HISTORY OF SOYBEANS AND SOYFOODS IN JAPAN,

AND IN JAPANESE COOKBOOKS AND RESTAURANTS

OUTSIDE JAPAN (701 CE TO 2014):

EXTENSIVELY ANNOTATED

BIBLIOGRAPHY AND SOURCEBOOK

See also:
How Japanese and Japanese-Americans Brought Soyfoods to the United States and the Hawaiian Islands – A History (1851-2011)

Jokichi Takamine (1854-1922) and Caroline Hitch Takamine (1866-1954): Biography and Bibliography

Compiled

by

William Shurtleff & Akiko Aoyagi

SOYINFO CENTER

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History of Fermented Black Soybeans in Japan
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DEDICATION AND ACKNOWLEDGMENTS

This book is dedicated to generations of soyfoods makers and researchers, and soybean growers in Japan.

Part of the enjoyment of writing a book lies in meeting people from around the world who share a common interest, and in learning from them what is often the knowledge or skills acquired during a lifetime of devoted research or practice. We wish to give deepest thanks...

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This book, no doubt and alas, has its share of errors. These, of course, are solely the responsibility of William Shurtleff.

■ This bibliography and sourcebook was written with the hope that someone will write a detailed and well-documented history of this subject.

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INTRODUCTION

Brief chronology of soybeans and soyfoods in Japan.

701 CE – The *Taihō Ritsuryō* [Taiho Law Codes], by Emperor Monmu, which some regard as Japan's first constitution, is the earliest document seen that mentions soyfoods (and by implication soybeans) in Japan. It is also the earliest document outside of China to mention fermented black soybeans (FBS), which it calls "*kuki*" or "*shi*." These law codes established the *Hishio Tsukasa*, or Bureau for the Regulation of *Hishio* Production, Trade and Taxation. The *Hishio Tsukasa*, located in the Imperial Palace, was an annex of the emperor's kitchen, where *hishio* was made. Using methods very similar to those developed in China, it transformed soybeans into *hishio* (which resembled Chinese *jiang*), fermented black soybeans (*kuki* or *shi*), and *misho* (an ancestor of miso; the term "miso" had not yet been coined). These foods and seasonings were consumed at the Imperial Household (Shurtleff & Aoyagi 1978, p. 219). FBS are again mentioned in Japan in 718, 730, and 923.

In 675 the first prohibition of meat eating in Japan was promulgated by Emperor Tenmu. Similar decrees, based on the Buddhist prohibition of killing, were issued repeatedly by emperors during the eighth and ninth centuries. Soyfoods gradually began to supply the savory flavor and protein that formerly had come from meat. Not until the 1860s did meat-eating resume in Japan, and not until after World War II did it become part of Japanese culture (Ishige 2001, p. 52-55, 146-153).

712 CE – The mythical story of the origin of the soybean in Japan is told in the *Kojiki* (Record of Ancient Matters).

720 CE – The mythical story of the origin of the soybean in Japan is told again in the *Nihon Shoki / Nihongi* (Chronicles of Early Japan).

725 CE – The *Harima no Kuni Fudoki* [Geography and Culture of Harima province], from Japan, is the first document that mentions koji outside of China. It states that by the early 8th century in Japan, koji was being made using airborne koji molds.

741 CE – Two new Buddhist temples are added to each feudal domain (*kuni*) in Japan: Kokubunji is for monks and Kokubunniji is for nuns. It is said that from this time, fermented black soybeans (*tera nattō*, or *shiokara nattō*) spread throughout Japan. They are made from soybean koji, which is soaked in salted water and dried.

760 CE – The *Manyōshū* (Collection of Japan's Earliest Songs and Poems) (from 350-759 CE) mentions koji – the 2nd earliest Japanese work to do so.

794 CE – The capital of Japan is relocated to Kyoto from Nara. The Heian period (794-857) begins.

901-08 CE – The modern word for *miso* first appears in Japan in the *Sandai Jitsuroku*.

927 CE – The *Engishiki* is completed by Fujiwara no Tokihira (871-811) and others. In this book it is written: "In the feudal domain of Omi 60 koku of soybeans [1 koku = 47.6 gallons or 180 liters], in the domain of Tanba 30 koku, in the domain of Harima 20 koku, in the domain of Misa 10 koku, and in the domain of Iyo 10 koku are recommended (*susumu*)." It seems that the soybean was now an important crop in Japan.

1051-1083 – The origin of natto is obscure. According to legend, it was discovered accidentally in northeast Japan by Minamoto (Hachimantaro) Yoshiie when warm, cooked soybeans, placed in a rice-straw sack on the back of a horse, turned into natto. The warmth of the horse (106 deg. F.) helped the fermentation; natto prefers 104 deg. F.

1058-1068 – The word "natto" first appears in Japan, but it refers to "salty natto" (*shiokara nattō*) (fermented black soybeans) rather than to "sticky soybeans" (*itohiki natto*). In about 1068 salty natto are first mentioned in Japan in the book *Shin Sarugakki*, [New Monkey Play Story: A humorous novel…] by Fujiwara no Akihara (lived 989-1066).

1183 Jan. – Tofu is first mentioned in Japan in the Diary of Hiroshige Nakaomi.

1192 – The Kamakura period and shogunate begins as Minamoto no Yoritomo (1147-1199) becomes the first head shogun. The seat of power has been moved from Kyoto (where the emperor resides) to far-away Kamakura, near today's Tokyo.

1228 – The Buddhist monk Kakushin returns to Japan from Song / Sung dynasty China having learned the method for making fermented Kinzanji miso. While fermenting the miso in Japan, he discovers that the liquid (tamari) which gathers on the bottom of the vats can be used as a tasty seasoning. This tamari is considered to be the first soy sauce in Japan.

1275 July 26 – Edamamé (green vegetable soybeans in the pods) are first mentioned in Japan (or worldwide) in a letter

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from Nichiren, the Japanese Buddhist saint. In a letter to Mr. Takahashi, one of the parishioners at his temple, he says "Thank you for the edamamé."

1288-1292 – Tamari-style shoyu is first sold from Yuasa in the Kishu area (in today's Wakayama prefecture).

1405 Dec. 19 – Natto (*itohiki natto*) is first mentioned in the diary of Noritoki Fujiwara; it is called *itohiki daizu* ("stringy soybeans").

1450 – The word "natto," referring to *itohiki-natto*, is next used in Japan in the *Shojin Gyorui Monogatari*. This is a funny story about foods that are depicted as people and a battle for rank between vegetarian and nonvegetarian foods. Natto, called "Natto Taro" or "Natto Taro Itogasane" (the last word meaning "many threads") is given a high rank.

1540? – *Mame no ko*, the early Japanese word for roasted soy flour, first appears in the *Nyōbō Shitsukegaki* [Women's Book of Manners] – according to the *Nihon Kokugo Daijiten.*

1542 Jan. 1 – *Mame no ko* appears again in the *Tamon-in Nikki* [Tamon-in Diary].

1587 June 19 – Kinako, the modern Japanese word for roasted whole soy flour, first appears in the *Sotan Chakai Kondate Nikki* [Master Sotan's Tea Ceremony Cookery Menu Diary] – in the morning menu.

1603 – *Vocabulario da Lingoa de Iapam* [Vocabulary of the Language of Japan], a Japanese-Portuguese dictionary, is compiled and published by Jesuit missionaries in Nagasaki, Japan. There are entries for:

Abura ague [Abura-agé, deep-fried tofu pouches]

Amazaqe [Amazake], a still-bubbling fermented liquid that has not yet completely become sake; or sweet sake.

Azzuqi or azzuqui [azuki beans].

Cabe [Kabe]. Same as tofu.

Côji [Koji], a yeast [sic] used in Japan to make sake, or mixed with other things

Daizzu [Daizu, whole dry soybeans].

Dengacu [Dengaku]. Dancing monks or skewered tofu spread with miso and broiled.

Fanben [Hanben]. A type of food which is made by broiling tofu and simmering it with miso.

Icchô. A way of counting some types of food, such as tofu.

Miso. A kind of mixture which is made with *graos* [grains, seeds, kernels], rice, and salt to season Japanese soups.

Misocoxi [*Misokoshi*], a bamboo strainer used for straining miso.

Misoya, a shop that sells miso.

Misoyaqijiru [*Miso-yaki-jiru*], a type of soup (Xiru) made with tofu and finely sliced daikon radish.

Misôzzu, which should properly be called Zosui, is a healing food made from vegetables, rice, miso, etc.

Nattô, a type of food made by a brief boiling of grains / seeds [graos], which are then put into an incubation chamber (muro).

Nattôjiru, a soup (*Xiru*) made from natto.

Tamari, a very savory liquid taken from miso which can be used for seasoning foods [when cooking] or at table.

Tôfu* – Taufu. A type of food. It is made into the shape of a cheese by crushing soybeans.

Tôfuya – Taufuya, a shop which makes and sells that cheese-like thing (tofu), which is made by grinding soybeans that have been soaked in water until they are soft.

Vdondôfu [Udon-dôfu]. Tofu which is made like udon (Japanese-style wheat noodles) and cooked.

Xôyu [Shoyu, or soy sauce], a liquid which corresponds to vinegar except that it is salty. It is used for seasoning foods. It is also called *sutate*.

Yudôfu – Yudaufu: A food made from thinly sliced tofu, served next to a *kakejiru*-type sauce [which is then poured over the top].

1605 –Tokugawa Ieyasu in Japan commands the monks at Daifukuji temple to make Hamana Natto – a type of fermented black soybeans, later known as Hamanatto (Saito 1985, p. 14-16).

1633 – The Tokugawa shogunate (upset at Portuguese Christian missionaries intent on making converts and instigating revolts) adopts a policy of national isolation which continues for 221 years until 1854. In 1639 the Portuguese are expelled. This leaves only the Dutch among the Europeans still trading with Japan.

1639 – By this time the Japanese had so successfully closed their doors to the outside world that subsequently Japan all but dropped out of the consciousness of Europeans. The only important exception was the annual Dutch vessel from the East Indies to the Dutch trading post on the island of Hirado, then Deshima in Nagasaki harbor.

1641 – The Dutch and their representatives are moved from Hirado to the tiny artificial island of Deshima / Dejima built by the shogunate in Nagasaki harbor, where they were kept as virtual prisoners. During this time Japan maintained contact with only two other nations: China and Korea. Chinese merchants were also allowed to trade at Nagasaki, but under strict controls.

1647 Oct. 16 – Japanese soy sauce (shoyu) is now being exported from Nagasaki, Japan, by the Dutch East India Company. In the earliest known handwritten letter (in Dutch)

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it is called *soije* (*Int. Comptoir Nagasaekij*). The Dutch merchants who exported shoyu in kegs from Japan did their best to spell it as it sounded – phonetically. Here is how that spelling evolved – based on documents now at Soyinfo Center; each appears in this book:

1647 Oct. – soije
1651 June – sooje
1652 July – soij
1652 Aug. – soije
1652 Oct. – soije
1652 Oct. – zoije
1654 July – soijo
1655 Aug. – soija
1656 March – soeije
1657 Aug. – soija
1659 Aug. – soija
1660 June – soije
1665 Feb. – soija
1669 Feb. – soija
1669 Feb. – soija
1674 Nov. – sooij
1675 Nov. – soija
1676 March – soija
1676 June – soija
1678 Nov. – soija
1680 June – soije

Note: The words "soy," "soya" and "soja," and the term "soy sauce" came into English from the Japanese word *shōyu* via the Dutch. Thus, the name of the soybean was derived from the name of the sauce made from it.

1661 – Kikkoman traces its origins to this date when the Takanashi and Mogi families constructed breweries and started brewing soy sauce (Fruin 1983).

1712 – Englebert Kaempfer, a German who lived in Japan, is the first European to give detailed descriptions of how miso and shoyu are made in Japan – in his landmark Latin-language book *Amoenitatum exoticarum politico-physico-medicarum* [Exotic novelties, political, physical, medical, Vol. 5, p. 834-35]. He also mentions koji (which he calls *koos*), but he does not understand what it is, how it functions, or how it is made.

1727 – Miso is first mentioned in an English-language publication, *The History of Japan*, by Englebert Kaempfer. He spells it "*Midsu*, a mealy Pap, which they dress their Victuals withal, as we do butter."

1750 Dec. – Soy sauce first reaches North America – arriving first in New York Harbor bearing the name "India Soy." It was made in Japan and exported by the Dutch East India Co. to Amsterdam; from there it made its way to New York.

1797 – The *Nihon Sankai Meisan Zue* [Illustrations of Japanese Products of Land and Sea] contains the earliest known illustration of koji being made in Japan; the koji is then shown being made into sake.

1804 – San Jirushi starts making tamari shoyu and miso in Kuwana, Japan. The company name was changed in 1909 from 'Minato-ya' to 'Sato Shinnosuke Shoten' and finally to 'San-Jirushi Brewing Corporation' in 1963 (Earle 1988).

1853 July 8 – A fleet of ships headed by Commodore Matthew Perry (USA) arrives in Japan to "open" Japan to trade with the West. For the previous 220 years, during the Tokugawa period (1600-1868) the ruling shoguns had initiated a policy of self-imposed isolation (*sakoku*) or exclusion to keep out foreign influences.

1867 – *A Japanese and English Dictionary* (*1st edition*), by James C. Hepburn, is published. Many soy-related words and terms appear. * = word first appears in English in this dictionary:
Amazake *
Daidz [Daizu]
Go – Beans mashed into paste.
Gokoku – The five cereals, incl. beans.
Hirodz * [Hirodzu, Hiryozu]
Kinako *
Kiradz * [Kiradzu, Kirazu = okara]
Koji *
Mame
Mame no ko
Miso
Natto *
Nigari
Sh'taji * [Shitaji = woman's word for soy sauce]
Shoyu *
Tofu *
Yuba *
Yu-dofu

1868 Sept. 12 – The Meiji Restoration in Japan begins. Formal coronation of the emperor Meiji. He is the first emperor of Japan with real power since 1192 – during which time the military shoguns had held the real power. Oct. 23 – The name of his era is changed to Meiji. Nov. 6. The capital of Japan is moved from Kyoto to Edo, and Edo is renamed Tokyo.

1871 July – A brewing tax (*jōzō-zei*) and patent tax are levied on clear sake (*seishu*), unclear sake (*dakushu*), and shoyu. But in 1875 the two taxes on shoyu are discontinued because shoyu is considered one of the necessities of life.

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1873 May – The Japanese government exhibits soybeans at the exposition in Vienna, Austria. Also at this expo, Kikkoman uses glass bottles for their shoyu for the first time.

1878 – The first official government statistics on soybean cultivation in Japan start to be compiled. This year the area is 411,200 hectares and production is 211,700 metric tons [tonnes; the yield is 514 kg/ha].

1890 Dec. – Jokichi Takamine arrives in Chicago, Illinois, and (working closely with both his wife's parents), establishes the Takamine Ferment Co. and becomes involved in a project (with the "whisky trust") to replace malt with koji in the manufacture of whisky in order to increase the yield of whisky per bushel of corn and decrease the cost of making whisky.

1891 Feb. 28 – The first article about the work of Jokichi Takamine that mentions "diastase" (a starch-digesting enzyme now, called amylase) or "koji" (the source of enzymes in making Japanese sake, soy sauce, miso, and amazake) is published. These enzymes "convert starch into sugar," which (in the absence of salt) can then be fermented into alcohol.

It also states that "Mr. Takamine has patented his new process in Europe and the United States" and that he has just entered into a contract with the Distillers' and Cattle Feeders' Company (whisky trust) of Peoria, Illinois (*Peoria Herald*, p. 8).

1894 Feb. 23 – Jokichi Takamine applies for his earliest patent (U.S. Patent No. 525,823) which contains the word "enzyme" (or enzymes") or the terms "diastatic enzyme" or "taka-koji" or "tane-koji" in connection with koji. This is the first patent on a microbial enzyme in the United States. This enzyme "possesses the power of transforming starch into sugar." This patent was issued on 11 Sept. 1894. It was the key patent in the production of Taka-diastase, a digestive enzyme.

"Takamine, in 1894, was probably the first to realize the technical possibilities of enzymes from molds and to introduce such enzymes to industry" (Underkofler 1954, p. 98).

1895 April 17 – The Treaty of Shimonoseki ends the Sino-Japanese War (1894-95); Japanese victory establishes Japan as a regional power. China is obliged to cede Taiwan (Formosa), the nearby Pescadores Islands, and the Kwantung Peninsula in South Manchuria to Japan; recognize Korea's independence; pay 200 million taels indemnity; open more ports; and negotiate a commercial treaty. The latter, signed in 1896, gave Japan all the privileges that the Western powers had in China and added the further privilege of carrying on 'industries and manufactures,' using the cheap labor in the treaty ports. The Kwantung Peninsula (southern Manchuria) soon became an important source of soybeans for Japan.

1901 – Crushing of soybeans starts in Japan. Owada Seisakusho of Tsuruga, Fukui prefecture, Japan, starts making soy oil and soybean cakes using the press method (*assaku-ho*).

1901 – Nakahara Kota is issued a patent on his process for making dried-frozen tofu indoors in a freezer (*jinko kôri-dofu*). This makes it possible to produce a good-quality product year round. This year there are 453 makers of dried-frozen tofu in Nagano. Nagano prefecture encouraged production of this product during the Russo-Japanese War as a side home industry.

1905 Sept. 5 – The Treaty of Portsmouth ends the Russo-Japanese War (Feb. 1904-1905). In a mere 50 years Japan had transformed itself from an isolated underdeveloped country with no industrial base into a modern nation, a major military and industrial power. The victorious Japanese move into Korea. The treaty gave Japan the Russian lease on the Kwantung Peninsula and the Russian-built South Manchurian Railway as far north as Changchun. This event won for Japan full status as a world power and equality with the nations of the West. In its victory over Russia, Japan became the first non-white or non-Western nation to defeat a white or Western nation in a war.

1905 – At about this time, soybean cake (*daizu kasu*) passes fish cake to become the main fertilizer for crops in Japan.

1906 April – Katayama, in Japan, reports that he has made "A condensed vegetable milk" from soy-beans.

1906 Aug. – "On the microorganisms of natto," by S. Sawamura is published in a scientific journal in Japan. He found two bacteria in natto. He was the first to isolate *Bacillus natto* Sawamura from natto, to give that name to the newly-discovered microorganism, and to show that it was responsible for the natto fermentation.

1906 – Soybeans and soybean cake are first successfully exported from Manchuria to Japan. During 1906 the exports were 16,130 tons of beans and 64,520 tons of cake, and in 1907, 17,359 tons of beans and 26,605 tons of cake. In Japan the bean cake was used as a fertilizer (Maynard 1911; Turner 1914).

1907 March – Nisshin Mamekasu is founded (initial capitalization is 3,000,000 yen). The next year its soybean crushing plant in Dairen, Manchuria, starts to operate. In 1918 the company merged with Matsushita Mamekasu to become Nisshin Seiyu K.K.

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1907 – Korea becomes a Japanese protectorate.

1910 – Japan forcibly annexes Korea as a province called Chōsen. Japan will continue to exercise rather harsh control over Korea until 1945, including importing a large percentage of the soybeans grown in Korea.

1912 – Dr. Shinsuke Muramatsu of the Morioka College of Agriculture publishes "On the Preparation of Natto" in English. He found that three *Bacillus* species or strains produced fine natto with strong viscosity and good aroma at 45°C, but that *Bacillus* No. 1 produced the best product; he recommended its use as a pure culture. He concluded by giving the first nutritional analysis of fresh natto and of natto that was several days old. Soon Dr. Muramatsu started producing his "College Natto" at the College of Agriculture. His students helped to make and sell it, as a source of income, and it became very popular.

1914 – The Mogi Saheiji family in Noda starts to sell shoyu in 1-sho bottles (1 *sho* = 1.805 liters or 3.81 pints). Before this time a ceramic sake bottle (*tokkuri*) was used.

1917 Dec. – Eight Mogi and Takanashi family companies, the leading shoyu producers in the Noda area, merge to form Noda Shoyu Co., Ltd., a company with capital of ¥7 million and the predecessor of Kikkoman Corporation.

1918 March – Arao Itano of Japan is the world's first person to conceive of making an ice cream from soy. In an article titled "Soy beans as human food," in the *Massachusetts Agricultural Experiment Station Bulletin* No. 182 he states "Vegetable butter, ice cream, oil (table use) and lard (cooking): The manufacture of these articles from soy beans needs further investigation."

1919 – Dr. Jun Hanzawa, of Hokkaido University's Department of Agriculture, published the first of three key reports which helped to bring natto production in Japan out of the "Dark Ages." Serving simultaneously as a microbiologist, and extension worker, and a pilot plant operator, Dr. Hanzawa began by making a pure-culture bacterial inoculum for natto; this enabled commercial natto manufacturers, for the first time, to discontinue the use of rice straw as a source of inoculum. Secondly, disliking the use of rice straw even as a wrapper, he developed a simple, low-cost method for packing, incubating, and selling natto wrapped in paper-thin sheets of pine wood (*kyōgi*) or small boxes of pine veneer (*oribako*). A third important improvement followed shortly; the development of a new incubation room design (*bunka muro*), which had an air vent on the ceiling and substantially decreased the natto failure rate. These three developments laid the basis for modern industrial, sanitary, scientific natto manufacture. Commercial natto makers filled his classes and he worked as a consultant for them. Like Dr. Muramatsu before him, Dr. Hanzawa sold his "University Natto" from his research lab, promoting it as a rival to cheese. He was given the appellation of "the father of modern natto production," and he was given the honor of addressing the emperor of Japan on the subject of natto.

1920 – Soybean production in Japan peaks at about 548,000 metric tons per year, as Japan begins to import more and more low-cost soybeans from Manchuria and Korea. As a result, soybeans become unprofitable for Japanese farmers and they tend to grow soybeans mainly for their own home use. Soybean production in Japan continues to fall until 1945 – near the end of World War II.

1922 April – The oil production department of Suzuki Shokai [which went bankrupt in 1922] becomes independent and founds Hohnen Oil Co., Ltd. (*Hohnen Seiyu*).

1923 Sept. – The Great Kanto / Tokyo Earthquake (*Kanto Daishinsai*) strikes. 70% of the miso factories in the area are burned down, causing a shortage of miso. But miso makers in other parts of Japan use this opportunity to ship their miso to Tokyo, and the people of Tokyo come to realize the good taste of miso made elsewhere in Japan.

1925 – Soybean meal begins to be used as a protein source in livestock and poultry feeds to supplement the traditional fish meal (Kitamura 1965).

1926 – Nakazawa Ryoji, a famous Japanese microbiologist, becomes the first Japanese to study or write about tempeh. In April and May of 1926 (following preliminary investigations in 1912 and 1924) Nakazawa took a research trip to Java and Sumatra and carefully collected (in sterile containers) 59 samples of soy tempeh and onchom from various markets and small manufacturers. He published his findings in the April 1928 issue of *Nippon Nogeikagaku Kaishi.*

1929 Feb. 18 – P.H. Dorsett (age 67) and W.J. Morse (age 45) leave Washington, DC, by train, for a 2-3 year expedition to the Orient. Two of the main goals of the expedition are to collect soybean varieties and soybean products, and learn as much as possible about growing and processing soybeans in Japan, Korea, Manchurian, and China. The group sails for Japan on March 1 aboard the *President Grant*. They arrive in Tokyo on March 18, set up headquarters there, and spend most of the first year in Japan. At the end of each day they type up their notes and add original photographs to their trip report.

Major accomplishments of the expedition:

■ **(1) Soybean varieties**: They collect and send back to the USA 4,451 soybean varieties (PI numbers) of which 986 (22.2%) were still in the USDA germplasm collection in

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1981 (R. Bernard, 1981). However none of these are major ancestors of soybean varieties grown in 1972 (National Research Council, 1972, Chap. 13).

■ **(2) Soybean products**: Morse collects, Dorsett photographs, they describe and send back more than 300 soybean products.

■ **(3) Trip report**: The typewritten Log of the Dorsett-Morse Expedition to East Asia, which fills 17 volumes and contains more than 8,818 pages plus about 3,200 glossy black-and-white photo prints, is now at the USDA National Agricultural Library (Beltsville, Maryland), in the Rare and Special Collections.

■ **(4) Vegetable-type soybeans / Edamame**: Morse discovers a new type of soybean. He realizes that Japanese think of vegetable-type soybeans (which are grown by horticulturists and home gardeners, and eaten as a green vegetable – e*damame*) as completely different from regular soybeans (*daizu*). He collects more than 100 different edamame varieties, and they soon become popular in the United States (Lloyd & Burlison 1939; Cates 1939).

1931 Sept. 18 – The Manchurian Incident (also called the Mukden Incident) is used by the Japanese as an excuse for occupying all of Manchuria. For Japan, "the prize" in Manchuria is soybeans, soybean cake and soybean oil, which they export to Japan.

1941 Dec. 7 – Japanese aircraft attack Pearl Harbor. The United States enters World War II.

1945 Sept. 2 – Surrender of Japan after World War II. The documents of unconditional surrender are signed on board the battleship *USS Missouri* in Tokyo Harbor. Japan's empire is broken up. Manchoukuo (Manchuria) and Formosa (Taiwan) are returned to China. Korea is divided into north and south; South Korea declares independence in May 1948 as the Republic of Korea with Seoul as its capital. The island of Sakhalin reverts to the Soviet Union

The United States now stands astride the world as the only remaining great power. General Douglas MacArthur, as Supreme Commander for the Allied Powers (SCAP) in Japan, and his staff helped Japan to rebuild itself (to the amazement of most Japanese), institute democratic government, and chart a new course that ultimately made Japan one of the world's leading industrial powers.

1945 – Soybean production in Japan drops to the lowest level since record-keeping began – 170,000 metric tons per year. The next year it starts to rise and continues to rise until 1952 (521,000 tonnes) when rapidly increasing soybean imports from the USA cause Japanese production to enter a long, steady decline.

1948 Oct. 10 – Since the end of World War II, Japan has imported only 42,569 tons of soybeans (Kurakake 1948).

1950 June 25 – Outbreak of the Korean War between North and South Korea. Soybean imports from China to Japan come to a complete stop (Hirano 1952).

1951 – From about this time, the number of natto makers in Japan increases rapidly. Natto consumption begins to spread southward from the northeast prefectures (*Tohoku chiho*).

1956 Jan. – There are now in Japan about 50,000 tofu shops, 6,000 soy sauce plants, 5,000 miso shops, and 3,000 oil mills (Strayer 1956, p. 8).

1956 April – The Japan American Soybean Institute (JASI) is established in Tokyo with Shizuka Hayashi as its first director and most of its funding from USDA's Foreign Agricultural Service (FAS). It has only one objective: To increase the market for U.S. soybeans and soybean products in Japan. With its earlier major sources of inexpensive soybeans in Manchuria and Korea now gone, Japan quickly becomes a major importer of U.S. soybeans. However Japanese makers of soyfoods constantly complain, year after year, of the poor quality of U.S. soybeans (too much foreign matter, broken soybeans, weed seeds, etc.).

1957 June – Kikkoman International Inc. (KII), a soy sauce sales company, is established in San Francisco, California, in the United States. KII imports Kikkoman Shoyu from Japan and markets it in the USA.

1957 – Japan's first commercial soymilk, sold in bottles, named *Tônyu*, is introduced by the Ueda Tofu Shop in Hachioji, Tokyo. Dr. Harry Miller is the inspiration for and helps to establish the shop.

1959 – The first instant miso soup is introduced by Yamajirushi Miso in Nagano. It contains dried green onions, wakame, dried tofu [probably dried-frozen tofu], etc.

1960 – Soybean imports rise to 1,128,000 metric tons (tonnes) topping 1,000,000 tonnes for the first time.

1960 – Per capita consumption of shoyu drops to 13.7 kg. It has now fallen below 14 kg/person. Japan is moving toward a more Western-style diet, with bread replacing rice and with more total protein, animal protein, meat, and fat.

1961 July 1 – The tax on imported soybeans is removed.

1962 – A new natto container made of Styrofoam (*PHP yoki, happo suchiroru*) is invented.

1963 Jan. – William Brandemuhl (an American) arrives

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in Japan to begin 15 months of field research on soybean realization. In June 1963 he is joined by Tomoko Arai, his bride to be, who helps him greatly. Their resulting book (now published *only* on Google Books), containing many photos, gives a detailed record of soyfoods in Japan at this time.

1964 Oct. – Noda Shoyu Co., Ltd., is renamed Kikkoman Shoyu Co., Ltd.

1965 – Per capita miso consumption drops to 7.8 kg, falling below 8 kg/person.

1966 – At about this time meat analogs, based on modern soy protein products, start to be sold commercially in Japan.

1966 – Soybean imports rise to 2,168,467 tonnes, passing the 2 million tonne mark for the first time. Production of soybeans in Japan drops below 200,000 tonnes for the first time. Japan now produces only 9% of the soybeans it consumes.

1966 May – Kikkoman starts to sell low-salt shoyu.

1968 July – Shizuka Hayashi retires as managing director of the Japanese American Soybean Institute in Tokyo after 12 years of service. Scott Sawyers takes over as country director in Japan for the American Soybean Association.

1968 – Bottling of Kikkoman Soy Sauce for the American market begins at the Leslie Foods plant in Oakland, California.

1969 March – Nineteen major food manufacturers in Japan join to form the New Protein Food Council, which will make meat alternatives based on modern soy protein products and wheat gluten.

1969 – Annual per capita consumption of soy oil in Japan rises to 3.2 kg, passing the 3 kg mark for the first time. In 1960 it was 1.2 kg/person.

1960s – In Japan, soymilk slowly increases in popularity. New manufacturers are: Nihon Tanpaku Kogyo (1962). College Health Foods (later renamed San-iku Foods) in Chiba prefecture with its Soyalac (1969, also inspired and aided by Dr. Harry Miller). Luppy Tanpaku (House Shokuhin) in Saitama prefecture with its Luppy soymilk (1969).

1972 March – Kikkoman Foods, Inc. (KFI), is established in Walworth, Wisconsin (USA) for the purpose of manufacturing soy sauce and teriyaki sauce. The grand opening and ribbon-cutting is on 21 June 1973, with the governor of Wisconsin present.

1973 June 27 – President Richard Nixon sets new regulations for soybean exports from the USA. This comes as a huge shock to the Japanese – and causes them to look to other soybean suppliers, such as Brazil, to diversify their sources.

1978 – Soybean imports rise to 4,260,000 tonnes, topping 4 million tonnes for the first time. This is 4.5 times as much soybean imports as 20 years earlier.

1979 – Tofu production continues to rise, reaching 1,114,000 tonnes, and topping 1.1 million tonnes (metric tons) for the first time.

1980 – Production of natto reaches 153,000 tonnes, up 33% compared with 10 years ago (when it was 115,000 tonnes). This is largely a reflection of the health food movement in Japan.

1980 Oct. – Kikkoman Shoyu Co., Ltd. is renamed Kikkoman Corporation – the company's present name.

1981 Feb. – Morinaga Tofu starts to be imported and sold in the USA from Japan.

1981 June – Japan's first soymilk ice cream is made by Kibun in Tokyo.

1981 Nov. – The Ministry of Agriculture and Forestry in Japan announces a Japanese Agricultural Standard (JAS) for soymilk. The soymilk boom in Japan starts; the total yen value of the soymilk by all major Japanese manufacturers is 5,000 million yen. The boom peaks in 1983.

1982 – Annual per capita consumption of soy oil in Japan rises to 5.1 kg, passing the 5 kg mark for the first time. In 1960 it had been 1.2 kg/person.

1983 June – Torigoe Seifun, Japan's fifth-largest flour miller, starts production of tempeh. This is the earliest known commercial tempeh ever made in Japan.

1983 July – At the NNFA show in Denver, Eden Foods surprises the natural foods industry by launching designed-for-America Edensoy in plain and carob flavors. Made in Japan by Marusan-Ai and exported by Muso, it is packed in a 6-ounce retort pouch. Sales of Edensoy soon skyrocket.

1983 Nov. 19 – House Shokuhin Kogyo, a major Japanese food company, invests $2.5 million in Hinode Tofu Co. in Los Angeles as part of a joint venture to expand tofu production.

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1983 – The soymilk boom in Japan peaks this year at 116,724 kiloliters (kl.). By 1986 it has fallen to 43,392 kl, which is only 37% of the peak.

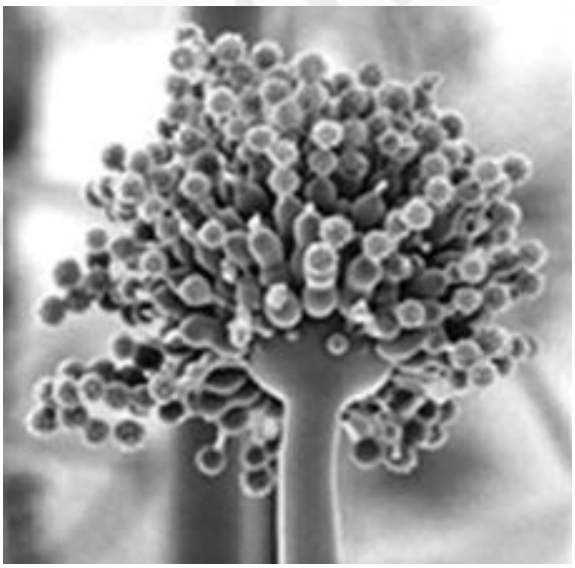
1985 Sept. – Tofu Time Inc. (founded by David Mintz, maker of Tofutti) enters into an agreement with Daiei, Inc., Japan's largest ice cream retailer, to export $350,000 worth of Tofutti to Japan. Daiei also plans to open three Tofutti Shops in Tokyo within the next 6 months.

1994 – Yamasa Corporation (the world's 2nd largest manufacturer of soy sauce after Kikkoman) opens a plant making shoyu in Salem, Oregon. The shoyu is first shipped in April 1995.

1996 April – Kikkoman establishes Kikkoman Foods Europe B.V., Europe's first soy sauce manufacturer, located in Hoogezand-Sappemeer, in the Netherlands.

1997 March – Kikkoman holds a ground-breaking ceremony for its second U.S. soy sauce production plant in the United States, in Folsom, California. Shipments start in Oct. 1998. Kikkoman's U.S. production of soy sauce rose from 1.59 million gallons in 1973 to 23.81 million gallons in 1993.

2005 Nov. Yamasa Corporation purchases San Jirushi Corp. and San-J International of Kuwana, Japan, and Richmond, Virginia.



ABOUT THIS BOOK

This is the most comprehensive book ever published about the history of soybeans and soyfoods in Japan. It has been compiled, one record at a time over a period of 35 years, in an attempt to document the history of this interesting subject. It is also the single most current and useful source of information on this subject.

This is one of more than 100 books compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyinfo Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features detailed information on:

- 92 different document types, both published and unpublished.
- 10,285 published documents - extensively annotated bibliography. Every known publication on the subject in every language.
- 899 unpublished archival documents.
- 634 original Soyinfo Center interviews and overviews never before published, except perhaps in our books.
- 334 commercial soy products.

Thus, it is a powerful tool for understanding the development of this subject from its earliest beginnings to the present.

Each bibliographic record in this book contains (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English language publications together with an English translation of the title, month and issue of publication, and the first author's first name (if given). For most books, we state if it is illustrated, whether or not it has an index, and the height in centimeters.

All of the graphics (labels, ads, leaflets, etc) displayed in this book are on file, organized by subject, chronologically, in the Soyinfo Center's Graphics Collection.

For commercial soy products (CSP), each record includes (if possible) the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as advertisements, articles, patents, etc.) are also given.

A complete subject/geographical index is also included.

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ABBREVIATIONS USED IN THIS BOOK

A&M = Agricultural and Mechanical
Agric. = Agricultural or Agriculture
Agric. Exp. Station = Agricultural Experiment Station
ARS = Agricultural Research Service
ASA = American Soybean Association
Assoc. = Association, Associate
Asst. = Assistant
Aug. = August
Ave. = Avenue
Blvd. = Boulevard
bu = bushel(s)
ca. = about (circa)
cc = cubic centimeter(s)
Chap. = Chapter
cm = centimeter(s)
Co. = company
Corp. = Corporation
Dec. = December
Dep. or Dept. = Department
Depts. = Departments
Div. = Division
Dr. = Drive
E. = East
ed. = edition or editor
e.g. = for example
Exp. = Experiment
Feb. = February
fl oz = fluid ounce(s)
ft = foot or feet
gm = gram(s)
ha = hectare(s)
i.e. = in other words
Inc. = Incorporated
incl. = including
Illust. = Illustrated or Illustration(s)
Inst. = Institute
J. = Journal
J. of the American Oil Chemists' Soc. = Journal of the American Oil Chemists' Society
Jan. = January
kg = kilogram(s)
km = kilometer(s)
Lab. = Laboratory
Labs. = Laboratories
lb = pound(s)
Ltd. = Limited
mcg = microgram(s)
mg = milligram(s)
ml = milliliter(s)
mm = millimeter(s)
N. = North
No. = number or North
Nov. = November
Oct. = October
oz = ounce(s)
p. = page(s)
photo(s) = photograph(s)
P.O. Box = Post Office Box
Prof. = Professor
psi = pounds per square inch
R&D = Research and Development
Rd. = Road
Rev. = Revised
RPM = revolutions per minute
S. = South
SANA = Soyfoods Association of North America
Sept. = September
St. = Street
tonnes = metric tons
trans. = translator(s)
Univ. = University
USB = United Soybean Board
USDA = United States Department of Agriculture
Vol. = volume
V.P. = Vice President
vs. = versus
W. = West
°C = degrees Celsius (Centigrade)
°F = degrees Fahrenheit
> = greater than, more than
< = less than

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You will be told how many times this term appears, then the first one will be highlighted.
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Chronological Order: The publications and products in this book are listed with the earliest first and the most recent last. Within each year, references are sorted alphabetically by author. If you are interested in only current information, start reading at the back, just before the indexes.

A Reference Book: Like an encyclopedia or any other reference book, this work is meant to be searched first - to find exactly the information you are looking for - and then to be read.

How to Use the Index: A subject and country index is located at the back of this book. It will help you to go directly to the specific information that interests you. Browse through it briefly to familiarize yourself with its contents and format.

Each record in the book has been assigned a sequential number, starting with 1 for the first/earliest reference. It is this number, not the page number, to which the indexes refer. A publication will typically be listed in each index in more than one place, and major documents may have 30-40 subject index entries. Thus a publication about the nutritional value of tofu and soymilk in India would be indexed under at least four headings in the subject and country index: Nutrition, Tofu, Soymilk, and Asia, South: India.

Note the extensive use of cross references to help you: e.g. "Bean curd. See Tofu."

Countries and States/Provinces: Every record contains a country keyword. Most USA and Canadian records also contain a state or province keyword, indexed at "U.S. States" or "Canadian Provinces and Territories" respectively. All countries are indexed under their region or continent. Thus for Egypt, look under Africa: Egypt, and not under Egypt. For Brazil, see the entry at Latin America, South America: Brazil. For India, see Asia, South: India. For Australia see Oceania: Australia.

Most Important Documents: Look in the Index under "Important Documents -."

Organizations: Many of the larger, more innovative, or pioneering soy-related companies appear in the subject index – companies like ADM / Archer Daniels Midland Co., AGP, Cargill, DuPont, Kikkoman, Monsanto, Tofutti, etc. Worldwide, we index many major soybean crushers, tofu makers, soymilk and soymilk equipment manufacturers, soyfoods companies with various products, Seventh-day Adventist food companies, soy protein makers (including pioneers), soy sauce manufacturers, soy ice cream, tempeh, soynut, soy flour companies, etc.

Other key organizations include Society for Acclimatization (from 1855 in France), American Soybean Association, National Oilseed/Soybean Processors Association, Research & Development Centers (Peoria, Cornell), Meals for Millions Foundation, and International Soybean Programs (INTSOY, AVRDC, IITA, International Inst. of Agriculture, and United Nations). Pioneer soy protein companies include Borden, Drackett, Glidden, Griffith Labs., Gunther, Laucks, Protein Technologies International, and Rich Products.

Soyfoods: Look under the most common name: Tofu, Miso, Soymilk, Soy Ice Cream, Soy Cheese, Soy Yogurt, Soy Flour, Green Vegetable Soybeans, or Whole Dry Soybeans. But note: Soy Proteins: Isolates, Soy Proteins: Textured Products, etc.

Industrial (Non-Food) Uses of Soybeans: Look under "Industrial Uses ..." for more than 17 subject headings.

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Pioneers - Individuals: Laszlo Berczeller, Henry Ford, Friedrich Haberlandt, Artemy A. Horvath, Englebert Kaempfer, Mildred Lager, William J. Morse, etc. Soy-Related Movements: Soyfoods Movement, Vegetarianism, Health and Dietary Reform Movements (esp. 1830-1930s), Health Foods Movement (1920s-1960s), Animal Welfare/ Rights. These are indexed under the person's last name or movement name.

Nutrition: All subjects related to soybean nutrition (protein quality, minerals, antinutritional factors, etc.) are indexed under Nutrition, in one of more than 70 subcategories.

Soybean Production: All subjects related to growing, marketing, and trading soybeans are indexed under Soybean Production, e.g., Soybean Production: Nitrogen Fixation, or Soybean Production: Plant Protection, or Soybean Production: Variety Development.

Other Special Index Headings: Browsing through the subject index will show you many more interesting subject headings, such as Industry and Market Statistics, Information (incl. computers, databases, libraries), Standards, Bibliographies (works containing more than 50 references), and History (soy-related).

Commercial Soy Products (CSP): See "About This Book."

SoyaScan Notes: This is a term we have created exclusively for use with this database. A SoyaScan Notes Interview contains all the important material in short interviews conducted and transcribed by William Shurtleff. This material has not been published in any other source. Longer interviews are designated as such, and listed as unpublished manuscripts. A transcript of each can be ordered from Soyinfo Center Library. A SoyaScan Notes Summary is a summary by William Shurtleff of existing information on one subject.

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About the Soyinfo Center: An overview of our publications, computerized databases, services, and history is given on our website.

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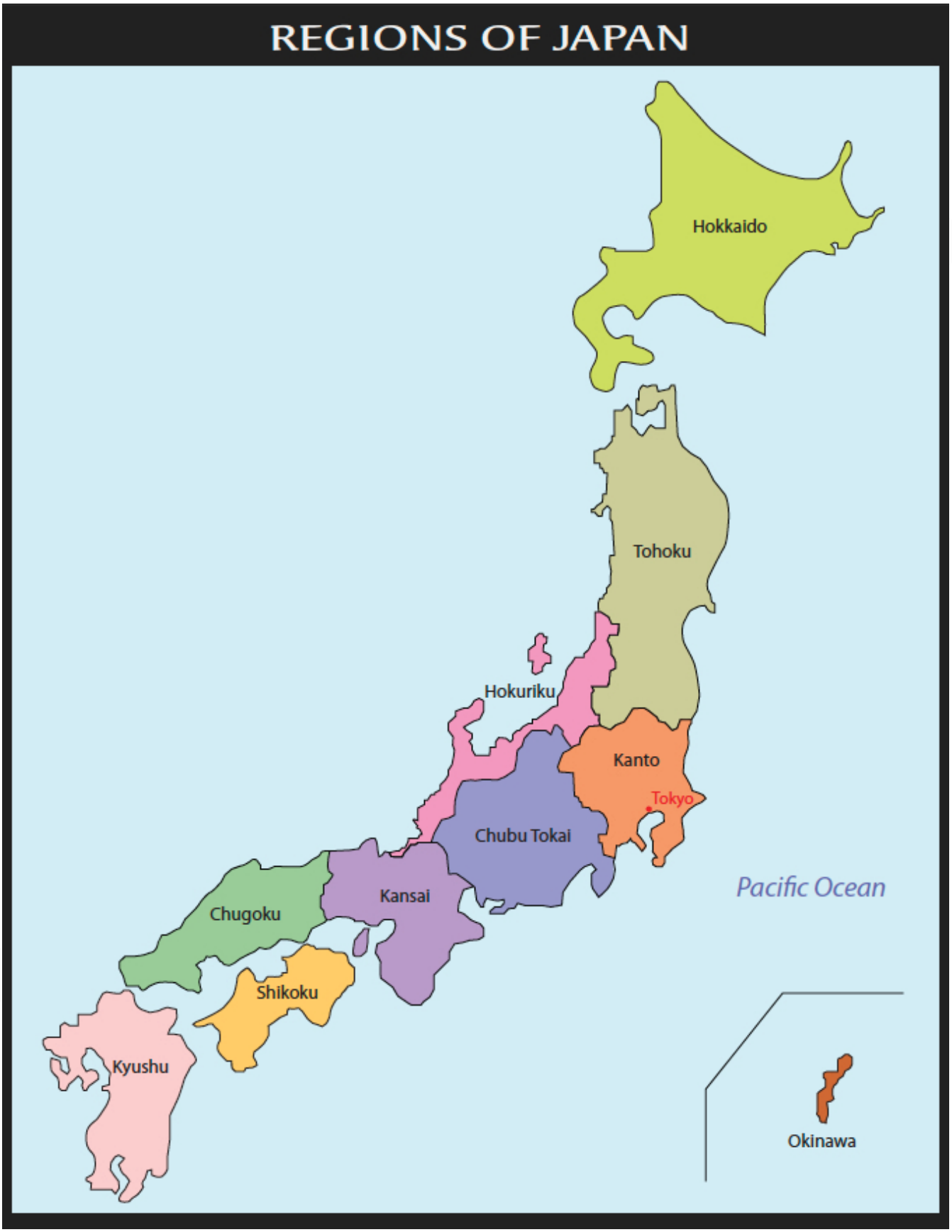

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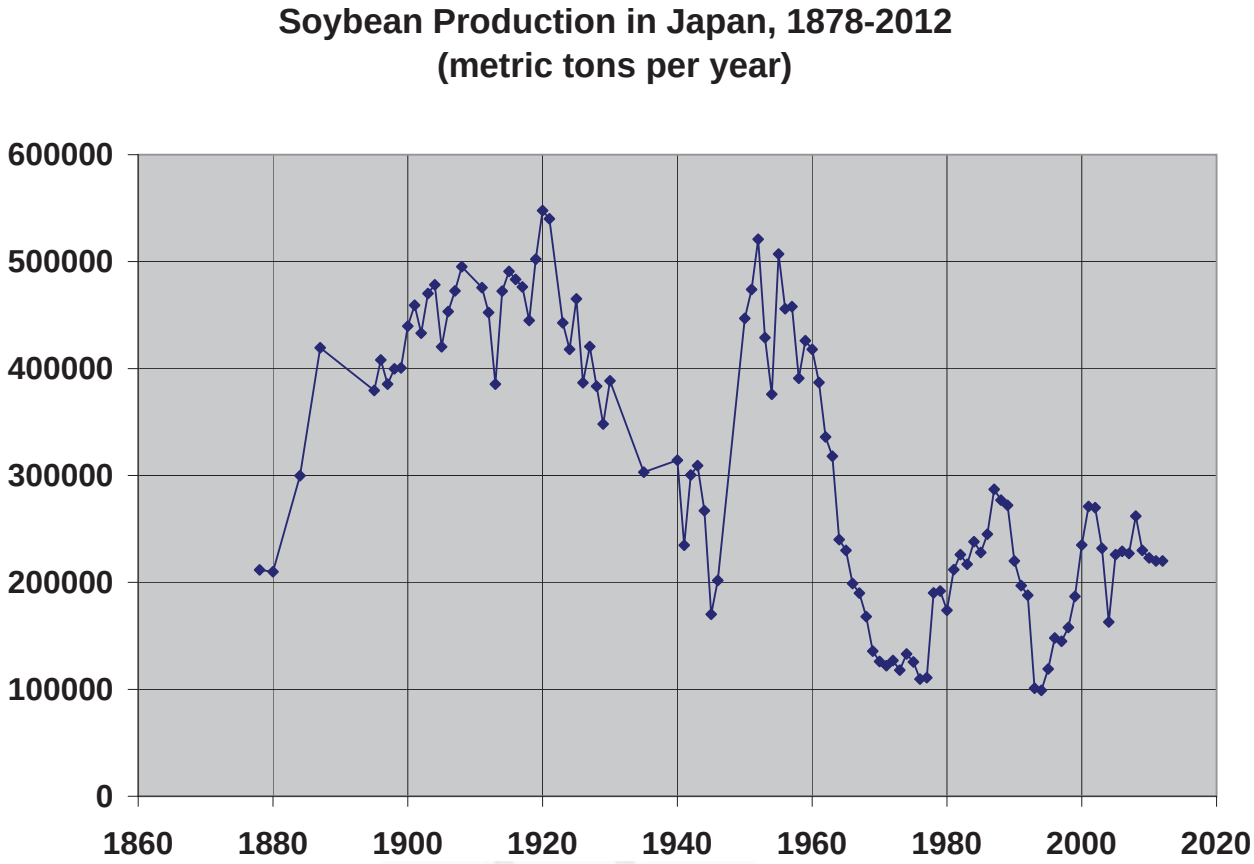

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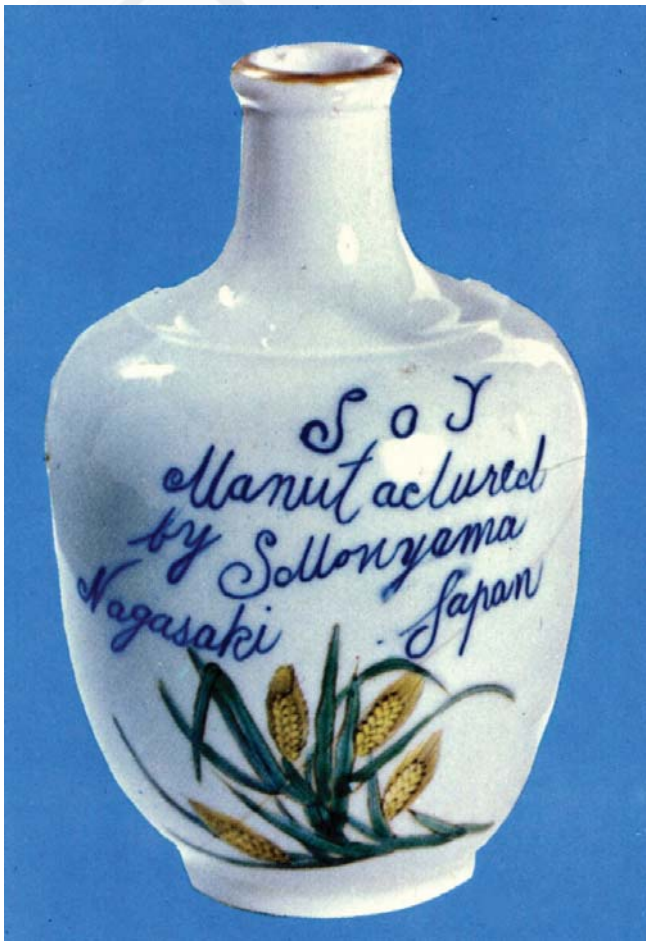

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HISTORY OF SOYBEANS AND SOYFOODS IN JAPAN, AND IN JAPANESE COOKBOOKS AND RESTAURANTS OUTSIDE JAPAN (701 CE TO 2014)

1. Emperor Monmu. 701 AD. Taihô ritsuryô [The Taiho Law Codes]. Japan. [Jap]*

• ***Summary:*** This is the earliest document seen (Jan. 2014) concerning soybeans, soybean products, or miso in Japan. Although it does not specifically mention soybean cultivation, the soybeans used to make the various fermented soy products described below must have been grown in Japan. This document also contains the earliest date seen for soybeans in Japan, or (by inference) the cultivation of soybeans in Japan (A.D. 701).

Shurtleff and Aoyagi (1976. *The Book of Miso,* p. 216; 1983. *The Book of Miso,* 2nd ed., p. 219): One of Japan's earliest constitutions, the *Taihô Ritsuryô* established the *Hishio Tsukasa,* or Bureau for the Regulation of Hishio Production, Trade, and Taxation in A.D. 701; it went into effect in 702. The Hishio Tsukasa, located in the Imperial Palace, was an annex of the emperor's kitchen (*kunaicho daizenshoku*), where hishio was made. Using methods very similar to those developed in China, it transformed soybeans into high- and low-quality *hishio* (which resembled Chinese *jiang*), fermented black soybeans (*kuki* or *shi*), and *misho* (an ancestor of miso; the word "miso" had not yet been coined). These foods and seasonings were consumed at the Imperial Household.

Note: This is the earliest Japanese document seen (Nov. 2011) that mentions *kuki,* an early type of Japanese fermented black soybeans / salted fermented soybeans.

Yokotsuka (1986, p. 198) states that the "Taiho-Law (701) mentioned soybean-hishio, miso, kuki (same as shi), taremiso, usu-dare, and miso-damari." But in a letter (June 1988) to William Shurtleff, who questioned the correctness of this, he stated, "This was a serious mistake. I am fully aware that there is no description of filtered soy sauce in the *Taiho Ritsuryo.* I should have written:

"Taiho-Law (701): Sho-shi and miso

"Taremiso, usudare, miso-damari (1300-1500)

"Ekirinbon-setsuyoshu (1598): Shoyu."

Usudaré and *miso-damari* were apparently liquid soy sauces. *Usu-daré* means a thin taré, where *taré* is a typically thick seasoning sauce. Miso-damari is the liquid that separates or is separated from miso, often forming a pool in the upper surface of the vat.

Reischauer and Fairbank (1960, p. 481-82) notes: "The Law Codes. The details of the administrative system which the Japanese borrowed from China can best be learned from the law codes they compiled on the basis of the Chinese models... The very concept of law was a new idea. Hitherto the Japanese had had only the unwritten precepts of the Shinto religion... The first code seems to have been compiled under Tenchi, but the most famous was the Taiho Code of 701."

2. Kojiki [Kojiki: Record of ancient matters]. 712 AD. Japan. [Jap]

• ***Summary:*** This is Japan's oldest chronicle. The mythical story of the origin of the soybean in Japan is as follows, from Philippi's 1968 translation (p. 87): "Chapter 18. Opo-ge-tu-pime produces food and is killed by Susa-no-wo. Again, [Susa-no-wo-no-mikoto] asked food of Opo-ge-tu-pime-no-kami. Then Opo-ge-tu-pime took various viands out of her nose, her mouth, and her rectum, prepared them in various ways, and presented them to him. Thereupon Paya-susa-no-wo-no-mikoto, who had been watching her actions, thought that she was polluting the food before offering it to him and killed Opo-ge-tu-pime-no-kami. In the corpse of the slain deity there grew [various] things: in her head there grew silkworms; in her two eyes there grew rice seeds; in her two ears there grew millet; in her nose there grew red beans [lit. "small beans," probably azuki]; in her genitals there grew wheat; and in her rectum there grew soy beans. Then Kami-musubi-mi-oya-no-mikoto ['Divine Generative Force Deity'] had these taken and used as seeds." Note: This is the earliest Japanese-language document seen (Jan. 2005) that mentions azuki beans.

Concerning the book, Reischauer and Fairbank (1960, p. 464-65) note: "The 'Kojiki' and 'Nihon Shoki.' The most important materials bearing on Japanese origins and the formation of the Japanese state are the early native records, but this is not for reasons of accuracy. The *Kojiki* (*Record of Ancient Matters*) was compiled only in 712 and the *Nihon shoki* (*History of Japan,* also known as the *Nihongi*) in 720. Influenced by eighth century concepts, the authors of these works obviously reshaped Japanese mythology and historical traditions to enhance the prestige and power of the ruling family and to create a false picture of long centralized rule and a respectable antiquity comparable to that of China. Although reasonably reliable on the later periods, their accounts of the early centuries are almost worthless as history...

"The accounts of early history in the *Kojiki* and *Nihon shoki* were woven together out of a variety of myths, legends, genealogies, vague historical memories, and borrowings from Chinese philosophy and history. Frequently the two books flatly contradict each other, of the *Nihon shoki* offers a series of variants of a myth or tradition." In the Japanese creation myth, the first deities to emerge were a sister and brother, Izanami and Izanagi, who, descending to earth, gave birth to the islands of Japan and a number of

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other deities, including a Sun Goddess called Amaterasu [also called Amaterasu-omikami, the Shinto Sun Goddess], and a male deity named Susa-no-o (also called Susa-no-wo). The Japanese state was said to be founded in 660 B.C. in Yamato, the area centering around the Nara Plain, a short distance inland from Osaka. The founder of the imperial line was said to be Jimmu, the "Divine Warrior."

Note: Historically, the Yamato emperors lived in the 5th century A.D. "Since their direct lineal descendants still occupy the Japanese throne, the Japanese imperial family is by far the oldest ruling line on earth."

"The Kojiki is written partly in Chinese, partly in Chinese characters used phonetically to represent individual syllables of Japanese names or words, and partly in Chinese characters used to express the meaning of whole Japanese words. The result, naturally, is extremely difficult to read. The *Kojiki* deals largely with early myths and legends and dwindles to little more than genealogies for the rulers traditionally dated between 488 and 628.

"The *Nihon shoki,* by contrast, is written in pure Chinese and becomes increasingly more detailed as it approaches its terminal date of 689."

Concerning azuki, the *Kojiki* states that when the god *Susano no Mikoto* came to earth, he killed a man and azuki sprang from the man's nose.

Harlan (1992, p. 45) notes that the source of soybeans suggests flatulence. Note: This is the earliest document seen (July 2012) suggests flatulence in connection with soybeans.

Concerning azuki beans, Lumpkin & McClary (1994, p. 37, based on Hoshikawa 1985) write: "The *Kojiki* states that when the god *Susano no Mikoto* came to earth, he killed a man and azuki sprang from the man's nose..."

3. Fujiwara, Fuhito. 718 AD. Yôryô ritsuryô [Yoryo ritsuryo]. Japan. [Jap]*

• ***Summary:*** According to Ichiyama (1968) an early reference to hishio, perhaps a soy-based product, appeared in this book. It mentioned various types of chiang and fermented black soybeans, plus *misho,* the second character of which was *chiang.* Address: Japan.

4. Nihon shoki (or Nihonshoki, or Nihongi) [Nihon shoki: Chronicles of early Japan]. 720 AD. Japan. [Jap]

• ***Summary:*** The second version of the mythical story of the origin of the soybean in Japan, following that told in the Kojiki (A.D. 712) is as follows, from a note in Philippi's 1968 translation of the *Kojiki* (p. 404-05): "Ama-terasu-opo-mi-kami [also called Amaterasu-omikami, the Shinto Sun Goddess], hearing that a deity called Uke-moti-no-kami [a food deity] dwelt in the Central Land of the Reed Plains, sent Tuku-yomi-no-mikoto [the moon god] to inquire after her.

"When Tuku-yomi-no-mikoto arrived there, Uke-moti-no-kami took rice, fish, and meat from her mouth, and, placing them on tables, offered them to him. At this he became angry and killed her, then returned and reported this matter.

"Then Ama-terasu-opo-mi-kami rebuked the moon deity and vowed never to set eyes on him again. For ever after she dwelt one day and one night apart from him. [A mythological explanation for the rotation of sun and moon.]

"When Ama-terasu-opo-mi-kami sent a messenger to see, in the dead Uke-moti-no-kami's head there had come into being cattle and horses, on her forehead millet, on her eyebrows silk-worms, in her eyes Deccan grass [MJ *hie;* also panic grass], in her belly rice, and in her genitals wheat, soy beans, and red beans [probably azuki].

"When these were taken and presented to Ama-terasu-opo-mi-kami, she rejoiced and caused these things to be used by mortal men for their livelihood. [Asahi ed., I, 86-87; Aston, I, 32-33.]"

For a background on this book, see *Kojiki* (A.D. 712). For other English translations see Aston (1896, 1972; p. 32-33).

5. Tôdaiji shôsôin monjo [Documents in the Shosoin imperial treasury at Todaiji temple in Nara]. 730-748 AD. Japan. [Jap]*

• ***Summary:*** Sato (1963, p. 27), in his book titled "Documents on Fermented Black Soybeans, Chiang, Miso, and Shoyu," cites this as the earliest Japanese document seen on the subject. He gives the date as Tenpyo 2 (730 A.D.). It is written entirely in Chinese characters (*Kanbun*).

Ichiyama (1968) says this is a collection of documents, not just one. "In 730 AD taxes were being paid on miso and *hishio,* in 731 on *kuki, arabishio,* and *richio."*

Shinryû Sekine, in his book *A Study on Eating Habits in the Nara Period* (1969, 1974) quotes from the *Shosoin-monjo,* a document preserved in the Shosoin, the storehouse at the Todai-ji temple in Nara. From the phrase "... to obtain liquid out of brewed or fermented soybeans..." in the document, Sekine says: It is clear in those days that *sho* in those days was liquid.

Shurtleff and Aoyagi (1983. *The Book of Miso,* 2nd ed., p. 219): "The most detailed information to date on the early relatives of miso and the first clear reference to a soybean hishio appeared in the Todaiji Shosoin documents, written between 730 and 748, and still preserved in excellent condition in the Imperial Treasury of the Shosoin, connected with Nara's Todaiji temple. It records that in 730 taxes were being paid on hishio and on misho (a variety of hishio and an early relative of miso). A document from the next year mentions the same foods again. A document written prior to 748 clearly referred to soybean hishio (Ichiyama 1968)."

6. Manyôshû [Man'yoshu: Collection of Japan's earliest songs and poems]. 760 AD. Japan. For translations see Pierson 1929 and Honda 1967. [Jap]*

• ***Summary:*** The earliest poems in this extraordinary work

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were written in AD 315. In most poems Japanese words are elaborately spelled out with Chinese characters used phonetically.

Sato (1963, p. 29), in his book titled "Documents on Fermented Black Soybeans, Chiang, Miso, and Shoyu," cites this as the second earliest Japanese document seen on the subject. It was published in year 3 of Tenpyo Hoji (760 A.D.) and the pertinent information is in Volume (Kan) 16. It is written entirely in Chinese characters (Kanbun).

Shurtleff and Aoyagi (1983. The Book of Miso, 2nd ed., p. 219): "One of the first references to this hishio appears in the *Man'yoshu,* an extraordinary collection of thousands of Japan's earliest songs and poems recorded from as early as the year 315 A.D. and compiled circa 760. In most of the poems, the Japanese words are elaborately spelled out with Chinese characters used phonetically. The character for hishio (chiang) appears in scroll 16 in a poem by Imiki Okimaru (686-707), a humorous bard who improvised at banquets for the court nobility. We and Pierson (1929) translate this as:

"I want to eat red snapper (*tai*)

"With a dressing of minced garlic and vinegar-hishio

"So do not offer me a leek soup.

"Another poem describes two comic crabs happily making themselves into crab hishio seasoned with pounded elm bark. Mention is also made of hishio containing wild game and deer meat. Unfortunately we are not told exactly what type of product this hishio was nor how it differed from miso and chiang, yet it is now generally believed that all of these products were well known at this period among the nobility and, to a lesser extent, the common people."

Yokotsuka (1986, p. 198) states that the *Manyo-shu* (350-759 A.D.) mentioned Koji (mold-cultured cereals) and Hishio (same as chiang, made from fish, meat, or soybeans). If that is true, this would be the earliest Japanese-language document seen (June 2012) that refers to koji.

7. Omi, Mifune. 785 AD. Tang Da He Shang Dong Zheng Zhuan [Biography of the great monk from the T'ang dynasty who traveled to the East]. China. [Chi]*

• ***Summary:*** Wade-Giles reference: *T'ang Ta He Shang Tung Cheng Chuan.* Tang dynasty. Williams (1988): The monk discussed is Chien Chên (Jap. Ganjin, who lived A.D. 688-763), who was blinded while traveling to Japan to teach Buddhism. The author, Omi, lived A.D. 722-785 in Japan, wrote this work in Classical Chinese, probably between A.D. 763 and 783. New editions of the work have been published in 1936 and 1979.

Concerning Ganjin, Shurtleff and Aoyagi write in *The Book of Miso* (1976. p. 216): "One of the most colorful chapters in the history of miso concerns the great Chinese Buddhist master Ganjin. The founder of the Japanese Ritsu or 'precepts' sect and of the well-known Toshodaiji temple in Nara, Ganjin spent over 11 years trying to reach Japan. After being blocked by pirates, shipwrecks, and storms, and having lost his eyesight during one of his 6 attempted crossings, he finally succeeded in 754 at the age of 66. The records of his ship's cargo show that in addition to 185 monks, sailors, and craftsmen, he brought 100,000 gallons of 'sweet kuki.' Later records show that this same fermented soybean food was prepared at his temple, carried by foot to Kyoto, and peddled there in the streets.

"Although Ganjin's sweet kuki was related to miso, it was probably more a preserved food than a seasoning, similar to today's Daitokuji natto. Nevertheless, Ganjin is often said to have brought the first prototype of Japanese miso from China, and if we take this sweet kuki to be the original Japanese miso, then he was clearly its transmitter. But records show that something called 'miso' was already being sold in Nara's markets more than 20 years before Ganjin's arrival. Hence, some scholars have concluded that the popular 'Ganjin theory' probably reflects more of a desire on the part of early miso makers and Buddhist priests to link their new product to Ganjin's lofty reputation than to historical fact."

H.T. Huang (2000, p. 317). There are two popular theories about how tofu was transmitted from China to Japan. The first theory holds that it was brought from China by the delegation of Buddhist monks headed by the master Kanshin (Jianzhen; W.-G. Chien Chên), who arrived in A.D. 754. While this view is certainly plausible, there is as yet no documentary evidence to support it.

Note 1. This is the earliest document seen (March 2003) concerning an early foreign traveler in Japan (Chien Chên; Jap. Ganjin) in connection with soybeans.

Note 2. This is the earliest document seen (April 2001) that is a biography of a person involved with soyfoods (fermented black soybeans) or soybeans.

8. Kiyohara Natsuno. 834 AD. Reigekai or Ryôgekai [Reigekai or Ryogekai]. Japan. [Jap]*

• ***Summary:*** Sato (1963, p. 8), in his book titled "Documents on Fermented Black Soybeans, Chiang, Miso, and Shoyu," cites this as the fifth earliest Japanese document seen on the subject. The pertinent information is in volume 1 (Teninrei). It was completed in the 10th year of the Tencho era (834 A.D.). It is written entirely in Chinese characters (Kanbun).

9. Endo Hoju. 843 AD. Zoku Nihon kôki [Continuation of the Nihon Koki]. Japan. July. [Jap]*

• ***Summary:*** Sato (1963, p. 29), in his book titled "Documents on Fermented Black Soybeans, Chiang, Miso, and Shoyu," cites this as the fourth earliest Japanese document seen on the subject. It was published in the 7th month of the 9th year of the Jowa era (July of 843 A.D.). It is written entirely in Chinese characters (Kanbun).

10. Koji dan [Stories about ancient things]. 886 AD. Japan.

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[Jap]*
• ***Summary:*** Sato (1963, p. 8), in his book titled "Documents on Fermented Black Soybeans, Chiang, Miso, and Shoyu," cites this as the seventh earliest Japanese document seen on the subject. It was published in the second year of the Ninna era (886 A.D.). It is written entirely in Chinese characters (Kanbun). Not clear are 2 shinsetsu. 49 Koko. Mitsutaka.

11. Nichinichi Ju (Monk). 893 AD. Shinsen jikyô [Newly selected character mirror dictionary]. Japan. [Jap]*
• ***Summary:*** Sato (1963, p. 31), in his book titled "Documents on Fermented Black Soybeans, Chiang, Miso, and Shoyu," cites this as the eighth earliest Japanese document seen on the subject. It was published in the 4th year of Kampyo [Kanpyo]. It is written entirely in Chinese characters (Kanbun).

12. Sagawaka Doshin (Michimasa?). 893 AD. Ruiju Kokushi [Ruiju Kokushi]. Japan. [Jap]*
• ***Summary:*** Sato (1963, p. 29), in his book titled "Documents on Fermented Black Soybeans, Chiang, Miso, and Shoyu," cites this as the third earliest Japanese document seen on the subject. It was published in Kanpyo 4 (173 saii, Nen soshin). It is written entirely in Chinese characters (*Kanbun*).

13. Ogura Yoshiyuki. 901-908 AD. Sandai jitsuroku [Three generations of real records]. Japan. Widely circulated in manuscript form by 886 A.D. [Jap]*
• ***Summary:*** Note: This is the earliest document seen, and the earliest Japanese-language document seen, (March 2011) that contains the modern word miso. This is also the earliest document seen (Jan. 2009) concerning the etymology of miso. It portrays miso as a truly Japanese food, rather than a Chinese import. Ichiyama (1968), however, shows that the modern characters for miso are not in it, but in *Fuso Ryakuki.* Sato (1963, p. 30), in his book titled "Documents on Fermented Black Soybeans, Chiang, Miso, and Shoyu," cites this as the sixth earliest Japanese document seen on the subject. It comes from the *Shoin Zashin Kobai Shinko,* published in the first year of Teikan, by Daizen Tenzashin. It is written entirely in Chinese characters (Kanbun).

Shurtleff & Aoyagi (1983. *The Book of Miso,* 2nd ed., p. 220): "At the beginning of the Heian period, the word 'miso' suddenly began to be written with a new combination of characters, which is used to this day. The character for 'mi' meant 'flavor' and the one for 'so' meant 'throat.' The second character was, itself, a Japanese invention and is presently used in no other words. It first appeared in an official Japanese document in 806 in connection with a food called *enso,* a salt seasoning... We may well inquire why the Japanese of this period deliberately invented a new character to replace the character chiang (hishio) that had been used during the previous two centuries, and why they introduced the character meaning 'flavor' into the combination. It seems likely that by this time the Japanese had so thoroughly transformed chiang into a food suited to their own culture and tastes, that they felt it deserved a uniquely Japanese name. In fact, the *Sandai Jitsuroku* portrays miso as a truly Japanese food rather than as simply a Chinese import. But there were broader cultural changes too behind the change in characters. In 894, at the beginning of the Heian period, Japan essentially cut off contact with the outside world, and began an extended period of assimilating and transforming Chinese cultural imports. During this period, Japan also developed the *hiragana* and *katakana* writing styles, which were completed in the 10th century. It was as part of this larger cultural transformation that the change in miso and its characters took place."

Saito (1985, p. 13): "The Chinese character *so* in the present word *miso* appeared for the first time in the *Sandai Jitsuroku* (858-887).

Fukushima (1989, p. 9): "The first appearance of the present word 'miso' was in the *Nihon-Sandai- Jitsuroku,* a history book by M. Sugiwara, Y. Minamoto, T. Fujiwara, and Y. Okura, published in 901 AD in Japan."

14. Minamoto no Shitagau. 923 AD. Wamyô ruijûshô (Wamyôshô) [General encyclopaedic dictionary. 10 vols.]. Japan. [Jap]*
• ***Summary:*** Heian period. This is a collection of Japanese names, by subject.

Needham (1986, p. 590) cites this as: Minamoto no Shitagau. +934. *General Encyclopaedic Dictionary.*

Shurtleff & Aoyagi (1983. *The Book of Miso,* 2nd ed., p. 221): "Some scholars believe that the pronunciation 'miso' originated in the *Wamyosho* (also called *Wamyo Ruijusho*), the earliest dictionary of the Japanese language, encyclopedic in scale and written between 903 and 938 by Minamoto no Shitagau. It was modeled after Chinese dictionaries and listed many types of hishio including ones pronounced *miso, misho,* and *kara hishio.* It also mentioned fermented black soybeans."

J.R. Wang and Y.H. Lee (1976) in "Traditional soybean foods in Korea" state that: "Since an old Japanese literature [document], *Hwameyruitsuroku* [*Wamyô Ruijusho;* Collections of Japanese Names, by Subject], of Heyan [Heian] records that 'Maljang (Meju) is a Korean soy sauce and paste' and a record on Maljang was also observed in the ruins of Nara, it is evident that soy sauce and paste were introduced from Korea to Japan during the Nara period (645-793 A.D.)."

Sato (1963, p. 33), in his book titled "Documents on Fermented Black Soybeans, Chiang, Miso, and Shoyu," cites this as the tenth earliest Japanese document seen on the subject. See section 16 (Shoume/Anbai). The selections were made during the Encho period then published more than 700 years later in about 1615, during the Genwa era. It is written

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entirely in Chinese characters (*Kanbun*).

Note: This is the earliest document seen concerning soybeans or soybean products in Korea. It seems very likely that soybeans were also being grown in Korea by this time, but this is not stated.

15. Fujiwara, Tadahira; et al. comp. 927 AD. Engi shiki [Law codes of the Engi period]. Japan. 50 volumes. See vols. 23, 33, 39, 42. Japanese summary by Kawakami 1978, p. 207-08. [Jap]

• ***Summary:*** Compilation of this book started in 905 and was completed in 927. Containing the earliest known information on production of hishio and miso in Japan, it lists 10 types of miso and hishio. The word *miso* is written in 5 different ways. Sato (1963, p. 31), in his book titled "Documents on Fermented Black Soybeans, Chiang, Miso, and Shoyu," cites this as the ninth earliest Japanese document seen on the subject. It was published in the 7th year of the Engi era. It is written entirely in Chinese characters (*Kanbun*).

Shurtleff & Aoyagi (1983. *The Book of Miso,* 2nd ed., p. 221): "The earliest Japanese document to contain information about the production of miso and hishio was the *Engi Shiki,* an elaboration of old law codes, compiled in about 927 by Fujiwara Tokihira and others. In it we are told that miso was a fermented food with soybeans as its main ingredient, but it also contained rice, rice koji, wheat, salt, and saké. The *Engi Shiki* gave detailed information about the Hishio Tsukasa government bureau, stated that hishio was given to the Emperor's civil and military officials as part of their annual wage, and listed at least ten different types of miso and hishio. Among these, the word 'miso' was written using at least five different character combinations, all of which were pronounced 'miso,' or perhaps occasionally 'mishio.'

"It is not always clear whether each of these names refers to a different food, or whether the name of a single variety was simply being written with different character combinations. The book gives the amounts of basic raw materials used in preparing numerous different types of miso and hishio, but most of the quantities appear quite inaccurate and cannot be used experimentally to make the products they describe.

"Although notebooks dating from as early as the 8th century reveal that miso was bought and sold in the marketplaces of the former capital at Nara, the first shops specializing in its sale are said to have originated in about 925 in the new capital at Kyoto. The *Engi Shiki* records the presence of a miso retail shop in Kyoto's western market and a hishio outlet in the eastern market. Moreover, 50 other shops are reported to have carried hishio, and 32 miso, as one among numerous other foods. Thus by the middle of the 10th century, it seems that hishio and miso were becoming basic staples."

Gotoh (1984, p. 136) states: "Engishiki (completed 927 AD) which described in detail the regulations on crop products (for example, exchange rates of soybeans with bundles of rice and barley for yearly tribute), stated that the Kinki, Chugoku, and Shikoku districts [all located in southwest Japan, from Kyoto to just north of Kyushu] were the main soybean production areas." He gives a good map of Japan showing these three regions.

Lumpkin and Konovsky (1991, p. 121, citing Igata 1977) state that *"Aomame* [meaning "green soybeans"] is mentioned in the *Engishiki,* a guide to the conduct of government and religious affairs, published in 927 A.D." [Heian period].

Iino (1999, p. 14): "The *Engishiki,* the legal code of the Heian era, which provides details on the implementation of ancient laws, offers examples on the use and provision of *sho / hishio.* It seems that *sho* was a daily necessity up to this period. Iino adds: "The Chinese character *sho* was pronounced *hishio* in Japanese and meant fermented soybeans... No clue as to the original recipe for *sho* can be found, with one exception in 'General Instructions and Recipes,' part of the *Daizen-ge* in the *Engishiki.* This recipe states that *sho* made to present to the emperor consists of soybeans, malted rice [koji?], glutinous rice, wheat, liquor and salt. It tells us the proportions of ingredients and the amount of the resulting *sho* but provides no further details."

There is a debate among scholars as to whether *sho* was a liquid or more like a mash (*moromi*). One part of the *Engishiki* mentions *'sho* dregs.' It seems likely that the dregs remained after the liquid was filtered off. "In the *Engishiki,* liquid *sho* and *sho* dregs were used for pickling gourds, wax gourds, turnips, and eggplant. The *Engishiki* also refers to some foods that are very likely *sho*-pickled fish, such as crucian carp, blowfish, and sardines." Many kinds of *sho*-pickles were available during this era.

"Mash-style *sho:* When used as a seasoning for processed food, *sho* was probably prepared in mash-like form, not as a liquid. It is not very difficult to prepare liquid *sho:* all you have to do is filter out or extract the mash-like *sho.* Doing so, however, severely reduces the efficiency of the process. The *Engishiki* states that the amount of liquid *sho* produced was less than a third of the total amount of ingredients used. The *Daizen* and *Naizen* in the *Engishiki* also indicate that large quantities of *sho* were used for provisions, workers' meals and feasts, as well as for many kinds of pickles. It is impossible to think that all this *sho* was of the labor-consuming, wasteful liquid type. Besides, *sho* dregs without liquid after filtering lack the taste and quality that are necessary."

Note: This is the earliest document seen (July 2007) that mentions sake in Japan.

16. Konjaku monogatari-shû [Tales of today and yesterday. A compilation of popular and funny Buddhist and historical stories from India, China, and Tibet]. 1050-1185. Japan.

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Japanese summary by Kawakami 1978, p. 215-16. [Jap]

17. The legendary early discovery of natto in Japan by Hachiman-taro Yoshiie (Early event). 1051-1083.
• ***Summary:*** The origin of natto in Japan is obscure. This is the most famous legend of that origin.

In "Chronology of Soybeans," by Akio Saito (1985. *Daizu Geppo* (*Soybean Monthly News*). Jan. p. 12-14–in Japanese) we read: In the year A.D. 1083, stringy natto (*itohiki natto*) is discovered accidentally in Oshu (Oshû, northeast Japan) during the conquest of Oshu by Minamoto (Hachimantaro) Yoshiie (lived 1041-1108). It is said that the natto was made when cooked soybeans were placed in a [rice-straw] sack strapped over the back of a horse. The warmth of the horse helped the fermentation. There are so many legends like this one in the northeast prefectures (*Tohoku Chiho*) of Japan that it seems possible that natto was originally made there.

In the book *Nattô kenkô-hô* [*The natto way to good health*], by Ohta Teruo (1975, Tokyo: Futaba Books. 242 p.–in Japanese) there is a chronology of natto. One page 223 we read under the year A.D. 1051: Hachimantaro Yoshiie's natto legend started. *Oshû Kaido* became known as the "natto road." More details and conjecture about the "Natto Road" are given on p. 37-39. Since ancient times, there have been many legends concerning the origin and development of natto. These legends are centered in Oshû, in the cold northeast provinces (*Tôhoku Chihô*) of Japan, which, in the eleventh century, was just north of the area controlled by the Japanese government. A man named Hachimantaro Yoshiie was the hero of two wars: The Zenkunen War of 1051 and the Gosannen War of 1083. When the weather was very cold, the crops were often poor. The government tried to collect taxes and the peasants threatened not to pay or to revolt. To apprehend those who refused taxes, and prevent the insurrection from spreading, the government sent in Minamoto no Yoriyoshi Yoshiie. Following the Oshu Road (*Oshû Kaido*) he led his soldiers and horses northward. The horses were fed cooked soybeans and straw. The war dragged on. The story goes that one night Yoshiie planned to attack the enemy. He made a camp and cooked soybeans but suddenly he was attacked, so he quickly put the cooked soybeans in a rice-straw bag (*tawara*), slung the bag over a horse's back, and escaped. The next day, when the bag was opened, the soybeans–as if by magic–had turned to stringy natto–which had a distinctive fragrance and aroma. The four conditions necessary for making natto had been present: Cooked soybeans, rice straw, warmth, and moisture (heat and sweat from the horse's body). The bacteria that caused the fermentation were found naturally on rice straw.

During the Gosannen war, the peasants who revolted were in Kiyohara. This time Yoshiie made the natto deliberately. A poet and popular figure who was respected and intelligent, he recognized that natto was a good food–not simply spoiled soybeans. It made him and his soldiers feel strong. He considered it a portable "war food" that could be made with little effort while he was on a campaign.

Nagai and Tamang (2010, p. 194-95) retell the legend like this: "The most famous legend of the origin of *natto* is that of Yoshiie's. In 1083, Hachiman-taro Yoshiie, the chief of a samurai legion, stayed at a house on the course of conquering the northern area of Japan. His retainer boiled soybeans for horses and wrapped the remaining soybeans with straws [sic]. The wrapped soybeans were fermented, after being tied to the back of a horse, that produced a viscous material on the soybeans. The retainer ate the soybeans and found it [sic] tasted very delicious. The fermented soybean food was *natto.*"

Note: Japanese natto scholars and historians find these legends interesting, but are quick to add that they are not supported by any documentary evidence. We have never been able to determine when this legend was first committed to writing.

18. Fujiwara no Akihira. 1058-1068. Tamatsukuri komachi sôsui-sho: Shin sarugakuki [New monkey play story: A humorous novel about the Uemon family in Nishi-kyo]. Japan. Japanese summary by Kawakami 1978, p. 220-22, and by Naomichi Ishige. Undated. [Jap]
• ***Summary:*** *Sarugaku* is a funny story or play, the origin of Noh and Kyogen dramas. Written in Chinese (*Kanbun*).

Ito (1976) and Iwadare (1976) both say that the word for salty natto [fermented black soybeans] first appeared in 1286 in this book. This document is said to contain an early reference to fermented black soybeans. Kawakami (1978) in his half-page summary of the book makes no mention of natto or of soynuts. Two books, Motoyama's *Inshoku Jiten* (1958) and Zenkoku Natto's *Natto Enkakushi* (1975) give the date of this book as A.D. 1286. The fermented soyfood mentioned in this book is not *itohiki-nattô,* but a type of spring (or crab) salty natto (*shiokara nattô*), fermented with a mold rather than a bacterium, and thus in the family of fermented black soybeans.

Kawakami and Eiichi (1985) in *Daizu ryôri kotoba no rekishi* ["History of soyfoods terminology in Japan"] (p. 35, 39) state that the word "irimamé" (dry roasted soybeans) first appears in the *Shin Saru Gakki* [New and Funny Lewd Stories], a book published in Japan during the Heian period in about A.D. 1058-1065. *Sarugaku* (*Saru* means "monkey") is a kind of comedy containing some obscene stories that make it especially entertaining. It is found in the collected works titled *Gunsho Ruiju no Sarugakki* which states (volume 136, p. 344) "Sakana wa Irimame," which means that irimame is used as a food to serve with saké (*o-tsumami*). The story is about a woman who loved saké.

Ohta (1986) says: The earliest document known to have mentioned the word "natto" is the *Shin Sarugaku Shiyu,* written by A. Fujiwara in 1068; yet no description was given

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of the method for making this natto.

Fujiwara no Akihira lived 989-1066.

Note: This is the earliest document seen (Dec. 2012) that mentions dry roasted soybeans for food use, or the Japanese word for such soybeans, *Irimame / irimamé.*

Letter (e-mail) from Naomichi Ishige, Japanese food historian and expert on natto. 2008. Nov. 16. "The author of the book you asked about was Fujiwara Akihira, and its title was *Shin-sarugaku-ki* (in English: "New sarugaku story"). The book is supposed to have be written during 1058-1065.

"Sarugaku is a kind of show consisting mostly of music, singing, dancing, acrobatics, etc. This show was popular among people during the Heian period (794-1185) in Japan. *Shin-sarugaku-ki* first commentated on Sarugaku, and then introduced a man watching sarugaku one night. The story described the whole family of this man, so it became encyclopaedic information about the life of ordinary people in Kyoto at that time.

"This is the first book which used the word *natto* to refer to "salty natto" [fermented black soybeans]. However, salty natto itself has existed from ancient times in Japan; it was called *kuki.*

"Concerning the origin of the word 'natto': According to the widely held theory, the character pronounced *na* originated from *nasso,* which refers to a temple's kitchen. *To* means 'beans.' Monks ate lots of natto because they were (and still are) vegetarians. Thus *natto,* which means 'beans of a temple's kitchen,' became used among people.

"I once wrote about natto as a food in Southeast Asia and East Asia. I shall send photocopies to you." Address: Japan.

19. The word *natto* first appears in Japan, but it refers to "salty natto" (*shiokara natto* [fermented black soybeans]) rather than to "sticky natto" (*itohiki natto*) (Early event). 1058-1068.

• ***Summary:*** Letter (e-mail) from Naomichi Ishige, Japanese food historian and expert on natto. 2008. Nov. 16. "The author of the book you asked about was Fujiwara Akihira, and its title was *Shin-sarugaku-ki* (in English: 'New sarugaku story'). The book is supposed to have be written during 1058-1065.

"This is the first book which used the word *natto* to refer to 'salty natto' [fermented black soybeans]. However, salty natto itself has existed from ancient times in Japan; it was called *kuki."*

Note: This is the earliest English-language document seen (Nov. 2011) that uses the term "salty natto" or the term "shiokara natto" to refer to fermented black soybeans.

"Concerning the origin of the word 'natto': According to the widely held theory, the character pronounced *na* originated from *nasso,* which refers to a temple's kitchen. *To* means 'beans.' Monks ate lots of natto because they were (and still are) vegetarians. Thus *natto,* which means 'beans of a temple's kitchen,' became used among people."

20. Tôji ruiki [Toji ruiki]. 1080. Japan. [Jap]*

• ***Summary:*** Mentions many types of chiang (Ichiyama 1968).

21. Nakaomi, Hiroshige. 1183. Nakaomi Hiroshige nikki [Diary of Hiroshige NAKAOMI]. Entry for January 2. Unpublished manuscript. Japanese summary by Kawakami 1978. [Jap]

• ***Summary:*** This diary was written during the Heian period by a Shinto priest (*kannushi*) of the Kasuga jinja (shrine) in Nara, Japan. The date of the entry, 2 Jan. 1183, is that measured by the old almanac. The diary entry stated that "one type of *shunkin* tofu" was included in the offerings at the shrine's altar.

Note: This is the earliest document seen (April 2013) that mentions tofu in Japan, or tofu in any country outside of China; the document was discovered by the great Japanese food historian Osamu SHINODA (1971).

Saito (1985) states: 1183–Tofu is first mentioned in a document from the Great Kasuga Shrine (*Kasuga Taisha*) in Nara. The characters used to write the word tofu then were different from the characters used today. It seems that this tofu was very hard.

There are four interesting points about this first mention: (1) The word "tofu" was written with characters different from those used today. The first character, pronounced *to* (rhymes with the "toe" on your foot), means "T'ang" as in "T'ang dynasty," and the second character, pronounced *fu,* meanings a "sign, mark, charm, or amulet"; (2) The tofu appears at a Shinto shrine rather than, as expected, at a Buddhist temple, and especially a temple with strong influence from China; (3) The tofu is used, not as a food, but as an offering at the altar. A similar mention appears in the annals of the same shrine on the same date one year later, but this time the reference is to "one type of *sokuan* tofu" (Note: The meanings of the terms *shunkin* and *sokuan* are not clear); (4) The date, January 2, is during the coldest time of the year, when the tofu would stay fresh longest. Address: Nara, Japan.

22. Buddhist monk Kakushin returns to Japan during the Sung dynasty from China having learned how to make Kinzanji miso (Early event). 1228.

• ***Summary:*** In *The Book of Miso,* by Shurtleff and Aoyagi (1976, p. 219-20) we read: "The origins of modern shoyu can be traced more clearly to the mid 1200s when the Japanese priest Kakushin [1207-1298] returned from China, having learned there the technique for preparing Kinzanji miso. Establishing himself at Kokoku-ji temple near the town of Yuasa (in today's Wakayama prefecture, just south of Osaka), he began to teach the local people both Buddhist meditation and the method for preparing his miso specialty.

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According to non-documented oral tradition, he soon discovered that the liquid which settled to the bottom of the miso kegs made an excellent seasoning, so he decided to alter the process slightly by increasing the proportion of water in the basic mixture. After the regular fermentation period, the excess liquid was ladled off and briefly heated to stop fermentation... Kakushin's creation, too, came to be known as *tamari,* deriving its name from the verb *tamaru,* meaning 'to accumulate,' as 'water accumulates into ponds,' and by 1260 it was being produced for home consumption in the nearby towns of Yuasa and Hiromachi... By 1290, the first Yuasa tamari was said to have been sold commercially, and soon even poets began to sing the praises of this new delicacy, calling it *murasaki* or 'deep purple,'..."

In "Chronology of Soybeans," by Akio Saito (1985. *Daizu Geppo* (*Soybean Monthly News*)**.** Jan. p. 12-14–in Japanese) we read: 1228–The Buddhist monk Kakushin returned from Sung dynasty China having learned the method for making fermented Kinzanji miso. While fermenting the miso, he discovers that the liquid which gathers on the bottom of the vats can be used as a tasty seasoning. This tamari is considered the first soy sauce in Japan. Kinzanji miso is a type of *namémiso* (Finger Lickin' Miso) made from roasted soybeans and barley koji. To these are added eggplant, white melon (*shiro uri*), etc., and the mixture is fermented.

23. Tsutsumi Chûnagon monogatari [A collection of 11th century short stories of Japan]. 1250. Japan. [Jap]*
• ***Summary:*** According to the *Nihon Kokugo Daijiten* the earliest known appearance of the word *irimame* was in the *Tsutsumi Chûnagon Monogatari,* which appeared in Japan during the period mid-11th to mid-13th century. Address: Japan.

24. Nichiren, Saint. 1275. Re: Thank you for edamamé. In: *Nichiren Shonin Gosho Zenshu* (*The Collected Writings of Saint Nichiren*)**.** [Jap]*
• ***Summary:*** In the year 1275 Saint Nichiren (*Nichiren Shônin*) was living at Mount Minobu (*Minobu-san;* the headquarters of the Nichiren sect, in Yamanashi prefecture near the town of Minobu, about 80 miles west southwest of Tokyo). He received many gifts from his followers or devotees. He wrote down the name of each gift and the amount given, then sent a very courteous thank you letter to each of the gift givers. These letters are published in a book titled *Nichiren Shonin Gosho Zenshu* (*The Collected Writings of Saint Nichiren*)**.** In the letter dated 26 July 1275 he wrote to a Mr. Takahashi: "Thank you for the edamamé."

Note 1. This letter was first cited by Kawakami and Kimura (1985). They believe that this is the earliest known document that contains the term *edamamé* (characters: branch + beans), which in English are also called "green vegetable soybeans" or "green soybeans in pods."

Note 2. This is the earliest document seen (June 2009) worldwide concerning green vegetable soybeans or edamamé in Japan; it may well be the earliest document seen (June 2009) that clearly mentions green vegetable soybeans worldwide–as an earlier Chinese poem is not clear.

Note 3. This is also the earliest document seen (June 2009) that contains the word "edamamé," or that concerns the etymology of green vegetable soybeans. Address: Japan.

25. Tamari-style shoyu is sold commercially from Yuasa in the Kishu area of Japan (in today's Wakayama prefecture) (Early event). 1290.
• ***Summary:*** *The Book of Miso,* by Shurtleff and Aoyagi (1976, p. 219-20) states that when the Japanese priest Kakushin returned from China [in 1228], he established himself at Kokoku-ji temple, near the town of Yuasa. By 1260 tamari "was being produced for home consumption in the nearby towns of Yuasa and Hiromachi... By 1290, the first Yuasa tamari was said to have been sold commercially, and soon even poets began to sing the praises of this new delicacy, calling it *murasaki* or 'deep purple,' a synonym for the finest shoyu, used to this day." A nine-line poem about tamari follows.

In "Chronology of Soybeans," by Akio Saito (1985. *Daizu Geppo* (*Soybean Monthly News*)**.** Jan. p. 12-14–in Japanese) we read: 1228–The Buddhist monk Kakushin returns to Japan from Sung dynasty China having learned the method for making fermented Kinzanji miso. While fermenting the miso in Japan, he discovers that the liquid which gathers on the bottom of the vats can be used as a tasty seasoning. This tamari is considered the first soy sauce in Japan...

1288-1292–Tamari-style shoyu is sold from Yuasa in the Kishu area (in today's Wakayama prefecture).

26. Saito, Akio. 1292. [Chronology of soybeans, 122 B.C. to A.D. 1292] (Document part). In: Akio Saito. 1985. Daizu Geppo (Soybean Monthly News). Jan. p. 12-14. [Jap; eng+]
• ***Summary:*** 122 B.C.–It is said that Lord Liu An of Huai-nan (*Wainan O Ryuan*) invented tofu. Therefore it is sometimes called "Wainan."

300 A.D.–By this time in Japan people are using fermented foods such as kuki, sake, vinegar, sushi, and hishio made from herbs (*kusa-bishio*) and grains (*koku-bishio*)**.** Kuki is a bean-based product related to miso, natto, or tamari.

630 A.D.–Igunami no Otasuki is sent as a student from Japan to T'ang dynasty China (*Kentoshi*)**.** It is thought that foods like tofu were brought back to Japan by such student monks when they returned [but there are no records of this].

701 A.D.–The Taiho Law Codes (*Taiho Ritsuryo*) are established, and they call for the establishment of the Hishio Tsukasa (Bureau for the Regulation of Production, Trade, and Taxation of Hishio and Misho), located in

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the Imperial Palace as an annex to the emperor's kitchen (*daizenshoku*). Soybeans were definitely used to make these fermented foods and seasonings such as hishio (like Chinese chiang), fermented black soybeans (*shi, kuki*), and misho (a forerunner of miso; the term "miso" had not yet been coined).

741 A.D.–Two new Buddhist temples are added to each feudal domain (*kuni*): Kokubunji is for monks and Kokubunniji is for nuns. It is said that from this time, fermented black soybeans (*tera nattô,* or *shiokara nattô*) spread throughout Japan. They are made from soybean koji, which is soaked in salted water and dried.

794–The capital of Japan is relocated to Kyoto from Nara. The Heian period (794-857) begins.

794-1190–Salted pickles (*shio-zuke*), hishio pickles (*hishio-zuke*), miso pickles (*miso-zuke*), and sake lees pickles (*kasu-zuke*) are eaten. The pickles were made by various methods. But only during and after the Muromachi period (1338-1573) were the various pickles made often.

802–Sakanoue no Tamuramaro (758-811) recommends that farmers in Tanzawa grow soybeans as an emergency food.

840–Each feudal domain (*kuni*) is encouraged to plant millet, barnyard millet, barley, wheat, soybeans, azuki beans, and sesame seeds.

901–The Chinese character *so* in the present word *miso* appears for the first time in the *Sandai Jitsuroku.*

927–The *Engishiki* is completed by Fujiwara no Tokihira (871-811) and others. In this book it is written: "In the feudal domain of Omi 60 koku of soybeans [1 koku = 47.6 gallons or 180 liters], in the domain of Tanba 30 koku, in the domain of Harima 20 koku, in the domain of Misa 10 koku, and in the domain of Iyo 10 koku are recommended (*susumu*). It seems that the soybean was an important crop in those days. Soybeans, rice, wheat, sake, and salt are given as the raw materials for making misho (a product resembling miso). The places famous for making misho are Omi, Hida, Yamato, etc. There are 27 misho shops in the Nishi no Kyo area of Kyoto. It is stated in the *Engishiki* that in order to make 1.5 koku of hishio you need 3 koku of soybeans, 1.5 koku of salt, 0.15 koku each of rice, wheat, and sake, and 0.043 koku of non-glutinous rice (*uruchi-mai*). Hishio at that time would seem to resemble today's kidamari; it would seem to have been very salty.

1068?–Salty natto (*shiokara nattô;* probably fermented black soybeans) appears for the first time in the book *Shin Sarugakki,* by Fujiwara no Akihira (lived 989-1066). In this book the lifestyle, manners, and customs of the time are described.

1083–Stringy natto (*itohiki nattô*) is discovered accidentally in Oshu (northeast Japan) during the conquest of Oshu by Minamoto (Hachimantaro) Yoshiie (lived 1041-1108). It is said that the natto was made when cooked soybeans were placed in a sack strapped over the back of a horse. The warmth of the horse caused the fermentation. There are so many legends like this on in the northeast prefectures (*Tohoku Chiho*) of Japan that it seems possible that natto was originally made there.

1183–Tofu is first mentioned in a document from the Great Kasuga Shrine (*Kasuga Taisha*) in Nara. The characters used to write the word tofu then were different from the characters used today. It seems that this tofu was very hard.

Note: See Diary of Hiroshige NAKAOMI, entry of 1183.

1192–The Kamakura period and shogunate begins as Minamoto no Yoritomo (1147-1199) becomes the first head shogun.

1228–The Buddhist monk Kakushin returns to Japan from Sung dynasty China having learned the method for making fermented Kinzanji miso. While fermenting the miso in Japan, he discovers that the liquid which gathers on the bottom of the vats can be used as a tasty seasoning. Note 1. This tamari is considered the first soy sauce in Japan. Kinzanji miso is a type of *namémiso* (Finger Lickin' Miso) made from roasted soybeans and barley koji. To these are added eggplant, white melon (*shiro uri*), etc., and the mixture is fermented.

1288-1292–Tamari-style shoyu is sold from Yuasa in the Kishu area (in today's Wakayama prefecture).

Note 2. This document contains the earliest clear date seen for the cultivation of soybeans in Japan (A.D. 802, and 840), and for the appearance of the term "tamari" in Japan (1228).

Note 3. This is the earliest document seen (Sept. 2000) that mentions sesame seeds (802 A.D.). Address: Norin Suisansho, Tokei Johobu, Norin Tokeika Kacho Hosa.

27. Kagenki [Kagenki treasure at Horyuji temple in Nara]. 1338. Entry of July 26. First cited by Kawakami 1985. Unpublished manuscript. [Jap]
• ***Summary:*** This document, which was in *Gunsho Ruiju,* mentions "taufu-jiru," pronounced "toufu-jiru." Kawakami says this is the second oldest reference to tofu in Japan. Address: Nara, Japan.

28. Kagen ki [Record of the Kagen era (1305-1364)]. 1338. Japan. [Jap]*
• ***Summary:*** In this document, tofu is referred to in the form of *taufu-jiru.*

Note 1. According to Osamu Shinoda (1968), this is the earliest document seen that refers to tofu in Japan.

Note 2. Kagen is the name of a Japanese era when ran from 1303 to 1306. The Kagen-ki which started in 1305–during the Kagen era–covers the period 1305-1364. Address: Japan.

29. Gion shigyô nikki [Diary of an official at Gion-sha].

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1350. Japan. [Jap]*
• ***Summary:*** In this document, tofu is referred to as *Mori.*

Note 1. According to Osamu Shinoda (1968), this is the 2nd earliest document seen that refers to tofu in Japan.

Note 2: Gion-sha is today's Yasaka Shrine in Kyoto. Address: Japan.

30. Shijô ryôri-sho [Cookbook of the Shijo School]. 1384. Japan. [Jap]*
• ***Summary:*** This book mentioned "tare-miso," "usu-tare," and "tare usu," which are soy sauces similar to tamari.

31. Fujiwara Noritoki. 1405. Noritoki-kyô ki [Diary of the nobleman Noritoki FUJIWARA]. Entry of Dec. 19. Japanese summary by Kawakami 1978, p. 225-26. [Jap]
• ***Summary:*** Kawakami (1978) in his one-page summary of this work (which contains 3 volumes (*satsu*), 783 pages) makes no mention of natto. He does say, however, that this book discusses *shiro-zake* (white sake).

However Kawakami and Kimura (1985) state that this diary contains the earliest known reference to natto. They state: What we now call natto (*itohiki-nattô*) was written as *itohiki daizu* ("string-pulling soybeans") in the old days. It was written like that in the entry for 19 Dec. 1405 in the *Noritoki-kyo ki* (*Diary of Noritoki Fujiwara*), which is the earliest document seen (Jan. 2012) that mentions natto. The author's name was FUJIWARA Noritoki, but he was usually called Yamashina Noritoki because this nobleman's family, which lived on land they owned in Yamashina near Kyoto, kept their diary for five generations. This Yamashina family was in charge of the supplies department for the Imperial Court (*Chotei*), and all supplies that went to the Court had to pass through this family, which recorded them in detail. Another diary was kept by the family's manager (*banto*), and it is even more detailed, containing all of the prices of the goods ordered, and including wages paid to laborers, carpenters, etc. Therefore it is also a very useful book.

Letter (e-mail) from Naomichi Ishige, Japanese natto expert. 2007. March 20. This photocopy is from the late Kozo Kawakami (1995, p. 21). The large section on *itohiki nattô* states that the second earliest known appearance of this food is found in the *Noritoki kyo-ki,* which mentions itohiki-daizu ("string-pulling soybeans") in the entry for 19 Dec. 1405. This diary was written by TAMASHINA Noritoki, who was an aristocrat.

Note 1. This is the earliest document seen (Jan. 2012) that mentions natto (*itohiki nattô*), which it calls *itohiki daizu.*

Note 2. This is the earliest Japanese-language document seen (Dec. 2011) that uses the term *itohiki daizu* to refer to natto.

Note 3. Kozo Kawakami was born in 1898. Address: Japan.

32. Inryôken nichiroku [Daily record of Inryôken]. 1437. Japan. [Jap]*
• ***Summary:*** In this document, tofu is referred to in the form of *dengaku.*

Note: According to Osamu Shinoda (1968), this is the 3rd earliest document seen that refers to tofu in Japan. Address: Japan.

33. Ise no Jôshin. 1445? Sôgo daisô-shi [Sôgo daisô-shi]. Japan. Undated. [Jap]*
• ***Summary:*** K. Tsuchiya (Soymilk, 1982, p. 30) states that in this book, written in about 1417-1473, there is a section on cooking *unohana* (okara). Tsuchiya thinks this soup was similar to today's soymilk except that the okara had not been removed. The author was the ancestor of Ise no Teijô, who lived during the Tokugawa (Edo) period and wrote that the word *Tofu-kan* should actually be pronounced *Tofu-ko,* and that it means "soup" (*shiru*). When the last character is pronounced "kan" it means "yokan." Note: Could Mr. Tsuchiya be confusing Manpukuji's *tofukan* (hard tofu) with the word *tofukan* (written with different characters) that means soymilk? Address: Japan.

34. Nijo, Yoshimoto. 1450. Shôjin gyorui monogatari Shôjin gyorui monogatari [A comic tale of the great war between vegetarian foods and animal foods]. Japan. 79 p. Japanese summary by Kawakami 1978. [Jap]
• ***Summary:*** Some say that the author was Yoshimoto NIJO (lived 1320-88), but Kawakami thinks that the work was more likely written a little later, in the mid-Muromachi period (the period ran from 1338 to 1573). The original handwritten copy has been lost but the published copy (79 pages) still exists.

This is a funny story about foods that are depicted as people. There are different fish people, Suri-dofu (grated tofu), Natto Taro (or Natto Taro Itogasane; the last name means "many threads"), etc. The story explains that vegetarian foods and fishes got together at the high ranking samurai's place. A red snapper that showed up late was placed at a lower ranking seat below the vegetarian foods. Natto Taro was placed next to the top samurai. The red snapper got upset and called on the fish, shellfish, poultry, and meats to attack the vegetarian (*shojin*) foods. Some animal names weren't even foods.

Letter from Naomichi Ishige, Japanese natto expert. 2007. Jan. 17. This monogatari contains the 2nd earliest known reliable reference to natto in Japan.

Note 1. This is the 2nd earliest document seen (Jan. 2012) and the 2nd earliest reliable Japanese-language document seen that mentions natto. This is also the 2nd earliest document seen (Dec. 2011) concerning the etymology of natto. For more details see: M. Hirano. 1990. *Nattô bunka-kô* [Thoughts on the culture and history of natto]. *Shoku no Kagaku* (*Food Science Journal*) No. 144. p.

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16-22 (see p. 21).

Note: This is the earliest document seen (July 2002) concerning soyfoods and vegetarianism in Japan.

35. Jinson Daisôjô ki [Record of Jinson Daisôjô]. 1457. Japan. [Jap]*
• ***Summary:*** In this document, tofu is referred to as *tôfu.*

Note: According to Osamu Shinoda (1968), this is the 4th earliest document seen that refers to tofu in Japan, and the earliest that refers to it by the name still used today, *tôfu.* Address: Japan.

36. Oogusa ryôri-sho [Cookbook of the Ogusa School]. 1467-1614. Japan. [Jap]*
• ***Summary:*** Developed by one of Kyoto's two leading cooking school families. It mentioned soy sauce frequently.

37. Oyudono no Ue no nikki [Diary of Oyudono no Ue]. 1477. Japan. [Jap]*
• ***Summary:*** In this document, tofu is referred to in the form of *oden.*

Note: According to Osamu Shinoda (1968), this is the 5th earliest document seen that refers to tofu in Japan, and the earliest that refers to it in connection with oden. Address: Japan.

38. Gohôkôin Konoe Masaie ki [Record of Gohôkôin Konoe Masaie]. 1479. Japan. [Jap]*
• ***Summary:*** In this document, tofu is referred to as *shirakabe.*

Note: According to Osamu Shinoda (1968), this is the 6th earliest document seen that refers to tofu in Japan, and the earliest that refers to it as *shirakabe.* Address: Japan.

39. Ninagawa Chikamoto ki [Record of Ninagawa Chikamoto]. 1483. Japan. [Jap]*
• ***Summary:*** In this document, tofu is referred to as *shirakabe.*

Note: According to Osamu Shinoda (1968), this is the 7th earliest document seen that refers to tofu in Japan, and the 2nd earliest that refers to it as *shirakabe.* Address: Japan.

40. Jurin-in naifu ki [Daily record of Jurin-in]. 1484. Japan. [Jap]*
• ***Summary:*** In this document, Jurin-in is the name of a court nobleman. According to Kawakami & Kimura (1985), this is the earliest document seen that mentions *nimame* (sweet simmered black soybeans) in Japan. Nimame appears in the entry for 12 May 1484. They ate nimame on that day. Although black soybeans are not specifically mentioned, the dish must have been made from black soybeans. Nimame is still a popular New Year's dish in Japan. Address: Japan.

41. Shoken nichiroku [Daily record of Shoken]. 1486. Japan. [Jap]*
• ***Summary:*** In this document, tofu is referred to as *dengaku.*

Note: According to Osamu Shinoda (1968), this is the 8th earliest document seen that refers to tofu in Japan, and the 2nd earliest that refers to it in the form of *dengaku.* Address: Japan.

42. Inryôken nichiroku [Daily record of Inryôken]. 1487. Japan. [Jap]*
• ***Summary:*** In this document, tofu is referred to in the form of *mura dengaku.*

Note: According to Osamu Shinoda (1968), this is the 9th earliest document seen that refers to tofu in Japan, and the earliest that refers to it in the form of *mura dengaku.* Address: Japan.

43. Honcho bunsho 1487. Japan [Jap]*
• ***Summary:*** Yokotsuka (1985, p. 205) states: According "to such books as *Honcho bunsho* (AD 1487), *Shijoryu hochosho* (AD 1489) and others (AD 1504, 1537), Taremiso or Usudare seems to have been the name for the liquid drained off or press-filtered from the boiled mixture of miso or *sho* [*hishio*] and salt water." But the word *shoyu* (written with the same characters as *chiang-yu* [*jiangyou*] in Chinese) did not appear in any of these books. Address: Japan.

44. Rokuon nichiroku [Daily record kept by supervisory priests (*soroku*) at a subtemple of the Zen Buddhist temple Shokokuji in Kyoto]. 1489. Japan. [Jap]*
• ***Summary:*** In this document, tofu is referred to as *tôfu.*

Note: According to Osamu Shinoda (1968), this is the 10th earliest document seen that refers to tofu in Japan, and the 2nd earliest that refers to it as *tôfu.* Address: Japan.

45. Tajimi Teiken. 1489. Shijôryû hôchôsho [Cookbook of the Shijo school?]. Japan. [Jap]*
• ***Summary:*** This famous cookbook mentioned "tare miso," "usu tare," and "surimiso."

Yokotsuka (1985, p. 205) states: According "to such books as *Honcho-bunsho* (AD 1487), *Shijoryu-hochosho* (AD 1489) and others (AD 1504, 1537), Taremiso or Usudare seems to have been the name for the liquid drained off or press-filtered from the boiled mixture of miso or *sho* [*hishio*] and salt water." But the word *shoyu* (written with the same characters as *chiang-yu* [*jiangyou*] in Chinese) did not appear in any of these books.

46. Shichijû-ichiban shokunin-zukushi uta awase [Seventy-one matching poems / songs concerning Japanese craftsmen. 3 vols.]. 1500. Japan. [Jap]*
• ***Summary:*** A woodblock print titled "Tofu seller" (*Tofu uri*) shows a Japanese woman seated in the seiza position (on her heels) on the ground behind a short table (about 4 inches high, 4½ feet long, and 14 inches wide). On the table is one

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large cake of tofu (about 10 inches square and 3 inches high) and four smaller pieces (each about 6 inches square and 1 inch high).

47. Oogusaden yori soden no kikigaki [The Ogusaden and Soden cookbook?]. 1504. Japan. [Jap]*

48. Iseno, Teijo. 1525? Teikun ôrai [Teikun ôrai]. Japan. [Jap]*
• ***Summary:*** Ohta (1975, p. 226) states that this book was written during the Muromachi (Ashikaga) period [ca. 1336-1573] in Japan. It contains recipes for using fermented black soybeans (*shiokara nattô*).

K. Tsuchiya (Soymilk, 1982, p. 30) states that in this book, written during the Muromachi (Ashikaga) period in Japan, the word *tofu-kan* appears in the section titled *Shojin Ryori* (Buddhist Vegetarian Cookery). That word used to mean "tofu soup" but it actually refers to what Japanese today call soymilk (*tônyû*).

Toyo Shinpo. 1983. Jan. 1. "Tonyu no rekishi wa furui" [Soymilk has a long history]. Based on new book by Kanji Tsuchiya.

49. Tsuneatsu Hôin nikki [Diary of Tsuneatsu Hôin]. 1532. Japan. [Jap]*
• ***Summary:*** In this document, tofu is referred to as *taufu.*

Note: According to Osamu Shinoda (1968), this is the 11th earliest document seen that refers to tofu in Japan, and the 3rd earliest that refers to it as *tôfu.* Address: Japan.

50. ôkusa-ke ryôri-sho [The house of okusa cookbook]. 1532. Japan. [Jap]*
• ***Summary:*** According to Yokotsuka (1980), the word *shoyu,* written with the characters used today, was first used in a cooking book in this work. The next major event with shoyu in Japan was when a brewer in Noda sent tamari to Kawanakajima.

This book also contains a detailed recipe for making Natto Miso Soup (*nattô-jiru,* a special type of miso soup that contains diced natto), which became popular during this period.

Letter (e-mail) from Naomichi Ishige, Japanese natto expert. 2007. March 20. The title of this book is *ôkusa-ke ryôri-sho.* The "nattô" used to make nattô-jiru (natto miso soup) is actually kuki, or fermented black soybeans (*shiokara natto, tera natto*)*;* it is not *itohiki nattô.* This cookbook was reprinted in a modern version in 1932 (Dec. 15) in Tokyo by Zokugunsho-rui Ju Kanseikai (Ohta Yoshimara [person]).

Note: This is the earliest document seen (Dec. 2011) that mentions *nattô-jiru* [Natto Miso Soup] or miso soup of any type.

51. Shishinki [Record of my heart; diary kept by a priest (1496-1564)]. 1534. Japan. [Jap]*
• ***Summary:*** In this document, tofu is referred to in the form of *tengaku.*

Note 1. According to Osamu Shinoda (1968), this is the 12th earliest document seen that refers to tofu in Japan, and the earliest that refers to it as *tengaku.*

Note 2. This record is related to Ishiyama Hongan-ji, the primary fortress of the Ikkô-ikki, mobs of warrior monks and peasants who opposed samurai rule. It was established in 1496, at the mouth of the Yodo River, on the coast of the Seto Inland Sea–near today's Osaka. In use from 1532 to 1580, it was finally demolished in 1580 by Oda Nobunaga. Address: Japan.

52. Rokuon nichiroku [Early Japanese dairies kept by head priest at Rokuon-in temple in Kyoto]. 1536. Japan. [Jap]*
• ***Summary:*** Iino (2001, p. 22-23) states: "The next [actually the first real] reference to shoyu is an entry in the *Rokuon-nichiroku* for June 28, 1536, in which the writer mentions preparing shoyu. An entry for the previous day mentions preparing *hishio,* which suggests that shoyu and *hishio* were prepared separately. In addition, an entry for August 14 of the same year mentions putting *sho* in a cask, as if it were intended as a gift.

"Tou-miso prepared at the Tamon-in was usually ready for consumption in about sixty days; the koji being incubated in the latter half of June, followed by the addition of brine within a week after incubation, and the refining process in the middle of August7. This sho referred to in the *Rokuon-nichiroku* was probably the end product of the batch of shoyu prepared on June 28."

"The *Rokuon-nichiroku* consists of a collection of diaries kept by the head priest at the Rokuon-in temple, a smaller temple within the larger Shokokuji temple. The Rokuon-in was located in the center of Kyoto, then the nation's capital, while the Tamon-in was in Nara. Because of its location, the Rokuon-in was likely to have been influenced by Chinese culture earlier than the Tamon-in, and may well have begun manufacturing soy sauce before the Tamon-in, and give the name shoyu to it. In any event, it is apparent that soy sauce was already being manufactured in Japan by the middle of the sixteenth century."

"An entry in the *Rokuon-nichiroku* for September 8, 1599 mentions a breakfast menu that included a dish of *matsutake* mushrooms simmered in soy sauce. Subsequent entries also refer to dishes made by simmering various foods in soy sauce."

Note: This diary contains (as of April 2012) the earliest known written (but unpublished) reference to word "shoyu" in Japan. Address: Japan.

53. Nyôbô shitsukegaki [Women's book of manners]. 1540? Japan. [Jap]*
• ***Summary:*** According to the *Nihon Kokugo Daijiten* [Shogakukan Unabridged Dictionary of the Japanese

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Language, 2nd ed.] the earliest known appearance of the word *okabe,* meaning "tofu" was in the *Nyôbô Shitsukegaki,* a work produced toward the end of the Muromachi period. The entry explains that this is a *nyôbô kotoba* that means "woman's word."

Concerning the idea of *nyôbô kotoba,* the *Encyclopedia of Japan* (Kodansha, 1993; an English-language work) states: "A group of special feminine words originally created and used by court ladies (*nyôbô*) of the imperial household in the Muromachi period (1333-1568) to achieve a certain euphemistic elegance when discussing food and other mundane matters among themselves."

Again, according to the *Nihon Kokugo Daijiten* [Great Japanese Encyclopedia] the earliest known appearance of the word *mame no ko* (written in hiragana) was also in the *Nyôbô Shitsukegaki.*

Kawakami and Kimura (1985) state at "Kinako" (p. 36): The earliest known word for kinako was *mamenoko,* a word or term mentioned in the *Onna no Shitsukegaki* (Women's Book of Manners). They cannot find that book anywhere; it may be in the *Gunsho ruijû* [Great collection of old documents. 670 vols. Published in 1819]. In that latter book we read: *Mame no ko o ba kinako to mosu* (*Mame no ko* is also called kinako). Note: This may well be the earliest document seen (Nov. 2012) that mentions roasted soy flour, which it calls *mame no ko.* Address: Japan.

54. Iida Ichirobei of Shimôsa makes tamari shoyu and sends it to the Takeda family in Koshu. This is the beginning of Noda Shoyu (Early event). 1558.

• ***Summary:*** In *The Book of Miso,* by Shurtleff and Aoyagi (1976, p. 221-22), in the section titled "The development of shoyu," we read: "The area of Shimousa, about 30 miles northwest of Tokyo and already famous as a center of miso production, was to become the birthplace of the product now known as shoyu. In 1561, in the town of Noda, Iida Ichiro Heibei made a new variety of tamari-shoyu from hishio and presented it to the samurai Takeda Shingen, already known for his interest in miso. The flavorful product soon became known by its elegant name: Kawanakajima Goyo Tamari-Shoyu. It was first produced commercially in Shimousa in 1574."

In "Chronology of Soybeans," by Akio Saito (1985. *Daizu Geppo* (*Soybean Monthly News*). Jan. p. 12-14–in Japanese) we read:

1558–Iida Ichirobei of the feudal domain of Shimôsa (*Shimôsa no kuni;* today's Noda city in Chiba prefecture) makes tamari shoyu, called Kawanaka-jima Goyo Tamari, and sends it to the Takeda family in Koshu. This is the beginning of Noda Shoyu. It is said that the taste of shoyu gave a great boost to the energy of Takeda's army. At about this same time Takeda Shingen (lived 1521-1573) starts to use dried-frozen tofu (*kori-dofu*) for his army in Kawanaka-jima after tasting the delicious kori-dofu from Sahtobei?

55. Tokitsugu kyôki [Diary of Tokitsugu Yamashina]. 1559. Japan. Japanese summary by Kawakami 1978. [Jap]

• ***Summary:*** This diary contains (as of April 2012) the 2nd earliest known written (but unpublished) reference to word "shoyu" in Japan. One volume mentions *shirozake* (white sake, close relative of Amazake).

The diaries of five Yamashina family members are famous in Japan. The first word in each diary title is the given name of that family member; *kyoki* means "diary." The Noritoki Kyoki (1405-1410) is 3 volumes, 783 pages. The Norioki Kyoki (1410-1417) including one of the former volumes is 27 pages. The Tokikuni Kyoki (1474-1493) is 4 volumes plus 1 unfinished, 1,125 pages. The Tokitsugu Kyoki (1527-1571) is 6 volumes, 2,801 pages. The Tokitsune Kyoki (1576-1600) is 10 books, with total pages not given.

Iino (2001, p. 23) states: "Later [after the *Rokuon-nichiroku*], an entry in the *Tokitsugu-kyoki* for August 27, 1559 mentions putting *shoyuu* in a small cask for use as a gift. There is a strong likelihood that the *sho* and *shoyuu* placed into casks for use as gifts were not *tare-miso* [a by-product of the miso-making process], but were in fact soy sauce."

56. Hôchô kikigaki [Transcribed instructions for cooking]. 1560-1580. Published in the *Gunsho Ruijû.* Japanese summary by Kawakami, p. 136. [Jap]

• ***Summary:*** A *hôchô* is a Japanese kitchen knife; *kikigaki* means "listening and writing." According to Kawakami and Kimura (1985, p. 36-37) the term *shiokara nattô* ("salty natto") appears in the work titled *Gunsho Ruiju* [compiled about 1819-20] (*Katsuji-hon,* page 344, lower section, line 5). The authors think this is the earliest document that mentions *tera nattô* or non-stringy natto [fermented black soybeans]. But after that time, the same food appears to be called *ko no daizu* or *kaori no daizu* ("fragrant soybeans"), and that term first appeared in the *Hôchô Kikigaki,* a cookbook that was published about 1560-1580 and that is part of the *Gunsho Ruiju* (Katsuji-hon, page 800, upper section, line 6).

This book also gives recipes using *tare miso,* made by mixing miso and water. Mentions chiang.

Also contains a very early possible footnote reference to soybean sprouts, *Moyashitaru mame.*

Note: If this footnoted term does refer to soybean sprouts, this is the earliest Japanese-language document seen (Jan. 2013; and the earliest nonChinese-language document seen) that mentions soy sprouts.

57. Seiryô-ki [Agronomy in Japan]. 1560. Japan. [Jap]*

• ***Summary:*** Goto (1984, p. 136) states: "Seiryôki (published around 1560) which is the oldest Japanese book of agronomy, identified two types of soybeans, namely summer and autumn types." Address: Japan.

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58. Matsuya Hisamasa. 1561. Nattô-jiru [Natto miso soup]. In: Matsuya Hisamatsu chakai-ki [Three-generation diary of the Matsuya family's tea ceremonies]. Sept. 5. Compiled by Hisashige Kaiki. Japanese summary by Kawakami 1978, p. 261. [Jap]*

• ***Summary:*** Concerning *natto-jiru* (natto soup): Kawakami and Kimura (1985) state that in the olden days in Japan, people used natto in a soup (*nattô-jiru*), which was quite popular. However these two authors think that the *natto* used in this soup was probably fermented black soybeans (*kuki, shiokara natto, tera natto*) rather than *itohiki* natto. This is the 2nd earliest document seen (Jan. 2012) that mentions *nattô-jiru.* It is mentioned in the entry for 5 Sept. 1561. Mr. Matsuya was a rich merchant in the Nara area. His family kept their diary for three generations. Address: Japan.

59. Nôin Eshun. 1568. Tamon-in nikki [Tamon-in diary]. Nara, Japan. See entry for May 21 and Oct. 25. English-language summary by Kodama & Yoshizawa 1977, p. 427. Japanese summary by Kawakami 1978, p. 222. [Jap; eng]

• ***Summary:*** This diary was kept from about 1539 to 1596 (58 years) at the Tamon-in monastery inside the Kofuku-ji temple in Nara City, Japan.

Concerning soy sauce: Iino (2001, p. 23) states: "By the second half of the sixteenth century, shoyu was being written using the same characters as those used today. An entry in the *Tamonin-nikki* for October 25, 1568 mentions taking shoyu to Choinbo, a Buddhist monk. This appears to be the first time the contemporary characters were used. An entry in the same diary for August 24, 1582 uses different characters to refer to soy sauce. By this stage it seems that the Tamon-in had also started using the term shoyu when referring to *tou-miso."*

Iino (2003, p. 9): In this diary shoyu made from a second pressing of the moromi (*niban shoyu*) is referred to as *tou-miso niban* (second tou-miso) and its production is discussed. This can be seen in several places, including the entry for the date of the 17th year of Tenmon (1548) Jan. 1.

Concerning natto: Letter (e-mail) from Naomichi Ishige, Japanese natto expert. 2007. March 30. The entry for 21 May 1568 mentions *netaru-natto.* The entry was written by Nôin Eshun, who was the chief priest at Tamon-in, a monastery that belonged to Kofuku-ji in Nara. Kawakami et al. (1978) understood *netaru natto* to mean what we now call *itohiki natto.*

Note 1. This is the earliest Japanese-language document seen (Jan. 2012) that uses the term *netaru natto* to refer to natto.

Kawakami and Kimura (1985) state at "Kinako" (p. 36): The *Tamon-in nikki* is the diary of a monk in Nara. On 1 Jan. 1542–New Years day, *mamenoko* [kinako, roasted whole soy flour] is mentioned. A few years before the Edo period (1600-1867) the word *kinako* began to be used. As you know, you cannot make roasted soy flour without roasting the soybeans first. If you roast them, then grind them in a quern or grinding stones (*ishiusu*), it is easy to make kinako. But at that time grinding stones were very rare and precious. But if you had them, it was not hard to make kinako.

This diary also describes in detail a heating method to kill the microorganisms in saké (Japanese rice wine). It was almost identical with the process invented by Pasteur in France in 1865 (300 years later) for low-temperature pasteurization of wine and milk. The Japanese process was later used on soy sauce.

60. A feudal lord who controls the port of Nagasaki in Kyushu is converted to Christianity. As a gift of thanks, he cedes Nagasaki to the Jesuits (Early event). 1580.

• ***Summary:*** Alessandro Valignano (1539-1606) was an Italian Jesuit missionary who was a leader in the introduction of Catholicism to East Asia, especially Japan. In 1584 he wrote "Historia del Principo y Progresso de la Compania de Jesus en las Indias Orientales (1542-64)" which states: In 1580 the daimyo who controlled the port of Nagasaki was converted to Christianity. As a gift, he ceded the port to the Society of Jesus (Jesuits). Under Jesuit control, Nagasaki would grow from a small fishing village with one street to an international trading port rivaling Goa or Macao in influence.

61. Konko chômi-shû [Present and old cooking collections]. 1580. Publisher unknown. 276 p. Handwritten. Japanese summary by Kawakami 1978, p. 46. [Jap]

• ***Summary:*** The year 1580 was the year the book was copied. The actual year it was written is unknown. It is a sort of encyclopedia of cooking, and includes 17 varieties of sake, 3 varieties each of hishio and miso, plus a tofu section... and much more.

62. Allesandro Valignano, a Jesuit, later says he bought miso in Japan (Early event). 1583.

• ***Summary:*** Valignano (1539-1606) was an Italian Jesuit missionary who was a leader in the introduction of Catholicism to East Asia, especially Japan. He first visited Japan from 1579 to 1582, when he developed a strategy for the introduction of Christianity. His luxurious life and authoritarian attitudes were criticized by members of the mendicant orders such as the Franciscans and Dominicans. He emphasized study of the Japanese language and culture, and required that all new missionaries spend at least two years in a language course and do their best to learn Japanese customs and manners. He was a great admirer of the Japanese people and envisioned a future when Japan would be one of the leading Christian countries in the world. He famously wrote that the Japanese "excel not only all the other Oriental peoples, they surpass the Europeans as well" (Alessandro Valignano, 1584, "Historia del Principo y Progresso de la Compania de Jesus en las Indias Orientales

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(1542-64)").

In order to finance the Jesuit seminaries, schools, and printing presses, the missions needed money. The local daimyo curried favor with the Jesuit administration in hopes of having Portuguese trading ships visit their local port more often. In 1580 the daimyo who controlled the port of Nagasaki was converted to Christianity. As a gift, he ceded the port to the Society of Jesus (Jesuits). Under Jesuit control, Nagasaki would grow from a small fishing village with one street to an international trading port rivaling Goa or Macao in influence. In all, Valignano made three visits to Japan: 1579-1582, 1590-1592, and 1598-1603.

In 1954 his *Sumario de las cosas de Japón* (*1583*)*. Adiciones del Sumario de Japón* (*1592*)*. Editados por José Luis Alvarez-Taladriz* [Summary of the things of Japan (1583). Additions to the Summary of Japan (1592), edited by José Luis Alvarez-Taladriz], was published.

In the 1st book, on page 93, the author mentions that he bought the necessary provisions, rice, miso, dried fish, etc. Footnote 240 gives a long definition of *misso* (sic, miso) in Italian from *Saverio Orientale,* by Bernardino Ginnaro (1641, Naples).

63. Matsuya Hisamasa. 1587. Uba [Yuba]. In: Matsuya Hisamatsu chakai-ki [Three-generation diary of the Matsuya family's tea ceremonies]. Jan. 24. Compiled by Hisashige Kaiki. Japanese summary by Kawakami 1978, p. 261. [Jap]*
• ***Summary:*** Concerning yuba–the film that forms atop soymilk when it is heated: According to Kawakami (1978), the entry in this diary for 24 Jan. 1587 contains the earliest known reference to *uba* (yuba) in Japanese. Kawakami and Kimura (1985) repeat this information.

Note: This is the earliest document seen (Oct. 2012) worldwide that mentions yuba, which is calls *uba.* Note that it is from Japan rather than China. Address: Japan.

64. Sotan. 1588. Sotan Chakai Kondate Nikki [Master Sotan's Tea Ceremony Cookery Menu Diary]. Japan. [Jap]*
• ***Summary:*** According to Kawakami and Kimura (1985, p. 36-37), the term *ko no daizu* or *kaori no daizu* apparently refers to salted non-stringy natto (tera natto or fermented black soybeans). It appeared in the *Sotan Chakai Kondate Nikki* (*Master Sotan's Tea Ceremony Cookery Menu Diary*)*,* in the morning menu for 19 March 1588.

According to Kawakami and Kimura (1985, p. 36), in this diary, on 19 June 1587, in the morning menu, kinako is mentioned; it is an unexpectedly new food.

Note: This may well be the earliest document seen (Nov. 2012) that contains the word *kinako,* which it uses to refer to roasted whole soy flour.

65. Francesco Carletti of Florence later says he saw miso in Japan (Early event). 1597.
• ***Summary:*** Carletti, a 16th century Florentine merchant (lived 1573-1636), set out from Seville, Spain with his father in 1594, on what was intended to be a relatively brief slave trading voyage but eventually became a circumambulation of the globe. In June 1597 he arrived in Nagasaki, Japan, where he saw miso soup–and crucified Christians. After losing most of the wealth he had accumulated by astute trading, he finally returned to Florence, Italy in July 1606. There he was welcomed at the court of Ferdinando de' Medici [lived 1549-1609], Grand Duke of Tuscany, to whom he made the first verbal reports of his experiences, which later were written down as the *Ragionamente* (Chronicles). Thus, he didn't actually write about miso until after July 1606. Scholars generally agree that the best copy is a 17th century manuscript titled *I Viaggi di Francesco Carletti* in the Biblioteca Angelica in Rome (Codice 1331; T.3.22). A much-polished and heavily edited version was published in 1701.

In 1964 Herbert Weinstock's English-language translation of the Roman version was published as *My Voyage Around the World.* On page 110 Carletti says the following about the rice miso (he calls it *"misol"*) which he saw in Japan in 1597.

"They prepare various sorts of dishes from fish, which they flavor with a certain sauce of theirs which they call *misol.* It is made of a sort of bean that abounds in various localities, and which–cooked and mashed and mixed with a little of that rice from which they make the wine already mentioned [saké, p. 100-01], and then left to stand as packed into a tub–turns sour and all but decays, taking on a very sharp, piquant flavor. Using a little at a time, they give flavor to their foods, and they call *shiro* [sic, probably *shiru* but possibly shoyu] what we would call a potage [soup] or gravy. They make this as I have said, of vegetables and fruit and fish all mixed together, and even some game, and they eat it with rice, which serves them as bread and is cooked simply in water and served in certain wooden bowls lacquered with red lacquer, eating it very cleanly and never touching it with their hands. For they eat everything by using two small sticks..."

Note: This is the earliest document seen (June 2009) concerning soy in connection with (but not yet in) Italy.

66. Ekirinbon setsuyôshû [Early Japanese dictionary]. 1597. Japan. [Jap]*
• ***Summary:*** This dictionary contains (as of April 2012) the earliest known published reference to shoyu (soy sauce) in Japan, written with the characters used today. Prior to this, other characters were used: Hishio / chiang, mame-bishio, etc. Written by a Japanese priest between 1469 and 1503, it was widely circulated in manuscript form and used by the common people. Modern rendering by Kawakami 1978, p. 220. It also mentions amazake and ko (the early term for amazake).

Note: This is the earliest Japanese-language document seen (June 2012) that mentions amazake, which it calls

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"amazake" and "ko." This is also the earliest document seen (March 2001) concerning the etymology of amazake.

Yokotsuka (1985, p. 205; 1986, p. 198) gives the title and date as "Ekirinbon-Setsuyoshu (1598)" and notes that the word shoyu [written with the same Chinese characters as chiang-yu / jiangyou, the Chinese word for soy sauce] first appeared in this book.

Akio Saito (1985) states that this book was published in 1521.

Fukushima (1989, p. 9): "The word 'shoyu' first appeared in *Ekirinbon-Setsuyoshu,* a Japanese dictionary published in 1597 during the Muromachi period."

Iino (2001, p. 23): "Next [after the *Tamonin-nikki* entries of 1568 and 1582] we find an entry for shoyu (using contemporary characters) in the *Ekirinbon-setsuyoshu* (1597). The oldest of these dictionary-like *setsuyoshu* is thought to be the *Bunmeibon-setsuyoshu.* Following its publication, similar volumes appeared successively, but none of these contains any reference to shoyu. The entry in the *Ekirinbon-setsuyoshu* appears to be the first reference to shoyu in a *setsuyoshu.* By this stage it seems clear that soy sauce was in common use, both in name and in practice."

67. Saito, Akio. 1599. [Chronology of soybeans in Japan, 1336 to 1599, the Ashikaga/Muromachi period] (Document part). In: Akio Saito. 1985. Daizu Geppo (Soybean Monthly News). Jan. p. 14. [Jap; eng+]

• ***Summary:*** 1350–Dengaku (Oden) is mentioned in the records of the Gion shrine in Kyoto.

1444 June–The present characters for "tofu" appear in the *Kagakushu* encyclopedia.

1450–The suribachi (a serrated earthenware grinding bowl or mortar) becomes popular among the common people, therefore miso soup becomes popular.

1469–In the feudal domain of Sanuki (*Sanuki no kuni*) the Sakade Salt Farm (*Sakade Enden*) starts operation.

1500–In the published collection of Japanese poems and songs titled *Shichijû-ichiban shokunin-zukushi uta awase,* there is a drawing of a lady in a black kimono and white headband sitting cross legged on a low platform on a street and selling large and small pieces of cut tofu.

1521–The present characters for the word "shoyu appear for the first time in the book *Ekirinbon Setsuyoshu.*

1526–In a memorandum by Munenaga is written: "Late in the night, sitting by the sunken open-hearth fireplace together, and eating many Dengaku tofu" (*Yo mo fuke, irori-be ni hiza o narabe, Dengaku tofu o do kasanari.*) It seems that at the end of the Muromachi period, people spread miso on tofu, grilled it over a fire, then ate it.

1535–In Kishu (today's Wakayama prefecture), Akagiri Umataro? (Zenuemon/Yoshiuemon?) starts selling Yuasa Shoyu, which is derived from Kinzanji miso.

1558–Iida Ichirobei of the feudal domain of Shimôsa (*Shimôsa no kuni;* today's Noda city in Chiba prefecture) makes tamari shoyu, called Kawanaka-jima Goyo Tamari, and sends it to the Takeda family in Koshu. This is the beginning of Noda Shoyu. It is said that the taste of shoyu gave a great boost to the energy of Takeda's army. At about this same time Takeda Shingen (lived 1521-1573) starts to use dried-frozen tofu (*kori-dofu*) for his army in Kawanaka-jima after tasting the delicious kori-dofu from Sahtobei?

1559–The book *Tokitsugu Kyoki* by Yamashina Tokitsugu (lived 1507-1579) states that Tokitsugu sent a small keg of shoyu to Nagahaki kyoku. It seems that at the end of the Muromachi period, shoyu is becoming popular.

1560 May–Oda Nobunaga (who lived 1434-1582) wins the war over Imagawa Yoshimoto (1519-1560) in Okehazama. At about this time people start use the technique of frying to prepare the side dishes to their meals (*fukushoku-hin*) for the first time.

1573-91–Shoyu making starts on the island of Shodo-shima.

1574–Tanaka Chobei of the feudal domain of Shimousa (today's Chiba prefecture) Ichikawa starts making shoyu.

1587–Maruo Magouemon of Hanshu Tatsuno makes shoyu using Mikazuki soybeans.

1591–Akagiri Saburobei of Yuasa in Kishu-han (today's Wakayama prefecture) starts to use Shoyu Kaisen, a ship of at least 200 koku [9,520 gallons] capacity to transport his shoyu to other feudal domains (*kuni*) for sale.

1594–The term *koma-dofu* appears in the Rokuon Diary of Ginkakuji. "Rokuon" means "deer garden." *Koma-dofu* is a very firm tofu which originated in Korea.

Note. This is the earliest document seen (April 2013) that mentions firm tofu. Address: Norin Suisansho, Tokei Johobu, Norin Tokeika Kacho Hosa.

68. Companhia de Iesus [Society of Jesus (Jesuit)]. 1603. Vocabulario da lingoa de Iapam, com a declaraçáo em Portugues, feito por alguns padres, eirmaós da Companhia de Iesu [Vocabulary of the language of Japan, with definitions in Portuguese, produced by some fathers and brothers of the Society of Jesus]. Nagasaki, Japan. 403 p. [Por; Jap]

• ***Summary:*** At the bottom of the title page is written: "Com licença do ordinario, & Superiores em Nangasaqui no Collegio de Iapam da Companhia de Iesus. Anno M.D. CIII." The "Licença" or license by Francisco Pasio is dated 2 Jan. 1603. A romanized version of each Japanese word is given, followed by a brief explanation in Portuguese. In Japanese, this book is known as *Nippo Jisho, Nagasaki-ban.* In 1960, Iwanami Shoten published a facsimile edition in Japan, titled *Nippo Jisho: Vocabulario da lingoa de Iapam,* compiled by Tadao Doi (822 p., 22 cm), then in 1980 they published a Japanese translation (xxxiv + 862 p., 27 cm). Kawakami (1978) has summarized some soy-related portions. Iwai (1953, p. 11) notes that this dictionary was compiled by Joao Rodrigues–but this is controversial.

Soy-related terms in this dictionary, and a translation

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of their definitions from Portuguese, through Japanese, into English, are as follows:

Abura ague. 1. Abura agueno mono. Abura-agé [deep-fried tofu] or abura-agé mono. Things which are deep-fried in oil. Note 1. This is the earliest document seen (April 2013) that mentions fried tofu.

Aburidôfu. Slice tofu, which is made from beans like raw cheese, broil in a fire.

Amazaqe [Amazake], a still-bubbling fermented liquid that has not yet completely become sake; or sweet sake. Note 2. This is the earliest Portuguese-language or Western-language document seen (June 2012) that mentions amazake, which it calls "Amazaque."

Azzuqi or azzuqui [azuki beans]. *"Hus feijoes pequenos como lentilhas"* means "Beans that resemble green peas (endo). Azzuqigai is rice porridge (o-kayu) that contains azuki beans. Azzukimochi is mochi that contains azuki beans. Note 3. This is the earliest European-language document or Portuguese-language document seen (Jan. 2005) that mentions azuki beans, which it calls *Azzuqi* or *Azzuqui.*

Cabe [Kabe]. Same as tofu. A type of food which is made from ground beans. This is a woman's word. Note 4. This is the earliest document seen (April 2013) that uses the word "cabe" (or "kabe") to refer to tofu.

Côji [Koji], a yeast [sic] used in Japan to make sake, or mixed with other things. Note 5. This is the earliest European-language document seen (June 2012) that mentions koji.

Daizzu [Daizu]. Mame. Graos, ou feijoes de Iapao [grain, seed, kernel, or Japanese beans].

Dengacu [Dengaku]. Dancing monks (Bôzos). Or tofu which is skewered, and on top of each slice is spread miso; then it is broiled. Note 6. This is the earliest document seen (April 2013) that mentions Dengaku, a type of delicious broiled / grilled tofu seasoned with miso.

Fanben [Hanben]. A type of food which is made by broiling tofu and simmering it with miso.

Icchô. A way of counting some types of food, such as tofu.

Miso. A kind of mixture which is made with *graos* [grains, seeds, kernels], rice, and salt to season Japanese soups.

Note 7. This is the earliest European-language (or Portuguese-language) document seen (March 2009) that mentions miso, which it calls *Miso.*

Misocoxi [*Misokoshi*], a bamboo strainer used for straining miso. Note 8. This is the earliest document seen (March 2011) that mentions a *misokoshi.*

Misoya, a shop that sells miso.

Misoyaqijiru [*Miso-yaki-jiru*], a type of soup (*Xiru*) made with tofu and finely sliced daikon radish. Note that the word tofu was written as "Tofus" in the dictionary but should be written "Tôfus."

Misôzzu, which should properly be called Zosui, is a healing food made from vegetables, rice, miso, etc. and served to those who are old, weak, or sick. Another meaning of this term is a type of porridge [*kayu*] containing a mixture of rice, vegetables, and other things.

Nattô, a type of food made by a brief boiling of grains / seeds [*graos* is the word used, but soybeans are actually employed], which are then put into an incubation chamber (muro).

Nattôjiru, a soup (*Xiru*) made from natto. Note 9. This is the earliest Portuguese-language document seen (Jan. 2012) that mentions *natto* or *Nattôjiru.* However recall that the "natto" used in Nattôjiru may well be fermented black soybeans.

Saqe (sake, saké).

Tamari, a very savory liquid taken from miso which can be used for seasoning foods [when cooking] or at table. Note 10. This is the earliest document seen (April 2012) that mentions tamari.

Tôfu*–Taufu. A type of food. It is made into the shape of a cheese by crushing soybeans. * Note: The sound of the Japanese character for bean (mame) is "tou." But at that time "taufu" was the typical pronunciation. In other documents it is the same, for example the *Iitsugu Kyoki* (Iitsugu Diary) written during the Tensho period (1573-1586), with entries in 1588, 1591, and 1600. Sometimes they used the characters for "T'ang" (as T'ang dynasty in China) and "cloth," although they were also pronounced as "taufu." In this 1603 Portuguese dictionary there appear a number of tofu terms written in the "open sound form" (kaionke): Cabe [Kabe = wall], Dengacu [Dengaku], Fanben, Icchô [One cho or cake of tofu], Vdondôfu, and Yudofu. One exception is the term Aburidôfu.

Tôfuya–Taufuya, a shop which makes and sells that cheese-like thing (tofu), which is made by grinding soybeans that have been soaked in water until they are soft.

Vdondôfu [Udon-dôfu]. Tofu which is made like udon (Japanese-style wheat noodles) and cooked.

Xôyu [Shoyu, or soy sauce], a liquid which corresponds to vinegar except that it is salty. It is used for seasoning foods. It is also called *sutate.* The character *su* means "bamboo mat" [as in "sudare"] and the character *taté* means "to stand up." Note 11. This is the earliest Portuguese-language document seen (April 2012) that mentions shoyu or soy sauce, which it calls Xôyu.

Yudôfu–Yudaufu: A food made from thinly sliced tofu, served next to a *kakejiru*-type sauce [which is then poured over the top].

The following terms are not mentioned: Agé (but abura-agé is), Daitokuji natto, Edamame (or Eda mame or Yeda mame), Fu (or gluten or wheat gluten), Hamanatto or Hamana-natto, Hiya-yakko, Kinako, Koya-dofu (or Kori-dofu), Okara, Soi*, Soj*, Shoyu, Tonyu, Unohana, Yaki-dofu, Yuba, Zoy*.

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Note 12. This is the earliest dictionary of the Japanese language compiled by Europeans. It is also the earliest document seen (Feb. 2001) concerning soybeans or soybean products in connection with (but not yet in) Europe or Portugal, and the first such document to mention miso or natto.

Note 13. This is the earliest European-language (or Portuguese-language) document seen that mentions tofu, which it calls *Cabe, Tôfu,* or *Taufu.*

Michael Cooper (1974, p. 222-23), in his excellent biography of Rodrigues, states that in the preface to this celebrated work, the "compilers promised to produce shortly a supplement containing additional terms and words inadvertently admitted from the dictionary. The supplement appeared the following year, and the Bodleian Library, Oxford, possesses a copy of both the *Vocabulario* and its supplement bound together in one volume. The dictionary runs a formidable total of 330 folios, while the supplement extends to 71 more folios, each page carrying two columns of text. The value of this great dictionary, containing a total of 32,798 entries, is considerable." "Whether or not Joao Rodrigues had a hand in the compilation of the *Vocabulario* is still a debatable point... Thus until further evidence appears, the identity of the principal European collaborators must remain conjectural." Address: Nagasaki College of Japan.

69. Rodrigues, Joao. 1604-1608. Arte da lingoa de Iapam [The art of the language of Japan]. Nagasaqui [Nagasaki], Japan: Collegio de Iapao da Companhia de Iesu. 239 leaves. [Por]*

• ***Summary:*** This is the second major dictionary published by Jesuit priests in Japan. Doi (1980) notes that the 1603 dictionary was developed to help the priests understand dialects, lower-class speech, and the confessions of the local common people. The 1604 dictionary focused on the speech of the upper classes and more educated people. Thus the 1603 dictionary collected words the priests needed to understand, while the 1604 dictionary collected those that they wanted to use. The author (whose name has also been written Padre Iaao Rodriguez) lived 1561-1634 (or 1558-1633). A reprint was published in 1969 in Tokyo by Bunkashobô Hakubunsha (479 p.).

In the book *Treatise on Epistolary Style: Joao Rodriguez on the Noble Art of Writing Japanese Letters,* by Jeroen Pieter Lamers (2002, Center for Japanese Studies, Univ. of Michigan, Ann Arbor), Lamers states that this is a grammar (not a dictionary), and is a treasure trove of valuable information on language use in the early 1600s, especially in polite Japanese society. The 1604 work has three main divisions, including syntax and styles of writing. Address: Nagasaki College of Japan.

70. Saris, John. 1613. [Log of trip to Japan] (Log–unpublished). Unpublished log. [Eng]

• ***Summary:*** On 29 Aug. 1613, while in Japan (near Shizuoka), Saris wrote: "Of Cheese [probably tofu] they haue plentie. Butter they make none, neither will they eate any Milke, because they hold it to bee as bloud [blood], nor tame beasts."

Note 1. This log was first published in 1900 as follows: Satow, E.M. 1900. "The voyage of Captain John Saris to Japan, 1613." *Works Issued by the Hakluyt Society* (*London*)*. Series 2.* 5:126. Saris probably wrote this in Japan in August 1613 as he was traveling by land from Hirado (an island off northwest Kyushu) to Shizuoka, where he would meet Japan's ruler, Ieyasu. His traveling companions included William Adams (the first Englishman to arrive in Japan–by boat in April 1600), 10 other Englishmen, and an escort of 7 Japanese guards to protect them (Samurai William, by Giles Milton, 2002, p. 167-71).

Note 2. This is the second earliest document seen (Feb. 2004) on soy by a European–but note that Saris does not mention soy, presumably because he did not realize that their "Cheese" was made from soybeans. It is the second earliest document seen (April 2013) by a European that mentions tofu (though it is not mentioned by name) or any other soyfood.

Note 3. This is the earliest English-language document seen (April 2013) that mentions tofu, or that uses the word "cheese" to refer to tofu, or that mentions tofu in connection with Japan.

Note 4. This is the earliest document seen (Feb. 2004) concerning soy or tofu in connection with (but not yet in) England.

71. **Product Name:** [Higeta Shoyu].
Foreign Name: Higeta Shôyu.
Manufacturer's Name: Choshi Shoyu.
Manufacturer's Address: Choshi, Japan.
Date of Introduction: 1616.
Ingredients: Soybeans, wheat, water.
Wt/Vol., Packaging, Price: Keg
How Stored: Shelf stable.
New Product–Documentation: Chamberlain, Basil Hall; Mason, W.B. 1901. Handbook for travellers in Japan: Including the whole empire from Yezo to Formosa. 6th ed., revised. London: John Murray; Yokohama, Shanghai, Hongkong, Singapore: Kelly & Walsh, Ltd. ix + 577 + 94 p. In the ads at the back is a full page advertisement (p. 49) for "Higeta Soy, manufactured by G. Tanaka, Chôshi, Shimôsa, Japan." An illustration shows the Higeta trade mark. "Higeta Soy dates from 1615 A.D. (Second year of Genwa). Higeta Soy is honoured with the distinguished patronage of the Imperial Household. Higeta Soy was awarded the superior medal at the World's Fair at Chicago, and gold and other superior medals by the Home Exhibitions.

Fruin, W. Mark. 1984. "History of Higeta Shoyu Co."

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4060 Amaranta Dr., Palo Alto, California 94306. 4 p. May 15. Unpublished manuscript. Higeta shoyu is one of the oldest brands of soy sauce in Eastern Japan, tracing its history back to the Hamaguchi brothers who migrated at the beginning of the 17th century from Hiromura in Wakayama prefecture (across the river from Yuasa, the birthplace of shoyu in Japan) to Choshi on the eastern tip of the Miura Peninsula, which curves around the top of Tokyo Bay. The Black Current, which runs northward from Wakayama to Choshi, carried the Hamaguchi brothers' ships. They had the foresight to transport shoyu from its place of origin in western Japan to the newly opened vistas in the 17th century of Tokyo and the Kanto plain hinterland.

Around 1615 the elder of the two Hamaguchi brothers established Hiroya, a food distribution company in Tokyo (then Edo), while the younger brother ventured into the manufacture of Yuasa shoyu. For the next several centuries, Yamasa was noted as a good but local shoyu, indistinguishable from other local brands except for the access to the Tokyo market, which it enjoyed through Hiroya.

In 1914 the elder Hamaguchi joined with two other Choshi families, Tanaka Genba and Fukui Kichibei, to form the Higeta Shoyu Co. Ltd. Each family continued to produce their own brands of shoyu but around 1925 Higeta, which had been Tanaka Genba's brand, became the sole company brand. An ambitious plan of expansion of expansion was drafted to leapfrog Higeta over Yamasa its local rival.

Akio Saito. 1985. [Chronology of soybeans in Japan]. *Daizu Geppo* (Soybean Monthly News). Jan. p. 14-16. 1616– Tanaka Genba of Kamiusa no Kuni is advised to make tamari shoyu as a side business by Sanagi Kyurouemon of Settsu. The latter runs a sake factory and has a wholesale seafood products shop in Edo. This is the beginning of Choshi Shoyu and Higeta Shoyu.

1895–Around this time the number of small shoyu makers decreased dramatically as Kikkoman, Yamasa, and Higeta increasingly used advanced industrialized methods.

Note: This is one of the earliest brands of commercial soy sauce seen made by any company in Japan. This is also the earliest known commercial soy product made in Japan.

72. Anrakuan, Sakuden. 1623. Seisuishô [Laughs to banish sleep]. Japan. [Jap]*

• ***Summary:*** Orie Endô (2006, p. 38) states: There are also examples of men using words such as *murasaki, himojii,* and *okabe* in a collection of popular common stories called *Seisuishô* (1623).

Note: The author's name is not a real Japanese name; it is made up and humorous.

73. Vliet, Jeremias van. 1637. [Re: Request for provisions]. Letter to Nicolaes Coeckenbacker, head of Dutch office at Firando [Hirado Island, near Nagasaki, Kyushu, southern Japan], June 11. p. 555-65 See p. 565. Handwritten, with signature. [Dut]

• ***Summary:*** This request includes: 10 pots of sugarloaf, 50 candlesticks dismantled into parts, 50 lacquered plates with legs and gilded flowers, 10 Kegs Murasaki to hawk among the Moors (*10 Balien Moersackjen om onder de Mooren te venten*). Note 1. Murasaki (literally "purple") is an ancient poetic synonym for soy sauce.

Bibliographic reference in Dutch: NA, VOC 1125, overgekomen brieven en papieren (11-6-1637) 555vo-565vo. The letter is a contemporary hand-written copy, written in a letter-book for the administration on Deshima.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 1125 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 1125].

Note 2. This is the earliest Dutch-language document seen (April 2012) that uses the word "Moersackjen" [murasaki] to refer to soy sauce.

Note 3. The Dutch word for "murasaki" also appears in at least two other letters written requesting provisions during the late 1630s, but in each case "murasaki" seems to be a solid, ordered in units of pieces or bales (such as indigo), as follows: (1) 1638 May 5. NFJ 277, p. 319. Letter from the prince of Tonkin to the president of the VOC settlement at Firando. "8 pieces of murasaki or violet (*8 stucx mourasacquij ofte violeth*). (2) 1638 July 15. NFJ 277, p. 472. Letter from Henrick Nachtegael in Siam to the honourable mister president Nicolaes Couckenbacker at Firando. "Twenty bales of murasaki to sell and use as a present (*Twintich baelen moersacquij om te vercoopen ende te verschencken*).

Note 4. Assuming "Moersackjen" refers to soy sauce: This is the earliest document seen (Feb. 2012) concerning soybean products (soy sauce) in Siam. This document contains the earliest date seen for soybean products in Siam (1637); soybeans as such have not yet been reported. Address: In India at the office in Siam (*India op het comptoir Siam*).

74. Ginnaro, Bernardino. 1641. Saverio Orientale, o vero Istorie de Cristiani [Oriental Xavier, or the true history of Christianity]. Naples, Italy. With engraved title page and folded map. [Ita]*

• ***Summary:*** In Book 1, Chapter 13, p. 49, is a description of miso and miso soup (*shiru*). *"Misso: che è una pasta ammassata ri riso, faivoli, o vero ceci corroti, con frumento cotto, e notabile quantità di sale, che per lungo tempo si conserva, e ridotta poscia in polvere, rende el brodo ove si mescola simile alla salamoia, da cui vene sluzzicato P appetito di mangiare il riso."*

Note: This is the earliest Italian-language document seen

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(March 2009) that mentions miso, which it calls *Misso.*

75. Kebukisô [Hair blows like grass]. 1643. Japan. [Jap]*
• ***Summary:*** The second earliest known reference to Kori-dofu (dried-frozen tofu) appeared in this work.

76. Ryôri monogatari yorozu kikigaku [Many tales of cooking I have heard and recorded]. 1643. Japan. [Jap]*
• ***Summary:*** This famous printed book by an unknown author is the earliest Japanese book that specialized in cooking. Therefore it was widely quoted in many subsequent cookbooks. Recipes include miso soup and taremiso.

Some Japanese authors cite the Japanese title as simply *Ryôri monogatari* however the eminent scholar T. Yokotsuka (1985, p. 206) cites it as *Ryôri monogatari yorozu kikigaku.*

The names of the volumes include *Ryôri Taikan, Nihon Ryôri Taikan, Zokugun Shoruiju Inshokubu, Shokumotsu Koza.*

Note: This is the earliest document seen (April 2013) worldwide, and the earliest Japanese-language document seen (April 2013) that mentions dried-frozen tofu or frozen tofu, which it calls *kôri-dôfu.* Miyashita, who cited this early reference, gave the book's date as 1624.

Concerning shoyu: Iino (2001, p. 21) contains a "Table of ingredients used in *tou-miso* and shoyu during the Edo period." The entry for *Ryori Monogatari* (compiled in 1643) states that *Masaki shoyu* is made from the following ingredients: Soybean 19.6%. Wheat / barley 22.5%. Salt 15.7%. Water 39.2%.

In the section on "Foods, Sake," is a section on "Quick preparation of amazake. Wash 1 *sho* (1.8 liters) of cooked and dried glutinous rice (*domyoji*) in hot water and drain. Mix in 1 sho of koji and 1.5 sho of water; grind in a suribachi very well. Strain in a strainer (*suino*), then simmer in a pot, while stirring. It will become good amazake. Adding white sugar is good."

In the section titled "Man Kiki Gaki" is a description of "How to make Shirokawa Amazake. Crack by grinding 3 sho white rice, steam well and cool. Mix in 5 sho of koji, 5 sho of water, and knead well. Strain in a strainer (*suino*). Discard the pulp and keep the liquid to make amazake. Mix it occasionally. In summer it takes 3 days and in winter 5 days until it is ready."

77. **Product Name:** [Hatcho Miso].
Foreign Name: Hatchô Miso.
Manufacturer's Name: Hayakawa Kyuemon Shoten (Also called Hatcho Miso Kakkyu Goshi-kaisha).
Manufacturer's Address: Aza, Okan-dori 69, Hatcho-cho, Okazaki-shi, Aichi-ken 444, Japan.
Date of Introduction: 1645.
New Product–Documentation: Kaneko. 1972. Hatcho Miso; Shurtleff & Aoyagi. 1983. The Book of Miso. 2nd ed. p. 223, 256. The company claims that it was established in 1362, but other evidence indicates that it was established in the late 1500s or 1600s.

Letter from Tsuneo Hayakawa. 1992. March 17. He is studying the company's early history. Most early documents, written during the Edo period (1868-1912) state that the company was established in 1645. A death register, which had been kept in the Buddhist temple where his ancestors' tombs stand, supports this view.

Note: This is the earliest known commercial soy product (with a brand name) made in Japan (July 2012; one of two products).

78. **Product Name:** [Unknown brand of shoyu].
Manufacturer's Name: Unknown shoyu company.
Manufacturer's Address: Choshi, Chiba-ken, Japan.
Date of Introduction: 1645.
New Product–Documentation: Ad in The East. 1968. Fruin. 1984. History of Five Japanese Shoyu Companies. Soya Bluebook. 1987. p. 94. Address: Kakigaracho 1-23-8, Nihonbashi, Chuo-ku, Tokyo 103, Japan.

Note 1. This is the earliest known commercial soy product made in Japan (July 2012; one of two products).

Note 2. This is the earliest record seen (July 2011) concerning the ancestor of Yamasa Shoyu.

Note 3. The Yamasa Corporation USA website (printed 3 July 2011) under "Company history," states: "In 1645, company founder Gihei Hamaguchi began brewing soy sauce in Choshi, Japan, under the Yamasa name." "Yamasa Corporation began exports of soy sauce to the U.S. over 130 years ago" (i.e., before 1881).

Note 4. The early history of the company now named Yamasa Shoyu is shrouded in mist. We can find no early document which states that the name "Yamasa Shoyu" existed before 1854. And at that time it was the name of a brand of shoyu, not the name of a company.

79. In't Comptoir Nagasaekij [In the office of Nagasaki]. 1647. Letter to Taiwan / Formosa, Oct. 16. Unpaginated. Handwritten, with signature. [Dut]
• ***Summary:*** Shipped and loaded in the sailing ship (*fluijtschip*) the *Zwarte Beer* [literally "black bear"] sailing from this place with a Bill of Lading of the chiefs [of this office] to Taiwan (*Taijoan*) in consignment send to the honorable Pieter Antonisz, Maritime (*Overwater*), President of the Island of Formosa (*Eijlants Formosa*).

The list of provisions sent includes: "12 pots of hard bread costs together with the pots–f 30:--:--. 10 kegs (*balien / taru*) of sake (*sackij*) of 15 *maas* a piece–f 15:--:--. 10 kegs (*balien*) of Soy [sauce] at 27 *condrijn* a piece–f 2:-7:--.

Bibliographic reference in Dutch: NA, NFJ 847, Journal (16-10-1647).

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 847. Boekhoudkundig journaal

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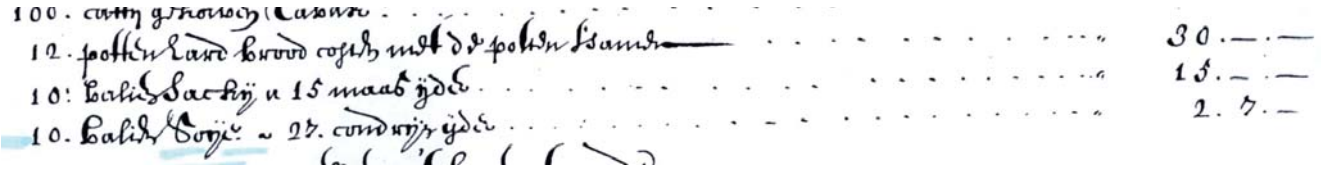

[National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 847. Journal of bookkeeping].

Note 1. This is the earliest Dutch-language document seen (April 2012) that clearly mentions shoyu or soy sauce, which it calls *Soije.*

Note 2. A *maas* and a *condrijn* are old units of Asiatic currency of account used in China and Japan. The VOC glossary says: 1 *maas* = 7 or 8 stuivers, but in Siam 1 *maas* = 9 stuiver. A *condrijn* is smaller than a *maas.* The symbol "f" stands for guilder, the basic Dutch monetary unit. "f 2:07:8" is read "two guilders, 7 stuivers and 6 pennigen." One gulden (singular of guilder) = 20 stuivers. One stuiver = 12 pennigen.

Note 3. In 1624 the Dutch established their first trading post on Formosa. They had their colonial capital at Tayoan City (source of the modern name "Taiwan," and site of present day Anping).

Note 4. This is the earliest document seen (July 2007) concerning involvement by the Dutch or the Dutch East India Co. (VOC) with soyfoods (soy sauce) or soybeans.

Note 5. This is the earliest document seen (April 2012) concerning soy sauce trade (imports or exports). In this case exported from Japan to today's Taiwan.

Note 6. This factory (trading post) on Deshima Island in Japan was owned by the Honorable Dutch East India Company (VOC). Deshima was a small island in Nagasaki harbor, on Japan's southernmost main island of Kyushu. In 1600 the Dutch first made contact with Japan when the Dutch ship *De Liefde* drifted ashore in Usuki Bay in northeastern Kyushu. Many of the original 110 crewmembers had died and only 6 of those remaining could walk ashore unassisted. Two of the survivors went on to earn important places in Japanese history: William Adams and Jan Joosten.

In 1616 European ships were limited to the two ports of Nagasaki and Hirado (an island off the northwest coast of Kyushu, just northwest of Nagasaki).

In 1633 the Tokugawa shogunate (upset at Portuguese Christian missionaries intent on making converts and instigating revolts) adopted a policy of national isolation which continued for 221 years until 1854.

In 1639 the Portuguese were expelled. This left only the Dutch among the Europeans still trading with Japan and their representatives were moved in 1641 from Hirado to the tiny artificial island of Deshima / Dejima built by the shogunate in Nagasaki harbor, where they were kept as virtual prisoners. During this time Japan maintained contact with only two other nations: China and Korea. Chinese merchants were also allowed to trade at Nagasaki, but under strict controls.

By 1639 the Japanese had so successfully closed their doors to the outside world that subsequently Japan all but dropped out of the consciousness of Europeans. The only important exception was the annual Dutch vessel from the East Indies to the Dutch trading post on the island of Deshima in Nagasaki harbor.

During the 1600s and 1700s, the Dutch expanded their network of trading posts throughout Asia, they continued to order provisions from Japan via their tiny but very important trading post at Deshima. Address: Deshima, Nagasaki, Japan.

80. Teitoku bunshû [Collected writings of Mr. Teitoku]. 1648-1651. Japan. [Jap]*
• ***Summary:*** The third earliest known reference to Kori-dofu (dried-frozen tofu) appeared in this work.

81. Yorozu kikigaki hiden [Secrets of things heard and written]. 1650. Japan: Publisher unknown. 102 p. 2 volumes. Japanese summary by Kawakami 1978, p. 158. [Jap]
• ***Summary:*** Within the 54 sections, 34 sections concern food preparation, preservation, etc. Includes how to make shoyu, natto, dried-frozen tofu (kori-dofu), and miso. Between 1650-1673, nine printings were made. Each successive publication became more compact and more popular.

82. Nattô monogatari [The story of natto]. 1650? Japan. [Jap]*
• ***Summary:*** Contains a recipe for Natto Miso Soup (*Nattô Jiru*).

Note: Recall that this *Natto Jiru* may well be made with fermented black soybeans rather than itohiki natto.

83. Craijers, E. Hendrick; Westerwolt, Volckerus; Momme, Hendrick. 1651. [Re: Request for silver]. Letter to Pieter Sterthenius, president of the Deshima factory [Nagasaki, Kyushu, southern Japan], June 30. p. 48-52. See p. 52. Handwritten, with signature. [Dut]
• ***Summary:*** This request for silver includes: 10 bales of flour, 4 bales of buckwheat, 6 kegs of sake (*sackje*), 8 kegs of soy [sauce] (*balien* [*taru*] *sooje*), 24 little hams, 4 jars of hard bread,... 8 kegs of pickled vegetables (*kônomoro* [*kô-no-mono*]), 4 books of paper, 6 kegs of soy [sauce] (*moersackien* [*murasaki*]*;* a poetic synonym for soy sauce), 12 boxes of marmalade.

Bibliographic reference in Dutch: NA, NFJ 284, ontvangen brieven (30-6-1651). On microfilm.

Location: Nationaal Archief, Den Haag, De Archieven

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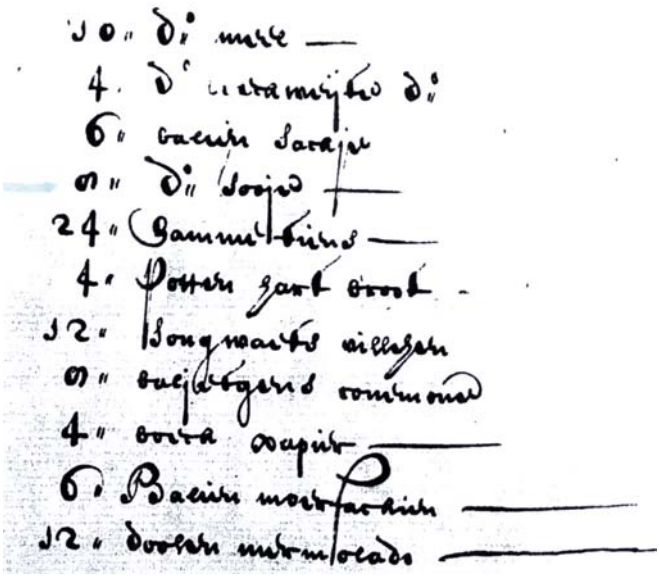


van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 284 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 284].

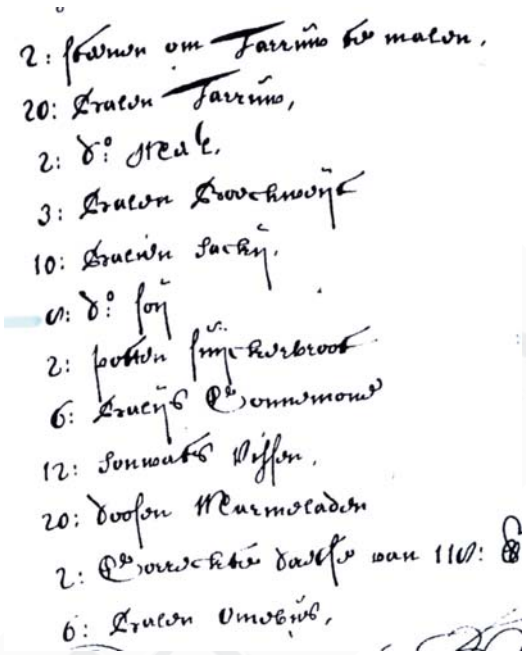
Note 1. This is the earliest Dutch-language document seen (April 2012) that uses the word "sooje" to refer to soy sauce.

Note 2. About the recipient: In *Pieter van Dam's Beschryvinghe van de Oostindische Compagnie,* by F.W. Stapel is an entry for Pieter Sterthenius. He was Council of Justice in Batavia and thereafter in 1651 for one year president of the Dutch merchant settlement in Japan. From 1655 to 1658 he was director of Bengal. In 1658 he went back home to the Netherlands as commander of the return fleet. This letter is a contemporary handwritten copy, in a letter-book for the administration on Deshima. It was sent on the ship *Coninck van Polen.* Address: Supreme merchant and head of the settlement at Siam (*Oppercoopman en opperhooft des comptoirs Siam*).

84. Creijers, Henrick; Westerwolt, Volckerus; Rijck, Jan van. 1652. [Re: Request for Japanese silver to keep the commerce going]. Letter to Adriaen van der Burch, director of commerce at the Deshima factory [Nagasaki, Kyushu, southern Japan], July 3. p. 73-77. See p. 77. Handwritten, with signature. [Dut]

• ***Summary:*** This request for silver and provisions includes: Two stones to grind wheat, 20 bales of wheat,... 3 bales of buckwheat, 10 kegs of sake (*balien sackij*), 8 kegs of soy [sauce] (*balien soij*), 2 pots sugarloaf, 6 kegs of pickled vegetables (*kônomoro* [*kô-no-mono*]), 12 *sonwats vissen* (*sonquat* = Japanese New Year), 20 boxes of marmalade, 6 bales umeboshi (*omebus;* salted or pickled plums).

Bibliographic reference in Dutch: NA, NFJ 285, ontvangen brieven (3-7-1652) 73-77. On microfilm.



Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 285 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 285].

Note 1. This is the earliest Dutch-language document seen (April 2012) that uses the word "soij" to refer to soy sauce. The pronunciation of this word is remarkably similar to that of "soy."

Note 2. Henrick Creijers = Hendrick Craijers.

Note 3. This is the earliest document seen (May 2010) that clearly mentions soybean products (soy sauce) in Siam. This document contains the earliest clear date seen for soybean products in Siam (1652); soybeans as such have not yet been reported. Address: Siam.

85. Keijser, Jacob; Grevenraet, Joannes; Brummel, Luder; Baron, Henrick. 1652. [Re: Request for provisions for the settlement]. Letter to Adriaen van der Burch, director of commerce at the Deshima factory [Nagasaki, Kyushu, southern Japan], Aug. 14. p. 93-100. See p. 98-99. Handwritten, with signature. [Dut]

• ***Summary:*** This request includes: 80 to 90 kegs of good sake (*balijen goede sackij*). 50 piculs of wheat meal. 150 bales of white rice for the settlement and the ships. 70 bales of little beans (*boontjens*) for the settlement and the ships. 40 bales of peanuts (*cadjangh*) for the settlement and the ships. 10 bales of barley for the settlement and the ships. 16 pots of round rusk. 4 pots with sugarloaf. 25 piculs of smoked hams. 2 kegs of mustard seed. 4 kegs of miso (*misio*). preserved with pickled vegetables (*connemonne* [*kô-no-mono*]). 15 kegs soy [sauce] (*soije*) and 16 pieces of

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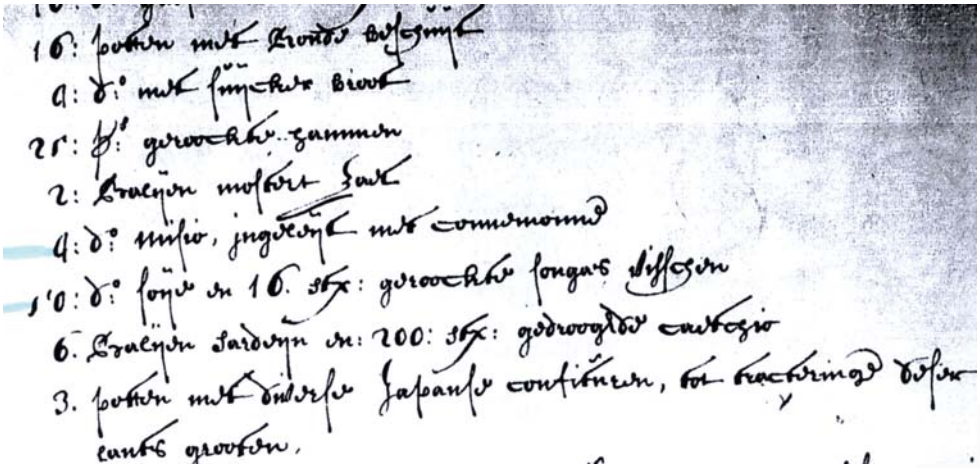


dried katsuo (*caetchio* [*katsuobushi*]). 2 pots with various Japanese candied fruits to treat native leaders. As much rice as they need before they are back in Japan, because wheat is expensive in Tonkin.

Bibliographic reference in Dutch: NA. NFJ 285, ontvangen brieven (14-8-1652) 93-100. On microfilm.

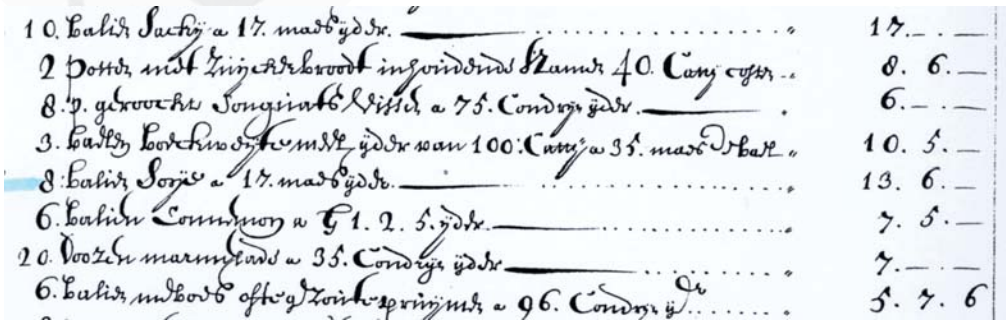
Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 285 [National Archives. Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 284].

Note 1. Henrick Creijers = Hendrick Craijers. Note 2. 1 picul is about 125 pounds, the amount a man can carry with a yoke.

Note 3. This is the earliest Dutch-language document seen (March 2009) that mentions miso, which it calls "misio."

Note 4. This is the earliest document seen (May 2010) concerning soybean products (soy sauce) in Tonkin [in today's Vietnam]. This document contains the earliest date seen for soybean products in Tonkin [in today's Vietnam] (1952); soybeans as such have not yet been reported. Address: Written on the ship Taiwan moored on the river of Tonkin [in today's north Vietnam] before the bar.

86. In't Comptoir Nagasaekij [In the office of Nagasaki]. 1652. Letter to Taiwan / Formosa, Oct. 22. Unpaginated. Handwritten, with signature. [Dut]



• ***Summary:*** Shipped and loaded in the sailing ship (*fluijtschip*) the *Trouw* [literally "faithful / true"] sailing from this place with a Bill of Lading of the skipper Christiaen de Groeve and the second merchant Mijndert Messteecker to Tayoan (*Taoijan*) in consignment send to the honorable Nicoales Verburgh [Island of Formosa].

The list of provisions sent includes: "12 kegs (*balien*) of sake (*sackij*) of 17 *maas* a piece–f 17:--:--. 8 kegs (*balien*) of Soy [sauce] (*Soije*) at 27 *maas* a piece–f 13:-6:--. 6 kegs umeboshi (*mebos* [salt pickled plums]) of 96 *condrijn* a piece–f 5:-7:-6.

Bibliographic reference in Dutch: NA, NFJ 851, Journal (22-10-1652).

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 851. Boekhoudkundig journaal [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 851. Journal of bookkeeping]. Address: Deshima, Nagasaki, Japan.

87. In't Comptoir Nagasaekij [In the office of Nagasaki]. 1652. Letter to Tonkin [today's Hanoi, Vietnam], Oct. 27. Unpaginated. Handwritten, with signature. [Dut]

• ***Summary:*** See next page. Shipped and loaded in the yacht (*jacht*) *Taijouan* [Tayoan / Taiwan] sailing from this place with a Bill of Lading of the skipper Hendrick Volckmans and the second merchant Abraham Stuijlingh directly to Tonkin (*Tonckijn*) in consignment send to the merchant Jacob Keijser head of the Company's trade.

The list of provisions sent includes: "25 smoked hams of 8 *maas* a piece–f 20:--:--. 6 bales mustard seed of 15 *maas* a piece–f -9:--:--. 4 kegs of pickled vegetables (*kô-no-mono, Connemon*) of 12½ *maas* a piece–f -5:--:--. 50 little kegs (*kleene balijtjens*) of Soy [sauce] (*Zoije*) of 2 *maas* a piece–f 10:--6:--. 2 kegs of sardines (*Serdeijn*) of 8 *maas* a keg–f -1:-6:--. 16 pots of round Dutch rusk costs total–f 70:-2:-4. 80 catties (1 cattij = 625 gm) candied fruit in 6 pots costs–f 16:-9:--. 4 pots of sugarloaf costs f 19:-6:-8.

Bibliographic reference in Dutch: NA, NFJ 851, Journal (27-10-1652).

Location: Nationaal

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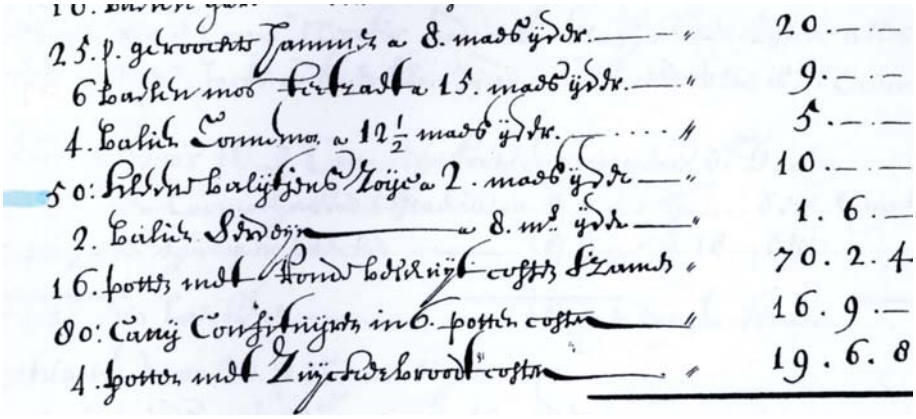

Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 851. Boekhoudkundig journaal [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 851. Journal of bookkeeping].

Note 1. This is the earliest Dutch-language document seen (April 2012) that uses the term "Zoije" to refer to soy sauce. Address: Deshima, Nagasaki, Japan.

88. Caesar, Cornelius. 1654. [Re: Order for provisions]. Letter to Honourable Hapart at the Deshima factory [Nagasaki, Kyushu, southern Japan], July 18. p. 46-56. See p. 53. Handwritten, with signature. [Dut]

• ***Summary:*** This order for provisions includes: 25 smoked hams, 4 kegs of miso (*4 balies miso*), 4 kegs of soy [sauce] (*4 ditos soijo*), 6 large kegs of the very finest pickled vegetables (*connemon van de alderbeste*), 25 bales of white stamped rice.

Note 1. This is the earliest Dutch-language document seen (March 2009) that uses the word "miso" to refer to miso.

Note 2. This is the earliest Dutch-language document seen (April 2012) that uses the word "soijo" to refer to soy sauce.

Bibliographic reference in Dutch: NA, NFJ 286, ontvangen brieven (16-7-1654). On microfilm.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 286 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 286].

Note: About the sender: In *Pieter van Dam's Beschryvinghe van de Oostindische Compagnie,* by F.W. Stapel is an entry for Cornelius Ceasar. In 1609 he was born in Goes, a commune in Zeeland province, southwest Netherlands. By 1635 he was already a merchant in the VOC service. In 1636 and 1637 he was a merchant in Quinam [Cochin China]. Then he was a merchant in Taiwan and in Japan. In 1641 he became supreme merchant. From 1646-1651 he was back in Holland. In 1651 he became Council of Justice in Batavia. From 1653 to 1656 he was Governor of Formosa. In 1657 he died in Batavia. This letter is a contemporary handwritten copy, in a letter-book for the administration on Deshima. Address: Governor of Taiwan and the Council of Formosa.

89. Coijett, Fredrick; Schedel, Fredrick; Dammans, R.; Alphen, Pieter van; Pedel, Thomas. 1655. [Re: List of provisions ordered]. Letter to Honourable Leonard Winnix on Deshima (Nagasaki, Japan), Aug. 3. p. 1-13. See p. 8. Handwritten, with signature. [Dut]

• ***Summary:*** In this letter (p. 8) is an order for provisions: 12 Japanese hams. 25 bales of white stamped rice. 6 kegs of good pickled vegetables (*connemon* [*kô-no-mono*]). 4 kegs of miso (*Balijen Miso*). 4 kegs of soy [sauce] (*Soija*). 4 bales of buckwheat. 8 Japanese room-mats (*camermatten*). 5 to 6 ordinary tea kettles.

Bibliographic reference in Dutch: NA, NFJ 287, ontvangen brieven (3-8-1655) 1-13. On microfilm.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 287 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 287].

Note: This is the earliest Dutch-language document seen (April 2012) that uses the word "Soija" to refer to soy sauce. This soon becomes by far the most widely used spelling of "soy sauce" in Dutch; of the 11 letters that mention soy sauce (and that we have seen) written in the 21 years between Aug. 1657 and Nov. 1678, all but one ask for "Soija." "Soije" was a distant second. Address: Fort Zeeland (Casteel Zeelandia) on Taiwan.

90. Sterthemius, Pieter. 1656. [Re: Order for provisions]. Letter to E. Joan Boucheljon, head of the Deshima factory [Nagasaki, Kyushu, southern Japan], March 8. Unpaginated. Handwritten, with signature. [Dut]

• ***Summary:*** Order for: 8 little kegs of good soy [sauce] (*8 balietges goede soeija*), 2 kegs of pickled vegetables (*connemonne* [*kô-no-mono*]), 2 kegs of good sake (*sackje*),... 2 sake kettles (*sackie ketels*).

Bibliographic reference in Dutch: NA, NFJ 355, ontvangen brieven (8-3-1656). On microfilm.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 355 [National Archives, Prins

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Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 355. The pages are not numbered]. This letter is written in a letter-book for the administration on Deshima.

Note 1. This is the earliest Dutch-language document seen (April 2012) that uses the word *soeije* to refer to soy sauce or shoyu.

Note 2. This trading post was established by the Portuguese in 1537, by the English at Hooghly in 1651, and by the Dutch at Chinsura in 1656; the towns were united as Hooghly-Chinsura in 1865.

Note 3. This is the earliest document seen (Nov. 2010) concerning soybean products (soy sauce) in India. This document contains the earliest date seen for soybean products in India (1656); soybeans as such have not yet been reported.

Note 4. About the sender: From 1655 to 1658, Pieter Sterthemius was director of the VOC's Bengal settlement. On 17 December 1659 he went back home to the Netherlands as a commander of nine ships.

About the recipient: In *Pieter van Dam's Beschryvinghe van de Oostindische Compagnie,* by F.W. Stapel the entry for E. Joan Boucheljon appears under Jan Boucheljon. In 1641 he left Holland and sailed as an assistant writer to Asia. He worked mostly in Japan, where he was head of the VOC settlement on Deshima. Three times (in 1655, 1657, and 1659) he was a member of the Council of Justice in Batavia. In Holland, he was known as someone with a good reputation. On 24 Jan. 1661 he returned home to Holland as commander of two ships: the *Kalf* and the Venenburg. Address: Director of the Bengal Settlement [on the Hooghly {Hooghly-Cinsura} in today's West Bengal, northeastern India, on the Hugli River].

91. Indijck, Hendricq; Kettingh, Pieter; Stouthart, Adrien. 1657. [Re: Order for provisions]. Letter to the Deshima factory [Nagasaki, Kyushu, southern Japan], July 8. p. 5-9 See p. 9. Handwritten, with signature. [Dut]

• ***Summary:*** "For the provision of this settlement [Cambodia] we request... 20 kegs sake (*sackie*), with drinking utensils / accessories, a little soy [sauce] (*wat soija*), and vegetable pickles (connemonne [kô-no-mono]) to treat the Japanese and other merchants from time to time."

Bibliographic reference in Dutch: NA, NFJ 288, ontvangen brieven (8-7-1657) 41. On microfilm.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 288 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 288].

Note 1. This is the earliest document seen (Feb. 2012) concerning soybean products (soy sauce) in Cambodia; soybeans as such have not yet been reported.

Note 2. About the sender: In *Pieter van Dam's Beschryvinghe van de Oostindische Compagnie,* by F.W. Stapel is an entry for Hendricq Indijck. He was supreme merchant in Cambodia and after that he became, three times, head of the trading post in Japan. In Cambodia he was succeeded by Pieter Kettingh. This letter is a contemporary handwritten copy, in a letter-book for the administration on Deshima. The letter was received on 10 Aug. 1657 by the yacht (*jacht*) *Erasmus.* Address: Head (*Opperhofd*), Dutch factory in Cambodia.

92. Coijett, Fredrick; Schedel, Fredrick; Dammans, Reijnier; Pedel, Thomas; Valentijn, Jacobus. 1657. [Re: List of provisions ordered]. Letter to [illegible] on Deshima (Nagasaki, Japan), Aug. 3. p. 1-5. See p. 4. Handwritten, with signature. [Dut]

• ***Summary:*** In this letter (p. 8) is an order for provisions: With the return ships, you must send for the use of this settlement and otherwise the following: 10 to 12,000 bales of new rice. 500 bales of wheat. 800 pairs of cotton dress coats for the for the slaves of the factory based on the model / pattern sent with the skipper of the *Domburgh / Domburg;* they must be more suitable than the last ones. 150 piculs [1 picul = about 125 lb] of good Japanese tobacco, to fill all cargo space available. 20 bales of white stamped rice. 8 hams. 6 kegs of pickled vegetables (*connemonne* [*kô-no-mono*]). 6 kegs of good sake (*sackie*). 3 kegs of miso (*missouw*). 3 kegs of soy [sauce] (*soija*). 2 pairs of scales [for weighing] with their accessories.

Note: This is the earliest Dutch-language document seen (March 2009) that uses the word "missouw" to refer to miso.

Bibliographic reference in Dutch: NA, NFJ 288, ontvangen brieven (8-7-1657) 1-5. On microfilm. Received 19 July 1657. Sent with the ship *Domburgh / Domburg.*

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 288 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 288]. Address: Fort Zeeland (Casteel Zeelandia) on Taiwan.

93. Tosa, Mitsunobu. 1657. Shichijû-ichiban shokunin-zukushi uta awase [Seventy-one matching poems / songs concerning Japanese craftsmen. 3 vols.]. Japan. [Jap]*

• ***Summary:*** A woodblock print titled "Sellers of tofu and somen noodles" (*Tofu to somen uri*) shows two Japanese women. At the lower right, one woman is seated in the seiza position (on her heels) on the floor or ground behind a short table (about 4 inches high, 4½ feet long, and 14 inches wide). She is wearing a dark kimono and a white head-tie. On the table is one large cake of tofu (about 10 inches square and 3 inches high) and four smaller pieces (each about 6

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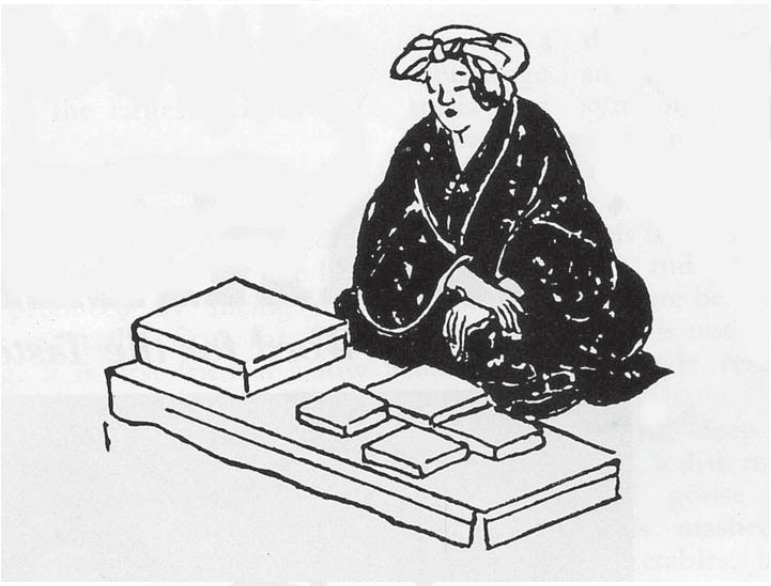
『七十一番職人尽歌合』より―豆腐売りとそうめん売り
（都立日比谷図書館加賀文庫蔵）



inches square and 1 inch high).

In the upper right, another women is standing near a rack, drying somen noodles.

Note: This book is located in the *Kaga Bunko* section of *Tokyo Toritsu Hibiya Toshokan* (library) at 1-4 Hibiya Koen, Chiyoda-ku, Tokyo 100.

94. Coijet, Fredrik; Oetgens, Johan; Pedel, Thomas; van Iperen, Thomas; Harthouwer, D. 1658. Lijst met handelswaar [Re: List of commodities ordered]. Letter to Joan Boucklejou on Deshima (Nagasaki, Japan), July 30. p. 25-33. See p. 28. Handwritten, with signature. [Dut]

• ***Summary:*** In this letter (p. 28) is an order for provisions: "20 bags of white stamped rice. 6 kegs of pickled vegetables (*6: balien connemonne* [*kô-no-mono*]). 3 kegs of miso (*missoe*). 3 kegs of soy sauce (*soija*). 3 kegs of umeboshi (*mebos* [salt pickled plums]). 6 kegs of sake (*sackij*). 12 pieces of smoked ham." Also information about copper weights. On p. 33 are the names of the writers.

Note 1. This is the earliest Dutch-language document seen (March 2009) that uses the word "missoe" to refer to miso.

Note 2. This is the earliest document seen (Dec. 2006) concerning umeboshi salt plums.

Bibliographic reference in Dutch: NA, NFJ 289, ontvangen brieven (30-7-1658) 28. On microfilm.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 289 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 289].

Note 1. This is probably a list of goods for Goijet's table, because he requested the same sort and amount of provisions on 7 Aug. 1659. Address: Governor of Formosa, Fort Zeelandia (Casteel Zeelandia) on Formosa [in today's Taiwan].

95. Coijet, Fredrik; Oetgens, Johan; Pedel, Thomas; van Iperen, Thomas; Harthouwer, David. 1659. Des provisen voor de Tafel van den Gouverneur [Re: Order of provisions for the governor's table]. Letter to Wagenaar, head of the trading station, Nagasaki (*opperhooft en den Raadt des Nagasakkisen Comptoir*) [Deshima, in Kyushu, southern Japan] and the councillors of this place, Aug. 7. p. 40-41. See p. 41. Handwritten, with signature. [Dut]

• ***Summary:*** In the postscript of this letter (p. 41) is an "order for provisions for the Governor's table. Will Your Excellency please send us: 6 kegs of pickled vegetables (*6: balien connemonne* [*kô-no-mono*]). 3 little kegs (*balitjes*) of the best soy sauce (*soija*). 2 kegs of miso (*missoe*). 1 keg of umeboshi (*mebos* [salt pickled plums]). 6 kegs of good sardines (*sardeijn*), mostly little ones. 20 pieces of smoked ham. 6 pieces *songuats* fishes. 50 sets of three finest dishes or plates of a certain size (*drielingen*). 30 sets of four finest dishes or plates of a certain size (*quarten* [*kwarten*]). 100 fine flat dishes (*pieringen*). 50 fine flat dishes (*pieringen*) of the smallest." At the end of the postscript are the names of the writers.

Bibliographic reference in Dutch: NA, NFJ 290, ontvangen brieven (7-8-1659) 41. On microfilm.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 290 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 290]. Address: Governor of

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Formosa, Fort Zeelandia (Casteel Zeelandia) on Formosa [in today's Taiwan].

96. Rijck, Jan van. 1660. [Re: Order of provisions for private use]. Letter to Joan Boucheljon, president and head of the trade and other business, Nagasaki [Deshima, in Kyushu, southern Japan], June 29. Unpaginated. Handwritten, with signature. [Dut]
• ***Summary:*** The provisions ordered include: 200 catties (1 catty = 625 gm or 1.3 lb) uncut tobacco, 50 catties cuttle-fish (*Zeekath*), 200 pieces *Cantjo* (*Cantio*), 3 kegs of pickled vegetables (*connemon* [*kô-no-mono*]), 3 kegs soy [sauce] (*soije*), 20 kegs of sake (*sackie*), 30 bales of wheat, 6 Japanese coats with double linings, 6 smoked hams, 6 smoked *songuadts / songuat* fishes, 4 copper candle holders.

Bibliographic reference in Dutch: NA, NFJ 291, ontvangen brieven (29-6-1660). On microfilm.

About the recipient: E. Joan Boucheljon is mentioned as Jan Boucheljon in *Pieter van Dam's Beschryvinghe van de Oostindische Compagnie,* by F.W. Stapel. In 1641 he left Holland and sailed as an assistant writer to Asia. He worked mostly in Japan, where he was head of the settlement in 1660. Three times (in 1655, 1657, and 1659) he was a member of the Council of Justice in Batavia. In Holland he was known as someone with a good reputation. On 24 Jan 1661 he returned home to Holland as a commander of two ships: the *Kalf* and the *Venenburg.*

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 291 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 291]. Address: Siam.

97. **Product Name:** [Shoyu].
Foreign Name: Shôyu.
Manufacturer's Name: Takanashi Hyozaemon XIX.
Manufacturer's Address: Noda, Japan.
Date of Introduction: 1661.
Ingredients: Soybeans, wheat, water.
Wt/Vol., Packaging, Price: Bottle.
New Product–Documentation: Noda Shoyu K.K. (Morio ICHIYAMA, ed.). 1955. Noda Shoyu Keizai Shiryo. Noda: Noda Shoyu Research Dept. p. 1.

Mark Fruin. 1983. Kikkoman: Company, Clan, and Community. p. 1, 16, 18, 21. "Takanashi Hyôzaemon XIX, whose descendants help manage Kikkoman today, began brewing shoyu, or natural soy sauce, in 1661 in the town of Noda... Using a work force of twenty that included fifteen contract laborers, he produced 3,000 gallons his first year."

Note: This is the earliest commercial soy sauce seen made by any company that later became Kikkoman. Although Kikkoman states on the label of each bottle of its soy sauce that the company originated in 1630, we can find no evidence indicating such an early date. The first shoyu made by a member of the Mogi family dates from the 1760s.

98. **Product Name:** [Miso].
Foreign Name: Miso.
Manufacturer's Name: Mogi Shichizaemon I.
Manufacturer's Address: Noda, Japan.
Date of Introduction: 1662.
New Product–Documentation: Mark Fruin. 1983. Kikkoman: Company, Clan, and Community. p. 16. In 1662 Mogi Shichizaemon started with the manufacture of miso, the rice or soybean paste similar to shoyu in fermentation technology. This is the earliest known soyfood product made by a member of the Mogi family, whose descendants now run Kikkoman.

99. Verdonck, -. 1664. [Re: Order for provisions]. Letter to the Deshima factory [Nagasaki, Kyushu, southern Japan], Aug. Handwritten, with signature. [Dut]
• ***Summary:*** Order for some small kegs of soy [sauce].

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); inventaris nummer 295 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); record number 295]. Address: Head (*Opperhofd*), Dutch factory in Tonking [Tonkin, in today's northern Vietnam].

100. Speelman, Cornelis; Lange, Pieter de; Huijberts, Pieter; Carpentier, Roelant de. 1665. [Re: Request for copper and provisions]. Letter to E. Jacob Gruijse, supreme merchant and head of the Council (*oppercoopman end opperhooft en aen den Raet*) at the Deshima factory [Nagasaki, Kyushu, southern Japan], Feb. 28. Unpaginated. Handwritten, with signature. [Dut]
• ***Summary:*** This request includes: 2,500 chests of copper. 60 kegs of Japanese camphor. No tea because we do not like it and it is very foul. 1,500 pieces of porcelain after the specifications of last year, but the bowls were much too coarse; they must be snow-white. 6 to 8 kegs of soy [sauce] (*balities Soija*) and 2 to 3 kegs pickled vegetables (*connemonne* [*kô-no-mono*]). As many walking canes (*rottangs*) as last year if they are beautiful.

Bibliographic reference in Dutch: NA, NFJ 295, ontvangen brieven (28-2-1665). On microfilm.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 295 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 295]. Address: In the Company's castle Geldria at Pulicat / Palghat (*Casteel Geldria tot Paliacatta*) (in today's Tamil Nadu, Coromandel Coast, southeastern India).

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101. Maetsuyker, Joan. 1668. [Re: Request for a decision concerning private merchandise]. Letter to Heren XVII ("17 Lords," leaders of the Dutch East India Company, VOC), Netherlands, Dec. 19. [Dut]

• ***Summary:*** The Governor-General and the Council in Batavia requested a decision from the "Heren XVII" about private merchandise from Japan imported into Batavia. Mostly this private merchandise consists of saké (*sacky*), murasaki [soy sauce], (*moersacky*), pickled vegetables (*connemonne* [*kô-no-mono*]), etc. This merchandise is imported in little quantities, but with great frequency. The Governor-General and the Council in Batavia advises the Heren XVII to permit this private merchandise, because small quantities were imported... so there is no disadvantage to the VOC. They are goods sent by people in Japan to their friends in Batavia.

Bibliographic reference in Dutch: W. Ph. Coolhaas, Generale Missiven van Gouverneurs-Generaal en Raden aan Heren XVII, RGP grote serie deel 3 ('s-Gravenhage 1968) 663. The pages with the quotation is folio 274v-275v.

Note 1. This is the earliest letter seen that mentions "murasaki" written to the Heren XVII or to the Netherlands.

Note 2. If *moersacky* refers to soy sauce, this is the 2nd earliest document seen (April 2012) concerning soybean products (soy sauce) in Indonesia; soybeans as such have not yet been reported. Address: Governor-General in Batavia [today's Jakarta, Indonesia].

102. Shiomisaka, Baian (Umean). 1668. Ryôri anbai-shû [Collected cooking instructions]. Japan: Publisher unknown. 120 p. Japanese summary by Kawakami 1978, p. 159. [Jap]

• ***Summary:*** The 21 sections include sections on miso (there are many miso soups) and tofu. Perhaps miso soup became popular at about this time.

103. Pavilioen, Anthonio; Caulier, Jaques; Carpentier, Roelant d'; Broeck, Pieter van den; Duijcker, Hendrick; Outhoorn, Hendrick van; Sonhuis, Johan B.; Huijsman, Johannes. 1669. [Re: Order for provisions]. Letter to Governor-General Joan Maetsuyker [Maasuijcker] and the Councillors of the [Dutch East] Indies [Heren Raden van Indië] in Batavia [Dutch East Indies], Feb. 1. p. 424-35. See p. 433r. Handwritten, with signatures. [Dut]

• ***Summary:*** This order for provisions includes: "30 kegs sake (*sakkij*), 12 kegs of soy [sauce] (*balije soija*), 12 kegs of miso (*missoe*)."

Bibliographic reference in Dutch: NA, VOC 1270, OBP (1-2-1669) 424r-435vo. On microfilm. This letter is part of the correspondence in the series *Overgekomen Brieven en Papieren* (OBP)–letters and papers sent from Batavia and other factories to the headquarters of the VOC in the Netherlands. This is an important and voluminous part of the VOC archive.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.02; inventaris nummer 1270, 424r t/m 435va. [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.02; record number 1270].

About the sender: In *Pieter van Dam's Beschryvinghe van de Oostindische Compagnie,* by F.W. Stapel is an entry for Anthonio Paviljoen. From 1659 to 1665 he was commander of Jaffanapatnam in Ceylon. From 1665 to 1676 he was governor (head) of the VOC's settlements on the Coromandel Coast, along the east coast of southern India. From 1668 he was extraordinary councillor and from 1676 to 1678 ordinary councillor of the Council of the Indies (*Heren Raden van Indië*). In 1678 he was fired by the Heren XVII.

Nagapatnam (Now {2007} usually spelled Nagapattinam, formerly Negapatnam, Nagappattinam), which was one of these settlements on the Coromandel Coast, in today's southeast Tamil Nadu, 160 miles (275 km) south of Madras. It was occupied by the Dutch from 1660 to 1781.

About the recipient: In 1635 Joan Maetsuyker was appointed pensionary (*pensionaris*) to the Council of Justice of Batavia, in 1646 councillor of the Council of the Indies, from 1646 to 1650 governor of Ceylon and from 1653 to 1678 governor-general.

Note 3. Paliacatta (also spelled Paliacatte; today's Pulicat), long the chief Dutch settlement and headquarters of the VOC factories on the Coromandel Coast, was a Dutch post from 1610. Pulicat was a small walled town on the coast. At its center was the Dutch Fort Geldria, with its permanent garrison of soldiers, and its cannon and armory to protect the various Company trading posts along the Coromandel Coast. Inside the fortress was the governor's two-story residence, magnificent and solidly constructed. Pulicat became British in 1825. It is located in today's Tamil Nadu, at the south end of Pulicat Lake.

This letter has been collated into Casteel Geldria (Fort Geldria) in Palliacatta on 1 Nov. 1670 by Joannes Huijsman, the secretary. Address: Fort Geldria, Palliacatta / Paliacatta [in today's southern India].

104. Veliers, Joan; Tierens, Jacob; Indijck, Dirck; Schellinger, Gerrit; Noortman, Pieter. 1669. [Re: Arrival of Honorable Dutch East India Company ships in Bengal]. Letter to Governor-General Joan Maetsuijcker [Maetsuyker] and Council in Batavia [Dutch East Indies], Feb. 11. p. 1697r to 1704vo. See p. 1698r. Handwritten, with signature. [Dut]

• ***Summary:*** Mentions the arrival of Hon. Dutch East India Company (VOC) ships in Hooghly, Bengal. The cargo contains large quantities of gold, bar-copper and tin, plus 15 pairs of porcelain bottles (*flessen*), 6 pairs of water pots, 6 pairs of *Jacquans,* 12 kegs of sake (*sackij*), 8 kegs of soy [sauce] (*balien Soija*), 4 pairs of lacquered leather canisters

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(*Cannassers,* made of basket wicker), 50 pairs of lacquered inkpots, 2 kegs of mum (a kind of beer brewed in Brunswick, Germany), 1 little elephant 147 cm (4.8 feet) high.

Bibliographic reference in Dutch: NA, VOC 1273, OBP (11-2-1669) 1967r-1704vo. On microfilm. The letter is written in a letter-book for the administration of the 'Heren XVII' (the directors of the VOC in the Netherlands). The letter is in a manifest (list of cargo) of the ships Rammekens, Buiksloot, Zwarte Leeuw, Zwaan and Tulp. Special attention: This letter is written to give the governor-general information about the cargo received in Bengal from Japan. The ships transported their cargo from Japan via the Strait of Malacca (between the southern Malay Peninsula and the island of Sumatra) to Bengal.

Location: Nationaal Archief, Den Haag, De Archieven van de Verenigde Oost-Indische Compagnie (VOC); inventaris nummer 1273 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch East India Company (VOC); record number 1274].

Note 1. This trading post was established by the Portuguese in 1537, by the English at Hooghly in 1651, and by the Dutch at Chinsura in 1656; the towns were united as Hooghly-Chinsura in 1865.

Note 2. This is the earliest document seen (July 2006) concerning soybean products (soy sauce) in Bengal (a former part of British India, as of Oct. 2010 divided between India and Bangladesh. Hooghly is now in West Bengal, India). This document contains the earliest date seen for soybean products in Bengal (Feb. 1669); soybeans as such have not yet been reported.

Note 3. About the recipient: In 1635 Joan Maetsuijcker (usually spelled Maetsuyker) was appointed pensionary (*pensionaris*) to the Council of Justice at Batavia, and in 1646 councillor of the Council of the Indies (Heren Raden van Indië). From 1646 to 1650 he was governor of Ceylon and from 1653 to 1678 he was governor-general. Address: Director, Hooghly [Hooghly-Cinsura in today's West Bengal, northeastern India, on the Hugli River].

105. Pavilioen, Anthonio; Meersche, Jacob van der; Welsingh, Isaac; Exbusier, Jacob; Buijtendijck, Reijnier van; Hervendoncq, Joris. 1670. [Re: Order for goods from Batavia for use by the Honorable Dutch East India Company in Nagapatnam]. Letter to Governor-General Joan Maatsuijcker [Maetsuyker] and the Councillors of the Indies [Heren Raden van Indië] in Batavia [Dutch East Indies], Feb. 13. p. 550r to 574r. See p. 572r. Handwritten, with signatures. [Dut]

• ***Summary:*** On p. 572r (the recto {front} of folio {page} 572) we read: "Our order for commodities and other items for the use of the Honorable Company. Gold from Japan and from other places with which Coromandel has commerce each year. A list of merchandise: 8 little pints (*pintjes*) of fine oil of cloves, cinnamon, mace, etc. 12 *leggers* (a legger is a large keg of 400 liters capacity) of Spanish wine. 20 kegs of Mum. 2 kegs of good Dutch butter. 20 leggers of wine-vinegar. 9 aums (an aum is a keg of 153.6 liters capacity) of good olive oil. 30 kegs of sake (*Zakkij*) from Japan. 12 kegs of soy [sauce] (*baliën Soija*) from Japan. 6 kegs of miso (*missoe*) from Japan.

Bibliographic reference in Dutch: NA, VOC 1274, BBP (13-7-1670) 550r-574r. On microfilm.

This letter has been collated into Casteel Geldria (Fort Geldria, the headquarters of the VOC factories on the Coromandel Coast) in Palliacatta on 1 Nov. 1670 by Joannes Huijsman, the secretary. The letter is part of a thick bundle of correspondence in the series *Overgekomen Brieven en Papieren* (Letters and papers sent from Batavia and other factories to the headquarters of the VOC in the Netherlands).

This long letter is about management and commerce. The first three folios discuss ships that have arrived. Two folios deal with a political question in the area around Masulipatnam. Folios 552 to 562 discuss merchandise supplied from several districts to Nagapatnam by ship and from the interior, and commerce problems in some districts. Folio 563 is about the weight of the coin used in Pulicat. Folio 565 is about timber. Etc.

Location: Nationaal Archief, Den Haag, De Archieven van de Verenigde Oost-Indische Compagnie (VOC); toegangsnummer 1.04.02: inventaris nummer 1274, folios 550-574 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch East India Company (VOC); inventory number 1.04.02: record number 1274, folios / pages 550-574].

Note: This is the earliest document seen (May 2010) that clearly mentions soybean products (soy sauce and miso) in Indonesia; soybeans as such have not yet been reported. Address: Fortified town of Nagapatnam [in today's southern India].

106. [List of goods to be provided from the various Dutch factories in Asia]. 1671. Colombo. Dec. 20. Unpublished manuscript. [Dut]

• ***Summary:*** An order from Japan for the year 1672 for the table of the Governor. Includes 12 kegs of soy [sauce].

Location: Nationaal Archief, Den Haag, De Archieven van de Verenigde Oost-Indische Compagnie (VOC); inventaris nummer 13511 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch East India Company (VOC); record number 13511]. On microfilm.

Note 1. Colombo, a seaport in the Sinhalese kingdom, was settled by Arabs in the 8th century AD, occupied in 1517 by the Portuguese, captured in 1656 by the Dutch, then taken over in 1796 by the English, who first called the island Ceylon.

Note 2. This is the earliest document seen (Nov. 2010) concerning soybean products (soy sauce) in Ceylon;

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soybeans as such have not yet been reported. Address: Colombo [in today's Sri Lanka].

107. Maetsuyker, Joan. 1674. [Re: List of ships ready to sail for the Netherlands]. Letter to Heren XVII ("17 Lords," leaders of the Dutch East India Company, VOC), Netherlands, Nov. 18. [Dut]

• ***Summary:*** The ship named "Sticht Uijtrecht" will sail for the chamber of Amsterdam. Private merchandise of Willem van Achterveld, sergeant: Includes: 2 crates [with bottles] Spanish wine and mum. 1 crate of brandy. 1 little barrel of soy [sauce] (*1 vaatie met sooij*)**...**

Bibliographic reference in Dutch: NA, VOC 1297, OBP (18-11-1674) f.142r.

Note: This is the earliest Dutch-language document seen (April 2012) that uses the word "sooij" to refer to soy sauce.

Location: Nationaal Archief, Den Haag, De Archieven van de VOC; toegangsnummer 1.04.02; inventaris nummer 1297 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the VOC; access number 1.04.02; record number 1297]. Address: Governor-General in Batavia [today's Jakarta, Indonesia].

108. Governor General and Council of the Indies (*Indië*)**.** 1675. Generale missive [General missive]. Letter to Heren XVII [directors of the VOC] in the Netherlands, autumn. 3 p. Handwritten. [Dut]

• ***Summary:*** "Specification of the goods which several persons take along with them on the ships for the respective chambers of Amsterdam, Zealand, Delft, Rotterdam and Enkhuizen. Homeward shipped on request and permitted by the Governor General and the Council of the Indies with written decree to take along with them the following goods."

"The ship *Ternate* for the chamber of Amsterdam." Note 1. For some ships, lists of private goods are mentioned. But soy [sauce] is mentioned only in the list of private goods for Joan Putmans, the merchant on the ship ternate. On folio / page 225 we read: "2 chests (*kelders*) with Japanese porcelain pots in one of them and candy or candied fruit in the other. 1 chest (*kelder*) with Japanese Soy [sauce] (*Japanse Soija*)**,** 25 pots with *atchian / atchiar* [maybe atjar pickles] and diverse candied fruit, 1 picul tea [1 picul = about 125 lb], 20 catties bird nests in a little basket of cane / canister" [1 catty = 625 gm]."

Note 2. The goods owned by Joan Putmans are being shipped as "private trade freight" (Japanese: *waki nimotsu*) rather than as "official trade freight" (*motokata / compania nimotsu*)**.** It is not known how much soy sauce he was shipping or in what type of containers it was packaged. Dutch research Herman Ketting, PhD thinks there is a good chance that Putmans used the soy for himself or gave it to friends and relatives in the Netherlands.

Note 3. About the sender: The Governor and the Council of the Indies send a General Letter for the Heren XVII with every homeward bound fleet. This letter is a contemporary handwritten copy. The letter is written in a letter-book for the administration of the Heren XVII, who are the administrators of the Dutch East India Co. (VOC).

Note 3. Herman Ketting, who found this letter, writes (16 July 2007): "So far as I can see now, the cargo lists in the General Missive are the only lists of the VOC, which mentioned the soy [sauce] shipped yearly to the Netherlands. They were made for the Heren XVII and the administration of the VOC-chambers. So I think the soy loaded in the ships bound for the Netherlands, actually arrived in the Netherlands."

Note 4. If this soy sauce did actually arrive in the Netherlands, this would be the earliest document seen (July 2007) showing soy sauce in the Netherlands, or in Europe.

Bibliographic reference in Dutch: NA, VOC 1307, Generale Missiven (najaar 1675) 224r.-226r.

Location: Nationaal Archief, Den Haag, Archieven van de Verenigde Oost-Indische Compagnie (VOC); toegangsnummer 1.04.21; inventaris nummer 1307 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 1307]. Address: Batavia [today's Jakarta, Indonesia].

109. Hase, François de; Fentsel, Herman Pit, Jan. 1676. [Re: Order for provisions]. Letter to Joan Camphuijs, chief merchant and director (*oppercoopman en opperhooft*) and to the Council of the Company of Merchants in Japan [Deshima factory, Nagasaki, Kyushu, southern Japan], March 17. Unpaginated. Handwritten, with signature. [Dut]

• ***Summary:*** We request Your Excellency to send with the return ships via the Straits of Malacca... lacquered ware. Also: "50 usual hams. 6 kegs of miacose sake *sackie***.** 4 kegs of soy sauce (*Soija*)**.** 3 kegs of pickled vegetables (*connemon* [*kô-no-mono*])**.** 2 kegs *mineranskij* (*ameneranskij?*)**.** 2 kegs of umeboshi (*mebos* [salt pickled plums]). Note: This means that the soy sauce was also sent via Malacca to Bengal.

Bibliographic reference in Dutch: NA, NFJ 307, ontvangen brieven (17-3-1676). On microfilm.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 307 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 307].

Note: This trading post was established by the Portuguese in 1537, by the English at Hooghly in 1651, and by the Dutch at Chinsura in 1656; the towns were united as Hooghly-Chinsura in 1865. Address: Director, Hooghly [Hooghly-Cinsura in today's West Bengal, northeastern India, on the Hugli River] (Houglij in Bengalen).

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110. Hoorn, J. van. 1676. [Re: Order for provisions]. Letter to the Deshima factory [Nagasaki, Kyushu, southern Japan], June 30. Unpaginated Handwritten, with signature. [Dut]
• ***Summary:*** "General request for merchandise and necessities, which are required from Japan this year for several settlements in Asia as for the fatherland (*vaderlandt / patria*).

For Batavia: 100 kegs of several provisions such as: 40 kegs sake (*sackij*), 20 kegs soy [sauce] (*Soija*), 15 kegs pickled vegetables (*connemon* [*konmono*]), 10 kegs salted, pickled plums (*meboos* [*umeboshi*]), 10 kegs miso (*missauw*).

For Ceylon (*Chijlon*): 48 kegs of provisions as follows: 20 kegs of good sake, 12 kegs soy [sauce] (*Soija*), 8 kegs pickled vegetables, 4 kegs salted, pickled plums [*umeboshi*], 4 kegs *ameneranskij*.

Note 1. This is the earliest document seen (June 2010) concerning soybean products (soy sauce) in Ceylon; soybeans as such have not yet been reported.

For Coromandel (*Choromandel*): As many kegs of Japanese provisions as is specified hereafter for Bengal.

For Bengal: 17 kegs of provisions as: 6 kegs sake, 4 kegs soy [sauce], 3 kegs pickled vegetables, 2 kegs *Ammeneranskij*, 2 kegs salted, pickled plums [*umeboshi*].

For Malacca: Provisions: 2 kegs each of Soy (*Soija*), pickled vegetables, miso (*missouw*), salted, pickled plums [umeboshi], and *ameneranskij*.

Note 2. This is the earliest document seen (May 2010) concerning soybean products (soy sauce) in today's Malaysia. This document contains the earliest date seen for soybean products in Malaysia (June 1676); soybeans as such have not yet been reported.

For Surat (*Zuratta*): 9 kegs of provisions such as sake, pickled vegetables, and soy [sauce] (*Soija*).

Bibliographic reference in Dutch: NA, NFJ 307, ontvangen brieven (30-6-1676). On microfilm.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 355 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 355. The pages are not numbered]. This letter is written in a letter-book for the administration on Deshima.

Note 3. It seems that soy [sauce] is always mentioned in lists of provisions for the table of VOC governors or directors, and their guests; this was written in one letter (see Coijet 1659, Aug. 7).

Note 4. This is a special letter. Part of it contains information from a letter written in the Netherlands by the directors in Holland (Heren XVII). The rest of the information comes from settlements in Asia and was collected and written in Batavia, then sent to Japan. Address: Batavia castle (Batavia in't Kasteel) [today's Jakarta, Indonesia].

111. Breving, Abert; Haas, Dirk de; Schim, Isaac; Bank, C. 1678. [Re: Unable to comply with order for provisions]. Letter to Rijcklof van Goens, Governor-General and the Council of the [Dutch East] Indies in Batavia [today's Jakarta, Indonesia], Nov. 4. Unpaginated. Handwritten, with signature. [Dut]
• ***Summary:*** There was a request from governor-general Rijckloff van Goens in Batavia to transport Sake (*Sakki*) and Soy [sauce] (*Soija*) in waterproof vats, so that the liquids will be well preserved. Albert Brevinck in Japan answers: "That is impossible because we are lacking good vats (*vaten*). For this reason we request that you send vats of first rate quality to Japan. This year we will send the sake for Batavia and Ceylon in good double-walled kegs (*balien*) to help preserve the sake."

Bibliographic reference in Dutch: NA, NFJ 309, verzonden brieven (4-11-1678). On microfilm.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 309 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 309. The pages are not numbered]. This letter is written in a letter-book for the administration on Deshima.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); inventaris nummer 309 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); record number 309].

Note: About the sender: In *Pieter van Dam's Beschryvinghe van de Oostindische Compagnie,* by F.W. Stapel is an entry for Albert Breving under Albert Brevinck. In 1671 he was already head of the settlement in Japan, but after that he was transferred to Tonkin. From 1677 to 1679 he was again head of the settlement in Japan. In 1681 he was Council of Justice and he refused a request to once again become head of the settlement in Japan.

About the recipient: Rijckloff van Goens lived 1619-1682. In 1631 he began his VOC service. In 1655 he was back at home in the Netherlands. In 1656 he was appointed to extraordinary Council of the [Dutch East] Indies, In 1660 he became governor of Ceylon. From 1675 to 1678 he was director-general in Batavia, and after that until 1681 he was governor-general. He died in Nov. 1682 at home in the Netherlands. Source: *Bewind en belied bij de VOC... 1672-1702,* by Femme S. Gaastra (Zutphen 1989). Address: Nagasaki [Japan].

112. Locke, John. 1679. Journal. In: Lord [Peter] King, ed. 1829. The Life of John Locke, with Extracts from his Correspondence, Journals, and Common-place Books. xi +

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407 p. See p. 133-34. 28 x 23 cm. [Eng]

• ***Summary:*** This section of Locke's journal, written in 1679, was not published until 1829. In the section titled "Extracts from the Journal of Locke," it is noted by Lord King that in 1679 John Locke wrote in his journal directions for some foreigner about to visit England. Among his description of the foods and condiments which ought to be enjoyed in London, Locke noted: "Puddings of several sorts and creams of several fashions, both excellent, but they are seldom to be found, at least in their perfection, at common eating-houses. Mango and saio are two sorts of sauces brought from the East Indies."

Note 1. The word "saio" almost certainly refers to *shoyu* and was cited as such by both Yule and Burnell in Hobson-Jobson (1886, p. 651, "Soy") and the *Oxford English Dictionary* (1919, "Soya"). If so, this is the earliest English-language document seen (April 2012) that mentions soy sauce, which it calls *saio.*

Note 2. This is the earliest document seen (Feb. 2012) concerning soybean products (soy sauce) in England, or in the East Indies; soybeans as such have not yet been reported.

Note 3. This is the earliest document seen (Oct. 2003) concerning soy sauce in international trade–imported to England, perhaps from British India, to which it was shipped–probably from Japan. Yet the big question is: How did the soy sauce get to British India and where was it made?

John Locke was an English philosopher who lived 1632-1704. After his death, "his papers, correspondence, and manuscripts, came into the possession of Sir Peter King, his near relation and sole executor." Lord King, the 7th baron, lived 1776-1833.

The *Oxford English Dictionary* defines East Indies as "A geographical term, originally including Hindustan, Further India, and the islands beyond [including today's Indonesia]. Opposed to the West Indies or Central American Islands, and now usually restricted to the Malay archipelago." The term was used as early as 1598.

Webster's New Geographical Dictionary (1988) defines East Indies as "1. also East India. Collective name, applied loosely and vaguely, to India, Indochina, and the Malay Archipelago. 2. In better usage, politically, the Republic of Indonesia, formerly the Netherlands East Indies. See Indies. But some writers used to include the islands of the Malay Archipelago."

Talk with Ted Hymowitz. 2003. Sept. 4. Early imports of soy sauce to England were transported in amphoras (resembling the ancient Greek jars or vases); they were sealed with wax at the top. Address: London.

113. Goens, R. van; Speelman, Cornelius; Both, Balthasar; Hurrt, Anth.; Blom, Dirk; Outhoorn, W. van; Camphuijs, Joan. 1680. [Re: Sending sake and soy sauce in casks and pots]. Letter to the Deshima factory [Nagasaki, Kyushu, southern Japan], June 30. Unpaginated. Handwritten, with signature. [Dut]

• ***Summary:*** Van Goens etc. request that the sake (*sakij*) and soy [sauce] (*soije*) be poured into well-made casks before shipping. They advise for sake and soy [sauce] as well as for pickled vegetables (*konnemon* [*kô-no-mono*]), umeboshi (*mebos*, [salt pickled plums]), etc. to send them in pots (*potten*). Every pot must be placed in a keg and the space between the pot and the keg must be filled up with straw, so there is no danger of the pots breaking in the kegs.

Van Goens etc. will send pots made in the Netherlands for the shipping of the sake and soy. At Coromandel [on the coast of southeast India] the merchants are annoyed at the bad quality of the sake in the kegs; this is caused by the native wood of which the kegs are made.

Another summary (by Cynthia Viallé): "Batavia informs Deshima that it is sending Dutch tubs to hold the sake and soy [sauce]. The tubs should be cleaned first and prepared to contain the sake and soy."

An appendix to this letter: For Batavia: Four aums of Soy [sauce] in aums and half aums [Note: 1 aum is a measure of capacity (a barrel) of about 177 liters]. Twenty pots put in kegs with pickled vegetables (*konnemon*) and miso (*missou*). Twelve pots of umeboshi as before with fruits. If possible we want them as good as the Japanese send to their friends who live in Batavia, because those are better than the fruits they usually send to us.

For Coromandel: 6 quarter kegs of miso (*missouw*). 10 kegs of Soy [sauce] (*Zoija*). 10 kegs of pickled vegetables. 12 double kegs of saké (*Zackij*). 10 kegs of *omenaranski* [meaning unclear], 4 kegs of umeboshi.

For Ceylon [today's Sri Lanka]: 15 single kegs of Soy [sauce]. 6 double kegs of saké (*sackij*). 12 kegs of pickled vegetables. 20 kegs of umeboshi. 12 kegs *omenaranski* [meaning unclear], 6 kegs of miso (*missouw*).

Bibliographic reference in Dutch: NA, NFJ 311, ontvangen brieven (30-6-1680). On microfilm. The first page of this letter is torn off.

About the sender: Rijckloff van Goens lived 1619-1682. In 1631 he began his service (as a boy) in the VOC (Dutch East India Company). In 1655 he returned home to the Netherlands. In 1656 he was appointed to the extraordinary Council of India (the Dutch East Indies). From 1660 he was governor of Ceylon. From 1675-1678 he was director-general in Batavia, and after that until 1681 he was governor-general. He died in Nov. 1682 at home in the Netherlands.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); inventaris nummer 311 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); record number 311]. Address: In the castle (*kasteel*) Batavia [today's Jakarta, Indonesia].

114. [Manifest (cargo-list) of goods imported to Batavia in 1681 by two Chinese junks]. 1681. Colombo. p. 860r-61r.

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See p. 860r. Feb. 7 and 28. Unpublished manuscript. [Dut]
• ***Summary:*** Two Chinese trading junks had arrived from Japan in 1681. On Feb. 7, the junk of captain Quanjock arrived with: 22 straw Calmus (Sweet flag) roots... 1 wicker basket (*canasser*) of medicine and one of tea, 681 kegs and pots containing pickled vegetables (*connemon* [*kô-no-mono*]), soy [sauce] (*soij*) and miso (*missoij*).

Note: This is the earliest Dutch-language document seen (March 2009) that uses the word "missoij" to refer to miso.

On Feb. 28 the junk of captain Lunsincqua arrived with: 40 little bureaus. 5 double kegs and 6 single kegs of camphor. 200 kegs and pots containing chestnuts (*carthanjen*), soy [sauce] (*Zoija*), and pickled vegetables (*connemon* [*kô-no-mono*]).

Bibliographic reference in Dutch: NA, VOC 1354, OBP (7 and 28-2-1681) 860r-861r. On microfilm. This letter is part of the correspondence in the series *Overgekomen Brieven en Papieren* (OBP)–letters and papers sent from Batavia and other factories to the headquarters of the VOC in the Netherlands. This is an important and voluminous part of the VOC archive.

Location: Nationaal Archief, Den Haag, De Archieven van de Verenigde Oost-Indische Compagnie (VOC); inventaris nummer 1354, folio 860 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch East India Company (VOC); record number 1354, folio / page 860]. On microfilm. Address: Colombo [in today's Sri Lanka].

115. Schinne, Isaac van; Cansius, Hendrik; Jonge, Constantin Ranst de; Buijtenhem, Hendrik van; Sweers, Balthasar; Dijck, Pieter van. 1681. [Re: Sending provisions]. Letter to the Governor-General and the Council in Batavia [today's Jakarta, Indonesia], Oct. 31. Handwritten, with signature. [Dut]
• ***Summary:*** The Deshima factory is sending 1,000 pairs of cotton stockings, all the porcelain, also the soy [sauce] (*Soija*), saké (*Sackij*), miso (*Misou*), pickled vegetables (*Konnemon* [*Kô-no-mono*]), and umeboshi (*Mebos* [salt pickled plums]), all of the best quality we can get, just as you ordered.

Note: This is the earliest Dutch-language document seen (March 2009) that uses the word "Misou" to refer to miso.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 312 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 312]. Address: Deshima factory, Nagasaki [Japan].

116. Aizu-nôsho [Aizu-nosho]. 1684. Japan. [Jap]*
• ***Summary:*** Goto (1984, p. 136) states: "Aizu-nôsyo (1684)... described in detail the characteristics of many cultivars, and various cultivation practices, namely ridging and intercropping with barley." Address: Japan.

117. Hishikawa, Moronobu. 1685. Wakoku shoshoku e-zukushi [Various Japanese occupations described in pictures]. Japan. [Jap]*
• ***Summary:*** One woodblock print shows a Japanese man carrying two water-filled wooden tubs of tofu suspended by 4 ropes at each end of a shoulder pole. He is selling tofu, probably in Kyoto. To his left is walking a kimono-clad woman, with a similar wooden tub (covered with a cloth but probably containing tofu) atop her head. She probably bought the tofu from him. Both people are bare footed. The caption says: "Please eat tofu. I came all the way from Nara."

118. Kurokawa Dôyû. 1686. Yôshû fushi [Topography of Yamashiro near Kyoto, based on Yoshu in ancient China]. Kyoto: Shorin Mohe. 10 volumes. Japanese summary by Kawakami 1978, p. 266. [Jap]
• ***Summary:*** OCLC / WorldCat cites this book as follows: Title: Yôshû fushi. Author: Dôyû Kurokawa (who died in 1691). Publisher: [Kyoto]: Shorin Mohe. Year of publication [1686]. Available in Japanese in Microform or microfilm.

Describes shoyu making.

Yokotsuka (1985, p. 205) states: "And in a book (*Yoshu-fushi,* AD 1686), shoyu was defined as a common Shi-ju (Shi-tche in Chinese)..." Note: "Shi" refers to fermented black soybeans." Therefore the juice from *shi* would be similar to today's tamari, which is soy sauce made with little or no wheat.

Fukushima (1989, p. 9) states that the *Yoshu-Fushi* (Kurokawa, 1682) describes miso and shoyu. Yokotsuka (1991, p. 332) states: "The method of preparing salted and unsalted *douchi* [fermented black soybeans] is described in the book *Yoshufushi* (1686) and elsewhere.

Iino (2003, p. 8) quotes from this 1684 book: "... though *Sakai-joyu* (Sakai soy sauce) was once available only from liquor shops in Izumi (modern-day Osaka) and remains very popular, soy sauce is now made by liquor shops in Kyoto, as well as made by hand at home making the purchase of *Sakai-joyu* unnecessary." "In the first half of the Edo Period (17th century), soy sauce was made in all regions of Japan and could be purchased anywhere. In addition, soy sauce was made by hand in the large majority of houses"–This is made clear by this references in this book. "The method for making soy sauce is first recorded in the *Yôshu Fushi.* The method described calls for a malt to be made from boiled soybeans and roasted barley. Salt and water are added to the malt and the entire mixture placed in a large barrel. The mixture is to be stirred two or three times a day with a pole resembling an oar. After a minimum of 70 days, the *moromi* (dregs [mash]) is to be placed in a sack cloth. A stone is to be placed on top of the sack and the liquid squeezed out. This liquid can then be boiled with other ingredients to create a variety of

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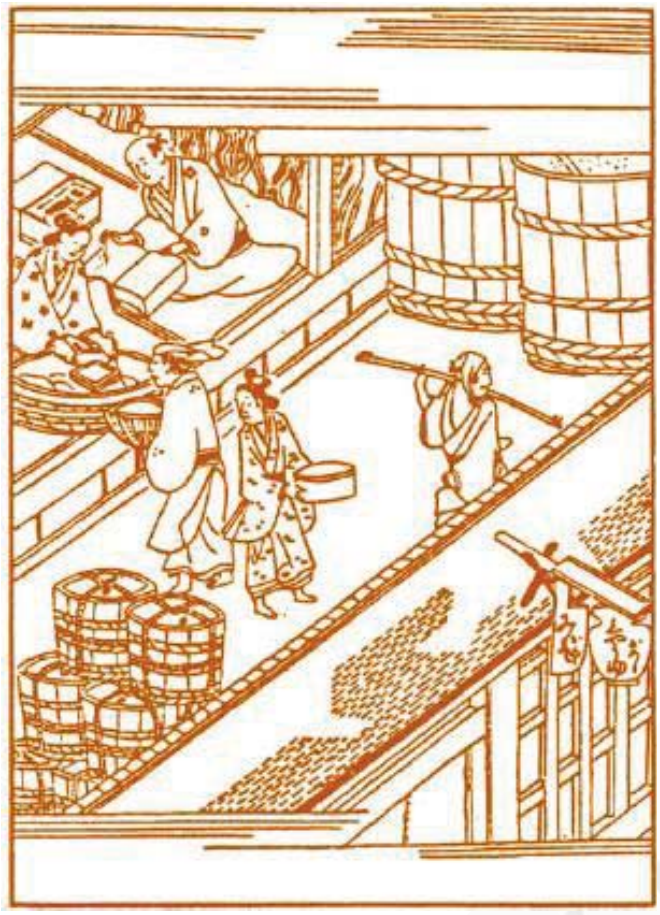

dishes." Iino then comments: "This explanation shows us that the method for producing soy sauce varied little form the way it is made today, though rather than wheat, barley was used and heat was not applied to the extracted liquid."

119. Rakka Yajin Danshoken. 1686. Shogei shokan: Ryôri no bu [A small sample of various skills: Cookery section]. Japan: Nakamura Magobei in Kyoto, Honya Kiyobei in Edo (Tokyo), and Okada Saburo in Osaka. 66 p. Japanese summary by Kawakami 1978. [Jap]
• ***Summary:*** Pronunciation of the author's name is not clear. This book contains many interesting recipes but almost all were copied from the *Ryôri Monogatari* (1643) and the *Edo Ryôri-shu.* It describes methods for making Maruyama Hishio and tamari, plus a rich miso soup recipe. It is not clear whether or not he copied these recipes.

120. Nihon Saiji-ki 1687. Japan. [Jap]*
• ***Summary:*** Iino (2003, p. 8) states that this 1687 book mentions the shoyu production process, noting that barley was used in place of rice. Iino comments: "It seems that it took some time for wheat to be established as the proper mate for soybeans in the production of soy sauce." Address: Japan.

121. Nihon saijiki 1687. Japan. [Jap]*
• ***Summary:*** Iino (2001, p. 21) contains a "Table of ingredients used in *tou-miso* and shoyu during the Edo period." The entry for *Nihon saijiki* (compiled in 1687) states that *Shoyu* is made from the following ingredients: Soybean 19.2%. Wheat / barley 19.2%. Salt 19.2%. Water 42.3%. Address: Japan.

122. Hyakushô-denki [Farmers' record]. 1688. Japan. [Jap]*
• ***Summary:*** Goto (1984, p. 136) states: "Hyakusyô-denki (around 1688) described in detail the characteristics of many cultivars, and various cultivation practices, namely ridging and intercropping with barley."

Note: Recent editions have apparently been published in Japanese in 1970 and 1977. Address: Japan.

123. Saikaku Ihara. 1688. Nihon Eitaigura Japan. [Jap]*
• ***Summary:*** Iino (2003, p. 8) states that in this 1688 book, the author "presents two stories about the makers of soy sauce. The first story is that a small miso and soy sauce manufacturer in Echigen Tsuruga thought that by using his talents to produce a product at low cost, he could enlarge his business. However, as his business grew, customers dwindled, feeling out of place in the large establishment. In the end, his business failed. The second story is about the soy sauce merchant Kiheiji who walked around town selling his soy sauce from wooden buckets attached to a pole carried on his shoulders. In these two stories, Saikaku discusses the selling of soy sauce from the point of view of a large merchant as well as that of one who sells soy sauce from door to door."

An illustration shows a slanting overhead view of the inside of a shop where soy sauce and miso are sold retail. The small sign hanging outside above the door reads: Soy Sauce and Miso Retailer. Address: Japan.

124. Wakan shôjin ryôri-sho [Japanese-Chinese vegetarian cookbook]. 1688. Japan. [Jap]*
• ***Summary:*** The fourth earliest known reference to Kori-dofu (dried-frozen tofu) appeared in this work.

125. Gôrui nichiyo ryôri-sho (or ryôri shinan-sho) [The recipe book with mixed variety for daily use]. 1689. Nishimura Hanbei (Edo), Nishimura Nishimura Ichiroemon and Nakagawa Moheibei (Kyoto). 5 volumes. Japanese summary by Kawakami 1978. [Jap]
• ***Summary:*** Other names for this book are *Gorui Nichiyo Ryôri Shinan-sho, Ryôri Shinan-sho,* and *Ryôri-sho.* The author is unknown. Fermented foods (*jozo shokuhin*) are included in volume 1, and tofu in volume 3. Unlike a typical recipe book, this one contains many descriptions of methods and processes for making foods. The book also contains detailed recipes for making and serving natto, plus a history of natto.

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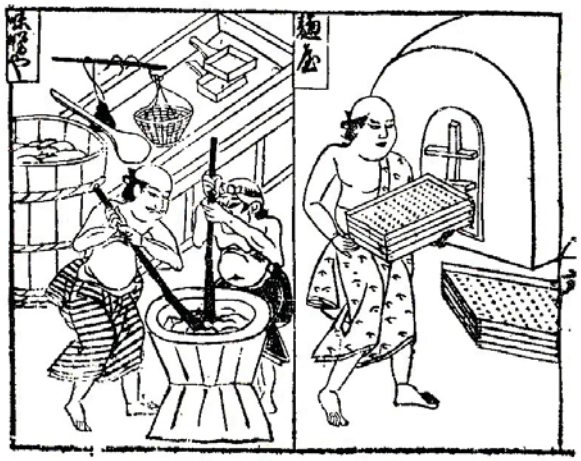
126. Jinrin kinmô zui Jinrin kinmô zui [Illustrated encyclopedia of life in the Edo period]. 1690. Kyoto, Japan. Reprinted in 1990 by Heibonsha (Tokyo); edited by Asakura, Haruhiko. [Jap]

• ***Summary:*** The following page numbers refer to the 1990 reprint edition published in Tokyo by Heibonsha. The compiler of this remarkable work is unknown. At the bottom of almost every page (up to p. 293) are one or two half-page illustrations. Pages 317-31 are footnotes, followed by a syllabary index (a e u e o, ka ki ku ke ko).

The original edition was divided into seven volumes, including: 2. Noh drama. 3. Producers (farmers, woodcutters, fishermen, etc.). 4. Merchants (sellers). 5. Craftspeople. 6. Various and other jobs. 7. Entertainers. At the end is a long section of footnotes and annotations.

Page 121. The illustration is titled *Kuzune-hori* (Digging kuzu root). Yoshino kuzu is the best known in Japan.

Page 142. Shoyu is a famous product of Sakai. Produced in Osaka and Sakai, it is shipped to various places (no illustration).



Page 144. The right illustration is titled *Koji-shi* (Koji maker). Miso makers, manju (steamed bun) makers, and many others use koji. The illustration shows a man carrying four koji trays (*koji-bune*) filled with koji; he is about to put them into the incubation room (*muro,* which has a rounded top) where the koji will ferment. The text mentions a "thin board" (*usuita*), which may be a second type of koji tray, shown on the ground at right, lacking either one or both ends. The volume of koji is measured by the standardized size of the koji tray.

Page 144. The left illustration is titled *Miso-ya* (Miso shop). It shows two men mixing or pounding something (either koji, cooked soybeans and water before fermentation, or miso after fermentation) in a wooden mortar (*usu, suribachi*) using long wooden spatulas or pestles. They use a wooden spatula (*sekkai*) as their store sign. Behind the men to the left is a vat of fermenting miso with stones on top for pressure. Two wooden scoops in a rectangular wooden "boat" are used for scooping and measuring koji, cooked soybeans, and/or salt. The text says: "Miso makes a good seasoning and helps keep people healthy. A day cannot go by without it."

Page 152. The illustration, titled *Kome-ya* (Rice shop), shows a man unloading a bale of rice (wrapped in rice straw) from the back of his horse. Nearby is a rice merchant, standing on a low platform near two other bales of rice. The text notes that the shop sells the "five grains" (*go-koku*), which include soybeans (*daizu*).

Page 160. The left illustration, titled *Yakidofu-shi* (Grilled tofu man), shows a man making grilled tofu over a rectangular brazier. In his right hand is a fan, with which he fans the coals beneath several cakes of tofu. In his left hand is a skewer with two prongs that pierce a cake of tofu.

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In front of his brazier is a wooden pail, which may be used to store cakes of tofu in water. At the front left is a sloping tray on which slices of tofu are drained. The maker of grilled tofu can found in market places, temple gatherings, festivals, and wherever people gather around. Note: This is the earliest Japanese-language document seen (April 2013) that mentions grilled tofu, which it calls *yaki-dôufu.*

Page 162. The illustration, titled *Ko-ya* (Flour shop), shows three people turning a large hand-turned stone mill in which various types of flour (including soy flour, *daizu no ko,* which is probably roasted soy flour {kinako}) are ground. Ropes from the ceiling hold up the t-shaped end of a push-pull device used to help turn the heavy upper stone.

Page 166. The right half of the illustration (not shown) is titled *Seller of Tataki natto in Kyoto.* To make this natto, dice stringy (*itohiki*) natto finely, then shape into a thin, flat square. Mix in finely chopped greens and tofu. It is an inexpensive, fast food. It is sold by walking street vendors from the end of September until February, especially at Tomikoji-dori, Shijo-agaru machi (probably in Kyoto).

The other illustration shows two men in front of a shop. Each is carrying a shoulder pole on one shoulder; from each end are suspended containers used to hold food. Each is also wearing straw sandals (*waraji*). The man on the right carries containers that are shaped like boxes with the long edges oriented vertically. A sliding panel may be used to open each box. Inside are either utensils and the ingredients for making tataki-natto, or bowls of tataki-natto ready to eat.

Note: This is the earliest document seen (Jan. 2012) that contains the word *itohiki* or the term "Tataki natto" in connection with natto,

Page 225. The left half of the illustration is titled *Horo miso,* which is a kind of miso. The character for *Ho* means "law" or "dharma." The man on the left has cylindrical wooden containers (*magemono,* shaped like traditional Japanese steamers) suspended from each end of his shoulder pole. Atop each is a bamboo mat (*sudaré*). The text states: This miso is made with black soybeans (*kuro mame*). The men who sell it all wear orange robes dyed with persimmons. They never put down the merchandise. Its container was covered and they carried it using a shoulder pole to keep it clean. When they had to put it down, they placed it with one side leaning against something. If anyone stepped over it, the seller demanded that that person buy it. To make *horo miso,* cook black soybeans, then drain off and squeeze out the liquid. The result is a very firm miso with a low water content. Originally it was used in temples, but later it came to be used by the common people.

Note: Naomichi Ishige, a scholar of and expert on Japanese food history, writes (personal communication, March 2008): "To make *horo miso,* mix miso, minced walnut, sesame, and Japanese *sansho* pepper, then saute the mixture with vegetable oil in a pan. People eat *horo miso* with rice, or have it as a relish when they drink sake.

"In the *Jinrin kinmo zui,* the reason tataki natto is thin and formed is because people thought that type of natto could be easily dissolved in miso soup. However, its rectangular shape does not relate to the way of cooking.

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"I am not sure how the peddler in the picture put his goods in a box that he carried. I only imagine that he wrapped a rectangular tataki-natto in a bamboo sheath and stored it in the box.

"When peddlers began to sell granulated itohiki natto, they put the itohiki-natto into a bamboo basket. They ladled up the quantity needed by a rice scoop (*shamoji*) and sold it. Or, they wrapped the itohiki-natto in a straw parcel and sold the parcel." See also letter about natto history from Ishige sensei to Shurtleff, dated 16 March 2008.

Page 225. The right illustration is titled *Tofu-shi* (Tofu maker). The text states: Among the craftsmen, tofu makers rise the earliest each morning. Some sell deep fried tofu pouches (*aburaagé*). The book *Kuni Hana Manyoki* mentions the places named Maruyama and Reizan where the craftsmen lived. There may have been a lot of tofu makers who lived in this area. The illustration shows a tofu maker in his shop, sitting at the end of a firm pole used as a lever press to press the soymilk out of the okara in the pressing sack (which is placed on a rack) into the wooden vat below. It will then be curded to make tofu. Also visible in the tofu shop are a wooden tofu forming box with 3 holes in each side, and four hanging *noren* curtains.

Page 291. The illustration is titled *Yaku-harai* (Driving out bad luck). The text mentions *setsubun* (the annual festival on the evening of the last day of winter, just before the first day of spring, also celebrated by some as New Year's Eve–according to the old lunar calendar) and roasted soybeans (*iri-mamé / iri-mame*). On the evening of setsubun, Japanese wished to be cleansed of all bad spirits and bad luck. So they scattered roasted soybeans (with coins?) and cried out a slogan wishing for long life. This kept them very busy. Note: New Year's Eve and Day are not traditional Japanese concepts; they were imported from China and the West during the 20th century. Address: Japan.

127. Matsuo Bashô mentions *mamenoko* (*kinako*) in a haiku poem (Early event). 1690. [Jap]

• ***Summary:*** The poem (in Romanization) reads as follows:

"Niawashi ya.

"Mamenoko meshi ni.

"Sakura-gari."

Translation: "Suitable it is / Rice covered with kinako / for hunting cherry blossoms."

Note: This poem appears in the book *Cherry Blossom Epiphany,* by Robin T. Gill (2007, p. 47). It is not clear when Basho wrote this, but it was before 1694, when he died.

The same poem appears in the book *The Essential Bashô,* compiled and edited by Sam Hamill (1999, 184 p.).

It also appears in *Basho's Haiku: Selected Poems by Matsuo Basho,* compiled and edited by David Landis Barnhill (2004, 331 p.).

Makiko Kageura (e-mail of 1 Oct. 2012), a young Japanese Haiku poet, says that Bashô wrote this poem in about Genroku 3 = 1690, at Iga-Ueno (Iga Ueno) located in Iga city, Mie prefecture, Japan.

128. Haikai, zôdanshû [Comic / unorthodox, collections of various topics]. 1692. Japan. [Jap]*

• ***Summary:*** According to the *Nihon Kokugo Daijiten* [Japanese Language Dictionary], this is the earliest known Japanese document that contains the word *kirazu,* referring to the dietary fiber remaining after making tofu or soymilk.

Thanks to Toshie Marra of the University of California, Librarian for the Japanese Collection, C.V. Starr East Asian Library.

Note. This is the earliest Japanese-language document seen (June 2013) that mentions okara, which it calls *kirazu.*

129. Onna chôhô-ki 1692. Japan. [Jap]*

• ***Summary:*** According to Ryoichi Iino (2003, p. 10) the term *oshidashi* was used in this book to indicate / refer to soy sauce.

130. Yaoya-shû [Collection of various things]. 1693. Japan: Publisher unknown. Volumes 1-3 have 54, 48, and 46 pages respectively. Japanese summary by Kawakami 1978, p. 152. [Jap]

• ***Summary:*** The three parts of the book discuss (1) processing foods, (2) cooking, and (3) mochi and confectionery (*kashi*). This is mostly a copy of *Gorui Nichiyo Ryôri Shinan-sho,* but the sequence of the material and the wording has been changed. Some new things have been added. Includes discussions of Nara Horin Miso, quick production of shoyu, and quick preparation of amazake, and Ukeire Tofu. It is not known what the latter is.

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131. Hitomi, Hitsudai. 1695. [Honcho shokukan. See Pen chao shih chien]. [Chi]*
• ***Summary:*** Yokotsuka (1985, p. 206; 1986, p. 198) cites this as *"Honcho Shokukan* (1692)" but apparently does not cite it in his bibliography in either case.

The Japanese title can be translated as "Japan's food dictionary" or "Our country's food model." Written during the Edo period, the book is mostly about tea. The section about sushi states: Mix fish meat into cold rice, then mix in a little vinegar.

132. Hitomi, Hitsudai. 1695. Pen chao shih chien / Ben zhao shi jian [A mirror of food in this dynasty. 12 vols.]. Osaka?: Hiranoya Katsuzaemon. 22 cm. Widely referred to as *Honchô Shokkan* in Japanese. Modern rendering by Morohashi 1955, trans. p. 13. Complete modern translation into Japanese by Isao Shimada (1976; Tokyo: Heibonsha). [Chi]*
• ***Summary:*** This book, written by a Japanese man in Japan, yet entirely in Chinese, contains early references to yuba, frozen tofu, natto, shoyu, and miso. When Japanese read the Chinese characters for yuba, *doufu-lao,* they pronounce them *tôfu no uba. Lao* or *uba* means "old woman" or "wet nurse."

The book states that the word "natto" is derived from *nassho,* meaning "temple kitchen" or literally "place of offering, perhaps because the food was offered to Buddha before being offered to the monks." It also contains the earliest known written mention of natto's medicinal or healing effects, together with recipes for preparing natto miso soup (*natto-jiru*).

Note: Recall that this *natto-jiru* may well be made with fermented black soybeans rather than itohiki natto.

Saito (1985, p. 15-16) notes: "In 1695 Dr. Hitomi Hitsudai, a Japanese physician, age 74, writes the *Honcho Skokkan* and talks about the good and bad points of daily foods from his medical viewpoint. The 12 volume book is written entirely in Chinese. He writes: 'Soybean: Makes one feel calm, relaxes the stomach, and is good for the intestines. Miso: One should not be without it. Natto: Makes one feel calm, conditions the stomach, enhances a good appetite, and detoxifies poisons. Tofu: Nowadays tofu in Edo is pretty good. Among the various types, Nishiki-dofu and Kezo-in-dofu are famous... But it cannot compete with the tofu made in Kyoto. Shoyu: Inactivates any poisoning from eating food, drinking alcohol, or taking medicine.' The above is taken from the translation into Japanese by Shimada Isao."

T. Yokotsuka (1985, p. 206; 1986, p. 198) cites this as *Honcho Shokukan* (1692) but apparently does not cite it in his bibliography in either case.

Needham (1986, p. 581) cites this as *Pên Ts'ao Shih Chien* (Materia Medica in Tasteful Verse, by Chu Lun). Ch'ing dynasty. 1739. Partly translated by Swingle. But Needham does not discuss its content.

Fukushima (1989, p. 9) states that the *Honcho-Shokkan* (Hitomi, 1695) describes miso and shoyu.

Concerning shoyu: Iino (2001, p. 21) contains a "Table of ingredients used in *tou-miso* and shoyu during the Edo period." The entry for *Honcho-shokukan* (compiled in 1695) states that *Shoyu* is made from the following ingredients: Soybean approximately 22%. Wheat / barley approx. 22%. Salt approx. 22%. Water approx. 34%.

Iino (2003, p. 8) states: "In the first half of the Edo Period (17th century), soy sauce was made in all regions of Japan and could be purchased anywhere. In addition, soy sauce was made by hand in the large majority of houses"– This is made clear by a reference in this 1695 book (*Honchô-Shokkan*), which also mentions the shoyu production process, noting that barley was used in place of wheat. On p. 9 Iino adds that detailed instructions for making *niban shoyu* (soy sauce from a second pressing of the moromi with salt water) are also described in this book. Iino then comments: "It is clear that with the beginning of soy sauce production, use was also made of the dregs [shoyu presscake] to make *niban shoyu."*

133. Endo Genkan. 1696. Chanoyu kondate shinan [Instructions concerning menus for tea ceremony cookery]. Yamaoka Shirobei (Kyoto) and Maedaya Tokubei (Edo). 8 volumes averaging 70 pages per volume. Japanese summary by Kawakami 1978, p. 100. [Jap]
• ***Summary:*** For each day of the month various menus are given with descriptions on how to make them for tea ceremony cookery. Contains the first appearance of awase-joyu, using shoyu. A second edition was published in 1837 by Nakamura Sanshido in Osaka.

134. Miyazaki, Yasusada. 1696. Nôgyô-zensho [Encyclopedia of agriculture in Japan. 2 vols.]. Kyoto?, Japan. Re-issued in 1978 as vols. 12-13 of Nihon Nôsho Zenshu. Published in Tokyo by Nôsan Gyoson Bunka Kyokai. [Jap]*
• ***Summary:*** Saito (1985, p. 16): "There are various kinds of soybeans. They come in four colors: Yellow, white, black, and green (*aoi*). There are large and small, round shaped, flat, or of various other shapes. Also there is the *tsuru daizu* (vine soybean = wild soybean). It is from this document that we now know how many different varieties of soybeans were cultivated at that time."

135. Ovington, John. 1696. A voyage to Suratt, in the year, 1689. Giving a large account of that city, and its inhabitants, and of the English factory there. London: Printed for Jacob Tonson. 606 p. See p. 385, 397. See also Oxford University Press edition (1929), edited by H.G. Rawlinson. A voyage to Surat in the year 1689. p. 231. [Eng]
• ***Summary:*** Concerning soy sauce: In the chapter on "The English Factory at Surat," at the section on "Several Sorts of Indian Dishes," the author is describing Palau [rice pilaf],

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baked fowl, and beef or mutton cabob roasted on a spit, seasoned with sweet herbs and basted with oil and garlic. He concludes: "Bambou and Mangoe Achar [pickle], Souy the choicest of all Sawces, are always ready to whet the Appetite."

Note 1. This is the earliest English-language document seen (April 2012) that uses the word "Souy" to refer to soy sauce.

Note 2. This soy sauce was probably made in Japan and shipped from there to India in wooden kegs or vats. In 1796 Thunberg states that Japanese shoyu was shipped to India in vats. Noda Shoyu (1955) states: "According to Dr. Iwao, whose source of information was the Japanese-Dutch Hague Archives in the Netherlands (*Waran Haagu Bunshokan.* Probably Nederlandse Vereiniging van Bibliothecarissen, Documentalisten en Literatuuronderzoekers (NVB)), in 1668 the Japanese sent 12 kegs of shoyu to Coromandel, India (a coastal region of southeast India on the Bay of Bengal), in 1670 to the island of Ceylon, in 1677 to Coromandel again, in 1679 and 1681 to Surat in northwest India and to Coromandel..."

Concerning the peanut or groundnut: Page 77 states: "Sometimes they feast with a little Fish, and that with a few Pindars [peanuts or groundnuts] is esteemed a splendid banquet. These Pindars are sown under ground, and grown there without sprouting above the surface." Note 3. This is the earliest document seen (Jan. 2005) that mentions the peanut, or that uses the word "Pindars" to refer to peanuts. This is also the earliest citation in the *Oxford English Dictionary* for pindars (also spelled pinda, pinder, pindal, pinda, or pindel). In the Congo, the term is *mpinda.* It was carried by negroes to America and was used in the West Indies and southern USA for the peanut or groundnut. Note 4. This is the earliest document seen (Sept. 1996) that mentions both soybeans and peanuts.

Note 5. *Webster's New Geographical Dictionary* (1988) defines Surat (also formerly spelled "Suratte") as a city in southeast Gujarat on the coast of western India, on the Tapti River near its mouth 150 miles north of Bombay. It was a chief seaport of India by the late 1500s. In 1608 an English factory was established there, the first in India and the beginning of the British Empire in India. Surat was the seat of British Indian government until 1687. It began to decline in the early 1800s. A photo (frontispiece) facing the title page shows "Surat: The fort from the river bridge."

The subtitle reads: "Likewise a description of Madeira, St. Jago, Annobon, Cabenda and Malemba (upon the coast of Africa), St. Helena, Johanna, Bombay, the city of Muscatt, and its inhabitants in Arabia Felix [the Arabian Peninsula], Mocha, and maritime towns upon the Red-Sea, the Cape of Good Hope, and the island Ascention [Ascension]. To which is added an Appendix, containing: I. The history of a late revolution in the Kingdom of Golconda [in south central India]. II. A description of the Kingdoms of Arraacan and Pegu. III. An account of the coins of the Kingdom of India, Persia, Golconda, &c. IV. Observations concerning the silk worms.

Note 6. Ovington lived 1653-1731. First cited by Yule & Burnell (1886, p. 651; and 1903, p. 859), and the *Oxford English Dictionary* (1919, Soy).

Note 7. The Coromandel Coast in southeast India extends from Point Calimere northwards to the mouths of the Krishna River; to the east is the Bay of Bengal. It has a low shoreline with no good harbors, and is beaten by heavy seas year-round, but especially during the northeastern monsoon (October to April). The chief ports are (as of 1999) Nellore, Madras, Pondicherry, Cuddalore, Tranquebar, and Nagapattinam. Address: M.A. Chaplain to his Majesty.

136. Honkan shokkan [Japanese model cookbook?]. 1697. Japan. [Jap]*

137. Nôgaku-zensho [Complete book of farming]. 1697. Japan. Reprinted in 1979-81 by Sôgô Shinteiban (Tokyo; 7 vols). [Jap]*
• ***Summary:*** Goto (1984, p. 136) states: "Nôgaku-zensyo (1697) outlined the principles and practices of soybean management already widely applied, and mention was made of vegetable beans (*Edamame*) [green vegetable soybeans]." Address: Japan.

138. Saito, Akio. 1699. [Chronology of soybeans in Japan, 1600 to 1699, the early Tokugawa/Edo period] (Document part). In: Akio Saito. 1985. Daizu Geppo (Soybean Monthly News). Jan. p. 14-16. [Jap; eng+]
• ***Summary:*** 1600–Komakabe?, the name of a type of tofu, appears in the *Diary of Oyudono no Kami* (*Oyudono Kami no Nikki*). The very firm tofu called *kata-dofu* that is presently sold in Kochi prefecture (on the southern part of the island of Shikoku) originated from Komakabe.

1601–Daté Masamune (DAH-tay Mah-sah-MU-nay; lived 1567-1636) of Sendai establishes the Goenso-gura and starts making miso. This is the first time that an organized method has ever been used to make miso in Japan. The purpose of this is to make miso for the army and to store salt. According to some theories, the date was 1645 rather than 1601.

1603–In *Nippo Jisho,* a Japanese-Portuguese dictionary, tofu (called "taufu") is mentioned. It says that tofu is a food that is made from powdered / ground beans and that looks like freshly made cheese.

1605–Tokugawa Ieyasu commands the monks at Daifukuji temple to make Hamana Natto. Note 1. This is the earliest document seen (Nov. 2011) that mentions "Hamana Natto" (or "Hamanatto," regardless of capitalization). This document contains the earliest date seen for Hamanatto–1605! Note 2. This is the earliest document seen (Nov. 2011) stating that Hamanatto [fermented black

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soybeans] were made at Daifukuji temple in Hamamatsu.

1616–Tanaka Genba of Kamiusa no Kuni is advised to make tamari shoyu as a side business by Sanagi Kyurouemon of Settsu. The latter runs a sake factory and has a wholesale seafood products shop in Edo. This is the beginning of Choshi Shoyu and Higeta Shoyu.

1619–At about this time shoyu in quantity is brought from the Kyoto-Osaka area (*Kansai*) to Edo by Taru Kaisen and Hishigaki Kaisen. Note 1. A "Kaisen" is a ship that has a carrying capacity of at least 200 koku (= 9,520 gallons or 36,000 liters). That shoyu is regarded as the best quality and it soon takes over the entire Edo shoyu market.

1624-1644–Konpura Nakama (The union of merchants who go to Dejima / Deshima, an island in Nagasaki Bay) starts to export shoyu through the Dutch East India Company (*Higashi Indo Gaisha*) to Europe and Southeast Asia. It is said that in Europe this shoyu even reached the dining table of Louis XIV. Note 2. This document contains the earliest date seen for soybean products (shoyu) in Europe and Southeast Asia (probably Indonesia, 1644); soybeans as such had not yet been reported by that date. [Question: What is the source of these two dates?]

1626–Sendai Han (*daimyo* domain) starts to monopolize the selling of salt for the first time in the history of Japan. Because of this, all other Hans start to do likewise. Makabeya Ichibei of Kokubunji-cho in Sendai starts to sell Sendai Miso. He continues to sell his miso to the Han government for several generations.

1642–Because of famines in various provinces (*kuni*), the people were advised to eat coarse grains (*zakkoku*) and banned from eating rice. The sale of tofu, udon (wheat noodles), soba (buckwheat noodles), and *manju* (steamed glutinous rice cakes with a sweet azuki-jam filling) were also prohibited.

1645–The Ako Han starts a salt farm. Hatcho miso starts to be made in Mikawa, Okazaki. Hamaguchi Gihei of Hiromura in Kishu goes to Choshi and starts making shoyu. This is the beginning of Yamasa Shoyu.

1649 Feb.–The Tokugawa government (*bakufu*) passes a law to control the lives of farmers. Called Kanno Jorei (*Keian no Ofuregaki*), it states that farmers must plant soybeans and azuki beans between their rice fields and farms. Azé-mame (soybeans grown on the raised footpaths between rice fields) may have started from this forceful edict.

1652 May–Various farmers in Waksa, Kohama-han, Enshiki-gun? protest the heavy soybean tax increase. The farmland tax is often paid with soybeans. The leaders of the protest are killed.

1657 Jan. 18-19–A large fire (called *Sodefuri Kaji*) burned Edo (today's Tokyo). Laborers came from throughout Japan to reconstruct the city. To feed them, many sellers of pre-cooked, ready-to-eat food sprung up in Edo.

1666–Maruo Magouemon? Chotoku? of Hanshu Tatsuno makes Usukuchi Shoyu (light-colored soy sauce). After this, Tatsuno Shoyu's main product becomes Usukuchi Shoyu.

1681–The government bans the withholding or monopolizing of crops (such as rice, barley, or soybeans) following a year with a bad harvest.

1695–Dr. Hitomi Hitsudai, a Japanese physician, age 74, writes the *Honcho Skokkan* and talks about the good and bad points of daily foods from his medical viewpoint. The 12 volume book is written entirely in Chinese. He praises the therapeutic virtues of soybeans, miso, natto, tofu, and shoyu. A translation into Japanese was later made by Shimada Isao.

1695–At about this time, tofu is sold by vendors sitting by the road. We do not know for sure when tofu was first sold by walking street vendors, but it is guessed that this may have taken place in about 1837-1853 when the book *Morisada Manko* was written by Kitagawa Morisada.

1696–There is famine throughout Japan. In eastern Japan, especially in Tsugaru Han, half of the population dies of starvation.

1696–One of the greatest scholars of agriculture during the Edo period, Miyazaki Yasusada (1623-1697), write *Nôgyo Zensho* (Encyclopedia of Agriculture). In it he described the many different colors, sizes, and shapes of soybeans cultivated at that time.

1697–Koikuchi shoyu, similar to the type made today, starts to be made from tamari shoyu in Choshi.

1698–After a big fire in Edo, sellers of Dengaku (skewered grilled tofu with a sweet miso topping) start to appear. Address: Norin Suisansho, Tokei Johobu, Norin Tokeika Kacho Hosa.

139. Carletti, Francesco. 1701. Ragionamenti di Francesco Carletti Fiorentino sopra le cose da lui vedute ne'suoi viaggi si dell'Indie Occidentali, e Orientali come d'altri paesi..., 1594-1606 [Chronicles of his voyage around the world]. Florence, Italy: Stamperia di Giuseppe Manni, per il Carlieri. 395 p. See Part II, p. 26. 18 cm. [Ita]

• ***Summary:*** Carletti lived 1573?-1636. This is a much-polished and heavily edited version of his original Chronicles. This book is divided into two main parts. Part I is titled "First account: The West Indies" (p. 1-166). In Part II, titled "Second account: The East Indies," the pagination starts over again at page 1, and miso is mentioned on page 26. More specifically: In the chapter titled "First chronicle of the East Indies," Carletti states that he arrived in Japan in June 1597 at Nagasaki. On page 26 he discusses rice miso, which he calls *"misol."*

In Italian, the sentence reads: *"Di questo Pesce ne fanno ancora molt' altre sorte di vivande, le quali assaporano con una certa lor salsa, che chiamano Misol, fatta d' una sorta di Fagiuoli, de quali abbondano;"* For details see the 1606 entry for Francesco Carletti.

Note: This is the earliest Italian-language document seen (March 2009) that uses the word "misol" to refer to miso. Address: Florence, Italy.

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140. Kaki hyôshi 1702. Japan. [Jap]*
• ***Summary:*** According to the *Nihon Kokugo Daijiten* the earliest known appearance of the word *mamemaki* was in the *Kyaki Hyôshi,* which appeared in Japan in 1702. Address: Japan.

141. **Product Name:** [Silken Tofu].
Foreign Name: Kinugoshi-dôfu.
Manufacturer's Name: Sasa-no-Yuki.
Manufacturer's Address: Tokyo, Japan.
Date of Introduction: 1703.
New Product–Documentation: Shurtleff & Aoyagi. 1975. *The Book of Tofu.* p. 307. Based on a 1973 interview with the owner. This is the world's oldest known existing tofu shop. All of the tofu they make and serve is silken tofu.

Was the tofu they made and served when they opened in 1703 named "Sasa-no-yuki" or was it also referred to as kinugoshi? Whatever it was called, this is the earliest known silken tofu in Japan.

142. Chikamatsu Monzaemon. 1703. Sonezaki no shinchû [The love suicides at Sonezaki]. Japan. [Jap]*
• ***Summary:*** Iino (2003, p. 9): In this 1703 book, Chikamatsu's first novel set in current times, "the hero, Tokubei, is an apprentice in the Hirano soy sauce shop. He instructs an employee to make the rounds of regular customers carrying casks of *kijoyu"* [raw / unheated soy sauce]. Iino comments: "With such an explanation, it seems that this soy sauce must have been pure and undiluted, even though diluted soy sauce was also being made" [at this time in history]. Address: Japan.

143. Sherard, William. 1704. [Autograph observations on the first two volumes of John Ray's Historia Plantarum. 2 vols. in 1]. See p. 438. Unpublished manuscript. [Eng]*
• ***Summary:*** Some of the notes from this unpublished manuscript (cited in The Compleat Herbal) were incorporated into John Ray's 1704 work titled *Historia Plantarum, Vol. 3, Supplementum,* which see. John Ray lived 1627-1705.

Note: Tournefort in *The Compleat Herbal* (1730, p. 481; published in London), states: "81. Phaseolus Japonicus fructo albo, ex quo Soia conficiunct Japoneses." He cites his source as "D. Sherard. Raii Supp. 438," then translates the Latin as "Japanese Kidney bean with a white fruit, out of which the Japanese make their Soia."

Concerning this document, an article by B. Daydon Jackson in the *Journal of Botany* 12:129-38 (1874) titled "A sketch of the life of William Sherard," states: "In 1700 Sherard was appointed tutor to Henry, second Duke of Beaufort... Sherard stayed here for about two years, until his Grace was eighteen, busy getting new seeds and plants for the garden, in which the Dowager Duchess took the keenest interest, and which then stood second to none in the kingdom, and helping Ray, now in a weak state of health, to revise his MSS. for the concluding volume of the 'Historia Plantarum,' to which he contributed 'over a thousand plants.' A part of his additions in his own handwriting is preserved in the Botanical Department of the British Museum."

Stafleu and Cowan in Taxonomic Literature (1976-88) note: Sherard, a British botanist, lived 1659-1728. He studied law at Oxford (St. John's College, B.C.L. 1683), botany in Paris (under J.P. Tournefort, 1686-1688) and Leiden (Netherlands, with P. Hermann 1688-1689). He was in Ireland 1690-1694; D. C.L. Oxford 1694; Consul at Smyrna [Izmir, Turkey] 1702-1716; collecting in Greece and Asia Minor; founded a chair of Botany at Oxford of which J.J. Dillenius was the first occupant.

144. Dale, Samuel. 1705. Pharmacologiæ, seu manuductionis ad materiam medicam supplementum:... [Pharmacology, or a food as a supplement to medicines:...]. Londini (London): Sam. Smith & Benja. Walford. 12 + 389 p. + 67 p. See p. 183-84. 16 cm. See also 1751, Ed. 5, p. 238. [95* ref. Lat]
• ***Summary:*** The information on soy sauce appears in Section XIX, titled "De Herbis flore papilionaceo seu Leguminosis: De Leguminosis Scandentibus," under the heading "I. De Phaseolo. Pag. 318 pro 2da Specie Phaseoli adde."

Page 184 states "3. Soia *Offic.* [probably Officinarum] Phaseolus Japonicus ex quo Japonesium Soia, qui intinctus species est, conficitur *Herm.* Species Phaseoli parvi albi, è Japonia allata, è qua conficiunt condimentum *Ketchup* dictum, duum generum, liquidum nimirum & solidum.

Hujus notitiam debemus Botanico erudito D. *Paulo Hermanno* nuper defuncto, qui eam doctissimo amico nostro D. *Gulielmo Sherrard* [Sherard], LL.D. communicavit, sub titulo suprascripto, unde nos habuimus.

English translation: "I. About Phaseolus. Page 318 for two species of Phaseolus [See Note 1 below]. 3. Soy sauce which is kept in stock at the pharmacist's [apothecary's or druggist's or chemist's] laboratory. The Japanese bean from which Japanese soy sauce is made. The latter is a kind of dip. The bean is the Hermann-type [see Paul Hermann, below] of a small white bean brought from Japan; from it they make a condiment called *Ketchup* [Ketjap, Kecap], of two kinds, one clearly liquid and one solid. I owe the notice of this to the erudite Paul Hermann, recently deceased. He communicated this to our most learned friend D. Gulielmo Sherard LLD, under the title written above, whence we have gotten it."

Note 1. The term "Soia" was first used by John Ray (Joannis Raii) in his *Historia Plantarum,* published 1704 in London in 1704 by Smith and Walford, who also published Samuel Dale's Book. On page 438 Ray states: "28. Phaseolus *Japonicus* fructo albo, ex quo *Soia* conficiunt *Japonenses* D. *Sherard."*

Note 2. This is the earliest Latin-language document seen (April 2012) that mentions soy sauce, which it calls

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Soia.

Note 3. This is the earliest document seen (April 2003) that uses the word "papilionaceo" (or any related word starting with the prefix "papilion" which means "butterfly" in Latin) in connection with the soybean.

Note 4. This passage by Dale raises several questions. (1) It is not clear what sentence starting with "Page 318..." means, since there is nothing related to Phaseolus on page 318 of this book or of any other book we know of published before 1705. (2) Both Dale and Ray refer to Sherard as their source, yet we do not know to which document by Sherard they are referring. (3) Paul Hermann first published information about the soybean in 1717 in his *Musaeum Zeylanicum.* How did he know about the soybean in 1705, and in what way did he communicate this information to Sherard, who then communicated it to Dale? (4) It is not clear what the term Soia *offic.* refers to and is an abbreviation of. Note that Linnaeus (1747) miswrites this as "Soja officinarum" (this was the first time that the term "Soja" was used in connection with the soybean) but gives the page as 238. The author's name on the title page is written "Samuelis Dale." He lived 1659?–1739.

Note 5. Talk with Prof. Ted Hymowitz, Univ. of Illinois. 2006. Sept. 1. This document shows clearly and irrefutably that Dale considered *Ketchup* to be a type of soy sauce; he listed it "taxonomically" under soy. Soia *Offic.* is a pre-Linnean taxonomic name, not a pharmaceutical name. It is curious that "soy" is not listed in the 1710 edition of this book. However the Soia entry in 1718 edition is exactly the same as is this 1705 first edition. Address: England.

145. Dampier, William. 1705. Voyage round the world. The supplement of the voyage round the world, describing the countreys of Tonquin, Achin, Malacca, &c. their product, inhabitants, manners, trade, policy, &c. London: Printed for James Knapton, at the Crown in St. Paul's Church Yard. See vol. II. Part I, p. 26-28. See also 1729 and 1906 editions. [Eng]

• ***Summary:*** The passage on soy sauce, written by Captain Dampier in 1688 (as indicated by a note in the margin reading "An. 1688"), makes this the earliest document seen (April 2012) that contains the word "soy," used to refer to what is now called "soy sauce." He begins by describing the process used by the natives in Tonquin (Tonkin, today's northern Vietnam) for using shrimps, small fish, salt, and water to make what is today called nuoc-mam in an earthen vessel or jar. "The masht Fish that remains behind is called *Balachaun,* and the liquor pour'd off is called *Nuke-Mum.* The poor people eat the *Balachaun* with their Rice. 'Tis rank scented, yet the taste is not altogether unpleasant; but rather savory, after one is a little used to it. The *Nuke-Mum* is of a pale brown colour, inclining to grey; and pretty clear. It is also very savory, and used as a good sauce for Fowls, not only by the Natives, but also by the *Europeans,* who esteem it equal with *Soy.* I have been told that *Soy* is made partly with a Fishy composition, and it seems most likely by the taste: tho a Gentleman of my acquaintance, who was very intimate with one that sailed often from *Tonquin* to *Japan,* from whence the true *Soy* comes, told me, that it is made only with Wheat, and a sort of Beans mixt with Water and Salt."

Note 1. This is the earliest English-language document seen (Jan. 2000) that mentions soy sauce in connection with Japan.

Note 2. First cited by Yule and Burnell (1886, p. 651. They cite the 1729 London ed.; and 1903, p. 858), and the *Oxford English Dictionary* (1919, Soy). Dampier lived 1652-1715.

About this book: It was first published in 1697 in London. A second edition was published the same year, a third edition (corrected) in 1698-1703. Tonquin refers to northern Vietnam, called Tonquin when it was part of French Indochina. Achin is today's Aceh (Atjeh), a region on the northern tip of Sumatra, Indonesia, whose main town is Banda Aceh (formerly Kutaranja). Malacca is a coastal town in today's Malaysia on the Straight of Malacca near Sumatra. This document contains no clear reference to soya in Tonquin (today's North Vietnam). Address: London.

146. Kôka-shunjû [Koka-shunjyu]. 1707. Japan. [Jap]*

• ***Summary:*** Goto (1984, p. 136) states: *"Kôka-shunjyû* (1707) described special types of soybeans, such as boiled soybeans (*Nimame*). This book also described how to grow soybeans on dikes or levees between paddy fields." Address: Japan.

147. Yamato hongusa 1708. Japan. [Jap]*

• ***Summary:*** Iino (2003, p. 8) states that in the section titled *Shauyu* (another term for shoyu or soy sauce), this 1708 book "states that soy sauce can be made from either soybeans and barley and soybeans and wheat." Address: Japan.

148. Kaibara, Ekiken. 1709. Yamato honzô [Japanese materia medica. 2 vols.]. Japan. 23 cm. Reprinted in 1932-1936 by Shunyôdô in Tokyo. [Jap]*

• ***Summary:*** The author, Ekiken Kaibara, lived 1630-1714. Nagata (1960, p. 75) states that E. Kaibara (1709, *Yamato Honzô*) described that autumn soybeans of high quality had been produced in Omi province–today's Shiga prefecture.

Kotzsch (1981, p. 43) states: "Another probable influence on Ishitsuka [the founder of macrobiotics in Japan] was Kaibara Ekken, a philosopher and writer and a popularizer of Confucian thought and ethics, who lived from 1630 to 1714. He wrote on a wide variety of subjects, including philosophy, education, ethics and natural history. His work *Yôjôkun* (*Rules for the Nourishing of Life*) is a practical manual of hygiene and health care... While Ishitsuka does not cite it in his own work, nor does Ohsawa

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mention it in his autobiography, it most likely had an influence on Ishitsuka's thought."

Adachi (1982) notes that tamari (written with the characters for bean + oil) was mentioned.

Saito (1985) notes: "Kaibara Ekken (1630-1714) writes *Yamato Honso,* in which he discusses the shapes and use of the 1,362 products from Japan, China, and other countries. He notes that among the five crops (*go-koku*), soybeans are the second most widely produced after rice."

Kotzsch (1985, p. 18) noted: "In case of illness one should first try fasting or a very simple diet as a cure. If that fails then acupuncture, moxibustion (burning pellets of plant fiber on the appropriate *tsubo,* key energy spots) and herbal remedies may be tried as a last resort."

Note: This is the earliest document seen (Jan. 2009) connected with macrobiotics.

149. Tôryu setsuyô ryôri taizen [Our school's big book of cooking]. 1711-1715. Japan. [Jap]*

• ***Summary:*** The sixth earliest known reference to Kori-dofu (dried-frozen tofu) appeared in this work.

150. Lockyer, Charles. 1711. Account of the trade in India: Containing rules for good government in trade... London: Printed for the author, and sold by Samuel Crouch. [12] + 340 p. See p. 128-29. 19 cm.

• ***Summary:*** Mr. Lockyer visited Sumatra, Canton, and India during the early 18th century. In Chapter 5, titled "Canton in China," he gives precautions to observe when buying each of various goods there: "Soy comes in Tubs from *Jappan* [Japan], and the best Ketchup [soy sauce] from *Tonqueen;* yet good of both sorts, are made and sold very cheap in *China.* Buy none but what is right, which you are likelier to meet with among the Merchants than Shop-keepers. The best way is to agree by the Catty; for the Tubs are seldom or never full: But if they will not hearken to it, try which are the heaviest, and refuse all that are not likely to contain the Quantity they ought; draw it off immediately, and secure it in Bottles: Therefore in your Passage thither save as many as you can; for I know not a more profitable commodity.

Note 1. *Tonqueen* refers to Tonkin, which is the northern part of today's (Feb. 2010) Vietnam. France assumed sovereignty over all of Vietnam after the Sino-French War (1884-1885). The French colonial government then divided Vietnam into three different administrative territories. They named the territories: Tonkin (in the north), Annam (in the center), and Cochinchina (in the south). The great majority of the Vietnamese regarded their country as a single land and fought for much of the next 90 years to achieve unification.

Note 2. A catty is a Chinese unit of weight; 1 catty = 1.33 lb. weight avoirdupois.

151. Terajima Ryôan. comp. 1711. Wakan sansai zue [Collection of Japanese and Chinese diagrams and drawings of all things]. Japan. 40 books, 106 sections. Japanese summary by Kawakami 1978, p. 269. Translation into modern Japanese titled *Wakan Sansai Zukai* published by Heibonsha in Toyo Pocket Library series. [Jap; eng+]

• ***Summary:*** This is Japan's oldest encyclopedia, written in *kanbun,* the Japanese transcription of Chinese writing. It is a Japanese compilation, which originated in Japan and is not a Japanese translation of a Chinese work. When cited in Chinese, the title in pinyin is: *Hehan sanchai tuhui* (W.-G. *Ho Han San Ch'ai T'u Hui*). The author's nickname (*aza*) is Shojun; his artist's name (*go*) is Kyorindo. The work contains many illustrations, although they were generally primitive and not very accurate.

In volume 105 (*Jozorui*), which is about brewing and fermented foods, a clear distinction is made between miso, shoyu, and tamari.

The section on yuba states: "Tofu film is made on the surface while making tofu. It looks like yellow paper. If you stir too much, the film will not form properly. If you wish to obtain the film, add coagulant and boil the milk. The wrinkled look of the film resembles (the skin of) an old woman. If you remove too much film, the yield of tofu decreases and the tofu becomes hard to eat." Yuba is referred to as *doufu-pi,* the present Chinese term. When the text notes that yuba "resembles (the skin of) an old woman," it seems to imply that the earlier term *lao* or *uba* was used because of

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the similarity of yuba and an old woman's face.

T. Yokotsuka (1985, p. 206) cites this as *"Wakan sansaizue* (1715)" but apparently does not cite it in his bibliography.

Fukushima (1989, p. 9) states that the *Wakan Sansai Zue* (Narushima, 1712) describes miso and shoyu.

Ebine (1989, p. 91-93) gives the date of this work as 1712, and states that volume 105 describes the preparation of "tama-misho" using broad beans (*Vicia faba; Japanese: soramame*), and a "whitish misho" using soybeans. For each of these Ebine gives a flowchart. Rice or barley are soaked in water, steamed, and fermented to make rice koji, which is mixed with salt, and then the salted koji is mixed with broad beans that have been cooked and dehulled. The mixture is formed into balls, which are wrapped with rice straw, hung under the rafters over a fireside for several weeks, crushed in a mortar, then mixed with water to make tama-misho. To make whitish misho from soybeans and rice: 10 parts of soybeans are soaked in water, dehulled by brushing, and cooked. The hulls are first removed from the cooker, then the cooked beans are removed, formed into balls, and the balls are sliced. Meanwhile, about 14 parts of rice are polished, soaked in water, steamed, cooled, and allowed to mold spontaneously to yield 16 parts of rice koji. The rice koji, sliced soybean balls, and 1.3 parts of salt are mixed, pounded, packed into vats, and fermented for 10 days to yield the whitish misho.

C.N. Li (1958): Making Fermented Products, Fermented black soybean sauce (*shizhi;* W.-G. *shih chih*). Note: Shih is often used at meals to harmonize the five flavors. People used to use it during this dynasty. Nowadays, if people do not use chiang, they do not use shih; they use soy sauce (*chiang-yu*), not fermented black soybean sauce (*shizhi*).

Modern rendering by Morohashi (1955). He translated p. 5 (roasted flour), p. 17 (fermented black soybean sauce). Confection of soy flour and *ame = Ame chimaki.* In "Making Fermented Foods." Morohashi (1955) translated p. 5. *tou i* (*mame ame*). In: vol. 10, p. 63.

Concerning shoyu: Iino (2001, p. 21) contains a "Table of ingredients used in *tou-miso* and shoyu during the Edo period." The entry for *Wakan-sansai-zue* (compiled in 1712) states that *Shoyu* is made from the following ingredients: Soybean 18.2%. Wheat / barley 28.2%. Salt 19.2%. Water 45.5%.

Iino (2003, p. 8) notes that this 1712 book "states that soy sauce made from wheat is suitable for the public and soy sauce made from barley is of low quality." Iino comments (p. 8-9): "Put simply, the soy sauce sold in shops was made from wheat because that made from barley was inferior.

On the same page, Iino shows a full page reproduction of the page titled "shoyu" in this book. It gives: "An explanation of soy sauce production with an illustration of the proper sort of barrel to be used." Iino notes (p. 9): "Another method for producing soy sauce requires a heating process. The *Wakan Sansai Zue* states: '... Squeeze the *moromi* to extract the oil [sic, liquid]. If the color is light, the flavor will not be good. Boil the oil [liquid], place it in a pail and leave it over night to darken the color and improve the flavor. Mix the dregs [presscake] again with salt water and extract the oil [liquid]. This [second pressing] is called *niban shoyu* (second soy sauce), and the flavor is very much inferior.'"

152. Kaempfer, Engelbert. 1712. Amoenitatum exoticarum politico-physico-medicarum, fasculi v. [Exotic novelties, political, physical, medical. Vol. 5]. Lemgoviae, Germany: W.W. Meyerei. See p. 834-35, 837-40. Illust. p. 838. Reprint of original edition published in 1983 by Steiner (Wiesbaden). [Lat]

• ***Summary:*** This is Kaempfer's first major work, his most famous, and his first to mention the soybean. Kaempfer was born on 16 September 1651 at Lemgo, Germany. [Lemgo is presently a city in North Rhine-Westphalia, 44 miles southwest of Hannover.] He lived and traveled in Japan from 23 September 1690 to November 1692 and made many interesting observations. This book, written in Latin, was published in Lemgo in 1712, some 16 years after his homecoming. The fifth fascicle of the 900 page book, which contains a description of the plants of Japan, includes a full-page illustration (drawing; p. 838), by Kaempfer, of a soybean plant with details of the flower parts and their names. This is the earliest illustration of a

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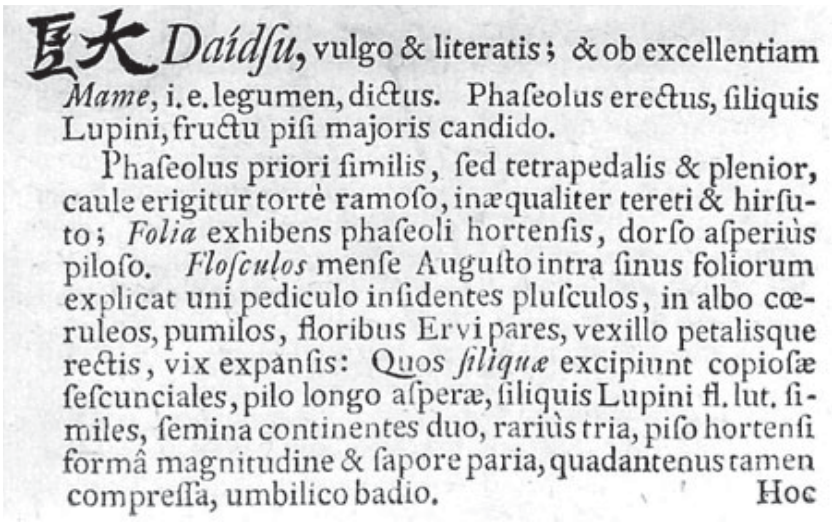

豆大 *Daídſu,* vulgo & literatis; & ob excellentiam *Mame*, i. e. legumen, dictus. Phaſeolus erectus, ſiliquis Lupini, fructu piſi majoris candido.

Phaſeolus priori ſimilis, ſed tetrapedalis & plenior, caule erigitur tortè ramoſo, inæqualiter tereti & hirſuto; *Folia* exhibens phaſeoli hortenſis, dorſo aſperiùs piloſo. *Floſculos* menſe Auguſto intra ſinus foliorum explicat uni pediculo inſidentes pluſculos, in albo cœruleos, pumilos, floribus Ervi pares, vexillo petalisque rectis, vix expanſis: Quos *ſiliquæ* excipiunt copioſæ ſeſcunciales, pilo longo aſperæ, ſiliquis Lupini fl. lut. ſimiles, ſemina continentes duo, rariùs tria, piſo hortenſi formâ magnitudine & ſapore paria, quadantenus tamen compreſſa, umbilico badio. Hoc

soybean plant published in the Western world. Also contains a description of the plant, and descriptions of how to make miso and shoyu. He called the soybean "Daídsu" and wrote the Chinese characters before the romanized name in the sequence "zu" "dai" from left to right. The actual Japanese spelling is "daizu."

Note 1. This the earliest published European document about the soybean and the earliest one that links the soybean and products made from it (miso and shoyu / soy sauce).

Note 2. This is the earliest document seen (May 2012) written by a European or Westerner in which Chinese characters are used to write the name of the soybean or related products.

Kaempfer's description of the soybean in Latin (p. 837-40; see next page) begins: "Daídsu, vulgo & literatis; & ob excellentiam *Mame,* i.e. legumen, dictus. Phaseolus erectus, siliquis Lupini, fructu pisi majoris candido..."

Translated into English, this reads: "Daidsu–as people and scientists call it, is also called 'mame' for its excellence. An upright bean, a leguminous plant like the lupin, with whitish fruit somewhat larger than peas. A bean, similar to the afore-mentioned, but four feet high and with more branches and leaves, with upright stem, irregular branches and with hairs. It stretches forth leaves like the garden bean, but with more pubescence on the under side of the leaf. In the month of August it bears on pedicels in the axil of the leaves several bluish white flowers with a large standard, which resemble those of lentils. These tiny blossoms are followed by pods measuring 1½ inches long, which are covered with heavy hairs (pubescence) resembling those of the yellow lupin. The pods contain two, and more rarely three seeds, similar to garden peas in size, shape and taste, but laterally somewhat compressed, and with a chestnut brown eye (hilum).

"This legume supplies to the Japanese kitchen vital elements, for they make from it the following: 1–A kind of pap that they call miso, which is added to dishes instead of butter. Butter is unknown under this strip of heaven. 2–And then the famous so-called shoyu (*Sooju*), a sauce which is poured over if not all dishes, at least over all cooked and fried meals. I add the processing methods for both.

"To make miso, one takes one measure of mame or phaseolus Daidsu (phaseolorum *Daids*) which is cooked with water for a long time and then brayed or ground and mixed into a soft pap. Under continued braying, common salt is added, in summer four parts, in winter three. If less salt is added, one gets the product quicker, but shelf life is shorter. After reducing has been repeated, one mixes the pap with *koos* [he probably meant koji] or dehulled rice (Oryza), and mixes the total by repeated braying. This rice in preparation has been boiled a little in the steam of unsalted water. One lets the mixture cool down and remain in a warm cellar one or two days and nights to ripen. This mixture, which has the texture of a pap or spread, is put into a bowl that recently contained the popular *sacki,* a rice wine. Before using, one lets the bowl stand one or two months untouched. Koos lends to the product an agreeable taste, and its production requires, like that of the Germans' 'polenta,' the experienced hand of the master. Those therefore who make it are held in high esteem, and they sell it ready made.

Note 3. This is the earliest Latin-language document seen (March 2009) (and the earliest document published in Europe) that mentions miso, which it calls *Miso.* It is also the earliest document seen (March 2009) that compares miso to butter.

"To make shoyu (*Sooju*) one uses the same beans just as thoroughly cooked. And *muggi,* which is barley or wheat fermented (with wheat the product becomes darker) which has been coarsely ground. One mixes equal units with ordinary salt, or only one unit with half of it. The beans are blended with the prepared grain, and one lets the mixture stand in a warm place under cover a day and a night for fermentation. Then the salt is added, one stirs the mass and mixes with water, normally two units to half. When this has been done, the well covered mass is stirred once (better two or three times) the next day and each subsequent day by means of an oven rake. This work is continued for two or three months, then the mass compressed and filtered and the liquid preserved in wooden containers. The older it becomes, the clearer and better it will be. The squeezed mass is again filled up with water and newly stirred and some days after treatment pressed again.

Note 4. This is the earliest document seen (April 2012) that uses the word *koos* to refer to koji, or that uses the word *Sooju* to refer to shoyu (soy sauce).

Paragraph 3 reads as follows in the original Latin: "Hoc legumen in coquina Japonicâ utramque replet paginam; Ex

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Hoc legumen in coquina Japonicâ utramque replet paginam; Ex eo namque conficitur: tum puls *Miſo* dicta, quæ ferculis pro conſiſtentiâ & butyri loco additur, butyrum enim hôc cœlô res ignota eſt; tum *Sooju* dictum celebre embamma, quod niſi ferculis, certè frictis & aſſatis omnibus affunditur. Utriusque conficiendi modum appono:

Pro *Míſo* elaborando recipiunt menſuram unam *Máme*, ſive phaſeolorum *Daidſ*, quos aquâ diutiſſimè & ad omnimodam mollitiem percoctos in pultem molliculam contundunt. Pulti, ope iterandæ contuſionis, permiſcent Salis communis menſuras æſtate quatuor, hyeme tres; quò minus ſalis additur, eò productum obtinetur lautius, ſed minùs durabile. Mox æquali phaſeolis quantitate, unam addunt & repetitâ contuſione permiſcent menſuram *Kooſ*, i. e. Oryzæ degluptæ, in vapore aquæ dulcis parum coctæ, & poſtquam refrixerit, in cellâ calidâ unum vel duos dies noctesque, ad ſitum usque contractum, repoſitæ. Mixturam hanc (quæ pultis vel cataplaſmatis conſiſtentiam exhibet) vaſi immittunt ligneo, quod nuper cereviſiam popularem *Sacki* dictam continuerat; & ante uſum uno vel duobus menſibus intactum ſervant. *Koos* pulti gratiam ſaporis tribuit, & in elaborando, velut polenta Germanorum, expertam requirit manum magiſtri; Quapropter ſunt, qui in eo elaborando operam unicè collocant & paratam venundant.

Pro *Sooju* conficiendo recipiunt eosdem phaſeolos ad aliqualem mollitiem coctos; *Muggi*, i. e. frumenti, perinde hordei an tritici (à tritico productum magis nigricat) craſſè contriti; & Salis communis partes æquales, ſive ſingulorum menſuram unam. Phaſeolos cum frumento contrito miſcent, & in loco calido mixturam uno die ac nocte reponunt coopertam, ut efferbeat. Tum maſſam ollæ fictili immiſſam ſale prædicto obruunt, affundendo aquæ

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aquæ communis menſuras duas cum dimidiâ: quo facto, maſſam probè operculatam poſtridie ac ſequentibus diebus ſingulis ad minimum ſemel (ſatiùs bis vel ter) rutabulo agitant. Labore duobus vel tribus menſibus continuato, maſſam filtrant & exprimunt, liquorem vaſis ligneis aſſervantes; qui quo antiquior fuerit, eò clarior eſt & melioris notæ. Maſſam ita emulſam, affuſâ aquâ, denuo irrigant & ab agitatione aliquot dierum exprimunt.

未豉 *Siuku*, vulgo *Kuro mame*, i. e. Phaſeoli nigri. Phaſeoli *Daidſu* ſpecies ſive varietas, fructu nigro.

Idem fructu nigricante, pumilo medicinali; cujus grana tria vel quatuor in pulverem redacta propinantur aſthmaticis.

eo namque conficitur: tum puls *Miso* dicta, quæ ferculis pro consistentiâ & butyri loco additur, butyrum enim hôc coelô res ignota est; tum *Sooju* dictumcelebre embamma, quod nisi ferculis, certè frictis & assatis omnibus affunditur. Utriusque conficiendi modum appono:"

On page 834 Kaempfer lists the Gokoku (five chief cereal grains): *come* [*kome*], Oryza in genere: quinque grana Japoniis *go kokf* secundum excellentiam dicuntur: *come,* Oryza; o muggi, Hordeum; *ko muggi,* Triticum; *daidsu,* Phaseoli facie Lupini [Soja hispida]; *sjodsu* seu *adsuki,* Phaseoli vulgaribus similes [Adzuki, azuki, or Phaseolus radiatus, L.].

On page 836 are botanical descriptions, each with 1-2 Chinese characters (read from right to left), of: Broad beans (*Sora mame*), sword beans (*Natta mame* [*nata mame*]), peanuts (*Nankin mame or Nankino*), and cowpeas (*Sasagi* [*sasage*], *Shiro Sasangi*).

On p. 837 is a detailed botanical description (in Latin) of the azuki bean, starting with a Chinese character: "Too, vulgo Atsuki [Adzuki], Phaseolus hirsutus..." Note 5. This is the earliest Latin-language document seen (Jan. 2005) that mentions azuki beans, which it calls *sjodsu, adsuki,* or *atsuki.*

On page 840 are shorter descriptions (in Latin) of "Siuku, vulgo Kuro mame [Black soybean], i.e. Phaseoli nigri. Phaseoli Daidsu species sive varietas, fructo nigro," and "Katz, vulgo Kudsu [Kudzu], Kudsu Kádsura."

Note 6. This is the earliest document seen concerning soya in connection with (but not yet in) Germany. Other early authors to cite it were Linnaeus (1747, p. 222, and 1753, p. 727), Osbeck (1771, p. 253), Linnaeus (1772, p. 171), de Candolle (1885, p. 331), Yule & Burnell (1886, p. 651), and Blasdale (1899).

Note 7. This is the earliest document seen (June 2001) by or concerning Englebert Kaempfer in connection with soybeans.

Note 8. This is the earliest document seen (Sept. 2003) that mentions lupins.

Note 9. This is the earliest document seen (May 2003) that mentions both lentils and soybeans.

An illustration, which is thought to show Engelbert Kaempfer riding on a horse in Japan, was sent to Soyfoods Center by Herr Deubel of Germany. Address: Lemgo, Germany.

153. Ryôri kômoku chômi-sho [The book of seasonings by cooking category]. 1716-1735. Japan. [Jap]*
• ***Summary:*** The seventh earliest known reference to Koridofu (dried-frozen tofu) appeared in this work.

154. Kogetsu Ushiyama. 1716. Kenkai shokkyô [Tired of thinking, food as a mirror?]. Kyoto: Ibaragi Tauemon and Tanaka Shobei. 230 p. Japanese summary by Kawakami 1978, p. 38. [Jap]
• ***Summary:*** This resembles a dictionary of Chinese herbal medicine. It is written in *kanbun* (Chinese characters), except for Japanese names, which are written in *katakana.* For the first time, the term for okara is written with the characters snow + flower + vegetable, probably pronounced "kirazu."

155. Zoshu seiho 1716. Japan [Jap]*
• ***Summary:*** Yokotsuka (1985, p. 206), who cites this book as *"Zoshu-seiho* (1716)," states that it is about the development of and formulas for commercial shoyu during the Edo period. Address: Japan.

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156. Kokon meibutsu gozen-gashi hidensho [The old and now famous secret methods of confectioners]. 1718. Kyoto: Umemura Ichirobei. 70 p. Japanese summary by Kawakami 1978, p. 43. [Jap]
• ***Summary:*** The book, whose author is unknown, contains 105 descriptions of how to make confections. In the section on making manju (steamed buns) is a description of making amazake for use in the buns.

157. Thedens, Johannes. 1724. Diary. In: Paul van der Velse and Rudolf Bachofner, eds. 1992. The Deshima Diaries Marginalia, 1700-1740. Tokyo: Japan-Netherlands Institute. xxiii + 595 p. See p. 287 (#196).
• ***Summary:*** 1724 April 29–This entry describes the return trip, largely by ship, from Edo to Nagasaki. Departing from Itami, they passed Nishinomiya and arrived at Hyôgo, where they went ashore and visited a little temple named Sjacote, which means "ladle." After they had dined, the village elder "showed us his sake distillery and his soy press which had a large capacity." Address: Opperhoofd (Chief of the Dutch factory), Deshima, Nagasaki, Japan.

158. Kaempfer, Engelbert. 1727. The history of Japan,... Its metals, minerals, trees, plants, animals, birds and fishes;... Together with a description of the Kingdom of Siam 1690-1692. (translated by J.G. Scheuchzer from the original edition of April 1727. 2 vols.). London: Printed for the translator. See vol. I, book I, chapter IX, p. 121-22. [1 ref. Eng]
• ***Summary:*** In Chapter IX, "Of the fertility of the country as to plants," the section titled *Gokokf* [*Goku-fu*] ("five grains," p. 121-22) states: "The chief produce of the Fields, which contributes most to the sustenance of Life, is by the Japanese comprehended under the name of *Gokokf,* that is, the *five Fruits of the Fields.* 'Tis by their good or bad growth they estimate the value of the Ground, the fruitfulness of the Year, and the wealth of the Possessor. They make up the chief dishes at their meals, and make good the want there is of Flesh-meat, which Custom and Religion forbid them to eat." Note 1. This is the earliest English-language document seen (Dec. 2003) that uses the term "Flesh-meat" to refer to meat.

The five grains (*Gokokf*) are: (1) *Kome* or Rice (from which "they brew a sort of strong fat Beer, call'd *Sacki*..."). (2) *Oomugi* or Barley. "They feed their Cattle and Horses with it: Some dress their Victuals with the Flower [Flour], and make Cakes of it." (3) *Koomuggi* or Wheat. (4) *Daidsu* or Daidbeans. (5) *"Adsuki* [azuki] or *Sodsu* [shôzu, shôdzu = small + bean] that is Sobeans" [azuki].

Concerning soybeans: "4. *Daidsu,* that is, *Daidbeans,* is a certain sort of Beans, about the bigness of Turkish Pease, growing after the manner of Lupins. They are next to the Rice in use and esteem. Of the Meal of these Beans is made what they call *Midsu,* a mealy Pap, which they dress their Victuals withal, as we do with Butter. What they call *Soeju,* is also made of it, which is a sort of an *Embamma,* as they call it, which they eat at meals to get a good stomach. This *Soeju* is exported by the Dutch, and brought even into *Holland.* I have describ'd their way of making it in my *Amoenitates Exoticae.* p. 839. where the Plant it self bearing these beans is figur'd and describ'd."

Note 2. *Midsu* clearly refers to miso, and *Soeju* to shoyu. This is the earliest English-language document seen (March 2009) that mentions miso, or miso in connection with Japan. It is also the earliest English-language document seen (March 2009) that compares miso with butter. *Midsu* has almost the same pronunciation (phonetics), and the same etymology and meaning as the today's word "miso." Since spelling did not become fixed until the 18th century, this could be considered the earliest occurrence of "miso" in an English-language document.

Note 3. This is the earliest English-language document seen (April 2012) that uses the word *Soeju* to refer to soy sauce. It is clearly Kaempfer's spelling of the Japanese word *shoyu.*

The author continues (p. 121-22): "5. *Adsuki* or *Sodsu,* that is Sobeans. They grow likewise after the manner of Lupins, and are black, not unlike *Lentils,* or the Indian *Cajan.* The flower [flour] is bak'd with sugar into *Mansje* [*Manju*] and other Cakes."

Note 4. This is the earliest English-language document seen (March 2006) that clearly mentions azuki beans. It is also the earliest English-language document seen (March 2006) that uses the word "Adsuki" or the word "Sodsu" to refer to azuki beans. Cooked and mashed or ground dry into flour are mixed with sugar to make *an* or "sweetened azuki bean paste." This is used as a filling for the popular steamed Japanese sweet bun named *manju.*

Besides the several sorts of *Gokokf* just mentioned, the following Plants are comprehended under the same name: *Awa,* Indian Corn, (*Panicum Indicum Tabern*)*, Kibi,* or *Milium vulgare nostras, Millet: Fije,* or *Panicum vulgare juba minore semine nigricante:* And in general all sorts of Corn and *Mami* [Mamé = beans], that is pease and pulse. Azuki beans, though usually red, also occasionally have black or white seedcoats.

In the Introduction to this book, the translator explains that it was first published in English, after Dr. Kæmpfer's death in 1716, thanks to Sir Hans Sloane, who purchased all of Kæmpfer's plates, drawings, and manuscript memoirs as they were about "to be disposed of." Sloane added them to his library, which the translator believes is "the completest of its kind in Europe," with an extensive collection of Books of Physik, Natural History and Travels." "This History of Japan was by the Author divided into five Books."

Note 5. Kaempfer lived 1651-1716. John Gaspar Scheuchzer lived 1702-1729. His first translation was this one, in 1727. The title page states that the original was

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"Written in High-Dutch by Engelberus Kaempfer, M.D., Physician to the Dutch Embassy to the Emperor's Court; and translated from his Original Manuscript, never before printed, by J.G. Scheuchzer, F.R.S. and a member of the College of Physicians, *London.* With the Life of the Author, and an Introduction. Illustrated with many copper plates."

Note 6. In 1986 a 3 volume edition was published in Glasgow, Scotland by James Maclehose and Sons. This book contains no mention of soybeans in Siam (Thailand).

Note 7. This is the earliest English-language document seen (Nov. 2007) that mentions Lupins (or "lupin" or "lupine" or "lupines").

Note 8. This is the earliest English-language document seen (Dec. 2000) that mentions the *Goku-fu* or "five grains" and includes the soybean among them.

Note 9. This is the earliest English-language document seen (June 2008) that mentions lentils; it compares them with adsuki [azuki] beans. Address: M.D., Physician to the Dutch Embassy to the Emperor's Court [in Japan].

159. Three great historical stages in the transformation of ketjap into ketchup (Early event). 1728. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** The two words sets of "ketjap" and "ketchup, catsup, catchup" and their corresponding seasonings have histories that are intertwined and difficult to separate.

So far as we can tell, the Indonesian word "ketjap" meant, and still means, "Indonesian-style soy sauce." It was a fermented food based on soybeans. The etymology of the word probably traces its origin to southern China, where it can refer to various kinds of sauces.

The transformation from "ketjap" to "ketchup" began in about 1728. Before this time, both products were fermented soybean condiments from Asia. Since the mid-1600s, soy sauce had been imported from Asia to Europe. Initially, Japanese shoyu (soy sauce) was imported from the port of Nagasaki in Japan to the Netherlands by the Dutch East India Co. The Dutch, who purchased *shoyu* eventually standardized the name as "Soy." In 1750 this "Soy" was first imported into the United States.

Neither the Dutch nor the European and American consumers of "Soy" had any idea of how this sauce was made in Japan, but they knew it was expensive and tasty. So they began to see if they could make it in Europe–using European ingredients. Their initial experiments focused on using vinegar seasoned with mushrooms or walnuts. They were unaware of soybeans at the time and had no access to them, So the first big change was the European ketchup was made without soybeans. The second big change was that European ketchup not a fermented product–although it was aged. The third big change was that the European products were lower-cost imitations, trying to match the flavor and aroma, color and consistency of a more expensive imported product, by trial and error. The fourth big change was the change in name; shoyu (from Japan) was called "Soy" and "ketjap" (probably from Java) was called "ketchup," "catsup," "catchup, etc.

One interesting hint of the basic similarity of Soy and ketchup was the way they were list in advertisements (usually retail ads) in Europe and the United States. Even though 20-50 items might appear in the ad, Soy and ketchup would almost always be listed together, one below the other in the list.

Over the period of about 250 years Soy remained basically the same product, whereas "ketchup" evolved in major ways. The early ketchups were rarely associated with the tomato, yet today the word "ketchup" is generally understood to mean "tomato ketchup."

160. Kaempfer, Engelbert. 1729. De beschryving van Japan: Behelsende een verhaal van den ouden en tegenwoordigen staat en regeering van dat ryk... [The history of Japan]. In 's Gravenhage; En t' Amsterdam: P. Gosse en J. Neaulme: Balthasar Lakeman. vi + 50 + 500 p. Illust. (engravings, XLV double leaves of plates). 36 cm. [Dut]*

• ***Summary:*** "Published in English [1727], French [1729], and Dutch [1729] about a half-century before its appearance in German"–Hunt botanical cat., p. 44.

Bancroft owned Y 6 238 The Bancroft Library copy defective; lacks many plates.

161. Tournefort, Joseph Pitton de. 1730. The compleat herbal: or the botanical institutions of Monsr. Tournefort, Chief Botanist to the late French King... translated [by J. Martyn] from the original Latin. With large additions, from Ray, Gerard, Parkinson, and others. Vol. II. London: Printed for J. Walthoe... See p. 481. No. 81. Reproduced from John Ray 1704. [2 ref. Lat; Eng]

• ***Summary:*** "80. Phaseolus Japonicus niger. Butyri vices supplens Deysumisi boondi, *D. Sherard. Raii Supp.* 438. *Black Japanese Kidney-bean supplying the place of Butter."*

Note 1. This citation and the one that follows were reproduced from William Sherard's 1704 unpublished manuscript titled *Autograph observations on the first two volumes of John Ray's Historia Plantarum* (2 volumes in 1), p. 438. But Tournefort made a small error in transcribing Ray's text. Ray actually wrote *Deysu-Misi-boondi* D. *Sherard.* This text almost certainly refers to "Daizu-Miso-beans," thus stating that black soybeans are used to make miso. Early Europeans occasionally considered miso to be a type of butter.

"81. Phaseolus Japonicus fructo albo, ex quo *Soia* conficiunt Japoneses, *D. Sherard. Raii Supp.* 438." *Japanese kidney bean with a white fruit, out of which the* Japanese *make their* Soia.

Note 2. This is the 2nd earliest English-language document seen (Feb. 2006) that uses the term "Kidney-bean" (or kidney bean) or the term "Japanese Kidney-bean"

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to refer to the soybean. Address: France.

162. Isei teikin ourai [Encyclopedia in question and answer format]. 1730? Japan. Author unknown. Japanese summary by Kawakami 1978, p. 206. Undated. [Jap]
• ***Summary:*** One theory says this book was written by Kokan Shiren (pr? d. 1346), but it was probably written later. In this book, yuba is called *tofu uwamono* (literally 'tofu upper substance').

163. Miyake, Yarai. 1732. Mankin sangyo bukuri [How to produce daily household necessities]. Japan: 6 volumes (satsu). Japanese summary by Kawakami 1978, p. 258. [Jap]
• ***Summary:*** Volume 6, which is about food and drink, emphasizes methods of production, and describes how to make shoyu, sake, vinegar, konnyaku, and many other foods. The book was also known under the title *Machikata Bantaku Shobai Shiho Taisei* ("All houses in the town area business method collection").

T. Yokotsuka (1985, p. 206) cites this as *"Mankin sangyo bukuri* (1731)" but does not cite it in his bibliography.

Fukushima (1989, p. 9) states that the *Mankin-Sangyotai* (Miyake, 1732) describes how to make miso and shoyu.

Iino (2003, p. 9) states that the *Mankin Sugiwai-bukuro* (1732) discusses only the soy sauce production method using wheat (not barley) and soybeans. Iino comments: "With the beginning of the 19th century, the large bulk of soy sauce seems to have been produced using wheat." In column 2 of page 9 he adds that this books also gives a description of the method for making *kijoyu* (raw / unheated soy sauce). Iino then comments that from this description we learn that, "while *kijoyu* was very flavorful and could be kept for a long time, the high cost of production made selling *kijoyu* difficult. Therefore a blend of approximately 7-8 liters of *modoshi* [modoki = imitation?, a dilutor?] for every 18 liters of moromi was being sold." Address: Kyoto, Japan.

164. Charlevoix, Pierre Francois Xavier de. 1736. Histoire et description generale du Japon: Ou l'on trouvera ce qu'on a pu apprendre de la nature & des productions du pays... & l'examen de tous les auters, qui ont ecrit sur le meme sujet... 2 v. [History and general description of Japan... Including the examination of all the authors who have written on the same subject. 2 vols.]. Paris: Chez Julien-Michel Gandouin [and 4 others]. Illust. Index. 26 cm. [Fre]*
• ***Summary:*** Peanut = Arachide, cacahuete. Other writers on soy: 1696–poids jaunes, pois jaunes, soui or soi / 1790–Dolic du Japon, bouillie, miso, soja, sooju / 1796–Dolichos Soy, dolic bean, daidsou, feves de dolic, miso. Pierre Charlevoix lived 1682-1761. Address: Jesuit father.

165. Ship Enckhuizen in Nagasaki loaded with soy [sauce]. 1737. *
• ***Summary:*** Herman Ketting is working with William Shurtleff, trying to find when the Dutch East India Company (VOC) first imported soy sauce from Japan to the Netherlands. Ketting writes (20 June 2007): The citation gives the following information: On 13 October 1737 a ship named Enckhuizen (which we know was in Asia at that time) was in Nagasaki loaded with 75 double barrels of Soy [sauce] marked with a "Z." The 75 Barrels were shipped from Nagasaki to Batavia, the VOC's headquarters. Of this total, 35 barrels were bound for mainland Holland [Netherlands].

This was surely not the first shipment of soy [sauce] to Holland, because I have sent you some information about the ship Westerwik which lay off the Cape of Good Hope [South Africa] with some tainted soy the same year. In the meantime I have found a letter sent to Holland which informed the Herren XVII that soy is being sent to Holland in June 1737. If you like, I will send you this information [from the General Missives] in the usual format.

166. Ship Westerwijk lying off the Cape of Good Hope with a cargo of tainted soy [sauce]. 1738. *
• ***Summary:*** Herman Ketting is working with William Shurtleff, trying to find when the Dutch East India Company (VOC) first imported soy sauce from Japan to the Netherlands. Ketting writes (4 June 2007): Most important is perhaps the record about the Ship Westerwijk (1738) lying off the Cape of Good Hope [South Africa] with a cargo of tainted soy [sauce]. This record has a distinctive inventory number (VOC 9149) and therefore is probably more extensive than the other records. So it may contain some references to soy being imported to Asia from Holland.

167. Governors General and the Council of the Indies (Indië). ed. 1739. Generale missiven [General missives]. In: Willem P. Coolhaas and Jurrien van Goor, comp. 2004. Generale Missiven van Gouveneurs-General en Raden aan Heren XVII der Verenigde Oostindische Compagnie: Deel X: 1737-1743. 's-Gravenhage: Nijhoff. Book X. 1159 p. (Letters to the Heren XVII of the Dutch East India Company). [Dut]
• ***Summary:*** On page 253 (31 Jan. 1739) "zoya" is mentioned twice and "Japans soja" once: "Ship *Enkhuyzen / Enkhuisen / Enckhuizen.* Soy [sauce] (*Zoya*) for Hoorn and Enkhuizen f139:12:-8."

"Ship *Schellack.* 4 chests (kelders) of Soy sauce for Delft and Rotterdam f139:12:-8."

"With the fleet of 1739 in total, 36 chests (kelders) of Japanese Soy (*Japanse soja*) f 1231:--:--.

Note 1. Enthuizen, Hoorn, Delft, and Rotterdam were harbor towns and early "chambers" (*kamers*) of the Dutch East India Co. (VOC), from which overseas trade with the East Indies was conducted. The other two early chambers were Amsterdam and Zeeland.

Note 2. The symbol "f" stands for guilder, the basic

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Dutch monetary unit. "f 2:07:8" is read "two guilders, 7 stuivers and 6 pennigen." One gulden (singular of guilder) = 20 stuivers. One stuiver = 12 pennigen.

Note 3. This is the earliest Dutch-language document seen (April 2012) in which the word *Zoya* is used to refer to soy sauce.

Note 4. The General Missives are letters written by the Governors General and the Council of the Dutch East Indies (*Indië*) and sent to the Heren XVII [the directors of the VOC] in the Netherlands. Items in the General Missives are the demand for men and materials for Indies, the number and quality of ships in the Indies, questions about management and information concerning the cargo sent with the fleet to the Netherlands. Address: Batavia, Netherlands.

168. Valckenier, A. 1739. [Re: Merchandise loaded from Batavia, Dutch East Indies]. Letter to Heren XVII ("17 Lords," leaders of the Dutch East India Company, VOC), Netherlands, Jan. 31. p. 2000-01 [Dut]

• ***Summary:*** Loaded merchandise is listed according to their place of origin. For example merchandise from Coromandel.

Batavia's collection: 11,500 pounds of tin from Malacca. f. 3942:-4:-. 30,500 pounds of copper, Japanese, by staffs, f. 13,944:12:-. 36 crates with bottles of Japanese soy sauce (*Zoija Japance*) f. 1231:16:-8. 45,000 pounds of spiaulter (an alloy / mixture of lead and tin) f. 150,606:-6:-8. 4,209 pounds of black ebony f. 90:-3:-.

Bibliographic reference in Dutch: NA, VOC 2422, OBP (21 Jan. 1739) 2001vo.

Location: Nationaal Archief, Den Haag, De Archieven van de VOC; toegangsnummer 1.04.02; inventaris nummer 2422 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the VOC; access number 1.04.02; record number 2422].

Note 1. The symbol "f." stands for guilder, the basic Dutch monetary unit. "f 2:07:8" is read "two guilders, 7 stuivers and 6 pennigen." One gulden (singular of guilder) = 20 stuivers. One stuiver = 12 pennigen.

Note 2. A. Valckenier was Governor General in Batavia from 1737 to 1741.

Note 3. An alloy of lead and tin is commonly called either old pewter, tin pewter, or solder. Address: Governor-General, and the Councils of the Indies, in Batavia [today's Jakarta, Indonesia].

169. De vergadering van het Haags Besogene [Meeting of the Haags Besogene]. 1740. The Hague, Netherlands. Unpaginated. [Dut]

• ***Summary:*** The meeting of the Haags Besogene starts 20 Oct. 1740. The committee works on the 24th four-year (quadrennial) account of the Dutch East India Co (VOC).

Monday, 24 Oct. 1740, in the morning. Proceeding with the reading and control of the delivery books to be sold and delivered goods and merchandise, from 1 June 1737 until 15 May 1738, item from 16 May 1738 until 15 May 1739, and finally from 16 May 1739 until 31 May 1740.

Monday, 24 Oct. 1740, after midday. Started with the reading and control of the accounts and merchandise, which on 17 May 1736 were stockpiled in the warehouse of this chamber [Amsterdam] and four years ago were received from the [Dutch East] Indies (Indië [Batavia]). Items that since 31 May 1736 were delivered from the stock according to the journal of bookkeeping and the ledger and the part of the stock lying unsold in the Company's warehouses:... Japanese Soy [sauce] (*Japanse Soija*)*;* received as before–30 kelders. Note 1. A kelder is a chest; in this case it contains bottles of soy sauce.

Bibliographic reference in Dutch: NA, VOC 4472, Haags Besogene (20 t/m 24-10-1740).

Location: Nationaal Archief, Den Haag, De Archieven van de Verenigde Oost-Indische Compagnie (VOC); toegangsnummer 1.04.21; inventaris nummer 4472. Notulen van het Haags Besogene [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch East India Co. (NFJ); access number 1.04.21; record number 4472. Notes of the Haags besogene].

Note 2. This is the earliest document seen (June 2007) showing soy sauce in the Netherlands. This document contains the earliest date seen for soy in the Netherlands (31 May 1736).

Note 3: The Haags Besogne prepared the meetings of the Heren XVII [the 17 directors who made the most important decisions]. To prepare those meetings, the Haags Besogne had to deal with the letters received from Batavia and the chambers in Holland and Zealand. The Haags Besogne also controlled the different bookkeeping journals, and they saw every letter, report or bookkeeping document in the administration of the VOC; they made many abridgements of or notes about them. On the basis of the findings, the Haags Besogne gave advice to the Heren XVII. After that. the Heren XVII made their decisions. So we can found in the archive of the Haags Besogne some information from books or sources which are lost. There is only one problem: there is no index to or register on the notes of the Haags Besogne. So a researcher must be familiar with the notes of the Haags Besogne. Address: The Hague, Netherlands.

170. White's China and Flint-Glass Warehouse. 1744. Classified ad: To be sold at seven pence per pound,... *Daily Advertiser* (*London*)**.** May 16. p. [5], col. 2.8.

• ***Summary:*** "Where likewise is sold at the lowest Prices,... Japan and Chinese Soy [sauce], India Ink and Fans, the finest Havanna [Havana, Cuba] and Spanish Snuffs, Lavender, Orange-Flower, Hungary, Honey, and Sanspareil Waters, &c."

Note: This is the earliest English-language document seen (April 2012) that uses the term "Chinese Soy" to refer to soy sauce. Address: Opposite the King's Arms Tavern in

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New Bond-street [London].

171. Ellis, William. 1744. The modern husbandman: or, The practice of farming. Vol. 3 of 4. Containing the months of July, August and September. London: Printed for and sold by T. Osborne. See p. 117-18. [Eng]
• ***Summary:*** The chapter titled "Of potatoes" states (p. 117-18) that there are many ways to cook and serve them: "A Third Way. Others, when they are boiled, have a Sauce ready to put over them, made with Butter, Salt, and Pepper; others use Gravy Sauce, others Ketchup, some eat them boiled with only Pepper and Salt, others cut the large ones in Slices, and fry them with Onions, or stew them with Salt, Pepper, and Ale, or Water."

Note: Vol. 1 is Jan. to March. Vol. 2 is April to June. Vol. 3. July to Sept. Vol. 4 is Oct. to Dec.

172. Brouwer, David. 1744. Diary. In: Leonard Blussé, Cynthia Viallé, et al, eds. 2004. The Deshima Diaries Marginalia, 1740-1800. Tokyo: Japan-Netherlands Institute. xl + 898 p. See p. 50, 63 (#180).
• ***Summary:*** 1744 Oct. 7–"The *compradoors* asked whether I wanted to buy the regular provisions. I replied that I was willing to buy provisions at the prices they charged others. They replied that the *sake* they supplied us was especially brewed for the Company and that the barrels of soy [sauce] given to us are bigger than the regular ones. I ordered provisions amounting to 1,903 taels or f3,806." Address: Opperhoofd (Chief of the Dutch factory), Deshima, Nagasaki, Japan.

173. Notulen van het Haags Besogene [Notes of meeting of the Haags Besogene]. 1744. The Hague, Netherlands. Unpaginated. Oct. 19-22. [Dut]
• ***Summary:*** Monday 19 Oct. 1744. The committee starts to work on the 25th four-year (quadrennial) account [of the Dutch East India Co (VOC)] and has agreed to come together for that purpose during the morning from 9 until 12 and after midday from 3:30 until 5:30 p.m...

Thursday 22 Oct. 1744. Started with the reading and control of the account of goods and merchandise which on 31 May 1740 were stockpiled in the warehouse of this chamber [Amsterdam] and which 4 years ago were received from the Indies (*Indië* [Batavia]). Items that according to the journal of bookkeeping and the ledger have been delivered from the stock since that time and the part of the stock from 15 May 1744 has lain unsold in the Company's warehouses. The findings are stated below:

"... Japanese Soy [sauce] (*Japanse Soija*)*:* from the years 1738 and 1739 were stockpiled–30 kelders. Added to this, received from the Indies (*Indië*) during the past four years–61 kelders.

Total in stock as of 15 May 1744–91 kelders. Note 1. A kelder is a chest; in this case it contains bottles of soy sauce.

Bibliographic reference in Dutch: NA, VOC 4472, Haags Besogene (19 t/m 22-10-1744).

Location: Nationaal Archief, Den Haag, De Archieven van de Verenigde Oost-Indische Compagnie (VOC); toegangsnummer 1.04.21; inventaris nummer 4472. Notulen van het Haags Besogene [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch East India Co. (NFJ); access number 1.04.21; record number 4472. Notes of the Haags besogene].

Note 2. A careful examination (by a Dutch PhD researcher at the Hague) of the records VOC shipments arriving in Holland from Batavia finds no evidence that soy sauce was delivered to intermediaries for the Dutch or other markets. For goods such as pepper, sugar, coffee and tea, the Haags Besogne always noted how much was delivered. But for soy sauce they did not. Therefore the soy sauce was probably consumed by VOC directors and their servants.

Note 3. Soy was delivered by VOC ships and stored in VOC warehouses. The inspectors of the warehouses never mentioned that this soy had been delivered to a private merchant. Our reached his conclusion after comparing the note about soy and, for example, a note about pepper. Address: The Hague, Netherlands.

174. [Re: Journal of the first bookkeeper in Amsterdam. Items purchased from the VOC]. 1745. Amsterdam, Netherlands. p. 222 [Dut]
• ***Summary:*** In Amsterdam, 31 March 1745. The following persons purchased Soy [sauce] worth a total of f. 1456:-9:- (*aan Soija guldens*).

Entry No. 250: About 70 crates with bottles (*fleskelders*) sold and delivered at several prices as before folio 189.

Entry No. 321: Sacharias Tielman, according to the delivery book fo. 189, 20 crates with bottles, f430:-9:-.

Entry No. 103 [in ledger]: Nicolaas Fremjin, 20 crates with bottles, f421:-8:-.

Entry No. 311: Jan Leonard Apol, 10 crates with bottles, f207:-4:-.

Entry No. 78: Blote and Knibbe, 10 crates with bottles, f202:-4:-.

Entry No. 367: Jacob Gudmanson, 10 crates with bottles, f194:-4:-.

Total: 70 crates with bottles, f1456:-9:-.

Bibliographic reference in Dutch: NA, VOC 7145, journaal van de opperboekhouder (31 maart 1745) 222.

Location: Nationaal Archief, Den Haag, De Archieven van de VOC; toegangsnummer 1.04.02; inventaris nummer 7154 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the VOC; access number 1.04.02; record number 7154.].

Note 1. This is the earliest document seen (Jan. 2012) that gives a price for soy sauce; that price is in Dutch guilders. We are not told the volume of each bottle or how many bottles per crate.

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Note 2. The symbols "f" and "f." stand for guilder, the basic Dutch monetary unit. "f2:07:8" is read "two guilders, 7 stuivers and 6 pennigen." One gulden (singular of guilder) = 20 stuivers. One stuiver = 12 pennigen.

Note 3. Items records above are not all that a person or persons purchased. For example, Blote and Knibbe bought, in addition to soy [sauce], cloves, coffee, tea, brown pepper, cinnamon, borax, gum resin, and gum olibanum [for incense].

Note 4. The journal of the first bookkeeper is arranged by product type, whereas the ledger of the first bookkeeper is arranged by the surname of the buyer. Address: Amsterdam.

175. Notulen van het Haags Besogene [Notes of meeting of the Haags Besogene]. 1748. The Hague, Netherlands. Unpaginated. Oct. 25. [Dut]

• ***Summary:*** Started with the reading and control of the account of goods and merchandise, which on 15 May 1744 are stockpiled in the warehouses of this chamber [Amsterdam] and which have been received during the last four years from the Indies (*Indië* [Batavia]). Items that according to the journal of bookkeeping and the ledger have been delivered from the stock since 31 May 1748 and that part of the stock lying unsold in the Company's warehouses.

"... Soy [sauce] (*Soija*)*:* According to the list closed on 15 May 1744 were stockpiled–91 kelders. And received from the Indies (*Indien*) during the past four years–72 kelders."

Total: 163 kelders. Note 1. A kelder is a chest; in this case it contains bottles of soy sauce.

"From that is delivered during this time: 106 chests (kelders).

"On account of the filling of half empty bottles (*flessen*) and broken bottles: 4 chests (kelders).

"For the benefit of inns and yachts used: 2 chests (kelders). Total: 163 chests (kelders) [So the books balance].

Bibliographic reference in Dutch: NA, VOC 4474, Haags Besogene (25-10-1748).

Location: Nationaal Archief, Den Haag, De Archieven van de Verenigde Oost-Indische Compagnie (VOC); toegangsnummer 1.04.21; inventaris nummer 4474. Notulen van het Haags Besogene [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch East India Co. (NFJ); access number 1.04.21; record number 4474. Notes of the Haags besogene]. Address: The Hague, Netherlands.

176. Hakubôshi. 1748-1750. Ryôri sankaikyô. 5 vols. [Cooking in mountain and sea countries]. Kyoto, Japan: Nakamura Jinbê [and others]. 19 cm. [Jap]*

• ***Summary:*** The eighth earliest known reference to Kori-dofu (dried-frozen tofu) appeared in this work. On double leaves, Oriental style in case.

177. *Amsterdam: Avec Privilege de Nos Seigneurs, les Etats de Holland et de West-Frise.* 1750. Pais Bas (Pays Bas): D'Amsterdam l4e 5. Octobre [The Netherlands: Amsterdam, Oct. 5]. 80:Oct. 6. [Fre]

• ***Summary:*** This periodical has no page numbers. However on the 4th page of this issue, in the right column is a description of articles from the East Indies (*des Indes-Orientales*), from Batavia, which arrived at Texel on the 26th of last month. These include 591,964 units of brown pepper, 257 units of ginger conserves, 4 kegs of Arak, 26 cases of soy [sauce] from Japan (*Caves Soya du Japon*), and 44 silk robes from Japan (*Robbes de Soye du Japon*).

178. Homoed, Hendrik van. 1750. Diary. In: Leonard Blussé, Cynthia Viallé, et al, eds. 2004. The Deshima Diaries Marginalia, 1740-1800. Tokyo: Japan-Netherlands Institute. xl + 898 p. See p. 126, 134, 138 (#156-57).

• ***Summary:*** In the section titled "Arrival of the *Haarlem* and the *Zuiderburg,"* at 1750 Oct. 17–"On behalf of his master and the incoming governor, Kawachi-no-kami, the secretary, gave me a present consisting of sixty barrels of *sake,* sixty barrels of soy and two presentation trays heaped with fresh fish. I expressed my gratitude most humbly..." Address: Opperhoofd (Chief of the Dutch factory), Deshima, Nagasaki, Japan.

179. Rochell & Sharp. 1750. Classified ad: Just imported by the last ships from London,... *New-York Gazette Revived in the Weekly Post-Boy* (*New York City*)*.* Dec. 17. p. 3.

• ***Summary:*** ... and to be sold cheap by Rochell & Sharp, at Mr. Seabring's, Baker, in Wall Street, Superfine & middling Broad Cloths, Bearskins,... Pickles, Durham Mustard,... pickled Mushrooms in Quart Bottles, Sallad Oil in do. [ditto = same] pickled Onions in Quart do. Pint do. of Indian Soy [sauce], Bottles of Weston's superfine Scotch Snuff..."

This ad also appeared in this newspaper on 24 Dec. 1750, p. 3 and 7 Jan. 1751, p. 4.

Note 1. This is the earliest document seen (Aug. 2012) concerning soybean products (soy sauce) in the British colonies of North America (now the United States), or in New York. This document contains the earliest date seen for soybean products in the British colonies of North America or in New York (Dec. 1750); soybeans as such have not yet been reported. At least 66 different ads for soy sauce appeared in New York City newspapers before 1800!

Note 2. This is the earliest English-language document seen (April 2012) that uses the term "Indian Soy" to refer to soy sauce; it was probably imported from the Indies, the East Indies, or India. To date, 103 documents in the SoyaScan database contain the term "Indian Soy" (regardless of capitalization) but only the earliest ones have been given the keyword for "India." The term "Indian Soy" was the earliest name given to soy sauce imported to the British colonies of North America. But what does it mean? Where was it made? It was probably typical Japanese-style soy sauce

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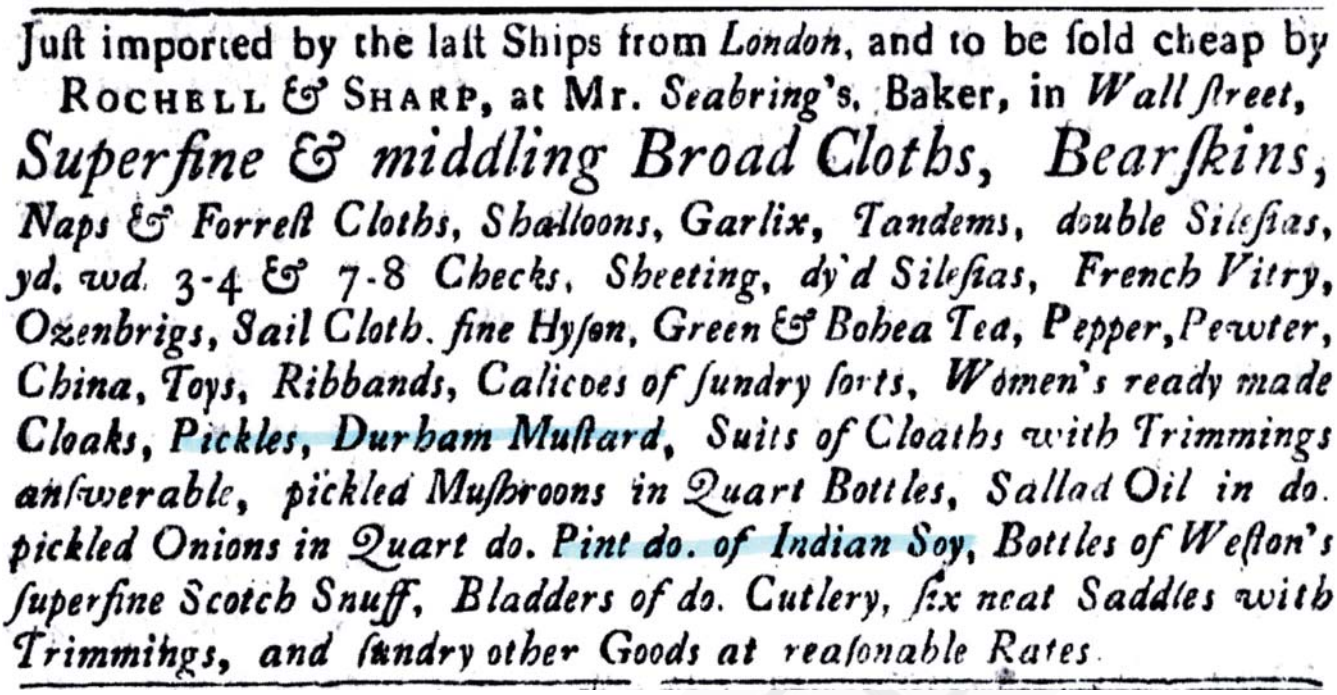
Juſt imported by the laſt Ships from *London*, and to be ſold cheap by ROCHELL & SHARP, at Mr. *Seabring's*, Baker, in *Wall ſtreet*, *Superfine & middling Broad Cloths, Bearſkins, Naps & Forreſt Cloths, Shalloons, Garlix, Tandems, double Sileſias, yd. wd. 3-4 & 7-8 Checks, Sheeting, dy'd Sileſias, French Vitry, Ozenbrigs, Sail Cloth. fine Hyſon, Green & Bohea Tea, Pepper, Pewter, China, Toys, Ribbands, Calicoes of ſundry ſorts, Women's ready made Cloaks, Pickles, Durham Muſtard, Suits of Cloaths with Trimmings anſwerable, pickled Muſhroons in Quart Bottles, Sallad Oil in do. pickled Onions in Quart do. Pint do. of Indian Soy, Bottles of Weſton's ſuperfine Scotch Snuff, Bladders of do. Cutlery, ſix neat Saddles with Trimmings, and ſundry other Goods at reaſonable Rates.*

(*shoyu*), made in Japan and exported from there by the Dutch East India Company (VOC), probably via Batavia (today's Jakarta), to Amsterdam–where it was purchased at auction by merchants who brought it by sailing ship to North America.

Note 3. This is the earliest document seen (July 2006) that mentions Durham Mustard, a famous product made in the city of Durham, in northern England. "In 1720 Mrs. Clements discovered a method for extracting the full flavour from mustard seed by grinding the seed in a mill and subjecting to similar processes used in the making of flour from wheat" (Durham city website).

180. Mogi family rules to live by (16 article creed) and poem written (Early event). 1750? Undated.

• ***Summary:*** "Make strong morals your foundation, and focus on money last.

"Don't forget your foundation.

"Strive for harmony in your family.

"Avoid luxury: a simple life is a virtuous life.

"Do the job that you were born to do, and only that job.

"Treat a loss and a big gain the same.

"Competition can help you get ahead, but do not compete unfairly or to an extreme.

"Make your main meal boiled rice and barley and one bowl of miso soup.

"Eat the same food as your servants.

"Be strict with yourself, but be kind to your servants.

"Keep your personal expenses low.

"Use the rest of your money for the good of the community to a level in keeping with your circumstances.

"Keep track of your finances, and save money for the unexpected.

"Have a family reunion twice a year. At these reunions, don't judge your family members based on their income, but rather on their character.

"Family Creed Poem by Tadataka

"Tie this scroll up tightly and keep these words in your heart.

"Even if you work and it is not enough, it is your job.

"If you work hard, there will be happiness."

Source: University of Massachusetts at Amherst website. http://www.umass.edu/fambiz/ articles/values_culture/ kikkoman.html.

Ira Bryck adds: "I have had the Creed of the Mogi Family on this website (Umass-Amherst) for several years.

"Recently, a researcher from Japan let me know of a much older creed, plus a family creed poem, predating the one I had, written in an older Japanese, comparable to Shakespearean English, as he described it. I list that older one below. I am told it is similar in style to a commonly used Samurai creed. Many thanks to Aragorn Quinn, UMass graduate language student, for his fine translation, and to Irene Starr for finding Aragorn; and to Machie Uemura for bringing this all to my attention."

181. Oogimachi, Kinmichi [pseudonum: Hakugyoku Ou]. 1750? Hakugyoku Ou tôfu ki [Hakugyoku Ou's record of tofu]. Japan. Undated. [Jap]

• ***Summary:*** The caption of this striking illustration of two Japanese women in kimonos states (in Japanese): *Mizuchaya to Tofuchaya.* This can be translated as "Water Tea House and Tofu Tea House." The woman on the right is making dengaku using skewered pieces of tofu over a charcoal brazier.

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水茶屋と豆腐茶屋

This illustration comes from a book that is hard to pin down; we are not even sure that such a book exists. The illustration appears in the book titled *Tôfu no Hon* [The book of tofu], by Koryû Abe and Shigemitsu Tsuji (1974, Tokyo, p. 7, in Japanese). On page 6 they cite the source (somewhat vaguely) as the source we cite above, and give the date as mid-Edo period. The Edo (or Tokugawa) period lasted from 1600 to 1867.

Abe and Tsuji state (p. 6) that the above ancient book mentions *Niken Jaya* ("two tea houses") and their tofu (Gion-dofu) and Dengaku. *Hakugyoku* means "white jewel" and *Ou* means "old man / man's."

They then make things more confusing by stating: According to *Sejidan,* written by Kikuoka Senryo of the mid-Edo period, Gion-dofu was made for the first time at these two tea houses (*Niken Jaya*), which were located to the east and west of the tall wooden gate in Kyoto's Gion section (*Gion Rômon*). That was the start of the Kyoto Water Tea House (*Kyo Mizu Chaya*). The two tea houses were named Fuji-ya (the eastern Niken Jaya) and Nakamura-ya (the western Niken Jaya). In those old days they sold tofu. Today only Nakamuraya exists, but its name is now Nakamura-ro.

A Japanese website named Union Catalog of Early Japanese Books (http://base1.nijl.ac.jp) lists some 20 documents by Hakugyoku Ou (the pronunciation of his name is shown in furigana = hiragana written next to the Chinese characters / kanji), but no dates are given. Unfortunately the book about tofu cited above is not mentioned among the 20.

According to *The Book of Tofu,* by Shurtleff and Aoyagi (1975, p. 307): The Nakamura-ro restaurant, which is said to be "the oldest of all existing Japanese restaurants, began about 400 years ago as a simple tea shop serving travelers, pilgrims, and townspeople who came to pay homage at the revered Yasaka Shrine in Kyoto's Gion Quarter. Over the centuries, the shop grew into a restaurant and became famous for its 'Gion-dofu.'... The present master and head chef, Mr. Shigemitsu Tsuji, is famous throughout Japan as a cook, lecturer, and author." An illustration by Aoyagi of the interior of Nakamura-ro appears from the time she and Shurtleff visited the restaurant in about 1973. Address: Japan.

182. Kondate [Menus]. 1751-1781. Publisher unknown. 100 p. Japanese summary by Kawakami 1978, p. 47. [Jap]
• ***Summary:*** The menus, by an unknown author, are for tea ceremony cooking. Mentions *Higo-dofu,* which is tofu shaped like a piece of macaroni (hollow tube).

183. Dale, Samuel. 1751. Pharmacologia, seu manuductio ad materiam medicam:... [Pharmacology, or eating as a supplement to the materia medica:... 5th ed]. Lugduni Batavorum [Leiden]: Impensis Gerardi Potuliet. See p. 238. 26 cm. [117* ref. Lat]
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Summary: The information on soy sauce appears in the section on medicinal plants under the heading "I. De Phaseolo... A. 3. Soia, *Offic.* [probably officinarum] Phaseolus Japonicus, ex quo Japonensium Soia, qui intinctus species est, conficitur, *Herm.* Species Phaseoli parvi, albi, è Japonia allata, è qua conficiunt condimentum *Ketchup* dictum, duum generum, liquidum nimirum & solidum.

"Phaseolus erectus siliquis Lupini, fructu pisi majoris candido, *Kemph. Amoen. Exot.* 837.

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Hujus notitiam debemus Botanico erudito D. *Paulo Hermanno* defuncto, qui eam doctissimo nuper amico nostro D. *Gulielmo Sherrard* [Sherard], LL.D. communicavit, sub titulo suprascripto, unde nos habuimus.

This entry is the same as that in the original 1705 edition except for the addition of a middle paragraph from Kaempfer's *Amoenitatum Exoticarum* and small changes in the positions of several words. The author's name on the title page is now written Samuelis Dalei, M.L. Also near the bottom of the title page is written "Ex scriptis Hermanni Boerhaave locupletata. Indice Gallico, Germanico, Belgico, aucta."

A full-page illustration (engraving) shows a oval portrait of Samuel Dale, M.L.

184. Valle (Berto). 1752. Classified ad: Just arrived from Italy in twenty-eight days, in the *Ruby,* Capt. Peter Mauger. *Daily Advertiser* (*London*). Feb. 24. col. 2.9.
• ***Summary:*** Also "... Morelles, new Provence Olives, Spanish and Lucca ditto [Olives], Japan Soy [sauce], Russia Cavear [Caviar] and Butargo, new Gorgona Anchovies, fine small Capuchin Capers,... French, Hungary and Lavender Water,..."

Note: This is the earliest document seen (April 2012) that uses the term "Japan Soy" to refer to soy sauce. Address: In the Hay-Market, St. James's [London].

185. Homoed, Hendrik van. 1752. Diary. In: Leonard Blussé, Cynthia Viallé, et al, eds. 2004. The Deshima Diaries Marginalia, 1740-1800. Tokyo: Japan-Netherlands Institute. xl + 898 p. See p. 154, 163-64 (#117-18).
• ***Summary:*** 1752 April 28–"I was amazed by what they told me because they know that they cannot keep it a secret from me if the junk is from Batavia [Jakarta]. As soon as they had left, I asked about the Japanese who had told the story of it being a junk from Batavia. The first slave brought him. I asked him where the junk was from and he replied from Jacatra [Jakarta] and that it carried only *miso* beans [i.e., soybeans used to make miso]... The Japanese coolie told me that there was no truth to his story about the junk."

1752 May 1–"Several apprentices clarified the story about the junk. The Chinese farmers have been mistaken for female slaves. They wear a different type of clothes. I asked Jûemon why the junk was being unloaded because I could not imagine that the government would accept a cargo of *miso* and other beans as tradable goods. Japan produces enough *miso* beans itself. He replied that the cargo will be sold out of compassion for the Chinese farmers." Address: Opperhoofd (Chief of the Dutch factory), Deshima, Nagasaki, Japan.

186. Notulen van het Haags Besogene [Notes of meeting of the Haags Besogene]. 1752. The Hague, Netherlands. Unpaginated. Oct. 19. [Dut]
• ***Summary:*** On the first page of notes of the meeting concerning the stock in the warehouses we read:

"Thursday, 19 Oct. 1752: Started with the reading and control of the account of goods and merchandise, which on 31 May [1752] were stockpiled in the warehouses of this chamber [Amsterdam] and which have been received during the last four years from the Indies (*Indië* [Batavia]). Items that according to the journal of bookkeeping and the ledger have been delivered from the stock since 31 May 1752 and that part of the stock lying unsold in the Company's warehouses.

"... Japanese Soy [sauce] (*Japanse Soija*)*:* According to the list closed on 31 May 1748 were stockpiled–51 *kelders.* And received from the Indies (*Indien*) during the past four years–51 *kelders."*

Total: 102 *kelders.* Note 1. A kelder is a chest; in this case it contains bottles of soy sauce.

"From that is delivered during this time: 39 chests (kelders).

"According to the list closed on 31 May 1752, in stock: 45 chests (kelders).

"Provided for consumption in inns and yachts: 3 chests (kelders).

"In disuse, broken and empty: 15 chests (kelders). Total: 102 chests (kelders) [So the books balance].

Bibliographic reference in Dutch: NA, VOC 4475, Haags Besogene (19-10-1752).

Location: Nationaal Archief, Den Haag, De Archieven van de Verenigde Oost-Indische Compagnie (VOC); toegangsnummer 1.04.21; inventaris nummer 4475. Notulen van het Haags Besogene [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch East India Co. (NFJ); access number 1.04.21; record number 4475. Notes of the Haags besogene]. Address: The Hague, Netherlands.

187. Society of Gentlemen. 1754. A new and complete dictionary of arts and sciences; comprehending all the branches of useful knowledge, with accurate descriptions... Vol. 2 of 4. London: Printed for W. Owen. 1084 p. See p. 985.
• ***Summary:*** The entry for "Drug" states (p. 985): "a general term for goods of the druggist and grocery kinds, especially for those used in medicine and dying [dyeing]. The principal drugs in medicine make the greatest part of the wholesale trade in the druggist and spicery ways. Some are produced in France, England &c. but the greatest part is brought from the Levant, and the East Indies. The chief drugs imported into this kingdom, are from the East-Indies, being as follows, alum, china-root, camphor, rhubarb, musk, vermillion, soy of Japan, ketchup,..."

Note: This is the earliest English-language document seen (April 2012) that uses the term "soy of Japan" to refer to soy sauce made in Japan.

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"Ketchup" may well have referred to soy sauce made in the Dutch East Indies (today's Indonesia). Address: [England].

188. Sendai-johoku Haku-furosai. 1755. Chûnin hitsuyô [The cook's necessities]. Publisher unknown. 6 volumes (satsu). Japanese summary by Kawakami 1978. [Jap]
• ***Summary:*** The author's first name is unknown. His last name is apparently Haku-furosai, and he comes from Sendai-johoku. This is a Chinese herbal reference book for cooks. It lists tofu as a product made from soybeans, and lists many tofu recipes which are not found even in the famous Tofu Hyaku-chin.

189. Notulen van het Haags Besogene [Notes of meeting of the Haags Besogene]. 1756. The Hague, Netherlands. Unpaginated. Oct. 20. [Dut]
• ***Summary:*** On the first page of notes of the meeting concerning the stock in the warehouses we read:

"Wednesday, 20 Oct. 1756. Started with the reading and control of the account of goods and merchandise, which on 31 May 1756 were stockpiled in the warehouses of this chamber [Amsterdam] and which have been received during the last four years from the Indies (*Indien* [Batavia]). Items that according to the journal of bookkeeping and the ledger have been delivered from the stock since 31 May 1756 and that part of the stock lying unsold in the Company's warehouses.

"... Japanese Soy [sauce] (*Japanese Soija*)*:* According to the list closed on 31 May 1752 there were stockpiled–45 kelders. And received from the Indies (*Indien*) during the past four years–60 kelders."

Total: 105 kelders. Note 1. A kelder is a chest; in this case it contains bottles of soy sauce.

"From that is delivered during this time: 93 chests (kelders).

"Provided for consumption in inns and yachts: 2 chests (kelders).

"In disuse, broken and empty: 10 chests (kelders). Total: 105 chests (kelders) [So the books balance].

Bibliographic reference in Dutch: NA, VOC 4477, Haags Besogene (20-10-1756).

Location: Nationaal Archief, Den Haag, De Archieven van de Verenigde Oost-Indische Compagnie (VOC); toegangsnummer 1.04.21; inventaris nummer 4477. Notulen van het Haags Besogene [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch East India Co. (NFJ); access number 1.04.21; record number 4477. Notes of the Haags besogene]. Address: The Hague, Netherlands.

190. Ryôri oboe-gaki [Writings on cookery remembrances]. 1756. Japan: Publisher unknown. 44 p. Japanese summary by Kawakami 1978, p. 161. [Jap]
• ***Summary:*** Mostly about snacks and confections (kashi). But there is an interesting description of miso-making using rice bran (nuka) and koji with salt. It is called nuka miso. This was a type of miso, and it was used in nuka miso soup (nuka-miso shiru). Today, nuka-miso refers to salted rice bran used as a pickling bed. It does not contain any actual miso, though it has a similar consistency.

191. Osbeck, Per. 1757. Dagbok ofwer en Östindisk resa åren 1750, 1751, 1752. Med anmärkingar uti naturkunnigheten, främmande folkslags språk, seder, hushållning, m. m. [Voyage to the East Indies in the years 1750, 1751, 1752...]. Stockholm: Tryckt hos L.L. Grefing. 4 + 376 + [16] p. Illust. 14 cm. German edition published in 1765, English in 1771. [Swe]*
• ***Summary:*** See the English translation of the book made in 1771. Page 358: *Dolichos sinensis*–by the Chinese called Ta-o–Diadelphia decandria.

Note: Osbeck lived 1723-1805. A photostat copy of the original is in the library of the Arnold Arboretum and in the rare book room of the University of Illinois (Champaign / Urbana).

192. *Journal de Commerce* (*Brussels*)**.** 1759. D'Amsterdam. Arrivée & chargement des vaisseaux des Indes Orientales [From Amsterdam: Arrival and loading of vessels from the East Indies]. 5:198-202. Sept. See p. 199. [Fre]
• ***Summary:*** Lists the cargo on six vessels, including (p. 199): "26 Futailles Soya de Japan" [26 kegs of soy (sauce) from Japan].

Note: The various reference to the word *Soye* concern silk, not soy sauce.

193. Ekeberg, Karl Gustaf. 1764. Om Chinesiska Soyan [On Chinese soy sauce]. *Kongliga Vetenskaps Academiens Handlingar* (*Transactions of the Royal Academy of Sciences, New Series, Stockholm*) 25:38-40. Jan/March. [Swe; eng+]
• ***Summary:*** A detailed description in Swedish of how the Chinese make soy sauce, written with the intent that Europeans would start making it themselves.

"The natives of nearly all of the Indies (India) use for their cooking a sauce which they have prepared in advance. This sauce serves the purpose of both economizing and making the food better tasting. The inhabitants of the Moluccan Islands [later part of Indonesia] and the islands lying around the Strait prepare, by rotting of small fish, a sauce which in taste and smell doesn't differ much from anchovies, rather than [using] the soy [sauce] that more recently has become known in Europe.

"The Chinese, who are not inferior to any other people of the world when it comes to home economy or the ability to imitate what they have seen, although not the inventors of soy sauce themselves, have tried to imitate their neighbors the Japanese, whose soy sauce surpasses that of the Chinese,

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be it more in price than in taste (goodness). They favor using it in the preparation of several dishes, and especially for dipping meat, fish, and vegetables into, lavishly and differently from other sauces.

"I have the honour to herewith to describe how Chinese soy sauce is prepared, because it has come to be used by us and we ought to be able to produce it ourselves.

"I have previously remarked in a short account of Chinese home economics in the country, that they have a type of small bean called Pactau ["white bean" = white soybean] among their grains. It differs only in size from the Caravance bean (*Caravancer*) usually used as nourishment on board during the voyage home. These Pactau beans are the main ingredient of the soy sauce, and since both types of beans resemble one another fairly closely in taste, and since the Caravance beans do not differ very much from our Turkish beans (*Turkika Boner*), I do not doubt that soy sauce could be prepared from the latter [Turkish beans], if not from our own field-beans. The Chinese prefer, when short of their Pactau beans, to prepare the sauce from a type of lesser blackish-green bean, which they call Hactau. Our native beans ought to be tried, therefore, in case the crop of Pactau beans, imported for experimenting, should fail.

"Thirty-five pounds [actually skalpund; 1 skalpund = 425 gm] of these beans, are cleaned then boiled for 2 or 3 hours in a covered kettle in clean water over a slow fire, until they can be easily mashed between the fingers. Water is added little by little so that the beans do not burn. The beans are removed and spread out on wide, shallow containers (trays) so that the water can run off, and while they are still damp they are rolled in a fine flour (which is ground from the same kind of bean) until they are covered on all sides. They are then placed on smaller trays or loosely woven mats and stacked one and a half inches (literally "thumbs"), one above the other, then placed in an open and loosely woven basket, which is wrapped in a mat or cloth, so that they can ferment and grow moldy during a period of three or four days. Then the cloth is removed and air let in, so that they should become withered and somewhat dried by the time they are left in strong solar heat (or in any other warm area) so that they can dry until they become so hard that they shatter when hit with a hammer and the pieces fly around.

"The flour and the mold are now separated from the beans by rubbing them between the hands. Then the beans are placed in a large or several smaller jars (earthen vessels) and covered with a clear (salt) pickling brine, prepared from 20 pounds of nice clean salt and 100 pounds of clean spring water. The vessels are placed open in the sun during the day, but are closed at night to keep out the cold and the dampness. Otherwise they are placed in a warm area for six whole weeks, to draw [until their whole substance has been well extracted]. When it is observed that the pickling brine has become dark brown and strong, it is poured off, and brought to a boil several times to increase the strength. Some people add sugar, ginger and other spices to it, according to taste, while it is cooking. They then let the sauce stand with the spices for a few days, before the spices are removed by straining."

Note 1. The author, Carl Gustaf Ekeberg (written like this on title page) lived 1716-84. He was captain of a ship in the Swedish East India Company's service. He arrived in Canton on 24 August 1766, but had previously visited in 1762. Beckmann (1798, p. 344) gives an English translation of the latter half of this document, starting at "Thirty-five pounds..." Note 2. This is the earliest Swedish-language document seen that uses the term *Caravancer* to refer to soybeans.

Note 3. This is the earliest document seen (July 2001) stating that sugar and/or spices are sometimes added to soy sauce during the last stage of processing.

Note 4. This is the earliest journal article seen (Oct. 2001) that mentions soy.

Note 5. This periodical started publication in 1739 in Stockholm. Address: Captaine vid Ostindiska Compagniet (Captain with the East India Company).

194. **Product Name:** [Shoyu. Brand named Jôjû Shoyu in 1772].
Foreign Name: Shôyu.
Manufacturer's Name: Takanashi Hyozaemon XXII (Renamed Mogi Hyozaemon in 1764).
Manufacturer's Address: Noda, Japan.
Date of Introduction: 1764.
New Product–Documentation: Noda Shoyu K.K. (Morio ICHIYAMA, ed.). 1940. Noda Shoyu K.K. Nijunen-shi [Twenty-year history of Noda Shoyu, Inc.]. p. 473. The Jôjû brand of shoyu (of which the logo is shown) was introduced in Anei 1 (1772).

Mark Fruin. 1983. Kikkoman: Company, Clan, and Community. p. 18. "In 1764 the eldest son of Takanashi Hyozaemon, now the XXII, married the daughter of Mogi Shichizaemon V. As was often the case when marriage was tied to business, he married into her family, assuming her family's name an occupation. In the year of their marriage, 1764, the adopted son-in-law (*muko-yôshi*) and his bride established a shoyu factory on the advice and with the financial support of the bridegroom's natural family, the Takanashis, who had been making shoyu in Noda since 1661. This was the first Mogi family to venture into shoyu manufacture, but two years later, in 1766, the bride's father, Mogi Shichizaemon, whose ancestors had established the first Mogi household in Noda in 1630, added the manufacture of shoyu to the manufacture of miso, which his family had begun in 1662." Fruin (p. 73) says that by 1909 this shoyu was sold under the Kamigata brand, but Ken Mogi of Kikkoman says that Kamigata (the brand introduced by Takanashi Hyozaemon in Anei 1 = 1772) should be pronounced Jôjû, not Kamigata.

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195. Diderot, Denis. 1765. Encyclopédie, ou dictionnaire raisonné des sciences, des arts et des métiers: Soui, ou soi [Encyclopedia, or rational / systematic dictionary of the sciences, arts, and trades/crafts: Soy]. Paris: Briasson. See vol. 15, p. 403. Published from 1751-1765 in 17 volumes or fascicles. [Fre]

• ***Summary:*** "Soui, or soi, singular masculine (Cuisine) is a type of sauce that the Japanese prepare, and which is very much sought after by the peoples of Asia, and by the Dutch, which import it from Japan. It is a type of extract or of liquid which goes well with all types of meats, and above all with partridge and ham. Then one adds to it mushroom sauce, lots of salt, pepper, ginger, and other spices which give it a very strong flavor, and which help to prevent the resulting sauce (*liqueur*) from spoiling. It will keep for many years in bottles that are well corked, and a small quantity of this liquid mixed with ordinary sauces, enhances them and gives them a very agreeable flavor. The Chinese also make soy (souï), but that of the Japanese is regarded as superior. It is said that the reason for this is that the meats are much more succulent in Japan than in China."

The text in French reads: *"SOUI, ou SOI, s.m.* (*Cuisin.*) *c'est une espece de sauce que les Japonnois préparent, & qui est très recherchée par les peuples de l'Asie, & par les Hollandois qui en apportent de ce pays; c'est une espece d'extrait ou de suc qui se tire de toute sorte de viandes, & sur-tout des perdrix & du jambon. On y joint du suc de champignons, beaucoup de sel, de poivre, de gingembre, & d'autres épiceries qui lui donnent un goût très fort, & qui contribuent à empêcher que cette liqueur ne se corrompe. Elle se garde pendant un grand nombre d'annés dans des bouteilles bien bouchées, & une petite quantité de cette liqueur mêlée avec les sucs ordinaires, les releve, & leur donne un goût très-agréable. Les Chinois font aussi du souï, mais on regarde celui du Japon comme supérieur; ce qui vient, dit-on, de ce que les viandes sont beancoup* [*sic, beaucoup*] *plus succulentes au Japon qu'à la Chine."*

Note 1. Diderot, the French encyclopedist, lived 1713-1784.

Note 2. This is the 2nd earliest French-language document seen (Jan. 2010) that refers to soybeans or soyfoods.

Note 3. This is the earliest French-language document seen (April 2012) that uses the words *le Soui* or *le soi* to refer to soy sauce. The text seems to imply that soy sauce had been introduced to France by this time, however we cannot be sure of this. If that were the case, this would be the earliest document seen (Jan. 2010) concerning soybean products (soy sauce) in France; soybeans as such have not yet been reported.

Note 4. This is the earliest Western-language document seen (Feb. 2004) that recommends adding seasonings (such as mushroom sauce, salt, pepper, ginger, or other spices) soy sauce to enhance its flavor. This idea may have been a French innovation.

Note 5. The earliest publication seen that cites this early document (Diderot 1765) was by Shigeru Otsuka, in his book *A Journey into the World of Shoyu* (1987, p. 75). But 14 years earlier, in his chapter titled "All About Shoyu" in *The Kikkoman Way of Fine Eating* (1973, p. 10), when discussing how Europeans got to know about shoyu, he wrote: "It was the great misfortune of the Portuguese that they did not know it. The Dutch traders that followed them, however, did notice shoyu, and began to export it to Europe. It was about 100 years later that Louis XIV of France began to prize shoyu as a secret ingredient in the luxurious court fare of the time." Note that Louis XIV reigned from 1643 to 1715, more than 50 years before Diderot wrote this passage. We know of no document which states that Louis XIV ever used shoyu. And when we asked Mr. Otsuka for his source concerning Louis XIV's use of shoyu, he was unable to give any source. Dr. Yokotsuka of Kikkoman (1983) thinks the original source was Dr. Obata. Address: France.

196. **Product Name:** [Shoyu].
Foreign Name: Shôyu.
Manufacturer's Name: Horikiri Monjiro.
Manufacturer's Address: Nagareyama (near Noda), Japan.
Date of Introduction: 1766.
New Product–Documentation: Mark Fruin. 1983. Kikkoman: Company, Clan, and Community. p. 18. In 1766 Horikiri Monjirô from Nagareyama began making shoyu. "His wife was the second daughter of Mogi saheiji III, who would himself begin soy sauce brewing in a few more years."

197. **Product Name:** [Shoyu].
Foreign Name: Shôyu.
Manufacturer's Name: Mogi Shichizaemon V.
Manufacturer's Address: Noda, Japan.
Date of Introduction: 1766.
New Product–Documentation: Mark Fruin. 1983. Kikkoman: Company, Clan, and Community. p. 18. "In 1764 the eldest son of Takanashi Hyozaemon, now the XXII, married the daughter of Mogi Shichizaemon V. As was often the case when marriage was tied to business, he married into her family, assuming her family's name an occupation. In the year of their marriage, 1764, the adopted son-in-law (*muko-yôshi*) and his bride established a shoyu factory on the advice and with the financial support of the bridegroom's natural family, the Takanashis, who had been making shoyu in Noda since 1661. This was the first Mogi family to venture into shoyu manufacture, but two years later, in 1766, the bride's father, Mogi Shichizaemon, whose ancestors had established the first Mogi household in Noda in 1630, added the manufacture of shoyu to the manufacture of miso, which his family had begun in 1662."

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198. Ryorikata banhô [Many methods for cooks]. 1766? Japan: Publisher unknown. 60 p. Japanese summary by Kawakami 1978, p. 165. [Jap]*
• ***Summary:*** This manual, by an unknown author, describes how to make various foods, rather than how to prepare recipes. It discusses shoyu, barley hishio, Kinzanji miso, kiku hishio (it is not known what "kiku" means), hishio, natto, toko miso, uzu-miso, and amazake.

199. Kastens, Herman Christiaan. 1767. Diary. In: Leonard Blussé, Cynthia Viallé, et al, eds. 2004. The Deshima Diaries Marginalia, 1740-1800. Tokyo: Japan-Netherlands Institute. xl + 898 p. See p. 311-12 (#73, 77).
• ***Summary:*** In the section titled "Diary kept by Deputy Christ during the absence of Kastens," at 1767 April 9–"A small *wangkang* without its top mast, which had stranded off the island of Koshiki on 25 January, arrived in the roadstead. It had departed from the Chinese harbor of Zoesio on November 17 last year. It was destined for Lionton. Its cargo consisted merely of 56,200 *ganting miso* beans [soybeans used to make miso] and 9,000 catties of oil."

Note: A *ganting / gantung* is a measure of weight. It is not clear what kind of oil this is.

1767 May 6–"Today the *wangkang* which arrived here on 9 April got a top mast. It sold part of its cargo of *miso* beans to cover its expenses." Address: Opperhoofd (Chief of the Dutch factory), Deshima, Nagasaki, Japan.

200. Stork, William. 1769. A description of East-Florida, with a journal, kept by John Bartram of Philadelphia, botanist to His Majesty for the Floridas; upon a journey from St. Augustine up the River St. John's, as far as the lakes. With explanatory botanical notes... The third edition, much enlarged and improved. London: Sold by W. Nicoll; and T. Jeffries. [4], viii, 40, [2], xii, 35, [1] p. Illust. maps. 30 cm. [2 ref]
• ***Summary:*** This book is divided into two parts, each of which is paginated separately. At the beginning of the 2nd part is "The introduction to the journal" of John Bartram. When talking about the importance of new plants and naturalists to the American colonies he states (p. ii): "I cannot touch upon this subject without mentioning Mr. John Ellis, Fellow of the Royal Society, and agent for West-Florida... It is to this very ingenious gentleman that I am indebted for the following catalogue of plants that may be useful in America, in which, to avoid confusion in the botanical names, Mr. Ellis hath given both the generical and the specifick or trivial names of the plants, with the page referred to in the celebrated Dr. Linnaeus's 2nd edition of his Species of Plants..."

There follows (p. iii on) a 4-column table in which numerous plants are listed under the following column headings: (1) The "Latin names"–genus and species. (2) "2d Ed. Lin. Sp."–The page on which this plant is mentioned in the 2nd ed. of Linnaeus' *Species Plantarum.* (3). English names. (4) Observations.

On p. v we read: "Dolichos soja Linn. Lin. Sp. 1023. A kind of kidbean called Daidsu. Used for making Soye* or Indian Ketchup. See Kaempfer, Amoenitatis, 837.

"* The method of preparing East-India Soye or India Ketchup. Take a certain measure, for instance a gallon, of that sort of kidney-beans, called Daidsu by the Japonese, and Caravances by the Europeans; let them be boiled till they are soft; also a gallon of bruised wheat or barley, (but wheat makes the blackest Soye) and a gallon of common salt. Let the boiled caravances be mixed with the bruised wheat, and be kept covered close a day and a night in a warm place, that it may ferment. Then put the mixture of the caravances and wheat, together with the gallon of salt, into an earthen vessel, with two gallons and a half of common water, and cover it up very close. The next day stir it about well with a battering machine or mill (Rutabulum) for several days, twice or thrice a day, in order to blend it more thoroughly together. This work must be continued for two or three months, then strain off and press out the liquor, and keep it for use in wooden vessels; the older it is the clearer it will be, and of so much more value. After it is pressed out, you may pour on the remaining mass more water, then stir it about violently, and in some days after you may press out more Soye."

Note 1. This is the earliest American document seen (Dec. 2005) that uses the term "Dolichos soja" or the word "Daidsu" or "kidbean" to refer to the soybean.

Note 2. This is the earliest English-language document seen (April 2012) that uses the word "Soye" to refer to soy sauce, or the term "East-India Soye" or the term "India Ketchup" to refer to soy sauce from the East Indies, probably the Dutch East Indies (today's Indonesia). The ideas that soy sauce is a type of ketchup, and that this soy sauce comes from the Indies (India) are extremely interesting in trying to understand the origin of the word "ketchup" (regardless of spelling) and the early relationship between soy [sauce] and ketchup.

Note 3. This is the earliest English-language document seen (April 2012) that uses the term "bruised wheat or barley" in connection with the process for making soy sauce. This term and this descriptive recipe would be repeated in more than 20 publications–even though the recipe will not work, since it contains no koji, and many must have wondered just how they are supposed to make "bruised wheat or barley."

Note 4. John Ellis (ca. 1705-1776), an Irish naturalist living in London, was active in studying the plants of the American colonies and in introducing new plants to them. He was also a commercial agent, representing a number of American colonies in London. In 1769 Ellis was the commercial agent for West Florida in London. Notice that his is a list of plants "that may be useful in America." He does

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not say they are already growing in America.

Note 5. Ellis does not mention koji (grains or beans covered with a white mycelium of *Aspergillus* mold), and does not understand its importance in making soy sauce. Kaempfer, from whom Ellis got his instructions for preparing soy sauce, did not mention koji either in connection with soy sauce. However Kaempfer did mention *koos* (by which he probably meant koji), in the previous paragraph of his 1712 classic, in which he described how to make miso.

Note 6. This is the earliest English-language document seen (March 2006) that uses the word "Caravances" (using this or any related spelling) to refer to soybeans.

Note 7. Also included in Ellis's catalog are: Safflower, *Sesamum Orientale* [sesame seeds], locust tree or St. John's Bread (*Ceratonia Siliqua*), true opium poppy, tallow tree of China, true rhubarb, sago palm-tree, true bamboo cane, East India mango-tree, paper mulberry tree, arnotto [anatto], etc.

Note 8. This is the earliest English-language document seen (Aug. 2007) that uses the word "Sesamum" or the term *Sesamum Orientale* to refer to sesame seeds, or that gives their scientific name; it says (p. iii): "Latin name: *Sesamum Orientale.* 2d Ed. L. Sp. [2nd edition of Linnaeus' *Species plantarum*]*:* p. 883. English names: Oyly grain. Observations: Propagated in the Levant [countries of the eastern Mediterranean] for oyl, which does not soon grow rancid by keeping."

Note 9. William Stork, a German botanist and member of the Royal Society (London), had this treatise published in London as a promotion of Florida as an attractive place for settlers by describing the climate, soil, flora, and fauna. He emphasized its agricultural potential for cultivating rice, cotton, silk, sugar, and other profitable crops. According to Prof. Ted Hymowitz (March 2006), Stork lived in St. Augustine, Florida, in 1765, and then went to England. Address: [England].

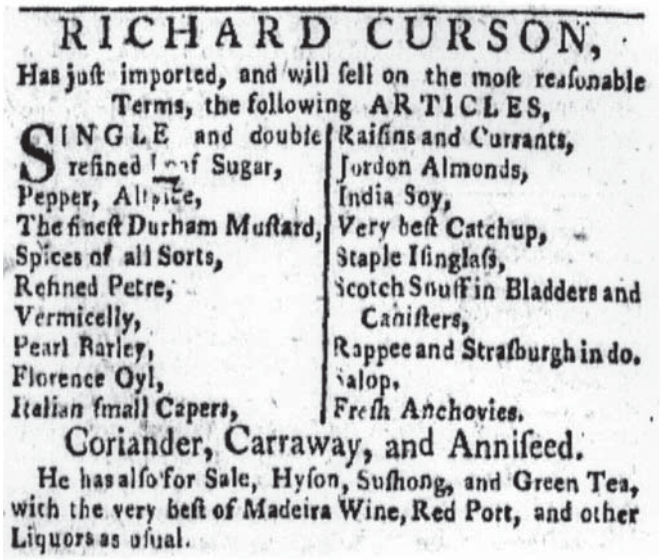
201. Curson (Richard). 1770. Classified ad: Has just imported and will sell on the most reasonable terms, the following articles,... *New-York Gazette; and the Weekly Mercury* (*New York City*)**.** Nov. 26. p. 3.

• ***Summary:*** "... Single and double refined Loaf Sugar, Pepper, Allspice, the finest Durham Mustard,... Vermicelly [Vermicelli], Pearl Barley, Florence Oyl, Italian small Capers, Raisins and Currants, Jordon [Jordan] Almonds, India Soy [sauce], very best Catchup, Staple Isinglass,..."

Note 1. This is the earliest document seen (May 2012) in which both soy sauce ("India Soy") and Catchup appear in the same shipment and ad in the British colonies of North America; they also appear one right after the other in the ad.

Note 2. This ad also appeared in the Dec. 3 (p. 4), Dec. 10 (p. 3), Dec. 17 (Supplement p. 1), and Jan. 7 (1771, Supplement p. 1) issues of this newspaper.

Note 3. "Florence Oyl" refers to olive oil.


RICHARD CURSON,
Has just imported, and will sell on the most reasonable Terms, the following ARTICLES,
SINGLE and double refined Loaf Sugar,
Pepper, Allspice,
The finest Durham Mustard,
Spices of all Sorts,
Refined Petre,
Vermicelly,
Pearl Barley,
Florence Oyl,
Italian small Capers,
Raisins and Currants,
Jordon Almonds,
India Soy,
Very best Catchup,
Staple Isinglass,
Scotch Snuff in Bladders and Canisters,
Rappee and Strasburgh in do.
Salop,
Fresh Anchovies.
Coriander, Carraway, and Anniseed.
He has also for Sale, Hyson, Sushong, and Green Tea, with the very best of Madeira Wine, Red Port, and other Liquors as usual.

202. Ellis, John. 1770. Directions for bringing over seeds and plants, from the East-Indies and other distant countries, in a state of vegetation: Together with a catalog of such foreign plants as are worthy of being encouraged in our American colonies for the purposes of medicine, agriculture and commerce. London: Printed and sold by L. Davis. 41 p. 25 cm. [1 ref]

• ***Summary:*** In this, his first booklet, Ellis tells how to pack seeds to prevent them from spoiling on long sea voyages. He depended especially on packing the seeds in beeswax. One page (26) is a 4-column table in which numerous plants are listed under the following column headings: (1) The "Latin names"–genus and species. (2) "2d Ed. Lin. Sp."–The page on which this plant is mentioned in the 2nd ed. of Linnaeus' *Species Plantarum.* (3). English names. (4) Observations.

The last entry is: "Dolichos soja Linn. Lin. Sp. 1023. A kind of kidney-bean called Daidsu. Used for making Soye* or India Ketchup. See Kæmp. Amoenitat. [Kaempfer Amoenitatis], 837.

"* The method of preparing East-India Soye or India Ketchup.

Take a certain measure, for instance a gallon, of that sort of kidney-beans, called Daidsu by the Japonese, and Caravances by the Europeans; let them be boiled till they are soft; also a gallon of bruised wheat or barley, (but wheat makes the blackest Soye) and a gallon of common salt. Let the boiled caravances be mixed with the bruised wheat, and be kept covered close a day and a night in a warm place, that it may ferment. Then put the mixture of the caravances and wheat, together with the gallon of salt, into an earthen vessel, with two gallons and a half of common water, and cover it up very close. The next day stir it about well with a battering machine or mill (Rutabulum) for several days, twice or thrice a day, in order to blend it more thoroughly together. This work must be continued for two or three months, then strain off and press out the liquor, and keep it for use in wooden

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vessels; the older it is the clearer it will be, and of so much more value. After it is pressed out, you may pour on the remaining mass more water, then stir it about violently, and in some days after you may press out more Soye."

Note 1. This information by Ellis, in a different context but in identical form and with only a few words changed, first appeared in Stork 1769.

Note 2. John Ellis (ca. 1705-1776), an Irish naturalist living in London, who was active in studying the plants of the American colonies and in introducing new plants to them. He was also a commercial agent, representing a number of American colonies in London.

203. Ellis, John. 1771. A catalogue of such foreign plants as are worthy of being encouraged in our American colonies for the purposes of medicine, agriculture and commerce. Philadelphia, Pennsylvania. From a pamphlet by John Ellis, F.R.S. Presented by the Honorable Thomas Penn, Esq. to the American Philosophical Society thro' the hands of Samuel Powell, Esq. See p. 255-66. 25 cm. *

• ***Summary:*** Note 1. This pamphlet is mentioned in the minutes of the "Early proceedings of the American Philosophical Society for the Promotion of Useful Knowledge" on 1770 Oct. 19. However Ellis is not mentioned as its author (Lesley 1884, p. 58). It was then published in the Transactions of the American Philosophical Society, held at Philadelphia, for Promoting Useful Knowledge, 1771 (or 1772), i, 255-66 (See p. 259, Dolichos soja Linn.).

Note 2. John Ellis (ca. 1705-1776), an Irish naturalist living in London, was active in studying the plants of the American colonies and in introducing new plants to them. He was also a commercial agent, representing a number of American colonies in London. He may have published this pamphlet in England.

204. Eckeberg, Charles Gustavus [Ekeberg, Karl Gustaf]. 1771. A short account of the Chinese husbandry. In: Peter [Per] Osbeck. 1771. A Voyage to China and the East Indies... Translated from the German by John Reinhold Forster. Vol. 2. London: Printed for Benjamin White. 367 p. See p. 267-317. [Eng]

• ***Summary:*** For details, see Osbeck 1771. Address: Captain of a ship in the Swedish East India Company's service.

205. Osbeck, Per. 1771. A voyage to China and the East Indies, by Peter Osbeck ... Together with a voyage to Suratte, by Olof Toreen ... and an account of the Chinese husbandry, by Captain Charles Gustavus Eckeberg. Translated from the German by John Reinhold Forster. Vol. 1. London: Benjamin White. See vol. 1, p. 73, 77, 218, 253, 304-05. Original edition published in 1757 in Swedish. [Eng]

• ***Summary:*** Note 1. All of the following passages were written in 1751.

In Canton, China: "Fish cut to pieces were carried about for sale on little tables, which hung on poles as described above: the same was done with bacon, and *Fdaufu* [tofu], a dish which is like our sweet cheese, but which was prepared of *Chinese* beans (*Dolichos Chinensis*)*"* (p. 218).

China: "Soya, or the *Tyong-yao* [*jiangyou*] of the *Chinese,* (*Dolichos Soja* Linn.) the *Japan Soya* is better and dearer than the *Chinese.* For its preparation see *Kæmph.* Amoen. p. 839. and likewise *Soja Dolichos, Flor. Zeylan.* 354. It was sold the katty for three kanderins" (p. 253).

Note 2. This is the earliest English-language document seen (Feb. 2007) that uses the word "Soya" in connection with the soybean or with soy sauce.

Note 3. This is the earliest English-language document seen (April 2012) that uses the word "Japan Soya" to refer to soy sauce, probably made in Japan. As of Feb. 2012, the term "Japan Soya" (referring to soy sauce) appears in this database three times from 1771 to 1907.

"Fdau-fu, or *Tou-fu* [tofu], which has been mentioned on page 218, was sold by pieces in several places. The *Chinese* shewed me a sort of small pease, which they call *U-ang-teo* [huangdou = "yellow bean"], and of which cheese [tofu] is said to be made, though the name gives reason to conjecture that it has been made from *Tao,* which are the *Chinese* beans, or *Callvanses."* (p. 305).

Note 4. This is the earliest English-language document seen (April 2013) that uses the word "Fdaufu" (or "fdou-fu"), or the term *Tou-fu* to refer to tofu.

Non-soy: "Spain, March the 6th, 1751. On my arrival at Cadiz [a seaport and province in southwest Spain], I saw the *Hedysarum coronarium,* or French honey suckle, in plenty. The Spaniards call it *Soya,* and the French *Saint Foin* (Note: What we call St. Foin in England is *Hedysarum Onobrychis;* the *Hedysarun Coronarium* is planted for ornament in our gardens); it was brought to town in great bundles as food for the cattle (p. 77).

Note 5. This plant called Soya in Spain is probably not the soybean.

"Callvanses (*Dolichos Sinensis*) (Footnote: *caule erecto ramosissimo, pendunculis erectis multifloris, leguminibus pendulis; Chinensibus Tao*)**.** They are planted on dry hills, and treated like dwarf kidney beans. They do not grow high, and therefore do not much want to be supported; this however is done in some places, and especially where they stand in the open fields... These beans are of the smallest kind, and are quite white except the germen [hilum], which is black, but white in the middle. The *Europeans* buy them in great quantities, and make use of them in their return from China instead of pease. They have thin husks and are very palatable. A katty, which answers to a pound we use for grocery, was sold for two kandarin, or about three stivers" (p. 304). [Note 6. According to *Index Kewensis* and *Hortus III, Dolichos sinensis* (later named *Vigna sinensis* and now named *Vigna unguiculata subsp. sesquipedalis*) is the yard-

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long bean or asparagus bean, a subspecies of the cowpea.]

"Lack-Tao [Luk Taw or mung bean] (Footnote: *Phaseolus Max, Mungo Persarum*) is the *Chinese* name of another sort of beans, or pease, which are much less than our wild vetches. The plant itself grows like the former... With these pease they feed the parrots. Among the many seeds which I brought to *Sweden,* was a kind of small green pease, which was so nicely eat up by the worms at my arrival, that nothing but the husks were left, which served as a nidus [nest or breeding place] to the little beetles, with which they were almost filled" (p. 304-05).

The author: Peter Osbeck, a Swede, lived 1723-1805. He was a pupil of the great Linnaeus and he generally used botanical terms used by Linnaeus. In 1750 he set out on a journey to China as chaplain to a Swedish East Indiaman, *The Prince Charles,* which visited Java and southern China, and returned to Gothenburg, Sweden, on 26 June 1752. Osbeck was a zealous naturalist and brought home a rich collection of natural objects, chiefly Chinese specimens, for during his long stay at Whampoa and Canton he had ample opportunity to collect. All of his collections he placed in the hands of Linnaeus, who described the plants in his *Species Plantarum,* published a year after Osbeck's return. Osbeck's original account of his voyage appeared in 1757 in his native language, Swedish, titled *Dagbok öfver en ostindisk resa.*

The book: Linnaeus is indebted to this book for the greater part of the Chinese plants and animals he described. All of the 244 Chinese specimens collected by Osbeck belong to the neighborhood of Canton. Most of the plants Linnaeus knew from China were those collected by Osbeck, but Linnaeus seems to have been under the mistaken impression that Osbeck's plants came from India, a place that Osbeck never visited. Strangely, most of the systematic botanists who compiled general systematic works on botany after Linnaeus (Lamarck, Willdenow, Sprengel, de Candolle, Kunth, etc.) incorrectly referred to Linnaeus rather than to his source, Osbeck (Bretschneider 1880, p. 88-91).

Bretschneider (1880, p. 116) notes: "The third account of Swedish naturalists in China translated by John Reinhold Forster, is a treatise on *Chinese Husbandry* by Charles Gust. Eckeberg. Eckeberg was Captain of a Ship in the Swedish E.I. [East India] Company's service. We know from Sparrmann's brief account of his voyage to China that Eckeberg was captain of the Navarcha and that his ship arrived in Canton Aug. 24 in 1766. It was at this place that Eckeberg made his observations on Chinese husbandry, on which subject he subsequently published a very interesting account, of which I shall give an abstract. It seems that Eckeberg had previously visited Canton, about 1762."

Note 7. This is the earliest English-language document seen (Oct. 2010) that uses the word "husbandry" in connection with animals. Address: A Swede and pupil of Linnaeus, he traveled in China, arriving in 1751.

206. Shinsen ryôri kondate bunruishû [Newly selected and collected cooking menus, divided by category]. 1772-1780. Japan. [Jap]*
• ***Summary:*** The ninth earliest known reference to Kori-dofu (dried-frozen tofu) appeared in this work.

207. Inaho. 1772. Gakutaiko Japan. [Jap]*
• ***Summary:*** According to the *Nihon Kokugo Daijiten* [Japanese Language Dictionary], this is the earliest known Japanese document that contains the word *okara,* referring to the dietary fiber remaining after making tofu or soymilk.

Thanks to Toshie Marra of the University of California, Librarian for the Japanese Collection, C.V. Starr East Asian Library.

208. **Product Name:** [Kihaku Shoyu].
Foreign Name: Kihaku Shôyu.
Manufacturer's Name: Mogi Shichirouemon.
Manufacturer's Address: Noda, Japan.
Date of Introduction: 1772.
New Product–Documentation: Noda Shoyu K.K. (Morio ICHIYAMA, ed). 1940. Noda Shoyu K.K. Nijunen-shi [Twenty-year history of Noda Shoyu, Inc.]. p. 467. The Kihaku brand of shoyu (of which the logo is shown) was introduced in Anei 1 (1772).

Mark Fruin. 1983. Kikkoman: Company, Clan, and Community. p. 18. "By 1768 the first of this series of marriage-business alliances, that of Takanashi Hyôzaemon's son to Mogi Shichizaemon's daughter, was recognized as a separate household in the Mogi line. By 1772 Mogi Shichirôuemon, head of the newly formed Kashiwa household, had accumulated enough know-how, experience, and capital to disassociate himself formally from his paternal household and establish himself as an independent householder and shoyu brewer. By 1781, therefore, when a shoyu manufacturing guild was established in Noda, two of the original seven members were Mogis (Shichizaemon and Shichirôuemon); by 1782, one year later, Mogi Saheiji, head of the oldest branch of the Mogi line, had added shoyu fermentation to his already established ventures in grain sales and miso manufacture, making the Mogi's proportion of representation in the guild three out of seven. By 1822 two more Mogi families had been added, and a Mogi majority within the guild was secured." Page 73 notes that by 1909 the four major brands manufactured by the Noda shoyu cartel were Kikkoman, Kihaku, Kamigata (Joju), and Kushigata. Page 96-97 describes the struggle between the Kikkoman and Kihaku brands as the one to represent the new Noda Shoyu Co.

209. Ellis, John. 1772. A catalogue of such foreign plants as are worthy of being encouraged in our American colonies for the purposes of medicine, agriculture, and commerce. *Transactions of the American Philosophical Society* 1:255-

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66. See p. 259. (Held at Philadelphia, for Promoting Useful Knowledge). [1 ref]
• ***Summary:*** A facsimile copy of a catalogue by John Ellis is reproduced in the *Transactions of the American Philosophical Society, Held at Philadelphia for Promoting Useful Knowledge.* It begins: "From a pamphlet by John Ellis, F.R.S. [Fellow of the Royal Society]. Presented by the Honorable Thomas Penn, Esq; to the American Philosophical Society thro' the Hands of Samuel Powell, Esqr."

In the section title 'Foreign plants' (p. 327), numerous plants are listed in a 4-column table: The Latin name, the page on which it is mentioned in the 2nd ed. of Linnaeus' Species Plantarum, the English names, and observations.

"Dolichos soja Linn. Lin. Sp. 1023. A kind of kidbean called Daidsu. Used for making Soye* or Indian Ketchup. See Kaempfer, Amoenitat.

"* The method of preparing East-India Soye or India Ketchup. Take a certain measure, for instance a gallon, of that sort of kidney-beans, called Daidsu by the Japonese, and Caravances by the Europeans; let them be boiled till they are soft; also a gallon of bruised wheat or barley, (but wheat makes the blackest Soye) and a gallon of common salt. Let the boiled caravances be mixed with the bruised wheat, and be kept covered close a day and a night in a warm place, that it may ferment. Then put the mixture of the caravances and wheat, together with the gallon of salt, into an earthen vessel, with two gallons and a half of common water, and cover it up very close. The next day stir it about well with a battering machine or mill (*Rutabulum*) for several days, twice or thrice a day, in order to blend it more thoroughly together. This work must be continued for two or three months, then strain off and press out the liquor, and keep it for use in wooden vessels; the older it is the clearer it will be, and of so much more value. After it is pressed out, you may pour on the remaining mass more water, then stir it about violently, and in some days after you may press out more Soye."

Note 1. This is the earliest American document seen that uses the term "Dolichos soja" or the word "Daidsu" to refer to the soybean.

Note 2. John Ellis (ca. 1705-1776), an Irish naturalist living in London, was active in studying the plants of the American colonies and in introducing new plants to them. He was also a commercial agent, representing a number of American colonies in London. In 1770 Ellis was the commercial agent for West Florida in London.

Note 3. Ellis does not mention koji (grains or beans covered with a white mycelium of Aspergillus mold), and does not understand the importance of koji in making soy sauce.

Note 4. This document was first cited by Hymowitz. 1986. Bibliography of early, previously uncited publications on soybeans in the United States. 2 p. Unpublished.

Note 5. Also included in the catalog are: Safflower, *Sesamum Orientale* [sesame seeds], locust tree or St. John's Bread (*Ceratonia Siliqua*), true opium poppy, tallow tree of China, true rhubarb, sago palm-tree, true bamboo cane, East India mango-tree, paper mulberry tree, arnotto [anatto], etc.

Note 6. This is the earliest English-language document seen (July 2003) that refers to sesame seeds or gives their scientific name; it says (p. 256): "Latin name: *Sesamum Orientale.* 2d Ed. L. Sp. [2nd edition of Linnaeus' *Species plantarum*]*:* p. 883. English names: Oily grain. Observations: Propagated in the Levant [countries of the eastern Mediterranean] for oil, which does not soon grow rancid by keeping."

210. Agricola Sylvan. 1776. Article XIV. To make Soy or India Ketchup. *The Farmer's Magazine, and Useful Family Companion. Consisting of Practical Essays,... on the Different Branches of Husbandry,...* 1(7):268. Oct. London: Printed for R. Snagg,... [2 ref]
• ***Summary:*** "Boil a gallon of that sort of kidney-beans, called Daidsu by the Japonese, and Caravances by the Europeans, (the *Dolichos Soja* of Linnæus, Sp. Plant. 1023–Kæmp. Amoenit. 837) till they are soft; then take the caravances, and mix with them a gallon of bruised wheat, or barley, (but wheat makes the blackest Soy) and a little common salt, and let the whole be kept closely covered for a day and a night in a warm place to ferment; then put the mixture into an earthen vessel with ten quarts of water, and cover it up very close. The next day stir it about very well with a battering machine or mill, twice or thrice, in order to blend it more thoroughly together, and continue this for two or three months, when the liquor must be strained and pressed out, and kept in wooden or glass vessels for use; the older it is, the clearer it will be, and consequently of more value. After it is pressed out, more water may be added to the mass, and having stirred it about violently as before, for some days, more Soy may be pressed out."

Note: This is an annual periodical. "Agricola Sylvan" is a pseudonym. Address: Gentleman.

211. Long (Joshua). 1779. Classified ad: New Minorca honey, very fine and cheap;... *Morning Chronicle and London Advertiser* (*England*). April 13. p. [1], col. 3.7.
• ***Summary:*** Also "... real Russia Rein Deer [Reindeer] Tongues, very fine new Olives, genuine Japan Soy [sauce], Cheroquee Sauce [Cherokee Sauce], cold drawn Castor Oil, real French Mareschall Powder,...

Note 1. This is the earliest document seen (April 2012) that uses the term "genuine Japan soy" to refer to soy sauce.

Note 2. This is the earliest document seen (Oct. 2010) that uses the term "Cheroquee Sauce."

Note 3. Although we searched the Web and old French dictionaries, and consulted a French translator, we have been unable (May 2011) to determine the meaning of "real French Mareschall Powder." Address: Warehouse, No. 73, Cheapside, London.

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212. Encyclopaedia Britannica; or, A dictionary of arts, sciences, &c. On a plan entirely new: by which, the different sciences and arts are digested in the form of distinct treatises or systems, comprehending the history, theory, and practice of each, according to the latest discoveries and improvements... 2nd ed.: Dolichos. 1779. Edinburgh: Printed for J. Balfour and Co. 10 volumes publ. 1778-1783. See vol. 4, p. 2511-12.

• ***Summary:*** "Dolichos... 2. The soja is a native of Japan, where it is termed *daidsu;* and, from its excellence, *mame;* that is, 'the legumen or pod,' by way of eminence. It grows with an erect, slender, and hairy stalk, to our height of about four feet. The leaves are like those of the garden kidney-bean (*See *Phaseolus*). The flowers are of a bluish white, and produced from the bosom of the leaves, and succeeded by bristly hanging pods resembling those of the yellow lupine, which commonly contains two, sometimes three, large white seeds. There is a variety of this kind with a small black fruit, which is used in medicine. Kempfer [Kaempfer] affirms that the seeds of this when pounded and taken inwardly, give relief in the asthma."

Note. This is the earliest English-language document seen (June 2013) which mentions whole soybeans, or which mentions black soybeans, or which states that black soybeans are used in medicine–apparently in Japan.

"This legumen is doubly useful in the Japanese kitchens. It serves for the preparation of a substance named *miso,* that is used as butter; and likewise a pickle celebrated among them under the name of *sooju* or *soy* [sauce]. To make the first, take a measure of mame, or the beans produced by the plant: after boiling them for a considerable time in water, and to a proper degree of softness, they beat or bray them into a softish pulse [pulp?]; incorporating with it, by means of repeated braying, a large quantity of common salt, four measures in summer, in winter three. The less salt that is added, the substance is more palatable; but what it gains in point of taste, is loses in durability. They then add to this mixture a certain preparation of rice, to which they give the name of *koos* [koji] and, having formed the whole into a compost, remove it into a wooden vessel which had lately contained their common ale or beverage named *sacki.* In about two months it is fit for use. The koos give it a grateful taste; and the preparing of it, like the polenta of the Germans, requires the skilful hand of an experienced master. For this reason there are certain people who make it their sole business to prepare the koos, and who sell it ready made for the purpose of making miso: a substance which cannot fail to be greatly valued in those countries, where butter from the milk of animals is unknown. To make sooju, or soy, they take equal quantities of the same beans boiled to a certain degree of softness; of muggi, that is corn, whether barley or wheat, roughly ground; and of common salt. Having properly mixed the beans with the pounded corn, they cover up the mixture, and keep it for a day and a night in a warm place, in order to ferment; then, putting the mass into a pot, they cover it with the salt, pouring over the whole two measures and a half of water. This compound substance they carefully stir at least once a-day, if twice or thrice the better, for two or three months: at the end of which time, they filtrate and express the mass, preserving the liquor in wooden vessels. The older it is, the better and the clearer; and if made of wheat instead of barley, greatly blacker. The first liquor being removed, they again pour water upon the remaining mass; which, after stirring for some days, as before, they express a second time, and thus obtain an inferior sort of soy."

Note 1. The descriptions of how to make miso and soy sauce are based on those of Englebert Kaempfer, published in 1712 in Latin in his book *Amoenitatum exoticarum...* and first written in Japan in 1690-92.

Note 2. This is the earliest English-language document seen (March 2009) that contains the word *miso.* While some miso (though usually described as a paste) has a consistency like butter, and a few types have a yellow color resembling that of butter, the Japanese have never used miso like butter. Rather they use it as a base for soups, sauces, and stews. The misunderstanding that miso "is used as butter" probably comes from the following statement by Englebert Kaempfer in his book *The history of Japan...* (1727). "Of the Meal of these Beans is made what they call *Midsu,* a mealy Pap, which they dress their Victuals withal, as we do with Butter." Concerning its etymology, the word "miso" seems to have come into English from the German *Midsu,* and into German from the Japanese *miso.*

Note 3. This is the earliest English-language document seen (April 2012) that uses the word "sooju" to refer to shoyu or soy sauce. Kaempfer used the same term (written *Sooju*) in 1712 in his book *Amoenitatum exoticarum...* which was written in Latin.

Note 4. This is also the earliest English-language document seen (Oct. 2006) that uses the term "the soja" as a singular noun to refer to the soybean.

Note 5 This is the earliest document seen (Dec. 2002) which states that soybeans can be used to give relief from asthma or other allergic conditions. Address: Edinburgh, Scotland.

213. **Product Name:** [Shoyu: Named Kikkoman Shoyu in 1784].
Foreign Name: Kikkôman Shôyu.
Manufacturer's Name: Mogi Saheiji.
Manufacturer's Address: Noda, Japan.
Date of Introduction: 1782.
New Product–Documentation: Noda Shoyu K.K. (Morio ICHIYAMA, ed). 1940. Noda Shoyu K.K. Nijunen-shi [Twenty-year history of Noda Shoyu, Inc.]. p. 466. The Kikkôman brand of shoyu (of which the logo is shown) was introduced in Tenmei/Temmei 2 (1784).

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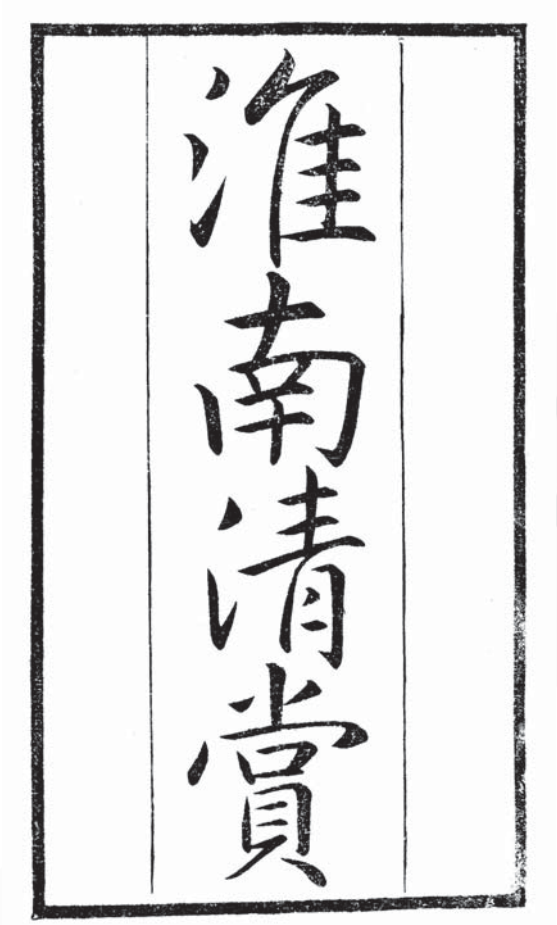
Fruin, W. Mark. 1983. Kikkoman: Company, Clan, and Community. p. 18. By 1782 "Mogi Saheiji, head of the oldest branch of the Mogi line, had added shoyu fermentation to his already established ventures in grain sales and miso manufacture, making the Mogi's proportion of representation in the [Noda shoyu manufacturing] guild three out of seven."

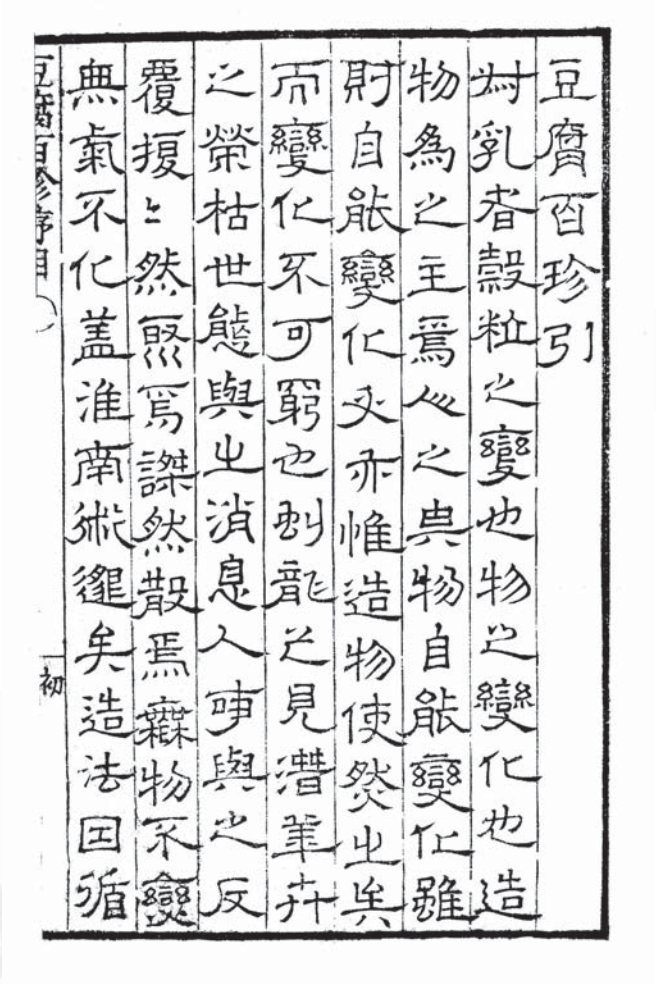
214. Ka, Hitsujun. 1782. Tôfu hyakuchin [One hundred rare and favorite tofu recipes]. Edo: Yamazaki Kinbe; Osaka: Fujiwara Zenshichiro (Kochiya Moheibei). 9 + 31 leaves. Illust. 21 cm. Photoreproduction of original edition. Edited by Abe Koryu, with rendering into modern Japanese. Tokyo: Shinshu Shorin. 280 p. Publ. 1971. Japanese summary by Kawakami 1978. [Jap]


淮南清賞

•***Summary:*** Containing many beautiful illustrations (wood block prints), this is Japan's earliest and most famous book on tofu. Several pages look like this.

In Japanese, the first reads *Wainan seisho,* which might be translated: [Tofu is] The pure and excellent thing from Wainan [Huainan].

This is the earliest Japanese document seen (May 2002) with the word "tofu" in the title, or that contains illustrations of tofu; it mentions dried-frozen tofu as well. Because of


豆腐百珍引
物為之主焉其與物自能變化雖
財自能變化又亦惟造物使然也
而變化不可窮也則龍之見潛革
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無窮不化蓋淮南術邇矣造法因循

its immediate success, a second volume (*Tofu Hyakuchin Zokuhen*) was published the next year. Devoted solely to tofu cuisine and combining the virtues of a travel and restaurant guide with those of a cookbook, the two books introduced the Japanese people to about 230 varieties of (or general recipes for) tofu cuisine served in the different provinces. It is still widely quoted. Abe (1971, 1974) has published a modern facsimile edition, nicely illustrated.

Illustrations (black-and-white wood-block prints on unnumbered pages) show (see next pages)::

(1) A village (2-page spread) seen from a distance with people appearing very small. (2) Five Japanese ladies in kimonos cutting tofu, grilling it to make *dengaku* over a low charcoal stove, and serving it on plates.

Note: This is the world's first book written entirely about tofu, or about soybeans or soyfoods.

215. Bryant, Charles. 1783. Flora diætetica: Or history of esculent plants, both domestic and foreign. In which they are accurately described, and reduced to their Linnæan generic and specific names. With their English names annexed, and ranged under eleven general heads. London: B. White. 379 p. See p. 297, 300-01. [2 ref]

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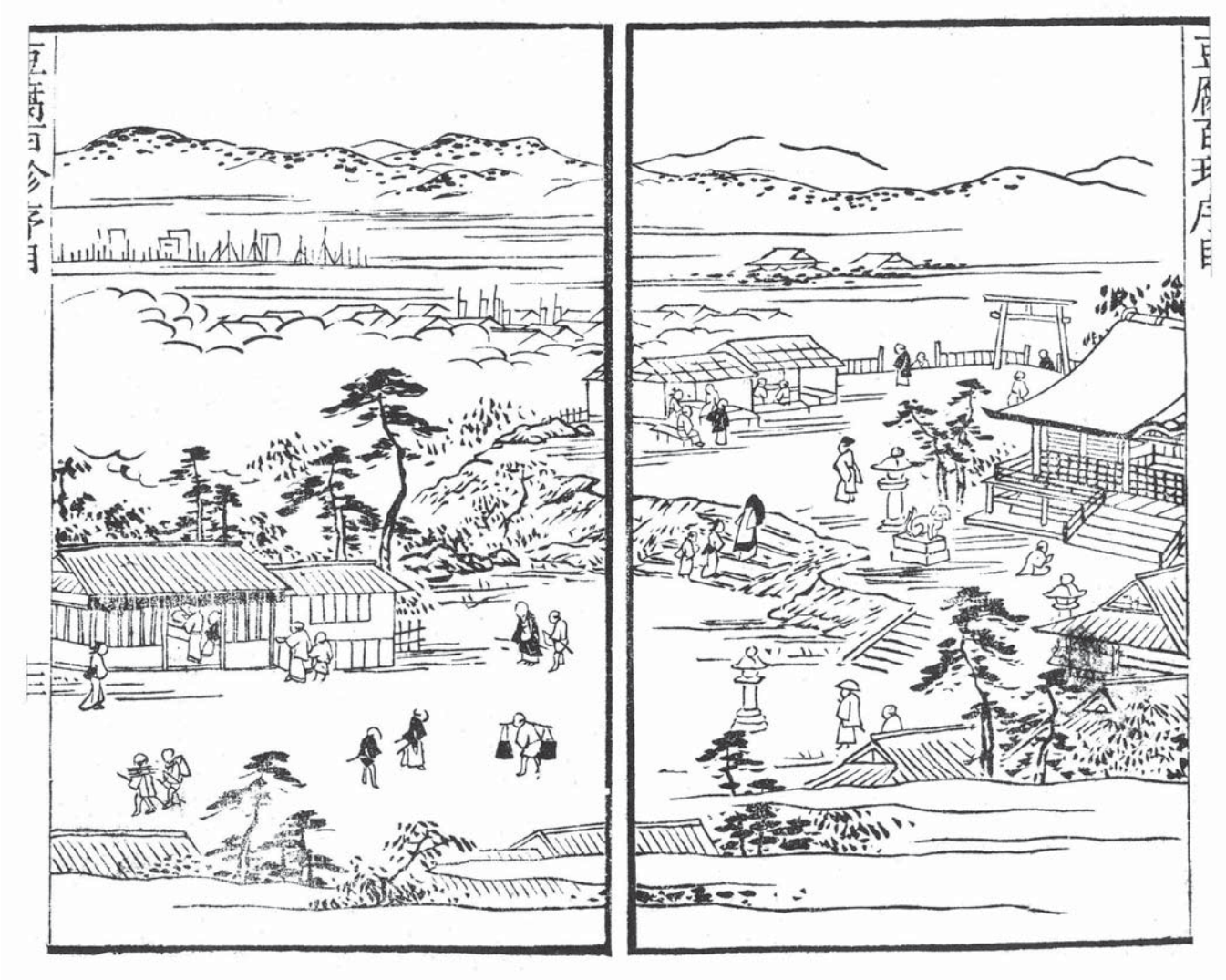

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• ***Summary:*** In Chapter VII. Leguminous plants. Section I. Pods and seeds of herbaceous plants (p. 297), there is a listing for "3. Dolichos soja. East India Kidney Bean." Pages 300-01 contain full details: "Dolichos soja. Indian Kidney Bean. Lin. Sp. pl. 1023. This is a perennial and a native of India. It sends up an erect, slender, hairy stalk, to the height of about four feet, furnished with leaves much like those of the Common Kidney Bean, but more hairy underneath. The flowers are produced in erect racemi, at the bosoms of the leaves; they are of the pea-kind, of a bluish white color, and are succeeded by pendulous, hairy pods, resembling those of the Yellow Lupine, each containing three or four oval, white seeds, a little larger than peas.

"This plant is much cultivated in Japan, where it is called *Daidsu,* and where the pods supply their kitchens for various purposes; but the two principal are with a sort of butter, termed *Miso,* and a pickle, called *Sooju* or *Soy* [sauce].

"The Miso is made by boiling a certain quantity of the beans for a considerable time in water, till they become very soft, when they are repeatedly brayed with a large quantity of salt, till all is incorporated. To this mass they add a certain preparation of rice, named Koos [probably koji; Kaempfer introduced this term in 1712], and having well blended the whole together, it is put into a wooden vessel, where in about 2 months it becomes fit for use, and serves the purposes of butter. The manner of preparing the Koos is a kind of secret business, and is in the hands of some certain people only, who sell the Koos about the streets, to those who make Miso.

"In order to prepare Sooju they take equal quantities of beans, wheat, or barley-meal, and boil them to a pulp, with common salt. As soon as this mixture is properly incorporated, it is kept in a warm place for twenty-four hours to ferment; after which the mass is put into a pot, covered with salt, and a quantity of water poured over the whole. This is suffered to stand for two or three months, they never failing to stir it well at least once a day, if twice or thrice it will be the better; then the liquor is filtered from the mass, and preserved in wooden vessels, to be used as occasions require. This liquor is excellent for pickling anything in, and the older it is the better."

Note 1. Bryant's account is largely based on that of Engelbert Kaempfer in his book *Amoenitatum Exoticarum,* written in Japan in 1690-92, and published in 1712. Bryant's book has an excellent, extensive index. It is the earliest English-language document seen (May 2006) that contains a detailed botanical description of the soybean.

Note 2. This is the earliest document seen (Oct. 2010) concerning soybeans (but only wild perennial relatives of soybeans) in India; cultivated soybeans have not yet been reported.

Note 3. This is the earliest English-language document seen (April 2009) that uses the term "East India Kidney Bean" (singular or plural, regardless of capitalization or hyphenation) to refer to the soybean.

Note 4. This is the earliest English-language document seen (March 2009) that uses the term "a sort of butter" to refer to miso.

Also discusses: Several species of edible seaweeds [sea vegetables]: "13. *Fucus saccharinus–Sweet Fucus or Sea Belts. Lin. Sp. pl.* [*Species plantarum*] *1630. Fucus alatus sive phafnagoides. Bauh. Pin. 364* [*Caspar Bauhin. 1623. Pinax Theatri Botanici*].

"14. Fucus palmatus–Handed Fucus. Lin. Sp. pl. 1630.

"15. Fucus digitatus–Fingered Fucus. Hud. Flo. Ang. 579 [*William Hudson. 1762, 1798. Flora Anglica*]. *Fucus arboreus polyschides edulis. Bauh. Pin.*

"16. Fucus esculentus–Edible Fucus Hud. Flo. Ang. 578 (p. 90-91, 100-01).

"39. *Ulva lactuca* or Green laver. Lin. Sp. pl. 1632. *Muscus marinus lactucæ similis. Bauh. Pin. 364* (p. 117-18).

Amaranthus oleraceus or Esculent Amaranth from India (p. 119). *Arachis hypogæa* or American Ground Nut [Peanut] (p. 298-99). *Cicer arietinum* or Chich Pea [Chick Pea] (p. 299; it "grows naturally among the corn in Spain and Italy, and it is much cultivated in these places for the table... It is much cultivated in Barbary [the Mediterranean coast of north

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Africa], by the name of *Gravances,* and is counted one of their best sorts of pulse"). *Ervum lens* or Lentil (p. 301-02; it "is a common weed in the cornfields of France... *Lentils* are a strong, flatulent food, very hard of digestion, and therefore seldom used now but to boil in soups, in order to thicken them"). *Lotus tetragonolobus* or Square-podded Pea [Winged Bean]. Lotus ruber, siliqua angulosa Bauh. Pin. 332 (p. 302-03). *Lupinus albus* or White Lupine (p. 303-04). *Ceratonia siliqua* or Carob tree (St. John's bread, p. 309-10). Coffea Arabica or Arabian coffee (p. 311). Coffea occidentalis or American coffee (p. 311-12). *Coix lacryma Jobi* or Job's tears (p. 332). *Polygonum fagopyrum* or Buck Wheat (p. 343). Ginkgo or Maiden-hair tree (p. 377-78). Bread fruit tree (378-79). Some of these are described in detail in separate records.

Note 5. This is the earliest Western document seen (Jan. 2005) that discusses sea vegetables (p. 117-18).

Note 6. This is the earliest document seen (June 2006) that mentions *Coix lacryma Jobi* or Job's tears.

Note 7. This is the earliest English-language document seen (June 2008) that gives a scientific name for lentils (*Ervum lens*).

Note 8. This is the earliest English-language document seen (June 2008) that mentions the chick pea (which it calls "Chich Pea") or gives its scientific name (*Cicer arietinum*).

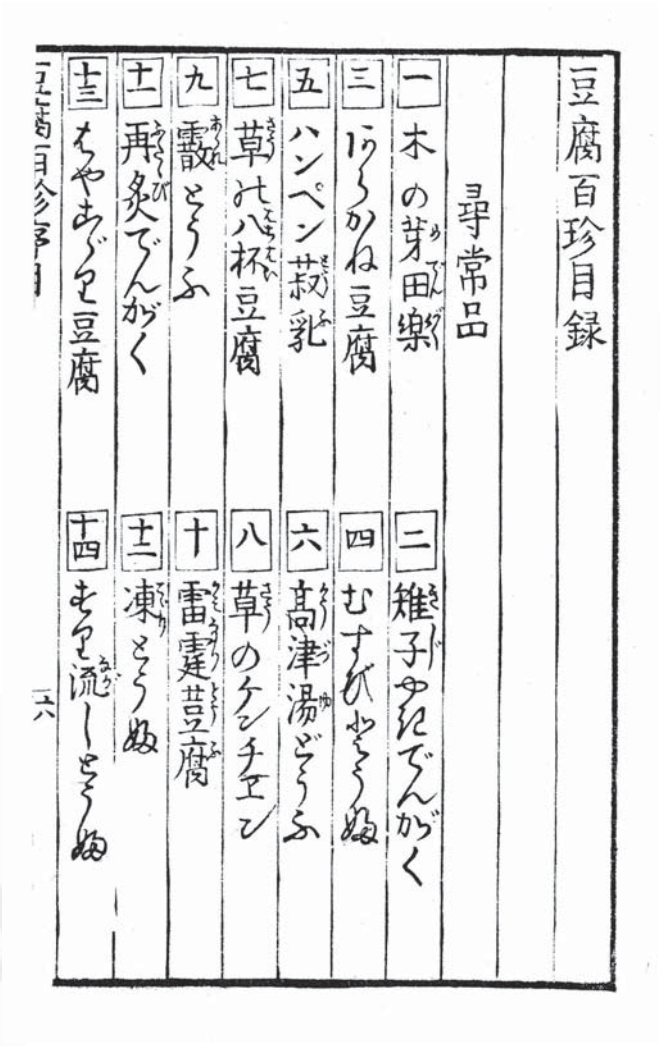
Note 9. This is the earliest English-language document seen (June 2012) that mentions koji, which it calls Koos.

Near the front of the book, a section titled "Terms explained" (xiii-xvi) is a glossary that gives concise definitions of the following botanical terms: Annual, biennial, perennial, sessile, serrated, crenated, pinnated or winged, peduncle, spike, spicula, panicle, spadix, racemus, umbel, calyx, catkin, petal, glume, arista or awn, floret, germen or seed bud, pericarpum, capsule, stamina, styles, stigma, summit. Address: Norwich, England.

216. Ka, Hitsujun. 1783. Tôfu hyakuchin zokuhen [One hundred rare and favorite tofu recipes: Sequel]. Osaka: Kochiya Moheibei. 280 p. (40 cho). Photoreproduction of original edition. Edited by Abe Koryu, with rendering into modern Japanese. Tokyo: Shinshu Shorin. 280 p. Publ. 1971. Japanese summary by Kawakami 1978. [Jap]

• ***Summary:*** The second volume of the popular *Tofu Hyakuchin,* which see.

Beautiful illustrations (black-and-white wood-block prints on unnumbered pages) show: (1) A lady in a kimono kneeling on her right knee in front of a low table on which are piled cakes of tofu. With a knife in her right hand, she is about to cut the tofu. (2) A restaurant in a temple with various people seated and walking. (3) A busy city street with people walking and eating in restaurants, whose fronts are open to the street, and whose names appear on a little cloth sign (*noren*) hanging from the eves. (4) "Dengaku Hoshi"–A Buddhist priest balancing on a single stilt called a "heron's



leg." (5) A hand holding a Japanese-style vegetable knife cutting a large block of tofu rested in an L-shaped wooden support; this helps in cutting the tofu into thin slices / sheets. (6) A specially-shaped long wooden box (*tsukidashi*) having about the same cross section as that of a block of tofu, with a handle on one end, a screen over the opposite exit end, and a wooden pusher, which is used to push a block of tofu into the box and through the screen, thereby creating tofu noodles, similar to those called *tokoroten* made from a block of gelled *tengusa / gelidium* seaweed.

Masaaki Yasuda states in "Fermented tofu, tofuyo" (2011, p. 302): "The earliest known reference to fermented tofu in Japan comes from Osaka. In 1883, Ka Hitsu Jun published the famous book, *Tofu Hyaku Chin Zokuhen* (The Sequel to One Hundred Favorite Tofu Recipes). In this book, 'red tofu' and the other fermented tofu, 'tofu-ji,' were introduced. According to the book, how to make the red tofu was a family secret, and few details on its production were provided. The other description was clearly of Chinese style red furu, because the materials not only included red koji from China, shiro zake (white sake, Chinese distilled liquor

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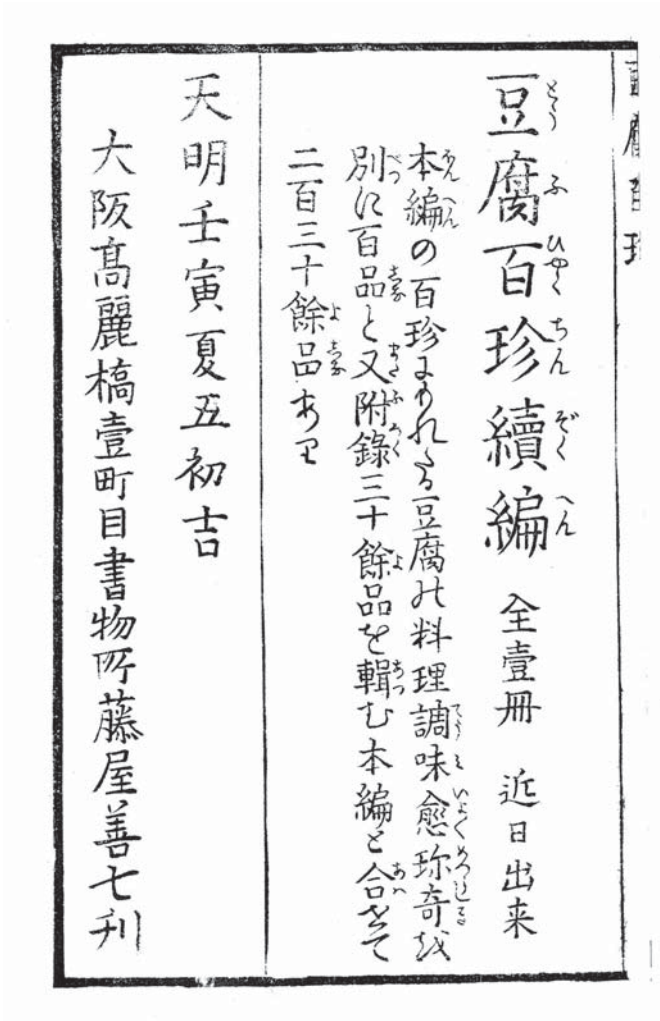

豆腐百珍續編

全壹冊　近日出来

本編の百珍よりれも豆腐け料理調味愈珎奇絶別に百品と又附錄三十餘品を輯む本編と合せて二百三十餘品あり

天明壬寅夏五初吉

大阪高麗橋壹町目書物所藤屋善七刊

豆腐百珍續編　序目

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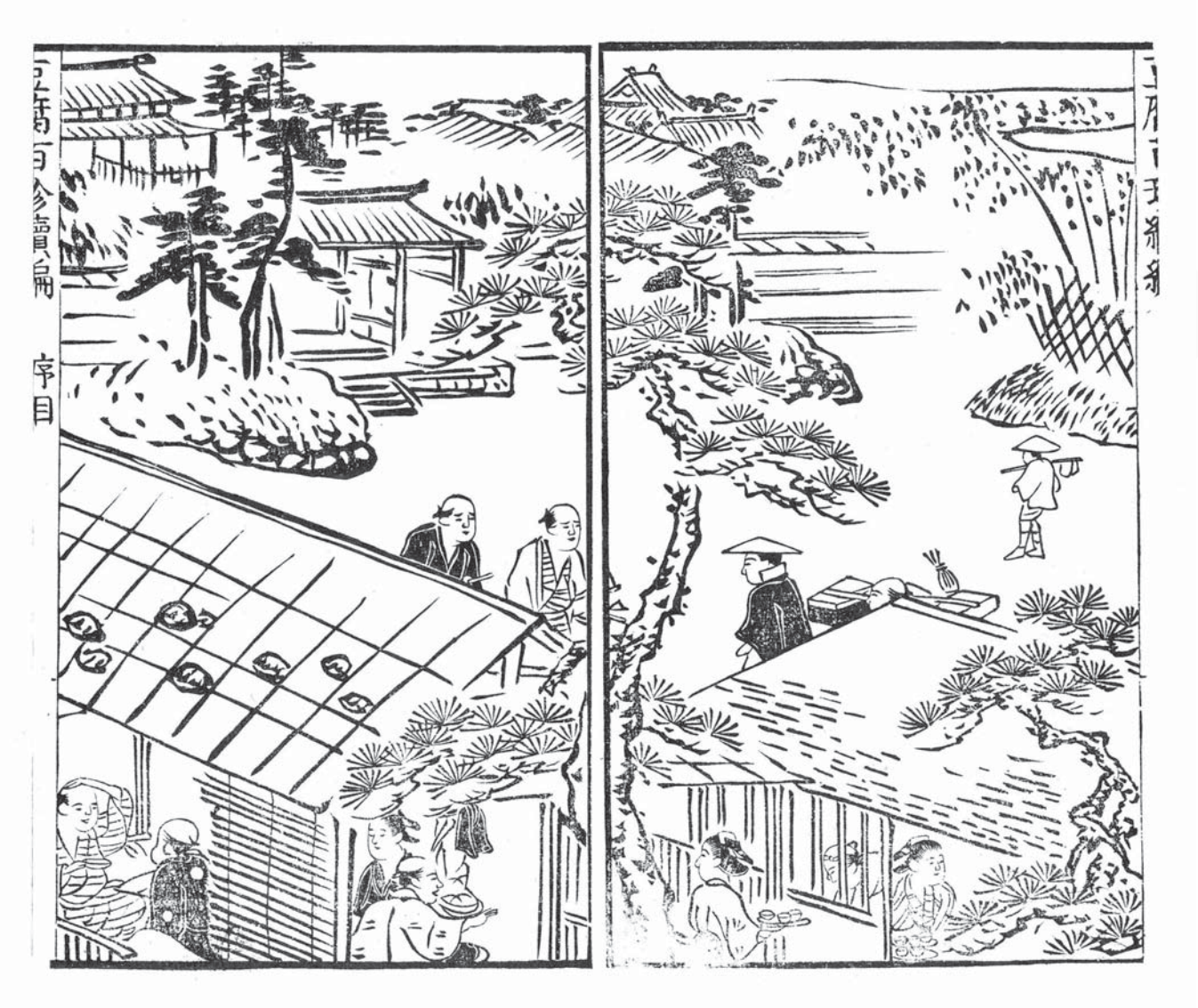

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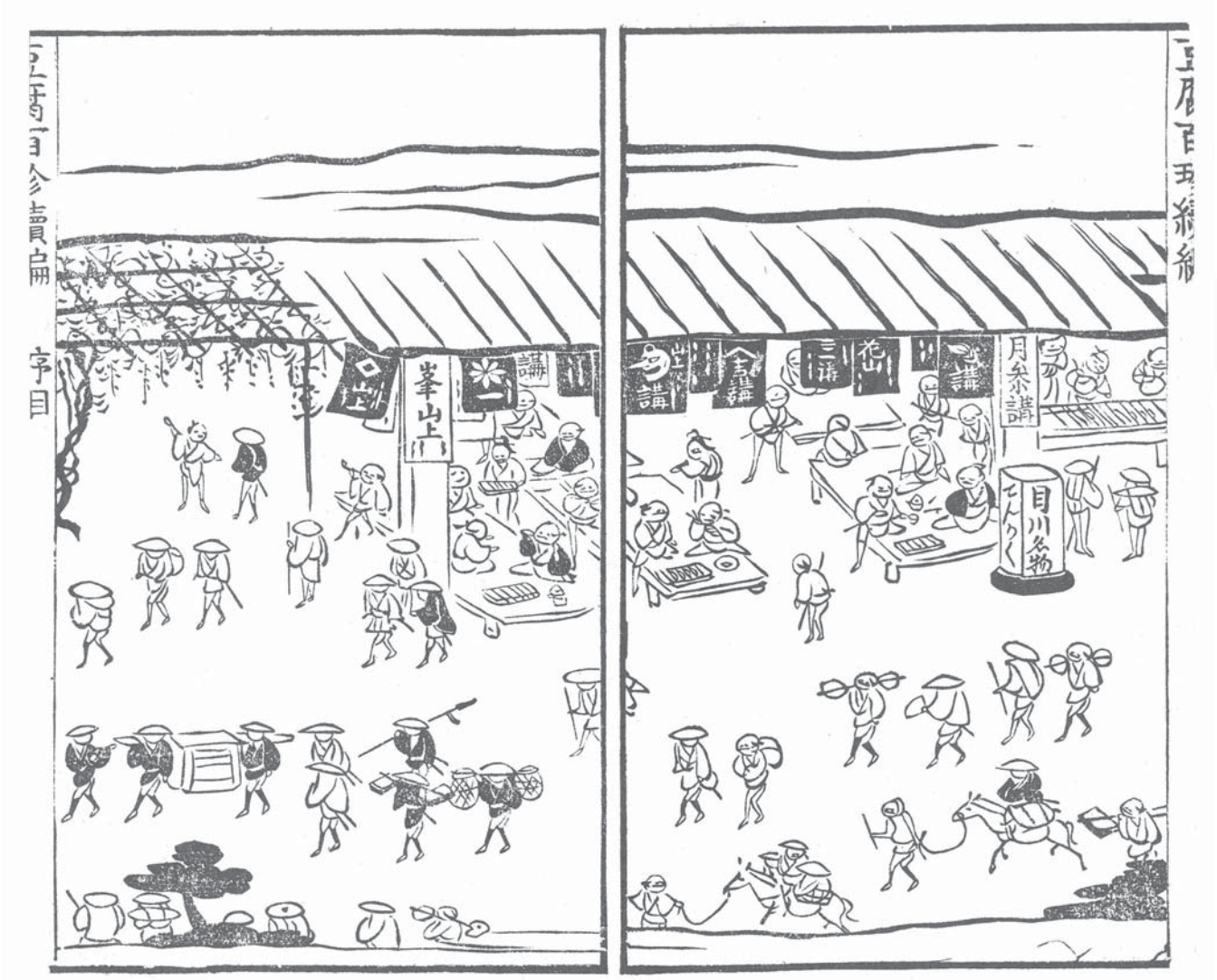

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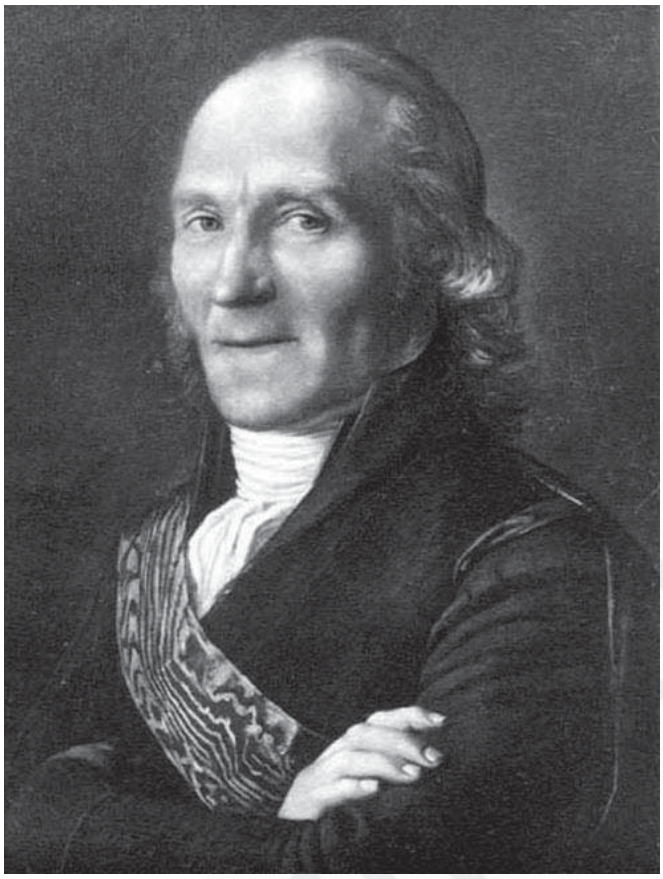
named 'Bai-Jiu'), *sansho* (Japanese spice, this spice seems to be used instead of chili), but also refer to it as tofu-ji and use the same method of preparation."

217. Thunberg, Karl Peter. 1784. Flora Iaponica, sistens plantas insularum Iaponicarum... [The flora of Japan, setting forth the plants of the Japanese islands]. Lipsiae (Leipzig), in bibliopolio I.G. Muelleriano. lii + 417 p. See p. 279, 282-83, 377-78. [Lat]



• ***Summary:*** In the chapter titled "Diadelphia. Decandria," within the genus Dolichos is listed D. Soja (p. 282). After a botanical description in Latin, the last paragraph reads: *"Soja Iaponensium, quae Kitjap chinesium praefertur e seminibus huius praeparatur, et plurima fercula atque embemmata tantum non omnia ingreditur, viceque Salis marini contusi fungitur."*

In the chapter on "Kaempfer's Illustrations" (*Kaempfervs Illvstratvs*) are listed (p. 377): *Coix lachryma* [Job's tears] (834). Soba (buckwheat noodles, 835). *Sesamum orientale* (sesame seeds, 835). On page 838: Atsuki (azuki, 837). Dolichos soja–Daidsu (837). Kudzu (840).

Karl Peter Thunberg lived 1743-1828.

Talk with Prof. Ted Hymowitz of the University of Illinois. 1995. March 24. The Japanese recently (and finally) published a Japanese-language edition of Thunberg. They found his illustrations in Russia in Maximowicz's collection.

An excellent old illustration of "Carolus Pet. Thunberg" is found on page 1 in the book *Miscellaneous Papers Regarding Japanese Plants* (1935; 562 p.). Address: Sweden.

218. Tôfu hyakuchin yôroku [One hundred and rare and favorite tofu recipes, additional record]. 1784. Nishimura Ichirouemon and Nakagawa Toshiro (Heian, Horikawa), Fujio Zenshichi (Osaka, Koribashi). 50 p. Japanese summary by Kawakami 1978, p. 117. [Jap]

• ***Summary:*** There was a book called Toka-shu ("Collection of Bean Flowers") that appeared from an unknown author during the Edo period (1600-1868). A bookstore owner in Osaka bought that book and showed it to Ka Hitsujun, the author of the *Tofu Hyakuchin.* They decided to publish the book under the name *Tofu Hyakuchin Yoroku.* They bought the wood blocks in 1784 but did not actually publish the book until 1788. The contents of the book is like the *Tofu Hyakuchin* except that it has recipes of the Edo-period style.

219. Long (Joshua). 1785. Classified ad: Just arrived, a Parcel of fine French Pomatums, hard and soft... *Times* (*London*). April 28. p. 1, col. 4. RiceVerm

• ***Summary:*** "... also West India Pickles of all Sorts; the same from the East Indies, as mangoes, Limes, Pickalilly, and Mountain cabbage; Lemon Pickle, Lime Juice, Lime Rob, &c... Vermicelli and Maccaroni [Macaroni], Lock Soy, &c. real Japan Soy [sauce], Kian Pepper [Cayenne Pepper], and real East India Currie Powder."

"N.B. An exceeding fine Parcel of real cold drawn Castor Oil."

Note 1. This is the earliest document seen (April 2012) that uses the term "real Japan Soy" to refer to soy sauce.

Note 2. This is the 2nd earliest document seen (April 2012) that uses the term "Lock Soy." Notice that in this list of items advertised, "Lock Soy" comes immediately after "Vermicelli and Macaroni." Most early publications that describe "Lock Soy," starting with *A Voyage to Cochinchina, in the Years 1792 and 1793,* by John Barrow (published 1806, p. 315) state that it is type of rice vermicelli; made in today's south central Vietnam (Cochinchina around Da Nang) and in China. In Cochinchina it is perfectly transparent, whereas "The Chinese Lock-soy is opaque." It (apparently) does not contain any ingredient made from the soybean.

Letter (e-mail) from Andrea Nguyen, Vietnamese-born food writer from Santa Cruz, California. 2010. May 4. Lock Soy could well be Soi Loc–a type of noodle made from tapioca in the area of Da Nang, Vietnam. Squiggly and chewy, it resembles worms. Soy is a misspelling of *soi,* which means "strands." Loc refers to "tapioca." If this explanation is correct, it used mostly with sweets and does not contain any soy ingredients.

As of May 2011, the term "Lock Soy" appears in this

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database 17 times from 1760 to 1911.

Note 2. This is also the earliest document seen (Aug. 2011) that uses the term "real Japan soy" to refer to soy sauce. As of Feb. 2007, the term "Japan Soy" (referring to soy sauce) appears in this database 42 times from 1785 to 1873.

Note 3. This is also the earliest document seen (Dec. 2005) in the *Times* (London) that uses the term "Soy" (with or without capitalization) to refer to soy sauce.

Pomatum is a synonym for "pomade," a perfumed ointment, especially a fragrant hair dressing. Address: No. 73, Cheapside, London.

220. Bryant, Charles. 1785. Carl Bryant's Verzeichniss der zur Nahrung dienenden so wohl einheimischen als auslandischen Pflanzen. 2 v. [Flora diaetetica: Or history of esculent plants, both domestic and foreign. 2 vols.]. Leipzig: Bey Weidemanns Erben und Reich. See Vol. I, Part I (Erster Theil), p. 478-80. 21 cm. [Ger]

• ***Summary:*** This is largely a German translation of Engelbert Kaempfer's book *Amoenitatum Exoticarum,* written in Japan in 1690-92, and published in 1712.

The section titled "Dolichos Soja. *Indian Kidney Bean. Linn.* Spec. plant. 1023.–Sojabohne" (p. 478-80) discusses the soybean (also called "Daidsu") and various soy products, including miso, koji (*Koos*), and soy sauce (*Der Sooju*).

Note 1. This is the earliest German-language document seen (March 2009) that mentions miso, which it calls "Miso." The actual text reads: "... *aber macht man Suppen und eine Art Butter daraus, welche Miso heisst,...*"

Note 2. This is the earliest German-language document seen (April 2012) that mentions soy sauce, which it calls "Sooju" or "Soy." The actual text reads: *"Dieser lezten Bereitung legt man den Namen Sooju oder Soy bei." "Der Sooju wird folgender Gestalt zubereitet;..."*

The chapter on legumes (p. 474-75) also discusses: (1) Arrachis Hypogaea. American ground nut. (2) Cicer arietinum. The chich pea, or Garavances. French: Pois Chiche. (3) Dolichos Soja. East Indian kidney beans. Sojabohne.

Note 3. The term "East Indian" probably refers to the Dutch East Indies–today's Indonesia.

(4) Ervum Lens. Lentil. (5) Lotus edulis. (6) Lotus tetragonolobus. Square podded crimson pea. Spargelerbsen. Viereckiger Schotenklee. (7) Lupinus albus. (8) Phaseolus vulgaris. Common kidney bean. French: Faseole. Haricot commun blanc. (9) Pisum sativum. (10) Pisum Americanum. (11) Pisum maritimum. 12. Vicia Faba. Common garden bean

Note 3. Charles Bryant died 1799. Address: Norwich.

221. Sake shoyu denjuki [Information about sake and shoyu]. 1785. Japan [Jap]*

• ***Summary:*** Yokotsuka (1985, p. 206), who cites this book as "*Sake shoyu denjuki* (1785)," states that it is about the development of and formulas for commercial shoyu during the Edo period. Address: Japan.

222. Shôyu denjuki [A record of initiation into shoyu]. 1785. Japan. [Jap]*

• ***Summary:*** Early book on shoyu production.

223. Powell (William). 1786. Classified ad: Assortment of groceries to be sold... *Connecticut Journal* (*New Haven*). June 14. p. 3.

• ***Summary:*** "At the store formerly occupied by Mr. Joseph Howell... Mersailles [Marseilles] and Florence sweet Oil. Japan Soy [sauce]. English Kitchup."

Note 1. This is the earliest document seen (March 2011) concerning soybean products (soy sauce) in Connecticut; soybeans as such have not yet been reported.

Note 2. This is the earliest document seen (June 2007) that contains the term "Florence sweet oil," suggesting that this sweet oil might be olive oil. Address: Head of the Long-Wharf.

224. Bankes, Thomas. 1788. A new and authentic system of universal geography, antient and modern: All the late important discoveries made by the English, and other... Vol. 1 of 2. London: Printed for C. Cooke. 623 p. See p. 122.

• ***Summary:*** In the chapter on Japan, Section IV states (p. 122): "Their articles of exportation are wrought silk and cotton, rice, soy, Japan ware, porcelain, gold, silver, copper,..."

Other titles: "New, Royal, and Authentic System of Universal Geography..." Address: Rev., Vicar of Dixton, Monmouthshire [Wales].

225. Burgess. 1789. Classified ad: For families going into the country. Delicacies for the table. *Times* (*London*). July 27. p. 1, col. 2.

• ***Summary:*** "To the Curious in Fish Sauce and Gravies. Burgess's new invented Sauce Picante, to eat with all kinds of cold meats, and directions given for using it. His Original and Superior Essence of Anchovies, so much approved of for Anchovy Sauce. Also the finest flavoured Gorgona Anchovies, for bread and butter, and for making Sandwiches, &c."

"Japan Soy [sauce], and Lemon Pickle. Fine Capoot Capers." Also many types of hams, tongues, pickles and vinegar.

This ad also appeared in the Aug. 3 issue (p. 1, col. 2). Address: No. 107, Corner of Savoy Steps [London].

226. *SoyaScan Notes.* 1789. Terms used in the *Times* (London) to refer to soy sauce (Overview). 23 Jan. 2007. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** In descending order of frequency, terms with

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two or more appearances are: Japan Soy–10. Lock Soy (probably a type of rice vermicelli, not soy sauce)–8. India Soy–5. China Lock Soy (probably vermicelli)–2. Lack Soy (probably rice vermicelli)–1. China Lack Soy (probably rice vermicelli)–1.

Note: The prevalence of the term "Japan Soy" indicates (1) That this type of soy sauce was probably most popular, and (2) That it was probably purchased from Dutch merchants; they were the only Europeans allowed to trade with Japan during the 1780s.

227. Ellis, John. 1789. A catalog of such foreign plants as are worthy of being encouraged in our American colonies for the purposes of medicine, agriculture and commerce. *Transactions of the American Philosophical Society* 1:325-36. See p. 327. (Held at Philadelphia, for Promoting Useful Knowledge. Second edition corrected). [1 ref]
• ***Summary:*** "From a pamphlet by John Ellis, F.R.S. [Fellow, Royal Society]. Presented by the Honorable Thomas Penn, Esq. to the American Philosophical Society through the hands of Samuel Powell, Esq."

"Dolichos soja Linn. Sp. 1023. A kind of kidbean called Daidsu. Used for making Soye* or Indian Ketchup. See Kaempfer, Amoenitat.

"* The method of preparing East-India Soye or India Ketchup. Take a certain measure, for instance a gallon, of that sort of kidney-beans, called Daidsu by the Japonese, and Caravances by the Europeans; let them be boiled till they are soft; also a gallon of bruised wheat or barley (but wheat makes the blackest Soye) and a gallon of common salt. Let the boiled caravances be mixed with the bruised wheat, and be kept covered close a day and a night in a warm place, that it may ferment. Then put the mixture of the caravances and wheat, together with the gallon of salt, into an earthen vessel, and with two gallons and a half with common water, and cover it up very close. The next day stir it about well with a battering machine or mill (*Rutabulum*) for several days, twice or thrice a day, in order to blend it more thoroughly together. This work must be continued for two or three months, then strain off and press out the liquor, and keep it for use in wooden vessels; the older it is the clearer it will be, and of so much more value. After it is pressed out, you may pour on the remaining mass more water, then stir it about violently, and in some days after you may press out more Soye."

Note: In 1770 Ellis was the commercial agent for West Florida in London. His first book, published in 1770, was titled *Directions for Bringing Over Seeds and Plants... with a Catalogue of Such Foreign Plants as are Worthy of Being Encouraged in Our American Colonies...* It told how to pack seeds (often in beeswax) to prevent them from spoiling on long sea voyages.

First cited by Hymowitz. 1986. Bibliography of early, previously uncited publications on soybeans in the United States. 2 p. Unpublished. \

228. **Product Name:** [Kimbue Soy Sauce].
Foreign Name: Kimbue Shôyu.
Manufacturer's Name: Fueki Shoyu Co. Ltd.
Manufacturer's Address: 660 Kamiigusa, Kawashima-cho, Hiki-gun, Saitama prefecture, Japan.
Date of Introduction: 1789.
New Product–Documentation: Product with Label (Soken Gentle Tamari) purchased at Open Sesame in Lafayette, California. 1991. Feb. 16. "Low Sodium Wheat Free Soy Sauce." Since 1789. Ingredients: Whole soybeans, well water, sea salt. "Soken Gentle Tamari... is brewed by the Kimbue Co., makers of fine soy sauce for over 200 years."

Note: Kimbue is not the name of a company, but rather of a brand of Japanese soy sauce. As of Dec. 1991, Kimbue is made by: Mr. Toyohiko Fueki, Fueki Shoyu Co. Ltd., 660 Kamiigusa, Kawashima-cho, Hiki-Gun, Saitama-ken, Japan. Phone: 0492-97-0041.

229. Alting, Willem Arnold. 1790. [Re: Request for provisions]. Letter to Hendrik Casper Romberg (Chief) and Petrus Theodorus Chasse, Deshima factory [Nagasaki, Kyushu, southern Japan], June 23. Handwritten, with signature. [Dut]
• ***Summary:*** In the future, we request that your honourable sirs do not send the demand for fruits that we normally claim from Japan, except for Soy [sauce] (*Soija*) and Saké (*Sackij*). [i.e., please continue to send soy and sake].

Bibliographic reference in Dutch: NA, NFJ 410, ontvangen brieven (23-6-1790). No page or folio numbers. Contemporary hand-written letter in a letter-book for the administration on Deshima.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 410 [National Archives. Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 285]. Address: Governor-General, and the Council, Batavia [today's Jakarta, Indonesia].

230. Governor-General and the Council. 1790. [Re: Provisions]. Letter to the Deshima factory [Nagasaki, Kyushu, southern Japan], June 23. Handwritten, with signature. [Dut]
• ***Summary:*** Batavia informs Deshima that in the future no preserved fruits [such as *umeboshi*] need to be sent to Batavia, only the soy [sauce] and sake requested. The tubs should be cleaned first and prepared to contain the sake and soy.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); inventaris nummer 410 [National Archives, Prins Wilhem Alexanderhof 20,

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The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); record number 410]. Address: Batavia [today's Jakarta, Indonesia].

231. Romberg, Hendrik Casper. 1790. Diary. In: Leonard Blussé, Cynthia Viallé, et al, eds. 2004. The Deshima Diaries Marginalia, 1740-1800. Tokyo: Japan-Netherlands Institute. xl + 898 p. See p. 628-29 (#122, 127).
• ***Summary:*** In the section titled "The arrival of the *Zuiderberg,"* at 1790 Sept. 1–"The five men went aboard... I ordered *sake* and soy for the Company." Address: Opperhoofd (Chief of the Dutch factory), Deshima, Nagasaki, Japan.

232. Lamarck, Jean Baptiste... de. 1790. Dictionnaire encyclopédique méthodique. Botanique. Vol. 2. Dolic du Japon, Dolichos soja Lin. [Systematic and encyclopedic dictionary. Botany. Vol. 2. The Soybean, Dolichos soja]. Paris: Chez Laporte, Imprimeur-Libraire. 774 p. See p. 299. [1 ref. Fre]
• ***Summary:*** Plants are listed by French names. The author lists the soybean under Dolic. as follows: "28. Dolic du Japon, *Dolichos soja. Lin. Dolichos caule erecto flexuos, racemis axillaribus eredis, leguminibus pendulis hispidis subdispermis.* Lin. Thunb. Fl. Jap. 282.

"Phaseolus erectus, siliquis Lupini, fructu pisi majoris candido. Kæmpf. Amoen Exot. 837. t. 838. Japonicè; daidsu s. mame. Phaseolus Japonicus. Raj. Suppl. 438. nº. 28 [John Ray. 1704. *Historia plantarum. Vol. 3. Supplementum.* See p. 438].

The original French reads: "Sa tige est droite, haute d'un pied & demi, striée ou cannelée dans sa partie supérieure, & abondamment chargée de poils rousseâtres. Ses feuilles sont composées de trois folioles ovales, obtuses, velues, molles, soutenues sur des pétioles communs velus & striés. Les fleurs font petites, purpurines, disposées dans les aisselles des feuilles sur des grappes droites, velues, & fort courtes. Les gousses sont longues d'un pouce & demi, pendantes, un peu comprimées, pointues, dispermes, & couvertes de poils rousseâtres fort abondans. Cette plante croît au Japon, dans les Indes orientales, & est cultivée au Jardin du Roi. Les Japonois préparent avec ses semences une sorte de bouillie qui leur tient lieu de beurre, & dont ils font une sauce fameuse, qui se sert avec les viandes rôties; ils nomment la bouillie *miso,* & la sauce *sooja* ou *soja.*"

In English, this means: "Its stalk is straight, a foot and a half high, striped or fluted in its upper part and abundantly covered with reddish or russet hairs. Its leaves are comprised of 3 oval leaflets, obtuse (rounded at the free end), hairy, soft, several leaves are borne on petioles that are hairy and striped. The flowers are small, purplish, arranged on the axils of the leaves, in straight clusters which are hairy and very short. The pods are an inch and a half long, pendant, slightly compressed (not round), pointed, dispermes, and covered with very abundant reddish hairs. This plant grows in Japan and the East Indies, and is cultivated at the Royal Garden (*Jardin du Roi*)**.** It is an annual, and I have seen a living plant specimen. Using its seeds, the Japanese prepare a sort of paste [miso], which they use in place of butter, and that is also used to make a famous sauce, which is served with roasted meats. They call the paste *miso* and the sauce *sooja* or *soja.*

Note 1. This is the earliest (and only) French-language document seen (Jan. 2010) that uses the term *"Dolic du Japon"* (regardless of capitalization or hyphenation) to refer to the soybean.

Note 2. This is the earliest French-language document seen (April 2012) that uses the term *la sauce soja* to refer to soy sauce.

Note 3. Merrill stated incorrectly that Lamarck called the soybean "Phaseolus max" following Linnaeus. Address: Former officer in the Regiment de Beaujolais, Royal Academy of Sciences.

233. Loureiro, Joao de. 1790. Flora Cochinchinensis: sistens plantas in regno Cochinchina nascentes. Tomus II. [The flora of Cochin China, setting forth the plants in the kingdom of Cochin China. Vol. 2.]. Ulyssipone [Lisbon], Portugal. p. 433-884. See p. 441-42, 522-24. 27 cm. [Lat]
• ***Summary:*** In the section titled "Diadelphia. Decandria" (p. 441-42) we read: "Sp. 13. Dolichos Soja, Dau nanh. Hoam téu [huang-tou = yellow bean]. Writing in Latin, he gives a botanical description of the plant, describes its habitat as Cochin China and China, and cites as sources Thunberg, Kaempfer, and Rumphius. Then he adds: "Uses: These seeds, having been boiled or lightly toasted, are quite acceptable to both the stomach and the palate. From them is made the famous Japanese soy sauce called Soia, which the Chinese and Cochin Chinese frequently use for cooking food and stimulating the appetite. There is also produced a white food resembling coagulated milk (*lactis coagulati*) and called Teu hu or Tau hu [tofu] by the Chinese; it is the most widely used food among them. Although it is rather bland by itself, if the appropriate condiments are added, it becomes a food which is neither unpleasant nor unhealthy."

The author: Ioannis (Joao) de Loureiro was born in Portugal in 1715. Somewhere between 1735 and 1743 he arrived in Cochin China (today's Vietnam) as a Jesuit missionary. Living at Hué, the capital, near the sea coast, he tells us that he had no access to European medicines. So he was obliged to depend entirely on native medicinals, and by investigating them he was necessarily induced to study the local flora and to make botanical collections. Thus he developed a herbarium of nearly 1,000 species. In 1779 he went to Canton to do botanical research for 3 years, living within a factory. He left for Lisbon in 1782, and died in 1794 or 1796. He was one of the most prominent botanical collectors of the 1700s, giving rich descriptions of

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economical and medicinal uses.

The book: Volume 1 was first published in 1789; the set was reissued 3-4 years later edited by Willdenow, with added notes. It describes 1,257 plants (Bretschneider 1880, p. 129-46).

Note 1. This is the 2nd earliest document seen (May 2010) concerning soybeans in Vietnam, or the cultivation of soybeans in Vietnam. This document contains the 2nd earliest date seen for soybeans in Vietnam, or the cultivation of soybeans in Vietnam (1790). The source of these soybeans is unknown.

Note 2. This is the earliest Latin-language document seen (April 2013) that uses the word "Teu hu" or the word "Tau hu" to refer to tofu.

Also discusses: *Dolichos tetragonolobus* (p. 437. Winged bean? Habitat: Cochin China and China). The genus *Arachis* (p. 522-24), with two species: *Arachis asiatica* and *Arachis africana.* He notes (p. 524) that Linnaeus calls the latter *Arachis hypogoea* [peanut]. Address: Portugal.

234. Miller, Philip; Chazelles, Laurent Marie. 1790. Dictionnaire des jardiniers,... Supplement: Dolichos soja [The gardener's dictionary,... Supplement]. Paris: Chez Guillot, Libraire de Monsieur. See Vol. 1, p. 415. [Fre]
• ***Summary:*** Entries for the 27 species in the genus *Dolichos* begin on p. 410. On p. 415 we read: "24. *Dolichos soja. Linn. sp. 28. Thumb. flor. Jap. p. 282."* Dolic from Japan (*Dolic de Japon*). The stem of this annual plant is flexuous, erect, much bristled and a foot tall; its leaves are ternate, hairy and pedunculated. Its flowers are purple, laid in axillary clusters: the corolla is barely larger than the calyx: the pods are pendulous, bristling, and hold two white seeds, with the appearance of two large peas, with which the Japanese make a sauce, which they call Soy (*Soja*), to season their culinary preparations.

The French text states: *"Dolic du Japon. La tige de cette plante annuelle est flexueuse, érigée, très-hérissée et longue d'un pied. Ses feuilles sont ternées, elues et pédonculées. Ses fleurs sont propres et en grappes axillaires... les gousses sont pendantes, hérissées, et renferment deux semences blanches, comme de gros pois, dont les Japonois font une sauce pour assaisonner leurs mets, et qu'ils nomment Soja."*

235. Ryôrisho. Fu to tôfu [Cookbook on wheat gluten and tofu]. 1790. Japan. 38 p. Unpublished manuscript. Japanese summary by Kawakami 1978, p. 175. [Jap]
• ***Summary:*** This must be the last volume of a three volume work. This one is about Zen vegetarian cookery (*shojin ryori*). The other two were about fish and poultry. There are a lot of tofu recipes, including Suizenji Tofu, Enmeiji Tofu, Uneri Tofu, and Shiruko Tofu. A description of how to make sweet simmered miso (*neri-miso*) is also given.

236. Burgess (J.). 1792. Classified ad: Genuine rich sauce, for fish, made dishes, hashes, beef-steaks, &c. &c. *Observer* (*London*). Feb. 5. p. 1.
• ***Summary:*** "Bengal Currie Powder, with a receipt for using it. Zoobditty Mutch. Walnut Ketchup. Oyster Ketchup. Mushroom Ketchup. Lemon pickle. Fine Japan soy [sauce]. Quin's Sauce..." Address: No. 107, Corner of Savoy-steps, Strand, London.

237. Hemmij, Gijsbert. 1793. Diary. In: Leonard Blussé, Cynthia Viallé, et al, eds. 2004. The Deshima Diaries Marginalia, 1740-1800. Tokyo: Japan-Netherlands Institute. xl + 898 p. See p. 667 (#30).
• ***Summary:*** 1793 April 3–"On behalf of the first retainer of the Lord of Tsushima, Sukezaemon presented me with some dried fish and a barrel of soy [sauce]. I dutifully reciprocated." Address: Opperhoofd (Chief of the Dutch factory), Deshima, Nagasaki, Japan.

238. Loureiro, Joao de. 1793. Flora Cochinchinensis: sistens Plantas in regno Cochinchina nascentes. Vol. 2. Dolichos soja [The flora of Cochin China. Vol. 2.]. Denuo in Germania edita cum notis Caroli Ludovici Willdenow; Bernolini [Berlin], impensis. See p. 537-38. Edited by Willdenow, with added notes. Also published by the Acad. Sci. of Lisbon. [Lat]
• ***Summary:*** The first edition of this important work was published in 1790. The content of this 1793 edition concerning *Dolichos soja,* published in Berlin and edited by Willdenow, is almost identical to that of the 1790 edition. The text has been re-set to fit on the smaller pages, and some abbreviations have been written out. In the chapter titled "Diadelphia. Decandria" we find: Arachis (p. 430-31; incl. Arachis Asiatica and Arachis Africana, also called Arachis Hypogoea). Phaseolus radiatus (p. 435). Dolichos Soja (p. 537-38).

By unusual coincidence, the earliest known recorded feeding of cow's milk to a human infant (by Underwood) also occurred in 1793. Address: Portugal.

239. *Monthly Review* (*The*). *Series 2.* 1794. Thunberg's travels. 13:121-32. Feb. See p. 127. [Eng]
• ***Summary:*** "'The Dutch and the Chinese are the only nations that are suffered to trade to Japan. The Dutch now send hither annually two ships only, which are fitted out at Batavia in the month of June, and return at the latter end of the year. The principal articles carried from hence are Japan copper, raw camphor, and lacquered woodwork; porcelain, silks, rice, Sakki, and soy [sauce], make a very inconsiderable part of the private trade.'"

240. Moench, Konrad. 1794. Methodus plantas horti botanici et agri Marburgensis, a staminum situ describendi [A method of describing plants in the botanical gardens and fields of Marburg (Germany), according to the position of the

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stamens]. Marburg, Germany: Marburgi Cattorum. 780 p. See p. 153. [2 ref. Lat]

• ***Summary:*** The plant which Linnaeus had named *Dolichos Soia,* was here rechristened by Mönch (Moench), a German botanist from Marburg, as *Soia hispida.* Moench coined the genus name Soia, a term which had been used previously, but not as a genus name, by Ray (1704), Dale (1705), Tournefort (1730), and Loureiro (1790, 1793). Tournefort had named the soybean *Phaseolus Japonicus.*

After a 6-line description of the genus in Latin, he describes its only species as follows: *"hispida,* leguminibus pendulis hispidis: caule erecto subflexuoso: racemis axiliaribus: corolla vix calyci maiore. *Dolichos Soia. Linn. Kaempfer Amoen. exoticae. p. 837. icon. p. 838.*

"Defectus cali prohibet genera Dolichos Linnaei adsociari, neque cum Phaseolis propter figuram corollae convenit.

"h. H. Annua."

Note 1. This is the earliest document seen (April 2008) concerning soybeans in Germany, or the cultivation of soybeans in Germany. This document contains the earliest date seen for soybeans in Germany, or the cultivation of soybeans in Germany (1794). The source of these soybeans is unknown, as is the date they first arrived in Marburg and were first planted there.

Note 2. The 1966 2-volume reprint of this book, published by Otto Koeltz Antiquariat, Koenigstein-Taunus, contains an English-language introduction and biography by William T. Stearn of London. It notes that the town of Marburg, Hessen, north-western Germany (located in West Germany after World War II, on the Lahn River about 46 miles north of Frankfurt am Main) became the seat of a new university in 1527–Europe's first Protestant university. Named the Academia Marpurgensis (now the Philipps-Universitaet zu Marburg), it was inspired by the Reformation and built with Imperial privilege, but without Papal sanction. "This rapidly became a major center of Protestant learning and controversy. Moreover, being the first university established after the Reformation which had no Papal Bull at its founding, it provided a precedent for the independent creation of other universities by Protestant rulers. Like most young universities, Marburg immediately set out to attract scholars of standing, notably from Erfurt, then the foremost German university. Among them was the poet and physician Erucius Cordus (1486-1535)..." He became the university's first professor of medicine and his teaching covered the study of medicinal herbs. His short book but influential, *Botanilogicon* (Cologne, 1534) concerned botanical nomenclature. "Cordus was particularly dismayed by the danger of wrong drugs being administered through errors in naming, of which he gave examples. In so doing, he indicated the plants which he himself grew" in his private garden at Marburg. The university did not acquire an official botanic garden until 1786.

Conrad Moench (1774-1805), originally a pharmacist, was a professor of botany and chemistry, and director of the botanic garden at Kassel. In 1785, he was transferred to Marburg, where he helped to develop the new botanic garden. In 1794, when Moench published his book *Methodus Plantas Horti...* the garden, according to Wenderoth, contained 1,674 phanerogams (seed plants or flowering plants; spermatophytes). By 1802, when Moench published his *Supplementum,* a further 634 had been added. The aim of these publications was two-fold. First, to provide an enumeration of the cultivated and wild plants of the Marburg district, making their taxonomy accord with the modifications of Linnaean genera proposed by Joseph Gaertner (1732-1791), Friedrich Casimir Medicus (1736-1808), Antoine Laurent de Jussieu (1748-1838), and Moench himself. And second, to elaborate the general system of classification proposed by Johann Gottlieb Gleditsch (1714-1786) in his *Systema Plantarum a Staminum Situ* (1764). "Their spirit was anti-Linnaean. Not only did they reject Linnaeus's system of classification and his generic concepts whenever possible, they likewise rejected his generic names in favor of those used earlier by Tournefort and others... The numerous living plants available at Marburg were mostly European, but included a number from North America and South Africa." Moench's two books from Marburg are "of interest as a record of the plants available at the end of the eighteenth century in a well-stocked German botanic garden and thus provide historical evidence for the introduction and spread of plants in cultivation."

The International Code of Botanical Nomenclature takes Linnaeus's *Species Plantarum* of 1753, together with his *Genera Plantarum* of 1754 as the starting point of modern botanical nomenclature. After 1753 there was great debate among biologists and botanists over the new sexual and binomial system of nomenclature proposed by Linnaeus. Many considered Tournefort's genera better founded. Linnaeus's most bitter and sarcastic critic was the Mannheim botanist Medicus, who supported Tournefort. Conrad Moench also rebelled against the widely used concepts and names of Linnaeus in the same way that Linnaeus had earlier been a rebel against Tournefort's system.

Talk with Ted Hymowitz, and summary of *Oxford English Dictionary.* 1990. Oct. 1. Concerning the terms "Soia" and "Soja," and the letters "I" and "J." The letter "J" is a comparatively late modification of the letter "I." In the ancient Roman alphabet, "I" was used both as a vowel and a consonant. Thus, Iapon, Iapan, or iaponica refer to Japan, Iesus for Jesus, and Gaius Iulus Caesar. From the 11th to the 17th century, the letter "I" represented at once the vowel sound of "I" and a consonant sound far removed from the vowel. Starting in the late 1500s, the letter "J" was carved out of the "I" for use as the consonant (typically before a vowel), leaving "I" for use as the vowel. The differentiation was completed before 1640. Later taxonomists allowed "I,"

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when used as a consonant, to be considered a "J." They considered that in this case it was being used as a consonant. Thus, for example, Piper and Morse in *The Soybean* (1923, p. 32) write: "Moench (1794) rechristened the Linnaean plant *Soja hispida."* Address: Marburg, Germany.

241. Thunberg, Charles-Pierre. 1794. Voyage en Afrique et en Asie, principalment au Japon, pendant les années 1770-1779. Traduis de Suédois [Voyage to Africa and to Asia, especially to Japan, during the years 1770-1779. Translated from Swedish]. Paris: Chez Fuchs, Librarie. xii + 532 p. 20 cm. [Fre]

• ***Summary:*** Chapter 10, written by Thunberg in Sept. 1775, discusses Japan, Nagasaki (Nangasaki), and the Dutch trade to Batavia [today's Jakarta]. On page 298-99: The goods which they buy in Nagasaki consist mainly of rice, porcelains, umbrellas, silk kimonos, lacquer works, soy [sauce] (*soja ou souï*), copper, and large earthenware pots.

Soy [sauce], which is exported in little kegs, is a liquid or the quintessence of different aromatic ingredients which is good for stimulating the appetite, and is added in small quantities to sauces.

The last sentence in the original French: *"Le soja que l'on exporte en petits barils, est une liqueur ou quintessence de différens ingrédiens aromatiques propre à exciter l'appétit, en en ajoutant une petite quantité aux sauces."*

Note 1. This is the earliest French-language document seen (April 2012) that uses the word *souï* to refer to soy sauce.

Note 2. Carl Peter Thunberg lived 1743-1828. Address: Chevalier de l'Ordre de Wasa, Professeur de botanique à l'Université d'Upsal [Sweden].

242. *British Critic: A New Review.* 1795. Thunberg's Travels. Vol. IV. 6:473-81. Nov. See p. 478. [Eng]

• ***Summary:*** This magazine is publishing long excerpts from Thunberg's *Travels.* Before each is a short introduction (p. 478): "Though soy-sauce is very commonly used in this country, its composition is but little known. It is a considerable article of commerce in Japan, and we here find it thus described.

"'Soy-sauce, which is every where and every day used throughout the whole empire, I might almost say in every dish, and which begins even to be made use of in Europe, is prepared from Soy Beans (*Dolichos Soja*) and salt, mixed with barley or wheat..." p. 121 of Thunberg.

243. Shokumotsu waka honzô [The book of Japanese foods?]. 1795. Japan. [Jap]*

• ***Summary:*** Mentions natto miso soup (*nattô-jiru*).

Note: Recall that this *natto-jiru* may well be made with fermented black soybeans rather than itohiki natto.

244. Thunberg, Charles Peter. 1795. Travels in Europe, Africa, and Asia, made between the years 1770 and 1779. In four volumes. Vol. IV. Containing travels in the empire of Japan, and in the islands of Java and Ceylon, together with the voyage home. 3rd ed. London: Printed for F. and C. Rivington. xix + 310 p. See p. 37, 88, 107, 121-22, 177. Index. 21 cm. [Eng]

• ***Summary:*** In the chapter on Japanese foods, we read (p. 37): "Rice, which is here exceedingly white and well-tasted, supplies, with the Japanese, the place of bread; they eat it boiled with every kind of provisions. *Miso* soup, boiled with fish and onions, is eaten by the common people, frequently three times a day, or at each of their customary meals. *Misos* are not unlike lentils, and are small beans, gathered from the *Dolichos soja."* Note 1. The latter sentence, which is incorrect, led many subsequent early writers to believe that the seeds of the soy bean were called miso, or that miso was a type of small bean. Rather, miso is a paste made from soy beans.

In the chapter on Japanese agriculture, we read (p. 88): "Of Beans, Peas, and Lentils, many sorts are cultivated, both the larger (*Phaseoli*) and the smaller (*Dolichos*). Of *Daidsu* Beans (Dolichos *Soja*) the meal is used for dressing victuals, and the expressed juice for making Soy; as is likewise the whole Bean for the soup called *Miso,* which is a daily dish with the common people. *Atsuki* [Azuki] Beans likewise (*Phaseolus radiatus*) are ground to meal, of which small cakes are made with sugar."

Note 2. This is the 2nd earliest English-language document seen (Jan. 2005) that clearly mentions azuki beans, which it calls *Atsuki Beans.* It is also the earliest English-language document seen (March 2006) that uses the word *Atsuki* to refer to azuki beans.

Note 3. It is not clear what Thunberg means by "meal" when he says "the meal is used for dressing victuals."

In the chapter on Commerce, after discussing the tea trade, Thunberg writes (p. 107): "The *Tea Trade* is confined entirely to the inland consumption, the quantity exported amounting to little or nothing. The traffic in *Soy* [sauce], on the other hand is more considerable; and as the tea produced in this country is reckoned inferior to that of China, so the soy is much better than that which is brewed in China. For this reason, soy is not only exported to Batavia [today's Jakarta], in the wooden barrels in which it is made, but likewise sold from thence to Europe and to every part of the East Indies. In some places in Japan too the soy is reckoned still better than in others; but, in order to preserve the very best sort, and prevent its undergoing a fermentation, in consequence of the heat of the climate, and thus being totally spoiled, the Dutch at the Factory [at Desima / Dezima / Dejima] boil it up in iron kettles, and afterwards draw it off into bottles, which are then well corked and sealed [by applying bitumen / coal tar to the stopper]. This mode of treatment renders it stronger and preserves it better, and makes it serviceable for all kinds of sauce. The *Silk trade* is

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indeed in a very flourishing state in the empire..."

In the chapter titled "Residence at Dezima [1776], Previous to my Return Home," the author writes (p. 121-22): "Soy-sauce, which is every where and every day used throughout the whole empire, I might almost say in every dish, and which begins even to be made use of in Europe, is prepared from Soy Beans (*Dolichos Soja*) and salt, mixed with barley or wheat. For this purpose, they cultivate this species of bean in several places, although it grows in great plenty wild. Scarcely any kind of legumen [legume] is more copiously used than this. The seeds are served up in soups, once or twice a day all the year round, to people of distinction or otherwise, to the poor and to the rich. *Soy* is prepared in the following manner: The beans are boiled till they become rather soft; afterwards an equal quantity of pounded barley or wheat is added. These ingredients being mixed together, are set in a warm place, and covered up for four and twenty hours, that they may ferment. An equal quantity of salt is then added to the mixture, and twice and a half as much water is poured upon it. After it has been mixed in this manner in an earthen vessel, it must stand well covered two or three whole months together, during which period it is necessary however at first for it to be stirred about several times in the day for several days together. The liquor is then pressed and strained off, and kept in wooden vessels. Some provinces furnish better soy than others; but exclusively of this, it grows better and clearer through age. Its colour is invariably brown, and its chief excellence consists in the agreeable salt taste which it possesses."

While in Colombo, Ceylon, in 1777 the author stated that "the *Dolichos pruriens* grew here tolerably common, with its hairy pods, the hairs of which attaching themselves to the hands, occasion much itching, which is allayed by oil, or decoction of rice, and are celebrated as a Vermifuge."

Note 4. This plant appears in the index as "Dolichos Soja."

Note 5. This is the earliest English-language document seen (March 2009) that contains the term "Miso soup."

Note 6. On the title page, the author's name is given as Carl Peter Thunberg, rather than Karl Peter. Of the four volumes, only vol. IV bears a date, which is 1795. The translator's name is not given, not even in the "Translator's preface" nor in any record on WorldCat / OCLC online bibliographic database. The original text was written in 1776. Yule & Burnell (1886, p. 651, and 1903, p. 859) state: "1776. An elaborate account of the preparation of Soy is given in *Thunberg's Travels,* E.T., [vol.] iv. 121-122;"

Note 7. This is the earliest English-language document seen (Feb. 2008) that contains the word "Soy Beans" (or "Soy-Beans") (p. 121-22).

Note 8. This is the earliest English-language document seen (April 2012) that contains the term "Soy-sauce" (or "soy-sauce"). The *Oxford English Dictionary* says (incorrectly): "1818 Todd (transl. Thunberg), Soy-sauce is prepared from soy-beans (*dolichos soja*) and salt, mixed with barley or wheat."

Note 9. Lewis and Murakami (1923, p. 223) state: "The third English edition of Charles Peter Thunberg's *Travels* (London 1796) contains an English-Japanese vocabulary of approximately 1,500 words; this was probably the first English-Japanese vocabulary ever published. It seems to have been unknown to our author [Ranald MacDonald] and his scholars." Address: Prof. of Botany, Univ. of Upsal [Uppsala], Sweden.

245. Thunberg, Karl Peter. 1796. Voyages de C.P. Thunberg. Tome second [Voyages of C.P. Thunberg. Vol. 2]. Paris: Benoit Dandre. iv + 544 p. See p. 3, 4, 145, 266-68. [Fre]
• ***Summary:*** An early traveler to East Asia who mentioned soyfoods was the Swedish doctor and prof. of botany at the Univ. of Uppsala, Carl P. Thunberg. In Chapter 20 titled "Japanese Foods" he states (p. 267-68): "Three times a day, with each meal, the people eat miso soup prepared with fish and leeks. These miso [he apparently thought miso was the name of a legume; see Thunberg 1796 in English] closely resemble lentils. They are the small dolic beans of Japan (*ce sont de petites fèves de* dolic *du Japon*)*.*"* (Footnote: ** "Dolichos soja.* Lam. Diction. [Lamarck 1790. Dictionary] No. 28)."

"Miso or soy sauce (*Le miso ou la sauce de soya*) constitute the principal food of the Japanese. People of all levels, great or small, rich or poor, eat them several times a day year-round. Here is how they are prepared. The beans are cooked until they are just soft, then they are mixed with an equal quantity of barley or wheat, and the mixture is allowed to ferment for 24 hours in a warm place. Now an equal quantity of salt and 2½ times the amount of water. The mixture is put in an earthen pot, which is well closed and left for 2½ months; it is stirred during the initial days. After the necessary time the liquid is pressed out and stored in wooden kegs. The inhabitants of certain provinces make better 'soya' than those in others. Moreover, the longer it ages, the tastier and clearer it becomes. It is always brown and its principal flavor is a pleasant saltiness. The Japanese also eat fish, boiled or fried in oil" (p. 267-68).

"The tea of Japan is inferior to that of China. However, Japanese 'soya' [soy sauce] is preferable to that of the Chinese. It is shipped in numerous vats to Batavia [today's Jakarta, Indonesia], India, and Europe. The Dutch have found a way of protecting it from the effects of heat and of preserving the fermentation. They boil it in an iron pot, funnel it into bottles, and seal the mouths with pitch. This liquid retains all its 'force' and can be mixed with all other sauces." Note: All this took place long before Appert's invention of canning in 1809 and Pasteur's invention of pasteurization in 1862. In fact pasteurization had been practiced in Japan for 200 to 300 years before this time.

In Chapter 23, "The State of Agriculture in Japan," the

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author notes (p. 291): The Japanese plant a great deal of rapeseed, and the seed furnishes an excellent oil for lamps. In Japanese, the plant is named *na tanne* and the oil *na tanne abra* or *na tanne no abra* (sic, *natane abura*). "Soy flour (*La farine des fèves de daidsou* (Footnote: *Dolichos soïa*)) is used in various dishes.

Note 1. This is the earliest French-language document seen (Nov. 2012) that mentions roasted soy flour, which it calls *La farine des fèves de daidsou.*

The liquid that is pressed out is used to make soy sauce (*du soya*). The roots are put in a soup named *miso,* which the people use daily for nourishment. Small cakes are also made with the flour of azuki beans (*la farine de haricots d'atsouki* (Footnote: *Phaseolus radiatus*)) mixed with sugar."

Note 2. This is the earliest French-language document seen (Jan. 2005) that mentions azuki beans, which it calls *haricots d'atsouki.*

Pages 314-15 state: "Their soy sauce (*sauce de soya*), which has been introduced by many Europe countries, is made with soybeans (*se fait avec des fèves-soya* (Footnote: *Dolichos soya*)), barley or wheat, and salt. Although these beans come spontaneously and abundantly in many places, the consumption which they make of this flour causes them to take particular care with the plant's cultivation."

Note 3. This is the earliest French-language document seen (April 2012) that uses the term *sauce de soya* to refer to soy sauce. Address: France.

246. *Times* (*London*). 1797. Classified ad: Japan Soy.–For sale. March 13. p. 1, col. 4.
• ***Summary:*** "... at No. 34, Fish street... near the Monument; Genuine Japan Soy [sauce], in casks from 10 to 60 gallons, at 16*s.* per gallon, for ready money only." Address: [England].

247. Hemmij, Gijsbert. 1797. Diary. In: Leonard Blussé, Cynthia Viallé, et al, eds. 2004. The Deshima Diaries Marginalia, 1740-1800. Tokyo: Japan-Netherlands Institute. xl + 898 p. See p. 707 (#27).
• ***Summary:*** 1797 May 12–"I summond the *rapporteurs* and handed them three kinds of Dutch cakes and three kinds of confitures in newly made boxes for the governor. They returned in the afternoon and assured me that the governor had been very pleased and he was sending me a reciprocal present of two flasks of medicinal *sake,* a couple of boxes of flour and *laxa,* and a barrel of *miso* fish" [fish pickled in miso]. Address: Opperhoofd (Chief of the Dutch factory), Deshima, Nagasaki, Japan.

248. Brown (T.). 1797. To families, resident in Chelsea, Pimlico, Battersea, Wandsworth, Kensington, and Knightsbridge (Ad). *Observer* (*London*). Nov. 26. p. 1.
• ***Summary:*** "Genuine wines, now on sale, in fine condition, at Brown's New Tea Warehouse, the Chinese and Tea Plant, Paradise Row, Chelsea,... Fish Sauces of all sorts. Perfumery and Confectionary. New Anchovies, Capers, Japan Soy [sauce], Cayenne Pepper, Oils, Vinegars, &c.;..."

Note: This is the earliest British newspaper seen (Oct. 2009) in which the term "Japan soy" is mentioned. Address: Paradise Row, Chelsea, London.

249. Encyclopaedia Britannica; or, A dictionary of arts, sciences, and miscellaneous literature... 3rd ed... greatly improved. 18 vols. 1797. Edinburgh: Printed for A. Bell and C. Macfarquhar.
• ***Summary:*** In vol. 6, part 1 (D-E), the entry for Dolichos (p. 81) states: 2. The soja is a native of Japan, where it is termed *daidsu;* and, from its excellence, *mame;* that is, "the legumen or pod," by way of eminence. It grows with an erect, slender, and hairy stalk, to the height of about four feet. The leaves are like those of the garden kidney-bean *. The flowers are of a bluish white, and produced from the bottom of the leaves, and succeeded by bristly hanging pods resembling those of the yellow lupine, which commonly contain two, sometimes three, large white feeds. There is a variety of this kind, with a small black fruit, which is used in medicine. Kempfer [Kaempfer] affirms, that the seeds of this when pounded and taken inwardly give relief in the asthma. This legumen is doubly useful in the Japanese kitchens. It serves for the preparation of a substance named *miso,* that is used as butter; and likewise a pickle celebrated among them under the name of *sooju* or *soy* [sauce]. To make the first, they take a measure of mame, or the beans produced by the plant: after boiling them for a considerable time in water, and to a proper degree of softness, they beat or bray them into a softish pulse [pulp?]; incorporating with it, by means of repeated braying, a large, quantity of common salt, four measures in summer, in winter three. The less salt that is added, the substance is more palatable; but what it gains in point of taste, it loses in durability. They then add to this mixture a certain preparation of rice, to which they give the name of *koos* [*koji*]*;* and having formed the whole into a compost, remove it into a wooden vessel which had lately contained their common ale or beverage named *sacki.* In about two months it is fit for use. The koos gives it a grateful taste; and the preparing of it, like the polenta of the Germans, requires the skillful hand of an experienced master. For this reason there are certain people who make it their sole business to prepare the koos, and who sell it ready made for the purpose of making miso: a substance which cannot fail to be greatly valued in those countries where butter from the milk of animals is unknown.

"To make sooju or soy, they take equal quantities of the same beans boiled to a certain degree of softness; of muggi, that is corn, whether barley or wheat, roughly ground; and of common salt. Having properly mixed the beans with the pounded corn, they cover up the mixture, and keep it for a day and a night in a warm place, in order to ferment; then putting the mass into a pot, they cover it with the salt, pouring over the whole two measures and a half of water.

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This compound substance they carefully stir at least once a-day, if twice or thrice the better, for two or three months: at the end of which time, they filtrate and express the mass, preserving the liquor in wooden vessels. The older it is, the better and the clearer; and if made of wheat instead of barley, greatly blacker. The first liquor being removed, they again pour water upon the remaining mass; which, after stirring for some days, as before, they express a second time, and thus obtain an inferior sort of soy."

For Sakki (*saké*) see vol. 9, part 1 (p. 71, under Japan). Address: Edinburgh, Scotland.

250. Nihon sankai meisan zue [Illustrations of Japanese products from land and sea]. 1797. Japan. [Jap; eng+]

• ***Summary:*** See next page. The first illustration shows koji being made in Japan. In the front center a man is cooling the steamed rice by raking it on a straw mat. To the left another man is carrying the cooled rice by holding the four corners of a straw mat. At the top center another man inside the koji incubation room (*koji muro*) awaits the arrival of the rice, which he will spread on wooden koji trays. As it is inoculated naturally by airborne spores of *Aspergillus oryzae* (the room is full of them), the rice will be transformed into koji–in the first step of the sake-making process.

Another illustration shows an expanded view of the first illustration with subsequent steps in the sake-making process.

Also titled *Nippon Sankai Meisan Zue*, this volume of illustrations is devoted to the making of koji and sake and is historically important as the first book with illustrations of sake making and of the recently developed artisanal technique for making clear sake (*seishu*), requiring clarifying the rice liquor and stabilizing the sake through pasteurization. The work contains seven black and white wood engraved prints: six are 205 x 326 mm, double-page prints with five detailing the step-by-step manufacturing process. Larger scale production of sake (*nihonshu*), the iconic Japanese alcoholic beverage brewed from fermented rice, developed during the Edo period in breweries in Itami and Nada (from description by www.abebooks July 2012).

Illustration sent and source cited by Izumi Motai of Takara Sake USA Inc., Berkeley, California.

251. Beckmann, Professor [Johann?]. 1798. Account of the methods employed in Japan and China to prepare soy, with some observations on the bean from which it is produced. *Philosophical Magazine* (*The*) (*London*) 1:342-45. Sept. [4 ref]

• ***Summary:*** "This article [soy sauce], which is a brown saline liquor, imported to Europe from the East Indies, is employed for seasoning various kinds of dishes, and improving the taste of different sauces. It is brought from Japan in small wooden vessels, and also from China and other parts of India in glass flasks, several of which are packed together in a wooden box. The use of it has been long general in the East Indies; where it is placed on the table at each meal, instead of salt, for the purpose of dipping in it flesh, fish, and other kinds of food.

"The Japanese are said to be the inventors of this article; and, at present, their soy is preferred to any other; though it is asserted by connoisseurs that this preference arises more from the price than the goodness. In my opinion, it was first introduced in the European commerce in the present century; for it is not to be found in the old catalogues of goods; in Saavary's or Ludovici's dictionaries, nor in the old books on cookery. The first account of the method of preparing it after the Japanese manner was published by Kempfer [Kaempfer].

"Before I give a description of this method, it may not be improper to inform the reader that the people in India, instead of our common kidney beans, cultivate and use as food another species of a familiar kind, called in botany *dolichos,* and which comprehends several species. Among these there is one called *dolichos soya.* The plant is all over rough; and its weak stem rises to the height of a man. Its flowers, which are small, scarcely appear above the calyx, and are a blueish or almost violet color. The rough husks contain for the most part only two seeds, which in form, size and taste differ very little from our garden pease, except that they are flatted, shaped somewhat like an egg, and have a black speck at the place where they begin to germinate*. (Footnote: * *Hilum fuscum.* The first description and figure of this plant was given by Kempfer in his *Amoenitat. exot.* p. 837, 838. Both these, however, were improved and rendered more complete by Bergius in *Abhandlungen der Schwedisch. Akad.* xxvi. p. 281. The latest descriptions are those of Thunberg in his *Flora Japonica,* p. 282.; and Jacquin in *Collectanea ad botanicam et hist. nat.* vol. i. p. 46).

"These seeds form the principal component part of soy. In Japan they are first boiled, and then mixed with the same quantity of barley or wheat meal (the latter is for the purpose of giving the soy a darker colour); and the mixture, being covered up, is deposited for twenty-four hours in a warm place, where it ferments. The same quantity of common salt, with the like quantity and half as much water, is thrown over it; and the whole mass, for the space of two or three months, is stirred round daily with a chocolate stick, and closely covered immediately after. At the expiration of that period it is strained or squeezed through a linen cloth, and the liquor, which is preserved in wooden vessels, becomes always clearer and better the longer it is kept. The mass which remains is again subjected to a like process by having water poured over it, and, being stirred round for some days, as before, is then strained.

"Of the preparation in China the following account has been given by Eckberg [sic, Ekeberg or Eckeberg], a Swede:" Beckmann then translates the last half of Ekeberg's 1764 Swedish-language article titled "Om Chinesiska Soyan" (On Chinese Soy Sauce), which see.

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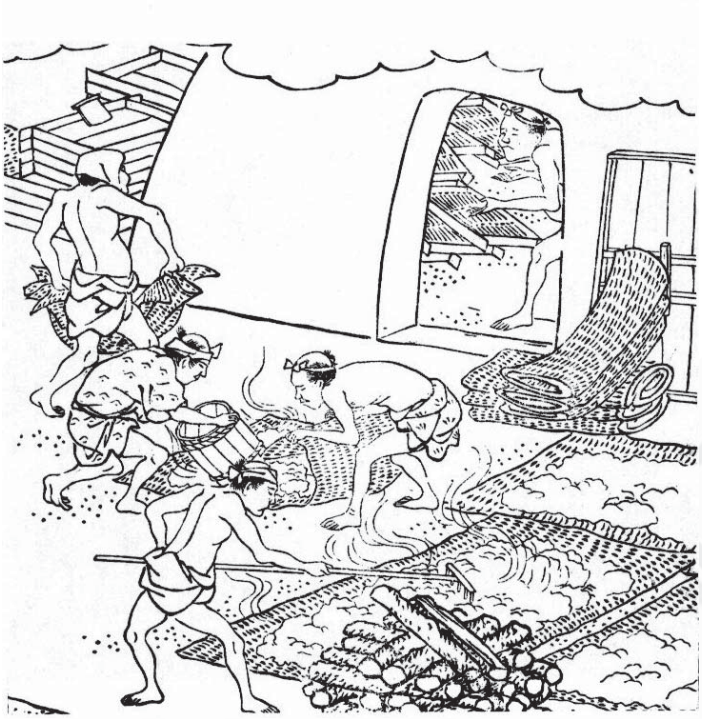

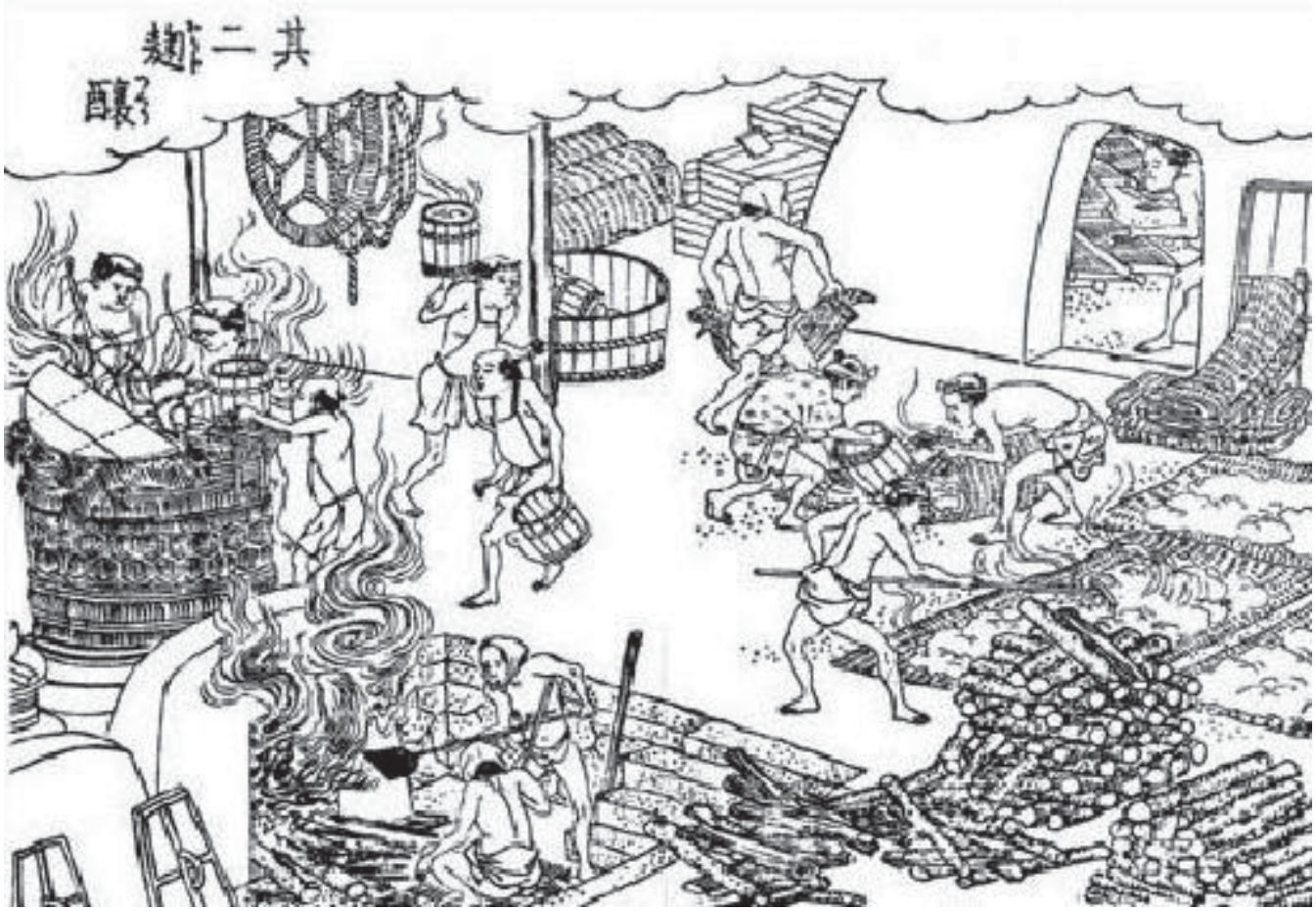

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"From what has been above said, it may be readily perceived that the preparation of soy in Europe would be attended with no difficulty if it were possible to cultivate the beans. Bergius, however, gives his countrymen little hope that this can be done; and chiefly for this reason, that the plant blows so late in green-houses, that the summer is gone before the fruit can ripen. But this is often the case with exotics which are reared by our gardeners in hot-houses. As they only begin to blow when their nourishment decreases and occasions a stoppage of their growth, the same thing may happen too late in too fertile a soil, or when they have a superfluity of nourishment. On the other hand, when they are transplanted into soil somewhat poorer, and into an open place where they have less shelter, they do not grow so quick and so long; but they blow earlier. And hence it happens, that many exotics planted in the open air produce ripe seeds, which could never be obtained from them while they were preserved as curiosities and favourites of the gardener in green-houses. I consider it, therefore, as an experiment worth making, to plant these beans in the open fields; and I am inclined to think that in many summers they would produce ripe seeds, especially as Jacquin says expressly that they throve well at Vienna [Austria] in the open air.

"Should my conjecture, however, be not realised, this would not, at any rate, be the case with that of Bergius, who is of opinion that a kind of soy might be obtained from our peas and beans by the same or a similar process; but indeed it would have this great fault, that it would be too cheap, and too soon become common."

Note 1. The author is probably the German Johann Beckmann (lived 1739-1811). He spoke English, taught mathematics, physics, and natural history at the Lutheran St. Peter's Gymnasium in St. Petersburg, and is best known as the author of that fascinating bedside book *The History of Inventions.* A trained botanist and student of Linnaeus, he first visited Linnaeus in 1765 (See W. Blunt. 1971. p. 166, 172, 174, 175). He also wrote a book on botany, and on the history of inventions and discoveries.

Note 2. This is an excellent, accurate description of both soy sauce and the soybean. It is difficult to tell whether it is compiled from other writings (most likely, see footnote), or whether Beckmann visited India and described (in the third paragraph above) the soybeans that he actually saw growing there. If the latter were true, this would be the earliest document seen (Oct. 2010) concerning soybeans in India, or the cultivation of soybeans in India. And this document would contain the earliest date seen for soybeans in India or the cultivation of soybeans in India (1798; one of two documents–the other being Roxburgh 1832).

Note 3. This is the second earliest English-language publication or article seen with the word "soy" (or any variation of soy) in the title. Note that this "soy" refers to soy sauce. Address: England.

252. Stavorinus, Johan Splinter. 1798. Voyages to the East-Indies. Translated from the original Dutch by Samuel Hull Wilcocke. 3 vols. London: Printed for G.G. and J. Robinson. vi + 534 p. See vol. 1, p. 360. [Eng]

• ***Summary:*** In Chapter 29, as part of a discussion of Dutch trade with Japan, the translator adds the following footnotes not found in the original text (see p. v-vi): Two Dutch ships go yearly to Japan. They also export "a trifling amount in soy [sauce], china, lacquered ware, and large silk nightgowns. The private trade of the Dutch officers and ships' crews to Japan, is also very considerable, as well as profitable; they carry out, camphor, china-root, saffron, Venice treacle, Spanish liquorice, ratans, spectacles, looking glasses, watches, manufactured glass, and unicorns' horns (the horn of the menodon monoceros), and receive in return, soy, silks, silk nightgowns, china, lacquered ware, fans, and fine rice" (p. 360).

There are also extensive notes by the translator about the Dutch forts and trading posts / factories in Asia including those on the coast of Coromandel, Negapatnam [Nagapatnam, the head settlement], Sadraspatnam [Zadraspatam, Sadrangapatnam], Pulicat, Sadras, Palicol [Palikol, Katira], Bemelipatnam, Geldria, Surat; In Japan: Decima [Deshima], Nangasakki [Nangasaki, Nangasacqui, Nangasacky, Nangasackij, Nagasaki]. Address: Rear Admiral in the service of the States General.

253. Communications to the Board of Agriculture; on subjects relative to the husbandry and internal improvement of the country. Vol. II. 1800. London: Board of Agriculture. Printed by W. Bulmer. 501 p. See p. 193-96. Illust.

• ***Summary:*** Section IX (p. 193-94) is titled "Copy of a letter from Mr. Campbell, at Fort Marlborough, with an account of seeds sent by him, by the *Queen* Indiaman."

He writes: "Those which go by the Queen are, the cordage palm; the caminium; the copaya, or oil-nut of the Malays; the teak; the soy bean of Japan; and the catupa, a delicate fruit lately discovered." "The adjoined catalogue contains short notices and references to works in which these plants are amply treated of."

He encourages the Board to distribute and test these seeds worldwide, and not only to British colonies. The letter is signed Charles Campbell, Fort Marlborough, 17 May 1798.

On pages 194-96 is an addendum titled "Account of seeds sent in the *Queen* Indiaman." On p. 196 we read:

"*Dolichos Soja,* the Soy Bean.

"This pulse is exotic to the West coast [of Sumatra], and seems to have been imported by the Chinese colonists.

"It is little cultivated here; and never, I believe, with a view to prepare the condiment from it.

"Much of the sauce sold in Europe, under the name of Japan Soy, is manufactured at Batavia [today's Jakarta], by a very simple process. Satisfactory information will, I believe,

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be found respecting this, in Kempfer's *Amoenitates* [sic, Kaempfer's *Amoenitatum exoticarum...* (1712)], a work I regret the want of.

Note 1. This is the earliest English-language publication seen (Aug. 2008) that contains the word "soy bean" (or "soy beans").

Note 2. Fort Marlborough was in Bengkulu, Sumatra (in today's Indonesia).

254. Linnaeus, Carolus. 1800. Species plantarum; exhibentes plantas rite cognitas ad genera relatas... Editio quarta, post Reichardianam quinta... Curante Carolo Ludovico Willdenow. Tomus III. [Species of plants. 4th ed. Edited by Carl Ludwig Willdenow. Vol. 3, Part II.]. Berolini (Berlin). Impensis G.C. Nauk. p. 851-1474. See p. 1051. [6 ref. Lat]

• ***Summary:*** "45. Dolichos Soja.

D. caule erecto flexuoso, racemis axillaribus erectis, leguminibus pendulis hispidis subdispermis. *Fl. zeyl.* 634. *Mat. med.* 171. *Jacq. ic. rar.* 1. *t.* 145. *Collect.* 1. *p.* 46.

Phaseolus erectus, siliquis lupini, fructu pisi majoribus candido. *Kaempf. amoen.* 837. *t.* 838.

Houttuyn Lin. Pfl. Syst. 8. *p.* 564.

Soja Faseln. W.

Habitat in India *orientali*, Japonia. (*v. v.*) Corollae *vix calyce majores.* Flores *subsessiles* 3. 5.

Legumina *disperma.*

Also on page 1051, No. 47 is *Dolichos angularis* W.–the Alsuki [Adsuki] bean; Habitat: In Japan.

Note 1. According to the *Columbia-Lippincott Gazetteer of the World* the term "East Indies" originally referred to India, then by extension to Southeast Asia, and finally to the Malay Archipelago. Note 2. For date of issue, see Schubert in *Rhodora.* xliv, 1942, p. 150. Address: (Amsterdam?).

255. Matsudaira, Fumai? 1800. Yotsu no toki no hana [Flowers of the four seasons]. Japan. Publisher unknown. 2 large volumes. Japanese summary by Kawakami 1978, p. 157. [Jap]

• ***Summary:*** These two volumes of writing on cookery contain information on tea ceremony cuisine (*kaiseki ryori*) menus, including grilled tofu (*yaki-dôfu*), Simmering Tofu (*Yu-dôfu*), Miso no Sashimi, Natto Miso Soup (*Natto-jiru*), and Yamabuki Shoyu. The author, Matsudaira, lived 1751-1818.

Note: This is the earliest document seen (Dec. 2011) that mentions *nattô-jiru* [Natto Miso Soup] in connection with sticky natto.

256. *Monthly Review* (*The*)*: Or Literary Journal, Enlarged.* 1801. Art. XI. Communications to the Board of Agriculture; on subjects relative to the husbandry and internal improvement of the country. Vol. II. 4to. pp. 500. 1*l.* 1s. Boards. Nichol, &c. 1800. 34:160-74.

• ***Summary:*** The section titled "Copy of a letter from Mr. Campbell, at Fort Marlborough, with an account of seeds sent by him, by the Queen Indiaman" (p. 168) states: "This paper is more calculated for a botanical than an agricultural society; and we do not perceive of what use it can be to farmers, nor how it can advance the internal improvement of our northern isle. In fact, its object is to promote the transfer of the useful trees and plants of Sumatra to our West Indian colonies, and to the continent of America. The seeds sent home by the Queen were those of the cordage palm, the caminium, the copaya, or oil-nut of the Malays, the teak, the soy bean of Japan, and the catupa, a delicate fruit lately discovered."

Note: Fort Marlborough was in Bengkulu, Sumatra (in today's Indonesia).

257. Ryôri shinan taizen [The big book of Shinan cookery]. 1801. Japan. [Jap]*

• ***Summary:*** The twelfth earliest known reference to Kori-dofu (dried-frozen tofu) appeared in this work.

258. Pinkerton, John. 1802. Modern geography: A description of the empires, kingdoms, states, and colonies; with the oceans, seas, and isles; in all parts of the world: Including the most recent discoveries, and political alternations. Digested on a new plan... With numerous maps. Vol. II. London: T. Cadell Jun. and W. Davies; and T.N. Longman and O. Rees. viii + 835 p. See p. 110, 170. Maps. Index. 29 cm.

• ***Summary:*** On page 83 is a detailed map of China. In the chapter titled "China proper" (p. 83), the subsection on "Botany" states (p. 110): "Besides the multitude of vegetables that are cultivated as articles of human food, and which are probably natives of India, Japan, and the neighbouring islands, the following are found in a truly wild state in China, viz. three species of dolichos, *kidney bean;* d. sinensis, *calavanses;* d. soya from the beans of which the true Indian soy is made; and d. cultratus..."

In the section on "Japan" (p. 152-), in Chapter IV, "Natural geography," the subsection on Botany states (p. 170): "The vegetable treasures of Japan are numerous, and have been ably explored by Kæmpfer and Thunberg... There are several points of resemblance between the floras of China and Japan, and this similarity has probably been strengthened by a mutual interchange of useful vegetables; if indeed both countries have not rather derived some of their most valuable plants from Cochin-China, or the Philippine islands: the ginger, the soy bean, black pepper, sugar, cotton, and indigo, though perhaps natives of the more southern regions of Asia, are cultivated here with great success and in vast abundance." Note: Pinkerton lived 1758-1826. Address: [England].

259. Shôjin gyorui sokuseki ryôri [Quick recipes for Zen vegetarian cookery and fish]. 1802. Kochiya Yoshisuke

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(Osaka) and Kichimonjiya Risuke. Japanese summary by Kawakami 1978. [Jap]
• ***Summary:*** This book, whose author is unknown, was issued by two publishers in 1802. Kichimonjiya published an edition titled only *Sokuseki Ryôri* (Instant Recipes). One was a folded book 30 by 40 cm, one was a woodblock print 15 by 8 cm. The front side is fish and poultry, the backside is Zen vegetarian cookery. In the latter section there is a recipe named Yuba Anpei that contains yuba and silken (*kinugoshi*) tofu.

260. Thunberg, Charles Peter. 1802. Travels in Europe, Africa, and Asia, performed between the years 1770 and 1779. In: William Fordyce Mavor, ed. 1802. An Historical Account of the Most Celebrated Voyages, Travels, and Discoveries, from the Time of Columbus, to the Present Period. Philadelphia, Pennsylvania: Published by Samuel F. Bradford. Vol. 12 of 14. 299 p. See p. 217, 236, 267, 275. Series: Early American Imprints: Second series no. 2640.
• ***Summary:*** In writing about Japan, Thunberg states: Page 217: Shimonoseki "is situated at one extremity of Nippon, the largest of all the islands, and contains the two capitals of the kingdom. On the seashore a kind of ulva, called AwaNori, is found, which, when dried and roasted over the coals, and afterwards pulverized, is eaten with boiled rice, and sometimes put into miso-soup."

Page 236: "The Japanese eat thrice a day and their general fare is miso-soup boiled with fish and onions."

Page 267: "Ladies do not eat with the men, but by themselves. Rice supplies the place of bread, and is boiled with every kind of provisions. Miso-soup, boiled with fish and onions, is the customary food of the common people. Misos are small beans, like lentils, the produce of the dolichos soja. Fish and fowls are very plentiful, and are eaten in abundance. Even the flesh of the whale is a common dish among the poorer people.

"Tea and sakki constitute the whole beverage of the Japanese. Wines and distilled liquors they can scarcely be prevailed on to taste. Hitherto they have never suffered themselves to be corrupted by European modes of living, but still retain their original temperance and frugality... Sakki is transported to Batavia as an article of commerce;..."

Page 275: "Rice is their principal corn. Wheat, barley, and rye are little used... They have many kinds of beans and peas, and also of alliaceous plants, turnips, and cabbages. From the seeds of the latter they express an oil for their lamps" [probably rapeseed oil]. Address: M.D., Knight of the Order of Vasa, Prof. of Botany, Univ. of Upsal [Uppsala], etc. Sweden.

261. Honsô kômoku keimô [Collected essentials of herbs and trees, materia medica for enlightenment]. 1803. Japan. [Jap]*
• ***Summary:*** The thirteenth earliest known reference to Kori-dofu (dried-frozen tofu) appeared in this work.

262. Smith, Thomas. 1803. The wonders of nature and art; or, A concise account of whatever is most curious and remarkable in the world; Whether relating to its animal, vegetable, and mineral productions, or to the manufactures, buildings, and inventions of its inhabitants, Compiled from historical and Geographical works, of established celebrity, and illustrated with the Discoveries of modern travellers. 12 vols. London: Printed for J. Walker. 282 p. See vol. 6, p. 277. Illust. 15 cm.
• ***Summary:*** An encyclopedia. In Chapter VIII, "Of Japan" (p. 230+), in the section titled "Customs, manners, &c." the author borrows text from Thunberg (1802, p. 267) without using quotation marks (p. 259): "Ladies do not eat with the men, but by themselves. Rice supplies the place of bread, and is boiled with every kind of provisions. Fish and fowls are very plentiful, and are eaten in abundance; but miso-soup * boiled with fish and onions is the customary food of the common people."

Footnote: *"Misos are small beans, like lentils, the produce of the dolichos soja." Address: Rev. and author [England].

263. Sugino Bakuka. 1803. Shinsen hôchô kakehashi [Newly selected kitchen knife ladder]. Osaka Shorin: Akamatsu Kyubei and Asano Yahei. 176 p. Japanese summary by Kawakami 1978, p. 79. [Jap]
• ***Summary:*** Cooking know-how for family use including descriptions of how to make shoyu, vinegar, miso, etc. Contains many illustrations of how to set the table, etc. The author wrote this more for family than for professional use.

264. Sugino, Hakuka. 1803. Shinsen hôchô kakehashi [New edition vegetable knife bridge]. Osaka, Japan: Akamatsu Kuhe; Asano Yahe. 5 + 18 + 62 + 3 leaves. Illust. (woodcuts). 26 cm. On double leaves, oriental style (*fukurotoji*). [Jap]*
• ***Summary:*** Iino (2003, p. 9): The 1803 issue of this publication "gives instructions for making homemade soy sauce. It states that by adding *modoki* the soy sauce loses its qualities for preservation making it susceptible to both mold and worms. By adding stock, acidity is increased, affecting the flavor. Therefore it states that *modoki* must not be added when making homemade soy sauce." Address: Japan.

265. Grubbens, M. de. 1804. Method of preparing Chinese soy. *Philosophical Magazine* (*The*) (*London*) 19(75):260-63. First quarter. [1 ref. Eng]
• ***Summary:*** "Extracted from the Memoirs of the Academy of Sciences at Stockholm for 1803, first quarter, by M. Lindbom, Captain of the Swedish Mines.* (Footnote: *From the *Annales de Chimie,* No. 148).

"The Transactions of the Swedish Academy for the year 1761 contain a description of the method of preparing soy

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[sauce], by the late captain Ekeberg; but as this description is incomplete as well as incorrect, since the real Chinese soy will not be obtained by following it, I am fully persuaded that M. Ekeberg never saw, nor was acquainted with, the true process for preparing this substance. There is reason to believe that he gave his description from the accounts of the Chinese, who are not always ready to speak the truth, as I observed during the five years I resided in China... but as I have now procured a very correct account of it [manufacturing soy], I think it my duty to communicate it to the Academy.

"Soy is prepared from a kind of beans, which are whiter and smaller than those of Turkey, the farina of wheat, salt, and water. The proportions are 50 pounds of beans, 50 pounds of salt, 60 pounds of farina of wheat, and 250 pounds of water." Note: Farina here refers to finely ground wheat meal, a little coarser than wheat flour.

"After the beans have been well washed, they are boiled with well water in an open pot for some hours, or until they become soft enough to be kneaded with the fingers. During the boiling they must be always covered with water that they may not be burnt. Care must be taken not to boil them too much: if they are diluted, too much of the substance remains in the juice. When the beans are boiled they are put into large flat wooden tubs, or, as the Chinese do, into vessels made of thin broad splinters of bamboo, two inches and a half in depth and five feet in diameter. In the latter they are spread out to the depth of two inches. When they are sufficiently cooled to be touched with the hand, the farina of wheat is added, and well mixed with them; and this is continued till the whole farina is exhausted. When the mass becomes too dry for the farina to adhere to the beans, a little warm juice is added.

"When the whole is well mixed, the mass is spread out in the tubs above mentioned, taking care that the strata are not more than an inch or an inch and a half in thickness. The mass is then covered, by placing over it a lid which exactly closes it. When it is observed that the mass becomes mouldy, and that heat is disengaged from it, which takes place in the course of two or three days, the cover must be raised up, by placing two rods below it, in order that the air may have freer access. In the mean time a rancid odour is exhaled. If the mass assumes a green colour, it is a sign that every thing goes on well; if it begins to grow black, the cover is raised a little more, in order that the mass may be more in contact with the air. When the mass becomes completely black it is entirely spoiled.

"As soon as it is observed that the whole mass is green and mouldy, which is generally the case in eight or ten days, the cover is removed, and the mass is exposed for some days to the air and the sun.

"When the whole mass has become hard like a stone, it is cut into small fragments, which are thrown into an earthen pitcher, and 250 pounds of water, in which 50 pounds of salt are dissolved, are poured over them. The whole is well stirred; and the height which the water occupies in the pitcher is noted. In case one pitcher is not sufficient, the mass is put into several, taking care that each be proportioned to the quantity of the matter.

"When the pitcher is thus filled it is placed in the sun. The matter must be regularly stirred and shaken every morning and evening, but at night care must be taken to put the cover on it to preserve the mass from the cold. This cover is made convex on the outside that the rain may more readily run off from it, and it is employed also in the day time, when it rains. The greater the heat of the sun, the more the preparation of the soy is accelerated. This operation in general is undertaken only in summer, and yet it continues for two or three months.

"In proportion as the mass decreases by evaporation, well water is added, and this is continued till the salt water has entirely dissolved both the farina and the beans. The pitcher is then left some days longer in the sun, in order that the solution may be so much the more perfect, as on this depends the good quality of the soy, and even during this time the matter must be stirred every day.

"When the mass has become very succulent and oily, the whole is poured into bags, which are pressed to squeeze out the soy, which is then pure, and ready to be employed. It is not boiled, as M. Ekeberg asserts. It is then put into bottles, which are well closed. The Chinese, who deal in this article, put it into large pitchers. The soy before it is squeezed out is of a dark brown colour, but it afterwards becomes black.

"The Chinese prepare from the refuse that remains two other kinds of soy. The first time they add 150 pounds of water and 30 pounds of salt: having squeezed this mass, they again pour over it 100 pounds of water and 20 pounds of salt, proceeding always in the same manner as above described.

"The last two kinds are not strong, but very salt [sic, salty]; especially that of the last extraction, the colour of which is also clear. These two kinds are the commonest in China. The difference between them is as 8, 4, 1.

"In the year 1759 I prepared in this manner, in my lodgings at Canton, all the soy which I employed. I even brought some bottles of it to Sweden: it was succulent, oily, moderately salty, and entirely different from that usually sold in Europe: in regard to its taste it was equal to that of Japan, which is generally considered as the best.

"This description is the more certain, as I always executed the preparation myself: I will even venture to assert, that it is that used to obtain soy of the best quality.

"M. Ekeberg asserts that the soy is boiled, and that sugar, ginger, and other spiceries are added: but this is void of foundation and cannot be true, since a Chinese pound of soy does not cost more than two *canderins* Chinese money, which are equal to one and a third skilling Swedish.* This was the usual price during my residence in China, and there is no reason to believe that these ingredients were employed

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in the preparation of it. Besides, soy has no taste either of sugar or of spiceries; the prevailing taste is that of salt."

266. Nihon ryôrihô taizen [The big book of Japanese cooking methods]. 1804-1817. Japan. [Jap]*
• ***Summary:*** The fourteenth earliest known reference to Koridofu (dried-frozen tofu) appeared in this work.

267. **Product Name:** [Tamari, and Miso].
Foreign Name: Tamari, and Miso.
Manufacturer's Name: Minato-ya. Renamed Sato Shinnosuke Shoten in 1909, then San-Jirushi Brewing Corp. in 1963.
Manufacturer's Address: Ooaza Senba, Kuwana-cho, Kuwana-gun, Ise-no-kuni, Japan.
Date of Introduction: 1804.
Ingredients: Soybeans, water, salt.
Wt/Vol., Packaging, Price: Wooden kegs.
How Stored: Shelf stable.
New Product–Documentation: San Jirushi advertisements in 1980s. Talks with Steve Earle and Michael Fountain. Letter from Steve Earle. 1988. March 7. The best source seen up to this time on the early history of San Jirushi. The product was originally called tamari, not "tamari-shoyu."

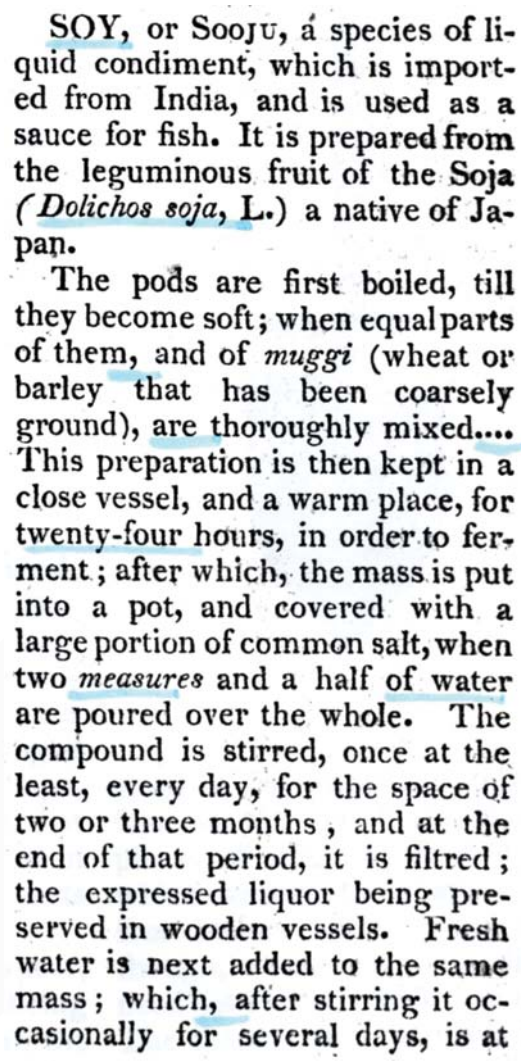
Note: This is the earliest record seen (Feb. 2012) concerning San Jirushi of Kuwana, Japan.

268. Mease, James. 1804. Soy. In: A.F.M. Willich, ed. 1804. The Domestic Encyclopedia. Philadelphia, PA: William Young Birch and Abraham Small. See Vol. V, p. 12-13.
• ***Summary:*** This work is subtitled: "First American edition; with additions applicable to the present situation of the United States: by James Mease." Material added by Mease appears in square brackets ["Crotchets"].

"SOY [sauce], or Sooju, a species of liquid condiment, which is imported from India, and is used as a sauce for fish. It is prepared from the leguminous fruit of the Soja (*Dolichos soja*, L.) a native of Japan.

"The pods are first boiled till they become soft; when equal parts of them, and of *muggi* (wheat or barley that has been coarsely ground), are thoroughly mixed... This preparation is then kept in a close [sic, closed] vessel, and a warm place, for twenty-four hours, in order to ferment; after which, the mass is put into a pot, and covered with a large portion of common salt, when two *measures* and a half of water are poured over the whole. The compound is stirred, once at the least, every day for the space of two or three months, and at the end of that period, it is filtered; the expressed liquor being preserved in wooden vessels. Fresh water is next added to the same mass; which, after stirring it occasionally for several days, is at length strained; and the liquor, though of an inferior kind, thus rendered fit for use.

"*Soy* possesses a strongly saline taste, but has only a slight aromatic flavor: it is chiefly used at the tables of the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luxurious; and is one of these artificial stimulants of the palate, which deserves no commendation, especially for vitiated or relaxed habits.

"[The Soy-bean bears the climate of Pennsylvania very well. The bean ought therefore to be cultivated.]." Note 1. A portrait of James Mease, M.D., appears in the following book: True, Rodney H. 1939. *Sketch of the History of the Philadelphia Society for Promoting Agriculture:... 150th anniversary... Memoirs Vol. 6.* Philadelphia, Pennsylvania: Philadelphia Society for Promoting Agriculture. ix + 228 p. Portrait is facing p. 29.

Note 2. This is the earliest document seen (July 2011) that clearly refers to the cultivation of soybeans in Pennsylvania. This document also contains the earliest clear date for the cultivation of soybeans in Pennsylvania (1804). However soybeans were probably grown in Philadelphia in 1769 (See Lesley 1884). Mease probably learned that the soy-bean grows well in Philadelphia from John Bartram, who also lived in Philadelphia and was also a member of the American Philosophical Society.

Note 3. This document by Mease was first cited in:

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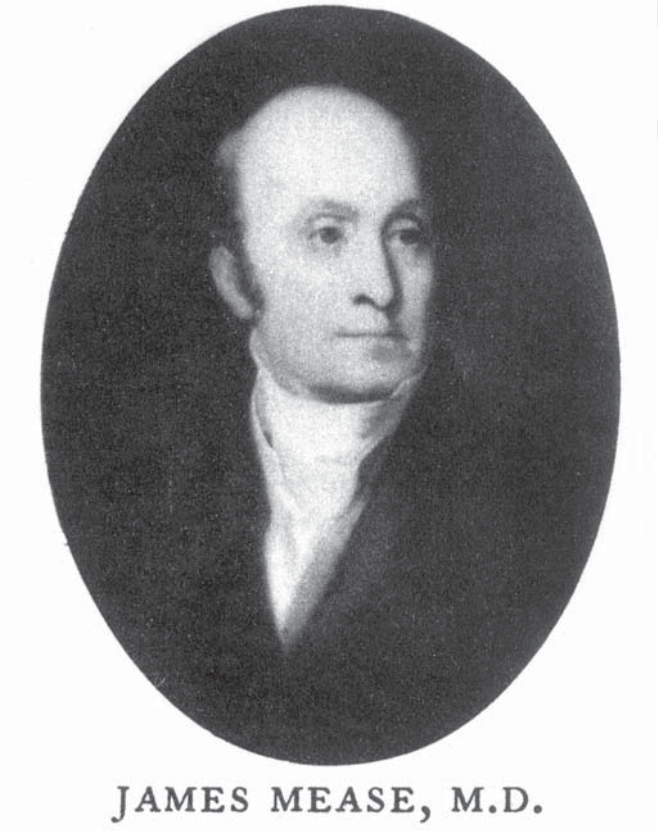
Piper, C.V.; Morse, W.J. 1916. "The soy bean, with special reference to its utilization for oil, cake, and other products." *USDA Bulletin* No. 439. Dec. 22. See p. 7.

Note 4. This is the earliest English-language document seen (Feb. 2007) that contains the term "Soy-bean" (or "Soy-beans"), or "the Soja." The term "Soy-bean" is the earliest close ancestor / cognate of the modern American word "soybean." By what thought process did Mease coin this term? Did he think: The Soy-bean is the bean used to make Soy [sauce]?

Note 5. This is the earliest English-language document seen (April 2012) with the word "Soy," used alone to refer to soy sauce, in the title.

Note 6. Hymowitz (1991) reports that the soybeans referred to by Mease were those introduced by Samuel Bowen. Dr. James Mease, a physician, scientist, and author, was born on 11 Aug. 1771 in Philadelphia. He was a leader in the organization of the Pennsylvania Horticultural Society and in 1802 was elected to the American Philosophical Society. Mease obtained his information that "The Soy-bean bears the climate of Pennsylvania very well" from the writings Charles Thomson, one of the secretaries of the American Philosophical Society for the year 1770. The last sentence in this 1804 article is a paraphrase of Thomson's Preface to the *Transactions of the American Philosophical Society* (Vol. 1, p. VII) for the year 1770.



JAMES MEASE, M.D.

In 1805 Mease, age 23, was the secretary of the Philadelphia Society for Promoting Agriculture, in Philadelphia; in 1844 he was chosen president. In 1810 he was secretary of the Agricultural Society of Philadelphia. On 19 Sept. 1991 Dr. Ted Hymowitz of the University of Illinois sent a photocopy of an oval illustration (painting) of a portrait of James Mease, M.D. Address: M.D., Fellow of the American Philosophical Society, Philadelphia, Pennsylvania.

269. Pinkerton, John. 1804. Modern geography: A description of the empires, kingdoms, states, and colonies; with the oceans, seas, and isles; in all parts of the world: Including the most recent discoveries, and political alternations. Digested on a new plan... The article America, corrected and considerably enlarged, by Dr. Barton, of Philadelphia. With numerous maps. Vol. II. Philadelphia: John Conrad & Co.; Baltimore: M. & J. Conrad & Co.;... [ii] + 698 p. See p. 85, 130. Index. 23 cm.

• ***Summary:*** The information about soy in this book is very similar to that in the 1802 edition, although it appears on different pages. In Chapter 4, on the natural geography of China, the section on "Botany" (p. 85) states: "The following are found in a truly wild state in China, viz. three species of dolichos, *kidney bean;* D. sinensis, *calvances;* D. soya, from the beans of which the true Indian soy is made; and D. culcratus: dioscorea alata, *yam;* cucurbita sinensis, China gourd; nicotiana tabacum, tobacco; and convolvolutus battatas, *sweet potato.*

In another Chapter 4, on the natural geography of Japan, the section on "Botany" (p. 130) states: "... the ginger, the soy bean, black pepper, sugar, cotton, and indigo, though perhaps natives of the more southern regions of Asia [Cochin-China] are cultivated here [in Japan] with great success and in vast abundance."

Note 1. Pinkerton lived 1758-1826.

Note 2. This is the earliest document seen (March 2001) that mentions wild soybeans. Address: [England].

270. Shimazu, S. 1804. Seikei-zusetsu [Illustrations. 30 vols.]. Japan. 26 cm. [Jap]*

• ***Summary:*** Nagata (1960, p. 75) states that Shimazu has pointed out in *Seikei Zusetsu* (1804-1806) that summer soybeans were sown in April preceding the autumn in the western provinces.

Goto (1984, p. 136) states: "Seikei-zusetsu (1804) outlined the methods of soybean production as recent practices." The book was apparently compiled, authored and/or illustrated by Senshun Sô (1751-1834) and Kunihashira Shirao (1762-1821). Address: Japan.

271. Kinsei shokuhin zukushi ekotoba [Abundant food illustrations and captions of the early modern period]. 1805. Japan. [Jap]

• ***Summary:*** A large, superb illustration shows tofu being

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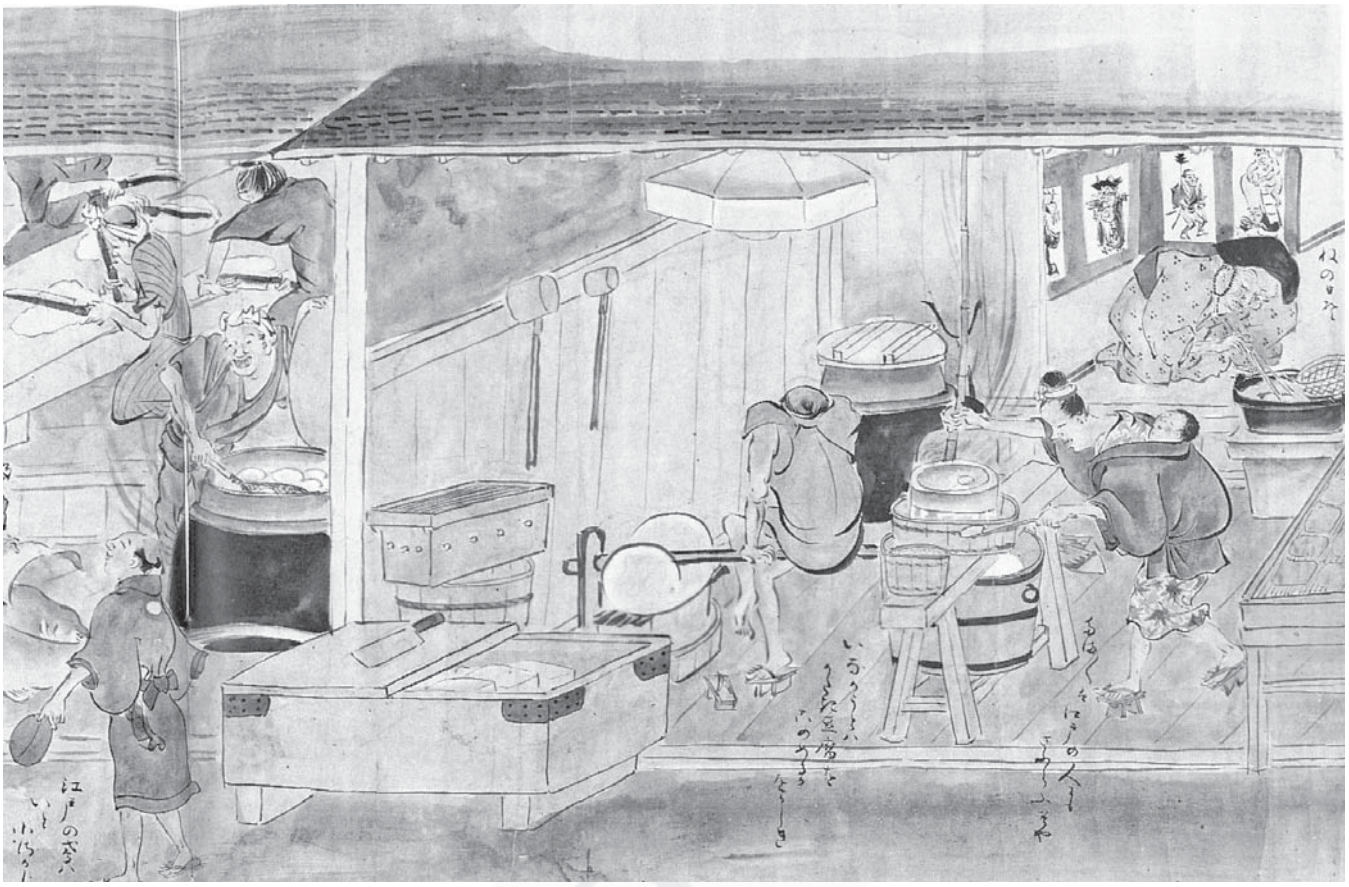

made in a commercial tofu shop. The basic steps are unchanged to this day. A lady with a baby on her back, grinds the next batch of soaked soybeans in a hand-turned stone mill. She turns the mill with her right hand while ladling in soaked soybeans using a shallow spoon with her left. She is wearing raised wooden shoes (*geta*) to keep her feet dry and clean. The smooth white puree runs down into a wooden barrel beneath the mill. Puree from the last batch of soybeans she ground has been cooked with water (in front of her) in a large iron caldron covered with a wooden lid. That cooked puree was ladled out into a pressing sack.

A man, probably the tofu maker (with his back to us) is sitting on a lever press (a sturdy board attached to a fulcrum on the wall) pressing a white sack so that the soymilk runs down into a curding barrel and okara remains in the sack.

After a coagulant (nigari or calcium sulfate or both) is added to the hot soymilk in the curding barrel, the milk is transformed into white curds and yellow whey. The whey is ladled off (see two ladles hanging on wall) and the curds are scooped into the cloth-lined perforated wooden forming box that rests atop a wooden tub next to the wall just to the left of the ladles. The curds in the forming box are pressed to make tofu.

A previous batch of tofu is now under cold water in a wooden sink near the left front of the illustration. A knife, used to cut blocks of tofu into smaller cakes, rests on that part of the sink which is covered. A potential customer (far left), with a fan in his left hand, stands on the street.

At the far right of the illustration, thinly sliced pieces of tofu are draining on a mat on a long table, in preparation for deep frying. At the top right, an elderly person from the tofu maker's extended family (probably a parent of the tofu-maker or his wife), kneeling on the tatami mats in the home–one step up from the tofu shop, appears to be deep-frying–probably to make deep-fried tofu pouches (aburagé).

An adjacent room (to the left) is a fish shop where fish are being cut into smaller pieces and deep-fried (perhaps to make cakes or patties of *Satsuma agé*).

On the illustration of the tofu shop are three groups of old, hard-to-read Japanese characters, handwritten in script format. (1) At the top right is written *Ne no hi no.* "Ne no hi" is a word somewhat like "Tuesday," the name of one of the days of the week in old Japan under the lunar calendar system–even though there was no idea of a "week" in Japan at this time. "Ne ho hi" occurred roughly 3 times each lunar month of 28 days, typically at 12-day intervals.

(2) Below the feet of the women with the baby on her back is written: *Tamatama ni Edo no hito* [*?*] *mo saburafu ya,* which may mean "Sometimes people from Edo visit here."

(3) Below the man sitting on the pole that is pressing the sack of okara is written *Inaka* [*?*] *hito wa kataki tofu*

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o konomeruga okashiki, which may mean "It's funny that country folks prefer firm tofu."

272. Barrow, John. 1806. A voyage to Cochinchina, in the years 1792 and 1793: Containing a general view of the valuable productions and the political importance of this flourishing Kingdom... To which is annexed an account of a Journey, made in the years 1801 and 1802, to the residence of the chief of the Booshuana {Botswana} Nation, being the remotest point in the interior of southern Africa... London: T. Cadell and W. Davies. xvii + 447 p. 28 x 22 cm.

• ***Summary:*** In the section titled "Sketch of the character and condition of the natives of Turon," "Lock-soy" is mentioned.

In a discussion about the food of Cochinchina we read (p. 314-15) [p. 118] that rice "'is with them the grand support of existence. Of this grain they have the art of making a kind of vermicelli, usually called *Lock soy,* which is perfectly transparent, and held on that account in high estimation both in Japan and China; to the latter of which it is exported in considerable quantity. It communicates to soup a gelatinous consistence, but at the same time preserves its form and transparency, qualities which would lead one to doubt if rice be the only ingredient in its composition. The Chinese *Lock-soy* is opaque.'"

Note: This is the earliest document seen (May 2011) stating that Lock-soy is a type of dried vermicelli made from rice (rice noodles). Why is "soy" part of the food's name? Is soy an ingredient? Soy flour? What is the origin and etymology of the name?

Sir John Barrow (of England) lived 1764-1848. Address: Esq., F.R.S.

273. Shecut, John Linnaeus Edward Westridge. 1806. Flora carolinæensis; or, A historical, medical, and economical display of the vegetable kingdom; according to the Linnæan, or sexual system of botany. Being a collection or compilation of the various plants hitherto discovered and made known by the several authors on botany, &c. 2 vols. Charleston, South Carolina: Printed for the author by J. Hoff. 584 p. See vol. 1, p. 514. [1 ref. Eng]

• ***Summary:*** This book, about the flora of Carolina, was written for the purpose of stimulating an interest in the study of botany and simplifying the Linnaean system for beginners.

In Vol. 1, page 514 the genus Dolichos is described. Concerning that genus Shecut says: "There are 24 species, mostly exotic, growing in the Indies." [probably the Dutch East Indies]. The 3rd member of the genus listed is the soybean–today's Glycine max.

"3. Dolichos Soja, *Soy,* or *Sooja,* a native of Japan, though bearing this climate; and is the bean, the leguminous fruit of which affords the liquid condiment called Indian Soy [sauce]. Kempfer [Kaempfer] affirms that the seeds of this species give relief in the Asthma."

Note: Given that the title refers to a flora of the Carolinas, the author seems to be saying that the soybean either grows or will grow in South Carolina. However the sentence at the end of the subtitle appears to say something altogether different; therefore we cannot be sure. Or, Shecut may have read James Mease (1804), who states: "[The Soy-bean bears the climate of Pennsylvania very well. The bean ought therefore to be cultivated.]." In the same article, Mease says of soy sauce: "SOY, or Sooju, a species of liquid condiment, which is imported from India,..." From Mease, Shecut he may have adopted the phrases "bearing this climate" and "liquid condiment called Indian Soy." It is possible that this is the earliest document seen (Aug. 2011) concerning soybeans in South Carolina, or the cultivation of soybeans in South Carolina–but this is not at all clear. And all things considered–we think it is unlikely that Shecut observed the soybean growing in South Carolina.

John Shecut lived 1770-1836. Address: Charleston, South Carolina.

274. Layman, William. 1807. Outline of a plan for the better cultivation, security, & defence of the British West Indies: Being the original suggestion for providing an effectual substitute for the African slave trade, and preventing the dependence of those colonies on America for supplies. London: Printed and sold by Black, Parry, and Kingsbury, Booksellers to the East India Company. viii + 9-93 p. See p. 47.

• ***Summary:*** The Introduction notes that, following the abolition of the slave trade by England, an effectual alternative must replace it. The section titled "Outline of a plan" begins: "The immense importance of our West-India colonies to the manufactures, commerce, revenue, and naval strength, of this country is so well known... next to our home trade they unquestionably form the greatest source of our wealth and power,..."

A footnote states: "In 1805, the number of British ships employed in the West-India trade was 837, amounting to 206,510 tons, and employing 17,680 seamen."

Layman's basic proposal is to introduce Asian cash crops, "the growth of which the soil and climate are sufficiently well adapted" (p. 43), to the British West Indies so that the former slaves can earn a living cultivating them, and so that Britain can purchase the surplus and ship it back to England.

A four-page list of potentially profitable crops is given (p. 44-47), each with its common name, scientific name, and the place or places where it now grows well. Included in this list are: "Soy-bean–Dolichos Soja–Japan" (p. 46). "Soy–China."

Seed oils are: "Cadjan [Cajan, Cajanus]–Japan. Scramium–Sesamum Orientale–Japan and China. Mustard–Sinapsis–China and Bengal. Cole–Brassica oreintalis–Japan. Rape. Linseed. Tsubaki–Camellia Japonica–Japan." Address: Captain of the Royal Navy, Oakley-House.

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275. Miller, Philip. 1807. The gardener's and botanist's dictionary: Containing the best and newest methods of cultivating and improving the kitchen, fruit, and flower garden and nursery; of performing the practical parts of agriculture; of managing vineyards, and of propagating all sorts of timber trees... The whole corrected and newly arranged..., by Thomas Martyn Vol. II. London: Printed for F.C. & J. Rivington. 2 vol. in 4. Unpaginated. 38 cm. 20 plates. [9 ref. Eng]

• ***Summary:*** The plants are arranged alphabetically in the book by genus, but not alphabetically within one genus by species. "33. Dolichos Soja: *Lin. spec.* 1023. *syst.* 659. *Reich.* 451. *fl. zeyl. n.* 534. *mat. med.* 171. *Kaempf. amoen.* t. 838. (Phaseolus). *Thunb. jap.* 282. *Lour. cochinch.* 441. *Rumph. amb.* 5. t. 140. (Cadelium). *Stems flexuose, racemes axillary, erect, legumes pendulous, hispid, containing about two seeds."*

Three pages later, under "33." is a description of the plant and its uses. "Stem round at bottom and smooth; above striated, very hirsute, a foot and more in height. Leaves petioled, hirsute: leaflets petioled, ovate, obtuse with a point, entire, the middle one on a longer petiole and larger, an inch in length: petiole striated, hirsute, a finger's length. Flowers in short, erect, hirsute racemes: subsessile, from three to five together. Corollas purple, scarcely larger than the calyx.*

"Native of the East Indies, Ceylon, Japan, &c.

"The seeds, which are usually called *Miso* [sic] in Japan, are put into soups, and are the most common dish there, insomuch that the Japanese frequently eat them three times a day. The *Soja* [soy sauce] of the Japanese, which is preferred to the *Kitjap* of the Chinese, is prepared from these seeds, and is used in almost all their dishes, instead of common salt. The Chinese also have a favourite dish made of these seeds, called *Teu hu* or *Tau hu* [tofu], which looks like curd, and though insipid in itself, yet with proper seasoning as [is] agreeable and wholesome.**"

Footnotes: "*Thunb. and Linn. **Thunb. and Loureiro."

Note 1. This is the earliest English-language document seen (April 2012) that uses the word *"Soja"* or "The *Soja"* (regardless of capitalization or italics) to refer to shoyu or soy sauce.

Note 2. Miller associates the word "Kitjap" with Chinese rather than with Indonesian soy sauce, a point of key historical interest.

Glycine javanica: "*Java Glycine. Lin. spec.* 1024. *Reich.* 453. *Thunb. in Linn. trans.* 2. 340. *Leaves ternate; stalk villose; petioles rough-haired; bractes lanceolate minute.*

"Stem twining, as in *Phaseolus,* with yellow, reflex hairs scattered over it. Leaves of *Phaseolus.* Pedicels yellow, with close hairs. Stipules, to the petioles oval-oblong, to the peduncles lanceolate. Peduncles the length of the leaves, terminated by an ovate-oblong, close spike of nodding violet-coloured flowers, with very minute bractes between them.– Native of the East-Indies*; and near Nagasaki in Japan, where it is called *Fajo Mame,* and flowers in september and october [sic].**" Footnotes: "*Linn spec. **Thunberg."

On the title page, the subtitle reads: "To which are now first added a complete enumeration and description of all plants hitherto known, with their generic and specific characters, places of growth, times of flowering, and uses both medicinal and economical. The whole corrected and newly arranged, with the addition of all the modern improvements in landscape gardening, and in the culture of trees, plants, and fruits, particularly in the various kinds of hot houses and forcing frames: with plates explanatory both of them, and the principles of botany. By Thomas Martyn, B.D., F.R.S. Regius Professor of Botany in the University of Cambridge."

This elegant set of large books consists of 4 volumes, plus 2 volumes of plates. The soybean appears only in volume 2. Miller gives the most detailed botanical description of the soybean in English up to this time.

Note 3. Philip Miller was head of the famous Chelsea Physic [botanic] Garden in England. Among his many students was William Aiton, who introduced the soybean to England.

Note 4. This is the earliest English-language document seen (Oct. 2004) that uses the term "twining" to describe wild perennial ancestors of the soybean.

Note 5. This is the earliest English-language document seen (April 2013) that uses the word "Teu hu" (or "teu-hu"), or the word "Tau hu" (or "tau-hu") to refer to Chinese-style tofu.

Note 6. This is the earliest English-language document seen (April 2013) that uses the word "curd" in connection with tofu.

Note 7. This is the earliest English-language document seen (Jan. 2004) that uses the word "leaflets" (or "leaflet") in describing the soybean plant.

Note 8. This is the earliest English-language document seen (July 2001) that uses the word "petiole" (or "petioles" or "petioled") in connection with the soybean plant. *Webster's Dictionary* defines petiole (derived from New Latin for little foot), a word first used in 1753, as "a slender stem that supports the blade of a foliage leaf," i.e., the stem of a leaf.

Webster's Dictionary defines stipule (derived from New Latin *stipula,* which is derived from the Latin word meaning "stalk"), a word first used in about 1793, as "either of a pair of appendages borne at the base of the leaf in many plants." Address: F.R.S., Gardener to the Worshipful Company of Apothecaries at their Botanic Garden in Chelsea [England] and a Member of the Botanic Academy at Florence.

276. Ryôri no sho [The book of cooking]. 1807. Japan. 50 p. Unpublished. Japanese summary by Kawakami 1978, p. 187. [Jap]

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• ***Summary:*** This is not the book's true name, but a tentative name applied after it was written. It is not a recipe book but a book on how to make foods, including shoyu and miso. The author was a person who could experiment with shoyu production. A lot of old things are mentioned. The book must be a collection of writings about what the author has heard and also quotations from other books.

277. The new encyclopædia; or, universal dictionary of arts and sciences: Dolichos soja. 1807. London: Printed for Vernor, Hood, and Sharpe. See vol. VII. Dol. (p. 417-418). [2 ref. Eng]
• ***Summary:*** "3. Dolichos Soja is a native of Japan, where it is termed *daidsu;* and, from its excellence, *mame;* that is, the *legumen* or *pod,* by way of eminence. It grows with an erect, slender, and hairy stalk, to the height of about 4 feet. The leaves are like those of the garden kidney-bean. See Phaseolus. The flowers are of a bluish white; are produced from the bosom of the leaves, and succeeded by bristly hanging pods resembling those of the yellow lupine, which commonly contain two, sometimes 3, large white seeds. There is a variety with a small black fruit, which is used in medicine.

"Kempfer [Kaempfer] affirms, that the seeds when pounded and taken inwardly give relief in the asthma. This legumen [legume] is doubly useful in the Japanese kitchens. It serves for the preparation of a substance named miso, that is used as butter; and likewise of a pickle celebrated among them under the name of sooju or soy [sauce]. See these articles."

Note: This is the earliest English-language document seen (Feb. 2008) that has the word "Soja" in the title.

278. Barrow, John. 1808. Reise nach Cochinchina in den Jahren 1792 und 1793: Nebst Nachrichten... [A voyage to Cochinchina, in the years 1792 and 1793: Containing a general view of the valuable productions and the political importance of this flourishing Kingdom... To which is annexed an account of a Journey, made in the years 1801 and 1802, to the residence of the chief of the Booshuana {Botswana} Nation, being the remotest point in the interior of southern Africa...]. Weimar [Germany]: Landes-Industrie-Comptoir. xlxi (i.e. xlvi) + 504 p. 20 cm. Series: Bibliothek der neuesten und wichtigsten Reisebeschreibungen zur Erweiterung der Erdkunde... By Matthias Christian Sprengel, Theophil Friedrich Ehrmann... [Ger]
• ***Summary:*** Lock-Soy is mentioned on pages 412-13. Sir John Barrow (of England) lived 1764-1848.

279. Nicholson, William. 1808. A dictionary of practical and theoretical chemistry, with its application to the arts and manufactures... London: Printed for Richard Philipps. 826 p. Illust. [20 p. and 13 leaves of plates, some folded]. 22 cm.
• ***Summary:*** The entry for "Soy" on an unnumbered page begins: "We find in the Memoirs of the Swedish Academy [Grubbens 1803] the following account of the mode in which this kind of sauce is prepared.

"The ingredients are 50 lbs. of a small, white bean, the fruit of the dolichos soja, 50 lbs. of salt, 60 lbs. of wheat flour, and 250 lbs. of water.

"After having well washed the beans, they are boiled in well-water in an open vessel for some hours, or until they have become so soft as to be worked between the fingers. During the boiling they must be kept covered with water, to prevent their burning; and care must be taken not to boil them too much, because in that case too much of their substance would remain in the water of decoction.

"The beans, being thus boiled, are taken out, and put into large shallow wooden vessels, which in China are made of thin staves of bamboo, two inches and a half in depth, and five feet in diameter. In these they are spread out to the depth of two inches, and when they are cold enough to be worked with the hand, the wheat flour is gradually thrown in, and mixed with the beans, till the whole of the before-mentioned quantity has been used. When the mass becomes too dry, so that the flour does not mix well with the beans, a little of the hot water of the decoction is added..." Address: [England].

280. Willdenow, Carl Ludwig. 1809. Enumeratio plantarum Horti Regii Botanici Berolinensis:... [Enumeration of the plants in the royal botanical garden of Berlin:...]. Berolini [Berlin]: In Taberna Libraria Scholae Realis. vi + 1099 + x + 70 p. (supplement). See p. 755. [165* ref. Lat]
• ***Summary:*** In the section on "Diadelphia Decandria," under the genus *Dolichos* (No. 816) (p. 754-55) we read: "7. Dolichos Soja. ++ Erecti.

"D. caule erecto flexuoso, racemis axillaribus errectis, leguminibus pendulis subdispermis. *Sp. pl. ed. W. 3.* p. 1051.

"Habitat in India orientali, Japonia" [Habitat is in the East Indies, and Japan]. Symbol for annual plant. Symbol C. for plant that prefers a warm climate, 10-15 degrees on the Réaumur [Reaumur] thermometor.

Note 1. Willdenow (1765-1812) was a German botanist and pharmacist. Born in Berlin, he studied medicine and botany at the University of Halle. He was a director of the Botanical garden of Berlin from 1801 until his death. There he studied many South American plants, brought back by the explorer Alexander von Humboldt. He was interested in the adaptation of plants to climate, showing that the same climate had plants having common characteristics. His herbarium, containing more than 20,000 species, is still preserved in Berlin (Source: Wikipedia).

Note 2. The Réaumur temperature scale, first proposed by René Antoine Ferchault de Réaumur (of France) in 1731, set the freezing and boiling points of water at zero and 80 degrees respectively. Daniel Fahrenheit, a German who lived most of his life in Holland, had already invented the alcohol thermometer (1709) and the mercury thermometer (1714).

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Later, in 1742, Anders Celsius, of Sweden, was the first to describe a centigrade thermometer–one having 100 degrees between the freezing and boiling points of water. Address: Prof. Publ. Ord. Botan. et Hist. Natural, etc. [Prof. of Botany and Natural History, Berlin].

281. Mease, James. ed. 1810. Archives of useful knowledge, a work devoted to commerce, manufactures, rural and domestic economy, agriculture and the useful arts: Chinese soy. Philadelphia, Pennsylvania: David Hogan. See vol. 1. No. 2, p. 219-23. Oct. [4 ref]
• ***Summary:*** In this introduction to an article by M. de Grubbens titled "Method of Preparing the Chinese Soy," Dr. Mease writes: "The agreeable flavour which the Chinese and Japanese *Soy* [sauce] communicates to fish is well known. But the high price of the article confines its use to few persons. Hence it has always been an object to discover the peculiar mode of preparing it. Several processes, particularly those by Professor Beckmann, M. Ekeberg, and by Sir Tilloch, have been published; which have been copied into various periodical publications, and Encyclopedias.

"It will be seen however, that the following method, carries internal evidence of coming nearer to the truth than any other, and is therefore recommended to our readers. The Editor has the satisfaction to assure them that the Bean, *Deliches Soyae* [sic, *Dolichos*], bears the climate of Pennsylvania well; there is therefore nothing to prevent our enjoying the agreeable condiment, of which it is the basis, except our own indifference. Accounts of the trials of the recipe will be thankfully received."

M. de Grubbens' article is "extracted from the *Memoirs of the Academy of Sciences at Stockholm* for 1803, first Quarter, by M. Lindbom, captain of the Swedish mines." Note 1. For a translation, see de Grubbens 1804. de Grubbens lived for 5 years in China. He prepared soy sauce in 1759 in Canton and brought some bottles of soy that he made to Sweden. Mease lived 1771-1846.

Note 2. This is the earliest English-language document seen (April 2012) that uses the term "Japanese *Soy*" (or "Japanese soy") to refer to Japanese-style soy sauce.

Note 3: This is the earliest English-language document seen (Jan. 2007) that contains string "Soya" or the word "Soyae" in connection with soybeans. The word "Soyae," used as the species name of the soybean may have been a mistake or typographical error, just as the genus name "Deliches" was also an error; neither one was never used again. Mease may have intended to write *Dolichos soja* L., although the correct scientific name of the soybean at this time (1810) was *Soja hispida* Moench. Address: Secretary to the Agricultural Society of Philadelphia, Pennsylvania.

282. Ukiyo burô. 3 vols. 1811. Japan. [Jap]*
• ***Summary:*** According to Ryoichi Iino (2003, p. 10) the term *oshidashi* was used in this book to indicate / refer to soy sauce.

283. Lindner, Friedrich Ludwig. 1811. Neueste Laender- und Voelkerkunde: Ein geographisches Lesebuch fuer alle Staende. Vol. 11 [The newest geography and ethnology: A geographical reader for those in all walks of life. Vol. 11]. Weimar [Germany]: The Geographical Institute. [Ger]
• ***Summary:*** This seems to be a German translation of *A Voyage to Cochinchina, in the Years 1792 and 1793,* by John Barrow Esq. Lock-Soy is mentioned on page 543.

284. Pinkerton, John. 1811. A general collection of the best and most interesting voyages and travels in all parts of the world: Many of which are now first translated into English. Digested on a new plan. Vol. 7. London: Printed for Longman, Hurst, Rees, Orme, and Brown. 820 p. See p. 269.
• ***Summary:*** Each book of this 17-volume work is composed of unnumbered chapters, each describing a different voyage. One of these (p. 231-270) is "The embassy of Peter de Goyer and Jacob de Keyzer from the Dutch East India Company to the Emperor of China in 1655. By John Nieuhoff, Steward to the Ambassadors. Translated from the Dutch."

The Introduction begins: "Although China was discovered over land by Marco Polo the Venetian, towards the end of the thirteenth century, yet it was very little known to Europeans, till the Portugueze [Portuguese] arrived there by sea towards the end of the fifteenth, and the Romish [Catholic] missioners found admittance into the empire. In 1517, they established a trade at Quan-tong [Guangdong], commonly called Kanton [Canton]: afterwards they settled a factory also at Ning Po [Ningbo], called by them Liampo, on the eastern part of China, and drove a considerable trade along the coast, between those two famous ports, till their unsufferable [insufferable] pride and insolence brought on their destruction every where but at Ma-kau, or Makao [Macau], an island in the mouth of the river of Kanton [Pearl River], which they still hold, though under great restrictions."

On p. 269 we read that the daily allowance of food by the two ambassadors (de Goyer and Keyzer) included "six tael of mison" (possibly miso). Note: A tael is a unit of weight equal to 1/10 of a catty, or about 50 gm.

"Their secretaries daily allowance was, one katti [catty, a measure of weight] of fresh meat, five measures of tea, one katti of meal, one measure of taufoe [tofu],... four measures of oil, four tael of mison [miso?], one katti of herbs, and one cup of arrac" [arrack, a strong distilled alcoholic beverage mainly in South- and Southeast Asia].

Note 1. This is the earliest English-language document seen (April 2013) that uses the word "taufoe" to refer to tofu.

Note 2. Kaempfer's History of Japan–first published in English in 1727–also appears in this book. The text is almost identical to the 1727 text. The section about soybeans and soyfoods is in Chapter 6, pages 697-98.

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Note 3. Pinkerton lived 1758-1826. Address: Author.

285. Virey, Julien-Joseph. 1811. Traité de pharmacie: Théorique et pratique [Treatise on pharmacy: Theory and practice]. Paris: Rémont and Ferra. 613 p. See Vol. 1, Book 1, p. 107. [Fre]
• ***Summary:*** In Book 1, in section 85 (p. 103) on Legumes, is a subsection titled "Dolic" which states: The *D. Soja,* L. of Japan, has excellent seeds. A sauce is made with the soybean (*le soja*) which is very highly esteemed in Europe.

Note: Julien-Joseph Virey lived 1775-1846. Address: Head Pharmacist, Military Hospital of Paris.

286. Davies, Benjamin. 1813. A new system of modern geography: or, A general description of the most remarkable countries throughout the world;... 3rd ed. Philadelphia, Pennsylvania: Published by Johnson and Warner,... xxiv + 25-447 p. See p. 183.
• ***Summary:*** In the chapter on Japan (p. 178-84), the section titled "Vegetable and animal productions" states (p. 183): "The ginger, the soy-bean, black pepper, sugar, cotton, and indigo, though perhaps natives of the more southern regions of Asia, are cultivated here with great success, and in vast abundance."

Note: One interesting section (p. vii-xii) is titled "The common names of ancient geography, explained by the synonymous modern names, and arranged in alphabetical order." For example: "Albion, now England... Batavia, now Holland... Belgium, now Flanders... Lusitania, now Portugal... Lutetia, now Paris... Memphis, now Cairo, the capital of Egypt... Scandinavia, now Denmark, Norway and Sweden... Thracia, now Romania... Vindebona, now Vienna, capital of Austria." Address: [United States].

287. Stiles & Williams. 1813. Classified ad: Java coffee, Japan soy, spices, &c. *Baltimore Patriot & Evening Advertiser.* Oct. 1. p. 3.
• ***Summary:*** "... 50 mats old Java. Coffee. 2 dozen bottles Japan Soy [sauce], a scarce and delicious Catsup. A few bottles Curry and old Arrack."

Note: What a surprising and interesting definition of "Japan Soy!" Address: Corner of Market and South Streets.

288. Asano, Kozo? 1813. Maniawase ryôri. Sassoku hôchô. Shôjin gyorui [Makeshift, quick cooking. For Zen vegetarian and fish cookery]. Osaka, Japan: Kochiya Kashichi. Japanese summary by Kawakami 1978. [Jap]
• ***Summary:*** The author (who is not known for sure, by may be Asano) lists recipe names and explains briefly how to make them, including recipes using miso.

289. Keizai yôroku 1813. Japan. [Jap]*
• ***Summary:*** Iino (2003, p. 9) notes that this 1813 book "states that the highest quality soy sauces are made using wheat as the flavor harmonizes well with the soybeans." Iino comments that this supports "the idea that wheat, rather than barley, made for a better soy sauce. Therefore, it is thought that the switch from soy sauce made with barley to that made with wheat had been completed by the 18th century." Address: Japan.

290. Kyônan rubetsu-shi [History of Kyonan Rubetsu?]. 1813. Japan. [Jap]*
• ***Summary:*** This work contains the earliest known reference to "yuba" written in the Japanese way. The new term's origin is explained as follows: "On Yuden Mountain, a sacred holly mountain in the feudal province of Dewa, there was an inn, Kinshiya Inn, which was visited by many pilgrims who came to the mountain to pray. The esteemed vegetarian cuisine was prepared by an old woman who was very skilled at making a variety of delicious foods from ground soybeans and soymilk. One of the foods was a thin film, which she fried before seasoning it. Others liked it so much that they began to make it themselves here and there. Sometimes they made it in the shape of bags and squares. In Kyoto, the capital, they used it in vegetarian dishes. Since the new food had been created by the old woman of Yuden Mountain, people named it *yuba,* where *yu* is taken from the *Yu* of Yuden Mountain, meaning 'hot water' and *ba* is the character for 'old woman.'"

Note that while this word was pronounced "yuba," just as it is today, the second character is different from the character used today.

291. Milburn, William. 1813. Oriental commerce; containing a geographical description of the principal places in the East Indies, China, and Japan, with their produce, manufactures, and trade... Vol. II. London: Black, Parry & Co. See p. 519-20.
• ***Summary:*** The subtitle continues "... including the coasting or country trade from port to port; also the rise and progress of the trade of the various European nations with the Eastern world, particularly that of the East India Company, from the discovery of the passage round the Cape of Good Hope to the present period; with an account of the company's establishments, revenues, debts, assets, &c at home and abroad. Deduced from authentic documents, and founded upon practical experience obtained in the course of seven voyages to India and China."

"Soy [sauce]: Is prepared in China and Japan, from a particular species of bean, in the following manner:–the beans are boiled till they become rather soft, to which an equal quantity of wheat or barley is added, and set in a warm place to ferment; the same quantity of salt is then put to the mixture, and three parts as much water added to it. After being properly mixed, it is left to stand, well covered, for two or three months; it is then pressed, and strained off, and kept in wooden vessels. Some places produce better soy

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[sauce] than others, but exclusively of that, it grows better and clearer through age; its colour is invariably brown. Japan soy is esteemed superior to the Chinese, and is an article of trade from thence to Batavia [Jakarta]. The Dutch, in order to preserve the best sort, and prevent its fermenting, boil it up, and afterwards draw it off into bottles, which are then well corked and sealed.

"Soy should be chosen of a good flavour, not too salt or too sweet, of a good thick consistence, of a dark brown colour and clear; when shaken in a glass, it should leave a coat on the surface, of a bright yellowish brown colour; if it does not, it is an inferior kind, and should be rejected."

Note 1. This is the earliest document seen (May 2012) which states that soy can be shaken in a glass to determine its quality. It is also the first which states that good-quality soy, "when shaken in a glass," "should leave a coat on the surface, of a bright yellowish brown colour..."

"The following are the quantities imported and sold at the East India sales, in the years 1804 to 1808 inclusive, together with sale amount and average price per gallon" [see table below]:

1804: None.

1805: 443 gallons worth £317 (March Sale) and 1125 gallons worth £642 (September Sale), for a total of 1568 gallons worth £959 (average 12 shillings 5 pence per gallon).

1806: 807 gallons worth £477 (September Sale); (average 11 shillings 10 pence per gallon).

1807: None.

1808: 2148 gallons worth £2022 (September Sale); (average 18 shillings 10 pence per gallon).

252 gallons of soy are allowed to a ton. Note 2. Total sold during the 5 years: 4523 gallons worth £3458. Address: Of the Honourable East India Company's Service.

292. Virey, Julien-Joseph. 1814. Des fruits alimentaires [Edible fruits]. *Bulletin de Pharmacie et des Sciences Accessoires* (*Paris*) 6(1):5-25. Jan. See p. 10-11. [Fre]
• ***Summary:*** In the section on "Dry fruits, farinaceous fruits, or those containing amylaceous [sweet] starch" (p. 9), subsection 5 is titled "Crude starch of leguminous seeds and those containing various principles." It states: Before their perfect maturity, *Dolichos lablab, D. chinensis, D. ensiformis, D. lignosis, D. soja, D. catiang, D. tetragonolobus* of Linné [Linnaeus] and Thunberg, which are species of beans (*haricots*) from Asia, contain more or less of the saccharine principle combined in their starch, and above all the soybean (*le soja*) of the Japanese and the catiang of the Chinese.

Gluten is mentioned on page 9, Job's tears on p. 10, and chick peas and lupins on page 11. Address: France.

293. Layman, William. 1814. Hints on slave labour and West India cultivation. *Gentleman's Magazine* (*London*) 84:561-68. June; 84:657-64. Supplement. Part I. New Series. See p. 659.
• ***Summary:*** This is basically a condensation of the following 93-page book published 7 years earlier: Layman, William. 1807. *Outline of a Plan for the Better Cultivation, Security, & Defence of the British West Indies: Being the Original Suggestion for Providing an Effectual Substitute for the African Slave Trade, and Preventing the Dependence of those Colonies on America for Supplies.* London: Printed and Sold by Black, Parry, and Kingsbury, Booksellers to the East India Company. viii + 9-93 p.

A table (p. 659) states: "Soy-bean–Dolichos Soja–Japan." "Soy–China." Address: Captain.

294. Tokaidôchû hizakurige 1814. Japan. [Jap]*
• ***Summary:*** According to Ryoichi Iino (2003, p. 10) the term *oshidashi* was used in this book to indicate / refer to soy sauce.

295. Santo Kyoden. 1815. Kottô-shû [Collected antiques. Historical essay on this transitory world]. 2 volumes. Japanese summary by Kawakami 1978, p. 243. [Jap]
• ***Summary:*** This work contains an early reference to yuba, and offers a different etymology of the term from that given in the *Kyonan Rubetsu-shi* of 1813. *"Doufu-p'i* has traditionally been called *yuba,* however this is a mispronunciation. Its real name is *uba.* Some people say that the reason this film is called *yuba* [written with the characters 'hot water' plus 'old woman'] is due to its yellowish color and the wrinkled surface, which resembled the face of an old woman. However this is not true. According to the *Isei teikin ourai* [Encyclopedia in question and answer format, written in ca. 1730] yuba is called *tofu uwamono* [literally 'tofu upper substance'] and this is the correct name, since yuba is a film which forms on the surface while making tofu. It is also abbreviated as *tofu-no-ha* ('tofu film'). *Uba* is a mispronunciation of *uha,* in which the sound *ha* is mispronounced as *ba. Uba* and *yuba* each contains the sound *uba,* so that it is quite understandable that the dialectical term *yuba* was created."

296. Tuckey, James Hingston. 1815. Maritime geography and statistics: or, A description of the ocean and its coasts, maritime commerce, navigation, &c. &c. &c. Vol. III. London: Printed for Black, Parry, and Co. Booksellers to the Hon. East-India Company. vii + 567 p. Index.
• ***Summary:*** "The exports from Japan by the Dutch Company are copper in bats and camphire, each ship's cargo consisting of 675O pickle [piculs] of the former, and 364 boxes* of camphire, of 125 lbs. each; all of which are purchased on the Company's account only.

"The articles permitted to be purchased by the individuals of the crew are tea, soy [sauce], porcelain, silk and rice." Address: A commander in the Royal Navy.

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297. *Asiatic Journal and Monthly Miscellany.* 1816-1845. Serial/periodical. London: Wm. H. Allen & Co. [etc.]. Monthly. 22 cm. *
• ***Summary:*** Note 1. Other titles: *Asiatic Journal and Monthly Register for British and Foreign India, China, and Australasia.*

Note 2. Vol. 1 (Jan. 1816)–vol. 28 (Dec. 1829); New series, Vol. 1 (Jan/April 1830)–vol. 40 (Jan/April 1843). 3rd series, Vol. 1 (May 1843)–vol. 4 (April 1845).

298. Adelon, Nicolas P.; Chaumeton, François Pierre. 1816. Dictionaire des sciences médicales [Dictionary of the medical sciences]. Paris: C.L.F. Panchkoucke. See vol. 17 (Fra-Gen), p. 97. [Fre]
• ***Summary:*** In the section on "Fruit" (p. 89), subsection 5 (p. 97) is on the vegetables with pods, or papilionaceous vegetables, of which many types are listed, including Dolichos soja. These foods are accused of causing intestinal gas, although they are very nourishing and agreeable, above all the soybean (*le soja*) of Japan and the catiang of China.

Lupins and peanuts are also mentioned. Sesame seeds are mentioned on p. 98.

Note: The subtitle is: By a Society of Physicians and Surgeons (*Par une Société de Médecins et de Chirurgiens*).

299. Encyclopædia Perthensis; or, Universal dictionary of arts, sciences, literature, &c. 2nd ed: Soy, or sooju. 1816. Edinburgh: Printed for John Brown. 23 volumes. See vol. XXI. Soy. (p. 197-98). [1 ref. Eng]
• ***Summary:*** "Soy [sauce], or Sooju, n.s., a celebrated pickle, much used by the Japanese, made from the *mame* or beans of the *Dolichos Soja.* (See Dolichos, No. 3). To make it they take equal quantities of the beans boiled to a certain degree of softness; of *muggi,* or corn, whether barley or wheat, roughly ground; and of common salt. Having properly mixed the beans with the pounded corn, they cover up the mixture, and keep it for a day and a night in a warm place, to ferment; then putting the mass into a pot, they cover it with the salt, pouring over the whole two measures and a half of water. This compound substance they carefully stir at lest once a day, for two or three months; after which, they filtrate and express the mass, preserving the liquor in wooden vessels. The older it is, the better and the clearer; and if made of wheat at instead of barley, greatly blacker. The first liquor being removed, they again pour water upon the remaining mass; which, after stirring for some days, as before, they express a second time, and thus obtain an inferior sort of soy."

300. Encyclopaedia Britannica; or, A dictionary of arts, sciences, and miscellaneous literature. 5th ed. Illustrated with nearly six hundred engravings. Enlarged and greatly improved. 20 vols. 1817. Edinburgh: Printed at the Encyclopaedia Press for Archibald Constable. Illust. 28 cm. *
Address: Edinburgh, Scotland.

301. Kitchiner, William. 1817. Apicius redivivus; or, The cook's oracle: wherein especially the art of composing soups, sauces, and flavouring essences is made so clear and easy, by the quantity of each article being accurately stated by weight and measure, that every one may soon learn to dress a dinner, as well as the most experienced cook; being six hundred receipts [recipes], the result of actual experiments instituted in the kitchen of a physician, for the purpose of composing a culinary code for the rational epicure, and augmenting the alimentary enjoyments of private families; combining economy with elegance; and saving expense to housekeepers, and trouble to servants. London: Printed for Samuel Bagster. Unpaginated. First edition. 15 cm.
• ***Summary:*** Since the pages are unnumbered, it is sometimes difficult to describe exactly where references to soy are found. In the chapter on "Roasting," at the end of No. 62 is a "Recipe to sauce for wild fowls" which contains this ingredient: "Sauce à la Russe*, (the older the better), 1 tablespoonful." A footnote on that page states: "* By à la Russe we suppose cavice, or coratch, or soy [sauce], is meant."

In the chapter on "Broths, gravies, and soups," at the top of the 6th page we read: "culinary scribes indiscriminately cram into almost every dish, anchovies*, garlick, bay leaves, and that hot, fiery spice, Cayenne pepper." A footnote on the same page explains the asterisk (*) after "anchovies": "* Soy, cavice-coratch, anchovies, curry powder, browning, catsup, pickle liquor, beer, and wine, are occasionally very convenient auxiliaries to soups, &c.:"

The recipe for "Plain browning (No. 322) Is a very convenient article in the kitchen, to add to those soups or sauces where it is supposed the deep brown of its complexion denotes the strength and savouriness of the composition, and it is a very good substitute for what is called 'India, or Japan Soy.' Put half a pound of moist sugar and a tablespoonful of water into a clean iron saucepan..."

Recipes in the book that call for "Soy" [sauce] as an ingredient include: Mackarel broiled (No. 169; "send it up with fennel sauce in a boat, or plain butter with mushroom catsup or soy in it"). Mackarel roe sauce (No. 266). Cream sauce for fish (No. 277). Camp vinegar (No. 403). Fish sauce (No. 425).

The "Original receipt for Quin's sauce (No. 424) does not contain soy sauce in this edition, although it does in later editions. However it does state: "Obs. [Observations]– The above is copied from this celebrated epicure's original receipt now lying before me, for which I am indebted to Wm. Blachford. Esq., of Gray's Inn: it authenticity may be fully relied on. This sauce is prepared, as here described, by Messrs. Ball, 81, New Bond St., London." Note 1. In early recipes for prepared sauces, such as Worcestershire, soy

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was considered a secret ingredient, and was therefore not revealed."

Note 2. Tom Jaine, expert on early culinary history, of Prospect Books (England) thinks (Dec. 2007) that "Obs.–" stands for "Observation(s)."

The section titled "The magazine of taste" (No. 463, near back of book) contains a list of 28 "flavoring materials" which will enable "the thorough-bred *gourmand"* to develop a mahogany "sauce box" containing bottles of favorite ingredients. No. 15 is "Soy (436)." This refers to soy sauce; No. 436 is a recipe for making it at home. The other materials include: Pickles, brandy, curacao, salad sauce, pudding catsup, sauce superlative or double relish, walnut pickle, mushroom catsup, vinegar, oil, mustard, curry powder, etc.

Turning to No. 436 we read: "SOY. (No. 436.). To a small teacupful of water add half a pound of treacle, or moist or lump sugar; set it on the fire in an iron pot till it boils to a dark brown colour, keep stirring it, and take great care, or it will burn: when it is become quite thick, add to it a quarter ounce of salt, and gradually as much water as will reduce it to the consistency of soy; mix well together and boil up for 5 minutes. The addition of a quarter of a pint of good strong beef glaze (Footnote: See No. 187) to three quarters of a pint of the burnt sugar will very much improve it: those who like a goût [taste] of acid may add vinegar.

"Obs.–This will hardly be told from what is commonly called *"genuine India soy,"* and will answer every purpose that is used for. Burnet treacle, or sugar, and Chili vinegar, garlick, and pickled fish appear to be the bases of almost all the sauces that are now sold in the oil-shops. Although indefatigable research and experiment has put us in possession of all these compositions, it would not be quite fair to enrich the cook at the expense of the oilman, &c."
Note 3. The meaning of "Burnet treacle" is unclear. Burnet is a common herb. Treacle mustard is a plant. And treacle is the British word for molasses.

Concerning catsup: "Mushroom catsup" (No. 439) is mentioned 30 times in this book. After the basic recipe we read: "Excellent mushroom catsup may be had at Butler's herb and seed shop, opposite Henrietta Street, Covent Garden [central London]. "Walnut catsup" (No. 438) is mentioned 8 times. Also mentioned are: Oyster catsup (No. 441), Cockle and muscle [sic] catsup (No. 442), Tomata catsup [tomato catsup] (No. 443), White catsup (No. 444), Cucumber catsup (No. 445), and Pudding catsup (No. 446). The word "catchup" does not appear in this book.

The author–who name does not appear on the title page of this first edition–lived 1775?-1827. He was a nonpracticing Scottish physician. Address: England.

302. Raffles, Thomas Stamford. 1817. The history of Java. 2 vols. London: Black, Parbury & Allen. Vol. 1, xlviii + 479 p. Vol. 2, cclx + 291 p. See vol. I, p. 98. Oxford in Asia Historical Reprints, Oxford Univ. Press, 1978.
• ***Summary:*** In the section titled "Cooking" (Vol. I, p. 98) we read: "The Chinese prepare from the *gédelé* [*kédelé* = soybean] a species of soy [sauce], somewhat inferior to that brought from Japan.

A passage on rice cultivation (Vol. I, p. 116-17) states: "Besides the annual crop of rice which is raised on the *sáwah* lands, a variety of plants are raised upon them as a second or light crop within the same year. Among these are several species of *káchang* or bean... Among the most important are... *kédéle* [soybeans]..." "Together with rice are deposited the seeds of other vegetables, which arrive to maturity at different periods, chiefly after the rice harvest. The most common and useful among these is cotton... Next to this are various leguminous and other plants, which do not interfere with rice. No less than six or eight kinds of vegetables are sometimes in this manner seen to shoot up promiscuously in a single field."

The section on Java's "Oil-giving plants" (p. 123) states: "Of the oil-giving plants there are many. The *káchang góring* of the Malay countries, or, as it is indifferently termed by the Javans, *káchang chína, pénden,* or *tána* [peanut] is cultivated almost exclusively for the purpose of obtaining its oil... It is never employed as an article of food by itself; but what remains of it after the oil is expressed, forms an ingredient for the seasoning of rice... The oil is obtained by grinding the seeds between two grooved cylinders, and then separating it either by expression or boiling. The former is chiefly used by the Chinese, and yields as a refuse the oil-cakes, which I formerly observed were employed as manure in some of the gardens near Batavia."

Raffles (lived 1781-1826) was lieutenant-governor of Java from 1811 to 1816. He acquired and founded Singapore on 6 Feb. 1819. A 2nd edition was published in 1830 in London by J. Murray. Address: Lieutenant-Governor of Java.

303. Beeler (Louis). 1818. Classified ad: Just received. *Alexandria Herald* (*Virginia*). Jan. 28. p. 4.
• ***Summary:*** "... Also, fresh Zaan-currants, ground nuts, palm nuts of a new kind,... cloves, cinnamon, nutmegs, mace, Japan soy [sauce] or East India catsup, almond oil, English mustard,..."

Note 1. This is the earliest document seen (Sept. 2011) concerning soybean products (soy sauce) in Virginia. This document contains the earliest date seen for soybean products in Virginia (Jan. 1818); soybeans as such have not yet been reported.

Note 2. The idea that soy [sauce] is a type of catsup [regardless of spelling] from the East Indies continues to persist.

304. Ryôri tsû [The connoisseur of cookery]. 1818-1829. Japan. [Jap]*
• ***Summary:*** The sixteenth earliest known reference to Kori-

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dofu (dried-frozen tofu) appeared in this work.

305. Shôjin ryôri kondate-shi [History of Zen vegetarian cookery menu preparation]. 1818-1830. Japan. [Jap]*

306. Golownin, Capt. Vasilii Mikhailovich [Golovnin, Mikhaiforich]. 1818. Narrative of my captivity in Japan, during the years 1811, 1812 & 1813; with observations on the country and the people. To which is added an account of voyages to the coast of Japan, and of negotiations with the Japanese, for the release of the author and his companions, by Captain Rikord. 2 vols. in 1. London: Printed for Henry Colburn. 348 p. See p. 58, 66. No index. 22 cm.
• ***Summary:*** In Vol. II: The author, a Russian, was confined to a prison. Page 58: "... our cages were cleaned out, and our coverlets and night-dresses aired in the sun during our absence. Food was brought to us every morning, noon, and evening. At each meal we received thick boiled rice instead of bread. It was dealt out to us in portions which were more than sufficient for Mr. Chlebnikoff and me;... In addition to the rice, we were served with soup made of sea-cabbage and other wild plants, such as sweet cabbage, wild garlic, and water angelica; to which, for the sake of rendering it savoury, pickled beans (Japanese *misso* [miso]) and some pieces of whale fat were added."

Page 66: "We were now supplied with better food: we were frequently treated with a kind of pudding, which the Japanese call tufa [tofu]; fine beans were boiled with our rice, forming a dish which is considered a great delicacy in Japan;..."

Page 198: "Our food in Matsmai [Matsumae] was incomparably better than it had been in Chakodade [Hakodate]... The fish were fried in oil of poppies, and were seasoned with grated radish [daikon] and soy [sauce]."

Note: This is the earliest document seen (Feb. 2001) concerning soya in connection with (but not yet in) Russia or Eastern Europe.

307. Hall, Basil. 1818. Account of a voyage of discovery to the west coast of Corea, and the Great Loo-Choo Island;... London: John Murray. 222 p. See p. 95-97. Translated in 1982 into Japanese by SUDO Toshikazu as Bahiru Hooru Dairyukyuto Kokai Tanken-ki. Dai-ichi Shobo, publisher. See p. 36, 64. [1 ref. Eng]
• ***Summary:*** This book starts when the author's ship lands in China in Aug. 1816. It contains the earliest indirect reference seen to fermented tofu in Okinawa or Ryukyu. In 1816 Captain Hall, an Englishman, visited Naha harbor in Okinawa on his way from China. On 23 Sept. 1816 he and his party and Captain Maxwell went to visit the king of Loochoo (today's Ryukyu Islands, including Okinawa). They enjoyed a meal of local food with a Loochoo chief. A detailed description of the meal is given (p. 95-97). "An entertainment was now served, beginning with a light kind of wine, called sackee (*saké*), which was handed round in very diminutive cups, filled... from a small high pot in which the sackee was kept hot. They insisted on our emptying the cup every time, showing us a fair example themselves. During the whole feast the sackee never left the table, being considered apropos to all the strange dishes which we partook of. The first of these consisted of hard boiled eggs, cut into slices, the outside of the white being colored red. A pair of chopsticks was now given to each person... There was something like cheese given us after the cakes, but we cannot form a probable conjecture of what it was made. Most of the dishes were so good that we soon made a hearty dinner..." The author states (p. 217) that "milk is never used" on the island.

Note 1. The red color was probably imparted to the outside of the shelled eggs by red rice koji (*beni koji*) and the food resembling cheese may well have been *tofuyo,* a special type of fermented tofu, which is also made with red koji and for which this area was famous. There is no information on fermented tofu in Korea.

Note 2. If the above conjectures are true, this would be the earliest document seen (Oct. 2011) that mentions *tofuyo* or Okinawan wine-fermented tofu, and the earliest English-language document seen (Jan. 2014) that mentions fermented tofu. It would also be the earliest document seen (Jan. 2014) that mentions red koji (*beni koji*).

Note 3. This is the earliest document seen (Jan. 2014) that mentions Okinawa in connection with soy.

Note 4. "Chopsticks" are also mentioned elsewhere in this book (p. 116, 160): "for instance, when we first tried to eat with their chopsticks: on that occasion there was a sort of giggling embarrassment shewn by some of us,..." Address: England.

308. Shôjin ryôri tsû [The connoisseur of Zen vegetarian cookery]. 1818. Japan. [Jap]*
• ***Summary:*** The fifteenth earliest known reference to Kori-dofu (dried-frozen tofu) appeared in this work.

309. *Port Folio* (*The*) (*Philadelphia and London*). 1819. On China. 7(2):91-111. Feb. See p. 105-06.
• ***Summary:*** The article begins: "The following letter from a gentleman of this city [Philadelphia, Pennsylvania?], now abroad, is the result of careful observation, during a long residence among the people whom it professes to describe."

Page 105: "The Chinese make great use of beans, not only to feed their sheep and cattle, but also as food for themselves, in what they call, *thow foo* [doufu; tofu], and *foo chack,* [dried yuba sticks], a kind of flummery [soft jelly or porridge], exceedingly palatable and nourishing."

Note 1. This is the earliest English-language document seen (Oct. 2012), and the earliest European document seen (Oct. 2012), that mentions yuba.

Note 2. This is the earliest English-language document

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seen (Oct. 2012), and the earliest European document seen (Oct. 2012), that mentions dried yuba sticks or rolls, which it calls *foo chack* [Chinese; also spelled elsewhere *foo jook, fooh jook* or *fuchu,* "bamboo yuba"]. The yuba is rolled so it looks like a bamboo shoot at each end then folded to form a "V." It is often cooked in a sweet broth, and eaten as a sweet soup; the dried yuba becomes soft, delicate and subtly sweet thin sheets.

"Soy [sauce] is likewise made from beans, with the aid of molasses and salt. The beans are boiled until nearly all the water evaporates and they begin to burn; they are then placed in large jars exposed to the sun, water and molasses are poured upon them and stirred well every day until the liquid is completely impregnated with their flavour; it is then strained off, salted, boiled and skimmed, until perfectly clarified. It will keep any length of time. Many persons have thought that gravy was employed in this condiment, which is not the case, it being entirely a vegetable composition, and certainly very wholesome and agreeable. There are many qualities of it, and it requires much care and attention to make the best. Japanese soy is most esteemed, and is vastly superior to any made in China. Many shopkeepers have large platforms on the roofs of their houses, where a number of jars are placed, for the purpose of making this article of which there is an enormous consumption, since neither rich nor poor can breakfast, dine, or sup without it. It is sauce for every sort of food, gives zest to every dish, and is the *sine qua non* of a Chinese meal."

310. *P.P.F. DeGrand's Boston Weekly Report.* 1819. Shipping news: Abstract of foreign arrivals. June 5. p. 1.
• ***Summary:*** "May 31st. Ship *Levant,* [Captain] Cary, of Boston, from Canton, 128 days.–1530 boxes sugar;... 2 boxes China; 1 tub Candy; 1 box Japan Soy [sauce]."

In the same issue of this newspaper (p. 3) is a section titled "Consignees of Foreign arrivals," which shows that the 1 box of Japan Soy has been consigned to "Adventures."

Note: The meaning of the word "Adventures" is not clear. Most of the goods were assigned, by name, to various merchants or their companies. Of the many types of merchandise that arrived from May 29 to June 2, this is the only lot assigned to "Adventures."

311. Golownin, Capt. Vasilii Mikhailovich [Golovnin, Mikhaiforich]. 1819. Recollections of Japan, comprising a particular account of the religion, language, government, laws and manners of the people, with observations on the geography, climate, population & productions of the country. with observations on the country and the people. To which is added an account of voyages to the coast of Japan, and of negotiations with the Japanese, for the release of the author and his companions, by Captain Rikord. Vol. II. London: Printed for Henry Colburn. 302 p. See p. 157, 213. No index. 22 cm.

• ***Summary:*** Page 157: "... many kinds of beans, which are a favorite dish of the Japanese; they sometimes eat them merely boiled in water, sometimes in treacle or soy [sauce]; small beans are often boiled with thick rice, and pass for a great delicacy. The Japanese soy is also prepared of beans, and turned sour in casks. They say that three years are required for preparing the best soy."

Page 213: Footnote: "The imports by the Dutch ships at Nangasaki, consisted, in 1775, of sugar, elephant's teeth, Japan wood for dying, tin, lead, bar-iron, fine chintzes, Dutch cloths of various colours and fineness, silks, spices, tortoise-shell, saffron, Venice treacle, Spanish liquorice, canes, optical glasses, watches, and the sea-unicorns' horns from Greenland, which bear a high value in Japan. The exports were copper, raw camphor, lackered wood work, porcelain, silks, rice and soy" [sauce]. Address: Russian Navy.

312. Good, John Mason; Gregory, Olinthus; Bosworth, Newton. 1819. Pantologia: A new cabinet cyclopædia,...: Soy. London: Printed for J. Walker;...; Edinburgh and Dublin. See Vol. 10, Q–Soy, last page, last entry. [Eng]
• ***Summary:*** "Soy [sauce], or Sooju, a species of liquid condiment, which is imported from India, and is used as a sauce for fish. It is prepared from the leguminous fruit of the soja (*dolichos soja,* Linnéus) a native of Japan.

"The pods are first boiled, till they become soft; when equal parts of them, and of muggi (wheat or barley that has been coarsely ground) are thoroughly mixed. This preparation is then kept in a close vessel, and a warm place, for twenty-four hours in order to ferment; after which the mass is put into a pot, and covered with a large portion of common salt, when two measures and a half of water are poured over the whole. The compounds is stirred, once at least, every day, for the space of two or three months; and, at the end of that period, it is filtered; the expressed liquor being preserved in wooden barrels. Fresh water is then added to the same mass; which, after stirring it occasionally for several days, is at length strained; and the liquor, though of an inferior kind, thus rendered fit for use.

"Soy possesses a strong saline taste, but has only a slight aromatic flavour: it is chiefly used at the tables of the luxurious; and is one of those artificial stimulants of the palate, which deserves no commendation, especially for vitiated or relaxed habits."

Note: This entry is copied from: Mease, James. 1804. "Soy." In: A.F.M. Willich, ed. 1804. *The Domestic Encyclopedia.* Philadelphia, Pennsylvania: William Young Birch and Abraham Small. See Vol. V, p. 12-13. Address: 1. Esq., F.R.S., Member of the American Philosophical Society, and of the Linnean Society of Philadelphia; 2. LL.D., Of the Royal Military Academy, Woolwich,...; 3. Mr., of Cambridge.

313. Hanawa, Hokinoichi. comp. 1819. Gunsho ruijû [Great

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collection of old documents. 670 vols.]. Tokyo Japan. New ed. published 1959-60. [Jap]*

• ***Summary:*** The compiler was born in 1746 in Hokino Village, Saitama prefecture, about 100 km north of Tokyo. He was a great Japanese scholar–and he was blind. At age 34 he decided to begin the compilation of this large work. He set out to gather as many old documents as possible from all over Japan, and examine and select worthy ones for compilation, regardless of their character. Thanks to his efforts, it is now possible for everyone to refer to them whenever they want.

Kawakami and Kimura (1985, p. 36-37) state that *shiokara natto* (also called *tera-natto*) was first mentioned in the *Gunsho Ruijû* (*Katsuji-hon,* p. 344, lower section). They think this compilation is one of the oldest documents in Japanese literature to mention fermented black soybeans. But after that fermented black soybeans in Japan were called *Kaori no Daizu* (or *Ko no Daizu*–Fragrant soybeans). They think the second-earliest mention was in the *Hôchô Kikigaki,* which they think was published in about 1560-1580. However this 2nd book was published in the *Gunsho Ruiju* (*Katsuji-hon,* p. 800, upper section, 6th line).

In 1959-60 a new edition of *Gunsho Ruiju,* compiled and published by the Zoku Gunsho Ruijû Kansei Kai ("Complete Society"). See Section 9; *Bun Pitsu Bu* (Literature Dept.), and *Shôsoku Bu* (News Dept.) Also Section 23. *Buke Bu* (Samurai warrior Dept.). Address: Japan.

314. Rees, Abraham. ed. 1819. The cyclopedia; or, universal dictionary of arts, sciences, and literature: Dolichos soja. London: Longman, Hurst, Rees, Orme & Brown. See vol. XII. Dol. N.P. (Unpaginated). [2 ref. Eng]

• ***Summary:*** "Of the upright kinds [of Dolichos], *D. soja,* Linn. Sp. Pl. 1023. Jacq. Ic. Rar. t. 145, a native of Japan and the East Indies, is famous for its seeds, a great article of food in China and Japan. They are made into a kind of jelly or curd [tofu], esteemed very nutritious, and rendered palatable by adventitious seasoning; or they are prepared with salt, so as to produce the liquid well known at our tables by the name of Soy [sauce]. The flowers of this species are small and unornamental."

First cited by Hymowitz. 1986. Bibliography of early, previously uncited publications on soybeans in the United States. 2 p. Unpublished.

Note 1. This is the earliest English-language document seen (Feb. 2004) that mentions tofu in connection with Japan.

Note 2. This is the earliest English-language document seen (April 2013) that uses the word "jelly" in connection with tofu.

Note 3. This is the earliest English-language document seen (Nov. 2002) that uses the term "upright" to describe the soybean plant.

Note 4. This is the earliest English-language document seen (Dec. 2003) with the word "nutritious" (or "nutrition," "nutritional," "nutritive," or "nutrients") in the title that also mentions soy.

Note 5. Sylvester Graham is said to have obtained much of his information about milling, bread baking, and early diets from this encyclopedia (McCance & Widdowson 1956, p. 49).

315. Crawfurd, John. 1820. History of the Indian Archipelago. Containing an account of the manners, arts, languages, religions, institutions, and commerce of its inhabitants. 3 vols. Edinburgh: Printed for Archibald Constable and Co.; London: Hurst, Robinson, and C. See vol. 1, p. 197-98, 370. Vol. 3, p. 319.

• ***Summary:*** Note: "Indian Archipelago" probably refers to today's Indonesia and Malaysia.

In Vol. 1, the chapter on "Useful arts" states (p. 197): "This preparation, called by the Malays *blachang,* and by the Javanese *trasi,* is a mass composed of small fish, chiefly prawns, which has been fermented, and then dried in the sun. This fetid preparation, so nauseous to a stranger, is the universal sauce of the Indian islanders, more general than soy [sauce] with the Japanese. No food is deemed palatable without it."

Continuing on p. 198: Dampier describes it with perfect accuracy, as follows: "Baluchaun is a composition of a strong savour, yet a very delightsom dish to the natives of this country. To make it, they throw the mixture of shrimps and small fish into a sort of weak pickle, made with salt and water, and put it into a tight earthen vessel or jar. The pickle being thus weak, it keeps not the fish firm and hard, neither is it probably so designed, for the fish are never gutted. Therefore, in a short time they turn all to a mash in the vessel; and when they have lain thus a good while, so that the fish is reduced to a pap, they then draw off the liquor into fresh jars, and preserve it for use. The masht fish that remains behind is called balachaun, and the liquor poured off is called nuke-mum [nuoc-mam]. The poor people eat the balachaun with their rice. 'Tis rank scented, yet the taste is not altogether unpleasant, but rather savory, after one is a little used to it. The nuke-mum is of a pale brown colour, inclining to grey, and pretty clear. It is also very savory, and used as a good sauce for fowls, not only by the natives, but also by many Europeans, who esteem it equal with soy."* (Footnote: *"Dampier's Voyages, Vol. II, p. 28").

The chapter titled "Husbandry of the materials of food" notes (p. 370): "The whole class of leguminous plants are called by the generic name *Kachang.*

"The most commonly cultivated as green crops, are two broad leaved plants called *Kachang Kadale,* (*Phaseolus max,*) [soy bean] and *Kachang Ijo,* (*Phaseolus radiatus.*) The *Kachang Ijo,* or green pulse, is a superior grain to the last, but is more delicate, and requires more care in the culture. The Chinese colonists manufacture Soy from it [sic], and it is

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for their consumption chiefly that it is raised. Of the *Kadale* ten seeds are considered a good return, and of the other about seven may be an average."

In vol. 3, the chapter titled "Intercolonial commerce" states (p. 319): "The specific commodities which Japan is either capable of affording, or actually does afford, for exportation, are gold, silver, copper, tutenague [tutenag; zinc], iron, camphor, ambergris, tea, rice, soy [sauce], wrought silks, lacquered-ware, and earthenware." Address: F.R.S., Late resident at the court of the Sultan of Java.

316. Virey, Julien-Joseph. 1820. Histoire naturelle des médicamens, des alimens et des poisons, tirés des trois règnes de la nature [Natural history of medicines, of foods, and of poisons, drawn from the three kingdoms of nature]. Paris: Rémont and Ferra. xii + 570 p. See p. 281. Index. [Fre]
• ***Summary:*** In the section on "Legumes" is a subsection titled "Dolic" (p. 281) which states: The *D. Soja,* L. of Japan, has excellent seeds. A sauce is made with the soybean (*le soja*) which is very highly esteemed in Europe.

The word *soja* also appears once on p. 46 (*Les légumineuses sont celles des fèves, haricots, pois, lentilles, vesces, lupins, orobes, dolics, soja, arachide, etc.*), twice on page 413 (incl. the soybean of Japan -*le soja au Japan*), Z. Address: Medical doctor at the Faculty of Paris.

317. Kitchiner, William. 1821. The cook's oracle: containing receipts for plain cookery on the most economical plan for private families: Also, the art of composing the most simple, and most highly finished broths, gravies, soups, sauces, store sauces, and flavouring essences: The quantity of each article is accurately stated by weight and measure; the whole being the result of actual experiments instituted in the kitchen of a physician. 3rd ed., which is almost entirely re-written. London: Printed for A. Constable & Co., Edinburgh, and Hurst, Robinson, & Co., Cheapside. xvi + 464 p. 18 cm.
• ***Summary:*** The section titled "The magazine of taste" (No. 463, p. 371) contains a list of 28 "flavoring materials." No. 15 is "Soy" [sauce]. The others are the same as in the 1817 first edition.

After the word "Soy" is printed (No. 436) which should mean, according to the format of the book, that recipe No. 436 is a recipe for making soy sauce at home. However, when we look for No. 436 we are surprised to find that it is missing. Clearly recipe No. 436 for "Soy" has been removed since the 1817 edition (probably because the result tasted almost nothing like real soy sauce) but the cross reference on p. 371 was not.

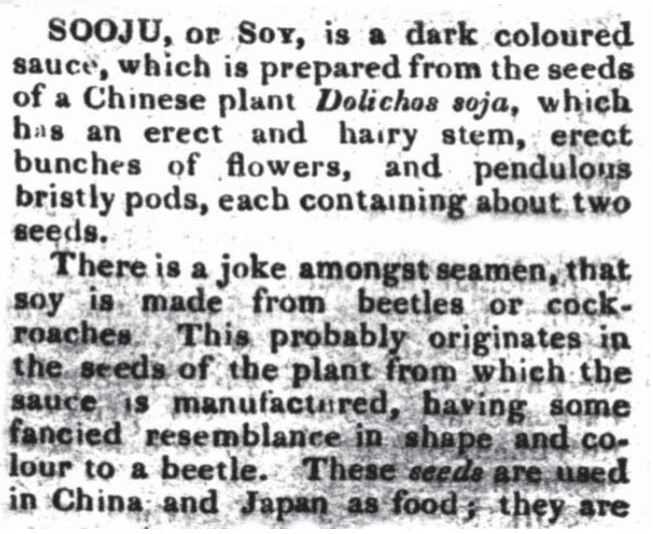
The recipe for Browning (No. 313) "Is a very convenient article to colour those Soups or Sauces... It will commonly be told from what is commonly called *'genuine Japanese Soy*,'* for which it is a very good substitute." (Footnote: *"'By the best accounts I can find, Soy is a preparation from the seeds of a species of the *Dolichos,* prepared by a fermentation of the farina of this seed in a strong lixivium of common salt.'– Cullen's *Mat. Med."* [*Lectures on the Materia Medica.* vol. i, p. 430]). "Browning" is made by simmering half a pound of pounded Burnt Sugar with water, stirring well. "Then add to it an ounce of salt, and dilute it by degrees with water, till it is the thickness of Soy;..."

Several other recipes in the book call for "Soy" [sauce] as an ingredient: Mackarel roe sauce (No. 266). Shrimp sauce (No. 283). Liver sauce for fish (No. 288). Camp vinegar (No. 403). Fish sauce (No. 425). Sauce superlative (No. 429). A note to this latter recipe states that one purpose is to enable "the good Housewives of Great Britain to prepare their own Sauces..."

In the Introduction, the author lists (in approximately chronological order) the title and date of publication of about 250 English recipe books that he has consulted. There are 14 books from 1513 to 1599, and 39 books from 1600-1699, and 90 books from 1700-1799, and 52 from 1800 to 1819.

Note 2. This book was first published in 1817, with the title *Apicius redevivus; or, The cook's oracle...* The author– who name does not appear on the title page of this 3rd edition–lived 1775?-1827. Address: [England].

318. Willich, Anthony Florian Madinger. 1821. The domestic encyclopedia: Or a dictionary of facts and useful knowledge. Chiefly applicable to rural & domestic economy. 2nd American edition, with additions, by Thomas Cooper. Esq, M.D.: Sooju or soy. Philadelphia, Pennsylvania: Abraham Small. See vol. 3, p. 264-65.


SOOJU, or Soy, is a dark coloured sauce, which is prepared from the seeds of a Chinese plant *Dolichos soja*, which has an erect and hairy stem, erect bunches of flowers, and pendulous bristly pods, each containing about two seeds.

There is a joke amongst seamen, that soy is made from beetles or cock-roaches. This probably originates in the seeds of the plant from which the sauce is manufactured, having some fancied resemblance in shape and colour to a beetle. These *seeds* are used in China and Japan as food; they are

• ***Summary:*** "SOOJU, or Soy [sauce], is a dark coloured sauce, which is prepared from the seeds of the Chinese plant *Dolichos soja,* which has an erect and hairy stem, erect bunches of flowers, and pendulous bristly pods, each containing about 2 seeds.

"There is a joke amongst seamen, that soy is made from beetles or cockroaches. This probably originates in the

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seeds of the plant from which the sauce is manufactured, having some fancied resemblance in shape and colour to a beetle. These *seeds* are used in China and Japan as food; they are made into a kind of jelly or curd [tofu], which is esteemed very nutritious, and which is rendered palatable by seasonings of different kinds [see A. Rees 1819]. The liquid which we know by the name of *soy* is thus prepared. After the seeds have been boiled, until they become soft, they are mixed with an equal weight of wheat or barley meal, coarsely ground. This mixture is fermented; and a certain portion of salt and water being added, the whole is allowed to stand for two or three months, care being taken to stir it every day: and by the end of that time it is ready for use.

"Soy is chiefly prepared in China and Japan; but that imported from Japan is considered preferable to any other. The quantity annually vended at the East India Company's sales is from 800 to 2000 gallons; at an average price of sixteen or eighteen shillings per gallon.

"The Soy-bean bears the climate of Pennsylvania very well. The bean ought therefore to be cultivated."

Note 1. This is the earliest document seen, published in America, that mentions tofu. Willich got his definition of tofu from *The cyclopedia; or, universal dictionary of arts, sciences, and literature* (see Dolichos soja) edited by Abraham Rees (1819).

Note 2. This is the earliest document seen (May 2012) that mentions the words "beetles" or "cockroaches" as an ingredient in the production of soy sauce. This idea is, of course, totally incorrect.

Note 3. This is the earliest document seen (Oct. 2010) that gives statistics for the amount of soy sauce sold per unit of time in England, or the sale price per unit volume.

Note 4. According to the *Oxford English Dictionary,* the "East India Company is a company formed for carrying on an East Indian trade, especially the English company incorporated in 1600 and described in its charter as 'The Company of Merchants of London trading to the East Indies', which from 1773 exercised political power in the East, and had the chief part in the administration of the affairs of Hindustan, till 1858, when the government was assumed by the Crown." Address: USA.

319. Kitchiner, William. 1822. The cook's oracle: Containing receipts for plain cookery on the most economical plan for private families... From the latest London edition, which is almost entirely re-written. Boston, Massachusetts: Published by Munroe and Francis. viii + 9-380 p. Index. 18 cm. [30+* ref]

• ***Summary:*** The title page states that these recipes are the "result of actual experiments instituted in the kitchen of a physician." The chapter titled "Fish sauces" includes several references to other recipes (p. 92): "Soy [sauce], No. 436. Mushroom catsup, No. 439."

The chapter on "Broths and soups" states (p. 99): "We again caution the Cook to avoid *Over-Seasoning,* especially with predominant flavors, which, however agreeable they may be to some, are more extremely disagreeable to others... Zest 255, Soy 436, Cavice, Corach, Anchovy, 433... Catsups 432,..."

In the chapter on "Fish," the section titled "To dress them maigre" lists various sauces for maigre [meatless] dishes (p. 188): "Obs. [Observations]–Mushroom Catsup, No. 439,,... Anchovy and Soy,–or Oyster Catsup, No. 441, variously combined and thickened with flour and butter, are convenient substitutes."

The chapter on "Gravies and sauces" has a recipe (p. 243) for "Mackerel roe sauce" (No. 266). The last line reads: "Mushroom catsup, Walnut pickle, or Soy, may be added."

The same chapter has a recipe (p. 244) for "Anchovy sauce" (No. 270). The first note (2nd paragraph) states: "Obs.–Foreigners make this Sauce with good Brown Sauce No. 329, or White Sauce No. 364, instead of melted Butter,–and add to it Catsup,–Soy,–and some of their flavoured Vinegars, as Elder or Tarragon,..."

The same chapter has a recipe (p. 247) for "Shrimp sauce" (No. 283). The first note ends: "... strain off the liquor to melt the butter with, and add a little Lemon Juice,–Cayenne,–and Essence of Anchovy,–or Soy,–Cavice, &c.–but *the Flavour of the Shrimp is so delicate,* it will be overcome by any of those additions."

The same chapter has a recipe (p. 249) for "Liver sauce for fish" (No. 288) which can be seasoned with "... a little Essence of Anchovy No. 433, or Soy, or Catsup No. 439."

The same chapter has directions (p. 257-58) for "Browning" (No. 322) which begins: "Is a very convenient article to colour those Soups or Sauces, of which it is supposed their deep brown complexion denotes the strength and savouriness of the composition." "Walnut Catsup" is sometimes used." "It will hardly be told from what is commonly called 'genuine Japanese SOY*,' for which it is a very good substitute." Footnote: *"By the best accounts I can find, *Soy* is a preparation from the seeds of a species of the *Dolichos,* prepared by a fermentation of the farina [flour] of this seed in a strong lixivium of common salt."- *Cullen's Materia Medica.*

In the same chapter is a recipe (p. 281) for "Camp vinegar" (No. 403) whose ingredients include: "Soy, two tablespoonsful. Walnut Catsup, four tablespoonsful. Six anchovies, chopped..." Plus cayenne pepper and minced garlick [garlic]. "Steep all for a month in a pint of best Vinegar, frequently shaking the bottle: strain through a tammis [tamis; cloth strainer], and keep it in small bottles, corked as tight as possible."

The same chapter has a recipe (p. 288) for "Fish sauce" (No. 425) which calls for two wineglasses each of Port and Walnut pickle, and four of Mushroom catsup. 6 anchovies, pounded. 6 "Eschallots sliced and pounded; a tablespoon of Soy, and half a drachm [dram, a small unit of

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weight] of Cayenne pepper." "Obs. This is commonly called *Quin's Sauce,* and was given to me by a very sagacious Saucemaker."

Note: This is the earliest document seen (Feb. 2008) stating that soy sauce is an ingredient in Quin's Sauce, a popular store sauce.

In this same chapter ("Gravies and sauces") is a section titled "The Magazine of Taste" (No. 463, p. 303-04) which begins: "This is a convenient auxiliary to the Cook. It may be arranged as a pyramidical *Epergne* [a stand or tiered center dish] for a *Dormant* in the centre of the table, or Travelling Store Chest." It consists of a Sauce Box containing four 8-ounce bottles, sixteen 4-ounce bottles, and eight 2-ounce bottles. Of these 28 "useful flavoring materials." No. 15 is "Soy" [sauce] (No. 436) in a 4-ounce bottle.

The chapter titled "Made dishes" has a recipe (p. 321-22) for "Savory salt beef baked" (No. 496). For gravy, use strong Consomme, "Soy, or Browning, see No. 322,..."

This book mentions "Catsup" on pages 169-70, and 185. It mentions "Walnut Catsup" on pages 161, 243, 254, 265-66, 281, 287, 291, 292, 319, 329. It mentions "Mushroom Catsup" on pages x, 92, 125, 160, 165, 187-88, 191, 208, 220, 224, 226, 235, 243, 246, 252, 254, 259, 261, 263, 266-67, 274, 287-88, 287-88, 291-92, 304, 323, 331-32, and 357.

Note: Kitchiner's name does not appear on the title page nor in the book. Address: M.D., England.

320. Sôsôshi–Shokoku Dôchû Kinwaraji [Sôsôshi]. 1822. Japan. [1 ref. Jap]*

• ***Summary:*** An article in *Toyo Shinpo* (Soyfoods News). 1991. March. 21. p. 4, shows this illustration (wood block print) by Mimaru KITAO of a lady in the early 1800s in Japan preparing tofu dengaku over a grill (see above right).

The 3 Chinese characters in the book's title are kusa or grass + twin + paper or newspaper. In the subtitle: Shokoku means various countries. Kinwaraji means gold sandal. The meaning of Dôchû is unknown.

321. Encyclopaedia Britannica; or, A dictionary of arts, sciences, and miscellaneous literature. 6th ed... enlarged and improved. 20 vols. 1823. Edinburgh: Printed for A. Constable. Illust. (582 plates). 28 cm. *
Address: Edinburgh, Scotland.

322. Savi, Gaetano. 1824. Osservazioni sopra i generi Phaseolus et Dolichos [Observations on the genera Phaseolus and Dolichos]. *Nuovo Giornale de'Letterati* (*Pisa, Italy*) 8(15):106-23. May/June. See p. 113-14. Continuation of Memoria II, Sectio IV. [3 ref. Ita; Lat]

• ***Summary:*** The section titled "Soja" (p. 113-14) begins by describing general characteristics of the genus, then lists three species as follows: *"Soja japonica hirsuta, caule erecto-flexuoso superne subvolubili, racemis axillaribus erectis, leguminibus pendulis.* Nob.

さし絵：草双紙「諸国道中金草鞋」から
（1822年、北尾美丸画）

"Dolichos Soja caule erecto flexuoso, racemis axillaribus erectis, leguminibus pendulis hispidis subdispermis. Lin. Iacq. Collect. 1. p. 46. Ic. rar. 1. tab. 145.

"Daidsu. Phaseolus erectus siliquis lupini, fructu pisi majoris candido. Kaempf. Amoen: exot. p. 837. tab. 839." There follows a detailed a detailed description of the latter plant species.

Note: This document is widely cited since, in it, Savi was the first to give the scientific name *Soja japonica* to the Japanese soybean. This article is apparently part 2 of a 3-part series published from 1822 to 1825.

Gaetano Savi lived 1769-1844. Address: Professore di Botanica nell'I. e R. Università de Pisa.

323. Golownin, Capt. Vasilii Mikhailovich [Golovnin, Mikhaiforich]. 1824. Memoirs of a captivity in Japan, during the years 1811, 1812, and 1813, with observations on the country and the people. 3 vols. 2nd ed. London: Printed for Henry Colburn and Co. Vol. 1, iv + 315 p. No index. 22 cm.

• ***Summary:*** In vol. 1, p. 135-36, a footnote states: "Our food in Chacodade [Hakodate] was at first extremely bad. It usually consisted of boiled rice, a kind of soup made of warm water with grated radish; a handful of finely chopped young onions with boiled beans; or instead of the onions

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and beans, two pickled cucumbers or radishes. Instead of the radish soup, we sometimes had puddings made of bean meal [tofu?] with rancid stockfish or whale oil. Perhaps twice in the space of fifty days we were supplied with fish, receiving each the half of a kind of plaice (Pleuronectes), with soy [sauce]."

In vol. 1, chapter 4, on p. 206, the author is describing his life and food in the prison where he is being held. Page 198: "Our food in Matsmai [Matsumae, a town on the southwest tip of Hokkaido, Japan; the oldest town on Hokkaido] was incomparably better than it had been in Chakodade... The fish were fried in oil of poppies, and were seasoned with grated radish and soy [sauce]." Note: The grated radish was probably *daikon.* Capt. V. Golownin lived 1776-1831.

324. Titsing, Isaac. 1824. Bereiding van de Soija [Preparation of soy sauce]. *Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen* 3:159-60. Published in Batavia. [Dut]

• ***Summary:*** "The preparation of soy sauce (*soija*) is simple, and is performed in the following way:

"One takes a *gantang* (a local Malay unit of measure equivalent to 3.125 kg of rice, or about a gallon) of boiled miso-beans (*gestoofde miso-boonen*). A gantang of boiled wheat or barley groats (*gestoofde tarw of gort*), and as many roasted and ground (*gebrande en gemalen*) wheat or barley groats as one deems to be sufficient to give it the necessary color. One then mixes these three together and encloses the mixture in a cupboard to let it mold, for which 8 days are required. After this mixture has become completely green from the mold, it is taken out of the cupboard and allowed to dry in the sun for one full day.

"Next one takes 2½ gantang of boiled water and one gantang of pure salt, which one dissolves in the water completely; after this it is allowed to stand for 24 hours, until the dirt from the salt has sunk and the water has turned cold. The pure water is then strained off, followed by the addition of the above-mentioned molded substance, which is then stirred with a shovel for 14 days.

"One uses wheat or barley groats for this. The difference is that when the soy sauce (*soija*) is made out of barley groats, it will be much thinner, whereas that made from wheat will be much thicker, have more body, and look like ink.

"The soy sauce (*soija*), which the Chinese call *ketjap* is used like a very delicious and tasty salt with roasted flesh foods, both in Batavia [Jakarta] and in the Netherlands."

Note: The previous sentence is very interesting! In 1824, in the capital of today's Indonesia, the Chinese called soy sauce *ketjap.* Mr. Titsingh [Titsing] lived 1744-1812. He wrote a lot about the Dutch East Indies and Japan. Note that in 1880, Mr. A. Paillieux, in the appendix to his long and excellent article on the soybean in *Bulletin de la Societe d'Acclimatation* (Oct. p. 594-95), gives a French translation of this article but cites the original year of publication as 1781, Vol. III. We believe the date should be 1824 instead.

The resulting soy sauce product is more like Chinese-style soy sauce [*kecap asin*] than Indonesian-style soy sauce, which typically includes sugar plus various herbs and spices. It is very interesting that Titsingh chooses to use the word *soija* (based on the Japanese word *shoyu* = soy sauce) rather than the local Malay word *ketjap* to describe how *ketjap* is made. Address: Netherlands.

325. Wallace, Robert Grenville. 1824. Memoirs of India: Comprising a brief geographical account of the East Indies; A succinct history of Hindostan... Designed for the use of young men going out to India. London: Longman, Hurst, Rees, Orm, Brown and Green. xii + 504 p. See p. 193-94. Index.

• ***Summary:*** "Alligators and noxious reptiles are very numerous near Batavia and the river Caiman takes its name from the number of the former in it."

"The trade of Batavia is considerable. Opium, camphor, benzoin, pewter, iron,... from China [come], porcelain, teas, silks, nankeens, alum, borax, brimstone, cinnabar, mother-of-pearl, paper, sweetmeats, and tobacco; from Japan, copper, sabre blades, camphor, soy, and curious articles of furniture varnished, and flowered with mother-of-pearl. The exports are pepper, sugar, coffee, rice, and arrack, with other indigenous varieties. Batavia arrack is the best in the world."

326. *Bulletin des Sciences Naturelles et de Geologie.* 1825. Continuation du second mémoire sur les genres Phaseolus et Dolichos; par le doct. Gaetan Savi [Continuation of the second memoir of the genera Phaseolus and Dolichos; by Gaetan Savi]. 4:346-48. Deuxième Section du Bulletin Universel des Sciences et de l'Industrie,... [1 ref. Fre]

• ***Summary:*** In the "Botanical" section is a 3-page (p. 346-48) French-language summary of an Italian-language article by Gaetano Savi (Prof. of Botany at Pisa), published in *Nuovo Giornale de' Letterati* (May and June, No. 15, p. 106).

At the top of p. 348 we read: The genus *Soja* has but one species, *Soja japonica,* Savi; it was *Dolichos Soja* of Linnaeus. The Japanese ferment the seeds of this species with rice and wheat to make a sauce used to season various foods.

327. Candolle, Aug. Pyramus de. 1825. Prodromus systematis naturalis regni vegetabilis... Vol. 2 [Introduction to the natural system of the vegetable kingdom... Vol. 2]. Paris: Sumptibus socorium Treuttel et Wuertz. 644 p. See p. 396. A 14-volume work. [6 ref. Lat]

• ***Summary:*** In the chapter on Leguminosae, after the genus Phaseolus and before the genus Dolichos, we find (p. 396): "CLXXIV. SOJA *Moench meth.* 153. *Savi diss.* 1824. p. 16. DC. *leg. mem.* IX. An 8-line description of the genus in Latin

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is then given, followed by:

"I. Soja hispida (Moench l.c.) (I) [Indigenous] in Japonia, India orient, Moluccis. Dolichos Soja Linn. spec. 1621. Jacq. icon. rar. t. 145. Soja Japonica Savi diss l.c.– Kaempf. amoen. 837 et 838. icon. Corollæ violaceæ vix calyce longiores (v.v.) [vidi vivam = I have seen a living plant specimen.]

"*Beta pallida* [seeds white], floribus flavis, seminibus albis Roxb. [Roxburgh] cat. p. 55."

Also discusses the following plants: *Psophocarpus tetragonolobus* [the winged bean], p. 403; Grows in Mauritius and Madagascar.

Arachis hypogaea [the peanut], p. 474.

Voandzeia subterranea [the bambarra groundnut], p. 474.

Augustin Pyramo de Candolle (lived 1778-1841) was the father of Alphonse de Candolle. His son was a joint author.

Note 1. "Roxb. cat. p. 55" refers to: Roxburgh, William. 1814. *Hortus bengalensis, or a catalogue of the plants growing in the Honourable East India Company's botanic garden at Calcutta.* The soybean (*Dolichos Soja*) is listed on p. 55. A footnote explains that in the garden are growing "Two varieties, one with white seed and yellow flowers, the other with black seed and purple flowers." However the word "pallida" is not mentioned.

Note 2. This is the earliest document seen (Oct. 2004) that uses the word *pallida* in connection with soybeans or the color of soybean seeds. The Latin word *pallidus* means pale or white. One of the two soybean varieties described by Roxburgh in 1814 had white seeds. Address: France.

328. Grubbens, M. de. 1825. Method of preparing Chinese soy. *Economist and General Adviser* (*The*) (*London*) 2:24+. [Eng]

• ***Summary:*** Note: The text of this document is the same as the following: Grubbens, M. de. 1804. "Method of preparing Chinese soy." *Philosophical Magazine* (The) (London) 19(75):260-63. First quarter–except that the first paragraph is not included.

329. *Journal des Connaissances Usuelles et Pratiques.* 1826. Économie domestique: Manière de préparer le Soya chinois [Domestic economy: How to prepare Chinese soy sauce]. 3(14):129-32. [1 ref. Fre]

• ***Summary:*** This excellent, detailed description begins as follows: Soy sauce (*Le Soya*) is made with a species of small bean named *dolichos soya,* smaller and whiter than the broad bean of Turkey (*le fève de Turquie*), plus soft wheat flour (*farine de froment*), salt, and water, which are used in the following proportions: 50 pounds (*livres*) of the beans, 50 pounds of salt, 60 pounds of soft wheat flour, and 250 pounds of water. After the beans have been washed well, they are boiled with well water, in a pot with no lid on, for several hours, or until they are sufficiently softened to be kneaded with one's hands. While they are cooking, they must remain covered with water so they do not burn. One must be careful not to over-boil them lest too much of their substance escape in the broth.

Once the beans have boiled sufficiently, they are spread in large, flat wooden vats or, as the Chinese do it, in jars fashioned with bamboo sections, large and thin; these jars or vats must be two and a half inches deep and five feet in diameter; the beans are spread into them to a depth of two inches. Once they have cooled enough that they can be touched by hand, soft wheat flour is added and all is mixed; the mixing should be continued until the soft wheat flour is absorbed. Should the matter become too dry for the flour to adhere to the beans, then a little broth is added to it.

Once everything is well mixed, the material is poured into the vats we already spoke about, taking care that the layers do not exceed one inch or an inch and a half in depth. A lid is placed on each vat and it is closed tightly. Once one observes that the mixture begins to mold (*moisir*) and that the heat has fully escaped (this will take from two to three days), the lid is lifted slightly, propped up with little round sticks so that air has easier access to the inside. If the matter takes on a green cast, it means that all is going well. Should it begin to blacken, one must then lift the lid more so as to increase the contact with the air. Should it blacken completely, then the lot is considered ruined.

As soon as one has observed the matter turning green and rancid (*rance*) (which will typically take from 8 to 10 days), the lid is removed and the mixture is exposed for several days to the air and to the sun. Once the whole mass [koji] become as hard as a stone, it is broken into small pieces. These are then thrown into a large earthenware jar and 250 pounds of water, in which 50 pounds of salt has been dissolved, is poured unto it; the whole thing is stirred and one makes note of the height reached by the liquid in the container. Should one jar not be sufficient, one can reach for several other jars, taking care that each one remains in proportion to the amount of mixture involved.

Once the jug is filled, it is put out in the sun. The substance is regularly shaken and stirred nights and mornings; at night however, one must take care to put the lid back on in order to ward off the cold. This lid is convex on the outside so that the rain water can drip away more readily. The more intense the heat from the sun rays is, the faster the preparation. In general, this operation is only undertaken during the summer, and it can go on for several months.

As the volume of the mixture decreases through evaporation, well water is added until the water and the salt have completely dissolved the flour and the beans. The earthen jar is left out in the sun for several more days, so that the dissolution can be as perfect as can be; for this will ultimately determine the soya quality. And during that time, one should continue to stir the mixture every day as was

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done previously.

Once the mixture has become substantial and uniform / smooth (*oncteux*), it is poured in bags, that are strongly pressed so as to extract the soy sauce (*soya*), which is then pure and ready to be used; it is never boiled. It is poured into bottles that are carefully capped. The Chinese, who make a large trade of it, place it in large jugs. Before being expressed, soy sauce is of a brown black color; thereafter it becomes completely black.

With the presscake / lees (*la lie*), the Chinese prepare also two other kinds of soy sauce. They first add 150 pounds of water and 30 pounds of salt; after having stirred this mixture well, they will pour another 100 pounds of water and 20 pounds of salt and proceed for the rest as we described it earlier.

Soy sauce being such a substantial item of trade, it might be useful to introduce into France the bean with which it is made; it is possible that we, ourselves, already have in our possession other beans that could also achieve the goal that we are pursuing.

The Japanese people, who also make great use of soy sauce to season their food, know how to prepare, with this species of bean, a food [miso] that they will use in place of butter, mostly to season prepared foods and meats.

Note 1. This is the earliest French-language document seen (April 2012) that uses the term *Le Soya* to refer to soy sauce.

Note 2. The basic recipe calls for the use of more wheat flour than soybeans (60 pounds vs. 50 pounds). In French, *farine de froment* is softer than *farine de blé.*

Note 3. This Chinese-style soy sauce is not heated before bottling–unlike its Japanese counterpart.

330. Lelius, -. 1827. Journal of a voyage from Calcutta to China. *Quarterly Oriental Magazine, Review and Register* (*Calcutta*) 7(14):222-67. June. See p. 257-58.

• ***Summary:*** Pages 257-58: "A Chinese dinner is a curiosity of the first magnitude, and one which it behoves [behooves] every lover of the ludicrous to witness–One of the Hong merchants *Pon Keequa* by name, or as he is more generally termed "the squire," gave a dinner to a select party of the Factory, at which I had the good fortune to be present."

"We at length arrived at the banquetting-room... There were about twenty courses, and dishes innumerable–I counted sixty on the table at one time; they consisted chiefly of small basins or cups of the most beautiful China-ware, and were arranged in three rows down the centre of the table. We were given to understand, I know not with what truth, that we had the happiness to partake of stewed pigeons' eggs, wild cat, fricassied [fricasseed] frogs, dried worms (particularly recommended as a *bonne bouche* for wine at dessert), sea slugs, sharks, and fins, and a variety of other delicacies,* to which European prejudice might be inclined to apply another term, but which, whatever they may really have been, were rendered extremely palatable by the application of a little Japan soy [sauce],+ or 'essence of cockroach,' the finest I ever tasted."

+ Footnote: +"Soy is really made of a small species of Bean peculiar to Japan; though this may be a bold assertion, considering that the prejudice is so much in favor of Cockroaches."

331. Kitchiner, William. 1827. The cook's oracle: Containing receipts for plain cookery on the most economical plan for private families... A new edition. London: Printed for Cadell and Co., Edinburgh; Simpkin and Marshall, and G.B. Whittaker, London; and John Cumming, Dublin. 491 p. Index. 18 cm. [30+* ref]

• ***Summary:*** This book is "the result of actual experiments instituted in the kitchen of William Kitchiner, M.D. Author of..." The titles of his seven books are given.

Soy [sauce] is mentioned often: Fish sauces (p. 99). To add zest to broths and soups (p. 108). In sauce for maigre fish dishes (p. 209-210). Mackarel roe sauce (p. 275 [Mackerel]). Anchovy sauce (p. 276). Shrimp sauce (p. 279). Liver sauce for fish (p. 282).

In the chapter on "Gravies and sauces" the recipe for "Browning" (p. 291-92) states: "It is a convenient article to colour those *Soups and Sauces,* of which it is supposed their deep brown complexion denotes the strength and savouriness of the composition." Burnt Sugar is a favourite ingredient. "When employed for Culinary Purposes, this is sometimes made with strong Gravy, or Walnut Catsup... It will hardly be told from what is commonly called 'genuine Japanese Soy,' * [footnote refers to "Cullen's *Mat. Med.* vol. i, p. 430] (for which it is a very good substitute)."

To make "Browning": "Put half a pound of pounded Lump Sugar, and a table-spoonful of water, into a clean iron saucepan, set it over a slow fire, and keep stirring it with a wooden spoon till it becomes a bright brown colour, and begins to smoke; then add to it an ounce of salt, and dilute it by degrees with water, till it is the thickness of Soy; let it boil, take off the scum, and strain the liquor into bottles, which must be well stopped:..."

Camp vinegar (p. 320).

In the chapter on "Store sauces," the recipe (p. 328) for "Fish sauce.–(No. 425)" includes "a tablespoonful of Soy" and concludes: "Obs. [Observations]–This is commonly called Quin's Sauce, and was given to me by a very sagacious Saucemaker."

The section titled "The magazine of taste" (No. 463, p. 346) contains a list of 28 "useful flavoring materials." No. 15 is "Soy" [sauce] (No. 436).

Catsup (incl. mushroom catsup, oyster catsup, walnut catsup, cockle and muscle catsup) is mentioned on pages 103, 151, 176, 180, 189, 209, 210, 214, 225, 231, 244, 256, 276, 285, 287, 291, 292, 302, 303, 334, 335, 336, 337, 271, 381, 390, 419, and 426. "Mushroom ketchup" appears on

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page 90. Address: M.D., England.

332. Hamilton, Walter. 1828. The East-India gazetteer: containing particular descriptions of the empires, kingdoms, principalities, provinces, cities, towns, districts, fortresses,... 2nd ed. Vol. 1 of 2. London: Printed for Parbury, Allen, and Co. See p. 148. Two (folded) maps. 23 cm. [6 ref]
• ***Summary:*** Under the entry for Batavia: "The Dutch being the only nation that keeps up an intercourse with Japan, a ship is annually despatched from Batavia laden with kerseymeres, fine cloths, clock-work, spices, elephant's teeth, sapan wood, tin and tortoiseshell. The returns from Japan consist principally of ingots of the finest red copper, which is converted into a clumsy sort of coin for paying the native and European troops. Various other articles are smuggled in by the officers such as sabre-blades of an excellent temper, Japan camphor, soy [sauce], china-ware, lacquered ware, and silk goods. The cargo always contains a present for the emperor of Japan, and he in return sends one to the Governor general, consisting usually of...

"A.D. 1619, John Pieterson Coen, the Dutch governor, took the town of Jacatra by assault, and in a great measure destroyed it. He afterwards founded another city, not exactly on the same spot, to which he have the name of Batavia. In 1811 it surrendered at discretion to the British army under Sir Samuel Auchmuty... During the British possession of Batavia, which lasted until 19th August 1816, its condition was greatly improved and even its pestilential atmosphere somewhat ameliorated by the great pains bestowed on the draining of the marshes, the cleaning of the town, and the removing of the Europeans to the elevated tracts of the interior."

Note: A kerseymere is a fine woolen cloth with a fancy twill weave. Address: M.R.A.S.

333. Iwasaki, Tsônemassa. 1828. Phonzo Zoufou [Honzô Zufu: Atlas of Japanese medicinal plants. 96 vols.]. Tokyo: Subaraya. See vol. 50. Fol. 2. Vol. 43, fol. 1-9. 8º (20-25 cm). [Jap]*
• ***Summary:*** In Japanese, *honzô* means "plants" or "trees and herbs." *Zufu* means a "chart, picture, or figure." This illustrated materia medica contains 1,795 illustrations (plates), most of them colored. The plates start with volume 50. The author, T. Iwasaki, lived 1786-1842; his first name is also written as "Kan'en."

Franchet and Savatier (1875, p. 108) state: For the wild soybean–*Glycine soja* (Sieb. et Zucc.) see vol. 50, fol. 2?, under *Kin mame.* For the cultivated soybean–*Glycine hispida* (Moench, Meth) see vol. 43, fol. 1-9.

For the adzuki bean, *Phaseolus radiatus,* see vol. 43, fol. 11, under *Kin Adz'ki,* and vol. 43, fol. 9 verso, under *Adz'ki.*

For kudzu, *Pueraria thunbergiana,* vol. 27, fol. 15, under *Koutsou.* Mène (1882, p. 3793) also states that Kudzu is mentioned in Vol. XXVII, fol. 15 of this work.

Itie (1910, p. 43) notes: "The varieties of soybean in Japan. The number of varieties of *mame* or *daizu* cultivated in Japan is at least as large as the number in China. *Somokou Zoussetz* (*Somoku Zusetzu*) has portrayed and described them in the same way as the *Phonzo Zoufou,* which has given them proper names. The former book illustrates Glycine Soja Sieb. et Zucc. under the name *Tsourou mame,* the second under the name *Kiu mame;* but the identification of these drawings is doubtful."

Note: The UCLA Biomedical Library has another edition of this book; the year of publication is given as 1920. Volume 50 is Curcubits and volume 43 is Brassica. Each volume contains only 20-30 sewn pages. There is an index in the last few volumes. See: Vol. 40 (1-2) and vol. 47 (2). At the back of Vol. 20 are 20 listings for *Glycine soja,* but none for *Glycine hispida.* Address: Japan.

334. Nuttall, Thomas. 1829. Soy bean (Letter to the editor). *New England Farmer* 8(14):105. Oct. 23. Friday.
• ***Summary:*** In this front-page letter dated Oct. 14, Nuttall writes: "As this plant thrives well in this climate, and perfects its seeds, it may not, perhaps, be amiss to say something of its use and history. It is an annual Bean, not much unlike those we commonly cultivate, with an erect stem, showing a slight tendency to twine at the summit only; the flowers are very small for the germs, and reddish in axillary clusters; the legumes are pendulous, hispid with brown bristly hairs, with which the whole plant is more or less clothed–these pods contain 2 or 3 beans when mature, almost of a chocolate brown, and somewhat smaller than any generally cultivated in this country." It belongs to the genus *Dolichos* (*D. Soja*), which also affords us several other edible legumes. It is said to be indigenous to India and Japan, where as well in China and Cochin-China, it is very generally cultivated for food and probably preferred for its great productiveness. A single bean produced, and perfectly ripened with us at the Botanic Garden, 182 pods with 2 to 3 beans in each. Whether in this country, where so many fine legumes are cultivated, it might be esteemed for food, is doubtful; the experiment may easily be made. But its principal recommendation at present in [sic, is] only as a luxury, affording the well known sauce called *Soy,* which at this time is only prepared is [sic, in] China and Japan–that of the latter country being usually preferred. The mode of obtaining this sauce, is said to be as follows: -

"After the seeds are boiled until they become soft, they are mixed with an equal weight of wheat or barley flour coarsely ground. This mixture is fermented, and a certain proportion of salt and water being added, the whole is allowed to stand for two or three months, care being taken to stir it every day; and by the end of that time it is ready for use. Its composition then appears to be perfectly harmless, which cannot be said of many other sauces; and among the Asiatics it is considered beneficial in promoting an appetite.

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"Yours, respectfully, Thomas Nuttall."

Note 1. Unfortunately Nuttall did not indicate where he obtained his seeds. In 1831 a person known only as "H." received a few soybeans from Nuttall and grew them in Milton, Massachusetts. Nuttall lived 1786-1859.

Note 2. This is the earliest document seen (May 2011) concerning soybeans in Massachusetts, or the cultivation of soybeans in Massachusetts. This document contains the earliest date seen for soybeans in Massachusetts, or the cultivation of soybeans in Massachusetts (1829). The beans were probably planted in about May-July 1829. The newspaper was published in Boston.

Note 3. This is the earliest English-language publication seen (Sept. 2006) with the word "soy bean" (or "soy beans") in the title.

Note 4. This letter was reprinted in the *American Farmer* (Baltimore, p. 260-61) on 30 Oct. 1829 (Vol. 33, No. 11). Address: Botanic Garden, Cambridge, Massachusetts.

335. King, Lord. 1829. The life of John Locke, with extracts from his correspondence, journals, and common-place books. London: Henry Colburn. xi + 408 p. See p. 133-34. 30 cm.
• ***Summary:*** In the section titled "Extracts from the Journal of Locke," Lord King notes: "The following directions appear to have been set down for some foreigner about to visit England. They are curious, as affording a comparison with the improvement of the present time. 'England.–1679.'"

Among his description of the foods and condiments which ought to be enjoyed in London, Locke noted: "Puddings of several sorts and creams of several fashions, both excellent, but they are seldom to be found, at least in their perfection, at common eating-houses. Mango and saio are two sorts of sauces brought from the East Indies." Saio almost certainly refers to *shoyu* (Japanese-style soy sauce) and was cited as such by both Yule and Burnell in Hobson-Jobson (1886, p. 651, "Soy") and the *Oxford English Dictionary* (1919, "Soya").

An illustration (engraving; see above right) shows a portrait of John Locke (lived 1632-1704), an English philosopher. The preface to this work notes that "After the death of Locke, his papers, correspondence, and manuscripts, came into the possession of Sir Peter King, his near relation and sole executor." Lord Peter King King, the 7th baron, lived 1776-1833.

An 1884 edition of this book, with a slightly different title (which see), was published in London by George Bell & Sons. Though not a facsimile edition, the passage on soy sauce also appears on page 134. Address: Ockham.

336. Schrank, F.v.P. von; Martinus, C. von. 1829. Hortus regius Monacensis: Verzeichniss der in koeniglichen botaniscen Garten zu Muenchen wachsenden Pflanzen [Hortus regius Monacensis: Catalog of the plants growing in the royal botanical garden in Munich]. Munich: Im

Königlichen Central-Schuleücher Verlage; Leipzig: in Commission bei Friedrich Fleischer. xii + 210 p. See p. 185. [Ger]
• ***Summary:*** Page 135: "Soja Moench. (Dolichos L.) "hispida Moench. (Dolichos Soja L.) Japan, East Indies. Annual. Economic plant." Address: [Munich, Bavaria].

337. Shôjin ryôri kondate shû [A collection of Zen vegetarian cookery menus]. 1829. Japan. [Jap]*
• ***Summary:*** The seventeenth earliest known reference to Kori-dofu (dried-frozen tofu) appeared in this work.

338. Rakugo shôfurin [A treasury of witty stories]. 1830-1844. Japan. [Jap]*
• ***Summary:*** This book (see next page) contains an illustration of a natto seller by Shigemasa Kitao. He is crouched down between two tall wooden boxes, in which he carries his natto suspended from both ends of a shoulder pole. To his right stands a man in traditional Japanese dress, with kimono and geta footwear, waiting to buy some natto. Address: Japan.

339. **Product Name:** [Kushigata Shoyu].
Foreign Name: Kushigata Shôyu.
Manufacturer's Name: Mogi Shichizaemon.
Manufacturer's Address: Noda, Japan.
Date of Introduction: 1830.
New Product–Documentation: Noda Shoyu K.K. (Morio ICHIYAMA, ed.). 1940. Noda Shoyu K.K. Nijunen-shi [Twenty-year history of Noda Shoyu, Inc.]. p. 471. The Kushigata brand of shoyu (of which the logo is shown) was introduced in Tenpo/Tempo 1 (1830).

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Mark Fruin. 1983. Kikkoman: Company, Clan, and Community. Page 73 notes that by 1909 the four major brands manufactured by the Noda shoyu cartel were Kikkoman, Kihaku, Kamigata (Joju), and Kushigata.

340. Crawfurd, John. 1830. Journal of an embassy from the Governor-General of India to the courts of Siam and Cochin China: Exhibiting a view of the actual state of those kingdoms. 2 vols. 2nd ed. London: Henry Colburn and Richard Bentley. See Vol. II, p. 155, 282, 359.

• ***Summary:*** Chapter 2, about Siam, states (p. 155): "The imports from China [to Siam] are very numerous, consisting of what are called in commercial language 'assorted cargoes.' The following is a list of the principal commodities: coarse earthenware and porcelain, spelter, quicksilver, tea, lack-soy (vermicelli), dried fruits, raw silk, crapes, satins and other silk fabrics, nankeens, shoes, fans, umbrellas, writing-paper, sacrificial paper, incense rods, and many other minor articles."

In Chapter 6, about the people of Cochin China (today's Vietnam), we read (p. 282): "They eat vermin, and the flesh of the alligator; hatched eggs with them are a delicacy; and their favourite sauce is a kind of soy [probably nuoc-mam], in part, at least, composed of the juices of putrid fish, and which, both from taste and odour, would be in tolerable to any other people."

Chapter 8, about the Island of Singapore, states (p. 358-59): "The first direct arrival from England to Singapore was in the year 1821; in 1822, four ship cleared out with cargoes for the European market; in 1823, nine; in 1824, twelve; in 1825, fifteen; and in 1826, fourteen ships. The greater number of these were bound for London and Liverpool, but there were some also for Stockholm, Hamburgh [Hamburg], and Bordeaux. The staple imports of this branch are cotton goods, woolens, iron, and spelter [unrefined zinc]. The exports are very various, and may be enumerated as follow: ore of antimony, aniseed, aniseed oil, benjamin [gum benjamin, a balsam or resin from a tree], camphor, cassia, cassia-buds, coffee, cubebs [small spicy berries of the *Piper cubeba* from Java], dragons' blood [a resinous substance, or red juice, extracted from the *Dracoena draco*], elephants' teeth [tusks, ivory], gamboge [a concrete vegetable juice or gum-resin from Cambaja or Cambodja {Cambodia}], horns of cows, deer, and buffalo; hides of ditto, mother of pearl shells, musk, nankins [nankeens, a type of cotton cloth, originally from China], orpiment [sulphuret of arsenic], pepper, Chinese paper, Chinese raw silk, Chinese wrought silk, ratans [small canes, grown in India] and canes; rhubarb, cloves, mace, and nutmegs; pearl sago, Siam sugar, Japan soy [sauce], tin, tortoiseshell, turmeric, gold and silver bullion, and sapan-wood [sappan wood; a red soluble brazilwood obtained from an East Indian tree *Caesalpinia sappan*]. In 1824, and I have seen no later statement, the sworn value of these articles was 1,035,868 Spanish dollars."

Note: This is the earliest document seen (May 2010) concerning soybean products (soy sauce) in Singapore. This document contains the earliest date seen for soybean products in Singapore (1826); soybeans as such have not yet been reported. However, in 1830 soy sauce exported from Singapore was probably made in Singapore from soybeans that were in Singapore at this early date; soybeans may well have been cultivated in Singapore at this time. Address: Esq, FRS, FLS, FGS, &c.

341. Dobell, Peter. 1830. Travels in Kamtchatka and Siberia; with a narrative of a residence in China. 2 vols. London: Henry Colburn and Richard Bentley. See vol. 2, p. 324-25. 20 cm.

• ***Summary:*** Note 1. The first several paragraphs of this are copied from *Portfolio* (1819, p. 105-06).

In Chapter XII of the section titled "A Residence in China," the author is describing Chinese food, especially in the Canton area: "An article of food, of which all classes appear extremely fond, is *thow-foo* [tofu] and *foo-chack,* a sort of flummery [soft jelly or porridge], made from beans, very palatable and nourishing.

Note 2. This is the earliest English-language document seen (April 2013) that uses the term *thow-foo* to refer to tofu.

Note 3. The Cantonese term *foo jook* means dried yuba sticks. Perhaps the author was describing the product after the sticks had been broken into pieces and cooked until soft.

Soy, their famous sauce for all kinds of food, is also made from beans. The beans are boiled until all the water is nearly evaporated, and they begin to burn, when they are taken from the fire, and placed in large, wide-mouthed jars, exposed to the sun and air; water and a certain portion of molasses or very brown sugar are added. These jars are stirred well every day, until the liquor and beans are completely mixed and fermented; the material is then

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strained, salted, and boiled, and skimmed until clarified; and will, after this last process, become of a very deep brown colour, and keep any length of time. Many persons have thought that gravy was used in preparing this condiment; but this appears not to be the case, the composition being entirely a vegetable one, of an agreeable flavour, and said to be wholesome. There are two or three qualities of it; to make the best requires much care and attention. Japanese *soy* is much esteemed in China, on account of the superior manner in which it is made; perhaps they have a particular sort of bean for that purpose. Shopkeepers at Canton who sell soy, have large platforms on the roofs of their houses, where the jars for preparing soy are all arranged, and exposed to the sun; for the consumption of this article is enormous. Neither rich nor poor can dine, breakfast, or sup without soy; it is the sauce for all sorts of food, gives a zest to every dish, and may be said to be indispensable at a Chinese repast.

"In general, very little meat is eaten."

Note 4. The author spent 7-8 years in China between 1798 and 1820. He died in 1852. Address: Counsellor of the Court of His Imperial Majesty, the Emperor of Russia.

342. First report (Part II). Minutes of evidence taken before the select committee of the House of Commons appointed to enquire into the present state of affairs of the East-India Company, and into the trade between Great Britain, the East-Indies, and China;... 1830. London: Printed for Parbury, Allen and Co. p. 246-418. See p. 385.

• ***Summary:*** On 16 March 1830, Mr. John Deans is called in and examined. He has resided constantly in the Eastern Archipelago of the East Indies for upwards of twenty years. For most of the time he lived in Java.

#3609. "Can you give the Committee any information with respect to the trade with Japan?–The Dutch are allowed to trade with Japan, and they are only allowed to send two ships. The trade was conducted until two years ago by the Dutch government of Java. I have here a list of the cargoes in the year 1825, both the imports and exports."

#3610. "Will you state the principal items of the trade?–In the Japan trade in 1825 there were two ships, amounting in all to about 1,300 tons; one was 600 and the other was 700 tons... The import cargoes [to the East Indies from Japan] consisted of... sackie and soy [sauce], 14,332 f. [Dutch florins];..."

343. Hogendorp, C.S.W. de. 1830. Coup d'oeil sur l'île de Java et les autres possessions néerlandaises dans l'archipel des Indes [A glance around the isle of Java and the other Dutch possessions in the East Indies]. Brussels: C.J. de Mat. xii + 422 p. Folded color map. 24 cm. [Fre]

• ***Summary:*** Page 158: Under the Malay name of *katjang idjoe,* the Chinese and some indigenous people cultivate a legume which is quite like the pea (*phaseolus radiatus*), from which is made on Java a sort of soy sauce (*soya*), which is called *ketjap.*

Note: Soy sauce in Java is made from the soybean, not from the mung bean (*katjang idjoe*). In Java, soy sauce is, indeed, called *ketjap.*

Page 204: The Europeans burn coconut oil in their lamps; and for this use it is preferable to bean oil (*l'huile de katjang*) [probably soy bean oil].

A long table (p. 396-97) shows the items to be taken on an expedition to Japan in 1827. The items exported from Japan on the return trip will consist mainly of refined copper, camphor, silk cloth,... porcelain, soy sauce (*du soya*), saké (*du sackie*),... Address: Graaf [Count], Knight of the Legion of Honor, Former Resident of Batavia, Buitenzorg, and Crawang.

344. Kitamura Kintei. 1830. Kiyu shôran [Play and laugh joyfully. Take a good look]. 12 volumes plus appendix. Japanese summary by Kawakami 1978, p. 238. [Jap]

• ***Summary:*** Tells the story of seasoned minced natto (*tataki-nattô*) and whole-bean natto (*tsubu nattô*) in Edo (today's Tokyo).

Note: This is the earliest document seen (Jan. 2012) that contains the term "tsubu natto."

345. Loudon, John Claudius. 1830. Loudon's hortus Britannicus: A catalogue of all the plants indigenous, cultivated in, or introduced to Britain. Part I. The Linnean arrangement,... London: Printed for Longman, Rees, Orme, Brown, and Green. xxiv + 576 p. See p. 316. [300+ ref]

• ***Summary:*** In the section on "Diadelphia Decandria, Class XVII," we read (p. 316): "2151. Soja moen. Soja (Sooja, its name in Japan). Leg. Pap. Vic. 1.

"19457. Soja hispida Moen. Dolichos Soja L." Address: F.L., H., G., & Z.S.

346. Siebold, Philipp Franz von. 1830. Synopsis plantarum oeconomicarum universi regni Japonici [Synopsis of the economic plants from the entire empire of Japan]. *Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen* 12:1-74. See p. 54-57. Also first table at end. [Lat; Dut]

• ***Summary:*** The English translation of this periodical title is: "Transactions of the Batavian Society of Arts and Sciences." Batavia roughly corresponds to today's Jakarta on the island of Java, Indonesia. This work lists 447 economic plants, including the soybean. The section on Leguminaceæ [sic, Leguminosæ] (p. 54+), mentions plants of the genera *Dolichos* (incl. *D. hirsutus* or Kudsu / Kudzu), *Sooja, Phaseolus, Pisum, Vicia, Medicago, Arachis, Glycyrrhiza,* and *Mimorsa.* There are two species of soybeans: *Sooja Japonica,* the cultivated soybean, and *Sooja nomame,* the wild soybean. The genus and its species and varieties are described as follows (p. 56):

"CLXXVIII. Sooja, Moench. Sieb. (Sooja du Japon).

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296 *S. Japonica,* Sieb. *Sooju* vernacular *Daisu,* Japan.

Varieties, grouped by color: a. White seeds. *Daisu,* Japan. b. White fuscis seeds. *Tobimame,* Japan. c. Fuscis seeds. *Sinsjumame,* Japan. d. Black round seeds. *Kuromame,* Japan. a. Black flattened seeds. *Kurotokorosun*, Japan. a. Greenish seeds. *Awomame,* Japan.

Uses: To make *Sooju, Miso, Toofu* (shoyu, miso, and tofu).

297 *S. nomame,* Sieb. *Nomame ac Jawaraketsmai,* Japan (v.v.). [vidi vivam = I have seen a living plant specimen.] *Plantae sponte crescentis folia adhuc tenera pro potu Thea colliguntur.*

At the end of this article are two large fold-out tables, each 30 by 18 inches, and each titled "Synoptic Table of Plant Uses." Each table contains six vertical double columns. References to soy appear only in table I. At the bottom right corner of the first is written in Latin: *"Dabam in Insula Dezima mensi Novembris 1827, Dr. von Siebold."* This translates as: "Given [as a letter for delivery] from the island of Dezima [Deshima], November 1827, Dr. von Siebold." The plants are divided into categories by type of use. For example: I. Simple foods: A. Cereal grains. B. Legumes. C. Fruits, etc. Under each category is a numbered list of the scientific names of the Japanese plants in that category, followed by its name written in both katakana and Chinese characters. Soy-based uses include: IA. Simple foods (*Alimenta simplicia*) (columns 1-4): Legumes (Legumina). 1. *Sooja Japonica,* Sieb. Daizu, "Yellow + Bean." See next page,

Note 1. This is the second earliest document seen (June 1999) written by a European or Westerner in which Chinese characters are used to write the name of the soybean or related products.

II. Composite foods (*Alimenta composita*) (columns 4-5). B. For the sauce "Sooju." Shoyu. Sooja Japonica, Sieb.

C. For the paste (*pulto*) "Miso." Miso. Sooja Japonica, Sieb. plus rice and barley

D. For the cake (*placenta*) "Toofu." Tôfu. Sooja Japonica, Sieb. Note 2. This is the earliest Dutch-language or Latin-language document seen (April 2013) that uses the word "Toofu" or the word "Tôfu" to refer to tofu.

P. For the sprouts (*germinatione artifaali*) "Mogasi." Moyashi. Soja Japonica, Sieb.

Note 3. This is the earliest document seen by Siebold in which the soybean is mentioned. This document also contains the earliest date connected with Siebold and soybeans (Nov. 1827). His name on the title page is written "De. de Siebold."

Note 4. This is the earliest Latin-language document seen (Jan. 2013) that mentions soy sprouts, which it calls *germinatione artifaali,* "Mogasi." Moyashi. Soja Japonica.

Note 5. Siebold was born on 17 Feb. 1796 in Würzburg [Bavaria, Germany]. In 1821, as a young ship's doctor, he arrived in Japan, where he worked as a doctor at Deshima near Nagasaki for the Dutch colony.

Also discusses: Column 1 of table 1 also mentions: 13. *Coix lachryma,* P.S., suudama [Job's tears]. 2. *Phaseolus atsuki,* Japon, Azuki. "Red + Small + Bean." 12. *Arachis hypogaea,* L.E. Rakkasei [peanut]. "Fall + Flower + Bean." Column 2 mentions *Sesamum Orientale, P.S., goma* [*sesame seeds*]. Column 3 mentions the wild soybean (*Sooja nomame*), *Amaranthus oleraceus, A. Japonicus,* and *A. bicolor.* Column 4 also includes sea vegetables (*kaiso*).

Column 5 mentions *ame* [grain syrup], *fu* [wheat gluten cakes], *soba, somen* [wheat noddles], *mochi, konnyaku, kudzu,* and *tokoroten.* III. Medicinal foods (*Medicamina*) (columns 5-6).

347. Tôyô kondate ryôri haya-shikumi [Quick plan for impromptu menu cooking]. 1830. Japan. [50+ ref. Jap]*
• ***Summary:*** Contains an early reference to Kori-dofu (dried-frozen tofu).

348. Ward, Fanny (Mrs. R.). 1830. A child's guide to knowledge,... by a lady. 3rd ed. London: Hurst, Chance, and Co.; Whittaker and Co.; Simpkin and Marshall; and Harvey and Darton. iv + 302 p. See p. 78-79. Index. 16 cm.
• ***Summary:*** Pages 78-79: "Q. What is soy? A. A dark-coloured sauce, made from the seeds of a Chinese plant.

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B. *Legumina.*			3
1. Sooja Japonica, Sieb.	ダイズ	黄豆	4
2. *Phaseolus atsuki, Japon.*	アヅキ	赤小豆	4

II. ALIMENTA COMPOSITA.		
A. *Pro cerevisia «Sake.»*	サケ	酒
Oriza sativa, Seringe.		
B. *Pro embammate «Sooju.»*	シヤウユ	醤油
Sooja Japonica, Sieb.		
Hordeum hexast. ac vulgare, Ser.		
C. *Pro pulto «Miso.»*	ミソ	醤豉類
Sooja Japonica, Sieb.		

6. Sooja nomame, Sieb.	カハタ大豆	青豆

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"Q. Is there not a joke among seamen, that soy is made from beetles and cock-roaches? A. Yes: it originates from a fancied resemblance in colour and shape of the seeds to the beetle.

"Q. Where is this esteemed sauce prepared? A. Chiefly in China and Japan; that brought from the latter place is most preferred."

349. Utagawa Kinuyoshi. 1830? Eho kaho fuku no iri-mame [Lucky casting of soybeans completed at a fortunate compass point]. Japan. Undated. Woodblock print. [1 ref]

• ***Summary:*** This is a typical woodblock triptych print, *oban tat-e.* The man throwing the roasted soybeans (*mamemaki*), a young nobleman at left, holds a wooden stand in his left hand. His two female attendants will scramble for the lucky beans. The artist, Utagawa Kinuyoshi, lived 1797-1861. Original owned by the British Museum.

350. *Times* (*London*). 1831. Mode of making soy. Sept. 23. p. 2, col. 5.

• ***Summary:*** From *Dobell's Travels:* "Soy, the famous sauce for all kinds of food, is made from beans. The beans are boiled until the water is nearly evaporated, and they begin to burn, when they are taken from the fire, and placed in large wide-mouthed jars, exposed to the sun and air; water and a certain amount of molasses or very brown sugar are added. These jars are stirred well every day, until the liquor and beans are completely mixed and fermented; the material is then strained, salted, boiled, and skimmed, until clarified; and will, after this last process, become of a very deep brown colour, and keep any length of time. Many persons have thought that gravy was used in preparing this condiment; but this appears not to be the case, the composition being entirely a vegetable one, of an agreeable flavour, and said to be wholesome. There are two or three qualities of it; to make the best requires much care and attention. Japanese soy is much esteemed in China, on account of the superior manner in which it is made; perhaps they have a particular sort of bean for that purpose. Shopkeepers at Canton who sell soy, have large platforms on the roofs of their houses, where the jars for preparing soy are all arranged, and exposed to the sun; for the consumption of this article is enormous. Neither rich nor poor can dine, breakfast, or sup without soy; it is the sauce for all sorts of food, gives zest to every dish, and may be said to be indispensable at a Chinese repast."

Note 1. This description of the Chinese process for making soy sauce is unusual in several ways: (1) The writer apparently does not know the name of the bean used. (2) The process of making koji, step one of the two-step fermentation process, is not mentioned. (3) Molasses or brown sugar are added before fermentation. (4) Salt is added after fermentation. (5) The sauce is sunned / fermented on a rooftop rather than in a courtyard at ground level.

Note 2. *Dobell's Travels* refers to: Dobell, Peter. 1830. *Travels in Kamtchatka and Siberia; with a Narrative of a Residence in China.* 2 vols. London: Henry Colburn and Richard Bentley. See vol. 2, p. 324-25.

Note 3. The quotation above differs slightly from that of the original.

351. Remond (John). 1832. Classified ad: Hams, smoked beef, tongues, cheese, &c. *Salem Gazette* (*Massachusetts*). July 3. p. 1.

• ***Summary:*** "... 6 doz Calcutta Curry, just imported. Canton and Japan Soy [sauce]. Cases of Maccaroni [Macaroni]. Jars of Olives. Pickled Walnuts, &c."

Note 1. This is the earliest English-language document seen (April 2012) that contains the term "Canton Soy," which apparently refers to soy sauce made in Canton, China. In the Early American Newspapers (EAN) online database (produced by Readex, a division of NewsBank), there are at least 5 issues / records that contain the term "Canton Soy" from Aug. 1832 to April 1839.

Note 2. This ad last appears in this newspaper on 3 Aug. 1832 (p. 2). Address: No. 8 Derby Square.

352. Don, George. 1832. A general system of gardening and botany: Containing a complete enumeration and description of all plants hitherto known; ...Founded upon Miller's Gardener's Dictionary, and arranged according to the natural system. Vol. 2. London: C.J.G. and F. Rivington. 875 p. See p. 356-57 (Soja), 220-21 (Glycine). Index at front. 27 cm. [3 ref]

• ***Summary:*** This work was published in 4 volumes between 1831 and 1838. It was "caused to be prepared" by the

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proprietors of *Miller's Gardener's and Botanist's Dictionary.* The alphabetical arrangement of genera used by Miller was discarded. "It only remained, therefore, to choose between the Linnæan artificial method, and the Natural System of Jussieu; but the numerous advantages of the latter, particularly in an extensive work like the present, were too apparent to leave any doubt in the mind of the Editor as to which he ought to adopt... In the Linnæan artificial method, it often happens, that genera, intimately related, are separated far apart into different classes and orders, merely on account of the difference in the number of their stamens and pistils; a circumstance now found in many instances scarcely to be of sufficient importance, even to separate species, still less genera... The plan of the present work is founded on that of M. de Candolle, in his invaluable works entitled *Regni Vegetabilis Systems Naturale* and *Prodromus,* with such alterations as were rendered necessary by the rapid increase of science, and with numerous additions of new genera and species..." Like Miller, Don classifies soybeans in the genus *Soja.*

"CXC. SOJA (*sooja* is the name of a sauce prepared from the seeds by the Japanese). Moench. meth. 153. Savi, diss. 1824. p. 16. D.C. legum. mem. ix. prod. 2. p. 396.

Note 1. This is the earliest English-language document seen (April 2012) that uses the term "sooja" to refer to soy sauce.

"Lin. Syst. *Diadélphia, Decándria.* Calyx bibracteolate at the base, 5-cleft, the 3 lower segments straight and acute, but the 2 upper ones are joined together beyond the middle. Corolla with an ovate vexillum, which stands on a short stipe, and with an oblong straight keel." Note 2. *A Dictionary of Botany,* by Little and Jones (1980) defines vexillum (plural: vexilla) as "See Banner." Banner is defined as "The broad uppermost petal of a papilionaceous corolla as in the irregular flowers of certain members of the pea family, Fabaceae. Synonym: Standard or vexillum."

"Stamens diadelphous, the tenth one approximate, but certainly distinct. Stipe of ovary not surrounded by a sheath at the base. Style short. Legume oblong, 2-5 seeded, membranous; the seeds intercepted by cellular dissepiments. Seeds ovate, compressed.–A hispid erect herb, with pinnately-trifoliate leaves, and with the flowers either aggregate in the axils of the leaves on short pedicels, or disposed in short peduncalate racemes.

"1 S. híspida (Moench. l. c.) Annual. Hardy. Native of Japan, East Indies, and the Moluccas. Dólichos Soja, Li. spec. 1621. Jacq. icon. rar. t. 145. Soja Japónica, Savi, diss. 1. c. Kæmpf. amoen. 837 and 838, with a figure. Corolla violaceous, hardly longer than the calyx.

"The seeds, which are usually called *Miso* [sic, error based on Miller 1807] in Japan, are put into soups, and are the most common dish there, insomuch that the Japanese frequently eat them three times a day. The *Soja* of the Japanese, which is preferred to the *Kitjap* of the Chinese, is prepared from the seeds, and is used in almost all their dishes instead of common salt. The Chinese also have a favourite dish made of these seeds, called *ten-hu* [*sic, teu-hu,* i.e. tofu] or *tau-hu,* which looks like curd, and though insipid in itself, yet with proper seasoning is agreeable and wholesome.

"*Var. Beta, pállida* (D.C. prod 2. p. 396.) flowers yellow; seeds white. Roxb. [Roxburgh] hort. beng. p. 55.

"*Hispid* Soja. Fl. [Flowering] July, Aug. Clt. [Cultivated since] 1790. Pl. [Plant] 1½ foot.

"*Cult* [Culture and propagation]. The seeds of this plant only require to be sown in a warm sheltered situation in the month of May."

Under Phaseolus, Don lists a species named *Phaseolus max,* following Linnaeus and Rumphius, but he apparently did not confuse this with the soybean (listed on the same page under Soja hispida), since he noted that the species was not sufficiently known, the seeds were black, about the size of coriander-seeds, and that *Max* is the Spanish name of the plant.

On p. 220 we read: "XCV. Pueraria (in honour of M.N.N. Puerari, a professor at Copenhagen [Denmark]). D.C. ann. sc. nat. 1825. jan. p. 29. Leg. mem.vi. prod.2. p. 240. Lin. syst. Monadélphia, Decándria." Species: *P. tuberosa, P. Wallichii.*

George Don, son of George Don (1764-1814), was a British plant collector and nurseryman, born in Scotland, and lived 1798-1856. He collected plants on various expeditions for the Horticultural Society of London in Brazil, West Indies, and Sierra Leone. One of the most indefatigable and accurate botanists. Philip Miller lived 1691-1771. Note the similarity of the section on food uses of soybean seeds to that of Miller (1807). Address: England.

353. Encyclopædia Americana: A popular dictionary of arts, sciences, literature, history, politics and biography. A new edition. 14 vols.: Soy. 1832. Philadelphia, Pennsylvania: Lea & Blanchard. See vol. 11, p. 502-03.

• ***Summary:*** "Soy; a dark-colored sauce, prepared by the Chinese from the seeds of a sort of bean (*dolichos soja*). The plant has an upright and hairy stem, erect bunches of flowers, and pendulous, bristly pods, each containing about two seeds. The common story that soy is made from cockroaches or beetles, has probably originated from the form and color of these seeds. The process of preparing soy consists in boiling the seeds until they become soft, and mixing with them an equal weight of wheat or barley meal, coarsely ground. This mixture is fermented, and, a certain proportion of salt and water being added, the whole is allowed to stand for two or three months, care being taken to stir it daily: at the end of this time it is ready for use. The seeds are, besides, employed in China and Japan as food: they are made into a kind of jelly or curd, which is esteemed very nutritious, and is rendered palatable by seasoning of different kinds. In Japan, they are put into soups, and are the most common

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dish of the country, being frequently eaten three times a day. Soy [sauce] is chiefly imported from China and Japan, and that from the latter country is the most highly esteemed. The quantity annually sold in England, at the East India company's sales, is from 800 to 2000 gallons."

Note 1. Much of this information is taken from Willich (1821).

Note 2. The identical information appeared in the 1849 edition of this encyclopedia, in the same volume and pages.

354. Tokashiki, Tsûkan Peichin. 1832. Gyozen honsô [Food herbal]. Japan. In Higaonna Kanjun's 1955 hand-written copy of the original book (located at the Okinawa Prefectural Library), see pages 23 and 27. [Jap]*

• ***Summary:*** E.H. Walker (1976) states: "Originally published in about 1860. Treats animal as well as plant foods, with Japanese names only... A new edition was published in 1961 in Okinawa. The author, T. Tokashiki, lived 1793-1845."

Yasuda (1983, p. 839), in discussing how to eat tofuyo, states" In the *Gyozen Honsô* (*Food Herbal*) (1832, a book about food and medicine) the physician TOKASHIKI Tsûkan Peichin wrote: Tofuyo has a delicious flavor and is good for the stomach. It makes eating a pleasure and is good for various types of sickness" (Ref. #9; Note: This book contains the earliest known direct reference to tofuyo. Peichin refers to a high-ranking officer).

355. Carolinian, A. 1834. The introduction of exotics. *Southern Agriculturist* (*The*) 7:629-31. Dec. [1 ref]

• ***Summary:*** The author begins by reflecting on the widely held feeling that times past were better than the present, but that the present generation often thinks–out of vanity–it is more intelligent than those preceding it. "These reflections have occurred to me in looking over a paper, published above seventy years ago [i.e., before 1764], which furnishes a cataloge [sic] of foreign plants, suitable to this country, and recommending their introduction among us. What the fathers did in these respects, the sons can scarcely hope to equal... The wide world appears to have been searched and made tributary to the resources of South-Carolina...

"The paper referred to, contains the following catalogue:–" Seventy-eight plants are listed with both their common American and scientific names. One of these is: "Daidser: a kind of kid bean, *Dolichos soja.*"

Note 1. The author's name may mean simply a person from the Carolinas. This journal was published in Charleston, South Carolina.

Note 2. This is the earliest document seen (May 2004) that contains the word "Daidser," which should probably be "Daizu" or "Daidzu" [Japanese words for "soybean"]. The term "Dolichos Soja" was first used in 1749 by Linnaeus in his *Materia medica, per regna tria naturae.*

First cited by Hymowitz. 1986. Bibliography of early, previously uncited publications on soybeans in the United States. 2 p. Unpublished.

Note 3. The information on soybeans in this publication probably comes from a publication by John Ellis titled "A catalog of such foreign plants as are worthy of being encouraged in our American colonies for the purposes of medicine, agriculture and commerce." Originally published as a pamphlet, it was then reprinted in the *Transactions of the American Philosophical Society* in 1771 or 1772 (1:259). Concerning the soybean it states: "Dolichos soja Linn. Sp. 1023. A kind of kidbean called Daidsu. Used for making Soye* or Indian Ketchup." The four key pairs of similar terms are: (1) "catalogue" and "catalog." (2) "a kind of kid bean" and "a kind of kidbean." (3) "Daidser" and "Daidsu." And (4) "Dolichos soja."

356. Spach, Edouard. 1834. Histoire naturelle des végétaux. Phanérogames. Tome I. [Natural history of plants. Phanerogams. Vol. 1]. Paris: Librairie Encyclopédique de Roret. viii + 490 p. See p. 328. [1 ref. Fre]

• ***Summary:*** The section on "Les Papilionacees–Papilionaceae" (p. 149) contains a subsection for "Les Phaseolees" (p. 156) under which (on the same page) there is an entry for *Soja Moench.*

However in the section on "Les Phaseolees–Phaseoleae" (p. 317) is the actual taxonomic description (p. 328) for "Genre Soja. Soja Moench." After the brief description of the genus, which contains only one species, we read: "Soja hérissé.–*Soja hispida* Moench.–*Dolichos Soja* Linn. Jacq. Ic. Rar. I, tab. 145 [*Icones plantarum rariorum* (Illustrations of rare plants), by Nikolaus Joseph Jacquin (1781)].

Following a brief description of the species: This plant is cultivated in China, in Japan, and in India. The Japanese prepare from its green seeds a type of preserve (*conserve*) with which they season most of their dishes / food. Moreover, these seeds are farinaceous [sic] (*sont farineuses*) and are edible like haricot beans (*les Haricots*).

Note: Phaneorogams are seed-bearing or flowering plants; also called spermatophytes. Edouard Spach lived 1801-1879. Address: Asst. Naturalist, Museum of Natural History [Paris, France; Aide-Naturaliste au Muséum d'Histoire Naturelle].

357. Titsingh, Isaac. trans. 1834. Nipon o daï itsi ran: ou, Annales des empereurs du Japon, tr. par M. Isaac Titsingh [Annals of the Japanese emperors. Translated by Isaac Titsingh, edited by and Julius H. Klaproth]. Paris: Printed for the Oriental translation fund of Great Britain and Ireland. 3 + xxxvi + 460 p. See p. 345. 31 cm. [Fre]

• ***Summary:*** Page 343 states that 1444 was the first year of the Bunnan (*Boun an*) era. In the third month of this year, there fell from the sky-blue vault the beans called *miso** and the red beans (*des fèves rouges*) [azuki]. (Footnote: *In Chinese *Ta teou, Dolichos soya.* [Klaproth] The two Chinese

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characters for soybean are shown).

Note 1. This is the third earliest document seen (June 1999) written by a European or Westerner in which Chinese characters are used to write the name of the soybean or related products.

Note 2. The meaning of this entry is not clear. Isaac Titsingh [Titsing] lived 1744-1812. Julius Heinrich Klaproth lived 1783-1835. The title pages states that this work was translated by M. Isaac Titsingh with the aid of several interpreters attached to the Dutch factory or settlement at Nagasaki. The work includes a glance at the mythological history of Japan by Mr. J. Klaproth.

358. Balbi, Adriano; Bradford, Thomas Gamaliel. eds. 1835. An abridgement of universal geography, modern and ancient: Chiefly compiled from the *Abrégé de Géographie* of Adrian Balbi. New York, NY: Freeman Hunt, & Co.; Boston, Massachusetts: William D. Ticknor; Philadelphia, Pennsylvania: Desilver, Thomas, & Co. 520 p. Illust. 28 cm.
• ***Summary:*** In the chapter on "Empire of Japan," section 3 titled "Towns" states (p. 418): "Kio, or Meaco [Kyoto, or Miako], was for a long time the Capital, end contains the most remarkable edifices... Meaco is the centre of Japanese commerce and manufactures; silks, tissue, soy [sauce], and lacquered wares are purchased here in their greatest perfection;..."

359. Burnett, Gilbert Thomas. 1835. Outlines of botany: Including a general history of the vegetable kingdom,... Vol. 1. London: John Churchill. viii + 1190 p. See p. 666.
• ***Summary:*** "(2145.) *Sooja* is the name of a Japanese sauce, prepared from the seeds of a species of Dolichos, now made into a distinct genus, and called *Soja hispida.* The *Soja* of Japan is preferred as a sauce to the *Kitjap* of China; both, however, are imported into England in large quantities, and are here known as *Soy* [sauce]. In bond it is worth about 6*s.* a gallon; but, after it has been adulterated, it is sold at 3*s.* and upwards a pint. The Japanese make a soup of the seeds, called *Miso,* which is one of their most favorite and common dishes, the natives eating of it three times a day. The Chinese also have a popular dish made of these seeds, called *Teu-hu* or *Tau-hu* [tofu], which looks like curd; and, though insipid in itself, yet with proper seasoning is rendered agreeable and wholesome."

Note: Burnett, like Miller (1807) and Don (1832) before him, associates the word "Kitjap" with Chinese rather than with Indonesian soy sauce, and reports that both are imported into England in large quantities. The Japanese product was clearly called and sold as "soy" in England. But what was the Chinese product called and sold as? Was it sold as "real" ketchup, catsup, catchup, etc.? Address: F.L.S., Prof. of Botany in King's College, London.

360. Dictionnaire de l'Académie française. Sixième edition: Soy [Dictionary of the French Academy, 6th ed.: Soy]. 1835. Paris: Institut de France, and Librairie de Firmin Didot Frères. See Vol. 2, p. 774. [Fre]
• ***Summary:*** Soy, singular masculine noun. Pronounced so-EH (*Soé*)**.** A type of sauce, of which the usage has come from Japan.

Note: This is the earliest French-language document seen (April 2012) that uses the word *Soy* to refer to soy sauce.

361. Schouw, M. 1835. Esquisse d'un cours sur la geographie des Plantes [Sketch of a course on the geography of plants]. *Annales des Sciences Naturelles* 3:117-143. Series 2. See p. 124. [1 ref. Fre]
• ***Summary:*** In the section titled "VI. Région des Camellia et des Celastrinées" (The Chinese and Japanese region–Region of Kaempfer), under cultivated plants, in the third paragraph we read (p. 124): "*Pois velus* (*Soja hispida*)**.**"

Note 1. *Pois velus* means "hairy pea."

In the section titled "VII. Région des Scitaminées" (The Indian–Region of Roxburgh), under cultivated plants, in the third paragraph we read again (p. 126): "*Pois velus* (*Soja hispida*)**.**"

Note 2. This is the earliest document seen (March 2013) in which the term *Pois velus* is used to refer to the soybean. Address: Prof. at Copenhagen [Denmark].

362. Dictionnaire des productions de la nature et de l'art [Dictionary of the productions of nature and of art...]. 1836. Brussels, Belgium: Impremerie de Balleroy. See Vol. 2, p. 237. [Fre]
• ***Summary:*** Soja. Soy sauce (*Le soja*) is a liquid (*liqueur*) prepared with the seeds of the dolic of Japan [soybean]. The dolic is a plant of the leguminous family and of the genus of diadelphia decandria (*diadelphie déandrie*)*:* it contains 16 known species.

Note 1. This is the earliest French-language document seen (April 2012) that uses the term *Le soja* to refer to soy sauce.

Note 2. The subtitle of this book is: *Qui sont l'objet du commerce tant de la Belgique que de la France* [Which are the object of commerce for both Belgium and France].

363. Woodblock print by Hiroshige showing shoyu being made in 19th century Japan. 1837.
• ***Summary:*** Utagawa Hiroshige III (also known as Ando Hiroshige) was a Japanese ukiyo-e artist who lived 1797-1858; the date of print is a guess, based on the dates he lived. The print is part of a series by Hiroshige on Japanese

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industries.

Note: A black-and-white photo of this print appears in the book titled *The Kikkoman Way of Fine Eating* (1973, p. 19), with the caption "Hiroshige print showing shoyu making (19th century).

Note: We have been unable to find this print, or reference to it, in one large book about Hiroshige and his prints. He did, however, create a series of color woodblock prints showing Japanese craftsmen and industries.

364. Firth (Robert) and Co. 1839. Classified ad: This day, Wednesday, the 2d of Oct. Messrs. Robert Firth and Co. will sell by Public Auction,... *Bombay Times and Journal of Commerce* (*India*). Oct. 2. p. 625.
• ***Summary:*** "... at their Rooms, an invoice of Damask Table Cloths,... several cases of Insects, Japan Soy [sauce], China Preserves, Lavender Water, Books,..."

365. Aulagnier, Alexis François. 1839. Dictionnaire des alimens et des boissons en usage dans les divers climats et chez les différens peuples... [Dictionary of the foods and beverages in use in the various climates and among the different people]. Paris: Printed by Cosson. [ii] + 731 p. See p. 248. No index. [Fre]
• ***Summary:*** Called Manne [sic, mame / mamé] in Japanese. This species also grows in the East Indies [*Indes orintales*]*;* the pods resemble those of the lupin, the seed is the size of a large pea; from it, in the countries where it is grown, is made a type of pap or mush which is used in place of butter and which is served with roast meats; this pap is called *miso* or soy sauce [*sauce de soja*] and it constitutes one of the main foods of the Japanese. People of all ranks [and social classes] eat it several times each day throughout the year. It [soy sauce] is prepared in the following manner: cook the beans until they are soft; mix them with equal quantities of barley and of wheat; let them ferment for 24 hours in a warm environment; meanwhile add a certain quantity of salt and 2½ times as much water; keep the mixture in an earthenware pot that is well sealed for 2½ months, observing and stirring it during the first days. After that, press out the liquid and store it in wooden kegs. The more this sauce ages, the better it tastes and the clearer it becomes, until it remains with a brown color. Its main taste is salty and agreeable.

A member of the genus Dolichos with slender or small pods also grows in the East Indies; its white seeds offer, after rice, a food of which those people make the greatest use. Address: Member of the Royal Academy of Medicine.

366. Couverchel, Jean-François. 1839. Traité des fruits, tant indigènes qu'exotiques, ou Dictionnaire Carpologique, comprenant... [Treatise on fruits, indigenous as well as exotic, or Dictionary of Fruits]. Paris: Impremerie et Librairie de Bouchard-Huzard. 717 p. See p. 150-51. [Fre]
• ***Summary:*** In the section titled *Dolics, dolichos, L. famille des Légumineuses, J.* we read (R.6): The seeds of *dolichos soja* or *soya,* highly esteemed in Japan, are used to make, together with the juice from meat, the famous extract (*coulis*) or sauce called soy sauce (*soja*) so restorative and so thought after to revive strengths depleted by an excess of pleasure; furthermore, they prepare a boiled paste (*bouillie*) that they use in lieu of cow milk butter and that they call 'miso.'

In order to prepare the *soja* or *soya* (soy sauce) one should choose preferably the species of bean known under the name of *dolichos soya;* a predetermined measure of said beans is gathered and cooked in a sufficient amount of water; it is then mixed (kneaded) with wheat flour, salt and water in the proportions of one part of each; once it is well mixed, it is spread in thin layers in flat and appropriate vessels; these are covered over and left to stand alone; Within a few days, this paste molds, takes on a green cast and a rancid odor; these characteristics indicate that all is going well. It is then exposed to the outside air in order to desiccate it; these flat cakes are then broken into pieces; introduced in varnished or glass vessels, and water is poured into it in the proportions of five to one; it is placed under the sun and shaken quite

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frequently. When this mixture becomes consistent and creamy, it is poured into bags that are then put under a press. The viscous liquid so obtained is poured into bottles that are carefully corked and saved for subsequent use. Address: France.

367. Graham, John. 1839. A catalogue of the plants growing in Bombay and its vicinity; spontaneous, cultivated or introduced, as far as they have been ascertained. Bombay: Printed at the Government Press. ix + 254 p. See p. 52. 22 cm. [5 ref]

• ***Summary:*** "205. Soja. W. & A. [Wight & Arnott 1834] Diadelphia Decandria. *Sooja*–name of a Chinese sauce prepared from the seeds.

"405. S. [Soja] Hispida W. & A. 762. Dolichos soja. Rox. [Roxburgh] Flora. 3. p. 314. Jacq. [Jacquin] Ic. Rar. t. 145. An annual, hairy plant; flowers small, of a reddish purple; in gardens. In Japan the seeds are called *Miso* [sic, error based on Miller 1807], and are commonly eaten in soups (Don. [1832])

"206. Dolichos. L. Diadelphia Decandria. *Greek,* for long, -tedious: (Odys.) name given in allusion to the habit of the plants, sending forth long shoots. Gaert. *t.* 150. Lam. *t.* 610." The author then gives brief descriptions of Dolichos uniflorus, D. falcatus, and D. sinensis.

The title page reads: "Published under the auspices, and for the use of the Agri-Horticultural Society of Western India. To be continued and completed Printed by special permission, at the Government Press, Bombay." A quote from Linnaeus is on the title page. The author, John Graham, lived 1805-1839. Voigt (1845) notes that Dr. J. Graham was a professor of Botany at Edinburgh, Scotland. Contains a preface giving a short account of the author and a manuscript index of native names. Address: Deputy Post-Master General of Bombay.

368. Australian Auction Company. 1840. Entire cargo of the "Juliet." To be sold by public auction (Ad). *Sydney Gazette and New South Wales Advertiser* (*NSW, Australia*)**.** Jan. 9. p. 3.

• ***Summary:*** "On Monday, the 13th January next,... at 11 o'clock precisely."

"The Entire Cargo of the Barque Juliet from Java consisting of–1,546 Packages superior Black Teas, 7,857 [packages] Superior quality Sugar, 221 baskets fine white ditto [Sugar], 516 Bags Table Rice, 286 Bags Coffee,...125 Casks Arrack [palm wine],... 10 Barrels and 100 cases best Cognac Brandy,... 92 Baskets Salad Oil, 6 Ditto [Baskets] Japan Soy [sauce], 189 Cases French Wines,..."

Note: This is the earliest of 3 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "Japan Soy." Address: The Mart, George-street [Sydney].

369. Goodrich, Samuel Griswold. eds. 1840. A pictorial geography of the world, comprising a system of universal geography, popular and scientific,... 2nd ed. 2 vols. Boston, Massachusetts: C.D. Strong. 1008 p. Illust. ("One thousand illustrative engravings"). Index. 28 cm.

• ***Summary:*** In Vol. 2, the chapter titled "Empire of Japan" states (p. 969-70): *"Kio* or *Meaco* [Kyoto or Miako], was for a long time the capital, and contains the most remarkable edifices... Meaco is the centre of Japanese commerce and manufactures. Silks, tissue, soy [sauce] and lacquered wares, are purchased here in their greatest perfection,..."

Note 1. This passage mentioning soy also appears in the 1856 ed. (p. 472) in the chapter on "Empire of Japan," section 3 titled "Towns."

Note 2. Issued in ten parts. "Illustrated by more than one thousand engravings. With a copious index, answering the purpose of a gazetteer."

370. Holman, James. 1840. Travels in China, New Zealand, New South Wales, Van Diemen's Land, Cape Horn, etc., etc. 2nd ed. London: George Routledge. viii + 519 p. Illust. Forms vol. 4 of the author's *Voyage Round the World.*

• ***Summary:*** Mr. Holman was in southern China in Sept. and Oct. 1830. He visited Macao and Whampoa, but stayed at Canton, where the following events took place.

On the page titled "Mode of preparing soy" (p. 105): "He also sells soy [sauce], both of the kind made in China, and that which is brought from Japan. The latter is considered the best. There is a large manufactory of this article in the island of Honan, opposite Canton; and another at Whampoa.

"Soy is made from the seeds (or beans) of the Dolichos Sooja, and the process of preparing it is as follows:–The beans are first boiled soft, when nearly an equal quantity of wheat or barley flour is added. After this has gone through a regular process of fermentation, a quantity of salt is put in, sufficient to make a brine strong enough to float an egg, using three times as much water as the original quantity of beans. This compound is then left for two or three months, when it is pressed, and strained for use. It improves by age, and is best preserved in earthen jars, and bottles, well sealed."

The page titled "Dine with Tin-Qua" (p. 139) describes his dinner at a Hong merchant's house: "On dinner being announced, we were conducted to a circular table, and each of us provided with a pair of ivory chopsticks mounted with silver, a silver ladle with the handle much curved, a small cup of soy, a saucer or stand for the bowls out of which we were to eat, and an elegant silver cup richly gilt, with two handles, mounted on a stand of similar material, and resembling in form an inverted saucer."

Page 140: "The dinner commenced with a large bowl of birds'- nest soup, from which each person helped himself. We found it very insipid until flavoured with soy, as the

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necessary condiments of salt and pepper seem to be wholly neglected in Chinese cookery." Also served "was a vegetable soup made of prepared sea-weed from the coast of Japan." This dried weed is called Tay-choey. Address: R.N., F.R.S. [England].

371. *Manchester Guardian* (*England*)**.** 1841. Domestic, miscellaneous, &c.: Chinese dinners. March 31. p. 4.
• ***Summary:*** From Saturday Magazine: "A festival given at Canton by one of the Hong merchants... to a select party of English, is thus described by one of the party. We sat down in number about fifteen... We were told we had the happiness to partake of stewed pigeon's eggs, wild cat, fricassied [fricasseed] frogs, dried worms (particularly recommended as a *bonne bouche* for wine at dessert), sea slugs, sharks fins, and other delicacies, which, whatever they may really have been, were rendered extremely palatable by the application of a little Japan soy [sauce].

Note: It seems surprising that soy sauce from Japan would have been used at a banquet in Canton, China. How would the writer have known where the soy sauce had been made? How interesting if the Chinese were actually importing soy sauce from Japan at this time because they considered it superior to their own. Or perhaps the writer is using "Japan soy" as a generic term for all soy sauce.

372. *Musée des Familles: Lectures du soir* (*Paris*)**.** 1841. Études de voyages. Les aventures d'un bossu [Studies of voyages. The adventures of a hunchback]. 8:161-71. March. [Fre]
• ***Summary:*** In Chapter 4, "Productions of the country" (*Chapitre quatrieme: Les productions du pays*) (p. 170+) we read on p. 171: Different species of beans or broad beans (*de haricots ou de feves*) are very popular and much appreciated by the Japanese. They eat them either boiled in water, or paired with syrup or soy sauce (*du soya*)*;* beans cooked with rice are considered a delicacy.

373. Siebold, Philipp Franz von; Busk, M.M. 1841. Manners and customs of the Japanese, in the nineteenth century: From recent Dutch residents of Japan, and the German of Dr. Ph. Fr. von Siebold. London: John Murray. xi + 423 p. 20 cm. No index.
• ***Summary:*** This book was compiled from earlier sources, especially those of the first three physicians at Dejima, Japan.

Philipp Franz von Siebold, a learned German, lived 1796-1866. Note Sieb. & Zucc. Siebold's German book titled *Nippon* was published in 1897. Japan is largely an unknown country. Europeans are excluded except for the Dutch factory at Dezima [Dejima]. Siebold, "like his talented and indefatigable predecessors, Kaempfer and Thunberg, held the situation of physician to the factory."

In the chapter on "Banquets" we read (p. 186): "At entertainments of this description, each guest is served with a portion of every dish in a small bowl. Another bowl is placed beside him, and kept constantly replenished with rice, whilst the sauces and other condiments, of which, besides soy [sauce], are salted ginger and salted fish, are handed round by the servants of both sexes, who are in constant attendance."

The chapter on "Husbandry" states (p. 329): "Barley and wheat are likewise grown–the former for feeding the cattle; the latter is little valued, and chiefly used for cakes and soy. This last is made by fermenting together, under ground, wheat, a peculiar kind of bean, and salt. Beans of all sorts, some other vegetables, and various roots, are sedulously cultivated,..."

"Dr. Von Siebold's Japanese museum [at Leyden] is said to be the finest in Europe, and far richer and in every respect superior to the Japanese rooms in the Royal Museum at the Hague." (p. 297). Mrs. M.M. Busk is listed by some as the compiler of this book, but her name does not appear in this 1841 edition.

Note: Soy is not mentioned in this book.

374. Penny cyclopaedia of the Society for the Diffusion of Useful Knowledge: Soja hispida. 1841. London: Charles Knight & Co. See vol. 22, p. 193-94. [2 ref]
• ***Summary:*** "Soja Hispida (Moench), Soja Japonica (Savi), the Dolichos Soja (Linn), a leguminous plant, native of Japan and the Moluccas, and abundant in the peninsula of India, though probably introduced there. The seeds resemble those of the haricot, French or kidney bean, and are used by the Chinese to 'form a favourite dish, called *ten-hu,* or *tau-hu* which looks like curd, and which, though insipid in itself, yet with proper seasoning is agreeable and wholesome' (Don's *Dictionary*)**.** The Japanese call the seeds *Miso* [sic, error based on Miller 1807] and put them into soup, of which they sometimes partake three times a day. They likewise prepare with them the sauce termed *Sooja* which has been corrupted into *Soy.*

"'The beans are boiled until all the water is nearly evaporated, and they begin to burn, when they are taken from the fire, and placed in large wide-mouthed jars, exposed to the sun and air; water and a certain proportion of molasses or very brown sugar are added. These jars are stirred well every day, until the liquor and beans are completely mixed and fermented; the material is then strained, salted, and boiled, and skimmed until clarified, and will after this process become of a very deep brown colour, and keep any length of time. It has been stated that the gravy or juice of meat was used in preparing this condiment, but it appears to be entirely made from vegetable materials. There are two or three qualities of soy. To make the best requires much care and attention. Japanese soy is much esteemed in China on account of the superior manner in which it is made. Shopkeepers at Canton who sell soy have large platforms on the roofs of their houses, where the jars for preparing soy are

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arranged and exposed to the sun; for the consumption of soy is enormous. Neither rich nor poor can breakfast, dine, or sup without it; it is the sauce for all kinds of food; gives a zest to every dish, and may be said to be indispensable at a Chinese repast.' (Dobell's *Kamschatka.*) Soy is only sparingly used as a sauce in this country. It has the character of being a useful stomachic, but not more so than any of the other condiments when used with moderation."

Note: This is the earliest document seen (May 2004) that uses the word "stomachic" in connection with soy sauce. *Merriam-Webster's Collegiate Dictionary* (1998) defines stomachic (first used as a noun in 1735) as "a stimulant or tonic for the stomach." Address: London, England.

375. Vaucher, J.P. 1841. Histoire physiologique des plantes d'Europe [Physiological history of the plants of Europe]. Paris: Librairie de Marc Aurel Frères, Éditeurs. See Vol. 2, p. 208. [Fre]
• ***Summary:*** In the section titled "Fifth tribe–Phaseoleae" (p. 201), the "Sixth genus" is Soja (p. 208).

A botanical description of the genus is given in French. The habitat of soybean (*Le Soja*) is the Indies (*les Indes*) and Japan, where two varieties can be distinguished: those with violet colored flowers and those with yellow flowers and white seeds. They are both cultivated in botanical gardens. Address: Professor at the Academy of Geneva.

376. Dobel, Pierre. 1842. Sept années en Chine: nouvelles observations sur cet empire: l'archipel Indo-Chinois, les Philippines et les îles Sandwich (Nouv. éd.). traduite du russe par le prince Emmanuel Galitzin [Seven years in China: New observations concerning this empire: the archipelago of Indo-China, the Philippines and the Sandwich islands. New ed. Translated from the Russian by prince Emmanuel Galitzin]. Paris: Amyot. vii + 358 p. Illust. 22 cm. [Fre]
• ***Summary:*** On page iv we read that the author of this work, Mr. Dobel, made three voyages to China and stayed a total of 7 years. Mr. Dobel was born in Ireland, in County Cork. His parents, after being established in North America, placed their son in the University of Pennsylvania. He finished his studies but he lost his parents. He initially chose a military career, but then later decided to be a traveler in Asia.

In the description of a meal (p. 105) he mentions that vinegar and soy sauce (*le soya*) are placed on the table.

Chapter 12, about China (p. 178+), contains a long section about the soybean (Soya) (p. 188-89): After mentioning yuba (*fu-fu* or *fu tchock*) it discusses how soybean jiang and soy sauce are made. There are three grades of soy sauce; the first comes from the first liquid removed by filtering from the soybean jiang, etc. Soy sauce made in Japan and imported to China is the most esteemed. In Canton, huge courtyards are devoted to the production of soy sauce. The consumption of this seasoning is immense; it is served everywhere, by rich and poor alike. Soy sauce is found on every table and at each meal of the day.

For an earlier English edition, see Dobell (1830). Peter Dobell lived 1772-1852. Address: Counselor at the College in the Service of Russia, and former Consul to this power in the Philippines.

377. Tsukue no chiri 1843. Japan. [Jap]*
• ***Summary:*** In Japan today (Jan. 2014) the word "yuba" is written either with two Japanese hiragana characters or with the two Chinese (kanji) characters that mean "hot water" + "leaf." In 1843 these two characters were first used to mean yuba in the *Tsukue no Chiri*–according to the *Nihon Kokugo Daijiten.*

378. Ryôri dokukeiko [Practice in cooking by oneself]. 1843. Japan. [Jap]*
• ***Summary:*** Contains an early reference to Kori-dofu (dried-frozen tofu).

379. Waterston, William. 1843. A cyclopædia of commerce, mercantile law, finance, and commercial geography:... Edinburgh, Scotland: Oliver & Boyd; London: Simpkin, Marshall, & Co. iv + 684 + 39 + 128 p. 23 cm.
• ***Summary:*** The section titled "Soy" (p. 627) states: "Soy, a peculiar savoury sauce made from the bean of the *Soja,* a species of *Dolichos* growing in the eastern parts of Asia. Genuine soy is well flavoured, thick, brown, and clear; and when shaken in a glass, it should leave a coat on the surface of a bright yellowish brown colour. It is imported from Canton, but the best is brought from Japan by way of Batavia" [today's Jakarta in the Dutch East Indies].

Note 1. Following p. 672 (the end of the basic cyclopædia) is a one-page table titled "Tariff of duties exigible in the United Kingdom." For each imported item there are two rates: (1) From foreign countries, and (2) From British possessions. Tariffs are levied on beans (10 pence/bu), "oil-seed cakes" (1 shilling/ton), and some seeds ("Cole, flax, hemp, rape, sesamum;" 1 pence/qr [pence/quarter; in the UK a "quarter" is usually a quarter of a hundredweight {112 lb} or 28 lbs]).

Note 2. No soybeans or soy cakes were being imported to England at this time. Soy [sauce] is not mentioned. At the end of the book is an alphabetical "Supplement" and three maps of Great Britain.

Note 3. This is the earliest English-language document seen (March 2005) that mentions "rape" seeds (or the rape plant), or that mentions "Cole" a seed very similar or identical to rape seed.

Note 4. This is the earliest English-language document seen (Sept. 2006) that contains the term "oil-seed" (or "oil seed").

Note 5. This is the earliest English-language document seen (Sept. 2005) that contains the term "oil-seed cake" (or "oil-seed cakes" or "oil seed cake"). Address: Accountant,

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Edinburgh [Scotland].

380. Siebold, Philipp Franz von. 1844. Liste des plantes anciennement et nouvellement importées du Japon et de la Chine, cultivées dans la pépinière de la Société Royale pour l'encouragement de l'horticulture, outre quelques éclaircissements historiques sur l'importation de plantes du Japon depuis l'anneé 1824 jusqu' en 1844 [List of plants imported from Japan and China in recent and ancient times, cultivated in the nursery of the Royal Society for the Encouragement of Horticulture, plus some historical clarifications on the importation of plants from Japan from 1824 to 1844]. *Annuaire de la Societe Royale pour l'Encouragement de l'Horticulture dans les Pays-Bas* p. 1-39. (Publ. by C.L. Blume and Ph. F. von Siebold, Leiden). [Fre]*
Address: Leiden, The Netherlands.

381. Morrison, John Robert. 1844. A Chinese commercial guide: Consisting of a collection of details and regulations respecting foreign trade with China. 2nd ed., revised throughout... Macao: Published by the author. vii + 280 p. 24 cm.
• ***Summary:*** Section 6, "Description of the articles of export at Canton" (p. 131+), contains a long description of soy sauce (p. 141): "50. Soy. This is a condiment made from the Dolichos bean, which grows in China and Japan; the name is derived from the Japanese *siyau* [sic, *shôyu*]. To make it the beans are boiled soft, and then an equal quantity of wheat or barley is added; after this has thoroughly fermented, a quantity of salt, and three times as much water as the beans were at first, are added. The whole compound is now left for two or three months, and then pressed and strained. Good soy has an agreeable taste, and if shaken in a tumbler, lines the vessel with a lively yellowish-brown froth; the color of soy in the vessel is nearly black. It improves by age. Japan soy is considered superior to the Chinese, but both are of different qualities, and are probably made of various materials, some of which may be base enough. It is for the most part sent to England and America."

Note 1. This is the earliest English-language document seen (April 2012) that uses the word *siyau* to refer to shoyu or soy sauce.

Note 2. This is the earliest English-language document seen (Feb. 2008) that uses the word "tumbler," or the word "froth," or the term "yellowish-brown froth" in connection with soy sauce.

Note 3. John Robert Morrison lived 1814-1843.
Address: LL.D., Hongkong.

382. Okura, Nagatsune. 1844. Kôeki kokusan-kô [Greatly beneficial domestic production ideas. 8 vols.]. Edo [later Tokyo], Japan: Suharaya. Illust. 23 cm. [Jap]*
• ***Summary:*** This is an early multivolume work about farm management and farm production (including production of foods) in Japan. The author, Nagatsune Ohkura, lived 1768 to about 1847.

Iino (2003, p. 9) presents two illustrations from this 1844 book showing soy sauce production.

(1) A woman, standing, facing forward, and wearing a kimono, is roasting soybeans in a large metal wok over a hot fire in a cauldron dais. A man, kneeling on the floor and facing away, appears to be spreading something (perhaps the freshly roasted soybeans) on a straw mat (probably to cool). Four groups of Japanese script characters describe what is happening in the illustration.

(2) See next page. A man in the foreground is stirring moromi in one of two wooden barrels (each is about 3 feet tall, 3 feet in diameter, with the staves bound together by three braided bamboo hoops). The stirring tool that he is using is illustrated in the lower right corner; at the bottom tip is attached a circular wooden disk about 6 inches in diameter and ½ inch thick. A man in the background, facing forward, is using a long-handled dipper, held in his right hand, to ladle shoyu out of a woven bamboo colander (partially submerged in one of the wooden barrels described above) and into a wooden keg (about 18 inches tall, 20 inches in diameter with the staves bound together by three braided bamboo hoops) on the floor next to the barrel. Three groups of Japanese script characters describe what is happening in the illustration.
Address: Japan.

383. Okura, Nagatsune. 1844. Kôeki kokusankô [On profitable local industries / Essay on the nation's benefit].

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Japan [Jap]*

• ***Summary:*** In 1978 an enlarged modern edition was published in Tokyo, Japan, as part of the series *Nihon nosho zenshu.* The new edition contains 8 + 437 + xiii pages, is illustrated, and is 22 cm tall. The original edition is said to have been published in 2 volumes in 1842.

Yokotsuka (1985, p. 206), who cites this book as *"Koeki Kokusanko* (1844)," states that it is about the development of and formulas for commercial shoyu during the Edo period.

Edward E. Pratt, in *Japan's protoindustrial elite* (1999, p. 158) cites this as "Ookura Nagatsune, *Kôeki kokusankô* (1842).

Christie's auction website says that Okura lived from 1766 to 1860. Address: Japan.

384. Siebold, Ph. Fr. de; Zuccarini, J.G. 1845. Florae Japonicae familiae naturales, adjectis generum et specierum exemplis selectis [Flora of Japan: Natural families with genera and selected examples of species]. *Abhandlungen der Mathematisch-Physikalischen Classe der Koeniglich Bayerischen Akademie der Wissenschaften* (*Munich*). Vol. 4, no. 3, part 2. See p. 119. Reprinted as a monograph in Muenchen, Germany, 1851. [3 ref. Lat]

• ***Summary:*** This work by Philipp Franz von Siebold and Joseph G. Zuccarini first gave the soybean its present genus name, Glycine. It also gave the wild soybean its present scientific name *Glycine soja.*

"9. Glycine DC.

"14. *Gl. Soja Sieb. et Zuccar.*–Gl. volubilis retrorsum hirsuta, foliis longe petiolatis ovato-lanceolatis acutis vel acuminatis hirtis, intermedio pedicellato bistipellato, stipulis parvis linearibus, stipellis setaceis, racemis axillaribus 8–12-floris petiolo multo brevioribus, floribus parvis, inferioribus 3–4 tantum fertilibus, leguminibus linearibus compressis subfalcatis hirsutis 2–3-spermis, styli basi uncinata terminatis, seminibus trausversim ellipticis compressiusculis.–An hic *Glyc. javanica Thunb. Act. Linn. II.* p. 340 excl. Synon?"

"10. Soja Mönch.

"15. *S. hispida Mönch. Dolichos Soja L.–Soja japonica Savi. Daidsu vel Mame Kämpf. Amoen* pag. 837 c. ic. opt., ubi et condimenti conditio effuse describitur."

Note: The year of publication is also given as 1843-1846.

385. Voigt, Johann Otto. 1845. Hortus Suburbanus Calcuttensis: A catalogue of the plants which have been cultivated in the Hon. East India Company's Botanical Garden, Calcutta, and in the Serampore Botanical Garden, generally known as Dr. Carey's Garden, from the beginning of both establishments (1786 and 1800) to the end of August 1841. Calcutta: Bishop's College Press. 745 p. + lxviii. See p. 231. [Eng]

• ***Summary:*** "Soja, Moench. (DC. pr. [De Candolle. Prodromus Systematis Naturalis Regni Vegetabilis] 2, p. 396;–W. and A. pr. [Wight and Arnott. Prodromus Florae Peninsulae Indiae Orientalis] 1, p. 247.) 1. hispida, Moench. (DC. l. c. [De Candolle locus citatus];–W. and A. l. c. [Wight and Arnott locus citatus];–J. Grah. Cat. B. pl. [J. Graham's Catalogue of Bombay plants] p. 52.–S. japonica, Savi.–Dolichos Soja, L.; Jacq. icon rar. [Jacquin, (Nicolas Jos. von) Icones Plantarum Rariorum, 3 vols. 1781] t. 145;–Roxb. fl. ind. [Roxburgh's Flora Indica] 3, p. 314.–Kaempf. amoen. [Kaempfer, (Engelbert) Amoenitates Exoticae, 1712] p. 837, t. 838.)

"Gari-kulay. Annual: Japan. Moluccas. Nepal. Taong-Dong. Cultivated in gardens. Fl. [flowers] smallish, reddish-purple, and seeds black, C.S. [Cold season]. Seeds in Japan commonly eaten in soups. (G. Don.) Beta. leucosperma. Seeds white; flowers yellow."

Note 1. This work contains a valuable 10-page listing of the "Principal abbreviations employed in this volume," as shown above. It translates the bibliographic shorthand used by botanists of the day into a form that can be understood by today's reader. A statement after the subtitle reads: "Drawn up according to the Jussieuan arrangement, and mostly in conformity with the second edition (1836) of Lindlay's Natural System of Botany."

Note 2. Voigt, a Surgeon of the Danish Government, working in India, lived 1798-1843; this work was published after his death.

Note 3. This is the earliest document seen (May 2010) concerning soya in connection with (but not yet in) Denmark. Address: Surgeon of the Danish Government,

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Serampore, India.

386. Webster, Thomas. 1845. The encyclopædia of domestic economy: Comprising such subjects as are most immediately connected with housekeeping... Assisted by the late Mrs. Parkes, author of "Domestic Duties." From the last London edition with notes and improvements by D. Meredith Reese, A.M., M.D., of New York. Illustrated with nearly one thousand engravings. 2 vols. New York, NY: Harper & Brothers. 1,238 p. See Vol. II, Nos. 4932, 5072. From the last London edition. With notes and improvements by Meredith Reese. Illust. 24 cm.
• ***Summary:*** In Vol. II: No. 4263 (p. 764). "Rice is boiled to a kind of paste, and drawn out into threads forms a transparent substance used to thicken soups, and is known by the name of China lock soy. There is a kind that is opaque, and which is less esteemed."

Recipe No. 4932 (p. 876), "Cod sounds, broiled," calls for "a tea-spoonful of soy [sauce], and a little mustard." Catsup is also called for in recipe No. 4871.

No. 5072 (p. 889). "Soy.–This sauce, much used for fish, comes from Japan and is called there soja [sic, shôyu]. It is made from the seeds of a plant called *Dolichos soja.* Some is also brought from China, but the Japanese is best. It is supposed to be extensively counterfeited in this country. When genuine, it is of an agreeable flavour, neither too salt [sic, salty] nor too sweet, of a thick consistence and clear brown colour. When shaken in a glass, it should leave a coat on the surface of a bright yellowish-brown colour.

"A somewhat similar sauce may be prepared in the following manner: Boil a gallon of the seeds of the *Dolichos soja* till they are soft; and even pease or kidney-beans may be used as a substitute; add an equal quantity of bruised wheat; put this mixture into a warm place for twenty-four hours, and add a gallon of common salt and two gallons of water. Shake the whole together, and put it into a stone jar, where it should remain closed up for two or three months, during which time it should frequently be shaken. After this time, the liquor should be pressed out through a sieve, which will constitute the soy. An inferior kind may be procured by putting salt water upon what remains, and treating it in the same manner."

Note: This is the 2nd earliest document seen (April 2012) that uses the word "soja" to refer to soy sauce.

Note: Thomas Webster lived 1773-1844. Address: F.G.S., Royal Institution of Great Britain for the Application of Science to the Common Purposes of Life.

387. E. 1846. Soy (Letter to the editor). *Farmers' Cabinet and American Herd-Book* 10(12):379-80. July 15.
• ***Summary:*** Letter dated 26 June 1846. "Dr. Emerson of this city [Philadelphia] has received from a friend in China, some seeds of the *Dolichos soja,* a plant from which the Chinese and Japanese prepare their celebrated dark coloured sauce called soy [sauce], an article largely consumed by all ranks of people in those populous countries. The consumption is rather limited in the United States, but in England about 1000 gallons are imported annually, in addition to a large quantity counterfeited at home. It is excellent on fish and with soups. The flavour is peculiar, but when once acquired, the taste like that for olives and many other things, becomes very strong. By the Chinese and Japanese *soy* is not only esteemed for its agreeable but for its wholesome qualities. The notion of its being made for cock-roaches is of course a vulgar error."

After giving a brief description of the process for making "soy," the author notes: "The best *soy* comes from Japan. When genuine, it is of an agreeable flavor, neither too salt nor too sweet, of a thick consistence, and clear brown color. When shaken in a glass, it should leave a coat on the surface of a bright yellowish brown color." An alternative method of making soy [sauce] from the seeds of *Dolichos Soja* is then described. Both this and the previous method mention that soy is made by a fermentation process, but they do not mention koji or any other source of microorganisms.

"The seeds or soy-beans are also employed in China and Japan in various ways as food. They are made into a kind of jelly or curd [tofu], which is esteemed very nutricious [nutritious] and is rendered palatable by seasoning of different kinds. In Japan they are put into soups, and are the most common dish of the country, being frequently eaten three times a day."

An editor's footnote to this letter dated June 26 states: "Dr. E. has left with us a few of the *Soy* beans, which will be distributed among those who may incline to plant them. As the season is late, it is doubtful whether they would mature this summer; a few however might be tried, and others left to plant next spring."

Note 1. Hymowitz (1986, personal communication) thinks this may have been Ralph Waldo Emerson. This journal was published in Philadelphia, Pennsylvania. First cited by Hymowitz. 1987. Introduction of the Soybean to Illinois. Economic Botany 41(1):28-32.

Note 2. This is the earliest journal article seen worldwide that refers to tofu–which it calls "a kind of jelly or curd." Address: Philadelphia, Pennsylvania.

388. Herincq, F. 1846. Coup d'oeil sur la culture au Japon. I. Plantes potagères, plantes économiques [A glance at the culture of Japan. I. Vegetable garden plants, economic plants]. *Revue Horticole: Journal d'Horticulture Pratique* (*Paris*) 5:69-75. April/Dec. Series 2. See p. 72-73. [Fre]
• ***Summary:*** Legumes include beans (*haricots, fève*) and their varieties, peas, and above all the *Dolichos soja,* with which the sauces etc. are prepared. Address: France.

389. T.W.H. 1847. The soy bean (Letter to the editor). *Farmers' Cabinet and American Herd-Book* 12(3):78-79. Oct. 15.

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• ***Summary:*** Letter dated 18 Sept. 1847. "It is a native of Japan and of the Molucca Islands. It thrives well in New England, having been successfully raised in the Botanic Garden, at Cambridge, and elsewhere in Massachusetts... The plant is very productive. Eight of the beans, planted in Milton, Mass., in 1831, yielded a wine pint of seed, weighing eleven and a half ounces. One hundred and ten of the beans, taken promiscuously, weighed half an ounce. In this proportion, the production of the eight beans would be 2530, or more than 316 for one. In 1829, a single bean, in the Botanic Garden in Cambridge, produced 182 pods, which, as some of them contained three beans, was more than 364 for one. Should their qualities as articles of food be found agreeable, these beans will become valuable on account of their great productiveness.

"The inhabitants of Japan, of China, and Cochin China, and of some parts of India, cultivate these beans extensively, and eat them cooked or prepared in various ways. They make a very important article in the cookery of the Japanese, who use them chiefly in two forms. The first, called *Miso,* is a rich paste, of the consistence of butter, the place of which it supplies in various dishes, and is composed of a mixture of the beans and rice stewed and highly seasoned with salt. The second, called *Sooju* [shoyu] by the Japanese, is the celebrated sauce, known in commerce by the name of *Soy* [sauce] and imported in large quantities from the East, the best being brought from Japan. The Japanese method of making *Soy* was described by Kaempfer, in the 'Amoenitates Exoticae,' published in Latin, in 1712. It is as follows:" An 18-line description is then given.

"Kaempfer says that the Japanese use this sauce to season every dish of fried or roasted food. For fish, beef, and mutton, it forms a very savoury as well as a harmless condiment, the flavour of which is much admired by those who have become accustomed to it; and by many it is preferred to the best Chinese catsup."

"The making of *Soy,* as here described, seems to be a very simple process, and the experiment is worth trying. Should it prove successful, the cultivation of the plant in this country, may become profitable. The beans are said to be good when cooked, like common kidney beans; but it is doubtful whether they would ever take the place of our best varieties of them."

First cited by Hymowitz. 1986. Bibliography of early, previously uncited publications on soybeans in the United States. 2 p. Unpublished.

Note 1. This is the earliest document seen (July 2000) published in the United States that contains the word "Miso."

Note 2. This is the earliest document seen (June 2001) that mentions the term "profitable" (or "profit" or "profits") in connection with soybeans in the United States. Address: Cambridge, Massachusetts.

390. Honzô kômoku keimô [Complete study of materia medica]. 1847. Japan. [Jap]*

• ***Summary:*** According to the *Nihon Kokugo Daijiten* [Japanese Language Dictionary], this is the earliest known Japanese document that contains the word *unohana,* referring to the dietary fiber remaining after making tofu or soymilk.

Thanks to Toshie Marra of the University of California, Librarian for the Japanese Collection, C.V. Starr East Asian Library.

Note. This is the earliest Japanese-language document seen (June 2013) that uses the term *unohana* to refer to okara.

391. **Product Name:** [Inari-zushi (Vinegared Sushi Rice in Sweetened Tofu Pouches/Agé)].
Foreign Name: Inari-zushi.
Manufacturer's Name: Jukkenten Restaurant.
Manufacturer's Address: Tokyo, Japan.
Date of Introduction: 1848.
Ingredients: Deep-fried tofu pouches, water, sugar, shoyu, mirin, sushi rice, sweet vinegared gingerroot (gari).
How Stored: Refrigerated.
New Product–Documentation: Shurtleff & Aoyagi. 1975. *The Book of Tofu.* p. 194. "In Japan, the most popular way of serving agé [deep-fried tofu pouches] is in the form of *Inari-zushi.* Packed into lightweight wooden boxes and topped with thin slices of vinegared gingerroot, Inari-zushi are often found at picnics and outings of all kinds where they play much the same role as do sandwiches in the West. Served at most sushi shops, they are very inexpensive and are prepared in a different way by each chef.

"Inari-zushi is said to have originated in Tokyo about 1848, the creation of one Jiro Kichi, chef at the *Jukkenten* restaurant. Kichi peddled his new culinary treats at night through the streets of Tokyo carrying a four-sided paper lantern called an *andon.* On this he painted a red Shinto *torii* gateway, the hallmark of the Inari shrine where the Goddess of rice is said to abide. Since foxes are said to be very fond of agé, and since the fox is the patron animal of Inari shrines, this pictorial symbolism and its curious logic seemed natural and appropriate; Inari-zushi soon spread throughout Japan."

392. Morrison, John Robert. 1848. A Chinese commercial guide: Consisting of a collection of details and regulations respecting foreign trade with China. 3rd ed., revised throughout. Canton: Printed at the Office of the Chinese Repository. viii + 310 p. Illust. 22 cm.

• ***Summary:*** Section 6, "Description of the articles of export at Canton" (p. 170-83), contains a long description of "Soy" [soy sauce] (p. 180). It is identical to that found in the 2nd ed. of 1844.

Note: Chapter 3 contains detailed information on money (from many countries), Chinese weights & measures, etc. (incl. Chinese measures of capacity, length, and land measures). Interesting terms in Section 6: Aniseed stars,

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Chinaware or porcelain (now widely made in Europe), crackers (fire-crackers), pecul / peculs [piculs], caties [catties], lackered ware (the best kind comes from Japan), Nankeens (a kind of cotton cloth, so named from Nanking), paper (that used in books is made from yellow bamboo). Address: LL.D., Hongkong.

393. Williams, Samuel Wells. 1848. The Middle Kingdom: A survey of the geography, government, education, social life, arts, religion, &c., of the Chinese empire and its inhabitants. With a new map of the empire, and illustrations, principally engraved by J.W. Orr. London and New York: Wiley and Putnam. 2 volumes. See vol. I, p. 283, 290; vol. II, 402-03. • ***Summary:*** In volume 1, in Chapter 6 titled "Natural History of China," the section on legumes (p. 283) states: "The widely diffused and extensive tribe of Leguminosæ holds an important place in Chinese botany, affording many esculent vegetables and valuable products. Peas and beans form important objects of culture, and the condiment called *soy* [sauce] (a word derived from the Japanese *soya*) is prepared chiefly from a species of Dolichos. One of the commonest modes of making this condiment is to skin the beans and grind them to flour, which is mixed with water and powdered gypsum, or turmeric. The common Chinese eat few meals, without the addition of one form or other of the bean curd or bean jelly" [tofu].

Note 1. This is the earliest document seen (April 2013) that mentions turmeric in connection with tofu, or the uses the terms "bean jelly" or "bean jam" [probably incorrectly] to refer to tofu. However, Williams seems to be a bit confused here. He starts to describe how the condiment soy sauce is made in China, but he first states (incorrectly), that the dehulled beans are ground to flour which is then mixed with powdered gypsum or turmeric (also incorrect) before the soy sauce fermentation. The powdered gypsum and turmeric are part of the process for making bean curd–in which hot soymilk is curded with gypsum. Typically, to make bean curd in China, soaked (not dry) soybeans are ground to a slurry or paste (not a flour), mixed with water to make soymilk, which is cooked, then mixed with gypsum, which curds the hot soymilk. Firmly pressed tofu can be cooked with turmeric [and often soy sauce] to preserve it and give it a yellow color. Williams' incorrect idea that whole dry soybeans are first ground to a flour before being made into tofu is repeated by many subsequent European writers.

Note 2. This is the earliest English-language document seen (Feb. 2004) that uses the word "flour" in connection with the soy bean.

In a long discussion of the famous *Pun Tsau* [*Pên Ts'ao* or *Ben Cao*] herbal, by Li Shih-chen, the author notes (p. 280) that "The second division of grains contains four families:... 3. That of leguminous plants; and 4. The family of fermentable things, as bean curd, boiled rice, wine, yeast, congee, bread, &c., which, as they are used in medicine and produced from vegetables, seem most naturally to come in this place."

In volume 2, in Chapter 13 titled "Architecture, dress, and diet of the Chinese," the section on "Vegetables eaten by the Chinese" (p. 43) states: "The Chinese have a long list of culinary vegetables, and much of their agriculture consists in rearing them. Leguminous and cruciferous plants occupy the largest part of the kitchen garden; more than twenty sorts of peas and beans are cultivated, and the pods and seeds of two species of Dolichos are eaten, and the beans of another species made into soy by boiling and powdering the kernels, then fermenting them with yeast, and mixing other ingredients according to the taste of the maker or purchaser. Another still more common condiment made from beans, is called bean curd or bean jam, by boiling and grinding them, and mixing the flour with water, gypsum, and the juice of yellow seeds."

Concerning oils and fats (p. 46): "Oils and fats are in universal use for cooking; crude lard or pork fat, castor oil, and that expressed from two species of Camellia and the ground-nut, are all employed for domestic and culinary purposes."

Chapter 20 titled "Commerce of the Chinese," states (p. 402-03): "The silk trade is more likely to increase than any other branch of commerce, after tea, and the Chinese can furnish any amount of raw and manufactured silks according to the demand for them. The best *Soy* is made by boiling beans soft, adding an equal quantity of wheat or barley, and leaving the mass to ferment; a portion of salt, and three times as much water as beans, are afterwards put in, and the whole compound left for two or three months, when the liquid is pressed and strained. The flavor and ingredients of soy vary considerably, even among the people who make it, and much of that exported is supposed to be more or less adulterated." Note: The author apparently does not know what kind of beans are use to make *Soy.* In the 1882 edition of this book, he gives a more accurate description.

Note: This is the earliest document seen (Oct. 2002) concerning soy and adulteration. It speculates that much exported soy [sauce] is adulterated.

Also discusses: *Coix lachryma,* a kind of grass used for weaving floor matting (p. 276). "Hemp is cultivated for its fibres, and the seeds furnish an oil used for household purposes, and medicinal preparations; but the intoxicating substance called *bang,* made from it in India, is unknown in China" (p. 281). Samuel Wells Williams lived 1812-1884. Address: New York, Author of "Easy Lessons in Chinese," "English and Chinese Vocabulary," &c.

394. Hedde, Isidorel; Renard, Éd.; Haussmann, A.; Rondot, Natalie. 1849. Étude pratique du commerce d'exportation de la Chine [Practical study of the business of exporting from China]. Paris: A la Librairie du Commerce, Chez Renard; Canton, China: Chez Reynvaan et Cie.; Batavia: Chez

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Sanier. 280 p. See p. 188-90. [3 footnotes. Fre]
• ***Summary:*** Item No. 64 is "Soy sauce" (*Soya*). Names: English: soy. Portuguese: soja. Chinese court dialect [Mandarin]: chi-you. Chinese (Cantonese): chi-yaou. Nature and origin of the basic material: Soy sauce (*le soya*) is a seasoning made with the seeds of a species of bean (*haricot*), which grows in China and Japan: it is the *si-yao* of the Japanese, the *you-tao* of the Chinese, the *dolichos soja* of the botanists. It is a member of the legume family. Footnote: The *you-tao* is found among the edible plants of Macao and Canton, and entire fields of it are cultivated on the island of Tchou-san, as well as in the provinces of Fujian (*Fo-kièn*) and Zhejiang (*Tché-kiang*).

Method of manufacture: The manufacture of soy sauce (*du soya*), without being difficult, requires attentive care and practice; Chinese families prepare their soy sauce themselves.

Weigh a certain quantity of black [soy] beans (*haricots noirs*), boil them over a low flame; they must be taken out in time to avoid overcooking. Drain them, then add a certain quantity of wheat or barley flour [the amount is not specified]. Cover the vessel, and leave it for a bit in some warm and humid corner. Fermentation begins, an abundant mold forms, and when it is withered and dried out, wash the beans. Next throw them in a jar with an equal weight of sea salt, three times as much boiling water and some aromatic substances. There is nothing more to do than to place the terrine [a glazed, earthenware cooking dish] in the sun; open it during the day and close it at night or when it rains. One month later, the soy sauce is done, which does not prevent many housekeepers from allowing theirs to age thirty or forty days more. Clarify, drain the mass, and put the liquid in bottles.

Description of the finished product: Soy sauce (*Le soya*) is a clear liquid, brownish-black in color; when shaken in a bottle, it should leave a brownish yellow foam on the walls. Its flavor is pleasant and renders it an excellent seasoning.

Soy sauce from Japan is much more esteemed than that of China; its taste, quality, and aroma are so unlike that it is not doubtful that the preparation is different. It appears, besides, that the Japanese use other very common ingredients, they say, in their empire.

Price in Canton (piasters/picul): First grade: 12. Second grade: 10. Third grade: 8. However you can buy a good grade for as little as 5.25 to 7.75 piasters/picul. Churn-ching [Chunking?] sells for 3 piasters a dozen bottles of superior quality soy sauce which is ordinarily sent to British India.

Exportation, destination, and usage: This seasoning has now been adopted throughout almost all of British India, and for the last 20 years [since 1829] it has even been served on the tables of London, Singapore, Pulao Pinang (the first British settlement in Malaya; *Poulo-Pinang*), Manila [Philippines], Batavia [today's Jakarta, Indonesia], and Bourbon [today's island of Réunion / Reunion]–and much is consumed. The usage is expanding in the United States.

A table shows exports of soy sauce (quantity and value) from Canton: In 1844–1,120 piculs worth 9,029 piastres / piasters; 98.9% is sent to England, 0.9% to the USA, and 0.01% to France. In 1845–568 piculs worth 6,380 piasters; 75.7% is sent to England, 13.7% to Denmark, 8.5% to Sweden, 1.6% to the USA, and 0.5% to Germany.

The Chinese consume large quantities of it which they make themselves in their homes; products destined for export come from factories in Henan (a province in central China; W.-G. Honan) and Canton.

Export duties: 4 mèces per picul = 5.05 francs per 100 kg.

Note: This is the earliest document seen (Aug. 2009) concerning soybean products (soy sauce) in Réunion. This document contains the earliest date seen for soybean products in Réunion (1849 or before); soybeans as such had not yet been reported by that date.

Note 2. This is the earliest document seen (April 2007) concerning export duties or tariffs on a soy product–soy sauce exported from China–or soybeans.

Note: This is the earliest French-language document seen (April 2012) that uses the words *chi-you* or *chi-yaou* to refer to soy sauce. Address: Commercial Delegates attached to the French Mission in China.

395. Kôto gosui 1850. Japan. [Jap]*
• ***Summary:*** According to Ryoichi Iino (2003, p. 10) the term *oshidashi* was used in this book to indicate / refer to soy sauce.

396. Dubois de Jancigny, Adolphe Philibert. 1850. Japon, Indo-Chine, Empire Burman (ou Ava), Siam, Annam (ou Cochinchine), Péninsule Malaise, etc., Ceylan [Japan, Indo-China, Burmese Empire (on Ava), Siam, Annam (or Cochinchine), Malay Peninsula, etc., Ceylon]. Paris: Firmin Didot Frères. 2 p. + 666 p. 3 maps (1 folded). No index. 21 cm. [50* ref. Fre]
• ***Summary:*** All references to soy are in the first part of the book, which is about Japan. Page 129 R.3: The dishes are arranged on the table in groups of five. One contains rice, another fish and vegetables seasoned with soy (des légumes confits dans du *soy,...*).

Page 176 R.1: The commercial products most researched are the wax tree (*Rhus succedanea*), bamboo, saké, soy (*du soy; soya*), mustard, silk fabrics,..."

Page 184 L.7: Wheat is one of the principal ingredients of soy, the Japanese sauce, which is so widely used throughout the archipelago and is even shipped to Europe.

Note: The table of contents (at end of book) shows that this book is divided into two major parts: (1) Japon [Japan] and Indo-Chine [Indochina]. The latter part is divided into the following geographical sections: Birmah [Burma], Siam, Péninsule Malaise [Malay Peninsula],

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Provinces anglaises dans l'Indo-Chine [British provinces in Indochina]; Arakan {former name of the Rakhine State of Burma}, Martaban (now Mottama, in southeast Burma), Maulmein [Mawlamyine, Moulmein in lower Burma], Amherst [Kyaiikkami, Burma], Ye [Mon State, in Burma], Tavoy [Dawei, Burma], Tenasserim [Tanintharyi Division of Burma], Annam ou Empire Cochinchinois, and Ceylan [Ceylon]. This gives us a nice French definition of "Indochina" at this time.

Also: Page 317 R.1. Ngapi is a fish sauce, a favorite among the people of Burma. Address: Aide de Camp du Roi d'Oude.

397. Rundall, Thomas; Adams, William. 1850. Memorials of the empire of Japon: In the XVI and XVII centuries. London: Printed for the Hakluyt Society (Series 1, No, 8). xxviii + 186 p. 22 cm. Facsimile edition reprinted in 1968 by B. Franklin (New York). [20+ ref]

• ***Summary:*** Contents: Preface–A description of the empire in the 16th century. From... Harleian manuscript #6249. Six letters of William Adams, 1611 to 1617. Notes. Summary of a narrative by His Excellency Don Rodrigo de Vivero y Velasco... of his residence in the empire: A.D. 1608-1610.

The preface states: The Portuguese first arrived in Japan in about 1542; the Spaniards arrived a little later. The first indication of any misunderstanding between the Japanese government [shogun, "Taico Sama"] and the Europeans residing there appears in 1587. In that year the shogun "despatched [dispatched] two imperial commissioners, in rapid succession, to Father Cuello, the vice-provincial of the Portuguese, to demand: 1. Why he and his associates forced their creed [Jesuit Roman Catholicism] on the subjects of the empire. 2. Why they incited their disciples to destroy the national temples? 3. Why they persecuted the bonzes [native priests]? 4. Why they, and the rest of their nation, used for food animals useful to man, such as oxen and cows? [see note M]. Finally, why they permitted the merchants of their nation to traffic in his subjects, and carry them away as slaves to the Indies?" The replies of the vice-provincial are given, showing disdain for the Japanese and their religions (p. x-xi).

On p. xxiv is a detailed discussion of Dutch trade with Japan and the island of Deshima.

The English attempts at trade with Japan failed. "The English retired from Japan in 1623, and a subsequent attempt was made (in 1673) to renew the intercourse; but it proved unsuccessful" (p. xxv).

"The Americans must be placed in the same category with ourselves [the British]. In the year 1837 the *Morrison,* a vessel belonging to citizens of the United States, sailed from Singapore, on an expedition to Japan." It was driven away by cannon fire from isolationist Japan (p. xxviii). Note: In addition to its commercial aims, the ship (headed by Charles W. King) had been attempting to repatriate seven shipwrecked Japanese citizens who had been picked up in Macau. It also carried Christian missionaries such as Samuel Wells Williams.

Letter No. IV by Sir Thomas Smith to William Adams concerns Capt. John Saris of the *Clove,* who anchored near Firando [Hirado] in June 1613.

Unites of currency (p. 88). 10 Condrins = 1 Mas = 6 pence (British). 10 Mas = 1 Taie = 5 shillings.

In the section of the book titled "Notes," Note O (p. 123-24) is about "Produce of the fields" (from E. Kaempfer). One of the five fruits of the field is: "4. *Daidsu,* or *Daid-beans;* from which *soeju* [shoyu], or *soy* [sauce], is made; and which is highly esteemed as an article of food."

Note A A (p. 164-67), titled "Fate of the English factory at Firando," discusses what items the Spaniards, Portuguese, and Dutch tried to import to Japan, and the weak demand for these products. Note: William Adams lived 1564-1620.

398. *Daily Alta California* (*San Francisco*)*.* 1851. China and Japan. Per Auckland. 2(86):2. Cols. 4-5. March 5. Wednesday morning.

• ***Summary:*** "We learn from Capt. Jennings of the barque Auckland, which arrived in the port yesterday, in seventy days from China, that about 500 miles off the coast of Japan he fell in with a Japanese junk, which was completely water-logged. The crew, consisting of seventeen persons, were taken off by Capt. Jennings, and are now on board his vessel. They had been fifty days on the wreck, and were in great distress, having exhausted their provisions. No communication, of course, has been had with them, beyond what could be accompanied by signs, but they appear exceedingly grateful for the assistance and kind treatment received from the Captain. On approaching land, they exhibited striking evidences of joy and devotion. A box belonging to them, which they have presented to Capt. Jennings, contains what are probably the junk's register, &c., a chart, which we understand to be a very curious affair, and a compass differing entirely from those in use among us, and some gold and silver Japanese coins.

"This would seem to afford a good opportunity for attempting to open an intercourse with Japan. These persons should be well treated, and sent back in one of our ships-of-war, the commander of which should be authorised to make overtures to the Japanese government."

In column 5 on this pages, the Auckland is mentioned 4 times: "Importations... Per Auckland–150 bxs [boxes] and 400 mats sugar, 7352 bxs tea, 700 bbls [barrels] flour, 1 bx mdze [merchandise].

"Consignees... Per Auckland–Macondray & Co, Howard & Green.

"Arrived... Barque Auckland, Jennings, 70 days from Hongkong; sugar &c, to Macondray & Co.

"Memoranda:... Per Auckland–About 25th Jan. fell in with a Japanese junk, which had encountered a severe

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typhoon, and became very leaky. There were 17 people on board, all of whom have been brought on here."

Note 1. The box given to Capt. Jennings almost certainly contained soybeans, which were taken by Dr. Benjamin Franklin Edwards to Illinois and Ohio. See Hymowitz 1987. Note 2. Commodore Matthew Perry first arrived in Japan on 8 July 1853 demanding that the Japanese government open trade relations with the United States. Thus the Japanese on board the Auckland arrived in San Francisco about 2 years and 4 months before Commodore Perry arrived in Japan.

399. *Daily Alta California* (*San Francisco*)**.** 1851. Intercourse with Japan. 2(87):2. March 6, col. 4. [1 ref]
• ***Summary:*** "In our paper of yesterday was a very interesting item respecting the picking up and bringing here of a crew of ship-wrecked Japanese. We suggest that now is perhaps the best opportunity ever offered for attempting to open communications with Japan. Would it not be wise and probably profitable for some of our merchants to fit out a pioneer expedition from this port to Japan? Send a vessel with a cargo suited to the market, if one could be obtained, and take along these poor Japanese, who are represented as very grateful for the favor shown them. They would carry back a favorable report of us 'outside barbarians,' and might prove the opening wedge for a free commerce between the world and Japan. Who knows but what the fullness of the time has come when her exclusive policy shall give way, and this incident be the fulcrum on which the lever turns?"

Note: Commodore Matthew Perry first arrived in Japan on 8 July 1853 demanding that the Japanese government open trade relations with the United States.

400. *Daily Alta California* (*San Francisco*)**.** 1851. An hour with the Japanese. March 17. p. 2, col. 2.
• ***Summary:*** "Through the politeness of C.C.P. Parker, Esq., custom-house inspector, we had an opportunity, yesterday afternoon, to visit the barque Auckland on board of which vessel are seventeen natives of Japan, picked up by the Auckland nearly five hundred miles from their native land. They are a fine looking set of people, the oldest seventy years old. The information we gathered from Capt. W.F. Jennings, and Mr. H.S. Salters, the mate of the Auckland, was that on the 22d February, in latitude 31 54 N., and 105 14 E., they discovered a dismasted junk, which they endeavored to board. Those on board the junk took to their boat, and were received on board the Auckland. They had been blown off-shore in a gale of wind, had been dismasted, and their vessel thrown upon her beam-ends. She was of about 600 tons burthen, and was filled with a valuable cargo. By signs, we gathered that when they were picked up, they had been at sea nearly fifty days, and were in great distress. Among the articles which were saved from the wreck, were a sheet containing official documents, medicines, etc., a chart of the coast of Japan, and a compass, and also, a quantity of coin, gold, silver and copper. They have been treated with the utmost kindness by Capt. Jennings and the officers and crew of the Auckland. We are told that they rise at daylight every morning and bathe in cold water...

"We understand that they will be placed on board the revenue cutter Polk to-morrow or next day, where they will remain until orders with reference to them are received from Washington [DC]. Mr. King, the Collector, has represented the facts to the President, and it is supposed that an armed vessel will be despatched to convey these people to their homes. The steam frigate Savannah, it is said, is now on the passage from New York to San Francisco, from which latter port she will proceed to Japan. The effect of the taking of these people to their homes cannot be predicted with any certainty. It may be the means of opening a communication with that country. They came on shore yesterday, for the first time, and appeared to be highly delighted with all they saw. We believe these men are the first Japanese who have ever set foot on the American continent. We hope the Government will provide for their conveyance to Japan as speedily as possible, and that Mr. King will see that all things necessary are provided them."

401. *Evening Picayune* (*San Francisco*)**.** 1851. The seventeen shipwrecked Japanese. 2(192):2. Col. 5. March 17.
• ***Summary:*** "These unfortunate individuals who were picked up by Capt. Jennings, of the barque Auckland, some time since, in latitude 31. 54 N. longitude, 105. 14 E.–several hundred miles from the Japanese Islands–came ashore yesterday, in this city, and are the first of their nation, we believe, who have visited any portion of the American continent. They seem to be highly gratified and gazed with some astonishment at the thousand new sights presented to their view. They are perfectly astounded at the movements of the ocean steamers and steamboats, as they move about our harbor. We had several varieties of their coin made of copper and iron, and a drawing of a junk in which they were wrecked, made in a very few minutes by one of them. They resemble the Chinese, but are more intelligent looking.

"We understand that an application has been made to the General Government for a vessel to take them to their native land. Perhaps their return may be means of opening intercourse with Japan."

402. *Daily Alta California* (*San Francisco*)**.** 1851. Something new. March 18. p. 2, col. 2.
• ***Summary:*** "The shipwrecked Japanese, of which so much has been said and of whom so little is known, will be at the *Grand Fancy Dress and Masquerade Ball,* at the California Exchange, on Wednesday evening, March 19th. They will appear in costume, and will perform some of their most favorite dances in the true Japanese style. They are the first of the Japanese race who have ever set foot on the American continent. Their stay here being but very limited, it becomes

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every one who is desirous of seeing them to avail themselves of the opportunity which is now offered. It will be very amusing, independent of their own dancing, to see them dancing with the ladies of a civilized country."

Note: These Japanese brought soybeans to San Francisco and gave them to Dr. Benjamin Franklin Edwards, who took them to Illinois (see Hymowitz 1987 "Introduction of the Soybean to Illinois").

403. *Evening Picayune* (*San Francisco*). 1851. Something new. 2(193):2. Col. 4. March 18.
• ***Summary:*** This article is identical to one with the same title that appeared earlier in the day in the *Daily Alta California* (San Francisco).

404. *Daily Alta California* (*San Francisco*). 1851. Masquerade ball. March 19. p. 2, col. 3.
• ***Summary:*** "A masquerade ball comes off at Cole's California Exchange, this evening, at which the Japanese, who were brought to our harbor in the barque Auckland, will attend in their native costume. This will be a good, and perhaps the only opportunity that our citizens will have of seeing these singular beings, the first of their tribe who ever set foot upon American soil, and who have voluntarily shut themselves out from the remainder of the world. They will be treated with the greatest degree of respect by Mr. Cole and his associates, and will doubtless be highly pleased with the entertainment, and, when they return to their native land, have a good story to tell of the manner in which they were treated by the Americans."

405. *Evening Picayune* (*San Francisco*). 1851. The Japanese. 2(195):2. Col. 3. March 20.
• ***Summary:*** "These tanned gentlemen visited the masquerade last evening, and presented the chief attraction of the evening. They may be set down as the most decided curiosities that have ever visited our state. They were dressed in similar garb as were our Chinese population before American styles persuaded them from their propriety, but which accoutrements were pronounced to be their every day dress, they having been forced to emigrate on so short notice as to preclude the possibility of donning their finery. Their complexions are of the greyish order, and the expression of their features a counterpart of that of their Asiatic neighbors, the Celestials... Their general intelligence and good nature was universally marked... Their conception of the polite was very evident, and nearly all present were favored by them with a low obeisance and hearty shake of the hand. One facetious *hombre* completed the sale of one of the foreign gentlemen... The visitors all seemed highly pleased with the novel sights presented, and retired from the festivities at an early hour."

Note: These Japanese brought soybeans to San Francisco and gave them to Dr. Benjamin Franklin Edwards, who took them to Illinois (see Hymowitz 1987 "Introduction of the Soybean to Illinois").

406. *Alton Telegraph* (*Illinois*). 1851. Dr. B. F. Edwards. May 2. p. 3, col. 4. Friday.
• ***Summary:*** "The numerous friends of this gentleman, in this and the neighboring counties, will be glad to hear that he arrived at his home in this city on Tuesday last [April 29], in good health. By the politeness of the Doctor, we have been furnished with San Francisco papers to the 15th March."

Note: This is the full text of this short article. Soybeans are not mentioned. In his 1987 article "Introduction of the Soybean to Illinois" (Economic Botany 41(1):28-32), Hymowitz first mentioned this article as follows: "On April 29, 1851 Dr. Benjamin Franklin Edwards returned to Alton, Illinois carrying soybean seeds in his personal possessions." Note: Soybeans must have been in California by this date, as future documents by Dr. Edwards will show. Dr. Edwards obtained the soybeans from shipwrecked Japanese. Address: Alton, Illinois.

407. *Ohio Cultivator*. 1852. Our thanks are due to John Lea,... 8(11):168. June 1.
• ***Summary:*** "... of Cincinnati, for a few seeds of the Japan Pea. And to our old friend H.N. Langworthy, of Rochester, New York, for seeds of the Mammoth Squash. We have planted them, and expect to raise something great for the State Fair."

Note 1: This is the earliest document seen (Oct. 2012) that uses the term "Japan pea" to refer to the soybean.

Note 2: This is the earliest document seen (July 2012) concerning the soybean in New York–that is not about imported soy sauce.

408. Crawfurd, John. 1852. A grammar and dictionary of the Malay language: With a preliminary dissertation. 2 vols. London: Smith, Elder, and Co. 21 cm
• ***Summary:*** Vol. I, "Dissertation and Grammar," contains two parts: A long essay about the language (p. i to ccxci), and a "Grammar of the Malay language" (84 p.). On p. clxxxiv is a list of cultivated plants. *Kachang* means "pulse" in both Malay and Javanese. Malay is always written in the Arabic alphabet, to the 28 letters of which 6 are added using diacritical marks to express sounds unknown to the Arabic language. Of the 34 letters, there are only 3 vowels, all long (p. 1). The Arabic alphabet is very ill adapted to pronunciation of the Malay language, whose native sounds "can be expressed with ease and precision by Roman letters, and with a few trifling modifications, so as to furnish one unvarying character for every sound" (p. 2).

Vol. II is titled "Malay and English, and English and Malay Dictionaries" (208 + 201 p.). Abbreviations: J. = Common to the Malay and Javanese. v. = variants / variant of. Soy-related words and terms include: "Kachang (J.). A

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common term for pulses or leguminous plants." "Kachang-jâpun. The Japan or soy bean, *Soja hispida."* "Kachang kâdâle (Telinga). Hairy-podded bean, *Phaseolus max."* "Ragi (J.). Yeast, barm. In Javanese, it more frequently means spiceries."

The following soy-related terms do *not* appear: Bungkil, bunkil, kachap, kechap, kechipir, onchom / ontjom, tahu, tahua, takoa, takua, taosi, tausi, tapai, tapé, tauchi, tauge, tempe.

Other terms that do appear: "Agar-agar. The name of the alga or sea-weed which is a considerable article in the Chinese trade, *Plocaria candida"* (p. 2). "Bijen (J. wijen). The sesame plant, *Sesamum indicum."* Note 1. This is the earliest English-language document seen (Jan. 2005) that contains the word "sesame."

"Kachang-china. Chinese pulse, *Phaseolus lunatus;* v. Kachang-mas." "Kachang-goreng. The ground-nut, *Arachis hypogæa;* v. Kachang-tanah and Kachang-miñak." "Kachang-gunung. Mountain pulse, *Hedisarum* [*Hedysarum*] *gangeticum."* "Kachang- ijau. Green pulse [mung bean], *Phaseolus radiatus."* "Kachang-jâriji. The lablab bean, *Lablab vulgaris."* "Kachang-kakara, v. Kachang-jâriji." "Kachang-kakara-gatal. Cowitch, *Dolichos pruriens."* "Kachang-kayu. The pigeon pea, *Cytisus cajan."* "Kachang-kâchil. Rayed bean *Phaseolus radiatus humilis."* "Kachang-manila. The Manilla bean [Manila bean] *Voandzeia subterranea."* "Kachang-mas. Golden bean, or Chinese bean *Phaseolus radiatus;* v. Kachang-china." "Kachang-miñak. Oil bean or ground-nut, *Arachis hypogæa;* v. Kachang koreng and Kachang-tanah." "Kachang-moñat. Monkey bean or snail-flower, *Phaseolus caracalla."* "Kachang-pendek. Lowly bean, *Phaseolus compressus."* "Kachang-putih. White bean, *Dolichos kachang."* "Kachang-tanah. Ground-nut or oil bean, *Arachis hypogæa."* "Lânga (J. oil). The sesame plant, *Sesamum indicum."* "Wijen (J.). The sesame or oil plant, *Sesamum orientale.* In Javanese it has the epithet of, alas, 'wild,' or 'of the forest.'"

John Crawfurd lived 1783-1868.

Note 2. This is the earliest English-language document seen (Aug. 2007) that contains the term "pigeon pea."

Note 3. This is the earliest English-language document seen (May 2008) that contains the term "ragi," which is the Malay / Indonesian word for a "starter culture," such as "ragi tempe," which is tempeh starter made with predominantly *Rhizopus* mold grown on soybeans.

Note 4. "Cowitch, *Dolichos pruriens,"* probably refers to the velvet bean, *Mucuna pruriens* (L.) DC. If it does, this is the earliest document seen (April 2007) and the earliest English-language document seen (April 2007) that mentions this plant. Address: Author of "The History of the Indian Archipelago" [London, England].

409. Dickens, Charles. 1852. The world here and there: or, Notes of travellers. From "Household Words," edited by Charles Dickens. New York, NY: George P. Putnam. 231 p. See p. 76.

• ***Summary:*** "Rice fields, of course, we pass; rice is a staple article of diet to the Japanese, as to so many other millions of the human race. It is the vegetable food that finds its way into more mouths than any other. There is wheat, also, in Japan, used chiefly for making cakes and soy [sauce]; barley for feeding cattle. The cattle being used as beasts of draught and burden, it is thought improper to kill them, or to deprive the young calves of their milk; the Japanese, therefore, refrain from milk and beef. They eat great quantities of fish, poultry, and venison."

410. MacFarlane, Charles. 1852. Japan: An account, geographical and historical, from the earliest period at which the islands composing this empire were known to Europeans, down to the present time, and the expedition fitted out in the United States, etc. New York: Putnam. xii + 365 p. Illust. 19 cm. Reprinted in 1856 by S. Andrus & Son (Hartford, Connecticut). Facsimile edition reprinted in 2002 by Ganesha Publishing (London) and Edition Synapse (Tokyo). Series: Japan in English, Vol. 1. [50* ref]

• ***Summary:*** Charles Mac Farlane, a British romantic author, lived 1799-1858. He explains in the Preface that he never traveled to Japan, and that this is a compilation. It is rather superficial, relying heavily on Englebert Kaempfer (1727).

The section on plants states, rather vaguely (p. 243): "Not only the fields and flat country... but likewise the hills and mountains, are made to produce corn, rice, pease, pulse, and numerous edible plants."

The section on domestic manners describes a Japanese feast. The host "drinks a cup of sackee [sake] with each guest... As whets, servants, of both sexes, from time to time, hand round soy [sauce], other sauces, pickled or salted ginger,... which are all eaten with the Chinese chopstick" (p. 288-89). Address: Esq., Canterbury, England.

411. McCulloch, John Ramsay; Vethake, Henry. 1852. A dictionary, practical, theoretical, and historical, of commerce and commercial navigation. 2 vols. Philadelphia, Pennsylvania: Hart, Carey and Hart. See Vol. 2, p. 201, 536, 18 at end.

• ***Summary:*** Nangasacki [Nagasaki] (p. 200-01): The Japanese islands are believed to contain 50,000,000 people. All foreigners are rigidly excluded, "with the exception of the Dutch and Chinese; and they are allowed to visit Nangasacki, the former with 2 ships and the latter with 10 junks."

"The Chinese trade with Japan is understood to be conducted from the port of Ningpo, in the province of Chekiang, which is so conveniently situated, that 2 voyages may be performed in the year, even by the clumsy junks of China. The commodities with which the Chinese furnish the Japanese, consist of raw sugar, cow and buffalo hides,

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wrought silks, consisting chiefly of satins and damasks, eagle and sandal wood, ginseng, tutenague or zinc, tin, lead, fine teas, and, for more than 100 years back, some European broad cloths and camlets. The exports consist of copper, limited to 15,000 piculs, or about 900 tons; camphor, sabre [sword] blades, pearls, some descriptions of paper and porcelain, and some Japan ware, which is either curious or handsome, but not so substantial as that of China."

"The following are the quantities and value of goods exported and imported by the Dutch in their trade with Japan in 1825; the ships employed being one of 600, and one of 700 tons burden. The trade is exclusively carried on with the port of Batavia." A table shows exports to and imports from Nangasacki. Imports from Nangasacki to Batavia, then Holland include: "Sakkie [saké] and soy [sauce]. Value: 14,302 florins.

Soy (p. 536): a species of sauce prepared in China and Japan from a small bean, the produce of the *Dolichos soja.* It is eaten with fish and other articles. It should be chosen of a good flavour, not too salt nor too sweet, of a good thick consistence, a brown colour, and clear; when shaken in a glass, it should leave a coat on the surface, of a bright yellowish brown colour; if it do not, it is of an inferior kind, and should be rejected. Japan soy is deemed superior to the Chinese. It is worth, in bond, from 6*s.* to 7*s.* a gallon. It is believed to be extensively counterfeited.–(*Milburn's Orient. Com.*).

At the end is a long table titled "The new tariff of 1846, together with the tariff of 1842, reduced to ad valorem rates, as far as practicable." On page 18 is "Soy." 1846 = 30. 1842 = 30. Address: 1. Esq.; 2. LL.D, Prof., Univ. of Pennsylvania.

412. Watts, Talbot. 1852. Japan and the Japanese: From the most authentic and reliable sources. With illustrations of their manners, costumes, religious ceremonies, &c. New York, NY: J.P. Neagle. 184 p. Illust. No index.
• ***Summary:*** In the section titled "Customs, manners, &c." the author borrows text from Thunberg (1802, p. 267) without using quotation marks (p. 111): "Ladies do not eat with the men, but by themselves. Rice supplies the place of bread, and is boiled with every kind of provisions. Fish and fowls are very plentiful, and are eaten in abundance; but miso-soup * boiled with fish and onions is the customary food of the common people."

Footnote: *"Misos are small beans, like lentils, the produce of the dolichos soja."

In the chapter titled "Empire of Japan (from Goodrich's Pictorial Geography)" under "Towns" (p. 122) we read: "Kio, or Meaco [Kyoto, or Miako], was for a long time the Capital, end contains the most remarkable edifices... Meaco is the centre of Japanese commerce and manufactures. Silks, tissue, soy [sauce] and lacquered wares, are purchased here in their greatest perfection,..."

The chapter titled "The Japanese empire (From Memoirs of a Captivity in Japan, by Captain Golownin, of the Russian Navy)" contains a long excerpt (p. 140) about the mode of making soy [sauce]. "The Japanese soy is also prepared of beans, and turned sour in casks. They say that three years are required for preparing the best soy..." Address: M.D. [USA], Late in the service of the Hon. D. E. I. [Dutch East India] Company.

413. *Ohio Cultivator.* 1853. Japan pea. 9(3):40. Feb. 1.
• ***Summary:*** "Our thanks are due to A.H. Ernst, Esq., of Cincinnati, for a few of these peas, (or beans). We will attend to their trial in the spring."

Note This is the earliest English-language document seen (April 2013) with the term "Japan pea" (or "Japan peas") in the title.

414. *New York Times.* 1853. Latest intelligence: National agricultural convention. First annual meeting of the United States Agricultural Society. Feb. 3. p. 1.
• ***Summary:*** "Washington [DC], Wednesday, Feb. 2. The first annual meeting of the United States Agricultural Society was held at the Smithsonian Institute, this morning."

"Prof. Mapes presented specimens of the Japan Pea– very productive. Also, of the California Soap plant."

Note: "Prof. Mapes" was probably James J. Mapes (1806-1866) of New York. An inventor, chemist, and civil engineer, he was a pioneer in the use of super-phosphates in the U.S. and developed "Improved Super-Phosphate" (also called "Super-Phosphate of Lime") which he made from the bones of animals. He was most active in the mid-1850s, when many articles about him appeared in agricultural journals.

415. *Pittsfield Sun* (*Massachusetts*). 1853. New York Farmer's Club. 53(2733):4. Feb. 3.
• ***Summary:*** The "N.Y. Sun says the business of the day was opened by the Secretary reading an article on the present state of Agriculture in Japan... They have few hogs, no sheep or goats. The Japan pea grows 4½ feet high, with a strong stem, and its size is between the common pea and the bean."

Note: This is the 2nd earliest document seen (Feb. 2008) that uses the term "Japan pea" to refer to the soybean.

416. *Moore's Rural New Yorker.* 1853. The Japan pea. 4(7):54. Feb. 12.
• ***Summary:*** "The attention of horticulturists has been directed to a new pea, which, on account of the source from which it was received, is called the Japan pea. Samples of them have been sent to the Massachusetts Horticultural Society, by Mr. A.H. Ernst, who has grown them in his garden, near Cincinnati, Ohio, the past season.

"The account of their transmission into American hands is, that a Japan vessel in distress was encountered by an American vessel, which took off the crew and some of the

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stores, landing them at San Francisco, California. Among other things were some of these peas, which falling into the hands of Dr. [Benjamin Franklin] Edwards, of Alton, Illinois, he handed them over to J.H. Sadd, a distinguished horticulturist, by whom they were placed at the disposal of the Horticultural Society of Cincinnati. Mr. Ernst, who has successfully cultivated them, speaks of their being a peculiar plant, of an upright, stiff form, branching much,–the leaves large, light green and downy beneath. The flower is small, lilac-colored, the seed pods numerous, small, and wooly, grow in clusters, and are very productive. Its bearing propensities are large, the plant attaining good size, which it is believed will adapt it for field culture. They mature fully on the Ohio River, and it is believed that they may be introduced into general cultivation.

"Mr. J.E. Teschemacher, the botanist at the Mass. Hort. Society furnishes the following information which will be found interesting:

"The plant alluded to by Mr. Ernst is Cajanus bicolor, a native of the East Indies, Amboyna, Japan, &c.; flowers small, interior yellow, vexillum purple, erect shrub, pubescent [hairy], nearest in alliance to the Lupinus. The seeds are good to eat and, when young, very delicate. On soaking the round seeds for an hour in moderately hot water, they take exactly the form and appearance of the common white bean, become quite tender, and have a pure and delicious nutty and oily flavor. *The whole plant, with the seed, is excellent for fattening hogs and cattle.*

"There is one other species, Cajanus flavus, common in South America and the West Indies, where it is sometimes used for a fence to sugar plantations. In Jamaica, this species is much used for feeding pigeons, and is there called the Pigeon-pea. In Martinique the seed is much esteemed for the table.

"Being a tropical plant, it would hardly stand our winters. Yet, from the observations of Mr. Ernst, it is not improbable that our climate might admit of an annual harvest of the seed, which seems to be so abundantly produced as to make an experiment highly interesting."

In summary, Dr. Benjamin Franklin Edwards, in San Francisco, probably examined quarantined Japanese on the barque Auckland and received soybeans, called Japan peas, as a gift. This is the key document describing how soybeans got to California, and then to the Midwest.

First cited by Hymowitz. 1987. Introduction of the Soybean to Illinois. Economic Botany 41(1):28-32.

Note 1. This is the earliest document seen (July 2011) concerning soybeans in Ohio, or the cultivation of soybeans in Ohio (one of two documents).

Note 2. This is the earliest document seen (March 2011) concerning soybeans in California (one of two documents).

Note 3. This is the earliest document seen (June 2007) concerning soybeans in Illinois (one of two documents).

Note 4. This is the 2nd earliest English-language document seen (April 2013) with the term "Japan pea" in the title. It clearly explains the origin of the term. At least seven other documents published in 1853, after this one, also mention the Japan pea.

Note 5. Mr. Teschemacher's identification of this plant seems to be mistaken. Prof. Ted Hymowitz notes (personal communication, 18 Oct. 1991): "The descriptions by Teschemacher and others of the Japan Pea clearly point to the soybean. *Cajanus bicolor* DC is a synonym for *Cajanus cajan* (L.) Millsp., the common pigeon pea cultivated throughout the *tropics*. Obviously Mr. Teschemacher has confused the pigeon pea with the soybean. The pigeon pea could not possibly produce seed in Ohio, Massachusetts, etc. In addition, the plant that Teschemacher saw is described as reaching a height of 2 to 4 feet–typical heights for the soybean. Pigeon peas (except for recently developed dwarf types) reach a height of from 6 to 10 feet or more. In sum, no one pays much attention to Mr. Teschemacher's identification. Thus it is not mentioned in the modern literature."

Note 6. This is the earliest English-language document seen (May 2000) that uses the word "pubescent" in connection with the soybean.

Note 7. This is the earliest English-language document seen (Feb. 2003) that contains the term "Pigeon-pea" (or "Pigeon-peas" or "Pigeon pea")–even though the identification is mistaken.

Note 8. This is the earliest English-language document seen (June 2013), published in the USA, which states that whole soybeans are good to eat.

Note 9. This is the earliest English-language document seen (Feb. 2003) that mentions soybeans as a feed for "hogs." A hog is a domestic pig or swine which weighs more than 120 pounds. Address: Rochester, New York.

417. *Hartford Daily Courant* (*Connecticut*). 1853. The Japan pea. Feb. 14. p. 2.

• ***Summary:*** "At the late annual meeting of the U.S. Agricultural Society at Washington [DC], as we learn from the *National Intelligencer,* Prof. Mapes of New Jersey handed to the President a portion of the vine or stalk of the Japan pea, which was raised last season in Suffolk County, New York. The seed was originally obtained from some of the company of a Japanese vessel wrecked on the coast of California, and formed a portion of their food. He described it as a plant whose botanical character had not yet been precisely settled, but which was probably well deserving the attention of agriculturists. The specimen offered was cut off about two feet from the ground, and was thickly studded with seed pods, thus producing very many times the crop of the ordinary pea of our gardens. In planting, these peas are set about five feet apart, and in the course of their growth cover the whole surface of the intervening ground. They require no sticking or other support, the stem being quite stiff

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and unyielding. This pea appears to be specially useful for feeding to horses; but may no doubt be made to contribute largely to human sustenance."

Note 1. Prof. James J. Mapes (1806-1866), a professor of analytical chemistry in New York, moved to Newark, New Jersey, in 1847; there he pursued his agricultural interests for the rest of his life.

Note 2. Letter (e-mail) from Prof. Ted Hymowitz. 2006. Sept. 29. Ted is not surprised by this story. "In 1852 Mr. Ernst sent soybean seed to the New York State Agricultural Society. The society must have distributed seed" to those who requested it. It seems likely from the above that Prof. Mapes had soybeans in New Jersey by Feb. 1853–but we cannot be sure. If he did, this would be the earliest document seen (March 2011) concerning soybeans in New Jersey. It seems less likely that he cultivated them, since he does not mention this, and instead states that they were cultivated in Suffolk County, New York.

Note 3. This is the earliest document seen (July 2011) concerning soybeans in New York, or the cultivation of soybeans in New York. This document contains the earliest date seen for soybeans in New York, or the cultivation of soybeans in New York (spring 1852). The source of these soybeans was probably the New York State Agricultural Society, but possibly A.H. Ernst of Spring Garden, Cincinnati, Ohio.

Note 4. This is the earliest document seen (March 2011) concerning soybeans in Washington (one of two documents).

418. Ernst, A.H. 1853. [Letter to B.P. Johnson (Corresponding Secretary) dated January 4]. *J. of the New-York State Agricultural Society* 3(10):81-88. Feb. See p. 84.
• ***Summary:*** "Mr. A.H. Ernst, Spring Garden, Cincinnati, writes us, under date of January 4, 1853,

"'Dear Sir–I send you this day, by Livingston, Fargo & Co.'s Express, a small package of seed, which appears to be a new article in our country, at all events it is so here. I know not where it should be classed. In growth and leaf it neither resembles the bean nor pea; yet the grain or seed, very strongly resembles the former, when in a green or forming state, assuming the round form of the latter at maturity.

"'The growth of the stock is upright, stiff and woody, seed-pod rough and wooly. It evidently requires room in the cultivation, to enable the laterals to expand; the plant attains three feet or more in height, and seems well adapted to take care of itself, from its stiffness and form, a desideratum to the agricultural economist. A few seeds, which were kindly given me last spring, proved very productive, which you will see by the number of pods on the stock. Should its cooking qualities prove good, which I have not tested, but is said to be so, it may prove a valuable acquisition to our agricultural products.

"'Its history is briefly this: an American ship took from a Japan vessel, in distress, the crew, with some of the stores, and carried them to San Francisco, and from which a few of the seeds were brought to Alton, Illinois, where Mr. John H. Lea grew them last year, (summer of 1851,) and sent a part of the product to our Horticultural Society, from which, those I sent you, I grew the past summer.'"

This reference was first cited by Hymowitz in his 1987 article "Introduction of the Soybean to Illinois." *Economic Botany* 41(1):28-32. He noted that Dr. Benjamin Franklin Edwards gave the soybean seeds he brought with him from San Francisco to Mr. John H. Lea of Alton, Illinois. Lea planted them in his garden during the summer of 1851.

Note 1. This is the earliest document seen (April 2011) concerning soybeans in Illinois (one of two documents), or the cultivation of soybeans in Illinois. This document contains the earliest date seen for the cultivation of soybeans in Illinois (summer of 1851) (one of two documents). It is of interest to the compiler of this bibliography, William Shurtleff, that the oldest college in Illinois, Shurtleff College, was located in Alton, Illinois. It ceased operation in 1959 but its campus is still used by the Dental School of Southern Illinois University–Edwardsville.

Note 2. This is the earliest document seen (July 2011) concerning soybeans in Ohio, or the cultivation of soybeans in Ohio (one of two documents). This document contains the earliest date seen for soybeans in Ohio, or the cultivation of soybeans in Ohio (summer 1852). The source of these soybeans was John H. Lea of Alton, Illinois. He in turn received them from Dr. Benjamin Franklin Edwards of Alton, Illinois, who got them from shipwrecked Japanese fishermen in San Francisco.

Note 3. This is also the earliest document seen (March 2011) concerning soybeans in California (one of two documents).

Note 4. This is the earliest document seen (July 2011) concerning soybeans in New York (one of two documents). The source of these soybeans was Mr. A.H. Ernst of Cincinnati, Ohio.

Note 5. This is the earliest document seen (Sept. 2000) concerning Andrew H. Ernst and soybeans. A.H. Ernst (1796-1860), a native of Germany, was a devoted horticulturist, nurseryman, and pioneer pomologist. He owned and operated "Spring Garden" nursery, one of the earliest and best nurseries in Ohio, located 1½ miles from Cincinnati. He was also one of the founders of Cincinnati's famed and beautiful Spring Grove Cemetery. Address: Spring Garden, Cincinnati, Ohio.

419. *Pittsfield Sun* (*Massachusetts*). 1853. Agricultural. Saturday, February 26, 1853. 53(2737):4. March 3.
• ***Summary:*** At a meeting of the New York Farmer's Club, held in the rooms of the American Institute, Broadway, New York, the subject of the day was new plants. Judge Meigs, Secretary, "in regard to the cultivation of the Japan Pea, said that the land must be rich, deeply tilled, then divided

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into squares of four feet each. One person with a blunt stick to mark holes an inch deep in the centre; another person to put a pea in each hole and cover up with earth. Two men or boys could plant an acre before dinner. No other plant, much less a weed, should be allowed in the field, which should be perfectly clean and tilled. The Japanese never allow any plant, but of one sort, in a field, all pure wheat, pure rye, peas, &c."

420. *New England Farmer.* 1853. State Board of Agriculture: Met January 25, 1853. 5(3):116. March.
• ***Summary:*** "Mr. Wilder presented a dried specimen of a plant covered with seed, which he had received from A.H. Ernst, late President of the Cincinnati [Ohio] Horticultural Society. The plant is the *Cajanus flavus,* near allied to the Lupines. The seed was introduced into the country two years since by one of our ships, which found a Japan vessel in distress, from which the crew, with part of the stores, were taken and carried into San Francisco. This seed was among their provision stores, and a small quantity was brought to Alton, Illinois, by Dr. [Benjamin Franklin] Edwards, and grown by Mr. John H. Lea, a careful horticulturist of that place. The plant presented grew in Cincinnati last summer. Mr. Wilder read a statement from Mr. Teschemaker [Teschemacher, of Boston], which describes this new plant as follows: 'Shrub erect, pubescent, native of the East Indies, Amboyna, Japan, &c. The seeds are good to eat, and when young, very delicate.'"

Note: Since the New England Farmer is published in Boston, Massachusetts, the State Board of Agriculture is probably the board for Massachusetts.

421. *New England Farmer.* 1853. United States Agricultural Society. 5(3):135. March.
• ***Summary:*** "The First Annual Meeting of the United States Agricultural Society was holden at Washington [DC], on the 2d of February 1853, at 10 o'clock, in the Lecture Room of the Smithsonian Institution."

"Prof. Mapes, of New Jersey presented specimens of the Japan pea, an account of which we have recently given, as it was presented at the State Board of Agriculture, on the 25th January."

422. *Magazine of Horticulture, Botany, and All Useful Discoveries and Improvements in Rural Affairs* (*Boston*). 1853. Art. II. Massachusetts Horticultural Society. 19:186-89. April.
• ***Summary:*** Page 188: Jan. 22. "Dr. Wight read a letter from Mr. A.H. Ernst, accompanied with seeds of the Japan peas; and also a note from Mr. Teschemacher, upon the same. The Letters are as follows:–"My Dear Sir:–I herewith send for your distribution amongst the members of the M.H. Society, a small parcel of peas.

"The growth of the plant is peculiar, being of an upright and stiff form, somewhat branching; the leaves are large, light green, and downy beneath; the blossom is small and of a lilac color; seed pods numerous, small and wooly,–growing in clusters over the entire plant, proving very productive.

"Its habit of growth is such as to fit it to withstand severe storms; and, should it prove valuable as food for cattle, it must commend itself to the agricultural community in field culture.

"In its cultivation it evidently requires room, to give the plant a full development for branching. Its bearing properties are immense. Accompanying the seeds I send a plant, to show its habits of growth and bearing properties. Its origin is said to have been Japan. It was introduced into this country, some two years since, by the agency of one of those calamities which sometimes result in benefit to mankind.

"An American ship encountered a Japan vessel in distress, and the crew were carried to San Francisco, California. Amongst the stores which were transferred was the 'Japan pea,' a few of which found their way into the hands of Dr. Edwards, of Alton, Illinois. He handed them over to Mr. J.H. Ladd, a distinguished horticulturist, who presented the produce to our society. Those now sent you were grown in my grounds,–having fully matured in our climate. Your climate may prove too severe.

"I have sent small packages of seed to kindred associations, with the request that they may be placed in careful hands. It is possible that it may not be anything new with you. I would be thankful for any information you may possess in reference to it.–Very respectfully, A.H. Ernst, Spring Garden, Cincinnati, Ohio, Jan. 11th, 1853."

"'The plant alluded to by Mr. Ernst is *Cajànus bicolor* [sic], a native of East Indies, Amboyna, Japan, &c. Flower small, interior yellow, vexillum purple; erect shrub; pubescent; nearest in alliance to Lupinus. The seeds are good to eat, and, when young, very delicate. On soaking the round seeds for an hour, in moderately hot water, they take exactly the form and appearance of the common white bean, become quite tender, and have a pure and delicious nutty and oily flavor. *The whole plant, with the seed, is excellent for fattening hogs and cattle.*

"'There is one other species, *Cajàanus flàvus,* common in South America and the West Indies, where it is sometimes used for a fence to sugar plantations. In Jamaica this species is much used for feeding pigeons, and is there called the Pigeon-pea. In Martinique the seed is much esteemed for the table.

"'Being a tropical plant, it would hardly stand our winters. Yet, from the observations of Mr. Ernst, it is not improbable that our climate might admit of an annual harvest of the seed, which seems to be so abundantly produced as to make an experiment highly interesting.–Most truly yours, J.E. Teschemacher, Boston, 19th Jan., 1853.'"

Note: Mr. Teschemacher has confused the pigeon pea with the soybean.

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423. *Western Horticultural Review* (*Cincinnati, Ohio*). 1853. Transactions. The Cincinnati Horticultural Society. 3(7):328-30. April.

• ***Summary:*** "Has kept up its regular meetings, which have been of considerable interest, especially the discussions upon different subjects connected with Horticulture. The Japan Pea, which has been liberally distributed by Mr. Ernst and has excited much interest among other societies, was again brought upon the tables, and its excellent properties were pressed upon the members. It should have room to grow, say four feet each way, when it will be very productive. When cooked, it was found to be savory, like the "Horticultural Bean," and in boiling, the skin separated so as to be readily removed from the surface of the water. This plant is recommended especially as a food for stock. The members considered that Mr. Teschemacher's decision respecting it, as reported in the proceedings of the Massachusetts Horticultural Society, were not correct, and that it was not a Cajanus, but a Phaseolus, as described in the pages of this work, last year, by Mr. James Ward."

424. Lea, John. 1853. Japan pea (Letter to the editor). *Western Horticultural Review* (*Cincinnati, Ohio*) 3(8):389. May.

• ***Summary:*** "Dr. Warder:–When I introduced the "Japan Pea" to the Horticultural Society of this city, in November, 1851, I advised its being planted about a foot apart in the row, and the rows about two feet apart. Your last number of the *Horticultural Review* (for April) recommends planting "four feet each way." This makes a great waste of ground, and the error should be corrected. Perhaps eighteen inches apart in rows two or three feet apart, is the proper distance. I did not recommend this pea "as a food for stock," but for *domestic* winter use [as food]. As a pea for *summer* use, it is not suitable. It requires the full length of our season to ripen, and flourishes under great heat and drought. This "pea," so called–in fact a bean–is self-supported by a remarkably hard, *wood-like* stem, about three feet high. It is very productive."

John Lea, April 20, 1853.

425. *Ohio Cultivator.* 1853. Japan pea. 9(23):360. Dec. 1.

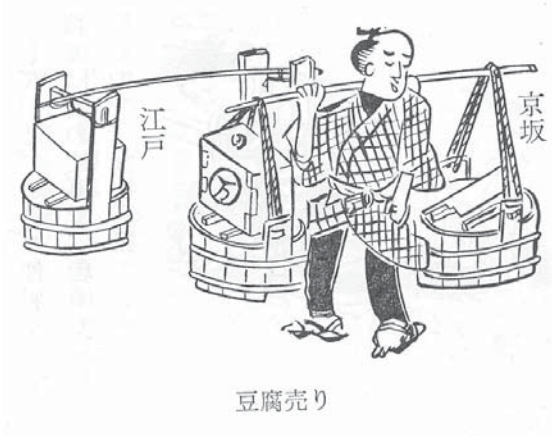
• ***Summary:*** "Among the new products which promise to be profitable for western farmers, the Japan Pea deserves special notice. It grows upon a strong, branching stem, some three feet high, with numerous clusters of pods, containing about three peas each, of the size of the common field pea. An ordinary stem which we raised this season produced 276 pods; and we have reports of others producing much more than this. Many farmers desire to raise field peas for stock purposes, but are unable to grow them upon our rich lands, to such the Japan Pea may prove valuable; it is also said to be good for table use, but of this we cannot speak from experience. In taste it resembles a bean, rather than a pea. Any one wishing to try the experiment of cultivating this pea will be furnished with a dozen grains, while our stock lasts, on sending us a *fip* or two stamps, to cover expense of postage and paper. We shall publish an article on the mode of culture, in due time."

Note: The word "fip" refers to a "fippenny bit," which was a silver coin that circulated in the eastern U.S. before 1857 and was valued at about six cents.

426. Kitagawa, Morisada. 1853. Morisada mankô [Mr. Morisada's book of comical illustrations without particular thoughts]. Japan. [Jap]*

• ***Summary:*** This book contains an early reference to Kori-dofu (dried-frozen tofu), and an illustration of a man selling natto (*nattô*). He is squatting with a bowl in one hand between two baskets of natto which are apparently connected by a shoulder pole. In his right hand is a cup with a handle on it, which he uses to scoop out the natto.

In *Tôfu no Hon* [The Book of Tofu], by Abe and Tsuji (1974, p. 8) is an illustration of a tofu street vendor taken



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from this book. It shows two types of shoulder poles and attached carrying containers. The upper left one is from the Edo / Tokyo area. The one actually on the man's right shoulder is from the Kyoto & Osaka area.

According to Saito (1985, p. 16) the book may also mention and have an illustration of a walking street vendor selling tofu. The author was born in 1810. The book may have a second title, *Ruijû kinsei fûzoku-shi.*

427. *Report of the Commissioner of Patents, Agriculture.* 1853. Acknowledgment of seeds received from the gentlemen named below: p. 448. For the year 1852.
• ***Summary:*** "A.H. Ernst, esq., of Cincinnati, Japan peas." Ernst is listed simply among seven men from various states who sent seeds to the Patent Office. No more is said about Ernst or his seeds.

Note 1. This is the earliest document seen (April 2007) concerning soybeans in Ohio (one of two documents).

Note 2. This is the earliest document seen (March 2011) concerning soybeans in Washington, DC, where the office of the Commissioner of Patents was located (one of two documents). This document contains the earliest date seen for soybeans in Washington, DC (1852).

Note 2. This is the earliest document seen (June 2007) concerning the work of the U.S. Patent Office (forerunner of the U.S. Department of Agriculture) with soybeans. Address: Cincinnati, Ohio.

428. T.E.W. [Wetmore, T.E.]. 1854. The Japan pea. *Moore's Rural New-Yorker* 5(3):22. Jan. 21.
• ***Summary:*** "I received last spring a few seeds for trial–planted them as early as the nature of the ground would admit. They came up well and made a stout growth. Being of an upright, bushy growth, in my ignorance of them, I planted and permitted them to grow too thickly.–They have large, bean-like leaves, small, axillary, inconspicuous flowers–which appeared so late that but a very small portion matured seed sufficiently to plant again. The plants were crowded with short, downy pods–one plant, standing somewhat apart, having over 200 well formed pods, whilst the least in the thickest part of the drill had 65. I see in the journal of the New York State Agric. Society, those who have reported their success to the secretary, speak of its great prolificness. From this fact, if it can be sufficiently acclimated, it would seem to bid fair to be an important addition to our leguminous crops. But there is another drawback which would debar its general cultivation as a field crop. Its stems are quite large and hard as wood, so that to harvest a field of Japan Peas would be about as easy as to harvest a field of brush."

Note 1. This is the earliest document seen (March 2002) concerning the harvesting of soy beans; they are difficult to harvest. It is also the earliest document seen (April 2002) that uses the word "harvest" as a verb in connection with soybeans.

Note 2. This is the earliest document seen (March 2003) concerning quantitative research conducted on soybeans.

Note: This is the earliest English-language document seen (March 2003) that uses the word "trial" (or "trials") in connection with soybean research. Address: [Michigan].

429. *New York Times.* 1854. Latest intelligence: From Washington. Feb. 24. p. 1.
• ***Summary:*** "Washington [DC], Thursday, Feb. 23... The United States Agricultural Society met this morning... Prof. Mapes exhibited some wheat and cress growing on the same head."

"In the evening, Prof. Mapes showed a model of an improved sub-soil plow, invented by himself; and Dr. Warden, of Ohio, distributed some Japan peas, and described them."

Letter (e-mail) from the Ohio Historical Society (Columbus, Ohio). 2007. Jan. 12. "We are unable to find any record of a Dr. Warden related to this topic in Ohio. We tried various Cincinnati histories, as well as trying the Census, but without a first name or some other context, we cannot go much further."

430. *Observer* (*London*). 1854. Public amusements: Japanese exhibition. Feb. 26. p. 1.
• ***Summary:*** "The first direct importation from Japan is now open for exhibition, at the Gallery of the Society of Painters in Water Colours, 5A, Pall-mall East, until 15th March, as the society requires the gallery for their paintings.–Admittance, 1*s.*

"Japan.–Some of the scarce, but noted Japan Soy [sauce], has been forwarded amongst the curiosities now on exhibition at 5, Pall-mall East. On the Continent it is esteemed as far superior to that in general use."

This announcement also appeared in the March 5 edition, p. 1.

431. Jones and Bonham. 1854. Sales by auction: This evening.–150 framed and glazed prints,... (Ad). *Times* (*London*). May 3. p. 15, col. 2.
• ***Summary:*** This company "(late George Jones and Son) will sell by auction, at their great Rooms... superior property... 50 dozen sparkling Champagne, 35 baskets of the fine Japanese soy [sauce], superior miscellaneous goods,..."

Note: "Japanese soy" refers to soy sauce made in Japan. Address: [London].

432. *American Agriculturist.* 1854. Japan pea or bean. 13(11):120. Nov. 1. Note from George Haywood of New-Rochelle, New York.
• ***Summary:*** "We have just received from Mr. George Haywood of New-Rochelle, a stalk of this new pea, or, as we should term it, bean, since it more resembles the latter. This can be examined in our office, by those interested.

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"This stalk is about an inch in diameter at the bottom, is about 2½ feet high, with branches upon two sides only–east and west, in the growing position. We counted on this one stalk 308 pods, containing two and three beans in each, in all somewhat over 700. Some others have raised twice this number from one stalk. Mr. H. informs us that he planted it in ordinary soil, well manured, in the latter part of June. They should usually be planted much earlier." Address: New-Rochelle, New York.

433. *Horticultural Review and Botanical Magazine* (*Cincinnati, Ohio*). 1854. U.S. Agricultural Society. 4(11-12):571-72. Nov/Dec. New series.
• ***Summary:*** "The third annual session of this society was held, on February 28th, 1845, in the Smithsonian Institution. Twenty-six States were represented by accredited delegates from the State and county societies, and a large number of individual members of the Society was also present."

"Dr. Warder distributed specimens of the Japan Pea which was recommended as a valuable food for stock of various kinds and especially adapted, as a fodder and grain plant for the Southern States,..."

Note: Dr. Jno A. Warder of Cincinnati is one of the editors of this periodical.

434. Ernst, A.H. 1854. The Japan pea. *Report of the Commissioner of Patents, Agriculture.* p. 224-25. For the year 1853.
• ***Summary:*** "The Japan Pea, in which so much interest has been manifested in this country for a year or two past, from its hardihood to resist drought and frost, together with its enormous yield, appears to be highly worthy of the attention of agriculturists.

"This plant is stated to be of Japan origin, having been brought to San Francisco about three years since, and thence into Illinois and Ohio. Its habit of growth is bushy, upright, woody, and stiff, branching near the ground, and attaining a height of three or four feet. The leaflets are large, resembling those of an ordinary bean, occurring in sets of three, with long quadrangular stems. The flowers, which are small and white, but rather inconspicuous, sometimes having purple centres, grow in thick clusters, nearly covering the principal branches of the plant, are succeeded by downy pods, from an inch to an inch and a half in length, each containing from one to three compressed oval beans, when green, but unmarked, and of a buff color, resembling peas when dry. The stalks appear to be too woody for fodder in a dried state, though they may be used as such, together with the large thick leaves, when green. The excellency of the seed, at maturity, when properly cooked, for winter food, both for man and animals, has been fully tested, notwithstanding contradictory statements have been made.

"This product will grow well on moderately fertile, as well as on rich soils, and may be planted in the latitude of Washington [probably D.C.], one seed in a place, at the distance of three feet apart, from the last of April to the first of July. It seems to be well adapted to plant, as an after-crop, on land which has been cultivated with early potatoes or peas, or to supply the vacancies in a corn-field caused by birds or worms."

Note 1. This is the earliest English-language document seen (April 2003) that uses the term "habit of growth" (or "growth habit") in connection with soybeans. Note that the habit of growth was described as "bushy, upright, woody, and stiff,..." rather than viny.

Note 2. This is the earliest document seen (Nov. 2002) that uses the term "bushy" to describe the soybean plant.

Note 3. This is the earliest English-language document seen (Aug. 2007) indicating that soybeans are a drought-resistant plant. Address: Cincinnati, Hamilton County, Ohio.

435. Hakura, Yokyu? 1854. Yôshû roku [A record of small provision]. Japan. Publisher unknown. 46 p. Written in Kanbun (Chinese). Japanese summary by Kawakami 1978, p. 156. [Jap]
• ***Summary:*** Mentions red miso (*aka-miso*), how to make a type of miso soup called *shi-yu* or *kuki-yu,* and tofu. Hatcho miso from Mikawa was recommended as red miso.

436. *Report of the Commissioner of Patents, Agriculture.* 1854. Preliminary remarks. p. v-vi. For the year 1853.
• ***Summary:*** "Among the foreign products which have been more recently introduced and distributed, and which appear to be adapted for profitable cultivation, we would instance... peas from Japan... Among the products proposed to be introduced from abroad, are rice and the soja bean of Japan, the latter of which is used for making the celebrated 'Soy sauce.'"

Note 1. The author apparently does not realize that the "peas from Japan" and the "soja bean of Japan" are one and the same plant.

Note 2. This is the 2nd earliest English-language document seen (Feb. 2008) that uses the term "soja bean" (or "soja beans") to refer to the soybean.

Note 3. This is the 2nd earliest English-language document seen (April 2012) that contains the term "soy sauce" (without a hyphen).

437. *Reports of the Committees of the Massachusetts Horticultural Society.* 1854. Report of the committee on flowers: Awarding premiums for 1853. For the year 1853. p. 8-12. See p. 10.
• ***Summary:*** Under "Gratuities" (p. 9-10): "To J. Nugent, for Japan pea plant,–$1.00."

438. Simmonds, Peter Lund. 1854. The commercial products of the vegetable kingdom, considered in their various uses to man and their relation to the arts and manufactures; forming

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a practical treatise & handbook of reference for the colonist, manufacturer, merchant, and consumer... London: T.F.A. Day. xix + 668 p. See p. 313. Index. 23 cm.

• ***Summary:*** In the section on "Pulse" we read (p. 313). "The well known sauce, Soy, is made in some parts of the East, from a species of the Dolichos bean (*Soja hispida*), which grows in China and Japan. In Java it is procured from the *Phaseolus radiatus.* The beans are boiled soft, with wheat or barley of equal quantities, and left for three months to ferment; salt and water are then added, when the liquor is pressed and strained. Good soy is agreeable when a few years old; the Japan soy is superior to the Chinese. Large quantities are shipped for England and America. The Dolichos bean is much cultivated in Japan, where various culinary articles are prepared from it; but the principal are a sort of butter, termed *mico,* and a pickle called *sooja.*

"1,108 piculs of soy were shipped from Canton in 1844, for London, British India, and Singapore. 100 jars, or about 50 gallons of soy, were received at Liverpool in 1850. The price is about 6*s.* per gallon in the London market."

One page earlier, the section on "Pulse" states (p. 312): Of leguminous grains there are various species cultivated and used by the Asiatics, as the *Phaseolus Mungo* [mung bean], *P. Max* [soya bean], and *P. radiatus* [probably azuki bean], which contains much alimentary matter; the earth-nut (*Arachis hypogaea*), which buries its pods under ground after flowering."

"Captain H. Biggs [sic, Bigge], in a communication to the Agri.-Hort Soc. [Agricultural & Horticultural Society] of India, in 1845 [sic, Aug. 1844], states that of the esculents a large white pea forms the staple of the trade of Shanghae [Shanghai], or nearly so, to the astonishing amount of two and a-half millions sterling. This he gives on the authority of the Rev. Mr. Medhurst, of Shanghae, and Mr. Thoms [sic, Thom], British Consul at Ningpo. These peas are ground in a mill and then pressed, in a somewhat complicated, though, as usual in China, a most efficient press, by means of wedges driven under the outer parts of the framework with mallets. The oil is used both for eating and burning, more for the latter purpose, however, and the cake, like large Gloucester cheese, or small grindstones in circular shape, is distributed about China in every direction, both as food for pigs and buffaloes, as also for manure."

Note 1. The "large white pea" is clearly the soybean.

Note 2. This is the earliest document seen (Aug. 2001) that uses the spelling "Shanghae."

In the chapter titled "Oleaginous plants" we read (p. 512): "In Japan a kind of butter, called *mijo,* [sic, *miso*] is obtained from a species of the Dolichos bean (*Dolichos soja*).

Also discusses: Almonds and almond oil (p. 510, 533). Wheat gluten (221, 234, 264). Hemp and hemp oil (p. 510). Sesame or teel, sesame oil, black til, and gingelie oil (p. 511, 533-34). "The export of linseed and rapeseed cakes from Stettin" (p. 564).

Note 3. Peter L. Simmonds lived 1814-1897.

Note 4. This is the earliest English-language document seen (July 2003) that uses the words "gingelie" or "teel" to refer to "sesame."

Note 5. This is the earliest English-language document seen (Sept. 2006) that uses the word "Oleaginous" or the term "Oleaginous plants" in connection with the soybean. Oil derived from the soybean is also mentioned. Address: England.

439. Montgaudry, Baron de. 1855. Compte rendu des expériences faites pour l'acclimatation des semences importées en France par M. de Montigny [Report of experiments made on the acclimatization of seeds imported into France by Mr. de Montigny]. *Bulletin de la Societe d'Acclimatation* 2(1):16-22. Jan. See p. 17, 20-22. [Fre]

• ***Summary:*** For years Mr. de Montigny has been sending seeds and plants from China to the Society for Acclimatization. When he last returned from China, in April 1854, Mr. de Montigny brought five varieties of seeds; a portion of this collection was entrusted to the Society for Acclimatization for experimentation.

Mr. Montgaudry was given responsibility by the Society for Acclimatization for distributing these five varieties of seeds to its members. These seeds were three varieties of rice, a variety of green bean (*Haricot*) unknown in France, alpist or canary-grass (*Alpiste*), giant maize / corn (*Maïs géant*), and two varieties of soybeans (*Pois oléagineux,* literally "oil peas") (p. 17).

The two varieties of soybeans are completely dissimilar. One has small green seeds; the other has rather large yellow seeds. These seeds are very precious and of the highest usefulness for France. Every year, France is obliged to buy from abroad more than 30 million francs worth of edible oil, but during the years when the two types of rapeseed (*les Colzas et les Navettes*) freeze or cannot produce because of drought, some 60 to 80 million francs must leave the country [to buy oil].

The two types of rapeseed only grow successfully on choice land, which must be both light and rich in humus. Generally, this quality of land comprises only a small proportion of the total is almost all localities [in France]. The soybean (*Le Pois*), however, is much less choosy about the soils where it grows well: it prospers on all terrains. In the valleys it grows wonderfully and on the mountains it gives good crops (p. 20).

The soybeans brought back by M. de Montigny are cultivated on a large scale in the fields of northern China. It is principally in the provinces of Honan, Shantung, and Shansi that one finds vast expanses covered with these soybeans. The climate of these provinces is quite similar to that of our own so-called 'cold provinces.' In China there is a large trade based on products obtained from these soybeans.

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The oil is used in many ways and is preferred to rapeseed oil and colza oil (refined rapeseed oil). Although it has an aftertaste of peas or beans, this is not as disagreeable as the bitterness from rapeseed or colza oils. With the addition of a little lard, it becomes similar in flavor to second-grade olive oil.

Note 1. He was referring to unrefined, probably filtered soy oil.

The residue left after expressing the oil is in the form of cakes, which the Chinese use to fatten their livestock and enrich their soil. These cakes are a powerful soil amendment in the countryside.

Note 2. *Webster's Dictionary* defines a soil amendment as "a substance that aids plant growth indirectly by improving the condition of the soil."

In China, soybeans are transformed into both a food for the poor and a seasoning highly regarded by the rich. For the poor, the flour of these soybeans (*la farine de ces Pois*) [i.e. ground soybeans] is used to prepare a paté resembling that of *fromage blanc* (a fresh dairy cheese resembling cream cheese; quark), known in France as *fromage à la pie;* it [i.e., tofu] is sold in public places for a few cents (*centimes*) a portion and cut into cakes by means of a brass wire according to the customer's wishes. Ordinarily the Chinese fry their paté or cheese (*fromage*) [tofu] in the oil which also comes from soybeans; this fried food is highly esteemed.

For the rich, a seasoning (*assaisonnement*) is prepared which requires more care and culinary talent. The soybean paté (*La pâte de Pois*) [fermented tofu] is fermented after having been seasoned with pepper, salt, powdered bay/laurel leaves, powdered thyme, and other aromatics. During the fermentation, the producer bastes the paté with soybean oil (*l'huile de Pois*). After several days of fermentation, the preparation is ready. This paté or cheese [fermented tofu] becomes a very powerful digestive (aid to digestion) and an aperitif, which no one can resist because it is extremely tasty.

"At Kaifeng in Honan, at Tsinan in Shantung, and at T'aiyuan in Shanshi, the oil and cheese of soybeans are made in huge amounts, and are consumed locally. But the city of Ning-po, capital of Chekiang, is the center of production and of shipping of various products made from soybeans. The port of Ning-po is hard to reach in large vessels, but they can stop at the island of Choushan, where there is a very good port. Thousands of Chinese junks leave Ning-po and travel along the coast of China with no cargo but the products of soybeans, which they carry to all parts of the Celestial Empire, to Japan, and to all countries where they are known.

Soybeans have produced seeds in France since 1854. Their acclimatization is assured. Unfortunately we still have only a small quantity of seed, but M. de Montigny, who must return to China, will send the Society a large enough amount so that this precious seed will soon be distributed to all parts of France. This will be an eminent service rendered to the nation.

Mr. de Montigny had brought back a large quantity of soybeans, but it was not going to be up to him (as early as 1854) for this seed to be cultivated on a large scale on French soil. Most of the supply was lost in Paris, for reasons independent of all the zeal, all the planning by Mr. de Montigny, who was not in control of the steps undertaken by persons who appeared to offer to him all the warranties and from whom he could not anticipate the odd way (*façon singulière*) of using such precious seeds (p. 22).

Note 3. Monsignor Louis C.N.M. de Montigny, bearer of the seeds, was born at Hamburg of French parents in 1895. In 1843 he went to China and in 1847 he was appointed Consular Agent at the port of Shanghai, where he stayed, with promotions, until 1895. There he rendered great services to natural science and horticulture by introducing into France useful Chinese plants and animals, via the Society for Acclimatization (Bretschneider 1898, p. 536).

Note 4. The Baron of Montgaudry, author of this article, was the nephew of Comte Georges-Louis Leclerc de Buffon (1707-1788), a French naturalist who held the prestigious position of superintendent of the Royal Garden (*Jardin du Roi/Roy, Jardin des Plantes*) in Paris and was on the cabinet of the Natural History Museum. According to Paillieux (1880, p. 561) starting in 1739, French missionaries in China sent Buffon specimens and seeds of the most important plants in that country. Soybeans were probably received and planted by 1739 or 1740, and definitely by 1779. Buffon was a contemporary and ardent opponent of Linnaeus. He must have been disappointed when, in 1744, Louis XV issued the order that the Linnaean system was to be adopted in the future. Buffon was the author of the superbly illustrated *Histoire Naturelle* (1749-1804) in 44 volumes, some of them published posthumously.

Note 5. This is the earliest document seen (Feb. 2001) concerning soybeans in France, or the cultivation of soybeans in France.

Note 6. This is also the earliest document seen (June 2001) describing the work of the Society for Acclimatization in France with soybeans.

Note 7. This is the 3rd earliest French-language document seen (April 2013) that mentions tofu. It is also the earliest French-language document seen (April 2013) that compares to the particular French cheese named *fromage à la pie* (quark in German).

Note 8. This is the earliest French-language document seen (April 2012) uses the term *pois oléagineux* to refer to the soybean.

Note 9. This is the earliest Western-language, or French-language, document seen (Sept. 2006) that mentions soy oil, which it calls *l'huile de Pois* [*oléagineux*]. This is also the earliest document seen (April 2002) concerning the etymology of soy oil.

Note 10. This is the earliest Western-language document seen (Nov. 2012) that mentions fermented tofu, which it calls

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La pâte de Pois.

Note 11. This is also the earliest document seen in the Western World that mentions an industrial (non-food) use of soybeans (as a fertilizer for the soil).

Note 12. This is the earliest document seen (May 2005) that mentions flavor problems with soy–in this case, soybean oil.

Note 13. This is the earliest document seen (June 2007) that mentions the use of junks (or barges or boats) or water to transport soybeans or soy products within a country (China).

Note 14. This is the earliest French-language document seen (Nov. 2013) that mentions soy flour, which it calls *la farine de ces Pois.* Address: French Consul at Shanghai and Ning-po, China.

440. Bartlett, Levi. 1855. The Japan and Oregon peas–rape. *Granite Farmer* (*Manchester, New Hampshire*)**.** Vol. 6. No. 7. Feb. 17.

• ***Summary:*** "The last *Patent Office Report* contains a notice of the Japan pea, by A.H. Ernst of Cincinnati, O [Ohio]. As also, a very flattering account of the Oregon Pea, by A.B. Rozell of Tennessee. The glowing account given of this pea, by Mr. R. will be read by thousands of farmers, here at the north, and doubtless many of them will be anxious to obtain seed, even at very high prices. In Tennessee and Ohio, these peas may be fully entitled to all the praise they have received in the P.O. Report. But in New Hampshire they are of no more agricultural value, than the cotton plant or the sugar-cane.

"Last spring we received from the Patent Office a package of each kind, accompanied by a printed circular, stating their good properties, manner of cultivation, &c.

"The two kinds were planted on the 12th of May [1854], in a warm, deep, loamy soil, and well sheltered from rains. They were frequently hoed; and about the 20th of September, they had grown some three feet in height. The Japan pea produced many clusters of short, hairy pods, from an inch to an inch and a half in length, each containing from one to three compressed oval beans... We think that but a few if any of the seeds of the Japan pea matured sufficiently to vegetate. Very similar results attended the cultivation of both kinds in western New York, and Michigan, as we learned by the *Rural New Yorker...*

"Accompanying the pea, we received a paper of *Rape seed,* (a plant of the cabbage tribe) with a printed circular, giving the method of cultivation, use, &c. of the plant and seed." There follows a long description of his successful trial and high evaluation of the rape. "The seed is distributed in small packages from the Patent Office..." "When rape seed is exhausted of its oil, it comes from the press in the form of hard (rape) cakes, which crushed to powder, forms a valuable manure,..."

"[We distributed scored of packages of the peas referred to, and requested our friends to experiment with them in various ways. The result in no case was favorable, and we readily came to the same conclusion expressed by Mr. Bartlett.–Ed.]"

Note 1. This is the earliest document seen (July 2011) concerning soybeans in New Hampshire, or the cultivation of soybeans in New Hampshire. This document contains the earliest date seen for soybeans in New Hampshire, or the cultivation of soybeans in New Hampshire (12 May 1854).

Note 2. This may be the earliest document seen (Aug. 2011) concerning soybeans in Tennessee, or the cultivation of soybeans in Tennessee, but this is not completely clear.

Note 3. Piper (1914, p. 551) states that an early name for the mung bean in the USA was the "Oregon pea under the erroneous idea that it came from that region." Address: Warner, New Hampshire.

441. Browne, D.J. 1855. Report on the seeds and cuttings recently introduced into the United States. Preliminary remarks. *Report of the Commissioner of Patents, Agriculture.* p. x-xxxv. For the year 1854. See p. xv.

• ***Summary:*** *"Japan pea,* also described in last year's report, and has been since cultivated with remarkable success.

"Soja bean, (Soja hispida) procured by the Japan Expedition [of Commodore Perry]; two varieties, the 'White' and the 'Red-seeded,' both of which are employed by the Japanese for making *soy,* a kind of black sauce, prepared with the seeds of this plant, wheaten flour, salt, and water. This 'soy,' or 'soja,' which is preferred to the *Kitjap* of the Chinese, is used in almost all their dishes instead of common salt. The soy may be made as follows:

"Take a gallon of beans of this plant and boil them until soft; add bruised wheat, one gallon; keep in a warm place for twenty-four hours; then add common salt, one gill [½ cup], and water, two gallons; and put the whole into a stone jar, and keep it tightly closed for two or three months, frequently shaking it; and then press out the liquor for use.

"The seeds of this plant only require to be sown in a warm, sheltered situation at the time of planting Indian corn, and cultivated as any garden bean."

Note 1. The author of this report apparently did not realize that the Japan Pea and the Soja Bean are one and the same plant. Note 2. This is the earliest American document seen (Jan. 2003) that uses the term "Soja hispida" to refer to the soybean.

Note 3. The "Japan Expedition" refers to that led by the American Commodore Matthew Calbraith Perry (lived 1794-1858).

Note 4. Piper and Morse (1923, p. 40) state concerning the Perry Expedition to Japan in 1854: "The Mammoth may well be the 'white-seeded' soja bean obtained by the Perry expedition. The 'red-seeded soja bean' was, probably, the adsuki bean (*Phaseolus angularis*), as no red-seeded soybean is known." If this were an adzuki bean, this would be the earliest document seen (March. 2003) concerning azuki in

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the United States.

Note 5. This is the earliest English-language document seen (April 2012) that uses the term "Kitjap" to refer to Chinese soy sauce." Observe the similarity between the words "Kitjap" and "Ketchup"–suggesting that the word "ketchup" may have a Chinese origin.

Note 6. Also discusses: White quinoa (*Chenopodium quinoa,* p. xiii-xiv). White Lupine (*Lupinus albus,* from southern Spain and Germany, xv-xvi). Yellow Lupine (*Lupinus luteus,* from Germany, p. xvi). Chinese yam (*Dioscorea batatas,* from China but more recently from France, p. xvii).

Note 6. This is the earliest document seen (Jan. 2005) that mentions quinoa in the USA. Address: United States Patent Office, Washington, DC.

442. *Country Gentleman* (*Albany, New York*)**.** 1855. Japan and Oregon peas (Abstract). 5(10):151. March 8. Whole No. 114.

• ***Summary:*** A short summary of an article by Levi Bartlett in the Granite Farmer. "Levi Bartlett gives it as his opinion, in the *Granite Farmer,* founded on experiments, that while in Tennessee and Ohio, these peas may be entitled to all the praise they have received, in New-Hampshire they are of no more value than the cotton plant or sugar cane."

Note: This periodical is published in Albany, New York. Address: New Hampshire.

443. J.W. 1855. Japan peas. *Country Gentleman* 5(12):184. March 22.

• ***Summary:*** "Will you please inform me in regard to the use of the Japan pea and its cultivation."

Will some of our correspondents please answer? Address: [New York? Journal published in Albany, New York].

444. T.V.P. [T.V. Peticolas]. 1855. Japan pea. *Country Gentleman* 5(15):232. April 12. Whole No. 119. Also published in The Cultivator 3(5):159. May. Series 3.

• ***Summary:*** "... on the subject of the Japan Pea, or rather Bean. I have cultivated it for the last three years, and have disseminated it from Canada to Texas. It produces abundantly in common corn ground, planted six inches apart in the row, and the rows from 18 inches to two feet apart–wide enough to hoe or use a small cultivator. When eaten a few times they are pleasant enough, but have very little flavor–better when mixed with other beans. Before cooking, they must be soaked at least twenty-four hours. They are inconvenient to use green, being so difficult to hull. Chickens are very fond of them, and hogs devour them with great gusto. I think they would do for a field crop sown broadcast in good soil."

Note 1. This is the earliest document seen (Oct. 2012) concerning soybeans in Canada or in Texas. This document contains the earliest date seen for soybeans in Canada or Texas (April 1855). These soybeans may well have been grown in Canada and/or in Texas, but we cannot be certain of that.

Note 2. This is the 2nd earliest English-language document seen (June 2009) that mentions green vegetable soybeans; it notes "They are inconvenient to use green, being so difficult to hull."

Note 3. This is the earliest document seen (Oct. 2003) that uses the word "cultivator" in connection with soybean production.

Note 4. This is the earliest document seen (July 2002) concerning the feeding of soybeans or soy products to chickens in the United States.

Note 5. Letter from Ted Hymowitz. 1994. May 18. He says this man's full name is T.V. Peticolas. He probably received his soybean seeds from A.H. Ernst. His evaluation of soybeans as a potential new crop was amazingly astute (Hymowitz 1987, p. 31). Address: Mount Carmel, [Clermont Co.], Ohio.

445. Worthington, T. 1855. [Japan peas]. *Letters and Reports of the Agricultural Division of the Patent Office, 1839-60.* Vol. 7. p. 211-12. May 22.

• ***Summary:*** "I heard the other day in Cinti [Cincinnati?] that your department had sent there for Japan peas. Enclosed is a specimen of some raised of me last summer producing 50 bushels to the acre when corn [illegible word] them? brought? but 10 bushels. I never knew any thing stand the drowth [drought] so well and they are valuable for stock but I have not been able to cook them so as to acceptable for human food. They may be planted successfully till the 20th of June...

"... I derived? & can forward at once four or five gallons of Japan peas and will take in return such useful seeds for this? latitude and season? as you may have yet on hand.

"... I should like to have samples of... the Soja [Foja?, Foya?] bean of Japan."

Note: The author apparently does not realize that the Japan pea which he has is the same as the Soy bean of Japan, which he is requesting. Question marks and blanks indicate illegible handwritten text.

First cited by Graff 1949. Address: Logan, Hocking Co. Ohio.

446. T.V.P. 1855. Japan pea. *Cultivator* (*The*) 3(5):159. May. Third Series.

• ***Summary:*** Reprinted from *The Country Gentleman.* 1855. April 12. p. 32. "... on the subject of the Japan Pea, or rather Bean. I have cultivated it for the last three years, and have disseminated it from Canada to Texas. It produces abundantly in common corn ground, planted six inches apart in the row, and the rows from 18 inches to two feet apart–wide enough to hoe or use a small cultivator. When eaten

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a few times they are pleasant enough, but have very little flavor–better when mixed with other beans. Before cooking, they must be soaked at least twenty-four hours. They are inconvenient to use green, being so difficult to hull. Chickens are very fond of them, and hogs devour them with great gusto. I think they would do for a field crop sown broadcast in good soil." Address: Mount Carmel, Ohio.

447. *Pittsfield Sun* (*Massachusetts*). 1855. The farm of General Worthington near Chillicothe... 56(2866):1. Aug. 23.
• ***Summary:*** "... contains seven or eight hundred acres of the best land in the garden of Ohio, well supplied with the purest water, and adorned with magnificent groves of forest trees... Figs from the land of Smyrna, frijoles from the plains of Mexico, and peas from Japan [Japan peas], flourish in his garden."

448. Munch, Frederick. 1855. [Japan peas]. *Letters and Reports of the Agricultural Division of the Patent Office, 1839-60.* Vol. 7. p. 1228-29. Nov. 25.
• ***Summary:*** "The Japan pea is one of the finest looking vegetables in the garden, grows prolific [sic], bears well, is not injured by insects, & requires but moderate attention; our season is just long enough to have it fully matured."

Note 1. This is the earliest document seen (June 2011) concerning soybeans in Missouri, or the cultivation of soybeans in Missouri. This document contains the earliest date seen for soybeans in Missouri, or the cultivation of soybeans in Missouri (Nov. 1855). First cited by Graff 1949.

Note 2. This is the earliest document seen (Aug. 2001) that mentions insects in connection with soybeans. Address: Marthasville, Warren County, Missouri.

449. Browne, D.J. 1855. Agricultural operations of the United States Patent Office. *American Institute of the City of New York, Transactions* p. 587-632. For the year 1854.
• ***Summary:*** In the section on "Legumes" (p. 596) we read (p. 598): "Japan pea, also described in last year's report, and has been since cultivated with remarkable success.

"Soja bean (*soja hispida*), procured by the Japan expedition; two varieties, the 'white' and the 'red-seeded,' both of which are employed by the Japanese for making soy [sauce], a kind of black sauce, prepared with the seeds of this plant, wheat flour, salt and water. This 'soy,' or 'soja,' which is preferred to the kitjap [ketjap, kecap] of the Chinese, is used in almost all their dishes instead of common salt. The soy may be made as follows: take a gallon of the beans of this plant and boil them until soft, add bruised wheat one gallon; keep them in a warm place for twenty-four hours, then add common salt one gill, and water two gallons, and put the whole into a stone jar and keep it tightly closed for two or three months, frequently shaking it, and then press out the liquor for use. The seeds of this plant, to be cultivated, only require to be sown in a warm sheltered situation, at the time of planting Indian corn, and cultivated as any garden bean." Address: Philadelphia, Pennsylvania.

450. Danforth, John. 1855. The Japan pea. *Report of the Commissioner of Patents, Agriculture.* p. 194. For the year 1854.
• ***Summary:*** "Last May, I planted four Japan peas, from which I raised, in number, thirteen hundred and seventy-six [1376], measuring about a pint. As this plant appears to be well adapted to our climate, I have reserved my peas for planting next year."

Note: This is the earliest document seen (March 2011) concerning soybeans in Connecticut, or the cultivation of soybeans in Connecticut. This document contains the earliest date seen for soybeans in Connecticut, or the cultivation of soybeans in Connecticut (May 1854). Address: New London, New London County, Connecticut.

451. Hildreth, Richard. 1855. Japan as it was and is. Boston, Massachusetts: Phillips, Sampson and Co.; New York: J.C. Derby. xii + 576 p. Folded map. Index. 21 cm. Facsimile edition reprinted in 1973 by Scholarly Resources (Wilmington, Delaware).
• ***Summary:*** Richard Hildreth (lived 1807-1865) never traveled to Japan, but he read widely from the writings of those who did. He summarizes them and quotes them in this book, which is basically a history (in chronological order, by the date of Hildreth's source).

In Chapter 32 (1690-1692), in the section on tea, the following quotation (probably from Engelbert Kaempfer) appears (p. 312): "'The common sauce for these and other dishes is a little *soy* [sauce], as they call it, mixed with *saki* [*sake*], or the beer of the country.'"

In Chapter 39 (1775-76), in the section on imports and exports, the following summary appears (from C.P. Thunberg) (p. 390-91): "The chief articles of export were copper, camphor and lackered [sic, lacquered] goods; porcelain, rice, saki, soy,* were also exported" (Footnote: *"This sauce, used in great quantities in Japan and exported to Batavia by the Dutch, whence it has become known throughout the East Indies and also in Europe, is made from the soy bean (*Dolichos Soia*) [sic], extensively used by the Japanese in the making of soup [sic]. The soy is prepared as follows: the beans are boiled until they become rather soft, when an equal quantity of pounded barley or wheat is added. These ingredients being mixed, the compound is set away for twenty-four hours in a warm place to ferment. An equal quality of salt is than added, and twice and a half as much water. It is stirred several times a day for several days, and then stands well covered for two or three months, when the liquid portion is decanted, strained, and put in wooden casks. It is of a brown color, improves with age, but varies in quality, according to the province where it is made. The Dutch of Deshima cork up the better qualities in glass [sic,

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porcelain] bottles, boiling the liquor first in an iron kettle, to prevent fermentation, by which it is liable to be spoiled)." Address: Author, Boston, Massachusetts.

452. Miquel, Friedrich Anton Wilhelm. 1855. Flora van Nederlandsch Indie (Flora Indiae Batavae) [Flora of the Netherlands Indies. Vol. I, part 1]. Amsterdam and Utrecht: C.G. van der Post. 1116 p. See p. 196-97 (Phaseolus species) and p. 221-24 (Glycine and Soya species). [9 ref. Dut]
• ***Summary:*** Miquel's Soya species include: 1. Soya hispida Moench, 2. Soya Wightii Grah. (named Glycine javanica by Linnaeus and Soya javanica by Grah.), 3. Soya angustifolia Miq. 4. Soya hamata Miq.

Glycine species include: 1. Glycine labialis Linn., 2. Glycine mollis Wight et Arn.

Note: This is the earliest document seen that mentions *Soya angustifolia.*

According to Merrill (1917), Miquel (p. 197) named a narrow-leafed form from Java *Phaseolus radiatus.* He erroneously thought it was the soybean. Note: It may have been the azuki bean.

Miquel was born on 24 Oct. 1811 at Neuenhaus, Germany, and died on 23 Jan. 1871 at Utrecht, Netherlands. A botanist, he was the son of a country physician. His University studies and subsequent academic career took place in the Netherlands. "Trained as a physician at the University of Groningen, Miguel specialized in botany and was director of the Rotterdam botanic garden (1835-1846), professor of botany at Amsterdam (1846-1859) and at Utrecht (1859-1871), and director of the Rijksherbarium at Leiden (1862-1871). His numerous (296 items in his bibliography) botanical publications deal mainly with the floras of the former Netherlands East Indies, Surinam, and Japan... Miguel was also the founder of the University of Utrecht herbarium."

An illustration (see above) facing the title pages shows a portrait of Georgius Everhardus Rumphius, blind and white-haired in his old age, holding a branch on a table.

Also discusses: *Psophocarpus tetragonolobus* [winged bean] (p. 181). Address: Hoogleeraar in de Plantenkunde te Amsterdam.

453. Pratt, S.D. 1855. The Japan pea. *Report of the Commissioner of Patents, Agriculture.* p. 194. For the year 1854.
• ***Summary:*** "The Japan peas sent to me last spring, eight in number, were planted on the 3rd day of June. The ground was made mellow with a hoe, and the peas were planted about one foot apart, like garden beans. Six of them came up within a week and presented a thrifty, vigorous appearance. The season was the dryest [sic] within the recollection of our oldest inhabitants; and when the garden plants were drooping and wilting from excessive drought, they retained a fresh, healthy appearance.

"These peas were planted so late that they did not mature before the last of October, after several frosts, and two or three of the plants were broken down by accident; but with all these things against me, I harvested about half a pint, which will be distributed among farmers in this vicinity who may be desirous to cultivate them. The plant in its growth was not troubled with insects, and the downy covering of the pods will prevent the fly or bug from inserting its ovipositor into the green pea, and leaving there a rudimentary bug to revel on the farmer's toil and blast his hopes. The pea should be planted at least two feet apart, about the time of corn-planting. That they can be successfully cultivated in Central New York there is no doubt." Address: Pompey, Onondaga County, New York.

454. Victor, T. 1855. The Japan pea. *Report of the Commissioner of Patents, Agriculture.* p. 194. For the year 1854.
• ***Summary:*** "In the latter part of April last, I planted six Japan peas, from which, notwithstanding the unfavorableness of the season, I raised seven hundred and twenty-six [726] in number, or about one hundred and twenty [120] to one." Address: City and County of New York.

455. Champley, G. 1856. [Japan peas]. *Letters and Reports of the Agricultural Division of the Patent Office, 1839-60.* Vol. 10. p. 45-46. Jan. 7.
• ***Summary:*** "I should be highly gratified if you will forward me a few seeds of The 'Japan pea,' The Chinese Sugar-Cane [sorghum] & any other suitable for the extremely rich soil of the Prairie."

Note 1. This is the earliest document seen (Oct. 2012)

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concerning soybeans in connection with (but not yet in) Indiana. Presumably, the Patent Office sent him the soybeans he requested. First cited by Graff 1949.

Note 2. As of 1 Nov. 2000 directory assistance has no phone listings for anyone with the surname "Champley" in Oxford, Indiana, or in Benton County, Indiana, or in the surrounding area. Address: Oxford, Benton Co., Indiana.

456. Donohue, John. 1856. [Japan peas]. *Letters and Reports of the Agricultural Division of the Patent Office, 1839-60.* Vol. 10. p. 751. Feb. 14.
• ***Summary:*** "M. Brown Esq: Sir I received? from you last spring 28 Jappan [sic, Japan] pea 26 of them came up, and from our pea I counted 2000 and I think that they [illegible word] 1500–I had some of them cooked and found them to be the [illegible word] pea I've eat."

Note: This is the earliest document seen (May 2011) concerning soybeans in Maryland, or the cultivation of soybeans in Maryland. This document contains the earliest date seen for soybeans in Maryland, or the cultivation of soybeans in Maryland (spring 1855). First cited by Graff 1949. The name of the author's town is difficult to read. It also looks like Hardigran. Address: Havre de Grace, Harford Co., Maryland.

457. Herndon, Jno. B. 1856. [Japan peas]. *Letters and Reports of the Agricultural Division of the Patent Office, 1839-60.* Vol. 10. p. 779-80. Feb. 14.
• ***Summary:*** The writer encloses a newspaper clipping titled "The Japan Pea," which he wrote on 1 Nov. 1855 to the editors of the *Louisville Bulletin* (which see), accompanied by these words: "Please accept the enclosed Statement: any use you may make of it in your Agricultural Report will be agreeable to me."

First cited by Graff 1949. Address: Mayslick, Kentucky.

458. F.D. 1856. Japan pea. *Country Gentleman* 7(9):144. Feb. 28. Reprinted in Cultivator, Series 3, 3:125-26. April.
• ***Summary:*** "Perhaps you or some of your many correspondents, can inform me whether any reliable experiments have been made with the Japan pea, to determine its value as a food for stock? Hogs seem to be very fond of it, and I observe cattle eat the hulls with a good relish, but how far it possesses any value as a nutritious and economical food for any kind of stock, is the question I shall be glad to have answered. It is easy of cultivation, very prolific, and from the density of its shade, keeps the ground clean of weeds, advantages which would render it a desirable plant to the farmer provided it contains the elements of a good food for stock."

Note: This is the earliest document seen (August 2001) that mentions soybeans in connection with weed control. Address: New Richmond, Ohio.

459. Thorburn (J.M.) & Co. 1856. Classified ad: Agricultural–New Chinese or Japan potato (*Dioscorea Batatas*). *New York Times.* March 8. p. 3.
• ***Summary:*** "Just received, a few thousand in prime condition, of this new esculent. Price $3 per dozen or $20 per 100. Printed description, with directions for its culture, furnished to purchasers and other applicants.

"Also, new Annual Chinese Sugar Cane, Japan Peas, new Orange Water mellon, Oregon Peas [mung beans], &c., &c.,..."

Note 1. This ad also appeared in the March 10 and 11 (p. 3) issues of this newspaper.

Note 2. *Dioscorea batatas,* which is now more widely known by the scientific name *Dioscorea opposita,* is called either *nagaimo* or *yamaimo* in Japanese, depending on the root shape. In Chinese it is known as *huai shan, shan yao,* or *hua shan yao.* In English it is known as Chinese yam, Japanese mountain yam, or glutinous yam. Grated *nagaimo* is known as *tororo,* which is a key ingredient in the Japanese cold noodle dish *tororo udon. Jinenjo* (wild glutinous yam) is another variety of Japanese yam that is used as a topping in soba noodles. Address: No. 15 John-st. [New York City, New York].

460. Danforth, John. 1856. [Japan peas]. *Letters and Reports of the Agricultural Division of the Patent Office, 1839-60.* Vol. 11. p. 7-72. March 18.
• ***Summary:*** "Hon. Charles Mason, Patent Office, Washington [DC]: I learn from a Gentelman [sic] in Kentucky that you have not got any of the Japan Peas in your office at Washington. If this is true I will send you a small lot. Say one pint or a quart. I have had over forty applications for those peas this season and have furnished the all with [sic] a few, by mail without price pay or reward, requesting them to make their? Report & Return to the office at Washington."

Note: First cited by Graff 1949. Address: New London, Connecticut.

461. F.D. 1856. Inquiries and answers: Japan pea. *Cultivator* (*The*) 4(4):125-26. April. Third Series.
• ***Summary:*** First printed in *Country Gentleman,* 28 Feb. 1856, p. 144–which see. Address: New Richmond, Ohio.

462. Wyche, John J. 1856. [Japan peas]. *Letters and Reports of the Agricultural Division of the Patent Office, 1839-60.* Vol. 11. p. 641-42. May 31.
• ***Summary:*** This handwritten, faded letter is hard to read. "Accompanying (?) this you will (?) receive a lot of Japan Peas, which it is not too late to distribute in the South to which indeed it is better adapted than to the North. In return for the multiplied favors received from your Department I hope this fall (?) to be able to send (?) a number of new (?) seeds I have now under cultivation..."

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Note: This is the earliest document seen (April 2012) concerning soybeans in North Carolina, and (probably) the cultivation of soybeans in North Carolina. This document contains the earliest date seen for soybeans in North Carolina (May 1856). Henderson is a city in the north central part of the state. The population in 1980 was about 13,500. First cited by Graff 1949. Address: Henderson [Vance County], North Carolina.

463. *Richmond Daily Whig* (*Virginia*). 1856. The Japan pea. Dec. 27. p. 3, col. 1.
• ***Summary:*** "The Japan pea is much recommended by Mr. Thomas Maslin, of Moorefield, Hardy county, Virginia. He says that from six Japanese peas sent to him in 1854, which were not cultivated in a way to give much hope of success, the product first season was 7,350, or an average of 1,225 to each stalk. The next year he planted two ounces of the beans, many of which were destroyed in their growth by the cut-worm, but the product was about five bushels, after the family had used what had been wanted in the green state. He further remarks:

"They grow up in a stiff stalk about the size of a man's finger, and throw out branches from the ground up, and every branch is completely covered with pods, which contain three or four peas, and form a bush nearly as large as a flour barrel. When green, they are about the size and shape of a corn bean. I counted some stalks this fall that had 2,500 to 3,000 peas, and have seen as much as one hundred pods upon branches not a foot long. I have no doubt that they will yield five times as much per acre as any other grain or vegetable I have ever seen. They are fine for table use, either green or dry, but particularly so when dry, and have no doubt but they will be valuable for stock, as my fowls and the rats eat them in preference to corn."

Note 1. This is the earliest document seen (Sept. 2011) that clearly refers to soybeans in Virginia, or the cultivation of soybeans in Virginia. This document contains the earliest date seen for soybeans in Virginia (1854), or the cultivation of soybeans in Virginia (1855 or before). The source of these soybeans is unknown.

Note 2. This is the earliest document seen (Feb. 2000) that uses the term Japanese peas (or Japanese pea) to refer to soybeans.

464. L. 1856. Japan peas. *Cultivator* (*The*) 4:376. Dec. Third Series.
• ***Summary:*** The writer asks how to cultivate the Japan peas that he received from the Patent Office. "The Japan pea is a bushy, upright plant, growing 3 or more feet in height, and branching near the ground. To secure large and showy plants, the seed should be planted one in a hill at a distance of about 3 feet. It will not probably ripen its seed as far north as Ulster, but if it does, you may cook it for your own use, if fond of peas, or feed it to your pigs." Address: Ulster County, New York.

465. Adams, James O. ed. 1856. Experiments with foreign seeds. *Transactions of the New Hampshire State Agricultural Society* p. 351-57. For the year 1855. See p. 353.
• ***Summary:*** "The Japan Pea is very prolific, yielding by the hundred fold. The pea, however, is very small, and not superior to our common varieties. They will be serviceable for sheep."

Levi Bartlett, Esq., of Warner [New Hampshire] is mentioned on p. 357 as one of two gentlemen who have furnished reports of their success in experiments with these seeds. Address: Secretary of the State Society, New Hampshire.

466. *Annalen der Landwirtschaft in den königlich-preussischen Staaten.* 1856. Bericht des General-Garten-Directors Lenné ueber die Resultateder Anbau-Versuche mit den von dem Koeniglichen Landes-Oekonomie-Collegium vertheilten oder anderweitig begozenen Saemerien [Report of the General Garden Director of Lenné on the results of cultivation trials using seeds sent by the Royal Landes-Oekonomie- Collegium or obtained in other ways]. 14(27):107-167. See p. 107-08, 135. [Ger]
• ***Summary:*** The 1st section titled "Oilseeds" (*Hülsenfrüchte,* p. 107-08) mentions: "Japan Pea. *Soja hispida"* and White beans from China." Both were obtained from the Patent Office in Washington, DC, via Mr. von Gerold on 28 Dec. 1854.

The section on "Beans" (*Bohnen*) mentions "5. Peas, Erbse." Apparently Soja Hispida. These seeds probably came from Japan.

Note: In the title, a collegium is a group in which each member has about equal weight.

467. Crawfurd, John. 1856. A descriptive dictionary of the Indian islands & adjacent countries. London: Bradbury & Evans. 459 p. Reprinted in 1971 by Oxford University Press, with an introduction by M.C. Ricklefs.
• ***Summary:*** This book is about the region now (May 2011) known as Southeast Asia, and especially about the Malay Archipelago (today's Indonesia and Malaysia). Its main focus is geography, history, language, culture, and colonial affairs, but there is some information about food and agriculture.

The section titled "Pulses" (p. 361) states: "The generic name in Malay and Javanese for all leguminous plants, is kachang, by adding an epithet to which we have the name of the species. Several species are regular objects of cultivation, as Phaseolus max, lunatus and radiatus; Dolichos kachang; Lablab vulgaris; Soja hispida; Cytisus cajan, and Arachis hypogæa. In Java, the greater number of these are cultivated in the dry season from irrigated land, which during the wet had yielded a crop of rice; that is, they form one of two crops

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from the same land within the year. The last-named plant, the ground nut, is raised in inferior dry lands, and is the chief source of the lamp-oil consumed by the natives. Most of the cultivated leguminous plants may be judged by the epithets annexed to them to be exotics; thus, Phaseolus lunatus, is called Kachang China, or Chinese pulse; and Soja hispida, the soy-bean, Kachang-Jâpun, or Japanese pulse; Phaseolus max has a Talugu or Telinga name annexed to it, kâdâlé."

Note: Crawfurd seems to be confused about Phaseolus max, an early and outdated name for the soybean, which is now (Feb. 2004) called "Kachang kedele" (rarely "kadele," never "kadale") in Indonesia.

The section on "Oil" notes "in Malay miñah, and in Javanese lânga, both of them words of extensive currency throughout the Malay and Philippine Archipelagos. The plants from which fatty oils are chiefly extracted are the coco-palm [coconut], the ground pea [peanut], the sesame, and the palma-christi; the first for edible use and the three last for the lamp... Animal oils are hardly used in any shape; essential oils are obtained from the clove, the nutmeg, the kayu-puti (Melaleuca cajeput) and in great abundance and cheapness from the Malay camphor-tree (Dryobalanops camphora)."

The section titled "Arachis" (p. 13, about the peanut) states: "The Arachis hypogæa, or ground pea, is known in the Malayan countries under the several names of kachang-tanah, kachang-China, and kachang-Jâpun, meaning ground, Chinese, and Japan pulse. The two last of these names would seem to imply, what is probable, that the plant is an exotic, and was introduced either from China or Japan, with both of which the inhabitants of the Archipelago had maintained a commercial intercourse before the arrival of Europeans in India. With the exception of the coco-palm, it is, of all the oil-yielding plants, the most extensively cultivated in the Archipelago."

Note: This is the earliest English-language document seen (Sept. 2006) that contains the terms "oil-yielding" or "oil-yielding plants" in connection with seeds.

Other food-related entries include: Agar-agar, Kaempfer (Engelbert), nutmeg, onion (Allium), opium, orange, potato, Rumpf / Rumphius, safflower, and sago. John Crawfurd lived 1783-1868. Address: F.R.S. [London, England].

468. Encyclopædia Britannica, or dictionary of arts, sciences, and general literature: Japan. 1856. Boston, Massachusetts: Little, Brown, & Co.; Chicago, London, Toronto...: Encyclopaedia Britannica, Inc. 820 p. 8th ed. See vol. 12.
• ***Summary:*** In volume 12, under Japan, the section on agriculture (p. 693) states: "Beans and peas of different kinds are cultivated in great abundance, particularly the bean *Dolichos soja,* from which *soy,* a kind of sauce, is prepared by boiling and fermentation, is made."

Note: This encyclopedia has no index. This is the only entry seen for the soybean; it is not mentioned under beans, China, or Indonesia, and there are no entries for Japan pea, soy*, or soya.

469. Faulkner, Alexander. 1856. Faulkner's dictionary of commercial terms: With their synonyms in various languages. Bombay, India: Printed at L.M. D'Souza's Press. iii + 158 + vii p. 18 cm. [1 ref]
• ***Summary:*** "Soy. A peculiar savoury sauce, made from the bean of the *Soja,* a species of *Dolichos,* growing in the Eastern parts of Asia. Genuine soy is well flavoured, thick, brown, and clear; and when shaken in a glass it should have a coat on the surface of a bright yellowish-brown colour. It is obtained from Canton [China]; but the best is exported from Japan, by way of Batavia [Dutch East Indies]. Waterston."

Also discusses: "Ground nuts.–Guz. (Guzerattee) [Gujarati], Hind [Hindi], *Bhoysing.* Groundnuts are now extensively cultivated in the Concans on account of the oil which they afford. They are occasionally exported to England and France.

"Ground nut oil.–Hind. *Bhoysing ka teil.* It is the oil obtained from ground-nuts by expression. It is largely exported from Bombay to France and England."

Note: The Concans or Co'ncan was an extensive maritime district of southwestern India in the province of Bejapore extending 220 miles along the shore from Damaun to Malabar, bounded on the west by the Indian Ocean and on the south by Canara and Sattara [Satara]. Between 16º and 20º north latitude. On today's map, it would be along the coast south of Bombay. A long range of mountains, named the Western Ghats, runs right along the shore of western India from the Gulf of Khambhat to near the southern tip of the continent (Cape of Comorin).

470. Green, Daniel S. 1856. Narrative of the expedition of an American squadron to the China Seas and Japan, performed in the years 1852, 1853, and 1854, under the command of Commodore M.C. Perry, United States Navy. Report upon the agriculture of Japan. *Senate Executive Document* No. 79. 33d Congress, 2nd Session. Vol. 1. p. 52; Vol. 2. p. 85. Also published as House of Representatives Executive Document No. 97. Same Congress, Session, and pages.
• ***Summary:*** Upon his return and at Commodore Perry's request, Dr. Daniel S. Green, surgeon of the expedition, wrote a short "Report upon the agriculture of Japan" from notes and from memory, hoping that it might afford some interest to American farmers. This document marked the introduction of Japanese products to American agriculture.

"Their chief grain is rice, of which they are said to produce the best in all Asia. They also make barley and wheat. The first is used for feeding the cattle; the other [wheat] is not much valued, and is chiefly used for cakes and soy [sauce]. This last is made by fermenting, under ground, wheat with a peculiar kind of bean and salt" (1:52).

"Of beans the Japanese have several sorts, as white

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and black, runners or climbers, and bush or snap beans; the black-eye or cow pea, and a peculiar hairy-podded bean, growing upon a branching stem, called commonly Japan pea; and also a diminutive one, not much larger than a lentil [probably azuki]. From one of these [Japan pea] the famous *soya* is made, a fermented condiment used for various dishes" (II:85).

Vol. I, p. 369 gives a list of articles received from the Japanese government, from Udono, 4th commissioner, including "1 box, 10 jars of soy."

Note 1. This is the earliest journal article (from an irregular serial) seen (Oct. 2001) that mentions soy.

Note 2. This is the earliest English-language document seen (Oct. 2006) that uses the term "black-eye" to refer to the cow pea.

Note 3. This document was published as a book in 1856 in London by Trubner & Co. (624 p.). Compiled by Francis Lister Hawks, the lead author is given as Matthew Calbraith Perry. Address: USA.

471. Hawks, Francis L. comp. 1856. Narrative of the expedition of an American squadron to the China Seas and Japan, performed in the years 1852, 1853, and 1854, under the command of Commodore M.C. Perry, United States Navy,... New York: D. Appleton and Co.; London: Trubner & Co. viii + 296 p. See p. 66, 430, 443, 511.

• ***Summary:*** Introduction (p. 66): "Their [the Japanese] chief grain is rice, of which they are said to produce the best in all Asia. They also make barley and wheat. The first is used for feeding the cattle; the other is not much valued, and is chiefly used for cakes and soy [sauce]. This last is made by fermenting, under ground, wheat with a peculiar kind of bean [soy bean] and salt."

Page 430: A list shows articles received from the Japanese government: "5th. From Udono, 4th commissioner–... 1 box, 10 jars of soy."

Page 443: "All formal business being now concluded to the mutual satisfaction of both parties, the Japanese commissioners invited the commodore and his officers to partake of an entertainment prepared for the auspicious occasion... When all were seated, the servitors brought in a rapid succession of courses, consisting chiefly of thick soups, or rather stews, in most of which fresh fish was a component part. These were served in small earthen bowls or cups, and were brought in upon lacquered stands, and placed, one before each guest, on the tables. Together with each dish was a supply of soy or some other condiment, while throughout there was an abundant quantity of saki–the Japanese national liquor–a sort of whisky distilled from rice. Various sweetened confections, and a multiplicity of cakes, were liberally interspersed among the other articles on the tables."

In describing the shops in Hakodadi [Hakodate] (p. 511): "The provision shops contain rice, wheat, barley, pulse, dried fish, seaweed, salt, sugar, saki, soy, charcoal, sweet potatoes, flour,... There is no public market in the town, as neither beef, pork, nor mutton are eaten, and very little poultry." Address: D.D., LL.D.

472. MacFarlane, Charles. 1856. Japan: An account, geographical and historical, from the earliest period at which the islands composing this empire were known to Europeans, down to the present time, and the expedition fitted out in the United States, etc. Hartford, Connecticut: Silas Andrus & Son. xii + [9]-365 p. Illust. No index. Folding map. 21 cm. [15 ref]

• ***Summary:*** In the section on "Domestic manners" is a description of a Japanese feast (p. 288-89) which states: "A Japanese feast usually consists of seven or eight courses. During the several removes, the master of the house walks round, and drinks a cup of sackee with each guest. This is their way of hobnobbing, or "taking wine." The viands consist of game, venison, poultry, fish, and all kinds of vegetables, seaweeds not excepted. Fish is, however, the *pièce de résistance,* the standing dish, the roast beef of the Japanese... As whets, servants, of both sexes, from time to time, hand round soy, other sauces, pickled or salted ginger, and small nicely-cut morsels of salted fish, which are all eaten with the Chinese chopstick. It is expected that the guests compliment the giver of the feast on the beauty of his lacquered ware, on the splendor of his bowls, and on the richness and beauty of his domestic utensils, and furnishing in general."

Since the author has never been to Japan, he uses the last part of the Appendix (p. 331-65' see especially p. 363-65) to give a bibliography of his sources.

Charles MacFarlane, a British romantic author, lived 1799-1858. Address: Author [England].

473. Siebold & Comp. 1856. Catalogue raisonné et prix-courant des plantes et graines du Japon cultivées dans l'établissement de von Siebold & Comp. à Leide [Annotated catalogue and current price list of plants and seeds from Japan cultivated at the firm of von Siebold & Co., Leiden, Netherlands]. Leyden [Netherlands] and Bonn: Henry & Cohen. 24 p. 23 cm. [1 ref. Fre]

• ***Summary:*** In the section titled "Seeds of garden and agricultural plants harvested in the fall of 1855 in Japan" is a one-line entry (p. 18) which reads: "28. Soja japonica Savi * à graines blanch. vert et noir. Usage: Pl. à Soy. Un petit paquet: Fr. 1." (Footnote: *"C'est la plante légumineuse, des graines de laquelle les Japonais préparent le Soy (*Sojû*). sauce bien connue aux gourmands.")

Translated into English: "28. Soja japonica Savi *; white, green, or black seeds. Usage: Plant can be used to make soy sauce. (Footnote 4: *"This is a leguminous plant, whose seeds the Japanese use to make Soy (*Shôyu*) sauce, which is well known to connoisseurs of fine food (*gourmands*)."*)*

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Note 1. This is the earliest seed catalog seen (Dec. 2003), worldwide, in which soybean seeds are offered for sale–although no prices are given. The original catalog is located at the Department of East Asian Studies, Ruhr-Universitaet Bochum, Universitaetsstrasse 150, 4630 Bochum 1, Germany.

Note 2. Siebold & Co., plant and seed company, was started in 1842 by Philipp Franz von Siebold with Blume and Rodbard; Siebold and Joseph G. Zuccarini first gave the soybean its present genus name, Glycine. They gave the wild soybean its present scientific name *Glycine soja.* M.M. Busk in 1841 wrote: "Dr. Von Siebold's Japanese museum [at Leyden] is said to be the finest in Europe..." For details on Siebold's life and work as a botanist see: Bretschneider (1882–*Botanicon Sinicum,* Part I, p. 126-27).

Note 3. This is the earliest French-language document seen (April 2012) that uses the term *Le Soy* (*Sojû*) to refer to soy sauce.

Note 4. First cited by Prof. Ted Hymowitz, Univ. of Illinois. Personal communication 1 Jan. 1997. Address: Leyden, Netherlands.

474. Smith, J. Jay. 1856. Editor's table: New and valuable trees and fruits. *Horticulturist, and Journal of Rural Art and Rural Taste* (*Albany, New York*) 11:330-31. [1 ref]

• ***Summary:*** "One of the most remarkable catalogs ever published has just appeared in Leyden [Netherlands]; it contains a priced list of the Japanese plants actually cultivated in the nursery of Siebold & Co., of that place" [Leyden].

"He also offers seeds of the Soja japonica, the real plant from which the sauce called Soy is prepared."

Note 1. Siebold & Co. was started by Philipp Franz von Siebold; he and Joseph G. Zuccarini first gave the soybean its present genus name, Glycine. They also gave the wild soybean its present scientific name *Glycine soja.* M.M. Busk in 1841 wrote: "Dr. Von Siebold's Japanese museum [at Leyden] is said to be the finest in Europe..." For details on Siebold's life and work as a botanist see: Bretschneider (1882–*Botanicon Sinicum,* Part I, p. 126-27).

Note 2. This is the earliest document seen (March 2002) stating that the soybean was being sold in a seed catalog.

Note 3. First cited by Prof. Ted Hymowitz, Univ. of Illinois. Personal communication 1 Jan. 1997.

To continue: "As is well known, the Dutch monopolize the intercourse of Europeans with Japan, the country most in climate like the British Isles, but resplendent with a vegetation infinitely richer and more varied. Camellia, Cephalotaxus, Cryptomeria, Aucuba, Chimonanthus, Clematis, and Pyrus Japonica, sufficiently indicate how beautiful and hardy is the flora of Japan, to say nothing of Weigela, Forsythia, and the whole race of Moutans. Availing themselves of their commercial privileges, the Dutch have sedulously occupied themselves with the acquisition of everything most worthy of introduction to Europe, and the result is already a total number of 3 or 400 species and varieties offered for sale by the firm mentioned above. Of so curious an assemblage, we are sure that a brief account will be interesting to all lovers of gardens. We shall, however, confine our remarks to what are represented to be hardy races."

These include conifers (4 species) and sycamores (2). "Fruit trees comprehend a very early apricot called *Armeniaca Mume* [later *Prunus mume*], whose early rose-colored flowers are extremely ornamental, while the fruit, owing to the firmness of the flesh, is particularly well adapted for preserving [as *umeboshi* in Japan]... Mention, moreover, is made of a Japanese variety of Peach." Also described are many small flowering trees and shrubs, and some climbing shrubs. "Finally there is a considerable number of herbaceous plants, among which are included several new kinds of *Funkia* and *Lilium,* a Burdock called *Lappa edulis,* the roots of which are eaten like Scorzonera; a couple of Irises; *Polygonatum japonicum* whose roots are a substitute for asparagus; a *Polygonum* called *Sieboldi,* recommended as a green crop for cattle food, as an excellent bee plant, &c. &c.; and the Chinese Yam, which M. Siebold calls *Dioscorea opposita,* and to the hardiness of which he fully testifies." Soja japonica is then mentioned.

"Some of these novelties have already been introduced into England, and are offered for sale by E.G. Henderson. Who will be the first to advertise these interesting articles in America?"

Note 4. This is the earliest English-language document seen (Dec. 2006) that refers to umeboshi salt plums, but it does not mention them specifically.

475. *American Agriculturist.* 1857. The Japan pea. 16(1):10. Jan. 7.

• ***Summary:*** "This we have not yet tried as our first impressions were not greatly in its favor. We first saw them cooked, upon the table of a friend, and were not especially pleased with the flavor. As we have seen them growing, the large spreading branches, the hard woody character of the stalks, which unfit them for feeding, and the small number of peas in the pods, seem to be against their adaptedness to general cultivation. Others are better pleased with them. Mr. Thos. R. Joynes of Accomac, Virginia, writes as follows: 'On the 9th of April I planted a row of about 20 yards in length, the seed about 3 inches apart in the row... They were gathered about Oct. 1st, and yielded about 6 quarts of beautiful plump, rich, yellow or cream-colored peas. I think they would have yielded more had they not been sown so thickly...

"'As to their eating qualities, I can only say that I have just risen from the table at which I made my first trial of them, and I want nothing better. They make a rich and most excellent dish–inferior to no bean or pea I have ever seen.'

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"We think, on further trial, Mr. Joynes will be less pleased with their eating qualities–at least such has been the experience of most of those who have attempted to use them for culinary purposes... We first saw them cooked, upon the table of a friend, and were not specially pleased with the flavor."

Note 1. This is the earliest English-language document seen (Sept. 2004) that uses the word "cream" or the term "cream-colored" to describe the color of soybean seeds.

Note 2. It is not clear whether the soybeans were consumed as green vegetable soybeans or whole dry soybeans.

Note 3. This periodical was published (in Jan. 1857) by Orange Judd, 191 Water-st., New York. Terms: One dollar a year in advance.

476. Abell, B.Z. 1857. [Japan peas]. *Letters and Reports of the Agricultural Division of the Patent Office, 1839-60.* Vol. 15. p. 259-60. Jan. 15.

• ***Summary:*** "Hon. Charles Mason. Dear Sir. Of the Japan Peas I received, I planted eight, from which, I gathered about one quart of peas fit for planting. They received no extra care. Our mode of cooking is, to soak them, in warm water over night, & boil next day. By this method, we have an agreeable substitute for green peas thrwo? [sic, throughout?] the fall, winter, and spring.

"Cooked in this way, they are, in taste, very much like the Lima Bean. By most who have tried them here they are thot [sic, thought] to be a valuable addition to the list of garden products. They will stand quite a frost without injury.

"Should you have at your disposal a few seeds of the Chinese Sugar Cane (Sorghum Sacc?) & of the Improved King Phillip Corn, it would give us pleasure to try them, distribute, and report concerning their adaptability? to our soil, which, as you are aware?, is upon the sandstone that underlies the coal [illegible word]."

First cited by Graff 1949. Address: Welchfield, Geauga Co., Ohio.

477. Coy, Edward L. 1857. Trial of seeds from the Patent Office. *Cultivator* (*The*) 5(1):29. Jan. Third Series.

• ***Summary:*** "Japan pea–...Last spring I received from the Patent Office a package of the seed. I had heard and read so much in its favor, that I was desirous of raising all I possibly could from what little seed I possessed." He planted the seeds on May 1. The plants grew well but "the peas were not 'forthcoming.' At the time of our first heavy frost (Oct. 15) they were about half grown. The frost did not kill them at once; but they did not grow any after it. The experience of others in this section agrees with mine, as to their adaptation to the climate of Northern New York. A few of the plants were exhibited at our County Fair that were as green as mine. In fact, I doubt if they can be ripened (unless under glass) as far north as this." Address: West Hebron, New York.

478. Read, John. 1857. [Japan peas]. *Letters and Reports of the Agricultural Division of the Patent Office, 1839-60.* Vol. 15. p. 795-98. Feb. 12.

• ***Summary:*** "Chas. Mason... The Japan Pea I have cultivated for three years very successfully and? this? distributed very generally and are? proved suited our climate.

"They are an excellent article of diet in winter use. From personal experience they are the most productive article I ever cultivated.

"I send you by this day's mail a few samples of the above [illegible word]."

"Japan and Oregon Peas and Pea? [illegible word] Hoo Sung Seed? I can send you some more Japan Peas & some Mexican Turtle South Beans if you wish."

Note 1. First cited by Graff 1949, p. 111. The binding of this volume obscures some of the text of this letter.

Note 2. Piper (1914, p. 551) states that an early name for the mung bean in the USA was the "Oregon pea under the erroneous idea that it came from that region." Address: Huntington, Pennsylvania.

479. Lindsley, W.D. 1857. [Japan peas]. *Letters and Reports of the Agricultural Division of the Patent Office, 1839-60.* Vol. 15. p. 1045-46. Feb. 28.

• ***Summary:*** "On the first day of May last, I planted one acre with the Jappan [sic] Pea, the product of a parcel of peas I received from the Patent Office in 1856... The pea, though planted on the same day, and in the same field [as the corn], came up in good order, but grew slowly owing to the backwardness of the season and drouth. In fact they did not all ripen? before the fall of frost, but the yield was abundant. I harvested 2 square rods & procured sixty lbs. The yield per acre 4,800 lbs. I planted the peas with my corn drill in rows 2? ft apart & gave them the same attention I do my corn. After the pea had become dry, I allowed my hogs to harvest them at their leisure. I was surprised at the avidity they ate them. I then turned in my sheep, & finally my cattle & horses, & all ate them with a relish, that satisfied me, that it is one of the most valuable plants the farmer can raise. The main stalk grows from 3 to 4 ft high & remains? erect? for months after the pea is ripe & not a pea? is lost when sheep & hogs do the harvesting. The pod does not open like other peas when ripe, or frosted. I believe them to be superior to corn for fattening sheep, & equally as good for hogs. I shall raise acres? the coming season? for my stock to feed upon the coming winter. Respectfully..."

Note 1. This is the earliest document seen (July 2002) concerning the feeding of soybeans or soy products to sheep.

Note 2. This is the earliest document seen (July 2002) concerning the feeding of soybeans to cattle, but it is not clear whether these were dairy cows or beef cattle.

Note 3. First cited by Graff 1949. Address: Sandusky, Ohio.

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480. Jefferson, -. 1857. Chinese sugar cane (Letter to the editor). *American Cotton Planter and Soil of the South* (*Montgomery, Alabama*) 1(9):264. Sept.
• ***Summary:*** A letter to the agricultural editor and proprietor, N.B. Cloud. M.D. "Dr. Cloud–Dear Sir: I here send you my experience in regard to the cultivation, and the value, as a field crop, of the following forage plants, recently introduced among us, to-wit: Chinese Sugar Cane, Chinese Japan Pea, and Peabody's Prolific Corn. All of these I have planted this year, and it is gratifying to me to say that they were all what they were recommended to be. The Chinese cane though, I think is far superior to the others as a field crop..."

"As regards to the Japan Pea, I can say that they are superior to any that I have yet seen.–They are very prolific and will make more food off one acre than any other Pea will take off two."

Note 1. This is the earliest document seen (June 2011) concerning soybeans in Mississippi, or the cultivation of soybeans in Mississippi. Since Mr. Jefferson refers to soybeans as "Japan Peas" he may have obtained them from the Agricultural Division of the Patent Office.

Note 2. This is the earliest document seen (Jan. 2003) stating that the soybean is a good forage crop.

Note 3. This journal was formed by the merger of two others. Volume 1 of this journal equals Vol. 5 of *Cotton Planter* and Vol. 7 of *Soil of the South.* Address: Hamburg, Mississippi.

481. Garber, J.B. 1857. Remarks on some of the new Chinese plants. *Horticulturist, and Journal of Rural Art and Rural Taste* (*Albany, New York*) 12:77-79.
• ***Summary:*** Page 77: "Japan Pea.–We are also indebted to the Celestial Empire for this plant, now pretty extensively disseminated, and I have often been asked the question: What it is good for? If you will soak them over night in warm water, and, next day, give them a good cooking, serve them up as Lima beans, and do not say they are superior to beans, then I can only say, 'tastes differ.' The Pea is raised with less trouble, and produces more abundantly in all soils and all seasons than Lima beans. Last spring, we received two new varieties of the Japan Pea via California, nothing different, however, except in color, one being green, and the other red."

Note: The Japan Pea is the soybean. Benjamin Franklin Edwards brought the ones from California. Address: Columbia, Pennsylvania.

482. Smith, J. Jay. 1857. Editor's table. *Horticulturist, and Journal of Rural Art and Rural Taste* (*Albany, New York*) 12:287.
• ***Summary:*** Page 287: "The Japan Pea has various common names. It is, as you suppose, the *Soja hispida* of botanists. Many species of *Cajanus* are used for the same purpose as this, and occasionally get the same common name. Our correspondent recommends it very highly as a productive, easily cultivated, and excellent family vegetable." Address: Philadelphia, Pennsylvania.

483. Osmond, A.P. 1858. [Japan peas]. *Letters and Reports of the Agricultural Division of the Patent Office, 1839-60.* Vol. 20. p. 26. Feb. 13.
• ***Summary:*** "D. Sir: A friend gave me last spring 3 Japan Peas which I planted in my back yard in the city of Wilmington, Del. They vegetated nicely, but one plant was by accident broken off. The others grew and matured and without any cultivation the two peas produced 800 well formed peas. As this is a better result than I had seen I thought I would inform you of the result.

Note: This is the earliest document seen (March 2011) concerning soybeans in Delaware, or the cultivation of soybeans in Delaware. This document contains the earliest date seen for soybeans in Delaware, or the cultivation of soybeans in Delaware (spring 1857). First cited by Graff 1949. This letter has text on both sides of the page, but bears the single page number 26. Address: Canterbury, Kent Co., Delaware.

484. *Nautical Magazine and Naval Chronicle* (*The*)*: A Journal of Papers on Subjects Connected with...* 1858. Hakodadi. 27(4):179-85. April. See p. 185.
• ***Summary:*** From Commodore Perry's Voyage: "The town of Hakodadi or Hakodate, lies on the southern coast of Yesso" [now named Hokkaido].

"The shops in Hakodadi generally contain such goods as are of a cheap sort, and adapted to the restricted wants of a poor population. The stock is made up of a miscellaneous assortment of coarse thick cottons, inferior silks, common earthen and China ware, lacquered bowls, cups, stands and chopsticks, cheap cutlery, and ready-made clothing. Furs, leather, felted cloths, glass ware, or copper articles, are rarely seen; nor are books and stationary very common. The provision shops contain rice, wheat, barley, pulse, dried fish, seaweed, salt, sugar, saki, soy [sauce], charcoal, sweet potatoes, flour, and other less necessary articles..."

485. Perry, Matthew Calbraith. 1858. Japan opened: Compiled chiefly from the narrative of the American Expedition to Japan in the years 1852-3-4. London: The Religious Tract Society. viii + 296 p. See p. 197, 248.
• ***Summary:*** This book is an abbreviated version of: Hawks, Francis L. 1856. *Narrative of the Expedition of an American Squadron to the China Seas and Japan, Performed in the Years 1852, 1853, and 1854, under the command of Commodore M.C. Perry, United States Navy,...* New York: D. Appleton and Co.; London: Trubner & Co. viii + 296 p.

"Soy" sauce is mentioned twice: Page 197: "Together with each dish was a supply of soy or some other condiment,

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while throughout there was an abundant quantity of saki–the Japanese national liquor–a sort of whisky distilled from rice."

Page 248: In Hakodadi [Hakodate] "The provision shops contain rice, wheat, barley, pulse, dried fish, seaweed, salt, sugar, saki, soy, charcoal, sweet potatoes, flour, and other less necessary articles, and all apparently in abundant quantities."

486. Simmonds, Peter Lund. 1858. A dictionary of trade products, commercial, manufacturing, and technical terms: with a definition of the moneys, weights, and measures of all countries, reduced to the British standard. London: G. Routledge & Co. viii + 422 p. 18 cm.

• ***Summary:*** Two entries are related to the soybean: "Mico, mijo [miso], a vegetable butter or solid oil, made from *Soja hispida,* in Japan."

"Soy, a sauce or flavoring originally made in the East; and said to be produced from a species of *Dolichos* bean." Note: the author is apparently unaware that the sauce is made from soybeans.

The Preface begins: "The present is especially a practical, commercial and industrial age: newspapers, lecturers, popular authors, all lend their efforts towards the diffusion of sound and useful knowledge among the masses; and the commercial and industrial element has become the leading feature of instruction."

Also discusses: Almond oil, almonds, amande, arachis oil ("generally known in commerce as nut oil"), catsup (non-soy; "Catsup, Ketchup, a seasoning or sauce for meat, made of mushrooms, tomatoes, walnuts, or other vegetable substances), earth-nut (see ground-nut; in America called pea-nut), flax, flax-seed, gingelie (Indian name for *Sesamum orientale* or teel seed), gluten, glutinous, ground-nuts (from which oil is expressed), hemp (a fibre), hemp-seed (from which oil is expressed), ketchup (see catsup), lima-bean ("the *Phaseolus limensis,* an esteemed kind of pulse cultivated in the tropics; the perennial kidney-bean, *P. perennis"*), linseed, linseed-meal, linseed-oil, oil (fixed or fat oils vs. volatile or essential oils; solid fats vs. fluid fixed oils), oil-cake ("the marc or refuse after oil is pressed from flax-seed, rape-seed, coconut pulp, &c..."), pea-nut (an American name for the ground-nut), sesame (a plant from which oil is expressed; in India called Gingely, Gingelie, teel or til), siritch (Arab name for sesame oil), soya (see sherbet).

Note 1. This is the earliest English-language document seen (Jan. 2009) that gives "Phaseolus limensis" as the scientific name of the lima bean.

Note 2. Peter L. Simmonds lived 1814-1897. This book is dedicated to Dr. Lyon Playfair, C.B., F.R.S., President of the Chemical Society, etc. Address: F.R.G.S., F.S.S., author, 8 Winchester St., Pimlico [southwest London, England].

487. Dagregister gehouden door de Nederlandse Commissaris in Japan vanaf 17 augustus 1658 tot februari 1859 [Journal with a shipment register by the Director of The Netherlands in Japan from 17 Aug. 1658 to 16 Feb. 1859]. 1859. Deshima, Japan. Jan. 4. Unpublished manuscript. [Dut]

• ***Summary:*** (Freight carried by other ships). Departure of the American clipper *Ann* with captain "Kanto," sailing to Shanghai, China, [from Japan]. Her cargo includes 5,000 piculs pit coal, 100 barrels rapeseed oil, 100 piculs camphor, 12 barrels soy [sauce] (*soja*), plus lacquerware and porcelain.

Bibliographic reference in Dutch: NA, NFJ 1621, dagregister (4-1-1859). On microfilm.

Location: Nationaal Archief, Den Haag, De Archieven van de Nederlandse Factorij Japan (NFJ); toegangsnummer 1.04.21; inventaris nummer 1621 [National Archives, Prins Wilhem Alexanderhof 20, The Hague. www.nationaalarchief.nl. The Archives of the Dutch Factory in Japan (NFJ); access number 1.04.21; record number 1621. The pages are not numbered].

Note: A clipper is a fast sailing ship, especially one with long, slender lines, an overhanging bow, tall masts, and a large sail area. Address: Deshima, Nagasaki, Kyushu, Japan.

488. *New-York Daily Tribune.* 1859. Baring Brothers & Co.'s circular. Sept. 2. p. 7.

• ***Summary:*** "London, Friday, Aug. 19, 1859–5 p.m. Our Colonial and Foreign Produce markets continue very quiet, and prices generally are without material alteration."

"Drugs–262 cases Calcutta 30 casks Bombay Castor Oil chiefly sold,... 100 kegs Japan Soy [sauce] bought in at 2/."

489. Cornwallis, Kinahan. 1859. Two journeys to Japan, 1856-7. 2 vols. London: Thomas C. Newby. Vol. 1, vii + 340 p.; Vol. 2, 340 p. Illust. No index. 19 cm. Facsimile edition reprinted in 2002 by Ganesha Publishing (London) and Edition Synapse (Tokyo). Series: Japan in English, Vols. 4-5.

• ***Summary:*** This book appeared five years after the Perry Expedition to Japan captured the interest of the western world. Cornwallis, a young British writer, took advantage of this interest by writing this book–which was later exposed as a forgery (See: Yamigawa, Joseph K. 1941. "Cornwallis Account of Japan a Forgery and its exposure. *Monumenta Nipponica* 4(1):124-32. Jan.). He drew his material partly from the numerous authentic books about Japan already widely available, and partly from his imagination.

Cornwallis said that he first arrived in Japan in July 1856 on an American sloop of war which landed in the harbor of Shimoda. He immediately becomes enchanted by everything about Japan, and depicts it as an almost ideal place.

During a visit to Simoda [Shimoda], he had lunch at the temple of the Russians: "After we had discussed to our satisfaction the birds and the fishes, the rice and the soya, the latter the finest fish sauce in the world, we wound up by eating fruit and drinking saki [sake],..." (p. 34).

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The next morning, on board ship after the usual Japanese breakfast, a Russian came on board. "He laughed at our complaints [about the food, and said] that we had better, for our own peace, make up our minds to rest content with a good supply of rice, soya, saki, and a stray chicken or fish now and then, so long as we remained at our present anchorage" (p. 35).

His 2nd journey to Japan supposedly took place in Aug. 1857. This time he was on board an American steam-frigate that went from Shanghae [Shanghai, China], to the "Japanese island of Lew-kew" [in the Ryukyu Islands, also spelled Luchu or Loochoo; a chain of islands extending 600 miles from Taiwan to Kyushu, Japan].

Part / Volume II contains a long history of European exploration of and visits to Japan. With his host, Mr. Noskotoska, he visits Nagasaki and the old Dutch trading post there he calls "Desima" [Dejima, Deshima]. During a visit in Nagasaki to the Noskotsuka home, where he is fascinated by the women (who do not feel embarrassed to be seen naked after bathing) and treated like a king, he was invited to "the mid-day repast" at home. "Here were four small lacquered tables, on each of which lay the accustomed ivory chopstick, the small porcelain cup for tea, and the larger one of lacquer-work for saki [sake, saké], the small glass cruet of soy [sauce], the porcelain spoon, and the silver fork" (p. 105). Address: [England].

490. Oliphant, Laurence. 1859. Narrative of the Earl of Elgin's mission to China and Japan in the years 1857, '58, '59. 2 vols. Edinburgh and London: William Blackwood and Sons. xiv + 492 p. Illust. (coloured lithographs). Map.
• ***Summary:*** Page 60: In Nagasaki, they visit a tea-garden high on a hill above the city. "We have long since taken off our shoes, and now squat in a circle on the floor, and gaze with curiosity, not unmixed with alarm, at the display before us. There is raw fish thinly sliced, and salted ginger; there are prawns piled up with a substance which in taste and appearance very much resembles toffy; there are pickled eggs and rock-leeches, and pieces of gristle belonging to animals unknown, to be eaten with soy [sauce];... but still the experiment is hazardous, and we are relieved at the sight of a bowl of rice as a safe *piece de resistance."*

Pages 67-68: In Macao, at a Chinese restaurant, the author "managed, by the aid of chopsticks, to make a very satisfactory repast off eggs a year old preserved in clay, sharks' fins and radishes pared and boiled into a thick soup, *bêche de mer* or sea-slugs, shrimps made into a paste with sea-chestnuts, bamboo roots, and garlic, rendered piquant by the addition of soy [sauce] and sundry other pickles and condiments, and washed down with warm samshu in minute cups. Dishes and plates were all on the smallest possible scale, and pieces of square brown paper served the purpose of napkins."

Pages 398-99. The author found it very difficult to obtain any statistics about Tientsin or its trade. He finally found a respectable, local Chinese merchant. "The theme upon which he dwelt most feelingly was the excessive poverty of the city of his abode. It exported absolutely nothing, he averred... Among its imports from the south are dried fruits, sugar, glass ware, camlets, woollens [woolens], opium, &c., in small quantities. Numerous cargoes of [soya] beans and bean-cakes are brought over from Neu-chwang [Newchwang] and the Manchurian coast."

In Appendix II a table (p. 491) shows "Trade returns between Shanghai and Japan." Imports from Japan from 1st Jan. to 30th June 1859. Isinglass (Kanting) 1,551 peculs [piculs]. Seaweed, all kinds, 61,561 peculs. Soy [sauce] 562 peculs. Address: Private secretary to Lord Elgin.

491. Sakato, Shi. 1859. Ryôri chôhô-ki [Records on convenience cooking]. Japan. 60 p. Unpublished manuscript. Japanese summary by Kawakami 1978, p. 177. [Jap]
• ***Summary:*** Contains many recipes for tofu and miso, plus amazake and shirozake (lit. "white sake"), hishio, natto, and Kinzanji miso.

492. Steinmetz, Andrew. 1859. Japan and her people. London and New York: Routledge, Warnes, and Routledge. xv + 447 p. Illust. No index. 22 cm. 2nd ed. 1860. Facsimile edition reprinted in 1973 by Scholarly Resources, Inc. (Wilmington, Delaware). Reprinted again in 2002 by Ganesha Publishing (London) and Edition Synapse (Tokyo). Series: Japan in English, Vol. 1. [30 ref]
• ***Summary:*** The author of this book has apparently not been to Japan; he compiled it from more than 30 major works on Japan (see p. xi-xii). The book is divided into two parts and 7 chapters. The 35 old illustrations add to the color of the book.

In Chapter 3, "Palaces, temples, castles, towns, houses, gardens, vehicles, etc." we read (p. 175): ";... all sorts of vegetables which the season affords, and innumerable other dishes peculiar to Japan, made of seeds and powdered roots, and dressed in many different ways. The common sauce for these and other dishes is soy mixed with saki."

In Chapter 6, "Social and domestic life," is a long quotation from Kaempfer (1727) describing the great yearly festival held on the third day of the third month [*hina matsuri,* dolls' festival]. "... cakes made of mugwort and rice, which they call *futsumotzi* [*sic, kusa mochi*], that is, mugwort cakes, are prepared after the following manner:–The mugwort leaves [are finally] "reduced to powder, and mixed with boiled rice and *adsuki,* or red beans, coarsely powdered, and so baked into cakes" (p. 273).

"A Japanese feast usually consists of seven or eight courses... As whets, servants of both sexes, from time to time, hand round soy [sauce], other sauces, pickled or salted ginger, and small, nicely-cut morsels of salted fish, which are all eaten with Chinese chopsticks" (p. 274-75). Andrew

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Steinmetz lived 1816-1877. Address: Esq,. of the Middle Temple, Barrister-at-Law [England].

493. Timbs, John. 1859. Hints for the table: or, The economy of good living. London: Kent and Co. x + 184 p. See p. 80-81, 93. Illust. No index.

• ***Summary:*** The chapter on "Sauces and Gravies" states (p. 80-81): "Nine-tenths of the ketchup sold by grocer-oilmen is a vile compound of liver and the roe of fish, seasoned with pepper and other condiments. If you wish the article genuine [apparently mushroom ketchup], procure the mushrooms, and make it yourself. "India Soy is difficult to purchase genuine: it should be made from an Indian plant called Dolichos soja, or soya; but treacle and salt are the basis of the soy ordinarily sold.

"'Many persons,' observes Mr. Dobell, in his *Travels in China,* 'have thought that gravy was used in preparing soy; but this appears not to be the case, the composition being entirely a vegetable one, and made from beans. Japanese soy is much esteemed in China; probably it is made with a particular bean.* In China the consumption of soy is enormous: neither rich nor poor can dine, breakfast, or sup without soy; it is the sauce for all sorts of food, and may be described as indispensable at a Chinese repast.'" (Footnote: *"Now that Japan is open to our trade, we hope to receive Japan soy with greater certainty").

The chapter on "Salads" notes (p. 93): "The following are excellent salad ingredients: essence of anchovies, soy [sauce], sugar, truffles, flavoured vinegars;..."

Note: The name of the author, J. Timbs, does not appear on the title page.

494. *Gardener's Monthly.* 1860. Questions and answers. 2(7):212. July.

• ***Summary:*** Page 212: "Lady or calavan pea–J.J.F.–The pea you send is the Japan pea, or *Soja hispida,* a popular bean with the Japanese, of which the celebrated Soy soup [sic, Soy sauce] is made."

Note: This is the earliest document seen (June 2008) that refers to the soybean as either the "Lady pea" or the "calavan pea."

495. Schroeder, Georg. 1860. Handbuch für Zollbeamte und Steuerpflichtige: ein alphabetisch geordnetes Waarenverzeichniss,... [Handbook for customs officers and tax collectors: an alphabetical list of goods...]. Cassel. 528 p. See p. 101. 8vo. [Ger; Eng]

• ***Summary:*** The entry for *Japanische Soja* (Japanese soy) states (p. 101): a very strong kind of Arrak or Branntwein from Japan [sic].

Note: This is the earliest German-language document seen (April 2012) that uses the term "Japanische Soja" to refer to soy sauce or to Japanese soy sauce.

The entry for *Soja, Soya, Soy* states (p. 218): An Indian liquid for the seasoning of foods. Address: Zoll-Inspektor.

496. Unger, F. 1860. On the principal plants used as food by man. *Report of the Commissioner of Patents, Agriculture.* p. 299-362. For the year 1859. See p. 318. Translated from the German.

• ***Summary:*** Page 318 states: *"Soja hispida,* Monch. (*Soja japonica,* Sav.), or Soy, from Japan, is cultivated in Southern Asia and Europe.

Note 1. The author is using the word "Soy" to refer to the soybean plant rather than to soy sauce.

"What the previously mentioned legumens [legumes] are to the colder portions of the earth the Ground nut (*Arachis hypogaea,* L.) is to the warmer zone. This plant was known neither to the ancient Egyptians and Arabians nor to the Greeks. The latter certainly did not understand this plant under the name of *arachos* [written in Greek letters], which was probably a species of *Vicia.* It has been cultivated for a long time on the west and east coast of Africa, and only quite recently introduced into the Mediterranean regions. A Hindostan [Hindustan] name alone exists for it in Asia. In modern times only, it has been cultivated generally in China and Cochin China, which countries it has reached in some unknown way. On the other hand, six species of *Arachis* certainly belong to the *Flora* of Brazil, and the older authors also mention the cultivation of *Arachis hypogaea* under the names of *Mandubi, Anchic,* and *Mani,* on which account there is little reason to doubt its American origin. The thick tuberous seeds are frequently eaten raw, but are very palatable when roasted. The oil from it is excellent, and is much esteemed in India."

Also discusses "the bean (*Vicia faba,* Linn., *Faba vulgaris,* Mönch.)," lupines (*Lupinus hirsutus, L. albus,* and *L. termis*), lentil (*Ervum lens*), pea (*Pisum sativum*), Chick-pea, Flat-pea (*Lathyrus sativa*), and kidney bean (*Phaseolus vulgaris*) (p. 316-17).

Note 2. This is the earliest English-language document seen (June 2008) that uses the term "Chick-pea" (or "chick-pea" or "chick pea"). We read: "The Chick-pea (*Cicer arietinum,* L. {Greek name}, Theophrastus), is an important kind of pea to the East. The Jews, Greeks, and Egyptians cultivated it in ancient times, and it was also used as an object of devotion, at an early period, even in India, as is shown by the Sanscrit [Sanskrit] names. The common class of Greeks even now make use of it, both raw and roasted, during the winter months, and employ it as a substitute for coffee. It is also cultivated frequently, at the present day, in Egypt, as far as Abyssinia, and, according to Th. Kotschy, is one of the most generally distributed of cultivated plants on the heights of Lebanon as well as in Spain. This plant is represented as almost growing wild in the Caucasian countries, in Greece, &c, and is also found run wild here and there in the fields of Middle Europe." It was "introduced into the model farm of Charlemagne" (p. 317). Address: Dr.,

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Germany.

497. Viridet, Marc. 1861. Circulaire de la Section d'Industrie et d'Agriculture de l'Institut Genevois [Circular of the Section of Industry and of Agriculture of the Geneva Institute]. *Bulletin de l'Institut National Genevois* 10(21):80-83. March. [Fre]

• ***Summary:*** This circular, published in this periodical, begins: "The Section of Industry and of Agriculture of the Geneva Institute continues to invite its members, as well as agriculturists and amateurs in our Canton, to try cultivating the following plants, whose introduction and popularization would be advantageous. Nineteen plants are described briefly.

No. 7 is: The soybean of Japan (*Soja japonica* {*Soja du Japon*}), a type of bean whose seeds and pods [as green vegetable soybeans] are good to eat. It succeeded very well in the Canton, where Mr. James Fazy has cultivated it successfully for three years in a row at his field in Russin.

Note 1. Russin is a municipality in the canton of Geneva, Switzerland, at the far southwestern tip of the Canton (46º11' north latitude), reaching deep into France. This latitude is about the same as that of central Maine or northern Minnesota–thus, quite far north for soybeans to bear seeds. Some plants bore 90-132 pods (p. 82).

Note 2. This is the earliest document seen (Jan. 2010) concerning soybeans in Switzerland, or the cultivation of soybeans in Switzerland. This document contains the earliest date seen for soybeans in Switzerland, or the cultivation of soybeans in Switzerland (before March 1861). The source of these soybeans is unknown.

Note 3. This is the earliest (and only) French-language document seen (Jan. 2010) that uses the term *"Soja du Japon"* (regardless of capitalization or hyphenation) to refer to the soybean. Address: President of the Section, Geneva, Switzerland.

498. Hodgson, Christopher Pemberton; Hooker, William Jackson. 1861. A residence at Nagasaki and Hakodate in 1859-1860. With an account of Japan generally. With a series of letters on Japan by his wife. London: Richard Bentley. xxxii + 350 p. Illust. No. index. 19 cm. Facsimile edition reprinted in 2002 by Ganesha Publishing (London) and Edition Synapse (Tokyo). Series: Japan in English, Vol. 9. [20* ref]

• ***Summary:*** Soy is not mentioned in the body of this book. However near the end is a special section (p. 327+) titled "Catalogue of Japan plants, systematically arranged, communicated by Sir William Hooker." It is compiled from many sources, including Dr. Von Siebold and Prof. Zuccarini, Dr. Asa Gray, etc. Under Leguminosæ (p. 322) are listed: *"Soja hispida,* Moench. *Glycine Soja,* S. & Z." Address: Late British consul to these ports.

499. Iinuma, Chôjun [Yokusai]. 1861. Sômoku zusetzu [Sômoku zusetsu, or an iconography of plants indigenous to, cultivated in, or introduced into Nippon (Japan). 20 vols.]. Japan. See vol. XIII, p. 18-21, 37, 126 (No. 17), 129 (No. 32). 27 cm. [Jap]

• ***Summary:*** This botanical contains 1,215 illustrations (plates), in black and white. The author's name is also romanized as Ynouma Tsiodjoun, and the title as Sô mokou Zoussetz. Each sheet of paper in this book is a leaf–folded only once (called *fukurotoji* in Japanese). Both sides of each folded sheet have the same leaf number.

In vol. XIII, the section on soybeans is on leaves 17-20. There are illustrations on leaves 18-20. In the section titled "beans" (*mame,* in katakana), is a section on soybeans (*O mame*). In Japanese, the scientific name of the plant is *Dolichos soja* (pronounced "Dorikosu soya" in Japanese); it is also called *Japansche Slingerboon* (probably a Dutch term, pronounced "Yappanse Suringeru-boon" in Japanese). The description starts on the back (verso) of leaf 17 (=17b). The soybean has 15 varieties, each based on the seed shape and color. For each variety: At the top of the page, two simple color illustrations (line drawings) show the shape, color, and hilum size and location. Below that is the name, usually written in katakana (phonetic), but with occasional Chinese characters. Remember that *mame* means "bean" in Japanese: Gogatsu-mame (5th month bean), Wase-mame, Nakate-mame, Okute-mame, Maru-mame, Shiroteppo-mame, Kuro-mame (black soybean), Kuroteppo-mame, Goishi-mame (Go = Chinese chess. Ishi refers to the "stones" moved in that board game), Aomame (green soybean), Kage-mame, Aka-mame (red soybean, with 4 additional forms and colors), Chamame (brown soybean, with 2 additional forms and colors), Kurokurakake-mame, Akakurakake-mame, Fuiri-mame (uzura-mame–speckled).

Note 1. This is the earliest document seen (Oct. 2004) that gives the names of various Japanese soybean types or varieties such as *Nakata-mame, Okute mame,* etc.

Note 2. This is the earliest document seen (Oct. 2013) that describes the color of numerous different soybeans.

Note 3. This is the earliest document seen (Oct. 2004) that mentions red soybeans, or that uses the term *Aka-mame* to refer to red soybeans.

Also in vol. XIII, on the back of leaf 36 is a description of the wild soybean (*tsuru-mame*) followed on leaf 37 by an illustration of the *tsuru-mame* plant, with flowers and seeds. Vol. XIII stops at folio 55.

Franchet and Savatier (1875, p. 108) state: For the wild soybean–*Glycine soja* (Sieb. et Zucc) see vol. 13, fol. 37?, under *Tsourou Mame.* For the cultivated soybean–*Glycine hispida* (Moench, Meth.) see vol. 13, fol. 18 and 21.

For the adzuki bean, *Phaseolus radiatus,* see vol. 13, fol. 30. Under: *Tsourou adzou ki* and *Boundô, Ya enari.*

For kudzu, *Pueraria thunbergiana,* vol. 13, fol. 26, under *Koutsou.*

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This book was cited by Maximowicz in 1873 (p. 398; says "Soo bokf. XIII 18-21, 37").

Mène (1885) says of this book: The soybean is shown in vol. XIII, p. 126, No. 17, under the name *O mame;* in No. 18 on the same page its name is given as *Soja hispida,* var. *lanceolata* and *Midzu-kugusi.* As for the wild soybean, *Glycine Soja* of Siebold and Zuccarini, it is classed under the names *Tsuru-mame* and *Nô-mame* in vol. XIII, p. 129, No. 32.

Iinuma lived 1782-1865. Note that all editions of this work were published posthumously.

Talk with E. Ito of the Japanese section of the Library of Congress (LOC). 2004. Sept. 21. LOC has two copies of this book. One is in the rare book cage of the Asian Division; it is fragile and cannot be photocopied. This first edition was published as follows: Vols. 1-5 in 1856. Vols. 6-15 in 1861. Vols. 16-20 in 1862. Address: Japan.

500. Smith, George. 1861. Ten weeks in Japan. London: Longman, Green, Longman and Roberts. xv + 459 p. Illust. Index. 23 cm. Facsimile edition reprinted in 2002 by Ganesha Publishing (London) and Edition Synapse (Tokyo). Series: Japan in English, Vol. 11. [20* ref]

• ***Summary:*** This is a very interesting book by a careful observer of Japanese culture. In 1860 he stayed mostly in Nagasaki, Yokuhama (Yokohama), and Yeddo (Edo, later Tokyo). Though he has long experience living as a Christian missionary and bishop in China and Hong Kong, he generally admires the Japanese, yet repeatedly calls them "pagans."

While walking among the shops in Nagasaki, he notes (p. 27): "Soon again we pass the spacious warehouses of the dealers in sauces, condiments and soys, where large jars lie filled with decoctions of pulse and rice, and are left to ferment and become mellow with exposure and age."

In the countryside around Yeddo he observed (p. 235): "The large quantities of rye grown in these parts were explained to us as being used in the manufacture of the celebrated Japanese soy; while rice is the ordinary material employed in making the universal spirituous beverage so often alluded to under the name of sakee" (saké, sake). Note: The word "sakee" appears in at least 19 places in this book.

"The secluded Chinese community who reside in Nagasaki compose a trading guild and factory, subjected for ages to all the past vexatious restrictions experienced by the Dutch." They generally number about 200 persons (p. 32).

The chapter on "Nagasaki" begins (p. 78-79): "The Chinese form no unimportant part of the community in Nagasaki and are regarded with much dislike by the Japanese. In ancient times there was a free intercourse and unrestricted commerce between the two countries. But the change produced by former European difficulties and civil wars in the policy of the Japanese government towards the Spaniards, Portuguese and Dutch, was extended also to the Chinese mercantile strangers. After the severe edicts against the Christian religion and the prohibition of Christian books, the Chinese were detected importing Roman Catholic publications, and incurred the heavy displeasure of the government. In the year A.D. 1688 they were forcibly confined to a small settlement on the edge of the harbour, and subjected to the same restraints as those endured by the Dutch in the neighbouring scene of their imprisonment in Desima (Deshima). In the year A.D. 1780 the Chinese trading guild was removed a couple of hundred yards further back from the harbour to a Budhist [Buddhist] monastery... Rigidly guarded and watched, the Chinese factory shared with the Dutch the humiliation and inconvenience of a common captivity." The Chinese guild is now confined to their factory in the southern suburb, where they are isolated by Japanese guards. "Formerly the Chinese were not allowed to walk into the city... At present they amount to about four or five hundred persons, their number being diminished or increased by the departure or return of their junks trading to Japan." At present, three Chinese junks are annually permitted to make a trading voyage to Japan.

Mr. von Siebold first came to Japan in 1823 and remained in the Dutch factory at Desima until 1830, "devoting himself to literary pursuits and scientific researches into the botany and natural history of the country." While studying the "history and geography of Japan, he purchased and published a native map of the empire. In the days of the old regime this audacious act was easily made to bear the appearance of constructive treason; and the colonel was... imprisoned for thirteen months in a solitary room at Desima, and finally banished from the Japanese empire. After an absence of nearly thirty years he returned eight months ago, and has resumed at the age of sixty-four his studies and investigations respecting the country in the hope of being able after three or four years to perfect his observations and on his return to Europe to publish the results of his lengthened researches for the benefit of the scientific world." He now has a lithographed map of Nagasaki, and believes the population is a little over 60,000 (p. 208-09).

A table shows that 35 ships with cargo and 20 in ballast (empty) arrived in Nagasaki during the last 6 months of 1859. During the same period there departed 43 ships with cargo and 9 in ballast. Much of the trade is with China; items include sea weed for jelly, sea slugs for soup, peas and beans (p. 227-28).

Along the Tokaido, near Kanagawa: "The usual crops of wheat, barley, bean, peas and small quantities of still ungathered rape-seed, prevailed..." (p. 271). Address: D.D., Bishop of Victoria, Hong Kong.

501. Tilley, Henry Arthur. 1861. Japan, the Amoor, and the Pacific: With notices of other places comprised in a voyage of circumnavigation in the Russian corvette "Rynda," in

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1858-60. London: Smith, Elder and Co. xii + 405 p. Illust. No index. 22 cm. Facsimile edition reprinted in 2002 by Ganesha Publishing (London) and Edition Synapse (Tokyo). Series: Japan in English, Vol. 12.
• ***Summary:*** The section titled "Natural productions" (p. 93-95) states: "... the sauce called Soya, made from bean meal [sic] and salt, flavoured with herbs; different fermentations of rice known as saki [saké]; flax and a kind of nettle (*Urtica Japonica*) from which ropes are made;..."

"The chief food of the people is fish and rice, with eggs, vegetables, vermicelli, sea-weed, and pickled roots, cakes, and sweetmeats, to diversify the diet. Saki, tea, and sugar-water are the only drinks."

Japan is described (p. 56) as a "mysterious land so long a marvel to the rest of the civilized world."

The merchants and trading classes of Japan "are considered contemptible" [the lowest of the six classes] by higher authorities, government employees, and feudal retainers" (p. 61). The pariahs [outcasts] are all those whose business is with dead animals, in skinning them, &c. (p. 82).

Trade with foreign nations begins each year on July 1. Wax, camphor, and seaweed are exported in large quantities from Japan (p. 65).

"The Japanese belong to the Mongolian race, of which they may be considered the first class, as they are certainly superior to the Chinese, both morally and physically" (p. 83).

"Education is widely spread among the people, who are all able to read and write; the bonzes [Buddhist priests] being the chief instructors" (p. 89). Address: [Englishman].

502. Rural. 1862. The farm and garden: Illinois coffee. *Chicago Daily Tribune.* Feb. 25. p. 0_3.
• ***Summary:*** "Champaign, Feb. 17, 1862." Mr. Huffman, of Effingham, has sent specimens of the berries of this coffee... It is neither the *Okra* or *Japan Pea,* but a legitimate member of the pea family, and will doubtless prove as valuable for coffee as any of its congeners." Mr. Huffman sells 50 seed for a dollar, postpaid; this is $23 a pound or $138 per bushel.

"The plant grows about two feet high, and has a habit closely resembling the Japan pea,..."

"The Japan pea had a large run, and those who had seed for sale were, for a time, lavish in its praise, but it has thus far proved of no value."

Note 1. "Japan pea" was an early name for the soy bean in the United States.

Note 2. This is the earliest article on soy seen (Feb. 2005) in the *Chicago Tribune.*

503. Simon, Eugène. 1862. Sur un envoi d'animaux et de végétaux du Japan [On a shipment of animals and vegetables from Japan (Letter to the editor)]. *Bulletin de la Societe d'Acclimatation* 9:689-93. Aug. See p. 691-93. [Fre]
• ***Summary:*** This is a long letter addressed to the Secretary General of the Society for Acclimatization. A section titled *Sur la fabrication du soja* [On the production of soy sauce] (p. 691-93) states: Soja, or soy sauce, is a condiment which, in Japan, is consumed in considerable quantities. Some years ago it enjoyed marked success in America, England, Holland, and in India, where it had first been introduced. Today, the popularity remains only in America. The exportation is weak from the Indies, where it is replaced by another product, and the trade is nearly null in Europe because of the difficulty of making it cross the hot latitudes of the tropics via the tip of South of Africa.

It is nevertheless an excellent product, which could offer the culinary art a resource to be used in many ways, if one could obtain a quality as good as that in the country from which it comes. Actually, nothing could be easier. All one needs to do is to make it locally [in France]. This is a very important industry in Japan. There are more than 6 factories in the city of Nagasaki, and each occupies an average area of 700 to 800 square meters. In total, they produce 1.2 million kg of soy sauce for consumption.

Two types of grain are necessary to make soy sauce. One is a special type of bean called haricot Soja, or soybeans, of which 15 kg are included under #5 in the shipment I have just made to France. The other is ordinary barley (*orge,* not *ble,* wheat). One makes equal parts of beans and wheat. The beans are cooked in an equal volume of water and the wheat is roasted. Then one combines them in a big tub, into which one pours them little by little, while mixing them as much as possible with the aid of a large wooden spatula (pusher). When it all has the consistency of a rather thick paste, one places it in a wooden mold (koji tray) about 1.5 inches deep, 18 inches long, and 8 inches wide. In arranging this cake or this brick in the mold, one must make the upper surface slightly concave. These cakes are then transported into hermetically sealed chambers (the koji room), where it must ferment on shelves around the walls and in the center of the room. All the walls and the openings, with the exception of two window placed at the height of a man, from which one can watch the fermentation from the outside, must be carefully insulated or padded with straw, fixed in the middle of a lattice of bamboo or other wood.

The fermentation starts at the end of very few hours [no inoculation?] but if the temperature of the chamber is very low, one can stimulate the fermentation by placing a small brazier here. However, one must use the brazier only as a last resort; the effect is to brown the cakes. The fermentation lasts for 7 days, during which time one can enter once or twice into the chamber, in order to assure oneself that all is in good condition. When they are well made, the cakes must have a uniform yellowish gold tint. They are then removed and thrown into a large vat, 6 feet deep and 4.5 feet in diameter. Here one adds a saturated salt solution [*sel a chaux* = calcium oxide] in the proportion of 2 kg of solution to 1 kg of cake. One agitates it and mixes it gradually until the vat is full.

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One must then leave the vat alone for at least one year, but when one wants an extra fine soy sauce (*soja*), it must be left for 3 years. Regardless of the time, one removes the mash (*pâte*) from the vat, puts it in a hemp sack, or better yet, one of palm filaments, and carries it to the press. The soja which collects during the first turns of the press is the best quality. But because of the high price it would be able to demand, one would not find its sale assured. One therefore renounces this quality, except in the two capitals of Edo (Tokyo) and Miyako (Kyoto), where there live a large number of princes and rich people, who can conveniently pay for it.

In general, only two grades of soy sauce are made. The first is made from all the liquid which one is able to extract by the press, and which is then of a good medium quality. The second is obtained by mixing the presscake with salt water and letting it stand for 6 months; this is only sold to the poor. A jar of soja weighing 214.5 kg sells in Japan for 16-17 French francs. The ordinary soja of the first quality is a liquid of thick consistency and dark brown color. It is almost the only sauce for all Japanese dishes, rich or poor. It always accompanies fish. The Europeans in China or Japan, who have used it a lot or a little, add it to beef or to beef bouillon, to which it imparts a most agreeable color and flavor. The number 10 case of various products, which will be a part of my shipment contains 3 bottles of soja of different qualities under the numbers 18, 19, and 20. No. 18 comes from Miyako (Kyoto), but it is possible that the trip may alter it a little.

Note: This is the 2nd earliest French-language document seen (April 2012) that uses the word *soja* to refer to soy sauce. The French used the word *soja* to refer to soy sauce before they used it to refer to the soybean. Address: French consul in China.

504. Cloquet, Jules. 1862. Rapport sur les travaux de la Société Impériale d'Acclimatation [Report on the work of the Imperial Society for Acclimatization]. *Bulletin de la Societe d'Acclimatation* 9:1061-64. Nov. See p. 1064. [Fre]
• ***Summary:*** This speech was presented at the International Exposition of London. Extracted from reports by members of the French section of the international jury of the Universal Exposition of London of 1862, vol. 6, p. 123. The Imperial Society for Acclimatization was founded in Paris in 1854. It was recognized as a public agency by imperial decree on 25 Feb. 1855.

The author discusses important introductions made by the Society. "5th. Plants. A large number of plants have been the object of attempts at acclimatization; several have given good results. Thus, one can cite among the main food or industrial plants acclimatized: 1. The Chinese yam (*l'Igname de Chine; Dioscorea batatas*), an excellent food tuber introduced by Mr. de Montigny; 2. Chervil (*le Cerfeuil bulbeux; Chærophyllum bulbosum*), and the Cerfeuil bulbeux of Siberia (*C. Prescottii*), excellent vegetables; 3. The soybean of China and Japan (*le Pois oléagineux de la Chine et du Japon; Soja hispida*); 4. Chinese sweet sorghum (*le Sorgho sucré de la Chine*), which is very versatile; 5. The *Lo-za* [*Loza*] *de la Chine,* mentioned by Mr. Rondot, a bush completely acclimatized to France, whose leaves produce a beautiful dye known as 'Green of China' (*vert de Chine*); 6. Chinese bamboos (*les Bambous de la Chine; Bambusa nigra* and *B. mitis,* or edible). These two species have been acclimatized in the garden at Alger by Mr. Hardy, and introduced in several departments of southern and central France." Address: France.

505. Ripley, George; Dana, Charles A. eds. 1862. The new American cyclopaedia: A popular dictionary of general knowledge. 16 vols. New York, NY: D. Appleton and Company. 850 p. See Vol. 14, p. 800. 26 cm.
• ***Summary:*** The entry on p. 800 for "Soy" states: (Japanese, *sooja*), a sauce prepared in Japan and China from the small beans of the plant called by McCulloch *dolichos soja,* and by others *soja hispida* or *soja Japonica.* The beans are boiled nearly to dryness, then put in wide-mouthed jars with water and molasses or brown sugar, and exposed to the sun and air. Every day they are well stirred; and when the fermentation is completed the mixture is strained, salted, and boiled, and skimmed until clarified. Japanese soy is considered the best; but there are many deceptions in the article. It is recognized by a peculiar flavor, neither too salt nor sweet; a thick consistence and clear brown color; and particularly by its leaving, when shaken in a glass, a coat of bright yellowish brown upon the sides. It is imported into Europe and the United States to be used with fish.

506. Chû kano sho [Rough writing/draft for the kitchen]. 1863. Publisher unknown. 62 p. Handwritten. Japanese summary by Kawakami 1978, p. 101. [Jap]
• ***Summary:*** The Japanese title of this work, by an unknown author, may be pronounced Kuriya no Shitagaki. It contains a listing of many fish names, and mentions *Kokusho* (*or Kokushiho*), a unique and rich miso soup from the Edo period.

507. Fortune, Robert. 1863. Yedo and Peking. A narrative of a journey to the capitals of Japan and China [in 1860-61]. London: John Murray, Albemarle Street. xvi + 395 p. See p. 350. Illust. Index. 22 cm.
• ***Summary:*** "Large quantities of Indian corn, buckwheat, sweet potatoes, and soy-beans were here under cultivation" [near the town of Chan-chow-wan, near the banks of the Pei-ho River, in the Peking plain of China].

Note: A fold-out map at the back shows Japan and North China. Address: London. Born in Scotland. Honorary Member of the Agri-Horticultural Society of India.

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508. Simmonds, Peter Lund. 1863. The dictionary of trade products, commercial, manufacturing, and technical terms: with a definition of the moneys, weights, and measures of all countries, reduced to the British standard. New edition, revised and enlarged. London: Routledge, Warne & Routledge. 463 p. 17 cm.

• ***Summary:*** Two entries are related to the soybean: "Mico, mijo [miso], a vegetable butter or solid oil, made from *Soja hispida,* in Japan."

"Soy, a sauce or flavoring originally made in the East; and said to be produced from a species of *Dolichos* bean, *Soja hispida."*

Peter L. Simmonds lived 1814-1897. Address: F.R.G.S., F.S.S., author.

509. Williams, Samuel Wells. 1863. The Chinese commercial guide: Containing treaties, tariffs, regulations, tables, etc... With an appendix of sailing directions. 5th ed. Hongkong: A. Shortrede & Co. xvi + 387 + 266 p. Index. 21 cm. Facsimile edition reprinted in 1966 by Ch'eng-Wen Publishing Co., Taipei, Taiwan.

• ***Summary:*** In the section titled "Description of articles of export" [from China, alphabetical], Chinese characters (see next page) accompany every entry. On p. 111 is an entry for "Beans and peas" (*tau*) incl. bean cake (*tau ping* or *tau shih* = "bean stones"). "The Chinese cultivate legumes to a greater extent, perhaps, than any other nation."

The manufacture of bean jam [jiang] and bean curd cakes [tofu] for food from the flour employs many people. The cakes used for manure are made by crushing the ripe peas [sic, beans] and boiling the grits soft; the mass is then pressed into cakes in iron hoops, and made solid by means of wedges driven down by heavy mallets. Peas and bean cakes are exported from Yingtsz' [Ying-k'ou, Yingkou?] and Tientzin to Amoy and Swatau [Swatow, Shantou, in Guangdong province]; they comprise one-fourth of all the produce shipped from Tientsin in 1861; and there is little else sent from Yingtsz'. In 1859, about a million piculs [1 picul = 133.33 lb] of the cake were reshipped to the south of China from Shanghai alone, chiefly for the consumption of sugar growers."

In the same section is an entry (p. 139) for: "Soy, *shi yú* [*shiyu* = fermented black soybean sauce], and *tsiáng yú* [*jiangyou* = soy sauce], is a condiment made from the Dolichos bean, which grows in China and Japan; our name is derived from the Japanese *siyau* [*shoyu*]. To make it, the beans are slowly boiled soft, then an equal quantity of wheat or barley flour is added; after this has thoroughly fermented and become mouldy, the beans are washed, and put into jars with their weight in salt, adding some aromatics, and three times as much boiling water as the beans were at first. The whole compound is now left for a month or more, exposed to the sun, and then pressed and strained. Good soy has an agreeable taste, and if shaken in a tumbler, lines the vessel with a lively yellowish-brown froth; its color in the dish is nearly black. There are many qualities of it, and when well made all improve by age. Japan soy is considered superior to Chinese, but both are of different qualities, and are probably made of various materials, some of which may be base enough. It is most commonly sent to England, India, and Europe, to form the basis of other sauces and condiments. It is worth from $4 to $8 per picul and goes chiefly from Canton."

On p. 129 is a section on "Oil" (*yú*), incl. [soy] bean oil (*tau yú*), wood oil (tung), cotton-seed oil, sesamum oil, olive oil, ground-nut oil, cabbage or rape oil, fish oil, etc.

In the same section (p. 149) is an entry for "Vermicelli (Chinese characters) *fun sz,* i.e. flour threads. This article, sometimes called *loksoy* [*lock soy*], manufactured from both rice and wheaten flour, is extensively used among the natives in soups. It is everyway inferior to the European."

Note 1. This is the earliest English-language document seen (Sept. 2006) that uses the term "bean oil" to refer to soybean oil, or that mentions *tau-yú* as the Chinese (Cantonese) name for soybean oil.

Note 2. This is the earliest English-language document seen (Sept. 2006) that uses the term "Dolichos bean" to refer to the soybean. It is also the earliest English-language document seen (Sept. 2006) that repeatedly uses the word "bean" (not preceded by the word "soy" or "soya") to refer to the soybean.

Note 3. This is the earliest English-language document seen (Sept. 2003) that contains the term "cotton-seed" or term "cotton-seed oil" (each spelled with a hyphen).

Note 4. This is the earliest English-language document seen (Oct. 2006) that that uses the term "crushing" (or "crush," "crushes," "crushed" or "crushings") in connection with soybeans to refer to the process of pressing the beans to yield oil and cake.

This section also discusses (alphabetically): Almonds (but not almond oil), ground-nuts (*hwa sang* characters, ground-nut cake characters hwa sang ping; the "oil is the chief article of export"), gypsum (*shih kau,* used especially in making bean-cakes and curd [tofu], sometimes called bean-macaroni), manure cakes or poudrette (*kang sha,* made from night soil mixed with earth for exportation. "The refuse of ground-nuts, sesamum, rape-seed, and other oleaceous seeds, is prepared for manure and for feeding swine and sheep, and sent from one part of the country to another"), salt, seaweed, sesamum seed, and silk.

A table titled "Rates of freight in steamers to Canton" states (p. 228): "Soy, per tub of 1 picul–$0.75."

In the section on "Foreign commerce with Japan" we read (p. 254): "Camphor, sulphur, porcelain, copper, nut-galls, vegetable wax, cassia, soy, and verdigris, have been furnished at rates and quantities sufficient to export to Europe."

Other sections discuss Chinese, Japanese, and British

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BEANS and *peas* 荳 *tau*; bean-cake 荳餅 *tau ping* or 荳石 *tau shih*. The Chinese cultivate legumes to a greater extent, perhaps, than any other nation.

OIL, 油 *yú*; bean oil 荳油 *tau yú*, tea or camellia nut oil 茶油 *cha yú*; wood oil 桐油 *tung yú*; cotton-seed oil 棉油 *mien yú*; and sesamum oil 芝蔴油 *chí má yú*; also olive oil, 生菜油 *sang tsái yú*; ground-nut oil, 花生油 *hwá sang yú*; cabbage or rape

SOY, 豉油 *shi yú*, and 醬油 *tsiáng yú*, is a condiment made from the Dolichos bean, which grows in China and Japan; our name is derived from the Japanese *siyau*. To make it, the beans are slowly boiled soft, and then an equal quantity of wheat or barley flour is added; after

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weights and measures, numerals, coins and currency.

Samuel Wells Williams lived 1812-1884. Address: LL.D., Hongkong.

510. Brennwald, C. 1865. Rapport général sur la partie commerciale de la Mission suisse au Japon [General report on the commercial section of the Swiss mission to Japan]. Berne, Switzerland: Printed by J.A. Weingart. 155 p. See p. 100-01, 103. [Fre]

• ***Summary:*** The section on Japanese exports mentions miso and soy sauce. Address: Counselor and Secretary of the Legation [to Japan].

511. Burr, Fearing, Jr. 1865. The field and garden vegetables of America: Containing full descriptions of nearly eleven hundred species and varieties; with directions for propagation, culture, and use. Boston, Massachusetts: J.E. Tilton. xv + 667 p. See p. 499-500. Illust. Index. 20 cm. [25* ref]

• ***Summary:*** Pages 499-500 state: "Japan. *Hov. Mag.* [*The Magazine of Horticulture, Botany, and Rural Affairs.* By C.M. Hovey. Boston [Massachusetts]. Monthly. 1834 to the present time].

"Cajanus bicolor. The Japan Pea is a native of the East Indies, and also of Japan, as implied by the name. The plant makes a strong, erect growth, with numerous spreading branches; the leaves are large, light green and downy beneath; the flowers are small, yellow at the centre,–the upper petal purple; the seed-pods are small and downy, and are produced in profuse abundance,–growing in clusters over the entire plant; the seeds are small, roundish, or pea-form, and of a cream-yellow color when ripe." Note: This is the earliest English-language document seen (Sept. 2004) that uses the term "cream-yellow" to describe the color of soybean seeds.

"Propagation and Culture.–It is raised from seed, which, as the plant requires the entire season for development, should be sown as soon as the ground is warm and settled. Make the drills about 20 inches apart, and drop the seeds ten or twelve inches apart in the drills, covering half or three fourths of an inch deep. The plants will blossom the last of July or beginning of August, and the seeds will be suitable for use in their green state, from the 20th of August until destroyed by frost, the crop being seldom fully perfected in the Northern States.

Use.–The seeds are the only parts of the plants eaten, and these, while young, are tender and delicate. The ripe seeds if soaked for an hour in moderately hot water, take the form and appearance of the Common White Bean, become quite soft and tender, and have a pleasant, nutty, and oily flavor. The whole plant with the seeds, is also used for feeding stock.

"A variety occurs with green seeds, which is not only considered superior to the Common Yellow-seeded just described, but is two weeks earlier."

Note 1. The plant referred to here is actually the soybean, which Mr. Teschemacher incorrectly identified as the pigeon pea *Cajanus bicolor* in Feb. 1853. Note 2. No reference to the Japan Pea appears in the 1863 edition of this book.

Also discusses: Chufa or earth almond (*Cyperus esculentus,* edible cyperus, nut rush, p. 32. When dried and pulverized, the tubers "are said to impart to water the color and richness of milk"). Note 3. This is the earliest English-language document seen (Sept. 2002) concerning a non-soy, non-dairy milk–made from chufa or earth almonds. Amaranthus (Chinese amaranthus, Chinese spinach, p. 279-80). Quinoa (*Chenopodium quinoa,* p. 292-93. Varieties: white-, black-, or red- seeded, from Mexico or Peru. Goosefoot). Pea-nut (Ground bean, earth nut, pindar nut, ground-nut, *Arachys hypogea,* p. 544-46. Varieties: African, Wilmington {North Carolina}, and Tennessee). Winged pea (*Lotus tetragonolobus,* Red birdsfoot trefoil, p. 547. Pods 3½ inches long, with four longitudinal leafy membranes, or wings; seeds globular, slightly compressed, yellowish-white. *Use.*–"The ripened seeds are sometimes used as a substitute for coffee; and the pods, while young and tender, form an agreeable dish, not unlike string beans"). Bene-plant (Oily grain, *Sesamum* sp., p. 548-49. This medicinal plant {which is "cooling and healing"} may be used for food or oil. Varieties: biformed-leaved, oval-leaved, trifid-leafed {having three parts}). Address: Hingham [Massachusetts].

512. Champion, Paul. 1866. Sur la fabrication du fromage de pois en Chine et au Japon [On the production of tofu in China and Japan]. *Bulletin de la Societe d'Acclimatation* 13:562-65. Oct. Meeting of June 1. [Fre]

• ***Summary:*** "The Chinese and the Japanese eat considerable quantities of a white material rather analogous in its appearance to the French product named *fromage à la pie* (quark), and which they make with a particular type of soybean (*Pois oléagineux*) which is also used for food and from which one can extract a rather expensive and very good quality oil. The production of this cheese [tofu] is simple, but it requires care and rather extensive practice to produce a white product."

The author then gives a detailed 3-page description of how tofu (*fromage de pois,* literally "pea cheese") is made–though he never mentions its name in either Chinese or Japanese.

Note. This is the earliest French-language document seen (April 2013) that uses the term *fromage de pois* to refer to tofu.

It is coagulated with magnesium chloride, and will keep for 1 day in summer and 1 week in winter. It is also often salted and it is mixed with various sauces which allow it to keep for several years. In the process of making tofu, the hot soymilk is poured into a second tub and allowed to cool

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before the coagulant is added. The foam is removed using a copper scoop. After several minutes, a skin / film (*une peau*) [yuba] forms on the surface of this liquid. It can be lifted off by passing a stick (*baguette*) underneath it and hung up to dry by inserting one end of the stick into one of many holes that have been deliberately created in the wall. This film, by the way, has a rather agreeable taste, and is eaten either fresh or dried; a second film is often formed and is lifted off in the same manner.

Note 1. This is the earliest French-language document seen (Oct. 2012) that mentions yuba, which it calls *une peau.*

After the tofu has been pressed, so that the volume has been reduced by half, it is removed from the forming box, or the tofu (cheese) is sometimes shipped out to a great distance. To transport them, it is sufficient to close the box with planks, nailed with the aid of bamboo pegs. Arriving at the destination, it is cut into small pieces by means of a large metal knife.

Tofu (pea cheese) is generally a grayish white and looks like a jelly. It does not keep for more than a day during the hot months, and to preserve it from rapid deterioration, it is generally mixed with salt or sauces of various types. It can then be kept for several years. A piece of tofu the size of a fist sells for 2 Cash (i.e., 1 centime).

He then (p. 564) describes shops in China selling hot soymilk for breakfast. "Generally, the shops where this cheese (*ce fromage* = tofu) is made are filled with Chinese, who bring cups to get some of the hot liquid (*le liquide chaud*), which is used to make the cheese and which has not yet been coagulated; they drink this beverage (*ce breuvage*), which has an insipid but not disagreeable taste, just like we enjoy coffee with tea. For many of the poor, the morning meal consists of a cup of this liquid, in which they dip various types of deep-fried crullers" (*des espèces de gâteaux frits à l'huile*).

"I will send with this note some samples of soybeans which, according to the analysis that I am in the process of making, contain more than 10% oil, and all the materials employed in this industry as well as some small preserved dried cheeses (*des petits fromages secs conservés*), of which I have spoken above. I have seen this production established on a large scale in many ports of China from the south to Peking, and also in various ports of Japan which I have visited. This cheese, when well prepared, has a very agreeable flavor. Deep-fried it makes a delicious dish. It is widely consumed among the Chinese and would be able to be employed, I believe, to advantage in Europe."

Note 2. This is the earliest document seen (Oct. 2011) worldwide–in any language or in any country–that discusses the use of soymilk as a beverage. We find this quite surprising! Why are there no earlier references to its use as a beverage in Chinese documents? This is also the earliest French-language document seen (Aug. 2013) that mentions soymilk, which it calls *le liquide chaud* and *ce breuvage.*

Note 3. This is the earliest document seen (April 2013) that describes how to make tofu on a commercial scale. Address: France.

513. Miquel, Frederich Anton Wilhelm. 1866-1867. Prolusio florae Iaponicae [Essay on the flora of Japan]. Amstelodami (Amsterdam): Printed by C.G. van der Post. viii + 392 p. See p. 240. 2 plates 45 cm. [Lat]*
• ***Summary:*** Discusses *Glycine hispida* (*Soja hispida*).

514. Lindley, John; Moore, Thomas. eds. 1866. The treasury of botany: A popular dictionary of the vegetable kingdom; with which is incorporated a glossary of botanical terms. 2 vols. (Parts I and II). London: Longmans, Green, and Co. xx + 1254 p. See Part I. p. 131, 536-37, 747. Part II. p. 1068, 1075. Illust. 17 cm.
• ***Summary:*** Bean (Part I, p. 131) "Sahuea bean, *Soja hispida.*

Glycine (Part I, p. 536-37) "A small genus of *Leguminosae,* all, excepting one, being slender decumbent [reclining along the ground, but with ascending apex or extremity] or twining herbs, with alternate stalked leaves made up of three to seven leaflets varying much in form, and bearing axillary racemes or fascicles of small yellow or violet pea-flowers. The genus belongs to the tribe *Phaseoleae,* and is most nearly allied to *Teramnus,* from which it is distinguished by its pods being destitute of the hardened hooked style seen in the latter, and by the ten stamens, which are united into a tube, being all, instead of the alternate ones only, anther-bearing. The species are pretty equally distributed through tropical Asia, Africa, and Australia, where a few inhabit extratropical regions.

"The Sooja of the Japanese, *G. Soja,* the only erect species of the genus, a dwarf annual hairy plant, a good deal like the common dwarf kidney or French bean (*Phaseolus vulgaris*), has small violet or yellow flowers, borne in short axillary racemes, and succeeded by oblong two to five-seeded hairy pods.

"The seeds, like kidney beans in form but smaller, are called Miso [sic, error based on Miller 1807] by the Japanese and are made into a sauce which they call Sooja or Soy. The manner of making it is said to be by boiling the beans with equal quantities of barley or wheat, and leaving it for three months to ferment, after which salt and water is added, and the liquid strained. The sauce is used by them in many of their dishes, and they use the beans in soups. The Chinese cook the beans also in various ways, and the plant is cultivated for the sake of them in various parts of India and its Archipelago.

"Mr. Bentham groups the species in three sections, which some regard as genera: *Soja,* with flowers fascicled on the racemes, and falcate pods with depressions but not transverse lines between the seeds; *Johnia,* with flowers similarly arranged, and straight pods with transverse lines

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between the seeds; and *Leptocyanus,* with solitary flowers on the racemes, and straight pods. The Glycine or *Wistaria* of gardens is now referred to *Millettia.*

Miso (Part II, p. 747). "A fatty substance obtained from *Soja hispida.*

Soja (or Soya) hispida (Part II, p. 1068) is the only representative of a genus of *Leguminosae* of the tribe *Papilionaceae,* and much cultivated in tropical Asia on account of its beans, which are used for preparing a well-known brown and slightly salt sauce (Soy), used both in Asia and Europe for flavouring certain dishes, especially beef, and supposed to favour digestion. Of late it has been cultivated as an oil-plant. S. hispida is an erect hairy herb, with trifoliate leaves, and axillary racemose flowers, which have a five-cleft calyx, a papilionaceous corolla, ten diadelphous stamens, and an oblong pod which contains from two to five ovate compressed seeds. Modern botanists generally refer the plant to Glycine: which see."

Soy (Part II, p. 1075) "A sauce originally prepared in the East, and said to be produced from the beans of *Soja hispida.*

Note 1. This is the earliest document seen (April 2003) in which the soybean is classified under *Papilionaceae.*

Note 2. This is the earliest English-language document seen (April 2003) that uses the term "oil-plant" to describe the soybean.

Also discusses (in alphabetical order): Agar-agar. Alfalfa. Algæ. Almond. Amande de terre (French, *Cyperus esculentus*). Amaranthus. Arachis [peanuts]. Aspergillus. Bean, under-ground kidney = *Arachis hypogaea.* Cannabis. Chenopodium [Common Goosefoot]. Coix [lachryma, Job's tears]. Cyperus. Earth-nut (*Arachis hypogæa*). Flax. Gingelly oil. Hemp.

Part II: Job's tears. Legume. Leguminosæ. Linseed. Linum. Lupinus (incl. *Lupinus albus, L. luteus*). Nut, bambarra ground (The seed of *Voandzeia subterranea,* p. 795). Nut, earth (*Arachis hypogæa*). Oil (incl. sesamum). Oilcake ("The residuum after expressing the oil of various seeds, especially linseed and rape, which is used for cattle feeding, and as a manure"). Oil-plant (*Sesamum orientale*). Pindals, pindars. Psophocarpus. Pueraria. Quinoa (*Chenopodium Quinoa*). Sea-girdles (*Laminaria digitata*). Sea-hangers. Sea-wand (*Laminaria digitata*). Seaware. Seaweeds. Seawrack. Seawracks. Sesame. Sesamum. Tetragonolobus.

"Voandzeia. So called from Voandzou, the name given by the natives of Madagascar to the only known representative of this genus of *Leguminosæ,* the *V. subterranea* of botanists, a creeping annual, with long-stalked leaves composed of three leaflets... It is a native of Africa, and is extensively cultivated in many parts of that continent, from Bambarra and the coast of Guinea to Natal [in today's South Africa], its esculent pods and seeds forming common articles of food among the inhabitants of those regions. Although the plant is not indigenous to the Western Hemisphere, it is commonly found in many parts of South America, such as Brazil and Surinam, whither it has been carried by the negro slaves and has now become naturalised. The pods are sometimes called Bambarra Ground-nuts; in Natal the natives call them Igiuhiuba; while in Brazil they are known by the name of Mandubi d'Angola (showing their African origin), and in Surinam by that of Gobbe.

"Voandzou. The Malagassy name of a genus of *Leguminosae,* called after it *Voandzeia"* (p. 1224).

Note 3. This is the earliest English-language document seen (Nov. 2005) that contains the word "oilcake" (or "oilcakes"). Address: 1. Ph.D., F.R.S., F.L.S., Botanic Garden, Chelsea. Late emeritus Prof. of Botany in University College, London; 2. F.L.S., Curator of the Chelsea Botanic Garden.

515. Soubeiran, J.L. 1867. Séance de 5 July 1867 [Meeting of 5 July 1867]. *Bulletin de la Societe d'Acclimatation* 14:448-64. Aug. See p. 453. [Fre]

• ***Summary:*** Page 453: Dr. Mourier sent from Yokohama (Japan) several boxes containing: (1) Upland rice, *Okano-komé,* which is cultivated like wheat... (3) Red-azuki (*Aka-adzeuki*). (4) Black azuki (*Kouro-Adzeuki*). (5) White beans (*Shiro mamé*) [probably white soybeans]. (6) Black soybeans (*Kouro-mamé*); these four seeds [Nos. 3-6] are used to make miso and tofu,

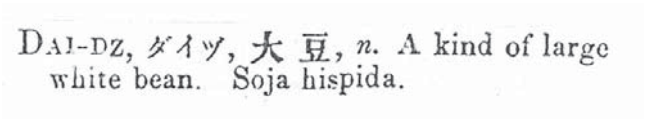
Note: Azuki beans are never used to make miso or tofu, but white and black soybeans are–especially white soybeans. Address: Secretary of the meeting.

516. Hepburn, James C. 1867. A Japanese and English dictionary; with an English and Japanese index. Shanghai, China: American Presbyterian Mission Press. xii + 558 + 132 p. 2nd ed. 1872; Abridged ed. 1873, 1881; 3rd ed. 1886; 4th ed. 1888; 5th 1894; 7th ed. 1903. First edition was reprinted in 1966 and 1983. Index. 24 cm.

• ***Summary:*** This is Hepburn's earliest Japanese-English dictionary. The words are arranged alphabetically by their romanized spelling. Each word is written in three ways. After the romanized word (main entry), written in uppercase letters with diacritical marks (which we have largely omitted below), the same word is written in katakana, then again in Chinese characters. Finally, one or more definitions are given.

Soy-related words and terms in the 1867 edition:
Amazake: Sweet sake, a kind of fermented rice.

Daidz [Daizu]: A kind of large white bean. Soja hispida.


DAI-DZ, ダイヅ, 大豆, *n.* A kind of large white bean. Soja hispida.

Go: Beans mashed into paste. *Mame no go.*

Gokoku: The five cereals, wheat, rice, millet, beans, *kibi.*

Hiriodz [Hiriodzu, Hiryozu]: A kind of food [made of

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tofu fried in oil].

Note 1. This is the earliest English-language document seen (April 2013) that contains the term *Hiriodz* (the modern spelling is Hiryozu) which refers to Kyoto-style deep-fried tofu treasure balls.

Ireru–*Kono mame wa yoku iremash'ta:* these beans are well parched.

Iriru–Mame wo iriru: to parch peas [beans].

Kinako ["yellow flour"]: A kind of food made of beans.

KINA-KO, キナコ, 黄紛, *n.* A kind of food made of beans.

Kiradz [Kiradzu, Kirazu]: The refuse left in making *tôfu* .

Koji: Malt made by fermenting rice or barley, in the process of making sake, and soy [sauce].

Koji-buta: A shallow box for holding malt.

Mame: Bean, pea. *Mame no ko:* bean flour [probably kinako, roasted whole soy flour].

Miso: A kind of sauce made of [soy] beans.

MISO, ミソ, 味曾, *n.* A kind of sauce made of beans.

Natto: A kind of food made of [soy] beans.

NATTŌ, ナットウ, 納豆, *n.* A kind of food made of beans.

Nigari: The brine formed by the deliquescence of salt.

Sashi (verb): Shoyu wo sashi–To season with soy [sauce].

Sashimi: Raw fish cut in thin slices and eaten with soy.

Sh'taji [Sorted after "Shis," Shitaji]: Soy (used only by women). Syn. Note 2. This is the earliest English-language document seen (April 2012) that uses the word "sh'taji" or shitaji" to refer to soy sauce.

Shoyu: Soy, a kind of sauce made of fermented wheat and beans.

SHŌYU, シャウユ, 醤油, *n.* Soy, a kind of sauce made of fermented wheat and beans.

Note: This is the earliest English-language document seen (April 2012) that uses the word "shoyu" (spelled correctly like this) to refer to soy sauce.

Tofu: A kind of food made of beans.

TŌFU, トウフ, 豆腐, *n.* A kind of food made of beans.

Umeboshi (*hakubai*). Dried plums. Ume-dzke [Ume-zuke]: Pickled plums. *Ume ga mada umimasen:* The plums are not yet ripe.

Yuba [hot water + leaf]: A kind of food made of beans.

YUBA, ユバ, 湯葉, *n.* A kind of food made of beans.

Note 3. This is the earliest English-language document seen (Oct. 2012) that contains the word "yuba." The Chinese characters (meaning "hot water" + "leaf") are the same used today."

Yu-dofu: Boiled tofu.

YU-DŌFU, ユドウフ, 湯豆腐, *n.* Boiled *tōfu.*

The English-Japanese part of this dictionary starts after p. 558 and is titled "An index; or, Japanese equivalents for the most common English words." Separately numbered to p. 132, it includes: "Bean, Mame. Barm, Kôji, tane. Pea, saya yendo [saya-endo]. Soy [sauce], Shôyu."

Terms NOT mentioned include Aburaage, Aburage, Atsu-age, Daitokuji natto, Edamame (or Eda mame or Yedamame), Ganmodoki, Hamanatto, Hiya-yakko, Kori-dofu, Koya-dofu, Nama-age, Okara, Tamari, Tonyu, Unohana, Yaki-dofu.

Note 4. The author apparently did not realize that the various soyfoods he defined (with the possible exception of soy sauce) were made from soybeans.

Note 5. This is the second earliest English-language document seen (June 1999) in which Chinese characters are used to write the name of the soybean or related products.

Note 6. This is the earliest English-language document seen that contains the word "tofu" (April 2013) or the word "natto" (Jan. 2012), or the word "koji" or the term "koji-buta" (July 2012).

Note 7. This is the earliest English-language document seen (Feb. 2004) that refers to amazake, which it calls "Amazake."

Note 8. This is the earliest English-language document seen (Oct. 2012) that uses the term "Shoyu" (or "shoyu") to refer to soy sauce.

Note 9. This is the earliest English-language document seen (Nov. 2012) that uses the word "Kinako" to refer to roasted soy flour.

Note 10. This is the earliest English-language document seen (June 2013) that uses the word "Kiradz" [Kiradzu, Kirazu] to refer to what is now called "okara," or "soy pulp." Address: Shanghai, China.

517. Knight, Charles. ed. 1867. The English cyclopædia–Natural History. Vol. IV: Soja. London: Bradbury, Evans, & Co. 1291 p. See p. 843.

• ***Summary:*** "Soja, a genus of Plants belonging to the natural order *Leguminosæ*.*Soja hispida* (Moench), *S. Japonica* (Savi), the *Dolichos Soja* (Linn.), is a native of Japan and the Moluccas, and abundant in the peninsula of India, though probably introduced there. The seeds resemble those of the

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haricot, French or kidney bean, and are used by the Chinese to 'form a favourite dish, called "ten-hu," or "tau-hu" [tofu], which looks like curd, and which, though insipid in itself, yet with proper seasoning is agreeable and wholesome' [Don 1832]. The Japanese call the seeds 'Miso' [sic] and put them into soup, of which they sometimes partake three times a day. They likewise prepare with them the sauce termed 'Sooja,' which has been corrupted into 'Soy.' Soy is only sparingly used as a sauce in this country. It has the character of being a useful stomachic, but not more so than any of the other condiments when used in moderation."

Note: The entry for "Soy" says to see "Soja."

Note: Much of the information in this entry for Soja comes from the *Penny Cyclopaedia of the Society for the Diffusion of Useful Knowledge* (London, 1841. See Soja hispida).

Also in this volume: Sesamum (p. 758). Voandzeia (p. 1224).

518. Miquel, Frederich A.W. 1867. Prolusio florae Iaponicae [Essay on the flora of Japan]. *Annales Musei Botanici Lugduno-Batavi* (*Leiden*) 3:52-53, 99. [5 ref. Lat]

• ***Summary:*** Under Glycine Linn. (p. 52) the author lists one species: "1. Glycine soja Sieb et Zucc. Abh. l.c. IV. 2, p. 119. A *Soja angustifolia* Miq. *Fl. Ind. bat.* I. 1, p. 223... *Siebold legit; "sponte crescentum"; in vallibus m. Kawara Jama ins. Kiusiu legit Pierot, propre Nangasaki* [*Nagasaki*] *Oldham n. 368.*

Under Soja Moench (p. 52-53) the author lists one species with 3-4 varieties: "1. Soja hispida Moench., Sieb et Zucc. l.c.p. 119. Maxim. Prim. p. 87. *Dolichos Soja* Linn. *Soja iaponica* Savi."

Variat sub cultura vario mondo, v.c. seminum colore quae autem sub germinatione omina plantulas similes proferunt, teste Sieboldo. Spontanea etam provenit, foliolis latioribus, medio basi leviter attenuato–In regione littorea prope Oko Mura ins. Kiusiu et in fruticetis prope urbem Kokura legit Pierot; aliis locis cultam legerunt Siebold et Buerger [Bürger], prope Nangasaki [Nagasaki] Oldham n. 360.

[Translation: Pierot collected it in the coastal regions on the island of Kyushu near Oko Mura {or Okumura; *mura* = village} and in the shrubbery near the city of Kokura {in northern Kyushu, Japan}; Siebold and Buerger collected it in other places where it was cultivated / grown, and {Richard} Oldham (specimen No. 360) collected it near Nagasaki {located on the far western tip of central Kyushu, near Deshima / Dejima, where Siebold and Buerger usually resided}].

- Kuro mame [Black soybean], No mame [wild soybean], Kuzu, Kokura iap.

var. praecox Sieb. [Siebold], humilior, non vel vix volubilis, densius rufo-hirta, foliolis satis variantibus.–Culta.

var. obtusa Miq. [Miquel] humilis stricta robusta dense hispida, foliolis late ovalibus utrinque obtusissimus.–Spontaneam legit Pierot ad radicem m. San Saka Toge ins. Kiusiu [island of Kyushu].–Jama [Yama] daisu iap. [Mountain soybean of Japan].

var lanceolata Miq., elatior, minus hispida, foliis longe petiolatis, foliolo terminali sublanceolato, lateralibus semilanceatis, mucronatis. In regione littorea prope oppidum Oko Mura ins. Kiusiu [island of Kyushu] detexit Pierot–Kuzu iap.

Observ. Cl. Bentham (*Journ. Linn. Soc.* VIII, p. 269) hanc sp. et superiorem coniunxit; nostrae autem plane diversae, a b. Zuccarinio determinate.

Other non-soy genera: Under Pueraria DC (p. 52) he lists *Pueraria Thunbergiana* Benth. Journ. Proceed. Linn. Soc. IX. p. 122.–*Pachyrrhizus Thunbergianus* Sieb. et Zucc. Abh. l. c. IV. 3, p. 237. *Neustanthus chinensis* Benth. Hongk. p. 86. Dolichos hirsutus Thunb. in Linn. Transact. II. p. 339...

Under Phaseolus (p. 52) Linn. he lists *Phaseolus radiatus* Linn., Miq. Fl. Ind. bat. I. p. 197. Ph. Mungo (Linn.) Sieb et Zucc. Abh. l. c. IV. 2, p. 118. Cum pluribus ut veditur varietatibus cultus. *Assuki* iap. [Japanese adzuki] and *Phaseolus nanus* Linn.

Under Deutzia Thunb. (p. 99) he lists 3 species: crenata, scabra, and gracilis.

Note 1. How Miquel compiled this book (according to Bretschneider 1882): In 1830 the Japanese government forced Siebold to leave Japan, saying that he had a map of the island, which was illegal. "Siebold had forwarded one portion of his vast botanical collections accumulated in Japan to Prof. C.L. Blume in Java, who described some of these plants in the *Museum botanicum Lugduno-Batavorum,* 1849-51... The greater part of his dried plants, however, had been transmitted by Siebold to the Museum of Leyden, and from these materials Prof. Miquel compiled his *Prolusio Florae japonicae* [*Prolusio florae Iaponicae*], 1865-67."

Note 2. This is the earliest document see (May 2002) concerning Heinrich Bürger.

Note 3. Richard Oldham (1837-1864) collected plants for the Kew gardens (England) in Eastern Asia in 1861. The Oldham numbers, 360 and 368, refer to the numbers of the specimens in his collection–which is now at the British Museum of Natural History, Kew. Address: Prof. of Botany, Director of the Rijksherbarium in Leiden, Netherlands.

519. Simmonds, Peter Lund. 1867. The commercial dictionary of trade products, manufacturing and technical terms:... A new edition, revised and enlarged. London and New York: George Routledge and Sons. viii + 463 p. See p. 353. 17 cm.

• ***Summary:*** The entry for "Soy" is two words longer (and more accurate) than that in the 1858 edition. "Soy, a sauce or flavoring originally made in the East; and said to be produced from a species of *Dolichos* bean, *Soja hispida.*

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seem to be identical to those of the 1858 edition except that a long supplement has been added to the rear, p. 423-63.

Soy-related entries in the supplement: "Midsu [sic, miso], an oily pulp made from beans in Japan, with which food is dressed instead of butter." "Miso, a substance used in Japan as butter by boiling the soy bean (*Soja hispida*), and mixing it with rice, salt, etc.

Other interesting entries in the supplement: Agar-agar, chufas, hasheesh (Arabic word for hemp, hay; also an intoxicating drug made of hemp, which is sold in the form of sweetmeats, paste, and tobacco), mindoubi (a name in Brazil for the ground nut, *Arachis hypogæa*). Peter L. Simmonds lived 1814-1897. Address: F.R.G.S., F.S.S., author, 8 Winchester St., Pimlico [southwest London, England].

520. *Brisbane Courier* (*Queensland, Australia*). 1868. Sauces. Jan. 11. p. 7.
• ***Summary:*** "India Soy [sauce] is difficult to purchase genuine; it should be made from an Indian plant called Dolichos soja, or soya, but treacle and salt are the basis of the Soy ordinarily sold. 'Many persons,' observes Mr. Dobell, in his *Travels in China,* 'have thought that gravy was used in preparing soy, but this appears not to be the case, but the composition being entirely a vegetable one, and made from beans. Japanese soy is much esteemed in China, probably it is made with a particular bean? In China the consumption of soy is enormous; neither rich nor poor can dine, breakfast, or sup without soy; it is the sauce for all sorts of food, and may be described as indispensable at a Chinese repast.'"

Note: This is the earliest of 2 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "Japanese soy."

521. **Product Name:** [Matsuyama-Age Dried Deep-Fried Tofu].
Foreign Name: Matsuyama-agé, or Kansô Aburagé.
Manufacturer's Name: Hodoya Shoten.
Manufacturer's Address: Doita-cho 499-1, Matsuyama-shi, Shikoku island, Japan.
Date of Introduction: 1868.
Ingredients: Water, soybeans, coagulant, oil for deep-frying.
New Product–Documentation: Shurtleff & Aoyagi. 1975. *The Book of Tofu.* p. 190. "Japan's most unique variety of agé is Crisp Agé (*Kanso Aburagé*), which comes in light crisp sheets that are mild in flavor, golden brown in color, and about 6 by 8 by ¼ inch in size. Rich in protein (24%) and natural oils (64%), it has a very low water content (4.5%), which allows it to be stored for more than 3 months at room temperature without spoilage... It has been prepared for several hundred years in the city of Matsuyama on the large island of Shikoku, as well as on Okinawa. Talk with a Japanese from Shikoku. 1981. This product has been made since the start of the Meiji period on Shikoku. Each piece is about 8 inches square. The first manufacturer was Hodoya-Shoten. The current president of Hodoya is Mr. Takaaki."

522. Chambers's encyclopædia: A dictionary of universal knowledge for the people: Soy. 1868. London: W. and R. Chambers. See vol. IX, p. 10.
• ***Summary:*** "Soy is a thick and piquant sauce, made from the seeds of the Soy Bean (*Soja hispida*), a plant of the natural order *Leguminosæ,* suborder *Papilionaceæ,* so nearly allied to the genus Dolichos (q.v.) as to be often included in it. It is a native of China, Japan, and the Moluccas, and is much cultivated in China and Japan. It is also common in India, although, probably, not a native of that country. The seeds resemble those of the Kidney Bean, and are used in the same way. The Japanese prepare from them a substance called *Miso,* which they use as butter.

"Soy is made by mixing the beans softened by boiling with an equal quantity of wheat or barley roughly ground. The mixture is covered up, and kept for 24 hours in a warm place, to ferment. The mass is then put into a pot, and covered with salt, the salt used being in quantity about equal to each of the other ingredients. Water is poured over it; and it is stirred, at least once a day, for two months, after which the liquor is poured off and squeezed from the mass, filtered, and preserved in wooden vessels. By long keeping, it becomes brighter and clearer. A Chinese sauce, called *Kitjap* (Ketchup), is often sold in Britain as soy, but is very inferior to the true soy."

523. Pagés, Léon. 1868. Dictionnaire japonais-français [Japanese-French dictionary]. Paris: Firmin Didot frères, fils et cie. 933 p. See p. 597. [1 ref. Fre]
• ***Summary:*** This is a French translation of the Japanese-Portuguese dictionary published in 1603 in Nagasaki by the Society of Jesus [Jesuits].

Includes: Daizzou [daizu] (p. 252). (Mame), grains, ou haricots du Japon (*Soja hispida,* Moench.- Hoffm.).

Mame (p. 518). Haricots, ou pois chiches du Japon (*Soja hispida,* Moench.- Hoffm.).

Miso (p. 548): Certaine préparation de graines, de riz, et de sel, avec lequel on assaisonne le *Chirou* [*shiru*] du Japon.

Nattô (p. 597). Certain mets de grains légèrement cuits, et ensuite mis au four. Nattôjirou [nattôjiru]. *Chirou* [*shiru*] ou bouillon fair avec des grains [nattô].

Note: This is the earliest French-language document seen (Jan. 2012) that mentions natto.

Tôfou [tofu] (p. 803). Espèce d'aliment qui se fait avec des grains pulvérisés, en manière de fromage frais. Tôfouya [tofu-ya]. Maison où l'on fait ou vend des especès de fromages, faits de grains amollis dans l'eau et réduits en pâte. Address: Japan.

524. Saito, Akio. 1868. [Chronology of soybeans in Japan,

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1700 to 1868, the last half of the Tokugawa / Edo period] (Document part). In: Akio Saito. 1985. Daizu Geppo (Soybean Monthly News). Jan. p. 16. Feb. p. 10-11. [Jap]
• ***Summary:*** 1707 May–The Tokugawa shogunate government (*bakufu*) passes a law to lower the prices of goods. Shops selling high-priced tofu are punished. But tofu makers argue that although the price of soybeans has dropped, the prices of other ingredients such as nigari and oil have risen.

1709–Kaibara Ekken (1630-1714) writes *Yamato Honso,* in which he discusses the shapes and use of the 1,362 products from Japan, China, and other countries. He notes that among the five crops (*go-koku*), soybeans are the second most widely produced after rice.

1712–Kaempfer, the German physician and naturalist who stayed in Japan during 1691-1692, writes *Nihon-shi* in the Netherlands. In the book he discusses soybeans and includes a very accurate illustration of the soybean. This draws the attention of other European scholars.

1722–Kinzanji miso becomes popular in Edo (today's Tokyo).

1724 Feb.–The Tokugawa shogunate government commands that various goods, such as sake and shoyu [soy sauce], should be lower in price because the price of rice has decreased.

1726–The amount of shoyu imported to Edo from the Osaka-Kyoto area (*kudari shoyu*) is about 132,000 kegs (*taru*). Note: The average keg held 9 shô = 16.2 liters = 4.28 gallons (U.S.). Thus, 132,000 kegs = 564,960 gallons or 2,138,400 liters.

1730–The amount of shoyu imported to Edo from the Osaka-Kyoto area increases to 162,000 kegs.

1739–A French missionary living in China sends some soybean seeds to France for the first time. Attempts are made to grow them at the botanical garden, but the weather is not good and they fail. Later unsuccessful attempts were made to grow soybeans in Germany in 1786 and in England in 1790. There is another theory which says that the soybean went to Europe through Russia.

1748–The cookbook titled *Ryôri Kasen no Soshi* is published. It is the first cookbook which introduces the present form of tempura batter.

1753–The Swedish naturalist Linne (Linnaeus; 1707-1778) gives the soybean its first scientific name.

1770–Sugita Genpaku (lived 1733-1817) discusses the nutritional value of foods and uses the word *eiyo* (meaning "nutrition") for the first time in Japan.

1782–The book *Tofu Hyakuchin* (One hundred rare and favorite tofu recipes) is written by Ka Hitsujun (his pen name) of Osaka. He introduces about 100 tofu recipes. The next year he publishes a supplementary volume, *Zoku Tofu Hyakuchin.* He divides tofu recipes into five different categories according to their special characteristics, like common, regular, good, very good, and fantastic (*jinjohin, tsuhin, kahin, myohin, and zeppin*). In his jinjohin category, he includes 36 recipes such as *Kinome Dengaku, Kijiyaki, Dengaku,* etc.–showing that these were common recipes of the period. Over the next several years, many books with the word "Hitsujin" at the end of the title appear.

1783-1787–The terrible famine of the Tenmei period (*Tenmei no Dai Kikin*) occurs. It is worst in Oou province, where several hundred thousand people die of starvation. Many farm villages are abandoned.

1788–At about this time the word *nukamiso* first appears.

1802–Takizawa Bakin (lived 1767-1848) writes *Kiryo Manroku,* a travel book, and in it he states: "Gion tofu is not as good as the Dengaku of Shinzaki, and Nanzenji tofu is not better than Awayuki in Edo. He criticizes tofu as a famous product from Kyoto (*Kyoto meibutsu tofu*) in his writing.

1804–Takahashi Fumiuemon (or Bunuemon) on the island of Shodoshima starts making shoyu; he starts selling it in 1805.

1810–Choshi Shoyu receives an order from the Tokugawa Bakufu (*Gozen Goyo-rei*).

1818–There are now 10 miso manufacturers in Edo (today's Tokyo). Yomo Hyobei's miso shop in Shin Izumi-cho (presently Ningyo-cho 3-chome, Nihonbashi, Chuo-ku, Tokyo) has a prosperous business. In some funny poems (*Senryu*) this shop is mentioned: "With sake and miso their name is ringing in the four directions" (*"Sake, miso de sono na mo shiho ni hibiku nari"*). And: "This shop is surrounded by nested boxes for food, and these boxes are used for red miso" (*"Jûbako ni torimakaretaru shiho-ga-mise"*). His red miso and his fine sake made with water from a waterfall (*takisui*) are very popular.

1822–Pounded natto (*tataki natto*), an instant food made of chopped natto, sells for about one-fifth the price of tofu on a weight basis. The restaurant Sasa no Yuki in the Negishi area of Edo, becomes well known for its tofu cuisine.

1832–Shoyu production in Noda reaches 23,000 koku (1 koku = 180 liters or 47.6 gallons), compared with only 17,000 koku in Choshi. Thus Noda passes Choshi in shoyu production.

1839–Shibata Kyuo (1783-1839), a follower of Shingaku, writes *Zokuzoku Kyuo Dowa* in which he pens words that later become famous: "In a place where the cuckoo can sing freely, you have to walk 3 *ri* (1 *ri* = 2.445 miles or 3.924 km) to buy your sake and 2 *ri* to buy your tofu" (*Hototogisu jiyu jizai ni naku sato wa, sakaya e san ri, tofu-ya e ni ri*). Shingaku, founded by Ishida Bangai, is a popular teaching of the time combining Shinto, Buddhism, and Confucianism (*Jugaku*). It emphasizes that "to understand heart/mind is the most important thing."

1845–Inari-zushi becomes very popular in Edo. It originated around Hiranaga-cho (presently Sadacho 1-chome, Chiyoda-ku, Tokyo). It is made with deep-fried tofu pouches (*abura-agé*) stuffed with rice or okara and sells

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for 7 *mon* each.

1851–There are now 140 miso manufacturers in Edo. Half of them are in the Hongo area of Tokyo.

1853–Kitagawa Morisada (born 1810) writes *Morisada Manko,* the story of his life during the Edo period. In it he says of tofu: "In the Kyoto-Osaka area it is soft, white, and delicious, but in Edo [today's Tokyo] it is hard, not white, and not tasty." Of miso he says: "In the Kyoto-Osaka area many people make their own miso each winter, but in Edo people buy red miso and Inaka miso (from the countryside), and nobody makes their own miso." Concerning the sale of natto (*natto-uri*) he says: "Cook soybeans, ferment them overnight, then sell them. In the old days, natto was sold only in the winter, but recently it has also come to be sold in the summer."

1857–Soybean varieties brought back from Japan by the Perry Expedition are distributed to the U.S. Commissioner of Patents.

1858–Eitaro, a Japanese confectionery shop in Nihonbashi, Edo, starts selling Amanatto [sugar-sweetened red beans] made from Kintoki Sasage for the first time. Sasage is a type of cowpea [*Vigna sinensis*].

1864–For the first time shoyu made in the area around Edo (*Kanto shoyu*) is permitted to use the term "highest quality shoyu" *saijo shoyu* to describe the product.

1865–Inflation in Edo. The prices of rice, sake, miso, oil, vegetables, fish, etc. skyrocket. The Tokugawa Shogunate (*Bakufu*) orders people to lower their prices and forbids holding back or buying up goods. Address: Norin Suisansho, Tokei Johobu, Norin Tokeika Kacho Hosa.

525. White, William Nathaniel; Van Buren, J.; Camak, J. 1868. Gardening for the south: or, How to grow vegetables and fruits. New York, NY: Orange Judd and Co. 444 p. See p. 238.

• ***Summary:*** "Japan pea.–(*Soja hispida*). This is an erect-growing, rough-hairy, annual Leguminous plant, with a woody stem, growing some three feet high, branching near the ground, with ternate leaves, resembling those of the Kidney bean. There are three varieties; those with white, red, and yellow seeds.

"They are planted at the same time with Kidney beans in rows 3 feet apart and 2 feet in the row, leaving but one plant in the hill; cultivate as corn. The peas, when ripe, after soaking over night, are prepared for the table like Kidney beans, and are largely used for preparing the soy sauce of Japan and China." Address: 1. Athens, Georgia.

526. Champion, Paul; Julien, Stanislas. eds. 1869. Industries anciennes et modernes de l'empire chinois, d'après des notices traduites du Chinois par M. Stanislas Julien et accompagnées de notices industrielles et scientifiques par M. Paul Champion [Ancient and modern industries of the Chinese empire. According to accounts translated from the Chinese by Stanislas Julien and accompanied by industrial and scientific accounts by Paul Champion]. Paris: Eugene Lacroix. xiii + 254 p. See p. 185-89. 25 cm. [Fre]

• ***Summary:*** Contains a chapter about tofu titled "Fabrication du fromage de pois en Chine et Japon," by Champion and Lhôte (p. 185-89), which is cited separately. Address: Champion: Prof. of Chemistry at the Polytechnic Assoc. Former delegate of the Society for Acclimatization in China and Japan.

527. Champion, Paul; Lhôte, M. trans. 1869. Fabrication du fromage de pois en Chine et au Japon Fabrication du fromage de pois en Chine et au Japon [Production of tofu in China and Japan]. In: P. Champion and S. Julien, eds. 1869. Industries Anciennes et Modernes de l'Empire Chinois... Paris: Eugene Lacroix. xiii + 254 p. See p. 185-89. [Fre]

• ***Summary:*** This chapter gives a detailed description of the production of tofu, but also mentions soymilk and yuba. "Tofu (*Le fromage de pois,* literally "pea cheese") which is regarded in China and Japan as a very important food, looks similar to *fromage à la pie* (a smooth cottage cheese or soft cream cheese; quark). It is made from a particular variety of soybeans (*pois oléagineux,* literally "oil peas"), which are also consumed directly and which can be used, in addition, to make an oil of very good quality and rather high price.

"The production of tofu is simple, but it demands much care. The soybeans are first soaked for about 24 hours, then they are drained in a wicker basket. Next they are ground in a mill, while mixing them with the soak water, which had been set aside. The mill used for this purpose is made of horizontal discs of hard stone. The upper stone is pierced with a conical hole. The apparatus is rotated by means of a connecting rod, connected by joints, that a worker rotates with one hand while the other hand is used to throw the soybeans into the hole of the upper stone with a spoon / scoop (*cuiller*). With each addition of the soybeans, a certain amount of water for grinding is added. The soybeans, ground by the action of the mill, are transformed into a liquid slurry (*bouillie liquide*), which collects between the millstones, falls into a circular channel, and accumulates in a tub. This slurry is poured onto a filter formed of a linen cloth attached to an overhead frame; when the filtration is very slow, the material is mixed. To facilitate this operation, the frame / chassis is suspended from the ceiling at the height of a man.

"The liquid filtrate (*Le liquide filtré*), mixed by hand, is collected in a wooden vat and poured into a cooking pot, where it is cooked slowly. This cooking pot is formed of a deep, wide pan of cast iron, surrounded by a type of wooden tub (frame?); the metallic surface presenting a limited area, permits the person cooking the liquid, without fear, to raise the temperature briskly; this can alter the material. This apparatus is almost always used by the Chinese for cooking organic materials. A second cooking pot is located next to the first one on the same stove, in the form of a parallelepiped (a

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six-sided polyhedron all of whose faces are parallelograms lying in pairs of parallel planes) and receives the direct action of the fire-box. The liquid which has flowed from the mill starts to be covered with foam at about 100ºC. It is kept boiling for about 10 minutes, then is decanted into the second cooking pot, where it is subjected to a lower cooking temperature, because of the disposition of the stove. The first cooking pot, once empty, is refilled immediately with a new quantity of liquid filtrate; the drained pulp (*la pulpe égouttée*) [okara] on the filter cloth is washed with water, and the liquid which runs out is used to wet the beans which undergo grinding. This wash water carries with it a significant quantity of usable material.

Note 1. This is the earliest French-language document seen (June 2013) that mentions okara, which it calls *la pulpe égouttée.*

"When the liquid (*la liquer*) has been heated for a few moments in the second pot, it is poured into a large tub and allowed to cool. One is careful to agitate it with the aid of one's hand, causing it to rotate. The foam which forms gathers in the middle of the surface and is removed with the aid of a copper scoop. After standing for several minutes, the liquid becomes covered with a thick film

pellicle (*pellicule épaisse*) [yuba], which is removed with a stick (*baguette*) without tearing it. The film is hung up to dry by affixing the stick in the wall. Sometimes a second film is formed; it is treated in the same manner. The material thus solidified at the surface of the liquid is employed in foods. It is eaten either fresh or dried and its flavor is not disagreeable.

Note 2. This is the earliest French-language document seen (Oct. 2012) that uses the term "pellicule épaisse" to refer to yuba.

"The liquid which remains in the vat is destined to produce the tofu (*fromage de pois*). One first adds to it a small quantity of water mixed with plaster (*plâtre*) [calcium sulfate], which has probably been baked in the cooking stove. Finally one adds a few drops of a concentrated solution from a salt marsh. (According to our analysis, this is nothing but magnesium chloride.) The liquids are mixed slowly to form a homogeneous mass, which soon coagulates and becomes a solid. The plaster is certainly added to coagulate the casein of the soybeans (*pois*). As for the magnesium chloride, it is rather difficult to define the role that it plays; it is used in only a few cities in China.

"Once formed, the tofu curds are poured, while still hot, into a square forming box, 40 cm on a side and 5 cm deep. These boxes, stacked up double, are placed side by side on a long stone table, having gutter drains along the two sides. The boxes on the table are closed at their lower part by a fine-weave linen, through which the water trapped in the cheese (*fromage*) can flow out. When the tofu (*fromage de pois*) is sufficiently drained, it is compressed in the box where it is trapped, by putting on the top a plank laden with weights. When the volume is reduced by half, the box is removed and the cheese it contains is sometimes shipped out to a great distance. To transport them, it is sufficient to close the box with planks, nailed with the aid of bamboo pegs. After arriving at the destination, it is cut into small pieces by means of a metal knife.

"Tofu is generally a grayish white and looks like a jelly. It does not keep more than a day during the hot months, and to preserve it from rapid deterioration, it is generally mixed with salt or sauces of various types [especially soy sauce]. It can then be kept for several years.

"A piece of tofu the size of a fist sells for 2 Cash, i.e., one centime. Sellers of tofu also offer for consumption the hot uncoagulated liquid (*le liquide chaud non coagulé*) [soymilk], of which we have spoken previously. Poor Chinese nourish themselves on this substance, which has a dull flavor but is not disagreeable. The shops where this cheese is sold present a curious aspect at certain times of the day. Chinese workers come in great numbers to buy a portion of liquid cheese (*de fromage liquide*), which they carry away in small cups; others consume the coagulated cheese on the spot.

"For many people of the poorer class, the morning meal consists solely of a cup of soymilk (*une tasse de fromage de pois liquide*) in which they soak some cakes [crullers] that have been deep-fried in oil."

Note 3. This is the earliest French-language document seen (Aug. 2013) that uses the term *fromage de pois liquide* to refer to soymilk.

"The production of tofu ("pea cheese") is executed on a grand scale in most of the ports of China through which we have traveled, from the south to Peking, and in the few towns in Japan that we have been able to visit.

"Tofu is rather agreeable in flavor. It could render a great service to the feeding and nourishment of Europeans if they are able to cultivate the seeds... Tofu, deep-fried like french-fried potatoes, makes a very delicious dish.

"The seeds used to make tofu usually contain 17% of a clear oil, whose flavor is not disagreeable."

"We will add to the above information some analytical results that our colleague, Mr. Lhôte, and we, have obtained on the soybeans (*pois oléagineux*, literally "oil peas") and tofu (*le fromage*)." A table (p. 189) gives: (1) The percentage composition of soybeans (now called *Pois de Chine,* or Chinese Peas) on an as-is basis and on a moisture-free basis: Water 15.07/ -, ash 4.63/5.45, lipids (*matières grasses*) 12.98/15.28, and nitrogen 5.79/6.81.

(2) The percentage composition of tofu (called *Fromage de pois,* or pea cheese) on an as-is basis and on a moisture-free basis: Water 90.37/ -, ash 0.76/7.89, lipids 2.36/24.50, and nitrogen 0.78/8.09.

(3) The percentage composition of yuba (called *Matière coagulée pendant la préparation du fromage,* or "The material coagulated during the preparation of tofu") on an

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已足歇火一日揭榻取出竹蘇入清水漂塘之內洗淨其塘底面四維皆用木扳合縫砌完以妨泥汚（造粗紙者不須）爲此洗淨用柴灰漿過再入釜中其上按平平鋪稻草灰寸許桶內水滾沸卽取出別桶之中仍以灰汁淋下倘水冷燒滾再淋如是十餘日自然臭爛取出入臼受舂（山國皆有水碓）舂至形同泥麵傾入槽內凡抄紙槽上合方斗尺寸濶狹槽視簾簾視紙竹蘇已成槽內清水浸浮其面三寸許入紙藥水汁于其中（形同桃竹葉方語無定名）則水乾自成潔白凡抄紙簾用刮磨絶細竹絲編成展卷張開時

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as-is basis and on a moisture-free basis: Water 9.36/ -, ash 4.01/4.42, and nitrogen 9.70/10.71.

From 120 gm of soybeans on obtains 184 gm of tofu.

One full page (frontispiece, facing the title page; see previousw page) contains a specimen of the Chinese text translated by Mr. Stanislas Julien. The characters are written with handsome calligraphy. Address: China & France.

528. Jephson, Richard Mounteney; Elmhirst, Edward Pennell. 1869. Our life in Japan. London: Chapman and Hall. xviii + 428 p. Illust. No index. 23 cm. Facsimile edition reprinted in 2002 by Ganesha Publishing (London) and Edition Synapse (Tokyo). Series: Japan in English, Vol. 14.
• ***Summary:*** This is largely a silly book, that tries to be amusing, but ends up being foolish. It's about Englishmen riding horseback and hunting in Japan, while taking many opportunities to belittle Japanese culture and religion– although there are some parts of Japanese culture that they appreciate. The authors arrived in Japan on 9 May 1866 after having been in Hong-Kong for a year. At breakfast in Japan, one of them, "suddenly changing his tone to one of reckless indifference,... tell the cook to make some more of that grill, with no end of Cayenne pepper and Worcestershire sauce in it!" (p. 62).

"Extreme cleanliness characterises not only their dwellings, but their food, manner of cooking, serving it, &c. As an instance to show how well assured we became of this, we may mention that on more than one occasion, when returning home late at night, we have partaken of the delicate seaweed soup that is hawked about in the streets of every town, and that without any fear of either the materials of the soup itself, or the cups we drank out of, being less clean than at our own table. When you come to consider that the price of the soup rendered it accessible to the meanest coolie,..." (p. 381). Note: This may well have been miso soup with wakame.

"They consume little or no meat, except in the form of soups;..." (p. 381).

"The first Japanese dinner we ever went to, caused us more wonderment at the time, and appeared to possess more novelty, than anything we had ever seen before. This was an entertainment given at Nagasaki by some of the chief officers of Prince Satsuma to the British Admiral and his friends" [on 28 July 1866] (p. 382). Every aspect of the 40-course dinner is described in great detail. "The drink was a spirit called *saki,* which is extracted from rice." (p. 383). It is consumed hot.

The Bill of fare, describing briefly each of the 40 courses, is given; it includes "1. Bitter Green Tea (whipped)," hot Saki, seaweed, salted plums, "14. Soup of fish and seaweed," and "27. Soup of Vermicelli, with 'Soy' [probably sauce] and Red Berries." (p. 385-86). Address: Englishmen.

529. Martens, Georg Matithias von. 1869. Die Gartenbohnen. Ihre Verbreitung, Cultur und Benuetzung. Zweite vermehrte Ausgabe [Garden beans. Their distribution, culture, and utilization. 2nd expanded edition]. Ravensburg, Germany: Druck und Verlag von Eugen Ulmer. 106 p. See p. 103-05. With 12 color plates. 28 cm. [94* ref. Ger]
• ***Summary:*** The author discusses the soybean under the name *Soja hispida* Moench, gives a botanical description of the species, then and gives a classification of 13 varieties that he had secured from various sources, of which he apparently grew but one. He grew that one by his window in Stuttgart, having obtained it from the village of Daguiga, near the city of Aigun [or Ai-hun, in northeast Heilungkiang province] on the Amur River. He planted the seeds on May 23 and they were ripe by Sept. 24. He describes their area of distribution in East Asia, from the 50th north latitude in Siberia down to the Moluccas near the equator, but notes that their center of cultivation is Japan, where they are made into a type of butter named Miso, and a famous sauce named Soja that stimulates the appetite (*eine Art Butter, Miso genannt, und eine berühmte, den Appetit reizende Sauce, die Soja,...*). He considers these two delicacies fit for gourmets and epicures. The sauce was introduced to Europe by the English. In China, the beans are cooked to a white, thick paste (*Brei*), tofu (*Teu hu*), one of the most popular foods there.

In Europe, with suitable care, soybeans can be made to ripen / mature as far north as 53º north latitude, near Berlin. Thus, during the last continental blockade [first, of the British, by Napoleon, based on his 1806 Berlin Decree and 1807 Milan Decree; then in 1807 the British retaliated with their own sort of blockade], which is still an infamous memory, in the lands that at that time were part of the French empire, the soybean was prized and cultivated for a while as a coffee substitute (*als Kaffeesurrogat*). Later the milk vetch (*Kaffeewicke; Astragalus baeticus* L.), the chufa or earth almond (*Erdmandel; Cyperus esculentus* L.), and other coffee substitutes were used, but they have all been long since forgotten–except for chicory [*Cichorium intybus;* the thick roots of this perennial herb are dried, ground, and roasted, then used to flavor or adulterate coffee].

Martens divides the species into 3 subspecies based on the form of the seed, under which the varieties are named according the color and size of the seed. In this, he creates an entirely new system for classifying and naming soybeans.

I. *Soja elliptica* Martens. Seeds oval. 1. *S. elliptica nigra.* Seeds black and elongated; obtained through his son from Shanghai and Paris. 2. *S. elliptica castanea.* Seeds brown and elongated; obtained from Chefoo (China), Venice (Italy), and Berlin. 3. *S. elliptica virescens.* Seeds greenish yellow and elongated; obtained from Shanghai and Paris. 4. *S. elliptica lutescens.* Seeds yellow; brought by Mr. Schottmueller from Chefoo as "true Chinese oilbeans."

II. *Soja sphaerica.* Seeds globose/spherical. 5. *S. sphaerica nigra.* Seeds black, large; obtained from

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Yokohama and Nagasaki, Japan. 6. *S. sphaerica minor.* Seeds black, small; obtained from Japan and Sumatra. 7. *S. sphaerica virescens.* Seeds greenish; obtained through his son from Yokohama as "Ao mame" and from Shanghai. 8. *S. sphaerica lutescens.* (The *Soja pallida* of Roxburgh). Seeds pea-colored to pea-yellow, large; obtained from Dr. Schuebler in Oslo (Christiana), Norway, as "New Japan peas," under which name they have been recommended and popularized in the United States. 9. *S. sphaerica minima.* Seeds yellow, small; obtained through his son as "Shiro mame" from Yokohama.

III. *Soja compressa.* Seeds compressed. 10. *S. compressa nigra.* Seeds black and flat, the largest of all soybeans; obtained as "Kuro Mame" from Yokohama. 11. *S. compressa parvula.* Seeds black, small; obtained via Schotmueller from Chefoo. 12. *S. compressa virescens.* Seeds greenish; obtained from Chefoo and from Berlin as *Soja ochroleuca* Bouché. 13. *S. compressa zebrina.* Seeds brown banded with black like a zebra; obtained from the Berlin Botanic Garden.

Note 1. This is the earliest document seen (Nov. 2012) which states clearly that soybeans have been (or can be) used as a coffee substitute (*als Kaffeesurrogat*). It is also the earliest German-language document seen (Nov. 2012) that mentions soy coffee.

Note 2. This is the earliest document seen concerning soybeans in Norway. It is not clear whether or not the soybeans were being grown in Norway at this time.

Note 3. This is the earliest German-language document seen (April 2013) that mentions tofu, which it calls *Teu hu.*

Note 4. This is the earliest German-language document seen (April 2012) that uses the term *die Soja* to refer to soy sauce.

Note 4. This is the earliest document seen that (Aug. 1999) that divides the species into 3 subspecies based on the form of the seed, under which the varieties are named according the color and size of the seed. Martens is the first to use a number of such terms in connection with the soybean, such as "nigra" "castanea," "virescens," "lutescens," "elliptica," "Soja elliptica," "Soja pallida," etc.

Note 5. This is the earliest document seen (Feb. 2007) that uses the word "nigra" to refer to black soybeans.

Note 6. This is the earliest document seen (July 2001) in any language that contains the word "Chefoo," a port city in Shandong province, presently named Yantai (Wade-Giles: Yen-t'ai), and long associated with soybeans and soybean cake.

Note 7. Also discusses *Psophocarpus tetragonolobus* Dec. (p. 101). Address: Doctor der Naturwissenschaften, Germany.

530. Henfrey, Arthur. 1870. An elementary course of botany: Structural, physiological and systematic. 2nd ed. Revised and in part re-written by Maxwell T. Masters. London: John Van Voorst. xv + 708 p. Illust. (500+ woodcuts). Index.

• ***Summary:*** "Soja" beans are found in China and Japan (Kaempfer's region) (p. 657), and in India (Roxburgh's region) (p. 658). Address: Prof., F.R.S., L.S.., &c, London.

531. Balfour, Edward. 1871. The Cyclopaedia of India and of eastern and southern Asia, commercial, industrial, and scientific; products of mineral, vegetable, and animal kingdoms, useful arts and manufactures. 2nd ed.: Soy [sauce]. Madras, India. Printed at the Scottish and Adelphi presses. See vol. 1, p. 426, 707, 709, 277 (near end of book). 26 cm. Reprinted in 1985 by International Book Distributors, Dehra Dun, India. [6 ref]

• ***Summary:*** Page 426: Bhut, Hind. [Hindi]. Said to be the Soy bean, the Soja hispida.

Butters, vegetable (p. 707): "Mijo of Japan [Miso of Japan]. Butter from Dolichos soja."

Page 709: "Butwas, Hind. Glycine." Note: It is not clear whether or not this refers to the soybean.

The section on "Cochin-China" [today's south Vietnam] states (p. 277, near end of book): "They eat vermin, and the flesh of the crocodile; hatched eggs with them are a delicacy, and their favourite sauce is a kind of soy, in part, at least, composed of the juices of putrid fish, and which, both from taste and odour, would be intolerable to any other people." Address: L.R.C.S.E., Inspector General of Hospitals, Madras Medical Dep. [India].

532. Merck, Klemens. ed. 1871. Neustes Waaren-Lexikon fuer Handel und Industrie [Newest dictionary of products and commodities for trade and industry]. Leipzig, Germany: Verlag von Otto Spamer. 568 p. See p. 493. [Ger]

• ***Summary:*** Soya is a brown, salty liquid, imported from China and Japan, and used as a seasoning on roasts (*Braten*), sauces, fish, and other foods, but which, in order to be pleasant, must be used sparingly. This article is prepared from a small bean of the legume family named *Dolichos Soya.* The beans are cooked, mixed with roasted wheat in salt water, and allowed to stand for 2 to 3 months. A type of fermentation takes place, and the process apparently resembles that of pickling cabbage or cucumbers. Finally, the liquid is pressed out of the ripened or fermented mass and filtered. The product comes into the trade sometimes in corked glass bottles, and sometimes (from Japan) in small kegs (*Fässchen*). The Japanese product is the better of the two; it is used daily by the people in Japan. The product is, in general, of rather inconsistent quality; the best products are recognized by their aroma and taste. It is presumed that great adulteration takes place with this product. In England, an investigation was undertaken by shaking some of the product in a glass. If a shiny, yellowish-brown film did not form on the surface, the product was considered to be of poor quality. In 1867, England imported 11,493 gallons of this sauce and, of that, exported 2,166 gallons.

Also discusses: *Cyperus esculentus* (*Erdmandeln,* p.

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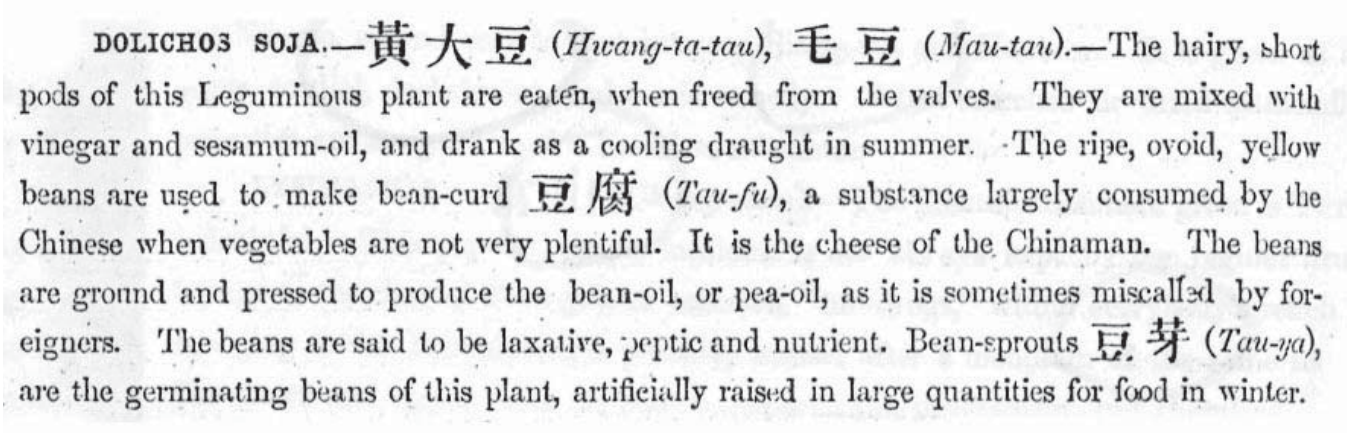

DOLICHOS SOJA.—黃大豆 (*Hwang-ta-tau*), 毛豆 (*Mau-tau*).—The hairy, short pods of this Leguminous plant are eaten, when freed from the valves. They are mixed with vinegar and sesamum-oil, and drank as a cooling draught in summer. The ripe, ovoid, yellow beans are used to make bean-curd 豆腐 (*Tau-fu*), a substance largely consumed by the Chinese when vegetables are not very plentiful. It is the cheese of the Chinaman. The beans are ground and pressed to produce the bean-oil, or pea-oil, as it is sometimes miscalled by foreigners. The beans are said to be laxative, peptic and nutrient. Bean-sprouts 豆芽 (*Tau-ya*), are the germinating beans of this plant, artificially raised in large quantities for food in winter.

125), peanuts (p. 135), and sesame oil (p. 484).

The full subtitle reads as follows: *Beschreibung der im Handel vorkommenden Natur- und Kunsterzeugnisse, namentlich der Kolonial-, Material-, Droguerie- und Farbwaaren, Mineralien- und Bodenprodukte, chemisch-technischer und anderer Fabrikate. Unter Mitwirkung bewährter Fachmänner bearbeitet von...* [Description of natural and artificial products in commerce, especially of the colonial materials, drugs, and dyestuffs, minerals, and other products of the earth / agricultural products (*Bodenprodukte*), chemical-technical and other manufactured goods. With the assistance of well-known experts].

Note 1. *Bodenprodukte* ("products of the earth") probably includes cultivated agricultural products and noncultivated commercial products such as berries, mushrooms, hay, and perhaps even firewood. Note 2. The 4th edition of this book was published in 1890. Address: [Germany].

533. Smith, Frederick Porter. 1871. Contributions towards the materia medica & natural history of China. For the use of medical missionaries & native medical students. Shanghai, China: American Presbyterian Mission Press, and London: Truebner & Co. vii + 237 p. See p. 88, 202-03. 24 cm.

• ***Summary:*** This book, based in part on the famous *Pen-ts'ao kang-mu* by Li Shih-chen (1578-1597), contains a listing of medicinal plants arranged alphabetically by either their popular English name or scientific name. Chinese characters for the plant name, the romanized Chinese name, and key related terms are also given immediately after the main entry. There is no index. The soy bean is listed under "Dolichos soja (*Hwang-ta-tau;* characters = Yellow + large + bean), (*Mau-tau;* characters = hairy + bean).–The hairy, short pods of this Leguminous plant are eaten, when freed from the valves. They are mixed with vinegar and sesamum-oil, and drank as a cooling draught in summer. The ripe, ovoid, yellow beans are used to make bean-curd (*Tau-fu*), a substance largely consumed by the Chinese when vegetables are not very plentiful. It is the cheese of the Chinaman. The beans are ground and pressed to produce the bean-oil, or pea-oil, as it is sometimes miscalled by foreigners. The beans are said to be laxative, peptic [promoting digestion] and nutrient. Bean sprouts (*Tau-ya*), are the germinating beans of this plant, artificially raised in large quantities for food in winter (p. 88).

Note 1. This is the second earliest English-language document seen (Jan. 2013) that refers to soy sprouts, which it calls "Bean sprouts (*Tau-ya*)... And this is the earliest English-language document seen (Jan. 2013) that uses the term "Bean sprout" or *Tau-ya* to refer to soy sprouts, then goes on to explain what these terms mean.

Note 2. This is the earliest document seen (Feb. 2000) that uses the word "laxative" in connection with soy beans.

Note 3. This is the earliest English-language document seen (April 2013) that uses the term "cheese of the Chinaman" to refer to tofu.

Note 4. This is the earliest English-language document seen (Sept. 2006) that uses the term "pea-oil" ("as it is sometimes miscalled by foreigners") to refer to soybean oil

Also on p. 88, under *Dolichos trilobus* (*Koh*) is a description of kuzu. "The Pachyrizus trilobus is sometimes included under this name... A fibre resembling linen, called (Chinese characters) *Koh-pu* or *Kung koh,* of a yellow color, very fine and durable, and much prized in Hankow, is obtained from the climbing branches. The best of this cloth comes from Wu-chang hien (Hupeh), and from Kwang-sin fu in Kiangsi. The root is eaten, although to some extent deleterious, if not thoroughly cooked. A kind of arrow root (Chinese characters), called *Koh-fen,* is made from the root in Ngan-king fu (Nganhwui), Kwang-sin fu (Kiangsi) and at Teh-ngan fu (Hupeh). Emetic, diaphoretic and antiphlogistic properties reside in the root, which is given in fevers, exanthemata and rashes of all kinds, and in bloody fluxes [excessive abnormal discharge from the bowels]. Every part of the plant is officinal" [medicinal].

Soy sauce (p. 202) is listed under "Soy (*Tsiang-yú*)–The condiment known by this name, derived from a Chinese synonyme used by the Japanese, is a black, thin liquid, having an agreeable, saltish flavour, and frothing up of a yellow colour when very slightly shaken. It is the universal

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sauce of the Chinese and Japanese, and is largely exported to India and Europe as a convenient menstruum for other flavouring substances used as condiments. The yellow beans of the Dolichos soja are boiled very soft, and mixed with any cereal flour in varying proportions, and allowed to ferment and become mouldy. Salt and tea, or boiling water, are then added, and the mixture is then exposed to the sun and dew of the open air for three weeks or a month, care being taken to avoid rain. The liquid becomes much thicker, darker and more uniform in consistence, and after constant stirring is then strained and kept for use. Bran is sometimes used in making it. Large quantities are both sold from the shops and made at home by the Chinese. It is considered to provoke the appetite, and to correct any injurious quality of food. It is laxative, cooling, and an antidotal, according to Chinese estimation. It is sometimes daubed upon burns, scalds, eczematous and leprous sores."

Note: This is the earliest English-language document seen (April 2012) that uses the term "Tsiang-yú" to refer to the Chinese word for soy sauce.

Under "Maccaroni [Macaroni] (Mien-kin)," following the description of the basic kind made from wheat flour (which is "a part of the diet of priests and those fasting from animal food"), we read: "A kind of macaroni, very much like foreign macaroni, is made from bean-curd and called *Tau-kin* (bean + muscle, sinew, or tendon)."

Under "wheat," the author discusses the grain itself, "wheaten flour," and "wheaten starch," but he does not mention wheat gluten. Nor are azuki beans (*hsiao-tou*) listed. Bretschneider harshly criticizes this book: "Of little value, unreliable." But Rev. G.A. Stuart, M.D., in his Chinese Materia Medica (1911) states on the title page "Extensively revised from Dr. F. Porter Smith's Work." Smith lived 1833-1888. He wrote the preface in Nov. 1870 from Hankow, China. Address: Medical missionary (from England) in central China [Hankow].

534. House, E.H. 1872. A Japanese statesman at home. *Harper's New Monthly Magazine* 44(262):589-600. March. See p. 598.

• ***Summary:*** The statesman is Kenzo Hirosawa, who is at home in Yeddo [Edo, today's Tokyo], Japan.

"Raw fish!" The writer forces himself to try it. "But is it utterly revolting and untenable? Hardly so. Do I like it, then? Truly, not too well. But I willingly admit it might be worse, especially as it is deftly mitigated by pungent soy. I do not know its name, but it is like salmon in aspect, and in taste like nothing in my particular prior experience"

535. *Phoenix* (*The*)*: a Monthly Magazine for India, Burma, Siam, China, Japan & Eastern Asia.* 1872. Japanese proverbs. 2(23):191. May. [Eng]

• ***Summary:*** "(52) *Tôfu ni kasugai:* Like using a clamp-shaped nail to fasten Tôfu (a soft kind of food) together."

Note 1. This is a remarkable periodical, with many interesting articles about East Asia in each issue.

Note 2. This article started on page 127 (No. 20, Feb), where it states: "We are indebted to Mr. W. G. Aston, Interpreter to H.M. [British] Legation in Yedo, for the text and translations which we give below, and also to two Japanese gentlemen for a careful revision of both."

536. Buckle, Thomas Henry; Taylor, Helen. 1872. The miscellaneous and posthumous works of Henry Thomas Buckle. 3 vols. London: Longmans, Green, and Co. See vol. 3, p. 24. 23 cm.

• ***Summary:*** In *Common Place Book* (p. 24) under "1485. The soy [sauce] of the Japanese first used in Europe in the eighteenth century," are excerpts from four early sources that discuss soy:

"The Japanese soy is also prepared of beans, and turned sour in casks. They say that three years are required for preparing the best soy" (*Golownin's Captivity in Japan,* 8vo, 1824, vol. iii. p. 157).

"Thunberg (*Travels in Japan,* London. 1795, vol. iv. p. 121) says, 'Soy sauce, which is everywhere and every day used throughout the whole empire, I might almost say in every dish, and which begins even to be made use of in Europe, is prepared from soy beans (*Dolichos Soja*) and salt, mixed with barley or wheat.'"

"In 1679, Locke, in his Journal, mentions at London, "Mango and saio, two sorts of sauces brought from the East Indies" (*King's Life of Locke,* 8vo, 1830, vol. i. p. 249).

"At iv. 107, Thunberg says, 'The soy is much better than that which is brewed in China.' The Chinese highly value the Japanese soy, of which they consume immense quantities (see *Dobell's Travels through Kamtchatka, &c.,* 8vo, 1830, vol. ii. p. 325).

"On Soy, see Crawfurd's *History of the Indian Archipelago,* Edinburgh, 8vo, 1820, vol. i. p. 370."

Henry Thomas Buckle (1821-1862) was an English historian, the author of *History of Civilization in India.*

537. Hepburn, James C. 1872. Japanese-English and English-Japanese dictionary. 2nd ed. Shanghai: American Presbyterian Mission Press. xxxi + 632 + 201 p. 28 cm.

• ***Summary:*** This is Hepburn's 2nd Japanese-English dictionary. The words are arranged alphabetically by their Romanized spelling. Each word is written in three ways. After the romanized word (main entry), written in uppercase letters with diacritical marks (which we have largely omitted below), the same word is written in katakana, then again in Chinese characters. Then comes an abbreviation of the part of speech (n. = noun; v. = verb, etc.). Finally, one or more definitions are given.

This 2nd edition is 162 pages longer than the original 1867 edition; the Introduction is 19 pages longer, the Japanese-English section 74 pages longer, and the English-

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Japanese section 69 pages longer.

We will not repeat definitions that are identical to those in the 1867 edition. For new spellings, the 1867 spelling will be shown in parentheses. No new soy-related words were found in this 1872 edition. Soy-related words and terms in the 1872 edition: Adzuki (replaces Adzki) [azuki]. Amazake. Daidzu (replaces Daidz) [Daizu]. Hiriodzu (replaces Hiriodz) [Hiryozu]: A kind of food made of *tofu* fried in oil.

Note 1. This is the earliest English-language document seen (April 2013) that contains the term *Hiriodzu* (the modern spelling is Hiryozu) which refers to Kyoto-style deep-fried tofu treasure balls.

Kinako.

Kiradzu [okara]. Koji: Barm or yeast made by the fermentation of rice or barley, in the process of making sake and soy [sauce]. Koji-buta: A shallow box for holding barm. Miso. Miso wo suru: To rub *miso* in a mortar. Natto.

Nigari. Sashi (verb). Sashimi. Shitaji (replaces Sh'taji). Note 2. This is the earliest English-language document seen (April 2012) that uses the word "shitaji" [spelled like this] to refer to shoyu or soy sauce.

Shoyu. Tofu: A kind of food made of beans, bean curd. Umeboshi (*hakubai*).

Yuba [hot water + leaf]. Yu-dofu.

The English-Japanese part of this dictionary starts after p. 558 and is titled "An index; or, Japanese equivalents for the most common English words." Separately numbered to p. 132, it includes: "Barm, Kôji; tane." "Soy, Shôyu."

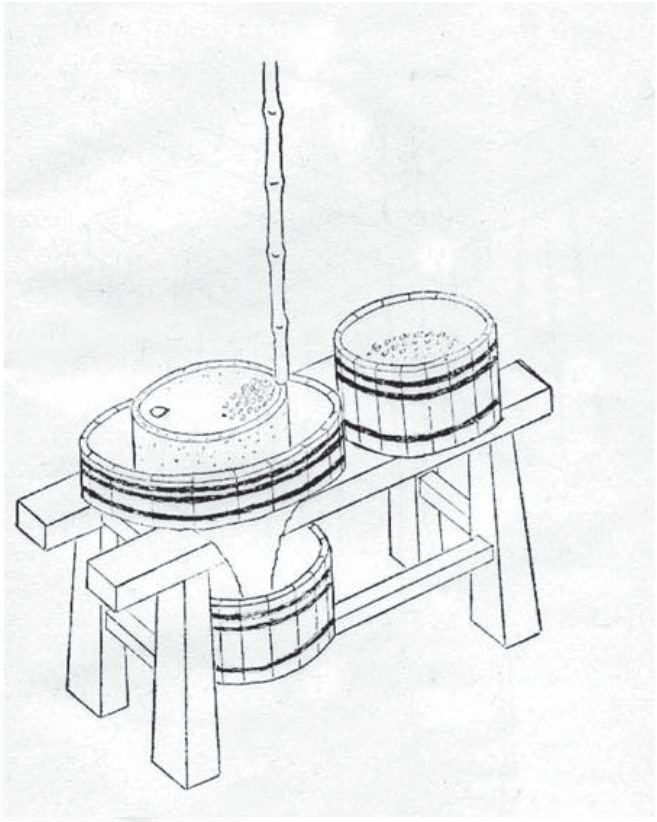
Terms NOT mentioned include Abura-age, Aburaage, Aburage, Atsu-age, Daitokuji natto, Edamame (or Eda mame or Yedamame), Ganmodoki, Hamanatto, Hiya-yakko, Kori-dofu, Koya-dofu, Nama-age, Okara, Tamari, Tonyu, Unohana, Yaki-dofu.

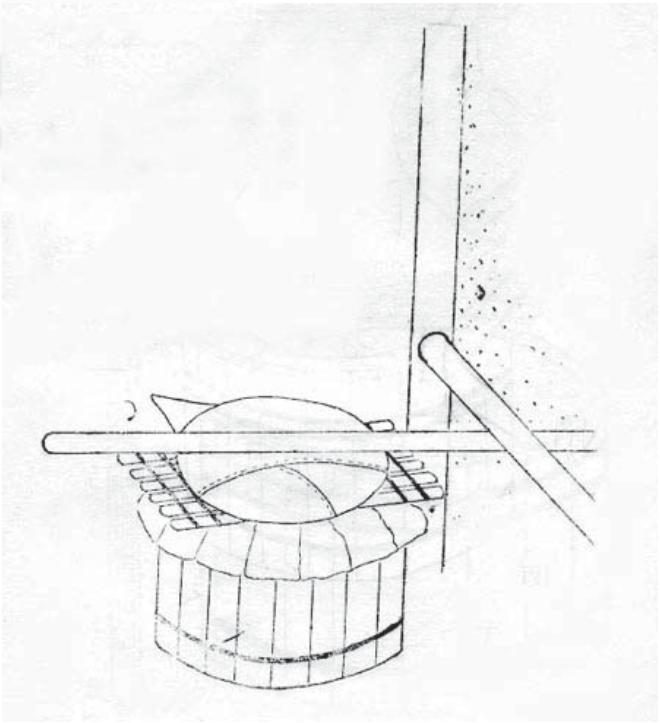
Note 2. The author apparently still did not realize that the various soyfoods he defined (with the possible exception of hiriodzu and soy sauce) were made from soybeans. Address: M.D., LL.D.

538. Katagiri, Torakichi; Sakakibara, Yoshino. 1872. Tôfu shûsetsu [Tofu: Collected theories]. Tokyo: Ministry of Education. 40 p. Illust. 19 cm. [Jap]

• ***Summary:*** The cooking teacher and author was Sakakibara Yoshino. The tofu production teacher was Katagiri Torakichi. Both of the first two men told it by word of mouth. It was written by the Japanese Ministry of Education (*Mombusho/ Monbusho*).

This charming booklet contains many illustrations (line drawings) of different types of tofu (*tsuto-dofu, tsumiire tofu, Matsukawa-dofu, yaki-dofu, agé-dofu, chikuwa-dofu, shôro-dofu* [pine-dew tofu]) and tofu making equipment (hand-turned stone mill on a stand, wooden tubs and vats, ladles, bamboo whisk, pressing sack design, a round wooden lever being used to press soymilk from the pressing sack into a wooden vat, bamboo colander, paddle for stirring in nigari,





forming box cloths, forming box design, large knife for cutting tofu into cakes).

For an English-language translation of a document quite similar to this one, with different but related illustrations, see Richard B. Hubbard (1886).

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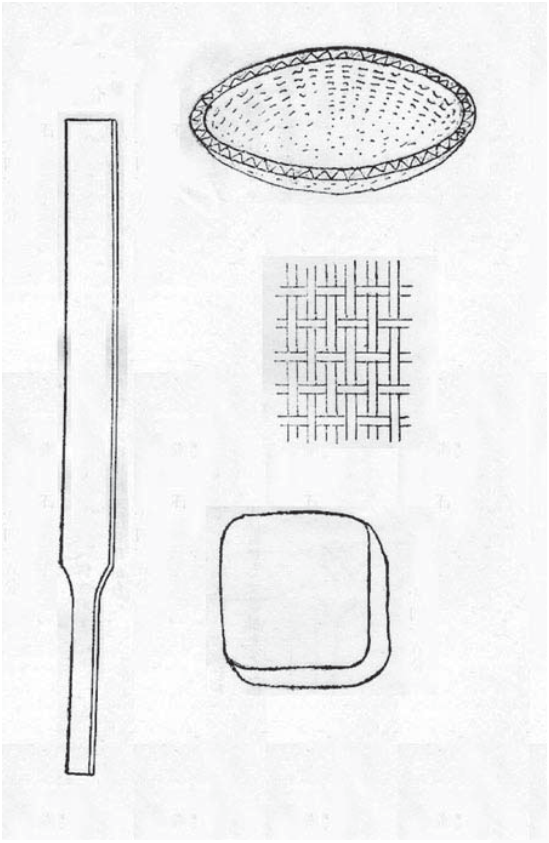
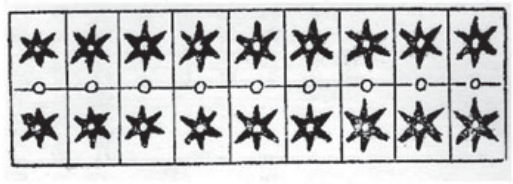
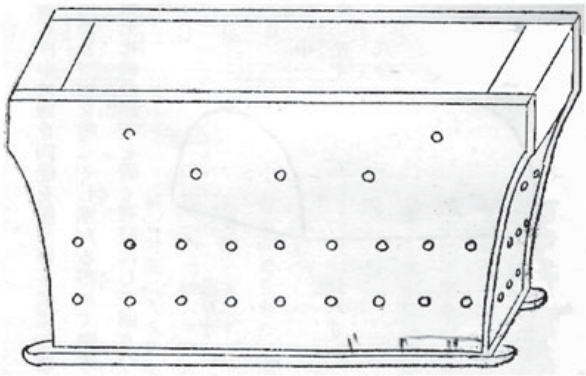
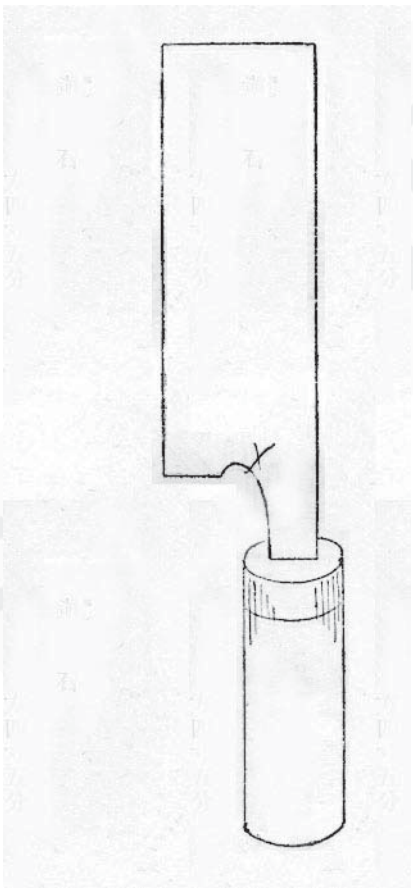
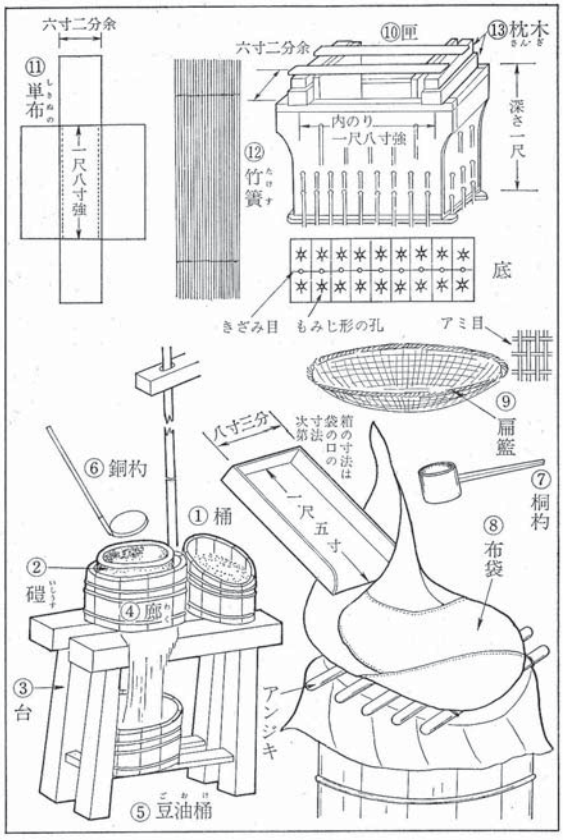








51 豆腐のはなし



『豆腐集説』に見られる道具類

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Note 1. This is the earliest document seen (April 2001) that discusses or illustrates equipment for making tofu.

Note 2. This is the earliest booklet seen (Oct. 2001) that mentions soy.

539. Mogi, Fusagoro. 1872. [Scroll from Mogi Fusagoro with preface by Mogi Keizaburo to Shoda Bunuemon on the founding of a Noda Shoyu brewery]. 2 p. Unpublished manuscript. Translated by W.M. Fruin, 1983. p. 307-08. Original in Shoda Shoyu Company Archives, not far from Noda. [Jap; Eng]

• ***Summary:*** Gives a detailed recipe for making shoyu, including the amount of each ingredient and the month in which each step is performed. To make the *best* quality shoyu: "Mix together: First year, January, 2 koku (95.2 gallons) of the *best* grains. First year, April, 2 koku. First year, October, 2 koku. Second year, March, 2 koku. Ferment the above mixture for an average of 16½ months from January of the first year and press before November of the second year. Note the importance of starting the shoyu at the coldest time of the year and of not adding all ingredients at the beginning.

Three alternative recipes are given using lower quality grains. The fermentation times are 15 or 19 months from July of the first year. Income and expenses are calculated. Costs of raw materials for 1,200 kegs of the best quality shoyu are 50 koku soybeans for 250 ryo (unit of currency), 50 koku wheat for 167 ryo, and 200 hyo akaho salt for 67 ryo. Note: A hyo is apparently a small sack of salt. Shoda later became famous as a cereal milling company. Nisshin separated off from Shoda. Address: Noda, Japan.

540. Scherzer, Karl von. 1872. Fachmaennische Berichte ueber die oesterreichisch-ungarische Expedition nach Siam, China und Japan (1868-1871). Im auftrage des k.k. Handelsministeriums redigirt und herausgegeben [Expert report on the Austro-Hungarian expedition to Siam, China, and Japan (1868-71). Edited and published on behalf of the Imperial Ministry of Trade]. Stuttgart: Verlag von Julius Maier. xvi + 418 + 494 p. Index. 25 cm. [Ger]

• ***Summary:*** See Appendix (*Anhang*) by Syrski, p. 190, 207. Address: Germany.

541. Stoeckhardt, Adolph; Senff, Emanuel. 1872. Untersuchung von chinesischen Oelbohnen [Investigation on Chinese oilbeans (soybeans)]. *Chemische Ackersmann* (*Der*) 18:122-25. [Ger]

• ***Summary:*** "On a trip to England, Mr. Berndt, a manufacturer of velvet in Deuben [in Saxony], made the acquaintance of an English seaman, who told him many things about Manchuria, in China, where he had often been. He explained, among other things, that in northern China several varieties of beans are cultivated, and from them is obtained an oil (*ein fettes Oel*) which, like our cottonseed oil, is used as a food oil (*Speiseöl*), and also a type of cheese (*eine Art Käse*) [tofu], which is widely used as food. Finally, from this bean, one can make a type of soy sauce (*eine Art Soya*), which can also be used with foods. Later Mr. Berndt shared with me two small samples of these beans, which were sent to him by post from Hongkong through the arrangement of Mr. C. Eckardt; one was yellowish white and one black. The former, egg-shaped, had somewhat the size and color of small, pale peas; the latter was significantly smaller, shiny black, and of somewhat flattened, egg-shaped form. Both belong to the genus (*Gattung*) Phaseolus."

Note 1. This is the earliest German-language document (April 2013) seen that uses *Käse,* the German word for "cheese," to refer to tofu.

A table (p. 122) gives a laboratory analysis, conducted by Assistant Senff, of the two beans. It showed the following percentage composition (Yellowish white / black): Crude oil (ether extract, *Aetherauszug*) 20.53 / 16.88. Nitrogen-containing substances (*stickstoffhaltige Substanzen*) 38.54 / 38.04. Nitrogen-free extract (*stickstofffreie Extractstoffe*) 24.61 / 27.79. Cellulose (*Rohfaser* = crude fiber) 5.13 / 5.53. Minerals (ash) 4.50 / 4.62. Water 6.69 / 7.14. Note 2. This is the earliest document seen (April 2002) that mentions the term "nitrogen-free extract," which includes starch, sugar, gums, and the like. The nitrogen-free extract and fiber soon came to be classed together under the name of carbohydrates. This is also the earliest document seen (Dec. 2001) that clearly mentions fiber in soybeans, or the fiber content of soybeans.

"The composition of these beans is actually of surprisingly high grade, in part because of the high content of oil which takes the place of starch, and also because of the high nitrogen content. The chemical composition of lupine seeds (*Lupinensamen*) has already provoked lively astonishment, since in these, unlike the seeds of other known legumes, we find no starch, but rather a large amount of oil and protein (*eine reichlichere Menge von fettem Oel und Proteinstoffen*). So we are confronted with the Chinese oilbeans (*chinesischen Oelbohnen* = soybeans) in which the unique characteristic of the lupine seeds seem to be expressed in a higher potency, as shown in the following comparison." A table shows that most beans and peas contain 30-35% starch, 1.5-3% oil, and 24-26% protein. Lupine seeds contain no starch, 5-8% oil, and 30-35% protein. But the seeds of the Chinese oilbeans [soybeans] contain no starch, 16-20% oil, and 38-39% protein. The oilbeans are thus shown to be the most protein-rich livestock fodder; they also have a high respiration value (*Respirationswerth*). They seem even more important because these two main components are also suited for the human diet. The use of the oil as food oil (*die Verwendung des Oels als Speiseöl*) is confirmed, and the use of the proteins is not unlikely, since they consist largely of plant casein, through the application of salt and aromatic plants and subsequent fermentation,

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may well produce a tasty cheese, like that made from milk casein. Note 3. This is earliest document seen (May 2008) that clearly mentions starch in soybeans, and states that they contain none.

Note 4. This is the earliest German-language document seen (May 2008) which refers to soybeans as *chinesischen Oelbohnen* = "Chinese oilbeans."

"The high nitrogen content of the beans may also be confirmed through an analysis of their cake (presscake?). Upon inquiry to professor Völcker [Voelcker] in London I received the answer that he could not state for sure that the beans could be used to make a type of cheese, however he has investigated the oilcake ('Chinese Oilbean Cake') and found the following percentage composition compared to rapeseed cake: oil 5.32 / 8-9. Nitrogen-containing substances 45.93 / 27-28. Nitrogen-free extract 24.52 / 32-25. Cellulose 5.71 / 15-16. Minerals (ash) 5.70 / 6-7. Water 12.82 / 12-15.

"Concerning the preparation of soy sauce (*Soya*), this indispensable table seasoning among the people of India and seafarers, a trusted friend who is very familiar with Oriental trade conditions, informs me that 'according to tradition, certain fungi, fruits, and parts of fish (especially also parts of the crablike sea-spider) are added to it, in a very complicated and long process that lasts several months.' From another source I learned the following: 'Soy sauce (Soya) is prepared from an oil-rich bean that grows in China. During the process it is mixed with other ingredients. Thereby a significant percentage of good-tasting oil is obtained and the residue is used as an excellent fodder for cows. Can any of my valued readers provide more specific information on the above?"

Note 5. This is the earliest document seen (May 2008) containing mention of soybean cake in the western world. It also the earliest document seen (May 2008) containing an analysis of the cake.

Note 6. This is the earliest document seen (July 2000) concerning soybeans in Hong Kong. This document contains the earliest date seen for soybeans in Hong Kong (1872). Soybeans were probably also being grown at that time in Hong Kong, but we cannot be certain of this.

Note 7. Mr. Carl Berndt of Saxony, is mentioned several times by Prof. Friedrich Haberlandt in his classic *Die Sojabohne* (1878). In part 1, page 4, Haberlandt states that Carl Berndt, a velvet manufacturer at Hainsberg-Deuben in Saxony, was one of the first people in Germany who attempted to cultivate soybeans. He had no success. "He wrote me about his efforts as follows: 'I had received 8 piculs of those beans [Note 8. A picul is a Chinese unit of weight = 133.33 pounds] (some green and some yellow), which I obtained through an official order of Governor (*des Minister-Präsidenten*) Dr. Weinlich of Shanghai via our local consul. I sent samples of those all over with the request that the recipient inform me of the results of his agronomic trials. Unfortunately I have waited in vain and I assume that the outcome was as unfavorable as it had been in my case and in my neighborhood. Although some gardeners and I managed to raise a few plants and harvest a few seeds, they rotted after being replanted and therefore could not germinate.'" Pages 10-11 of Haberlandt note that the first analysis of the composition of soybean seeds that became known in Germany was carried out by (Mr.) Senff using seeds obtained directly from Japan by Mr. Berndt. The results of this analysis were first published in 1872 in the journal *Chemischer Ackersmann* ("Chemical Farmer," p. 123). The tests showed soybeans to contain on average 38.29% protein and 18.71% oil. Page 14 of Haberlandt describes a letter that Carl Berndt wrote to Prof. Haberlandt. And in part 4, page 79 of Haberlandt states that Carl Berndt conducted soybean trials in 1877 in Deuben with 300 seeds; these trials succeeded beyond all expectations.

Note 9. This is the earliest document seen (Sept. 2002) that mentions the use of ether or any other solvent for extracting soybean oil. The extraction was on a laboratory scale. Ether is a light, volatile, flammable liquid (hydrocarbon), also used as an anesthetic.

Note 10. This is the earliest German-language document seen (Sept. 2006) that mentions soybean oil, which it calls *ein fettes Oel.*

Note 11. This is the earliest German-language document seen (Aug. 2003) that uses the term *Stickstoffhaltige Bestandtheile* to refer to nitrogen-containing constituents / protein in connection with soybeans. Address: Acad. Laborat Tharand.

542. Syrski, S. 1872. Landwirthschaft in Japan [Agriculture in Japan]. In: Karl von Scherzer, ed. 1872. Fachmaennische Berichte ueber die oesterreichisch-ungarische Expedition nach Siam, China und Japan. (1868-1871) [Expert Reports on the Austro-Hungarian Expedition to Siam, China, and Japan]. Stuttgart: Verlag von Julius Maier. Appendix (Anhang), p. 175-227. See p. 175, 186, 190, 207. Index. 25 cm. [Ger]

• ***Summary:*** Page 186 gives the prices of 1 *shô* (*schio* = 1.825 liters) of various staples. A Tempo is apparently a Japanese unit of currency and a kr. is an Austro-Hungarian unit of currency: Fava beans (*Rossbohnen, Sora-mame*) 4 Tempo (18 kr.), azuki (*Adsuki*) 10 Tempo (45 kr.), soybeans (Daidsu; Dolichos soja) 6 Tempo (27 kr.), Kintoki, with red seeds 5 Tempo (22 kr.) [Note: Kintoki is an abbreviation of "kintoki azuki," which is a large variety of red azuki beans], barley 3 Tempo (13 kr.), wheat 6 Tempo (27 kr.), sesame 10 Tempo (45 kr.). Note: This is the earliest German-language document seen (Jan. 2005) that mentions azuki beans, which it calls *Adsuki.*

Page 190 notes: The pickled beans (*Bohnensulze*), called "Misso" in Japan, is prepared from Daizu, a variety of Dolichos, together with wheat- and barley meal/flour, plus some added salt. The seasoning soy sauce (*Soia*) is likewise made from soybeans (*Daidzu-Dolichos*) and wheat meal

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with the addition of salt, and sprinkled on many foods... Essentially the diet of Japanese peasants consists of rice and the above-mentioned miso, therefore of an easily digestible carbohydrate (*aus einem leicht verdaulichen Kohlenhydrate*) and a strong nitrogenous substance (*stickstoffhaltigen Substanz,* protein), which is made easily digestible through processing. Concerning the nutritional value of their most important foods, Japanese peasants believe that fish, eggs, and poultry give the most strength (*Kraft*)**.** These are followed by miso and vermicelli made from wheat flour, then rice and potatoes. They believe that buckwheat gives but little strength.

The section titled "Legumes" notes: A green Dolichos variety (*Dolichos unguiculatus* according to Thunberg, called Jaenari in Japanese) is planted in the fields of central Japan in June and harvested at the beginning of October. A Dolichos variety (*Dolichos soia;* called *Daidsu* in Japanese) is planted in southern Japan in April and harvested in July. In central Japan this crop is planted between rows of wheat as they near maturity in May, and harvested in September. The ground is not manured (*nicht gedüngt*)*;* the plants make use of the fertilizer (*Düngungsmaterial*) already applied for the wheat. As a rule, 6 shô of seed-beans yield a crop of 120 shô on a field of 300 tsubo.

Note: Rein (1889, p. 57) states: "According to Scherzer, six Shô of seed-beans of the early-ripening Shiro-mame are credited with a crop of 120 Shô on 300 Tsubo of land. This means a harvest of only 20-fold, or, taking account of the seed lost in sprouting, about 12 pods of two beans each to every plant."

"This type of Dolichos, as is well known, is the main ingredient in the seasoning soy sauce (*Soia*) and the aspic or pickle (*Sulze*) miso (*"Misso"*)**.**

"A black variety of Dolichos, called Kuro-mame in Japanese (i.e. black soybeans) is planted in the area around Nagasaki in April on land fertilized with ashes (*auf einem mit Asche gedüngten Boden*)*,* and in central Japan in May two seeds are laid in a hole between the rows of wheat. It is harvested in August or September in southern Japan, and in October in central Japan, and used rather widely as a food."

Note 1. Scherzer lived 1821-1903.

Note 2. This is the earliest document seen (Feb. 2005) concerning soy in connection with (but not yet in) Hungary.

Note 3. This is the earliest document seen (Oct. 1999) that mentions the use of fertilizers for growing soybeans.

Note 4. This is the earliest document seen (Aug. 2001) that mentions carbohydrates in connection with soybeans.

Note 5. This is the earliest German-language document seen (April 2012) that uses the word *Soia* to refer to soy sauce. Address: PhD.

543. Quihou, M. 1873. Rapport sur les principales cultures faites en 1872 au jardin d'acclimatation du bois de Boulogne [Report on the principal plants cultivated in 1872 at the garden of acclimatization in the woods of Boulogne]. *Bulletin de la Societe d'Acclimatation* 20:482-95. May. See p. 489. [Fre]

• ***Summary:*** "We have received from China, through the good offices of Mr. Renard, two stalks of different cereal grains... Under the false designation of "peas" (*Pois*)*,* Mr. Renard has also given us several varieties of *Soya hispida* [soybean], a Japanese legume whose cultivation has already been tried several times without success in our climate. We have not been any more successful than the previous person." Address: Head gardener, France.

544. Maximowicz, C.J. [Maksimovich, Karl Ivanovich]. 1873. Diagnoses plantarum novarum Japoniae et Mandschuriae [Descriptions of new plants from Japan and Manchuria]. *Bulletin de l'Academie Imperiale des Sciences de St.-Petersbourg* 18:371-402. July. See p. 398. (3rd Series, Vol. 2). [6 ref. Lat]

• ***Summary:*** This paper, read by the author on 30 Jan. 1873, contains the first use of the term *Glycine hispida.* The information on soybeans is found within a section titled *"Observ.* Ceterae *Phaseoleae,* in *Japonia* et *Mandshuriae* certe spontaneae, sunt:" The author discusses first the wild, then the cultivated soybean: [1] *"Glycine Soja* S. Z. l. c. I. 119.–non Benth.–*Gl. usuriensis* Rgl. Fl. Usur. n. 146. tab. VII. fig. 5-8.–*Tsuru mame.* Soo bokf. XIII. 37.

In *Kiusiu* et *Nippon,* ad Yokohamam; in *Mandshuria* [Manchuria]: a finibus Koreae secus Usuri [Ussuri] et Sungari fl. ad Amur meridionalem.

[2] *"Gl. hispida* m. vocanda est *Soja hispida* Mch. [Moench]–*Dolichos hispidus* Thbg. et Soo bokf. XIII. 18-21., quae in *Japonia, China,* et *Japonia* ubique colitur, et a praecedente tantum hispiditate majore, caule erecto et legumine majore differt, an igitur forsan varietas culta censenda?"

Note: This and other articles were reprinted in the Academy's *Mélanges Biologiques Tirés du Bulletin de l'Académie Impérial des Sciences de St.-Pétersbourg* (*Akademiia Nauk S.S.S.R., Leningrad*)*.* They were later published by the Academy as a book titled *Diagnoses plantarum novarum asiaticarum.*

545. *Chicago Daily Tribune.* 1873. The Japanese at table. Oct. 12. p. 5.

• ***Summary:*** "From the Far East: If bread is the staff of life with Europeans, so is rice with Asiatics. It is the staple food of the people, and with a little soy [sauce] or pickle, or some other simple condiment, is often the only food of the lower classes in Japan... It is strikingly curious to see them eat for the first time...

"A small table about 9 to 12 inches square and 6 to 9 inches high is placed sometimes in the middle of the feeders, sometimes one to each person. On this table are two or three small dishes,–perhaps one has some slices of cold fish,

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another some pickles, lily root, green ginger, and horseradish [wasabi], another a little soy, and so on... ever and anon there is a pause to take a slice of fish, which is rendered more palatable by being dipped in the soy."

546. *Far East* (*The*) (*Yokohama, Japan*). 1873. A curious phase of superstition has been exhibited since the formation of lotteries. 4(4):92. Oct.
• ***Summary:*** "The temple of Oiwa Inari is one very much venerated by the citizens of Tokei; and is one to which, actors, geishas, and the like go to pray for success in their profession. Since the lotteries have been in vogue, it has been given out that this is the temple at which to pray for good fortune in the drawings; the fox Oiwa having such things under his special care. The consequence is, it is always crowded with poor people who have invested (many of them their all) in these lotteries: who bring Sekihan (made of rice and red beans) and Aburage (beans fried in oil) of which the fox is said to be very fond; and who pray incessantly for the favour of Oiwa. The crowd is everyday very great from morning until night; but particularly on the days of drawing."

Note 1. This is the earliest English-language document seen (April 2013) that uses the word "Aburage" to refer to deep-fried tofu pouches.

Note 2. This article appears in the section titled "Monthly Notes from Local Papers," which starts on p. 88.

547. *Manchester Guardian* (*England*). 1873. Commercial markets: London Produce Market, Tuesday. Nov. 5. p. 6.
• ***Summary:*** "Japan Soy [sauce].–410 cases chiefly sold at 12*s.*"

548. Hepburn, James C. 1873. Japanese-English and English-Japanese dictionary. Abridged by the author. New York: A.D.F. Randolph & Co.; London: Trübner & Co. vi + 330 + 206 p.
• ***Summary:*** "Preface: In order to render the Dictionary more portable and convenient in size, the Author has thought it best to abridge the larger work and bring it out in its present form. In so doing, he has omitted the Chinese and Japanese characters, the synonyms, and the examples showing the use of the words, excepting such as contained a peculiar idiom, and which could not be included in a definition. All the native Japanese words, with the exception of those which were rarely used or obsolete [such as Yu-dofu], have been retained; as, also, all the words derived from the Chinese which are in current use."

"The Second, or English and Japanese, Part, has not been abridged or altered from the original, except in the correction of such typographical errors as were met with."

Note 1. New words in this edition that are not in the 1867 edition are preceded by "**."

Soy-related terms: Adzuki: A small red bean. Amazake: Sweet sake, a kind of fermented rice. Daidzu: A large white bean. Soja hispida. Hiriodzu: A kind of food made of tofu fried in oil.

Kinako: A kind of food made of beans. Kiradzu: The refuse of beans left in making tofu. Koji: Barm or yeast. Koji-buta: A shallow box for holding barm. Miso: A kind of sauce made of beans.

** Moromi: The grounds left in making soy [sauce], used as an article of food.

Note: This is the earliest English-language document seen (April 2012) that contains the word "Moromi." However the definition is poor. The word *moromi,* which is often translated as "mash," is the stage in making soy sauce (it has a consistency resembling apple sauce) before the liquid shoyu (soy sauce) is pressed out, leaving behind the shoyu presscake or residue (which could be called "grounds").

Natto: A kind of food made of beans. Nigari: The brine formed by the deliquescence of salt. Sashimi: Raw fish cut in thin slices and eaten with soy. Shoyu: Soy, a kind of sauce made of fermented wheat and beans. Tofu: A kind of food made of beans. Yuba: A kind of food made of beans.

Terms NOT mentioned include Aburage, Abura-age, Aburaage, Daitokuji natto, Edamame (or Eda mame or Yedamame), Hamanatto, Hiya-yakko, Koya-dofu, Kori-dofu, Okara, Tamari, Tonyu, Unohana, Yaki-dofu.

Note 2. The author apparently did not realize that the various soyfoods he defined (with the possible exception of soy sauce) were made from soybeans. Address: M.D., LL.D.

549. Heuzé, Gustave. 1873. Les plantes alimentaires [Edible plants. 2 vols.]. Paris: Libraire Agricole de la Maison Rustique. Undated. See Vol. II, p. 381-82. 27 cm. [soy ref. Fre]
• ***Summary:*** Vol. II, Part II concerns "Leguminous plants with pods." In Book 2, titled "Dolic or dolique" (p. 371+), Chapter II (p. 373-83) concerns "Species and varieties." The soybean is in the second major group, "Dwarf dolics" (p. 380), as follows: Variety "15.–Japanese soybean (*Dolic du Japon. Dolichos soja,* Linn.; p. 381-82) states: Synonyms: *Dolic soja. Soja japonica,* Sav. *Dolic à café* [the coffee bean]. *Soja hispida,* Moench."

Note 1. This is the earliest French-language document seen (Nov. 2012) that uses the term *Dolic à café* to refer to the soybean.

Note 2. This is the earliest French-language document seen (Nov. 2012) that refers to the soybean in connection with coffee.

A botanical description in French follows: "The stems, which are from 65 to 100 cm tall, are hispid / hairy, straight, straight, and rust-colored. The leaves have three cordiform folioles, equipped with stipules; flowers violet, sessile [attached directly by the base], in short clusters, straight and axillary [growing from an axil]. The pods are lightly curved, slightly pendulous, very short, bumpy, and covered with rust-

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colored hairs. The seeds are oval, shiny, compressed, clear nankeen (*nankin clair;* brownish yellow) in color, and almost dull.

This variety is cultivated in China, Japan, and Asia. Its flowers are white, purple, or violet, according to the variety.

The types that are most widely cultivated, after the core / main type [nankeen colored], are two: 1. The black soybean (*Le soja noir, Soja hispida*). 2. The yellow soybean (*Le soja jaune, Soja ochroleuca*).

The Japanese transform the seeds of this dolic into a paste (*miso*), with which they make a sauce (*soja*), which they use to prepare various foods.

This species is an annual; in France it has been called *pois oléagineux* ("oil peas"). It was introduce here from China by Mr. de Montigny. It is cultivated in some points in the departments of Ariège and of Haute-Garonne. It grows rapidly and is quite resistant to drought.

Also discusses: *Dolichos tetragonolobus* L. Synonyms: *Pois carré* (in Europe). *Psophocarpus tetragonolobus* DC. In India it is known as *mourou-kouavré* (p. 377). Gustave Heuzé lived 1816-1907. The book is undated, but the date usually given in catalogs is 1873 (less commonly as 1872). Address: Member of the Central Society of Agriculture of France. Adjunct inspector general of agriculture.

550. Maximowicz, C.J. (or Maksimovich, Karl I.). 1873. Diagnoses plantarum novarum Japoniae et Mandshuriae [Diagnoses of new Japanese and Manchurian plants]. *Melanges Biologiques Tires du Bulletin de l'Academie Imperial des Sciences de St.-Petersbourg* (*Akademiia Nauk S.S.S.R., Leningrad*) 9(1&2):69-70. [Lat]

• ***Summary:*** Maximowicz points out that Glycine Soja S. & Z. is not the cultivated soybean but rather the wild species that was subsequently described by Regel and Maack as *Glycine ussuriensis.* The exact text relating to two Glycine species reads:

"Glycine Soja S. Z. l. c. I. 119.–non Benth.–*Gl. usuriensis* Rgl. Fl. Usur. n. 146. tab. VII. fig. 5-8.–*Tsuru mame.* Soo bokf. XIII. 37.

"In *Kiusu* [Kyushu] et *Nippon,* ad Yokohamam; in *Mandshuria* [Manchuria]: a finibus Koreae secus Usuri [Ussuri] et Sungari fl. ad Amur meridionalem.

"Gl. hispida m. vocanda est *Soja hispida* Mch.–*Dolichos hispidus* Thbg. et Soo bokf. XIII. 18-21., quae in *Japonia, China,* et *Japonia* ubique colitur, et a praecedente tantum hispiditate majore, caule erecto et legumine majore differet, an igitur forsan varietas culta censenda?"

551. *American Agriculturist.* 1874. The Japan pea. 33(2):63-64. Feb. With one engraving.

• ***Summary:*** "The Southern seedsmen have advertised and southern journals have had articles in relation to the Japan Pea... we last spring obtained from Mark W. Johnson, dealer in seeds and agricultural implements,

Atlanta, Ga. [Georgia], a sample of these peas... This fall we have received a sample of the same pea from L.L. Osment, Cleveland, Tenn. [Tennessee], who says they are 'unsurpassed for table use.'

"The plant grows to a height of three or four feet, and is hairy in all its parts... Mr. Johnson, who sent us the seed, wrote 'not desirable for table use.' Remembering to have seen the same thing some years ago in the garden of a friend near Boston we wrote him for his experience. He writes: 'They may be delicious to the celestial palate, but my wife found them hard to cook and I found them hard to eat–never getting soft no matter how long they were boiled.' Thus far we think the weight of evidence is against their utility as a table vegetable. As an agricultural crop, they are highly promising, at least in localities where the seasons are sufficiently long to mature them. Mr. Johnson speaks highly of the wonderfully prolific character of the pea, and its excellence as a food for stock. It is so much esteemed in some quarters that it has received the rather extravagant name of 'Southern Relief Pea.' Mr. Osment claims it to have produced 200 bushels to the acre. From the manner in which the pods set upon ours we should judge the yield would be very large. This pea is deserving the attention of cultivators as a fodder crop and for plowing in as a fertilizer. As to what the pea is botanically we are not quite sure; it does

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not belong to the proper Pea (*Pisum*), but is very near the Chinese Soy Pea, and is probably a form of that or a closely related species. The Soy Pea (formerly *Soja hispida,* but now *Glycine Soja*) is cultivated in China, Japan, and other parts of the east, and is used to make the sauce called Soy, which was formerly more used than at present."

A handsome illustration (engraving; p. 64) shows "The Japan Pea" by J.W. Fasel. Note 1. This document contains the earliest illustration seen (Aug. 1996) of the soybean in the USA.

Note 2. This is the earliest document seen (Aug. 2011) that clearly refers to soybeans in Tennessee, or the cultivation of soybeans in Tennessee. This document contains the earliest date seen for soybeans in Tennessee, or the cultivation of soybeans in Tennessee (summer 1873).

Note 3. This is the earliest English-language document seen (Feb. 2002) that uses the terms "Soy Pea" or "Chinese Soy Pea" or "Southern Relief Pea" to refer to the soybean.

Note 4. This is the earliest English-language document seen (March 2008) which states that the scientific name of the Japan pea is probably *Glycine Soja,* previously *Soja hispida*–that is, the soybean.

Note 5. This is the earliest document seen (Jan. 2000) stating that a seed dealer in the USA (Mark W. Johnson in Atlanta, Georgia) is selling soybeans for seed use. Line 1 implies that earlier advertisements exist.

Note 6. This is the earliest English-language document seen (July 2002) that describes "plowing in" soybean plants in the USA for use as a fertilizer [green manure] to improve the soil.

Note 7. Starting with this article, and continuing until after World War II, some writers incorrectly referred to the scientific name of the cultivated soybean as *Glycine soja,* whereas that is actually the scientific name of the wild soybean.

Note 8. This is the earliest document seen (Nov. 1998) that uses the word "promising" in connection with the soybean as an agricultural crop–in any country worldwide.

552. *American Agriculturist.* 1874. The Japan pea. 33(6):205. June.

• ***Summary:*** "'Jap' writes: 'When properly cooked, they are very palatable to persons who are fond of beans or peas, for the taste resembles a mixture of navy beans and lady peas cooked together. To cook them: Put in soak over-night in warm water; then boil them, taking care not to add cold water, grease, or salt. When done, mash, season to suit taste, and bake."

First cited by Hymowitz. 1986. Bibliography of early, previously uncited publications on soybeans in the United States. 2 p. Unpublished. \

553. Ritter, H. 1874. Tofu, Yuba, Ame [Tofu, yuba, ame]. *Mittheilungen der Deutschen Gesellschaft fuer Natur- und Voelkerkunde Ostasiens* (*Yokohama*) 1(5):3-5. July. [Ger]

• ***Summary:*** The discussion begins with tofu: Tofu (*Das Tofu*), one of the foods that is rather widely enjoyed by Japanese, is made from beans. It can be described most simply as 'bean cheese (*Bohnenkäse*);' the literal translation of the two characters, 'beans rotten,' seems to give us the first glance of its earlier meaning as a cheese–which is a product of fermentation. However, this only appears to be so, since tofu is definitely fresh and unfermented. Perhaps the earlier name signifies that the tofu essentially consists of legumin (*Legumin;* a legume protein), not considered as a portion but as a fermentation product of the beans.

The preparation is very simple. White soybeans (older beans are preferred to newer) are soaked for about 12 hours in cold water or 8 hours in hot water, then ground with water between the stones of a handmill to form a slurry (*Brei*). The slurry is filtered through a silk or very fine-meshed sieve. The larger particles remaining in the sieve are reground in the mill. The amount of water used during grinding is such that from one measure [volume] of beans about 10 measures of slurry are obtained. This slurry is then poured into a kettle, which contains an amount of boiling water equal to about one-third the volume of the slurry; it is simmered over a low / weak fire. It is best, when the kettle is only half full, because the foam will suddenly starts to rise; this rise can be moderated by the addition of some oil. As soon as the contents of the kettle comes to a boil, it is removed from the fire and the slurry is filtered through a cotton sack [over a vat], then pressed with a lever. The pressed residue in the sack (*Der Pressrueckstand* [okara]) is often cooked again with half the amount of water. Note 1. This is the earliest German-language document seen (June 2013) that mentions okara, which it calls *Der Pressrueckstand.*

"The filtered liquid (*Die filtrirte Fluessigkeit* [soymilk]), which now consists of a solution of legumin, is carefully freed of its foam, and then the precipitation of legumin is brought about using nigari (*shio no nigari, Salzbitter*) as the coagulant. Nigari is the mother-liquor which drips out of [a sack of] sea salt in humid / wet weather, consists mainly of calcium- and magnesium salts. The nigari is added in three steps. First, about ½% of the liquid id added and only on the surface, while stirring slightly, since too much stirring would be disadvantageous. Then a somewhat larger amount is added, and without disturbing the first precipitation, stirred lightly. Finally, after most of it [the curd] has settled, a little more nigari is added, as much for the formation of the final curds and to obtain the right consistency. If you add too little nigari, you won't get any cakes (*Kuchen*) [of tofu], but too much nigari will give you a hard cake; soft tofu is preferred.

The author concludes by noting: "One cannot deny that most of the dishes made from tofu are rather nice, even for the European palate."

Note 2. This is the earliest German-language document seen (April 2013) which contains a description of tofu by a

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German living in Japan or East Asia.

Note 3. This is the earliest German-language document seen (April 2013) that uses the word *Bohnenkäse* ("bean cheese") to refer to tofu.

Note 4. This is the earliest document seen written by a Westerner (Nov. 2003) that uses the word *Nigari.*

Note 5. This is the earliest German-language document seen (Aug. 2013), that mentions soymilk, which it calls *Die filterte Fluessigkeit.*

Yuba (*das uba*) and *ame* (*das Ame*) are then described briefly. "Yuba is a peculiar preparation made from the legumin of the soybean [Note: *Webster's Third New International Dictionary* (1963) defines legumin (a term derived from the French *légumine*) as "a globulin [a type of protein] found as a characteristic constituent of the seeds of leguminous plants."] This thin yellow or brownish leathery tough film or skin is formed and consists of legumin which has become insoluble through cooking in contact with the air. It is prepared in the manner described above from the legumin solution in the soybean with addition of wood ashes [which raise the pH], cooked in an open kettle. As is the case with all alkaline protein solutions, there forms on the surface an insoluble film, which is then lifted off with a skewer and dried. Yuba is prepared as a food in various ways, but is used mostly as an addition to other foods."

Note 6. This is the earliest German-language document seen (Oct. 2012) that mentions yuba, which it calls *uba.*

Ame (grain syrup or *Midzuame*) is a widely used delicacy and sweet, loved by Japanese children. It consists of glucose (starch sugar) and dextrin that results from the malting of millet (*Hirse*) or rice. The *ame* made from millet is the sweetest, while that made from rice, especially from glutinous rice (*mochi kome*), has the advantage of being whiter." The process of making *ame* is then described in detail.

Dr. Rein adds to these proceedings that tofu is used in place of protein in lacquered or japanned work, in order to produce a more plastic product.

Note 7. This is the earliest document seen that mentions rice syrup (*ame* or *midzuame*) in Japan.

Note 7. The name of this journal varies. This issue was titled *Mittheilungen der Deutschen Gesellschaft für Natur und Voelkerkunde Ostasien's* and also known as the *Transactions of the German Asiatic Society of Japan.* The place of publication is Yokohama. This article actually has no title. Address: PhD, Japan.

554. Hoffmann, J.J. 1874. Ueber die Bereitung von Schoju, Sake und Myrin [On the preparation of shoyu, saké and mirin]. *Mittheilungen der Deutschen Gesellschaft fuer Natur- und Voelkerkunde Ostasiens* (*Yokohama*) 1(6):8-11. Dec. [Ger]

• ***Summary:*** The author was the first Westerner to make a scientific study of the shoyu process, of which he gives an accurate and detailed 2-page description: Soybean sauce (*Bohnensauce- Schoju*)–shoyu–is for the Japanese almost as indispensable as rice and is used as widely as tea or tobacco. The rich man and the beggar use it in the same way, but with differences in quality, as the main seasoning at their meals, and in no household, in fact at no meal may it be absent.

It is made in large factories, and in countless stores in all cities and towns throughout the entire island empire, it is stocked and sold in small wooden kegs.

It is made with soybeans, indeed very high protein, starch-free small soybeans (Dolichos Soja jap. Nagatemame), plus wheat, salt, and water in the same proportions by volume. Small kegs are used to measure the ingredients. The beans and grains are used in the same condition of dryness.

Before the basic raw materials are mixed, the soybeans are cooked in large iron kettles for half a day. The wheat is roasted in large containers (*Steingefaessen*) and then cracked into grits / pieces using a small hand-mills. Then the moist beans are mixed with the wheat grits on a firmly packed clay floor, then to them is added a fermentation starter culture consisting of wheat kernels covered with mold spores. The mixture is filled into rectangular wooden trays each about 2-3 inches deep, and these are placed and stacked in a closed room that resembles a large bakery oven.

Here the wooden trays stay for 3 days, during which time an effort is made to keep the room evenly warm throughout. During the cold seasons of the year the room is heated with a small charcoal burner. In this way the plant seeds gradually become covered with mold spores and develop their capacity to produce diastase enzymes. In cold weather, the room may be kept closed on the 2nd and 3rd days, but on warm days it may be vented using the door and windows during the 2nd and 3rd days to prevent overheating. To determine the suitable temperature, no thermometer is used; the feel of the maker is used instead.

On the 3rd day the contents of the wooden trays are thickly covered with a mycelium of mold. The contents of the trays is now transferred into large wooden vats (each of 20-30,000 liters capacity) and mixed with water and table salt. The contents of each vat is mixed with a wooden plunger as the fermentation proceeds. The process typically begins at the start of winter. The fermentation typically last for 3 to 5 years. The 3-year material is a dirty brown whereas the 5-year material is pure dark-brown in color.

The 3- and 5-year products are then mixed in equal proportions. The 5-year material adds its pleasant aroma, but it has a somewhat unpleasant bitter taste. This is masked with the 3-year material which has a nice flavor but less aroma.

This mixture is now filled into sturdy cotton bags, each 2 feet long and ½ foot wide. These are then pressed with a very primitive angle press consisting of a long lever arm weighted at the end by large stones. The shoyu (*Schoju*) from the first pressing is the best and most expensive type, but it is usually not sold as such. Rather it is dispensed preferentially

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to those with advanced orders. It has the strongest aroma and a beautiful dark-brown color. When put in a glass and shaken it makes a fat-glistening ring.

The shoyu presscake (*Rueckstand*) is mixed with salt water and some days later, after frequent stirring, repressed. This shoyu is very clear with little aroma, so it is mixed with a good dark-brown shoyu and with some sweet sake (*suessem Sake*).

The wooden kegs in which shoyu is sold are everywhere the same having a capacity of 18 liters or 4.76 gallons (1 *to*). In new kegs, the shoyu keeps for only a few months; it keeps longer in older kegs. There are four grades of shoyu. The prices are 6 German marks for grade 1, 4 marks for grade 2, 3 marks for grade 3, and 2 marks for grade 4.

As an article for export, shoyu has not gained much significance, despite great efforts. During shipping there is a buildup of mold which impairs the good flavor and aroma. The best varieties of shoyu are, however, very pleasing to the taste of most Europeans, and at the same time very effective in stimulating the appetite and digestion. For these reasons and because it is completely harmless / safe, shoyu is preferred to many European products [such as meat extracts] that serve the same purpose.

Hoffman then describes how sake is made; yet nowhere in either of these two parts of the long article does he mention the word *koji,* even though he describes it. He learned all of this at the famous shoyu-mirin factory of Mr. Sagamia Monjiro in Nagareyama, 5 German miles north of Yedo / Edo [today's Tokyo].

Note 1. The date on the title page is Nov. 1876, but Hoffmann's paper was not presented until 1878. This is the earliest document seen (Oct. 2001) that is a study of several fermented foods, including one made from soybeans–*shoyu.*

Note 2. This is the earliest document seen (April 2012) that describes how to make soy sauce (actually shoyu) on a commercial scale.

Note 3. This is the earliest German-language document seen (April 2012) that uses the term *Schoju* or the term *Bohnensauce* to refer to shoyu or soy sauce. Address: Prof., School of Medicine, Tokyo Univ., Japan.

555. Iinuma, Chôjun [Yokusai]. 1874. Shintei sômoku zusetzu [An illustrated flora of Japan. New ed. Edited, with corrections, etc., by Tanaka Yoshio and Ono Motoyoshi]. Japan. See vol. XIII, p. 17-22, 36-37. Illust. Dec. 27 cm. [Jap]

• ***Summary:*** This entire work consists of 20 volumes, divided by yellow divider pages and bound in 5 physical volumes. It is printed on very light-weight (low-density), rather translucent, double-folded Japanese paper, and extensively illustrated. On title page of vol. 1 is written Mino Ogaki, Hirabayashi-so, which may refer to the publisher (a person) and his publishing company. The date on the title page is Meiji 7, 12th month (Dec. 1874). Near the front of volume 1 is a preface in French titled "Préface de la deuxième edition du Sô-mokou-Zoussets. Revue et augmentée" by Tanaka Yoshiwo, dated 24 July 1874. It notes that it has been a long time since the first edition was published; the author and scholar Yokoussai died unexpectedly before he was able to finish his work, and a little later his son followed him to the grave. Otherwise, the only roman letters in the book appear at the top of illustrations, giving the name of the plant in Japanese, its scientific name, and its family. On the spine of each volume is printed "Sintei Somoku Dzusetsu, by Yokusai Iinuma." Today the title would be written "Shintei Sômoku Zustesu." The author's name is often catalogued as Chôjun Iinuma; he lived 1782-1865. A full-page illustration of the author appears near the front of volume 1, and below it is written in roman letters "Iinouma Yokoussai."

The section on soybeans is very similar to that in the 1861 edition. Soybeans are discussed only in Vol. XIII, Diadelphia. Called ômame, mame, or daizu in Japanese, the scientific name of the plant is *Dolichos soja* (pronounced "Dorikosu soya" in Japanese); it is also called *Japansche Slingerboon* (probably a Dutch term, pronounced "Yappanse Suringeru-boon" in Japanese).

After a 1-page description of the plant (see next 2 pages) written in old-style "kanbun" rather than contemporary Japanese, making it very hard to read), there follow 5 pages of detailed descriptions of 23 different soybean varieties, each with its Japanese name or names. Note that *mame* (pronounced MAH-may) means "bean" in Japanese. 1. *Go-gatsu mame.* 2. *Wasé mame.* 3. *Nakaté mame.* 3a. *Okuté mame.* 4. *Maru mame.* 5. *Shiro teppô mame.* 6. *Kuro mame.* 7. *Kuro teppô mame.* 8. *Koishi mame.* 9. *Ao mame.* 10. *Kage mame.* 11-15. *Aka mame.* 16-18. *Cha mame.* 19. *Kuro kura kaké mame.* 20. *Aka kura kaké mame.* 21-23. *Fuishi mame.* Above each name is a hand-painted color illustration of the seed showing the color of its seed coat and hylum, shape, and actual size.

On page 21 (plate 17) is a full-page black and white illustration (line drawing) of ô-mame, Glycine hispida moench (Leguminosae), with a color flower.

On page 22 (plate 18) is a full-page black and white line drawing of *midzu-kugiri, Glycine hispida* Moench F. lanceolata (Leguminosae), with two color illustrations of the seeds, and preceded by a brief description of the plant. On pages 36-37 (plate 17) is a full-page black and white illustration (line drawing) of the wild soybean, *tsuru-mame, no-mame, Glycine soja* S. et Z. (Leguminosae) (Leguminosae), with a color illustration of its flower, and preceded by a brief explanation.

Note: This is the earliest document seen (June 2009) that gives the color of the seed coat of many different soybean varieties. Address: Japan.

556. Williams, Samuel Wells. 1874. A syllabic dictionary of the Chinese language; arranged according to the Wu-Fang

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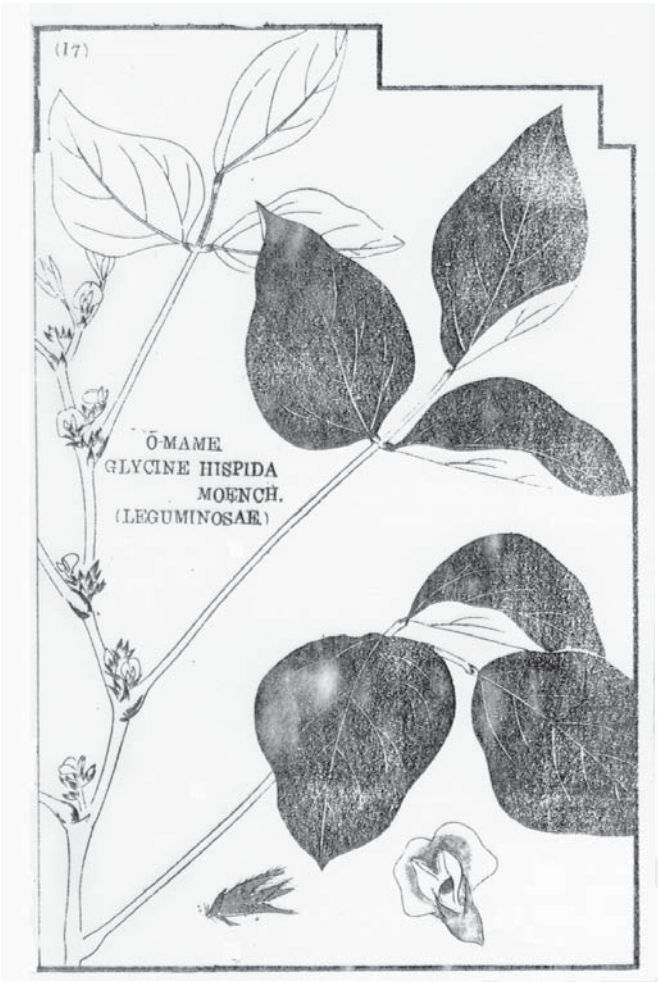

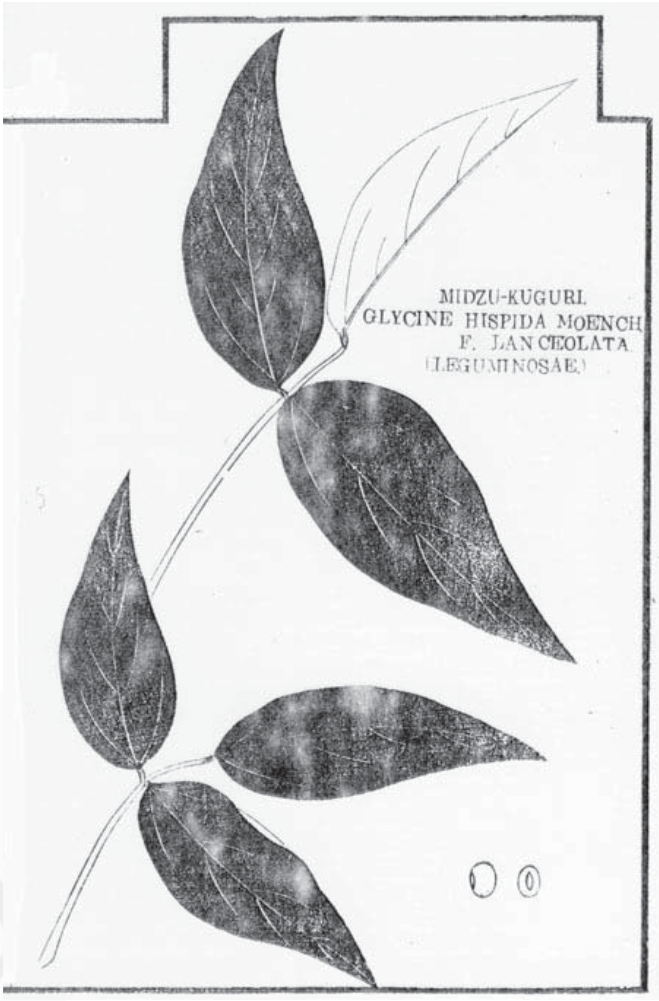

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Yuen Yin, with the pronunciation of the characters as heard in Peking, Canton, Amoy, and Shanghai. Shanghai, China: American Presbyterian Mission Press. lxxxiv + 1252 p. 28 x 22 cm. [8 ref. Eng; chi]

• ***Summary:*** In this dictionary, the Chinese characters are arranged alphabetically. Each main character, written large, has the pronunciation written below it, and the meaning written in English to the right. Below these are numerous compound words in which the character appears, followed by a definition of each. No pronunciation is given for compounds or combinations of several characters, such as teu-fu [doufu], which makes the dictionary hard to use. The main radical relating to soya is no. 151, Teu, 7 strokes, referring to pulses and sacrificial vessels (p. 874).

Page 145, under fu (rotten, corrupt, spoiled), lists the characters (teu-fu) for "bean curd; low policeman and underlings are named teu-fu-kwan because they live on and are no better than this curd; and also the teachers in low government schools."

Page 764, under shi, lists the characters for "salted beans" [fermented black soybeans], "salted beans and flour," "soy [soy sauce; shi yu in Chinese or shoyu in Japanese], an English word probably derived from this name."

Note: This is the earliest English-language document seen (Nov. 2011) that uses the word "shi" to refer to fermented black soybeans.

Pages 874-75, under teu, list the characters for "legumes of every kind, pea, beans," "bean-curd jelly" [tofu].

Note. This is the earliest English-language document seen (April 2013) that uses the term "bean-curd jelly" to refer to tofu.

Page 968, under tsiang [ch'iang], lists the characters for "a relish made of salt mixed with bean or other kinds of flour, and water, and allowed to remain until cured; it is used as a condiment; relishes, sauces, condiments; salted preparations," "a dry relish," "a shop for sale of oilman's stores, and condiments," "bean sauce, this is the basis of most of the Chinese relishes," "vegetables seasoned in soy."

On page 839, under ta (big), there is no listing for ta-teu, the soybean. On page 252, under hwang (yellow), there is no listing for hwang-teu, the yellow soybean. On page 580, under mao (hair), there is no listing for mao-teu (fresh green soybeans). Thus it seems that the compiler of this dictionary was unaware of the soybean.

Page 1111, under yiu, lists the character for oil in various combinations. When preceded by the character for "fragrant" it refers to "sesamum, gingilie, or benne oil," made from the seeds of *Sesamum orientale.* Soybean oil is not specifically mentioned.

Note: This is the earliest English-language document seen (Feb. 2005) that uses the word "benne" to refer to sesame seeds. Address: United States Legation, Peking.

557. Southern Seed & Plant Co. 1875. Strange but true! (Ad). *Atlanta Constitution* (*Georgia*). March 10. p. 4.

• ***Summary:*** "Japan Peas–200 bushels per acre on common land; unequaled for stock or table use; grows on upright stalks. 15 cts [cents] per paper, 50 cts per pint, 80 cts per quart.

"Chufas–Furnish grazing all summer and food for yourself all winter; fine for poultry and fattens more hogs than ten times the area in corn; 150 bushels per acre on poorest land. 10 cts per paper, 40 cts per pint, 70 cts quart, $10 per bushel."

"Send for our free catalogue, giving full list, descriptions and *testimonials from those who have grown the above seeds."*

Note: The official record yield for soybeans in the national yield contest first topped 100 bushels/acre in 1969. Yet this seed company's display ad is claiming 200 bushels per acre in 1875! Unbelievable.

Also offers: Toong Qua cucumber that grows to weigh 70 pounds each. Snake Cucumber grows from 2 to 8 feet long and coils like a snake. Japan Radish [daikon], pods 2 feet long and delicious. Address: Gallatin, Tennessee.

558. Renard, Édouard. 1875. La pêche et la pisciculture dans l'Extrême Orient [Fishing and fish culture in the Far East]. *Bulletin de la Societe d'Acclimatation* 22:281-99. June. [Fre]

• ***Summary:*** Contents: Malaysia and the Indian Archipelago (*Archipel Indien;* probably Dutch East Indies). Cochin China. China. Japan.

Mr. Dabry de Thiersant (p. 292) has written a magnificent work about fish farming (*la pisciculture*) in China, where all fish are classified into two large categories: (1) The cyprinids (family Cyprinidae, *Kia-Yu*) such as carp, etc., which are herbivores and which they raise in artificial ponds and in regular ponds (*les pièces d'eau, dans les étangs*). (2) Marine fish, and even some that live in fresh water, such as pike and perch, are called *Ye-Yu* or wild fish (*poissons sauvage*). These latter are often the bane of Chinese aquaculturists, who use every possible means to get rid of them when they are accidentally introduced into their fish ponds (*viviers*).

Note: This is the earliest European-language document seen (Nov. 2002) concerning fish farming or aquaculture; however soybeans are not mentioned.

In Japan, people of the upper classes (the officers, feudal lords {*daimyo*}, etc.) eat carp entirely raw. Removed from the water, it is served on the table on bamboo leaves–still alive. What are our colleagues at the Society for the Protection of Animals going to say about such a barbaric process? When all the meat has been cut from the bones so that only a skeleton is left, these thin slices of fresh carp meat, dipped in shoyu (*trempées dans la soya*), constitute one of the most savory dishes of Japanese epicures (*Lucullus,* p. 295).

Note: Lucullus, a Roman general who lived 117-58

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B.C., was known for the splendor of his banquets.

Also discusses: Sea vegetables in Japan–kombu, fucus, and agar (Isinglass) (p. 296-97). Address: France.

559. Vidal, Dr. 1875. Animaux et plantes utiles du Japon [Useful animals and plants of Japan]. *Bulletin de la Societe d'Acclimatation* 22:506-31. Sept. [Fre]

• ***Summary:*** These are answers to questions posed by the Society about the useful plants of Japan. The plants are grouped alphabetically by family. Includes discussion of the following: 19–Edible plants: Gingerroot, *Kadzoura* (a type of mountain grape from northern Japan; p. 506-07), sweet potato (*Sato imo*), mikan orange, yuzu citron (p. 507). Legumes (p. 512): Cowpea or string bean (*sasaghé = sasage, la feve de marais*) [*Vigna sinensis*], the ordinary white haricot (*Inghi mame*), several species of large pea (*Pois grossiers, Mame* = perhaps soy beans). Concerning the latter: "The Japanese make various cakes and some pâtés with these different seeds. But there is one species of large bean (*Pois grossier*) which is cultivated only in the fields for use as a fertilizer; as soon as it has reached full growth, it is turned under and left to rot [as green manure].

"Two or three species of *Dolichos* are cultivated; the root of one of these, *Dolichos bulbosus* (*Koudzou* [*probably kuzu*]), furnishes a very good starch, which is widely used by the Japanese.

Sarassin (*Soba*) and Patience, *Rumex Patentia* (*Gobo*), apricots (*Andzhou*), and prunes (*Oumé = ume*) (p. 513). Sesame seeds (*goma*, p. 514) are widely used for oil. Eggplant (p. 515).

20-22–Medicinal, industrial, and accessory plants: Ginseng (p. 515), ornamental legumes including two lovely species of Glycines–*Wistaria chinensis* and *W. brachybotrys* (p. 520). *Ginkgo bilboa* (p. 524). Warabi (edible fern). Mushrooms (incl. Shiitake, Matsutake, Samatsu shimeji, etc. p. 525).

560. Franchet, Adrien; Savatier, Lud. 1875. Enumeratio Plantarum in Japonia sponte crescentium... [Listing of plants native to Japan. Vol. I.]. Paris: F. Savy. xiv + 487 p. See p. 108, 390. [4 ref. Lat; fre]

• ***Summary:*** The authors reported two types of soybeans from Japan: "451. Glycine soja Sieb. et Zucc. fam. nat., n. 14.–Miq. Prol. [Miquel. 1867. Prolusio florae Iaponicae], p. 240." Habitat: In mountainous regions. Kyushu, in the mountainous valleys of the Kawara mountains (*Iama, Buerger*); Nangasaki [Nagasaki] (Oldham). Japanese name: Unknown. Icon. Jap. [Japanese illustrations]–So mokou Zoussetz, vol. 13, fol. 37? sub: Tsourou [Tsuru] Mame. Phonzu Zoufou, vol. 50. fol. 2? sub: Kin mame. Observations (in French): "It is with doubt that we cite the illustrations of this plant, which remains unknown to us.

"452. Glycine hispida Moench. Meth., p. 153 (sub: Soja hispida)–Miq. Prol. p. 240. Habitat: Kyushu. Japanese names: Kuro mame [black soybean], no mame [wild soybean], kuzu, yama daizou [mountain soybean] (ex Miquel). Japanese illustrations:–So mokou Zoussetz, vol. 13, fol. 18 to 21. Phonzu Zoufou, vol. 43. fol. 1-9. Observations (in French): Bentham and Hooker do not admit the genus *Soja*, and with good reason, it seems, we have changed the name of *Soja hispida* Moench. The two species of *Glycine* that we cite here seem very closely related, and Mr. Bentham believed that he had to unite them. But, on the other hand, Miquel affirms that they are distinct. According to him, the seeds of *G. soja* are not separated within the pod, that is to say the pod does not have any of the constrictions and dividing cellulose membranes which exist in the pod of *G. hispida*, a characteristic which is more or less pronounced in all of the species of the genus *Glycine* according to Bentham and Hooker. See: Bentham and Hooker Gen. Plant. 1, p. 530, and Miquel. Prol. p. 240-41.

According to Piper and Morse (1923, p. 33) the authors considered that the cultivated soybean was probably derived from *Glycine ussuriensis* Regel & Maack.

The authors also discuss the genus *Amaranthus* (see vol. 1, p. 390-91): *A. caudatus, A. mangostanus,* and *A. melancholicus.* Address: Medical doctor, Yokosuka, Japan and Paris.

561. Ripley, George; Dana, Charles A. eds. 1875. The American cyclopædia: A popular dictionary of general knowledge. Vol. 13. New York, NY: D. Appleton and Company. See p. 203.

• ***Summary:*** Under the entry for "Pea" we read (p. 203): "The Japan pea, at present widely advertised as a most valuable plant for its seeds and fodder for the southern states, is a species of *soya,* very near the soy pea, *S. hispida,* if not a form of it."

562. Haberlandt, Friedrich. 1876. Der Anbau der rauhhaarigen Soja oder Sojabohne (Soja hispida Moench) [The cultivation of the hirsute soybean]. *Wiener Landwirthschaftliche Zeitung* 26(9):87-89. Feb. 26. [Ger]

• ***Summary:*** Contains a detailed account of Haberlandt's first trials and analyses of the oil and protein content of the soybean's seeds.

"Among the seeds that the teaching staff of agronomy at the Royal College of Agriculture (*Lehrkanzel des Pflanzenbaues an der Wiener Hochschule für Bodencultur*) in Vienna, acquired at the Viennese World Exposition of 1873, were a number of varieties of soya (Soja), gathered from the Chinese, Japanese, Mongolian, Transcaucasian, and East Indian expositions." An illustration shows a soybean plant with pods.

Note 1. This is the earliest document seen (July 2008) by Prof. Haberlandt about soybeans or that mentions Prof. Haberlandt in connection with soybeans. Also subsequently published in *Biedermann's Centralblatt* (June 1876, p. 441-

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45).

Note 2. This is the earliest document seen (July 2002) concerning soybeans in Austria, or the cultivation of soybeans in Austria. This document contains the earliest date seen for soybeans in Austria (1873), or the cultivation of soybeans in Austria (1875). The source of these soybeans is the various expositions at the World Exposition in Vienna of 1873.

Note 3. This is the earliest document seen (April 2008) concerning soybeans in Transcaucasia, or the cultivation of soybeans in Transcaucasia–which is a region roughly equal to that occupied in 2008 by the countries of Armenia, Azerbaijan, and Georgia. This document contains the earliest date seen for soybeans in Transcaucasia, or the cultivation of soybeans in Transcaucasia (1873). The source of these soybeans is unknown. We cannot be certain that soybeans were being cultivated in Transcaucasia by 1873, although Haberlandt says in 1878 that these soybeans were "from Transcaucasia" so they were almost certainly being cultivated there–especially since they were seen as being important enough to take to this Viennese World Exposition. Moreover, Wuchino (1901) states that soybeans were first grown in Transcaucasia in the 1870s. We learn later (1878) that Haberlandt got black soybeans from the Transcaucasian exposition.

Note 4. This is the earliest document seen (May 2008) concerning soybeans in Central Asia (Transcaucasia), or the cultivation of soybeans in Central Asia. This document contains the 2nd earliest date seen for soybeans in Central Asia, or the cultivation of soybeans in Central Asia (1873). The source of these soybeans is unknown.

Note 5. This is the earliest document seen concerning soybeans in Mongolia, or (probably) the cultivation of soybeans in Mongolia (one of two documents). It is possible, but unlikely, that these soybeans came from the nation that since 1911 has been called Mongolia (formally Mongolian People's Republic, also called Outer Mongolia). It is more likely that they came from what is today called Inner Mongolia, which is part of China, an autonomous region in northern China bounded on the north by the Mongolian People's Republic. Address: Prof., Wiener Hochschule fuer Bodencultur, Vienna.

563. Rauch, A. 1876. Die Soya [The soybean]. *Fundgrube* (*Die*) (*Monatschrift fuer die gesammten praktischen Beduerfnisse und Interessen des taeglichen Lebens, von Dr. A. Rauch, Bamberg*) 3:177-78. Oct. [Ger]

• ***Summary:*** The soybean (*Soya hispida* or *Dolichos Soya;* many German writers use the name "Soja") is a creeping and climbing bean (*rankendes Bohnengewaechs*) that is native in Japan, and in all of southern Asia, especially in China, is likewise widely cultivated, like the common bean in Germany. The seeds, which are distinguished by an especially good taste, are used as very popular food in the countries where soybeans are grown, which is found at almost every meal. They are also part of a significant commercial product, since they are used to make a strong sauce, which is much sought after in fine kitchens / cuisine. In England, for example, each year more than 1,200,000 lb (*12,000 Zentner*) of the beans and significant quantities of the Soya sauce*, which is made in China, are imported. Footnote: *"Some sauces sold as 'Soya sauce' in England do not contain any of the actual sauce."

In Europe, various attempts have already been made to acclimatize the soybean. But these have so far been unsuccessful, in that the plants, at best, flower, but never bear seeds. "Previously I received several seeds of various soybean varieties from Japan, from my longtime friend, honorable [Philipp] v. Siebold, who died at an early age. However my attempts to cultivate them was unsuccessful.

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The plants came up, and some of them bloomed, but so late (in September) that none ripened seeds.

"I was therefore quite astonished to read an article in the *Wiener Landwirthschaftliche Zeitung,* by Dr. Haberlandt, professor at the Royal College of Agriculture in Vienna (*Wiener Hochschule für Bodencultur*)*;* he reported that soybean cultivation at he Agricultural Experiment Garden (*landw. Versuchsgarten*) in Vienna, during the summer of 1875, had completely succeeded." Describes the pioneering work of Friedrich Haberlandt with soybeans in Austria.

Note: Bamberg is a city in Bavaria, in south central Germany on the Regnitz River 30 miles west of Bayreuth. Address: Germany.

564. Griffis, William Elliot. 1876. The Mikado's empire. New York, NY: Harper & Brothers, Publishers. 625 p. Illust. Index. Map. 23 cm. [25+* ref]

• ***Summary:*** Book 1. History of Japan from 660 B.C. to 1872 A.D. Book 2. Personal experiences, observations, and studies in Japan, 1870-1874.

This is a remarkable book, beautifully written by an American teacher and traveler in Japan who loves the culture and the people, who lived and traveled widely among them in both the countryside and cities during his four years in Japan (29 Dec. 1870 to 25 July 1874), and who speaks Japanese. He has a deep knowledge of many aspects of Japanese history, including the history of Japanese religions (incl. Buddhism). He was invited to Japan to organize a scientific school on the American principle in Fukui, Ichizen, and to give instruction in the physical sciences. This is the 1st of 18 books he wrote about Japan. He returned to Japan in 1926 the receive the Order of the Rising Sun.

Among the Aino [Ainu] in Hokkaido [Yezo] (p. 31): They sit, like the Japanese, on their heels. Their food is mainly fish and sea-weed, with rice, [soy] beans, sweet-potatoes, millet, and barley, which, in Southern Yezo, they cultivate in small plots."

Describing the Japanese origin myth, with the Sun Goddess (Amaterasu), Izanami, Izanagi, etc. (p. 48-49): "The God of Clay and the Goddess of Fresh Water married. Their offspring was Naka musubi. From his head grew the mulberry and silk-worm, and from his navel sprang the five cereals, rice, wheat, [soy] beans, millet, and sorghum." "Reporting the matter in heaven, Amaterasu was angry at Sosanoö, and degraded her (the Moon-goddess) from joint rule, and condemned her to appear only at night, while she, the Sun-goddess, slept. Amaterasu then sent a messenger the second time to see whether the Food-goddess was really dead. This was found to be the case. Out of the dead body were growing, millet on the forehead; silk-worms and a mulberry-tree on the eyebrows; grass on the eyes; on the belly, rice, barley, and large and small beans." Note 1. Large beans are soybeans; small beans are azuki.

Page 208: The native sauce, *shô-yu,* made of fermented wheat and beans, with salt and vinegar, which the cunning purveyors of Europe use as the basis of their high-priced piquant sauces [such as Worcestershire sauce], was made and used as early as the twelfth century. The name of this saline oil (*shô,* salt; *yu,* oil) appears as 'soy' in our dictionaries, it being one of the three words (soy [sauce], bonze, moxa) which we have borrowed from the Japanese." Note 2. The author's derivation is incorrect; *shô* does not mean "salt," but rather *hishio* or *jiang,* which is the mash, having the consistency of applesauce, before the liquid is pressed out.

Page 357: In the cooper shops is a "dazzling array of wood-work, so neat, fresh, clean, and fragrant... There are two coopers pounding lustily away at a great rain-tank, or saké-vat, or soy- tub" [vat]. An illustration shows two coopers at work hooping a vat.

At the pagan temple (p. 381): "Several old women have stands, at which they sell holy [soy] beans, pious pease, and sanctified rice. These are kept ready in tiny earthen saucers. The orthodox buy these, and fling them to the cloud of pigeons that are waiting on the temple eaves, and fly, whirring down, to feed. Ten thousand sunbeams flash from their opaline necks..."

Page 420: "The village houses were built of a frame of wood, with wattles of bamboo smeared with mud, and having a thatched roof. Within, the floor was raised a foot or so above the ground, and covered with mats. When the rooms had partitions, they were made of a frame of wood covered with paper, and made to slide in grooves. In the middle of the floor was the fire-place. From the ceiling hung pot-hooks, pots, and kettles–one for tea, one for rice, another for radishes, beans, or bean-cheese [tofu]. In these villages good-nature and poverty seemed to be the chief characteristics of the people."

Page 426-27: "The seller of fish, vegetables, oil, and bean-cheese, each uttering his own trade trade-cry, ambled on."

Page 455: "Men or women itinerants carry a small charcoal brazier under a copper griddle, with batter, spoons, cups, and shoyu sauce, to hire out for the price of a cash each to the little urchins, who spend an afternoon of bliss making their own griddle-cakes and eating them."

Note 3. This is the earliest English-language document seen (April 2012) that uses the term "shoyu sauce" (regardless of capitalization or hyphenation) to refer to soy sauce.

Page 496: "... a shop to which the *élite* of the epicures of Yedo [today's Tokyo] resorted daily for the delicacy of eels fried in soy [sauce]. The appetizing odor was wafted" into the neighborhood.

Page 516: "May 1st [1871]–During the past month I have made many excursions on horseback through the country round. staying overnight at the village inns. Sasaki and Iwabuchi have been my companions. I have seen the paper manufactories, oil-presses, the sake breweries, soy-

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vats,..."

Page 542: Jan. 22d, 1872. For dinner: "Rice, bean-cheese, daikon, mushroom, fish, are served."

Azuki beans (red beans, small beans) are also mentioned on pages 454 and 469. The population in 1872 was 33.3 million. On pages 587-88 is a sort of bibliography.

William Elliot Griffis lived 1843-1928.

Note 4. This is the earliest English-language document seen (April 2013) that uses the term " bean-cheese" (hyphenated, by itself, with a space before the word "bean," and where it is not preceded by the words "soy," "soya," "soja," etc.) to refer to tofu. Address: A.M., Late of the Imperial Univ. of Tokyo; presently in New York.

565. Imperial Japanese Commission to the International Exhibition at Philadelphia (1876). 1876. Official catalogue of the Japanese section: And descriptive notes on the industry and agriculture of Japan. Philadelphia, Pennsylvania: Published by the Japanese Commission. 130 p. 24 cm.

• ***Summary:*** The Preface (p. 3) begins: "Never until the year 1873, had Japan participated to any great extent in the various European International Exhibitions. Up to that time she had been merely represented by some of the provincial governments, acting independently of the central Government. However, the Government determined to be worthily represented at the Vienna International Exhibition of 1873,..." But Japan was well prepared for the Philadelphia Centennial Exhibition.

Under classes of "Agricultural products" (p. 32, 34): Class 621–Peas, beans, etc. (incl. Soya, adzuki). Class 650–Sea weeds (incl. Vegetable isinglass [agar, kanten]). Class 657–Flour and starch (incl. Kudzu {*Pueraria thunbergiana*}). Class 659–Wines and other kinds of drinks (incl. Sake, Soy {a kind of sauce}).

Page 71 discusses relief painting in lacquer: "The lacquer can even be carved, and, finally, the artisan can incrustate mother-of-pearl shell, ivory, thin metal, or anything he likes into the lacquer. By mixing a sort of paste made of [soy] bean powder, or the white of eggs, with the lacquer, he can thicken it to such an extent as to give it a kind of plasticity, admitting the possibility of making impressions which remain visible after hardening."

In the long chapter titled "Descriptive notes on the industry and agriculture of Japan (p. 37-117) is section on "Agricultural products. Classes 620-21–Cereals, vegetables, etc." (p. 104-06). Beans, generally referring to soy beans, are mentioned many times. "Manures of a mineral nature consist of marls, shells and ashes; those of vegetable origin of inferior kinds of beans and peas or their residues, of [soy bean] oil-cakes, the residues of sake-brewing,..."

"The excellent kinds of beans and peas, which are made into a kind of cheese [tofu] and a peculiar mixed dish called 'misso' [miso] afford the necessary nitrogenous substances, and to a certain extent form the substitute for meat; the Soyu [shoyu; soy sauce] also belongs to this kind of food, and is frequently mixed with other dishes. With regard to animal food, it is limited almost exclusively to fish, poultry and eggs. But a change has already been effected to a certain extent in the larger towns, where butcheries have been established. An experiment of sheep farming was commenced one or two years ago" (p. 106).

Note: This is the earliest English-language document seen (April 2012) that uses the word "Soyu" (regardless of capitalization) to refer to shoyu or soy sauce.

Under "Class 657, 658–Flour, starch, etc. we read (p. 110-11): "It has been mentioned above that the various kinds of beans constitute a very important element of the national diet. Some of the preparations made of beans and peas are worthy of a short notice. In preparing the 'Tofu,' white beans are soaked in water, ground between two stones, strained through a sieve and afterwards boiled. The contents of the kettle are then filtered through cotton cloth and the residue pressed out. The liquid [soymilk], which may be considered as an alkaline solution of legumine, is precipitated by successive additions of the bitter lye [nigari] which runs off from sea-salt by deliquation, and which is mostly composed of magnesium salts. The precipitate is legumine with a small percentage of legumine-composits [-composites] and a large proportion of water. The 'yuba' is also made by boiling the above-mentioned legumine solution in an open kettle, with a slight addition of ash-lye. The insoluble skins which form upon the surface of the boiling liquid, are taken off and dried. Another kind of preserved food is the 'misso' [miso]. White beans are first boiled, pounded in a mortar to form a paste, then mixed with fermenting rice and salt, whereupon the whole mixture is placed in tubs and left in some cool place; at the end of a month it is ready for use. In mentioning the various preparations made of beans, the 'Soy' or, as the Japanese call it, 'Soyu' [shoyu] should not be omitted; but as it belongs rather to the produce of fermentation, the process will be described under the head of Class 660 [Alcohol and malt liquors].

One page 112 we read: "The soy, or 'soyu,' is made of a small bean, the 'Dolichos soja,' or 'Soya hispida,' to which are mixed wheat, salt and water. The beans are first boiled, and the wheat bruised and steamed; both are then mixed with a small addition of fermenting wheat, placed in flat wooden boxes and kept for several days at a fixed temperature in a special room. At the end of three days, the mass [koji] is all covered with fungi and partly with roots of germination. After having been mixed with a salt-lye, which has been prepared hot and allowed afterwards to cool down, and to depose certain impurities, the mashings are now removed to enormous coops [vats] in which they are kept for several years. Experience has shown that the best soy is produced by mixing equal quantities of mashings of three years and five years' standing. This mixture is transferred into bags of thick cotton-cloth, placed in large boxes, and then submitted

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to pressure–at first only to a slight pressure, which yields the best soy, and afterwards, however, to a gradually increasing pressure, the separation of the last portions being assisted by an addition of salt water.

"The soy forms a very important condiment for all kinds of dishes, and is consumed in large quantities. In 1874 the production amounted to 1,506,402 hectolitres."

An interesting term in the Index (p. 129) is "Bean-cheese," which refers to tofu (p. 110).

Also: Use of hemp (*asa*) for manufacture of cloth (p. 77, 113). The tea ceremony (p. 108). Sea weeds, incl. cultivated nori and Asakusa nori in Tokio bay, kanten or vegetable isinglass, and fu (that resembles carragheen [carrageenan] moss and is used in the sizing of the warp of silk goods) (p. 109). Kudzu (p. 110). Sake (p. 111). Address: Japan.

566. Philadelphia International Exhibition, 1876. Official catalog of the British section. 1876. London: Printed by George E. Eyre and William Spottiswoode. Part I. 424 p. Published by authority of the Lord President of the Council. 23 cm.

• ***Summary:*** The book contains an interesting chapter titled "Exhibitions–Their origin and progress." Prior to 1851 there had been many local exhibitions worldwide, dating back to Biblical times. The first international exhibition was held in London in 1851. To date there have been five international exhibitions: London (1851, 1862), Paris (1855, 1867), and Vienna (1873). These have been attended by a total of 32,959,097 visitors. The Annual International Exhibitions at South Kensington in 1871, 1872, 1873, and 1874 did not realize the expectations of their promoters; public interest rapidly died out and the scheme was abandoned. The first exhibition of the Japanese Empire was held at Kiôto (Kyoto) and contained the objects destined for the Vienna exhibition of 1873. This Kyoto exhibition opened on 17 April 1872 and was so successful that the original limit of 50 days was extended, and the Exhibition did not close until the end of July. The next year the Mikado (emperor) decreed an exposition on a much wider basis, presenting a comparison between the past and present, and even affording a glimpse into the future of Japan. Note 1. This is the earliest document seen (Aug. 2011) that contains the Japanese word "Mikado," meaning Emperor of Japan.

In terms of classification of products, Agriculture is Department VI, in the agricultural building. Agricultural products are classes 620-629; cereals, grasses, and forage plants are class 620, and leguminous plants and esculent vegetables are class 621. Animal and vegetable products are classes 650-662; preserved meats, vegetables, and fruits, dried or in cans or jars. Meat and vegetable extracts is class 656. Vegetable oils is class 662. Horticulture is Department VII, in the horticultural building.

Note 2. This is the earliest English-language document seen (May 2006) that contains the term "vegetable extracts" (or "vegetable extract"). The context shows that they resemble meat extracts. It would be very interesting to know of what and how they are made, and how they are used. By 1896 a type of soy sauce named "Dr. Lahmann's Japan Soja" was described as a "vegetable extract."

An alphabetical list [directory] of exhibitors includes Crosse & Blackwell (Soho Square, London; classes 656, 660, 662), and Lea & Perrins.

On page 246 is the following: "Cl. [Class] 656, 203. Lea & Perrins, Sauce Manufacturers, Worcester, Worcestershire Sauce. (917) Exhibitors, New York, 1853 (Medal)."

On page 77 begins a "List of articles of produce and manufactures chargeable with duty on being imported into the United States." A table titled "Of articles of produce and manufactures chargeable with duty on being imported into the United States" shows (p. 289) that the duty on "Soy" [sauce] is 35 per cent. This is the only reference to soy seen in this book.

Note 3. This is the earliest document seen (April 2001) that contains a directory including listings related to soy. Address: England.

567. Satow, Ernest Mason; Masakata, Ishibashi. comps. 1876. An English-Japanese dictionary of the spoken language. London: Trübner & Co.; Yokohama, Japan: Lane, Crawford, & Co. xv + 366 p.

• ***Summary:*** Page 295: Soup, n. [noun] (flavored with soy [sauce]) *tsuyu; sui-mono;* (made with miso) *otsuke; miso-shiru; o mi otsuke* (the last used only by women).

Soy, n. shôyu (c).

Note 1. The symbol "(c)" denotes that the word which precedes it is of Chinese origin. However, the word *shôyu* is not of Chinese origin, but rather of Japanese origin.

Note 2. This is the 2nd earliest English-language document seen (April 2012) that uses the term "shôyu" to refer to soy sauce. Address: 1. Japanese Secretary to H.M. Legation at Yedo; 2. Imperial Japanese Foreign Office.

568. Blavet, A. 1877. Le *Soja Hispida* et le *Cicer Arietinum* [The soybean and the chickpea]. *Moniteur Horticole* (*Belgium*) No. 1. p. 7. Jan. [Fre]*

• ***Summary:*** Even though not shining among the first rank of the food species, these two legumes are of real interest for our vegetable plots. For some time now, based on favorable trials conducted in France, they have been recommended very seriously to all those who are interested in the important question of food. We believe, therefore, that it would be useful to our readers to give a brief description of these two vegetables which are still almost unknown in our country.

The *Soja Hispida* or *Dolichos Soja* belongs to a genus that is very closely related to the genus *Glycine,* and certain botanists even lump them together. It is an annual hairy (*hispide*) plant, about 1 meter in height when erect. Its leaves are trifoliate, consisting of three leaflets or folioles.

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Its flowers are violet, arranged in clusters (*en grappes ascillaires*), followed by oblong pods, slightly arched, each containing from 2 to 5 oval seeds, a little compressed. It originated in Asia.

In Japan, in China, and in tropical Asia (I might add in Mexico), these seeds are eaten as a vegetable [green vegetable soybeans]. In these regions, it can be said that the culinary art owes them a lot, because they enter into the preparation of all the sauces. Among other things, they are made into the celebrated Soy [sauce], so sought after by Asiatic gastronomes, and which is also known and used in Europe to enhance the taste of certain dishes, and especially beef, whose digestion it uniquely facilitates. The soybean (*le Soja*) is also said to be an important oil-bearing plant.

In October 1878 we had two soybean plants growing in our plot of vegetables at the Universal Exposition [in Vienna]. One member of our society asked Mr. Vilmorin what he knew about this plant. He replied: About eight years ago [i.e., in 1870] I saw it appear, then it was not spoke about again. Anyway, the visitors [at the Exposition] paid such high honors to our two plants, that all we were left with was the stems [because the visitors had stripped off the pods and seeds].

You know better than anyone how much perseverance and stubbornness it takes to propagate a novelty, regardless of its excellence. You have to convince, particularly at the beginning, you have to overcome the bad will, the habits, the distrust, the jealousy, the incompetence, the conviction that it is impossible to do better... and whatever! This the first year I gave the soybean (*le Soja*) to market gardeners / vegetable growers (*maraîchers*); a certain number of them did not wait for the plant to reach maturity before putting it on the compost pile. They called it an obscenity which took up room unnecessarily. They came to a hasty conclusion / judgment, as you can tell.

Others who thought about it more gave the plant the opportunity to bear fruit, but the failed to write a report about its cultivation.

Finally, only two people understood that this very accommodating legume was not out of place. Yet one must add that this was thanks to the presence of a ship-owner (*armateur*), who had eaten it in Mexico. He was very fond of this product, and it is to this fact that the plant was given the honor of being cultivated on a large scale in one of the châteaus where one of our two gardeners happened to be.

Note: This is the earliest document seen (Feb. 2009) concerning soybeans in Mexico, Central America, or Latin America. It is not clear whether or not these soybeans were cultivated in Mexico (they may well have been) or where they came from (they may well have come from China on a Manila galleon as part of the China trade).

It's the same kind of thinking. Without the laudable perseverance of one of our horticulturists, our excellent Etampes soybean (very early), would never have come to our attention. What if it had been grown by a market gardener who just brought some of it to our market without thinking for years to give it the least extension to its cultivation.

The first year it was sold for 12 francs per liter.

569. Haberlandt, Friedrich. 1877. Der Anbau der rauhhaarigen Sojabohne [The culture of the hirsute soybean]. *Landwirthschaftlichen Versuchs-Stationen* 20:247-72. [5 ref. Ger]

• ***Summary:*** Haberlandt submitted this article in Jan. 1877 from Vienna. The original soybean seeds were obtained at the Vienna World Exposition of 1873 then grown out in the garden of the Royal College of Agriculture (*Hochschule für Bodencultur*) in Vienna. The seeds grown in Vienna and harvested in 1875 and 1876 were larger and heavier than those obtained at the Exposition.

"Among nutritional plants, the hirsute soybean (*der rauhhaarigen Soja*) is of the first rank. For no other legume nourishes so many people, and has such great nutritional value, and multiple food uses" (p. 247). On p. 248 Haberlandt shows that he is familiar with the soybean work of the Society for Acclimatization in France. "In France the soybean is known as the oil pea, and it is cultivated at various points in the departments of Ariège and Haut-Garonne... Many years ago attempts were made to grow *Soja hispida* in Hohenheim [Germany], but the plants were barely brought to a blooming state. People also had the same experience in other places. Dr. A. Rauch of Bamberg [Germany] (see *Die Fundgrube von Dr. A. Rauch. III. Jahrgang. Bamberg* 1876), on several occasions, received seeds of various soybean varieties from Japan. They were sent by his long-time friend, Colonel [Philipp Franz] von Siebold, who died at an early age. But every trial by Dr. Rauch was unsuccessful.

In 1875 Prof. Haberlandt conducted soybean trials at the Royal College of Agriculture in Vienna. In early 1876 he published detailed results of these trials in the *Wiener Landwirthschaftliche Zeitung.* Nutritional analyses of these seeds were published.

In early 1876 Prof. Haberlandt then sent samples of seeds to seven cooperators in central Europe, who planted and tested the seeds in the spring of 1876, with good or fairly good results in each case. These men reported the details of their agronomic trials (*Anbauversuche*) to Haberlandt, who quotes from their reports (p. 253-59). Haberlandt sent soybeans to: Master-gardener W. Köhler (p. 253-54) in Ungarisch-Altenburg [Hungarian Altenburg, formerly Magyarovar, today's Mosonmagyarovar in Hungary about 22 miles northwest of Györ]. He planted 100 seeds in mid-May, 1876, in a sunny place in the botanical garden, in a bed 5 meters long by 2 meters wide. All the seeds germinated (*Alle Samen keimten*) and the plants developed luxuriantly. But one night, when they were 5-6 cm tall, all the young plants were eaten by rabbits. However they grew back and yielded

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1.6 kg of seeds.

Landowner (*Gutsbesitzer*) A. Stojics (p. 253-54) in Gross-Becskerek in Hungary. He planted 100 brownish-red (*braunrothen*) and 100 yellow soybeans in mid-April. In mid-September he harvested 0.33 kg seeds of the former and 0.32 kg of the latter.

Note 1. This is the earliest document seen (Feb. 2005) concerning soybeans in today's Hungary (though Hungary was not officially created until 1918), or the cultivation of soybeans in Hungary. This document contains the earliest date seen for soybeans in Hungary, or the cultivation of soybeans in Hungary (mid-April 1876) (one of two documents). The source of these soybeans was Friedrich Haberlandt in Vienna.

Landowner Graf. H. Attems (p. 253-55), owner of a seed testing station (*Samenculturstation*) in St. Peter bei Graz in Steiermark [today's Styria, capital of Graz in Austria]. On 19 May he planted 50 brownish-red (*braunrothen*) seeds from China and 50 yellow seeds from Mongolia. He harvested the seeds between Oct. 11 and 24, obtaining 0.870 kg of the brownish-red and 0.642 kg of the yellow.

Mr. A. Tomaszek [Tomasek] (p. 253, 255-56, 260, 263), farmer and civil servant (*Oekonomie-Beamter / Verwalter*) in Napagedl in Mähren [Moravia, a region in today's central Czech Republic]. He planted 25 yellow and 25 reddish-brown soybeans on April 29. The yellow yielded 1,400 seeds and the reddish-brown 1,350 seeds.

Note 2. This is the earliest document seen (Feb. 2005) concerning soybeans in what is today the Czech Republic (though it was not officially created until Jan. 1993), or the cultivation of soybeans in the Czech Republic. This document contains the earliest date seen for soybeans in the Czech Republic, or the cultivation of soybeans in the Czech Republic (29 April 1876) (one of two documents). The source of these soybeans was Friedrich Haberlandt in Vienna.

Note 3. Concerning Mähren (Moravia): from 1849 to 1918 it was a separate crownland of Austria, with capital at Brno. In 1918 it was organized as a province of Czechoslovakia.

Princely Privy Councillor (*Hofrath*) W. Janig (p. 253, 256-57) in Prague in Böhmen [Bohemia]. He was sent 200 seeds which he sent to 5 locations (including in Sichrow, Swijan [on the Iser or Jisera River], and Darenic) in Bohemia [now in the Czech republic] for planting. All but 5% sprouted. In Sichrow, 25 seeds planted in early May yielded 2,500 seeds in October. Continued. Address: Mittheilungen aus dem landwirthschaftlichen Laboratorium und Versuchsgarten der k.k. Hochschule fuer Bodencultur in Wien [Vienna].

570. Haberlandt, Friedrich. 1877. Der Anbau der rauhhaarigen Sojabohne [The culture of the hirsute soybean (Continued–Document part II)]. *Landwirthschaftlichen Versuchs-Stationen* 20:247-72. [5 ref. Ger]

• ***Summary:*** Continued from p. 253. Prof. Dr. Kulisz (p. 253, 257) in Tetschen-Liebwerd in Böhmen [Bohemia, now in the Czech Republic] planted 150 seeds of 3 varieties. Despite snow, rain, and frost in May, 98 plants survived, yielding 660 seeds. The tallest plant was not over 50 cm high.

Dr. Nicolaus Dimitriewicz (p. 253, 257-58), a former student at the Royal College of Agriculture in Vienna, and now a farmer (*Oekonom*) in Bukovina [Bukowina or Bucovina, a former Austrian crownland, now (2005) divided between the Ukraine and Romania]. He received 100 seeds which he sent to 6 farmers he knew in four nearby locations in the district of Kotzman (*des Kotzmaner Bezirks*).

Note 1. As of 1994, Kotzman is the town and district of Kitsman in the southwestern Ukraine, just north of the border with Romania. Also spelled Kotzmann, Cotman, Cozmeni, Kosman, Kozmeny, or Kucmeh, it is located 19 miles northwest of Chernivtsi (also spelled Chernovtsy, Chernowitz, or Czernowitz).

The seeds were planted late, on April 20 or later, and some were killed by frost. Others, protected from the frost, grew fairly well. For example, the second farmer harvested 669 seeds from 19 plants. The 64 plants which survived yielded less than 2.821 kg of seed. Note 2. This is the earliest document seen (Feb. 2001) concerning soybeans in the Ukraine, or the cultivation of soybeans in the Ukraine (one of two documents). This document contains the earliest date seen for soybeans in the Ukraine, or the cultivation of soybeans in the Ukraine (20 April 1876). The source of these soybeans is unknown.

And A. Schnorrenpfeil (p. 253, 258), Administrator of *Gutswirthschaft* at the Agricultural Academy in Proskau (*Landwirtschaftlichen Akademie Proskau*) [now named Proszkow, in today's southwest Poland] in Preussisch-Schlesien [Prussian Silesia, a Prussian province later divided into upper- and lower Silesia]. He planted 50 seeds of two varieties in late April.

Note 3. Proszkow is a market town located 7 miles southwest of Oppeln (now Opole), in southwest Poland at north latitude 50º40'.

Note 4. This is the earliest document seen (Feb. 2005) concerning soybeans in Poland, or the cultivation of soybeans in Poland (one of two documents). This document contains the earliest date seen for soybeans in Poland, or the cultivation of soybeans in Poland (20 April 1876). The source of these soybeans was Prof. Haberlandt in Vienna.

Joh. Stua (p. 263-64), of the Technolog. Laborat. der k.k. [kaiserlich-königliche] Hochschule für Bodencultur [Imperial-Royal College of Agriculture] in Vienna, conducted a detailed nutritional analysis of the yellow Mongolian, yellow Chinese, and brownish-red (*braunrothe*) varieties. The first 3 columns of a full-page table (p. 264) show percentages in air-dried soybeans of (1) the original soybean seed sample, (2) soybeans grown the first year,

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and (3) soybeans grown the second year. Columns 4-6 show the same information adjusted as if the soybeans had a 10% water content. For each variety, data are given for water, protein, fat, nitrogen-free extract (Stickstofffreie Extractivstoffe), crude fiber, and ash (*Aschenbestandtheile*). Note 5. This is the earliest German-language document seen (Oct. 2004) that mentions red soybeans (actually brownish-red) or that uses the word *braunrothe* to refer to the color of soybeans. In many other documents by or about Prof. Haberlandt, the term "reddish-brown" (*braunrothen*) is used to describe the color of a type of soybean he obtained from China.

Tomaszek (p. 263) wrote Haberlandt that he was astonished by the high oil and protein content of the soybeans he grew and harvested and had analyzed by a chemist at the sugar factory. So he had the analyses repeated by Prof. K. Zulkowski of the technical university at Brünn, and got similar results. Zulkowski found (table, p. 263) that the air-dried seeds of yellow soybeans from China contained 16.99% fat, 40.19% protein, and 6.43% nitrogen. The brownish-red soybeans from China contained 16.68% fat, 44.93% protein, and 7.19% nitrogen. Note 6. This is the earliest document seen (April 2003) that mentions Zulkowski.

These analyses are in close accord with those published by Senff in 1872 (table, p. 265). Soybeans are compared with lupins and other legumes.

On pages 270-71 Haberlandt discusses food uses of soybeans. "The soy sauces, which were imported from India and spread from England over Continental Europe, could in no way awaken a favorable opinion of the flavor of the soybean, for these sauces have a strong flavor of browned (*gebräuntem*) sugar, perhaps also mixed with other ingredients, so that the soybean's own flavor is completely masked (*verdekt wird*). Because of their complete lack of starch, soybeans do not become soft through cooking, so it is necessary to crush and rub the half-soft cooked seeds before their further preparation... Best would be a use [of soybeans] which imitates that of corn kernels (*Maiskörner*), from whose flour the people of southern Europe prepare their beloved dish, Polenta. Soybeans roasted at 160ºF taste delicious and surpass all other plants that have heretofore been used as coffee substitutes."

Note 7. This is the earliest document seen (Nov. 2012) in which Dr. Haberlandt mentions that roasted soybeans made a good coffee substitute.

Note 8. Tables from this article are described in a separate record. Address: Mittheilungen aus dem landwirthschaftlichen Laboratorium und Versuchsgarten der k.k. Hochschule fuer Bodencultur in Wien [Vienna].

571. Haberlandt, Friedrich. 1877. Der Anbau der rauhhaarigen Sojabohne [The culture of the hirsute soybean: Tables (Document part)]. *Landwirthschaftlichen Versuchs-Stationen* 20:247-72. [5 ref. Ger]

• ***Summary:*** Tables show: (1–p. 260) The weight in grams of 1,000 original seeds compared with the first progeny in 1875 and the second progeny in 1876. Yellow soybean from Mongolia: 81.5, 126.0, and 163.6. Note the significant increase in seed weight. Yellow soybean from China: 92.5, 148.0, 143.0. Reddish brown soybean from China: 105.0, 154.5, 141.8. Black soybean from China: 101.6, 110.6,–(no value given).

(2–a full-page table, p. 261) Prof. Haberlandt's results in testing 7 different types of soybeans in 1876: Yellow from Mongolia (progeny), yellow from China (progeny), reddish-brown from China (progeny), black from China (one original, one progeny), black from Mongolia (original), and black from Japan (original). For each variety is given: Size of the trial plot in square meters (range 4.0 to 11.0), Planting date (April 25 to May 5), successful emergence of sprouts (May 19 to June 2), first flowering (June 20 to July 3), start of ripening (Aug. 25 to Oct. 24), date of harvesting (Sept. 26 to Nov. 6), number of plants harvested (52 to 339), weight of the harvested seeds in grams (570 for black from Mongolia to 3,710 for yellow from China), weight of the air-dry straw in grams (1,920 for black #1 from China to 7,270 for yellow from China), calculation of weight of seeds per hectare (in kg) (1,111.1 for black from Japan to 3864.6 for yellow from China), calculation of weight of straw per hectare (in kg) (4,062.5 for black #1 from China to 6,025 for black from Mongolia), number of seeds per plant (40.5 to 124.4 for black #1 from China), weight of 100 air-dry seeds in grams (101.6 from black #1 from China to 163.6 for yellow from Mongolia).

(3–p. 268) The total heat units (*Wärmesummen*) required for 7 different types of soybeans in 1876 to the start of ripening and to harvest: Yellow from Mongolia (progeny) 1824ºC, 2230ºC. Yellow from China (progeny) 1887ºC, 2253ºC. Reddish brown from China (progeny) 1699ºC, 2293ºC. Black from China (original) 2844ºC, 3175ºC. Black from China (progeny) 2661ºC, 3175ºC. Black from Mongolia (original) 2905ºC, 3175ºC. Black from Japan (original) 2954ºC, 3175ºC. Note that the yellow varieties (the first two) required the fewest heat units, while the black varieties required the most.

Note 1. This is the earliest document seen (Oct. 2013), worldwide, that contains information on the weight of soybean seeds. Haberlandt measured the weight in grams of 1,000 soybean seeds.

Note 2. This is the earliest document seen (Oct. 2004) that clearly mentions soybean straw, which the stems, leaves, and empty pods left after the plants have been thrashed for seed. Soybean hay is the whole dry plants with the beans left in the pods, cut at any time from the setting of seed until the leaves begin to turn yellow. Address: Mittheilungen aus dem landwirthschaftlichen Laboratorium und Versuchsgarten der k.k. Hochschule fuer Bodencultur in Wien [Vienna].

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572. *Landwirth* (*Der*)*: Allgemeine Landwirthschaftliche Zeitung* (*Breslau*)**.** 1877. Die rauhhaarigen Sojabohnen [The hirsute soybeans]. 13(48):261. June 15. [Ger]

• ***Summary:*** At the Vienna World Exposition of 1873, many varieties of soybeans from Mongolia, China, and Japan were represented. They are widely cultivated in those countries. Subsequently, at the Royal School of Agriculture in Vienna, trials were made to study the growth and yield of the plant. The results from the year 1876, according to Prof. Haberlandt–as reported in the *Wiener Landwirthschaftliche Zeitung*–lead to the conclusion that the soybean can only mature seeds where the medium level of summer warmth is a little over 140 R. and where neither grape tendrils nor maize (*Mais;* corn) are able to ripen more. In Austria-Hungary, early-ripening soybeans can be cultivated. The small number of trials seem to indicate that large-scale cultivation would produce good yields. The experimenters noted the remarkable fruitfulness of the soybean. In Bukowina [Bukovina or Bucovina, a former Austrian crownland, now divided among the Ukraine and Romania], each seed yielded 188 seeds. Moreover, analyses show that the seeds are of great nutritional worth, and the progeny of the original seeds have more protein and fat than their forbears. The straw also has high value as a feed, and feeding trials show that cows like not only the green plants but also the straw. Since soybeans are widely used for food among the people of East Asia, Prof. Haberlandt hopes that this plant, because of its great fruitfulness, will become widely cultivated in Europe within a few years, and will been seen as competing in importance with the various cereal grains, potatoes, and corn.

Note: Breslau (see Journal name; the German name for Wroclaw [pronounced vrot-SLAF]) came under the control of Prussia in 1741, and remained part of Germany until 1945, when it was assigned to Poland by the Potsdam Conference.

573. Warren, C.F. 1877. Places I have visited in Japan. *Church Missionary Intelligencer and Record, a Monthly Journal* 2:475-80. Aug. New series.

• ***Summary:*** (Continued from p. 414). Part "VII. Temple of Inari at Fushimi, near Kiyoto [Kyoto] (p. 479)."

Page 480: "Idolatry is practised here, but the fearful superstition connected with the worship of Inari is carried on beyond the principal shrine in a somewhat more retired spot backed by a hill in the distance. Some 350 wooden *torii,* placed close together, and forming two pathways side by side, show that we are approaching a spot where many press to worship–for these *torii* are offerings made by devotees. The shrine to which they lead is small, the entire building being only a few feet square. Its doors are closed, and there is only a small aperture, a few inches square, left open to admit the numerous offerings. On the shrine small toy-like *torii,* about a foot in height, may be counted by the dozen. What exalted deity is here worshipped? It is the fox! On one occasion I happened to be at the spot, just as an old man came to take away the offerings made the preceding day. When he opened the door I examined the interior of the shrine. The only furniture it contained was a box, placed under the small aperture in the door, to receive offerings, and a tray, placed against the back of the shrine, on which some of the offerings of the previous day had been arranged. The old man was provided with a basket, into which he put the offerings on the tray. He then took fresh offerings from the box by the door, and laid them in order in the place. They consisted of fried bean curd, *mochi*–a kind of unleavened cake made from rice flour–peas, beans, dried fish, &c, and cash. These had all been offered to the fox-gods; and on one side of the shrine I observed a small hole, through which these deified animals are supposed to enter, to feast on the supply provided for them."

Note: This is the earliest English-language document seen (April 2013) that contains the term "fried bean curd."

"Worshippers come to this shrine, ring the bell, clap their hands, present an offering, bow, and mutter a prayer; then they pass into the spacious grounds at the back to visit the holes of foxes. As they go over the well-beaten path, they stop at place after place to pour a few drops of wine, or to make some other small offering at the foxes' holes. Several years ago this form of superstition was discouraged by the Government, but it still survives, and no doubt will survive, until the people are taught to worship the great Creator, and to serve Him alone. The superstition is widespread. Education may do much to show its absurdity; however, nothing will effectually eradicate it but the Gospel of Christ." Address: Rev.

574. Richthofen, Ferdinand Freiherr von. 1877-1912. China: Ergebnisse einiger reisen und darauf gegrundeter studien [China: The results of some travels and studies based on them. 5 vols.]. Berlin: Verlag von Dietrich Reimer. Illust. Index. 29 cm. [Ger]

• ***Summary:*** Contents: Vol. 1. Introduction, 1877. Vol. 2. Northern China, 1882. Vol. 3. Southern China, edited by E. Tiessen, 1912 (since Richthofen died on 6 Oct. 1905). Vol. 4. Paleontological part. Vol. 5. Conclusions.

This German-language travelogue describes the author's seven trips throughout China from 1867 to 1871. Various color maps in Vol. 1 show the course of each journey. Soy is mentioned in volumes 1, 2 and 3.

In vol. 1, p. 420, in discussing the *Zhouli* (Rites of the Zhou dynasty, ca 300 B.C.) we read: (4) Beans, and to be sure probably the soya-bean (*shu*) which is also mentioned in other early texts. Note: Thus, Richthofen believes that *shu* refers to soybeans.

But only in Vol. 2, p. 145-46 is the soybean discussed in detail. Elsewhere soybeans (called simply *Bohnen* or "beans") are listed among the different crops grown in various provinces. In chapter 4, titled "Southern Manchuria

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or the province of Shönking" (also spelled Shengking or Shing-King, a geographical area in southern Liaoning province, apparently known only to Germans since it is not one of China's 18 provinces) we read (p. 145-46) that legumes are the No. 1 export. Almost all the export of *Ying-tze* consists of [soy] beans, the [soy] bean oil (*Bohnenöl*) pressed from them and the bean cake (*Bohnenkuchen*) that remains. Most of the beans are shipped to the coast of northern China, where they are used as food. The bean cake is used in part as a fodder for cows (*als Futter für das Vieh*) and, in part, as fertilizer on the sugar fields of southern China. Recently Japan started to import this cake from Manchuria. The [soy] bean oil is used for the preparation of foods in the central and southern provinces of China. MacPherson reports that in the one province of Shöng-king, soybeans account for 20% of all exports. All the rest come from *Piën-wai.* The trade is in the hands of Chinese merchants, who buy the beans at the various inland locations, then consolidate them at other locations where they are pressed [to give soybean oil and meal]. The presses are often located in the same villages where the beans are grown. A description of the press and its operation are given. In 1867 a large English firm from Shanghai erected a steam-driven press at Ying-tsze, in the hope that the use of greater pressure, speed, and volume of work, they could make a less expensive product, and thereby gain a significant part of the oil processing business. However the cost of erecting this plant was very high, since many changes had to be made. There were also numerous other problems. However at the time of Richthofen's visit, after the expenditure of much effort, time, and money, they were finally able to obtain favorable results. Many Europeans are now entering China with modern technology and great energy, bringing better and faster methods to silk spinning, sugar refining, and in Siam to rice hulling.

Soybeans are also grown (along with maize, millet, kaoliang, and some opium poppies) in the Liao valley of east of Mukden (p. 143), throughout southern Manchuria (p. 144, along with wheat, barley, millet, sorghum, cotton, peas, rice, indigo, sesame, tobacco, opium poppies, and potatoes), in the mountains of Shandong (p. 248-49, with wheat, peanuts, sesame, and rapeseed). At a harbor in Shandong, major imports include [soy] beans, sugar, paper, lumber, some English cotton goods and lead (p. 261). Soy beans are also grown in the northern part of the provinces of Chili and Shansi (p. 360, along with kaoliang, oats, buckwheat, peas, and black [soy] beans), in the province of Shanxi (p. 480, along with wheat, cotton, tobacco, maize, sorghum, and oilseeds), and in the province of Henan (p. 535, along with wheat, barley, peas, rapeseed, sweet potatoes, and poppies for opium production; from June until the end of July 80% of the fields are planted to cotton, and soybeans are planted between the stands of cotton).

Vol. 3 states that soybeans (*Bohnen*) are grown along the Yangtze River (p. 81, along with rice, various types of sorghum, maize, and some sugarcane), in the mountains of Szechuan south of the Yangtze (p. 223, along with sweet potatoes, buckwheat, and millet; and p. 238, along with hemp, peanuts, silk, and opium poppies; and p. 260-61, winter crops include "field beans" {*Feldbohnen*}, of wheat, barley, peas, and rapeseed. Summer crops include soybeans {*Bohnen*}, soybeans {*Soya*}, peanuts, maize, sesame, millet, kaoliang, hemp, buckwheat, and tobacco), in southeast China (p. 412-13, along with hemp and potatoes, plus peanuts, sesame, and rape as oilseeds), in the province of Kwangtung (around Canton in southern China, p. 482, along with rice, sugar cane, wheat, buckwheat, tobacco, and rapeseed), in Hupei province of central China (p. 531-32, along with oil-cake and rapeseed), in the mountains eastern Chekiang and Anhwei (p. 671, along with rice, what, tobacco, maize, and sweet potatoes, and p. 677, along with maize, sweet potatoes, and kaoliang sorghum), in Kiangsu on the island of Tai-hu (p. 701, along with vegetables).

Also discusses: Peanut oil (Vol. 3, p. 498). Sesame oil (Vol. 3, p. 413).

Note 1. This is the earliest German-language document seen (Sept. 2006) that uses the term *Bohnenöl* to refer to soybean oil.

Note 2. Ferdinand Richthofen lived 1833-1905. Note 3. This is the earliest European-language document seen (March 2002) that mentions kaoliang (literally "tall millet"). However Bray (1984, p. 449) says that this word first appears in the *Wang Chen Nung Shu* (also called *Nung Shu;* Wang Chen's Agricultural Treatise) of +1313. Address: Bonn, Germany.

575. Houghton, Ross C. 1877. Women of the Orient: An account of the religious, intellectual, and social condition of women in Japan, China, India, Egypt, Syria, and Turkey. Cincinnati, Ohio: Hitchcock and Walden; New York, NY: Nelson and Phillips. 496 p. Illust. Index. [10* ref]

• ***Summary:*** In Chapter 4, "Education" is a long passage quoted from an article in the *Leisure Hour* [date, author, and title not cited] (p. 88-90) which contains "a translation of one of the very few Chinese works designed for the instruction of women." Page 90: "The third important thing is, do not waste rice or flour; be careful of the soy [sauce], vinegar, oil, and salt; in the day of plenty think of a day of want, that when that time comes you may not have to beg."

In Chapter 12, "Woman's position and life in the household," notes (p. 241): "The domestic position of an average Japanese woman is superior to that conceded to her sisters in other Eastern countries. Although she does not enjoy all the rights and privileges secured to a married woman in a Christian land, still she is treated as the companion rather than the slave of her husband, and her likes and dislikes are, to a considerable degree at least, respected. She is, however, without legal rights, and her evidence is not

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admissible in a court of justice."

Concerning Japanese food (p. 242-43): "A favorite relish is 'soy,' a strong sauce composed of pepper [sic] and fermented black beans."

Illustrations show: (1) A Japanese family at dinner (p. 242). (2) A Japanese lady (p. 243). Address: Rev., A.M., St. Louis, Missouri.

576. Leunis, Johannes. 1877. Synopsis der Pflanzenkunde: Ein Handbuch fuer hoehere Lehranstalten... Zweite gaenzlich umgearbeitete Auflage... 3 vols. [Synopsis of botany: A handbook for institutions of higher learning... 2nd ed. 3 vols.]. Hannover: Hahn'sche Buchhandlung. See vol. 2, p. 412. [Ger]

• ***Summary:*** Volume 2 (*Zweiter Theil*) is devoted to botany, bound with vol. 1, and arranged by plant families. Under legume family (*Leguminosae, Huelsenpflanzen*) are the papilionaceae (*Schmetterlingsblüter,* p. 374+) within which we find the genus Dolichos (p. 412), which includes *D. pruriens, D. Lablab,* and *D. Soja* (the soybean). Symbols indicate that the genus contains plants with therapeutic or medicinal value (*Apotheker–oder Arzneipflanzen*) and that the soybean alone is a commercial plant (*Handelspflanze*).

Concerning the soybean we read: *Dolichos soja** L. (Footnote 5: *The term Soja or Sooja is used by the Japanese to refer to a sauce {*Tunke*} in which soybeans {*die Soja-Bohnen*} are used) or *Soja japonica*** Savi (Footnote 6: **Japanese)

Note 1. This is the earliest German-language document seen (April 2012) that uses the word *Tunke* to refer to soy sauce.

The Japanese Soybean (*Japanische Sojabohne*). Cultivated in its native Japan and now also throughout all of southern Asia, because the beans taste good and also serve for the preparation of a piquant, brown, thick, sauce, which is very popular on foods, and in India is added to almost all foods and is also imported to Europe and used to improve sauces or extracts (*Brühen*) and also as a sauce for roasts (*Braten-Sauce*)*;* however the Soya that is now in commerce in Europe is not made from soybeans but rather made by us from other materials, namely from molds (*Pilzen*).

Also discusses: Alfalfa (p. 382-83). Lupines (p. 410). Voandzeia (p. 411). Almonds (p. 414).

Note 2. Leunis lived 1802-1873. His portrait (an illustration) faces the title page of Vol. 1. This book was published after the author's death by A.B. Frank, lecturer in Botany at Leipzig University. Volumes 1-2, 1230 pages, have no index. Vol. 3, mostly about algae, has an index. Address: PhD, late Prof. of Natural History at the Josephinium in Hildesheim [near Hannover, Germany] (weiland Professor der Naturgeschichte am Josephinum in Hildesheim).

577. Shôyu shûsetsu [Collected theories on shoyu]. 1877. Japan. [Jap]*

• ***Summary:*** Book on shoyu production showing the wide variation in formulas used. For a translation of several parts, see Fruin 1983 (p. 26-27).

578. *Boston Daily Globe.* 1878. Japanese ways: An entertaining lecture at Horticultural Hall, yesterday, before the Free Religion Association, by Professor E.S. Morse. Feb. 15. p. 5.

• ***Summary:*** Prof. Morse, gave "in an off-hand way his impressions of that country, with whose ways he seems to have fallen in love." "There are many beautiful fish caught on the coasts; and the Professor said that they were excellent eaten raw, and advised his hearers to try some raw fish, sliced, with soy sauce, and see if they did not like it. 'The Japanese use neither butter, milk, bread, nor cheese.'"

"Kindness to animals is a great characteristic; no bird is ever shot at, no animal ever beaten, and on all the highways you will find stones, erected centuries ago, directing men to water their horses here."

579. Ahlburg, H.; Matsubara, Shinnosuke. 1878. Kôji no setsu [Theory of koji]. *Tokyo Iji Shinshi* (*Tokyo Medical Journal*) 24:12-16. March 10. [Jap]

• ***Summary:*** According to Nakazawa (1950, and to the SoyaScan database), this is the earliest publication seen on koji. Note that although the document is in Japanese, a European is listed as the first author. Actually, Ahlburg, a German, was a co-experimenter but not an author. The original scientific name of the koji mold dates from this document. Romanized terms (all uppercased) appearing in the article are: Mycoderma vini, Mycoderma ceriviae [Cerevisiae?], Bacterium aceti, Mucor, Euntium, Eurotium, E. Oryzae Ahlbg.

Murakami (1971) says of this article: "Ahlburg, in 1876, isolated for the first time a yellow-white mold from koji for *Saké* making." It as originally named *Eurotium oryzae* Ahlburg although it was renamed *Aspergillus oryzae* (Ahlburg) Cohn by Cohn in 1884.

580. *Mittheilungen der Deutschen Gesellschaft fuer Natur- und Voelkerkunde Ostasiens* (*Yokohama*). 1878. Sitzung in Tenkoin, Yedo, am 22ten Juli 1878 [Meeting in Tenkoin, Tokyo, on 22 July 1878]. 2(16):271. July. [Ger]

• ***Summary:*** "Concerning Dr. Langgaard's communication on tofu, Mr. Kempermann remarks that in his opinion tofu is mainly a food of the wealthy; for the poor seem to place great significance on sugars [carbohydrates], and in times of great shortages of rice, sugar consumption will be considerable.

"Dr. Langgaard remarks that shoyu plays a very insignificant role as a source of nutrients. Shoyu contains a great deal of salt and serves mainly as a seasoning. It is important to mention, concerning shoyu, that, especially when it is used in fresh condition, at one and the same meal,

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only small quantities can be enjoyed.

"After this, Mr. Netto pointed out that tofu consumption depends on the price of fish. In Kosaka* the poorest people eat tofu when they must forego the enjoyment of fish."

* Note: The meaning of the term "Kosaka" is unclear. The only known place by that name is a relatively unknown small town in Akita prefecture, in northeastern Japan. Address: Japan.

581. *Tokyo Iji Shinshi* (*Tokyo Medical Journal*). 1878. Miso, tôfu, yuba shikensetsu [On the nutritional value of miso, tofu, yuba]. No 25. p. 3-7. July. [Jap]*

582. Wein, Ernst. 1878. Ueber den Anbau der rauhhaarigen Sojabohne in Bayern. I. Ernteresultate der auf der Versuchstation angestellten Culturversuche [On the cultivation of the hairy soja bean in Bavaria. I. Harvest results from culture trials in agricultural experiment stations]. *Zeitschrift des Landwirthschaftlichen Vereins in Bayern* 68:469-74. Dec. [Ger]

• ***Summary:*** Professor Haberlandt, who died earlier this year in Vienna, had successes with acclimatization trials using the hairy/hirsute soybean in the various crownlands of the Austrian-Hungarian monarchy. These became the stimulus for the cultural trials with this plant conducted by Prof. Dr. J. Lehmann in all the administrative districts of the Kingdom of Bavaria. Some 69 farmers took part in these trials and most of them reported their results.

Here the writer would like to report the results of the cultural trials conducted at the experiment station. Most of the seeds for these trials came from the Austrian trials, but a small portion were original seeds from Japan. Planting took place on April 30, with 10 seeds planted 3 cm deep per square meter. These were transplanted into 21 square meters of humus-rich soil in the garden. Two varieties of seeds were planted, one light-yellow (white) and one brown. These were of various sizes, so each variety was divided into small and large seeds. On parcel I were planted 720 small yellow (white) seeds weighing 94.7 gm. On parcel II were planted 560 large yellow seeds weighing 93 gm. On parcel III were planted 420 small brown seeds weighing 47.9 gm. On parcel IV were planted 412 large brown seeds weighing 75.5 gm. On parcel V were planted 500 yellow original seeds weighing 69.2 gm. The plants broke ground (emerged) on May 6. Flowering on the first 4 parcels lasted from July 24 to Aug. 4, which the 5th parcel first bloomed in October. The plants developed slowly at first due to the cold, moist weather, but later they developed and grew well.

The average temperature from May 1 to Oct. 1 was 16ºC. The plants showed early on that they had been planted too densely. Results of the harvest are given for each parcel. For example: Parcel I. Small yellow variety. Date of harvest: Oct. 17. Number of plants harvested: 629 (629 seeds weighed 82.7 gm). Number of seeds harvested: 23,498. Average number of seeds per plant: 37. Weight of the seeds: 2,758 gm. Weight of the pods: 1,212 gm. Weight of the straw 9,142 gm. Total weight harvested: 13,112 gm. One thousand seeds weighed 117 gm.

A table (p. 473) shows the main figures for parcels I-IV. Parcel IV gave the best results, yielding 49,429 seeds which weighed 6,846 gm, etc.

Note: In 1878 the Kingdom of Bavaria was ruled by Ludwig II (lived 1845-1886; reigned 1864-1886), who built the beautiful fairy-tale castle Neuschwanstein, was close friends with Richard Wagner, and was declared mad and deposed in 1886. Address: Dr., Central Agricultural Experiment Station, Bavaria, Germany.

583. Ahlburg, H. 1878. Das Koji und die Hefe [Koji and the yeasts: About Eurotium oryzae]. *Mittheilungen der Deutschen Gesellschaft fuer Natur- und Voelkerkunde Ostasiens* (*Yokohama*) 2(16):252-55. In: Korschelt 1878. Ueber sake... [2 ref. Ger]

• ***Summary:*** Contents: Observed facts. Discussion of the genera *Mucor, Aspergillus* (*flavus*), *Botrytis, Eurotium* (*Oryzae*), *Monilia flava.* Address: Japan.

584. Commission Imperiale à l'Exposition Universelle de Paris, 1878. 1878. Le Japon à l'Exposition Universelle de 1878 [Japan at the Universal Exposition of 1878]. Paris: Publiè sous la Direction de la Commission Impériale de Japon. 2 volumes in one. 26 cm. Preface by M. Matsugata. Facsimile edition (preservation photocopy) reprinted in 1998 by BookLab, Inc. [Fre]

• ***Summary:*** Part I (159 p.) is about the geography and history of Japan. Part II (192 p.) is about art, education and teaching, industry, production, agriculture, and horticulture in Japan. The Preface is by M. Matsugata, Head of the Imperial Department of Agriculture and President of the Japanese Commission to the Universal Exposition of 1878.

In Part II, the section on "Fermented beverages–Condiments" contains a long section on "Shoyu" (p. 124-25). It gives a brief description and discusses the ingredients (equal parts dehulled wheat, soybeans, and salt; the best salt comes from Ako in the province of Harima), purifying the salt by dissolving then heating it in water, and stirring the mash (2 or 3 times a day from June to September), aging for 15, 20, or sometimes 30 months to obtain shoyu. The mash in then pressed in cotton sacks, and the resulting liquid is boiled, cooled, allowed to settle, then stored in small wooden tubs. The residue from the first pressing can be used to make a second-grade shoyu, which can be mixed in varying proportions into different grades of shoyu.

Note 1. This is the earliest French-language document seen (April 2012) that uses the term *shoyu* to refer to soy sauce.

In the section on "Agriculture," the subsection on "Cereal grains" (p. 133) discusses both soybeans and azuki

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beans (*Phaseolus radiatus*). "The soybean (*Le Mame*) or *Soja Hispida* is comprised of several varieties: The green soybean (*l'Awo mame*), the white soybean (*le Shiro mame*), the black soybean (*le Kuro-mame*), the yellow soybean (*le Ki mame*), *Konrinza mame, Ichia mame,* and the saddled soybean (*Kurakake mame*). Some of these different varieties are early maturing and some are late.

The soybean finds numerous uses, for it can be eaten cooked, ground into flour [kinako / roasted soy flour], or used for the manufacture of shoyu, miso, or tofu. The bean, its seed coat, pod, leaves, and stem serve as feed for horses. Lately it has been used on a trial basis to feed sheep, and the results proved that it was the best feed that one could give to them.

Tofu is made with two kinds of boiled soybeans: White and yellow. After being pressed and hardened, it will last for a long time. Yuba is a somewhat similar product, made with the same ingredients. Note 2. This is the earliest French-language document seen (March 2004) that contains the word *Tofu.*

The black soybean speckled with white (*Gan Kui mame* [*Gankui*]) is one of the best varieties to eat.

The azuki (*L'Azuki ou Phaseolus radiatus*) includes the early and late types, and comes in several varieties such as the *Hine no Azuki,* the Dainagon Azuki (*le Dai Nagon Azuki*), the White Azuki (*Shiro Azuki*), etc. Sweet azuki bean paste (*L'An*), is widely used in confectionery, is made by mixing the Azuki and sugar. One cake made from it is called *Yokan.* Azuki flour (*farine de l'Azuki*) is used to remove greasy stains from fabric / cloth. The *Yaye Nari,* a green bean (*haricot*), is used in the same ways as the azuki bean (p. 135). Note 3. This is the earliest French-language document seen (Jan. 2005) that uses the word "Azuki."

Also discusses: Sea vegetables (many individual types with both Japanese and scientific names, p. 127-29). Kudzu (*Pueraria thumbergiana* [sic, thunbergiana], starch from the roots and fodder from the leaves, p. 139; fibers used to make cloth, p. 153). Hemp seeds (p. 139). Sesame seeds and sesame oil (*Goma,* p. 145). Peanuts and peanut oil (*Tojin mame,* p. 145). Hemp as a fiber plant (p. 151). Address: Paris, France.

585. Geerts, A.J.C. 1878. Les produits de la nature japonaise et chinoise:... partie inorganique et minéralogique [The natural resources of Japan and China: Inorganic and mineralogic part]. Yokohama, Japan: C. Lévy, imprimateur-Éditeur. xi + 294 p. See p. 150-51. [1 ref. Fre]
• ***Summary:*** This book intends to be a modern-day *Bencao Gangmu* (in Japanese *Honso Komoku*)–a famous Chinese text. Pages 150-51 discuss *nigari* (*yen-tan-sui, shiwo-no-nigari*). It is widely used in China for the manufacture of tofu (*fromage végétal, to-fu*), by precipitating the legumine or leguminous casein (*légumine ou caseine légumineuse*).

Note 1. This is the earliest French-language document seen (April 2013) that uses the term *fromage végétal* to refer to tofu.

Note 2. Geerts' initials stand for Antonius Johannes Cornelius. He lived 1843-1883.

586. Haberlandt, Friedrich. 1878. Die Sojabohne: Ergebnisse der Studien und Versuche ueber die Anbauwuerdigkeit dieser neu einzufuehrenden Culturpflanze [The soybean: Results of studies and trials on the potential for growing this newly introduced crop plant]. Vienna, Austria-Hungary: Carl Gerold's Sohn. ii + 119 p. 28 cm. [30 ref. Ger]
• ***Summary:*** This is the first book about soybeans written in the western world. An extremely important, classic work, it discusses the introduction of soybeans to Europe, by many cooperators.

Contents: Foreword. Part 1 (p. 1-15). Introduction: The possibility of increasing the number of our cultivated plants from the legume family. Prospects opened to us by the cultivation of soybeans. Previous soybean agronomic trials in Hohenheim, Bamberg (by Dr. A. Rauch using seeds from Japan supplied by Siebold), Hainsberg-Deuben in Saxony (*Sachsen*) (by Carl Berndt, a velvet manufacturer), and Coswig bei Messen (in 1872) in Germany. Acclimatization of the soybean in France. Sporadic, heretofore unnoticed occurrences of soybeans in South Tirol (also spelled Tyrol), Istria (or Istrian Peninsula; now in Slovenia), Dalmatia [now mostly in Croatia; see Note below], and Italy. The collection of soybeans, obtained at the Vienna World Exposition (*Wiener Weltausstellung*) of 1873 from China, Japan, Mongolia, Transcaucasia, and Tunis [North Africa], and their use in wider agronomic trials. Enumeration of authors who have cited (*anführen*) the soybean under different names and planned for its dissemination. Characteristics of the soybean plant. Description of the seeds and their anatomical structure. Their high nutritional value in comparison with ordinary legumes. Their use in Japan, according to Kaempfer. Obtaining oil and cake from the soybean.

Part 2. Agronomic trials in the years 1875 and 1876 (p. 16-35; see Document part for details). Source of the supply of the various soybean varieties used in the original trials. Trials at the Royal College of Agriculture (*Hochschule für Bodencultur*) in Vienna in 1875. Results from 1876 from Hungarian Altenburg and Gross-Becskerek in Hungary, in St. Peter bei Graz in Steiermark [Styria], in Napagedl in Mähren [Moravia; in the Czech Republic as of Jan. 1993], in Sichrow, Swijan, Darenic, Tetschen-Liebwerd in Böhmen [Bohemia], in Bukowina [Bukovina or Bucovina, a former Austrian crownland, as of 1994 divided among the Ukraine and Romania], in Proskau [now Proszkow in today's Poland] in Preussisch-Schlesien [Prussian Silesia], and in the experimental garden at the Royal School of Agriculture. Comparison of the resulting seeds with the original seeds. Chemical analysis of the seeds and straw. Evidence of the "heat units" (Wärmesummen; "warm temperature

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summation" or "warm sum," similar to U.S. maturity groups) which the soybean was able to use for their development in Vienna, St. Peter, Tetschen-Liebwerd, and Proskau.

Part 3. Agronomic trials in the year 1877 (p. 36-86). Results of the soybean agronomic trials in Austria-Hungary, Germany, etc. in 1877. Extracts from 14 reports of various trial locations in lower Austria, and 11 trial locations in Mähren [Moravia]. Extracts from 19 reports from Bohemia, 10 from Austrian Silesia (Oesterr.-Schlesien), Galizien [Galicia; a former Austrian crownland; after World War II the western half was made part of Poland and the eastern half was made part of the Ukranian S.S.R. in the Soviet Union], Bukowina, and Russian-Poland, 6 reports from upper Austria, Salzburg, and Tirol, 11 reports from Steiermark, Krain [Carniola; now mostly in Slovenia], and Kärnthen [Kaernten or Carinthia, an Austrian crownland; now a state of southern Austria, bordering on Italy and Yugoslavia], 12 from Istria, Dalmatia, and the Grafschaft [county and earldom] of Görz, 40 from Hungary and Croatia [formerly part of Yugoslavia], 23 from Germany, 1 from Switzerland, and 1 from Holland.

Part 4 (p. 87-113). Comparison of the value of the three different colors of soybeans (yellow, reddish-brown, and black) used in the trials. Time of planting. Ability of hydrated seeds to withstand freezing. Width of planting. Condition and care of the soil. Requirements for light and warmth. Need for moisture. Time that the harvests took place and general remarks on the weather in 1877. The quantity of planted and harvested soybeans in 1877 and the yields. Animals [incl. insects, especially the so-called Drahtwurm, the larva of *Agriotes segetis*] and parasites that damage soybeans. Chemical composition of the soybeans [by Dr. Mach and asst. Portele in S. Michele {South Tirol}, and by Caplan in Vienna]. Feeding trials with the straw and preparation of the seeds as a food for humans. Retrospective and conclusion.

Note 1. Austria-Hungary is a former "dual monarchy" in central Europe formed in 1867. It included what is now Austria and Hungary, Bohemia, Moravia, Bukovina, Transylvania [now in northwestern and central Romania], Carniola, Kustenland, Dalmatia, Croatia, Fiume [later named Rijeka in Croatia], and Galicia. After the treaty of Berlin in 1878, it administered the Turkish provinces of Bosnia and Herzegovina, which it annexed in 1908. It was a member of the triple alliance with Germany and Italy from 1882 to 1914. It collapsed as a result of defeat in World War I. In 1918 it was divided into many independent republics, including Austria, Hungary, and Czechoslovakia.

Note 2. Dalmatia, a former Austrian crownland, is a region on the Adriatic Sea, largely in today's Croatia. It extends from Zadar on the north to near the border of Montenegro, and contains a small southern portion of Bosnia and Herzegovina (Jan. 1993). It is mountainous and contains many island and good harbors.

Note 3. Carniola (German: Krain) is a region that lies in

today's Slovenia. The chief town is Ljubljana. It is bounded on the west by the Julian Alps and on the northwest by east end of the Carnic Alps. It was a duchy of Austria until 1849, then an Austrian crownland from 1849 to 1918. It was divided after World War I with 80% of the area going to Yugoslavia and 20% going to Italy. A 1947 treaty placed it entirely within Yugoslavia.

Note 4. This document contains the earliest date seen for soybeans in Hungary, or the cultivation of soybeans in Hungary (April 1876) (one of two documents). The source of these soybeans was Prof. Friedrich Haberlandt in Vienna.

Note 5. Details on parts I and IV are given in separate 1878 "Document Part" records in this database.

Note 6. This is the earliest document seen that contains the word *Wärmesummen* ("heat units").

Note 7. This book, surprisingly and unfortunately, contains no illustrations.

Note 8. A portrait of Dr. Haberlandt (oil painting) is owned by the University of Mosomagyarovar in Hungary. Soyfoods Center owns a black-and-white photo of the painting.

Note 9. The Vienna World Exposition opened on 1 May 1873 and closed on 1 November 1873. So it lasted for 6 months. Address: Hochschule fuer Bodencultur, Vienna, Austria.

587. Haberlandt, Friedrich. 1878. Erste Abtheilung [Part 1, pages 4-6 (Document part)]. In: F. Haberlandt. 1878. Die Sojabohne [The Soybean]. Vienna: Carl Gerold's Sohn. ii +

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119 p. [4 ref. Ger]

• ***Summary:*** Page 4 begins: "Even though the soybean has already found its way to Europe several times, attempts to cultivate it have failed completely because the seeds were from Japan, southern parts of China, and from India. Consequently they were late-ripening seeds. Many years ago attempts were made to grow *Soja hispida* in Hohenheim [Germany], but the plants were barely brought to a blooming state. People also had the same experience in other places. Dr. A. Rauch of Bamberg [Germany] (see *Die Fundgrube von Dr. A. Rauch. III. Jahrgang. Bamberg* 1876), on several occasions, received seeds of various soybean varieties from Japan from his long-time friend, Colonel (*Oberst*) [Philipp Franz] von Siebold, who died at an early age. But every trial by Dr. Rauch was unsuccessful. The plants came up and some even blossomed, but the blooming happened so late in the year (starting in September) that it was unthinkable that the seeds would ripen fully.

"Mr. Carl Berndt, who owned a silk factory at Hainsberg-Deuben in Saxony was also one of the first to conduct agronomic trials (*Anbauversuche*) with soybeans in Germany. He had no success. He wrote to me about it as follows: 'I had received 8 piculs of those beans [Note: a picul is a Chinese unit of weight = 133.33 pounds] (some green and some yellow), which I obtained through an official order of Governor (*des Minister-Präsidenten*) Dr. Weinlich of Shanghai via our local consul. I sent samples of those all over with the request that the recipient inform me of the results of his agronomic trials. Unfortunately I have waited in vain and I assume that the outcome was as unfavorable as it had been in my case and in my neighborhood. Although some gardeners and I managed to raise a few plants and harvest a few seeds, they rotted after being replanted and therefore could not germinate.'

"One type of soybean that requires warmer weather must have been the one which was introduced to France by M. de Montigny from China. In France it is called oil pea (*pois oléagineux*) and is cultivated at several locations in the districts of Ariège and Haut-Garonne. It is said to have the capacity for rapid growth and resistance to drought*. (Footnote: *Gustav Heuzé: "Les plantes alimentaires." Paris, p. 382, vol. 2).

"During the last German-French war [Franco-Prussian War, 1870-72, France lost], Otto Wehrman, captain in the artillery, found one of those acclimated soybeans in the botanical garden of Montigny near Metz. He liked the plant and took four or five seeds back home. On his estate in Coswig near Meissen he conducted an agronomic trial in 1872 and harvested 80-100 seeds in the fall. He wrote me that in the year 1873 he did the planting sooner, around mid-April, and obtained a fairly decent harvest. In the year 1874 he discontinued the cultivation because he had no use for the harvested beans. Meanwhile, his neighbors became interested in the soybean, so he decided to start growing the plant again in 1875. He harvested 3 liters of seed, which he replanted in April 1876. As a result of the long drought that year, the plants became stunted and the majority of pods had not yet full ripened when early frosts set in and destroyed the crop completely. The quantity of seeds harvested was smaller than that sowed. Its quality was far worse, which caused Wehrman to give up further trials with this variety of soybean.

"Even though the soybean has already spread here and there in the south of Austria, it still hasn't become known in broader circles. Thus, last summer, Dr. E. Mach, director of the agricultural academy (*Lehranstalt*) in South Tyrol [Tirol], sent me a sample of a plant which was supposed to be already long known in that area, and it was none other than a soybean plant. In that area it is called 'coffee bean' (*Kaffeebohne*) and its seeds are used for the preparation a coffee substitute (*Kaffesurrogat*). Likewise, Mr. Josef Kristan, teacher in a primary school in the Istrian Peninsula (*Capodistria in Istrien*), reported to me that he had discovered that the soybean could already be found in Istria and its seeds are used as a coffee substitute. A friend of his assured him that there wasn't any difference between these and real coffee. He also received several seeds from Albona [named Labin as of 1988; a commune in western Croatia, on the Istrian Peninsula, 21 miles northeast of Pula], where people grow it from time to time in their gardens without knowing its value. Acquaintances of his stated as well that they had seen the same plant in Dalmatia and in southern Italy. All of the above information only came to my attention after I had been conducting soybean agronomic trials for two years. I had been in correspondence with the authorities mentioned above in order to send them small samples so that agronomic trials could be continued at other locations as well.

"The soybeans which I had used in my first tests in 1875 had been acquired at the Vienna World Exposition in 1873, and were in part from Japan and China, and in part from Mongolia, Transcaucasia, and Tunis [p. 6; later renamed Tunisia]. There were, in total, no less than 20 varieties (*Sorten*) as follows (table): Five yellow-seeded, three black-seeded, three green-seeded, and two brownish-red-seeded varieties from China. One yellow-seeded and three black-seeded varieties from Japan. One black-seeded variety from Trans-Caucasia. And one green-seeded variety from Tunis.

"During the first year of trial (1875) it had already become apparent that among those were several types that could be recommend for further agronomic trials because they ripened early. Among these were yellow-seeded varieties from both Mongolia and China, and a reddish-brown variety from China. One black variety each from China, Japan, and Transcaucasia ripened poorly. The remaining varieties either didn't bloom at all or only started to bloom in the late fall. Still others developed only a small number of unripe or poorly ripened pods with stunted grains

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that couldn't germinate."

Note: This is the earliest document seen (Aug. 2009) concerning soybeans in Tunis (Tunisia). This document contains the earliest date seen for soybeans in Tunisia (1873). The source of these soybeans in unknown. Address: Hochschule fuer Bodencultur, Vienna, Austria.

588. Haberlandt, Friedrich. 1878. Erste Abtheilung [Part 1, pages 6-7 (Document part)]. In: F. Haberlandt. 1878. Die Sojabohne [The Soybean]. Vienna: Carl Gerold's Sohn. ii + 119 p. [4 ref. Ger]

• ***Summary:*** "Different authors have given the soybean many different names. It gets its most extensive and earliest recognition in the famous work of Kaempfer, *Amoenitatum exoticarum politico-physico-medicarum,* which comprises 5 volumes and was published in 1712 in Lemgo [Germany, in today's North Rhine-Westphalia]. The work includes a detailed description of Kaempfer's travels in Persia and Central Asia. He calls the soybean by that vernacular name "Daidzu" or "Mame," a name still common today in Japan, which means legumes, so called because of its superiority. He describes it as an upright type of bean with pods that resemble those of the lupine and a white seed like larger peas: 'Four feet long but more luxuriant or lush (*üppiger*) than *Phaseolus,* it winds straight up with its many-branched, unevenly round and rough stem. The leaves look like those of the green bean except that the underside is more bristly. The small flowers, somewhat gathered on short stems, bloom in August. They are bluish-white, small, and similar to the lentil, with a straight flag and barely spread wings (*mit gerader Fahne and kaum ausgebreiteten Fluegeln*). The stems that bear the abundant pods are long and bristly, similar to the pods of the lupine. They contain 2 or sometimes 3 seeds and resemble in shape, size, and taste the garden pea. But they are somewhat compressed with a protruding hilum (*Nabel*).

Linné [Linnaeus] chose for this legume the name *Glycine Soja.* In his *Icones plantarum rariorum,* N.J. Jaquin [Jacquin] gives its name as *Dolichos Soja* and gives an illustration, which however is inferior to the one by Kaempfer. Dr. Ph. von Siebold and Dr. J. Zuccarini cite it in their *Florae Japonicae familiae naturalis* (vol. 4, part 2, 1846) as *Glycine Soja.* Other than that, it can be found as *Soja japonica, Savi.* and *Soja hispida, Mönch.*

"De Candolle, in his *Prodromus syst. nat.,* notes that the soybean is distributed across Japan, South India (*Süden Indiens*) [sic, East Indies, *India orient*], and on the Moluccas. Franchet and Savatier state in their *Enumeratio plantarum in Japonia sponte crescentium,* p. 108, that it grows in the mountainous regions of Kyushu [Japan's southernmost main island], the valleys of Kawara, the Janca? mountains, near Nagasaki. Maximovicz [Maximowicz, Maksimovich] mentions in his *Primitiae florae Amurensis,* page 47, that it is cultivated along the upper Amur River, near Aicho, where it covers entire fields. Ditmar found it on 19 July 1856 in Ana [Aua] on the Ussuri River, and in Chinese gardens in bloom on 10 Aug. 1855. Roxburgh pays respect to the soybean in his *Flora indica* and mentions its occurrence in the Moluccas." Address: Hochschule fuer Bodencultur, Vienna, Austria.

589. Haberlandt, Friedrich. 1878. Erste Abtheilung [Part 1, pages 10-15 (Document part)]. In: F. Haberlandt. 1878. Die Sojabohne [The Soybean]. Vienna: Carl Gerold's Sohn. ii + 119 p. [4 ref. Ger]

• ***Summary:*** "The value of soybeans results from their high content of the most important nutrients. The first analysis that made the composition of these seeds known in Germany was carried out by [Mr.] Senff using seeds obtained directly from Japan by Mr. [Carl] Berndt. The results of this analysis* (Footnote: *See the journal *Chemischer Ackersmann* ("Chemical Farmer") 1872, p. 123) showed that 100 parts of air-dried soybeans have the following composition:" A table (p. 11) based on two samples and their average shows: Water 6.91%, protein 38.29%, oil (*Fett*) 18.71%, nitrogen-free extract 26.20%, crude fiber 5.33%, and ash (minerals) 4.56%.

A second table (p. 11) which compares the nutritional composition of soybeans, common beans (*Fisole*), peas, lentils, fava beans (*Pferdebohne = Vicia faba* = "horse beans") and yellow lupins, shows that soybeans have a much higher content of protein (38.29%, followed yellow lupins at 35.32%), oil (18.71% followed by yellow lupins at 4.97%), and ash (minerals, 4.56%, followed by yellow lupins at 3.78%).

"There are few statements in the pertinent literature concerning soybean utilization. But there is no doubt that, in their native countries, they have heretofore been used exclusively as foods. In *Synopsis der Pflanzenkunde* ("Synopsis of Experience with Plant Culture;" 1877, Hannover, Vol 2, p. 413), Dr. Johannes Leunis says that soybeans taste good and are also used to make a thick brown sauce, which is added to almost all foods in India, China, and Japan, and is also an article of commerce in Europe, used to improve sauces and gravies. However the sauce now available in Germany is said to be made of other ingredients rather than soybeans, namely mushrooms. From England, where this soy sauce is imported from India by the firm Grosse [sic, Crosse] & Blackwell in London, its use is spreading to the continent and is available in Vienna. Kaempfer, who describes the soybean plant so excellently in the classic work on his travels, also gives detailed information about its use as foods in Japan, which has since appeared in numerous other writings, such as Oken's *Allgemeine Naturgeschichte aller Stande* ("General Natural History of All Places") [1841] vol. III, part 3, page 1661."

Haberlandt then quotes in their entirety Kaempfer's descriptions of miso and soy sauce (about 200 words each).

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He also indicates a vague knowledge of tofu.

"It is reported that in China a type of food is made from the oilcakes or perhaps from soybeans directly, that superficially resembles a soft cheese or Quark (a European white unfermented cheese; *nach dem weichen Käse oder dem Quark ähnliche Speise machen*) presumably the original mush is subjected to a fermentation process and then mixed with pepper and other spices. A large part of China's population is said to use this staple food."

Note 1. This is also the earliest German-language document seen (April 2013) that uses the word "Quark" in connection with tofu.

He goes on to describe the chemical composition and uses of the oil presscake in China.

Page 14: "Since the oil content (*Oelgehalt*) of the soybean is lower than that of other oilseeds, it must be assumed in advance that its application for the production of oil (*Oelgewinnung*) must be disregarded. This also became evident through a test which Mr. Carl Berndt conducted on the rest of the soybeans that hadn't been used for agronomic trials. He was kind enough to give me the following report: 'Although I should have expected that one could not determine the full quantity of oil from a relatively small quantity of seeds, I was still astonished that there was not more than 6%. The analysis had resulted in 16 to 18%, and therefore the mechanical quantity was estimated at 10-12%.

"'Actually it was quite difficult to locate an oil miller who would clean his mill sufficiently that one received pure oil. Moreover, these people didn't proceed with the interest and care that are necessary, since I found lots of oil in the presscakes, indicating that they had not been pressed sufficiently. In terms of quality, I am more satisfied than I had expected to be. I had someone prepared baked goods where oil was used in the recipe and I could not detect the slightest after-taste. As a cross-check, I had another part of the baked goods prepared with Provenzer oil, but I could not tell the difference between the two.

"'To what extent the [soybean] oil could be used for industrial [non-food] purposes, especially as a mordant (*Beize*) for the dyeing of Turkish-red, which uses very old, spent oil (that is soluble in carbonic potassium) can only be established when a sufficient quantity of oil becomes available.'"

Note 2. This is the earliest document seen (Oct. 2001) concerning special industrial uses of soybean oil as a non-drying oil, as a mordant for dyeing. Address: Hochschule fuer Bodencultur, Vienna, Austria.

590. Haberlandt, Friedrich. 1878. Zweite Abtheilung. Anbauversuche im Jahre 1875 und 1876 [Part 2: Culture trials in the years 1875 and 1876 (Document part)]. In: F. Haberlandt. 1878. Die Sojabohne [The Soybean]. Vienna: Carl Gerold's Sohn. ii + 119 p. See p. 16-35. [30 ref. Ger]
• ***Summary:*** Contents of Part II: Source of the supply of the various soybean varieties used in the original trials. Trials at the Royal College of Agriculture (*Hochschule für Bodencultur*) in Vienna in 1875. Results from 1876 from Hungarian Altenburg and Gross-Becskerek in Hungary, in St. Peter bei Graz in Steiermark [Styria], in Napagedl in Mähren [Moravia; in the Czech Republic as of Jan. 1993], in Sichrow, Swijan, and Darenic [Czechoslovakia], Tetschen-Liebwerd in Böhmen [Bohemia; in the Czech Republic as of Jan. 1993], in Bukovina [Bukowina or Bucovina, a former Austrian crownland, as of 2005 divided among the Ukraine and Romania; by Dr. Nik. Dimittrievicz], in Proskau [now Proszkow, in southwest Poland] in Preussisch-Schlesien [Prussian Silesia], and in the experimental garden at the Royal School of Agriculture. Comparison of the resulting seeds with the original seeds. Chemical analysis of the seeds and straw. Evidence of the "degree days" or "heat units" (Wärmesummen; "warm temperature summation" or "warm sum," similar to U.S. maturity groups) which the soybeans needed for their development in Vienna, St. Peter, Tetschen-Liebwerd, and Proskau.

In 1875 Prof. Haberlandt conducted the first agronomic trials with the 19 soybeans he obtained at the Vienna World Exposition (*Wiener Weltausstellung*) of 1873. On 2 May 1875 he planted three varieties of seeds at the Royal School of Agriculture in Vienna. The brownish-red variety (plot #1) from China blossomed on June 28, the light-yellow variety (plot #2) from China blossomed on July 1, and the light-yellow variety (plot #3) from Mongolia blossomed on June 29. The seeds of all three varieties ripened on Sept. 11. On plot #1 grew 27 plants, that yielded 249.2 gm of seeds (equivalent to 2,769 kg/hectare). On plot #2 grew 25 plants, that yielded 336.5 gm of seeds (equivalent to 3,739 kg/hectare). On plot #3 grew 15 plants, that yielded 196.9 gm of seeds (equivalent to 2,177 kg/hectare).

Prof. Haberlandt then sent samples of seeds to seven cooperators in central Europe, who planted and tested the seeds in the spring of 1876, with good or fairly good results in each case. These men reported the details of their agronomic trials to Haberlandt, who quoted from their reports. For details see: F. Haberlandt. 1877. "Der Anbau der rauhhaarigen Sojabohne." *Landwirthschaftlichen Versuchs-Stationen* 20:247-72.

In addition, on April 25 and May 5 Prof. Haberlandt planted 7 varieties (some original seeds, some reproductions; 4 black, 2 yellow, and 1 brownish-red [*braunrothe*]) in the experimental garden at the Royal School of Agriculture. A table (p. 26) gives his detailed results. Comparison of the resulting seeds with the original seeds showed that individual seeds in each new generation generally weighed more than those in the previous generation. Page 29 shows a chemical analysis of the seeds and straw. Haberlandt then calculated (p. 33) the "degree days" or "heat units" (*Wärmesummen;* "warm temperature summation" or "warm sum," similar to U.S. maturity groups) which his different soybean varieties

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needed for their development. For the seeds to begin to ripen they seem to need a total of 1824 to 5924 heat units (ºC), and to be ready for harvest 2230 to 3174 heat units. The minimum need at Proskau was 2246.9. The soybean can be grown as a green fodder plant at locations with less heat units. A table on p. 34 shows the mean temperature for each month, the northern latitude, and the elevation (meters above sea level) at Vienna, Graz, Tetschen-Liebwerd, and Proskau. Graz had the lowest latitude (47º4') and Tetschen-Liebwerd the highest (50º44'). Vienna and Graz had the warmest temperatures in May, June, and July. Address: Hochschule fuer Bodencultur, Vienna, Austria.

591. Haberlandt, Friedrich. 1878. Dritte Abtheilung. Anbauversuche im Jahre 1877 [Part 3: Culture trials in the year 1877. Part I (Document part)]. In: F. Haberlandt. 1878. Die Sojabohne [The Soybean]. Vienna: Carl Gerold's Sohn. ii + 119 p. See p. 36-60. [Ger]

• ***Summary:*** Contents: Excerpts from 14 reports of various trial locations in lower Austria (*Nieder-Oesterreich*), and 11 trial locations in Moravia (*Mähren*). Excerpts from 19 reports submitted from Bohemia, 10 from Austrian Silesia (*Oesterr.-Schlesien*), Galicia (*Galizien*) [a former Austrian crownland; after World War II the western half was made part of Poland and the eastern half was made part of the Ukraine], Bukowina, and Russian-Poland, 6 reports from Upper Austria, Salzburg, and Tirol [Tyrol], 11 reports from Steiermark, Krain [Carniola; now mostly in Slovenia], and Kärnthen [Kaernten or Carinthia, an Austrian crownland; now a state of southern Austria, bordering on Italy and Yugoslavia], 12 from Trieste (*Triest*) [an Austrian crownland from 1867 to 1919, when it was ceded to Italy by the Treaty of St. Germain], Istria, Dalmatia, and the Grafschaft [county and earldom] of Görz (Goerz), 40 from Hungary and Croatia [formerly part of Yugoslavia], 23 from Germany, 1 from Switzerland, and 1 from Holland.

In lower Austria soybeans were tested by: Mr. Zurakowski (Title: Administrator of a archducal farm estate, *erzh.* [*erzherzoglich*] *Gutsverwalter.* Note: The archduke was a prince of The House of Austria) in Gmünd (Gmuend), Mr. Ruzicka in Essling, Baron (*Freiherr*) von Tschudi in Jacobshof, Ferd. Ritter v. Erb in Grinzing near Vienna, Graf Christ. Kinsky in Matzen, Mr. H. Weyringer in Simmering near Vienna, Mr. Kaudelka in Therasburg, Mr. von Maygraber of k.k. Major in Altlengbach, Mr. Carl Rauch in Osterburg, Mr. Pfarrer Engelbert Richl in Münchendorf (Muenchendorf), Mr. G. Simon in Hirschstetten near Vienna, Prof. Jul. Thausing of the agricultural teaching institute in Mödling (Moedling), Dr. F. Leithner in Krems [lower Austria, on the Danube River, 38 miles west-northwest of Vienna], and Dr. Ditz (Title: Agricultural Administration of princely Liechtenstein, *fürstl. Liechtenstein'schen Oekonomieverwaltung*) in Wilfersdorf. Note: As of 1994, Wilfersdorf is in the northeast corner of Austria, about 25 miles north-northeast of Vienna and about 335 miles northeast of Liechtenstein.

Agronomic trials in Mähren [Moravia] by: J. Hoch of the Agricultural School in Gross-Meseritsch, Mr. Turecek in Mistek, Prof. Schmerz of the educational establishment in Brünn (Bruenn; Brno in the Czech Republic as of 1994), A. Tomasek in Napagedl, Mr. Vrba [Wrba] of the agricultural institute in Eubenschitz [Eibenschitz, as of 1994 in the Czech Republic], Mr. Emanuel Ritter of Prosskowetz [Proskowetz] in Kwassitz, Mr. J.B. Uhlirz director of the agricultural middle-school in Prerau, Prof. Dr. A. Zöbl (Zoebl) of the agricultural middle-school in Neutitschein, farmers of the princely Economic Administration of Liechtenstein in Eisgrub bei Lundenburg and in Rabensburg using seeds sent by Dr. Ditz, Norbert von Baratta in Budischau.

Agronomic trials in Bohemia (Böhmen) by: Mr. A. Fritsch in Stenonitz, Mr. Friedrich (Title: Agricultural administrator of a farm estate, *Gutsverwalter*) in Krizanau (45 km northwest of Brünn / Brno), the Marquis de Bellegarde in Schloss Niemes, Jos. Dolzer in Hohenfurt, Ludwig von Beer in Vojnic, Mr. Rothe (castle-gardener) in Schönpriesen (Schoenpriesen), Dr. Hanamann Director of the research station in Lobositz, Mr. Klimetschek of the princely Schwarzenberg trial-school in Zittolieb, Mr. J. Susta of the princely Schwarzenberg domain of Wittingau, Mr. Ferd. Marouschek [Marousek] in Kloster-Münchengrätz (Muenchengraetz), Mr. Pachmayer in Luzan, Dr. Nickerl of the Physiokrateum [Faculty of Natural Sciences] in Prag [Prague], Mr. M. Schlöcht (Schloecht) in Dobrai, Prof. Dr. Kulisz of the agricultural middle-school in Tetschen-Liebwerd, Prof. A. Nowoczek of the agricultural teaching institute in Kaaden, Mr. F. Honilec of the agricultural school in Klattau, Planic, and Kout, Ad. Eckert Director of the agricultural school in Chrudim, Mr. A. Svoboda [Swoboda] (Title: Owner of an estate, *Hofbesitzer*) of Schnackhof bei Zamrsk, and the princely Schwarzenberg Wirthschafts-Direction in Frauenberg.

A large table (p. 26) shows Prof. Haberlandt's results in testing 7 different types of soybeans in 1876: Yellow from Mongolia, yellow from China, brownish red (*braunrothe Sorte*) from China, black from China (2), black from Mongolia, and black from Japan.

Agronomic trials Austrian Silesia (*Oesterr.-Schlesien*), Galizien [Galicia], Bukowina [Bukovina], and Russian-Poland by: Baron von Tschudi of the Swiss Confederation in Vienna wrote of trials on his land in Schönbach (Schoenbach) in Austrian Silesia, Mr. Bischof of the Baron Brunicki Domain in Zaleszczyki in East Galicia, Mr. Seling [Seeling] Ritter von Saulenfels in Szdebnik bei Lekawice, Johann Ritter von Breuer in Suchawola, Mr. A. Praunn (a forester in Stadt Lemberg) in Zubrza bei Lemberg, Mr. S. Jakubovszki in Tarnow, Mr. Ritter von Stavinsky in Kleczy, Mr. Klemens Botkouski (Title: Owner of an aristocratic estate, *Gutsbesitzer*) in Lukaczestie (or Luka-czestie,

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Bukovina [in today's {2005} Romania, 16.5 km east of Gura Humorului]), M. C.W. Ambrosius in Radautz (Bukovina), Mr. Stanislaus von Trebicki in Kurowice bei Sterdyn (Russian Poland).

Agronomic trials in Upper Austria (*Oberösterreich*), Salzburg, and Tirol by: Baron von Thysebärt at Schloss Grünau (Gruenau) bei Ried-Mauthausen in Upper Austria, Mr. E. Klusak (castle-gardener) in St. Wolfgang bei Ischl in Upper Austria, Mr. C. Braunbart director of the agricultural school at the Ritzlhof in Upper Austria, Mr. von Kempf (k.k. Major) in Salzburg, Mr. Alfr. Erttel in Planta bei Meran in southern Tirol, Dr. Eduard Mach director of the agricultural teaching institute of San-Michele in South Tirol.

Agronomic trials in Steiermark, Krain [Carniola], and Kaernthen [Kärnten, Kaernten or Carinthia] by: Mr. Hans Graf Haller in St. Johann bei Pettau in Steiermark, Mr. J. Rothschädl (Rothschaedl) in Reitenau in Steiermark, Mr. Fr. Auchmann (a maker of champagne and coffee-substitutes) in Marburg in Steiermark, the seed cultivation station in St. Peter bei Graz (owned by Graf H. Attems), Ad. Baumgartner director of the agricultural school in Grottenhof bei Graz (he cooked the seeds for use in a salad and as a vegetable), Mr. Goethe director of the Obst- und Weinbauschle in Marburg, Burgermeister J. Fiala in Friesach in Carinthia, Mr. Cos. Schütz (Schuetz) secretary of the agricultural society in Klagenfurt, Baron von Ankershofen in Klagenfurt, Mr. J. Mach in Slateneg in Krain [Carniola], Mr. Franz Schollmayer in Laibach [as of 1994 Ljubljana, the capital of Slovenia; summary of his 1977 article].

Note: This is the earliest German-language document seen (June 2009) that mentions green vegetable soybeans, which it describes as shown above. Continued. Address: Hochschule fuer Bodencultur, Vienna, Austria.

592. Haberlandt, Friedrich. 1878. Vierte Abtheilung. 9. Chemische Zusammensetzung der Sojabohne, Fuetterungsversuche mit dem Stroh und Zubereitung der Samen als Nahrungsmittel fuer den Menschen [Part 4, Section 9. Chemical composition of the soybean, feeding trials with the straw, and preparation of the seeds as human food (Document part)]. In: F. Haberlandt. 1878. Die Sojabohne [The Soybean]. Vienna: Carl Gerold's Sohn. ii + 119 p. See p. 87-110. [4 ref. Ger]

• ***Summary:*** A table (p. 95, continued from p. 84, and reproduced in part in Piper & Morse. 1923. *The Soybean.* p. 156) shows that Haberlandt planted seeds of one variety at Vienna at intervals of one week for 11 even weeks throughout the season (from March 31 to June 9) and attempted to correlate the number of days to maturity (life periods) with the number of heat units (*Wärmesumme / Wärmesummen,* in ºC) required for three different stages of growth–germination, blossoming, and maturity. The life period ranged from 182 days for the seeds planted first to 138 days to the seeds planted next to last. The seeds planted first (March 31) required the most heat units to come to maturity (2,972ºC) whereas those planted last (June 9) required the fewest heat units (2,322).

Note 1. This is the earliest document seen (March 2003) concerning the scientific study of soybean germination, or the relationship between heat units and germination.

In 1877 several new analyses of the soybean were conducted, to add to those from past years. One was communicated by Mr. A. Tomasek in Napagedl [in Mähren / Moravia, a region in today's central Czech Republic], the other by Dr. Eduard Mach in St. Michele [South Tirol]. The first was conducted by the sugar factory chemist, Mr. Schroeder, in Napagedl (p. 103). For air-dried reddish-brown (*rothbraun*) and yellow soybeans he found the following: Protein: 36.12% / 35.87%. Nitrogen: 5.78% / 5.74%. Fat: 17.50% / 18.25%.

Dr. Mach had his analysis conducted in the agricultural education center by his assistant C. Portele. He examined 3 varieties (yellow, reddish-brown, and black) obtained from Haberlandt and grown out in San Michele, and a fourth reddish-brown variety, which is grown in southern Tirol (Tyrol) as the Coffee Bean, has been acclimatized there for a long time, and until now has remained entirely unknown and unrecognized. The composition of the four is as follows: Water: 8.1 / 9.4 / 9.9 / 10.1%. Ash: 5.4 / 5.1 / 4.8 / 5.2%. Protein: 36.8 / 31.6 / 31.2 / 38.1%. Fat: 17.6 / 17.4 / 18.1 / 17.8%. Crude fiber: 4.8 / 4.3 / 4.2 / ?%. (p. 103-04).

Also Mr. C. Caplan (p. 104), assistant at the agricultural chemistry research station in Vienna, conducted analyses of the seeds, their pods, and the leaves and stalk. His results were published in 1878 in the *Oesterreichisches landw. Wochenblatt* (No. 3, p. 26): Water: 14.0 / 14.0 / 14.0%. Protein: 32.32 / 4.64 / 6.08%. Fat: 16.76 / 1.29 / 2.03%. Nitrogen-free extract: 26.56 / 41.87 / 37.12%. Crude fiber: 5.57 / 30.45 / 22.79%. Ash: 4.76 / 7.79 / 9.31%.

It is unnecessary to emphasize the importance of the soybean as a food for man and his animals. Not only is there high nutritional value in the beans and straw, they also have a flavor such that eating them takes no special effort.

A considerable number of taste experiments have been made and it can be stated that nobody's sense of taste has revolted against food uses of soybeans.

Dr. F. Leithner complains that they are not easily cooked softly enough. 'I tasted them with oil and vinegar, sort of baked bean style, and as a soup. In oil and vinegar they seemed to have a slightly sweet aftertaste, like sweet peas. Also as soup they reminded me of regular bean soup with a slightly sweet flavor. One of my guests liked them very much.'

Mr. Alfred Erttel, captain of the royal-imperial army in Planta near Meran wrote: 'Cooking experiments were highly satisfactory; the soybean is finer and has a better flavor than regular beans.'

Director A. Baumgartner in Grotenhof had them

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prepared as a salad and as a vegetable. He found them to be very much like regular beans.

Director D.E. Mach commented about the taste experiment he conducted: 'In order to come to a valid opinion about the savoriness of the soybean and its value as a food, we tried to have them prepared in various ways. We must admit that they were very tasty cooked whole or as a puree, as well as with oil and vinegar, yes, even finer than peas or lentils. It must be mentioned however that soybeans take a long time to cook soft.'

By adding that no negative opinion about the soybean has come to my attention, I would also like to state: I believe that the seeds of the soybean by themselves are too concentrated a food and they would be best mixed with other foods, which are less concentrated and contain mostly carbohydrates. The Chinese and Japanese have instinctively been led toward that. They add their 'miso' or their soy mush to most of their other dishes in a certain ratio without eating soy by itself. Kaempfer describes a way that the Chinese and Japanese prepare miso which is very complicated; the cooking takes a lot of time and money. So it would seem simplest to use soybeans in the kitchen in a finely ground form. I had soy grits (*Sojaschrot*) of that kind added to various potato dishes, for example mashed potatoes and rice. I mixed soy grits with wheat grits, cooked with milk or water, and I had soy grits added to mashed potatoes to make a dish resembling Polenta. This might be called Sojenta. My family also experimented with adding soy meal to wheat flour to make bread, with and without the addition of milk, and in all cases we were highly pleased with the results. This opinion about the taste of soy was shared by others, who shared in the tasting (p. 107).

Note 2. At this point (p. 107-08) Haberlandt adds a lengthy footnote from his friend and colleague Professor W. Hecke who followed with great interest the progress of soy culture in Austria and who had conducted taste tests with soy grits (*Sojabohnenschrot*)**.** Hecke encouraged the use of soy with potatoes to make a nutritionally balanced, inexpensive, tasty, and easily accepted basic dish. One part of soy flour or grits (*Sojamehl oder Schrot*) and two parts fresh potatoes were cooked separately, then mixed into a fairly stiff mush / porridge. Salt and fried onions were added as seasonings. The milk and fat, ordinarily added to mashed potato dishes could be omitted. Note 3. This is the earliest German-language document seen (Nov. 2013) that mentions what is probably whole soy flour or grits, which it calls *Sojamehl* or *Sojabohnenschrot.*

Note 4. This is the earliest document seen (Nov. 2013) that describes a cereal-soy blend, or the use of soy flour to make bread.

Haberlandt then continues: If used in this way, the soybean will someday play a major role in the diets of the poor. It will be more than salt for potatoes. With its fat (*Fett,* i.e., oil) it will replace lard [Note 5. Soybean oil was later used to make lard compounds, lard substitutes, and shortening] and with its protein it will supply strength. Appropriate mixtures will be easily developed according to the other ingredients used.

As grits or fine meal (flour) it will also move into the palaces of the rich, in whose kitchens from India and China is already a common item. It will only be a question of finding suitable ways of preparing them. The flavor of half-cooked soy grits resembles that of poppy seeds or almonds, and should be suitable as an addition to the finest foods otherwise made from meals (flour).

The soybean could be of major importance in the provisioning of forts and ships and in supplies for armies. It could justly be used as a better substitute for peas in 'Pea Sausage' [*Erbstwurst,* a cooked food containing pea meal fixed with fat pork and salt.] It will compete effectively as a coffee substitute with other plant products now used for this purpose. Soy coffee is already produced in South Tirol [Austria] and Istria [now a peninsula in Croatia and Slovenia]. Mr. Franz Mark of Budapest [Hungary] pointed out the possibility of using soybeans as a chocolate substitute, for which it would undoubtedly serve better than the peanut, which, in Marseilles [port in southern France], is mixed with sugar to make an inexpensive chocolate substitute.

Note 6. This is the earliest document seen (Aug. 2002) concerning the use of soy as a meat extender (in Pea Sausage).

Note 8. This is the earliest document seen (Nov. 2012) that mentions the possibility of using soybeans as a chocolate substitute. Address: Hochschule fuer Bodencultur, Vienna, Austria.

593. Isono, Tokusaburo. 1878. [On shoyu]. Inaugural dissertation at Tokyo Imperial University, Japan. [4] + 25 p. [Eng]*

• ***Summary:*** Discusses the preparation and analysis of shoyu with a description of salt manufacture in Japan. Republished in 1879 in Tokyo by the Dept. of Science in Tokyo Imperial University (*Tokyo Daigaku*)**.** Address: Tokyo.

594. Isono, Tokusaburo. 1878. On shoyu [Its preparation and analysis, with a description of salt manufacture in Japan]. Inaugural dissertation at Tokyo Imperial University, Japan. 25 p. [Eng]*

• ***Summary:*** Page 4: "Common salt is indispensable as an article of food in Japan as well as... This nigari is used in precipitating to-fu as I stated before on page 3..." Address: Tokyo.

595. Langgaard, A. 1878. Bemerkungen ueber den Naehrwerth des Tofu nach Analysen von J. Schimoyama [Observations on the nutritional value of tofu from analyses by J. Schimoyama]. *Mittheilungen der Deutschen*

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Gesellschaft fuer Natur- und Voelkerkunde Ostasiens (*Yokohama*) 2(16):268-69. See also p. 271. [Ger]
• ***Summary:*** This article begins: "A large number of foreigners living in Japan are of the opinion that the physical condition of the Japanese people has completely deteriorated (*körperlich vollkomen heruntergekommenes ist*)**.** This opinion is heard not only from lay people but, also (quite often) from physicians, with the additional opinion that with such a nitrogen-poor [low-protein] diet as the Japanese eat, you can hardly expect anything different."

Dr. Langgaard praises tofu as a food which is enjoyed almost daily by all classes of Japanese society, even the poor. In German it is called by the suitable term "bean cheese" (*Bohnenkäse*)**.** One table (based on research by J. Schimoyama [Shimoyama]) gives the nutritional composition of tofu: Dry matter 11.79%. Water 88.21%. Fat: 26.11% of dry matter or 3.08% of fresh tofu. Protein: 69.54% of dry matter or 8.19% of fresh tofu. Salts [ash]: 4.35% of dry matter or 0.52% of fresh tofu.

Note 1. This is the 2nd earliest German-language document (April 2013) seen that uses the term *Bohnenkäse* to refer to tofu.

A second table, combining the research of Liebig with data from the previous table, compares the following foods on an equal nitrogen basis: Mother's milk, tofu, beef, wheat flour, potatoes, and rice. It shows that tofu is very rich in protein, and the lowest of all foods compared in non-nitrogenous [non-protein] substances. A third table shows that the Japanese diet based on rice and tofu is an economical way to obtain the nutrients one needs, and is comparable to the European diet of potatoes and meat. Address: M.D., Japan.

596. Wernich, Albrecht Ludwig Agathon. 1878. Geografisch-medicinische Studien nach den Erlebnissen einer Reise um die Erde [Geographical-medicinal studies based on the experiences of a trip around the world]. Berlin: Verlag von August Hirschwald. x + 423 p. See p. 85. No index. 23 cm. [3 soy ref. Ger]
• ***Summary:*** Chapter 5, titled "Japan–Food value and foods" contains a long discussion of the soybean (*Dolichos Soja*) and soyfoods (p. 84-87) including tofu (*Bohnenkäse oder Bohnengefaultes*) and shoyu (*Soja oder Schoju*)**,** with two long quotations. Soybeans are rich in protein and almost free of starch. They can be roasted to taste like nuts and used in baked goods.

Note. This is the earliest German-language document seen (April 2013) that uses the term *Bohnengefaultes* to refer to tofu.

Endnote No. 35 (p. 411) states that miso soup (*Misoschiru*) or shoyu soup (*Schio-ü-schiru*) are part of the typical Japanese breakfast. Miso is made from beans, barley, and salt; shoyu is made from beans, wheat, and salt. The soup typically contains small amounts of vegetables (such as varieties of potatoes), beans, cabbage and mushrooms, turnips or carrots, onions, etc. weighing a total of about 170 gm. The main dish at breakfast is rice (weighing about 470 gm). Also included are fish or an egg, salt-pickled vegetables, and 100 gm of tea.

Also discusses *Pueraria Thunbergiana* (kuzu, p. 87). Total references: 162. Albrecht Wernich lived 1843-1896. Address: Docent for Special Pathology and Therapy at Berlin University.

597. *Kogyo Tokei-hyo* (*Census of Manufacturers*)**.** 1878--. Serial/periodical. Tokyo: Japanese Ministry of International Trade and Industry (MITI), Research and Statistics Dept. (Tsusho Sangyo Daijin Kanbo Chôsa Tokei-bu). Annual. [Jap]
• ***Summary:*** Contains statistics concerning Japan's industries and commodities. For example, in the report for the year 1987 (published in June 1989) under miso we find "124111 Miso (Including powdered or spray-dried miso). Total production in Japan: 641,337 tonnes. Value in million yen: 138,960..." Similar figures are given for each of Japan's 47 prefectures, listed from north to south, starting with Hokkaido and ending with Okinawa. The four largest producing prefectures are Nagano 186,316 tonnes (29% of the total), Aichi 63,294 tonnes, and Shin (?) 34,282, and Aomori 32,145 tonnes.

Note: The powerful and influential publisher, MITI, is called Tsûsan-sho in Japanese. Address: Tokyo, Japan.

598. Podoba, Ivan Grigor'evich. 1879. Iz zametok po opytam kul'tury novovvodimykh v Novorossiiskom krae rastenii [Notes on experiments of newly cultivated plants in the Novorossiiskya region of southern Russia. III]. *Zemledel'cheskaya Gazeta.* No. 6. p. 82-85. Feb. 10. [Rus]
• ***Summary:*** The section on leguminous plants (*Bobovyya rasteniya*) (p. 83-85) begins with a long table which shows the following for 22 plants that Podoba tested: Collection No., Name of plant, weight planted, weight harvested, net weight, important notes. The plants included two lentils, two flax varieties, two horse beans (*Pferde-Bohne, Vicia Faba,* one each from Scotland and Algeria), various lupins and *Lathyrus* species, and Japanese peas (*Japanische Erbse* [possibly soybeans]).

At the end of this table is a section titled *Soja hispida* (*soya;* the soybean) which states: "From the family Papilionaceae, with little flowers. In the spring of 1877, along with 25 seeds of *Lallemantia Iberica,* I received 50 seeds of *Soja* from Professor Haberlandt of Vienna. Concerning the productivity of this plant, it is possible to draw the clear conclusion that 45 seeds yielded 20 ounces (40 *lot;* 1 lot = ½ ounce). The second year's harvest was also wonderful, however due to rabbits, which ravaged the planted area, I was able to obtain only two pounds of seeds. The yield of pods per plant stalk (up to 2 feet in height)

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of this Chinese plant surpasses the yield of all our other leguminous plants. The seeds [of soya] resemble those of small haricot beans and according to foreign chemical analyses, soybean seeds contain 34-35% crude protein (peas have 23%) and 18.2 to 18.4% fat (peas have 1.8%). Thus, according to the composition data, soya is a more nutritious [and better for feeding] than peas (see No. 6 of *Zemledel'cheskaya Gazeta,* 1877).

"I am cultivating two varieties of soybeans: No. 151. With yellow seeds–more productive and ripens at the end of July. 152. With dark-red seeds–ripens later and not as fruitful."

In the previous section B, titled "Oil-bearing and other industrial plants," is a numbered list of seeds, which the author received from various places. The scientific name (in Roman letters), source, and (usually) a description of the cultivation and harvest is given. The plants include: 121. Linseed. 122. *Lallemantia Iberica.* "In the spring of 1877, at my request, Prof. Haberlandt sent me 25 seeds, of which I planted 22." 123. Sesame (*Sesam orientalis*), sent by a Russian consulate in Persia. 124. *Madia sativa.* 126. Opium poppy (*Papaver somniferum*).

Under 122. *Lallemantia Iberica* the author notes: Due to the absence of this plant from both commercial seed catalogs and reports of cultural trials, it is assumed that it was first cultivated in Europe. In 1873, Haberlandt introduced several varieties of seeds from Persia to the Vienna World Exposition for acclimatization. In the spring of 1877, at my request, Haberlandt sent me 25 seeds, of which I planted 22. After two harvests, I have 22 pounds of the plant–not including the amount I gave away.

Note 1. This is a continuation of an article in issues No. 2 and No. 4 (p. 57) of this periodical.

Note 2. This is the earliest Russian-language document seen (March 2003) concerning the soybean, and the earliest document seen (March 2003) concerning the soybean by I.G. Podoba.

Note 3. Novorossiisk / Novorossiysk is a seaport city in western Krasnodar Kray, in southern Russia in Europe, on the northeast shore of the Black Sea, about 65 miles west-southwest of the city of Krasnodar. Address: Tavricheskaia [Ukraine as of 2002].

599. *Wiener Landwirthschaftliche Zeitung.* 1879. Tagesneuigkeiten: Original-Sojabohne aus Japan [News of the day: The original soybean from Japan]. 28(13):152. March 30. [Ger]

600. *Brisbane Courier* (*Queensland, Australia*). 1879. Queensland trade with Japan. April 30. p. 3.
• ***Summary:*** "The following letter was addressed to Mr. Wildash previous to his departure from Japan: 'Interior Department, Tokio, Japan, January 25, 1879. Sir, I have the honor to request you to hand to the Government of Queensland two maps of Japan, also a small assortment of agricultural seeds to the National Agricultural and Industrial Association of that colony, as exchanges for those conveyed through you to the Government of Japan from Queensland. I have also great pleasure in forwarding you various samples of our national productions for the purpose of distribution in your colony, and with a view of fostering a commercial intercourse between the two countries.–I have the honor to be your obedient servant, Ito Hirobumi, Minister of the Interior Department.'

"The following is the list of agricultural seeds received from Japanese Minister of Interior, and referred to in Mr. Wildash's letter:–Barley, wheat, rye, millet (Oplysmenus frumentacus), millet (Panicum miliaceum), bean (black Soja), bean (Soja Glycine), pea (Pisum sativum), pea (white), Indian corn."

Note 1. This is the earliest document seen (March 2010) concerning soybeans (not including wild perennial relatives of the soybean) in Australia or Oceania. This document contains the earliest clear date seen (April 1879) for soybeans in Australia or Oceania.

601. *Brisbane Courier* (*Queensland, Australia*). 1879. Monday, May 19, 1879. May 19. p. 2.
• ***Summary:*** "The agricultural seeds forwarded to the National Association by the Japanese Minister of the Interior, per Mr. Wildash, are now available for distribution to farmers and others desirous of proving their characteristics and value. The seeds comprise barley, wheat, rye, maize, millet (two kinds), soja bean (two kinds), pea (two kinds), all of which have been raised in different districts of Japan. The secretary will be happy to forward small trial quantities on application."

Note: These may be the first soya beans available for cultivation in Australia. They came from Japan. They were almost certainly cultivated in mid-1879 in Queensland, but we cannot be 100% sure.

602. *Bulletin Trimestriel de la Societe des Sciences, Agriculture et Arts de la Basse-Alsace* (*Strasbourg*). 1879. M. Fuehrer lit un compte-rendu d'un mémoire qui a été publié dans la *Wiener Landwirthschafliche Zeitung* par M. le professeur Hecke sur la fève soja [Mr. L. Führer reads a report of an article on the soybean published in the *Wiener Landwirthschafliche Zeitung* by Prof. Hecke]. 13(3):355-62. Meeting of 3 Sept. 1879. M. Rod. Turckheim, residing. [1 ref. Fre]
• ***Summary:*** Gentlemen, I should inform you of the report published in the journal *Wiener Landwirthschafliche Zeitung* by Prof. Hecke on the agronomic trials done in Austria, Bavaria, and Silesia of the bean, introduced following the Universal Exposition of Vienna and known to former botanists by the name Dolichos bean of Japan (*Dolic du Japon*) [the soybean]. The beans of this plant are used in

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Japan to make a type of sauce that is served as a condiment called *Soja.* The plant was first placed in the botanical system in the genus Dolichos, from which it takes its name, and which is found in Theophrastus, from a variety of beans having very elongated pods. This genus, differing from true beans (*haricots*) only because their carina (*carène*) is not twisted in a spiral, contains 60 species, all exotic, including *Dolichos lablab,* the famous Egyptian lentil for which the patriarch Esau had to give up his right of primogeniture [to his younger brother Jacob]. Our plant had taken the name of *Dolichos soya* within the genus, and later, the genus Dolichos having acquired too many species, it served as a model for a particular genus known as *Soja hispida* [the soybean]. Note 1. In botany, the word "carina" refers to the two conjoined lower petals of a bean, pea, or other legume flower that enclose the stamen and style. It is derived from the Latin word *carina,* meaning the hull or keel of a boat.

Soy sauce (*la sauce du soja*) was well known in Europe; it was even stylish (*à la mode*) at the turn of the century [ca. 1800] in London and Paris, but no one there had the plant. It was only after the Universal Exposition of Vienna where Dolichos beans of all [sic, several] countries figured, that the attention of some farmers and notably that of Professor Haberlandt had been called to these beans. Some agronomic trials were done; it was soon recognized that the species or varieties coming from Japan and north China were those that could adapt themselves most easily to the climate of central Europe, and the yellow variety was recognized as being preferable to any other.

Let us also recall that at last April's meeting, our colleague Mr. Wagner made a rather large distribution of seeds coming from his own crop. It will be then possible to obtain exact information on the merit of the new legume.

The journal *Isis,* which also contains an article on soy (*soja*), publishes a table comparing the composition of different edible beans. It compares the water, albumin, non-protein extracted material, and ash content of the soybean, haricot bean, pea, lentil, broad bean / faba bean (*fève*), and lupine.

It is certain that a great number of plants have been extolled for agriculture and we should have expected marvelous results. Yet very few justified the reputation that had been made of them, and in the majority of cases the plants in use for centuries prevailed over their new competitors. But it is not less true that to agronomic trials of exotic plants we owe wine, potatoes, tobacco, and many others. These trials would merit encouragement then, even if of 50 new plants only one succeeds, and could improve our agriculture. It is for this reason that I wish to call the Society's attention to another plant which I mentioned earlier–the *Dolichos lablab* or Egyptian lentil (*le lentille d'Égypte*).

Note 2. Mr. L. Führer is a member of this Society and responsible for publishing the Bulletin and for the "Initiative / Information Commission" (*commission d'initiative*). Address: Basse-Alsace, France.

603. Warington, Robert. 1879. Agricultural chemistry in Japan. *Chemical News and Journal of Industrial Science* 40(1039):195-96. Oct. 24.

• ***Summary:*** "In the International Exhibition, now being held at Sydney [Australia], a collection of soils, manures, and agricultural products is shown by the Imperial College of Agriculture in Tokio, Japan. Accompanying the collection is a descriptive catalogue, compiled by Mr. Kinch, the Professor of Chemistry at the College, in which a short account is given of the various products exhibited, with chemical analyses of the majority of them. The catalogue contains in all about 80 analyses of Japanese products. The whole of this important work has been accomplished in the laboratory of the College, under the superintendence of Mr. Kinch, and is certainly highly creditable to the Institution."

The section titled "Soy Bean (*Glycine* [*Soja*] *hispida*)" (p. 195) mentions miso, tofu, and shoyu.

Starch and sugar: Starch is prepared in Japan from the root of a leguminous plant, *Pueraria Thunbergiana* (p. 196).

"Alcoholic liquors.–Rice-beer (*Sake*) is the most important beverage of the country. It is manufactured only during the winter months. The ferment is first prepared by spreading steamed rice mixed with wood-ashes in shallow trays, which are then seeded with the yellow spores of the fungus developed in a previous operation, and kept for some days in a warm chamber. When the fungus has developed, the mass is used to inoculate a fresh quantity of steamed rice. The mash is prepared by adding to steamed rice and water a certain proportion of the above ferment, and the whole is repeatedly agitated for two days. In this stage of the operation the starch of the rice is converted into sugar. The mash is then transferred to a large vessel, and the temperature raised to that of the human body. In this stage an active alcoholic fermentation takes place. The liquor thus formed is not, however, the final product. To it are added fresh quantities of steamed rice, water, and ferment, and after three days mashing this addition is again, and yet again repeated. When the last rice has been added the whole is allowed to ferment for thirteen days. The sake is now strained, and the residue pressed. After standing fifteen days to clear, the pure sake is heated to 120º F. to destroy any remaining yeast, and is then fit for use.

"Finished sake contains, according to six analyses given by Mr. Kinch, 11.33 to 15.0 per cent of alcohol by weight, and 2.33 to 3.05 per cent of solid matter; the total free acid, reckoned as acetic, was 0-20 to 0-27 per cent. Various sweet, imperfectly fermented, liquors are also manufactured. The solid residue left after pressing out the sake is distilled, and yields spirit of various strengths. The strongest spirit exhibited was 10.7 over Proof." Address: M.R.C.S. Eng.

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604. *Revue Horticole: Journal d'Horticulture Pratique* (*Paris*). 1879. Société Centrale d'Horticulture de France: Seance du 13 Novembre 1879 [Central Horticultural Society of France: Meeting of 13 Nov. 1879]. 51:454-55. Dec. 1. [Fre]

• ***Summary:*** The section on the soybean (p. 455) states: Mr. Duchartre reads a note on the comparative richness in nitrogen and fat contained in several species of plants considered to be the richest in these sorts of substances, such as the pea, haricot beans, broad beans, lentils and soya. The note draws the conclusion that, of all these, soya is by far the richest in these factors. Thus, while up to this time, broad beans had been regarded of having a superior output [content]: 30.80% proteins and 70% fats, soybean seeds contain 35% proteins and 73% fat. Such an output, if it is indeed justified, would explain the use that is made of soy beans as a food source and would justify the label of "Oleaginous pea" (*Pois oléagineux*) that has been given to *Soja hispida.*

After reading this note, Professor Baillon tells the audience that this plant, known since ancient times, is nothing but the *Glycine hispida,* and mentions the numerous culinary uses the Japanese have for it and the very diverse preparations and products in which they use it, most frequently adding rice to it. These pieces of information are extracted from the *Amoenitates exotice* [sic], by Kaempfer, one of the first naturalist travelers who visited Japan.

605. Bryan (C.C.). 1879. Holiday goods (Ad). *Washington Post.* Dec. 16. p. 4, col. 2.

• ***Summary:*** "Finest Dehesa raisins [from Malaga, Spain], finest Layer figs,... Catawba grapes, Malaga grapes,... Mexican beans, Japanese soy sauce, Scotch jams and marmalades."

This ad also appeared in the Dec. 18 and 25 issues of this newspaper. Address: Northwest corner 15th and I sts. northwest [Washington, DC].

606. Atkinson, R.W. 1879. The chemical industries of Japan. No. 2.–Ame. *Transactions of the Asiatic Society of Japan* 7:313-22.

• ***Summary:*** Although *amé* "is best known to foreigners in the form of a sweetmeat much esteemed by children," it is also largely used "in the manufacture of *mirin* and *shoyu.* In a viscous liquid form, sold out of jars in shops, it is called *midzu-ame,* with the best variety of the latter called *awa-ame.*

The basic starch-containing raw material is either millet (Jap. *awa*), or *mochigome* (glutinous rice), or the common kind of rice called *uruchi.* The *ame* made from rice is much sweeter than that made from millet. The late Dr. Ritter wrote in detail of ame in a paper published by the German Asiatic Society in 1874 [See: *Mittheilungen der Deutschen Gesellschaft fuer Natur- und Voelkerkunde Ostasiens* (Yokohama) 1(5):3-5. July]. A detailed description of the process for making ame is then given. Address: B.Sc., London.

607. Cook, G.H. 1879. The soja bean; a new forage plant. *Rutgers Scientific School, Annual Report* 15:54-58. [1 ref]

• ***Summary:*** "When in Munich last year, I saw the soja bean in cultivation, as a new crop, and probably a desirable addition to our forage products. It was seen in the grounds of the Bavarian Agricultural Experiment Station, and was in very vigorous growth. The gentleman in charge gave me a few seeds; and seeds of several other varieties of the same plant were procured at Vienna by my friend Mr. James Neilson. We have planted them, and gathered crops of the different kinds this year. The following is a translation of the paper sent out from the Bavarian Experiment Station to those who were growing and testing the capabilities of the plant." Note 1. See: Lehmann, Julius. 1878. *"Ueber den Anbau der rauhhaarigen Sojabohne. Zeitschrift des Landwirthschaftlichen Vereins in Bayern* 68:61-64. Feb.

"On the Cultivation of the Hairy Soja Bean."–"The exertions made in the last decade to naturalize foreign useful plants in Germany, and by their cultivation to increase the income from farm lands, have so far been without result. This has been the case with sorghum, ramie, Siberian fodder, water rice, &c., for each of which great hopes have been excited; but nothing now remains but the remembrance and the proof of the difficulties in the way of our agriculture.

"Fortunately the success of this pursuit depends less on such attempts, than on increasing the quantity of our well-known crops, by good cultivation and heavy manuring–by careful selection of seed and proper care of the plant. All farmers taking these precautions, and using discoveries in these directions, will surely gain satisfactory profits even without new plants.

"Yet the progressive farmer will be interested and make personal experiments, of these attempts at acclimating, if the plant promises to fill some want. We now seem to have such a one for our increasing cattle raising. We need a fodder for young cattle, for milk cows and for bullocks, whose seeds contain, in proper amount, albumen and fat, with a pleasant taste. In cereals and their brans, and also in leguminous seeds, we have fodder containing albumen but not fat enough. The addition of oil-cake is not entirely satisfactory, because the proportion of fat in it varies, and its cost is too great.

"Two years ago Prof. Haberlandt, of Vienna, an untiring botanical experimenter, introduced to us a plant whose pleasant-tasting seeds are rich in albumen and fat, in very digestible forms. This plant is the hairy soja bean (*Soja hispida, Mönch.*) Prof. Haberlandt found samples of the seed at the Vienna Exposition among the agricultural products of China, Japan, Mongolia, Transcaucasia and India. He says this plant has been cultivated from early ages. It grows wild

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in the Malay Archipelago, Java and the East Indies, and is cultivated extensively in China and Japan. Its seeds, boiled or roasted, have a pleasant taste, and form an almost daily part of the food in India, China and Japan. The soja is an annual leguminous plant."

"In 1876, twenty experiments were made in various parts of Bohemia, Moravia [both in the Czech Republic as of Jan. 1993], Southern Austria, Styria [a state in Austria, called Steiermark in German], Hungary, and Upper Silesia [a region mostly in southwest Poland]. From the well-ripened seeds of these crops, one hundred and thirty-five trials were made the next year under various climatic influences. Prof. Haberlandt has written us that only twelve of the experiments failed, and most of the results were unusually good.

"According to Professor Haberlandt there are several varieties of the soja, which vary much in their time of ripening. For the climate of Middle Europe the early kind is best. Sown early in May the seeds mature at the end of September or October. Its time of growth is like that of the horse bean. (This is the *Vicia faba,* the horse bean or Windsor bean of Europe, which is cultivated there for feeding domestic animals, and, like it, ripens after harvest.) It differs from this bean in its productiveness and its non-liability to harm from insects. It has harvested from thirty-three to fifty-five bushels of seed, and two and one-third tons of very nutritious straw to the acre."

"Prof. Schwackerhofer of Vienna, has analyzed the original and harvested seed [two crops], and the soja straw, with the following results." A table shows that the original seed contained 30.56% albuminoids and 15.81% fat. The first and second crops contained and average of 34.56% albuminoids and 18.32% fat–both much higher. The soja straw contained 4.43% albuminoids and 2.51% fat.

A second table (p. 58) compares the composition and comparative value per 100 pounds of 12 feed and fodder crops. Soja beans were found to contain 4.8% ash, 34.7% albuminoids (second highest value after cotton-seed cake (decorticated)), 18.3% fat (the highest), 28.3% carbohydrates, and a comparative value of 2.55 (the highest, with clover hay taken as 1.0).

"In this table the soja bean is shown to have the highest value of any of the substances named, and by mixing it with oat straw or cured corn-fodder, it will make a rich and healthful fodder for cattle, and one which can be afforded in greater quantity and at less expense than first quality timothy or clover hay. It would form, too, a proper crop to be in the rotation between corn and wheat, instead of oats or potatoes, as now practiced. It is not subject to the same difficulties in curing as our common field bean, as the beans do not easily shell out, and coarser stalks enable it to be cured [to make hay] like Indian corn. And being a sowed crop, it is cultivated with the minimum of labor."

Note 2. Prof. George Hammell Cook was instrumental in establishing the New Jersey State Board of Agriculture at Rutgers on 7 April 1872; he was appointed its first secretary. Rutgers thus become one of the early state institutions that conducted agricultural research. On 10 March 1880 the New Jersey Agricultural Experiment Station was established at Rutgers College (New Brunswick)–with state funding only (no federal aid). On 2 March 1887 the Hatch Act created state agricultural experiment stations with federal grants. This is the earliest document seen (Jan. 2005) concerning soybean research by a state research institution or agricultural experiment station.

Note 3. This is the earliest document seen (July 2011) concerning soybeans in New Jersey, or the cultivation of soybeans in New Jersey. This document contains the earliest date seen for soybeans in New Jersey, or the cultivation of soybeans in New Jersey (1879). The source of these soybeans was Bavaria, Germany, and Vienna, Austria.

Note 4. This is the earliest document seen (March 2001) describing cultivation of soybeans by a U.S. land grant institution.

Note 5. This is the earliest document seen (Feb. 2008) that uses the word "albumen" (or "albumens") or the word "albuminoids" (or "albuminoid") in connection with soy. The word "albumen" usually refers to the white / protein of an egg, but here it refers to protein of the soja bean "whose seeds are rich in albumen" (protein). The word "albumin" (first used in 1869) refers to any of numerous simple heat-coagulable, water-soluble proteins that occur in muscle, egg whites, milk, and other animal substances, and in many plant tissues and fluids.

Note 6. This is the earliest English-language document seen (Feb. 2011) that refers to soynuts. Discussing the soybean, it says: "Its seeds, boiled or roasted, have a pleasant taste, and form an almost daily part of the food in India, China and Japan." It is also the earliest document seen (March 2001) concerning the etymology of soynuts.

Note 7. This is the earliest document seen (April 2001) that uses the term "hairy soja bean" to refer to the soybean.

Note 8. This is the earliest English-language document seen (Oct. 2012) with the word "soja bean" (or "soja beans") in the title.

Note 9. This is the earliest English-language document seen (Jan. 2002) related to soybeans that uses the word "forage" in the title.

Note 10. This is the earliest document seen (March 1999) that mentions Mr. James Neilson who, in 1878, obtained several soybean varieties in Vienna, Austria, brought them back to the United States, and planted them at Rutgers University in New Brunswick, New Jersey, in 1879.

Note 11. This is the earliest document seen (May 2000) that uses the word "rotation" or discusses crop rotation in connection with soybeans.

Note 12. This is the earliest English-language document seen (Sept. 2001) that mentions the word "carbohydrates" in connection with soybeans.

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Note 13. This is the earliest annual report seen (Oct. 2001) that mentions soy.

Note 14. This is the earliest document seen (July 2002) that mentions feeding soybean fodder to milk cows, however none has yet been fed.

Note 15. This is the earliest document seen (Nov. 2005) that mentions cotton-seed cake (any spelling). It is also the earliest English-language document seen (Nov. 2005) that contains the term "cotton-seed cake" or "decorticated" in connection with such cake or meal.

Note 16. This is the earliest English-language document seen (Oct. 2004) that uses the word "cured" in connection with making soybean hay. Address: New Brunswick, New Jersey.

608. Kinch, Edward. 1879. Japan: A classified and descriptive catalogue of a collection of agricultural products exhibited in the Sydney international exhibition by the Imperial College of Agriculture, Tokio, Japan. Tokyo: Agricultural Bureau (Naimushô), Home Dept. 65 p. 20 cm. [Eng]

• ***Summary:*** Each item that was displayed is numbered. All chemical / nutritional analyses give percentage composition unless otherwise stated. The chapter on "Manures "begins (p. 4): "The principal manures used in this country are human excrements both solid and liquid, which are collected with the greatest care and applies to the land whilst in a more or less advanced state of decomposition. The excreta are often made into a compost with dried grass.

The section titled "vegetable manures" (p. 7-13) gives analyses of rape cake (*abura kasu*), malt dust (*ame kasu*), sesamum cake (*goma kasu*), rice beer residues (*sake kasu*), soy [sauce] residues (*shoyu kasu;* water 16.37%, ash 4.96%, organic matter 78.67%), rice cleanings (*nuka*), and barley bran (*fusuma*).

Note 1. This is the earliest English-language document seen (May 2012) that contains the term *shoyu kasu* (in italics, without diacritics) which it defines as "Soy residues," and the earliest that gives its composition.

The chapter on "Foods" begins (p. 16): "By far the most important national food is rice, *Kome;* more than one half of the cultivated land of the Empire is devoted to paddy fields, *Ta,* and besides the rice grown on this irrigated land a considerable quantity is grown on the dry fields, *Katake."* *Mochi-gome* or glutinous rice, is specially used for making the new years' cakes, *Mochi.*

The many kinds of leguminous plants include: Peas, field and haricot beans, vetches, lupins; soy beans *Glycine* (*soja*) *hispida, O-mame or Daidzu;* fol. lanceolata (*Midzu-kugiri*)*; Phaseolus radiatus, Adzuki* or *Shodzu; P. radiatus v. pendula, Tsura-adzuki; P. radiatus subtriloba, Bundo;* Horse gram, *Dolichos uniflorus, Sasagi;* Gram, *Dolichos umbellatus, Hata-sasagi;* Overlook pea, *Canavalia incurva, Nata-mame;* Ground nut, *Arachis hypogæa, Rakkasho* or *Tojin-mame.*

"Also should be mentioned the sesamum, *Goma,* the oil of which is extensively used in cooking; *Perilla ocymoides, Ye-goma;* and rape, *Brassica sinensis, Abura-na,* which is cultivated for its seed, the oil being used for burning." Also list (with scientific and Japanese names, p. 17-18) the principal root crops, fruits, sea weed and lichens, fungi, and starch.

Next: Chemical analyses of rice, wheat, rye, "red bean–*Adzuki–Phaseolus radiatus* (large variety and small variety)."

Note 2. This is the earliest English-language document seen (March 2006) that uses the word *Shodzu* (or *shôdzu* or *shôzu* or *shodzu* or *shozu*) or the word "red" or the term "red bean" to refer to the azuki bean, or that gives its scientific name as *Phaseolus radiatus,* or that reports the existence of large and small varieties, or that uses the word *Bundo* to refer to a variety of azuki bean.

Then (p. 22-26): "44. Beans. *O-mame, Daidzu. Glycine* (*soja*) *hispida.* White round soy bean. Miso mame. Percentage composition (table): Water 11.32, albuminoids 37.75, fat 20.89, fibre 1.50, ash 3.86, starch and soluble cellulose 24.58. Total 100.00.

"This bean is met with in several varieties of different colour and size, but they differ little in composition. It is vegetable which approaches nearest in chemical composition to animal food (meat), containing as it does one fifth of its weight of fat and often two-fifths of nitrogenous matter. It is an extremely valuable adjunct to the food of a people who subsist so largely on a purely vegetable diet, of which the bulk is rice so rich in heat producers–starch, and poor in flesh formers–albuminoids.

"Shoyu, Miso, and *Tofu,* are made from these beans, and enter largely into the food of the nation.

"45. Miso. *Shiro-miso* or white miso. From Osaka. Percentage composition: Water 50.73, fibre 12.93, ash 6.58 (containing 5.4 per cent of common salt), sugar 17.54, albuminoids 5.64, soluble carbohydrates 6.58. Total 100.00. Soluble in water 35.88 per cent.

"46. Miso. *Aka-miso* or red miso. From Osaka. Percentage composition: Water 50.40, fibre 8.25, ash 12.50 (containing 12 per cent of common salt), sugar 0.61, albuminoids 10.08, soluble carbohydrates 18.16. Total 100.00. Soluble in water 34.71 per cent."

Note 3. This is the earliest English-language document seen (March 2009) that uses the term "Shiro-miso" refer to white miso (and vice versa) or "aka-miso" to refer to red miso (and vice versa).

"In the preparation of *Miso* the beans are boiled, pounded in a mortar into a paste and mixed with fermenting rice, *Koji* (see *sake*) in various proportions, and with more or less salt, and the mixture is placed in tubs and left in a cool place for about a month. It will be seen that one variety, white miso, contains much sugar, derived from the *koji,* and

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little salt; whilst the other variety contains very little sugar and much more salt.

"47. Tofu. Percentage composition: Water 89.29, ash 0.48, fibre 1.01, nitrogenous substances 4.87, non-nitrogenous substances 4.35 (containing 3.32% fat). Total 100.00.

"This food is made by boiling the white soy beans, *Shiro-mame,* in water after they have been soaked, ground and strained through a sieve. The solution is filtered through cotton cloth and the residue pressed; the liquid, containing legumin in solution, is precipitated by the addition of the brine which runs off from sea salt during its deliquescence in the air. The precipitate constitutes *Tofu."*

Note 4. This is the earliest English-language document seen (Oct. 2008) that uses the word "legumin" to refer to the water soluble protein in soybeans than can be precipitated by a coagulant to make tofu.

"48. Kori tofu. Percentage composition: Water 18.75, ash 1.60, nitrogenous substances 48.80, non-nitrogenous substances, chiefly fat 30.85. Total 100.00.

"Prepared from the above [tofu] by exposing it to the air during frost, until it freezes, and afterwards thawing in the sun, by which the greater quantity of the water is removed.

Note 5. This is the earliest English-language document seen (April 2013) that mentions dried frozen tofu, which it calls Kori tofu.

"49. Soy [sauce]. Shoyu. Specific gravity 1.1996. Grams per litre: Total solid residue 359.888, ash 195.168 (principally common salt), sugar 31.034, albuminoids 41.000, free acid expressed as acetic acid 6.200.

Note 6. This is the earliest document seen (Jan. 2008) that uses the term "specific gravity" in connection with soyfoods–in this case soy sauce.

"Manufacture of *Shoyu. Shoyu* is made from the soy bean, *Glycine* (*soja*) *hispida q.v.* together with wheat, salt and water. Equal parts of beans and wheat are used. A small part of the wheat is mixed with *Koji* (see *sake*) and allowed to ferment. The remainder is roasted and the beans are also roasted. The roasted beans and wheat are then mixed together with the fermenting wheat, placed in shallow wooden boxes, and kept for some days, at a fixed temperature, in a warm chamber with thick walls, until the whole mass is covered with fungus. It is very important that the temperature of this chamber should be kept at the proper point. By these processes, part of the starch of the wheat is converted into dextrin and sugar, and lactic acid and acetic acid are formed. It is then mixed with salt lye, the proportion used being about 4 *go* of salt to 12 *koku* of water to extract 1 *koku* of the fermented product. The mashings are removed to large vats and there kept for at least 20 months and generally for 3 or 5 years. The better qualities of *shoyu* are kept the longer times. It is found that the best soy is produced by mixing that kept for 5 years with that kept for 3 years. After it has been kept a sufficiently long time, it is strained through thick cotton bags and the residue pressed in the same manner as in *sake* pressing. Before filtering, honey is sometimes added in the proportion of 10 *kin* to 1 *koku* of *Moromi* or mixed soy, in order to give it a sweet taste. Occasionally a sweet sake, obtained by taking 1 *koku* of *koji* to 7 *to* of water and 1 *to* of steamed rice, mixing them together and steaming for two hours, is added instead of honey. The residue obtained on pressing *moromi* is again mixed with salt and water, in the proportion of 8 *to* of salt to 1 *koku* of water and again pressed, this yields and inferior *shoyu.* Sometimes water is added to this second residue and it is again pressed. The residue first obtained is sometimes used as food, and the last residue as manure. One *koku* of the mixture, *moromi,* produces 4 *kuwamme* of residue at the first filtration and about 3.5 *kuwamme* of residue at the second and third. The *shoyu,* after pressing, is allowed to settle for two days in large tanks, and then drawn off and again filtered. *Shoyu* is a very important condiment, it is mixed with a great many kinds of food and is produced and consumed in very large quantities.

"1000 *Go* = 100 *Sho* = 10 *To* = 1 *Koku* = 4.929 Bushels. 1 *Kin* = 1.325 lbs. 1 *Kuwamme* = 8.28 lbs.

Note 7. This description of how shoyu is made contains several major errors.

Finally, there are chapters on alcoholic liquors (with emphasis on sake or "rice beer, sometimes called rice wine"), sweet liqueurs (*mirin, homeishiu, shiro-zake*), food adjuncts (incl. salt, vinegar, spices, herbs, and perhaps shoyu), edible sea weeds (20 varieties, with both Japanese and scientific names, and an analysis of each), tea, tobacco, fodder, animal foods, dye stuffs, oils and waxes, and starch (incl. *kudzu, Pueraria thunbergiana*).

Note 8. This is the earliest document seen (July 2008) concerning soybean products (tofu, dried-frozen tofu, and shoyu) in connection with (but not yet in) Australia.

Note 9. This is the earliest document seen (July 2008) by Edward Kinch (1848-1920) that mentions soy. Kinch was born on 18 Aug. 1848 at Henley-on-Thames, Oxfordshire, England, the 3rd child of Charles Kinch and Emma Plumbe Kinch. He was baptised there on 12 Dec. 1845 in St. Mary's church. Kinch was a chemist, specializing in agricultural chemistry. In 1869 he became assistant professor at the Royal Agricultural College (RAC) in Cirencester (in southwestern England). From 1876 to 1881 he was a professor of agricultural chemistry at the Imperial College of Agriculture in Tokyo, Japan. Then from 1881 to 1915 he was professor of chemistry at the RAC in Cirencester. He married Edith Shirley Huntington in 1889 in Pembroke district, Pembroke, Wales. They had two children, William (born ca. 1886) and Dora Ann (born ca. 1893). He died on 6 Aug. 1920 in Haselmere, Surrey, England.

Note 10. This catalog was displayed at the Sydney International Exhibition, held in Australia in 1879. The Sydney International Exhibition was Australia's first

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international exhibition, a showcase of invention and industry from around the world. An imposing Garden Palace was constructed in the Botanic Gardens as a home for the exhibition. Address: F.I.C., F.C.S., &c., Prof. of Chemistry. Imperial College of Agriculture, Komaba, Tokio, Japan.

609. Pickering, Charles. 1879. Chronological history of plants: Man's record of his own existence illustrated through their names, uses, and companionship. Boston, Massachusetts: Little, Brown, and Co. 1222 p. See p. 763. [10 ref]

• ***Summary:*** In the section titled "Chronological arrangement of accompanying animals and plants," at the year 1296 A.D. we read: "*Soja hispida* of Japan. Enumerated by the Chinese official 141 as unknown in Cambodia:–'miso' beans are mentioned in 1444 in the annals of the Japanese emperors (transl. Tits. [Titsingh / Titsing] and Klaproth); were observed by Kaempfer v. 837, and Thunberg, under frequent cultivation near Nagasaki and elsewhere; are known to be made into the condiment called 'soia' (Pers.) in English *soy;* also into a white porridge [tofu] in general use among the Chinese and called by them 'teu hu' or 'tauhu' (Loureiro). Westward, S. hispida was observed by Mason in Burmah; by Roxburgh, and Graham, in the gardens of Hindustan. Transported to Europe, it is described by Jacquin rar pl. 145" [*Icones plantarum rariorum*].

Note 1. This may be the earliest document seen (May 2010) concerning soybeans in Burma (later renamed Myanmar), or the cultivation of soybeans in Burma. This document may contain the earliest date seen for soybeans in Burma, or the cultivation of soybeans in Burma (1879). The source of these soybeans is unknown. However, as of Feb. 2012 we have been unable to find verification for Pickering's statement about Mason in the writings of Francis Mason. Finding the earlier citation by Mason may allow us to push back this date.

Note 2. This is the earliest English-language document seen (April 2013) that uses the word "tauhu" to refer to Chinese-style tofu. Address: M.D., Boston, Massachusetts.

610. *New-York Tribune.* 1880. A new vegetable from China. Feb. 8. p. 4.

• ***Summary:*** From The Globe: "Some experiments carried on by two or three Austrian and German horticulturists [including Friedrich Haberlandt of Vienna] have brought into notice an almost forgotten plant which was introduced into Europe from China nearly thirty years ago, but whose existence, and whose products have been undeservedly lost sight of. This is the *Soja hispida,* a species of leguminous plant, somewhat resembling in habit and appearance the well-known pea. Unlike the latter, however, it has two distinct uses–industrial as well as alimentary. It is highly prized in China and Japan, and is said, indeed, to take its scientific title [Soja] from the Japanese name of the sauce–sooja–which is made from its seeds."

Chinese are referred to as "the Celestials."

611. G.P. 1880. I opet povoljan izvjestaj o "soji" [Once again, a favorable report on "soybeans"]. *Gospodarski List* (*Farmer's Newspaper, Zagreb, Croatia*) 28(6):46. March 20. [Cro]

• ***Summary:*** "Reading the German agricultural journals and our *Farmer's Newspaper* (*Gospodarsky List*) last year, I thought the legume soya (*soja*) would very soon take roots and start growing everywhere, thus giving humans as well as our domestic animals good food and feeds. But our *Farmer's Newspaper* published in this year's issue No. 2 that soya in our country has been alas quickly disapproved, has no future, and so future testing and dissemination should be disregarded–even though in all other Austro-Hungarian crown lands it is planted and spreading, even in German Bavaria and Saxony. Since, over the last two years, I have carefully followed articles at home and abroad about soya, and made trials myself, I should not like to miss the chance to report to you about this excellent legume.

In 1878 I got from the Agricultural Society at Zagreb 1 kg of a Japanese soybean variety, imported from Japan by Mr. Auchman. Interested growers and some advanced farmers received two-thirds of the lot, and one-third was sown from May 9 to 13 on the experimental field of the school. Although in this cold month some common beans were damaged by frost, the soybean has not been affected. Flowering started on Aug. 14, at a height of between 2 and 3 feet, and they were harvested on Oct. 31. After 10 days of drying shelled, they gave 6 kg of pure seeds. Other trials yielded less and with some growers did not ripen at all, since they were planted too late (at the end of May). These growers disapproved of soya, declaring that it was not suitable for our climate and soils. This Japanese soybean variety from Mr. Auchman is the main reason that soybeans have so quickly gotten so much disapproval from so many growers in our country. In the report of trials from Count Attems in Graz, and in the agricultural journal from Vienna, all agree that Auchman's soybean variety is too late and cannot compete with the Chinese varieties, which ripen in our country at the same time as some varieties of common beans. I was pleased to understand the problem. So last year in March, I got 500 gm each of yellow, brown, and black Chinese varieties from Count Attems in Graz to use for my own trials.

On 15 May 1879 I planted one plot with Chinese varieties, and another with the Japanese variety. The Chinese varieties started to flower on July 15, after only 2 months, but the Japanese variety didn't flower until August 15, a month later and 3 months after sowing. In the second half of September, the Chinese varieties were ready to be harvested, but the Japanese variety was still green, and on Oct. 16 it was covered with snow. About 10 days later it was harvested; after being dried for 15 days in the barn and being

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shelled, it gave only 6 kg of seeds. Only a few pods were ripe, about half of them developed soft seeds, and the rest remained green. The test weight was much lower than with the Chinese varieties, but there was no difference in the taste. According to this trial, the Japanese variety should be grown where early sowing (at the beginning of April) is possible, and where moisture and frosts in October are absent. It has a much better growth habit and dry-matter weight of the total plants than the Chinese varieties, so it could give a higher yield of fodder for our animals.

The rest of the Chinese soybean varieties were divided among 3 farmers, and half of that sample was sown in time. They did not expect such results, especially after this summer's extreme drought, which killed all common beans–but the soybean remained green and yielded well. They were surprised that some plants, damaged in one place by sheep, and in another trial by an ox, still gave some seeds. Some plants had between 180 and 200 pods containing 300 to 400 seeds.

"I harvested 10 kg of yellow, 4 kg of brownish-red, and 4 kg of black Chinese varieties with the aim of distributing all seeds among farmers, amateurs, and schools in this [Ogulin] district so as to spread this excellent legume as quickly as possible.

"Even though this newspaper has published a lot about planting the soybean, I would like to add my opinion that it should be sown more densely, about 20 cm apart, if only every third seed emerged [and survived]. It could be sown also in rows of thin corn since ripening together, and cultivation is almost the same, only soybeans should not be hilled, since many pods are very close to the soil surface and they may start spoiling due to the high moisture of the hills. And in regard to nutritional value, no other of our legumes could compete with the soybean, since as soon as one tastes the soybean he decides to plant it in his own garden. It can be consumed without any spices, and what is most important, it is easily digested, its coat being so thin that it is not a bother in the mouth, compared with the coats of our beans which remain undigested even in a stronger stomach. Soybean soup is also excellent, so it can surpass expensive fasting soup on many bourgeois tables.

"I send you this report with that wish that soya should take root in our country as soon as possible. I will try to repeat it also in the coming season and will not forget to report again after harvest about the new results. (Editor: We are looking forward to that as soon as possible).

Translated by Dr. Joze Spanring of Ljubljana, Slovenia. Address: Teacher, Ogulin, Croatia.

612. *Bulletin de la Societe d'Acclimatation.* 1880. Extraits des procés-verbaux des séances de la société. Séance générale du 16 Avril 1880 [Excerpts of verbal proceedings from meetings of the society. General meeting of 16 April 1880]. 27:185-96. April. See p. 191-92. [Fre]

• ***Summary:*** Mr. Vavin shows the assembly seeds of *Soja hispida* and indicates the remarkable size to which they expand when soaked in water. Mr. Paillieux states that the true name of this plant is *Glycine hispida.* Mr. Vavin replies that, according to Mr. Baillon, 23 varieties (*variétés*) of this plant exist in China, but only 3 of these varieties are known in Europe.

"Our colleagues then express regret that Mr. Blavet, president of the Society of Horticulture of Étampes, who has conducted agronomic trials with soya using seeds provided by the Society for Acclimatization, has not yet sent us a sample of his crop, even though he was able to give 9 liters of seed to Mr. Vilmorin."

Mr. Grisard observes that, according to the observations of Mr. Corroy, director of the botanical garden of the farm at Mares, in Cochinchine (French Indochina), the seeds of soya–at least those which are black–are generally not much relished by livestock.

Mr. Paillieux notes that the seeds of *Glycine* come in different colors–green, yellow, white, black, and red. There are also early and late varieties (*variétés*)*;* only the early varieties will bear mature seed in France. As for the number of varieties, there would seem to be more than 30 in Japan.

613. Sempolowski, A. 1880. Zur Kultur und Verwerthung der Sojabohne [On the culture and use of soybeans]. *Fuehlings Landwirtschaftliche Zeitung* 29(5):278-81. May. [Ger]

• ***Summary:*** It is well known that Prof. Dr. Fr. Haberlandt, who obtained soybeans in 1873 at the Vienna Exposition (and unfortunately died at too young an age), conducted many soybean trials in order to find varieties that yielded well in Austria and bordering countries. The best varieties proved to be the yellow-seeded ones that originated in Mongolia. Later, in other areas many more trials were conducted.

"I conducted my first trials with soybeans two years ago [i.e., in 1878] at 53-53º north latitude. The yield was satisfactory, however I had to let the harvested plants finish ripening indoors." Further trials were conducted in former years in several places in Posen [Poznan; a very old city and province in west central Poland, part of Prussia 1793-1918]. A table (p. 279) shows where soybeans were grown (at Oswiezem, Twno, Zabikowo, Prusinowo, and Zabikowo), the number of seeds planted, the dates of planting (April 24-May 15) and harvest (Oct. 4-16), the seed spacing, yield (in kilograms and number of seeds), seeds harvested per seed planted (maximum 146 to 1, minimum 22 to 1), and quality of the harvested seed. This table shows the extraordinary fruitfulness of the soybean.

"In China and Japan, soybean seeds are used as food. Almost daily they are enjoyed as vegetables, like our beans (*beinahe tagtäglich als Gemüse, gleich unseren Bohnen, genossen wird*), or they can be used to prepare various sauces, which are known as tasty and digestion-promoting

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additions to the other dishes and which have been shipped to Europe." The process for making soy sauce is described. Soybeans are used as a source of oil, especially in the provinces of Newchwang and Cheefo, where there are many oil mills. The method for pressing out the oil is still very primitive (see a report on the agricultural part of the Paris Exhibition of 1878; Berlin 1879, page 57). Soybean cake is used as fertilizer on sugar plantations. Cooked soybeans are also tasty, as in a salad with oil and vinegar, or in soup. It must be noted that it takes a long time to cook soybeans until they are soft–at least 24 to 48 hours. A table shows the nutritional composition of soybeans (9.23% water and 33.35% protein). Because the leaves and hulls are also quite nourishing, the soybean has a great future as a fodder plant. Address: Dr.

614. *Southern Farmers' Monthly* (*The*). 1880. A Chinese vegetable. 3(6):170. June.

• ***Summary:*** "Some experiments recently carried on by two or three Austrian and German horticulturists, have brought into notice an almost forgotten plant which was introduced into Europe from China, nearly thirty years ago, but whose existence and whose products have been undeservedly lost sight of. This is the *Soja hispida,* a species of luguminous [leguminous] plant, somewhat resembling in habit and appearance the well-known pea. Unlike the latter, however, it has two distinct uses–industrial as well as alimentary. It is highly prized in China and Japan, and is said, indeed, to take its scientific title from the Japanese name of a sauce sooja–which is made from its seeds... The peas are boiled for about 20 minutes, and furnish a dish which is highly relished, not only by the Celestials, but by Europeans who have tasted it. It is said to resemble in flavor the green pea, but lacks its sweet taste... The sauce has a high reputation among the Chinese and Japanese, not merely as a condiment, but as a medicinal agent. Chemical analysis of the seeds show [sic, shows] them to be very rich in proteine.

"The oil is available for many uses–for burning in lamps or even as a substitute for olive oil. Being somewhat of a siccative [drying] nature, it is not adapted for a lubricant, but is for that reason useful as a substitute for linseed oil in the manufacture of paints and in other similar industrial arts. Finally, to complete the list of virtues of this Celestial pea, the haulm [stem or stalk] gives an excellent fodder for cattle and horses."

Note 1. This is the earliest document seen (June 2001) that mentions the use of soybean oil in paints (or varnishes or enamels). First cited by Hymowitz. 1986. Bibliography of early, previously uncited publications on soybeans in the United States. 2 p. Unpublished. The editor of this periodical in 1880 was L.C. Bryan.

Note 2. This is the earliest document seen (Sept. 2001) concerning the use of soybean oil as a lubricant–for which use it is not suitable.

Note 3. This is the earliest English-language document seen (Aug. 2003) that contains the term "proteine" (or "proteines") in connection with soy.

Talk with Ted Hymowitz. 1991. Sept. 16. After 2½ weeks of searching he has just found that this "Dr. Emerson" was Dr. Gouvenneur Emerson (lived 4 Aug. 1795–8 July 1874), a surgeon on the ship "Superior" that went to China. He received his M.D. degree from the University of Pennsylvania, and was a member of the American Philosophical Society, and of the convention which resulted in the formation of the American Medical Association. He never married. The source of this information is: *Who Was Who in America: Historical Volume, 1607-1896. Rev. ed.* 1967. Published by Marquis Who's Who Inc., Chicago, Illinois. 689 p. See p. 239. Address: Editor, Savannah, Georgia.

615. Greev, Edward. 1880. What the Japanese eat. *Frank Leslie's Popular Monthly* (*The American Magazine*) 10(2):164-74. Aug.

• ***Summary:*** A very interesting article with many large illustrations. On page 171 we read: "We quitted the dealer in vermicelli, etc., and entered a shop devoted to the manufacture of *tofu* (bean-curd, or cheese), a national dish. It is semi-gelatinous, white, delicious and wholesome. Yuba is another sort of paste food, made from white beans. Misso [miso] is a white bean paste, mixed with fermented rice and salt. It requires a Japanese-trained stomach to digest this.

Note: This is the earliest English-language document seen (March 2009) that uses the term "bean paste" (not preceded by the word "soy" or "soya") to refer to miso.

"Soyu [shoyu] (soy), a sauce made with boiled beans and wheat, was also sold at this establishment. The mess is fermented until it is a mass of fungi, then cooled and salted with hot lye. It is next transferred to enormous vats, in which it is kept for several years, then pressed in bags made of thick cotton cloth. The brown juice that runs from the horrible mass is soyu, and is not only palatable, but wholesome. The Japanese flavor dishes with it, and use it as we do vinegar, for pickling. It tastes like mushroom catsup.

"I had seen the process of soy-making, therefore declined to visit one of those establishments; whereupon my guide took me to a candy factory. As a nation, the Japanese are not large consumers of sugar."

Mentions many other Japanese foods and beverages including saké (rice-wine or rice-beer); he describes how it is made. Illustrations: (1) Seven Japanese men and women seated on tatami mats around a low table having a meal; in the background is a large painted wall. (2) A Japanese butcher's shop, as seen from outside. (3) A salt vender and house servant, carry goods at both ends of a shoulder pole. (4) The *Pelor japonicum*–a curious Japanese fish. (5) A dealer in dried fish with a man carrying goods on a shoulder pole. (6) Japanese entertaining European guests, seated in

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chairs at a raised table. (7) A rice warehouse near Tokyo. (8) A saké shop at New Year's with a large crowd of men. (9) A Japanese tea house.

616. *Gardeners' Chronicle* (*London*). 1880. The cultivation and uses of the soy bean (Soja hispida). 14:369-70. Sept. 18. [1 ref]

• ***Summary:*** "The cultivation of the Soy Bean (Soja hispida) is being strongly recommended in France as a green vegetable." Planting instructions are given.

"The greatest use to which the plant is put in China and Japan is in the preparation of soy [sauce] and of food from the ripe seeds. The manufacture of shoyu, or soy, is thus described in a descriptive catalog of agricultural products of Japan exhibited at the late Sydney International Exhibition [Australia; held in Oct. 1879]. Equal parts of Beans and Wheat are used..." The koji is made in shallow wooden boxes. "The mashings are removed to large vats, and kept there for at least twenty months, but more often for three or five years, the better qualities being those that are kept for the longer periods. The best soy is produced by mixing that kept for five years with that kept for three years. After it has been kept a sufficiently long time, it is strained through thick cotton bags, and the residue submitted to pressure. Before filtering honey is sometimes added. The residue is again mixed with salt and water and again pressed, the yield being soy of an inferior kind. Sometimes water is added to this second residue, and is again pressed. The residue first obtained is occasionally used as food, and the last residue as manure."

Note 1. It seems from the above text (and seems likely in itself) that both shoyu and the catalog describing the shoyu were exhibited at the Sydney International Exhibition of 1879. Address: England.

617. Paillieux, Auguste. 1880. Le soya, sa composition chimique, ses variétés, sa culture et ses usages [The soybean, its chemical composition, varieties, culture, and uses]. *Bulletin de la Societe d'Acclimatation* 27:414-71. Sept.; 27:538-96. Oct. 28 cm. [73 ref. Fre]

• ***Summary:*** One of the most important and original of the early publications on soya in Europe. Its in-text bibliography on soya was the largest of any published up to that time.

Contents: Part I: Introduction and extracts on soybeans and soyfoods from 30 articles published previously in the *Bulletin of the Society for Acclimatization* from 1855 to 1880 (pages 414-430. Note 1. Each of these articles has a separate record in this database).

1. Soybean botany (p. 430-31). 2. The soybean in Japan (p. 431-42): Engelbert Kaempfer and his writings on miso and shoyu, information on soya from a document titled *Japan at the World Exposition of 1878* (*Le Japon á l'Exposition universelle de 1878,* written in French by a Japanese, p. 29-33), recipe for making shoyu in France, tofu. 3. Soya in Cochinchine (French Indochina, p. 442-46): Black soybeans. 4. Soya in China (p. 446-51): Soy oil (*Huile de Soya*), fermented tofu (*le fromage de soya, teou-fou*), soy sauce (*tsiang-yeou;* In London, England, it is sold under the name of "India Soy" at Cross & Blackwell, Soho-Square {p. 451}).

Note 2. This is the earliest French-language document seen (April 2013) that uses the term *fromage de soya* (p. 449) to refer to tofu. 5. Soya in Austria-Hungary (p. 452-71): Starting with soybeans at the World Exposition of Vienna in 1873, includes a long, in-depth discussion (with many excerpts) of Prof. F. Haberlandt's book *Le Soja,* published in Vienna in 1878.

Tables in Part I show: (1) The chemical composition (in both their normal and dry states) of Chinese soybeans (*pois de Chine*), tofu (*fromage de pois*), and tofu curds (p. 427). (2) The yield of tofu. 120 gm of soybeans yields 184 gm of tofu (p. 427). (3) The weight and nitrogen content of the different components when tofu is made from soybeans (p. 428). (4) The Japanese names of 23 soybean (*mame*) varieties and a very brief description of their characteristics (p. 435-36; e.g., 1. *Go-guwatsu no mame* {5th month bean}. 2. *Use mame* [*sic, Wase mame*] {early}. 3. *Nakate mame* {half season}. 3a. *Okute mame* {late}. 4. *Maru mame* {round}. 5. *Shiro teppo mame* {white, like a pistol bullet} 6. *Kuro mame* {black}. 7. *Kuro teppo mame* {black, like a pistol bullet} 8. *Koishi mame* {small stone}. 9. *Awo mame* {*Ao,* green}. 10. *Kage mame* {shade, shadow}. 11-15. *Aka mame* {red; 1 of same species, two of different species}. 16-18. *Tsya mame* {*Cha,* tea colored}. 19. *Kuro Kura Kake mame* {black saddled}. 20. *Aka Kura Kake mame* {red saddled}. 21-23. *Fu iri mame* {striped, variegated, mottled; see Uzura mame = speckled like quail eggs}). This nomenclature was taken from a Japanese work titled: "Explanation, with figures, of trees and plants recently determined / identified."

(5) The romanized Chinese names of six types of soybeans and a French translation of each (e.g., *Houang-teou = Soya jaune*) (p. 447). (6) Two analyses of soybean seeds, reprinted from *Chemischer Ackersmann,* 1872 (p. 458). (7) The chemical composition of three soybean varieties, including Yellow of Mongolia, Yellow of China, and Reddish-Brown of China; the composition of the original seeds and the first generation seed is given for each type (p. 460-61). (8) The chemical composition of reddish-brown, yellow, and black varieties of soybeans (p. 469-70; data from M. Schroeder, Mach, and Caplan, published by F. Haberlandt). (9) Weight of 1,000 seeds for four generations grown out in Vienna. Original seeds: 81.5 to 105 gm. First generation: 110.5 to 154.5 gm. Second generation: 141.8 to 163.6 gm. Third generation: 116.0 to 151.0 gm.

Contents (continued), Part II. 6. The Soybean, by Count Heinrich Attems (p. 538-60): Soybean cultivation, time of planting, spacing of seeds, quantity of seeds, harvest, uses, and food preparations made from whole soybeans. Practical

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soybean culture trials on a grand scale, in the domain of the archduke Albert, an extract from a booklet by Edmond de Blaskovics titled "The Soybean, Its Culture, Use, and Value as Forage" (Vienna, 1880). Excerpts of six articles on soya from the *Wiener Landwirthschaftliche Zeitung* (*Viennese Agricultural Journal*) (Jan. 1879 to June 1880) (p. 548-54). Excerpts of ten articles on soya from the *Oesterreichisches Landwirtschaftliches Wochenblatt* (*Austrian Agricultural Weekly*) (March 1879 to Feb. 1880) (p. 554-59).

7. The soybean in France (p. 561-76): History (starting with Buffon, who became director of the *Jardin des Plantes* [Royal Garden, also called Jardin du Roi] in 1739), varieties grown, cultivation, utilization (mainly as forage plant for livestock and as an oilseed for oil and meal), accessory uses (miso, Japanese-style soy sauce {*shoyu*}, Chinese-style soy sauce {*tsiang-yeou*}, Japanese-style tofu {*tô-fu*}, Chinese-style tofu {*téou-fou*}, fermented black soybeans {*téou-che*}, and soy coffee {*café de Soja*}, white fermented tofu {*fromage blanc*}, red fermented tofu {*fromage rouge*}, green vegetable soybeans {*des graines fraîches, écossées encores vertes, comme le Haricot flageolet*}, whole dry soybeans {*les graines sèches comme le Haricot blanc ordinare*}).

8. Conclusion and tables showing French analyses of soybeans (p. 576-78). Appendixes (p. 579-96): Summaries of letters to the Society describing 27 cultural experiments with soybeans conducted during late 1880 at various locations in France, Switzerland and Algeria. (Note 3. Though the publication date of this appendix is given as Oct. 1880, some of the letters are dated as late as 21 Nov. 1880). Reprint of a 2-page letter from Eugene Simon, former French consul in China, on soybean farming in China (p. 591-93). Reprint of a description by Eugene Simon, based on the description of a Chinese, of how tofu is made in China (p. 593-94). A French translation of a 1781 article by Isaac Titsingh on preparation of soy sauce in Indonesia (p. 594-95). And some information about soybeans from the ancient Chinese herbal *Pên Ts'ao Kang Mu* (p. 595). Reprints of 2 letters from Eugene Simon in China, on soya and tofu in China. French translation of a 1781 article by Isaac Titsingh on preparation of soy sauce.

Note 4. We find it surprising that this superb work contains no illustrations of a soybean plant, or of any part of the plant, or of any foods made from soybeans; the only illustration (p. 569) is a cross section of an empty pit into which one could put a mixed silage that contained 20% soybean plants. The distance a-b is 3 meters; f-g is 2 meters; e-f is 0.5 meters; a-e is 1 meter; i-h is 0.4 meters.

Note 5. This is the earliest French-language document seen (Dec. 1999) that uses the term *Huile de Soya* to refer to soybean oil.

Note 6. This is the earliest document seen (March 2001) that has a bibliography of more than 50 references concerning soybeans.

Note 7. This is the earliest European-language document seen (Sept. 2004) that mentions the Japanese soybean types *Nakata-mame* or *Okute mame*.

Note 8. This is the earliest French-language document seen (April 2012) that uses the term *tsiang-yeou* to refer to Chinese-style soy sauce. Address: France.

618. Paillieux, Auguste. 1880. Le soya, sa composition chimique, ses variétés, sa culture et ses usages [The soybean, its chemical composition, varieties, culture, and uses (Continued–Document part I)]. *Bulletin de la Societe d'Acclimatation* 27:414-49. Sept. 28 cm. [73 ref. Fre]
• ***Summary:*** Introduction (p. 414): At the moment, when according to all appearances, a precious plant is going to take the place in our culture to which it has the right, we consider it our duty to bring back to light the previous efforts of the Society for Acclimatization, to introduce and propagate this plant in France. We will publish, therefore, word for word excerpts of everything soya in the records, reports with articles, letters and notes published in the bulletins of our society during the past 25 years. Our study, it seems to us, cannot be proceeded by an introduction more interesting than this.

From 1855 until the present (1880), the Society has not ceased to receive and distribute soybean seeds, and to make known its cultivation and utilization. It has rewarded successful trials by recognition and publication, and described the production processes of the industries that use soybeans.

We might have tried to refer the reader to past bulletins of the Society, but not everyone has access to these old documents, and besides looking up these articles on soy takes time and care. These motives led to our decision.

The question of soy has been dormant for a long time. But it awakens today with cultural experiments, which have been carried out for seven years in Etampes, using seeds given by the Society, with tests of tofu making which have been conducted in Marseilles; it was finally highlighted with the introduction of the plant in Austria-Hungary, in Bavaria, in Italy, etc. The question is ripe for a solution.

We do not know, whatever our own hopes may be, what the future holds for soy, but if its cultivation may render one day great service to the country, all the honor would belong to the Society, which, during a quarter century, has not ceased to facilitate and to encourage it.

Written on the 25th anniversary of Society's work with soy. We will divide this work into 6 chapters, starting with excerpts from past bulletins of the Society.

Chapter 1. Linnaeus gave our plant (*Le Soya*) the name *Dolichos Soja* (*Species plantarum,* 1621). Jacquin mentioned it later in his *Icones plantarum rariorum,* p. 143. Moench gave it the name Soja hispida. Moench gave it the name Soja hispidia (*Method plant. hort. bot. et agri Marburgensis,* 1794, p. 153).

Messrs. Bentham and Hooker have not admitted this genre; for them the plant is nothing but a veritable Glycine.

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This is also the opinion of almost all modern botanists. Miquel affirms that there are two species of *Soja* in Japan, *Prolusio florae Japonicae.* These are: (1) *Glycine hispida* (*Soja hispida,* Moench). (2) Glycine Soja, Sieb. et Zucc.

Note 1. In 1880 Paillieux called it Soja Hispidia.

Chapter 2. The soybean (*Le Soya*) in Japan. Begins with the full story of Englebert Kaempfer [see our chapter on Kaempfer], including translations into French of his writings on miso and shoyu.

There follows a list of Japanese soybean varieties of which they possess the names, 19 names, 22 species (see previous record, table, p. 435), with nomenclature taken from a Japanese work entitled Explications, with figures, of trees and plants newly determined, with the last 3 names taken from a work entitled Japan at the World's Fair of 1878, written in French by a Japanese. (Note that only in 1880 did Paillieux change the name of soybean to Le Soya). Then come descriptions of the characteristics of some of the various beans. "In short we can say that the various types of Mame can be used to make miso, shoyu, or to-fu." The Japanese do not make soybean oil (*huile de Soja*). They use sesame oil for cooking and rapeseed oil to burn in lamps... Soybean straw is given to animals. In Satsuma, in the far south of Japan, horses are given soybeans (*graines de Daizu*) at the end of their rations and it is claimed that this is good nourishment and not as expensive as naked barley. (Confusion about Mame and Daizu). Here is what is said about soybeans in the work entitled *Japan at the World's Fair of 1978:* The Mame serves numerous usages; it can be cooked, ground [after being dry roasted] to a meal or flour, and used to make shoyu, miso, and tofu. The soybean, its pods, its leaves, and its stalks serve to nourish horses and sheep; tests show that this is the best nourishment available... Shoyu, after being filtered, is boiled, then cooled. The lees / dregs are then removed and it is stored in small kegs. The reside of first grade shoyu is used as follows. One takes 5 *to* of this residue and one ads one *to* of water. It is mixed, pressed, and boiled, Then one ads 2 *to* of salt, lets it rest and decants it. This second product is then added in larger or smaller quantities to various qualities of shoyu (p. 440). There follows a detailed practical recipe for making shoyu in France by an unnamed correspondent. He recommends substituting peas for soybeans in France. He uses the word *Daizu* for soybean (1½ page description). Here is the recipe for the sauce I have learned in Japan. He made it in France, using 2 parts by volume of naked barley and 3 parts of soybeans (*Daizu*).

Page 441: In Japan, there is no village, no matter how small, that does not have a shoyu maker. It is also made in private homes. The correspondent says: During my stay in Japan, the price of shoyu varied, according to the quality, from 8 to 12 sen, 40 to 60 centimes per *masu,* that is to say per 1.8 liters. To-fu (*Fromage de Daizu*). Note that they now call soybean Daizu. This is a detailed description of how tofu is made in Japan.

Page 442: Key points. Cold extraction of the slurry. The residue is used as fodder for livestock–from beef to rabbits. Soymilk (which he calls "the albuminous liquid" {*Le liquide albumineux*}) is put on the fire. Coagulate it with nigari (*eau de mere*) which contains magnesium chloride. Put the tofu in a basin of running water. To-fu is usually eaten fresh (he says *To-fu* for Japanese tofu and *Teou-fou* for Chinese). It is very frequently cooked with shoyu and dried fish, sometimes fried, more often grilled. Sometimes during the winter it is frozen, then dried to give it a spongelike consistency. In this state it lasts a long time and is cooked / prepared in various ways. In its fresh state, this vegetal cheese (*fromage végétal*) has a very delicate consistency, but it has a certain taste of raw beans that is not pleasant / agreeable.

Note 2. This is the earliest French-language document seen (April 2013) that mentions dried frozen tofu.

Chapter 3. Le Soya in Cochin China (p. 442). France has long been involved in Indochina as a Colonial power. There follows a report from the Committee on Agriculture and Industry in Cochin China. Siebold et Zuccarini. There is a long excerpt (Corroy 1878) from an article about "The feeding of horses and mules imported into Cochin China" from *Bulletin du Comite Agricole et Industriel de la Cochinchine* 1:449-58. For the year 1877. Series 2. See p. 456-58. It is about using black soybeans (*Glycine Soja*) as feed.

Glycine soja is cultivated in India up to the Himalayas and down to Ceylon, in Philippines, Java, etc. The seeds, boiled or lightly roasted are agreeable to the taste and to the stomach. Soy sauce is used to stimulate the appetite. The people also make a white pâté resembling coagulated milk, called Teu hu or Tau hu by the Chinese, which is for them a food more widely used than any other and which, though bland by itself, when served with seasonings and condiments, is a pleasant and healthy dish.

Chapter 4. Le Soya in China (p. 446). The generic name of the soybean is Yeou-Teou. Yellow soybeans are huang-tou. He-tou is black soybeans. Certain varieties are selected for each of the various food uses; not just any varieties are used. Soybeans are used to make fermented spirits and artificial wines called Teou-che.

Soy oil (p. 448). This oil is very widely used. It is of the first grade among the 15 or 20 oils possessed by the Chinese. Europeans find that it has a disagreeable aftertaste of raw beans. Except for this, it is of excellent quality. It was written in the introduction that M. Fremy analyzed the seeds / grains of Soya and that they contained 18% oil. Three samples analyzed by the German chemist Senff contained an average of 18.71% lipids. The analysis of Mr. Pellet of 3 samples of yellow Soya from China, Hungary, and Etampes, that we furnished him, gave about the same result.

Tofu (*Le fromage de Soya,* p. 449): Only the Tartars, scattered throughout the Empire, have continued to use milk.

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The Chinese do not use it. For them the soya takes its place. From the soybean they extract and filter a milk, a true milk (*lait*) usable like the milk of the cow, goat, or ewe (female sheep).

We are reporting in the chapter entitled Soya in France what type of tests we have done personally and those which have been done by the Society of Horticulture of Marseille. We have but to mention here the immense consumption of soymilk (*lait de Soya*) in China, as such or in form of cheese [tofu]. The Introduction contains reports on tofu by Baron Montgaudry and M. Champion, so there is no need for us to say any more about tofu here. Continued. Address: France.

619. Kinch, Edward. 1880. Contributions to the agricultural chemistry of Japan. *Transactions of the Asiatic Society of Japan* 8(Part 3):369-415. Oct. See p. 392-93, 398-401, 413-15. Reprinted in March 1907 as a monograph. [29 ref]
• ***Summary:*** "Of vegetable manure the principal are sea-weed, the residues from different manufactures, e.g. rape cake, sesamum cake, cotton cake and other oil residues, as from camellia seeds, the residues from the manufacture of *shôyu, ame* [*rice syrup*], *sake, shôchu,* indigo etc." (p. 392). [Note that soybean cake is not mentioned].

"The oil cakes, *ame kasu* (malt dust, the residue from the manufacture of ame from rice, millet and malt of wheat or barley) and *shôyu kasu* [The residue from the manufacture of shoyu] are the most valuable. These manures should not be applied in quantity at the seed time in an unmixed state, owing to their fermenting and also attracting and harbouring insects, which attack the seeds and young plants." Rape cake (*Abura kasu*) and Sesamum cake (*Goma kasu*) are also mentioned.

There are original analyses (p. 393) of 6 samples of "Soy [sauce] residues, *Shôyu kasu* Residue from the manufacture of *Shôyu* from beans and wheat." These vary over an extremely wide range. Nitrogen content ranges from 1.27% to 5.20%, and ash is 0.57% to 11.53%.

"Soy bean, sometimes called Japan pea, *Glycine hispida* (Moench) also known as *Soja hispida:* of this many varieties of different colour and size, etc. are met with, but as far as is known, they differ but little in composition. They are known collectively as *Daidzu* or *O-mame;* a common white round variety is known as *Miso-mame* and *Shiro-mame;* other names of varieties are *Awo-mame, Kuro-mame, Ki-mame, Ichiya-mame, Kurakake-mame* and *Korinza* (p. 398).

Note 1. This is the earliest English-language document seen (March 2008) which states clearly that the present scientific name of the Japan pea is *Glycine hispida* (Moench)–that is, the soybean. Actually, however, the correct scientific name since 1873 had been *Glycine hispida* (Maxim.)

"This bean approaches more nearly in its proximate chemical composition to animal food than any other vegetable known. It contains about one-fifth of its weight of fat and nearly two-fifths of nitrogenous matter. It is extensively cultivated in the north of China and also grows in the Himalayas. In China it is compressed for the sake of its oil, and the residual cake is used for food and also extensively as a manure. In Japan it is used in the preparation of *Shôyu, Tôfu, Miso* and also of *Yuba,* and in these various forms enters to a considerable extent into the food of the nation, to which it is a most valuable contribution, supplying as it does the alimentary principles–albuminoids and fat–in which the staple food, rice, is deficient: it also contains a much larger percentage of the necessary mineral matters than does rice. Of late years this bean has been grown experimentally in different parts of Germany, with success. The haulm and leaves which furnish a valuable fodder, and a variety is cultivated specially for that purpose and known as *Kari-mame.*

"The composition of a sample of the white round variety known as *Miso-mame* was found to be: Water 11.32%, ash 3.86%, fat 20.89%, albuminoids 37.75%, fibre 2.00%, starch etc. 24.08%. Total: 100%" (p. 398). Note 2. This and each of the following nutritional analyses appear to be original, not cited from earlier sources.

A table then contains an analysis of each of the following 4 products: Shiro-miso from Osaka, aka-miso from Osaka, to-fu [tofu], and kori to-fu [tofu]. The composition of aka-miso was found to be: Water 50.40%, ash 12.50% (incl. 11.00% common salt), sugar 0.61%, nitrogenous matter 10.08%, fibre 8.25%, soluble carbohydrates 18.16%. Total: 100%.

The composition of to-fu was found to be: Water 89.29%, ash 0.48%, fat 3.32%, nitrogenous matter 4.87%, fibre -, soluble carbohydrates 2.04%. Total: 100%.

The composition of kori to-fu was found to be: Water 18.75%, ash 1.60%, fat 28.80%, nitrogenous matter 48.80%, fibre -, soluble carbohydrates 2.05%. Total: 100%.

There follows a discussion (p. 398-400) of foods that can be made the soy bean (*miso, kôji, tôfu, kôri-dôfu,* and *shôyu* or soy), and a description of how each is made. *"Miso* is made by mixing the boiled beans with *Kôji* (rice ferment used in *sake* brewing) in various proportions, and with more or less salt, and keeping the mixture in tubs in a cool place for about a month. It will be noticed [from the table above] that one variety contains much sugar, derived from the *Kôji,* and little salt, and the other much salt and little sugar.

"*Tôfu* is made by pounding the soy beans after soaking in water, then straining through a sieve and boiling in water. The solution is filtered through cotton cloth and the residue pressed; the strained liquor, containing vegetable casein or legumin, is precipitated by brine. *Nigari,* formed by the deliquescence of common salt. The precipitate pressed and cut into cakes is *tôfu."*

Note 3. This is one of the earliest English-language documents seen (Jan. 2004) that uses the word "tofu." This is *the* earliest document seen (Jan. 2004) that uses the word

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"cakes" in connection with tofu.

Note 4. This is the earliest English-language document seen (Oct. 2008) that mentions "vegetable casein" in connection with soybeans or tofu, or that equates "vegetable casein" with "legumin" (the word Kinch used in 1979), the water soluble protein in soybeans that can be precipitated to make tofu.

"Kôri-dôfu is prepared from the above by freezing it and afterwards exposing to the sun, when, in the process of thawing, the greater quantity of the water is removed, leaving a horny spongy residue.

Note 5. This is the 2nd earliest English-language document seen (April 2013) that mentions dried-frozen tofu, which it calls "kori to-fu" or *kôri-dôfu.* This is also the earliest document seen (April 2013) that uses the word "spongy" to describe the texture of dried-frozen tofu.

"An example of *shôyu* or soy was found to have a specific gravity of 1.199 and to contain per litre: Total solid residue 359.88 grms., ash 195.16 grms., sugar 31.03 grms., nitrogenous matters 41.00 grms., free acid, expressed as acetic acid 6.20 grms. The ash is chiefly common salt, but contains a quantity of phosphates derived from the mineral matter of the beans and kept in solution by the acetic acid formed."

"The [shoyu] mashings are removed to large vats and there kept for many months, usually twenty, and frequently for 3 or 5 years. The better qualities of *shoyu* are kept the longer times. It is found that the best soy is produced by mixing that kept for five years with that kept for three years. After it has been kept a sufficiently long time, it is strained through thick cotton bags and the residue pressed. Before filtering, honey is sometimes added in the proportion of 10 *kin* to 1 *koku* of *moromi* or crude soy, in order to give it a sweet taste. Occasionally a sweet sake, *ama-sake,* prepared by taking, 1 *koku* of *koji* to 7 *to* of water and 1 *to* of steamed rice, mixing them together and steaming for two hours is added instead of honey. The residue obtained on pressing *moromi* is usually again mixed with salt and water, and pressed; this yields an inferior *shoyu.* Sometimes water is added to this second residue and it is again pressed. The residue first obtained is sometimes used as food and the last residue as manure.

"The *Shoyu* after straining is allow[ed] to settle for two days in large tanks, then drawn off and filtered; before sale it is heated to incipient ebullition, otherwise it quickly goes bad.

"The quantity of nitrogenous matter in solution in *shoyu* appears to increase with the length of time elapsing before filtering the *moromi."*

Note 6. *Webster's Dictionary* defines ebullition as "the act, process, or state of boiling or bubbling up."

Also contains detailed information on and chemical composition of adzuki beans or *shôdzu* (*Phaseolus radiatus*), daikon, sea-weeds (incl. three types of Asakusa nori (*Porphyra vulgaris*), kobu (*Laminaria saccharina*) [konbu, which Thunberg and Kaempfer also discussed], wakame, arame or kokusai, awo-nori or ohashi-nori, hijiki, Irish moss or carrageen, tokoroten-gusa or agar agar, kanten or tokoroten, and funori), and sake.

At the end of the article is the summary of a discussion. Professor Atkinson made some remarks about shôyu. He said that Mr. Isono, a graduate of the University of Tôkiyô, had made analyses of *shôyu moromi* at various periods (after 3, 10, and 20 months), which are printed in full, together with an analysis of Kikkoman shoyu. "It was interesting to observe the disappearance of the glucose, and the gradual increase of the soluble nitrogen from the first sample to the last. The greatest change took place between the third and the tenth months. but, after the removal of the greater part of the glucose and dextrin, converted into alcohol and lost by evaporation, very little alteration occurred, except in the color of the liquid, which became darker."

Note 7. This is one of the earliest English-language documents seen (May 1999) that contains an accurate description of miso; it also contains very early information on the composition of different types of miso.

Note 8. This is the earliest English-language document seen (Dec. 2000) that uses the term "chemical composition" in connection with the soy bean.

Note 9. This is the earliest English-language document seen (Nov. 2003) that uses the term "sesamum cake" to refer to sesame cake.

Note 10. This is the 2nd earliest English-language document seen (April 2012) that uses the term "shôyu" to refer to soy sauce.

Note 11. This is the earliest English-language document seen (July 2001) that contains the word "fibre" in connection with soy beans. The fibre content of one variety of soy bean and one miso variety are given.

Note 12. This is the earliest English-language document seen (July 2003) that uses the Japanese word "Goma" to refer to "sesame."

Note 13. This is the earliest English-language document seen (Nov. 2005) that contains the term "cotton cake."

Note 14. This is the earliest English-language document seen (April 2012) that contains the word "Kikkoman."

Note 15. This is the earliest English-language document seen (May 2012) that contains the term *shôyu kasu* (in italics, with diacritics) which it defines as "Residue from the manufacture of *Shôyu* from beans and wheat." Address: Prof. of Chemistry, Imperial College of Agriculture, Komaba, Tôkiyô.

620. Paillieux, Auguste. 1880. Le soya, sa composition chimique, ses variétés, sa culture et ses usages: Le soja en France [The soybean, its chemical composition, varieties, culture, and uses: Soya in France (Document part)]. *Bulletin de la Societe d'Acclimatation* 27:561-76. Oct. [Fre]

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• ***Summary:*** Page 561: "Historical–Buffon [Comte Georges-Louis Leclerc de Buffon, lived 1707-1778] became director of the *Jardin des Plantes* [Royal Garden, also called *Jardin du Roi*] in 1739. Shortly thereafter French [Catholic] missionaries in China sent him specimens and seeds of most of the important plants of that country. Soybeans or their seeds were almost certainly among their shipments, and without being able to prove it, we have no doubt on this subject. Be that as it may, we have recovered from the Museum [of Natural History] a sachet which, in 1779, contained soybean seeds. It bears the following dates of harvest: 1834, 1836 to 1841, 1843, 1844, 1846, 1847, 1849, and 1850 to 1855 inclusive. Then 1857 to 1859, 1862, 1865 to 1867, 1870, 1871, 1873, 1874, 1877.

"In fact, soybeans have been cultivated at the Museum very probably since 1740, certainly in 1779, and more recently from 1834 to 1880 without interruption. The plant has always germinated and borne fruit as desired, cultivated like haricot beans (French green beans), without any particular problems. It has proved its hardiness and the small influence which changes in atmospheric conditions have on it.

"Since 1855, the abundant distribution of soybean seeds ceaselessly by the Society for Acclimatization, has allowed soybean agronomic trials to be conducted throughout France. But it is difficult, if not impossible, to obtain information about trials made before 1855.

Mr. Blavet, president of the Horticultural Society of Etampes, has uncovered an interesting document in a brochure titled *Seance publique de la Societe d'Agriculture de l'arrondissement d'Etampes* (Public session of the Agricultural Society of Etampes), for the year 1832, page 84. One chapter bears the title "Report by Mr. C. Brun of Beaumes, member of the Agricultural Society of Etampes, chevalier of Saint-Louis, doctor on the faculty of sciences of France, of some agronomic trials conducted by him in 1821, on various species of cereal grains, on his property of Champ-Rond, near Etampes [Seine-et-Oise], France." A final note says: The heat of the summer of 1821 was so favorable to exotic plants that I saw the following plants bear fruit abundantly in my outdoor garden at Champ-Rond, near Etampes: the Dolichos of China (*le Dolichos de la Chine;* perhaps wistaria), the soybean (*Dolichos Soja*), and Dolichos Lablab (also called hyacinth bean). The Niouelle (?) of Senegal showed here for the first time its long pods (*épis*), etc." Note: This is the earliest document seen (April 2000) that describes the 1821 soybean experiment by Mr. C. Brun of Beaumes.

"The duty of the Museum, as a public-interest organization is to distribute seeds, either as a pure gift or as part of an exchange, to persons who request them. Undoubtedly, therefore, trials have been made at various early dates, but we have no record of them.

"Starting in 1855 a large number of participants received seeds from the *Société d'Acclimatation* and experimented with them. Most of these people did not report the results of their trials, as they were obliged to. Others, however, did, including Messrs. Vilmorin, Delisse, Lachaume, etc. But their cultivation did not lead to any progress, so the soybean was not established a permanent crop in France.

"In 1868 Mr. Chauvin, vice-president of the Society of Horticulture at Côte-d'Or [a department in eastern France], cultivated several soybean varieties there, and the culture has continued there to this day.

"In 1874 the Society of horticulture of Etampes received soybean seeds from the Society for Acclimatization, and began experiments that continued until 1880. One can find them mentioned in the Introduction to the Etampes livestock reports. Their cultivation is direct with great seal by Mr. Blavet, president of the horticultural society of that area.

During the same period, one Dr. H... brought the best soybean varieties from Japan and cultivated them. He failed in this trial because his soybeans were late-maturing types. He then restricted himself to cultivating yellow soybeans from China. He encountered no more difficulties and he made *Sho* [perhaps shoyu, or Japanese-style soy sauce] by himself for use in his home.

"In 1878 we received seeds of two soybean varieties. One, from Japan, had white flowers and very pale yellow seeds with a greenish hue. The other, from China, was yellow and belonged to the *Houang-téou* ["yellow soybean"] series; they were among the seeds received from Mr. Montigny and other donors, and have been cultivated at the Museum, at Etampes, at Marseilles, and a little bit all over. (Footnote: These varieties look a little different on the outside, but their chemical composition, usage, and cultivation are the same).

"The seeds from Japan give us nice green foliage, but the plants do not mature their seeds. The Chinese variety succeeds in France as it does anywhere else."

In 1879 a yellow variety received directly from China matured well and was harvested at Marseilles. In 1880 Vilmorin-Andrieux & Company introduced into France one of the varieties tested by Haberlandt in Austria, which variety has proven well adapted to French conditions.

On pages 564-65 the author attempts a sober appraisal as to why a plant with such obvious merits, that has been known in France for over 140 years, is still virtually unknown. Established institutions such as the Museum of Natural History and the government had taken exasperatingly little interest in aiding the private efforts of the Society to introduce new plants. Chemical analyses, demonstrating the nutritional superiority of the soybean, had been lacking until about 1855, when Mr. Frémy [Fremy] confirmed that the soybean contained oil. Messrs. Champion and Lhôte have given an incomplete analysis [published in 1869]. But the classical books on agricultural chemistry, the works of our professors, which make known the chemical composition of the seeds of our typical legumes, omit information on the

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soybean. There was a general resistance, especially on the part of the establishment, to growing new crops and using new foods. And finally the basic approach of the Society in introducing soya first and foremost as a human food was questioned.

"Our point of departure has not been successful. Soya has been presented simply as a new legume. But it is more difficult to cook than other legumes, The flavor is good, but not superior. Fresh, it takes lots of time to shell. Dry, it requires pre-soaking for 24 hours in water that is not hard. If one is ignorant of its nutritive properties, there would be little incentive to grow it, and one would keep growing the traditional legumes instead.

"The people of Austria-Hungary have been wiser. Having already acquired incontestable proof of the value of soya for livestock fodder, they have no other objectives. They seem at the very least to have considered as secondary the utilization of soya for human nutrition. Therefore as soon as they had enough seed, they cultivated large areas, while we were still cultivating the furrows between the rows in the kitchen garden for use as food.

"The seeds will soon be found in all the good markets of southern Germany. The small farmer will then find them (soybeans) all around him at low prices. In eating them, he will find himself strengthened. Then he, in turn, will plant them himself."

Varieties (p. 565-66): In 1878, Japan, China, and the Dutch East Indies have presented all their varieties of soybeans at our Universal Exposition in Vienna. We think that there are more than 30 varieties of soybeans. Let the Society for Acclimatization and Messrs. Vilmorin, Andrieux, etc. get us seeds and we will plant them all. Then we will find among them, perhaps, some early varieties, to add to those we know.

Cultivation (p. 566-56).

Utilization (p. 567-71): We believe it has already been demonstrated that the cultivation of soybeans is easy, that its fecundity is great, and that its chemical composition is superior. Then why have they not been cultivated for the past 10 years?

We tried to introduce soya as a food plant for the garden rather than as a fodder and oilseed. We started where we should have finished. If we persist in this direction we shall fail. Soya will fall back into oblivion, while in southern Germany, the Danube provinces, central Russia, and Italy, it will soon be widely grown and serve as a source of riches.

Accessory uses (p. 571): The soybean is used to make miso (*le miso*), shoyu (*le shoyu*), Chinese-style soy sauce (*le tsiang-yeou* [*jiangyou*]), the tofu (*le tô-fu*) of the Japanese, the tofu (*le teou-fou*) of the Chinese, fermented black soybeans (*le teou-che* [*douchi*]), and soy coffee (*le café de Soja*). We have always said that the shoyu of the Japanese is excellent, whereas the soy sauce of the Chinese is inferior (p. 571).

In the middle of page 571 and near the bottom of page 572 the term *fromage de soja* is used to refer to tofu.

Note 2. This is the earliest French-language document seen (April 2013) that uses the term *fromage de soja* to refer to tofu.

Note 3. This document contains the earliest date seen for soybeans in France, or the cultivation of soybeans in France (very probably in 1740, certainly in 1779). The source of these soybeans was French missionaries in China. Continued. Address: France.

621. Mene, Édouard. 1880. Des productions végétales du Japon [The vegetable products of Japan]. *Bulletin de la Societe d'Acclimatation* 27:644-66. Nov. [3 soy ref. Fre]
• ***Summary:*** This is part of a longer article, published in several issues, which is an excellent review of earlier publications and work. This part begins with a section on legumes. Among the legumes discussed are *Vicia Faba* (*sora mame, otafuku mame, okakura mame*), *Dolichos unguiculatus* (*sasaghe* [*sasage,* present name: *Vigna unguiculata* (*L.*) *Walp. subsp. unguiculata*], incl. *Jin-roku Sasaghe, Yuhuté Sasaghe, Heritori-yu- roku-Sasaghe*), *Canavalia* (*nata-mame = C. incurva* [*sword bean*], *shiro-nata mame = C. lineata*), *Haricot* (*Phaseolus vulgaris,* incl. *Ingen mame* and azuki {*Phaseolus radiatus* var. *subtrilobata*}), sesame, etc. The author saw samples on display at the Japanese Ministry of Agriculture and at the Exposition at Champ-de-Mars in France.

"Soy sauce (*Le Shoyu*) (p. 648-49): This condiment, so appreciated by the Japanese, had samples displayed is the class of fermented beverages. It is often made with wheat flour and beans (*haricots*), but more often with boiled soybeans (*pois*).

"Chinese *Soye* or *Soya* (*Le Soye ou Soya chinois*) is the same condiment, but more especially made with red beans (*haricots rouges*). Note: Clearly the author did not realize that soy sauce is made from soybeans (not from haricot beans or peas, nor from azuki beans).

Note: This is the earliest French-language document seen (April 2012) that uses the words *Le Soye* or *Soya Chinois* to refer to soy sauce.

"In Canton, it is made in the following way: the red beans are cooked in water for one hour; thrown in a sieve and drained; next the beans are sprinkled with wheat flour and carefully spread out on a wood plank that is put in a warm and humid place that favors the development of considerable mold; after four or five days the mold is taken off and the beans, after having been dried in the sun for 24 or 48 hours, are washed in cold water; salt and water are added, and the mixture is exposed to the sun for two weeks. It is then boiled for half an hour, adding for flavor a bit of star anise, regular anise, and orange peel; the mixture is then filtered through a basket and finally bottled as *Soya."*

There follows a short section titled "Peas" (*Pois, Pisum*

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sativum), including *Endo mame.* Next comes a detailed but somewhat confused discussion of soybeans (*Pois oléagineux, Soja hispida*) and a listing (often repetitive) of many different types and colors, as follows (p. 649-50): "There was also a variety of soybeans (*Pois oléagineux, Soja hispida*), an early soybean (*mamé*), one with large hanging pods covered with red hairs, and one with large, yellowish-white seeds.

"The principal varieties of *Soja* and *Soja hispida* indicated in the watercolors of the Tokyo Bureau of agriculture were: 1. *Soja* with white flowers, a yellowish-white bean of medium size with white pods. 2. Early green *Soja,* a large yellowish-white bean with large pods covered with red hairs. 3. *Soja blanc,* with large yellowish-white seeds. 4. *Grand Soja blanc,* a large, yellowish-white bean with rather long greenish pods. 5. Green *Soja,* a yellowish-white bean of medium size with little green pods and the stem scattered with brown hairs. 6. *Kinoshita-mame,* a small yellow bean with little hairy pods. 7. Red *Soja,* a red bean of medium size with green, velvety leaves and red flowers. 8. Black *Soja,* a black medium-sized bean. 9. *Kouro-hiro mame,* a large black oval bean [*kouro = kuro* = black]. There are also varieties called: 10. *Awo-mame,* a large, greenish-white bean [*awo = ao* = green]. 11. *Shiro-mame, Kuro-mame, Kuro-kake mame, Kinname* (*Glycine soja*), *Kouringa, and Ichia-mame.*

"In the collection of beans at the Exposition of Champ de Mars the following soybeans were found: 12. *Daizu* (*Soja hispida*), a round yellowish bean of medium size. 13. *Shiro-daizu,* a large yellowish bean [*shiro* = white]. 14. *Oshiro-daizu,* a very large yellowish bean, twice the size of *Shiro-daizu.* 15. *Akayendo,* a medium-sized yellowish bean. 16. *Awo-mame,* a large, greenish-white bean (variety of *Glycine*). 17. *Aokuro-daizu,* a large greenish bean speckled with black. 18. *Thya-iro-mame,* a large, reddish-brown bean (variety of *Glycine*) [*Thya-iro = cha-iro* = brown]. 19. *Shiro-mame,* a white bean speckled with grey (variety of *Glycine*). 20. *Aka-daizu,* a large red bean [*aka* = red]... 21. *Kouro-daizu,* a large black bean."

Near the end of this subsection we read (p. 651): "In China, an oil is extracted (*on extrait*) from soybeans (*pois oléagineux,* literally 'oil peas'); it is used for both cooking and illumination. The green or black peas are often used to color rice wine. Mixed with beans (*haricots*) and wheat, they form the base for the manufacture of soy sauce and of tofu (this latter condiment is composed of two species of boiled beans). With soybean seeds (*Avec les graines de Soja*) the Japanese also prepare a sort of pap (*bouillie*) which for them takes the place of butter and which they call *Miso.* The leaves and branches of the soybean serve to nourish goats and sheep." Address: France.

622. Bishop, Isabella Lucy (Bird). 1880. Unbeaten tracks in Japan: An account of travels on horseback in the interior, including visits to the aborigines of Yezo [Hokkaido] and the shrines of Nikkô and Isé, by Isabella L. Bird. 2 vols. New York, NY: G.P. Putnam's Sons. See vol. I, p. 232, 237-38.
• ***Summary:*** The section titled "Notes on food and cookery" (p. 232-40) states: "Some fish are fried in the oil of the *Sesamum Orientale,* which produces an odour which makes one fly from its proximity. Eels and other dainties are served with soy (*shô-yu*), the great Japanese sauce, of a dark brown colour, made from fermented wheat and beans with salt and vinegar [sic], and with a dash of *saké* added to give it a higher flavour" (p. 232).

Buddhist teachings on the sacredness of life have, in some parts of Japan, been effaced by contact with foreigners. There some people eat wild birds and fowl. "Seaweed is a common article of diet and is dried and carried everywhere into the interior. I have scarcely seen a coolie make a meal of which it was not a part, either boiled, fried, pickled, raw, or in soup" (p. 234). *Brinjal* or egg-plant are among the many vegetables pickled. Confections consist of sugar-coated [azuki] beans, and *yokan*–made from seaweed. Mochi is a small round cake of unbaked rice dough.

"The common people are also fond of 'a pot-boil of birds' in which a little soy and *mirinshu* are added to the water" (p. 237).

"The chief kinds of soup used by the middle classes are bean soup [miso soup], egg soup, and clear soup. The latter is of two kinds, one water and salt, the other water and soy" [sauce]. Among the lower classes there are many kinds, most of which taste like dirty water with a pinch of salt, and contain cubes of bean curd, strips of dried fish, cuttlefish, etc... Carp is used with bean soup only..." (p. 237-38).

Note: This is the earliest English-language document seen (July 2011) that uses the term "bean soup" to refer to miso soup.

In formal entertainments, the highest of the three classes is *san no zen* in which three small tables of eatables are provided to each guest. The first table includes rice, and "bean soup with carp." Each table contains from 8 to 12 bowls or dishes (p. 238).

Note 2. The author, Mr. J.F. Bishop, lived 1831-1904. Note 3. Yezo (also spelled Yezzo, Yeso) refers to Hokkaido, Japan's northernmost main island. Address: Author [England].

623. Walker, Francis A. ed. 1880. International Exhibition, 1876 [at Philadelphia]. 10 vols. Washington, DC: Government Printing Office. 24 cm. No index.
• ***Summary:*** This, the sixth international exhibition and the first held outside of Europe, also celebrated the 100th anniversary of America independence. Unfortunately the many volumes covering this exhibition are extremely poorly organized and difficult to use. They contain no indexes, either for the entire set or for each volume. The table of contents of each volume does not match the actual contents of that volume. Since there seems to be no logical sequence,

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one must look page by page.

In Vol. I (p. 600), the section on "Animal and vegetable products (used as food or as materials)" includes: Class 650–Sponges, sea weed. Class 655–As musk, civet, ambergris. Class 656–Preserved meats, vegetables, and fruits. Dried, or in cans or jars. Meat and vegetable extracts. Class 662–Vegetable oils.

The next section, "Textile substances of vegetable or animal origin" (p. 600) includes hemp, flax, jute, ramie, and silk. Note: This is the earliest English-language document seen (June 2002) that uses the term "animal origin."

In Vol. IV, Groups III-VII (1880), is a section titled "Group IV. Animal and vegetable products, and the machinery for their preparation" (p. 2) by Ryland T. Brown. In Group IV, under "Reports on Awards" (p. 94-95) we read: "487. Lea & Perrins, Worcestershire, England. Worcestershire sauce. Report.–Commended for the following reasons: 1. Excellent taste. 2. Very carefully prepared." "496. Naga-oka Zenpachim Tokio, Japan. Sauces. Report.–The Shoyu sauce, to be used with meat and fish for the purpose of flavoring gravies and soups, is excellent; the preparation is most careful, and it recommends itself strongly for its purity and flavor."

The 11th volume (bound in 2 volumes) in the series of reports on the International Exhibition of 1876 is titled "Report of the Board on behalf of United States Executive Departments at the International Exhibition, held at Philadelphia, Pennsylvania, 1876." For more details, see the Official Catalog of the British Section in the exhibition. Address: Chief of the Bureau of Awards.

624. Nanrido Eiraku. 1880? Nenjuban saisen: Shirôto ryôri. Sassoku hôchô [Year-round recipes: Speedy cooking for amateurs]. Publisher unknown. Undated. Japanese summary by Kawakami 1978. [Jap]

• ***Summary:*** Written in the Kyoto-Osaka area of western Japan some time during the 1800s, this book quoted the *Tofu Hyakuchin.* It lists daily home recipes, including tofu recipes and some using shoyu. Kirazu, the early term for okara, is mentioned. The recipes are listed according to the season in which they are best prepared.

625. Smith & Dewar. 1881. Sales of household furniture: Saturday, 5th March at one, within 79 George St., entirely without reserve. *Scotsman* (*Edinburgh*). Feb. 26. p. 12.

• ***Summary:*** "Important cellar of high-class bottled wines, champagnes, brandies, whiskies, and liqueurs (the Property of an Edinburgh Gentleman,...) and consisting of over seven hundred dozens."

"Miscellaneous.–Sauterne by Schroder & Schyler, Old Marsala [wine, from around the city of Marsala, Sicily], Old Wedderburn Rum, Old Dry Muscatel in Antique German Flasks, Five Cases Finest Chinese Ginger, Six Jars Chow Chow [a relish made of different vegetables that are pickled in a jar and served cold], Genuine Japan Soy [sauce] from Jeddo [Edo, today's Tokyo]: Quarter Cask Brandy... Cigars.–Two Cases Manila Cheroots and Cigars, 1877."

Note: In legal contracts, the term "without reserve" is frequently used in conditions of sale at public auction, that the property to be offered for sale, will be sold without reserve (i.e., no matter how low the best price offered). Address: Auctioneers & Valuators, 79 George St., Edinburgh [Scotland].

626. Ladureau, A. 1881. Culture et composition du Soya hispida [Cultivation and composition of soybean]. *Association Francaise pour l'Avancement des Sciences* 10:944. April. Excerpt from minutes of proceedings. 10th Session, 17 April 1881, Alger/Algiers. [Fre]

• ***Summary:*** "The soya hispida is an oil pea (*pois oléagineux*), native to Japan, remarkable for its richness in oil and protein. It contains 20% oil and 7% nitrogen. This is a richness of which no other examples are found among all the other known plants.

"It can be used for human food, but its taste requires some getting used to. The beans can give very good results in the feeding of livestock, being fed either when green or after being soaked.

"The characteristic point in the culture of this plant is that it requires a large spacing between plants, 30 cm in fertile soil and 25 cm in poor soil, where the plant doesn't develop as well; but this minimum limitation of 25 cm should never be exceeded."

"Discussion: Mr. Corweneinder says that the ensilage (*l'ensilage*) of soya hispida is very easy; after the seeds begin to form, one must simply put the plants in a silo. In this way, one obtains excellent results." Address: Directeur de la Station Agronomique du Nord, France.

627. Renouard, Alfred. 1881. Sur l'introduction du soja hispida en Europe [On the introduction of the soybean to Europe]. *Association Francaise pour l'Avancement des Sciences, Comptes Rendu* 10:945-51. April. Session of 17 April 1881, Algiers. [3 ref. Fre]

• ***Summary:*** Contents: Introduction. History. Cultivation and harvest. Soya as a forage plant. The edible soybean [food uses]. "The *soya,* or rather the *soja hispida* is a plant that is cultivated at many locations in Europe, but whose name is not well known here, and which has only been cultivated for several years. Japan has long known the specialties of its cultivation. There it is well known under the name of *o'mamé* and from it is extracted, from the roasted seeds, the sauce called "japonaise," which is found in the commerce of Europe, where it enjoys a good reputation.

History: At the Exposition of Vienna, in 1873, the Japanese government exhibited, for the first time, the soya as a forage and food plant. Some Austrian scholars, including Prof. Haberlandt of the Institute of Agronomy at Vienna,

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then studied the composition of this oilseed and perceived that it would make an excellent forage. In 1877 trials started in Austria. In 1871 the Society for Acclimatization in Paris sent several samples of soya seeds to M. Blavet, president of the Horticultural Society of Étampes. He grew the crop and sent samples to other departments and abroad. Later the seed house of Vilmorin coined the name "Soya of Etampes" (*soya d'Étampes*). But it does not seem that these laudable efforts have been crowned with success. Mr. Paillieux of the National Society for Agriculture, Mr. Saint-André, director of the Agronomic Station at Montpellier, Mr. Vavin of the Society for Acclimatization, have all worked with soya and are still working for the propagation of this useful plant.

"In the region of Nord, it is to a Frenchman, who actually lives in Moravia, that we owe the actual propagation of soybean culture: Mr. Julius Robert, who cultivates nearly 3,000 hectares at Seelowitz. Last year he made a gift of several hundred liters of soybeans to the Society of Farmers of Nord. At the instigation of Mr. Corenwinder, several farmers tried them. The results obtained by the first experimenters were, in general, satisfying, but we should not yet make a final judgment as to the plant's definite acclimatization. Nearly 30 farmers from around the town of Lille are proposing to plant soybeans again. Free samples, provided to our society by Mr. Olivier Lecq (of Templeuve), an agent for Mr. Robert and those who conducted the first trials, have been rapidly distributed. Today we can consider the soybean as definitely well tested in our department.

"Cultivation and harvest of soybeans: Mr. Yossida [Yoshida], a Japanese man from Tokyo, was sent to the town of Lille by his government to work seriously on cultivation and preparation of flax / linseed. He told us that there were at least 100 varieties of soybean in Japan. A Japanese book titled *Explanation, with Illustrations, of Trees and Plants Newly Determined,* mentioned 25 very distinct varieties of soybeans. The Chinese herbal only cited five varieties, which seems to prove that the soybean is native to Japan.

"In France, we barely know 2 or 3 varieties: the yellow and the brown soybean for temperate climate, and the black for the warm climate. It is the yellow variety that was tried in the department of Nord, and also, by the way, the one that has been cultivated at the Museum since 1790; there we can observe that it comes up well but it does not produce seeds every year" (p. 946).

"In the department of Nord the soybean, can be harvested toward the end of September or during October. However, in warmer countries or regions, the harvest can begin in August or September."

"The harvest ought to be done like that of the like the dwarf bean (*haricot nain*), in the department of Nord, in ripping out the stalks entirely, then suspending them from poles in an open field, the bundles of soybeans tied just above the top of the roots [hung upside down]. The plant thus dries rapidly, if the weather does not pose an obstacle to it. When the soybeans are well dried out, they can easily be stored: they are not attacked by weevils (*bruches*) that cause, as everyone knows, so much damage to beans, peas, lentils, etc."

In 1879 in Austria trials were conducted by Mr. de Blackowicz [Edmund v. Blaskovics] under orders from the Hungarian Ministry of Agriculture. In 1879 he obtained an average yield of 1,699 liters/hectare (range: 237 to 3,262).

Mature and well dried, the soybean constitutes an excellent feed for animals in France. On this subject, comparative experiments on the nutritional value of air-dried soybean pods and dead leaves were conducted in 1879 by Messrs. Weiske, Delmel, and Schulze at the Proskau agronomic station.

In total, 1,000 gm of pods were fed to each of two sheep, from Jan. 8-15 then from Jan. 16-23. One table shows percentage of each nutrient in the pods digested by each sheep (p. 948). A second table shows the percentage of each nutrient in the dead leaves digested by each sheep (p. 949).

"Finally, the soybean has been fed to animals after having been ensiled in a mixture with various forages. The fermentation which these forage crops undergo changes the composition of each. For example, in mixing soya with maize (which contains only 4-5% protein), the protein content of the mixed silage is increased. The following analysis, made in 1879 at Lobozitz (Bohemia) in the agricultural laboratory of the prince of Schwartzenberg, is of a forage composed 80% maize on the stalk and 20% soya on the branches. A table (p. 949) shows: Moisture 8.62%, fatty materials 2.33%, cellulose 43.94%, nitrogen-free extracts 27.56%, proteins 8.75%, and ash 8.80%.

On the farm of Mr. Julius Robert, the cattle being fattened were fed as follows (per head per day). A table (p. 949) shows–in February: Hay 3 kg. Soya and maize ensilage 5 kg. Corn flour 1 kg. Beet peels 40 kg. Chopped straw 6 kg. Salt 80 gm. The amount of soy and maize silage fed in March and April were increased to 8 kg. The next table (p. 950) shows that the cattle gained (on average) 633 kg in Feb., 654 kg in March, and 690 kg in April. The increases in weight gain in March and April must be due entirely to the marked increase in the amounts of soy and maize silage fed during those two months.

The article concludes: "To make from the soybean what the Japanese and Chinese make from it is the least important part of the question; because we think that Europe will leave them with their soy butter (*mizou* [miso]), their sauce (*soyo* [shoyu]) and their cheese [tofu]. It is not surprising that people tried to make cheese; the legumine [a kind of protein] which the soybean contains in large proportion, is, as we know, analogous to casein and undergoes the same chemical reactions. By the way, all these products, except the sauce, are detestable to the European palate.

"Next year I shall give an account of the results obtained during three years of trials in the department of Nord" [in far

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northern France on the border with Belgium].

Contains eight tables from earlier publications by other authors.

Note: This is the earliest French-language document seen (April 2012) that uses the word *soyo* to refer to soy sauce. Address: The Younger (*fils*), Civil engineer, manufacturer at Lille, secretary general of the Industrial Society of Nord [a department in northern France] (Ingénieur civil, Manufacturier à Lille, Secretaire général de la Société industrielle du Nord).

628. Atkinson, R.W. 1881. On the diastase of *kôji.* *Proceedings of the Royal Society of London* 32:299-332. May 12. [6 ref]

• ***Summary:*** Read March 10, 1881, by Prof. A.W. Williamson. At the bottom of page 299 Atkinson states: "* I feel that some apology is needed for using the Japanese word *kôji,* but as there is no foreign product in any way resembling it, I have thought that there would be less danger of confusion arising by retaining the Japanese word than by using the word 'malt.' As will be seen from the following description, the nature of this substance is quite different from that of malt, so that the use of that word might lead to erroneous impressions."

"Summary: Section I.–Preparation of the kôji: Mechanical preparation of the rice. Addition of spores of *Eurotium oryzae* (Ahlb.). Growth of mycelium in warm chamber. Rise of temperature during growth sufficient to preserve the temperature of the chamber constant, and, in winter, much above the temperature of the outer air. Temperature of koji itself from 10º to 23º F. above that of the chamber.

"Activity of growth shown by the rapid replacement of oxygen in a confined portion of air by carbonic acid.

"Loss of weight of the rice during the growth of the fungus.

"Section II.–Action of water on kôji: Amount of solid matter dissolved depended upon time and temperature of digestion, and upon the proportion of water used.

"Amount of albuminoids dissolved depended mainly upon the duration of digestion.

"Temperature of greatest change in cold water extract of kôji.

"Section III.–Action of kôji extract upon some carbohydrates: Extract of koji causes inversion of cane-sugar. It also effects the hydration to dextrose of maltose and dextrin. Curve A.

"Extract of koji breaks up the starch molecule into maltose and dextrin; the maltose is quickly hydrated, and the products after some time are dextrin and dextrose.

"Experiments showing the action of koji extract upon starch-paste at various temperatures from 4-10ºC. to 70ºC. Curves B to H.

"Effect of common salt in neutralising the hydrating power of koji extract.

"Section IV.–Change which the rice grain undergoes by the growth of the fungus: It is shown by a comparison of the analyses of rice and koji that the principal change which is to be observed is the conversion of the insoluble albuminoids of rice into the soluble state, and, probably as a result of this, the large increase in the total soluble solid matter.

"It may be desirable before entering upon the preparation and properties of the substance which the Japanese call *kôji,* to mention briefly the uses to which it is put in this country. It is universally employed as a fermenting agent, but it is something differing from such a body as 'barm or yeast,' by which Dr. Hepburn translates koji in his invaluable dictionary. Its principal use is in the production of sake, the alcoholic liquid which is everywhere consumed in Japan. This liquid is prepared from steamed rice by digestion with koji, the diastase of which effects the conversion of the starch into matter capable of being fermented.

Another use to which koji is applied is in bread-making. It is also employed in the manufacture of the famous sauce 'Soy' [sauce], which is likewise a product of fermentation, though its preparation is much more complicated, and has not yet received an explanation.

"In *Nature* (September 10th [sic, 12th], 1878), I gave a very brief account of the mode of producing sake, and about the same time Mr. O. Korschelt read a paper before the German Asiatic Society of Japan giving a detailed description of the process, together with some experiments upon the action of water upon koji. The result of his investigation was that koji acted as a kind of diastase, converting starch into sugar, but he gave no experiments which could serve to identify the product.

In a paper read before the Chemical Society in March, 1880, of which an abstract appears in the *Chemical News,* April 9th, 1880, I gave a series of analyses of the mash, as the result of which the conclusion was drawn that the diastase of koji, unlike that of malt, yields dextrose and dextrin when it acts upon gelatinised starch. The conclusion was correct as referring to the ultimate products, but further experience has shown that the first product is not dextrose, but maltose, which, however, is quickly hydrated to dextrose. Evidence of this will be found in a later part of this paper" (p. 300).

"The Japanese prepare a kind of sweetmeat by the action of malt-extract upon steamed rice or millet, and this product, called *âmé* (*amé*), from the examination of a large number of specimens, was found to contain 68 to 94 per cent. of maltose."

Page 327 notes that Mr. Watanabe is preparing to conduct an investigation into the chemistry of the 'Soy' manufacture. He is aware that "the diastase of *kôji* resembles that of malt in one respect, that its activity is lessened by the presence of certain bodies, such as common salt."

The koji "manufactory" with which Prof. Atkinson is

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most familiar is the one at Yushima, in Tokio [Tokyo]; Mr. Jihei Kameyama is the proprietor. "It consists of a long arched passage, cut in the thick bed of clay which underlies Tokio at a depth below the surface of 15 to 20 feet." In this manufactory, "there are in all four of these underground passages, only one of which is used during the summer, as very little koji is made during that season. The height is rather less than 4 feet, the breadth about 7 or 8 feet, and from the entrance, reached by descending a vertical shaft, it extends about 25 or 30 feet in one direction, then bends off nearly at right angles for about the same distance."

"That the growth of the [koji] fungus takes place with great vigor is shown not only by the rise in temperature, but by the rapidity with which it removes oxygen from the air." The oxygen is replaced by carbonic acid... The rice contained 14.2 per cent. of water and the *kôji* 29.5 per cent; thence 85.8 parts of dried rice yielded 76.35 parts of dry *kôji,* that is, 89 per cent., and thus a loss of weight occurs amounting to 11 per cent. of the dry rice used. This loss consists mainly of starch, which is oxidised to carbonic acid and water..."

The large amounts of carbonic acid formed in the underground koji passages must be removed by ventilation. "The only means adopted of effecting a change of air consists of a square shaft about 8 inches in one direction and 6 inches in the other, leading from the anterior end of the passage into the open air above. It will be evident, therefore, that as the ventilation depends upon the difference of temperature between the inner and the outer air, it will be much better in winter than in summer. In fact it is in the spring and early summer that the [work] stoppages occur." Lacking air, "the growth of the fungus must be much less active, and perhaps this is one reason why the production of *kôji* in the summer is almost abandoned."

"The *kôji* prepared in the manner just described consists of grains of rice bound together in lumps by the interlacing threads of mycelium."

Note 1. This is the earliest English-language document seen (March 2002) with the word *koji* in the title.

Note 2. This is the earliest document seen (March 2002) that mentions diastase in connection with koji. However neither the word "enzyme" nor the word "enzymes" appear in this paper. Address: B.Sc. (Lond.), Prof. of Analytical and Applied Chemistry, Univ. of Tokio, Japan.

629. Raveret-Wattel, C. 1881. Extraits des procés-verbaux des séances de la société. Séance générale du 20 Mai 1881 [Excerpts of verbal proceedings from meetings of the society. General meeting of 20 May 1881]. *Bulletin de la Societe d'Acclimatation* 28:380-93. May. See p. 385-86. [Fre]
• ***Summary:*** A letter to the Society from Eugene Simon states: "In the Feb. 1881 issue of this *Bulletin* there was an article titled *'Le Haé-Téou ou Hei-Teou'* which was excerpted from the *Cultivateur de Saône-et-Loire* [No. 37. 1 Feb. 1881]. Pretending to render under Caesar that which belongs to Caesar, the author attributes to a French missionary, Mr. P. Leboucq, the first French-language reference to this black-seeded variety of *Soja hispida* [the soybean].

"However, I believe that, as early as 1857 or 1858, Monsieur de Montigny shipped us considerable quantities of black soybeans at the same time as he shipped us yellow soybeans. And in any case, I made additional shipments at several intervals in 1861, 1862, and 1863. (Footnote: The first shipment by Mr. de Montigny was as early as 1855. For more details, see the excellent summary by Mr. Paillieux titled "The Soybean at the Society for Acclimatization," published in this Bulletin in 1880, p. 415+).

"I shipped soybeans from Shanghai, from Peking, from Japan, and from Szechuan. My reports to the ministry and probably also to the *Bulletin of the Society for Acclimatization,* who received some from the ministry, would bear witness to this." Address: Secretary of the meetings, France.

630. *Tropical Agriculturist* (*Ceylon*)**.** 1881. New and old tropical products. 1(1):2, 71. June 1. [1 ref]
• ***Summary:*** "From a recent Price Current of Messrs. Lewis & Pat of London, we transcribe a list of products" imported from various parts of the world."

A long table has three columns: (1) Imported from China, Japan and the Eastern Islands. (2) Quality. (3) Quotations. The entry for "Soy" [sauce] gives the quality as "Good" and the quoted price as 1*s.* 10*d.*" [1 shilling 10 pence].

631. *Oesterreichische Monatsschrift fuer den Orient* (*Vienna*)**.** 1881. Zur Verwendung der Soja-Bohne als Nahrungsmittel [The utilization of the soybean as food]. 7(7):119-20. July 15. [2 ref. Ger]
• ***Summary:*** This article is about tofu (*Bohnenkäse*), based on sources published earlier.

632. Van Buren, Thomas Broadhead. 1881. The food of the Japanese people. Yokohama, Japan: Printed at the Japan Gazette. 19 p. No index. 24 cm.
• ***Summary:*** Contents: Introduction (meat eating countries vs. Japan). Cerealia (cereals). Leguminous plants. Tubers and roots. Herbaceous food-plants. Ame. Leading food plants (with Japanese name, scientific name, and parts eaten; incl. kudzu, udo, konnyaku, and daikon). Sauce.

Most civilized people are and always have been meat-eaters. "So universal has meat-eating been among the dominating races that it has become a generally received opinion that animal flesh is a necessity to a well-developed physique. The praises of beef are sung wherever Occidental civilization has penetrated. It is not only a popular belief, it is as accepted scientific opinion, that a considerable percentage of animal flesh must enter into the nourishment of any well-

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fed people."

"The food of Japan, with a population of 36,000,000, or about that of Great Britain and Ireland, engaged in every branch of human industry, presents a complete contrast to all this. Here they are essentially vegetarians, animal flesh being largely prohibited by religion, and its general use made impossible by reason of its comparative scarcity and consequent high price." Until a few years ago, their "isolation prevented the introduction of new food-plants adapted to their climate..."

In Japan there are little more than 1,000,000 head of cattle. Of these, only the cows (not more than 600,000) are eaten; male cattle are used only as beasts of burden. Thus in Japan there are less than 2 head to every 100 people, compared with 73 head in the United States. Of the 36,000 cattle slaughtered last year in Japan, "more than one-half were consumed by foreign residents and the foreign naval and merchant marine. The Japanese army and navy also consume considerable beef. It is therefore safe to say, as I have already intimated, that beef does not enter into the food of the mass of the people to any appreciable extent. Mutton and pork, outside of the treaty ports, are almost unknown. Of barnyard fowls, geese, and ducks there is a large variety. The wildfowl, consisting of pheasants, quail, woodcocks, grouse, ducks and geese are also abundant, but these, as well as eggs, on account of their high prices, can scarcely be said to enter into the diet of the common people at all, except upon rare occasions. Fish is more largely eaten. The variety of fish is very large... A very considerable percentage of the catch is dried." "At present it may be said that one-half the people eat fish every day, one-quarter two or three times a week, and the balance perhaps once or twice a month.

"Even with these exceptions the food of the masses is fully or even more than 90 per cent. vegetable." The Japanese exhibit "endurance of body and power of intellect to a very considerable degree, while deprived of the usual nutriment held to be essential to such developments."

The main cereals of Japan, in descending order of the quantities produced, are rice, barley, millet, rye, and Indian corn. The three main varieties of millet are extensively cultivated and used: First class is *Setaria Italica* (Italian millet). Second class is *Panicum miliaceum* (Indian millet). Third class is *Panicum frumentacum* (Called "hiye" [hie] in Japan).

"Leguminous plants. Perhaps in no country in the world are beans and pease comparatively so extensively cultivated as in Japan. There are more than 40 varieties. That known as the soy-bean is especially important, as it is rich in those nutritive properties which are wanting in rice, and is invaluable in a country where meat is almost entirely lacking in the diet. The composition of this variety, known as Miso-mame, is as follows (table): Water 11.32%. Ash 3.86%. Fat 20.89%. Nitrogenous matter 37.75%. Gluten 2%. Starch and sugar 24.08%. Its "proximate chemical composition approaches more nearly to animal food than any other known vegetable." Tables showing the composition of lean and fat beef are then given for comparison.

"I know it is held by scientists that, while these plants show a great chemical likeness to beef, the action upon the human body is not the same, being much less valuable. I can only repeat that here is a race of people of good physique, of stalwart and well proportioned, although not tall, frames, and of cheerful dispositions, who daily perform tasks requiring great strength and endurance, who eat almost exclusively this vegetable food, and who, without any of the comforts of our western homes, and undergoing extreme exposure unknown to our people, live about the average lives of the laborers of Europe and America, with a table expenditure of about one-sixth or one-seventh that required by the latter."

All classes of Japanese also consume many algæ and other sea plants, including many species of chondrus and Fucus-laminaria. Instead of sugar they use *ame,* "made from malted barley and rice or millet, the malt converting the starch of the rice or millet into dextrine and maltose, and producing the product varying from a thick sugar or honey up to a hard candy. The food value of this article is very great, and, as it is sold at a low price, its consumption is large. A table shows the composition of two grades of *amé,* first and second (cheaper).

Sauce enters very largely into the preparation of Japanese food for the table. The most widely-used kind is made as follows: "'Shoyu,' known to us as 'soy' [sauce], the one almost exclusively employed is made from wheat and the shoyu bean [soy bean] (ground) in equal proportions of one *sho* each (a sho is about 1 quart, 1 pint, and ½ gill). The materials are mixed and boiled, after which the mass is steamed in a basket or box prepared for the purpose, with a perforated bottom. When the steaming process is finished it is put in a cask and left until a green yeast is produced. The compost is then taken with salt water. After standing a good length of time the liquid is strained, and the sauce is ready for use. It has a rather pleasant flavor, and is said to be the basis of most of the renowned sauces [such as Worcestershire] prepared in England. The refuse is fed to cattle."

Note: This is the earliest English-language document seen (April 2012) that uses the term "shoyu bean" (regardless of capitalization) to refer to the soybean.

The last 6 pages (p. 14-18) contain a "List of plants used for food, or from which food is obtained in Japan." They are arranged by families. For each species is given: Botanical name, Japanese name(s), and remarks. Under Leguminocea [sic, Leguminosae], Papilionacea [Papilionaceae], we read: *Glycine soja* (S. & Z.), Tsuru mame; No mame, seeds. *Glycine hispida* (Moench) or *Soja hispida* (Miq.), Omame; daidzu, Soy bean; seeds; many varieties. *Dolichos soja* (L.), Japan pea. *Glycine hispida* f. lanceolata, Midzukugiri.

The section on legumes (p. 15) also discusses: (1)

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Arachis hypogea (L.), Rakkasho, Tojinmame, Ground-nut; earth-nut; fruit. (2) *Vicia faba* (L.), Sora mame, Broad beans; seeds = *Faba vulgaris.* (3) *Pisum sativum* (L.), Yendo [Endo], Pea; seeds; two main varieties; midori yendo [endo] and saya yendo [endo], the latter eaten for the pod. (4) *Pueraria thunbergiana* (Benth.), Kudzu, root, starch = *Dolichos hirsutus* (Th.). (5) *Canavalia incurva* (D.C.), Nata mame, seeds = *Dolichos incurvus* (Th.). (6) *Phaseolus radiatus* (L.), Adzuki-Shôdzu, seeds. *Phaseolus radiatus* var. pendulus (Savatier), Tsuru-adzuki, seeds. *Phaseolus radiatus* var. subtrilobatus (Sav.), Bundo-Yayenari, seeds. (7) *Dolichos umbellatus* (Th.), Sasage, Adzuki-sasage, seeds. (8) *Atylosia subthombea* (Miq.), No-adzuki; Hime-kudzu, seeds.

Note 1. This is the earliest English-language document seen (Jan. 2005) that uses the term "broad beans" (or "broad bean") to refer to *Vicia faba.*

Note 2. This is the earliest English-language document seen (March 2006) that uses the word "Yayenari" (or "Yaye-nari" or "Yaenari" or "Yae-nari") to refer to a variety of azuki beans. Address: United States Consul General of Japan, Kanagawa.

633. *New York Times.* 1881. Editorials [Vegetable food in Japan]. Sept. 10. p. 4, col. 6.

• ***Summary:*** "So universal has meat-eating become among the dominating races, remarks our Consul-General at Yokohama, that the praises of beef are sung wherever Occidental civilization has gone, and it is not only a popular belief, but an accepted scientific opinion, that any well-fed people must use animal food considerably; to have meat to eat frequently is reckoned the best proof that the common laborer in a country is well favored. Japan, with a population of 36,000,000, equal to that of the United Kingdom, engaged in very diversified industry, presents a complete exception to the rule as to food. The scarcity of animal food in consequence of the nonintercourse policy, and its almost unnecessary prohibition by the religious faith, have made a nation of vegetarians, except as to fish, which is not forbidden as 'flesh.'

"There are now in the country hardly more than 1,000,000 cattle; of these, as emasculation is not practiced, the males being used for breeders, only 600,000 cows can be looked to as food, and there are less than 2 head to each 100 people, against 73 head in this country. Of the 36,000 head slaughtered in 1880, the foreign residents and the foreign marine consumed more than half. Outside of the treaty ports mutton and pork are almost unknown; there is an abundance of fowls, both wild and barn-yard, but the common people cannot pay for them. The supply and variety of fish, however, are very large, over 200 kinds being used as food, and the Government is actively working to increase both. Already probably one-half the people eat fish once a day, one-quarter several times a week, and the rest several times a month. Still the food of the masses is more than nine-tenths vegetable, and the list of this has been made long by their necessity-sharpened wits. Of cereals, rice is the most important, occupying more than half the tilled area in the Summer; barley, millet, wheat, rye, and corn rank next in the quantity produced."

"Beans and peas are more extensively cultivated in Japan than anywhere else, and there are over 40 varieties. One–the soy bean or Nirva-mume–contains 20 per cent fat and 60 of nitrogenous matter, starch, and sugar, and closely approaches meat both in composition and in its action on the body. The sweet potato, being very prolific and cheap, ranks next to rice in importance, 16,000,000 bushels being the last reported production... A surprisingly large list of wild plants and sea-weeds is utilized as food. The place of sugar is considerably supplied by a preparation made from millet or rice and malted barley, the starch of the rice or millet being converted by the malt, and the product varying from a thick sugar or honey up to hard candy, being cheap and in large consumption.

"Sauce, so-called, enters very largely into use with food plants; its name is shoyu, known to us as soy [sauce]. The kind almost exclusively used is made from wheat and the shoyu bean ground in equal parts. It is boiled and steamed, then left to ferment; after being then dried in the sun it is allowed to stand awhile in a cask of salt water, is then strained and is ready for use, the refuse being fed to cattle. Its flavor is pleasant, and it is said to be the basis of most of the celebrated sauces put up in England. The proof of the pudding being in the eating, it is interesting to note the testimony that the Japanese–a race of good proportion, physique, and strength, whose comforts are much less and whose exposure is much greater than in case of Western nations–live an average life, in length and health fully up to that of the European or American, with a table expenditure of not more than one-sixth or one seventh that of the latter."

Note 1. Much of this editorial is borrowed from a recently published booklet titled *The Food of the Japanese people,* by Thomas B. Van Buren (1881). However both the meaning and source of the meaningless term *Nirva-mume,* which is said refer to the soy bean, remain a complete mystery.

Note 2. This is the earliest article on soy seen (Aug. 2002) in the *New York Times.* It is also the earliest document seen (Aug. 2002) that is an example of major media coverage of soyfoods in North America.

634. *Gardener's Monthly and Horticulturist.* 1881. The soy bean. 23(275):337. Nov.

• ***Summary:*** "This–the Soja hispida–has been under culture in American gardens ever since Commodore Perry's memorable expedition to Japan. But no one seems to have known the use of it, and so it soon disappears, as, in the usual way of cooking it, any ordinary bean is better. Among Mr. Dreer's Japan collection at the State Fair [probably

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Pennsylvania] we noted that it again appeared, and we are moved to give the following from the Gardener's Chronicle, as showing how to use it:

"'The greatest use to which the plant is put in China and Japan is in the preparation of soy [sauce] and of various kinds of food from the ripe seeds. The manufacture of shoyu, or soy, is thus described in a descriptive catalogue of agricultural products of Japan, exhibited at the late Sydney International Exhibition [Australia; held Oct. 1879]. Equal parts of beans and wheat are used; a small part of the wheat is mixed with koji, which is an alcoholic [sic] preparation from rice, and allowed to ferment; the remainder is roasted, and the beans are also roasted. The roasted beans and wheat are then mixed together with the fermenting wheat, placed in shallow wooden boxes, and kept for some days at a fixed temperature in a warm chamber with thick walls, until the whole mass is covered with fungus. It is very important that the temperature of this chamber should be kept at the proper point. By these processes part of the starch of the wheat is converted into dextrine and sugar, and lactic acid and acetic acid are formed. It is then mixed with salt lye. The mashings are removed to large vats, and kept there for at least twenty months, but more often for three or five years, the better qualities being those that are kept for the longer periods. The best soy is produced by mixing that kept for five years with that kept for three years. After it has been kept a sufficiently long time, it is strained through thick cotton bags, and the residue submitted to pressure. Before filtering, honey is sometimes added. The residue, after pressing, is again mixed with salt and water, and again pressed, the yield being soy of an inferior kind. Sometimes water is added to this second residue, and it is again pressed. The residue first obtained is occasionally used as food, and the last residue as manure. (See *Gardeners' Chronicle,* vol. xiii., new series, pp. 178, 209, 242.)

"'Shoyu, or soy, is a very important condiment; it is mixed with a great many kinds of food, and is produced and consumed in very large quantities. Regarding the use of the soy bean as a vegetable in Japan, the writer of the foregoing remarks on soy says: 'It is the vegetable which approaches nearest in chemical composition to animal food (meat), containing, as it does, one-fifth of its weight of fat, and often two-fifths of nitrogenous matter. It is an extremely valuable adjunct to the food of a people who subsist so largely on a purely vegetable diet, of which the bulk is rice, so rich in heat producers–starch, and poor in flesh formers–albuminoids.'"

635. Penhallow, D.P. 1881. Meiso [Miso]. *Kansas City Review of Science and Industry* 5(7):437-41. Nov.

• ***Summary:*** "It is well known that the Japanese are a rice-eating people, with whom this article, meiso, is perhaps, the most important of all their foods, but it is not so generally known that the flesh of animals could hardly be considered a regular article of food until within the past few years, and even now, with the great mass of the people, meat is seldom used. Thus for centuries, these people have lived almost wholly without that which western people consider so important a source of nitrogen. It seems, however, that the demands of nature were recognized and met by obtaining from the vegetable kingdom what they failed to secure from the animal, and thus it is we find them consuming enormous quantities of beans prepared in a great variety of ways. Some of the important preparations from beans are cheese, or tofu–a white, curdy mass strongly resembling cottage cheese, unflavored with salt, and held in high estimation. It is prepared in a variety of ways, but almost invariably forms a part of every meal as a constituent of soup. Cake–a stiff, jelly-like confection made by straining boiled [azuki] beans and incorporating with a large proportion of sugar. Pickles–beans in the pod and frequently on the stem [edamame], pickled in a strong brine; they are eaten without further preparation. Sugared beans–roasted beans enveloped in a heavy coating of sugar, and sold as a confection. Shoyu, or Soy–a liquid of dark color and salty flavor, made by fermenting a mixture of salt, beans, and roasted wheat or barley. It is largely eaten with fish and rice. There are other modes of preparation which we will pass over with the exception of meiso, which forms the subject of this article.

"The pasty mass manufactured and sold under this name constitutes one of the most important of the preparations from beans, and enters largely into the diet of all classes as a basis for soup, or, in various forms, as a sauce for fish and meat. In composition it consists of:

"Salt–4.5 *to* = 2.30 bushels.

"White [soy] beans–1 *koku* = 5.13 bushels.

"Rice–4 *to* = 2.05 bushels.

"Salt.–The salt employed is of a very crude sort. It is obtained from sea water by evaporation under the influence of solar heat, and as no attempts are made to secure any special degree of purity, it is consequently contaminated with other salt's and its specific value thereby lessened. Sticks, straw–especially from the coarse bags in which it is transported–and dirt are also always to be found, and as no efforts to cleanse or purify, beyond removal of the larger fragments of straw, etc., are made at the factory, the product into which such salt enters has a rather uninviting appearance. It is always used dry.

"Beans.–The ordinary white [soy] beans appear to be used in preference to any others. They are prepared by boiling for about six hours, when the fire is drawn and they are allowed to cool in the boiler. The next morning they are removed from the boiler and placed in mash boxes which measure 10 x 3 x 1 feet, where they are thoroughly reduced and mixed with the rice and salt by means of a round pole used as a pestle.

"Rice.–White rice, or that which has been well cleaned, is soaked in cold water for two days. It is then well drained

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and transferred to a boiler containing fresh water, when it is steamed for three hours. While yet hot, it is taken to a warm room and allowed to remain under the influence of a warm, moist air for four days, when the whole is found to be covered with an abundant growth of fungus.

"The room in which this operation is performed usually measures about 10 x 20 feet, is constructed of mud walls–eight or ten inches in thickness, and is made as close as possible with the exception of one small window to admit light for the workmen, and a door through which to enter. The only moisture in the room is that which comes from the moist rice, but a constant temperature of 80ºF. is maintained by means of a large charcoal fire at each end of the room. It is regarded that a warm, moist air, undisturbed by draughts, is quite essential to the success of the operation, though darkness is not deemed requisite, the absence of windows being more a matter of economy than anything else. The production of the fungus is usually regarded as the critical part of the whole manufacture, and failure sometimes occurs. No reason could be obtained from the Japanese why the subsequent fermentation is dependent upon the presence of the fungus; that its production is an essential part of the process was all the information that could be obtained.

"At the end of four days, the rice is taken out into a large airy room and spread upon straw mats, 3 x 6 feet, and allowed to cool for one and a half hours. It is then transferred to small trays which measure 18 x 8 x 8½ inches, for convenience in handling, when it is allowed to cool as rapidly as it can. Whether the rice now dries or remains moist appears to be a matter of indifference. As soon as thoroughly cooled, it is incorporated with the salt and beans. It is generally customary, however, to prepare the rice in large quantities once in four days, and thus have a stock always on hand. In that case, as soon as cooled, it is mixed with the salt and placed in large storage vats, where it is tamped solid by the feet, and will then keep without trouble for two months.

"When all the ingredients have been thus prepared, they are placed, cold, in the mixing boxes already described, and thoroughly incorporated into a stiff, pasty mass by means of a long mixing rod. This mixture is then placed in large vats having a capacity of about seventeen koku or eighty-seven bushels. Here it is packed solid by the feet and allowed to undergo a very slow fermentation. Every effort is made to keep the temperature of the mass down as low as possible, and if, during the summer, the heal of fermentation gets too great, the whole mass spoils. It is then mixed with roasted wheat and by further fermentation converted into shoyu or soy. Sometimes the mixture fails to ferment properly, when it is taken out and mixed with a fresh portion of beans. The fermentation is allowed to continue six months in summer und eight months in winter, at the end of which time the meiso is ready for the market.

The result of these various operations is a stiff, pasty mixture of repulsive appearance and disagreeably sour odor, and though it would hardly find favor with Americans or Europeans, possibly excepting epicures, it seems to be in great demand with the Japanese.

"The factory where these facts were obtained employs six men, and the annual produce amounts to from 900 to 1,000 *koku,* equal to 4,617 to 5,130 bushels. The cost of the various ingredients and the finished product is as follows: *"

"Beans, 1 *koku*–5.13 bu–6 yen.

"Rice, 1 *koku*–10 yen.

"Salt, 1 *koku*–5.40 yen.

"Total cost of meiso per koku–7.13 yen.

"Market price per koku–13.20 yen.

Footnote (*): "Prices for 1880; probably somewhat higher at present. Yen, gold, is equal to the U.S. dollar." Continued. Address: Prof., late of the Imperial Agricultural College of Japan [Tokyo].

636. Penhallow, D.P. 1881. Meiso [Miso] (Continued–Document part II). *Kansas City Review of Science and Industry* 5(7):437-41. Nov.

• ***Summary:*** Continued: "The mouldy rice, prepared as described, constitutes the yeast of the Japanese, and is used for all the purposes, including bread-baking, for which we would employ ordinary yeast. Its production is, therefore, of considerable importance, as upon it depends the manufacture of meiso, saki (fermented liquor), vinegar, and shoyu. It, therefore, becomes evident that, the principal interest of this entire manufacture centers in the fungus which develops upon the rice, because of the variety of forms which may be developed from its spores under different conditions of warmth and moisture, and also exposure to the air.

"In order to obtain some satisfactory evidence on this interesting subject, the various products–mouldy rice, meiso, yeast, and vinegar–were submitted to microscopical examination. A sample of meiso was taken from a vat where fermentation had been in progress for some time. It was noticed that the temperature was so low that the whole mass felt cold to the hand, and thus whatever fermentation was in progress, must have been going on at a very slow rate. On examination, there appeared numerous spore-like bodies, similar in form and size to the spores from the mouldy rice, which they doubtless were. In addition, there were many short and irregularly branched filaments in all stages of growth from the spore. Nothing was seen which could be called yeast-plant proper, or *S. cerivisiae* [*Saccharomyces cerevisiae*].

"A sample of freshly made vinegar showed the liquid to contain a very large number of spermatia-like bodies, while masses of the true vinegar-plant were also numerous. The cells of these measured one seven-thousandth of an inch in diameter. No true yeast-plant was to be found, though this may possibly have been due to the degree of saccharine exhaustion as well as the low temperature of the fermentation

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A sample of vinegar, containing a good surface growth of the vinegar-plant, was kept for three weeks, in the hope that fruit might appear and thus furnish one more link in the chain of evidence; but none appeared, although the net-work of cells constantly and rapidly increased, and further observations were interrupted by departure for home.

"Yeast made in the ordinary way, but using the mouldy rice to start the ferment, showed the familiar forms of the true yeast-plant. The fungus on the mouldy rice proved to be our old friend *Penicilleum* [*Penicillium*].

"These observations furnish us with a practical illustration of the fact that these vegetable structures of low degree of organization, are not necessarily constant in form and structure, but are liable to vary greatly under different conditions of temperature, moisture, and exposure, and that they are associated with fermentation of varying rapidity as well as with products which are more or "less dissimilar. They furnish one instance of the effect which environment has upon the individual.–*The Kansas City Review* [of Science and Industry. 1881. Vol. 5, No. 7, p. 437-41. Nov.]. Address: Prof., late of the Imperial Agricultural College of Japan [Tokyo].

637. *Tropical Agriculturist* (*Ceylon*). 1881. The soy bean, a new feeding stuff. 1:567. Dec. 1.

• ***Summary:*** This is reprinted from *British Mail* [*Masl*]. "Mr. Wamford [Warnford] Lock has drawn attention to the soy bean of China and Japan, Glycine soya (Soja hispida), sufficiently familiar as the source of the eastern sauce of that name, and affording a valuable oil (bean oil), which is the subject of an article in the new 'Industrial Encyclopaedia.' It is attracting considerable attention among Continental agriculturists, and has recently been experimented on with regard to its value as a food for milch cows and fat cattle. As a forcing food for milch cows, the soy bean is superior to grains; for fat cattle, it is less adapted, and ranks second to grains.

"The plant can be cultivated in Central and Eastern Europe, and similar localities, especially in unfavourable years, when other crops are backward. For growth as a field crop it is recommended to be sown in rows 18 in. apart in the middle of May.

"The qualities of the beans grown in diluvial [deposited by a flood] and alluvial [deposited by running water] soils are shown by the following analyses [alluvial given in parentheses]:–Water 15.20 (19.50), fat 16.21 (17.94), protein 28.63 (25.94), non-nitrogenous extractive matter 30.84 (33.16), fibre 4.38 (4.45), mineral matter 4.74 (8.82).

"The straw or haulm of the plant is practically worthless for neat cattle, but the husks and leaves, mixed with mashed food, or even alone, are readily eaten. It has also been found that the chopped beans, soaked for 12 hours in water containing a little salt, are greedily taken by cattle, and that few pass through undigested.

"According to M. Roman, a French savant, the cultivation of the soja or soya, has of late years been largely developed in Austria-Hungary, Italy, and parts of France. This plant is extensively cultivated by the Chinese, who make a cheese and various dishes from its fruit. When roasted the seeds form an excellent substitute for coffee, and altogether M. Roman thinks that the plant will pay better than the potato. At present the retail price of the soja beans is sixpence per pound, but as the plant becomes more extensively cultivated, they will no doubt be reduced in price."

Note 1. This journal is published by the Dept. of Agriculture, Peradeniya, Ceylon.

Note 2. This is the earliest English-language document seen (Nov. 2012) that uses the term "substitute for coffee" in connection with soy coffee.

Note 3. This is the earliest English-language document seen (Aug. 2003) that uses the word "protein" in connection with soybeans.

638. *Oesterreichische Monatsschrift fuer den Orient* (*Vienna*). 1881. Die japanische Sojabohne als Nahrungsmittel [The Japanese soybean as a source of food]. 7(12):204-05. Dec. 15. [1 ref. Ger]

• ***Summary:*** In the July issue of this periodical was information on the preparation of miso from soybeans. Additional information was sent by Dr. G. Wagener, our correspondent in Tokyo.

Contains a detailed description of how to make miso (miszo). Soybeans are soaked for 12 hours until soft. The water is poured off and the beans are then cooked for 5 hours in fresh water. The thick, viscous, sweet-tasting cooking liquid is filtered off (using a basket) and the beans are mashed underfoot. To each 1.8 liters of beans are added 5.4 liters of koji (made by the fermentation of rice), 5.4 liters of salt, and 1.8 liters of the cooking liquid. The combination is mixed and filled into vats, which are then covered with oiled-paper (*Oelpapier*). This koji miso or white miso is ready after 10 days.

A very delicious red (aka) miso is made without koji. In the countryside, miso is prepared in other ways and can be kept for 7-8 years.

639. Renouard, Alfred. 1881. Compte-rendu des travaux de l'année 1881: Section des sciences appliquées [Report on the work of the year 1881: Section of applied sciences]. *Bulletin Trimestriel de la Societe des Agriculteurs du Nord.* p. 23-24. Solemn meeting of Dec. 18. [Fre]

• ***Summary:*** For a long time, a number of learned societies, among which I must place at the forefront the Society for Acclimatization of Paris, have tried to introduce into France the cultivation of a sort of oil pea (*pois oléagineux*), resembling both the lentil and the haricot, and imported from Japan to Austria under the botanical name of *Soya hispida.*

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According to one of the associate members of our society, Mr. Julius Robert, who resides at Seelowitz, Moravia, this pea gives excellent results in the feed of livestock, and it is also sought after for domestic [human] consumption. Mr. Albert Lapureau wanted to determine its chemical composition; he has noticed in various analyses he has conducted a considerable quantity of nitrogenous materials. Based on their faith in the valuable information about this Dolichos bean (*dolique*) provided by Misters Julius Robert, Corenwinder, and Olivier Lecq, who first occupied themselves with it, as by Mr. Ladureau, a certain number of members of the Society decided to plant soybeans.

The most detailed results were furnished to us on this subject by Mr. Victor De Swarte, treasurer-general of Jura. With a care that denotes all of the benevolent ardor with which our colleague devotes himself to what can be useful to the agriculture of his country, Mr. De Swarte brought back the results obtained from two farmers from Lons le Saulnier, Messrs. Nel and Grant, and he sent us a very interesting communication on these trials. We cannot thank Mr. De Swarte enough, and we encourage him to keep us informed of his further observations on this subject.

Let us again remember here that, according to the opinion of Mr. Robert, confirmed scientifically by our wise colleague Mr. Corenwinder, the soybean grown in our countries, must be cut while still green to be used as forage. [At this stage] the useful principles (*principes* [nutrients]) of the plant have not yet migrated to the seed, and as they remain entirely in the plant, they profit all the more the farmer, who uses it [the soybean plant] to feed his livestock. Address: The Younger (*fils*), Secretary-Archivist [of the Society, France].

640. Bankoku gokuhiden [For all nations, top secret]. 1881. Japan. 126 p., handwritten. Publisher unknown. Japanese summary by Kawakami 1978, p. 129. [Jap]
• ***Summary:*** Contains 90 interesting recipes, including goma-dofu (sesame tofu), tofu umeboshi, aniri tofu, and tofu kamaboko.

641. Henderson, Peter. 1881. Henderson's handbook of plants. New York, NY: Peter Henderson & Co. 412 p. See p. 95, Glycine. Index. 27 cm. [1 ref]
• ***Summary:*** "Glycine: from *glykys* sweet; referring to the taste of the roots of some of the species. *Linn. Diadelphia-Decandria.* Nat. Ord. *Fabaceæ.*

"A small genus, nearly all of which are tender climbing plants, producing axillary flowers, singly or in racemes, white, yellow, or rose; they are only adapted for green-house culture. There is one species, *G. soja,* that is a hardy annual, a native of Japan, that produces seeds like small kidney beans, which the Japanese use in large quantities, either in soup, or in making a sauce called sooja or soy, this sauce being used in many of their dishes. The *Wistaria* was formerly incorrectly called Glycine."

Note 1. This is the earliest document seen (Dec. 2004) by Peter Henderson or his company that mentions the soybean. However, there is no indication that he is selling any of the plants or seeds described in this book.

Note 2. This book is divided into two parts: (1) A description of different plants, listed alphabetically, and (2) a useful "Glossary of botanical and general horticultural terms and practices, with synopses of the natural orders, etc." Includes terms such as: Corolla, dicotyledons, papilionaceous, soil, and sowing. Peter Henderson lived 1822-1890. Written on the title page: "Author of *Gardening for Profit, Practical Floriculture, Gardening for Pleasure,* etc. etc." A description of each book is given on p. 412.

Also discusses: Sesamum. Bene Plant. *S. Orientale,* a native of the East Indies, "is the Bene Plant of our gardens, and of domestic medicine, being used with excellent results in severe cases of dysentery. It is now grown for that purpose in the vicinity of New York and other large cities... In the Southern States and in Africa this species was, and is yet to some extent, considerably grown for the oil the seed yields, which oil will keep many years without acquiring any rancid taste or smell. When first made it is quite heating, and is used as a stimulant; but after two or three years it becomes quite mild, and is used as a salad oil. The seeds are used by the negroes for food, which they prepare in various ways. In Japan, the oil is used as we use butter in cooking." Address: 35 Cortland St., New York.

642. Hepburn, James C. 1881. Japanese-English and English-Japanese dictionary. Abridged by the author. Shanghai & Hongkong: Kelly & Walsh; Yokohama: Kelly & Co.; London: Trübner & Co.; New York: M.D.F. Randolph & Co. vi + 330 + 206 p.
• ***Summary:*** The content of this 1881 abridged edition is identical, page for page, with that of the 1873 abridged edition. The only significant difference is in the publishers: The 1881 edition was published by four different publishers, two of which were in East Asia. The 1873 edition was published only in New York and London. Moreover, the appearance of the text in the 1873 edition is cleaner and sharper than that of the 1881 edition, as if the latter had been stereotyped or photographed from the former. Address: M.D., LL.D.

643. *Memoires et Proces-Verbaux.* 1881. Exrait des Procès-Verbaux des séances de la Société des Amis des Sciences, de l'Industrie et des Arts de la Haute-Loire [Extract of the Oral Proceedings of the meetings of the Society de friends of Science, of Industry and of the Arts of Haute-Loire]. 2:452-53. Meeting of 1 July 1880. M. Aymard presiding. [Fre]
• ***Summary:*** The president calls attention to the journal of Mr. Barral and to a new species of oil pea or soybean (*pois oléagineux, le soja hispida*), a legume appreciated for its

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culinary and forage qualities, and which grows in Japan, the Indies and in the Moluccas. They were planted from April 15 to May 15 and their culture was the same as for haricot beans. The dry plants (*Les fanes*) and the pods of the soybean (*du soja*) make good feed for sheep. In food value, the dry plant closely approaches that of clover. We strongly encourage our agriculturists to cultivate this legume, for they will have a double profit: the seeds which give an excellent dish and, at the same time, a good forage for the sheep. Address: Haute-Loire, France.

644. Phares, David Lewis. 1881. Farmer's book of grasses and other forage plants, for the southern United States. Starkville, Mississippi: Published by the author. J.C. Hill, printer. 148 p. See p. 19. 22 cm.

• ***Summary:*** "Glycine hispida Japan pea: This bean (it is not a pea) came under my observation some twenty-five years ago [i.e. in about 1856], as the Japan Pea. It was then cultivated to a limited extent for a few years; but ceased to attract attention till the close of our civil war; when it was again widely sold as the Southern Relief Pea. The catalogues name it Soja hispida. Though not a climber, it may be the Dolichos Soja, or Soy bean of China and Japan.

"In this country, this bean is probably not esteemed so highly as it should be either for the table or for forage. Few people bring it to the table more than once; for when prepared as other beans it is inedible and disgusting. But when the ripe seeds are soaked from twelve to twenty-four hours they may be cooked so as to afford a most delicious and nutritious dish. The soaking changes the shape of the bean from globose to oblong."

"This is probably the Sooja or Miso of Japan so much used in soups in that country. The soy or sauce made from these seeds is used three times a day, as salt with us, in nearly all dishes. The favorite Chinese curd-like dish, *Teu hu,* also is made of these beans."

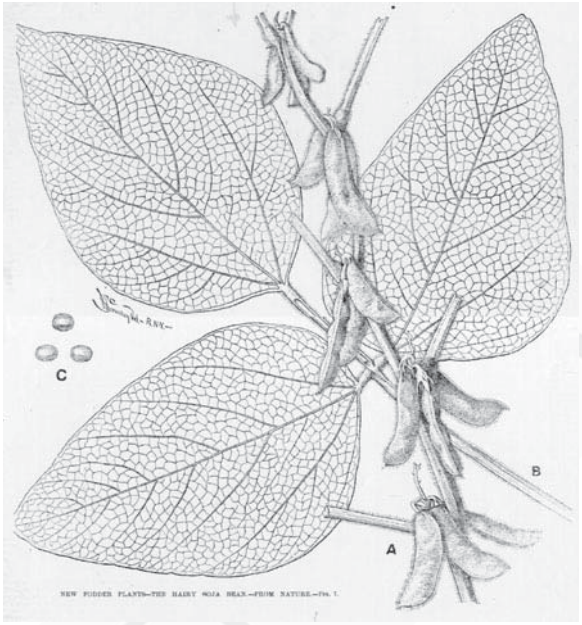
Phares lived 1817-1892. He resided in Mississippi in 1881, and says that he observed soybeans being cultivated in about 1856, but it is not clear that they were being cultivated in Mississippi, either in about 1856 or at the time this letter was written. Later documents (Riley 1909) prove that soybeans were grown in Mississippi as early as 1857.

Note 1. This is the earliest American document seen that uses the term "Glycine hispida" to refer to the soybean.

Note 2. This is the earliest document seen (April 2008) that mentions the soybean in connection with the U.S. Civil War. Address: A.M., M.D., Prof. of Biology, A&M College of Mississippi, Sanitary Commissioner for the State at large of Mississippi.

645. *Rural New-Yorker.* 1882. Notes from the experimental grounds of the Rural New-Yorker [The Hairy Soja Bean]. 41:9-10. Jan. 7.

• ***Summary:*** A large, excellent illustration (line



drawing, by W. Scranton of the *Rural New Yorker*) shows three leaves, several clumps of pods, 3 seeds, and the upper stems of soja bean plant.

"The Hairy Soja Bean ["Hairy" is based on the German term "rauhaarigen"], of which an original sketch is now presented,... was first brought to our notice by Professor Geo. H. Cook of the Rutgers Scientific School of New Brunswick, New Jersey... he says that when in Munich in 1878, he saw the Soja Bean in cultivation as a new crop, and probably a desirable addition to our forage products. It was seen in the grounds of the Bavarian Agricultural Experiment Station, and was in very vigorous growth. The gentleman in charge gave him a few seeds; and seeds of several other varieties of the same plant were procured at Vienna by Mr. James Neilson. Both planted them and gathered crops of the different kinds in 1879. The following is a translation of a part of a paper sent out from the Bavarian Experiment Station to those who were growing and testing the capabilities of the new plant: "Two years ago Professor Haberland [Haberlandt], of Vienna, an untiring botanical experimenter, introduced to us a plant whose pleasant-tasting seeds are rich in albumen and fat in very digestible forms. This plant is the Hairy Soja Bean (Soja hispida, Moench). Professor Haberland found samples of the seed at the Vienna Exposition among the agricultural products of China, Japan, Mongolia, Transcaucasia and India... Its seeds, boiled or roasted, have a pleasant taste, and form an almost daily part of the food in India, China and Japan."

Experiments were made in various parts of Bohemia, Moravia [both in the Czech Republic as of Jan. 1993], Southern Austria, Styria [the capital of Graf in today's Austria], Hungary and Upper Silesia in 1876. The next year 135 trials were made under various climatic influences from the well-ripened seeds from these crops. Professor

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Schwackerhofer, of Vienna, has analyzed the original and the harvested seed, and the Soja straw.

The article then summarizes two articles on soybeans, one from *La Nature* in France (July 1881) and another from *Gardener's Chronicle* in London (18 Sept. 1880).

"Seeds of the Soja Bean were sent to us by Mr. James H. Gregory [seedsman] of Marblehead, Massachusetts, at our request, last winter." The Rural New-Yorker grew them, and concluded: "While the leaves and stems were quite green our cattle eat them with evident relish but the relish was less apparent as they ripened–and they were refused entirely after being cut and dried. From the above test we should never raise the Soja Bean as a fodder plant. Many kinds of the cow-pea, as may be seen from our reports in these columns during 1880, will yield five times the amount of vine and leaves."

646. Grisard, Jules. 1882. Extraits des procés-verbaux des séances de la société. Cinquième section. Séance du 31 Janvier 1882 [Excerpts of verbal proceedings from meetings of the society. Fifth section. Meeting of 31 Jan. 1882]. *Bulletin de la Societe d'Acclimatation* 29:311-14. Jan. [Fre]
• ***Summary:*** Mr. Paillieux, recently elected vice-president of the section, distributes to the members seeds of several vegetables, then gives information about each. There are four varieties of soybeans: "Soya. I spoke about this plant at great length last year. Today I will be brief. I know of only three varieties of soya that can be cultivated in the climate of Paris. I will say a few words about each of these.

"*Le Soya d'Étampes.* The Horticultural Society of Etampes received this variety some years ago from the Society for Acclimatization. Its culture as been succeeded perfectly. It is one of the numerous yellow-seeded varieties that exist in China and Japan. It does not mature early and, most of the time, its pods do not become sufficiently dry in the fields; they require drying in a barn. It is very productive and develops extraordinarily well. Therefore, when it is planted, it must be given more space than other varieties. It is of excellent quality and has been tasted more often than any other variety.

"The green soybean of Japan (*Le Soya vert du Japon*). This variety was introduced 4 years ago by Mr. Dedouvres, who cultivated it with success in Paris. Its chief merit is to produce seeds of a color that are preferred in cuisine.

"The yellow soybean of Hungary (*Soya jaune de Hongrie*). This is a Chinese variety cultivated on a large scale in Austria-Hungary and imported by MM. Vilmorin-Andrieux & Co. This variety (*Ce Soya*) matures earlier than Étampes, and ripens its seeds in the fields in 15 to 21 days less than Étampes. It is not as strong as the Étampes, less well developed, but it occupies less space. Since the yield of the Hungarian soybean is about 25% less than the yield of Étampes, you must plant it on 25% more land to get equal production."

"Today I will distribute to you seeds of the *Soya d'Étampes* and the green soybean of Japan. On March 7, I will distribute seeds of the early soybean of Hungary."

Mr. Paillieux also distributes seeds of *hadaka mugi* (naked barley), *pois de Géorgie* (Georgia peas) and *La courge de Siam* (the gourd of Siam–which is cultivated all over Spain).

Page 314 notes that Mr. Chappellier has grown his crops on a very dry terrain; the soybeans (*les Soya*) have not grown tall here. Mr. Paillieux remarks that if the soil does not possess a certain humidity conducive to prompt germination, the seeds do not give good results. Mr. Millet observes that the grains could be soaked in water. Mr. Paillieux responds that, for the soybean, this method has been employed in Germany, but it offers no advantages. Address: Secretary, France.

647. Penhallow, D.P. 1882. Meiso [Miso]. *Scientific American Supplement* 13(319):5091. Feb. 11.
• ***Summary:*** Originally published in *Kansas City Review of Science and Industry.* 1881 5(7):437-41. Nov. Address: Prof., late of the Imperial Agricultural College of Japan [Tokyo].

648. *Sun* (*The*) (*Baltimore, Maryland*). 1882. Letter from the Pacific Coast (Correspondence of the *Baltimore Sun*) (Letter to the editor). Feb. 13. p. 6.
• ***Summary:*** "San Francisco, Feb. 3, 1882. New plants from China and Japan are being added to the agriculture of California." When the seeds of two valuable trees were sent to California recently by the United States consul-general at Shanghai, these seeds were "distributed freely by the publishers of the *San Francisco Evening Bulletin."*

"Last year the *Bulletin* distributed the Soja beans of Japan, which grow luxuriantly, and which will supersede all other varieties of food for men and animals. For centuries these heavy podded beans have fed the millions of Eastern Asia, and they are now favorite food in Southern Europe. The plant grows shrubby here and three feet high. The pod never drops its beans on the field. No other leguminous plant bears beans of such tasteful, healthy and nutritious qualities, in which the straw participates largely as fattening food for cattle.

"Analysis finds in Soja beans 34½ per cent. of albuminous element and 18¼ per cent. of fat, while horse beans show only 25½ and 1½ per cent., respectively, and maize contains 10½ and 4½ per cent. only. As an alternative crop the Soja bean will prove a blessing and a restorative to the soil here and in all your Southern States, where we predict its speedy introduction."

Note 1. This is the earliest document seen (Oct. 2009) concerning the cultivation of soybeans in California. This document contains the earliest date seen for the cultivation of soybeans in California (1881 or before).

Note 2. Unfortunately, this letter is not signed. The

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writer appears to be closely associated with the *San Francisco Evening Bulletin,* however he could be a special correspondent for the *Baltimore Sun.*

649. Kraevskii, -. ed. 1882. Peterburskago sobranii sel'skikh khoziaev: 16-go fevralia 1882 goda [St. Petersburg meeting of agriculturists: 16 Feb. 1882]. *Golos* (*"Voice"*) (*St. Petersburg, Russia; Newspaper*) No. 72. March 18. p. 5. [Rus]

• ***Summary:*** This full-page article begins: Head of the meeting: "Our colleague, K.A. Skachkov, who is well acquainted with China and its agriculture, will present his report about the soybean and its use in Chinese agriculture."

K.A. Skachkov: He notes the previous mention of soybeans by A.V. Sovetov. Soybeans are considered "new" only in Europe; they have existed for centuries in China and Japan, where they are well documented in monographs on soybeans. He discusses soybeans in northern China (methods of cultivation, climate, yield) and uses of soybeans in China and Japan such as soy sauce (*tsiap yu*), jiang (after processing soybeans to make jiang, which is fermented, the jiang is used to pickle the roots of vegetables which, being well salted, are eaten between meals and called *jiang-tsai*), soybean prices in Russia, and various types of tofu (*age-dofu, yaki-dofu,* etc.). He notes that in China soybeans are not sold in raw form (?), but can be obtained from factories.

After the talk, the head of the meeting asks if there are any questions or comments; various Russian participants (not only Skachkov) answer the questions. First, K.A. Skachkov comments on the preparation of tofu; the "60-day" soybean is best planted during the latter half of June in Russia.

E.I. Ragozin, asks: "What are the practical uses of the soybean for us [in Russia]? How can it be used in our agriculture? Can it be used only as feed for livestock or can it play a more important role? It is very interesting to discuss the theoretical possibilities of soybeans, but in my opinion it would be better to put them to use." A.V. Sovetov replies that, as he has discussed in a previous report, the soybean can be used as both livestock feed and human food. "It is of high nutritional value and contains twice as much nitrogen as meat, but only 18% fat. The answer to the question of how soybeans can be assimilated into Russian agriculture (and how successfully it can be bred here) lies in numerous experiments and trials of actually growing this plant here. Podoba has already proven that it can be grown in the far southern region of Russia (Tavricheskaia), as has Chernoglazov in the Poltavskaia region and Levanda in the Kiev region. However, I do not known how far north soybeans can be grown, although I have heard of trials in the Voronezhkaia region."

A.S. Ermolov: "My cultivation of soybeans in the Voronezhkaia region was not successful. I know that they are not acclimatized to withstand frost." Again A.V. Sovetov replies that soybeans can handle a light spring frost, but an early fall frost kills soybean plants just as it does pea plants. As Podoba reports, it can survive temperatures 2-3ºC below zero. Discusses successful times and temperatures for soybean cultivation.

A.S. Ermolov: "Nevertheless, the soybean plant is fairly easily acclimatized. I talked about this matter with Friedrich Haberlandt, who agrees with me. It is just a matter of obtaining the right varieties."

Head of the meeting: "I would like to add that with time and patience, plants can be gradually acclimatized to almost any environment." A.V. Sovetov, in agreement, adds: Cucumbers and pumpkins, which are warm-weather plants, have been acclimatized to the colder climates of northern Russia. Likewise with beans. E.I. Ragozin adds that he cultivates beans here in the St. Petersburg region.

A.S. Ermolov concludes that soybeans can be cultivated perfectly well in at least *southern* Russia. However, he still questions how soybeans can be used in Russia. None of the other agriculturists at this meeting have told the society how they use the soybeans they grow, so Ermolov suggests listening to the ideas Sovetov has and will present.

A.V. Sovetov: Soybeans can be used to make: Soybean broth, a substitute for beans or peas, soybean potato cakes, a mixture with rice or corn. Soybeans have a very high nutritional value. They can also be used as a feed for livestock, or as food for the army or navy.

Head of the meeting: Difficulties in cultivating this plant should not prevent us from trying.

E.I. Ragozin: Would it be possible for me to obtain and attempt to cultivate the 60-day bean plant? A.V. Sovetov: Of course, but this 60-day bean plant is not a soybean plant, so the previous statements may not apply to it. Head of meeting: Closing remarks.

650. *Bulletin de la Societe d'Acclimatation.* 1882. Extraits des procés-verbaux des séances de la société. Cinquième section. Séance du 7 Mars 1882 [Excerpts of verbal proceedings from meetings of the society. Fifth section. Meeting of 7 March 1882]. 29:376-82. March. [Fre]

• ***Summary:*** Mr. Paillieux distributes to the members who are present seeds of several vegetables, then gives information about each. "2. The Early Soybean of Hungary (*Soya hâtif de Hongrie*). Mr. Vavin observed, apropos of soya, that it is mistaken to name the Soya d'Étampes with this name since it is the Society for Acclimatization which originally supplied the seeds to the Society of Etampes.

"Mr. Paillieux recalled that a note on the usage of the soybean can be found in one of the Bulletins from last year [Feb. 1881, p. 158-60].

"The dishes which can be made from it are very widely consumed in China and Japan. Roasted, it can replace chicory in making coffee."

Mr. Paillieux also distributes seeds of Japanese broad beans (*Sora mame Musaraki* [*Murasaki? = purple*]*;* also

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called horse beans), and Japanese white melon (*Shiro uri*). Address: France.

651. D'Utra, Gustavo. 1882. Soja [Soya]. *Jornal do Agricultor* (*Brazil*) 4(7):185-88. Sept. 16. [Por]
• ***Summary:*** The name of this plant comes from the Japanese. The soybean was cultivated at the Bahia School of Agriculture in 1882. He notes that Soja and Daidsu are Japanese names, that the Japanese use soybeans to make a paste called miso, which can be used as a substitute for butter, and a sauce called sooia or soja, which can be used to season meat.

The Chinese also use the soybean (*a soja, Dolichos sinensis*), also known as the bean of the Indies (*feijao das Indias*) a food known as *kitjap* [soy sauce].

Sr. Dias da Silva Junior (the editor of this journal) has distributed soybean seeds free of charge.

Note 1. This is the earliest document seen (May 2009) concerning soybeans in Brazil or South America, or the cultivation of soybeans in Brazil or South America or Latin America. This document contains the earliest date seen for soybeans in Brazil or South America or Latin America, or the cultivation of soybeans in Brazil or South America or Latin America (1882). The source of these soybeans is unknown.

Note 2. This is the earliest Portuguese-language document seen (April 2012) that uses the word *sooia* or the word *soja* or the word *Kitjap* to refer to soy sauce. Address: Engenheiro-Agronomo, Rio de Janeiro, Brazil.

652. Mene, Édouard. 1882. Des productions végétales du Japon [The vegetable products of Japan]. *Bulletin de la Societe d'Acclimatation* 29:466-90. Sept. See p. 477-90. [40 soy ref. Fre]
• ***Summary:*** This excellent review of earlier publications and work, which is largely about the soybean, contains 40 references to earlier publications, many of them from the *Journal of the Society for Acclimatization* and from early European botanists. Much of the information is taken from earlier issues of this periodical and from the book *Le Japon a l'Exposition universelle de 1878.*

Contents: The soybean (*Soja hispida, O mame: Daizu,* p. 477). The wild soybean (Glycine hispida, Soja hispida, p. 477; it is found in the wild in the coastal regions of the island of Kyûshû. Called *Tsuru-mame* and *Nô-mame* by Franchet and Savatier. Soybeans in the catalog of the Japanese Universal Exposition of 1878: No. 24–The black soybean (*Kuro-mame*), No. 25–The white soybean (*Shiro-mame*), No. 26–The green soybean (*Ao-mame*), No. 37–The black soybean speckled with white (*Gankui-mame*). Where the soybean is cultivated: Not only on the island of Japan, but also in India, on the island of Ceylon, on the Malacca peninsula (i.e., Malay Peninsula), on the Philippine islands, in Borneo, Java, in the Kingdom of Siam, in Cochin China, at Tong-King [Tonkin, formerly in North Vietnam] and throughput China, but mainly in Mongolia and in the provinces of Honan, Shengking [Liaoning], Shantung, and Shansi.

Note 1. This is the earliest document seen (May 2010) concerning soybeans in Malaysia, or the cultivation of soybeans in Malaysia. This document contains the earliest date seen for soybeans in Malaysia, or the cultivation of soybeans in Malaysia (1882). The source of these soybeans is unknown.

Note 2. This is the earliest document seen (May 2010) concerning soybeans in the Philippines, or the cultivation of soybeans in the Philippines. This document contains the earliest date seen for soybeans in the Philippines, or the cultivation of soybeans in the Philippines (1882). The source of these soybeans is unknown.

Note 3. This is the earliest document seen (May 2010) concerning soybeans in Siam (renamed Thailand in 1938), or the cultivation of soybeans in Siam. This document contains the earliest date seen for soybeans in Siam, or the cultivation of soybeans in Siam (1882). The source of these soybeans is unknown.

Note 4. This is the 2nd earliest document seen (May 2010) concerning soybeans in Siam Vietnam, or the cultivation of soybeans in Vietnam. This document contains the 2nd earliest date seen for soybeans in Vietnam, or the cultivation of soybeans in Vietnam (1882). The source of these soybeans is unknown.

The Chinese exposition (class 73) contains samples of all the varieties of soya cultivated in the provinces of the empire: No. 2991 and 3000–Green, white, black, yellow, striped / streaked / variegated (*panachés*), and red soybeans. Source: Chinese customs at Newchwang. No. 3014-3016–Yellow, black, and green soybeans. Source: Customs at Tientsin [Tianjin]. No. 3058 to 3061–Yellow, green and black soybeans., from the customs at Chefoo [Yantai]. No. 3091. Yellow soybeans, from the customs at Chinkiang [Zhenjiang]. No. 3103 to 3109–White, red, black, and yellow soybeans from the customs at Shanghai. No. 2135 to 3128–White, black, red, and green soybeans from the customs at Wenchow [Wenzhou]. No. 3152 to 3156–White, green, and black soybeans from the customs at Takow [Kao-Hsiung].

At the Japanese exposition (class 74, condiments and stimulants) are samples of miso and shoyu from Tokyo and the province of Hizen, especially the town of Nagasaki.

The Chinese exposition also contains in class 74 (condiments and stimulants) samples of soy sauce [*soye, soya*] called *Tsiang-yeou* from the Chinese customs at Chefoo, Ning-po, Wenchow, and Canton. The Chinese often add aroma in the form of star anise, green anise, and orange rind. Chinese soy sauce is made with yellow soybeans called *Houang-téou.*

Descriptions of how to make shoyu, miso, tofu, and soybean oil based on earlier European publications (p. 479-83).

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In France, Mr. Vilmorin and Dr. Adrien Sicard (of Marseilles), both of whom are involved with soybean cultivation, have prepared soy cheese (*fromage de Soja*) numerous times. Dr. Sicard has made both the white cheese and the red cheese; the latter is rolled in a powder made by grinding red sandalwood (*santal; Pterocarpus santalinus*), mace, and cinnamon (p. 482).

In China, quite a few soy oil factories are found at Calfond in Henan, at Tsinan in Shantung, and at Tayeurn in Shanxi. But the center of soy oil production in China is Ning-po in Zhejiang / Chekiang. From the port of Ning-po and from a port on the island of *Tcheou-chan* [*Zhoushan?*] a large number of junks, carrying only soy oil, depart. Two other manufacturing centers are Newchwang and Chefoo (p. 483).

There follows a long section on the introduction and acclimatization of the soybean in Europe (p. 484-89) based on earlier European documents.

The next section, about kudzu (*Pueraria Thunbergiana,* p. 489-90) cites 9 early references, including *Le Japon a l'Exposition universelle de 1878,* vol. II, p. 153). Address: France.

653. *Southland Times* (*Otago, New Zealand*)**.** 1882. Diet of the Japanese. Oct. 6. p. 4.
• ***Summary:*** From: *Phrenological Journal:* This is a summary of an 1879 article by Prof. Edward Kinch, of the Tokio University. "Few natives, except officers in the capital, sailors and soldiers eat beef. Mutton and pork beyond the treaty ports are hardly yet known. About two hundred varieties if fish are eaten, one-half of the people eating fish every day. The food of the masses is 'ninety per cent. vegetable.'"

"The Soybean, which in chemical composition closely approaches animal fibre [sic, flesh], is extensively cultivated. Probably no country excels Japan in the variety of leguminous plants raised for food."

654. Giliaranskii, V.P. 1882. Monografiya Kitaiskago maslichnago gorokha "Soja hispida" [Monograph on Chinese oil-bearing pea plant *Soja hispida*]**.** *Trudy Imperatorskago Vol'nago Ekonomicheskago Obshchestva, St. Petersburg* (*Transactions of the Imperial Free Economic Society*) 3(3):269-71. Nov.; 3(4):435-50. Dec. [10 ref. Rus]
• ***Summary:*** Part I (Nov.): Soybeans were introduced to Russia to increase the country's food production. Discusses the nutritional value of soybeans. Haberlandt introduced the cultivation of soybeans to Europe, and his trials proved that soybeans could be successfully grown in various European countries. However Podoba was the first who practically / experimentally proved the success of soybean in Europe. Podoba also installed a laboratory partner named Fein in southern Russia. The first popularizer was A.V. Sovetov, who initiated further projects and data collection.

Giliaranskii began his work in 1881 when he received 5 soybean seeds from his director, Nikolai Pavlovich Ill'inu, who also allowed Giliaranskii to use his equipment and laboratory. In 1880 the Asian Department of Foreign Ministry (of Russia) obtained soybean samples by demand. In the same year, crop information about soybeans was received from the Consulate.

In the text, Giliaranskii then cites five documents that were helpful to him in compiling this article: (1) Organov, N. 1881. *Soia ili maslichnyi gorokh* (*Soja hispida* *) [Soybean or oil-bearing plant (Soja hispida *)]. *Trudy Imperatorskago Vol'nago Ekonomicheskago Obshchestva, St. Petersburg* (Scholarly Works of the Imperial Free Economical Society 1(2):184-198. Feb.; 1(3):304-325. March). (2) The publications of Dr. Bretschneider, who was on a mission to Peking. (3) La Planta Soja hispida, by Geerts, a report from a mission to Japan. Chapters 3 and 4 from Part 1; Chapters 4 and 5 from Part 2 (translation from French), including much information about soy sauce and miso. (4) The famous book: Haberlandt, Friedrich. 1878. *Die Sojabohne: Ergebnisse der Studien und Versuche ueber die Anbauwuerdigkeit dieser neu einzufuehrenden Culturpflanze* [The soybean: Results of studies and trials on the potential for growing this newly introduced crop plant]. Vienna, Austria-Hungary: Carl Gerold's Sohn. ii + 119 p. (5) *Oesterreichische Monatsschrift für den Orient* (Vienna). 1881. *Die japanische Sojabohne als Nahrungsmittel* [The Japanese soybean as a source of food]. 7(12):204-05. Dec. 15.

Part II (Dec.): Chapter 1. Oil of soybean seeds (*Maslo semian soi*)**.** Bretschneider discusses the taste and use of soybeans in Russia. Karl Brendt is mentioned again. Giliaranskii states: "My yield included 40 *zolotnik* (1 *zolotnik* = 4.26 gm) of oil, produced from the variety of seeds received from Mr. Podoba. The oil was extracted using sulfuric ether. I had about 4 lb of soybeans, which I ground in a coffee mill. Then I immersed the flour in ether in a test tube for 4-5 days. Almost all of the oil was extracted. I also extracted the oil using carbon bisulphide, but the yield was 1.5% less than with sulfuric ether.

"I also tried to extract the oil using petroleum ether, but again the yield was unsatisfactory. In addition, the petroleum ether dissociates from the soybean oil, thus changing the latter's smell and taste. The product known as *rigolen,* which has a boiling point of 35ºC, would be the best solvent of all, it is impossible to obtain in St. Petersburg.

"The oil I extracted using sulfuric ether had a clear, heavy yellow color, similar to olive oil in color and viscosity... however as time passes, under certain conditions, it becomes black in color." Through his experiments, Giliaranskii proved that soybean oil contains nitrogen. Sato and his experiments are mentioned (p. 436-37).

A table (p. 437-38) gives the percentage composition of soybean cake (water, protein, fat, nitrogen-free extract, cellulose, ash), with two columns based on the research

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of Völcker (1872) and J. Küehn (see Pott 1889, p. 490). Soybean oil cakes, known in English as "bean-cakes," are an important export from the port of Newchwang to southern China, especially to Syamou (?). Discusses the price of soybeans.

Chapter 2. Uses of soy sauce (in China, as well as Europe). Methods of preparing soy sauce are described in numerous Chinese and Japanese publications, but also in European publications such as: (1) *Etude pratique du commerce d'exportation de la Chine,* by N. Rondot (1848, Renard, p. 188). (2) *Chinese Commercial Guide,* by W. Williams (1863, Hong Kong, p. 139). (3) Newspaper article by K.A. Skachkov in *Golos* [Voice] (No. 72, 1882). The main ingredients used in making soy sauce are yellow soybeans (*Soja hispida,* Shiro-daizu or Teppo-mamé or Shoyu-mamé), wheat koji, salt, and water. A detailed description of the process is given. Amazake is sometimes added to soy sauce to give variation in the flavor. Kinch's analysis of Geerts' data (p. 443) gives the relative density of soy sauce as 1.199. The density of soy sauce solids is 359.88 gm/liter. A table (p. 443) gives the density (in gm/liter) of soy sauce constituents as follows: Ash 195.16. Sugars 31.03. Albumen 41.00. Acids 6.20.

Chapter 3. Sauce *miso* or *dai-dzu-ko.* Describes seven different types of Japanese miso and how each is made: 1. Original miso or *shiro miso*–white with little salt. 2. *Chu-miso*–very salty. 3. *Aka-miso*–red, prepared with koji. 4. *Nagoya-miso.* 5. *Kinzanji-miso*–made with soybeans, eggplant and gingerroot. 6. *Mugi-miso*–made with barley and soybeans. 7. *Kogane-miso*–a type of *aka-miso.* A table (p. 445) compares the nutritional composition of *shiro-miso* and *aka-miso.*

Chapter 4. Tofu. Chinese name: doufu. English name: bean-curd. Japanese name: tofu. Yellow soybean varieties (*Gogwatsu-mamé, Wase-mamé,* and *Natsu-mamé*) are widely used in Japan to make tofu. A table (p. 447-48) gives the percentage composition of tofu, with two columns based on the research of Kinch (1880) and Geerts (1876). Tofu is seen as an excellent alternative for dairy cheeses.

Chapter 5. Preparation and composition of dried-frozen tofu (kori-tofu) and other types of tofu (dried cheeses). A table gives the nutritional composition of kori-tofu (based on Kinch 1880). Also discusses *agé-tofu, abura-tofu,* and yuba. Describes the method for preparing yuba, which is eaten in soups in Japan. Several tables were summarized by Nikitin in Russian (1900) and German (1901).

Note: This is the earliest Russian-language document seen (Oct. 2012) that mentions yuba. Address: USSR.

655. Kinch, Edward. 1882. Die Sojabohne [The soybean]. *Biedermann's Central-Blatt fuer Agrikulturchemie* 11:753-55. Nov. [Ger]

• ***Summary:*** According to Watt (1890, p. 511): "In 1882, Professor Kinch urged the advisability of renewed efforts [to grow soya] in the Himalayan tracts, and, as a consequence, the government of India directed the attention of local officials to the subject. Seed obtained from the Government Gardens, Saharanpur, were distributed to Madras, the Panjab, Bengal, Bombay, Hyderabad, and Burma, for experimental cultivation. It appears to have been grown from seed obtained from China with a fair amount of success at the Saidapet Experimental Farm in 1882."

"The chemical composition of the bean, according to Professor Kinch, places it above all other pulses as an albuminous food, while that of the straw also surpasses in nitrogen value that of wheat, lentils, and even hay."

Table 1 gives original analyses of the nutritional composition of various soybeans, including: from Japan, pale/colorless from China, yellow from Germany, from India, brown, round black, and oblong black soybeans.

"The average composition of the straw, the pods, and of a type of soybean straw from Japan, which are used as very tasty feeds for horses, cows, and sheep" are given in table 2.

Table 3 gives the nutritional analyses of various soybean products: White miso, red miso, Tofu or *Bohnenkäse,* frozen tofu (*gefrorener Bohnenkäse*), and soybean cake (*Sojabohnenkuchen*) which remains after pressing out the oil (*Abpressen des Oels*).

Table 4 shows the percentage composition of nine different mineral salts in the ash of soybean seeds and straw.

Note 1. This may be the 2nd earliest document seen (May. 2010) concerning soybeans in Burma. It seems likely that soybeans were cultivated in Burma at that time, but that is not certain. This document may contain the 2nd earliest date seen for soybeans in Burma (1882).

Note 2. This may be the second earliest document seen (Oct. 2010) concerning soybeans in Pakistan, however that is not certain. The nation of Pakistan was created out of British India in 1947. In 1882 Panjab (Punjab) was a province in British India. It was divided in Aug. 1947 into East Punjab, India (with about 1/3 the area and ½ the population of the original province), and West Punjab, Pakistan. West Punjab was renamed simply Punjab and is now one of Pakistan's four provinces; its capital is Lahore.

Note 3. This is the earliest German-language document seen (April 2013) that mentions dried-frozen tofu, which it calls "gefrorener Bohnenkäse." Address: Professor, Cirencester, England.

656. Paillieux, Auguste. 1882. Yaye nari.–*Phaseolus radiatus* L. [Azuki bean, or Yaye nari]. *Bulletin de la Societe d'Acclimatation* 29:641. Nov. [Fre]

• ***Summary:*** Mr. Paillieux, vice-president of the Society, is presiding at the meeting on 6 June 1882. He offers the members present the seeds of various edible plants, about which he gives the following information: "The Yaye nari belongs to a race of beans which are very esteemed in Japan and which bear the name Azuki, *Phaseolus radiatus* of

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Linnaeus. The varieties of Azuki are numerous. I cultivate the summer (*Natsu*) azuki, which is early and red. I have given up on the autumn (*Aki*) azuki, which is late. This spring, for the first time, I planted the white (*Shiro*) azuki.

To these names one must add those cited by the Japanese author of *Japan at the Universal Exposition of 1878,* that is to say the Hine [Hime] no azuki, Dai nagon [Dainagon] azuki, and the Yaye nari. *An,* a sweetened bean paste widely employed in confectionery, is made with the azuki and sugar, The cake or confection named *yokan,* according to several authors, is also made with the azuki. Azuki flour is also used to remove fat or grease from fabrics.

"I have eaten a puree of summer azuki and I found it very delicious. It does not have a flavor like our Haricot beans, but more like a mixture of Haricots and lentils.

"I received from my helpful correspondent a sweetened dish named *yokan,* and I had some prepared for me by Mr. Mamoz. It is rather tasty, and it could be a popular confectionery product if it could be sold at a low price, however sugar is very expensive in France.

"I have not yet tasted the Yaye nari, of which I present some seeds to you today. Last year I planted only a few bunches, but the importance of its culture in Japan and China is without doubt. Seeds have been sent to M. Vilmorin Andrieux and Co., and to Mr. Faivre, of Beaune. It seems to mature earlier than the summer azuki. I believe therefore that it is now time to plant the seeds I am offering to you. I would be very grateful if you would let me know next year what results you obtained.

"I would like to take this occasion to say several words about an operation that is very widely used in Japan and in China. I believe it is applied to both the soybean and to the azuki.

"Be that as it may, in Japan, the azuki is soaked in water and then allowed to sprout (*fait germer*), in a warm dark place, in earthenware vessels. Then they are washed with a large quantity of water to remove the seed coats, and [the sprouts] are consumed under the name of Moyashi ("eye and legs"). It goes without saying that one cooks them first in salted water and then in shoyu. They are rather tasty, and this is an easy way to provide a fresh vegetable in winter.

"I am indebted for this information to Dr. Hénon, Abbot David and Abbot Perny, and of course Mr. Eugène Simon; they have told me that the etiolation of germinating seeds is widely practiced in China and yields a good food." Address: France.

657. Mason, Francis. 1882-1883. Burma, its people and productions: or, Notes on the fauna, flora, and minerals of Tenasserim, Pegu, and Burma. 2 vols. Rewritten and enlarged by W. Theobald. Hertford, England: Published by order of the Chief Commissioner of British Burma, by S. Austin & Sons. 19 cm.

• ***Summary:*** The previous edition of this work was published in 1860. This edition is greatly enlarged and expanded. In Volume II (published in 1883), on page 513, in the section on Leguminosae, under *Glycine* we read that *Glycine soja* is cultivated in Ava. "Erect. Flowers in small axillary clusters. Pods 1-1½ in. long, almost falcate. Seeds 3 lines long, slightly compressed, pale-coloured.

"The word 'soja' is a variation of the Japanese 'soya,' whence our word 'Soy,' for a sauce prepared in China and Japan from the seeds of one or more species of *Dolichos* or allied genera."

Note 1. Pickering (1879, p. 763) states: "Westward, S. hispida was observed by Mason in Burmah."

Note 2. This is the earliest document seen (May 2010) that clearly refers to soybeans in Burma or the cultivation of soybeans in Burma. This document contains the earliest clear date seen for soybeans in Burma or for the cultivation of soybeans in Burma (1883). The source of these soybeans is unknown.

Note 3. Ava is a ruined city on the Irrawaddy River, in Sagaing division, 6 miles southwest of Mandalay. Founded in the 14th century, it was the capital of Burma for 400 years. In 1783 it was replaced by Amarapura, but was again the capital from 1823 to 1837.

Ground nuts (*Arachis hypogæa*) [peanuts] are mentioned under "Order Leguminosae" (p. 491). The Burmese name is given as Mye-leh. "Indigenous to South America, but cultivated all over the East for its edible kernels and the oil extracted from them, which is excellent" (p. 500). In the index of vernacular names of Burmese plants, the name of the peanut is given as "Myeh-peh" (p. 713). Address: Rev. D.D., M.R.A.S.

658. Bretschneider, Emil V. 1882. Botanicon sinicum. Notes on Chinese botany from native and Western sources. I. *J. of the Royal Asiatic Society, North China Branch. Series 2.* 16:18-230. For the year 1881. [1882* ref. Eng]

• ***Summary:*** The single most important early work on Chinese botany written by a Westerner. Bretschneider, an M.D., lived 1833-1901. Contents: Preliminary Notices (p. 18-22). 1. Contribution towards a history of the development of botanical knowledge among eastern Asiatic nations: Chinese literature on materia medica and botany (p. 22-75, incl. the Materia Medica of Shen Nung, p. 26-32), Chinese works on agriculture (p. 75-86). Chinese geographical works containing botanical information (p. 86-92). Early acquaintance of the Chinese with Indian and Western Asiatic plants (p. 92-95). History of materia medica and botany in Japan (p. 96-101). On the botanical knowledge of Coreans [Koreans], Manchoos [Manchus], Mongols, and Tibetans (p. 101-05).

2. On the scientific determination of the plants mentioned in Chinese books (p. 105+, incl. Cleyer, Siebold, and Kaempfer, p. 124-27). 3. Alphabetical list of Chinese works (p. 131-216). Index of Chinese authors (p. 217-22).

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Celebrated mountains of China (p. 223-28).

Concerning Shen nung, "Chinese works on agriculture" (p. 75) states: "The primeval Emperor *Shen nung,* whom the Chinese believe to have composed the first treatise on Materia medica, is also credited with having laid the foundation of Chinese Husbandry. His name implies this tradition, for Shen nung means: the Divine Husbandman. It is related in the early records that the people of his age were rude and wholly unacquainted with the advantages of agriculture. They subsisted on fruit, vegetables, and the flesh of birds and beasts. Shen nung examined first the quality of the soil, fashioned timber into ploughs and taught the people how to till the ground and raise grain. On a previous page I referred to the mountain in Shan si, where tradition makes him first teach his people the fundamental processes of agriculture. Sz' ma Ts'ien [Ssu-ma Ch'ien] (B.C. 163-85) records in the *Shi ki* [*Shih chi; Historical records*] (book 1) that Shen nung sowed the five kinds [of cereals]."

In the section on the work of early Europeans who studied the flora of East Asia, the following researchers are discussed in detail: Cleyer (p. 124), Kaempfer (p. 125-26), Thunberg (p. 126), Siebold (p. 126-27), Miquel and Zuccarini (p. 127), Hoffman and Schultes (p. 127-28), Dan. Hanbury (p. 128), O. Debeaux (p. 128), Dr. Fr. Porter Smith (p. 128-29), and P. Perny (p. 130; very critical). Address: China.

659. Bretschneider, Emil V. 1882. Botanicon sinicum. Notes on Chinese botany from native and Western sources. I. Andreas Cleyer and Engelberth [Englebert] Kaempfer (Document part). *J. of the Royal Asiatic Society, North China Branch. Series 2.* 16:18-230. For the year 1881. See p. 125-26. [1 ref. Eng]

• ***Summary:*** "The first attempt of a European to study the Flora of Japan was made by Andreas Cleyer, a German, who visited Yeddo in 1683 as envoy of the Dutch East-India Company, and who resided in Nagasaki as chief supercargo [in charge of the commercial concerns] of the Dutch factory till 1686. His letters on Japanese plants addressed to Dr. Mentzel have been published in the *Academiæ naturæ curiosorum Ephemerides,* 1686-1700. Cleyer's descriptions as well as the drawings appended have little value."

In the Royal Library at Berlin Bretschneider saw Cleyer's drawings as well as "another volume entitled *Cleyer's Flora Japonica,* containing only 101 coloured drawings of Japanese plants, apparently painted from nature in Japan by Cleyer's order. These have more claim to botanical correctness. Cleyer has himself added some memoranda. The names are given in Japanese letters only. This volume was referred to Dr. Siebold, who in 1856 drew up an Index of the drawings and added the scientific botanical names.

Note: Cleyer's diary was published in German in 1985 under the title *Tagebuch des Kontors zu Nagasaki auf der Insel Deshima, 20 Oktober 1682–5 November 1683,* edited by Eva. S. Kraft.

"A few years after Cleyer had left Japan, another German, an able explorer and botanist, arrived in that country and spent about two years there. Engelberth [Englebert] Kaempfer was born in 1651 at Lemgo (Lippe-Detmold). In 1683 he accompanied a Swedish Embassy to Persia as secretary, but on its return he separated from it and proceeded to the Persian Gulf, where a Dutch fleet was stationed at that time. In 1685 he entered the service of the Dutch East-India Company as a surgeon, and arrived at Batavia [later renamed Jakarta, Indonesia] in 1689. In the following year a Dutch squadron was sent out to Siam and Japan, and Kaempfer was of the party. On the 22nd September 1690 he reached Nagasaki. He had two opportunities of visiting Yeddo, performing the journey thither partly by the overland road, partly by sea. His first stay in Yeddo lasted from March 13 to April 5, 1691; the second from March 31 to April 29, 1692. He left Japan in the same year, returned to Europe in 1694, and died in 1716 in his native country. For further biographical details regarding Kaempfer see Rosny's "Variétés orientales," 1872, p. 98, where an interesting account of his life and scientific works is found. Kaempfer was not only a skillful botanist, but an acute observer in general. He has connected his name imperishably with the history of botanical discoveries in Japan, and the accounts he noted down with respect to the Japanese Empire and other countries he visited will always stand as a model of accurate and judicious information and keen observation. In 1712 he brought out his *Amoenitates Exocticae.* The second fasciculus [fascicle] (p. 466) contains an account of the plants from which paper is manufactured in Japan; in the third fasciculus (p. 605) a treatise on the Tea-shrub is found. Besides this the whole of the fifth fasciculus (p. 707-912) is devoted to the description of more than 500 species of Japanese plants, 31 of which are represented by excellent drawings. The Japanese names of the plants are always given, and Chinese names in Chinese characters are generally added. Although these characters are often wrongly or indistinctly printed, there is no difficulty in deciphering them. Kaempfer's botanical descriptions are generally faithful, in some instances much detailed.

"The Amoenitates Exoticae represents only a small portion of Kaempfer's labours. After his death all his unpublished manuscripts as well as his herbarium, namely the plants collected in Japan and his drawings of Japanese plants, were purchased by Hans Sloane, the well-known collector and promoter of science, whose immense collection subsequently gave origin to the British Museum. In 1727 Kaempfer's valuable *History of Japan,* etc. was published in English, translated from his original (Dutch) manuscript. In 1791 Sir J. Banks edited a volume with the title: *Icones selector plantarum quas in Japonia collegit et delineavit E. Kaempfer, ex archtyp, in Museo Britannico asservatis.* It

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contains 50 plates." Address: China.

660. Bretschneider, Emil V. 1882. Botanicon sinicum. Notes on Chinese botany from native and Western sources. I. C.P. Thunberg (Document part). *J. of the Royal Asiatic Society, North China Branch. Series 2.* 16:18-230. For the year 1881. See p. 126. [1 ref. Eng]
• ***Summary:*** After describing the pioneering botanical work of Englebert Kaempfer in Japan, Bretschneider continues: "After Kaempfer the first botanist to visit Japan was C.P. Thunberg, a Swede, born in 1743, died in 1822. He landed at Nagasaki in 1775, and on the 4th of March of 1776 proceeded by the overland route to Yeddo, where he arrived on the 30th of June. As the fruit of the botanical collections made during his stay in Japan he published in 1784 his *Flora japonica,* 50 plates. I have seen in St. Petersburg [Russia] another unpublished volume of drawings representing Japanese plants, executed from nature by order of Thunberg. As a scientific botanical nomenclature did not exist at the time when Kaempfer wrote, Thunberg tried to name those Japanese plants described in the Amoenitates exoticae, which had not been previously determined and named by Linæus, and to identify the native names mentioned by Kaempfer." Address: China.

661. Bretschneider, Emil V. 1882. Botanicon sinicum. Notes on Chinese botany from native and Western sources. I. Philipp Franz von Siebold (Document part). *J. of the Royal Asiatic Society, North China Branch. Series 2.* 16:18-230. For the year 1881. See p. 126-27. [1 ref. Eng]
• ***Summary:*** After describing the pioneering botanical work of Englebert Kaempfer and C.P. Thunberg in Japan, Bretschneider continues: "Much more was done in this respect by Dr. Siebold, the well-known and ardent explorer of Japan.–Ph. Fr. v. Siebold, a German, was born in 1796 in Wuerzburg. After having studied medicine and natural sciences he went to Holland, and entering the service of the Dutch East-India Company, set out for Batavia, where he arrived in 1822. The next year he was sent as a physician and naturalist to Japan. He lived several years in the Dutch Factory at Decima [Deshima] (Nagasaki). In 1826 he had an opportunity of visiting Yeddo [Edo, today's Tokyo]. As the Japanese government suspected him of being in possession of a map of Japan, he was obliged to leave the country in 1830, and returned to Europe, where he employed himself for several years in publishing the results of his researches in Japan. In 1859 he went again to that country, where he lived till 1862. He died at Munich in 1866.

"Siebold had forwarded one portion of his vast botanical collections accumulated in Japan to Prof. C.L. Blume in Java, who described some of these plants in the *Museum botanicum Lugduno-Batavorum,* 1849-51. H. Zollinger published a few years later an Index of Siebold's plants in the Java Herbarium (Buitenzorg). The greater part of his dried plants, however, had been transmitted by Siebold to the Museum of Leyden, and from these materials Prof. Miquel compiled his *Prolusio Florae japonicae* [*Prolusio florae Iaponicae*], 1865-67.

"Siebold himself, with the assistance of Prof. J.G. Zuccarini of Munich, had commenced much earlier to describe his Japanese botanical collections, but their publications were left in a fragmentary state. The most interesting of them is the *Flora japonica,* sive plantæ quas in Imperio Japonico collegit, descripsit, ex parte in ipsis locis pingendas curavit Dr. Ph. Fr. de Siebold, digessit Dr. Zuccarini, 1835-1844, 127 plates. Miquel attempted to continue this iconographical work and published, from 1868-1870, 23 additional plates.* The original drawings to which Siebold alludes on the title pages (about 600) have been purchased, together with a set of Siebold's dried Japanese plants, from his widow, by the Academy of St. Petersburg [Russia]. The drawings form eight large volumes and are beautifully executed.

"Siebold always tried to ascertain the Japanese names of the plants he gathered, and also noted down the Chinese characters applied in Japan to these plants. He was assisted in this task by native botanists, and we can, I think, assume that his identifications are quite reliable."

Footnote: *"I know only the 127 plates published by Siebold and Zuccarini. Franchet and Savatier, *Enum. plant. Japon.* [*Enumeratio Plantarum in Japonia sponte crescentium...*], Pref. XIII, state that in all 175 of these plates have been published, but in the second vol. p. 665 that authors assign to Flora japonica 150 plates only." Address: China.

662. Bretschneider, Emil V. 1882. Botanicon sinicum. Notes on Chinese botany from native and Western sources [Part I]. London: Trübner & Co. 228 p. No index. 28 cm. [1882* ref. Eng]
• ***Summary:*** The contents of this book was first published in 1882 as an article in the *Journal of the Royal Asiatic Society, North China Branch.* (Vol. XVI, 1881; Article III). Series 2. The contents and pagination of this book is the same as the original article (which see). Address: M.D., Physician of the Russian Legation at Peking, China.

663. Greey, Edward. 1882. Young Americans in Japan: or, The adventures of the Jewett family and their friend Oto Nambo. Boston, Massachusetts: Lee and Shepard Publishers. xiii + 372 p. See p. 49. Illust.
• ***Summary:*** Chapter 3, titled "Nagasaki by night" states (p. 49): "After a brief delay, a number of servants entered, bearing *zen* (low tables) filled with dishes of food, which they set before each of the party. When the covers were removed the attendants retired, and, the Professor having asked a blessing, Oto said, -

"'You will find this bean-soup [miso soup] nice; the

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lumps in it are pieces of fish. That clear white food is raw carp; it is very good. The boiled fish is also excellent. The vegetables are potatoes, turnips, and mushrooms.'"

In Chapter 20, "Japanese New Year's festivities" we read (p. 358-59): "'My gracious! What is this about?' cried Sallie, pointing to a kakemono representing a man throwing something at two hideous demons, while in the background Dai-koku and Yebisu [Ebisu] were enjoying a bowl of hot *saké.*

"'Ah!' exclaimed the old gentleman. 'That is a picture of a ceremony we call *Oniwa soto* (expelling the demons). You must know that to-day is termed *Toshi koshi* (passing away of the year). I performed a similar ceremony this evening, just before you arrived.'

"'Please, tell us all about it,' said Sallie.

"Mr. Nambo smiled and continued, -

"'I roasted some [soy] beans, mixed them with some broken charcoal, brick and potsherd, and put the mixture in a rice *masu* (two-quart measure [square wooden measuring box]), then I dressed myself in my old ceremonial robes, took a *sambo* in my left hand, placed the *masu* on it and bade my youngest male servant follow me with a broom. We first entered my sleeping-room and closed the door to within an inch or so, then I threw a handful of the broken stuff to the ceiling and cried, *'Fukuwa uchi oniwa soto.'* (Good fortune come in, bad go out)."

"'What jolly fun!' exclaimed Fitz. 'Well?'

"'The ceremony is not a joke,' gently observed Mrs. Nambo."

"'After I had made the adjuration, my servant shouted: *'Gomotomu osaye mashu'* (You are quite right). Saying which, he slapped his broom on the floor as though driving out the demons. When I had cried and he answered me thrice, we retired to the next room, carefully closing the door of my chamber behind us. We visited each apartment and repeated the ceremony, then I threw what remained in the *masu* at the demons who were skulking about the veranda.'"

Note: The author was a member of the first American expedition to Japan; he later landed and traveled in Japan. "This book describes the adventures of an American family and a young Japanese who has been educated in the States. They land at Nagasaki,..." and travel to Tokio. "The story, though essentially a work of fiction, is founded on facts that have come under my personal observation,..." The book contains 171 illustrations. Address: Author, Manchester-by-the-Sea, Massachusetts.

664. Ministry of Agriculture and Commerce, Farm Bureau (Nôshômushô Nômukyoku); Nôshômu-sho, Sanrin-kyoku, Japan. 1882. Beibaku daizu tabako natane sanrin kyôshinkai hôkoku [A report of the united association of promoting rice, barley, soybean, tobacco, rapeseed, and forest products]. Tokyo: Nômu-kyoku. 151 p. 21 cm. [Jap]
Address: Japan.

665. Spon, Edward N.; Spon, Francis N. 1882. Spons' encyclopaedia of the industrial arts, manufactures, and commercial products. Vol. 4: Bean-oil. London and New York: E. & F.N. Spon. p. 1153-1536. See p. 1378. Edited by Charles G. Warnford Lock.

• ***Summary:*** The section titled "Oils and fatty substances" begins (p. 1360) by noting that in everyday language the word "oil" is often "made to embrace three distinct classes of bodies:–(a) 'fixed' or 'fatty' oils, (b) 'volatile' and 'essential' oils, and (c) 'petroleum' and other 'mineral' oils... The term 'fat' is applied to these oils when they are in a solid state; thus the same product may be an 'oil' in one climate, and a 'fat' in another."

In the section on "Vegetable oils and fats [A. Fatty or fixed]" we read (p. 1377-78): "Bean oil.–The seeds of the Chinese oil-bean, the *sooja* or *miso* of the Japanese (*Glycine Soja* [*Soja hispida*]) afford 17-18 per cent. of a fatty oil. The plant is shrubby, attaining a height of 3-4 ft., and resembling the common dwarf kidney or French bean. The seeds are somewhat smaller than French beans, and vary in colour, from white to yellow and green. The plant is chiefly cultivated in the north of China, especially in the province of Shantung. The Chinese usually obtain 17 per cent. of oil from the seeds by simple pressure. The oil bears a general analogy to the ordinary edible oils of commerce, possessing an agreeable flavour and odour. It is useful for burning; exposed to a low temperature it becomes pasty, and oxidizes rapidly on exposure to the air. As a drying oil, it might replace linseed for some purposes. As an illuminator, it is being rapidly replaced by American petroleum, but is still extensively used for food. The oil, the cake left after expression of the oil, and the beans themselves, are important articles of Chinese commerce.

"The exports from Chefoo in 1878 were 2468½ *piculs* (of 133.3 lb each) of bean-oil, 994,188 of bean-cake, and 160,549 1/3 of beans; in 1870, the exports of the oil from this port were 44,530 *piculs;* in 1877 only 327 *piculs;* and in 1879, 1491 *piculs.* The exports of bean-oil from Newchwang were 4947 *piculs* in 1877, 3287¼ in 1878, and 11,630 in 1879; of beans, in the same years, 1,439,062, 2,156,064, and 1,835,444 *piculs* respectively; and of bean-cake, 792,166, 1,924,968, and 1,800,523 *piculs.* Chinkiang exported 69,090 *piculs* of beans in 1877, and 43,784 in 1879. Hankow imported 21,077 3/4 *piculs* of native bean-oil, value 15,624*l.* [British pounds sterling], in 1879. Kiukiang, in 1879, imported 17,675 *piculs.* Shanghai, in 1879, imported 282¼ *piculs* from native ports, and exported 33,940 *piculs* (besides 372 re-exports) to native ports. Wuhu imports quantities of the oil from Hohan, via Hankow, also from Hochow, Luchowfu, and some other places north of the [Yangtze] river; the figures were, 659½ *piculs* in 1877, 13,574¼ in 1878, and 5284 in 1879. The cake is used for human and cattle food, and as manure. (See also Spices–Soy.) The

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plant is cultivated for its beans in many parts of India and the Archipelago; and has been successfully introduced into Austro-Hungary and N. Germany."

Note 1. This is the earliest English-language document seen (Nov. 1999) with any term referring to the oil of the soybean in the title.

Note 2. This is the earliest document seen (Oct. 2001) containing industry or market statistics on soybean crushing, including production and trade of soybean oil, meal or cake.

Note 3. This is the earliest document seen (Oct. 2001) containing industry or market statistics on production or trade of soybeans.

Vol. 4 also discusses: Under narcotics–Hemp (bhang, charas, ganja, hashish; p. 1305-07). Under "Oils and fatty substances: Vegetable oils and fats"–Almond oil (p. 1377). Hempseed oil (p. 1391). Linseed oil (p. 1393-94). Miscellaneous and unenumerated oils–*Cyperus esculentus* (p. 1413-14). Under animal oils and fats–Butterine, bosch, oleomargarine, or artificial butter (p. 1362-63, 1464-66). Bibliography of oils (p. 1483-84).

Note: This is the earliest English-language document seen (Aug. 2013) that contains the term "Hempseed oil" (regardless of capitalization) written just like this. Address: England.

666. Spon, Edward N.; Spon, Francis N. 1882. Spons' encyclopaedia of the industrial arts, manufactures, and commercial products. Vol. 5: Soy. London and New York: E. & F.N. Spon. p. 1537-2142. See p. 1814. Edited by Charles G. Warnford Lock.

• ***Summary:*** In the section titled "Spices and condiments" we read: "Soy.–This useful condiment [soy sauce], said to form the basis of almost all the popular sauces [such as Worcestershire sauce] made in Europe, is prepared by the Chinese and Japanese from the fruit of *Glycine Soja* [*Soja hispida*], which holds an important place among the oil-yielding plants, and has been described under the article on Vegetable Fatty Oils (p. 1378). The condiment is prepared by boiling the beans with an equal quantity of roughly-ground barley or wheat, and leaving it covered for 24 hours to ferment; salt is then added in quantity equal to the other ingredients, water is poured over, and the whole is stirred at least once daily for two months, when the liquid is poured and squeezed off, filtered, and preserved in wooden vessels, becoming brighter and clearer by long keeping. Its approximate value in the London market is 2s. 3d. to 3s. a gallon for Chinese, and 2s. 4d. to 2s. 5d. for Japanese. [Note: The Chinese sauce is more expensive]. It is not specified in the trade returns, but doubtless forms the chief item in the unenumerated spices imported from China."

Note 1. This is the earliest English-language document seen (Sept. 2003) that contains the term "fatty oils"–which refers to edible oils that are liquid at room temperature (see also p. 1360).

Note 2. This is the earliest English-language document seen (Sept. 2006) that contains the terms "oil-yielding" or "oil-yielding plants" in connection with the soybean.

Also discusses: Varnish–Hempseed oil (p. 2024). Address: England.

667. *Agricultural and Horticultural Society of India, Proceedings and Report* (*Calcutta*). 1883. Japan pea. Jan. 5. p. xxvii, xxxi-xxxii. New Series.

• ***Summary:*** This paper appears in the "Proceedings of the Society," for "Thursday, the 5th January, 1883 [For December 1882]. W.H. Cogswell, Esq., President, in the Chair." A.H. Blechynden is secretary. "Read a note from the Superintendent of the Botanic Garden, Saharunpore, forwarding a small paper of the Japan Pea (*Soja hispida*,) and promising a larger quantity on receipt of a supply shortly expected from Japan.

"The Secretary stated that this pea had been brought to the notice of the Society some 38 years ago, as the following extract from its proceedings for August 1844 [p. 170] will show. A correspondent from China (Captain Bigge,) presenting an assortment of seeds from China, makes the following remarks in regard to one kind, which is doubtless the *Soja hispida:* -

There follows the complete text of the following document: *Agricultural and Horticultural Society of India, Proceedings and Report* (Calcutta). 1844 "Presentations to the gardens and museums." 3(Part 2):170. Meeting of Aug. 14.

Note: Saharunpore, now spelled Saharunpur, is in today's northwest Uttar Pradesh, India.

668. Geerts, A.J.C. 1883. Observations on Kinch's list of plants used for food. *Transactions of the Asiatic Society of Japan* 11(Part 1):31-35. April. [3 ref. Eng]

• ***Summary:*** Note 1. Geerts is referring to the article by Kinch titled "List of plants used for food or from which foods are obtained in Japan," on pages 1-30 of this issue of this periodical.

"Prof. Kinch seems not to have been acquainted with the list of 447 economical plants, published in 1826 by Ph. Fr. von Siebold in the *Transactions of the Batavian Society of Arts and Sciences* [*Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen*], Vol. XII, under the title of *'Synopsis plantarum oeconomicarum universi regni Japonici,'* for Mr. Kinch mentions only the more imperfect list given by Thunberg in his *Flora Japonica.* Further, several articles written on the subject of economic Japanese plants, published by von Siebold in the Journal of the Royal Dutch Society for the Advancement of Horticulture, during the years 1844-45-46, etc., might be perused with advantage by those who wish to study the practical side of Japanese economic plants.

"In Karl von Scherzer's work, *Fachmaenuische Berichte*

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ueber die oesterreichisch-ungarische Expedition nach Siam, China und Japan, Stuttgart, 1872, there is an extensive article by Dr. S. Syrski, on Japanese horticulture and economic cultivated plants, pp. 175-220. Several interesting observations on the mode of culture, time of sowing, planting, and harvesting, will be found there."

"As a preliminary catalogue Mr. Kinch's list may be useful for those persons who do not possess the botanical literature on the Japanese flora, but as a practical indication for horticulturists the list is deficient. Note 2. Chinese characters (or katakana) are given for each for the following Japanese terms.

"For instance the plant *Dai-dzu* or *O-mame,* the Soja hispida, Moench, has in Japan five distinct cultivated varieties and eleven or perhaps more sub-varieties, viz:

"I. White or slightly yellow beans, Haku-dai-dzu. 1. Very early variety with very small bean. Harvest in July. *Goguwatsu-mame* 2. Early variety with small white bean, *Wase-mame* or *Natsu-mame.* These [first] two varieties are also called *Bai-to* or *Tofu-mame* and serve especially for preparing *To-fu* [tofu]. 3. Middle early variety with somewhat larger round beans, *Nakate-mame.* Much used for preparing miso. 4. Late variety with round and hard beans, *Okute-mame.* 5. Late variety, with smaller, perfectly round and hard beans, *Maru-mame.* Can be kept a very long time and is much used as food for horses. 6. Late variety, with large, perfectly round, and very hard beans, *Teppo-mame* or *Aki-mame.* Is much valued for the preparation of *Shoyu* [soy sauce].

II. "Black beans, *Koku-dai-dzu* or *Kuro-mame.* 1. Middle late variety, with round, small, hard, black beans, *Kuro-mame.* 2. Middle late variety, with round, large black beans, *Kuro-teppo-mame.* 3. Late variety, with flat, elliptic, black beans, *Go-ishi-mame* or *Kuro-torokusun* or *Hachi-bu-name* or *Tamba-kuro-mame.* These kinds [in category II.] are eaten in a boiled mixed with sugar as *entremets.*

"III. Brown beans, *Katsu-dai-dzu.* 1. Round reddish brown beans, *Aka-mame.* According to the size the Japanese distinguish even six subvarieties of this brownish Soya-bean. The reddish kinds are far less cultivated than the white and black varieties. 2. Light brownish-red and round beans, *Cha-mame.* According to the more or less intense colour the Japanese distinguish three sub-varieties of *Cha-mame.* They are rarely cultivated. [Both these types] are eaten with sugar in a boiled state" (p. 34).

Note 3. This is the earliest English-language document seen (Oct. 2004) that mentions red or reddish soybeans (actually brownish-red).

Note 4. This is the earliest English-language document seen (Feb. 2007) that contains the word "Soya-bean" or ("Soya-beans").

"IV. Greenish or blue-greenish beans, *Sei-dai-dzu* or *Aö-mame.* 1. Round, middle-sized greenish beans, *Aö-mame.* The Japanese distinguish two sub-varieties, viz., α. *Sei-hi-to* with the epidermis only of a green colour, but white inside [and] Beta. *Nikuri-Sei,* which are outside and inside of a greenish colour. 2. Light green round beans, *Kagemame.* [All] are only cultivated in the provinces of Ise, Iyo, Harima, Idzumo [Izumo], Omi. Eaten with sugar in a boiled state. Note 5. This is the earliest English-language document seen (Oct. 2004) that uses the term "light green" to describe the color of a soybean.

"V. Spotted beans, *Han-dai-dzu* or *Fu-iri-mame.* 1. Greenish, flat, oblong beans with a black spot at the navel. *Kuro-kurakake-mame.* Relatively rare and only cultivated in Nagato [an old province on the southwest tip of Honshu, Japan; as of 2003 part of Yamaguchi prefecture], Idzumo [Izumo] and the environs of Kiyoto [Kyoto]. 2. Yellowish-green, flat, and slightly oblong beans, with a dark brown spot at the navel. *Aka-kura-kake-mame.* Rare. 3. Yellowish-green beans with many dark spots. *Furi-mame* or *Udzura-mame.* Rare. Cultivated in Harima province."

Note 6. This is the earliest English-language document seen (Oct. 2004) that uses the term "Yellowish-green" to describe the color of a soybean.

Note 7. This is the earliest English-language document seen (Sept. 2004) that uses the word "spots" (or "spotted" or "spotting") or the term "reddish brown" to describe the color of soybean seeds.

Note 8. This is the earliest English-language document seen (Oct. 2013) that discusses the color of many soybean varieties.

Note 9. Geerts' initials stand for Antonius Johannes Cornelius.

Note 10. This is an excellent, original article, which gives the names of many Japanese soybean varieties for the first time in English or any other European language. That information is largely derived from Iinuma (1861 and/or 1874).

669. *Good Health* (*Battle Creek, Michigan*). 1883. Food of the Japanese. 18(4):103. April.

• ***Summary:*** "In noticing a recent report sent to his Government by Thomas V. Van Buren, U.S. Consul-General to Japan, the *Scientific American* remarks as follows:

"'Among the many reports returned to the State Department at Washington [DC] by our consular agents abroad, this report on the food of the Japanese people is of exceptional interest."

"More than forty varieties of peas and beans are cultivated. The richly nutritive soy bean properly supplements the rice, which plays so large a part in the national diet."

Note: This is the earliest document seen (Dec. 2013) in which Dr. John Harvey Kellogg [or any other Seventh-day Adventist] mentions the soy bean.

670. Kinch, Edward. 1883. List of plants used for food or

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from which foods are obtained in Japan. *Transactions of the Asiatic Society of Japan* 11(Part 1):1-30. April. Read April 12th, 1882. Reprinted in March 1907 as a monograph.
• ***Summary:*** "In the following list of food plants the genera have been arranged according to the system pursued by G. Bentham and J.D. Hooker in their 'Genera Plantarum'... I am not aware that any list of the plants used for food in Japan has been published since that by Thunberg in his 'Flora Japonica,' 1784 [which mentions 'Dolichos polystachyos et Soja' in the Preface]."

"In the last hundred years this list has been considerably extended. The principal works consulted have been Thunberg's 'Flora,' Franchet and Savatier's 'Enumeratio,' Miquel's 'Prolusio' and Tanaka and Ono's 'So moku Zusetsu' and part of Suringar's 'Algae 'Japonicae."

Under the heading Leguminoseæ (Suborder Papilionaceæ), Kinch reports: (1) Glycine soja, S. & Z., called tsuru-mame or no mame in Japanese, has no English name. Its seeds are used. (2) Glycine hispida Moench (synonyms: Soja hispida Miq. and Dolichos soja L.), called O-mame or Daidzu in Japanese, is called Soy bean or Japan pea in English. Its seeds are used and there are many varieties of seeds. (3) Glycine hispida f. lanceolata, called midzu kugiri in Japanese, has no English name. Its seeds are used.

Also discusses in this suborder: (4) *Arachis hypogæa,* L., Rakkuwasho [rakkasei] or Tojin-mame, ground nut, earth nut. (5) *Vicia faba,* L., Sora-mame, broad beans. (6) *Pisum sativum,* L., Yendo, pea. (7) *Pueraria thunbergiana,* Benth. = *Dolichos hirsutus,* Th., Kudzu, for root starch. (8) *Phaseolus vulgaris,* L., Ingen mame, French bean. (9) *Phaseolus radiatus,* L., Adzuki or Shôdzu, for beans. (10) *Phaseolus radiatus* var. *pendulus,* Savatier, Tsuru-adzuki, for seeds. (11) *Phaseolus radiatus* var. *subtrilobatus,* Savr., Bundo or Yayenari [Yaenari], for seeds.

Also mentions *Prunus mume* or plum. "Unripe fruit preserved in vinegar and salt as a pickle" [umeboshi].

Note: This is the earliest English-language document seen (Dec. 2006) that uses the term *Prunus mume* to refer to the scientific name of the plum tree whose fruits are used to make umeboshi salt plums. This is also the 2nd earliest English-language document seen (Dec. 2006) that refers to umeboshi salt plums, but it does not mention them specifically.

Note 3. Some of this information is very similar to that in Van Buren (1881, p. 15). Address: Royal Agricultural College, Cirencester, England. Formerly Prof. of Chemistry, Imperial College of Agriculture, Tokyo.

671. Carrière, E.-A.; André, Ed. eds. 1883. Chronique horticole: Essais d'acclimatation [Horticultural chronicle: Acclimatization trials]. *Revue Horticole: Journal d'Horticulture Pratique* (*Paris*) 55:313-16. July 16. See p. 315-16. [Fre]

• ***Summary:*** The Society for Acclimatization distributes to its members the seeds of exotic, edible or industrial plants, in order to test their cultivation and multiplication in France.

Recently, Mr. de Muratel, who resides in the Tarn region, gave an account of the trials that he made using the seeds he had been entrusted with. The results are very interesting.

Discusses the soybean of Etampes (*Le Soja d'Étampes*), and the green soybean of Japan (*Le Soja vert du Japon*).

Also discusses the chufa of Spain and the Yaye-Nari (*Phaseolus radiatus;* azuki bean). Address: France.

672. *New York Times.* 1883. Scientific gossip. Dec. 2. p. 12.
• ***Summary:*** "Both E. Meissl and F. Böcker assert that the soja bean, which has been but recently imported into Europe from Japan, is a very valuable fodder, being exceedingly rich in fatty constituents."

673. Leunis, Johannes. 1883-1885. Synopsis der Pflanzenkunde; Ein Handbuch fuer hoehere Lehranstalten [Synopsis of botany: A handbook for institutions of higher learning. 3d ed. 2 vols.]. Hannover, Germany: Hahn'sche Buchhandlung. Vol. 1, xv + 994 p. Vol 2, xxii + 1002 p. See vol. I, p. 836. Vol. II, p. 130-32. [Ger]
• ***Summary:*** In the section on Phaseolus: "51. Soja* Moench. *Soja or Sooja is the Japanese name of the sauce (*Tunke*) for which soybeans [Soja-Bohnen] are used.

Soja hispida [hispida means rough] Moench. (S. japonica [japonica means Japanese]). Savi (Dolichos Soja. L.). The Japanese soybean. An annual, upright plant, indigenous to Japan and now cultivated throughout eastern Asia, because the beans are equal in protein to lupins, taste good, and are also used for the preparation of a piquant or pungent, brown, thickish sauce, which is used in India with almost all meals, and is also sold in Europe to improve broths and as a grilling, roasting, or baking sauce. However the soy sauce (*Soja*) presently sold commercially in Europe is not made from soybeans, but rather from other materials, namely from fungi / mushrooms (*Pilzen*), and it is made by us. The plant also grows in our climate although it often does not bring its seeds to ripeness / maturity. Therefore recommendations to grow it are uncertain.

"52. Dolichos L." Address: Germany.

674. Okoshi, Narinori. 1883. A sketch of the fisheries of Japan (Fisheries exhibition literature). London: William Clowes and Sons, Ltd. 43 p. See p. 22, 24. Index. 22 cm.
• ***Summary:*** Section VI, titled "Fish cookery" (p. 22) begins: Cookery of fish is almost an art in Japan." In the first mode of preparing raw fish, "the flesh of the fish is cut in thin slices and arranged on a plate very neatly in the form of waves,... and it is served with sauce (shoyu), mashed raw turnips [grated daikon], horse-radish [wasabi], and generally some fresh vegetables cut in small pieces and sea-weed."

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"The most essential element of our cookery of either fish or vegetables is the sauce known here under the name of Japanese shoya, properly called *shoyu,* which is extracted from beans and koji; hard dried fish [katsuobushi] is also greatly used" (p. 24).

Note 1: This paper was presented on 23 Oct. 1883 at the International Fisheries Exhibition, London. Also gives statistics on sea vegetables (p. 8-9, 11-12, 14).

Note 2. This is the earliest English-language document seen (April 2012) that uses the word "shoya" or the term "Japanese shoya" to refer to shoyu or soy sauce. Address: Member of the Japanese Consulate in London [England].

675. Pogson, Frederick. 1883. Manual of agriculture for India. Calcutta, British India: Thacker, Spink and Co. 296 p. See p. 280-81. Index. [1 ref]

• ***Summary:*** Chapter 14, "Field pea crops, including the Japan pea" states (p. 184): "The Japan pea assumes the form of a bush from two to three feet in height. In the plains it should be sown after the rains cease. Drills should be made three feet apart, and a single seed should be sown at every three feet; the spot where the seed is sown being manured as for beans. The botanical name of the Japan pea is *Soya Hispida.* It is half pea and half bean in appearance, with singular leaves, and pods somewhat like the pods of the *Cajanus sativa* or *Urhur Dall* [*Dahl*] of the next chapter."

In the Appendix (p. 267+) is a section titled "Japan pea" which states (p. 280-81): "A small supply of this pea-bean was received by the writer in the spring of 1882. It was freely distributed in Dehra, but failed entirely as a hot-weather crop. A few seeds sown at Mussoorie grew to the height of two feet, and bore pods very much resembling those of the *Urhur Dall* (*Cajanus sativa*). At the writer's request a supply of the seed was sent to Simla, and the result is given beneath.

"'The Government of India has decided on the cultivation of the Japan pea being extended in this country, and with this view it has suggested that further experiments should be made in suitable places. This bean or pea has its natural habitat in China and Japan, it also grows in Mongolia, and in India in the Himalayas, and within the last few years it has been cultivated experimentally in several European countries, under the name of the Soy bean. It is a vegetable, which approaches most nearly in its proximate chemical composition to animal food. The Soy bean first attracted attention in Europe in the year 1873, when specimens from Japan, from China, and from India were shown at the Vienna International Exhibition. Dr. Forbes Watson, reporter on the products of India, called attention to it in the catalogue of the exhibits of the India Museum. Since then numerous experiments have been made on the European continent on its growth, and also feeding experiments with the bean and its straw on different kinds of animals have been prosecuted. Such experiments have been carried on by Woolling and Wein at Munich; by Haberlandt, Lehman, Harz, Stahel, Zimmerman, Siewert, Wieske, and others at various stations in Germany, Austria, and Hungary; and experiments have also been made in France and in Italy.

"'In Japan it is known by names signifying THE bean, and from it are made not only soy [sauce] but a paste, known as *miso,* which is in constant request at nearly every meal, *tofu* or bean cheese, and other foods used to a less extent. This bean cheese is also well known in China, and is obtained by extracting the legumin from the beans with water and precipitating it with brine. These foods are most valuable additions to the dietary of the Oriental nations, and especially the Japanese, who use so little animal food. They tend to supply the deficiencies of the staple food, rice, in nitrogenous matter [protein], fat, and also in mineral constituents. The Buddhist priests, who are strictly forbidden the use of animal food, consume considerable quantities of these beans, principally in the form of *miso.'–Vide 'Simla Argus,' 18th November, 1882.*"

Note: Simla was a hill station in British India. The *Argus* was a periodical published at Simla, a hill station in British India in the 1880s. The Simla Argus Press published a few books at the same place and time. Address: Lieutenant, Her Majesty's Bengal Army, Dehra Doon; Honorary Member Agri-Horticultural Society of India.

676. Schaedler, Carl. 1883. Die Technologie der Fette und Oele: Des Pflanzen- und Thierreichs [The technology of oils and fats: From the plant- and animal kingdoms]. Leipzig, Germany: Baumgartner. Berlin: Polytechnische Buchhandlung. 1108 p. Illust. Index. 22 cm. [Ger]

• ***Summary:*** In Chapter 12, "Descriptions, properties, and confusions of the oils and fats" is a section titled "Papilionaceae (Leguminosae), papilionaceous plants (*Schmetterlingsblüthler*)." The first plant discussed (p. 370) is the soybean: "1. Dolichos Soja Linn = Soja japonica = Chinese oilbean (*Chinesische Oelbohne*), *Sao; Sojabohne.* It is native to Japan and China and cultivated in southern Asia. The seeds, which have a piquant (*pikante*) taste and are used as food. The oil, called soybean oil (*Sojabohnenöl*), and incorrectly called "oil of peas" "(*Huile de pois*)" serves as an edible oil.

Also discusses: Margarine (p. 85). Peanuts (p. 360-65. The oil is called *Erdeichelöl, Oleum Arachidis, Huile d'Arachide, Huile de Pistache de terre, Ground-nut oil, Earth-nut oil, Pea-nut oil, Moong-phullie* (Hindostan), *Katjang-tannah* (Java), *Cochang-gorung* (Sumatra), *Mandobi* (Brazil), *Amendoim* (Brazil)). Almonds and almond oil (p. 370-79). Sesame oil (p. 444-50). Chufa (*Cyperus esculentus, Erdmandel, Grasmandel, indianische Süsswurzel,* p. 480-810). Chufa oil (*Cyperi esculenti, Cyperus oil, Huile de souchet comestible*). Linseed oil (p. 494-509). Hemp and hempseed oil (p. 150-52, 535-39). Contains many superb text illustrations, including multi-part illustrations of the plant, seeds, and flowers of the peanut, almond, sesame seeds, and

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hemp. The soybean is not illustrated.

Note 1. Carl Schaedler was born in 1843.

Note 2. This is the earliest German-language document seen (April 2012) that uses the term "Chinesische Oelbohne" to refer to the soybean.

Note 3. This is the earliest German-language document seen (Sept. 2006) that uses the term *Sojabohnenöl* to refer to soybean oil. Address: PhD, Vereideter Chemiker und Sachverstaendiger der Koenigl. Gerichte zu Berlin.

677. Scheube, Botho. 1883. Die Nahrung der Japaner [The food of the Japanese]. *Archiv fuer Hygiene* p. 352-83. [3 soy ref. Ger]

• ***Summary:*** In the Japanese diet, rice plays the most important role. From a special type of glutinous rice, the Japanese prepare their beloved rice cakes, called mochi, which are found in every house during the New Years festival. The Japanese bake no bread, yet *Fu* (made from wheat gluten) could be considered a kind of bread. The process for making it is described.

Legumes, beans and peas, also are important in the Japanese diet. Countless types are cultivated, but the most important is the remarkable soybean (*Sojabohne–Glycine hispida*), on account of its richness in nitrogen [protein] and fat, and its relatively low starch content. The most important foods made from soybeans are tofu, miso, and shoyu; a detailed description is given of the process by which each is made. Two analyses of shoyu, by Ogata and by Kinch, give its composition. Beans and peas are also eaten as vegetables by the Japanese, and bean meal [probably kinako] is used in the preparation of many kinds of cakes.

On pages 361-67 are many tables containing descriptions of the diets consumed by various individual Japanese persons, usually for three days or three meals. For each is given: The age and approximate weight of the person, the foods consumed, and the weight (in grams) of each food consumed each day. Tofu (*Bohnenkäse*), miso soup (*Miso-Suppe*), and wheat gluten cakes (*fu*) appear with rice (and/or sushi or mochi) and tea in most diets. The word *Bohnensauce* (p. 362) appears to refer to shoyu (soy sauce).

Botho Scheube lived 1853-1923. Address: Docent, Univ. of Leipzig, Germany.

678. *University of California, College of Agriculture. Report of the Professor in Charge to the President.* 1883. List of donations of seeds and living plants, received since December, 1880. p. 118-21. For the year 1882. See p. 119.

• ***Summary:*** "From San Francisco Bulletin Company: March, 1881... *Soja* Bean, from Japan;..." (p. 119).

679. *Times* (*London*). 1884. Japan at the health exhibition. Aug. 28. p. 2, cols. 4-5.

• ***Summary:*** "The last foreign court completed at the International Health Exhibition [in London] is that of Japan." In a few days, a Japanese restaurant will be opened. "Two Japanese cooks have accompanied the Commissioners, and here the visitor will be able to make the acquaintance of some of the dishes which find a place on the *menus* of the Parisians of the East. Sweet-tasting bamboo sprouts, sweetmeats and confectionary of fanciful appearance; *saké,* 'the wine of the country,' a fermented drink made of rice and containing 11 to 12 per cent. of alcohol, the nutritious *miso* made from soy beans and fermenting rice [koji], frozen töfu [sic, dried frozen tofu] or bean curds, tangle [kombu], salted mushrooms, dried shrimps, cured bonito, laver [nori], various edible sea-weeds, orange vinegar, and several soys [soy sauces], are among the good things which those who are adventurous in dietary may enjoy."

Note: This is the earliest English-language document seen (April 2013) that uses the word "frozen" in connection with tofu; there is no such word as *töfu.*

680. *Times* (*London*). 1884. The Health Exhibition Japanese restaurant. Sept. 17. p. 4, col. 6.

• ***Summary:*** The Nippon Rioriya, modeled after the eating houses in Tôkio, is hard to find at the exhibition. "Taking advantage of the concession to European prejudices the Commissioners have made in providing spoons, instead of obliging him to drink his soup like tea from the bowl, the adventurous diner-out will find that he has before him a savoury compound called on the card *misoshiru* [miso soup]. This is made, as the root word denotes, from *miso,* a fermented mixture of soy beans, wheat, and salt." He may also enjoy "a piece of plump sole stewd in soy" [sauce], the "brown soy-coloured beans and strips of *kikurage,* or ear-shaped mushrooms," the *wanmori* which includes "pieces of a soaked *fu,* a kind of biscuit made from the glutinous part of wheat flour. The gravy in which these *pièces de résistance* are floating is thickened with a transparent starchy substance, obtained from the root of a climbing plant (*Pueraria Thunbergiana*), called by the Japanese *kuzu."*

"One other relish must be noticed, the sliced root of the burdock, salted and preserved in *miso."*

681. International Health Exhibition, London. 1884. The Health Exhibition Literature. Vol. XVII. London: William Clowes and Sons, Ltd. 749 p.

• ***Summary:*** Also cited as: (1) "Catalogue of the exhibits of Japanese Food Products at the International Health and Education Exhibition, held in London, 1884." (2) "Japan. International Health Exhibition A. Descriptive catalogue..." (3) "London, International Health Exhibition, London. 1884. The Health Exhibition Literature. Vol. XVII."

A map of the "International Health Exhibition, London, 1884" (p. 537-38), which was held at the Royal Albert Hall in South Kensington, on Exhibition Road near the High St. Kensington Station; gives an overview of the hall and surrounding roads and railway stations. The title of the

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section related to food is "Japan. A descriptive catalogue of the exhibits sent by the sanitary bureau of the Japanese Home Department," prepared under the direction of K. Nagai, Commissioner, and J. Murai, Assistant Commissioner. There follows a 2-page Introduction by Kiuichiro Nagai, dated Sept. 1884. Then a table of contents of five groups; Group I is food. Then a table of Japanese weights and measures. Pages 545-71 begin: the "Descriptive catalogue." Group I–Food. Detailed information and / or chemical analyses are given of the following: are given: (7) Soy bean (*Glycine hispida*) *O-mame.* (7A) Phaseolus radiatus. Adzuki. (192) Dried fruit of *Lagenaria vulgaris–Kan-pio* [*kanpyo*], cook with soy sauce. Mushroom (*Agaricus campestris*). *Shii-take* [*Shiitake*], cook with soy sauce. Kanten, vegetable isinglass, cook with soy sauce. Frozen konniaku [konnyaku]. Minoboshi daikon, cook with soy sauce. Fu, nama-fu, yaki-fu (roasted) (Wheat gluten). Kuzu starch. Buckwheat soba, cook with soy sauce. (203) Hijiki sea weed (*Cystoseira* species), cook with soy sauce. (204) Ogo sea weed (*Gigartina* sp.), cook with soy sauce. (205) Wakame sea weed (*Alaria pinnatifida*), cook with soy sauce. (206) Agar-agar (*Gelidium corneum.* Tengusa). Use to make tokoroten or kanten. (207) Tangle (*Laminaria japonica*). Kombu [konbu]. (208) Laver, dried (*Porphyra tenera*). *Asakusa-nori.* (209) Awonori [Aonori], dried (*Enteromorpha compressa*).

(210) Frozen bean-curd. *Kôri-tôfu.* "Preparation.–It is made by steeping soy beans in water and then grinding them, after which the refuse is removed by boiling and dissolving it in a little oil. This refuse is called 'Kiradzu' [kirazu] or 'Unohana.' The liquid [soymilk] remaining after taking away such refuse is put into a kettle and again boiled. Upon the surface of the water [sic, soymilk] there forms a thin substance [film] like wet paper; this is skimmed off and dried. It is called 'Yuba' (lit., bean-curd skin), the taste of which is very agreeable. When it [the soymilk] begins to bubble up brine is sprinkled over it in order to stop the bubbles, and it is put into a special wooden box, then thrown into a cotton cloth bag and coagulated into long square shapes, which is bean-curd."

Three tables follow: (1) "Analysis of bean curd" [tofu]. (2) "Analysis of dried bean-curd" [dried frozen tofu]. (3) "Analysis of refuse of bean-curd" [okara].

Note 1. In the description of making tofu (above), yuba is removed during the tofu-making process.

Note 2. This is the earliest English-language document seen (June 2013) that uses the word "Unohana" or the term "refuse of bean-curd" to refer to okara.

(211) Yuba (Skin of bean curd; "Yuba is made during the process of making bean curd, and is a thin, yellow, transparent substance)."

Note 3. This is the earliest English-language document seen (Oct. 2012) that uses the term "bean-curd skin or the term "Skin of bean curd" to refer to yuba.

(213) Somen (Vermicelli), cook with *shioyu* (soy sauce).

Note 4. This is the earliest English-language document seen (April 2012) that uses the term *shioyu* to refer to shoyu / soy sauce.

(228) Umeboshi (Salted and dried plums). (229) Miso (a fermented substance made from soy beans and yeast [koji]). *Miso-ai, Sansho-miso, shoga-miso, wasabi-miso, togarishi-miso, goma-miso* [*sesame miso*], *keshi-miso, katsuwo-miso* [*katsuo-miso*]. (229a) Konomono [*Kô-no-mono*] (Vegetables pickled in fermenting mixture of bran and salt (incl. Nukamiso-dzuke ([Nukamiso-zuke] pickled in salt and bran), Takuwan-dzuke (Takuan-zuke; daikon radishes pickled in salt and bran), Shiwodzuke ([Shiozuke] salt-pickled), Shio-oshi (salted and pressed), Kasudzuke ([Kasuzuke] pickled in sake residue), Misodzuke (Misozuke; pickled in miso), &c.)). Takuwandzuke [Takuanzuke; Takuan pickles]. (229b) Kasu-zuke (mentions miso soup). (230-35) Shoyu (Soy) and how it is made [p. 21 of section]. Chemical analysis of Kikkoman shoyu. Eight chief brands of shoyu. (236) Mirin (a kind of sweet liquor), with koji. Sembei [senbei], with miso. (242) Yokan, three varieties. (246) Midzu-ame [mizuame]. Frozen mochi.

Class III–Prepared animal substances. Dried cod fish, cooked with soy [sauce]. Beef tsukudani, cooked with soy [sauce].

Note 5. This is the earliest English-language document seen (June 2013) that contains the word "tsukudani."

Class IV. Beverages. Sake (wine), made with koji (yeast). "Koji (yeast) is used for brewing Sake in Japan, almost like malt used for brewing beer in western countries,..."

Class VI. Cookery practically demonstrated. Nippon Ryoriya (Japanese restaurant), incl. misoshiru (miso soup), and konomono. Address: England.

682. International Health Exhibition, London. 1884.
(210) Frozen bean-curd. Kôri-tôfu (Document part). In: International Health Exhibition, London. 1884. *The Health Exhibition Literature.* Vol. XVII. London: William Clowes and Sons, Ltd. 749 p. See p. 560-61.

• ***Summary:*** "It is made by freezing common bean-curd. Bean-curd is made of *Daidzu Glycine* (*soja*) *hispida* and contains a largo quantity of vegetable albumen. This is one of the most frequent kinds of food of the middle and lower classes of the people of Japan; it contains an abundance of nourishment, and Hygeists [Hygienists] recommend its use. However, bean-curd is indigestible as in passing through the process of freezing, it undergoes a change. Ordinary bean-curd is not a safe eatable to remove to a distance, as it spoils very readily: therefore, frozen bean-curd only is exhibited here with explanation of the ingredients of the common curd.

"Preparation.–It is made by steeping soy beans in water and then grinding them, after which the refuse is removed by boiling and dissolving it in a little oil. This refuse is called 'Kiradzu' or 'Unohana.'

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Note: This is the earliest English-language document seen (June 2013) that uses the word "Kiradzu" or the word "Unohana" to refer to okara.

The liquid remaining after taking away such refuse is put into a kettle and again boiled. Upon the surface of the water there forms a thin substance [yuba] like wet paper; this is skimmed off and dried. It is called 'Yuba' (lit., bean-curd skin), the taste of which is very agreeable. When it begins to bubble up brine is sprinkled over it in order to stop the bubbles, and is put into a special wooden box, then thrown into a cotton cloth bag and coagulated into long square shapes, which is the bean-curd.

"Analysis of bean curd: Nitrogen 0.76%. Fat 2.36%. Water 90.37%. Ashes [ash] 0.76%.

"Analysis of dried bean-curd [moisture free]: Nitrogen 8.09%. Fat 24.59%. Ashes [ash] 7.79%.

"Analysis of refuse of bean curd [kirazu or unohana]: Albumen 3.664%. Fat 0.837%. Glucose 0.266%. Starch 2.630%. Cellulose 2.896%. Other non-nitrogenous substances 6.156%. Water 85.660%."

Note 1. This is the earliest English-language document seen (July 2012) that seems to use the word "nitrogen" and the word "albumen" interchangeably.

"Use.–Bean curd is prepared for eating by boiling it or holding it over a fire; it is usually eaten with soy [sauce] and various condiments. It easily digests and is suitable food for adults, for infants, or for invalids, but it cannot be preserved for more than a day or two, owing to its perishable nature, whereas frozen bean curd does not easily spoil and can be preserved for a length of time, but it is indigestible and furnishes less nourishment than the unfrozen."

Note 2. This is the earliest English-language document seen (April 2013) that uses the term "Frozen bean-curd" or the term *Kôri-tôfu* or the term "dried bean-curd" or the term "frozen bean curd" to refer to dried-frozen tofu. Address: England.

683. International Health Exhibition, London. 1884. (211) Yuba (Skin of bean curd) (Document part). In: International Health Exhibition, London. 1884. *The Health Exhibition Literature.* Vol. XVII. London: William Clowes and Sons, Ltd. 749 p. See p. 561-62.

• ***Summary:*** Preparation.–Yuba is made during the process of making bean curd [tofu], and is a thin, yellow, transparent substance.

"Use.–It is used as a food adjunct with boiled rice, by most persons, by boiling or warming over a fire and salting it.

"Analysis: Albumen 51.597%. Yellow oil 15.620%. Cellulose 0.401%. Nitrogenous substances 6.651%. Ashes [ash] 2.821%. Water 22.850%. Total 100.000%

"Analysis of dry substance [moisture free]: Carbon 2.821%. Nitrogen 22.850%. Hydrogen 42.024%. Oxygen 8.257%. Ashes 5.868%. Water 18.180%. Total 100.000%" Address: England.

684. International Health Exhibition, London. 1884. (229) Miso (a fermented substance made from Soy Beans) (Document part). In: International Health Exhibition, London. 1884. *The Health Exhibition Literature.* Vol. XVII. London: William Clowes and Sons, Ltd. 749 p. See p. 563-65.

• ***Summary:*** "Preparation.–There are many ways of making miso, they do not differ much from each other, and the kind containing the largest quantity of yeast [koji] is considered the best. The usual mode is, after soaking soy beans in water for about two hours, to put them into a suitable vessel and steam them; then, after mixing them with salt and yeast (the proportions are one *to* of beans to three *sho* of best salt and one *to* of yeast) [10 *sho* = 1 *to* = 18 liters = 4.76 gallons], they are removed to wooden plates; the next step is to evenly mix the ingredients. The liquid is then put into casks, and is then left untouched for upwards of a year.

"Another method.–Three *to* of yellow soy beans are soaked in water for a night; then they are boiled in a large kettle, and as soon us the water in the kettle has evaporated and the beans show a reddish yellow colour, they are removed to a mortar and pounded; they are then placed on mats. When they are thoroughly cooled, they are shaped into balls, as large as hand balls, cut with a knife into flat pieces about an eighth of an inch thick, and placed on mats shaped like scales of fish. As soon as mould appears upon them, they are taken, crushed into small pieces, and exposed to the rays of the sun for a day or two. When nearly dry, one and a fifth *to* of salt and a suitable quantity of water are added to them, and the whole is pounded in a mortar. After preserving in a cask for twenty or thirty days, it is again pounded thoroughly, and then left in a cask for a month or two, and sometimes longer, when the preceding process will be repeated. Finally, if it is sealed up in casks, it will never deteriorate. It is in prime condition when three years old.

"Use.–In Japan miso is one of the most necessary articles of food, and has been used from time immemorial, both by nobles and men of inferior rank. It is made into a soup, and is one of the courses served up as a principal article of every day diet. The mode of making it into soup is, in the first place, to rub it around an earthenware bowl [suribachi], into which a suitable quantity of water has been poured; it is then filtered through a sieve called *misokoshi,* and vegetables according to taste are added to it; the whole is then boiled and served up. The quantity of water to be used depends on the taste of those who have to eat it. Miso is used to give an agreeable flavour by mixing it with other food, and is then called Miso-ai [Miso-ae]. There are many other preparations of miso mixed with various condiments, namely, Sansho-miso (miso and Japanese pepper), Shogamiso (miso with ginger), Wasabimiso, Tagarashi-miso, Gomamiso (miso with horseradish, chillies, and sesame),

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Keshi-miso (miso with poppy seeds), Katsuwo-miso (miso with Katsuwo [Katsuo is oceanic bonito]), &c.

The uses of miso are innumerable, and it is most nutritious food.

Analysis, by Komaba Agricultural College:–Red Miso, from Osaka–Water 50.40%, fibre 8.25%, ashes [ash] (containing nearly 12 per cent. of common salt) 12.50%, sugar 0.61%, albumen 10.08%, soluble carbohydrates 18.16%. Total 100.00%.

Note: This is the earliest English-language document seen (Dec. 2008) that contains the word *misokoshi.* Address: England.

685. International Health Exhibition, London. 1884. (230-235) Shoyu (soy) (Document part). In: International Health Exhibition, London. 1884. *The Health Exhibition Literature.* Vol. XVII. London: William Clowes and Sons, Ltd. 749 p. See p. 565.

• ***Summary:*** "Shoyu is a mixture of soy beans, wheat, salt and water; the quantity of soy beans and of wheat being the same. The mode of preparing it, is to thoroughly boil, after washing in a cask with water, 50 *koku* of [soy] beans and to parch about 50 *koku* of wheat, in a pan for a little while, and thoroughly boil it after grinding on stone mill. When these two substances are mixed together and kept in *Oka-muro* (a warm room) for about four days the substances are converted into a yellow flower-like matter; this is yeast [sic, koji]. This yeast is then thrown into a mixture of 120 *koku* of water and of 6 *kuwanme* of salt. It is afterwards thoroughly cooled, boiled in a large kettle, and stirred with a bamboo instrument twice a day in summer and once a day in winter. After the lapse of three years the sediment is poured into a bag, then put into a small tub, and is submitted to strong pressure by means of a bar, at the end of which hangs a heavy stone. The fluid expressed is poured into a kettle and submitted to a heat of not more than 80ºC; it is again removed to a large tub and set away for a night, when it becomes of a deep black colour and acquires a very delicious taste.

"Use.–Shoyu is one of the most valuable foods, and is in daily use. Mixed with several kinds of food it imparts to them a delicious flavour. It is universally liked and is really indispensable in the Japanese kitchen. The quantity of shoyu annually consumed in Japan is extremely large, and of late years the article has been exported.

Analysis of Kikkoman Shoyu from Noda (province Shimosa) by Isono Tokusaburo B.Sc.–1,000 c.c. of Shoyu contains following constituents:–Specific gravity 1.199. Total residue 421.706. Ashes 175.864. Chlorine 94.001. Glucose 53.226. Dextrin 54.710. Alcohol 1.650. Volatile Acid 1.920. Fixed Acid (as SO_3 [sulfite]) 13.031. Nitrogen 17.208

"The following eight are the chief kinds of Sho-yu:–1. Sho-ji. 2. Sashimi. 3. Yamasa. 4. Yamajin. 5. Yamada. 6. Yigamisa [Jigamisa]. 7. Yamadai. 8. Yamataka." Address: England.

686. Paillieux, Auguste; Bois, D. 1884. Le potager d'un curieux. Histoire, culture et usages de 100 plantes comestibles exotiques, peu connues ou inconnues: Soya [The inquisitive person's kitchen garden. History, culture, and uses of 100 exotic, edible, little-known or unknown plants: Soya]. *Bulletin de la Societe d'Acclimatation* 31:896-916. Nov. See p. 907-11. [2 ref. Fre]

• ***Summary:*** In this excellent series of articles, the various plants are listed alphabetically by their French name. The section titled "Soya" begins with a summary of what Kaempfer said about the soybean. But whereas Kaempfer knew of only one variety, the authors know of at least 30, which have seeds of various colors and either a white or brown hilum. Only a view varieties will grow in the area around Paris; they have experimented with four (the rest do better in southern France): (1) a Chinese soybean, grown in Hungary, imported by M.M. Vilmorin-Andrieux & Co., which is a good source of seeds. This is the latest variety they know; (2) The Étampes soybean, which was distributed in 1874 by the Society for Acclimatization; (3) A green soybean from Japan; and (4) A pale green soybean from Japan and China. Instructions are given for growing soybeans; they should be planted from April 25 to May 10. The harvest starts in late October for most varieties but in September for the China/Hungary variety. When the seeds have attained their full development but before they begin to dry, they can be eaten as an excellent fresh vegetable. Dry soybeans are also a good food; cook them with a little soda (*soude;* salt wort or kali). The soybean makes unquestionably the best coffee substitute. In fact soybeans are cultivated in Tirol (Tyrol, part of Austria since 1814) and in Istria under the name "Coffee Bean (*Fève de café*), and this may well also be the case in Dalmatia and in the south of Italy.

"Heuzé, in his book *Plantes alimentaires* (*Edible Plants*) gives the soybean the name *Dolic à café* (the coffee bean) and that it is cultivated in some points in the departments of Ariège of Haute-Garonne; but we have not been able to verify this. Quite recently we have been notified by Mr. Faivre, of Beaune, that about 12 years ago the soybean was introduced at Allerey, a commune of Saône-et-Loire, by the abbot Mr. Crétin, and that its seeds have been used to make coffee by many families in the countryside. Mr. Faivre, and ardent and generous propagator of soya, has sent us seeds of the plant cultivated at Allerey. They are brown and identical to those recently imported by MM. Vilmorin.

"Worldwide the soybean occupies a place of equal importance with wheat, corn, and potatoes. It yields an excellent forage. It contains 18% oil. After extraction of the oil (*Après extraction de l'huile*), the cakes (*les tourteaux*) furnish a powerful fertilizer. In its many forms, the seeds of the soybean enter into the daily diet of hundreds of millions of people. They also nourish livestock, especially millions of horses and mules. They constitute, as numerous analyses

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demonstrate, the most rich and complete food that one can desire." Address: 1. Member of the Société nationale d'Acclimatation; 2. Preparateur de botanique au Muséum. Both: France.

687. *Gardeners' Chronicle* (*London*)**.** 1884. Japanese food vegetable products. 22:781-82. Dec. 20. New Series.
• ***Summary:*** "The Japanese Commission at the late International Health Exhibition have produced an excellent catalog of their exhibits, which contains a great deal of valuable information on the production and uses of the specimens in question. In the first group, devoted to food products, a series of analyses is given of the principal grains and pulses, fungi, cucurbitaceous fruits, &c."

"*Kori-tôfu: Frozen Bean Curds.*–It is made by freezing common Bean curd, which is made of Daidzu (Glycine [Soja] hispida), and contains a large quantity of vegetable albumen. This is one of the most frequent kinds of fruit of the middle and lower classes of the people of Japan; it contains an abundance of nourishment, and hygeists [hygienists?] recommend its use. Bean curd is indigestible, but in passing through the process of freezing it undergoes a change. Owing to the Bean curd spoiling very readily, it is not suitable for carrying long distances. It is made by steeping Soy Beans in water and then grinding them, after which the refuse is removed by boiling and dissolving it in a little oil. The liquid remaining after taking away such refuse, is put into a kettle and again boiled. Upon the surface of the water a thin substance, like wet paper, forms, this is skimmed off and dried and known as 'Yuba,' the taste of which is very agreeable. When it begins to bubble up brine is sprinkled over it in order to stop the bubbles and it is put into a special wooden box and afterwards thrown into a cotton-cloth bag and coagulated into long square shapes, which is the Bean curd.

"Bean curd is prepared for eating by boiling it, or holding it over a fire. It is usually eaten with soy [sauce] and various condiments; it is easily digestible and is suitable food for adults, infants, or invalids, but it cannot be preserved for more than a day or two owing to its perishable nature, whereas frozen Bean curd can be preserved for a length of time, but it is indigestible and furnishes less nourishment than the kind first named. The "yuba" or skin of the Bean curd is used as a food adjunct, with boiled Rice, by most persons, by boiling or warming over a fire and salting it."

Other Japanese foods described in detail in this early article are Ginkgo biloba (Ginnan, the fruit of the maidenhair tree), Lagenaria vulgaris (Kau-pio, a dried fruit), Agaricus campestris (Shii-take [Shiitake] mushrooms), Gelidium corneum (Agar-agar or Kanten), Frozen Kouniaku [Konnyaku], Katakuri Starch, Kuzu Starch (from the root of Pueraria Thunbergiana), Warabi Starch, Hijiki (Cyrtoseira sp.), Ogo (Gigartina sp.), Wakame (Alaria pinnatifida), Tangre [Tangle] or Kombu (Laminaria japonica. "It is used as a food by boiling with soy, sugar, mirin, &c., or served in soup"), Laver, dried–Asakusa-nori (Porphyra vulgaris) [Note that items from Hijiki to Laver are sea vegetables], Umeboshi: Salted and dried plums.

Continued in the issue of 10 Jan. 1885.

Note 1. This is the earliest English-language document seen (April 2013) that uses the terms "frozen," or "Kori-tôfu," or "Bean Curds," or "Frozen Bean Curds" to refer to frozen tofu.

Note 2. This is the earliest document seen (Jan. 2010) concerning the use of soya in infant foods or infant feeding.

Note 3. This is the earliest English-language document seen (Dec. 2006) that uses the word "Umeboshi" or the term "Salted and dried plums" to refer to umeboshi salt plums.

Note 4. As of 1975, the scientific name of the shiitake mushroom was *Lentinus edodes.* It had been cultivated and used as human food for centuries in China and Japan. It is not used much in most developing countries, nor in the West where the common champignon *Agaricus bisporus* (*A. brunnescens*) is the mushroom of commerce. One important advantage of shiitake is that it can be cultivated on wood.

Note 5. This is the earliest English-language document seen (Oct. 2008) that uses the term "vegetable albumen" to refer to soy protein.

688. Candolle, Alphonse de. 1884. Origin of cultivated plants. London: Kegan Paul, Trench & Co. viii + 468 p. See p. 330-32, 442-43, 451. Index. 20 cm. (International Scientific Series, v. 49 [i.e. 48]). Translation of Origin des Plantes Cultivees, 1883 ed. 2nd ed. 1886. [15 ref. Eng]
• ***Summary:*** This is the first English-language edition of this landmark work by de Candolle (lived 1806-1893), the renowned Swiss botanist, whose father (Augustin Pyramo de Candolle, lived 1778-1841) was also a famous botanist. The world's first authority on the origin of cultivated plants, Alphonse de Candolle postulates (p. 17) that agriculture arose independently in three regions: "China, the southwest of Asia (with Egypt), and intertropical America."

The section on soy is compiled from 15 earlier publications, which are footnoted. There is no separate bibliography at the back of the book.

"Soy–*Dolichos soja,* Linnaeus; *Glycine soja,* Bentham. This leguminous annual has been cultivated in China and Japan from remote antiquity. This might be gathered from the many uses of the soy bean and from the immense number of varieties. But it is also supposed to be one of the farinaceous substances called *shu* in Chinese writings of Confucius' time, though the modern name of the plant is *ta-tou.* The bean is nourishing, and contains a large proportion of oil, and preparations similar to butter, oil, and cheese are extracted from it and used in Chinese and Japanese cooking. Soy is also grown in the Malay Archipelago, but at the end of the eighteenth century it was still rare in Amboyna, and Forster did not see it in the Pacific Isles at the time of Cook's

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voyages. It is of modern introduction in India, for Roxburgh had only seen the plant in the botanical gardens at Calcutta, where it was brought from the Moluccas. There are no common Indian names. Besides, if its cultivation had been ancient in India, it would have spread westward into Syria and Egypt, which is not the case.

"Kaempfer formerly published an excellent illustration of the soy bean, and it had existed for a century in European botanical gardens, when more extensive information about China and Japan excited about ten years ago a lively desire to introduce it into our countries. In Austria, Hungary, and France especially, attempts have been made on a large scale, of which the results have been summed up in works worthy of consultation. It is to be hoped these efforts may be successful; but we must not digress from the aim of our researches, the probable origin of the species.

"Linnaeus says, in his *Species,* 'habitat in India,' and refers to Kaempfer, who speaks of the plant in Japan, and to his own flora of Ceylon, where he gives the plant as *cultivated.* Thwaites's modern flora of Ceylon makes no mention of it. We must evidently go further east to find the origin both of the species and of its cultivation. Loureiro says that it grows in Cochin-China and that it is often cultivated in China. I find no proof that it is wild in the latter country, but it may perhaps be discovered, as its culture is so ancient. Russian botanists have only found it cultivated in the north of China and in the basin of the river Amur. It is certainly wild in Japan. Junghuhn found it in Java on Mount Gunung-Gamping, and a plant sent also from Java by Zollinger is supposed to belong to this species, but it is not certain that the specimen was wild. A Malay name, *kadelee,* quite different to the Japanese and Chinese common names, is in favour of its indigenous character in Java.

"Known facts and historical and philological probabilities tend to show that the species was wild from Cochin-China to the south of Japan and to Java when the ancient inhabitants of this region began to cultivate it at a very remote period, to use it for food in various ways, and to obtain from it varieties of which the number is remarkable, especially in Japan."

Soy is also mentioned as follows: "The Chinese, who grew wheat 2700 B.C., considered it a gift direct from heaven. In the annual ceremony of sowing five kinds of seed, instituted by the Emperor Shen-nung or Chin-nong, wheat is one species, the others being rice, sorghum, *Setaria italica,* and soy. (p. 355).

A "General table of species" (p. 436+) shows the origin of cultivated plants. Under those "Cultivated for the seeds–Nutritive" (p. 442-43) is listed: "Soy–*Dolichos soja* Date: A. Origin: Cochin-China, Japan, Java."

The date code "A." signifies (see p. 436-37) that this Old-World species has been cultivated for more than four thousand years, according to ancient historians, Chinese works, and botanical and philological indications.

Also listed in this general table: Lupin, Egyptian Lupin, Bambarra Ground Nut, three types of buckwheat, and Kiery (*Amaranthus frumentaceus,* from India).

Plants native to North America: Jerusalem artichoke, mushroom (*Agaricus campestris*), pumpkin and squash, Virginia strawberry. Some other interesting plants: Tea from Assam, China, Mantschuria [Manchuria] (p. 117). Tobacco (p. 139). Cacao (*Theobroma cacao*) from tropical Brazil (p. 313). Arabian coffee from tropical Africa, Mozambique, Abyssinia, Guinea (p. 415).

In the final chapter, "General observations and conclusions" we read (p. 451): "Men have not discovered and cultivated within the last two thousand years a single species which can rival maize, rice, the sweet potato, the potato, the bread-fruit, the date cereals, millets, sorghums, the banana, soy. These date from three, four, or five thousand years, perhaps even in some cases six thousand years" (p. 451).

Soy is listed in the Index in three places as follows: Dolichos Soja, Glycine soya, and Soy.

Note 1. This is the earliest document seen (June 2006) that clearly refers to the cultivation of soybeans in Ceylon (renamed Sri Lanka in 1972).

Note 2. This is the earliest English-language document seen (Sept. 1996) that uses the word "soy" to refer to the soybean. Since 1688, "Soy" has always referred to soy sauce.

Note 3. When de Candolle refers to the scientific name of the soybean as *Glycine soja,* it is not clear whether he is using this term incorrectly as a synonym for the cultivated soybean, or correctly as the scientific name for the wild soybean.

Note 4. On the title page, under the author's name, we read: "Foreign associate of the Academy of Sciences of the Institute of France; Foreign member of the Royal Society of London, Edinburgh [Scotland], and Dublin [Ireland]; of the academies of St. Petersburgh, Stockholm, Berlin, Munich, Brussels, Copenhagen, Amsterdam, Rome, Turin, Madrid, Boston, etc.

Note 5. The term "centers of origin" or "centers of origin" does not appear in this book.

Note 6. Also discussed: Bambarra ground nut (*Glycine subterranea, Voandzeia subterranea;* p. 347-48). Quinoa (p. 351-52). Lupin (p. 325-27). Address: Geneva [Switzerland, 1882].

689. Cohn, Ferdinand. 1884. Ueber Schimmelpilze als Gaehrungserreger [On molds as instigators of fermentation]. *Jahres-Bericht der Schlesischen Gesellschaft fuer Vaterlaendische Cultur* (*Breslau/Wroclaw*) 61:226-30. For the year 1883. [Ger]

• ***Summary:*** In this lecture, presented on 31 May 1883, Prof. Cohn named the species *Aspergillus oryzae.* It had previously been named *Eurotium oryzae* Ahlburg (now a synonym).

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Note: Thom and Raper (1945, p. 261) note that "The name *E. oryzae* with an incomplete description for the saké organism was published by Korschelt, in *Dingler's Polytechnisches Journal* 230:330. 1878, as taken from a letter from 'Herr Ahlburg.'"

On page 227 Cohn notes: "In the winter of 1883 I obtained some grains of tane kosi [sic, *tané koji, tane koji*] (the so-called mother-yeast of the Japanese rice wine, saké) from Shinkizi [Shinkiji] Nagai, a native of Tokyo who was staying in Breslau as a student of agriculture. I prevailed upon this intelligent and industrious young man, under my supervision, to make sake using the tané koji and methods he had learned in Japan. After a number of unsuccessful trials, we met with excellent success. The Japanese methods are, although used for hundreds of years, so rational, that they can hardly be improved based on a scientific understanding of the process. Tane Kosi are grains of rice which are overgrown with the mycelium and spore bodies (*Fruchttraegern*) of *Aspergillus oryzae,* the splendid rice mold with its greenish-yellow conidia."

"Another fermentation product made by *Aspergillus oryzae* is the well-known soy sauce (*Sojasauce*). This was also prepared at our institute by Mr. Shinkizi Nagai using the Japanese method. This soy sauce was prepared from soybeans (*Sojabohne, Dolichos Soja*) that have recently been cultivated here. Soybeans are different from our typical beans in that they have a very low content of starch and are very rich in fat and 'Cheese-stuff' (literally *Kaesestoff,* Legumin, vegetable casein) [i.e., protein]. Because of this fact, the soybean is used to make cheese [tofu] in Japan."

A detailed description of the process for making soy sauce is then given.

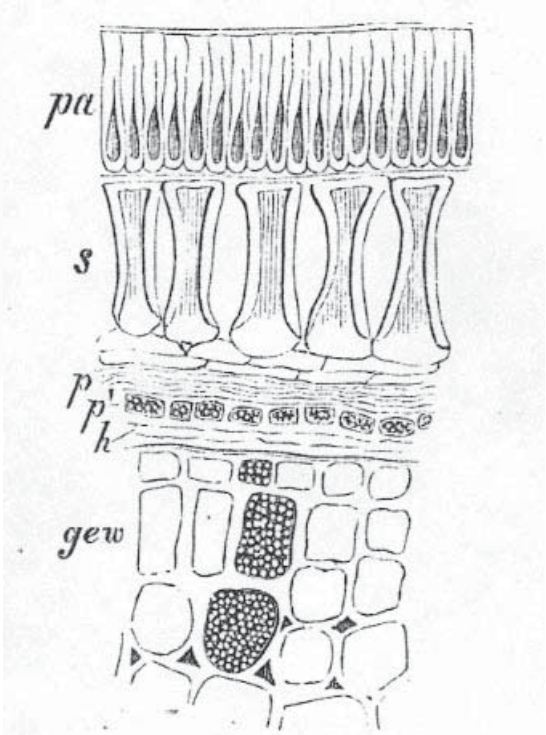
Note 1. This is the earliest German-language document seen (April 2012) that uses the term *Sojasauce* to refer to soy sauce.

Note 2. Breslau is the German name for Wroclaw, a city in southwest Poland. Address: Prof., Dr.

690. Ebihara, Kôjirô. 1884. Yûeki shôyu seizôhô hiketsu [Secrets of making wholesome / profitable shoyu]. Tokyo: Chinkôdô. 32 p. 18 cm. [Jap]*
Address: Japan.

691. Hanausek, Thomas Franz. 1884. Die Nahrungs- und Genussmittel aus dem Pflanzenreiche: Nach den Grundsaetzen der wissenschaftlichen Waarenkunde fuer die Praxis und zum Studium [Foods and food adjuncts (stimulants / enjoyables) from the vegetable kingdom: On the principles of scientific study of food products in practice and theory]. Kassel: Verlag von Theodor Fischer. xiv + 485 p. See p. 99. Incl. 100 illust. and tables. 19 cm. Vol. 5 in the series *Allgemeine Waarenkunde und Rohstofflehre.* [8 soy ref. Ger]

• ***Summary:*** This book describes how to analyze commercial products (chemically, microscopically, etc.) to determine their composition and to detect adulteration. Chapter III (p. 75-105) is titled "The legumes and their starches" (*"Die Huelsenfruechte und ihre Stärke"*). Section 8 (p. 99-103) within that chapter is titled "The soybean" ("Die Sojabohne"). The author discusses soy sauce and how to tell when it is adulterated, miso and how it is made in Japan, and the use of the soybean as a coffee substitute. He gives the weight of seeds according to data from Haberlandt, lists different varieties according to a classification by Harz (1880, 1885), describes the shape and structure of the seeds, gives a microscopic analysis of the shape of the cells in a cross-section of the seed coat. An illustration (line drawing of a microscopic image, p. 101) shows a "Cross section through the soybean," with the following cell types labeled: pa = palisade cells (*Pallisadenzellen* {*Palisadenzellen*}), s = hour-glass cells (*Säulenzellen*), p and p' = outer and inner parenchyma layer (*Aeussere und innere Parenchymschicht*), h = hyalin stria (*hyaline Streifen*), gew = seed tissue (*Samengewebe*). Starch-bodies are missing.



pa Pallisaden-, s Säulenzellen, p äussere, p' innere Parenchymschicht, h hyaline Streifen, gew Samengewebe. Stärkekörner fehlen.

Note 1. This is the earliest document seen (Feb. 2002) that describes use of a microscope to examine soybean cells or that contains an illustration of those microscopic cells.

The author presents a chemical analysis and description of the seeds. He notes that no trace of starch can be found

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in soybeans, a characteristic shared by lupins, one of the infallible criteria for detecting both, and an indication of the high nutritional value of the soybean. Peanut seeds are also discussed on p. 103.

On pages 417-31 Hanausek gives a detailed analysis of coffee substitutes. On page 424, in the subsection on "Coffee substitutes made from the seeds of legumes," he notes that this type is rarely found any more, but that the soybean may be used.

Note 2. Under the term "Genussmittel" (food adjuncts {stimulants / enjoyables}), Hanausek includes: Tobacco, tea, cocoa, coffee, kola nuts, cacao, Guarana* (paste from the seeds of the shrub or bush *Paullinia sorbilis Mart.* (*P. Cupana Kth.*) used in north Brazil), Tschan (Chan)* (made from the fruits of a type of sage plant in Guatemala), betel nuts, opium, and hashish. (* = not in a German dictionary).

Hanausek lived 1852-1918. Address: Krems an der Donau (Krems on the Danube), Austria.

692. Lincoln, Mary Johnson. 1884. Mrs. Lincoln's Boston cook book: What to do and what not to do in cooking. Boston, Massachusetts: Roberts Brothers. xiv + 536 p. Illust. Index. 20 cm.

• ***Summary:*** Worcestershire sauce is used as an ingredient (often optional) in 8 recipes in this book: Mock turtle soup (p. 137-38). Fish chowder (p. 155-56). Remnants of cooked fish (p. 169-70). Scalloped oysters (p. 177). Devilled lobster (p. 183). Tartar sauce (Hot for broiled fish, p. 194). Veal cutlets (p. 240-41). Salamis of game (p. 270).

In the section titled "Explanation of terms used in cookery" is the earliest definition of soy [sauce] found in a U.S. cookbook (p. 506): "Soy. A Japanese sauce prepared from the seeds of *Dolichos Soja.* It has an agreeable flavor and a clear brown color. Used to color soups and sauces."

In the section on "Bread and bread making" we read (p. 42): *"Health-Food Flour.*–A still better method of converting wheat into flour, and one which is indorsed by leading scientists and physicians, has been recently introduced by the Health Food Company of New York. Only the choicest kinds of wheat are used. The outer husk is first removed by moistening the grain, and subjecting it to a gentle rubbing by what is termed the 'attrition process.' This softens the woody fibre of the outer bran, which is easily removed by sifting, but does not affect the hard gluten coats. The grains are dried, then pulverized into various grades by a compressed cold-air blast, which dashes the grains into atoms with tremendous force. This is called *whole-wheat flour,* the name indicating that the whole of the gluten, or nutritive part of the flour, is retained. It is not sifted like other flours, but pulverized into all the varieties of *crushed wheat, coarse granulated and fine granulated wheat;* each variety, even the finest flour, containing all that is valuable as food. Bread made with this flour has been found, after repeated trial, to be sweet and agreeable to the taste, light and spongy in texture, with none of the objectionable features of Graham bread, and answering fully all the demands of perfect nutrition.

"Cheap inferior Graham flour, made of poor flour mixed with bran, is worse than no food at all." "The Arlington, the Franklin, and some other brands of whole-wheat flour, are highly indorsed by those familiar with them."

Note: Perhaps the most influential cookbook published in America before 1900, and "one of the most innovative, original cookbooks of all time, and precursor and predecessor of the most-enduring American cookbook, Fannie Farmer's *Boston Cooking School Cook Book* (1896)." "One reviewer at the time wrote: 'It is the trimmest, best arranged, best illustrated, most intelligible, manual of cookery as a high art, and as an economic art, that has appeared.'" "Lincoln's methods, often referred to as 'scientific cookery,' required cooks to understand systematic measurements, nutrition, digestion, and the chemistry of cooking, as well as the basics of keeping an orderly kitchen and serving as a gracious hostess."

Mary Johnson Lincoln lived 1844-1921. In the late 1870s, when her husband suffered from failing health, she "worked as a domestic to maintain an income... It was at this time that the Woman's Education Association (WEA) of Boston decided to establish a cooking school–the Boston Cooking School–which would become the most famous of the first American cooking schools." Lincoln wrote that the determining influence in its organization "'was the return of Mrs. Sarah T. Hooper... who had seen the work at the South Kensington School on her way through London, and came home filled with enthusiasm to have similar work in Boston, especially for the benefit of the poor and those who would work out as cooks.' Hooper, an active member of the WEA, became the first president, and hired Joanna Sweeney and Maria Parloa to teach classes." Lincoln soon became a teacher as well (MSU biography). Address: Boston Cooking School, Boston, Massachusetts.

693. Matsumura, Jinzô. 1884. Nippon shokubutsumeii; or, nomenclature of Japanese plants in Latin, Japanese, and Chinese. Tokio, Japan: Z.P. Maruya & Co. 209 p. + xciii. See p. 87. Supervised by R. Yatabe, Prof. of Botany in the Univ. of Tokio. Added title page in Japanese. 22 cm. 2nd ed. 1895. Third ed. 1916. [Lat; Jap; Chi]

• ***Summary:*** Matsumura lists two species of Glycine: "1,029. *G. hispida,* Moench.–Leguminosae. ô-mame, mame, daizu" (in Chinese characters).

"1,030. *Glycine Soja,* Sieb. et Zucc. tsuru-mame, no-mame" (Has no Chinese characters). Address: Asst. Prof. of Botany in the Univ. of Tokio, Japan.

694. Rein, Johann Justus. 1884. Japan: Travels and researches undertaken at the cost of the Prussian government. Translated from the German. London: Hodder and Stoughton, and New York: A.C. Armstrong and Son. x + 534

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p. See p. 420. 25 cm. 2nd ed. was 1888 (543 p., New York).
• ***Summary:*** The only apparent reference seen to soy (p. 420) states "Dwarf and long beans, peas and dolichos-beans are a good deal cultivated, though like various other vegetables they are much less important than two plants, which the Japanese can hardly do without. These are long white radishes or daikon... and the nasu or egg-plant (Solanum melongena)..."

Beans are also mentioned on pages 384, 405 (the *go-koku* or "five chief fruits of the field–rice, barley [and/or wheat], millet, hemp and beans"), and 446 (*go-koku*). Soy is not listed in the index. Johann Justus Rein lived 1835-1918. Address: Prof. of Geography in Marburg.

695. Yûeki shôyu seizô-hô hiketsu [Secrets of making fine, profitable shoyu]. 1884. Japan. [Jap]*

696. *Gardeners' Chronicle* (*London*). 1885. Japanese food vegetable products. 23:51. Jan. 10. New Series.
• ***Summary:*** This is the conclusion of an article begun in the 20 Dec. 1884 issue. "Soy. Two preparations from the Soy Bean (Glycine soja), besides that already referred to, deserve mentioning–namely, miso, a fermented substance; and shoyu, or soy itself. The first is a curious preparation, described as follows:–There are many ways of making miso, differing very little from each other; the kind containing the largest quantity of yeast is considered the best. The usual mode is after soaking Soy Beans in water for about two hours to put them into a suitable vessel and steam them; then, after mixing them with salt and yeast, they are removed to wooden plates; then the ingredients are very evenly mixed, the liquid is put into casks, and is then left untouched for upwards of a year. Another method is to soak a quantity of yellow Soy Beans in water for a night, then boil them in a large kettle, and as soon as the water in the kettle has evaporated, and the beans show a reddish-yellow colour, they are removed to a mortar and pounded, after which they are placed on mats. When they are thoroughly cooled they are shaped into balls as large as hand-balls, cut with a knife into flat pieces about an eighth of an inch thick, and placed on mats shaped like scales of fish. As soon as mould appears upon them they are taken, crushed into small pieces, and exposed to the rays of the sun for a day or two. When nearly dry, salt and water are added to them, and the whole is pounded in a mortar and then left in a cask for a month or two, and sometimes longer, when the preceding process will be repeated. Finally, if it is sealed up in casks it will never deteriorate. It is in prime condition when three years old. It forms one of the most necessary articles of food in Japan, and has been used from time immemorial, both by nobles and men of inferior rank. It is made into a soup, and is one of the courses served up as a principal article of everyday diet. The mode of preparing the soup is to rub the miso around an earthen bowl, into which a suitable quantity of water has been poured. It is then filtered through a sieve, and vegetables added according to taste; the whole is then boiled and served up. Miso is also used to give an agreeable flavour by mixing it with other food, and it is likewise mixed with condiments, as Japanese Pepper, Ginger, Horse-Radish, Chillies, Sesame, Poppy seeds, &c.

"Soy [sauce] or *Shoyu*, is perhaps the chief product of the Soy Bean. It consists of a mixture of these Beans, Wheat, salt, and water. The mode of preparing it is to thoroughly boil, after washing in a cask with water, fifty parts of Beans, and to parch about fifty parts of Wheat in a pan for a little while and thoroughly boil it, after grinding on a stone mill: when these two substances are mixed together and kept in a warm room for about four days, the substances are converted into a yellow flour-like matter: this is yeast. This yeast is then thrown into a mixture of salt and water, and afterwards thoroughly cooled, then boiled in a large kettle, and stirred with a Bamboo instrument twice a day in summer, and once a day in winter. After the lapse of three years, the sediment is poured into a bag then put into a small tub and submitted to strong pressure by means of a bar at the end of which hangs a heavy weight. The fluid expressed is poured into a kettle and submitted to a heat of not more than 80º; it is again removed to a large tub and set away for a night, when it becomes a deep black colour, and acquires a very delicious taste.

"Soy is one of the most valuable foods, and is in daily use; mixed with several kinds of food it imparts to them a delicious flavour. It is universally liked, and is really indispensable in the Japanese kitchen. The quantity annually consumed in Japan is extremely large, and of late years the article has been exported."

697. Furukawa, Sakae. 1885. Shôyu ryakuki [Note on shoyu]. *Tokyo Iji Shinshi* (*Tokyo / Tokei Medical Journal*) No. 360. p. 231-35. Feb. 21; No. 361. p. 260-63. Feb. 28. [Jap]
Address: Igaku-shi (M.D.), Japan.

698. Furukawa, Sakae. 1885. Tôfu ryakusetsu [Brief explanation of tofu]. *Tokyo Iji Shinshi* (*Tokyo Medical Journal*) No. 362. p. 298-302. March 7. [Jap]
Address: Igaku-shi (M.D.), Japan.

699. Grisard, Jules. 1885. Cinquième section. Séance du 10 Mars 1995 [Fifth section. Meeting of 10 March 1885]. *Bulletin de la Societe d'Acclimatation* 32:321-25. May. [Fre]
• ***Summary:*** Mr. Paillieux gives a lecture on two subjects: Shoyu (*Le Shoyu*) and *Le Haricot radié* (which appears to be a confused mixture of the green mung bean and the red azuki bean). "In 1880 I published in this bulletin an extended article about the chemical composition, varieties, culture, and uses of the soybean (*du Soya*)... Today I would like to call your attention again to *Shoyu*, a precious sauce which the Japanese could not live without, and to provide the means to taste it by distributing to each of you some small flasks that

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contain a sufficient quantity of it.

"You do not have to thank me for my generosity; these flasks were given to me by MM. J. de Vigan and Company, a large house importing Japanese and Chinese products..."

"I beg you not to confuse *Shoyu* with *India-Soy,* which is sold in London and even in Paris; the latter is only a poor imitation.

Note: Where and how is India-Soy made? What are the major differences in sensory qualities between the two sauces?

"*Shoyu* is not a condiment in the sense that we normally attach to this word. It does not have a pungent, heating taste like pepper, mustard, chili peppers, etc. To the contrary, it is refreshing. MM. de Vigan can speak of it with reason and precision, for they consume a bottle a week of it, as much for their children as for themselves.

"The Japanese put *Shoyu* on all that they eat, and according to all appearances, we would be tempted in France to make an immoderate usage of it when we begin to use it.

"I shall not speak to you of Japanese cuisine, which to me is strongly suspect, but I shall tell you that for me *Shoyu* can, in many cases, replace meat stock, quite a unique thing, but that explains itself perhaps by the notable proportion of fat that soybeans contain.

"A teaspoon of Shoyu in an ordinary broth makes it much better. It does wonders in *court-bouillon* for the cooking of fish. It combines advantageously with beefsteak stock. In a salad with cold meat, it has a very good effect. Finally, it is incomparable in scrambled eggs (*oeufs brouillès*).

"The house Potel and Chabot, whose chef is our colleague Mr. Lhermitte, served the table of the Japanese mission in 1878. He assures me that Shoyu is excellent in bean salads and unsurpassed with eggs, whatever the mode of preparation.

"You see that it is not necessary to be Japanese to multiply the uses of Shoyu. When a first-rate chef (*cordon-bleu*) has it, his/her cooking is transformed and becomes so much better that one does not perceive the use made of the famous sauce, at a moderate dose.

"Here, gentlemen, is a recipe for preparing Shoyu, made in France by my excellent correspondent Dr. Hénon who had learned it in Japan:

"'Take two parts naked barley or wheat and three parts soybean (*Daïdzu* (*Soya*)). Next soak for a day and a night in soft (non-calcareous) water. Then steam until completely cooked. The grains need not pop open but must be tender. Mix the two grains then spread them out in beds 2-3 cm high in wooden trays that are kept in a place that is fairly warm, neither too dry nor too humid. The grains will mold in 12-15 days, according to the season. The best time is spring or autumn. The mold must be greenish blue, thick and resembling velvet.

"'The big red or black molds are worthless; discard them as soon as they appear. When the grains are completely covered with mold and form a solid mass, expose them to the sun. When they are dry, rub them between the hands and sift them to get rid of the powder (mold spores?) produced by the moldy debris (*la poussière produite par les débris des moississures*). At this time, take two parts salt for three parts molded grains; place in barrels or earthenware vases with a sufficient quantity of water to cover all with 3-4 inches of liquid.'"

"'Stir the mixture up from time to time and wait three to six months, then filter the sauce through a sieve. It can be stored in casks or bottles for several years, and for my taste, replaces broth or meat stock quite well in cooking.

"'I do not know,' adds my correspondent, 'how much Shoyu is exported from Japan or how much is consumed in that country, but it is the basis of Japanese cuisine. It replaces butter, oil, fat, and meat stock. All beans, fish, and pasta ordinarily are accompanied by Shoyu. There is not a village, no matter how small it may be, that does not Shoyu makers in it. In addition, it is made often in particular houses.

"'During my sojourn in Japan, the price of Shoyu varied, according to its quality, from 8-12 *sen* (40-60 centimes) per *sho,* that is, 1.80 liters.'

"I published two other procedures, practiced in industry, that present notable differences with the household recipe that I just gave you.

"In one it is said that the grains ought to ferment in hermetically-sealed chambers, with the exception of two windows placed at the height of a man which allow surveillance of the operation.

"In the other, they prescribe a particular preparation of the salt destined for production of Shoyu.

"I do not give you the text of these documents. They are rather drawn out and are found in the report I published on soybeans. I do not want to abuse your kind attention."

At the end of the meeting, Mr. Paillieux distributed Shoyu to the attendees. Address: Secretary, France.

700. Watanabe, Eijiro. 1885. Tôfu no setsu [Theories on tofu]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 7:62-76. [Jap]

• ***Summary:*** Begins with a brief biography of the author by a friend named Sugiura. The author was an organic chemist employed at the Japanese patent office, and this article is an analysis of the chemical composition of tofu, published in part for reasons of public health and hygiene. Address: Japan.

701. Balfour, Edward. 1885. The Cyclopædia of India and of eastern and southern Asia, commercial, industrial, and scientific; products of mineral, vegetable, and animal kingdoms, useful arts and manufactures. 3rd ed.: Glycine hispida, Bentham. London: Bernard Quaritch. See vol. 1, p. 1213. 26 cm.

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• ***Summary:*** Soja hispida, Moench, from Glykys, sweet, the roots and leaves of most of the species being so. An annual herb of India, China, and Japan; the main ingredient of the Soja condiment. G. Soja, Sieb, is said to be distinct from G. hispida.

There follows a detailed description of *Glycine Sinensis* [Wisteria or Wistaria], considered one of the most beautiful plants in Chinese gardens. Address: 2 Oxford Square, Hyde Park, London [England]. Founder of the Madras Muhammadan Library; of the Government Central Museum, Madras; of the Mysore Museum, Bangalore [India].

702. Balfour, Edward. 1885. The Cyclopædia of India and of eastern and southern Asia, commercial, industrial, and scientific; products of mineral, vegetable, and animal kingdoms, useful arts and manufactures. 3rd ed.: Leguminosae. London: Bernard Quaritch. See vol. 2, p. 697-98. 26 cm.

• ***Summary:*** "Leguminosae is a name of the Fabaceae or bean tribe, *q.v.* Leguminous and cruciferous plants occupy the largest part of the Chinese kitchen garden; many sorts of peas and beans are cultivated, and the pods and seeds of two species of dolichos are eaten, and the beans of another species made into soy by boiling and powdering the kernels and then fermenting them with yeast, and mixing other ingredients, according to the taste of the maker or purchaser. Peas and beans form important objects of culture, and the condiment called soy (a word derived from the Japanese Soya) is prepared chiefly from a species of dolichos. One of the commonest modes of making this condiment is to skin the beans and grind them to flour, which is mixed with water and powdered gypsum or turmeric. The common Chinese eat few meals without the addition of one form or other of the bean-curd or bean-jelly. The soy was at one time largely used as a condiment in the several countries of Europe, but has been displaced for others. See Fabaceae. ['The bean tribe, leguminous plants.' Soy is not mentioned.]" Address: 2 Oxford Square, Hyde Park, London [England]. Founder of the Madras Muhammadan Library; of the Government Central Museum, Madras; of the Mysore Museum, Bangalore [India].

703. Balfour, Edward. 1885. The Cyclopædia of India and of eastern and southern Asia, commercial, industrial, and scientific; products of mineral, vegetable, and animal kingdoms, useful arts and manufactures. 3rd ed.: Soy [sauce]. Bentham. London: Bernard Quaritch. See vol. 3, p. 715. 26 cm.

• ***Summary:*** This entry is shorter than and different, in parts, from its counterpart in the 1873 edition. New text: "Chinese use Soja hispida pulse when ripe for the manufacture of an oil, and give the remnant of the grain, together with stalks and leaves of the plant, as a food for cattle. Its cultivation has become general in Syria [sic, Styria], Dalmatia [in Croatia], and Hungary. In the two former countries, the grain, after being allowed to ripen, is threshed out and roasted, and then employed for making coffee. In China, the grains are soaked till they swell and become soft, and then cooked like the small sort of beans. In other places, the seeds are set in a very damp, watery soil, and kept in darkness until they sprout up into a long white stalk, 4 or 5 inches high, which is then cut and served up after the manner of a salad. A sort of cheese, consumed in quantities by the poorer people both in China and Japan, is made from Soja hispida.

Note: This appears to be the earliest document seen (June 2007) concerning soybeans in Syria, or the cultivation of soybeans in Syria. However, Balfour got his information about Syria, Dalmatia, and Hungary from Friedrich Haberlandt's classic book *The Soybean* (*Die Sojabohne*), the only early work in which Dalmatia and Hungary are both discussed. The third place, however, is Styria (Steiermark in German), not Syria! The next earliest reliable document concerning cultivation of soybeans in Syria was published in 1975, and describes soybean trials in Syria in April 1974. Address: 2 Oxford Square, Hyde Park, London [England]. Founder of the Madras Muhammadan Library; of the Government Central Museum, Madras; of the Mysore Museum, Bangalore [India].

704. Candolle, Alphonse de. 1885. Origin of cultivated plants. New York, NY: D. Appleton and Co. viii + 468 p. See p. 330-32, 443. The International Scientific Series Vol. 48. Translation of Origin des Plantes Cultivees, 1883 ed. 2nd ed. 1886. Reprinted in facsimile in 1959 by Hafner Publ. Co, New York. 19 cm.

• ***Summary:*** This is the first U.S. edition of this landmark work by de Candolle (lived 1806-1893), the renowned Swiss botanist, whose father was also a famous botanist. The section on soy in this edition is identical to (in fact, a facsimile of) that in the first British edition published in London in 1884.

De Candolle, a Swiss botanist, was the first to recognize that information from botany, philology, geography, and archaeology must be integrated if scholars were to understand the origins of agriculture. He tried to determine the regions where most of the world's important crops were first domesticated. Address: Foreign Assoc. of the Academy of Sciences of the Inst. of France.

705. Koibuchi, Chûho. 1885. Shôyu kashizeisoku [Tax regulations concerning shoyu used in making Japanese-style confections]. Kôfu [Yamanashi prefecture], Japan: Published by the author. Unpaginated (7 chô) 19 cm. [Jap]*

• ***Summary:*** Note: This may include the use of shoyu in making rice crackers (*o-senbei*).

706. Mene, Édouard. 1885. Des productions végétales du Japon [The vegetable products of Japan]. Paris: Au Siège de

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la Société Nationale d'Acclimatation. 592 p. Index. 24 cm. [34 soy ref. Fre]

• ***Summary:*** The title page states in small letters: *Extrait du Bulletin de la Société Nationale d'Acclimatation,* indicating that much of the material in this book is based on articles previously published in this French-language Bulletin. However many other early books on Japanese agriculture have also been consulted and are carefully cited.

In the Introduction, the author explains that he was appointed by the Society for Acclimatization to prepare this report on the vegetable products of Japan which had been exhibited at the Universal Exposition of Paris in 1878–in two parts. Those displayed by the Japanese firm Trocadero, and those displayed in the galleries of the palace at Champ-de-Mars. The author and many others were deeply impressed by this exhibition.

Grains (class 69, p. 31): Wheat or rice are mixed with beans or peas and fermented to make shoyu and miso. Shoyu is one of the most widely used condiments in Japanese cuisine. The method of production is described briefly. Among the condiments displayed in class 74 were a number of flasks of shoyu from Tokyo.

Legumes (p. 40-47): Discusses soybeans, tofu, azuki beans (*Phaseolus radiatus* var. *subtrilobata,* p. 42-44; incl. yayenari, red, white, black, and yellowish azuki, Dainagon azuki, azuki flour, an, yokan), shoyu, soybeans (*Pois oléagineux, Soja hispida,* p. 45-46; incl. Kuro-mame {Black soybeans}, various colors and shapes of dry soybeans {green, yellowish, large yellowish, greenish black, brownish red, white, large red}).

There is also a special, long section on soybeans (*Soja hispida. O mame: Daizu;* p. 270-83) and soyfoods. In the Japanese exposition, the display of useful products (*tableau des productions utiles*) designates: No. 24. *Kuro-mame.* Black-seeded soybeans, the size of an average sized haricot bean. No. 25. *Shiro-mame.* White-seeded soybeans, spotted / flecked / speckled / mottled (*tachetées*) with gray. No. 26. *Ao-mame.* Greenish-seeded soybeans. No. 34. *Gankui-mame.* Black-seeded soybeans, flecked with white.

The soybean (*Le Soja*) is cultivated in Japan, India, Ceylon, the Malacca peninsula [today's Malaysia], the Philippine islands, Borneo, Java, the kingdom of Siam, Cochin China, Tongkin (*Tong-King*), and throughout China, primarily in Mongolia and in the provinces of Henan / Honan, Liaoning (*Shenking*), Shandong / Shantung, and Shanxi / Shansi (*Chan-si*).

The Chinese exposition (class 73) contained samples of all the varieties of soya cultivated in all the provinces of the empire. Nos. 2991 to 3000. Green, white, black, yellow, striped or variegated, and reddish soybeans, provided by the Chinese customs office at Newchwang. Nos. 3014-16. Yellow, black, and green soybeans from the customs office at Tientsin. Nos. 3058-61. Yellow, green, and black soybeans from customs at Yantai / Chefoo. No. 3091. Yellow soybean from customs at Chinkiang. Nos. 3013-19. White, red, black, and yellow soybeans from customs at Shanghai. Nos. 3125-28. White, black, red, and green soybeans from customs at Wenzhou / Wenchow. Nos. 3152-56. White, green, and black soybeans from customs at Kao-hsiung (*Takow*).

The soybean is one of the plants most widely used in Japan and China for both food and industrial purposes. As indicated previously, shoyu, miso, and tofu are indispensable to the Japanese diet. Samples of these products were displayed in the Japanese exhibit in class 74 (condiments and stimulants); they came from Tokyo and from the province of Hizen, mainly from the town of Nagasaki. In the Chinese exhibit, also in class 74, were samples of (*soye*) or (*soya*) which are similar to Japanese shoyu but are called *Chiang-yu* (*Tsiang-yeou*) in China. They were provided by the customs offices at Yantai / Chefoo, Ning-po, Wenzhou / Wenchow, and Canton. For aroma, the Chinese often add star anise, green anise, and orange peel. Chinese soy sauce is made from yellow soybeans (*Houang-téou*).

Note: This is the earliest French-language document seen (April 2012) that uses the term *Chiang-yu* to refer to soy sauce.

Note: This is the earliest document seen (Jan. 2006) describing a soy sauce made with star anise, green anise, orange peel or other spices or herbs outside of Indonesia.

A detailed description of the method for making Japanese shoyu is given, excerpted from the book *Le Japon à l'Exposition universelle de 1878* [Japan at the Universal Exposition of 1878] (1878, vol. II, p. 124). Additional excerpts concerning shoyu, miso, and tofu are taken from: Simon 1862, Kaempfer 1712, *Bulletin of the Society for Acclimatization* 1880 (p. 248), and Champion 1866.

In France, Mr. Vilmorin and Dr. Adrien Sicard (of Marseilles), who are both involved with soybean cultivation, have prepared soy cheese (*fromage de Soja*) numerous times. Dr. Sicard has made both the white cheese [probably tofu] and the red cheese; the latter is rolled in a powder made by grinding red sandalwood (*santal; Pterocarpus santalinus*), mace, and cinnamon (p. 276).

One of the most important soy products is the oil, which is obtained from the seeds–especially the large yellow soybeans that the Chinese call *Houang-téou.* The Japanese do not make soy oil (*huile de Soja*) but in China manufacture of this product gives rise to considerable commerce. Fremy (1855) found that soybean seeds contain 18% oil. The oil is a drying oil, yellow in color and with a special odor and a taste of dried legumes, similar to that of peas. It is used in cooking and illumination. In China, quite a few soy oil factories are found at Calfond in Henan, at Tsinan in Shantung, and at Tayeurn in Shanxi. But the center of soy oil production in China is Ning-po in Zhejiang / Chekiang. From the port of Ning-po and from a port on the island of *Tcheou-chan* [*Zhoushan?*] a large number of junks, carrying only soy oil, depart. Two other manufacturing centers are Newchwang

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and Chefoo. There follows a detailed description (p. 276-77) of how soy oil is obtained from soybeans.

Another common use is as fermented black soybeans (*Chi*) which (according to Stanislas Julien) contain soybeans mixed with ginger and salt. Kiu-tsee is a fermented soy product made in Canton; it contains red rice, soybeans, and the leaves of *Glycosmis citrifolia.* The Chinese also make a pasta and a sort of vermicelli from soybean seeds named *Hou-mi-téou.*

The stems and leaves make excellent forage. Black soybean seeds are often mixed with chopped soybean hay and fed to horses and mules in northern China and Manchuria.

In Japanese and Chinese medicine, black soybean seeds, ground and made into a decoction, are used to combat asthma attacks.

There follows a long history (p. 277-83) of the introduction of the soybean to Europe (starting at the Jardin des Plantes in Paris, in 1740 or 1779) and its acclimatization, based largely on articles from the *Bulletin of the Society for Acclimatization.* It includes a summary of the work of Prof. Haberlandt in central Europe.

Also discusses: Japanese plum trees (*Prunus mume*) and umeboshi salt plums (p. 52-54, 466-67). Sesame seeds and sesame oil (p. 54-55). Amaranths (p. 63-64). Job's tears (*Coix lacryma;* p. 214-15). Kudzu, kuzu powder, and kuzu cloth (*Pueraria Thunbergiana;* p. 283-85). Peanuts and peanut oil (*Arachis hypogæa, Tojin-mame;* p. 286-87). Sesame seeds and sesame oil (*Sesamum indicum, Goma;* p. 518-20). Hemp and hemp oil (*Cannabis sativa, Asa;* p. 558-59). Address: Médecin de la Maison de Santé de Saint-John de Dieu [Paris, France].

707. Official report of the Calcutta International Exhibition, 1883-84. 2 vols. 1885. Calcutta: Bengal Secretariat Press. See Vol. I, Part I, p. 270. 23 cm.

• ***Summary:*** On the title page: "Compiled under orders of the Executive Committee."

In Vol. I, Part I (which is 489 pages), page 270 states: "(6) Glycine Soja, (S. & Z.)–The Soy Bean.

"This is known in the vernacular as *Gari-kulay,* Beng. [Bengali]; *Bhat, bhatwan,* Hindi; *Tsu dza,* Naga. This plant is densely clothed with fine ferruginous hairs, is sub-erect; met with in the tropical regions and the outer Himalaya, from Kumaon to Sikkim, the Khasia and the Naga Hills to Upper Burma. Dr. Stewart mentions a field of bhat having been observed in Bissahir in the Panjab [Punjab; probably in today's Pakistan], altitude 6,000 feet. The plant is chiefly met with in a state of cultivation. Dr. Roxburgh first saw it from seed received from the Moluccas in 1798."

Note 1. The reference to "Dr. Stewart" almost surely refers to John Lindsay Stewart who wrote important books in 1867, 1869, and 1874 (plus at least 6 scientific articles) on the plants of the Punjab and north-west India. Two of these books have now been scanned in "full view" but we can find no statement resembling the one above attributed to Dr. Stewart. In 1864 Dr. Stewart was appointed the first Conservator of Forests in the Panjab. He died on 5 July 1873 in Dalhousie at age 41.

"De Candolle views it, and apparently correctly, as a native of Cochin China, Japan, and Java. But he remarks that "it is of modern introduction into India." "There are no common Indian names" for it. This seems to be a mistake; the plant is well known in India under the names given above. In Manipur and the Naga Hills it is one of the most abundant of pulses. Its Naga name is *Tsu dza,* a name not unlike *Soja,* but at the same time it may be viewed as related to the old Chinese name *Shu.* The Soya most likely reached India from China, passing by way of Assam. But while it cannot be said to be wild on the Naga hills, from the existence of so large a percentage of Japan and Java plants on those hills, the Soya might quite probably have had its most western home on the mountain tracts bordering on Assam. The importance of these hill tracts in settling questions of the nativity of cultivated Indian and Chinese plants has not been fully appreciated, and we might fairly anticipate that many statements at present accepted as facts will be considerably modified with an extended knowledge of the wild and cultivated plants of the Assam and Chinese frontier. The thorough exploration of this region is very desirable.

Note 2. This document contains the 2nd earliest date seen for the cultivation of soybeans in north east India (1885).

Note 3. This is the earliest document seen (Sept. 2010) concerning the cultivation of soybeans in Manipur, or in Nagaland, both North East Indian states which shares a long border with Assam.

"This pulse is an important article of food in Tibet. It is made in India into a sauce called "Soy." The advisability of extending its cultivation on the Himalayan tracts was pressed on the Government of India in 1882 by Professor Kinch, and the attention of local Governments also was called to it."

Note 4. This is the earliest document seen (Sept. 2010) concerning soybeans in Tibet, or the cultivation of soybeans in Tibet. This document contains the earliest date seen for soybeans in Tibet, or the cultivation of soybeans in Tibet (1909). The source of these soybeans is unknown–as, unfortunately, is the author's source of this information about soybeans in Tibet. Note that the lowest elevations in Tibet are about 12,000 to 15,000 feet, and the summer temperatures are quite cold. It seems unlikely that soybeans would grow under these conditions.

Note 5. Is it possible that soya is really "an important article of food in Tibet?" If so, what is the author's source of information? We have seen no such source? Is it cultivated there? In what form is it consumed? Roasted soy flour might be used like *tsampa* (roasted barley flour).

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In the section on "The oils, oil-seeds, soap..." we read (p. 305): "Very extensive collections of oilseeds were shown, especially those collected by the Chamber of Commerce, Bombay... The following may be enumerated as the most interesting and useful oils:..." Among the 71 oils listed, No. (36), page 308 is: *"Glycine Soja,* (*Sieb.*).–The Soy Bean. Large quantities of this seed are annually consumed in the manufacture of an edible oil."

Other oils include: "(9) *Arachis hypogæa,* (*Linn.*).–The Ground-nut or Earth-nut. This may be described as a modern industry; the oil, as a substitute for olive oil, having within the past 30 or 40 years developed in an almost unprecedented manner." France is a major importer of the nuts.

On the last two pages of Vol. I, Part I is a "Vernacular notice," whose "Translation" is given. It begins: "It is hereby brought to the notice of the general public that an Exhibition of all things worthy to be shown from all countries of the world will be held in Calcutta on the Maidan from the 4th of December 1883 till the 1st of March 1884." The frontispiece shows an aerial view of the Exhibition.

Note 6. Maidan, which means literally "open field," is the largest urban park in Calcutta. As of Oct. 2010 it still exists, is widely used, and is the home to numerous play grounds, including the famous cricketing venue Eden Gardens, several football stadia, and the Kolkata Race Course.

"(26) *Cocos nucifera,* (*Linn.*).–The Cocoa-nut." "(68) *Sesamum indicum,* (*Linn.*).–Gingelly or Sesame Oil." Address: Calcutta, Bengal [British India].

708. Paillieux, Auguste; Bois, D. 1885. Le potager d'un curieux. Histoire, culture et usages de 100 plantes comestibles, peu connues ou inconnues: Soya [The inquisitive person's kitchen garden. History, culture, and uses of 100 edible, little-known or unknown plants]. Paris: Librairie Agricole de la Maison Rustique. 294 p. See p. 261-65. 2nd ed. 1892. 3rd ed. 1899, p. 575-625. [1 soy ref. Fre]
• ***Summary:*** The five-page section on Soya (p. 261-65) discusses its use primarily as a vegetable. For more about its broader uses, see Paillieux's 1881 book titled *Le soya, sa composition chimique, sa culture et ses usages.* This section discusses: Englebert Kaempfer's writings: "In Japan, this plant is named *Daidsu* and surnamed *Mame,* that is to say a food grain *par excellence."* Cultivation trials with four varieties conducted by the Society for Acclimatization: (1) Soybean from China, cultivated in Hungary, imported by MM. Vilmorin-Andrieux and Co. The seed color is pale yellow and the hilum is brown. This is the earliest maturing variety we have seen. (2) Soybean of Etampes. These seeds were distributed in 1874 by the Society for Acclimatization. The seeds are light yellow and the hilum is white. The plant is beautiful, very strong and very productive, but a little late in maturing. (3) The green soybean, originating from Japan, has rather roundish green seeds and a brown hilum. Its is not as early as the soybean from China, mentioned above. (4) The light green soybean, with a white hilum, has somewhat flattened seeds. It has come to us from both Japan and China. Its pods mature rather late. Vilmorin is importing more varieties, including a brown one. The variety in their 1880 catalog seemed a bit late.

There follow instructions for planting, cultivating, and harvesting soybeans (*Soya*). When the soybeans are fully developed, but before the pods begin to dry, they should be picked. At this stage they are as good as fresh flageolets–though the pods are a bit difficult to remove.

In the dried state, soybean seeds make a good food. Their taste is sweet and very agreeable. We have prepared them like ordinary white haricot beans. They should be soaked for 24 hours before cooking in water that is not hard, or in distilled water. For best results, add 3 grams per liter of soda crystals [sodium bicarbonate].

Soya is without doubt the best of all the coffee substitutes. Many housewives serve a mixture of coffee and chicory each morning for breakfast. But [ground] roasted soybeans need not be mixed with anything. It gives a good coffee *au lait* whose aroma resembles that of Mocha–though it is not as strong. The soybean is cultivated in Tyrol [Tirol] and the Istrian Peninsula under the name of "coffee bean," and we suppose this is also the case in Dalmatia and the south of Italy.

Mr. Heuzé in his book *Edible Plants* (*Plantes alimentaires*) gives the soybean the name *Dolic à café* (the coffee bean) and says that it is cultivated in some points in the departments of Ariège and of Haute-Garonne; we have not been able to verify this. Recently we learned from Mr. Faivre, of Beaune, that the soybean had been introduced, about 12 years ago, at Allery, a commune in Saône-et-Loire [in east central France] by Father Cretin (*M. l'abbé Crétin*), and that its seeds were used like coffee beans by many families in the country.

Mr. Faivre, an ardent and generous propagator / spreader of soya, sent us some seeds of the plant cultivated at Allery. They are brown and identical to those recently imported by Vilmorin. Finally, the engineer and head of one of our departments wrote us that he enjoys Soya each morning for breakfast, and that he prefers it to Mocha. He recommends roasting the seeds lightly.

If gardeners will set aside a little space for Soya each year in their gardens, they will obtain, at no extra expense, the coffee needed each morning by their families.

There is much more we know and could say about Soya. Worldwide, it occupies a place equal to wheat, corn, and potatoes. Indeed, it makes an excellent forage. It contains 18% oil. The cake, which remains after the oil is extracted, makes a powerful fertilizer. Under various forms, these seeds become part of the daily food of hundreds of millions of people. They are also used to feed animals, especially millions of horses and mules.

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As numerous analyses have demonstrated, they constitute the richest and most complete food that one can desire. We recommend to the reader the recent work, done with great care by Pettet and Schou, in *Revue des Industries Chimiques et Agricoles* (1882).

Contents: Introduction. Discussion of individual plants arranged alphabetically by their French names. For each plant is given, below the French name: Scientific name, early sources, and plant family. Some of the plants discussed include: Amaranth (*Amarantus oleraceus*). *Glycine apios* (legume family). The peanut (*Arachis Hypogaea; Arachide, Pistache de terre*) (p. 20-23). Daikon or Japanese radish (*Raphanus Sativus,* L. var; *Daikon ou radis du Japon*). Azuki bean (*Phaseolus Radiatus; Haricot radié*) (p. 102-07; The section titled "A Java" mentions seasoning a dish with *Ketjap,* which it calls *la sauce noire,* or "black sauce"). Glutinous yam (*Dioscorea Batatas; Igname*). Konnyaku (*Amorphophallus Rivieri; Koniaku*). Kudzu (*Pueraria Thunbergiana; Kudzu*) (p. 154-64). White melon of Japan (*Cucumis Melo; Shiro uri; Melon blanc de Japon*). Myoga (*Zingiber mioga; Mioga*). Udo (*Aralia cordata; Oudo*). White quinoa (*Anserine Quinoa; Chenopodium quinoa; Quinoa blanc*) (p. 242-45). Chufa (*Cyperus esculentus; Souchet comestible, Souchet sultan, Amande de terre*) (p. 256-61). Soya (*Dolichos Soja; Soja hispida Moench; Glycine Soja; Soya*) (p. 261-65). Bambarra groundnuts (*Voandzeia subterranea; Voandzou*) (p. 272-74). Table of contents (by both French name and scientific name). Address: 1. Member of la Société nationale d'Acclimatation; 2. Préparateur au Muséum. Member of the Société Botanique de France.

709. Welch, Adonijah Strong. 1885. Report on the organization and management of seven agricultural schools in Germany, Belgium, and England. Washington, DC: Government Printing Office. 107 p. See p. 73-77. Made to Hon. George B. Loring, U.S. Commissioner of Agriculture. • ***Summary:*** The last section is titled "The Royal Agricultural College at Cirencester, England," where the author visited on 8 Feb. 1884. The subsection titled "Work of the laboratory" (p. 73) describes seven types of current original research. including: "7. On the soy bean (Soja hispida), its chemical composition and value as a food.

"The following is a detailed account of Prof. Edward Kinch's description and analyses of the soy bean of China. I append his entire report of the results of this interesting investigation, because it not only shows the character of the work done in his laboratory, but indicates that this bean may be profitably grown in some parts of the Western States. Indeed, the same bean was grown on the experimental grounds of the Iowa Agricultural College last year, and showed a very large yield."

Prof. Kinch's report, titled "The Soy bean," states: "This bean, sometimes known as the Japan pea and China bean, is the seed of the *Soja hispida,* Miquel (*Glycine hispida,* Moench; *Dolichos Soja,* Linné; *Glycine Soja,* Jaquin), a plant of the natural order Leguminosae,..." suborder Papilionaceae, and tribe Phaseolæ. Its natural habitat appears to be China and Japan; it also grows in Mongolia and in India, in the Himalayas, and within the last few years it has been cultivated experimentally in several European countries. This bean is worth more than a passing notice, as it is the vegetable which approaches most nearly in its proximate chemical composition to animal food. This will be seen later on. There are a great number of varieties of the soy bean known, which differ to some extent in the shape, size, and especially in the color of the seed, and in a few minor particulars, but which seem to vary comparatively little in chemical composition. Dr. C.O. Harz has classified the principal varieties as follows:

"Group I.–*S. hispida platycarpa. 1. olivaeea. 2. punctata. 3. melanosperma* (*a. vulgans. b. nigra. c. renisperma. d. rubro-cincta*). *4. platysperma. 5. parvula.*

"Group II.–*S. hispida tumida. 6. pallida* (*Roxburgh*). *7. castanea. 8. atrosperma.*

"These names sufficiently indicate the nature of the variety as far as the seed is concerned. The soy bean is extensively cultivated in the north of China, whence it is exported, to the southern provinces; it is here pressed for the sake of its oil and the residual cake largely used as a food for man and beast, and also as a manure.

"In Japan it is known by names signifying the bean, and from it are made not only soy [sauce] but a paste known as *miso,* which is in constant request at nearly every meal, *tofu,* or bean cheese, and other foods used to a less extent. This bean cheese is also well known in China, and is obtained by extracting the legumin from the beans with water and precipitating it with brine. An analysis of it is given below.

"These foods are most valuable additions to the dietary of the Oriental nations, and especially of the Japanese, who use so little animal food; they tend to supply the deficiencies of the staple food, rice, in nitrogenous matter, fat, and also in mineral constituents.

"The Buddhist priests, who are strictly forbidden to use animal food, consume considerable quantities of these beans, principally in the form of *miso.* The soy bean first attracted attention in Europe in 1873, when specimens from Japan, from China, and from India were shown at the Vienna International Exhibition. Dr. Forbes Watson, reporter on the products of India, called attention to it in the Catalogue of the Exhibits of the Indian Museum. Since then numerous experiments have been made on the European Continent on its growth, and also feeding experiments with the bean and its straw on different kinds of domestic animals have been prosecuted. Such experiments have been carried on by Wolling and Wein, at Munich; by Haberlandt, Lehman, Harz, Stahel, Zimmerman, Siewert, Wieski, and others, at various stations in Germany, Austria, and Hungary, and experiments have also been made in France and in Italy.

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"The proximate chemical composition of some of the different varieties, grown in different places, is now given and compared with some other foods of vegetable and animal origin."

Table 1, titled "Percentage composition of the soy bean," gives the percentage of six constituents (water, nitrogenous matter [protein], fat, carbohydrates, fiber, and ash) in seven different types of soy beans: Pale yellow (from Japan, China, Germany &c., India), brown, round black, and long black.

"It has been shown by Levallois (*Comptes-Rendus*) that the soybean contains a special variety of sugar, many of its properties resembling mellitose; this constitutes about 10 per cent, of the soluble carbohydrates. Of the nitrogenous matters nearly all is in the form of albumenoids; a small quantity, about 1 per cent., appears as a peptone-like body, and about one-tenth to two-tenths per cent. is non-albuminoid."

Table 2, titled "Percentage composition," compares the percentage content of the six constituents listed above for six foodstuffs: Peas, [common] beans, lupins, lentils. lean beef, and fat mutton.

"These analyses show the greater richness of the soy beans in nitrogenous matter and in fat than the common bean and pea, and that, when the water is equalized, it more nearly approaches meat in proximate composition. The only leguminous seed of common occurrence, which contains more oil than this bean, is the earth-nut or ground-nut, *Arachis hypogæa,* which is now so largely cultivated abroad for its oil and its cake. In order to compare the soy bean straw with hay and with other straws of like nature, the following average analyses are given:

Table 3 (untitled) compares the percentage content of the six constituents listed above for six feeds: Meadow hay, bean straw, pea straw, lentil straw, soy bean straw, soy bean hulls.

"A special variety of *Soja hispida* is cultivated in some parts of Japan as a fodder crop and cut just as the pods are fully formed. The hay made from this is much relished by horses, cattle, and sheep. A sample of a crop grown on the Imperial College of Agriculture Farm, Komaba, Tokiyo, gave on analysis: Water 15.0%, nitrogenous matter 19.8%, fiber 35.9%, ash 6.8%, carbohydrates and fat 22.5%. Total 100.0%.

"It will be seen that this hay exceeds even lentil straw in the amount of nitrogenous matter it contains." Continued. Address: LL.D., Ames, Iowa.

710. Welch, Adonijah Strong. 1885. Report on the organization and management of seven agricultural schools in Germany, Belgium, and England (Continued–Document part II). Washington, DC: Government Printing Office. 107 p. See p. 73-77. Made to Hon. George B. Loring, U.S. Commissioner of Agriculture.

• ***Summary:*** Continued from page 76: "The following are means of various analyses made in Japan of food products obtained from the soy bean, and which are largely consumed there:"

Table 4, titled "Percentage composition," shows the percentage content of the six constituents listed above in four Japanese food products: White miso, red miso, bean cheese [tofu], and frozen bean cheese [dried frozen tofu].

Note 1. This is the earliest English-language document seen (April 2013) that uses the term "frozen bean cheese" to refer to dried-frozen tofu.

"The ash of miso consists mainly of common salt, which is added in the process of manufacture.

"The ash of the soy bean was found, as a mean of several samples, to have the following percentage composition. The composition of that of the straw is also given: Table 5 (untitled) lists the percentage composition of each of the following constituents in soy bean ash and soy bean straw ash: Potash, soda, lime, magnesia, ferric oxide, chlorine, phosphoric pentoxide, sulphur trioxide, and silica.

"The crop takes from the soil a large amount of valuable mineral constituents, phosphoric acid and potash, as well as a large amount of nitrogen.

"The results of the German and Austrian experiments show that where temperature is not too low, the result of the harvest as compared with that of ordinary beans or peas is exceedingly satisfactory.

"The kinds most suited for cultivation there are the yellow, brown, round black, and long black varieties, i. e., *pallida, castanea, atrosperma,* and *melanosperma,* especially the first three named. They require a vegetation time of about one hundred and fifty days, during which the average temperature must be about 58º F. (14.3 C.), and number of heat units (the average temperature multiplied by the number of days) [*Wärmesummen*] about 2,100 C. They may be sown the beginning of May and harvested the end of September or even the beginning of October.

"The seeds should not be sown deeply, not more than 1 to 1½ inches deep, and about eighteen plants to the square yard may be left after weeding and thinning out. The plants grow to a small bush about 2½ feet high, and produce pods with two to five seeds. The most suitable soil is a peaty soil, or one containing a good deal of organic matter, and the next most favorable is a calcareous soil. Nitrate of soda has been found to be a good manure for the crop in Germany and also potash salts, especially potassium sulphate. Ammonium sulphate did not give as good a return as the same amount of nitrogen in the form of nitrate; on soils poor in organic matter it would probably be better to supply the nitrogen in some organic combination, such as rape-cake, shoddy, and the like. Phosphoric acid, especially as a dicalcic phosphate was a help on some soils.

"Field experiments made by myself on this crop in Japan showed that wood ashes had a good effect, and that anything like an excess of nitrogen was very harmful to the yield of grain. In that country the plants are often sown on

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the dividing ridges between the plots of paddy and without any manure. The yield of seed and straw in the German experiments compares very favorably with that of peas and beans grown under the same conditions; from 2,000 to 3,000 pounds of seed and from 5,000 to 10,000 pounds of straw per acre have been obtained.

"Feeding experiments with the produce have been made with pigs, sheep, oxen, and milch cows, and with very good results. The bean is a most excellent addition to other foods, especially such as are deficient in nitrogenous matter and fat. The digestion co-effients of the nitrogenous matters of the fat and of the non-nitrogenous matter of the soy bean, and also in the cake left after its pressure for oil, closely approximate to 90 in each case. As a mean of two direct experiments with soy bean straw, the digestion coefficients were found to be as follows: Nitrogenous matter 60.8, fat 6.2, fiber 33.6, and non-nitrogenous extractive matters 69.0. The hulls are rather less digestible.

"The albuminoid ratio in the bean is about 1 to 2.3, in the straw 1 to 8.1, in the hulls about 1 to 20, and in the cake 1 to 1.3. An analysis of the cake shows: Water 13.4%, nitrogenous matter 40.3%, fiber 5.5%, carbohydrates 28.1%, fat 7.5%, ash 5.2%. Total: 100.0%.

"In good condition it would be a valuable addition to our feeding cakes, but it is too highly valued in the East to enable it to be imported to any extent at a profit.

"The soy bean plant has considerable power of resisting unfavorable climatic influences, as cold, drought, and wet; and appears to be particularly free from insect attacks, and, indeed, from all parasites; this last, if it continues, is by no means a slight advantage. The soy beans are eagerly bought by the natives of Southern Italy, an almost vegetarian race; that they are easily digested I can speak from experience, having frequently used them on my table, cooked after the manner of haricots. Taking into account the great richness of these beans in valuable food constituents, their easy digestibility, the value of the straw, and the great probability of some variety being able to be acclimatized without great trouble, this *Soja hispida* is worth consideration. The bean would form an exceedingly useful addition to the food of the poorer classes, as a substitute for a portion of the animal food which in the kitchens of the laboring classes is so wastefully cooked. One use it has already found, not altogether to be commended, viz., after roasting, as an adulterant of and substitute for coffee.

"We have procured seeds of several varieties direct from Japan, and of one variety from Germany, and these are now being cultivated in the botanic garden. They were sown rather late, and the month of June has not been favorable to their growth, but some of the varieties promise fairly." Address: LL.D., Ames, Iowa.

711. Enslie, J.J. 1886. Japan. Report for the year 1885 on the trade of Nagasaki. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 39. p. 1-11.
• ***Summary:*** A table (p. 8) shows the quantity (in lbs) and value (in pounds sterling; 1 pound = $4.88 in 1885 and $5.00 in 1884) of principal articles imported to Nagasaki during the year 1885. Oilcake [soya]: 1885–2,706,054 lbs worth £4,316. No figures are given for 1884. Note: By far the most valuable export from Nagasaki in 1885 was coal (for use as a fuel in ships, and for heating).

Note: This is the earliest English-language document seen (Nov. 2005) that uses the word "oilcake" to refer to cakes made of soybeans from which the oil has been removed by pressing. Address: Japan.

712. Hubbard, Richard B. 1886. Japanese bean curd. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 19(68):646-51. Sept. [1 ref. Eng]
• ***Summary:*** "I transmit herewith a translation of an article on the manufacture of tôfu, or Japanese bean curd, published by the Educational Museum of Tokio. The use of this bean (the *Soja hispida* or *Glycine hispida*) in the manufacture of so nutritious an article of diet, the nearest approach as it is stated, in its chemical constituents to animal food among known vegetable foods, seems to me to be one to which our attention should be called, with a view to introduce it to our tables. Richard B. Hubbard, United States Legation, Tokio, June 24, 1886."

Contents: Early history. Method of preparation (with 5 excellent illustrations {line drawings}, described below). Preparing tofu for the table. Uses of tôfu. The soy bean (excerpts from Prof. Kinch's article upon the Agricultural Chemistry of Japan, *Transactions of the Asiatic Society of Japan.* 1880. Vol. 8, p. 398).

The translation was made by Dr. W.N. Whitney, interpreter of the legation. "Early history: Tôfu or bean curd was first used in China, according to the statement of Chinese authorities, in the reign of Wai-rau-wo of the Han dynasty (B.C. 206 to A.D. 25). In Japan, the record of its uses only dates back to the third decade of the fourteenth century, mention being made of it in the works called Tei-kiu-wo-rai and Isei-tei-kui-wo-rai, edited by Kitabatake Geni, and previous to which time we do not find any reference whatever to tôfu of the bean from which it is made, the *Soja hispida."*

"Method of preparation: The yellowish-white beans are soaked in water for twenty-four hours, or a night and a day, when they are poured into a stone mill (Illustration, Fig. 1) and ground. As the quality of the product of manufacture is largely dependent upon the purity of the water used, it is necessary that the purest water obtainable should be employed. The beans, having been first pounded, are mixed with an equal quantity of water in the oblong tub, Fig. 1 (a), and gradually poured into the orifice in the upper stone of the mill with a copper dipper. This mill resting within a

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bottomless tub (b) some eight or ten inches in height, upon the narrow wooden stand, is rotated by means of a bamboo rod or handle (d), which has one end inserted into a socket in the upper millstone. The thin pulp [slurry] of ground beans and water as it flows between the stones of the mill is directed into a tub beneath (e), and kept from running along the horizontal bars of the table by the perpendicular sides of the bottomless tub which surrounds the mill.

"The pulp which is collected in the under tub (e) is put into an iron pot and heated over a wood fire until it begins to boil, which stage is indicated by the appearance of bubbles or foam upon the surface. One or two gills of cold water [a gill is ½ cup or ¼ pint] are then poured around the edge of the pot inside, and as soon as the foam has subsided the pot is covered and a second boiling takes place; cold water is then again poured in and the contents allowed to stand. In stirring and mixing the pulp in the pot, a kind of wisp [whisk], made of split bamboo and coated with thickened oil dregs, is employed. The pulp is then dipped out of the pot with a ladle of bamboo, into a grass-cloth bag (Fig. 2, a), to prevent it running over the sides of which, a kind of flat trough (b) is used. Several dipperfuls of water are then poured into the bag, the mouth of which is tied up and the whole laid upon a mat of sticks (c), and over a linen cloth stretched over the top of a shallow tube [sic, tub], as shown in Fig. 2.

"Pressure is then brought to bear upon the bag by means of the round wooden stick used as a simple lever, as shown in Fig. 3. The liquor [soymilk] which oozes out, filters through the cloth laid over the top of the shallow tub, into the vessel beneath. Should the quantity of pulp ground up be large, several bags will be necessary, or one bag may be refilled several times.

"The contents of the tub, being the liquor expressed from the grass-cloth bag containing pulp, is then stirred up with about a gill of brine* poured in with a little bamboo ladle, and the cloth cover replaced." (Footnote: *"The brine used is obtained by deliquescence, and precipitates the vegetable caseine [casein] or legumen contained in the liquor [soymilk] expressed from the pulp.–Translator"). The cloth is again removed after the lapse of a few minutes allowed for the brine to thoroughly mix, and two gills more of brine are poured in, and, a few minutes later, still another portion of two or three gills, a little at a time.

"Whenever coagulation takes place in the filtered liquor in the tub, a shallow bamboo basket (Fig. 4), containing a stone to keep it down, is twice let down into the liquor, and the water [whey] which runs into the basket is removed. When coagulation is complete, the bamboo basket is inverted and the tub tilted to one side, to allow the water to drain off through the meshes of the basket.

"The next step is to transfer the coagulum from the tub to a rectangular-formed box (Fig. 5), which is accomplished in the following manner: A wooden frame, which just covers the edges of the forming box, is placed in position upon the open top of this box, which, it should be stated is 1.8 feet long, 0.62 feet wide, and 1 foot deep inside..." After the tôfu is pressed, the "box with its contents are then placed in a large trough of cold water." After cooling, the tofu, which has assumed "the consistency of a cooked omelet, is cut up with a broad-bladed brass knife into quite thick slabs of about 4 by 6 by 1½ inches in size. The quantity of water and brine used in the preparation of tôfu should be in the proportion of 15 sho (1 sho = 107.92 cubic inches) of water and ½ sho of brine to 4.5 sho of the bean.

"Preparing tôfu for the table: Tôfu may be prepared in many ways for the table, such as by frying or toasting, or making into soup. It may also be scrambled or made into croquettes. When fried, toasted, or scrambled, it has very much the taste of sweet-bread, and when saturated with Japanese soy is not unlike that dish in appearance and consistency. When used in soup it is cut up in little squares. There are several books in Japanese treating of this subject, such as the 'Tôfu-zoku hyaku-chin,' or the 'Hundred curiosities in Tôfu.'

"Uses of Tôfu: Tôfu, and the residue [okara] in its manufacture, are used for various other purposes, such as in the imitation of *tsuye-shu,* a kind of vermilion. For this purpose tôfu from which the water has been expressed is mixed with a kind of red lacquer, with a spatula, and thoroughly kneaded. This resulting paste is laid upon the articles to be manufactured, and after drying it may be carved or engraved upon.

"The warm water in which the beans are first boiled is used to extract grease from clothing, and to cleanse the mats used upon the floors of Japanese houses, and also for washing the ceilings, for which purposes it has no equal. The pulp [okara] remaining in the grass-cloth after the vegetable caseine has been expressed, is used by the Japanese women as a substitute for soap in washing the hair. It is also used when mixed with finely-chopped straw as a food for horses and cattle, and sometimes as manure."

Note 1. This is the earliest English-language document seen (June 2013) that uses the word "residue" or the word "pulp" to refer to okara.

Note 2: This is the earliest English-language document seen (Sept. 2004) that uses the term "yellowish-white" to describe the color of soybean seeds.

Note 3. This is the earliest document seen (June 2001) that uses the word "soap" in connection with soybeans; okara is used in Japan as a soap. Address: Minister, United States Legation at Tokio, Japan.

713. Tamari, Kizo. 1886. Vegetables in Japan. *Transactions of the American Horticultural Society* 4:77-80. For the year 1886.

• ***Summary:*** "Peas and beans are so numerous in varieties that they can not be easily described. Besides common cultivated peas and beans, we have asparagus beans with

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long and tender pods, ensiform beans [shaped like a sword blade], many kinds of kidney beans and soy beans (*soya hispida*), etc. Some [such as soy beans] are used green, in pod, and the seeds are mostly used for making different kinds of cakes [confections] or as parched beans" [soynuts / irimame].

Note 1. This is the earliest English-language document seen (Dec. 2012) that uses the term "parched beans" to refer to soynuts.

The most important crop among our pulse is the soy bean. The annual product is about the same as that of wheat, viz.: eleven and one-half [11.5] million bushels. This large amount is consumed in three different forms in our culinary uses, viz.: miso, shioyu [shoyu] and tofu. The first and second are made of the beans, wheat or barley, common salt and water; the first in the form of paste, and the second a liquid, commonly called Japanese sauce. The third is a white mass, made by coagulating extract juice of the bean with a solution of epsom [sic, Epsom] salts. This is called Chinese cheese by the English."

Note 2. This is the 2nd earliest English-language document seen (April 2013) that uses the term "Chinese cheese" to refer to regular (nonfermented) tofu.

"Tofu is very extensively and commonly used, especially among those living apart from the seacoast, and where they can not get fresh fish, this is cooked and used as a substitute for fish. This bean is exceedingly rich in nitrogenous substances. It contains about thirty-seven per cent. of albuminoids, or over three times as much as wheat, barley, or oats, and one and a half times as much as peas or beans. So far, our people are the most extensive consumers of pulse of any people in the world. It seems to me that it is caused by the demand for nitrogenous food, which was almost excluded from animal food besides fishes on our table."

Note 3. The latter refers to the fact that Buddhism in Japan prohibits the consumption of four-legged creatures.

Note 4. This volume is a report of the seventh annual meeting, held at Cleveland, Ohio, September 7th to 10th, 1886. Address: Japan.

714. *J. of the Society of Arts* (*London*). 1886. Manufacture of tofu in Japan. 35(1778):102-03. Dec. 24.
• ***Summary:*** "The United States Minister at Tokio says that considerable attention is paid in Japan to the manufacture of *tôfu,* or bean curd, which approaches more nearly in its chemical composition to animal food than any other vegetable known." An excellent, detailed description is given of the method of preparing tofu in Japan.

Note 1. For the full report, see: Hubbard, Richard B. 1886. "Japanese bean curd." *U.S. Bureau of Manufactures, Department of Commerce and Labor, Monthly Consular and Trade Reports* 19(63):646-51.

Note 2. This is the earliest English-language document seen (April 2013) with the word "tofu" in the title. However in the body of the article, the word is always italicized and spelled *töfu.*

715. Candolle, Alphonse de. 1886. Origin of cultivated plants. 2nd ed. London: Kegan Paul, Trench & Co.; New York, NY: D. Appleton and Co. viii + 468 p. See p. 330-32, 355, 443, 451. Translation of Origin des Plantes Cultivees, 1883 ed. 2nd ed. 1886. The latter reprinted in facsimile in 1959 by Hafner Publ. Co, New York. Index. 20 cm. [15 ref]
• ***Summary:*** The main section on soy in this edition is identical to (in fact, a facsimile of) that in the 1885 edition by the same publisher in New York.

The author, a famous Swiss botanist, whose father was also a famous botanist, lived 1806-1893. Address: Geneva, Switzerland.

716. Church, Arthur Henry. 1886. Food-grains of India. London: Published for the Committee of Council on Education by Chapman and Hall, Ltd. 180 p. See p. 140-44. Illust. Index. 27 cm. 35 plates, with Fig. 26 being of the soybean. South Kensington Museum science handbooks. With 23-page supplement, 1901. Reprinted in New Delhi, India in 1983 by Ajay Book Service. [17 ref]
• ***Summary:*** "The soy-bean. *Glycine Soja,* Sieb. and Zucc. *Synonyms*–Soja hispida (Moench.); Dolichos Soja (Linn.); Soja angustifolia (Miq.). *Hind.* [Hindi]–Bhat, Bhatwan. *Punjab* [Panjabi]–Bhút. *Beng.* [Bengali]–Gari-kulay. *Naga*–Tsu-dza.

"This important bean is the seed of Glycine Soja, a small, sub-erect, trifoliate, hairy annual, with pods generally 3 to 4-seeded. It belongs to the natural order Leguminosae, sub-order Papilionaceae, tribe Phaseoleae, and sub-tribe Glycineae; 5 genera are included in this sub-tribe. Glycine contains about 12 species, chiefly Australian, but 3 are Indian, namely *G. javanica, G. pentaphylla,* and our present species.

"The soy-bean forms a considerable article of food in China and Japan. Since 1873 it has been successfully grown, as an experiment, in some of the warmer parts of Europe. It is widely spread in the outer Himalaya, and tropical regions from Kumaun to Sikkim, and the Khasir [Khasia / Khasi Hills], and the Naga Hills to Upper Burma. It is often cultivated, rather largely in Busti and Gorakhpur [in today's Uttar Pradesh], Patna, and Purniah [Purnea] Districts [both in today's northeast India].

"This crop is generally grown by itself; the seeds are sown from June to September; the harvesting takes place between November and January. It is consequently a kharif crop. The seeds should be placed at a depth not exceeding 1 to 1½ inch; 18 plants may be left, after weeding and thinning, to the square yard. A peaty soil, or one rich in organic matter, suits the plants best; a calcareous soil is also favourable to its growth. Sulphate of potash is a good

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manure, nitrogen may be supplied either as nitrate of soda or, in the case of soils poor in organic matter, in the form of rape or mustard cake, but it is rarely needed, while large applications of nitrogenous manure exert a distinctly injurious effect upon the yield of beans. So far as we know, this very important, vigorous, and productive pulse is not attacked by any insect or parasitic fungus."

A full-page illustration (p. 141) shows the upper part of a soy-bean plant, with flowers and a lengthwise cross section of one of the pods.

"Very few vegetable products are so rich as this bean at once in albuminoids and in fat and oil, the former constituent amounting to 35 per cent., and the latter to 19. The cultivation of the pale large-seeded varieties should be extended."

A table titled "Composition of soy-beans" (p. 143) shows that the seeds contain 35.3% protein, 18.9% fat, 4.6% ash, 11.0% moisture. "The nutrient-ratio is here about 1:2, while the nutrient-value is 105. Potash forms nearly one-half, and phosphorus-pentoxide one-third of the ash of the soy-bean. Ripe soy-beans require long soaking, preferably in warm water, in order to render them soft.

"In China and Japan three preparations are extensively made from the soy-bean. Soy sauce is the best known of these, but more important are the soy or bean cheeses, and a kind of paste. The beans are sometimes pressed for the sake of the oil they yield; the residual cake forms an extremely rich cattle food, containing as it does 40 per cent. of flesh-formers and 7 per cent. of oil. The soy-bean may also be grown as a fodder plant. If cut just when the pods are fully formed it makes an excellent hay, superior to that of the lentil."

Note 1. This is the earliest English-language document seen (April 2013) that uses the term "bean cheeses" or (by implication) "soy cheeses" to refer to tofu.

Webster's New Geographical Dictionary (1988) defines Bengal (earlier Bengal Presidency) as a former province in northeast British India, and now a region encompassing West Bengal, India, and Bangladesh. The capital was Calcutta, located on the Hooghly River about 90 miles from its mouth. Calcutta is now the capital of West Bengal, India. Dhaka (Dacca) is the capital of Bangladesh. Bangladesh was formerly East Bengal (part of India, 1700s-1947), then East Pakistan, 1947-1971. It became Bangladesh in 1971.

This one of the earliest document seen (March 2001) that clearly refers to soybeans growing in Burma, but it is not clear whether these are cultivated or wild soybeans.

Page 127 discusses "The Pea-Nut. *Arachis hypogaea,* L." Six local vernacular names are given. "This plant is probably of American origin, although it has long been cultivated in India, on the West Coast of Africa, and in many other tropical countries. There is a similar plant, *Voandzeia subterranea* [Bambara groundnut], allied to Vigna, which grows under the same conditions." The composition of pea-nuts (in 100 parts and in 1 pound) is given. "Half the weight of pea-nuts is oil... Pea-nuts, after the greater part of the oil has been extracted by pressure, yield a cake well adapted for feeding cattle." An excellent full-page illustration (line drawing, p. 126) shows the pea-nut plant with seeds growing under ground and details of flowers and seeds.

Note 2. This is the earliest document seen (March 2001) that mentions *Voandzeia subterranea. Webster's Third New International Dictionary* has an entry for "voandzeia: [NL, from Malagasy *voandzou*]. A genus of tropical creeping herbs (family Leguminosae) with trifoliate leaves and small axillary flowers." We later learn that one species, *Voandzeia*

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subterranea (L.) Thouras, is called the Bambara groundnut. The Bambara are a Negroid people of Upper Niger.

Note 3. This is the earliest English-language document seen (Oct. 1999) that contains the term "nitrate of soda" (as a fertilizer) in connection with soy-beans. It was later renamed "sodium nitrate."

Note 4. This is the earliest document seen (Oct. 2002) that uses the word "kharif" to refer to the rainy season in South Asia.

Note 5. A long, positive review of this book appeared in the *Times of India* (25 Dec. 1886, p. 4), which mentioned that even though Church had never been to India, he derived his knowledge from reliable sources. The word "soy-beans" appeared twice in the review. Address: Prof. of Chemistry, Royal Academy of Arts, London.

717. Hepburn, James Curtis. 1886. A Japanese-English and English-Japanese dictionary. 3rd ed. Tokyo: Z.P. Maruya & Co., Limited. Yokohama, Shanghai, Hongkong & Singapore: Kelly & Walsh, Limited. London: Trübner & Co. 962 p. 22 cm.

• ***Summary:*** "During the fourteen years which have elapsed since the publication of the last edition of this Dictionary [in 1867], the Author has kept it constantly before him, correcting errors, improving and enlarging the definitions, and adding new words and illustrations, according as his time and other important engagements allowed him. But owing to the amazing changes and rapid advancement of the Japanese in every department, he has found it difficult to keep pace with the corresponding advance of the language in the increase of its vocabulary. He has endeavored, however, to collect these words, examine, classify and define them. Many, no doubt, have escaped his notice. Still there is an addition of more than ten thousand words to the Japanese and English part."

New soy-related definitions in this edition, not found in or changed from the 1867 edition: Aburage: Anything fried in oil or grease, especially fried *tofu.* [fried tofu].

Amazake: Sweet *sake,* a kind of drink made of fermented rice.

Azuki: A small red bean, Phaseolus radiatus. Daizu: A kind of large white bean, Soja hispida.

Hiriôzu: A kind of food make of *tôfu* fried in oil.

Note 1. This is the earliest document seen (April 2013) that contains the word *Hiriôzu.* It refers to Kyoto-style deep-fried tofu treasure balls. It is also the earliest document seen (Dec. 2013) that contains a traditional Asian meat alternative made from deep-fried tofu.

Kinako: A flour made of beans.

Kirazu: The refuse of beans left in making *tôfu* [okara].

Note 2. This is the earliest English-language document seen (June 2013) that uses the word "Kirazu" [not Kiradzu] to refer to what is now called "okara" or "soy pulp."

Koji: Barm or yeast made by the fermentation of rice or barley in the process of making *sake* or *soy* [sauce].

Miso: A kind of sauce made of beans, wheat and salt. Miso wo suru: To rub miso in a mortar.

Sake: A fermented liquor brewed from rice. Sake wo kamosu: To brew sake. Sake ni yô: To be drunk. Sake no uye ga warui hito: One who behaves disorderly because of drink. Sake ni oboreru: To be addicted to drink [alcohol].

Shoyu: Soy, a kind of sauce made of fermented wheat and beans. Syn. [Synonym]: Shitaji.

Tamari: Soy, shôyu. Note 3. This is the earliest English-language document seen (April 2012) that uses the word "Tamari" to refer to a type of Japanese soy sauce,

Tofu: A kind of food made of beans, bean curd.

Unohana: The Deutzia scabra; also refuse of beans [okara] from making tofu. Yuba: A kind of food made of beans, the skin of bean curd.

Terms listed unchanged from the 1867 edition include Natto, and Yu-dofu.

No listing is given for: Daitokuji natto, Edamame [Yedamame], Hamanatto, or Okara.

The "English and Japanese dictionary," which starts on page 771-73, contains the most important English words with numerous examples. Included are: Bean: Mame. Spec. Azuki, sora-mame, daizu, endo, ingen, sasage. Bean pod: Mame no saya. Bean curd: Tôfu.

Soy: Shôyu. Address: M.D., LL.D., Yokohama, Japan.

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718. Kellner, O[skar Johann]. 1886. Fuetterungsversuche mit Schafen ueber die Verdaulichkeit verschiedener Futterstoffe: Sojabohnenheu, Sojabohnen [Feeding trials with sheep on the digestibility of various fodders]. *Landwirtschaftlichen Versuchs-Stationen* 32:72-89. See p. 82-84, 87-89. [5 ref. Ger]

• ***Summary:*** In this early feeding trial, sheep (incl. Merino sheep) were fed soybean hay and seeds (*Sojabohnenheu* and *Sojabohnen*). Section 4 is titled "Composition and digestibility of soybean hay" (p. 82-84). Tables show the following values with the pods still attached (*Schoten eben angesetzt*) on a moisture-free basis. Year of investigation: 1882. Proteids 16.91%. Crude fat 2.56%. Nitrogen-free extract 31.28%. Crude fiber 42.29%. Ash 6.96%.

Section 6, titled "Composition and digestibility of the soybean" (p. 87-89), contains four tables.

Note 1. This is the earliest soy-related publication seen by Dr. Kellner (lived 1851-1911). He was a prolific writer. In the *Catalog of Scientific Papers* compiled by the Royal Society of London, from 1800-1883 he had 6 references, from 1874-1883 he had 13 references, and from 1884-1900 he had 29 references as the sole author and 22 additional references where he was the senior author with other authors, mostly on livestock and their feeds. In the *Dictionary Catalog of the National Agricultural Library: 1862-1965,* he has 98 references.

Note 2. This periodical is also titled: *Mittheilungen aus dem agriculturchemischen Laboratorium zu Tokio.* Address: Agricultural-chemical Lab., Tokyo [Japan] (Aus dem agriculturchemischen Laboratorium zu Tokio).

719. Kihara, Hakushô. 1886. Sake shôyu tsukurioke yôsekihyô [Chart showing the volumes of various sizes of containers (kegs) for sake, shoyu]. Tokyo: Takasaki Shûsuke. 176 p. 20 cm. [Jap]*

• ***Summary:*** Note: At this time, both sake and shoyu were sold in wooden kegs called *oke* in Japanese.

720. Rein, Johann Justus. 1886. Japan: Nach Reisen und Studien, im Auftrage der Koeniglich Preussischen Regierung dargestellt [Japan: Travels and researches undertaken at the cost of the Prussian government. Vol. II.]. Leipzig, Germany: Verlag von Wilhelm Engelmann. 679 p. See p. 5, 65-70, 123-27, 185, 649. Illust. Indexes (1 German and Latin, 1 Japanese). 2nd ed. 1905. [9 ref. Ger]

• ***Summary:*** A superb book, showing the high German art of studying other cultures. The many illustrations are either beautiful wood engravings (*Holzschnitte*), real photographs, or actual samples of paper or textiles (glued in). In the chapter on "Food plants" (*Nährpflanzen*), the following is a partial contents of the section on "Pulse or leguminous plants" (*Hülsenfrüchte oder Leguminosen,* p. 65-71): Introduction to crops cultivated in Japan. 1. The ground-nut and ground-nut oil. 2. The soybean: "Among the pulse of Japan (and not the less of China), the soy-bean ranks first in extent, variety of use, and value; and chemical analyses prove the empirical judgment is well founded. In point of nutriment, the soy-bean is of all vegetables the nearest to meat. It contains nearly two-fifths of its weight in legumin rich in nitrogen, and nearly one-sixth in fat. The soy-bean is to the inhabitants of Japan what their *garbanzos* (chick-peas) are to the Spanish, and their *feijao preto* (black beans) to the Brazilians. The author then describes the characteristics of the soy-bean, the work of Haberlandt with soy-beans in Austria, and the yields that he and his co-workers obtained.

"In Japan the varieties of soy-bean are distinguished– according to colour, as white (more properly yellowish), black, brownish red, green, and spotted; according to duration of growth [maturity] as early-ripening, middle-ripening, and late-ripening; according to form, as spherical, ellipsoidal, kidney-shaped, and compressed laterally; and according to use, as to those which serve primarily in making Shôyu (soy), Tôfu (bean-cheese), and Miso (a sort of sauce), and those eaten in any plain shape."

Soy-bean varieties in Japan include: 1. "White (pea-yellow) soy-beans, Japanese Shiro-mame or Haku-daidzu. To this division belongs an early-ripening sort with very small seeds, called Goguwatsu-mame [Go-gatsu], or 'five-months-kind,' because it ripens in the fifth month of the old Japanese calendar, our July; also another small-seeded, early-ripening variety, the Wase-mame or Natsu-mame, that is, early and summer-bean. These two are also called Tôfu-mame, because they are used chiefly in making Tôfu. Another sort serves to produce Miso. It is called Nakate-mame, 'middle-late bean,' its time of maturity occurring half-way between that of the early and late kinds. Its seeds are round and somewhat larger. The late ripening varieties, Okute-mame (late-bean), Maru-mame (bullet-bean), and Teppô-mame (gun-bean), or Aki-mame (autumn-bean) have, as their names indicate, mostly bullet-shaped seeds, which become harder and larger than the early ones. The variety last named is used in making Shôyu, while Maru-mame is valuable as horse-feed.

2. Black soy-beans, Japanese Kuro-mame or Koku-daidzu. These are eaten boiled with sugar, as an entrée, or as a relish to rice. There is a middle-late sub-species, with round, elliptical seeds, Kuro-mame, in short, and another like it with big, bullet-shaped beans is called Kuro-teppô-mame. And again there is a late-ripening sort with flat, elliptical seeds under several names.

3. Brown soy-beans, Japanese Katsu-daizu (thirsty soy-bean) are much less grown than the white and black sub-species, and are used like the latter. They are distinguished as Aka-mame, red soy-beans, round, reddish-brown in colour, in different varieties, and Cha-mame, tea beans, three light-brown sorts of small extent and significance.

4. Greenish or bluish green soy-beans, Japanese Ao-mame or Sei-daizu, are eaten mostly boiled and with

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sugar, like the black and brown-red varieties. And, with the brownish sorts, they are much less widely grown than the black and yellowish. The Japanese distinguish the following sub-species of Aö-mame [sic, Ao-mame]:–(a) Sei-hito,– epidermis green, inside a whitish yellow. (b) Nikuri-sei,– greenish throughout. Both sub-varieties run from roundish-ellipsoidal to a bullet roundness, are of medium size, and remind one of green peas. (c) Kage-mame, with pale green, round beans. 5. Speckled soy-beans, Japanese Fuiri-mame or Han-daidzu. This group is not important. Its cultivation is confined to a small area, in a few provinces. Its sub-varieties are known as:–(a) Kuro-kura-kake-mame, with a black spot on the saddle (eye), otherwise greenish; flat and with the outline of an egg. (b) Aka-kura-kake-mame, with a brown spot on the saddle (eye), otherwise yellowish-green, flat and drawn out long. (c) Fuiri-mame or Udzura-mame, speckled or spotted soy-bean, yellowish-green with many dark flecks. A rare variety, grown only in a few places, especially in Harima.

"Early-ripening soy-beans are sown as early as April in Southern Japan, in Central Japan during May. Those that ripen in autumn need much more warmth, and are sown, as a rule, one month later... Late-ripening Daidzu is also a favourite for planting along the edge of fields and on the new-built dykes of rice-fields."

Returning to the work of Haberlandt: "At the end of his above-mentioned treatise, Haberlandt summed up in five noteworthy propositions, the results of his experiments with the soy-bean and of its chemical analysis. His conclusions are as follows:

"(a) The acclimatization of the early-ripening sorts, particularly those with yellow and reddish brown seeds, appeared to have fully succeeded in Central Europe.

"(b) The seeds obtained were larger, heavier, and handsomer than those from Eastern Asia, the chemical composition, however, remaining unchanged.

"(c) The soy-plant resists light spring frosts better than our young beans, and endures greater dryness in summer than most leguminous plants, though otherwise much like other kinds of beans.

"(d) It is distinguished by heavy crops, besides furnishing, in its stems and leaves, either green or dried, a nourishing feed, of which cattle are very fond.

"(e) In their high percentage of protein and fat, they far excel all other pulse in nutritive quality; and when properly prepared are second to none in flavour.

"After such favourable judgments, it might have been expected that the soy-bean, at least in the warmer regions of the Austro-Hungarian monarchy, would soon become popular and generally cultivated. The result, however, was quite otherwise. The hopes which he had aroused in behalf of this plant seem to have disappeared with Haberlandt, who died in 1878.

3. Azuki beans (many varieties are named and described).

Two tables (p. 73-74) show the following: (1) Analysis of 10 different numbered samples of soybeans, empty pods, and straw and leaves. Eight are from Haberlandt's book *Die Sojabohne* [The Soybean] (1878), two are from Caplan, and one each from Mach, Senff, Levallois, and Kinch. (2) Comparative composition of 9 different legumes, including soybeans, azuki beans, common peas, broad beans / faba beans, lentils, yellow lupins, and peanuts. The soybean has by far the most crude protein, is second in fat (after peanuts), and is average in (minerals).

Foods made from soybeans (p. 123-27): Shoyu (*Shôyû, die japanische Bohnensauce, auch Soja*). Miso (made with rice koji [*Kôji oder fermentierender Reis*]). Tofu (*Tôfu, Bohnenkäse,* made with *Shio-no-nigari* (*Salzbitter*)) incl. dried-frozen tofu (*Kori-tôfu, gefrorener oder Eis-Tôfu*).

"Kori-tôfu, frozen or ice-Tôfu, is the spongy, horn-like substance that remains when common Tôfu is allowed to freeze and then thawed and dried in the sun, thus getting rid of most of its water. By Yuba [Yuba] is meant a third preparation, consisting of brownish, tough skins (*Häuten*), made by boiling the dissolved legumine of the Tôfu-process, with the addition of some wood-ashes, and then taking away in succession the skins that rise" (p. 126-27; see Rein 1889).

Note 1. This is the earliest German-language document seen (Oct. 2012) that contains the word Yuba.

The section on "Oil plants and their products" (p. 176-89) gives details on 13 plants and the oil obtained from them, including: 1. Rapeseed oil. 2. Mustard oil. 3. Camellia oil. 4. Cottonseed oil. 5. Peanut oil. 6. Sesame oil. 7. Perilla oil (*Perilla ocymoides*). 11. Hempseed oil. Soybean oil is not one of these. However a table (p. 185) gives the average composition of various Japanese oilseeds (Source: E. Wolff et al.; Ollech 1884): Rapeseed, peanuts, cottonseed, sesame (brown and white), hemp seeds, shelled beech-nuts, and soybeans.

Note 2. Volume 1 was published in 1881. The title of volume 2 is Land-und Forstwirtschaft, Industrie und Handel. Johann Justus Rein lived 1835-1918.

Note 3. This is the earliest German-language document seen (April 2013) that uses the term "kori-tôfu," or "gefrorener Tôfu," or "Eis Tôfu" to refer to dried-frozen tofu.

Note 4. Also discusses: Ame, midzu-ame, and barley malt syrup (p. 121-22). Fu, or baked wheat gluten cakes. Hemp, hempseed, and hempseed oil (p. 88, 177, 184-85). Kudzu (p. 75, 199, 217). Peanuts and peanut oil (p. 176-81, 185). Sea-weeds–especially marine algae (p. 93-96). Sesame seeds and oil (p. 88, 176-78, 181-82, 185). Address: Prof. of Geography, Univ. of Bonn, Germany.

721. Yule, Henry; Burnell, Arthur Coke. 1886. Hobson-Jobson: Being a glossary of Anglo-Indian colloquial words and phrases, and of kindred terms; etymological, historical,

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geographical, and discursive. London: John Murray, Albemarle Street. xlviii + 870 p. See p. 651 ("soy"). 23 cm. [1166* ref. Eng]
• ***Summary:*** "Soy, s. A kind of condiment once popular. The word is Japanese *si-yau* [sic] (A young Japanese fellow-passenger gave the pronunciation clearly as shô-yu–A.B.), Chinese [Cantonese] *shi-yu.* It is made from the beans of a plant common in the Himalaya and E. Asia, and much cultivated, viz. *Glycine Soja,* Sieb. and Zucc. (*Soya hispida,* Moench.) boiled down and fermented."

The authors then quote passages relating to soy from Lord King's *Life of John Locke* (1679), Dampier (1688), Ovington (1690), Kaempfer (1712), and Thunberg's Travels (1776).

Yule lived 1820-1889. A small illustration shows Arthur Burnell (lived 1840-1882).

Contents: Dedication to Sir George Yule, C.B., K.C.S.I. Address: 1. Living in Palermo; 2. Madras Civil Service, one of the most eminent modern Indian scholars.

722. *Otago Witness* (*New Zealand*). 1887. Miscellaneous. Feb. 11. p. 8.
• ***Summary:*** From The Standard: "The cultivation of the Soy bean (Soja hispida), extensively used in Japan, is being recommended in the United States, where it has been tried on a small scale. It is a round, yellowish-white bean, which is constituents is said to come nearer to animal food than any other vegetable. According to an article published at the Educational Museum of Tokio, this bean was first raised in China about 200 years B.C. [sic, 11th century BC] and its use in Japan dates back to the fourteenth century [sic, at least the 8th century]. In the latter country it is chiefly used as 'tofu' or bean curd, which is cooked in various ways. Analysis shows that the bean contains 37 per cent. of albuminoids, and nearly 21 per cent of fat. In Germany the Japanese bean has been cultivated with success."

723. Tahara, R. 1887. Shôyu bunseki setsu [Theory of shoyu analysis]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 61. p. 80-89. March. [Jap]
• ***Summary:*** The earliest study on the flavor of shoyu, and a very early study on the composition of shoyu.

724. Williams, W. Mattieu. 1887. Tofu and vegetable cheese. *Gentleman's Magazine* (*London*) 257(1878):616. June.
• ***Summary:*** The article begins: "Vegetarians should look to this. Tofu is a curd manufactured from beans in Japan. According to the 'Journal of the Society of Arts.' December 24, 1886, it 'approaches more nearly in its chemical composition to animal food than any other vegetable known.'"

The author describes briefly how tofu is made in Japan. "The fibrous residue left in the bag [okara], after the filtering out of the vegetable casein [protein], may be mixed with chaff as a food for cattle."

Note. This is the earliest English-language document seen (June 2013) that uses the term "fibrous residue" or "fibrous residue left in the bag" to refer to okara.

He adds that he has made tofu from common split peas in a similar manner and precipitated the vegetable casein with acetic acid. "All kinds of peas and beans will yield soluble casein when thus treated, and most valuable food may thus be obtained free from the woody fibre, which is difficult to digest.

"My experiments were avowedly but preliminary and suggestive; they, however, point to the possibility of a very important industry in the manufacture of a new and most desirable food, viz. vegetable cheese. If I am not altogether mistaken, it may be produced on a large scale at about threepence per pound, and be equal, if not superior, to the best cheese made in the dairy. As I have shown in the work above quoted, a sheep weighing 60 pounds contains less nutritive matter than 20 pounds of ordinary cheese. This also applies to the vegetable cheese."

725. Kellner, O.J.; Mori, Y[ôtarô]. 1887. Beitraege zur Kenntnis der Ernaehrung der Japaner [Contributions to an understanding of the nutrition of Japanese]. *Mittheilungen der Deutschen Gesellschaft fuer Natur- und Voelkerkunde Ostasiens in Tokio* (*Yokohama*) 4(37):305-21. Aug. [37 ref. Ger]
• ***Summary:*** *Vegetarian Messenger* (May 1888, p. 127-28) states that the staple diet of the Japanese "is almost wholly Vegetarian... As to beef, however (there is no mutton in Japan), there can be no question that its consumption is very small. In 1882, only 36,288 beasts were slaughtered, or about one kilogramme of meat per head of population, and it must be borne in mind that a large consumption takes place at the open ports amongst Europeans, and in the proximity of vessels... It would appear that the flesh of mammals is almost entirely excluded from that diet." Address: Tokyo.

726. Osawa, Kenji; Ueda, Keiji. 1887. Shokumotsu shôka no ryôhi (zokkô) [The quality of digestion of foods (continuation)]. *Chugai Iji Shinpo* (*Medical News, Foreign and Domestic, Tokyo*) No. 177. p. 16-21. Aug. [Jap]*
• ***Summary:*** A digestion experiment with tofu continued for two days, October 28-29, 1885. The subject, K.U., weighed 51.45 kg at the beginning and 49.36 kg at the end of the experiment. The diet consisted of tofu with some shoyu and starch. The following percentages of the basic nutrients were digested: Protein 96.1%. Fat 97.4%. Carbohydrates (incl. fiber) 88.4%. Ash 72.4%. Address: Physiological Institute, University of Tokyo.

727. *Vegetarian Messenger* (*Manchester, England*). 1887. Japanese bean curd. Sept. p. 303-07. [1 ref]
• ***Summary:*** This excellent, detailed article on tofu, by Mr.

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Hubbard of the United States Legation at Tokio, is reprinted from: R.B. Hubbard. 1886. "Japanese bean curd." *U.S. Bureau of Manufactures, Department of Commerce and Labor, Monthly Consular and Trade Reports* 19(63):646-51.

728. *Vegetarian Messenger* (*Manchester, England*)**.** 1887. Correspondence: Notes and queries. Oct. p. 341-43.
• ***Summary:*** "Soy beans.–Where can these be procured, and how are they to be cooked?–X.Z."

"Vegetable boots and shoes.- Are these now made and sold? If so, where?–T.B." No reply is given to either question.

"Vegetable cheese.- *Querist* asks when we are to have the vegetable cheese [tofu] promised in a former number of the *Vegetarian Messenger* [May 1887, p. 154-55]. (We fear that the death of an active friend, Mr. Nunn, who was making experiments in this direction, and who made the promise alluded to, will postpone the appearance of vegetable cheese indefinitely. Experiments should, however, be made by those who have any practical acquaintance with the chemistry of foodstuffs. Mr. Mattieu Williams, writing in the *Gentleman's Magazine* for June, on the subject of the manufacture of Japanese bean cheese," discusses his experiments with peas and beans. These investigations "'point to the possibility of a very important industry in the manufacture of a new and most desirable food, viz., vegetable cheese. If I am not altogether mistaken, it may be produced on a large scale at about 3 pence per pound, and be equal, if not superior, to the best cheese made in the dairy.'").

Note. This is the earliest English-language document seen (April 2013) that uses the term "Japanese bean cheese" to refer to tofu.

729. *Chemist and Druggist* (*London*)**.** 1887. The manufacture of Japan soy. 31:613. Nov. 12.
• ***Summary:*** "At a recent meeting of German chemists a Mr. Erich communicated a paper on the preparation of Japan soy, a product of which the details of manufacture are as yet imperfectly known. Soy has been manufactured in Japan for over a thousand years, and forms a very considerable article of consumption in that country and throughout the East. There are many factories of the condiment in the country, one of the largest being at Tokio, where considerably over one million gallons are specially prepared for export every year. The principal ingredients known to be used in the manufacture of soy are a very hard long-awned variety of barley, common salt, soya beans (*Dolichos soya*), a specially prepared ferment, and water. The soy beans are roasted like coffee, the barley is partly roasted and partly malted. The roasted parts of the barley and the beans are soaked in cold water, cooled, and preserved by the addition of a liberal dose of common salt. To this are added first a diastase solution, and afterwards a specially prepared ferment, which causes an extremely slow fermentation, but without any considerable formation of carbonic dioxide or alcohol. The degree of strength of the soy depends upon the time used in the process of manufacture, which varies from one to three years. If kept cool and out of the light soy can be kept good for a very long time, but the action of light and the free access of air cause fermentation."

730. *Scientific American.* 1887. The manufacture of Japan soy. 57(24):373. Dec. 10.
• ***Summary:*** "At a recent meeting of German chemists a Mr. Erich communicated a paper on the preparation of Japan soy, a product of which the details of manufacture are as yet imperfectly known. Soy has been manufactured in Japan for over a thousand years, and forms a very considerable article of consumption in that country and throughout the East. There are many factories of the condiment in the country, one of the largest being at Tokio, where considerably over one million gallons are specially prepared for export every year. The principal ingredients known to be used in the manufacture of soy are a very hard long-awned variety of barley, common salt, soya beans (*Dolichos soya*), a specially prepared ferment, and water. The soy beans are roasted like coffee, the barley is partly roasted and partly malted. The roasted parts of the barley and the beans are soaked in cold water, cooled, and preserved by the addition of a liberal dose of common salt. To this are added first a diastase solution, and afterward, a specially prepared ferment, which causes an extremely slow fermentation, but without any considerable formation of carbonic dioxide or alcohol. The degree of strength of the soy depends upon the time used in the process of manufacture, which varies from one to three years. If kept cool and out of the light, soy can be kept good for a very long time, but the action of light and free access of air cause fermentation."

731. Tawara, R. 1887. Nihon shoku no chôsa (Zen kôno tsuzuki). Shoku sen chôsa [Investigation of Japanese foods. Part II]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 8:53-76, 77-101. [Jap]
• ***Summary:*** Discusses miso, natto, tofu, and yuba.

732. Hepburn, James C. 1887. A Japanese-English and English-Japanese dictionary. Abridged by the author. Second edition. Revised and enlarged. Tokyo: Z.P. Maruya & Co., Limited. Yokohama: Kelly & Walsh, Limited. London: Truebner & Co. vi + 330 + 962 p. 16 cm.
• ***Summary:*** Soy-related definitions include: Dengaku: A kind of food made of baked *tôfu.*

Go: [Soy] Beans mashed into paste for making *tôfu;* also used by dyers to limit colors. Mame no go: [Soy] bean paste.

Go-koku [Gokoku]: The five cereals–wheat, rice, millet, beans, and sorghum.

Hitashi-mono [Hitashimono]: Beans or vegetables boiled or steeped in *shôyu* [shoyu].

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Irimame: Parched peas [sic, parched soybeans = soynuts].

Kirazu: The refuse of beans left in making *tôfu.*

Mamemaki: The ceremony of scattering parched beans [parched soybeans] about to drive out evil spirits on the last evening of the old [lunar] year.

Toshi-koshi [Toshikoshi]: The crossing from the old to the new year; the ceremonies observed on the last day of the year,... when parched beans [parched soybeans] are scattered after sundown to drive off noxious influences and evil spirits. The parched beans used this evening, if kept and eaten when the first thunder of the new year is heard, are supposed to protect against lightning.

Note 1. This is the 2nd earliest English-language document seen (Dec. 2012) that uses the term "parched soy beans" to refer to soynuts / irimame.

Tsui-na (*oni yarai*)*:* The ceremony of driving evil spirits out of the house by scattering parched [soy] beans about on the last evening of the old year.

Note 2. This is the earliest English-language document seen (Dec. 2012) that uses the term *Tsui-na* in connection with Setsubun and the ceremony scattering of roasted soybeans in Japan.

Yô-kan [yokan]: A kind of confectionery made of sugar and [azuki] beans.

Yuba: A kind of food made of beans.

James Curtis Hepburn lived 1815-1911. Address: M.D., LL.D., Tokyo, Japan.

733. Smithsonian Institution Board of Regents. 1887. Annual report of the Board of Regents of the Smithsonian Institution. Part II. Washington, DC: The Institution. xviii + 771 p. See p. 73-74. Illust. Index.

• ***Summary:*** Part II is "United States National Museum." Otis T. Mason is curator of this museum (p. 63). Under "Report of the Department of Ethnology," accessions are listed by country. Under "Japan," is a list of 304 "Japanese articles used chiefly in the former times. (Following mainly Dr. Klemm's classification, Smithsonian Report, 1873.)." Both the Japanese name of these items and a translation of that name are enumerated. These include various kitchen utensils:

"113. Saji, wooden spoon... 125. Suribachi, a bowl for rubbing Miso, (fermented mixture of soy beans, wheat, and salt)... Misokoshi, a [bamboo] sieve for filtering miso. 154. Misoshiru wan, Miso soup bowl. 155. Hira, flat wooden bowl for fish and vegetables... 167. Shoyutsugi, Shoyu pourer... 182. Misoshiruwan (see No. 154)." Address: Rev. and author [England].

734. *Moniteur Scientifique-Quesneville.* 1888. Fabrication du tofu au Japon [Manufacture of tofu in Japan (Abstract)]. 31:368-69. March. 4th Series. [Fre]

• ***Summary:*** A French-language summary of the following English-language article: *J. of the Society of Arts* (London). 1886. "Manufacture of tofu in Japan." 35(1778):102-03. Dec. 24.

735. Lecerf, Ch. 1888. Sur la valeur alimentaire du Soya hispida [On the nutritional value of the soybean (Continued–Document Part II)]. *Bulletin de la Societe de Medecine Pratique de Paris* p. 442-49. Meeting of April 26. Presided over by M. Laburthe. [Fre]

• ***Summary:*** Continued from page 444: Finally, this bean is the base of a sort of sauce that has now jumped the boundaries of Asia and whose consumption is widespread among the well-to-do classes (*les classes aisées*) of North America, England, and Holland. This is the *Tsiang-yeou* [*pinyin: jiangyou*] of the Chinese, the *Shoyu* of the Japanese, the *Ketjap* of Batavia and Java, the India-Soy of the Americans and the English, and the *Zoya* of the Dutch. This product is a liquid of a darker or lighter brown, depending on the quality, obtained by the fermentation of cakes (*gâteaux* [of koji]) made of grilled barley and boiled soybeans. These cakes, after fermentation, are dissolved in water with salt, and left alone for 2 and even 3 years [for a 2nd fermentation], then pressed in sacks. The liquid that flows out is *Shoyu;* it has a taste and a smell that are reminiscent of meat extracts. In Japan it replaces butter, oil, fat and meat sauces. Everything–vegetables, fish, noodles–is ordinarily seasoned with *shoyu.* It is the object of an important industry: in Nagasaki, there are more than 10 factories that produce 1,200,000 kg/year for consumption. The most sought-after quality is that of Tokio (Yédo). It is from this city that originates the sketch that I have the honor to present you.

Composition: According to analyses communicated by Mr. Pellet to the Academy of Sciences in May 1880, here are the composition of two soybeans, the first from China and the second harvested in France. Table 1 (p. 445) gives the percentage of macro- and micronutrients in each. The Chinese soybeans contain 16.4% lipids (*matières grasses*), 35.5% protein (*matières proteiques*), and 4.8% ash (*cendres*) vs. 14.12%, 31.75%, and 5.15% for the French. Table 2 (p. 446) gives the composition of the ash for the two soybeans as follows: phosphoric acid, potash, lime / limestone, and magnesia. It shows that the phosphoric acid and potash represent about 75% of the weight of the ash. Table 3 (p. 446) compares the composition of 100 soybeans harvested at Nice and analysed by Levallois, with the composition of 100 grains of wheat analysed by Isidore Pierre. The soybeans contain about 2.8 times as much nitrogen (protein).

To the analyses done by Mr. Pellet, we must add some slight corrections: according to the analyses made by Mr. Müntz, at the Agronomic Institute (*l'Institut agronomique*), the starchy and sugary materials [carbohydrates] have been increased to 6.40%, the nitrogenous materials [protein] to 36.67% and the fatty materials to 17.00%.

The sugary material, contained in the soybean (*Soya*),

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constitutes a particular sugar that, like cane sugar, only reduces to Fehling's solution / liquid after having been inverted by sulfuric acid, as Levallois discovered as well.

Its rotary power is much higher than that of cane sugar. Exact degree measurements are given.

Let us now compare the compositions of wheat, beans, potatoes, according to Boussingault, with that of soybeans. Table 4 (p. 446-47) gives percentages of starch and sugared principles, nitrogenous materials, fatty materials, water, potash, and phosphoric acid.

This comparison shows the superiority of soybeans over these vegetable products, even over wheat, for if the ash of it appears richer in phosphoric acid, we must take into account that wheat furnishes 2.41% ash while soybeans give more twice the weight of ash, 5.15%.

The liquid prepared with soybeans in Japan, *shoyu,* was analyzed at the official laboratory in Tokio (no. 1 [on table 5]). I duplicated the analysis (no. 2) to reassure myself that shipment [to France] had not altered its composition. Table 5 (p. 447) shows, nearly identical values for the two sauces, in terms of density, dry extract, ash, nitrogenous materials, salt (NaCl), phosphoric acid, and potash.

As these analyses show, *shoyu* contains about a third of its weight in solid matter, half of which is formed of minerals. Of the latter (minerals), table salt (NaCl) is found in the proportion of 9/11 [i.e., 82% of the minerals is NaCl], phosphoric acid 2%, and potash 3%. Nitrogenous materials represent about a tenth of the total solid matter.

Conclusions: The analyses that I just cited make the considerable value of soybeans from a nutritional point of view stand out. Its richness in protein (*matières protéiques*), in fact [make it] a vegetable meat (*une chair végétale*), and this meat would be superior, as a concentrated food, to [real] meat. In fact, here is a comparison of percentage compositions (*compositions centésimales*) of soybeans and beef that has had its fats and oils removed [probably in the laboratory]. Table 6 (p. 447) compares water, protein, fat, potash, and phosphoric acid.

These figures need no commentary; they are quite eloquent by themselves and make comprehensible how in Japan a handful of this bean suffices to nourish a vigorous man.

One could, advantageously use soybean flour (*la farine de Soya*) as a powerful food, in a small volume, with debilitated individuals. It is, like milk, a type of complete food, joining the plastic element, represented by protein, the respiratory element, fat, and salts, in which phosphoric acid and potash dominate.

Note 1. This is the earliest French-language document seen which gives a specific name to soy flour, or which uses the term *farine de Soya* to refer to soy flour.

The almost total absence of starchy materials, and the insignificant quantity of sugar that this grain contains, indicates it quite naturally as the best base for bread or rusks for the use of diabetics.

I have the honor to present to the Society some samples of bread and rusks made with soybeans.

Finally, *Shoyu*, that combines a significant proportion of nitrogenous materials [protein] with a rather strong quantity of sodium chloride, could be usefully administered to consumptives [people having tuberculosis], who would find there, beside highly nutritious materials, to compensate for / offset the weakening caused by the loss of salt (*déchloruration*) to which they are subject.

Note 2. This is the earliest document seen (March 2010) which is of practical importance concerning the use of soy in diabetic diets.

Discussion: Mr. Roussel–Could Mr. Lecerf please give us some information about the cultivation of soya and tell us if this plant can be acclimatized in France.

Mr. Lecerf–The Soya grows rather well in the same geographical area as corn / maize. The essential requirement for it to bear seeds, is that neither light nor heat be obstructed. Fertilizer is not necessary for it. Even fresh manure is harmful to it, it grows well in all types of terrain, and all atmospheric variations support its growth.

It is planted from the middle to the end of April. It yields about 600 to one [600 seeds from every seed planted]. It is harvested about the end of October. One indispensable precaution is to space the plants from 0.25 to 0.5 meters apart, according to the richness of the soil, by putting several seeds in the same hole, but not to let them develop as a single clump.

Mr. Duchaussoy–I am very happy with the communication by our colleague. I have cultivated Soya for several years. The first year, the harvest had been average, but the second year I harvested almost nothing. I attribute this to the cold, humid weather. Has Mr. Lecerc not observed that the odor of the Japanese *liqueur* [soy sauce] recalls that of the extract of belladona? [deadly nightshade, which is dark purple; he is being sarcastic].

Mr. Lecerf–The odor of this *liqueur* made from Soya, which the Japanese call Shoyu, is somewhat reminiscent of buckwheat bread, or better still of meat extracts.

Mr. Bardet–I would like to ask Mr. Lecerf if it is not possible to modify the color of the bread [which is too dark], and if there is no butter in the bread [i.e., did he add some butter to his soy bread to make it taste better, or is he "buttering up" the whole subject].

Mr. Lecerf–This bread, being made with only soy flour, could not have its color modified by the addition of other types of flour, which would detract from its value as a bread that contains little or no starch.

Mr. Léon Petit–The bread that was presented to us had an excellent flavor. Mr. Lecerf has accomplished a true *tour de force* in masking the bitter taste, so difficult to avoid when one uses Soya flour–a taste due to the oil contained in the seeds.

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736. Petit, Léon. 1888. L'huile de soya. Son emploi en médecine comme purgatif à petite dose [Soy oil. Its use in medicine in small doses as a purgative]. *Bulletin de la Societe de Medecine Pratique de Paris.* p. 449-52. Meeting of April 26. Presided over by M. Laburthe. [Fre]

• ***Summary:*** Kaempfer first introduced soybean seeds into Europe from Japan, where they are used to make *miso* and *shoyu* (a black and limpid liquid). These two are indispensable condiments in the Japanese diet. They also make a vegetable cheese, tofu, which is usually eaten fresh, and of which the people are very fond.

In Cochin China, soya occupies a major place in the culinary art. The Chinese do not consume milk; instead, they crush the soybean and obtain from it a liquid, rich in casein and oils, which they use like we use the milk from cows' goats, or sheep. From it, they also make white cheeses, red cheeses [fermented tofu], and a sauce, *Tsiang-Yéou* (*jiangyou* or soy sauce), which are greatly appreciated. For my part, I have had the occasion to taste this condiment several times and I admit that I do not share, in this regard, the enthusiasm of the Chinese. Much more, *soya* enters in the preparation of a ferment used for making spirits and wines.

Nothing could be easier than obtaining soybeans; in France, they germinate as easily as haricots. They contain 30-35% protein and make excellent forage.

The soybean has been tested as a forage plant, either alone or mixed with hay, oats, barley, sugar beets, etc. Mr. Paillieux, a distinguished agriculturalist, even conducted various trials in using the soybean for human food.

He cooked the seeds, like one cooks haricot beans, after they had been soaked in distilled water. He also roasted soybean seeds to make a sort of coffee. He successfully reproduced the various Japanese and Chinese food preparations. He even tried to make a flour by grinding the beans, but this flour degenerated [rancidified] because of the large quantity of oil and fat that it contains.

It is possible that if this oil were extracted, the soybean oilcake (*le tourteau de Soya*) could be ground / reduced into flour which would contain more than 40% nitrogenous materials [protein] and would have no bad [after]taste. But unfortunately, this flour would have a rather high net cost, because of the manipulations that its production would necessitate, unless a use for soybean oil, which is the object of an enormous traffic in China, is found. This very limpid oil, which has a beautiful yellow color like olive oil, leaves a little acrid taste in the mouth which is not disagreeable. It possesses very obvious drastic qualities. I had a liter at my disposition, and I observed that with a minimum dose of 10 gm, you obtain a very energetic purging [like diarrhea], without any type of abdominal pain / colic (*colique*). I hope, before long, to receive a certain quantity of soybean oil that I shall place at the disposition of those of our colleagues who would like to test it as a purgative.

Note: The writer is the only person ever to ascribe a "purging" or "purgative" property to soy oil.

There follows a question and answer session. Mr. Terrier asks: Can Mr. Lecerf provide us with some information about the use of this oil in China and Japan? Mr. Petit responds: I believe that the Chinese and Japanese use this oil only for therapeutic purposes. Soy sauce (*La liqueur de Soya*) is widely employed in England as a condiment. Mr. Lecerf adds: I know nothing about how the Chinese and Japanese use soy oil as a medical substance; but, as I said, this oil is of the highest rank among the oils consumed throughout China. I would say to Mr. Petit that the *India Soy,* which the English consume, is a product which contains only a small proportion of soybeans; it is made with considerable quantities of barley and rice [sic], and it comes from China. However *Shoyu,* which I present to you, is originally from Edo [Tokyo, Japan]. Like that from Batavia [Jakarta] (Ket-Jap [ketjap, kecap]), it is made with from equal parts wheat and soybeans (*Soya*).

Mr. Gillet de Grandmont asks: Very precise and extensive information on the cultivation of soybeans can be found in the *Annals* [*Bulletin*] *of the Society for Acclimatization.* This bean, which I have tried to use for food, does not soften easily upon cooking; it always retains a very disagreeable, acrid taste. I could hardly stand it, except consumed in the form of a salad after cooking.

Mr. Lecerf replies: In the fresh state [as green vegetable soybeans], soybeans are not hard and their taste is even agreeable. In the dry state, it is easy to render them less tough, by adding a small quantity of sodium bicarbonate [baking soda] to their cooking water, and by taking care to soak them in water 24 hours in advance. Address: M.D., 2 Rue Casmir-Delavigne, Paris.

737. Suchi, Tokutaro. 1888. Shibô no eiyôtaki kôyô [Digestion experiments with rice and tofu]. *Tokyo Igakkai Zasshi* (*J. of the Tokyo Medical Society*) 2(9):457-62. May; 2(10):511-20. June? [Jap]

• ***Summary:*** K. Oshima (1905, p. 153) reports that T. Suchi, age 21 and in good health, conducted these experiments upon himself. "The amount of fresh rice and fresh tofu eaten per day was exactly the same in both experiments. In cooking the tofu 40 cubic centimeters of shoyu and 10 gm of sugar were used each day. In experiment No. 17 the tofu used was fried in rapeseed oil by the investigator himself, the amount of oil thus used being carefully weighed." Urine and feces were collected and analyzed.

Digestion experiment No. 16 continued for 7 days, Nov. 18-24, 1887. Suchi weighed 41.30 kg at the beginning and 41.51 kg at the end. The diet consisted of rice and tofu. Suchi digested 95.2% of the protein (*tanpakushitsu*) in the diet, 96.5% of the fat, 98.3% of the carbohydrates, and 77.2% of the ash.

Digestion experiment No. 17 continued for 6 days, Nov.

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29 to Dec. 4, 1887. Suchi weighed 41.42 kg at the beginning and 41.47 kg at the end. The diet consisted of rice, tofu, and vegetable oil. Suchi digested 94.2% of the protein in the diet, 93.9% of the fat, 99.5% of the carbohydrates, and 78.9% of the ash.

Note: This is the earliest Japanese-language document seen (Aug. 2003) that uses the term *tanpakushitsu* to refer to protein in connection with soybeans. Address: Physiological Institute, Tokyo University.

738. *Journal de Medecine de Paris.* 1888. Revue des sociétés savantes: Pains, biscottes et liqueurs de Soya hispida [Review of learned societies: Soy bread, biscuits, and soy sauce]. 14(23):912-14. June 3. Meeting of April 26. [Fre]
• ***Summary:*** Mr. Lecerf presented samples of bread, biscuits, and sauce obtained by him from the soybean. He briefly describes soybean cultivation and yields. He then answers questions by Mr. Duchausoy about shoyu, by Mr. Bardet about soy bread (which contains only soy flour and no butter; the only oil or fat in the bread is that contained naturally in the flour).

The British consume large amounts of soy sauce which they call *India soy.* The shoyu presented here originated in Edo, Japan; like that of Batavia [Jakarta, in today's Indonesia] (called *Ket-Jap*), it is made with a mixture of equal parts wheat and soybeans.

Mr. Gillet de Grandmont says that the soybean is hard to soften by boiling and has a very disagreeable flavor. Mr. Lecerf replies that fresh soybeans are not hard and their flavor is not disagreeable. Dry soybeans should be soaked for 24 hours, then cooked in water that contains baking soda. Address: Paris, France.

739. *Chicago Tribune.* 1888. An eel dinner in a Tokio cafe. An appetising meal that is manipulated with chop sticks. June 9. p. 16.
• ***Summary:*** From Rumah in St. Louis Globe Democrat: "A specialty of Tokio houses of refreshment is eel houses." "We celebrated a recent anniversary day by an eel dinner at a famous eel house."

"The feast began with a soup or stew of eels, the bottom of the bowl being filled with a delicate white curd [tofu], and the flavor of the dish being as mild and evasive as flaxseed tea... The plain broiled eels are called white eels, and after them came black eels, or eels dipped in soy [sauce] before and during the broiling. They acquire a rich brown tint and a most piquant flavor by this treatment, and the soy, or bean sauce, with which the Japanese always improve their fish and birds, might be used in the same way in other countries. Japanese soy is the foundation of Worcestershire sauce, and is much better before it is charged with all the spices and cayenne that convert it into the English condiment."

740. Kellner, O.J. 1888. Researches on the composition and digestibility of Japanese feeding stuffs. *Bulletin of the College of Agriculture, Tokyo Imperial University* 1(2):1-45. July. See p. 25-29, 39-45. [3 ref. Eng]
• ***Summary:*** Section "V. Hay of soy beans (karimame)" (p. 25-29) describes experiments feeding soy bean hay to sheep (rams). "This hay is considered the best coarse fodder in this country. It is usually cured, when the pods have developed their normal size but the leaves are still green. A specimen of such hay was examined in 1883 by Mr. *M. Ota."*

In part "II. Soy bean (daizu)" (p. 39-45), Kellner notes: "Although the soy beans are somewhat expensive owing to their principal utilization as human food (tofu, miso and shoyu), it may happen that small proportions of them are resorted to in the feeding of the live-stock, for the purpose of supplementing the protein of a ration otherwise too poor in that nutrient." Soy beans, apparently raw, were fed to sheep. Feces ejected, water drunk, and live weights were measured. The article concluded: "The specimen of soy beans examined by us contains the following proportions of digestible nutrients, percent of the dry matter: Crude protein 34.30, fat 18.25, fiber 9.09; nitrogen-free extract 19.65; the last 2 total 28.74.

"Of all raw vegetable products, earth nuts perhaps excepted, the soy beans are the richest in the most valuable nutrients, protein and fat, and contain them in a highly digestible form."

Note 1. This is the earliest English-language document seen (April 2008) that uses the term "human food" in connection with soy beans.

Note 2. This is the earliest English-language document seen (Aug. 2003) that contains the term "crude protein" (or "crude-protein" or "crude proteins") (one of two documents). Address: Dr., Prof. of Agricultural Chemistry, Imperial College of Agriculture and Dendrology, Komaba, Tokyo, Japan.

741. Carrière, E.-A.; André, Ed. 1888. Chronique horticole [Horticultural chronicle]. *Revue Horticole: Journal d'Horticulture Pratique* (*Paris*) 60:409-13. Sept. 16. See p. 411. [Fre]
• ***Summary:*** The section titled "The soybean in Japan" (*Le Soja hispida au Japon*) states (p. 411): This legume, which is expanding rather slowly among our crops, is cultivated in Japan on a large scale, annual production having risen to about 470 million liters.

Since the average price in Japan is about 12 French francs per 1,000 liter, the total harvest is worth about 5.64 million francs–a very respectable figure. The yield can be as high as 40,000 liters per hectare. Address: France.

742. Tsuboi, Jirô. 1888. Miso no gan chitsubutsu [Nitrogenous matter of miso]. *Tokyo Igakkai Zasshi* (*J. of the Tokyo Medical Society*) 2(18):952-54. Sept. [Jap]*
• ***Summary:*** The author took 2,508 gm of miso powder

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(*miso-ko*), added 50 cc of 80% alcohol, and boiled it for 3-2 minutes. He put on a wooden lid or stopper and kept it in a warm water bath at 60ºC for several hours. Then he filtered it, added 25 cc of water to the remaining solids, extracted the liquid, and made that extract more concentrated by putting it in a warm water bath. He added oxalic acid (*shû-san*) and evaporated it dry. He then removed the dark brown substances remaining, measured the nitrogen. He calculated the nitrogen extract (*ekisu-sei chisso*) and found that it was 0.204%, while the total nitrogen was 1.158%. Therefore the nitrogen in miso is found mostly in the protein and the amount of nitrogen in the extract (*ekisu-bun*) is very small. The *ekisu-sei chisso* is 17.616% of the total nitrogen. (Tô I Kai 2, 952-954 [Sugi]).

743. *Bayerische Gewerbe-Zeitung* (*Nuremberg*). 1888. Japanische Soja [Japanese soy sauce]. No. 23. p. 538-40 [Dec.]. [Ger]

• ***Summary:*** Under the trade name of "Japanische Soja," a peculiar product has also recently become known in Germany. Used as a seasoning with different dishes, it is said to enhance their good taste and nutritive value, and also to stimulate ones appetite. It is a slightly thick, dark reddish-brown liquid with a piquant, pleasant, salty and aromatic taste.

The main constituent of this product is the meal of the soybean (*das Mehl der Sojabohne*), an East Asian plant that sometimes grows wild and is sometimes cultivated. Its kidney-shaped seeds are used daily in Japan in the food of the poorer classes (The soybean has also found practical uses in Germany) or they can be prepared as soya extract or gravy (*Sojabrühe*) which is added to many foods instead of butter or meat.

The production of shoyu (*Soja*) is successful even in large factories, as well as in small shops, and the process is apparently thousands of years old. A measure of the extraordinary amounts of shoyu used in Japanese households is that fact that one company, which is widely known in Europe, at its head factory in Japan employs about 2,000 workers who produce about 1 million gallons = 4,543,500 liters of shoyu. This company, named Tokyo Shoyu Kaisha, in addition to its head factory in Tokyo, has some 48 distilleries (*Brennerien*) throughout the country and a steamship to carry their products to the capital. After many years of effort, it has found a way to preserve the product so it is suited for export to foreign countries, despite many previous unsuccessful attempts.

The way of manufacturing shoyu, about which there have previously been only sketchy reports, is essentially as follows: Dehulled soybeans are dried, then roasted like coffee beans, so they do not lose their aroma during transport. A very hard type of wheat is used in unpolished form; part of it is roasted with the soybeans. A specific quantity of fresh wheat is malted (*gemalzt*), and from this an infusion (*Aufguss*) is prepared, similar to that in our distilleries. In a separate vat, the roasted beans and wheat are combined with cold water and soaked for a long time, during which an artificially very low temperature and the abundant addition of cooking salt [NaCl], the fermentation is allowed to proceed. After a certain time, the diastase solution, which is prepared from the malt, is added to the whole; it is stirred now and then, and left alone. As soon as a certain stage of development is reached, which usually can be recognized from experience by the color of the condiment, a special kind of yeast (*Hefe*) (unknown outside Japan) is added. Under the prevailing conditions, namely of low temperature and high salt content, this yeast causes a very slow fermentation– supposedly without the development of carbonic acid and without alcohol as an end product.

According to the difference in the content of the extract and in the quality of the raw materials, three kinds [of moromi] are manufactured: The lowest quality is allowed to ferment for one year, the middle quality for two years, and the highest quality for three years. During this time the vats [of moromi] remain untouched [and are not stirred].

After being separated from the dregs / sediment (*Bodensatz*), the soy sauce (*Soja*) is ready for use. It is stored in cool rooms in tightly-closed porcelain bottles (*Flaschen*); it stays good for several years. With the entrance of air or light, a slow fermentation continues but without recognizable changes during many weeks. Through the slow fermentation in a strong salt solution, according to several chemical analyses, the rather considerable protein of the [soy] beans and barley is made soluble. The dark color is caused by the strong roasting of these materials. In recent years, public attention has been drawn from various sides to the agricultural value of soy sauce, and its introduction or importation for general use has been recommended. With potatoes, as in Japan with rice, it can form a true food of the people. To that end, it should be made available in small quantities to purchase for only a few pennies. In addition, it seems that, because of its ability to stimulate and promote digestion, it can improve the taste of soups and sauces, all kinds of meat and fish, vegetables, etc. It is better suited than the often-used strong spices, whose sharpness / harshness is not good for everybody.

Either during cooking or at the table, add soy sauce to the dishes according to taste.

In order to avoid the formation of a thin film of salt [sic, yeasts] on the surface of bottled soy sauce (even though it is not detrimental), you should store bottles of soy sauce lying on their sides [rather than upright].

Note 1. A line at the end of this article states that its source was *F.A. Günther's Bäcker- und Konditor-Zeitung.*

Note 2. King Ludwig II of Bavaria (lived 1845-1886; reigned 1864-1886) was actively involved in the craft movement that gave rise to this periodical. He sponsored a trade museum and annual prizes for the best hand-crafted

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articles. He is famous for the beautiful castles he had built in Bavaria: Neuschwanstein, Herrn Chiemsee, and Lindenhoff. Address: [Bavaria, Germany].

744. *Bayerisches Industrie- und Gewerbeblatt* (*Munich*). 1888. Japanische Soja [Japanese shoyu]. 20(52):721-23. [Ger]
• ***Summary:*** This is a nearly (but not exactly) identical reprint of an article by the same title in: *Bayerische Gewerbe-Zeitung* (Nuremberg). No. 23. p. 538-40. Only a few words and indentations are different.

Note: A line at the end of this article states that its source was the *Bayerische Gewerbe-Zeitung* (Nuremberg). Address: [Germany].

745. Hirano, I. 1888. Shôyu bunseki seiseki [Results of shoyu analysis]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 71. p. 72-74. [Jap]
Address: Tokyo Eisei Shikensho.

746. Tawara, R. 1888. Shôyu shiken seiseki [Results of an experiment with shoyu]. *Eisei Shiken Iho* (*Bulletin of the Imperial Hygienic Laboratories*) 3:63-71. [Jap]*

747. Filet, G.J. 1888. Plantkundig woordenboek voor Nederlandsch-Indië. 2nd ed. [Dictionary of plants for the Netherlands Indies. 2nd ed.]. Amsterdam, Netherlands: J.H. de Bussy. See p. 127, no. 3127. 23 cm. First ed. was 1876 (362 p.) published in Leiden by G. Kolff. [Dut]
• ***Summary:*** Each plant is given a number, starting with 1 for "Aantigan." The short passage on the soybean reads: "3127. *Kadeleh of kadaleh S. M. & J.* [*S. = Sundaneesch. M. = Maleisch. J. = Javaansch*] = *Soya hispida Mönch, Nat. fam. der Papilionaceæ. Gr.* [*Groeiplaats*] *Op Java en elders in tuinen, uit Japan overgebracht; zaadplant. Gebr.* [*Gebruik*] *De zaden dienen tot bereiding der Soya of Kétjap."*

This can be translated as follows: "No. 3127. Named kadeleh or kadaleh in Sundanese, Malayan, and Javanese. Scientific name: Soja hispida Moench. Member of the natural family Papilionaceæ. Places of growth: On Java and elsewhere in gardens, imported from Japan; a seed plant. Uses: The seeds are used for the preparation of soy sauce or ketjap."

Note: Filet lived 1825-1891. The only other species of the genus Soja mentioned in this book is Soja Wightii (*Tjijhe-badak*), No. 8846 (p. 297). Address: Oud-Officier van Gezondheid van het N.-I. Leger.

748. Holbrook, Martin L. 1888. Eating for strength: or, Food and diet in their relation to health and work, together with several hundred recipes for wholesome foods and drinks. New York: M.L. Holbrook & Co. 236 p. No index. 20 cm.
• ***Summary:*** The author, a health reformer, advocates a vegetarian diet. Chapter 9, titled "Alimentary products of the vegetable kingdom," has a section on "Peas, beans and lentils" which states (p. 117): "The special characteristic of the bean, as compared with cereals, is a less amount of starch and a larger amount of nitrogenous matter. This renders it an excellent substitute for flesh meat. All experience goes to show that it is a more satisfying vegetable product for hard-working men than almost any other. In Catholic countries, especially France, where flesh food is less used, and where during Lent and on Fridays it is proscribed, leguminous products are more extensively used than elsewhere. They are much used by the vegetarians of India and China..."

"In Japan the bean is made into a curd [tofu], a most nutritious article of diet, and the nearest approach in its chemical constituents to animal food of any of the vegetable foods. A very full account of the mode of preparing and using it was published by the United States Government in the consular reports for 1886. This curd is used in soup, croquetts [croquettes] and a hundred other ways, and is said to be well liked. It might to our advantage be introduced into our country, and so might the soy bean generally used in Japan and China, which is richer in fat than our own beans are." A table (p. 118, based on Kinch 1880) gives the composition of the soy bean.

Note 1. This is the earliest English-language document seen (Nov. 2003) that contains the term "substitute for flesh" or "substitute for flesh meat" to refer to a meat alternative.

Note 2. This is also earliest document seen (March 2001) concerning the etymology of meat alternatives.

The chapter on "Food in various diseases" recommends remedies for constipation (brown bread, fruit, and fresh vegetables), chronic rheumatism (a vegetarian diet), diabetes (gluten bread, "made now by many health food companies"), food for orphan asylums, prisons, etc. ("a rightly constituted vegetable diet," 'non-flesh' diet, or 'Vegetarian' dietary).

Note 3. This is the earliest English-language document seen (Sept. 2006) that contains the term "health food" (or "health-food" or "health foods"). Address: M.D., Prof. of Hygiene in the New York Medical College and Hospital for Women, Editor of the *Herald of Health,* etc.

749. Kamiyama, Yoshimotsu. 1888. Sake shôyu okerui yôryô kokusûhyô [Chart showing the volume (in koku) of various kegs and other containers for sake and shoyu]. Matsuyama: Kôyôsha. 53 p. 16 cm. [Jap]*

750. Leuillieux, Abel. 1888. Le "Soya hispida," sa valeur alimentaire, ses indications ["Soya hispida," the soybean: Its nutritional value and indications]. Paris: Imprimerie de A. Davy. 53 p. 8vo. [21 ref. Fre]
• ***Summary:*** Contents: 1. Historical and botanical description. Soya (*Le Soya*) in Japan: Miso (according to Kaempfer), shoyu (*Le Sooju, Shoyn*), soybean varieties (23, soy oil, tofu), Japan at the exposition of 1878, practical recipe in France by the correspondent of the Horticultural

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Society of Paris (*Sociète d'Horticlture de Paris*), soy cheese or tofu (*fromage de daizu* (*To-ju*)), soya in China, soy oil, fermented tofu (*Le fromage de Soya, Teou-Fou*) (white fermented tofu, red fermented tofu), soya in Cochinchina (black soybean), soya in France (history), preparation of soya for the table. Letter from Maurice Dupuy (chemist at Vienna, June 1888, to M. Lecerf; nutritional value of Soya hispida, nutritional composition of 2 samples). Conclusions. Bibliography. Address: M.D. Faculté de Médecine, Paris; Former student at the Industrial and Agronomic Institute of Nord [Ancien élève de l'institut industriel et agronomique du Nord].

751. *Pharmaceutische Centralhalle fuer Deutschland.* 1889. Japanische Soja [Japanese soy sauce]. 30(3):44-45. Jan. 17. New series: Vol. 10. Extracted from Bayerisches Industrie- und Gewerbeblatt. [1 ref. Ger]

• ***Summary:*** Japanese soy sauce (*Japanische Soja*) is a thick, dark-brown liquid, with a piquant, pleasant, salty taste and an aromatic fragrance. Coming from Japan, it has recently been recommended as an addition to meals, not only to make foods taste better but also to enhance their nutritional value.

In Japan, soy sauce is made in large factories, the largest of which employ 2,000 workers. A description of the process is given. For the best quality soy sauce, the fermentation process should take three years.

752. Osawa, Kenji. 1889. Shôka shiken tsuika [Additional investigations on digestion]. *Chugai Iji Shinpo* (*Medical News, Foreign and Domestic, Tokyo*) No. 211. p. 6-8. Jan. [Jap; eng+]

• ***Summary:*** Experiment no. 18 was a digestion experiment with rice and tofu, plus small amounts of starch (kuzu powder), shoyu, and sugar. It was conducted for 3 days, June 20-22, 1887. A table shows the amount and nutritional composition of each food used. The following percentages of the basic nutrients were digested: Protein 95.2%. Fat 94.8%. Carbohydrates 98.8%. Ash 83.4%. The author concluded that mixed foods (except for fat) are more easily digested than single foods. Address: Physiological Institute, Tokyo University.

753. Carrière, E.-A.; André, Ed. 1889. Chronique horticole: La production de Soja hispida au Japon [Horticultural chronicle: Production of soybeans in Japan]. *Revue Horticole: Journal d'Horticulture Pratique* (*Paris*) 61:121-25. March 16. See p. 125. [Fre]

• ***Summary:*** Soya hispida is now raised in a few market gardening operations in Europe, but it is only found in small amounts, not because its seeds are rare but because this type of bean is not regarded as a highly lucrative vegetable.

In Japan, the opposite is true and this crop has expanded to the point that the average value of the annual crop surpasses 100 millions francs. Address: France.

754. Kellner, O.J. 1889. Tofu cakes. *Bulletin of the College of Agriculture, Tokyo Imperial University* 1(4):24-25. March. [Eng]

• ***Summary:*** This article is about okara and its uses. "Tofu, e.g. bean curd essentially consists of legumin, and is prepared from soy beans, which are steeped in water, finely ground on stone mills and extracted with much water. The solution of legumin thus obtained is heated to boiling, filtered after cooling, and precipitated with the brine that drains off from the crystals of common salt during the preparation of the latter from sea water. The precipitate, after being pressed in wooden frames represents the tofu, a common human food in China and Japan. The portion left undissolved of the beans, called *tofu kasu* [okara] is chiefly used as food for domestic animals, but sometimes also consumed by the poorer classes or used as manure.

An analysis of such cakes, by Mr. J. Sawano, gave the following results (fresh substance): Water 85.74%, crude protein 3.82%, fat 1.44%, crude fibre 3.15%, nitrogen free extract 5.38%, ash 0.47%, total nitrogen 0.611%, albuminoid nitrogen 0.024%. The following are "per mille" [i.e., mg/100 gm]: Potash 1.71, soda 0.07, lime 0.97, magnesia 0.40, ferric oxide 0.10, phosphoric acid 1.20, sulphuric acid 0.12, silica and sand 0.12, chlorine 0.01.

"As the dry matter of the cakes is still rich in protein (26.7%) and fat (10.3%), they deserve, of course, to be more recommended as a food for cattle and hogs, than as a manure for direct application."

Note: This is the earliest English-language document seen (June 2013) that uses the term *kasu* or *tofu kasu* to refer to okara. It is also the earliest document seen (June 2013) stating that okara is fed to "hogs" or "domestic animals." Address: Tokyo, Japan.

755. Tahara, J.; Kitao, M. 1889. Notes sur la composition du shoya. Sur les matières azotées dans la sauce japonaise dite "Shoya" [Notes on the composition of shoyu. On the nitrogenous materials in the Japanese sauce called "Shoya"]. *Revue Internationale des Falsifications* 2:159-61. April 15. German-language summary in Chemisches Central-Blatt 1889(1):732. [1 ref. Fre]

• ***Summary:*** The sauce well known as "Shoya" [sic, shoyu] is indispensable in the culinary art of Japan. Mr. T. Isono, in his 1878 thesis on shoyu, reported that it is a clear, dark brown liquid, having a sweet and salty taste and a particular savory aroma. The relative density ranges from 1.15 to 1.23. All foods in Japan, whether of animal or vegetable origin, are prepared with the aid shoyu, without the addition of sea salt; however the latter is a major ingredient in shoyu. The annual production of shoyu in Japan is about 3-4 million *koku* (1 koku = 180.4 liters, thus 540-720 million liters) and each Japanese consumes, on average, 60-100 cc/day.

A table shows that 13 samples of shoyu, examined at

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a laboratory in Tokyo, were found to have the following average composition by weight: Solids (dry residue) 36.71%, nitrogen 1.33%, glucose 3.80%, dextrin 1.30%, acids (calculated as acetic acid) 0.72%, ash 19.45%, sea salt 15.86%, phosphoric acid 0.48%. Maximum and minimum values are also given for each nutrient.

"As far as we know, research on shoyu (*Shoya*) conducted to date is limited to qualitative analyses. Furthermore, Mr. Isono has measured the alcohol and nonvolatile acids. We propose to determine whether the shoyu contains nitrogen in the form of proteinaceous materials which come from the beans used in its manufacture, or whether these substances have already undergone a partial alteration during the fermentation period.

"To this end, we obtained the best quality shoyu, made by the House of Yamoguchi [Yamaguchi] in Shimosa prefecture" [just northeast of Tokyo]. The product had a specific gravity of 1.26 at 21ºC. The reaction was distinctly acid.

A second table shows the results of the qualitative analysis, 100 gm calculated by weight: Solids (dry residue) 32.58%, total nitrogen 1.18%, glucose 2.76%, dextrin 1.30%, alcohol 0.43%, volatile acids (calculated as acetic acid) 0.16%, non-volatile acids (calculated as acetic acid) 0.83%, inorganic salts 17.47%.

A third table gives an analysis of the ash by weight: sodium chloride (table salt) 87.26%, sulfuric acid 2.84%, phosphoric acid 2.65%, magnesium 3.90%, calcium traces, potassium traces. ash 19.45%, sea salt 15.86%, phosphoric acid 0.48%.

In addition, ammonia and amines were found in shoyu, plus a new aromatic substance that crystallizes and contains nitrogen. It melts at 213ºC. 100 cc of shoyu contains total nitrogen 1.18%, proteins 0.55% and of the new aromatic substance 0.46%; it will be discussed in a future article.

Most Japanese believe that shoyu is very nutritious article of food, rich in protein. The above tests show that view to be erroneous, since it contains only 3.4% protein. However shoyu is indispensable to Japanese cuisine.

Note: This is the earliest document seen (July 2001) that uses the word "Shoya" to refer to soy sauce. Since the word was spelled this way twice in the title and at least 13 times in the body of this French-language article, it appears not to have been a typographical error. "Shoya" was subsequently used by only one other author (Loges 1910), but in that case to refer to soybeans. Address: Tokyo.

756. Wileman, A.E. 1889. Salt manufacture in Japan. *Transactions of the Asiatic Society of Japan* 17(1):1-66. April. See p. 27. Read 14 Nov. 1888. [Eng]
• ***Summary:*** In Japan, salt is made from sea water "in the numerous salt gardens, or salterns, scattered along the coast." After the water has been evaporated from salt, it still contains "bitterns" or "mothers," which possess a very bitter or acrid taste due to the magnesium salts (mainly magnesium sulphate) present in solution.

The pans used for making salt by evaporation last only 35-40 days because of a build-up of "pan scale" on the inside surface.

Page 27: "Several expedients are resorted to for diminishing the pan scale as much as possible and frequently with success.

"One consists in adding to the brine contained in the boiling pan the lees [sic, whey] obtained from the manufacture of Tôfu [Tofu] or Bean Curd. This bean curd is made by treating a large white bean called the 'Daizu,' or scientifically, Soja Hispida, with water and then boiling it. The liquor exuding from these beans when squeezed in a cloth, is what is used for putting into the brine. For a boiling of two *koku* (= 40 gallons) of brine, two *shô* (= 3 quarts) is the regulation quantity."

757. Kellner, O.J.; Mori, Y.; Nagaoka, M. 1889. Researches on the manufacture, composition, and properties of "koji." *Bulletin of the College of Agriculture, Tokyo Imperial University* 1(5):9-33. July. [10 ref. Eng]
• ***Summary:*** A detailed analysis. *"Koji* i.e. steamed rice or barley upon which is developed the mycelium of special fungus plays an essential part in various manufacturing processes peculiar to Japan and China. It is used as a saccharifying substance in the preparation of rice wine (*sake*) and alcohol (*shochiu*) and seems likewise to be the chief active ingredient which brings about the slow fermentation as well in the manufacture of *miso,* a food adjunct very common in Japan, as in the preparation of *shoyu,* a peculiar sauce also largely consumed in the country.

"... we prepared koji from rice and barley in the following way, which is generally adopted in the koji works, and which has already been described by O. Korschelt (1878), and R.W. Atkinson (1881)." Address: Dr., Prof. of Agricultural Chemistry, Imperial College of Agriculture and Dendrology, Komaba, Tokyo, Japan.

758. Lecerf, Ch. 1889. Le soya, sa valeur alimentaire et son emploi thérapeutique [The soybean. Its food value and therapeutic applications]. In: Compte Rendus, Congrès International de Thérapeutique et de Matière Médicale. 1889. Paris. 347 p. See p. 296-302. Meeting of Aug. 3. Therapeutic section. [4 ref. Fre]
• ***Summary:*** The soybean (*Le Soya or Soja*) is a legume of the group *Phaséolées,* widely cultivated in China, Japan, and the Far East, where it serves as a foundation of the food of the indigenous people.

The Dutch traveler Kaempfer, in 1712, first reported on this plant, which he designated under the Japanese name Daïdsu. After that it was named: *Dolichos soja* by Linnaeus, *Soja hispida* by Moench, and *Glycine hispida* by Siebold. A detailed botanical description is given. It is an

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annual herbaceous plant, having slender stems about 80-90 cm in height. Its leaves are trifoliate with a special pattern of veins (*imparipennées- trifoliolées*), its leaflets / folioles are hairy and oval but pointed on the ends. Its flowers are small, papilionaceous corolla, varying in color from white to purple; they are disposed in axillary groups, etc.

The type that I have just described is the one that acclimatizes itself most easily to the European regions where the cultivation of corn / maize is possible. In Japan and China, there are numerous varieties of soya, having brown, black, or greenish seeds. In these countries, each of these varieties has a special use: One kind is used to make tofu (*le Téou-fou*), a kind of cheese of which the Chinese people are very fond. Another is used in the preparation of Shoyu, a kind of sauce which is (so to speak) indispensable to the Japanese. Yet another kind is employed by the Chinese to make Cantonese wine starter (*Kiu-tsée;* [from China]) a solid ferment, which is used in making wines and artificial brandies.

All that is known about the various uses of Soya, about the trials that have been made concerning the acclimatization of this plant in Europe, as well as the chemical composition of the plant and its seeds, can be found in an excellent monograph by Mr. A. Paillieux [1881].

In April 1888, in a communication to the Society for Practical Medicine (*Société de médecine pratique*), I called to the attention of the medical corps the services that this legume could render to diabetics and to invalids, and presented samples of bread made with soya flour.

I am happy to note that my idea did not remain without a response / an echo. Our learned president, Prof. Dujardin-Beaumetz, was kind enough to present to the Academy of Medicine (on 29 May 1888) the soya bread (*pains de Soya*), which I made with no flour other than non-soy flour; he was kind enough to conduct trials with this bread in his department at the Cochin hospital [a famous hospital in Paris].

Later, Mr. Blondel published (*Journal de pharmacie et de chimie,* 5th series, vol. 18, p. 537) a very interesting study on the structure of soybean seeds., and demonstrated the almost complete absence of starch in their tissues. Then Mr. Egasse, in an excellent article in *Bulletin général thérapeutique* (30 Nov. 1888) summarized the various works concerning Soya and its economic and therapeutic applications.

Not much attention was given to Soya [in Europe] until after the Exposition of Vienna in 1873, to which the Japanese brought numerous samples. Professor Haberlandt and Count Cettems were the principal popularizers, and even though they recommended its cultivation mainly from the viewpoint of feeding and fattening livestock, they opened the door to the idea that the seed could be of service if it were introduced as a human food.

In France, the Society for Acclimatization encouraged cultivation trials with Soya, which it sought to popularize; but in spite of the numerous trials that were made and of which the majority gave excellent results, its cultivation continued only in and around Étampes (Seine-et-Oise).

The analyses [of the chemical composition] of soybean seeds that have been made in Austria, Germany, and France are numerous. The writer then gives the composition (in two large tables on p. 299) of three samples of soybeans (from China, Hungary, and Etampes) and their ash as conducted by Mr. Pellet and published in the *Comptes Rendus des Seances de l'Academie des Sciences* (Paris) (1880, vol. 40, p. 1177).

The analyses of Mr. A. Muntz was based on French samples, whose content of starch and sugar was rather high. They contained 6.4% (p. 299).

The sweet material (*matière sucrée*) of the soybean was studied by Mr. Levallois, who also made comparative analyses of the proportion of phosphoric acid and nitrogen contained in wheat and in soybeans. His latter results are given in the form of a short table.

If we compare the chemical composition of Soya, according to the analyses of Mr. A. Muntz, and that of beef that has been defatted (as in a laboratory) according to the analyses of M. Lehmann, we see that the Soya contains more of the useful nutrients / principles than the meat. A table (p. 300) compares the amylaceous and sweet materials, proteins, fats, phosphoric acid, and water for the two foodstuffs.

Soya is therefore a precious plant, which, in a small volume, offers a large nutritive value. Its low starch content makes it very useful in diabetic diets.

The oil contained in the soybean seed, even though it is said that the Chinese use it as an edible oil, is a laxative and has a taste that is not very agreeable; this taste would make it hard to use, even as a substitute for castor oil. It is the oil, above all, which makes it difficult to make bread from Soya flour, and which gives this flour a disagreeable taste, which even cooking does not diminish noticeably. This oil is not, strictly speaking, a drying oil as is often said; it is a mixture of resin, fixed oil, and essential oil (*de résin, d'huile fixe et de huile essentielle*).

With the flour, from which most of the oil has been removed, I have succeeded in making a bread that is not disagreeable. It stays fresh for 4 to 5 days, and has the great advantage for sick people over gluten bread of having a good crumb (the soft, white part of a loaf, other than the crust), not to mention the insignificant amount of starch that it contains.

This bread, cut into slices and dried in a drying stove, furnishes biscuits; finally the flour, mixed with egg yolks, enables us to makes wafers / thin waffles than can be sweetened with saccharine.

Soya bread, in appearance, has a great similarity to rye bread; its color darkens gradually as it ages. And it is easily digested, provided, as Mr. Dujardin-Beaumetz advises, one does not consume more than 250 gm per day.

In using this bread, a certain accommodation must be

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made; during the first few days it has a mild laxative effect, but this diminishes as one gets used to it.

Many sick people, having previously used gluten bread, have switched to Soya bread basted on its good taste. Then they discovered the additional advantages of a bread that absorbs and retains moisture well, and that stays fresh and soft for rather a long time. Note: At mealtimes, many French people used to dunk their bread (which is served next to the meal) into a hot, tasty liquid (soup, milk, coffee, gravy, etc.) and use it like a utensil to move or push other foods around, and clean the plate at the end of the meal.

The trials conducted to date do not yet allow us to say for sure, in diabetes mellitus, what the action of Soya is on the production of sugar. But we can affirm, already, that the quantities of glucose (*glycose*) do not increase when Soya bread is substituted for gluten bread. A fact that appears to remain constant with diabetics who use Soya, is a decrease in the volume of urine excreted in 24 hours.

If, by virtue of their low starch content, Soya preparations are useful to diabetics, the relatively large proportions of proteins and of phosphates which they contain make them a substantial food which can render a service to debilitated persons.

Discussion: Mr. Constantin Paul says–Concerning Soya biscuits, sweetened with saccharine, recently recognized as good for the feeding of diabetics, I would like to call the attention of the Congress to the services which can be rendered, in the diets of the sick, by the use of saccharine in general, so convenient to use to console the diabetics that that they do not have completely suppress all sweets...

Mr. Stokvis adds that saccharine has been recently used in Holland and he would like to make the same observation as Mr. Paul. As long as saccharine is used in a sufficiently alkaline milieu, no stomach problems are observed. Address: Pharmacist, Paris.

759. *Pharmaceutische Centralhalle fuer Deutschland.* 1889. Offene Correspondenz [Open correspondence]. 30(47):698. Nov. 21. New series: Vol. 10. [Ger]
• ***Summary:*** Mr. W. in The Hague (Netherlands) is looking for a supplier of soybeans. An extract of soybeans is on the market under the name of "Soya Japan" [probably Japanese shoyu / soy sauce] or "Kefo" and is used as an ingredient in or seasoning for soups. One supplier of this Soya extract is Gehe & Co. in Dresden.

760. Stearns, Frederick. 1889. A Japanese dinner: An elaborate and somewhat curious affair of many courses. Dainty dishes served in rare and most exquisite porcelains: A cup of tea made from priceless leaves–The menu in detail. *Detroit Free Press.* Dec. 8. p. 16.
• ***Summary:*** The writer was invited to dine with a Japanese gentleman in Tokio at a "beautiful new tea house, called *Kan-toku-tei* (lofty virtue), in the midst of one of the finest and oldest landscape gardens of Tokio. This garden is over 250 years old." The first-class Japanese dinner was laid for four persons. Since the writer was unable to sit on his heels or to use chopsticks, the dinner was served on a Western style and he used "that vulgar utensil called a fork."

Each dish and the vessel in which it was served are described. Three little piles of zests were served with one course: Yellow chrysanthemum petals, bruised and moistened with salted water; horse radish; and small cucumbers very thinly sliced and pickled in brine. Several of the foods were dipped "into a little cup of soy [sauce], adding at the same time one or more of the zests."

Another course "consisted of young bamboo shoots (resembling somewhat our asparagus) cooked in soy sauce and mirin. With these were... salmon soaked first in soy sauce and then broiled, but eaten cold. This is called teriyaki."

Note: This is the earliest English-language document seen (April 2012) that contains the word "teriyaki." It does not contain the term "teriyaki sauce."

The next course, a soup, included "a greenish sea weed called nori,..."

"The only criticism I would make upon Japanese food is that it is too much salted to suit foreign palates. But for daintiness of appearance, pretty decorations and exquisite porcelains it would be difficult to find a parallel." Address: Yokohama, Japan.

761. Kellner, O. [Oskar Johann]; Nagaoka, M.; Kurashima, Y. 1889. Researches on the manufacture and composition of "miso." *Bulletin of the College of Agriculture, Tokyo Imperial University* 1(6):1-24. Dec. [12 ref. Eng]
• ***Summary:*** Contents: Introduction. Raw material and preparation of miso: Soy beans, koji from rice or barley, common salt. The chemical processes during the ripening of miso (incl. chemical composition of fresh substance and dry matter, which include nitrogenous substances or albuminoids, ether extract [crude fat], carbohydrates, crude fibre, ash, solubility, water). Varieties, composition, and nutritive properties of miso: (1) "Shiro miso, white miso, is characterized not only by its white colour but also by its low content of salt and by the short time it will keep good"–no longer than 10 days; 4 days fermentation time. (2) "Yedo miso, so called from the former name of the metropolis" [Yedo/Edo, now Tokyo]; 20 days. (3) "Inaka miso, country miso, is the richest in salt and is prepared with the help of barley koji"; 11-12 months. (4) "Sendai miso derives its name from the city of Sendai in Miyagi prefecture where it is widely prepared, but is frequently also termed *Aka miso* (red miso)"; 8-15 months. (5) Other sorts of miso which are only of local importance. Four are consumed mostly in miso soup: Sano miso, Nagaseyama miso, Mikawa or Sanshiu miso [Sanshu miso]. Four others can be consumed uncooked and used as condiments: Kinzanji miso ("named after a

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Buddhist temple and prepared by fermenting a mixture of soy beans, barley koji, salt, starch-sugar {*amé*}, slices of egg plant {*Solanum melongena*}, and ginger roots"), Sakura miso ("quite similar to the preceding, but sweeter on account of an admixture of large quantities of starch-sugar or raw cane sugar"), Tetsuka miso [Tekka miso] ("is common miso with the addition of sesamum oil, roasted soy beans, and slices of the roots of burdock {*Arctium Lappa"*}), Kogo miso ("is prepared like common miso but with an addition of rice bran").

Note 1. This is the earliest English-language document seen (Dec. 2012) that contains the term "roasted soy beans."

The introduction begins: "Miso, e.g. a food prepared from a mixture of soy beans, rice or barley, common salt, and water, by slow fermentation, seems to have been known in Japan since remote times. Its manufacture, like so many other useful processes, appears to have been taught to the Japanese by Chinese or Koreans. At least the *Sandai jitsu roku,* tells us, that a Chinese priest named *Jingo* transmitted more than 1000 years ago a small quantity of miso to the then Emperor of Japan, and the name *'Korei shiwo'* sometimes, though not frequently used instead of the word 'miso,' points to its introduction from Korea, where indeed, as well as in China, miso is still a favorite food.

"In Japan miso is very widely consumed, especially by the lower classes, who enjoy it as a sort of food adjunct to the vegetables of which their daily diet consists. Although it is eaten throughout the whole country, it seems to be especially favoured in the north-eastern provinces. Statistics on its consumption do not exist at present and may also be difficult to compile, as in the countryside it is made by families themselves [at home], and only in large communities are special miso works [factories] established. Assuming, however, 10 monme (37.5 grms.) to be the lowest quantity daily consumed per head, and 20 millions out of the 39 [million] of the whole population to eat miso every day, a yearly amount of nearly 30 million kilograms of miso is arrived at, for the preparation of which more than half the yearly produce of soy beans (2.3 million koku [335,000 tonnes] in 1883) is needed. Although these figures are certainly too low, they surely indicate the importance of this food in the nutrition of the Japanese people."

Tables show: (1) The composition of three different types of soy beans that make good shoyu and good miso, and the weight of 1000 grains/seeds of each (p. 3). (2) The composition of four different types of sea salt: Ajino from Bizen, Ako from Harima, Mitajiri from Suwo, and Giotoku from Shimosa [Shimôsa] (p. 4). (3) The composition of soy beans and of barley, and amount of each used in making miso (p. 6). (4) The composition of the fermenting miso after 50, 85, 120, and 150 days, on a fresh (as-is) basis (p. 7) and a dry-matter basis (p. 8). (5) Changes in nutrients in the soy beans and in the barley during fermentation (p. 11). (6) Changes in the miso during fermentation (p. 13). (7) Temperature of the original mixture and length of fermentation for four types of miso: Shiro miso, Yedo miso, Inaka miso, and Sendai miso (p. 15). (8) Composition of five types of miso (p. 19). (9) Proportion of raw materials, age, temperature of the beans when mixing them with the other ingredients, and price per *kin* (=0.601 kg) of the same four types of miso.

Note 2. Dr. Kellner published three subsequent articles in this journal but none concerned soybeans: (1) "Manuring experiments with paddy rice" (Bulletin No. 8, June 1890); (2) "Manuring experiments with paddy rice. (Third year)" (Bulletin No. 11, July 1892); (3) "Comparative experiments on the effects of various phosphatic fertilizers on upland soil, and analysis of rice grain" (Bulletin No. 12, March 1893).

Note 3. This is the earliest English-language document seen (Sept. 2002) that contains statistics on the production or consumption of soyfoods (in this case miso), in Japan.

Note 4. This is the earliest document seen (Sept. 2002) that contains statistics on miso by geographical area.

Note 5. This is the earliest English-language document seen (Aug. 2001) that mentions the word "nutrition" in connection with soy.

Note 6. This is the earliest document seen (March 2009) that mentions "Inaka miso" [made at home in the countryside], or "Tetsuka miso" [Tekka miso], or "Yedo miso" [Edo miso], or "Sendai miso" [a dark rice miso made in and around the city of Sendai], or "Kinzanji miso," or "Sanshiu miso" [Sanshu miso, a soybean miso made in central Japan].

Note 7. The parallel Japanese title of this English-language periodical is *Tôkyô Nôrin Gakkô. Gakujutsu hôkoku.* Address: Dr., Prof. of Agricultural Chemistry, Imperial College of Agriculture and Dendrology, Komaba, Tokyo, Japan.

762. Department of Agriculture, C.P. 1889. *Report on the Nagpur Experimental Farm in the Central Provinces* (*India*) 17 p. For the year 1889-90. Ending 31 March 1889. See p. 3, 17.

• ***Summary:*** In the section titled "Field experiments: Kharif crops," a table (p. 3) shows 0.55 acres of the Japan pea (*Glycine hispida*) were cultivated for grain (seed). The average out-turn [yield] of this crop was 69 lb/acre in 1887 and 67 lb/acre in 1888. Also mentions the following crops: Mung (*Phaseolus mungo*), popat white (*Lablab vulgaris*), til (*Sesamum indicum*), castor, chillies (*Capsicum annuum*), linseed, hemp, and cotton.

A table titled "Total area under experiment on Nagpur Experimental Farm during the year 1888-89" (p. 17) gives similar information for Japan pea and other crops mentioned above. Total kharif acres were 27.46; total rabi acres were 39.61.

"When the bean in 1885 was grown experimentally at Nagpur from Japanese seed, it yielded at the rate of 180 lbs.

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per acre (see Report Experimental Farms for that year, p. 5), but later (*vide* Nagpur Experimental Farm Report for 1889-90, p. 5) it yielded but an average of 88 lbs. per acre over five years." Address: Superintendent of the Experimental Farm, Nagpur.

763. Dôjin, Enankyô. 1889. Tôfu hyakuchin: tegarû ryôri [One hundred and rare and favorite tofu recipes: Easy cookery]. Osaka, Japan: Shinkada Seishichi. 18 p. 19 cm. [Jap]
• ***Summary:*** This book appears to be a simplified and condensed version of the 1782 classic *Tôfu Hyakuchin,* by Ka Hitsujin.

764. Hayward, Albert I. 1889. Report of the Agriculturist. *Maryland Agricultural Experiment Station, Annual Report* 1:70-75. For the year 1888. See p. 71-73.
• ***Summary:*** The section titled "The soja bean (*Soja hispida*)" (p. 71-73) states: "The object of this crop was to test the qualities of this Japanese forage plant." The crop was planted on 9 June 1888 on 27 plots, each one-eighth of an acre in size. All growth stopped in mid-July when a blight seemed to seize the plants. "Aphides were found on the leaves and the ends of the roots were dead." "About the 10th of August new leaves began to appear and the growth was very vigorous from that time till harvest," which began Sept. 21. The average plant height was 2 feet, but some plants reached 3 feet. "The pods had begun to form but the seed was not developed. The stems were hard and woody near the ground. The crop was run through a fodder-cutter and ensiloed with corn and sorghum, alternating the loads as they were drawn, thus mixing three forage plants. This proves to be a food eaten very readily by cattle and showing a marked improvement in the flesh of the animals and in quantity of milk produced. The woody stems of the beans are kept moist in the silo and the stock eat them up clean." The largest yield was at the rate of 11,088 lb/acre. "This would undoubtedly have been very much increased by a reasonable quantity of manure or fertilizer." A table (p. 73) shows the chemical composition of the soja bean plant (at two stages of growth, Sept. 22 & 26), red clover, and timothy.

When "the Soja Bean and common Red Clover are compared ton for ton of green product, at time of harvesting, the former gives more total dry substance, or food, than the latter, and this in the form of more valuable nutrients. It has also been abundantly proven that land which will not produce enough clover to pay for cutting, will yield an average crop of the Soja Bean."

Note: This is the earliest English-language document seen (May 2000) that uses the word "silo" (or "silos") in connection with soybeans (one of two documents). Address: B.S., Agriculturist.

765. Hirayama, Akira. 1889. Shinsen tôfu ryôri [Fresh tofu cookery]. Japan: Published by the author. 70 p. 18 cm. [Jap]*

766. Imbrie, William. 1889. Handbook of English-Japanese etymology. 2nd ed. Tokyo: Z.P. Maruya & Co. viii + 287 + iv p. See p. 265-66. Index. 20 cm.
• ***Summary:*** This is a page for page translation of *In Puris Naturalibus.* Page 265: The left half of the page is written in Romanized Japanese, and the right hand side is the English translation. The word *kirazu* appears (in Romanized Japanese) four times on page 265 and 4 more times on page 266. For example (p. 265): *kirazu: kono tôfu no kirazu wo... sono kirazu wo kau koto...*" "The father is poor, and the children are numerous; and they can hardly live from day to day. Such humble people get along by mixing in these tôfu husks to eke out their rice. And there are ever so many people of that kind. And yet such persons are extremely ashamed of being seen buying the husks." One boy's mother asked him to go fetch a basket of tofu husks [okara]. As he walked home he met some boys: "And so the boy with the basket said, 'Pshaw! none of you can tell. Why! it is tofu husks.' Thereupon a lot of the boys called out together, 'Oh I say! really is it husks? Then, take down the basket and let us see inside.' 'No!' said he,' I can't let you see inside.' 'Why won't you let us see inside?' said they. 'Because my mother told me to bring them home without showing them to people.' Oh the heart of a child–how innocent, how pure it is!"

Note 1. The terms *kirazu* and *tôfu no kirazu* (meaning okara) are used only in Japanese and are translated as "tôfu husks."

Note 2. This is the earliest English-language document seen (June 2013) that uses the term "husks" or "tôfu husks" to refer to okara.

Tofu is mentioned on pages 264, 265, 266, and 271. Miso is mentioned on p. 266.

William Imbrie lived 1845-1928. Address: Philadelphia.

767. Kellner, O.J.; Mori, Y[ôtarô]. 1889. Untersuchungen ueber die Ernaehrung der Japaner [Investigations on the nutrition of the Japanese]. *Zeitschrift fuer Biologie* 25:102-22. [16 ref. Ger]
• ***Summary:*** The Japanese practice a near-vegetarian diet and consume very little meat. In 1882 only 36,288 cattle were slaughtered and the 37 million inhabitants consumed less than 1 kg per capita each year. The authors found that rice constitutes about 50% of the total vegetable food of the Japanese, followed by barley and wheat (27%), other small grains such as millet and buckwheat (13.9%), with green vegetables, roots, tubers, etc. making up the remainder. Soybeans, which are rich in protein and fat, are not widely consumed as such directly, but are made into other unique foods such as tofu and miso, and a tasty sauce, shoyu. Miso is made in almost every household in Japan. The process for making miso, tofu (*Bohnenkäse*), and shoyu is described (p.

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103-04).

A table (p. 121) gives the chemical composition of various Japanese foods (on a moisture-free basis), including soybeans cooked with shoyu, and tofu (*Bohnenkäse*). Address: Tokyo, Japan.

768. Koenig, Franz Joseph. ed. 1889. Chemische Zusammensetzung der menschlichen Nahrungs- und Genussmittel. Vol 1. Chemische Zusammensetzung... Ed. 3 [Chemical composition of human foods and food adjuncts (stimulants / enjoyables). Vol. 1. Chemical composition... 3d ed.]. Berlin: Verlag von Julius Springer. 1161 p. See p. 241-42, 595-600, 625, 631-32, 1041. See also Vol. 2, 1893. [21 ref. Ger]

• ***Summary:*** Summaries of early studies on chemical composition of soybean seed and of miso. The long and interesting section titled "Commercial sauces and food seasonings" (p. 241) is discussed in a separate record.

A table (p. 389) gives numerical data on the oil from various oilseeds, including the soybean: Melting point, saponification number, neutral fat (*neutralfett*), free fatty acids, total fatty acids, molecular weight of the fatty acids, lecithin, stearic acid from lecithin, phosphorus, unsaponifiable components.

Pages 486-90 give a good review of the literature on soybeans, discussing the various types, composition, shoyu or soy sauce, koji, Japanese miso, and tofu. A table (p. 489) gives the composition of 5 soy products analyzed by Edward Kinch: White miso, red miso, fresh tofu, frozen tofu, and soybean cake. König notes that some of these foods are not suited for the German palate, however E. Wein makes several good-tasting dishes from soybeans, used in a soup like beans or peas, in a salad like green beans, or cooked with potatoes or rice and pureed to resemble the Italian 'Polenta'–called 'Sojenta' by Haberlandt. The taste of these soybean preparations reminds one somewhat of almonds or chestnuts. See also soy flour under "Meal" (*Mehl*) (p. 625).

Pages 595-600 give detailed nutritional analyses of soybeans based on studies by various authors: Black oblong soybeans (based on E. Wein 1881, and Edw. Kinch 1882). Yellow soybeans (Anderson, Senff, Fr. Schwackhoefer and Joh. Stua, Zulkowski, E. Mach and K. Portele [of Versuchs-Station St. Michele, original communication; harvested in Tirol, Austria, in 1877], R. Ulbricht and von Koritsánsky [Koritsansky, of Acad. Laborat. of Hungarian Altenburg, original communication; harvested in Hungarian Altenburg in 1878], E. Wildt [of Vers.-Stat. Posen, original communication; harvested in Posen], Schroeder-Napagedl, Blaskovics, Wein, Weiske, Kinch). Brown soybeans (Schwackhoefer, Zulkowski, E. Mach and K. Portele, Ulbricht, E. Wein, Schroeder, Weiske, Kinch). Black round soybeans (Senff, Mach, Wein, Kinch). Other soybeans (Caplan, Mach, Wagner, H. Pellet, Carriere, Kinch, Meissl, Kellner, Jenkins). Soybeans grown with fertilizer / manure (*Gedüngte Sojabohnen*, E. Wein).

Page 625 contains one analysis of whole soybean flour (Sojabohnenmehl) conducted in 1882 by C.H. Knorr in Heilbronn; the analyst was *v. d. Becke und Cosack*. This flour contained 10.23% water, 25.69% nitrogenous substances, and 18.83% fat, etc.

Note: This is the earliest document seen (Nov. 2013) that uses the word *Sojabohnenmehl* to refer to whole soybean flour.

Pages 631-32 give detailed nutritional analyses of soybean products based on studies by various authors: Leguminose-Maggi (18 brands made by Jul. Maggi & Co. in Kempthal, Switzerland; sampled from 1885-1888; studies by E. Schumacher-Kopp, M. Wesener [personal communication]). Soybean preparation named "miso" (Made by Jul. Maggi & Co. in Kempthal; sampled in 1888; Study by W. Kisch [personal communication]). Miso (red or white, 1882; by Edw. Kirch [sic, Kinch]). Tofu (fresh or frozen; E. Kirch [sic, Kinch]). Address: Prof. and Head, Agricultural-Chemical Experiment Station, Muenster in Westphalia, Germany (Professor und Vorsteher der Agric.-Chem. Versuchsstation Muenster i. W., Germany).

769. Matthews, Charles George; Lott, Francis Edward. 1889. The microscope in the brewery and malt-house. London: Bemrose & Sons. 198 p. See p. 85, 184-85. Illust. Index.

• ***Summary:*** This book is dedicated to Mon. Louis Pasteur. In Chapter 6, "The moulds or microscopic fungi," states (p. 85): "The only distinct industrial purposes to which mould-growths are applied, are in connection with this power of forming Alcoholic ferments. It appears besides, that moulds may give rise to a species of Diastase, as for instance, in the preparation of the Japanese 'Koji,' made from steamed rice on which a yellow dust–the spores of a fungus–is placed, and subsequently allowed to vegetate. 'Koji' is capable of liquefying gelatinized starch, and setting up a fermentation in it, giving rise to a kind of Beer–the Japanese 'Saké' Koji is also used in breadmaking and as a source of 'Soy' [sauce]. The mould giving rise to these spores is called Eurotium Oryzæ" [Aspergillus oryzae].

In the Glossary we read: "Eurotium Oryzæ, a mould, the spores of which are found in Kôji, the Japanese ferment" (p. 184).

"Kôji, macerated rice containing fungus spores, used by the Japanese as a ferment in making Saké, and bread; also in the manufacture of 'Soy'" [sauce]. Address: 1. F.C.S. [Fellow of the Chemical Society], F.I.C. [Fellow of the Inst. of Chemistry], etc.; 2. F.I.C., A.R.S.M., etc. [England].

770. Rein, Johann J. 1889. The industries of Japan. Together with an account of its agriculture, forestry, arts, and commerce. London: Hodder and Stoughton. xii + 570 p. See p. 6, 55-59, 62-63, 105-08, 157. Illust. Indexes (English and Latin; Japanese). 26 cm. [3 ref. Eng]

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• ***Summary:*** This book is a translation of volume II of his superb book *Japan nach Reisen und Studien,* published in 1886. The result of many years of study, including a stay in Japan, it is based on travels and researches undertaken at the cost of the Prussian government. Rein spent the first five months of 1874 in Japan, residing in the German Legation in Tokio and studying lacquer. After submitting a detailed report on the subject, he traveled throughout Japan.

On page 6, the author discusses the *Gokoku* (five chief cereals) and the introduction of agriculture to Japan. "As Tokugawa Ieyasu, the founder of the last Shôgun [shogun] dynasty, emphasizes in the twelfth of his 'Eighteen Laws,' the introduction of agriculture into Japan is ascribed to the sun-goddess *Tenshô Daijin* (Amaterasu). She was, to the old Japanese, Janus and Ceres in one. Her temple, at Yamada, in Ise, was the great national sanctuary, which had to be cared for according to law, and built anew every twenty-one years out of consecrated Hinoki-wood (*Chamæcyparis obtusa* S. and Z.) 'in order that the land might have peace and thrive.' By Gokoku (five chief cereals) were meant rice, barley and wheat, Italian millet, other kinds of millet, and beans–in fact, the principal *Kokurui,* that is, cereals and pulse. The term Go-koku, however, did not meant the same thing in all ages. Thus we find in Kaempfer, *Amoenitatum exoticarum* (1712, p. 834), Kome (*Oryza*), O-mugi (*Hordeum*), Ko-mugi (*Triticum*), Daidsu (*Dolichos soja,* L.), and Adzuki (*Phaseolus radiatus,* L.) mentioned as Gokoku. Later the idea was extended farther, and included all important food-plants belonging to the group of cereals and pulse."

"The Emperor Shinnung [Shen Nung] had introduced and spread the practice of agriculture in China, about the year 2700 B.C. For this he was deified after death, and a temple was dedicated to him in Peking. In the park-like surroundings of this temple, the emperor of China since then, at the time of the spring equinox, annually ploughs a piece of land and sows it with go-koku." Note 1. This is the second earliest document seen (Dec. 2000) that gives an early date (2700 B.C.) for Shen Nung. It is the earliest document seen (Dec. 2000) that weakly links Shen Nung with soybeans, which were probably one of the Gokoku.

Soy-bean is described in the chapter on "Food Plants," under "Pulse or Leguminous Plants." "Among the pulse of Japan (and not the less of China), the soy-bean ranks first in extent, variety of use, and value; and chemical analyses prove the empirical judgment is well founded. In point of nutriment, the soy-bean is of all vegetables the nearest to meat. It contains nearly two-fifths of its weight in legumin rich in nitrogen, and nearly one-sixth in fat. The soy-bean is to the inhabitants of Japan what their *garbanzos* (chick-peas) are to the Spanish, and their *feijao preto* (black beans) to the Brazilians. The author then describes the characteristics of the soy-bean, the work of Haberlandt with soy-beans in Austria, and the yields that he and his co-workers obtained. Note 2. This is the earliest English-language document seen (June 2008) that uses the word "garbanzos" (or "garbanzo") to refer chick peas.

"In Japan the varieties of soy-bean are distinguished–according to colour, as white (more properly yellowish), black, brownish red, green, and spotted; according to duration of growth [maturity] as early-ripening, middle-ripening, and late-ripening; according to form, as spherical, ellipsoidal, kidney-shaped, and compressed laterally; and according to use, as to those which serve primarily in making Shôyu (soy), Tôfu (bean-cheese), and Miso (a sort of sauce), and those eaten in any plain shape." Soy-bean varieties in Japan include: 1. "White (pea-yellow) soy-beans, Japanese Shiro-mame or Haku-daidzu. To this division belongs an early-ripening sort with very small seeds, called Goguwatsu-mame [Go-gatsu], or 'five-months-kind,' because it ripens in the fifth month of the old Japanese calendar, our July; also another small-seeded, early-ripening variety, the Wase-mame or Natsu-mame, that is, early and summer-bean. These two are also called Tôfu-mame, because they are used chiefly in making Tôfu. Another sort serves to produce Miso. It is called Nakate-mame, 'middle-late bean,' its time of maturity occurring half-way between that of the early and late kinds. Its seeds are round and somewhat larger. The late ripening varieties, Okute-mame (late-bean), Maru-mame (bullet-bean), and Teppô-mame (gun-bean), or Aki-mame (autumn-bean) have, as their names indicate, mostly bullet-shaped seeds, which become harder and larger than the early ones. The variety last named is used in making Shôyu, while Maru-mame is valuable as horse-feed.

2. Black soy-beans, Japanese Kuro-mame or Koku-daidzu. These are eaten boiled with sugar, as an entrée, or as a relish to rice. A species like it with big, bullet-shaped beans is called Kuro-teppô-mame. 3. Brown soy-beans, Japanese Katsu-daizu (thirsty soy-bean) are much less grown than the white and black sub-species, and are used like the latter. They are distinguished as Aka-mame, red soy-beans, round, of red-brown colour, in different varieties, and Cha-mame, tea beans, three light-brown sorts of small extent and significance. 4. Greenish or bluish green soy-beans, Japanese Ao-mame or Sei-daizu, are eaten mostly boiled and with sugar, like the black and brown-red varieties. And, with the brownish sorts, they are much less widely grown than the black and yellowish. The Japanese distinguish the following sub-species of Aö-mame:–(a) Sei-hito,–epidermis green, inside a whitish yellow. (b) Nikuri-sei,–greenish throughout. Both sub-varieties run from roundish-ellipsoidal to a bullet roundness, are of medium size, and remind one of green peas. (c) Kage-mame, with pale green, round beans. 5. Speckled soy-beans, Japanese Fuiri-mame or Han-daidzu. This group is not important. Its cultivation is confined to a small area, in a few provinces. Its sub-varieties are known as:–(a) Kuro-kura-kake-mame, with a black spot on the saddle (eye), otherwise greenish; flat and with the outline of an egg. (b) Aka-kura-kake-mame, with a brown spot on the

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saddle (eye), otherwise yellowish-green, flat and drawn out long. (c) Fuiri-mame or Udzura-mame, speckled or spotted soy-bean, yellowish-green with many dark flecks. A rare variety, grown only in a few places, especially in Harima. Note 3. This is the earliest English-language document seen (Sept. 2004) that uses the word "speckled" (or "speckling" or "specks"), or the word "flecks," or the term "light-brown" to describe the color of soybean seeds.

"Early-ripening soy-beans are sown as early as April in Southern Japan, in Central Japan during May. Those that ripen in autumn need much more warmth, and are sown, as a rule, one month later... Late-ripening Daidzu is also a favourite for planting along the edge of fields and on the new-built dykes of rice-fields."

Note 4. This is the earliest English-language document seen (June 2009) which states that there are early-, medium-, and late-ripening varieties of soybeans.

"At the end of his above-mentioned treatise, Haberlandt summed up in five noteworthy propositions, the results of his experiments with the soy-bean and of its chemical analysis. His conclusions are as follows:

"(a) The acclimatization of the early-ripening sorts, particularly those with yellow and reddish brown seeds, appeared to have fully succeeded in Central Europe.

"(b) The seeds obtained were larger, heavier, and handsomer than those from Eastern Asia, the chemical composition, however, remaining unchanged.

"(c) The soy-plant resists light spring frosts better than our young beans, and endures greater dryness in summer than most leguminous plants, though otherwise much like other kinds of beans.

"(d) It is distinguished by heavy crops, besides furnishing, in its stems and leaves, either green or dried, a nourishing feed, of which cattle are very fond.

"(e) In their high percentage of protein and fat, they far excel all other pulse in nutritive quality; and when properly prepared are second to none in flavour.

"After such favourable judgments, it might have been expected that the soy-bean, at least in the warmer regions of Austro-Hungary, would soon become popular and generally cultivated. The result, however, was quite otherwise. The hopes which he had aroused in behalf of this plant seem to have disappeared with Haberlandt, who died in 1878.

"As I know from a reliable source, people soon became convinced that it was possible to cultivate with certainty the early-ripening yellow sorts. The crops from these, however, are unsatisfactory. It is so difficult to boil them soft that they have no sale and cannot be turned to due account."

The seeds of certain wild kinds of beans also serve for food, incl. Tsuru-mame or No-mame (*Glycine soja,* S. and Z.) and No-adzuki (*Atylosia subrhombea,* Miq.). (p. 62).

Tables (both based on other sources) show: (1) Analyses of soy-beans (*Glycine hispida,* Moench) (p. 62). Gives the nutritional composition of 8 varieties, plus the empty pods, and the straw and leaves. (2) Comparative "analyses of various pulse" (p. 63), including *Glycine hispida* (*Daidzu*–soy-beans), *Phaseolus radiatus* (*adzuki*), *Pisum sativum* (*Yendo*–peas), *Vicia faba* (*Sora-mame*), lentil, yellow lupine, and ground-nut.

Pages 105-08 contain accurate, detailed discussions of shoyu, miso (which "does not spoil, and is said to be at its best when three years old"), and tofu.

A table titled "Average composition of various Japanese oil-seeds according to E. Wolff and others" (p. 157) includes the composition of ground-nut [peanut], sesame (brown, or white), hemp-seed, and soy-beans.

Also discusses: Adzuki (*Phaseolus radiatus,* p. 60, 108). Algae, marine, used as food [sea vegetables] (p. 77, 80-82). Ame, midzu-ame, and barley malt (p. 103-04). Arachis hypogæa (p. 56, 153-54). Fu (wheat gluten, p. 108). Hemp (*Cannabis sativa,* p. 75, 157, 165-66). Kudzu (p. 65, 160, 184). Sesame seeds (Benni-seed, gingeli, p. 154-55). Address: Prof. of Geography, Univ. of Bonn [Germany].

771. Rein, J.J. 1889. Shoyu (Document part). In: J.J. Rein. 1889. The Industries of Japan. Together with an Account of its Agriculture, Forestry, Arts, and Commerce. London: Hodder and Stoughton. xii + 570 p. See p. 105-07. [3 ref. Eng]

• ***Summary:*** "6. Shôyû, the Japanese bean-sauce, also called Soja, English Soy, both being corruptions of the Japanese name, is a dark-brown fluid with a pleasant aromatic odour and a peculiar salty taste. It foams up yellow when shaken, and leaves behind on the side of the glass a clear shining line of a fatty appearance, so that the Japanese designation "soy-oil" (Shô = soy, yû = oil) is quite appropriate. Its specific gravity, which Kinch gives as 1.199, may vary not inconsiderably according to the method of its production...

For the manufacture of Shôyu as I became acquainted with it in Kiôto (Kyoto), they use wheat (Ko-mugi), light-yellow Soja-beans (Shiro-mame), common salt (Shio or Shô), and water (Midzu); the first two in equal parts, three parts of water, and five or six parts of salt. In other places they take equal volumes of all four components. A small portion of the wheat is brought to fermentation with Kôji (rice-ferment); the rest is roasted to a delicate light-brown in iron pans over a fire of coals and then ground in little hand-mills. The Soja-beans are boiled soft for about half a day with a little water, in iron kettles, and after that pounded to mush. Flour, bean-mush, and the fermenting wheat are now thoroughly mixed, poured into little wooden boxes, and exposed to fermentation for three days in a suitable room, at as uniform a temperature as possible (25ºC.), whereby the mass becomes covered with mould-fungus" (See also Hoffmann 1874).

"All through winter, for several minutes every day, the paste or porridge in these vats is vigorously and thoroughly stirred. In the warm season, when the fermentation takes

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place more rapidly and the solid parts collect on the surface, it is only necessary to stir it from twice to four times daily. This is done with a sort of wooden shovel with a long handle, to use which the workman stands on the edge of the butt.

"A common proverb says, the more rats have found their death in the butts, the better the Shôyû. This, though not to be taken literally, expresses the long time required for making Shôyû. This period varies, in fact, from twenty months to five years, beginning in autumn as a rule, after the Soya-bean harvest. In this slow and peculiar fermentation process a considerable proportion of starch is converted into dextrine and sugar, besides which lactic acid and acetic acid are formed. The paste, at first thick, becomes thinner and more fluid, while its grey hue gradually changes to a muddy brown, and at last to a pure dark-brown. This last and the agreeable aroma accompanying it, together with a bitter taste, are developed generally between the third and fifth year. The Shôyû which is most prized for its odour and taste is obtained only by mingling equal quantities of three-year and five-year product. The mixture is put into strong, coarse, close-woven bags of wool or hemp-linen, which have been rendered closer still by being dipped in Shibu (which see). These bags, 60 to 70 cm. long and 18 cm. wide, are filled loosely, and then laid lengthwise and crosswise on top of each other in a large square box. Then a heavy wooden cover is put on, and a simple lever-press applied, one in which the long arm of 4 or 5 m. is weighted with stones. The expressed Shôyû flows through a hole in the bottom of the box into a bamboo cane, and through this to a cask sunk in the ground, and is then ready for use. As in oil refining, the first stuff produced is the most valuable. By continued pressure with increased weight a second quality is obtained, and at last a third, clear-flowing and less aromatic, as the dregs are mixed with salt-water and then squeezed again. Shôyû reaches the market in wooden barrels containing one To (20 liters). According to Hoffmann, the price was 1.5 yen (six shillings) for a To of the best sort, from three to four shillings for the second, and two shillings for the last.

"The delightful aroma and pleasing taste of Shôyû are quickly lost in a long sea-voyage, through the formation of mould. In good condition, however, Shôyû proves an excellent means of sharpening the appetite and assisting digestion. It is, on this account, as Chief Staff-surgeon Hoffmann justly remarks, much preferable to European preparations that are supposed to effect the same result, being perfectly harmless to the human system." Note 3. This is the earliest English-language document seen (April 2012) that uses the term "bean-sauce" to refer to soy sauce. Address: Prof. of Geography, Univ. of Bonn.

772. Rein, J.J. 1889. Tofu, kori-tôfu, and yuba (Document part). In: J.J. Rein. 1889. The Industries of Japan. Together with an Account of its Agriculture, Forestry, Arts, and Commerce. London: Hodder and Stoughton. xii + 570 p. See p. 107-08. [3 ref. Eng]

• ***Summary:*** "8. Tôfu, called in English bean curd, in German and French, less appropriately, *Bohnenkaese* and *fromage de pois,* is a valuable article of food made in Japan and China from yellow Soja-beans. It consists of fresh coagulated legumine [legumin], so that the English term suits it better than the German. Its preparation is simple.

"The yellow Soja-beans are put to soak, in cold water for from twelve to twenty-four hours, or a shorter time in warm, and then ground between the stones of a hand-mill, water being added to assist maceration. It becomes thus a thin mass, in which the quantity of water exceeds that of the beans about ten times. This is next filtered or pressed through a fine sieve, and the remnant put through the mill a second time. Ten volumes of this filtered stuff are now diluted with three volumes of hot water, and heated to boiling-point. This is done in a kettle, which is only about half filled. When cool again, the mass is filtered through a woollen sack, and the process ends with pressing it under the lever.

"As in our soups from leguminous plants, the legumine is now found dissolved in the filtrate. To coagulate and separate it, there is added Shio-no-nigari (salt-bitter), i.e. brine from sea-salt, consisting principally of chloride of magnesium. Care is taken to have the precipitation take place slowly and quietly. (In China, according to St. Julien, burnt gypsum is also added.) When the liquor has cleared it is dipped out carefully, while the stuff precipitated is placed in four-cornered wooden forms with punctured, movable walls, which are lined with cloth. This is folded together over the Tôfu, a board is laid on top, and the Tôfu pressed out with a moderate weight of stones. Finally, the soft greyish mass is cut into tablets with broad latten [resembling brass] knives, and put away under water. In summer this suffices only for a short time. To be kept longer, it is put up in Shôyu, or pickled, etc.

"Kori-tôfu, frozen or ice-Tôfu, is the spongy, horn-like substance that remains when common Tôfu is allowed to freeze and then thawed and dried in the sun, thus getting rid of most of its water. By Yuba is meant a third preparation, consisting of brownish, tough skins, made by boiling the dissolved legumine of the Tôfu-process, with the addition of some wood-ashes, and then taking away in succession the scums that rise."

Note 1: This is the earliest English-language document seen (April 2013) that uses the term "frozen Tôfu" or "ice-Tôfu" to refer to dried-frozen tofu.

Note 2. This is the earliest English-language document seen (Oct. 2012) that uses the word "scums" to refer to yuba. Address: Prof. of Geography, Univ. of Bonn.

773. Whitney, William Dwight. ed. 1889. The century dictionary: An encyclopedic lexicon of the English language. 6 vols. New York, NY: The Century Co. See vol. I, p. 488.

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• ***Summary:*** This dictionary contains three entries related to the soy-bean in Volume 1. At the entry for "bean" we read: "Sahuca or soy beans, the seeds of *Glycine Soja,* largely cultivated in India and China, from which the sauce known as *soy* is made.

"bean-cake, n. A large cheese-shaped compressed cake of beans after the oil has been expressed, used largely in northern China as food for cattle, and in the sugar-plantations of southern China as manure."

"bean-curd, n. A thick white jelly resembling blanc-mange [blancmange], made of beans, much eaten by the natives of northern China, Corea [Korea], and Japan."

Note 1. This is the earliest document seen concerning soybean products (bean-curd) in Korea; soybeans as such have not yet been reported.

Note 2. This edition of *The Century Dictionary,* published from 1889-1891, is the earliest edition listed in the *National Union Catalog.* Address: Prof. of Comparative Philology & Sanskrit in Yale Univ.

774. G. [Greshoff, M.?]. 1890. De Soja-boon en hare beteekenis als voedingsmiddel voor Nederlandsch-Indie [The soybean and its significance as a food for the Netherlands Indies]. *Tijdschrift voor Land- en Tuinbouw en Boschkultuur in Nederlandsch Oost-Indie* 5(10):347-56. Jan. 1. [5 ref. Dut]

• ***Summary:*** In the Netherlands Indies, the soybean (*De soja*), which is called *katjang kadeleh* and *katjang djepoen,* plays a very important role in the production of the sauce known as *ketjap.* However real soy sauce (*soja*) is of much greater importance to the Japanese and Chinese. The Chinese have carried their tradition of soy sauce usage and consumption abroad. The natives of Java use unripe beans, whereas the Chinese use well-ripened beans.

Chemical analyses over recent years have proven the superior nutritional value of the soya bean. No other legume has given such a favorable analysis. This shows how the experience makes the right choice ages before theory had its say about such things. It is as if every reputable chemical food analyst has to issue their own personal analysis of the soya bean in order not to embarrass themselves. According to the Japanese Yossyda [Yoshida?], there are 100 varieties of soya in cultivation in his homeland. Geerts describes 16 different kinds in his monograph. Analyses are given of several soybean varieties. The first, by Geerts and Dewars (Dutch) analyzed 7 varieties: yellow soybeans from Japan (*Wase-mamé*) and China, black soybeans from Japan (*Kuro-mamé*) and China, green soybeans from Japan (*Ao-mame*), Nakaté from Japan, a yellow soybean cultivated in south Russia. One analysis is given by Meissl and Böcker (German), and one by Church (British). Then seven analyses by Church are given of other common legumes from India. Then follows Church's analyses of rice, Indian wheat, corn / maize (*Djagoeng* [*jagung*]), and common sorghum (*Sorghum vulgare; Djagoeng tjeutriek*)–followed by a short explanation.

Experience has shown that in colder climates, the starch content of soybeans rises, while the content of other nutrients drops. This is why major areas of soybean cultivation (as promoted for 15 years by Haberlandt) have been limited to central Europe.

The soybean is said to contain an enzymatic substance which rapidly converts starch to sugar, and to which the high value of soy sauce is attributed. But tests have yet to prove this. Then follows an essay on the caloric value of soy compared to other foods, and how to calculate this correctly. Church's methods of determining the nutrient value of foods are described as too limited.

Among vegetable foods, the soybean is very digestible. According to the latest research by Ladd, comparing the digestibility of various proteins (*eiwitstoffen*), soybean is 75% versus 64% for flour and 54% for grains. Because soya is very low in starch, it is a perfect food for diabetics. At a recent congress for doctors in Paris, soy bread was promoted and given much attention. Prof. Stokvis told the congress how a baker named Koehler bakes soy bread and soy cookies of high quality.

The soybean is also appropriate, because of its nutritional composition, as a food for children and the sick. It is up to an enterprising person to bring it onto the market. Also, soy sauce would be a good commercial product if manufactured in Europe. But the most important point is that soya is an excellent food and, as such, is not given the recognition it deserves in the Netherlands Indies. It is an inexpensive vegetable meat. It deserves to be cultivated, because it can serve as a good, low-cost source of protein for a large number of people. It is appropriate for use in institutions, orphanages, and the army and navy, and deserves experimentation on a large scale. The indigenous people of the Netherlands Indies are used to eating the bean unripe, and not very well cooked–and they are persistent in serving it like this, which has led to the rejection of soy in many important circles.

Glycine soja is a very good secondary crop, next to rice. There is no need to emphasize this, since the Inspector of the Civil Medical Service has brought to the attention of the Netherlands Indies government and its officials, in a very professionally written piece, the advantages of soya cultivation.

"I can't give you any indications about the basis on which the soybean ("katjang kadeleh") will best thrive. There are so many questions concerning the growth and function of the so-called root nodules (*wortelknolletjes*) of the *Papilionaceae* and the microorganisms that live therein. It has been determined that these plants, which include the soybean (*de soja*) are capable of creating free nitrogen and assimilating it."

Note 1. This is the earliest document seen (June 2012) concerning soybean root nodules and nitrogen fixation in

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Europe.

The author closes with the wish that the import of soya will prove to be a blessing for Java. [Note 2. This could mean either importation of soybeans from China, or more widespread introduction of soybean culture to Java, or import from Java to the Netherlands.] For about a year he has been trying to bring soy to the attention of the Netherlands, an attempt he wants to repeat again under the favorable auspices of a small official publication circulated to those who are interested.

Note 3. Paerels 1913 (p. 288) and Kempski 1923 (p. 79) both cite F.A. von Stuerler as the author of this article, but at the end of the article, the author's name is written simply as "G." On the same line is written: "B. Nov. 1889."

Note 4. This is the earliest Dutch-language document seen (Feb. 2001) that has the word "Soja" (or "Soja-boon" or "Sojaboon") in the title.

Note 5. This is the earliest Dutch-language document seen (Aug. 2003) that uses the word *eiwitstoffen* (or *eiwitstoff*) to refer to proteins in connection with soybeans.

775. Brooks, William P. 1890. Division of Agriculture: General results of a trial of a few Japanese crops. *Massachusetts* (*Hatch*) *Agricultural Experiment Station, Bulletin* No. 7. p. 14-17. Jan.

• ***Summary:*** The article begins: "At the time of leaving Japan in October of last year I was unaware that I should be placed in charge of a department of the Hatch Experiment Station, and did not, therefore, make arrangements for the forwarding of any considerable amount of seed of any kind. I had been located in a section of that country, however, with a climate having essentially the same range of temperature as that of Massachusetts; and had become convinced by observation that some of the crops there cultivated were of peculiar value. I, therefore, on my own account had the seeds of a few varieties collected, and left them to be forwarded with shrubs and trees which were to be taken up after the fall of their leaves.

"I have thought it best to make these statements in explanation of the fact that the quantities of some of the seeds were so small... All these crops were planted on June 3d on a light loam..."

In section IV titled "Varieties of beans" (p. 16-17) are two subsections on soja beans and one each on red beans and white beans (*Phaseolus radiatus* [azuki beans]). "Soja Bean. Medium Early–*Glycine hispida,* Jap. *Daidzu.* This variety showed its first flowers July 28th, and the crop was fully mature Sept. 25th, when it was pulled. The area was 880 sq. ft. and the yield 30 lb of cleaned beans, which is at the rate of 25 bu. per acre. Should this class of beans prove desirable here this variety will be superior to most of the kinds offered under the same name so much earlier. It is well known that the beans of this class are of remarkable richness, containing a very unusual proportion of nitrogen, and it certainly seems desirable to give them a fair trial.

"Soja Bean No. 2, Very Early Variety–*Glycine hispida.* Jap. *Kurakake Mame.* The Japanese name means "*Saddled* Bean," and is given because of the peculiar disposition of black around the eye and on the sides of the bean, for all the world to their fancy like a saddle on the back of a horse. The first blossoms were noticed July 10th and the crop was pulled fully ripe on Aug. 31st. "In Japan I have cultivated this variety side by side with some of our earliest sorts and found it to excel them in earliness, but no comparative test was made here this year.

"Red beans.–*Phaseolus radiatus* [red azuki]. The peculiarity both of this and the following variety in germination may be of interest. They 'come up' like peas, the bean remaining wholly underground. The pods of both are unusually long, containing eight to ten small beans, which are characterized by a very thin and tender skin. This variety blossomed about the end of July, and was well ripened Sept. 25th, when it was pulled. The area was 440 sq. ft., and the yield was 23 lbs. of dry beans, or at the rate of about 38 by. per acre. These beans present an unusually handsome appearance and bid fair to prove an acquisition.

"White beans.–*Phaseolus radiatus* [white azuki]. This variety was in full blossom July 27th, and was ripe Sept. 25th, when it was pulled. The area under cultivation, 440 sq. ft., gave 21 lbs. dry beans (weight taken, as in case of all crops spoken of, Dec. 21st) which is at the rate of about 35 bu. per acre. This variety except in color closely resembles the preceding; but it is not as handsome. The amount of seed now on hand is insufficient for a trial of their food qualities, but another season, if successful in securing crops, we shall make such a trial."

Note: The "Red beans" and the "White beans" were almost certainly red azuki beans and white azuki beans, respectively; their scientific name at this time was *Phaseolus radiatus.* This is the earliest English-language document seen (Jan. 2005) that uses the term "red beans" to refer to red azuki beans, or the term "white beans" to refer to white azuki beans.

Other Japanese crops planted on June 3 were: (1) Millet (*Panicum crus-coroi* [sic, *crus-galli*]. Jap. *Hiye*), (2) Millet (*Setaria Italica* or *Panicum Italicum,* Red Headed Variety. Jap. *Mochi awa,* or glutinous millet), and (3) Millet (*Setaria Italica* or *Panicum Italicum.* Jap. *Awa*).

Note 1. The terms "Medium Early" and "Very Early" used to describe the soja beans are probably just descriptive terms rather than early varietal names. Address: Agriculturist, Amherst, Massachusetts.

776. Henderson (Peter) & Co. 1890. Quarterly wholesale catalogue for market gardeners or truckers. 1890, from January 1st to March 1st. New York, NY. 30 p. 26 cm.

• ***Summary:*** On the cover is the company's registered trademark and logo of a bird flying inside a circle. In its beak

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is a banner that reads "Tested seeds." In one talon is an ear of corn. The soja bean appears on page 13, in the section titled "General List of Vegetable Seeds," under "Beans, Dwarf or Bush–Green Sorts," along with about 24 other such beans. The entry reads: "Soja or Japan. Peck: $1.50. Bushel: $5.00."

The same listing of seeds and prices appears on the right-hand half of the page in German. The title: *"Bohnen, Zwerg oder Busch–Grüne Sorten."* There, the soybean is called *"Soja oder Japan."* The prices are the same.

Location: Bailey Hortorium, Mann Library, Cornell University, Ithaca, New York.

Note 1. This is the earliest entry seen (Dec. 2004) for the soybean in any seed catalog published by Peter Henderson & Co. The soybean appeared in at least three Henderson catalogs published in 1890, but the exact date of printing does not appear in any of them.

Note 2. Peter Henderson lived 1822-1890. His company is described on the front of this catalog as "Seedsmen, Market Gardeners & Florists." Address: 35 & 37 Cortland St., New York.

777. Furukawa, Sakae. 1890. Shôyu oyobi seishu-chû tôbun no shiken-hô [A method of testing for sugars in shoyu and sake]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 97. p. 168-73. March 26. [Jap]
Address: Igaku-shi (M.D.), Japan.

778. *Industrialist* (*The*) (*Manhattan, Kansas*). 1890. Local matters. 15(34):135. April 26.
• ***Summary:*** "Prof. Georgeson has received a considerable consignment of seeds direct from Japan for experimental trial here."

Note: Soya beans, though not mentioned specifically in this article, were among these seeds; they were grown successfully at the College in 1890.

779. Furukawa, Sakae. 1890. Shôyu no seishitsu [On the nature and character of shoyu]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 102. p. 494-99. Aug. 26. [Jap]
• ***Summary:*** Largely about the chemical composition of shoyu. Address: Gakushi.

780. McCarthy, Gerald. 1890. The best agricultural grasses. *North Carolina Agricultural Experiment Station, Bulletin* No. 73. 97 p. Oct. 15. See p. 45, 64-68, 70.
• ***Summary:*** "Soja Bean–*Glycine hispida.* The soja bean, or as it is sometimes called, Japan pea, is indigenous to South-eastern Asia, and is a near relative of the cow pea. Though this bean has been known in the Southern States for a long time, its cultivation has never become very extended. The beans are regarded as a staple food in Japan, but in this country they are scarcely edible, probably because they are not properly cooked. The soja bean is a tender annual, and its habit of growth, use and value, is much like the cow pea.

"This bean is usually sown in drills two feet apart, and on good soil has yielded as high as forty bushels per acre. This yield of vine fodder is less than that of the cow pea, and the fodder is more difficult to cure. Cattle are not so fond of it as of cow-pea hay. It makes good ensilage. This plant requires as good soil and treatment as are usually given to field beans."

Table I titled "Flowering period, use, &c., of grasses" (p. 64) states that the soja bean flowers in July, prefers medium soil, gives an average yield of 4-6 tons/acre on good soil, and is used for meadow (not pasture).

Table II titled "Seeds" (p. 65) states that there are, on average, 2,800 seeds/ounce, and 90% of these are vital [viable]. An average of 60-100 lb of commercial seed is required to plant 1 acre. There are 60 lb per bushel.

Table III titled "Proximate composition and feeding value of hays containing 14 to 14.3 per cent. water" (p. 66) analyzes 28 types of hay. According to analyses by the South Carolina Agricultural Experiment Station, the proximate composition and feeding value of soja bean hay is: albuminoids 14.05% total, 9.28% digestible. Crude fiber: 24.03% total, 14.09% digestible. Nitrogen free extract: 38.00% total, 23.18% digestible. Fat 2.09% total, 0.40% digestible. Nutritive ratio 1:4.1. Relative feeding value per ton: 15.09. The author then defines several key terms: "The nutritive ratio is the sum of the per cent. of digestible fiber and digestible nitrogen free extract added to the per cent. of digestible fat, multiplied by 2½, and the total divided by the per cent. of digestible albuminoids. A well balanced ration has a ratio of 1:5.

Footnote (p. 67): In Table 3, since "few of the plants included have been analyzed by American chemists, and for the sake of uniformity [Emil] Wolff's analyses have been very largely used." "The relative feeding value has been obtained by multiplying the number of pounds of digestible fat and digestible albuminoids in one ton of hay by 4½ cents, and the number of pounds of digestible fiber and nitrogen free extract by 0.9 cent. These values owe also to German experimenters."

Table IV titled "Digestion co-efficients" [coefficients] (p. 67) gives values 8 types of hay. For soja bean vines: Albuminoids 64, fiber 58, non-nitrogenous extract 61, fat 24.

Table V (p. 68) shows the dry substances contained in 2,000 pounds of air-dry hay composition and feeding value of 27 types of hay containing 14 to 14.3 per cent. water. One analysis by the South Carolina station is given. The cash value of the fertilizing matter contained in one ton of soja bean hay is $9.36, about average.

Table VI titled "The theoretical value of hay" (p. 70) gives values for 28 plants. For hay made from soja bean vines: Feeding value per ton: $15.09 (4th highest among all 28 plants tested, after lucerne $16.74, Japan clover $16.17, and cow pea vine $15.89). Net manurial per ton: $7.48 (3rd

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highest after cow pea vine $8.82, and lucerne $8.28). Total relative cash value per ton: $22.57 (4th highest after lucerne $25.02, cow pea vine $24.71, and Japan clover $23.88).

Note: This is the earliest English-language document seen (Oct. 2006) that contains the term "cow pea vine" (or "cow pea vines"). Address: Botanist, Raleigh, North Carolina.

781. *Chemisches Central-Blatt.* 1890. Japanische Sojabohne [Japanese soybeans (Abstract)]. 1890(25):1013. Dec. 17. [1 ref. Ger]

• ***Summary:*** A German-language summary of the following German-language article: *Bayerische Gewerbe-Zeitung* (Nuremberg). 1888. "Japanische Soja" (Japanese soy sauce). No. 23. p. 538-40. It also cites four other articles on the same subject, for comparison.

782. Georgeson, C.C.; Cottrell, H.M.; Shelton, W. 1890. Experiments with forage plants. *Kansas Agricultural Experiment Station, Bulletin* No. 18. p. 173-91. Dec. See p. 186-88.

• ***Summary:*** In the section titled "Miscellaneous forage plants" we read (p. 186-88): "Soy Beans, *Glycine hispida.*– We tested several varieties of these beans the past season, the object being to learn something of their value for this country and climate. As noted below, one variety was obtained from Peter Henderson & Co. and one was from home-grown seed, having been raised on the farm in 1889; the others were imported direct from Japan. These beans did remarkably well, considering the drouth they went through, and the early-ripening varieties give promise of becoming valuable to this country. The good qualities in the Soy beans have long been known, but the great difficulty with most varieties that have heretofore been tried in the North and West has been that our season is rarely long enough for them to mature properly, and hence the yield has usually been cut short. The varieties which we imported are all early, and will mature here in any season. This fact, taken in connection with their highly nutritive qualities both for man and beast, their heavy yields and easy culture, will in a measure forecast their usefulness. The average composition of Soy beans is as follows:

"Water 10.0%, ash 5.0%, crude protein 33.4%, crude fiber 4.8%, nitrogen free extract 29.2%, crude fat 17.6%."

The following four soy bean varieties are described: (1) "Kuiske Daidzu.–Seed imported from Japan." (Note that this name is spelled "Kiuski" in 1891 in the next issue {no. 19} of this Kansas Bulletin, then spelled "Kiyusuke" 5 times thereafter, from 1892 to 1910, starting in issue no. 32 of this Kansas Bulletin. In 1891 we learn that "Kiyusuké" is the name of a person). (2) "Edamame [green vegetable soy beans].–Seed imported from Japan." (3) "Yellow Soy Bean.–From Peter Henderson & Co." [seedsmen, New York]. (4) "Large Yellow Soy Bean.–Seed grown on the farm in 1889."

"We also obtained from Japan two varieties of *Dolichos radiatus.* The Japanese name for this class of beans is *Adzuki.* The two varieties grown here are known only by their native names, viz. *Shiro Saya Shozo"* [red seeds, white pods] and *"Kuro Saya Shozo"* [red seeds, black pods].

In search of new fodder plants, the Station also tested *"Coix lachryma* (Job's Tears), a grass which grows 6 to 8 feet tall, and produces a large grain, rich in protein." The test failed, "owing mainly to drouth."

Note 1. This is the earliest document seen (June 2004) stating that Peter Henderson & Co. is selling soybeans. We learn later (in an 1898 publication) that Henderson & Co. is located in New York.

Note 2. Opposite the title page are listed the Kansas Agric. Experiment Station staff. One of the assistants is "W.T. Swingle, B.Sc., Botany." By 1907 Walter T. Swingle was a physiologist with the Bureau of Plant Industry. By 1909 he was translating Japanese articles related to soy into English.

Note 3. This is the earliest document seen by Prof. C.C. Georgeson about soybeans, or about adzuki beans.

Note 4. This is the earliest English-language document seen (July 2013) that mentions Edamame (spelled as one word), a soybean variety imported from Japan, or that contains the word "Edamame" (regardless of capitalization).

Note 5. This is the earliest document seen (July 2013) that mentions the soybean varieties Yellow Soy Bean or Kiyusuke Mame.

Note 6. This is the earliest document seen (July 2013) that capitalizes the first letter of each word in a soy bean name to indicate that the name refers to a soybean variety (e.g. "Yellow Soy Bean," "Large Yellow Soy Bean").

Note 7. This is the earliest document seen (Sept. 2004) that gives the color (Yellow) of various soybean varieties.

Note 8. This is the earliest U.S. document seen (Sept. 2004) that contains the word "Adzuki" (or "Azuki" or "Adsuki") beans. Address: 1. M.Sc., Prof. of Agriculture and Superintendent of Farm; 2. M.Sc., Agriculture; 3. Foreman of the Farm.

783. Shimada, Kôichi. 1890. Shôyu no hyôjun [Standards for shoyu]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 11(10):149-50. Dec. [Jap]

• ***Summary:*** This study was conducted on 10 brands of regular shoyu. When sugar or barley malt syrup are added to the shoyu, the contents of these are listed separately. Maximum, minimum, and average figures are given for each nutrient. Only the average figures are translated here. Specific gravity 1.205. Solids 38.01%. Grape sugar/glucose 4.29%. Free acid (lactic) 1.04. Nitrogen 1.28 (Range 0.51 to 1.56). Inorganic salts 20.27 (range 17.47 to 23.61). Sodium chloride 17.81 (range 15.25 to 21.76), phosphate 0.47. Salt as a percentage of solids 46.84.

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784. Aomori Prefecture, Japan. 1890. Aomoriken kome daizu mugi awa asa mayu kiito orimono shikki suisan-butsu kyoshin-kai hokoku-sho [A report of the United Association of Aomori prefecture promoting rice, soybean, barley, millet, hemp, (silk worm) cocoon, raw silk, textiles, lacquerware, marine products]. Aomori, Japan: Aomoriken Dai Ichibu. 109 p. 19 cm. Series: Chôsa hôkokusho no. 18. [Jap] Address: Aomori, Japan.

785. Chamberlain, Basil Hall. 1890. Things Japanese: Being notes on various subjects connected with Japan. London, K. Paul, Trench, Trübner & Co.; Tokyo, the Hakubunsha, Ginza; etc. ii + 408 p. Index. 21 cm. 2nd ed. 1891. Slightly revised edition published 1905. Reprinted in 1970 by Charles E. Tuttle Co., Inc. (Rutland, Vermont, and Tokyo). [50+* ref]
• ***Summary:*** The author, who arrived in Japan in 1873 and was first introduced to the mysteries of the Japanese language by a dear old samurai, has lived through the transition stage of modern Japan.

This book is arranged alphabetically by subject. An extensively revised 2nd edition was published in 1891. Food (p. 122-25): "The following is a specimen of the bill of fare at a Japanese banquet. The reader must understand that everything is served in small portions, as each guest has a little table to himself, in front of which he squats on the floor:–Preliminary course, served with sake:–*suimono,* that is, a kind of bean-curd [tofu] soup;... *sashimi,* minced raw fish; *hachi-zakana,* a fine, large fish, either boiled with salt or boiled with soy [sauce]; *uma-ni,* bits of fish or sometimes fowl, boiled with lotus-roots or potatoes in soy and in a sort of liqueur called *mirin;*...

"First course (*Zembu*):–*Shiru,* soup which may be made of bean-curd [tofu], of fish, of sea-weed or of some other material;... *aemono,* a sort of salad made with bean sauce [miso] or pounded sesamum seeds;..."

"It is the custom, too, to set food before a guest, at whatever time of day he calls. On such occasions soba is in request–a sort of buckwheat vermicelli, served with soy [sauce] and the sweet liqueur called *mirin;* or else *shiruko,* that is, rice-cakes [mochi] with a sauce made of red beans [azuki] and sugar."

On Buddhism and vegetarianism in Japan (at Food, p. 122-23): Beans are a constant part of the daily diet. Buddhism has left its impress here, as on everything in Japan. To Buddhism was due the abandonment of a meat diet, now over a thousand years ago. The permission to eat fish, though that too entailed the taking of life, which is contrary to strict Buddhist tenets, seems to have been a concession to human frailty. Pious frauds, moreover, came to the rescue. One may even now see the term 'mountain whale' (*yama-kujira*) written up over certain eating-houses, which means that venison is there for sale. The logical process is this:–A whale is a fish. Fish may be eaten. Therefore, if you call venison 'mountain whale,' you may eat venison. Of course no actual prohibition against eating flesh, such as existed under the old *régime,* exists now. But the custom of abstaining from it remains pretty general; and though beef and pork were introduced at the time of the late revolution,... recent statistics show that meat-eating is again on the wane."

There are also interesting sections on Kaempfer, Engelbert (p. 187-88), Perry (Commodore) (267-69), and Siebold, Philipp Franz, Freiherr (p. 320-22).

For an excellent, later book with the same title, written by a Japanese in English, see Mock Joya (1960). Address: Prof. of Japanese and Philology in the Imperial Univ. of Tokyo, Tokyo [Japan].

786. Fesca, Max. 1890. Beitraege zur Kenntniss der japanischen Landwirtschaft. I. Allgemeiner theil [Contributions to an understanding of Japanese agriculture. I. General part]. Tokyo: Printed by Seishi-Bunsha for the Kaiserlichen Geologischen Reichsanstalt. x + 277 p. No index. 25 cm. Also published as vol. 1 of 2 volumes bound in one (Paul Parey, 1893). [1 ref. Ger]
• ***Summary:*** Fesca, a sophisticated German agricultural chemist, looks at Japanese agricultural practices, and finds many of them inefficient. Contents: Foreword. Weights and measures in the Japanese and decimal systems. Natural factors: The climate, the soil. The soil as an economic factor of production: Land prices, crop rotations, etc. Techniques for using the soil: Soil improvement, fertilizers.

Various legumes, and especially the soybean, grow in the temperate (*gemaessigte*) Zone northeast of Tokyo (p. 43-44). Two large tables (p. 134-35) show the amount of rice land per capita and the amount of dry land per capita in each province. The five provinces with the most rice land per capita are: Kaga (5.01), Noto, Bizen, Ugo, Awa (on Shikoku).

In the section on crop rotations, soybeans are mentioned on pages 171-72, 175-77.

A table (p. 190) compares various crops (including soybeans) with rice in terms of their profitability to the farmer. Soybeans are less profitable. Tobacco is the most profitable, followed by indigo, cotton, and potatoes–all of which are more profitable than rice.

Soy is discussed most in the chapter on fertilizers (p. 222-25, 266). A large table (p. 222) gives the chemical composition of four traditional fertilizers, including sake lees (*sakekasu*), shoyu dregs (*shoyukasu*) and okara (*tofukasu*). Shoyu dregs, okara, and cooked soybeans are all discussed in detail on p. 224, based (in part) on analyses conducted previously by Kellner, also a German. "Cooked soybeans are widely used as a fertilizer; they are a concentrated source." Soybeans (p. 232). Also discusses: Sesame and peanut cake (p. 226). Kudzu (p. 231).

Bound at the back are two large color fold-out maps: (1) Showing the provinces and the six vegetation zones of the Japanese islands. (2) Showing the value of land in each

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province (in yen/cho). Address: Tokio [Tokyo].

787. Fuller, J.B. 1890. Annexure B, and Annexure C. *Report on the Nagpur Experimental Farm in the Central Provinces* (*India*). For the year 1889-90. Ending 31 March 1890.
• ***Summary:*** Annexure B, titled "Results of cultivation of the non-experimental area of the Nagpur Farm during the year 1889" states (p. 8) that 0.55 acres of Japan peas yielded 87 lbs. of grain and no straw. Cost of cultivation: 17 rupees, 14 annas, and 6 paise. Value of produce: Not sold.

Annexure C, titled "Total area under cultivation on the Nagpur Experimental Farm during the year 1889-90" states (p. 9) that 0.55 acres of Japan peas were cultivated in the non-experimental area. Also mentions three kinds of cotton (Upland Georgian, Hinghanghat Bani, and Sea Island), sorgho, til [sesame], wheat, linseed, sugar cane, juar, tur, mung, urd, and popat (white). Address: Commissioner of Settlements and Agriculture, Central Provinces [India].

788. Gorkom, K.W. van. 1890. Supplement op De Oost-Indische Cultures, in betrekking tot handel en nijverheid [Supplement to East-Indian crops: In relation to commerce and industry]. Amsterdam, Netherlands: J.H. de Bussy. vii + 303 p. See p. 283-87. Supplement to the 1884 publication of the same title. 25 cm. [2 ref. Dut]
• ***Summary:*** The section titled "Kadelé" (Soybeans) discusses the cultivation of soybeans (also called *katjang djepoen* [Japan beans], Soya, *Glycine hispida,* or *kadelé boontjes*) on Java and the experimental culture in Europe. Interest is shown in the cultivation of soybeans as a food for diabetics.

Soya is cultivated in Java both for its seed and for its green leaves which are used as animal feed. The small soy beans are roasted by the indigenous people or, in the form of cakes / patties (*tetempé* [tempeh]), eaten like bean-cheese (*boonen-kaas* [tofu]). (*"De kadele boontjes worden door de inlanders geroosterd of, in den vorm van koeken* (*tetempé*)*, als boonen-kaas gegeten"*).

Note. This is the earliest Dutch-language document seen (April 2013) that uses the term *boonen-kaas* to refer to tofu.

The author considers that Indonesian soy sauce (*kétjap*) is inferior to Japanese soy sauce. Nutritionally, soya is rich in proteins (*proteïnestoffen*) (± 38%) and fat (± 21%), and low in starch and sugar.

In Germany and Austria, many years have been spent in developing and cultivating varieties of soybeans adapted to the European climate. Dr. Haberlandt, professor at the University of Vienna, distinguished himself for this work, even to the extent that a variety was named after him. In the experimental gardens at the National Agricultural in Wageningen [Netherlands], a field of soya is cultivated, but the results are not yet satisfactory. Yields are low, especially during the dry and warm summers, when the plant flowers abundantly, but the seeds don't have time to develop properly. The author hopes that through continued experiments, a suitable variety will be developed.

The soya bean has received attention from the medical profession because of its composition. Dr. Le Cerf of Paris was one of the first to try using soya with diabetic patients. He introduced soya bread instead of an almond bread and was successful with it. Dr. Stokvis, a professor in Amsterdam, recommended soy bread (see *Nederlandsch Tijdschrift voor Geneeskunde* No. 10), and the chemical analyses published by Mr. L.C.W. Cox in the same journal (issue No. 19) supported the recommendation. Patients were content with the bread, although they did not find it very appetizing. The author states that if rye or wheat flour could be used together with soy flour (*soja-meel*), they would yield a very digestible and nutritious food. For this reason also he recommended experiments aimed at acclimatizing soya to Europe.

Dr. Sollewijn Gelpke has published a work titled "The Yield and Cultivation of Dryland Crops," in which he writes that the cultivation of soya is quite easy and in Java takes place on sawahs (wet rice fields) and clay, in contrast to peanuts (*katjang-tanah*), which is grown on tegals and sand. [Note: A tegal is a dry (not irrigated) field, near the rice fields, but used for vegetables and other secondary crops.] Soya beans are sun-dried, soaked in water for 24 hours, then sown on land that has first been flooded with water. Otherwise they are sown by poking holes in the ground and dropping in the seeds. Gelpke says that soya is so appealing to the indigenous people that, if the soil is hard, he just opens the surface with a crowbar and sows his seeds. This way of cultivation is seen especially on the heavy clay soils of Java.

In the Netherlands it is not well known that soya is cultivated in Java, because it could be imported for less money than is currently the case. The author has samples of the beans and has noticed that the seeds from European experiments are smaller in size than those grown in Java.

Various laboratory analyses are given. It is noted that soya flour coming from Hungary is used for the production of soy bread, baked by Mr. Koehler of Amsterdam. Mr. Cox studied this bread. The author believes that the sugar content of this bread is high enough to make it unsuitable for diabetic patients, and notes the presence of starch and dextrin. Morawski and Harz have confirmed that ripe soya beans don't contain starch, whereas unripe beans do.

Note 1. Kempski (1923) says: "see van Gorkom's Oost-Indische Cultures, neu herausgeg. von Prinsen-Geerligs, Verlag de Bussy, Amsterdam, 1913, Vol. III, p. 283/86."

Note 2. This is the earliest Dutch-language document seen (Aug. 2003) that uses the word *proteïnestoffen* (or *proteïnestoff*) to refer to proteins in connection with soybeans.

Note 3. This is the earliest Dutch-language document seen (Nov. 2013) that mentions soy flour, which is calls *soja-meel*. Address: Dr., Former Head Inspector of Crops,

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Dutch East Indies (Oud-Hoofd-Inspecteur der Cultures in Nederlandsch Oost-Indië).

789. Henderson (Peter) & Co. 1890. Henderson's American farmers manual. New York, NY. 26 p. 28 cm.
• ***Summary:*** In the section titled "Miscellaneous Plants for Forage, Soiling, &c.," the soybean appears on page 24, along with 24 other such plants. The entry reads: "Soja or Japan Bean. (*Glycine hispida.*)–A variety altogether distinct from any other Bean. The haulm is strong and vigorous, and covered with soft fur. The pods contain four to five small Beans of a yellowish brown color. This Bean is very suitable for growing in the *South,* and is used largely for plowing under. In Japan the beans are used principally for making 'Tofu' or bean curd. Per lb., 20 cts. [$0.20]; per bushel of 60 lbs., $6.00."

Note 1. This is the earliest listing seen for the soybean in any seed catalog published by Peter Henderson & Co. where a description of the plant is given. Sherry J. Vance, research aide at the L.H. Bailey Hortorium (462 Mann Library, Cornell University, Ithaca, New York 14853-4301) wrote to William Shurtleff of Soyfoods Center on 22 April 1997: "Per your request, I have checked our catalogs for Peter Henderson from 1881 to 1890 looking for entries on soybeans. Despite a thorough search, I was unable to locate soybeans offered in any of the Henderson catalogs from 1881-1889."

Note 2. Peter Henderson lived 1822-1890. On the cover of this catalog are four illustrations of farming scenes. Across the top is written: "If you have no use for this Catalogue, kindly give it to some of your farmer friends." Address: 35 & 37 Cortland St., New York.

790. Henderson (Peter) & Co. 1890. Manual of everything for the garden–1890. New York, NY. 146 p. 28 cm.
• ***Summary:*** The soybean appears on page 50, in a half-page section titled "Miscellaneous and Sundry Seeds for the Farm," along with about 39 other such seeds. The entire entry reads: "Bean, Soja or Japan, 20 cts. lb.; $6.00 bu."

Location: Bailey Hortorium, Mann Library, Cornell University, Ithaca, New York.

Note 1. The soybean appeared in at least 3 Henderson catalogs published in 1890.

Note 2. Peter Henderson lived 1822-1890. On the cover of this catalog is a painting of a little girl sitting with in the front yard of a house with a fountain, where many flowers are growing.

Note 3. Other "sundry" seeds listed in this section on p. 50 include: Pearl millet, early orange sugar cane, kaffir corn, rural branching doura (milo maize), Egyptian rice corn, halapense (Johnson grass), yarrow or milfoil, chicory (for coffee), opium poppy, ramie (bohmeria or urtica), tenacissima (Java Ramie), osage orange, honey locust, teosinte (*Reana luxurians*), serradella, lupins of sorts, wild rice (*Zizania Aquatica*).

Location: Special Collections, USDA National Agricultural Library, Beltsville, Maryland. Address: 35 & 37 Cortland St., New York.

791. Henderson (Peter) & Co. 1890. [Catalog]. New York, NY. 114 p. 28 cm.
• ***Summary:*** On the cover of this catalog is a "Partial view of our Exhibit at the semi-centennial N.Y. State Fair held at Syracuse, Sept. 11th to 18th 1890." The exhibit is huge.

The soy bean appears on page 50, in a half-page section titled "Miscellaneous and Sundry Seeds for the Farm," along with about 41 other such seeds. The entry reads: "Bean, Soja or Japan, 20 cts. lb.; $6.00 bu."

This catalog is owned by Special Collections, USDA National Agricultural Library, Beltsville, Maryland. Address: 35 & 37 Cortlandt St., New York.

792. Kellner, O[skar Johann]; Mori, Y[ôtarô]; Nagaoka, M[uneshige]. 1890. Beitraege zur Kenntniss der invertirenden Fermente [Contributions to the knowledge of inverting enzymes]. *Hoppe-Seyler's Zeitschrift fuer Physiologische Chemie* 14(3):297-317. [13 ref. Ger]
• ***Summary:*** This article contains a long analysis of the role of koji and its enzymes (*Koji-Ferment*) in the fermentation process that creates rice wine (saké). The process of making koji from spores is described, as well as the quantitative changes which take place with the development of the mycelium on two substrate (rice or barley) at various temperatures. The work of Prof. Atkinson is discussed at length.

On pages 306-08 Kellner gives the results of his experiments on the effects of koji extracts on various carbohydrates: cane-sugar, milk sugar (lactose), maltose, inulin (a tasteless white polysaccharide), and starch. (Note: In chemistry, inversion, is the conversion of dextrorotary sucrose into a levorotary mixture of glucose and fructose). Before the inversion, there is 4.04% reducing sugar, expressed as dextrose (optical rotation 20.9º); after the inversion there is 7.46% (optical rotation 8.4º). Kellner summarizes these results on p. 310 as follows: "From our investigations, one can conclude that koji contains a powerful inverting ferment [enzyme], which transforms cane sugar into dextrose and levulose, maltose into dextrose, and starch into dextrin, maltose, and dextrose. However milk sugar and probably also inulin are not transformed. Therefore the koji enzyme (*Koji-Ferment*) is entirely different from the diastase of malt; it is also probably different from the invertin (*Invertin* = invertase) of beer yeasts, which easily inverts cane sugar to dextrin and maltose–according to Mr. J. Kjeldahl. Kellner then repeats the experiments on carbohydrates using yeast extracts (p. 311-13) and confirms that the latter give different results than koji extracts. He then coins the term "Invertase" (p. 313) to refer to the inverting

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enzyme in *Eurotium Oryzae* Ahlb. (later renamed *Aspergillus oryzae,* the koji mold).

On p. 316 Kellner explains: In addition, koji is frequently used in a mixture with considerable amounts of table salt (*Kochsalz* = NaCl), steamed soybeans, and other materials (*Stoffen*) for the preparation of miso (a food {*Nahrungsmittel*} very widely found throughout Japan) and shoyu (a sauce which is also known in Europe); it seems to be used here mainly as the carrier of a slow, often years long fermentation. "Since miso contains only 6-12% salt and shoyu contains about 150-160 grams of salt per liter, and since this salt limits the action of soluble ferments, we have investigated how the transformation of soluble starch takes place through invertase the presence of various amounts of salt." A table (p. 317) shows two experiments. The percentage of table salt in the mixture is increased from zero to 20% in five or six steps. As the percentage of salt increases, the reducing sugar (expressed as dextrose) decreases moderately, while the relative activity of the invertase decreases dramatically. Fehling's solution is used in the experiment. Address: Japan.

793. Merck, Klemens. 1890. Klemens Merck's Warenlexikon fuer Handel, Industrie und Gewerbe. Beschreibung der im Handel vorkommenden Natur- und Kunsterzeugnisse, unter besonderer Beruecksichtigung der chemisch-technischen und anderer Fabrikate, der Drogen- und Farbwaren, der Kolonialwaren, der Landesprodukte, der Material- und Mineralwaren. Vierte, wesentlich vermehrte auflage [Merck's dictionary of products and commodities for trade, industry and commerce. 4th ed.]. Leipzig, Germany: Verlag von G.A. Gloeckner. viii + 722 p. + 48 p. See p. 576. 25 cm. [Ger]
• ***Summary:*** The entry for "Soya" (p. 576) is almost identical to that in the 1882 edition. Soya is also mentioned under Beans (*Bohnen,* p. 78-79). The title page states that this book was compiled in cooperation with Messrs. Lorenz Brauer, Paul Degener, and others. Edited/published (*Herausgegeben*) von Dr. G. Heppe.

Also discusses: Peanuts (p. 150). Sesame seeds and sesame oil (p. 562). Address: [Germany].

794. Purdy, Charles W. 1890. Diabetes: its causes, symptoms, and treatment. Philadelphia and London: F.A. Davis. viii + 184 p. See p. 87. Index. Physicians' and students' ready reference series, No. 8. [2 soy ref]
• ***Summary:*** In Section VI, "Treatment of diabetes mellitus," the soya bean is mentioned (p. 87): *Soja,* or Japanese bean, owing to its high nutritive properties and its low percentage of starch, is likely to enter largely into the diabetic diet of the future. It has recently been much cultivated in some parts of Europe, especially in Hungary. Its composition is as follows: Nitrogen, 36.6 per cent.; fatty matter, 17 per cent.; starchy matter, 6.4 per cent.

"A sauce is made from *soja* which bears the name of *miso* and *soju* [shoyu]. A kind of cheese [tofu] is made from it, and very much prized in Japan as a table-luxury. (Footnote: See Egasse 1888, p. 433-38).

"In Europe the soja has already been utilized for food of men and animals, and recently the attempt has been made to make bread of it. This is very difficult because of the large proportion of oil which it contains. This oil is very purgative [sic], and hence it becomes necessary to rid the meal of it in order to render it fit for domestic usages. Lecerf in Paris and Bourdin in Rheims have succeeded in rendering the bread made from this meal very well supported by the stomach.

"This bean, which, as the analysis shows, is more nutritive than meat, serves for nourishment to a great country like Japan, under the forms of sauce, of cheese, of farina, and even of *real* artificial milk" (Footnote: Therapeutic Gazette, March 15, 1890, p. 150).

Note: This is the earliest English-language document seen (Aug. 2013) that uses the term "artificial milk" or "real artificial milk" to refer to soymilk.

Gluten is also mentioned several times (p. 84-85): "First in importance ranks the question of bread in the construction of any diabetic diet-list. The withdrawal of this article from the list is usually the most serious deprivation the patient has to encounter. In consequence of this fact, an almost endless number of breads have been placed upon the market, which are *claimed* to be free, or nearly free, from starch, and are hence named diabetic breads. Now, I do not hesitate to say that most breads which have been put upon the market with such claims are 'a snare and a delusion,' and have unquestionably shortened the lives of hundreds of diabetic patients. Most samples of so-called 'diabetic flour,' from which the starch is claimed to have been eliminated, 'or nearly so,' contain from 30 to 70 per cent. of that article... But Dr. Chas. Harrington, of Boston, has rendered us under perpetual obligations to him for fearlessly exposing the most of these deceptions, by publishing a careful analysis of most of them in detail. It may first be noted that his analysis of home-made bread gives the proportion of contained starch as 44.99 per cent. The Graham wafer, made of Graham flour, contains 58.45 per cent. of starch. The gluten flour, of Farwell & Rhines, of Watertown, N.Y., contains 67.17 per cent. of starch... The gluten flour of the New York Health Food Company contains 66.18 per cent. of starch. Bread made of this flour would contain 35 per cent. of starch... The Boston Health Food Company's diabetic flour, No. 1, sold as absolutely non-starchy, contains 62.94 per cent. of starch. Bread made of this flour would contain 30 per cent. of starch." Address: M.D., Queen's Univ. [Kingston, Ontario, Canada].

795. Watt, George. 1890. A dictionary of the economic products of India. Vol. 3. London: W.H. Allen & Co.; Calcutta, India: Office of the Superintendent of Government Printing. 534 p. See p. 509-11. Index (in Vol. 7). 25 cm. [14

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ref]

• ***Summary:*** Contents related to the soy bean: *Glycine* (p. 509-10). *Glycine hispida,* Maxim. (p. 510-11): Synonyms, vernacular, references, habitat, oil, medicine, food and fodder, chemistry, the bean, oil.

Under Glycine: "Reference having been made to the authorities of the Calcutta Herbarium on the subject of G. soja, Sieb. et Zucc., being, as shown in the Flora of British India, a native of this country, Dr. Prain kindly went into the subject very carefully. He writes: 'We have not, from any part of India, any specimens of G. soja proper. The Khasi Hills plant is more erect, more hispid, and has larger legumes than the Himalayan, and indeed resembles G. hispida, Maxim., quite as much as it does the Indian cultivated "G. soja," which, indeed, it connects with G. hispida. It is, in fact, the plant most like the wild G. soja, S. et Z., which no one ever professes to have found wild in India, while it is also the one most like G. hispida, Maxim. (which has never been found wild anywhere). It is the plant collected by Dr. Watt and myself in the Naga Hills.'

"The writer noted on his Naga Hill specimens that they were found in a semiwild state, and that the plant was known to the Angami Nagas as *Tsu Dza,* a name not unlike soja. Throughout India, the soy bean is cultivated, black and white seeded forms being met with, which vary to some extent, but all preserve the specific characters of G. hispida. Plants raised at Saharanpur from Japanese seed have larger and broader leaves than the usual Indian forms. The fact that this cultivated plant possesses, even among the aboriginal tribes, names which are original, i.e., in no way modern derivatives, points to an ancient cultivation, if, indeed, it may not be accepted as an indication of its indigenous nature. (Editor.)"

"Vern[acular]–Bhat, bhatwan, ram kurthi (Hind. [=Hindi or Hindoostanee]); Bhut (Punj. [= Panjabi]); Gari-kulay (Beng. [=Bengali]); Hendedisom horec (black-seeded), Pond disom, horec (white-seeded variety) (Santal); Tzu-dza (Naga); Bhatnas, bhatwas (Nepal); Seta, kala botmas (Parbat.); Musa, gya (Newar); Khajuwa (Eastern Terai); Bhut (Kumaun).

References: The author cites 17 early references concerning soya and, using information from these.

This brief bibliography on soya is one of the best and worst seen. Its is good in that it cites a host of previously uncited publications. It is bad in that the references are so abbreviated as to often be incomprehensible; and some of them are incomplete or incorrect.

Habitat: "Extensively cultivated throughout India and in Eastern Bengal, Khasia hills, Manipur, the Naga hills, and Burma, often found as a weed on fields or near cultivation."

Medicine: "A decoction of the root is said to possess astringent properties." Food and fodder: "The Soy-bean forms an important article of food in China and Japan. Since 1873, it has been successfully grown in the warmer parts of Europe. It is also widely spread, in a cultivated state, over a great part of the Himálaya [Himalaya] and the plains and lower hills of India. On the plains the crop is generally grown by itself, as a *kharif* crop; the seeds are sown from June to September, and the harvesting takes place from November to January.

"The bean is eaten in India in the localities where cultivated. The Rev. A. Campbell states that in Chutia Nagpur it is generally used roasted and ground as *satu,* or simply roasted in the form of *atá.* In other parts of the country it is also eaten in the form of *dal.* In China and Japan three preparations are made from the soy-bean, namely soy-sauce, soy-cheese, and a kind of paste. The last two of which are manufactured by crushing and pressing the seeds."

Note 1. An extensive "List of works consulted" (bibliography) appears in Vol. I (1889, p. xiii-xxii), followed by a list of contributors (p. xxiii-xxvi) and list of abbreviations (p. xxvii-xxxiii).

Note 2. This is one of earliest documents seen (March 2005) that clearly refers to the cultivation of soybeans in Burma.

Note 3. This is the earliest English-language document seen (Nov. 2012) that uses the word *satu* to refer to roasted whole soy flour, or that mentions roasted whole soy flour is made and used in India.

Sir George Watt lived 1851-1930. This 7-volume work, published from 1889 to 1896, is arranged alphabetically by product. An extensive bibliography is in vol. 1, and the index comprises vol. 7. Address: M.B., C.M., C.I.E., Reporter on Economic Products with the Government of India.

796. Whitney, William Dwight. ed. 1890. The century dictionary: An encyclopedic lexicon of the English language. New York, NY: The Century Co. See the entry for "Soy" in Vol. 5, p. 5790.

• ***Summary:*** This dictionary contains three entries related to the soy-bean in Volume 5: (1) "Soy (soi), noun. [Also *sooja;* = F. *soy, soui* = G. Sw. Dan. *soja* (NL. *soja, soya*); Jap. *si-yan,* Chinese *shi-yu,* soy.] 1. A kind of sauce prepared in the East from the soy-bean (see def. 2). It is eaten with fish, cold meat, etc. There are two or three qualities of soy [sauce], but the Japanese soy is reckoned the best.

'I have been told that *soy* is made with a fishy composition, and it seems most likely by the Taste; tho' a Gentleman of my Acquaintance who was very intimate with one that sailed often from Tonquin [Tonkin, in today's Vietnam] to Japan, from whence true *Soy* comes, told me that it is made only with Wheat, and a sort of Beans mixt with Water and Salt.' Dampier, Voyages, II, 28.

'From travellers accustom'd from a boy / To eat their salmon, at the least, with *soy.'* Byron, Beppo, vii.

2. The soy-bean or -pea, *Glycine Soja* (*Soja hispida,* etc.). It is an annual leguminous plant with stout nearly erect or somewhat climbing stems covered with rusty hairs, bearing trifoliate leaves and from their axils two or three

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pods 1½ or 2 inches long. The seeds are made into the above sauce and variously used in cookery; an oil is also expressed from them, and the residue is extensively used in China for feeding cattle and as a fertilizer. The plant is native from northern India to Japan. The cultivated plant differs somewhat from the wild, and by some authors is distinguished as *Glycine hispida.* Also *Sahuca bean.*

(2) soy-bean (soi'bên), noun. See *soy,* 2.

(3) soy-pea (soi'pê), noun. See *soy,* 2.

Note 1. James Platt (1899) says: The word "Soy" has been badly treated by all our dictionaries. The best is the 'Century,' where it is traced to 'Japanese *siyan,* Chinese *shiyu,'* but even that involves two errors. One is a misprint (*'siyan'* should be *siyau*)*;* the other is that it accounts for only half the English word.

Note 2. "Miso" is not mentioned in this dictionary. Address: Prof. of Comparative Philology & Sanskrit in Yale Univ.

797. Brooks, William P. 1891. The Agricultural [sic, Agriculturist]. *Massachusetts* (*Hatch*) *Agricultural Experiment Station, Annual Report* 3:4-5. Jan.

• ***Summary:*** "Report has been made on several varieties of Japanese crops, viz., four varieties of beans and three of millet. Of the latter, two, the Setaria Italica (*Jap. Mochi Awa*) and the Setaria Italica (*Jap. Awa*), seem especially promising for seed production and fodder...

Note: In the 4th Annual Report (p. 8-9), published one year after this one, we learn that the Soja bean was one of the four varieties of beans tested. Red beans [azuki] were almost certainly another one of the four (see Brooks 1890, Bulletin No. 7, p. 14-17). Address: Agriculturist, Amherst, Massachusetts.

798. Wigmore, J.H. 1891. Notes on the eiraku-sen. *Transactions of the Asiatic Society of Japan* 19:501-04. See p. 502. Read 17 March 1891. [1 ref]

• ***Summary:*** The *eiraku-sen* was an important Japanese coin. "In the 10th year of Oyei (1403), says the story, the greatest typhoon ever known in Japan drove a Chinese ship [off course] to Misaki village in Izu, now Sôshû." The people on the ship requested harbor. Mitsukane "confiscated the ship's cargo, and after provisioning the crew with miso, salt, fuel, and rice, sent them back to China."

The author of *Denyen Jikata Kigen* gives three reasons for believing that this story is not true.

799. Georgeson, C.C. 1891. Experiments under way on the farm. *Industrialist* (*The*) (*Manhattan, Kansas*) 16(37):145-46. June 6.

• ***Summary:*** Fifty-five distinct field experiments are under way, with an aggregate of 2,068 plats subject to separate study, observation, and thought. Crops being studied are wheat, corn, oats, forage and miscellaneous crops. In the section titled "Forage and Miscellaneous Crops" we read: "8th. trial of Soy Beans.–The results obtained last year with certain early varieties imported from Japan were full of promise." Address: Prof., State Agricultural College.

800. Goodale, George Lincoln. 1891. Some of the possibilities of economic botany. *Nature* (*London*) 44(1144):530-36. Oct. 1. See p. 532-33. [1 ref]

• ***Summary:*** This is an "Abstract of the Presidential address delivered before the American Association for the Advancement of Science, at Washington [DC], August, 1891..."

For details see full address published in *American J. of Science* (Oct. 1891, p. 271-302). Address: M.D., LL.D., Fisher Prof. of Natural History, Harvard Univ., Cambridge, Massachusetts.

801. Rita. 1891. The ladies' column. *Bush Advocate* (*Hawke's Bay, New Zealand*). Oct. 3. p. 7.

• ***Summary:*** One section reads: "Indian soy [sauce].–Indian and Japanese soy prepared from the dolicas saja [sic, Dolichos soja], termed by them 'soga' [sic, shoyu, soya?]. A good imitation is made as follows: Take one gallon or haricot or kidney beans; boil till soft; add bruised wheat one gallon. Keep in a warm place 24 hours, then add one gallon common salt, 2 gallons water; put the whole in a strong jar, bung it up for two or three months, stirring frequently, then press out the liquor."

Note: This same recipe appeared in the *Evening Post* (New Zealand) on 27 Feb. 1892.

802. Goodale, George Lincoln. 1891. Some of the possibilities of economic botany. *American J. of Science* 42(250):271-316. Oct. Third Series. See p. 280-85, 302. [1 ref]

• ***Summary:*** This is the Presidential address delivered before the American Association for the Advancement of Science, at Washington [DC], August, 1891..."

The section titled "Vegetables" (p. 280-85) states that Vilmorin is an authority on the many unique vegetables now available in Europe. "In 1854 the late Prof. Gray called attention to the remarkable relations which exist between the plants of Japan and those of our eastern coast. You will remember that he not only proved that the plants of the two regions had a common origin, but also emphasized that many species of the two countries are almost identical."

"One of the most convenient places for a preliminary examination of the vegetables of Japan is at the railroad stations on the longer lines... For native consumption there are prepared luncheon boxes of two or three stories, provided with simple and yet embarrassing chopsticks. It is worth the shock that it causes ones nerves to invest in these boxes and try the vegetable contents... "Prof. Georgeson, formerly of Japan, has kindly identified some of these for me,...

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"Prof. Georgeson, whose advantages for acquiring a knowledge of the useful plants of Japan have been unusually good, has placed me under great obligations by communicating certain facts regarding some of the more promising plants of Japan which are not now used here. It should be said that several of these plants have already attracted the notice of the Agricultural Department in this country.

"The soy bean (*Glycine hispida*). This species is known here to some extent, but we do not have the early and best varieties. These beans replace meat in the diet of the common people" [in Japan].

Footnote 22 (p. 302) includes: "Beans (*Glycine hispida*), many kinds and prepared in many ways." Also mentions pickled green plums (Ume-boshi). "Several kinds of seaweeds are also very commonly served with rice." Address: M.D., LL.D., Fisher Prof. of Natural History, Harvard Univ., Cambridge, Massachusetts.

803. De Negri, G.; Fabris, G. 1891-1892. [Vegetable oils. Oil of Soja hispida (soja bean)]. *Annali del Laboratorio Chimico Centrale delle Gabelle* (*Rome*). p. 220-256. [Ita]*

• ***Summary:*** The Soja hispida is a herbaceous plant of the *Leguminoseae,* indigenous to China and Japan, where the seeds are highly valued as a comestible. The seeds contain a large quantity of a fermentable sugar, and also a ferment (enzyme) similar in its properties to diastase. The oil, present in the proportion of 14-18%, can be extracted by pressure or by means of ether; it possesses laxative properties, a yellowish-brown color and a slight aromatic odor. It readily solidifies, and is intermediate between the siccative (drying) and non-siccative oils. Note: This is the earliest document seen that uses the word "laxative" in connection with soy bean oil. Petit (1888) said soy oil was a "gentle purgative" and Smith (1871) noted that soy beans were said to be laxative.

The following physical and chemical constants are given for soy oil; they confirm those obtained by Stingl and Morawski (1886): Specific gravity at 15ºC 0.9242. Solidifying point 8-15ºC. Melting point of the fatty acids 27-29ºC. Solidifying point of the fatty acids 23-25ºC. Maumené test (temperature rise) 59ºC. Iodine number 121.3. Iodine number of the fatty acids 122. Saponification value 192.5.

The oil gives, with Hauchecorne's reagent, a dirty white coloration in the cold, but deep orange when heated; with Brulle's reagent a deep orange; but no coloration with Bechi's reagent.

804. Chamberlain, Basil Hall. 1891. Things Japanese: Being notes on various subjects connected with Japan... 2nd ed. revised and enlarged. London: Sampson Low, Marston and Company, Ltd.; Hongkong, Shanghai, Yokohama, and Singapore, Ltd.: Kelly & Walsh, Ltd. [8] + 503 p. Index. 1st ed 1890 (408 p.). Slightly revised edition published 1905. Reprinted in 1970 by Charles E. Tuttle Co., Inc. (Rutland, Vermont, and Tokyo). [14 ref]

• ***Summary:*** This book is arranged alphabetically by subject. Festivals (p. 154): *"Setsubun* is the name of a movable feast occurring sometimes late in January, sometimes early in February, on the eve of the first day of spring, old calendar. Beans [roasted soybeans] are scattered about the house on the evening of this day in order to scare away demons, and of these beans each person present eats one more than the number of the years of his age."

Food (p. 168): Same as in the 1890 ed.

Sun, moon and stars (p. 394): There are three great nights of the lunar year for moon viewing. "The 15th night of the 8th moon, which is no other than our harvest moon at the full, is celebrated by an offering of beans and dumplings and of bouquets of eulalia-grass [*susuki*] and lespedeza blossom. This moon is termed the 'bean moon.'"

Note: In *Chado: The Way of Tea,* a translation of the Japanese classic *Sado-sai-jiki,* and various other Japanese books we learn that the full moon on the 15th night of the 8th lunar month is the brightest and most widely viewed one of the year and is called *meigetsu* (literally "bright moon"). Aesthetic appreciation of the full autumn moon originated in China as early as the Han dynasty (202 BC to AD 220). Moon-viewing became popular in China during the Tang dynasty (618-907) and this tradition was transmitted to the Japanese court in Kyoto in about the 8th century; the aristocracy called this festival *Otsukimi* ("moon viewing") and celebrated it, outdoors, by composing poems, listening to music, etc. Today that date falls in mid-September. In both Japan and the West, this is the "harvest moon" and its celebration a pre-harvest festival.

However it is the *next* full moon, about a month later, on the 13th day of the 9th lunar moon that is called the "bean moon" (*mame-meigetsu*). It is indeed, as Chamberlain says, celebrated by an offering of beans (*edamamé,* or green vegetable soybeans) and dumplings (glutinous rice steamed with chestnuts). In some parts of Japan the edamamé are mashed, sweetened with sugar, then used to coat rice-flour dumplings. This *mame-meigetsu* is still celebrated at the Kitano Tenmangu Shrine in northwest Kyoto.

Tea (p. 403): Other tea-like infusions: *"Mugi-yu,* an infusion of parched barley; *Mame-cha,* a similar preparation of beans. *Fuku-ja,* or 'luck tea,' is made of salted plums, sea-weed, and xanthoxylon seeds, and is partaken of in every Japanese household on the last night of the year."

Concerning red beans [aduki]: Birthdays (p. 56): "Birthdays are not much observed in Japan, except that rice mixed with red beans [azuki] is eaten on the auspicious day."

Festivals (p. 154-55): Dec. 13.–This day is called *Koto-hajime,* that is, "the beginning of things," because such preparations for New Year as house-cleaning, decorating, and the pounding of rice for cakes (*mochi*), are then taken in hand. People eat *o-koto- jiru* on this day,–a kind of stew

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whose ingredients are generally red beans [azuki], potatoes, mushrooms, sliced fish, and a root called konnyaku."

Jan. 15-16.–The end of the New Year holidays. The 16th is the *Hokônin no Yado-iri,* or Prentices Holiday Home. Rice-gruel mixed with red beans [azuki] is eaten."

N.B. *Azuki-meshi,* that is, rice mixed with red beans, is eaten on the 1st, 15th, and 28th of each month, these being the so-called *san-jitsu,* or "three days." On the 30th, people eat buckwheat vermicelli (*misoka-soba*).

Overview of Japanese commerce: "The chief progress made during the past thirty years has been in industrial developments" (p. 433). A large table show imports to Japan in 1890 (p. 434): The top five imports (with the value in million yen) are: Textiles and textile fabrics 20.49. Rice 12.30. Sugar 8.48. Raw cotton and wool 5.74. Kerosene oil 4.95. "Oil cake" [mostly soybean cake] is another major import, but grouped with oils, oil wax, and paints in oil 0.41.

Exports from Japan (p. 434-35): The top five are: Raw silk, waste silk, and cocoons 16.75. Tea 6.28. Copper 5.36. Silk piece goods and silk manufactured goods 3.64. Coal 3.10. Also seaweed 0.68.

The top five ports for exports and imports are (p. 435): Yokohama 73.0. Kobe 49.0. Nagasaki 7.7. Osaka 3.80. Shimonoseki 1.77.

Japan's leading trading partners (imports + exports) are: Great Britain 32.5. USA 26.7. Hongkong 14.8. China 14.0. France 12.2. Address: Emeritus Prof. of Japanese and Philology in the Imperial Univ. of Tokyo, Tokyo.

805. Dujardin-Beaumetz, Georges Octave. 1891. Ueber die Behandlung des Diabetes mellitus [On the treatment of diabetes mellitus]. In: Verhandlungen des X. Internationalen Medizinischen Congresses. See vol. 2, part 5, p. 78-101. Held 4-9 Aug. 1890 at Berlin, Germany. [Fre]

• ***Summary:*** This section of the International Medical Congress consists of three papers on the treatment of diabetes. The first, by Mr. Pavy of London, is in English. The second, by Mr. Dujardin-Beaumetz of Paris (p. 84-91), is in French. Since Mr. Dujardin-Beaumetz was unable to attend, his paper was read by Mr. Ewald of Berlin. The third paper, by Mr. Seegen of Vienna, Austria-Hungary, is in German. Thereafter is a long discussion with many participants.

Only the paper by Mr. Dujardin-Beaumetz includes a discussion of soybeans. Gluten bread, introduced by Bouchardat, was a step forward, but it contained too much starch. Almond bread, as suggested by Seegen, was tried in France with fairly good results. But the best results came from soy bread (*le pain de soja*).

The soybean (*Glycine hispida*), which provides a much-appreciated food in Japan and a cheese (*un fromage*) [tofu] now widely researched, is presently cultivated on a large scale in Europe. It contains almost no starch, and the histological samples taken by Blondel proved that soybean seeds contain almost no starch. However, it contains a purgative oil, soya oil (*l'huile de soja*), which creates difficulties when making soy bread.

Nevertheless, a soy bread is now made commercially in France, either with or without gluten. It is accepted by numerous diabetics and it is far superior to the best gluten bread. Unfortunately the unusual and rather strong soy taste will always limit the use of this bread.

The first participant in the discussion is Mr. Miura (Tokyo, Japan), who comments (in German, p. 100-01) on the treatment of diabetes in East Asia and notes that soybeans are widely used. Address: Paris, France.

806. Popenoe, E.A.; Mason, S.C.; Marlatt, F.A. 1891. Germination of weeviled peas–Garden notes on potatoes, beans, and cabbage. *Kansas Agricultural Experiment Station, Bulletin* No. 19. p. 193-201. Dec. 1890. See p. 199-201.

• ***Summary:*** The section titled "Some Japanese beans" (p. 199-201) lists and describes ten such beans, all but two of which were procured from Japan by Prof. Georgeson. Of the ten, four are soy beans, and the first 3 of these were collected by Georgeson. "The three imported Soy beans seem to be specially commendable as resisting drought and heat to a degree surpassing all others on trail, and in ripening so uniformly that they may be pulled or cut, harvesting the crop at once without material loss from shelling." For each plant, there is a description of the plant, its flowers and seeds, time of ripening, and yield.

"No. 7. Glycine hispida–'Soy'–'Eda-mame' (Jap.)... [The seeds are] oval, or nearly round, smooth, greenish yellow. This was the earliest of the Soy beans, being fully ripe by August 29th. The plants continued vigorous through the severest drought of the summer, seeming to suffer little from it. The average yield per acre was estimated at 1,669 pounds.

"No. 8. Soy–'Kiuski Daidzu' (Jap.)... Ripened a week to ten days later [than No. 7]. Average yield per acre estimated at 1,026 pounds.

"No. 9. Soy–'Yamagata Cha-daidzu' (Jap.)... "Seeds, three-eighths of an inch long, oval, dull brown in color. Began bearing the latter part of August and continued till frost. The average yield per acre estimated at 1,693 lb.

"No. 208. 'Soja'–Glycine hispida (Wood). The seed of this was received from T.W. Wood & Sons, of Richmond, Virginia, and the results obtained are shown for comparison with the Japanese varieties. Planted at the same time, they were only in first bloom August 27th, when No. 7 of the Japanese list was nearly ripened. The vines grew rank and succulent, three to four feet high. No pods were ripened till late in September, and further production was cut short by frost. The estimated yield per acre was 498 pounds."

Two varieties of adzuki beans (*Phaseolus radiatus*) are also described. The black podded one yielded 934 lb/acre and the other yielded 628 lb/acre.

Note 1. This is the earliest document seen (July 2013)

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that mentions a named soybean variety in the United States, or that mentions the soybean varieties Yamagata Cha-daidzu or Eda-Mame (or "Eda Mame," spelled as two words).

Note 2. This is the earliest soy-related English-language document seen (March 2003) that contains the word "Entomology."

Note 3. This is the earliest English-language document seen (Sept. 2004) that uses the term "dull brown" to describe the color of soybean seeds. Address: Dep. of Horticulture and Entomology [Manhattan, Kansas].

807. Rathgen, Karl. 1891. Japans Volkswirtschaft und Staatshaushalt [Japan's economy and national budget]. Leipzig: Duncker & Humblot. xx + 785 p. See p. 328, 331, 397, 445, 611-12. In: Staats- und Socialwissenschaftliche Forschungen. Vol. 10. No. 4. [2 ref. Ger]

• ***Summary:*** Wheat flour is an important component in the production of shoyu (p. 328).

"Production of soybeans by year was as follows. (Note 1. 1 cho = 2.45 acres and 1 koku = 180 liters or 47.6 gallons): 1878 was 414,961 cho and 1,642,183 koku. 1881 was 427,557 cho and 2,175,337 koku. 1884 was 440,647 cho and 2,323,435 koku. 1887 was 466,315 cho and 3,253,790 koku (p. 330). The large increase in numbers is due mainly to a 76% increase in yields during this 9 year period. This must be difficult since most soybeans are grown around the edges of fields, on paddy bunds and in very small plots.

"Soybeans are grown throughout Japan, but they are concentrated in Tokyo plain and the prefectures bordering on its north. In 1887 the following 12 prefectures accounted for 56% of Japan's total production: Kanagawa, Saitama, Chiba, Ibaraki, Tochigi, Gunma, Nagano, Niigata, Yamagata, Fukushima, Miyagi, and Iwate.

Note 2. This is the earliest document seen (Jan. 2005) that gives soybean production or area statistics for Japan.

"This exceptionally nutritious bean appears in all possible forms in Japanese cooking, as a vegetable, boiled in sugar, as tofu ("als Tofu (Bohnenkäse)" = bean cheese), and as the main component of fermented miso soup (*Miso-Suppe*) and of soy sauce (*Soja-Sauce*).

"During the period 1870-74, the price of soybeans averaged 3.015 yen/koku. In 1875 it was 4.46 yen and in 1886 3.98 yen, with a high of 7.11 yen/koku in 1882."

"Since 1885, with the introduction of use taxes, new production statistics have begun to be kept on the shoyu industry. In 1887/881 some 1,180,188 koku of shoyu was taxed from 11,687 businesses, averaging 101 koku per factory. By comparison, the amount of shoyu taxed in 1888-89 was 1,304,551 koku from 10,634 businesses, averaging koku per factory. As with sake breweries, the number of plants has diminished from 13,682 in fiscal year 1885/86 to 10,634 in the fiscal year 1888/89. Although shoyu factories are found throughout Japan, there are certain regions of concentration. Chief among these is Chiba prefecture, which in 1887/88 had 689 factories and a production of 121,816 koku, averaging 177 koku/factory. The capital of the industry is the city of Choshi. Other major shoyu producing prefectures are Ehime (555 plants, 73,525 koku), Hyogo (544 plants, 73,168 koku), Okayama (580 plants, 64,389 koku), Fukuoka (381 plants, 58,022 koku), Ibaraki, Aichi, Kanagawa, and Saitama.

On p. 611-12 is a detailed discussion of Japan's shoyu tax. Shoyu production was already being taxed in 1875. Then law 10, enacted on 8 May 1885, which went into effect of 1 July 1885, reinstated the tax. This tax is similar to the sake tax. A yearly license costing 5 yen is required and a tax of 1 yen/koku of shoyu produced is levied. Government tax revenues from shoyu grew from 640,379 yen during the partial year 1885/86 to 1,215,254 in 1889/90.

Rathgen lived 1856-1921. Address: Leipzig, Germany.

808. Riley, C.V. ed. 1891. Reports of the United States commissioners to the Universal Exposition of 1889 at Paris. Vol. 5, Agriculture. Washington, DC: Published under direction of the Secretary of State by authority of Congress. 935 p. See p. 127. Index.

• ***Summary:*** In the section on "African and Asiatic countries" is a subsection titled "Japan" (p. 127) which (according to the table of contents) is about "The Soja (*Glycine hispida*) and the azouki [azuki] (*Phaseolus radiatus*), two important Japanese vegetables."

The actual entry states: "The exhibit in class 71 was particularly interesting; beside the Government exhibit there were fifteen private ones and eleven of these exhibits contained soja or *daizon* [*sic, daizu*]. The soja (*Glycine hispida*) is a leguminous plant closely resembling the pea, and is one of the principal vegetables in use among the Japanese, who employ it in various ways; *kôritôfou,* or cheese of the soja [dried frozen tofu], is a sort of alimentary paste, prepared by coagulation and freezing. The soja is also grown to a small extent in France, and was exhibited in a collective exhibit from the département de l'Aube. Its grain contains very little amylaceous matter (starch) and sugar, and is therefore particularly adapted for food for diabetic patients, while it also contains much nitrogenous matter and phosphoric acid, which renders it very nutritive.

Note. This is the earliest English-language document seen (April 2013) that uses the term *kôritôfu* to refer to dried-frozen tofu.

"Another vegetable much used in Japan is the *azouki* (*Phaseolus radiatus*), a sort of bean [azuki]. Dried prunes, *anzous* (*Prunus armeniaca*) [apricots], were also shown and were of good quality. There was a fine exhibit of dried ginger. Raisins, nuts, peanuts, preserved bamboo sprouts, etc., were also shown, and the whole display was a good one."

Note: This is the earliest document seen (Aug. 2011) about the United States Department of Agriculture

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(USDA) in connection with the soybean. Address: Ph.D., Representative of the U.S. Dep. of Agriculture.

809. *Vierteljahresschrift ueber die Fortschritte auf dem Gebiete der Chemie der Nahrungs- und Gunussmittel.* 1891. Japanische Soja [Japanese soy sauce (Abstract)]. 5:161-62. For the year 1890. [1 ref. Ger]
• ***Summary:*** A German-language summary of the following German-language article: *Bayerische Gewerbe-Zeitung* (Nuremberg). 1888. "Japanische Soja" (Japanese soy sauce). No. 23. p. 538-40.

810. *Journal des Ouvriers Inventeurs.* 1892. Le Soja hispida au Japon [The soybean in Japan]. 3:1. Jan. 16. [Fre]
• ***Summary:*** This is a reprint of an article from the *Journal d'Hygiène,* by Dr. M. de T.

811. Speth, G. 1892. Irish potatoes, sweet potatoes, tomatoes, forage plants. *Georgia Agricultural Experiment Station, Bulletin* No. 17. p. 163-98. March. See p. 190-91, 196-98.
• ***Summary:*** The section on "Forage plants" (p. 190+) begins with a long subsection on cow peas, which is considered the "most valuable" forage plant in the Southern States. The subjection titled "Soja bean" (p. 196-98) begins: "Although known in the Southern States for a long time, it has never been fully appreciated, but promises in time to become a great rival to the cow pea; it produces a great amount of forage, which seems to cure easier than the cow peavines and proves more productive of peas.

"It is of as easy culture as our cow peas, yielding a forage which is greatly relished by farm stock, and which compares favorably with cow pea vines. The beans which possess most highly nutritive qualities, being rich in protein and fat, which are the most expensive elements in all feeding stuffs, resembling in composition, good beef. In its home, Japan, where it is extensively cultivated, it takes that place which meat takes here."

Professor Atwater has stated in an article in the *Century:* "In the most economical feeding of animals it takes a number of pounds of hay, corn and other feeding stuff to make a pound of beef or pork." The Bulletin continues: "If a pound of vegetable protein costs 2½ cents as we find it to cost in the Soja beans, a pound of animal protein must cost considerable [sic] more if produced by the aid of protein obtained from corn at a cost of double that amount."

A long discussion, comparing the effect of soja beans and corn on soil fertility, notes that "leguminous plants are not dependent on nitrogenous fertilizers; they gather their supply from the atmosphere..."

There follow five related tables: (18) Yield of forage and seed of cow peas, soja beans, varieties of corn and peanut vines." For each crop it gives the amount of forage per acre (green, and dry), and seed per acre. Soja beans yield 9,730 lb per acre of green forage or 2,940 lb per acre of dry forage or 1,307 lb per acre of seed.

(19) Composition of cow peas, soja beans and corn. (20) Composition of cow pea vines, soja bean vines, corn forage, and peanut vines (cured). (21) Yield of crude nutrients of one acre of (vines and forage). (22) Yield of crude nutrients of one acre of (seeds and grains).

The article ends: "The results evidence the exceptionally high value of the Soja beans as a feeding stuff, far greater than that of corn or cow peas, the superiority of the vines for forage, which in composition are equal to the cow peas and greatly surpass the corn forage."

Note 1. This is the earliest English-language document seen (Aug. 2003) that contains the term "vegetable protein" (or "vegetable-protein" or "vegetable proteins").

Note 2. This is the earliest English-language document seen (Aug. 2003) that contains the term "animal protein" (or "animal-protein" or "animal proteins"). Address: Horticulturist, Experiment, Georgia.

812. Brooks, William P. 1892. Division of Agriculture. *Massachusetts* (*Hatch*) *Agricultural Experiment Station, Bulletin* No. 18. p. 41-104. April.
• ***Summary:*** The section titled "Report on trial of miscellaneous crops" (p. 97-104) includes many varieties imported from Japan: Oats (3 varieties). Millet, *Panicum crus-galli.* Millet, *Panicum miliaceum.* Hemp. Flax. Wheats. Japanese varieties of beans.

All the beans "belong to two distinct classes, known to the Japanese respectively as *'Adzuki'* or *'Shodzu,'* the latter name meaning 'small bean' and *'Omame'* or *'Daidzu,'* both the latter names meaning 'large bean.' The beans of the first class are a distinct species, *Phaseolus radiatus* and are used by the Japanese almost entirely in confections. They are characterized by a remarkably thin skin, and are generally boiled, put through a sieve, and variously sweetened and colored although also prepared in other ways. An enormous quantity of these confections is eaten by persons of all ages and classes.

"The beans belonging to this class have been sometimes incorrectly designated Soja beans by American writers." It grows fairly well but is "much poorer in albuminoids [proteins] and fat than the soja bean."

A table compares the nutritional composition of a red adzuki bean raised in Massachusetts in 1890 with a kidney bean (*Phaseolus vulgaris*).

"Whether the beans of this class [adzuki] will prove valuable here may be doubtful. They are certainly unusually attractive in appearance; but it is not likely that the Japanese bean confections, which nearly all foreigners in Japan regard as decidedly flat and insipid, will ever come into favor here."

"The beans of the second class (*'Daidzu'*), belong to a distinct genus and by some authorities are named *Soja hispida,* whence the common designation soja (sometimes soya) bean; by other authorities, the species is named

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Glycine hispida which name, probably, has the claim of priority. The name 'soja' or 'soya' has undoubtedly been taken from the name 'soy' given to a sauce (used extensively as a condiment), in the manufacture of which this bean is largely used. The name given to the Japanese variety of this sauce is *'shoyu.'* This bean is also extensively used in many ways in Japan as human food, and is also largely employed as food for horses and cattle.

"It has been said that this bean is the richest known vegetable substance. 'In point of nutriment the soy bean is of all vegetables nearest to meat,' says Rein [1886]. A sample of beans grown here in 1890 has been submitted to analysis, with results shown below:"

A table titled "Soya Bean. *Glycine hispida.* shows: Dry matter: 11.53%. Crude protein: 34.49%. Crude fat 16.45%. Nitrogen free extract 26.29%. Crude fibre: 4.40%. Ash: 6.55%.

Several of the varieties which I have had under cultivation, having been taken from northern Japan (Sapporo), ripen seed here with as great certainty as the kinds of corn under cultivation. It is believed that some of these varieties will prove valuable grain crops. The yield, it is true, cannot be expected to equal that of corn; but the grain is far richer, and because of the high percentage of protein it contains it is fitted to take the place of bran, cotton-seed meal and linseed meal for which our dairymen yearly pay out so much money.

"It should further be remembered that if the results of modern investigations on this point are not misleading, this plant must be able to take most of its nitrogen from the air which must vitally affect the question of its economy as a farm crop. Most of our crops are nitrogen consumers. This, being a nitrogen gatherer, should enable the farmer to dispense in large measure with purchased nitrogenous fertilizers."

Details of cultivation of red and white adzuki beans are given. The red yielded at the rate of 27.3 bushels per acre and the white yielded at the rate of 21.7 bushels per acre. "We have invariably found the red varieties superior to the white in productive capacity, and in beauty of appearance. The seed of these varieties was kindly sent us by Prof. Georgeson of the Kansas Experiment Station, as our original stock had been destroyed by fire. The seed was planted May 14th, the crop pulled Oct. 3rd. and threshed Oct. 23d."

Six varieties of soya beans were also tested (p. 103-04): Eda [sic, Eda Mame] (8.37 bu/acre), Kuiske [Kiyusuke] (14.26), Medium Early White (23.25). Medium Black (22.8), Medium White (19.5), Medium Green (30.2). The first two were sent by Prof. Georgeson, the last four imported from Sapporo, Hokkaido [Japan], by Brooks. The yields in bushels per acre are given after each variety name in parentheses. Medium Early White had previously yielded as high as 35 bushels per acre. "I believe that crops of about 30 bushels per acre of this variety [Medium Early White] may be safely anticipated."

Note 1. This is the earliest English-language document seen (Aug. 2013) that mentions the soybean varieties Medium Black, Medium Early White, or Medium White.

Concerning the variety Eda [sic, Eda Mame] (p. 103): "Seed received from Prof. Georgeson, planted May 14th, crop pulled Oct. 3d., and threshed Oct. 23d. The area occupied by this variety was 20.3 square rods; the yield was 1.06 bushels, or at the rate of 8.37 bushels per acre. This is one of the poorest varieties we have under cultivation."

Note 2. An analysis of "Georgeson" plus "Eda" shows clearly that Georgeson et al. named this variety "Eda Mame." Address: Agriculturist.

813. Medium Early White: New U.S. domestic soybean variety. 1892. Seed color: White or pale yellow.
• ***Summary:*** Sources: Brooks, William P. 1892. "Division of Agriculture." *Massachusetts* (*Hatch*) *Agricultural Experiment Station, Bulletin* No. 18. p. 41-104. April. See p. 104. "Variety, Medium Early White; seed originally from Sapporo [Japan]. The past season is the third that this variety has been cultivated upon our grounds. The area the past season was 37.17 square rods, the yield 5.4 bushels, or at the rate of 23.25 bushels per acre. In previous years we have had crops at the rate of 22.5, 25, 27, and 35 bushels per acre. As we had but a very small quantity of seed, the seeding of the past season was thinner than desirable for a full crop from the land. I believe that crops of about 30 bushels per acre of this variety may be safely anticipated. The dates of planting, etc., of this variety were the same as in the case of the varieties described above" [i.e., planted May 14th, crop pulled Oct. 3d, and threshed Oct. 23d]. Note: This description seems to contain a contradiction: If the past season was the third that this variety was cultivated on these grounds, then there could have been no more than two previous harvests and yields. Yet four previous yields are given, implying that this past season was the 5th season this variety was grown. Since in soybeans in Massachusetts are typically harvested in about October, the first crop was probably harvested in about Oct. 1887.

True, A.C. 1894. "Report of the Director of the Office of Experiment Stations." *Report of the Secretary of Agriculture.* p. 417-64. For the year 1893. See p. 439-40. Address: USA.

814. Medium Green: New U.S. domestic soybean variety. Synonyms: Early Green, Green, Guelph (Ball 1907), Medium Early Green (Morse 1927). 1892. Seed color: Green (chromium).
• ***Summary:*** Sources: Brooks, William P. 1892. "Division of Agriculture." *Massachusetts* (*Hatch*) *Agricultural Experiment Station, Bulletin* No. 18. p. 41-104. April. See p. 104. "Variety, Medium Green; seed imported from Sapporo [Japan]; planted, etc., as above [planted May 13th; pulled Oct. 13th and threshed Oct. 25th]; area, 0.76 square rods;

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yield, 8.5 pounds, or at the rate of 30.2 bushels, of 60 pounds per acre. This is apparently a very vigorous and productive variety, and may prove a valuable acquisition."

Hills, J.L. 1894. "Dairying." *Vermont Agric. Exp. Station, Annual Report.* 7:70-118. For the year 1893. See p. 118.

Flagg, Chas. O. 1894. "Rotation of crops: Experiments with leguminous plants." *Rhode Island Agric. Exp. Station, Annual Report* 6:176, 190-92. For the year 1893. See p. 191. A table shows the range of yield of green fodder (in pounds per acre) for Medium Green (4613–6597 pounds). This was one of 32 legumes planted on 29 May 1893.

Brooks, William P. 1895. "The Agricultural Division." *Massachusetts* (*Hatch*) *Agric. Exp. Station, Annual Report* 7:7-16. Jan. See p. 13-14. The seed was originally brought from Japan by Brooks in late 1889. Medium Green appears to be most valuable for ensilage. Note: The term "medium green" (written in all lowercase letters) was first used to describe soybean strains by Brooks in Jan. 1894.

Ball, Carleton R. 1907. "Soy bean varieties." *USDA Bureau of Plant Industry, Bulletin* No 98. 28 p. May 27. See p. 20-21. States that Medium Green is a synonym for Guelph. Piper and Nielsen (1909) and Piper and Morse (1910) state the same thing. Piper and Morse (1923) say "Guelph or Medium Green." Then in 1927, Morse gives separate entries for both Guelph and Medium Green.

Morse, W.J. 1927. "Soy beans: Culture and varieties." *USDA Farmers' Bulletin* No. 1520. 34 p. April. See p. 7, 9. "Early Green.–The same as Medium Green." "Green.–The same as Medium Green." "Guelph.–The same as Medium Green." "Medium Early Green.–The same as Medium Green."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 14-15. Medium Green is in the USDA Germplasm Collection. Maturity group: I. Year named or released: by 1903. Developer or sponsor: Prof. W.P. Brooks, Massachusetts AES (Agric. Exp. Station). Literature: 01, 03. Source and other information: From Japan in 1889 by Prof. W.P. Brooks, Massachusetts AES (Agric. Exp. Station). 'Guelph' was synonym. Prior designation: None.

Talk with Dr. Richard Bernard, former curator of the USDA Germplasm Collection. 1998. Oct. 15. "Many varieties got named long after they were released, especially in the old days. It took them a while to settle on name. They decided that names like Medium Green, while descriptive, were not valid variety names, so they came up with Guelph." Dr. Bernard further complicated the problem because he had two different strains that were called Medium Green or Guelph, so he let the two names exist together, because the strains are different. These two are still in the soybean germplasm collection. Address: USA.

815. Medium White: New U.S. domestic soybean variety. 1892. Seed color: White or pale yellow.
• ***Summary:*** Sources: Brooks, William P. 1892. "Division of Agriculture." *Massachusetts* (*Hatch*) *Agricultural Experiment Station, Bulletin* No. 18. p. 41-104. April. See p. 104. "Variety, Medium White; seed imported from Sapporo [Japan]; planted, etc., as above [planted May 13th; pulled Oct. 13th and threshed Oct. 25th]. Area occupied, 0.76 square rods; yield, 5.5 pounds, or at the rate of 19.5 bushels per acre. In explanation of the comparatively small yield of this variety, as well as of the preceding [Medium Black], it should be stated that as we had but a mere handful of the seed, it was planted very thinly. This variety, I believe, is essentially, perhaps identically like or original stock."

Hills, J.L. 1894. "Dairying." *Vermont Agric. Exp. Station, Annual Report.* 7:70-118. For the year 1893. See p. 118. There are three entries (X, XI, and XIII) for "Soja (or soy) bean (*Soja hispida*)." Entry XI is for "seed obtained from the Hatch Experiment Station of the Massachusetts Agricultural College... This is a Japanese plant which has been grown in this country for several years. It has been very generally successful as a forage crop. The dried and ground beans make a passable imitation coffee (Plumb 1894). A few varieties, 'Early White,' 'Medium White,' 'Medium Green,' 'Medium Black,' and perhaps others mature seed in Massachusetts, and have yielded from 22 to 28 bushels per acre. It is a good plant for fodder or ensilage. The seed planted here in 1893 was obtained from two sources. That obtained from the Massachusetts Station grew best and yielded five tons of green fodder, a ton and a quarter of dry matter and a quarter of a ton of protein to the acre." Address: USA.

816. Coupin, Henri. 1892. La soya [The soybean]. *Nature* (*La*) (*Paris*) 20:203-04. Aug. 27. [Fre]
• ***Summary:*** An overview of the soybean (*La Soya*). It is not possible to encourage too much the acclimatization of exotic plants in France. One cannot doubt the worthiness such an interest when a plant, such as the soybean, has found, in its country of origin, such numerous applications.

This plant is used in China and Japan for human food and for animal feed, for making bread, cheese [tofu], for extracting an oil [soy oil], etc. Why would we not do the research necessary to raise such a precious plant in France? Many trials have already been conducted and have succeeded rather well; we will return to that later, but first we must see how the soybean behaves in Japan and China.

The soybean (*Glycine Soya*) belongs to the legume family. A botanical description is given.

In Japan, the soybean is one of the most widely used plants. It is known under the name of either *mame* or *daizu*, and it is widely used to make a sort of paste, named *miso* (*le Miso*). The process for making miso is described. [Note: However koji is not mentioned so it will not work]. It ferments for 1-2 months, and then is ready for food use. It is

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part of the breakfast of many Japanese.

The second product made from soybeans is a condiment, a liquid named *Shoyu.* It is a sort of dark brown syrup which serves as a sauce to season dishes, especially fish. The manufacture of shoyu is a very important industry in Japan. In the city of Nagasaki alone there are as many as ten factories, and each makes more than 1.2 million kilograms per year of shoyu. A description of how shoyu is made is given using equal quantities of boiled soybeans and roasted wheat, plus salt. 1.8 liters sells for 40-50 centimes.

The third product made from soybeans is a cheese called tofu (*le To-fu* or *fromage de Daizu*). The process for making tofu is described. It can be eaten fresh, but unfortunately it retains the taste of raw beans, which is not very agreeable.

In China the soybean is known as *Yeou-teou,* but here it is not ordinarily cultivated on a large scale, as it is in Japan. According to Eugene Simon: Each person makes his or her own cheese [tofu]. Very also, often, each one makes his oil, if not at home, then at least at one of his parents' homes or in the neighborhood; it is distributed by the head of the family.

There is a variety of black soybean which constitutes the principle food of animals; horses and mules eat the seed in nature. People use mainly the white soybean (*la Soya blanche*)*:* from it they extract an oil [soy oil], which is the object of an enormous trade and which occupies the top rank among the oils used in China. As in Japan, the Chinese also make tofu. According to Paillieux and Bois, in the entire Chinese empire, only the Tartars use daily milk; the [Han] Chinese do not consume it at all. They use soymilk instead. The soybean is solid milk. Not all legumes contain legumine, as the soybean does. Describes how to make soymilk from soybeans.

Trials for the acclimatization of soybeans in Europe are rather numerous. In 1875, the first ones were conducted by F. Haberlandt and Blaskovics in Austria-Hungary. In France, Buffon received soybean seeds and cultivated them at the Museum [of Natural History]. One of the problems with the soybean is that its seed mature very late. However some varieties mature their seeds earlier than others.

An illustration [non-original] shows a soybean plant. At the bottom of the column on page 1, we read: See No. 425, of 25 July 1881, p. 115 [an article by E. Roman]. Address: Ingenieur en chef à Périgueux.

817. *Vegetarian Messenger* (*Manchester, England*). 1892. Japanese agriculture. Aug. p. 226. [1 ref]
• ***Summary:*** An article in the *Times* (London) summarizes a recent USDA report on this subject. "All kinds of leguminous plants are raised in abundance in almost every part of the empire, beans being largely used in the manufacture of soy, a kind of sauce."

818. *Homestead* (*The*) (*Des Moines, Iowa*). 1892. The soy bean. 38(39):889. Sept. 23. Whole No. 1897. [1 ref]
• ***Summary:*** "In our recent visit to Manhattan, Kansas, we were very much interested in the soy bean, of which several acres of four different varieties are growing on the college farm... Prof. C.C. Georgeson, in charge of the station, was for three years employed by the Japanese government as professor of agriculture. While there he made a special study of the economic plants of Japan, particularly of *soy,* or as it is commonly called, the *soja* bean. Out of the many varieties in use in Japan, he has selected four with which he is making his experiments. In a recent number of the *Industrialist* [27 Aug. 1892, p. 1] he gives the following report:

"We are just now, August 24, harvesting a portion of the soy bean crop." The seeds of four varieties were sown in rows 32 inches apart. The crop was planted May 23-24. "Cattle and hogs eat all parts of the plant greedily... At no time since we began to grow this plant in 1890 has it suffered from dry weather."

Professor Georgeson is experimenting with the soy bean mainly to try to find a crop which will do well in that large portion of Kansas where clover is not reliable and alfalfa does not fit well with any rotation. One of the virtues of the soy bean "lies in this, that it can be planted after corn planting is finished, cut in time to sow the ground to wheat and furnishes an exceedingly large amount of food highly nitrogenous, and hence the best possible combination with the carbonaceous foods such as corn, corn fodder, straw, etc., which are so abundant and cheap in the West. We shall watch the development of the soy bean with a great deal of interest. The Agricultural College at Ames has been experimenting with the bean, but with varieties that are not a success in the climate of Iowa."

First cited by Hymowitz. 1986. Bibliography of early, previously uncited publications on soybeans in the United States. 2 p. Unpublished. \

819. *Homestead* (*The*) (*Des Moines, Iowa*). 1892. The soy or soja bean. 38(48):1099. Nov. 25. Whole No. 1906.
• ***Summary:*** "Early in the fall we called attention to our readers as to the possibilities of the soy bean as a substitute for clover in Kansas and Nebraska, and especially in that part of these states where clover has not been a pronounced success. This bean has been known for some years, and been the subject of experimentation at the various stations in the East and South, but has not been very highly esteemed, especially in the eastern states. The *Rural New Yorker* has recently been taking the consensus of agricultural opinion on the matter... It does not meet with much favor in Vermont, New York or Connecticut, these states claiming that they have a better thing in the common red clover. The Massachusetts Station gives a better report probably because it has a better variety and knows better how to handle it. North Carolina reports that it is a very valuable crop, a trifle better in its nutritive value than clover grown on the same ground. Kansas, however, gives it the highest commendation,

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and we give the report of her experimentation in full. Prof. Georgeson, of the above station, who by the way studied the plant in Japan, has four varieties that mature in the latitude of Manhattan, Kansas, says:

"1. I unhesitatingly recommend our farmers to experiment with it. 2. It will produce more feed to the acre here than clover, and do it in half the time required for the latter. We cannot start clover with any other crop; when the so-called 'nurse crop' is harvested the young clover is killed by the scorching sun. This is so generally the case that but few experienced farmers in central Kansas and westward ever attempt sowing clover with wheat or oats, or any other crop. The first year, even when seeded by itself, it seldom affords much hay, and it is unwise to pasture it for fear of killing it. The soja beans we have, yield a full crop of feed during three months of the summer. They are harvested, and the ground can be put in fall wheat, by the time the clover crop is fairly established. Moreover, the soja bean can be grown where clover cannot get a foothold on account of the heat and drouth. 3. So far as tried, I have found it best to grow it in rows about thirty inches or a little more apart, and let the plants average one to every two inches in the row. I cultivate them until shortly before the blossoms appear. I have so far had no difficulty in curing them as I would a heavy crop of clover. Whether it is better to cure it as hay or to put it in the silo is yet to be determined by experiment. 4. I see many reasons why it can be made a profitable crop throughout this state, and throughout the West, but especially in the region where the corn crop and tame grasses are uncertain.

"These reports are what we should have expected. It is very hard to find any better in the way of a forage producer and fertilizer combined than the red or mammoth clovers. It is where these fail that the soy bean finds its appropriate place."

This bean "has the advantage, that it will endure drouth that is fatal to the clovers... We expect much from the soy or soja bean, but most where it can be used as a substitute for the clovers. "We notice that a man down in Missouri [perhaps Mr. Cole] is selling it as 'The Domestic Coffee Berry.' It is all right for the grower to grind the beans and mix them to adulterate his own coffee if he wishes, but even then he should buy a peck or so at the price he is asked by this man for a pound, and then give his pigs and calves a share before grinding for his coffee."

Note 1. This is the second earliest U.S. document seen (Aug. 2002) that uses the term "coffee" in the name of a soybean variety. It is the earliest document seen that calls it "The Domestic Coffee Berry" or uses the term "Coffee Berry." In the earliest U.S. coffee-related document seen, published in 1858, it was called the "Coffee plant." First cited by Hymowitz. 1986. Bibliography of early, previously uncited publications on soybeans in the United States. 2 p. Unpublished.

Note 2. This is the earliest document seen (Sept. 2011) concerning soybeans in connection with (but not yet in) Nebraska, and Vermont.

Note 3. We have been unable to identify the source of this long, interesting quotation. However during the week of Nov. 19, 1892, Prof. Georgeson and George T. Fairchild (President of the Kansas State Agricultural College [and father of David Fairchild, of plant introduction fame]) attended the annual convention of Agricultural Colleges and Experiment Stations at New Orleans, Louisiana (See The *Industrialist* 19 Nov. 1892, p. 55). The quotation probably came from a talk that Prof. Georgeson gave at that convention.

820. Georgeson, C.C.; Burtis, F.C.; Shelton, W. 1892. Test of some Japanese beans. *Kansas Agricultural Experiment Station, Bulletin* No. 32. p. 232-38. Dec. 1891.

• ***Summary:*** "Two species of Japanese bean have been grown here at the Station for two years past. These are the soy bean (*Glycine hispida*), and the adzuki–the mungo, of India (*Phaseolus radiatus*). Both of them have given promise of much usefulness in this country. They have been subjected to severe tests concerning their endurance of this climate, and have come out triumphantly. Having seen these beans grown in Japan, and noted the very important part they take in the diet of the Japanese, the writer became anxious to try them here, which has been done with gratifying success."

The Soy Bean. "The United States Department of Agriculture made an effort to introduce it [the soy bean]

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years ago, and several enterprising seedsmen have from time to time made attempts in the same direction; but with the result that it has been generally successful only in the South because the varieties introduced were too late to mature in the latitude of the Northern States. Knowing this, pains were taken to procure some of the earliest varieties grown in Japan. A few dozen beans of each of several kinds arrived in the spring of 1890. They were planted in the latter part of May and matured seed before frost, in a little over three months' time. The amount planted being so small, no attempt was made to estimate the yield, but they appeared to be very productive. One thing in their favor was proved that first season–their ability to withstand drouth...

"The seed thus raised was planted in the latter part of May, in 1891, and harvested early in September, with yields ranging for the several varieties from 12½ to nearly 19 bushels of beans per acre. These yields would under more favorable conditions have been considerably larger...

"The bean takes its common name, 'Soy,' from a sauce manufactured from it, which in commerce goes by the name of 'Soy,' though the Japanese name for this sauce is 'Shoyu.' The beans are boiled and mixed with certain proportions of rice and salt, and the compound is then allowed to undergo a process of fermentation, which results in the delicious brown sauce so common in Japan, and which forms the basis of the best sauces in this country. The term 'soja,' often applied to this bean, is misleading, inasmuch as the species named by Siebold and Zuccarini *Glycine soja* is not cultivated there, or at least rarely cultivated, though it is wild in the south; and later this species was confounded with the cultivated species, *G. hispida* Moench, whence the origin of the term 'soja,' as applied to the cultivated bean. The soy bean is a native of Japan, and it has been cultivated there from a very remote period, as is testified by the numerous and strongly-differentiated varieties which have been developed. The Japanese cultivate it extensively, and it is to them an important article of food. It takes to a very large degree the place of meat in their diet, and it is altogether too costly and precious an article to be fed to live stock, except when it on rare occasions is grown as a hay crop. They use the beans ripe, and, properly cooked, they make a palatable and highly-nutritious dish. Sometimes they are eaten green when nearly full grown; they are then boiled in the pods and shelled at the meal.

"In this country they will likely be of most value as a fodder plant, though they compare favorably with navy beans for table use; they are, however, more glutinous and less starchy than navy beans, and on this account may not suit the taste of all persons."

"The following four kinds are early enough to be depended upon to mature seed in this latitude every year." *Eda-mame:* yield, 12.6 bushels beans (at 60 pounds per bushel) per acre. *Yellow Soy Bean:* yield, 14.57 bushels per acre. *Yamagata Cha-daidzu* (tea-colored bean, from Yamagata): yield, 18.8 bushels per acre. *Kiyusuké Daidzu* (Kiyusuke is the name of a person): yield, 18.23 bushels per acre.

"As has been stated, all of these yields would have been larger if the weather had permitted the saving of the crop in better shape."

Pages 237-38 give detailed information on "The adzuki (*Phaseolus radiatus*)," including white-podded and black-podded varieties. Mrs. Nellie S. Kedzie, Professor of Household Economy, tested the adzuki beans in recipes and found them to be "a very good bean for cooking purposes." Baked in the old-fashioned way, the adzuki is "sweeter that the ordinary white bean; so less sugar or molasses is needed in baking. I found this bean especially nice for making bean soup."

Photos (p. 232) show yellow soy bean, Yamagata-Cha-daidzu, and white podded adzuki plants.

Note 1. This is the earliest document seen (Sept. 2005) that contains a photo of the soy bean or of the adzuki.

Note 2. This is the earliest document seen (Oct. 2004) that mentions the soybean variety *Kiyusuké Daidzu* (spelled that way). Address: 1. M.Sc., Prof. of Agriculture, and Superintendent of Farm; 2. B.Sc., Asst. in Agriculture; 3. Foreman of the farm. All: Kansas State Agricultural College, Manhattan, Kansas.

821. Georgeson, C.C. 1892. The economic plants of Japan–XVI. Leguminous plants. *American Garden* (*New York*) 13(12):727-29. Dec.

• ***Summary:*** This article begins: The soy bean (*Glycine hispida,* Moench); Jap. *O-mame, Diadzu* [*sic, Daidzu*]**.** A bush-bean extensively cultivated in all parts of Japan. The plant varies from 1½ to 3 feet in height, according to the variety and soil, and the varieties, which are numerous, differ much in size, color, time of ripening and the general appearance of their beans... The beans are more or less lenticulate, some almost globular.

"This vegetable is always grown in rows about two feet apart, and usually as a second crop, the early beans being planted between the rows of wheat and barley, and the late ones immediately after these crops are harvested. After the beans are well up, they are cultivated with the hoe once or twice, and if the soil is poor, enriched with liquid manure, but otherwise they receive no special care. The beans are, for the most part, not used until ripe, when they are prepared for food in a multitude of ways. Occasionally the green pods, containing nearly full-grown beans, are boiled, and the beans shelled and eaten from the pod. The early varieties mature in from 80 to 100 days, and the late ones from 100 to 120 days.

"Varieties of this bean are numerous. Probably more than a hundred can be found in the country. Beans of all varieties of this species are in shape intermediate between peas and our common beans. Many of them are nearly round, many are somewhat flattened on two sides, or lentil-shaped,

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and some are oblong, but never to the same degree that our common beans are elongated. As to size, they vary from that of duck-shot to a little above very large peas. The size of the hilum and its markings are in many cases characteristic."

Note: This is the earliest English-language document seen (April 2007) that uses the word "hilum" in connection with soy bean seeds. The hilum is the place on the seed where it is attached to the pod. The hilum of most soybean varieties is dark in color.

"The beans are easily classed, according to color, as white, yellow, black, brown, green and spotted varieties. About 38 sorts that came under special observation I noted down as being worthy of more general culture. Some of these were sent from the Japan Imperial College of Agriculture to the French Exposition in 1889. Four of the varieties have been grown successfully at the Kansas Agricultural College for several years, and may be trusted to mature seed in this latitude. Two other kinds tested here proved failures because they ripened too late. The successful kinds yielded under field culture last year from 16 to 18 bushels of beans an acre. They promise to become quite valuable in this country, not only for the table but for stock-feed. Soy beans are more nutritious than any other known species of bean. They yield as much nourishment as good beef–pound for pound. Most of the housekeepers who have tried those grown here pronounce them fully equal to the navy bean for table use, and some think them superior. They contain more albumen and less starch than the navy beans, and so do not cook quite so mealy as the latter, but they are fully equal to them in flavor. Their rough and rather tough pods render them unsuited for use in the green state, hence they will not come in competition with wax beans; but they can compete with the navy beans, and they have doubtless a great future as stock feed. Not only is the bean itself nutritious, but the entire plant is rich in nitrogen. The Japanese as yet consume but little meat; with them the soy bean takes the place of meat, especially with the middle classes. One of their favorite uses of this bean is in the form of bean-cheese, or tofu.

"For making bean-cheese the *Shiro-mame,* or white soy bean, is commonly used. The beans are soaked in cold water for 24 hours, then while still wet they are ground between two small millstones turned by hand, the product being not flour but a thin paste, which is collected in a tub below. To this more water is added, and it is then boiled in a large kettle for an hour. On being removed from the fire it is strained through a bag to remove the hulls, the filtrate running into a tub or vessel of suitable size. Water is stirred into it, and a small quantity of 'bitter brine' (refuse from the salt-works, consisting chiefly of chloride of magnesium) is added, about a quart of 'bitter brine' to every two gallons of dry beans. This causes the legumin to be precipitated; when it has settled to the bottom of the tub, a little pressure is applied by means of a lid, which fits inside the vessel and is weighted somewhat. When cool, the water is decanted off, and the *tofu* or curd is cut in slices, and is now ready for the market. In this condition it is a spongy yellowish white substance, resembling cheese-curd. It is peddled from house to house, and is universally esteemed; but it is always roasted, fried, baked or cooked in some way before it is served. It has been my privilege to eat it on many occasions, and I can testify that it is both palatable and satisfying. The only scruple one need have about eating it is concerning the purity of the water used in its preparation. According to Professor Kinch, *tofu* has this composition: water, 89.29; ash, 0.48; fiber, 1.01; nitrogenous substances, 4.87; non-nitrogenous substances, 4.35. Americans eat many things less nourishing than this bean-cheese." Address: Prof., Kansas Agricultural College.

822. Georgeson, C.C. 1892. The economic plants of Japan–XVI. Leguminous plants. Adzuki (Document part). *American Garden* (*New York*) 13(12):727-29. Dec. See p. 728-29.
• ***Summary:*** This section of the article states: "*Phaseolus radiatus,* L.; Jap. Adzuki. This is another bean largely grown. It is not a native, but was in all probability introduced from India. It is a bush-bean, about two feet tall; leaflets oval, often sinuate or lobed; flowers yellow; pod long and narrow; beans very small and mostly red or yellowish green, square at the ends and very short–in fact, they resemble a hand-satchel in shape. They are used mostly for grinding into flour, from which a sort of bean-cake is made. They are also boiled with rice, producing a dish called *aka-meshi,* which is served on festive occasions. They have the reputation of being the best-flavored beans in existence, but much depends on their preparation. Doctors of the Chinese school attribute medicinal properties to this bean, and order it as an exclusive diet for *kake* [sic, *kakke* = beriberi] patients, a disease sometimes attacking people who live largely or exclusively on rice. These beans are cultivated like soy beans, as a second crop, in rows two feet apart. Most varieties ripen in three months from the time of planting. Japan produces annually from a million and a half to two million bushels of this bean. I imported a little seed of two varieties two years ago, along with the soy beans already mentioned, and they have yielded very satisfactorily, producing last year twelve bushels to the acre. They ripen earlier than soy beans, and are not such robust growers." Address: Prof., Kansas Agricultural College.

823. Chisholm, George Goudie. 1892. Handbook of commercial geography. 3rd ed., revised. London: Longmans, Green, and Co. 515 p. See p. 72-73, 344. Illust. Maps. Index.
• ***Summary:*** In the Chapter I, "Commodities directly or indirectly on climate," in Section A, "Products of the temperate zone," is a subsection titled Pulses which states (p. 72-73): "167. The chief pulses of commerce are common peas and beans, chick-peas, and soya beans."

"In warm countries, where butcher-meat is little

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consumed, this [chick-peas] and other pulses are in fact an almost essential part of the regular diet, since they supply elements of food not contained in sufficient quantity in grain and fruits. It is for this reason that soya beans are largely consumed in two other warm countries, China and Japan, as well as in India. According to Decandolle this bean is indigenous in Cochin-China, Java, and Japan. It is now very extensively cultivated throughout Eastern Asia, and is made (along with other pulses) into a great variety of preparations for use as human food. Soya [sauce], an extract from soya-beans, is also exported to Europe, and especially to England, to be used as an ingredient in soups and sauces, but much of the so-called soya is manufactured in Europe itself from various mushrooms [sic]. Oil can also be expressed from the beans, and in some parts of Central Europe the cultivation of this bean as food for cattle has been tried."

In the section on "Countries," under Asia–Japan we read (p. 344): "787. Besides rice, the principal food-crops are wheat, barley, and soya beans."

"788. Japanese agriculture leaves little room for live stock. Sheep have only recently been introduced in small numbers experimentally. The number of horses is about a million and a half, that of cattle one million, as against nearly two millions of the former and upwards of ten millions of the latter in the British Isles, which have a rather smaller population. Japan is thus altogether without, or very poorly supplied with, some important products. It has no native wool, no milk, butter, or cheese, and a comparatively small supply of leather, which has to be replaced for different purposes by various other materials." Address: London.

824. Giles, Herbert Allen. 1892. A Chinese-English dictionary. London: Bernard Quaritch; Shanghai, Hongkong, Yokohama & Singapore: Kelly and Walsh, Ltd. xlvi + 1416 p. 31 cm. [4 ref. Eng; chi]

• ***Summary:*** This massive volume, weighing almost 12 lb, contains more than 1,450 pages and 13,848 Chinese characters. Contents: Dedication (to the Honourable C.P. Chater). By the same author (17 books). Preface: Number of characters, the characters numbering, duplicate characters, phonetic arrangement, orthography, the tones, the dialects (Beneath the number attached to each character will be found its rhyme (R) as given in the *P'ei-wên-yün-fu.* The romanization of each character is given in Cantonese, Hakka, Foochow, Wênchow, Ningpo, Peking, Mid-China, Yangchow, and Ssuch'uan {Szechwan} dialects, as well as in Korean, Japanese, and Annamese, each being distinguished by its initial letter), the definitions, the entries, etymology, grammar, difficulty of Chinese, personal. Philological essay (incl. tones, ranging from 4 to 9, in ten dialects). Table of sounds.

Examples of soy-related characters:

Chiang (p. 122, No. 1220). "A soy made by mixing salt with bean-flour. Sauce. Pickled food." Fourteen compounds using this character are given, including: Bean sauce, soy. Pickled bean curd [fermented tofu]. Bean sauce. Soy [sauce] is of two kinds, the clear and the thick. Dry relishes. Soy colour–a dark reddish drab. He won't use money for vinegar to buy soy.

Ch'ih (p. 205, No. 1996). "Salted fruits, etc., dried and used as relishes." Four compounds incl.: Salted beans. Soy, sauce.

Ch'ou (p. 259, No. 2521). "Sweet-smelling; strong-smelling. Stinking. *Ch'ou fu.* "stinking bean-curd; noxious."

Note 1. This is the earliest English-language document seen (Oct. 2011) that mentions *Ch'ou fu* which it translates as "stinking bean-curd." This is also the earliest document seen (Oct. 2011) that uses the term "stinking bean-curd."

Fu (p. 458, No. 3686). "Rotten; putrid; worthless." Eleven (p. 458, No. 3686). "Rotten; putrid; worthless." Eleven compounds and sayings include: Bean curd, see No. 11,417. Bean curd officials–a term of contempt applied to certain of the poorer classes of official servants who are compelled to feed largely on this cheap food. Also explained as flabby or unenergetic officials. A Mongol name for cheese. A kind of milk made from beans (*rufu* = milk + fu) [Note: Probably fermented tofu, *not* soymilk].

Huang (p. 522, No. 5124). Yellow. Compounds: Yellow beans [soja].

Mao (p. 778, No. 7,679). "Hair, down, feathers." But the word "Hairy beans" = edamame does not appear here.

Shih (p. 988, No. 9999). See No. 1996.

Ta (p. 1,036-37, No. 10,470). "Great." But the word "Great bean" = soybean does not appear here.

Tou (p. 1,127, No. 11,417). "Beans; pulse." See also No. 11,412. Thirty compounds, incl.: Bean-sprouts. Bean-curd. A cheap restaurant (a bean-curd restaurant). Bean-cake. Bean oil. Big bean, black bean, or yellow bean = the soja bean (*Glycine hispida,* Max.), used for making bean-curd, soy, oil, etc. Ground-nuts.

Yu (p. 1,316-17, No. 13,409). "Oil, fat, grease." 45 compounds incl. Sesamum-seed oil. Linseed. Wood oil. An oil factory. Oil dregs. But "bean-oil" = soybean oil does not appear here.

Note 2. This is the earliest English-language document seen (Aug. 2007) that contains the term "sesamum-seed oil."
Note 3. Herbert Giles lived 1845-1935.

Note 4. Unfortunately, the pronunciation of the compounds is not given (as in Mandarin).

Note 5. This is the earliest English-language document seen (Oct. 2011) that uses the term "pickled bean curd" to refer to fermented tofu.

Note 6. This is the earliest English-language document seen (Oct. 2002) that uses the term "Wood oil" to refer to what would later be called "China wood oil" or "tung oil," a pale yellow drying oil obtained from the seeds of tung trees (any of several trees of the genus *Aleurites*), and used mainly in quick-drying varnishes and paints, and for waterproofing.

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Address: H.B.M. [Her Britannic Majesty's] Consul at Ningpo [Zhejiang province, China].

825. Goodale, George Lincoln. 1892. Cultivated plants of the future. *J. of the Royal Agricultural Society of England* 53:600-13. Third series. See p. 607-08. [2 ref]
• ***Summary:*** Prof. Georgeson, who has lived and taught in Japan, and acquired a good knowledge of its useful plants, recommends: "The soy bean (*Glycine hispida*). This species is known in the United States to some extent, but we do not have the early and best varieties. These beans replace meat in the diet of the common people" [in Japan]. Address: Fisher Prof. of Natural History, Harvard Univ., Cambridge, Massachusetts.

826. *Kansas Agricultural Experiment Station, Annual Report.* 1892. Bulletin No. 32. December, 1891. Chemical and Farm Departments. 4:x. For the year 1891.
• ***Summary:*** The introductory portion of this report gives a summary of each of the Bulletins published by the station during 1891. On p. x, the summary of Bulletin No. 32 states: "Test of the soy bean (*Glycine hispida*) and *Phaseolus radiatus* [adzuki bean], both imported from Japan, with comments on their probable value for this country; the use of plaster and oil meal as fertilizers on millet; the effect of plaster applied as a fertilizer on both tame grasses and prairie grass."

Note: Bulletin 32 is titled "Test of Some Japanese Beans," by Georgeson, Burtis, and Shelton. Address: Manhattan, Kansas.

827. Kojima, T. 1892. Jimawari shôyu bunseki [Analysis of local shoyu]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 125. p. 701. [Jap]
• ***Summary:*** The local shoyu is from Choshi in Chiba prefecture, and Otsu in Saitama prefecture. Address: Yakugaku Kyoshi-bu, Ika-daigaku, Japan.

828. Paillieux, Auguste; Bois, D. 1892. Le potager d'un curieux: Histoire, culture et usages de 250 plantes comestibles, peu connues ou inconnues. Dieuxième édition [The inquisitive person's kitchen garden: History, culture, and uses of 200 edible, little-known or unknown plants. 2nd ed.]. Paris: Librairie Agricole de la Maison Rustique. xii + 589 p. See p. 502-49. Illust. Index. 24 cm. [2 ref. Fre]
• ***Summary:*** Contents of section on soy: Introduction: Work of the Society for Acclimatization with soy, structure of this book, excerpts on soy from past issues of the *Bulletin the Society for Acclimatization.* Botany of the soybean. 1. Soy in Japan: Kaempfer's writings, including miso and shoyu, Japan at the World's Fair of 1878, miso, shoyu, tofu. 2. Soy in Cochin China: Black soybeans, various foods. 3. Soy in China: Soy oil, tofu and fermented tofu, soy sauce, other uses. 4. Soy in Austria-Hungary. 5. Soy in France: Historical, varieties, cultivation, utilization.

The author's full name is Nicolas-Auguste Paillieux (lived 1812-1898; he died on 8 Feb. 1898 at age 85). An illustration (non-original line drawing; p. 503) shows a mature soybean plant bearing many pods, plus a close-up of three pods to the lower right of the plant (from an original in J.R.F. 1882). Note: Desire Bois lived 1856-1946.

Also discusses (listed alphabetically): arachide (peanuts, p. 26-28), haricot mungo (azuki, p. 201-09), kudzu or ko (p. 271-84), quinoa (p. 460-66), souchet comestible (chufa, p. 498-502, with illustration). Address: 1. Member of the Societe Nationale d'Acclimatation 2. Asst. de la Chaire de Culture, Museum d'Histoire naturelle de Paris.

829. Schaedler, Carl. 1892. Die Technologie der Fette und Oele des Pflanzen- und Thierreichs. 2 vermehrte und verbesserte Auflage [The technology of oils and fats from the plant- and animal kingdoms. 2nd ed.]. Leipzig, Germany: Baumgaertner's Buchhandlung. xiv + 1373 p. Illust. 22 cm. [Ger]
• ***Summary:*** In Chapter 16, "Descriptions, properties, and confusions of the oils and fats" is a section titled "Papilionaceae (Leguminosae), papilionaceous plants (*Schmetterlingsblüthler*)." The first plant discussed (p. 525) is the soybean: "1. Dolichos Soja Linn = Soja japonica, Soja hispida = Chinese oilbean (*Chinesische Oelbohne*), *Sao; Sojabohne.* It is native to Japan and China and cultivated in southern Asia. The seeds, which have a piquant (*pikante*) taste and are used as food. The oil, called soybean oil (*Sojabohnenoel*), and incorrectly called "oil of peas" (*"Huile de pois"*) serves as an edible oil.

The composition of the soybean is given, according to Meissl and Böcker. The starch content depends on the degree of ripeness of the beans, according to O. Harz; completely mature seeds contain very little starch, while unripe seeds contain more of it.

The ether-soluble portion of the bean consists of about 90% neutral triglycerides (*Neutralfett*) and 5-10% cholesterol (*Cholesterin*), lecithin, wax, and gum (*Harz*).

Also discusses: Margarine (p. 157, 1325-29). Peanuts (p. 511-20. The oil is called *Erdeichelöl, Madrasöl, Oleum Arachidis, Huile d'Arachide, Huile de Pistache de terre, Ground-nut oil, Earth-nut oil, Pea-nut oil, Moong-phullie* (Hindostan), *Nelay-cadalay* (Tamil), *Katjang-tannah* (Java), *Veru-sanaga Feling, Cochang-gorung* (Sumatra), *Mandobi* (Brazil), *Amendoim* (Brazil)). Almonds and almond oil (p. 526-36). Sesame oil (p. 611-17). Chufa (*Cyperus esculentus, Erdmandel, Grasmandel, indianische Süsswurzel*, p. 655-56. The oil is called *Oleum Cyperi esculenti, Cyperus oil, Huile de souchet comestible*). Linseed oil (p. 672-90). Hempseed oil (p. 721-24). Contains 463 superb text illustrations, including multi-part illustrations of the peanut plant, seeds, and flowers, Underwood's peanut picker (wooden machine), Crooker's wooden separator for peanuts, and a metal peanut

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sheller. Also a multi-part illustration of the almond seed and flowers. The soybean is not illustrated.

Note: Carl Schaedler was born in 1843. The author of the first edition of this book, Paul Lohmann, who had exactly the same position at the same place in Berlin as Schaedler, died shortly before this second edition was published. Thus, Dr. Schaedler finished preparing it for publication. Address: Vereideter Chemiker und Sachverstaendiger der Koenigl. Gerichte zu Berlin.

830. Shimizu, Sazao. 1892. Tôfu putomain chûdoku [Ptomaine poisoning from tofu]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 129. p. 1130-33. [Jap]
• ***Summary:*** This is the earliest document seen (Feb. 2012) expressing concern with the microbiological safety of tofu.

Note: *Webster's Dictionary* defines ptomaine (derived from the Greek ptoma = corpse, and first used in 1880) as: "any of various organic bases which are formed by the action of putrefactive bacteria on nitrogenous matter and some of which are poisonous." Webster's defines ptomaine poisoning (first used in 1893) as: "food poisoning caused by bacteria or bacterial products." Address: Gifu-ken, Japan.

831. Suda, Katsusaburô. 1892. Kansai shôyu bunseki seiseki [Analysis of shoyu from Kansai (the Kyoto-Osaka area of southwest Japan)]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 128. p. 1000-03. [Jap]
Address: Kyoto, Japan.

832. Takahashi, Saburo. 1892. Gyo shôyu seibun [Constituents of fish shoyu]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 129. p. 1127-30. [Jap]
• ***Summary:*** Soybeans (*daizu*) are mentioned. Address: Kure, Kyushu, Japan.

833. Tokyo Eisei Shiken. 1892. Kaki shôyu no seibun [Constituents of oyster shoyu]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 124. p. 594-96. [Jap]
Address: Atsugan, Hokkaido, Japan.

834. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*). 1892. Shôyu no seibun [Composition of shoyu]. No. 124. p. 596-97. [Jap]
Address: Naimusho, Eisei Shikensho, Tokyo, Japan.

835. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*). 1892. Shôyu bunseki seiseki [Analysis of shoyu]. No. 125. p. 700. [Jap]
Address: Osaka, Japan.

836. *Temps* (*Le*) (*Paris*). 1893. On lisait dans *l'Avenir de Diego Suarez* du 2 mars cet avis: [One reads in *l'Avenir de Diego Suarez* of March 2 this notice:]. April 8. p. 2, cols. 2-3. No. 11641. [1 ref. Fre]
• ***Summary:*** The governor hurriedly lets the residents know that he has just received from Mr. de Mahy a box of soya bean seeds (*une boîte de graines du haricot* soya), with which is made a cheese [tofu] that keeps for a very long time. It improves with age and that is a precious resource for settlers who live far from the urban centers.

This notice appears to have surprised a few of our colleagues. It did not contain, however, the revelation of an unknown food.

Cheese made from soya is called tofu (*to-fu*). Here is the recipe for tofu, which seems to us of interest to reproduce given the efforts being made to acclimatize this legume in Europe. You begin by softening the seeds of this bean in water, then you crush them in a mortar so as to make a milky paste. When this paste is pressed in a piece of linen it separates into two parts: one [okara] stays inside the linen and is used for animal feed. The other, a liquid which passes through the linen, is rich in emulsified fatty matter and in albuminoidal matter (albuminoids). This liquid is heated; coagulation is facilitated by adding nigari (eau mere / mother water, which flows out of sea salt piles). This curd separates and gives the cheese. It is eaten either raw, or cooked with fish, or most often pulverized. During the winter [after being frozen], it is dried. In this state, it keeps for a very long time.

Soya cheese (*Le fromage de soya*) is a very important food in China. Only the Tartars / Mongols have continued to use [cow's] milk. The Chinese do not consume any such milk. In its place they use soya. Its seed is a sort of solid milk. No other legume contains as much legumin (a substance chemically analogous to casein) as the soybean. None other is as rich in fatty acids. All you need to do is to crush the soya seed, dilute it with water, and filter through a sieve to obtain a product with milklike properties that can be used just as you would milk. Soya cheese looks just like quark cheese (*fromage à la pie*).

The soybean (*La soya*) which is cultivated in Japan, in China, in the Indies [Dutch East Indies, today's Indonesia], in Cochin-China [today's South Vietnam], in Tonkin [today's North Vietnam], etc. is used for more than just making tofu. It is used in these countries in a great variety of ways to make human foods and seasonings. Transformed by cooking in water into a gruel / pap (*bouillie*) which is mixed with salt and polished rice, one obtains miso, which is served at lunch [as the seasoning in miso soup] by many Japanese.

Mixed with barley and submitted to fermentation, after adding additional water and being pressed, one obtains a syrupy liquid, called shoyu, a unique sauce used to season almost all Japanese foods (*mets*), and which is employed in such large quantities that the factories of the city of Nagasaki make more than 1,200,000 kilograms of it each year. Finally, an oil is extracted from the soybean which is the object of an important trade and which serves for both human consumption and in industry.

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837. *Natuur* (*De*). 1893. Soja [Soya]. 42(20):233-34. May 13. [1 ref. Dut]

• ***Summary:*** This Dutch-language periodical appears inside a German-language periodical titled *Die Natur* (Halle). The author of this article (whose initials "CKN" appear at the end) discusses: The soybean plant, named *Glycine Soya* or *Dolichos Soja* or (in Dutch) *de Sojaboon,* which is widely used for food in Japan (where it is called *Mame* or *Daizu*) and China. Food products made from the soybean in Japan: Miso, shoyu (soy sauce), To-fu [tofu] or *Kaas van Daizu;* a brief description is given of how each is made. Soybeans in China, where it is called "Yeou-teou," and where they make a cheese (*Soja kaas*), oil (*eigen olie*), and milk (*melk*) which resembles cow's milk.

Note. This is the earliest Dutch-language document seen (April 2013) that uses the term *To-fu* or the term *Kaas van Daizu* or the term *Soja kaas* to refer to tofu.

Black soybeans (*zwarte Soja*) are widely used. Proteins in the soybean, including legumine. In Europe, by 1881, the soybean was known in Italy, Austria, Hungary, and France (especially at Etampes and Montpelier); from the seeds, people learned to obtain oil, milk, cheese, an excellent cattle feed, and a vegetable for humans–similar to the French bean but much better (*en een groente voor den mensch, gelijkende op onze spersiebonen, maar veel beter*). Soybeans are used by doctors to treat people suffering from diabetes.

In France, the seeds are roasted like coffee beans; the result is a good-tasting coffee substitute (*dure koffie,... een even goed smakend surrogaat verkrijen*).

A large illustration (engraving; see above) shows a soybean plant bearing many pods. In the lower left corner is one large pod. In the lower right is written "Al Clement," which appears to be the artist's name.

Note 1. This is the earliest Dutch-language document seen (Nov. 2012) that mentions soy coffee.

Note 2. This is the earliest Dutch-language document seen (June 2009) that mentions green vegetable soybeans, which it calls *"een groente voor den mensch,..."*

Note 3. This is the earliest Dutch-language document seen (Aug. 2013) that mentions soymilk, which it calls *melk.*

Note 4. This is the earliest Dutch-language document seen (Oct. 2003) that mentions oil from the soybean, which it calls *olie.*

838. *St. Louis Post-Dispatch* (*Missouri*). 1893. Use of the soya bean. Nov. 12. p. 20.

• ***Summary:*** "The use of the Soya bean in the dietary of diabetics has recently attracted much attention. Heretofore the bean has been used only for culinary purposes, the Japanese using a liquid called sooju [shoyu] or soja [soy sauce], a condiment which they prepare by fermenting the seeds of the Soya bean. The Japanese name of the plant is Daidsu [Daizu]. Linnaeus, the great botanist, called it *Dolichos Soja."*

The Japanese call the beans Mame, and make 'miso' or sooju from them. The preparations are used principally in cooking meat. In China an emulsion [soymilk] is made from the oil of the beans [sic, from the whole beans]. It forms a white liquid and is drunk in the districts in which milk is too dear for the poor to buy it. The Chinese also make a kind of cheese [tofu] from the beans. Soy sauce is exported to and used in many European countries. The Dutch call it 'Zoya.' In the East Indies it is known as 'Ket Jay' [sic, 'Ket Jap'] (probably the source of 'catchup' or 'ketchup'). This liquid is obtained by fermentation of cakes of roasted barley and boiled soya bean. After [the first] fermentation salt is added. The whole is kept for two or three years and then the sauce is squeezed out of the mass.

"Bread and biscuit, made from the flour of the beans, have been highly recommended for diabetics on account of the low proportion of starch and the high proportion of fat and proteid. They are said to be pleasant to the taste. Dr. W. Hale White, writing from Guy's Hospital, London, where he has used the bread and biscuit for some time, says: 'They are to patients suffering from diabetes not only a good substitute for gluten bread, but they form a pleasant change from it, and many patients much prefer the taste of them to gluten bread.'"

839. Duthie, John F. 1893. Field and garden crops of the North-Western Provinces and Oudh, with illustrations. Part (volume) III. Roorkee: Dep. of Land Records and

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Agriculture, N-W. Provinces and Oudh (India). Printed at the Thomason Civil Engineering College Press. x + 65 + xix p. + unnumbered plates. See p. 3, 45 and plate LXXXV. [6 soy ref]

• ***Summary:*** "Glycine hispida, Maxim. See plate LXXXV. Soy bean or Japan pea; bhat (N.-W. Himalaya); kajuwa (Tarai); bhatnas, bhatwas (Nepal and N. Tirhoot).

"Natural order *Leguminosæ.* An annual clothed with ferruginous [rust-colored] hairs. Stems stout, suberect, or climbing. Leaves trifoliolate, on long petioles. Flowers small, reddish. Pods 2-3 seeded, axillary, linear oblong, recurved, and densely pubescent.

"The *Glycine Soja,* under which name the soy bean is described in the Flora of British India, is another species, and has been identified with *G. ussuriensis* of Regel, which grows quite wild in Mandchuria [Manchuria], whereas this plant has nowhere been found as unmistakably wild...

"In these provinces its cultivation is confined to the lower slopes of the Himalaya and to a few of the neighboring plains districts. It is grown in poor soils during the rainy season, and represents a very inferior variety of the Japan pea, which under proper cultivation is a much more robust plant, with broader leaves and larger pods and seeds...

"The plant affords excellent fodder for all kinds of stock, if harvested before it is fully matured. From the seed a preparation called *miso* is largely used in China and Japan; and the green pods yield the well known sauce" [sic].

Plate LXXXV, drawn by H. Hormusii, is an excellent illustration of the cultivated soy bean plant (Glycine hispida, Maxim.) showing young and old leaves, flowers, and slightly hairy stems. An inset shows five different views and parts of the flower.

The author acknowledges his indebtedness to Dr. Watt's most useful "Dictionary of the Economic Products of India" and Prof. Church's "Food Grains of India." Address: Director, Botanical Dep., Northern India.

840. Fesca, Max. 1893. Beitraege zur Kenntniss der japanischen Landwirtschaft. II. Specieller theil [Contributions to an understanding of Japanese agriculture. II. Special part]. Berlin: Paul Parey. ix + 929 p. See 187-203, 872-73. Also published as vol. 2 of 2 volumes bound in one (Paul Parey, 1893). [7 ref. Ger]

• ***Summary:*** The chapter on the legumes (*Die Huelsenfruechte,* p. 187-203) is partly a review of the literature, with emphasis on soybeans (*Daizu, Omame, Sojabohne*). He begins by noting that for a nation like Japanese, where the people live predominantly on plant foods (*Pflanzenkost* = vegan diet), legumes are of major importance for the nutrition of the people, in that they offer a substitute for meat. They also supply important nitrogen to the soil. A table (p. 188) shows soybean production and yield in Japan from 1879 to 1887. The area increased from 441,699 *cho* to 466,315. Note: 1 *cho* = 2.45 acres. Production increased from 2,280,135 *koku* to 3,253,790. Note: 1 *koku* = 180 liters or 47.6 gallons. Yield increased from 5.1 *cho/koku* to 7.69. Soybeans like the climate of northeastern *Yezzo* [Hokkaido]. A table (p. 190) gives the date of planting, date of harvest, and days to maturity at Hakodate, Sapporo, and Nemuro (all on Hokkaido). Also discusses: Soy sauce (*Shoyusauce;* p. 190), dates for other locations, and fertilizer (*Düngung*) needs (p. 191-92, incl. phosphoric acid, potash, wood ashes, straw, and superphosphate). A table (p. 193) shows soybean area (in *cho*), production. and yield in 1887 in 6 parts of Japan (Yezzo, northern Japan, central Japan [which had by far the greatest planted area and production], western Japan, Shikoku, Kyushu).

Also discusses: The extraordinarily high nutritional value of the soybean (p. 196), yellow lupins (p. 196), defatted soybean cake (*Daizukasu,* p. 196), shoyu or soy sauce, *Shoyubohne,* and koji (p. 197-99), tofu, *Bohnenkäse,* and *Tofumame* (p. 199), Kori-Tofu and E. Kinch (p. 199).

His analysis of shoyu presscake (*Shoyukasu*) and okara (*Tofukasu*) showed that they contained respectively: Water 53.6 and 85.7%. Ash: 6.7 and 0.5%. Crude protein: 12.6 and 3.8%. Crude fat: 13.7 and 1.4%. Nitrogen-free extract: 6.7% and 5.4%. Crude fiber (*Rohfaser*)*:* 6.7 and 3.2%. *Tofukasu* is a rather good livestock feed, and it is also eaten by poor people. The shoyu presscake, although richer in nutrients than okara, is used, at most, only in small amounts in feeds and then it must be cooked. Living yeast cells in the koji can easily cause stomach diseases and problems, and the presscake also has a high salt content. Note: This is the earliest German-language document seen (June 2013) that uses the term *Tofukasu* to refer to okara.

Miso (4 types; p. 200-02): (1) White miso (*Shiro-Miso:* Low salt content and short shelf life; keeps for 10 days); made with rice koji. Fermented for 3-4 days. (2) Edo Miso (*Yedo-Miso*)*:* Higher salt content, shelf 5-4 months up to 1 year. Made with rice koji. Fermented for 10 days in summer, 30 days in winter. (3) Farmhouse miso (*Inaka-Miso*)*:* Very high salt content. Shelf life: About a year; made with barley koji. Fermented for about 11-12 months. (4) Sendai miso, also known as Red miso (*Sendai-miso: auch Aka-Miso genannt*)*:* Red color and high salt content. Shelf life: several years. Made mostly with barley koji. Fermented for 1½ to 2 years.

Azuki (*Phaseolus radiatus,* with planted area, production and yield for 1883 and 1884, p. 203).

A table (p. 873) shows a valuation of Japan's agricultural production for about 17 major crops (Source: *Japan's Volkswirtschaft und Staatshaushalt*). For each crop, the annual production (in koku), the worth per unit, and the value of the total crop in yen are given. The most valuable crops are: Rice: 40 million koku, 200 million yen. Dehulled barley (*beschalte Gerste*)*:* 7 million koku, 14 million yen. Naked barley (*nakte Gerste*)*:* 5 million koku, 12.5 million yen. Soybeans (*Sojabohnen*)*:* 3 million koku, 12 million yen.

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Wheat (*Weizen*)*:* 3 million koku, 12 million yen. Address: Prof., Dr., Germany.

841. Flagg, Chas. O.; Towar, J.D. 1893. Agricultural Division. *Rhode Island Agricultural Experiment Station, Annual Report* 5:129-62. For the year 1892. See p. 149-52, 156-57. [4 ref]

• ***Summary:*** The section titled "Forage Plants" (p. 149-62) states: "From Dr. O.C. Wiggin of Keysville, Va. [Virginia], was received a small package of Soja beans and two varieties of cowpeas... six varieties of Japanese beans [including two soja bean varieties, Yamagata Cha daidzu, and Kiyusuke daidzu, see p. 157] were received from the Kansas Experiment Station."

"Soja or Soya Bean. (Soja hispida, natural order Leguminosæ)." According to *Henderson's Hand-book of Plants* (p. 417) "'This is a climbing annual plant allied to (*Dolichos*) ("cow-pea"). It is much cultivated in tropical Asia on account of its beans, which are used for preparing a well-known brown and slightly salt [sic] sauce (Soy) used both in Asia and Europe for flavoring certain dishes, especially beef, and supposed to favor digestion.'

"We believe this plant worthy of trial by those who desire a variety of crops for soiling and especially as, in common with all the *Leguminous* plants, it is rich in nitrogenous elements. It could easily be cut and stored as ensilage...

"During the early winter a variety of this bean was extensively advertised by a party in Missouri as 'Cole's Domestic Coffee Berry,' and offered for sale at the extravagant price of $3.50 per pound. Its wonderful merit as a substitute for coffee was set forth in a 'dodger' with 'testimonials' attached. The seed can be purchased of J.M. Thorburn & Co., No. 15 John St., New York, or other large seed dealers, in small quantities, at 15 cents (15 cts.) per pound."

A table (p. 151) gives the composition of soja beans, red clover, and cowpea plants. Values for the soja bean plant are based on three analyses, two grown at the Massachusetts Experiment Station in 1889 and cut August 20th and August 30th, the third grown at the South Carolina Experiment Station and cut in full bloom August 5th 1889."

Another small table (p. 152) gives the fertilizer constituents of the above soja bean plant cut in full bloom: Moisture 7.05%. Nitrogen 2.37%. Potash 1.315%. Phosphoric acid 0.58%. The crop from one acre of soja beans cut and weighed green (27,769.5 lb) has the following fertilizing values, based on the value of each constituent: Vines $34.54. Roots $4.99. Total: $39.53.

"For many years the idea has been prevalent among the farmers of southern New England that it does not pay to sow clover... This condition of things is unfortunate for our agriculture in the light of the discovery within recent years that the *leguminous* plants are able to use the nitrogen of the atmosphere for their growth through the medium of *bacteria* infesting a *nodular* growth upon the their roots. All the clovers, peas, beans, lupines, vetches, spurry, serradella, and sainfoin belong to this class and are generally cultivated for their seeds, for fodder or for green manuring. None other of our ordinary field and garden plants, grasses, cereals, root crops, vines, etc., have yet been shown to posses any such ability to assimilate atmospheric nitrogen, hence are dependent for their growth upon the supply of nitrogen within the soil and rain water, or supplied by the farmer in manure or fertilizers. When purchased, nitrogen is the most expensive element, costing more than three times as much per pound as potash and more than twice as much as phosphoric acid, hence true economy should direct the prudent farmer to invest his money in *phosphoric acid, potash* and the *seeds* of *leguminous plants* in so far as he can use such crops for market, for feeding or for green manuring" (p. 155).

A table titled "Summary of analyses of leguminous crops" (p. 157) compares the composition of soja beans, cowpeas, and three types of "Japanese beans" (Yamagata Cha daidzu, Kiyusuke daidzu, and Black Podded Adzuki). The two "daidzu" beans are actually types of soja beans.

Note 1. This is the earliest document seen (Aug. 2011) concerning soybeans in Rhode Island, or the cultivation of soybeans in Rhode Island. This document contains the earliest date seen for soybeans in Rhode Island, or the cultivation of soybeans in Rhode Island (1892). The source of these soybeans was Dr. O.C. Wiggin (of Keysville, Virginia), and the Kansas Agricultural Experiment Station.

Note 2. This is the earliest document seen (Jan. 2000) that mentions J.M. Thorburn & Co. in New York, or Mr. Cole in Missouri, as seedsmen for soja beans.

Note 3. This is the earliest English-language document seen (June 2007) that uses the word "nodular" or the word "bacteria" (or "bacterium") in connection with root nodules.

Note 4. The authors apparently do not realize that Yamagata Cha-daidzu and Kiyusuke daidzu are the names of soja bean varieties (see table p. 157).

Note 5: This is the 2nd earliest document seen (Nov. 2012) that contains the term "Cole's Domestic Coffee Berry," used as a clever name for the soybean. Address: 1. B.Sc., Director of the Station, Agriculturist, and President of the Board; 2. B.Sc., Asst. Agriculturist. Both: Providence, Rhode Island.

842. Goodale, George Lincoln. 1893. Some of the possibilities of economic botany. *Smithsonian Institution Board of Regents, Annual Report* p. 617-46. See p. 631. [1 ref]

• ***Summary:*** This is the complete "Presidential address delivered before the American Association for the Advancement of Science, at Washington [DC], August, 1891. from the *Proceedings of the American Association for*

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the Advancement of Science, vol. XL, pp. 1-38; also, *The American Journal of Science,* Oct. 1891, vol. XLII, pp. 273-303.

Page 631: "Prof. Georgeson, formerly of Japan, has kindly identified some of these [foods and plants] for me,..."

"The soy bean (*Glycine hispida*)**.** This species is known here to some extent, but we do not have the early and best varieties. These beans replace meat in the diet of the common people" [in Japan]. Address: M.D., LL.D., Fisher Prof. of Natural History, Harvard Univ., Cambridge, Massachusetts.

843. Henry, Augustine. 1893. Notes on economic botany of China. Shanghai, China: Printed at the Presbyterian Mission Press; Kilkenny, Ireland: Boethius. 68 p. See p. 13-14. 18 cm. Facsimile edition printed in 1986 by Boethius Press, Kilkenny, Ireland. [Eng]

• ***Summary:*** The book begins: "Missionaries and others living in the interior, are often in a position to make enquiries concerning the natural production of China, the results of which would be of great service to science. I intend to publish a few notes, pointing out the direction in which such work might be done as regards articles derived from the vegetable kingdom."

The author focuses on the vegetable products of Shêng-king [Liaoning, a province in northeast China whose capital is Mukden]. The soja bean is a staple of Newchwang trade.

"7. The Soja bean, *Glycine hispida,* Max. is noted for its numerous varieties and manifold uses. *Ta-tou* is the book-name of the *species;* but in the colloquial the varieties have each a distinct name, and these have not been very well made out for China. In Japan there are five great varieties, the white or yellowish, green, black, brown, and spotted, divided into sixteen sub-varieties, according to difference in form (which varies from spherical to flattened elliptical) size and colour. These sub-varieties differ in their use, time of arriving at maturity, etc. In China the chief kinds are *Huang-tou* [Yellow soybean] and *Hei-tou* [black soybean]: and perhaps the following sorts mentioned in the Paris Ex. C. [Exhibition Catalogue?] as occurring at Newchwang, are simply varieties of the Soja bean, viz., *Pai-tou* [*white soybean*]*, Ch'ing-tou* [green soybean] and *Ma-tou* ["sesame bean"]. Information is wanted about these varieties. The Soja bean is the most important of the legumes cultivated in China; from its seeds *bean-oil* is produced; the refuse in the manufacture of which, *bean-cake,* is largely used in the South for manuring the sugar plantations. From certain varieties *bean-curd, soy* and *bean-sprouts* are prepared...

"For Sheng-king we wish descriptions and uses of the different varieties of the Soja bean, distinguished according to the local names."

Also discusses other species of beans and peas cultivated in China (p. 12-13; each is accompanied by two Chinese characters): 1. *Pien-tou,* the *lablab* bean, of which there are two varieties, one with purple, the other with white flowers. Botanists call this species *Dolichos lablab,* L.

2. *Kang-tou, Vigna sinensis Hassk,* the "chow-lee" of India [cowpea].

3. *Tao-tou* ([jack bean], literally "sword bean"), *Canavalia ensiformis,* D.C., the "over-look" pea of the West Indian negroes.

4. *Tsan-tou* ("silkworm bean"), *Vicia Faba,* L, the common bean, the broad bean.

5. *Wan-tou, Pisum sativum,* L., the common garden pea.

6. *Phaseolus mungo,* L. This haricot includes in China two if not more very distinct varieties. (a). *Lu-tou* ("green bean"), the Chinese vermicelli pea [mung bean]; the small seeds of this are ground into flour and are used for making the kind of vermicelli known as *Fên-t'iao.* (b). *Ch'ih-hsiao-tou* ("red small bean"), small red haricots [azuki].

8. Besides the foregoing there are several other species of beans cultivated to a small extent, among which may be mentioned the *Man-tou* of Hupeh, *Phaseolus chrysanthus,* Sav. and lentils, *Ervum Lens,* L. which is called at Ichang *Chin-mai-wan.*

Note 1. This is the earliest English-language document seen (April 2003) that uses the term "lablab bean."

Also: kudzu (*ko,* p. 57-59), which is said to grow all over China, especially in the vicinity of Kiukiang.

Note 2. The edition published in Ireland in 1893, having the same title, has E. Charles Nelson as the 2nd author. It has vx [15] pages of front matter plus 6 unnumbered pages. And it is 21 cm tall, rather than 18. According to OCLC / Worldcat (Oct. 2010) the edition published in Ireland is owned by 44 libraries worldwide, compared with only 2 for the Shanghai edition. Address: I.M. Customs, Shanghai, China.

844. Japan, Dep. of Agriculture and Commerce, Agricultural Bureau. 1893. A descriptive catalogue of the agricultural products exhibited in the World's Columbian Exposition. Tokyo: Printed at the Seishibunsha. 115 p.

• ***Summary:*** The World's Columbian Exposition was a World's Fair held in Chicago, Illinois, to celebrate the 400th anniversary of Christopher Columbus's arrival in the New World in 1492.

Discusses 38 commercial products, with most divided into basic information and products made from the crop. Includes: Rice ("The manures applied to rice fields" include "green manures, farm yard manures, composts, ordures, fish manures, Sake kasu, Shoyu kasu, rape seed cake, and soy bean [cake] {p. 11}), barley ("It is much used as the material for making miso. Miso is prepared by pounding together boiled soy bean, salt, and the Koji {yeast}* prepared from common barley or naked barley; and is one of the most common articles of food in Japan." (Footnote: *"Eurotium oryzae). It [barley] is also used for making *ame* {p. 23}).

Wheat ("Wheat is used principally for preparing soy

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[sauce], vermicelli, onmen [sic, somen?], undon [sic, udon], and several kinds of confectionary" {p. 27}. It is also used for making *fu* or wheat gluten; "Roast 'fu' is used as food by boiling it with soup, soy, mirin, etc." {p. 29}), naked barley (*Hordeum nudum; hadakamugi*), Job's tears (*Coix lacryma; hatomugi*), soy bean (*Soja hispida; daidzu*), adzuki (*Phaseolus Radiatus,* [*azuki*]), sasage (*Dolichos Umbellatus*), haricot bean (*Phaseolus vulgaris*), peas, buckwheat ("Sobakiri" and "Kôri-soba" are both seasoned with soy sauce {p. 46}), rape seed (*Brassica chinensis, natane*) and rape seed oil (*natane abura*), sesame seeds (yellow {*kigoma*}, white {*shirogoma*}, and black {*kurogoma*} are displayed) and sesame oil (made from only yellow and white sesame), yegoma (*Perilla occimoides*), hemp, shiitake, chilli (*Capsicum Longum; tôgarashi;* "The fresh unripe fruit and leaves of certain varieties are eaten by cooking them with soy, sugar, "Katsuwobushi" [katsuobushi],* etc." {p. 103}). Also discusses: Dried daikon (p. 109-11), konjak flour (*Conophallus konjak; konniak-ko, konnyaku;* "For cooking, it is cut into small pieces and boiled with soy, soup, mirin, sugar etc." {p. 112}), kampio (*Lagenaria vulgaris; kampio* [*kampyo, kanpyo*]*;* "It is used as an article of food by boiling with water, soy, sugar, mirin etc." {p. 113}), wine.

Concerning the soy bean: In 1887, the total area of arable land devoted to soy bean cultivation is 4,633,152 *tan* (1 *tan* = 0.245 acre; thus 1,142,472.2 acres or 462.352.16 hectares). The total production of soy bean in the Empire was estimated to be 3,253,790 *koku* [419,459 metric tons] (1 *koku* = 180 liters, and 1 bushel = 35.2390 liters; thus 585,682,200 liters = 16,620,284 bushels).

Note 1. From the above figures, a yield of 14.53 bushels per acre can be calculated.

From 1887 to 1891 the price of soybeans per *koku* ranged from 4.180 yen in 1888 to 5.319 yen in 1890. Four specimens of soybeans were exhibited: Green soy bean (*awo-daidzu*). Black soy bean (*kuro-daidzu*). Common soy bean.

"Daidzu or soy bean is extensively used in Japan to prepare various kinds of foods indispensable for the daily meal, such as 'soy' or 'shôyu,' 'tamari' (a kind of soy), tofu, and miso. It is also largely used as a food for horses and manure [bean cake].

Note 2. This is the 2nd earliest English-language document seen (April 2012) that mentions tamari, which it calls "tamari" (not "tamari shoyu").

A analysis of the percentage composition of 3 kinds of soy beans analyzed by the Sanitary Experiment Station at Tokio is given; Green soy beans have the highest crude protein content (42.85% with 12,28% water). White soy beans (*shiro-daidzu*) have the highest ash content (5.00% with 13.46% water). Black soy beans have the highest fat content (18.26%, and the 2nd highest crude protein content 40.25%, with 11.09% water). Soy bean (*Itachi-daidzu*) from Saitama prefecture.

Although daizu is abundantly produced in Japan, since its daily consumption by all classes of people is great, it is now imported from China and Korea in large quantity. However imported soy bean is never used to make first class shoyu or soy, since the imported beans are inferior to those produced in Japan.

A table shows the quantity (in *kin*) and value (in *yen*) of soy bean exported from Japan from 1887 to 1891; 2.1 million *kin* were exported in 1889.

Four specimens of soy sauce are on display. Two brands (the trade marks are shown) are made by Mr. Mogi Shichirouemon, and two are made by Mr. Mogi Saheiji. All are made at Noda-machi, Chiba prefecture, Japan. Brands (a) and (c) are of the first quality; brands (b) and (d) are of the second quality.

A table shows the amount of shoyu made in Japan each year from 1887 to 1891; the amount ranges from 1,304,551 *koku* in 1888 to 1,157,982 *koku* in 1890. Since 1 *koku* = 180 liters, the amount made in 1888 is 234,819,180 liters. The total number of shoyu manufacturers in 1889 was 10,682. A table shows the price (in yen) of various brands and quantities of shoyu from 1887 to 1892. A brief description of the process for making shoyu is given. The word "barm" is used instead of koji. Either barley or wheat can be used with daizu to make the barm. The "mixture is kept for about 25 months, stirring it occasionally with a paddle, say twice a day during winter and three times in summer, and when it is fermented to the required degree, soy is extracted by means of a soy press. The clear liquid thus obtained is pasteurized by heating to about 130º F. and when entirely cooled, it is transferred into casks."

As shoyu is manufactured from daizu, wheat, etc., "it naturally contains a large quantity of albuminous matter. Shoyu is used in Japan as table salt is in Europe and America; consequently it is indispensable for daily use for cooking fish, meat, vegetables. etc. It has a remarkable merit when applying it in the place of sauces (like 'worcestershire') for beefsteak, fry, stew, etc. It answers better than salt when used with cold meat.

"Japanese soy or 'Shoyu' has long been exported to various parts of Europe where those who once taste it never fail in extolling its flavour. It is said that in Holland, Japanese soy has been used by many people from long years ago and highly esteemed by them." A table shows the chemical composition of shoyu.

"Since the fine flavour of Japanese soy has recently become known to people abroad, several trial consignments were made both to Europe and America, and the result, though it has obtained a high reputation among them, still it has not yet become a leading article of export." A table shows the annual amount and value of shoyu exported from Japan from 1887 to 1891. It ranges from 1,302.71 *koku* worth 11,091 in 1887 to 3,749.01 *koku* worth 41,028 yen in 1891. Thus the exports are growing rapidly.

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Three specimens of tamari are one display, one dilute and one concentrated. The first two are made and sold by Mr. Ishima Mosaku. The 3rd (regular tamari) is made and sold by Mr. Morimoto Chôhachi. All are made at Yokkaichi in Miye [Mie] prefecture. Tamari is made chiefly in the prefectures of Miye, Aichi and Gifu [in central Japan]. Tamari is very similar to shoyu except that no wheat is used in manufacturing tamari.

Tofu (bean curd): "Tofu is one of the most favourite foods of Japanese and sold in all places both in towns and villages. The specimen here exhibited is called Yakidofu and is prepared by roasting partially dried 'Tofu' over a charcoal fire." "As 'Tofu,' sometimes called bean curd, being a coagulated vegetable albumen of soy beans, it contains a large proportion of nutritious matter, most important to human life, especially, to those who subsist mainly upon vegetables." The price of this Yakidofu is 18 yen per 10 dozen.

Note 3. This is the earliest English-language document seen (April 2013) that mentions grilled tofu, which it calls *Yakidofu.*

A specimen of Kôri-tôfu or frozen bean curd is displayed; it is made in Minami Adzumi-gun, Nagano prefecture. "As it can be preserved for many years it is a suitable for provision for vessels undertaking long voyages."

Concerning adzuki: There are both red adzuki and white adzuki. Early varieties are sown in the spring; late varieties {called aki-adzuki in the autumn}. "It is mostly used for preparing "An"–a pulpy mixture of boiled Adzuki flour and sugar, and in that state is largely used for making various kinds of confectionary." It is also used to make "Sarashi-an or refined flour of 'adzuki," and "shiruko–a juice prepared by boiling the flour with a suitable quantity of water and adding sugar..." Note 4. Shiruko could be described as adzuki bean soup with mochi (rice cake).

Concerning rape seed: "Rape was formerly cultivated to a great extent but since the introduction of Kerosene Oil, the acreage of its cultivation has been much diminished, yet it is grown in nearly all parts of Japan and forms one of the important farm crops."

845. Japan. Dep. of Agriculture and Commerce, Bureau of Commerce (Nôshômushô Shôkôkyoku). 1893. General view of commerce & industry in the empire of Japan. Tokyo: Printed by M. Onuki. ii + 491 p. See p. 22, 37, 67, 247, 324, 345, 349-51, 429-30, 440-41, 469-70, 474. Index.

• ***Summary:*** Name of organization with diacritics is: Nôshômushô Shôkôkyoku. Pages 21-22: A list of all the 71 commodities exported from the port of Kobe in 1891 whose value exceeded ¥10,000. The largest by far was rice (5.5 million yen), followed by tea, matches, and camphor. Also: Kanten or colle vegetable [agar] 408,615. Rape seed oil 114,572. Sea weeds 22,372. Cut sea-weeds 17,765. Soy [sauce] 11,483 yen.

Page 37: After the "Restoration of Meiji," a new port was opened at Kobe, near Osaka. Its principal articles of merchandise were "rice, salt, sugar, tea, soy,..."

On pages 61-67 are tables of Japanese weights and measures and comparative tables with those of the empire of Great Britain, including both troy and avoirdupois. These show Japanese units for length (9 units; the standard is the shaku), area of land (6), capacity (5), and weight (6; the standard is the kwan). In 1885 the Government of Japan joined the Universal Metric Convention, and in 1891 established the present system of weights and measures.

Page 67: Industrial pursuits can be classified into original ones (that existed from ancient times, having first been introduced from China and Corea [Korea]) and those introduced from the West. Original industries include "salt making, sugar making, Sake brewing, soy brewing, oil producing,..."

Page 247: Exports (Class 22) include "Soy. The total value of the latest export is 41,029 yen, and chiefly exported to Hawaii."

Page 324: A table shows imports (both weight and value) of "Oil-cake" from 1887 to 1891, from China, Korea, and Other.

Page 345: Class II–Duty free goods includes "Oil cake."

Page 349: Class II–Duty free goods, includes "All kinds of Mush-rooms, excepting Shiitake, Confectionaries, all kinds of Liquors, Vinegars, Soy [sauce], Oils, and Prepared Tobacco... Sea-weeds excepting Kobu [Kombu, seaweed],..."

Pages 429-30: "Table of the total quantity [weight in picul or catty] and value [in yen] of the commodities exported from Japan to the United States." Soy [sauce] rose from 7,862 catties [1 catty weighs 1.33 lb] worth 261 yen in 1887 to 9,744 catties worth 1,146 yen in 1891.

Page 440-41: Chapter 7, "Commercial and industrial unions in Japan," lists the 2,013 "trade unions" of businesses in the same general field. One of these, "Liquor and soy," has 106 members.

Pages 469-70, 474: Table III lists "Industrial corporations." One class, "Soy and miso," has 4 members and capital of 75,500 yen. Address: Tokyo, Japan.

846. Kaeufliche Saucen [Commercial sauces (Document part)]. 1893. In: F.J. Koenig, ed. 1893. Chemie der Menschlichen Nahrungs- und Genussmittel. Zweiter Theil. Ihre Herstellung, Zusammensetzung und Beschafftenheit, ihre Verfaelschungen und deren Nachweis. Dritte Auflage [The Chemistry of Human Foods and Stimulants. Vol. 2. Their Production, Composition and Properties, their Falsification and Proof of that. 3rd ed.]. Berlin: J. Springer. xvi + 1385 p. See p. 194-95. [3 ref. Ger]

• ***Summary:*** The most widely available sauce is Japanese shoyu (die "Japanisch Soya," or *Shoya,* or Soy), which, in Japan, is made by a fermentation process from barley or wheat (for the malting {koji} phase), table salt, yeasts, water,

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and mainly out of a soybean variety (*Dolichos Soya* or *Soya japonica*) cultivated especially for this purpose. The soybean has an excellent aroma for this purpose. The composition of the soybeans used for this purpose (according to Kellner 1887) are given.

For details on the art of making Japanese shoyu, see Vol. 1, p. 241.

Shoyu is a very important foodstuff / seasoning (*Nahrungsmittel*) in Japan; it is enjoyed with almost all dishes and must partially take the place of meat. Each year in Japan about 540 to 720 million liters are manufactured; the Japanese enjoy, on average, 60-100 cc of shoyu (*Shoya*) per day.

The next section is basically a summary of Tahara and Kitao (1889) Nagai and Murai found the composition of Japanese shoyu to be as follows (in gm per 100 cc): dry matter 35.17, total nitrogen 8.93, sugars 4.44, dextrin 4.56, alcohol 0.14, volatile acids = acetic acid 0.16 gm, non-volatile acids = lactic acid 1.08 gm, ash 14.67 gm, specific weight (relative density) at 21ºC 1.199.

A large table at the bottom of p. 195 gives a detailed nutritional analysis of nine commercial sauces by C. Söllscher and F.J. König. These nine include: Essence of Anchovies, Harvey-Sauce, Japanese Soya (shoyu), Indian Soya, Beefsteak Sauce, and Maggi's Suppen- und Speisegewürze (Seasoning for Soups and Foods). The contents of a typical bottle and the relative price are also given: Japanese Soya is the most expensive (2.75) and Beefsteak Sauce is the least expensive (1.50).

Note: This is the earliest document seen (April 2012) that mentions an HVP sauce product (Maggi's).

847. Koenig, Franz Joseph. ed. 1893. Chemie der menschlichen Nahrungs- und Genussmittel. Zweiter Theil. Ihre Herstellung, Zusammensetzung und Beschafftenheit, ihre Verfaelschungen und deren Nachweis. Dritte Auflage [The chemistry of human foods and food adjuncts (stimulants / enjoyables). Vol. 2. Their production, composition and properties, their falsification and proof of that. 3rd ed.]. Berlin: Verlag von Julius Springer. xvi + 1385 p. See p. 194-95, 389, 486-90, 529-30, 1044-53, 1071. Illust. Index. 24 cm. [12 ref. Ger]

• ***Summary:*** Summaries of early studies on the chemical composition of soybeans and various soyfoods, including some original studies. Discusses (p. 194-95) commercial sauces, including Japanese shoyu (*"Japanisch Soya oder Shoya oder Soy"*). See separate entry.

Discusses (p. 1044-51) adulteration of coffee and coffee substitutes. Under "Coffee made from legumes" (p. 1051) we read: "The soybean (compare p. 486) is also used for the preparation of a coffee substitute." A table (p. 1053, based on Kornauth) compares the composition of 12 roasted seeds and fruits used to make coffee substitutes, including chicory, barley, figs, soybeans, white lupins, and chufa.

An illustration (p. 1071) shows different cellular layers of the soy bean sprout leaves (*Keimblätte*)–after an illustration by J. Moeller.

Also discusses: Peanuts (*Erdnusse, Arachis,* p. 322, 373, 385, 389, 494, 621, 686, 1051). Sesame seeds (p. 322, 385, 372, 389, 408, 494). Almonds (p. 322). Hemp (p. 322, 385, 493). Lupins (p. 372, 385, 389, 490-91, 1050, 1053, 1068-69). Chufa (*Erdmandel, Cyperus esculentus,* p. 1051, 1053). Address: PhD, Prof. (who teaches but does not have a faculty seat or voting rights) at the Royal Academy and Head of the Agricultural-Chemical Experiment Station at Muenster, in Westphalia, Germany (ordentlicher Honorarprofessor der Koeniglichen Akademie und Vorsteher der agric.-chemischen Versuchsstation Muenster i. W.).

848. Neale, A.T. 1893. III. Field tests of forage crops. I. Varietal tests of southern pea vines, &c. *Delaware Agricultural Experiment Station, Annual Report* 5:31-35. For the year 1892.

• ***Summary:*** Contents: Relative yields of green crop per acre. Relative yields of seed per acre. Cost of seed. Peculiarities of growth. Effects of commercial fertilizers upon crop yields. Summary.

The "Soja bean, a Japanese plant, is urged by a few farmers and experimenters as superior to all other fodders." At Dover, the soja bean gave a maximum yield of 8.6 tons/acre of green vine fodder when fertilized with Nitrate of Soda and Muriate of Potash. By comparison, the best cow pea varieties gave 12.5 and 12.6 tons/acre under similar conditions. Soja bean seed costs $2.25 per bushel, and 1 bushel sowed 4.0 acres.

The section titled "Peculiarities of growth" states (p. 33): "The Soja bean is upright in its growth, makes a great deal of foliage and does not run or tangle; it, too, could be easily handled with mowing machinery, &c., if thickly planted."

Note: This is the earliest document seen (Jan. 2003) that uses the word "machinery" ("mowing machinery") in connection with soybean harvesting or production. Address: Director of the Station, Newark, Delaware.

849. Sagot, Paul Antoine; Raoul, Edouard François Armand. 1893. Manuel pratique des cultures tropicales et des plantations des pays chauds [Practical manual for tropical crops]. Paris: Augustin Challamel. xxxii + 734 p. See p. 151-55. [Fre]

• ***Summary:*** In the chapter titled *Légumes et Culture Potagère,* there is a section on soybeans and soyfoods written by Edouard Raoul titled "Soja hispida Moench, Pois Soja, Pois oléagineux de Chine. Daïzou des Japonais." It discusses the widespread culture of soybeans in southern Asia, China, and Japan. "The seed is very rich in oil and in casein soluble in water. Its consistency, especially before maturation, is very tender and fine. Unfortunately it does not have much

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taste of its own. The pod is very small and contains only 2-3 seeds. It is not easily opened. I prefer soybean seeds having a color that is clear fawn-colored or tawny (*fauve*) or greenish, to those which are black."

"The plant must be sown from very fresh seeds. The germination (in Europe) is often very unequal, and many of the seeds don't develop... Some seeds sent by me to French Guiana (*la Guyane*) have been cultivated by Mr. Bar au Maroni, and have borne fruit, but I don't have precise details on their vegetation or ease of utilization."

Brief descriptions are then given of miso, shoyu, tofou (tofu), *kouri-tofou* [dried-frozen tofu], "which is nothing but tofu dried using heat" [sic], and *uba* (yuba, "a product very rich in nitrogenous materials {proteins} and fats"), followed by a list of the names of the best-known Japanese soybean varieties, and a discussion of the difference between *Glycine hispida* Moench (*Kuro mame* [black soybeans], *no mame, kuzu, yama-daizou* [wild soybeans]), and *Glycine soja* Siebold et Zuccar. (*kiu mame* and *tsourou-mame*). Typical analyses of the stems and leaves, seeds, and entire plants are given based on research conducted by M. Joulie. A comparison of the nutritional value of soya and wheat is given based on the research of Wechler in Austria and Messrs. Fremy, Muentz, and Pellet in France. Dr. Menudier uses soy flour in diabetic diets.

Also discusses: Winged beans (p. 149-50; *Psophocarpus tetragonolobus* Dec., *Dolichos tetragonolobus* L., *Pois carré*). Peanuts (p. 150-51; *Arachide, Arachis hypogœa*). Bambarra groundnuts (p. 151; *Voandzou, Voandzeia subterranea* Dup. Th.).

Note 1. This is the earliest document seen (May 2009) concerning soybeans in French Guiana, or the cultivation of soybeans in French Guiana. This document contains the earliest date seen for soybeans in French Guiana, or the cultivation of soybeans in French Guiana (1893). The source of these soybeans was Prof. E. Raoul, who was apparently in France.

Note 2. This is the earliest French-language document seen (April 2013) that uses the term *kouri-tofou* to refer to dried-frozen tofu.

Note 3. Sagot lived 1821-1888.

Note 4: This is the earliest document seen (Nov. 2003) concerning general information on soybean production in the tropics.

Note 5. Notice that "kuzu" is given as a name for the wild soybean in Japan. Address: 1. Docteur en Médecine, Ancien Chirurgien de la Marine, Ancien Professeur d'Histoire Naturelle a l'École Normale Speciale de Cluny; 2. Pharmacien en Chef du Corps de Santé des Colonies. Professeur du Cours de Productions et Cultures Tropicales a l'École Coloniale.

850. Zavitz, C.A. 1894. Report of the experimentalist. *Ontario Agricultural College and Experimental Farm* (*Guelph*), *Annual Report* 19:53-130. For the year 1893. See p. 79.

• ***Summary:*** The section titled "Beans, comparative test of 17 varieties" (p. 79), states: "In 1893, 17 varieties of beans were grown on plots side by side... Each plot was one one-hundred and-sixtieth of an acre. The beans were planted in rows 25 inches apart on May 22nd..."

A table shows the names of the 17 varieties and the yield of each. "Yellow Soy" yielded 20.4 bushels/acre and Edamaine [Edamame] yielded 7.7 bushels/acre. The seed of the Yellow Soy was obtained from the United States, and that of the Edamaine [sic], a fodder plant, was obtained from the Kansas Experiment Station [from Prof. Charles C. Georgeson]. "Other varieties [sent by Georgeson] which did not mature their seed were Yamagata, Cha Daidzie [sic, Yamagata Cha-Daidzu], Kiyusuke Daidzie [sic, Kiyusuke Daidzu; both soy bean varieties] and Black Podded Adyuski [sic, Adzuki]. These varieties will be tested again in another year.

Note 1. This is the 2nd earliest document seen (Jan. 2010) that clearly refers to soybeans in Canada, or in Ontario province, Canada, or to the cultivation of soybeans in Canada, or in Ontario province, Canada (May 1893). The source of these soybeans was the United States, probably from Kansas.

Note 2. This is the earliest document seen (Jan. 2010) by or about C.A. Zavitz in connection with soybeans. Zavitz apparently does not realize that Yamagata Cha-daidzu and Kiyusuke daidzu are the names of soja bean varieties (see p. 79).

Note 3. This is the earliest document seen (Jan. 2010) in which C.A. Zavitz states that he obtained soybeans from Kansas. Between 1890 and 1893 the Kansas Agricultural Experiment Station and Prof. Charles C. Georgeson who worked there published more than twenty articles on soybeans; Prof. Zavitz probably read at least one of these before he contacted Kansas to request soybean seeds.

Note 4. Bound at the back of this volume is the 15th "Annual Report of the Ontario Agricultural and Experimental Union." Address: B.S.A., Experimentalist, Ontario Agricultural College [Guelph, Ontario, Canada].

851. McCarthy, Gerald; Emery, F.E. 1894. Some leguminous crops and their economic value. *North Carolina Agricultural Experiment Station, Bulletin* No. 98. p. 133-54. March 1.

• ***Summary:*** This bulletin contains three parts, the first two of which discuss soy beans. Part I, titled "Legumines as improvers of the soil," by G. McCarthy, states: "Among the natural orders or families of plants, none hold a higher place in relation to human welfare than the *Leguminoseæ* or Pulse family. This family includes every variety of bean, pea, clover, medic, vetch, and many useful and poisonous drugs, besides a number of the finest ornamental and timber trees. The legumines were among the first vegetables cultivated by

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mankind, and have ever been among those most esteemed. Nearly all of this family of plants have a peculiarly-shaped butterfly-like flower, and the seeds are enclosed in pods, which are often arranged in one-seeded joints. Both the stems and the seeds of all the legumines are very rich in albuminoids–the food which goes to form the muscular or lean-meat portion of flesh, and are therefore especially valuable for a young and growing stock and for working animals.

"In North Carolina, the most valuable and generally used forage and fertilizing plants of this family are the true clovers, medics [such as black medic (*Medicago lupulina*) and burr clover (*Medicago denticulata*)], Japan clover, vetches, cow-peas, and Japan peas... It is well know that most or all of this family of plants have a property possessed by no other family of plants–that of harboring in their roots a species or class of yet unnamed microbes which fix the free-nitrogen of the air which is then absorbed and utilized by the plant in its growth and fruition. We can therefore, by stimulating a luxuriant growth of legumines obtain at slight expense the nitrogen required by other nitrogen-consuming crops."

On p. 242 we read: "Japanese peas–*Glycine hispida.*– The Japanese or Mongolian pea is more commonly called 'soja' and 'soy' bean, but it is not a bean. Recently there have been introduced several new varieties of this pea. All the following varieties were sown May 20 [1893] and received the same treatment:

"The common Soja Bean or Soy Pea.–Seed round, yellow. Vigorous growing, hairy, bushy plant attaining a height of 20 to 25 inches. Stems become woody soon after flowering. A very prolific bearer of round yellow seeds, which are sometimes used as a substitute for coffee. The peas, when properly cooked, are edible and palatable. The edible qualities of the soy bean are so highly esteemed in Japan that it is there rarely fed to stock.

"The following directions [recipe] for cooking the 'soy' pea are given by Dr. J.H. Mills, of the Baptist Orphanage at Thomasville, N.C. [North Carolina]: Soak the peas till the skins come off. Then stir the peas in the water until the skins rise to the surface and skim them off. Boil the peas with bacon until soft. Add pepper and butter to suit and serve hot. If the peas are green the preliminary soaking may be omitted. This makes a most palatable dish, well liked by children.

"Japan Pea No. 9.–A vigorous, bushy plant resembling the 'soy,' but smoother and has larger dark-colored seeds. This is the best of the new varieties.

"Japanese Pea No. 7.–A small, slender, bushy plant bearing a fair crop of small cream-colored peas–inferior to the soy and No. 9.

"Japanese Beans–Phaseolus radiatus [Adzuki beans]–*Japanese Bean No. 5.*–A low and slender-growing plant bearing numerous pods well filled with a small red bean which makes excellent soup.

"Japanese Bean No. 6.–A plant scarcely distinguished from No. 5 and of about the same value. Both these beans are for table use only and not for forage."

An illustration (p. 142) by "VAC" or "VC" shows the "Japanese or Soy Pea" plus several enlarged pods in the lower right corner.

In Part III, titled "The fungous and insect enemies of legumines," by Gerald McCarthy, Section C, "Insect enemies," discusses the following insects that damage leguminous forage plants in North Carolina: (1) The pea weevil, *Bruchus pisi,* is the larger of the two common weevils. But *"Bruchus fabæ* [the bean weevil] is our most destructive weevil and is the species which infests cow-peas and table beans [including soy beans] in store [storage]." This weevil is the smaller of the two, "is light yellow in color and quite hairy." As soon as this bean weevil matures in stored beans or cow-peas, it immediately "lays eggs on the hard seeds and these soon hatch into devouring grubs, which, after eating their fill, again produce the winged form to lay more eggs, and so on while the food supply lasts. A few weevils in the stock of beans put into the bin in the fall may increase to millions by the spring and ruin a thousand bushels of beans or cow-peas.

Remedies: If the presence of weevils is suspected, the seeds of beans or peas "should be plunged into water nearly scalding hot–140ºF for five minutes before sowing. As soon as the seed is threshed out and before bagging for storage, it should be placed in a tight bin, or hogshead, or piled in a conical heap on the floor of a tight room and subjected to the fumes of carbon bisulphide."

(2) The clover-seed midge, a two-winged fly, is "a sister species of the notorious Hessian fly, *Cecidomyia destructor.* Also mentions the clover root borer and the clover hay worm.

Note 1. This is the earliest English-language document seen (May 2012) that uses the term "Japanese Pea" or "Mongolian pea" or "Japanese Pea No. 7" to refer to the soy bean. Since "Japanese Pea" is mentioned in only one other document (Soule 1907, p. 280-81, from Virginia) we conclude that this is not the name of a new soy bean variety.

Note 2. This is an early reference to the soybean in connection with Mongolia.

Note 3. This article contains one of the earliest American recipes for cooking whole soybeans.

Note 4. In the late 1800s, the adzuki bean was sometimes given the scientific name *Phaseolus radiatus.* In the U.S., Georgeson of Kansas gave it this name in 1890 and 1892. Later the name was used for the mung bean.

Note 5. This is the earliest English-language document seen (Aug. 2000) that contains the word "entomologist."

Note 6. This is the earliest English-language document seen (March 2007) that uses the word "medic" to refer to a leguminous plant, probably alfalfa (*Medicago sativa*). It is also the earliest English-language document seen (March

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2007) that uses the word "medics" to refer to members of this plant family.

Note 7. This is the earliest English-language document seen (Feb. 2007) that uses the word "legumines" to refer to legumes.

Part II of this article (p. 147-50), titled "The cultivation of leguminous plants for forage," by F.E. Emery, notes that the soy bean was one of the most common "legumines" used for hay, soiling, and silage. "The cow-pea and the soy bean will give better satisfaction for soiling or silage than for hay, unless sown broadcast..." For soiling: "Soy beans grow upright and may be planted alternately with corn in the same row and cut at the same time with it." Address: 1. Botanist and entomologist; 2. Agriculturist. Both: Raleigh, North Carolina.

852. McCarthy, Gerald; Emery, F.E. 1894. The forage plant garden, including full notes taken during growth. *North Carolina Agricultural Experiment Station, Bulletin* No. 98. p. 157-70. March 1.

• ***Summary:*** Pages 169-70 contain sections with the following titles: "Japan or Mongolian Pea.–*Glycine hispida* and Red Bean, *Phaseolus radiatus* [azuki bean]. Japan Pea No. 9.–*Glycine hispida,* variety. Japan Pea No. 5.–*Phaseolus radiatus.* Japan Pea No. 7.–*Glycine hispida,* variety. Japan Pea No. 6.–*Phaseolus radiatus.* Japan Pea.–*Glycine hispida,* common Soy Pea or 'Soja Bean.' The Japanese Peas and Beans."

Some of the information in these sections is very similar to that given in a previous section of this same bulletin, on pages 142-43 but pages 169-70 contain more details–and illustrate the confusion that existed about these plants and their names. The last section titled "The Japanese Peas and Beans" (p. 170) states: "As forage plants the common so-called Soja Bean, more properly named Soy Pea, is by far the best of all these plants. It is later than Nos. 7, 8 and 9, but grows much more luxuriant and will give 50 to 100 per cent. more forage per acre." Address: 1. Botanist; 2. Agriculturist. Both: Raleigh, North Carolina.

853. Schlegel, Gustave; Cordier, Henri. 1894. The Chinese bean-curd and soy and the soya-bread of Mr. Lecerf. I. Tofu. *T'oung Pao* (*General Newspaper*) 5:135-46. March. [11 ref. Eng]

• ***Summary:*** "Of late these Chinese preparations have again attracted the notice of Europeans. The *Temps* in France published last November [sic, April 8, 1893] a note upon the subject after an article in the *Avenir de Diego-Suarez* of 2 March 1893, and Dr. Vorderman, of the civil medical service in Java and Madura... We will add to these notices what is written about the subject by the Chinese themselves.

"I. Tao-fu or Bean Curd. According to 'Collected Omissions of *Sieh-choh'* nothing had been ever heard of the confection of bean-curd before or after the period of the three dynasties of antiquity (B.C. 2205-250), and it was only mentioned for the first time in the work of *Liu-ngan* [*Liu An*] king of Hoai-nan [Huai Nan] of the Han (second century before our era) Cf. Mayers, Chinese Readers Manual, No. 412, Cap. 24."

"The *Tao-fu* or Bean-curd was also called 'Leguminous milk', and was prepared by boiling curds or milk from beans.

"It is further related that when *Shi-tsih* [pinyin: Shi Ji] was governor of *Ts'ing-yang* [pinyin: Qing Yang] (Latitude 30º45', Longitude 115º26') he, in order to purify himself and to rouse the population, did not permit himself the use of meat, but bought every day in the market several pieces of bean curd, so that the townpeople called these curds 'The little slaughtered sheep.'

"The bean of which this curd is prepared is known in science by the name of *Soja hispida,* and has been imported in the form of a meat-sauce from Japan to Europe under its japanese name of *Sho-yu,* the corrupted japanese pronunciation of the chinese *tsiang yu* or 'relish-oil' which this sauce bears in some parts of China, and which has been further corrupted by the Dutch into *Soja,* by which name (also written *soya* and *soy*) it became known all over Europe. We will return to this by and by.

"According to Dr. Vorderman (loc. cit. p. 354) the soy-beans are distinguished in light-colored (cream-color, straw-yellow, light ochre-yellow and amber-yellow), brown and black. The first two sorts are roundish, the last either roundish or oblong, as they come from the one or the other variety of the plant. Accordingly, the plant with roundish seeds is called *Soja hispida, tumida* and that with oblong seeds *Soja hispida, platycarpa,* amounting, with the differences in color, to four varieties: 1. Soja hispida, tumida Beta pallida; 2. Soja hispida, tumida Beta atrospuma [atrosperma]; 3. Soja hispida, tumida Beta castanea; 4. Soja hispida, platycarpa Beta melanosperma.

"No. 2 and 4 are black and serve especially for the fabrication of Soy or Ketchup, whilst No. 1 (pale-yellow) and No. 3 (brown) are used for other culinary purposes.

"Since the Vienna [Austria] exhibition of 1873, when several samples of Chinese, Japanese and Indian soybeans were exhibited, their great nutritive proprieties and richness of azote [nitrogen] and fat have been shown by chemical analysis, and the culture of this plant has been largely introduced into Europe, especially in Hungary."

Note 1. This is the earliest English-language document seen (July 2003) that contains the word "soybeans"–spelled as one word.

König in his work *Die menschlichen Nahrungs und Genussmittel,* 2nd Ed., Vol. II, p. 372, gives an analysis of the composition of 4 types of soybeans. "Dr. Vorderman says that he has not been able to detect amylum [starch] in the Soybeans of Java, China and Annam in applying the reaction of jodium [iodine] upon the section of the bean. The texture of the cotyledons consists principally of oblong, radiating

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parenchyme-cells, about five times longer than broad.

Note 2. This is the earliest English-language document seen (Oct. 2004) that uses the word "cotyledons" in connection with soybeans.

"II. *Tao-kan* or Preserved Bean Curd. The Chinese make of the Soy-beans two preparations, one called in Java *Tao-hu* and the other *Tao-toa.* They both consist of leguminous cheese, obtained from the light-brown beans, principally those obtained from Annam. But at present many Chinese in Batavia prefer the so much cheaper *kadele putih* grown in the *Preanger* and the *Ommelanden* (circumjacent territory of Batavia).

"These lightcolored beans are macerated during five hours in rainwater, when they swell up to about twice or thrice their original size. After having been cleansed from accidental dirt or admixtures, they are ground in a stone handmill, very much resembling that in which Europeans ground colors. One Chinese turns the mill, whilst the other throws the macerated beans, still in their husk, with a little water into the mill, so that the stuff runs as a white, thin mass, by a small gutter, into a tub prepared for its reception. This mass is then heated upon the fire in a large iron open cauldron, until it reaches the boiling-point. The froth is skimmed, and the fluid strained, after boiling, through a cotton cloth, in which a white, doughy residu [sic, residue = okara] remains, having a peculiar oily smell, and which serves as food for ducks and fowl.

"The filtrated fluid, which has a milkwhite color, is mixed, whilst it is being cooled, with a certain proportion of common Madura-salt or with a little calcined gypsum.

Note 3. This is the earliest English-language document seen (Aug. 2013) that refers to soymilk, which it calls the "milk from beans" and "The filtrated fluid, which has a milkwhite color..."

"This gypsum is imported from China in the form of large lumps of radiated gypsum. As it is specially used for preparing the leguminous cheese of the soybeans, it is called by traders in Batavia by the Malay-Chinese hybrid word *Batu-tao* i.e. 'bean-stone.'\ "The salt (or, as in China, the chloride of magnesium) and gypsum change the juice, by precipitation of the legumine [legumin], into a white, gelatineous [gelatinous] mass, which, when sufficiently cooled, obtains a certain consistency, allowing it to be cut into flat square pieces. This can, however, not be done for after two hours after the precipitation. These squares are then laid upon plantain-leaves protected by a white cotton cloth against dust, and hawked about in the streets.

"They have an unpleasant raw bean-flavor, but when mixed with other victuals, this taste is lost. It is used as well in the preparation of Chinese victuals, as in that of the so-called Indian rice-dish.

"In order to preserve the *tao-fu* for continuous use, it is made to *tao-koa* (or dried beans) by the following method.

"The *tao-fu,* cut into flat squares, is plunged into a decoctum of *Curcuma longa,* which colours it intense yellow. These yellow cakes are then wrapped up in white square pieces of cotton, laid between boards and exposed to a certain pressure. Generally they are at the same time stamped with Chinese characters.

"By this pressure a good deal of water is lost, but the cakes can be preserved much longer.

"Dr. Vorderman says that both *tao-fu* and *tao-koa* can be successfully used in the nourishment of feeble children, who refuse to take eggs. *Tao-koa* is also imported from China, but these cakes are much larger than those prepared in Java, and are always stamped with Chinese characters."

Note 4. This is the earliest document seen (Aug. 2002) that mentions Liu An of Huai Nan in connection with tofu.

Note 5. This is the earliest English-language document seen (April 2013) that uses the word "Tao-fu" (or "Tao fu"), or the word "Tao-hu" (or "Tao hu"), or the word "Tao-kan" (or Tao kan") to refer to Chinese-style tofu.

Note 6. This is the earliest English-language document seen (Sept. 2004) that uses the term "pale-yellow" or the term "straw-yellow" to describe the color of soybean seeds.

Note 7. An article in this same issue, titled "The Chinese in Boston" [Massachusetts], notes that presently "1,000 Chinese live in Boston, of which 700 work in the 180 laundries, and about 300 are merchants and traffickers, all dwelling on Harrison Ave. Here one also finds 63 gambling dens (or houses of ill repute) and several others where opium is smoked–visited in part by the most vile class of Americans."

Note 8. We wonder if there wasn't at least one tofu shop in Boston at this time. Address: 1. Professeur de Chinois à l'Universite de Leide [Leiden]; 2. Professeur à l'Ecole spéciale des Langues orientales vivantes et à l'Ecole libre des Sciences politiques à Paris.

854. Schlegel, Gustave; Cordier, Henri. 1894. The Chinese bean-curd and soy and the soya-bread of Mr. Lecerf. III. Tao-yu or soy oil. *T'oung Pao* (*General Newspaper*) 5:135-46. March. See p. 140-43. [10 ref. Eng]

• ***Summary:*** This section is not about soybean oil, but about various types of Chinese soy sauce. "But the Soy-bean does not only serve for the preparation of beancurd, but also for the renowned condiment and sauce known as *Soya,* not only in the far east, but also over all Europe and America. It is known by the name of *Shi* which is explained in the *Yih-ya* as being a homonyme of the word *Shi* or 'taste' and was known by the people of *Thsi* because it is a combination of the five tastes.

Note: This is the earliest English-language document seen (Nov. 2011) that uses the word *Shi* to refer to fermented black soybeans.

"In the dictionary *Shwo-wen* [*Shuowen*] (about A.D. 100) the condiment is described as 'Salt-mixed dark pulse.' Bretschneider (Botanicon Sinicum, II, 165, Shanghai 1892)

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says he cannot understand what the character (dark) is intended to mean.

"If he had looked up the word in our Dutch-Chinese dictionary published in 1884, i.v. *Soya,* he would have found its explication given according to the *Tan-yuen-luh,* written by *Yang-shin,* one of the most prominent scholars of the Ming-dynasty (Wylie, Notes, p. 130), who says: *'Shi* is properly a bean; it is mixed with salt and *darkly* shut up into jars and pots, wherein it is fermented; this is why it is called dark pulse.' In fact, this is the way the Soya is made. The beans are first boiled soft, mixed with an equal quantity of wheat or barley, and left to ferment; a portion of salt, and three times as much water as beans, are afterwards put in, and the whole compound left for two or three months, when the liquid is pressed and strained.

"As we have said above, the mass is fermented in large stone covered jars, and any-one who has visited Canton will have, if not seen, at least smelled the disagreeable stench emanating from the large jars with fermenting Soy in the Soymakers-lane.

"The Chinese say that the character *Shi* does not occur in the nine classics, but that in the commentary of the 'Great bitter, the salt and the sour of the Nine discussions of Sung-yuh,' the 'Great bitter' is explained as being the *Shi* or Soy; and that in the Chapter on Aliments in the Annals is spoken of a thousand measures of salted soybeans (*shi*)*:* whilst, according to the History of Aliments of the former Han-dynasty, soy was sold in (the capital) Chang-ngan by a certain *Fan Shau-ung,* who was on that account called the Soy-Fan."

"In the Elegies of Thsoo (Wylie, Notes, 181) 4th Century B.C., is equally spoken of the Great bitter, the salt, the sour, the pungent and the sweet, where, according to the commentary, the great bitter is the Soy, the pungent are Pepper and Ginger and the sweet Sugar and Honey; and that it means that the juice of the Soybean was mixed with Pepper and Ginger, and that the salt and sour was mixed with Sugar and Honey, so that the pungent and sweet flavor was produced.

"In the book 'Antiquities of Wu-lin' (Wylie, Notes, p. 45), written during the southern Sung-dynasty (13th century), we find mentioned among the victuals in the market: birdsnests (?), gingered soy (*shi*) and honied and gingered soybeans.

"This is the native soy; but the *Poh-wuh chi* (Wylie, Notes, p. 153), published in the latter part of the 3d century, says that Soy is also prepared in foreign countries. The beans are steeped in bitter wine and afterwards dried very hard; they are then boiled in and again dried, which process is thrice repeated. Afterwards the mass is mixed with a proportional quantity of powdered pepper. This species of Soy is called in China *Khang-pih* (Man-strengthening) because it pushes down the humours and composes them.

Bretschneider thinks that though the character *Shi* does not occur in the Classics, Soy was very probably known in olden times under the name of *Tsiang* [chiang or jiang] which occurs in the *Li-ki,* the *Chow-li* a.o. The common name for Soy in Peking, he says, is *Tsiang-yu* or *Tsiang* oil. This name, imported into Japan, but pronounced there *Sho-yu,* from which our word Soya has been corrupted, was first imported by the Dutch from Japan to Europe.

"But this supposition is not supported by Chinese authorities, who describe the *Tsiang* as a salted condiment or sauce made from all sorts of meat, fishes, fruits, etc., but never from beans.

"According to the *Fan-tsze-ki-jen* the *Tsiang* was introduced from *Toung-hai,* the modern *Hoai-ngan fu.* The first quality cost 200 pieces a pound; the middling sort one hundred, and the inferior quality thirty. This condiment was so expensive that we read in the Annals that a thousand jars of briny *tsiang* were put upon a par with a state of a thousand carriages.

"In the *Ping-tsih* are mentioned Briny Tsiang of stewed chicken, Briny Tsiang of stewed fishroe (Footnote: With reference to this condiment, we may mention the *Ké-tsiap,* brine of pickled fish or shell-fish, prepared in Fuhkian [Fujian, W.-G. Fukien] {Douglas [1873], Dict. of the Amoy dialect}, and which is most surely the origin of the word *Ketchup,* another name for soy [sauce]. It has nothing to do with the Malay, though the malay word *Ketjap* 'to taste' has a family-air.), of stewed turtles, of hashed fish mixed with mustard, and of the fat of the elk.

"In old *Nan-yueh* people ate *Tsiang* made of the *Kow-fruit,* a kind of mulberry according to some, but the betelpepper according to others.

"A condiment was also made of the peony roots of the elmseeds which was called *Mut,* of bitter squash and of the bottle-goard [gourd].

"In like wise a sauce was made of the *Yu-tsih* fish, and even of salted bees, crabs, shrimps, or rather lobsters, and ant-eggs. But not a single writer speaks of *tsiang* made of beans, and more particularly of the soyabean" (p. 143).

Note: This is the earliest English-language document seen (Feb. 2007) that contains the word "soyabean" (or "soyabeans"), written as one word. Address: 1. Professeur de Chinois à l'Universite de Leide [Leiden]; 2. Professeur à l'Ecole spéciale des Langues orientales vivantes et à l'Ecole libre des Sciences politiques à Paris.

855. *Charlotte Observer* (*North Carolina*)**.** 1894. The experiment station of Raleigh NC desires to assist the farmers of North Carolina. April 8. p. 1 [unnumbered].
• ***Summary:*** This is apparently an insert on unnumbered pages from the North Carolina Experiment Station. This one, dated 29 March 29 1894, has a section titled "Some late bulletins from the North Carolina Experiment Station" (Nos. 90-98). No. 97 (48 p.) is titled "Digestion experiments," "The digestion work covers feeding with soy (soja) bean hay,

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cat-tail millet, Johnson grass hay,...” No. 98 (24 p.) is titled “Some leguminous crops and their economic value.” “Gives the result of the year 1893, with a great many varieties of clovers, cow peas, soy (soja) beans and other legumines. The bulletin includes discussions of legumines as improvers of the soil, their cultivation for forage, and their fungous and insect enemies.”

The section titled “Field peas” discusses the contents of Bulletin 98 and states: “In the soja bean class, the old yellow variety is the most productive, both in fruit [seed] and foliage, but is much later than some of the newer variety [sic, varieties].

“Concerning the popular names of these plants it may be said that the so-called cow pea is not a pea but a bean and is more properly called Chinese beans. The so-called soja bean is a true pea, and should be called soy pea, or Japan pea. But by whatever names we call them, these plants are among the most valuable crop the southern farmer can grow.

“Gerald McCarthy, Botanist, N.C. Experiment Station.”

856. *Times* (*London*). 1894. The cereal crops of Japan. April 9. p. 12, cols. 2-3.
• ***Summary:*** “A report has been made to his Government by M. Sienkiewicz, the French Minister at Tokyo, upon the cereal crops of Japan, which comprise rice, barley, wheat and rye.” Although only one-eighth of the total area of Japan is cultivated, it produces (in ordinary years) enough food to feed the population of more than 40 million people. “Wheat and barley are largely employed in the manufacture of *shoyu,* or Japanese sauce, and also for making pastry.” Most of the article discusses rice, including huge exports (at high prices) and imports (at low prices).

857. Shimada, Koichi. 1894. Kansai shôyu oyobi tamari shiken seiseki [Results of tests on shoyu and tamari from Kansai, or Western Japan]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 146. p. 297-327. April. [Jap]
• ***Summary:*** Early information on the chemical composition of soy sauce in Japan. The term “tamari” (with furigana attached) is written with the characters “kuki” plus “sho or chiang.” Very revealing.

858. *Weekly Argus* (*Crawfordsville, Indiana*). 1894. Too sacred to touch. Stricken down, he lay where he fell until death came to his relief. May 19. p. 7.
• ***Summary:*** “The ex-lord abbot, of the Otani sect, who died lately at his residence in Kyoto, was the head of all the Buddhist priests in Japan.” He had been in poor health since the previous year. While making his way along a hallway, attended by a male servant, he fell. The alarm was sounded, and instantly about twenty women charged will all sorts of duties and ceremonial offices in the house of the prelate ran to the spot. But so inflexible is the etiquette of the abbot’s household “that in the absence of his wife not one of the attendants might touch the body of the incarnate Buddha, even in the moment of his death agony.” He died about an hour later. Describes the many ceremonies conducted.

The funeral ceremony was on a grand scale. However: “The viands served were of the plainest kind–a little miso soup, with square cut pieces of bean curd, and some rice.”

859. *Chicago Daily Tribune.* 1894. Japanese substitute for coffee. The soy bean declared to be equal to the genuine article (Abstract). July 7. p. 14.
• ***Summary:*** From New York *Sun:* “The agricultural experiment station of the Purdue University of Indiana has issued a circular setting forth the qualities of the soy, or soja bean and advocating its use as a substitute for coffee. The soy bean (soja hispida) is a Japanese plant which can be grown in this country.

Note: This is a summary of: Plumb, Charles S. 1894. “A substitute for coffee.” *Purdue University* (*Indiana*) *Agric. Exp. Station, Newspaper Bulletin* No. 6. 4 p. May 9.

To that is added new information about chicory. “Inquiry among coffee merchants in this city discovered that the soy bean as a substitute for coffee was not commercially or otherwise known here. According to an expert who has been a coffee taster for nearly a quarter of a century, chicory is the only thing which can be considered a substitute for coffee. By substitute he means adulterant, using the word in a good sense... Chicory,... mixed with a good grade of coffee is a better and more wholesome drink than some of the low-grade coffees. The expert said that while he and his partners sold pure coffee to their customers unless they ordered otherwise, they used coffee mixed with chicory themselves.

“Chicory, although considered the best adulterant, is not the only one. Several of the cereals play a part in the preparation of cheap coffee, if they do not pretend to be substitutes. It is said that the entire Canadian pea crop, and a large part of the Michigan crop are devoted to the adulteration of coffee. Rye and barley are also used as adulterants.”

860. *Mataura Ensign* (*Otago, New Zealand*). 1894. Corea [Korea] and Coreans: Roasted dog and other delicacies. In search of a female. Sept. 29. p. 7.
• ***Summary:*** From NZ Press, by Fare Fac: “The Kingdom of Corea has for centuries been a bone of contention between China and Japan... But, with one exception, the Chinese have always come out victorious. This was in 1592,” when Japanese forces invaded the country and defeated the Chinese. Five years later, however, the Chinese again became possessed of the country, and have held it as a suzerain ever since. It was the Japanese who gave the name to the outside world. The Chinese name is Tsiotsien, the native name Kaoli, and the Japanese name Korai, *Anglice* Korea or Corea.”

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The eastern slope is not very fertile, so most of the population lives on the western slope. Here they raise a little barley, rice and [soya] beans in the alluvial pockets of the foothills.

"The [soya] bean cake is the pressed marc of the pulse grown on the western shores. The oil is used internally and externally–it smells worst when it in used outside–also for lighting and lubrication. The marc is used for fuel and stock food. The bean cakes look exactly like 24 inch grindstones and are quite as soft."

861. Carpenter, Frank G. 1894. Li's banquet: A dinner with the premier in one of his palaces. How a Chinese state dinner is served. *Los Angeles Times.* Oct. 21. p. 13.
• ***Summary:*** This banquet took place in Tien-Tsin, China. The dinner was given in honor of General John W. Foster, our ex-Secretary of State, who was then on a trip around the world. As is the custom, no women were present at the banquet.

"All of the Chinese dishes were served in such shape that they could easily be taken up with chopsticks. In place of salt, each man has a little bowl of Japanese soy into which he dipped his food before eating it."

862. *Chemisches Central-Blatt.* 1894. Pflanzenkaese [German review of "On the vegetable cheese, natto" (Abstract)]. 1894(26):1049-50. Dec. 26. [1 ref. Ger]
• ***Summary:*** A German-language summary of the following English-language article: Yabe, Kikuji. 1894. "On the vegetable cheese, natto." *Bulletin of the College of Agric., Tokyo Imperial Univ.* 2(2):68-72.

Note: This is the earliest German-language document seen (Jan. 2012) that mentions natto, which it calls *Pflanzenkäse, der Natto,* or *Nattokäse.* Address: Imperial Univ., College of Agriculture, Tokyo, Japan.

863. *Age* (*The*) (*Melbourne, Australia*). 1894. [Vegetarianism in Japan]. Dec. 29. p. 4. [1 ref]
• ***Summary:*** This untitled article begins: "Japan is moving. The *Sei-i-kwai,* a medical journal published in Tokio, has a number of original articles in the English language, and while the tone and treatment are clearly imitative, there is nevertheless evidence of a certain originality of thought. The following of an extract from an article by Dr. Ishizuka on the Natural Food of Man affords a good example of the peculiar style and treatment." Observes that the teeth of men or closer in structure and movement to those of herbivorous, than of carnivorous animals. "Now, among the foods which are fitted to the normal teeth of men, there is nothing better than the cereals." "It is the general opinion at present that meat and vegetables are necessary articles for animal nutrition, but it is contrary to the principal purpose of creation... Consequently Shaka, the founder of Buddhism, separated days for abstaining from meat and fish in order to regulate the use of them, and Confucius also gave an instruction against the excessive use of meat. It will be clear then that meat is not an article of daily use."

"It is a well known fact that Buddhist monks never eat meat and fish, but they eat beans more than most people in various forms, *miso, natto,* etc."

864. Yabe, Kikuji. 1894. Nattô no kenkyû [Studies on natto]. *Nogakkai Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 24. p. 3-10. Dec. [Jap]
• ***Summary:*** Also published earlier this year under the same title in *Tokyo Kagaku Kaishi* (*Journal of the Tokyo Chemical Society*) 15:196-205.

865. *Eisei Shiken Iho* (*Bulletin of the Imperial Hygienic Laboratories*). 1894. [Analysis of Kansai (southwest Japan) shoyu and tamari]. 9:90-. [Jap]*
• ***Summary:*** JTULM says (2001/08): This serial owned by Faculty of Pharmaceutical Sciences Library, University of Tokyo. Phone: 03-5841-4746.

866. Murai, Junnosuke. 1894. Shôyu bunsekihyô [Tables of shoyu analyses]. *Eisei Shiken Iho* (*Bulletin of the Imperial Hygienic Laboratories*) 8:35-45. (Journal also called Tokio Eiseisiken Iho. Edited by Naimu-sho Eisei-kyoku). [Jap]
• ***Summary:*** Investigated the composition of 40 samples of soy sauce. Discusses shoyu nitrogen, albumins, and peptones. Address: Tokyo Eisei Shikensho, Tokyo, Japan.

867. Yabe, Kikuji. 1894. Nattô no kenkyû [Studies on natto]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 15:196-205. Also in Nogakukai Kaiho 24:3-10 (1894). [Jap]
• ***Summary:*** For an English-language version, see Yabe's 1894 article titled "On the vegetable cheese, natto" in the *Bulletin of the College of Agriculture, Tokyo Imperial Univ.* 2(2):68-72. Address: Nôgaku-shi, Japan.

868. Cavendish, Alfred Edward John; Goold-Adams, Henry Edward. 1894. Korea and the sacred white mountain: Being a brief account of a journey in Korea in 1891. London: George Philip & Son. 224 p. Illust. (40 original, many color). Maps. Index.
• ***Summary:*** This book is an amplification of the author's diary kept during a stay of a few weeks in Korea. Soy is mentioned as follows: Page 12: "Chefoo is the watering-place for Korea, Pekin, Tientsin, and Shanghai, but the foreign portion of it is very small, with three indifferent boarding-houses, but good pears and good bathing, if you do not mind a naked fisherman or two about. The chief exports appear to be straw plait for hats and bean-cake for manure."

Page 33-34: Korean ponies, which carry foreign travelers and their belongings, are very small. The forage ration consists of about 2 lbs. of beans and millet boiled in water, and the whole poured hot into a trough; the average

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feed is two gallons of this mixture, given three times a day, and supplemented by 2 lbs. of chopped straw (rice or millet)." "Other means of transport are found in donkeys, cattle, and coolies."

Page 48: Beans are becoming largely grown in Korea, for the demand for them in Japan is increasing, as they are used in the manufacture of Bean-curd, Miso, and Soy [sauce], while the Japanese are growing instead mulberries for sericulture. Wheat, barley, and rice, the latter of two kinds, one of which grows in dry soil, are also increasing, the export of these in 1890 being–barley, 5,260,533 lbs., value $50,341; beans, 87,950,800 lbs., value $1,004,762; wheat, 5,869,466 lbs., value $60,381; rice, 116,622,000 lbs., value $2,057,868."

Page 54. "Besides flax, maize, and cotton, there were fields of the small millet (*Setaria italica*), substitute for porridge, and of the tall millet, Susu or Kaoliang (*Holcus Sorghum*), with stems 8 to 12 feet high and as thick as a man's thumb, turning to golden yellow or bright mahogany colour; from the latter kind the Koreans make the coarse cloth of which their rough garments are composed, when they do not use Manchester shirtings; also fields of beans, food for cattle and men, and the foundation of Japanese soy [sauce] and our Worcestershire sauce."

Pages 146-47: "He produced some samshu, a muddy fluid which smelt and tasted like Kaffir beer, with strong spirit in it; this peculiar taste is due to the bean-water [water in which soy beans have been boiled] which they mix with the spirit distilled from rice or millet. We were given a bottle of this liquor by the head-man, and the cook bought another of Chinese make, which was quite clear and less diluted with bean-water."

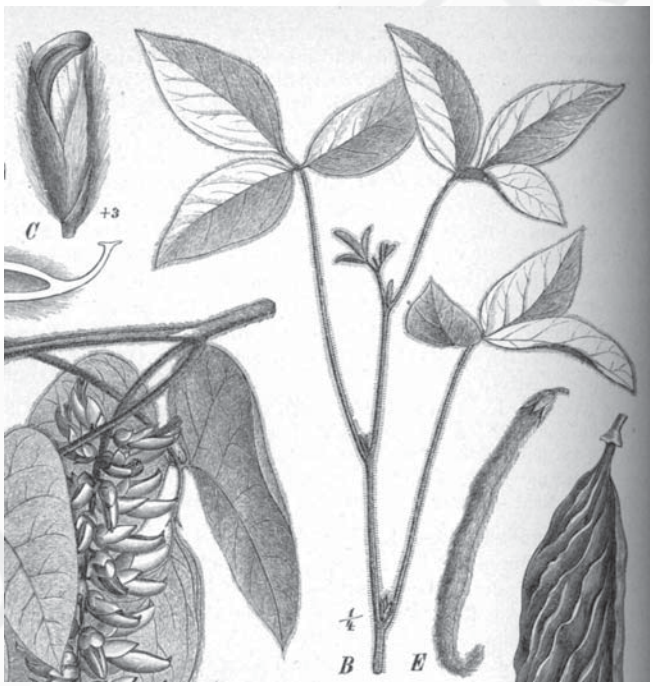
Pages 195-96: "Whilst waiting in the inn to-day, I had plenty of opportunities of observing the nauseous smell of the food greedily devoured by the Koreans. Five or six little dishes, containing various preparations of meat or fish, chillies, [soy] beans, cabbage, rice, &c., were ranged on a little table a foot high, and gave forth a most evil odour. A Korean likes his viands very highly seasoned, and in eating takes a little of every dish into his mouth, that he may enjoy the pleasant mingling of the different flavours." Note: At least one of these dishes probably contained Korean-style soy sauce or miso–but we cannot be sure.

Bean or beans (usually noted in passing as a crop with other crops) are mentioned on pages 66, 67, 68, 134, 138, 150, 191, 194, 199. Address: 1. Captain, F.R.G.S., 1st Argyll and Southern Highlanders, now in Edinburgh; 2. Captain, R.A.

869. Engler, Adolf; Prantl, L.K. 1894. Die Natuerlichen Pflanzenfamilien nebst ihren Gattungen [The natural plant families, together with their genera]. Leipzig: Verlag von Wilhelm Engelman. 396 p. See vol. 3. Part 3, p. 360-61, 392 (Fig. 131 B-D). [Ger]

• ***Summary:*** "390. Glycine L. (*Soja* Savi, *Johnia* W. et Arn., *Notonia* W. et Arn., *Leptocyamus* Benth., *Bujacia* E. Mey.)... There are about 15 varieties in tropical Africa, Asia, and Australia...

"Uses: *G. hispida* Maxim., the Japanese soybean is grown throughout East Asia for the pleasant tasting seeds; they serve also for the preparation of a pungent brown sauce, which in South Asia accompanies almost all meals and is also imported to Europe. The plants also thrive in Germany and are recommended for cultivation, however they do not always ripen in our climate, so their cultivation is unsure.



Illustrations (p. 362, Fig. 131) show (B) the leaves and flowers of a soybean plant (¼ size), and (C) an enlarged soybean flower (3 times normal size).

Also discusses the peanut (p. 324-25) with an excellent five-part illustration. Address: 1. Prof. der Botanik und Direktor des botan. Gartens in Berlin; 2. Prof. der Botanik und Direktor des botan. Gartens in Breslau.

870. Flagg, Chas. O. 1894. Rotation of crops. *Rhode Island Agricultural Experiment Station, Annual Report* 6:176-95. For the year 1893. See p. 190-93.

• ***Summary:*** The section titled "Experiments with leguminous plants" (p. 190-93) states: "The trial of legumes was made upon three of our most uniform and thoroughly exhausted plots of the experiment land on the plain. The object, aside from studying the habits ad growth of the most common leguminous plants, was to determine the effects of different applications of nitrogen. The three plots (permanently numbered 17, 19, and 21) each received an application of 1,200 pounds dissolved South Carolina Rock (16.63 per cent. total phosphoric acid), and 180 pounds

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muriate of potash (50 per cent. potassium oxide), while in addition No. 19 received 150 pounds of nitrate of soda (15.50 per cent. nitrogen), and No. 21 received 450 pounds of nitrate of soda of the same strength, while no nitrogen whatever was applied to No. 17."

Seeds of 32 legumes were sown on 29 May 1893 in duplicate rows 3 feet apart across on each of the three plots. Seven varieties of soja beans were planted. A "Table giving weights of short rows and computed yields per acre" (p. 191) shows the amount of nitrogen or soda applied to each plot and the computed yield of green fodder (in pounds per acre) for the 3 plots. The Soja Bean varieties and their yield range for the three plots are: Medium Green Soja Bean (4613–6597), Medium Black Soja Bean (4386–7108), Early White Soja Bean (1890–2646), Yamagata-cha Daidzu [brown] (2646–4915), Kiyusuke Daidzu (5369–7562), Edamame (3403–3781), Yellow Soy (2193–3856). The two varieties giving the highest yields were Kiyusuke Daidzu (7562 lb/acre) and Medium Black Soja Bean (7108 lb/acre). Yields are also given for Black Podded Azuki (3100–5218) and White Podded Azuki (4537–5596), White Lupine, Blue Lupine, Yellow Lupine, Serradella, and Spurry (*Ornithopus sativus*).

"In our last report (Fifth Annual Report, page 150) we called attention to the merits of the varieties of the soja or soya bean and cow pea as fodder crops especially valuable to the dairy man for summer feeding, soiling and for ensilage. They are tender plants and can only be sown when all danger of frost is past and must be harvested before frost in the fall, therefore their season of usefulness is somewhat limited. The farmer with a large herd of milch cows and limited pasture desires an abundant crop for soiling early in spring and late in autumn. We can find such among the leguminous plants."

Note 1. This is the earliest document seen (one of two documents, July 2013) that mentions the following soybean varieties: Early White, Medium Black, Medium Green.

Note 2. This is the earliest document seen (May 2000) that uses the word "rotation" or "rotations" in the title in connection with soybeans.

Note 3. This is the earliest English-language document seen (March 2006) that uses the word "Azuki" to refer to azuki beans. Address: Director of the Station, Agriculturist, and President of the Board of Managers, Providence.

871. Japanese Bureau of Agriculture (Norinsho). 1894. The fisheries of Japan. *Bulletin of the United States Fish Commission* 13:419-435. For the year 1893.
• ***Summary:*** The short section titled "Utilization of algæ" (p. 434-35) was compiled and arranged from the 1893 "Descriptive Catalogue of Exhibits Relating to the Fisheries of Japan at the World's Columbia Exhibition" by Hugh McCormick Smith.

It notes of amanori (*Porphyra vulgaris*)*:* "The weed is but seldom eaten fresh and nearly always is made into thin sheets like paper, and dried for preservation. This is heated over the fire and eaten with broth, or by itself with a little [soy] sauce. It is also used for various other culinary purposes."

Company name with diacritics is: Nôrinshô.

872. *Landwirtschaftlichen Versuchs-Stationen.* 1894. Personal-Notizen [Personal notices–Dr. O. Loew to replace Dr. O. Kellner]. 43:192. [Ger]
• ***Summary:*** Dr. O. Loew of Munich has been invited to be the successor to Prof. Dr. O. Kellner at the Agricultural-Chemical Laboratory in Tokyo.

873. Nagai, Sôji. 1894. Sake shôyu kokusû sanshutsu shinpô [A new method of calculating the number of koku (a Japanese unit of volume) of sake and shoyu]. Iiyamachi, Nagano-ken, Japan: Published by the author. 75 p. 20 cm. [Jap]*
• ***Summary:*** A *koku* is a Japanese unit of volume. One *koku* is approximately 278.3 liters. One koku was originally defined as enough rice to feed one person for one year. A koku of rice weighs about 150 kilograms or 330 pounds.

Note: A masu is a square wooden measuring box; the sides are joined at each corner using a finger joint or comb joint. They come in different sizes.

1 *go* = 180 cc = 0.763 cups (U.S.).

1 *sho* = 10 *go* = 1800 cc = 1.8 liters = 1.903 quarts = 0.476 gallons (U.S.).

1 *to* = 10 *sho* = 18 liters = 19.03 quarts = 4.76 gallons (U.S.).

1 *koku* = 10 *to* = 180 liters = 190.3 quarts = 47.6 gallons (U.S.). Address: Iiyamachi, Nagano-ken, Japan.

874. Saunders, William. 1894. Report of the Superintendent of Gardens and Grounds. *Report of the Secretary of Agriculture.* p. 365-394. For the year 1893. See p. 378, 387.
• ***Summary:*** In the section titled "Notes in miscellaneous plants (p. 365+), there is a subsection on "Soy bean" (p. 378) which states: *"Glycine soja* is a low-growing annual plant resembling the well-known kidney or bush bean of the gardens. The seeds of this species are used by the Japanese and Chinese in the manufacture of the sauce which they call soy, or soja. This is said to be made by boiling the seeds or beans in water together with millet, wheat, or other grains, the mixture being allowed to ferment, and afterwards refined and stored for use. Soy is a thick, black liquid resembling molasses, but not so tenacious. This sauce is a favorite accompaniment to other food dishes in China and Japan. The leaves [sic, seeds] furnish a valuable oil, and the resulting cake is used for feeding animals and for manure to the fields of sugar cane in Southern China. These beans have frequently been recommended as a substitute for the coffee bean, but they are a poor substitute for it–about equal to scorched wheat or rye."

In the section titled "Interrogatories and Replies" (p.

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385+) is a letter (p. 387) from "E.P.D. (Massachusetts)" who asked: "Can you inform me if the soja or Japan bean is cultivated in this country? It is said to be valuable as an article of food, being more nutritious than meat.

"Reply–The soja bean has been grown more or less, chiefly as a novelty, in this country for many years–for half a century at least–but having gained recognition as being of special importance. It has been recommended for the oil contained in it as a substitute for coffee, etc. It is said to be used in Japan mainly as an ingredient in a sauce called soy. Seeds can be obtained from most of the large seed stores in this country." Address: Superintendent of Gardens and Grounds [USDA, Washington, DC].

875. True, A.C. 1894. Report of the Director of the Office of Experiment Stations. *Report of the Secretary of Agriculture.* p. 417-64. For the year 1893. See p. 439-40.
• ***Summary:*** In the section on "Practical experiments at the Agricultural Experiment Stations" (p. 365+), there is a long subsection titled "Soja beans" (p. 439-40) which states: "These beans are also known as soya and soy beans. Two distinct species have been called by these names. The small bean (*Phaseolus radiatus*) is largely used in Japanese confections, but is of no special value as a forage plant.

"The large bean (*Soja hispida* or *Glycine hispida*) is the true soja bean, and has been found by the stations in a number of States to be a valuable forage plant. In Japan this bean is largely used as food for man and animals.

"The soja bean is an animal leguminous plant resembling the bunch or upright varieties of cowpeas. The growth is erect and from 3 to 4.5 feet high. The short pods are borne thickly on the stocky, bushy plant. Stems, leaves, and pods are densely covered with short hairs.

"The soja bean can not be said to be a new plant in the United States but was introduced from Japan before the organization of the experiment stations in 1888. However, the varieties first introduced were too late in maturing for localities in which early autumn frosts occur. The Massachusetts State Station and the Kansas Station introduced from Japan early varieties of soja beans, Repeated experiments at these stations indicated that these matured in Massachusetts with the same certainty as the common varieties of corn, and that they ripened in Kansas in any season. The varieties which experiments have shown to be early enough for Kansas are Eda mané [sic, Eda-mame; see Popenoe, Mason, and Marlatt 1891], Yellow Soy, Yamagata Cha-daidzu [brown], and Kiyusuké Daidzu. In Kansas soja beans have shown considerable ability to resist drought.

"The seed should be planted only after the ground is warm in the spring. In Kansas the latter part of May is the preferred season. The beans, at the rate of 5 to 10 per foot, are planted in drills from 2.5 to 3 feet apart. The cultivation is similar to that given the bunch varieties of the cowpea and should not occur while the leaves are wet with dew or rain. The vines are cut when the beans begin to ripen, cured in small, high piles, and threshed when dry.

"At the South Carolina Station the yield of beans was from 10 to 15 bushels per acre. At the Georgia Station soja beans yielded 1,307 pounds of beans per acre, while the yield of cowpeas on an adjacent plat was only 840 pounds. The weight of dry forage from the former was also greater than that of the hay from cowpeas. At the Massachusetts Hatch Station the variety Medium Early White soja bean yielded at the rate of 35 bushels per acre. The variety Black Medium made a ranker growth of vine than most of the other sorts. At the Massachusetts State Station soja beans yielded 5,949 pounds of dry matter per acre. The red varieties [probably azuki beans] have been found superior to the white in productiveness and in beauty of appearance. At the Georgia Station soja-bean forage was relished by stock and was more easily cured than cowpea vines. The yield of soja bean forage, exclusive of beans, was at the rate of 2,940 pounds of dry matter per acre, containing 88.2 pounds of crude fat, 438.06 pounds of crude protein, 730.29 pounds of fiber, 1,143.36 pounds of nitrogen-free extract and 186.39 pounds of ash. Analysis showed the beans to be much richer than cowpeas in protein and fat but poorer in starchy matters. One hundred pounds of air-dry beans contained 25.86 pounds of nitrogen-free extract. The nutritive ratio is very narrow. This very high percentage of fat and protein makes soja beans a suitable substitute for cotton-seed meal and linseed meal and other concentrated and costly feeding stuffs which dairymen often find it necessary to purchase. Soja bean meal without any admixture was relished by milk cows at the Massachusetts Hatch Station.

"The soja-bean plant has been advantageously used for hay, for soiling, and for silage, and is believed to have, in common with most cultivated leguminous plants, the power of obtaining some of its nitrogen from the air, and hence acting as a soil renovator."

Note: This is the earliest English-language document seen (Oct. 2006) that contains the term "cowpea vines" (or "cowpea vine"). Address: Director of the Office of Experiment Stations [USDA, Washington, DC].

876. Wilson, James. 1894. Soiling crops, 1894. *Iowa Agricultural Experiment Station, Bulletin* No. 27. p. 85-104.
• ***Summary:*** Various soiling crops were fed to milch cows. "During the summer of 1894 we grew Soja beans, or Japan beans, under experimental conditions for feeding to dairy cows, so as to get indications of their value as an addition to our field crops and their effect on the quantity and quality of milk, and on the flavor of butter. This bean comes to blossoming–which is the best feeding stage for milk-making–in August, when few plants now known to our cropping system are in succulent condition. It seems to be entirely at home in a dry climate. It is rich in protein, palatable when cows become used to it, gives a fine flavor to

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butter, increases the flow of milk when substituted for green sweet corn, and increases the fat per cent over corn, as our tables will show.

"The seed was sent to the college by Prof. Georgeson, of Manhattan, Kansas, who brought several varieties of it from Japan."

Leguminous plants that furnish the protein element can be grown on the farm. When fed with green corn, corn meal, or by themselves, they give good results and can save a farmer money.

Page 96 is titled "Soja Bean" and states: "The Soja bean, or soy bean, or Japan bean has been grown at different times on the college farm for twenty years [i.e. since 1874]... The seed used came from Prof. Georgeson, of Manhattan, Kansas, who, during his residence in Japan, selected varieties suitable to our climate. We grew two varieties of it, the yellow soja, the earlier, and the Keyuska [Kiyusuke] succeeding, in order of ripening... We grew it in hills, planted and cultivated as corn is... It is widely advertised as a coffee plant, and sold at high figures for that purpose. The cows did not eat it readily at first, but after getting it sprinkled with bran and salt for a few days they ate it readily... at the end of the test period, August 19th, they had reached a larger flow [of milk] than at any time during the feeding of sweet corn." Note: This is the earliest document seen (March 2012) that uses the term "Japan beans" or "Japan bean" as other names for the soy bean.

Page 97 gives an analysis of the soja bean plant, cut in August (as is, and dry matter). Address: Director of the Station, Ames, Iowa.

877. Yabe, Kikuji. 1894. On the vegetable cheese, natto. *Bulletin of the College of Agriculture, Tokyo Imperial University* 2(2):68-72. German summary in Chemisches Central-Blatt 1894(2):1049-50. [Eng]

• ***Summary:*** "Since remote times there has been prepared in Japan from soya beans, a sort of vegetable cheese called *natto.* The beans are first boiled in water for five hours to render them exceedingly soft. The still hot mass is in small portions wrapped in straw and the bundles thus formed, well tied at both ends, are then placed in a cellar, the middle of which a fire is kindled, whereupon the cellar is well closed. The heat is left to act for twenty-four hours, after which the product is ready for consumption. Although the moderate heat of the cellar acts only for twenty-four hours, there is still a considerable bacterial change going on. The microbes may be derived either from the air or from the straw. Of course it can not be expected that bacteria on the surface of the soya beans would still be very active. They are probably killed by the five hour's boiling*. (Footnote: *Exceptional cases where bacteria can stand boiling heat still longer are known, for instance with *Bacillus subtitlis.*) This product has a peculiar but not putrid smell. The soft mass of the beans is kept together by a very thick viscid substance. In this substance I have found four kinds of microbes present, and the chemical decomposition of proteids must be due to one or more of these microbes."

The author then describes but does not give scientific names for the four microbes. Three of these were micrococci (a yellow, an orange yellow, and a white micrococcus), and the fourth was a small, not motile, bacillus which liquified gelatine and produced a greenish fluorescence. "With regard to the specific smell of *natto,* repeated experiments have convinced me that the above mentioned yellow micrococcus is the chief cause, while with regard to the slimy substance which shows such an enormous degree of viscidity further experiments have to be carried out; because the yellow micrococcus is not the cause of this viscidity."

A table (p. 72) compares the nitrogenous substances in soya beans and natto made from those same soya beans. The moisture rises 3.9-fold from 15.16% to 59.12%. The total nitrogen increases by only 2%, from 7.355 to 7.542. Footnote: This may be chiefly due to the loss of carbon dioxide during the fermentation. The nitrogen of proteids (excluding peptones) decreases by 42%, from 6.899 to 4.033. The nitrogen of amides increases 14.7-fold from 0.128 to 1.892. The nitrogen of peptone increases almost five-fold from 0.328 to 1.617.

"There can hardly be any doubt that the *natto*-preparation is more easily digestible than the original soya bean, as it is very soft (Footnote: While the water of the air-dry soya bean amounted to 15.16%, that of *natto* amounted to 59.12%) and contains peptone" (p. 72).

Note 1. This is the earliest English-language document seen (Jan. 2012), written by a Japanese, that contains the word "natto."

Note 2. This is the earliest English-language document seen (Jan. 2012) that gives a detailed description of how natto is made, its chemical composition, a little about its microbiology. and its final appearance, smell, etc. However, we told nothing about how or when it is eaten in Japan. Although Yabe mentioned *Bacillus subtilis* in a footnote (p. 68) as a heat-resistant bacterium, he did not realize that it was the actually the bacterium / bacillus that caused the natto fermentation.

Note 3. This is also the earliest English-language document seen (Jan. 2012) that uses the term "vegetable cheese" or the word "cheese" or the word "slimy" to refer to natto. Address: Nôgaku-shi; Tokyo Univ., Japan.

878. Kellner, O.J. 1895. Ueber die Bereitung von Sake, Shoyu, und Miso [On the preparation of sake, shoyu, and miso]. *Chemiker-Zeitung* 19(6):97-98; 19(7):120-21. Jan. 19. [6 ref. Ger]

• ***Summary:*** The first installment of this article gives details on the production of sake in Japan. The process can be divided into 4 steps: The production of a diastatic ferment (koji), the culturing of the yeast (*Hefezüchtung*), the main

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fermentation, and separation of the fermented liquid (sake). A detailed description is given of the preparation of both koji starter (the ash of camellia wood is used) and koji. The koji, make in koji cellars, contains a very powerful, inverting ferment (*ein sehr kräftiges, invertirendes Ferment*), whose effect goes further than the diastase of malt. The finished sake, which contains 11-14% alcohol, is consumed hot. Sake makers in Japan, like beer makers in earlier times in Germany, are very conservative and will hardly allow the introduction of a thermometer into their operations.

Shoyu or "Bohnen-Sauce" is called Soja or Shoja in Germany. About one-fourth of the wheat is finely pulverized. It is fermented in vats for various times ranging from 8 months to 5 years. Then the liquid is pressed out in cotton sacks. Finally the press-cake is mixed with salt water, and re-pressed to yield a lower quality product. The finished product consists of a mixture of soy sauces of different ages to improve the flavor and aroma. The best soy sauce is made from equal parts of 3-year and 5-year soy sauce. The press-cake is used for fertilizer.

A nutritional analysis of shoyu is given. Its relative density ranges from 1.182 to 1.193. In 1888-89 in Japan 10,634 shoyu plants produced 1.3 million koku [1 koku = 180 liters or 47.6 gallons, so 1.3 million koku = 234 million liters or 61.88 million gallons]. Per capita consumption was about 5.5 liters per year.

Concerning miso, the author discusses rice miso first, then barley miso, implying that the former is more widely used. He notes that miso can be made in only 4 days by incubating it hot. He then gives nutritional analyses of 5 types of miso that he made in 1889. "According to my estimation, at least 30 million kg, over half of the yearly soybean harvest, is used in miso production... Those soybeans that are not used for shoyu and miso production, serve largely for the production of tofu (*Bohnenkäse*)." The tofu is coagulated with a solution obtained from sea salt that is rich in magnesium chloride [i.e. nigari]. Address: Privy Councillor (Hofrath), Japan.

879. Brooks, William P. 1895. The Agricultural Division. *Massachusetts* (*Hatch*) *Agricultural Experiment Station, Annual Report* 7:7-16. Jan. See p. 13-14.

• ***Summary:*** A table (p. 13) compares the composition of "American average of corn silage" with "Millet and soya bean silage." The author concludes: "It will be noted that the millet and soya bean silage is considerably richer than the corn silage in protein, which is the most valuable portion of a fodder,–the nitrogenous portion." The two fodders contained 11.25% vs. 8.0% crude protein on a dry matter basis.

The section titled "Soya beans" (p. 13) states: "We have continued to experiment with a number of varieties of this crop. We find three of value, and these we call 'Early White,' 'Medium Green' and Medium Black.' The seed of all was originally brought from Japan [by Brooks in late 1889; See Brooks 1890, p. 14, 16]. The first is the most reliable for seed production in this vicinity, though neither of the others has failed to ripen every season during the last 6 years. The 'Medium Green' appears to be the most valuable for ensilage. This has given a yield of rather over eight tons per acre when ready for the silo...

"Pot experiments in the culture of three varieties of the soya bean, employing for each soil from our own grounds and soil from a locality where this crop had never been grown, were carried out in 1893. The pots were variously fertilized in two parallel series for each kind of soil. To the soil of every pot in one series for each kind of soil a little dust from the floor where soya beans had been thrashed was added. The object aimed at was to determine whether the addition of this dust, which, it was known, must contain in abundance the germs of the tubercle bacillus peculiar to soya bean roots,–the bacillus which gives the plant the power to fix atmospheric nitrogen,–would affect the development of root tubercles and the growth and yield of the plants. The results were striking. From a very early stage, the plants in the pots to which a pinch of dust from the threshing floor had been added were of a markedly greener color and more vigorous. The weight of both vine and seed from such pots was larger. Upon examination after harvest the roots were found to have a far greater number of tubercles. The important point here is, that the tubercle development is coincident with greater vigor.

"Out-of-door experiments of a similar nature upon a large scale have been tried in the field this year. Upon ½ of a number of areas similarly fertilized throughout, a small quantity of earth from a field where soya beans had been cultivated for several years was scattered; the result in every instance was a marked increase in crop.

"Soya beans, as well as other leguminous crops, sometimes fail to assimilate atmospheric nitrogen to any great extent when first cultivated in a neighborhood. This is frequently, no doubt, because the appropriate tubercle bacilli are not present in sufficient numbers. They will usually increase from year to year, and when they become abundant, success will be more certain. It may sometimes pay to import a small quantity of earth from a locality where the crop does well, for the purpose of securing a supply of the needed bacilli."

Note: It is not absolutely clear how the tubercle bacilli that Brooks used in his pioneering experiments arrived in America. They apparently arrived on the seeds that Brooks imported from Japan in 1889. These may have been the first soybean bacilli in America. In 1897 David Fairchild "wrote to Japan and imported several pounds of soil from a soybean field" (Fairchild 1948, p. 14).

"A considerable number of miscellaneous crops have been under trial on a small scale. The more important of these are the following: mummy pea, Canada field pea, blue-stem wheat, naked black barley, Japanese naked barley,

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Japanese barley, Japanese clover, dwarf Essex rape, spurry, flat pea (*Lathyrus sylvestris*), and alfalfa." Details are given on four of these.

"Soya bean meal [probably ground whole soybeans] compared with gluten meal" (p. 16). The two were tested as "part of a ration for milch cows. The results do not indicate any considerable difference. Cream separated by the Cooley submerged system is more perfect in the milk from cows receiving the bean meal. The line of demarcation is far more distinct, and the cream is thicker and richer in fat."

880. Martin, Ernest. 1895. Le Tao-fu (soya), son origine, ses propriétés, son acclimatation [Tofu (soya): Its origin, properties, and acclimatization]. *Revue Scientifique* (*Revue Rose*) 3(5):144-46. Feb. 2. Series 4. [Fre]

• ***Summary:*** A French-language review of the literature on tofu, including a brief discussion of soy sauce and soybeans. The Soya hispida (Family: Papilionacées; Glycine Phaseolus) is an oilseed (*graine oléagineuse*) that originated in China. According to the research of Prof. Schlegel at the University of Leiden, it was first mentioned in the work of Liu-An, king of Huai-nan, of the Han dynasty, in the 2nd century before the Christian era. From this period, the seed was boiled and a milk-like liquid [soymilk] was extracted which had the reputation of possessing beneficial properties.

When the soybean (*le soya*) was imported to Europe, it was in the form of a sauce made in Japan and sold by the Dutch who were the first [sic] European navigators to arrive in Japan. Note: Portuguese navigators arrived in and traded with Japan before the Dutch.

Its name was *sho-yu,* which is nothing but the corruption of the Chinese characters *tsiang-yu,* which signifies savory oil [sic]. From sho-yu, the Dutch made the word "soya" or "soy" the name by which the bean is known in Europe.

Discusses: The shape and color of soybeans. The Exposition of Vienna [Austria] in 1873. König's discovery that soybeans contain 31-33% protein. The research of Vorderman and Pellet. Tao-Kan, Tao-Hu (tofu in Java), and Tao-Koa. Tofu exported from Annam. How Chinese in Batavia make soymilk and tofu (curded with gypsum); use of the pasty residue (*résidu pâteux*) [okara] for feeding to penned poultry, such as chickens and ducks. Further processing of tofu to extend its shelf life.

Note: This is the earliest French-language document seen (June 2013) that uses the term *résidu pâteux* to refer to okara. Preparation of soy sauce. Many uses of tofu in Chinese therapy. Shi-tsih as the founder of the vegetarian diet. Writings of Montigny, the French consul general. Soy bread in diabetic diets. Mr. Desvilles. Soybean trials and acclimatization in France. Composition of soybeans grown in France.

"From the viewpoint of practical utility, we conclude that the acclimatization of species of the vegetable and animal kingdoms, which was formerly the goal of multiple costly tests, has now lost much of its importance. The ease of communications and the rapidity with which exotic shipments can be made often provide the same results.

"However we must continue to be attentive to failures of acclimatization, for they have much to teach us. One of the most interesting problems of science is that of mutations. The work of the mutationists (*tératologistes*), and especially of Dareste, on the production of artificial anomalies, has led to new proof that the variability of animal organization is much greater than one would be tempted to believe–and this variability extends also to plants... Such research can help elucidate the problem of the origin of races, which has heretofore remained in the deepest obscurity despite the work of savants such as Is. Geoffroy Saint-Hillaire, Darwin, and Quatrefages.

"Thus there is nothing surprising in the transformations manifested in living things which, transplanted from afar, find themselves placed in telluric [terrestrial] and climatological conditions completely different from those of their original habitat. Examples of this transformation multiple with each new day;" they include the opium poppy, rhubarb, some legumes, numerous varieties of bamboo. "What is the reason for these laws of transformation and degeneration that extend over each of the large kingdoms of nature? The problem is posed but has not been seriously addressed.

"As for the soybean (*graine de soya*), we have shown that it undergoes this transformation in a very sensitive manner: in it, the protein molecule progressively gives way to the starch (*amylacée*) molecule. At the heart of the plant organism, a special synthesis is accomplished: its chemical composition is modified in proportions such that it becomes inappropriate for the goal targeted by its cultivation in Europe."

881. Hanausek, T.F. 1895. Correspondenz: Mittheilungen aus Japan [Correspondence: Communications from Japan. Enquiry on miso to Dr. Kellner]. *Chemiker-Zeitung* 19(11):222. Feb. 6. [Ger]

• ***Summary:*** Letter dated 26 Jan. 1895. Address: Vienna, Austria.

882. Kellner, O.J. 1895. Die Bereitung von Miso in Japan [The preparation of miso in Japan]. *Chemiker-Zeitung* 19(13):265. Feb. 13. [3 ref. Ger]

• ***Summary:*** This is an answer to questions from Dr. Hanausek to *Chemiker-Zeitung.* Kellner wrote his first major article on miso in 1893. There are 4 basic types of miso in Japan: 1. Shiro miso (white miso) is made from large-seeded soybeans (*grosskörnigen Sojabohnen*), rice koji, and salt. The ingredients are mixed at 70-90ºC, and the product is ready after 3-4 days of fermentation. It will not keep longer than 10 days. Note 1. This is the earliest document seen (Oct. 2001) worldwide that mentions "large-seeded soybeans."

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The next document to use that term appeared in 1936 in the USA.

2. Yedo miso (named after the early name for Tokyo) is made from the same ingredients as Shiro miso. The ingredients are mixed at 35-45ºC, and a part of the salt is added in a cooled solution after the mixing. The fermentation takes about 10 days in summer, 30 days in winter. The miso will keep for 4 to 15 months at room temperature.

3. Inaka miso (countryside or peasant's miso). Less expensive barley koji is used in place of rice koji. The soybeans are steamed for a very long time until they attain the desired reddish color. The fermentation takes 11-12 months, and the finished miso will keep for about 1 year. This type contains the most salt. To accelerate the fermentation, mix the ingredients while the soybeans are still hot.

4. Sendai miso (named after the city of Sendai) is substantially different in preparation from the other types. The cooked beans are rubbed to a paste, formed into prismatic pieces [*prismatische Stuecke*], and hung up with straw cords to dry for 1 to 1½ months. Then they are washed with lukewarm water, pulverized, sifted through a fine sieve, mixed with barley koji, salt, and cold water, and mashed in a mortar. The mass is put in the fermentation vat and roughly every 2 months reworked in the mortar. The fermentation, for which a cool room is used, is first ended after 1 to 1½ years, and the finished miso has a fine aroma, sweet taste, and reddish color. Because of the latter it is widely referred to as "red miso."

In the production of special types of miso, the following ingredients may be added to the basic ingredients before the fermentation: Glucose or cane sugar, gingerroot, slices of eggplant, Japanese burdock, roasted soybeans (*geröstete Sojabohnen*), rice bran, sesame oil. Moreover, many families, for use in their homes, prepare a miso using the press-cake that is left over after making shoyu and that has not been washed with salt water. It is used in place of steamed soybeans, and it is permeated with a fermentation-instigating power. In place of koji, dehulled barley may be used. In commercial miso production, only rice- or barley koji is used.

Note 2. This is the earliest German-language document seen (Dec. 2012) that mentions soynuts, which it calls *geröstete Sojabohnen.* Address: Prof., Dr., Moeckern [near Leipzig], Germany.

883. Wehmer, Carl. 1895. *Aspergillus oryzae*, der Pilz der japanischen Saké-Brauerei [*Aspergillus oryzae*, the mold of Japanese sake breweries]. *Zentralblatt fuer Bakteriologie. Series 2.* 1(4/5):150-60. Feb. 23; 1(6):209-20. March 11. [40 ref. Ger]

• ***Summary:*** The first detailed description of *Aspergillus oryzae.* Address: Privatdozenten an der Technischen Hochschule, Hannover.

884. Yabe, Kikuji. 1895. ["On the vegetable cheese, natto"]. *Zentralblatt fuer Bakteriologie. Series 2.* 1(11):413-14. May 15. [1 ref. Ger]

• ***Summary:*** This is a German summary of the English-language article by Yabe which was published in 1894 in Japan in the *Bulletin of the College of Agric., Tokyo Imperial Univ.* 2(2):68-72. No German or other foreign title is given.

"In Japan a vegetable cheese named 'natto' is prepared from soybeans..." ("In Japan bereitet man aus Sojabohnen einen 'Natto' genannten vegetabilischen Käse, indem..."). Address: Nôgaku-shi, Imperial Univ., College of Agriculture, Tokyo, Japan.

885. Inoue, M. 1895. Note on nukamiso. *Bulletin of the College of Agriculture, Tokyo Imperial University* 2(4):216-18. Aug.

• ***Summary:*** Nukamiso (which is unrelated to miso) is rice-bran in a state of lactic fermentation that is used for pickling and softening certain vegetables such as daikon (Japanese white radish) and egg-plant. Nukamiso is prepared in barrels by almost every family in Japan.

The article concludes: "It may be that *nukamiso* will gradually find its way into other countries, as our soya-sauce or *shoyu* has done."

Note 1. This is the earliest English-language document seen (April 2012) that uses the term "soya-sauce" to refer to soy sauce.

Note 2. The parallel Japanese title of this English-language periodical is *Tôkyô Teikoku Daigaku. Nôka Daigaku. Gakujutsu hôkoku.* Address: Nôgakushi [Tokyo, Japan].

886. Inouye, M. 1895. The preparation and chemical composition of tofu. *Bulletin of the College of Agriculture, Tokyo Imperial University* 2(4):209-15. Aug. [6 ref. Eng]

• ***Summary:*** One of the best early articles on tofu in Japan. Inouye tried to make a product resembling Swiss cheese with tofu, with moderate success.

"The efforts to prepare an easily digestible food from soya beans led to the preparation of *miso* and *natto,* two kinds of vegetable cheese, which were investigated some time ago in the laboratory of this college. (Footnote: On the preparation of *miso,* by O. Kellner, this Bulletin, Vol. 1, No. 6. On *natto,* by Yabe; Bulletin Vol. 2, No. 2).

"But the most interesting preparation is *tofu,* which consists principally of the protein-matter of the soya bean and which, according to the investigation of Prof. Osawa in Tôkyô, is as easily digestible as beef. This preparation is freshly made every day and sold in the form of tablets [cakes] about 10 c.m. broad, 2 c.m. thick, and 25 c.m. long [4 by 10 by 0.8 inches thick], is of snow-white appearance and of the consistency and taste of freshly precipitated casein of milk, but as there is no trace of bacterial action connected

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with its preparation, the name vegetable cheese is certainly not justified." A table (p. 211) shows the composition of tofu a determined by *Kellner.*

"*Tofu* is also sold in another form called *kori-dofu* [dried-frozen tofu]. It is prepared by exposing the fresh *tofu* tablets to the action of frost, under which they shrink considerably, lose water, and become more compact. While fresh *tofu* contains, on an average, 89.02% of water, *kori-dofu* contains only 15.32% in the air dry condition. The analysis of *kori-dofu* gave me the following results: Water 15.32%. Albuminoids 41.42%. Fat and lecithin 23.65%. Non-nitrogenous extract 15.05%. Cellulose 1.48%. Ash 3.08%."

Note 1. This is the earliest English-language document seen (April 2013) that uses the term *kori-dofu* to refer to dried-frozen tofu.

The author then describes the tofu manufacturing process, noting that it "is manufactured only on a small scale, by people who sell it in their own shops." "The beans are first soaked for about twelve hours in water and then crushed between two mill-stones until a uniform pulpy mass is obtained. This is then boiled with about three times its quantity of water for about one hour, whereupon it is filtered through cloth. This liquid is white and opaque, exactly like cow's milk; while the smell and taste remind one of fresh malt." "I also analyzed the fresh milky liquid with the following results" for "Soya bean milk" and cow's milk, respectively (p. 212): Water 92.53% / 86.06%. Albuminoids 3.02% / 4.00%. Fat 2.13% / 3.05% Fibre 0.03% /–. Ash 0.41% / 0.70%. Non-nitrogenous extract, including carbohydrates 1.88% /–. Milk sugar–/ 5.00%.

"The fat contained in this liquid as well as in the *tofu*-tablets was found to consist partly of lecithin. *Tofu* dried at 100º yielded 26.65% fat and 4.83 gr. of this fat yielded, after igniting with carbonate of soda and nitrate of potash in the usual way, 0.280 grm. of magnesium pyrophosphate, which, when multiplied by the lecithin-factor, 7.2703, corresponds to 2.035 grm. lecithin, amounting to 11.2% of dried *tofu,* leaving for the genuine fat 15.4% (Footnote: A portion of this lecithin was probably present in the soya bean as lecithalbumin; comp. Leo Liebermann, J.B. f. Thierchemie, 1893, p. 32, and E. Schulze, *Chemiker Zeitung,* 1894, No. 43); more of the latter, therefore, is left in the refuse than of the former."

Note 2. This is the earliest English-language document seen (March 2001) that contains the word "lecithin" or "lecithalbumin" in connection with soy–in this case tofu.

"In the manufacture of *tofu*-tablets from the freshly prepared milky liquid, about 2% of concentrated brine [natural nigari] as it is obtained as mother liquor from the preparation of sea salt, is added with constant stirring, whereupon a flocculent precipitate is soon formed which is separated by means of a cloth filter, slowly pressed, and then cut into tabular shape. I have tried to arrive at a satisfactory explanation of the nature of *tofu,* and have found that the salt-brine does not act by its chloride of sodium, but by the calcium and magnesium salts which are in it; for we can at once obtain precipitate from the milky liquid if we add a little calcium nitrate or magnesium sulphate, while we can not obtain any separation or precipitation by adding even considerable quantities of sodium chloride or sodium sulphate."

"I have analysed a sample of the salt brine used for *tofu* making and found it to contain, besides chloride of sodium, 27.9% of chloride of magnesium and 7.0% of chloride of calcium."

Footnote 4 (p. 213): "In order to see whether a product similar to Swiss Cheese could be obtained from the crude soya casein or *tofu,* I infected 50 grm. of fresh *tofu* with a small dose of pulverised Swiss cheese, and added ten per cent of common salt to the mixture, pressed it in cloth, and allowed it to stand in a moist beaker glass for several months. The product resembled, only to a limited extent, the cheese from milk, but further experiments with the addition of small quantities of milk sugar are intended."

Note 3. This is the earliest English-language document seen (Aug. 2013) that contains the term "soya bean milk."

Note 4. This is the earliest English-language document seen (Aug. 2013) that contains the word "milky" in connection with soymilk, or that uses the term "milky liquid" to refer to soymilk. It is the second earliest English-language document seen (Aug. 2013) that mentions soymilk, and the earliest that mentions it in connection with Japan. However there is no suggestion that Japanese consume soymilk as a beverage.

Note 5. This is the earliest English-language document seen (March 2009) that uses the term "vegetable cheese" to refer to miso. Address: Nôgaku-shi [Prof. of Agriculture], Japan.

887. Miyoshi, Manabu. 1895. Anwendung japanischer Soja und deren Gemisch fuer Pilz Kultur [Use of Japanese soya and mixtures of it for culturing molds]. *Botanical Magazine* (*Tokyo*) 9(104):361-65, 403-04. Oct. 20. [2 ref. Jap; ger]
• ***Summary:*** The first part of this article (p. 361-65) is in Japanese. The second part is a 1½-page German-language summary of the article, apparently by the author. Address: Prof., Botanical Institute, Tokyo Imperial University, Japan.

888. Georgeson, C.C. 1895. Soy beans for stock. *Prairie Farmer* 67(45):1. Nov. 9.
• ***Summary:*** "Jas. E. Booge, of Sioux City, Ia [Iowa], writes: 'I wish to know in what climate soy beans grow, and what time it is best to plant them. It is something I know nothing of, and I would like to try them. How many bushels will they produce to the acre, and what kind of stock will eat them, and how should they be prepared for food?'

The author replies: "We have grown soy beans here,

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at the Kansas Experiment Station, for the last six years, and always with gratifying success. They withstand the dry weather and hot winds better than any other legume that we have tried so far. Their power to resist drought and their highly-nutritious qualities are their chief recommendations. The early varieties can be grown successfully as far north as South Dakota and in Wisconsin. The later varieties cannot be depended on to mature seed even here in Kansas. They should not be planted until the ground is warm. We usually plant the main crop here at the Kansas Station during the last ten days of May, but they can also be planted later. Last year I planted a field on the wheat stubble just after the wheat was removed in the beginning of July, and although the season was excessively dry they still produced a crop of beans which matured seed before frost. Like all other crops, they do best on rich soil, but they will grow on poor soil also. They yield better than navy or other field beans. They can be planted with a bean planter, a corn planter or even a grain drill. We usually plant them with a shoe press drill, stopping up three hoes [sic, holes] so as to leave the rows thirty-two inches apart, and a plant to each two inches of row is thick enough. A bushel of seed put in in this manner will plant an acre."

"As to the use of the soy bean as stock food, we have fed it to stock as ensilage in the form of hay, and the ripe beans ground to a meal, in all cases with gratifying results. The ensilage produced a marked increase in the quantity, and an improvement in the quality of the milk, and the bean meal is better than oil meal in nutritive qualities. To be exact, linseed oil meal contains twenty-seven pounds digestible protein, and 32.2 pounds carbohydrates, and 7.1 pounds fat, in 100 pounds of meal, whereas soy bean meal contains 30.1 pounds digestible protein, 30.7 pounds carbohydrates, and 15.8 pounds fat in 100 pounds. If made into hay the crop should be cut when the beans in the pod are about half grown, just before the leaves begin to fall. After it is cured it should be handled as little as possible to avoid crumbling the leaves. This hay has a nutritive quality equal to that of bran. We have, in a favorable season, raised three tons of this hay per acre.

"The seed from which the stock we have here, is grown was originally imported by the writer direct from Japan."

Note 2. This is the earliest document seen (Aug. 2011) concerning soybeans in South Dakota, or the cultivation of soybeans in South Dakota. This document contains the earliest date seen for soybeans in South Dakota, or the cultivation of soybeans in South Dakota (Nov. 1895). The source of these soybeans is unknown.

Note 3. This is also the earliest document seen (Sept. 2011) concerning soybeans in Wisconsin, or the cultivation of soybeans in Wisconsin. This document contains the earliest date seen for soybeans in Wisconsin, or the cultivation of soybeans in Wisconsin (Nov. 1895). The source of these soybeans is unknown.

Note 4. This is the earliest document seen (Oct. 2003) that uses the word "planter" ("bean planter"), or the word "drill" (referring to an implement), or the term "grain drill" in connection with soybean production. This is also the earliest document seen (Oct. 2003) that mentions the use of a machine (a planter or drill) for soybean production. Address: Prof., Kansas Agric. Exp. Station [Manhattan, Kansas].

889. Prinsen Geerligs, H.C. 1895. Eenige Chineesche voedingsmiddelen uit Sojaboonen bereid [Some Chinese foods made from soybeans]. *Pharmaceutisch Weekblad voor Nederland* 32(33):1-2. Dec. 14. Summarized in Teysmannia (1897) 7:413-15. [5 ref. Dut; eng]

• ***Summary:*** Contents: Introduction. Tofu or bean cheese (*Tao-hoe of boonenkaas*). Chinese soja or Fao-ijoe (boonenolie; soybean oil). Japanese soya (soy sauce; In Japanese: Shoijoe; in Chinese: Sex-sze-ijve). Taucho or bean paste (*Fao toio of boonenbrei*).

In the section on tofu, soymilk is mentioned twice.

Note 1. This is the earliest Dutch-language document seen (April 2013) that uses the term *boonenkaas* (unhyphenated) to refer to tofu.

Note 2. This is the earliest Dutch-language document seen (Aug. 2013) that uses the term *melkachtige, vettige vloeistof* ("milky, fatty liquid") or *gefiltreerde melkachtige vleistof* ("filtered milky liquid") to refer to soymilk.

Note 3. This is the earliest document seen (March 2009) that mentions Indonesian-style miso, which it calls "Fao toio." This would later be spelled tao-tjo, taotjo, tauco, or taucho.

At the end of the section on tofu, the author continues: Another widely used bean preparation is soy sauce (de Soja), of which two kinds exist: the Japanese and the Chinese Soja. The first-mentioned has already been repeatedly described, for example by König (1889, p. 241), further by J.J. Hoffman in his "Contributions to the Knowledge of the Language, Geography, and Ethnology of the Netherlands Indies" (*Bijdragen tot de Taal-, Land- en Volkenkunde van Nederl. Indië;* Vol. V, p. 192), and recently by G. Schlegel in T'oeng pao [T'oung Pao 1894] (Part 5, No. 2) and O. Kellner in *Chemiker Zeitung* (1895, p. 120). While I could not find anything in the literature about the preparation of Chinese soy sauce (*Soja*), I have copied the following from the manufacturers themselves.

Chinese Soja or Fao-ijoe (bean oil). For this, only black varieties of the *Soja hipida* [*sic, hispida*] *humida Beta atrosperma* or *Soja hipida platycarpa Beta melanosperma* have been used. Their seeds are cooked and the water poured off, after which the beans are left in the sun for half a day to dry. Now they are cooled on big trays of woven bamboo out of the sun, then covered with leaves of a *Hibiscus* variety. On the beans there will always appear a type of mold, the *Aspergillus Oryzae* to be precise, which, at least on Java, appears every time again on moist soybeans exposed to

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the open air, but strangely enough does not appear on other foods. The beans are allowed to stand until the mold sporulates, which can be seen by the green color of the mold threads (hyphae), then they are dried again for some days and then put in a strong salt solution that has been cooled. This mixture is put in the sun for 8 days and afterwards it is boiled. The salt solution is then poured off from the beans and saved. The beans are boiled again and the water is added to the first salt solution. This process is repeated as many times as it takes to extract the residue completely.

The decoction is strained through a fine sieve, boiled again, and the sugar from the areng palm, star anise (not the leaves), and some other herbs (which are available from Chinese druggists as "soya herbs") are added. Finally, this dark brown, pleasantly aromatic liquid is boiled down until salt crystals start to appear on the surface, indicating that the liquid is completely saturated with salt. After cooling, the soy sauce (*soja*) is ready to use. It yields a spice which is used together with all different kinds of foods as a pleasant condiment, and in the Chinese, Javanese, and even the European kitchen on Java it is an irreplaceable ingredient.

Soy sauce is sold in several quality grades, of which the best is a thick sauce with a special aroma. The lesser kinds are thinner and are made by diluting the thick soy sauce with salt water, while in the very low-grade kinds, instead of the pleasantly sweet-tasting palm sugar, the bitter, sour-smelling unassimilated molasses from sugar factories is used.

Note 4. This is the earliest document seen (May 2010) that describes the preparation of a sweet Indonesian-style soy sauce quite similar to *ketjap manis* (which seems to have been first created about 1960), yet the writer does not mention its name.

The Chinese soy sauce appears as a black colored, thick, clear liquid in which sometimes a viscous sediment can be found. When diluted with water it turns turbid or cloudy, but after adding salt this cloudiness disappears. Here is an analysis of one of the most common varieties: Specific gravity 1.254, saccharose and glucose 15.60%, nitrogen containing substances (*stikstofhoudende stof*) soluble in alcohol 4.87%, nitrogen containing substances not soluble in alcohol 2.62%, nitrogen-free substances soluble in alcohol 0.25%, nitrogen-free substances (*stikstofrije stof*) not soluble in alcohol 0.75%, salt 17.11%, other ash components 1.65%, water 57.12%. Total 100%.

The substances insoluble in nitrogen consist (except for peptone) mainly of legumin, which is soluble in strong salt solutions (compare Beilstein, *Handbuch Organische Chemie,* III, p. 1275) and will precipitate when diluted. This protein product (*eiwitstof*) has, by repeated precipitation with alcohol and renewed dilution in water and salt, been cleaned and could be recognized as a legumin. The elementary analyses gave these figures: Carbon 51.6, hydrogen 7.1, nitrogen 15.9.

Furthermore, the dilution in water was precipitated by ammonium sulfate, magnesium sulfate and sodium sulfate and not by a large quantity of sodium chloride.

The nitrogen containing substances soluble in alcohol were leucine, tyrosine and aspartic acid, all breakdown products of legumin, plus a little ammonia. Nitrogen-free extraction substances are almost not present and consist of a little pectin and the black coloring agent from the skin of the soybeans, which gives the black color to the soya.

Just like Kellner (*Chemiker Zeitung* 1895, p. 121) remarks, the composition of the soya is very similar to the one of meat extract, by which the big importance of this condiment in countries, where mainly vegetable type food is consumed, can be readily explained. Very peculiar moreover is the way in which during the preparation of the soya the heavily digestible protein substances, which are locked into the thick skinned cells of the soya, have been converted into an easily digestible, very delicious food.

One lets the boiled beans mold by means of the *Aspergillus oryzae,* which above all has the quality of changing amylodextrine and starchy substances into sugars followed by carbonic acid and water breakdown. We can say that a microscopic investigation of a molded soybean shows that the mold threads (hyphae) penetrate the cell walls of the complete soybean and partly dissolve them so the contents will be more readily available. When the mold has used up all that food, as shown by its fructification, the beans are put into a strong solution of salt water so that the legumin will dissolve, producing a thick fluid liquid. At the same time, the broken down substances of the legumin will dissolve pepton [peptone], leucine, tyrosine and ammonia, next to the aromatic substance that will start to form in this stage. The continued manipulations, addition of sugar, herbs, etc., are of course of minor importance, but principally the clever way in which the mold is being used to dissolve the cell walls is highly interesting. This, like so many Chinese preparations, is completely empiric and no Chinese would have the slightest notion of what all this molding is about.

This article describes the first attempt to identify the tempeh mold. In the section on Indonesian miso (taucho), the author notes: In a similar way, in Java, other molds are used to make leguminous seeds into more digestible foods. Thus the presscake, which remains after making peanut oil and would be indigestible without further preparation, is subjected to the action of molds. In central and eastern Java *Chlamydomucor Oryzae* [now known as *Amylomyces rouxii*] is used, whereas in western Java an orange mold of the family Oospore (Neurospora) is used. In the former case, the food is called 'bongkrek,' and in the latter 'ontjom.' If soybeans are molded with *Chlamydomucor* the spice is called 'tempets' [sic, tempeh]. In the preparation, the seeds are boiled, spread, mixed with a little molded cake from a former batch, and left alone for a while until the mass is bound into a solid white cake.

All the aforementioned molds have the ability to break starch and pectin substances down into sugars, by which

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means the cell walls are opened and the seeds made more easy to digest.

In the case of the starch-containing peanut presscakes, the breakdown of starch into sugars, followed by the use of the resulting sugars, proceeds so rapidly that the cakes become warm and within 1 day about 5% of their weight will disappear.

Kagok Tegal 28.9.95.

Note 5. This is the earliest document seen written only in Dutch that mentions Indonesian miso, which it calls *Fao toio* or *boonenbrei,* and *tao tsioe.*

Note 6. This is the earliest document seen stating that Hibiscus leaves are used in Indonesia to make soyfoods–in this case soy sauce.

Note 7. This is the earliest document seen (April 2012) that mentions "bongkrek"–but the explanation is incorrect.

Note 7. This is the earliest document seen (Sept. 2011) that mentions "ontjom." Address: Java, Indonesia.

890. Yabe, Kikuji. 1895. Un fromage végétal, le "natto" [A vegetable cheese, natto]. *Annales Agronomiques* 21:494. [Fre]

• ***Summary:*** This is a French-language summary the following English-language article published in Japan. Yabe, Kikuji. 1894 "On the vegetable cheese, natto." *Bulletin of the College of Agric., Tokyo Imperial Univ.* 2(2):68-72.

891. Agricultural Society of Japan (*Dai Nihon Nokai*). 1895. Useful plants of Japan: Described and illustrated. Vol. 1. Tokyo: Agricultural Society of Japan. 233 p. See p. 5-6. 22 cm. [Eng]

• ***Summary:*** Discusses five varieties of *Glycine hispida* (p. 5-6) including: 21. Black soy-bean, Jap. *Kuro-mame.* "The beans have black skin. They are eaten either boiled or parched and also used to make *miso* (a kind of sauce with solid consistency), cakes, and *natto* (a cooked beans eaten as relish to rice)."

Note 1. The writer fails to mention that both miso and natto are fermented foods.

Note 2. This is the earliest English-language document seen (Jan. 2012) stating that natto is eaten with rice, or as a relish to rice.

22. White soy bean, Jap. *Shiro-mame.* Similar to No. 21 but the beans have yellowish-white skins. "Numerous varieties as to size, form, or duration of growth occur, and all are eaten either boiled or parched. Many important services are due to this bean. They are used to make malt [koji], *miso* (a kind of sauce), *shôyû* (bean sauce), and *yuba* (a kind of food). The *mamenoko* (bean flour) [probably roasted soy flour or *kinako*] is made of the beans and is eaten with *dango,* etc. It yields a dye called *Mame-no-go.* Oil is also pressed out from these beans. They are used in many other different ways."

Note 3. This is the earliest English-language document seen (Nov. 2012) that uses the word *mamenoko* to refer to roasted soy flour.

23. Green bean, Jap. *Ao-mame.* Similar to No. 21 but with larger seeds of greenish color. "One variety with green colour both of the skin and albumen called *Konrinzai* occurs, and is used to make *Aomame-no-ko* (green bean flour).

24. Jap. *Goishi-mame.* The seed of this variety is flat and black. Eaten boiled.

25. *Gankui-mame.* "Closely allied to the preceding. The beans are larger and thinner in the middle, and eaten principally boiled."

Also discusses: Job's tears (*Coix lachryma,* Jap. *Tômugi, Hatomugi,* p. 5. The grain is pounded in a mortar, cleaned, and "consumed as meal and *mochi.* An infusion of the parched and ground grains is used instead of tea, and is called *Kosen*)." Five varieties of adsuki beans (*Phaseolus radiatus,* p. 7-8).

Pea-nut (*Arachis hypogœa,* Jap. *Tôjin-mame, Nankin-mame,* p. 9. "They are eaten parched or used in confectionery, or to extract oil. A variety with larger nuts about 3 times bigger was introduced from America in 1873").

Kudzu (*Pueraria thunbergiana,* Jap. *Kudsu, Makudsu,* p. 69-70, 92. "The largest roots are about 3-4 ft. [long] and about the thickness of a man's arm. In winter they are taken, and an excellent starch is prepared from them. It is used for food or paste. The vine is used to make baskets, and its fibre is taken for cloth. The leaves are used to feed cattle").

Sesame (*Sesamum indicum,* Jap. *Goma,* p. 84. "There are three varieties, black, white, and brown colored. The latter variety is the best to take oil. The oil is principally used for dressing food. The grilled seeds are used to add to cakes, salads, etc."). Address: Tameike 1, Akasaka, Japan.

892. Atwater, W.O. 1895. Methods and results of investigations on the chemistry and economy of food. *USDA Office of Experiment Stations, Bulletin* No. 21. 222 p. See p. 193-94.

• ***Summary:*** In the section on "Food Consumption" a subsection titled "Japanese Dietaries" (p. 193-94) states: "The legumes are little eaten in their natural state but form the basis of a number of prepared foods and relishes, such as miso, tofu, and shoyu, all of which are made from the soja bean. The miso is prepared from cooked beans, which are rubbed to a thick paste and fermented with the ferment used in the preparation of the rice wine. Tofu, or bean cheese, is essentially the legumin of the soja bean, which is first extracted with water and then precipitated by the addition of the mother liquor (magnesium chlorid), obtained from the evaporation of sea water in the manufacture of salt. The cheese is eaten fresh. The shoyu sauce is prepared from a mixture of cooked and pulverized soja beans, roasted and pulverized wheat, wheat flour, salt, and water. The mixture is fermented with the above-mentioned rice ferment for 1½ to 5

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years in casks. This sauce is used very largely by all classes." Address: Prof. of Chemistry in Weslyan Univ. Director of the Storrs (Connecticut) Agric. Exp. Station, and Special Agent of the U.S. Dep. of Agriculture.

893. Flagg, Chas. O.; Towar, J.D.; Tucker, Geo. M. 1895. Field experiments. *Rhode Island Agricultural Experiment Station, Annual Report* 7:111-28. For the year 1894. See p. 114-19.

• ***Summary:*** The section titled "Experiment with leguminous plants" (p. 114-20) states: "The experiment with leguminous plants which began last year (see Annual Report for the year 1893, p. 190) upon plots 17, 19, and 21, was continued through this year with slightly varying results. The three plots received like quantities of potash and phosphoric acid, but plot 17 received no nitrogen, plot 19 received one-third ration, and plot 21 full ration. In nearly every case in 1893 the plot (19) that received one-third ration (150 lbs.) of nitrate of soda gave a larger yield than either plot 17 or 21. While in 1894 a majority of the plants on the full-ration plot (21) gave the largest yields, although the gain was not great except in two or three cases; in no case was the gain in weight of plot 21 over plot 19 sufficient to cover the expense of applying the extra 300 lbs. of nitrate of soda."

A table (p. 116) gives the names of the crops planted (all were planted on 13 June 1894), the weight of three fertilizers added (in lb/acre; phosphate rock, muriate of potash, and nitrate of soda) the height of the plants, usual method of sowing (broadcast vs. drilled; all the crops mentioned below were drilled in 24-inch rows), date of harvest, excess yield due to additional nitrogen. The crops include: Soja bean (common), Soja bean (Medium Green; plants or beans), Soja bean (Medium Black; plants or beans), Soja bean (Early White; plants or beans), Black podded adzuki (plants or beans), White podded adzuki (plants or beans), Kiyusuke daidzu (plants or beans), Yamagata daidzu (plants or beans), Eda-mame (plants or beans), Yellow soy (plants or beans).

"With most of the soja beans the increase of yield is not sufficient the cover the cost of applying any nitrogen at all the second year, while the first year there was a slight profit made by applying the one-third ration."

A table (p. 118) shows the composition of dry matter of some leguminous green fodders (including 5 types of soja bean) as compared with corn, oats, and millet.

Page 119 states: "All varieties of *Soja Beans* are used profitably either as silage, as green fodder, or as a green manure. They grow readily; the *Common* variety and the *Early White* are among the earliest to mature. One bushel of seed is required per acre.

"Black Podded Adzuki, White Podded Adzuki, Kiyusuke Daidzu, Yamagata Daidzu, Eda-mame and *Yellow Soy,* are Asiatic varieties of beans similar to the soja beans. The seed of these varieties, as well as the soja beans, makes an excellent, rich meal for stock feeding, while the Black Podded Adzuki beans are said to be desirable and nutritious for table use."

Note 1. The above text indicates that the investigators do not realize that soja beans, daidzu, eda-mame, and yellow soy are all different types of soybeans. Some of these are Japanese names.

Note 2. This is the earliest English-language document seen (June 1998) that uses the term "green manure" in connection with soybeans.

This is the earliest English-language document seen (June 2000) that mentions the use of "phosphate rock" or "rock phosphate" as a fertilizer, or in connection with soybeans. Address: Kingston.

894. Heco, Joseph. 1895. The narrative of a Japanese: What he has seen and the people he has met in the course of the last forty years. Edited by James Murdoch, M.A. 2 vols. Tokyo: Maruzen. Illust. 23 cm.

• ***Summary:*** Vol. 1 is from the time of his being a castaway in 1850 down to the battle of Shimonoseki. The ship *Auckland* is mentioned in Vol. 1 on pages 83, 91, 92, and 100 of this book, however soy is not mentioned.

Hymowitz (2007/06) wrote: "Amazingly, one of the Japanese fisherman rescued by the crew of the *Auckland* remained in the United States. As a 14-year-old he took the name Joseph Heco (ne Hizozaemon), learned to read and write English, and became a U.S. citizen. He published a book in 1895 that confirmed the *Auckland* incident from the Japanese point of view."

Note: Summary of book from WorldCat record: "Joseph Heco (1837-1897), a native of the province of Sanyodo, went to sea in 1850. When his ship was dismasted, he and other members of the crew were rescued by an American ship which took Heco to California; the young Japanese did not return to his native land until 1859. The narrative of a Japanese, vol. 1 (1895) contains Heco's reminiscences, based on diaries that he began to keep as soon as he had mastered English..."

This book was first published in 1800 by American-Japanese Pub. Association; they reprinted it in 1970. Edited by James Murdock. Library of American Civilization.

895. Hills, J.L. 1895. Dairying. *Vermont Agricultural Experiment Station, Annual Report* 8:142-92. For the year 1894. See p. 167-68.

• ***Summary:*** Section VI, titled "Miscellaneous fodder crops" (p. 167-68) begins: "A series of experimental plots containing a tenth of an acre each was laid out in the spring of 1894... The following crops survived the attacks of insects, drought, etc., and were harvested. The first table gives the plot number, name of nine crops–incl. Soja Bean (Green) and Soja Bean (Black), original substance (percentage water and dry matter), and the composition of the dry matter (percentage crude ash, crude protein,

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crude fibre, nitrogen-free extract, ether extract, nitrogen, phosphoric acid, and potash). The second table contains the same columns plus "Total yield" and the same crops. The Soja Bean (Green) was by far the best yielder, followed by the Soja Bean (Black). The composition is given in total pounds rather than as a percentage.

On p. 168 we read: "Soja (or Soy) Beans, green and black medium varieties, (*Soja hispida*). Seed was obtained from the Hatch Experiment Station of the Massachusetts Agricultural College; 27 inch rows. These beans were grown in 1893 as well as in 1894, and proved satisfactory each year. As explained in the last report, they are of Japanese origin, make good dry fodder or ensilage, and are relished by cattle. No other leguminous hoed crop which we have grown have given us better returns in tonnage of green fodder, dry matter or protein. The green variety this year yielded at the rate of six and a half tons green fodder, two tons dry fodder and nearly a quarter of a ton of protein to the acre." Address: Director of the Station and Chemist, Burlington, VT.

896. Kingsford, Anna Bonus. 1895. The perfect way in diet: A treatise advocating a return to the natural and ancient food of our race. 6th ed. London: Kegan Paul, Trench, Truebner & Co. Ltd. xiii + 121 p. 16 cm. [92* footnotes]
• ***Summary:*** *The Encyclopedia Britannica* (1929, at Vegetarianism) considers this book one of the two classics on the subject. It is a revised and enlarged translation of the author's July 1880 thesis, from the University of Paris, under the title *De l'Alimentation Végétale chez l'Homme.* The original thesis was published in Paris in French, then translated into German. The first English edition was published in 1881. The author, a physician (M.D.) deals much more with the physical and social aspects of a vegetarian diet, than with its moral and philosophical aspects. This is not because she regards the latter of lesser importance, "but because their abstruse and recondite nature renders them unsuitable to a work intended for general reading."

This long essay, which is not divided into chapters, discusses both vegetarianism and animal welfare. It begins with a Proem (prose poem, from *The Light of Asia,* about the life of the Buddha by Edwin Arnold), then discusses anatomy and physiology, cookery, physical force, national habits, chemistry, stimulating effects of flesh food, alcoholism, slaughter houses, social considerations, sufferings of cattle, dangers of flesh-eating, treatment of disease, economical considerations, over-breeding, the leather question, cruelty in the fur trade, the manure question, sport, recapitulation, conclusion.

On page 26 the author praises the Japanese diet: "The Japanese not only abstain from animal food, but even from milk and its productions. One of the laws which they most religiously observe is, not to kill, nor to eat anything that is killed... The Japanese are represented as robust, well made, and active, remarkably healthy, long-lived and intelligent...

"'Fish and rice are the staple articles of Japanese diet... Beans are an important article, and from these is manufactured *tofee* [sic, tofu]–literally bean-cheese, an article largely used by the poorer classes'" (*New York World* 1887).

"China.–'The perfection of the art of cooking is nowhere more observable than in the monasteries of the Buddhists. They have but the simplest elements of food to deal with. No meat, no fish, no poultry are allowed at their tables. No eggs, no lard, no butter, no milk must be introduced into their confectionery. Vegetables alone are permitted, and yet by means of these a dinner of surprising variety is served, and if the guest judged only be appearances he would suppose that the worthy abbot had forgotten the rigid rules of his monastic establishment, and was about to break his vow by partaking of most heretical viands'" (*Pictures of the Chinese,* by Rev. R.H. Cobbold, M.A.).

On pages 93-94 the author shows that a meatless diet will support a much larger population from a given area of land than a meat-centered diet for which the land is used for pasture and grazing. Address: Doctor of Medicine of the Faculty of Paris, 11 Chapel Street, Park Lane [London?].

897. Matsumura, Jinzô. 1895. Shokubutsu mei-i. Enumeration of selected scientific names of both native and foreign plants, with Romanized Japanese names, and in many cases Chinese characters. Tokyo: Z.P. Maruya (Maruzen K.K.). 8 + 26 + 17 + 321 + 62 p. See p. 134. With a 26-page European-language bibliography and a 16-page Japanese bibliography on botany. [606* ref. Eng]
• ***Summary:*** The author admits two species: Glycine soja (tsuru-mame or no-mame, indigenous) and G. hispida (of foreign origin).

Note: The National Union Catalog states that two similar editions of this work were published in Tokyo in 1895. The first, published by Maruya, is 321 p. The second, published by "Z.P. Maruya & Co. (Maruzen K.K.)," is 455 p. Address: Rigakuhakushi. Prof. of Botany, Tokyo Imperial Univ.

898. Miyoshi, Manabu. 1895. Die Durchbohrung von Membranen durch Pilzfaeden [Penetration of membranes by mold filaments]. *Jahrbuecher fuer wissenschaftliche Botanik* (*Berlin*) 28(2):269-89. [39 ref. Ger]
• ***Summary:*** Japanese shoyu was first used by Prof. Miyoshi of this Institute as a liquid cultural medium for various molds. He recommended a mixture of 50 parts water, 20 parts Japanese shoyu, 5 parts raw sugar, and 25 parts concentrated cooked onion juice.

Note: This is the earliest document seen (Sept. 2001) that describes the industrial uses of soybeans or soy products (shoyu) as a culture medium (for growing microorganisms). Address: Prof., Botanical Institute, Tokyo Imperial University, Japan.

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899. The Sino-Japanese War (1894-1895), and the Treaty of Shimonoseki (17 April 1895) (Important event). 1895.
• ***Summary:*** "Japan's opening of Korea in 1876 led to increasing embroilment with China over the peninsula. Peking adamantly insisted on its suzerainty over Korea, which Japan refused to recognize...

"During the next decade the Chinese intensified their efforts at modernizing their military forces, particularly the navy, while the Japanese became increasingly involved in Korea, thus setting the stage for an even more serious confrontation. Then the Tonghak ('Eastern Learning'), a popular religious organization with a strongly antiforeign bias, broke out in revolt in southern Korea in 1894, China sent a small body of troops at the Korean king's request, and Japan then sent in a larger force, demanded reforms of the Korean government, and finally seized control of it and had it declare war on China. War followed between Japan and China on August 1.

"The ensuing hostilities were the first real test of the efforts at military modernization both China and Japan had been making for a whole generation. Most Westerners assumed that the Chinese giant would win through sheer size, but Japan quickly proved that its modernization had been more successful. Its armies seized the whole of Korea and then invaded Manchuria. But victory was largely determined by sea power, which in the absence of railways controlled even China's access to Korea. While the Chinese fleet was larger, the Japanese was qualitatively much better. On September 17 off the mouth of the Yalu River, the Japanese, using modern British naval tactics, severely crippled the Chinese fleet, which came out like cavalry, lined abreast. The Japanese then captured the naval base of Port Arthur in South Manchuria and besieged Weihaiwei on the northern coast of Shantung, where the remainder of the Chinese fleet was bottled up. Weihaiwei fell, the fleet surrendered, and China had to sue for peace.

"The terms of the Treaty of Shimonoseki, signed between Itô and Li on April 17, 1895, were relatively severe, though perhaps less so than they might have been had not a Japanese fanatic shot and wounded Li. China was obliged to cede Taiwan, the nearby Pescadores Islands, and the Kwantung Peninsula in South Manchuria; recognize Korea's independence; pay 200 million taels indemnity; open more ports; and negotiate a commercial treaty. The latter, signed in 1896, gave Japan all the privileges that the Western powers had in China and added the further privilege of carrying on 'industries and manufactures,' using the cheap labor in the treaty ports." Note: The Treaty of Shimonoseki gave all foreigners a clear right to establish factories in treaty ports. After 1895, foreign-run factories using Western technology rapidly increased in number as, revealingly, did privately owned Chinese factories using Western technology.

"Japan's triumph, however, was soon tarnished by a blatant power play by the Western nations. Russia, which itself had ambitions in both Manchuria and Korea, was alarmed by Japan's success. It persuaded Germany and France to join in a diplomatic intervention on April 23, 1895, 'advising' Japan to give up the Kwantung Peninsula. Bowing to *force majeur,* Japan complied, receiving in compensation 30 million taels of additional indemnity. There was naturally a strong reaction of indignation among the Japanese public, which became further embittered when the same three powers appropriated pieces of China for themselves in 1898, the Russians taking, under a twenty-five year lease, the Kwantung Peninsula that Japan had been forced to disgorge only three years earlier.

"The achievement of equality: Still, Japan's victory over China greatly impressed the West, and the British in particular, disillusioned with the incompetence of the Chinese government, began to show a decidedly more pro-Japanese attitude."

"On July 30, 1902. the Anglo-Japanese Alliance was signed–the first military pact on equal terms between a Western and a non-Western nation... The British, seeing their long dominance of the eastern seas threatened by the rise of new naval powers, bolstered their position in East Asia by allying themselves with the only strong naval power in the area. They also forestalled by this pact any Russo-Japanese pact to partition Northeast Asia and instead secured Japanese support for the maintenance of the treaty system in China. The Japanese, faced with growing rivalry with Russia over Korea and Manchuria, needed the alliance to ensure that, if war broke out, Russia would not be joined by other European powers, as it had been in its intervention over the Kwantung Peninsula in 1895. The wording of the alliance made it clear that in such a case Britain would come to Japan's aid."

But an even more important victory came a few years later in 1904, when Japan defeated the powerful Russian Empire.

Source: Fairbank, Reischauer, and Craig. 1973. *East Asia: Tradition and Transformation.* p. 553-55.

900. Yabe, Kikuji. 1895. Ueber einen vegetabilischen Kaese aus Sojabohnen [On a vegetable cheese made from soybeans]. *Landwirtschaftlichen Versuchs-Stationen* 45:438-39. [1 ref. Ger]
• ***Summary:*** This is a German summary of the English-language article by Yabe titled "On the vegetable cheese, natto," which was published in 1894 in Japan in the *Bulletin of the College of Agric., Tokyo Imperial Univ.* 2(2):68-72. "The Japanese prepare from soybeans (*Sojabohnen*), which are rather rich in proteins, two types of cheese: miso and natto. Miso, made with koji, is consumed in greater quantities than natto (*Natto-Käse; literally 'natto cheese'*)."

Note: This is the earliest German-language document seen (Jan. 2012) that uses the term *vegetabilischen Kaese* to refer to natto. Address: Japan.

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901. *Times* (*London*)**.** 1896. Agriculture: Crops and live stock. Jan. 13. p. 8, col. 3. [1 ref]
• ***Summary:*** "A vegetable preparation possessing many of the dietetic properties of meat is produced in Japan under the name of 'tofu.' It consists principally of the protein matter of the soya bean, and is said to be as easily digestible as beef. It is freshly made every day, and is sold in thin tablets of snow-white colour, and of the consistency and taste of freshly-precipitated casein of milk. The name 'vegetable cheese,' proposed to be applied to it, is not justifiable, as there is no trace of bacterial action associated with its preparation. Another form, known as 'kori-dofu,' is prepared by exposing the fresh tofu tablets to the action of frost, with the result that they shrink considerably, lose water, and become more compact. Fresh tofu contains, on the average, 89 per cent of water, whilst kori-dofu contains only 15.3 per cent, in air-dry condition. Tofu is manufactured by the people who sell it in their shops. The beans are first soaked for 12 hours in water, and then crushed between two millstones to a uniform pulpy mass. This is boiled for an hour with three times its quantity of water, and is then filtered through cloth. The liquid passes through white and opaque, exactly like cow's milk, whilst the smell and taste is suggestive of fresh malt. Upon standing, very fine particles separate on the surface, and these under the microscope are easily recognizable as small globules of fat. After two or three days there is a strong development of lactic acid, under the influence of which the casein separates exactly as in the souring of milk. Mr. Inouye, of the College of Agriculture at the Imperial University, Tokio, states that in preparing tofu tablets from the fresh milky liquid about 2 per cent of concentrated brine is added with constant stirring; a flocculent precipitate soon forms and is separated by means of a cloth filter, slowly pressed, and cut into tabular shape. In this way about one-fourth of the total quantity of the proteid in soya beans is obtained in the tofu. The brine employed is made from sea water, and it is to the potassium and magnesium salts contained in this that the precipitation of the tofu appears to be due. Wherever rice forms the principal food of man, as in China and Japan, the addition of some other food rich in nitrogenous matters, or proteids, is necessary to make up for the deficiency of proteids in rice. The people of the sea coast supply this want by the use of marine animals, whilst inland the seeds of various leguminous plants, and notably the soya bean, are employed, as beef and other meats have only recently come into use. Tofu, therefore, may be regarded as a kind of vegetable beef prepared artificially from a plant product, and, when consumed in conjunction with rice, filling the *róle* of a nitrogenous or proteid food in the presence of a larger quantity of a carbonaceous one."

Note: This is the earliest article seen (Dec. 2005) in the *Times* (London) that contains the term "soya bean."

902. Prinsen Geerligs, H.C. 1896. Einige chinesische Sojabohnenpraeparate [Some Chinese soybean preparations]. *Chemiker-Zeitung* 20(9):67-69. Jan. 29. (Exp. Station Record 8:72). [3 ref. Ger]
• ***Summary:*** This is a German translation of the author's 1895 Dutch article, but with two mistakes concerning tempeh corrected. He changed the name of the mold from *Chlamydomucor Oryzae* to *Rhizopus Oryzae* and he changed the name of the product from "tempets" to "tempeh." He added in conclusion that "it was finely sliced and enjoyed, mold and all." But he continued, apparently mistakenly, to refer to tempeh as a Chinese soyfood.

He also improved his description of Chinese-style soybean paste, which he now calls *Tao-tjiung* (*Bohnenbrei*) [*doujiang*], and says has much similarity with the miso of the Japanese (p. 68 R.7).

Note 1. These two articles by Prinsen Geerligs ushered in the era of scientific research on tempeh by European microbiologists and food scientists.

Note 2. This is the earliest document seen (Sept. 2011) that contains the word "tempeh"–spelled with an "h" on the end.

Note 3. It is also the earliest German-language document seen (Sept. 2011) that mentions tempeh, which it calls "tempeh."

Note 4. This is the earliest German-language document seen (Aug. 2013) that uses the term *milchweisse Flüssigkeit* ("milk-white liquid") to refer to soymilk. Address: Java, Indonesia.

903. *Vegetarian Messenger* (*Manchester, England*)**.** 1896. Tofu, a Japanese vegetable cheese. Feb. p. 33-35.
• ***Summary:*** A summary of a long paragraph on tofu from an article titled "Agriculture: Crops and live stock," in the *Times* (London) (13 Jan. 1896, p. 8).

904. Corson, Juliet. 1896. A Lenten dinner: Good things that can be made in the lean season even. *New York Times.* March 8. p. 27.
• ***Summary:*** "Soya, or soy, is a favorite table sauce, which was first brought to England by officers returning from India. Small pieces of fish, poultry, and vegetables are preserved in this sauce, with the double effect of keeping them entirely sweet and making them tender... being remembered that the Chinese soya is sweet and spicy, but less peppery than the cassareep of the West Indies. The Japanese is salter [sic, saltier] and less spicy and sweet than the Chinese."

Note: "Cassareep is a thick black liquid made from cassava root, often with additional spices, which is used as a base for many sauces and especially in Guyanese pepperpot. Besides use as a flavoring agent, it also acts as a preservative" (Source: Wikipedia, Sept. 2010).

905. Hickman, J. Fremont. 1896. Forage crops. *Ohio*

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Agricultural Experiment Station, Bulletin No. 70. p. 79-107. April. See p. 85-87, 94-95, 105.

• ***Summary:*** In the section titled "Leguminous Forage Plants" is a subsection on "The Soja Bean. (*Glycine hispida.*) This is known in its native country (Japan) as the Japanese or Mongolian pea, in the United States as the 'Soja' or 'Soy' bean... In Japan the soja bean is regarded, when properly cooked, as an edible and palatable dish, being so highly esteemed that it is rarely fed to stock. The berries, when broken and boiled in water, make a fair substitute for coffee.

"In May, 1893, two varieties were planted in rows three feet apart and in hills twelve inches apart in the row; these were cultivated, much as we would cultivate potatoes, during the season. They made a very fine growth."

On 17 May 1895 a small patch (one-tenth acre) of soja beans was planted in rows, and another one-tenth acre was planted with a grain drill at the rate of one bushel per acre. A photo (Plate I, facing p. 94) shows this patch when the plants were about six weeks old. "To the right of the soja beans is a patch of rape, which is shown more distinctly in Plate II" (next page).

The soja bean plant, "like alfalfa and cowpeas, may be used in at least three ways: as a forage crop, for hay, and as a green manure, for plowing under."

"This plant has not been tested at this Station as a green manure, but, belonging as it does to the Leguminous family, and making such a large, strong growth within a single season, it would seem to have the advantage over the clovers, which take a full year to develop enough to turn under.

"From my present knowledge of this plant I regard it as one of the most promising new plants, either as a forage crop or for plowing down."

Page 105 summarizes: "*The soja bean* is one of the most promising new forage crops grown at this Station. It makes a very good yield per acre, is a hardy, rapid grower, makes a relatively good soiling crop, and promises well as a green manure." Address: M.A.S., Agriculturist, Wooster, Ohio.

906. Kellogg, John Harvey. 1896. Bean cheese: Editorial. *Modern Medicine and Bacteriological Review* (*Battle Creek, Michigan*) 5(5):112. May.

• ***Summary:*** "A variety of cheese known as *tofu* is much used by the Japanese. It is made from the soja bean, which, after soaking for twelve hours in water, is ground to a uniform pulpy mass, then boiled for an hour in three times its quantity of water, and afterward filtered through a cloth. The milky liquid thus obtained is allowed to stand two or three days, when lactic acid develops, by which the vegetable casein is separated as in sour milk. Ten per cent. of concentrated brine is added by constant stirring, which causes a flocculent precipitate. This is separated by a cloth filter, and is formed into tablets by a slow pressure.

"*Tofu* is eaten in the form of soup and in many other ways. The solid nutriment which it contains amounts to only about ten per cent. Sometimes the greater part of the water is separated by freezing, and the block of frozen *tofu* afterward allowed to thaw in the sun. When prepared in this way, the proportion of solid nutriment, chiefly fat and vegetable casein, is nearly eighty per cent."

Note 1. This is the earliest document seen (Dec. 2013) in which Dr. John Harvey Kellogg clearly mentions a soyfood product–tofu.

Note 2. This is the earliest English-language document seen (April 2013) that uses the term "frozen tofu" to refer to dried-frozen tofu. Address: M.D., Battle Creek Sanitarium, Michigan.

907. Smith, Jared G. 1896. Fodder and forage plants, exclusive of grasses. *USDA Division of Agrostology, Bulletin* No. 2. 58 p. [2 ref]

• ***Summary:*** Includes detailed discussions of the following plants (listed here alphabetically; many are illustrated): Amaranthus (p. 8)–Bigweed, pigweed, tumbleweed (fig. 2). Several species are used on the western ranges, incl. *A. blitoides.*

Amphicarpæa monoica (p. 8)–Hog peanut. "A wild bean, native of the woodlands and forests throughout the region east of the Missouri River, with two kinds of flowers...

Arachis hypogæa (p. 9)–Spanish peanut, peanut, ground nut, goober, earth nut (fig. 4). "An annual herb, a native of Peru and Brazil, introduced very widely in cultivation throughout the Southern States. The peanut is hardy as far north as Maryland. This is one of the most valuable fodder plants for the Southern States. There are two varieties–the one which furnishes the peanut of commerce, which requires a long season; and the Spanish peanut, which matures in about three months. The pods of the latter are smaller, and the seeds fewer and smaller, than those of the edible variety. Peanut-vine hay is more nutritious than that of red clover. The yield of nuts ranges from 50 to 75 bushels to the acre. The Spanish peanut is the one usually grown for forage... The nuts or beans are rich in oil and albuminoids. Peanut meal makes a richer stock food than cotton-seed meal. A valuable oil can be expressed from the seeds."

Cyperus esculentus (p. 15)–Chufas, hognut, ground almond (fig. 12). "A Perennial sedge, spreading extensively by underground stolons, which produce enormous numbers of edible tubers... The oil extracted from the nuts is said to surpass in excellence all other oils used for culinary purposes."

Glycine hispida (p. 21)–Soja bean, soy bean, coffee bean (fig. 17). "An erect annual legume, with hairy stems and leaves, which has been cultivated in China and Japan from remote antiquity. It was long grown in botanic gardens, but when the facts concerning its use as a human food by oriental nations came to light about twenty years ago, it was largely introduced into this country and Europe, where through trials of its forage and food value have been made...

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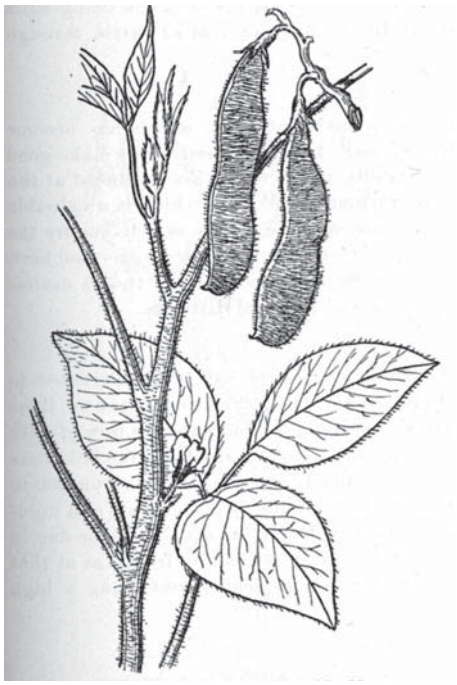

When fed to milch cows, a ration of soja beans increases the yield of milk, improves the quantity of the butter, and causes the animal to gain rapidly in weight. It is an excellent addition to a ration for fattening cattle. In China and Japan, where the soja bean is an article of diet, substances similar to butter, oil, and cheese, as well as a variety of dishes, are prepared from it. The yield of green forage amounts to from 6 to 8 tons per acre, and of the beans from 40 to 100 bushels. The feeding value of the bean has been found to be greater than that of any other known forage plant except the peanut."

Lotus tetragonolobus–square pod pea (p. 27). A much-branched ascending annual, closely related to the birdsfoot clover. It is a native of southern Europe [sic], and is grown there for salads and as an ornamental plant. It has been recommended by the California Experiment Station as the best winter crop for plowing under in spring as green manure. It yields from 20 to 25 tons of green fodder, equivalent to 4 to 5 tons of air-dried hay, and the roots are described as being fairly incrusted with tubercles, whose office it is to extract nitrogen from the air; and though the plant does not contain as high a percentage of crude protein as alfalfa or the clovers, it is worth as a green manure two or three times as much as either, because of the enormous amount of herbage produced. Sown in January, it will be ready to be plowed under in May. The seed should be sown broadcast thinly on freshly plowed earth and harrowed in.

Lupinus albus–White lupine. Lupinus hirsutus–Blue lupine. Lupinus luteus–Yellow lupin (p. 27-28).

Note 1. This is the earliest document seen (Aug. 2008) by or about USDA's Division of Agrostology and soybeans. On 1 July 1895, within the USDA, the new Division of Agrostology was established. Directed by Frank Lamson-Scribner, it conducted research on grasses and forage plants, especially in the Western U.S.

Note 2. This is the earliest English-language document seen (Aug. 2008) that contains the word "Agrostology" or "Agrostologist" in connection with soybeans. Address: Asst. Agrostologist, Div. of Agrostology, USDA.

908. Trimble, Henry. 1896. Recent literature on the soja bean. *American J. of Pharmacy* 68:309-13. June. [12 ref]
• ***Summary:*** One of the best early reviews of the literature, especially the Japanese and European literature, published in the United States. This paper introduced several new soyfoods (such as *natto* and *kori-dofu*) to the United States Contents: Introduction. Nutritional composition of the soja bean based on analyses of 5 samples from China, Hungary, France, and Japan. Diastatic enzyme / ferment "present in the soja beans to a greater extent than in many other leguminous seeds (see Güssmann 1890). Composition of etiolated soja shoots [sprouts]. The oil [of the soja bean]. Starch content. Sugar content. Use of soybeans as food in Japan. Miso. Natto. Tofu. Kori-dofu. Introduction of the soja bean to the United States in about 1888. Ability to obtain nitrogen from the air.

Note. This is the earliest English-language document seen (Jan. 2013) that uses the term "etiolated soja shoots" to refer to soy sprouts.

"The immediate excuse for the appearance of this paper is the fact that a number of contributions have recently appeared on the soja bean, notably from the College of Agriculture, Imperial University of Japan."

"The oil may be extracted by pressure or by means of solvents [in the laboratory]; it is said to possess some laxative properties, is of a yellowish brown color, and has a slightly aromatic odor; it is intermediate between the drying and non-drying oils." The following constants, based on Stingl and Morawski (*Chemiker Zeitung,* 1886, p. 140) are given: "Specific gravity at 15ºC: 0.924. Point of solidification: 8-15ºC. Fusing point of the fatty acids: 27-29ºC. Point of solidification of fatty acids: 23-25ºC. Temperature rise: 59ºC. Iodine number: 121.3. Iodine number of the fatty acids: 122. Saponification number: 192.5. Note: Trimble actually got these constants from *J. of the Society of Chemical Industry,* 31 May 1893, p. 453-54, which summarised an Italian-language article by De Negris and Fabris (1891), whose values confirmed those obtained by Stingl and Morawski.

Trimble (p. 311-12) gives a good, detailed description of natto based entirely on Yabe (1894). Parts of his summary perceptive: "Yabe found in this substance four kinds of microbes present, and he believes the chemical decomposition of the proteids to be due to one or more of these microbes... A chemical investigation by the author just mentioned [Yabe] revealed tyrosine, peptone, guanine, leucin and xanthine. The total proteids amounted to considerably

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more in the *natto,* when allowance is made for moisture, than existed in the original bean, and the artificial product is also considered to be much more digestible."

Concerning tofu and soymilk: "A still more interesting preparation of the soja bean than either of the preceding [miso and natto] is *tofu.* This has been described and investigated by M. Inouye (*Bulletin Imp. College of Agriculture,* Vol. 2, No. 4 [1895]). The beans are first soaked for about twelve hours in water, and then crushed between two millstones until a uniform pulpy mass is obtained. This is then boiled with about three times its weight of water, and filtered through cloth. The liquid filtrate is white and opaque, very closely resembling cow's milk, while the odor and taste remind one of fresh malt. On standing, the liquid becomes sour from the formation of lactic acid, and a coagulation of the casein takes place. The freshly boiled and filtered liquid is coagulated either by the addition of a portion of the sour liquid which has been set aside from a previous lot, or it is treated with about 2 per cent of a concentrated brine, such as is obtained as mother liquor from the preparation of sea salt."

"Somewhere about the year 1888 the soja bean was introduced into the United States. It has been tried in a number of State Experiment Stations, and is gradually working into favor in the Southern States. In Kansas the plant has been found to withstand considerable drought... The plant is valuable for forage or soiling. The beans have been produced in South Carolina to the amount of 10 to 15 bushels per acre. On account of their richness in oil they have been used as a substitute for cotton-seed meal in feeding cattle, with very satisfactory results.

"The plant is believed to have, in common with most leguminosæ, the power of obtaining some of its nitrogen from the air, and hence, of acting as a soil renovator."

Note 1. This is the earliest document seen (Aug. 2013), published in the USA, that contains the word *tofu,* or *kori-dofu* [dried-frozen tofu], or that discusses soymilk.

Note 2. This is the earliest English-language document seen (March 2003), published in the USA, that uses the word "crushed" or one of its cognates (crushing, crushers, etc.) in connection with soybeans.

Note 3. This is the earliest U.S. document seen (Sept. 2002) that mentions the use of a solvent for extracting the oil from soybeans.

Note 4. This is the earliest English-language document seen (March 2008) that contains the term "iodine number" (regardless of hyphenation or capitalization).

Note 5. This is the earliest English-language document seen (March 2008) that contains the word "drying" in connection with soy oil and its iodine number, or that states that soy oil is intermediate between the drying and non-drying oils. Address: USA.

909. Yabe, Kikuji. 1896. Kaese aus sojabohnen ["Cheese from soybeans"]. *Zentralblatt fuer Bakteriologie. Series 2.* 2(23/24):769. Dec. 24. [2 ref. Ger]

• ***Summary:*** This is a German-language review of an article from the *Nederlandsch Landbouw Weekblad.* 1896. No. 82– from *Molkerei-Zeitung.* 1896. No 43. The Japanese prepare from the Legumin-rich soybean two types of cheese, which are named miso and natto. Address: Nôgaku-shi, Imperial Univ., College of Agriculture, Tokyo, Japan.

910. Chicago City Directories, Shinzaburo Mogi, Kikkoman, Shinzo Ohki, Oriental Show-You Co. 1896-1923. Chicago, Illinois.

• ***Summary:*** The Chicago city directory shows no listings in 1896, 1902, or 1904 for Mogi or Yamato. In 1914 Shinzaburo Mogi is president of Yamato Importing Co., 824, 36 S. State in Chicago. S. Nakinura also works there. They import silks. In 1916 Shinzaburo Mogi is still president but the address is now 3rd floor, 319 West Adams. S. Kurihara is secretary. Mr. Mogi's residence is at 6050 Blackstone Ave. Mr. Tanba and Oriental Show-You are not listed.

In 1923 Shinzaburo Mogi is treasurer of Oriental Show You Co. and resides at 6210 Dorchester Ave. The listing for Oriental Show-You Co. shows Shinzo Ohki, president, Earlie Diffendarfer, vice president (residence: Columbia City, Indiana), Mitsuji Kiyohara, secretary, and Shinzaburo Mogi, treasurer. Soy mfgrs, 208 N. Wab Av. The listing for Yamato Importing Co. shows S. Mogi, president, S. Kitazawa, vice president, N. Kimura, secretary, T. Kinchi, treasurer. Whol[esale] dry goods. 305 W. Adams. Address: Chicago, Illinois.

911. **Product Name:** [Dr. Lahmann's Japan Soja].
Manufacturer's Name: Dr. Heinrich Lahmann.
Manufacturer's Address: Germany.
Date of Introduction: 1896.
How Stored: Shelf stable.
New Product–Documentation: Ad in Ellen Goodell Smith. 1896. *The Fat of the Land and How to Live on It.* A description of "Japan Soja" is given on p. 164-65. A full-page ad (p. 258) is titled "Pure. Vegetable. Nutritive." by The Hygienic Supply Co. (F. Witte), 203-205 Park Ave., Baltimore, Maryland. They are "Importers of German health goods and books" including Dr. Lahmann's Japan Soja, which "Is a pure vegetable extract, which is far superior to Meat Extract. It can be used for making soups, or may be added to other foods in order to make them more appetizing. Price per jar, $1.00." Other German imports include Dr. Lahmann's Vegetable Milk (for infants), Dr. Lahmann's Vegetable Extract, and Dr. Lahmann's Nutritive Cocoa.

Note 1. According to *Vegetarisches Kochbuch mit Gesundheit Regeln,* by Carlotto Schultz (1886), Dr. H. Lahmann of Stuttgart is an authority on the feeding of infants and problems related to indigestion. Note 2. Strittmatter (1915, p. 56) says that H. Lahmann M.D. lives in Munich, Germany.

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Note 3. Janet Barkas in *The Vegetable Passion* (1975, p. 100) states that Dr. Heinrich Lahmann was an early, influential vegetarian in Germany. "Lahmann traced many illnesses to an over-reliance on meat and unnatural medications." He was one of the first German physicians to use natural healing methods. He was the author of at least 3 major books, his sanitorium generated much enthusiasm, and, at the turn of the century, he founded a vegetarian society in Dresden.

Note 4. This is the earliest known commercial soy product made in Germany.

912. Aston, W.G. trans. 1896. Nihongi (Nihon Shoki). Chronicles of Japan from the earliest times to A.D. 697. 2 vols. London: Published for the Japan Society by K. Paul, Trench, Truebner. 443 p. [Eng]

• ***Summary:*** This incident appears in the first book, in the chapter titled "The Age of the Gods." The Deity Uke-mochi no Kami, the Goddess of food, brought forth from her mouth all kinds of foods, which were prepared and set out on 100 tables for the entertainment of the Deity Tsuki-yomi no Mikoto. Seeing this, the latter "became flushed with anger and said:–'Filthy! Nasty! That thou shouldst dare to feed me with things disgorged from thy mouth.' So he drew his sword and slew her."

Then the Sun Goddess, Ama-terasu no Oho-kami [also called Amaterasu-omikami, the Shinto Sun Goddess], sent another messenger, Ame-kuma-bito, to see the Goddess, who "was truly dead already. But on the crown of her head there had been produced the ox and the horse; and on top of her forehead there had been produced millet; over her eyebrows there had been produced the silkworm; within her eyes there had been produced panic [*Panicum* millet]; in her belly there had been produced rice; in her genitals there had been produced wheat, large beans and small beans."

Two footnotes explain that, according to Hepburn, "large beans" refer to soybeans (*Soja hispida*), and "small beans" to azuki beans (*Phaseolus radiatus*).

"Ame-kuma-bito carried all these things and delivered them to Ama-terasu no Oho-kami, who was rejoiced, and said:- 'These are the things which the race of visible* men (*as opposed to the unseen gods) will eat and live.' So she made the millet, the panic, the wheat, and the beans the seed for the dry fields, and the rice she made the seed for the water-fields" (p. 27).

Note 1. Aston is a very famous early Japan scholar, born in 1841. Reischauer and Fairbank (1960, p. 464) cite this as *Nihon shoki* (*History of Japan,* also known as the *Nihongi*), compiled in A.D. 720.

Note 2. The 1896 edition of this book is very rare. In 1924 the original edition published by the Japan Society was reissued as two volumes in one. The story cited above appears on p. 32-33. In addition, the "five kinds of grain" (including hemp, millet, rice, corn and pulse) are mentioned on p. 21 and p. 278. Address: C.M.G., England.

913. Gregory, James J.H., & Sons. 1896. Catalog of home grown seeds. Marblehead, Massachusetts. 72 p.

• ***Summary:*** In the section titled "Grains, Grasses and Forage Plants," page 36 states: "Soja or Soya Bean. The 'American Coffee Berry.' Under the name of American Coffee Berry this Japanese bean is being sold in the West at fabulous prices. It does not even belong to the coffee family of plants, still it is a fact, as we find by actual test, that when roasted and *coarsely* ground it tastes so nearly like Brazilian coffee the difference is scarcely perceptible. It certainly is the best of all substitutes for coffee yet found, and as there is nothing injurious about it, it being the most nutritious of all vegetable products, and as it can be raised almost anywhere where corn will mature, and yield from twenty to thirty bushels per acre, we believe that the time is not far distant when it will be quite generally raised as a substitute for cheaper varieties of coffee. The extraordinary richness of the seed makes them an excellent home substitute for cotton and linseed meal for feeding purposes. Cows are very fond of the ground beans, and the meal mixed with corn meal makes valuable food for poultry. Price per quart, postpaid, 45 cents; per package, 10 cents.

"Varieties–We have grown many varieties imported chiefly from Japan and have selected three to catalogue.

"Extra Early Dwarf.–This will mature wherever bush beans will. It grows two feet high and bears a chocolate-colored bean. Price, per quart, postpaid, 45 cts.; per package, 10 cts.

"Medium Early.–This will mature as far north as central New England, grows three feet in height, is an abundant cropper, bearing round, straw-colored beans. Price, per peck, per express, $1.25; per quart, postpaid, 45 cts.; per package, 10 cts.

"Late or Ensilage.–These varieties cannot be relied on to ripen north of southern New England, but for ensilage purposes they can be successfully raised in middle New England. Plants four feet high; beans varying in color. Price, per bushel, per express or fright, $3.00; per peck, $1.00; per quart, postpaid, 40 cents; per package, 10 cents.

"Both Medium Early and Late are excellent sorts to use for ensilage, layer and layer with corn, for they greatly enrich the ensilage, contributing the rich nitrogenous element in which the corn stalks are markedly deficient. For this purpose the stalks should be cut when the beans are about full sized. They not only help the yield of milk but keep the cows in better flesh, and add decidedly to the richness of the manure pile, making it worth as much again for plant food as that made from corn stalks." An illustration shows a soja bean plant containing many pods.

Other plants listed in this catalog include: Alfalfa or lucerne, Japan clover (*Lespedeza striata*), golden wonder Millet, kaffir corn, manshury barley, Japanese buckwheat,

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yellow doura, prickley comfrey [prickly comfrey], milo maize, Japanese millets, and sacaline (*Polygonum Sachalinense*).

This catalog is owned by the Smithsonian Horticulture Branch Library in Washington, DC.

Note: This is the earliest document seen (Aug. 2013) that mentions the soybean variety Extra Early Dwarf. Address: Marblehead, Massachusetts.

914. Nishimura, Eijuro. 1896. Miso shôyu jôzôhen [Miso and shoyu fermentation]. Tokyo: Hakubunkan. 316 p. See p. 18. 20 cm. Series: Tsuzoku nichiyo kagaku zensho, no. 11. [Jap]*

• ***Summary:*** More than 90% of the protein in soy beans is in the form of albuminoids.

Note: This is the earliest book in WorldCat / OCLC that has miso as a subject or title word.

915. Skeat, Walter William. 1896. A concise etymological dictionary of the English language. 4th ed., further revised with enlarged supplement. New York, NY: Harper & Brothers, Publishers. xii + 633 p. See p. 453-54, 611.

• ***Summary:*** The etymology of the word "Soy" states (p. 453-54): "Soy, a sauce. (Japanese.) Also *sooja,* 'which has been corrupted into 'soy;' Eng. Cycl. Japanese *shóyu,* soy, sauce; though the name is now given to the bean (*Dolichos soja*) whence *soy* is made."

In Appendix 6, "Distribution of words according to the languages from which they are derived," is a section (p. 611) "19. Words of Asiatic origin, but neither Aryan nor Semitic." Under "Japanese" are listed only two words: "japan, soy." Address: Rev., Litt.D, LL.D., Elrington and Bosworth Prof. of Anglo-Saxon in the Univ. of Cambridge [England].

916. *Bruce Herald* (*Otago, New Zealand*). 1897. Miscellaneous. Jan. 12. p. 6.

• ***Summary:*** "Vegetable meat of Japan, called "torfu" [sic, tofu], is said to consist chiefly of protein of the soya bean, and to be as nutritious and digestible as meat. It is sold in tablets, is white as snow, and tastes like fresh malt."

917. Hanai, T. 1897. Physiological observations on lecithin. *Bulletin of the College of Agriculture, Tokyo Imperial University* 2(7):503-06. Feb. [9 ref. Eng]

• ***Summary:*** "Seeds rich in starch generally contain much less lecithin than such as are rich in proteid, thus barley grains contain less than half the amount of lecithin that soja-beans do (see Schulze & Steiger 1889, *Hoppe-Seyler's Zeitschrift für Physiologische Chemie,* Vol. 13). Probably there is also a larger proportion of lecith-albumin in the seed of soja and lupin than in those of squash and barley.

Note 1. This is the earliest English-language document seen (Aug. 2003) that contains the term "albumin" (or "albumins") in connection with soy.

Note 2. In this article, Hanai did not investigate soybeans; he studied only the leaves of the tea plant (*Thea chinensis*) and the bark of *Prunus Cerasus.* Address: Nôgaku-shi, Japan.

918. Tokio Nurseries Co. 1897. General catalogue of plants, bulbs, seeds, &c. &c. Tokio, Japan. v + 53 p. 25 cm. [Eng]

• ***Summary:*** In the section titled "Vegetable seeds" (p. 45-50) is a subsection on "Pulse" (p. 47-48). The first entry is: "Soya Hispida, glycine hispida, soy bean, wide cultivation of this bean in the East, is used in the preparation of Japanese Soy [sauce], of Vegetable Bean Cheese [tofu], as well as Green fodder and manure. Thus the bean forms one of the staple products of Japan.

"'Early Variety,' sow April, crop in June. $1.20 per 10 lbs. $12.00 per 100 lbs.

"'Late Variety,' sow May, crop in August, eaten only when fully boiled down. $2.00 per 10 lbs. $18.00 per 100 lbs."

Other species of pulse listed are: *Phaseolus Mungo var. subtrilobata* ([azuki], 4 varieties; "'Common,' a very hardy productive one, sending out bushy crowns. The beans are crushed and made into sweets. $1.00 per 10 lbs." Also: White, Black-Eyes, New Prolific), *Phaseolus Mungo var. radiatus* ([mung beans]; "green podded, which when smashed is made into sweets, June-Sept., $1.50 per 10 lbs."), broad beans, peas ("Ordinary pisum sativum, also used in the preparation of viscous soy" [sauce]), red pea, *Dolichos Lablab, Mucuna Capitata,* French beans, Speckled Partridge ("correct botanical name is not yet identified"), *Canavalia ensiformis.*

"Cable address: Nurseries Co., Tokio. Headquarters for lily bulbs, Cycas revoluta, Japanese plants and seeds." On the cover are two photos: (1) A horse pulling a two-wheeled cart loaded with boxes. (2) People packing things into trays and baskets outdoors.

Note 1. This is the earliest Japanese seed catalog seen (Dec. 2004) that mentions soybeans.

Note 2. This is the earliest Japanese seed catalog seen (Dec. 2004) that contains one or more photographs.

Note 3. This is the earliest English-language document seen (April 2012) that mentions a non-soy sauce made from peas that resembles soy sauce. Address: Komagome, Denchu, Tokio, Japan.

919. Williams, Thomas A. 1897. The soy bean as a forage crop. *Farmers' Bulletin* (*USDA*) No. 58. p. 1-19. March. Revised (very slightly) in 1899. [7 ref]

• ***Summary:*** Contents: General characteristics and origin. Varieties. Conditions of growth. Methods of culture. Harvesting. Yield. Chemical composition. Digestibility. Value and uses: As a soiling crop, as a silage crop, as a hay crop, as a pasture plant, as a soil renewer, value of the bean for feed. Summary. Appendix–Soy beans as food for man.

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In the letter of transmittal printed at the front of this bulletin, F. Lamson-Scribner (USDA Agrostologist) says: "For reasons set forth in the body of this bulletin [see p. 4], the name 'soy' has been adopted to 'soja,' by which it has been generally known.

"In 1875 Professor Haberlandt began an extensive series of experiments with this plant in Austro-Hungary, and in a work published in 1878 he gave the results of his studies and strongly urged the cultivation of the soy bean as a food plant for both man and beast. Although he succeeded in exciting a great deal of interest in its cultivation while making his experiments, and distributed a considerable amount of seed, very little seems to have come of it; for at his death, which occurred in 1878, the interest flagged, and the soy bean has failed to obtain the place as a staple crop which he prophesied for it."

"It is only within the last 15 years that it [the soy bean] has received much attention as a forage crop." Robert C. Morris of Illinois grew soy beans in 1896.

"The term 'soy' applied to this bean is derived from a Japanese word 'shoyu,' denoting a certain preparation from the seeds which is a favorite article of diet in that country. The term 'soja' is often used in connection with this plant, but Professor Georgeson, who spent some time in Japan, and who, since his return to this country, has experimented extensively with this plant, says [1892, "Test of some Japanese beans"]: 'The term *soja,* often applied to this bean, is misleading, inasmuch as the species named by Siebold and Zuccarini *Glycine soja* is not cultivated there (Japan), or at least rarely cultivated, though wild in the south...'" (p. 3-4). Note 1. Prof. Georgeson played an important role in changing the name of this plant to soy bean from soja bean.

"Varieties (p. 5-7): The different varieties of soy bean are distinguished largely according to the color, size, and shape of the seed, and the time required for the plants to reach maturity. They also differ more or less in the habit of growth and in the character and degree of the hairiness of the various parts of the plant. The names applied to the varieties here in the United States usually refer to the time of reaching maturity and the color of the seed; as, for example, 'Early White,' 'Medium Late Green,' 'Medium Black,' etc. The early varieties generally fruit heavier in proportion to the size of the plant than the later ones, and hence are better to grow for seed, while the medium or late varieties are better for forage on account of the larger yield of fodder that may be obtained.

"The 'Early White' soy bean is an excellent variety to grow when a crop of seed is desired, particularly in the North, where the growing season is likely to be short... 'Medium Early Green' is one of the best varieties to plant for hay, as it yields heavily and retains its leaves well. For soiling or for ensilage 'Medium Early Green,' 'Medium Early Black,' or the 'Late' green or black varieties may be used, according to the length of the season and the time at which the crop is to be used. In the New England States the 'Medium Early Green' variety is generally preferred, while in the Central States 'Medium Early Black' seems to be the favorite... For green manuring the large medium or late varieties are best; 'Medium Late Black' being excellent for this purpose."

Harvesting: The "best forage will be obtained by cutting just as the pods are forming... In harvesting a crop for the seed, the plants may be pulled by hand or cut with a scythe or mower and gathered into small piles, which should be relatively high and of a small diameter, so that the plants may dry out readily. Thrashing can be done with a flail or with the thrashing machine. Very good results can be had with common grain thrashers by taking out a portion or all of the concaves and substituting blanks."

The subsection titled "As a pasture plant" (p. 16) states: "In some parts of the country, particularly in the South, the soy bean crop is often pastured. Although hogs are perhaps most frequently used, all kinds of stock can be pastured on it. The crop can often be fed in this manner to great advantage. The labor and expense of harvesting is saved and the droppings from the animals are of great value to the land. Young stock, particularly sheep and hogs, can be very profitably pastured on this crop. Many farmers maintain that by this method of feeding the land is benefited as much as if the crop had been plowed under, and they obtain the pasturage in addition."

The subsection titled "As a soil renewer" (p. 16-17) states: "Leguminous plants, through the aid of the root tubercle organisms, are able to add to the available nitrogen of the soil... When the soy bean was first introduced into the United States it did not form root tubercles, owing to the absence of the tubercle organism from the soil, and it has been grown for several years in some localities without the appearance of any tubercles. In other cases the tubercles have developed in great abundance after a short time. At the Massachusetts (Hatch) Station the medium green soy bean produces great numbers of the tubercles. (See fig. 5.) At the same station it was found that a liberal application of nitrates interfered with the development of the tubercles."

"Value of the bean for feed: There is no crop so easily grown that is so rich and can be used to such good advantage in compounding feeding rations as the soy beans. Excepting the peanut, there is no other raw vegetable product known which contains such high percentages of protein and fat in such a highly digestible form.

"For feeding to animals the beans should be ground and the meal used with some less concentrated feeding stuffs. Comparatively few experiments have as yet been made in the United States to test the feeding value of soy-bean meal. Professor Brooks, in Massachusetts, found that it compared very favorably with cotton-seed meal. Cows fed on soy-bean meal gave richer milk and produced a better quality of butter than when fed on cotton-seed meal, but on the latter the

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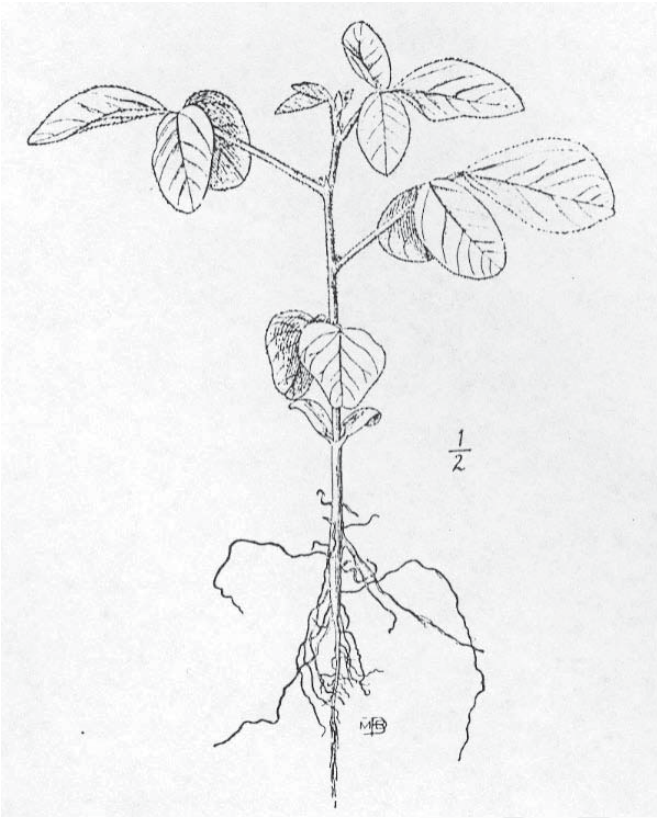
cream was richer. Professor Georgeson obtained excellent results in feeding hogs on a ration of which soy-bean meal was a prominent constituent" (See Bulletin No. 61 of the Kansas Station).



Excellent illustrations (line drawings, some made from photos, p. 4-7, 17; see also next page) show: (1) A young seedling soy bean (½ size). (2) (a) flowering branch of a soy bean plant (reduced 2/3). (b) one of the flowers (enlarged), (c) pods of a soy bean plant (reduced 2/3). (3) Extra early soy bean, leaves and roots at age 7 days (¼ size). (4) Medium black soy bean, leaves and roots at age 7 days (¼ size). (5) Roots of a soy bean plant, showing tubercles.

Tables show: (1) Composition of soy bean at four different stages of growth. (2) Chemical composition of the various kinds of forage made from the soy bean (incl. hay and ensilage). (3) Total amounts in pounds of food constituents produced on an acre of land by soy bean and fodder corn (proteins are flesh formers; fat, fiber, and extract matter are fat and heat producers). (4) Digestibility of soy-bean forage.

An appendix to this article is titled "Soy Beans as Food for Man," by C.F. Langworthy (which see).

Note 2. This is the earliest document seen (Jan. 2003) that uses the word "mower" or the word "concaves" in connection with soybean production.

Note 3. This is the earliest English-language document seen (Jan. 2003) that uses the word "machine" (thrashing machine) in connection with a specific machine for soybean production.

Note 4. This is the earliest document seen (Aug. 2013) that mentions the soybean varieties Medium Early Black, Medium Early Green, or Medium Late Black.

Note 5. This is the earliest document seen (Oct. 2004) which gives details on use of soy bean as a good "pasture plant" or a pasture plant well suited for use in fattening hogs.

Note 6. This is the earliest English-language document seen (Oct. 2004) that uses the words "pasturage," "pasture," or "pastured," or the term "pasture plant," in connection with soybeans. Address: Asst. Agrostologist, Div. of Agrostology, USDA.

920. *Otago Witness* (*New Zealand*). 1897. Pater's chat with the boys. April 1. p. 51.
• ***Summary:*** The section titled "Japan: Past and present" states: "Twenty years ago she [Japan] was an isolated nation, untalked of among the nations of the west; but she is now a great military, manufacturing, and commercial power, combining the maritime instincts of Britain with the go-aheadism of America, and so becoming the combined John Bull and Yankee of the Pacific. So afraid have the United States become of the competition of the lively Japs that one of the planks in the last election was exclusion of the Jap and his products." These protectionist measures are bound to fail for two reasons, which are given.

Japan is facing labour troubles and a rise in the cost of living, as a table shows. If 100 "is taken as the unit of cost of living in 1872," then "the figures below show the amount of advance since [to about 1897]:–Rice 100 to 161. Miso 100 to 189. Shoyu 100 to 158. Firewood 100 to 141. Charcoal 100 to 150. Cotton 100 to 150. Rent 100 to 228–or an average increase of 64 per cent., while wages have gone up only 33 per cent., or little more than half as much."

921. Loew, Oscar. 1897. Ueber die Bereitung der Shoyu-Sauce [On the preparation of soy sauce]. *Mittheilungen der Deutschen Gesellschaft fuer Natur- und Voelkerkunde Ostasiens* (*Yokohama*) 6(60):474-76. [1 ref. Ger] Address: Prof. of Agricultural Chemistry, Imperial University of Tokyo.

922. Curtis, Minnel Wakeman. 1897. Experiment of American family in Japanese housekeeping. *San Francisco Chronicle.* June 27. p. 1.
• ***Summary:*** "At noon they unpacked their rice and dried fish, and took their tiffin seated in the open doorway. The former dish was eaten dark with shoyu sauce; the latter, soaked and delicately fried, looked exactly like squares of coarse white lace."

"... with hot sweet potatoes, cutlets, and turbans of fish and squares of pressed rice coated with shoyu, together with other delicacies,..."

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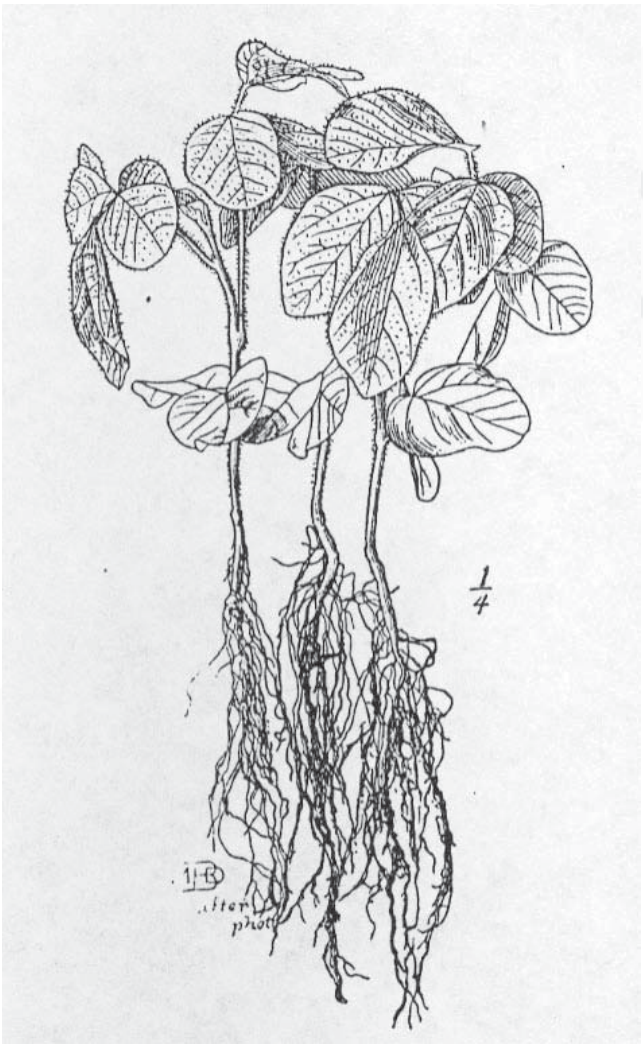

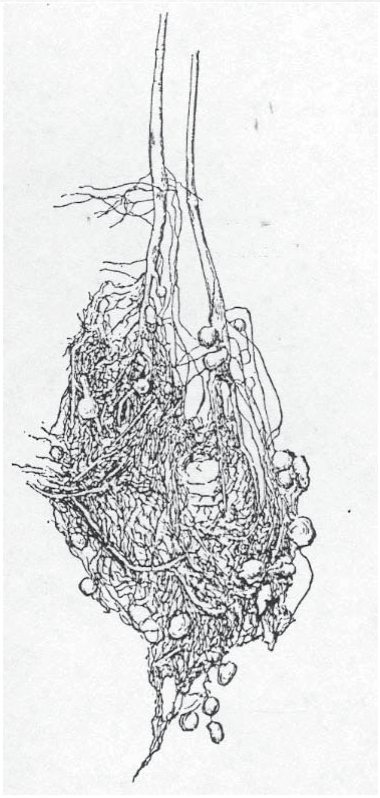

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Note: A "turban" is a rolled stuffed fillet of fish.

923. Nishimura, Y. 1897. The chemistry of soja sauce manufacture. *Bulletin of the College of Agriculture, Tokyo Imperial University* 3(3):191-206. June. German summary in Chemisches Central-Blatt 1897(2):817. [5 ref. Eng]
• ***Summary:*** Contents: Introduction. Preparation of wheat and soja bean. Preparation of soja koji. Chemical processes during the ripening of soja sauce wort (*moromi*). Microscopical examination. The production of the flavour. Suggestion for the improvement of manufacture.

"The manufacture of soja sauce forms one of the important industries of Japan and the export of the article [is] increasing from year to year. (Footnote: Every Japanese uses daily in place of common salt from 50 cc. to 80 cc. of this sauce as a food condiment.) The production in 1893 was 2,307,844 hectoliters (=1,279,238 koku). The number of brewers was now nearly 10,000. One of the factories in Tokio alone employs 250 workmen and manufactures annually 45,000 hectoliters."

This is a detailed description of the process for making koji, moromi, and soja sauce, and an attempt to improve the process and product, and to reduce the fermentation time. Making soja sauce consists of four principal stages: Preparation of the wheat and soja bean, preparation of the soja koji, the ripening process, and pressing and boiling. "Soja sauce is prepared from wheat (sometimes also from barley), the soja bean,* and a salt solution by a slow process, which requires from one to two years and sometimes more. (Footnote: *"The so-called yellow soja bean (*itachi*) which principally serves for the manufacture of soja sauce is rather small and has a certain lustre... All materials for my investigation were obtained from the great soja sauce factory, *Asamasa,* at Nakano near Tokio)."

"It was clear to me that the whole ripening process consisted principally in the action of the powerful enzymes of *Aspergillus oryzae* upon the carbohydrates and proteids in the soja bean and wheat, and further in the development of an agreeable flavour" (p. 19).

"As the present method of manufacture of soja sauce requires much time and therefore a considerable amount of unremunerative capital, it seemed to me of great importance to find some way by which the process could be shortened. Two points seemed to me worthy of consideration. 1. To hasten the action of enzymes. 2. To produce the agreeable taste and flavour in the same measure as the enzyme action is hastened" (p. 200).

First the author crushed freshly prepared moromi so as to increase the surface area acted upon by the enzymes. Then he diluted the moromi with an equal amount of water and heated the mixture to a temperature of 30-35ºC for 1 week. But the normal flavour of good soja sauce had not developed. "The colour of the mixture was dark brown and its taste decidedly sour. To the mixture just mentioned was added 2% cane sugar and 2 c.c. of thick sake yeast for 300 grams of the mixture, and this was again digested at 30-50ºC for 12 days. In this case the flavour was more agreeable and the taste not sour." The author also recommended the direct addition of alcohol in the form of sake or *nigori* (crude sake) to improve the flavour. In this way he was able to make soja sauce with a good odour and taste in 5 weeks. He then tried making soja sauce with germinated soja beans [sprouts], but no real advantage was gained.

Note. This is the earliest English-language document seen (Jan. 2013) that uses the term "germinated soja beans" to refer to soy sprouts.

Microscopical examination demonstrated that "the membranes of the cells of the wheat-endosperm and of the seeds of the soja bean, had been attacked and partially dissolved; only the husk of the wheat had resisted completely. This action must be due to the powerful enzyme derived from the *Aspergillus oryzae* developed during the preparation of the koji." "The mycelium observed was mostly due to *Aspergillus* and *Penicillium.* The small elliptic yeast cells observed resembled *Saccharomyces exigus* while the large kind of yeast resembled the sake yeast" (p. 203). Bacteria were observed during the summer on the surface of the moromi, but could never be found alive in its interior.

The gradual production of alcohol seems to affect the development of flavour.

The article concludes: "I hope that the manufacture of soja sauce will be improved, however, not only by adopting the measure I propose, but also by introducing steam power and other modern appliances."

Note 1. This is the second earliest English-language document seen that contains statistics on the production or consumption of soyfoods (in this case soy sauce) in Japan.

Note 2. The parallel Japanese title of this English-language periodical is *Tôkyô Teikoku Daigaku. Nôka Daigaku. Gakujutsu hôkoku.* Address: Nôgakushi.

924. Langworthy, C.F. 1897. Soy beans as food for man. *Farmers' Bulletin* (*USDA*) No. 58. p. 20-23. July 7. Revised (very slightly) in 1899. [1 ref]
• ***Summary:*** Describes and gives the nutritional composition of various Japanese soyfoods, including natto, miso (white, red, or Swiss), tofu, frozen tofu, yuba, shoyu. Many of his descriptions of soyfoods are based on Trimble (1896).

"Tofu, or bean cheese, is prepared as follows: The beans are soaked in water for about twelve hours, and crushed between millstones until of a uniform consistency. The ground material is then boiled with about three times its bulk of water for about an hour, and filtered through cloth. The filtrate is white and opaque, having somewhat the appearance of milk. It has, however, the taste and smell of malt. This milky liquid, to some extent, resembles cow's milk in composition, as is shown by the following table:" The table, titled "Comparison of the composition of soy-bean milk and

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cows' milk," shows that the two liquids (soy / cow) have the following composition: Water 92.53% / 86.08%, albuminoids 3.02% / 4.00%, fat 2.13% / 3.05%, etc.

"The protein in soy-bean milk is precipitated by adding the mother liquor obtained in the manufacture of salt from sea water, which contains considerable magnesium chloride. The precipitate is filtered off and formed into cakes with the hands. It is eaten in the fresh state or frozen. In the latter case it loses part of its water."

"Though these soy-bean products are prepared chiefly in Japan and other eastern countries, their manufacture has been attempted to some extent in Switzerland and elsewhere..."

"Bean sausages in considerable variety are prepared in Germany, and formed part of the ration of the German soldier in the Franco-Prussian war. So far as can be learned, these are always made from ordinary varieties of beans and not from soy beans...

"Under the name of coffee beans, soy beans are eaten to some extent in Switzerland as a vegetable, and dried and roasted are also used as a coffee substitute. Their use for this latter purpose is not unknown in America. The attempt has recently been made by certain dealers to place the soy bean on the market as a new substitute for coffee and to sell it under other names at an exorbitant price.

"Bulletin No. 98 of the North Carolina Experiment Station recommends soy beans as a palatable vegetable when prepared as follows: Soak the beans until the skins come off and stir in water until the skins rise to the surface and then remove them. Boil the beans with bacon until soft, season with pepper, salt, and butter, and serve hot. If the beans are green the preliminary soaking may be omitted. No other references to the use of soy beans for human food in the United States have been found."

Note 1. This is the earliest English-language document seen (Aug. 2013) that contains the term "soy-bean milk." It is also the earliest U.S. government document or USDA document seen (Aug. 2013) that uses the term "soy-bean milk" (or any other term containing the word "milk") to refer to soymilk.

Note 2. This is the earliest document seen (Jan. 2005) concerning the work of the USDA with nutrition (or home economics) and soybeans. Address: Office of Experiment Stations, USDA, Washington, DC.

925. *Consular Reports* [*USA*]**.** 1897. New tariff in Japan. 55(204):91-101. Sept. See p. 97. [Eng]
• ***Summary:*** This tariff was annexed to the "protocol of the Anglo-Japanese Treaty, signed at London, July 16, 1894." Edwin Dun, U.S. Minister, in Tokyo, sends a translation of the tariff law and states that the budget for the year 1897 was passed without amendment by both branches of the Japanese Diet, so this statutory tariff bill regulates the customs dues to be levied in all cases wherein Japan is not bound by treaty stipulations.

Under "Section X.–Oil and wax," we read: "Bean or pea oil"–10% ad valorum tax.

Note: Japan's first modern legislature, the Imperial Diet, was established in 1890 under the Meiji Constitution.

926. Ward, A.B. 1897. An agricultural experiment station. *New England Magazine* 15(1):65-81. Sept. See p. 78.
• ***Summary:*** Discusses the origins of the experiment station at Connecticut and the pioneering work in the new field agricultural microbiology.

Over the past fifty years, since the farm and laboratory have joined hands, "advance has been steady and secure. But little more than forty years ago, Sir John Bennet Lawes and Dr. J.H. Gilbert were establishing their station at Rothamsted, Boussingault [1802-1887] was experimenting in his laboratory in Alsatia [Alsace, France], and, best of all, the farmers in Möckern, in Saxony [later part of Germany], were petitioning the government to assist them in founding a station to study the questions arising their work.

"It was in emulation of Möckern that American scientists sought to provide Connecticut with similar advantages;...

"Japanese beans, with broad low leaves flapping in the wind and curious pods which seem to have slid from a Satsuma jar or a Banko teapot. There are two classes of these beans–the Japanese Soja or Soya bean, 'the delicious soy,' of which there are seven varieties under cultivation, and a smaller, thin-skinned bean which, boiled, sifted, sweetened and colored, forms a favorite Japanese confection."

927. *New-York Tribune***.** 1897. Dinner at the Japanese legation: There are some peculiarities in the menu, though not many. Oct. 17. p. C14.
• ***Summary:*** "Chickens, too, are served in a peculiar way. They are cut up into small squares, fried and then dressed with a sauce called 'shoyu,' which the Japanese say is the origin of the so-called Worcestershire sauce."

928. *New Zealand Tablet* (*National*)**.** 1897. Science notes: The flavours of butter and cheese. Oct. 22. p. 27.
• ***Summary:*** "We learn some curious facts about butter and cheese from that section of Professor Marshall's learned Presidential Address on Botany, at the meeting of the British Association, which was devoted to the bacteriology of the dairy. To different forms of bacteria, he tells us, are due the distinctive flavours of varieties of butter and cheese..."

"The lecturer suggested that interesting results might be obtained from the investigation of the vegetable cheese [tofu] made in China and Japan from the curd of the soy bean, which is allowed to become mouldy in the process" [fermented tofu].

929. *Star* (*Canterbury, New Zealand*)**.** 1897. In a Japanese inn. Oct. 23. p. 8.

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• ***Summary:*** From *St. James's Budget:* The writer, who stayed in a traditional Japanese inn (*hatoga*), described eating a meal there. "The European traveller will be confronted with a variety of surprises." Of the soups, he liked the *wan mori* (clear soup) best. *"Chawan mushi,* or soup with eggs in it, thick and custard-like, containing minced meats, fish, vegetables, &c.; and miso shiru, or bean soup [miso soup], are also palatable.

"It is only within the last few years that the Japanese have begun to eat meat. Now, however, in most of the inns on the main roads *ushi nabe* will appear on the menu. This dish is composed of beef cut up small, stewed and served *aux fines herbes,* together with a liberal admixture of soy [sauce]. *Tori nabe,* or stewed fowl, is a similar dish and most appetizing. Soy gives a strong flavouring also to another esteemed dish, *unagi meshi,* or eels and rice."

930. *Times* (*London*). 1897. The condition of Japanese agriculture. Nov. 2. p. 3, col. 6. [1 ref]
• ***Summary:*** The Department of Agriculture and Commerce in Tokyo has recently issued a report on Japanese agriculture. It shows the agricultural wealth of the country and the relative importance of various crops and other productions. Rice is the most important crop and during the past 10 years the area devoted to its cultivation has steadily increased. "Japan consumes all her own rice and produces enough for her own consumption in an average year... The total yield of the three grains, barley, rye, and wheat is increasing, and is now about half the yield of rice... The growth of the soya bean and Italian millet has declined steadily" in recent years.

931. Davenport, E. 1897. The cow pea and the soja bean. *Illinois Agricultural Experiment Station, Circular* No. 5. 4 p. Dec. 1.
• ***Summary:*** "The cow pea, which is essentially a bean, and the soja bean, which is a pea, are so similar in nature and use as to be closely associated in the public mind and to make it expedient to treat of them in close connection. Both are natives of Southeastern Asia, where the seed is used principally as human food and the vines as stock food. In this country they are used almost exclusively for stock."

"The cow pea is more spreading, makes more hay and of better quality, because the soja bean, though very upright, has a woody stem, and drops its leaves badly... The cow pea succeeds best in the South... The soja bean has been but recently introduced from Japan, succeeds best in the North and fails utterly in the far South. Both may be sown either broadcast or in drills, but both yield more seed from drills. Both enjoy good land, but will grow upon land 'too poor to raise anything else.'... The cow pea has more than 60 varieties ranging from two to five months for maturity, and from upright to trailing in habit; the soja bean has few varieties and they are all upright."

Table 1 shows the composition and digestibility of the cow pea and the soja bean (green, hay, and seeds) in comparison with that of Indian corn. The hay from soja beans is inferior for reasons given above.

"The two common varieties of soja beans are the Black Medium and the Early White, or Improved White. Of these the first seems to give the ranker growth of vines and the latter the heavier yield of seed." Address: Director of the Station, Urbana, Illinois.

932. Angell, Stephen H. 1897. Soya as food and fodder. *Consular Reports* [*USA*] 55(207):551-52. Dec. [2 ref. Eng]
• ***Summary:*** A remarkable article about all aspects of soybeans and soyfoods. It begins: "The following is a translation from an article by M. Henri Fortune, the well-known French agriculturist. 'There exists a plant extensively cultivated throughout China, Japan, Cochin China, and Tonquin, of which the culture on clay and flinty clay lands would be an excellent experiment for agriculturists and persons interested in the progress of agriculture. This plant acclimatizes perfectly in Belgium.

"'It is employed in the above countries as a food and for divers other purposes. Transformed by cooking into a pulp, which is mixed with salt and rice, we obtain the 'miso,' which constitutes the regulation breakfast of the Japanese. I have eaten this preparation in Yedo [Edo, Tokyo] in 1892, and I found it excellent in taste and very nourishing.

"'Mixed with barley, fermented with water and pressed, this product yields a sirup known as the "soya," which is, so to speak, the unique sauce for all and every Japanese dish, and is employed in such large quantities that the works in the town of Nagasaki have a yearly production of 2,000 tons. The soya also yields a very superior quality of oil, which advantageously replaces olive oil.'"

"'The bread made from the flour of the soya is as good as cake without sugar, and is very appetizing, and is not to be compared with gluten bread, which constipates.'" Fortune believes that 'soya bread is twice as nourishing as wheaten bread, five times as poor in starch, and ten times as rich in fatty materials, and, once its qualities are fully known, the soya may be pronounced the bread of the future.' He recommends the use of soya in bread and biscuits for diabetic diets.

"'In China, the soya replaces milk, which the Chinese do not drink at all. To make this milk, the grain must be crushed, put in a sieve, water slowly poured over it, and a product obtained having all the qualities of milk.

"'The cheese made from soya is delicious. The grain is softened in water and pounded in a mortar. The pulp compressed in a cloth gives two parts; that which is hard is used to feed poultry, etc., and the other, which passes through the cloth, is albumen, and is put on the fire, the curds separated with the aid of rennet, and, when coagulated, a little salt is added.'"

Of green vegetable soybeans he writes: "'We have a

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project in hand to call together the principal Paris restaurant keepers this winter, to allow them to partake of this new vegetable, which will advertise it throughout the world under the patronage of such substantial connoisseurs.

"'In a few years hence, one will buy soya at the grocers, as to-day one buys beans. It is an excellent substitute for hay, and keeps horses in good condition, and cows, when fed on it, will yield at least 20 per cent more milk daily than when fed on ordinary hay.

"'The soya produces per hectare (2.471 acres) from 2,500 to 3,000 kilograms (5,512 to 6,614 pounds) of seed, especially if phosphate fertilizers are sufficiently employed.'"

Note: This is the earliest document seen (Feb. 2001) concerning soybeans in Belgium, or the cultivation of soybeans in Belgium. This document contains the earliest date seen for soybeans in Belgium, or the cultivation of soybeans in Belgium (Dec. 1897). The source of these soybeans is unknown. Address: Commercial Agent, Roubaix, France July 13, 1897.

933. Japan. Dep. of Agriculture and Commerce, Bureau of Commerce (Noshomusho Shokokyoku). 1897. General view of commerce & industry in the empire of Japan. Tokyo: Printed by Y. Yamaguchi. 315 p. See p. 22-23, 234. Also published in 1900 in Paris by M. de Brunoff)
• ***Summary:*** Name of organization with diacritics is: Nôshômushô Shôkôkyoku. Page 5: "The treaty ports or towns open to foreign trade are: Yokohama and Tokyo, on the Bay of Tokyo. Kobe and Osaka on the Bay of Osaka. Niigata, on the western coast of Honshiu [Honshu]. Hakodate, on the Tsugaru Strait. Nagasaki, on the south-western coast of Kiushu [Kyushu]. Kelung, Tamsui, Takow, and Taiwan on the western coast of Taiwan. Ten partially opened ports in Japan and three in Corea [Korea] are also listed.

On pages 18-22 are tables of Japanese weights and measures and comparative tables with those of the empire of Great Britain, including both troy and avoirdupois.

Agriculture and mining (p. 22-23): Agriculture has been the leading pursuit of the people since earliest times and in the greater part of the cultivated area rice is grown; other principal food crops are wheat, barley, and soya beans. Industries not imported from the west include "salt making, sugar making, sake brewing, soy brewing, oil producing,... (p. 23).

Imports–Class II.–Duty free goods (p. 228) includes: "Grain, including rice, paddy, wheat, barley, oats, rye, peas, beans [incl. soya beans], millet, Indian corn. Flour and meal prepared from the above. Oil cake [when imported from Manchuria, this was typically soya bean cake].

Exports–Class II.–Duty free goods (p. 232-34) includes: "All kinds of mushrooms, excepting Shiitake, Confectionaries, all kinds of liquors, Vinegars, Soy [sauce], Oils, and Prepared Tobacco... Sea-weeds excepting Kobu [Kombu, seaweed],..." Address: Tokyo, Japan.

934. Lafar, Franz. 1897. Technische Mykologie. Ein Handbuch der Gaerungsphysiologie... Erster Band: Schizomyceten-Gaerungen [Technical mycology. A handbook of fermentation physiology... Vol. 1: Schizomycetic fermentations]. Jena: Verlag von Gustav Fischer. xiii + 362 p. See p. 290, 305-15. Illust. No index. 25 cm. Foreword by Prof. Dr. Emil Chr. Hansen (Carlsberg-Laboratorium, Kopenhagen [Copenhagen]). [7 ref. Ger]
• ***Summary:*** The introduction gives a detailed early history of the discovery of fermentation, microorganisms and *Mikrozymen / Mikrozyma* (microzymes) (including the work of Needham, Spallanzani, Franz Schulze, Theodor Swann, Schröder and Dusch, Louis Pasteur, and Béchamp), its relation to spoilage, the development of fermentation theory, and the nature of the fermentation organisms.

In Chapter 31, "Cheese fermentations and related decompositions," section #179 is titled "Natto and miso." These fermented foods are both made from the soybean (*Soja-Bohne*). For natto: The fermentation results in a partial transformation of the proteins into amides, peptones, guanin, xanthin, and tyrosin. The resulting mass is called natto in Japan, and is sold commercially. Note: Even though the word "enzymes" is not used, the author describes their action. This is the earliest document seen (July 2003) describing the action of enzymes produced during a soybean fermentation. At the end of the same section, koji, shoyu, tofu, nukamiso, taohu, and tao-yu (Chinese-style tofu and soy sauce) are mentioned–with 7 partial references.

Chapter 33, titled "The binding of free nitrogen by bacteria" (p. 303-17) discusses this relatively new idea in depth, including the discovery of root nodules on legumes, the origin and function of the nodules, and the nodule bacteria; Soybeans are mentioned on p. 303. Chapter 36, titled "Nitrogen-fixing bacteria" (p. 335-43) gives more details.

Note 1. Although there are many in-text citations, the bibliography for this volume appeared in Vol II, published in 1901-1907. An English-language translation of this volume was published in 1910.

Note: This is the earliest document seen (Sept. 2002) concerning the early history of microbiology and the discovery of enzymes. Address: Unestablished university lecturer (*Privatdozent*) for Fermentation-Physiology, Technical High School. Assistant at the Physiological Laboratory of the Royal Experiment Station for the Fermentation Industry at Hohenheim near Stuttgart [Germany].

935. Porter, Noah. ed. 1897. Webster's international dictionary of the English language. Springfield, Massachusetts: G&C Merriam Co. 2011 p. 30 cm.

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• ***Summary:*** "Soy (soi) n[oun]. (Chinese shôyû) 1. A Chinese or Japanese liquid sauce for fish, etc., made by subjecting boiled beans (esp. soja beans), or beans and meal, to long fermentation and then to long digestion in salt and water. 2. (Bot[anical]). The soja, a kind of bean. See Soja."

"Soja (sôja or sôya). n[oun]. (Bot.) An Asiatic leguminous herb (Glycine Soja) the seeds of which are used in preparing the sauce called *soy."*

"Catchup, or catsup (Probably of East Indian origin because it was originally a kind of East Indian pickles). A table sauce made from mushrooms, tomatoes, walnuts, etc. (Written also *Ketchup*)*."*

Note: At the entries for Ketchup and for Catsup, it says, "See Catchup." Address: Springfield, Massachusetts.

936. Scott, Charles Payson Gurley. 1897. The Malayan words in English. New Haven, Connecticut: The American Oriental Society. 93-144, 49-124 p. See p. 64-67. Index. 25 cm. [73* ref]

• ***Summary:*** The word "ketchup" is discussed in detail (p. 64-67). It is a well-known name for various kinds of sauces. The word *catchup,* which first appears in English in 1690, is defined as a "high East Indian Sauce." This word is found in Malay as *kechap* or *kichap,* and in Dutch transliteration as *ketjap.* It is also found in Lampong as *kichap* and in Sundanese as *kechap.* In Malay dictionaries from 1884 to 1895 it is defined as soy [sauce], Japanese soy [sauce], or indigenous / native soy [sauce]. The earliest Sundanese entry found (Rigg 1862) states: *"Kéchap,* Catchup, a dark coloured sauce prepared by the Chinese."

But what is soy? The word comes from the Japanese *shô-yu* (Hepburn 1867). The Chinese form, in Mandarin, is *sh'-yiu* (Williams 1874) or *shi-yu* (Doolittle 1872), Canton *shi-yau* (Chalmers 1870; Williams 1856), Ningpo *tsiang-yiu* (Morrison 1876). The Chinese forms are probably original.

Other words that have come into English from Malay or other languages of the Malay archipelago (Javanese, Lampong, Sundanese, etc.) include: agar-agar (a sea-weed), amuck (frenzied, homicidal rage), bantam (a dwarf fowl), batik (spotted cloth), catchup (see ketchup), cockatoo (a parrot), compound (from campong, a village), gecko (a lizard), gingham (cotton cloth), gong (instrument of sound), gutta-percha (a gum or resin produced by a tree), junk (a boat), kachang (a legume), ketchup (a condiment), lorikeet (a parrot), lory (a parrot), orang-utan (primate animal), padi (rice), picul (a weight), rattan (part of palm stem used for walking sticks and wickerwork), sago (pith of a palm), sambal (a curry).

Note: Reprinted from the *Journal of the American Oriental Society* vol. 17 (1896) and vol. 18 (1897).

937. *Tropical Agriculturist* (*Ceylon*). 1898. The soy beans. 17(7):460. Jan. 1. [1 ref]

• ***Summary:*** "The Madras Government sends us a paper showing how Surgeon-Lieutenant -Colonel W.G. King, Sanitary Commissioner for Madras, addressing the District Medical and Sanitary Officer, Vizagapatam, the Deputy Collector of Bellary and the Tahsildar of [nearby] Saidapet [Tamil Nadu], on 8th September 1897, says:

"I have the honour to forward herewith __ oz of soy beans, with the request that you will kindly cause them to be sown in any suitable place where they can be carefully watched as to progress of growth, and that you will oblige me by stating the nature and amount of crop obtained and whether you think the beans can be grown successfully in your district from the experience so obtained. I need not remind you that the 'Soy bean' is probably the most nutritious form of readily assimilable pulse at present known, and that, should it prove possible to introduce it widely in this Presidency, it would prove of great advantage in jail administration and also to the poorer classes generally... In asking you to kindly undertake the experiment, I may state that it was only after long and persistent search in India and Burma that I have ultimately obtained specimen."

"Very few vegetable products are so rich as this bean at once in albuminoids and in fat or oil, the former constituent amounting on the average to 35%, and the latter to 19... In China and Japan three preparations are extensively made from the soy bean. Soy sauce is the best known of these, but more important are the soy or bean cheeses, and a kind of paste. The beans are sometimes pressed for the sake of the oil they yield; the residual cake forms an extremely rich cattle food, containing as it does 40 per cent. of flesh-formers and 7 per cent. of oil. The Soy bean may also be grown as a fodder plant. If cut just when the pods are fully formed, it makes an excellent hay, superior to that of the lentil."

938. Yokohama Nursery Co., Ltd. 1898. Descriptive catalogue... for 1898. Yokohama, Japan. 72 p. Illust. Index. 27 cm. [Eng]

• ***Summary:*** On the cover of this English-language catalog is an illustration of a wistaria (*Wistaria Chinensis*) blooming in a decorated pot. In the section "Price list of seeds" (p. 67-70) is a subsection (p. 70) titled "Some vegetable seeds," which gives the price of 6 types of seeds in American gold dollars per pound. These include: Soy bean 0.06, Tennoji turnip (flat, very large) 0.30, egg plant (round and long) 0.75, Sakurajima mammoth radish [daikon] 0.85, gourd 2.00, and cucumber (climbing kind) $10.00 per 10 lbs.

Some sections (such as "Porcelain flower pots") contain beautiful illustrations. "Branch office: At 15 Broadway, New York, U.S.A... Cable address: Uyekikaisha Yokohama, Suzuki New York. The company is most famous for its lily bulbs, Cycas revoluta, rhapis palms, chrysanthemums, bamboos, and peonies. Unnumbered pages at the front describe: Testimonials. Terms of business. Time of shipping from Japan. Freight rates from Yokohama worldwide. Packing and proximate measurement. Steamers (companies,

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frequency of departure, and destinations).

Concerning the binding of these catalogs: The Yokohama Nursery catalogs from 1898 to 1901 seem to have a spine with internal stitching. Most of the thicker catalogs are bound with colored thread, although this may be partly or mostly for decorative reasons. Some of the earlier thinner catalogs (e.g., Tokio Nurseries, 1894) are bound with colored thread. Address: Nos. 21-35 Nakamura, Yokohama, Japan.

939. *Chicago Daily Tribune.* 1898. Great is kaffir corn... Value of the soy bean. March 21. p. 4.
• ***Summary:*** "There is still another food coming into cultivation in Kansas and Nebraska that will have an important effect probably on agriculture in those states. The food is the soy bean, a Japanese product that was brought to this country in 1890. This bean has the peculiar property of being able to supply certain qualities that are lacking in all varieties of corn as a fattening product. It is a little black bean that has been grown for centuries in Japan, and takes its name from a sauce into which the beans are made in that country. None of the ordinary fodder plants of this country compare with the soy bean in nutritive qualities. As a food it is equally attractive to human beings as to live stock. It compares favorably with the ordinary bean for table use."

Then summarizes the following experiment in which 12 pigs were fed rations based on varying proportions of Kaffir corn and soy beans: Georgeson, C.C.; Burtis, F.C.; Otis, D.H. 1896. "Feeding experiments." *Kansas Agric. Exp. Station, Bulletin* No. 61. p. 147-60. Nov.

940. *Southland Times* (*Otago, New Zealand*). 1898. Soja bean. March 26. p. 6.
• ***Summary:*** "Glycine hispida (Soja bean; soy bean; coffee bean). It is an erect annual legume with hairy stems and leaves, which has been cultivated in China and Japan from remote antiquity. It was long grown in botanic gardens, but when the facts concerning its use as a human food by oriental nations came to light about twenty years ago it was largely introduced into this country [USA] and Europe, where thorough trials of its forage and food value have been made. There are a large number of named varieties which vary in the color of their seeds and the length of time which the plants require to come to maturity.

"The seed is planted at the rate of half a bushel to the acre, in drills 2½ to 3 feet apart, and cultivated about the same as Indian corn. In Virginia soja beans are planted between the hills of corn, so that two crops are produced on the same field at the same time. The yields of seed are often enormous. Soja beans are fed to stock green, as silage, or as hay. The haulms are rather woody, and do not make the best quality of hay, but as either ensilage or green forage they are unsurpassed. The hay contains from 14 to 15 per cent crude protein and 3 to 6 per cent of fat. The beans contain from 32 to 42 per cent protein, and from 12 to 21 per cent of fat in fresh material. When fed to milch cows a ration of soja beans increases the yield of milk, improves the quality of the butter, and causes the animal to gain rapidly in weight. It is an excellent addition to a ration for fattening cattle.

"In China and Japan, where the soja bean is an article of diet, substances similar to butter, oil, and cheese [tofu], as well as a variety of dishes, are prepared from it. The yield of green forage amounts to from 6 to 8 tons per acre, and of the beans from 40 to 100 bushels. The feeding value of the bean has been found to be greater than that of any other known forage plant except the peanut."

941. Matsumura, Shônen. 1898. Daizu no gaichû ni tsuite [An insect injurious to soybeans]. *Dobutsugaku Zasshi* 10(114):126-30. April 15. [Jap; eng]
• ***Summary:*** The English-language summary is titled "Grapholita glycinivorella, sp. nov." It gives a detailed description and illustration (p. 129) of this insect (moth and larva), whose wing expanse is 13-15 mm, and whose body length is 7 mm. It is a form of *G. nebritana,* Treitschke. Its habitat is Sapporo, Japan.

This insect is now called *Leguminivora glycinivorella, Sargus cuprarius.* Note: This is the second earliest publication about an insect that attacks soybeans.

942. Dujardin-Beaumetz, Prof. 1898. The soya bean: A vegetarian treasure. *Vegetarian* (*The*) (*London*). July 23. p. 468.
• ***Summary:*** From *Health News:* The Soja, or Soya bean, is the Japanese bean (*Glycine soja*), cultivated in certain countries of Europe, and more particularly in Hungary, since 1875. This bean, which contains extremely little starch, and has been employed in the dietetic treatment of diabetes by Lecerf, contains a very large amount of albuminoid matter (flesh formers); and, on referring to the different analyses published by Steuff [Steuf], Capan, Pellet, and Muntz, we find the following percentage of alimentary principles contained in the bean:–Albuminoid matter, 36.67 per cent.; fatty matter, 17.60 per cent. If this analysis is compared with that of meat, the Japanese bean has a decided advantage over beef.

"From an alimentary point of view, the soya bean serves several uses. A sauce is made from it, which bears the name of *stiso* [*miso?*] and *soju* [shoyu], but the most curious and interesting point in the application of soja to dietetics, is a kind of cheese made from it–it is the *pea or bean cheese* [tofu], very much prized in Japan.

"In Europe, the soya bean has been utilized as the food of men and animals, and in the last few years the attempt has been made to make bread of it, which is a matter of considerable difficulty, by reason of the large proportion of oil which this bean contains. This oil, as Leon Petit has shown, is very purgative, and might replace castor oil in medical practice. Hence it becomes a necessary to rid the

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meal of this oil, in order to render it fit for domestic use. Lecerf, in Paris, and Bourdin, in Rheims, have succeeded in rendering the bread made from this meal very well borne by the stomach.

"Here, then we have a bean which is more nutritive than meat, and which serves for nourishment to a great country like Japan, under the different forms of sauce, of cheese, of farina, and even of an artificial milk. The advantage which the Vegetarian dietary may derive from such a food is evident." Address: Physician to the Cochin Hospital, Paris.

943. Fesca, M. 1898. Die Sojabohne [The soybean]. *Tropenpflanzer* (*Der*) (*Berlin*) 2(8):233-46. Aug. [7 ref. Ger]
• ***Summary:*** The author writes about the importance of soybeans for the German colonies. This is primarily a review of earlier writers, such as O. Kellner and E. Kinch. "The soybean is one of the most important cultivated plants in East Asia. In Japan and most parts of China, it is by far the most important legume. It is also cultivated in India..." In Japan, 385,000,000 kg of soybeans are produced on 430,000 to 450,000 ha of land. This is 8½ to 9% of Japan's total agricultural land and 19% of the land not planted to rice. Large amounts of soybeans are also planted around the edges of fields and on the tops of dams. The yield of soybeans in Japan for 1892-94 was 880–900 kg/ha. The soybean is one of the main crops in Shantung province, China, according to travelers Williamson and von Richthofen; it is used extensively for oil. An excellent 5-part illustration (p. 235) shows the cultivated- and the wild soybean plant, with close-ups of the pods, seeds, and flowers.

The author then discusses *Shoyu.* Through a long, slow fermentation process some of the starch is transformed into dextrin and sugar, then lactic and acetic acids are formed. Aromatic compounds are also formed but little is known about their amount or composition. The fermentation breaks down proteins. He then gives Kellner's analysis of the composition of shoyu. According to E. Kinch, one liter of shoyu contains 31.03 gm of sugar and 41 gm of nitrogenous substances.

The author praises tofu as a fine protein source and cites E. Kinch's 1879 analysis of the composition of tofu and dried-frozen tofu [*Kori-Tofu*].

He gives analyses of the composition of shoyu presscake (*Shoyuruechstande*) and okara (*Tofurueckstande*). Of the shoyu presscake he says: "Unfortunately the high content of salt (NaCl; 3-5%) makes it unusable for man or beast. It can, however, be used as a fertilizer." Address: Prof., Dr.

944. Takamuku, T. 1898. Shôyu kôji no enchiimu narabini moromi no jukusei ni tsukite [On the enzymes of shoyu koji and the ripening of moromi (mash)]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 19(8):787-803. Nov. [Jap]
• ***Summary:*** The title on the English-language table of contents reads: "On the Enzyme of Soja Kôji and the Process of Soja Sauce Ripening."

945. Tôa Dôbunkai. 1898-1909? Manshû daizu chôsa hôkokusho. Dai 5-ki [Report of a survey on soybeans in Manchuria. 5th period]. Tokyo: Tôa Dôbunkai. 1 vol. (microfilm reel). Undated. [Jap]
Address: Aomori, Japan.

946. Bishop, Isabella L. Bird (Mrs.). 1898. Korea and her neighbors: A narrative of travel, with an account of the recent vicissitudes and present position of the country. 2 vols. London: John Murray; New York, NY: Fleming H. Revell Co. Vol. 1: x + 261 p. Illust.
• ***Summary:*** In Vol. 1: Preface, p. vi: "It must be evident to all who know anything of Korea, that a condition of tutelage, in some form or another, is now absolutely necessary to her existence as a nation. The nominal independence won for her by the force of Japanese arms is a privilege she is not fitted to enjoy, while she continues to labour under the burden of an administration that is hopelessly and superlatively corrupt."

Page xi: The author made four visits to Korea between Jan. 1894 and March 1897 as part of her larger plan to study the characteristics of the Mongolian races. Her first journey produced the impression that Korea was the most uninteresting country she ever travelled in.

Soy [sauce] is mentioned–Pages 141-42: If, while traveling, no "clean room" existed in an inn, "I had a room in the women's quarters at the back, remarkable only for its heat and vermin, and the amount of ang-paks, bundles of dirty clothes, beans rotting [fermenting] for soy [sauce and paste], and other plenishings which it contained,..."

Page 177: "A quart of rice, which when cooked is of great bulk, is a labourer's meal, but besides there are other dishes, which render its insipidity palatable. Among them are pounded capsicum, soy [sauce], various native sauces of abominable odours, kimchi, a species of sour kraut [*kimchi*], seaweed, salt fish, and salted seaweed fried in batter. The very poor only take two meals a day, but those who can afford it take three and four."

Page 179: Koreans are omnivorous, and they waste nothing. "Cooking is not always essential. On the Han I saw men taking fish off the hook, and after plunging them into a pot of red pepper sauce, eating them at once with their bones. Wheat, barley, maize, millet, the Irish and sweet potato, oats, peas, beans, rice, radishes, turnips, herbs, and wild leaves and roots innumerable, seaweed, shrimps, pastry made of flour, sugar, and oil, *kimchi*, on the making of which the whole female population of the middle and lower classes is engaged in November, a home-made vermicelli of buckwheat flour and white of egg, largely made up into a broth, soups, dried persimmons, spongecakes, cakes of the edible pine nut and honey, of flour, sugar, and sesamum seeds, onions, garlic, lily bulbs, chestnuts, and very much else are eaten. Oil of sesamum is largely used in cooking,

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as well as vinegar, soy [sauce], and other sauces of pungent and objectionable odours, the basis of most of them being capsicums and fermented rotten [soy] beans!"

Page 182: The inn, if inn it was, gave me a room 8 feet by 6, and 5 feet 2 inches high. *Ang-paks,* for it was the family granary, iron shoes of ploughs and spades, bundles of foul rags, seaweed, ears of millet hanging in bunches from the roof, pack-saddles, and worse than all else, rotten beans fermenting for soy [sauce and paste], and malodorous half-salted fish, just left room for my camp-bed."

Note: The author does not mention Korea's very popular soybean pastes–such as doenjang or kochujang. She may well have used the word "soy" to refer to both soy sauce and soy pastes.

Bean or beans are mentioned: Page 18: "Hides, [soy] beans, dried fish, *bêche de mer,* rice, and whale's flesh are among the principal exports. It was not till 1883 that Fusan was officially opened to general foreign trade, and its rise has been most remarkable."

Page 39: In the market booths are to be seen "rice, millet, maize, peas, beans,..."

Page 85: In 1894 they paid taxes on barley, beans, rice, and cotton.

Page 100: "... they conveniently export their surplus produce, chiefly beans, tobacco, and rice, and receive in return their supplies of salt and foreign goods."

Page 112: In the Han River valley: "Every valley has its streamlet, and is barred across by dykes of mud from its head down to the Han–rice, with tobacco, beans, hemp, and cotton, being the great articles of export."

Page 119: "Ma-Kyo is the river port of Che-chön... "It exports rice, beans, and grain from the very rich agricultural country on both sides of the river,..."

Page 123: "When full grown a bull can carry from 350 to 500 lbs. They are fed on boiled beans, cut millet stalks, and cut pea haulm, and the water in which the beans are boiled."

Page 138: Korean ponies "are fed three times a day on brown slush as hot as they can drink it, composed of [soy] beans, chopped millet stalks, rice husks, and bran, with the water in which they have been boiled."

Page 147: "There is much wet rice along the route, as well as dry rice, with a double line of beans between every two rows,..."

Page 149: "It is a most fertile tract, and could support a large population, but not being suited for rice, is very little cultivated, and grows chiefly oats, millet, and beans, which are not affected by the strong winds."

Page 150: "There the villagers could not or would not take us in. They said they had neither rice nor beans, which may have been true so late in the spring."

Page 185: "A smaller valley contains about 3,000 acres of rice land only, and on the slopes surrounding all these are rich lands, bearing heavy crops of wheat, millet, barley, cotton, tobacco, castor oil, sesamum, oats, turnips, peas, beans, and potatoes."

Page 186: "In wheat, barley, or rye fields the sowing is in October, and the harvest in May or June, after which beans, peas, and other vegetables are sown."

Page 187: "Grain, peas, and beans are threshed out with flails as often as not in the roadway of a village,..."

Page 189: The village "has several schools, and exchanges rice and beans for foreign cottons at Won-san,..."

Page 217: Newchwang "is a city of 60,000 souls, the growth of its population having kept pace with its rapid advance in commercial importance since it was opened to foreign trade in 1860. Several British steamers with big Chinese characters on their sides were at anchor in the tideway, and the river-sides were closely fringed with up-river boats and sea-going junks, of various picturesque builds and colours, from Southern China, steamers and junks alike waiting not only for cargoes of the small beans for which Manchuria is famous, but for the pressed bean-cake which is exported in enormous quantities to fertilise the sugar plantations and hungry fields of South China."

Page 218–Concerning Newchwang: "'Peas,' really beans (Footnote: *Glycene hispides* [sic, *Glycine hispida*] {Dr. Morrison}), are its chief *raison d'être,* and their ups and downs in price its mild sensations. 'Pea-boats,' long and narrow, with matting roofs and one huge sail, bring down the beans from the interior, and mills working night and day express their oil, which is as good for cooking as for burning."

Page 235–Muk-den [Mukden] is a busy place, and does a large and lucrative trade, specially in grain, beans, and furs."

Seaweed is mentioned on pages 38, 140, 142, 177, 179, 182, 198-99. Kimchi: p. 98, 147, 177. Address: F.R.G.S., Geographer, Great Britain.

947. Bretschneider, Emil V. 1898. History of European botanical discoveries in China. 2 vols. London: Sampson Low, Marston and Co., Ltd. xv + 1167 p. Indexes (names of persons, names of plants). 28 cm. 2nd ed. 1935. [200+* ref] • ***Summary:*** A magnificent work. Vol. I ends on page 624. Vol. II is on pages 625-1167. National Union Catalog says Bretschneider's formal Russian name is Emilii Vasil'evich Bretshneider (1833-1901).

In Vol. 1: On pages 401-03 the author discusses the life and work of George Bentham, the author of *Flora Hongkongensis.*

On pages 403-51 the author discusses the life and work of Robert Fortune. "The travels and explorations of R. Fortune in China, beginning with the year 1843, inaugurate a new era in the history of botanical discoveries in that country. Previous to that time the Chinese plants known to our botanists in Europe and introduced into our gardens, came from Canton or Macao...

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"R. Fortune was born in Berwickshire, Scotland, on the 16th of Sept., 1812, and was educated in the parish school of Edrom... Fortune visited China four times, 1843-45, 1848-51, 1853-56, 1861, and accordingly published four interesting accounts of his travels in that country." Fortune traveled in Japan during 1860, visiting the ports of Nagasaki, Kanagawa, and Yukuhama [Yokohama] near Yedo. He visited Yedo for 15 days. In the spring of 1861 he returned to Japan. His four books are "Three years wandering in the northern provinces of China" (1847), "A journey to the tea countries of China" (1852; in which he discusses the soy bean), "A residence among the Chinese" (1857), and "Yedo and Peking: A narrative of a journey to the capitals of Japan and China" (1863).

Pages 536-37 discuss Louis C.N.M. Montigny, who was born on 2 Aug. 1805 at Hamburg [Germany] of French parents. He first went to China in 1843, as *chancellier* accompanying the French Embassy. In 1847 he was appointed Consular Agent at Shanghai, where he stayed until about 1858. He died on 14 Sept. 1868 and his obituary appeared in the *Revue Horticole* (1869, p. 52). During his residence in Shanghai he rendered great services to natural science and horticulture by introducing into France interesting beasts and birds, and useful Chinese economic plants–including *Soja hispida* and its oil. These plants were cultivated a distributed by the *Société d'Acclimatation* of Paris.

Page 545 notes that Voisin, a French missionary who went to China in 1824, obtained from China several economic plants among which was the textile plant, *Ko.* Seeds were presented to the Museum of Natural History in Paris through Stanislas Julien and the plants raised from these seeds were examined by Prof. Jussieu, who found that it was a legume resembling *Dolichos bulbosus.* It was later identified as Pueraria.

Pages 554-55 discuss Stanislas Julien the great French sinologist, who was born in 1797. In 1832 he succeeded A. Rémusat as Professor of the Chinese language at the Collège de France. He translated several interesting Chinese treatises on economic plants, their cultivation and use, generally with a view to incite his countrymen to introduce these plants into France. In 1855 he wrote about *Soja hispida* in the *Bulletin of the Society for Acclimatization* (France) (p. 225). He died in 1873.

Contents: Preface (book includes, in addition to China proper, Manchuria, Mongolia, Eastern Turkestan, Tibet, Corea [Korea], and the Liu kiu [Loochoo] and Bonin [Ogasawara] Islands. Note: The latter are about 30 subtropical islands located about 1,000 miles directly south of Tokyo, Japan).

Also discusses: azuki beans (*Phaseolus radiatus,* p. 76, 129), cowpeas (*Vigna sinensis,* p. 77), hemp (*Cannabis sativa,* p. 166), kuzu (*Pueraria Thunbergiana,* p. 175, 738, 755, 1051), peanuts (p. 231, 233, 451), sesame (*Sesamum orientale,* p. 11, 158, 165, 227, 487).

Concerning *Prunus mume* we read: "Near the entrance to the pass on the Canton side, Abel [Dr. C. Abel, 1816-1817] saw a species of *Prunus* in full flower, in Chinese *mei hwa shoo;* hence the name of the mountain. (The *mei hwa* is *Prunus Mume,* S. & Z. [Siebold & Zuccarini]) (184)" (p. 233). See also p. 893.

Note: This is the earliest English-language document seen (Dec. 2006) that uses the term *Prunus mume* to refer to the name of the tree whose fruit is used to make umeboshi salt plums. Address: Late physician to the Russian Legation at Peking.

948. Brinkley, Frank; Nanjô, F.; Iwasaki, Y.; Mitsukuri, K.; Matsumura, J. comp. 1898. An unabridged Japanese-English dictionary: With copious illustrations. Tokyo: Sanseido. xxvi + 1687 p. Illust. 19 cm. [Jap; Eng]

• ***Summary:*** "... with coöperation of Prof. K. Mitsukuri in zoological terms, Prof. J. Matsumura in botanical terms."

For each entry, the romanized word comes first, followed by the word written in hiragana and then in kanji (Chinese characters). Note: The authors often use the word "bean" when they should use the word "soybean." Soy related:

"Aburage: Bean-curd fried in oil.

"Amazake: Sweet *sake;* a kind of drink made of fermented rice. Syn. [Synonym]: Hitoyozake, Kozake.

"Ame: A honey-like jelly made of flour of various grains; starch-sugar.

"Ammochi: Mochi stuffed or covered with boiled and crushed pea-beans [sic, azuki beans] mixed with sugar.

"Azuki [bot.] Mungo.

"Azuki meshi: Rice and red pea beans mixed and boiled for food.

Azuki mochi: Same as Am-mochi.

"Dengaku: (2) (Coll.) *Tôfu* baked and covered with sweetened miso. *Dengaku wo yaku:* to bake or prepare *dengaku.*

"Dengaku-dôfu: See above.

"Daizu (Bot.) Soja bean.

"Edamame: (1) (lit.) Branch bean. (2) (coll.) [Soy] Beans boiled in pods on the stalks.

"Gobuzuke: Dried radish chopped into pieces of about 5 *bu* (of half an inch) in length and cooked with soy [sauce] and sugar.

"Gusokuni: Lobster chopped into transverse pieces and cooked with sugar and soy.

"Hachihaidôfu: *Tôfu* chopped into small pieces and boiled in a soup composed of four cups full of water, two of soy, and two of sake.

"Hitasu–Shôyu ni hitasu: To steep in soy.

"Hiyayakko: *tôfu* served cold.

"Ikanago-shôyu: Soy prepared in Sanuki [on Shikoku island], from a kind of fish called *Ikanago.*

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Irimame: Parched peas or [soy] beans. *Irimame ni hana ga saku* (coll. Prov.) (lit.) blossoms on parched peas; something regarded as impossible.

"Iritori: Fowls boiled with a mixture of sugar, soy and *mirin* until the sauce is fully absorbed.

"Iritsuke: Any fish roasted or boiled in a pan until the sauce or soy is fully absorbed.

"Kabayaki: (1) A way of roasting fish. (2) Eels cut open on the dorsal line, covered with soy mixed with sugar, and roasted. (3) Unagi no kabayaki: Roasted eels.

"Kenchin: (Modern Chin.) (1) Black beans malted and fried, and eaten with soy or table salt. (2) A soup containing various vegetables and *tôfu* mixed together and fried.

"Kigaracha-meshi: Rice boiled with water and a small quantity of *sake* or soy (so called from its yellowish color).

"Kijiyaki: The flesh of bonito or tunny-fish covered with soy and sugar, and baked.

"Kinako: [Soy] Bean flour (of yellowish or greenish color).

"Kinome-dengaku: *Tôfu* or the fruit of the egg plant covered with a pasty mixture of *miso,* sugar, and the buds or leaves of the *sanshô,* and baked.

"Kiuri-momi: Cucumber chopped fine and seasoned with salt, vinegar and soy.

"Kôji: Yeast, barm [sic]. *Kôji wo nekasu:* To make yeast [sic, kôji].

"Kokushô: A soup prepared with *miso* and the flesh of *koi* [carp] (*cyprinus haematoperus*).

"Kombumaki: Roasted or cooked fish wrapped in a piece of *kombu,* tied and boiled with sugar and soy.

"Kuromame: (Bot.) Black soy bean.

"Kyarabuki: The stems of the *fuki* boiled with soy.

"Mamemaki: A ceremony of scattering parched peas [sic, soybeans] about in an occupied house to drive out evils spirits, celbrated on the last night of December, or the early part of January (o.s.) [old style] crying aloud the while *fuku wa uchi* (fortune inside), *oni wa soto* (devils outside). Syn. Oniyarai, Setsubun.

"Mame-no-ko: [Soy] Bean flour used for covering or sprinkling over *mochi, dango.* Syn. Kinako.

"Miso: A kind of sauce made of wheat, [soy] bean, and salt. *Miso wo tsukeru:* (a) (lit.) to spoil (as one's coat) with miso. (b) (fig. coll.) to disgrace one's self; *Tonda miso wo tsuketa:* (coll.) have met with a shocking failure.

"Misokoshi: A miso strainer.

"Misomame: (Bot.) Soja bean, Glycine.

"Misoshiru: A kind of soup made with miso.

"Moromi: The grounds or lees left in making soy or *sake* and used as food.

"Moromi-sake: A kind of sake with rice grounds not separated from the liquid. Syn. Doburoku, Nigorizake.

"Murasaki: Another name for the sardine, or for soy.

Namaage or Nama-age: Not listed.

"Nattô: A kind of food made of boiled [soy] beans (usually sold in small packages made of rice straw).

"Nigari: The brine left by the deliquescence of salt.

"Nigashio: Same as Nigari.

"Oborodôfu: (1) A *tôfu* boiled down until it is almost dry and relished with soy and sugar. (2) A kind of *tôfu* [sic, unpressed tofu curds].

"Omame: (Bot.) Soy bean.

"Satsuma-iri: Food prepared by cooking a mixture of parched rice and finely chopped sweet potato, and relishing it with soy and sugar.

"Shitaji: Soy. See *Shôyu.*

"Shôyu: A kind of sauce made by pressing a fermented mixture of calcined barley meal, boiled [soy] beans, yeast, water, and salt; soy. Syn. Shitaji, tamari.

"Shôyu no moromi: Soy before it is pressed.

"Suiri: Cooked with vinegar. *Iwashi no suiri:* A sardine cooked with a mixture of vinegar and soy. Syn. Suni.

"Sukimi: Flesh of fish sliced thin, and eaten relished with soy and *wasabi* or horse-radish.

"Sukiyaki: Roasting sliced meat or flesh with soy, in a shallow pan. Note: This is the earliest document seen (April 2012) that contains the word "sukiyaki."

"Sumiso: A kind of sauce made by rubbing together *miso* and vinegar in a mortar [suribachi].

"Suribachi: An earthenware vessel used in rubbing *miso;* a mortar.

"Sushi: (1) Fish seasoned with vinegar. (2) A general name for food made of boiled rice and fish, eggs, vegetable, etc. seasoned with vinegar and soy. As an affix the form is changed to *zushi. Inari-zushi:* food made of fried *tôfu* stuffed with a kind of *chirashi-zushi.*

"Tamari: Soy before it is pressed [sic].

"Tekkamiso: A kind of food made by roasting *miso* mixed with parched beans, chopped burdock, and a little oil.

Temae: (1) One's own side. *O temae miso wa shio ga karai:* (coll.) Self approbation is disgusting.

"Teriyaki: Flesh of fish baked with a kind of sauce composed of soy, *mirin,* and sugar.

"Tôfu: A kind of food made from bean curd hardened by mixing with a small quantity of the brine left after the deliquescence of salt [nigari]. In composition the form changes into dôfu. *Tôfu ni kasugae:* (Prov.) (lit.) an iron clamp to connect pieces of tofu; no effect. Yaki-dôfu: Baked [grilled] *tôfu.*

"Tsukuru: To pickle in sake, brine vinegar, etc. *Shôyu wo tsukete yaku:* To bake [grill] seasoned with soy. Syn. Hitasu, uruosu.

"Uchimame: The soy bean flattened with hammer and boiled in soup.

"Udondôfu: Tôfu cut into udon like pieces, and eaten boiled in a soup made of cups of soy, two of *sake* in four cups of water.

"Yuba: The skin of bean curd used as food. Syn. Uba.

"Yudôfu: Boiled *tôfu."* Address: 1. Captain, R.A., Editor

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of the *Japan Mail;* 2. M.A., Bungakuhakushi; 3. Nôgakushi.

949. Chamberlain, Basil Hall. 1898. A handbook of colloquial Japanese. 3rd ed. London: Sampson Low, Marston, & Co.; Tokyo: The Shuyeisha, Ichigaya; Yokohama, Shanghai, Hongkong, Singapore: Kelly & Walsh, Ld. ix + 567 p. 19 cm.
• ***Summary:*** Page 241: Court words, used by the Imperial Family, include: For miso they say *"o mushi* (lit. honourably steamed). English: bean sauce." For tôfu they say *"o kabe.* English: Bean-curd." O-kabe belongs also to the language of women.

Note. This is the earliest English-language document seen (Oct. 2012) stating that *o-mushi* is the Japanese court word or women's word for "miso."

Page 451: A poem of 31 syllables (5, 7, 5, 7, 7) says: Hototogisu / Jiyû jizai ni / Kiku sato wa,–/ Saka-ya ni san ri, / Tôfu-ya ni ni-ri!" Translation: "The village where one may listen undisturbedly to the cockoo's song is–three leagues from the grog shop, and two from the bean-curd shop!"

Anglo-Japanese vocabulary: soy [sauce], *shôyu, shitaji.*

Japanese-English vocabulary: "kabe, (with honorific prefix *o*), the Court word for tôfu, bean-curd."

Page 517: "miso, a kind of bean sauce."

Page 520: "mushi, (with honorific prefix *o*), the Court [women's] word for miso, bean sauce."

Page 538: "shôyu, soy (our word comes from the Japanese)."

Page 546: "tôfu, bean-curd: tôfu-ya, a shop for or seller of bean-curd." Address: Emeritus Prof. of Japanese and Philology in the Imperial Univ. of Tokyo, Tokyo.

950. Dodson, W.R.; Stubbs, Wm. C. 1898. Grasses, clovers, forage and economic crops. *Louisiana Agricultural Experiment Station, Bulletin* No. 53. 55 p. See p. 28-29. Series 2.
• ***Summary:*** In the section titled "Leguminous forage crops" (p. 13+), the subsection on "Soy bean or soja bean (*Glycine hispida* or *Soy hispida*)*"* (p. 28-29) states: "It seems to be very well adapted to Louisiana as far as the production of hay is concerned, but it is not sure to mature seed. In 1895 and 1896 the crop of seeds at Baton Rouge was very small, while in 1897 there was a heavy crop that matured well, both of early and late planting... It is the purpose of the station to secure all the varieties possible directly from Japan, and test their relative merits. The term Soy bean is therefore indefinite, and reports as to its merits will mean nothing till someone characterizes the varieties that may be met with."

A photo (p. 27), titled "Pea nuts, pindars, goobers (*Arachis hypogœa*)*,"* shows a portion of the stem with flowers and fruit–about one-sixth natural size. The correct technical [scientific] name of "cow-peas" is also discussed; most authorities agree that *Vigna catjang* and *V. sinensis* are synonymous. Address: 1. A.B., S.B., Botanist; 2. Ph.D., Director of the Station. Both: Baton Rouge, Louisiana.

951. *Foreign Seeds and Plants Imported by the Section of Seed and Plant Introduction, USDA, Inventory.* 1898. Serial/ periodical. U.S. Department of Agriculture, Division of Botany. Inventory No. 1, S.P.I. Numbers 1-1000, is 81 p.
• ***Summary:*** This serial publication, begun by O.F. Cook, is the single best source of information on early soybean introductions to the USA. A sequential number was assigned to each new seed or plant introduced. The earliest Seed and Plant Inventory numbers for "Glycine hispida–Soja bean" are #480 (received March 1898 through Prof. N.E. Hansen, from South Ussurie, Siberia) and #647-56 (received March 4, 1898, through Hon. A.E. Buck, from Tokyo, Japan).

The Introductory Statement in Inventory No. 1, written by O.F. Cook (Special Agent in Charge of Seed and Plant Introduction) states: "When the work of this section [of Seed and Plant Introduction] was formally organized the Department was already in the possession of a considerable quantity of seeds [not including soja beans] secured by Prof. Niels Ebbesen Hansen of the Agricultural College of South Dakota during a visit to Russia, central Asia, and Siberia." The first seeds from Prof. Hansen, cabbage seeds, were received in Feb. 1898. "More recently there has arrived from France a large series of seeds [not including soja beans] and cuttings personally selected by Mr. Walter T. Swingle, agricultural explorer of this section."

"The organization, methods, and purposes of this section have been recently explained in a bulletin and a circular, which are available on application. It should be repeated here that our efforts are on a line quite distinct from that of the Congressional seed distribution, whose object is the general and popular distribution of vegetable, field, and flower seeds."

No starting date is given in Issue No. 1. The transmittal date of No. 2 is 5 July 1899. The final year for this serial is not clear. In 1902 this publication ceased and the inventory was continued in the USDA Bureau of Plant Industry, Bulletins No. 5 (issued 18 Jan. 1902), No. 66 (8 Feb. 1905), No. 97 (15 March 1907), No. 106 (20 Dec. 1907), etc. co

Ted Hymowitz notes that most of these early soybean varieties have been lost (Pers. comm. 27 May 1989). We can find no explanation in the early issues of what the abbreviation "S.P.I." means.

952. Osborne, Thomas B.; Campbell, George F. 1898. Proteids of the soy bean. (*Glycine hispida*)*. Connecticut Agricultural Experiment Station, Annual Report* 21:374-82. For the year 1897.
• ***Summary:*** Contents: Introduction. Yellow soy bean. Soy bean (*Kiyusuki diadzu*) [sic, *Kiyusuki daizu*]*.* Conclusion.

The article begins: "The proteids of the soy bean, so far as we are informed, have never been the subject of special investigation. The seeds used by us were grown in Kansas

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and kindly supplied by Prof. C.C. Georgeson. Two varieties have been examined, one known as the yellow soy bean and the other, called in Japan, kiyusuki diadzu [sic, *kiyusuke daidzu*]." The authors give a detailed discussion (6 pages) of the methodology used for extracting, filtering (or, where filtration was impossible, passing through a centrifugal separator), isolating, and measuring the proteids in the soy bean. A globulin, which the authors named "Glycinin," was prepared by saturating a 10 per cent sodium chloride extract of the meal with ammonium sulphate, redissolving the resulting precipitate, and dialyzing the solution. A table (p. 377) gives an analysis of glycinin in terms of its content of carbon, hydrogen, nitrogen, sulphur, and oxygen–based on 9 samples. The authors then state: "It is probable, therefore, that we have here a definite proteid, distinct from legumin, containing 0.50 per cent. less nitrogen and 0.30 per cent. sulphur than that substance. We propose for this globulin the name *Glycinin.* They then describe its numerous reactions, as with sodium chloride, by dialysis or cooling ("it separates in the form of spheroids"), etc.

Other tables: (2) The composition of dried glycinin (p. 379). (3) Composition of the glycinin from Kiyusuki diadzu (p. 380). "These results agree well with those obtained from the yellow soy bean." (4) Comparison of the composition of glycinin from the two soybean varieties (p. 381). The true composition of glycinin (p. 381). It consists of 52.12% carbon, 6.93% hydrogen, 17.53% nitrogen, 0.79% sulphur, and 22.63% oxygen.

"Conclusion: The soy bean contains as its chief proteid constituent *glycinin,* a globulin similar in properties to legumin, but of somewhat different composition, containing nearly twice as much sulphur, four-tenths per cent. more carbon and one-half per cent. less nitrogen... The soy bean contains a more soluble globulin which resembles phaseolin in its composition, and, so far as we could ascertain, also in its reactions... Besides these globulins about 1.5 per cent. of the albumin-like proteid *legumelin* was obtained. We have found legumelin in a number of other leguminous seeds, the pea, vetch, horse bean, lentil, adzuki bean, and cow pea."

Tables (p. 382) show the chemical composition of (1) legumin as found in the soy bean, and (2) the small amount of proteose obtained from the soy bean. "Owing to the small amount of proteose no evidence was obtained as to the purity or individuality of this preparation."

Note 1. This is the earliest U.S. agricultural experiment station publication seen (Aug. 1998) which is entirely about soy beans.

Note 2. This is the earliest English-language document seen (Oct. 2008) that uses the word "albumin" (or "albumins"), or the word "globulin" (or "globulins"), or the word "glycinin," or the word "legumelin," or the word "proteose" in connection with soy. It is also the first U.S. study of soy proteins. Note 3. This is the earliest document seen (Oct. 2004) that mentions the soybean variety Kiyusuki daizu. Address: 1. Ph.D.; 2. Ph.B. [Bachelor of Philosophy]. Both: Chemists, Connecticut Agricultural Experiment Station.

953. Richthofen, Ferdinand Freiherr von. 1898. Schantung und seine Eingangspforte Kiautschou [Shandong and its port of entry, Kiaochow (Jiaoxian)]. Berlin: Dietrich Reimer. xviii + 324 p. Illust. Index. 25 cm. [Ger]

• ***Summary:*** The section on the "Agriculture" of Shandong province states (p. 109) that the soybean (*die Sojabohne*) is one of the most important crops, along with wheat, barley, millet, kaoliang (sorghum), corn, rapeseed, peanuts, cotton, hemp, and tobacco. Poppies are also widely grown for the production of opium.

In the section on "Economic goals" we read (p. 273-74) that [soy] bean cake (*Bohnenkuchen*) is the province's second largest export (after strawboard), being worth 1,340,000 taels, ahead of silk, and of peanut oil (160,000 taels). Bean cake is the substance left over after pressing the oil out of certain types of beans. These cakes go mainly to Swatow for use in fertilizing the sugarcane fields, and more recently to Japan as a substitute for fish manure. The regions where these beans are cultivated lie to a much greater extent in the present district of Kiaochow than in that of Chefoo (*Tschifu*) [presently named Yantai].

Note 1. The town of Kiaochow [Jiaozhou], in Shandong province, was under German control from 1898-1914. Note 2. Ferdinand Richthofen lived 1833-1905.

Note 2. This is the earliest document seen (Oct. 2003) that uses the word "taels" (or "tael") in connection with soybeans. A tael is a unit of Chinese currency. Address: Berlin [Germany].

954. Tokio Nurseries Co. 1898. General catalogue of plants, bulbs, seeds, &c. &c. Tokio, Japan. v + 37 p. 25 cm. [Eng]

• ***Summary:*** In the section titled "Vegetable seeds" (p. 32-35) is a subsection on "Pulse" (p. 33-34). The entries concerning soybeans and other beans are very similar to those in the 1897 edition. However the prices in this English-language catalogue are all given in Japanese yen. A note at the bottom of each page states: "Yen is equivalent to about 50 cents U.S. currency, 2 shillings or 2½ francs." Address: Komagome, Denchu, Tokio, Japan.

955. Zavitz, C.A. 1899. Report of the experimentalist. *Ontario Agricultural College and Experimental Farm* (*Guelph*), *Annual Report* 24:119-83. For the year 1898. See p. 174, 181.

• ***Summary:*** The section titled "Fodder crops" (p. 174) contains a table listing six varieties of fodder crops that have been tested for 4 years in succession on plots of 1/100 acre in size. One of the crops was Yellow Soya Beans. Average height of crop in 1898: 23.0 inches. Average height in four years: 25.5 inches. Average yield per acre in 1898: 8.07 tons.

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Average yield per acre in four years: 8.52 tons. Egyptian peas gave the largest average yield of green crop per acre in 4 years (9.0 tons), followed by Grass peas (8.88). "The Yellow Soya bean, which has proven to be one of the best soja beans which have been grown at this place, occupies third place in production of green crop per acre" [8.52 tons].

In the section titled "Miscellaneous crops" we read (p. 181): "Soya, Soja, or Japanese beans. Five varieties of Japanese beans have been grown for two years in our experimental grounds. Most of these varieties were brought out from Japan by Prof. Brooks of Amherst University, Massachusetts. Some of them are doing well in the State of Massachusetts. They produce grain which is the richest of any produced on the farm. Our experiments, so far, are not of sufficient extent to justify our saying much in regard to the place these beans are likely to occupy in the future of agriculture in Ontario. It might be stated, however, that in yield of grain per acre, the Yellow Soya beans, the seed of which we originally obtained from the state of Kansas, stands highest, and that the Early White, Medium Black and Medium Green gave yields in the order named. The seed of the last three were secured from Prof. Brooks. In yield of green crop per acre the largest returns were secured from the Yellow and from the Medium Green varieties of Soya beans." Address: B.S.A., Experimentalist, Ontario Agricultural College [Guelph, Ontario, Canada].

956. Suzuki & Iida. 1899. Trade list of Japanese bulbs, seeds and plants: 1899-1900. New York City, New York. 16 p. April. Index. 21 cm. [Eng]

• ***Summary:*** In the section on "Seeds" (p. 13-16) is a subsection (p. 16) titled "Vegetable seed." "Soy bean" sells for $0.15 per lb.

Cable address: Suzuki, New York. Uyekigumi, Yokohama. Note: This company is the U.S. branch of the Yokohama Nursery Co., Ltd. of Yokohama, Japan. Their most popular product appears to be lily bulbs. Address: 11 Broadway, New York City, New York; 3 Nakamura, Yokohama, Japan.

957. Yamamoto, Masami. 1899. Seishu, gyûnyû, shôyu-chû no horumuarudehiido bôfu no kôryoku jikken seiseki [Results of experiments on the antiseptic power of the formaldehyde in sake, milk, and shoyu]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 206. p. 313-25. April. [Jap]

958. *Foreign Seeds and Plants Imported by the Section of Seed and Plant Introduction, USDA, Inventory.* 1899. [Soy bean introductions]. No. 1. S.P.I. Numbers 1-1000. 81 p.

• ***Summary:*** S.P.I. Number 480. "Glycine hispida. Soja bean. From South Ussurie [Ussuri, Usuri], Siberia [Russia]. Received through Prof. N.E. Hansen, March 1898. (1 package)." Note 1. This document contains the earliest clear date seen for soybeans in Russia, or the cultivation of soybeans in Russia (March 1898). The source of these soybeans is unknown, but it seems likely that they came across the Ussuri (*Wusuli*) River from Manchuria.

647-656. "Glycine hispida. Soy bean. From Tokyo, Japan. Received through Hon. A.E. Buck, March 4, 1898.

"647. 'Akasaya.'

"648. 'Nakade.'

"649. 'Deko;' medium early.

"650. 'Sennari;' medium early.

"651. 'Fuknishiro' [maybe 'Fukunishiro']; medium early.

"652. 'Kiyomasa;' late.

"653. 'Mejiro;' late.

"654. 'Aoteppo;' late.

"655. 'Kinoshita;' late.

"656. 'Asahi;' late."

Note 2. This is the earliest document seen (Oct. 2013) concerning introduction of soybeans to the United States by USDA's Section of Foreign Seed and Plant Introduction. These soybeans were all received in March 1898 from both South Ussurie, Siberia, and from Tokyo, Japan.

Note 3. The last named soybean variety above, #656, Asahi, may well be the same variety tested at the Kansas Agric. Exp. Station in 1900 and described in their Bulletin No. 100 in March 1901. Address: Washington, DC.

959. *Foreign Seeds and Plants Imported by the Section of Seed and Plant Introduction, USDA, Inventory.* 1899. [Soy bean introductions]. No. 2. S.P.I. Numbers 1001-1900. 94 p. Transmittal date: 5 July 1899.

• ***Summary:*** 1492-1493. "Glycine hispida. Soy bean. From France. Received through Mr. W.T. Swingle, December 1898.

"1492. (2 packages.) 'An erect annual legume, with hairy stems and leaves, which has been cultivated in China and Japan from remote antiquity. It was long grown in botanic gardens, but when the facts concerning its use as a human food by oriental nations came to light about twenty years ago, it was largely introduced into this country and Europe, where thorough trials of its forage and food value have been made. There are a large number of named varieties, which vary in the color of their seeds and the length of time which the plants require to come to maturity. The seed is planted at the rate of half a bushel to the acre, in drills 2½ to 3 feet apart, and cultivated about the same as Indian corn. In Virginia soy beans are planted between the hills of corn, so that two crops are produced on the same field at the same time. The yields of seed are often enormous. Soy beans are fed to stock green as silage, or as hay. The stems are rather woody and do not make the best quality of hay, but as either ensilage or green forage they are unsurpassed. The hay contains from 14 to 15 per cent crude protein and 3 to 6 per cent of fat. The beans contain from 32 to 42 per cent

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protein, and from 12 to 21 per cent of fat in fresh material. When fed to milch cows, a ration of soy beans increases the yield of milk, improves the quantity of the butter, and causes the animal to grow rapidly in weight. It is an excellent addition to a ration for feeding cattle. In China and Japan, where the soy bean is an article of diet, substances similar to butter, oil, and cheese, as well as a variety of dishes, are prepared from it. The yield of green forage amounts to from 6 to 8 tons per acre, and the beans from 40 to 100 bushels. The feeding value of the bean has been found to be greater than that of any other known forage plant except the peanut.' (Jared G. Smith.)

"1493. (1 Package.) 'Soja hispida à grain noir' (black-seeded *Soja hispida*)." Address: Washington, DC.

960. *San Francisco Chronicle.* 1899. A San Franciscan's impressions of the Orient. Aug. 20. p. 3.
• ***Summary:*** George A. Newhall, Vice-President of the San Francisco Chamber of Commerce, visited Asia where he was officially commissioned to promote international trade. His first stop was in Yokohama, Japan where "he was received with the greatest cordiality by Kahe Otani, president of the Yokohama Chamber of Commerce, member of the House of Parliament,..." Mr. Otani "has two houses, one of modern European style, the other a typical Japanese dwelling, and it was in the latter that the repast was offered." Mr. Newhall removed has shoes and refused a chair that was offered to him.

"The numerous courses were served by served by dainty little soft-footed Japanese maidens all of the food being in elaborate lacquered bowls and served on lacquered trays richly ornamented with gold. The courses were as follows:

"1. Sweetmeats with rice, molded in different shapes, representing birds, flowers and beasts.

"2. Entree of meat and vegetables, with soye sauce.

"3. Fish-tai, baked and served cold with piquant Japanese sauce."

"The banquet lasted seven hours, from 3 to 10 P.M., and Mr. Newhall heroically sat it out, using chopsticks,..."

961. *Washington Post.* 1899. Food from the Orient: Americans may really become lotus eaters. Some Asiatic food products. Special investigation of the subject being made by the Department of Agriculture. Sept. 3. p. 27.
• ***Summary:*** A commission has been appointed by Secretary of Agriculture James Wilson to look into the subject of useful Asian vegetables. "Now that the Pacific Ocean has become an American lake,... Yankee enterprise is on the alert to gobble up whatever may be available for use on the other side of that large pond..."

The section titled "Better than potatoes" states: "Among other valuable Asiatic food plants are millet and the soy bean. The former is a cereal of the first rank, cultivated on an enormous scale both in India and China. The latter forms an important part of the largely vegetarian diet of the Chinese and Japanese. It has been cultivated for many years in Europe, and is beginning to be extensively grown in the United States, though mainly for forage. It resembles a pea rather than a bean, but is very different from our peas and beans."

962. Omako, M. 1899. "Ramuko" su oyobi shôyu no sekiri, korera oyobi chôchi fusu no sankin ni taisuru sakkin ryoku ni tsuite [The bacteriocide power of soda-water, vinegar, and shoyu against the bacilli of cholera, typhoid fever, and dysentery]. *Tokyo Iji Shinshi* (*Tokyo Medical Journal*) No. 1119. p. 1-6. Sept. 16. [6 ref. Jap]
• ***Summary:*** Nakazawa (1950) translates the title of this article as "The antiseptic power of lemonade vinegar and shoyu on the bacillus of dysentery, cholera, and typhus."

Note: Wine is said to have been first made by the Babylonians about 3,000 B.C. But vinegar existed as much as 5,000 years before that. It is mentioned in the Bible. It is produced naturally after a wine fermentation when bacteria called acetobacters convert the alcohol to acetic acid. The English word "vinegar," first used in the 14th century, is derived from the French *vin aigre,* or sour wine. In German it is *essig,* and in Italian *aceto,* which is where the name acetic acid comes from. Address: Osaka, Japan.

963. Platt, James. 1899. "Soy." *Notes and Queries* (*London*) 4:475. Dec. 9. 9th Series. [2 ref]
• ***Summary:*** "This word has been badly treated by all our dictionaries. The best is the 'Century,' where it is traced to 'Japanese *siyan,* Chinese *shiyu,'* but even that involves two errors. One is a misprint (*'siyan'* should be *siyau*)*;* the other is that it accounts for only half the English word.

"To explain this, I must draw a distinction between three kinds of Japanese. (1) In Japanese as written with the native character *soy* would not be *siyau,* but *siyau-yu.* (2) In the Romanised Japanese this is simplified to *shoyu.* (3) Colloquially this is still further reduced by dropping the final vowel, to *shoy* or *soy* (*sh* in Tokio, *s* in some other dialects). Of this monosyllable only the *so* represents the classical *siyau;* the final consonant (*y*) is a relic of the termination *yu.* Hence my remark that the 'Century' accounts for only half the English word. The English word is derived from the Japanese, the latter from the Chinese. The Chinese form given by the 'Century' is Northern Mandarin. At Shanghai it becomes *sze-yu,* at Amoy, *si-iu,* at Canton *shi-yau* [fermented black soybean sauce]. The first element is defined by Williams, in his 'Dictionary,' p. 764, as 'Salted beans, or other fruits, dried and used as condiments'; the second element merely means 'oil' (Williams, p. 1111)."

964. Haury, Alfred. 1899. Die Schimmelpilze und ihre industrielle Anwendung [Molds and their industrial application]. *Oesterreichische Chemiker-Zeitung* 2(23):605-

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11. Dec. Series 2. [24 ref. Ger]
• ***Summary:*** Discusses three genera of molds: *Penicillium, Aspergillus,* and *Mucor.* Gives details and a review of the literature on the use of *Aspergillus* species of mold for the production of saké, koji, soy sauce, miso, and various other East-Asian foods. In 1896 a book titled *Les moisissures* (*The molds*), by Calmette was published in Brussels, Belgium; he discussed sake, the chemical composition of koji, and the action of its diastase enzyme. "It was a Japanese named Jokichi Takamine who first had the idea of using koji in place of malt in American and European distilleries. In 1889 in the USA he was issued a patent on the process for using koji (or a mixture of koji and moto) in a fermentation to make of product containing 15-18% alcohol. The process was first tested in practice at Peoria, Illinois, is a distillery of the Distilling and Feeding Co., but not with the results that all the world had expected. Both Delbrueck (1894) and Saare (1895) had the opportunity to the process on the spot in 1894; in the opinion of Delbrueck koji is suited for use in place of malt in the saccharification of starches. For the production of koji, Takamine uses an inexpensive wheat bran instead of the typical rice. The process is then described in detail.

Aspergillus oryzae plays a key role in the production of two East-Asian foods: soy sauce (*Shoyu-Sauce*) and miso. The former is made with wheat, soybeans, salt, and water; miso is made from soybeans, koji, salt, and water. For details see Kellner's publication "On Saké, Shoyu and Miso." In Java, another species of Aspergillus, namely *A. Wentii* is used to make their soy sauce (*Sojasauce*), according to Prinsen-Geerligs.

Also discusses the use of Mucor species, such as *Amylomyces rouxii,* in the production of spirits or brandy from dehulled rice. In 1892 Calmette was head of the Pasteur Institute in Saigon; today he is director of the Pasteur Institute in Lille, France. He has taken considerable interest in Mucor species, and published the results of his research in his 1896 book. Colette has a factory at Seclin near Lille. Colette and Boidin have formed the Amylo Society (*Société d'Amylo*) in Lille. Address: Chemist, Austria.

965. Stoddard, W.H. 1899. Soy, or Soja beans. What they are,.... how to grow them, and what they are good for. Carlinville, Macoupin County, Illinois. Published by the author. Printed by Enquirer Printing Establishment. 6 p.
• ***Summary:*** "This is an extract from a paper read before the Macoupin (pronounced muh-KOO-pun) County Farmers' Institute, Dec. 21, 1898. It was mentioned in letter by Mary H. Stoddard, 25 Nov. 1944. On page 2 is inscribed: Compliments of Mary Hoyt Stoddard Best (Mrs. Earl), daughter of William H. and Mary V. (English) Stoddard. 202 Sue St., Carlinville, Macoupin Co., IL 62626. July 28, 1975.

The publication begins: "To our brother farmers and stock men. In answer to the many inquiries received, asking for information about the soja beans, we have prepared the following circular to answer some of the many questions, giving a few of the facts we have learned about them from the reports of several state experiment stations, and from our own personal experience in growing them for a feed, seed, and fertilizing crop. All intelligent farmers know there is an urgent need for a grain and forage crop other than corn. A crop rich in nitrogen and fat. A crop that can be grown easily, quickly and with little or no extra cost over that of corn. If possible, one that will *not* exhaust the soil like wheat, oats and corn, but rather add to its fertility."

The author discusses clover, alfalfa, and cow peas. He says he has obtained a yield of 10 bushels "with less than half a stand." He accurately reviews the nutritional value of soy beans compared to available supplements. "The last and best of this trio of legumes is the soy bean, or as it is generally but incorrectly called, the 'soja' bean. This plant is a native of South-Eastern Asia, growing wild in Japan, Java and parts of China. In Japan, where the greatest use has been made of it as food for man and beast, there are many varieties, like our corn with us, but only a few have been introduced into this country. Here it is divided into three classes, the Early Dwarf, the Medium Early and the Late Mammoth. Of these three there are white, yellow, green and black seeded varieties, which differ but little in value. They are of an upright, branching growth. None of the varieties ever run or vine like the cow peas.

"The Early Dwarf grows from 16 to 24 inches high, matures seed fit to feed green in 69 to 75 days, and ripens fit to cut for a seed crop in 80 to 90 days.

"The Medium Early varieties grow 3 to 4 feet high and are a few weeks later than the Early Dwarf.

"The Late Mammoth grows 5 to 7 feet high, but seldom forms seed north of the Ohio river, and only ripens in our southern states. It is worthless here except for hay or green forage for pasture, or to plow under for fertilizing. The Early Dwarf has been grown successfully as far north as Wisconsin and Minnesota, where corn is a doubtful crop.

"No soil is too poor for it to thrive and grow. It even yields a fair crop on ground too poor to grow clover. Unlike cow peas, which are a failure as a seed crop on rich land, it stands prosperity, and instead of running to vines, it simply increases alike its yield of forage and seed. So far no insect is known to injure the vines while growing. Chinch bugs never touch it. Drouths that burn up clover and cow peas and fire corn, have little effect on it. Rains that make "little yellow corn" and rot off cow pea vines, do not injure the sojas. If cut for hay or seed and lying on the ground, rains that would utterly ruin clover, corn fodder or cow peas, rarely injures the sojas.

"This fall part of my own crop was cut and lay on the ground all through the two weeks' rain in October, and I never lost a handful of vines or a pint of seeds from that cause. The little, fine, velvety hairs on stalk, leaf and seed-

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pods, seem to hold the water at a distance till it can dry out. These same little hairs on the green, growing plant attract and hold the dew till the large pulpy leaves can absorb the nitrogen it contains, transferring it through leaf, stalk and the mass of thread-like surface roots to the soil which supports it, thus paying its rent, till the ground is richer after growing the crop than it was before planting."

"Now for the food value of the seeds: Of protein or food nitrogen, which is as necessary to the growth and health of animals as it is to plants, forming blood, bone and muscle, Soja bean seed contain 34 per cent; ground linseed oil-cake contains 32 per cent; cow peas 20 per cent; wheat and oats each 11 per cent; corn 10 per cent; wheat bran and ship stuff 15 per cent; artichokes 2½ per cent; sugar beets 2 per cent. Of fat, which goes to make heat, life and energy in the animal, these same foods contain: Soja beans 17 per cent; linseed oil-cake meal 3 to 7 per cent; corn 5 per cent; oats 5 per cent; wheat 2 per cent; bran and ship stuff each 4 per cent; cow peas 1 4-10 per cent only; artichokes two-tenths of 1 per cent; sugar beets 2 per cent."

"One of our most successful cattle feeders, Mr. J.F. Clark, of this county, reports having pastured the past season his field of sojas when summer feed was short, and says he never had cattle thrive and fatten faster on any kind of feed.

"Mr. E.G. Duckles, of Chesterfield, cut and fed his green sojas to his dairy cows the past summer with a quick and decided gain both in quantity and quality of the milk and butter.

"In my own experience I can say I never tried a better feed for calves or shoats [shotes], or brood sows and pigs, than the sojas either green or dry. They fairly go wild over the mature green beans if offered to them when grass is dry and before corn is ready to feed."

"Prices of seed for 1899: Early Dwarf Sojas, $2.50 per bushel; $1.50 per half bushel; $1.00 per peck. Medium Early Sojas, $2.00 per bushel; $1.35 per half bushel; $0.75 per peck." Note 1. No price is given for Late Mammoth Sojas.

At the end of the booklet is a full-page ad: "Macoupin County Stock and Seed Farms. W.H. & C.L. Stoddard, proprietors, Carlinville, Macoupin County, Illinois. Our specialties: Ohio Improved Chesterwhite Swine, Soja Beans, and 'Big Macoupin' White Seed Corn."

Note 2. This is the earliest document seen (June 2011) concerning soybeans in Minnesota, or the cultivation of soybeans in Minnesota. This document contains the earliest date seen for soybeans in Minnesota, or the cultivation of soybeans in Minnesota (Dec. 1899).

Note 3. This is the earliest English-language booklet seen (Aug. 2001) about soybeans, i.e. with the word "Soy" (or any of its cognates) in the title.

Note 4. This is the earliest English-language document seen (Oct. 2006) that uses the term "the sojas" to refer to soybeans.

Note 5. This is the earliest document seen stating that William H. and C.L. Stoddard of Macoupin County Stock and Seed Farms are selling Soja Beans.

Note 6. This is the earliest document seen (July 2013) that mentions the soybean varieties Early Dwarf or Late Mammoth.

Note 7. *Merriam-Webster's Collegiate Dictionary* (1998) defines shoat (derived from Middle English *shote*), a term first used in the 15th century, as "a young hog usually less than one year old." Address: Farmer, Carlinville, Macoupin County, Illinois.

966. Kano, S.; Iishima, S. 1899. Honpo-san shizenbutsu oyobi shikohin 18 shu no kyûshû ni tsuite [Digestion experiments on 18 Japanese foods]. *Gun-i Gakko Gyofu Koku Nobu* (*Bulletin of the Army Medical College*) No. 3. p. 101-33. [Jap]

• ***Summary:*** These human digestion experiments with single food materials were conducted at the Army Medical College in Tokyo. They are summarized in English by Oshima (1905, p. 168-73). Most of the experiments used shoyu as a seasoning. Experiment #89 used *kingyo fu* (a gluten preparation) and raw red azuki (adzuke) beans. #92 used tofu. #93 use tofu cake or okara. #94 used yuba. #97 used kuzu starch (made from *Pueraria thunbergiana*). Address: Army Medical College, Tokyo.

967. Beresford, Charles William. 1899. The break-up of China, with an account of its present commerce, currency, waterways, armies, railways, politics, and future prospects. New York and London: Harper & Brothers Publishers. xxii + 491 p. See p. 34, 40, 60-61, 63, 70. Index. 23 cm.

• ***Summary:*** Lord Beresford visited many parts of China and Manchuria on a mission given to him by the president of the Associated Chambers of Commerce. "The break-up of an Empire of four hundred millions of people is an even that has no parallel in history." Recently controversy has raged over the "Open Door" and "Sphere of Influence" concepts.

All of the information related to soybeans appears in Chapter IV, titled "Newchwang." The author arrived at that port in Manchuria on 4 Nov. 1898. Two of the largest British trading companies are Butterfield & Swire, and Jardine & Matheson Steamship Co. Each has about 35 steamers which, in 1897 made about 250 trips in and out of Newchwang. Newchwang and Talienwan are the only two ports on the sea that can be used for trading with all of Manchuria. "The backbone of the Chinese coasting trade under the British flag is the Newchwang coasting trade–[soya] beans, bean-cake, pease, and kindred stuffs. If Newchwang is closed the whole coasting trade would be very materially affected." (p. 34).

"The freight carried by boats in the summer is borne in the winter by carts, carrying on an average 22 cwt. [1 cwt = hundredweight = 112 pounds], which would take advantage of the frozen ground to bring down loads of beans, oil, maize, millet, and grain," etc. (p. 40).

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The staple exports from Newchwang "are beans, bean-cake, and bean oil... Until recent years the bulk of the beans and bean-cake trade was carried on with the south of China; but since the Chino-Japanese war [Sino-Japanese war, 1894-95] an extensive trade has been carried on with Japan; in fact Japan has outstripped China altogether." Exports to Japan increased from 460,000 taels in 1891 to 5,079,000 taels in 1897, from 2,727,000 taels in 1891 to 2,438,000 taels in 1897. Exports to Canton increased from 1,751,000 taels in 1891 to 2,338,000 taels in 1897. "Beans are sent to Hong Kong and Canton for food, and bean-cake is sent to Swatow for manure." (p. 60-61).

"In 1868, a steam bean-mill was started here [in Newchwang]; but, owing to native opposition, it was not allowed to work, and thus the experiment came to an end. In 1896 Messrs. Butterfield & Swire erected a bean-mill, and with satisfactory results, the profit accruing from the making of bean-cake in this way being enormous. The mill is worked by Chinese only, and is practically Chinese-owned. Other mills are shortly to be erected, and their erection will greatly enhance the importance of Newchwang as an open port." (p. 63).

In Newchwang "I also visited a bean-factory for pressing the oil out of the beans; it was the most primitive process conceivable. The beans were placed in receptacles made of grass, which in their turn were put into perforated iron vessels. The pressure was produced by wedges, driven home with slung stones, the bearings being solid trees with the heart cut out to make a guide. The Chinese have generally set their faces against machinery for this industry. Messrs. Jardine & Matheson have imported machinery which would carry out the work far cheaper and better, but I was told the Chinese merchants had boycotted both the bean-cake and the oil, and that the mill had to be closed." (p. 70).

Page 484 shows that of the 730,964 tons of shipping entered and cleared from Newchwang, 363,922 tons (49.8%) were on British ships. China's five largest ports in terms of value of trade in 1897 were Shanghai (101,832,962 Haikwan taels), Tientsin (55,059,017 taels), Canton (49,934,391 taels), Hankow (49,720,630 taels), and Newchwang (26,358,671 taels). China's five largest cities in terms of estimated population were: Canton 1,600,424, Peking 1,300,000, Tientsin 1,000,000, Hankow 800,370, and Foochow 636,351.

On the same page are definitions of the following Chinese weights and measures: 16 taels = 1 catty. 1 catty = 1.33 lb avoirdupois. 100 catties = 1 picul. 1 picul = 133.33 lb weight avoirdupois. 6 mou = 1 acre. 3.3 li = 1 mile. 1 Haikwan (or Customs) tael = $0.72 American or 2*s.* 11.75*d.* English.

A large full-body photo, facing the title page, shows Lord Charles Beresford.

Note: This is the earliest document seen (April 2008) concerning the Sino-Japanese War and soybeans. Address: England.

968. Chamberlain, Basil Hall; Mason, W.B. 1899. A handbook for travellers in Japan: Including the whole empire from Yezo to Formosa. 5th ed., revised and augmented. London: John Murray; Yokohama, Shanghai, Hongkong, Singapore: Kelly & Walsh, Ltd. ix + 577 + 53 p. "With 28 maps and plans and numerous illustrations." Index.

• ***Summary:*** Contents: Introduction. Routes: 1. Eastern Japan. 2. Routes connecting Tokyo and Kyoto. 3. Central Japan. 4. Western Japan and the Inland Sea. 5. The island of Shikoku. 6. The island of Kyushu. 7. Northern Japan. 8. The island of Yezo [Hokkaido]. 9. Luchu and Formosa. Glossary.

Page 10: Provisions: "Curry-powder will often help to make insipid Japanese dishes palatable, and *shôyu* (soy [sauce]) adds a zest to soups." "The following Japanese articles of food are considered palatable by most foreigners: *Kaseteira* [*Kasutera*], sponge cake. *Miso-shiru,* bean-soup [miso soup],... *Sakana no tempura,* fish fritter. *Unagi-mesihi,* layers of rice with eels done in soy. *Yokan,* sweet bean-paste" [azuki].

Gods and Goddesses (p. 56): Toyo-Uke-Bime, also called Uke-Mochi-no-Kami, is "the Shinto Goddess of Food or of the Earth. The *Nihongi,* one of the two principal sources of Japanese mythology and early history..." The Moon God killed the Goddess of Earth. From the body of the murdered Earth sprang cattle and horses, millet, silkworms, rice, barley, and [soy] beans, which the Sun-Goddess decreed should thenceforth be the food of the human race. In the *Kojiki* version of the myth, it is Susa-no-o who slays the Goddess of Food, and there are other differences of detail."

Eastern Japan (p. 225): "Tenjin-yama or Minato (Inn, Suiryo-kwan). This prettily situated place contains a few sake breweries and soy manufactories, the produce of which is shipped in junks to Tokyo;..."

Mountains of central Japan (p. 281): "Narada (accommodation at a Buddhist temple)" consists of but a few households; the people are isolated and poor. "Rice, *sake,* and soy [sauce] are with them luxuries to be indulged in on rare occasions, their ordinary food consisting only of millet and potatoes."

Central Japan (p. 334): "Yuasa (Inn, Edo-ya) is a dull town, noted for its manufacture of soy."

Central Japan (p. 336): "There is a current belief to the effect that Koya-san is so precipitous that such luxuries as bean-curd (*tôfu*) cannot he carried up to it, but that the priests place coppers on the temple balustrade, with which the crows fly off to Kumano and bring back bean-curd in return."

Central Japan (p. 389-90): Kasuga no Miya (a Shinto temple). The oratory "is now used by the townspeople on the evening of the Setsubun (3rd February) for the performance of the ceremony of scattering [roasted soy] beans to expel evil spirits."

Central Japan (p. 403): Matsudô. "Travellers will remark the great industry and economy practised in the agriculture

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of this district, even the ridges between the rice-fields being sown with beans or barley." Note 1. Soy beans were often planted on such ridges, then harvested as green vegetable soybeans.

Note 2. The last 53 pages of this book are advertisements. Address: 1. F.R.G.S., Emeritus Prof. of Japanese and Philology in the Imperial Univ. of Tokyo, Tokyo; 2. Corresponding member of the Royal Scottish Geographical Society, and late of the Imperial Japanese Dep. of Communications.

969. Fraser, Hugh (Mrs.). 1899. A diplomatist's wife in Japan: Letters from home to home. 2 vols. London: Hutchinson & Co. See vol. 1, p. 231, 233, 238. Chap. XI. With 250 Illust. 24 cm. [Eng]

• ***Summary:*** The author's maiden name is Mary Crawford. These letters, written in a poetic, flowery style during a three years' residence in Tokyo, Japan (April 1889 to April 1892), describe many aspects of Japanese life. Chapter XI, written in Nov. 1889, begins with a description of a Japanese mushroom hunting party in the autumn woods of Kyoto. After the mushrooms (the most prized at *matsu-také*) are gathered, they are cooked over a little fire in the woods. "Then begins the business of roasting the mushrooms, in which everybody helps; and great enthusiasm is shown over the delicious odour they give out. 'Ii nioi! Ii nioi de gozaimasu!' (Good smell! Honourably good odour!) exclaim the ladies, as they deftly peel off the outer skin of the toasted fruit, which is then shred into small pieces, flavoured with *shoyu* (soy) and vinegar, and eaten with *o'hashi,* the honourable chop-sticks."

During his visit to Japan, there was an attempt on the life of the young Russian prince Cesarévitch. There was a great outpouring of sympathy and condolences and love from Japanese people of all ranks "to the boy who lay healing of his wound in Kobe Harbour. The poor sent the most touching gifts–the rice and shoyu, the fish and barley flour, which would have fed the little family for a year;..." Address: Tokyo, Japan.

970. Heuzé, Gustave. 1899. Les plantes alimentaires des pays chauds et des colonies. 2 ed. [Edible plants of the tropics and colonies. 2nd ed.]. Paris: Librairie Agricole de la Maison Rustique. xii + 381 p. See p. 174-78. 19 cm. Series: Cours d'Agriculture Pratique. [Fre]

• ***Summary:*** The soybean is referred to in French as "Dolic du Japon ou soja." An illustration (non-original, p. 175; by Thiebault, from Carrière 1880) shows the soybean plant (titled *Dolic du Japon ou soja*) and a cluster of pods. Its scientific names are Soja japonica, Sav. or Soja hispida, Moench. Synonyms are Dolic soja, and Dolic à café. A botanical description is given. "Varieties which are most widely cultivated are the yellow soybean (le soja jaune; Soja ochroleuca) and the black soybean (le soja noir; Soja hispida). A sub-race named *soja d'Étampes* is the most widely appreciated in France. It is very productive but it needs 4-5 months to ripen its seeds. The soybean is an annual; it was introduced to France from China by de Montigny under the name *pois olèagineux.* It is successfully cultivated in China, Japan, the Indies, the Moluccas, etc. It is rather easily sold in the green state at various markets. Its principal merit is its ability to resist drought. It needs as much heat as haricots...

"The Japanese transform the seeds of this legume into a puree (tofu; *ten-hu*) or a paste (*miso*) with which they make a sauce (soja), which they use to prepare various seasonings named *shoyu* or *sooju* and *tofu* or *daïzu.*

"Soybean seeds germinate very irregularly and very late in Europe, especially in their second year of existence. An analysis of the soybean seed on a moisture-free basis, conducted by Mr. Joulie, is given.

"The soybean is richer than wheat in fatty and proteinaceous materials. When one prepares dry soybeans, it is useful to soak them in water for 8-10 hours before cooking, for they are naturally very hard. They are also eaten in the shelled green state.

"The varieties with branches [les variétés à rames] are not yet cultivated in Europe." Gustave Heuzé lived 1816-1907. Address: Membre de la Société Nationale d'Agriculture. Inspecteur Générale Honoraire de l'Agriculture.

971. Itô, Tokutaro; Matsumura, Jinzô. 1899. Tentamen florae Lutchuensis. Sectio prima. Plantae Dicotyledoneae polypetalae [Essay on the flora of the Ryukyu Islands. Section 1. Dicotyledonous multi-petaled plants]. *J. of the College of Science, Univ. of Tokyo* 12:263-541. See p. 420. [30 ref. Lat; eng]

• ***Summary:*** In the section titled "Leguminosæ," by J. Matsumura, descriptions of the following plants are given in Latin: *Glycine hispida* (p. 420). *Glycine hispida* (p. 420). *Pueraria thunbergiana* (p. 426). *Phaseolus radiatus* L. var. *typica* (p. 427–Azuki is not mentioned).

Note: The Ryukyu Islands were formerly called the Loochoo Islands. This is an unfinished systematic enumeration with citations, notes, and few descriptions, but without keys. Address: 1. Societatis Linnæanæ, Londeniensis Socius; 2. Dr., in Universitate imperiali Tokyoensi botanices Professor [Tokyo, Japan].

972. Killebrew, Joseph B. 1899. Grasses and forage plants. Knoxville, Tennessee: Printed for University of Tennessee by S.B. Newman & Co. 144 p. See p. 108-11.

• ***Summary:*** The title page reads: "Bulletin of the Agricultural Experiment Station of the University of Tennessee. Vol. XI. 1898. Nos. 2, 3 & 4." Charles W. Dabney is president of the station. The author, Col. J.W. Killebrew, A.M., Ph.D., is "probably the greatest authority in the South

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upon the culture and uses of grasses and forage plants." The section on soy beans (p. 108-11) is titled "Soy bean–coffee bean–soja bean–(*Glycine hispida*)–(Forage, Ensilage and pasture)."

Note: This is the earliest document seen (Jan. 2011) that contains the term "coffee bean" used to refer to the soy bean in connection with soy coffee.

"This plant has recently been introduced into cultivation in the United States, though it has been known in China and Japan from a remote antiquity. It is one of the crops grown for human food in oriental countries. It yields a large amount of seed while the forage, both green and dry, is capable of sustaining and even fattening domestic animals. Experiments that have been tried in Tennessee in its culture have been fairly successful.

"The soy bean is an annual, belongs to the leguminous family, and is grown for the same purposes as cowpeas and clover. As a soil renovator, as a hay and as ensilage it is nearly the equal in every respect of red clover.

"There are many varieties of the soy bean. The early varieties are thought to be the best to cultivate for seed. The medium early green is the best for hay and this with the medium early black is best for soiling and for ensilage... It will bear moisture well and a case is given by Mr. Robert C. Morris, of Illinois, where soy beans stood three weeks in water during the month of July without any permanent injury."

"The yield of the soy bean is very prolific, running from 25 to 40 bushels per acre and even 100 bushels have been reported under very favorable conditions...

"Probably the best use which can be made of the soy bean in the South is for the fattening of hogs. When so used the labor and expense of harvesting is saved..." There follows a long quotation by Prof. Georgeson of the Kansas [Agric. Exp.] Station on the value of soy beans for pork production.

"The farmers of Tennessee would do well to test the value of this bean practically on all different varieties of soils. It would unquestionably be a valuable addition to the crops of the Cumberland table-land. It would be valuable in the sandy soils of West Tennessee but it would grow with the greatest luxuriance upon the valley lands of East Tennessee and upon the limestone soils of the Central Basin and the clayey lands of the Highland Rim."

Note: Limestone is one of the most useful zoogenic deposits. Also used as a common building stone, it is formed chiefly by the accumulation of organic remains such as shells or coral. A photo (p. 109) shows a stand of soy beans growing near some corn plants (courtesy U.S. Dept. Agric–USDA). Address: A.M., Ph. D., Grass expert, Agric. Exp. Station, Knoxville, Tennessee.

973. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*). 1899. Shôyu no kanteihô ni tsuite [On the evaluation of shoyu]. 2:424. [Jap]

974. Langworthy, C.F. 1899. Appendix: Soy beans as food for man. *Farmers' Bulletin* (*USDA*) No. 58 (Revised ed.). p. 20-23. [1 ref]
• ***Summary:*** This part of Bulletin 58 is identical to the original July 1897 edition. Address: Ph.D., Office of Experiment Stations, USDA, Washington, DC.

975. Paillieux, Auguste; Bois, D. 1899. Le potager d'un curieux: Histoire, culture et usages de 250 plantes comestibles, peu connues ou inconnues. Troisième édition entièrement refaite [The inquisitive person's kitchen garden: History, culture, and uses of 250 edible, little-known or unknown plants. 3rd ed. completely redone]. Paris: Librairie Agricole de la Maison Rustique. xvi + 678 p. See p. 575-625. Illust. Index. 25 cm. [2 ref. Fre]
• ***Summary:*** The information about soy in this 1899 third edition is very similar to that in the 1892 second edition, but the page numbers are different. Contents of section on soy: Introduction: Work of the Society for Acclimatization with soy, structure of this book, excerpts on soy from past issues of the *Bulletin the Society for Acclimatization.* Botany of the soybean. 1. Soy in Japan: Kaempfer's writings, including miso and shoyu, Japan at the World's Fair of 1878, miso, shoyu, tofu. 2. Soy in Cochin China: Black soybeans, various foods. 3. Soy in China: Soy oil, tofu and fermented tofu, soy sauce, other uses. 4. Soy in Austria-Hungary. 5. Soy in France: Historical, varieties, cultivation, utilization.

The author's full name is Nicolas-Auguste Paillieux (lived 1812-1898; he died on 8 Feb. 1898 at age 85). An illustration (non-original line drawing; p. 576) shows a mature soybean plant bearing many pods, plus a close-up of three pods to the lower right of the plant (from an original in J.R.F. 1882). Note: Desire Bois lived 1856-1946.

Other related or interesting subjects (listed alphabetically): Adzuki (p. 224). Amande de terre: See Chufa. Amarantus / Amarante (p. 14-16). Arachide / Arachis hypogæa (p. 32-35). Chufa / *Cyperus esculentus / souchet comestible* (p. 571-75). Daikon (p. 173). Gado-gado [Salad with peanut dressing] (p. 224). Gobo (p. 45). Jinenjo (p. 246). Katakuri (p. 336). Koniaku [konnyaku] (p. 289). Ko / kudzu (p. 300-315). Mioga (p. 396). Moyashi (from adzuki, p. 226). *Phaseolus radiatus* / azuki (p. 222-24). Pistache de terre: See arachide. Quinoa (p. 523-25). Udo (p. 448). *Voandzou / Voandzeia subterranea* (p. 650-53). Wasabi (p. 420). Yama gobo (p. 496). *Zingiber mioga* (p. 396). Address: 1. Honorary member of the Council of the Societe Nationale d'Acclimatation 2. Asst. de la Chaire de Culture, Museum d'Histoire naturelle de Paris.

976. Robertson, L.S. 1899. The importance of leguminous crops to Agriculture. *Illinois Agriculturist* 3:25-33. See p. 27. [3 ref]

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• ***Summary:*** "The Soja Bean has been but recently introduced from Japan into our northern states. It is not a success in the South. Like the Cow Pea it will grow on any soil, and is relished by stock both for its seeds and vines. The hay is inferior to that of the Cow Pea on account of its heavy woody stems and because the leaves readily fall off. Like the Cow Pea also, the roots are small and not much of value as a fertilizer." Address: Univ. of Illinois, Class of 1900.

977. Robertson, R. 1899. Experimental farm for the Maritime Provinces. Report of Superintendent. *Annual Report of the Experimental Farms* (*Ottawa, Canada*). p. 241-61. For the year 1898. See p. 255.
• ***Summary:*** The section titled "Experiments with soja beans" (p. 255) states: "The seed used in these experiments was of a very early variety of soja bean from Japan, sent by the Director. The experiments were planned with the object of finding out the best distance apart for growing this variety of bean, and also its value as a forage crop... The seed was sown 5th June." The best yield, 5 tons 600 pounds, was obtained by sowing the beans in drills 2 feet apart. Distances of 2.5 and 3 feet gave lower yields.

Note 1. This is the earliest document seen (Jan. 2010) concerning soybeans in Nova Scotia province, Canada, or the cultivation of soybeans in Nova Scotia province. This document contains the earliest date seen for soybeans in Nova Scotia province, or the cultivation of soybeans in Nova Scotia province (5 June 1898). The source of these soybeans was Japan.

Note 2. Robertson was the first superintendent of the experimental farm for the maritime provinces, at Nappan, Nova Scotia, serving from 1897-1913. Address: Superintendent, Experimental Farm, Nappan, Nova Scotia, Canada.

978. Saito, Akio. 1899. [Chronology of soybeans in Japan, 1868 to 1899, first half of the Meiji period] (Document part). In: Akio Saito. 1985. Daizu Geppo (Soybean Monthly News). Feb. p. 11-12. [Jap]
• ***Summary:*** 1871 July–A brewing tax (*jôzô-zei*) and patent tax are levied on clear sake (*seishu*), unclear sake (*dakushu*), and shoyu. But in 1875 the two taxes on shoyu are discontinued because shoyu is considered one of the necessities of life.

1873–At about this time a sincere farmer, Itoi Mosuke, of Akita prefecture finds a special type of soybean and names it Itoi-mame. Later the name changes to Ani and they are cultivated all over Akita prefecture.

1873 May–The Japanese government exhibits soybeans at the exposition in Vienna, Austria. And the USA becomes interested in soybeans. Also at this expo, Kikkoman uses glass bottles for their shoyu for the first time.

1875–At about this time, shoyu becomes so popular overseas that a German-made fake shoyu appears.

1877–There are now 40-50 miso shops in Tokyo, centered in Hongo (which comprises the areas of Yotsuya, Fukagawa, Shiba, Shinagawa, Ooi, Oshima, etc.).

1877 Feb.–Dried-frozen tofu (*kôri-dôfu*) is purchased as an army supply for the Seinan no Eki war.

1877 Aug.–The first domestic exposition is held in Japan, at Ueno Park, Tokyo. Kikkoman shoyu wins an award.

1878–The quick method of miso fermentation (*miso no sokujo-ho*) is mentioned in a government report.

1878–The first official government statistics on soybean cultivation in Japan start to be compiled. This year the area is 411,200 hectares and production is 211,700 metric tons [tonnes; yield = 514 kg/ha].

1879–The price of high-quality miso in Tokyo is 4 *sen* per kg. In 1980 the price is 303 yen/kg–or about 7,575 times higher. Note: From now on prices from the Meiji era come from a book titled *History of Lifestyle of the Meiji, Taisho, and Showa periods as seen from prices of the day* (*Nedan no Meiji Taishi Showa Fuzoku Shi*). It is published by the Weekly Asahi (*Shukan Asahi*).

1882–Around this time many small shoyu manufacturers appear and quite a few bad quality shoyu products are on the market. Shoyu loses considerable consumer confidence.

1885–The price of 1 keg (*taru,* 16.2 liters or 9 *sho*) of shoyu at this time is as follows: Highest grade (*jo no jo*) (Kikkoman) 1 yen, 40 sen; Middle upper grade (*jo no chu*) (3 makers including Yamasa) 1 yen 38 sen; Lower upper grade (*jo no ge*) (Kamibishi) 1 yen 25 sen; Upper middle grade (*chu no jo*) (Fujita) 1 yen 25 sen; Lower middle grade (*chu no ge*) (Chigusa) 1 yen 17 sen; Lower grade (*ge*) (Kinka) 80 sen. Yamaguchi Yoshibei of Yamasa Shoyu starts to sell Worcestershire Sauce, called "Mikado Sauce."

1885 May–The government reinstates the tax on shoyu to raise money for the army.

1887–Soybean production in Japan tops 400,000 tonnes (419,700 tons) for the first time.

1890–The Tokyo-Area Shoyu Brewers' and Wholesalers' Union (*Ichifu Rokken Shoyu Jozo-ka Tokyo Tonya Kumiai Rengokai*) forms a cartel for the first time because of a 50% increase in the price of their raw materials.

1891–Mogi Kenzaburo of Kikkoman (1st generation) starts to use a special press (*gendo maki assaku-ki*) invented by Yamazaki Izuko to press the shoyu out of the moromi mash more efficiently and quickly.

1893–In recent years the import of soybeans to Japan has increased rapidly, and this year it reaches 96,000 tonnes. These soybeans are grown mainly in Manchuria. The average price of 2 liters of high-quality shoyu in Tokyo is 10 sen. (In 1982 it is 584 yen, or 5,840 times more than in 1893).

1894–Around this time miso soup is recognized for its value as a protein food. Dr. Sito Nesaku, an agricultural specialist, says that miso is a farm household's milk.

1894–Yabe Kikuji (1868-1936) calls natto "Japanese

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cheese" and presents the first academic paper on natto bacteria in Japan.

1895–Around this time the number of walking vendors of tofu, natto, and boiled whole soybeans (*ni-mame*) increased, as did the production of dried-frozen tofu (*kori-dofu*). The number of small shoyu makers decreased dramatically as Kikkoman, Yamasa, and Higeta increasingly used advanced industrialized methods. Recipes and methods for making miso pickles (*miso-zuke*) using carrots, daikon, udo, and ginger are given in women's magazines such as *Jokan, Katei Zasshi* and *Jogaku Kogi.*

1896–Around this time the importation of salt starts, as shoyu makers in Noda and Chiba buy 15,000 tons of salt from England.

1897–Soybean imports this year increase to about 140,000 tonnes, which is one-fourth of Japanese consumption. Domestic soybean production is 400,000 tonnes.

1899–Mogi Keizaburo of Kikkoman of Kikkoman (1st generation) starts using a boiler for the first time in the shoyu industry. Address: Norin Suisansho, Tokei Johobu, Norin Tokeika Kacho Hosa.

979. Tokyo Plant Seed Co. (Konoyen). 1900. Condensed seed & plant list for 1900. Tokyo, Japan. 7 p. Jan. 1. Illust. 21 cm. [Eng]

• ***Summary:*** In the section on "Seeds" (p. 5-6), "Soya beans" sell for $0.06 per lb. (U.S. gold dollars). The seeds of 43 plants are offered. Only two are less expensive than soya bean: upland rice (all varieties) and Japan buckwheat, each $0.05 per lb.

This catalog is a "Supplement to The Farm Annual for 1900 of the Tokyo Plant Seed Co." The cable address is "Konoyen, Tokyo." Address: No. 2-5 Tameike, Akasaka, Tokyo, Japan.

980. Stoddard, W.H. 1900. Soy or soja beans and cow peas for feeding and fertilizing. *Independent Press* (*Griggsville, Illinois*) 21(9):1, 4. Jan. 3. Paper read at the Farmers' Institute.

• ***Summary:*** W.H. Stoddard, a soybean pioneer in Illinois, argues that the three best crops to restore depleted soil on farms are the legumes clover, cow peas, and "soy or soja beans." Moreover, these can combine with a grain crop as fodder for livestock. "I think the best of this trio of leguminous plants is the soy bean or as it is generally but incorrectly called, the soja bean. This plant is a native of Southeastern Asia, growing wild in Japan, Java and parts of China. In Japan, where the greatest use has been made of it as food for man and beast, there are many varieties, like our corn with us, but only a few have been introduced into this country. Here it is divided into three classes, the Early Dwarf, the Medium Early and the Late Mammoth. Of these three there are white, yellow, green and black seeded varieties, which differ but little in value of composition for feeding... I prefer the yellow as they have proven more productive of seed and the seeds are larger than the other varieties...

"The Late Mammoth grows 3 to 7 feet high, but seldom forms seed north of the Ohio river and only ripens in our southern states. It is worthless here except for hay or green forage for pasture or to plow under for fertilizing. The Early Dwarf has been grown successfully as far north as Wisconsin and Minnesota where corn is a doubtful crop.

"No soil is too poor for it to thrive and grow. It even yields a fair crop on ground too poor to grow clover. Unlike cow peas, which are a failure as a seed crop on rich land, it stands prosperity, and instead of running to vines, it simply increases alike its yield of forage and seed. So far no insect is known to injure the vines while growing. Chinch bugs never touch it. Drouths that burn up clover and cow peas and fire corn, have little effect on it. Rains that make 'little yellow corn' and rot off cow pea vines, do not injure the sojas. If cut for hay or seed and lying on the ground, rains that would utterly ruin clover, corn fodder or cow peas, rarely injures the sojas...

"My sojas with less than half a stand, averaged 10 bushels per acre, while crops, of 25 to 60 bushels are common, average crops, according to soils and seasons, and over 100 bushels per acre have been grown at the south. Grown for forage or hay it yields 5 to 15 tons green and 2 to 5 tons dry. As hay the sojas are ¼ richer feed than clover, 3 times richer than field corn cut green purposely for fodder...

"As a dairy feed they are of the greatest value, giving an additional amount of milk and butter and also adding to the quality of the latter...

"In my own experience I can say I never tried a better feed for calves or brood sows and pigs than the sojas, either green or dry. They fairly go wild over the mature green beans if offered to them when grass is dry and before corn is ready to feed.

How to plant, cultivate, harvest, and thresh the sojas: "Plant about a peck per acre in drills with a corn planter in rows 20 to 30 inches apart... To harvest the Early Dwarf is quite a task, as the seed pods set so low on the stalks and they are so tough and hard when ripe it is impossible to cut them with a machine. It has to be done by hand with corn knives or hatchets. Cut as soon as the pods turn yellow. Catch the tops with one hand, cut and throw into small piles to cure. Dry thoroughly and then thresh or store in a barn; or better, in open shed till ready to thresh or feed. If many are grown, they are best threshed with a common grain separator, removing the concave and putting in a board in its place. Don't use a wind-stacker machine if you can get any other, as they have to run too fast to do good work. If ripe, don't cut with a scythe; it shatters the beans and does not cut low enough. Don't use a hoe, the handle strikes the vines, shatters seeds and the blade digs up clods of dirt to get mixed

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with the seeds."

The author concludes: "Don't feed like it was corn fodder or hay; remember they are very rich, condensed feed. Try them. Write to the secretary of agriculture, Washington DC, for Farmers' Bulletins Nos. 16, 22 and 58. They are sent free of charge to any address. No. 58 is specially valuable as it is devoted entirely to the topic of soy beans as food for man and beast, the different varieties and how to grow them."

Note 1. This is the earliest document seen (Jan. 1998) that uses the word "separator" or the term "common grain separator" in connection with soybean production. Address: Carlinville, Illinois.

981. Aso, K. 1900. The chemical composition of the spores of *Aspergillus oryzae. Bulletin of the College of Agriculture, Tokyo Imperial University* 4(1):81-96. Feb. [5 ref. Eng]
• ***Summary:*** "Our knowledge of the chemical composition of the spores of fungi is still very scanty, and as regards their ash, no analysis whatever has thus far been made." The spores of *Aspergillus oryzae* "can easily be obtained in any quantity in Japan, as the rice grains covered with the mycelium and the spores of this fungus form an article of commerce under the name of *Tane-Koji* or *Koji-dané.* I have preferred however to collect the spores myself, in order to obtain them in a pure state.

"Aspergillus oryzae plays a great part in several industries in Japan, being used not only in the manufacture of Sake or rice wine, but also in that of Shoyu or Soja-sauce, and of Miso."

Note: This is the earliest English-language document seen (April 2012) that uses the term "Soja- sauce" (or "soja-sauce") to refer to soy sauce.

"This fungus contains powerful enzymes, a diastase, a maltase, invertase and a peptase. Oxydases appear to be present only in traces."

In the section titled "Preparation of samples" (p. 82) the author describes how he prepared and collected the spores: "Tane-kôji was prepared roughly milled rice without mixing any ash [in sake factories the ash of oak leaves is typically mixed with the rice substrate]; and when the rice grains became covered with innumerable spores, they were brought out from the cellar and the spores were separated from the rice grains and the mycelium by tapping on the bottom of the culture boxes (*kôji-buta*) inverted on a sheet of paper." These spores "were then sifted with a very fine silk sieve to remove all impurities... This sample was exposed to air in a balance room for two weeks and kept in a bottle."

Two tables (p. 83) show the organic constituents in 100 parts of air-dry spores, and 100 parts of dry matter. The latter contains 5.151% ash, whose composition is discussed in more detail on pages 93-96. A table (p. 95) shows the ash content and composition of winter wheat, paddy rice (not whitened), oats, soy-bean, rice (not whitened), and spores of Aspergillus. The latter is by far the richest in ash, potash, and phosphoric acid. In conclusion, the author expresses "much thanks to Dr. O. Loew, formerly professor in this college..."

Note: This is the earliest English-language document seen (Jan. 2006) that uses the term "Soja-sauce" (regardless of capitalization) to refer to soy sauce. Address: Nôgakushi, Japan.

982. *New York Times.* 1900. A missionary exhibit: Oriental curios to be seen soon at Museum of Natural History. March 4. p. X8.
• ***Summary:*** It is chiefly an exhibit of curios from Asia, collected by various missionaries. The Japanese department is one of the most complete. "There are specimens of Japanese food supplies, beans of different kinds, rice, dried edible mushrooms grown in an oak grove [probably shiitake],... long, transparent strips of a tempting looking stuff which is labeled 'seaweed'; a bottle of [soy] sauce made of fermented wheat and beans; a cake made of wheat flour and looking much like ordinary bread but with odd black lines running through it [*fu,* or dried wheat gluten cake with nori]; a stick for stirring bean curd [tofu];..."

Note: An almost identical article appeared in this newspaper on June 12, p. 2. It describes the exhibit that this article is announcing.

983. Cottrell, H.M.; Otis, D.H.; Haney, J.G. 1900. A new drought-resisting crop–Soy beans. *Kansas Agricultural Experiment Station, Bulletin* No. 92. p. 19-28. March.
• ***Summary:*** Contents: Introduction. Description of the soy bean. Variety to plant. Planting. Cultivating. Harvesting. Yield. Feeding value: Steers, dairy cows, calves, cattle, hogs and pigs, pasture for hogs, hay. Cost of production. Faults of the soy bean. Fertilizing value ("it improves the soil on which it is grown"). Will it pay for the Kansas former to raise soy beans? Obtaining the seed.

"The Kansas Experiment Station began raising soybeans in 1889 and has raised them every year since–in 1889 having 70 acres in this crop. We have found the soy bean to stand the drought as well as Kaffir-corn or sorghum; it is not touched by chinch-bugs; the grain is a richer feed than linseed meal, and the plant enriches the soil on which it is grown. We believe that in 1900 the soy bean should be tried on a small scale by every Kansas farmer...

"The soy bean was brought [to Kansas] from Japan, where it is extensively cultivated for human food, taking the place of beef on account of its richness in protein. Because of its peculiar flavor but few Americans like it.

"Variety to plant: Kansas farmers should plant the Early Yellow soy bean. The Kansas Experiment Station has tried many other varieties, and the Early Yellow is the only sort that we have found that is satisfactory under Kansas conditions. Other kinds either yield too little or the crop does not mature during our season. In the spring of 1899

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we issued a press bulletin describing the merits of the soy bean and recommending the farmers to give the crop a trial. The College had no seed for sale and farmers ordered from the seed men, simply writing for soy beans. As long as the supply of Early Yellow soy lasted orders were filled with it, and the crops are reported satisfactory. After this supply was exhausted the seed men filled the orders with the Late Yellow soy, a variety that matures in Georgia and Alabama. Kansas farmers who planted the seed of this late variety report that but a small portion of the crop matured, the rest being killed by frost. Early Yellow soy beans planted May 12, 1899, were harvested August 23; planted after wheat, July 14, 1989, were ripe October 9."

"The beans should be planted in rows 30 to 42 inches apart, with the single beans dropped 1 to 2 inches apart in the rows. One-half bushel of seed per acre is required. The ground should be in good tilth, and the weeds thoroughly killed just before the beans are planted... We cultivate the same as corn, using the two-horse cultivator with small shovels and taking great care not to ridge the ground... Where more than 10 acres of soy beans are grown, it will pay to harvest them with a regular bean harvester... As soon as cut, the beans should be raked into windrows and immediately shocked, and left to cure in the cocks. The thrashing may be done with the ordinary grain thrasher, using all blank concaves, and running the machine slow enough to prevent cracking the beans... Farmers with better ground than ours report a yield of 20 bushels per acre, using our seed."

Five experiments were conducted feeding ground soybeans (14.4% fat) to hogs: "These experiments show that when soy beans are fed with corn or Kafir-corn for fattening hogs a saving was made in the amount of feed needed to make 100 pounds of gain of 13, 24, 31, 33, and 37 per cent., the amount varying in different experiments. Can the Kansas farmer afford to go without the soy bean and lose this saving?" (p. 25). Soy beans also make a pasture that is greatly relished by hogs.

Cost of production (p. 26): When grown on a large scale in Kansas, with ordinary prices for farm labor, it costs about 40 cents a bushel to raise soy beans. "This includes all expenses from preparing the ground for planting to storing the thrashed beans in the bin, but does not include rent.

"During the summer of 1899 we kept an account of the cost of raising soy beans on fields containing a total area of sixty acres. Labor cost $1.25 per day for a man and $2.50 per day for a man and team. The cost per acre was: Preparation of land, $1.35; planting, 30 cents; cultivating, $2; hoeing, 70 cents; harvesting, $1.40; thrashing, $2.57; total, $8.32. The yield of the 60 acres was 932 bushels, making the total cost per bushel nearly 54 cents." Kansas dairymen, hog raisers, and stockmen should all raise soy beans.

"Obtaining the seed: Most seed men sell soy beans, listing them as soy beans, soja beans, or coffee beans. The following farmers report having raised soy beans in large quantities in 1899: Hon. Geo. M. Munger, Eureka, Kansas; A.E. Clark, Pleasant Hill, Kansas; M.L. Dickson, Edgerton, Kansas; Wm. C. Lee, Manhattan, Kansas; H.H. Clothier, Vera, Kansas; D.L. Beale, Montana, Kansas; O.E. Simmers, Abilene, Kansas."

Illustrations (by Hench, p. 20, 22-23) show: Two soy bean pods and two soy beans (full size). A soy bean knife on a cultivator beam. A full-page soy bean plant, with many leaves and pods.

Note 1. This is the earliest document seen (Jan. 1998) that uses the word "harvester" harvester ("a regular bean harvester") or the word "horse" (or "horses"; "the two-horse cultivator") in connection with soybean production.

Note 2. This is the earliest document seen (Sept. 2007) that gives an itemized accounting of the cost of producing soybeans.

Note 3. This is the earliest document seen (July 2013) that mentions the soybean variety Early Yellow. There is good reason to believe that this is simply a new name for the Yellow Soy Bean, the name which had been used at Kansas since 1890. Address: 1. M.S., Agriculturist; 2. M.S., Asst. in Dairying; 3. B.S., Asst. in Field and Feeding Experiments. All: Manhattan, Kansas.

984. *Ohio Agricultural Experiment Station, Press Bulletin.* 1900. The soy bean a substitute for clover. No. 206. April 16. Published at the end (p. 270) of Ohio Agric. Exp. Station Bulletin No. 120 (June 1900).

• ***Summary:*** "The Soy or Soja bean is an upright, stiff-stemmed, branching bean, introduced a few years ago from Japan, which is rapidly coming to the front as a most valuable forage plant. It has been grown for several years by the Ohio Experiment Station with very satisfactory results. Planted in some of our poorest soils, it has produced two to three tons of excellent dry forage or hay per acre, which is eaten with relish by all kinds of stock. As a crop to turn under for green manuring, we do not know its equal.

"As the Soy bean is a warm weather plant it should not be planted before the last of May in Northern Ohio, nor before the middle in the southern part of the state... It should be harvested before frost and cured as hay.

"The Soy bean, like clover, adds nitrogen to the soil, and it is therefore a renovating, instead of an exhausting crop. It is especially suited to take the place of clover in a systematic rotation where the clover has been killed out by severe winters, as is the case at present over a large part of Ohio, or where the spring seeding of clover has failed to catch. The Ohio Experiment Station has used it in such cases with such good results that it feels justified in urging the farmers of the state to give it a careful trial.

"There are several varieties of Soy beans, some of which will mature seed in Ohio, while others will not. As a rule, the latter class are more valuable for forage, as they make larger growth. The beans, however, which are produced at the rate

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of ten to twenty bushels per acre, are a valuable feeding stuff, as they are quite high in protein, and to some extent take the place of such materials as linseed meal in the ration. The Kansas Experiment Station has fed them to fattening hogs with the result of effecting a large saving in the quantity of food required to make a pound of pork, and others report similar results in feeding them to sheep.

"The Experiment Station has no seed of these beans for distribution, but it may be procured of most of the principal seedsmen." Address: Ohio.

985. Nikitin, A.F. 1900. Bobi soi i poluchayemiye iz nikh produkti v khimiko-dieteticheskom otnoshenii [The soybean and its products from a chemical and dietetic viewpoint]. *Viestnik Obschestvenoi Gigieny, Sudebnoi i Prakticheskoi Meditsiny* (*Bulletin of Public Hygiene, Forensic-, and Applied Medicine*) (*St. Petersburg*) 4(2):453-69. April. English-language summary in Experiment Station Record 13(2):166 (1901). German summary in Zeitschrift fuer Untersuchung der Nahrungs- und Genussmittel 4:39-40 (1901). [46 footnotes. Rus]

• ***Summary:*** An excellent summary of the Russian and foreign literature on soybeans. Nikitin published two of his own original analyses of the chemical composition of soybeans, plus six analyses done by Giljaranski and one by Lipskii. These were black, yellow, and greenish soybeans from Russia, China, and Japan. He published numerous investigations on the nutritional value of soybeans. Lipskii found, in his investigations on the digestibility of soybeans, that in a diet consisting exclusively of mashed soybeans, 19.5% of the nitrogen and 19.2% of the fat remained undigested. The nitrogen loss is also somewhat larger than a diet of mashed peas, which Rubner found to be 17.5% undigested.

I.G. Podoba, a researcher, made Zwieback from soybeans. It consisted of 11.4% water, 24.57% nitrogenous substances, 9.16% fat, 47.09% nitrogen-free extract, 5.10% crude fiber and 4.62% minerals. Podoba gave this Zwieback for 4 consecutive days to five children at 9:00 A.M. They felt full until 2:00 P.M., whereas they usually felt hungry by 12:00 noon.

Tables show the nutritional composition of the following based on various investigations: 1. Soja hispida platycarpa var. melanosperma Harz (black, long; 3 investigations {1879} by E. Wein and Kinch, plus average). 2a. Soja hispida tumida var. pallida Harz (yellow; 25 investigations {1861-1881} by Anderson, Senff, Schwackhöfer & Stua., Zulkowski, Mach, Ulbricht, Wildt, Schröder, Blaskowics, E. Wein, Weiske, Kinch, plus average, p. 456). 2b. Soja hispida tumida var. castanea Harz (brown; 13 investigations {1876-1882} by people mentioned above, plus average, p. 457). 2c. Soja hispida tumida var. atrosperma Harz (black, round; 5 investigations {1872-1882} by Senff, Mach, Wein, Kinch, plus average, p. 457). 3. Analysis of soybeans whose botanical origin is unknown (17 investigations {1877-1886} and average, p. 457-58; Planted soybeans and harvested soybeans by Caplan. Tirol "coffee bean" by Mach. Unknown by Wagner. From China, Hungary {Pressburg}, and Étampes by H. Pellet. Unknown by Carriére. From Japan and India by Kinch. From Japan by Meissl. Three from Japan by Kellner. Two from Japan (Dai-dzu) by unknown. From America by Jenkins). 4. Analyses of soybeans derived from other sources and grouped together (13 analyses, p. 458). Address: USSR.

986. *Washington Post.* 1900. Dinner a la Japanese: A repast that is certainly picturesque and may be digestible. May 20. p. 22.

• ***Summary:*** From the Boston Evening Transcript: "In each course there are half a dozen dishes and the host tells what they are. First suimono, a bean soup [sic, clear soup, often with tofu];... sashimi, raw fish cut into thin slices and covered with ice. This is dipped into rich sauce called soy, and is really very good."

Note 1. This is the earliest document seen (Jan. 2014) concerning soy ingredients used in Japanese-style recipes, food products, or dishes outside Japan.

987. Langworthy, C.F. 1900. Vegetable cheese. *Sanitary Home* (*Fargo, North Dakota*) 2(3):55-57. May.

• ***Summary:*** "It is commonly believed that the Japanese, Chinese, and other oriental peoples live almost exclusively on rice, eating little or no meat... In the course of centuries the Japanese and Chinese have evolved the art of preparing substances resembling dairy products from vegetable sources. It is well known that beans, peas, and other legumes contain large amounts of protein... The soy bean, which is perhaps the principal legume grown in Japan and China, is less suited for food in its natural state."

"Though the soy bean is not relished when cooked in the ordinary way, the Chinese and Japanese prepare very satisfactory foods from it in ways which are unknown to western cooks. Bean cheese or bean curd, called by the Japanese tofu and by the Chinese tao hu, is one of the most important of these products and is prepared as follows: The soy beans are soaked in water for about 12 hours and crushed between mill stones until of a uniform consistency. The ground material is then boiled with about three times its bulk of water for an hour or more and filtered through cloth. The filtrate is white in appearance and has somewhat the appearance of milk. It has the taste and smell of malt. Analysis shows that it resembles cow's milk in composition. When heated a film forms on the surface which in appearance suggests cream. This is dried and eaten under the name of yuba. As soon as the soy bean milk becomes cool, some material is added; for instance, crude sea salt, containing magnesium chlorid [chloride], which precipitates the proteid material, the fat being inclosed in the coagulated mass. The coagulated material is pressed and kneaded into

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small cakes or cheeses. These are sometimes dipped in saline solutions of curcuma to color them. The bean cheese cakes are sometimes eaten fresh or may be cooked in different ways. Often when practicable they are frozen. This removes a considerable part of the water present. As shown by analysis, the fresh bean cheese contains about 5 per cent of protein and 3 of fat. Ordinary cheese made of milk contains about 28 per cent protein and 36 per cent fat.

"Miso resembles tofu to some extent. It is prepared from cooked soy beans, which are rubbed to a thick paste and fermented with rice wine ferment. Shoyu is a thick sauce prepared from a mixture of cooked pulverized soy beans, roasted and pulverized wheat, wheat flour, salt, and water. The mass is fermented with rice wine ferment in casks for from one to five years being frequently stirred. The resulting product is a moderately thick, brown liquid, in odor and taste, not unlike a good quality of meat extract, though perhaps a trifle more pungent. Throughout the East it is eaten in large quantities with rice and other foods and is an important source of protein. Under the name of soy sauce, it has been known to Europeans in India for many years, and is not unknown in the United States. Most of the soy bean products are fermented; that is, they are prepared with the aid of micro-organisms. The micro-organisms break down the cell walls and similar materials and thus the cell contents are rendered more accessible to the digestive juices at the same time peculiar and pleasant flavors are developed. The manufacture of these products is of very ancient origin and affords an interesting, practical illustration of the use of bacteria for economic purposes.

"The Chinese residents of San Francisco and other cities consume large quantities of these soy bean products and it is stated on good authority that soy bean cheese is manufactured in this country, though doubtless it is seldom, if ever, eaten by any except the Chinese."

Note 1. This periodical was later named *North Dakota Farmer.*

Note 2. This is the earliest English-language document seen (April 2013) that uses the term "bean cheese cakes" to refer to tofu.

Note 3. This is the earliest document seen (June 2011) concerning soybeans in connection with (but not yet in) North Dakota.

Note 4. This is the earliest English-language document seen (Aug. 2013) that contains the term "soy bean milk."

Note 5. Dr. E.F. Ladd was a nationally-known pioneer in food safety and sanitation in the United States. He published this periodical, *Sanitary Home,* in Fargo and distributed it free of charge like an extension publication before the extension service was created; North Dakota State Univ. paid the printing and mailing expenses. Interested in home safety, he rewrote technical publications in a language homemakers could understand. He did much work with North Dakota food purity and chemical purity laws. Address: PhD, Office of Experiment Stations, Dep. of Agriculture, Washington [DC, USA].

988. Kozai, Y. 1900. Chemische und biologische Untersuchungen ueber Sake-Bereitung [Chemical and biological investigations on sake production]. *Zentralblatt fuer Bakteriologie. Series 2.* 6(12):385-405. June 8. [42 ref. Ger]

• ***Summary:*** Contents: Techniques of sake production. The molds of the koji grains: Molds (*A. oryzae,* a white mold, other molds), yeasts. The use of pure-culture yeasts in sake production (2 experiments).

The author reviews the literature concerning the early investigations on *Aspergillus oryzae* and its commercial applications. He gives credit to Hoffman and Korschelt as the first writers upon the subject.

Note: An illustration (frontispiece) facing the title page shows many forms of *Mucor rouxii* from C. Wehmer.

989. Abel, Mary Hinman. 1900. Beans, peas, and other legumes as food. *Farmers' Bulletin* (*USDA*) No. 121. 32 p. See p. 9-11. Illust. Revised Nov. 1904. Corrected March 1906. [1 ref]

• ***Summary:*** A section titled "Soy Bean (*Glycine hispida*)" (p. 9-11) briefly describes the soybean plant and the rich nutritional composition of its seeds. The first paragraph is quoted from USDA Farmers' Bulletin 58.

Starting with paragraph 2: "This leguminous plant, probably native in China, is the most important legume of China and Japan... In the Orient this bean and the various food products made from it are so largely consumed that it is perhaps the most important food plant next to rice. The soy bean is eaten to a small extent boiled like other beans, but in China and Japan it is elaborated into a variety of products, all of which have a high percentage of protein, and when eaten in connection with the staple food, rice, which is so deficient in that constituent [protein], helps to make a well-balanced dietary. Some one of these products is eaten at perhaps every meal and by rich and poor alike, especially in the interior of these countries, where sea food is not obtainable.

"One of the most important of these preparations is shoyu, and it is the only one that has been introduced to any extent into other countries, where it is known as soy sauce...

"There are also several varieties of bean cheese or similar products made from this legume which are very important foods. These are natto, miso, and tofu. Natto is made from soy beans that have been boiled for several hours until very soft, small portions of the still hot mass being then wrapped securely in bundles of straw and placed in a heated, tightly closed cellar for twenty-four hours. Bacteria, probably from the air or the straw, work in the mass, producing an agreeable change in its taste.

"For tofu, the soy bean, after soaking and crushing, is boiled in considerable water and filtered through cloth.

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To the resulting milky fluid 2 per cent of concentrated sea brine is added, which, probably by virtue of the calcium and magnesium salts present, precipitates the plant casein, which is then pressed into little snow-white tablets. It is made fresh every day. Tofu is sometimes cooked in peanut oil before it is eaten. In natto and miso the action of minute organisms plays an important part. In tofu there is no such action. The composition of a number of these products is as follows:"

A table (p. 11) shows the nutritional composition of food products made from soy beans, including fresh tofu, natto, white miso, red miso, Swiss miso, and shoyu (2 samples).

An illustration (non-original line drawing, p. 10) shows a soy bean plant with a cluster of 7 pods to its upper left (slightly changed from an original in Carrière 1880, p. 154).

This bulletin also discusses (with an illustration of each): The bean–Broad or Windsor bean (*Vicia faba*). Kidney bean (*Phaseolus vulgaris*). Lima bean (*Phaseolus lunatus*). Scarlet runner (*Phaseolus multiflorus*). Frijole (*Phaseolus spp.*). Cowpea (*Vigna catjang*). Lablab bean (*Dolichos lablab*) and other common varieties. Locust bean (*Ceratonia siliqua*).

The pea–Field pea (*Pisum arvense*). Garden pea (*Pisum sativum*). Chick-pea or gram (*Cicer arietinum*).

The lentil (*Lens esculenta*). The peanut (*Arachis hypogæa*).

Note 1. This is the earliest English-language document seen (Aug. 2013) that uses the term "milky fluid" to refer to soymilk.

Note 2. Mary Hinman Able was not an employee of the USDA or of the federal government. She was a pioneer in the fields of nutrition, nutrition education, home economics, and popularizing science for the general public. Between 1904 and 1913 she wrote several farmers bulletins for the USDA. From 1909 to 1915 she was editor of the *Journal of Home Economics*.

990. *Times* (*London*). 1900. Japanese commercial interests in Manchuria. Oct. 5. p. 12, col. 2. [1 ref]

• ***Summary:*** "The Commissioner of Chinese Customs at Niu-chwang [pinyin: Yingkou, formerly Newchwang; Niuchwang, Niuzhang] refers, in his report for the past year, to the important part played by Japan in the recent rapid growth in the foreign trade of Manchuria."

"This growth in trade with Japan may be said to have commenced with the war between Japan and China [1894-1895], which probably opened the eyes of the Japanese to the wealth of Manchuria and the peculiar value of its products to themselves. The Soya bean is consumed in enormous quantities in Japan, the better qualities for food and the inferior ones as manure. In former years the supply was obtained from Korea, but the Manchurian bean is cheaper. Beancake is used as a food for cattle and for manure, and its value in both respects is well known. Japanese shipping at Niu-chwang naturally shows a great increase likewise."

991. *North Otago Times* (*New Zealand*). 1900. The industries of Japan. Oct. 13. p. 2 (Supplement).

• ***Summary:*** "Agriculture is the chief pursuit of the people of Japan, and in the greater part of the cultivated area rice and the principal food crops, wheat, barley, and soya beans, are grown."

"The industries of the Japanese empire may be distinguished as 'original' and 'imported.' The original industries which existed from early times are those of... vegetable wax, salt, sugar, sake, soy [sauce], oil, tobacco, indigo, and raw silk."

992. *Chicago Daily Tribune.* 1900. Simple diet of the Japs. Nov. 25. p. 36.

• ***Summary:*** The "Japanese have an advantage because of their simpler and cheaper diet. The Japanese eat thrice a day, but their food is so simple that foreigners find it difficult to satisfy themselves with it until they try it for two or three weeks, by the end of which time they generally concede its merits over the heavier foods of America and England.

"A Japanese breakfast consists of a tiny cup of tea, followed by a soup which may be made of bean curd, fish, or seaweed, a small piece of boiled fish, a small omelette, and a small cup of hot rice."

"The monotony is so great to a European that there is never any temptation to overeat, and the Japs are not gluttons. Yet this is the diet of the Japanese" against whom the Americans "will soon be pitted for commercial supremacy."

993. Sack, J. 1900. Samenstelling van Indische voedingsmiddelen: Tweede serie (LI-C) [Composition of Indonesian foods: Second series (51-100)]. *Bulletin van het Koloniaal Museum te Haarlem* No. 23. p. 85. Nov. Fold-out table bound at the end of No. 23. [3 ref. Dut]

• ***Summary:*** This is the second such table published in this Bulletin. The first table by J. Sack was published in Bulletin No. 22 (March 1900). Dr. M. Greshoff supervised the work. The composition of fifty Indonesian foods is given, with two lines of notes in one wide column after each. Each food is numbered: 51-100. Soy-related foods are: 56. Black soybeans (*Katjang kadelé itam; zwarte soja*). 76. Tempeh (*Tempé*). 81. Japanese shoyu (*Japansche soja*).

Also discusses: 57. *Katjang poetih* (Poetih [putih] means "white." A note says this is a type of soybean but we think it is a species of *Vigna*). 58. Katjang ketjipir (*Psophocarpus tetragonolobus*). 67. Sesame seeds. 82. Agar-agar. Address: Assistent bij het Laboratorium, van het Koloniaal Museum te Haarlem [Netherlands].

994. *Journal of the Oriental Institute* (*Vladivostok*). 1900-1901. Sovremennaia letopsis' Dal'nego Vostoka [Contemporary chronology of the Far East]. p. 157-58. [Rus]*

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• ***Summary:*** This chronology was published in installments under a specific grant from the Governor-General of the Amur Region. The entry for 1900-1901 titled "Japanese interests in Manchuria" describes increasing Japanese soybean imports from Niuzhuang, Manchuria, since soybeans from Manchuria are found to be less expensive than those imported from Korea.

995. Bailey, Liberty H. 1900-1903. Cyclopedia of American horticulture. 2nd ed. 4 vols. New York, NY: The Macmillan Co.; London: Macmillan & Co., Ltd. See vol. 1, p. 136-37. Vol. 2, p. 653. Vol. 4, p. 1693. Assisted by Wilhelm Miller, Assoc. Editor.

• ***Summary:*** This classic is illustrated with over 2,000 original engravings, including two of the soy bean. Full-sized illustrations (fig. 191; p. 136) in Volume 1, under "Bean," show the seeds of 6 types of beans, including four seeds of *Glycine hispida* (the soy bean).

Another illustration (fig. 195; p. 137) shows the leaves and pods of the Soy Bean–Glycine hispida (one-third size), and the accompanying text states: "Of greater value [than the Cow-pea] for the same purposes, north of New Jersey, seems to be the Japanese Soy Bean, which is early enough to come to maturity almost anywhere in the United States. Its foliage is rather thin or open, however, which impairs its value for green-manuring. The dry Bean constitutes one of the richest vegetable foods known, and its flavor seems unobjectionable to all kinds of stock. Sow 1 bushel to the acre."

Volume 2, p. 653 notes: "Glycine (Greek for Sweet). Leguminosae. Perhaps 15 or 20 species in tropical Asia, Africa, and Australia, mostly twining vines. The Glycines are allied to Dolichos, Vigna and Phaseolus: The cultivated species are distinguished by small and hairy flowers in short axillary racemes... In this country Glycine is known only in the Soy Bean, G. Hispida, Maxim. (fig. 195; p. 137), which is an erect, hairy annual from Japan and China. It is also known as the Soja Bean, Coffee Bean and Coffee Berry... In China and Japan the seeds are much used for human food, but in this country the plant is grown for forage, having begun to attract attention about 25 years ago. The beans may be used as a substitute for coffee; and for this purpose the plant is often sold. The Soy Bean, in the form in which we know it, seems to be unknown in a wild state. It is probably a domesticated form of Glycine Soja, Sieb. & Zucc., which is wild in Japan. These two species are united by some authors and separated by others (see Franch. & Sav. Fl. Jap. 1:108. Maxim. Bull Acad. St. Petersb. 18:398). For purposes of perspicuity and definition, they may well be kept separate in the books... Glycine was once applied to Wistaria. It is sometimes used for that genus at the present day in foreign lists (L.H.B.)"

Vol. 4, p. 1693 states: "Soy Bean (*Glycine hispida,* which see for botanical description) is a legume, and while it has long been a staple crop in Japan it has but somewhat recently been cultivated in the United States. Figs. 191, 195. It grows to perfection only in a tropical or semitropical climate. In its native country, Japan, the seed is an important human food product, but in the United States its principal use at present is as a forage plant for farm live stock and as a soil renovator...

"To the horticulturist the Soy Bean is valuable chiefly as a soil renovator... When the soil is so hard and forbidding that clover will not thrive the Soy Bean may be made to serve as a nitrogen gatherer, and when plowed under it serves to greatly improve the physical condition of the land. See also *Glycine* (L.A. Clinton)." Address: Prof. of Horticulture, Cornell Univ., New York.

996. Yanada, S. 1900. [Studies on the soy bean pod moth]. Unpublished thesis. [Jap]*

997. Boorsma, P.A. 1900. Scheikundig onderzoek van in

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Ned.-Indie inheemsche voedingsmiddelen. De sojaboon [Chemical analysis of some indigenous foodstuffs in the Netherlands Indies. The soybean]. *Geneeskundig Tijdschrift voor Nederlandsch-Indie* 40:247-59. [18 ref. Dut]

• ***Summary:*** Contents: Literature review. Introduction (Boorsma is living in Java). Chemical composition of indigenous soybeans: Table giving figures (based on Boorsma's original research) for large black, large yellow, small yellow, unripe or immature black soybeans, soy protein (*eiwit in de soja*) or legumine, the oil (*De vette olie*), analysis of the ash, starch, the black soybean (*zwarte kedeleh*), use of soybeans in Java and Japan. Japanese soy preparations (*Japansche soja preparaten*)*:* Shoyu (soja) made with koji, tofu, yuba, miso and natto. Indigenous (Chinese) preparations: Tempeh (*tempe kedeleh*), Indonesian soy sauce (*Ketjap–Bataviasche soja*), tofu and pressed tofu (*Tao-hoe en Tao-koan*), Indonesian miso and fermented black soybeans (*Tao-tjo en Tao-dji*).

Note 1. This is the earliest document seen (Jan. 2012) in any language that mentions "Tao-dji."

Note 2. This is the earliest Dutch-language document seen (Jan. 2012) that mentions fermented black soybeans, which it calls *Tao-dji.*

Note 3. This is the 2nd earliest document seen (March 2009) that mentions Indonesian-style miso, which it calls "Tao-tjo." This is the earliest Dutch-language document seen (Feb. 2009) that uses the word "Tao-tjo" to refer to Indonesian-style miso.

The section titled "Japanese soy preparations" (p. 251-53) includes descriptions of koji, tofu, dried frozen tofu (*kori-tofu*), yuba, miso and natto, as follows: Tofu is the Japanese name for a yellow-white to gray mass, which is prepared by macerating the finely ground up soybeans with water; an initial [natural] fermentation, which occurs alongside, creates enough acid to precipitate part of the protein. Then a short heating, causes as much fat as possible to bind to the protein, so that the liquid after filtration has a milky appearance. Through the addition of the highly alkaline magnesium concentrate, a by-product of making sea salt, the protein is precipitated, separated out by hand and shaped into cakes–which contain lots of water, protein and fat. As a side dish or in the preparation of soup, tofu is used a lot. To remove most of the water, it is common to freeze and dry the cakes in the sun afterward. Then they are called kori-tofu.

Note. This is the earliest Dutch-language document seen (April 2013) that mentions dried frozen tofu, which it calls kori-dofu.

Yuba is an even fattier product obtained by the evaporation of the cream layer, that aggregates on the surface of the just mentioned bean milk.

In Japan, most soybeans are processed into cheese types, called miso and natto [which the author confuses in the following].

The cooked beans, that have been formed into a firm dough are fermented again with koji, kitchen salt and water. The temperature and the amount of kitchen salt, that one uses, affect the nature of the product [miso] and the speed of fermentation. Finally the mass is cooked for a long time in the brine, separated and shaped into cakes. The resulting vegetable cheese [natto] is then wrapped in bundles, of about 500 grams, of straw, and left to its own for a few days in a heated space; where, according to Loew [sic, Yabe 1895, p. 438-39] the microbes attached to the straw cause an additional post-fermentation.

The reason for the somewhat extensive attention [in this writing] to the latter, is that the native soybean (katjang kedeleh) preparations of the Dutch East Indies are, more or less, patterned after the Japanese.

This excellent article contains a 4½-page description (the best seen to date, p. 253-58) of the traditional process for making soybean tempeh (*Tempe kedeleh*). The soybeans are parboiled, soaked in water for 2-3 days, drained, steamed in a steamer (*koekesan*), spread in a layer several centimeters thick on woven bamboo trays in shelves, and covered completely with banana leaves. They are then inoculated with the *bijang,* which is the "mold containing residues of a previous preparation." This is mixed in here and there, then the trays are covered lightly with banana leaves so as to let in some air. "Rampant growth of the mold soon begins. In the evening the mass is molded a little and after two 24-hour periods one will obtain a coherent cake, which is cut into pieces and taken as is to the market."

The cotyledons are stuck together by a dense mycelium, which has grown into a somewhat white covering. According to Prinsen Geerligs (cited above), the name of the mold is *Chlamydomucor Oryzae.*

During the two days of rampant mold growth, a radical conversion takes place in the components of the seeds; a lot of water, carbonic acid, and heat start to develop... A thermometer inserted into the fermenting mass shows a temperature 10-12ºC above that of the environment.

As the preparation is finished, the banana leaves are taken away; the temperature drops slowly to normal, the rampant mold growth stops, and the mass dries out slightly. In this condition, the tempeh can be kept for several days without spoiling.

When the rampant mold growth is allowed to continue for a third day, simply by leaving the banana leaves in place, the conversion will soon become much stronger as noted by the formation of ammonia. Also poisonous products start to form; a monkey, given a little bit [of overripe tempeh] among his other foods that day was vomiting violently one hour later. Thus we should admit that the stories about poisonings caused by various sorts of tempeh [such bongkrek, made from coconut presscake] probably have some foundation. But there is little fear of this from soybean tempeh.

After microscopic examination, Boorsma concluded that

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Prinsen Geerligs and others were wrong in stating that (1) the mold hyphae penetrate and dissolve the hard soybean cell walls, and (2) cellulose is decreased during tempeh (*tempe*) fermentation. He studied the chemical and compositional changes at four stages during a 3-day tempeh fermentation; a table shows his findings. He observed that fats and soluble carbohydrates decreased substantially, while nitrogen decreased only slightly. He also discussed the hydrolysis of soybean lipids, and why tempeh is easier to digest than whole soybeans.

Note 4. This is the earliest Dutch-language document seen (Sept. 2011) that uses the term *tempe kedele* or the word *tempe* to refer to tempeh.

Note 5. This is the earliest document seen (Jan. 2012) that describes how to make tempeh on a commercial scale.

On page 258 Boorsma briefly discusses Ketjap (which he called *Bataviasche soja,* or Jakarta soy sauce) and Tao-hoe and Tao-koan (tofu and firm tofu), based on information from Prinsen-Geerlings (for both) and Vorderman (for firm tofu). For each he gives a nutritional composition. On page 259 Boorsma briefly discusses *Tao tjo* and *Tao-dji* (Indonesian-style miso and fermented black soybeans). Note 6. This is the earliest Dutch-language document seen (Dec. 1999) that uses the term *Tao tjo* to refer to Indonesian-style miso or tauco / taucho.

Note 7. This is the earliest document seen (April 2001) that contains the term *Tao-koan.*

Note 8. This is the earliest Dutch-language document seen (Jan. 2012) that contains the word *natto.*

Note 9. This is the earliest Dutch-language document seen (Oct. 2012) that mentions yuba, which it calls *Yuba* and describes as *een nog vetrijker product dat verkregen wordt bij uitdampen van de roomloog, die zich bij de zooeven genoende boonenmelk aan de oppervlatke verzamelt."*

Note 10. Boorsma was a Dutch naturalist who lived in Indonesia in the early 1900s. Address: Netherlands.

998. Fraser, Hugh (Mrs.). 1900. A diplomatist's wife in Japan: Letters from home to home. 3rd ed. London: Hutchinson & Co. 709 p. See p. 190. Chap. XI. [Eng]
• ***Summary:*** See the 1899 edition, which contains the identical text but on different pages. Note: A revised edition, titled *A Diplomat's Wife in Japan: Sketches at the Turn of the Century,* edited by Hugh Cortazzi, was published by Weatherhill in New York in 1982. Mrs. Fraser died in 1922. Address: Tokyo, Japan.

999. Illustrations of a Noda Shoyu (later Kikkoman) soy sauce brewery at the turn of the century (1900). 1900.
• ***Summary:*** These line drawings by Akiko Aoyagi (see next page), based on a Japanese color illustration (above), appears in *The Book of Miso,* by Shurtleff & Aoyagi (1976, p. 222-23). The color illustration (also shown) appears in Kikkoman Foods Inc. (1973, p. 10).

Important steps (and places) in the process of making shoyu are numbered as follows: (1) Wheat and soybean granary. (2) Soybean caldron. (3) Grinding and cracking wheat. (4) Steaming cracked wheat. (5) Koji incubation room. (6) Salt storeroom. (7) Moromi-filled vats. (8) Pressing shoyu from moromi. (9) Making kegs. (10). Branded kegs.

1000. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*). 1900. Chôshi shôyu jôzô no genkyô to yushutsu [Present status of Choshi shoyu and its export]. 3:788. [Jap]

1001. Satow, Ernest M. ed. 1900. The voyage of Captain John Saris to Japan, 1613. London: Printed for the Hakluyt Society. viii + lxxxvii + 242 + 20 p. See p. 126. Series: Works Issued by the Hakluyt Society (London). 2nd Series. No. 5. [20 ref]
• ***Summary:*** On 29 Aug. 1613, while in Japan (near Shizuoka), Saris wrote: "Of Cheese* they haue plentie. Butter they make none, neither will they eate any Milke, because they hold it to bee as bloud, nor tame beasts."

(Footnote [by Satow]: *"This must be a mistake of Saris. Perhaps he mistook bean-curd (*tôfu*) for cheese, which is not known to have at any time formed part of the diet of the Japanese").

Note 1. The body of this work is a log kept by Captain Saris during his voyage to Japan and nearby areas. Each entry is dated. His spelling conventions have been preserved.

Note 2. Richard Hakluyt (pronounced HAK-luyt; lived ca. 1552-1616) was an English geographer and historian of Welsh extraction. He decided at an early age to devote his life to "globes, maps, and spheres." A good

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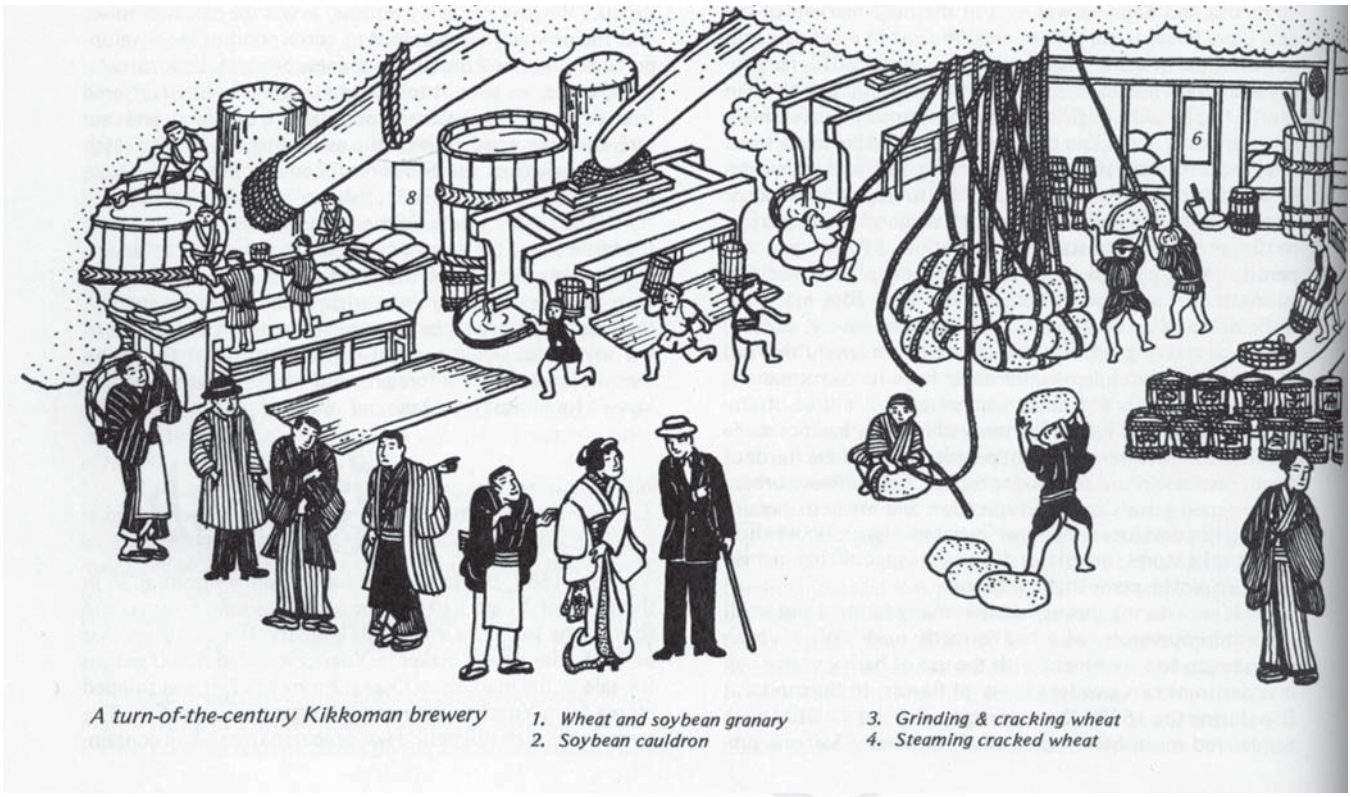
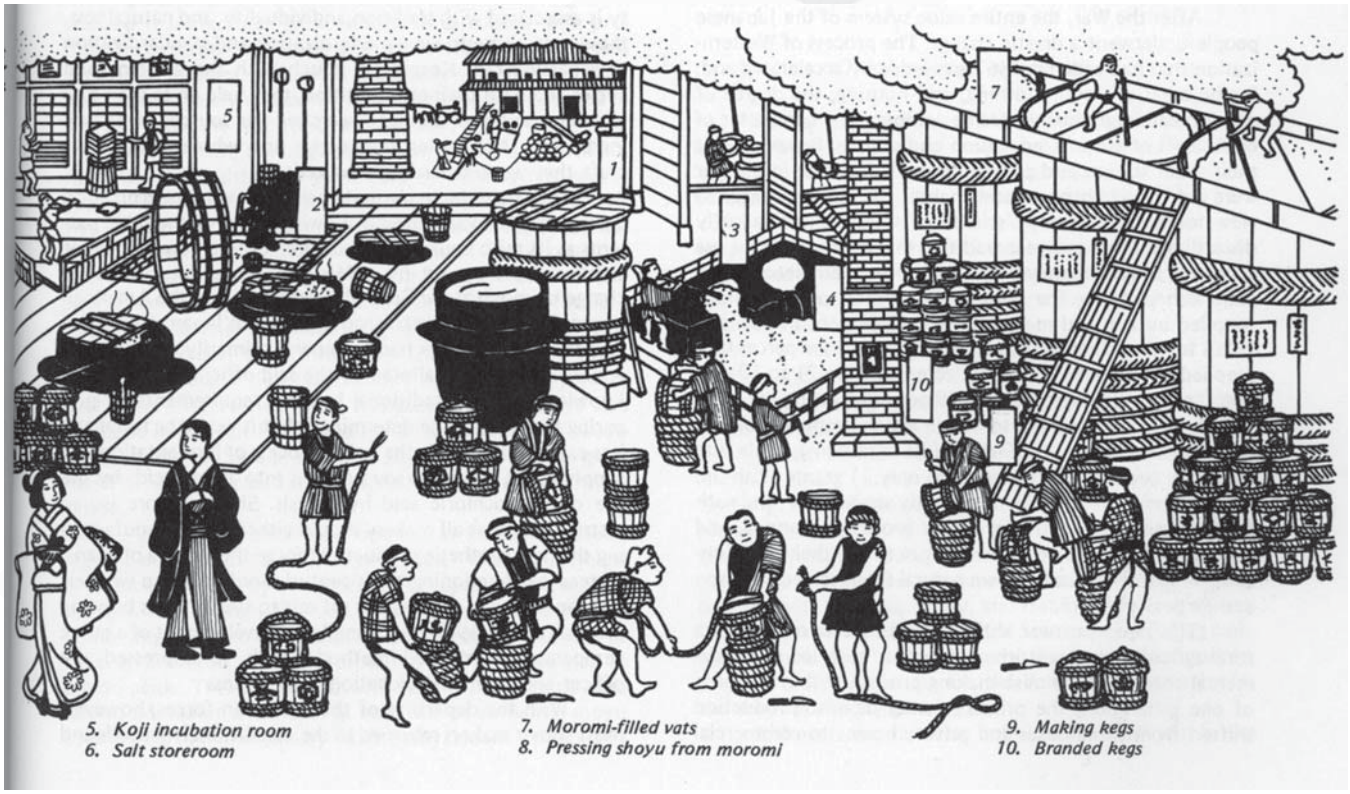


A turn-of-the-century Kikkoman brewery

1. *Wheat and soybean granary*
2. *Soybean cauldron*
3. *Grinding & cracking wheat*
4. *Steaming cracked wheat*



5. *Koji incubation room*
6. *Salt storeroom*
7. *Moromi-filled vats*
8. *Pressing shoyu from moromi*
9. *Making kegs*
10. *Branded kegs*

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researcher, he burrowed into all the records he could find of the early Spanish and French voyages, and laid before Queen Elizabeth a one-man encyclopedia of the wonders of America. It was, he assured everyone, a land "of huge and unknown greatness," though he himself had never been west of Bristol, England. In short, he helped to paint a picture of America as a land veined with gold and blazing with precious stones–the English version of the Spanish El Dorado.

An illustration (frontispiece) facing the title page shows the Shogun Ieyasu, seated in flowing robes. Address: Sir, K.C.M.G. [Knight Commander of (the Order of) St. Michael and St. George, Her Majesty's Envoy Extraordinary and Minister Plenipotentiary to Japan [England].

1002. VanBuskirk, J.D. 1900. Some common Korean foods. *Transactions of the Korea Branch of the Royal Asiatic Society* 14:1-8.

• ***Summary:*** Table 1, "Korean food products," based on statistics published in the 1917 report by the Bureau of Agriculture of the Government General, shows Korean production in millions of bushels: Rice 61. Barley 25. Millet 19. Wheat 8. Beans and peas 18. Since exports and imports of foodstuffs are relatively small compared to the amount produced, and the number of animals fed is not large, "these figures should give us a good idea of the amount of food eaten."

Rice is sometimes cooked with peas or beans (incl. soy beans) mixed in (called *pat-pap* or *kong-pap*). But the cooking takes longer and the beans are often not well cooked, and thus less digestible (p. 3).

The section titled "Bean and pea foods" (p. 4-5) gives the name of each food in Korean characters and discusses: (1) Bean curd (*tu-bu*), equivalent to Japanese tofu, is curded with the "concentrated mother liquid from sea water" [Jap. nigari]. The bean residue [okara] (*pi-ch'i*) left over from making tofu is also sometimes eaten. Bean curd "is not generally eaten without further preparation; it is commonly added to soups and stews and often made into omelets with eggs; another palatable food is made by cooking the bean curd for a short time in bean sauce (*chang*) and serving this with sesame oil, pepper and onions; it is called *to-bu cho-rim.* Bean curd may be eaten without further cooking served in sauce."

Note 1. This is the earliest English-language document seen (April 2013) that uses the term *tu-bu* to refer to Korean tofu.

Pea curd (*mook*) is similar to beancurd in composition but made from peas using a very different process.

"Bean Sauce (*kan-chang*) is somewhat like the Japanese 'sho-yu' but is more salt and not sweetened. Soy beans are thoroughly boiled, mashed, made into cakes and partially dried. These cakes (*me-ju*) are stored for months and allowed to mold and slowly ferment: when ripe they are broken up and soaked in salt water for a long time, then strained, the solid part being dried and used as a condiment (*toin-chang*). The liquid is boiled and the coagulated protein scum frequently removed; when sufficiently concentrated the liquid sauce is cooled and stored. This is the indispensable condiment for Koreans.

Note 2. This is the earliest English-language document seen (April 2012) that uses the term *kan-chang* to refer to Korean soy sauce.

"Another bean sauce (*ko-cho-chang*) is made by taking about equal parts of the fermented bean cakes, rice, and salt, with a large amount of red pepper, the mixture being soaked in a small amount of water till ripe. This too is very important as a condiment."

Note 3. This is the earliest document seen (March 2009) that clearly mentions a Korean-style miso, which it calls "ko-cho-chang,"–today commonly called "red pepper sauce."

"'Kong-cha-ban' is made by boiling beans in the bean sauce; they do not swell but are hard, brittle, and very salty. Sugar and sesame oil may be added when serving them.

"Sprouted beans (*kong-na-mul*) are very common. The beans are soaked in water and allowed to sprout. When the sprouts are quite long both beans and sprouts are boiled and served–sauce is generally added."

Kim-chi, a fermented food made from cabbage or sliced turnips, is sometimes served with added bean sauce.

Among animal foods: "'Mut-chim' is dried fish soaked in water, then shredded; it is then soaked in bean sauce. Sesame oil and pepper are added; it is then allowed to stand for a shot time." Address: M.D.

1003. Wilson, James. 1900. Report of the Secretary of Agriculture. *Report of the Secretary of Agriculture* p. 8-76. For the year 1900. See p. 30.

• ***Summary:*** In the section titled "Some valuable importations" (p. 30) has a subsection on "Grasses and forage plants" which states: "Superior varieties of soy beans have been brought from Japan."

A section titled "Experimental Farm at Arlington" [Virginia] (p. 75) is identical in content to that in the Yearbook of 1900. Address: Secretary of Agriculture, Washington, DC.

1004. Zavitz, C.A. 1900. Report of the experimentalist. *Ontario Agricultural College and Experimental Farm* (*Guelph*), *Annual Report* 25:101-29. For the year 1899. See p. 121-22.

• ***Summary:*** The section titled "Soy, Japanese beans" (p. 121-22) begins: "The Soy beans, which are also called Soja beans, have been grown for a great length of time in Japan and in South-eastern Asia... About eighteen years ago Prof. Georgeson, then connected with the Agricultural College in the State of Kansas, imported from Japan fifteen varieties of the Soy beans, with which he conducted practical

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experiments on the Experiment Station grounds and found that five of the varieties gave good results. These five varieties were imported from Kansas some seven years ago [i.e. in about 1892] for growing in our experimental plots. The Yellow Soy bean has given decidedly the best results among the five varieties which we obtained from Kansas. A few years ago, the Agricultural College of Massachusetts also imported a number of varieties of the Soy beans from Japan, and three of these have now been tested in our experimental grounds here at the College.

"The *Yellow Soy* bean which was imported from Kansas has given an average of eight tons of green crop per acre, being two and one-quarter tons per acre more than that produced from the common beans, and three and one-quarter tons per acre more than that produced from the horse beans. In each of the past three years the *Medium Green* Soy bean has given the largest yield of green crop per acre among the three varieties imported from Massachusetts, but each of these years the Yellow Soy variety has given better satisfaction than the Medium Green in yield of crop per acre, although the results in 1898 were practically equal. We hope to grow these two varieties in larger lots, in order that we can compare them thoroughly in regard to their qualities for green fodder and for hay.

"In the production of grain the Yellow Soy variety has produced the greatest yield of each of the tests made at the College. Of the different varieties tested during the past three years, the Extra Early Dwarf is the earliest, the Yellow Soy the second earliest, the American Coffee Berry the third earliest, and the Medium Green is the latest to reach maturity. In many of the localities in Ontario the Medium Green variety of Soy beans would be too slow in maturing to produce seed.

"In the spring of 1899 three varieties were sent out over Ontario in connection with the co-operative work, to find out how these varieties would succeed over the Province. The varieties distributed were the Medium Green Soy beans, American Coffee Berry and the Extra Early Dwarf Soy beans. The Medium Green and the American Coffee Berry gave upwards of twenty bushels of seed per acre, and the Extra Early Dwarf an average of about thirteen bushels per acre. The Yellow Soy bean was not included in the experiment, as the seed of that variety was not available at the time. Arrangements have been made, however, to secure seed of this variety from the Kansas Experiment Station, for 1900. We feel justified in making somewhat extensive experiments with the Soy beans on account of the strong claims made for these beans in a few places where they have been grown. The following is taken from the bulletin issued by the United States Department of Agriculture on the Soy bean as a forage crop:"

"The Experiment Station at Kansas is growing the Soy beans very extensively; they had no less than sixty acres in Soy beans this year."

"We understand that at least five complex food products are prepared from the Soy beans in Japan, although the beans are seldom used alone as a vegetable. They are also frequently dried and roasted, and used as a substitute for coffee."

Note 1. This is the earliest document seen (June 2005) concerning co-operative research on soy beans (one of two documents). This research was initiated and organized in 1899 by C.A. Zavitz of Ontario Agricultural College in Canada; he also recorded and compiled the results.

Note 2. This is the earliest English-language document seen (June 2005) that uses the word "co-operative" (or "co-operatives" or "co-op" or "co-ops" spelled with a hyphen) in connection with soy beans. Address: B.S.A., Experimentalist, Ontario Agricultural College [Guelph, Ontario, Canada].

1005. Zavitz, C.A. 1900. Co-operative experiments in agriculture. *Ontario Agricultural and Experimental Union, Annual Report* 21:6-37. For the year 1899. See p. 9, 16, 31-32.

• ***Summary:*** A table (p. 7) shows the number of distinct experiments in agriculture, number of experimenters, and number of satisfactory reports each year for 1886, 1888, and 1891-99. For 1886 these numbers were 1, 12, and 8. For 1888 they were 1, 90, and 40. For 1891 they were 12, 203, and 126. For 1895 they were 15, 1699, and 513. For 1899 they were 23, 3485, and 739. Thus, during these 14 years the Union made remarkable progress.

A table titled "List of experiments for 1899" (p. 9), under "Grain crops" includes "Testing three varieties of Japanese beans–3 plots."

In a long "List of experimenters" we read (p. 16) that the Japanese beans were grown by: (1) F.B. Doud, Branchton, Brant Co. (2) Simon Miller, Unionville, York Co. (3) Jno. D. Neilson, Thedford, Lambton Co. (4) O.A.C., Guelph, Wellington Co.

In the section titled "Conclusions" (p. 31-32), table 15 shows the results (based on 4 tests) of testing three leading varieties of Japan [soy] beans: Medium Green (estimated value 72), yielded 2.6 tons/acre of straw and 22.4 bu/acre of grain. American Coffee Berry (estimated value 100), 1.4 tons/acre of straw and 21.3 bu/acre of grain. Extra Early Dwarf (estimated value 86), 1.1 tons/acre of straw and 12.7 bu/acre of grain.

The text immediately below the table explains: "The Soy beans [sic] (Glycine hispida) is a leguminous plant native of Japan and China, and ranks very high from a chemical point of view. The plant is an annual, erect in growth and branches profusely. There are a large number of varieties, nearly all of which are too late for the conditions of Ontario. The different varieties are distinguished largely by the time required for the plants to mature and by the color of the seed; the yellow, the green, and the black, being the most common. The Soy beans are used for green fodder, silage, hay, pasture, and

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as a soil renovator, and the grain is used as a feed for live stock. These beans have been used as a food for man from the earliest times in Japan and China, and more recently in the European countries. They are not used as a food by themselves, but are made into different complex forms, of which five are quite common among Japanese, namely: natto, tofu, miso, yuba, shoyu.

"Conclusions.

"1. The Soy beans gave very good results in the Union experiments in 1899.

"2. The medium green Soy beans which gave the largest yield of grain per acre of the three varieties tested over Ontario in 1899, is the latest of the three varieties.

"3. The American Coffee Berry was the most popular variety with the experimenters when yield, time of maturity, etc., were all taken into consideration."

Note 1. This is the earliest report seen (Aug. 2002) in this periodical concerning soy beans. C.A. Zavitz is also secretary of the Ontario Agricultural and Experimental Union, and a member of its Committee on Agriculture (appointed at the last annual meeting).

Note 2. This is the earliest document seen (Jan. 2012) that mentions natto in Canada. Address: B.S.A., Director of Co-operative Experiments in Agriculture, O.A.C. [Ontario Agricultural College], Guelph [Ontario, Canada].

1006. Nikitin, A. 1901. Die Sojabohne und ihre Produkte in chemisch-diaetetischer Beziehung [The soybean and its products from a chemical and dietetic viewpoint (Abstract)]. *Zeitschrift fuer Untersuchung der Nahrungs- und Genussmittel* 4(1):39-40. Jan. 1. [2 ref. Ger]

• ***Summary:*** A German-language summary of the following original Russian-language article: Nikitin, A.F. 1900. "Bobi soi i poluchayemiye iz nikh produkti v khimiko-dieteticheskom otnoshenii [The soybean and its products from a chemical and dietetic viewpoint]." *Vestnik Obschestvennoi Gigieny Sudebnoi i Prakticheskoi Meditsiny* (*Bulletin of Public Hygiene of Forensic and Applied Medicine*) (St. Petersburg) 4(2):453-69. April.

A table shows analyses of different types of soybeans. Two are by the author himself, conducted on black soybeans from southern Russia; six are by Giljaranski on a yellow soybean from Russia, and yellow and black soybeans from China and Japan; and one is by Lipski [Lipskii] on a yellow soybean from Russia. He notes that cultivation of soybeans has lapsed since it was not understood how to use them as food, but only as fodder.

Very few investigations have been conducted on the nutritional value of the soybean. Lipski, in his investigations on the digestibility of soybeans, found in the case of an exclusive diet of soybean paste (*Sojabohnenbreikost;* probably made from cooked, ground soybeans) that 19.5% of the nitrogen and 19.2% of the fat remain undigested. I.G. Podoba, a researcher, made zwieback from soybeans; it contained 11.43% water, 24.57% nitrogenous substances, 9.16% fat, 47.09% nitrogen-free extract, 5.10% crude fiber, and 4.62% minerals. Podoba fed this zwieback to 5 children on 4 days for at morning tea-time. They remained satisfied until 2:00 P.M., whereas they were usually hungry by 12:00 noon. Address: Russia.

1007. Wilson, James. 1901. Report of the Secretary. *Yearbook of the U.S. Department of Agriculture.* p. 9-78. For the year 1900. See p. 32, 72, 77.

• ***Summary:*** The frontispiece is a portrait photo of William Saunders (1822-1900). / In the section titled "Some valuable importations" (p. 32) is a subsection on "Grasses and forage plants" which states: "Superior varieties of soy beans have been brought from Japan."

A section titled "The Library" (p. 72) is quite detailed: "Growth of the library–Additions to the Library during the past year have numbered about 5,000 volumes. A larger proportion of the additions has come by way of exchange than ever before, owing to arrangements for exchange made by the Librarian as a result of a personal visit to various points in Europe. These arrangements have a salutary effect in bringing to the attention of scientific bodies in other countries the numerous valuable, scientific publications of the Department, adding prestige to the Department as a whole and to its scientific workers in particular.

"Card index–Cards have been issued containing entries of all articles in the Yearbooks and Farmers' Bulletins issued by the Department; these have been printed and distributed to nearly 4,000 libraries, thus assisting in the efforts to make these publications more available to readers."

"Card catalogue–The additions to the card catalogue have been so great that it is probable that it will be in shape to be printed within a year or two. Such a catalogue, if printed, would be of the greatest use to workers in agricultural experimentation wherever located."

The section titled "Experimental Farm at Arlington" (p. 77) notes: "Congress at its last session authorized this Department to take charge of part of the Arlington grounds lying east of the Georgetown and Alexandria road. These grounds are susceptible of being made productive and very attractive, but at the present time require grubbing, draining, surfacing, and fertilizing. This work is being vigorously pushed; drain tile will be laid during the coming year; $10,000 should be appropriated to carry on the work." Address: Secretary of Agriculture [USDA], Washington, DC.

1008. Yokohama Nursery Co., Ltd. 1901. Descriptive catalogue... for 1901. Yokohama, Japan. 78 p. Illust. Index. 27 cm. [Eng]

• ***Summary:*** On the cover of this English-language catalog is an illustration of a dwarfed *Prunus mume* [ume plum] tree blooming. In the section "Price list of seeds" (p. 71-75) is a subsection (p. 75) titled "Some vegetable seeds," which

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gives the price of 7 types of seeds in American gold dollars per pound. These include: Soy bean 0.10 or $6.00 per 100 lbs. One new seed is Nerima long radish 0.50. A forage plant seed is *Pueraria Thunbergiana* [kuzu] 0.35 (see description in the section on climbing plants). Branch office: Suzuki & Iida, 11 Barclay St., New York, NY. The rest of the catalog is quite similar to the 1898 edition. Address: Nos. 21-35 Nakamura, Yokohama, Japan.

1009. Fraser, Hugh (Mrs.). 1901. Shiwo San's pilgrimage. *New-York Tribune.* Feb. 10. p. B5.
• ***Summary:*** Shiwo San recalled: "I had a present from my married daughter, a mosquito net and some bean curd, and she had another son, but Kokichi is naughtier than ever." "... daikon, whose smell already ravaged the house."

1010. Asahi: New U.S. domestic soybean variety. 1901.
• ***Summary:*** Sources: Cottrell, H.M.; Otis, D.H.; Haney, J.G. 1901. "Soy beans in Kansas in 1900." *Kansas Agric. Exp. Station, Bulletin* No. 100. p. 55-115. March. See p. 58-59. A table titled "Varieties of soy beans" includes "Asahi" obtained from Japan. Days from planting to maturity: 166.

Bailey, L.H. ed. 1907. *Cyclopedia of American agriculture.* Vol. II. "Crops." New York and London: Macmillan & Co. xvi + 699 p. See p. 585. "Asahi" is a late-maturing variety, requiring a growing period of 114-166 days. Address: USA.

1011. Cottrell, H.M.; Otis, D.H.; Haney, J.G. 1901. Soy beans in Kansas in 1900. *Kansas Agricultural Experiment Station, Bulletin* No. 100. p. 55-115. March. (Issued April 1901).
• ***Summary:*** This is an extremely detailed report, remarkable for soy beans in the year 1900. It is composed mainly of county by county reports by farmers of planting tests made during the year, and yields of forage and/or seed. The first general trials of soy beans throughout the state of Kansas were made in the summer of 1900.

One table (p. 58) shows the "Yield per acre on the college farm" of soy beans, corn and kaffir corn from 1889 to 1900, inclusive. The average soybean yield over these 12 years was 12 bushels/acre, the top yield was 17.0 bu/acre in 1889, and the lowest was 2.6 bu/acre in 1894.

A second table, titled "Varieties of soy beans" (p. 59), shows the varieties tested, the source of the seed (many seedsmen), the yield of beans per acre, the yield of hay per acre, and the days from planting to maturity. The varieties with their yields in bushels per acre (sorted in descending order of seed yield) are: Early Yellow, from Kansas State Agricultural College (7.4 bu/acre), Early Soy, from Peter Henderson & Co. (New York) and Johnson & Stokes (Philadelphia, Pennsylvania) (6.5 and 6.2), Dwarf Soy, from George W. Hilliard (Brighton, Illinois) (6.4), American Coffee, from J.J.H. Gregory (Marblehead, Massachusetts) (5.5), Medium Early Black, from J.J.H. Gregory (3.0), Extra Early Dwarf, from J.J.H. Gregory (2.7), Late Soy, from Johnson & Stokes (* = did not mature), Medium Soy, from Hilliard (*), Chastain Soy, from E.N. Chastain (Hume, Missouri) (NS = no stand), Nalrade, from Japan (Days from planting to maturity: 166), Asahi, from Japan (Days to maturity: 166), Tamarat Sukun, from Japan (Days to maturity: 151), Soy bean 4912, from USDA, from Japan (Days to maturity: 128), Best White 4913, from USDA, from Japan (Days to maturity: 128), and Best Green 4914, from USDA, from Japan (Days to maturity: 166). Early Yellow also gave the best yield of hay (1.4 tons/acre).

A map (p. 60) shows where soy beans were grown in Kansas in 1900; they were grown in at least one location in 75 of the of the 105 counties of the state. These locations are concentrated in the eastern one-third of the state, and especially in the northeast.

The report concludes by stating that "a majority of the 292 who reported growing soy beans in 1900 think them a profitable crop, and this with a new crop, in an unfavorable season."

Most farmers who tested soy beans responded to most of the following questions (their letters were condensed to 5-15 lines typeset): Have you grown soybeans before; if so, starting when? Type of soil in which this year's crop of soy beans was planted? Method and date of planting. Spacing between rows, and of plants within each row. Method and frequency of cultivation. Method of harvesting (one of the biggest problems). Pests you noticed (rabbits–often jack-rabbits–and grasshoppers were reported by many; only a few reports mentioned injury from other insects, and none from diseases). Yield of beans (most farmers got less than 15 bushels/acre; the highest yield was 31 bu/acre). Results of feeding beans or plants to livestock (almost every feeding trial was highly favorable; hogs, milch cows, and sheep generally thrived on them). Degree of satisfaction with the crop and its profitability. Do you plan to try soy beans again next year? Many farmers reported that the beans withstood drought very well. No mention was made in the Bulletin of any farmer having tried the soy bean as food.

H.C. Whitford, of Garnett, in Anderson County: "Tried to cut with mower, but this broke the clods and we had to resort to hand pulling. Got badly injured in the shock. [Presumably the soy beans, not Whitford.] I thought them worthless and fed them to hogs; the hogs were very fond of them." William Matthias, of Huron, in Atchison County: "Pigs and poultry got a taste of the ripe beans, and they made desperate raids on the field."

Joseph Shaw, of Strong, in Chase County: "Pigs were crazy for them, and ate stalks and all." John German, of Hiattville, in Bourbon County, said *his* hogs wouldn't touch the beans, although his calves and yearlings would. C.O. McLane, another Bourbon County man, from Uniontown, said concurringly that calves and also colts would climb

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low fences to get at some sorghum he had liberally laced with soybeans. Many respondents grumpily observed that soybeans were relished by rabbits.

Concerning soybean pioneers: H.J. Gifford of Haviland, in Edwards country: "I have planted the Little Yellow soy bean on a small scale for the past seven years [since about 1894]–principally as a coffee substitute." Gustave Koehler of Troy, Doniphan County: "I have raised the soy bean for years, and find it not a paying crop." Carl L. Howe of Emporia, in Lyon County: "Have raised soy beans for four or five seasons..."

Full-page photos show: 1. Early Yellow soy bean (p. 83). Brooks early soy bean (Henderson; p. 85). Early Yellow soy beans in the field (p. 87). Sixteen acres of Early Yellow soy beans (p. 89).

An excellent summary (p. 111-15) is given of these tests by Kansas farmers. The Early Yellow variety gave the best results. 135 farmers (46%) stated that soy bean is a profitable crop, 68 had a favorable opinion but needed further trial, 33 gave an unfavorable report, and 30 found the crop to be a total failure. The others did not express their opinion. "The season was the most unfavorable for growing soy beans but one that we have had in twelve years." Another major reason for low yields was probably the failure to inoculate the soy beans with nitrogen-forming bacteria before planting. Inoculated soil was first sent to 25 farmers in the spring of 1900; roughly 1,000 to 1,200 lb of inoculated soil are required per acre. "Soy beans have been grown on the College farm for twelve years... On Kansas farms where there is a sufficient supply of alfalfa for all the stock, we do not think it will usually pay to grow soy beans. Alfalfa supplies protein and mineral matter at a less cost than soy beans."

Note 1. This is earliest English-language document seen (June 2004) that uses the term "pest" or "pests" in connection with soybeans.

Note 2. This is the earliest document seen (July 2013) that mentions the soybean varieties Tamarat Sukun, Nalrade, Asahi, or Best Green.

Note 3. This is the earliest document seen (Dec. 2005) that contains a map directly related to soybeans. Address: Manhattan.

1012. Nalrade: New U.S. domestic soybean variety. 1901.
• ***Summary:*** Sources: Cottrell, H.M.; Otis, D.H.; Haney, J.G. 1901. "Soy beans in Kansas in 1900." *Kansas Agric. Exp. Station, Bulletin* No. 100. p. 55-115. March. See p. 58-59. A table titled "Varieties of soy beans" includes "Nalrade" obtained from Japan. Days from planting to maturity: 166.

Bailey, L.H. ed. 1907. *Cyclopedia of American agriculture.* Vol. II. "Crops." New York and London: Macmillan & Co. xvi + 699 p. See p. 585. "Nalrade" is a late-maturing variety, requiring a growing period of 114-166 days. Address: USA.

1013. Tamarat Sukun: New U.S. domestic soybean variety. 1901.
• ***Summary:*** Sources: Cottrell, H.M.; Otis, D.H.; Haney, J.G. 1901. "Soy beans in Kansas in 1900." *Kansas Agric. Exp. Station, Bulletin* No. 100. p. 55-115. March. See p. 58-59. A table titled "Varieties of soy beans" includes "Tamarat Sukun" obtained from Japan. Days from planting to maturity: 151.

Bailey, L.H. ed. 1907. *Cyclopedia of American agriculture.* Vol. II. "Crops." New York and London: Macmillan & Co. xvi + 699 p. See p. 585. "Tamarat Sukun" is a late-maturing variety, requiring a growing period of 114-166 days. Address: USA.

1014. Phelps, C.S. 1901. The soy bean as a forage and seed crop. *Connecticut* (*Storrs*) *Agricultural Experiment Station, Bulletin* No. 22. 20 p. April.
• ***Summary:*** Contents: Introduction. Varieties. Uses of the crop. The soy bean as a forage crop: As a soiling crop, as a silage crop, soy bean fodder compared with corn fodder [from "Indian corn"], proportions of nutrients in soy bean fodder, digestibility of the nutrients of soy bean fodder, comparison of the amounts of digestible nutrients in soy bean and corn fodders. The soy bean as a seed crop: Introduction, proportions of total and digestible nutrients in soy bean seed, feeding value of soy bean meal. Culture of the soy bean: Soil and fertilizers, seeding and cultivating, harvesting (use as a soiling crop for milch cows, growing for silage, growing for seed), methods of introducing the nitrogen gathering germs, experiments on inoculating soy beans to produce root nodules. Summary and deductions.

"The soy bean is a legume... It is a native of southern or eastern Asia, and has been cultivated in China and Japan from very early times. In those countries it is cultivated principally for its seed, which is used as food for man... In this country it has been grown for many years, chiefly in the South; but only within fifteen years has it received much attention as a forage or grain crop in other parts of the country... The Storrs Station began studies on the soy bean in 1890, and has cultivated the crop and continued its studies each year since then" (p. 3).

"Several varieties of the soy bean are grown in this country. They are distinguished chiefly by the color of the seeds and the time of reaching maturity. The most valuable varieties grown in recent years were imported from Japan, and were brought to the attention of the farmers in this country by the Hatch Experiment Station of Amherst, Massachusetts. The three leading varieties are the *early white,* the *medium early green* and the *medium black.* The first named produces a small plant and a rather light growth of seed. It is better adapted than the other varieties to rather poor soils, and is valuable mainly for its seed, as it produces a small amount of forage. The medium early green is

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valuable either as a forage crop or for its seed. It produces a heavy growth of leafy fodder, and will generally mature a large amount of seed before frost. The medium black is a large, leafy plant much like the medium early green, except that it does not produce quite as heavy yields of fodder and requires a little longer season in which to mature its seed" (p. 3-4).

Seed crop: "During the past ten years the soy bean has been quite generally recommended in this country as a valuable crop to grow for seed to be ground into meal... The Hatch Station at Amherst, Massachusetts, reports yields of 25 to 40 bushels per acre..." (p. 12).

Harvesting: "When grown for seed the crop should remain standing until the seeds are well matured. By this time most of the leaves will have dropped. The plant should then be pulled or cut and placed in small stooks [shocks]. As soon as dry the crop should be hauled and stored in a dry place. If left in the field after the pods become dry the seeds are liable to scatter [shatter] badly by the snapping open of the pods and considerable waste will result in case the weather is dry" (p. 15).

"Methods of introducing nitrogen gathering germs" (p. 15-17). It is well known that plants belonging to the legume group "are able to acquire nitrogen from the air. This nitrogen is taken into the plants through the agency of bacteria that live in the little wart-like bunches on the roots, known as root tubercles or nodules. The nodules are the home of the bacteria, and several distinct species or kinds of bacteria are found on the roots of different kinds of plants. It seems to be well proven that where the nodules are not found on the roots the plant does not acquire atmospheric nitrogen, except possibly in very small amounts. The proper species of bacteria for the inoculation of most of our common legumes are found in nearly all soils." "The introduction of the germs may be brought about in any of three ways: first, the spores of the bacteria may be carried to and introduced into the new soil with the seed; second, the spores may be introduced by mixing with the soil of the new field a small amount of soil from a field where the beans have been grown and have produced nodules; third, the spores may be introduced by gathering the dust and dirt that falls from the roots of the soy beans when threshed, and applying it in the soil when the beans are planted."

"Experiments on inoculating soy beans to produce root nodules" (p. 17-19). "The Station began to grow soy beans in 1890 and has grown them each year since; but for the first three years no nodules were found on the roots. During this time the yields were light, unless the crop was heavily fertilized, and the foliage was pale yellow in color. In 1893, seed of the early white variety was obtained form the Hatch Station, of Amherst, Mass., and, at the same time, some soil from a field where soy beans had been grown by that Station and where the nodules were abundant the year before. This soil was obtained for the purpose of introducing nitrogen gathering germs. Six hundred pounds were scattered over about one-tenth of an acre at time of planting." By mid-summer, the soy beans on the larger field, over which the special soil had been scattered, had their roots covered with nodules; no nodules were found on the soy beans in field to which no imported soil had been added. "The plants upon which no nodules were found were pale yellow in color and produced a light growth of seed. The plants [with nodules] on the larger field made a vigorous growth and seeded heavily."

"The results of this test seem to indicate that the presence of the nitrogen gathering bacteria, as indicated by the abundance of nodules, increased the percentage of nitrogen and of protein in the seed. This experiment would seem to show that the presence of the nodules is not only accompanied by an increase in the amount of the crop, but, in this case at least, by an increase in the proportion of protein as well. The only other experiment similar to this that has come to our attention was made by D.H. Otis, and reported by the Kansas Station in Bulletin 96. In this experiment, however, the ripe seeds were discarded and only the stems and leaves were analyzed."

A table (p. 18) shows that the soybean seeds from plants having abundant nodules on the roots contained about 10% more nitrogen and protein (on a water-free basis) than seeds from the plants with few or no nodules (p. 17-19).

Other tables show: (1) Soy bean fodder: Yields per acre with different types of fertilizers, 1895-1899. (2) Proportions of total and digestible nutrients in the fresh (green) substance of soy bean fodder, corn fodder, and corn silage. (3) Proportions of the total nutrients that are digestible in soy beans compared with those of other feeding stuffs. (4) Experiments with soy bean and corn grown for fodder. Estimated amounts of digestible nutrients per acre. (5) Composition of soy bean seed compared with that of other grain feeds (incl. Chicago Gluten meal). (6) Effect of nitrogen gathering bacteria on the percentage of nitrogen and protein in the seed. Address: Vice-Director of the Station and Agriculturist, Mansfield (P.O. Storrs), Tolland County, Storrs, Connecticut.

1015. Suzuki & Iida. 1901. Trade list of Japanese bulbs, seeds and plants: 1901-1902. New York City, New York. 20 p. April. 25 cm. [Eng]
• ***Summary:*** In the section on "Seeds" (p. 16-20) is a subsection (p. 20) titled "Vegetable seed." "Soy bean, 3 varieties, $0.15 per lb." Note: We wish they had listed the 3 varieties. Address: 31 Barclay St., New York City, New York; 3 Nakamura, Yokohama, Japan.

1016. Tokyo Plant Seed Co. (Tokyo Kônôen). 1901. Export price list: Seeds, plants, bulbs, implements, insecticides, books, etc. Tokyo, Japan. 12 p. Aug. 1. 21 cm. [Eng]
• ***Summary:*** Company name with diacritics is: Tokyo

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Kônôen. In the section on "Seeds" (p. 2+) is a subsection titled "Pulse." The first of the 11 different listings is: "Soya Hispida, Glycine Hispide, (dozen var.) 3.50 per 100 lbs." (U.S. gold dollars). Note: We wish they had listed the dozen varieties.

Other types of pulse listed: Phaseolus (radiatus [mung], subtrilobata [azuki], etc.). Hardy prolific red peas. Pod edible sugar peas. Prolific broad beans (*Vicia faba*). Large broad beans. Extra large broad beans. *Dolichos umbellatus.* Sword beans (*Canavalia incurva*). *Mucuna capitata.* Japan pole beans.

Company president: T. Watase. Cable address: "Watase," Tokyo. Address: 2 & 5, Tameike, Akasaka, Tokyo, Japan. Phone: Shimbashi 2421.

1017. Thavis, L. William. 1901. Farm work in Alaska: Progress of agricultural experiments there. A Kansan is in charge. Prof. Georgeson, formerly of the Manhattan Agricultural College, talks of the possibilities of raising things to eat in North. *Kansas Semi-Weekly Capital* (*Topeka*). Dec. 20. p. 6.

• ***Summary:*** This article begins: "Special Correspondence of the Capital. Washington, D.C., Dec. 17.–Prof. C.C. Georgeson of Manhattan, Kansas, is now special agent in charge of the government agricultural experiment stations in Alaska, with headquarters at Sitka. He is today one of the best paid agricultural explorers and experts in the United States..."

"Prof. Georgeson is a Dane by nativity, having come to this country when a youth. He began his work as a gardener and general horticulturist, passing his apprenticeship in this line in his native land. A year after he landed he entered the Michigan Agricultural college, from which he graduated in 1878. He was at once offered the position as assistant editor of the *Rural New Yorker,* published in New York city. That position he held for two years. In the fall of 1880 he was chosen professor of agriculture and horticulture in the Texas Agricultural college. This was followed in 1885 by an offer from the Japanese government to fill a similar chair in the Imperial college of agricultural in Tokio, which he accepted. He remained in Japan nearly four years and returned to the United States in the fall of 1889. Very shortly after his return he was invited to take the position of professor of agriculture in the Kansas Agricultural college at Manhattan. He accepted the offer in January, 1890, and remained in that college nearly eight years till September, 1897, when the final dispersion of the old faculty took place at the hands of the Populist party.

"Prof. Georgeson's work in Kansas is well known to the farmers of the state. The experiment stations maintained by the national government had just been fairly started when he came to Kansas and his work in that line at the Manhattan station may be traced through the thirty bulletins which he wrote while there."

"The Soy bean was introduced into this country for the first time by Mr. Georgeson at the Kansas station in 1890. He sent to Japan for the seeds and grew them that year at the college. The scientist found it to be a valuable drouth resisting plant and grew it extensively and distributed the seed widely gratis to the farmers of Kansas. He introduced the growing of this bean as a second crop after wheat, and plowed it under for green manure if it failed to ripen. Prof. Georgeson proved by his feeding experiments that the meal of the Soybean was more valuable than linseed oil meal for both steers and hogs, and that the farmers could raise them at a fraction of the price per ton that the oilmeal costs.

"In January, 1893, Secretary of Agriculture Rusk sent Prof. Georgeson to Europe to investigate the dairy industry in the Denmark. There was at that time a great revival in the dairy industry in the United States, and Denmark stood at the head of the list of dairy countries."

"The results of the professor's investigations were published by Secretary Morton in a report entitled 'The Dairy Industry of Denmark,' which was well received by the American people." Note: "Report on the dairy industry of Denmark," by Prof. Charles C. Georgeson. Published in 1893 as *U.S. Bureau of Animal Husbandry, Bulletin* No. 5. 133 p.

"When the Populists broke up the Kansas college in 1897 Prof. Georgeson took the civil service examination for an assistantship in the United States Department of Agriculture. His examination proved satisfactory, and he was appointed assistant in the division of agrostology. He was immediately sent by the department to the Panhandle of Texas to investigate the pasture conditions in that locality. In March, 1898, Mr. Georgeson was appointed special agent in charge of the Alaska agricultural investigations, and at once started for the North, where he has since remained.

"Prof. Georgeson arrived in Washington a few days ago from Sitka. He expects to remain several weeks, during which time he will seek desired legislation for the new country. In an interview he said:

"'Three years ago scarcely no one believed that everything could be grown in Alaska outside of a few hardy vegetables. Even the old residents shook their heads and prophesied utter failure when anything more was attempted. We have, in spite of this feeling, however, succeeded in maturing all the leading grains and also flax and buckwheat.'"

If agriculture can be developed in Alaska, then it can become a populous state. "If agriculture is not developed, it must always remain what it is–a distant gold camp in which poor men can live only as servants of the rich, because if their livelihood can not be drawn from the soil, living will be too expensive."

A portrait photo shows Prof. C.G. Georgeson with a large mustache, dressed in a dark suit and bow tie.

Note: The Populists were a political party in Kansas

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that wanted to protect Kansas farmers from interference by big government and Eastern money, advocated "free silver," and disliked Republicans. In 1896 the Populist party gained control of the Kansas legislature, and the next year they threw out the administration and faculty at Kansas Agricultural College–including Prof. Georgeson and President George T. Fairchild–and installed new people more sympathetic to their views. But several years later, when the Populists lost power to the Republican party, the Republicans did the same thing in reverse.

1018. D.A.R. 1901. Katjang-Kedelihpraeparaten [Soyfoods]. *Orgaan van de Vereeniging van oud Leerlingen der Rijks Landbouwshool* (*see Landbouwkundig Tijdschrift*) 13(161):242-45. Dec. [Dut]

• ***Summary:*** The author wrote an article in the April issue of this magazine about soybean cultivation. Now he will discuss how soybeans are used to make foods. As mentioned in the previous article, soya beans as such are not good to eat, even boiled or roasted; they need to be processed so as to digest the indigestible protein; then this protein can be absorbed by the digestive enzymes of the stomach and intestines.

As Japan is *the* soya country, we will start with the product that is most popular there, soy sauce, which has also earned its place in Europe. It is made from equal parts of roasted soybeans and wheat, 1-3 parts water, and much salt. The koji is fermented for a long time. Prof. Dr. M. Fesco [sic, Fesca], who provided much of this information, said it takes about 20 weeks to 5 years. The longest and slowest fermentation gives the best quality product. In Japan, every housewife makes her own soya sauce and there is competition for the best homemade soy sauce. Late-ripening protein-rich soybeans, called shoyu-mame, are used. In Java, the residue from soy sauce is used a lot, along with peanut presscake, for fertilizing sugar-cane fields.

In the Netherlands Indies, ketjap [Indonesian-style soy sauce] is made solely by the Chinese. Also called Tao-yoe, it is prepared by covering cooked soybeans with hibiscus (*waroe*) leaves. The age and variety of the leaves is very important. The mold that grows produces substances [enzymes] that digest legumin [soy protein]. More of the process is described.

Note 1. This is the earliest document seen (Feb. 2009) that contains the term Tao-yoe. H.T. Huang (e-mail of 25 Feb. 2009) states: "Tao-Yoe sounds like Cantonese for *Douyou* (pinyin) or *tou yu* (W.-G.) which in Mandarin mean soy sauce, and which first appeared in about 1750 in the *Xingyuan Lu* (*Hsing Yüan Lu*). See Huang 2000, p. 371-73.

Star anise (*Hades manies*) is also added to Indonesian soy sauce. Some Chinese have gained a reputation for their knowledge of the different additives (*boemboengs* [*boemboes*]). 61. kg of soybeans (1 gantang or 10 katties) can yield 3 bottles of number 1 ketjap (which retails for 50 Dutch cents per bottle), plus 3 bottles of 2nd extraction ketjap (each 40 cents), plus 3 bottles of ketjap no. 3 (which is little better than salt water with a light brown tint; each 20 cents).

The Japanese also use soybeans to make tofu (*tofoe*). Precipitated with magnesium chloride, it is a greyish-white dough, or sometimes yellow product. Although containing 90% water, it is a concentrated food. A table (based on analyses by E. Kirch [sic, Kinch] of Tokyo) shows the composition of tofu and kori-tofu; the latter is made by freezing tofu then thawing it. Tofu is a good product for vegetarians, but beware than it can act as a laxative because of the magnesium chloride.

Note 2. This is the earliest Dutch-language document seen (Sept. 2011) with the term *Katjang-Kedelihpraeparaten* in the title; it means "Soyfoods."

Note 3. This is the 2nd earliest Dutch-language document seen (April 2013) that mentions dried-frozen tofu, which it calls kori-tofu.

1019. Lafar, Franz. 1901-1907. Technische Mykologie. Ein Handbuch der Gaerungsphysiologie... Zweiter Band: Eumyceten-Gaerungen [Technical mycology. A handbook of fermentation physiology... Vol. 2: Eumycetic fermentations]. Jena: Verlag von Gustav Fischer. x + 507 p. (p. 365-871). See p. 638, 640, 674-76. Illust. No index. 25 cm. Foreword by Prof. Dr. Emil Chr. Hansen (Carlsberg-Laboratorium, Kopenhagen). [5 ref. Ger]

• ***Summary:*** This book is continually paginated with Vol. 1, so the first numbered page is 365. Part 15 (chapters 56-58) is titled "Morphology, physiology, and classification of the technically important higher Ascomycetes and related forms" (p. 627-704). Chapter 56, by Prof. Dr. Carl Wehmer (*Dozent an der Technischen Hochschule zu Hannover* [Germany]), "Morphology and classification of the families of the Aspergilli (*Aspergillaceen*)*"* discusses (p. 627+): Eighteen illustrations of Aspergillus conidiospores (p. 632-33). *Aspergillus Oryzae* (Ahlburg) Cohn (=*Eurotium Oryzae* Ahlburg), which is widely used in Japan to make saké, soy sauce (*Soja-Sauce*), and miso (p. 638-39, with illust.). *Aspergillus Wentii* (Wehmer), which is used in Java to make Tao-Yu (Chinese-style soy sauce) using cooked soybeans covered with *Hibiscus* leaves (p. 640).

Chapter 57, also by Prof. C. Wehmer, titled "Chemical effects of the Aspergilli (*Aspergillaceen*)*,"* discusses (p. 674+): Saccharification of starches, diastase and diastatic enzymes, Takamine's research using Aspergillus to make diastase (Takadiastase) and its efficiency compared with similar enzymes of different origins, koji extract which contains amylase and other enzymes, use of *A. oryzae* to make saké, shoyu, and miso (p. 675-76).

This book also discusses: Zygospore production (p. 379). Sporulation and Aspergillus (p. 387-89, with illust.). Morphology and classification of the Mucorales, zygomycetes, zygospores (p. 420-21). The genus Mucor,

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sporangia, Rhizopus (p. 424-27, illust.). Mucorales used in the spirits industry, Mucor rouxii, Chinese yeasts (p. 436-37). Ragi/raggi and tapé (*tapej*) (p. 441). Decomposition of proteins and their derivatives, protease (p. 690-91). Film-forming surface yeasts and their accompanying phenomena, *Mycoderma* (p. 732-33). Invertase (p. 828). Other enzymes discussed in this chapter include maltase, melibiase, lactase, trehalase, raffinase, and amylase. Address: Prof. of Fermentation Technology and Bacteriology at the Imperial-Royal Technical College at Vienna [o. ö. {obiger Oesterreichischer} Professor der Gaerungsphysiologie und Bakteriologie an der k.k. {kaiserlich-königliche} Technischen Hochschule zu in Wien].

1020. Dep. of Finance (Okurashô). 1901. Financial Annual of Japan (No. 1). Tokyo, Japan: Government Printing Office. 74 p.

• ***Summary:*** A table titled "Amount of taxation under various heads" (p. 12-13) gives the government revenue (in yen) from various types of taxes from 1867-68 to 1901-02. The soy [sauce] tax began in 1885-86 and was 640,179 yen that year. The rates of taxes on soy and income were raised in 1899. The soy tax jumped from 1,535,648 in 1898-99 to 2,453,392 in 1899-1900. In 1901-02 it was 3,808-730.

Note 1. In 1867-88, Japan's main sources of income were land tax (2.00 million yen), customs duties (0.721 million yen) and other miscellaneous taxes (0.534 million yen) for a total of 3.265 million yen.

In 1901-02, Japan's main sources of income were land tax (46.56 million yen), income tax (5.618 million yen), saké tax (55.280 million yen), various business taxes (6.263 million yen), customs duties (15.77 million yen) and other miscellaneous taxes (2.233 million yen) for a total of 138.741 million yen.

Note 2. In 1894-95 was the First Sino-Japanese War, over domination of Korea; Japan won. In 1904-05 was Russo-Japanese war; Japan won, gaining complete control of Korea. Address: Japan.

1021. Bie, H.C.H. de. 1901. De landbouw der inlandsche bevolking op Java [The agriculture of the indigenous people in Java]. *Mededeelingen uit 's Lands Plantentuin* (*Buitenzorg*) No. 45. 143 p. See p. 97, 99, 138-43. [Dut]

• ***Summary:*** The soybean is discussed in the chapter titled "Cultivation of crops other than paddy rice: Cultivation of secondary crops (*Palawidja*)." Soya bean is one of the secondary foods served with rice, but it is mostly used to make soy sauce and tempeh (*tempe*). One variety of soybean, which originally came from Japan, is widely grown as a second crop on the wet rice fields (*sawahs*), and it is easy to cultivate at altitudes of 1,200 to 1,500 feet above sea level. It is called *katjang kedele* in Central and East Java, but *katjang djepoen* in Sunda or West Java (*de Soendalanden;* [the area around Bandung only]). A description of the plant and the method of cultivation in Java is then given. It is planted much more on wet rice fields than on dry (non-irrigated) fields (*tegalans*) near the rice fields used for vegetables and secondary crops. Usually the soybean seeds are planted right after the paddy stumps have been cut away, but sometimes they are planted just before or during the paddy harvest, and pressed into the earth under the feet of the paddy cutters. They are rarely weeded, excepted when the crop is suffocated by tall weeds. At harvest, the plants are pulled completely out of the ground and bound into bunches. At night they are stored under a specially-constructed roofed shelter in the field, and during the day they are sun-dried on bamboo structures or on the ground. This takes at most 3-4 days, if the plants are really ripe and the weather is good, after which the bunches are put on bamboo mats in heaps and threshed. To protect the seeds from damage, one preferably uses piece of banana tree branches which still have fibrous veins. The fibrous plant stems and branches are removed together with the soybean pods and burned on the sawah fields. Poor people first sort out the pieces good enough for fuel and take these home. Immature green leaves are fed to animals. Sometimes soybeans are planted on the dikes of the paddy fields at the same time as or a few days later than the paddy rice. The fresh seeds from this harvest are then planted in the sawah fields after the paddy is harvested. Soybeans planted in this way are called *katjang apitan.*

There are two varieties of soya: one has an ivory yellow seed coat and the other is black. The latter is used almost exclusively to make soy sauce; the former to make pastry and condiments for rice or as a vegetable (*sayur; sajoer*). Soya is cooked with salt in the green pod and eaten as a snack.

The indigenous people do not occupy themselves with the production of soya (soy sauce) or *ketjap* or other products made from soybeans such as *taoetjo* [*tao tjo, tauco, taucho* = Indonesian style miso], *taoehoe* [*tao hoe, tahu* = tofu], *taoekwa* [*tao koan, taokoan or takoa* = fermented tofu], and *taoetji* [*tao dji, tausi* = fermented black soybeans]. The work is too involved and takes too long before the product is ready to be sold. Most people are too inexperienced and there is not enough of a market for the product.

The only food that most people make out of soybeans is tempeh (*témpé*), which plays the same role in Central and East Java as does ontjom in Sunda or West Java, and is prepared similarly. The tempeh-making process is described. It takes place indoors, out of the light. Tempeh is sometimes cut into smaller pieces. It is usually eaten pan-fried after being soaked in a solution of tamarind and salt. It is also cooked with vegetables.

Most soybean seeds are sold to the Chinese, who export them or process them to make soy sauce and other products. To make soy sauce, the seeds are roasted to aid in removing the hulls. Some people pound the seeds instead. They are cleaned, boiled in water, drained, spread on flat bamboo

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trays (*tampah* or *njiroe*) and dried daily for a week in the wind. They are washed again then soaked for 30-40 days in salt water which has been boiled then cooled. This mash is mixed thoroughly and strained through a cloth. To the black liquid is added a boiled and cooled mixture of cane sugar and water, then the mixture is boiled until its volume is reduced by 20%. If the solid residue removed by filtering still tastes salty, it is put into water, kneaded and strained again. A sugar solution is added and all is boiled down as before to make second-grade ketjap.

To make *taoetjo* (*tauco, taucho* or Indonesian-style miso), the soybeans are soaked in fresh water, the hulls are removed, the seeds boiled and spread on bamboo trays to cool. Rice or glutinous rice flour is roasted until golden brown, then mixed with the seeds and set aside for 2-3 days to ferment between hibiscus (*waroe*) leaves on flat trays. When the mass has molded, it is sun dried for a few days until very hard. Note: This is the soybean koji used making taucho.

Remove the leaves and put this mass of soybean koji into salt water. On the third or fourth day, add some yeast (*gist*) and some cane sugar syrup. Continue the soaking and fermentation in salt water for 2-3 weeks. Place it [in crocks] daily outside in the dew, taking care that no rain gets on it.

To stimulate the fermentation, take steamed rice or glutinous rice that is only half cooked. Add *ragi* starter and allow it to ferment for 2-3 days until a sweet, alcoholic flavor develops. This kind of fermented rice is called *peujeum* in West Java, or *tapé* in Central or East Java. Now add this fermented rice to the soybeans in salt water to enhance both the fermentation and the product.

After 3-4 weeks the soybeans should be very soft like porridge; then the taucho is ready to be used. It is eaten raw with cooked or raw vegetables, or mixed with meat or rice dishes; other condiments are also made from it.

Another product that the Chinese make out of soybeans is tofu (*tahoe* or *tauwhoe*). Soaked soybeans are ground and the puree is mixed with fresh water. Then a milky liquid (*melkachtige vloeistof*) is filtered off and coagulated. The Chinese use a coagulant called *tjiogo* (gypsum or calcium sulfate), which is specially imported from China and is not always available, even to the Chinese apothecary. It is first burned, then cooled before being added to the milky liquid. The white mass which is precipitated is called tofu. A similar product can be made from mung beans. Address: Batavia (Jakarta), Java.

1022. Chamberlain, Basil Hall; Mason, W.B. 1901. Handbook for travellers in Japan: Including the whole empire from Yezo to Formosa. 6th ed., revised. London: John Murray; Yokohama, Shanghai, Hongkong, Singapore: Kelly & Walsh, Ltd. ix + 577 + 94 p. "With 28 maps and plans and numerous illustrations." Index.

• ***Summary:*** This 6th edition is quite similar to the 1899 5th

edition, but with some important changes, and 41 pages of additional advertisements at the rear. In the concise English-Japanese dictionary (p. 21-22): Beans–mame. Soy–shôyu, shitaji.

Eastern Japan: Chôshi (Inn, Daishin): "Chôshi is noted for its soy, the manufacture of which may be seen at Tanaka Gemba's establishment, the oldest and largest, which supplies the Imperial Household."

In the ads at the back is a full page advertisement (p. 49) for "Higeta Soy, manufactured by G. Tanaka, Chôshi, Shimôsa, Japan." An illustration shows the Higeta trade mark. "Higeta Soy dates from 1615 A. D. (Second year of Genwa).

"Higeta Soy is honoured with the distinguished patronage of the Imperial Household.

"Higeta Soy was awarded the superior medal at the World's Fair at Chicago [Illinois], and gold and other superior medals by the Home Exhibitions.

"Higeta Soy has an excellent flavour and is very nutritious, being made of the best kind of bean, wheat, rice, and table salt." A table gives a nutritional analysis.

"Higeta Soy, not being acrid, is suited for ladies and children.

"Higeta Soy can be preserved even in hot countries, if kept in a dark place. This fact has been proved by many years' experience." Detailed directions for use are given.

Note: This is the earliest document seen (Feb. 2012) that mentions "Higeta" in connection with soy sauce. Address: 1. Emeritus Prof. of Japanese and Philology in the Imperial Univ. of Tokyo, Tokyo; 2. Corresponding member of the Royal Scottish Geographical Society, and late of the Imperial Japanese Dep. of Communications.

1023. Conn, Herbert William. 1901. Agricultural bacteriology: A study of the relation of bacteria to agriculture, with special reference to the bacteria in the soil, in water, in the dairy, in miscellaneous farm products, and in plants and domestic animals (Continued–Part II). Philadelphia, Pennsylvania: P. Blakiston's Son & Co. vii + 17-412 p. Illust. 22 cm. [265* ref]

• ***Summary:*** Part II of this book is "Bacteria in soil

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and water" (p. 53-174). In the section on "Bacteria and leguminous plants," the subsection titled "Nitrogen fixation by legumes" (p. 136-37) notes that in 1881 it was shown that peas and other legumes can assimilate atmospheric nitrogen. "This conclusion, so contradictory to the belief accepted at the time, was at first vigorously disputed; but, upon being subjected to further experimentation by many observers, was found to be strictly correct. Many of the plants of the great family of legumes certainly do have the power, under certain circumstances, of fixing atmospheric nitrogen and absorbing it into their tissues." During the next 10 years it was shown that this fixation was dependent on the growth of certain soil bacteria associated with "root tubercles" on the legumes (p. 137). Note 1. This is the earliest English-language document seen (March 2003) that uses the term "nitrogen fixation" in connection with legumes.

"Only such plants as developed tubercles were able to increase the amount of nitrogen in their tissues, and the amount of nitrogen fixation was roughly proportional to the development of tubercles" (p. 139).

In 1866 Woronin found small bodies (whose nature he did not understand) inside the tubercles (p. 140). These small bodies were soon found to be bacteria, and Beyerinck–who first studied them with care–gave them the name *Bacillus radicicola* (p. 142). By 1901 it was known that the bacteria enter by passing through the delicate root hairs (p. 143).

"The tubercle, therefore, may be regarded as a peculiar abnormal growth of the root of the leguminous plant, stimulated by the presence of invading organisms" (p. 144). Whether "it is the legume or the bacterium which fixes the nitrogen, or whether it is a phenomenon occurring only as a result of the two organisms combined together in a united growth, is not so clear" (p. 145).

It is now generally believed that the leguminous plant and the bacteria together, by *symbiosis,* absorb and fix atmospheric nitrogen, "each benefitting by the presence of the other."

The section titled "Different species of the tubercle organism" notes (p. 148-49) that "the soil of Connecticut is not adapted to the legume called the *soy bean.* When this bean is planted in the ordinary Connecticut soil it does not flourish but yields a small crop, unless heavily fertilized, and does not produce tubercles. This species does, however, grow readily in Massachusetts. Some years ago the experiment was tried of importing the Massachusetts soil, upon which this plant had produced abundant tubercles, and mixing it with the Connecticut soil, subsequently planting the soy bean. The result was an excellent growth of the soy bean and the development of tubercles in the Connecticut soil. At the present time these particular plots of land are capable of producing large luxuriant crops of the soy bean, with abundant root tubercles and a large fixation of atmospheric nitrogen. It is interesting to note that the same experiment has been repeated in Germany, where the soy bean does not readily grow. In this case soil was imported from Japan, where the plant flourishes, and was used for supplying the German soil with the proper species of organism. The result was equally successful with those of Connecticut experiments. Evidently Connecticut soil does not contain the species of bacteria adapted for producing the tubercles in the soy bean, although those which produce tubercles on the pea and the clover are abundant enough.

"These experiments indicate that the root-tubercle bacteria are not all alike..."

In the section titled "Importance of the leguminous crops to agriculture," a subsection titled "Selection of a proper legume" (p. 152) notes: "The most vigorously growing legume is best. The plants most commonly found useful are peas, cow peas, beans, soy beans, alfalfa, vetches, seradella [serradella], and some others."

The next subsection titled "Insuring presence of proper bacteria" (p. 152-53) states: "As already mentioned some species of legume find in a certain soil the tubercle organism adapted to them, while other species of legume will not find the proper organism in the same soil. The soy bean is a most excellent crop for this purpose, since it is an extremely luxurious growing legume, producing abundant tubercles and a large fixation of nitrogen when supplied with the organisms which produce tubercles. But in order to make use of this crop it may be necessary to import the proper bacteria from other soils."

During the past few years bacteriologists have attempted to meet these difficulties by "furnishing to the agriculturist a culture of the tubercle bacteria for the purpose of inoculating his soil, and thus providing it with the proper organisms to produce the tubercles. Such a material has now been on the market and under experimental tests for several years under the name of *Nitragin.* This commercial product is found by analysis to consist of a practically pure culture of certain of these tubercle bacteria, which are capable, when inoculated into sterilized soil, of producing the tubercles upon the roots of leguminous plants. Although the method of manufacture is not known, there is little doubt that the material comes directly from the tubercles of certain leguminous plants, and that the bacteria thus obtained have been produced in large amount in the bacteriological laboratory" (p. 154). Note 2. This is the earliest English-language document seen (March 2003) that uses the word "bacteriologists" or "bacteriology" (or "bacteriologist") in connection with nitrogen fixation by legumes.

Experiments with Nitragin have been carried on in large numbers in many localities for some years. "The results of the use of this material have been very irregular." Some experimenters have found no advantage accruing from its use. However quite a number "have found that the inoculation of Nitragin into the soil has increased the yield and produced a larger fixation of nitrogen" (p. 154-55). It works very well in sandy soil. Note: No address for ordering

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Nitragin is given. Address: Prof. of Biology, Wesleyan Univ., Middletown, Connecticut.

1024. Davis, Nathan Smith, Jr. 1901. Dietotherapy and food in health. Philadelphia, Pennsylvania: P. Blakiston's Son & Co. [ix] + 372 p. Illust. 23 cm. Index. Series: This is Volume VI of A System of Physiologic Therapeutics..., edited by Solomon Solis Cohne, A.M., M.D.

• ***Summary:*** Contents: Part I–General principles of diet and diet in health. Part II–Diet in Disease. In Chapter 3, "The elements of food," the section on "Proteids" states (p. 32): "Meat is not a necessity of life. Nitrogenous food is a necessity, but it can be obtained in sufficient quantities from vegetables. An exclusively vegetable [vegan] diet will enable a person to do as much, at times even more work, as a diet containing an excessively large amount of meat, but it will not fit one to meet sudden demands for great exertion. A mixed diet is undoubtedly the most desirable; one that contains a very moderate amount of meat is best."

In Chapter 4, on the same subject (continued), the section titled "Vegetarianism" states (p. 42): "Those who live chiefly upon cereals, vegetables, fruits, and nuts are called vegetarians. These foods are with rare exceptions supplemented by such animal foods as milk, cheese, and eggs... The nitrogenous matter obtained from vegetables is less easily digested than that which is of animal origin; a much larger percentage passes from the alimentary tract unutilized. Few persons live entirely upon a vegetable diet. Those who attempt it lose vigor and show languor and disinclination for physical and mental work. They become less able to resist disease. Because a vegetable diet is an economical one, it has sometimes been forced upon the bodies of laborers, but uniformly the decrease in the amount of work they are able to perform more than counterbalances the decreased expense of their food." Note: The source of this information is not cited. How about the Chinese laborers who built so much of America's transcontinental railroad? Research by Chittenden at a Yale University [New Haven, Connecticut] soon proved Davis's statements to be incorrect.

In Chapter 6, titled "Animal foods," a table (p. 61) gives the "Comparative composition of various types of milk" (Source: Koenig, *Chemie der menschlingen Nahrungs- und Genussmittel,* 3rd ed. Vol. I, p. 267-362). The sources of milk are: Woman, cow, dog, ewe, buffalo, cat, goat, llama, ass, and mare–all mammals of course. Mare's milk has the lowest total protein (1.3%), followed human milk and ass milk, tied for the 2nd lowest protein content (2.3%). Cow's milk has 3.5% protein (52% more than human milk), and dog's milk has the highest protein content (11.2%).

Chapter 8, titled "Vegetable foods," contains a section on "Peas and beans" (p. 104-05). A table gives the "Composition of fresh and dried legumes..." The dried legumes include navy beans, frijoles, lentils, cowpeas, soy beans, chick-pea, peanuts, and St. John's bread (carob bean).

Taka-diastase is mentioned as a useful aid to digestion (p. 176).

In the section on "Diet in diabetes" (p. 334-44), soya bread, gluten bread, almond cakes, cocoanut, and peanut are listed in a table (p. 340) of important ingredients in diabetic breads. Soya bread is said to contain from 3% to 23% carbohydrate and sugar.

Nathan Smith Davis, Jr. lived 1858-1920. Address: A.M., M.D., Prof. of the Principles and Practice of Medicine, Northwestern Univ. Medical School [Chicago, Illinois].

1025. Hosie, Alexander. 1901. Manchuria: Its people, resources, and recent history. London: Methuen & Co. xii + 293 p. See p. 180-84, 218-24, 240-45, 252-53. Illust. Index. 23 cm.

• ***Summary:*** The Preface states that Hosie was in charge of the British consulate at Newchwang in Manchuria from Nov. 1894 to July 1897 and from April 1899 to April 1900. In 1900 he made the first careful estimate of soybean production in Manchuria, calculating the amount at 600,000 tons. He noted that during that period most of Manchuria's soybean exports went to southern China, through the ports of Swatow, Amoy, and Canton, where mills were erected for extracting the oil; the cake was used for fertilizing sugar plantations there and in Java. Nearly all of the soybean oil exported from Manchuria was consumed in China.

Chapter 2, titled "Recent events in Manchuria" (p. 39-72) begins with the Sino-Japanese war of 1894-95 (it began on 3 Aug. 1894 and concerned a dispute over the kingdom of Corea [Korea]), the Japanese invasion of Corea and Manchuria, Japanese victory and the treaty of Shimonoseki (17 April 1895), the complexities of railway construction and financing in Manchuria (from the start of construction of the Manchurian Railway on 28 Aug. 1897), and the expected effects of the new railroads on Manchurian trade. Manchurian trade currently labors under serious disadvantages due largely to climatic conditions, absence of good roads, and the slow and clumsy methods of transport. "I have said that it is practically impossible to sow, reap, and export [soy] beans, the most valuable trade product of the country, in the same year, and that they have to be carried by cart and stored at depots on the waterways to await shipment when the ice breaks up in the following spring. In this way capital is locked up for months and heavy storage charges are incurred" (p. 67). The Russian Central Manchurian Railway should greatly alleviate these problems. Bubonic plague struck Manchuria in 1899 (p. 69).

Note 1 This is the earliest document seen (Jan. 2008) concerning the transportation of soybeans by railway.

Chapter 7, titled "Agriculture and agricultural products" (p. 172-98) contains extensive information on "Beans" (which are actually soybeans). Beans are often used on large farms in the second year of a 4-year crop rotation consisting of millet, beans, rice (or barley or wheat), and millet. Other

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important cereal crops are Job's tears (*Coix lachryma,* used medicinally and in making sweetmeats) and tall millet (*Kao-liang*).

"A large variety of beans is grown in Manchuria, and, together with their resultants, bean-cake and bean-oil, they constitute by far the most valuable item in the export trade of the three provinces." In April they are sown by hand in drills, and the crop ripens in September. "The Chinese distinguish the beans of commerce by their colours, and they are known as Yellow (Huang Tou), Green (Ch'ing Tou), Black (Hei, or Wu Tou), White (Pai Tou), Red (Hung Tou) and Small Green (Lü Tou). The yellow, green and black are varieties of the soy bean (*Glycine hispida, Moench.,* or *Dolichos soja,* L.)..." The white and red beans are "the ray-fruited dwarf bean (*Phaseolus radiatus,* L.)" [azuki bean]. The Lü Tou (small green bean, *Phaseolus mungo,* L.) [mung bean], "the smallest but one of the most important of the beans of commerce cultivated in Manchuria," is used to make vermicelli and bean sprouts.

Concerning soy beans: The "yield per acre, which requires from 16 to 18 lb. of seed, is estimated at from 27 to 39 bushels, with a weight of about 40 lb. per bushel." [Note: A U.S. bushel of soy beans weighs 60 lb.]. "Each variety of soy bean has a number of sub-species. The yellow has three, known respectively as (a) Pai-mei (white eyebrow), from the white scar on the saddle or point of attachment to the pod; (b) Chin-huang, or Chin-yüan (golden yellow or golden round), from the golden colour and more rounded shape of the bean; and (c) Hei-chi (black belly), from the dark brown scar on the saddle. All the three sub-species are highly prized for the quantity of oil or fat which they contain, but sub-species (a) and (b) are noted for the quality of the bean-curd (Tou-fu) or legumine obtained from them, as well as for the sprouts which are procured by soaking the beans in water, and which are greatly relished as a vegetable.

"There are two sub-species of the green bean (Ching-Tou)." One has a green epidermis (skin) but is yellow inside, while the other is green on the both the surface and inside.

The black bean (Wu Tou) has three sub-species:–(a) To-wu-tou (large black bean), where the epidermis is black and the inside green. It yields oil or fat, and it is likewise boiled with millet or rice and used for food.

"(b) Hsiao-wu-tou (small black bean), where the bean is somewhat smaller than the sub-species (a), with a black epidermis and yellow inside. It is largely used for horse feed and also yields oil, the refuse being employed for feeding pigs. It is likewise pickled for food.

"(c) Pien-wu-tou (flat black bean), where the epidermis is black and the inside yellow. It is flattened and elliptical in shape, and is mostly used for pickling and for horse feed." (p. 181-82).

A detailed description is then given of Tou-fu, or bean curd, and how it is made (p. 183-84).

"Besides these beans of commerce there are several varieties of garden beans cultivated for food, such as...; the Mao Tou, or hairy bean [probably green vegetable soybeans], with short hairy pods, each containing one to three beans (epidermis white and inside green);... With the exception of the Mao Tou these are usually cooked and eaten with the pods" (p. 186).

"The plants grown in Manchuria whose seeds yield oil are six in number. They are (1) *Dolichos soja,* L., or soy bean," (2) Castor oil plant. (3) *Sesamum orientale,* or sesame. (4) *Perilla ocymoides,* L., or perilla. (5) The cotton plant. (6) *Cannabis sativa,* L., or the true hemp plant. "The names and uses of these [six] oils are the following: (1) *Tou yu* [soy bean oil]–cooking, mixing paints and lighting" [illumination]. All these six "oil-yielding seeds" (with the exception of *sesamum seeds,* which are roasted) are crushed, steamed and subjected to great pressure. A table (p. 188) shows the percentage and value of the oil and cake extracted from these six seeds.

A black-and-white photo shows a Chinese bean mill at Newchwang with a huge granite stone wheel (facing p. 220).

Also discusses: Job's tears or pearl barley (p. 180-81). *Phaseolus radiatus* (the ray-fruited dwarf bean [azuki] which is red or white, p. 182-83). Hemp, a valuable textile plant (p. 186-88, 251). Sesamum seed (p. 188). Ground-nuts [peanuts] (p. 188, 251). The ground nut (*Arachis hypogæa,* L.) is cultivated in Manchuria for food, however not to any great extent. The oil is not extracted from the nuts, as it is in the south of China. Seaweed (p. 258).

A second edition of this work was published in 1904 (London: Methuen & Co., 293 p.; New York: C. Scribner's Sons; see p. 181-87). In the 1910 ed. (published in Boston by J.B. Millet Co.; 320 p.), see p. 75-79. Address: M.A., F.R.G.S., Once Acting British Consul, Tamsui; Now at Aberdeen (Scotland or Hong Kong).

1026. Hosie, Alexander. 1901. Manchuria: Its people, resources, and recent history. Chapter X–The trade of Manchuria (Document part). London: Methuen & Co. xii + 293 p. See p. 236-59.

• ***Summary:*** "There can be no doubt that millet (*Horcus sorghum,* L.) is the principal and most valuable crop of Manchuria; but being the staple food of the people, the common feed of beasts of burden, and the grain used by the distilleries in the manufacture of *samshu,* it is nearly all consumed in the country itself." The rest is exported to other parts of China. Other important related grain crops are Kao-liang (*Holcus sorghum,* L.) and Hsiao-mi (*Setaria italica,* Kth.).

The port of Newchwang is the only Manchurian port still open to foreign trade and the only place at which reliable trade statistics were available. These statistics, collected and published by the Imperial Maritime or Foreign Customs, cover the trade in vessels for foreign type only, and do not include the native junk trade, which is conducted under the

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supervision of the Native Custom-House. The latter type of trade is considerable, but the statistics are not reliable.

After the Sino-Japanese war of 1894-95, Japan invaded and occupied the southern province of Manchuria. Some expressed gloomy views concerning the commercial future of Manchuria, but Japan has now become the main market for Manchurian agricultural products, and in turn is now trying to sell her manufactured goods to Manchuria. Since the war, the trade of Manchuria has actually trebled. "The chief export from Manchuria is beans and their products, bean-cake and bean-oil..." A table (p. 242) shows "Exports of beans, bean-cake and bean-oil for 1898 and 1899 in foreign-type vessels. For each product is given the quantity (tons) and value (in both Haikwan taels and British pounds). In 1899 the quantities were as follows: [Soy] Beans (yellow 153,745 tons {58.6% of total weight} worth 4,694,750 Haikwan taels; green 95,649 tons {35.3% of weight} worth 3,306,172 taels; black 21,076 tons {7.8%} worth 602,492 taels) totaling 270,470 tons worth 8,603,414 taels. Bean-cake 260,798 tons worth 6,711,364 taels (=£1,010,200). Bean-oil 9,512 tons worth 1,000,193 taels (=£150,550).

An estimated additional 30,000 tons of [soy] beans were exported that year from Newchwang in junks headed for China Proper.

"A few years ago the consumption of pulse and bean-cake was practically confined to the southern provinces of China (through the ports of Swatow, Amoy and Canton), where mills were erected for extracting the oil from beans and the bean-cake was used for fertilising the sugar plantations." Since the Chino-Japanese [Sino-Japanese] was of 1894-95, Japan has occupied the Liao-tung Peninsula and realized the value of Manchurian agricultural products. In 1899 Japan's purchases of these products had surpassed that exported to Southern China. In Japan, "bean-cake is replacing fish manure," which in recent years has become scarce and expensive due to the shortage of herrings along the Japanese coast. From Canton, some bean-meal goes to the sugar fields of Java. Nearly all of the bean-oil exported through Newchwang is consumed in China. Due to the rough roads, bean-oil from the interior of Manchuria is brought in large, strong watertight wooden boxes lined with paper to the port of shipment, where the boxes are broken up and the contents, like the oil extracted in Newchwang itself, poured for export into large brittle jar- or carafe-shaped wicker baskets lined inside and outside with layers of waterproof paper."

Beans and their products "are, in a word, the wealth of Manchuria. They were worth 2.5 million British pounds in 1899 exports alone.

A table titled "Summary of the export trade of Manchuria through Newchwang, 1898-1899" (p. 252) shows that beans, bean-cake, and bean-oil are by far the most valuable export, worth much more than all other exports combined. A second table titled "Distribution of Manchurian exports through the Port of Newchwang, 1898-99" (p. 253) shows that in 1899, the destinations receiving exports of greatest value were (in million British pounds sterling): Japan 1.2, Shanghai 0.95, Swatow 0.505, Canton 0.404, and Amoy 0.272.

A final table (p. 259) shows that in 1899 the tonnage exported from Manchuria by steam ship was more than 38 times as great as the tonnage exported by sailing ship to destinations.

Note: This is the earliest English-language document seen (Dec. 2005) that uses the term "bean-meal" to refer to ground, defatted soybeans. Address: M.A., F.R.G.S., Once Acting British Consul, Tamsui; Now at Aberdeen (Scotland or Hong Kong).

1027. Irish, H.C. 1901. Garden beans cultivated as esculents. *Missouri Botanical Garden, Annual Report* 12:81-165. See p. 147-48. [3 soy ref]

• ***Summary:*** The article begins: "In entering upon a study of garden beans in 1898, all procurable varieties catalogued by leading seed firms of America and Europe were grown at the Missouri Botanical Garden during that and the two succeeding years. Habit of growth and other varietal characters were carefully noted in the field each year. These, together with the seed characters, have been brought together and classified. The varieties studied are here grouped under five genera which are distinguished from each other mostly by technical characters as follows:" Phaseolus, Dolichos, Vigna, Glycine, and Vicia. There follow detailed descriptions, keys, synonymy and figures of all the seeds various esculent [edible] varieties, with notes on diseases, culture, and cooking.

Under *Glycine hispida* Maxim. (p. 147-48) is a list of five previous scientific names for the soybean and the sources in which those names were first cited. A photo (plate 44) shows the front and side views of six soybean varieties.

A full-page original illustration (see next page; line drawing, plate 46) shows the leaves, pods, and flowers of a soybean plant.

Describes five varieties whose seeds can be obtained from seedsmen Haage & Schmidt: Yellow Soy, Black Soy, Green Soy, Brown Soy, and Etampes Soy. The accession numbers for each of these, and their original foreign names and places or countries of origin are given.

A long footnote states that a number of the domestic U.S. seeds came from the Field Columbian Museum or the Philadelphia Commercial Museum [Pennsylvania]. Most of the imported seeds came from Japan, including at least seven soybean ("Daidzu") varieties: (1) Yellow–10757, "Daidzu," Mujage Agric. School, Japan. (2) Yellow–10758, "Daidzu," Iwate Agric. Institute, Japan. (3) Yellow–10760, "Daidzu," Japan. (4) Black–10752, "Kuro mame," Japan. (5) Black–10753, "Daidzu," Osaka Agric. School, Japan. (6) Green–7743, "Awo-daidzu," Yamacata [sic, Yamagata],

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Japan. (7) Green–10756, "Daidzu," Iwate Agric. Institute, Japan.

But at least one each came from Russia (10470 Kazan), Siam (10574 "Waa Tai"; 10768 "Lau Lao Peas"), Korea (10771 "Pea Bean"), Floyd County, Georgia (USA; 10932), and Polk County, Georgia (USA; 10937 "Weevil Proof Peas" (Beans)).

1028. Jaffa, M.E. 1901. Nutrition investigations among fruitarians and Chinese at the California agricultural experiment station, 1899-1901. *USDA Office of Experiment Stations, Bulletin* No. 107. p. 1-43. [15+* ref]

• ***Summary:*** Contents: I. Nutritive value of fruits. Introduction. Analysis of food materials: Description of samples. The dietary studies: Individual studies of 6 fruitarians, discussion of fruitarian dietaries. Digestion experiment with a girl: Metabolic nitrogen, balance of income and outgo of nitrogen.

II. Dietary studies of Chinese. Introduction. Composition of food materials. Dietary studies and a discussion of the results of each: A dentist's family, a Chinese laundry association, employees on a Chinese truck farm. Summary. Conclusions.

In part I, the author studied a family of 6 healthy fruitarians living in California almost exclusively on fruits and nuts. He found that they were apparently in good health, although underweight. The children were somewhat smaller in stature than average American children of their age and sex. However the youngest child in this family, "and the only one who had lived as a fruitarian [on nuts and fruits] almost from infancy, was certainly undeveloped. Her bones were very small, although she showed no tendency toward rachitis. She looked fully 2 years younger than she was" (p. 20).

In part II, "Dietary Studies of Chinese," the introduction begins: "We often hear those who recommend a vegetarian diet say, 'See how much hard work the Chinamen can do, and they live almost entirely upon rice,' and many believe that the Chinese to a great extent are vegetarians." The author notes that in Japan "bean cheese [tofu], and other foods comparatively rich in protein which are made from soy beans are eaten in large quantities by all classes." Of the 3 groups of Chinese studied, each one ate "bean cheese" [tofu] and 2 of the 3 ate "dried bean cheese" [probably dried-frozen tofu] during the study. The food was inexpensive, costing an average of $0.19 per man per day. Rice was consumed in large amounts, but was far from being the only food eaten. In fact "the diet was about as varied as that in the ordinary American households."

"The Chinese studied, who are believed to be fairly representative of Chinese residents in California in similar employment, did not, as is often supposed, live almost entirely upon a vegetable diet. Indeed, they approached no nearer to such a diet than does the average American, who has no thought of doing without animal food.

"Rice on an average constituted between one-half and one-third of the total food consumed and held much the same relation to the total food of the Chinese as do bread and other cereals, starches, etc., to the total food of the ordinary American family." Address: Asst. Prof. of Agriculture, Univ. of California.

1029. Moore, R.A. 1901. Field experiments with grain and forage plants. *Wisconsin Agricultural Experiment Station, Annual Report* 18:237-54. For the year ending June 30, 1901. See p. 252-53.

• ***Summary:*** In a section titled "Summary" (p. 250-54) we read (p. 252-53): "Soy Beans.–Soy beans were introduced into the United States from Japan and are now quite extensively grown in the south as a forage plant. Several of the western Experiment stations have tested them and found them an excellent soiling crop. If cut at the proper time a fine grade of hay can be procured which is noted for its richness in protein.

"The experiments carried on at the Wisconsin Station

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last year [1900] seemed to indicate, that while a large amount of green forage or hay could be produced, the plant matured so late that severe frosts prevented the ripening of the beans for seed.

"The seed used this season was northern-grown, having been procured from Michigan; the test made largely to determine if soy beans would ripen in Wisconsin... They were harvested October 2 and threshed, giving a yield of 22 bushels ripe seed beans per acre...

"A portion of one plot was cut and gave a yield of 4 tons of green forage or 2¼ tons of cured hay per acre.

"Stock of all kinds eat soy beans with a relish." A photo (p. 253) shows a man standing in plots of soy beans (probably in Wisconsin).

"Barley: Sixteen varieties of barley were also tested on the experimental plots this year. The Oderbrucker and the Mandscheuri No. 62 have been grown for three successive years and given excellent satisfaction. The Mandscheuri barley was first introduced into Ontario [Canada] by the Agricultural College at Guelph [OAC], from Russia, and the Wisconsin Station received its original supply therefrom." Note 1: From this original Mandscheuri barley, Prof. Charles A. Zavitz of the OAC produced a variety called OAC 21 in 1906; it was soon was adopted as the standard malting variety by Canada's brewing industry.

Note 2. This is the earliest English-language document seen (May 2008) that uses the word "Mandschurei" to refer to Manchuria or to a plant variety. Address: Agriculturist, Madison, Wisconsin.

1030. Rafu Shinposha. comp. 1901. Rafu nenkan [Rafu Shimpô yearbook, No. 1]. Los Angeles, California: Rafu Shinpôsha. [Jap]*
Address: Los Angeles.

1031. Smith, Jared G. 1901. Commercial plant introduction. *Yearbook of the U.S. Department of Agriculture* p. 131-44. For the year 1900. See p. 133, 138-40.
• ***Summary:*** In the section titled "Cooperation with experiment states in plant introduction" (p. 131+) states (p. 133): "But the cultivation of the sunflower may be undertaken, using our improved methods and machinery, as feed for poultry or in combination in feeding rations; also the soy bean for forage and hay to fatten animals. New varieties of sunflower may be obtained from Russia or new soy beans from Japan to satisfy our needs in these particulars,..."

Pages 138-39: At the California station–"At the Amador substation, Prof. C.H. Shinn reports... The common, scarlet, purple, and hedge vetches also made a very fine growth, indicating that they are worthy of more extensive planting in the Sierra foothills. These vetches did even better in northern California. The European lupines and many forms of field peas have also done well, as have the soy beans, cotton, sorghums, and the Russian millets."

Page 140: "Kansas Station–At the Kansas experiment station... Three varieties of soy beans from Japan did finely, and one of them, a late variety, produces pods without any rank or bitter taste, indicating that it might be developed into a good garden vegetable."

"Kentucky Station–At the Kentucky experiment station three varieties of soy beans from Japan did well, and the early maturing ones seemed especially adapted to cultivation in Kentucky." Note: No variety names are listed. Address: Chief of the Section of Seed and Plant Introduction, USDA.

1032. Soybeans are first crushed in Japan for oil and meal by Owada Seisakusho (Early event). 1901.
• ***Summary:*** In 1901 crushing of soybeans starts in Japan. Owada Seisakusho of Tsuruga, Fukui prefecture, Japan, starts making soy oil and soybean cakes using the press method (*assaku-ho*).

The source of this fact is the "Sixty Year History of the Nisshin Oil Mill Co."

Note: In 2013 this fact was confirmed by the former executive director of the Japan Oilseed Processors Association, Mr. Y. Komura.

1033. Wuchino, A.E. 1901. Soia [Soya: As one of the best food and feed products from the plant world]. Tiflis (Tblisi), Republic of Georgia: K.P. Kozlovski (Ave. Golovin, No. 12). 45 p. 26 cm. [Rus]
• ***Summary:*** Page 12 states: The information about growing soybeans in Transcaucasia is very poor, but the first planting was done in the 1870s. G. Sturua obtained some varieties of soybeans from Tokyo, Japan, via his brother. He gave some of these seeds to the Tblisi Botanical Garden [in Georgia]. In 1898 at the agricultural school in Kutaisi, they conducted a good soybean trial.

Note 1. This is the earliest document seen (April 2008) concerning soybeans in the Republic of Georgia, or the cultivation of soybeans in Georgia. This document contains the earliest date seen for soybeans in Georgia, or the cultivation of soybeans in Georgia (1898 in Kutaisi). The source of these soybeans is unknown, but they may have come from Japan. It is not clear whether or not the soybean seeds were cultivated at the Tblisi Botanical Garden. They probably were, but we cannot be certain.

Note 4. This is the 2nd earliest document seen (May 2008) concerning soybeans in Central Asia (Transcaucasia), or the cultivation of soybeans in Transcaucasia. This document contains the 2nd earliest date seen for soybeans in Central Asia or the cultivation of soybeans in Central Asia (1870s). The source of these soybeans is unknown.

Note 4. Kutaisi (or Kutais) is a city in western Georgia on both banks of the Rioni River about 65 miles (105 km) northeast of Batumi.

Note 5. This is the earliest document seen (May 2008) that mentions G. Sturua. How can we learn more about his

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life and work with soybeans? For more details, see Tupikova 1930. Address: Georgia.

1034. Photograph of Kintaro Oshima with colleagues at Göttingen University, Germany. 1901? Undated.

• ***Summary:*** This undated group photograph was taken at the University of Göttingen (in the town of Göttingen, central Germany) in about 1901, the year Peter A. Yoder graduated with his PhD degree. Kintaro Oshima (relatively short in height) is the 2nd person from the left, standing. The location appears to be a chemistry classroom. The photo was apparently taken by Peter Yoder, who studied at this university from 1899 to 1901, when he received his PhD degree. Back in the United States, Yoder worked for 20 years as an agricultural chemist and technologist for USDA's Bureau of Plant Industry.

On the back of the photo (see next page), each of the 16 persons in it has signed his name and place of origin. For example: "Kintaro Oshima, Sapporo, Japan." Note: He also wrote (vertically) in Japanese: Ooshima Kintaro, Dai Nippon Teikoku [Empire of Japan], Sapporo." "B.B. Ross, Auburn, Alabama. Charles A. Browne, Jr., State College, Pennsylvania. A.J. Gibson, Queensland, Australia." It was a multinational group: Four people were from Russia, two from Holland, two from Göttingen, and one each from Hannover, Germany, Java (Dutch East Indies), France, and Australia.

Note: Oshima's name appears in our SoyaScan database in nine different records from 1909 (USDA Bulletin titled "A digest of Japanese investigations on the nutrition of man", suggesting he was in Japan at the time) to a 1914 article on "The presence of creatinine in beans" published in *Journal of the Tokyo Chemical Society.* The photo was sent to Soyinfo Center in Feb. 2008 by Chris Yoder of Michigan. Dr. Peter A. Yoder (born 21 Aug. 1867 in LaGrange Co., Indiana; died 20 July 1929 in Washington, DC; buried in Ft. Lincoln Cemetery, Washington, DC) was Chris Yoder's grandfather's uncle.

1035. *USDA Bureau of Plant Industry, Inventory.* 1902. Seeds and plants imported through the Section of Seed and Plant Introduction for distribution in cooperation with the agricultural experiment stations. Numbers 4351 to 5500. No. 9. 79 p. Jan. 18. Also titled USDA Bureau of Plant Industry, Bulletin No. 5.

• ***Summary:*** Soy bean introductions: Glycine hispida.

4628. "From Massachusetts. Received March 13, 1900. *Medium green.* Distributed."

4912-4914. "A collection of soy beans from Japan. Received March 23, 1900. They are as follows:

"4912. Common. Distributed.

"4913. Best White. Distributed.

"4914. Best Green. Distributed."

4980. "From Yokohama, Japan. Received March 27, 1900. A collection of vegetable seeds presented by Suzuki & Iida, New York City. *Early soja."*

5039. "From Paris, France. Received March 30, 1900. Presented by Vilmorin-Andrieux et Cie. *Extra early black-seeded.* A very early maturing strain."

Note 1. This is the earliest document seen (Jan. 2005) by or related to the USDA Bureau of Plant Industry. Note 2. This is the document earliest seen in this series with an issue date (Jan. 18, 1902) printed on the cover. Address: Washington, DC.

1036. Makino, T. 1902. Observations on the flora of Japan. *Botanical Magazine* (*Tokyo*) 16(179):34-35. Jan. 20. [42 ref. Eng]

• ***Summary:*** Gives numerous early references concerning Glycine Soja, Dolichos Soja Linn., Soja hispida Moench, Glycine hispida Maxim., Soja japonica, Sooja japonica Sieb., and Daidsu. Habitat: Japan, widely cultivated, having various forms. There are not any wild forms in Japan. "Soja" was derived from "Shoyu" or Soy, a kind of sauce made of boiled seeds of this plant and fermented wheat, commonly used by Japanese.

Glycine (Soja) ussuriensis. Glycine Soja, Soja angustifolia, Johnia javanica, Glycine javanica, Phaseolus lathyroides. This species is never in cultivation and the seed grains are useless hence the specific name "Soja" given to it is very inappropriate. Probably a variety of the preceding species.

1037. Boehmer (L.) & Co. 1902. Wholesale catalogue: 1902-1903. Yokohama, Japan. 44 p. Illust. 26 cm. [Eng]

• ***Summary:*** The section titled "Plants and seeds of economic value" (p. 30+) gives the first detailed information seen (Dec. 2004) in Japanese seed catalog about the different varieties of soy-beans as follows: In large letters near just below the section title we read: "We are in a position to fill special contracts for the following food-, fodder-, vegetable-, and other plants, which are used in the textile and other industries."

After describing 3 types each of rice and millet the text continues: "Soy-bean. Dolichos soya L. Jap. nom. [Japanese name(s)] Daidzu and O-mame. These Jap. soybeans have been well acclimatized in Central Europe and there yield very fine crops." Three types, based on seed color, are described:

(1) "The white Soy-bean. Jap. nom. Shiro Mame. The following varieties are recommendable: Five-months bean. Goguwatsu Mame. Ripening in July. Summer bean. Wase or Natsu Mame. Small seeded, early. Middle-late bean. Nakate Mame. Larger in seed than the foregoing. Late bean. Okute Mame. Bullet bean. Maru Mame. Very valuable as horse feed. Gun bean. Teppo Mame. This kind is principally used

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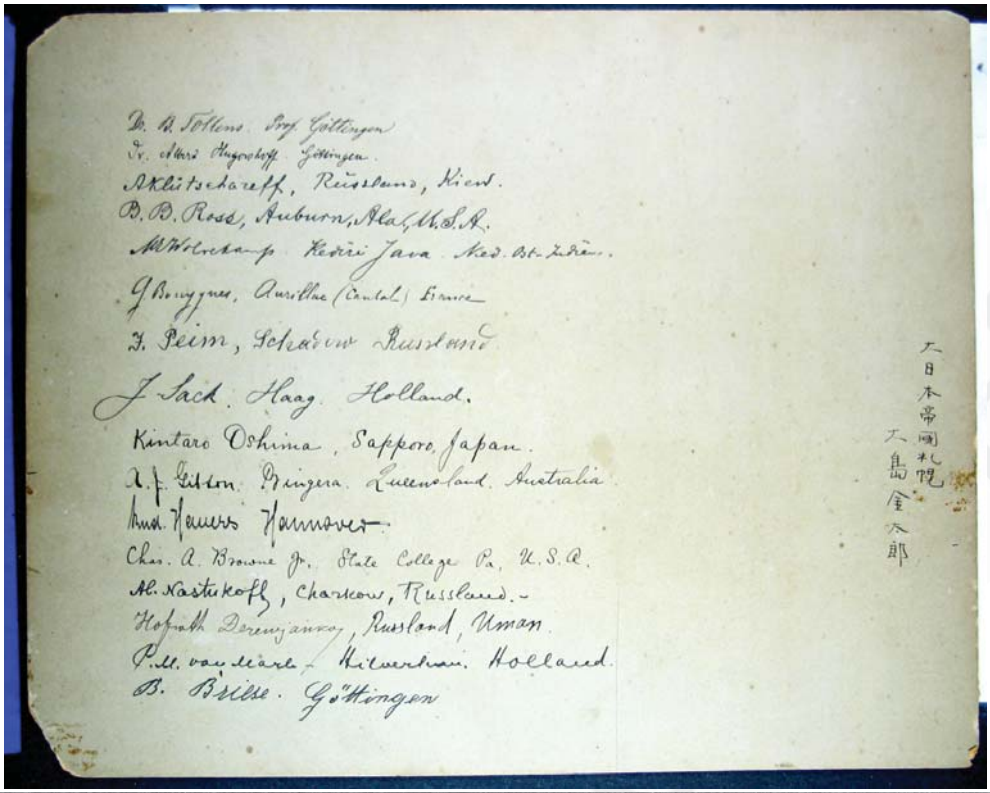

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to make the famous Soyu-sauce" [shoyu, soy sauce].

Note: This is the earliest document seen (April 2012) that uses the term "Soyu-sauce (regardless of capitalization or hyphenation) to refer to soy sauce.

(2) "The black Soya-beans. Kuro Mame. Round middle-late bean. Kuro-Teppo Mame. Green Mame. Nicuri [Nikuri] Sei. Green throughout. Pale green–Kaje [Kage] Mame. Round seeds."

(3) "Speckled Soya-beans. Jap. nom. Fuiri Mame. Green and black bean. Kuro-Kura Kake-Mame. Green and brown bean. Aka-Kura Kake-Mame. Flat and long bean. Yellow-green bean. Fuiri Mame. Marked with many dark spots."

Other food legumes on this page include: Sword bean–Dolichos incurva, nata mame. Ray-fruited dwarf bean–*Phaseolus radiatus,* adsuki [azuki], small pealike bean of very fine fine flavor and therefore very popular. *Phaseolus typicus*–Oku Adzuki–Very large seeded bean. *Phaseolus pendulus*–Kuro Adsuki–Black fruited. Shiro Adsuki–White fruited. Tsuru Adsuki–Twining bean. *Phaseolus subtrilobatus*–Bundo [Yayenari], bearing each from 4 to 6 hanging pods. Also (p. 31): *Pueraria Thunbergi*–Kudzu.

Note 1. The above information on soybean varieties and other economic plants appears to have been taken in large part from any of three books about Japan by Johann J. Rein published from 1884 to 1889, especially his 1889 book.

Photos show: (1) A characteristic Japanese garden, with many stone lanterns and trees, and people walking along the stone pathways around the central pond. (2) A Japanese woman seated, packing bulbs into baskets. (3) The company's packing department, showing many Japanese and European workers and trays of bulbs. (4) A bamboo-walk in Japan.

Note 3. The title page of this catalog states: "Nurserymen & exporters. The only European nursery firm established in Japan. Established in 1882. Cable address: Boehmer Yokohama." It suggests that the company's main business is in "lily-bulbs, iris, peonies, and other Japanese flower roots." Page 1 states that this is the first Boehmer catalog in which "photo-arto-prints" appear. Page 3 notes: "Prices are quoted and will be charged in Yen and Sen, 1 ¥ = 100 sen. The value of the Yen is subject to slight fluctuations, but about equal to 0.50 Gold $; 2 shillings; 2 Mark; 1 Rubel [sic, Ruble]; 2.50 Frcs. [French francs]; 1.20 Fl. [Florins, probably Austria-Hungary], etc." Address: Nos. 5 and 28 Bluff, Yokohama, Japan.

1038. Yokohama Nursery Co., Ltd. 1902. Descriptive catalogue... for 1902. Yokohama, Japan. 80 p. Illust. Index. 26 cm. [Eng]

• ***Summary:*** On the cover of this English-language catalog is an illustration of a flowering cherry tree (*Prunus Pseudo-cerasus*) blooming. In the section "Price list of seeds" (p. 72+) is a subsection (p. 76) titled "Some vegetable seeds." The contents (incl. the entry for "soy bean") is identical to that in the 1901 catalog. Address: P.O. Box No. 72. Nos. 21-35 Nakamura, Yokohama, Japan.

1039. Mammoth: New U.S. domestic soybean variety. Synonyms: Late Yellow, Mammoth Yellow, Southern, Yellow (Ball 1907). Late (Piper & Morse 1923, p. 42). 1902. Seed color: Yellow (straw), hilum tawny.

• ***Summary:*** Sources: E.B.D. [Evan B. Davis, of Hendricks County, Indiana]. 1902. "Soy beans will be valuable this season." *Indiana Farmer.* 62(5):3. Feb. 1. "While it [Early Yellow, or Dwarf] will not produce as much forage or seed as the... Mammoth, it is a sure crop for Indiana and the other varieties are not."

Ball, Carleton R. 1907. "Soy bean varieties." *USDA Bureau of Plant Industry, Bulletin* No 98. 28 p. May 27. See p. 12, 13, 26-27. "Classification–Key to the varieties (p. 11): VI. Yellow seeded: 1C. Later, 125 to 135 days, taller, 32 to 42 inches = Mammoth." "The Mammoth is the best known and most widely cultivated variety in the Southern States. It has also been sold to a considerable extent in the North, mostly because of the splendid growth it makes, but it has never given satisfaction there because of its lateness. It has been a commercial variety in this country for a great many years, but its origin is not known... The time required to reach maturity varies from 110 to 140 days, the average being 120 and 130 days. The yields of 17 plats at Washington varied between 4 3/5 and 15 bushels to the acre, with an average of 9 1/3 bushels. The name, Mammoth, is very suitable for this variety, and is coming into use for it in agricultural press and by some seedsmen. Numbers and sources of lots grown: Agrost No. 1195, 'Yellow,' S.P.I. No. 4285, Virginia; Agrost. No. 1300, 'Late,' F. Barteldes & Co.; Agrost. No. 1305, T.W. Wood & Sons; Agrost. No. 1307, 'Southern,' T.W. Wood & Sons; Agrost. No. 1308, Iowa Seed Co.; Agrost. No. 1309, Johnson & Stokes; Agrost. No. 1310, Plant Seed Co.; Agrost No. 1311, C.J. McCullough; Agrost. No. 1314, 'Late Yellow,' Peter Henderson & Co.; Agrost No. 1315, Northrup, King & Co.; Agrost No. 1465, 'Yellow,' Breck & Sons; Agrost. No. 1466, 'Yellow,' Texas Seed and Floral Co.; Agrost. No. 1472, 'Southern,' J.M. Thorburn & Co.; Agrost No. 1477, Hammond Seed Co.; Agrost. No. 1976, union of seven of above serial numbers; Agrost No. 1977, union of seven of above serial numbers; S.P.I. No. 4285, 'Yellow,' T.W. Wood & Sons; S.P.I. No. 17280, grown from Agrost. Nos. 1976 and 1977."

Piper, C.V.; Nielsen, H.T. 1909. "Soy beans." *USDA Farmers' Bulletin* No. 372. 26 p. Oct. 7. See p. 8-9. "Mammoth (Yellow)."

Piper, Charles V.; Morse, W.J. 1910. "The soy bean: History, varieties, and field studies." *USDA Bureau of Plant Industry, Bulletin* No. 187. 84 p. Dec. 31. See p. 29. "The Mammoth is at present the most important soy bean grown in the United States. It has also been known as Late, Yellow, Late Yellow, Southern, and Mammoth Yellow. The

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date of introduction of this variety is very obscure, and nothing definite is known regarding its origin. None of the numerous recent introductions are identical and but one is closely similar, No. 23328, from Erfurt, Germany, received as 'Yellow Riesen.' It is not probable, though, that this was a German-grown seed, as so late a variety could scarcely mature in Germany. Several varieties from Shanghai, China, and from Japan are closely related. It may possibly be the 'white-seeded' soy bean introduced by the Perry expedition. We have been unable to find any early published records that definitively refer to this variety. It is not improbable that it is this variety that was grown at the North Carolina Agricultural Experiment Station in 1882. There can be but little doubt that it is the "soja" bean from T.W. Wood & Sons, Richmond, Virginia, grown by the Kansas Agricultural Experiment Station in 1889 (see their Annual Report for 1899, p. 43) and in 1890 (see their Bulletin 19, p. 201). Since 1895 Mammoth has been a well-known variety."

Piper, Charles V. 1914. *Forage Plants and Their Culture.* New York, NY: The Macmillan Co. xxi + 618 p. See p. 513-14, 519. The Mammoth variety "was introduced previous to 1882. It is largely due to the introduction of this variety that the soybean has become an important crop in the United States, as a very large percentage of the acreage is still planted to this variety." "This is a tall late variety, under average conditions growing from three to five feet high, and strictly bushy in habit. At the present time probably two-thirds of the acreage of soybeans in the United States is devoted to this variety. On account of its lateness, it will not usually mature seed north of the District of Columbia and Kentucky, This variety was introduced prior to 1882, but there is no record as to its exact source. The seeds are yellow, one pound containing about 2100. The pubescence is gray, and the flowers are white" (p. 519).

Morse, W.J. 1918. "The soy bean: Its culture and uses." *USDA Farmers' Bulletin* No. 973. 32 p. July. See p. 15. "The Mammoth (fig. 10) is the standard commercial late variety, more extensively grown at the present time than any other. It yields well both in grain and forage, but for grain it cannot be expected to mature north of Virginia and Tennessee. As forage, however, it can be utilized much farther north."

Kinney, E.J.; Roberts, George. 1921. "Soybeans." *Kentucky Agric. Exp. Station, Bulletin* No. 232. p. 23-57. May. See p. 33. Concerning the Mammoth variety: "The chief variety of the Cotton Belt and by far the most extensively grown of any variety in the United States. The introduction of this excellent variety in 1882 was largely responsible for the greatly increased interest in the soybean in this country."

Piper, Charles V.; Morse, William J. 1923. *The soybean.* New York, NY: McGraw-Hill Book Co. xv + 329 p. March. See p. 41-43, 166. Page 41 states: "The early introduced varieties.–Previous to the numerous introductions by the United States Department of Agriculture beginning in 1898, there were not more than eight varieties of soybeans grown in the United States." One of these was Mammoth (with yellow seeds). Page 42 states: "Mammoth.–The Mammoth is at present the most important soybean grown in the United States. It has also been known as Late, Yellow, Late Yellow, Southern, and Mammoth Yellow. The date of introduction of this variety is very obscure, and nothing definite is known regarding its origin."

Note: This is the earliest document seen (Dec. 2004) that mentions Northrup, King & Co. in connection with soybeans. Address: USA.

1040. Sawa, S. 1902. Note on Hamananatto, a kind of vegetable cheese. *Bulletin of the College of Agriculture, Tokyo Imperial University* 4(5):419-20. March. [1 ref. Eng]
• ***Summary:*** "This peculiar product is prepared from soy-beans, as are also two other kinds of vegetable cheese manufactured in Japan, the *Miso* and the *Natto;* but it has a different flavour and taste, and lacks the slimy character of the common *Natto.* It is manufactured only in the central provinces of Japan–especially in those of Mikawa and Totomi, from which it finds its way all over the country. It has an agreeable salty taste and a peculiar odor somewhat resembling that of the fresh crust of brown bread. There is not any mycelium discernible with the naked eye. The soy-beans composing it form no compact mass, and are of a brown colour with a thin layer of a salty taste and a somewhat sticky consistency.

"In preparing this product, the soy-beans are well washed, boiled to softness, spread on straw mats, and mixed with wheat flour (6 liters flour to 10 liters soy-beans). Moldfungi will now develop, but soon afterwards this mixture is exposed to the direct sunlight for three days, probably to kill the fungi, and is then put into flat tubs. After 12-13 days some common salt and ginger are added. The entire mass is then kept in tubs under pressure for about thirty days.

"A portion, carefully freed from the pieces of ginger and particles of straw mats used in its manufacture, was dried, pulverized and sifted through a 0.5 mm sieve. I found the chemical composition of the dry matter to be as follows: Albuminoid nitrogen 3.57%. Crude fat 3.44%. Crude fibre 6.87%. Total carbohydrate excluding cellulose 8.40%. Total ash, including salt added 18.54%. The fresh sample contained 44.73% water and 55.23% dry matter.

"There exist at least three different kinds of bacteria in this product. The most numerous colonies on agar are of two kinds." A detailed microbiological description is given.

Note 1. This is the earliest document seen, and also the earliest English-language document seen (Nov. 2011) that contains the word *Hamananatto* (or "Hamanatto").

Note 2. This is the earliest English-language document seen (Jan. 2012) that uses the word "sticky" to describe natto.

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1041. Orton, W.A. 1902. Some diseases of the cowpea. I. The wilt disease of the cowpea and its control. *USDA Bureau of Plant Industry, Bulletin* No. 17. p. 9-20. April 22. See p. 15-18.

• ***Summary:*** In the section titled "Preventive measures," the subsection on "Substitution of other crops" states (p. 15-16): "The soy bean and Florida beggar weed may be used as hay as a summer crop, or hairy vetch may be sown in the fall. All these crops have in common the disadvantage of being unfamiliar to the average farmer... while the cowpea is cultivated and its use understood everywhere."

The subsection titled "Experiments with cowpeas and other crops" states that on 29 May 1901 1½ acres were planted of land thoroughly infected with cowpea wilt were planted "to a number of varieties of cowpeas, soy bean, velvet bean, and some Japanese forage plants obtained through the section of Seed and Plant Introduction of this Department." "The soy beans were a disappointment, as they made a very small growth, one foot or so high, and produced only a small crop of seed. They were badly attacked by the nematode [*Heterodera radicicola*] and suffered much from dry weather.

"A brief account of these forage plants as grown on land infected with wilt disease and nematode follows:... *Soy bean* (*Glycine hispida*).–Eight varieties were tried on ten plats. All proved to be immune to the wilt disease, but none of them was adapted to the local conditions. The writer planted the soy bean in 1900 on Edisto Island, South Carolina, "where it made a heavy growth, 3 to 4 feet high, and produced a large crop of seed. It was free from wilt disease there and showed great promise as a forage crop." The varieties tested at Monetta [South Carolina, in cooperation with Mr. T.S. Williams of Monetta] were as follows:" Best Green, Early Black, Yoshioka, Rokugatsu, Gosha, Black Round, Green Medium, and Bakaziro [Bakajiro]. All but the first and second originated in Japan. The first, seventh, and eighth were most affected by the root nematode.

Note 1. This is the earliest document seen (July 2013) that mentions the soybean varieties Black Round, Gosha, Rokugatsu, or Yoshioka, and the earliest document seen (one of two documents, July 2013) that mentions the soybean varieties Early Black, Bakaziro, or Green Medium.

Note 2. Some of these named soy bean varieties were later renamed in 1907 as follows: Best Green became Tokio / Tokyo. Early Black became Buckshot. Yoshioka became Yosho. Rokugatsu became Ito San. Gosha became Manhattan. Black Round became Buckshot. Green Medium became Guelph. Bakaziro became Amherst. Address: Asst. Pathologist.

1042. Suda, Katsusaburô; Yoneki, Z. 1902. Nattô no biseibutsu ni tsuite [On the microorganisms of natto]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 242. p. 321-26. April. Special Conference Lecture (Rinji Taikai Enzetsu). [Jap]

• ***Summary:*** The authors believe that the microorganisms contained in natto consist of one sort of motile [mobile] and two sorts of immotile varieties. They predict that the varieties which take part in the fermentation of natto and cause the change in its chemical composition, producing thereby its characteristic smell and stickiness, are probably the motile and one of the immotile varieties. Address: 1. Sendai; 2. Joshu.

1043. Webber, Herbert J.; Orton, W.A. 1902. Some diseases of the cowpea. II. A cowpea resistant to root knot (*Heterodera radicicola*). *USDA Bureau of Plant Industry, Bulletin* No. 17. p. 23-36. April.

• ***Summary:*** "Root-knot or root-gall, as it is ordinarily termed, is one of the most common and destructive plant diseases in the southern United States. The disease is caused by the attacks of a nematode, *Heterodera radicicola* (Greef.), Müll.*, which enters the roots and causes large galls (Footnote: **Heterodera* is referred to in various publications under the generic names *Tylenchus* and *Anguillula*). It is interesting to note that the nematode producing the root-knot of plants is closely related to the trichina of pork, which has become a household word and a universal terror."

Nematodes are popularly called "nematode worms." "The size of the gall is largely determined by the number of nematodes present. As new nematodes are hatched and take up their abode in fresh portions of the tissue the gall increases in size."

"The best descriptions of the development and metamorphosis of the root-knot nematode (*Heterodera radicicola*) known to the writers are those by Professor George F. Atkinson (1889, "Nematode root galls"), then of the Alabama Experiment Station, and by Dr. G.E. Stone and Ralph E. Smith (1898, "Nematode worms"), of the Hatch Experiment Station of Massachusetts." Full citations are given for each of these two papers.

"Extent of the disease: The disease is evidently very common throughout the Gulf States and South Carolina, and may possibly extend farther northward. However, it will probably never become a serious malady north of this general region, except in greenhouses, as the nematode is killed by severe cold."

The section titled "A resistant cowpea" states (p. 35) that four soybean varieties (Best Green, Early Black, Green Medium, and Bakaziro [Bakajiro]) were grown in the same experimental field as the cowpeas, on nematode and wilt infested soil. All four were "badly affected" by the nematodes. One variety of cowpea, the Iron cowpea, showed considerable nematode resistance.

Note 1. This is the earliest document seen (Oct. 1997) stating that nematodes attacked soybeans in the United States.

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Note 2. This is the earliest document seen (one of three documents, July 22013) that mentions the soybean varieties Early Black or Bakaziro. Note 3. These soybeans were apparently grown on the farm of Mr. T.S. Williams, Monetta, South Carolina. Address: 1. Pathologist; 2. Asst. Pathologist.

1044. Ono, Ryozo. 1902. Shôyu-chû yori sekisetsu kesshôtai ni tsukite no jikken [Investigation of the crystallized substance separated from shoyu]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 245. p. 649-54. July. [Jap; eng]
• ***Summary:*** The author examined the crystals that separate from shoyu during the winter; he reports on the cause and prevention of such separation.

1045. Meyer, Frank Nicholas. 1902. Letters of Frank N. Meyer. 4 vols. Compiled by Bureau of Plant Industry, USDA. 2444 [i.e. 2577] leaves. Unpublished typescript.
• ***Summary:*** Only two copies of these rare, magnificent unpublished documents exist. One is Rolls 28-30, Vols. 105-109, Project Studies, Division of Plant Exploration and Introduction, Record Group 54: Records of the Bureau of Plant Industry, The National Archives. The second is at the University of California at Davis. Most are carbon copies of typewritten letters. Includes some illustrations (pencil sketches) by Meyer.

The first letter in this collection, dated 7th Oct. 1902, is from Meyer in Santa Ana, California, to Mr. Adrian J. Pieters (a fellow Dutchman) at USDA in Washington, DC. Meyer arrived in California on 18 Sept. 1902 and started immediately to work for USDA at the plant introduction garden in Santa Ana; he stayed 7 months. In April 1904 Meyer is in Guadalajara, Mexico. In March 1905, Meyer receives an offer from David Fairchild and Pieters to work for USDA as an agricultural explorer in northern China. In August 1905, he is in Nagasaki, Japan. In Sept., he is in Shanghai, China. In Oct. 1905, he writes a long letter to Fairchild. Meyer made four very fruitful expeditions to Asia, eastern Europe, and the Middle East. His first expedition was to China, Manchuria, and Siberia, 1905-08. His second was to Europe, Russia, Caucasus, Transcaucasia, Turkestan, and Siberia, 1909-12. His third was Russia, Siberia, Manchuria, China, and Japan, 1912-15. And his fourth and final expedition was to Japan and China, 1916-18.

On 23 Dec. 1917, war engulfed Frank Meyer at Ichang (I-ch'ang or Yichang) on the Yangtze River. He was trapped there until 2 May 1918 when he managed to break through lines of soldiers. The last letter in this collection, dated 18 May 1918, is from Meyer to Fairchild written from Hankow, China. He died about 1-2 June 1918, having drowned in the Yangtze River below Anking, and above Wuhu, China.

Meyer did not report any soybeans in Russia or Turkestan.

Note 1. This is the earliest document seen (July 1998) concerning Frank N. Meyer.

Note 2. Ichang, which opened as a treaty port in 1876, was a city of 40,000 people by 1920. It is situated at the head of steam navigation on the Yangtze, at the throat of the main outlet from Szechuan, and at the point where the mountains of Szechuan and western Hupeh meet the central plain of Hupeh.

Note 3. Soyfoods Center owns all pages that mention soy, plus: (1) The full U.C. Davis cataloging record for the archival collection, which is in Special Collections SB108 A7M49 1902 v1-4. (2) A letter from Melissa Tyler of U.C. Davis, dated 22 Sept. 2003, discussing the collection and its lack of front matter. (3) Appendix A: Bureau of Plant Industry, by Knowles Ryerson about a dispute he had with Secretary of Agriculture Henry Wallace involving Nicholas Roerich, Dr. H.G. MacMillan, and James F. Stephens over a plant exploration expedition to Manchuria and the Gobi Desert. In 1934 Ryerson was appointed Chief of the USDA's Bureau of Plant Industry; this dispute led to his removal that same year; he was replaced by Frederick D. Richey. Address: USDA Bureau of Plant Industry.

1046. Morse, Edward S. 1902. Glimpses of China and Chinese homes. Boston, Massachusetts: Little, Brown & Co.; London: Kegan Paul. xv + 216 p. Oct. Illust. Index. 21 cm. Reprinted in 2001 by Kegan Paul.
• ***Summary:*** In Chapter 3, "A Chinese dinner," the author notes (p. 65): "Women are excluded from the table, as in Japan." He gives a list of the foods he was served for dinner, with his comments (p. 67). The last is: "Fermented bean-curd soup. Very poor."

Edward Sylvester Morse (an American, from Hartford, Connecticut) lived 1838-1925. The book is illustrated by sketches from his journal. Prof. Morse, who lived and taught for several years in Japan in the late 1870s and 1880s, and quickly grew to admire and love the Japanese, finds little to like or admire among the Chinese: "In my short experience with the Chinese I do not recall the faintest indications of kindliness, politeness, or urbanity; whether high or low in station, their attitude was always the same." "The reception a foreigner encounters in China is due to an intense dislike of us, coupled with an absolute contempt for all we do and for all we have accomplished" (p. 206-07).

Note: This is the 2nd earliest English-language document seen (Oct. 2011) that clearly mentions fermented tofu, which it calls "Fermented bean-curd" (one of two documents). Address: Former Prof. of Zoology, Imperial Univ., Tokyo.

1047. *Times of India* (*The*) (*Bombay*). 1902. Improving Indian agriculture: Some recent experiments. Dec. 1. p. 6.
• ***Summary:*** "In two previous articles we described the highly interesting experiments, now in progress at the Bombay Government farms established at Poona and Surat,

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in the improvement of Indian cotton...

These farms are intended to benefit Indian agriculture. "The Bombay government for many years enjoyed the services of Mr. J. Mollison, the present Inspector-General of Agriculture, a most experienced and practical agriculturist. Under his supervision the work of the farms was framed on lines which ensure that any discoveries made shall be of direct value to the ryots" [farmers].

"The seed store is the microcosm of the experimental farm, for there are gathered together specimens of every kind of grain and vegetable which is being tested. A single example will give an idea of the work which is in progress. Here are some half dozen sealed jars containing different varieties of the soy bean. This is largely utilized as human food in Japan, and is much richer in albuminoids than any other pulse. It is grown to a certain extent in Northern India, but the quality is far inferior to that produced in Japan. So Japanese seed has been procured, with a view to its acclimatization and substitution for the inferior Indian variety.

"A curious circumstance transpired in connection with this particular bean. In one small area in the Central Provinces it was found that a kind was growing far superior to any raised elsewhere in India. Traced to its source, it was ascertained that this exception rose from five seeds carried thither by a wandering *fakir"* [Muslim Sufi ascetic].

The groundnut is also discussed.

1048. Matsumura, J. 1902. A conspectus of the leguminosae found growing wild, or cultivated in Japan, Loochoo and Formosa. *Botanical Magazine* (*Tokyo*) 16(181):37-115. See p. 85 (31). [Eng]

• ***Summary:*** "51. Glycine, L. I. Stems erect. Leaflets usually broadly ovate or elliptical. Flowers white or violet. Stamens diadelphous. Fl[owers]. July. Japan; Liukiu [Ryukyu]; Formosa. Cult[ivated]. Daizu. G. hispida, Maxim.

II. Stems twining. Leaflets usually oblong or linear. Flowers violet. Stamens monadelphous or diadelphous. Tokio; Formosa? Fl[owers]. Sept. Tsuru-mame. G. ussuriensis, Regel et Maack.

1049. Becker, Joseph Ernest de. 1902. The sexual life of Japan: being an exhaustive study of the nightless city... or, The "History of Yoshiwara Yûwaku." New York: American Anthropological Society. xvi + 386 p. + 25 unnumbered leaves of plates. See p. 160. Illust. 25 cm. *

• ***Summary:*** By an English student of sociology. On prostitution in Tokyo. J.E. de Becker lived 1863-1929.

1050. Candolle, Alphonse Louis Pierre Pyramus de. 1902. Origin of cultivated plants. New York, NY: D. Appleton and Company. viii + 468 p. See p. 330-32. 20 cm. The international scientific series, vol. XLVIII. [15 ref. Eng]

• ***Summary:*** The section on soy in this edition is identical to (in fact, a facsimile of) that in the 1885 edition by the same publisher in New York. The author, a famous Swiss botanist, whose father was also a famous botanist, lived 1806-1893. Address: France.

1051. Johnson & Stokes. 1902. Garden and farm manual (Mail order). Philadelphia, Pennsylvania. 88 p.

• ***Summary:*** In the section on "Selected Farm Seeds," page 58 states: "Soja Bean (Late Variety)–The demand for the **Soja** or **Japanese Soy Beans** has grown remarkably of late years. Their great value is as a forage crop and for fertilizing the soil and for pasturing or feeding the green fodder much in the same way as the cow pea. A valuable variety south of the Ohio River. Sow broadcast one-half bushel to the acre, or it may be planted in drills three feet apart and one foot between plants. Pkt., 10c.; lb., 25 c.; 3 lbs., 60 c., postpaid; by freight or express, qt., 20 c.; peck, 70 c.; bush., $2.25.

"Soja Bean (Early Variety)–The ordinary or late soja bean, described above, while valuable south of the Potomac and Ohio Rivers, is too late to be of value in the far Northern States. This variety ripens in all of the Northern States, where it has been grown over four feet in height, heavily podded with seed and yielded over ten tons per acre. It is a valuable fodder variety either for feeding green or for the silo. Being a rich nitrogenous feed, it is unsurpassed as a flesh-former, and, like the clovers, is a soil-improver, deriving its nitrogen from the air. Concerning the "New All who are interested in this class of plants should give our New Early Soja or Soy Bean a trial. Choice seed grown for us in Michigan" [by E.E. Evans]. Lb., 25 c.; 3 lbs., 60 c., by mail, postage paid; by express or freight, qt., 25 c.; peck, $1.00; bushel of 60 lbs., $3.50.

A very interesting photo (2.75 by 6.63 inches) shows "A field of our new early Soja Beans growing in northern Michigan." A mother and daughter are standing in the field.

Note: This is the earliest seed catalog seen (June 1999) that contains a photograph of soybean plants or soybeans. If we compare this photo with the photo on the cover of the "1904 Retail Price List" from the Evans Seed Co. of West Branch, Michigan, we can see clearly that the mother and daughter in each photo are the same! Therefore the photo of soybeans in this 1902 Johnson & Stokes catalog shows soybeans growing on the farms of the Evans Seed Co. in northern Michigan. Moreover, Johnson & Stokes almost certainly obtained its "New early variety" from the Evans Seed Co. Thus, the Evans Seed Co. must have been growing soybeans by 1902.

On the cover of this catalog is an illustration of a jovial, elderly man, admiring a giant tomato which he is holding on the five fingers of his right hand. He has a white beard, bald head, and fairly long white hair, and is wearing spectacles and suspenders. This is the first cover of a Johnson & Stokes catalog on which this man appears; he will soon appear on many more.

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This catalog is owned by the Smithsonian Horticulture Branch Library in Washington, DC. Call number: 11055. Address: 217 and 219 Market St., Philadelphia, Pennsylvania.

1052. Law, James Thomas. comp. 1902. Law's grocer's manual: A practical guide for tea and provision dealers, Italian warehousemen, chandlers, drysalters, bakers, confectioners, fruiterers, and general store-keepers. 2nd ed.: Tofu (Document part). London: Gilbert & Rivington, Ltd. 1185 p. See p. 957. Illust.

• ***Summary:*** "Torfu [sic, tofu] or Bean Curd.–(See also *Soy.*) A Japanese food product which is said to approach more nearly to animal food than any other vegetable. It is made by powdering the yellowish-white beans grown chiefly in the North of China and the Himalayas. The powder, or meal, is impregnated with brine, and undergoes elaborate treatment until coagulated. and preserved in a mass. It contains about 1-5 [one-fifth] its weight of fat and 2-5 [two-fifths] of nitrogenous matter, and when wanted for use is cut up into slabs which may be fried or toasted, and saturated with soy [sauce], so as to taste like a sweet bread, or it may be divided into small squares for soups, sauces, etc."

The first edition was published in 1896. A third edition was published in 1931 in London by W. Clowes & Sons (xiii + 774 p.; edited and revised by C.L.T. Beeching). A fourth edition was published in 1950 in London by William Clowes & Son (xv + 814 p.; edited and revised by W.G. Copsey).

1053. Rorer, Sarah Tyson. 1902. Mrs. Rorer's new cook book: A manual of housekeeping. Philadelphia, Pennsylvania: Arnold and Company. 730 p. Illust. Index. 21 cm.

• ***Summary:*** The soy bean is mentioned in two special sections: Botanical classification of our common vegetables (p. 281): "Leguminosae: Pulse family. Soy bean, peanut, kidney bean, string bean, lima bean, black bean, pea, chick pea, lentil, St. John's bread."

Soy bean (*Glycine hispida,* Maxim.) (p. 334-35): "Soy beans are grown principally in China where they form an important article of food; in fact, they are the richest of all in food constituents. It is also grown to a considerable extent in India [sic], where it is mixed with rice. This bean ranks high in fat and albuminoids and is their only muscle-making food. It has more than meat value. By the Chinese it is made into cheese [tofu], pastes [jiang], and sauces [Soy]. Soy sauce is used by them on all meat and fish dishes. For the English and Americans it forms the foundation for such sauces as club-house and Worcestershire."

Note 1. This is the earliest document seen (Feb. 2012) stating clearly that soy sauce is used as an ingredient in making Worcestershire sauce.

"Soy is an agreeable seasoning to creamed meat dishes and a very pleasant addition to French salad dressing. It can be purchased in jugs at any Chinese shop, or at the American wholesale druggists by measure." A table (based on Church) gives the composition of the soy bean: Albuminoids, etc. 35.3%. Fat 18.9. Starch and dextrin 12.5. Sugar 12.0. Cellulose 4.2. Water 12.5. Mineral matter 4.6.

"Soy" [sauce] is used as an ingredient in 12 recipes: Japanese fish sauce (p. 228). Japanese eggs (p. 253). Sautéd [sic Sautéed] celery ("When ready to serve sprinkle over two tablespoonfuls of soy or mushroom catsup, and send at once to the table," p. 389-90). Ginger chutney (p. 435). Japanese dressing (p. 442). Celery salad ("This is greatly improved by adding a few drops of Worcestershire sauce, soy or mushroom catsup," p. 451). Bobotee salad (p. 457). Philadelphia cream salad (p. 459-60). Shad roe salad ("one tablespoonful of Worcestershire sauce or soy," p. 469). Salad seasoning ("Agreeable seasonings to be kept on hand for salad making: Garlic, mushroom catsup, tomato catsup, Worcestershire sauce, soy, tobasco oil [sic, Tabasco], tarragon vinegar, mint sauce, capers and celery seed," p. 472). "A group of Hawaiian recipes"–To cook beef ("bake until brown. Then pour over it a half pint of sweet cream, to which you have added a tablespoonful of soy. Cook slowly for one hour, basting frequently with the cream," p. 691-92). Cream lettuce sauce to serve with fish ("a half saltspoonful of pepper and a teaspoonful of soy," p. 695).

Worcestershire sauce is used as an ingredient in at least 25 recipes. The first four are: Ox tail soup (p. 62). Cream of cheese soup (p. 74). Mock turtle soup (p. 80). Baked carp (p. 104).

Peanut butter is used as an ingredient in 5 recipes: Cream of peanut soup (p. 75). Lentil pie (p. 337-38). Peanut wafers (p. 535). Nut and fruit crackers (with almond butter or

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peanut butter, p. 537-38). Marguerites (p. 556).

The earliest recipe seen for homemade peanut butter states (p. 535): "Peanut Butter: Roast the nuts, shell and blow off the brown skins. When making it in large quantities, it will pay to have a bellows for this purpose, or put the peanuts on a coarse towel, cover them with another towel, rub them gently, then blow off the skins. If you use salt dust them lightly with it and grind at once. Pack the butter into glass jars or tumblers, cover them and keep in a cool place. This may be used plain or diluted with water."

Two recipes use almond butter as an ingredient: Almond wafers (p. 525). Nut and fruit crackers (p. 537-38). A recipe for homemade almond butter is given (p. 525).

The word "vegetarian" is mentioned in connection with 7 sections of recipes: Meats (p. 135-36). Vegetables (p. 277-78). Salsify (p. 317-18). Tomatoes and okra with curry (p. 417-18). Nuts (p. 522-23). Nut croquettes (p. 538). Sample menus–Vegetarian (p. 666). The author speaks very favorably of a balanced vegetarian diet. Scientists in general agree, she says, that animal proteids are easier to digest than vegetable proteids. "I must contend, however, that a well selected vegetable diet will give health, bodily vigor and mental strength to those who live rationally." In other countries and cultures, vegetarians are quite equal in strength to those of the same economic class who live largely on meat or on a mixed diet of proper proportions–and are most likely freer from disease. The out-door laborer would probably do better on a vegetarian diet whereas the sluggish digestive apparatus of an indoor is probably better suited to beef (p. 135-36).

"The American people, as a class, in their rushing and bustling life, prefer to take their nitrogen from animal products, which are more easily digested and assimilated than vegetables." "The Japanese, who do in their country the work performed by horses here, are practically vegetarians." The "vegetarian requires but two meals per day," yet they are more nourishing than three meals of meat. They take less time to eat, cost less, and offer more variety. "The amount of cellulose or waste in vegetable foods keeps up the peristaltic motion of the intestines and lower bowels; hence, vegetable eaters are rarely troubled with constipation and torpid livers." America has "grown into a meat-eating nation" in large part because the scullery maids who preside over the kitchen are largely uneducated, do not understand nutrition, and have never learned the subtleties of preparing vegetables (p. 277-78).

"To the vegetarian, they [nuts] are indispensable; they furnish his meat, milk and butter. They are palatable, nutritious, and, if well prepared, easy of digestion. Being of vegetable origin, they are free from the danger of disease germs. Their food value is generally overlooked by Americans as they are generally served as dessert"–on top of a heavy meal. "From the general awakening in regard to healthful diet, societies have sprung up all over the world, recommending the use of vegetable foods, especially fruits and nuts. We have well established, both in New York and London, large vegetarian societies, many with separate branches of 'fruit and nut eaters.' Personally I have tried the experiment, and find it most satisfactory" (p. 522).

The Preface notes that this "new book on Domestic Science... represents on paper The School at its highest period of development..." "A great change in the methods of living has taken place in America during the last few years." Not long ago, schools of cookery taught "fancy cookery"–"to succeed with these elaborate, dyspeptic-producing concoctions as the highest ambition. All this has now changed: the teacher or cook book (an ever present teacher) that does not teach health, body building, and economy in time and money, is short lived. There are still a few women who do elaborate cooking to please the palate and appetite,... They are still at the palate stage of existence. Strive to reach a higher plane of thought–eat to live. Why should any woman be asked to stand for hours over a hot fire mixing compounds to make people ill? Is this cookery? Is the headache that follows a food debauchery more pleasant or pardonable or less injurious than that which follows drink? Results of intemperance are identical. Simple living and high thinking have the approval of learned men and women,..."

Sarah Tyson Heston Rorer (1849-1937) "is one of the great ladies of American culinary history. She was a nationally recognized cookery expert, founded and ran a cooking school in Philadelphia for 18 years, authored over 75 books and pamphlets, edited her own magazine *Table Talk,..* and was domestic editor of the *Ladies Home Journal* for 14 years." With over 1,500 recipes, tips and advice, and more than 125 recipes, this "is one of America's great cookbooks. The *Ladies Home Journal* reprinted it in 1970. It offers an excellent view of American cookery at the turn of the 19th to 20th centuries" (MSU introduction).

Note 2. This is the earliest document seen (Jan. 2001) which states that "body building" is widely considered part of a healthy way of life. Address: Philadelphia.

1054. Yendo, K. 1902. Uses of marine algæ in Japan. *Postelsia: The Year Book of the Minnesota Seaside Station* p. 1-18. For the year 1901.

• ***Summary:*** Page 1: "I propose to mention briefly the more important algae which are generally used by the inhabitants of Japan."

Page 5: *"Phyllitis fascia* (*Haba-nori*)**.** Young plants of this species are collected and laid out in sheets after a method which will be explained more in detail in connection with the uses of Porphyra. The sheets are dried in the sun and afterwards baked, powdered and eaten with soy [sauce]. Haba-nori is used principally by the peasantry of the Province of Awa and Sagami.

"Chordaria abietina (*Matsumo*)**.***"* This is particularly abundant in northern Japan, where it is collected and packed

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in salt. It is cooked with soy and is a common food of the poorer classes in the north."

Page 6: "*Undaria pinnatifida* (*Wakame*). This species is used in several ways. Dried bales are common articles of merchandise. After washing with fresh water it is used as an ingredient of soup, cooked with soy, or eaten as a salad with vinegar."

Pages 7-9: *Laminaria* (*Kombu*). One form in which *Laminaria* is very much relished by the common people is the so-called Kombu- mati [Kombu-maki] or Laminaria roll. To make this, the dried weed is boiled in fresh water for a while and cut up into pieces of the desired length and width. Portions of dried herring, cod or other fish are wrapped up in the boiled alga and then recooked in dilute soy, soup or milk. *Laminaria* is also used upon New Year's day as a festoon, and for this purpose *L. radicosa* (*Antokume*) is utilized, but not as a food."

Pages 8-9: "*Cystophyllum fusiforme* (*Kijiki* [*Hijiki*]). The young fronds are collected and dried in the sun, in which condition they are a well-known article of merchandise. Cooked in soy it is eaten by the peasantry, but not by the better classes."

Pages 9-12: "*Porphyra* (*Asakusa-nori, amanori* or *nori*). This is one of the most important food plants of Japan. It is used by every class of people in a variety of ways and is cultivated in many districts. The plant is collected, made into sheets, and baked." The method of cultivation is described briefly. The sheets "are washed for a time to remove the mud and sand and are then laid out upon reed mats which are placed in the sun. The layer is made as thin as possible, the plants adhering to each other by their own gelatine. When such a sheet is quite dry it is peeled off from the surface of the mat, folded and ready for market. When baked before a gentle fire, Porphyra acquires a remarkably agreeable flavor; the rule of the cooks is to bake until the purple color changes to green. After cooking, *Porphyra* is eaten with soy, powdered and employed as a condiment or made up into sushi. This occupies somewhat the same place in the Japanese menu as the sandwich does in Europe and America. A sheet of Porphyra is laid out, boiled rice spread upon it, strips of meat or fish laid upon this, and the whole then rolled up. after which it is cut in slices. Everyone eats sushi."

"*Nemalion lubricum* (*Umi-zomen*). In some parts of Japan this plant is dried and bleached. It is then eaten with soy or vinegar, but its use is not common."

Page 14: "*Campylaphora hypnoides* (*Ego*). This is prepared similarly to Gelideum corneum. It makes a stiff jelly, which is used for food with sugar or soy, much as is cornstarch by the Americans."

Page 15: "*Grateloupia affinis* (*Comenori*) and *G. filicina* (*Mukade-nori*). These plants are dried, and after dipping in fresh water are eaten with vinegar or soy. Their use is not very general."

Statistics for exports (chiefly to China; weight in lbs and value in yen) for the years 1890-1894 are given for leaf laminaria, cut laminaria, and agar-agar. Address: [Minnesota and Japan].

1055. Yokohama Nursery Co., Ltd. 1903. Descriptive catalogue... for 1903. Yokohama, Japan. 75 p. Illust. Index. 26 cm. [Eng]

• ***Summary:*** On the cover of this English-language catalog is an illustration of a flowering cherry tree (*Prunus Pseudo-cerasus*) blooming. In the section "Price list of seeds" (p. 67+) is a subsection (p. 70) titled "Some vegetable seeds." The contents (incl. the entry for "soy bean") is identical to that in the 1902 (and 1901) catalog. Address: P.O. Box No. 72. Nos. 21-35 Nakamura, Yokohama, Japan.

1056. Pozzi-Escot, Emm. 1903. Chimie de l'industrie du soja [Chemistry of the soy sauce industry]. *Revue Generale de Chimie Pure et Appliquee* 6(3):64-69. Feb. German-language summary in Chemisches Central-Blatt 1903(1):849-50. [3 ref. Fre]

• ***Summary:*** "The manufacture of soja [soy sauce] (which is also called shojou or miso) forms one of the most important industries of Japan. It is obtained by fermentation of the soybean (*du haricot-soja*), wheat and koji, with the aid of certain molds." Soja is widely consumed in Japan and also widely exported. "It is a condiment more than a food, and it serves in place of salt in most culinary preparations. The average Japanese consumes 50-80 cc/day.

The production reached 2,307,844 hectoliters in 1893, and today it surpasses 2.5 million hectoliters, bringing in more than 6 million marks to the government [in taxes]. Today the number of brewers surpasses 11,000; it was nearly 10,000 in 1897 and 10,600 in 1900. One of the factories in Tokyo employs 250 workers and produces 50,000 hectoliters each year. The author has become friends and communicated with two professors in Tokyo, Dr. Oscar Loew (Prof. of Agricultural Chemistry at Tokyo University) and K. Aso.

Three tables (by Murai 1897, by Nagai and Murai, and by Prinsen-Geerligs 1895) give the composition of shoyu (the first two tables are each based on two analyses).

Noting that many erroneous works have been published on the manufacture of soja [soy sauce], the writer proceeds to describe the process as he understands it, based largely on Japanese publications–but also with many mistakes. The process has four main steps: 1. Preparation of the wheat or soybeans. 2. Preparation of the soja koji. 3. The fermentation process. 4. Extraction and sterilization. The total process takes 1-2 years. He concludes with some ideas for improving the process by reducing the fermentation time. He would heat the soy sauce during fermentation and add alcohol. Address: In charge of pure chemical research at the labs., Malzeville, France.

1057. Uyeno, K. 1903. Shinkoku-san kôji (Fonkyo) kenkyû

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yohô [Preliminary report on the investigation of Chinese koji (Honkio). Part I.]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 253. p. 225-38. March. [1 ref. Jap] Address: Yakugakushi.

1058. Balland, A. 1903. Sur les principales légumineuses alimentaires des colonies françaises [The principal edible legumes of the French colonies]. *Comptes Rendus des Seances de l'Academie des Sciences* (*Paris*) 136:934-36. Meeting of April 14. [Fre]

• ***Summary:*** This article appears to be a summary of, and contains less details than, one of the same tile by the same author published this year in *Annales d'Hygiene et de Medecine Coloniales.* Eight legumes are described briefly and the maxima and minima of their nutritional compositions given. Included are peanuts (*Arachide or Pistache de terre, Arachis hypogaea*), soybeans (*Soja, Dolichos soja*), and Bambarra groundnuts (*Voandzou, Voandzia* [*Voandzeia*] *subterranea*).

"Soja–The cultivation of the soybean (*Soja, Dolichos soja*) dates back to ancient antiquity in China and Japan. The seeds, which are rich in both nitrogen and oil, enter into culinary preparations which are very popular in these countries. The samples analyzed come from Cambodia, Cochin China [in today's Vietnam], and Tonkin." The protein content of these samples ranges from 34.85% to 38.41%, and the fat content from 12.95% to 14.80%. The mean weight of 100 seeds ranges from 5.00 gm to 11.23 gm.

Note: This is the earliest document seen (Feb. 2012) concerning soybeans in Cambodia (renamed Kampuchea in 1979) (one of two documents). Address: Ancien Pharmacien Principal au Laboratoire des Expertises du Comite de l'Intendance, France.

1059. Hennings, P. 1903. Einige neue japanische Uredineen. IV. [Some new Japanese Uredinales. IV.]. *Hedwigia* 42(3):107-08. In Supplement at back half of Vol. 42. May. [Lat; Ger]

• ***Summary:*** Begins with a 6-line Latin-language description of soybean rust. "Uredo Sojae P. Henn. n. sp." [=Phakopsora pachyrhizi; soybean rust]. He then explains, in German, where, on what part of what host plant, when, and by whom it was collected: "Tosa, Shimoda, on leaves of Glycine Soja S. & Z. September 1902. Yoshinaga. No. 42."

Note 1. This is the earliest document seen (March 2005) that clearly describes soybean rust on the genus *Glycine.* Notice, however, that *Glycine Soja* is the wild annual soybean, not the regular cultivated soybean (*Glycine max*).

Note 2. We learn from later Japanese documents (e.g., Kitani & Inoue 1960) that this rust fungus was collected in 1902 by Torama Yoshinaga. "No. 42" apparently refers to Yoshinaga's sample- or reference number; five other such numbers related to Yoshinaga are cited in this article.

Note 3. Tosa is an old province on southern Shikoku island, now Kôichi prefecture. Shimoda was and is a seaside town in Tosa / Kôichi. Address: Japan (probably).

1060. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*). 1903. Zappo: Tônyû oyobi jinzônyû [Miscellaneous news: Soymilk and other man-made or artificial milks]. No. 256. p. 616, 635. June. [Jap]

• ***Summary:*** Note: This is the earliest Japanese-language document seen (July 2012) that mentions soymilk in the title, or that uses the term *tônyû* (literally "bean milk") to refer to soymilk.

It is also the earliest document seen (Aug. 2013) in any language that mentions *tônyû* or *tonyu.* As of Aug. 2013 *tônyû* is the modern Japanese word for soymilk.

1061. *Chicago Daily Tribune.* 1903. Roosevelt order worries labor. Sept. 21. p. 2.

• ***Summary:*** "The new Japanese salad, 'udo,' and a condiment, 'wasabi,' similar to horseradish, will soon be introduced to the American people. They were found in Japan by Barbour Lathrop of Chicago [Illinois] and Prof. D.G. Fairchild, agricultural explorer for the government [USDA], who brought to this country cuttings of these plants, which are now growing in American soil."

"Prof. Fairchild says that in the tea houses of Japan the crisp blanched stems of udo are eaten with salt, as our native celery is served, or it is boiled and served with soy sauce."

1062. Hitier, H. 1903. Le soja hispida [Soja hispida, the soybean]. *Journal d'Agriculture Pratique* 67(49):746-47. Dec. 3. [Fre]

• ***Summary:*** In the session of 18 Nov. 1903, Mr. Foëx noted that *Soja hispida,* which serves as both an industrial and a forage plant, also furnishes a very favorable food for diabetics. Its seed contain high levels of protein, oils, and phosphates, and very little starch. At the Montpellier School of Agriculture, Mr. Foëx cultivated soya as a forage plant; the animals were very fond of it. But despite very careful cultivation at Montpellier, the soybean never gave yields near those presently obtained in China and Japan. What could be the causes of this inferior production? In examining the roots, the author can find no traces of root nodules (bactéroïdes), which are found on the roots of all other legumes cultivated in France. These soya bacteria apparently do not exist in local soils. In order to inoculate local soils, Mr. Foëx is having some soil containing the debris of soybean roots sent from Japan. He will notify the Society of the results obtained in growing soybeans under these new conditions.

Mr. Schribaux observes that there are many species and races of root nodule bacteria. It is important to find the right type for each host plant. Address: France.

1063. Dmitriev, Konstantin. 1903. Ekskursiia dlia izucheniia

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porta In-kou [A trip for the study of the port of Yingkou]. *Izvestiia Vostochnogo Instituta* (*J. of the Oriental Institute, Vladivostok*) 7:21-146; 8:115-270. [Rus]

• ***Summary:*** As the major export port for Manchurian soybeans and soy products prior to the completion of the Chinese Eastern Railway and the consequent rise of Dairen and Vladivostok to preeminence, Yingkou is the appropriate focus for a study of the increasing export trade to Southern China and Japan (especially) in the 1880s. Pages 85-88 list foreign companies and establishments operating in Yingkou in 1902-03.

Of particular interest might be Bandinel and Co. known in Chinese as Jichang (?) which represented such worldwide and regional ocean freighters as Hamburg- American, Lloyds and Mitsui Bussan as well as the oil mill carrying its own name (*Jichangyan*).

Tables (p. 256) give 1901 export statistics for soybeans, cake and oil both by quarters and destinations (Hong Kong, Japan, Chinese ports, Samarang [Semarang, Central Java], and Korea). Address: Manchuria.

1064. Balland, A. 1903. Les principales légumineuses alimentaires des colonies françaises [The principal edible legumes of the French colonies]. *Annales d'Hygiene et de Medecine Coloniales* 50(3):193-206. Third Series. [1 ref. Fre]

• ***Summary:*** Contents: Peanuts (*Arachide* or *pistache de terre, Arachis hypogaea*) in Congo (samples were analyzed from Bahr-el-Ghazal [a former province of southwest Sudan–just east of the Central African Republic] and from Haut-Oubangui [later in the Central African Republic]), Senegal, Guinea, Indochina [in today's Vietnam], Madagascar, New Caledonia.

Cajan (*Cajanus indicus*) in Guinea, French Guiana, New Caledonia, Réunion, Madagascar. Doliques (*Dolichos lablab, D. sinensis, D. uniflorus*) in French Guiana, Indochina, Cambodia, the Indies, Madagascar, New Caledonia, Réunion, Sudan. The Haricot bean (*Phaseolus vulgaris*) in the Congo, Dahomey, Guinea, French Guiana, Sudan, Madagascar, New Caledonia, and Réunion. Lima bean (*Haricot courbé, Phaseolus lunatus*) in French Guiana, the Indies, Madagascar, Réunion. Mung bean (*Haricot mungo, Haricot trilobé, Phaseolus mungo*) in the Indies, Indochina, Madagascar, Réunion.

Soya (*Soja, Dolichos soja*) (p. 204-05): The cultivation of soya dates back to the ancient past in China and Japan. "According to A. Candolle (1885): 'Known facts and historical and philological probabilities tend to show that the species was wild from Cochin-China to the south of Japan and to Java [Indonesia] when the ancient inhabitants of this region began to cultivate it at a very remote period, to use it for food in various ways, and to obtain from it varieties of which the number is remarkable, especially in Japan.' The seeds, which are rich in both nitrogen and oil, enter into culinary preparations which are very popular in these countries. The samples analyzed come from Cambodia, Cochin China, and Tonkin." The protein content of these samples ranges from 34.85% to 38.41%, and the fat content from 12.95% to 14.80%. The mean weight of 100 seeds (*Poids moyen de 100 grains*) varies by country as follows: Cambodia 11.23 gm, Cochin China 9.10 gm, and Tonkin 5.00 gm.

Note: This is the earliest document seen (Feb. 2012) concerning soybeans in Cambodia (renamed Kampuchea in 1979) (one of two documents).

Bambarra groundnuts (*Voandzou, Voandzia* [*Voandzeia*] *subterranea*) in Congo and Madagascar. This annual legume comes from sub-tropical Africa, where it is widely cultivated. According to Candolle, it is also called "Mandubi d'Angola." Address: Pharmacien principal de l'armée (Main pharmacist for the French Army).

1065. Hiltner, Lorenz; Stoermer, K. 1903. Neue Untersuchungen ueber die Wurzelknoellchen der Leguminosen und deren Erreger [New investigations on the root nodules of legumes and their instigators]. *Arbeiten aus der Biologischen Abteilung fuer Land- und Forstwirtschaft am Kaiserliche Gesundheitsamte* 3:151-307. Sonderabdruck. [72 ref. Ger]

• ***Summary:*** These investigations led the researchers to classify the nodule bacteria into two groups, based mainly on morphology.

Soybeans (Soja, both brown and yellow seeded) are mentioned throughout the report. Pure cultures of the commercial inoculant Nitragin were supplied for the soybean trials at 4 locations, starting in 1900; all four were successful in producing root nodules. Tests were conducted without nitrogen or glucose, with nitrogen, and with nitrogen and glucose. The authors pointed out that direct inoculation of large seeds such as lupin and soybean may not lead to nodule formation due to the excretion of substances from the seed coats during the swelling process. Soybean seeds were covered with distilled water for 5 hours and the water extract was used in studying the growth of the bacteria and their transformation into bacteroids. The authors conclude that a protein is given off from the seed contents [cotyledons] that favors the growth of the nodule bacteria, whereas from the seed coats substances are given off that may help to plasmolyze and destroy the bacteria. They suggest the possibility of antagonism between the substances given off by the seed contents and by the seed coats that reduces the toxic action of the seed coat excretion upon the bacteria.

Contents: Introduction. Field trials with Nitragin from the year 1900. Field trials in 1900 (including both successful and unsuccessful trials with late-ripening soybeans). Field trials in the experimental fields at Dahlem (brown- and yellow-seeded soybeans, with and without oats; soil from a Japanese soybean field was used for inoculation; Prof.

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Kirchner of Hohenheim had the first success with soybeans on these fields). Characteristics of the soya bacteria (general). Asparagin. Characteristics of the soya bacteria (without nitrogen or glucose, with nitrogen; with nitrogen and glucose). Characteristics of the pea bacteria. Figures. Tables (for soya, see p. 192, 195).

Note: This is the earliest document seen (Oct. 2005) describing successful soybean inoculation experiments using pure cultures. It is also the earliest document seen (April 2000) that mentions successful use of the commercial inoculant Nitragin with soybeans. Address: 1. Privy Councillor; 2. Huelfsarbeiter im Kaiserliche Gesundheitsamte (Helper in the Imperial Public Health Departments) (Dahlem?), Germany.

1066. Kokhanovskii, N. 1903. Ocherk ekonomicheskogo polozheniia Iaponii [An outline of Japan's economy]. *Izvestiia Vostochnogo Instituta* (*J. of the Oriental Institute, Vladivostok*) 5:1-130. [Rus]

• ***Summary:*** Includes a discussion (p. 6-11) of Japanese domestic agriculture. For 1900, soya was the fifth most important culture by area, occupying 6.9% of cultivated area. Rice, wheat, rye and barley were all ahead of soy. Statistics (bottom of p. 7) are shown for 1895-99 and 1900. The discussion of harvests is followed by a table (p. 10) of information on agricultural prices in Japan from 1887-1900, showing a clear rise in bean prices (though soya is not differentiated here from other bean products).

Pages 62-63 contain information on Japan's imports and exports for 1900-1902 taken from the sources listed at the bottom of page 62, footnote 2. Further examination of these would allow the compilation of clear statistics for growing Japanese import of soya and more gradual growth in the export of soya products.

1067. Lange, Rudolf; Noss, Christopher. 1903. A text-book of colloquial Japanese. Based on the *Lehrbuch der japanischen Umgangssprache.* Translated and revised by Christopher Noss. Tokyo: Methodist Publishing House. xxxii + 573 p. 23 cm.

• ***Summary:*** Page 32: The prefix *mi* expresses respect, as in *mikado* (Emperor), or *miya* (shrine). A woman's expression, *o mi o tsuke,* in which we find two honorifics, means a soup made of miso.

Page 66: Shô-yu or soy is a kind of sauce.

Page 71-72. Tôfu means "bean curd." A tôfuya is a tofu shop. "Tofu is one of the most important articles of food among the Japanese."

Page 108: *Shirouri wa misosuke ni suru to, taisô umô gozaimas'.* If you pickle white cucumbers in miso, they are quite delicious.

Page 353: *"Shoyu wo* (*o*) *shitaji to mo iimasu.* Shoyu is also called *shitaji."*

Page 395: A mixture of soy, *mirin,* and vinegar is called *sambaizu.*

In the Japanese-English dictionary are definitions of: *miso,* a kind of sauce (p. 510), *shô-yu,* a kind of sauce (p. 533), *tô-fu,* bean curd (p. 541). Address: 1. PhD, Prof. of Japanese at the School of Oriental Languages, Univ. of Berlin [Germany]; 2. Formerly missionary of the Reformed Church, Sendai.

1068. Whitehead, Jessup. 1903. The steward's handbook and guide to party catering. 6th ed. Chicago, Illinois: Jessup Whitehead & Co., Pubs. v + 464 + 29 p. Illust. No index.

• ***Summary:*** Page 60: "Those everlasting relishes" mentions catsups, soys, Worcestershire sauce, mushroom and walnut catsups, Harvey's sauce, India soy.

Page 87: Relishes: Tomato catsup, Worcestershire sauce. Page 214: Worcester sauce.

Alphabetical: Carp (p. 267): Baked carp; gravy made with Worcestershire sauce. Chinese cookery (p. 278-80): Chinese chop soly [chop suey], a savory ragout, is the national dish of China. Incidental ingredients include "salted black beans." Chop sticks.

Cucumber (p. 299) and eggs, with vinegar and Worcestershire sauce. Devil sauce (p. 303), with Worcestershire. Drinks (p. 305): Prairie oyster, with dash of Worcestershire sauce. Garum (p. 324): "One of the two principal sauces used by the ancient Romans...; a kind of soy,..." Horseradish (p. 343): Napolitaine sauce, with Worcestershire sauce.

Japanese cookery (p. 350-51): Mentions "Japanese misoshiru [miso soup]... This is made from miso, a fermented mixture of soy, beans [sic, soy beans], wheat and salt. It has a gamey flavor all its own." "Hachimono,... a piece of sole stewed in soy." "... the brown soy-colored beans and strips of Kukirage, or ear-shaped mushrooms." "Fu, a kind of biscuit made from the glutinous part of wheat flour." A gravy "thickened with a transparent, starchy substance, obtained from the root of a climbing plant (*Pueraria Thunbergiana*), called by the Japanese Kuzu."

Sauces (p. 430-34): "Harvey's sauce–'A fair imitation of Harvey's sauce may be produced by working the following recipe. Mince a clove of garlic very finely, add 6 chopped anchovies, ¼ oz. cayenne, 3 tablespoonfuls of Indian soy, 3 tablespoonfuls of mushroom or walnut ketchup..." "Soy–An East Indian bottled sauce; it is made of purple wrinkled morels, galangal root and spices." "Bottled table sauce–The recipe for making the genuine Yorkshire relish is probably known only to manufacturers. However, the following is said to yield a good imitation of that popular sauce: 1 oz. garlic, 1 teaspoonful cayenne, 2 tablespoonfuls Indian soy, 2 tablespoonfuls mushroom ketchup, and 1 pint vinegar."

Scottish cookery (p. 438): Mince collops–incl. a "dessertspoonful Worcester sauce..."

"Soy–A bottle sauce imported from China and India; composition uncertain."

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Tripe (p. 461): Tripe a la Creole, with Worcestershire sauce. Address: Chicago, Illinois.

1069. Yule, Henry; Burnell, Arthur Coke. 1903. Hobson-Jobson: A glossary of Anglo-Indian colloquial words and phrases, and of kindred terms, etymological, historical, geographical, and discursive. A new edition edited by William Crooke, B.A. London: J. Murray. New York: Humanities Press. New Delhi: Munshiram Manoharlal. 1021 p. See p. 858-59 ("soy"). Index. 22 cm. [6 ref]

• ***Summary:*** "Soy, s. A kind of condiment once popular. The word is Japanese *si-yau* (A young Japanese fellow-passenger gave the pronunciation clearly as shô-yu), Chinese *shi-yu.* [Mr. Platts (9 ser. N. & Q. iv. 475) points out that in Japanese as written with the native character, *soy* would not be *siyau,* but *siyau-yu;* in the Romanised Japanese this is simplified to *shoyu* (colloquially this is still further reduced by dropping the final vowel, to *shoy* or *soy*) Of this monosyllable only the *so* represents the classical *siyau;* the final consonant (y) is a relic of the termination *yu.* The Japanese word is itself derived from the Chinese, which at Shanghai is *sze-yu,* at Amoy, *si-iu,* at Canton, *shi-yau* [fermented black soybean sauce], of which the first element means 'salted beans,' or other fruits, dried and used as condiments; the second element merely means 'oil.'] It is made from the beans of a plant common in the Himalaya and E. Asia, and much cultivated, viz. *Glycine Soja,* Sieb. and Zucc. (*Soya hispida,* Moench.) boiled down and fermented. [In India the bean is eaten in places where it is cultivated, as in Chutia Nagpur (Watt, Econ. Dict. iii. 510 Seq.)]"

The authors then quote passages relating to soy from Lord King's *Life of John Locke* (1679), Dampier (1688), Ovington (1690), Kaempfer (1712), Thunberg's Travels (1776), and Mrs. Frazer, a Diplomat's Wife in Japan (1900).

Yule lived 1820-1889. Burnell lived 1840-1882. Address: 1. Living in Palermo; 2. Madras Civil Service, one of the most eminent modern Indian scholars. Died 1882.

1070. Societe Nationale d'Agriculture de France. 1904. Séance du 13 Janvier 1904 [Meeting of 13 January 1904]. *Bulletins des Seances de la Societe d'Agriculture de France* p. 25-28. Mr. Tisserand, presiding. [1 ref. Fre]

• ***Summary:*** The perpetual secretary notes that he has received from Dr. Trabut, a correspondent [in Algeria], information about the soybean (*le soja hispida*). There follows a long quotation.

At the meeting of 25 Nov. 1903 Mr. Foëx, in reporting on the soybean culture trials at Montpellier, called attention to the feeble / low seed yields of the soybean in France, and the absence of nodules on the roots. He thinks that in order to expand this crop, under normal conditions, it would be suitable to import from Japan soybean root bacteria.

Since 1892, having cultivated numerous soybean varieties in the botanical garden of the government botanical station, I am able to make some observations about this legume that I consider to be very interesting for southern countries.

In 1898 I published a notice for our colonies on the subject of root nodules, in which I expressed the following:

The next two paragraphs about soybean nodules ad nodulation are quoted from his 1898 publication.

In my annual report of 1898 I explained that since the cultures of this special soybean root bacterium have been propagated, all of the soybean plants cultivated at the station had numerous large nodules on their roots.

In this same report, I insisted on the value of this legume as a forage plant for dairy cows.

A cow which is well nourished, which gives 6 liters of milk every 24 hours, has always given 7½ liters when its ration is composed, instead of the current forage, of 18 kg of soybean plants cut while green at the moment of the formation of their seeds.

Since this time, soybean plants at the station have been cultivated in soil where the nodule bacteria were abundant, and I have never observed any large differences in their yields.

The yields varied, above all, depending on the soybean variety; there certainly existed a large number of varieties with distinct characteristics.

The different varieties can be divided into very early, medium, and late in their general development / maturity. It is the latter varieties which give the largest yields of green forage and which are of greatest interest as southern crops.

In summary, the soybean has not succeeded as a plant for human food; it is a very inferior substitute for the haricot bean. In Algeria, the indigenous people have accepted the soybean as a food rather well; but they prefer the *Dolichos Lubia* [*Vigna unguiculata* subsp. unguiculata; black-eyed pea or cowpea] which is, in effect, superior, but has more agricultural needs. The various soyfoods made in the Orient are very complicated; we must find a simpler way to utilize this seed. I think the flour, made from the defatted seeds, would be a good food.

As a forage plant, the soybean must be studied by the agricultural experiment stations with the goal of acclimatizing the varieties which are suitable for this use.

At Rouiba, I have obtained varieties which grow large and yield from 30 to 35 metric tons of green forage per hectare.

Discussion: Mr. Schribaux.–Mr. Trabut states that soybean plants with nodules did not produce more than soybean plants without them; we are probably looking at indifferent nodules, of the type that Messieurs Dehérain and Demoussy observed on the lupine plant.

I have the feeling that it is in the soils of the countries of origin of the soybean, in China, in Japan, that we would encounter the highest probability of securing active microbes; soils that would be wise to dry at a low

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temperature, before shipping, so that their useful organisms would not loose some of their vitality during the journey.

Mr. Tisserand.–These experiments would be easy to accomplish as we have Japanese persons, former students of our agricultural schools, that went back to their country and would certainly provide us with their cooperation.

Mr. Prillieux.–I have heard that the soybean bacteria are to be found in certain crops in Germany. Address: France.

1071. *Daily Sun* (*Saint John, New Brunswick, Canada*). 1904. Fighting Jap a worthy foe: Army built on French and German models. Cavalry a weak point–Rapidity and efficiency of the column already proven–Perfection in administration details. Jan. 27. p. 7.
• ***Summary:*** The section titled "Artillery officers" states: "A good soldier is twice as valuable if he has good care, and this, among other things military, the Japanese have learned. Everything which goes to make for the efficiency of the troops is scrupulously attended to. The rations are of the simplest–rice, dried fish, soy, and sometimes meat–but they are always ample and always the best of their kind."

1072. Hitier, H. 1904. Société Nationale d'Agriculture de France: Trèfle blanc et cultures fouragères [National Society of Agriculture of France: White clover and forage crops]. *Journal d'Agriculture Pratique* 68:1. p. 199-200. Meeting of 3 Feb. 1904. [Fre]
• ***Summary:*** Mr. J. Bernard reports to the Society about a note which was communicated to him by Mr. Fruewirth [Früwirth], professor at Hohenheim, on the subject of the cultivation of various forage plants. Mr. Fruewirth cultivated the soybean (*soja hispida*); he spread on the ground dirt from Japan that was rich in bacteria from this legume. The soybean roots were then covered with nodules, and the plant's yield increased. Address: France.

1073. Ansai [or Anzai], -. 1904. Bakteriologische Untersuchung ueber Shoyu [Bacteriological investigation on shoyu]. *Zentralblatt fuer Bakteriologie. Series 2.* 11(19):563-64. Feb. 27. Summary of Japanese article in Mitteilungen der medizinische Gesellschaft zu Tokyo 17(6):1. [1 ref. Ger]
• ***Summary:*** Bacteriological tests showed that 1 cubic centimeter of shoyu contains 9,280 to 19,700 bacteria. Address: Japan.

1074. *San Francisco Chronicle.* 1904. Declared contraband. March 18. p. 2.
• ***Summary:*** "St. Petersburg. March 17.–As the result of a conference between the Minister of Marine and Minister of Foreign Affairs, the following additional articles have been declared contraband of war: Provisions of all kinds designed for the Japanese army, including grain, fish, fish products, [soy] beans, [soy] bean oil, part of machines for the manufacture of weapons and ammunition."

Note: During wartime, contraband goods may be confiscated and thus prohibited from delivery to the enemy or to a belligerent power.

1075. Anzai, Shigetaro. 1904. Shôyu no saikingaku-teki kensa [Bacteriological investigations on shoyu]. *Tokyo Igakkai Zasshi* (*J. of the Tokyo Medical Society*) 17(6):209-15. March 20. German-language summary in Zentralblatt fuer Bakteriologie, Series II. 11:563-64. [Jap; ger]
• ***Summary:*** The short German-language summary at the end of the issue is titled *Bakteriologische Untersuchung uber Syoyu.*

1076. Kozai, Y.; Loew, O. 1904. Ueber fungicide Wirkungen von Pilzculturen [On the fungicidal effects of mold cultures]. *Bulletin of the College of Agriculture, Tokyo Imperial University* 6(2):77-79. March. German summary in Chemisches Central-Blatt 1904(2):252. [Ger]
• ***Summary:*** It has been observed that in Japan, a well-known vegetable cheese known as Miso, does not get covered with mold even during the hottest days of summer, despite its moist condition and the fact that it is exposed to the open air and dust in shops. The prompted the authors to conduct an experiment to see if *Aspergillus oryzae,* the miso mold, has fungicidal properties. The miso is made from the action of enzymes on cooked soybeans. Address: Tokyo Imperial Univ., Japan.

1077. Tsujimoto, Mitsumaru. 1904. Daizu abura ni tsuite [Soybean oil]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 7(73):222-30. March. [Jap]
• ***Summary:*** A very early, detailed discussion of the physical and chemical characteristics of soybean oil (*daizu abura*), and its composition. He also studied boiled soybean oil.

Note: This is the earliest Japanese-language document seen (Sept. 2006) that mentions soybean oil, which it calls *daizu abura.*

1078. Humphreys, Mary Gay. 1904. The aesthetic housekeepers of Japan. *Ogden Standard Examiner* (*Utah*). April 29. p. 23.
• ***Summary:*** The author, an American, writing from her experience of living in Tokio, notes that Japanese housekeepers bring a strong sense of beauty or aesthetics to every part of their daily life. Concerning foods: "One of these is bean curd, 'tofu,' a white substance that is sliced and fried like mush, with soy [sauce] for a flavor. This curd is so nutritious and so cheap that an American who lives in Japan suggested its being introduced into this country as a food. Soy is a liquid made from the black bean [sic] and is said to be the foundation of Worcestershire sauce. It enters into almost all cooking, and most agreeably."

A Tokio restaurant meal: "It was charming, a meal to be remembered, and meat thus cooked in soy [sauce] something

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'Japanesy' that we might well import."

Nuta salad: "This is made of clams, rape tops and onion with a sauce of bean paste, rice, mustard and soy [sauce], rubbed into a brown liquid." One large illustration shows a Japanese woman with elaborate dress and hairdo; three others show her working at home.

1079. *San Francisco Chronicle.* 1904. Preparations to quit Newchwang: Civilians fear a raid by Chinese bandits when Russians retire. May 9. p. 1.
• ***Summary:*** The Russians are evacuating Newchwang and the western side of the Liao Tung peninsula. The Japanese captured Dalny yesterday. Last week the Japanese landed 10,000 men at Kinchou bay, 10,000 at Foochou bay and 7,000 at Pitzwo. "The isolation of Port Arthur is complete. Sixteen Japanese war ships protected the landing of troops at Kinchou bay,...

"Food is scarce at Moukden [Mukden, later renamed Shenyang], the troops are eating [soy] bean cakes."

1080. *Boston Daily Globe.* 1904. Typical dishes. Japanese service is dainty in the extreme. May 22. p. 35.
• ***Summary:*** "Meat plays a small part in the Japanese menu,... Fish and rice are the staples... The following is a typical menu for a dinner of ceremony:" Soy-related dishes include: "Suimono–A kind of bean-curd [tofu] soup." "Hachi-zakana–A fine, large fish, either boiled with salt or boiled [broiled?] with shoyu." "Umani–Bits of fish or sometime fowl, boiled with lotus root or potatoes in shoyu and with 'mirin,' a sort of sweet liqueur." "Tsubo–Seaweed..." "Ayemono [Aemono]–A sort of salad made with bean sauce [miso?] or pounded sesamum [sesame] seeds." Raw fish–The favorite for festive occasions is the *tai* [sea bream], "on account of its name, which is the last syllable of the word *me-de-tai,* meaning 'congratulatory.'... Before eating, the slices are dipped lightly in soy [sauce], seasoned with grated horseradish or ginger."

1081. Brunson, John A. 1904. A glimpse of Japanese life. *Good Health* (*Battle Creek, Michigan*) 39(5):237-42. May.
• ***Summary:*** A good photo (p. 239) shows a Japanese vegetable vendor carrying his goods in baskets on a shoulder pole. Page 240 notes: *"Tofu,* or 'bean curd,' as the foreigners call it, is a favorite dish. The beans are first ground fine in hand mills. These mills consist of two stone discs about eighteen inches in diameter, and perhaps six or eight in thickness, one being placed above the other. To the upper stone is attached a handle by which it is turned, and the motor power is supplied by two women. It is a familiar sight in Japan to see 'two women grinding at the mill.' The husks and coarser parts of the bean flour are then carefully removed, and the fine white residuum is mixed with water and pressed into squares which somewhat resemble cottage cheese in appearance. The *tofu* is then boiled, and is both palatable and nutritious, but rather concentrated."

In Japan, fish are served raw, while yet fresh, "with *shoyu,* a kind of Japanese Worcester sauce."

Note 1. This is the earliest article seen (Aug. 1996) with detailed information on soyfoods in Dr. John Harvey Kellogg's periodical *Good Health.*

Note 2. This is also the earliest document seen (Aug. 1996) that compares tofu with cottage cheese.

1082. Bolce, Harold. 1904. First taste of raw fish: Approached with fear and trembling, but followed with ecstasy. *Washington Post.* July 22. p. 11.
• ***Summary:*** From Booklovers Magazine: The writer visited Japan ("this Sunrise Land"), where he met novelist and diplomat Tumio [sic, Tomio] Yano, who invited him to dinner at the Nippon club. "Not so well known among the Occidentals as soy sauce, but of equal merit as an appetizer, is wasabi. Its use is universal in Japan. It serves the same purpose as horseradish does on Occidental tables, but is less acrid." It is almost always eaten with raw fish.

Bolce closes with a song of praise to *Eutrema wasabi.* "All honor to triumphant agricultural Japan, and may this far Eastern member of the mustard family take deep root and spread and flourish in my native land." Address: [Washington, DC].

1083. Smith, Hugh M. 1904. Japan, the paramount fishing nation. *Transactions of the American Fisheries Society* 33:111-38. See p. 116. 33rd annual meeting held 26-28 July 1904 at Atlantic City, New Jersey.
• ***Summary:*** "Raw fish is one of the national foods. I acknowledge that my repugnance to it was great, but it was overcome with the first dish, for as prepared and served by the Japanese the thin, cold, boneless slices of perfectly fresh tai or mackerel, taken with chop sticks and dipped in soy-bean sauce, are delicious."

Note: This is the earliest English-language document seen (April 2012) that uses the term "soy-bean sauce" to refer to soy sauce.

The author traveled to Japan on assignment from U.S. Fish Commissioner Bowers to study the fisheries and related industries; he was the first American to ever do this. He traveled 5,000 miles within the country, always accompanied by helpful government officials, who were well familiar with the different regions and their fisheries, and to act as guides, companions, and interpreters.

"The artificial propagation of food fishes is not as yet important and is practically to salmon on the island of Hokkaido and to carp in all sections."

"A branch of fisheries in which Japan far surpasses all other countries as regards both extent and methods is the sea-weed industry. In the United States, not withstanding our long coast line and sea-weed resources not inferior to Japan's, the annual crop of marine vegetables is worth only

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$40,000, whereas in Japan these products are worth not less than $2,000,000, and are exceeded in value by only four animal products of the fisheries [herring, sardines, bonito, and tai / red snapper]. Gives detailed information about four of Japan's main "sea-weed resources" (p. 121-27) including *kombu* (*Laminaria,* kelp; and shredded kombu), *kanten* (vegetable isinglass, agar-agar), *nori* (*Porphyra,* laver; "the supply comes almost entirely from planted grounds, and in the cultivation of marine vegetables the Japanese stand alone).

This article contains many photos, including one of "bars of vegetable isinglass" (p. 123). Illustrations (from Japan) show (p. 122-25): (1): Gathering kelp in Hokkaido, showing both above and below water. (2) Planting dry brush on which laver is to grow in shallow water in Tokyo Bay. (3) Spreading and drying laver on mats.

1084. *Times* (*London*)**.** 1904. Summer conditions and food supplies in Manchuria. Aug. 9. p. 2, cols. 5-6.
• ***Summary:*** From a correspondent. There are two harvest seasons in Manchuria. The first is that of wheat and barley; the second is that of yellow millet and red millet, followed by [soya] beans, "which are the product *par excellence* of Manchuria," and finally *kao-liang,* or tall millet.

"The vast quantities of [soya] bean cake, stored in the country from last year's stock, which were not exported as usual to Japan, were enough to support at least 50,000 Russian horses. The beans and cake were stored in towns within easy access of the Russian centres. and have long since been secured."

"As regards food for her [Russia's] army, the natives can furnish a relatively small proportion of coarse flour made from wheat... The small millets can be used as porridge. Natives travel long distances on this alone. For the cold season the bean curd is splendid food for men who live in the open air. The supply of this is practically unlimited.

Note 1. This was written in the midst of the Russo-Japanese war (Feb. 1904–Sept. 1905); Japan beat mighty Russia.

Note: This is the earliest document seen (March 2008) that mentions Russo-Japanese War in connection with soya beans.

1085. *New York Times.* 1904. In the business world: Invoice values advanced. Aug. 26. p. 9.
• ***Summary:*** "Several heavy advances in invoice values were announced yesterday by the Board of United States General Appraisers... and from Many Fook & Co., Yokohama, 160 buckets Japanese shoyu sauce, entered at .80 and advanced to 1.40 yen a bucket. All good will be seized."

1086. Bellows, E.C. 1904. Agriculture in Japan. *Monthly Consular Reports* (*U.S. Department of Commerce and Labor, Bureau of Statistics*) No. 287. Aug. p. 22-25.
• ***Summary:*** In 1901 the artificial fertilizer manufacturing companies of Japan produced 62,400 tons; 151,000 tons of fish fertilizers were produced, and 83,967 tons of Chinese bean cakes were imported for use as fertilizers. Artificial fertilizers are also imported from Great Britain, fish guano from Siberia, animal bone from China, and other fertilizing materials from different countries.

"The principal agricultural products, named in the order of their acreage, are rice, rye, barley, wheat, [soya] beans, mulberries, sweet potatoes, millet, buckwheat, rape, red beans [azuki], Italian millet, tea, indigo leaves, potatoes, sorghum, tobacco leaves, cotton, and hemp. The area devoted to rice cultivation constitutes a little more than two-fifths of the total area of arable land." Address: Consul-General, Yokohama, Japan.

1087. *San Francisco Chronicle.* 1904. Reports defeat of besiegers: Dispatch from Harbin says the Japanese lost 1,300 in the attack on Port Arthur. Sept. 28. p. 2.
• ***Summary:*** Chefoo, Sept. 27. "Chinese say that the battle which began September 19th continued intermittently until September 24th. In defending one fort the Russians rolled bean cakes down on the massed Japanese. These bean cakes are very heavy and are pressed into the shape of circular grindstones."

Note: This article seems to be about the Russo-Japanese War (4 Feb. 1904 to 5 Sept. 1905). It was fought mostly in Manchuria. The Japanese won.

1088. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*)**.** 1904. Shodoshima no shôyu jôzô no jikkyô oyobi kairyôhô [Brewing of shoyu in Shodoshima and improvement]. 7(80):1127-34. Oct. [Jap]
Address: Shodo Island, Japan.

1089. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*)**.** 1904. Japan's fiscal resources. No. 289. Oct. p. 147-48.
• ***Summary:*** "The Commercial Intelligence, of London, England, September 14, 1904, contains an article on the 'Economic War Resources of Japan,' from which the following fiscal data is taken." In normal times, Japan derives her revenue from various taxes and duties, including a "land tax, income tax, business tax, tax on liquors, tax on soy, sugar excise" etc. These together are estimate to produce $69.5 million for the fiscal year 1904-05. Total revenue from all sources is estimated to be $111.8 million. But now the Japanese government needs more money for prosecuting its war with Russia.

A table (p. 148) shows revenues from the "Supplementary budget of Japan, 1904-05." The four biggest sources of revenue (in million dollars) are: Land tax $11.9. Sugar excise tax $4.1. Income tax $2.6. Business tax $2.5. The soy tax [on soy sauce] brings in only $567,208.

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Note: Pages 146-47 discuss "Japan's tobacco monopoly. The law relating to the monopoly of leaf tobacco was promulgated in March, 1896. This law provided that all leaf tobacco grown was to be bought by the government and in turn sold to the manufacturers by the Government at a fixed rate of profit." Address: Washington, DC.

1090. Abel, Mary Hinman. 1904. Beans, peas, and other legumes as food. *Farmers' Bulletin* (*USDA*) No. 121. 39 p. See p. 11-13, 18-20. Revised. Illust. [1 ref]*

• ***Summary:*** A revised edition, 3 pages longer than the 1900 original. The information about soy is unchanged, however it is on different pages (see above). The section titled "Nutritive value of the legumes" (p. 18-20) includes a table titled "Composition of fresh and dried legumes compared with that of other foods." Under "Dried legumes," the composition of "Soy beans" (dry, containing 10.8% water) is given.

1091. Evans Seed Co., Inc. 1904. 1904 retail price list: Northern grown legume, forage plant, grain and grass seeds (Mail-order catalog). West Branch, Michigan. 24 p. 23 cm.

• ***Summary:*** A black-and-white photo on the cover shows a man, a woman, and a child (little girl) standing in a "Field of soys and pearl millet at West Branch, Michigan." Below that is written in large letters: "Our northern grown seeds are unequalled for hardiness, earliness, vigor, high germinating power and purity." Printed by Herald-Times Print., West Branch, Mich. At the top of the cover in small letters: "44º12' North Latitude."

Contents: Note to the American Farmer and Stockman. Our terms. Legume seed department. Soy beans. Cow peas. Field peas. Garden peas. Beans (*Phaseolus vulgaris*). Spanish field pea (*Lathyrus sativus*). The vetches (*Vicia villosa* and *V. sativa*). Velvet beans (*Mucuna utilis*). Lupines (Blue and Large White). Faba or Broad Beans (*Vicia faba*). Lentils (*Lens esculenta*). Pea nuts (*Arachis hypogœa*). The clovers. Northern Grown Grain and Forage Plant Department: Field corn, Russian emmer (*Triticum spelta*). Spring wheat. Oats. Barley (*Hordeum vulgare*). Japanese barnyard millet (*P.* [*Panicum*] *Crus Galli*). East India pearl millet (*Pennisetum spicatum*). Teosinte (*Reana luxurians*). New legumes for 1905 (the Japanese Muroran bean is a forage crop that is earlier than the earliest soy or cow pea). Grass seeds: Timothy (*Phleum pratense*) and Orchard grass (*Dactylis glomerata*). Meadow fescue (*Fescuta pratensis*). Awnless brome (*Bromus inermis*). Red top (*Argostis vulgaris*). Kentucky blue grass (*Poa pratensis*). Root seeds. Seed potatoes. Bacteriated soil ("sand containing the bacteria adapted to peas, soys, cow peas, vetches, lentils, broad beans, lupins, etc. Sold in new 16-oz. cotton bags at $1.50 per 100 pounds. Not less than 100 pounds will be sold). A paradise for pork (Also called "hog heaven," it is a "combination crop." "Some plant corn, soys and mangels or sugar beets in alternate rows"). Chemical analysis vs. cow analysis [of feeds] ("All authorities, chemists and cows included, agree that the soy bean is the most digestible of all concentrated foods. And palatability–convince yourself. Plant an acre of soys and when they are ripening turn in your stock, your cows, horses, hogs, sheep, turkeys, ducks and chickens. They will tell you all about the palatability of the soy bean)." Standard of weights in Michigan: Beans, soy: 8-16 quarts of seed required per acre. Weight per bushel: 60 lb.

The note (p. 2) "To the American Farmer and Stockman" begins: "Greeting: It has always been our aim to be something more than seed sellers–or merchants." It states in detail the company's strong commitment to quality seeds. "Our terms are invariably net cash with order." The first section (p. 3+), titled "Legume seed department" begins: "From ancient times down to the present certain plants have been used for the purpose of renovating and maintaining the fertility of soils... It was not until 1888 that a German scientist discovered by which process these plants enrich the soil. Briefly, legumes are plants having the power, by aid of certain bacteria, of converting atmospheric nitrogen into nitrates available for plant food, and of storing it up in root nodules, or tubercles. We do not yet know whether this process is a mechanical or chemical one."

However, we do know that nitrogen, one of the vital elements of plant food, is the most elusive, the most expensive to buy and the most difficult to retain of all the elements that go into the production of any crop. We know that a crop of soys, peas, clover, or vetches enriches the soil by adding to the available nitrogen. It is absolutely true that the nitrogen removed from an acre of land by a crop of oats, corn, wheat or timothy often exceeds in value the entire cost of producing a crop of legumes. There can be no greater folly in farming than the continued production of cereals without a rotation in which legumes form a part, and the shorter the rotation the better for the land and the bank account... The *Leguminosæ* includes beans, peas, vetches, clover, lentils, cow peas, soys, faba, lupins, etc."

The subsection titled "Soy beans (*Glycine hispida*)*"* (p. 4-7) gives the most information about this crop to be found in any American seed catalog up to this time. "German, Soja. Japanese, daidzu [daizu]. Next to wheat this is probably the oldest of cultivated plants. It is mentioned in Chinese writings prior to 500 B.C., and remains to this day one of the staple crops of China and Japan. It was originally introduced into America about 1925-30, but failed to attract attention to its merits. It was not until the researches and experiments of Profs. Brooks [Massachusetts] and Georgeson [Kansas], within the past fifteen years, that the true value of soys became known. Since 1896 they have grown more rapidly in popularity than any crop ever introduced into America. Soys contain a higher percentage of protein in more digestible form, than any other farm product, and at a fraction of the cost of the so-called 'concentrated feeds.'" A table shows

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a nutritional analysis of five varieties of soys made by the Michigan Experiment Station [published in Bulletin No. 199, April 1902]. Ito San and Medium Early Yellow contain the most crude protein (41.04% and 41.52%). A photo shows two uprooted soybean plants, each covered with pods.

Page 5 continues: "Soya are as easy of culture as common beans, cow peas, or corn. They succeed on any soil that will produce corn. They will withstand drouth and wet weather that would ruin most of our staple crops, and will pass uninjured through frost that kills corn to the ground. This has been demonstrated hundreds of times here in Michigan. Scores of seedsmen catalogue soys with southern seed, generally the Mammoth Yellow. Such seed can be bought for $1.00 to $1.25 a bushel, but is absolutely worthless north of the Ohio river. We are the pioneers of the soy seed business at the north; have grown and sold them for the past 8 years [since about 1896]. We have not a bushel of soys grown outside of Michigan." "Evans' soys are known the world over. We sold them last year in England, Germany, Guiana [incl. British Guiana?], West Indies, Hawaii, Mexico and Canada.

Page 6 continues: "Plant soys in drills 28 to 30 inches apart, using 8 to 16 quarts seed per acre, according to variety and use. For ensilage, they may be planted with corn, but we believe it is more satisfactory to grow the two crops separately and mix them as they go through the cutter." The subsection titled "Varieties" gives details on each of the following: Ito San (named by Mr. Evans in honor of Marquis Ito, the Japanese statesman), Early Black or No. 6 (originated by Mr. Evans), Ogema, or Evans No. 9, Medium Early Green, Olive Medium (created and introduced by Evans), Medium Early Black.

Concerning: "Ogema, or Evans No. 9. Originated by Edw. E. Evans and offered for the first time last season. It is a cross of Dwarf Brown and No. 6 and is unquestionably the earliest of all soys. It can be planted later and farther north than any other variety. Beans dark chocolate color. Season 65 to 75 days. Stock limited." Ogema is the company's most expensive variety, selling for $7.50 per bushel, vs. $3.50 per bushel for most other varieties.

A table titled "Prices of soy beans" (p. 7) gives the prices of 12 varieties. The first seven are sold in quantities of one packet, quart, 4 quarts, peck, ½ bushel, and bushel. Most sell for $3.50/bu, but the price ranges from $3.00/bu for Ito San and Medium Early Yellow to $7.50/bu for Ogema. These seven are: Ito San, Ogema (earliest), Medium Early Green (general favorite), Olive Medium, Medium Early Black, Early Black (Evans No. 6), Medium Early Yellow. The last five varieties sold (all new) are: Dwarf Brown, Gosha, Rokugetsu [Rokugatsu?], Bakaziro [Bakajiro], and Hankow. Each is available only in the packet size at $0.15 per packet. On the last page of the catalog is a full-page order sheet.

Note 1. This is the earliest document seen (Aug. 2002) which mentions that turkeys eat or are fed soybeans.

Note 2. This is the earliest document seen (Aug. 2013) that mentions the following soybean varieties: Dwarf Brown, Hankow, Ogemaw, and Mammoth Yellow (one of three documents).

Note 3. This is the earliest English-language document seen (May 2003) that uses the word "bacteriated" to refer to soil containing nitrogen-fixing bacteria.

This catalog is owned by Special Collections, USDA National Agricultural Library, Beltsville, Maryland. Address: West Branch, Ogemaw Co., Michigan.

1092. Fesca, Max. 1904. Der Pflanzenbau in den Tropen und Subtropen [Plant cultivation in the tropics and subtropics. 2 vols.]. Berlin: Wilhelm Suesserott Verlagsbuchhandlung. Vol. 1: viii + 278 p. See vol. 1 (Erster Band), p. 159-65. 21 cm. Suesserotts Kolonialbibliothek. [2 ref. Ger]

• ***Summary:*** In Volume 1, in the chapter on legumes (*Huelsenfruechte, Leguminosen*), is a long section the soybean (*Die Sojabohne*) (p. 159-63), which focuses on soybean production. Contents: Introduction. Climate. Soil and cultivation of the soil. Fertilizers. Planting / sowing. Harvest. Yields. Composition of the seeds and straw. Soybean oil and cake in China. Food uses of soybeans in China and Japan, especially "Shoyusauce" (shoyu) from which the soybean derives its name. It is used in the preparation of Anglo-American sauces such as Worcestershire sauce, etc. A description of the preparation of shoyu is given, along with its composition based on analyses by O. Kellner and E. Kinch. "The fermentation lasts from at least 20 months up to 5 years; the longer the fermentation the better the sauce. The finest quality is a mixture of 3 and 5 year sauces." An analysis of shoyu presscake (*Shoyurueckstande*) is also given.

Note: This 3-volume work is volumes 1-2 in *Suesserotts Kolonialbibliothek*, vol. 708. Address: Germany.

1093. Hoshi, Hajime. 1904. Handbook of Japan and Japanese exhibits at World's Fair, St. Louis. n.p. 206 p.

• ***Summary:*** The Preface begins: "Since Commodore Perry, of the United States Navy, opened Japan to the world's commerce [in 1854], the foreign trade of the country has developed with wonderful rapidity. This startling rapid development of Japanese trade is due to the readiness and celerity [swiftness] with which the frank and courageous people of the Empire abandoned their old customs and turned their faces toward a new civilization. There was no hesitation, no halting, no looking backward. The entire nation awoke with a start to the realization that it was moving in the wrong direction, and turned about and dropped easily in the march of modern progress. Foreign ideas were adopted, foreign methods were imitated and frequently improved upon, and the closest commercial relations were sought with the United States and the countries of Europe. With this adoption of foreign ideas came a desire for

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foreign goods. New methods made necessary the use of Western machinery in factories and on farms. Even Western foodstuffs became popular.

"Japan's total foreign commerce was increased from 26.6 million yen in 1868 to 582.6 million yen in 1902 or 2,219 per cent. The total exports were increased from 15.5 million yen in 1865 to 281.7 million yen in 1903 or 1,811 per cent. During the same period the imports increased from 10.7 million yen in 1865 to 300.9 million yen, or 2,790 per cent."

Baron Masanoho Matsudaira is Vice-President of the Imperial Japanese Commission to the Louisiana Purchase Exposition.

Concerning "Shoyu, or soy.–The shoyu manufactories in 1901 numbered 15,993, producing 68,940,680 gallons annually" (p. 28).

In 1902 Japan's principal exports in million yen were (p. 40-41): Copper, crude and refined–10.3. Rice–6.7. Tea, green (pan fire)–6.2. Tea, green (basket fire)–3.6. Camphor–3.4. Cuttle fish–1.8. Fish oil–1.5. Sake–0.83. Sea weed–0.61. Shoyu (soy)–0.39.

Palace of Agriculture (p. 119). "In the Palace of Agriculture the Japanese Exhibit occupies an area of 8,667 square feet." "Tea, one of the leading products of Japan, forms the most important exhibit of the space." "There is a large exhibit of shoyu or soy, a famous Japanese sauce made from beans. This sauce is in as common use in Japan as salt and pepper are in the United States. It is used as a relish on the table, also for cooking and salad dressing. Soy is wholesome and exceedingly cheap, which qualities, combined with its splendid flavor, make it a most desirable article of diet.

"Sake, the national drink, is also well represented in the exhibit."

The names of the members of the Japanese Commission and of the commissioners now in the United States are given on pages 112-13. he names of the members of the Japan Exhibit Association are given on page 113. Note: Nowhere is this long and detailed book is the name of Jokichi Takamine mentioned.

The Japanese Garden: Area, 150,000 square feet is described in detail (p. 114-15), as are each of the buildings in it. These include the Japanese Pavilion (the building materials for it "were brought from Japan. It was built entirely by native carpenters after the style of Daimyo's garden–Goten, of about 400 years ago. The architectural style of the building is Heike. The artistically curved roofs, majestically projecting one upon the other..."). Note: This was the building that was renamed Sho-Foo-Den / Sho-Fu-Den by Jokichi Takamine. Other buildings are the Observation Cottage and (standing by the lake) and a reproduction of the Kinkaku Temple in Kyoto (*Kinkaku-ji,* the Temple of the Golden Pavilion).

"The total space occupied by Japan [p. 115] covers 282,455 square feet. he area is three times as great as that covered by Japan at the Paris Exposition in 1900, and three times as large as Chicago in 1893."

"Soy brewers and trade marks" (p. 161, full page, with the trade mark of each shown large and clear): Kikko Sakai: Brewer K. Toyoda, Sakai, Osaka, Japan. Yamakawa-roku: Brewer R. Wakaye, Osaka, Japan. Kikko Mata: Brewer M. Kawamori, Sakai, Osaka, Japan. Mitsu Uroka: Brewer G. Tagashima, Kaidzuka, Idzumi, Japan. Uyeki: Brewer K. Uyeki, Osaka, Japan. Yama-Ju: Brewer M. Yamamoto, Osaka, Japan. Maruichi Jo: Brewer S. Masuda, Osaka, Japan. Maru Matsu: Brewer Y. Motsutani, Osaka, Japan. Hon Ichi: Brewer K. Yehara, Osaka, Japan. Sun: Brewer K. Shindo, Osaka, Japan.

Across the bottom of this page: "The virtue of the sauce and direction for use. The Japanese Soy with the Trade Marks is brewed from the very best Japanese [soy] bean, wheat and salt. The Soy is of dark brown color and is specially adapted for every kind of boiled, baked and fried fish; for chops, steaks and cutlets and cold meats; also for cooking of vegetables. The article possesses a particular taste and flavor and advances [enhances] the digestion.

"The Japanese Soy with these Trade Marks may be stored for a long period and is guaranteed never to turn bad.

"The article is sold for 6 to 9.60 yen per case of 4 *go* bottles, F.O.B. Osaka. An order to any of the brewers will receive prompt attention."

Page 166: 1/3 page display ad for Ueki Shoyu, Osaka. Page 180: ½ page display ad for "Best shoyu. Ota Shoyu Brewing Company, (912 Minamiota Machi, Yokohama, Japan) was established in 1850..." Its shoyu is known as "Fuji Shoyu." "Second medal in 1859 and first Silver Medal in 1903. Exported to Germany, America, Hawaii, Corea, Shanghai, Hong Kong, England, Canada, Australia, India, Singapore, etc., through G. Brandel & Co., No. 41 Yamashita Cho, Yokohama."

Page 189: Full-page ad for "Shoyu, Japanese sauce. Izumiyama Shoyu Brewing Co., Hachinohe Mutsu, Japan. Its two trade marks are shown.

Page 193: ½ page display ad for "Maru Sen Shoyu. Awarded medals and shohai at the World's Exhibition, Paris, 1903, and others. Marusen Shoyu is brewed by Sutejiro Hosono, Kinatomura, Kitakanbara, Niigata ken, Japan.

Page 197: Full-page ad for Kameya Shoyu & Company, Nakaidzumi cho, Shidzuoka ken [Shizuoka-ken], Japan. A large photo shows Sokichi Tsukichi, proprietor, standing in a Western-style room with one hand on a chair. This shoyu is exported to the United States, Hawaii, Europe, China, and Corea.

1094. Kingsford, Anna Bonus. 1904. The perfect way in diet: A treatise advocating a return to the natural and ancient food of our race. 4th ed. London: Kegan Paul, Trench, Truebner & Co., Ltd. xii + 121 p. 17 cm. [92* footnotes]

• ***Summary:*** The Preface states: "The following treatise is

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a translation, revised and enlarged, of my 'These pour le Doctorat,' which, under the title 'De l'Alimentation Végétale chez l'Homme,` I presented in the month of July, 1880, at the Faculté de Médecine of Paris on completing my medical studies and taking my degree.

"The original thesis was published in Paris in the French language, and subsequently translated into German and issued with illustrative notes and other additions by Dr. A. Aderholdt. Encouraged by the success obtained by these two editions, and by the favourable notices they elicited from various foreign scientific and popular critics, I offer the present work to English readers, confident of a kindly welcome from the friends of the reform I advocate, and hopeful of a serious and intelligent hearing from those who as yet are strangers to the merits of that reform.

"The French and German editions of this treatise include an Appendix, containing short notices and citations from the works of the chief exponents and exemplars of the Pythagorean system of diet. In the present volume this Appendix is suppressed in favour of a forthcoming `Catena of Authorities Denunciatory or Depreciatory of the Practice of Flesh-Eating,' by a `Graduate of Cambridge'; an excellent and ample compendium to which the reader is referred.

"That I have dwelt chiefly on the aspects, physical and social, of my subject, and touched but lightly on those moral and philosophical, is not, assuredly, because I regard these last as of lesser importance, but because their abstruse and recondite nature renders them unsuitable to a work intended for general reading.

"Finally, if any into whose hands this book may fall, should be inclined to think me over-enthusiastic, or to stigmatise my views as `Utopian,' I would ask him seriously to `consider whether ` Utopia' be not indeed within the realisation of all who can imagine and love it, and whether, without enthusiasm, any great cause was ever yet won for our race. Man is the master of the world, and may make it what he will. Into his hands it is delivered with all its mighty possibilities for good or evil, for happiness or misery. Following the monitions and devices of the sub-human, he may make of it–what indeed for some gentle and tender souls it has already become–a very hell; working with God and Nature, he may reconvert it into Paradise."

Page 26. Japan. "`The Japanese not only abstain from animal food, but even from milk and its productions. One of the laws which they most religiously observe is, not to kill, nor to eat anything that is killed.'"

"'Fish and rice are staples of the Japanese diet... Beans are an important article, and from these is manufactured *tofee* [sic, tofu]–literally bean-cheese, an article largely used by the poorer classes'" (*New York World* 1887).

Note: Anna Kingsford lived 1846-1888. Address: Doctor of Medicine of the Faculty of Paris, 11 Chapel Street, Park Lane [London?].

1095. Lemaréchal, J.M. 1904. Dictionnaire japonais-français [Japanese-French dictionary]. Tokyo: Librairie Sansaisha; Yokohama: Librairie Max Nössler & Co. viii + 1008 p. See p. 133. Illust. 26 cm. [Fre; jap]

• ***Summary:*** Page 133: gammodoki, 2 Cc = Chinese characters given, *Tôfu* frit auquel ou mêle differents légumes hachés.

Page 877: tôfu, 2 Cc, Pâte de haricots détrempés dans l'eau et broyés sous une meule; yaki-dôfu, tôfu rôti. Address: M.A., de la Société des Misions-Étrangèrs de Paris.

1096. Loew, O. 1904. Ueber die Anwendung des Frostes bei der Herstellung einiger japanischer Nahrungsmittel [On the use of frost in the production of some Japanese foods]. *Mitteilungen der Deutschen Gesellschaft fuer Natur- und Voelkerkunde Ostasiens* 10(1):75-76. [Ger]

• ***Summary:*** Prof. Dr. O. Loew discusses the preparation of frozen tofu (*kôri-tofu*), frozen konnyaku (*kôri-konnyaku*), and frozen mochi (*kôri-mochi*). Address: Japan.

1097. Perkins, W.R. 1904. Chemical work. *Mississippi Agricultural Experiment Station / Agricultural and Mechanical College of Mississippi, Annual Report* 17:35-39. For the fiscal year ended June 30, 1904.

• ***Summary:*** In the section on "Field experiments for 1903," the subsection titled "Soja beans" (p. 38) states: "This crop gave yields that indicate the likelihood of its becoming a formidable rival of the cowpea as a producer of forage and as a restorative crop. Seven varieties [whose names are not given] were grown, six of which were Japanese varieties imported and distributed by the Bureau of Plant Industry at Washington, D.C., and the Mammoth Yellow variety procured from seedmen. The latter variety produced 4.5 tons of hay per acre with 40 per cent of moisture present. It kept perfectly in a stack and was entirely consumed by sheep during the winter. 24 bushels of seed per acre were secured on a part of the field."

Note: This is the earliest document seen (one of three documents, Aug. 2004) that mentions the soybean variety Mammoth Yellow. Address: M.S., Assoc. Chemist [Agricultural College, Mississippi].

1098. Smith, Hugh McCormick. 1904. The seaweed industries of Japan. *Bulletin of the Bureau of Fisheries* (*USA*) 24:133-81.

• ***Summary:*** A remarkable article, with reproductions of many old Japanese illustrations, plus many current photos. Contents: Introduction (with 7 early references, 3 in English). Kanten, or seaweed isinglass. Funori, or seaweed glue. Kombu. Amanori or laver. Seaweed iodine. Other Japanese algæ and their uses.

The article begins: "Seaweeds are among the most valuable of the aquatic resources of the Japanese Empire, and conduce largely to the prominent rank attained by the

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fisheries of that country. While marine plants are extensively utilized in France, Ireland, Scotland, and other European countries, in the East Indies, in China, and elsewhere, in no other country are such products relatively and actually so important or utilized in such a large variety of ways as in Japan." Only one species, laver (*nori; Porphyra lacinda*), is extensively cultivated. "The seaweed preparations to which special attention is given are kombu, amanori [nori], funori, kanten, and iodine."

Under "Food qualities of kombu" (p. 153): "Fronds after being scraped once are cut in 3/4-inch squares and boiled in soy-bean sauce, which treatment preserves them for a long time, and these pieces make an excellent relish, tasting like caviare [caviar] or anchovy sauce. The Japanese name, *tsukudani*, means 'boiled with soy-bean sauce.'" The average wholesale price of "kombu chips in soy sauce, 1.10 yen per kamme" (1 kamme [kan] = 8.28 pounds) (p. 154).

Under "Preparation and utilization of porphyra" [nori] (p. 159): "Recently it has been boiled with Japanese (soy bean) sauce and put up in tins."

The section titled "Other Japanese algæ and their uses" notes (p. 163-65) that many species are seasoned in soy-bean sauce: *Arame* (*Ecklonia bicyclis*) "is chiefly eaten as an ingredient of soups, as a salad, or mixed with soy-bean sauce."

Hijiki (*Cystophyllum fusiforme*) "is sun dried and is ready for use after boiling in fresh water or cooking with soy-bean sauce."

Wakame (*Undaria pinnatifida*)*:* "Before being used it is washed with fresh water, and then eaten as a salad, cooked with soy-bean sauce or put in soups... The thick root of wakame, called *mehibi*, is often dried, shaved, cut into slices, or eaten with sauce (miso)."

Suizenji nori (*Phylloderma sacrum*)*:* "This product is ordinarily eaten with raw fish (*sashimi*)*;* the dry weed is soaked in fresh water, and after it has swelled, boiling water is sprinkled over it and then soy-bean sauce is added. In the time of the feudal system this preparation was regularly presented to the local daimyo."

Miru (*Codium tomentosum, C. mucronatum, C. lindenbergii*)*:* "After drying they are preserved in ask or salt. They are prepared for food by boiling or baking in water, and are put in soups; or, after washing, by mixing with soy-bean sauce and vinegar."

Haba-nori (*Phyllitis fascia*)*:* "This plant is prepared for use after the manner of 'awa-nori' (*Porphyra*), principally by peasants of the provinces of Awa and Sagami. The young fronds are dried in the sun in sheet form and subsequently parched, powdered, and mixed with soy-bean sauce."

Matsuma (*Chordaria abietina*) "abounds in northern Japan and is consumed by the peasantry. It is preserved by packing in salt, and is cooked with soy-bean sauce."

Mozuku (*Mesogloia decipiens*) "is preserved by salting, and is eaten after washing out the salt and immersing in soy-bean sauce or vinegar."

Hondawara (*Sargassum enerve*) "When the plant is young it is eaten in soup or with soy-bean sauce."

Somen-nori (*Nemalion vermiculare*) "is eaten in soup or after mixing with vinegar and soy-bean sauce."

Tosaka nori (*Kallimenia dentata*) "is preserved by drying, and is eaten as a condiment or mixed with soy-bean sauce."

Other Japanese algæ which are eaten are: *Awo-nori* (*Enteromorpha compressa, E. intestinales, E. linza*). *Aosa* (*Ulva lactuca*), "the well-known sea lettuce of the United States." *Tsuno-mata, hosokeno-mimi* (*Chondrus crispus, C. ocellatus, etc.*). "The well-known Irish moss. *Ogo-nori* (*Gracilaria confervoides*).

"Other Japanese algæ which are dried and eaten or utilized in various other ways are: *Cata-nori* (*Gigartina teedii*), *comen-nori* (*Grateloupia affinis*), *mukade-nori* (*Grateloupia filicina*), *makuri* (*Digenea simpler*), *ego* (*Carnpylaephora hypneoides*), *okitsu-nori* (*Gymnogondrus flabelliformis*), *and tosaka* (*Sarcodia species*)*."* Address: Deputy U.S. Fish Commissioner.

1099. *Treasury Decisions under Tariff and Navigation Laws, Etc.* 1904. Bean cake, bean stick, and potato cake (24513–G.A. 5361). 6:542-44. For the year 1903.

• ***Summary:*** Bean cake is koya tofu [dried-frozen tofu]. Bean stick is dried yuba sticks. Potato cake is konnyaku.

"The merchandise in question in these cases was imported from Japan and China into the port of Honolulu, Hawaiian Islands, and consists of so-called bean cake, bean stick, and potato cake. The goods were classified and assessed for duty under the provision for "all vegetables prepared or preserved," in paragraph 241 of the tariff act of 1897 at 40 per cent ad valorem, and are claimed to be dutiable at 20 per cent ad valorem, as nonenumerated manufactured articles, under section 6 of the act.

"The bean cakes are small, approximately rectangular shapes of porous consistency and yellow color, which break into crumbs under pressure. The bean sticks [dried yuba sticks] are lengths of hard, brittle, yellow substance, having a glazed appearance and resembling a piece of molasses candy.

"Kikujiro Shimada, owner of the Tofu Manufactory in Yokohama, who has been engaged in this business over thirty-five years, thus describes the manner in which bean cake is made: To manufacture bean cake, koya tofu, first keep soja beans in water at least twenty-four hours (beans are now mostly imported from China), and when the beans become very soft, grind them under the millstone; mix the ground beans with water and boil the mixture in kettles about half an hour. When cooled, by pouring it into a cloth sack and squeezing it, we get a milk-like juice, which is too rich for tofu manufacturing. What remains in the sack is mixed with water and boiled again and the squeezing repeated. The thin milk-like juice we get is mixed with the rich one

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obtained by the first squeezing, and while the mixture is yet warm it is poured into the mold and a little quantity of nigari (the brine left by the diliquescence [deliquescence] of a salt) is added to cause the bean juice to coagulate. The mold has several holes lined with fine cloth to allow the water to drop away. In the course of an hour or so we get tofu, white jelly-like food. Slice the tofu carefully and freeze it in cold nights and then dry it in the sun. Repeat this for days and nights until the frozen tofu is perfectly dry, when it is marketable.

Note: This is the earliest English-language document seen (April 2013) that uses the term "koya tofu" to refer to dried-frozen tofu.

"The process of making bean stick is described in a letter dated February 20, 1903, from the commercial museum, department of agriculture and commerce, Tokio, received by the collector from the same source as the manufacturers' affidavits above quoted. It is as follows:

"Yuba (bean stick). Keep the soja beans in water until they are very soft; then rub them fine in "suribachi" (mortar like earthen pot) and then boil these. Thick creamlike matter will collect on the surface. This when dried by fire is yuba" (p. 544).

1100. Lea and Perrins. 1905. Lea & Perrins' Sauce (Ad). *Japan Weekly Mail* (*Yokohama*) 43(11):24. Jan. 7.

• ***Summary:*** This black-and-white ad (5 by 4 inches) states: "The original and genuine Worcestershire. By Royal warrant to His Majesty the King."

Note: This is the earliest document seen (Feb. 2012) that contains the phrase "By Royal warrant to His Majesty the King" in connection with Lea & Perrins' Worcestershire sauce. The phrase was used frequently in ads until about 1916. Address: England.

1101. Saito, Kendo. 1905. Microbiological studies on the brewing of Japanese Soja-Sauce. *Botanical Magazine* (*Tokyo*) 19(216):75-77. Jan. 20. Bound after p. 119 of Japanese text. [1 ref. Eng]

• ***Summary:*** The author has been able to isolate the following microorganisms from koji and moromi: 1. Moulds: *Aspergillus Oryzae, Rhizopus sp., Tieghmella sp.* Others incl. *Penicillium glaucum, Cladosporium herbarum,* etc. 2. Bacteria: *Sarcina Hamaguchiae* and *Bacterium Soja* (both new species). 3. Yeasts: *Saccharomyces Soja* (new species) grows copiously in moromi [the mash]. Film yeasts incl. *Saccharomyces farinosus* Lindner [Pichia farinosa (Lindner)], *Mycoderma sp.,* etc.

Note 1. This is the earliest document seen (Jan. 2009) describing Japanese investigation on the yeasts in shoyu mash (*moromi*).

Note 2. This is the earliest document seen (Jan. 2009) which mentions that *Saccharomyces* yeasts are involved in the shoyu fermentation. Address: Botanical Inst., Imperial Univ., Tokyo, Japan.

1102. Akizuki, Yoshizo; Nakanishi, Yoshitaka. 1905. Shôyu shiken seiseki hôkoku [Analysis of shoyu]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 275. p. 49-51. Jan. [Jap]
Address: Zeimusho-kannai, Matsuyama-shi, Ehime-ken, Japan.

1103. Tokyo Plant, Seed & Implement Co. (Tokyo Konoen). 1905. *Agriculturist* (*The*) No. 125. Jan. 56 p. [Jap]

• ***Summary:*** This illustrated monthly Japanese-language periodical, which began publication in 1894, has two main parts and functions: (1) Articles that promote agricultural theories and techniques to the public in easy-to-understand language. (2) A catalog of the publisher's seeds, plants, bulbs, and implements.

The catalog section titled "Beans" (p. 8+) includes two entries (p. 9) for soybeans (*daizu*)*:* (1) Juninko ("ten people like") variety. 5 sen per *gô* (100 sen = 1 yen; 1 *gô* = 180 cc = 0.763 cups {U.S.}). 40 sen per *shô* (1 *shô* = 1.8 liters = 1.903 quarts {U.S.}). A recently improved variety with medium sized, shiny seeds. They are good for making shoyu, miso, or other foods. (2) Kimusume ("fresh daughter") variety. 5 sen per *gô.* 40 sen per *shô.* Mid-season / medium-maturing, summer varieties that yield a big harvest. Address: Tokyo, Japan. Phone: 2421.

1104. Yokohama Nursery Co., Ltd. 1905. Descriptive catalogue... for 1905. Yokohama, Japan. 94 p. Illust. Index. 26 cm. [Eng]

• ***Summary:*** On the cover of this English-language catalog is an illustration of two different species of wistaria blossoms. In the section "Price list of seeds" (p. 82+) is a subsection (p. 87) titled "Some vegetable seeds." The contents (incl. the entry for "soy bean") is identical to that in the 1903 (and 1901) catalog. Address: P.O. Box No. 72. Nos. 21-35

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Nakamura, Yokohama, Japan.

1105. *USDA Bureau of Plant Industry, Inventory.* 1905. Seeds and plants imported during the period from September, 1900, to December, 1903. Nos. 5501 to 9896. Seed and plant introduction and distribution. No. 10. 333 p. Feb. 8. Also titled USDA Bureau of Plant Industry, Bulletin No. 66.
• ***Summary:*** Soy bean introductions: Glycine hispida.

5764-5766. "From Washington, D.C. Three varieties of soy beans from Japan, grown during the season of 1900 on the Potomac Flats.

"5764. Common. (S.P.I. No. 4912.)

"5765. Best White. (S.P.I. No. 4913.)

"5766. Best Green. (S.P.I. No. 4914.)"

6312/6314/6326/6333 -6336. "From the Tokyo Seed and Plant Company, Tokyo, Japan. Received April 20, 1901.

"6312. *Black Flat.*

"6314. *Yoshioka.*

"6326. *Rokugatsu.*

"6333. *Gosha.*

"6334. *Black Round.*

"6335. *Green Medium.*

"6336. *Bakaziro"* [*Bakajiro*].

6379. "Grown on the Potomac Flats, District of Columbia, under the direction of W.R. Beattie, from No. 3870."

6386/6396/6397/6414/6416. "From Pyeng Yang, Korea. A collection of seeds of economic plants which are cultivated in Korea. Presented by Rev. W.M. Baird. Received May 3. 1901.

"6386. *Black.*

"6396. *White.*

"6397.

"6414. 'Plant in May.' (Baird.)

"6416. *Black.*" Note:

Note 1. This is the earliest document seen (June 2000) concerning soybeans in Korea, or the cultivation of soybeans in Korea.

6556/6558-6561. "From China. Received through Dr. G.D. Brill, May 17, 1901. A collection of seeds and plants made during an extended trip through China in 1900. The notes regarding the various numbers are copied from letters written during this period, no separate descriptive list of the various introductions having been furnished. Doctor Brill's numbers are given.

"6556. (No. 57.) 'Much used for bean curd and oil all over central China. Probably as many of these are grown as all the other varieties together.' (*Brill.*)

"6558. From Hankow. (No. 59.) 'Used for bean curd and oil. Considered better than No. 6556.' (*Brill.*)

"6559. From beyond Chiu Niu. (No. 60.) 'Planted between the rows of rice and ripening late in the fall, after the rice is harvested. Used the same as No. 6556, only quality poorer. Will grow on very wet land.' (*Brill.*)

"6560. From beyond Chiu Niu. (No. 61.) 'Planted and used the same as No. 6559. Planted in July or August.' (*Brill.*)

"6561. From Hankow. (No. 62.) 'A black bean, used for same purposes as Nos. 6559 and 6560, but of better quality. Not planted with other crops.' (*Brill.*)*"*

8422-8424. "From Yokohama, Japan. Received through Dr. S.A. Knapp, February 24, 1902.

"8422. *Ita Name.* Early.

"8423. *Ita Name.* Medium.

"8424. *Ita Name.* Late." Note 2. This is the earliest document seen (Jan. 1999) that contains the words/name "Ita Name," which make no sense in Japanese. Perhaps "Eda Mamé" was intended.

8489-8497. "From Washington, D.C. Received March 10, 1902. A collection of seeds grown on the Potomac Flats by Mr. W.R. Beattie from seeds furnished by the Office of Seed and Plant Introduction.

"8489. Grown from No. 6314.

"8490. Grown from No. 6333.

"8491. Grown from No. 6334.

"8492. Grown from No. 6386.

"8493. Grown from No. 6396.

"8494. Grown from No. 6336.

"8495. Grown from No. 6397.

"8496. Grown from No. 6416.

"8497. Grown from No. 6312."

8584/8586. "From Chin-kiang, China. Received through Dr. S.A. Knapp from Rev. Dr. S.P. Barchet, Shanghai, China, April 15, 1902.

"8584. 'A very prolific, nearly white variety used for making oil and also for food. It is sometimes ground into flour and used for making cakes.' (*Knapp.*)

"8586. 'A very oily variety, used chiefly for fattening purposes. Planted in July or August.' (*Knapp.*)*"*

8900. "From Anjo, Japan. Received through Messrs. Lathrop and Fairchild (No. 963, June 29, 1902), July 24, 1902. 'Twenty-six numbered seeds of a giant soy bean presented to the Department by Mr. K. Obata, director of the Tokai branch agricultural experiment station at Anjo, Japan, on condition that should any of the seeds prove to have inherited the characteristics of its female parent he is to have returned to him a fair quantity of the beans which it produces. All the beans have been numbered, and it is desired especially that a record of each be kept for information. This "most exceptional sport" ["an individual exhibiting a sudden deviation from type beyond the normal limits of individual variation usually as a result of mutation, esp. of somatic tissue"] from which these beans are taken measured 12½ feet in length and had a stem 1 inch in diameter at the base. It yielded about one-fifth of a gallon of beans, while ordinary plants, I am assured by Mr. Obata, give from 50 to 60 seeds only. Its root system is well developed, but whether unusual it is impossible to say,

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as it was dug before Mr. Obata saw it. The history of this "most remarkable sport" is as follows: Mr. J. Miyazaki, a descendant of a Samurai and now a second-hand clothier in the village of Okasaki [Okazaki?], found in his small back yard a soy bean which neither he nor his wife had planted purposely, but over which they quarreled, the wife wishing to pull it up because it grew to such unusual proportions and spread over the whole yard. Mr. Miyazaki, however, found in this abnormal plant something to interest him, and when the local district fair was held in Mukada in October he dug up the plant and exhibited it there, but he unfortunately and thoughtlessly ate up most of the beans. Mr. Obata, of the experiment station at Anjo, saw the plant at the fair, visited Mr. Miyazaki's place, and rescued the remaining handful of seed. He got samples of the soil where the plant grew and has sown about 20 seeds in this soil at the experiment station. I have seen and photographed this remarkable sport and think it worth of the most careful attention.' (*Fairchild.*)"

9344. "From Chiu-hua, China. Secured by Dr. S.P. Barchet, of the United States consulate, Shanghai, China, at the request of Dr. S.A. Knapp. Received January 22, 1903. *Chiu-hua.* 'In case of future reference to the bean, if you call this the *Chiu-hua* bean I shall know what is meant, in the absence of a botanical name, as I have not seen this bean anywhere else. It is sown broadcast in paddy fields before the rice is harvested. The moist ground favors the sprouting, and the standing grain shields the sprouting plant from the sun. By the time the rice is harvested the beans have taken firm roots and require no further care. Horses and cattle are very fond of them green or in the ripe state. The bean also makes a good food for man. This bean I think well worth a trial in the Southern States.' (*Barchet.*)"

9407-9418. "A collection of soy beans grown by Mr. W.R. Beattie on the experimental grounds on the Potomac Flats, from introduced seed.

"9407. Grown in 1902 from S.P.I. No. 4912.
"9408. Grown in 1902 from S.P.I. No. 4913.
"9409. Grown in 1902 from S.P.I. No. 4914.
"9410. Grown in 1901 and 1902 from S.P.I. No. 6312.
"9411. Grown in 1901 and 1902 from S.P.I. No. 6333.
"9412. Grown in 1901 and 1902 from S.P.I. No. 6334.
"9413. Grown in 1901 and 1902 from S.P.I. No. 6336.
"9414. Grown in 1901 and 1902 from S.P.I. No. 6386.
"9415. Grown in 1901 and 1902 from S.P.I. No. 6396.
"9416. Grown in 1901 and 1902 from S.P.I. No. 6397.
"9417. Grown in 1901 and 1902 from S.P.I. No. 6414.
"9418. Grown in 1901 and 1902 from S.P.I. No. 6416."

Note 3. This is the earliest document seen (June 2007) that clearly refers to the cultivation of soybeans in Washington, DC (on the Potomac Flats). This document contains the earliest clear date seen for the cultivation of soybeans in Washington, DC (1900).

Note 4. This is the earliest document seen (March 2003) that mentions the Potomac Flats, an experimental garden owned and used by the USDA in Washington, DC, before it purchased the Arlington Farm in 1900. Even before that, starting in 1865, there was an experimental garden around the original USDA building on The Mall. The Potomac Flats were acquired by the USDA in 1899. They were located in Washington, DC, on the banks of the Potomac River, probably in what is now Potomac Park.

Note 5. This is the earliest document seen (July 1998) concerning David Fairchild and soybeans. Address: Washington, DC.

1106. Kadono, C. 1905. The diet of the Japanese. *Times* (*London*). Feb. 11. p. 6, cols. 3-4.

• ***Summary:*** This article is actually mostly about soya beans and their products. "It is well known that the Japanese diet consists chiefly of rice, vegetables, and fish, with very small and occasional additions of butchers' meat. The relative quantities of these, and vegetables and products thereof used, would be interesting and in some respects instructive.

"The following bill of fare, which attempts to give the three meals of a day for a family of moderate circumstances, will show how they live. It may also be said that all Japanese live rather simply whether high or low in their station of life, and the menu can be taken as typical of all classes.

"Breakfast (about 7 to 7:30 a.m.).–Miso soup (with vegetables, tofu, &c.), pickles, boiled rice, tea (sometimes raw egg or boiled sweet soya beans, or natto, &c.).

"Lunch (12 noon).–Fish boiled in soya, vegetables stewed in soya, pickles, boiled rice, tea.

"Supper (6 to 6:30 p.m.).–Soya soup (with vegetables, fishes, &c.), raw fish sliced and eaten with soya sauce, broiled fish (or boiled) with vegetables (or butchers' meat or fowl and vegetables stewed), rice, tea...

"From the foregoing it can be seen how cereals and vegetables predominate in Japanese diet. Rice and miso and soya, as will be seen from the menu, form the predominant feature of the food, and it may not be an exaggeration to say that the Japanese physique is mainly built up on the products of soya beans, such as miso, soya sauce, tofu, &c."

There follows a detailed table titled "Analysis of Soya Beans and Their Products. (Extract from a table by Mr. C. Omura.)" Nutritional analyses are given for the following, written exactly as they appear: Soya beans (5 varieties), miso (white, red Osaka, red Tokio, red Sendai), soya sauce (regular or Noda), tofu, dried frozen tofu, fried tofu, mash residue from tofu (Okara), yuba (Dried skim off tofu-mash), natto (Steamed beans with surface fermentation).

Note 1. This is the earliest English-language document seen (April 2013) that contains the term "fried tofu."

"Soya beans are grown all over Japan and in Manchuria, and so far as I know cannot be had here [in England]. They are eaten boiled, either young or ripe." They are manufactured into those articles shown above, of which miso, soya, and tofu are the most important..." The author

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then gives a 5-10 line description for each of how miso, soya sauce, and tofu are made. Tofu is coagulated with a "strong brine. "The remnant (okara), being a white pulverized mass, called fancifully 'snow balls' by Japanese, is eaten boiled and seasoned with soya sauce.

"I have given Japanese meals to some English friends and most have pronounced the food excellent, and some have even braved the sliced raw fish with soya sauce."

Note 2. Concerning the idea that okara is sometimes fancifully called "snow balls," the term *kirazu* is written with three characters: yuki = snow, hana = flower(s), and sai = vegetable(s). Or the author may be referring to a local term from some part of Japan.

Note 3. This is the earliest English-language document seen (June 2013) that uses the Japanese word *okara* or the term "mash" or "mash residue" or "mash residue from tofu" to refer to okara.

Note 4. This is the earliest English-language document seen (April 2013) that contains the term "dried frozen tofu" (or "dried-frozen tofu"). Address: England.

1107. *Manchester Guardian.* 1905. What the Japanese eat. Feb. 13. p. 12.
• ***Summary:*** This is a summary of: Kadono, C. 1905. "The diet of the Japanese." *Times* (London). Feb. 11. p. 6, cols. 3-4. Mentions soya beans, miso soup, tofu, natto, soya sauce, etc.

1108. *Star* (*Canterbury, New Zealand*). 1905. Fish as war food: The fish eater versus the beef eater. Tabloids of brain and nerve food furnished as emergency rations. Feb. 25. p. 2.
• ***Summary:*** "(By Frank G. Carpenter, in the New Orleans 'Times-Democrat'). Washington [DC], December 29, 1904. I saw this morning a specimen of the emergency rations furnished the Japanese Army. It [katsuobushi] looked like a petrified banana of the largest size,...

There follows a conversation with Dr. Hugh M. Smith about fish in Japan.

"Raw fish. 'How about eating fish raw, doctor, I understand that is common in Japan?'

"'It is, and I assure you that raw fish are not so bad when properly served. Take a fresh tai [sea bream] and slice it thin. Bring it cold to the table and eat it with chop-sticks, dipping each bite in soy or bean sauce, and you will find it delicious. The Japanese, however, usually eat their fish cooked.'"

1109. Uyeno, K. 1905. Shinkoku-san kôji (Fonkyo) no kenkyû. Dai nikkai hôkoku [Examination of Chinese koji (Honkio). Part II.]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 276. p. 93-102. Feb. [Jap; eng]
• ***Summary:*** Examination of the saccharifying power of Chinese koji (Honkio) showed it to be somewhat weaker than that of malt. The by-product of saccharification is not maltose (a for malt and Japanese koji) but dextrose. Address: Yakugakushi, Japan.

1110. *San Francisco Chronicle.* 1905. Heaps of corpses cover wide plain: Inspection of Oku's battle field shows fighting was desperate. March 17. p. 5.
• ***Summary:*** After the Battle of Moukden [Mukden, in Manchuria], the Russians fled, setting "fire to stores and railway stations, but they were only partially destroyed. The Japanese saved large quantities of flour and bean cake and other supplies."

1111. *Chambers's Journal* (*London*). 1905. Japanese diet. Vol. 8. March 25. p. 270. Sixth series. [1 ref]
• ***Summary:*** "The nations of the world have now had the opportunity of learning many a valuable lesson from the general management of the Japanese army... It is interesting to note that the hard work done by the Japanese Tommy is performed on a dietary table which would hardly satisfy the soldiers of any other country. A large quantity of the Japanese soldiers' rations is made up of compressed fish-meal... Another form of food which seems peculiar to the Japanese army is obtained from kelp and other seaweeds, many of which afford very nourishing sustenance...

"At home this is the bill of fare of a Japanese family in moderate circumstances, according to C. Kadono in the *Times.* Breakfast (about 7 to 7.30 A.M.)–miso soup (with vegetables, tofu, &c.), pickles, boiled rice, tea (sometimes raw egg or boiled sweet soya beans, or natto). Lunch (12 noon)–fish boiled in soya, vegetables stewed in soya, pickles, boiled rice, tea. Supper (6 to 6.30 P.M.)–soya soup (with vegetables, fish, &c.), raw fish sliced and eaten with soya sauce, broiled fish (or boiled) with vegetables (or butcher meat or fowl and vegetables stewed), rice, tea. The Japanese physique is thus largely built up on the product of soya beans, which are grown all over Japan and in Manchuria, and from which miso, soya, and tofu are made. Soya beans, which, we believe, are not to be had in this country, are much richer in albumen than either beef or mutton. The Japanese diet, therefore, mainly consists or rice, vegetables, and fish, with very small and occasional additions of butcher meat."

1112. Suzuki, Tozaburo. 1905. Apparatus for making soy extracts. *U.S. Patent* 0,785,776. March 28. 6 p. Application filed 28 July 1904. 6 drawings.
• ***Summary:*** Concerns soy sauce production. Six illustrations (line drawings) show the apparatus consisting of 3 vacuum evaporating pans, in series, working on the multiple effect system. The pans consist of a cylindrical drum containing the extract to be evaporated, surrounded by a steam jacket; a rotary stirring device is provided in each drum for keeping the liquid in motion, and the extremities of the stirring arms are fitted with brushes. The concentrated extract from the last evaporator is discharged into a vacuum finishing receptacle

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heated by hot water. This receptacle is divided into 2 sections, containing shelves composed of hot-water tubes, upon which trays containing the concentrated extract are placed for final drying; the air can be exhausted from either section independently.

Note: This is the earliest U.S. patent seen related to soy. The five earliest soy-related patents in the United States were all issued to Tozaburo Suzuki. This is the second earliest soy sauce patent seen worldwide, after the British patent of Samuel Bowen of 1767. Address: No. 401 Jibeishinden, Sunamura, Minami Katsushika, Japan.

1113. Lust (Benedict). 1905. Mother's milk (Ad). *Naturopath and Herald of Health* (*The*) (*New York City*) 6(3):Unnumbered page at front. March.
• ***Summary:*** "... is undoubtedly the best food for infants. When this, however, is not procurable the best substitute for it only should be used... Dr. Lahmann's Vegetable Milk (*Pflanzen-Milch*). Dr. Lahmann's Nutritive Salt Health Cocoa (*Närsalz-Cacao*). Dr. Lahmann's (sweetened) Chocolate. Dr. Lahmann's Nutritive Extract (*Närsalz-Extract*). Dr. Lahmann's Oatmeal and Närsalz Biscuits. Dr. Lahmann's Japan Soya Sause [sic, Sauce] $1.00.

"Descriptive pamphlet on receipt of 2 Cents stamp. For sale by all naturopathic sanitaria and N.D's."

Note: This is the earliest document seen (Aug. 2007) in this periodical that mentions soy. Address: Sole importer and agent for the U.S., 124 E. 59th St., New York City.

1114. Seita, Masashi. 1905. Nattô no baikingaku-teki kenkyû [Bacteriological study of natto]. *Chugai Iji Shinpo* (*Medical News, Foreign and Domestic, Tokyo*) No. 590. p. 328. March. [Jap]
Address: Tokyo Microscope Society (Tokyo Kenbikyô Gakkai Kôwakai).

1115. Uyeno, K. 1905. Kankoku kôji no kenkyû hôkoku, dai ikkai [Report of examination of Corean (Korean) koji, No. I.]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 277. p. 203-12. March. [Jap; eng]
• ***Summary:*** Investigation of its composition, and its saccharifying action, power, and products. It is considered identical to the "Fonkio" and "Weekio" of northern China. Like Fonkio, it contains 2 varieties of Mucor, plus one other variety closely resembling these two. Address: Yakugakushi, Japan.

1116. Muto, Ryûnosuke. 1905. Nattô enchiimu no kenkyû [Studies on the enzymes of natto]. *Tokyo Iji Shinshi* (*Tokyo Medical Journal*) No. 1404. p. 665-76. April 8. [Jap]
• ***Summary:*** According to Muramatsu (1912): Mr. Muto isolated several bacteria from natto and concluded that only one bacillus, belonging to the *B. subtilis* group, was necessary for the production of natto. Address: Japan.

1117. Ishizaka, S. 1905. Shôyu jôzô fukusan yubun ni tsuite [On the oil by-product of shoyu]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 8(86):381-91. April. [Jap]

1118. Smith, Hugh M. 1905. Japan, the paramount fishing nation. *American Fish Culturist* 2(4):101-10. April. See p. 108.
• ***Summary:*** From *Transactions of the American Fisheries Society,* 1904: "Raw fish is one of the national foods. I acknowledge that my repugnance to it was great, but it was overcome by the first dish, for as prepared and served by the Japanese the thin, cold, boneless slices of perfectly fresh tai or mackerel, taken with chop sticks and dipped in soy-bean sauce, are delicious."

1119. *Vegetarian Messenger and Health Review* (*Manchester, England*). 1905. The diet of the Japanese (Abstract). April. p. 86-87.
• ***Summary:*** This article is a summary of: Kadono, C. 1905. "The diet of the Japanese." *Times* (London). Feb. 11. p. 6.

1120. Suzuki, Tozaburo. 1905. Apparatus for brewing soy. *U.S. Patent* 0,789,299. May 9. 4 p. Application filed 5 July 1904. 3 drawings.
• ***Summary:*** Three illustrations (line drawings) show the apparatus consisting of a closed heating chamber, the temperature of which can be regulated, one or more brewing tanks sunk in the chamber, and stirring shafts passing centrally through the brewing tanks. These stirring shafts carry several pairs of radial stirring arms, the arms of adjacent pairs being of different radial lengths; the pairs of radial arms are connected by transverse stirring slats, the whole being so arranged as to bring the arms and slats of adjacent stirrers out of alignment and alternately to thrust the soy from the path of one stirrer laterally into the paths of adjacent stirrers. Address: Sunamura, prefecture of Tokio, Japan.

1121. Kitao, Motohide; Akiyama, Takuji. 1905. Miso shôyu chû ka kurooru tetsu ni yotte sarichiru-san to kokuji no nannô o teisuru ni tsuki. I. [On the substance which appears to resemble the reaction of salicylic acid with ferroperchloride in miso and shoyu. I.]. *Eisei Shikenjo Iho* (*Bulletin of the Imperial Hygienic Laboratories*) 10:79-87. May. [Jap]
Address: 1. Gishi; 2. Gishu. Both: Eisei Shikenjo.

1122. Korentschewski, W.; Zimmerman, A. 1905. Izsl'dovanie kitayskago bobovago masla [Research on Chinese bean oil]. *Viestnik Obschestvenoi Gigieny, Sudebnoi i Prakticheskoi Meditsiny* (*Bulletin of Public Hygiene, Forensic-, and Applied Medicine*) (*St. Petersburg*) 5:690-93.

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May. [Rus]
• ***Summary:*** During the Russo-Japanese War (1904-05) the authors conducted investigations on soy oil in the chemical-bacteriological laboratory of the Russian military hospital in Harbin. They carried out human feeding studies on all aspects of soy-bean oil, which was consumed with a basal ration of rye bread, cabbage soup, and buckwheat or millet cooked as a porridge. Three soldiers of normal health served as subjects and ate 100 grams of unrefined soy-bean oil daily, in addition to 46 grams of fat supplied by the basal ration. The total fat of the diet was on average 97% digested.

Note 1. This is the earliest document seen (Sept. 2001) concerning the effects of dietary lipids (or soy-bean oil) on blood lipids.

Note 2. This is the earliest document seen (Jan. 2004) that mentions the term "Harbin" in connection with soybeans. Address: 1. Head, Korentschewski Laboratory; 2. Head, Zimmerman Pharmacy. Both: Biochemical Laboratory of Harbin Unified Hospital (Kharbinskago Svodnago No. 1 gospitalya)).

1123. Ishisaka, S. 1905. Shôyu-jôzô [Analysis of the oil obtained as a by-product of shoyu fermentation]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 281. p. 589-99. June. [Jap]

1124. Kitao, G.; Akiyama, T. 1905. Miso, shôyu-chû ka kuroru tetsu ni yotte sarichiru-san to kokuji no hanno o tei suru seibun ni tsuki, dai ikkai hôkoku [A constituent of miso and shoyu which gives, with ferric chloride, a reaction similar to that of salicylic acid]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 280. p. 483-88. June. [Jap; eng]
• ***Summary:*** This constituent is thought to be tyrosine, which is a decomposition product of albuminous matter contained in the raw material. Authors also give the results of experiments on that constituent and the distinction between it and salicylic acid.

1125. Korentschewski, W.; Zimmermann, A. 1905. Sanitaer-hygienische Untersuchung des chinesischen Bohnenoeles [A sanitary-hygienic investigation of Chinese soybean oil]. *Chemiker-Zeitung* 29(58):777-78. July 22. [Ger]
• ***Summary:*** Some 20 different species of these beans are sold under the name 'doutsa,' some being used as human food, others as fodder for cattle, and others again for the extraction of the oil. A kind of vermicelli is also prepared from certain species. The oil is expressed by means of primitive plant in the Chinese factories and exported in large quantities to Japan and Korea. The method of extraction consists in first crushing the beans into caked masses by means of mill stones, then heating them on stone slabs until the appearance of vapors, and finally expressing them in an iron receptacle. As first obtained the oil is turbid, but after some time becomes clear, the deposit consisting of sand particles and vegetable fibres. Only the clear oil is exported, but the turbid oil is sold locally. It has a faint odor recalling that of Chinese wood (tung) oil, is bland to the taste, and of a dark brown colour. Four commercial samples examined by the authors (one being obtained direct from the factory in Kharbin [Harbin]) gave the following results:–Water, 0.3 to 1.80 per cent.; specific gravity at 15ºC, 0.9264 to 0.9287; solidification point, -14.6º to -15.3ºC; saponification value, 207.9 to 212.6; ester value, 203.9 to 207.7; insoluble fatty acids, 93.6 to 94.28 per cent.; iodine value (Hübl), 114.8 to 137.2; solidification point of fatty acids, 16ºC to 17.3ºC; melting point of fatty acids, 20ºC to 21ºC; Maumené test, 102º to 116ºC; and acid value 1.86 to 15.46. It was concluded that the oil contained a large proportion of oleïn. Practical tests showed that the oil was readily absorbed by the system and possessed a high food value.

Note: This is the earliest document seen (March 2000) that mentions tung oil. Address: 1. Dr.; 2. Mag. pharm.; Both: Aus dem chemisch-bakteriologischen Laboratorium des I. Militaerhospitals in Charbin (Chemical-Bacteriological Lab., I. Military Hospital, Harbin, Manchuria).

1126. *France Militaire* (*La*) (*Paris*). 1905. La Guerre Russo-Japonaise: La cuisson des aliments dans l'armée japonaise [The Russo-Japanese War: The cooking of foods in the Japanese army]. 6(6464):1. July 27. [1 ref. Fre]
• ***Summary:*** We borrow the following interesting details from the *Streffleurs Oesterreichische Militaerische Zeitschrift.* The Japanese soldier does not eat bread, which greatly simplifies supply operations, making it unnecessary to construct of bakeries or to carry fresh bread–which is very cumbersome. Moreover, meat is not as important to the Japanese as it is to European armies. Japanese soldiers can easily do without meat, for they are not accustomed to eat it regularly; they are content with rice and dried fish, provisions which are easily transported and distributed. When they are given meat, it is cut into small morsels and stewed with vegetables. They eat it with a sort of piquant sauce (*sauce piquante*) [i.e., soy sauce].

The Japanese eat their meals cold voluntarily–even canned meat.

1127. Clement, Ernest W. 1905. Mito samurai and British sailors in 1824. *Transactions of the Asiatic Society of Japan* 33:86-123. July. See p. 113, 122. Read May 17, 1905. [5 ref]
• ***Summary:*** In 1638, Tokugawa Iemitsu, the 3rd Tokugawa shogun, issued his famous edict with two parts: First, it prohibited foreigners from landing on the coast of Japan. Second, it prohibited Japanese from leaving Japan. Only a limited amount of trade was permitted at Nagasaki with the Dutch and the Chinese.

Yet no policy, no matter how stringent, could prevent the winds and currents from carrying foreign vessels to the

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Japanese shores. The seclusion became even more difficult to enforce after about 1750, when whaling and merchant vessels began to frequent the waters of the Pacific Ocean.

Page 88 cites three documents that discuss the attempts made before Commodore Perry's visit to open intercourse with Japan. Mito was a fief (*han*) on the eastern cost of Japan just northeast of today's Tokyo. Before 1824 various western ships were seen off the coast. "In 1823, some fishermen discovered a foreign ship off the coast of Hitachi [a village in Mito] and had an opportunity to go aboard. In the ship they found many swords, guns, etc.; and they saw the crew getting oil from whales." The crew of one stranded ship landed, and attacked and robbed the people, throwing them into confusion.

On about June 24, twelve foreigners [British] landed at the village of Hitachi. They attempted to communicate with a villager, and succeeded at basics; the story is told by Aizawa An, a prominent Mito samurai.

In *The Leading men of Japan,* by Charles Lanman [1883] we read (p. 283): "According to the native annals, the coast of Japan was visited by foreign vessels in 1637, 1673, 1768, 1791, 1793, 1796, 1803, 1808, 1813, and 1829." In 1846 two American ships first arrived at Nagasaki [then Tokyo Bay] under Commander James Biddle, and Commander Matthew C. Perry made his visit in 1853, made memorable by resulting in a treaty with the United States. In 1854, Sir James Stirling, an English admiral, visited Nagasaki, and also concluded a treaty with Japan;... Perry "opened" Japan primarily for the U.S. whaling industry. In 1824 British sailors landed in Japan.

Page 113: "Kuhachiro and Tôzô received the following provisions for three days' use: 3 *shô* of rice, 6 *seki* of *miso,* 6 *seki* of salt.

"The following are the provisions for horses: 2 *shô* 1 *gô* of soja bean, 1 *shô* 2 *gô* of rice-bran, 9 *kwan* of hay and straw. These were to be used for three days..."

Footnotes (p. 110, 113, 122): 1 shô = about 1.5 quarts. 1 *seki* is about 0.03 pint. 1 *gô* is about 0.3 pint. 1 *kwan* is 8.2673 lbs. 1 *hiki* is ¼ *sen* [a small unit of Japanese money].

Page 122: "6 *seki* and 6 *sai** of miso... 3 *gô* and 5 *seki* of soja beans." Address: M.A.

1128. Kurihara, T. 1905. Shôyu-chû shibashiba ganyu suru biryo no sanri yaji-san ni tsuite [On a minute quantity of salicylic acid often contained in shoyu]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 281. p. 599-600. July. [Jap; eng]
• ***Summary:*** The salicylic acid comes from the cask used in holding the shoyu. Address: Eisei Shikensho, Kurihara, Hyogo-ken, Japan.

1129. Sawamura, Shin. 1905. Nattô no saikin ni tsukite [On the microorganisms in natto]. *Nogakkai Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 67. p. 1-6. July. [Jap]
• ***Summary:*** This is Sawamura's earliest known paper concerning natto.

1130. Korentschewski, W.; Zimmermann, A. 1905. Sanitaer-hygienische Untersuchung des chinesischen Bohnenoeles [A sanitary-hygienic investigation of Chinese soybean oil (Abstract)]. *Chemische Revue ueber die Fett- und Harz-Industrie* (*Hamburg, Germany*) 12(8):190-91. Aug. [1 ref. Ger]
• ***Summary:*** A German-language summary of a German-language article with the same authors and title published in 1905 in *Chemiker-Zeitung* 29(58):777-78. July 22. Address: 1. Dr.; 2. Mag. pharm.; Both: Aus dem chemisch-bakteriologischen Laboratorium des I. Militaerhospitals in Charbin (Chemical-Bacteriological Lab., I. Military Hospital, Harbin, Manchuria).

1131. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1905. China: Fertilizing material wanted. No. 299. Aug. p. 14-15.
• ***Summary:*** In China, there is unlimited opportunity to sell modern fertilizers. Most of the country's land has been under intensive cultivation for some two thousand years. Current medical knowledge is forcing a change from old methods to help prevent typhoid, and the advantage of modern fertilizers is coming to be appreciated. The principal commercial fertilizer in China is presently [soy] bean cake. The port of Niuchwang alone ships bean cake to the value of $5,000,000 gold a year, most of it coming to lower Chinese coast ports. It is one of the chief commodities in the trade of Amoy, Swatow, and similar coast ports. China also typically ships about $3,800,000 worth of bean cake abroad each year, mostly to Japan, but the war interfered considerably with the sale last year. Address: Washington, DC.

1132. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1905. Japan: Principal articles imported. No. 299. Aug. p. 30.
• ***Summary:*** A table shows the value of the principal imports to Japan during the first six months of the calendar years 1904 and 1905. The amount imported is not given. "Oil cake" increased dramatically from $728,000 in 1904 to $3,033,000 in 1905. "Beans, pease and pulse" increased from $1,501,000 in 1904 to $2,479,000 in 1905. The largest imports in 1905 were cotton (raw) $34,221,000 and rice $19,872,000. Address: Washington, DC.

1133. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1905. Manchuria: Average prices for the years 1899, 1901, 1903, and 1905. No. 300. Sept. p. 112.
• ***Summary:*** A table shows the inflationary effect of the war with Japan. The price of [soy] "bean oil" (in gold dollars per

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pound) rose from $0.033 in 1899 to $0.038 in 1901 to $0.043 in 1903 to $0.05 in 1905.

The price of [soy] "bean cake" (in gold dollars per ton) rose from $15.12 in 1899 to $16.80 in 1901 to $18.48 in 1903 to $20.00 to $30.00 in 1905.

Footnote: "Bean cake is sold in units of ten pieces weighing 52 catties, or 69.33 pounds, each. The price for ten pieces has varied from $15.50 to $22.50, Japanese war notes, during the season of 1905. The rise in the price of bean cake is partially due to the decrease in the value of silver." Address: Washington, DC.

1134. Muroi, Zengo. 1905. Miso no hataraki ni tsuite [On the action of miso]. *Kenbikyo* (*Microscope*) No. 66. p. 1-8. Sept. [Jap]

1135. Yoshino, K. 1905. Higo kokusan kinrui [A list of the parasitic fungi collected in the province of Higo (Japan)]. *Botanical Magazine* (*Tokyo*) 19:87-103. May; 19:199-222. Sept. [Jap]
• ***Summary:*** Records occurrence on soybeans of Ascochyta sp., Cercospora sp., Gloeosporium sp., Hypochnus cucumeris, Isariopsis griseola, Nectria ipomeae, and Peronospora viciae.

1136. Macmillan, H.F. 1905. The "Soya (or Soy) Bean." (Glycine hispida). A new vegetable, fodder, and green-manure product for Ceylon. *Tropical Agriculturist* (*Ceylon*) 25(5):682-83. Nov. 15.
• ***Summary:*** "It is strange that a product so important, so simple of cultivation and so quick in yielding returns as this has not hitherto attracted attention in Ceylon. Notwithstanding the fact that it has been introduced several years ago by the Royal Botanic Gardens, and successfully grown at Peradeniya year in and year out, both for the instruction of visitors to the Gardens and for distributing seeds; I question whether there are at present half-a-dozen gardens or estates in Ceylon which count this amongst their crops."

"The Soya Bean thrives at Peradeniya, and appears to be well-suited to the climate and soil; whilst it also flourishes in the Mediterranean region and Southern Europe. It would therefore seem reasonable to expect it to thrive at a comparatively wide range of elevations in Ceylon, provided the conditions of soil and rainfall were at all favourable. In China and Japan the Soya Bean forms a standard article of food with all classes of the community, being prepared for use chiefly in the form of a sauce, paste or cheese, the latter two preparations being made by crushing and pressing the seeds. In India the seeds are said to be cooked and used in various ways, often 'roasted and ground as *satu,* or simply eaten in the form of *dal.'* Soy sauce is said to form the basis of many popular sauces made in Europe." A few years ago soy sauce in London was worth 2 shillings and 6 pence per gallon. "Personally I think Soya Bean as a vegetable is very agreeable and forms a good substitute for the Lentils and Broadbeans of Europe if cooked and served similarly. Its chemical composition, according to Professor Church, places it above all other pulses as an albuminous food."

The soya bean is also considered valuable as a fodder plant and for green manuring. A brief description of its cultivation is also given. "Regarding cultivation, probably few crops are less exacting in their requirements than this. Its most striking characteristic, judging by results recorded at Peradeniya, is the remarkably short space of time in which the plants grow and produce a crop. Here the seeds germinate in 3 to 5 days, the plants flower when a month old; a fortnight later the pods are fit for picking [for use as a green vegetable], and the harvesting is complete in about two months from the time of sowing. Thus, granted the seasons were favourable, it should be possible to obtain four crops a year. In making these statements, which may seem unduly optimistic, it is not by any means intended to convey the impression that practically no expenditure of labour is involved in the production of this crop. On the contrary it is pretty certain that to make it a profitable product for whatever purpose, even under the most favourable conditions for its growth, a reasonable amount of cultivation will be required. It has yet to be proved how far it would repay cultivation in Ceylon for fodder and green-manuring, but that it should prove a welcome adjunct to the food products of the natives, if not as a general vegetable, there seems no question."

A footnote states: "* Since writing this Mr. Kelway Bamber has presented a small quantity of Soya Bean seed to the Botanic Gardens, remarking that he intended to recommend it as a green-manure crop." Address: Curator of the Royal Botanic Gardens at Peradeniya.

1137. De Becker, J.E. (Joseph Ernest). 1905. The nightless city: or, the "History of Yoshiwara Yûwaku." 5th ed. revised. Shanghai, Yokohama, Bremen: Max Nössler & Co.; London: Probsthain & Co. xvi + 386 p. + 46 unnumbered leaves of plates. See p. 158-61, 221. Illust. 2 maps. 19 cm. Reprinted in 1971 by Tuttle & Prentice-Hall.
• ***Summary:*** A book about prostitution in Tokyo. Note 1. The approximate date of this 5th edition, Dec. 1905, is given on p. xvi, at the end of the "Preface to the fifth edition." The first edition was published in 1899.

"It was not until after the City of Yedo had become the seat of the Tokugawa government that regular houses of ill-fame were established, and up to the period of Keicho (1596-1614) there were no fixed places set apart for brothels and assignation houses" (p. 1).

The section titled "Dai-ya no koto (Cook-houses of the Yoshiwara)" (p. 158-61) notes that "these cook houses supply every conceivable kind of food be it *sushi* (a fish and rice roll), *kwashi* [*o-kashi*] (cakes)..."

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"By the way, there is, in the *Shôbai Orai* (Chinese characters) by Ikku, an item which shows a bill of fare in a *dai-ya* a hundred years ago. It is as follows;–The bill of the *Ki-no-ji-ya* consisted of:... *Teri-gomamé*–Dried young sardines roasted and boiled in sugar and soy... *Aburage*–Bean-curd fried in oil [fried tofu]... *Yaki-dôfu*–Roasted bean-curd... *Umani*–Any food cooked in a mixture of soy, *mirin,* sugar, and the shavings of dried bonito... *Ankake*–A kind of soup containing *tôfu* or arrowroot, etc., all of which foods are suitable to those persons who stop in brothels for several consecutive days.

Note 2. This is the earliest English-language document seen (April 2013) that uses the term "Yaki-dôfu" or the term "Roasted bean-curd" to refer to grilled tofu.

"Famous things of the Yoshiwara... *Sanya-tôfu*–Bean curd of Sanya... *Kobu-maki*–Rolled seaweed... *Ni-mamé*–Boiled [soy] beans... *Dengaku–Tôfu* baked and covered with sweetened miso... These things were very popular (even outside the Yoshiwara)" from 1772 to 1829.

Page 221: "The *yûjo* (prostitutes) did not all appear in the cages until the 20th of the 1st month, so the night aspect of the Yoshiwara did not resume its normal appearance until this date. The *saruhiki* (One who goes about getting money by leading a monkey who performs tricks) and *dai-kagura* (A kind of dance performed in the streets by boys wearing wooden lion-head masks) began to pour into the Yoshiwara from the 1st day of the 2nd month: on the night of the first 'horse day' the front of every brothel in the first and second wards of Yeido-chô and of Kyô-machi was illuminated by a large lantern on which was written the names of the *yûjo* in the house. Votive offerings of red rice [probably *sekihan,* azuki beans cooked with rice], fried bean-curd, and fruit were made to the family shrines of the god Inari."

J.E. de Becker lived 1863-1929. Address: Kamakura, Twenty years a resident of Japan, an English student of sociology.

1138. *Japan Advertiser* (*The*). 1905-1940. Serial/periodical. Tokyo, Japan. B.W. Fleisher. Frequency: Daily. 30-39 cm. [Eng]*

• ***Summary:*** This newspaper merged with the *Japan Times & Mail* to form *Japan Times and Advertiser* (Morning ed.).

1139. Japan Year Book. 1905-1952. Serial/periodical. Published by The Japan Year Book Office, Tsukiji, Tokyo; and by Foreign Affairs Assoc. of Japan. Annual. Serial/periodical. Published by The Japan Year Book Office, Tsukiji, Tokyo; and by Foreign Affairs Assoc. of Japan. Annual. [Eng]

• ***Summary:*** 27 volumes. Merged with *Japan Times Year Book* (1933) and *Japan-Manchoukuo Year Book* (1934-1941).

In the *Year Book* for 1906, in the chapter on agriculture, page 104 gives statistics from 1895 to 1903 for the production of the following: Miscellaneous grains (millet, buck wheat [buckwheat], Italian millet, Sarva millet), beans (soja beans, red beans [azuki]), sweet potatoes and potatoes.

Production of soja beans increased from 2,943,478 koku in 1895 to 3,647,830 koku in 1903–an increase of 23% in 8 years. The frontispiece, facing the title page, lists "Weights, measures, and moneys." 1 koku (dry) = 4.962 bushels.

1140. The Russo-Japanese War (Feb. 1904-1905), the Treaty of Portsmouth (5 Sept. 1905), and the Japanese move into Korea (Important event). 1905.

• ***Summary:*** "The event that really won for Japan full status as a world power and equality with the nations of the West was its victory over Russia, the biggest, even if not one of the more advanced, of the Western powers. Russia in 1896 had obtained from Peking the right to build the Chinese Eastern Railway across Manchuria to its port of Vladivostok on the Sea of Japan, thus shortening the Trans-Siberian Railway, the rail link it had started in 1891 to construct across Siberia to the Pacific. When Russia obtained the lease of the Kwantung Peninsula in 1898, it also got the right to connect this line by a southward extension, the South Manchurian Railway, to the ports of the peninsula, Port Arthur and Dairen (Dalian in Chinese). These railway concessions gave Russia considerable control over Manchuria, and the Boxer crisis allowed it to overrun the whole area militarily. Its efforts to take Manchuria over completely, however, ended in diplomatic frustration, and it agreed to a phased withdrawal of its forces.

"Mutual suspicion and enmity steadily mounted between Japan and Russia... Japan broke off relations on February 6, 1904, started hostilities on February 8 with a night torpedo-boat attack on the Russian fleet in Port Arthur, and only two days later declared war."

In the 5-month war that followed, the Japanese navy destroyed its Russian counterpart to win the final victory. The mighty Russians were shocked by their overwhelming defeat at the hands of a little-known Madame Butterfly nation. "Both countries were exhausted by war, and the Russians were plagued at home by revolution. They both readily accepted President Theodore Roosevelt's diplomatic initiative and met to discuss peace terms in Portsmouth, New Hampshire.

"The Treaty of Portsmouth, signed on September 5, 1905, recognized Japan's 'paramount interest' in Korea, restored at least in theory China's sovereignty and administration in Manchuria, and gave Japan the Russian lease on the Kwantung Peninsula and the Russian-built South Manchurian Railway as far north as Changchun. The Japanese were eager to extract an indemnity from the Russians, but the latter were adamant on this point, and eventually Japan settled for the southern half of Sakhalin [Island] instead [below the 50th parallel north, which Japan called Karafuto]. It was the failure to win an indemnity that

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the Japanese public found so disappointing.

"Japan was now free of all foreign competitors in Korea." In Nov. 1905 Japan "secured a convention making Korea a Japanese protectorate and ending its diplomatic contact with other powers." In 1907 Japan extended control over the Korean government and disbanded the Korean army. "In August 1910 Japan quietly annexed Korea." Called Chôsen, "Korea was governed for Japan's strategic and economic purposes by Japanese officials under a military governor-general."

In its victory over Russia, Japan became the first non-white or non-Western nation to defeat a white or Western nation. In a mere 50 years Japan had transformed itself from an isolated underdeveloped country with no industrial base into a modern nation, a major military and industrial power.

Japan was now free of all competitors in Korea, and in November 1905 secured a convention making Korea a Japanese protectorate and ending its diplomatic contact with other powers. In 1907 the Japanese extended control over the Korean government, arranged that Japanese could serve as Korean officials, and disbanded the Korean army. The widespread rioting that greeted these moved was severely suppressed. In Aug. 1910 Japan quietly annexed Korea. "There was no protest from the powers, which generally approved what was judged at the time as an inevitable step in world progress. The Japanese called Korea Chôsen and governed it for their own strategic and military purposes by Japanese officials under a military governor-general.

With the annexation of Korea, Japan also became a major imperialist/colonial power, with important colonies in Korea and Taiwan, and predominant rights in South Manchuria. It entered World War I as Britain's ally and, although playing only a minimal military role, it picked up the German colonial possessions in East Asia and the Pacific, including Kiaochow Bay and the port of Tsingtao on the south coast of Shantung. "Japan sat at the Versailles Peace Conference as one of the victorious Five Great Powers–the only non-Western nation to be accepted as a full equal by the West. Thus the Meiji leaders had succeeded far beyond their fondest dreams."

Source: Fairbank, Reischauer, and Craig. 1973. *East Asia: Tradition and Transformation.* p. 555-57.

1141. Bardet, M. 1905. Sur un pain sans matières amylacées à base de soja hispida [A bread without starch based on soja hispida (soybeans)]. *Bulletin General de Therapeutique Medicale, Chirurgicale, Obstetricale et Pharmaceutique* 149:181-84. [Fre]

• ***Summary:*** This is a presentation by Mr. Bardet to the Therapeutic Society (*Société de Thérapeutique*) in France about a new bread for diabetics. Soya, which is widely used in Japan, has met with little success in France. However it is of interest because it contains almost no sugars or starches–less than 5-6%–yet an average of 35% vegetable casein. The Japanese consume enormous quantities of vegetable cheese (*fromage végétal*) [tofu], which is obtained from soya.

"The bread which I have the honor to present has been prepared under the name of Krube bread (*pain Krube*). This is the first soy bread I have found which is truly acceptable. When fresh, it resembles a brioche, being somewhat soft and oily; when stale, it becomes firm but still retains the taste of a brioche. It is obtained by grinding the seeds in a special way to defat them (*dégraisser*) and make them better suited to bread." The man who developed the bread is a diabetic.

A table shows the composition of the soy flour: Nitrogenous materials (proteins) 28.69%. Oils and fats 38.00%. Minerals 4.24%. Inert substances 15.21%. Sugars and starches 5.80%. Moisture 8.06%. Total 100%. The bread contains 508 calories per 100 gm. Thus soy bread supplies 3.5 times the protein and twice the calories as regular bread.

Question from Mr. Berlioz: "What is the digestibility of this bread compared with wheat bread?" Answer: They are different foods and cannot be compared.

Question from Mr. Saint-Yves Mesnard: "These seeds [soybeans] were introduced to France by Montigny in 1855; people have tried unsuccessfully to acclimatize them in various places in France, so at present all our soya is imported from Japan. Thus soya is destined to remain a deluxe and rare food. This is very unfortunate, for it is a legume with nutritive properties which could be used advantageously by both diabetics and healthy individuals. It seems to me that this bread has been prepared extremely well and would almost give the illusion of a brioche, if its odor was not so strong. It represents major progress over the former breads which were more like rubber than bread." Answer: "Yes, soya is presently a deluxe product. I believe that the price of 100 kg of flour is about 150 francs, and that is enormous."

Comment by Mr. Laumonnier: "Soya has been successfully cultivated in and around Marennes (Charente-Inférieure) [Note: A department in western France on the Bay of Biscay by the Gironde River, now called Charente-Maritime]. The climate of this region is both temperate and humid–important factors for the culture of this plant. The Japanese army has tried to use soya in its food rations, but found them difficult to preserve."

1142. Becker, Joseph Ernest de. 1905. The sexual life of Japan: Being an exhaustive study of the nightless city... or, The history of Yoshiwara Yûwaku. 3rd ed. Japan? Box of Curios Printing and Pub. Co.: Privately printed [Published by the author]. xvi + 386 p. + [25] leaves of plates. See p. 160. Illust. 24 cm. [Eng]*

• ***Summary:*** J.E. de Becker lived 1863-1929.

1143. Clubb, Henry Stephen. 1905. Unpolished rice, the staple food of the Orient: A lecture to the Vegetarian Society of America; to which is added over one hundred receipts

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[recipes] for cooking unpolished rice, rice flour, rice polish; and testimonials of eminent food reformers. Philadelphia, Pennsylvania: The Vegetarian Society of America. 32 p. 18 x 14 cm. Pages unnumbered.
• ***Summary:*** Rev. Henry Clubb (born 1827) was an early advocate of the use of brown rice in America. He notes that this is the food on which the Japanese Army won its great victories (in the recent Russo-Japanese War), performed its rapid marches, remained comparatively free from camp diseases, and recovered rapidly from battle wounds.

On page 5 he notes: "In China, Japan and Java soy sauce, soy bean cheese [tofu], or a similar product is eaten with rice in considerable amounts, and furnishes a large part of the protein necessary for the daily diet of the laborious people."

On the inside rear cover of the booklet is a list of publications and products sold by the Vegetarian Society, which is located at 1023 Foulkrod St., Philadelphia.

Note 1. This is the earliest document seen (April 2011) concerning unpolished rice (brown rice).

Note 2. This is the earliest English-language document seen (April 2011) that contains the term "unpolished rice." Address: Rev., Philadelphia.

1144. Duthie, John Firminger. 1905. Flora of the upper Gangetic plain and of the adjacent Siwalik and sub-Himalayan tracts. Vol. I, part 1. Ranunculaceae to Campanulacae. Dehra Dun, India: M/s. Bishen Singh Mahendra Pal Singh; Delhi, India: M/s. Periodical Experts. 500 p. + v. See p. 231-32. 19 cm. [6 ref]
• ***Summary:*** In the section on "Leguminosæ" we read (p. 230-31): "20. Glycine, Linn.; Fl. Brit. Ind. ii, 183 [Hooker, Joseph D. 1879. *The Flora of British India.* Vol. 2, p. 183].

"Twining or suberect herbs... Species about 15, spread through the tropics of the old world, also in Australia.

"G. Soja, Benth, in *Journ. Linn. Soc.* viii, 266: F.B.I. ii, 184 (not of Sieb. & Zucc.) G. hispida, Maxim.; Watt E.D.; *Field & Gard. Crops* iii, 3, t. 85; Prain in *Journ. As. Soc. Beng.* LXVI (1897), 403. Soja hispida, Moench.; W.&A. *Prod* 247. Dolichos Soja, Linn.; *Roxb. Fl. Ind.* [Roxburgh's Flora Indica] iii, 314; DC. *L'Orig. Pl. Cult* 264. Vern. [Vernacuar] *Bhat.* (Soy bean, Japan pea).

"An annual, with stout suberect or climbing stems, densely clothed with fine rusty-coloured hairs. *Leaves* 3-foliolate, long-petioled; *leaflets* 2-4 in. long, ovate, usually acute. *Racemes* sessile, few-flowered. *Calyx* ¼ in., densely hairy; teeth long, setaceous. *Corolla* reddish-purple, not much exserted [sic]. *Pods* 2-3 in the axils of the leaves, 1½-2 in. long, linear-oblong, recurved, densely pubescent, subtorulose, 3-4 seeded.

"Sparingly cultivated within the area, and confined to a few of the Sub-Himalayan districts. It is grown more extensively on the lower slopes of the Himalaya up to 6,000 feet, from the Punjab eastwards; also in Bengal, on the Khasia, Manipur and Naga Hills, and in Burma, but nowhere in India has it been found truly wild. De Candolle considered the plant to be a native of Cochin China, Japan and Java at the time when the ancient inhabitants of that region began to cultivate it, and to use it as food. As grown within the area of this flora, and in other parts of India, it represents a very inferior form of soy bean. It is a rainy-season crop, and is usually sown in very poor land. Under proper cultivation the chemical composition of the bean shows it to be the richest of all the pulses in albuminoids and oil. In China and Japan various preparations are made from it, including soy-sauce, which is largely exported from those countries. The plant affords very excellent fodder for all kinds of stock, if harvested before it is fully matured." Address: B.A., F.L.S., Formerly Director of the Botanical Dep. of Northern India.

1145. Fujimura, Tôtarô. 1905. Tôfu keiran ryôri-hô: katei jitsuyô [Tofu and hen's egg cookery: For practical household use]. Tokyo: Daigaku-kan. 184 p. 22 cm. [Jap]

1146. Kikuchi, Senkichi. 1905. Tôfu oryôri [Tofu cookery]. Tokyo: Hôeikan. 200 p. 18 cm. [Jap]*
Address: Japan.

1147. Oshima, Kintaro. 1905. A digest of Japanese investigations on the nutrition of man. *USDA Office of Experiment Stations, Bulletin* No. 159. 224 p. See p. 20-33, 40-43, 46-47, 145-53, 168-73. [26 ref. Eng]
• ***Summary:*** One section titled "The Soy bean and its preparations" (p. 23-33) gives detailed discussions of tofu (including yuba, frozen tofu, kara [okara], and fried tofu), miso (incl. white miso, red or Sendai miso), shoyu, and natto. The nutritional composition of each is given, and many early studies by Western and Japanese scientists are cited.

"Next to rice in importance in the Japanese diet are legumes, which are universally used... Of the different legumes used as food in Japan, the soy bean (*Glycine hispida*) is by far the most important. According to agricultural statistics for the years 1879 to 1887, nearly 10 per cent of the cultivated land in Japan was devoted to the growth of this legume, an area somewhat larger than that devoted to wheat growing. In the northern Island [Hokkaido] in 1887 nearly 17 per cent of the total cultivated area was devoted to the soy bean. The average yearly production of soy beans amounts to about 360,000,000 kilograms... A part of the product is of course used for seed, and a not inconsiderable part is used as fertilizer.*" (Footnote: * "In northern China soy beans are used to some extent in the production of oil, which is used for cooking and illumination [in oil lamps]. The residue from this process [the presscake] is imported largely into Japan, where it is used as a fertilizer"). Other legumes widely used in Japan include the mungo bean (*Phaseolus mungo radiatus*) and the adzuki bean (*Phaseolus mungo subtrilobata*) (p. 23-24).

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"Many varieties of soy beans are known, being designated according to the color, size or shape of the seed, and the time required for maturity. For example, there are black, green, yellow, and white varieties, and these are again designated as early, medium, or late, according to the season of maturity, and small, medium, and large, according to the size of the seed. The black soy beans are used chiefly for cooking, with sugar and shoyu; the green variety is also used in this way, either in the fresh state or after being dried" (p. 24). There follows a long section on tofu (detailed in a separate record).

The "larger part of the leguminous food in the Japanese diet consists of the preparations of soy beans, such as miso, shoyu and tofu,..." (p. 46).

In Japan, legumes about 8% of the protein and 11% of the fat in the diet (p. 137). Many digestion experiments are described (p. 144-87), including those with tofu, shoyu, "tofu cake or kara, the soy-bean residue remaining from the preparation of tofu (see p. 26)," and yuba conducted in Japan by Osawa and Ueda (1887), T. Suchi (1887), Kano and Iishima (1899). Table 91 (p. 191) is a "Summary of results of digestion experiments with legumes and legume preparations." The percentages given are "coefficients of digestibility." Experiments No. 6 and 7–soybeans (average): Protein 65.5%, fat (uncertain), carbohydrates (incl. crude fiber) 85.7%. Experiments No. 8 and 92–tofu (average): Protein 92.7%, fat 96.4%, carbohydrates (incl. crude fiber) 93.3%. Experiment No. 94–"yuba (soy legumin coagulated):" Protein 92.6%, fat 95.7%, carbohydrates (incl. crude fiber) 86.6%, crude fiber 35.5%. Experiment No. 93–"tofu cake (soy-bean residue [okara]):" Protein 78.7%, fat 84.3%, carbohydrates (incl. crude fiber) 82.8%, crude fiber 89.6%.

Note: This is the earliest English-language document seen (June 2013) that uses the Japanese word *kara* to refer to okara.

Other Japanese foods discussed include adzuki or adzuke beans (*Phaseolus mungo subtrilobata*) (p. 24, 170), dried algae (sea vegetables, p. 34), and kuzu (p. 170). Address: Director, Hokkaido Agric. Exp. Station, Sapporo, Japan.

1148. Oshima, Kintaro. 1905. A digest of Japanese investigations on the nutrition of man: Preparations of cereals (Document part). *USDA Office of Experiment Stations, Bulletin* No. 159. 224 p. See p. 20-23. [10 ref. Eng]
• ***Summary:*** The section titled "Preparations from cereals" which gives detailed discussions of bread, *fu* (baked wheat gluten cakes), macaroni and vermicelli, sobakiri or soba (buckwheat noodles), mochi, ame [rice syrup].

"Fu: This is a gluten preparation obtained from wheat flour. The whole is mixed with water and made into a dough which is kneaded, the kneading and addition of water continuing until a large part of the starch is removed. What remains is known as "fu," and us used wither in the fresh state as an ingredient of soup, or is roasted to preserve it for future use."

While mochi is usually made from glutinous rice (*Oryza* [*Oryzae*] *sativa glutinosa*), "it may also be made from glutinous grains like millets. In the latter case some special prefix denoting the kind of grain used is also employed, as, for instance, Kibi-mochi, or Awa-mochi (Kibi is *Panicum miliaceum;* Awa is *Setaria germanica*). The use of mochi made from glutinous millets is usually confined to the rural and laboring classes... Mochi is considered one of the essential articles of food for New Year's feasts. It is generally eaten either roasted or cooked with shoyu sauce."

"Ame: This material is prepared most commonly from glutinous rice or glutinous millet, sometimes from common rice, and rarely from Indian corn or sweet potatoes. The essential feature of the process of ame preparation is the conversion of starch into maltose by diastase. Malt or sprouted barley is generally use to furnish the diastatic ferment. The cleaned rice or millet is soaked in water and then steamed, by which process the starch grains are broken open and made easily accessible to the ferment. The steamed grain is then transferred to a suitable vessel, mixed with certain proportions of powdered malt (added fractionally) and of water at about 60º C., and well stirred. The mixture is kept at a temperature of 50º to 60º C. In the course of 6 to 8 hours the diastatic ferment has acted upon the starch and converted it largely into dextrin and maltose. The liquid mass is then filtered by pressing through a fine linen bag, and the filtrate is condensed in a double boiler to the proper consistency, which varies slightly according to the season."

"The material thus prepared is called midzu-ame, which means liquid or soft ame. It is a dense, clear, light amber-colored liquid, not unlike the best commercial glucose in some of its physical properties. It is used in this form, or is further concentrated into kata-ame, or hard ame, a sort of hard, white, sweet candy. Stick ame is also made from midzu-ame by pulling.

"Ame has been manufactured in Japan for at least two thousand years, and long before sugar was known it was used for flavoring articles of food. Even at the present time it is sometimes used in place of sugar in cooking. Ame is also a favorite food adjunct for invalids.

"An interesting discussion of the relations between midzu-ame as made by the Japanese and malt products of European countries before sugar was so generally known is given by Storer and Rolfe (1904, p. 80), in which the process of ame making is described by Takaki, from information obtained from Japan. In the same publication is given also the translation by Takaki (Loc. cit., p. 95) of a 'Note on ame,' published in Japanese by Furukowa [sic, Furukawa] (1885, p. 355). A description of the manufacture of midzu-ame from glutinous rice has been given by Wiley and McElroy (1982, p. 57).

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"Whether made from glutinous rice, ordinary rice, millet, or corn, ame consists mainly of maltose and dextrin. Kokashima (1855, p. 233) gives the following as the average of three analyses of samples of ame made from glutinous rice: Water, 15 per cent; protein, 1.1 per cent. These figures are almost identical with those given by Furukowa. The composition of ame from ordinary rice, as given by the latter, is as follows: Water, 17.4 per cent; protein, 0.8 per cent; ether extract, 0.1 per cent; maltose, 58. 1 per cent; dextrin, 23.3 per cent, and ash, 0.3 per cent.

"Furukowa states that 'since the rice ame is rich in maltose and poor in dextrin, it has a sweeter flavor than the glutinous rice ame, the flavor of which is weaker in consonance with a similar quantity of maltose and a larger amount of dextrin in it. Since the proportion of nitrogenous matter in both kinds of ame is minute, this constituent would not readily suffer decomposition even if the ame were to be kept for a long time." Address: Director, Hokkaido Agric. Exp. Station, Sapporo, Japan.

1149. Oshima, Kintaro. 1905. A digest of Japanese investigations on the nutrition of man: Tofu (Document part). *USDA Office of Experiment Stations, Bulletin* No. 159. 224 p. See p. 26-28. [1 ref. Eng]

• ***Summary:*** "Tofu: This term is commonly translated as bean cheese–though sometimes bean curd–in English and *Bohnen-käse* in German. Tofu is not strictly equivalent to cheese, however, as neither bacteria nor ferments are involved in the process of manufacture. It consists chiefly of the albuminoid materials of the soy bean combined with magnesium and calcium salts, as pointed out by Inoue." To make tofu, soaked soybeans are ground between millstones. "The mass is then mixed with about three times its bulk of water and boiled for about an hour, after which it is filtered through a cloth. By this process about 30 per cent of the total protein of the beans is dissolved and contained in the filtrate, ready to be precipitated as tofu. The filtrate is white and opaque, somewhat resembling milk. To this is added, with constant stirring, about 2 per cent of the concentrated mother liquid [nigari] obtained in the manufacture of salt from sea water, whereupon the albuminoid material is precipitated in combination with calcium and magnesium salts." After pressing, the tofu is finally cut into cakes about 10 cm broad, 2 cm thick, and 25 cm long [about 3.9 by 0.79 by 9.8 inches], though the size varies in different localities.

"The residue from the boiled and filtered beans is known as kara [okara], or tofu cake, and contains a large quantity of protein and carbohydrates. It is a good food material, being used considerably by poor people as an ingredient of miso soup.

"If the milky filtrate mentioned above is boiled, a sort of film forms on the surface. This film, which consists mainly of coagulated albuminoids and fat, is sometimes prepared in large quantity, and when dried is used as an article of food, being known as yuba.

"Tofu is generally prepared every day and is eaten in the fresh condition simply with a little shoyu, though it is also frequently cooked in shoyu or in miso soup. Fried tofu, called abura-age, is also a very popular article of food. Rape-seed oil is generally used in frying, though sesame oil is sometimes used. Note 1. This is the earliest English-language document seen (April 2013) with the word "Tofu" in the title in a document published in the United States,

Note 2. This is the earliest English-language document seen (April 2013) that uses the word "abura-age" to refer to deep-fried tofu pouches.

"Tofu may also be prepared for preservation and transportation. For this purpose it is cut into smaller pieces and exposed to severe cold weather, to remove the water by freezing, and then dried in an oven. As thus prepared it can be preserved for several years. When the tofu is frozen the water collects in fine needles of ice distributed throughout the mass. When the ice melts and the water runs out, it leaves the tofu porous and it may be easily dried. If it is not frozen, it is difficult to dry it and the resulting material is dense and horn like."

Table 2 (p. 28) gives the average composition of the above-mentioned tofu preparations: "Fresh tofu, frozen tofu, fried tofu, tofu cake [okara], yuba."

The digestibility of the nutrients in tofu has been found to be high, as will be seen from the results of digestion experiments summarized later (p. 191). As much as 95 per cent of the protein is digested and about the same proportion of fat. The carbohydrates were found to be somewhat less digestible when the tofu was eaten alone, but when it was eaten with rice about 99 per cent of the total carbohydrates of the diet was digested.

"Both the composition and the digestibility of tofu, therefore, prove it to be a very nutritious food material. This is extremely significant, because tofu in its various forms is used very extensively by all classes of Japanese. In the interior of the country, where fish can not be easily obtained, it is a most important source of protein. For Buddhist priests, as well as the strict adherents to Buddhism (who eat no animal food), it forms a very popular and almost indispensable dietary article. Though no authentic record has been found regarding the manufacture of tofu in Japan, it is believed on good authority that the method was first introduced from China by Buddhists for their own use." Address: Director, Hokkaido Agric. Exp. Station, Sapporo, Japan.

1150. Oshima, Kintaro. 1905. A digest of Japanese investigations on the nutrition of man: Miso (Document part). *USDA Office of Experiment Stations, Bulletin* No. 159. 224 p. See p. 28-30. [1 ref. Eng]

• ***Summary:*** "Miso: This material is prepared from a mixture of soy beans, barley [note that he does not say rice], common

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salt, and water by a slow process of fermentation. Although it is highly probably that the process of preparing miso was first introduced either from China or from Korea, the exact date of the introduction is not known. Mention is made of miso in a Japanese record of the latter part of the ninth century.

"In the extent to which it is used, miso surpasses all other preparations from soy bean. Among the rural population and wage-earners in general it forms an indispensable part of the daily menu; among the people living in cities, however, it is used somewhat less extensively. Its chief use is in making soup and in cooking vegetables. For this latter purpose, however, miso and shoyu are to a certain extent replaceable, and generally when more shoyu is used the amount of miso consumed is smaller.

"Since it is the general custom for the people in rural districts to prepare miso for their own use, no accurate statistics regarding the total quantity manufactured and consumed are available. It has been estimated that the daily consumption of miso per person in the rural districts is about 40 grams. In the statistics of 25 dietary studies described beyond (p. 131), with people living elsewhere than in the country, the average daily amount was 43 grams, but the range was from 13 to 100 grams.

"The production of miso depends primarily on the action of a fermenting agent known as koji. The process of preparing the koji used for miso is similar to that for sake-koji (see p. 36), except that for the latter only rice is used, whereas miso-koji may be made from either rice or barley. The object of preparing miso-koji is to propagate certain forms of fungi, of which *Aspergillus oryzae* is the principal one. The koji also contains diastatic and inverting ferments which change the carbohydrates of the raw materials into maltose, glucose, etc., and a proteolytic ferment which acts upon the nitrogenous bodies, converting them into simpler and more soluble materials. The yeast which causes alcoholic fermentation is also regularly present. Koji is dried and finely powdered before it is used.

"To prepare miso the soy beans must first be steamed, and upon this process depends largely the quality and especially the color of the final product. The steaming is continued usually twenty-five hours, at first with strong heat but later very gently. When the beans are properly steamed and cooked, they are rubbed into a thick, uniform paste, to which are added proper amounts of powdered koji, salt, and water. The whole mass is then well mixed and stored in a special vat. The temperature of the mixture is kept at about 15º to 20º C., though as the fermentation advances it often rises to 25º C.

"Different kinds of miso are distinguished by color, taste, and keeping properties, and are prepared by somewhat different processes, the differences consisting chiefly in the use of rice or barley koji, the amount of common salt added, a longer or shorter fermentation, and the temperature at which it takes place. Two of the most important kinds of miso are the following:

"*White miso.*–This material is white in color, contains a small amount of common salt, is fermented with rice-koji for three to four days, and may be preserved about ten days.

"*Red or sendai miso.*–This material is red in color, contains a relatively large amount of common salt, is fermented usually with barley-koji for one and one-half to two years, and may be preserved for several years."

A table shows the composition of white miso and red miso. Note: The source of this table is cited incorrectly. Address: Director, Hokkaido Agric. Exp. Station, Sapporo, Japan.

1151. Oshima, Kintaro. 1905. A digest of Japanese investigations on the nutrition of man: Shoyu (Document part). *USDA Office of Experiment Stations, Bulletin* No. 159. 224 p. See p. 30-33. [1 ref. Eng]

• ***Summary:*** "Shoyu, or 'soy sauce,' is a dark-brown, moderately thick liquid very popular for use in cooking, and as a relish or condiment to increase the flavor and palatability of the diet. In odor and taste it is not unlike a good quality of beef extract. It is prepared from a mixture of soy beans, wheat (or sometimes barley), salt, and water by long-continued fermentation. For the preparation of shoyu a large and late variety of soy bean, that is rich in protein, is usually recommended. The varieties especially adapted to this purpose are called shoyu beans. The western name 'soy bean' for all varieties of *Glycine hispida* very probably owes its origin to his fact.

Note 1. This is the earliest English-language document seen (April 2012) that uses the term "shoyu beans" to refer to soybeans used to make shoyu (Japanese-style soy sauce). / "As shown by the average for five years (1887-1891), the annual production of shoyu in Japan, so far as statistics could be obtained, amounted to 221,000,000 liters. A small portion of the total product is exported, but this is more than counterbalanced by what is manufactured privately in rural districts and not included in the statistics quoted. It may be inferred from these figures that the yearly consumption per capita amounts to not less than 5 liters. It is generally estimated, however, on good authority, that the annual consumption per adult is 9 to 10 liters. In the average of 28 dietary studies included in the present compilation, 36 grams of shoyu were used per man per day, an amount equivalent to nearly 11 liters per annum, which is in agreement with the higher estimate quoted above.

"The term 'hishiwo' [hishio], which is considered as applying to a crude from of shoyu made without filtering, is found in a Japanese record dating from the early part of the eighth century. The manufacture of shoyu in its present form originated much later, probably in the sixteenth century, and has been gradually brought to the improved form of the present day."

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A detailed description is then given of the process for making shoyu and "shoyu-koji." "When the saline solution is cooled to the temperature of the air, the koji is added and the mixture well stirred. This material is kept in casks and allowed to ferment. It is stirred from time to time, the stirring being at more frequent intervals as the process of fermentation advances. The fermentation is allowed to continue usually one to two years, though often as long as five years. It is believed that the longer the period of fermentation the better the quality of the product, other things being equal. When the fermentation is completed, the mass is filtered and pressed and the filtrate is allowed to settle two to three days. The clear supernatant liquid is then removed and heated to 70º to 100ºC. in a double boiler 2 to 3 hours, after which it may be kept for a long time. To improve the taste, it is usual to add a certain quantity of sugar or sweet sake during the heating process."

Note 2. This is the earliest English-language document seen (April 2012) that uses the term "shoyu-koji" to refer to koji used to make shoyu (Japanese-style soy sauce).

Also discusses: The chemical composition of 3 samples of shoyu. The effect of fermentation, including "proteolytic ferments," "the diastatic fermentation" (which produces glucose), and the alcoholic fermentation.

"The vegetable diet of the Japanese people at large is more or less monotonous, hence the value of these preparations [miso and shoyu]. Indeed, the variety which they afford as food adjuncts can hardly be overestimated." Address: Director, Hokkaido Agric. Exp. Station, Sapporo, Japan.

1152. Oshima, Kintaro. 1905. A digest of Japanese investigations on the nutrition of man: Natto (Document part). *USDA Office of Experiment Stations, Bulletin* No. 159. 224 p. See p. 33. [2 ref. Eng]

• ***Summary:*** "Natto has long been used by the Buddhists. It is prepared by boiling the soy beans in water for about 5 hours to render them very soft; the hot material is then wrapped in small portions in straw, and the bundles, tied at both ends, are placed in a cellar in which a fire has been kindled. The cellar is then closed for twenty-four hours and the cooked beans allowed to ferment in the warm, moist atmosphere. The fermented product is a thick viscid mass having a peculiar but not offensive odor. Four different micro-organisms* (Footnote: * "Yabe found 1 bacillus and 3 micrococci."), the source of which is supposed to be either the straw or the air of the cellar, participate in the fermentation. The principal chemical change concerned in the ripening of natto taken place in the protein.

"In the water-free substance of natto, Yabe (1894) found the following percentages of nitrogen in different forms: Albuminoid nitrogen 4.03, peptone nitrogen 1.62, and amid nitrogen 1.89 per cent.

"The cleavage products leucin, tyrosin, and xanthin were also identified." Address: Director, Hokkaido Agric. Exp. Station, Sapporo, Japan.

1153. Plaut, Hermann. 1905. Japanese conversation-grammar: With numerous reading lessons and dialogues. Heidelberg, Germany: Julius Groos; New York & Washington, DC: Brentano's. viii + 391 p. See p. 111-13. [Eng; Jap]

• ***Summary:*** Words (p. 111): *"misoshiru*–a soup made with miso, a kind of bean-sauce." *"nimame*–boiled [soy] beans." *"teriyaki*–meat or fish baked with shôyu."

Page 113. "15. Reading Lesson. *Nihon no shokuji."* "teriyaki unagi."

Note: This is the 2nd earliest English-language document seen (Nov. 2009) that contains the word "teriyaki." It does not contains the term "teriyaki sauce." The word and the definition are both in English; the book is in English with Japanese lessons and words. Address: Berlin, Germany.

1154. Takenob, Y. 1905. Japan Year Book. Tokyo: Japan Year Book Office. 430 p. See p. 68, 104, 123, 126, 130, 348, 375, 382. [Eng]

• ***Summary:*** This book gives statistics for the Japanese empire: Japan Proper, Korea, and Formosa. At the beginning of the book, before the title page, are many pages of large advertisements on unnumbered pages. Likewise at the back of the book. For example, a full-page ad for Mitsui Bussan Kaisha (Mitsui & Co. in Europe & America) states that the company was established in 1876, and that they are "General Commission Merchants" for the import of [soy] beans, bean cakes, cotton,..."

The population of Japan Proper (p. 14) was:
1873–33.3 million.
1883–37.0 million.
1898–43.7 million.
1903–46.7 million.

A table of "Weights, measures and moneys" is on the page after the Table of Contents.

Page 68. In chapter VII on "Finances" is a table titled "Budget for April 1905 to March 1906. Revenue." "Tax on Soy" [sauce] brought in revenue of an estimated 4.541 million yen in 1904 and 5.149 million yen in 1905.

Page 104. In the chapter on "Agriculture," a table shows production of beans, including Soja beans and red [azuki] beans, 1895-1903 (in 1,000 koku). Production of soja beans increased from:

2.94 million *koku* in 1895
3.16 million *koku* in 1896
2.99 million *koku* in 1897
3.10 million *koku* in 1898
3.10 million *koku* in 1899
3.41 million *koku* in 1900
3.10 million *koku* in 1899
3.56 million *koku* in 1899

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3.10 million *koku* in 1901
3.13 million *koku* in 1902
3.64 million *koku* in 1903.

Page 123. In the chapter on "Forestry and fishery" is a section titled "fish fertilizers" which states: "The demand of fish-fertilizers has lately become quite marked, so active indeed that the supply can hardly keep pace with it. A large quantity of bean-cakes from North-China [Manchuria] is therefore arriving in Japan to make good this deficit. The following table shows the average amount of our fish-fertilizers made at home and of Chinese bean-cakes imported, during the recent ten years. The average for the last 10 years of "Homemade fish fertilizers" is 38.891 million kwan [kan] valued at 7.592 million yen, compared with "Chinese bean-cakes" weighing 20.282 million kwan valued at 2.524 million yen. Note: The soybean cakes are much less expensive per unit weight than the fish fertilizers.

Page 126, 130. The chapter on "Manufacturing industry" states (p. 126) that the manufacture of sake and soy [sauce] were among the principal forms of manufacturing in Japan before the country was opened to foreign commerce. A table titled "Quantity and value of chief manufactured goods" (p. 130) gives the amount of soy [sauce] made each year from 1894 to 1902. The quantity increased from:

1.329 million *koku* in 1894
1.409 million *koku* in 1895
1.505 million *koku* in 1896
1.528 million *koku* in 1897
1.532 million *koku* in 1898
1.838 million *koku* in 1899
1.557 million *koku* in 1900
1.717 million *koku* in 1901
1.762 million *koku* in 1902

Page 348. The chapter on "War finance" explains how Japan is financing its present Russo-Japanese war. One way is through extraordinary special taxes, including an addition 1.13 million yen tax on soy [sauce]. is a "Budget for April 1905 to March 1906." The two main sources of tax revenue are Land tax 63.6 million yen, and Tax on liquors 60.5 million yen. Tax on Soy is only 5.1 million yen.

In the Appendix, page 13 (under Group VII) gives the import tariff list for "Beans, soja" and page 20 (under Group X) gives the import tariff for "Oil, bean." There is both a "General tariff" and a "Extraordinary special tax." Address: Tsukiji, Tokyo, Japan.

1155. Yokohama Nursery Co., Ltd. 1906. Descriptive catalogue... for 1906. Yokohama, Japan. 95 p. Illust. Index. 26 cm. [Eng]
• ***Summary:*** On the cover of this English-language catalog is an illustration of 4 different species of lilies. In the section "Price list of seeds" (p. 78+) is a subsection (p. 84) titled "Some vegetable seeds." The contents (incl. the entry for "soy bean") is identical to that in the 1905 (and 1901) catalog, except that an 8th variety of vegetable seeds is offered: Runner bean (new long variety). Also on this page is a photo of a forage plant (*Polygonum Sachalinense*)–the first photo seen in this catalog. On the rear cover is an illustration of a Kaempfer iris (*Iris Kaempferi*) blossom. Address: P.O. Box No. 72. Nos. 21-35 Nakamura, Yokohama, Japan.

1156. Abel, Mary Hinman. 1906. Beans, peas, and other legumes as food. *Farmers' Bulletin* (*USDA*) No. 121. 38 p. March 25. See p. 11-13, 18-20. Corrected. [1 ref]
• ***Summary:*** A corrected edition, one page shorter than the 1904 revised edition. On the cover, below the title is written "(Corrected March 25, 1906)," yet at the bottom of the same page the publication date is given as 1904.

The section about soy (p. 11-13) is titled "Soy bean (*Glycine hispida*) and its preparations," but the information in that section appears to be the same as in the original 1900 edition, as is the illustration of the soy bean plant (p. 12) and the table on page 19.

1157. Takahashi, Y. 1906. Daizu sayamushi gai tai hanshu kisetsu shiken [Experiments on the relation of sowing period of soybean to the amount of damage caused by "Sayamushi" (*Grapholitha glycinivorella* Mats.)]. *Hokkaido Nogyo Shikenjo Hokoku* (*Hokkaido Agricultural Experiment Station, Report*) No. 2. p. 35-37. March. [Jap]
• ***Summary:*** Discusses *Leguminivora glycinivorella.* Address: Pathologist, Sapporo, Japan.

1158. List or manifest of alien passengers applying for admission to the United States: Heiji Ota. 1906.
• ***Summary:*** Line: Ocean Steam Navigation Line / Co. Sheet 10. No. 287. Name of passenger: Heiji Ota. Age: 32. Sex: Male. Married or single: Single. Occupation: Farmer. Able to–Read: Yes. Write: Yes. Nationality–Country: Japan. Race or people: Japanese. Last residence: Okayama. Destination: Portland, Oregon. 12 (?). By whom on passenger list: Self. Whether in possession of (?) money: Yes, $50. Whether going to a residence and relative: 54 N. 4th Dr., Portland, Oregon. Hashiya (?) 21. Port of Landing: Victoria [B.C.]. Date of Arrival: April 19, 1906. Date of embarcation: April 25, 1906. Head tax paid to: G.N. Ry.

Note 1. Heiji seems to be the only Ota on this ship. The Ota Tofu Co. of Portland, Oregon, had almost surely not yet been established.

Note 2. "Required by the regulations of the Secretary of the Treasury of the United States, under Act of Congress approved March 3, 1903, and Department Circular No. 97, dated Nov. 1, 1901."

1159. Katayama, T. 1906. On the preparation of a vegetable cheese from the protein of the soy bean. *Bulletin of the College of Agriculture, Tokyo Imperial University* 7(1):117-19. April. German summary in Chemisches Central-Blatt

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1906(2):540. [4 ref. Eng]
• ***Summary:*** Describes experiments to make a cheese similar to Swiss cheese. The soybean contains (according to Osborne and Campbell 1898) as its "chief proteid constituent glycinin, a globulin similar in properties to legumin, but of somewhat different composition, containing nearly twice as much sulphur..." and having the following composition: Carbon, 52.12; hydrogen, 6.93; nitrogen, 17.53; sulphur, 0.79; and oxygen, 22.63 per cent.

This protein can be extracted from [soaked, ground] soybeans by boiling. "The liquid thus obtained resembles cow's milk in appearance," and when treated with calcium and magnesium salts, yields a precipitate which is sold in Japan under the name of Tôfu. The author has attempted the preparation of a cheese from tofu. 450 gm of pressed tofu were mixed with 60 gm of common salt, 50 gm of finely-ground Swiss cheese, and the mixture was wrapped in a linen cloth saturated with brine, and left for five months in a room with an average temperature of 15º C. At the end of this time the mass was of a grey color, and quite compact; it was free from the numerous pores produced by evolution of gas in Swiss cheese. The cheese had an agreeable taste different from that of Swiss cheese, and when extracted with water, yielded a solution in which the presence of albumoses and peptones was detected. Further experiments with mixtures containing larger quantities of milk-sugar, but no casein, gave similar results. Address: Japan.

1160. Katayama, T. 1906. A condensed vegetable milk. *Bulletin of the College of Agriculture, Tokyo Imperial University* 7(1):113-15. April. German summary in Chemisches Central-Blatt 1906(2):540. [1 ref. Eng]
• ***Summary:*** A liquid closely resembling cow's milk is obtained by soaking soy-beans in water, crushing them, and boiling with water. "The composition of this milk prepared in Japan for the purpose of obtaining Tôfu by the precipitation with calcium or magnesium salts, is in average as follows:" A table titled "Soy-bean milk" shows: Water 92.53%. Protein 3.02%. Fat 2.13%. Fibre 0.03%. Non-nitrogenous extract, including carbohydrates (galactan), 1.88%. Ash 0.41%.

"There can be no doubt that this vegetable milk is of a certain value as an easily digestible food, although in regard to the nourishment of children it cannot replace cow's milk or mother's milk, even if the necessary amount of milk sugar be added.

"The idea suggested itself to prepare from that vegetable milk, the soy milk, by addition of sugar and evaporation a durable preparation resembling condensed cow's milk."

"In 4 litres of soy-milk were dissolved 4 g. dipotassium phosphate [to prevent separation of protein] and 600 g. cane sugar and the solution concentrated *in vacuo* to a very thick liquid. This no doubt can replace the much more expensive condensed cow's milk for certain purposes of the cuisine as e.g. for sweetening coffee and tea, and for the preparation of chocolate.

"It has an agreeable taste like cow's milk, but a very feeble odor recalling crude beans and a slightly yellowish color. If this preparation should be manufactured on a large scale, it must be, of course, always sold under its proper name, and adulteration of condensed cow's milk with condensed soy milk, must be strictly prohibited." Chemical investigations "must determine whether such an adulteration can be easily discovered. My experiments in this direction answer this question in the affirmative."

Such adulteration could be detected by addition of sodium carbonate, when a yellow coloration would indicate the presence of the soy milk. Also, if a portion of the suspected milk were mixed with twice its bulk of water, treated with a few drops of dilute sulphuric acid, and one-tenth of the whole distilled off, the distillate would possess the characteristic odor of the raw beans, if soy-milk were present. Adulteration might also be detected by separating the casein from the suspected sample with rennet, and adding calcium nitrate to the filtrate; the formation of a precipitate would indicate the presence of the globulin of soy-milk, the so-called glycinin.

Note 1. This is the earliest English-language document seen (Aug. 2013) that contains the term "soy milk" or the term "soy-milk."

Note 2. This is the earliest English-language document seen (Aug. 2013) that uses the term "vegetable milk" to refer clearly to soy milk.

Note 3. This is the earliest English-language document seen (Dec. 2010) that uses the term "condensed vegetable milk" to refer to condensed soymilk. It is also the earliest document seen (Dec. 2010) that mentions or discusses condensed or concentrated soymilk. Address: Japan.

1161. Suzuki, Tozaburo. 1906. Process of brewing soy. *U.S. Patent* 0,825,500. July 10. 4 p. Application filed 5 July 1904.
• ***Summary:*** "Attempts have been made recently to brew soy [shoyu] in a shorter time and easier way than in the process hitherto in vogue." One approach is to heat the mash. "In my invention I prepare the mass originally with a less amount of salt than heretofore has been the custom and subject it to slow and uninterrupted stirring in tanks or receptacles exposed to moderate external heat." When the fermentation is thoroughly completed, "more salt is added to regulate the quality of the soy."

"The soy-yeast is prepared with about 5.10 bushels of barley and 5.13 bushels of soybeans, to which is added salt water prepared by adding about 2.05 to 3.6 bushels of dissolved salt to about 63.52 imperial gallons of boiling water, the quantity of salt being one-third to one-half less than in mash prepared in the usual way."

Three illustrations (line drawings) show apparatus used in the process of brewing soy sauce. Address: Sunamura, Prefecture of Tokyo, Japan.

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1162. Ishizaka, S. 1906. Shôyu jôzô fukusan yubun no shiken [Analysis of the oil obtained as a by-product of shoyu fermentation]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 281. p. 589-99. July. [Jap]

1163. Sawamura, S. 1906. On the micro-organisms of natto. *Bulletin of the College of Agriculture, Tokyo Imperial University* 7(1):107-10. [1 ref. Eng]
• ***Summary:*** *"Natto* is a kind of vegetable cheese prepared in Japan by fermentation of boiled soy-bean wrapped in rice straw and left for one or two days in a warm place. This product contains much mucilage filled with innumerable bacteria and it is the great viscosity that is especially esteemed with this cheese."

"The microorganisms of *natto* consist in the beginning chiefly of bacilli, but on being kept for some time micrococci gain predominance.

The writer isolated various kinds of bacilli and micrococci from *natto* and observed their behavior in cultures on sterilised soy-bean." A detailed description of the characteristics of each of the bacilli is given. To Bacillus No. 1 the author gave the name *Bacillus natto.* He considered it to be a new species.

Note: The author was the first to isolate *Bacillus natto* from natto and to give the microorganism responsible for the natto fermentation that name.

He considered the other to be a variety of *Bacillus mes. vulgatus.* He also believed that both bacilli were required to make good natto. *B. natto* was a motile and facultative aerobe. "Natto produced by this bacillus has a good taste and aroma, but is not of so strong viscosity [stickiness] as that produced by Bacillus No. 2. The colonies of Bacillus No. 1 appear always in large number when plate cultures from natto are made. Hence it become probable that this microbe exerts the chief action in the fermentation of natto."

Soy-beans changed by Bacillus No. 2 "show a stronger viscosity but a less agreeable taste and aroma than those produced by Bac. No. 1."

Bacillus No. 2 also produced a "diastatic enzym which was confirmed by formation of reducing sugar in bouillon containing starch. From these facts we can infer that natto may exert some beneficial action on digestion."

Note 1. This is the earliest document seen that contains the term *Bacillus natto,* which refers to the natto bacterium. It is a milestone publication.

Note 2. This is the earliest English-language document seen (Jan. 2012) that uses the word "mucilage" or the word "viscosity" in connection with Japanese natto. Address: Imperial College, Tokyo, Japan.

1164. Yoshida, Kotaro. 1906. Shôyu no seibun ni tsuite [On the constituents of shoyu]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 294. p. 848-52. Aug. [Jap; ger]
• ***Summary:*** The author considers the art and practice of the so-called *hiire* (treatment with heat below 100ºC) during shoyu production to be the most important problem or challenge as far as shoyu quality is concerned. He proposes a modified method of heat treatment, then analyzes the shoyu before and after this treatment. Address: Kagawa-ken, Japan.

1165. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1906. Japan: America ranks third in sales. No. 312. Sept. p. 60-61.
• ***Summary:*** Consul Charles B. Harris reports from Nagasaki on the trade of that consular district: "The five most important imports into Nagasaki during 1905 were coal, valued at $2,708,305; kerosene, at $1,275,342; iron and steel, $796,833; rice, $664,379, and oil cakes, $549,116. Rice and oil cakes represent inter-Asiatic trade, a commerce which is bound to steadily increase... Imports from Great Britain led in 1905, the amount being $5,394,409, China coming second with $1,339,649, and United States third with $1,026,011."

"It is expected that the importance of Nagasaki will be greatly increased as a transshipping point when the Panama Canal is finished..." Address: Washington, DC.

1166. Hosie, Alexander. 1906. Report for the years 1904-05 on the foreign trade of China. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 3725. 120 p.
• ***Summary:*** This is a very detailed report by a seasoned expert on China. "Net foreign trade [in 1904] amounted in silver to 583,547,291 Haikuan taels" (83,580,992*l.* = pounds sterling).

Table H, titled "Principal articles of export in order of value (p. 32): Shows the three most valuable exports to be silk (£11,208,457 = 78,255,412 Haikuan taels), tea (£4,325,802), and cotton (£3,553,744). No. 6 was "Beans" [soy] (£705,662 = 4,926,805 Haikuan taels), and No. 17 was "Bean cake" [soy] (£337,436). Other exports include: Oils (vegetable), fire-crackers, tobacco, hemp, Chinaware, earthenware and pottery, opium (native; exported to Tonkin, etc.), sesamum seed, joss sticks, groundnuts, aniseed, and rhubarb.

Table L, titled "China's principal exports to Asiatic countries" (India excepted), expressed in units of quantity, 1903, 1904, and 1899-1903 average. The top two articles in terms of the 5-year average are [soy] bean cake (3,464,375 cwt) and [soy] beans (2,650,900 cwt). Note: 1 cwt = hundredweight = 112 pounds.

The section titled "Beans and bean cake" (p. 45) states: "I have already explained that the shortage in the export of beans and bean cake to Japan was due to the war being waged in Manchuria. In the total export from China, beans decreased by 823,412 cwts. as compared with 1903, and bean cake dropped from 4,052,026 to 1,370,178 cwts. In

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these products the Yangtsze [Yangtze] Valley is beginning to compete with Manchuria: in 1904 Hankow sent away 3,173,224 cwts. of beans of all kinds, and Chinkiang had an export of 580,989 cwts. of bean cake and 355,670 cwts. of beans and peas."

Under the year 1905, soy beans and bean cake are discussed on p. 94 and oils (vegetable) on p. 95. "The oils produced in China are numerous and varied. Rape, sesamum, groundnut, tea, wood (*Aleurites cordata,* M. Arg.), cotton seed, bean, poppy seed, tallow seed (*Sapium sobiferum,* Roxb.), castor, cocoanut, hemp seed, linseed, perilla seed (*P. ocymoides,* L.), as well as lighting oils from *Amoora Rohituka,* W. and A., and *Jatropha curcas,* L., are all well known. In addition to these we have the essential oils–camphor, cassia, aniseed, peppermint, ginger, clove, orange peel and sandalwood (from imported wood). The most important of these oils from a commercial point of view is wood oil." Address: Acting Commercial Attaché to His Majesty's Legation at Peking.

1167. Sydow, Hans; Sydow, Paul; Butler, E.J. 1906. Fungi Indiae orientalis. I. [Fungi of the East Indies. I]. *Annales Mycologici* 4(5):424-45. Oct. See p. 429. [Ger; lat]
• ***Summary:*** In the section on Uredineae, under Uromyces Link., a subsection titled "Uromyces Sojae (P. Henn.) Syd." (p. 429), begins with an 11-line discussion in German: In *Hedwigia* (1903, p. 108), P. Hennings describes as *Uredo Sojae* P. Henn. a Uredoform found in Japan on *Glycine Soja* (=*Glycine hispida* or *Soja hispida*). This fungus is rather widespread in Japan. On this same food plant (*Nährpflanze*) in Poona in the East Indies [today's India] (No. 601) there appears a Uromyces, which no doubt belongs to the same Uredoform. The scanty / sparse Uredospores, which are found on the Indian material, are identical with those of *Uredo Sojae.* There follows, in Latin, a five-line description of the teleuto-stage of *Uredo sojae.*

Note 1. These three authors are the first to identify the teleuto-stage and to name this fungus "Uromyces Sojae (P. Henn.) Syd." By 1917 it was renamed *Phakopsora pachyrhizi,* the present (2005) scientific name of the aggressive form of soybean rust.

Note 2. It is unclear whether these three authors, by their use of the equal sign (=) are mistakenly equating the wild annual soybean (*Glycine soja*) with the cultivated annual soybean (*Glycine hispida* or *Soja hispida*), or are saying that soybean rust grows on both the wild annual soybean (in Japan) and the cultivated annual soybean (in Poona, India). Address: Berlin, Germany.

1168. *Revue de Service de l'Intendance Militaire* (*France*). 1906. La cuisson des aliments dans l'armée japonaise [Cooking of foods in the Japanese army (Abstract)]. 19:202-03. [1 ref. Fre]
• ***Summary:*** A French-language summary of a French-language article with the title shown above, published in: *La France militaire,* 27 July 1905.

1169. Dampier, William. 1906. Dampier's voyages: Consisting of a new voyage round the world, a supplement to the voyage round the world,... Edited by John Masefield. 2 vols. London: E. Grant Richards. Portrait. See vol. I, p. 580.
• ***Summary:*** The following passage appears in the chapter titled "The Voyage to Tonquin from Achin in Sumatra" (p. 557-612). "Year 1688. The Nuke-mum [nuoc-mam, fish sauce] is of a pale brown colour, inclining to grey; and pretty clear. It is also very savory and used as a good Sauce for Fowls, not only by the Natives, but also by many Europeans who esteem it equal with Soy. I have been told that Soy is made partly with a fishy Composition, and it seems most likely by the Taste: tho' a Gentleman of my Acquaintance, who was very intimate with one that sailed often from Tonquin to Japan, from whence the true Soy comes, told me that it was made only with Wheat, and a sort of Beans mixt with Water and Salt."

Captain William Dampier, an Englishman, lived 1652-1715. Address: Capt., London.

1170. Gollan, W. 1906. Some results of acclimatization work at the Saharanpur Botanical Gardens. *Department of Land Records and Agriculture, United Provinces* [*of Agra and Oudh, India*], *Bulletin* No. 21. p. 27-28.
• ***Summary:*** One section (p. 27-28) is titled "Glycine Soja Sieb and Zucc. Natural order, Leguminosæ. Japan pea. Soy bean." It states: This is an erect or trailing herb, a native of and also often cultivated in warmer valleys in the Himalayas. It is also largely cultivated in Japan and China. The Japanese form is an erect plant with white or black seeds, and attains a height of 12 to 15 inches. The Himalayan form is a trailing plant, also with white or black seeds, but the latter are not quite half the size of the former. On this account the Japanese kind is a much superior variety to the one cultivated in this country.

"Seeds of the Japanese variety were received for trial at Sahárpur in 1882 from the Government of India. These were sown at Mussoorie in the spring at an elevation of 6,000 feet and at Chajurie, Mussoorie district, at an elevation of 4,000 feet. Both these sowings ripened a few seeds in the autumn of the same year, but neither were considered a success. In 1883, eight hundred pounds of the seeds were imported direct from Japan and were widely distributed, but the seeds proved faulty, as in most instances they did not germinate. A small sowing of half a pound, made at Sahárpur early in July of the same year but from a distinct importation from Japan, germinated freely and yielded 8½ pounds of seed in the autumn. In 1884, seven and three quarters of a pound of this seed was again sown at Sahárpur early in July, and it gave a return of 12 pounds in the autumn. This crop was far from healthy, and suffered from an excess of moisture during the

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rains. In 1885, the results were better as it is recorded that the black seeded variety gave a yield at the rate of 1,124 pounds of seed per acre. In 1886, this acclimatised seed was widely distributed. In some cases the crop failed and in others it was fairly successful, but in all cases where seeds were harvested, it was said that the people did not care for the pulse in any form whatsoever. The garden grew the crop for a few years longer, but as there was absolutely no demand for the seeds, it eventually abandoned its cultivation.

"There is no doubt the superior Japanese variety can be grown on the plains in a kind of fashion as a rainy season crop, but the yield is not heavy, while the pulse, although very popular in China and Japan, is not considered of much account by either the native or the European. The Himalaya variety, called "bhat" in the neighbourhood of Mussoorie, is grown there on a very small scale and only for the home consumption of the grower. " Address: Former Superintendent of the Gardens, United Provinces, India.

1171. Hearn, Lafcadio; Bisland, Elizabeth. 1906. The life and letters of Lafcadio Hearn [1890-1904]. 2 vols. Boston and New York: Houghton, Mifflin Co. 560 p. See Vol. 2, p. 28-30. Illust. Index. 23 cm.

• ***Summary:*** In a letter to Basil Hall Chamberlain, from Matsue, dated May 1891, Hearn writes: "Dear Professor Chamberlain,–I have just returned from a pilgrimage to the famous Kwannon temple of Kiyomizu–about 18 miles from Matsue–where it is said that the sacred fire has never been extinguished for a thousand years, to find your postal card."

"The scenery at Kiyomizu is superb. But there is no clear water except the view of Nanji-umi from the pagoda and the hills. The mamori, I regret to say, are uninteresting. There is, however, a curious Inari shrine. Beside it is a sort of huge trough filled with little foxes of all shapes, designs, and material. If you want anything, you pray, and put a fox in your pocket, and take it home. As soon as the prayer is granted you must take the fox back again and put it just where it was before. I should like to have taken one home; but my servants hate foxes and Inari and tofu and azuki-meshi and abura-gi [aburage] and everything related to foxes. So I left it alone."

"Through the goodwill of Basil Hall Chamberlain, Hearn gained a teaching position in the summer of 1890 at the Shimane Prefectural Common Middle School and Normal School in Matsue, a town in western Japan on the coast of the Sea of Japan. Most Japanese identify Hearn with Matsue, as it was here that his image of Japan was molded." In "1896, with some assistance from Chamberlain, he began teaching English literature at Tokyo (Imperial) University, a post he held until 1903" (Source: Wikipedia, at Lafcadio Hearn, Oct. 2008). Address: Matsue, Japan.

1172. Hutchison, Robert. 1906. Food and the principles of dietetics. 2nd rev. ed. New York, NY: William Wood and Co. xx + 582 p. Illust. Index. 22 cm. [100+* ref]

• ***Summary:*** Contains exactly the same information about soy and related products as the 1900 1st edition, in the same chapters, except it is on slightly different pages: See p. 232-35, and the section on diabetes, which has a subsection on "Diabetic breads" (p. 491-92).

"Vegetarian" or "vegetarianism" or "vegetable diet" are discussed on pages 172-73, and 185-86. The section on "The nutritive value of vegetable foods" (p. 171+) states: "But we must by no means suppose, even if the chemical constituents of vegetable food were equal in nutritive value to the corresponding constituents of animal food, that therefore vegetable food as a whole can replace meat, and vice versa. The form in which the nutritive ingredients are presented to the digestive organs materially affects their utility as foods. A glass of whisky is chemically the same whether it be taken 'neat' or diluted with a tumblerful of water, but the effects on the body are radically different.

"The question, therefore, presents itself: Is it better to obtain the nutritive constituents of our food in an animal or a vegetable form? and an attempt to reply to this question raises the whole problem of vegetarianism. With that problem we must now concern ourselves for a short space [see footnote].

"Vegetarianism may be advocated either on physiological or on economic grounds.

"As regards the physiological argument, it may be pointed out–what is apt to be lost sight of–that the vegetarian question is really a question of protein, and of that alone. The carbohydrates of the diet must almost perforce be derived from the vegetable kingdom, for there alone are they to be found in any quantity, and it has already been pointed out that the fat of the diet may be obtained with equal physiological advantage from either an animal or a vegetable source.

"But as regards proteins it is different. Even were a given quantity of pure vegetable protein fully equal in nutritive value to a similar quantity of the protein of flesh, we are still unable to extract the vegetable protein in a state of purity and eat it by itself, but must take it in the form in which it is presented to us by Nature. The real question, therefore, is: Shall we eat our protein in an animal or a vegetable form? Now, in the first place, it will scarcely be denied that vegetable foods are relatively much poorer in protein than animal foods are. Contrast typical examples of both kingdoms after the removal of water, for that is the only fair method of comparison, and one arrives at the following results:" A table shows: Dried lean beef contains 89% protein. Beef with fat contains 51% protein. Pea flour contains 27% protein. Wheat contains 16% protein. Rice contains 7% protein.

"The comparison shows that even the fattest meat is far richer in protein than the most nitrogenous forms of vegetable food.

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"Not only so: what protein is present in vegetable food has its value still further lowered in many cases by the defective nature of its absorption in the body. The truth of this has been already sufficiently demonstrated.

"It must be obvious from all this that vegetable food, unless eaten in large quantities, will not yield a sufficiency of protein to the body. The important question arises, therefore: How much protein does a healthy man require in his food daily? This question has been discussed in an earlier chapter, and it is only necessary to remind the reader that the amount of protein which is required daily by a healthy man doing a moderate amount of bodily work has been estimated at about 100 grammes (Footnote 1). And what are the consequences of living upon a diet which contains less protein than this? To this question, as we have also seen (p. 23), it is not easy to give an altogether satisfactory reply. In the first place it must be admitted that such a large amount of protein is by no means necessary for making good the mere daily waste of protein in the body. Very much less will suffice for that, and carefully-conducted experiments have shown that no impairment of the stock of protein in the body is incurred even if the amount in the food be cut down to as low a level as 60 grammes daily. Even if it be objected to such experiments that this minimum consumption of protein has only been maintained for very limited periods, yet it may be replied that the minimum reached is not much below that which forms the average daily consumption per individual in a large number of healthy races, such, for example, as the Japanese."

Pages 185-86: A vegetable diet is less expensive than a mixed diet, but it requires considerably more cooking time.

"In conclusion it may be well to summarize the main points in the argument which has been pursued in this chapter:

"1. Vegetable foods are rich in carbohydrates, and, with a few exceptions, comparatively poor in protein and fat. They are also bulky, partly from their richness in starch, but also from the presence of cellulose and a large amount of water. Even if compact in their raw state, they tend to take up much water and to become bulky on cooking.

"2. Animal foods are rich in protein and fat, but, with the exception of milk, poor in carbohydrates. They are compact in form (again with the exception of milk), and tend to become more so on cooking.

"3. Vegetable foods are less digestible in the stomach, and on the whole less completely absorbed than animal foods, partly by reason of their bulk, partly because of the indigestible coating of cellulose which invests their nutritive constituents, and in part also from their tendency to undergo fermentation in the intestine, with the production of acids which hasten on peristalsis. Their protein constituents suffer more from defective absorption than any other ingredient.

"4. Both from chemical composition and from defective absorption a purely vegetable diet is apt to be deficient in protein, and the question of vegetarianism becomes a question of whether it is advisable to live upon a protein-minimum or not.

"5. The consistent vegetarian must either live upon a diet which is relatively poor in protein or else consume an excessive bulk of food.

"6. The adoption of the former of these courses, there is reason to believe, tends to diminish energy and the power of resisting disease; the latter is apt to lead to derangement of the stomach and bowels.

"7. Both of these results may be avoided by supplementing the vegetable part of the diet by animal substances rich in protein, but two-thirds of the total protein can safely be taken in the vegetable form.

"8. Either meat, fish, eggs, milk or cheese may be used as the protein-carrier, but for healthy persons the moderate use of the first two has certain advantages. For the gouty, perhaps milk and cheese are more to be recommended, while skim or butter milk, salt fish, and the cheaper kinds of cheese are undoubtedly the most economical.

"9. Vegetable foods have certainly the advantage of being cheaper, both as sources of building material and energy, than the animal foods are, and vegetarianism may therefore be recommended on grounds of economy, both national and individual. The reasons for the inevitable costliness of foods of animal origin have been pointed out; the cost of cooking, however, must not be lost sight of in this connection, and modifies somewhat the above considerations.

"10. It may finally be added, though these points were not dwell upon, that vegetable foods are less highly flavoured than some animal foods, such as meat, but have the advantage of not being liable to undergo putrefaction, and of rarely producing disease." Address: M.D. Edinburgh, F.R.C.P., Asst. Physician to the London Hospital and to the Hospital for Sick Children, Great Ormond St. [London].

1173. Kaempfer, Engelbert. 1906. The history of Japan, together with a description of the Kingdom of Siam 1690-1692 (translated by J.G. Scheuchzer from the original edition of April 1727. 3 vols.). Glasgow, Scotland: James MacLehose and Sons. Vol. 1, xc + 334 p. Reprinted 1971 New York, NY: AMS Press Inc.

• ***Summary:*** Please see the original 1727 edition of this work for a long quote on soybeans, miso, shoyu, and azuki beans; it appears in this 1906 edition in Vol. 1, p. 187-88. Many of Dr. Kaempfer's botanical specimens may still be seen in the Natural History Museum, South Kensington. The front matter in this book is very interesting: The frontispiece shows a full-page portrait (illustration, painting) of Sir Hans Sloane. List of illustrations. Publisher's note. Biographical note of the Scheucher family, by Sir Archibald Geikie. To the King, by J.G. Scheucher. The names of the subscribers [alphabetical]. The author's preface. The life of the author,

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by the translator. An introduction, by the translator.

In the author's preface Kaempfer explains (p. xxix-xxxiii) that the Swedish Embassy, where he was secretary, was dismissed by the Persian Court. Since his native country Germany was at war, he decided to travel rather than to return home. He joined the Dutch-East India Company and went to Japan, where most visitors find it very difficult to obtain any information about the country, since all Japanese are obliged by solemn oath not to discourse with foreigners. But Kaempfer developed a rare friendship with his interpreters and the Japanese officers on his island (Deshima in Nagasaki Bay). He assisted them in the fields of medicine, astronomy, and mathematics, and in turn was able to learn about their country. Kaempfer was especially fortunate in gaining "the assistance of a discreet young man, by whose means I was richly supplied with whatever notice I wanted concerning, the affairs of Japan. He was about twenty-four years of age, well vers'd in the Chinese and Japanese languages, and very desirous of improving himself. Upon my arrival, he was appointed to wait on me, as my servant, and at the same time to be by me instructed in Physick and Surgery" (p. xxxii). The chief of the island allowed him "to continue in my service during the whole time of my abode in the Country, which was two years, and to attend me in our two journeys to Court, consequently four times almost from one end of the Empire to the other... As I could not well have obtain'd my end without giving him a competent knowledge of the Dutch language, I instructed him therein with so much success, that in a year's time he could write and read it better than any of our interpreters: I also gave him all the information I could in Anatomy and Physick, and farther allow'd him a handsome yearly salary, to the best of my abilities... There was not a Book I desired to see, on these and other subjects, which he did not bring to me, and explain to me, out of it, whatever I wanted to know."

A very interesting map of Japan shows each of the provinces and off-shore islands.

Note: The long index in volume 3, which makes interesting reading, includes acupuncture, algae (marine, used for food), amasake (amazake, see sake), *Amoenitates Exoticæ,* atheists, Buddhism & pagan worship, cami [kami], Canagawa [Kanagawa], cannnib, hempstuffs, Corea [Korea], Cublai–Tartar monarch, culis (see coolies), Deshima (island of Kaempfer at Nagasaki), Dutch East India Company, Fide Jori [Hideyori], Fide Joshi [Hideyoshi], Gendsii [Genji], gokokf [go-kokufu, chief kinds of peas], herbals, Hirando, Isje [Ise], Jejas [Ieyasu], Kami, Kioto (see Miaco), Koja [Koya], Marco Polo, Mikado, moxa, Nagasaki, oil seeds, opium, paganism, paper made by Japanese, pulse, Pythagoras, Quannon [Kwannon], religion, sago, saki [sake], salt, sasen [zazen], secular monarchs [Shogun], sesamum (plant and oil), Siaka (Buddha), Shimonoseki, submarine plants, Tokaido, Tokio, transmigration of souls, umbrellas, Wilstach (Maria Sophia, wife of Dr. Kaempfer). Address: Physician to the Dutch Embassy to the Emperor's Court, Edo (Tokyo), Japan.

1174. Loew, O. 1906. Ueber einige sonderbare japanische Nahrungsmittel [On some special Japanese foods]. *Mitteilungen der Deutschen Gesellschaft fuer Natur- und Voelkerkunde Ostasiens* 11(1):109-11. [Ger]

• ***Summary:*** Prof. O. Loew includes a discussion of tofu, soymilk, yuba, and shoyu (*shôyû-sauce*). On the coasts of Japan there were fresh seafish, and in the inland regions some salted fish were used. People have learned how to prepare wheat gluten (*Jap: fu; German: Weizenkleber*) in various dried forms, which are very porous and easily digested. The protein of the soybean, under the name of tofu (*Tôfu*), comes in the form of soft white cakes and is prepared daily. It is sold from door to door by salespeople.

The cooking of the softened soybeans, before the precipitation of the tofu, has a very milklike consistency. Without doubt, it is similar in nutritional value to milk but it can be recommended only for adults, and not for sensitive infants. "When this soybean milk (*Soyabohnenmilch*) mixed with some gelatine [sic] is simmered down, and while in a concentrated condition the mixture is poured into flat, level containers, there results from the drying of the gelatinous mass thin skins, which are sold under the name of yuba."

Note 1. This is the earliest German-language document seen (Aug. 2013) that uses the term *Soyabohnenmilch* ("soybean milk") to refer to soymilk.

Note 2. The date on the title page is given as 1907-09. The place of publication has now changed to Tokyo. Address: Prof. of Agricultural Chemistry, Imperial University, Tokyo, Japan.

1175. Okumura, Hanjirô. 1906. Tôfu hyakuchin: eisei ryôri [One hundred and rare and favorite tofu recipes: hygienic cookery]. Tokyo: Hagiwarashin Yôkan. 44 p. 18 cm. [Jap]

• ***Summary:*** This book appears to be a simplified, condensed and (somehow) sanitized version of the 1782 classic *Tôfu Hyakuchin,* by Ka Hitsujin.

1176. Senft, Emanuel. 1906. Ueber einige in Japan verwendete vegetabilische Nahrungsmittel, mit besonderer Beruecksichtigung der japanischen Militaerkonserven [On some vegetable foods used in Japan, with special attention to Japanese military canned foods]. *Pharmazeutische Praxis* 5(12):481-91. [5 ref. Ger]

• ***Summary:*** Working for the German Food Administration, the author examined a number of preserved foods that had played an important role in helping Japan to win the Russo-Japanese war. He drew heavily on Loew (1895). "Widely distributed in Japan is a unique baked good, which is produced primarily from wheat gluten with only a little of wheat flour; it is called *Fu* (wheat gluten bread).

"A very important role is played by the soybean and the

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many diverse products made from it: Yuba, the vegetable cheeses tofu, natto, and miso, plus shoyu or soy-sauce (*Shoju oder Soy-Sauce*). Like the soybean, tofu and natto are rich in protein. They supply the protein lacking in rice."

Also discusses fresh konnyaku, dried-frozen konnyaku, dried persimmons, sea vegetables (12 types in great detail, with an illustration of the cells of a kombu plant), and warabi (dried ferns). Address: Official of military medicines, Committee of military hygiene.

1177. Soya Gakugawa (Chusuke). comp. 1906. Tôfu sanbyakuchin [Three hundred rare and favorite tofu recipes]. Kyobashi: Shiki Shimaya Shobo. Japanese summary by Kawakami 1978. [Jap]
• ***Summary:*** This work is composed of three earlier books published as one: Tofu Hyakuchin (1782), Tofu Hyakuchin Zokuhen (1783), and Tofu Hyakuchin Yoroku (1788).

1178. Tôfu ryôri: Hôichi Shinbun kenshô tôsen [Tofu cookery: Hoichi Newspaper prize winners]. 1906. Tokyo: Hôichi Shinbunsha. 79 p. 21 cm. [Jap]*

1179. Boehmer (L.) & Co. 1907. Wholesale catalogue: 1907 / 1908. Yokohama, Japan. 38 p. Illust. 27 cm. [Eng]
• ***Summary:*** The section titled "Plants and seeds of economic value" (p. 20) gives detailed information about different varieties of soy-beans quite similar to that found in the 1902 catalog, except that now a fourth type, green, is described; it was formerly accidentally included as part of the black type– no new information is given. Soybeans are again offered for sale under the same terms as before.

The information about azuki beans (p. 21) is identical to that in the 1902-1903 wholesale catalogue. Also: Kudzu. At bottom of p. 20: "Prices and full particulars on application."

Alfred Unger, F.R.H.S. [Fellow, Royal Horticultural Society] is now the proprietor. Since this catalogue marks the company's 25th anniversary, the page following the title page states: "To our friends and customers: In this, the twenty-fifth year of our existence, we should like to review, for our patrons, the history of our firm, the founders of the export trade in Japanese Horticultural, Agricultural, and Forestry products.

"When in 1870 the Japanese government up the island of Yesso [Yeso, now named Hokkaido], a Commission of foreigners was appointed to aid in developing the island. Mr. Louis Boehmer joined this commission as head of the Horticultural Department, having been recommended for this position by Messrs Peter Henderson & Co. of New York. When this commission was dissolved in 1880, Mr. Boehmer, who had already seen the possibilities of a trade in Japanese horticultural products, came to Yokohama, founding in 1882 the firm of Louis Boehmer.

"By 1889 the trade had so increased, that Mr. Boehmer needed assistance and the present proprietor, Mr. Alfred Unger, was sent out by the great horticultural firm of J.C. Schmidt [named Haage & Schmidt by 1900], Erfurt, Germany, principally to look after the export of Cycas stems, which just at that time were in great demand. In October, 1892, he was made a partner and the firm of L. Boehmer & Co. was formed. This partnership lasted until 1896, in which year Mr. Boehmer died in Blankenburg am Harz, Germany, where he had gone to recuperate his health.

"Since that date Mr. Unger has been the sole proprietor..." Address: Nos. 5 and 28 Bluff, Yokohama, Japan.

1180. Yokohama Nursery Co., Ltd. 1907. Catalogue... for 1907. Yokohama, Japan. 90 p. Illust. Index. 26 cm. [Eng]
• ***Summary:*** On the cover of this English-language catalog is an illustration of a Kaempfer iris (*Iris Kaempferi*) blossom. In the section on "Seeds" (p. 73+) is a subsection (p. 80) titled "Some vegetable seeds." The contents (incl. the entry for "soy bean") is identical to that in the 1906 catalog, except that the price per pound of soy bean has decreased to $0.10 and a 9th variety of vegetable seeds is offered: Carrot (long Japanese).

This catalog contains many changes compared with its 1906 predecessor. The title has changed and, for the first time, appears on the cover rather than on the Contents page. A page about the company near the front explains that it was incorporated in 1890 and now has a telephone number. It has a new branch office in London at Craven House, Kingsway, W.C. Cable address: Tigrinum, London. The Index, for the first time, is in the back of the catalog, and (again, for the first time) contains an entry for "bean" (p. 80) but not for "soy." All other plants are likewise indexed by their common or scientific / botanical names. Address: P.O. Box No. 72. Nos. 21-35 Nakamura, Yokohama, Japan. Phone: 509.

1181. Moore, R.A. 1907. Division of Farm Crops: Plan of work for the coming year. *Wisconsin Agricultural Experiment Station, Annual Report* 5:145-70. Feb. See p. 165-67.
• ***Summary:*** Experiment No. 8 (p. 165-67) is titled "Soy beans." Some background on the crop is given, along with planting instructions. Then a "Report Blank," containing 22 questions, is provided so that each farmer who plans to participate in the experiment may provide detailed feedback on his results to the station. Questions include: Name of experimenter. County and state. Date of planting soy beans. Character of soil. What crop had been grown the previous year? Yield per acre of marketable beans? Did you use any bacteria-laden soil for inoculation purposes? Were nodules noticeable on the roots of the soy beans at any time during the growing period where such soil was used? Were they noticeable where the soil was not used? Give in general way your opinion of soy beans as a seed and forage plant for Wisconsin.

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The section on soy beans begins: "The soy bean was probably introduced into the United States from Japan about fifty years ago and has been cultivated with success in the southern states. In Japan it is used extensively as a human food, but in this country it is grown for the seed, as a forage plant, and as a soil renovator. As a forage its use as a soiling crop is becoming recognized, by stockmen and dairymen, as it withstands the drought exceptionally well and will give a good cutting of green forage at the time when other feeds are shriveled and wilted. Soy beans of the late variety gave a cutting of 9.9 tons green forage per acre at the Wisconsin Experiment farm in 1900 and yielded thirty-eight bushels of seed beans per acre in 1902, and forty bushels per acre in 1903." Address: Secretary, Madison, Wisconsin.

1182. *Poverty Bay Herald* (*Gisborne, New Zealand*). 1907. Our mail bag: Japanese vegetable milk. March 16. p. 7.
• ***Summary:*** A condensed vegetable milk has been prepared by Professor Katayama of the Imperial Agricultural College, Tokio, but it is not yet a commercial article.

"It is prepared from soy beans, and the liquid is said to be very similar in appearance to cows milk, having a yellowish color and an agreeable taste which would be quite like the product but for a slight odor of beans."

1183. *Bulletin of the Imperial Institute* (*London*). 1907. Utilisation of the soy bean. 5(1):86-87. [2 ref]
• ***Summary:*** "The plant yielding the "soy bean" (*Glycine soja*) has of late received much attention at the hands of agriculturists in tropical countries on account of its value as a green manure. The bean itself has long been employed in the East as a vegetable and food-stuff, and has been imported in large quantities into European countries, principally for use as a feeding-stuff for animals. It is also an important ingredient in Indian soy, which forms the basis of chutney. More recently the introduction of the extraction of cheaper methods for the extraction of fixed oils by the use of solvents has made it possible to utilise such materials as the soy bean, which contains only 10 per cent. of fixed oil, as a source of oil, and considerable quantities are now used in the United Kingdom in this way." Note: This is the earliest English-language document seen (March 2003) that uses the term "solvents" (or "solvent") in connection with the crushing of soybeans to give oil and meal.

Also discusses briefly the preparation of soymilk and tofu in Japan.

1184. Ballard, Walter J. 1907. Far Eastern progress. *Los Angeles Times*. April 11. p. II4.
• ***Summary:*** "The South Manchuria Railway Company is buying 150 locomotives and other railway equipment and supplies, to the aggregate value of $5,000,000. Apply to the Bureau of Manufactures, Washington, D.C., for the names of Japanese forms holding the specifications."

"Japanese enterprise is establishing [soy] bean-cake factories in Manchuria–the land of beans. The capital of the company is $2,490,000. Most of the cake manufactured will be sent to Japan, and the oil to Germany, to be used in soap manufacture."

1185. Suzuki, Tozaburo. 1907. Apparatus for brewing soy. *British Patent* 9,995. 5 p. Date of application, 30 April 1907. Accepted 3 Oct. 1907. 3 drawings.
• ***Summary:*** "This invention relates to improvements in apparatus for brewing soy... The object of this improvement is to provide auxiliary means for quickly changing the temperature of the tanks, said means being also adapted to act as a substitute for the closed chamber for effecting or giving the contents of the tanks a uniform temperature and also acting if desired in conjunction with said chamber for regulating the temperature of said tanks. In the brewing of soy the question of temperature is very important..."

"The novelty of this invention consists in combining with an apparatus, comprising a brewing tank, means for applying a constant temperature thereto, and means for constantly stirring the contents of the tank, an auxiliary means or arrangement whereby the temperature of the contents of the tank may be quickly changed."

Four illustrations depict the apparatus. Address: No. 401 Jibeishinden, Sunamura, Minami-Katsushika, Tokio [Tokyo], Japan.

1186. Suzuki, Tozaburo. 1907. Appareil pour brasser la sauce dite Soy [Apparatus for brewing soy sauce]. *French Patent* 377,294. April 30. 5 p. Application filed 6 July 1907. 4 drawings. [Fre]
Address: Japan.

1187. Funatsu, T. 1907. On different forms of phosphoric acid in press cakes. *Bulletin of the College of Agriculture, Tokyo Imperial University* 7(3):457-59. April. [Eng]
• ***Summary:*** This article begins: "Since refuse press cakes are frequently used as manure, it is of some importance to determine the amounts of phosphoric acid present in different forms, as the availability for plants differs very much in different compounds." The soybean cake used extensively as manure in Japan is imported from Manchuria. A table (p. 458) gives the percentage of phosphoric acid in three different oilseed cakes: Soybean cake, cotton seed cake, and rape cake, with herring guano used for comparison. In soybean cake: Total phosphoric acid 1.38%. Phosphoric acid as lecithin 0.17%. Phosphoric acid as nuclein 0.23%. Phosphoric acid soluble in dilute (4%) hydrochloric acid 0.98%.

In soybean cake, the relative amounts of phosphoric acid (so that the total = 100%) are: Phosphoric acid as lecithin 12.4%. Phosphoric acid as nuclein 16.5%. Phosphoric acid soluble in dilute (4%) hydrochloric acid 71.0%.

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Note: This is the earliest English-language document seen (Nov. 2005) that contains the term "cotton seed cake" (spelled exactly like this).

1188. Inomata, Yoshio. 1907. Shôyu ni hitaseru pesto nezumi shikabane chû pesto kin no unmei ni tsuite [On the fate of pest bacillus and pest bacillus in the corpse of a rat (killed by the bacillus) which was soaked in shoyu]. *Saikingaku Zasshi* (*Bacteriology*) No. 142. p. 576-83. April. [Jap]
Address: Wakayama-ken Dai Yon-bu Saikinshitsu.

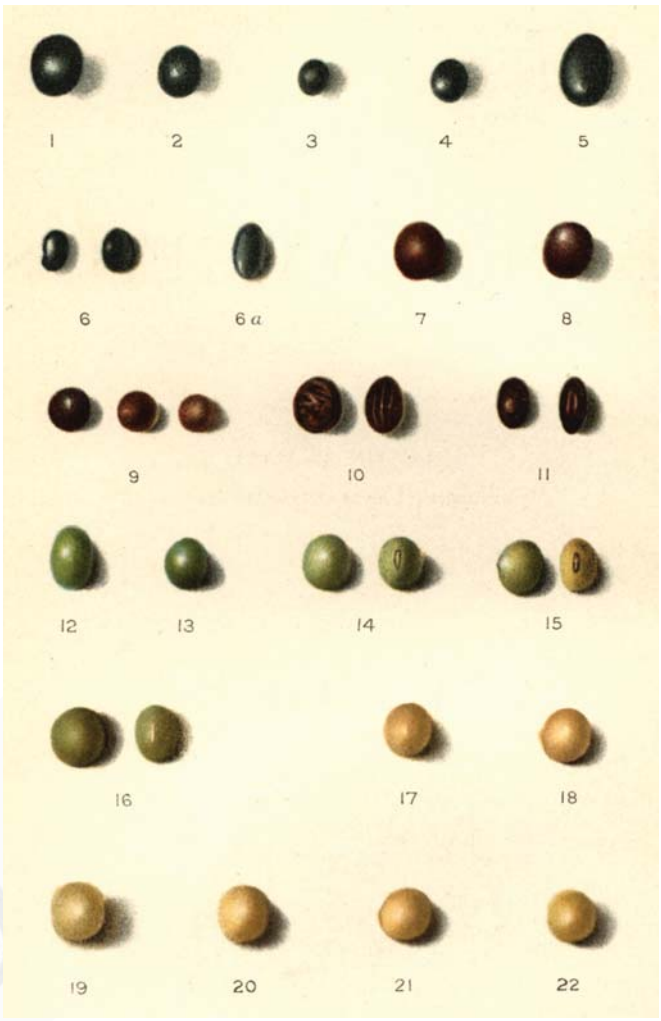
1189. Suzuki, Umetaro; Aso, Keijiro; Mitarai, Harukichi. 1907. Shôyu no seibun ni tsuite [On the constituents of soy-sauce]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 28(4):363-407. April. [2 ref. Jap]
• ***Summary:*** An analysis of the chemical composition of Japanese soy sauce. It is very difficult to isolate the various protein decomposition products and to understand the complex chemical changes that occur during shoyu fermentation. Tables show the composition of both soybeans and wheat. Address: 1-2. Nôgaku-shi, Japan.

1190. Ball, Carleton R. 1907. Soy bean varieties. *USDA Bureau of Plant Industry, Bulletin* No. 98. 30 p. + 5 plates. May 27.
• ***Summary:*** This publication started a new system for naming soybeans, giving them common names such as Buckshot, Ogemaw, and Ito San. Contents: Origin and introduction of the soy bean. Variability. Classification: Key to the varieties. Descriptions of the varieties (23–including the source of the name and the numbers and sources of lots grown, incl. Agrost. No. and S.P.I. No.): Black-seeded group (Buckshot, Nuttall, Kingston, Ebony, Flat King, Riceland), Brown-seeded group (Ogemaw, Eda, Baird, Brownie), Mottled-seeded group (Hankow {with patch or saddle, and usually eccentric lines or stripes outside the patch}, Meyer), Green-seeded group (Samarow, Guelph), Greenish-yellow-seeded group (Yosho, Haberlandt, Tokyo {incl. Best Green}), Yellow-seeded group (Ito San {"It has long and widely sold under the names, 'Yellow,' 'Early Yellow,' 'Early White,' etc."}, Manhattan, Butterball, Amherst, Hollybrook, Mammoth). List of synonyms.

Note 1. This is the earliest document seen (July 2013) containing a list and descriptions of early U.S. soybean varieties. Details on each of the 23 individual varieties discussed by Ball are given in separate records in this database with titles of the format "Buckshot: New U.S. domestic soybean variety" (for Buckshot).

Note 2. This is the earliest document seen (July 2013) which tries to standardize early soybean varietal names / nomenclature to prevent confusion.

Note 3. This is the earliest English-language document seen (Sept. 2004) that uses the word "mottled" (or "mottling") or the word "stripes" to describe the color of



soybean seeds. Note that both the mottled Hankow and Meyer varieties came from China.

"Classification: The first separation of the numerous forms or agricultural varieties of this species will naturally be through the colors of the seeds. The varieties having seeds of the solid colors black and yellow are by far the most numerous and most striking. The greens and browns are much less common and are also very variable in shade. The browns are of various shades of reddish brown and are also closely related to the mottled group. The yellows vary commonly into greenish shades, and any line drawn between the yellow and greenish yellow is only arbitrary. The yellows also vary into paler shades, and some have even been called 'white' in Japan. This is most noticeable in old seeds, but is never carried farther than pale yellow. It seems likely that none of the legumes commonly cultivated in Japan can have pure white seeds, like our navy beans for example, or the term 'white' would never be applied to a pale-yellow form. All yellow soy beans gradually turn paler with age for at least three to four years, although some varieties are originally paler than others. Although the black group shows more variation in the size of the seeds, the yellow is much

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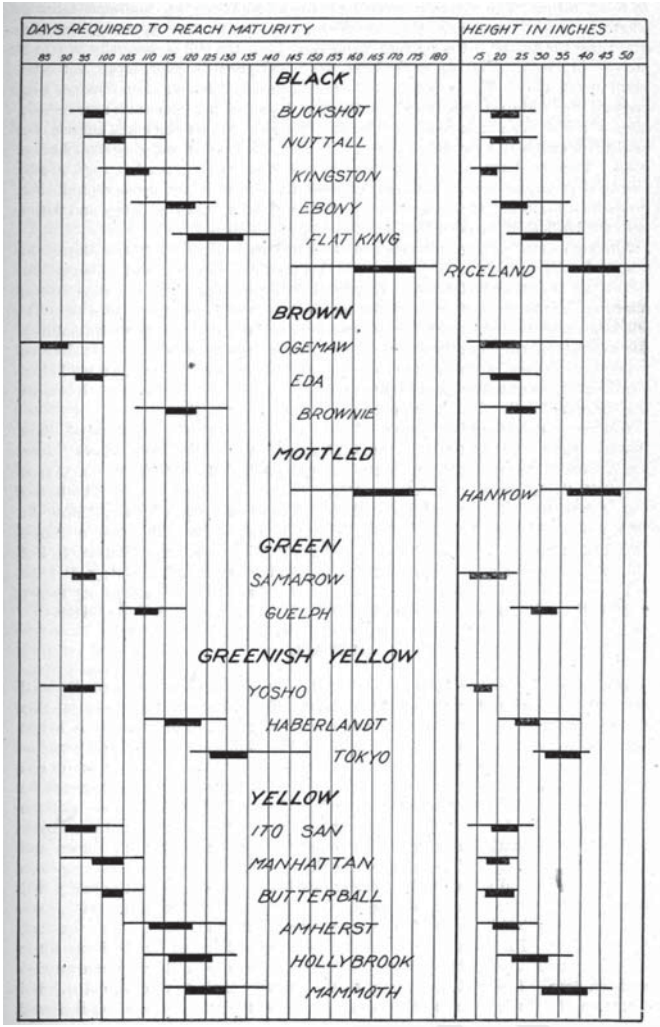
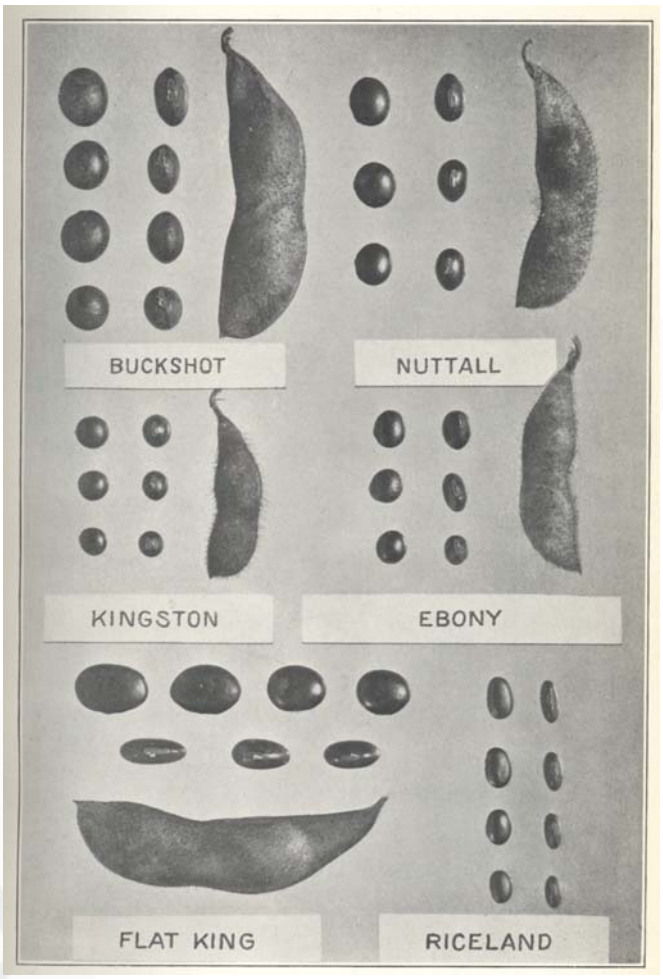


more variable in color shades... Figure 1 shows an attempt to represent graphically the relationships and importance of the various color groups." Six color groups are recognized and described herein.

Distribution numbers: Part I is "serial numbers under which soy beans were distributed by the former Division of Agrostology, with the name of the variety to which each has been referred." Part II is a "list of the serial numbers under which soy beans have been distributed by the Office of Seed and Plant Introduction and Distribution, with the name of the variety to which each is referred in this bulletin. Several S.P.I. numbers representing soy beans not studied by the writer are not included in the list. 3870–Hollybrook. 4285–Mammoth. 4912–Hollybrook. 4913–Amherst. 4914–Tokyo. 5764–Hollybrook," etc. up to "17852–Meyer." Note 4. One variety was often introduced several different times under different S.P.I. numbers, and that many varieties have an "Agrostology No." [Number] separate from their S.P.I. number. Description of plates.

"Origin and introduction of the soy bean (p. 7-8): The soy bean (*Glycine hispida* (Moench.) Maxim.) is an annual



leguminous plant from the Orient. Its native home is said to be from southern Japan southward through eastern China and Indo-China to Java. In China and Japan it has been in cultivation for many centuries, certainly since before the beginning of the Christian era. In those countries it is easily the most important legume grown, and in some provinces it is the most important of all crops. Owing, perhaps, to the almost complete isolation of that part of the Orient, its cultivation spread only slowly to other lands. It is now grown to some extent in India, but its introduction there seems to be of recent date. It reached Europe probably in the latter part of the eighteenth century, and its arrival in England is credited to 1790. For several decades it was grown merely as a curiosity in botanic and private gardens. Investigation of the economic value of this plant began more than thirty years ago in Europe, rather earlier than in this country, but the soy bean has not yet attained any great prominence there.

"The soy bean has been known in the United States for more than three-quarters of a century. In the New England Farmer of October 22, 1829, Thomas Nuttall wrote of its possibilities as a crop for this country. For many years it was grown only in gardens as a curious plant from the Far East. The Perry expedition to Japan in 1853 brought back two

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varieties, a yellow and a red sort [azuki?], which were tested here in a limited way.

"During the last twenty years the soy bean has been the subject of many experiments to determine its agricultural value and adaptations. The agricultural experiment stations of Kansas and Massachusetts were pioneers in these investigations and seed was imported directly from Japan by both stations. Through these efforts considerable interest was aroused, and two or three varieties soon became available commercially. The number of forms and varieties in this country was further increased by additional importations made by enterprising seedsmen. Since 1898 the Office of Seed and Plant Introduction of the United States Department of Agriculture has secured from seven different countries of the old world no less than 65 different lots of soy bean seeds, representing about twenty varieties."

Page 2 lists the 28 people and divisions in the Bureau of Plant Industry. Beverly T. Galloway is chief of the Bureau. Merton B. Waite and Irwin F. Smith are pathologists. Walter T. Swingle is physiologist in charge of plant life history investigations. Mark A. Carleton is cerealist in charge of grain investigations. David Fairchild is in charge of seed and plant introduction. Charles V. Piper is agrostologist in charge of forage crop investigations. Palemon H. Dorsett is pathologist in charge of the plant introduction garden, Chico, California.

Note 4. This is the earliest document seen (Aug. 2011) that mentions Palemon H. Dorsett in connection with plant introduction or with soy beans.

List of synonyms (p. 27): Adzuki = Ito San. Black = Buckshot. Brown Eda Mame = Eda. Crossbred No. 6 = Ogemaw. Early Black = Buckshot. Early Green = Guelph. Early Japan = Butterball. Early White = Ito San. Early Yellow = Ito San. Extra Early Black = Buckshot. Green = Guelph. Green Samarow = Samarow. Hollybrook = Hollybrook [sic]. Ito San = Ito San [sic]. Japanese No. 15 = Kingston. Kaiyuski Daizu = Ito San. Kiyusuki Daidzu = Ito San. Kysuki = Ito San. Large Black = Buckshot. Late Yellow = Mammoth. Mammoth Yellow = Mammoth. Medium Black = Buckshot. Medium Early Black = Buckshot. Medium Early Green = Guelph. Medium Green = Guelph, Ogema = Ogemaw. Southern = Mammoth. Yellow = Mammoth. Yellow Eda Mame = Ito San.

A color illustration (frontispiece, facing the title page) shows one or two views of the seeds of 22 different soy bean varieties, lined-up and numbered. Diagrams show: The probable relationships of the different groups of soy beans (block style; p. 10).

The number of days required to reach maturity and the height of the plant in inches, with averages, for each variety of soy bean (graph plot; p. 13).

The 1st plate, facing the title page, showing the seeds of 22 soybean varieties, is in color. Four full-page photos at the end show the pods (side view) and seeds (side and front views) of (typically) five soybean varieties.

Note 5. This is the earliest document seen (Sept. 2013) that mentions the following soybean varieties: Amherst, Baird, Brown Eda Mame, Brownie, Buckshot, Butterball, Ebony, Eda, Flat King, Guelph, Haberlandt, Kingston, Large Black, Manhattan, Meyer, Nuttall, Riceland, Samarow, Tokyo, Yosho.

Note 6. This is the earliest document seen (July 2013) which states that Black, Early Black, Extra Early Black, Large Black, Medium Black, and Medium Early Black are all the same as Buckshot, or that Early Japan is the same as Butterball, or that Brown Eda Mame is the same as Eda, or that Early Green, Green, Medium Early Green, and Medium Green are all the same as Guelph, or that Yellow is the same as Mammoth. Address: Agronomist, Grain Investigations, USDA Bureau of Plant Industry.

1191. Guelph: New U.S. domestic soybean variety. Synonyms: Early Green, Green, Green Medium, Medium Early Green, Medium Green (Ball 1907). Dwarf Green, Michigan Green, Ohio Medium Green, Wisconsin Early Green (Morse 1948). Large Medium Green. 1907. Seed color: Green (chromium).

• ***Summary:*** Sources: Ball, Carleton R. 1907. "Soy bean varieties." *USDA Bureau of Plant Industry, Bulletin* No 98. 28 p. May 27. See p. 11, 13, 20-21, 27-28. "Classification–Key to the varieties (p. 11): IV. Green seeded: 1. Medium, 110 days, 30 inches tall, pods broader, seeds round, deep green = Guelph." "Green-seeded group: The Guelph is one of the oldest and best known varieties in cultivation. For many years it has been sold by numerous seed houses as Early Green, Medium Green, and Medium Early Green. It is a rather curious fact that during the eight years in which the United States Department of Agriculture has been actively engaged in the introduction of oriental legumes it has but once secured this variety. This is probably due to the fact stated by writers on Japanese agriculture that the green-seeded and the brown-seeded forms are but sparingly cultivated in the Orient, the blacks and yellows being much preferred. The Guelph soy bean has become quite a favorite in the Northern States of this country, where it is highly esteemed for both seed and forage production. In Kansas, Indiana, Michigan, and in Ontario it has given splendid results in comparative tests extending through several years... At the Ontario Agricultural College and Experiment Farm, located at Guelph, Ontario, a great deal of work has been done with soy beans, and with this variety especially, and the name is given for that reason. Numbers and sources of lots grown: Agrost. No. 912, 'Early Green,' J.M. Thorburn & Co.; Agrost. No. 969, S.P.I. No. 6558; Agrost. No. 1306, 'Medium Early Green,' J.M. Thorburn & Co.; Agrost. No. 1312, 'Medium Green,' Henderson & Co.; Agrost. No. 1464, 'Early Green,' Henderson & Co.; Agrost. No. 1467, 'Medium Early Green,' J.M. Thorburn & Co.; Agrost. No.

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1469, 'Medium Early Green,' Breck & Sons; Agrost. No. 1473, 'Medium Early Green,' Hammond Seed Co.; Agrost. No. 1476, 'Medium Early Green,' Currie Bros.; Agrost No. 1764, 'Early Green,' Kansas Expt. Station; Agrost. No. 1971, 'Medium Green,' union of Agrost. Nos. 912, 969, 1306, 1312, 1464, 1467, 1469, 1473, and 1476; S.P.I. No. 6558, Hankow, China; S.P.I. No. 13503, Agrost. No. 912; S.P.I. No. 17261, grown from Agrost. Nos. 1764 and 1971." Page 27 states that synonyms for Guelph are Early Green, Green, Medium Early Green, and Medium Green.

Piper, C.V.; Nielsen, H.T. 1909. "Soy beans." *USDA Farmers' Bulletin* No. 372. 26 p. Oct. 7. See p. 10. "Guelph (Green)."

Piper, Charles V.; Morse, W.J. 1910. "The soy bean: History, varieties, and field studies." *USDA Bureau of Plant Industry, Bulletin* No. 187. 84 p. Dec. 31. See p. 30. "Guelph, or Medium Green, was introduced by Prof. W.P. Brooks, in 1889, from Japan, and is now quite extensively grown in the Northern States [Note: It did NOT originate in Guelph, Ontario, Canada.] The same variety was obtained from Hankow, China, in May, 1901,–S.P.I. No. 6558, according to Ball's identification (1907, p. 21). It has since been received from only one foreign source, namely, S.P.I. No. 22320, from Haage & Schmidt, as 'Green Samarow.' This last might easily be the progeny of the American introduction."

Morse, W.J. 1918. "The soy bean: Its culture and uses." *USDA Farmers' Bulletin* No. 973. 32 p. July. See p. 14. "The Guelph is also known as Medium Green, Early Green, Medium Early Green, and Large Medium. It is esteemed for its forage and as a silage crop in the Northern States. Although a good producer of grain, it is not desirable for this purpose, since the pods shatter badly before all the seeds are mature."

Piper, Charles V.; Morse, William J. 1923. *The soybean.* New York, NY: McGraw-Hill Book Co. xv + 329 p. March. See p. 41, 44, 165, 167. Page 41 states: "The early introduced varieties.–Previous to the numerous introductions by the United States Department of Agriculture beginning in 1898, there were not more than eight varieties of soybeans grown in the United States." One of these was Guelph or Medium Green (with green seeds). "Guelph or Medium Green." "Introduced from Japan, 1889." "Medium Early Green.–The same as Guelph." "Medium Green.–The same as Guelph."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 10-11. Guelph is in the USDA Germplasm Collection. Maturity group: III. Year named or released: 1907. Developer or sponsor: USDA. Literature: 01, 03. Source and other information: From Japan in 1889 by Prof. W.P. Brooks, Massachusetts AES (Agric. Exp. Station). Called 'Medium Green' from 1903 to 1907. Prior designation: None.

Talk with Dr. Richard Bernard, former curator of the USDA Germplasm Collection. 1998. Oct. 15. "Many varieties got named long after they were released, especially in the old days. It took them a while to settle on name. They decided that names like Medium Green, while descriptive, were not valid variety names, so they came up with Guelph." Dr. Bernard further complicated the problem because he had two different strains that were called Medium Green or Guelph, so he let the two names exist together, because the strains are different. These two are still in the soybean germplasm collection. Address: USA.

1192. Kingston: New U.S. domestic soybean variety. Synonym: Japanese No. 15 or #15 (Ball 1907). 1907. Seed color: Black.

• ***Summary:*** Sources: Ball, Carleton R. 1907. "Soy bean varieties." *USDA Bureau of Plant Industry, Bulletin* No 98. 28 p. May 27. See p. 11, 13, 15. "Classification–Key to the varieties (p. 11): I. Black seeded: 2A. Seeds small, 4 to 6 or 7 mm long, round or broadly elliptical, pods about 1 inch long. Medium [days to mature], 110 to 115 days, low, 15 to 18 inches tall, scarcely branched, seeds spherical or slightly flattened = Kingston." "Black-seeded group: Kingston. This is a small, medium early variety, with rather slender stems... The seeds are the smallest of any black variety, and are equaled in smallness by Brownie only... This variety is too small and unbranched to have much value for forage. It is likely to prove a fairly good yielder of seed, two tests sown thickly for forage having yielded between 8 and 9 bushels of seed per acre... The name, Kingston, is given in honor of the Rhode Island Experiment Station, located at Kingston, Rhode Island. That station has contributed largely to our knowledge of the soy bean as a crop for northern regions, and this variety was received from that source alone. Numbers and sources of lots grown: Agrost. No. 118, 'Japanese No. 15,' Rhode Island Agric. Expt. Station; S.P.I. No. 17255, grown from Agrost. No. 118-1."

Piper, C.V.; Nielsen, H.T. 1909. "Soy beans." *USDA Farmers' Bulletin* No. 372. 26 p. Oct. 7. See p. 23.

Piper, Charles V.; Morse, W.J. 1910. "The soy bean: History, varieties, and field studies." *USDA Bureau of Plant Industry, Bulletin* No. 187. 84 p. Dec. 31. See p. 31. "Kingston: The Kingston soy bean was received from the Rhode Island Agricultural Experiment Station in 1903 as "Japanese No. 15." It was obtained by them from Prof. W.P. Brooks, of the Massachusetts Agricultural Experiment Station, who brought a number of soy-bean varieties from Japan in 1889, and is probably the variety which he named 'Medium Black.' It has never been secured from any other source. In all probability this is the variety grown at the Rhode Island Agricultural Experiment Station in 1893 (see their Annual Report, 1893, p. 191) as 'Medium Black.'"

Etheridge, W.C. 1912. "Report of Division of Agronomy." *North Carolina Agric. Exp. Station, Annual Report* 34:16-18. For the year ended June 30, 1911. Kingston

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was one of the earliest maturing varieties grown.

Piper, Charles V.; Morse, William J. 1923. *The soybean.* New York, NY: McGraw-Hill Book Co. xv + 329 p. March. See p. 41, 44. Page 41 states: "The early introduced varieties.–Previous to the numerous introductions by the United States Department of Agriculture beginning in 1898, there were not more than eight varieties of soybeans grown in the United States." One of these was Kingston (with black seeds).

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 12-13. Kingston is in the USDA Germplasm Collection. Maturity group: IV. Year named or released: 1907. Developer or sponsor: Rhode Island AES (Agric. Exp. Station) and USDA. Literature: 01, 03. Source and other information: From Japan in 1889 by Prof. W.P. Brooks, Massachusetts AES (Agric. Exp. Station). Prior designation: PI 17255. Address: USA.

1193. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1907. Asia: Empire of Japan. No. 320. p. 36-39. May.
• ***Summary:*** Japan imported oil cake worth the following amounts: $5,567,500 in 1905 and $7,748,900 in 1906. Japan's biggest trading partners in 1906: Imports (in million dollars): United Kingdom $51.0, United States $33.8, British India $31.4, China $27.7, Germany $21.1. Exports (million dollars): United States $62.3, China $59.9, France $19.5, Hongkong $13.5, Korea $12.3, United Kingdom $10.7. Address: Washington, DC.

1194. Tokyo: New U.S. domestic soybean variety. Dry edible variety. Also spelled Tokio. Synonyms: Austrian Green, Ita Mame, Late Ita Mame, Southern Medium Green (Morse 1948). 1907. Seed color: Yellow (olive), hilum pale.
• ***Summary:*** Sources: Ball, Carleton R. 1907. "Soy bean varieties." *USDA Bureau of Plant Industry, Bulletin* No 98. 28 p. May 27. See p. 12-13, 22-23. "Classification–Key to the varieties (p. 11): V. Greenish yellow seeded: 3. Late, 130 days or over, 35 inches or over in height, very long branched, pods 1½ inches long, seeds larger, round or elliptical, hilum scarcely tinted = Tokyo." The Tokyo differs from the medium greenish yellow (Haberlandt) variety mostly in a somewhat more vigorous growth and in later ripening... The Tokyo is one of the very best varieties for all-around use. It will give heavy hay and silage crops, is equally good for pasture and cover-crop purposes, and where it matures it gives very good seed yields. Eight plots grown at Washington [DC] in two different years averaged 8 1/3 bushels of seed per acre, in which the lowest yield was 4 bushels and the highest 14½ bushels. The Kentucky Agricultural Experiment Station reports a very much higher seed yield, with the weight of green forage to the acre 11.84 and 14.08 tons from two plots, curing to 5.44 and 6.16 tons, respectively. It is too late for the best results in most Northern States, but it may be replaced there by the Haberlandt variety. This variety was named for the Japanese capital, where some of the importations were secured. Numbers and sources of lots grown: Agrost. No. 468, grown from S.P.I. No. 4914; Agrost. No. 696, grown from Potomac Flats; Agrost. No. 1171, 'Best Green,' S.P.I. No. 9409; Agrost. No. 1198, 'Late Ita Name,' S.P.I. No. 8424, Japan; Agrost. No. 1200, 'Medium Ita Name,' S.P.I. No. 8423, Japan; Agrost. No. 1298, 'Medium Green,' S.P.I. No. 6335, Japan; S.P.I. No. 4914, 'Best Green,' Japan; S.P.I. No. 5766, grown from No. 4914; S.P.I. No. 6335, 'Medium Green,' Japan; S.P.I. No. 8423, 'Medium Ita Name,' Japan; S.P.I. No. 8424, 'Late Ita Name,' Japan; S.P.I. No. 9409, grown from S.P.I. No. 5766; S.P.I. No.17264, grown from Agrost. No. 1198-1; S.P.I. No. 17265, grown from Agrost. No. 1200-1; S.P.I. No.17266. grown from Agrost No. 1171-1; S.P.I. No. 17267, grown from Agrost No. 1298-2." Note: The words/name "Ita Name" make no sense in Japanese. Perhaps "Eda Mamé" was intended.

Piper, Charles V.; Morse, W.J. 1910. "The soy bean: History, varieties, and field studies." *USDA Bureau of Plant Industry, Bulletin* No. 187. 84 p. Dec. 31. See p. 18, 45, 75. Variety name: Tokyo. Seed color: Olive yellow. S.P.I. No. 17264. "From Tokyo, Japan, 1901... Grown nine seasons. This variety was also obtained from Kobe, Japan, No. 20893." "The best varieties of soy beans (p. 75): Late– Tokyo, 17264."

Tracy, S.M. 1912. "Forage crops for the cotton region." *USDA Farmers' Bulletin* No. 509. 47 p. Oct. 11. See p. 29. The soybean variety Tokyo has recently become popular in the cotton region of the USA (the southern states).

Country Gentleman. 1915. "Soy beans for all climates." May 22. See p. 11. Note: This is the earliest document seen (Dec. 1998) which uses the spelling "Tokio" rather than "Tokyo" for this variety. In about 52% of all documents where this variety is mentioned, its name is spelled "Tokyo," while in the remaining 48% it is spelled "Tokio." The "Tokio" spelling was more common from 1919 to 1925, however it was not used after 1947, when "Tokyo" became the standard spelling.

Morse, W.J. 1918. "The soy bean: Its culture and uses." *USDA Farmers' Bulletin* No. 973. 32 p. July. See p. 16.

Piper, Charles V.; Morse, William J. 1923. *The soybean.* New York, NY: McGraw-Hill Book Co. xv + 329 p. March. See p. 68, 87, 89, 96, 100, 111, 152, 154, 158, 169, 171, 192-193. "Tokio–Introduced from Tokio, Japan, 1901." Seed olive yellow, hilum pale, germ yellow, oil 18.4 per cent., about 134,400 to the bushel.

Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (USDA). p. 1154-89. For the year 1937. See p. 1187. Origin: Introduction, Japan. Year: 1901. Days to mature: 140. Flower color: Purple. Pubescence color: Gray. Seed coat color: Olive yellow. Germ color: Yellow. Hilum color: Pale. Seeds per pod: 2-3. Seeds

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per pound: 2,260. Use: Grain, or dry edible beans. Note: This is the first of many documents in which Morse classified the Tokyo as a "dry edible" soybean, one of a limited number of "edible varieties of soybeans."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 18-19. Tokyo is in the USDA Germplasm Collection. Maturity group: VII. Year named or released: 1907. Developer or sponsor: USDA. Literature: 01, 03. Source and other information: 'Ita Name' from Yokohama, Japan, in 1902. Prior designation: PI 8424. Address: USA.

1195. Saito, K. 1907. Mikrobiologische Studien ueber die Sojabereitung [Microbiological studies on the brewing of Japanese shoyu]. *Wochenschrift fuer Brauerei* 24(24):323-24. June 15. [1 ref. Ger]

• ***Summary:*** This is a summary of an article in *Zentralblatt für Bakteriologie* II. 17. p. 20-27, 101-09, 152-61 (1907). Address: Aus dem pflanzenphysiologischen Laboratorium des Botanischen Instituts der Kaiserlichen Universitaet zu Tokio (Tokyo Univ.).

1196. Suzuki, U.; Aso, K.; Mitarai, H. 1907. Ueber die chemische Zusammensetzung der japanischen Soja-Sauce oder "Schoyu." [On the chemical composition of Japanese soy sauce or shoyu]. *Bulletin of the College of Agriculture, Tokyo Imperial University* 7(4):477-94. July. (Exp. Station Record 16:966). [2 ref. Ger]

• ***Summary:*** The koji for shoyu is made with the spores of *Aspergillus oryzae;* it is left in a room at 30-40ºC for 3 days. The shoyu is allowed to ferment for 1-3 years.

From 2 liters of shoyu were isolated: alanine 1.6 gm + 5.0 gm impure alanine. Leucine 6.0. Proline 3.0. Lysine 2.6. New base #1 1.0. New base #2 0.2 Ammonia 4.2. Proteins 5.4 (by calculation). Formic acids (*Ameisensaeure*) 0.1. Acetic acid 0.40. Lactic acid 3.20. Also present were: Tyrosine, asparagin acid, polypeptides, phenylalanine (*Phenylalanin*), cystine. Not found were: Glycocoll, histidine, arginine, serine, *Aminoisovaleriansäure ?,* glutamin acid? (*Glutaminsäure ?*) (p. 493-94).

1197. *New York Times.* 1907. Here is a Japanese bill of fare: Prof. Chittenden shows value of simple diet used in Japan. Aug. 11. p. SM5.

• ***Summary:*** A typical bill of fare of a Japanese family in moderate circumstances includes: "Breakfast (from 7 to 7:30 A.M.)–Miso soup with vegetables. Boiled rice, pickles, and tea. Sometimes raw egg or boiled sweet soya beans or natto.

"Lunch (12 noon)–Fish boiled in soya. Vegetables stewed in soya. Boiled rice, pickles, tea.

"Supper (from 6 to 6:30)–Soya soup. Vegetables. Raw fish sliced, eaten with soya sauce..."

"The miso, soya sauce, and topi [sic, tofu] are all products of the soya bean, on which, with rice, the Japanese physique may be said to be built up." "Rice is the main foodstuff, with the soya bean a close second."

Prof. Chittenden of Yale University notes that Japan's "exploits in war have recently attracted the attention of the civilized world." Yet the great majority of Japanese have "remained untouched by the prodigality of Western civilization." Their "habits and customs still bear the imprint of simplicity and frugality."

Since Japan defeated Russia in war, many observers have noted that "the people of no other nation... have greater powers of physical endurance, or greater bodily strength and agility..."

1198. Brady, Herbert F. 1907. China: Report for the year 1906 on the trade of Chefoo. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 3929. p. 1-24.

• ***Summary:*** Page 13 lists exports, including "bean oil, bean cake," vermicelli and joss sticks. Page 15 states: "Bean cake–It has been a fair year for manufacturers of bean cake. There are some 50 mills in Chefoo using from 2 to 8 stones each, and their estimated output is about 7,500,000 cwts. [1 cwt = hundredweight = 112 pounds] per year. The export amounted to 1,719,328 cwts., valued at 344,850*l."*

Table IV (p. 22), titled "Return of principal articles of export from Chefoo during the year 1906," shows 1,719,328 cwts. of bean cake, worth £344,850, was exported. 39,166 cwts. of beans, worth £13,523, and 34,162 cwts. of bean oil, worth £40,608, were also exported.

The largest item exported was bean cake, followed by vermicelli (worth £226,859). Large amounts of groundnuts (including shelled) were also exported.

Table V (p. 22), titled "Comparative table of principal articles of export from Chefoo during the years 1902-06," shows exports of bean cake rose to a peak of 1,719,328 cwts. in 1906. Exports of beans rose to a peak of 896,426 cwts. in 1905. Exports of bean oil rose to a peak of 34,162 cwts. in 1906.

The main nationalities and types of ships entering the port of Chefoo in 1906 were Japanese steam ships (1,319), followed by British (744, but with the largest total tonnage), Chinese (314), and German (197). Address: Consul.

1199. Hausser, -. 1907. China: Report for the year 1906 on the trade of Swatow. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 3931. 13 p.

• ***Summary:*** "Bean cake was in fair demand during the usual season. The import in 1906 was 3,159,276 cwts. [1 cwt = hundredweight = 112 pounds] as compared with 2,751,110 cwts. in 1905. Bean cake was in former years imported entirely from Newchwang [Manchuria] and Chefoo, but since the Japanese began importing from Newchwang it has been supplied to Swatow also by Chinkiang and Hankow.

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The trade thus opened is yearly increasing" (p. 6).

Table II, "Return of principal articles of native import during the years 1905 and 1906" (p. 10) includes the quantity (in cwts.) and value (in British pounds sterling) for bean cake, beans, groundnuts, and oil (bean, castor, groundnut, &c). Imports of bean cake in 1906 were 3,159,276 cwts. worth £835,430.

Table III, "Return of principal articles of export of native produce during the years 1905-06" (p. 11) includes the quantity (in cwts.) and value (in British pounds sterling) for groundnuts, and oil (bean, groundnut, &c). Address: British Consul.

1200. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1907. Asia: Chinese empire (Great commercial depression). No. 324. p. 59-72. Sept.

• ***Summary:*** At Newchwang [Manchuria], about "one-half of the Japanese steamers arrived here in ballast only, returning to Japan with cargoes consisting chiefly of beancakes."

The principal exports from Newchwang (as of May 1), which have been fully up to expectations, are as follows (in tons): Beancake [soy] 105,670. Bean oil [soy] 56. Beans [soy] 3,500. Wild silk 55. Silk refuse 333; "also silver coins $506,000, and silver sycee $197,000, both in United States gold values. Of the foregoing cargoes, practically all of the beancake went to Japan; bean oil, beans, silver coins, and silver sycee being shipped to various Chinese ports, and Shanghai taking all of the wild silk and silk refuse."

Note: *Webster's Dictionary* (1985) defines sycee (pronounced SAI-see, and derived from Chinese (Cantonese) *sai sz,* literally fine silk), a word first used in 1711, as "silver money made in the form of ingots and formerly used in China." Address: Washington, DC.

1201. Hosie, Alexander. 1907. Report for the year 1906 on the foreign trade of China. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 3943. 114 p. For the year 1906.

• ***Summary:*** Table N titled "Principal exports from China to Asiatic countries (India excepted)" (p. 66) gives exports of [soy] bean cake and [soy] beans in 1901-05 (average), 1905, and 1906. The section titled "Beans and bean cake" (p. 71) states: "Beans, according to the Chinese returns, show a falling-off in export to foreign countries from 3,173,241 to 1,778,035 cwts. [1 cwt = hundredweight = 112 pounds], but the decrease was not nearly so great, for the Japanese returns give Japan's receipts from Manchuria in 1906 as 972,246 piculs of the value of 3,536,740 yen."

The section titled "Oils, vegetable and essential" (p. 72) states that exports of vegetable oils (by weight) are up 31% over the average of the years 1901-05. "They consist of [soy] bean, groundnut, tea, wood and other oils, and it would be a great convenience if the customs would endeavour to classify these oils and give each class its respective value, for the lump value of different kinds of oils is of no use to anyone who wishes to find the price of, say, bean or wood oil."

Essential oils include star aniseed, cassia-leaf, etc. Address: Acting Commercial Attaché to His Majesty's Legation at Peking.

1202. Suzuki, Tozaburo. 1907. Apparatus for brewing soy. *U.S. Patent* 0,874,041. Dec. 17. 5 p. Application filed 18 July 1907.

• ***Summary:*** In this invention, several tanks were "sunk into a closed chamber wherein means were provided for regulating the temperature. Stirring apparatus was provided for effecting continuous and uniform agitation of he contents of the tanks."

"A further utility of the invention consists in providing means whereby hot water or a like heating medium may be directed through the auxiliary means to facilitate and hasten first maturing by heating the mash and whereby after the first maturing is complete cold water or a like cooling medium may be circulated through the auxiliary means to complete second maturing of the soy."

Four illustrations depict the apparatus. Address: Sunamura, Japan.

1203. Kato, Yogoro. 1907. Tôfu no gyôko ni tsuite [On the coagulation of tofu]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 28:1249-61. Dec. [Jap]

1204. **Product Name:** [Shoyu (Plum Tree Japan, Wisteria Japan, Pinetree Japan, and Water Chestnut Japan)].
Foreign Name: Shôyu.
Manufacturer's Name: Nihon Shoyu Jozo K.K. (Japan Shoyu Brewing Co.).
Manufacturer's Address: Tokyo, and Kyoto-Osaka area, Japan.
Date of Introduction: 1907.
New Product–Documentation: Kenji Kawakoshi, ed. 1972. Shashi-Choshi Shoyu Kabushiki Kaisha. Tokyo: Toppan. p. 72.

Mark Fruin. 1983. Kikkoman: Company, Clan, and Community. p. 69-72. "The Russo-Japanese War... brought on a formidable challenge: the appearance of a maverick entrepreneur named Suzuki who sought to dominate the soy sauce industry in much the same way that he had already prevailed over the world of sugar refining.

"In 1903 the Department of Provisions and Fodder of the Japanese Army had sought to purchase condensed or concentrated shoyu, but discovered that it was generally unavailable and, moreover, that, given the slowly changing technology of the day, it would not quickly become available. Upon learning this, Suzuki Tosaburo, who had already had great success with sugar refining, carefully studied the fermentation process of shoyu and designed

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a new tank that allowed for the application of heat to fermenting mash to speed fermentation. Thus, Suzuki challenged the traditional world of soy sauce manufacture by introducing high volume, energy- and capital-intensive production methods.

"In April 1904 Suzuki took out a patent on his fermentation tank design, and in 1906 he began sending samples of his new product to Hawaii for field testing. In 1907, after making various adjustments to his process based on the results of the taste sampling in Hawaii, Suzuki formed the Nihon Shoyu Jozo Kabushiki Kaisha (Japan Shoyu Brewing Company) with a capitalization of 10 million yen, and he opened two factories, one in the Tokyo area and one in the Kyoto-Osaka area, to manufacture soy sauce by his new method. Running both factories at full capacity, he produced 300,000 koku (14,280,000 gallons) annually–three times the current capacity of the combined Noda associates! He sold his product under the brand names Plum Tree Japan, Wisteria Japan, Pinetree Japan, and Water Chestnut Japan, at four different prices, thereby blitzing the soy sauce market with his brews."

1205. Okazaki, K. 1907. Eine neue Aspergillus-Art und ihre praktische Anwendung [A new type of Aspergillus and its practical application]. *Zentralblatt fuer Bakteriologie. Series 2.* 19:481-84. [2 ref. Ger]

• ***Summary:*** Of the enzymes that are produced by the lower molds, in recent years the enzyme diastase from *Aspergillus oryzae* has found a new application among physicians.

The writer succeeded in finding, in overripe rice koji, a white type of Aspergillus which he names *Aspergillus Okazakii* n. sp. [new species]. In Part I he gives a morphological description, a physiological description, a description of its close relatives (*Affinität*), and a diagnosis. In Part II he describes how to prepare the enzyme, which he names "Digestin," starting with the preparation of rice koji. Contains two plates with a total of nine figures.

Note: Neither Jokichi Takamine nor taka-diastase is mentioned in this article. Address: Head of the Pharmaceutical Factory of Yenjô, Somei, Sugamo, Tokio (Japan).

1206. Asai, Denzaburo; Saito, Rokuzan. 1907. Miso ryôri nihyakushû: katei jitsuyô [Two hundred miso recipes: For practical use at home]. Tokyo: Yurakusha. 159 p. 23 cm. [Jap]*

• ***Summary:*** Note: This is the 2nd earliest book in WorldCat / OCLC that has miso as a subject or title word. Address: Japan.

1207. Benedict, Francis G.; Osborne, Thomas B. 1907. The heat of combustion of vegetable proteins. *J. of Biological Chemistry* 3:119-34. [7 footnotes]

• ***Summary:*** "Very few determinations of the heat of combustion of vegetable proteins are to be found in the literature. The earliest appear to be those made by Danilewsky (1881), who found for 'Pflanzenfibrin' 6231, for legumin 5573 and gluten 6141 calories per gram."

Values are given for glycinin (a globulin forming the greater part of the protein matter of the soy bean, *Glycine soja*). For yellow soy beans, the values range from 5,147 to 5,255 calories/gram on an "as is" basis. For Japanese soy beans, the values range from 5,016 to 5,056 calories/gram. Calculated to an ash- and water-free basis, the two values are 5,667-5,672 and 5,619-5,665.

Values are also given for amandin (a globulin forming the greater part of the protein matter of the seeds of the almond, *Prunus amygdalus var. dulcis*), edestin (from hemp seeds), phaseolin (from the Japanese adzuki bean, *Phaseolus radiatus*), conglutins α and Beta (from yellow and blue lupins), glutenin (from wheat gluten), and hordein (from barley).

A table (p. 133) summarizes the percentages of carbon, hydrogen, nitrogen, sulfur, and oxygen in each type of protein and the average heat of combustion–which ranges from 5,358 for globulin (wheat) to 5,916 for hordein (barley). "In general the higher heats of combustion are found for those proteins which have a higher carbon content and similarly for those with a lower oxygen content." Address: Chemical Lab. of Wesleyan Univ. [Middletown, Connecticut] and the Lab. of the Connecticut Agric. Exp. Station.

1208. Colby, Frank Moore; Sandeman, George. eds. 1907. Nelson's encyclopædia: Everybody's book of reference. In 12 volumes, profusely illustrated. Vol. III. Ceve to Dende. New York, NY: Thomas Nelson & Sons. 618 p. Illust.

• ***Summary:*** This book, which comes in a 3-ring binder for easy updating, is also called *Nelson's Perpetual Loose-Leaf Encyclopædia.*

Under "Chile," the section titled "Commerce" (p. 85D, dated 1933) lists the principal imports in order of value. These include "bar iron and steel, coffee, soya bean oil,..."

Under "China," the section titled "Agriculture" (p. 93, dated March 1925) states: "In the north, rice is largely replaced by wheat, barley, millet, and maize, and by peas and beans. The soya bean is of special economic importance, ranking high in the list of Chinese imports."

The section titled "Commerce" (p. 93-94) states: "Tea, formerly the main staple of China's export trade, has suffered a decided decline through Indian competition, and is now surpassed by silk which contributes over one-third of the value of the country's exports, and by the soya bean and its products which have risen to a position of importance in the last few years."

The entry for "Dalny" (p. 532, dated Oct. 1919) begins: "Ta-lien-wan, Dairen, or Tairen, seaport town, Kwantung territory, Manchuria, on the south shore of Ta-lien-wan Bay.

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It is connected by rail with Port Arthur, 20 miles to the north, and with Tientsin and Peking, and by steamer with Hong-Kong and Shanghai. It has a fine ice-free harbor protected by a 1,000-yard breakwater and has a growing trade. Coal and soya bean oil and coke are exported.

"Dalny was founded (1898) on territory granted to Russia by the Chinese government as a terminus for the Chinese Eastern Railway. It was opened as a free port in 1901, and captured on May 30, 1904, by the Japanese, who officially renamed it Dairen, or Tairen, after Kwantung Territory was leased to Japan by the treaty of Portsmouth. Under Japanese control, the city was rebuilt, the harbor works (built in 1903-04) extended, and electric tramways installed. It was opened again as a free port in 1906, and in 1907 a Chinese custom house was established for goods crossing the border of Kwantung." The population in 1910 was 43,576, of whom 24,715 [56.7%] were Japanese and 18,774 [43.1%] were Chinese. Address: 1. M.A., New York; 2. M.A., Edinburgh [Scotland].

1209. Griffis, William Elliot. 1907. Corea: The hermit nation. 8th ed. Revised and enlarged. New York, NY: Charles Scribner's Sons. xxvii + 512 p. See p. 270. Illust. Index. 23 cm. 1st ed. 1882. [99* ref]

• ***Summary:*** This enlarged 8th edition is identical to the original 1882 ed. except that 4 pages of front matter (including a "Preface to the eighth edition") have been added, and the recent history of Korea to 1907 and the index have been updated, adding 50 pages to the end. A color fold-out map has been added, facing p. 506; it shows Korea, Tsushima, Shimonoseki, Karatsu, Hirado, Nagasaki, Goto Islands, northwest Kiushiu [Kyushu]. The information on soy remains unchanged, on p. 270. Address: Ithaca, New York. Formerly of the Imperial Univ. of Tokio, Japan.

1210. Hurrier, Paul. 1907. Matière médicale et pharmacopée Sino-Annamites [Chinese and Annamite (Vietnamese) materia medica and pharmacopoeia]. Paris: Vigot Frères. viii + 292 p. Illust. Index. 25 cm. Preface by Prof. Em. Perrot. [25 ref. Fre]

• ***Summary:*** The book begins with a chapter titled "History of medicine in China," which includes many abbreviated bibliographic references in the text. Pages 21-22 discuss acupuncture and a large fold-out illustration (facing p. 20) shows several views of the meridians on the human body. Part two of the book, titled "Special Chinese and Annamite drugs with therapeutic uses," contains four chapters: 1. Mineral kingdom. 2. Animal kingdom. 3. Vegetable kingdom. 4. Five indexes: Latin names, Chinese names, Annamite names, Japanese names, and Cambodian names.

In chapter 3, "Vegetable kingdom," in the section on Legumes (p. 144) is a subsection titled *Dolichos soja* L. (p. 147). It begins with the three Chinese characters for "Yellow soy bean" = *Teou-Ko* (Mérat); *Mau-tau* (Porter Smith); *Houang-teou* (in Chinese), *Dan-dèn* (in Annamite). The laxative seeds of this variety are used to make a special condiment, soy sauce (*le soy; Tsiang-yu*) composed of soybean flour, tea, and salt. From the cooked seeds, the Annamites make a vegetable cheese (*fromage végétal; Teou-fou*), which resembles goat cheese, and of which they consume very large amounts. Mr. Bloch, in a recent study on tofu (*"Quelques mots sur la fabrication et la composition du Teou-Fou,"* published in *Bulletin des Sciences Pharmacologiques* (Paris), March 1906, p. 138-43), described the process of making tofu, which is coagulated with magnesium chloride. The entire plant is used to make a decoction for treating smallpox and rheumatism.

Glycine javanica (*no-mame* in Japanese is also mentioned on p. 148).

Also discusses: Various sea vegetables (*kombu, kanten, funori, amanori;* p. 71-72). *Cannabis sativa* (hemp; p. 102). *Phaseolus radiatus* = small red bean (azuki in Japanese; p. 150). *Sesamum orientale* (sesame seeds; kuro-goma [black sesame] and shiro-goma [white sesame] in Japanese; p. 178). Address: Pharmacien de 1re class, Docteur de l'Université de Paris, France.

1211. Jumelle, Henri L. 1907. Les resources agricoles et forestiéres des colonies Françaises [The agricultural and forestry resources of the French colonies]. Marseille, France: Barlatier, Imprimeur-Éditeur. viii + 442 p. See p. 333. No index. 28 cm. [2 ref. Fre]

• ***Summary:*** In the chapter on Indo-China (p. 267-363) is a section on coconuts (p. 322+) followed by a section on "Other oil-bearing plants" (*Les autres plantes oléagineuses*), which contains paragraphs (p. 326-27) on the sesame seed (*Le sésame,* cultivated in Cambodia) and the peanut (*L'arachide,* long cultivated in Cochin China and central and south Annam). Some confusion exists concerning the oil of *Aleurites cordata* (Chinese wood oil, *l'huile d'abrasin*) (p. 331-32): "Why is this oil, so well known and widely used in Indo-China, not exported, as is its analogous oil from China? It is not ignored by European and American manufacturers; and in the United States, as in Europe, it is in demand * by the factories that make linoleum or that prepare varnish from copal." (Footnote: *"It seems that the oil imported into Europe and the United States is often adulterated with oil from the seeds of *Soja hispida* [soybeans], which is likewise a very drying oil").

The next section, titled "The indigenous food" (*L'alimentation indigène*) (p. 332-35) includes a discussion of various legumes consumed in Indo-China. "Among the leguminous seeds used as food, there is a large consumption of kidney-beans (*de haricots*), of dolichos beans (*de doliques*), and, even more, of soybeans (*de sojas*)." "The large consumption of the soybean (*du soja*) is due to the fact that its beans, not only are eaten after a long cooking, but, again, serve as the base for various preparations, as in Japan

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and China (Footnote: It is with these soybeans, mixed with wheat and *koji,* and coarse salt, that the Japanese make their *shoyou* [*shoyu,* soy sauce] and their *miso,* and the Chinese their sauces or analogous dishes, *teou-ju* and *teou-tiung.* In Java, the indigenous people make similar preparations. The fermentations are, in all these cases, caused by various molds.) It is thus that the Annamites [of central Vietnam] make a cheese called *dau-phu,* which is the *teou-fou* of the Chinese, the *tofu* of Japan. They likewise make a sauce named *tuong,* which is almost the same as the *teou-tiung* [*doujiang*] of the Chinese, and two cheeses [tofu], one solid, the other of a softer consistency, called *dau-hu* and *dau-hu-ao* in Cochin China." Address: Prof., Faculte des Sciences de Marseille [Marseilles], France.

1212. Katayama, T. 1907. On the preparation of a vegetable cheese from the protein of the soy-bean. *Zentralblatt fuer Bakteriologie. Series 2.* 19(19/20):601. [1 ref. Ger]
• ***Summary:*** German summary of an article from *Bulletin of the College of Agriculture, Tokyo* 7(1):117. The vegetable cheese is tofu. Address: Japan.

1213. Royal Botanic Gardens, Kew [England]. 1907. Official Guide to the Museums of Economic Botany. No. 1. Dicotyledons. Third edition, revised and augmented. London, Printed for H.M. Stationery Off. by Darling... 236 p. See p. 65. 19 cm.
• ***Summary:*** Page 65 states: "No 192. Soy beans (*Glycine hispida,* Maxim.). An annual, cultivated largely in China, Japan, and India. In the two former countries a sauce known as Soy is produced in large quantities and in Japan a kind of cheese or curd cake is prepared known as 'Natto.' The chief products of Manchuria are bean oil and bean cake. The seeds yield 17 per cent. of an edible oil obtained by expression, and the residue is made into large circular cakes, weighing about 60 lbs, similar to that exhibited, used in the East for feeding cattle and also as manure. Soy is imported into Europe in barrels and is said to form the basis of most of the popular sauces."

Also discusses "Ground nuts. Pods and seeds of *Arachis hypogaea,* L." (p. 63, No. 188), and Kuzu (*Pueraria thunbergiana,* p. 66-67, No. 195). Address: Kew, England.

1214. Saito, Kendo. 1907. Microbiologische Studien ueber die Soyabereitung [Microbiological studies on the preparation of soy sauce]. *Zentralblatt fuer Bakteriologie. Series 2.* 17(1/2):20-27; 17(3/4):101-09; 17(5/7):152-61. Plus 5 plates on unnumbered pages near end. [55 ref. Ger]
• ***Summary:*** Contents: Part I (p. 20-27): Introduction. (1) Process for making soy sauce (*Soya,* which can be divided into 3 steps): (a) Preparation of the koji (*Koji* or *Soyakoji*). (b) The main process, making the moromi or mash (*Maische*). (3) Pressing, clarifying, and pasteurizing. (2) Method for isolation of the microorganisms: Molds / fungi, yeasts, bacteria. (3) Special remarks: Molds–(a) *Aspergillus Oryzae* (Ahlbg.) F. Cohn.

Part II (p. 101-09): (b) *Rhizopus japonicus* Vuillemin nov. var. angulosporus (Fig. 1). (c) *Tieghemella hyalospora* nov. spec. (Fig. 5). (d) Other molds. Yeasts–Soya yeast (a) *Saccharomyces Soya* nov. spec. Diagnostic properties, comparison of soya yeast with other types of yeasts. (b) *Saccharomyces farinosus* Lindner (Fig. 2 and 8c). (c) A soya yeast that grows on the surface of liquids (*Soya-Kahmhefe*) (Fig. 3 and 8b).

Part III (p. 152-61): Conclusion of (c). (d) Mycoderma species (Fig. 6 and 8d). (e) Torula species (Fig. 7). Bacteria–(a) *Bacterium Soya* nov. spec. (b) *Sarcina Hamaguchiae* nov. spec. (Table 5, Fig. 10). Conclusion. Appendix: (1) *Rhizopus Tamari* nov. spec. (2) *Aspergillus glaucus* Link. (3) *Aspergillus Rehmii* Zukai (?). (4) *Cirencella mucoroides* nov. spec.

Explanation of five plates of illustrations.

Since ancient times, according to legend, a substance for salting foods has been made by the Japanese. About 300 years ago the process underwent a significant improvement through trade and communication with the Chinese, whose culture then stood on a higher level. For the first time a product named soy sauce (*Soya;* Japanese: *Shôyû*) came to be widely known, and from then on it found extensive use. By the year 1903 nearly 4 million hectoliters [i.e., 400 million liters] of shoyu were being produced in Japan, from which the state took the equivalent of about 7 million German marks in taxes.

Among the yeasts, the author found *Saccharomyces Soya* (a new species of film yeast), *Saccharomyces* (later *Pichia*) *farinosus,* and one species each of *Mycoderma* and *Torula.*

Illustrations show: Plate 1: *Rhizopus japonicus* in seven detailed views.

Plate 2: (2) *Saccharomyces farinosus.* (3) *Saccharomyces Soya,* a soya yeast that grows on the surface of liquids (*Soyakahmhefe*).

Plate 3: (4a-b) The new yeast *Saccharomyces Soya* from soya koji. (6) Mycoderma sp. x 900. (7) Torula sp. x 900.

Plate 4: (5) *Tieghemella hyalospora* (from rice culture) in seven detailed views.

Plate 5: (8) Large colonies (3 weeks old) of *Saccharomyces Soya,* a soya yeast that grows on the surface of liquids (*Soyakahmhefe*), *Saccharomyces farinosus,* and Mycoderma species. (9) *Bacterium Soya.* (10) *Sarcina Hamaguchiae.*

Note: This is the earliest document seen (July 2010) that mentions the species *Saccharomyces Soya.* Later (in 1909) the author gave this film yeast the name *Zygosaccharomyces japonicus.* In the early 1950s this species was renamed *Saccharomyces rouxii.* Address: Plant Physiology Lab., Botanical Inst., Tokyo Imperial Univ., Japan.

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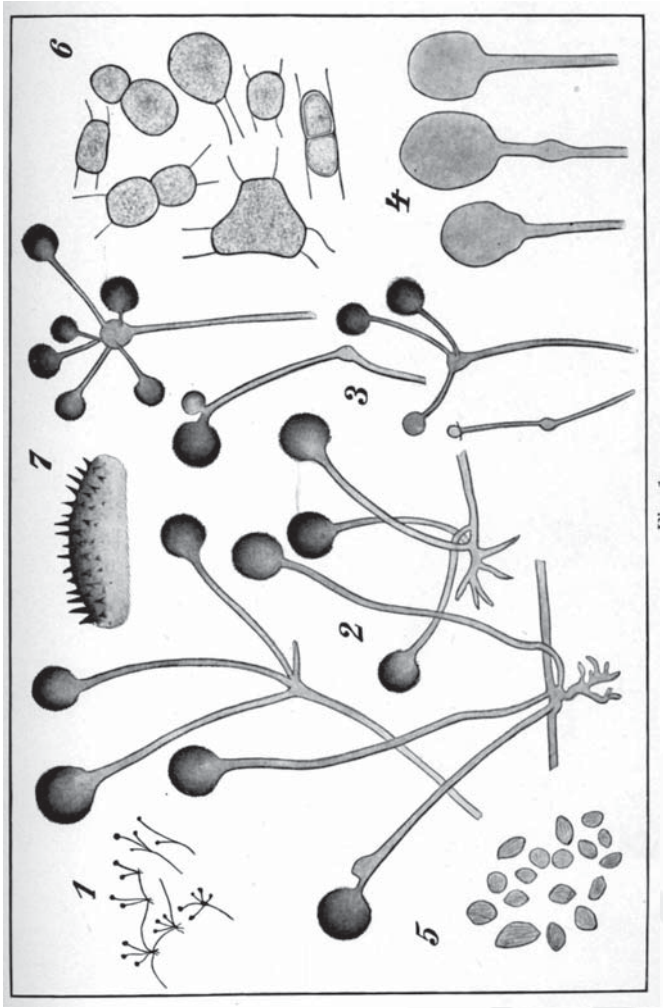

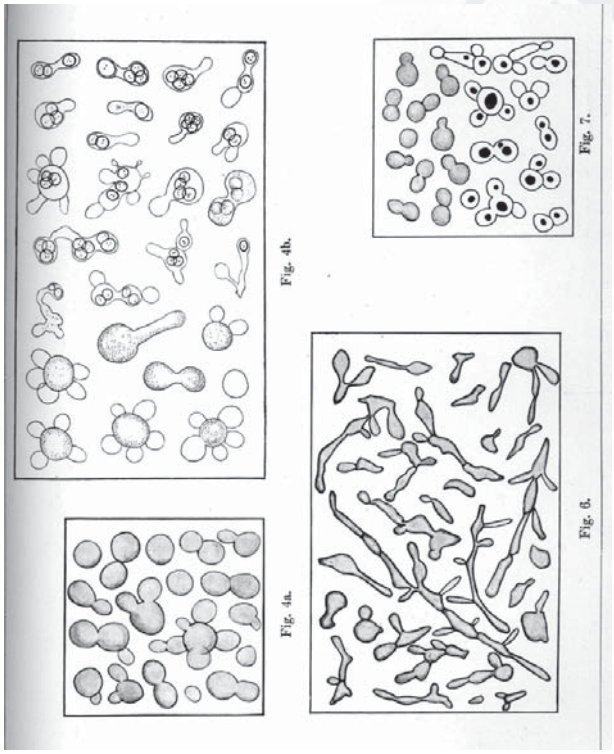

1215. Sawamura, Shin. 1907. On the microorganisms of natto. *Zentralblatt fuer Bakteriologie. Series 2.* 19(10/12):335-36. [1 ref. Ger]
• ***Summary:*** German summary of a 1906 article by Sawamura from *Bulletin of the College of Agriculture, Tokyo* 7(1):107. "Natto is a type of vegetable cheese which is made from cooked soybeans by a process of fermentation." Address: Japan.

1216. Senft, Emanuel. 1907. Ueber einige in Japan verwendete vegetabilische Nahrungsmittel, mit besonderer Beruecksichtigung der japanischen Militaerkonserven [On some vegetable foods used in Japan, with special attention to Japanese military canned foods]. *Pharmazeutische Praxis* 6(3):81-89; 6(4):122-24, 131-32; 6(6):211-12, 219. [19 ref. Ger]
• ***Summary:*** These three sections contain a good review of the literature (especially the Japanese literature) in German. Issue No. 3 begins with "Phanerogams. Chapter 5. Legumes. Soybeans and soybean preparations" (p. 81-89). Contents: Introduction. Varieties: Group I. Soja platycarpa-Harz (5 forms–olivacea-Harz and punctata-Harz, melanosperma, platysperma, parvula Martens). Soja tumida-Harz (3 forms–pallida Roseb. [sic, Roxb = Roxburgh], castanea-Harz [brown], atrosperma-Harz). Anatomy and cell structure of different parts of the plant and seeds. A non-original illustration (line drawing; p. 83) shows a soy bean, full-size and at cellular levels. Haberlandt and the Vienna World Exposition of 1873. Foods made from soybeans in China and Japan described by Charles Bryant (1785): Miso, soy sauce (*sooju-sauce* or soy), Roos, Koji. Tofu, sake. Shoju or Soja-Sauce. Miso (vegetable cheese; "Recently the firm Jul. Maggi & Comp. in Kempthal makes a type of miso and sells it commercially").

Issue No. 4 begins with "Natto and tofu" (*Bohnenkäse*) (p. 122-24) and includes fresh tofu and frozen tofu (*gefrorener tofu*). Yuba. A separate section on miso pickles (*Misozuke;* p. 131-32) describes the different types, especially those made with daikon (*Rettiche*).

Issue No. 6 discusses shoyu (called *Extrakt-Sauce Japonica,* or Shoju-Sauce) (p. 211). A table (p. 212) lists the main food plants of Japan, including five different "varieties" (*"var."*) of soybeans: *Kuro-mame, Shiro-mame, Ao-mame, Goishi-mame, Gankui-mame.* A photo (p. 219) shows various Japanese preserved foods, including a metal box containing "Fukujinsuke" [*fukujinzuke*] consisting of sliced vegetables (cucumbers, bamboo shoots, onions) preserved in soy sauce. Address: Military medicine official, Germany.

1217. Strakosch, Siegfried. 1907. Das Problem der ungleichen Arbeitsleistung unserer Kulturpflanzen [The problem of the unequal production efficiencies of our crop plants]. Berlin: Verlagsbuchhandlung Paul Parey. 110 p. No index. 23 cm. [Ger]

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• ***Summary:*** This book, dedicated to Julius Wiesner, "the master of plant physiology," looks at national food supplies from the viewpoint of plant physiology. In the section on "Calculation of assimilative effects," a table (p. 44-45) compares rye, wheat, corn, rice, soybeans, and potatoes in their production per hectare of starch, digestible protein, value of product in German marks, value of nutritive elements consumed, assimilative effect (defined as the ration of the value of the usable substance produced per unit area to the value of the nutritive elements borrowed from the soil by producing this substance), assimilative effect compared with rye, and difference between the production and consumption in German Marks. Soybean produces much more protein per given area of land than the other crops, has the highest assimilative ratio, 6.68 times larger than that of rye. Thus the culture of soybeans should be the most remunerative.

In the same section, a bar chart (p. 48) shows the value (in marks) of physiologically useful substance resulting from withdrawal of one mark worth of soil nutrients. The soybean gives the greatest returns of the 22 plants listed.

In the section on "Consideration of plant production efficiency in crop rotations" (p. 66+), the legumes are praised and soybeans are mentioned on pages 71 (the most productive of all legumes with an enormous number of 668) and 73. In this context, the work of Friedrich Haberlandt with soybeans and his book, *Die Sojabohne* (The Soybean, Vienna, 1878) are described in detail (p. 74-76). Haberlandt died shortly after the publication of this book, and Hecke, his friend, carried on his work.

In the last chapter, "Goals and consequences," a table (p. 102) shows the productivity in the northern U.S. states of nine crops, including wheat, barley, corn, sugar beets, peas, Jerusalem artichokes, and soybeans. In value of crop per hectare, soybeans are third after Jerusalem artichokes (German: Topinambur; French: Topinambour) and sugar beets. Two long footnotes (No. 122 and 123, p. 109-10) discuss the importance in Japan of soybeans and the various foods made from them including shoyu (Shoju, Shoyu), miso, tofu, and yuba. Address: Dr., Wien-Hohenau.

1218. Takenob, Y.; Takeda, G. 1907. Japan Year Book. Tokyo: Japan Year Book Office. 616 p. See p. 327, 467, 584, 602. Third annual issue. [Eng]

• ***Summary:*** Page 327. Chapter 14, "Agriculture" (p. 320-337) has a section that gives production data on "Soja beans" from 1900 to 1905 in *koku.*

3.562 million *koku* in 1900
4.069 million *koku* in 1901
3.136 million *koku* in 1902
3.647 million *koku* in 1903
3.710 million *koku* in 1904
3.261 million *koku* in 1905.

The same table gives production of "Red [azuki] beans which ranged from a high of 924,573 *koku* in 1901 to a low of 708,712 *koku* in 1902. Thus, in 1901 production of azuki beans in Japan was about 23% of that of soja beans [soy beans].

Page 467. In chapter 28, "Foreign trade" (p. 467-95), is a list for the "New import tariff schedule." "Import tariff," with an entry in Group II (Grains and seeds) for "Beans, soja." The tariff is 0.43 yen per 100 kin. On the next line is an entry for "Beans, red or white (small) (*Phaseolus subtrilobata*).

There is no information specifically on soja beans in the chapters titled Formosa, Karafuto [South Sakhalin Island], Korea, or Manchuria. However there are statistics for "Peas & beans" (1901-1905) in tables on pages 584 (Formosa [Taiwan], production in koku) and 602 (Korea, exports, 1902-1906, value in yen). Address: 1. Prof. at Waseda Univ. and Late of the *Japan Times;* 2. Editor of the *Pacific Ocean* and Late of the *Kokumin.* Both: 9, Yariya-cho, Ginza, Tokyo, Japan.

1219. Rafu Shinposha. comp. 1908. Rafu nenkan dai 1 kan [Rafu Shimpô's year book, No. 1]. Los Angeles, California: Rafu Shinpôsha. [14] + 107 + 66 + [38]. Plus 4 unnumbered leaves of plates. Illust. 28 cm. [Jap]

• ***Summary:*** Contents: Title page. Foreword (2 p.). Ad. Table of contents (2 p.). Ad. Map of Southern California. Ads (2 p.). Photos (2 leaves, printed one side only). Ads (2 p.). Photos (2 leaves, printed one side only). Ads and New Year's greetings (14 p.). Rafu Nenkan L.A. yearbook: Current events and situations (p. 1-107, numbered). Page 46 (top left): Number of tofu shops in Los Angeles in 1906: Zero. In 1907: Four. Increase: 4. Appendixes: (1) Useful information for Japanese-Americans (*Zaibei Nihonjin Nichiyôbinran*) (p. 1-32). (2) Japanese American Directory (*Zaibei Nihonjin Jûsho Seimeiroku*) (p. 33-66). Ads and New Year's greetings (38 p.). Note: This book focuses on southern California, but also covers Northern California, Colorado, Utah, Oregon, and Washington state. Address: Los Angeles.

1220. Meyer, Frank N. 1908. Re: Soy beans in China. In: Letters of Frank N. Meyer. 4 vols. 1902-1918. Compiled by Bureau of Plant Introduction, USDA. 2444 p. See p. 490-92. Letter of 8 Jan. 1908 from Peking, China, to David Fairchild of USDA.

• ***Summary:*** "Your letter of Nov. 16, 1907, concerning Soy beans. Yes, I think you are quite right in believing that there may be many more varieties still in existence. I personally think that China will afford for many generations yet, a fruitful field for exploration.

"You know that the Chinese have no seed-shops like what we have. Every farmer saves his own seeds of all his crops and as such, there may be countless strains of plants here in existence of which an explorer gets hold only once in a while."

"If it weren't for the missionaries throughout the land, I

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wouldn't have obtained as many things as I have now."

"I didn't receive as yet the full set of Soy-beans samples, put up by Mr. Piper. I am anxiously awaiting them. Yes, I really got away to China too much in a hurry, I never had even time to cast a glance at the collections of seeds of the Dept., but I hope when back and things go all right, to study these things thoroughly.

"In regard to the Soy beans again, I may say that when I visited the Agricultural Experiment Station of the Japanese in Mukden, I was amazed to find that I, in my half year's stay in Manchuria, had on my own account collected almost twice as many varieties as the Japanese had done under high official auspices. This may give you a small idea how difficult it is here to procure complete collections.

"I see in Mr. C.R. Ball's bulletin on the Soy bean [1907], that under the item of black seeded ones, there is no mentioning made of inside yellow and inside green. I sent some from New-chwang [Newchwang, later Yingkou], and the Chinese made distinction between them. I sent these green inside ones under No. 2550a and 256-a, while a yellow inside was sent in 1905 under No. 6-a. I also think that some more new forms will turn up in the next future, of the Soy beans I sent, as there were some rare local varieties among them, which I sometimes have seen only once."

Location: University of California at Davis, Special Collections SB108 A7M49. Address: USDA Plant Explorer, China.

1221. *Otago Witness* (*New Zealand*). 1908. Science notes. Jan. 22. p. 84.
• ***Summary:*** In a recent number of a Japanese journal, a Mr. T. Katajama [Katayama] described a process for the manufacture of a vegetable milk, the properties of which would render it highly suitable for use in tropical countries. The, preparation is obtained from a well-known member of the leguminous family of plants–namely, the Soja bean–which is a very popular article of food among the Chinese. The beans are, first of all, softened by soaking, and are then pressed and boiled in water. The resultant liquid is exactly similar to cows' milk in appearance, but it is entirely different in its composition.

"This Soja bean-milk contains 92.5 per cent. water, 3.02 per cent. proteine, 2.13 per cent. fat, 0.03 per cent. fibre, 1.88 per cent. non-nitrogenous substances, and 0.41 per cent. ash. Katajama added some sugar and a little phosphate of potassium (in order to prevent the elimination of the albumen), and then boiled the mixture down till a substance like condensed milk as obtained; this 'condensed vegetable milk' is of a yellowish colour, and has a very pleasant taste, hardly to be distinguished from that of real cows' milk. However it still retains the aroma of the Soja bean. It is recommended as a cheap and good substitute for condensed cows' milk."

Note: Summaries of this article appeared several times in New Zealand newspaper articles until 1914.

1222. Yokohama Nursery Co., Ltd. 1908. Catalogue... for 1908. Yokohama, Japan. 92 p. Illust. Index. 26 cm. [Eng]
• ***Summary:*** On the cover of this English-language catalog is photo of huge old flowering cherry tree (*Prunus pseudo-cerasus*) in full bloom in Japan, with people under its outspread branches enjoying the beauty. In the section on "Seeds" (p. 75+) is a subsection (p. 82) titled "Some vegetable seeds." The contents (incl. the entry for "soy bean") is identical to that in the 1907 catalog. Address: P.O. Box No. 72. 21-35 Nakamura, Yokohama, Japan. Phone: 509.

1223. Takahashi, Teizô; Shito, Gorô. 1908. Miso no seibun ni tsuite (yohô) [On the composition of miso (prediction)]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 29(2):101-16. Feb. 28. [Jap]
Address: 1. Nôgaku hakase, Japan.

1224. Suzuki, Tozaburo. 1908. Apparatus for brewing soy. *U.S. Patent* 0,888,204. May 19. 4 p. Application filed 5 Dec. 1907.
• ***Summary:*** "This invention relates to improvements in apparatus for brewing soy and has for its object the provision of means for quickly and uniformly controlling the temperature of the soy..."

"It is well known that during the process of making soy it is necessary to artificially change the temperature thereof to obtain fermentation and maturation at the proper time..." Two illustrations depict the apparatus, showing that a coil of pipe surrounds the container in which the soy sauce is fermented. A several paddles in the soy sauce, driven by a bevel gear, enable the soy to be stirred.

"In cold weather hot water or other suitable heating medium is passed through the coil until the first fermentation has been completed and in hot weather cold water or other suitable medium is used during maturing..."

"In order to uniformly and quickly change the temperature of the soy, during the process of brewing, it is desirable to agitate the contents of the receptacle..." Address: Sunamura, Japan.

1225. *Advertiser* (*The*) (*Adelaide, South Australia*). 1908. Correspondence: A curious milk used in Japan is described in a Japanese periodical (Letter to the editor). June 9. p. 11.
• ***Summary:*** "It is made from the Soja bean. The liquid is exactly like cow's milk in appearance, and in taste can hardly be distinguished from it. To make it the beans are first soaked and then boiled in water. Some sugar and phosphate of potassium are added, and it is boiled down till it has the consistency of condensed milk."

1226. Lea and Perrins. 1908. Lea and Perrins' Sauce (Ad).

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Japan Weekly Mail (*Yokohama*) 50(2):56. July 11.
• ***Summary:*** This black-and-white ad (5 by 6 inches) states: "Assists digestion and gives a delightful piquancy and flavour to all meat dishes, soups, fish, cheese, curries, game, poultry & salads. The original and genuine Worcestershire. By Royal warrant to H.M. the King." A large illustration shows a bottle of Lea & Perrins Worcestershire Sauce. Address: England.

1227. *J. of the American Asiatic Association.* 1908. Railways in China. 8(6):176-78. July. [2 ref]
• ***Summary:*** "South Manchuria: In transmitting a translation of the report of the South Manchuria Railway Company for the six months ended September 30, 1907, presented to the stockholders in Tokyo on December 14, Consul Roger S. Greene, of Dalny, furnishes the following information concerning the restoration of the road to normal conditions: It was decided to rebuild the road on the standard gauge (4 feet 8½ inches), and to equip it with new rolling stock.

"By order of the Japanese Government a double track was to be laid from Dalny to Suchiatun."

"The gross income from the railway and allied enterprises during the six months ended September 30, 1907, was $2,491,224, while the expenses amounted to $2,028,783, leaving a profit of $462,441, of which $122,722 was carried to reserve funds, $29,880 was distributed to the stockholders, with the exception of the Government, as a dividend at the rate of 6 per cent... Of the total income $2,038,525 was from the railway proper, $322,238 from the Fushun coal mines, and the remainder from the wharves, hotels, electric plant, land rentals, etc. Of the total issue of 600,000 shares, at 200 yen ($99.60) per share, 500,000 are held by the Japanese Government, in the name of the Minister of Finance, while the remaining 100,000 are divided among 7,354 persons. Practically all the shareholders are Japanese, there being among them only about twenty-five Chinese, mostly domiciled in Japan, whose combined interests amount to about 500 shares."

During the same period [Oct. to March 10] there arrived at Dalny 104,389 tons of beans and 71,879 tons of bean cake, or 176,268 tons in all, while the total arrivals of beans at other stations, including Newchwang, were only about 20,000 tons, no bean cake being received there, according to the Japanese railway authorities.

"An accumulation of freight similar to that at Changchun has taken place at other stations also. It is stated that the total amount of beans and bean cake awaiting shipment southward at all the stations was, on March 10, 69,127 tons."

"With March 31 the South Manchuria Railway Company completed its first year of actual operation, and the publication of its report for the second six months is awaited with great interest."

Note: According to the title page, the American Asiatic Association was founded in 1898. This periodical, published in at 78 Beekman St., New York City, covers events in Shanghai, Hongkong, Manila, Yokohama, Kobe, and Singapore.

1228. Nishiyama, Y. 1908. Daizu abura ni tsuite. I. [Soybean oil. I]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 11(125):659-71. July. [1 ref. Jap]
• ***Summary:*** A detailed discussion of the physical and chemical characteristics of soy oil, and its composition. Address: Kôgaku-shi.

1229. Wileman, A.E. 1908. Japan: Report for the year 1907 on the trade of the consular district of Tainan (South Formosa). *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 4083. 19 p. July.
• ***Summary:*** A table (p. 14) shows returns of imports from Japan from 1902 to 1907. The value of Soy [sauce] imports, which averaged £3,863 for the 5 years 1902-06, was £3,653 in 1906 and £6,764 in 1907. No quantities are given.

Table II (p. 15) shows returns of exports from the open ports of Anping and Takow from 1902 to 1907. [Soybean] "oil cake" was exported to Amoy, where it was used for manure. The value of oil cake exports, which averaged £2,001 for the 5 years 1902-06, was £1,626 for 16,572 cwts. [1 cwt = hundredweight = 112 pounds] in 1906 and £795 for 6,647 cwts. in 1907. Also exported were hemp, lungan (pulp or dried), and sesamum seed. Address: British Consul.

1230. *Chemist and Druggist* (*London*). 1908. Japanese soy. 73(6):223. Aug. 8.
• ***Summary:*** This small "filler" paragraph in the lower right corner of the page states: "Japanese soy [sauce] is an article the exports of which are increasing from Japan, owing to the number of Japanese residents being scattered in many parts of the globe. A new description, which is said to have many advantages and prepared by a new process, was put on the market last year. The exports of soy from Japan amounted in value to 100,500 *l.* [British pounds sterling] as compared with 97,000 *l.* in 1906."

1231. Griffiths, E.A. 1908. Japan: Report for the year 1907 on the trade of the consular district of Shimonoseki. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 4106. p. 1-15.
• ***Summary:*** The consular district of Shimonoseki comprises the combined ports of Shimonoseki (at the southern tip of Honshu) and Moji (at the northern tip of Kyushu), plus the two specially opened ports of Wakamatsu and Hakata– in northern Kyushu. A map shows this consular district comprising the prefectures of Yamaguchi, Hiroshima, Fukuoka, and Oita. A table (p. 12-13) titled "Return of Principal Articles of Import into the Ports of Shimonoseki and Moji during the Years 1906-07, and Average for the Five

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Years 1902-06" shows that "beans, pulse, &c." are imported, with 85.9% of the value coming from Corea [Korea] and 13.1% from China.

Four types of manure are imported: The great majority is "oil cake," followed by fish, phosphates, and other. Imports of oil cake increased from 49,574 tons in 1906 to 70,306 tons in 1907; most of this came from China. Address: Acting British Consul, Shimonoseki, Japan.

1232. Griffiths, E.A. 1908. Japan: Report for the year 1907 on the trade of the consular district of Shimonoseki. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 4106. 15 p. Aug.
• ***Summary:*** A map shows the Consular District of Shimonoseki, comprising the prefectures of Yamaguchi, Hiroshima, Fukuoka, and Oita. Shimonoseki is a seaport city located just north of Kyushu, on the Shimonoseki Strait, in Yamaguchi prefecture at the southwest extremity of Honshu. Opposite Shimonoseki, on the northern tip of Kyushu, is the city of Moji. At the center of the map is the Inland Sea, southwest of which is the large island of Shikoku.

In the section titled "Imports" under "Manure" (p. 6) we read that there has been a very large increase in the import of [soybean] "oil cake," amounting to 20,732 tons in quantity and 146,052*l.* (British pounds sterling) in value over the figures for 1906. Other fertilizer imports were fish manure from Corea [Korea] and phosphate rock (phosphorite) from Christmas Island. The latter was used (at Hikoshima, an island at the western entrance to the Straits of Shimonoseki) to make superphosphates for fertilizers, which were exported. Address: British Consul for Shimonoseki, Japan.

1233. Nishiyama, Y. 1908. Daizu abura ni tsuite. II. [Soybean oil. II]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 11(126):747-68. Aug. [Jap]
• ***Summary:*** A detailed discussion of the physical and chemical characteristics of soy oil (*daizu abura*), and its composition. Soy oil can be used to make a substitute for India rubber and a lubricating oil. The author studied the extent to which it can be used as a substitute for linseed oil, and what happens when it is heated and air is blow in.

Note 1. This is the earliest document seen (Oct. 2008) stating that soya bean oil can be used as a lubricant, or as a rubber substitute. Address: Kôgaku-shi, Japan.

1234. Okazaki, Keiichiro. Assigner of one-half to Hanuemon Yenjo of Tokyo, Japan. 1908. Nitrogenous food product. *U.S. Patent* 0,897,392. Sept. 1. 5 p. Application filed 13 March 1907. 3 drawings.
• ***Summary:*** For example: Steam rice hulls until their starch is reduced to a gelatinous state, then cool to a temperature favorable to the growth of Okazaki fungus (about 40º C). "Although both the diastarin fungus and the Okazaki fungus belong to the genus *Aspergillus,* they are easily distinguishable from each other." A table shows 6 differing characteristics. See also Fig. 2. Bring the gelatinous substance into contact with the fungus. *Aspergillus Okazaki* on rice hulls forms a proteolytic enzyme system which prevents coagulation of gelatin, legumen, or casein. A culture of "'Okazaki' fungus... converts the mass [in wooden trays] into perfect 'koji' if properly supplied with air and kept at a temperature of about 30ºC for several days." Then add water to the mass so that its nitrogen content can dissolve. Separate the liquid from the solids and evaporate the liquid to dryness at a temperature of below 100º C. The result is a fine powder which can serve as a digestive agent. Address: Tokyo, Japan.

1235. *Otago Witness* (*New Zealand*). 1908. The journey to Kagoshima. Sept. 9. p. 15.
• ***Summary:*** "There was also a great variety of beans, besides the ever-present soya [bean], from which Japan's national soy sauce is made."

Note: Kagoshima is a city at the southwestern tip of Kyushu, Japan's southernmost large island.

1236. Kametaka, Tokuhei. 1908. Notes on Japanese vegetable oils. *J. of the College of Science, Imperial Univ. of Tokyo* 25:(Article 4):1-7. Sept. See p. 6. [6 ref]
• ***Summary:*** The five oils discussed are: (1) Japanese wood oil (*Kiri-abura*). (2) Camellia oil or Oil of *Thea japonica* (*L.*) *Nois* (*Tsubaki abura*). (3) Oil of *Terreya nucifera S. et Z.* (*Kayano -abura*). (4) Soja bean oil or Oil of *Glycine hispida Maxim.* (*Daidzu-abura*). (5) Oil of Perilla *ocymoides* (*Eno-abura*).

Concerning soja bean oil: "The sample used was pure oil obtained from Tokushima. A bromine addition product of the mixed acids was obtained melting at 110º. This appears to be tetrabromostearic acid $C_{18}H_{32}Br_4O_2$.

"Oxidation of the mixed acids by Hazura's method gave dihydroxystearic acid and sativic acid, the yield being about 27.5 parts of the former and 10 parts of the latter from 100 parts of the oil.

"From these experiments it can be seen that the unsaturated acids in this oil are principally oleic acid and linolic acid, or its isomer." Address: Rigakushi, Japan.

1237. Lipman, Jacob G. 1908. Bacteria in relation to country life. New York, NY: Macmillan Co. xx + 486 p. See p. 231, 245, 258. Sept. Illust. Index. 20 cm.
• ***Summary:*** Chapter 23, titled "Soil-inoculation" (p. 221+) begins with a discussion of the early research of Hellriegel and Wilfarth, tests concerning legume nodules conducted in 1887 at the Moore Experiment Station at Bremen, Germany, and the development in Germany of "pure cultures" and of Nitragin followed by many disappointments from 1896-1898, "which cast discredit on artificial cultures." Yet there is now hope that they will be made to succeed.

The section on "Soil-inoculation in the United States"

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states (p. 230-31) that at first, crops such as clovers, cow-peas, field-peas, etc. did not appear to require any inoculation. "It was otherwise with at least two leguminous crops, soybeans and alfalfa. Soybeans, originally introduced into the United States from Japan, did not do very well. They frequently failed to develop that healthy, dark green color characteristic of vigorous leguminous plants. Careful examination showed their roots to be devoid of tubercles. Soybean earth, straw and chaff were obtained from Japan and placed in the ground together with the seed. The plants thus inoculated developed normally and produced an abundance of tubercles.

"This experience demonstrated the need of soil-inoculation of soybeans. Many cases are reported in experiment station literature in which these inoculations gave positive results. For instance, in the experiments of the New Jersey Station, on light sandy soils at Hammonton, when cowpeas and soybeans were planted in the same ground, the former grew luxuriantly and gathered nitrogen from the air by means of their numerous nodules, while the soybeans remained small and yellow and produced no tubercles. It was not until the introduction of some soil from a field where these plants had been grown successfully for several years that the soybeans developed properly and grew as luxuriantly as did the cowpeas.

"Similar observations were made time and again in the case of alfalfa." Figure 38 (three photos, p. 224) shows three soybean plants and their roots: (a) the largest, with nodules on the roots, is inoculated with soil; (b) medium size with no root nodules, is untreated; (c) thin and with no root nodules, is "inoculated with soybean chaff."

Note 1. This is the earliest English-language document seen (June 2011) that contains the term "soybean chaff." It refers a by-product that results when soybeans are threshed or the seeds cleaned.

In the Chapter 24, titled "Green-manuring" we read (p. 245): "The cowpea, soybean, and velvet bean as green-manure crops.–On the sandy soils of the East, the cowpea, soybean, sand vetch, crimson clover, and velvet bean have been widely used for improvement of the land. In the cotton-growing states of the South, the cowpea is almost indispensable as an aid in the maintenance of the humus and nitrogen of the soil." Soil bacteria decompose the vines and roots. "The soybean, which is related to the cowpea, has also been used as a green-manure on light soils. It does well, however, also on heavier soils, provided it is properly inoculated, and is not as readily injured by cold weather."

A full-page black-and-white photo (p. 258) shows "A thoroughly inoculated crop of soybeans" growing in a large field.

Chapter 1, titled "The rise of bacteriology" (p. 1-12) gives an interesting, early history. Leeuwenhoek (lived 1632-1723) in Holland first beheld bacteria with his lenses in 1675; he called them "animacules." "He recognized differences in their appearance and size as well as in their mode of motion." These and subsequent observations "gave rise to much speculation and heated discussion concerning the relation of the animacules to animal diseases"–and to the issues of contagion and spontaneous generation. Belief in spontaneous generation had existed since the Middle ages, and the discovery of bacteria seemed to support the ancient theory. But various experiments from 1765 to 1875 gradually disproved the theory.

"The physiology of bacteria.–Pasteur's epoch-making investigations on fermentation shed a broader light on the activities of microörganisms. His work plainly indicated that the various kinds of bacteria possess specific functions and differ in the chemical changes which they produce. This work may, therefore, be regarded as the starting point for much fruitful research... Bacteria were to be distinguished, henceforth, not by their appearance alone, but by the chemical transformations of which they are capable. They were to be regarded as chemical agents of wide significance, builders and destroyers in vegetable and animal substances, in organic and inorganic materials, in the presence or absence of air.

"*Bacteria as a cause of disease*.–The study of bacteria, and of other microorganisms, as agents of decay, putrefaction and fermentation, gained in interest with the recognition that bacteria may also be the specific cause of disease. As far back as 1762, the belief was expressed by Plenciz, a Vienna physician, that disease is the result of infection by animalcules; and, more important still, that every disease has its particular germ. The views of Plenciz met with no acceptance, and were soon forgotten amid the clashing opinions on spontaneous generation" (p. 6).

During the 1800s important advances were made by Bassi, Henle, Pasteur, and Lemaire. Lister developed a method of antiseptic surgery (1868), "through which medical science has achieved splendid results." "The investigations of [the German bacteriologist Edwin] Klebs during the Franco-Prussian War [July 1870–May 1871] traced the entrance and development of bacteria in wounds and their passing into the circulatory system. Klebs and other investigators also noted the constant presence of bacteria in diphtheric infections." "The systematic study of bacteria was furthered by the work of Schroeter, published in 1872." Ferdinand Kohn then articulated the "opinion that, among bacteria, as among more highly organized organisms, there exist definite species fairly constant in their structure and in their physiological activities."

"*Anthrax bacillus*.–In 1876, [the German Robert] Koch [1843-1910] demonstrated clearly and convincingly that anthrax in cattle is due to a specific germ, and thus confirmed a fact already, indicated by the observation of others. He isolated the anthrax bacillus in pure culture, studied it under the microscope, and showed that he could produce anthrax in other animals by inoculation from such cultures" (p. 8).

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"In agriculture, the development of bacteriology has given un new insight into the nature of soil fertility. We have learned to regard the soil as a culture medium with its almost endless number of species..." We have also "made some progress towards successful systems of soil-inoculation."

Chapter 47, titled "Bacteria in miscellaneous agricultural industries," states (p. 456-57): "The preparation of natto.– Natto is a vegetable cheese made in Japan by fermenting boiled soybeans. The fermenting mass is kept in a warm place for one or two days, at the end of which time it has become filled with vast numbers of bacteria. The material is then found to contain a large proportion of a mucilaginous, viscous substance, which is highly esteemed by the Japanese."

Note 2. This is the earliest English-language document seen (Jan. 2012) that uses the word "mucilaginous" or the word "viscous" to describe Japanese natto.

"The bacterial flora of natto consists at first largely of bacilli, but subsequently spherical forms become prominent.

"Two rod-shaped organisms, isolated by Sawamura, were found to change boiled soybeans into a product similar to natto. One of these produced the characteristics taste and aroma, but did not develop a strong viscosity in the beans. The other organism was found to possess a more pronounced ability to form mucilaginous materials, but did not develop as desirable a taste and aroma. The changes produced by these organisms in the preparation of natto were shown to be due to enzymes secreted by them."

Note 3. Although the date on the title page of some editions is 1911, the copyright page and last page of the Preface indicate that it should be Sept. 1908.

Facing the title page (frontispiece) is a painted portrait of Anton Van Leeuwenhoek (pronounced lay-ven-hook), a Dutch naturalist (1632-1723), who is generally cited as the first to discover bacteria [or microorganisms]. Address: A.M., Ph.D., Soil Chemist and Bacteriologist, New Jersey Agric. Exp. Station, New Brunswick, New Jersey, and Assoc. Prof. of Agriculture at Rutgers College.

1238. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1908. Chinese bean oil. Manufacture into oil and cake in Shantung. No. 336. p. 114-15. Sept.

• ***Summary:*** "Consul Wilbur T. Gracey, of Tsingtau, transmits the following report relative to the production of [soya] beans and bean oil in the Chinese province of Shantung:

"One of the principal exports of Tsingtau is bean oil, produced in the Shantung hinterland, amounting in 1906 to 146,160 hundredweight, in addition to 108,859 hundredweight of peanut oil. In the same year the export from all China of bean oil, peanut oil, tea oil, wood oil, etc., was 430,866 hundredweight, valued at $8,504,440 United States currency. The export of the oils alone from Tsingtau during the year 1906 was valued at $952,428. The refuse from the beans was pressed into bean cakes and exported from China to the amount of 2,423,834 hundredweight, valued at $10,136,611, the shipments from Tsingtau being 57,457 hundredweight. The method of producing the oil cakes may be of interest.

In Shantung province only one crop of beans is grown annually, a Chinese mau (4,200 square feet) of land producing about 300 pounds of beans, 10 per cent of which is saved for planting and the remainder sold or made into bean oil and bean cakes. It is estimated that 10O pounds of beans will-produce approximately 10 pounds of oil.

"The vines are grown on a wooden framework. Small pine poles or stout bamboos form the upright stanchions, with crosspieces of smaller bamboos, and a series of even smaller poles covering the whole roof of the structure and supporting the weight of the vines. The cost of the large stanchions is from $1 to $2 gold each, large bamboos being about 25 cents to 50 cents each, and the smaller ones from 5 to 10 cents.

"Harvesting and pressing: The bean vines are cut entirely by hand with a primitive hook-shaped knife manufactured from iron and sold at a small price... They are dried on the hillsides or on the thrashing floor of the village and the pods removed by a small stone roller pulled by an ass or, occasionally, by the farmer's wife or by the use of a flail. Each village farmhouse has its thrashing floor, a patch of smooth ground about 50 feet square. The beans are separated by winnowing, a small wooden fork or shovel being used to throw pods in the air on a windy day, the chaff being carried away by the wind. No modern machinery is used for any of these processes.

"The oil is extracted and bean cakes manufactured in one process. A rough press is constructed of wood and iron, a sketch of which is forwarded [and filed at the Bureau of Manufactures]. A cylinder of iron has a solid wooden top, upon which a crossbeam is supported which runs through a long slit in two heavy poles on either side of the cylinder. These stout wooden stanchions are from solid pieces of wood, planted solidly in the ground.

The beans are boiled for some time to soften them, then measured off into rough cloth bags. Four of these bags are placed in the iron cylinder, separated by round slabs of wood. A heavy cover is placed on top, the strong pole placed across this and through the slits in the upright stanchions, small wedges driven in between the cross pole and the stanchions, and with continual driving of more and more wedges the oil is extracted from the beans, running off into a trench which surrounds the cylinder, the beans in their bags being pressed into cakes about 18 inches in diameter and about 3 inches thick. The cloth bags are then removed and preserved for future use, the resulting hard cake being the well-known bean cake of China.

"In Shantung Province bean cakes are manufactured

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principally in and near the towns of Kiaochow and Kaumi, though bean-cake presses can be found in use outside most of the big cities to the north of Tsingtau.

"Shipping and prices: The average price of bean oil is from 4½ to 6 cents per pound. Most of the shipping of these products is carried on by natives almost entirely by Chinese vessels, each carrying 300 to 400 'baskets' of oil. These baskets are really large jars–a basket contains about 200 pounds of oil–with earthenware covers, which are sealed by paper seals, the entire jar being covered with a willow basket work for protection, and it is from this covering that they derive their name.

Bean cakes are not packed, being easily transported as though they were solid pieces of wood. The average price is about 1½ cents gold for 1.33 pounds, and a whole cake sells at 60 cents to 70 cents. They are sent in large quantities to other parts of China and to Japan, where they are used for feeding cattle and fertilizer. The oil is exported principally to South China.

"A peculiar fact which has recently been communicated to me is that cattle fed with a certain amount of bean cake in their food produce milk which contains from 7 to 8 per cent butter fat, while the ordinary cow's milk contains only about 3 to 4 per cent of fat." Address: Washington, DC.

1239. Nishimura, Torazô. 1908. Shôyu kôbo Saccharomyces soya Saito ni tsuite. I. [On the shoyu yeasts, Saccharomyces soya Saito. I.]. *Nogakkai Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 83. p. 11-52. Sept. [Jap]
• ***Summary:*** Three varieties of yeast which sporulated were isolated from the shoyu mash: *Torula shoyu, Torula shoyu var. minuta,* and *Torula turbinata.* These three species seem to play an important role in the brewing of shoyu. he also found several kinds of film-forming yeasts, two of which belong to the genus *Pichia* and others to *Mycoderma* and *Torula.* Address: Nôgaku-shi, Japan.

1240. *Agricultural Gazette of New South Wales.* 1908. Soy or soja bean. 19(10):811. Oct. 2.
• ***Summary:*** The Soy or soja bean "comes from Japan, and of late years has attracted attention as an annual leguminous plant which produces the richest of all beans in protein and fat. It closely resembles the cowpea... They give a greater yield of beans than cowpeas. They are not trailing in habit, hence are more easily harvested."

"As a food for pigs, either as beans, green forage, or hay, it has a high reputation. The animals fatten quickly, are always thrifty, with strong appetites; the hair and skin acquire a glossy look, and the skin feels as if they were fed on oil meals."

Yields as high as 10 bushels/acre were obtained. Address: Australia.

1241. Hall, J.C. 1908. Japan. Bean oil industry: Sample of oil on view. *Board of Trade Journal* (*London*) 63:184-85. Oct. 22.
• ***Summary:*** Reports that "bean oil in Japan... is very simply manufactured from the soy or soja bean (*soja hispida*), grown there and also largely imported from China and Corea. The beans are thoroughly steamed and immediately pressed by machinery, the resultant oil being run into tanks. There it is allowed to settle and purify, the product being a light yellow oil, suitable as material for food and for industrial purposes. The residue is used as manure and as food for cattle. The total production of oil is about 700 tons per annum, the price averaging about 20 *l.* 4*s.* [£20 4 shillings] per ton. So far this oil has been consumed principally in Japan; recently, however, it has been exported successfully.

"A sample of the oil may be seen on application at the Commercial Intelligence Branch of the Board of Trade, 73 Basinghall Street, London, E.C." Address: I.S.O., British Consul-General, Yokohama, Japan.

1242. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1908. Direct Manchurian-American trade. No. 3312. p. 6-7. Oct. 23.
• ***Summary:*** See Monthly Consular and Trade Reports. 1908. "Direct Manchurian-American trade." No. 339. p. 218-20. Dec. Address: Washington, DC.

1243. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1908. Manchurian conditions. No. 3318. p. 11-13. Oct. 30.
• ***Summary:*** See Monthly Consular and Trade Reports. 1908. "Manchurian conditions." No. 339. p. 12-13. Dec. Address: Washington, DC.

1244. *Chemist and Druggist* (*London*). 1908. Japanese bean oil. 73(18):699. Oct. 31. [1 ref]
• ***Summary:*** In the section titled "Trade report," this article begins: "The manufacture of bean oil in Japan from the soy or soja bean (*Soja hispida*) is the subject of note in the *Board of Trade Journal* (Vol. 63, No. 621, p. 184-85). The beans are thoroughly steamed and immediately pressed by machinery, the oil after purification being of light yellow colour, suitable for various industrial purposes. The total annual production is about 700 tons, the price averaging about 20 *l.* 4*s.* [£20 4 shillings] per ton. So far the oil has been consumed principally in Japan, but recently it has been exported with success."

1245. Hausser, -. 1908. China: Report for the year 1907 on the trade of Swatow. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 4125. p. 1-14.
• ***Summary:*** A map shows the area around Swatow. "Native imports. Bean cake–Owing to the diminution in the

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production of sugar in this district the importation of bean cake has fallen off by 30 to 40 per cent. Some 20 years ago, when the sugar growing industry here was at the height of its prosperity, the import of bean cake was from 3,500,000 to 4,000,000 pieces per annum, of which 3,000,000 to 3,500,000 pieces came from Newchwang [Manchuria] and the balance from Chefoo. The Newchwang market was then controlled entirely by the Swatow buyers, the Japanese taking only about 500,000 pieces each year. At present it is they who rule the northern market for bean cake, the fish which they formerly used as fertiliser, in the form of fish guano, being now dried and salted and sent to China for sale as food."

Table II (p. 12), titled "Return of principle articles of native import (net) during the Years 1906 and 1907", shows imports to Swatow of bean cake decreased from 3,159,276 cwts. in 1906 to 2,199,443 cwts. in 1907 [1 cwt = hundredweight = 112 pounds]. Imports of beans decreased from 1,070,357 cwts. in 1906 to 774,414 cwts. in 1907. Imports of oil (bean, castor, groundnut, &c.) decreased from 16,050 cwts. in 1906 to 12,348 cwts. in 1907. Table III (p. 12-13), titled "Return of principal articles of export of native produce from Swatow during the years 1906-07", shows an increase in the export of oil (bean, castor, groundnut, &c.) from 24,527 in 1906 to 29,498 in 1907. A table (IV; p. 13), titled "Return comparing values of 1907 with average values from 1902-06 for the principal articles of import and export", shows that native imports of beans and bean cake decreased from 1,022,189 on average from 1902-06 to 817,243 in 1907. Address: Consul.

1246. Hosie, Alexander. 1908. China: Report for the year 1907 on the foreign trade of China. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 4152. p. 1-99.

• ***Summary:*** A list (p. 52) shows that China's leading articles of export, in descending order of value (million Haikuan [Haikwan] taels), are silk (89.1), tea (31.7), cotton, raw (16.9), skins and hides, undressed (12.4), bean cake (9.1)... vegetable oils (4.2), fire-crackers (4.2)... sesamum seed (3.6)... groundnuts (0.4).

A table (p. 62) shows exports of these items from China to Europe and America in 1902-06 (average), 1906, and 1907. Exports of oil (bean, tea, groundnut, wood, etc.) dropped 2.5% in 1907 compared with 1906. A table (p. 64) shows exports from China to Asiatic countries (India excepted) in 1902-06 (average), 1906, and 1907. Exports of bean cake rose from 4,661,956 cwts. [1 cwt = hundredweight = 112 pounds] in 1906 to 4,978,588 cwts. in 1907. Exports of "beans" dropped from 1,778,037 cwts. in 1906 to 1,591,508 cwts. in 1907.

A section titled "Beans, bean cake and bean curd" (p. 68) discusses soybeans, soybean cake, and tofu. "Within the knowledge of the Chinese Imperial Maritime Customs the export of beans from China to foreign countries amounted in 1907 to 1,591,508 cwts. [1 cwt = hundredweight = 112 pounds] of the value of 526,735*l.*; but the total export was much greater, for Japan alone claims to have taken 2,003,840 cwts., of which Manchuria contributed 1,266,775 cwts." There are also discrepancies in the figures for bean cake, accounted for in part by the fact that there was no Chinese custom-house at Dairen until July 1, 1907, and that during the whole of the year beans and bean cake, especially the latter, found their way from Northern Manchuria by the Chinese Eastern Railway to Vladivostock [Vladivostok], and thence by steamer to Japan without coming under the cognisance of the Chinese customs."

"The export of the bean product known as bean curd [fermented tofu], which is packed in earthenware jars and shipped for consumption by Chinese emigrants in the East, was larger in quantity but fell in value."

A section titled "Oils, vegetable and essential" (p. 69-70) begins: "The quantity of oil (bean, groundnut, tea, wood, &c.) shipped to foreign countries in 1907 was 541,999 cwts, or 120,193 cwts. short of the export of 1906. The value of the shipment was 687,714*l.* [pounds sterling]. It is unfortunate that the Chinese customs authorities continue to group these oils under one heading. A detailed classification would be of considerable value in view of the important position which wood-oil has recently established in foreign markets... The same recommendation is applicable to essential oils which are grouped together as aniseed, cassia-leaf, &c." [incl. camphor oil].

A section titled "seeds and seed cake" (p. 70-71) notes: "The most important of all the seeds exported from China is sesamum, which has sprung into prominence within the last few years." Also discusses exports of rape seed, cotton seed; soy is not mentioned in this section.

Note: This is the earliest document seen (May 2005) that mentions the Russian port of Vladivostok in connection with soybeans. Address: Sir, Acting Commercial Attaché to His Majesty's Legation at Peking.

1247. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1908. Agriculture. Farm crops and methods. Japan. No. 337. p. 95-99. Oct.

• ***Summary:*** "Consul Hunter Sharp, of Kobe, transmits the following review of agricultural conditions in Japan,..." According to the 1906 census, Japan has a population of 48,304,397. "Sixty per cent of the people are agriculturists, and yet on account of the mountainous nature of the country, only about one-sixth of the total area is under cultivation."

"On the land known as rice fields, wheat, barley, or rape seed are sown about November, the crop being gathered the following June. Immediately afterwards the rice is planted, and is harvested in October. On the upland fields either wheat, barley, or rape seed is sown and harvested at the same

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season as above mentioned; after which corn, cotton, beans, panicum miliacum [millet], and various vegetables are sown, maturing at different times."

"Fertilizers freely used:... In 1906 the importation into Japan of oil cake alone amounted to $7,793,766, of which China supplied $7,436,958; ammonium sulphate, $2,637,751, to which Great, Britain contributed $2,543,264, while the United States sent nitrate of soda to the value of $34,236; oil cake, $3,823; and phosphorites, $74,211, aggregating $112,270." Note: We are not told what kind of oil cake the USA exported to Japan, but it was not soya bean cake.

"One year's crop: According to the statistics of 1906 the agricultural products of Japan are given as follows: Rice, the chief crop, has an acreage of 7,104,072, with a production of 229,794,826 bushels; barley comes next, with 3,359,238 acres and a production of 81,407,291 bushels; wheat, the principal crop in other grain-producing countries, occupies only 1,086,118 acres, with a yield of 19,664,325. An average crop for these three is about 30 bushels per acre. Other agricultural products are:" The first two crops shown in this large table are: Soy beans 17,655,973 bushels. Small red [azuki] beans 4,449,408 bushels.

A table titled "Exports of agricultural products" in U.S. dollars for 1902-1906 lumps together "Beans, pease, and pulse," which grew from $45,903 in 1902 to $76,051 in 1906. Exports of peanuts decreased from $175,585 in 1902 to $150,102 in 1906. Japan's largest agricultural export, tea, accounted for about 90% of total exports (worth $5+ million) during this period.

A table titled "Imports of agricultural products" in U.S. dollars for 1902-1906 lumps together "Beans, pease, and pulse," the second largest import category, which grew from $2,881,780 in 1902 to $4,839,708 in 1906. Most of these beans are supplied in about equal proportions by China and Korea. Japan's largest agricultural import, rice, accounted for about 70% of total imports (worth $13 to $39 million) during this period.

"Agriculture in Formosa and Sakhalin:... Japanese Sakhalin has a total area of 12,582 square miles, of which 89,296 acres can be cultivated, and in 1906 the population was 8,569. The agricultural products are barley, wheat, rye, oats, potatoes, peas, kidney beans, soja beans, red beans, hemp, flax, and vegetables. Of these the most successful are potatoes, barley, rye, oats, and wheat, and in a lesser degree peas, hemp, and flax." Soy beans are not mentioned under Formosa. Address: Washington, DC.

1248. Mortimore, -. 1908. China: Report for the year 1907 on the trade of Chefoo. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 4129. p. 1-15.

• ***Summary:*** Page 8 discusses "Bean cake.–The trade shows a falling off in 1907, due to the fact that many claims were made from Japan for short weight, which the Chinese refused to meet and the export to that country consequently fell off. Many merchants also now purchase bean cake in Dalny and Antung, from which places direct steamers are run to Amoy and Swatow, with a considerable saving of freight compared with that charged from Dalny to Chefoo and transshipment thence to the south." Table IV (p. 13), titled "Return of principal articles of export from Chefoo during the year 1907," shows 1,190,000 cwts. [1 cwt = hundredweight = 112 pounds] of bean cake, worth £330,017, was exported. 46,400 cwts. of beans, worth £17,924, and 11,533 cwts. of bean oil, worth £13,649, were also exported.

The largest export was fresh eggs, followed by bean cake. Large amounts of groundnuts (including shelled) were also exported.

Table V (p. 14), titled "Comparative table of principal articles of export from Chefoo during the years 1903-07," shows exports of bean cake rose to a peak of 1,719,328 cwts. in 1906. Exports of beans rose to a peak of 896,426 cwts. in 1905. Exports of bean oil rose to a peak of 34,162 cwts. in 1906.

The main nationalities and types of ships entering the port of Chefoo in 1907 were Japanese steam ships (1,281), followed by British (711, but with the largest total tonnage), Chinese (388), and German (181). Address: Consul.

1249. Playfair, F.W.W. 1908. Japan: Report for the year 1907 on the trade of Nagasaki. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 4151. p. 1-18. Oct.

• ***Summary:*** A map shows the Island of Kyushu, with railroads and the Nagasaki Consular District. Just southwest of the sea port of Nagasaki is the small island of Takashima. From Nagasaki by sea it is 700 miles to Vladivostock [Vladivostok], 150 miles to Fusan, 460 miles to Shanghai, and 1,100 miles to Hongkong.

Table 1 (p. 10-11) titled "Comparative Table of Articles of Import into Nagasaki during the Years 1906-07" show imports of "bean cake" + rape seed cake were 27,047 tons in 1906. In 1907 statistics were separated: 17,152 tons of bean cake and 10,968 tons of rape seed cake were imported. An aggregate figure is given for imports of "Beans, peas and pulse" (6,590 tons in 1906 rising to 8,536 tons in 1907). Sesame was also imported. Address: British Consul, Nagasaki.

1250. *Natal Agricultural Journal.* 1908. Oil from the soy bean. 11(11):1371. Nov. 27. [1 ref]

• ***Summary:*** An excerpt of almost the entire article by Mr. J.C. Hall (British Consul at Yokohama, Japan) from the *Board of Trade Journal* (*London*) of 22 Oct. 1908, p. 184-85. It describes the production and use of oil and meal from the soy bean (*Glycine hispida*), which is grown in Japan and also largely imported from China and Corea. Address: South

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Africa.

1251. Harrington, -. 1908. Japan: Report for the year 1907 on the trade of the consular district of Yokohama. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 4165. p. 1-47.
• ***Summary:*** Yokohama is Japan's leading port, accounting in 1907 for about 40% of all imports. Germany exported £13,000 in oil and bean cake to Japan (perhaps transshipped from China; p. 13). Japan's main imports from China via Yokohama included raw cotton £362,000, oil and bean cake £296,000, and soja beans £73,000 (p. 14). There was a small increase in the export of soy [sauce] to Canada (p. 16; no amounts are given).

A ten-page table (p. 22-32) titled "Imports into the Port of Yokohama during the Years 1905-07" shows the import of "oil cake" used as manure rose from 61,830 tons worth £281,870 in 1905 to 88,520 tons worth £461,460 in 1907 (p. 32).

A table (p. 34) titled "Exports from the Port of Yokohama during the Years 1905-07" shows the value of the export of "soy" [sauce] (mostly to the United States and Hawaii) rose from £42,007 in 1905 to £59,900 in 1907; no quantities are given. Groundnuts, rice, seaweed, and Bêche-de-mer (sea slug, trepang) were also exported from Yokohama. Address: Acting British Vice Consul, Yokohama.

1252. Ito, Teiji. 1908. Shôyu narabini tamari (kibiki-damari, sobiki-damari, niira tamari) naka no ekisubun gaitei ippô [A method of obtaining approximate measurements of extracts from shoyu and 3 types of tamari (*kibiki, sobiki,* and *niira* tamari)]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 321. p. 1200-07. Nov. [Jap]

1253. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1908. Milling in China. Prominent industry at large commercial city. No. 338. p. 100-01. Nov.
• ***Summary:*** "Vice-Consul-General Albert W. Pontius, writing from Hankow, supplies the following information of the progress at that Chinese business center in milling both wheat and beans:"

"There were five mills in Hankow in 1907, turning out [soya] bean cake and [soya] bean oil, with a daily capacity varying from 300 to 3,000 cakes. Three of these mills worked at a profit, one has only recently been started, and one lost money and has closed. According to information received, from five cakes 26.67 pounds of oil are derived. Each cake weighs 61.33 pounds. The price of beans averages $1.80 per 133.33 pounds, and the cakes sell for 60 cents each, and the oil at about $5.50 per picul of 133.33 pounds. There is a growing demand in Japan for Hankow-made cakes, which also supply the Swatow market."

"An opening for American machinery in its manufacture: Vice-Consul C.L.L. Williams, of Chefoo, furnishes the following; report, prepared by Marshal Edgar Kopp, of that consulate, concerning the export and manufacture of Chinese bean cake: The export of bean cake from North China is almost monopolized by Chefoo, Newchwang, and Dalny [Dairen]. Newchwang, being nearest to the bean fields of Manchuria, leads at present, but Dalny threatens to become a serious competitor, having excellent harbor and railway facilities. During the first quarter of 1908 the total exports of bean cake from all Chinese ports amounted to 321,910,497 pounds, of which 132,235,649 pounds were exported from Dalny, 51,059,099 pounds from Chefoo, 59,079,765 pounds from Hankow, 35,064,652 pounds from Chinkiang, 23,156,231 pounds from Shanghai, and only 17,675.853 pounds from Newchwang, although 50 per cent of the total exports from all ports during the year 1907 were from Newchwang.

"The exports of bean cake from Chefoo go to southern Chinese ports, while those from Newchwang go chiefly to Japan, where it is used, with great success, as a fertilizer on the rice and sugar-cane fields; it is also extensively used for cattle and hog feed.

"The manufacture of bean cake is conducted in a very primitive way. The work is done by hand, no steam or machinery being used, and there should be an opportunity to introduce some American machinery to replace the antiquated manner of forming and pressing.

"The by-product, bean oil, is of very good quality, and, if the beans are good, about 45 pounds of oil is got out of 5 bean cakes, each cake weighing over 100 pounds. It is extensively used for cooking purposes, and sells for $4.50 per 135 pounds. Chefoo has about 70 bean-cake factories, each of the largest employing 12 men, whose wages are about 6 cents gold per day, including board and lodging. The daily output of each factory is 120 cakes, which sell for 81 cents gold per cake. [Full descriptive information, by the consul, concerning the manufacture of bean cake, is filed in the Bureau of Manufactures.]" Address: Washington, DC.

1254. *USDA Bureau of Plant Industry, Inventory.* 1908. Seeds and plants imported during the period from July, 1906 to December 31, 1907. Nos. 19058 to 21730. No. 13. 192 p. Dec. 4. Also titled USDA Bureau of Plant Industry, Bulletin No. 132.
• ***Summary:*** Soy bean introductions: Glycine hispida.

19183/19184/19186. "From Manchuria. Received through Mr. F.N. Meyer, agricultural explorer, August 28, 1906. A collection of seeds as follows:

"19183. From Newchwang. '(No. 255a.) A small variety of the black soy bean. Used to make bean oil from, the remaining expressed material, known as bean cake, being exported to Japan and southern China as a very valuable fertilizer.' (*Meyer.*)

"19184. From Newchwang. '(No. 256a.) A large variety

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of the black soy bean. This is a very rare variety and is used for food: also for making a superior oil.' (*Meyer.*)

"19186. From Newchwang. '(No. 258a.) A medium-sized, greenish soy bean. This variety is the one most commonly used to extract bean oil from, the remaining yellow material, in the form of large, flat cheeses [actually cakes], being exported to different parts of Japan and especially to southern China as a very valuable fertilizer.' (*Meyer.*)" [Note: Piper and Morse (1910, p. 52) state that this variety was later named "Morse." They list no variety named "Virginia." But I. Cunningham (1984) states that this variety was later named "Virginia."]

19980-19987. "From Yokohama, Japan. Received through L. Boehmer & Co. [seedsmen], March 19, 1907.

"19980. Received under the name of *'Fuiri Mame,* the speckled soja bean.' [The scientific name is listed as Phaseolus vulgaris; the common name as bean. Clearly this is not a soy bean.]

"19981. Received under the name of *'Shiro Mame,* the white soja bean.'

"19982. Received under the name of *'Kuro Mame,* the black soja bean.'

"19983. Received under the name of *'Daizu* or *O-mane, Dolichos soja.'*

"19984. Received under the name of *Wase* or *Natsu Mame,* early summer bean.'

"19985. Received under the name of *'Nagate Mame,* middle late bean.' Note: Later referred to as Haberlandt.

"19986. Received under the name of *Okute Mame,* 'late bean.'

"19987. Received under the name of *Kuro-Teppo Mame,* round, middle-late bean.'

20011. "From Ko-bau, northern Korea. Received through Mr. Frank N. Meyer, agricultural explorer, February 20, 1907. '(No. 318a, Aug. 12, 1906.) A green variety of soy bean growing at high elevations. This variety is eaten as a food and is mostly grown in broad strips between buckwheat; a very late ripener. Seems to be the most northerly variety of soy bean seen yet and will do well in cool climes.' (*Meyer.*)"

20405-20412/20414. "From Siberia. Received through Mr. Frank N. Meyer, agricultural explorer, February 28, 1907. A collection of seeds, as follows:

"20405. From Khabarovsk. '(No. 643a, Nov. 15, 1906.) Round, yellow soy beans purchased in the market at Khabarovsk. The Chinese let these beans sprout and use the sprouts all winter as a vegetable. Oil is also extracted from this variety, and the cakes thus formed make a very nutritious food for horses.' (*Meyer.*)

"20406. From Khabarovsk. '(No. 644a, Nov. 15, 1906.) A yellow soy bean purchased in the market at Khabarovsk.' (*Meyer.*)

"20407. From Merkoechofka. '(No. 645a, Oct. 25, 1906.) A brown-black variety grown in eastern Siberia; does not scatter [its seeds] when ripe and is very late in ripening, as it is harvested in the last half of October. Is used for food, being boiled with millet. This variety seems to have come originally from more southern regions, as the season here is somewhat short for it.' (*Meyer.*)

"40408. From Khabarovsk. '(No. 647a, Nov. 8, 1906.) Black soy beans obtained from Mr. V.T. Kovaleff, in charge of the experiment station at Khabarovsk. These seeds came originally from Manchuria in 1899 and are ripening here to perfection, while the light and dark yellow varieties do not ripen well at all. Are used for food for domestic animals when boiled, and are also sometimes fed in the green state.' (*Meyer.*)

"20409. From Merkoechofka. '(No. 648a, Oct. 25, 1906.) Very small, brownish beans obtained from a farmer in Merkoechofka; said to have come originally from Manchuria.' (*Meyer.*)

"20410. From Merkoechofka. '(No. 649a, Oct. 25, 1906.) Very small, black beans obtained from a farmer in Merkoechofka; said to have come originally from Manchuria.' (*Meyer.*)

"20411. From Merkoechofka. '(No. 650a, Oct. 25, 1906.) Very small, dull-black beans obtained from a farmer in Merkoechofka; said to have come originally from Manchuria.' (*Meyer.*)

"20412. From Merkoechofka. '(No. 651a, Oct. 25, 1906.) Brown soy beans found mixed with No. 645a (S.P.I. No. 20406).' (*Meyer.*)

"20414. From Merkoechofka. '(No. 653a, Oct. 25, 1906.) Small, black soy beans obtained from a farmer in Merkoechofka; said to have come originally from Manchuria.' (*Meyer.*)"

20629/20699.

"From northern Europe, Siberia, and eastern Asia. Seeds collected by Prof. N.E. Hansen, of the agricultural experiment station, Brookings, South Dakota, in 1906 while traveling as an agricultural explorer for the Department of Agriculture on an extended trip through Scandinavia, Russia, Siberia and returning through China and Japan. Received March 1907.

"20629. From Manchuria. '(No. 109.) Variety *Hoo-an-dooh.* Used for human food and for fodder in Manchuria and brought from that country by a Russian student-soldier after the Russo-Japanese war.' (*Hansen.*)

"20699. From Ussurie [Ussuri] province, Pacific coast section, Siberia. '(No. 179.) From the farm of Mr. Fick, near Nicolsk.' (*Hansen.*)"

20797/20798. "Received through Mr. Frank N. Meyer, agricultural explorer, April 3. 1907.

"20797. From Shanghai, China. '(No. 722a.) *Black* soy beans obtained through Dr. S.P. Barchet, of the U.S. consulate at Shanghai. These beans come from Chin-hua-fu, Chekiang province, and are used apparently as a second crop on low-lying rice fields, and may as such be very valuable for the Southern States. They are mainly used as a food for

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domestic animals. It seems that they are sown broadcast after the sowing of the rice crop; specific details are not obtainable just now.' (*Meyer.*)

"20798. From Shanghai, China. '(No. 723a.) *Brown* soy beans obtained through Dr. S.P. Barchet, of the U.S. consulate at Shanghai. These beans come from Chin-hua-fu, Chekiang province, and are used apparently as a second crop on low-lying rice fields, and may as such be very valuable for the Southern States. They are mainly used as a food for domestic animals.' (*Meyer.*)"

20854. "From Harbin, Manchuria. Received through Mr. F.N. Meyer, agricultural explorer, April 11, 1907. '(No. 675a, Dec. 15, 1906.) Green soy beans; Chinese name *Ta shing toa.* These are boiled and used as food, and the sprouts of the germinated beans are also used as a vegetable throughout the winter months.' (*Meyer.*)"

20892/20893. "From Kobe, Japan. Presented by Hon. Hunter Sharp, American consul, who purchased them from J. Ikeda & Co., Tokyo, Japan. Received March 25, 1907.

"20892. White.

"20893. Green."

21079/21080. "Received through Mr. Frank N. Meyer, agricultural explorer, June 21, 1907.

"21079. From Tiëling, Manchuria. '(No. 693a, Jan. 18, 1907.) A light green soy bean; Chinese name *Shing toa.* This bean is used to produce bean oil and bean cake. The variety is very rarely seen.' (*Meyer.*)

"21080. From Tiëling, Manchuria. '(No. 694a, Jan. 18, 1907.) A dark green soy bean; Chinese name *Li dau shing.* This bean is used as a vegetable throughout the winter months, being eaten boiled after it has sprouted slightly. This variety is the most expensive of all the soy beans and is eaten by the better classes of Chinese; sent also from Harbin under No. 675a (S.P.I. No. 20854.)' (*Meyer.*)" Note: This is the earliest English-language document seen (Oct. 2004) that uses the term "dark green" to describe the color of a soybean.

[Notice the large number of seeds introduced by Frank Meyer during this period.]. Address: Washington, DC.

1255. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1908. Direct Manchurian-American trade. No. 339. p. 218-20. Dec.
• ***Summary:*** "Based on the desirable purchase of this wild silk for American manufacture, Mr. Arnell then draws attention to the large possibilities of supplying American manufactured goods through mercantile houses that would handle both ends of the trade:" The U.S. continues to import tussah and pongees [both silk fabrics] from Manchuria.

"At present the trade of the United States with this territory [Manchuria] is entirely one-sided. It sells but does not buy, and this fact constitutes one of the principal causes which are destined to handicap American sellers in competition with Japan, which purchases practically the entire output of beancake, Manchuria's most important export."

The Japanese "sell their piece goods and miscellaneous articles largely to the same Chinese merchants from whom they buy the bean cake." Americans should consider doing likewise with silk fabrics. Address: Washington, DC.

1256. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1908. Manchurian conditions. No. 339. p. 12-13. Dec.
• ***Summary:*** "Consul Thomas E. Heenan furnishes the following information."

"Extent of exports: The principal exports from Newchwang during the six months ended June 30, 1908, were beans, bean cake, and bean oil, of which bean cake and bean oil show an increase, while beans are slightly less. The figures given, as a whole, show an increase in the total export. It has been proposed to tax all bean cake brought to Newchwang for shipment abroad, as the local millers declare that the price of labor and other expenses in the interior is much cheaper than at Newchwang. It is feared that this project, if it succeed, will inflict serious injury to the real interests of Newchwang. All the bean cake exported goes to Japan, and this is one of the principal articles of export from Manchuria. During the present year the price paid has been higher than in other years, due probably to the low price of silver and silver coins. The beans were brought to Newchwang by carts during the winter months, and there was a constant stream of mules and carts during this period. It is said that as many as 1,000 carts came in daily loaded with beans and other articles for export when the river opened. It is seldom that a poor or a crippled mule or horse is seen among those which enter and pass out of the town from one year's end to the other. They are all in splendid condition, and look as if they were well cared for." Address: Washington, DC.

1257. Mooers, Charles A. 1908. The soy bean: A comparison with the cowpea. *Tennessee Agricultural Experiment Station, Bulletin* No. 82. p. 73-104. Dec.
• ***Summary:*** One of the earliest and best publications on soybean management. Presents information on varietal interaction to date of planting and row width, and gives directions for planting, cultivating, and harvesting the crop, as well as data on chemical composition of the seed.

The Introduction begins: "To the farmers of Tennessee the soy bean is a forage and grain plant of special promise. In grain production, as a supplement to corn for fattening stock, no crop tested at this Station has proved its equal... The data presented in the pages which follow indicate that under Tennessee conditions each crop has a place which the other can not take. The worth of the cowpea, however, is known everywhere, while the true value of the soy bean lacks much of being generally recognized."

Varieties: About 24 soybean varieties are reported in

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this bulletin. "Promising early varieties, such as Ito San and Early Brown, require 90 to 100 days to reach maturity from the time of planting. Under the same conditions the Mammoth Yellow will require 125 to 160 days. The following varieties are known to have been grown by farmers in this state: Mammoth Yellow, Hollybrook, Guelph (medium green), 'Common,' and Buckshot (early black). Other named varieties: Haberlandt, Kingston, Medium Green, Medium Yellow, Samarow, and Tokyo. Table X (p. 97) shows analyses of many of these varieties from the crops of 1906 and 1907.

In a series of time of planting tests, the extreme dates of successful planting in Tennessee were found to be April 3 and Aug. 6. June proved to be the most favorable month in which to plant any variety. In short, Mooers reported striking agreement in the length of season required by any given variety to reach maturity in different years when planted on a given date. He also noted a steady shortening of the growing season as planting was delayed, and that this shortening was much more marked in some varieties than in others.

"Harvesting: The harvesting of soy beans is in some respects more difficult than that of cowpeas... Trials have been made with both corn and wheat harvesters, but the bundles when tied are apt to mold... The mower has given at least fair results." Placing the mowed plants on a curing frame "gives reasonable assurance of success in the saving of both the hay and the grain."

"Threshing: In threshing, a common wheat thresher may be used, but the speed of the cylinder must be reduced, and other adjustments may be necessary in order to get satisfactory results. The Koger pea and bean thresher, which the Station has found to do splendid work, may be used to advantage. The soy beans were not found to thresh clean, however, when the air was very damp and the pods were tough.

"Storing: The seed should not be stored in bins, but in loosely woven sacks, which should be disposed so that air will circulate freely among them."

Photos show: (1) Four varieties (Mammoth Yellow, Ito San, Guelph, and Buckshot) of soy bean plants side by side (title page). (2) A field of cowpeas versus Ito San soy beans–early planted, 80 days after planting on 2 April 1908 (p. 76). (3) A field of cowpeas versus Ito San soy beans–late planted, 43 days after planting on 15 June 1908 (p. 77). (4) A field of Mammoth Yellow and "Japanese" soy beans, and Whippoorwill cowpeas; the photo was taken after a light frost, which killed the tops of the pea vines [cowpea vines] but did not injure the soy beans (p. 78). (5) A field of soy beans cured on frames at the Experiment Station (p. 92). (6) Curing soy bean hay in shocks (p. 92). (7) A man holding a curing frame taken apart (p. 95). (8) A man standing by a curing frame set up (p. 96).

1258. Takenob, Y.; Takeda, G. 1908-1909. Japan Year Book. Tokyo: Japan Year Book Office. See p. 391. Fourth annual issue. [Eng]

• ***Summary:*** This section on "Japanese wine and soy" is in Chapter 18, titled "Industry." The second part of this section, titled "Soy" (and meaning soy sauce or shoyu) states (p. 391): "For soy the prefecture of Chiba, which is contiguous to Tokyo municipality, heads all other places on the list. Parched wheat mixed with salt and beans is a principal ingredient. The process is still far from scientific, and several patented processes, notably that by Mr. Suzuki, do not seem to have attained ideal perfection. The production in recent years is as below:"

Note: According to the table of weights and measures at the front of this Year Book, one *koku* (liquid) = 100 *sho* = 39.703 gallons or 150.275 liters:

1902-03–1,767,366 *koku.* 1903-04–1,763,710 *koku.* 1904-05–1,859,165 *koku.* 1905-06–1,765,973 *koku.* 1906-07–1,932,492 *koku.* This latter figure is equal to 76,725,729 gallons.

The part on *"Saké"* above this notes: "For *sake,* the national liquor brewed from rice, the 'Five villages of Nada,' situated about midway between Osaka and Kobe, are the most noted center of production in Japan. What is interesting is that the fame of 'Nada sake' is generally attributed not so much to the long experience of the brewers at Nada as to the peculiar quality of water in certain wells existing in the five villages. The general opinion is that certain bacilli found in the water possess the virtue of imparting peculiar agreeable flavor to the liquor." Address: Japan.

1259. Takenob, Y.; Takeda, G. 1908-1909. Japan Year Book. Tokyo: Japan Year Book Office. See p. 334, 336.. Fourth annual issue. [Eng]

• ***Summary:*** In chapter 18, "Agriculture," the section titled "Manure. Consumption." states that the value of the top seven sources (in million *yen*) in 1905 were: Night soil (53), stable manure (47), bean cakes [soybean] (13), fish guano (10), artificial fertilizers (8), rice bran (4.3), and bones (0.9). Total 136.2.

In the section on "Staple farm products" is a subsection titled "Beans, sweet potatoes, and potatoes," which includes production figures for Soja Beans and Red Beans [Azuki] from 1902 to 1906. Note: According to the table of weights and measures at the front of this Year Book, one *koku* dry = 4.962 bushels.

For Soja beans: 1902–3,130,000 *koku* [= 15,531,060 bushels]. 1903–3,647,000 *koku.* 1904–3,710,000 *koku* [= 18,409,020 bushels]. 1905–3,261,000 *koku.* 1906–3,557,000 *koku.*

For azuki beans, production ranged from a low of 708,000 *koku* in 1902 [23% as much by volume as soja beans that year] to a high of 918,000 *koku* in 1903 [25% as much as soja beans that year].

By contrast in 1903, production of rice was 46,473,000

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koku (12.7 times as much as soja beans), and production of barley was 7,462,000 *koku* (twice as much as soja beans). Address: Japan.

1260. Agricultural Bureau, Department of Agriculture and Commerce. 1908. Agriculture in Japan. Tokyo: Agricultural Bureau, Department of Agriculture and Commerce. x + 455 p. See p. 225-29, 434, 439, 448, 453-54. No index. 23 cm. [Eng]

• ***Summary:*** A table of moneys, weights and measures (p. x) includes British equivalents of the following Japanese units: Money–*yen, sen, rin.* Length: *ri, chô, ken, shaku, sun.* Area: *cho, tan, sé, bu* or *tsubo, kô* (*9.724 tan*). Capacity / volume: *koku, tô, sho, go.* Weights: *kwan or kwamme, kin, momme.*

In Chapter 6 titled "Agricultural products," in section 2 on "staple food stuffs" is a subsection titled "Soja beans" (p. 225-29) which begins: "In point of production and use, soja beans occupy an important position among the various beans, they are extensively cultivated from the Hokkaido in the north to Formosa in the south. They find a congenial soil to prosper, the acreage for 1906 was 460,895 *cho* (1 cho = 2.45 acres) which with the exception of the acreage of barley (503,498 *chô*) is equalled by no other products from the upland fields. Their use is quite extensive. They are eaten boiled, baked and powdered while *soy, miso* and *tofu* (bean curd) made out of beans, are found even in the remotest villages. They are found on the table both of high and low. In making *soy* [*sauce*], a by-product in a shape of soy-cakes is obtained and may be used as excellent manure, while in making *tofu,* the remaining ingredients [okara] may be used as a subsidiary diet and as food for cattle. Soja beans may also be pressed, and its oil used for the purpose of diet and for various technical uses, while the residue forms excellent manure. The fresh stalks of soja beans may be used as forage or as effective green manure. In short, soja beans, either as an article of Japanese diet, or as agricultural manure or as food for cattle are indispensable.

"The cultivation of beans under the circumstances was developed from ancient times, and numerous varieties are most extensively cultivated while by its peculiar nature of root, it absolves nitrogen from air so that high priced nitrogenous manure may be dispensed with, and therefore the cultivation of beans like other agricultural products do not exhaust the productive power of the soil, but on the contrary, it operates favourably to improve the soil. As for rotation of crops of wheat, millets, corns and potatoes, beans are indispensable. Seeds are sown early in the beginning of May."

Tables show: (1) Output of soja beans in Japan, 1897-1906." For each year is given the area (in *chô*), the production (in *koku*) and the yield (in *koku* per *tan*) (1 *koku* = 4.962 bushels; 1 *tan* = 0.245 acres). The area increased from 435,605 *chô* in 1897 to a peak of 482,044 *chô* in 1898, then slowly fell to a low of 446,844 *chô* in 1904, then rose to 460,895 *chô* in 1906. Production increased from 3,100,973 *koku* in 1897 to a peak of 4,069,619 *koku* in 1901, then slowly dropped to 3,557,592 in 1906. The yield in 1897 was 0.712 *koku* per *tan,* rising to a peak of 0.830 in 1904. Hokkaido has the largest area (43,924 *chô*) and production (392,140 *koku*). The principal soja bean producing districts are Ibaraki (33,000 *chô*), Saitama (29,000 *chô*), Iwate (26,000 *chô*), Nagasaki (26,000 *chô*), Kumamoto (26,000 *chô*), Niigata (22,000 *chô*). There is no prefecture where the production does not exceed 10,000 *koku.*

(2) "As mentioned above, soja beans are used either boiled, baked or powdered or as material for *tofu* (bean curd), frozen *tofu, soy* and *miso* (bean-cheese), and particularly the latter two products besides meeting with domestic demands, are exported abroad in large quantities, as may be seen in the following table." This table shows amount and value (in *yen*) of miso and soy [sauce] exported from Japan each year from 1903 to 1907, inclusive. Miso exports increased from 1,670,092 *kin* (1 *kin* = 1.322 lb) in 1903 to a peak of 5,199,957 *kin* in 1907 (a 3.1 fold increase in 4 years), while soy [sauce] exports increased from 1,974,119 *shô* (1 *shô* = 1.9 quarts) in 1903 to 4,403,851 *shô* in 1907 (a 2.2 fold increase). The total yen value of these two exports rose from 489,213 *yen* in 1903 to 1,354,517 *yen* in 1907 (a 2.8 fold increase). In American units: Miso exports increased from 2.20 million lb (worth $347,647) in 1903 to a peak of 7.50 million lb (worth $132,652) in 1905, dropping to 6.86 million lb (worth $135,833) in 1907.

Shoyu exports increased from 5.92 million lb (worth $204,959) in 1903 to 13.21 million lb (worth $541,425) in 1907. Note that in 1907 shoyu exports are worth about 4 times as much as miso exports.

(3) Because of increasing exports, Japan now needs to import soja beans from abroad. This table (p. 227) shows the amount and value of soybeans imported by Japan for the years 1903-1907, inclusive. They rose from 146,971 tons (worth $3.18 million) in 1903 to a peak of 193,479 tons (worth $4.92 million) in 1905, dropping to 177,365 tons (worth $4.79 million) in 1907. They are mostly imported from Manchuria and Korea. "While a greater portion of these imports is used as material for *soy and miso,* it is also used in making bean-cakes and is sown for obtaining green manure, or used as manure or for feeding cattle."

(4) This table (p. 228) shows the quantity and value of [soy] bean-cakes imported into Japan for the years 1903-1907, inclusive. The cake was used mostly for fertilizer. Cake imports rose from 216,198 tons (worth $3.81 million and representing 57.8% of all fertilizers) in 1903 to 367,210 tons (worth $8.71 million and representing 44.8% of all fertilizers) in 1907. (5) This table (p. 229) shows acreage and production (output) of [soy] beans in Formosa [today's Taiwan]. Acreage doubled in 3 years from 11,226 *kô* in 1901 to a peak of 22,641 *kô* [53,886 acres] in 1904, then decreased slightly to 21,220 *kô* in 1906. Note 1. 1 *kô* = 9.724 *tan,* and 1

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tan = 0.245 acres. Therefore 1 *kô* = 2.38 acres.

Production in Taiwan increased more than 3-fold from 44,661 *koku* in 1901 to 135,271 *koku* in 1904, then decreased slightly to 100,803 *koku* in 1906. Note 2. Production of soja beans in Formosa in 1904 was only 3.6% as much as production of soja beans in Japan in 1904.

The next section, titled "Red-beans" (p. 229-30) gives similar detailed statistics on acreage, production, and yield for azuki beans in Japan. *Sarashi-an* (the powdered red bean) is made in Osaka, Tokyo, Niigata, and Aomori. A second table gives annual imports of red [azuki] beans to Japan from 1903 to 1907. They are imported mainly from China, Korea, and British India.

In Chapter 9, titled "Agricultural products in commerce," section 2 is on imports to Japan. A table (p. 433-34) gives imports of the following grains and seeds (in quantity / piculs and value / yen) from 1903 to 1907: Italian millet, soja beans, red beans [azuki] (small white), and sesame seeds. Another table (p. 438) titled "Miscellaneous" includes imports of "bean's oil cake" for the same period. An explanation titled "Soja-beans" (p. 439) states: "Not only as foodstuffs, but also as a manure a large quantity of beans are consumed each year, as that from China and Korea a considerable amount is imported. Besides beans, bean-cakes are imported from China in large quantity." Imports of sesame seeds, rice, wheat and rape-seed are also discussed on the same page. In this same chapter, section 3 is on Exports and imports in Formosa. Soy is mentioned on pages 434, 439, 442, 448, 453-54. "Beans, Soja: The demand for soja beans in Formosa is enormous and as the Formosan product was not sufficient to meet the demand, a large amount is imported from abroad. Soja beans produced in Manchuria, and Chin-kiang [Chinkiang, Zhenjiang] are imported from China and Hongkong." "Oil, Beans [soybean oil]: This is principally produced in Manchuria and is brought here through China and Hongkong. Originally it was used as an illumination, but the demand has greatly increased as it is used in making cut tobacco" [to keep it moist]. Ground-nut oil is used for the same purpose (p. 453-54).

Note 3. This is the earliest document seen (Oct. 2003) concerning miso in international trade–exported from Japan; export statistics are also given. Note 4. The preface, by Chuzi [Chuji] Shimooka, explains that this book was compiled for the International Agricultural Association meeting to be held in Italy in the autumn. The compiler did not have time to explain all the terms [and units] adequately. Address: Tokyo, Japan.

1261. Allen, Horace Newton. 1908. Things Korean: A collection of sketches and anecdotes, missionary and diplomatic. New York, Chicago, Toronto, London, Edinburgh: F.H. Revell Co. 256 p. See p. 74. Illust. (black and white photos). No index. 19 cm.

• ***Summary:*** Page 74: "Products.–The great product of Korea is rice, which is the staple of diet. Next come [soy] beans, which are largely used as a food for man and beast, being mixed with rice in the human dietary or used in the form of curd or cake [tofu], while they are indispensable for making the sauce so highly prized in Asia, and which is shipped abroad in vast quantities for the preparation of a celebrated English sauce as well as others, since it is the foundation for most of our sauces. Any one who patronizes a Chinese restaurant will be familiar with this bean sauce. Millet, rye, barley, oats, wheat and some poor corn, together with cotton and vegetables, form the chief farm crops raised in Korea after rice and beans."

Note 1. By "bean sauce" the author probably means "soy sauce," but he might also mean soybean jang (Korean-style soybean miso).

Note 2. The term "celebrated English sauce" clearly refers to Worcestershire sauce.

Preface: The author lived for 22 years "in China and Korea, including practically the whole period of the latter's diplomatic intercourse with the outside world,..." He spent 3 years in Korea as a medical missionary, 3 years in the Korean service, and 15 years in the diplomatic service of the United States government, "beginning as secretary of legation and ending as minister plenipotentiary." The poor Koreans are in desperate straits but opposition by them to their situation "seems at present to be unavailing if not suicidal." Sadly, the United States "deserted them in their time of need and ignored the solemn agreement we had entered into with them as an inducement for their abandoning the centuries-old position of exclusion and non-intercourse and emerging into the dazzling glare of treaty relations. Our treaty with Korea of May 22, 1882, in its first article, makes the following promise: 'If other Powers deal unjustly or oppressively with either government, the other will exert their good offices on being informed of the case, to bring about an amicable arrangement, thus showing their friendly feeling."

The U.S. disregarded this solemn pledge at the time of the Portsmouth convention; we violated our sacred covenant.

Chapter 16, "Political changes and probabilities."

1884–The "haughty Chinese drove the then inconspicuous Japanese so precipitately from the land that they left their dead in the streets to be devoured by the dogs" (p. 243); the Chinese continued their traditional domination of Korea.

1894-1895–First Sino-Japanese War, over domination of Korea; the Japanese won and in Oct. 1895 the treaty of Shimonoseki was signed. During this war the world got its first intimation of the excellence of Japanese military organization and power. But diplomatic mistakes in Korea by Japan, after her victory, enabled Russia to gain the upper hand. Yet Russia too made diplomatic blunders while for 10 years Japan prepared for another war over Korea.

1904-1905–Russo-Japanese war; Japan won, gained control of Korea, and drove Russia from the entire area

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except in the vicinity of Vladivostok. During the 20 previous years when Korea could have fortified the country, it "played at all manner of silly pastimes." Now Korea is Japan's to exploit for herself. The U.S. position in the area has been weakened. Japan's next great objective will surely be China; it is only a matter of time. Address: Toledo, Ohio; M.D., Late Envoy Extraordinary and Minister Plenipotentiary of the United States.

1262. Colby, Frank Moore. ed. 1908. The new international year book: A compendium of the world's progress for the year 1907. New York, NY: Dodd, Mead and Company. [6] + 860 p.

• ***Summary:*** The section titled "Manchuria" (p. 475-76) states: "By the treaty of Portsmouth (September 1905) Manchuria was practically divided into a northern or Russian sphere of influence, and a southern or Japanese sphere of influence. The Russian section is crossed by the Trans-Siberian Railway, which runs from east to west for a length of 960 miles over Manchurian soil until it reaches Vladivostok; and by the Central Manchurian Railway, which runs southward from Harbin, on the Trans-Siberian, to Changchun, with a branch line of 70 miles from Changchun to Kirin. The Japanese section is crossed by the continuation of the Central Manchurian line from Changchun to Port Arthur and Dalny, now known as the South Manchurian Railway [sic], which was surrendered by Russia to Japan; by the new Japanese line from Antung to Mukden, 187 miles long... Extensions of the Chinese Northern Railways are permitted by Japan only on condition that the capital, if not Chinese, be borrowed from the South Manchuria Railway Company."

"The leading exports are [soya] beans, bean cake, and bean oil, raw wild silk, maize, and millet. Newchwang and Dalny are the principal ports (p. 476).

"History–Reorganization of the Province: On April 20, 1907, an Imperial Chinese edict reconstituted the government of Manchuria. Instead of three provinces governed by three separate Tatar rulers, the whole country was placed under one viceroy, with a governor in each province."

The long and interesting section on Japan (p. 420-30) contains a map of the country. The section on agriculture states: The percentage of land owned by the tillers of the soil is 50.21 in rice field and 60.93 in upland. The rest is rented by tenants. In 1905 the production of soya beans was 3,261,881 koku and of red beans [azuki] was 804,485 koku (1 koku = 4.66 bushels). There is also detailed information on: Population (47 million in 1903) and immigration, fisheries, religion, education, mining, forestry, number of establishments [businesses] and employees, manufactures (incl. vegetable oils; "The Japanese Government is the greatest employer of labor in the country"). foreign commerce, shipping, railways, post and telegraph, banks and money, government (a constitutional monarchy; the Imperial Diet consists of a House of Peers and a House of Representatives; in 1904, 1.67% of the population could vote), finance (in 1907-08 projected internal revenue taxes on alcoholic beverages, soy [sauce] etc. totaled 96,331,881 yen), army, navy. History: Political parties, relations with the United States (incl. persecution of Japanese in San Francisco, California), relations with Great Britain, with France, with Russia, navy and military development, territorial expansion (retention of some troops in Manchuria as "railway guards," gradual absorption of Korea, and conquest of interior portions of Formosa, expansion of lumbering along the Yalu river, opening of 16 cities and towns in Manchuria as 'places of international residence and trade').

1263. Crowe, E.F. 1908. Japan: Report for the year 1907 on the trade of Japan. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 4026. p. 1-86.

• ***Summary:*** "Export of soy (p. 35): This sauce was again sent in large quantities to those countries where the number of Japanese residents is on the increase. A new kind, said to have many advantages, and prepared by a lately-invented process, was put on the market during the year."

Annex I (p. 64-65) shows imports of "Beans, peas and pulse" to Japan (mainly from China and Corea) from 1902 to 1907.

Annex II (p. 76-77) shows "Return of principle articles of export from Japan during the years 1907 and 1906." Exports of soy [sauce] were worth £97,000 in 1906, increasing to £110,500 in 1907. The average value for the 5 years 1902-06 was £65,300; no quantities are given. Other leading exports were tea, cotton undershirts and drawers, saké, and fish. Address: Commercial Attaché to His Majesty's Embassy, Tokyo.

1264. Kato, Yogoro. 1908. Physico-chemical studies on tofu. *Memoirs of the College of Science and Engineering, Kyoto Imperial University* 1:325-31. (Chem. Abst. 3:2182). [2 ref. Eng]

• ***Summary:*** Tofu is a foodstuff made by grinding the soy bean with water, filtering to obtain a milky liquid, and coagulating the suspended matter by the addition of a bitter salt solution (bittern). This bitter salt solution is obtained as the residue in making common salt from sea-water by evaporation. The author concludes that the tofu solution contains a negative colloid and belongs to the class of solutions which might be called colloidal suspension. "It seems quite probable that the manufacture of tofu is based upon the coagulation of the colloid by electrolytes: consequently, several electrolytes containing cation [cations] of high valency, besides calcium and magnesium, may be employed for the coagulation."

Note: This is the earliest English-language document seen (Aug. 2010) that contains the term "physico-chemical"

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or with the term "physico-chemical" in the title. Address: Chemical Lab., Higher Technological School of Tokyo.

1265. Morse, Hosea Ballou. 1908. The trade and administration of the Chinese empire. London, New York, Bombay, and Calcutta: Longmans, Green and Co. xv + 451 p. See p. 206, 296, 318. Illust. Index. 22 cm.
• ***Summary:*** An important early book on this subject. A second edition was published in 1913, and a third edition in 1921. The dedication states: "Thirty-three years ago [from 1907, i.e. in about 1874] four young men came to China direct from the halls of Harvard. To the other three, the fourth dedicates this work." The Preface begins: "This book is intended to portray the present state of the Chinese Empire, with such record of the past as will show by what process the evolution of the existing state has been reached." It continues: "The first two chapters on Chinese History have been written by the Rev. F.L. Hawks Pott, D.D., President of St. John's College at Shanghai, and author of the useful *Sketch of Chinese History.* His task of condensing the history of forty centuries into as many pages has been performed in a very judicious way."

A color map (facing p. 8) shows "The gradual extension of the Chinese empire." China originated in the northeast part of today's China, in the area around Shansi, Chihli, and northern Shantung provinces, southeast of Peking. The main river was the Yellow River, and the key cities were Lo-yang / Luoyang (the capital of several early dynasties) and Ch'ang-an / Changan or Hsi-an / Xi'an (the capital of 11 dynasties, beginning with Chou–founded 1111 B.C.). The empire gradually spread southward.

In Chapter 7, titled "The provinces and treaty ports," under Manchuria (p. 205-09) we read (p. 206): "The western part of this province is made up of the plain of the Liao and the valleys of its tributaries, and grows wheat and durra for food, and beans from which are made an esculent and illuminating oil, and bean-cake shipped to restore exhausted fertility to the fields of Japan and of Kwangtung." These beans are soy beans.

Chapter 9, titled "Foreign trade" notes that "silks of China reached the Roman Empire, following presumably the Central Asian caravan routes which were later followed by the Polo brothers and their nephew, Marco Polo" [lived 1254-1324; arrived in China 1375].

"The Portuguese were the discoverers of the East, as the Spanish were of the West, and the first recorded arrival of a European ship in China was that of Raphael Presetrello, who sailed from Malacca [a city in 21st century Malaysia on the Strait of Malacca] about 1511. Six years later, in 1517, Fernando Perez de Andrade entered Canton waters and was well received by the local officials, then as ever quite ready to encourage trade, and was allowed to proceed in person to Peking." The Spanish first arrived in China in 1575, when they were well received at Canton.

In this chapter, in the section on Exports, is a subsection on [soy] beans which states (p. 296-97): "Beans are used to make an oil for cooking and, prior to the introduction of kerosene, for illuminating purposes; the bye-product of this process, bean-cake, is used to fertilise the fields chiefly of Kwangtung and Japan. The foreign export of beans is first recorded in 1870 with shipment of 578,209 piculs, and of bean-cake in 1890 with 96,297 piculs; in 1905 the export of beans was 2,665,523 piculs, of which 80 per cent. went to Japan, and of bean-cake 2,897,948, entirely for Japan; in addition, over two million piculs of beans and two and a half million piculs of bean-cake were imported into Kwangtung ports. The chief source of production is Manchuria, next to that Shangtung, Hupeh, and the lower Yangtze."

The section titled "Oil seeds" (p. 298) discusses only cotton, rape, and sesamum seeds; these have only recently entered into foreign trade. In 1888 the export of rape-seed was 873 piculs, and of sesamum-seed 3,027 piculs. The sesamum seed goes chiefly to Germany and Japan.

In Chapter 10, titled "Internal Trade" (p. 302-22), the subsection on "Beans" states (p. 318): "Beans were shipped in 1903 (much of the trade was diverted from Manchuria during the Russo-Japanese War) to the extent of 3,423,766 piculs from Newchwang, 1,928,543 piculs from Hankow, 404,063 piculs from Chinkiang, and enough from other ports to make a total of 6,327,080 piculs; of this quantity 1,836,707 piculs were shipped to Japan, some 72,000 piculs to other foreign destinations, and the balance, except 590,000 piculs for Amoy, went to the Kwangtung ports, Canton and Swatow. In the same year *Bean-cake* was shipped, 4,553,367 piculs from Newchwang, 1,192,948 piculs from Chefoo, 583,095 piculs from Hankow, 423,447 piculs from Chinkiang, with total shipments of 7,030,325 piculs; of this quantity 3,400,444 piculs went to Japan, and the balance, except 731,161 piculs for Amoy, went to Kwangtung."

Also discusses internal trade of ground-nuts, hemp, jute, and ramie (p. 319). "Oil-seeds" (cotton-seed, rape-seed, and sesamum-seed) and "Vegetable tallow" (expressed from the seeds of *Stillingia sebifera*) are discussed on p. 320. A table (p. 321) gives details on railways in for each province of China (incl. Manchuria), including the points served and length in miles (completed, and under construction in late 1906). Address: A.B. (Harvard), Shanghai, China.

1266. Nihon hyakka daijiten: Daizu [Encyclopedia Japonica: Soybeans]. 1908. Tokyo: Sanseido. See vol. 6, p. 630-62. [Jap]
• ***Summary:*** The entries on soybeans are in volume 6 of this 10-volume work. Soybeans (*daizu*)*:* p. 630-31. A small illustration (line drawing) shows the upper part of a soybean plant, with leaves and pods. Soja-bean oil (*daizu abura*)*:* p. 632. Soybean cake (*daizu kasu*)*:* p. 632. Address: Tokyo, Japan.

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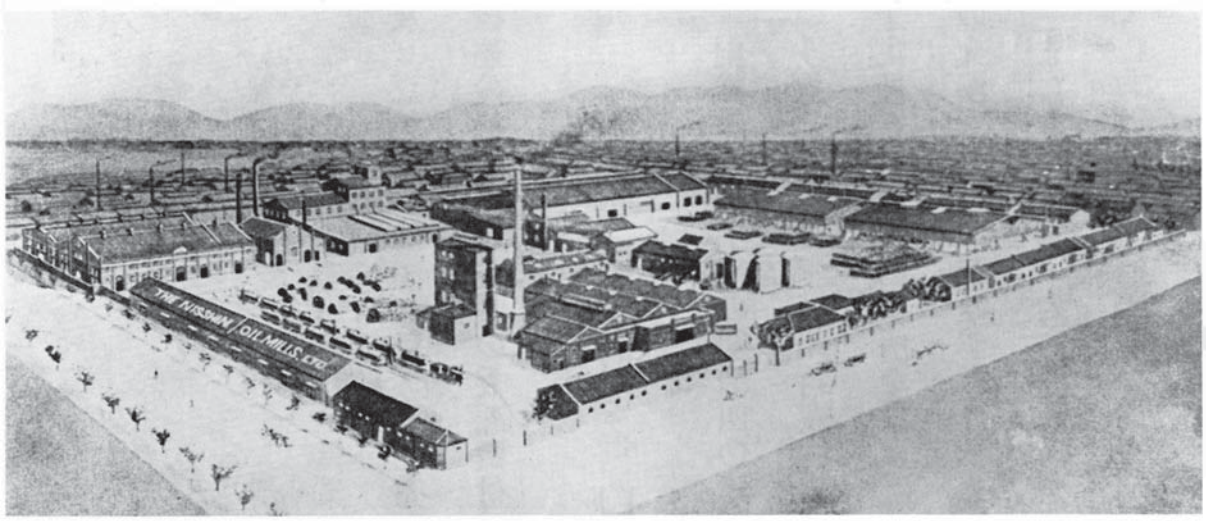

1267. Photograph of the soybean mill owned by Nisshin Oil Mills Co. in Dairen, Manchuria. 1908.
• ***Summary:*** This digital photo was sent to Soyinfo Center by Mr. Y. Komura of the Japan Oilseed Processors Association (Aug. 2013).

Note. This is the earliest document seen (Jan. 2014) related to Nisshin Oil Mills.

1268. Shimooka, C. 1908. Agricultural products: Products for food stuffs and special use. In: 1908. Agriculture in Japan. Tokyo: Govt. of Japan. x + 455 p. See p. 157-61, Chap. 6. [Eng]
• ***Summary:*** A table (p. 157-58), titled "Comparative Table of Yearly Acreage of Staple Food Stuffs," shows the area planted every 5 years from 1877 to 1906 to major crops. The area planted to soja beans grew from 188,233.1 *chô* in 1877, to a local peak 466,315.2 *chô* in 1887, decreasing slightly to 460,895.1 *chô* in 1906. 1 *chô* = 2.45 acres. Area statistics for the following crops for the same years is also given: Ordinary rice, glutinous rice, upland rice (non-irrigated), total rice, barley, wheat, naked barley, total wheat and barley, red beans [azuki], foxtail millet, proso millet, barnyard millet, buckwheat, sweet potatoes, potatoes (regular), cotton, hemp, indigo-leaves, tobacco leaves, rape-seed.

A ranking of Japan's major crops in 1906 shows ordinary (irrigated) rice to be far the largest with 2,557,958 *chô,* followed by naked barley (*hadaka mugi*) 700,887, wheat 669,838, soja beans 460,895, and barley 443,187 *chô.*

A table (p. 158-59), titled "Comparative Yield of Staple Food Stuffs," shows that production of soja beans on this land increased from 1,882,331 *koku* in 1877 to 3,557,592 *koku* in 1906. 1 *koku* = 47.6 gallons or 180 liters. Production statistics for the other crops mentioned above are also given, along with the output of sugar from 1878 to 1906.

Finally, a table (p. 161), titled "Comparative Table of the Output per *Tan* of the Food-Stuffs," shows the yield of each crop in *koku* per tan. A *tan* is about 0.245 acres. The yield of soybean has risen from 0.698 in 1887 to 0.772 in 1906. The 1906 yield is equivalent to about 18.7 bushels/acre.

Note: This is the earliest document seen (Jan. 2005) that gives historical statistics for soybean production and area in Japan.

1269. Tebbitt, -. 1908. China: Report for the year 1907 on the trade of Newchwang. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*)**.** No. 4000. p. 1-14.
• ***Summary:*** A map shows South Manchuria, Corea [Korea], the Yellow Sea, and the Gulf of Pe-Chi-Li, with major rivers (Liao, Yalu), railroads, ports (Newchwang, Tiaren [Dairen]) and cities (Mukden, Antung, Kuan Cheng Tzu [K'uan Ch'eng Tzu], Seoul).

Table C shows the quantity and value of the principal exports from Newchwang during the years 1906-07. In order of export value in 1907, the leading exports are: Bean cake (£1,434,233 for 4,453,380 cwts.) [1 cwt = hundredweight = 112 pounds], beans, all kinds (£484,225 for 1,408,778 cwts.), [soy] bean oil (£236,481 for 287,402 cwts.), millet, tall and small (£229,967), silk, raw, wild (£193,787), ginseng (£45,279). The leading export, [soy] bean cake, is used for manure and sold mostly to Japan (78% of the total) and South China. Because of the increasing shallowness of the Liao River, especially in its upper reaches, the percentage of beans carried in junks is decreasing, while that carried by railways is increasing. Address: Acting Consul.

1270. Visser, M.W. de. 1908. The fox and the badger in Japanese folklore. *Transactions of the Asiatic Society of Japan* 36(1):1-159. See p. 126. [100+* ref]
• ***Summary:*** "The words and deeds of the persons so possessed are very strange. They ask, for example, for azuki-meshi (rice and red pea-beans mixed), tôfu-juice (bean curd) and tai fish laid in miso (sauce made of wheat, beans and salt), and after having eaten very greedily the possessing fox

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demands through the mouth of the patient a piece of ground belonging to the family of the latter (in behalf of the fox keeper), menacing the life of the patient if it is refused."

Contains a long discussion about "Inari, the fox-shaped spirit of rice" (p. 129+), but does not mention Inari-zushi. Address: PhD, Japan.

1271. Watt, George. 1908. Commercial products of India. Being an abridgment of "The Dictionary of the Economic Products of India." London: John Murray. viii + 1189 p. See p. 564-65. [15 soy ref]

• ***Summary:*** Since Watt's *Dictionary of the Economic Products of India* has been out of print for some time, the Government of India asked him to write an updated 1-volume abridgement. He said that soybeans in India were first introduced from Indonesia. "The Soy Bean; in Indian vernaculars, *bhat, ram, gari-kulay, hendedisom horec, pond disom, an-ing-kiyo, tzu-dza, bhatnas, seta, musa, khajuwa,* etc.

"A sub-erect or creeping annual native of China, Cochin-China, Japan and Java, comparatively recently introduced into India, though recorded as acclimatised and even seen as an escape from cultivation. It might, in fact, be described as extensively cultivated, though more as a garden than a field crop; is especially prevalent in Eastern Bengal, Assam (Barpeta Sub-division), the Khasia hills, Manipur, the Naga hills and Burma. It is not infrequent in the plains of India proper, especially in Busti, Gorakhpur, Patna and Purnea, etc. In Bombay and Madras, however, the Soy Bean has apparently hardly passed the experimental stage.

"Cultivation.–Two chief varieties occur, one called white, the other black. On the plains it is generally grown by itself as a *kharif* (autumn) crop. The seeds are sown from June to September, and harvested from November to December... In Assam it is sown with*áhu* (autumn rice) in April and May. The*áhu* crop is removed in July and August, and its stubble acts as a support for the bean plants, which are ready for harvest in December and January."

"It is eaten in India in the localities where it is cultivated, chiefly in the form of *dál* or *satú.* In Japan it is largely used as a sauce, cheese (*natto*) or paste, and in China an edible oil is obtained from the seed. If cut when the pods are fully formed it makes a most nutritious fodder, and the seed-cake, as already stated, is an extremely rich cattle food."

Also discusses: Alfalfa (p. 778). Almonds (*Prunus amygdalus,* p. 905). Broad bean or Windsor bean (*Vicia faba,* p. 1106-07. "There are two distinct forms, the long-podded and the broad-podded, the latter originating the name 'Broad' or 'Windsor bean'"). Chufa (*Cyperus esculentus,* p. 465; also called Rush-nut, earth-almond, or tiger-nut). Coffee (p. 363-68, with an excellent history). Cowpeas (p. 1107-08). Lucerne or alfalfa (*Medicago sativa,* p. 778-79).

Mung bean, *udid,* and *urud / urd* (*Phaseolus mungo* or *P. radiatus,* p. 880-82). "There has been some confusion regarding the nomenclature of *Phaseolus Mungo* and the species which follows–*P. radiatus,*–due chiefly to Roxburgh having transposed the original Linnean names. *P. Mungo, Linn.,* is the present plant, udid or urd; while *P. radiatus,* Linn., is the plant known in the vernacular as mung. There are two varieties of udid, one with large black seeds, the other with smaller greenish seeds, and these correspond very possibly with *P. Mungo* proper and the variety *Roxburghii.*

Sea-weeds (Kelp, p. 50). Address: Kew Gardens, England; Formerly, Prof. of Botany, Calcutta Univ., Superintendent Indian Museum (Industrial Section) and reporter on economic products to the Government of India.

1272. *Christian Science Monitor.* 1909. Want favorite food duty free. Jan. 1. p. 3.

• ***Summary:*** "Washington–Greeks, Japanese and Chinese now want to take a hand in framing the new tariff bill. The San Francisco Chinese chamber of commerce,... has submitted to the ways and means committee a brief asking that the duties be reduced on Chinese soy [sauce], rice, fish, meat, type and fire crackers.

"The Japanese association of America, with headquarters in San Francisco [California], makes a plea that mizo [sic, miso], a food, shoyu, a sauce, and greenhouse stock be placed on the free list, and that the tariff be reduced on rice, vegetables, and earthenware."

1273. Brown, J. Macmillan. 1909. Pacific problems: Chinese and Japanese in Manchuria. XII–The moulding of the Chinese race. *Evening Post* (*Wellington, New Zealand*). Jan. 4. p. 3.

• ***Summary:*** "(Specially written for The Post)." This long, scholarly article includes a description of the people, land, and agriculture of Manchuria. "The farmhouses are few and far between, though the millet fields are continuous from mountain-top to plain. In other words, the farms are large; there is none of the small intensive culture of China and Japan. A single patch of millet or maize or soybean covers many acres." Address: Prof.

1274. *Chemist and Druggist* (*London*). 1909. Trade report. 74(1511):61-63. Jan. 9. See p. 63.

• ***Summary:*** Page 63: "Soy.–The new method in regard to the calculation of freight on soy has now been established. To arrive 1*s.* 2½*d.* [1 shilling 2 pence] c.i.f. is quoted, or 1*s.* 3½*d.* to 1*s.* 4*d.* per gal. [gallon] spot for good thick."

A subsequent entry [13 Feb. 1909, p. 270-74] reads: "Soy–Small spot sales of good thick have been made at 1*s.* 3½*d.* per gallon, but for shipment higher prices are asked."

Note: Soy sauce now seems to be categorized as thick and not thick (perhaps thin).

1275. *USDA Bureau of Plant Industry, Inventory.* 1909.

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Seeds and plants imported during the period from January 1 to March 31, 1908. Nos. 21732 to 22510. No. 14. 64 p. Jan. 9. Also titled USDA Bureau of Plant Industry, Bulletin No. 137.

• ***Summary:*** Soy bean introductions: Glycine hispida (Moench) Maxim. [Note the first use of this terminology in this publication.]

21754-21757. "From Paris, France. Purchased from Vilmorin-Andrieux & Co. Received January 3, 1908.

"21754. Yellow seeded.

"21755. *Ogemaw.* Extra early, brown seeded.

"21756. Black seeded.

"21757. Extra early, black seeded."

21818. "From Paris, France. Purchased from Vilmorin-Andrieux & Co. Received January 17, 1908. *Ito San.* Called by the French, *Yellow Etampes.*

21825. "From Hokkaido, Japan. Presented by Mr. K. Hashimoto, Kuchchau Agricultural Society, Abutagun. Received January 14, 1908. *Amherst* (?). 'Used in the manufacture of "soy," "miso," "tifu" [tofu], etc.' (*Hashimoto.*)"

21830/21831. "From Hokkaido, Japan. Presented by the Yokohama Nursery Company, Yokohama, Japan. Received January 24, 1908.

"21830. *Butterball.* Japanese name *Akita.*

"21831. Japanese name *Rumoi.*"

21946. "From Buitenzorg, Java. Presented by Dr. M. Treub, director of the Department of Agriculture. Received February 11, 1908. *'Zwarte kadelee'"* [black soybeans].

21999. "Received through Mr. F.N. Meyer, agricultural explorer for this Department at the Plant Introduction Garden, Chico, Cal., February 12, 1908. From Boshan, Shantung, China. '(No. 799a, Sept. 18, 1907.) A rare variety of soy bean, sparsely grown near Boshan. Chinese name *Ta ha tau.* Used by the higher classes as a vegetable in soups.' (*Meyer.*)"

22311/22312. "From Shanghai, Kiangsu, China. Presented by Rev. J.M.W. Farnham, Chinese Tract Society. Received March 11, 1908.

"22311. Black. 'Similar to *Nuttall* but larger.' (*Nielsen.*)

"22312. Yellow."

22317-22322. "From Erfurt, Germany. Purchased from Haage & Schmidt [seedsmen]. Received March 16, 1908.

"22317. Probably *Butterball.*

"22318. *'Giant Yellow.'* Probably *Amherst.*

"22319. Brown.

"22320. *Samarow.* Like No. 17260.

"22321. Probably *Cloud.*

"22322. *'Early Black* from Podolia [Ukraine].' Probably *Buckshot.*"

22333-22337. "Grown at Arlington Experimental Farm, Virginia, season of 1907. Received March 19, 1908.

"22333. *Baird.* 'This variety was mixed with *Brownie* when received from Pingyang [Pyongyang / P'yongyang], Korea. This mixture was given S.P.I. No. 6414. The two varieties were grown together under these numbers, 9417, 17256, and Agrost. No. 1542, respectively. The two varieties were separated in the 1907 seed from Arlington Farm, and *Baird* given the above new number, *Brownie* remaining as No. 17256.' (*Nielsen*).

"22334. Flat black. 'Received from Mr. H.B. Derr, Agricultural Experiment Station, Champaign, Illinois. The original source of the seed is not known. It is quite similar in growth to *Nuttall,* but the seed is not the same shape, being flatter and larger.' (*Nielsen.*)

"22335. Yellow. 'Received from Mr. H.B. Derr, Agricultural Experiment Station, Champaign, Illinois, where it was grown as *Illinois Medium Yellow.* It is very similar to *Hollybrook,* and perhaps is the same, but appears different on account of having been grown farther north.' (*Nielsen.*)

"22336. *Guelph.* 'Received from Mr. H.B. Derr, Agricultural Experiment Station, Champaign, Illinois. Original seed was procured from the Agricultural Experiment Station, Wooster, Ohio.' (*Nielsen.*)

"22337. *Guelph.* 'Received from Mr. H.B. Derr, Agricultural Experiment Station, Champaign, Illinois. Original seed was procured from the Agricultural Experiment Station, Fayetteville, Arkansas' (*Nielsen.*)."

22379-22381. "From Canton, Kwangtung [province], China. Presented by Dr. J.M. Swan, Cooks Hospital. Received March 20, 1908.

"22379. Yellow.

"22380. Black.

"22381. Green mixed with yellow and a few brown."

22406/22407. "From Hongkong, China. Presented by Mr. S.T. Dunn, Botanical and Forestry Department. Received March 26, 1908. [Note: It is not clear whether or not they were ever cultivated in Hongkong. These two soybeans (#22406 and #22407, both black seeded) were later given the names "Hongkong" and "Nigra" respectively, and introduced to the USA in about 1910].

"22406. Yellow.

"22407. Black."

22411-22415. "From Naples, Italy. Purchased from Dammann & Co. Received March 25, 1908.

"22411. *Samarow.*

"22412. Black. 'Similar to *Cloud.'* (*Nielsen.*)

"22413. Brown.

"22414. Yellow. 'Similar to *Acme.'* (*Nielsen.*)

"22415. Giant yellow."

"Glycine soja Sieb. & Zucc." [Note the first mention of this species.] 22428. "Grown at Arlington Farm, Virginia, season of 1907, under C.V.P. No. 0474. Received March, 1908. 'Original seed presented by the Botanic Gardens, Tokyo, Japan. A near relative to the soy bean, but a spreading or decumbent plant, abundantly provided with large root nodules. Has considerable promise as a cover or green manure crop.' (*Piper.*)"

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22498-22501. "From Hangchow, Chehkiang, China. Presented by Dr. D. Duncan Main, through Mr. J.M.W. Farnham, Shanghai, China. Received March 26, 1908.

"22498. Yellow. Similar to No. 18619.

"22499. Yellow.

"22500. Green. Similar to No. 17857.

"22501. Black."

22503-22507. "From Yokohama, Japan. Purchased from L. Boehmer & Co. Received March 31, 1908. The following seeds with Japanese names quoted; varietal descriptions by Mr. H.T. Nielsen:

"22503. *'Teppo Mame.'* Yellow, similar in appearance to *Amherst,* No. 17275.

"22504. *'Kaze Mame.'* Green.

"22505. *'Gogwatsu Mame.'* Yellow, similar to *Haberlandt,* No. 17271.

"22506. *'Maru Mame.'* Yellow.

"22507. *'Vieuri Lei.'* Green, similar to *Yosho,* No. 17262." Address: Washington, DC.

1276. Saito, Kendo. 1909. Preliminary notes on the spore-formation of the so-called "Soya-kahmhefe." *Botanical Magazine* (*Tokyo*) 23:96. Jan. German summary in Zentralblatt fuer Bakteriologie. II. 26:92-93. [2 ref. Eng; ger]
• ***Summary:*** Discusses the film-forming yeast that makes a film atop Japanese soy sauce. He believes this species is new to science, and proposes the name *Zygosaccharomyces japonicus.* Note: This is the earliest document seen (June 1999) that mentions the genus *Zygosaccharomyces,* or that mentions the species *Zygosaccharomyces japonicus.* In the early 1950s this species was renamed *Saccharomyces rouxii.* Address: Botanical Inst., Tokyo Univ., Japan.

1277. *Chemist and Druggist* (*London*). 1909. Trade report. 74(1516):272-74. Feb. 13. 9. See p. 272.
• ***Summary:*** Page 272: "Soy–Small spot sales of good thick have been made at 1s. 3½*d.* per gallon duty paid, but for shipment higher prices are asked."

1278. *USDA Bureau of Plant Industry, Inventory.* 1909. Seeds and plants imported during the period from April 1 to June 30, 1908. Nos. 22511 to 23322. No. 15. 81 p. Feb. 25. Also titled USDA Bureau of Plant Industry, Bulletin No. 142.
• ***Summary:*** Soy bean introductions: Glycine hispida (Moench) Maxim.

22534/22535. "From Weihsien, China. Presented by Mrs. C.W. Mateer. Received April 4, 1908.

"22534. Yellow. 'This bean is used for making lamp and cooking oil and for flour to make cakes; also for bean curd (a mush curdled by caustic soda and eaten fried). All these are nourishing, but more esteemed by Chinese than foreigners. The refuse after expressing the oil forms a cake (round) 2 feet in diameter and 3 inches thick. This is exported for feeding animals (pounded fine) and enriching land.' (*Mateer.*)

"22535. Black. Similar in appearance to *Cloud."*

22536-22538. "From Chefoo [Yantai], Shantung, China. Presented by Mr. Hunter Corbett, through Rev. J.M.W. Farnham, of Shanghai, China. Received April 4, 1908. The following seeds, varietal descriptions by Mr. H.T. Nielsen:

"22536. Green. Similar to No. 17857.

"22537. Green. Similar to No. 17262, *Yosho.* 'Chinese names (S.P.I. No. 22536) *Ching teo* and *Luh teo;* (S.P.I. No. 22537) *Whong teo.* These beans are used extensively for the manufacture of oil; the bean cake which remains after the oil has been pressed out is shipped south and extensively used as a fertilizer in vegetable gardens. Will grow well on level or high and hilly land. Is used by the people largely for food, being ground and made into a curd, also put in water and soaked until well sprouted and used as a vegetable. It is also boiled and eaten in the same manner as rice.' (*Corbett.*)

"22538. Black. Similar in appearance to *Cloud.* 'Chinese name *Shao hih teo.* Used chiefly for feeding animals.' (*Corbett.*)"

22633/22634. "From Sheklung, Kwongtung [Kwangtung / Guangdong], China. Presented by Mr. A.J. Fisher, American Presbyterian Mission. Received April 3, 1908.

"22633. Yellow. Similar in appearance to *Acme,* No. 14954, but seed is a trifle larger.

"22634. Black. Seed flatter than any other of the same size received from China."

22644-22646. "From Hangchow, Chehkiang, China. Presented by Mr. John L. Stuart. Received April 18, 1908. The following seeds, varietal descriptions by Mr. H.T. Nielsen:

"22644. Smoky yellow. Looks like it might possibly be a mixture.

"22645. Greenish yellow. Similar in appearance to *Haberlandt,* No. 17263.

"22646. Yellow. Practically identical with No. 18619."

22714. "From Saigon, Cochin China. Presented by Mr. Jacob E. Conner, American consul. Received April 21, 1908. Yellow."

22874-22885. "From Tokyo, Japan. Purchased from the Tokyo Plant, Seed, and Implement Company. Received May 14, 1908. The following seeds, varietal identifications and descriptions made by Mr. H.T. Nielsen:

"22874. Green.

"22875. *Flat King.* Same as Nos. 19982 and 17252.

"22876. Yellow. Similar in appearance to *Hollybrook,* No. 17269.

"22877. *Okute.* Apparently identical with No. 19986.

"22878. *Butterball.* Apparently identical with Nos. 19981 and 17273.

"22879. Yellow. Evidently two varieties; most of the seed very similar in appearance to *Acme,* No. 14954.

"22880. Yellow. Quite closely resembling *Hollybrook.*

"22881. Green.

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"22882. Yellow. Apparently identical with No. 20892.

"22883. *Buckshot.* Apparently identical with No. 19987.

"22884. Yellow, with a slight purple marking on many of the seeds.

"22885. *Amherst.* Apparently identical with Nos. 19983 and 17275."

22886. "From Swatow [Shantou], Kwangtung [province], China. Presented by Mr. William Ashmore, Jr., through Rev. J.M.W. Farnham, Chinese Tract Society, Shanghai, China. Received May 14, 1908. Black."

22897-22901. "From Paotingfu, Chihli [later Baoding, Hebei], China. Presented by Rev. J.W. Lowrie, D.D., through Rev. J.M.W. Farnham, Chinese Tract Society, Shanghai, China. Received April 22, 1908. The following seeds. Chinese names in italic as given by Mr. Lowrie. Descriptions of varieties by Mr. H.T. Nielsen.

"22897. *Da ching don.* Green. Similar to No. 17857.

"22898. *Hwang don.* Yellow.

"22899. *'Hei don.* Boiled as a fodder for mules and horses. Oil expressed from it, and refuse used as manure.' (*Lowrie.*)

"22900. *'Da wu don.* Tends to vary after successive plantings.' (*Lowrie.*) Black. Similar in appearance to *Nuttall,* Nos. 17253 and 19183, but has green cotyledons.

"22901. *Hsiao bai hei don.* Smoky yellow."

22919-22922. "From Ingchung, via Fuchau, China. Presented by Mr. J. Willis Hawley. Received May 22, 1908. The following seeds. Varietal descriptions by Mr. H.T. Nielsen:

"22919. Black. Very similar to No. 22886.

"22920. Yellowish green.

"22921. Yellow. Very similar to No. 22714.

"22922. Yellow. Seed resembles *Mammoth* very closely, but slightly smaller."

22927. "From Shanghai, Kiangsu, China. Presented by Rev. J.M.W. Farnham, Chinese Tract Society. Received May 27, 1908. Black. 'Identical with *Shanghai,* No. 14592; cotyledons are green.' (*Nielsen.*)"

23205. "From Shanghai, Kiangsu, China. Presented by Dr. S.P. Barchet, interpreter, American consulate. Received June 30, 1908. 'Similar in appearance to *Ebony,* No. 17254.' (*Nielsen.*) An important bean for dry rice land. Chinese name *Pu chi.'* (*Barchet.*)"

23207-23209/23211-23213/23229/23232. "From China. Received through Mr. Frank N. Meyer, agricultural explorer, and brought by him to the Plant Introduction Garden, Chico, Cal., June, 1908. Forwarded to Washington, D.C., and received July 6, 1908. The following seeds:

"23207. From Soochow, Kiangsu, China. '(No. 960a, April 27, 1907.) A large, greenish soy bean, grown around Soochow on the rather low-lying lands. Used when slightly sprouted as a vegetable. Chinese name *Tsin tou.'* (*Meyer.*)

"23208. From Tangsi, Chehkiang, China. '(No. 961a, April 20, 1908.) A large, yellow soy bean, often purplish colored on one side. Considered locally a very good variety. Chinese name *Sian chu tou.* Grows on the ridges around inundated rice fields.' (Meyer.)

"23209. From Tangsi, Chehkiang, China. '(No. 962a, April 20, 1908.) The ordinary variety of yellow soy bean as grown around Tangsi on the ridges and strips of land around and between inundated rice fields. Chinese name *Huang tou.'* (*Meyer.*)

"23211. From Tangsi, Chehkiang, China. '(No. 964a, April 20, 1908.) A very dark brown colored soy bean, grown near Tangsi; said to be very productive. Chinese name *Tsze pi tou.'* (*Meyer.*)

"23212. From Hangchow, Chehkiang, China. '(No. 965a, April 24, 1908.) An early-ripening, yellow soy bean, called the sixth month's bean, meaning ripening in the Chinese sixth month (our July). Chinese name *Lu ya pai mou tou.'* (*Meyer.*)

"23213. From Hangchow, Chehkiang, China. '(No. 966a, April 24, 1908.) A yellow soy bean called the seventh month's bean, meaning ripening in the Chinese seventh month (our August). Called in Chinese *Chi ya pai mou tou.'* (*Meyer.*)

"23229. From Tientsin, Chihli, China. '(No. 982a, April 4, 1908.) A dark brown colored soy bean; rare. Said to grow near Tientsin. Used for human food; boiled in soups or as a vegetable when slightly sprouted. Chinese name *Tse doh.'* (*Meyer.*)

"23232. From Shanghai, Kiangsu, China. '(No. 985a, May 11, 1908.) The *Barchet* soy bean, growing on wet rice lands. Chinese name *Ma liao tou.* Obtained through Dr. S.P. Barchet, of Shanghai, who procured these soy beans from Chinhuafu, in the Chehkiang Province, central China.' (Meyer.)"

23291/23292/23296/23297/23299/ 23303/23305/23306/23311/23312. "From China. Received through Mr. Frank N. Meyer, agricultural explorer, and brought by him to the Plant Introduction Garden, Chico, Cal., June, 1908; forwarded to Washington, D.C., and received July 6, 1908. The following seeds:

"23291. From Wutaishan, Shansi, China. '(No. 922a, Feb. 26, 1908.) Black soy bean, growing at 5,000 to 6,000 feet elevation. Are considered by the Chinese the best food for their hard-working mules and horses; they must always be boiled before being fed to the animals; otherwise they may cause colic; the Chinese also mix a liberal quantity of sorghum seed and chopped straw with these beans. Chinese name *Ghae doh.'* (*Meyer.*)

"23292. From Wutaishan, Shansi, China. '(No. 923a, Feb. 26, 1908.) Yellow soy bean. Growing at 5,000 to 6,000 feet elevation. They are used all through northern China for making bean curd and bean vermicelli. Chinese name *Huang doh.'* (*Meyer.*)

"23296. From Taichou, Shansi, China. '(No. 929a, March 2, 1908.) Yellow soy beans, found growing on

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strongly alkaline lands. Chinese name *Huang doh.'* For further remarks see No. 923a (S.P.I. No. 23292).' (Meyer.)

"23297. From Taichou, Shansi, China. '(No. 930a, March 2, 1908.) Black soy bean. Grows on strongly alkaline lands. Chinese name *Ghae doh.'* For further remarks concerning their uses see No. 922a (S.P.I. No. 23291).' (Meyer.)

23299. "From Tsintse, Shansi, south of Taiyuanfu, China. '(No. 933a, March 12, 1908.) Black and yellow. A rare local variety of a strange soy bean used as a vegetable when slightly sprouted, and after having been scalded for a few minutes in boiling water is eaten with a salt sauce; the skin must be removed before scalding. Chinese name *Yang yen doh,* meaning sheep's eye bean.' (Meyer.)

"23303. From Shiling, Chihli, China. '(No. 949a, Jan. 25, 1908.) Yellow soy bean. Chinese name *Ta huang doh.* For further remarks see No. 923a (S.P.I. No. 23292).' (Meyer.)

"23305. From Peking, Chihli, China. '(No. 951a, Feb.8, 1908.) Large, light yellow soy bean. Used mostly as a vegetable when slightly germinated, and eaten with a salt sauce. Chinese name *Ta huang doh.'* (*Meyer.*)

"23306. From Peking, Chihli, China. '(No. 952a, Feb. 8, 1908.) Large, black soy bean, green inside. Comes from Manchuria and is used mostly like the preceding number (S.P.I. No. 23305.) Chinese name *Ta ghae doh.'* (*Meyer.*)

"23311. From Shiling, Chihli, China. '(No. 957a, Jan. 25, 1908.) Large, green soy bean. Used as a vegetable when slightly sprouted, after having been scalded in boiling water. Chinese name *Ta ching doh.'* (*Meyer.*)

"23312. From Pautingfu, Chihli, China. '(No. 958a, Jan. 28, 1908.) A rare, local variety of soy bean, being small and of greenish yellow color. Chinese name *Shau ching doh.'* (*Meyer.*)*"*

Note: This is the earliest English-language document seen (Oct. 2004) that uses the term "dark brown" to describe the color of soybean seeds. Address: Washington, DC.

1279. Boehmer (L.) & Co. 1909. Wholesale catalogue: 1909. Yokohama, Japan. 40 p. Illust. 25 cm. [Eng]

• ***Summary:*** The section titled "Plants and seeds of economic value" (p. 32) gives detailed information about different varieties of soy-beans that can be ordered, quite similar to that found in the 1907 catalog. Address: Nos. 5 and 28 Bluff, Yokohama, Japan.

1280. Nishimura, Torazô. 1909. Shôyu kôbo Saccharomyces soya Saitô ni tsuite. II. [On the shoyu yeasts, Saccharomyces soya Saito. II.]. *Nogakkai Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 85. p. 3-44. Feb. [Jap] Address: Nôgaku-shi, Japan.

1281. *Scotsman* (*The*) (*Edinburgh, Scotland*). 1909. New oilcake industry. March 5. p. 10.

• ***Summary:*** "The following, which appeared in a recent issue of the *Eastern Morning News,* is referred to to-day by our agricultural contributor:–The arrival of the Javorina, s. [steamer], at Hull with the first cargo of Soya beans marks the beginning of what promises to be an important new industry in this country. Considerable interest is manifested in this new development as it will have an important bearing upon the future prosperity of the oilcake industry.

"The Javorina, s., is the first of a fleet of steamers bringing Soya beans to Hull. The beans are in good condition and this is due to the excellent arrangements made for ventilation in the holds. It is a long voyage from Vladivostok, the vessel leaving the Russian port on Boxing Day [probably Dec. 26]. The total quantity for Hull is about 4,700 tons, and the remainder will be transshipped to London.

"The Soya bean grown is immense quantities in Manchuria and China. The Japanese have adopted the bean to commercial uses, not for the food of animals, but for that of man. It is not an unpopular article of diet in many parts of the Far East, and during the campaign conducted in Manchuria by the troops of the Rising Sun the men were fed very often on little else. It possesses sustaining qualities, and is the basis of a Japanese sauce [shoyu, or soy sauce]. Its chief value to this country, lies in the fact, however, that it will be an excellent animal food because of its richness in albuminous compounds and nitrogen, which are very good feeding qualities."

"Several forms of cake manufacturers have conducted... tests and these have proved eminently satisfactory. The experimental Soya cakes which have been made in Hull have been tested by a practical and scientific dairyman in the East Riding, who has reported that one cow set aside for this test and fed with half a cake a day, in addition to other food, yielded a considerable extra quantity of milk daily, and was much improved in general condition. The large proportion of oil in the cake makes sparing use of it advisable.

"Up to the present soya beans have been imported to England only in small quantities, but the development of Manchuria promises to revolutionise what is an important industry in Hull."

"What it will mean to Hull alone is that this new source of supply will be available in the seed crushing trade when other classes of seed are scarce and the mills will, therefore, be able to continue running uninterruptedly.

"A combination of circumstances are said to be responsible for the development under such favourable conditions at the present time–the low price of silver, which is what everything is bought with in Japan and China, and low freights. The Javorina, s. [steamer], is the first of a fleet of nineteen vessels which are now on the way from Dalny or Vladivostock with large cargoes of the bean. Several of these vessels are definitely fixed for Hull, two for Liverpool, and the remaining eleven for other ports in the United Kingdom."

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1282. *Times of India* (*The*) (*Bombay*). 1909. Prospectus. March 15. p. 14.
• ***Summary:*** "This company has been formed for the purpose of erecting and working oil mills at some suitable place in British India or any of the native states in India and for the general purpose of carrying on the business of seed crushers and nut crushers and manufacturers of linseed, cotton, and other cakes, oil extractors and manufacturers, and makers and manufacturers of cattle food and of artificial manures and fertilizers of every description.

"The promoters think that there is a bright future for this industry in India.

"The mills will be equipped with the most modern machinery and will be the largest and first of their kind in India, and their capacity will enable the company to deal with about a minimum of 120 tons of seeds per day. The product of the mill will be such as can compete with the best known brands in the British, French and German markets.

"In recognition of the great importance of securing capable management to ensure the success of the undertaking, the promoters have secured the services of Mr. Louis Hoffman a specialist in refining oils, of great experience, who has been manager in complete charge of large oil works in Germany, Austria and China for over 15 years."

"This gentleman was the first to manufacture cocoanut-butter in 1896. He discovered the process of refining rapeseed oil without the help of acids. We have before us his essais, published in the German 'Revue der Harz, Oel- und Fettindustrie' 1908: 'About the manufacture of oils in China,' 'Chinese Woodoil,' 'Vegetable tallow (stillingia sebifera),' and on 'Soja beans (Soja Hispida Moench).' Mr. Hoffmann has been the means of improving oil milling machinery.

Note 1. This ad is strange. It is not part of the newspaper of that date, but it may have been inserted. No company name, address, or other contact information is given! We do not know whether or not this mill was ever constructed or operated.

Note 2. In OCLC / Worldcat, the largest database of publications in the world, no periodical with the title of that shown above (Revue der Harz...) is listed. The closest one published in 1908 is *Seifensiederzeitung und Revue über die Harz-, Fett- und Ölindustrie*–which seems fairly close. Eight libraries worldwide own this periodical, but none are in the USA.

Note 3. As of Aug. 2010, no record mentioning "Louis Hoffmann" or "L. Hoffmann" exists in the SoyaScan database of 85,700 records from 1100 B.C. to the present.

1283. Russell, W.P.M. 1909. China. Report for the year 1908 on the trade of Antung. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 4185. 18 p. March.
• ***Summary:*** The section titled "Exports for 1908" (p. 7-8) discusses the amount and value of Beans [soybeans], bean cake, and bean oil exported from this port. An excellent full-page map shows the Eastern Manchuria and Shenking Province, including all the major ports, rivers (Antung is a port on the Yalu River), railroads, and bodies of water.

"Products of Eastern Manchuria.–The following are some of the principal agricultural products of Eastern Manchuria: -

"Beans.–Many varieties are produced, of which the chief are: -

"1. Huangtou, yellow [soy] beans.–These are most extensively grown and are used for making bean cake and bean oil. The average bean cake weighs 50 catties and is worth 1 dol. 20 c to 75 c. small money at the place of production. The oil sells for about 15 c. a catty. The beans themselves fetch 10 dol. a picul on an average. [Note: 1 picul = 133.3 pounds weight.] They are also used for making bean curd, which is one of the chief foods of the people. It has the appearance of curds of milk and is made by a somewhat similar process. The beans are also used for feeding cattle.

"2. Hsiaotou, small beans [azuki].–These are used as a vegetable and also for feeding cattle. They are also used for making vermicelli. Note: This is the earliest English-language document seen (March 2006) that uses the term "small bean" to refer to the azuki bean.

"3. Lutou, green beans [mung beans].–The young sprouts of these are used as a vegetable. The bean is principally used for making vermicelli.

"4. Hetou [Heitou], black [soy] beans, are much grown and much used for feeding cattle and also for making oil and bean cake."

The section on "Exports for 1908" under "Beans" states that "owing to an exceptionally heavy supply coupled with a weak demand from the consuming quarters in Japan and South China, there was speedily a very heavy fall in price and 5 taels 50 c. was quoted [down from 7 to 8 taels last year]... It is stated that the restriction of the opium crop has caused an expansion of the area of the bean crop. The returns show an export of bean cake more than doubling that of the year 1907. Beans largely figure in the money market as a standard for deferred payments." Address: Acting Vice-Consul.

1284. Foster, Walter L. 1909. Visit to Shikoku, Japan. *Advent Review and Sabbath Herald* 86(16):13-14. April 22.
• ***Summary:*** "That night was spent at a very simple hotel by the roadside... For supper I had a few dried minnows, *tofu* (bean curd), and a bowl of rice."

1285. Mitsuda, Ryuichi. 1909. Shôyu no tansuikabutsu ni tsuite [On the carbohydrates in shoyu]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 30(4):335-48. April. [Jap]
• ***Summary:*** Note: According to Oshima (1922) an English-language translation was made by the office of W.T. Swingle,

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USDA Bureau of Plant Industry. Address: Nôgaku-shi, Japan.

1286. Takahashi, Y. 1909. Daishomame ni kansuru tôkeiteki kenkyû shohô [A biometrical study of adzuki and soy beans]. *Sapporo Norin Gakkaiho* (*J. of the Society of Agriculture and Forestry, Sapporo*) No. 2&3. p. 163-66. April. [Jap] Address: Sapporo, Japan.

1287. Tebbitt, -. 1909. China. Report for the year 1908 on the trade of Newchwang. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 4191. 12 p. April.
• ***Summary:*** The section titled "Exports" (p. 5-6) discusses the amount and value of Beans [soybeans], bean cake, and bean oil exported from this port. An excellent full-page map shows the south of Manchuria including all the major ports, rivers, railroads, and bodies of water.

"Bean cake.–Beans and their products–bean cake and bean oil–were very plentiful and the export brisk. The quantities of bean cake exported rose from 4,453,380 cwts. [1 cwt = hundredweight = 112 pounds] in 1907 to 5,594,678 cwts. in 1908." Each year from 1906 to 1908 Japan has taken about 78% of this bean cake–in spite of the increasing export from Tairen [Dairen] to Japan.

"Beans.–A new venture has been the export of beans during the winter of 1908-09 from Tairen to the United Kingdom, presumably to be used as food for cattle. Hitherto experimental shipments of beans from here have failed, as the beans fermented on the way. This might have been due to the beans having got wet coming down the river, either accidentally or on purpose so as to increase the weight. The beans at Tairen [Dairen], on the other hand, as they come down by rail, arrive dry and are shipped dry, and the success of the venture may be due to this fact."

Summarized in *J. of the Board of Agriculture* (*London*), June 1909, p. 229-30. Address: Acting Consul.

1288. Yokohama Nursery Co., Ltd. 1909. Descriptive catalogue... Bulbs, plants seeds. 1909-10. Yokohama, Japan. 98 p. April. Illust. Index. 26 cm. [Eng]
• ***Summary:*** On the cover of this English-language catalog is an illustration (line drawing) of two cranes and two tortoises. In the section on "Seeds" (p. 80+) is a subsection (p. 87) titled "Some vegetable seeds." The contents (incl. the entry for "soy bean") is identical to that in the 1908 catalog, except that the price per 100 lbs. of soy beans has dropped dramatically to $3.50, and there is a new entry: Shogoin mammoth turnip. A photo shows two of these turnips next to a hen's egg for size comparison. Other photos in the catalog include two large (4-7 feet tall) bronze lanterns (p. 98). This is the first Yokohama Nursery Co. catalogue in which we have found a copyright notice or a date of printing (p. 98). Address: P.O. No. Box 72. 21-35 Nakamura, Yokohama, Japan. Phone: 509.

1289. Okazaki, Keiichiro. 1909. Process of manufacturing soy or sauce substitute. *U.S. Patent* 0,923,070. May 25. 4 p. Application filed 2 May 1907.
• ***Summary:*** Okazaki and diastarin fungi are cultivated upon a mixture of bean-cake and wheat bran, water added to the mass and the resultant liquid separated and mixed with a liquid containing brewers' yeast. Illustrations (line drawings) show: (1) "A perspective view of a box containing sawdust and bran used in the cultivation of the okazaki and diastarin fungi; (2) A perspective view of the okazaki fungus [a whitish mold of the genus *Aspergillus*] and conidia thereof; (3) A perspective view of the diastarin fungus and conidia thereof." Address: Tokyo, Japan.

1290. *J. of the Board of Agriculture* (*London*). 1909. Soy beans. 16(2):128-29. May. [1 ref]
• ***Summary:*** An introduction to the soy bean. "There are many varieties known in Japan, China, Tibet, and the temperate portions of the Himalayas." "The soy bean requires about the same temperature as maize, and it may therefore be capable of growth in some of the southern and eastern parts of England. The Board have arranged for some experiments to be conducted with beans obtained from Japan."

Note: This is the 2nd earliest document seen (June 2010) concerning soybeans in Tibet, or the cultivation of soybeans in Tibet. Address: England.

1291. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1909. Oleaginous products: Oil cake and seed. No. 344. p. 153-55. May.
• ***Summary:*** Exports of [soy] beans and [soy] bean-cake from Newchwang, China, are increasing rapidly. The United States Consul at Newchwang, "Thomas E. Heenan, calls attention to the exports of Chinese beans to the United Kingdom as the beginning of what is expected to develop into considerable proportions.

"Since the closing of the river to navigation, large numbers of carts have been entering the town with inland produce, and great quantities of beans have been stored for export in the spring. It is difficult to obtain reliable figures concerning the quantity brought by rail, but up to date 64,000 tons have been brought by carts, and it is estimated that the total quantity brought in by rail and carts during the four Months December-March will reach 88,000 tons, against 30,000 tons for the same period last winter. This quantity, however, is small compared with the stocks shipped to Dalny by rail from the north, and when the thaw sets in, putting a stop to cart traffic, unless there are early spring rains, there is very little prospect of large supplies coming down by river boats, as the snow thus far has been insufficient to give the

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requisite draft of water in the up-river reaches.

"Countries to which shipments are made: Beans, bean cake, and bean oil are the principal products of Manchuria. The prices of these during the past season have been higher than ever before, but how much of this is due to the ability of Japan, a gold-standard country, to pay more in silver, because silver has been cheap, can not be positively stated. The bean cake and bean oil go chiefly to Japan, but shipments have gone to England, France, and the United States during the past year. The American shipment was a small quantity sent from Newchwang merely as a sample... During the year the exports to England amounted to about 70,000 bags. This is a new development, said to have been brought about by English experts who have made a study of the beans. They have discovered, it is said, a means of extracting an oil therefrom, for culinary use as well as for lubricating purposes., the residue being converted into cattle feed. The exports of bean cake from Newchwang to foreign countries in 1908 amounted to 246,608 tons, valued at $5,518,508.

"The exports of beans from Newchwang to foreign countries and other Chinese ports during 1908 were as follows, in tons:" Yellow [soy] beans 75,996. Green beans 31,873. Black [soy] beans 16,489. White beans 4,315. Red [azuki] and small green [mung] beans 3,634.

"United Kingdom: An experiment with the soya bean in Manchuria." U.S. Consul Walter C. Hamm of Hull [England] writes, under date of January 20,..." The soya bean "has been exported to some extent to the United States, and a few samples have been brought to England, but the present shipments to Hull are the first on a large scale. Three steamers, the Maroa, the Javorina, and the Matoppo, are now on their way from Dalny or Vladivostok with about 10,000 tons each, and the Claverdon and the Bannockburn are loading similar quantities at Dalny, making 50,000 tons in all."

A long quotation from an article in the *Eastern Morning News* describes the arrival at Hull, England, from China, of the first cargo of soya beans on board the Javorina. "The beans arrived in good condition, and this is due to the excellent arrangements made for ventilation in the hold." Experimental "soya cakes have been made in Hull and have been tested by a practical and scientific dairyman in the East Riding, who has reported that one cow set aside for this test and fed with half a cake a day, in addition to other food, yielded a considerable extra quantity of milk daily and was much improved in general condition. The large proportion of oil in the cake makes sparing use of it advisable... The Japanese have adapted the bean to commercial uses, not for the food of animals, but for that of man. It is not an unpopular article of diet in many parts of the Far East. It possesses sustaining qualities, and is the basis of a Japanese sauce [shoyu].

"Chinese beans in Scotland: Tests in crushing mills for oil and stock meal." U.S. Consul Rufus Fleming reports on Feb. 12 from Edinburgh: "In the production of oil cake and seed oil the crushing mills in this district have long used only Bombay and Egyptian cotton seed. Recently some of the mills have experimented with small quantities of 'soya beans' from Manchuria. The Chinese bean, which is about the size of a pea, has been found to contain from 15 to 16 per cent of oil suitable for soap making. The usefulness of the oil for other industrial purposes has not yet been demonstrated. The cake produced, containing about 6 per cent of oil, is said to be good feed for stock... The mills in this part of Scotland have undertaken to carry out thorough tests, and a shipment of 1,700 tons is expected to soon arrive at Leith for this purpose."

Note 1. This is the earliest document seen (Feb. 2003) concerning soybeans in Scotland. They were imported from Manchuria. Rufus Fleming filed his report on 12 Feb. 1909.

Note 2. This is the earliest English-language document seen (Feb. 2000) that uses the term "soya cake" or "soya cakes" to refer to ground, defatted soybeans.

Note 3. This is the earliest English-language document seen (Sept. 2006) that uses the term "Chinese beans" (or "Chinese-beans") to refer to soybeans.

Note 4. This is the earliest document seen (Oct. 2005) concerning soya beans imported to or processed in Hull, England. Address: Washington, DC.

1292. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1909. Agriculture: Foreign crop conditions–China. No. 344. p. 131-38. May. See p. 131-33.

• ***Summary:*** This section begins with a report from Vice-Consul General Frederick D. Cloud, of Mukden, on the products and population of the province of Shengking (Fengtien [Liaoning]). The total population of this Manchurian province is 10,312,241, of which 2,520,145 are engaged in agriculture. The province's largest crop is kaoliang (*Sorghum vulgare,* Barbados millet); 2,166,666 acres yield 76,526,643 bushels worth $26,019,059. "Kaoliang is the food staple of Manchuria, and bears the same relative value in the food economy of Manchurians that rice does with the southern Chinese, or wheat in the United States. Besides furnishing the greater portion of the Manchurian's daily food, it supplies an alcoholic drink, thatching for houses and barns, matting for summer sheds and winter floors, windbreaks to shield the farmer's household from the ice blasts of winter, and fuel to cook his food and warm his house. No part of the kaoliang plant is allowed to go to waste. Even the stubble and roots are carefully pulled up, dried, and put away for fuel."

The kaoliang plant "requires much from the soil, but gives nothing back in return. The soy bean, on the other hand, is a good soil fertilizer, and is extensively grown throughout the province, especially in the rich valley of the Liao River. The bean is the greatest of all export crops

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from Manchuria, and can always be relied upon to afford the farmer ready cash. Bean oil is used throughout China for culinary purposes, being employed as lard is used in American households, while the residue, after the oil has been expressed, bean cake, is exported mostly to Japan, where it is used for fertilizer." The total value of China's bean crop exports for the year 1907 was $9,860,790, the greater part of which was produced in southern Manchuria. Manchuria has a great advantage over most other agricultural regions, in that the soy bean can be grown most successfully throughout the entire region, from Dalny in the south to Harbin in the north."

The crop that ranks third in importance in Shengking province is millet is millet, of which there are several varieties. The best of these is known as Japanese millet, and is grown mostly for human food. The fourth most important crop is wheat–though it is still a relatively minor crop.

The second largest crop is soy beans; 1,300,00 acres yield 4,716,000 bushels worth $22,393,800. Tables (p. 132) show: The principal varieties of grain produced, and the value and production per acre of the different crops. The approximate acreage devoted to each crop, and the total amount produced and approximate value of each. Address: Washington, DC.

1293. Saito, Kendo. 1909. Preliminary notes on some fermentation organisms of Corea. *Botanical Magazine* (*Tokyo*) 23(268):97-98. May. Summarized in Zentralblatt fuer Bakteriologie. II. 26:92. [Eng; ger]

• ***Summary:*** Discusses the moulds in Corean [Korean] koji (mostly *Aspergillus oryzae, Rhizopus tritici,* and *Rhizopus tamari?*), and yeasts in the mash of Corean alcoholic beverages. The koji moulds or fungi possess, "as regards starch, strong saccharifying power, so that the saccharification of starch contained in the raw material can be accomplished by them." For one of the yeasts he proposes the name *Saccharomyces coreanus.* Address: Botanical Inst., Tokyo Univ., Japan.

1294. *Mark Lane Express Agricultural Journal and Live Stock Record* (*Farmer's Express, London*). 1909. Soya beans and soya cakes. 100(4054):667. June 7. See also Experiment Station Record 21:474 (1909). [1 ref]

• ***Summary:*** This is a detailed summary of a "communication which Professor Gilchrist, of Armstrong College, has sent to the press." "Trials to test the comparative feeding value of soya and decorticated cotton cakes have been carried out at Newton Rigg, the Cumberland, and Westmorland Farm School, under the supervision of the manager, Mr. W.T. Lawrence.

"Soya cake is produced from soy or soya (soja) beans (from which some of the oil is extracted), which are now being extensively imported from Manchuria to this country." "Soya cake" was found to be slightly superior to "decorticated cotton cake" for milk production. Six cows were fed for 6 weeks on each protein supplement. The basal ration consisted of hay, oatstraw, crushed oats, and roots. Concerning milk production, there was a slight advantage in favor of the soya cake but it was too small to be considered significant. Both feeds also gave similar results in terms of the fat content of the milk. The cows, however, gained somewhat more weight while they were being fed the soya cake than they did on the decorticated cotton cake.

"Soy, soja, or soya beans have been known in China and Japan for a considerable time. Soy (shoyu), the universal condiment in Japan, is prepared from soy beans, mixed in equal quantities with either wheat or barley. The British Oil and Cake Mills, Ltd., Hull, inform me that about 400,000 tons of these have been sold to this country within the past few months for delivery till the end of the year, of which 50,000 tons have now arrived, and a steady supply is anticipated in the future. Three qualities of these are now imported:–The Sakura, which are said to be the best, being shipped from Dalny [Manchuria], the Harbin from Vladivostock [Vladivostok], and the Hankow from Shanghai."

"Soya or soja meal is being sold in this country, which is soya beans from which the greater part of the oil has been extracted. This may contain as little as 1.5 per cent of oil, while the albuminoids and other constituents are consequently increased.

"Soya cake is now sold in the Newcastle district at about £6 15*s.* to £7 a ton."

Note 1. This is the earliest English-language document seen (Dec. 2005) that uses the term "soja meal" to refer to ground, defatted soybeans.

Note 2. This is the earliest document seen about feeding "soya cake" to dairy animals.

Note 3. This is the earliest document seen (Sept. 2004) that mentions "Sakura," which appears to a grade or quality of soybeans, rather than a soybean variety name. "Sakura" is not used as either a grade or soybean variety name in the USA. Address: Armstrong College, England.

1295. Mitsuda, Ryuichi. 1909. On the carbohydrates of shoyu. *J. of the College of Agriculture, Tokyo Imperial University* 1(1):97-101. June 16. [Eng]

• ***Summary:*** Contents: Isolation of sugars from shoyu. About furfurol [an aldehyde of furfuran; also called furfural]. About total pentosane. "Although the existence of sugars in shôyu is easily shown by the reduction of Fehling solution, it is comparatively difficult to isolate them in a pure state. At first I have tried to isolate them as the lead compounds... Afterwards I found that such a long operation is unnecessary." He used recrystallization of crude osazones.

He gives technical details of how each carbohydrate was isolated from shoyu or tamari. Furfurol, which is formed from pentose or pentosane, was found to increase with the

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age of the moromi. Address: Japan.

1296. Takahashi, Teizô. 1909. A preliminary note on the varieties of Aspergillus oryzae. *J. of the College of Agriculture, Tokyo Imperial University* 1(1):137-40. June 16. [Eng]

• ***Summary:*** Describes the first isolation of many different molds from koji. The author isolated 3 varieties of molds from 3 kinds of koji starter (*tane koji*) from 3 sources (saké, miso, and shoyu). A description of each variety is given.

Note: Murakami (1971) says of this article: Although *Aspergillus oryzae* was described in detail by Wehmer in 1895, it was not until the beginning of the 20th century that the koji mold was found to contain multiple kinds of microbes [microorganisms], when Takahashi in 1909 isolated many different molds from koji used in the manufacture of *Saké, Miso,* and *Shoyu* and found that all were varieties of *Aspergillus oryzae.* Address: Tokyo Imperial Univ.

1297. Takeuchi, T. 1909. On the occurrence of urease in higher plants. *J. of the College of Agriculture, Tokyo Imperial University* 1(1):1-14. June 16. (Chem. Abst. 2:213). Also in Tokyo Kagaku Kaishi (J. of the Chemical Soc. of Japan) 30:343 (1909). [5 ref. Eng]

• ***Summary:*** This classic article, which is about the soy-bean, begins: "Although much has been written about urease no mention is made of its occurrence in higher plants. Its presence has been proved only in Urobacteria and certain fungi. In the course of my investigations on a desamidizing enzyme [one which hydrolyzes amino compounds with the removal of the amino group] in higher plants, I have discovered a very powerful urease in both the resting seeds and seedlings of soy-bean (*Glycine hispida*)."

He then describes in detail how he isolated urease from the cotyledons of 30 seedlings (each about 3 cm high), and from air dry seeds. He found that this enzyme, urease, is capable of hydrolyzing urea into ammonia and carbon dioxide. The urease liberates ammonia from urea at ordinary temperatures, but does not act on other nitrogenous compounds. It is readily soluble in water, so that an infusion of soy beans may be employed to detect traces of urea in a mixture of organic matter, the ammonia liberated by the action of the urease being indicated by means of phenolphthalein. The author suggests the use of the seeds for the conversion of the nitrogen of urine into ammonium sulphate for manurial purposes.

Page 7 states that the urease from soy beans was tested but did not act on the following compounds: "Guanidine (carbonate), arginine (both nitrate and methylester hydrochloride), benzamide, allantoin, leucine, alanine, tyrosine, kreatine, histidine (hydrochloride), guanine (hydrochloride), glycocoll (ethylester hydrochloride), uric acid, hippuric acid."

Seven types of seeds were tested (p. 8, incl. Phaseolus radiatus = azuki bean) but the urease from the soy-bean liberated much more ammonia than that from any of the other seeds.

Takeuchi concludes: "It is strange that the urease acts exclusively on urea and not on allied substances. Its natural function in the plant body has still to be made out.

"There is no doubt that the enzyme is important, and its urea-splitting property can be turned to account for determining the presence of urea even in minute quantities in various organs and juices.

"Another application of the enzyme consists in its strong ammonifying action on fresh urine, and its application for the recovery of the chief nitrogen of fresh urine is undoubtedly a step in advance in the economy of manures.

Note 1. This is the earliest document seen (July 2003) that mentions urease in connection with soybeans. An enzyme which can hydrolyze urea into ammonia and carbon dioxide, urease was first discovered by Musculus in urine in 1874.

Note 2. This is the earliest English-language document seen (July 2003) with the word "urease" in the title (or in the article), or that contains the word "urea"–in connection with soybeans.

1298. Yoshimura, Kiyohisa. 1909. Ueber die chemische Zusammensetzung der Tamari-Schoyu [On the chemical composition of tamari shoyu]. *J. of the College of Agriculture, Tokyo Imperial University* 1(1):89-96. June 16. [3 ref. Ger]

• ***Summary:*** So-called Tamari-shoyu (*Tamari-Schoyu*) is a variety of shoyu (liquid soy sauce) which is mainly used and made in the middle and western part of Japan. The chief difference between this variety and the most common soy is the absence of wheat in the raw materials used in its preparation. The author isolated from 1 liter of "tamari-shoyu" 0.3 gm of putrescine, 0.7 gm of ornithine, 0.7 gm of a base $C_6H_9N_3$, and 4.5 gm of ammonium. Address: Japan.

1299. *Oil, Paint and Drug Reporter.* 1909. The soya bean and its probable effect on the markets. 75(25):7-8. June 21.

• ***Summary:*** "Once in a long while an event occurs in the industrial world to change, and sometimes even to revolutionize the set order of things... The latest event to attract prominent attention has been the introduction in an extensive way has been the introduction of the soya bean to the markets of Europe."

Within the last 6 months "there have been shipped to the United Kingdom, to Scandinavia, and to Germany upwards of 400,000 tons of the soya bean, which have been converted into oil, and from oil into soap, and the cake has found a useful place in the fodder markets of these countries. It is seldom indeed that in the course of one short season an unknown or rather an untried substance has ever forced its way into a market so cautious and conservative as that of

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Great Britain, where the manufacturer and consumer alike are so wedded to established formulas and customs."

"Soya bean oil is described in botanical works as 'obtained from the seeds of soja hispida, a plant indigenous in China, Manchuria and Japan, where the oil is used for edible purposes. The seeds contains 18 per cent of oil.' The manufacture of soya bean oil, says the same authority, forms one of the staple industries of Manchuria."

"The soya bean has occupied quite a foremost place among the agricultural products of South Manchuria for many years, and now seems likely to command still greater prominence. There are quite a number of oil mills in Manchuria, the principal plants being located at Yngkau [Yingkou?] and at Hsiackang, the Chinese quarter of Dalny. In these two centers there were all told in 1908 some thirty-six mills, but of these only five were equipped with modern machinery, the others comprise old stone rollers and presses worked by mules and horses. A mill with a daily capacity of ten piculs will keep six of these animals busy. The modern mill will average an outturn of 40 piculs per diem."

"Before last December there were no soya beans in England; by February there had been imported 120,000 tons, and by the close of the season another 120,000 tons had been added to this, making a total for the United Kingdom of 240,000 tons. The rest of Europe, comprising chiefly Norway, Sweden, Denmark, and Germany, consumed 160,000 tons, bringing the grand total up to 400,000 tons. The yield of oil by the naphtha process of extraction is about 18 per cent. This would make an outturn of 72,000 tons of oil, or, figuring five and one-half barrels to the ton, there would have been marketed in Europe 396,000 barrels of soya bean oil. The shippers, however, had oversold themselves and were obliged to buy back 75,000 tons of seed to fill obligations in Japan."

Concerning the oil: "Its cheapness commended it at a time when corn oil was very high priced, so it replaced corn oil in soaps. For edible purposes, it has not as yet found favor, and it is likely to remain restricted to its industrial uses, for the reason that the use of naphtha in the extraction renders it non-edible, and if pressed the yield would be but 10 per cent or less, which would make it too expensive."

A table gives the quantity of exports (in piculs) from Niutschwang [Newchwang = Ying-K'ou, Yingkou, or Yingkow] for six varieties of beans, beancake, and beanoil for the years 1906-08.

Note 1. This is the earliest English-language document seen (Sept. 2006) that contains the term "Soya bean oil" or that uses the word "beanoil" to refer to this oil.

Note 2. This is the earliest document seen (Sept. 2006) that mentions the use of soya bean oil in soaps. A number of other documents published in 1909 also mention this new use. Apparently soya bean oil was first used in soaps in Europe (Sweden or England), but by Sept. 1909 the manufacture of soap from this oil had been tried with good results in Asia, at a laboratory (probably British-owned).

Note 3. This may be the earliest document seen (May 2008) concerning soya beans in Denmark–although a strict interpretation of the sentence that mentions Denmark leaves open the possibility that soybeans were not specifically imported to Denmark. Later documents (Nov. 1910) appear to show that Denmark first imported significant quantities of soya beans in 1911; before that, Denmark imported soya bean cake, largely from England.

Note 5. This is the earliest document seen (Jan. 2010) that mentions naphtha (or naphthas) used for solvent extraction of soya beans.

Note 6. *Webster's New Geographical Dictionary* (1988) defines Scandinavia as 1. The ancient name of the country of the Norsemen. 2. The name of the region encompassing Denmark, Norway, and Sweden; sometimes expanded to include Finland and Iceland.

1300. LeMaire, M.E. 1909. Nouvelles du Japan savant et industriel [New from scientific and industrial Japan]. *Bulletin de la Societe Franco-Japonaise de Paris* No. 15. p. 43-48. June. See p. 45-46.

• ***Summary:*** In the section titled Scientific publications from the University of Tokyo is a summary (p. 45-46) of an article titled "Notes on Japanese vegetable oils," by Tokuhei Kametaka, Article 4, Vol. 25 (Sept. 1908) of the *Journal of the College of Science, Imperial University of Tokyo.* One of the articles discussed is: "3º L'huile de soja, *Glycine hispida Maxim.* Known as "soja bean oil" in English and *daizu-abura* in Japanese. We know that the soja bean is used to prepare miso, a sauce [sic, paste] that is used to make miso soup (*misoshiru*), a main dish for the Japanese. This oil, of a light yellow color, which has found numerous industrial uses locally, is beginning to be used by the Europeans. In 1907, Japan exported 700 tons of it, worth 20.4 pounds sterling per ton.

Note: This society was founded in 1909 by the government of Japan. Address: Ingenieur des arts et manufactures.

1301. Oshima, Kintaro. 1909. Daizu no tansui kabutsu ni tsuite [On the carbohydrates in soy beans]. *Sapporo Norin Gakkaiho* (*J. of the Society of Agriculture and Forestry, Sapporo*) No. 4. p. 1-8. June. [4 ref. Jap]
Address: Sapporo, Japan.

1302. Tsuda, S. 1909. On the different forms of phosphoric acid in organic manures. *J. of the College of Agriculture, Tokyo Imperial University* 1(2):167-70. June.

• ***Summary:*** "It is a well known fact that phosphoric acid (P_2O_5) is one of the essential manurial elements... The object of the present paper is the quantitative determination of different forms of phosphoric acid in several organic manures of vegetable as well as animal origin."

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The total phosphoric acid in 100 parts of dry "Soybean cake" was found to be 1.311. The phosphoric acid soluble in ether and alcohol (as lecithin) was 0.114. The phosphoric acid soluble in 0.2% hydrochloric acid was: 0.050 inorganic and 0.640 organic (as phytin). The phosphoric acid soluble in 5% hydrochloric acid was: 0.040 inorganic and 0.120 organic. The phosphoric acid in the last residue (as nuclein) was 0.236. Analyses of "Rape seeds cake" and Red clover hay (before flowering) are also given.

Animal manures (such as herring guano, steamed bone dust [rich in tricalcium phosphate], pressed cake of pupa of silk worms, or crab shells) contain much more phosphoric acid and it is mostly in the form of organic compounds, whereas in vegetable manures it is mostly inorganic, mainly in the form of phytin, with only small amounts of nuclein.

Note: This is the earliest English-language document seen that uses the term "soybean cake" to refer to ground, defatted soybeans. Address: Japan.

1303. *Indian Trade Journal* (*The*) (*Calcutta*). 1909. Soy bean trade in China. 14(170):17. July 1.

• ***Summary:*** "Attention is called by the United States Consul at Newchwang to the exports of Chinese beans to the United Kingdom, which are expected to develop into a considerable trade and which are competing seriously with Indian linseed and cotton seed in home markets...

"The bean cake and bean oil go chiefly to Japan, but shipments have gone to England, France, and the United States during the past year. The American shipment was a small quantity sent from Newchwang merely as a sample... The exports of bean cake from Newchwang to foreign countries in 1908 amounted to 246,608 tons. The exports of beans from Newchwang to foreign countries and other Chinese ports during 1908 were as follows, in tons: Black [soy] beans, 16,498; green beans, 31,873; white beans, 4,315; yellow [soy] beans, 75,996; red and small green beans, 3,634; total, 132,316 tons.

"Mr. Consul F.W. Playfair, in his Report on the Trade of Nagasaki for the year 1908, gives the following details about soy beans and their products: The largest increase under any heading is that of the import of oil cakes for manure, which is £83,485, an advance over 1907 of more than 60 per cent. The reasons for this increase are (1) the extremely low price of bean cake in China and (2) the increase in the area under cultivation. The bean cakes come from Newchwang and Dalny...

"In a report to his Government the Japanese Consul-General in Mukden says: 'The season for the export of beans and oil cake, the principal staples of Manchuria, opens in November and closes in March or April, and the destinations are chiefly Japan and other parts of China (Central and South). Lately beans have begun to be exported to Europe...'

"Mr. Consul Pitzipios, in his Report on the Trade of Chinkiang for the year 1908, states that the exports of bean cake in that year amounted to 588,123 cwts. [1 cwt = hundredweight = 112 pounds]. He adds that this cake is produced very cheaply and goes principally to Japan." Address: India.

1304. Mitsui & Co., Limited. 1909. Soya bean oil. China wood oil (Ad). *Oil, Paint and Drug Reporter* 76(1):20. July 5.

• ***Summary:*** "English soya bean oil–Prompt shipment from Hull. We are largest supplier of soya bean from Manchuria, and have special connections with crushers. Manchurian soya bean oil. Shipment from our Eastern Oil Plant. Fall delivery at New York." Other offices: "Kobe, Yokohama, Hankow, Shanghai, London, Hamburg [Germany], Antwerp. Also branches in all the principal cities of the world." Address: Head office: Tokio, Japan. New York: Silk Exchange Bldg. San Francisco: Merchant Exchange Bldg.

1305. Gordon, E.L.S. 1909. Manchuria. Export trade of North Manchuria in wheat and beans. *Board of Trade Journal* (*London*) 66:180. July 22. [1 ref]

• ***Summary:*** "The following information regarding the trade in agricultural produce of North Manchuria is extracted from an article which appeared in the 'Hoku Manshu,' a Japanese weekly paper published at Harbin, a translation of which article has been forwarded by the Acting British Vice-Consul at Dairen (Mr. E.L.S. Gordon): -

"During the occupation of North Manchuria by Russian troops, agriculture there underwent a great development, owing to the large demand for provisions. At the end of the Russo-Japanese war, however, the home demand suffered a collapse, and it became necessary to find an outlet in foreign markets. From 1906 to 1908 the staple produce of North Manchuria was exported to Japan through Vladivostok. During 1908 this trade suffered owing to the depression in Japan; however, towards the end of the year, North Manchurian beans and wheat began to be exported on a large scale to Europe.

"Up to the autumn of 1908, the export trade from districts north of Changchun [probably Ch'ang-ch'un, capital of Kirin province] had been carried on *viâ* the Chinese Eastern Railway and Vladivostok. Since last winter, however, the increase in the transporting capacity of the South Manchuria Railway, the better equipment and financial organisation of the Japanese merchants, and the higher freight rates that came into operation on the Chinese Eastern Railway in November last, have occasioned a diversion of the traffic to the South Manchurian Railway; large quantities of agricultural produce from districts to the north of Changchun [see Ch'ang-ch'un above] have been carried to that place by Chinese carts, and thence sent by rail to Dairen.

"Formerly the trade in wheat and beans was entirely carried on by Russian merchants, but since 1907 the trade through both Dairen and Vladivostok has fallen into the

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hands of Japanese, and, to some extent, of European merchants.

"Mr. Gordon further reports that the cereal crops in South Manchuria this year promise to be good. In some places beans have been sown instead of wheat, and it is stated that the bean crop will be greater this year than last by 30 per cent.

"In connection with the foregoing, it may be of interest to note that, according to H.M. Commercial Attaché at Paris, 89,000 tons of oil seeds ('fèves oléagineuses' [probably soybeans]) for cattle food, from Manchuria and Eastern Siberia, passed through the Suez Canal during the five months January–May of this year, destined chiefly, it is believed, for the United Kingdom." Address: Acting British Vice-Consul, Dairen.

1306. *Indian Trade Journal* (*The*) (*Calcutta*)**.** 1909. Soy bean. Memorandum by reporter on economic products. 14(174):136-38. July 29. [14 ref]

• ***Summary:*** This is an excellent review of the literature summary by Mr. Burhill (see this journal, 22 July 1909, p. 113), from original observations and many early Indian sources, of soybeans in India and the results of early soybean cultivation experiments in India. The introduction of the cultivated soy bean "into India is comparatively recent; and, except among those tribes or peoples who are mostly Mongolian, it has obtained little hold. I will state in what parts of India it may be found.

"The Burmese grow it under the names of Pe-ngapi and Pe-kyat-pyin, sowing it, never in great quantity, along with other beans on the mud banks as the falling rivers leave them bare in October, or more sparingly still away from the rivers. The Kachins and other hill-tribes grow a little of it on their hill-clearings, the Kachins calling it Lasi. The Khasis, the Nagas and other tribes between the Brahmaputra and Upper Assam cultivate it similarly. The Khasi name seems to be U-rymbai-ktung and the Naga name An-ing-kiyo or Tzu-dza; but these three names should be subjected to scrutiny as they may be wrong. In the Brahmaputra valley it is grown, so far as known, only towards Barpeta. Whether grown or not in the hills north of the Brahmaputra I cannot prove, but the probability is strong that it is. It is grown by the Lepchas in Sikkim, and is called by them Salyang or Selliangdun, or by the Bhutias [the Bhutia people constitute a majority of the population of Bhutan and form minorities in Nepal and India, particularly in the Indian state of Sikkim] Botumash Bhatwas or Bhatmars."

Note: This is the earliest document seen (Oct. 2010) concerning soybeans in connection with Bhutan. They may well be used or cultivated in Bhutan but we cannot be sure.

"It is apparently grown in the Kingdom of Nepal, for it is found just under the mountains in the north of Oudh and again in the valleys of the north-western Himalayas right to the extreme end, and sparingly up to an altitude of 6,000 feet. In western Bengal and through the submontane districts of the United Provinces it is rare, passing chiefly under the name of Ram Kurthi, or in Bengal also as Gari Kalai. Right upon the Nepal boundary it is known by the hill names, *e.g.,* Bhatnas or Bhatwas, as well as Kajuwa. The Santals grow it and call it Disom Horec. I saw it in 1902 sparingly grown towards Belgaum.

"There are several races in India differing in small points; the seeds may be black or whitish, the leaves may be larger or smaller, etc. The black-seeded races occur in the hills, the other colours of seed both in the hills and the plains. The Khasi hills contain both larger-leaved and smaller-leaved plants...

"We seem to have no green [soy] beans in India and nothing approaching the yellow Manchurian beans [described by Hosie in 1904] in shape nor the larger black."

Many analyses of the percentage, on a dry weight basis, of the oils in soy beans from various countries have been made. "The average of eight analyses of soybeans from China is 19.89. The average of six analyses from Japan is 20.01. The average of six analyses from Java is 21.62. The average of forty-two analyses from Europe is 18.98, being from Germany fourteen analyses with an average of 19.74, from Austria eleven, average 19.44, from Hungary six, average 19.16, from Russia nine, average 17.93, from France two, average 15.40...

Concerning the composition of Indian soy beans, Church, in his *Food Grains of India* (p. 141) stated that they contained: Water 11%, albuminoids [protein] 35.3%, fat 18.9%, starch and sugar 26.0%, fibre 4.2%, and ash 4.6%. "I Presume he had Indian seed but it is not possible to say what race he examined.

"Dr. Leather in 1903 analysed the seeds of seven samples of soy from Japanese seeds cultivated at Manjri, near Poona. The amount of oil in them varied from 14.92 to 23.05 per cent, being on the dry weight 15.97 to 24.41 per cent with an average of 19.99.

"My office is now studying the composition of the seeds of established races in order to see how they compare in oil content with such material as Manchuria exports, or such as Manchurian seed might give in India. At the present time India has not the supply of these beans for an export trade; but possibilities of a certain extent are evident."

"One of the first considerations must be the yield that soy will give per acre in various parts of the country. In British India, in Burma, since the soybean is rarely cultivated alone, no statistics on yields are available. "When the bean in 1885 was grown experimentally at Nagpur from Japanese seed, it yielded at the rate of 180 lbs. per acre [202 kg/ha] (see Report Experimental Farms for that year, p. 5), but later (*vide* Nagpur Experimental Farm Report for 1889-90, p. 5) it yielded but an average of 88 lbs. per acre [98.8 kg/ha] over five years. In Lahore in 1894-95 (*vide* Report on the Government Agri-Horticultural Garden, p. 2) it yielded

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at an estimated rate of 349 lbs. of seed per acre [391.9 kg/ha] and 349 lbs. of fodder, but on a very small area. Its yield was very poor in the next year. The estimated yield in 1898 in an experiment done in Madras was 468 lbs. per acre [525.6 kg/ha]. It has been grown sparingly at Nadiad in Gujarat, and elsewhere in the Bombay Presidency. In the Experimental Far Report, Bombay, for 1901 a big yield was chronicled, but in the next year the crops at Poona and Surat failed. In 1903 the seeds analysed by Dr. Leather, as already reported, were grown near Poona: the yield is not recorded. In 1904 a yield of about 300 lbs. per acre [337 kg/ha] was obtained (Experimental Farms Report, Bombay, p. 70) on light land. One year later nineteen plots were under trial but with unpromising results, for only five yielded seed enough to repay for the cost of cultivation. The yield varied from 50 to 293 lbs. per acre [56.2 to 329 kg/ha], the five promising to be remunerative yielding over 200 lbs. per acre [224.6 kg/ha]. The Manjri (Poona) farm grew 19 plots in 1905-06 with better results, probably as a consequence of better land. Plot No. 3 yielded at the rate of 700 lbs. per acre [786 kg/ha], No. 13 at the rate of 690 lbs. per acre [774 kg/ha], No. 4. at the rate of 650 lbs. per acre [730 kg/ha] and so on. Nearly all the plots gave returns likely to be remunerative. [Note that the size of the plots is unfortunately not indicated.] One year later it was reported by Mr. Fletcher, Deputy Director of Agriculture, Bombay (Annual Report of the Agricultural and Botanic Stations for 1906-07, pages 15-16) that plot No. 5 had yielded on the edge of black soil at the rate of 1,166 lbs. per acre [1,309 kg/ha], while plots numbered 6, 7, 12 and 13 gave, respectively, 513, 650, 575 and 395 lbs. per acre.

"Earlier than this in the United Provinces, many experiments had been done at the Sahranpur Botanic Gardens (*vide* Gollan in Bulletin of the Department of Land Records and Agriculture, No. 21, 1906, pages 27-28). He obtained yields at the rate of 1,124 lbs. per acre and 561 lbs. per acre.

"These experiments have not yet affected the ryots [peasants, tenant farmers]; the crop must be demonstrated very clearly as a paying one before it will do that."

Note 1. This is the earliest document seen (Sept. 2010) concerning soybeans in Lahore. It is not clear whether the Lahore referred to was in today's Pakistan or India. In 1846 Lahore was conquered by British troops and in 1849 placed under British sovereignty. Before 1947 Lahore was a division of the Punjab in British India. In 1947 it was divided, with the Gujranwala, Sheikhupura, and Sialkot, and parts of Gurdaspur and Lahore districts assigned to Pakistan. Ambala and Jullundur districts and the remainders of Gurdaspur and Lahore districts were assigned to India. In 1970 Lahore became the capital of the reconstituted Punjab province.

Note 2. This is the earliest document seen for seen (Sept. 2010) concerning the cultivation of soybeans in Sikkim.

Note 3. This is the earliest document seen for seen (Sept. 2010) that mentions the soybean in connection with the Lepchas of Sikkim, or the Bhutias of Bhutan and Sikkim.

1307. Crowe, E.F. 1909. Japan. Report for the year 1908 on the trade of Japan. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*) No. 4290. 85 p. July.
• ***Summary:*** The section titled "Import of manures" (p. 18) notes that most importers and dealers in manures lost money last year. "The gains were made entirely in ammonium sulphate and bean and cotton-seed cake, all the other lines showing a decrease. Bean cake in particular recorded an enormous advance, from over 5,500,000 piculs [1 picul = 100 kin = 132.27 lb weight] worth 1,780,000*l.* [pounds sterling], to 7,750,000 piculs, worth 2,220,000*l.*

"The fall in the value of silver of course made bean cake look very cheap as compared with other fertilizers, but it will be interesting to see whether the price will not rise considerably in the future as a result of the new development in the recent large shipments of beans from Dairen to Europe.

"As regards oil cake China and Kwantung province supplied nearly the whole quantity, while with sulphate of ammonia the United Kingdom still provided the greater share..."

A table in the section titled "Total volume of trade" shows imports, exports, totals, and differences between imports and exports for the years 1904-1908. It also shows net increases or decreases for various two year comparisons. Address: Commercial Attaché to His Britannic Majesty's Embassy, Tokio [Tokyo].

1308. Hodgson, R.M. 1909. Bean crop of Manchuria: Hints to shipowners as to charterparties for Vladivostok. *Board of Trade Journal* (*London*) 66:423-24. Aug. 26.
• ***Summary:*** The soybean crop in Manchuria is expected to be 20-50% larger than last year's crop. This would mean a total crop of 1,000,000 to 1,400,000 tons. It is being offered at 32 copecks per pood (about 2s. 1d. per cwt). Note: 1 cwt = hundredweight = 112 pounds.

"The export through Vladivostok of the 1908 crop is not yet entirely finished, some 20,000 tons still being stored there for shipment. The amount sent to Europe through Vladivostok so far has been 180,000 tons, and the greater part of this has been for the English market, although one full cargo went to Hamburg [Germany], and various small consignments to Scandinavian ports. The price, at the time of writing, was 72 copecks per pood (4s. 8d. per cwt.) [4 shillings 8 pence per hundredweight] f.o.b. Vladivostok...

"There is every prospect of the bean trade in North Manchuria developing into a complicated and highly speculative business. The industry has created interest in many quarters, with the result that the number of buyers is increasing. American firms have recently entered the market. German firms, in view of the repeal of the duty on beans in Germany, will undoubtedly buy largely; while a well

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known Japanese firm, by far the largest operators till now, are believed to be preparing for export on an even greater scale than hitherto. The tendency promises to be for Chinese merchants to get the business into their own hands, buying from the local producers and selling again to the European firms. At present the practice is for the agents of these last to go into the country and buy with Chinese measurements and money. The business is a very difficult one, and several firms engaging in the business for the first time have bought their experience dearly." Address: British Vice-Consul, Vladivostok [Russia].

1309. *Milling* (*Liverpool*)**.** 1909. A new British industry. Soya beans. Their cultivation and manufacture. Their wonderful food value. Great possibilities. 33(9):290, 292. Aug. 28. Also printed in 1910 as *Soya Beans,* a 27-page booklet by Northern Publishing Co. in Liverpool., Liverpool. Extensively quoted by Sawer 1910 (p. 27) and 1911 (p. 212). [1 ref]

• ***Summary:*** "The firms which first entered the export trade in Soya beans in quantity were Messrs. Nathanson (Russia) and Messrs. Mitsui and Co. (Japan). Several English firms have also entered the trade, and among these must be mentioned Messrs. S. Macgregor and Co., and Messrs. Jardine, Mathieson [Matheson] and Co. We believe that Messrs. [John] Bibby, of Liverpool, were one of the first British importers of Soya beans, that firm having received a considerable quantity last year. It was not until last Spring, however, that consignments arrived in this country in large cargoes. Up the present time the imports in 1909 have been estimated at about 300,000 tons. This is a large total for the first year of general crushing, and shows that the trade is certainly to be largely increased, providing that Manchurian exporters can secure the beans, and of this there does not appear to be any doubt."

The yellow Sakura soybean variety shipped from Dalny appears to be the best quality and commands a price of about 2/6 per ton more than small yellow varieties such as the Harbin variety shipped from Vladivostok or the Hankow variety shipped from Shanghai. "The black Soya bean appears to be the richest in oil, while analysis proves it to contain a large percentage of albuminoids and phosphates.

"The analysis of the ordinary yellow Soya bean, made by Mr. Alfred Smetham, F.I.C., F.C.S., of Brunswick Street, Liverpool, shows an average of about the following constituents:–Water 12 per cent., oil 17 per cent., albuminoids (protein) 38 per cent., carbohydrates 22 per cent., fibre 5 per cent., ash 5 per cent., and sand 1 per cent...

"Mr. Smethan, in a pamphlet he has prepared for the *Annual Journal of the Royal Lancashire Agricultural Society* for 1909, gives a number of analyses of Soya beans, besides the products of oil and flour millers generally. Some of our readers will be interested to learn that the Chinese in Liverpool have regularly imported various kinds of Soya beans, which are sold in the Chinese shops for human food. We understand that the method of cooking them is very similar to the British plan of steeping and boiling dried peas. In China the beans, after having had the oil extracted from them, are used for feeding pigs and cattle, as well as for manuring the land. The beans have long been known in Japan, where they are made into a favourite condiment known by the name of Shoyu, the meal from the beans being mixed with meal from either wheat or barley."

The oil is of a superior kind and finds a ready sale at high prices for a great variety of purposes, including the manufacture of margarine and other edible goods, the manufacture of fine toilet soaps and paint oils. Note 1. This is the earliest document seen (Oct. 2007) concerning the use of soybean oil in margarine.

"We hear that the Japanese are extracting the caseine [casein] from Soya beans, using it as a substitute for milk. It is said that this vegetable milk is produced by extracting the juice. The preparation, according to the *Java Times,* is a very popular drink among the poorer classes of China and Japan. In making the milk the beans are first softened by being soaked and then boiled in water. The liquor is secured by straining and is similar to cow's milk in appearance, but has a different composition, which renders it highly suitable for use in tropical countries...

"The most interesting use to which the bean can be put, from a corn miller's point of view, is the production of flour for bread-making purposes. This has been done by a Hull firm who recommend that the Soya flour be mixed with wheat flour in the proportion of one of the former and four or five of the latter. We have obtained a sample of Soya flour and blended it with white flour. After baking a loaf it was seen that the top broke but the crumb was all that could be desired. The flavour of the loaf was superior to that of average brown bread. The Soya flour cannot be bleached; therefore, it would not be suitable for white bread making. We think that a proportion of Soya flour might be blended into the millers' brown meal with advantage, because of its great food value and its flavour. Further mention is made of Soya beans and flour in our editorial notes.

"Just as we go to press a gentleman called at this office and showed us a Soya bean pod which had been plucked from plants raised in South-West Lancashire [England]. It was fully ripe and contained four beans... Soya beans, he informs us, have been grown before in this country as an experiment though without much success."

Note 2. This is the earliest document seen (Sept. 1999) that mentions Mitsui & Co. (a major Japanese trading company) in connection with soybeans.

1310. *Milling* (*Liverpool*)**.** 1909. Soya beans. 33(9):288-89. Aug. 28.

• ***Summary:*** This article, which precedes by 2 pages a larger article on the subject, is published under seven equal-sized

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heads: Soya beans. A new trade. Empire production. Buyers of soya beans. Food purposes. Brown bread. Wheat gluten. "There is a probability of the import of Soya beans becoming a trade of great importance in this country. For some years a cake, made from the residue left by crushing them for the sake of the oil they contain, has been imported into this country. The first really commercial import of these beans was, we believe, made by a Liverpool firm last year. Their great value, both for oil production and for other purposes, has been known for many years, but it was not until after the Russo-Japanese War that the development of the crops in Manchuria was commenced with a view to an export trade... Since the Spring of this year the import [of Soya beans to England] has been several hundred thousand tons."

Sir Alfred Jones is seeing if soybeans can be grown on the west coast of Africa. An influential commission appointed by the Canadian government visited England and other European countries to find out why Canada had lost a portion of her trade in bacon. It is thought that if farmers in Canada had soya bean meal they would be able to produce a much larger quantity of bacon.

"We mentioned in a recent issue of *Milling* how the beans were being finely desiccated and sold for admixture with wheaten flour. Since that time we have obtained baking samples of the flour which is far superior to that first seen. A loaf of bread was made from four parts of English patent [flour] and one part of Soya flour. The loaf produced was of a very pleasant flavour. It cut quite clean and there was an absence of crumbs... The colour of the loaf was a rich brown and the flavour was very good." The quality of brown bread could probably be greatly improved by the addition of soya flour.

"The albuminoids of wheat are of a very different order from those of most other cereals. They provide the baker with a substance which holds in the gas produced by the yeast and so cause the light loaf of bread in which bakers delight in producing... If we could make the albuminoids of other cereals as elastic and tough as those of wheat, light bread could be made from such as barley, maize, oats and Soya flours."

Note: This is the earliest English-language document seen (Nov. 2013) that uses the term "soya bean meal" to refer to ground, defatted soybeans. Address: England.

1311. *Tropenpflanzer* (*Der*) (*Berlin*)**.** 1909. Die Soja-Bohne [The soybean]. 13(8):388-90. Aug. [2 ref. Ger]

1312. *Manchester Guardian* (*England*)**.** 1909. The Manchurian soya bean: New industries projected. Sept. 10. p. 10.

• ***Summary:*** "Considerable interest has been awakened in commercial quarters by the statements recently published as to the immense possibilities of the Manchurian Soya bean and there is a probability that at Liverpool, if not also on the banks of the Ship Canal, an important new industry will spring up."

Note: The Manchester Ship Canal, opened in May 1894, transformed Manchester from a landlocked city into a major sea port, known as the Port of Manchester.

"The value of the bean has already been recognised in various parts of the world, but it was only in the recent opening of the Manchurian Railway for other than military purposes that revealed the immense trade possibilities connected with it."

"The uses of the bean are manifold. It is said to be excellent in bread; it yields a rich oil, is a capital food for cattle and pigs; and in Japan even milk has been derived from it, and from that milk cheese of various sorts has been made. It forms such a rich food for pigs that it requires to be mixed with plainer fare before being offered to them. Its advantages in this direction were quickly grasped by the enterprising Danish pig-breeders; they bought heavily on the Hamburg market, and the subsequent decline in the imports of Canadian hog products into this country has been attributed, in part at any rate, to the advantages gained by the Danish breeders as a result of the extensive use of the bean.

"The first cargo of the beans to reach this country came in the Myrtledene to Bristol and was consigned to a well-known Liverpool firm of cattle food manufacturers. The bean is now used also for soap-making at Port Sunlight. The Myrtledene's cargo arrived in February last, and since then 200,000 tons have been imported.

"Although firms at Hull and Newcastle-on-Tyne are also moving, a serious attempt is to be made to centre the imports of the bean at Liverpool, with the intention not merely of increasing the shipping trade of the port, but also with a view to establishing a new local industry. The exportable surplus of this year's crop will, it is said, probably exceed a million tons, so that the magnitude and value of the trade is readily appreciated. Several of the most prominent commercial men of Liverpool are interested in the scheme, amongst them Sir Alfred Jones, who contemplates attempting its cultivation in West Africa. He is also interested in the question of its shipment from Vladivostok, and particularly in the erection of special mills at Liverpool to deal with the bean. Efforts are now being made to promote a company to take the matter up, and in a few weeks it will be seen whether these efforts have been successful.

"In the meantime the British Vice Consul at Vladivostok reports that the condition of the coming crop is very favourable,..."

1313. *Toronto Daily Star* (*Canada*)**.** 1909. Beef-eating in Japan: Is on the increase–abandoning rice which is cause of beri-beri. Sept. 10. p. 7.

• ***Summary:*** London, Sept. 11. "The Japanese peasant does not eat much rice; it is too dear. Barley, vegetables, and fish are his staple foods. The upper and middle classes, however,

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who have hitherto eaten large quantities of rice, are now slowly beginning to add meat to their dietary. Beef is the favourite dish. It is cut up small, boiled with a native bean sauce [soy sauce] and vegetables, and eaten with the hashi or chopsticks."

1314. Gordon, E.L.S. 1909. Manchuria. Bean industry: Manufacture of bean cake, oil and soap. *Board of Trade Journal* (*London*) 66:645. Sept. 23. [1 ref]

• ***Summary:*** "It may be well to give a word of advice to those who may be desirous of engaging in the bean trade at Dairen. Most of the beans sent down to Dairen come from the districts north of Mukden, Changchun [probably Ch'ang-ch'un, capital of Kirin province] being the principal market. People will only incur losses if they merely have an office in this port and buy beans in the local market; it will be essential for them to travel in the interior and visit the country markets to make economical purchases."

Bean cake and bean oil: A chemical analysis of bean cake as it is presently prepared shows that it contains 16.9–19.19% water, 9.18–9.76% oily substances, and 40.98–45.00% albuminous substances. "By the present method, using hand presses, the amount of oil extracted from the beans is about 8 per cent. At one mill in Dairen, which is fitted with hydraulic presses, nearly 10 per cent. can be obtained. The quantity of oil in the soya bean is from 16 to 17 per cent., and by improved processes it should be possible to extract practically the whole of this, and still make from the fragments as good a quality of bean cake for fertilising purposes as is made now.

"In 1907 there were at Dairen two large Japanese mills for the manufacture of bean cake, in one of which steam is used as the motive power, while in the other electricity has been adopted, and a few Chinese mills where the old native method has been retained. During 1908 some 17 Chinese factories have been added, and more are in contemplation. The increase is likely to continue, though possibly not to the same extent, for economic reasons...

"The manufacture of soap from bean oil has been tried with good results. The soap is easily soluble in hard water. A cake made in the laboratory at Dairen weighs nearly 2½ ozs. troy, and the cost of manufacture, including wrapping and scenting, is said to be not more than ½*d.* per cake, or 2½*d.* per lb."

Note: This is the earliest document seen (Sept. 2003) which states that hydraulic presses are now being used in Manchuria or China–by one mill at Dairen.

Summarized in the *Indian Trade Journal.* 1909. Oct. 14. p. 45, and in *Tropical Agriculturist.* 1909. Sept. 15. p. 212. Address: Acting British Vice-Consul, Dairen.

1315. *Bulletin of the Imperial Institute* (*London*)*.* 1909. Cultivation and utilisation of the soy bean. 7(3):308-14. Reprinted in the Tropical Agriculturist, Supplement (Jan. 1910, p. 78-79). Summarized in Far Eastern Review, March 1910, p. 489. [3 ref]

• ***Summary:*** Contents: Introduction. Cultivation. Composition of the seeds. Utilisation of the seeds. Considerable expansion was stimulated by the large demand for provisions created by the occupation of North Manchuria by Russian troops during the Russo-Japanese war. After the end of the war and the withdrawal of the troops, the local demand declined and it became necessary to find an outlet for the crops in foreign markets. Much of the staple produce of North Manchuria was exported to Japan through Vladivostok from 1906 to 1908. In 1908 the trade suffered as a result of the depression in Japan. Towards the end of that year, beans and wheat began to be exported to Europe on a large scale. Large quantities of soy beans were imported into the United Kingdom and the Continent.

"The first large cargo of soy beans consigned to the United Kingdom arrived in Hull on the 2nd of March, 1909, and amounted to 5,200 tons. It is stated that before June contracts had been made for the delivery of no less than 200,000 tons. The beans are said to arrive at their destination in perfect condition in spite of the great distance they have to be carried.

"They are classified into three grades: No. 1, shipped at Dalny; No 2, shipped at Vladivostok; and No. 3, shipped at Hankow. The value of grade No. 1 is about £6 8*s.* per ton gross, c.i.f. European port direct, whilst the values of Nos. 2 and 3 are equal and about £6 6*s.* per ton gross, these prices being, of course, subject to the fluctuations of the market." Note 1. This is the earliest record seen (Feb. 2003) concerning soybean grades. Note that the highest grade has the highest value. However, the grade is based on the port from which the soybeans are shipped rather than standards by which the beans from each port can be graded. It is not clear whether the concept of grades originated with the buyers (European oilseed crushers), the shippers (Japanese, probably Mitsubishi), or the sellers (Manchurian merchants).

Most, if not all of the soy beans imported into England are "purchased by the proprietors of oil-mills, who crush the product and thus obtain a quantity of oil, amounting to about 10 per cent. by weight of the seed, and a residual oil-cake proved to be a valuable cattle-food" (p. 309).

The oil was chiefly used in England "for the manufacture of soap and is very well suited for this purpose" (p. 312).

The "oil-cake" that remains after expressing the oil is hard and heavy. Feeding trials comparing this cake with decorticated cotton cake have been conducted at the Cumberland and Westmoreland Farm School at Newton Rigg, and also at the Royal Agricultural College, Cirencester. At Cumberland it was found that cows, when fed the "soy-bean cake," gave more milk than when fed with cotton cake, but the difference was considered insignificant. The proportion of fat in the milk was the same in each case.

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At Cirencester, the experiment showed that the yield of milk was but little affected by the type of cake used. The percentage of fat in the milk was slightly higher from the cows consuming soy-bean cake.

"In view of the importance of the trade in soy beans, it has been considered desirable that attempts should be made to grow the product in other countries than China. The Imperial Institute has already brought the matter to the notice of the Governments of several British Dependencies, and experiments are now in progress in the Cape of Good Hope, Natal [South Africa], the East Africa Protectorate [Kenya] and the Gambia. An effort is also being made to stimulate the cultivation of the soy bean in India" (p. 313-14).

Note 2. This is the earliest document seen (Aug. 2009) concerning soybeans in Gambia or Kenya, or the cultivation of soybeans in Gambia or Kenya. This document contains the earliest date seen for soybeans in Gambia or Kenya, or the cultivation of soybeans in Gambia or Kenya (1909; one of three documents for Gambia).

Tables show: (1) The composition of soybeans grown in India, in China (deduced by Dr. Forbes Watson; with hulls, or dehulled), and in the United States. (2) Four chemical constants for soybean oil and cotton-seed oil: Specific gravity at 15ºC, saponification value, iodine value, and Hehner value.

Note 3. This is also the earliest document seen (May 2001) concerning the use of soy bean oil in soaps. Vladivostok is a seaport city, the capital of Primorski Krai, in the far Eastern Russian Soviet Federated Socialist Republic [i.e. Russian Far East]. It became part of the USSR at the time of the Russian Revolution in about 1917.

1316. Hausser, P.F. 1909. China. Report for the year 1908 on the trade of Swatow. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*) No. 4332. 14 p. Sept.

• ***Summary:*** The section titled "Bean-cakes" (p. 6-7) states: The total importation during 1908 was 3,036,906 cwts. [1 cwt = hundredweight = 112 pounds], valued at 714,200*l.* [Note: 1 *l.* = 1 £]., as compared with 2,199,443 cwts., value 600,415*l.,* in 1907. Owing to exceptionally large purchases made in the spring of 1908 by Japanese merchants in Newchwang and Dalny [Manchuria], prices went up from 1.40 to 1.80 taels per picul, but notwithstanding this advance, importers in Swatow could not get a corresponding increase for their goods. Prices here dropped from 3.30 taels at the beginning of the year to 2.60 taels per picul, and importers suffered heavy loss. Encouraged by the inflated price of sugar obtained at the end of 1908, the planters will probably invest more money in bean-cake for their sugar-cane plantations this year and the consumption will be correspondingly increased."

A table titled "Return of principal articles of native import (net) during the years 1907-08" (p. 12) shows that imports of "Bean cake" were as follows for each year: 1907–2,199,443 cwts / £600,415. 1908–3,036,906 cwts. £714,200. Imports of "Beans" [probably soy] were as follows for each year: 1907–774,414 cwts / £216,828. 1908–1,057,775 cwts. £249,187. Imports of bean cake in 1908 were second largest in value after rice (£753,300). Also gives figures for groundnuts, "oil–bean, castor, ground nut, etc. (lumped together), and three types of opium.

A table of exports (p. 13) shows that sugar (brown and white) was the most valuable export; the imported bean cake was probably used as fertilizer on the sugar cane fields.

Below the table of contents is a table of currency equivalents. Facing that page is a large map of Swatow [pinyin: Shantou; Wade-Giles: Shan-t'ou], including surrounding Canton [pinyin: Guangdong] province, plus neighboring Fokien [Fukien, Fujian] province to the north, and Kiang-Si [pinyin: Jiangxi] province to the northwest. Address: Consul [British].

1317. *Otago Witness* (*New Zealand*)**.** 1909. New Zealand products: Markets in the East. Oct. 6. p. 21.

• ***Summary:*** "(From our own correspondent). London, Aug. 20. Another hint has been received this week of the genesis of a large market for New Zealand products in the East"–where 400 million people are gradually beginning to adopt European practices.

"The head of the cattle-breeding department of the Japanese Government (Mr. Hashimoto) is at present visiting this country [Great Britain] to make purchases of stock.

"'Meat-eating,' said Mr. Hashimoto, is on the increase in Japan. Its popularity is increased by the recently advanced theory that an over-consumption of rice is a source of beri-beri. The Japanese peasant does not eat much rice; it is too dear. Barley, vegetables, and fish are his staple foods. The upper and middle classes, however, who have hitherto eaten large quantities of rice, are now slowly beginning to add meat to their dietary. Beef is the favourite dish. It is cut up small, boiled with a native bean sauce [soy sauce] and vegetables, and eaten with the hashi or chopsticks."

About 10-12 years ago Japan began to import European cattle into Japan to improve their native breeds. "'For ploughing purposes, Japanese farmers invariably use cattle. For this purpose the native breeds are good, but for milk and beef they are poor.'"

1318. Piper, Charles V.; Nielsen, H.T. 1909. Soy beans. *Farmers' Bulletin* (*USDA*) No. 372. 26 p. Oct. 7. Revised in 1916. [10 ref]

• ***Summary:*** Contents: Introduction. Climatic and soil requirements of soy beans. Varieties of soy beans (12): Mammoth (yellow); Hollybrook (yellow); Ito San (yellow); Guelph (green); Buckshot (black); Ogemaw (brown); Wisconsin Black; Wilson (black); Meyer (mottled black and brown); Austin (greenish yellow); Haberlandt (yellow);

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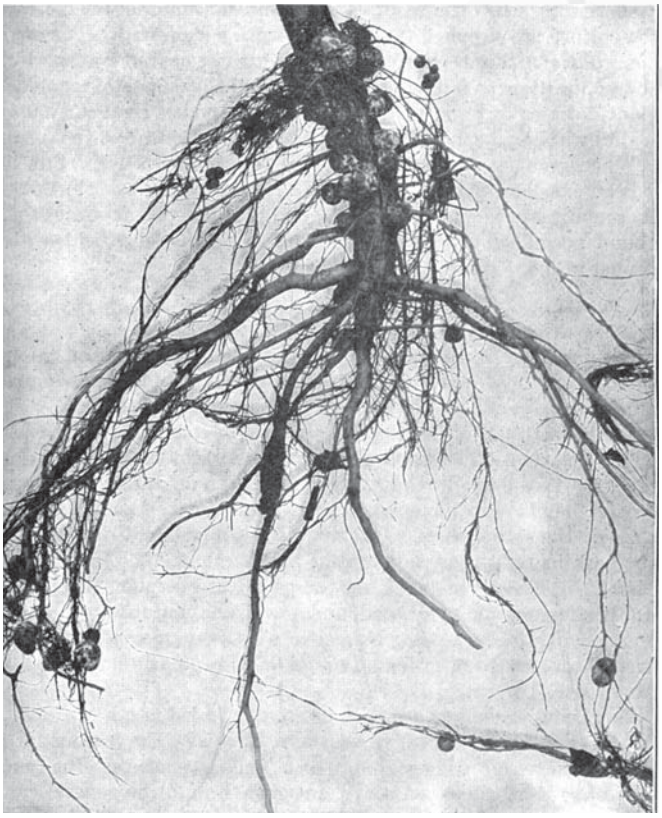

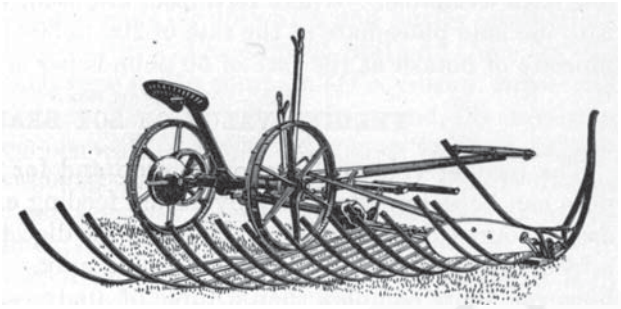

Riceland (black). The culture and planting of soy beans. The inoculation of soy beans. Soy beans for hay: Curing the hay. Soy beans for pasturage. Soy beans in mixture: Soy beans and cowpeas, soy beans and sorgo, soy beans and millet, soy beans and corn. Soy beans for ensilage. Soy beans for grain. Soy beans in rotations. Feeding value of soy beans: Feeding value for sheep, feeding value for dairy cows, feeding value for hogs. Storing soy-bean seed. Comparison of soy-bean grain and cotton-seed meal. Comparison of soy beans and cowpeas. Summary.

The bulletin begins: "The soy bean, also called the 'soja bean' (fig. 1), is a native of southeastern Asia, and has been extensively cultivated in Japan, China, and India since ancient times. Upward of two hundred varieties are grown in these countries, practically every district of which has its own distinct varieties. The beans are there grown almost entirely for human food, being prepared for consumption in many different ways. Their flavor, however, does not commend them to Caucasian appetites and thus far they have found but small favor as human food in either Europe or America.

"As a forage crop, however, soy beans have become of increasing importance in parts of the United States, especially southward. They have been tested at most of the State agricultural experiment stations, and it is clear that their region of maximum importance will be south of the red clover area and in sections where alfalfa can not be grown successfully. They thus compete principally with cowpeas, but as cultivation is usually required they fill a somewhat different agricultural need. Their culture has greatly increased in recent years, especially in Tennessee, North Carolina, Virginia, Maryland, Kentucky, and the southern parts of Illinois and Indiana [though no statistics are given]. It seems certain that the crop will become one of great importance in the regions mentioned and probably over a much wider area. The earlier varieties mature even in Minnesota, Ontario [Canada], and Massachusetts."

"Soy beans are also decidedly drought resistant, much more so than cowpeas, and but for the depredations of rabbits would be a valuable crop for the semiarid West. Rabbits are exceedingly fond of the foliage, and where they are numerous it is nearly useless to plant soy beans unless the field can be inclosed with rabbit-proof fencing."

At the present time seven varieties of soy beans are

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handled by American seedsmen: Mammoth (yellow seeds), Hollybrook (yellow), Ito San (yellow), Guelph (also called Medium Green, Medium Early Green, Large Medium Green), Buckshot (black; a very early variety handled by northern seedsmen), Ogemaw (brown), and Wisconsin Black. A detailed description, with a photo showing the seeds and pods, is given of each. The best of the new varieties, most of which will be available in 1910, are: Wilson (black), Meyer (mottled black and brown), Austin (yellowish green), Haberlandt (yellow; the seed is considerably larger than that of any of the other yellow-seeded varieties), and Riceland (black).

"During the past three years more than two hundred additional varieties have been introduced from China, Japan, and India, most of which have already been sufficiently tested to give some idea of their value. Many of the new varieties are so superior in various respects that they are certain to replace all of the above-named varieties except Mammoth and, perhaps, Ito San."

A table (p. 23) gives a nutritional analysis of seven varieties of soy beans: Austin, Ito San, Kingston, Mammoth, Guelph, Medium Yellow, Samarow.

Illustrations (line drawings) show: (1) A typical soybean plant with leaves, pods, roots and nodules (p. 5, by Boetcher).

(2) A bunching attachment on an ordinary mower for bean harvesting (p. 19). Photos show: (1) A plant of the Mammoth variety of soy bean (p. 6). (2) Seeds and pods of seven varieties of soy beans (full size; p. 8). (3) A man standing in a field of the Mammoth variety of soy bean in North Carolina (p. 9).

(4) Roots of a Mammoth variety of soy bean with characteristic nodules (p. 13).

Note: This is the earliest document seen (Oct. 2013) stating that USDA has tested nearly 200 soy bean varieties during the past three years. Address: 1. Agrostologist in Charge; 2. Scientific Asst. Both: Forage Crop Investigations, USDA Bureau of Plant Industry, Washington, DC.

1319. Edie, E.S. 1909. Cultivation and uses of soya beans. *Liverpool University, Institute of Commercial Research in the Tropics, Bulletin* 1(1):1-7. Oct. 8. [1 ref]

• ***Summary:*** An excellent article. Contents: Introduction. Uses of the soya bean: Forage, hay, ensilage, soya oil, soya milk, a type of cheese made from soymilk [tofu], soya meal [flour]; use of soya bean oil for soap, illumination, paints and other industrial products, soya bean meal used as a fertilizer on Chinese sugar plantations, soya beans as a legume for enriching the soil with nitrogen, planting between rows of maize. Cultivation of soya beans. Varieties of soya beans.

"The Soya bean (*Glycine hispida*) is a native of South-eastern Asia, where it has been cultivated for centuries in China and Japan. It was introduced at a later period into India, and arrived in England towards the end of the eighteenth century. A considerable number of experiments were carried out with the plant were carried out in Austria about thirty years ago, but it is only quite recently that it has become an article of commercial importance in Europe."

After discussing uses as hay and silage: "It is in the bean itself, however, that the chief value of the Soya plant lies. As food for man and domestic animals it is used to a very large extent in the East. In some parts of China the bean forms one of the staple articles of food, and it is cooked much as beans and marrowfat peas are, and also in soups and other forms. The oil is used largely for making salads and sauces, and is also mixed with flour in the manufacture of cakes. Mr. Turner tells me that the Chinese extract casein from the bean, and I have also seen this stated elsewhere.

"A liquid closely resembling cow's milk is prepared from Soya beans in Japan." The process is described. "This condensed product is of considerable value as a food, but it is unsuitable for the use of infants. This "Soya Milk" is also used in the preparation of a kind of cheese" [tofu]. Note: This is the earliest English-language document seen (Aug. 2013) that contains the term "Soya milk."

"Soya bean meal is now use in the manufacture of biscuits, and for mixing with flour for making brown bread in this country. In some parts of the Continent Soya meal is now being used in preference to rye meal for making bread."

"One of the most valuable products of the Soya plant is the oil. As mentioned before, it is used largely for eating purposes in the East, and Mr. Turner tells me that on the Continent a greater percentage of Soya oil than of Copra oil is allowed in the manufacture of margarine.

"Soya oil is largely used for soap making in the East, and I understand that it has recently been tried with very good results in this country also.

"As a considerable proportion of oil is left behind in the cake after expression of the oil, it may be more profitable to extract the oil by solvents such as naphtha and use it all for manufacturing purposes, as extraction by means of naphtha renders the oil unsuitable for edible purposes.

"In the East Soya bean oil is used as an illuminant and also in the manufacture of paints. The oil has a comparatively high iodine value, which is an index of the drying quality of an oil of that class." Note: This is the earliest English-language document seen (March 2008) which states that soy oil can be used in paints (or other coatings) in connection with its iodine number.

Cultivation: "Recently the question of raising this crop in various British colonies has been discussed. In most of the African colonies, including West Africa, the Soya bean would probably be successfully grown, and in rotation with, or along with maize and other crops, its cultivation would be a very profitable investment. I have seen samples of Soya beans at least three years old, which showed no signs of weevilling or deterioration in any way. Cargoes of the beans shipped from Vladivostock [Vladivostok] and Dalny

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to Hull and Liverpool are stated to have arrived in perfect condition."

Varieties: A table (p. 6) gives a nutritional analysis by S.H. Collins of "a sample of Chinese yellow Soya beans." Moisture: 10.23%. Oil 15.62%. Albuminoids 37.54%. Carbohydrates 27.27%. Woody fibre 5.02%. Ash 4.32%.

"I have analysed samples of five distinct varieties of Soya beans, some of which were obtained from the shop of a Chinaman who sells them to the Chinese in Liverpool for food. I do not, of course, know the age of the samples, nor their source..." After describing the shape and color (2 green, 2 brown, 1 black) of each, and noting that No. 4 came from Hong-Kong, he gives a nutritional analysis of each in tabular form, and the weight of 20 seeds of each in grams.

"In conclusion I have to thank Mr. A. Grenville Turner, Grain and Seed Broker, member of the Liverpool Corn Trade Association, for much valuable information regarding the Soya beans and for his kindness in obtaining samples for me. I am also largely indebted to an excellent article on Soya beans in the *Natal Agricultural Journal,* November, 1908.

"Since the above was written I have been enabled, through the kindness of Sir Alfred Jones, to analyse a sample of yellow Soya beans grown in West Africa from seed sent out by him early this summer." A table shows the analysis. Moisture: 10.52%. Oil 17.26%. Albuminoids 36.05%. Carbohydrates 26.16%. Woody fibre 5.39%. Ash 4.62%.

"The results show that in the first season at least the Soya bean underwent no deterioration in West Africa, and the plants also came rapidly to maturity."

Also published in 1909 as a 7-page booklet by C. Tinling & Co., Liverpool. Also published in 1911 Spanish by: Mexico. *Ministerio de Fomento, Colonización e Industria* under the title "Explotación de la soya," by E.S. Edic [sic, Edie]. The last line of the article seems to say that the author is at the central agricultural station (*Estación Agrícola Central*).–San Jacinto [probably in or near Mexico City], January 1911. Address: M.A., B.Sc, Liverpool Univ.

1320. *Economist* (*London*)**.** 1909. Trade and smuggling in Manchuria. Oct. 9. p. 691-92.

• ***Summary:*** "One of the most interesting features of the past year has been the development of Manchuria as an exporting country. An almost negligible quantity prior to the war, Manchuria has thrown some 300,000 to 400,000 tons of field produce into the United Kingdom during the last eight months, representing one and a half to two millions' sterling value.

"The principal article of export is the Soya oil bean. In appearance something like a pea, the Soya bean contains between 16 per cent. and 19 per cent. of oil, and has at once jumped into prominence as a food for cattle. The first steamer cargo left Vladivostock in January last [Jan. 1909], and numbers of large steamers were chartered to load at that port and at Dalny, cheap freights materially helping the business in the early stages. Supplies have continued regular during the season, and even now a large fleet is under charter for the United Kingdom, Liverpool and Hull being the principal consuming centres.

"The Manchurian Railway has benefited considerably by this additional trade activity, and though at intervals during the spring months the resources of the line were severely taxed to deliver the large quantities contracted for to the steamers in port at Dalny and Vladivostock, the authorities have been able to cope with the requirements of the trade with less confusion than might have been expected from such a sudden demand upon their carrying powers. The growing area is not confined to special localities, but may be said to extend to the whole of Manchuria. Harbin is one of the principal concentrating points, and from this town the railway runs south *via* Kirin to Vladivostock, and *via* Mukden to Dalny, both ports having ample accommodation for steamers of 6,000 to 10,000 tons capacity.

"The crop is harvested in November and December, and shipments begin towards the end of the latter month. The old crop continues to come down to port in October, and there is a gap of about two months between the old and the new crops. In the United Kingdom the bean is treated chiefly as an oilseed, being crushed in the crushing mills, the oil extracted, and the residue used as a cattle-feeding cake or in the form of meal, while the farmers also employ the bean, of course without crushing, in various forms for stock feeding. The oil is edible, and has already a large and regular sale at high prices.

"It may be safely anticipated, from the results of the present year, which was really only an experimental one as far as the United Kingdom was concerned, that we shall see increased activity during 1910. Owing to the successful trading of the past year, the area under bean cultivation has been increased by over 20 per cent. The total crop is between 800,000 and 1,000,000 tons, of which China and Japan consume about one-half, while the United Kingdom can now be reckoned upon to take the remainder. The success obtained by the oil crushers and farmers in England during the present season makes it certain that increased quantities will be imported into this country in the future if no large Continental competitors come into the field, and prices remain within the reach of consumers. Heavy import duties on foreign oilseeds both in France and Germany have kept these countries out of the market up to the present, to the advantage of the English manufacturers, who have thus been able to find an outlet for large quantities of the manufactured product, in the shape of beancake and oil, in the North of Europe.

"Nor is the future of Manchuria limited to the cultivation of the Soya bean. Several thousand tons of millet seed have been shipped this year to England for the first time, and in spite of the long voyage–six to eight weeks *via* the Canal and a fortnight more *via* the Cape of Good Hope..."

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"Much harm has been done by the Russian ordinance which lately closed Vladivostock and other Russian ports to the East and along the Amur River, where trade had hitherto been free and unrestricted. Lawful trade is now yielding to illicit trade. Along the frontier marked by the Amur and the Arguna the Chinese have opened up trading stations, selecting sites for them on their own side far from the Russian Customs and Excise posts, which, owing to their small number and to the enormous extent of the border-line between Siberia and China, are quite incapable of exercising any influence over the ever-increasing relations between the Russian and Chinese sides of the boundary. The commodities chiefly traded in by the Chinese are alcohol, vodka, tea, and sugar..." The "smuggling trade has assumed throughout the Amur the character of an organised industry in the hands of the Chinese."

1321. *Indian Trade Journal* (*The*) (*Calcutta*). 1909. The soy bean industry. 15(185):45. Oct. 14. Summarized in Tropical Agriculture (Sept. 1910, p. 212). [2 ref]
• ***Summary:*** This is a reprint of: Gordon, E.L.S. 1909. "Manchuria. Bean industry: Manufacture of bean cake, oil and soap." *Board of Trade Journal* (London) 66:645. Sept. 23.

Note: This is the earliest document seen (Dec. 2005) with the term "soy bean industry" (or "soy-bean industry" or "soya bean industry") in the title.

1322. *Chamber of Commerce Journal* (*London*). 1909. Foreign trade of China in 1908. Special Supplement. Vol. 28. Oct. p. 16-17.
• ***Summary:*** Contents: Introduction. General. Imports: Cotton goods, metals, foodstuffs, etc. (mainly wheat flour, rice, and sugar), other imports. A table shows the value (in Hk tls [Hong Kong taels]) of gross imports into China from the principal foreign countries and British possessions for the years 1907 and 1908. The biggest supplier by far was Hong Kong, however the "imports from Hong Kong came originally from Great Britain, the Continent of Europe, America, Japan, Australasia, India, the Straits, etc., and coast ports of China.

Exports: Total value increased by 12¼ million taels, tea, silk, beans and beancake, firewood, flour, sesamum, tin, provisions, sundry exports (mainly raw cotton).

The subsection titled "Beans and beancake" states: "The trade in beans and beancake attained to figures hitherto undreamt of. Beans were exported abroad to the amount of 4,770,000 piculs, and while they went chiefly to Japan, there were also shipments from Hankow and Dairen, totalling some 500,000 piculs, to England, where it is stated that they were in demand for the manufacture of oil. It seems probable, however, that the English demand for Chinese beans owed much to the combination of bumper crops and low sterling exchange, a combination which does not often occur in the same degree. The largest quantity of beans was shipped from Dairen–1,581,788 piculs–and Suifenho comes next with 1,110,339 piculs. Of beancake, the shipments amounted to 7,380,129 piculs, as compared with 4,182,009 piculs in 1907, Newchwang retaining the first place as a port of shipment, while Dairen takes the second and Suifenho the third."

1323. Gordon, E.L.S. 1909. Report for the year 1908 on the trade and navigation of the port of Dairen (Dalny). *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 4372. 18 p. For the year 1908.
• ***Summary:*** The 1st map shows the "Kwantung Leased Territory" (Dairen consular district), a long peninsula including Dairen and Port Arthur, which are connected by the South Manchuria Railway. A 2nd map, "Sketch map of part of Manchuria," shows the four three railways, plus major cities and towns, crops, and rivers: (1) South Manchuria Railway; (2) Chinese Eastern Railway; and (3) Chinese Imperial Railway.

Currency (p. 3): In ports other than Dairen, dealings with the Chinese are based on taels and copper cash, the amount of cash taken for each tael differing at each port. But "at Dairen, there are no taels or cash. The Chinese Imperial Maritime Customs of course make up their statistics in Haikwan taels, but the business here is all done in Yokohama Specie Bank Newchwang notes known as silver yen..." A table shows the value of Haikwan tael, gold yen, and silver yen in shillings and pence for 1907 and 1908.

Pages 3-4 state that "soya beans which come down from the north are made up in bags, each of which weighs from 185 to 200 lbs. avoirdupois. Bean cakes are reckoned by pieces, weighing nearly 60 lbs. apiece." A table defines the following weights and measures: Chinese: *catty, picul, li, mow.* Japanese: *kin, ken* (*6 shaku*), *ri, tsubo, koku* (liquid and dry), 1 S.M.R. ton (2,000 lb).

The section titled "Possible industries" contains subsection III on "Bean cake and bean oil" (p. 6). A table gives the chemical composition of 3 samples of bean cake. "By the present method, using hand presses, the amount of oil extracted from the beans is about 8 per cent. At one mill in Dairen, which is fitted with hydraulic presses, nearly 10 per cent. can be obtained. The quantity of oil in the soya bean is from 16 to 17 per cent., and by improved processes it should be possible to extract practically the whole of this, and still make from the fragments as good a quality of bean cake for fertilising purposes as is made now."

The section titled "The South Manchuria Railway" states (p. 6-7): The work of broadening the main line of the South Manchuria Railway and its Fushun and Newchwang branches from the 3 feet 6 inches gauge to the standard gauge of 4 feet 8½ inches was completed by the end of April, 1908. A new and improved system of trains was introduced, and a revision of fares and traffic rates, in most

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cases involving a reduction, has been effected. As a result the complaints that were so rife during 1907 are no longer heard, and both traders and passengers seem generally satisfied with the treatment accorded to them. In October express trains composed of Pullman dining and sleeping cars commenced to run between Dairen and Changchun, the northern terminus, twice a week, covering the distance of 437½ miles in 21 hours. This time is to be shortened during 1909 to 18 hours, and no doubt further accelerations will follow and the express run oftener.

"With the completion of the reconstruction of the main line, the work of doubling the tracks between Dairen and Suchiatun, a distance of 238 miles, was commenced, and is to be finished in the autumn of 1909."

The section titled "Exports" contains long subsections on [Soya] "Beans" and Bean cake" (p. 10-13). In the first subsection we read: "Towards the end of 1908 was commenced a trade in beans with the United Kingdom and Europe, which promises to have a great effect on this part of China, and, in view of the great possibilities of this trade, the following, taken from a report which appeared in the local newspapers some little time ago, may prove of interest."

There follows the full-text of a 3-page article on production and exports of soya beans in 1907 and 1908.

The subsection on "Bean cake" states: "In 1907 there were at Dairen two large Japanese mills, in one of which steam is used as the motive power while in the other electricity has been adopted, and a few Chinese mills where the old native method has been retained. During 1908 some 17 Chinese factories have been added, and more are in contemplation. This increase is likely to be sustained, though possibly not in the same proportion. A better price can be obtained for bean cakes made here than for those brought down from the interior, as the latter are apt to get damaged in the course of transportation, and the demand for bean cake as manure in other countries is steadily increasing."

Annex 1 (p. 14) gives the value of imports to Dairen during 1907 and 1908. In 1908 the value of soy [sauce] was £27,431 and of miso was £5,422.

Annex 2 (p. 16) gives the value (in British pounds sterling) of exports from Dairen during 1907 and 1908. [Soy] Beans: £658,135 / 1,000,948. Bean cake: £488,997 / 865,480. Bean oil:–/ £27,284. Address: Mr., Acting Vice-Consul [for Great Britain to Japan].

1324. *Revue Indochinoise.* 1909. Fabrication de l'huile et du tourteau de fève Soja [Production of soy oil and soybean cake]. 11:1046-47. Oct. [Fre]

• ***Summary:*** The extraction of oil from the soybean–*Soja hispida*–which is found in Japan and which is imported to Japan in large quantities from China and Korea, is a very simple operation. The beans are steamed then crushed in mechanical presses; the oil flows out and is collected in reservoirs. It is allowed to stand for a while and is then refined. The result is an oil with a clear yellow color which can be used for the table or for industry. The remaining cake can be used as fertilizer or as a feed for animals.

Total production of the oil is about 700 tonnes per year and the average price is about 20 pounds sterling and 4 shillings per tonne. Up to the present, this oil has been consumed mainly in Japan, however recently it has been exported with success.

Note: This is the earliest French-language document seen (Sept. 2003) with the word *tourteau* or the term *tourteau de fève Soja* in the title, used to refer to soybean cake.

1325. Meyer, Frank N. 1909. Re: Resumé of work as a USDA agricultural explorer. In: Letters of Frank N. Meyer. 4 vols. 1902-1918. Compiled by Bureau of Plant Introduction, USDA. 2444 p. See p. 811-13. Letter of 2 Nov. 1909 from Berlin, Germany.

• ***Summary:*** Meyer filled out this form for USDA as he was passing through Berlin on the way to his second expedition, which started in Russia. "Salary: $1,600 per annum. 1. Education: An ordinary school education up to 14 years of age. After that much private tuition in Foreign languages, in Botany, Drawing (mechanical and landscape), Arithmetic and Measuring, Principles of plant propagation, etc.

"2. Experience: From 14th to 16th years as a pupil in the Botanic Gardens of Amsterdam, from 16th to 23rd year as an gardener and assistant to Prof. Hugo de Vries in his special experimental garden. From 23rd to 25th year as a gardner in commercial nurseries in England, especially having learned the culture of fruits and vegetables under glass and the culture of fruit trees against walls and fences as is practiced in the countries of Northern Europe.

"3. Departmental Service: From October 23, 1901 to August 31, 1902, as a gardener in the Department greenhouses at Washington D.C. Resigned September 1, 1902. September 15, 1902, re-entered Departmental service again in the Plant Improvement Garden at Santa Ana, California. Worked there as a propagator and all-around gardener. Resigned on account of very unsatisfactory conditions at the garden and improper treatment by Mr. P. Pierce, in charge, on April 1, 1903. Worked as head gardener in a carnation and palm nursery in Montecito, California, from April 1903 until March 15, 1904. Made journeys of study in California, Mexico, and Cuba from March 16, 1904, until August 1, 1904. Worked in the St. Louis Botanical Gardens from August 1, 1904 until July 1, 1905, as a propagator of mainly herbaceous plants. Was also member of the Jury on Forestry at the World's Fair in St. Louis during September 1904. Re-entered Department service for the third time on July 10, 1905, as an agricultural explorer. Left Washington, D.C. on July 27, 1905, and returned to the same city July 7, 1908, having visited in these three years parts of Japan, Korea, Eastern and Northern China, Manchuria and

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Eastern Siberia and collected nearly 2000 numbers of various plans and seeds.

"4. Results accomplished: Valuable varieties of Chinese fruits, vegetables, cover crops and ornamental plants introduced. From February 1909 until July 1909 having written his observations on Chinese agri- and horti-culture in a series of four bulletins which are in course of publication.

"5. Special qualifications. These questions can hardly be answered by the undersigned himself."

"8. Value. To be answered by those in charge."

Location: University of California at Davis, Special Collections SB108 A7M49. Address: USDA Plant Explorer.

1326. *Chemical Trade Journal* (*Manchester, England*). 1909. Consular notes: Dairen [Manchuria] (Japan). Bean cake and bean oil. 45(1170):429-30. Nov. 6.

• ***Summary:*** A table gives the composition of three samples of [soy] bean cake made using hand presses. "The quantity of oil in the soya bean is from 16 to 17 per cent." The constituents are: Water. Oily substances (range: 9.18 to 9.76%). Albuminous substances. Carbohydrate. Fibre, vegetable. Ash.

"Soap: The manufacture of soap from [soy] bean oil has been tried with good results. Its chief characteristic is that it is easily soluble in hard water. A cake of the soap made in the laboratory here weighs only 2½ ozs. troy, and the cost of manufacture is said to be not more than ½*d.*, including wrapping and scenting, or at the rate of 2½*d.* per lb."

1327. *Indian Trade Journal* (*The*) (*Calcutta*). 1909. Indian soy beans. 15(189):145-46. Nov. 11. Summarized in Agricultural Journal of India (Calcutta) 5:375 (1910).

• ***Summary:*** "As long ago as 1885 the seed was tentatively grown as a possible food crop by the Agricultural Department at Nagpore; and the annual report of the agricultural stations in the Central Provinces, which has just issued, contains a reference to the cultivation of a small plot and to the absence of a local demand. Other provinces also made some experiments. In those days, the merits of the soy bean as a source of oil were scarcely recognised, and no demand for it on this account existed in western countries. Consequently the cultivator found small profit and the agricultural authorities as little encouragement in their attempts. But the crop was never quite lost sight of..."

Tables show: (1) Analyses of the moisture and oil content of 14 soybean samples grown from seed of Japanese origin at the Manjri Experimental Farm showed that the products are of good quality, with 6 samples containing more than 20% oil. "The crusher to whom the samples were submitted" commented that 11 of the 14 were distinctly good, and those containing more than 20% oil better in this respect than the best Sakura Manchurian beans.

(2) The range of oil content of soy beans grown in five countries or continents, as quoted by the Reporter on Economic Products: China 17.60 to 26.18. Japan 13.36 to 25.55. Java 18.37 to 26.18. Europe 15.16 to 21.89. North America 18.42 to 19.52.

(3) The yields per acre obtained in 1906-07 on various plots at the Manjri Farm averaged 660 lb, with a high of 1,166 lb. Address: India.

1328. *Colonist* (*Nelson, New Zealand*). 1909. News of the day. Nov. 13. p. 2.

• ***Summary:*** "The Japanese have discovered a cheap and good substitute for the milch cow in the form of a tiny bean. The juice, which is extracted by a special process from the bean, is said to be an excellent vegetable milk, the properties of which render it highly suitable for use in tropical countries. The preparation, according to the "Java Times," is obtained from the soya bean, a member of the leguminous family of plants, and a very popular article of food among the poorer classes [sic] of Chinese and Japanese."

1329. *Star* (*Canterbury, New Zealand*). 1909. Brief mention. Nov. 20. p. 4.

• ***Summary:*** "A new industry [sic] has sprung up in Japan in the cultivation of a plant known as the Soja bean, which is indigenous to Central Japan [sic] and Lower Manchuria. About three years ago a trial shipment of this bean was made to England, amounting in all to about 200 tons. Last year the export totalled 80,000 tons, and this year it is expected, 250,000 tons will be shipped.

"The value of this bean lies not only in the quantity of oil of high grade for lighting and lubricating purposes contained, but in the residue after the oil is expressed. This is of a highly nutritious nature, possessing a big percentage of nitrogen, and it is employed in the manufacture of biscuits, I as well as having great value as a fodder for stock."

Note: This article is filled with errors. For example: (1) The soja bean has been cultivated in Japan for at least 1,000 years. (2) It is a native of northeastern China, not of Japan. (3) The nitrogen-rich portion is used almost entirely for livestock feed, and only in tiny amounts for making biscuits.

1330. *Los Angeles Times.* 1909. Activities in the Far East. Nov. 21. p. VIII.

• ***Summary:*** "The Soya bean of China is competing in Europe with American cotton-seed products," according to consular reports.

"Japan proposes, at an expenditure of $50,000,000 gold, during the period of fifteen or twenty years, to develop Hokkaido, or Yezo, the most northern of the main group of Japanese islands, by improving its rivers and harbors, building bridges, roads, etc.

The Shantung Railway of China, owned by a German company, carries a great diversity of products including [soya] beans.

In Japan, rice is the leading crop in size on wet fields,

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followed by "wheat, large beans [soya beans], millet, sweet potatoes, buckwheat, red beans [azuki beans], Indian corn and Irish potatoes."

"Japan has become the principal market for Manchurian products. The price of [soya] beans and bean cake has risen 15 per cent., and Manchurian farmers are enjoying unprecedented prosperity, in spite of the financial depression prevailing in China during the past few years."

1331. *Apotheker Zeitung.* 1909. Das Vorkommen von Urease in hoeheren Pflanzen [Presence of urease in higher plants (Abstract)]. 24(94):886. Nov. 24. [2 ref. Ger]
• ***Summary:*** A German-language summary of the following English-language article: Takeuchi, T. 1909. "On the occurrence of urease in higher plants." *J. of the College of Agriculture, Tokyo Imperial University* 1(1):1-14. June 16.

1332. *Manshu Nichinichi Shinbun* (*Dairen*). 1909. The ubiquitous beans. Nov. 25. Lengthy excerpts given by Rea in Far Eastern Review, 10 March 1910, p. 455-56. *
• ***Summary:*** This is the story of how Mitsui & Co. gained control of the [soya] bean trade in Manchuria and exported the first [soya] beans to England and thus to Europe. "Everybody knows that the 'Ubiquitous Beans,' the 'wealth of Manchuria,' are booming up South and North Manchuria as nothing else has ever even come near to, or is ever likely to do. The credit for ushering this new era into the history of Manchurian trade goes without question to Messrs. Mitsui & Co. How this came about will be a matter of interest to many.

"This firm had, before the War, a branch at Newchwang and engaged in the export of Beans to Japan. They thought of shipping Beans, during the winter season when the northern port is closed by ice, to Port Arthur by the Chinese Eastern Railway and induced the latter to publish the freight tariff in the summer of 1903. This led the Mitsuis to consider it worth while to send Beans from Tiehling then taken by them as the buying centre, to Yingkou by junk down the Liao, and then to Port Arthur by rail. In October they made the first purchase of Beans ever undertaken by Japanese in the interior and in this example were followed by the now bankrupt Tungshengho, the then prosperous Newchwang merchants. Hardly had the Mitsui's two Bean steamers sailed out of Port Arthur with the total cargoes of 45,000 piculs when the first guns of the late War were fired. [Note: 1 picul = 132.27 pounds weight.] During the War, Russia saw fit to include Beans in the contraband list, and this effectually blocked all their outlets to Japan. It happened that neither could herrings enter into Japan from Saghalien way. These circumstances quite upset the fertilizer market in Japan. In the mean time, the far-seeing management of the Mitsuis started a painstaking study concerning the Bean producing centres of the world and were quite satisfied, as the result, of there being no others than Manchuria and Japan save for Asia Minor and Cochin China, which produced something like Beans. This discovery set them thinking more seriously than ever and was directly responsible for their undertaking the pioneer shipment of Beans to Europe.

"About the time the Battle of Liaoyang was being fought the Mitsuis bought up all the Beans to be had about Yingkou and dumped them at a fabulous profit on the short stocked market of Japan. They followed up the track of the victorious Army and also their advantage far into the inland and at once began enquiry into the producing capacity of those regions for Beans. It did not take long before they found out to their satisfaction that the output of Beans in South Manchuria has been ludicrously underestimated and then they immediately cast about for the best market in which to offer them, hitting, with a happy stroke of business foresight, upon Europe as such. No sooner was peace restored in October, 1906, than this firm opened its agencies at Tiehling, Mukden, Changchun, Hsinmintun and Kirin and during the winter of '05-'06, sent out their first trial shipment of Beans and Bean Cake to London. This venture proved a miserable failure because, owing to imperfect packaging, the cargoes deteriorated so badly on the way that all were thrown overboard. A second consignment to Europe of 500 piculs reached there in good condition in the spring last year and met such a favourable reception there that an order for 3,000 tons directly followed and then a string of larger ones in quick succession. The Mitsuis were allowed to reap all by themselves the golden harvest of their own sowing till the end of February this year (1909), when a number of strong foreign firms began to appear on the scene to help foster the Bean trade to what it is to-day."

Note 1. The words "Bean" and "Beans" are used to refer to "Soya Bean" and "Soya Beans" throughout this article. The latter two terms are never used.

Note 2. This periodical began in Oct. 1908 as the English-language column in the *Manshu Nichinichi Shinbun* ("Manchurian Daily Newspaper"). Address: Dairen, Manchuria.

1333. *Economist* (*London*). 1909. Oil and cake manufacture–The Soya oil bean. Dec. 4. p. 1144-45. [1 ref]
• ***Summary:*** "From a correspondent. In a recent issue of the *Economist* attention was drawn to the Soya bean trade in Manchuria, and to the rapid rise of the country as an exporter... During the past season the English oilseed crushers settled down to a highly lucrative trade, and for some months past many of the large mills have set their entire plant running on the crushing of Soya beans, to the exclusion of cottonseed, linseed, and other oleaginous seeds. The supposed shortage of the cotton and flax crops in the United States, and the anticipated shortage of linseed in the Argentine, with the resultant scarcity of cottonseed and linseed products has found the English market comparatively unperturbed, for the reason that Soya oil and cake can supply most of the requirements as well, if not better, while

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the foreigner is debarred from its use by the presence of high tariffs. This new industry supplies a good example of the value to this country of free imports of raw material compared with the protective duties in other countries. The removal or reduction of the duty on the Soya bean on the Continent and in America would be a great blow to our manufacturers,...".

"Large quantities of Soya oil are being shipped from English ports to the American seaboard, and the demand is likely to continue: but the trade has already been so large that it is difficult to buy oil for near delivery. The same oil is also being shipped from Japan and China to the United States, as well as to the North of Europe, and here we have–for the moment at least–the only serious competitors of English crushers. These two Eastern countries, in which the enhanced value of bean products is leading to the introduction of improved European manufacturing systems, are making great strides in the oil crushing industry, and will naturally import increased quantities of beans from Manchuria in proportion to the success which they achieve in the export of the oil.

"The new season has now commenced in earnest, and from December to April and May as many as fifty steamers have been chartered to load beans at Dalny and Vladivostock for English ports, representing something like 300,000 tons of raw material, or about £2,000,000 sterling value. During the whole of last season the sales to Great Britain amounted to 400,000 tons, so that in the month of December, with twelve months to run, we have contracted for a quantity only 100,000 tons short of the total English trade during 1909. While it is being estimated that Great Britain will require in 1910 double the quantity imported in 1909, the news comes that Japan and China will also want increased quantities next year. The crop barely covered the demands of East and West during the past season, so there is probably some justification for the fear that during the coming season there may be difficulty in supplying the extra demands which already appear certain to be made upon a comparatively limited crop.

"In America, although the beans have not yet been imported for the reason given, the Government has been at considerable pains to collect all available information regarding this product, with the object–should negotiations for the removal or reduction of the tariff fail–of planting the seed in those parts of the country which would be suitable for its cultivation. In Wisconsin, Massachusetts, and Tennessee, agricultural experiment stations have taken up the Soya bean, and issued extensive reports to the Department of Agriculture, all highly laudatory of the bean as compared with other animal feeding stuffs, such as cottonseed cake and meal, linseed cake, and maize, which are the principal feeding stuffs of the United States.

"In England, the bean cake is of even greater importance than the oil, representing as it does about 90 per cent. of the raw material. The cake is the residue after crushing, and the analysis compares favourably in oil and albuminous substances with the best decorticated cottonseed cake and meal, large quantities of which have been imported into this country for many years for cattle feeding.

"Owing to the low prices of imported beans, bean cake can be bought to-day at £6 12*s* 6*d* per ton in London, while cottonseed cake imported from America is as dear as £7 10*s* to £7 12*s* 6*d*. In Denmark, a great butter-producing country, some hesitation was shown in regard to the introduction` of the Soya bean, as it was feared lest the taste of the butter might be affected by feeding cows with Soya cake, but experiments have proved the reverse, and Denmark has secured 25,000 to 30,000 tons of beans for shipment from Manchuria during the next few months for crushing and cake-making. In France and Germany the tariffs are sufficiently high to shut out the article. Powerful interests are nevertheless at work in both countries to have the duty removed or reduced, but the removal of a duty is an object the accomplishment of which is invariably difficult, and it is to be hoped, for the sake of the English manufacturers, that some time will elapse before the large European countries are enabled to receive direct shipments from Manchuria free of duty, which would only increase competition for supplies of raw material and result in a limitation of our export of bean products, both cake and oil.

"The bean industry, though old to the East, is new to us, so much so that little is known as yet about the Eastern trade, which is responsible for the consumption of the greater part of the Manchurian crop. Reliable information on this head is eminently useful, not to say indispensable, to the English importer, as without knowledge of the local industry it is impossible to follow intelligently the trend of values, which are chiefly dependent upon the demand from China and Japan. In Manchuria the trade is mainly in the hands of the Chinese and Japanese."

The traditional method of crushing Soya beans to make oil and meal is described.

"This cake is used chiefly as a fertiliser in Japan and Southern China. During the present season these two countries imported about 600,000 tons of beancake from Manchuria for fertilising. -In this connection the following questions have been asked, the answers to which are of importance to the English importer:–(1) In the event of bean prices in the United Kingdom reaching high levels, will Japan and China be able to pay enhanced values, and continue to import beancake as a fertiliser? (2) For the same reason will Japan eventually come to rely on phosphates or other artificial manures? (3) If prices continue high in the United Kingdom, will a large quantity of the beans which at present go to the East in the form of beancake tend to come to Europe, thus increasing the available surplus for Europe? In the first place, the beancake as a fertiliser takes precedence of phosphates in Japan, which raises a valuable rice crop. In that country the beancake is considered an indispensable import. We are indebted to Messrs Mitsui and

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Co., of London, one of the largest shippers of Soya beans to England, for some interesting figures dealing with the import of beancake into Japan over a period of seven years. These figures are of considerable importance, as showing that, on the present level of prices, which is a high one for England, there is no likelihood of the East abstaining from competition with Great Britain for supplies of beans."

"Conditions are rapidly becoming more satisfactory to the native, and fresh producing centres are being opened to trade by the construction of lines connecting with the main routes to Dalny and Vladivostock. On the whole, it maybe confidently anticipated that the cultivation of beans in Manchuria will go on increasing in proportion to the impetus given to trade by broader markets and the provision of adequate railway communication in the interior."

A table (p. 1145) shows the steady growth of imports of beancake into Japan during the last 5 years: 1905–182,000 tons. 1906–258,000 tons. 1907–320,000 tons. 1908–400,000 tons. 1909–600,000 tons.

Note: This is the earliest English-language document seen (Sept. 2006) that contains the term "oleaginous seeds" in connection with the soya bean. Address: From a correspondent.

1334. *London and China Telegraph* (*London*). 1909. The soya bean. 51(2,415):1086. Dec. 6. [1 ref]

• ***Summary:*** "An exhibition of Soya beans and by-products from North China, together with photographs of the Soya bean industry, was held recently at the boardroom of the Manchester Chamber of Commerce. Explanations and full particulars of the industry were given by Mr. Cavendish Evelyn Liardet, lately returned form China.

"At a recent meeting of the committee of the African Trade Section of the Incorporated Chamber of Commerce of Liverpool Mr. A. Grenville Turner delivered an interesting address on the cultivation and uses of the Soya Bean.

"In the course of his address Mr. Turner said that it was estimated that this year's crop of Soya beans is likely to exceed 1,000,000 tons. There were about 20 to 25 varieties of the beans, different in colours, size, and shape. The beans contained about 18 per cent of oil, and it was stated that refined Soya oil fetches to-day a higher price even than refined cottonseed oil. The soya bean, which is an edible bean and can be used in the same manner as marrowfat peas, can be utilised for a number of purposes."

"In America an attempt has recently been made there by certain dealers to place the Soya beans on the market as a new substitute for coffee, and sell it under other names at fancy prices. A sample of coffee specially ground from the Soya bean, at the suggestion of Sir Alfred Jones, was submitted, and created much interest. Mr. Turner stated that according to a recent report issued by the Department of Agriculture of the U.S.A., as Soya beans contain no starch, they have been recommended for food for people suffering from diabetes. Soya bean cake is used as manure on the sugar plantations of Southern China, and on the rush beds, from which Chinese matting is made. Mr. Turner also stated that the Japanese extract casein from the bean from which they make a milk, which is condensed. Cheese is also made from this milk."

Also contains a long summary of information on the uses of soya bean oil and cake published recently: "Cultivation and utilisation of the soy bean." 1909. *Bulletin of the Imperial Institute* (London) 7(3):308-14.

1335. *USDA Bureau of Plant Industry, Inventory.* 1909. Seeds and plants imported during the period from January 1 to March 31, 1909. Nos. 24430 to 25191. No. 18. 73 p. Dec. 24.

• ***Summary:*** Soy bean introductions: *Glycine hispida* (Moench) Maxim.

"24610. From Trenton, Kentucky. Purchased from Mr. S.J. Leavell. Received January 6, 1909. *Trenton.* 'A brown-seeded variety picked out of *Mammoth* by Mr. Leavell in 1904, and in that year 12 plants produced 7 pounds of seed; in 1905 these 7 pounds produced 10 bushels; in 1906 Mr. Leavell reports that with exactly the same treatment it out-yielded *Mammoth* by 50 percent. Seems like a promising variety.'" (H.T. Nielsen).

24641-43. "From Taihoku, Formosa. Presented by Mr. I. Kawakami. Received January 21, 1909. The following seeds:

"24641. Cream-yellow.

"24642. Black, small.

"24643. Black, very small."

24672/24711. "From India. Presented by J. Mollison, esq., M.R.A.C., Inspector-General of Agriculture in India, Nagpur, C.P. Received February 10, 1909. The following seeds (quoted notes by Mr. Mollison; descriptions of varieties by Mr. H.T. Nielsen):

24672-2490.

"24672. *'Rymbai-ktung.* From Khasi Hills, Assam.' Similar to no. 18258a.

"24673. *'Bhatumsh* (red). From Darjeeling, Assam.' Light chocolate color, looks like no. 17852.

"24674. *'Bhatumsh* (yellow). From Darjeeling, Assam.' Straw-yellow with brown hilum.

"24675. *'Bhatwas.* From Safipur, Unao, U.P. [Uttar Pradesh].' Black, small seed about the same size as *Cloud,* but rather more dull in color.

"24676. *'Bhatwas.* From Hasangani, Unao, U.P.' Black, looks like no. 24675, only seeds are shiny like *Cloud.*

"24677. *'Bhatwas.* From Ranjitpurwa, Unao, U.P.' Black, just like no. 24676, only seeds are a trifle smaller.

"24678. *'Chabeni khurti* (spotted variety). From Hardupurwa, Teh Bidhanna, Etawah, U.P.'

"24679. *'Chabeni khurti* (black variety). From Bant, Teh, Sadar, Etawah, U.P.'

"24680. *'Chabeni khurti* (black variety). From Atsu,

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Teh, Auraya, Etawah, U.P.'

"24681. *'Bhatwas* (mixture of spotted and black). From Mainpuri, U.P.'

"24682. *'Kali khurti, Chabeni khurti, Khajwa.* From Mainpuri, U.P.'

"24683. *'Chabeni khurti* (black variety). From Kilerman, Teh, Sadar, Etawah, U.P.'

"24684. *'Chabeni khurti* (black variety). From Amapur, Teh, Kasaganj, Etawah, U.P.'

"24685. *'Chabeni khurti* (black variety). From Aliganj, Etawah, U.P.'

"24686. *'Chabeni khurti Bhundadar* (spotted variety). From Jalesar, Etawah, U.P.'

"24687. *Khajwa or kulti.* From United Provinces.'

"24688. *'Bhatwas.* From Cawnpore [Kanpur], U.P.'

"24689. *Bhatwas.* From Nanbasta, Cawnpore, U.P.'

"The preceding S.P.I. Nos. 24678 to 24679 are black, with small seed, about the size and shape of S.P.I. No. 20410. There is some slight variation in the size of the seed, but the entire lot might easily be taken for the same variety if judged by the seed only.

"24690. *'Bharat Safed.* From Dehra Dun, U.P.' Similar to S.P.I. No. 22901."

24693-24711. Japanese varieties of soy beans grown on Poona Farm, Bombay Presidency.

"24693. Straw-yellow, with rather an indistinct hilum, quite similar to *Manhattan,* S.P.I. No. 17277.

"24694. Straw-yellow, very similar to S.P.I. No. 24693; seeds may be a trifle larger.

"24695. Straw-yellow, seed very similar to *Ito San,* but the brown speck at end of hilum is very faint.

"24696. Just like above, S.P.I. No. 24695.

"24697. Similar to S.P.I. No. 20405.

"24698. Olive-yellow, very similar to No. 20893a.

"24699. Straw-yellow, seed about the size of S.P.I. No. 17269.

"24700. Pale straw-yellow, with a black hilum; seed about the size of *Acme,* S.P.I. No. 14954.

"24701. Dirty olive-yellow, with slate-colored hilum; seed about the size of *Ito San,* but more globular.

"24702. Straw-yellow, with very faint hilum; similar to *Butterball,* S.P.I. No. 17273, but seed rather smaller and not so bright in color.

"24703. *'Oylan Dai Dizen.'* Straw-yellow, very similar to *Okute,* S.P.I. No. 19986.

"24704. *'Gosha Dai Dizen.'* Very similar to S.P.I. No. 24700.

"24705. Light shade of chromium-green, similar in appearance to S.P.I. No. 17857, but the color is not quite the same. Note 1. This is the earliest English-language document seen (Oct. 2004) that uses the term "chromium-green" to describe the color of a soybean.

"24706. Black. Apparently just like our *Buckshot,* S.P.I. No. 17251.

"24707. *'Kuru Maru.'* Apparently just like *Nuttall,* S.P.I. No. 17253.

"24708. *'Sirohaha'* [Shiro-haha = white mother]. Apparently just like *Butterball,* S.P.I. No. 17273. "24709. *'Teppo.'* Citron-yellow, seeds about the size of *Butterball.*

"24710. *'Motonari.'* Seed very similar to S.P.I. Nos. 24700 and 24704, but the hilum is russet in this case.

"24711. *'Rokugatsu.'* Citron-yellow, with very faint hilum, seed about the size and shape of *Mammoth."* 24839-40 Grown at the Arlington Experimental Farm, Virginia, from seed obtained from Dr. S.P. Barchet, Shanghai, China, in 1906. Seed of the following:

"24839. Greenish. Grown in 1908 under temporary numbers 0578 and 0579, which proved to be identical.

"24840. Yellow. Grown in 1908 under temporary number 0580."

25116-25118. "From Pithoragarh, Kumaun District, India. Presented by Miss L.W. Sullivan. Received March 26, 1909.

"25118. *'Bhat dal.'* A small black variety of soybean."

25130-31. "From Knoxville, Tennessee. Grown at the Agricultural Experiment Station. Received through Prof. H.A. Morgan, March 29, 1909. Seeds of each of the following.

"25130. Early brown.

"25131. Medium yellow."

25132/25149. "From Soochow, Kiangsu, China. Presented by Rev. R.A. Haden, B.D. Received March 19, 1909. The following seeds:

25133-25137

"25133. Small yellow. 'Tom Thumb soy. The smallest variety; used only for bean sprouts.' Note 2. This observation, that Chinese prefer very small soybeans for sprouting, is very important.

"25134. Large yellow. 'Mammoth yellow soy. This is the very largest of the yellow soys. Used especially for oil and bean curds.'

"25135. Large green. 'Tea green soy. Sutt variety. May be put to all the uses of soy, but in practice they are only used to make parched Sutt beans eaten as a relish.'

"25136. Large reddish brown. 'Mammoth red soy. Used only for eating in the green state, but may be used for all the soy purposes. This is the largest of all the soys.'

"25137. Looks like *Meyer.* 'Mammoth mottled soy. Used especially for bean curd; said to give a special flavor to this; has also abundant oil qualities."

"25161. Grown at the Arlington Experimental Farm, Virginia, season of 1908, under Agros. No. 0824. Numbered for convenience in recording distribution, March 31, 1909. *Eda.* (?) Original seed from the Indiana Agricultural Experiment Station, where it was grown as *Early Brown.* 'This turned out to be identical with *Ito San* in every particular except color of seed. It is a uniform light brown, while *Ito San* is yellow. Neither superior or inferior to *Ito*

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San.' (H.T. Nielsen.)"

"25138. *Glycine soja:* 'Horse-feed peas, a literal translation of the Chinese. It grows wild over a very large portion of China. In the north peas by the same name, but a different variety, are extensively cultivated. Long vines, climbing on anything in reach; fruited from bottom to top. I think this should receive special attention, for the following reasons: It will be a good nitrogen producer. It is extensively used in Chinese medicine, entering largely into prescriptions taken internally for eye trouble. It will make a better drink than anything except good coffee. Parch until brown the whole pea, grind, and treat as boiled coffee. This I have tried and am very fond of it as a drink.' *Distribution.*- An annual vine, native and cultivated in the eastern part of Asia, extending from Amur and Manchuria through China and eastern India; also in Japan." Address: Washington, DC.

1336. Wildeman, É. de. 1909. Le soja [The soybean]. *Agronomie Tropicale; Organe Mensuel de la Societe d'Etudes d'Agriculture Tropicale* 1(12):195-200. Dec. 25; 2(1&2):5-8. Jan/Feb. 1910. [10 ref. Fre]

• ***Summary:*** An overview of the subject, including a brief history, based largely on a summary of about ten documents. It begins: "For some years now, attention has been drawn to the soybean (*Soja hispida* (Mönch) or *Glycine hispida* (Max.)), which comes from Manchuria; its products are now used in various ways in our daily lives."

"It is not a question of exhausting the question, but as the *Bulletin of the Imperial Institute* of London has already devoted several articles to this plant this year and that the first part of vol. I of the *Liverpool University, Institute of Commercial Research in the Tropics, Bulletin* [Edie, 8 Oct. 1909] is entirely devoted to it, it appeared useful to us to insist here on the soybean which would also have a certain importance for our colonies."

This legume originated in Southeast Asia, and has been cultivated for centuries in China and Japan. It is now abundant throughout Manchuria, where the seeds are widely appreciated for their nutritive value. It was later introduced into the Indies (*l'Inde*) and arrived in England at the end of the 18th century. About 30 years, it was the subject of numerous trials [by Haberlandt and co-workers] in Austria, but is only recently that it has become an article of commercial importance in Europe.

"The occupation of Northern Manchuria by Russian troops, during the Russo-Japanese War, gave rise to numerous demands for this bean, which stimulated the extension of [its] agriculture. After the departure of the troops, the local demand fell naturally, and it was necessary to find an outlet in foreign markets. From 1906 to 1908, a large part of the products of N. Manchuria were exported to Japan via Vladivostok, but in 1908 the economic crisis of Japan diverted a part of these products to Europe, which actually received large quantities of soybeans, especially in England. The first large shipment of soybeans contained 5,200 tonnes (metric tons) and arrived at Hull on 2 March 1909. The beans arrived at the destination in perfect condition despite the distance. They were classed in three categories: 1. Shipped from Dalny; 2. Shipped from Vladivostock; and 3. Shipped from Hankow. The value of those in category No. 1 is about £6 8*s.*/tonne [metric ton]; those in No. 2 and No. 3 is about £6 6*s.*/tonne, these prices being, naturally, subject to the fluctuations of the market. Most imported beans are monopolized by the manufacturers of oil who obtain 10-18% of the weight of the beans in oil. [The remaining] oilcake can be used in the feed of livestock."

There follows a long discussion of soybean cultivation and production, including soils, fertilizers, nitrogen fixation by root nodules, planting, intercropping, yields of forage and seed, use as silage, soil restoration, soybean varieties, tables showing the chemical composition of the plant and seeds showing their excellent nutritional value.

"Until recently, soybean cultivation has been confined to Asia and some states of the USA. Recently, the question of cultivating this plant in the various British colonies has been raised. In most of the colonies of West Africa, the soybean could probably be cultivated with success in rotation or mixed with maize or other crops, and give significant yields."

"In China, Japan, and Indo-China the seeds are used to prepare a sort of milky liquid (*liquide lactescent*) [soymilk] and a sort of cheese" [tofu]. A brief description of each process is given. The milk has considerable nutritional value "but is not suited for infants."

"The flour of soybeans (*La farine de fèves de soja*) is used to make biscuits, and, mixed with wheat flour, is used to make a brown bread; it is sometimes even preferred in this application to rye flour. Since it contains neither sugar nor starch, the soybean has been recommended as the basis of diabetic diets." Address: Prof., School of Horticulture, Vilvoorde, Belgium (Professeur au Cors colonial de l'École d'Horticulture de Vilvorde).

1337. Ker, W.P. 1909. China. Report for the year 1909 on the trade of China. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*) No. 4386. 76 p. Dec. See p. 57-58.

• ***Summary:*** A table (p. 5-6) lists 36 major Chinese [and Manchurian] port cities and 15 provinces in China, and the estimated populations of each. Cities with population of 600,000 or greater are: Canton 900,000, Hankow 820,000, Tientsin 800,000, Shanghai 651,000, Foochow 624,000, Chunking 610,000.

A table (p. 6) lists the estimated foreign population of China during the year 1908: Japanese 44,143, Russian 9,520, British 9,043, German 3,637, American 3,545... Total 77,960.

"Beans. Although Japan is the destination of most of the

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beans and bean cake exported from China, one of the most interesting features of the trade of China in 1908 was the commencement of the export on a large scale of the 'soya' bean of Manchuria direct to Europe. The first season of this trade only began in November, so that the full effect of the new development is not apparent in the customs figures. The port of Dalny, or Dairen as it is now called, is the chief seat of the export for Europe. It is estimated that during the season which began in November, 1908, and closed in June, 1909, over 152,000 tons of beans were shipped from Dairen to Europe, declared mostly for Liverpool, Hull and Bremen. The number of vessels employed for this purpose was 25. During the same period the export of beans from Vladivostock [Vladivostok] is stated to have been over 143,000 tons, of which 65,000 tons were shipped in June. More than half the quantity shipped from Vladivostock went to the United Kingdom. A well-known Japanese firm [Mitsui & Co.] was the first in the field for the export from Dairen, and is said to have made enormous profits, but three or four British firms soon followed and took a considerable share of the business, dispatching perhaps nearly 40 per cent. of the whole quantity. There is great demand in the United Kingdom for seed oil for machinery, soap-making, cooking and other purposes, and I understand that the demand for beans in the United Kingdom was stimulated by a shortage in the supply of cotton seeds from India and Egypt. The efficacy of beans for cattle food has also been proved in the United Kingdom. Excellent crops in Manchuria, low prices in gold for the produce and cheap freights made a combination of circumstances favourable for the trade, such as cannot reasonably be expected to occur frequently, and the purchase of beans in the interior is, I am told, an operation involving no small difficulty and financial risk. However, the prospects for next season's bean trade are, on the whole, bright.

"Hankow [in Hupeh province, on the Yangtze River, 585 miles upstream from Shanghai] also is the outlet of a great bean-producing district, but in its competition for direct export to Europe it is handicapped by a much heavier freight, 1*l.* 15*s.* [*l.* = £] per ton against 19*s.* per ton (rising afterwards to 1*l.* 6*s.*) from Dairen. Moreover, I am informed that some experimental shipments of Yangtse [Yangtze River] beans made in the autumn of 1908 turned out unsuccessful, the beans from the damper climate of Central China, although looking just as good when shipped as Manchurian beans, becoming mouldy on the voyage. An increase in the export of beans is noted also at Chinkiang [Chen-Chiang, in Kiangsu province, on the Yangtze River 43 miles downstream from Nanking].

"Bean cake is exported chiefly from Newchwang. The export there increased from some 4,300,000 cwts. [1 cwt = hundredweight = 112 pounds] in 1907 to some 5,400,000 cwts. in 1908, and in spite of an increasing export from Dairen, Japan took 78 per cent. of this amount, the same as in the two previous years." A table (p. 56-57), titled "Principal Exports from China, chiefly to Asiatic Countries (India excepted)," shows the articles exported (incl. bean cake and beans), averages for the years 1903-07, 1907, 1908, and increases or decreases in 1908 compared with 1907 and the average of 1903-07. For bean cake: Average 1903-07: 3,702,537 cwts. 1907: 4,978,588 cwts. 1909: 9,321,582 cwts. Address: Commercial Attaché to His Majesty's [British] Legation at Peking.

1338. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1909. Soya bean traffic. No. 351. p. 65-67. Dec.

• ***Summary:*** In the section titled "China: Large profits to several concerns handling them," Vice-Consul Gordon Paddock of Harbin, Manchuria, states: "The exports of these beans in the raw state to England was initiated in this district by the Mitsui Company, one of the most important Japanese mercantile concerns, which is said to have made over 1,000,000 yen ($498,000) in this business alone within the last year. More recently, since the beginning of 1909, several British concerns engaged in business in China, have become interested in the export of these beans to England." These include such important concerns as Jardine, Matheson & Co. (Limited), and Samuel Samuel & Co. (Limited) of London. "No large Chinese concern has thus far been interested in the export of these beans from this district."

The section titled "United Kingdom" states: "There is every prospect of the bean trade in North Manchuria developing into a complicated and highly speculative business... American firms have recently entered the market. German firms, in view of the repeal of the duty on beans in Germany, will undoubtedly buy largely; while a well-known Japanese firm, by far the largest operators till now, were believed to be preparing for export on an even larger scale than hitherto. The tendency promises to be for Chinese merchants to get the business into their own hands, buying from the local producers and selling again to the European firms."

The section titled "Liverpool: Experiments in Europe of mixing with flour, etc." states: "Oil millers of Liverpool are disposed to regard the products of the soya bean as additional articles of trade and not as competing to replace the manufactures of cotton seed... The first complete cargo of soya beans that arrived in the United Kingdom reached Liverpool February 14, 1909, and the interest in this new industry has grown apace since then." An expert Liverpool baker, as an experiment, has made a blend of soya flour and wheat flour for use as a "soya dog biscuit... A few German millers are reported to have mixed soya and rye flour in experiments in the making of the blackbread of that country, and local experimenters her [in Liverpool] are experimenting with a blend to improve their own brown bread.

"A vegetable cheese [tofu] is known to be produced

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from the caseine [casein] that the bean contains, but this has not advanced from the experimental to the commercial stage."

It is "stated that one of the large shipowners of Liverpool contemplates the introduction of the soya bean into West Africa, where soil and labor conditions are thought to be particularly favorable to the growth of good crops. This enterprise is cited as a parallel to the British cotton growing movement at its inception, and some measure of the same success is confidently predicted for it.

"Soya Bean Growing for Africa." Consul Horace Lee Washington of Liverpool "reports that several British firms displayed in the Liverpool office of a large shipping concern samples of soya-bean products. These samples are to be sent to the Calabar and Lagos [Nigeria] agricultural exhibitions, in order to encourage the cultivation of these beans in West Africa for transport to Liverpool. The samples consist of edible and crude oil, flour (for bread making), meal, biscuits, oil cake, soap, and a substitute for coffee.

"Russia: High Cost of Transportation Restricts Their Use." Consul Hernando de Sota, of Riga [as of 1994, the capital of Latvia] "writes that high freight rates on shipments from Manchuria to that district will probably prevent it use to any large extent. He says: 'The Manchurian soya bean has until the present date neither been imported into nor exported from the ports of this consular district. Some time ago one of the largest mills in this city purchased from Manchuria a few carloads of the bean for the purpose of making experiments in converting the bean into cake." However "on account of the high cost of transportation over the Siberia road, by which the bean could not be delivered at Riga for less than 1.20 rubles (62 cents) per pood (36 pounds), the business would not be profitable."

Note 1. This is the 2nd earliest document seen (Feb. 2005) concerning soybeans in Latvia. This document contains the earliest date seen for soybeans in Latvia (1909) (one of two documents).

Note 2. This is the earliest document seen (Aug. 2009) concerning soybeans/soya in connection with (but not yet in) Nigeria. Address: Washington, DC.

1339. Togano, Meijiro. 1909. Shôyu moromi-chû no saikin ni tsuite [Studies on the microbes in soya (or shoyu) mash (or moromi)]. *Nogakkai Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 90. p. 1-56. Dec. [Jap]
• ***Summary:*** The Japanese word *moromi,* which is often translated as "mash," is the stage in making soy sauce (it has a consistency resembling apple sauce) before the liquid shoyu (soy sauce) is pressed out, leaving behind the shoyu presscake. Address: Nôgaku-shi, Japan.

1340. Okamoto, Hansiro. 1909-1910. On a new species of Phloeothripidae of Japan. *Transactions of the Sapporo Natural History Society* 3:89-91. [Eng; jap]
• ***Summary:*** "The insect, which I propose to describe below, was first found crawling inside the corolla of a flower of *daizu* (*Glycine hispida* Maxim.) by my friend, Mr. Y. Takahashi of the Hokkaido Agricultural Experiment Station." He then describes *Liothrips glycinicola n. sp.* Note: The author's given name would today be written "Hanshiro." Address: Nôgaku-shi, Sapporo, Hokkaido, Japan.

1341. Imperial Hygienic Laboratories. 1909. Inshoku-butsu narabini shikô-hin bunseki-hyô [Analytical tables of food and luxury items]. *Eisei Shikenjo Hokoku* (*Bulletin of the Imperial Hygienic Sciences*) No. 10. p. 1-78. Miso, see p. 27-28. Shoyu, see p. 28-28. Soymilk, see p. 39-45. [Jap]
• ***Summary:*** Gives a detailed analysis of the nutritional composition of these basic foods, including analyses of various well-known brands, which are clearly specified. The number of products analyzed are: Miso 30 products, shoyu 122, fermented black soybean Chiang (Shoyu shisho) 4, shoyu moromi 2, shoyu presscake (kasu) 1, Thick (noko) shoyu 11, shoyu second generation products and imitation products 16, soymilk (containing only soybeans) 6, other soymilk products 89. Address: Eisei Shikensho (National Institute of Hygienic Science), Tamagawayoga-machi, Setagaya-ku, Tokyo, Japan (in 1962).

1342. Mitsuda, Ryuichi. 1909. Shôyu no tansuikabutsu ni tsuite [On the carbohydrates in shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 4(8):29-40. [Jap]

• ***Summary:*** This influential journal was still being published in 1990. This dynamic illustration, of Japanese men

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apparently pouring moromi into a vat where it will start fermenting, appeared on the cover. Address: Japan.

1343. Yoshimura, Kiyohisa. 1909. Tamari shôyu no seibun ni tsuite [On the chemical composition of tamari shoyu]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 30:43-120. [Jap]
• ***Summary:*** Note: This is the earliest document seen (March 2012) that contains the term *tamari shôyu* in Japanese.

1344. Carson, John M. 1909. Soya bean and products. *Special Consular Report* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) No. 41. Part 5. 35 p. Erroneously numbered Special Consular Reports, Vol. XL.
• ***Summary:*** Contents: Introduction. I. Countries of production. China: Newchang (Varieties of beans and amount produced {in centals [hundredweights; 1 cental = 112 pounds]}, methods of cultivating and harvesting, prices and exports, shipments to Europe–use by natives), Dalny (Manufacture of bean cake and oil, preparing the cake, expressing the oil and wages paid, freight charges to Dalny, exports, stock on hand, and prices), Chefoo (Beans imported for cake manufacture, quantity and value of output, bean vermicelli made by a peculiar process [from the small green bean lü tou {mung bean}], preparation of beans, drying of product and prices [for vermicelli]), Shanghai (Extent of export trade in beans), Shantung (manufacture of bean oil and cake, harvesting and pressing, shipping and prices), Swatow, Tientsin (Exports of raw beans, shipments of bean cake, extent of trade at Tientsin). Tables (p. 5) show prices and exports of soya beans, bean cake and bean oil at Newchang for the years 1905-1908. Japan: Cost of production and prices (of soya beans, quite detailed), imports of beans and cakes, use of the bean as food (shoyu, miso, tofu, koya-tofu, natto, flour), Kobe (Beans as human food {eaten boiled with a little soy [sauce], "made into bean curd, and a kind of sauce made of wheat, beans, and salt"}–small exports {"The total exports of beans, pease, and pulse [incl. soy] in 1908 were valued at $25,971, of which about $24,000 worth went to Hawaii, the United States, and Canada for use by the Japanese residents in those countries as an article of food"}, manufacture of cake), Nagasaki (Production of beans, imports of beans–market prices). Shipments from Vladivostok * [Russia, of soybeans probably grown in Manchuria] (Fluctuations in prices, shipments during present season, immense shipments planned next season (by Mitsui)).

"It is the intention of Mitsui Bussan Kaisha, the largest exporter from this port, to ship about 200,000 tons of beans via Vladivostok during 1909 and about double that quantity via Dalny. Many large contracts have been made for next season, and from present indications a strong effort will be made against the control of Mitsui Bussan Kaisha as the Chinese are making arrangements to deal direct with the European market without the aid of the Japanese" (p. 18).

Tables show: The quantities and value of soya beans, soya-bean cake, and bean oil imported into Japan during the year 1908 (p. 15). The soya bean harvests (in bushels) reported in various Japanese districts (p. 16).

II. Markets. Denmark: Experimental imports made, views of an importer. France: High duties prevent importation of soya beans, soya-bean flour bread used by diabetics, unknown in Calais district. Germany: Danger of feeding cattle on soya-bean products, oil value–prices at Hamburg, comparative food value of the bean. Italy: Beans imported and cultivated in limited quantities, prices of soya products–American cotton-seed oil, not imported into Catania, home products supply Piedmont district. Netherlands: A great future for the soya-bean trade predicted, prices of the bean and bean cake, soya cake as cattle feed, manufacture of soya-bean products begun, English soya-bean cake defective. Norway: Imports of soya-bean meal and cotton-seed meal. Russia: Beans and products unsatisfactory as feeding stuffs. Spain: Soya bean unknown in Valencia district [They are neither cultivated nor imported in this district]. Straits Settlements [Singapore and Malaya]. Sweden: Soya-bean products introduced through England. Comparative value of cattle feed [work by Nils Hansson of Sweden], comparative prices of feed stuffs. Turkey. England: Liverpool (Conversion of the soya bean into cake and meal), Plymouth (Soya cake and meal extensively consumed), Southampton (The bean appreciated as a fattener and as a dairy ration, the soya bean as human food [for use in diabetic diets]). Ireland: Chinese bean products are favorably received, soya bean introduced in Belfast, small imports at Cork. Scotland: Statistics as to use in Dunfermline not available, test of feeding value of soya cake [by Prof. Douglas A. Gilchrist], Edinburgh mills making experiments (based on 1909 report 1909 of U.S. Consul Rufus Fleming from Edinburgh).

III. Competitive American exports. Tables (p. 35) show exports for 1907, 1908, and 1909 of cotton-seed meal, cotton-seed oil, and cottolene, lardine [not defined: presumably shortening made from cottonseed oil], etc. to major countries, especially in Europe.

The Introduction notes: "In compliance with requests from manufacturers of cotton-seed products in the United States, who desired that an investigation be made of the production and use of the soya bean and its manufacturers in the Far East and of the extent to which they compete with American cotton-seed products in the European markets, the reports following have been submitted by consular officers in the various countries concerned...

"The reports of the consular officers have been placed in two groups, the first having to do with the countries that produce the soya bean and the second with the countries that are sought as markets. Statistics as to the imports of soya-bean products in many European countries were

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not available at the time the reports were submitted, but inasmuch as the prices quoted were generally lower than for other seed products, emphasis has been laid on the relative merits of the two classes of goods as shown by experiments and analyses in these countries. These manufacturers will have to work in meeting this new competition."

Note 1. This is the earliest document seen (Dec. 2007) concerning soybean products (oil or meal) in Turkey, Denmark, Ireland, the Middle East, or Sweden (one of two documents); soybeans as such have not yet been reported in any of these countries. This document contains the earliest date seen for soybean products in the Middle East or Turkey (1909).

Note 2. This is the earliest English-language document seen (Nov. 2013) that uses the term "soya-bean flour." Address: Chief of Dep.

1345. Carson, John M. 1909. Soya bean and products: Straits Settlements (Document part). *Special Consular Report* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) No. 41. Part 5. p. 26. Erroneously numbered Special Consular Reports, Vol. XL.

• ***Summary:*** "Vice-Consul-General George E. Chamberlin, of Singapore, reports that the soya bean is not cultivated in that district. As to the imports and the uses to which the beans are put, he writes:

"The beans are imported into Singapore and other ports of this district from China, Japan, and India, principally from the former country, in considerable quantities, and are used for making soya [soy sauce] and bean cheese [tofu], or bean cake–popular articles of food among the natives and Chinese. Practically no beans are exported and no bean cake, all being consumed locally.

"Soya beans in this locality are not made into meal, nor are they used for the same purpose as cotton-seed meal and cake. The present market price is about $2 per picul (133 1/3 pounds) for the white soya bean and $1.75 for the black."

Note 1. The Straits Settlements is a former British Colony on the south and west coast of the Malay Peninsula, including adjacent islands, comprising Singapore, Penang, and Malacca settlements.

Note 2. This is the earliest document seen (May 2010) concerning soybeans in Singapore. This document contains the earliest date seen for soybeans in Singapore (1909). Address: Chief of Dep.

1346. Carson, John M. 1909. Soya bean and products: Japan (Document part). *Special Consular Report* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) No. 41. Part 5. p. 13-16. Erroneously numbered Special Consular Reports, Vol. XL.

• ***Summary:*** Vice-Consul-General E.G. Babbitt of Yokohama writes: "The soya bean, or soja bean, as it is known here (Common Japanese name 'daidzu' [daizu]), is cultivated throughout the Empire of Japan. The total area of cultivation is in the neighborhood of 1,200,000 acres, or about 3.8 per cent of the total area devoted to the cultivation of rice and other cereals and grains. The soya bean is often cultivated, not in fields by itself, but in rows along the edges of rice or wheat fields. These edges are, as a rule, very soft, for they have been previously plowed, and little labor is required in planting... In harvesting the plants are uprooted, and, after being dried in the sun for several days, flails are used to separate the beans from the pods. The flails are of a very primitive type, with bamboo handle and of light weight. Female and child labor is invariably employed in flailing.

"The kinds of fertilizers used differ by districts. In the prefecture of Miyagi, for example, straw ashes and superphosphate of lime are commonly employed, while in the prefecture of Akita wood ashes, superphosphate of lime, and horse dung are used."

The average yield of soybeans in Japan over the past 10 years is 15.30 bushels per acre. For the year 1907 the highest yield is from Ishikawa prefecture, 21.62 bushels/acre, whereas the lowest yield is from Okinawa prefecture (Loochoo Islands, south of Kiushu [Kyushu]), 8.48 bushels/acre. During 1908 huge amounts of soya beans (3.3 million piculs; 1 picul = 132.277 pounds weight) were imported to Japan from China, Kwantung, and Korea, with small amounts coming from Asiatic Russia. Large amounts of soya-bean cake (7.760 million piculs) were imported from China and Kwantung, with small amounts coming from Asiatic Russia and none from Korea. "The total imports of bean oil in 1908 amounted to only 49,993 pounds, valued at $1,325."

"The soya bean is one of the most important articles of food in Japan. The beans are cooked in various ways, while in brewing soy (shoyu), in the manufacture of miso (pea or bean cheese), tofu (bean curd), koya-tofu (frozen bean curd), and natto (steamed beans) they are the chief ingredient. They are also manufactured into flour and make up the principal part of many Japanese sweetmeats. All these foodstuffs are daily used in Japanese homes.

"To a limited extent soya beans are used as horse or cattle food, being sometimes boiled and mixed with straw, barley, bran, etc."

The vice consul of Kobe states that in 1908 Japan produced 18,812,228 bushels of soya beans. Small amounts are exported "to Hawaii, the United States and Canada for use by the Japanese resident in those countries as an article of food." Three factories in the Kobe district make bean cake, largely from imported, lower-cost soya beans. "The beans are first crushed flat, then put into a big container and steamed, after which they are put into a steam press to extract the oil and to be made into cakes. The cakes come in circular pieces, a yard in diameter and an inch thick, each weighing about 50 pounds. The oil is used for lubricating machinery. The cake is used only as a fertilizer and is not fed

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to animals as it causes their hair to fall off."

Note 1. This is the earliest document seen (Feb. 2004) stating that soya bean oil can be used as a lubricant.

Note 2. This is the earliest English-language document seen (April 2013) that uses the term "koya-tofu" to refer to dried-frozen tofu.

Note 3. This is the earliest document seen (Aug. 2011) in *Chemist and Druggist* in which the toxicity of a soy product is discussed or alleged, namely soya cake "is not fed to animals as it causes their hair to fall off." Address: Chief of Dep.

1347. Carson, John M. 1909. Soya bean and products: Shipments from Vladivostok (Document part). *Special Consular Report* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) No. 41. Part 5. p. 17-18. Erroneously numbered Special Consular Reports, Vol. XL.

• ***Summary:*** "Consul Lester Maynard, of Vladivostok, reports that the first important shipments of soya beans to Europe through the port took place about a year ago. The beans are not grown in Siberia, coming to Vladivostok from Manchuria over the Chinese Eastern Railway. The principal distributing centers for beans are Harbin and Kuanchentsi (Japanese name: Changchun) and the area under cultivation is along the South Manchurian Railway and the Chinese Eastern Railway."

Most of the shipping from Vladivostok has been in British bottoms. "Almost two-thirds of the entire crop is shipped through Dalny, a small proportion going through Newchwang and about one-fifth of the crop through Vladivostok. Dalny is the popular port of shipment, due to the fact that it is to 2 days shorter, and there are not the formalities to be gone through that are necessary here."

"The shipments of [soya] beans through this port during the present season, it is estimated, will aggregate 175,932 tons, or about 19½ per cent of the total crop... Nearly all of these shipments have been taken by England."

"Immense shipments planned next season: It is the intention of the Mitsui Bussan Kaisha, the largest exporter from this port, to ship about 200,000 tons of [soya] beans via Vladivostok during 1909 and about double that quantity via Dalny. Many large contracts have been made for next season, and from present indications a strong effort will be made against the control of the Mitsui Bussan Kaisha, as the Chinese are making arrangements to deal direct with the European market without the aid of the Japanese."

Note: This is the earliest document seen (June 2007) that mentions the South Manchuria Railway in connection with soybeans (one of two documents). Address: Chief of Dep.

1348. Carson, John M. 1909. Soya bean and products: Dalny (Document part). *Special Consular Report* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) No. 41. Part 5. p. 6-8. Erroneously numbered Special Consular Reports, Vol. XL.

• ***Summary:*** Contents: Manufacture of bean cake and oil. Preparing the cake. Expressing the oil and wages paid. Freight charges to Dalny. Exports, stock on hand, and price.

"The manufacture of soya-bean products in Dalny is described in the following report by Vice-Consul A.A. Williamson, who also submits a statement of exports from that port and prevailing prices:

"The most up-to-date mill in Dalny at present is the Nisshin Bean Oil Mill of the Okura Gumi. It is the only one using presses run by steam; all the others apply pressure to the cake by hand screws or by driving wedges with heavy stone mallets suspended from the roof of the mill. A sketch of this bean-oil mill is submitted herewith. [On file in the Bureau of Manufactures.]"

There follows a long and detailed description of the process used at the Nisshin mill. "The first step in the process is to clean the beans of dust and dirt by an ordinary fanning system." Note 1. This is the earliest English-language document seen (Nov. 2006) that uses the word "fanning" or the term "fanning system" in connection with cleaning soybeans.

Warm the beans in the cleaning rooms, especially in winter, to increase their oil-giving properties. Run the beans along wooden troughs into roller machines, where they are crushed between an upper and lower roller, until each bean is the shape of a dime. Transport the crushed beans in an iron-lined trough using an Archimedian screw to an inclosed endless chain and bucket system. Scoop them into baskets, weigh them, and take them to a steamer, "which is a square, box-like arrangement of brick, whose wooden top has a circular opening some 4 feet in diameter, the sides being closed in with brick. A workman takes a heavy, loosely woven cloth, like ordinary gunny sacking, and spreads it over the circular opening. Another workman dumps the mashed and weighed beans onto this cloth. The first worker spreads them evenly, at the same time opening the steam-valve lever with his foot. The steam, which enters the box with 30 pounds pressure, penetrates the mass, softening and cooking the beans for about 1 minute."

Preparing the cake: Dump the steamed beans "into the waiting form, which is made of two iron hoops, 1¼ inches wide and forming a 23-inch diameter circle, laid one on the other. Above these a wider wooden hoop is laid. Across all three two bundles of grass (*Carex dispalatha,* Boott), which comes from China, are spread, fan shape." After spreading the coarse grass, thus forming the bottom of the form, set a thin wooden hoop about 15 to 18 inches wide, down inside the iron hoops on top of the spread grass. Dump the steaming hot beans into this receptacle. "A workman jumps in, his feet encased in large leather brogans, and tramps down the mass. Then he raises the iron hoops, the lower one about 1 inch, the upper one an inch or so higher. He then swiftly withdraws the retaining wooden hoop and casts it aside. The beans are

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now held in form by the grass bottom and grass sides, bound by two iron hoops." Two iron rods are laid across to keep the free ends of the grass in place.

"Expressing the oil and wages paid: All this has been done on an iron plate laid on the floor. This plate is carried to a small press, where it is tilted and the grass-bound cake slides into the bed of the hand press. A few turns of the screw causes a pressure of about 5 tons, under which the cake remains only long enough for another to be made ready. Then it is carried to the steam power press, which works simultaneously up stairs and down, and holds altogether about 100 cakes. As soon as it is full, pressure is applied, and gradually the bottom of the press rises until a pressure of 50 tons is reached. The oil now begins to flow, coming out in streams and falling into troughs at the base of the press. After 10 minutes the pressure is increased to 130 tons and the beans are allowed to stand for 2 hours.

"Meanwhile the oil runs into a small receiving tank, from which it is pumped into the large tanks of a special building. After 2 hours have elapsed the beans cease to emit oil, the pressure is removed, and the bean cakes thrown onto the floor. They are then stripped of the grass covering, the retaining iron hoops first being loosened with a peavy-like tool [resembling a lumberman's lever that has a pivoting hooked arm and metal spike at one end], and the edges trimmed with drawknives. They are now ready for weighing and storing. Those under proper weight (46 kin = 61.33 pounds) are sold at a reduced weight; excessive weight brings no increase in price. The oil is sold after being refined.

"This mill has four presses, each of which works independent of the others. With three crews of men, the work is kept up for 24 continuous hours, and the daily output is 4,000 cakes. Sixty-four pounds of beans give 5.33 pounds of oil and 61.33 pounds of cake. The laborers are all Chinese, only one or two overseers being Japanese. The ordinary coolie receives 30 cents per day, the scale rising according to the steps above the coolie. In this mill the hands share in excess of profits on an increase over a stated output per day, hence they work almost frantically [incentive system]. The finished bean cake measures a trifle less than 23 inches in diameter, 3.625 inches thick, and weighs 61.33 pounds."

Freight charges are given from several stations to Dalny on beans and bean cake per ton, by the carload. The stations are Mukden ($1.85), Hsinchengtzu, Shuangmiaotzu, Hsingtaitzu, Tieling, Kaiyuan, Chengtu, Fushun. Loading charges into ships per ton: Beans 12 cents; bean cake 13 cents; extra stevedore 7½ cents. Other small charges include storage and wharfage after 10 days, transfer charges on the wharf, export duty, rebagging if necessary, etc. "The silver yen at present rate of exchange is about 44 cents American currency."

Note 2. This is the earliest published document seen (Jan. 2014) that mentions Nisshin (a major Japanese soybean crusher), in connection with soybeans. Address: Chief of Dep.

1349. Kita, Gen-itsu. 1909. Shôyu jôzô ni kansuru kenkyû. I and II. [Studies on shoyu brewing. I and II.]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 12:1-24; 12:399-428. II. Application of natto microorganisms. [Jap]

• ***Summary:*** Part I is titled "Shoyu moromi and shoyu presscake" Address: Kôgaku-shi, Japan.

1350. Lewkowitsch, Julius. 1909. Chemical technology and analysis of oils, fats, and waxes. 4th ed. Entirely rewritten and enlarged. 3 vols. London: Macmillan and Co., Ltd. See vol. II, p. 122-24. [7 ref]

• ***Summary:*** The section titled "Soja bean oil (Soy-bean oil, Bean oil, Chinese bean oil)" (Vol. II, p. 122-24) gives details about the soja bean, which is indigenous to China, Manchuria, Korea, Japan, Formosa, and Indo-China. The soja bean industry is one of the most important in Manchuria and Japan. In Manchuria, the expressed meal is made into bean cakes (*Téou-fou-tcha*) which are exported in large numbers. The Japanese make shoyu and miso from soja beans. "Efforts have been made to ship soja beans to Europe, but on account of the deterioration which they undergo on the long voyage, as also on account of the difficulty of disposing of the cakes, attempts in this direction have been abandoned." Two tables give physical and chemical characteristics based on the investigations of: (1) Morawski and Stingl; (2) De Negri and Fabris; (3) Shukoff (from seed grown in an experimental station in South Russia); (4) Lane (who found 80.26% of liquid fatty acids).

Vol. II also discusses many other major and minor oils including: Linseed oil (p. 39-60), hemp seed oil (p. 76-77), sesamé oil (beniseed oil, gingelli oil, teel oil, p. 167-79), almond oil (p. 233-40), and arachis oil (peanut oil, earthnut oil, ground nut oil, p. 244).

Julius Lewkowitsch lived 1857-1913. Address: Ph.D., M.A., F.I.C., Consulting and analytical chemist, and chemical engineer, examiner in "soap manufacture" and in "fats and oils" to the City and Guilds of London Inst.

1351. Lloyd, Arthur. 1909. Every-day Japan. London, New York, Toronto and Melbourne: Cassell and Co., Ltd. xvi + 381 p. See p. 121, 124, 188. Introduction by Count Hayashi. Illust. Index. 24 cm. With 8 color plates and 96 reproductions from photographs.

• ***Summary:*** On the title page: "Written after twenty-five years' residence and work in Japan."

Chapter 22, "Life in a tea, silk, saké or shoyu district," states (p. 121): "As a striking contrast to the general poverty of appearance of districts purely agricultural–i.e. devoted to the cultivation of rice and other cereals–we have the general aspect of those districts in which tea is the principal product, where silkworms are cultivated, or saké and soy

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manufactured. In these districts–known as "Shoyu" districts–there is a far larger amount of wealth, and the general standard of comfort in all classes is much higher."

Continuing on p. 124: "Saké and soy [sauce] (the latter the foundation of our Worcestershire sauce) are old-established industries which have generally been carried on by the same families for generations." Soy is mentioned briefly on p. 128.

Chapter 35, "Sights and cries in Tokyo streets," states (p. 188-89): The first sounds he hears in the morning are those from a Buddhist temple. "Domestic life begins at a somewhat later hour, but in the streets I can already hear the cry of "Natto, na–tto–!" which tells me that the poor are beginning to bestir themselves. Natto is a concoction of beans which have been kept until they are beginning to go bad. It is said to have a rich tasty flavour, and to be very popular with some sections of the community. It is essentially a poor man's dish. By the time the natto sellers have done their business, other itinerant vendors have begun their rounds." Address: M.A., Lecturer in the Imperial Univ., Higher Naval College and Higher Commercial School, Tokyo. Formerly Fellow of Peterhouse [UK].

1352. Maurel, Edouard César Emile. 1909. Traité de l'alimentation et de la nutrition à létat normal et pathologique. Vol. 3 [Treatise on food and nutrition in normal and diseased conditions. Vol. 3]. Paris: O. Doin, Éditeur. xii + 685 p. Index (in vol. 4). 25 cm. [Fre]

• ***Summary:*** The last entry in the section on "Legumes," titled "Soy peas or beans" (*Pois ou fèves de Soja / Soya*), states: In order to be complete, to the preceding dried legumes I add the soybean, used here only as a therapeutic agent, but whose consumption in China and especially in Japan is considerable.

Its use in food is, moreover, completely justified by its great nutritive value. Here are some analyses of its nutritional composition: A table (p. 495) gives 6 analyses by three authors (each of whom cites other researchers) as follows: Balland (Gautier): maximum, minimum, mean. König (Siderski): black or yellow soybeans. König (Siderski): soy flour.

As you see, despite their great nutritive value, all the other legumes remain below that of the soybean. It contains more than 30% protein and 400 calories per 100 gm. It must be added that no other legume is as rich in minerals, for soy always contains at least 4%.

This legume, known in Japan by the name of *daidzou* [*daizu*], can be made into a cheese, tofu (*tôfou,*) and above all the national sauce, shoyu (*shôyou*) and miso. These three substances result from fermentation, but under different conditions.

Japanese miso is a venerable food; it's the *tao-tzung* of the Chinese. It is made of crushed soybeans, boiled and mixed with rice or wheat koji, then submitted to fermentation. Miso consumption in Japan is 30 million kg.

Tofu is also used frequently but less than the preceding [miso], and much less than soy sauce which constitutes the universal seasoning. The consumption of this last would be, in fact, 5.5 liters per inhabitant.

Discussed in this section are: Dry beans (*haricots secs;* [*Phaseolus vulgaris*]), lentils, peas or round peas (*pois ronds* [Pisum sativum]), square peas (*pois carrés;* probably winged beans {*Psophocarpus tetragonolobus*}, or flat pea / Lathyrus pea / chickly vetch {*Lathyrus sativus*}, or *Pisum sativum medullare*), chickpeas (*pois chiches*), and dry [broad] beans (*fèves sèches;* [probably *Vicia faba*], broad beans). Address: M.D., principal physician for the Naval Reserves, Prof. at the Faculty of Medicine, Toulouse (Médecin principal de réserve de la Marine).

1353. Piper, C.V. 1909. The search for new leguminous forage crops. *Yearbook of the U.S. Department of Agriculture* p. 245-60. For the year 1908. See p. 248, 257.

• ***Summary:*** The section titled "Soy beans" (p. 257) states: "Recent explorations in China and extensive correspondence with missionaries and others have yielded during the past few years a very large number of varieties of soy beans. Fully 200 distinct varieties have now been obtained, showing a diversity of growth and of possible value wholly unsuspected. Previous to these investigations only 5 or 6 varieties were known to American agriculture. The rapidly increasing prominence of the soy bean, especially in the Southern States, makes it important to secure the very best varieties. It is a curious fact that the variety most widely grown in the United States, the Mammoth, which was introduced at least thirty years ago, has never again been obtained. It is equally strange that of the other numerous new varieties obtained, nearly all of them, except certain Japanese varieties, have been secured in only a single locality. The truth is that throughout most of the Chinese Empire every variety is grown locally. Mr. F.N. Meyer, who has traveled widely in China, states that this extreme localization of these varieties is a very striking fact in Chinese agriculture, due, as he thinks, to the fact that for ages every Chinese farmer has grown his own seed, and there has been little or no exchange of seeds from province to province. It would therefore appear likely that numerous other varieties yet remain to be obtained."

"Among the new varieties of soy beans are some from far north in Manchuria and Siberia, which mature in seventy to eighty days, and others from southern China that are so late that they scarcely mature in our warmest States. Several of these new varieties in the trials thus far conducted promise to be decidedly superior to the Mammoth variety.

"Especially valuable are the Riceland soy beans, grown by the Chinese in rotation with rice. These varieties are very distinct from others and on account of their numerous slender stems, large size, and leafiness make hay of unusually fine

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quality.

"While at the present time soy beans are most important in the Southern and Middle Southern States, they will doubtless in time become of great value in the arid regions on account of their marked drought resistance. Unfortunately, rabbits are extremely fond of soy beans, causing so much destruction that it is practically impossible to grow this crop where these animals abound, as is still the case throughout our semiarid regions."

Soy beans are also mentioned briefly on p. 248. There are long sections on the "Florida velvet bean" (p. 247-49), "Kudzu" (p. 249-51, with a photo facing p. 48 of "A patch of kudzu (*Pueraria thunbergiana*) growing at Washington, DC"), "Adzuki bean" (p. 253-54, with two photos, plate xi, of a "Field of adzuki beans (*Phaseolus angularis*) grown at Arlington Farm, Virginia, in 1908)," "Cowpea" (p. 254-56), "Bonavist bean or hyacinth bean (*Dolichos lablab*)" (plate XII, p. 258), "Bur clovers" (p. 259-60) and "Vetches" (p. 260; many species of *Vicia;* common vetch, hairy vetch, scarlet vetch, black-purple vetch, woolly pod vetch).

Note: This is the earliest English-language document seen (June 2008) that uses the term "bonavist bean" to refer to *Dolichos lablab.* Address: Agrostologist in Charge of Forage Crop Investigations, Bureau of Plant Industry [USDA].

1354. Saito, Kendo. 1909. Tôyô-san yûyô hakkôkin [Useful fermentation microorganisms from East Asia]. Tokyo: Hakubunkan. 200 p. See p. 14-17, 108-09, 122-25, 144-47, 162-64. [Jap]

• ***Summary:*** This book contains a little information about *Rhizopus oligosporus,* onchom, and miso or *Tao-Tjiung* [probably *doujiang*]. Address: Botanical Inst., Tokyo Univ., Japan.

1355. Saito, K. 1909. Shôyu jôzô jô ni okeru biseibutsugaku-teki kenkyû [Microbial investigation of shoyu brewing]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 4(4):99-101. See p. 101. Part of his doctoral dissertation, in German. [Jap]

• ***Summary:*** Two illustrations (line drawings) show the equipment. Address: Japan.

1356. Smethan, Alfred. 1909. Some new feeding stuffs and their relative value as cattle foods. *Royal Lancashire Agricultural Society, Journal.* p. 28-45. For the year 1909. See p. 29-32, 41.

• ***Summary:*** The section titled "Soya Beans or China Oil Beans" (p. 29-32) begins: "Most notable, perhaps, of the new foods is the Soya Bean, which has come meteor-like into this country in large quantities during the last year or so."

"What circumstances or combination of events have made it possible at this particular period for merchants to ship the vast quantities of the Beans which have recently reached these shores I have not been able to discover, but it seems to me that the chief factor is to be found in the development of Manchuria by the Japanese as the result of the Russo-Japanese war. It is said that during the campaign Soya Beans entered largely into the dietary of the Japanese army, and, doubtless, during the progress of the war the Japanese became familiarised with the Bean-producing districts, and the exportation of the surplus supplies is the result. Be that as it may, the fact remains that up to the end of next August, so I am informed on very good authority, the estimated sales in the United Kingdom of the Soya Oil Beans may be roughly estimated at 250,000 tons. What the future is likely to be is uncertain, but from conversations I have had with those who have studied the subject, the general impression seems to be that they 'have come to stay,' and that in the near future at all events the Beans, either whole or crushed into cake, will have to be reckoned with as a serious competitor of the better known and more generally used feeding stuffs."

"The direct shipments of Soya Bean Cake–or, as it has been hitherto more commonly called, China Bean Cake–from the East, have so far been spasmodic and small in extent, and owing to the 'heated' condition in which they have arrived, have not been, I should say, a commercial success, on account of the relatively low price realized."

A table titled "Composition of soya bean cake and meal" (p. 32) includes the composition of "China bean cake (imported), Soya bean meal, Soya bean cake, Chinese bean cake (rolled or crushed), and Manchurian bean cake."

Soy is also mentioned in the "Appendix" (p. 39-45), a long table that gives the composition of many feeds: Soya beans, Soya bean cake, Soya bean meal (p. 41). Also includes (p. 44-45): Sesame cake, Benniseed (sesame) cake, Til seed (sesame) cake, Ground nut cake (earth nut), Gingelly and Niger seed cake, Pea nut cake (American), Sago flour, Hemp seed cake. Address: The Society's consulting agricultural chemist.

1357. Thomson, John Stuart. 1909. The Chinese. Indianapolis, Indiana: The Bobbs-Merrill Company. 441 p. Illust. (photos). Index. 22 cm.

• ***Summary:*** Page 118: "Eggs are preserved in a paste of saltpetre, soy [sauce] and earth for periods so long that they are blackened with their sulphur, and taste like our high school boy's experiment in sulphurated hydrogen. In Che-kiang Province hams are pickled in soy sauce."

Page 120: "Cassia, mushrooms,... carambola fruit, almond custard, orange wine, steamed sharks' fins, chicken cooked with rice wine, ginger, soy [sauce], sesamum, peanut oil and herbs,–are all drawn upon by these versatile cooks in preparing their menus, especially when a foreigner is to be invited."

Page 300: "The South Manchurian Railway route, now dominated by the selfish Japanese."

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Page 319: In Kowloon, "across the bay from Hong-Kong, is situated a village of soy-makers." "Behind the bamboo fences you will notice the bean poles, and the great earthenware pots, where the bean liquor is fermented, and stirred for two months in the blazing sun until it is black. The beans are skinned and made into a flour, into which gypsum is mixed. Salt and secret things are added to make this appetizing soy, which those who have learned the taste prefer to the flavored Worcestershire, of which it is the base. The soy costs only a trifle, and the workman who earns only ten cents a day will have it at his meal. The wealthy are equally proud of their national 'abettor of appetite.'" Note: Gypsum is used in making tofu, not soy sauce.

Page 408: "On the railway which the war gave her in Southern Manchuria, Japan is seeking a loan of $150,000,000, which will be reloaned to finance these Government-Baronial Development Companies. The railway is to be broad-gaged so as to exchange traffic with the Chinese railways coming from the south and west, rather than to look for trade with the broader gaged Siberian Railway at Kwang Chau Fu. Exclusive of the revenue from military transport the South Manchuria Railway is already earning $3,000,000 gold a year, or nineteen dollars gold a mile per day. The operating expenses are forty-five per cent. China is fighting Japan bitterly to parallel with the Fakumen Railway the Japanese South Manchurian Railway from the Russian railways down past Mukden to tidewater in Liaotung Gulf."

"Another knotty problem for the future in Manchuria is the question of taxation in the railroad zone. The Russians control the largest part of the Chinese Eastern Railway. The Japanese own as a war legacy the South Manchurian Railway. Now, if the Americans, British and French have a right to levy taxes in the settlements of Shanghai, Tientsin, etc., why have not the Russians and Japanese the same right in the railroad zones in Manchuria?"

Page 411: "On exports to Manchuria, the subsidized steamship lines, which so far are in private control, have been compelled by the [Japanese] government to reduce rates fifty per cent. During the first year after the war the government charged on its Manchurian Railway half rates on Japanese goods, which alone came duty and likin free through Tairen (Dalny), on the flimsy pretext that Russia, which is not a manufacturing nation at all, had no custom-houses on the Manchurian border."

Note: A "likin" is a former Chinese provincial tax at inland stations on imports or articles in transit.

1358. Walters, J.D. 1909. Prof. C.C. Georgeson (Document part). In: J.D. Walters. History of the Kansas State Agricultural College. 1909. Manhattan, Kansas: Printed by Printing Dep. of the Kansas State Agricultural College. 226 p. See p. 98-99. Illust. 25 cm.

• ***Summary:*** "Prof. Chas. C. Georgeson, M.Sc., chair of agriculture, came to this country from Denmark when a youth. He began his work as a gardener and general horticulturist, passing his apprenticeship in this line in his native land. A year after he landed he entered the Michigan Agricultural College, from which he graduated in 1878. He was at once offered the position as assistant editor of the *Rural New Yorker,* published in New York City. That position he held for two years. In the Fall of 1880 he was chosen professor of agriculture in Tokio, which he accepted. He remained in Japan nearly four years and returned to the United States in the Fall of 1889. Shortly after his return he was invited to take the position of professor of agriculture in the Kansas State Agricultural College. Shortly after his return he was invited to take the position of professor of agriculture in the Kansas State Agricultural College. He accepted the offer in January, 1890, and remained here nearly eight years, till September, 1897.

"Professor Georgeson's work in Kansas is well known to the farmers of the State. The experiment stations maintained by the national government had just been fairly started when he came to Kansas and his work in that line at Manhattan may be traced through the thirty bulletins which he wrote while here. Experiments in cropping, especially methods of culture best adapted to Kansas conditions, and experiments in steer feeding, were the main features of his work. The soy-bean was introduced into this country for the first time by Mr. Georgeson at the Kansas station in 1890 (Note: Georgeson first introduced soy-beans to the USA in 1890, but soy-beans were first introduced to North America (Province / Colony of Georgia) by Samuel Bowen in 1765, and by many other people before 1890). He sent to Japan for the seeds and grew them that year at the College. The scientist found it to be a valuable drouth-resisting plant and grew it extensively and distributed the seed widely gratis to the farmers of Kansas. He also introduced the growing of this bean as a second crop after wheat, and plowed it under for green manure if it failed to ripen. Professor Georgeson proved by his feeding experiments that the meal of the soy-bean was more valuable than linseed oil-meal for both steers and hogs, and that the farmers could raise them at a fraction of the price per ton that the oil-meal costs.

"In January, 1893, Secretary of Agriculture Rusk sent Professor Georgeson to Europe to investigate the dairy industry in Denmark. There was at that time a great revival in the dairy industry in the United States, and Denmark stood at the head of the list of dairy countries. He considered it important to obtain authentic detailed data in regard to the methods practiced by the Danes, and especially the reasons for the superiority of their butter, which always sold several points higher in the English markets than butter from other countries. The results of the professor's investigations were published by Secretary Morton in a report entitled 'The Dairy Industry of Denmark.'

"When the Populists assumed control of the College

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in 1897 Professor Georgeson resigned and took the civil service examination for an assistantship in the United States Department of Agriculture. He was first appointed assistant in the division of agrostology and was sent by the department to the Panhandle of Texas to investigate the pasture conditions in that locality. In March, 1898, Mr. Georgeson was appointed special agent in charge of the Alaska agricultural investigations, and started for the North, where he has since remained. During a whole decade he has worked in that semi-arctic region, testing its possibilities for raising grasses, vegetables, and grains. He has also made extensive experiments with the islandic reindeer, the northern sheep, and milch cows. His reports form one of the most interesting parts of the annual literature of the U.S. Agricultural Department." Address: Prof. of Architecture and Drawing, Kansas State Agricultural College, Manhattan, Kansas.

1359. Wilcox, E.V. 1909. Summary of investigations: Miscellaneous crops. *Hawaii Agricultural Experiment Station, Annual Report.* p. 9-16. For the year 1908. See p. 16.
• ***Summary:*** "Several varieties of soy beans have been grown for use as fodder, green manuring, and human food, particularly in the Japanese product, Miso. The yields have been very encouraging. About 500 tons of soy beans are annually imported from Japan, and the demand is increasing. The beans are sold in Honolulu for $3 per 100 pounds. The market can easily be supplied by home production.

"Peanuts have yielded gratifying results in various localities. On the trial grounds of the station a number of varieties have been grown, including Spanish, Bunch Jumbo, Running Jumbo, and Virginia Running."

Note: In 1898 Hawaii was annexed as a U.S. Territory. Address: Special agent in charge.

1360. Yukawa, Genyô. 1909. Ueber die absolut vegetarische Ernaehrung japanischer Bonzen [The strict vegetarian (vegan) diet of Japanese Buddhist monks]. *Archiv fuer Verdauungs-Krankheiten* 15:471-524. [5 ref. Ger]
• ***Summary:*** The author studied a group of 12 strict vegetarian [vegan] Buddhist monks in Japan and found them to be in good health. He estimated that their daily diets, if evaluated for a 150-pound male, supplied 3,575 calories and 113 gm of protein. The older men ate somewhat less. The diet consisted chiefly of rice and barley, with soy products, vegetables, and rape seed oil.

A table (p. 478-79) summarizes the author's research on the protein content of vegetarian meals by previous Japanese researchers. These meals contained various soy products: Miso (*Soybohnenmus*), soy sauce (*Soy*), and tofu. On pages 489-91 are definitions of miso soup, miso, soy sauce (*Soy*) koji, grilled tofu (*Yakidofu*), cooked soybeans (without the hulls removed), azuki bean paste, and mochi, which are served at Nanshuji temple. A table (p. 497-98) gives the nutritional composition of these and other foods. Amounts served at each meal are shown on p. 501, 514, 522, including daikon pickled in miso. The terms "Makrobiotik" and "Makrobier" are used. Address: Aus der Privatklinik fuer Magen- und Darmkrankheiten von Dr. Yukawa in Osaka, Japan.

1361. Jones, W.J. 1910. Manchurian development: The railways and the beans. *Grey River Argus* (*West Coast, New Zealand*). Jan. 3. p. 4.
• ***Summary:*** Contents: Introduction. A progressive company. The possibilities of the line. Refreshing solicitude. The ubiquitous [soja] bean. The processes of distribution. What the bean produces. The future of the beans.

Introduction: "Were any justification required for Dairen's existence as a city of importance it would be found in the fact that the splendid town which Russia established and Japan has improved is the headquarters of the South Manchurian Railway and the outlet for practically all the beans exported from the districts south of the Sungari river. The railway carries the beans, and the beans in return provide the Company with a material portion of its revenue. It is a fair exchange and as a result of the processes Dairen benefits. The South Manchurian Railway Company has been in existence for three years, being organised in 1906, with an authorised capital of £20,000,000 to operate the railway between Dairen and Kwancheng-tzu [Kuancheng district in the city of Changchun in Jilin Province; Kuanchengtze or Kuancheng-tze] transferred from Russia to Japan under the Treaty of Portsmouth. The enterprise was not thrust into the world fully matured; it passed through all the infantile ailments.

"During the progress of the war the gauge of the railway had been altered from 5 ft to 3 ft 6 inches that it might be adapted to the rolling stock bought from Japan to carry troops and supplies. For considerably over a year only a small number of second and third class cars were available and the complaints of the traveller–some reasonable, others gratuitous–were loud and frequent. With the conversion of the line to its present gauge of 4 ft 8½ inches and the arrival of the new equipment of engines and carriages from America the enterprise began to rise superior to serious criticism. Figuratively speaking, it took wings and began to soar out of the labyrinth of difficulties which beset it in its initial stage;..."

"A progressive company: There are indeed few more enterprising concerns than the South Manchurian Railway Company, and it is obvious that they have at heart the development of a country which has hitherto persistently ignored its natural resources." The main line runs from Dairen to Kwancheng-tzu, a distance of 483 miles, at 27½ miles per hour. The attention paid to the needs and comfort of the traveler is "unremitting almost to the point of embarrassment." The dining cars and sleeping cars are commodious and excellent. "When the farmers have been

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convinced that they are at present merely tinkering with the soil, and direct their attention to serious husbandry, the South Manchurian Railway Company must be one of the most important carrying agents in any part of the globe. Up till now perhaps even the name is unknown in Europe outside Hazell's or Whittaker's."

"The possibilities of the line: The railway is the prime factor in the development of trade in South and Central Manchuria. Its ramifications afford the farmer who has hitherto been merely a local producer an opportunity of coming into the market and securing the best ruling prices. The advantages are mutual... Tourists can now travel from London to Dairen by train in 14 days. From "June to December it is necessary to book weeks ahead to ensure a passage. Tsuruga to Vladivostock [Vladivostok] is still the route for the bulk of the tourists, but this is due to the almost incomprehensible lack of knowledge possessed by the travelling public, not to any superior advantages offered by the Russian port. The day of Dairen and Antung [as a route for tourists] is coming, and is within the sphere of next year's possibilities.

"Refreshing solicitude: The enthusiasm evinced by the public in the Company's operations augurs well for future success." "One cannot help being impressed with the pride of possession evinced, and the train boy who chases the flies off the windows is as important and as proud of the railway as the entire Board of Directors... Every manifestation of progress in South Manchuria contributes towards the success of the line, and manifestations of progress are so consistent and so numerous as to carry conviction to the heart of the most hopeless pessimist.

"The ubiquitous bean: The interests of the railway and the bean trade are inseparable. They are the blood and bone of Manchuria and provide occupation for practically all the merchants at present doing business in the country and at least three parts of the entire population. The bean industry is not a new one, but until recently the volume of business was reckoned by the peck; now it fills the bushel measure. Twenty years ago crops were grown, small areas being laid down calmly and deliberately in monotonous routine. The increase up till 1906 was almost imperceptible, cultivation of beans being confined almost entirely to the Liaoyang districts, while the markets were Japan, and in less degree Shanghai, Swatow, Amoy, and Chefoo. The approach of harvest brought with it no feverish expectancy either on the part of the farmers or merchants. The output never exceeded 200,000 tons, and in most instances it was a great deal less than this. The Chinaman seemed incapable of realising the great possibilities of the industry and was content to adjust his supply to the restricted demand. But in 1906 the 'awakening' came and since that time the bean has been almost an obsession throughout the country. It was an epoch-making discovery, and everything now dates from the beginning of the bean era. Crops are grown everywhere, supplies are stored everywhere, and nothing else is talked about anywhere. Dairen wharf during the season is a scene [?] of indescribable activity. Changchun becomes the focus for converging strings of Chinese carts, and the railway has to work day and night to keep pace with the requirements of shippers. The bean trade has become a real industry and for the stimulus given to it the Shanghai merchants are to thank, as they resolutely laid siege to a somewhat unwilling Government until the latter agreed to open up the country for more extensive cultivation. As a result the crop for 1906 had increased to 400,000 tons, double the best previous yield [crop]. Since then a gradual development has taken place and the returns for 1908 show 1,200,000 tons, or an increase of 70 per cent on the yield for the year previous. It is estimated that the crop now coming to maturity will amount to 1,500,000 or 1,600,000 tons, an increase of 30 per cent on that for 1908. The markets have already extended to London and several places on the Continent, small trial shipments being sent a year ago, with such satisfactory results that up till the end of June 160,000 tons of last year's crop have been shipped to Europe from Dairen and 180,000 tons from Vladivostock. In England the bean cake is largely use as a fodder for cattle, and according to reliable reports it has proved a splendid fattening and milk-producing agent." Continued.

1362. Jones, W.J. 1910. Manchurian development: The railways and the beans (Continued–Document part II). *Grey River Argus* (*West Coast, New Zealand*). Jan. 3. p. 4.
• ***Summary:*** Continued: "The process of distribution. The bean, which is commonly known as the Sakura oil bean in South Manchuria, and the Soja bean in Vladivostock [Vladivostok], has the appearance of the wild pea. It is now principally grown in the districts from Ta-shih-chao to the immediate south of Harbin for practically the whole breadth of the country, along the Antung route, and in many parts of Korea. The Kwancheng-tzu district has the distinction of being the greatest bean-producing centre and Chang-chun exists entirely for and upon beans. The processes through which the crop goes after leaving the hands of the producer are particularly interesting. The beans are taken by the farmers in Chinese carts to the nearest villages and are there exchanged with the innkeepers, who are also the storekeepers, for cloth and the ordinary requirements of housekeeping, a certain percentage of the purchase-money being received in cash. The innkeepers take the beans to the larger towns, and there effect a bargain with the merchants, receiving in return supplies to replenish their stock. The merchants in their turn convey the produce to the principal distributing centres, such as Tiehling, Changchun, and there sell it to the innkeepers, who own large yards where, the beans are stored. The proportions of the business may be gauged from the fact that these yards are 20 or 30 acres in extent. The receptacles are curious bins called tuns,

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constructed of straw, each 120 ft high and capable holding 150 tons. The last pre-export stage of all is reached when they are sold to the local merchants in Dairen or Newchwang at so much per *dan* (480 1b). The currency in which the farmer deals is the *tiao* (equal to from 5*d.* to 6*d.*). The dealers in the ports pack their produce into gunny bags holding 187 1b, and the consignment is then ready for steamer.

"What the bean produces: The first process in the treatment of the bean is the extraction of the oil. The Chinese, with their loyalty to primitive methods, use a hand press which is not so satisfactory as the efficient machinery of the European merchants, and the latter obtain not only 6 per cent more oil, but from 3 to 4 per cent of butter-fat, which is used in the manufacture of confectionery. From 9 to 10 per cent of oil is extracted by the hand-press and 15 to 16 by machinery. The oil is of various samples, the refined article almost equalling in quality fine olive oil, while the crude article is used by the Chinese for food and lighting. From about forty-eight pounds of beans forty pounds of bean cake and between four and five pounds of oil are obtained, the extra weight being released during the steaming process in manufacture. The beans cost in Manchuria about 5*s* per picul (133 1/3 pounds). The oil is sold at 17*s* per picul and the bean cake at 2*s* 3*d* to 2*s* 6*d* per picul.

"The future of the beans: Towards the end of last season the railway carried 6,000 tons per day to the ports, and it is estimated that this year the amount will be increased by 1,000 tons daily. This looks like business and the merchants would tell you that the prospects are promising. The bean cake is an excellent fertilizer, and an inexpensive one, and might find its way in increasing thousands of tons into countries to which it has not hitherto been exported. But there are difficulties to contend with and possibilities to consider which make trading in beans somewhat of a gamble. The fluctuations in the price of silver may cause a difference in values of as much as 40 per cent in the short period elapsing between sale and delivery. There is also a lack of confidence, consequent upon there being so many rivals on the market as oil-producing seeds. These are problems which may be solved to the satisfaction of bean merchants, and if so, there is a great future for beans and their by-products in Europe and other parts of the world. So far as China and Japan are concerned it is certain that their demand will increase annually by material quantities, at any rate this would appear to be the belief of those interested in the business, judging from the extension of the area placed under cultivation."

1363. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1910. Soya-bean crushing: Factories planned in both Europe and American Pacific Coast. No. 3681. p. 5. Jan. 10.
• ***Summary:*** "Consul Walter C. Hamm, at Hull, England, writes that it is reported that there are projects on foot in connection with the soyabean industry which may have far-reaching effects both on the industry in Hull and on the Pacific coast of America.

"As stated, one scheme is to erect large seed-crushing mills at Vancouver, British Columbia, and Seattle, State of Washington, where the bean can be crushed and the oil extracted. The Canadian Pacific and lines of steamers running from Vancouver and Seattle to Japan and China are said to be aiding this scheme.

"Another project proposed is to erect large factories in Copenhagen for the production of soya-bean oil and cake. It is hoped that the annual turnover of the new company will at first be not less than $1,100,000 and that 30,000 tons of soya beans will be shipped each year by the East Asiatic Company from Manchuria to Denmark. At present oil cake of various kinds to the value of $7,000,000 is consumed annually in Denmark, of which a large proportion is shipped from Hull. The Manchurian beans are the subject of comment in the report of the P. and O. Company, which speaks of the absorption of a very large amount of tonnage for their export. The report adds:

"'This is a new business in Europe, and whether it may prove a permanent factor in the commerce of this country it is at present impossible to say. Meanwhile the result is that Eastern freights have risen to a moderate extent for the first time for two or three years.'"

Note: This is the earliest document seen (Aug. 2001) that uses the word "crushing" or any of its cognates ("crushers," "crushed," etc.) in the title in connection with soybeans. Address: Washington, DC.

1364. *Advertiser* (*The*) (*Adelaide, South Australia*). 1910. Milk from the soya bean. Jan. 11. p. 7.
• ***Summary:*** "The Japanese make a milk, said to be very nourishing, from the soya bean. The process is as follows:- The beans are first of all softened by soaking, and are then pressed and boiled in water. The resultant liquid is exactly similar to cow's milk in appearance, but is entirely different in composition. The soya bean milk contains 2.5 per cent. of water, 3.02 per cent. albuminoid, 2.13 per cent. fat, 0.03 per cent. fibre, 1.18 per cent. non-nitrogenous substances, and 0.41 per cent. ash. Some sugar and a little phosphate of potassium are added in order to prevent the elimination of albumen, and then the moisture is boiled down till a substance like condensed milk is obtained. This condensed vegetable milk is of a yellowish color, and has a very pleasant taste hardly to be distinguished from real cow's milk."

1365. *Bulletin de l'Association Amicale Franco-Chinoise.* 1910. Le soja [Soya]. 2(1):62-64. Jan. [Fre]
• ***Summary:*** This periodical was established to promote understanding and friendship among the people of France and China.

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The name *Soja* or *Soya* comes from the name that the Japanese give to the sauce made from soybeans. In Chinese it is called *tsiang-yeou* (Cc = Chinese characters given [soy sauce]) and it is made from *houang-teou* (Cc [yellow soybeans]). This sauce, which is used in the well-known *Worcester sauce,* is widely used in China and Japan. Some Chinese residing in Paris [incl. Li Yu-ying] recently took the initiative to introduce into France this sauce, as well as several other products derived from these same 'yellow peas' (*pois jaunes*).

They have just built a factory near Paris in a town named Les Vallées (rue Denis-Papin), on the train line going to Saint-Germaine-en-Laye. There, perfected machines / equipment and the resources of western science allows them to obtain from the raw materials a much better yield than could be obtained using the rudimentary Chinese process. These things made it possible, at the same time, to develop many new soy products suited to European tastes.

A retail store named the Golden Jar in Paris (La Jarre d'Or, 4, rue du Renard) received the right to sell these products from *Caséo-Sojaïne.* And an exposition [of the soy products] was organized at the Grand Palace, at the time of the opening, last Nov. 20, of the Food Fair / Expo (*Salon de l'Alimentation*). There various products were offered.

A summary of the contents of an interesting brochure from that exposition is reprinted. Contents of the brochure: Introduction to the soybean. Products based on soymilk (*Le lait de soja, Le lait végétal*)*:* Liquid, powdered, or fermented soymilk, soy cheese (*Le fromage de soja, Le fromage végétal* [tofu]) (fresh, hard, and fermented). Soy sauce. Soy oil. Sweet soya preserves (*Confiture de Soja;* this soy cream {*crème de soja*} resembles chestnut cream {*crème de marron*}). Soybeans used as a vegetable (dehulled dry soybeans, and soy sprouts {*les germes de soja*}). Other soy products (including soy flour, bread for diabetics, whole-meal bread, and soybean cakes–used as feed for animals).

Note 1. It is unclear whether the Chinese-run factory, *Caséo-Sojaïne,* has started to make and sell commercial soy products, or whether they are just about to. They may have started on Nov. 20 of the previous year, however there is no description of soyfood products now being sold in Paris.

Note 2. This is the earliest document seen (April 2013) that contains the term *Caséo-Sojaïne,* which appears to be the name of a business, not of a product. This term would soon be used to also refer to "tofu." Li Yu-ying's name is not mentioned.

Note 3. This is the earliest document seen (Aug. 2013) that mentions soy cream (*crème de soja*).

Note 4. This is the earliest French-language document seen (Aug. 2013) that mentions powdered soymilk (*Le Lait de Soja, en poudre*).

Note 5. This is the earliest document seen (Sept. 2002) that mentions fermented soymilk (*Le Lait de Soja Fermenté*).

Note 6. This is the earliest French-language document seen (Jan. 2013) that mentions soy sprouts, which it calls *les germes de soja.*

1366. Itie, G. 1910. Le soja: Sa culture, son avenir [Soya: Its cultivation, its future]. *Agriculture Pratique des Pays Chauds* (*Bulletin du Jardin Colonial*) 10(82):37-49. Jan. See also: 10(83):137-44. Feb.; 10(84):231-46. March; 10(85):305-07. April; 10(93):485-93. Dec.; 11(94):55-61. 28 cm. [34 ref. Fre]

• ***Summary:*** A superb series of articles by G. Itié reviewing research and current developments with soybeans, and especially with soybean production / culture, worldwide. The extensive bibliography cites many early and rare works for the first time. Interestingly, the series started one year before Li Yu-ying wrote his equally excellent series in the same journal. The author introduced lots of U.S. soybean research to France, citing many U.S. Agricultural Experiment Station publications and early work with growing soybeans in the tropics.

Contents: Introduction. The soybean (Glycine hispida Maxim.). Vernacular names: In China, Tonkin, Cambodia (*Sân dêk*), India, Burma, Nepal, Ceylon (*Bhatwan*), Indo-Malaysia (*Katyang-kadeleh*), England, USA, Germany, Holland, France, Italy. Scientific names and synonyms. Description of the plant. Varieties, general, and in China, India, Hawaii, Japan, USA, Europe (varieties from Hungary, Podolia, Etampes-France, Italy). Origin. History. Climate and geographical area.

Concerning the early history in France: "In France it is very certain that in 1739 missionary fathers sent the soybean to the Jardin des Plantes, along with other plants from China. There exists, in any case, in the Museum, a sachet having contained seeds from the harvest of 1779, and the soybean has been cultivated here in an almost uninterrupted fashion since 1834.

"In France, large scale production of soybeans began in 1821 at Champ-Rond, near Etampes, where large yields were obtained. But above all, starting in 1855, the Society for Acclimatization made great efforts to introduce it. They distributed seeds and conducted tests in various regions, but the methods of culture were not progressive (advanced), and the soybean did not take the place in France that was hoped for."

A table (p. 490) shows the name, yield (in hectograms/hectare; 1 hectogram = 100 gm), and source (a U.S. agricultural experiment station) for the following soybean varieties: Medium Black (12.1, Massachusetts Hatch), Very Dwarf Brown (8.4, Indiana), Early Brown (10.54 to 13.58, Indiana), Early Green (7.80 to 14.00, Delaware & Virginia), Medium Green (12.10 to 36.30, Massachusetts Hatch & Illinois), Hollybrook (8.7 to 10.0, Indiana), Guelph (5.70 to 7, Indiana), Ito San (11.4 to 28.70, Indiana & Wisconsin), Japanese Pea (13.20, Virginia), Mammoth Yellow (7.5 to 18.20, Mississippi), Michigan Green (19.10 to 34.80,

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Wisconsin), Green Samarow (11.00+, Kansas), Tokyo (7+, Kansas), Early White (15.90 to 33.00, Massachusetts & Illinois), Dwarf Early Yellow (11.00+, Kansas), Early Yellow (13.10 to 22.00, Ontario, Canada), Medium Early Yellow (8.70 to 33.00, Indiana), Yellow (11.00+, Kansas), No. 9407 (43.5, Wisconsin), No. 19.186 (28.0, Delaware).

Other tables show: (1) The chemical composition of the stem, leaves, and pods (p. 138-39, 243). (2) Yields with different fertilizing methods (p. 139). (3) Number of pods and seeds in different varieties of soybeans (p. 236). (4) Spacing at different experiment stations for 3 years that gave the best yield (p. 239). (5) Number of plants and seeds, and yield for 3 different brown or yellow varieties of soybeans from China and Manchuria (p. 491). An illustration (p. 40, line drawing by A. Berteau) shows a cultivated soybean plant and its different parts, including leaves, pods, and flowers. The leaves of the wild soybean, *Glycine angustifolia* (Miq.), are also shown.

Note: The *Jardin Colonial* (Colonial Garden) is located in Paris, France. Address: Ingenieur d'Agriculture coloniale.

1367. Saito, Kendo. 1910. Notizen ueber einige koreanische Gaerungsorganismen [Notes on some Korean fermentation organisms]. *Zentralblatt fuer Bakteriologie. Series 2.* 26(13/15):369-74. Feb. 23. [4 ref. Ger]
• ***Summary:*** Mentions the molds *Aspergillus oryzae* and *Rhizopus Tamari.* Address: Botanical Institute, Tokyo.

1368. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1910. Oil-seed products. No. 353. p. 68-79. Feb. See p. 68-70, 76-79.
• ***Summary:*** In the section on "Germany" the following subsections discuss soya-bean meal: (1) "Hamburg market for oil-cake meal and vegetable oils." "The Germans are not taking very kindly to the soya-bean meal. It is thought that possibly 25,000 tons of the meal have been bought, but most of it will go to the extreme northern section around the port of Esbjerg" which is near England. "The English mills are sending out bullish letters concerning this product, stating they are sold far ahead, but all seem to be willing to sell small quantities of a hundred tons or so for prompt shipment."

(2) "Prices and qualities of soya bean and peanut meal." "Present prices of the soya bean meal are from $32.40 to $33.40 per long ton c.i.f. Hamburg." Peanut meal is popular in Germany with many of the farmers, and is used in rations for dairy cows. Large peanut crops are expected from the Coromandel (India) and the Gambia (West Africa). The peanut oil and cake is made from Rufisque peanuts; the price of this cake is now $38.40 per ton, but lower grades can be bought for $33.50 per ton.

(3) "Various seed cakes compared." "Soya bean meal, it is thought, will not influence the feedstuff situation to any great extent in Germany, and unless the peanut meal comes on the market in great quantities high prices of oil meals will continue to rule throughout the season."

Under "Cocoanut Products," page 76 notes: "A cotton seed oil crushing mill, the largest in the world, has recently been built in Harburg, which is across the river from Hamburg, by F. Thoerls Vereinigte Harburger Oelfabriken, A.G."

In the section titled "Sweden: The fodder value of soya meal and cake," is a lengthy English-language translation of an article on this subject prepared by Nils Hansson, of the Central Institute of Agricultural Experiments.

In the section on the United Kingdom, U.S. Consul Rufus Fleming of Edinburgh [Scotland] gives information already presented in the 21 Dec. 1909 issue of *Daily Consular and Trade Reports* (U.S. Dept. of Commerce, No. 3666, p. 9).

"Hull [England]: Factories planned in both Europe and America Pacific Coast." It is stated that one scheme is to erect large seed-crushing mills at Vancouver, British Columbia [Canada], and Seattle, State of Washington, where soya beans can be crushed and the oil extracted. The Canadian Pacific and lines of steamers running from Vancouver and Seattle to Japan and China are said to be aiding this scheme. Another project proposed is to erect large mills in Copenhagen [Denmark] for the production of soya-bean oil and cake. An estimated 30,000 tons of soya beans will be shipped each year by the East Asiatic Company from Manchuria to Denmark. Address: Washington, DC.

1369. Sagnier, Henry. 1910. Le soja et ses produits [The soybean and its products]. *Journal d'Agriculture Pratique* 74(1):307-10. March 10. [4 ref. Fre]
• ***Summary:*** The soybean was a curiosity in Europe until 2-3 years ago, when large amounts started to be imported. The prince A. d'Arenberg, president of the Suez Canal Society, told the National Society of Agriculture, that prior to 1908 no soybeans had passed through the Suez Canal, yet in that year 35,000 tons passed through it. It seems that the new commerce has been stimulated by the expansion of the crop in Manchuria and Korea, under Japanese influence. Most of the imports have gone to England and northern Europe. In England, the oil is used to make soaps and the cakes are fed to livestock.

Recently it was announced that the Chinese government, preoccupied with the expansion of exports, would have manifested the intention to prohibit these exports in view of preventing a shortage of soybeans in the interior of the country.

"The Chinese are now greatly expanding their efforts to make known in Europe the advantages to be gained from soya and from the products that can be extracted from its seeds. I recently had the occasion to present to the National Agricultural Society of France a study written by

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Mr. Liyuying [Li Yu-ying], delegate of the government of China for several missions. It was titled *Le soja, utilisation alimentaire, thérapeutique, agricoles et industrielle.* This study was accompanied by samples of yellow and black soybean seeds, and by the principal products which can be extracted from this plant: flour, bread for diabetics, cake (*gâteau*), seasoning sauce (*sauce condimentaire*), confections (*confitures*), raw milk (*lait cru*), cooked and sweetened milk (*lait cuit et sucré*), cake for livestock feed, (*tourteau pour l'alimentation du bétail*), fresh cheese (*fromage frais* [tofu]), and smoked cheese (*fromage fumé* [smoked tofu]).

"These products originated from processing imported soybeans. They have been prepared at a test factory (a photo, p. 309, shows the interior) set up just outside of Paris, at Vallées, near Asnières. Li Yu-ying's study gives complete details on these products" which are made from imported soybeans. This factory, named *Caséo-Sojaine,* "has been established by the agents of a civil society constituted in China under the name of *Société biologique de l'Extrême-Orient* (Far Eastern Biological Society). Made up of physicians, scholars (men of letters), and businesspeople, this society would seem to have as its principal goal/object to make known and have used in Europe the pharmaceutical and agricultural products of the Far East [East Asia]."

Note: This is the earliest document seen (May 2011) that mentions the Far Eastern Biological Society (*Société biologique de l'Extrême-Orient*)

The author concludes by discussing soymilk (*lait de soja ou lait végétal*), soybean cakes (*les tourteaux d'huilerie*), and a brief history of the soybean in France.

Illustrations (p. 308) show: Mature soy bean plant with pods. Close-up of soy bean pods and seeds. Soy milk and soy flour viewed under a microscope (p. 309).

1370. *Weekly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1910. Oil trade. 1(3):114-16. March 19.

• ***Summary:*** The first section, written by the U.S. Consul in Bradford, England, describes the "unexpected decrease in the output of cotton-seed oil [worldwide] and the increase in the use of soya bean and other oils and fats" [in England]. Soya beans are discussed in detail in three other sections: (1) Soya bean and other oils (p. 114-15). "The Liverpool firm also makes the following report on Chinese and Eastern oils and fats which are becoming important in Europe. "Shipments of soya beans from Manchuria during 1909 amounted to about 350,000 tons, and also a large quantity of soya oil from China and Japan. European markets welcomed this new supply, which has prevented a further rise in lower grades of vegetable oils. The greatest interest is shown as to the supplies of soya beans during 1910, but owing to the undeveloped state of the (Chinese) interior, reliable figures of stocks and available supplies can not be obtained."

(2) Soya bean transportation: Freight rates from Newchwang to the United States [San Francisco, California; and Seattle, Washington] (p. 115). (3) Dalny: Prices and cost of shipment.

A table (p. 115) shows exports of [soy] beans, bean cake, and bean oil, during the first three-quarters of 1909, from Newchwang to: Hongkong, Great Britain, Samarang [Semarang, Central Java], Germany, Japan, Chinese ports, and total.

1371. Cowie, W.B. 1910. Soya seeds and oil. *Chemist and Druggist* (*London*) 76(13):66. March 26. [1 ref]

• ***Summary:*** Overview of a paper presented by Cowie on 16 March 1910 in Edinburgh at an evening meeting of the North British Branch of the Pharmaceutical Society of Great Britain.

People have become suspicious of "soya-bean meal" because it has been sold mixed with Java beans which contain a significant amount of cyanogenetic glucoside. A table shows six constants for "soya-bean oil" based on studies by Cowie, E.S.L. & W, and Lewkowitsch. The iodine value was found to be 120, 130.4, and 122 respectively. When soya-bean oil is substituted for olive oil in B.P. liniments of ammonia, lime, camphor, or nitrate of mercury ointment, the ointment is a complete failure.

In Japan there are some 11,000 firms in which 2.5 million hectoliters of soya beans are expressed each year and fermented with *"Aspergillus oryzae* for the preparation of the liquid soy" [sauce].

Also gives an overview of the discussion that followed. Mr. Wilson noted that the use of soya oil in the manufacture of linoleum depends on its relatively high iodine value. He added that for feeding purposes, soya-bean is never used alone; a maximum of 25% is mixed with linseed or other feeding stuffs.

Note: This is the earliest document seen (March 2001) that mentions the term "Java beans." Address: Ph.C., F.C.S., Edinburgh.

1372. Cowie, W.B. 1910. Note on soya seeds and oil. *Pharmaceutical J. and Pharmacist* (*London*) 30:403-04. March 26. [3 ref]

• ***Summary:*** At yesterday's evening meeting of the Pharmaceutical Society of Great Britain, held in Edinburgh, Scotland, three varieties of soya beans and a sample of soya bean oil were exhibited. Seeds received from Mr. J. Rutherford Hill, of the yellow variety, yielded 18% of oil and 38.2% of proteins. They were found to contain no cyanogenetic glucoside. "All the suspicion attached to the soya bean meal seemed to have been caused by admixture with Java beans which contain an appreciable amount of cyanogenetic glucoside."

An analysis of the oil is given; it agrees quite closely with that given by Lewkowitsch and those given in Evans' *Analytical Notes* for 1909. A long passage quoted from the

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Scotsman of 4 March 1910 concerns the present great interest in soya bean trade. If the Manchurian supply should be cut off, the remainder might be supplied by Japan, where each year 11,000 installations transform 2.5 million hectoliters of soybeans, using fermentation and *Aspergillus oryzae,* into "soy [sauce], a liquid condiment used extensively by the population."

There follows a long discussion, with many questions and answers. Dr. Watt asks about the difference in price between soya bean oil, arachis oil, and cotton-seed oil–which are sometimes used as a substitute for olive oil. Mr. Giles asks if soya bean oil is less expensive than arachis oil. Mr. Cowie notes that it could be detected as an adulterant in olive oil, and that it could possibly be substituted for olive oil in the following official preparations: Liniments of ammonia, lime, and camphor, and nitrate of mercury ointment.

Mr. Wilson described the case in which soya bean oil had been supplied to a fried fish restaurant. When used in cooking, it seemed to decompose like crude linseed oil, creating an offensive smell.

Mr. McEwan recalled that about 15 years ago a baker in Edinburgh had tried to use soya bean oil in bread and biscuits, but had found it impossible to work with, and had long since abandoned it.

Mr. Hill recalled that a gentleman who had a garden a few miles from Edinburgh, Scotland, cultivated the soya bean for three years. Although they grew readily and flowered, he was never able to obtain seeds from them.

Note 1. Unfortunately, neither the name of the gentleman who cultivated the soya bean nor the date that be began cultivation are given. However, if he planted the seeds in May, he could have started no later than May 1906. Note 2. This document contains the earliest date seen for soybeans in Scotland, or the cultivation of soybeans in Scotland (by May 1906, near Edinburgh). The source of these soybeans is unknown. Address: Ph.C., F.C.S.

1373. Cloud, Frederick D. 1910. Why America is so interested in Manchuria. *New York Times.* March 27. p. SM5.
• ***Summary:*** Manchuria represents a huge potential market for American goods (especially those related to Manchurian railways, such as the East Manchuria Railway Co.) and is capable of becoming one of the world's greatest agricultural regions.

The Manchurian railways are presently controlled by Russia and Japan; the U.S. government is determined to ensure their neutrality.

"There is contained within the boundaries of the Three Eastern Provinces which together constitute Manchuria, an area of about 390,000 square miles in extent. A large portion of this vast area is arable land, which is scarcely excelled in productiveness by any territory in the world. At present, owing to the smallness of its population–18,000,000 people in the whole of Manchuria–there is but a fraction of the tillable land under cultivation.

"Yet the value of one crop alone, that of the soy bean, during the present season will amount to something like $25,000,000."

The soil and climate throughout are adapted to the growing of beans, wheat, oats, millet, tobacco, and barley, and in Southern Manchuria corn is a valuable crop. Address: Former American Consul at Mukden, Manchuria.

1374. *Far Eastern Review* (*Shanghai*). 1910. Oil and cake manufacture: The soya oil bean. 6(10):487-89. March. Reprinted from the *London and China Express,* Nov. 1909. [2 ref. Eng]
• ***Summary:*** This article begins: "In a recent issue of the 'Economist' attention was drawn to the Soya bean trade in Manchuria, and to the rapid rise of the country as an exporter... America and the Continent are casting envious eyes upon what almost amounts to a monopoly of the trade held by Great Britain at this moment as a consequence of the existing prohibitive import duties on oilseeds in the protected countries. During the past season the English oilseed crushers settled down to a highly lucrative trade and for some months past many of the large mills have set their entire plant running on the crushing of Soya beans, to the exclusion of cottonseed, linseed, and other oleaginous seeds. The supposed shortage of the cotton and flax crops in the United States, and the anticipated shortage of linseed in the Argentine, with the resultant scarcity of cottonseed and linseed products, has found the English market comparatively unperturbed, for the reason that Soya oil and cake can supply most of the requirements as well, if not better, whilst the foreigner is debarred from its use by the presence of high import tariffs. This new industry supplied a good example of the value to the United Kingdom of free imports of raw material compared with the protective duties in other countries... Soya oil manufactured in England continues to rise, in sympathy with the scarcity and dearness of linseed and cottonseed oils, and it is interesting to note that one of the main factors in the advance has been the demand from the United States, which is being supplied by the English crushers. Large quantities of Soya oil are being shipped form British ports to the American seaboard, and the demand is likely to continue; but the trade has already been so large that it is difficult to buy oil for near delivery. The same oil is also being shipped from Japan and China to the Untied States, as well as to the North of Europe, and here we have–for the moment at least–the only serious competitors of English crushers."

"In England, the bean cake is of even greater importance than the oil, representing as it does about 90 per cent. of the raw material. The cake is the residue after crushing, and the analysis compares favourably in oil and albuminous substances with the best decorticated cotton-seed cake and meal, large quantities of which have been imported into this

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country for many years for cattle feeding... In Denmark, a great butter-producing country, some hesitation was shown in regard to the introduction of the Soya bean, as it was feared that the taste of the butter might be affected by feeding cows with Soya cake, but experiments have proved the reverse, and Denmark has secured 25,000 to 30,000 tons of beans for shipment from Manchuria during the next few months for crushing and cake-making."

The bean cake made in Asia by primitive methods "contains a great deal of moisture, and is unsuitable for a long voyage, owing to its liability to become heated and unsound. This cake is used chiefly as a fertilizer in Japan and Southern China. During the present season these two countries imported about 600,000 tons of beancake from Manchuria for fertilizing." If the price of the beans rise, "will Japan eventually come to rely on phosphates or other artificial manures?"

A small table shows the imports of beancake into Japan during the last five years: 1905–182,000 tons. 1906–258,000 tons. 1907–320,000 tons. 1908–460,000 tons. 1909–600,000 tons.

"An exhibition of Soya beans and by-products from North China, together with photographs of the Soya bean industry, was held at the boardroom of the Manchester Chamber of Commerce on 17th and 18th inst. Explanations and full particulars of the industry were given by Mr. Cavendish Evelyn Liardet, lately returned form China.

"At a recent meeting of the committee of the African Trade Section of the Incorporated Chamber of Commerce of Liverpool, Mr. A. Grenville Turner delivered an interesting address on the cultivation and uses of the Soya Bean."

"In America an attempt has recently been made there by certain dealers to place the Soya beans on the market as a new substitute for coffee, and sell it under other names at fancy prices. A sample of coffee specially ground from the Soya bean, at the suggestion of Sir Alfred Jones, was submitted, and created much interest."

The oil-cake left after the expression of the oil has a nutritive value that "is approximately equal to that of decorticated cotton-seed cake. Feeding trial with this cake in comparison with decorticated cotton cake have been carried out at the Cumberland and Westmoreland Farm School at Newton Rigg, and also at the Royal Agricultural College, Cirencester. At the former institution it was found that the cows, when fed with Soya bean cake, gave rather more milk than when fed with cotton cake; but the difference was so small that it may be considered that the two cakes are equal in this respect. The proportion of fat in the milk was the same in each case... In view of the importance of the trade in Soya beans, it has been considered desirable that attempts should be made to row the product in other countries than China. The Imperial Institute has already brought the matter to the notice of the Governments of several British Dependencies, and experiments are now in progress in the Cape of Good Hope, Natal, the East Africa Protectorate [later Kenya], and the Gambia. An effort is also being made to stimulate the cultivation of the Soya bean in India. It is stated that considerable additional areas are available for cultivation in Manchuria.

"The annual report of the Hull Chamber of Commerce and Shipping states that the Seed Crushers' Committee report that 'the mills have been fairly well employed, and for the first time in the history of the trade soya beans have been crushed in quantity.' The Hull Seed, Oil, and Cake Association report that 'the outstanding feature of the year has been the advent of the soya bean from Manchuria, which marks an epoch in the crushing trade of the United Kingdom. About 400,000 tons have been shipped to the United Kingdom in 1909, of which 153,000 tons have arrived in Hull since March last. There is reason to hope that the soya bean will be a regular article of import.'"

1375. Ishii, T.; Okamoto, H. 1910. Daizu [Soy bean: Its culture and uses]. *Hokkaido Nogyo Shikenjo Iho* (*Hokkaido Agricultural Experiment Station, Bulletin*) No. 10. 33 p. March. [Jap]

• ***Summary:*** Contents: Preface. The position of soybeans in Hokkaido agriculture. Suitable climate and preparation of the soil for farming. Crop rotation. Varieties of soybeans. Compost. Seeds. Sowing seeds. Care after germination. Harvest. Utilization of soybeans: Green manure, as feed, soybean cake as fertilizer. Soybean diseases. Soybean insects.

An illustration (non-original) on the title page shows the roots of a soybean plant with a few nodules. Address: 1. Agronomist; 2. Entomologist. Both: Sapporo, Japan.

1376. Japan, Bureau of Agriculture (Norinsho, Nomukyoku), Dep. of Agriculture and Commerce. 1910. Outlines of agriculture in Japan. Tokyo: Agricultural Bureau, Department of Agriculture and Commerce. 132 p. March. Illust. No index. 23 cm. [Eng]

• ***Summary:*** This book was compiled to acquaint foreigners with agriculture in Japan. Company name with diacritics is: Nôrinshô, Nômukyoku. A map near the front shows Japan and its empire (incl. Korea, Formosa, Kwantung, Karafuto, and the Kurile Islands, with an inset pie chart showing the value of Japan's agricultural products). Oval photos show Japan's six top agricultural officials. A full-page table shows the moneys, measures and weights of Japan with English equivalents. Contents of the first part of the book: Introduction: Geographical location, area, population, topographical position, climate. 1. General remarks. 2. Condition of farmers. 3. Condition of agricultural land.

The section titled "Upland fields" (p. 18) states: "Upland fields are those portions of land being located in high and dry places which by wanting means of irrigation could not be converted into paddy fields. The utilization of these fields

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is commonly made by the rotation system and crops are raised twice a year. The commonest instance is that barely, naked barely, and wheat are raised as the first crop in winter whereas soja beans, sweet potatoes and millets are raised during the summer as the second crop." The profits from upland fields are generally smaller than from lowland / paddy fields. The average yield of soja beans over the past 10 years is given in Japanese units (p. 19).

In Japan only cows and horses are kept as work animals. In 1907 Japan had 1,008,922 cows and 2,204,031 horses. But they were used more for their manure than for plowing.

A table (p. 28) shows the value (in yen) of the principal commercial fertilizers in Japan from 1905 to 1907. "Soja bean cakes" (a key source of nitrogen) is by far the largest, averaging 12.9 million yen for these three years, followed by superphosphate of lime, mixed manure, rape-seed oil cakes, herring cakes, bone dust, and cotton-seed oil cakes. Note 1. This is the earliest English-language document seen (Nov. 2005) that uses the term "cotton-seed oil cakes" (plural or singular) to refer to cotton-seed cakes.

A table (p. 37) gives the cultivated area (in 1,000 *cho*) of major Japanese crops in 1887, 1892, 1897, 1902, and 1907. In 1907 rice had by far the largest area (2,906), followed by naked barley (694), barley (658), soja bean (471), wheat (444), mulberry tree (390), sweet potato (288), Indian millet (202), rape seed (143), small red bean ([azuki], 135). Soja bean area remained almost unchanged between 1887 (466) and 1907 (471).

A table (p. 39) gives average yield (in *koku/tan*) of the same major Japanese crops for the same years shown in the previous table. Yield of soja beans rose from 0.698 in 1887 to 0.777 in 1907. Since 1 *koku* = 4.963 bushels and 1 *tan* = 0.245 acres, the 1907 yield is 15.74 bushels/acre.

A table (p. 40) gives the production (in 10,000 koku) of the same major Japanese crops for the same years shown in the previous table. Production of soja beans rose from 325 in 1887 to 366 in 1907. Since 1 *koku* = 4.963 bushels, and 10,000 *koku* = 49,630 bushels, then 366 *koku* is 18.164 million bushels. The next table (p. 42) shows the value (in yen) of each of these agricultural products in 1905-07, and a table (p. 46) compares the cultivated area of each of these crops with rice; soja beans are 16.2% of rice.

In the section on "Food crops" (p. 47+) is a detailed discussion of each. Concerning "Soja bean" (p. 50-51) we read: "The use of this bean is extremely extensive since they are used for the purpose of supplying to the people low priced starchy food by being made into *miso* (pea cheese), soy, *tofu* (bean curd), and other food-stuffs required by the Japanese. The residue obtained from making these food-stuffs from the bean is used for the purpose of feeding cattle or of pressing oil while as manure it is highly valued. Soja bean is easily cultivated requiring less amount of manure and labour. It is therefore cultivated all over the country and occupies the principal position among summer crops of upland fields. Within recent years the demand for it has considerably increased at home and also the export of various food-stuffs prepared out of bean has shown some increase so that no small amount of bean is imported either from China [Manchuria] or Korea. The amount imported actually reaches 10,000,000 *yen.* Over and above these, the import of bean cakes is approximately figured at 20,000,000 *yen* so that the domestic output has somewhat been affected."

Also discusses: Barley and naked barley. Indian millet, Barnyard millet and sorghum. Small red bean [azuki] ("A large amount of small red bean is used as a material for cakes [confections], Hokkaido being the principal producing district." p. 51). Flax and hemp. Green manure crops, incl. *genge* (*Astragalus sinicus, umagoyashi* (*Medicago denticula*)), soja beans, etc.

Note 2. This is the earliest English-language document seen (March 2006) that uses the term "small red bean" to refer to the azuki bean.

Chapter 4, titled "Animal industry and poultry" (p. 69+) contains many statistics which may be of interest to vegetarians. Japanese traditionally ate fish rather than meat. "Even at present, the amount of meat consumed per capita a year does not exceed 1.7 pounds while that consumed in America is 150 pounds and in England 118 pounds per capita." etc.

A table (p. 85) shows imports of principal agricultural products (quantity and value) each year from 1906 to 1908. Imports of soja beans increased from 286 to 352 (x 10,000 piculs) during this period, while imports of [soja] bean cake increased from 433 to 776. Both were imported mainly from China. However "the output of *soy* [sauce] and *miso* made of soja bean is exported to the amount of 1,200,000 yen, while bean cake forms the principal fertilizer in Japan" (p. 86).
Address: Tokyo.

1377. Kita, Gen-itsu. 1910. Shôyu jôzô ni kansuru kenkyû. III. [Studies on brewing shoyu. III.]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 13(145):221-35. March. [1 ref. Jap; ger]
Address: Kôgaku-shi, Japan.

1378. Nippon Engei Kaisha, Ltd. (The Japan Horticultural Co.). 1910. Wholesale catalogue of Japanese plants, bulbs, and seeds: 1910-11. Ikeda, Settsu, Osaka prefecture, Japan. 46 p. Illust. 26 cm. [Eng]
• ***Summary:*** On the cover of this English-language catalog is an illustration of various species of lilies blooming. The section on "Seeds" (p. 41) contains a subsection (p. 45) titled "Vegetable seeds," which lists the price per pound and per 10 lbs. of the seeds of 27 different types of plants, including: "Soy bean, ¥0.16 per pound, ¥1.40 per 10 lbs."

"Prices are quoted in Japanese Gold Yen f.o.b. Kobe, one Yen being equal to about 50 cents, 2 shillings, or 2½ marks." "We have over 50,000 'tsubo' [40.8 acres = 16.53

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ha; 1 tsubo = 35.586 square feet = 3.954 square yards] of the best nursery land...” Address: P.O. Box 1, Ikeda. Kawanishi-mura, Ikeda, Settsu, Osaka prefecture, Japan.

1379. Rea, George Bronson. 1910. Beans: The solution of the commercial situation in Manchuria. *Far Eastern Review* (*Shanghai*) 6(10):453-61, 486-87. March. [Eng]

• ***Summary:*** The article begins: “Shanghai, March 1, 1910.–Neutralization of the Manchurian Railways and the construction of the Chinchow-Tsitsihar-Aigun Line are the latest moves in the prolonged diplomatic campaign to nullify Russian and Japanese preponderance in the Three Eastern Provinces. Since the termination of the late war foreign opinion has accepted the theory that unfair tactics and discrimination are the foundation of Japan’s commercial success in Manchuria. The average European has refused to believe Japan could secure control of the Manchurian trade, unless underhanded methods were employed... At the root of the trouble was the South Manchuria Railway, and on its operation and administration fell the burden of censure.”

Gives a detailed account of the first shipment of soybeans from Manchuria to Europe by Mitsui Bussan and alleged unfair commercial practices used by Japan in Manchuria, especially concerning the South Manchuria Railway. “For years Japan has been the largest consumer of Manchuria’s principal export of beans and bean-cake. The bean-cake was an absolute necessity to the Japanese farmer to fertilize his worn out fields... Before the Manchurian railways were constructed and Newchwang was the only treaty port, the larger British firms established there controlled the trade of the province. The beans or bean-cakes were carted or shipped by river junk to Newchwang to be stored in the godowns of the leading merchants, who also controlled the ocean shipping. At the time when the Japanese farmer required the bean-cake for fertilizing the ground for spring planting, the port was closed by ice, and very often the delay in shipping the cake to Japan entailed considerable loss and damage to the crops. The Japanese purchased their supplies of bean products from the foreign hongs who controlled this trade...

“But the war came and changed all this. Japanese merchants entered the field, and, with the ice free port of Dairen as a base, commenced an aggressive campaign to gain control of this important trade. The end was inevitable. As Japan consumed the bulk of the bean-cake, and controlled the railway transportation to a port where storage and lighterage could be eliminated, loading charges reduced to a minimum and their own steamers employed to freight the product to Japan at all seasons, it was natural that her merchants would underbid the foreigner and take away his monopoly. Despite the discriminating railway rate, giving Dairen the same tariff as Newchwang, the foreigner never had a ghost of chance after the appearance of Japan on the scene. The storage, handling, and lighterage charges at Newchwang were in themselves sufficient to offset any difference in the railway freight. Against such a condition of affairs it was useless for the foreigner to struggle. If he attempted to purchase beans or bean-cake, he would have to sell eventually to the larger Japanese firms controlling the exports to Japan at their price and most likely at a loss.

“So, with the export trade of Manchuria in their hands, it was an easy step to monopolize the imports for such Japanese goods suitable to the demand. At a time when Manchuria was impoverished as a result of a devastating war, and the purchasing power of the inhabitants reduced to a minimum owing to a shortage of currency, commerce was reduced to its original character of simple barter. The farmer, hauling his crop many miles to the nearest market town, exchanged his products for cotton goods and other necessities...

“As a result of the war, many new inland treaty ports were thrown open to trade, and where previously the foreigner was confined to the one port of Newchwang, and forced to deal with the inferior through native agents, he could now branch out and establish himself in many large centers of trade throughout the province...

“It is a far cry from high diplomacy to the humble Soya Bean, yet we hold to the belief that the past and present commercial situation and ultimate solution of the vexatious Manchurian problem is bound up in the control of this one product.”

Eighteen black-and-white photos (each about 3 by 6 inches) show: Upper end of wharf at Dairen. Dairen, the “white city” or amusement park. Loading steamer with [soy] beans at Dairen. Loading beans at Dairen wharves. Loading beans on vessels at Dairen wharf. Another loading scene at Dairen wharves. [Soy] bean oil awaiting shipment at Dairen. Storing beans at Manchuria.–Oil cake company’s warehouse. Loading beans into switch cars on Dairen wharves. View of piles of beans in sacks on Dairen wharves. Piles of beans (in sacks) and round bean cakes awaiting shipment on Dairen wharves. Scenes on Dairen wharves–storing beans into round osier bins. Panoramic view of Dairen, looking across the Nippon Bridge to the Old Russian administration town. Panoramic view of Dairen, from the hills looking towards the harbor. Delivering beans in carts. Open storing grounds at Dairen with piles of beans in sacks. Cleaning and re-sacking beans at Dairen for shipment to Europe. Sansing [a large gate], in North Eastern Manchuria. The new edifice of the Yokohama Specie Bank. The Civil Administration Building, Dairen. Kirin: The governor’s summer yamen [headquarters or residence]. Main street of Tiehling, a great bean and grain center. The streets of Newchwang.

Note 1. This is the earliest English-language document seen (Feb. 2004) that uses the term “bean-cakes” to refer to ground, defatted soybeans.

Note 2. This is the earliest document seen (Oct. 2001) concerning allegations of unfair trade practices.

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1380. Yokohama Nursery Co., Ltd. 1910. Descriptive catalogue... Bulbs, plants seeds. 1910-11. Yokohama, Japan. 100 p. March. Illust. Index. 26 cm. [Eng]
• ***Summary:*** On the cover of this English-language catalog is an illustration of various gorgeous Japanese flowers. In the section on "Seeds" (p. 82+) is a subsection (p. 89) titled "Some vegetable seeds." The contents (incl. the entry for "soy bean") is identical to that in the 1909 catalog, except that the price per 100 lbs. of soy beans has dropped again to $2.50. Address: P.O. No. Box 72. 21-35 Nakamura, Yokohama, Japan. Phone: 509.

1381. *J. of the Royal Society of Arts* (*London*)*.* 1910. Soy beans. 58:519. April 8.
• ***Summary:*** "At a recent meeting of the Linnaean Society, Mr. J.H. Holland, on behalf of the director of Kew, showed samples of Soy bean, *Glycine Soja,* Sieb. and Zucc (*G. hispida,* Maxim.), with herbarium specimens of the plant producing this seed... This plant is variously known as 'Soy,' 'Soja,' 'Soya,' 'White Gram,' 'American Coffee Berry,' and 'China Bean.'

The "Soy [Sauce] of Commerce" is made from the seeds of this bean, plus salt, flour, and fresh water. "Wenchow is an important centre of the manufacture, and here the bean used for the purpose is said to be chiefly the white form from Chinkiang."

"The principal use of the beans in this country is for the extraction of the oil, of which they contain about 18 per cent. suitable for soap-making, and in general as a substitute for cotton-seed oil... The beans can be bought in London at about £5 to £6 per ton; the oil realises about £21 to £22 per ton, and the cake about £6 to £7 per ton.

"Beans and bean-cake exported from China have gone chiefly to Japan, and certain parts of Asia, but recently, beginning about November 1908, an important trade has been developed in them, more especially with the beans, between Manchuria and Europe, Dairen (Dalny) being the chief place of export."

"The amount of the 1908 crop sent to Europe through Vladivostok up to July, 1909, was 180,000 tons, the greater part destined for the English market (Hull and Liverpool), and the remainder going to German (Hamburg) and Scandinavian ports.

"Up to 1907 the export of Soy beans from Manchuria did not exceed 120,000 tons annually. During 1908 the export rose to 330,000 tons (one half shipped from Dairen; 100,000 tons from Newchang, and 65,000 tons by rail *via* Suifenho [Suifenhe] to Vladivostok), the increase it is said being due entirely to the demand from Europe."

Note: This is the earliest document seen that mentions Suifenho [Suifenhe] (spelled Suifenhe in 1999), a border town on the railroad that joins eastern Manchuria with Vladivostok. It is located between the cities of Suiyang (in Manchuria) and Pogranichnyy (in Primorskiy Kray in the Russian Far East). Address: Kew Gardens.

1382. *New York Times.* 1910. Latest customs rulings. Japanese "miso" for use in preserving soups is dutiable at 20 per cent. April 22. p. 14.
• ***Summary:*** "The United States Circuit Court for the Territory of Hawaii has handed down a decision favorable to importing interests regarding the classification under the tariff of so-called 'miso,' a preparation used for the most part in making soup.

"The article in controversy is a Japanese preparation, and is used by both the Japanese and Americans. The question at issue was whether the commodity is subject to duty at 20 per cent., as claimed by S.B. Fujiyama, the importer making the test case, or at double that rate under the tariff provision for 'preserved vegetables' or as 'a sauce.' The Board of General Appraisers found in favor of the Government's contention at the higher rate. The importer than appealed to the Circuit Court, which finds for the protestant..."

"This Japanese product is made from [soy] beans and rice by process of cooking and fermentation, which have the effect of changing its taste and flavor, though not entirely destroying its form. The chief use of miso is in preserving soup with which it is used."

1383. Holland, J.H. 1910. Linnean Society of London: Soy bean. *Pharmaceutical J. and Pharmacist* (*London*) 30:515-16. April 23. Series 4.
• ***Summary:*** Reprinted from the *Proceedings of the Linnean Society of London.* Session of March 17, 1910. Address: F.L.S., London.

1384. Brenier, Henri. 1910. La question du soja [The soya question]. *Bulletin Economique de l'Indochine* (*Hanoi*) 13(83):105-28. March/April. Series 2. [22 ref. Fre]
• ***Summary:*** This is an in-depth look at the relevance of the soybean to France, both now and in the future. It is prompted by the rapid growth of soybean imports to Europe from Manchuria. The author has a good knowledge of the literature on soybeans and a familiarity with the crop in the field in French Indochina and China.

Contents: 1. Soybean cultivation: Species and varieties, major soybean producing countries (China, Japan, Korea, Indochina), other countries (Java and the Dutch East Indies, France, USA. The Imperial Institute of London is conducting trials in the Cape of Good Hope and Natal [South Africa], in British West Africa, and in Gambia), methods of cultivation and yield. 2. Commerce: Exports of soybeans and soybean cake (beancake, *tourteaux de soja*) from China and especially Manchuria (Newchwang, Dairen/Dalny, Antung, Ta tung kow, Suifenho [Suifenhe] / Sui-fen-ho), importing countries in 1908 in descending order of amount

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imported (Russian ports on the Pacific [Vladivostok, for re-export to Europe], Great Britain, France, Holland, Italy, Belgium, Germany), prices. 3. Soybean utilization: Chemical composition, use as a forage plant and for improving the soil, use in human foods (tofu, shoyu, Worcestershire sauce, tuong [Annamite soy sauce], miso, natto, soymilk), the soybean as an oilseed (yield of oil from various oilseeds), soybean cakes. Conclusions.

Page 109 discusses soybeans in Indochina, according to information received from M. Crevost, Curator of the Agricultural and Commercial Museum of Hanoi, and from the article by Bui-quang-Chiêu (Dec. 1905). The names of the soybean are different in the various parts of Indochina. In Cochin China (especially in the provinces of Chaudoc and Baria), in Annam (sporadically), and in Tonkin it is called *dau-nanh* or *dau-tuong* (*Tuong* is a sauce made with soybeans, described later under "Uses"). In Cambodia (*Cambodge*) it is called *sandek sieng.* The variety most widely cultivated in Indochina seems to be one with a yellowish-white color, more oblong than round, a little flattened (*soja platycarpa* of Harz [1880, 1885] (?)), different therefore from the fine (*belle*) varieties of Manchuria and Japan that are well rounded and pure yellow.

A table (p. 112) shows soy bean grain exports (in 1,000 metric tons) from different Manchurian ports for the years 1905-1908. The author notes that Indochina could be exporting soybeans to France. One factor that stimulated the large exports of soybeans from Manchuria in 1908 (besides an excellent harvest in 1907) was a program to suppress the cultivation of opium by expansion of soybean acreage (p. 113). The author uses the scientific name *Phaseolus radiatus* to refer to the *petit haricot vert* (probably mung bean). He observed soybeans planted in mixed culture in Szechuan.

Page 116 notes that the rise of soybeans in Manchuria is due in part to the power of the Japanese commercial house Mitsui Bussan Kaisha and the large English oil mills, which joined to develop an industry that had not previously existed. At the end of 1906, Mitsui, which had a dominant commercial role in Southern Manchuria, sent one or two trial shipments of soybeans to England. Mitsui was followed mainly by the British trading houses (Samuel & Samuel, Jardine, Matheson), then by the Germans (Otto Reimers, Arnhold Karberg), and the Russians. Continued suppression of opium growing led to further expansion of soybean cultivation.

A table (p. 117) gives the price of soybeans (per picul of 300 catties = 180 kg), soybean cake (per 10 cakes of 53 catties each or 318 kg for the 10), and soybean oil (per picul of 100 catties = 60 kg) in New chwang [Newchwang] taels and in French francs in the average year from 1882-1891, and in the year 1897. Prices were up in 1897.

Page 124 states: "A factory was recently founded near Paris (at Saint Germain en Laye), with Chinese capital, for the preparation of a series of products derived from soya: milk, *"caséo-sojaïne,"* cheese [tofu], sauce, and sweet soya preserves (*confiture* (*?*) *de soja*)*."* A footnote states: "I owe this curious piece of information to the amicability of the secretary of *Ecole française d'Extrême-Orient,* Mr. Ch. Maybon, who pointed it out in the January 1910 issue of the *Bulletin de l'Association amicale franco-chinoise.*

A table (p. 125) shows that the soybean gives the lowest yield of oil of all major oilseeds: copra (from coconut) yields 67-70% oil, sesame seeds 50-56%, poppy seed (*pavot*) 43-50%, castor oil plant 42-50%, rapeseed (colza) 42-45%, linseed 43%, peanuts 35-47%, cottonseed 21-26%, soybeans from Manchuria 16-18%.

Note: This is the earliest document seen (March 2000) that describes *caséo-sojaïne* as a product. Yet this may well be a mistake since its source of information is given as *Bulletin de l'Association Amicale Franco-Chinoise* (Jan. 1910)–which uses the term to refer to a business name. Address: Inspecteur-Conseil des Services Agricoles et Commerciaux de l'Indochine.

1385. Nishimura, Torazô; Inoue, T. 1910. Shôyu ni kansuru kagakuteki kenkyû. I. [Chemical investigation of shoyu. I.]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 13(146):378-85. April. [Jap; ger] Address: Nôgaku-shi, Japan.

1386. Noorden, Carl von; Lampé, Eduard. 1910. Ueber Sarton, ein neues Naehrpraeparat fuer Zuckerkranke [Sarton, a new food for diabetics]. *Therapie der Gegenwart: Medizinische-Chirurgische Rundschau* 51(4):145-46. New Series Vol. 12. [Ger]

• ***Summary:*** This article is mainly about soybeans, their chemical composition, and the various foods that can be made from them. "By coincidence, the soybean (*Soja hispida*), of Japanese origin, fell into our hands. The first experiments on this plant were conducted many years ago, initially in our private clinic in Frankfurt, then later by another one of us in Frankfurt and the other in Vienna.

"Soja hispida, a legume, produces a seed that lies somewhere between peas and beans in appearance. There are numerous varieties of soybeans and each has different qualities. Only certain varieties are useful in the kitchen. In Japan it is used to make the Japanese "bean sauce [*Bohnensauce*], called shoyu; it is also found in fine European kitchens. Moreover, in Japan, a peculiar dish called tofu (*Tofou*) is prepared from soybeans. It is rich in protein; almost all other nutrients of the beans are removed during its preparation. In its simple boiled state, the soybean is used as a vegetable or salad in Japan by the poor. Also in southeast Europe, people have been planting soybeans for three decades, but they don't have the same value here as in Japan.

"The high concentration of protein in soybeans (30-35%), the low concentration of starch and of digestible carbohydrates (ca. 6%) leads us to want to try soybeans in

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diabetic diets. But the plain, unprocessed bean, regardless of what we add to it, does not suit European palates..."

"Finally a method was found that removes almost all of the carbohydrates from soybean meal (*Sojabohnenmehl*), and also gets rid of the unpleasant tasting materials. Because this process is much too complicated to be carried out in one's household, Bayer & Co., a paint factory in Elberfeld, took over the production on a large scale. The preparation was next produced in the form of a thick puree, put into sterilized tin cans (about 18-19% solids, of which 8-9% was protein). Meanwhile they succeeded in making a dry powder, and the firm even told us that they would probably prefer to sell the preparation in a powdered form.

This soybean puree, given the name Sarton by the factory, contains no starches or red dextrins (*Erytrodextrins*) as indicated by a test with Lugol's solution. If properly prepared, the taste is excellent. All patients, and even healthy workers, accepted it very well. Like pea soup and lentil soup, the Soybean soup invites the use of plenty of butter or other fats, and thereby enables the incorporation of a high level of total nutrients–with little resulting sugar in the urine.

"More detailed communications about the soybean, about the chemistry of this and other preparations, about its digestibility, etc. will soon be published by Dr. E. Jürgensen from the Vienna Medical Clinic (*Wiener I. medizinischen Klinik*).

Note: This product, which originated in Japan, was made in its own factory in Potsdam. Address: 1. Vienna, Austria; 2. Frankfurt am Main, Germany.

1387. Sewaki, Hisao. 1910. Jika kôan shôyu baiyôki ni tsuite [On shoyu culture media developed by the writer]. *Seiikai Geppo* No. 338. p. 1-7. April. [Jap]
Address: M.R.C.S., L.R.C.P.

1388. Nishimura, Torazô. 1910. Shôyu kôbo no shurui sesshoku baiyô oyobi shôyu no nama kabi ni taisuru fuyu-hô no kôka. I. Shôyu kôbo no shurui [On the contact culture of shoyu yeast, and the effect of covering shoyu with oil to prevent molds. I. The varieties of shoyu yeast]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 94. p. 19-37. May 5. [Jap]

1389. Wilkinson, F.E. 1910. Bean industry of Manchuria. *Board of Trade Journal* (*London*) 69:282-84. May 12. [1 ref]
• ***Summary:*** This article is based on Diplomatic and Consular Reports, Annual Series (Foreign Office, Great Britain), No. 4440 (May 1910). "In 1909, 178,000 tons of beans and 318,000 tons of bean cake were exported from Newchwang and 438,000 tons of beans and 276,000 tons of bean cake from Dairen, making a total of 616,000 tons of beans and 594,000 tons of bean cake. Now, as 100 tons of beans are required to produce 9 tons of oil, it may be estimated that, to produce 594,000 tons of bean cake, 653,400 tons of beans must have been treated, so that the total quantity of beans represented by the combined exports of bean produce from the two ports was 1,269,400 tons. Exports from other places on the coast would bring the total exports from South Manchuria to about 1,300,000 tons...

"At the time of the first shipments to Europe the price of beans laid down at Dairen was about 3*l.* 10*s.* [£3 10 shillings] per ton. By the spring of 1909 the value of the soya bean as an article of commerce had become generally known, and, a large number of British and other firms entering the field as prospective buyers, competition gradually drove the price up. The new crop, though well up to the average, proved not to be equal either in quality or quantity to that of 1908. The price of beans consequently rose still further, and in February 1910, it reached £6 5*s.* per ton, the highest point it has touched as yet.

"At the price mentioned, China and Japan are practically out of the market as buyers, and about 80 per cent. of the purchases of beans made since December last have been for the European market." Address: British Consul, Newchwang.

1390. *Economiste Francais* (*L'*). 1910. Lettre d'Angleterre [Letter from England]. 38(21):761-63. May 21. [Fre]
• ***Summary:*** This unsigned letter from London is dated 18 May 1910. It gives a lengthy summary in French of a report from the British Consul at Newchwang (Ying-K'ou), Manchuria, concerning trade in soy beans and soy bean products (fèves de soya) between Manchuria, Japan, and England. Address: France.

1391. Langworthy, C.F. 1910. Apendice. La soya como alimento para el hombre [Appendix: The soy bean as human food]. *Boletin de la Sociedad Agricola Mexicana* 34(20):389-92. May 25. [1 ref. Spa]
• ***Summary:*** This is a Spanish-language translation of USDA Farmers' Bulletin No. 58 (1897, Revised 1899). The soybean is referred to throughout as "La haba soya." It describes and gives the nutritional composition of various Japanese soyfoods, including natto, miso (3 types; *miso blanco, colorado, Suiza* [*Swiss*]), tofu (*Tofu o queso de haba; Tofu fresco*), soymilk (*leche de la haba soya*), frozen tofu (*Tofu helado*), yuba, soy sauce (*salsa de la haba soya*).

Note 1. This is the earliest Spanish-language document seen (Oct. 2012) that mentions yuba, which it calls *yuba.*

Under the name of coffee beans (*habas de café*), soybeans (*las habas soya*) are sometimes consumed in Switzerland as legumes (*como legumbres*)*;* when they are dry and toasted, they are used as a substitute for coffee (*sustituir al café*). No mention is made of soybeans or soyfoods in Mexico.

Note 2. This is the earliest Spanish-language document seen (April 2013) that uses the term *Tofu* or the term *queso de haba* or the term *Tofu fresco* to refer to tofu

Note 3. This is the earliest Spanish-language document

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seen (Jan. 2012) that mentions natto, which it calls *natto.*

Note 4. This is the earliest Spanish-language document seen (March 2009) that mentions miso, which it calls *miso.*

Note 5. This is the earliest Spanish-language document seen (Nov. 2012) that mentions soy coffee or soy as a substitute for coffee, which it calls *sustituir al café.*

Note 6. This is the earliest Spanish-language document seen (Aug. 2013) that uses the term *leche de la haba soya* to refer to soymilk.

Note 7. This is the earliest Spanish-language document seen (April 2013) that mentions frozen tofu, which it calls "Tofu helado."

Note 8. This is the earliest Spanish-language document seen (April 2012) that mentions soy sauce, which it calls "salsa de la haba soya." Address: PhD, Office of Experiment Stations, USDA, USA.

1392. Sewaki, Hisao. 1910. On the preparation of a simple culture medium. *Sei-i-kwai Medical Journal* 39(5):515-16. May 31. Whole No. 339. [Eng]
• ***Summary:*** To replace the ordinary bouillon and agar culture media, most frequently used for the cultivation of bacteria, the writer describes five less expensive alternatives: (1) Shôyu-Bouillon–15 parts shoyu, 18 parts pepton, and 1000 parts water. (2) Simple shoyu culture medium. (3) Shoyu-agar medium. (4) Shoyu medium after Endo's method. (4) Shoyu medium after Conradi-Drigalsky's method.

Characteristics of these shoyu media: 1. The shoyu medium does not contain meat in any form. 2. Shoyu is employed in place of meat. 3. As shoyu contains sodium chloride, the latter is not used. 4. It takes only 2 hours to make an ordinary shoyu culture medium. 5. The above mentioned conditions make the expense very small and economise on time.

Note: This journal, later titled *Seiikai Geppo,* is published by the Society for the Advancement of Medical Science in Japan. Address: M.R.C.S., L.R.C.P.

1393. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1910. Soya Beans. China. No. 356. p. 92-93. May.
• ***Summary:*** Having received several inquiries from interested firms, Vice Consul C.C.L. Williams secured freight quotations on the shipment of Manchurian soya beans and bean cake from Newchwang to San Francisco, California, and Seattle, Washington.

Writing from Dalny at the end of January 1910, regarding soya beans, Vice-Consul A.A. Williamson states that "the whole market has been in an unprecedented state of upheaval this season." "Beans are now at prohibitive prices, higher than ever before–$1.66 gold per 133.3 pounds. Absolutely no guarantees as to oil contents or moisture can be given."

"On account of the high duty on beans–45 cents per bushel of 60 pounds–very few have gone to the United States. The chief product which Americans buy is oil." A table (p. 93) shows exports (in tons) of beans, bean cake and bean oil from Newchwang to Hongkong, Great Britain, Samarang [Semarang, Central Java], Germany, Japan, and Chinese ports during the first 3 quarters of 1909. Address: Washington, DC.

1394. *Monthly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1910. Oil-seed products. No. 356. p. 83-93. May. See p. 91-93.
• ***Summary:*** In the section titled "Cotton-seed oil and meal," under "England" there is a long subsection on "Soya Bean and Other Oils." In the section titled "Soya Beans" are the following subsections: (1) "China: Freight rates from Newchwang to the United States." A Japanese shipping company, Nippon Yusen Kaisha, has quoted a rate from Kobe to Seattle, Washington, and a French company has quoted rates from Chingwantao* to San Francisco, California, by direct steamer. Exports of "beans, bean cake, and bean oil" from Newchwang to the following ports are given for the first 3 quarters of 1909: Hongkong, Great Britain, Samarang [Semarang, Central Java], Germany, Japan, Chinese ports, and total. The leading buyer is Japan, and the leading export product is bean cake.

(2) "Dalny: Prices and cost of shipment." "Beans are now at prohibitive prices, higher than ever before–$1.66 gold per 133.33 pounds." A table (p. 93) shows the exports during the first 3 quarters of 1909 from this port to Hongkong, Great Britain, Samarang, Germany, Japan, and Chinese ports for beans, bean cake, and bean oil.

* Note: Chingwantao, also spelled Chinwangtao or Ch'in-huang-tao, is seaport town on the Gulf of Chihli, in northeast Hopeh province, northeast China (former Manchuria); a former treaty port. Address: Washington, DC.

1395. Nippon Shubyo Kabushiki Kaisha (Japan Seed & Plant Co., Ltd.). 1910. Eigyô annai [Sales information]. Tokyo, Japan. Spring. 26 cm. [Jap]
• ***Summary:*** On the cover of this Japanese-language catalog we read (in characters from right to left): Number one seed store in the Orient (*tôyô*). Capitalization: 700,000 yen. 43rd year [of Meiji], spring. Sales information.

Page 3 is devoted entirely to beans (*mamé rui*). Shipping and tax free. Each small bag costs about 2 *sen.* The first section described 7 varieties of soybeans: (1) Large white soybeans (*Ooshiro daizu*). 5 sen per *gô* (100 sen = 1 yen; 1 *gô* = 180 cc = 0.763 cups {U.S.}). 32 sen per *shô* (1 *shô* = 1.8 liters = 1.903 quarts {U.S.}). Large, shiny beans. Good tasting. Good for making *nimame* (boiled, seasoned whole soybeans) or kinako (roasted soy flour) (2) Black soybeans (*Kuro daizu*). 5 sen per *gô.* 32 sen per *shô.* Black beans, large beans, extremely productive. (3) Large green soybeans (*Ao*

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ômamé). 5 sen per *gô*. 23 sen per *shô*. The seed coat is green. Good for making kinako and roasted soybeans (*irimamé*). (4) Black soybeans for rice fields (*Ta no kuromamé*). 5 sen per *gô*. 32 sen per *shô*. Planted on the sides of the foot paths between rice fields (*azé*), these will produce a big crop. Good for making a type of boiled (?) soybeans and miso. (5) Branch and pod *Sangorô* soybeans (*Eda saya sangorô daizu*). 7 sen per *gô*. 60 sen per *shô*. Pull up the whole plant, boil the beans in the pods, and enjoy. Satisfies large demands. (6) "Little bells" soybeans (*Suzunari daizu*). 5 sen per *gô*. 40 sen per *shô*. Although the beans are small, they grow in many clusters, so you get a big crop and a big profit. (7) "Goose eating" soybeans (*Gan-kui mamé*). 5 sen per *gô*. 40 sen per *shô*. Black, large-seeded soybeans. Good for making *nimame* (boiled, seasoned whole soybeans).

Next come 5 varieties of azuki beans: (1) Summer azuki (*Natsu shôzu*). 5 sen per *gô*. 35 sen per *shô*. Early type, therefore if you grow them, they could be profitable. (2) White azuki (*Shiro shôzu*). 6 sen per *gô*. 40 sen per *shô*. Small and white, they are used to make high quality sweet azuki bean paste (*an*). (3) Dainagon shôzu. 5 sen per *gô*. 35 sen per *shô*. Large and high quality, they are the best to make sweet azuki bean paste (*an*). You can get a large crop on any type of land. (4) "Thin seed coat" azuki (*Usu kawa shôzu*). 5 sen per *gô*. 35 sen per *shô*. Although small seeded, they have thin seed coats and are good quality. (5) Mottled azuki (*Kasuri azuki*) 5 sen per *gô*. 40 sen per *shô*. White beans with white kasuri pattern. Tasty. Note: Kasuri is a famous type of Japanese dyed cloth with a splashed or mottled pattern, usually white on blue. (6) Green beans (*Yainari*. [Also written "yaenari"]). 7 sen per *gô*. 60 sen per *shô*. The very small green seeds can be used [ground] to make green kinako (*ao kinako*) or sweet azuki bean paste (*an*). Note: Yainari / yaenari is the most expensive variety of azuki. Address: Near Shinjuku Station, Tokyo, Japan.

1396. Nishimura, Torazô; Inoue, T. 1910. Shôyu ni kansuru kagakuteki kenkyû. II. [Chemical investigation of shoyu. II.]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 13(147):484-511. May. [Jap; ger] Address: Nôgaku-shi, Japan.

1397. Uehata, G. 1910. Manshû-san daizu abura ni tsuite [On Manchurian soybean oil]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 13(147):456-83. May. [Jap; ger]

• ***Summary:*** The German title is "Ueber das Mandschurische Soyabohnenoel." The author has made a detailed study of soap made from soybean oil. Address: Rigakushi, Japan.

1398. Wilkinson, F.E. 1910. China. Report for the year 1909 on the trade of Newchwang. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*) No. 4440. 23 p. May.

• ***Summary:*** The section titled "Exports" (p. 9) gives a detailed discussion of the amount and value of Beans [soybeans], bean cake, and bean oil exported from this port. An excellent full-page map shows the south of Manchuria and Corea including all the major ports (Newchwang, Port Arthur, Tairen [Dairen], Antung), cities, rivers, railways (existing and proposed), and bodies of water. Export of [soy] beans from Newchwang reached 4,242,943 cwt [1 cwt = hundredweight = 112 pounds], which has only once been exceeded, in 1899, before the port of Dairen came into existence. Export of bean cake has broken all previous records. Some 86% of the 6,365,654 cwts were sold to Japan, "where, owing to the dearth of fish manure, bean cake has become indispensable as a fertiliser in the rice fields... Experimental shipments of bean cake for cattle consumption were made during the year under review both to the United Kingdom and Germany. The shipment to the United Kingdom proved a failure, the cake arriving in a mildewed condition. The result of the shipment to Germany, which as a comparatively large one of about 500 tons, has for some reason or other been kept a secret. Special precautions were taken in this case to keep the consignment in good condition."

The great market for bean oil "is South China, where it is mainly used for cooking purposes as a substitute for lard, which is a more expensive commodity. In spite of its unpleasant odour, the poor consume the oil, as a rule, in its crude state without any attempt at refining it, but amongst the better classes it is boiled before being used and allowed to settle in jars for a couple of months. This process is said to do away to a great extent with the objectionable smell and to improve the flavour. There is also amongst the poorer classes a fairly brisk demand for bean oil for lighting purposes. They find it more economical than kerosene, besides saving them the cost of a lamp, for all they need to do is pour a little into a cup or bottle and drop a proper wick into it... A small quantity of bean oil was shipped to the United Kingdom, where their appears to be a demand for it for soap making... The shipments in 1909 were made in kerosene oil tins, but they have not been a success, as in every case there was a heavy loss by leakage."

"Total production of [soy] beans in South Manchuria." The author will now attempt to estimate this total based on the exports of beans and bean cake from Newchwang and Dairen in 1909. The "consumption by Manchuria of these special products is very limited, and the two ports between them almost monopolise the export. Beans, except to a limited extent, in the form of bean curd [tofu] or vermicelli, which is made of the green variety, do not enter into the diet of the population, nor is any use made by farmers of bean cake either in manuring their fields or feeding their cattle. The staple food of both man and beast in this country is millet, and, for the rich soil in the interior, the ordinary farm manure is the only fertiliser needed. It is probable, therefore,

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that at least 90 per cent. of the total crop is available for export. In 1909 212,000 tons of beans and 318,000 tons of bean cake were exported from Newchwang, and 438,000 tons of beans and 276,000 tons of bean cake from Dairen, or from the two ports together 650,000 tons of beans and 594,000 tons of bean cake. It is computed that it would require about 653,000 tons of beans to produce 594,000 tons of bean cake, so that the total quantity of beans represented by the combined exports of bean produce from the two ports was 1,303,000 tons. Exports from other places on the coast may account perhaps for another 30,000 tons, which brings the total exports from South Manchuria to 1,333,000 tons. The production therefore, under favorable conditions, may be safely estimated at not far short of 1,480,000 tons."

Tables show: Value of the total trade of Newchwang during 1905-09. Value of trade for beans, bean cake, and bean oil from 1908-09. Distribution of bean, bean cake, and bean oil export from Newchwang. Address: British Consul, Newchwang.

1399. Nishimura, Torazô. 1910. Shôyu kôbo no shurui sesshoku baiyô oyobi shôyu no nama kabi ni taisuru fuyu-hô no kôka. II. Shôyu kôbo beetaa (1) Kin no keitai oyobi kôzô no tsuzuki [On the contact culture of shoyu yeast, and the effect of covering shoyu with oil to prevent molds. II. The beta shoyu yeast (1) Its form and structure]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 95. p. 42-65. June 5. [Jap]

1400. *Weekly Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1910. Japan's purchases of fertilizers. 1(15):713. June 11.
• ***Summary:*** "Vice-Consul-General E.G. Babbitt, of Yokohama, reports that the imports of fertilizers into Japan in 1909 were valued at $17,899,322..." They weighed 1,347,541,898 *kin* (1 kin = 1.333 pounds). "The value of the chief fertilizers imported in 1909 was as follows [no amounts are given]: Bean cake, $11,140,407; sulphate of ammonia, $2,949,409; phosphate rock, $1,105,640; rape-seed cake, $588,523; animal bones, $503,578; cotton-seed cake, $400,853; nitrate of soda, $347,814; superphosphate, $218,333; dried fish, $182,334; bone dust, $128,572. The share of the United States in this business amounts to less than 1 per cent of the total."

1401. *Times of India* (*The*) (*Bombay*). 1910. Trade prospects in Manchuria. June 24. p. 6.
• ***Summary:*** "Discussions of the future of the Bombay mill industry are largely governed by the prospects of the China trade. And of the China trade by far the most promising branch is that with the fertile and growing province of Manchuria. We commend therefore to Bombay millowners interested in the China trade a valuable and suggestive report upon the commercial condition of the province in general and of Newchwang in particular, which has been written by Mr. Consul Wilkinson. The staple products of Manchuria are millet and beans. Millet takes the place of the Indian kharif as supplying the food of the people, and beans are the money-bringing produce. It is estimated that the total production of beans [soya beans] in Manchuria is not less than a million and a half tons,... Since 1909 the character of the trade has entirely changed."

"But in 1909 some European millers discovered the merits of the soya bean, and this discovery, synchronising with a demand for oil seeds at a high price, stimulated an enormous export to Europe. The result has been that Europe snaps up the Manchurian beans at prices which China and Japan cannot afford to pay, The cultivators dependent upon the bean cake for manure are hit hard, and the oil mills at Newchwang are standing idle."

1402. Nakamura, Keisuke. 1910. Ika shôyu-chû no chisso kagô-butsu [On the nitrogenous compounds in ika-shoyu (made from squid or ink-fish)]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 31(6):597-613. June. [Jap] Address: Nôgaku-shi, Japan.

1403. Parker, Edward C.; Hoagland, Ralph. 1910. The soy bean of Manchuria. *Minnesota Farm Review* 15(6):121-23, 138-39. June.
• ***Summary:*** Contents: Introduction. Soy beans the basis of Manchurian commerce: The only large cash crop. Original habit and limits of growth. Methods of production and transportation. Exports–local and foreign usage. Manchuria and world commerce. Imports of Manchurian products in the United States. Plant breeders should develop a soy bean for the American corn belt. Composition and feeding value of soy beans and soy bean cake. Fertilizing value of soy-bean cake. It is estimated that Manchuria produces about 50 millions bushels per year of soybeans.

Photos show: 1. "Manchurian soy bean-cake awaiting shipment on the Japanese railway to the seaboard where steamers carry most of it to Japan to fertilize the rice fields. Small shipments go to America." 2. "A station on the Chinese railways in Manchuria where native carts unload their stores of soy beans for shipment to the seaboard and thence through the Suez Canal to England." An illustration shows the University Farm–St. Anthony Park. Several tables show the composition of soybeans and soybean cake.

Note: This is the earliest English-language document seen that uses the term "soy-bean cake" to refer to ground, defatted soybeans. Address: University Farm, St. Anthony Park [Minnesota].

1404. Mitsui & Co. Ltd. 1910. Soya bean oil (Ad). *Oil, Paint and Drug Reporter* 78(1):20. July 4.
• ***Summary:*** "English soya bean oil–Prompt shipment from Hull. We are largest supplier of Soya Bean from Manchuria,

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and have special connections with crushers. Manchurian soya bean oil. Shipment direct from our eastern oil plant. Fall delivery at New York. Head office: Tokio, Japan. New York, Silk Exchange Bldg. San Francisco, Merchant Exchange Bldg.

On this page are 3 other large ads for soya bean oil. 1. Edward Hill's Son & Co., New York. 2. Welch, Holme & Clark Co., New York. 3. C.R. Laurence, San Francisco. Address: New York & Tokyo.

1405. Mitsuda, Ryuichi. 1910. Shôyu moromi-chû no kôbo no sûshu ni tsukite [On the yeasts of shoyu moromi]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 96. p. 43-54. July 5. [Jap]

• ***Summary:*** Eight photos (p. 48) show shoyu yeasts at different magnifications. Address: Japan.

1406. Nishimura, Torazô. 1910. Shôyu kôbo no shurui sesshoku baiyô oyobi shôyu no nama kabi ni taisuru fuyû-hô no kôka. II. Yasai-rui [On the contact culture of shoyu yeast, and the effect of covering shoyu with oil to prevent molds. II. Vegetable types]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 96. p. 1-17. July 5. [Jap]

1407. Reuter. 1910. The Far East. Russo-Japanese agreement. The situation in Manchuria. *Scotsman* (*Edinburgh*). July 8. p. 7.

• ***Summary:*** "Paris–The Russo-Japanese agreement consists firstly of a brief general statement of the determination of the two Governments to maintain jointly the *status quo* in Manchuria, territorially, administratively, and in other respects, and to co-ordinate railway interests there.

"Secondly, it consists of a detailed technical agreement between the eastern Chinese Railway Corporation and the South Manchuria Railway Corporation, regulating the direction and division of the traffic between Vladivostok and Dalny, establishing advantageous through rates with the railways in Russia and Japan, and adjusting several pending matters.

"The traffic agreement is designed to enable the railways to exploit the territory more profitably, subordinating local developments to a general plan. Vladivostok thereby gains a share in the export of grain and [soy] bean crops to Japan. It is intended to work the lines to be constructed in future as feeders to the existing trunk lines."

1408. Asakawa, K. 1910. Russo-Japanese treaty: Prof. Asakawa defends Japan's position on Chinese railways (Letter to the editor). *New York Times.* July 16. p. 6.

• ***Summary:*** "I venture to call your attention to the following points regarding the editorial entitled 'The Russo-Japanese Treaty, published in to-day's *Times.*

"The protocol that China will not, before the expiration of the terms of the South Manchuria Railway, construct a competing line in its neighborhood, which you describe as a 'secret agreement,' was not 'disclosed as a consequence of Mr. Knox's proposal.' It was signed at Peking in December, 1905, and the European and American Governments were notified of its conclusion early in 1906."

"In the meantime, the increasing exportation of Manchurian [soy] beans and [soy] bean products not only to Japan, but now also to Europe, is rapidly changing the commercial situation in Southern Manchuria, to the great advantage of foreign merchants competing with the Japanese in the import trade." Address: Prof., New Haven, Connecticut.

1409. *Times* (*London*). 1910. The soya bean: Its importance in Manchuria. July 19. p. 63, col. 4.

• ***Summary:*** This is part of a 96-page Times Supplement on "The Empire of Japan." Contents: Introduction–The bean trade in Manchuria. Its introduction to European markets. The growth of exports. The home consumption remains large. Efforts to secure foreign markets. A word of caution. The trade in England (Total: 2,500 words).

"The history of the growth of the bean trade in Manchuria is as captivating as the story of the rise of Jack's famous beanstalk of our nursery days. It reads more like a fairy tale than a page from the Board of Trade Returns." "More than the ordinary amount of imagination is required to grasp the fact that the first commercial consignment of this crop was sent to Europe in 1906, and that the requirements for the coming season are estimated at a million tons."

"The credit for the introduction of this useful article of commerce is undoubtedly due to Messrs. Mitsui and Co., the well-known Japanese financial and industrial firm, who sent their first trial shipment of beans to England in the winter of 1905-6. This consignment was not successful owing to imperfect packing. A second shipment met with better results and led to a succession of large orders. The beans were found to be valuable both for the extraction of oil... and also in the shape of cake for feeding cattle.

"Excellent biscuits have also been made out of one variety of these beans. The United Kingdom was at once able to take advantage of this newly-found import because of its admission free of duty, the high tariff on such produce precluding the Soya beans from access to Germany, France, and other Continental countries. So great was the demand that by the end of the season of 1908, the Mitsui Company had exported to Europe 200,000 tons of these beans... In the season of 1909 the sales to Great Britain alone are stated to have reached 400,000 tons, and several other important firms have entered the field, including the well-known firm of Samuel Samuel and Co."

"The growth of exports:... Figures supplied me by Messrs. Mitsui give the total exports for the season of 1908-9 (from the three ports of Dairen, Newchwang, and Vladivostok) at 788,916 tons and of bean cake (94 per cent.

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of which went to Japan) at 681,446 tons. Of the beans, 397,156 tons, or 51 per cent., went to Europe, 30 per cent. to China, and 19 per cent. to Japan."

"The home consumption remains large:... In Manchuria the Soya bean is primarily used for the extraction of oil and for the manufacture of cake; it is also made into vermicelli and similar articles of food. Manchuria seems to have a natural monopoly in the growing of this bean for export. The other producing countries, Japan and Korea, require all they are able to raise for domestic consumption, whilst the production of the French possessions in Asia, of Asia Minor, and of West Africa is said to be neither large nor promising enough to be of much account for export. Down to the present time, the Soya bean has not been successfully produced elsewhere, though experimental efforts to grow this particular bean in other parts of the world are in progress." Note 1. This is the earliest document seen (Dec. 2007) suggesting that soybeans may be growing or have been grown in Asia Minor [which is today the large eastern part of Turkey], or the Middle East. A similar and earlier, but weaker, suggestion appears in an article titled "The Ubiquitous Bean," in the *Manshu Nichi Nichi Shinbun* (Dairen) of 25 Nov. 1909. That article states that "Asia Minor... produced something like Beans" [Soya Beans].

"Efforts to secure foreign markets: The Treaty Port of Manchuria half a century ago began the exports of beans, bean oil, and bean cake. It is strange that the potency of the little green bean–it looks more like a dried pea than the bean grown in England–which is furnishing three railway systems with freight, hundreds of vessels with cargoes, three ports with business, and starting up new industries in the North of England should have remained so long undiscovered by Europeans. Even now its advantages appear to have been forced upon the attention of England by a Japanese merchant who, failing his first efforts, made a second attempt to introduce the Soya bean into Europe.

"These beans raised by industrious Chinamen toiling incessantly for a few pence a day are generally brought to the river in carts and shipped in junks in the summer time, while in the winter they are often brought for miles along very bad roads by cart to Newchwang.

"After the building of the railways it was natural that these exports should gravitate more and more to the maritime outlets of these lines at Dairen, Vladivostok, and, to a lesser extent, to Newchwang, which last port, as will be seen in an article elsewhere in this issue, is still receiving the bulk of its consignments by means of junks and by carts. The Newchwang exports consisted of oil and cakes which were manufactured by the aid of numerous crude Chinese oil presses worked with mule power–the oil going to China and the cakes to Japan.

"As soon as the bean assumed an international importance, Newchwang lost its monopoly of the trade. As recently as 1907 almost all the beans available for export–namely, 120,000 tons–were exported *via* Newchwang. Of the 800,000 tons exported last year half went by way of Dairen, and the remainder from Vladivostok and from Newchwang. In the export of bean cake Newchwang still holds the first position because of her numerous Chinese oil presses, together with one modern factory."

"A word of caution:" British merchants lured by the story of the rise of the Soya bean industry are warned that "it would be quite useless to start an office at some point like Dairen or Changchun in order to buy beans in the local market. The only way is to travel into the interior, to visit the country markets and to buy in small quantities for silver coins of low value, that is, 20 or ten cent pieces. The Chinese silver dollar is only worth 85 *sen* Japanese money, or 1s. 9d. [1 shilling, 9 pence], and 5 of the 20 cent silver pieces are worth about 2½d. less than the Mexican or Chinese dollar. The Japanese by purchasing the beans with the little silver coins obtain them cheaper than would be possible for an English firm which was paying for them in silver dollars. For some unaccountable reason, the Chinese producer prefers the small coin though its value is 10 per cent. less."

"The trade in England: The soya bean now constitutes an important part in the Hull import trade... The imports into Hull last year were about 200,000 tons." These large imports are likely to lead to a major decline in cottonseed imports. "The bulk of the soya beans imported into Hull are the yellow beans, and those engaged in the seed trade in the Hull district have a good opinion of the new bean. It is to the cattle grower, rather than to the oil trade, that the advent of the soya bean into this country is of importance, for the cake is cheaper than cottonseed cake and is at the same time richer in those constituents for which cake is used. The value of soya oil is also being widely recognized by soap manufacturers, and there is a notable tendency to employ it in preference to cotton oil.

"The beginnings of an export trade from Hull with the Continent are now in evidence. A considerable quantity of soya cake has already been exported from Hull... Continental dairy farmers are now employing soya meal, with which, apparently, experience has been quite satisfactory."

"With the breaking down of the prejudice of British farmers, which is gradually coming about, a real boom in the soya bean trade would appear to be imminent.

Note 2. This is the earliest document seen (June 2007) stating that Mitsui and Co. sent soybeans to Europe in 1906.

1410. *Christian Science Monitor.* 1910. Rapid development of the soy bean trade in China. July 21. p. 2.
• ***Summary:*** London. From the black variety of soy bean "is manufactured soy (so called from the Japanese equivalent So Yu [sic, Shoyu]), a sauce used by the Japanese as well as the Chinese in astonishing quantities with all kinds of cooked food. It is manufactured by boiling the beans and by allowing them to ferment with yeast [sic] after mixing thoroughly with

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water, flour, and salt, and is sold in glazed earthenware jars.

"The variety of yellow beans is used for making another product of general use, a clear [sic] jelly like substance known as bean curd. It is to be seen on sale in large slabs on every wayside food stall. The cheerful looking coolies in the accompanying photograph are pausing a moment in their work of grinding beans for the purpose under a revolving stone mill. The pulp [okara] so produced will be filtered, [the soy milk cooked], the casein coagulated by the addition of gypsum and the jelly-like coagulated mass pressed into shape for market.

"But it is the cultivation of a third variety, the white bean, which has developed during the last few years from a mere local crop, to supply far eastern demands, into an industry of world-wide importance. At a recent meeting of the Linnaean Society of London Mr. Holland, on behalf of the director of the royal botanic gardens, Kew, gave some statistics of the remarkable innovation for which Manchuria is apparently responsible. The output of soybeans from that country prior to 1907 did not exceed 120,000 tons annually, nearly all being taken by neighboring ports in China and Japan; but during 1908, owing to the demands from Europe, the export rose to 330,000 tons, while the 1909 crop has been estimated at 700,000 to 800,000 tons. The principal use of the beans in Europe is for the extraction of oil, of which they contain some 18 per cent, which is suitable for soap making, while the cake left after crushing is said to be a valuable cattle food likely to prove a serious competitor to cotton seed and linseed cake, at present in use for this purpose. The beans fetch $20 to $21 a ton in London, the oil from $84 to $88 per ton, and the cake about $26 per ton.

"The sudden influx upon the markets of the world of this extremely useful product is, strange as it may seem, undoubtedly due to the Russo-Japanese war, for the cultivation of the crop was extended in Manchuria in direct consequence of the large demand for the bean for food for the Russian army. When the troops were withdrawn other markets had to be sought for the products, the supply of which was at once greatly in excess of demand."

The photo caption reads: The grinding process. Soy beans being prepared for market in a Kwangtung [Guangdong] village. Note: Guangdong is a province in southeast China; its capital is Canton (Guangzhou).

1411. *Agricultural J. of India* (*Calcutta*). 1910. Cultivation of soy-beans in India. 5(3):277-78. Reprinted in Quarterly Journal of the Department of Agriculture, Bengal. 4:17 (1910). For the year 1910-11.
• ***Summary:*** "Soy-bean should be grown as a *kharif* (rainy season) crop. The seed should be sown in June-July. The cultivation is similar to that of other pulses grown in India, *e.g.*, gram, which however, is grown in the cold weather. The crop is ripe in October-November." Detailed instructions for cultivation are given.

"In a good year, the crop yields from 500 to 1,000 lb of grain per acre. In an experiment at the Poona farm in 1906-07 the average yield of different varieties introduced from Japan was 660 lbs. of grain per acre. The straw affords a very valuable fodder for all kinds of stock, who eat it most readily–(Editor)."

1412. Burtt-Davy, Joseph. 1910. The soy-bean (Glycine hispida). *Transvaal Agricultural Journal* 8(32):620-26. July.
• ***Summary:*** Contents: Introduction. Description. Climatic requirements. Varieties. Planting and cultivation. Harvesting the seed. Returns of seed. Use of the seed for stock feed. Use of the seed for human food. Commerce in the seed. Soy-bean oil. As green forage. For ensilage. For hay. As a rotation crop for green manuring. Some co-operative experiment reports (from South Africa).

"We have grown soy-beans successfully at Skinners Court and on the Springbok Flats since 1903. We have also tested them successfully in other parts of the country, but as there was no market for the beans, and farmers had not learned to use them for their own stock, they were not taken up as a regular crop. Another reason for this was that some varieties gave a uniformly poor germination, while on some soils, or under some conditions, none of the varieties did well.

"We have continued our experiments and have now established a strain of seed which gives very satisfactory results. But owing to the variations in soil and the apparent necessity for inoculation (natural or artificial) in some cases, I cannot recommend farmers to plant largely until they have given the crop a trial on a small scale...

"A variety brought by me from the United States in 1903, known as the 'Southern,' has given the best results of any tried by us, both at Skinners Court and on the Springbok Flats. The seed harvested in 1904 we distributed extensively in different parts of the Transvaal, and have had favourable reports of it, both from the high veld and the bush-veld. The original stock was obtained through [seedsmen] J.M. Thorburn & Co., New York.

"Writing from London, Messrs. Mitchell, Cotts & Co. state that only two varieties have been imported into England in any quantity, viz., the north Manchurian or 'Harbin' quality, exported from Vladivostok, and the south Manchurian or 'Sakura' quality, shipped from Dalny, both of which are described as very similar in appearance and composition; the 'Sakura' realizes about 2*s.* 6*d.* per ton more than the others. These are the classes which are most acceptable to the English market. Seed has been received through the courtesy of Messrs. Mitchell, Cotts & Co., and will be tried the coming season."

"Of the varieties grown in Europe we have tried Vilmorin's 'Extra-Early,' 'Extra-Early Black,' and 'Yellow Etampes' at Skinners Court, but they did not thrive at all, even though grown alongside the 'Southern' which did

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excellently" (p. 621).

A list of the names of soybeans grown in Japan, grouped according to seed color, is given. Among the six white seeded beans (*Shiro Mame*), Teppo Mame or 'Gun Bean' is "the sort principally used to make the famous Soy Sauce." Maru Mame or 'Bullet Bean' is recommended as very valuable for horse food. The names of three black seeded soybeans (*Kuro Mame*) and three speckled seeded soybeans (*Fuiri Mame*) are also given. "These have not yet been tested by the Department, but seed is on order for trial next season. In the meantime I recommend farmers to restrict themselves mainly to the 'Southern' variety." Note 1. In calculating yields, 1 muid = 3.33 bushels.

"In China and Japan the soy-bean is an article of human diet. In Japan it constitutes a large proportion of the food of the people, a variety of dishes being prepared from it as well as foodstuffs similar to butter, oil, and cheese. A condiment famous among the Chinese under the name of 'soy', is made from this bean. The beans are of a pleasant taste when boiled, either in a green state or when ripe; in the latter state they need considerable soaking before use...

"The Japanese are reported to extract the casein from soy-beans, using it as a substitute for milk. This vegetable drink is said to be a very popular drink among the poorer classes of China and Japan. The beans are first softened by being soaked and then boiled in water.

"Experiments are being made in Europe in the use of soy-bean flour as an admixture with wheat flour for bread. A biscuit is made and sold in Paris, containing soy-bean flour, which has no starch, and is recommended for persons suffering from diabetes.

"Biscuits seem to be the most likely form in which this flour can be used, and two or three large English firms are now making them... A coffee substitute is made in America and on the Continent of Europe, out of soy-beans."

Note 2. This is the earliest English-language document seen (Nov. 2013) that uses the term "soy-bean flour." Address: F.L.S., etc., Governnment botanist and agrostologist.

1413. Crowe, E.F. 1910. Japan. Report for the year 1909 on the trade of Japan. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*) No. 4511. 86 p. July.
• ***Summary:*** "Imports of manures.–The question of manures forms one of the most interesting items of 1909. A detailed table showing the quantities and values imported during the past three years will be found in Table 1 (B), page 61. Bean cake, of course, heads the list as regards value. The total amount imported in 1909 was 575,180 tons, worth £2,283,700, or £3 19*s.* 4*d.* a ton, as compared with 461,950 tons, worth £2,220,000 in 1908, or an average of £4 16*s.* 1*d.* a ton.

"Next comes the sulphate of ammonia, but in this item there was a big drop from 66,445 tons, valued at £898,000, to 45,835 tons, worth 604,700, while in the case of both phosphate rock and fish guano there was a decrease of about £100,000. Nitrate of soda made a small gain.

"It is a well-known fact that bean cake has for years occupied the position of the most popular imported fertiliser in Japan. Now, however, that the United Kingdom, and the Continent of Europe and America to a lesser extent, have become purchasers of Manchurian beans the questions arises as to whether Japan will be able to continue to buy bean cake in huge quantities if the price rises appreciably. In studying this question two factors should not be lost sight of; one is that Japan is herself a large grower of soya beans, having, according to the latest available returns (1908) over 1,200,000 acres under cultivation, producing annually some 19,000,000 bushels of beans, while the other is that Japan imports very large quantities of soya beans from China and Corea.

"The greater part of these beans is used for the purposes of human food, *i.e.,* the making of "soy," "miso," and bean curd, but a portion, by no means small, is used also as a fertiliser.

"The Russo-Japanese war had such an effect in curtailing the supplies of beans and cake that to arrive at a just appreciation of the position it is necessary to go back a good many years." A table (p. 18) shows imports of [soy] beans and bean cake (in piculs; 1 picul = 132.27 lb), the value of each, and the average price of silver each year from 1900 to 1909. Imports of [soy] beans increased from 1,575,022 piculs in 1900 to a record 3,623,377 piculs in 1909. Imports of bean cake increased from 2,280,687 piculs in 1900 to a record 9,663,036 piculs in 1909. The average price of silver fell by about 16% during this period. "Should the price in future be forced up very high in consequence of British and other demand, the presumption is that Japan would turn to sulphate of ammonia if the cost per unit of nitrogen therein were to be less than in the bean cake. On the other hand it must be remembered that the removal of duty on sulphate of ammonia in the United States of America means that that country will probably absorb large quantities of the British output and that Japan will have to pay a bigger price if she wants a share of this fertiliser.

"Thus the outlook for nitrate of soda becomes a good deal brighter and now that, owing to the subsidised Japanese line which runs to South America, it is possible to get cheap direct rates of freight, it looks as though the nitrate of soda will be a serious competitor to the other nitrogenous fertilisers, except in the matter of wet rice cultivation."

Page 31 shows the shares of principal countries in the import and export trade of Japan during the years 1908 and 1909. Japan's biggest imports came from the United Kingdom, followed by the USA, then China. The biggest customer of Japan's exports was the United States, followed by China then France (p. 31). Japan's biggest port (in terms of value of imports and exports) was Yokohama, followed

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by Kobe than Osaka (p. 37). Japan's population at the end of 1909 was estimated at 49,769,704 (not including Formosa or Karafuto [Japanese Sagalien]). Japan's most valuable exports in 1909 were tea, followed by rice then fish. Exports of "Soy" [sauce] rose from £110,500 in 1907 to £111,100 in 1909.

Summarized in *J. of the Board of Agriculture* (*London*), Aug. 1910, p. 410.

Note: This is the earliest document seen (Sept. 2001) that gives statistics concerning industrial utilization of soybeans–in this case soybean meal used as a fertilizer in Japan. Address: Attaché, British Embassy, Tokio [Tokyo].

1414. Paton, G.P. 1910. Japan. Report for the year 1909 on the trade and navigation of the port of Dairen. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*) No. 4504. 22 p. July.

• ***Summary:*** On pages 3-4 key weights and measures are defined: Chinese: catty = 1.333 lb, picul = 133.33 lb, *li* = 1/3 miles, *mow* = 736½ square yards; Japanese: 1 *koku* [liquid] = 39.703 gallons, 1 *koku* [dry] = 4.963 bushels. The Japanese, Chinese, and total populations are given for Dairen, Shaokangtzu [Shao-kuan, in Kwantung Leased Territory], Port Arthur, Chinchou [Chin-chou] and Pitsewo [Pikou, in Kwantung Leased Territory]. One map (p. 5) shows part of Manchuria, with the main towns, railroads, and where major commodities are produced. Next comes a large fold-out map of the Kwantung Leased Territory [and peninsula] (Dairen Consular District).

Dairen may now be considered the principal outlet for the produce of South Manchuria. The Central Laboratory is doing good work in the manufacture of bean cake and bean oil, and soap from bean oil. "The manufacture of soap from bean oil has been commenced on a very small scale by three different firms in Dairen, but the excessive price of bean oil since the end of 1909 is proving a great handicap." The South Manchuria Railway Company takes a major share in the development of South Manchuria as well as the Kwantung Peninsula. Its work during the past year is discussed. An ice-breaker has been added to facilitate the berthing of ships during the winter months.

"Export trade.–Thanks to the very large increase in the export of beans, the export trade is in a very thriving condition... Beans and bean products.–The most striking feature in the exports is the enormous increase in the shipments of beans and bean products, viz., oil and cake" which accounted for nearly 70% of all exports from Dairen. Export of [soy] beans rose from 206,653 tons in 1908 to 462,423 tons in 1909. In 1909, some 56% of these beans went to Europe, 29% to Japan, 12% to north China, and 21.4% to south China. "Of the amount sent to Japan, probably some was re-shipped to Europe; while of the quantity sent to Europe about 90 per cent. went to the United Kingdom." There follows a long discussion of economic factors causing the prices of soybean and bean cake to be currently high in Manchuria. If, as seems probable, the French, German, and U.S. governments remove the import duty on [soy] beans, then a great impetus will be given to the export... The farmer in Japan has learned the value of bean cake as a fertiliser for the paddy field and the mulberry plantation, and immense quantities are exported to that country. In 1909, indeed, Japan took over 99 per cent. of the bean cake exported from Dairen... A small quantity is exported to South China where it is used both as a fertiliser and as a food for pigs. A shipment was also made last year to Formosa [today's Taiwan] for trial in the sugar plantations and, as the result was successful, the experiment will probably be repeated this year."

"Bean oil.–In Manchuria the primary object of the bean mills is the manufacture of bean cake, and the oil is only of secondary importance. The mills are worked on the press system and only extract 7 or 8 per cent. of the 17 or 18 per cent. of the oil contained in the bean... The largest purchaser of bean oil is South China, which takes about one-half of the output. Of the remainder, the bulk goes to Japan, where it is mostly transhipped [transshipped] to Europe and America." The value of "Soy" (soy sauce) imports to Dairen increased from £22,367 in 1907, to £27,431 in 1908, falling to £21,551 (3,307 tons) in 1909. The value of miso imports to Dairen increased from £2,128 in 1907, to £5,422 in 1908, falling to £2,815 (656 tons) in 1909. Tables (p. 19-21) show returns of: (1) Import trade of Dairen during 1907-09 (2) Export trade of Dairen during 1907-09 (3) Shipping entered at the Port of Dairen during 1908-09. Note: In some parts of this report, the £ sign is written as "*l.*

Summarized in *J. of the Board of Agriculture* (*London*), Sept. 1910, p. 502. Address: Acting British Vice-Consul, Dairen.

1415. Suzuki, Umetarô; Furuya, Yeizô. 1910. Shôyu jôzô no sai ni okoru kagaku henka ni tsuite. I. [Chemical changes occurring during shoyu fermentation. I.]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 31(7):696-712. July. [Jap]

• ***Summary:*** Note: According to Church (1923, p. 26) an English-language translation was made by Dr. S. Komatsu, formerly of the USDA Bureau of Chemistry.

Note: Oshima 1922 (uncitable bibliography) says that Furuya's first name starts with "E" as in Eizô. Address: 1. Nôgaku hakase; 2. Nôgaku-shi.

1416. Hervier, P. 1910. Le pois oléagineux de la Chine (*Soja hispida*) [The "oil peas" of China (*Soja hispida*)]. *Jardin* (*Le*) 24:233-36. Aug. 5. [1 ref. Fre]

• ***Summary:*** The elder readers of this garden magazine will know well this plant, which is so useful and versatile. But that we will take advantage of the resurgence of interest in the soybean to give our young readers a summary of what

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various people appreciate this useful plant. It can be used as food, forage, in industrial products, and as a medicine. Those who have written about it include Blavet, D. Bois, A. de Candolle, Chevallier, Cusin, Foëx, Fruewirth, Grandeau, Guichard, Haberlandt, Lachaume, Ladureau, de Lunaret, Michelin, de Mortillet, Paillieux, Trabut, Vavin, Vianne, Vilmorin, and many more. We also want to encourage our young readers to at least try cultivating the soybean, since this is not difficult.

Contains a brief botanical description of the soybean, a list of the Asian countries where it is grown and its vernacular names in some of these countries, a long quotation from Kaempfer (1712) describing the soybean, and a history of the soybean in France from about 1740 when it was sent to the *Jardin du Roi* (today called the Museum) by missionaries in China–although the first records date from 1779. In 1821 it was tested by Mr. C. Brun of Beaumes on his land at Champ-Soue, near Etampes (Seine-et-Oise). At the end of 1855 the Society for Acclimatization distributed it to some farmers for trial.

Then in 1880, thanks to the introduction in the catalog of the house of Vilmorin-Andrieux & Co. of a variety cultivated in Austria-Hungary which could be propagated very easily, serious trials were conducted in different parts of France. From these, we can conclude that the early yellow soybean (*Soja jaune hâtif*) or oil-pea of China (*Pois oléagineux de la Chine*) (*Houang-teou* or *Houang-ta-teou,* whether referred to as the dwarf or as the tall variety) could be usefully cultivated (p. 233).

Being better advised than we are, the Austro-Hungarians, after the first trial they conducted in 1850, acquired incontestable proof of the value of Soya in the feeding of cattle / livestock (*du bétail*). So they developed this crop more and more; it took off strongly, especially after the Vienna World Exposition of 1873.

In the climate of Paris, only the yellow Chinese and the Mongolian varieties can be cultivated successfully, since their vegetative cycle is 3-4 months. South of the Loire River, one can add the brownish-red variety of China. Finally, even further south, in Languedoc, Provence [regions in south central France], and Algeria, all the late varieties can be cultivated, especially the ones with black seeds and those from Japan. A large number of these varieties are found in commerce, especially the early ones designed by names such as Early of Podolie and Early of Etampes (see fig. 140).

Gives details on how to sow, cultivate, and harvest the soybean for garden use. Its needs are quite similar to those of the Haricot. Unlike Haricot beans, which can only be eaten as green beans (pods and all), soybean seeds (*Pois oléagineux de la Chine*) can be consumed either fresh or dry. Moreover, soybeans are easily digested and do not cause the all-too-well-known inconvenience of Haricot beans. To eat them in the fresh green stage, they should be prepared/cooked like small green kidney beans (*flageolets*), which they resemble in taste. For the dry beans, soak them overnight in twice their volume of either rain- or river-water in which you have dissolved (per liter) 3 gm of baking soda or 50 gm of sugar. The next day, drain them then put them like any dry legume in cold water, bring to a boil, and simmer for 2½ hours. Half way through the simmering process, add salt and a walnut-sized piece of butter. After they are cooked, you can serve them either with or without fat [butter or lard] or meatless seasonings (*au gras ou au maigre*). The cooked dry soybeans are also excellent pureed (p. 234).

A table (p. 234) compiled by Prof. Haberlandt of Vienna compares the composition of seeds of soybeans, haricot, peas, lentils, feves, and yellow lupins. It shows that soybeans are the most nutritive, because they contain the most protein and fat.

A second table (p. 235) shows that this plant, cultivated in the garden solely for its seeds, removes from the soil the following amounts of minerals per 100 kg of seeds: Phosphoric acid 0.729 kg, lime 3.146 kg, magnesia 1.106 kg, and potash 0.811 kg.

A third table shows the amount of these four substances removed when the soybean is grown for forage; the yield is 20,000 to 30,000 kg/ha.

The Asiatics and particularly the Chinese and Japanese greatly value the seeds of the soybean (*du Soja*), which are both nutritive and rich in fat; they form the basis of their diet, replacing butter, oil, and milk. They are used in culinary preparations greatly appreciated in these regions.

The seeds are the richest of all legumes in the protein legumine, which is actually "solid milk." The Orientals soak the beans in water, then grind them, add extra water, then filter the mixture in order to obtain an artificial milk (*un lait factice*) which can be used like that of the cow, the goat, or the ewe (female sheep). Much of the vegetable casein in this milk is coagulated to make a cheese, similar to our *fromage à la pie* (quark), which is called *Teou-fou* in China and *To-fu* in Japan, and which they consume in large quantities, fresh or dry, uncooked or cooked.

"This cheese, when well prepared, is very tasty, and it forms a very exquisite dish when it is deep fried like potatoes.

When the seeds are roasted with an equal quantity of wheat or barley, then mixed with water and allowed to ferment, they become the appetizing condiment sauce of great renown, known as Tsiang-yeou or Shoyu; at this time it is greatly in vogue in England and America under the name of "Indian Soy." This sauce is greatly appreciated with roasted meat or fish; added to beef or beef bouillon, it communicates a color and savor that are very agreeable."

Aside from these food uses, the soybean is also used in Asia for forage and to make oil and meal. "Finally, the soybean can be used as a coffee substitute–as it has long been in the regions of Languedoc and Tyrol [Tirol]." Also

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discusses soy flour and its high nutritional value.

A non-original illustration (p. 235) shows a soy bean plant with pods and a close-up of the pods on stem (from an original in Carrière 1880).

1417. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1910. Japanese trade notes. 13(36):499. Aug. 15.
• ***Summary:*** "Consul-General Thomas Sammons, of Yokohama, furnishes the following notes concerning Japanese trade... Japanese 'soy' [sauce] is exported chiefly to the United States, Hawaii, Port Arthur and Dalny [Manchuria], and Korea, each taking approximately 400,000 gallons annually."

"Of Japan's total exports of peanuts the United States takes two-thirds."

"Korea leads in the consumption of Japan's national beverage, sake, taking 1,400,000 gallons a year; the United States consumes about 250,000 gallons annually." Address: Washington, DC.

1418. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1910. Soya-bean oil shipped from Dalny, Manchuria. 13(39):533. Aug. 18.
• ***Summary:*** "Soya-bean oil, worth $122,630, was shipped from Dalny, Manchuria, to the United States during the year ended June 30, 1910. This product enters free of duty and is largely used by soap works." Address: Washington, DC.

1419. *Oil, Paint and Drug Reporter.* 1910. Proposed soya bean exchange at Dairen. 78(9):40. Aug. 29.
• ***Summary:*** London, August 12, 1910: "The Reporters' London correspondent is advised through official channels that his Majesty's Consul at Dairen has intimated to the home authorities that the Mitsui Bussan Kwaisha [Kaisha], the Okura Gumi and other Japanese firms are considering the feasibility of establishing a bean exchange at Dairen, with a view to putting the trade on a sound basis."

1420. Lemarié, Charles. 1910. Les sojas du Japon [The soybeans of Japan]. *Bulletin Economique de l'Indochine* (*Hanoi*) 13(85):493-98. July/Aug. [4 ref. Fre]
• ***Summary:*** "As a contribution to the study of the question of soybeans, so clearly revealed by the Inspector-Consul Mr. Brenier in a recent edition of this Bulletin, he judged it useful to ask me for the notes hereafter collected as much over the course of my lectures as upon the occasion of my voyage to Japan in 1903.

"I borrow much from Rein (*The industries of Japan*) and from Messrs. Paillieux and Bois (*Le Potager d'un Curieux* or *The Kitchen-garden of a Curious One*) who summarized all that we know about soybeans (*soja*) in Europe up until recently" (p. 493).

Describes and gives the names of more than twenty cultivated varieties, using the classification system of Rein and the Japanese based on seed coat color.

"I have already said that it [the soybean] needs heat and frequent watering. These considerations explain, in part, the failures encountered up to now in the attempts to introduce this crop into Europe. I fear the same obstacles for Mr. Li-yu-Ying, of Chinese nationality, formerly a student at the school of practical agriculture at Chesnoy, near Montargis (Loiret).

Note: Loiret is a department of France just south of Paris. Montargis is a commune in the Loiret department; the ancient town is located about 110 km (68 mi) south of Paris.

According to a lecture he gave last year to his former classmates, Li set himself the task of taking up these trials on the outskirts of Paris: or was it on the manure fields / sewage farms (*champs d'épandage*) of Gennevilliers or Achères.

"But even if the cultivation of soybeans in France is not profitable, nevertheless the popularization of the diverse products that come from them is no less useful; Indochina, if the need be, could provide for new industrial ventures. With Mr. Albert Demolon, a scientifically educated agriculturist (*ingénieur-agronome*), then professor at Chesnoy, and today director of the Agricultural Station of Aisne [northeast of Paris] and of the Laboratory of Bacteriology at Laon, Mr. Li-yu-Ying again took up his previous studies related to these various products. In particular, he compared soymilk, which he calls *Caséosojaïne*, with animal milk, and he believed [it] possible, employing the highly developed procedures of handling and fermentation used [in France] with cow's milk, to obtain forms of tofu (*Téou-fou*) acceptable for our Western palates. That is to say: first, before any fermentation, a liquid [form of tofu] lends itself to the same uses as milk, especially useful for artificial feeding of livestock; then, after coagulation: 1. a hard cheese, corresponding to cheese of the firm sort (*fromage à pàte ferme*), cooked egg, or cooked meat in richness of protein; 2. a soft cheese, corresponding to fresh cheese (*fromage frais*) and able to be consumed as a legume; 3. a fermented cheese, after sterilization then inoculation with microorganisms of certain special cheeses, corresponding to these diverse fermented animal cheeses" (p. 497-98).

Also discusses: Azuki (p. 497). Address: Directeur des Services agricoles et commerciaux du Tonkin.

1421. Ueno, Senichi. 1910. Nihon shôyu jôkyô torishirabe no ken [The Japanese shoyu market in Honolulu, Hawaii]. Honolulu, Hawaii. 3 p. Sept. 3. Handwritten unpublished manuscript. [Jap; eng]
• ***Summary:*** This is a market report from Mr. Ueno at the Japanese consulate in Honolulu, to Mr. Yoshitaro Komura at the Japanese Ministry of Foreign Affairs.

Shoyu imports to Honolulu were 83,894 kegs (*taru*) in 1909 (about 1.359 million liters), with 90,000 expected in

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1910. The 1910 Japanese population was 65,790. Note: The average keg (*taru*) held 9 shô = 16.2 liters = 4.28 gallons (U.S.). One shô is 1.8 liters.

Note: This is the earliest document seen (Aug. 2002) that is a market study concerning soy products (shoyu). One of three documents. Address: Japanese Consulate, Honolulu, Hawaii.

1422. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1910. Heavy British purchases of soya beans. 13(58):761. Sept. 10.
• ***Summary:*** "In the first six months of the current calendar year the United Kingdom imported 345,470 tons of soya beans, valued at $12,000,000. The imports from China reached 144,600 tons, from Japan 142,000 tons, and from Russia 58,900 tons. China exported 206,653 tons in 1908 and 462,423 tons in 1909." Address: Washington, DC.

1423. *Oil, Paint and Drug Reporter.* 1910. Heavy purchases of soya beans. 78(11):28F. Sept. 12.
• ***Summary:*** Washington [DC], September 9, 1910: "According to a report which reached the Bureau of Manufactures, Department of Commerce and Labor, heavy purchases have been made during the past few months in Great Britain of soya beans. The aggregate of these purchases and the imports from Russia and China into the United Kingdom are given as follows: 'In the first 6 months of the current calendar year the United Kingdom imported 345,470 tons of soya beans, valued at $12,000,000. The imports from China reached 144,600 tons, from Japan 142,000 tons, and from Russia 58,900 tons. China exported 206,653 tons in 1908 and 462,423 tons in 1909.'"

1424. Yada, Naganosuke. 1910. Shôyu jôkyô torishirabe no ken [The Japanese shoyu market in Vancouver, British Columbia, Canada]. Vancouver, BC, Canada. 5 p. Sept. 13. Handwritten unpublished manuscript. [Jap; eng]
• ***Summary:*** This is a market report from Mr. Yada at the Japanese consulate in Vancouver, to Mr. Yoshitaro Komura at the Japanese Ministry of Foreign Affairs.

In 1909 1,390 koku (250,200 liters) of shoyu were imported to Vancouver, where about 8,000 Japanese lived. Address: Japanese Consulate, Vancouver, BC, Canada.

1425. Yoshimura, Kiyohisa. 1910. Ueber Faeulnis-Basen (Ptomaine) aus gefaulten Sojabohnen (*Glycine hispida*) [Ptomaines in decomposed soybeans]. *Biochemische Zeitschrift* 28(1):16-22. Sept. 15. (Chem. Abst. 5:299). [7 ref. Ger]
Address: University Laboratory for Food Chemistry, Halle on the Saale River, Germany.

1426. *Chemist and Druggist* (*London*). 1910. Soya-oil trade. 77(12):458. Sept. 17.
• ***Summary:*** This ¼-page article, which appears in the section titled "Trade report and market review," states: "In view of the abnormal conditions of the linseed and cottonseed oil markets, in which there is but little prospect of relief for consumers from the extraordinarily high prices ruling until better seed-crops are secured, the remarkable expansion which has taken place this year in the soya-oil trade deserves attention. But for the developments in this comparatively new article in the European crushing industry, the difficult position of consumers in certain directions, where the use of soya oil has become more popular, would probably be still more serious, although the latter product has also advanced considerably. The 'famine' conditions across the Atlantic as regards linseed and cottonseed oils have resulted for some time past in a persistent drain of supplies from this side to American ports, which also applies to soya oil. Considerable quantities of all these products have, indeed, again been just lately purchased by American interests for prompt shipment. An idea may be gathered of the extension of trading in the soya-bean oil from the Hull exports this year, which, so far, are already well over 12,000 tons, or about 10,000 tons in excess of those of the previous year. The almost prohibitive prices at which to increase their operations in soya beans, although they find considerable difficulty in getting rid of their soya cake on the Continent just at present. The price of soya oil in London is now about 30*l.* per ton, or 6*l.* over the lowest seen early in the year. According to reports from Manchuria, the new crop should yield 20 per cent more than last year, and allow of an export surplus for Europe of half a million tons. The shipments of old crop to Europe, which are now coming to an end, amount to about 420,000 tons. A fact worth mentioning is that Japan and China are consuming less owing to the high price. Japanese requirements heretofore took about 70 per cent of the crop chiefly for fertilising purposes. In 1909, 1,073,000 tons of soya beans and cake were taken by China and Japan combined, whereas the total quantity absorbed by these two countries in the first half of this year was only about 270,000 tons. While there are indications of a further contraction in the outlet in the Far East, there is thus a possibility that the article may enter into more active competition in the European oil markets, and this at a time when such competition should be welcome among manufacturers handicapped by the fabulous prices paid for kindred products."

1427. Choles, H.J. 1910. Soy beans: Their cultivation and uses. A new Natal industry. *Natal Agricultural Journal* 15(3):281-307. Sept. [4 ref]
• ***Summary:*** Contents: Introduction. I. Botany and habitat: Introduction, varieties. II. Cultivation: Conditions of growth, methods of culture, soy bean mixtures. III. Harvesting: When to harvest, curing, frame for curing soy bean hay, harvesting for seed, yield of seed, yield of forage. IV. Chemistry of

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the soy bean: Introduction, digestibility, soy bean oil, soy bean bake. V. Value and uses of the soy bean: Introduction, the uses of the soy bean (uses of the oil {7 uses}, uses of the bean as a vegetable in Natal {like marrowfat peas or haricot beans}, in bread or biscuits in Paris [France] for diabetics, in France and Switzerland as a coffee substitute or adulterant, soy bean flour used for making bread and biscuits in England, soya meal for cattle feeding, oil-free residue made into cake for stock-breeding purposes, liquid closely resembling cow's milk made in Japan, vegetable cheese [tofu] made from the milk, a sauce called "Shoyu" made in Japan, soy-bean cake used as a fertilizer in Japan and China), as a soiling crop, as a silage crop, as a hay crop, as a pasture plant, as a soil renewer. VI. Value of the bean for feed: Introduction, soy beans for hogs, soy beans for dairy cows, other experiments with milch cows.

Illustrations (non-original line drawings) show: The soy bean plant with pods and roots (p. 280; from an original in Piper 1909). Flowering branch with close-ups on flower, leaves and pods (p. 285; from an original in Lamson-Scribner 1899). Frame for curing soy bean hay (p. 291; reproduced from Messrs. Lever Bros. pamphlet on Soy Bean Cultivation). Roots of soy bean plant with nodules (p. 301).

Note: This is the earliest document seen (May 2005) concerning Lever Brothers in connection with soybeans.

1428. Higeta Shoyu Jozosho (The "Higeta" brand soy brewery.) Main office: Choshi, Chiba Prefecture (Document part). 1910. In: Japan's Industries: And Who's Who in Japan. 1910. Osaka, Japan: Industrial Japan. vi, iii, 687 p., iv p. See p. 152-53. Undated. Translated from unpublished Japanese manuscripts. 29 cm. [Eng]

• ***Summary:*** History: The 'Higeta' is one of the brands of soy made in Choshi. The concentrated kind of soy from which it is derived was first brewed in the second year of Genna (1616) by a brewer named Gemba Tanaka. After the quality had been greatly improved, a new variety of the brand was made in the second year of Bunsei (1819), known as 'Horai.' When the metropolis was moved from Kyoto to Tokyo in 1868, the firm was honoured by being appointed supplier of soy to the Imperial Household. Since then the business has greatly increased. In 1898 the firm, in conjunction with the Iwasaki and Hamaguchi concerns, started an experimental laboratory, under superintendence of Dr. Ryojun Tawara, and a staff of experts, in which a study was made of soy fermentation. As a result of the investigations, much improvement was effected in the quality of soy generally. In that year, 1898, the Imperial Household ordered a special supply of the 'Higeta' brand, and this fact, coupled with the improved methods of salt refining, greatly extended its sale. When the grand military manoeuvres were held in the vicinity of Kumamoto in 1902, attended by His Majesty the Emperor, an order was placed with the firm to supply the army with bottled soy; to commemorate this honour the brewer has sold bottled soy ever since.

"During the Russo-Japanese war, 'Higeta' soy was used by the Army Department for seasoning canned foods sent to the front. In 1905 a new kind of soy bottle, with a screw stopper, was made for the troops. Soy was afterwards sold to the public in this form. Since then the firm has gone on flourishing, nothing being left undone to maintain the quality of the brand, and improve it if possible.

"The firm possesses two breweries, fitted up with steam engines, and employing altogether 320 workmen. The 'Higeta' brand soy is used all over the country, especially at Tokyo and Yokohama. It goes also to the United States, Canada, Siberia, China, Korea, Hawaii, the Philippine Islands and the Straits Settlements [later Singapore], being much appreciated in all these markets.

"In addition to being suppliers to the Imperial Household, the brewer has been honoured in other ways. At the Milan Exhibition of 1906, the 'Higeta' brand, which was selected by the Japanese Department of Agriculture and Commerce as a typical soy, was awarded the highest order of the Grand Prix; besides this, the soy was presented to Their Italian Majesties by the Japanese Commissioner for the Exhibition, and they are reported to have expressed to him their high appreciation of its flavour. The following are the principal honours conferred upon the firm by various exhibitions:

"A First Prize at each of the five National Exhibitions.

"The Grand Prize at the Chicago [Illinois] Exhibition, 1890.

"A Gold Medal at the Asian Exhibition (Hanoi, French Indo-China), 1903.

"The highest Grand Prize at the St. Louis [Missouri] Exposition, 1904.

"The Grand Prize of Honour at the Seattle Exposition, 1909.

"Mr. Gemba Tanaka, the proprietor, who was born in 1871, studied political economy at Keio University. On succeeding to the business of his ancestors, he entered into his work with enthusiasm, and by his strenuous exertions did much to extend the sale of the 'Higeta' brand. Owing to the esteem in which he is held in the district, Mr. Tanaka has been elected to represent the highest taxpayers of his prefecture in the House of Peers."

A large photo shows "the interior of a Choshi soy brewery."

Note: This is the earliest document seen (April 2001) concerning Higeta Shoyu. Address: Japan.

1429. Japan's industries: And who's who in Japan. 1910. Osaka, Japan: Industrial Japan. vi, iii, 687 p., iv p. 4 p. of plates. Undated. Translated from unpublished Japanese manuscripts. Colophon title in Japanese: Sangyô no Nihon. 29 cm. [Eng]

• ***Summary:*** On the title page, below the subtitle, is written:

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"An Exponent Encyclopedia of the Present Industries of Japan has never been yet Published." Black-and-white photos (unnumbered front pages) show each of the major contributors. A photo shows "Dr. Teizo Takahashi (*Kogakuhakushi*), Professor of the Tokyo Imperial University." He contributed an article titled "The Outline of the Brewing Industry." Photos throughout the book show many companies and their owners. The book was apparently never published in Japanese.

This book was published under the support of Count Okuma, whose photo is shown, and who wrote the excellent first part (p. 1-22) titled "The Industries of Japan." Its contents is: 1. The industrial condition of Japan before the restoration: The great landmark in history (in 1858 Japan was forced to end nearly 300 years of seclusion), industries under the Tokugawa shogunate, industries in the Genroku era (1688-1704). 2. Japanese industries after the opening of the country: The industrial revolution, demand for things European, table of exports and imports (1868-1908; p. 5-6), general dissemination of education, progress of natural resources. 3. Industries before and after the Sino-Japanese War (1894-1895): The growth of foreign commerce, the improvement of the currency system and foreign commerce, entry into the comity of financial nations, manufacturing industries on a large scale (there was a major National Industrial Exhibition as early as 1877). 4. The state of Japanese industries before and after the Russo-Japanese War (1904-1905): The blow dealt by the war, abnormal trade and consequent reaction, the increase of population in Japan and Formosa, progress in the means of transport and communication (especially railways), the money market and industry, free trade and protection, protection in the United States, Japan need not imitate the USA, Great Britain's free trade policy. 5. The future of Japanese industries: Bright future for Japanese industries, silk yarn and silk production, cotton yarn and cotton manufacture, forestry, minerals, the trade in marine products, capital.

The book is composed of lengthy chapters on Japan's major industries, each preceded by a general overview and outline, and containing a detailed description of the largest 10-20 firms. These industries are cotton and silk spinning, Portland cement, sugar, brewing sake and soy [sauce], woollen textiles, hemp, electricity, engineering, mining, transportation, silk textiles, shipbuilding, ceramics, an appendix (p. 485-572) with representative firms from other industries (incl. Mitsui & Co. [p. 493-95], Osaka Gas Co. [p. 520]), and a Who's Who in Japan (p. 573-687; brief biographical sketches with photos of "over 700 names of representative captains of our business world," incl. Keizaburo Mogi [p. 632, soy brewer], Teizo Takahashi [p. 664, microbiologist]).

The chapter titled "The Brewing Industry" starts with a general outline by Dr. Teizo Takahashi on the brewing of sake, "shoyu or soya," beer, shochu, awamori, and mirin (p. 121-27). Representative soy breweries are discussed in detail, with photos, a brief company history, present conditions, awards of merit (in Japan and overseas), and a biographical sketch of the owner, proprietor, and or managing staff.

Part I: The soy industry of Choshi, Chiba prefecture (A photo shows the interior of a Choshi Soy Brewery). The four principal Choshi Soy Brewers are: (1) Higeta Shoyu Jozosho [Brewery] (The concentrated forerunner of this brand was first brewed in 1616. Proprietor: Mr. Gemba Tanaka. A photo shows interior of a Choshi Soy Brewery); (2) Jigamisa Shoyu Jozosho (brand first brewed ca. 1645. Proprietor: Mr. Kichibei Hamaguchi. A photo shows the Jigamisa brand soy brewery with hundreds of shoyu kegs); (3) Yamaju Shoyu Jozosho (brand first brewed ca. 1630. Proprietor: Mr. Jujiro Iwasaki. A photo shows a motor for brewing); (4) Yamasa Shoyu Jozosho (see separate record).

Part II: The soy industry of Noda, Chiba prefecture (p. 158): Joju Shoyu Jozosho (brand first brewed before 1710. Proprietor: Mr. Hyoyemon Takanashi. A photo shows the interior of the Joju brand soy brewery with several kegs of shoyu), Kihaku Shoyu Jozosho (brand first brewed in about 1750. Proprietor: Mr. Hichiroyemon [Shichirouemon] Mogi. A photo shows the Kihaku brand soy brewery and its proprietor), Kikkoman Shoyu Jozosho (see separate record), Kushigata Shoyu Jozosho (See separate record. It was 290 years ago [i.e. in 1620] the founder of the firm, the ancestor of the present proprietor, settled in Noda as a shoyu brewer. Proprietor: Hichizaemon [Shichizaemon] Mogi), Minakami Shoyu Jozosho (Brand first brewed in about 1710. Proprietor: Mr. Fusagoro Mogi. A photo shows machinery for pumping soy [sauce]).

The book begins (p. 1): "The year 1858 forms one of the greatest landmarks in Japanese history, for it was then that, after nearly three hundred years of seclusion, the country was definitely thrown open to foreign trade and intercourse. In that year, also, the Tokugawa Shogunate, (1591-1858) signed the first treaty of commerce and amity with the United States, Great Britain, France and Holland. By this treaty Old Japan ceased to be and the New Japan entered upon her career among the comity of nations."

Page 3 continues: "In 1868 [the first year of Meiji] the feudalism that had lasted for centuries, was abolished at a single stroke, and the reins of government restored to the Imperial Throne. Despotism was done away with, and an Imperial Edict announced that the prefectural system of administrature [administration] then inaugurated was to be the foretaste of constitutional government on Western lines twenty years later. Not only was this a political revolution, but a social and industrial revolution. One remarkable feature of this revolution, so complex in its effects, was that the new order of things inaugurated by it became at once stable and permanent, while the nation was infused with a new life and vitality. In this respect, there has never been a revolution in

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any country to compare with it. It is hardly necessary to say that the industrial side of a revolution is as important and as interesting as its political side, if not more so." Also in 1868 Yedo [Edo], the administrative headquarters of the Tokugawa Government, was renamed Tokyo.

A table of imports and exports (p. 5-6) shows that exports rose from 15.5 million yen in 1868 to 432.4 million yen in 1907, while imaports rose from 10.6 million yen in 1868 to 494.5 million yen in 1907. In a majority of these years, imports exceeded exports.

The improvement of the currency system and foreign commerce (p. 8-10). During the last 10 years of the Tokugawa Shogunate, about 60 varieties of coins were in circulation. In 1871 (Meiji 4) the new Meiji government adopted a gold standard. As foreign Powers were using the Mexican silver dollar as the basis of their exchange in the Far East, the Japanese Government issued silver coin of similar quality and weight (known as silver *yen*) for circulation in Treaty Ports. In 1877, to pay for the Satsuma Rebellion, the government was forced to issue inconvertible paper money. This led to chaos and undermined the gold standard. In 1873 Germany adopted the gold standard; this led to a depreciation of silver. Though Japan remained among the silver standard countries of East Asia, she found it necessary to issue silver trade dollars. In March 1897 the Diet passed an Act that again established a gold standard in Japan. This had a most salutary effect on Japanese finance. "On looking back on the history of foreign commerce in Japan from the time the country was opened in the mid-1800s, we find that it attained its full growth on adoption of the gold standard."

Note: How do we know when this undated document was published? The latest year published in the document is 1909 (see p. 12). But the National Union Catalog record gives the year as 1910. Address: Japan.

1430. Mitsui Bussan Kabushiki Kaisha (The Mitsui & Co., Ltd.) Head office: Suru-ga-cho, Tokyo (Document part). 1910. In: Japan's Industries: And Who's Who in Japan. 1910. Osaka, Japan: Industrial Japan. vi, iii, 687 p., iv p. See p. 493-96. Undated. Translated from unpublished Japanese manuscripts. 29 cm. [Eng]

• ***Summary:*** "History: The House of Mitsui is well known in British business circles, as well as on the Continents of Europe and America. Through the branch office of the latter company in London, they are one of the largest importers to the United Kingdom of silk goods, camphor, [soya] beans and bean cakes, lumber and rice, &c., while they are one of the largest exporters to Japan from the United Kingdom of all kinds of cotton & woolen goods, coal, manures, &c. The Mitsuis have the famous Mitsui Building in Tokyo for the head quarter of all the Mitsui Corporations,–The Mitsui Bussan Kaisha, Ltd. (Mitsui & Co., Ltd., in Europe and America), the Mitsui Bank, Ltd., the Mining Department, &c. The building is a large office building, built of steel frame with a handsome facade of stones and brick located in the centre of the city of Tokyo, and furnished with elevators and other modern appliances in the Occidental style.

"Although the Mitsuis have made it a point to adopt up-to-date European and American business methods, the history of their business undertakings is very old. The Mitsui family can be traced from Takayasu Mitsui, who lived as a feudal lord in the latter part of the 16th century. During the continuous civil wars at that time, he fought several battles, but, these having ended decidedly against him, he retired and spent his remaining years as a private citizen. His grand-son, Taketoshi Mitsui, started the business in Kyoto and also established a dry goods store in Yedo (now Tokyo). It was he who invented and introduced the system of cash retailing, and further, organized the system for collection and remittance of money throughout the country and this was done, be it remembered, when the knowledge of bills of exchange was almost lacking and monetary transactions were almost unknown in this country. In 1687, Takahira Mitsui, the eldest son of Takatoshi, was appointed by the Tokugawa Government as one of its purveyors, and, in 1691, was entrusted with its remittance business. It was in 1707, that the Mitsuis appointed an agent an agent at Nagasaki and became interested in foreign trade. With the restoration of the Meiji Era, the Mitsuis applied themselves with new energy and vigor to the reform and amelioration of their business undertaking on the model of Western procedure. Thus, in 1876, the old exchange house was transformed into the Mitsui Bank, the first and by far the largest private bank established in the country, while, in the same year, the Mitsui Bussan Kaisha, or Mitsui & Co., was organized for the purpose of general trading, but more particularly, for that of foreign trade.

A photo shows the huge and ornate Mitsui Building in Tokyo. Company president: Hachirojiro Mitsui, Esq. Nine Managing Directors are listed, starting with Giichi Iida, Esq. Address: Japan.

1431. Nagai, Shôzô. Japanese Consulate. 1910. Shôyu ni kansuru hôkoku teishutsu no ken [The Japanese shoyu market in San Francisco, California]. San Francisco, California. 7 p. Sept. Handwritten unpublished manuscript. [Jap; eng]

• ***Summary:*** This is a market report from Mr. Nagai at the Japanese consulate in San Francisco, to Mr. Yoshitaro Komura at the Japanese Ministry of Foreign Affairs.

About 50,000 Japanese live in San Francisco. About 6,000 large and small kegs (*taru*) of shoyu a month are imported, equaling about 97,200 liters. Address: Japanese Consulate, San Francisco, California.

1432. Takahashi, Teizô. 1910. The brewing industry: Chapter II. Shoyu or soya brewing (Document part). In: Japan's Industries: And Who's Who in Japan. 1910. Osaka, Japan:

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Industrial Japan. vi, iii, 687 p., iv p. See p. 125. Undated. Translated from unpublished Japanese manuscripts. 29 cm. [Eng]

• ***Summary:*** "Development of the industry: *Shoyu,* also called *soya* and more generally known in English as 'soy,' is a food adjunct or condiment especially used in Japan. Its origin is not known, but it is highly probable that the brewing of *shoyu,* like *sakê,* is of Chinese origin. The first description about *shoyu* appears at the beginning of the 16th century during the reign of the Emperor Go-Kashiwabara, and the demand for it appears to have somewhat increased at the end of the century, but the method of its preparation was artless and the product must have been a crude one. Certain improvements in brewing were made at the end of the 17th century, but *shoyu* of the kind at present in use was first prepared at the beginning of the 18th century.

"In 1751 a *shoyu* factory was established in the town of Noda in the Prefecture of Chiba. Other similar factories were opened there and they increased in number annually, and that city now stands in the first rank for this particular commodity. The annual production for the 5 years from 1904 to 1908 may be seen from the following table." Production grew from 74,367,040 gallons in 1904 to 84,952,440 gallons in 1908.

"In olden times *shoyu* brewing was somewhat different from the present method. The steamed *soya* beans were covered with layers of rice straw for 5 or 6 days until the surface of the beans appeared yellow by the growth of the fungus. After that the beans were dried in the sun and steamed again; then, after mixing with moderate quantities of common salt, ginger and orange peel, allowed to ferment in sealed tubs for 1 to 2 months. An improvement was made, probably by the introduction of Chinese methods of preparation, at the end of the 17th century; but the products of those days were very inferior compared with the *shoyu* as a present in use.

"*Shoyu* or Soy sauce is prepared from wheat (sometimes also from barley), the *soya* bean, and a salt solution by a slow fermentation, which requires from one to two years and sometimes longer.

"The process of brewing is divided into four stages: (1) Preparation of the wheat and *soya* bean; (2) Preparation of the soy *koji;* (3) The fermentation, of *moromi* process; and (4) Pressing and boiling." Address: PhD, Prof. at Tokyo Imperial Univ., Japan.

1433. Takahashi, Teizô. 1910. The brewing Industry: Chapter III. Soy breweries. (1) The soy industry of Choshi (Document part). In: Japan's Industries: And Who's Who in Japan. 1910. Osaka, Japan: Industrial Japan. vi, iii, 687 p., iv p. See p. 150-51. Undated. Translated from unpublished Japanese manuscripts. 29 cm. [Eng]

• ***Summary:*** "Outline: Soy is brewed in almost all parts of Japan, but the chief centres for its production are Chôshi and Noda in the Prefecture of Chiba; Sakai and Amagasaki, seaport towns in the vicinity of Osaka; and Tatsuno, Yuasa, and Shôdoshima in the prefectures of Hyogo, Wakayama, and Kagawa respectively. The soy of Chiba Prefecture is generally recognised as the best, and by far the largest quantity is made there. The soy brewers have derived great advantage from the river Tone which flows through the district; indeed the towns of Chôshi and Noda on its banks have flourished from early times in consequence, and have become famous throughout Japan as centres for the brewing of soy.

"Chôshi is right at the mouth of the river, on the Pacific Ocean, and is a few hours' railway journey from Tokyo, which is 73 miles distant. Only a small proportion of the soy, however, is carried by rail, the greater part of it being sent by sea, as the marine service is a good and safe one. Tokyo is the distributing centre for the sauce, both for home consumption and the foreign market. A good telegraph and telephone service facilitates the dispatch of business.

"Soy has been brewed in Chôshi for the past three hundred years. The first to brew the thick concentrated variety of soy was a man named Gemba Tanaka, an ancestor of the present Mr. Gemba Tanaka, who makes the 'Higeta' brand. From that time onward different varieties of soy came to be brewed, such as the 'Yamaju,' 'Yamasa,' and other such brands. In the year 1825, when there was much distress throughout the country owing to a famine, and the Tokugawa Shogunate issued an edict to regulate the prices, and thus allay the suffering as far as possible, four brands of soy made in Chôshi, and three in Noda, were specially exempt from the operation of this law on account of their excellent quality, and were moreover granted the rare privilege of being called the 'Best Soy.' Henceforth Chôshi's four first-class brands became famous throughout Japan, and the industry has grown more and more prosperous.

"The Chôshi brewers are very careful in the selection of their ingredients. The beans and wheat used are the best that Hidachi Province can supply; salt is brought all the way from Hyogo Prefecture, the centre of Japan's salt industry; all the water used is very carefully filtered through layers of sand, and in fact everything possible is done to ensure purity and good quality. Whenever possible, the soy factories are situated in shady, secluded spots, as the sunlight prevents proper fermentation. The machinery and apparatus used is constantly improved.

"It may be mentioned that the relations which subsist between masters and workmen are of a very cordial nature. For the most part, the labour is hereditary, the sons carrying on the vocation of their fathers. The workmen put heart and soul into their labour, rivalling each other in diligence and perseverance, and the employers, on their part, treat their servants with much liberality, and neglect no means to protect and guide them. A complete system of life insurance and old age pensions enables the men to carry on their work

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without anxiety as to their future. Their children, too, are not left uncared for, and special schools have been erected for their benefit. Indeed, it is to the complete harmony which exists between capital and labour that the great prosperity of Chôshi's soy industry is attributed.

"As already stated, it was the excellent quality of Chôshi soy which won for it such a wide reputation, even at a time when facilities for its transportation were not very good. The climate and the pure water in the vicinity have proved of tremendous advantage in the industry, while the improved means of communication and transport have also done much for its development in later years. And above all, the brewers have paid great attention to their apparatus and methods, so that not only is the industry in a flourishing state, but the prospects for its future development are of the brightest."

"The following articles give some account of the four principal Chôshi Soy Brewers." 1. Higeta Shoyu Jozosho. 2. Jigamisa Shoyu Jozosho. 3. Yamaju Shoyu Jozosho. 4. Yamasa Shoyu Jozosho.

A photo shows "the interior of a Choshi soy brewery." Address: PhD, Prof. at Tokyo Imperial Univ., Japan.

1434. Takahashi, Teizô. 1910. The brewing industry: Chapter III. Soy breweries. (2) The soy industry of Noda (Document part). In: Japan's Industries: And Who's Who in Japan. 1910. Osaka, Japan: Industrial Japan. vi, iii, 687 p., iv p. See p. 158-60. Undated. Translated from unpublished Japanese manuscripts. 29 cm. [Eng]

• ***Summary:*** "History: Noda is a small town of some 12,000 houses situated about 20 miles north-east of Tokyo, and is 8 or 9 miles from the nearest railway station, but the River Yedo, one of the tributaries of the River Tone, affords excellent means of direct communication with the Capital, and light railways traverse the town, these being used for the conveyance of the soy casks from the various factories to the wharves on the river bank, whence they are shipped to Tokyo. Noda is also well provided with an excellent telegraph and telephone service which facilitates business with various parts of the country.

"The major portion of the population is engaged in the industry of soy brewing, for which the place has been famous for very many years. It was back 350 years ago [i.e. 1560] that the first soy factory was established at Noda, the proprietor being a man named Ichirobei Iida. The success of his business proved the suitability of the place for the brewing of *shoyu* or soy, and subsequently Hyoyemon Takanashi, brewer of the 'Jôjû' brand soy, entered into partnership with the idea of doing business on a larger scale than had hitherto been attempted. That partnership was eventually dissolved, each partner starting business on his own account, and subsequently many other firms of soy brewers were established, such as Saheiji Mogi ('Kikkoman' brand soy), Fusagoro Mogi ('Minakami' brand soy), Heibei Yamashita ('Kinoyene' brand soy), and Okuyemon Mogi ('Ichiyama' brand soy), and great prosperity has attended the industry as a whole. In 1825 when, as a result of a famine, the price of commodities rose very high and great distress prevailed amongst the masses, the Government of the Tokugawa Shogunate issued an edict ordering that as a means of alleviating the distress lower prices should be charged for commodities. It is noteworthy that the 'Kikkoman', 'Jôjû' and 'Kihaku' brands of soy (together with the four best brands of soy made in Choshi) were granted the special privilege of being permitted to retain their former prices, on account of their superior quality. Moreover, they were allowed to use the distinguishing mark 'Best Soy' which was the highest testimonial to their general excellence.

"Mr. Keizaburo Mogi, a leading authority on matters relating to the soy industry, began experiments in 1879 at Noda with the object of applying scientific and mechanical methods to the fermentation of the sauce. In 1882 his experiments had progressed to such an extent that steam was successfully applied to the brewing of soy, while at the present time further advance is in contemplation by the utilisation of electricity, the necessary plans for this having already been completed. Mr. Mogi also made a close study of the question of the improvement of the *kôji* (yeast), the most important ingredient of soy, and in 1899 he completed a perfect method for its preparation. For this discovery he obtained a patent from the Government, but in order that the industry as a whole might benefit from his investigations, he made the process public and available to all the brewers. He has also made important investigations in regard to a more rapid process of brewing and has thus rendered very valuable services to the soy industry in general, and to that of the Noda district in particular.

"There are many reasons for the unrivalled position which Noda Soy holds, but the chief cause of its success lies in the extreme care bestowed upon the selection of the necessary ingredients in order that only the very best may be used. The wheat, beans, and salt required for the brewing of soy are not produced in the neighborhood of Noda, but are purchased from distant localities specially noted for those products. Salt, for instance, is brought from Nagasaki, about ten hundred miles distant, and this alone is sufficient proof of the care best owed by the Noda soy brewers upon their product. As in other brewing operations, one of the main factors is the water supply, and Noda is exceptionally well provided in this respect, having been noted from ancient times for the abundance and purity of its water supply, which has its source in a natural well 3,000 feet deep."

"There are over 5,000 labourers employed in the various soy breweries and the fact that there has never been a strike or unpleasantness to any extent is very good evidence that the work-people are satisfied with their lot and that employers are treating them fairly and with proper consideration."

Photos show: (1) The soy brewing laboratory, Noda.

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(2) Mr. Keizaburo Mogi (oval portrait; he is wearing two medals), "a leading soy brewer." Address: PhD, Prof. at Tokyo Imperial Univ., Japan.

1435. Gilbert, A.W. 1910. Soy beans and fertilizer question. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 13(79):55. Oct. 5. [1 ref]
• ***Summary:*** The following is an extract from the *National Review,* of Shanghai, China: "It is well known that soy-bean cake has for years been the most popular fertilizer in Japan. Now, however, that the United Kingdom, and the Continent of Europe and America to a less extent, have become purchasers of Manchurian beans, the question arises whether Japan will to be able to buy bean cake in huge quantities if the price rises appreciably. In studying this question two factors should not be lost sight of: One is that Japan is herself a large grower of soy beans, having according to the latest available returns (1908) over 1,200,000 acres under cultivation, producing annually some 19,000,000 bushels of beans, while the other is that Japan imports very large quantities of soy beans from China and Korea. The greater part of these beans is used for the purpose of human food–i.e., in making of 'soy,' 'miso,' and bean curd–but a portion by no means small is used also as a fertilizer.

"The Russo-Japanese war had such an effect in curtailing the supplies of beans and cake that to arrive at a just appreciation of the position it is necessary to go back a good many years. In making such a review it will be noted that, both in the case of beans and of cake, the amounts imported in 1909 were record importations, but that the average price was the lowest since 1903. Should the price in the future be forced up very high in consequence of British and other demands, the presumption is that Japan would turn to sulphate of ammonia, if the cost per unit of nitrogen therein were less than the cost of bean cake. On the other hand, it must be remembered that the removal of the import duty on sulphate of ammonia in the United States of America means that the United States will probably absorb large quantities of the British output, and that Japan will have to pay a higher price if she wants a share of this fertilizer. Thus the outlook for nitrate of soda becomes a good deal brighter, and now that, owing to the subsidized Japanese line to (South) America, it is possible to get cheap freight rates, it looks as though (Chilean) nitrate of soda will be a serious competitor to the other nitrogenous fertilizers, except in the matter of wet rice cultivation.

"There is a point which, though obvious enough to those intimately connected with the trade, is sometimes overlooked in general discussions on the subject of bean cake, viz, that the British farmer can afford to pay a proportionately higher price for cake than the Japanese farmer, the reason being that in the United Kingdom the cake, after serving for provender, turns into a fertilizer, whereas in Japan it is employed as a fertilizer directly, without any intermediate use.

"As regards rock phosphate, most of the supplies have hitherto come from Ocean and other islands. Owing, however, to the new fertilizer law which prohibits any admixture in Japan of earth and sand with rock, it will probably be found that the phosphate from the above-mentioned islands, being pure and expensive, will be displaced by the cheaper varieties of rock from Tennessee and Algiers, which are naturally mixed with impurities." Address: Vice-Consul, Nanking.

1436. *Los Angeles Times.* 1910. Fertilizers for Japan. A scarcity of soy beans makes a market for Tennessee rock phosphate. Oct. 13. p. I13.
• ***Summary:*** "It is well known that soy-bean cake has for years been the most popular fertilizer in Japan. Now, however, that the United Kingdom, and the Continent of Europe and America to a less extent have become purchasers of Manchurian [soy] beans, the question arises whether Japan will continue to be able to buy bean cake in huge quantities if the price rises appreciably.

"In studying the question, two factors should not be lost sight of: One is that Japan is herself a large grower of soy beans, having according to the latest available returns (1908) over 1,200,000 acres under cultivation, producing annually some 19,000,000 bushels of beans, while the other is that Japan imports very large quantities of soy beans from China [Manchuria] and Korea. The greater part of these beans is used for the purpose of human food–i.e., in making of 'soy' [sauce], 'miso,' and bean curd [tofu]–but a portion by no means small is used also as a fertilizer.

"The Russo-Japanese war had such an effect in curtailing the supplies of beans and cake that to arrive at a just appreciation of the position it is necessary to go back a good many years." In 1909 Japan imported record amounts of beans and cake, but "the average price was the lowest since 1903. Should the price in the future be forced up very high in consequence of British and other demands, the presumption is that Japan would turn to sulphate of ammonia, if the cost per unit of nitrogen therein were less than the cost of bean cake."

The "British farmer can afford to pay a proportionally higher price for cake than the Japanese farmer," since in the UK the cake, "after serving for provender [feed], turns into a fertilizer [manure], whereas in Japan it is employed as a fertilizer directly, without any intermediate use. "

1437. Williams, C.L.L. 1910. Trade of Newchwang and Manchuria. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 13(86):161-64. Oct. 13.
• ***Summary:*** Imports of gunny bags (p. 161-62): "Owing to the excellent harvest and large export of [soya] beans both last year and this, gunny bags are imported in large

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quantities. The sacking used is made from jute, principally in Rangoon [Burma]. The bags are in appearance similar to the potato sacks in use in the United States, but are somewhat larger and much firmer and heavier in texture."

The section titled "Exports of beans and coal" states (p. 162): "Among the articles exported [soya] beans and bean products are predominant. The falling off in the exports of these from Newchwang may be largely attributed to the fact that ocean steamships find great difficulty loading here and have, consequently, made Dalny their headquarters. Newchwang retains her command of the China coast trade, but the supply available for this market has fallen short of the 1909 figures. Prices, too, have ruled very high.

"According to press reports Dalny has shipped some 239,494 tons during the season (November to May, 1910), as against 207,452 tons for the same period in 1909. From the same source it is learned that the imports of beans into Japan for the season amounted to only 54,282 tons, a decrease of over 93,000 tons, and that as regards bean cake the falling off was even larger. This is attributed to industrial conditions in Japan and the high prices ruling for beans and bean cake.

"Various receptacle for shipping bean oil have been tried in an effort to secure some form of packing which will protect the contents from leakage or deterioration in the Tropics. Kerosene oil tins have not been found satisfactory nor have the wicker baskets used since time immemorial by the Chinese. The latest experiment is a steel drum.

"All authorities unite in estimating a large bean crop for the coming season. The acreage under cultivation is said to have been greatly increased, and the weather, despite partial local droughts in one or two localities, has been favorable." Address: Vice-Consul, Newchwang.

1438. *Board of Trade Journal* (*London*). 1910. Foreign trade of China in 1909. 71:20-25. Oct. 16. See p. 23-24. [1 ref]
• ***Summary:*** "The following article on the foreign trade of China in 1909 is based on the 'Abstract of Statistics and Report on the Foreign Trade of China' for 1909, recently published by order of the Inspector-General of the Chinese Imperial Customs...

"Apart from tea, silk, and two or three other articles, a marked general increase occurred in the leading exports to foreign countries; but the rise of a great export trade in beans is the fact which overshadows all others. From the earliest days of the Foreign Customs beans and beancake have been the principal exports from Newchwang, but for many years the trade was exclusively domestic. About the year 1890 a beginning was made with shipments to Japan, and the traffic soon rose into importance, Japan being practically the only foreign buyer of these products until 1908. During the eight years 1900-7 the average annual value of the beans exported abroad was 4.37 million taels [a unit of currency. The average value of the Haikwan tael is 2*s.* 7.19*d.* in 1909, 100 Haikwan taels = 111.40 Shanghai taels, for which exchange quotations are made]. In 1908 the total export of beans abroad rose to 4,770,000 piculs [1 picul weighs 133.33 lb], valued at 9 million taels, and in 1909 to no less than 14,438,000 piculs, valued at 32.78 million taels. The soya bean thus took at a bound a position equal to that of tea in the list of exports, and if to the shipments of beans be added those of beancake, giving a combined value of 52 million taels, even the position of silk at the top of the list is challenged. Of the beancake exported (10,088,359 piculs), all but an inappreciable quantity was of Manchurian origin; and of the beans, 10,915,000 piculs were sent out from Manchurian ports, 1,173,000 piculs from Hankow, 1,737,000 piculs from Chinkiang and Shanghai, and 600,000 piculs from Amoy [Xiamen] and Kwangtung [province in southeast China] ports. The ultimate destinations of the consignments of beans are less easy to determine with accuracy. There went directly to Japan 4,945,000 piculs; to Great Britain, 1,158,600 piculs; to Hongkong, 2,010,800 piculs; to Port Said ('for orders'), 2,021,600 piculs; and to Vladivostock [Vladivostok] through Suifenho [Suifenhe], 3,842,000 piculs. The statement, on good authority, that 400,000 tons of beans were shipped to the United Kingdom in 1909 may be accepted as not far from the mark, and would account for 6,800,000 piculs. Add the shipments to Japan and 460,000 piculs declared as for the Straits, Dutch Indies, and European countries, and there still remains a balance of over 2,000,000 piculs of which the destination is uncertain."

Tables show the net imports of foreign and native goods, and exports for the years 1907-09 of: Manchuria (p. 21). China (p. 22).

Note: This is the earliest document seen (March 2010) that gives soybean trade statistics for Southeast Asia (imports to Dutch Indies).

1439. *Oil, Paint and Drug Reporter.* 1910. The soya bean and the fertilizer question. 78(17):41. Oct. 24. [1 ref]
• ***Summary:*** "An extract from the *National Review of Shanghai*, regarding the relation of the soya bean to the fertilizer question, has been sent to the Department of Commerce and Labor by Vice-Consul A.W. Gilbert from Nanking. The discussion of the subject by the Review is as follows:" There follows a long excerpt.

1440. Grossmann, H. 1910. Ein neuer Welthandelsartikel [A new article of world trade]. *Berliner Tageblatt* 39(548):2. Oct. 28. Handels-Zeitung section. Evening edition. Friday. [Ger]
• ***Summary:*** The article begins: "In the history of modern world trade there has been nothing like it. A plant which has been known for many years in its native land, Chinese Manchuria, has enjoyed a significant culture, and the countless products that can be made from it include the indispensable foods for an entire people. In 1908, for the first time large amounts of its products were suddenly imported

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into Europe, and all at once there was great interest in this plant from the Far East. There followed many publications about the great economic importance of the soybean (*Sojabohne*)."

The soybean first became known in Europe in 1873 at the Vienna World Exposition (*Wiener Weltausstellung*). In 1909 not less than 400,000 tons of soybeans were imported to England. According to information from the British trade attaché, P. Ker, in Peking, the total shipments of soybean seeds (*Sojasaat*) to Europe from Manchuria, including Vladivostok, amount to about 518,000 tonnes. Almost 300,000 more tonnes are shipped to Japan from China. The main ports of exit are Dalny, Vladivostok, and Hankow. Address: PhD, unestablished university lecturer (*Privatdozent*).

1441. Page, H. Orville (Pat). 1910. Maroon baseball nine at ambassadors reception in Japan... Orientals give Yankees many treats before games. *Chicago Daily Tribune.* Oct. 30. p. C4.

• ***Summary:*** Tokyo, Oct. 2.–"The University of Chicago baseball team has been entertained royally since its arrival in Japan. Wednesday night Waseda university tendered the maroons an elaborate banquet at Seiyoken, Uyema, and welcomed us formally."

"Move number two found them [the Japanese baseball players] squatted around on mats with their individual charcoal stove [sic, stoves] before them... The [Japanese] athletes relished most the item entitled 'niku nabe,' cooked in 'shoyu,' a bean sauce,..."

1442. *Proceedings of the Linnean Society of London.* 1910. Soy beans. Oct. (122nd Session). p. 53-55. Meeting of March 17, 1910.

• ***Summary:*** "Mr. J.H. Holland, F.L.S., also on behalf of the Director of Kew, showed samples of the Soy Bean, *Glycine Soja,* Sieb. & Zucc. (*G. hispida,* Maxim.), with herbarium specimens of the plant producing this seed.

"He stated that the seeds of 'Soy,' of which there are many varieties, may be black, brown, green or greenish-yellow, yellow, or mottled; sometimes seeds are described as white, but there appears to be no Soy bean true white in color.

"The plant is variously known as 'Soy,' 'Soja,' 'Soya,' 'White Gram,' 'American Coffee Berry,' and 'China Bean.'

"In China and Japan, where the plant has been cultivated for many years–perhaps centuries–the beans are an important food, and they are also said to be used as a substitute for coffee.

"Bean cake and the sauce known commercially as 'Soy' is also made from them. It is stated that in the manufacture of the soy of commerce, in addition to the beans, the requirements are simply a large amount of salt and flour and an unlimited supply of fresh water. Wenchow is an important centre of the manufacture, and here the bean used for the purpose is said to be chiefly the white form from Chinkiang. The cultivation has been extended to India, Africa, and other warm countries...

"The principal use of the beans in this country is for the extraction of the oil, of which they contain about 18 per cent. suitable for soap-making, and in general as a substitute for cotton-seed oil. The residue, after the extraction of oil, is suitable for feeding cattle, and for this purpose appears likely to become a serious competitor of cotton-seed cakes, sunflower-seed cakes, linseed cakes, &c."

"Beans and bean-cake exported from China have gone chiefly to Japan and certain parts of Asia, but recently, beginning about November, 1908, an important trade has been developed in them more especially with the beans, between Manchuria and Europe, Dairen (Dalny) being the chief place of export.

"The cause of this sudden development may, perhaps, be attributed to the facts that a great increase in the cultivation took place in Manchuria during the Russo-Japanese war to meet the demands for food of the Russian Army; then, when the troops were withdrawn, the production being found, profitable, and the home demand reduced, other markets were sought. The trade extended to Japan, and afterwards, assisted perhaps by a period of depression in that country, it extended to Europe, where the industry has created interest in many quarters.

"The amount of the 1908 crop sent to Europe through Vladivostok up to July, 1909, was 180,000 tons, the greater part destined for the English market (Hull and Liverpool), and the remainder going to German (Hamburg) and Scandinavian ports.

"Up to 1907 the export of soy beans from Manchuria did not exceed 120,000 tons annually. During 1908 the export rose to 330,000 tons (one half shipped from Dairen; 100,000 tons from Newchang, and 65,000 tons by rail *via* Suifenho [Suifenhe] to Vladivostok), the increase, it is said, being due entirely to the demand from Europe."

Summarized in *Tropical Agriculture.* 1910. July 15. p. 28. Address: England.

1443. Sammons, Thomas. 1910. Soya bean trade on the Pacific. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 13(110):545. Nov. 10.

• ***Summary:*** "The shipment of [soya] beans and bean cake from the Orient to the North Pacific coast of America is receiving the serious attention of Americans interested in this subject, some of whom are making extended personal investigations in Japan and other parts of the Far East (the Pacific Oil Mills, of Seattle, Washington, being most active.) Note: This is the earliest document seen (June 2003) that mentions Pacific Oil Mills of Seattle, Washington, or the crushing of soybeans in the United States. Pacific Oil Mills

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began actual crushing of soybeans in 1911.

"It is roughly estimated that bean cake when prepared, through sterilization and other treatment, is worth $32 to $35 per ton in the North Pacific market, and that the cost in the Far Eastern markets, also roughly estimated, is placed in the neighborhood of $20 per ton. Therefore it is believed that there are possibilities of building up a fairly profitable business in this commodity.

"Heretofore the cost of transportation and the inability to scientifically treat bean cake in America in preparing it for the market have prevented any extensive shipments from the Far East to the Pacific coast. Those who are now giving the matter serious attention, however, find that for cattle feed bean cake, when ground and sterilized, is highly satisfactory. It is also believed that bean cake for fertilizing purposes may ultimately be introduced into the Hawaiian Islands. This can only be done in connection with satisfactory transportation arrangements. In 1906 samples of Manchurian bean cake as forwarded (by the writer) to the Honolulu Chamber of Commerce were pronounced entirely satisfactory and desirable for use on the sugar plantations." Address: Consul-General, Yokohama [Japan].

1444. *San Francisco Chronicle.* 1910. Fertilizer in Japan. Nov. 13. p. 57.

• ***Summary:*** "It is well known that soy bean cake has for years been the most popular fertilizer in Japan. Now, however, that the United Kingdom and the continent of Europe and America to a less extent have become purchasers of Manchurian beans, the question arises whether Japan will continue to be able to buy bean cake in huge quantities if the price rises appreciably."

1445. Lewkowitsch, Julius. 1910. Die Industrie des Soyabohnenoeles [The soya-bean oil industry]. *Chemische Industrie* (*Berlin*) 33(22):705-08. Nov. 15. Whole number 670. (Chem. Abst. 5:597). [3 ref. Ger]

• ***Summary:*** This is a major report on the world soybean oil industry. "In an astonishingly short period of time, the almost unknown soybean has become a major oilseed in Europe." The method of separating the oil from the soya bean in Manchuria is to soak the seeds in water overnight, to crush them, and, after boiling the mass with a little water, to express the oil in a primitive form of press. Owing to the length of time during which the pressure is continued, the yield of oil is as high, if not higher, than is given by the modern hydraulic presses [used in Europe]. The expressed oil is mainly used for food, while any that is unfit for that purpose is burned in lamps. The residual cakes in the press, which are about 3 inches thick and 2 to 3 feet in diameter, form a staple food product. The bean cakes in China are called *teou-fou-tcha* [sic, actually this term refers to okara].

Some idea of the trade done in these soya bean cakes may be formed from the fact that during the year 1904 no less than 160,000 tons of soya bean cake (not including the beans themselves or the oil) were exported to Japan alone, although that country itself produced about 2,500,000 hl. (1 hectoliter = 100 liters, so 6,875,000 bushels) of beans, which were utilised in 11,000 factories that manufacture soy sauce. In the year 1909 the quantity of beans exported from Manchuria to Japan reached 600,000 tons.

Until two years ago considerable difficulties stood in the way of the trade with Europe, for the long sea-voyage through the tropics and especially through the Red Sea, had such a deteriorating effect upon the beans, that, after removal of about 10 per cent of oil, the residual oil cake was quite unsuitable as a feeding stuff. Only a small amount arrived in Liverpool, where the resident Chinese created an insignificant demand for their favorite dishes. Nevertheless, small amounts of soybean cake (*Soyakuchen*) were imported to England for use in mixed feeds, although this branch of trade had but a paltry existence. Therefore the confluence of a number of particularly favourable conditions were required to introduce the beans into the world and European markets. During the Russo-Japanese War, soybeans served as a staple food for the Japanese, and later the Russian soldiers. After the war, Manchuria was thrown open to the commerce of the world. Thanks to the industrial activity of the Japanese and the decline in the shipping rates, a favorable opportunity arose, after the soldiers left, for exporting large quantities of the beans to England.

The first large consignment reached Liverpool towards the end of 1908, and its arrival coincided with a period of great scarcity of other oils and fats, due to various causes, and, in particular, to the increased consumption of edible fats, and the growing demand for dynamite glycerin for the Transvaal mines and the construction of the Panama canal. In addition to this, the cotton-seed harvest in the United States had been poor, and this had caused a considerable increase in the price of Egyptian cotton-seed, so that many oil-mills in England had been forced temporarily to suspend work. Hence attention was at once directed to the new raw material, large quantities of which were available at favourable prices.

The imported beans had the following average composition: Water 10%, oil 18%, proteins 40%, carbohydrates 22%, fibre 5%, and ash, 5%. It was not possible to reckon upon a higher yield of oil than 10 per cent. from the beans, but feeding experiments with the oil-cake showed that while it produced as much flesh as cotton-seed oil-cake, it caused the cows to yield a milk richer in cream. Thus for some time past soya cake has fetched higher prices in the market than cotton-seed cake.

Had it not been for the timely appearance of soy-bean oil the already high price of cotton-seed oil would have been at least 25 per cent. higher, and there would have been a corresponding increase in price of all the fats used in the soap industry. Immense quantities of the new oil were employed in the manufacture of soap, and during the year

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1909 more than 400,000 tons of the beans were imported into England. Only small quantities were sent to America, and, relatively, very little to the continent of Europe.

The high tariff on raw materials in Germany and in France prevented the importation of the seed, and at first the English oil manufacturers took advantage of this, and exported large quantities of soya oil and soya cake both to America and the Continent. Only within the last few months have the German oil manufacturers succeeded in obtaining the concession that soya beans may be imported into Germany free of duty, but in the near future the production of soya oil and soya cake may become an important branch of the German oil industry.

The chief use of the new material in the manufacture of soap is as a partial substitute for cotton-seed oil in the production of hard soaps, while for soft soaps it can completely replace cotton-seed oil and partly replace linseed oil. Soya-bean oil has also been extensively used as an edible oil, and in admixture with cotton-seed oil large quantities of it have been consumed in England. It has also been employed as an oil for the preservation of sardines. Attempts were made to use it as a substitute for linseed oil in the color and varnish industries, but it can never replace the latter oil completely.

The composition of soya-bean oil renders it particularly suitable for the adulteration of both linseed and cotton-seed oils, while it is also frequently employed as an adulterant of Japanese rape oil.

The chief ports for the export of soya beans are Newchang, Dalny, Vladivostok, and Hankow, while the principal European ports for their importation are Hull, London, and Liverpool, and, more recently, Hamburg. The supply of the beans is assured for several years, for, in addition to that produced in Manchuria and South China, attempts, which appear likely to be successful, are being made to cultivate the plant in West Africa and in the East Indies.

In the Southern States of North America the soya plants are already grown for fodder, and experiments are now being made to cultivate them for the production of oil seed. It has already been proved that the beans grown in West Africa from Asiatic seed do not yield less oil than the original seed. The author lived 1857-1913.

Note 1. This is the earliest document seen (March 2001) concerning soybeans in connection with (but not yet in) Panama or the Canal Zone. Address: London.

1446. *Times* (*London*). 1910. Soy bean as a fertilizer. Nov. 21. p. 14, col. 6.

• ***Summary:*** "Several subjects of importance to this country are discussed in the *Daily Consular and Trade Reports* published by the Bureau of Manufacturers, Department of Commerce and Labour, Washington [DC]. A note upon soy beans as a land fertilizer is particularly noteworthy in view of the doubt expressed in this country last year as to their manurial value."

There follows a summary of: Gilbert, A.W. 1910. "Soy beans and fertilizer question." *Daily Consular and Trade Reports* (U.S. Bureau of Manufactures, Department of Commerce and Labor). Oct. 5. p. 55.

1447. *Daily Post* (*Australia*). 1910. On the land: A column for rural producers. Growing importance of soya bean trade. Nov. 29. p. 3.

• ***Summary:*** "The extraordinary development of the export of Manchurian [soya] beans to Europe which began in the autumn of 1908 is considered by the British Commercial Attache at Pekin to form the most marked feature of the trade of China during the last year. It is a trade of special interest to us, as the United Kingdom, in consequence of the high import tariff of other countries, enjoyed practically a monopoly of the shipments, although we believe that both Germany and France have now arranged to admit the beans free of duty or at a much reduced tariff.

"In the meantime, British oil crushing industries have derived much profit from the large importations of the beans, being made to a great extent independent of the scarce supplies of cotton seed, linseed seed, etc., and the cake made from the crushed residue has provided an excellent cattle cake.

"During the last complete shipping season, from November 1908 to September 1909, as many as 34 steamers loaded cargoes of the beans, and the shipments for the year which ended last December was 234,000 tons from one port, shipped by British and Japanese firms. The total shipments to Europe from Manchuria in 1909 amounted to about 548,000 tons, and in Japan it is estimated that 294,000 tons were exported.

"The purchase of beans in the interior of the country is said to be an operation involving no small difficulty and financial risk. The effect of the keen competition which naturally followed the successful business of 1908-09 was to raise the price of beans, and difficulties were experienced in getting deliveries in accordance with contracts fixed when prices were low. The business lends itself to gambling, and large sums are said to have been lost by the less fortunate speculators.

"In the report of his Majesty's Consul at Newchwang on the trade of the port for 1909 will be found an estimate an estimate of the total production of [soya] beans in South Manchuria, based upon the amounts of beans and bean cake exported from Newchwang and Dairen. The conclusion is reached that these exports represent a total of 1,333,000 tons of beans, and that the production under favorable conditions can be estimated at not far short of 1,480,000 tons."

1448. Kato, Yogoro. 1910. Yuba no seisei [On the chemistry of the formation of yuba]. *Tokyo Kagaku Kaishi* (*J. of the*

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Tokyo Chemical Society) 31(11):1139-55. Nov. [11 ref. Jap]
• ***Summary:*** Contents: The surface tension of soymilk (p. 1140). Relationship between the formation of yuba and the gas in contact with the surface of the soymilk (1142). Relationship between the formation of yuba and the evaporation at the liquid surface (1143). Relationship between the concentration of soymilk and the formation of yuba: Table shows concentration vs. time for yuba to form (1144). Changes in the concentration of soymilk during yuba formation (1146). Relationship between the sequence of yuba films and their respective composition (1146). Changes in the composition of the soymilk during yuba formation and relationship between concentration of the milk and the yuba (1148). Relationship between yuba formation and temperature (1149). Nature of the soymilk after removal of oil/fat (1150). Experiment on film formation using cow's milk (1151). Formation of films on a liquid consisting of dissolved starch (1153). Summary and conclusion (p. 1153).

Note: Throughout this article, the term for "soymilk" is written *tôeki,* or "bean liquid." Address: Rigakushi.

1449. Reiter, H. 1910. Die Sojabohne, Glycine hispida Moench [The soybean, Glycine hispida Moench]. *Pflanzer* (*Der*) (*East Africa*)**.** Vol. 6. Flugblatt No. 9. 4 p. Nov. Beilage zum Pflanzer. Bound at the end the volume. [Ger]
• ***Summary:*** Contents: 1. What is the soybean? 2. Where is the soybean cultivated? 3. Where and how can the soybean be cultivated? 4. With which other crops is the soybean planted (in mixed cultures, as green manure, in rotations)? 5. Fertilizer for soybeans. 6. Use of soybeans: The beans, straw, hay, and silage, oil and cake (*Presskuchen*)**.** As a source of seed, the firm Boehmer & Co. in Yokohama is recommended. Note: No mention is made in the text of soybeans in connection with Africa or Tanzania. Address: Biologisch Landwirtschaftlichen Institut Amani, German East Africa.

1450. *Oil, Paint and Drug Reporter.* 1910. Prospects of lower soya bean values. Difference of opinion abroad–Crop large and quality better. 78(23):23. Dec. 5.
• ***Summary:*** The new Manchurian soya bean crop is expected to be 25-30% larger than last year's crop. One firm predicts that about 1,550,000 tons of soya beans will be available for export from the 1910-1911 crop; Japan will take 600,000 tons and South China 200,000 tons leaving 750,000 tons available for Europe. "The beans are required in Japan for making Japanese sauce–a national food in demand during the winter."

A table shows shipments of soya beans from Manchuria. from Oct. 1 to Sept. 30, 1908-09, and 1909-10, from three ports: Dalny (the leading port both years), Newchwang, and Vladivostok (having the smallest exports of the three).

1451. *Chemische Industrie* (*Berlin*)**.** 1910. Soyabohnen als Duengemittel in Japan [Soybeans as a fertilizer in Japan]. 33(24):792. Dec. 15. (Chem. Abst. 5:1511). [Ger]
• ***Summary:*** Up until now soybeans have been used in large quantities as fertilizers in Japan. However, because of the current rapid rise in the world demand for soybeans, their price has also risen a great deal, so it is expected that Japan will switch to using ammonium sulphate (*Ammonsulfat*) and saltpeter (*Salpeter,* potassium nitrate) as fertilizers.

1452. *Hartford Courant* (*Connecticut*)**.** 1910. Note and comment. Dec. 19. p. 8.
• ***Summary:*** "Japanese living in our Pacific states are importing canned beef from their native land." It "is known to the trade as 'Yamatoni' beef–'Yamato' being the poetical name for Japan and 'ni' meaning stewed or cooked. Before being cooked, the beef is sliced so as to permit of its being picked up with chopsticks. It is then thoroughly cooked with shoyu and sugar. Sometimes a little thin-sliced fresh ginger is added as a flavor" before it is canned.

1453. Piper, Charles V.; Morse, W.J. 1910. The soy bean: History, varieties, and field studies. *USDA Bureau of Plant Industry, Bulletin* No. 197. 84 p. Dec. 31. Includes 8 plates showing plants, pods, and seeds, and an excellent 6-page index. [27 ref]

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• ***Summary:*** Contents: Botanical history and identity of the soy bean. Botanical classifications of soy-bean varieties. Varietal characteristics of soy beans: Habit of growth, foliage, pubescence, flowers, pods, seeds. Frost resistance. Period of maturity (soybeans were planted at the Arlington Experimental Farm, near Washington, DC, from 3 June 1905 to June 1909). Changes in life period (soybeans were planted at the Arlington Farm in 1902). Pollination and hybridization. Mutations. Nomenclature and classification. Early agricultural history in the United States. Varieties introduced in the United States independently of the Department of Agriculture or previous to 1898: Enumeration, Ito San, Mammoth, Buckshot, Guelph, or Medium Green, Butterball, Kingston, Samarow, Eda, Ogemaw, or Ogema.

Varieties grown in Europe (p. 32-33; Early history, Samarow, Etampes, Chernie [from Khabarovsk, Siberia], "Yellow Riesen," Buckshot, "Yellow," "Brown," Butterball, S.P.I. No. 5039. European seed companies carrying soybeans include Dammann & Co., Naples, Italy; Haage & Schmidt, Erfurt, Germany; Vilmorin-Andrieux & Co., Paris, France).

The soy bean in Asia (p. 34-35): Asiatic sources of soy beans, list of varieties with SPI numbers from each of the following countries and places: Siberia (South Usuri [Ussuri], Khabarovsk, Merkoechofka), Manchuria (Newchwang, Harbin, Tieling), Korea (Pinyang, Ko-bau), Japan (Tokyo, Kobe, Yokohama, Hokkaido, Anjo), China (many places), Formosa (Taihoku), Cochin China (Saigon), India (Darjiling [Darjeeling] and Khasi Hills–Assam; Pithoragarh–Kumaon Dist.; Safipur, Hasangani, Ranjitpurwa–Unao, Uttar Pradesh; Etawah, Manipuri–Uttar Pradesh; Cawnpore, Dehra Dun, United Provinces; and Poona Bombay), Java (Buitenzorg), Celebes (Macassar).

Desirable characters in soy-bean varieties (p. 36-37): Considerations governing choice, habit of the plant ("Erectness of stem with upright or ascending branches is a prime requisite of a desirable variety. A tall habit is also important, as dwarf varieties usually bear pods very close to the ground, so that many will be left on the stubble..."), coarseness (a coarse, woody stem makes mowing difficult. However slender varieties often have small pods and seeds, often with vining tips and a tendency to lodge), ability to retain leaves, color of the seed ("Yellow or green seeds are preferable to darker colors, as the shattered seeds are more easily found by hogs pasturing the field or stubble"), shattering, resistance to disease ("In sections where nematodes and cowpea wilt occur most soy-bean varieties are seriously affected by both these diseases"), nonfilling of pods. Synopsis of the groups (plants bushy vs. twining). Synopsis of the varieties (within each group lists the total number and acquisition numbers of varieties with various colored seeds and germs: Group I–190 varieties (seeds straw-yellow, germ yellow–71 varieties; seeds olive-green, germ yellow–45 varieties; seeds chromium-green, germ green–17 varieties; seeds brown to olive, germ yellow–28 varieties; seeds black, germ yellow–18 varieties; seeds black, germ green–7 varieties; seeds bicolored, germ yellow–4 varieties). Group II–4 varieties. Group III–8 varieties. Group IV–76 varieties. Group V–7 varieties.

Of the 285 varieties in the five groups, 152 varieties (53.3%) have yellow (straw-yellow or olive-yellow) seeds, 55 varieties (19.3%) have black seeds, 44 varieties (15.4%) have brown seeds, 24 varieties (8.4%) have green seeds, and 10 varieties (3.5%) are bicolored).

Catalogue of soy-bean varieties (by S.P.I. number, from no. 480 in 1898 to no. 27,501 in 1909; p. 39-74). In 1908 USDA acquired soybean seeds from Vilmorin-Andrieux & Co. (Paris, France), Haage & Schmidt (Erfurt, Germany), and Dammann & Co. (Naples, Italy) (p. 57-60).

The best varieties of soy beans (p. 75, in 7 groups from very early to very late). Explanation of plates. Index.

The "Catalogue of soy-bean varieties" (p. 39) is "a complete list of soy beans imported by the United States Department of Agriculture, arranged chronologically in accordance with the sequential S.P.I. (Seed and Plant Introduction) numbers assigned to them by the Office of Foreign Seed and Plant Introduction." These numbers start at #480 (imported from South Ussuri, Siberia, in 1898) and end at #27501 (imported from Shanghai, Kiangsu, China, in 1909). Concerning No. 21825 (p. 58): "From Hokkaido, Japan, 1908... This variety is said to be used principally in the manufacture of 'soy,' 'miso,' 'tifu' [sic, tofu], etc. It has also been obtained again from the same place and grown under Nos. 21830 and 21831."

"The best varieties of soy beans" (p. 75) lists 35 varieties, each with a name and S.P.I. number, arranged in seven groups based on time to mature, from "Very early.–Ogemaw, 17258" to "Very late.–Barchet, 20798; Riceland, 20797 (In 1908 at Biloxi, Mississippi, it displayed astonishing diversity)." This list is "based primarily on the results at Arlington Experimental Farm [in Virginia], but those obtained in cooperation with various experiment stations have also been given due consideration:

"Very early.–Ogemaw, 17258.

"Early.–Early Brown, 25161 (from Indiana Agric. Exp. Station, 1909); and Vireo, 22874.

"Medium early.–Chernie, 18227; Auburn, 21079 A; Merko, 20412 (from Merkoechofka, Siberia); Elton, 20406; Chestnut, 20405 B.

"Medium.–Ito San, 17268; Medium Yellow, 17269; Tashing, 20854; Shingto, 21079; Swan, 22379; Brindle, 20407; Sedo, 23229; Lowrie, 22898 A.

"Medium late.–Brooks, 16789; Flava, 16789 A; Cloud, 16790; Ebony, 17254; Haberlandt, 17271; Peking, 17852 B; Wilson, 19183; Taha, 21999; Austin, 17263.

"Late.–Mammoth, 17280; Edward, 14953; Acme, 14954; Flat King, 17252; Tokyo, 17264; Hope, 17267; Hollybrook, 17278 (from Arkansas Agric. Exp. Station, 1904); Farnham, 22312.

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"Very late.–Barchet, 20798; Riceland, 20797."

Matsuura (1929 and 1933) cites this as the world's earliest publication on soybean genetics: "Recording segregation of seed- and flower-color in its natural hybrids." Page 11 notes that soybeans named "New Japan peas" were obtained from Norway (Source: Martens 1869). Page 20 notes that the Ogemaw variety of soybeans, which takes 92-97 days to mature, was obtained in 1908 from the Idaho Agricultural Experiment Station, where it had been grown for several years. Note 1. This document contains the earliest date seen for soybeans in Idaho, or the cultivation of soybeans in Idaho (about 1906).

Page 20 also notes that Buckshot variety of soybeans, which takes 92 days to mature, was obtained in 1908 from the Minnesota Agricultural Experiment Station, where it had been grown for several years. This is the second earliest document (April 2004) seen concerning the cultivation of soybeans in Minnesota. "Potomac Flats" is not mentioned in this report.

Concerning "Habit of Growth" (p. 12-13), the author states: "All soy beans are strictly determinate as to growth; that is, the plants reach a definite size according to the environment and then mature and die. The great majority of the varieties are erect and branching, with a well-defined main stem (Plates I and III)... In other varieties the stems and branches, especially the elongated terminals, are more or less twining, and usually weak, so that the plant is only suberect or even procumbent (Plates I-III)."

Photos show: (1) Plants of a wild soy bean grown in a greenhouse in a pot. (Fig. 1) (2) Plants of a wild soy bean from Soochow, China, grown at the Arlington Experimental Farm.

(3) Plants of a soy bean from Cawnpore, India. (4) Rows of different varieties of soy beans at Arlington Farm.

(5) Plants of seven varieties of soy beans, showing types of habit: Meyer 17852, Peking 17852 B, Austin 17263, Pingsu 18259, Unnamed 22504, Hollybrook 17278, Haberlandt 17271. (6) The same seven varieties shown in plate 4 after hanging in a dry room for 6 months.

(7-8) Eleven soy bean pods, ranging in size and shape.

(9) 36 varieties of soy bean seeds, showing variation in size and form.

Note 2. This is the most important document ever published on early soybean varieties in the USA.

Note 3. This is the earliest document seen (Oct. 2010) that uses the word "determinate" in connection with soybeans. Determinate plants terminate main stem elongation at, or soon after, the onset of flowering. Indeterminate cultivars continue main stem elongation several weeks after beginning flowering. Determinate / indeterminate is a genetic trait.

Note 4. This is the earliest publication see (Aug. 2011) written jointly by Piper and Morse, two of the most influential early advocates of the soybean in the USA. It is also the earliest document by or about Morse in connection with soybeans. Morse graduated from Cornell University, New York, on 20 June 1907 and 2 days later reported for duty at the Bureau of Plant Industry in Washington, DC, to work under Dr. C.V. Piper.

Note 5. This is the earliest document seen (Feb. 2004) in which Piper or Morse mention miso, tofu, or the use of soy beans as a coffee substitute.

Note 6. This is the second earliest document seen (July 1998) that uses the word "shatter" (or "shattered" or "shattering") in connection with soybeans. The earliest document (in 1854) used the word "shatter" in a very general sense. This document uses it more precisely, as the title of a section and for comparing varieties (p. 36): "When grown for grain alone, shattering is a serious fault. Some varieties, like Guelph, shatter inordinately; others, like Peking, scarcely at all... As a rule the varieties with large pods and seeds shatter much worse than those with small pods and seeds..."

Note 7. This is second the earliest English-language document seen (Oct. 2004) that uses the term "germ" to refer to a part of a soy-bean seed. The germ or embryo is the part of the seed inside the seed coat.

The section titled "Seeds" (p. 15) states: "The germs or embryos of soy-bean seeds are yellow, except in the green-seeded and part of the black-seeded sorts, in which they are green." Address: 1. Agrostologist; 2. Scientific Asst., Forage-Crop Investigations, Bureau of Plant Industry, USDA, Washington, DC.

1454. Piper, Charles V.; Morse, W.J. 1910. The soy bean: History, varieties, and field studies: Botanical history and identity of the soy bean (Document part). *USDA Bureau of Plant Industry, Bulletin* No. 197. p. 9-11. Dec. 31.

• ***Summary:*** "The soy bean was first made known to Europeans by Kaempfer, who spent three years, 1690 to 1692, in Japan. Kaempfer (Amoenitatum Exoticarum, 1712, p. 837) gives the Japanese name 'Daidsu Mame' and describes it as an erect bean, with the pod of a lupine and the seeds like a large white pea. Linnaeus (Flora Zeylanica, 1747, p. 534) describes the plant briefly under 'Dolichos' and states that it is cultivated in Ceylon. This last statement is probably an error. He also cites the descriptions of Kaempfer. In 1753 Linnaeus repeats the description of the Flora Zeylanica and formally names the plant *Dolichos soja,* giving its habitat, however as India. What Linnaeus's Ceylon or India plant may be is not certain, as will appear.

"Moench in 1794 rechristened the Linnaean plant *Soja hispida.* Savi in 1824 called the Japanese soy bean *Soja japonica.* Miquel in 1855 named a narrow-leafed form from Java *Soja angustifolia,* and Maximowicz in 1873, using Moench's specific name, published the soy bean as *Glycine hispida,* which name has been generally adopted. Siebold and Zuccarini had previously (1843) named a plant from Japan *Glycine soja,* supposing it to be the *Dolichos*

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soja of Linnaeus. This plant, however, was not the soy bean cultivated by the Japanese but the wild plant later described as *Glycine ussuriensis* by Regel and Maack. Under existing botanical rules, the soy bean, which is known only as cultivated, has been called *Glycine hispida* (Moench) Maximowicz, and its nearest relative *Glycine soja* Siebold and Zuccarini (*G. ussuriensis* Regel and Maack). Maximowicz considered that the soy bean was probably derived from the latter by cultivation, but this idea has not generally been accepted.

"*Glycine soja,* as heretofore known, differs from *G. hispida* in its more slender and more vining stems, in being less hairy, in bearing smaller pods and seeds, and especially in having smaller flowers. The flower is 3 to 5 mm. long, while that of *G. hispida* is 6 to 7 mm. The structure of the flower is the same in both, but the calyx lobes are usually longer in proportion to the tube in *G. hispida* than in *G. soja.* It is apparent, therefore, that the fundamental differences between the species are slight. The smaller flower we regard as the best single character to separate *G. soja* from *G. hispida,* but using this as a criterion *G. soja* is also a cultivated species."

Note: This is the earliest English-language document seen (Nov. 2002) that uses the word "vining" in connection with soybeans–in this case *Glycine soja,* the wild soybean.

"Among numerous lots of seeds received from India (S.P.I. Nos. 24672 to 24693 inclusive) representing seven varieties, there are at least two (see Nos. 24675 and 24682) which have very small flowers, 3 mm. long, indistinguishable from those of the wild *G. soja* that we have grown. Typical plants of *Glycine soja* obtained from the Botanic Garden, Tokyo, Japan (S.P.I. No. 22428), and from Soochow, Kiangsu, China (S.P.I. No. 25138), have been grown three seasons. The India plants are coarser stemmed, less vining, and bear somewhat larger pods and seeds, but the flowers are much smaller than those of any variety of *G. hispida* and precisely like those of *G. soja.* Other numbers from India are probably *G. hispida,* but the flowers are somewhat smaller than the Japanese varieties and the pods and seeds as small as any variety of *G. hispida.* It is therefore apparent that both *G. soja* and *G. hispida* are cultivated in parts of India, if we accept the flower character as decisive. This fact makes it doubtful which of the two plants Linnaeus named *Dolichos soja.* There seems no good reason why *G. hispida* may not have been derived from *G. soja* by cultivation, the smaller flowers of the latter being the principal difficulty to explain. In all other respects the two supposed species seem to merge completely. The identity of the plant cultivated in India has been commented on by Watt (Dictionary of the Economic Products of India, 1890, p. 509)...

"Prain apparently does not apply the size of the flower as a critical character. Applying this, however, two of the Indian varieties (see No. 24675 and 24682) are certainly *Glycine soja* [the wild annual soybean] but the plants are stouter and less twining, and the pods and seeds larger than the wild form from Japan. Three other varieties (Nos. 24672, Khasi Hills [in today's Indian state of Meghalaya], and 24673 and 24674, Darjiling [Darjeeling in West Bengal, India]) we would refer to *G. hispida* [the domesticated soybean] though the flowers are somewhat smaller than the Japanese and Chinese varieties. The first is erect and bushy, but the other two are procumbent and vining. A variety from Taihoku, Formosa, No. 24642, is very similar to the two varieties from Darjiling. On the whole, we are therefore inclined to believe that there is but one botanical species, which has been profoundly modified by cultivation."

Note: This is the earliest document seen (Oct. 2010) that contains the word "procumbent" in connection with the soybean.

To summarize: In most botanical works the soybean is named *Glycine hispida* (Moench) Maximowicz. By a few writers it is named *Soja hispida* Moench. The use of either of these names is based on the idea that the wild soybean *Glycine soja* Siebold & Zuccarini or *Glycine ussuriensis* Regel & Maack is a different species. Piper and Morse (above) have shown that this view is untenable, the wild and cultivated plants representing but one species. Address: 1. Agrostologist; 2. Scientific Asst., Forage-Crop Investigations, Bureau of Plant Industry, USDA, Washington, DC.

1455. Piper, Charles V.; Morse, W.J. 1910. The soy bean: History, varieties, and field studies: Early agricultural history in the United States (Document part). *USDA Bureau of Plant Industry, Bulletin* No. 197. p. 26-27. Dec. 31. [14 ref]

• ***Summary:*** "The first mention of the soy bean in American literature is by Thomas Nuttall, in the New England Farmer, October 23, 1829. Nuttall grew a variety with red flowers and chocolate-brown seeds in the botanic garden at Cambridge, Massachusetts.

"In the same journal two years later, November 23, 1831, is an account of the successful culture of the plant at Milton, Massachusetts, the seed having been obtained from Nuttall. No further mention of the plant in American literature appears until 1853, when a brief account appeared under the name 'Japan pea,' by A.H. Ernst, Cincinnati, Ohio...

"In the following year, 1854, the Perry expedition brought back two varieties of 'soja bean' from Japan, one 'white' seeded, the other 'red' seeded. These, together with the Japan pea, were distributed by the Commissioner of Patents in 1854, and, thereafter, frequent references to the plant occur in agricultural literature under such names as Japan pea, Japan bean, and Japanese fodder plant. Most of these articles speak of the plant as the Japan pea, none of them as the soy or soja bean. It is apparent from the early accounts that there were at least two Japan peas, one early enough to mature in Connecticut (Patent Office Report,

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1854, p. 194), the other very late (American Agriculturist, 1857, vol. 16, p. 10). Judging from all the accounts, we suspect that the early Japan pea may be the Ito San variety, which, however, has red flowers, while the late variety may be the Mammoth. The Ito San is still occasionally called the Japan pea, while the introduction and source of the Mammoth has never been definitely determined. From these early accounts the Mammoth may well be the 'white-seeded' soja bean obtained by the Perry expedition. The 'red-seeded soja bean' was perhaps, the Adsuki [azuki] bean (*Phaseolus angularis*), as no red-seeded soy bean is known.

"Prof. G.H. Cook, of New Brunswick, New Jersey, obtained seed of the soy bean at the Bavarian Agricultural Station in 1878. In the same year Mr. James Neilson obtained seeds of several varieties at Vienna, Austria. Both of these gentlemen planted the seeds and gathered crops of the different varieties in 1879. These varieties were without doubt those grown and distributed through Europe by Professor Haberlandt, of Vienna.

"A yellow-seeded soy bean was grown at the North Carolina Agricultural Experiment Station in 1882 and reported on in some detail. The source of the variety is not given, but by implication it is the same as the variety stated to be grown by a number of persons in the State, and is probably the Mammoth.

"Two varieties, one black seeded, the other with white seeds, were grown at the Massachusetts Agricultural Experiment Station in 1888. In 1890 Prof. C.C. Georgeson secured three lots of soy beans from Japan which were grown at the Kansas Agricultural Experiment Station in 1890 and subsequently. Prof. W.P. Brooks, of Amherst, Massachusetts, brought with him from Japan in 1889 a number of soy-bean varieties, including the Medium Green or Guelph, and the Ito San. It is quite certain that other importations of soy beans from Asia were made by others, but no definite records have been found. [Note: The Guelph variety was NOT developed in Canada.]

"Since 1890 most of the agricultural experiment stations have experimented with soy beans and many bulletins have been published dealing wholly or partly with the crop." Address: 1. Agrostologist; 2. Scientific Asst., Forage-Crop Investigations, Bureau of Plant Industry, USDA, Washington, DC.

1456. Piper, Charles V.; Morse, W.J. 1910. The soy bean: History, varieties, and field studies: Soy-bean varieties described and indexed in this publication (Document part). *USDA Bureau of Plant Industry, Bulletin* No. 197. p. 79-81. Dec. 31. [27 ref]

• ***Summary:*** Named soy-bean varieties described and indexed in this publication, listed alphabetically below with the color of their seeds, are: Acme (straw yellow), Amherst (straw yellow), Arlington (black), Auburn (black), Austin (olive yellow), Baird (brown), Barchet (dark olive brown), Black Beauty (black), Brindle (brown and black), Brooks (straw yellow), Brown (brown), Brown Eda Mame (brown), Brownie (brown), Buckshot (black), Butterball (straw yellow), Chadaidzu (brown), Chernie (black), Chestnut (brown), Cloud (black), Columbia (chromium green), Daidsu Mame (yellow), Dwarf Brown (brown), Early Black (black), Early Brown (brown), Early Japan (straw yellow), Early White (yellow), Early Yellow (yellow), Ebony (black), Eda (brown), Eda Mame (yellow), Edward (straw yellow), Elton (straw yellow), Etampes (yellow), Extra Early Black (black), Fairchild (black), Farnham (straw yellow), Flat King (black), Flava (straw yellow), Giant Yellow (yellow), Green Samarow (green), Guelph (or Medium Green) (green), Habaro (straw yellow) [From Khabarovsk, Siberia, Russia 1907], Haberlandt (straw yellow), Hankow (brown banded with black), Hansen (brown), Hollybrook (straw yellow), Hongkong (black), Hope (olive yellow), Ito San (straw yellow), Jet (black), Kingston (black), Kiyusuke Daidzu (yellow), Large Black (black), Late Yellow (yellow), Lowrie (olive yellow), Mammoth (straw yellow), Manhattan (straw yellow), Medium Black (black), Medium Early Black (black), Medium Green (Guelph) (green), Medium Yellow (straw yellow), Merko (brown), Meyer (black and brown), Morgan (olive yellow), Morse (olive yellow), Natsu (straw yellow), Nemo (olive yellow), Nielsen (olive yellow), Nigra (black), Nuttall (black), Ogemaw (Ogema) (brown), Okute (olive yellow), Peking (black), Pingsu (black), Riceland (black), Samarow (green), Sedo (deep brown), Shanghai (black), Sherwood (straw yellow), Shingto (olive yellow), Southern (yellow), Stuart (olive yellow), Swan (straw yellow), Taha (black with olive saddle), Tashing (chromium green), Tokyo (olive yellow), Trenton (brown), Vireo (olive yellow), Wilson (black), Wisconsin Black (black), Yamagata Cha-daizu (brown), Yellow (yellow), Yellow Eda Mame (yellow), Yellow Etampes (yellow), Yellow Riesen (yellow), Yosho (olive yellow).

Note 1. This is the earliest document seen (Sept. 2013) that mentions the following soy-bean varieties: Acme, Auburn, Arlington, Barchet, Black Beauty, Chernie, Columbia, Elton, Fairchild, Farnham, Flava, Lowrie, Morgan, Natsu, Nemo, Nielsen, Nigra, Okute, Peking, Sedo, Stuart, Swan, Taha, Trenton, Vireo.

Note 2. This is the earliest document seen (Sept. 2013) by Piper or Morse that is mainly about soybean varieties.

Note 3. This is the earliest document seen (Aug. 2013) which states that Black Beauty is a synonym of Ebony (see p. 43).

Note 4. This is the earliest English-language document seen (Sept. 2004) that uses the word "banded" (or "banding" or "bands") (with Hankow), or the term "olive brown" or "dark olive brown" (with Barchet) to describe the color of soybean seeds. Address: 1. Agrostologist; 2. Scientific Asst., Forage-Crop Investigations, Bureau of Plant Industry, USDA, Washington, DC.

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1457. Honcamp, F. 1910. Die Sojabohne und ihre Verwertung [The soybean and its utilization]. *Tropenpflanzer* (*Der*) (*Berlin*) 14(12):613-34. Dec. (Chem. Abst. 30:45). [9 ref. Ger]
• ***Summary:*** Contents: Introduction. Utilization as food and food adjuncts (stimulants / enjoyables) (*als Nahrungs- und Genussmittel*). Use for technical purposes. Use for fodder.

According to English consular reports the total production of soya beans in China amounted in 1907 to 580,000 tons, rising in the following year to 850,000 tons. During the year 1909 no less than 35 million kg of the beans passed through the Suez Canal.

Harz classified the varieties of Soja hispida into 2 main groups, one containing those of strongly compressed form and of olive green to brownish-black color, and the other swollen varieties more or less sickle-shaped, and of yellowish-brown to deep brown color.

Dietrich and König [1891] conducted 20 analyses of the soybean and found the following average composition: Water 11.34%, crude protein 35.11%, crude fat 16.98%, nitrogen-free extract 26.18%, crude fiber 5.88%, and ash 4.51%.

An analysis of the inorganic constituents of the beans by Schwackhöfer gave the following results: Potassium oxide, 44.56%; sodium oxide, 0.98%; lime, 5.32%; magnesia, 8.92%; iron oxide, trace; silica, trace; phosphoric acid, 36.89%; sulphuric acid, 2.70%; and chlorine, 0.27%.

Both in China and Japan the black varieties are boiled and roasted and eaten with rice, while the green and white varieties are ground to meal and baked into cakes, etc. The soy sauce, which is now largely exported to England and America, and used in the manufacture of other sauces, is prepared from wheat and a small light yellow variety of the bean, with the addition of salt and water, the prepared mass being fermented in open vessels at as low a temperature as possible for a period of 8 months to 5 years, and the sauce then separated from the residue. Another product made from the beans in Japan, and used in the preparation of soups and flavors for cooking, is know as miso. In addition to these, a so-called bean cheese (tofu), and a similar product from which the bulk of the water has been removed (kori-tofu), are prepared from soya beans in Japan.

Attempts to acclimatize the plant in Germany have not yet proved successful, although it may be possible to introduce an early-ripening variety with a short vegetation period.

Note: This is the earliest document seen (Aug. 2007) that gives soybean production or area statistics for China. It is not clear whether or not this includes Manchuria, or refers only to Manchuria. Address: Prof., Germany.

1458. Hokubei Jijisha. comp. 1910-1936. Hokubei nenkan [North-American Times year book]. Shako [Seattle], Washington: Hokubei Jijisha. Vol. 1, 1910. [Jap]*
Address: Seattle, Washington.

1459. Hooper, D. 1910. Indian oils. *Indian Museum Industrial Section, Annual Report.* For the years 1909-10. p. 26-31. *
• ***Summary:*** Soy beans–The amount of oil in 91 samples received from the different districts where the seeds are grown ranged from 13.5 to 22.4 per cent., those from Poona yielding the most. The beans grown in India yield almost as much oil as those from Manchuria and Japan. Only certain districts, such as upland areas in Burma and Assam and the lower valleys of the Himalayas, are suitable for the cultivation of Glycine. Address: India.

1460. Kinoshita, Asakichi. 1910. Tanshoku shôyu seizô-hô [Method of brewing usukuchi (light-colored) shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 5(3):23-29. [Jap]
Address: Kumamoto Zewimu-kan Tokukyoku Gishu. Kumamoto-ken Gishi.

1461. Takahashi, Teiz; Yamamoto, Takeji. 1910. Seishu tane kôji-kin to shôyu mata wa tamari kôji-chû no kôji-kin to no hikaku kenkyû [Comparison of the koji starter microorganisms used in sake with those in shoyu and tamari koji]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 32:454-76. [Jap]
Address: 1. Prof., Tokyo Imperial Univ.

1462. Togano, Meijiro. 1910. Shôyu moromi-chû no saikin ni tsuite [On the microbes in shoyu moromi. I-IV.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 5(3):1-22; 5(4):13-.; 5(5):1-15; 5(7):1-14. [Jap]
Address: Nihon Shoyu Jozo Kabushiki Kaisha Gishi, Nôgaku-shi.

1463. Togano, Meijiro. 1910. Shôyu moromi-chû no saikin ni tsuite [On the microorganisms (bacteria) in shoyu moromi]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 13:551-52. [Jap]

1464. Brodé, Julien. 1910. Oil-seed products and feed stuffs. *Special Agents Series* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) No. 39. 32 p.
• ***Summary:*** "Soya meal is finding its biggest outlet in Scandinavia, especially in Norway and Sweden" (p. 7).

A section titled "English Soya-Bean Industry" (p. 10-13), written from London by Brodé on April 23, discusses the following: Rapid development during past few years. Cause of fluctuation in price–current quotations. England may lose monopoly–exploitation by railroad. English process of refining oil. Secret process of English company. Production of "soya flour." Solvent process applied to cotton seed.

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"Soya beans were first imported by an English firm some ten years ago. Being free from sugar it was thought they would make an excellent food for patients suffering with diabetes. At that time a quantity was also shipped into Germany for the same purpose.

"It was known that the beans contained considerable oil and in 1907 a crusher at Liverpool was induced to buy 400 or 500 tons, which were shipped from Hankow at a cost of $50 per ton c.i.f. Liverpool, the freight rate at that time being over $10 per ton from Chinese ports. This crusher, from previous experiments with small lots, found he could produce an oil acceptable to soap makers, and the only problem was to find an outlet for the by-products–cake and meal. The latter, it was found, ran high in protein and could be utilized by the compound-cake manufacturers.

"From this time shipments gradually increased until in February, 1908, a cargo of 9,000 tons was imported. This went to Hull, and the selling price of the beans was $32 per ton c.i.f... The beans are grown in the interior of Manchuria, at points from which there are no wagon roads to the railroad. The beans are not moved until snow has fallen, enabling the farmers to bring them across country on sledges [sleds, sleighs]." A late snow at the beginning of the present season acted to increase prices and cause many problems. "The best way in which American mills can buy these beans is in cargo lots c.i.f. New Orleans [Louisiana].

"It is thought that next year England will not enjoy the monopoly in soya beans it has heretofore had. Germany has taken the import duty off them, and it is thought other countries will do likewise. The fact that they are called beans has prevented them from having a wider outlet, since in Germany, France, and Austria oil seeds have been on the free list, but beans have been subject to a tax. Under the new French tariff soya beans are subject to a duty of 2.50 francs per 100 kilos... Mills at Odessa [in the Ukraine] are preparing to crush the beans..."

"The North Easter Railway in England has built docks and warehouses for handling the beans and is advertising the products along its lines. At Hull it has a large window display of the products, which is attracting considerable attention. In this exhibit are samples of soya cake, oil, and meal, soya flour, soya bread, and soya biscuits. There are also large photographs showing the manner in which the beans are gathered, stored, and loaded in Manchuria, and how they are manufactured into products in England.

"Soya oil is not refined as is American cotton-seed oil, with caustic soda, but by means of sulphuric acid and fuller's earth. It is best adapted to soft-soap making, since it does not chill easily and is difficult to handle in making hard soap... One refiner is placing on the market an edible soya oil sold under the name of 'Omega soya oil.' This oil has a good color, is almost neutral in odor, and is rather palatable, the flavor being similar to that of peanut oil. The process for rendering crude soya oil edible is kept a close secret, but is thought to be by means of superheated steam... Soya cake is finding its biggest outlet in Denmark, about 150,000 tons having been purchased this season. Soya meal made from ground soya cake finds its biggest sale in Sweden, Norway, and from the northernmost part of Germany."

"The most interesting and, to the writer's mind, the most significant thing about the new soya industry is the process used by three mills in England for extracting the oil. This secret process belongs to the Premier Oil Extracting Company, of Hull, and for its use the two other mills are said to pay the company 40 cents royalty for every ton of seed treated. The seed are first finely crushed and then treated directly by a fat solvent, presumably benzine." No trace of the solvent remains in the oil and only about 1% of the oil remains in the meal. "Mills making meal by this process find their largest market in Scandinavia"–including Denmark.

"The Premier Oil Extracting Company also operates a large flour mill, and is placing on the market a so-called 'soya flour,' which is 25 per cent soya meal and 75 per cent wheat flour. The company has induced a number of bakers to use it in making a soya bread, which is finding sale on the market, although the price asked is the same as for all-wheat bread... The same mill has induced a large biscuit manufacturer to use soya flour in making a brand of biscuits called 'soya biscuits.' These are for sale all over England and are very palatable" (p. 12-13).

In India in 1909 there was "a large decrease in the value of exports of seeds, which may be possibly accounted for by the competition of the soya bean which is being extensively shipped from China and Japan" (p. 27).

A table (p. 27) shows that India's main seed exports are linseed, gingili seed [sesame seed], rape seed, and cotton seed. Destination countries, amount exported and value to each country, are given for the years 1908 and 1909.

"Soya meal has not found much favor in England or Ireland, but is gaining ground in Scotland. Owing to the scarcity of cotton-seed, many of the farmers were compelled to substitute soya."

Note: This is the earliest document seen (Jan. 2004) concerning commercial solvent extraction equipment and soybeans. Address: Special Agent for the Dep. of Commerce and Labor.

1465. Hosie, Alexander. 1910. Manchuria: Its people, resources, and recent history. Boston, Massachusetts: J.B. Millet. x + 320 p. Illust. Index. 25 cm. Oriental Series Vol. 14

• ***Summary:*** This book is similar in many ways to the 1901 edition with the same title except: (1) It contains 25 more total pages. (2) Chapters 7-10 in the 1901 edition have the same titles, are in the same order, and contain most of the same information as chapters 4-7 in the 1910 edition. (3) Most of the information on soybeans and soyfoods in this 1910 edition is identical or similar to that in the original

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1901 ed, but usually on different pages. For example, the long, excellent section on tofu and related products on pages 183-84 in the 1901 edition is identical to that on pages 78-79 in this 1910 edition. And the description of how a traditional crush-stone mill and wedge press are used to make bean-cake and bean-oil, on pages 218-24 of the 1901 edition is identical to that on pages 121-27 of this 1910 edition. Many more such examples could be cited. (4) There is extensive and very interesting new information on railways, which are discussed at great length in this 1910 ed.; they are found in a separate record in this database as a "document part."

Editorial note by Charles Welch (p. ix-x): The whole world is now closely linked together as newspapers keep us informed of the events in far-of lands. Manchuria was practically unheard of until the last two wars which Japan had to fight there against China (1894-1895) and Russia (1904-1905). Port Arthur fell easily when held by the Chinese, but its strong defense by the Russians "turned the eyes of the world to the citadel which lay at the point of the far Eastern peninsula called Manchuria." The Trans-Siberian Railway, started in 1889, ran east-west, eventually connected St. Petersburg (the capital of Russia from 1712 to 1918) to the Pacific Ocean port of Vladivstok–a distance of 5,772 miles. The Chinese Eastern Railway, started in 1897, ran north-south, connecting Mukden and Port Arthur. The building of these two railroads has shown to the world the great wealth of Manchuria, a province of China.

The war between Japan and Russia was fought in large part because Russia claimed special exclusive rights to mining, timbering, etc. in Manchuria. Japan fought for an "open door" policy in this wealthy region, the right to trade and commerce in Manchuria. Sir Alexander Hosie has been a resident of China for practically 40 years.

The Chinese call Manchuria the Tung-san-shêng (Three Eastern Provinces); it "is an agglomeration of petty Tartar or Manchu principalities, lying to the north-east of China Proper" (p. 3).

Soy beans or [soy] beans, bean oil, bean cake, or soyfoods are mentioned or discussed on the following pages of this 1910 edition: 69 (outer leaves of kao-liang or tall millet are woven into mats used for packing loads of grains and beans), 71 (barley in large amounts is ground with peas or beans as a ferment in the distillation of native spirit {*Shao chiu*} from tall millet / kao-liang), 75-80 (beans are the most important agricultural crop for external trade, and the second most important article of cultivation after kao-liang. The most important bean, considered together with its products bean-cake and bean oil, is the soy bean–*Glycine hispida;* discusses the many varieties of soy beans and soy bean products), 82 (Mao-Tou, soy beans cultivated as a garden bean for food), 84 (soy bean is one of six plants grown in Manchuria whose seeds yield oil), 101 (each skein or hank of silk is dipped in bean-flour water), 121-28 (how the oil is expressed from soy beans; Recent prices of soy beans and products. 1896 bean oil factory driven by steam), 142 (how boats carry soy beans and other export crops down the Liao River each spring after the ice breaks up), 146-47 (value of exports of soy beans and products; total value in Manchuria), 168 (the flourishing bean-oil and bean-cake industry at Dalny started in 1908, practically speaking), 172 (the 1907 depression in Manchuria's soy bean market), 174 (the 1907 depression is now over and the outlook for American goods in Manchuria is hopeful), 181-84 (value and amount of exports of soy beans and products from Dalny and other ports, mostly in 1908; ports of destination and uses at each), 196 (the matting, woven by hand from the outer sheaths of millet stalks, that rises high around every large cart carrying loads of loose beans and millet), 208-11 (city of T'ieh-ling on the Liao and its growing importance in the soy bean trade; met 1,000 carts heavily laden with produce from the interior), 216 (a large cart carrying beans and pulled in an ongoing sort of race by mules or ponies, has overturned, and the beans are scattered all over the roadway; such accidents are taken as a matter of course, and the way is cleared so that traffic can resume), 234 (Yi-t'ung [pinyin: Yitong, in central Jilin province] Chou, like T'ieh-ling [pinyin: Tieling], is a great storehouse for beans and grain, and there is extensive trade between the two cities), and 237 (met several caravans laden with empty "bean-oil boxes." Beans are carried from Newchwang by boats when the river is open and by carts when it is closed by ice).

Also discusses (see index): Job's tears or pearl barley. *Phaseolus radiatus* (the ray-fruited dwarf bean [azuki] which is red or white). Hemp (*Cannabis sativa*) and Abutilon hemp, the true hemp plant, *Abutilon avicennæ,* both valuable fiber crops. Sesamum seed. Ground-nuts [peanuts] (*Arachis hypogæa,* L.) Seaweed. Address: British Consul-General at Tientsin [Tianjin, China].

1466. Hosie, Alexander. 1910. Manchuria: Its people, resources, and recent history. Railroads (Document part). Boston, Massachusetts: J.B. Millet. x + 320 p. Illust. 25 cm. Oriental Series Vol. 14

• ***Summary:*** Railroads in Manchuria are discussed at great length in this book. These include the Chinese Eastern Railway Co., the Siberian Railway (incl. the Trans-Baikal and the Southern Ussuri sections), South Manchuria Railway, Trans-Manchurian Railway, and the Trans-Siberian Railway.

The South Manchuria Railway, the newest, is discussed in the most detail, especially in Chapter 7, titled "Trade of Manchuria" (p. 138-191). Page 145: "In addition to the purely foreign imports, however, there should be mentioned an item of $10,000,000 worth of railway materials imported from the United States by the South Manchuria Railway Company, on which no duties were paid, and which was omitted from the Chinese Customs Returns."

Page 149: "Although considerable interest in the mineral deposits of Manchuria has been evinced by American,

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British, and German engineers during the year, but little has been accomplished by them toward the development of the country's mineral resources. The South Manchuria Railway Company, on the other hand, has pushed forward development work on the Fu-shun (pinyin: Fushun) coal mines with great energy, and extensive additions to the equipment of the mines have more than doubled the output" daily during the year from 500 tons the beginning to 1,200 tons by the end of December. The Fu-shun coal mines constitute one of the chief assets of the Company."

Page 153. "Railway developments: The South Manchuria Railway has been standardised and the installation of new rolling stock has greatly increased the road's carrying capacity. Under the narrow-gauge regime the line's daily carrying capacity was about 2,000 tons, whereas at the present time, with its standard gauge, new American rolling stock, and improvement in its freight service, the capacity is more than 6,000 tons. Similar improvement has been made in the passenger service."

Page 154: "These trains are thoroughly modern in every respect, the cars and locomotives being of the latest designs of American make. Each train is composed of a mail car, a Pullman sleeper, a diner, and a combination day coach and baggage car. In addition to these improvements the South Manchuria Railway Company has established a weekly steamship service between Dalny and Shanghai, which shortens the time of travel between the latter city and Manchuria by two to five days, and will also bring about a reduction of freight rates. The Company is already issuing through bills of lading between Shanghai and Manchurian points."

Page 162: "The net increase of the Japanese population in Manchuria for the year 1908 was 14,149, of whom 5,296 settled in the leased territory and 8,853 scattered throughout the country, mostly along the line of the South Manchuria Railway. A conservative estimate of the number of Chinese immigrants during the year would place the figure at 25,000, the majority of the newcomers being of the agricultural class, who have come to Manchuria to find permanent homes and have settled in the fertile regions surrounding Fakumen and Chengchiatun. Should the plans of the Government for the settlement of waste lands meet with success, the number of Chinese arrivals will rapidly increase."

Page 165: "The general plans sanctioned by the management of the South Manchuria Railway provide for a northern terminal at Suchiatun, a station on the main line of the South Manchuria Railway some 10 miles south of Mukden. Suchiatun is already the junction of the branch line to the Fu-shun collieries, having the necessary yards and transshipping facilities. By making Suchiatun instead of Mukden the terminal of the line the company will obviate the necessity of bridging the Hun River and at the same time will save several miles of track."

Page 169-70: "First place in the import trade of Dalny is held by goods from Japan, which were valued by the customs last year at $6,824,440, but which Japanese figures place at $8,429,393. This total is made up of a large variety of articles, from lumber and railway material to notions and a great part simply represents the supplies of food, clothing, furniture, etc., drawn from Japan by Japanese residents in Manchuria for their own use. Of the staple goods for the Chinese market, the most important are cotton goods and cigarettes."

"The United States is second in the import list, with $3,762,653, according to customs figures, or about 32 per cent. This was almost entirely trade with the Japanese in Manchuria, and was made up mainly of supplies for the South Manchuria Railway Company. The figure seems to be too small, as the value of railway supplies ordered in America and received during 1907 and 1908 was approximately $10,409,000, of which much less than half came in during 1907. The explanation may be that entries of duty-free goods for the railway or for general consumption in the leased territory are less carefully prepared, as to details, by the consignees."

Page 171: "The domestic goods brought in from Chinese ports were valued at $1,310,622. The rails, locomotives, bridge work, and most of the cars purchased on the first orders for supplies for the South Manchuria Railway were bought in the United States and delivery was completed in 1909. Of the new purchases under this head, the most important were an order placed in Russia for some 6,600 tons of steel rails worth about $250,000, a new electric-power outfit costing $135,000, ordered in the United States; rails, cars, and trucks for the Dalny street railway, ordered in Germany and England and costing approximately $277,000; and a gas-generating plant and distributing pipes, purchased in Germany and Great Britain, respectively."

Page 182-83: "Coal seems destined to become an important item among the exports, but the business is still in an experimental stage. In 1908 shipments to foreign countries amounted to 4,686 long tons. Already the South Manchuria Railway Company has a contract for furnishing coal to the mail steamers of the Osaka Shosen Kaisha, which come here twice a week from Osaka and Kobe. The price has not been made public, but it would seem to be not far from $2.75 to $3 per ton delivered on board, and at this low cost it is said to be quite satisfactory. With the exception of $239,828, representing the customs valuation of [soy] beans shipped to England, and $1,209 for exports to Korea, the entire foreign export trade of Dalny is with Japan, the total value of exports to that country being $4,574,057."

Page 186: "In August, 1908, the South Manchuria Railway Company began a weekly freight and passenger service between Dalny and Shanghai, and while little business offered at first, both the number of passengers and the freight tonnage seem to be steadily increasing, as the railway company is making special efforts to develop this

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line by selling through tickets and by offering through bills of lading to interior stations at moderate rates.

"The trade to South China ports continues in the hands of two leading British coasting lines, whose business has greatly increased of late, so that they have had as many as eight ships in port at one time loading cargo or waiting for berths." Address: M.A., F.R.G.S., Once Acting British Consul, Tamsui; Now at Aberdeen (Scotland or Hong Kong).

1467. Inouye, Jukichi. 1910. Home life in Tôkyô. Tokyo, Japan: Printed by the Tokyo Printing Co. vii + 323 p. No index. Illust. (some color). 23 cm. Facsimile edition reprinted in 1985 by KPI (London & Boston). [Eng]

• ***Summary:*** Chapter 5, "Meals," states (in a description of making breakfast): "But in point of utility the soy bean comes next to rice, for our soy sauce which enters into almost all dishes is made from the bean, wheat, and salt. So extensively is this sauce employed that table salt is comparatively little needed. The bean is also the principal ingredient in *miso,* which is a mixture of the soy bean, steamed and pounded, with rice-yeast [koji] and salt. This *miso* is largely used in making soup; and the soups into which it does not enter are usually flavoured by boiling shavings of sun-dried bonito and straining them off" (p. 58).

"After the rice-pot is removed, another pot is put over the hearth for making *miso*-soup... *Miso*-soup contains strips of garden radish [daikon], edible seaweed (*alopteryx pinnatifida*) [wakame], bean-curd [tofu], egg-plant, or other vegetables according to season. These two, the rice and the soup, are all the cookery required in the morning. There must, of course, be hot water for tea." Pickled vegetables (called *kôkô* or *kô-no-mono*) especially garden radish, invariably accompany Japanese meals (p. 58-59).

"The breakfast, then, is very simple. Sometimes the family take their meals at a large low table which is set before them [as they sit on their heels in the *seiza* position on tatami mats] at each repast; but often a small tray, about a foot square and standing six inches or more high, is placed before each member. In the left corner of the tray near the person before whom it is set, is a small china bowl of rice, while on the right is a wooden bowl of *miso*-soup. A tiny plate of pickled vegetables occupies the middle or the farther left corner, while any extra plate would fill the remaining corner. This plate also holds something very simple, such as [*umeboshi*] plums preserved in red perilla leaves, boiled kidney beans, pickled scallions, minute fish or shrimps boiled down dry in soy sauce, a pat of baked miso, shavings if dry bonito boiled in a mixture of soy and *mirin."* An illustration (line drawing) shows such an individual meal tray, with chopsticks resting on the rim of the tray (p. 59-60).

"Soy [sauce] is usually sold in wooden kegs as it does not change [spoil] with time; but the poor buy it in half-pint bottles" (p. 68).

The midday meal is very simple. But the "evening repast is the principal meal of the day... fresh fish is more frequently served than at noon. The fish may be boiled in a mixture of *mirin* and soy, be put into a soup made with an infusion of dried bonito shavings, be roasted on the iron netting with a sprinkling of salt or repeated coatings of soy, or be taken raw in thin slices [*as sashimi*]**.** This raw fish is a peculiarly Japanese dish" (p. 70).

Note 1. In Japan, almost everything is done in an orderly way, followed by nearly everyone. There are rules (often unwritten) for how to do almost everything.

Chapter 6, "Food," states: "Sea-weeds are also in great demand. Of these the principal are the *konbu* (*Laminaria japonica*), which is largely exported into China, and the laver [*Porphyra tenera*], which is obtained in this sheets [*nori*] and taken with soy alone or with rice rolled into it." Yellow chrysanthemum flowers are also used as food, "either fried with a coating of *kuzu* (*pueraria Thunbergiana*) or boiled in brine and pressed" (p. 72).

Eels are eaten, with bamboo skewers passed through them; "they are roasted over a fire, being from time to time dipped in a gravy [sauce] of *mirin* and soy. Tokyo is especially noted for eels served this way." Sun-dried cuttlefish, which are flat and hard, "are cut into slices which are roasted and dipped in soy" (p. 73).

"As we do not use a knife and fork at table, all fowls have to be cut up before they are served... The commonest method with the domestic fowl and duck is to boil them in small slices in a shallow pan with bits of onion in a gravy [sauce] of soy, *mirin,* and sugar." "It is only of recent years that we have begun to eat beef and pork; but we have in Tokyo a large number of shops where they are sold." One kind of shop is "a sort of restaurant where beef is served in the same manner as the domestic fowl and duck above mentioned" (p. 74).

"Though cooking is mostly done at home, no small quantity of small quantity of prepared food is bought for the meals. The most important of such food is the bean-curd [tofu]. For this the soy bean is soaked in water, ground, steamed, and strained; and the liquid is allowed to coagulate by the addition of brine [nigari] and then pressed in a square box with a cotton-cloth bottom until the water has been drawn off, leaving behind a soft white curd. This curd is cut into small slices and put into soup in the morning; it is sometimes thrown into hot water, and as soon as it is warmed [as *yudofu*], dipped into a mixture of soy and *mirin* and eaten. It is also fried. Indeed, the bean-curd shares with the *tai* [sea-bream] the distinction of having a special treatise dealing with a hundred ways of dressing [cooking / serving] it" (p. 74).

"As there is no dessert at a Japanese meal, fruits are commonly eaten at odd hours, especially by children." Apples are grown mostly in Yezo [Hokkaido], "the most northerly of the larger islands" (p. 75).

A common dish for the bever [a light lunch eaten

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between meals] is the (*soba*) or buckwheat noodles. Soba "is dipped before eating, into an infusion of bonito shavings flavoured with a little soy and *mirin,* to which small bits of onion [*negi*] and Cayenne pepper have been added" (p. 77).

Another inexpensive food "is a kind of cracknel [*senbei*] made by baking and dipping small disks of rice or wheaten flour in soy" (p. 78).

"The bulk of confectionery is made of rice, red beans [*azuki*], millet or sugar. Glutinous rice is steamed, pounded in a wooden mortar into a pasty consistency, and left to cool" [to become mochi]. "The red bean is boiled, pounded, and strained through a coarse cotton bag to get rid of the skin, though the latter is sometimes retained, in which case the straining is unnecessary, and finally mixed with sugar" to make "red bean jam" [*an*], which "is the most important ingredient of Japanese sweetmeats as there is in our confectionery no other equivalent... The red bean jam is also used in making soup into which small rice dumplings are thrown; this soup is much in demand, especially in winter, to while away the tedium of long evenings. The red bean is also boiled with rice to give it a colour; the red-bean is eaten in old-fashioned families three times a month, on the first, fifteenth, and twenty-eighth" (p. 80).

Note 2. This is the earliest document seen (May 2011) that uses the term "red bean jam" to refer to Japanese *an* [sweet azuki bean paste].

"Starch extracted from the root of the *kuzu* (*pueraria Thunbergiana*) is also much employed in confectionery." "By steaming a mixture of red beans, sugar, wheat, and *kuzu,* we get a sweet dark-red cake, which is almost as popular as the sponge-cake" (p. 80).

Inouye, who lived 1862-1929, lived to witness the Meiji period end and westernization begin. A scholar, journalist, translator and Japanese diplomat, he served at Japanese embassies in Belgium and the United States. Returning to Japan in 1918, he devoted the remaining years of his life to compiling English-Japanese and Japanese-English dictionaries.

Note 3. This book comes in an elegant, traditional "folding case" (*chitsu*), consisting of five stiff pieces of paperboard, covered with cloth, and held in place by two ivory-looking pegs (each 3 cm long), each of which slips into a cloth sleeve. This folding case performs much the same function as a Western slipcase. Address: Tokyo, Japan.

1468. Lafar, Franz. 1910. Technical mycology: The utilization of microorganisms in the arts and manufactures. Vol. II. Eumycetic fermentation. Part II. Translated from the German by Charles T.C. Salter. London: Charles Griffin & Co. ix + p. 191-748. Illust. Index. 23 cm. [3240* ref. Eng]
• ***Summary:*** An extensive bibliography on mycology and fermentation (3,240 references) for both this volume and volume I appears at the back of this volume (p. 561-695). The first chapter in this volume is Chapter 49, titled Mineral Foodstuffs (p. 191-202).

Chapter 55, titled "Classification of the families Saccharomycetaceæ and Schizosaccharomycetaceæ" is on p. 270-295. Section XVII (starting p. 456) is titled "The enzymes and the enzyme actions of yeast." It begins with Chapter 53, on "Alcoholase," by Dr. Rudolf Rapp, which starts with an historical introduction. Page 506 mentions the "Amylo process."

Chapter 56, by Prof. Dr. Carl Wehmer, titled "Morphology and subdivision of the family Aspergillaceæ" discusses (p. 296-346): Eighteen illustrations of Aspergillus conidiospores (p. 300-19).

"*Aspergillus Oryzae* (Ahlburg) Cohn (=*Eurotium Oryzae* Ahlburg). This species is of practical importance as a saccharification fungus, and has been cultivated for centuries in Japan for the preparation of the rice mash for Saké, as well as for the production of Soja sauce and miso." It was first identified (as *Eurotium oryzae*) by Ahlburg in 1876, and was renamed *Aspergillus oryzae* by Cohn in 1883, though a full morphological description was not given until 1895 (by Wehmer) (p. 308).

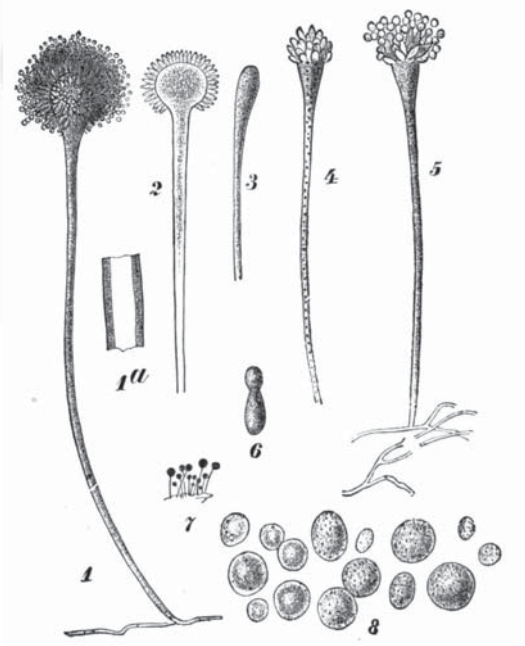

Fig. 166 shows *Aspergillus oryzae.* "1-2. Conidiophores with clavate and almost spherical glubule. 2. In optical section. 3-5. Development of a small conidiophore, distension of the hypha, protrusion of the sterigmata and incipient formation of conidia. 1a. Optical section of tough stem. 6. Sterigmata. 7. Conidial herbage, slightly magnified. 8. Conidia. Approximate magnification of 1-5 = 75 times. Of 6 = 400 times. Of 8–900 times. (After Wehmer).

Fig. 167. Conidiophores 1-5, 2 and 5 in optical section. Figs. 3-5, development of the globule (3) and sterigmata (4). The separation of the conidia is beginning in 5. Approximate magnification of 1-4 = 20 times. Of 5 = 120. *Aspergillus*

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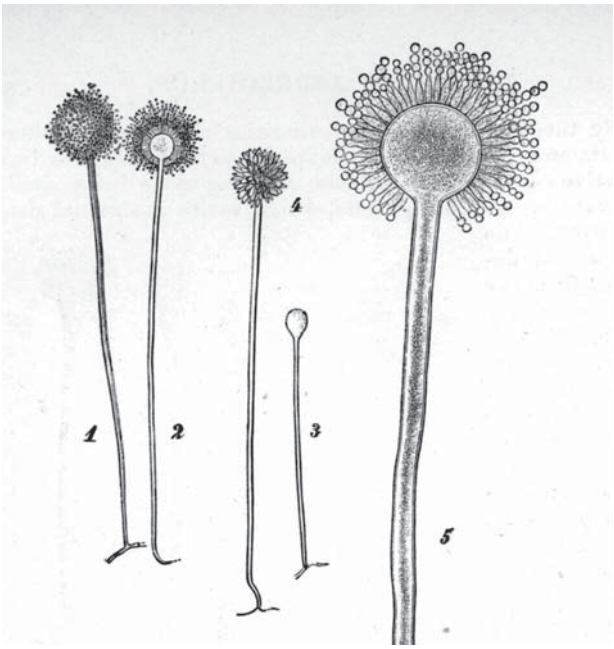

Wentii (Wehmer), which is used in Java to make Tao-Yu (Chinese-style soy sauce). It appears spontaneously on the boiled Soja beans that have been covered with *Hibiscus* leaves, as described by Wehmer in 1896 (p. 311).

Chapter 57, also by Prof. C. Wehmer, titled "Chemical activity of the Aspergillaceæ," discusses (p. 350-74): Saccharification of starch, Takamine's research using Aspergillus to make diastase (Taka-diastase) and its efficiency compared with similar enzymes of different origins, koji extract which contains amylase and other enzymes, use of *A. oryzae* in the preparation of rice-wine, Soya [shoyu], and Miso (p. 352).

This volume also discusses: The degradation of proteids and their derivatives, protease (p. 369-70). Film-forming surface yeasts and their accompanying phenomena, *Mycoderma* (p. 411-15). Invertase (p. 516). Other enzymes discussed in this chapter include maltase, melibiase, lactase, trehalase, raffinase, and amylase. Address: Prof. of Fermentation-Physiology and Bacteriology, Imperial Technical High School, Vienna.

1469. Li, Yu-ying. 1910. Ta tou: Le soja [The soybean]. Paris: Société Biologique de l'Extrême Orient. 66 p. Illust. 28 cm. [Chi]

• ***Summary:*** This remarkable work, written entirely in Chinese, was the first of Li's major works on soybeans and soyfoods. Published in Paris, it was written in Chinese and meant to be read by young people in China interested in coming to Paris to study or in helping Li with research on Chinese soybean varieties. An expanded and revised version was published into French the next year (1911).

Contents: Soybeans: 1. Introduction. 2. Names and varieties (colors, sizes, and shapes) of soybeans. 3. Where soybeans are produced and their history. 4. The place of soybeans in the hierarchy of plants (taxonomy). 5. Nutritional composition of soybeans. 6. Characteristics of soybeans (physiological, morphological, etc.). 7. Food uses of soybeans (incl. tables comparing the price of tofu with various meats, and the various sicknesses associated with eating different types of meat). 8. Equipment used in making soyfood products (a photo shows the equipment in Li's modern soymilk and tofu plant near Paris; p. 37), and compares soymilk with cow's milk. A large soybean utilization diagram in Chinese (p. 44) shows all the products that can be made from soybeans using the wet process (from soymilk) or the dry process (from flour). Note: This is the earliest document seen (July 2002) that contains a diagram of this type.

9. Value of soybeans in agriculture (incl. fertilizer use). 10. Conclusion. Appendixes: (1) About the *Société biologique de l'Extréme Orient* (Far-East Biological Society). (2) Membership form for the Far-East Biological Society (Paris): Date, name, A.K.A., Address, Occupation or subject of study, Place of birth. Please enclose 2 yuan membership fee (p. A6). (3) Bibliography of publications on soybeans by the Society of the Far East (p. A7-8). (4) Special announcement concerning soybean research (p. A9).

Illustrations (line drawings) show: (1) Comparison of shapes and colors of 7 different colors of soybeans (p. 5). (2) Five views of soybean pods with beans, incl. outside of pod, inside of both halves when open, with beans in one half, the two cotyledons of a single soybean (p. 11). (3) Soybean plant with pods (p. 12). Photos show: (1) The cellular components and layers of soybeans and hyacinth beans (p. 22, 23). (2) The interior and equipment in Li's soymilk and tofu plant on the outskirts of Paris (p. 37). (3) Microscopic views of soymilk (*doujiang*) and a liquid resembling soymilk made from soy flour (p. 38).

Tables show: (1) Size range (length, width, and thickness; maximum, average, and minimum) of 7 colors of soybeans: yellow bean, green skin bean, green bean, dark bean {"black" or "crow" bean}, black bean, red bean, spotted bean (p. 4). (2) Composition of four parts of a soybean plant: Comparison, water, protein, oil, carbohydrates, ash (p. 18). (3) Comparison of oil and protein content of 5 colors of soybeans (red, black, green, white, yellow) from various countries and regions: China, Japan, Southeast Asia, Russia, Hungary, and France (p. 19). (4) Composition of soybeans, hyacinth beans, and wheat (p. 21). (6) Comparison of the price of tofu with that of various meats (p. 29). (7) Ash content of soybeans, hyacinth beans, duck, uncooked rice, cabbage, egg, beef, chicken, lamb, pork, carp, wheat flour (p. 31). (8) Carbohydrate content of uncooked rice, wheat flour, hyacinth bean, soybean (p. 32). (9) Weight of products containing 100 gm of protein: Soybeans, tofu (somewhat firm), hyacinth bean, uncooked rice, bread, cooked rice, vegetables (p. 32).

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Publications listed in the Bibliography (p. A7-8): *Ta tou–The soybean* (this book; published 1909). *Bean curd–20 centuries of great craftsmanship around the world* (1908). *Soycrafting–China's manufacturing specialty* (1908). *The Paris Bean Curd Company* (1908, illustrated). *An outline of the agricultural societies of France* (1908). Note: the above publications concern industrial matters.

A description of herbs (*Chinese medicinal plants etc.*) (1909). *TB* [*Tuberculosis*] *and its cure* (1909). Note: the above publications concern medicinal herb and health matters.

The benefits of soyfoods (1909). *Smoking and its relationship to health, economics and industry* (1909). Note: the above publications concern industrial and health matters.

Special announcement concerning soybean research (p. A9): "Gentlemen–Many of us in this society are researching the benefits of the soybean. It may be considered as China's greatest resource. We have already published a number of specialized reports. These have been made available to you. In view of the fact that there are so many varieties of soybean in China and that the regions of cultivation are so extensive, we must rely upon you, our colleagues, in all parts of the country to go into the field and collect data for us. Only then will we be able to complete our research into every variety of Chinese soybean. If we should receive your kind consent, we beg you to be so good as to send the soybean varieties to the Peking postal address of this Society (address is given). We are interested only in soybeans (see pages 1-6 of this book) and need one or two catties (0.5-1.0 kg) of each. Once our research into the benefits and properties of these beans is complete, we will submit a further report to this Society, in order to repay your goodwill. If you would please advise us of the cost of the beans and the postal charges, we will make the appropriate refunds. We will also send you a copy of this book as a modest token of our gratitude. Enclosed please find an explanatory document. Please take the trouble to complete this and send it together with the beans.

"The Paris/Far-East Biological Research Society"

On page A-10 is a form to be used when submitting the Chinese soybean varieties.

1470. Midorikawa, Kôjirô. 1910. Tôfu to yasai no ryôrihô:*Hôchi Shinbun* kenshô tôsen [Way of cooking tofu and vegetables: *Hochi Newspaper* prize winners]. Tokyo: Kyôdô Shuppan. 87 + 130 p. 23 cm. [Jap]
Address: Japan.

1471. Ministry of Agriculture and Commerce, Farm Bureau (Nôshômushô Nômukyoku). 1910. Daizu sonota no mamerui ni kansuru chôsa [Survey of soybeans and other beans]. Tokyo: Nôshomu-sho, Nômu-kyoku. 213 p. 26 cm. [Jap]*
Address: Japan.

1472. Sawamura, S. 1910. The diet of the Japanese. In: IIe Congrès International d'Hygiène Alimentaire et de l'Alimentation Rationelle de l'Homme (2nd International Congress of Food, Hygiene and the Rational Feeding of Man). Sec. 2, p. 215-30. Held 4-8 Oct. 1910 at Brussels, Belgium. Under the patronage of His Majesty the King and the Government *

1473. The provinces of China, together with a history of the first year of H.I.M. Hsuan Tung and an account of the government of China. 1910. Shanghai, China: The National Review office. 187 p. See p. 158. Undated. Illust. 23 x 19 cm.

• ***Summary:*** Until a year or two ago, millions of otherwise well informed people in Europe and the USA were largely ignorant of China and "all matters Chinese." This book has one a chapter on each of China's 22 provinces.

The chapter on Shantung states (p. 38): Salt is largely obtained from the evaporation of sea-water and is used very extensively for the purpose of salting fish and vegetables, the making of soys [soy sauces] and bean sauces, and the like.

In Chapter 22, titled "Manchuria," the section on "Products" states (p. 158): "Manchuria is but sparsely populated. The settled inhabitants are re-inforced every spring by willing labourers from Shantung and Chihli coming to till, to sow, and to reap. Twenty thousand pass over to Newchwang and ports in south Manchuria from Chefoo alone; and these nearly all return in the autumn, when the harvesting is done. So that shortage of labour is a serious drawback in Manchuria. Next comes the climatic disadvantage. Agricultural and indeed all outdoor pursuits are confined to seven months of the year–from Mid-March to the middle or end of October."

The most important crop for Manchuria's external trade is pulse. "A large variety of beans is grown in Manchuria and, together with their products, bean-cake and bean oil, they constitute by far the most important item in the export trade of the Three Eastern Provinces. The beans are of many kinds, yellow, green, black, white, red, and small green. The yellow, green and black are varieties of the soy bean, and each variety has sub-varieties. Besides these beans of commerce there are several kinds of garden bean, cultivated for food." Two varieties of hemp, opium, tobacco, and ginseng are also grown in large quantities.

The section titled "Mammon" notes (p. 169): On all sides new enterprises have been springing up and new industries started. From Manchuria the export of beans has very rapidly, and largely during the past year, become a most important trade, so much so that the Indian exporters of oil seeds of one kind or another are beginning to feel the effect and to consider the possibility 'of producing the soy bean on Indian soil."

China's chief foreign complications have been with Russia and Japan, but "it is emphatically with Japan that the most serious trouble has taken place" (p. 172). The Japanese

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were found to be stealing supplies of nitrates from China's Pratas Islands–an incident which came to be known as the "Tatsu Maru case." This unwarranted intervention led to the "Manchurian Convention" which "is so obviously unfair to China." The publication of its terms "aroused great indignation in China and a boycott of Japan was immediately set in motion" (p. 173).

"It is possible that the terms of the Convention would have been vastly different had not Japan previously set all the canons of international morality at defiance by the seizure on the flimsiest of pretexts of the Antung-Mukden Railway. By the terms of an arrangement made in 1905 it had been arranged that Japan might within two years convert the Antung-Mukden Railway from a narrow gauge military railway to a standard gauge line suitable for all purposes. This privilege had lapsed with the flux of time and China was therefore exercising more than the necessary patience in acceding early in the year now under review to the survey of the line by a joint commission. The reason of Japan's delay had been obvious. If she delayed to begin the reconstruction of the line her term of tenure night be made to overreach that of the South Manchuria Railway, and would or could be pressed to imply an extension of the lease of the South Manchuria itself. When it was found that China was not so complaisant as she was expected to be the only alternative was to steal the line; this Japan promptly proceeded to do. This theft precipitated the Manchuria Convention for which Japan is never likely to be forgiven."

"Beans" (meaning soybeans) are also mentioned in passing, usually in section on "Productions" under Shensi (p. 9), Chihli (p. 28), Shantung (p. 36. "The beans are used for the manufacture of bean-oil and bean-cake, the oil being extracted [expressed] during the process of pressing the beans into cakes; the latter are exported for use as manure."), Szechwan (p. 49, in the Chengtu plain), Hupeh (p. 54. A table shows exports of beans and beancake each year from 1905 to 1908), Anhwei (p. 71, beans are exported), Kiangsu (p. 86, beans and beancake are exported from Shanghai), Yunnan (p. 92), Kweichow (p. 99).

Page 164 discusses the South Manchuria Railway and Newchwang (literally "Cattle Mart"), which was the leading port of entrance to Manchuria before the railway. Newchwang was formerly at the mouth of the Liao, but silting has left it 10 miles inland and the new port of Yinkow has been developed at its former place.

1474. *Board of Trade Journal* (*London*). 1911. Japan: Drawback of import duty on soya beans used in the manufacture of oil for exportation. 72:148. Jan. 19. [1 ref]
• ***Summary:*** "The Board of Trade are in receipt of information from H.M. Commercial Attaché at Yokohama to the effect that the Japanese Official Gazette of the 13th December contains an Imperial Ordinance providing that drawback of Customs duty paid on imported soya beans shall be allowed at the rate of 13 *sen* per 100 *kin* (2 3/4d. per cwt.) [1 cwt = hundredweight = 112 pounds] where the beans are used for the manufacture in Japan of soya bean oil for exportation. The drawback is to be allowed on the actual quantity of beans so used.

"Under the existing Japanese Tariff, soya beans are dutiable at the rate of 43 *sen* per 100 *kin* (8.92d. per cwt.).

"The regulations under which the drawback is to be allowed may be inspected by British traders interested at the Commercial Intelligence Branch of the Board of Trade, 73, Basinghall Street, London, E.C."

1475. Shaw, Norman. 1911. The soya bean of Manchuria. *Shanghai, Statistical Department, Inspectorate General of Customs. China Imperial Maritime Customs. II. Special Series* No. 31. 32 p. Also published by P.S. King & Son, 2 Great Smith St., Westminster, London SW, England. [6 ref. Eng]
• ***Summary:*** Contents: Introductory. Varieties. The plant. Soil and climate. Cultivation. Soil infestation. Yield. Uses of the soya bean: In the Far East: Bean sauce or soy (called shoyu in Japan [whence the name "soya"] and *chiang-yu* in China), the Chinese paste *chiang* (incl. *ta chiang* {great, made with yellow soybeans} and *hsiao chiang* {small, made with soybeans and maize}), tofu (incl. firm tofu {*tou-fu kan-tzu*}, tofu curds {*tou-fu nao,* curded with calcium sulphate instead of brine}, curd skin or yuba {*tou-fu p'i*}, layers of tofu pressed in cloth [pressed tofu sheets] {*ch'ien-chang tou-fu*}, and "frozen curd" {*tung tou-fu,* tofu that is frozen then dried}), bean flour, bean refuse {okara}, bean oil for food or industrial uses. Beancake and its uses. Uses in the Western world (beancake in Europe, and bean oil in Europe). The bean oil and cake industry in Manchuria. Trade development (statistics on exports from Newchwang have been kept since 1864). Beginnings of the European trade. Bean oil and cake production in South Manchuria. Chief sources of supply. Map references. Supplementary note.

Appendixes: 1. Table showing values (in Haikwan taels) per picul of [soya] beans, beancake, and bean oil at Newchwang, 1864-1909. 2. Graph showing monthly values (in silver yen) at Dairen of beans, bean oil, and beancake, 1907-10. 3. Table showing estimated [soya] bean production of Manchuria in normal years, compiled by the South Manchuria Railway Co. in 1909. 4. Estimates of [soya] bean production of Manchuria for the last 5 years by province and territory, compiled by the South Manchuria Railway Company in 1909: Fengtien province 1,092,350 tons. Kirin province 626,500 tons. Heilungkiang province 280,250 tons. Grand total for all Manchuria: 1,999,100 tons. Estimated soya bean production in Manchuria has increased from 600,000 tons in 1906 to a peak of 1,500,000 tons in 1908, to 1,400,000 tons in 1910. Percentage contributed by various colors of soya bean in 1910: Yellow 80.1%, green 9.4%, white-eye 3.8%, black-eye 3.2%, and black 3.4%. 5. Table

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showing total export of [soya] beans and bean products from Manchuria, 1909. For export of soya beans: Dairen 51% of total, Suifenho [Suifenhe] 25%, Newchwang 23%. For export of bean cake: Newchwang 50%, Dairen 44%, Antung 2%. For export of oil: Newchwang 75%, Dairen 21%, Harbin 1%. The writer frequently refers to Sir Alexander Hosie's book on Manchuria (1901, 1904).

The introduction begins: "It is only in the last three years that soya beans have become important in intercontinental commerce, and their rapid emergence from obscurity has, indeed, been one of the most remarkable commercial events of recent times. The circumstance that 'the rise of a great export trade in beans is that fact that overshadows all others,... the soya bean thus taking at a bound a position equal to that of tea in the list of exports and, with the addition of beancake, even challenging the position of silk at the top of the list'"* (Footnote: * = "Statistical Secretary's Report on the Foreign Trade of China in 1909").

The "bean district *par excellence* is the upland country beyond Moukden [Mukden] where the hills... are overlaid with wind-deposited soil..."

"Cultivation: In Manchuria the beans are produced almost entirely by hand methods. The plough, which is drawn by quaintly mixed teams of oxen, mules, and donkeys, has only one handle and a rough steel-tipped cutter. The seed is sown by hand, on top of the drills, in April, and is covered by hand. A heavy hoe is used for a good deal of the turning and breaking. When the plant appears the earth is heaped up round it, so that the roots may derive the maximum of nourishment from the soil."

"The harvest takes place in September, and the pods are usually harvested before they are quite ripe, as otherwise they are liable to burst on drying, a loss of seed being thus occasioned. The plants are pulled up by hand or cut with a straight-bladed sickle in Manchuria, and collected into small heaps in order to facilitate drying, and, when dry, the seed is separated by means of a cylindrical stone roller having longitudinal cuts on its surface, which is dragged over the plants by a mule as they lie on the threshing-floor. After this primitive threshing operation has been completed, the beans are winnowed in the usual Chinese method–that is, by throwing them against the wind. The only manure used is a compost of stable manure and earth, which is often taken from the miry pools formed in the roads–the despair of the carter but a boon to the farmer. In countries where chemical manures are used, it is only necessary to apply potash and phosphoric acid where they are lacking, for nitrogenous manure is unnecessary, owing to the property which the soya bean possesses, in common with other leguminous plants, of obtaining nitrogen from the air by means of colonies of bacteria."

Yield: In 1867 the Rev. A. Williamson, who travelled in the upper Sungari district at the time and who appears to have been a very close observer, estimated a maximum yield of 2,000 lb., or 15 piculs, to the acre.

The Chinese paste *chiang* is not the same as the Japanese paste miso. Chiang "is made by farmers and eaten with fish, meat, and vegetables, while the more expensive Chinese soy [sauce] is only made by wealthy families and restaurant keepers and is not consumed by the very poor. There are two kinds of *chiang: ta* (great) and *hsiao* (small)." Describes in detail how each is made. Great chiang is made from yellow soybeans, salt, and water. Small chiang contains a small amount of maize (p. 7).

Industrial uses of bean oil: (1) As an illuminant, where it has not been superseded by kerosene oil. One advantage is that "no lamp is needed to hold it, the wick being inserted into the basin or plate containing the oil." (2) As a lubricant, bean oil is used to a very considerable extent in north China and Manchuria "for greasing axles and parts of native machinery" (p. 8-9).

In China, bean oil "is used as a substitute for lard, in cooking. Although it is inferior to rapeseed and sesamum oils for this purpose, these oils cannot compete with it in point of price... In spite of its unpleasant characteristic odour and unpalatability, the poorer classes in China consume it in its crude state, but among the rich it is boiled and allowed to stand until it as become clarified" (p. 8). In Europe "Refined bean oil may be used as a salad dressing in place of other oils (but, owing to its unpleasant odour, is usually mixed with an oil of animal origin or with rapeseed oil), or in the manufacture of margarine, when a greater percentage of soya oil than of copra oil is allowed" (p. 10).

Traditional methods of pressing out the oil yield only about half of that present in the seed (9% of the weight of the beans); the rest is left in the cake, and this distracts very much from its fertilizing value. "By gasoline extraction the beans give up practically all their oil, which, as refined by this process, is a clear, pure liquid, hardly resembling the muddy, dark oil produced in the old way" (p. 14).

Photos on unnumbered pages show: (1) Seven varieties of soya beans: Large black, small black, large flat black, small flat black, two green, and two yellow. (2) Soybean root nodules. (3) A massive granite roller for crushing beans. (4) "Steaming vat with grating on which [soya] beans are placed in gunny bags during the steaming process." (5) Native bean press, showing cakes in receptacle and log wedges driven in to press out the oil. (6) Modern bean press [hand turned screw?] set up in bean mill. (7) Oil-motor and crusher. (8) Modern crushing machinery. (9) Piles of beans in sacks awaiting loading onto trains at Changchun. (10) Color fold-out map titled [soya] "Bean districts of Manchuria." A schematic diagram (in the form of a rhombus / diamond) shows the probable relationships of the different groups of soya beans based on their color. A beautiful map, approximately 17 by 22 inches, is attached between page 26 and page 27. "Wuchang" [not Wochan] is in the area labeled "Yellow Beans" in the map. Other labeled

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growing areas on the map include "Grasslands," "White eye," "Black beans" [soy], "Maize" and "Green beans." The major railways, rivers, roads, and towns / cities (with their Chinese characters) are shown. The major soybean markets (underlined) are Fenghwa / Maimaikai, Kungchuling, Changtufu, Tungkiangtze, Sinminfu, Tienchwangtai, Newchwang, Kaiyüan, Tiehling, Mafengkow, Moukden, Takushan, Antung, Harbin, and Shwangcheng.

Shaw finished writing this yellow book on 31 December 1910.

Note 1. This is the earliest document seen (July 2000) that mentions the South Manchuria Railway Company in connection with soybeans. This company was run by Japan. According to the *Encyclopedia Nipponica* (vol. 22, at "Minami"), the South Manchuria Railway Company (*Minami Manshu Tetsudo K.K.*) was established in 1905 based on the Portsmouth Treaty ending the Russo-Japanese War; Japan took over the rights to the railway from Russia. The company started to actually run the railway in 1907.

Note 2. This is the earliest English-language document seen (April 2013) that uses the term "frozen curd" to refer to dried-frozen tofu.

Note 3. This is one of the earliest English-language documents seen (Sept. 2006) that repeatedly uses the word "bean" (not preceded by the word "soya") to refer to the soya bean.

Note 4. This is the 2nd earliest English-language document seen (Oct. 2012) that uses the term "tou-fu p'i" (regardless of capitalization or hyphenation) to refer to yuba.

Note 5. This is the earliest English-language document seen (April 2012) that uses the term *chiang-yu* to refer to Chinese soy sauce. Address: 4th Asst., Custom House, Dairen.

1476. Shaw, Norman. 1911. The soya bean of Manchuria: Trade development, 1860-1909 (Document part). *Shanghai, Statistical Department, Inspectorate General of Customs. China Imperial Maritime Customs. II. Special Series* No. 31. 32 p. See p. 15-20. Also published by P.S. King & Son, 2 Great Smith St., Westminster, London SW, England. [6 ref. Eng]

• ***Summary:*** A chronology of important developments: 1860–The earliest available import returns for Swatow show 379,009 piculs of beancake, valued at $783,762 and 61,154 piculs of soya beans valued at $107,235. [Note: 1 picul = 132.27 pounds weight.]

1861–When the first British Consul at Newchwang, Mr. Meadows, took up his residence there, he found the bean trade an ancient and flourishing institution. Yingtzu–the new Newchwang–had been since 1835 a growing port of shipment for the great coastal trade in beans and beancake on which Manchuria's prosperity has always depended. In 1861 only 34 ships visited Newchwang, but four years later 271–most of which were engaged in the pulse [bean] trade entered and cleared. The first figures showing the amount of [soya] beans brought into Newchwang from the producing districts are those from the season 1861-62, when 1,450,000 *shih* (1 *shih* = 400 lb) came to the port.

1864–The first export statistics from Newchwang are recorded when the Customs Office opens. In 1864 816,000 piculs of [soya] beans, 842,000 piculs of cake, and 7,312 piculs of oil were exported. The import of beans from Newchwang to Swatow was more than double that of four years previously. "By the British Treaty of 1858, which opened Newchwang, the export of pulse and beancake from that port and from Tungchow (Chefoo), in British vessels, was prohibited; but this prohibition was removed by agreement in March 1862, and the trade developed with great rapidity."

1868–The first steam bean mill began operation at Newchwang, but largely due to Chinese opposition it proved a failure and was closed.

1880–An experiment was made with Manchurian bean cake as fertilizer in the coffee plantations of Ceylon; although a high opinion was formed of its qualities, the expenses of the transaction were too great to warrant further trial. "In Hawaii the same obstacle prevented any development of trade."

1887–A major increase and turning point in the bean trade with Japan.

1880s overview–"Even in the early days it was recognized that the promising feature of the trade of Newchwang was that the prosperity of the port did not depend, as was the case at most treaty ports, on a country already thickly populated and cultivated, but that the increase year by year of the area of cultivation over vast tracts of virgin soil would bring with it a corresponding increase in external trade. That no striking development of trade occurred for many years was due to the restrictive policy of the Central Government, which until the 'eighties' discouraged immigration into Manchuria."

1896–A "steam bean mill began working, and (unlike its unfortunate precursor) met with instant success, which led to the erection of others–one each in 1899, 1900, and 1901–so that the output of cake and oil was largely increased by the end of the century, the total output of these four mills being 15,600 cakes daily."

1898–And 1899 were each record years, with exports increasing 206% in ten years. In 1899 an import duty was levied for the first time on the beans and cake entering Japan, but no adverse affect was felt.

1900–The first careful survey of soybean production in Manchuria was made by Sir. A. Hosie, who estimated the amount at 600,000 tons; but Newchwang was no longer able to control the whole trade, for Dalny, the terminus of the new Chinese Eastern Railway line, was begun in 1898, and by 1902 the Russians were making strenuous efforts to attract freight.

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1905–After the Russo-Japanese war [Feb. 1904-1905], which left the Japanese in possession of the Kwantung peninsula, the rapid development of the bean trade became a matter of course, and Dairen (the new name for Dalny) soon rivalled Newchwang in its volume of exports. The importation of beancake to Japan, which in 1899 amounted to slightly over 2 million piculs, rose to 3 million piculs in 1905, to 4 million piculs the following year, and by 1908 had reached the very high figure of 7¼ piculs, of which over 2½ piculs were imported from Dairen. There is a small export trade from Russian Asia, while that from Chefoo is steadily decreasing. A table shows the market value, per piece, of cake imported to Japan from 1899 to 1909 (in gold yen). From 1.26 in 1899 it rose to a peak of 1.64 in 1907, then dropped to 1.18 in 1909. Address: 4th Asst., Custom House, Dairen.

1477. Shaw, Norman. 1911. The soya bean of Manchuria: Beginnings of the European trade, 1904-1910 (Document part). *Shanghai, Statistical Department, Inspectorate General of Customs. China Imperial Maritime Customs. II. Special Series* No. 31. 32 p. See p. 20-21. Also published by P.S. King & Son, 2 Great Smith St., Westminster, London SW, England. [6 ref. Eng]

• ***Summary:*** "During the Russo-Japanese war [Feb. 1904-1905] the vast armies which occupied the whole of South and Central Manchuria depended for their cereal food largely upon the local supplies, and a great impulse was given to Manchurian agriculture at that time. But after the withdrawal of the troops the cessation of local demand called, in the natural course of events, for the discovery of a fresh market, and especially so for the money crops of wheat and beans. The market for these crops seemed at first to be the neighbouring one of Japan, and the trade *via* Vladivostock [Vladivostok] received the earliest benefit from the new development; but when the *post-bellum* wave of depression swept over Japan the demand ceased there, and it became necessary to find a new field for the consumption of the surplus supplies. Before the creation of this new situation farmers had been content to plant small areas with but slight annual increase, merely adjusting the supply to the restricted demand; but the time was now ripe for a great development of the trade.

"It was in November 1908 that Messrs. Mitsui & Co. made the first considerable trial shipment to England. The result was so satisfactory that an order for a large consignment followed, and in March 1909 the first large cargo–5,200 tons–was landed in Hull. Contracts were at once made, as the suitability of the new oil seeds for many purposes became known and the good condition in which they arrived. During the season 400,000 tons were exported, almost all to England, and 'many of the large oil crushing mills set their entire plant to work on the crushing of the beans, to the exclusion of cotton seed, linseed, and other oleaginous seeds; the supposed shortage of the flax and cotton crops in the United States and the anticipated shortage of linseed in the Argentine, with the resultant scarcity of cotton seed and linseed products, found the English market comparatively unperturbed, for the reason that soya oil and cake can supply most of the requirements as well.' Messrs. Lever Brothers, of Port Sunlight, were the first soap manufacturers to use bean oil on an extensive scale, and were followed shortly by others, so that the demand increased to such an extent that for the new season (1909-10) 50 steamers were chartered to load beans at Dairen and Vladivostock, 300,000 tons, worth £2,000,000, being contracted for in December alone."

"The removal of the duty which had until this year (1910) been imposed on beans in Germany, followed by similar action on the part of the Canadian Government (which is said to be desirous of obtaining soya beans as feed for hogs, in order to revive the bacon trade), has opened fresh channels for export and stimulated competition for the raw material. But apart from this, the bean oil trade seems likely to receive the most rapid development: the first steamer to carry away a cargo of the oil in tanks has recently visited Newchwang. At present bean oil is carried in old kerosene oil tins or drums; but the method is not very satisfactory, complaints being made of loss by leakage. The tins cannot be returned to Manchuria, for freight is too high, and casks are not so suitable for stowing as tins in cases, so that the solution of the problem of conveying the oil to Europe seems to lie in the tank steamer, which would take the oil as a return cargo." Address: 4th Asst., Custom House, Dairen.

1478. Shaw, Norman. 1911. The soya bean of Manchuria: Bean oil and cake production in South Manchuria (Document part). *Shanghai, Statistical Department, Inspectorate General of Customs. China Imperial Maritime Customs. II. Special Series* No. 31. 32 p. See p. 21-24. Also published by P.S. King & Son, 2 Great Smith St., Westminster, London SW, England. [6 ref. Eng]

• ***Summary:*** "There are now at Newchwang one Japanese hydraulic mill (the Kodera, which may open a branch at Dairen), seven large Chinese steam mills, five small oil-motor mills, and nine crush-stone mills worked by animals." A table shows the output of the port from 1907 to 1909. [Soya] bean oil grew from 280,000 piculs in 1907 to 360,000 piculs in 1909. [Note: 1 picul = 132.27 pounds weight.] [Soya bean] cake grew from 2,896,000 piculs in 1907 to 3,726,000 piculs in 1909. Export statistics for the three years are also given.

"At Antung (where, though at present the industry is of small proportions, is capable of development) there are 12 Chinese crush-stone mills, and one steam mill owned by a joint Chinese and Japanese enterprise this mill has been running since last year. The total output of these mills is probably only about 25,000 piculs of cake annually, and it is

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consumed locally or taken away by junks. At Liaoyang the native mills have a daily capacity of some 4,000 beancakes with a corresponding proportion of oil, and, in face, every town in the bean country has its quota of mills, whose output is susceptible of increase if the demand requires it.

"At Dairen, besides some 40 native mills which can turn out 5,000 cakes daily, there are two large modern mills- the San Tai, a joint concern, with hydraulic power and a daily capacity of 6,000 cakes, which began work in April 1908; and the Nisshin, an electric mill, which has been at work since June of the same year, and can make 4,000 cakes daily. The united outturn of all these mills in 1909 was 2,214,624 cakes and almost 100,000 piculs of oil. This was an advance of 50 per cent. on the preceding year; but the figures are disappointing, as the total output in a 10-months working year should be 4½ million cakes. The mills in Dairen are primarily intended for cake manufacture; the oil is shipped to Japan for transhipment [transshipment] to Europe by large Japanese firms, and, as the Chinese manufacturers refuse to make oil without an 80 per cent. advance of 'earnest money,'direct trade has hitherto been slack."

Also discusses: Freights, insurance, charges, expenses of production, London market prices, bean oil and its changing prices.

"The eager competition to secure beans in Europe shows no signs of slackening; and the North American continent appears to be about to enter the field as a consumer, for a large shipment of beancake has just been sent to Seattle [Washington], and there appears to be a very good opening for the product on the Pacific coast, where the heavy railway freights from the east have caused dairymen and feeders to look round for a cheaper feed than that which comes across the Rockies. With freight from Dairen to Seattle at only (Gold) $4 per ton a good market should be developed. Soya beans are being grown in British West Africa, and experimental planting is carried on in practically every British colony; but it seems doubtful whether such experiments can meet with success in competition with the Manchurian product, which is raised under ideal climatic conditions and by the cheapest possible labour. The general impression prevailing seems to be, therefore, that the bean trade has a good future before it; that the time of stress through which it is passing will not last much longer, and that business will settle down when once normal conditions have been restored." Address: 4th Asst., Custom House, Dairen.

1479. *Advertiser* (*The*) (*Adelaide, South Australia*). 1911. To the Antarctic: The Japanese expedition. Feb. 10. p. 7.
• ***Summary:*** "Wellington [New Zealand], February 9. Further acquaintance with the Japanese exploring party confirms the first impression that they are a hardy, lot of men, not likely to be deterred in any task they may attempt... their food supply is certainly in odd contrast to the enormous quantities of provender carried southward by Scott and Shackleton. The list of goods aboard, as supplied to the Customs, comprises 90 bushels of rice, 90 bags of flour, 3 bushels of wheat, 40 dozen of canned meat, 143 cases of takuwanzuke [takuan-zuke], 4 sacks of soya beans, 3 dozen boxes of bread, 4 of butter, and 12 cases of pickled plums [umeboshi]. These are the leading items,... There is very little liquor aboard."

Note 1. This expedition reached Antarctica, and with them the first soybeans arrived in Antarctica.

Note 2. This was the expedition of Nobu Shirase in the Kainan Maru. From Wellington they sailed to Sydney, and from there they set off to Antarctica. For details see www.south-pole.com.

1480. Clerget, Pierre. 1911. La question du Soja [The question of the soy bean]. *Revue Generale des Sciences* (*Pures et Appliquees*) 22(3):100-01. Feb. 15. (Chem. Abst. 5:1637). [2 ref. Fre]
• ***Summary:*** Contains a brief description of the soybean and discusses its commercial importance, distribution, soil requirements, the value of the oil and its uses, and the composition and commercial value of the cake. During the past 2 years, the large amounts of soybeans exported from Manchuria to Europe have called attention to this plant. It is cultivated all over China, but especially in Manchuria (in the Liao Valley, where it is the second most important crop after sorghum), Japan, Korea, and Indo-China. In China it is often cultivated with maize; it demands a great of work, care, and good soil. The main exports come from the Manchurian ports of Newchwang and Dairen, and from Vladivostok. In 1908 some 859,200 tonnes of soybean and cake were exported from Manchurian ports, up from only 88,900 tonnes in 1905. Until 1908, Japan was the principal outlet for Manchurian soybeans (615,900 tonnes), but at the start of that year, exports to Europe began: 69,200 tonnes to Great Britain, 21,390 tonnes to France, 7,290 tonnes to Holland, etc.–for a total of 204,440 tonnes.

According to chemical analyses made at the Colonial garden of Nogent-sur-Marne, Manchurian soybean seeds contain 17.64% oil and 33.5% protein; yellow varieties contain more oil than black varieties. The soybean is used as a forage plant and for soil improvement, but its most important role in China and Japan is as a human food among people who consume little meat. According to Bloch (1908), it is most widely used in making a sauce [soy sauce] and a cheese [tofu]. It is also used to make numerous pastes and a sort of soymilk (*lait de soja*).

It also has industrial uses, thanks to its oil content of 16-18%. Indigenous mills can obtain only 8-10% oil, but modern hydraulic presses can obtain 12-14%. The oil and cake have made the soybean rise so rapidly on European markets. The oil, which has an agreeable smell and taste, is widely employed for culinary purposes in Manchuria. In England, as in France, it is used in making soap and

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margarine. It is more drying that cottonseed oil and can likewise be used in making paints. Soybean cakes (*Les torteaux de soja*) would give the same results as cottonseed cakes in terms of milk yield from dairy cows. As a fertilizer, they are used throughout Japan and on the sugarcane plantations of southern China.

The soybean could be introduced to Indo-China where, even if it has to compete against Manchurian soybeans, it could be service locally for soil improvement in the rice fields and as a food in the densely populated districts where there is hardly any room for animals, or where the animals have been decimated by disease. Address: Professeur à l'Ecole supérieure de Commerce (Graduate School of Commerce) de Lyon [France].

1481. Nishimura, Torazô. 1911. Shôyu kôbo aruhaa no seijô (zoku) [On the character and form of the shoyu yeasts "alpha"]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 104. p. 23-62. March 5; No. 105. p. 14-55. April 5. [Jap]
• ***Summary:*** In the English-language table of contents, shoyu is called "Soya." Address: Nôgaku-shi, Japan.

1482. Mitsuda, Ryuichi. 1911. Notes on yeasts of "sho-yu"-mash [moromi]. *J. of the College of Agriculture, Tokyo Imperial University* 1(3):345-56. March. German summary in Zentralblatt fuer Bakteriologie, Series II. 37:289 (1913). [2 ref. Eng]
• ***Summary:*** This is the third Japanese investigation on the yeasts in shoyu mash (*moromi*). "Three samples were used for the purposes of isolation, one from Noda, one from Tatsuno, and the other from Handa. Eight different varieties of yeast, 3 bacilli and 3 mould fungi were obtained from them." Among these was a red yeast and two film-forming yeasts. The first yeast variety discovered by the author "ferments sucrose, raffinose, dextrose, etc. but not lactose etc. (Cf. Table 2)."

The author believes that the five varieties of yeast he describes are different from the *Saccharomyces Soja* discovered by Saito, since they ferment "Sucrose and raffinose, while his does not ferment either" (p. 351).

Note: This is this is the earliest English-language document seen (March 2002) that contains the word "raffinose" (See p. 347, 351, 353). Address: Japan.

1483. Quintus Bosz, J.E. 1911. De samenstelling van Indische voedingsmiddelen [The composition of Indonesian foods]. *Bulletin van het Kolonial Museum te Haarlem* No. 46. 261 p. March. Also published in Amsterdam by J.H. de Bussy as a book. [8 ref. Dut]
• ***Summary:*** The nutritional composition and the source of information is given in a table for the following: Soybean seeds (p. 74-77). Soybean oil (*sojaboonen-olie*) (p. 76-77). Soybean flour or meal (p. 154-55). Soybean biscuit (*Beschuit*, 170-71). Japanese soy sauce and soybean tempeh (*Japansche soja, Tempé kedeleh* p. 242-43). Indonesian soy sauce (*Ketjap, Bataviasche soja* p. 244-45). Firm tofu (*Tao-koan,* 79.8% water. p. 244-45). Address: Dr., naar onderzoekingen in het Laboratorium van het Koloniaal Museum verricht onder leiding van Dr. M. Greshoff.

1484. Takahashi, Teizô; Yamamoto, T. 1911. Seishu tane kôji-chû no kôji-kin to shôyu mata wa tamari kôji-chû no kôji-kin to no hikaku kenkyû [Comparison of *Aspergillus oryzae* in various koji of sake, shoyu, and tamari]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 37. p. 369-90. March. [Jap]
Address: 1. Jozo Shikensho, Shokutaku Nôgaku Hakase; 2. Ditto, Gisho.

1485. *San Francisco Chronicle.* 1911. Doctors rally to check plague: Medical conference to investigate the dread disease to begin in Moukden today. April 3. p. 3.
• ***Summary:*** "Peking, April 2.–The Chinese have made elaborate preparations for the international medical conference to begin at Moukden [Mukden] tomorrow to investigate the plague."

"Reports from the famine district say that many missionaries are engaged in special efforts to save the children from starvation. They have established orphanages, and have been gathering together deserted children and those who have lost their parents.

"The distributing centers are unable to supply sufficient rice for food, but are giving out [soy] bean cakes, generally used as a fertilizer and to feed the cattle. Famine fever is raging and it is said that the famine is worse than in 1906."

1486. *Evening Post* (*Wellington, New Zealand*). 1911. Agricultural affairs. April 8. p. 12.
• ***Summary:*** "The soya bean boom still continues. A London paper has a communication from a correspondent in Manchuria, who says: 'You cannot open a newspaper in the Far East without your eye falling on the words "soya bean." People now come from England and other distant countries to get supplies of the beans at the season of their collection, and the leading banks of both Russia and Japan have established branches in Manchuria for the sole purpose of financing soya bean operations. One bean mill after another is erected, and for freight alone to Europe many thousands of pounds are sent annually. The history of the rise of this particular industry is without doubt a title to fame for the enterprising spirit of the Japanese banking houses [sic, house; actually *zaibatsu*], Mitsui and Co.'"

1487. Magelssen, William C. 1911. Soya-bean culture in Ceylon. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 14(85):169. April 12.

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• ***Summary:*** "The soya bean, which has come into prominence recently owing to its commercial value, has now been successfully experimented with in the island of Ceylon. The Agricultural Society secured a large quantity of seed some years ago from the Far East, and experiments were carried out at the botanic gardens at Peradeniya, but the cultivation proved a failure. The secretary of the Ceylon Agricultural Society has now succeeded, however, in turning out a large crop in the Government stock gardens in Colombo, producing two varieties, the Japan (white seed) and the Java (black seed), and seed will shortly be available for distribution.

"It is expected that the cultivation of the soya bean will be taken up largely in Ceylon, for besides its value as an article of food it can be exported to the European and American markets." Address: Consul, Colombo.

1488. Takeuchi, T. 1911. Eine technische Anwendung der Urease [A technical application of urease]. *Chemiker-Zeitung* 35(45):408. April 15. [1 ref. Ger]
• ***Summary:*** Urease does not act on uric acid, guanidine, arginine, creatine, or allantoin. Footnote 1. cites an early paper by Dr. Takeuchi: "Journal, College of Agriculture, Tokyo, 1909, Vol. 1." Address: Prof., Japan.

1489. Bontoux, Emile. 1911. Le Soja et ses dérivés [The soybean and its products]. *Matieres Grasses* (*Les*) (*Paris*) 4(36):2195-99. April 25; 4(37):2239-43. May 25; 4(39):2326-29. July 25; 4(40):2364-66. Aug. 25; 4(41):2405-07. Sept. 25. [48 ref. Fre]
• ***Summary:*** Contents. Introduction. The plant: origin and history, species and varieties, culture, and production: USA, Japan, Manchuria, France, England, China, Korea, Indochina (it is cultivated for the needs of the population in Cochin China {especially in the provinces of Chaudoc and Baria}, Annam, Tonkin, Cambodia), Formosa, Java, India, Africa. The soybean–a food plant: The plant, the seed, large table showing many analyses from many countries of the chemical composition of many soybean seed varieties.

Introduction to food products made from soybeans in East Asia. Shoyu [soy sauce] (and koji). Miso. Natto (from Japan). Le Tao-yu (a Chinese condiment also widely used in Japan. It is a thick, clear liquid [sometimes] made from black-seeded soybeans) Tao-tjiung (doujiang, from China). Tuong (from Annam). Tofu. Li Yu-ying. Table showing composition of powdered soymilk, fresh tofu, and soy flour.

The soybean–an oilseed plant. The soybean as an oilseed in the Far East. Table showing exports of soybean cake and oil from various Manchurian and Chinese ports in 1908 and 1909. The soybean as an oilseed in Europe and the United States. Table showing imports of soybeans to various British ports in 1909 and 1910 (the leading port by far is Hull, followed in 1909 by Liverpool, London, Bristol Channel, Scotland, and Other ports {Rochester, etc.}). Table showing exports of soy oil from Great Britain in 1910: To Germany, Austria, Australia, USA, Belgium, Denmark, Egypt, France, Holland, Italy, the Indies (*Indes*), Norway, Russia, Sweden, other, total (115,372 barrels, each weighing 175 kg). Discussion of soy oil and cake in most of the above countries.

Trade in soybean seeds: Mitsui Bussan, Manchuria, England, China, Japan. Soybean cake.

Soy oil: Physical and chemical properties. Applications and uses as food and in industry: Margarine, for illumination, soaps, as a drying oil, paints and varnishes, linoleum, artificial rubber. An extensive bibliography is at the end of the last article in the series.

Note: This is the earliest document seen (May 2010) concerning the cultivation of soybeans in Cambodia. This document contains the earliest date seen for the cultivation of soybeans in Cambodia (April 1911). Earlier documents imply that soybeans were being cultivated in Cambodia by 1900, and it is highly likely that they were being cultivated for at least a century before that time. Address: Ingénieur-chimiste E.C.I.L., France.

1490. Horne, H.; Sly, E.A.H. 1911. Effect of plague on the Manchurian bean trade. *Board of Trade Journal* (*London*) 73:185-86. April 27.
• ***Summary:*** "The British Acting-Consul at Dairen (Mr. H. Horne) states that probably no great influence will be felt during the present season. So far as can be ascertained, the total export of beans and bean cake has been larger this year than last, in spite of the adverse conditions, but the trade has been practically limited to the ports of Japan and South China, Europe taking some 7,000 tons only, as compared with 228,000 tons during the corresponding period of last season. The Harbin bean has been selling at 10s. per ton cheaper than the Southern bean. This season's large export to Southern China has caused considerable surprise in view of the high prices which have ruled throughout...

"It is in the coming season and possibly in the one following that the real effect of the plague will be felt...

"The British Acting Consul at Harbin (Mr. E.A.H. Sly) states that among the various reasons which have caused the plague to interfere with the business in last year's bean crop may be mentioned the following:–(1) lack of carts and coolies, (2) the danger of making monetary advances to the Chinese owing to their liability to fall victims to the plague, (3) the closure of the gates of certain cities, such as Pinchou, Hulan, Shuangch'engp'u, T'aolaichao, and Shih T'ou Ch'eng Tzu, all of which are bean centres, and (4) the consequent difficulty of getting produce out of the country. On the other hand, the shipments *viâ* Vladivostock [Vladivostok] to Europe have, so far, exceeded those of the corresponding period of last season...

"... the great bulk of the beans destined for Europe are this year being shipped *viâ* Vladivostock, since Dairen is

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apparently fully occupied with satisfying the demands of Japan, South China and Formosa, the prices paid by these places having been, on an average, 10 s. per ton higher than those given on cargo shipped to Europe. The 1910 crop also is considered to have exceeded that of the previous year." Address: 1. British Acting-Consul, Dairen; 2. British Acting-Consul, Harbin.

1491. Hattori, H. 1911. Ueber die Brauchbarkeit japanische Soja als Kulturmedium fuer die bakteriologischen Untersuchungen [On the usefulness of Japanese shoyu as a culture medium for bacteria]. *Botanical Magazine* (*Tokyo*) 25(291):97-103. [8 ref. Ger]
• ***Summary:*** The author refers to shoyu in German as "Soja" and discusses one brand named Yamadju [Yamaju]. "Japanese shoyu was first used by Prof. Miyoshi of this Institute as a liquid cultural medium for various molds. He recommended a mixture of 20 parts shoyu, 25 parts concentrated cooked onion juice, 5 parts raw sugar, and 5 parts distilled water." Address: Botanisches Institut der Kaiserl. Universitaet in Tokyo.

1492. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*). 1911. Shiryô to shite no abura kasu-rui [Oil-cakes as fodder]. 14:428-30. April. [Jap]

1493. Yokohama Nursery Co., Ltd. 1911. Descriptive catalogue... Bulbs, plants seeds. 1911-12. Yokohama, Japan. 108 p. April. Illust. Index. 26 cm. [Eng]
• ***Summary:*** On the cover of this English-language catalog is an illustration of two large Japanese flowers. In the section on "Seeds" (p. 87+) is a subsection (p. 94) titled "Some vegetable seeds." The contents (incl. the entry for "soy bean") is identical to that in the 1910 catalog, except that the price per 100 lbs. of soy beans has increased to $4.00. Address: P.O. Box No. 72. 21-35 Nakamura, Yokohama, Japan. Phone: 509.

1494. Nishimura, Torazô. 1911. Tamari miso sonota miso no kôbo kinrui ni kansuru kenkyû [Studies on the yeasts of tamari miso and other misos]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 106. p. 21-50. May 5; No. 107. p. 8-48. June 6; No. 108. p. 20-40. July 5. [Jap]

1495. *Chicago Daily Tribune.* 1911. Banzai, Little Nippon! How much you have changed since we saw you first! May 14. p. I2.
• ***Summary:*** Japanese university baseball teams have taken Chicago by storm. "The Takeda club, 2017 Prairie avenue, is the social center for young Japanese in Chicago, and here the ecstasy of baseball is at its height... Chef Hata exerted himself to make the banquet one to be remembered...

"The dinner began with misosshiru [sic, misoshiru, miso shiru], and included sashimu [sic, sashimi], garnished with che [?]. The main item was delicious sukiyaki. Speeches were made..."

Note: This is the earliest document seen (Aug. 2010) that mentions sukiyaki; no attempt is made to describe what it is or how it is prepared.

1496. Dahle, Alfred. 1911. Ueber das fette Oel der Sojabohne [On the oil of the soybean]. Dissertation from University of Jena. Published in Neustadt by J.K.G. Wagner (Wagnerschen Buchdruckerei). 43 p. 22 cm. See Jena Dissertations 1910-11. v.1, no. 7. [28 footnotes. Ger]
• ***Summary:*** The author's advisors were Prof. Dr. H. Matthes, and Prof. Dr. Haussner. Contents: Introduction: Nomenclature, history in Asia and Europe (Kaempfer, Haberlandt), taxonomy, chemical composition, Maggi and shoyu, miso, tofu, soy bread for diabetics, coffee substitute, soy oil in China and Japan, in England and Germany, use in soaps and as a substitute for linseed oil, constants (such as iodine number), fatty acids, the work of Prof. Matthes. Experimental part.

In Japan and China, two fermented products are made from soybeans: Shoyu or bean sauce (*Bohnensauce*) and miso. Shoyu is enjoyed with almost all foods as a seasoning, and for quite some time has been exported in abundance to England and America, where it is used in the manufacture of English and American sauces. Shoyu is even used in the well-known Maggi seasoning. With respect to its nutritional value and stimulating effect (on the appetite), shoyu sauce (*Shoyu-Sauce*) is somewhat comparable to meat extract. For the preparation of shoyu sauce, milled wheat, soybeans broken into large pieces then cooked until half soft, water, and table salt are combined in specific proportions and allowed to ferment in large vats. The fermentation lasts anywhere from 8 months up to 5 years.

The preparation of miso seems similar to that of shoyu except that barley or rice are used [instead of wheat]

Moreover, in Japan, a type of raw cheese, so-called "bean cheese" (*Bohnenkäse*), is made from soybeans (*Soja*); in Japan it is called tofu (p. 8). (p. 8).

Biography: The author was born on 20 March 1884, in Halberstadt, the son of a chemist, who was later the director of a sugar factory. Address: Halberstadt, Germany.

1497. Dubard, Marcel. 1911. A propos de quelques variétés de soja [Concerning some varieties of soybeans]. *Agriculture Pratique des Pays Chauds* (*Bulletin du Jardin Colonial*) 11(98):422-26. May. [1 ref. Fre]
• ***Summary:*** "The *Jardin Colonial* (Colonial Garden) is involved in the study of soybean varieties, and starting this year 15 of them have been grown out." Discusses the characteristics of the seeds and of the plant. Varieties described include Shirasaya, Akasaya, Gowari, Nakade, Dozan, and Juninzuki (all of Japan), and a soybean from

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Laos.

1498. Takahashi, Teizô; Yamamoto, T. 1911. Seishu tanekôji-chû no kôjikin to shôyu mata wa tamari kôji-chû no kôjikin to no hikaku kenkyû [Comparison of *Aspergillus oryzae* in koji of sake, shoyu, and tamari]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 32(5):454-76. May. [Jap]

1499. *Farben-Zeitung.* 1911. Die Sojabohnen-Industrie in Deutschland [The soybean industry in Germany]. 16(37):2067. June 10. [Ger]

1500. *Christian Science Monitor.* 1911. Plant cheese. July 15. p. 9.
• ***Summary:*** From the *Los Angeles Times:* "Plant cheese, made from the Soja bean, is a favorite food of the Japanese. The beans are boiled for several hours, pressed into a thick mass, shaped into cakes and then wrapped in straw and piled up in a cellar; a fire is made in the cellar, which is then closed and the cakes are left exposed to it 24 hours. Although containing no milk whatever, this cheese is like the milk cheese in taste, owing to a vegetable casein it contains in large quantity, but the odor is much more penetrant than that of ordinary cheese. This food goes under the name of natto in Japan."

1501. Keimatsu, S. 1911. Zur Kenntnis des Sojabohnenoeles [Toward a knowledge of soya bean oil]. *Chemiker-Zeitung* 35(91):839-40. Aug. 1. (Chem. Abst. 5:3633). [8 ref. Ger]
• ***Summary:*** The author, a Japanese living in Manchuria, gives a detailed discussion of the physical and chemical characteristics of soy oil, and its composition. The sample of oil examined contained about 12% saturated fatty acids, mainly stearic and palmitic acids, and about 80% unsaturated fatty acids, about half of which consisted of an acid isomeric with linolic acid yielding a hydroxy acid of melting point 158º-159ºC. Ordinary linolic acid [later known as linoleic acid] (yielding a sativic acid of melting point 173º-175ºC) and oleic acid were also present, together constituting about 15% of the unsaturated acids. The oil contained 0.2% of phytosterol, in which no stigmasterol could be detected. Address: Dalny, Manchuria.

1502. Togano, Meijiro. 1911. Shôyu no kôki ni tsuite [On the odor of shoyu]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 109. p. 1-38. Aug. 5. [Jap]
• ***Summary:*** In the English-language table of contents, shoyu is called "Soya." Address: Nôgaku-shi, Japan.

1503. Oyama, Jiro. 1911. Pootorando ni okeru yunyû Nihon shôyu ni kansuru ken [The market for imported Japanese shoyu in Portland, Oregon]. Portland, Oregon. 15 p. Aug. 8. Handwritten unpublished manuscript. [Jap; eng]
• ***Summary:*** This is a market report from Mr. Oyama at the Japanese consulate in Portland to Mr. Yoshitaro Komura at the Japanese Ministry of Foreign Affairs.

During the past 18 months 10,509 taru (170,460 liters, or 947 koku) of shoyu has been imported to Portland. A Japanese run shoyu company in Portland [probably *Sanyo Shoyu Jozo Gaisha;* see 1909 entry] made or makes about 300 koku (54,000 liters) a year. Address: Japanese Consulate, Portland, Oregon.

1504. Allen, T.J. 1911. Daily diet and health hints: The soya bean. *Boston Daily Globe.* Aug. 9. p. 12.
• ***Summary:*** "An American consul reports that the German government is introducing the soya bean extensively from Japan. This bean is superior to any of the varieties used in this country, which, while they are nutritious, are digested with difficulty, and their starch and their tough outer coating require so much cooking that the albuminous and mineral elements are largely injured. The soya bean contains about 20 percent fat and 40 percent proteid. It is much like the peanut in composition, but it is more easily cultivated. It is an excellent food in diabetes and should be generally be cultivated." Address: Dr., Food Specialist.

1505. Maynard, Lester. 1911. Vladivostok bean trade. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 14(194):794-95. Aug. 19.
• ***Summary:*** "Before Manchuria was opened up and connected by railway with the seacoast Manchurian beans were of purely local importance and were used as food for both man and beast. The first attempts to export beans were made as early as 1902, principally to Odessa, but the shipments met with little success, as the market was not prepared for the beans in the raw state, and the oil was not properly manufactured to stand competition with other vegetable oils.

"This failure killed the export trade for several years, and it was not until after the war–that is, during the season of 1906-7–that attempts to export beans were revived and small shipments were made to Japan. During 1906 the exports were 16,130 tons of beans and 64,520 tons of cake, and in 1907, 17,359 tons of beans and 26,605 tons of cake. In Japan the bean cake was used as a fertilizer and the oil in manufacturing.

"Beginning of direct shipments to Europe: About the end of 1907 a St. Petersburg firm sent the first shipments of beans direct to Europe. In the meantime large shipments of beans were being exported to Japan. The price at that time was $5.75 to $7.65 per ton, and was sufficiently low to enable the Japanese to import the beans in large quantities and reexport to Europe; the expense of this transaction was from $1.50 to $1.60 per ton.

"In 1908 the first European exporters came to the Far East, and as a result the Japanese transferred their interests

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from Vladivostok and concentrated the exporting of beans at Dalny, and attempted to keep the control of the European market, but the European firms being financially stronger, opened offices at Harbin and began making their purchases direct. The Chinese Eastern Railway, by introducing lower freight rates, succeeded in attracting large shipments of beans to Vladivostok for export, and to a certain extent stopped the rapid growth of Dalny as a bean exporting point. According to figures compiled by the London Exchange for the seasons of 1908-9 and 1909-10 the exports were as follows: From Vladivostok, 227,653 and 253,003 tons; Newchwang, 524,545 and 379,728 tons; Dalny, 717,945 and 556,983 tons, respectively.

"The purchase of beans is still carried on through Chinese dealers, and the exporters are not in a position to come in direct contact with the purchaser. For this reason, and because the beans come in various quantities from far outlying districts, some of which are not properly equipped for sorting, drying, and otherwise preparing them for export, the beans arrive at the seacoast mixed with dust and sand, and during the winter with snow, and in Vladivostok no attempt is made to clean the shipments before exportation. Certain precautions are taken in loading the beans on board ship, such as the installation of ventilating tubes, but these are not sufficient to guarantee the cargo arriving in good condition, as the beans are often frozen during railway transportation, and after being loaded on board ship have to pass through the Tropics on the way to market. Beans spoiled in this way during the 1909-10 season amounted to 35,657 tons out of 253,003 tons exported from Vladivostok.

"Difficulty of shipping through Vladivostok: One great drawback has been the shipment of beans by the railway on platform cars. Despite the tarpaulins that cover the bags snow sifts in, not alone between the bags, but into them, and although the bags are brushed on arrival at Yeagersheldt, the shipping port of Vladivostok, only the outside snow is removed. Yeagersheldt is poorly equipped for handling cargoes of this kind, and no facilities whatsoever exist for the handling of beans in bulk. According to statistics compiled by the Chinese Eastern Railway the capacity of the storing facilities at Yeagersheldt is as follows: Six tea warehouses, 6,970 tons; 26 warehouses and sheds, 54,296 tons; open areas, 11,590 tons; total, 72,855 tons. the capacity of these storage places is based on the following estimate: Five hundred pounds of beans in bags per square foot under roof, and 360 pounds of beans in bags per square foot in the open.

"Another drawback to shipments from Vladivostok is the lack of wharfage, there being room for only 5 steamers to load at a time, and, as a rule, there are 2 steamers discharging tea or salt or loading timber. The Chinese Eastern Railway made efforts to control the loading of bean steamers by requiring exporters to place this work in the hands of a workmen's society. This has been refused by the exporters, with the result that private stevedoring has been organized and the expenses reduced about 50 per cent. Regardless of this, the expense of loading and other charges are very high, amounting to $3.35 per ton. The exports of beans through the port of Vladivostok from 1908 to May, 1911, were as follows: 1908, 65,291 tons; 1909, 230,394 tons; 1910, 239,926 tons; 1911, 212,181 tons." Address: Consul.

1506. Boulter, R. 1911. Japan. Report for the year 1910 on the trade of Japan. *Diplomatic and Consular Reports, Annual Series* (*Foreign Office, Great Britain*). No. 4768. 87 p. Aug. See p. 62.
• ***Summary:*** A table titled "Return of principal articles of import into Japan during the years 1908-10" has a category "Manures" (p. 62) of which the largest items are as follows: "Oil cake–[Soy] Bean." Imports of this cake rose from 461,950 tons in 1908 to 575,180 tons in 1908, then decreased to 395,582 tons in 1910. Imports of phosphorite rose from 119,169 tons in 1908 to 166,896 tons in 1910. Imports of ammonium sulphate rose from 66,445 tons in 1908 to 68,813 tons in 1910.

1507. Nishimura, Torazô. 1911. Shôyu kôbo aruhaa, beetaa, oyobi ganmaa ni kansuru kenkyû [Studies on the shoyu yeasts "alpha," "beta," and "gamma"]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 110. p. 44-56. Sept. 5; No. 111. p. 16-41. [Jap]
• ***Summary:*** In the English-language table of contents, shoyu is called "Soya." Address: Nôgaku-shi, Japan.

1508. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1911. Soya beans in the USA. 14(208):1067. Sept. 6.
• ***Summary:*** "Extensive articles on the immense soya-bean trade of Manchuria have appeared in various numbers of Daily Consular and Trade Reports, and inquiries have also reached the Bureau of Manufacturers as to the progress being made in producing them in the United States. It has now become a considerable crop in the middle part of the South. D. A. Carpenter, a Tennessee farmer, writes for the *Southern Field* in regard to the growing of the bean as follows:

"'I grow the Mammoth Yellow variety, planting in rows 36 inches apart, and cultivating about the same as corn. I cut with a mower when ripe and allow them to lie on the ground for a couple of days. After being in shock for 10 days, they are hauled to the shed and thrashed. We consider the bean straw, after the beans are thrashed, as fully equal to timothy or redtop for a feed for cattle.

"'For late summer pasture I sow with a wheat drill about 1½ bushels to the acre. I am now feeding beef cattle and hogs on soya beans, and my dairy animals are producing more milk than ever before on a bean ration. Of course, other feeds are mixed with the bean, as soyas are rather rich when fed alone.

"'The Mammoth Yellow grows here from 3 to 5 feet

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high, according to cultivation, and yields 30 bushels of seed per acre, which will bring around $3 and $3.50 per bushel.

"'There is no finer improver of the soil than the soya bean. I have tried many other legumes, but none has given such uniformly high quality hay and returned such large amounts of nitrogen to the soil. I consider the soya bean the greatest crop ever introduced into this part of the country, both as a money crop and as a soil improver.'

"About $100,000 worth of soya-bean oil was shipped last year from Manchuria to the United States, against almost none the year before. From Hull, England, shipments last year of soya-bean oil to the United States amounted to $140,000; this was crushed from the Manchurian beans. Considerable shipments of soya-bean oil were also made in 1910 from Kobe, Japan, to the United States."

1509. H.L. 1911. Le Haricot soja ou Fève de Mandchourie: Cultures exitoques [The soybean or Manchurian bean: Exotic crops]. *A Travers le Monde* 17(36):288. Sept. 9. Bound in the back of *Le Tour du Monde.* [Fre]

• ***Summary:*** Contents: Introduction. Its utilization by the Japanese: Fertilizer, oil, and oil cakes. Its utilization by the Annamites [Vietnamese]: Milk and cheese. How will soybeans be used: The first exports to Europe. Some figures on the present trade in soybeans. The Germans are becoming masters of the European soybean market. Soya in France: It is utilized by foreigners.

Concerning the Germans: "Until the spring of 1909, the Japanese were the masters of the soybean market. Some German companies have in turn entered into competition in places of production, and there followed a rather significant rise [in production]. There resulted as a counter-measure some soybean cultural trials in terrains that seemed favorable to them in China. The result of these trials is not yet known.

"Be that as it may, the Germans hasten to assume first rank among the importers of soybeans in Europe.

"In effect, it follows from a report published by *The Chemical Trade Journal* (10 June 1911) that the port of Stettin recently received from Vladivostok a shipment of 4,823 tonnes (metric tons) of soybeans; the manufacturers of Stettin have established a society with capitalization of 1,875,000 francs for the utilization of this product.

"Its importation into Germany duty-free will favor its use for several reasons: first, soybean oil, a substitute for linseed oil, can be sold at a price that is one-third lower; secondly, it can be used in soap-making; thirdly, the cakes remaining after the extraction of oil can be used to feed livestock in the same way as cottonseed cakes. Finally, after the appropriate extraction of oil, the pulp, reduced to a flour and mixed with cereal flour, yields an edible bread or biscuit.

"The nascent industry in Germany of cottonseed oil, flour, and oil cakes, whose primary material is cottonseed imported from America, will have before long to struggle against the formidable competition of soybean products."

Concerning soya in France. "Soya (*soja*) is hardly known in France except by a few products that are found in certain food stores and that are bought sometimes, but without realizing their origin. (Footnote: Notably many flour products whose fortifying qualities are incontestable.)

"For, there would be every advantage to introduce this industry into our country where the mechanical and chemical resources would permit an improvement of yields. The example, moreover, is already given, not by French industries, but by the Chinese, who have established a factory at Vallées, Colombes, near Paris, where a Chinese workforce, exclusively employed, make all types of soy-based food products.

"Our industries would draw great profit from entering this path and not allowing themselves to be surpassed by German chemistry any longer."

1510. Krauss, F.G. 1911. Leguminous crops for Hawaii. *Hawaii Agricultural Experiment Station, Bulletin* No. 23. 31 p. Sept. 20. See p. 23-27, 30.

• ***Summary:*** "Soy bean (Glycine hispida): While possessing most of the good qualities common to other leguminous forage plants, the great diversity of type to be found in the soy bean adapts it to many uses and conditions unsuited to other legumes."

"Among its most important uses is that for culinary purposes especially in the manufacture of the Japanese products (soy and miso). These products are imported into Hawaii from Japan in large quantities, but their manufacture is being rapidly extended in Hawaii. This has created quite a demand for the bean locally. At present two and one-half million pounds of the bean are being imported into Hawaii annually. The average cost is about $3 per hundred pounds landed in Honolulu and the beans sell for $3.25 to $3.40 per hundred pounds. The Japanese coffee growers in the Kona district in Hawaii have been growing the bean as an intercrop for years. The total production is said to be about 200,000 pounds per annum. It will thus been seen that the immediate local demand is very far from being supplied at present."

Note 1. This is the earliest document seen (Jan. 2005) that gives soybean production or area statistics for part or all of the United States (Hawaii).

"The yield of seed obtained by the station from small experimental plantings ranges from 600 to 1,000 pounds per acre for the dwarf early maturing varieties, and about twice that amount from the medium late and medium tall sorts."

"The following list has been selected from about 100 varieties tested by the station. It is believed to include the best sorts for each of the several purposes for which the soy bean is especially recommended. In the case of culinary varieties, both quality and yield of seed have been considered. The soy and miso manufacturers demand a large, hard, light colored seed, with a thin skin, and the writer is indebted to Mr. N. Yamakami, manager of the Hawaiian

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Soy Co., for his assistance in selecting varieties according to these qualities.

"Under Group I has been collected the best culinary varieties. These are usually found among the dwarf, early maturing sorts, qualities which make them well suited for intercultures, short rotations, and catch crops. Group II contains the heaviest seeding sorts irrespective of their culinary qualities. These varieties are especially well suited for growing as grain for cattle feeding. Group III contains the rankest growing sorts. These supply the maximum yields of both forage and grain, which makes them especially valuable for fodder and green manuring." Two photos show two types of soy bean plants: (Fig. 1) Three dwarf types (culinary varieties). (Fig. 2) Three intermediate types (general purpose varieties). These are accompanied by a list of the soybean names in the 3 groups with SPI numbers and basic characteristics. The six culinary varieties in Group I include Hollybrook, Manhattan, Swan, Elton, and Acme. The four culinary and grain varieties in Group II include Acme, Edward ("Mr. Yamakami, of the Hawaiian Soy Co., pronounces this the largest seeded yellow soybean he has ever seen and considers it a very desirable variety for the production of miso and other Japanese food products"), Ito San, and Ruralnook. The two forage varieties in Group III (tall, rank-growing, and best suited for green manuring) are Riceland and Barchet.

Another photo (Plate VIII) shows "Seeds of leguminous plants described in this bulletin, natural size–including three colors and sizes of soy beans.

Note 2. This is the earliest English-language document seen (June 2005) that uses the word "intercrop" (or "intercropped" or "intercropping") in connection with soybeans.

1511. Ruhräh, John. 1911. Soy bean cookery. *Medical Record* (*New York*) 80:626-27. Sept. 23. [4 ref]
• ***Summary:*** Two tables give the nutritional composition of yellow soy beans and of "soy-bean flour" (also called "soy bean flour" and "soy flour" in this article). The flour [a whole- or full-fat soy flour] contains 44.64% protein and 19.43% fat.

"Egasse [1888] first suggested the use of the bean in the diet of various diseases, particularly in diabetes, and the first trials in this disease were made by Dujardin-Beaumetz at the Cochin Hospital in Paris.

"Since publishing the articles referred to above [3 articles relating to soy published between July 1909 and Dec. 1910], I have had so many requests for information about the preparation of the soy bean, especially for diabetics and also for its use in other diseases, that I thought it best to bring together a few of the methods of preparation which have been used with success."

"The simplest way to use the beans is to cook them like the ordinary navy bean, preparing either bean soup, boiled beans, or baked beans, the flavor usually being rather improved by the addition of a piece of fat salt meat. It is also a good plan to soak the beans for eight to ten hours, stir them up, and remove the rather firm envelope which encloses them, most of which will be found to come to the surface, from which they may be easily skimmed off."

The author then gives recipes for using soybeans or soy bean flour: Gruels, broths, muffins, nut-cakes, soy bean cakes, breakfast food, pancakes, soy bean cheese (tofu; "In Seattle, Washington, and other places in the West, I am informed that tofu is made by the Japanese and sold to the Oriental residents"). The following suggestions for cooking the bean are made by Goff (*Gazette des Hopitaux,* 7 March 1911, p. 399): Grilled soy beans, soy beans with butter, soy beans au gras, bread or cakes of soy beans. Address: M.D., 839 North Eutaw Street, Baltimore, Maryland.

1512. *Matieres Grasses* (*Les*) (*Paris*). 1911. Culture du soja a Ceylan [Soybean cultivation in Ceylon]. 4(41):2429-30. Sept. 25. [Fre]
• ***Summary:*** "Soybean cultivation is the order of the day. It has been tried with success in Ceylon. The Agricultural Society obtained a large quantity of seeds from East Asia some time ago and agronomic trials were conducted at the botanical garden at Peradeniya–but the crop did not succeed very well. However now the secretary of the society has attained success and has been able to obtain a good harvest at the Colombo garden. He obtained two varieties; a white-seeded one from Japan and a black-seeded one from Java. Shortly he will be able to provide seeds, then one must wait to see cultivation of this new crop undertaken in Ceylon. We predict that it will undergo a large expansion."

1513. Abel, Mary Hinman. 1911. Beans, peas, and other legumes as food. *Farmers' Bulletin* (*USDA*) No. 121. 38 p. See p. 11-13, 17-20, 35-36. Revised Nov. 15, 1906. Reprint, Sept. 30, 1911. [1 ref]
• ***Summary:*** This is a reprint of the 1906 revised edition. The information about soy is unchanged. On pages 17-18 is a section titled "The peanut" (*Arachis hypogæa*). On pages 35-36 is a section titled "Peanuts and peanut preparations" which includes a subsection titled "Peanut butter.–The roasted peanut ground to an oily meal has somewhat the consistency of butter and is now marketed under the name of peanut butter. Salt is perhaps quite generally added during the process of manufacture. Water is also sometimes added–usually before serving. Peanut butter is used like other butter to spread on bread, for the making of sandwiches, and in the preparation of a number of made dishes. Many persons like its flavor when it is fresh and of good quality, and it seems fair to say that the use of this and other sorts of nut butter is growing. As regards composition, peanut butter, which is essentially the ground roasted peanut, contains more protein and less fat than ordinary butter. Little is known regarding

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the digestibility of peanut butter, but the fine grinding would naturally seem to be of an advantage. Judged by Jaffa's experiments with a ration containing peanuts, it would be well digested. (See p. 26)

"Peanut oil.- At present the American peanut crop is not large enough to more than supply the roaster and the confectioner, hence the expressing of oil from the peanut has never become established here, but in Europe large quantities of the African-raised nuts are used for this purpose. The shelled nuts contain from 30 to 50 per cent. of oil. The oil is said to be of fairly good flavor, but inferior to olive oil. In 1899 some 80,000 tons of the nuts were used in Marseille alone for oil making. The unhusked nuts are passed between a pair of rapidly revolving grooved rollers and the shells and red inner skins are then removed by a winnowing process with the use of air currents and oscillating sieves. The cleaned kernels are ground and enveloped in fibrous mats and pressed to extract the oil.

"According to Brannt, "the first cold pressure yields 16 to 18 per cent of very fine table oil. The residue is then broken up, moistened with water, and again cold pressed, yielding 7 to 8 per cent of more or less valuable oil, used for table purposes and burning. The residue from this is heated and then pressed, giving 7 to 8 per cent more oil, unfit for table use, but used for soap and lubricating." The grades of oil are sold as salad oil alone or mixed with olive oil.

"Peanut cake.- When the oil has been pressed from the ground nut, the mass remaining, called oil cake, is used for fattening. Some experiments have also been made as to its food value for human beings. Containing, as it does, 47 per cent of protein and 9 per cent of fat and starch, and costing about 5 cents a pound, this attracted the attention of German scientists. The oil cake broken up and cooked a long time in water and eaten as a soup or porridge in a hospital. Most of those who tried it ate it with apparent relish, not once only, but again and again. No effort have been made to ascertain to what extent it was digested, and the use of the cake does not seem to have passed the experimental stage."

1514. Li, Yu-ying; Grandvoinnet, L. 1911. Le soja [The soybean]. *Agriculture Pratique des Pays Chauds* (*Bulletin du Jardin Colonial*) 11(102):177-96. Sept. See also: 11(103):270-94. Oct.; 11(104):360-75. Nov.; 11(105):459-74. Dec.; 12(106):28-38. Jan.; 12(107):120-32. Feb.; 12(108):213-23. March; 12(109):302-08. April. 28 cm. [33 ref. Fre]

• ***Summary:*** This series of articles, published in book form in 1912, is one of the earliest, most important, influential, creative, interesting, and carefully researched documents ever written about soybeans and soyfoods. Contents: Introduction. Origin and history of the soybean. Soybean culture. 1. Species and varieties of soybeans (botanical characteristics, species {vernacular names in Asia}, varieties {from China, Japan, India, Indochina, Hawaii, United States, and Europe}). 2. Needs of the soybean: Climatic (temperature, humidity), geographical area and varieties grown (in Asia [Manchuria, Japan, Formosa, Korea, Indochina], America, Guyane ("En Guyane, le soja mûrit" [ripens or matures]. Note: This probably refers to French Guiana [*Guyane française*], where Sagot and Raoul reported in 1893 that soybeans had been grown successfully), Europe [France, Italy, Russia], Southeast Asia (*Océanie* / Oceania) [Philippines, Java, Borneo], and Africa [Algeria, Tunisia, South Africa]), agrological needs of the soybean (physical, chemical).

"Oceania.–The soybean has been cultivated for a very long time in the Philippines, Java, and Borneo" (p. 194).

Illustrations (line drawings) show: Soybean plant with roots (p. 182). Soybean pods and beans (p. 183). A table (p. 191) and a graph (p. 192) show trade of soybeans, soybean cake, and the total of the two from five Manchurian ports (Newchwang, Antung, Ta-tung-ho, Dairen, and Suifenho [Suifenhe]) from 1905 to 1909; all have increased dramatically. Also contains 12 other tables from other sources. Note that this influential series of articles, like its predecessor by Itie in the same journal, were in large part prompted by the huge rise in imports of soybeans to Europe, starting in 1908. The contents of these articles is almost identical to that of the book by the same name, published in 1912, which see. Address: 1. Counseiller de 1ere classe au Ministère de l'Agriculture de la Chine; 2. Ingénieur agricole (G.).

1515. Nishimura, Torazô. 1911. Shôyu moromi oyobi shôyu ni shôzuru sanmakusei kôbo kinrui (zoku ni shôyu no kabi to shôsu) ni kansuru kenkyû [Species of film-building yeasts on shoyu]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 111. p. 42-63. Oct. 5. [Jap]

• ***Summary:*** In the English-language table of contents, shoyu is called "Soya." Address: Nôgaku-shi, Japan.

1516. Williamson, A.A. 1911. Commerce of the Liaotung Peninsula. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 14(255):535-40. Oct. 31.

• ***Summary:*** "The Dalny (Manchuria) consular district comprises the entire territory held under lease by Japan from China, lying at the extreme southern end of the Liaotung Peninsula, and is known and officially designated by the Japanese as the Kwangtung Province. Its area is given as 205 square 'ri,' or 1,220.57 square miles, and it has a population of 462,399 or 379 persons per square mile.

"The country is very hilly in the southern part of the Province, the elevation, however, seldom reaching over 900 feet above the sea. Toward the north the surface gradually becomes more level and partakes of the nature of the flat bean fields of north Manchuria."

"Dalny, the chief city and port of Kwantung Province,

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is said to have the finest wharves in the Far East., vessels drawing up to 28 feet being moored alongside the quay. Goods can be discharged from a ship and placed aboard the freight cars, which run out onto the wharves, in one operation. While ice forms in the protected parts of the bay at Dalny, it never becomes sufficiently thick to interfere with navigation, so that the port is open the year round and, Dalny being the southern terminus of the main line of the South Manchuria Railway, the advantages offered are at once evident."

The export returns for 1910 "show a decided decrease in shipments of beans and bean cake. The causes of this are undoubtedly the (for the farmers) favorable preceding year and the outbreak of plague with which the country was smitten during the export season. The first caused the farmers to sell rapidly in 1909 and to hold back in 1910; the latter, because of isolation and segregation measures, brought measures, brought traffic to a standstill. Undoubtedly the bean season will, in the end, show no falling off, as the estimates of production which have been obtainable show a considerable increase in cultivation."

The section titled "The export trade" states that "the Chinaman" has a strong hold upon the trade passing through Dalny; a high percentage of the imports came in the shape of native products and "the export trade with native products showed the greatest increase, over 90 per cent." A table shows "the principal articles exported through the Maritime Customs at Dalny during 1909 and 1910 by steamer and by junk." For 1909 and 1910 by steamer: Bean cake 615,252,933 / 526,030,267 pounds. [Soya] beans 981,274,267 / 713,489,867 pounds. [Soya] bean oil 19,021,067 / 31,642,267 pounds. For 1909 and 1910 by junk: Bean cake 22,398,000 / 28,863,733 pounds. [Soya] beans 43,657,007 / 13,827,333 pounds. [Soya] bean oil 2,679,000 / 2,864,133 pounds.

Under "Soya-bean trade," another table shows the destination of these three products (in pounds) during 1910 from the Dairen customs district, as given in the Imperial Chinese Maritime returns: Bean cake: Japan (incl. Formosa) 443,406,267 (99.9% of overseas total). Korea 307,333. Total overseas 443,730134. Chinese ports 111,163,866 (20.0% of grand total). Grand total 554,894,000.

[Soya] beans: Egypt 302,240,800 (#1). Japan 192,499,733 (#2). United Kingdom 59,455,867 (#3). Other: Denmark, Hongkong, Netherlands, Straits Settlements [today's Singapore]. Total overseas 603,120,800. Chinese ports 124,196,400 (17.1% of grand total). Grand total 727,317,200.

Bean oil: Japan 17,208,133 (#1). Belgium 6,097,200 (#2). Other: Denmark, Egypt, Hongkong, Netherlands, Straits Settlements. Total overseas 27,829,333. Chinese ports 9,677,067 (25.8% of grand total). Grand total 37,506,400.

A 3rd table shows prices of the three products month by month in 1910 in U.S. currency as reported by the Manshu Juyo Bussan Yushutsu Kumiai (Manchurian Staple Products Export Association). For bean cake, the price is per 61.33 lb. For soya beans and oil per 133.33 lb.

"There are still no American export and import houses in this district, and until some thoroughly American house opens here, trade with the United States will necessarily remain half-hearted, being in the hands of natural competitors." The main export from this district to the USA is soya bean oil, of which $93,974 was exported in 1910; only $8,532 worth of soya-bean cake was exported. Address: Vice Consul, Dalny, Manchuria.

1517. *Queensland Agricultural Journal.* 1911. Soya beans. 27(4):187. Oct. [1 ref]
• ***Summary:*** From Tropical Life: "Last year Corea [Korea] exported £584,500 of Soya beans, mostly to Japan. The Corean bean is said to be superior to its Manchurian rival, and so large an increase in its export (£200,000, or more than 30 per cent. over 1909) has released that quantity of Manchurian beans, required for the Japanese manufacturers of soya, &c., and enabled them to be sent to Europe, where the demand is rapidly increasing." Address: Australia.

1518. *Stanstead Journal* (*Rock Island, Stanstead, Quebec, Canada*). 1911. Farm and field: Export of soy beans from Japan. New industries are created. Nov. 2. p. 4.
• ***Summary:*** "Since the war between Japan and Russia, the export of soy beans from the East to Europe has largely increased. At one German port alone, we are told, 4,823 tons of these were imported in one shipment. The oil from these beans is said to be one-third cheaper than linseed and can be used for making soap and many other products including food. The bean meal is used for cattle feeding and also mixed with flour for human food. In fact, few agricultural products have made such changes in both farm and manufacturing industries as the soy bean promises to do in Europe.

"The soy bean has been grown in a comparatively small way in Ontario. It is not only a soil improver, but a very rich food, ranking with linseed."

1519. Kochi, Genichiro. 1911. Hatsuga daizu chû ni ganyûseru ni san no kôso (Enzymes) ni tsuite [Some enzymes in germinating soybean seeds]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 6(11):13-16. Nov. 10. [Jap]
• ***Summary:*** Mentions diastase, cytase, urease, proteolytic enzymes, lipase, invertase, maltoglucase, lactase, tannase, and inulase.

Note. This is the earliest Japanese-language document seen (Jan. 2013) that mentions soy sprouts, which it calls *Hatsuga daizu.* Address: Sanjo Kaiin [Japan].

1520. Greene, Roger S. 1911. Manchurian trade and commerce: Harbin. *Daily Consular and Trade Reports* (*U.S.*

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Bureau of Manufactures, Department of Commerce and Labor) 14(271):880-88. Nov. 18.
• ***Summary:*** The year 1910 was the first for which there were available complete customs returns of the traffic carried on over all the important trade routes connecting North Manchuria with the Russian Provinces upon which it borders"

The five customs stations in this region are Manchouli, Suifenho, Harbin, Sansing, and Aigun. "Nearly four-fifths of this trade passed through Suifenho and Manchouli,..."

"Shipments of bean products and grain: Exports of beans through the five customs stations of the Harbin consular district amounted to 268,333 tons in 1910, against 230,118 tons in the preceding year. Adding the rail shipments to the south from Changchun gives a total of 411,930 tons, in contrast to an aggregate of 454,486 tons in 1909.

"The exports of bean cake from the five stations came to only 11,186 tons. In 1909 the amount was also small (12,434 tons). Most of this product goes to Japan via Suifenho. Shipments of bean cake southward from Changchun aggregated only 6,990 tons.

"The exports of bean oil from all the stations amounted in round numbers to 11,127,000 pounds, as against 3,193,000 pounds in 1909, the bulk of the business being with the Russian Amur ports." Address: Consul, Harbin.

1521. Kent, William P. 1911. Manchurian trade and commerce: Newchwang. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 14(271):888-93. Nov. 18.
• ***Summary:*** Table 2 (p. 891) shows that significant "decreases occurred in the 1910 [soy] bean, [soy] bean-oil, and [soy] bean-cake shipments through the Newchwang customs. Beans were exported to Japan, Hongkong, and Samarang [Semarang, a port city on the north coast of the island of Java]; bean oil to Japan, the United Kingdom, Samarang, and Belgium; while Japan imported all the bean cake not consumed locally. All units for these three commodities are in piculs; A picul is equivalent to 133.33 pounds.

"The soya bean and its products... continue to grow in importance throughout Manchuria and to furnish the principal articles of commercial activity at Newchwang. When it is recalled how recently the soya bean and its extensive uses have come to the knowledge of the commercial world and how rapidly it has taken its place as an article of commerce, it must be regarded as a marvel of agricultural transformation, comparable alone in modern times to the discovery of Indian corn, tobacco, and the potato. The average price for 1910 of beans, bean cake, and bean oil, laid down at Newchwang, was: Beans, $4.90 per 400 pounds; bean cake, $5.55 per 687 pounds; and bean oil, $5.75 per 133.33 pounds.

"One of the by-products of the soya bean whose manufacture is increasing is soy sauce, a condiment much used in Japan and other parts of the East. The Japanese established a factory at Newchwang in 1903 for the manufacture of soy [sauce], starting with a small capital. It has been so successfully conducted that from the profits the plant is being englarged by an expenditure of $30,000. Some prominent Chinese capitalists from the south of China propose erecting two additional factories at Newchwang during the coming season.

"The most important and profitable adjustment of the bean trade is bean milling, and during the 1909-10 season great progress was made in the substitution of modern machinery for the old type of press, in which a system of wooden wedges was used. Up to December, 1910, the number of bean mills in operation at Newchwang was as follows: Seven steam mills with an average capacity of 5,000,000 pieces of bean cake and 21,000,000 catties (catty=1.33 pounds) of oil per annum; 7 smaller ones with an average annual capacity of 1,800,000 pieces of cake and 7,900,000 catties of oil; and 3 others with an average annual output of 300,000 pieces of cake and 1,300,000 catties of oil. One of steam mills employs hydraulic power on the mold presses; all the others utilize steam and oil engines simply to crush the beans preparatory to their being placed in the molds, which are worked by hand on a cog and screw system.

"What is desired is a machine similar to a cottonseed press, meeting certain requirements peculiar to the bean. This suggestion implies a matter of great importance to the first devisers of a machine meeting the approval of local bean-mill owners. To accomplish this end will require a personal investigation to acquire a close knowledge of the minor details of the industry. Descriptions and details are of no avail, owing to the probable omission of some item overlooked by an inexpert investigator.

"Declared exports–shipping: Beans have not as yet been shipped direct from Newchwang to the United States. A small shipment of bean oil was sent on trial to a New York firm, and should this prove satisfactory larger returns may confidently be expected." Address: Consul, Newchwang.

1522. *Washington Post.* 1911. Manifactured [sic, manufactured] milk: Tid bits. Nov. 26. p. MS2.
• ***Summary:*** "Cows are not numerous in Japan, but the Japanese are fond of milk, and to meet this demand in the face of a natural shortage they long ago put their wits to work and evolved a product that the average person cannot distinguish from the regular dairy article.

"The artificial milk is derived from the soja bean, The beans are first soaked, then boiled in water. Presently the liquid turns white; sugar and phosphate of potash in proper quantities are added, and the boiling continues until a substance the thickness of molasses is obtained [sic]. This fluid corresponds very accurately with ordinary condensed

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milk, and when water is added cannot be told from fresh. If the present rise in the price of British milk continues we can foresee a big run on soja beans. Now, Mr. Milkman, beware!"

Note: A very similar article appeared about two months later on 14 Jan. 1912 in the *Boston Daily Globe.*

1523. Barrett, O.W. 1911. Rice ally crops. *Philippine Agricultural Review* 4(11):592-98. Nov. See p. 594-96. [1 ref]
• ***Summary:*** The section titled "Soybeans" (p. 594-96) begins: "Probably every tourist who has visited any of the cities of Japan or China has noticed in the markets these peculiar blocks of a grayish white, jelly-like substance and wondered whether they were really good to eat, but comparatively few have ever tried there the three or four varieties of vegetable 'cheese' prepared from the soybean*."

*Footnote: A 3/4 page footnote, extracted from USDA Farmers' Bulletin No. 58 by Langworthy, discusses five preparations commonly made in Japan from the soybean: natto, tofu or bean cheese (eaten in the fresh state or frozen), miso, yuba, and shoyu.

"Experts in threpsology, the new science of nutrition, seem to be in accord on the fact that in dietary matters two kinds of food are at least four times as good as one... Recently the European food experts have realized the high nutritious value of the soybean and a factory has been established near Paris [by Li Yu-ying] for the manufacture of various food products from this wonderful seed."

"Now is the time for the Philippine Agriculturist to take up soybean culture in earnest, and to develop it in the same way, even if not to the same degree, as our neighbors across the way have been doing for centuries. The fact that there are practically no seeds of this valuable crop at the present in the Philippines is a sad commentary on the progressiveness of the Philippine farmer; but it is never too late to learn" (p. 596). Address: Chief of the Div. of Experiment Stations, Philippines.

1524. Ishikawa, S. 1911. Seishu oyobi shôyu-chû no horumuarudehiido kenshitsu ni tsuite [On the determination of formaldehyde in sake and shoyu]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 357. p. 787-803. Nov. [Jap; ger]
• ***Summary:*** The German title is "Ueber die Ermittelung von Formaldehyd in 'Sake' und 'Shoyu' (So-ya)." Address: Tokyo Eisei Shikensho, Japan.

1525. Takahashi, Teizô; Yukawa, Matao. 1911. Shôyu kôji oyobi shôyu moromi-chû no gaseikin ni tsuite (1) [Studies on the budding fungi of shoyu koji and shoyu moromi (mash) (1)]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 112. p. 1-26. Dec. 5. [Jap]
Address: 1. Nôgaku-Hakushi (Doctor of Agriculture), Japan; 2. Nôgaku-shi, Japan.

1526. *Christian Science Monitor.* 1911. Soy bean exports large. Dec. 15. p. 16.
• ***Summary:*** "Boston, by tradition, is a large center of bean consumption... A region of the world where the bean is indigenous, and where it has been a staple commodity of diet for centuries, is Asia, conspicuously India, China, and Japan. Until a comparatively recent date native consumption has kept pace with production and there has not been much export trade. But with recent development of Manchuria the soy bean crop has come to have a bulk and value that is astounding, the demand from Europe and Japan steadily growing, so that the latest reports of shipments from Dairen (formerly Dalny) and Vladivostock [Vladivostok] indicate that the Manchurian farmers are now raising annually about 1,800,000 tons of beans and beancake."

"Japanese capital and managers are profiting by the sudden and yet substantial expansion of the Manchurian export trade through their wise administration of the port of Dairen and the trading enterprises which they carry on in the zone along the railway that they control. Japanese in Japan are also profiting by the new and inexpensive form of food supply; there the soybean provides much for a people not over rich in foods and taxed at present to a point that only a people as loyal as the Japanese would bear long without complaint."

1527. *J. of the New Zealand Department of Agriculture.* 1911. The soya bean. Its possibilities in commerce. 3(6):487-88. Dec. 15. [1 ref]
• ***Summary:*** "In a recent communication to the Department, the High Commissioner in London conveys much interesting information of the soya-bean industry. This bean, which is taking a commanding position in the Old World [Europe] as a food for stock, has not yet been tested on a commercial scale in this part of the world; but added interest is being attached to it with the growing appreciation of the need of better feeding of our live-stock. The department is testing a number of varieties of soya bean received from the United States Department of Agriculture at the Tauranga Experimental Farm..."

The report notes that from Dalny (in Manchuria) and Vladivostok (in Russia) large quantities of soya beans are shipped to the United Kingdom. Small consignments of the bean and oil are received from Japan. "'These beans contain from 17 to 18 per cent. of oil, which is pressed out by ordinary crushers or extracted by the solvent extraction process. Originally the oil was used for soap-making but now it is used not only for this purpose, but much more largely for replacing linseed-oil. It is also used for lubricating, burning, and for edible The residue, after the oil has been extracted, is now well recognized as being one of the best foodstuffs for cattle. It is exceedingly rich in albuminoids in a readily

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digestible form. The opinion is expressed that in time this residue will come to be used as human food. Note: This is the earliest English-language document seen (March 2003) that uses the term "solvent extraction" in connection with the commercial crushing of soybeans to give oil and meal.

"'The greater quantity of the soya-bean supply is shipped direct to this country, is crushed either in Hull or Liverpool, and large quantities of the oil are shipped to the [European] Continent. I am informed that bean-oil, without the aid of driers of some kind, will not dry hard...

"'Experiments have been made in many countries to grow soya beans and apparently some of these experiments have been perfectly successful, as the Hull Oil-manufacturing Company have received samples grown within 200 miles of Calcutta, and the bean is now offered in small quantities from South Russia. Experiments are being made in Rhodesia, Canada, South America, and other places within the wheat and cotton belts.'" Address: New Zealand.

1528. Nishiwaki, Yasukichi. 1911. Kaki-iro kabi, kôji kabi oyobi kumonosu kabi o motte, shôyu jôzô hikaku kenkyû [Shoyu manufacturing experiment using orange-colored mold, koji mold, and *Rhizopus* mold]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 14(166):1161-65. Dec. [Jap; eng]

• ***Summary:*** The orange colored mold is actually called "persimmon colored" and refers to *Oidium lupli* or *Monilia sitophila* (used to make onchom or ontjom). The koji mold is *Aspergillus oryzae. Rhizopus japonicus* is called "spider-web mold." It is clear that shoyu can be made with molds other than just the koji mold. Good shoyu koji was made easily with the orange mold, which is little attacked by other molds. The *Rhizopus* mold gave unfavorable results. Address: Nôgaku-shi, Japan.

1529. Miyake, K. 1911-1912. Ueber das Verhalten der Pentosane und Methylpentosane der Samen von Glycine hispida und von Phaseolus vulgaris waehrend des Keimungsvorganges [On the conduct of pentosans and methylpentosans in the seeds of soybeans and common beans (*Phaseolus vulgaris*) during germination]. *Journal of the College of Agriculture, Tohoku Imperial University* (*See Hokkaido Daigaku, Nogaku-bu*) 4:327-35. [10 ref. Ger]

• ***Summary:*** Pentosans and methylpentosans are distinctly skeletal constituents not used in germination unless other substances are exhausted, and then methylpentosans are appropriated more than pentosans. Address: Japan.

1530. Kinoshita, K.; Taido, J. 1911. Seishu-chû "forumuarudehiido" kenshutsu-hô ni tsuite [Detection of formaldehyde in sake. I-IV.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 6(10):15-28; 6(12):5-15; 7(6):10-16; 7(2):12-25. [Jap]

1531. Kita, Gen-itsu. 1911. Shôyu seizô ni kansuru kenkyû hôkoku. IV. [Research report on shoyu production. IV.]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 14(156):109-28. [Jap]

• ***Summary:*** "Traditional shoyu production depends on alcohol fermentation as well as on protein degradation and acid fermentation. Therefore starch or the majority of the sugar is converted into alcohol, then into esters, which the flavor of shoyu. In 1907 Dr. Saito Kendo published a report titled "Microbiological studies on the preparation of soy sauce" (*Zentralblatt für Bakteriologie.* Series 2. 17(1/2):104-09, 152-53) in which he discussed shoyu yeasts. The major yeast is the new variety *Saccharomyces soya,* and there are others such as *Sacc. farinosus.*

"I tried to isolate the yeast in order to study the process of fermentation, the growth of yeast, the side effects the yeast, etc. After plating the yeast many times on a medium containing koji solution plus salt, the yeast can be purified by Lintner's method. Samples were obtained from Noda, Choshi, Shizuoka, Handa, Sakai, Shodoshima (island) and Tatsuno.

"I observed four types of yeast: Type 1 was isolated from the samples from Noda, Shizuoka, Sakai, Shodoshima, Tatsuno, Choshi, and Handa. It is the most common type which has the medium fermentation ability. Type 2 was isolated from the Shizuoka sample. Its characteristics are about the same as Type 1. Types 3 and 4 were isolated from the Noda sample; they do not ferment during cold weather.

The author then discusses: Microscopic observation. Plate culture. Large colonies. Agar culture. Liquid culture. Small droplet culture. Fermentation characteristics using various kinds of sugar. Apparent optimal temperature and the actual optimal temperature. Test for spore formation. Fermenting ability of the shoyu yeast (p. 115): 1. The growth condition when the medium contains salt and sugar. 2. The fermenting ability of various yeasts grown in boring (?) 10º or boring 20º sugar medium without salt (boring is a unit of concentration). 3. The fermenting ability of various yeasts grown in boring 10º sugar medium containing 10% salt. 4. The effect of alcohol on shoyu yeast. 5. The reaction of yeast to salt. 6. The fluctuation of nitrogen compounds in the culture medium due to the presence of yeast.

"The importance of alcohol fermentation in shoyu making (p. 125): Alcohol fermentation is one of the most important changes that takes place during the process of making shoyu. Although the flavor of shoyu depends a lot on alcohol fermentation, we don't know exactly how important its role can be. When the flavor and color of shoyu was evaluated, we did not find a significant difference, so that it seems unnecessary to add a large amount of wheat when making shoyu. Currently equal volumes of wheat and soybeans are mixed in order to make the best quality shoyu. However considering that regular quality shoyu doesn't require wheat at all makes us think that addition of wheat is

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arbitrary and irrational. I conducted the following tests (p. 116): 1. The effect of decreasing the amount of wheat on the taste and flavor of shoyu and the relationship between profit and cost. 2. The characteristics of koji (?) when cheaper soybeans are used instead of wheat. 3. characteristics of koji (?) when other cheaper starchy grains are used instead of wheat. These tests should be conducted with great caution, using a large quantity, and we should avoid drawing conclusions obtained from only a few experiments. I hope the shoyu makers will volunteer to conduct them. Here are some results which I obtained: The possibility of storing koji enzyme in salty water." Three photos (p. 111) show microorganisms growing in petri dishes. Address: Kôgaku-shi, Japan.

1532. Bowie, Henry P. 1911. On the laws of Japanese painting: An introduction to the study of the art of Japan. San Francisco, California: Paul Elder and Company. xv + 117 p. See p. 90. With prefatory remarks by Iwaya Sazanami and Hirai Kinza. Illust. Index. [14 ref]

• ***Summary:*** In Chapter 6, in the section on "Month and holiday subjects," under the month of "May" (p. 90) we read: "The fifth of May is the boys' festival, and the carp (*koi*) is the favorite subject for painting... When this fish is caught and about to be cut up alive for *sasshimi* [*sashimi*], a Japanese delicacy, once the carver has passed the flat side of the knife blade over the body of the fish the *koi* becomes motionless, and with heroic fortitude submits to being sliced to the backbone. Served in a dish, a few drops of soy being placed in its eye it leaps upward in a last struggle, to fall apart in many pieces."

References (Japanese title in Roman letters, English translation of that title, and author) to 14 of the best Japanese-language books about Japanese painting appear on p. 28; none have yet been translated. Address: Japan.

1533. Hooper, David. 1911. Soy bean in India: Glycine hispida. *Agricultural Ledger* (*Calcutta*) No. 3. p. 17-33. (Vegetable Product Series No. 114). Also reprinted in Tropical Agriculturalist, 1912. 38:11-15, 99-103.

• ***Summary:*** Contents: Introduction. Experimental cultivation in India. Vernacular names of the soybean. Method of cultivation: Green manure, harvesting. Races and varieties. Races in India: Yellow [grown in Poona Experimental Farm, Burma, Darjeeling, Dehra Dun, Simla, Punjab], green [Poona], black [Poona, Kashmir to Darjeeling, Simla], brown [Kashmir, Kalimpong to Darjeeling], mottled [Shillong, Assam]. Composition of the seed: From Church, from König, from Dr. J.W. Leather (1903), tables showing analyses made in India of Indian-grown Soy beans from various provinces (Burma, Hill Tracts, United Provinces [black seeds], and Poona). Soy bean oil. Soy bean oil-cake. Composition of hay. Use as food: Soy-bean milk, bean cheese (topo, sic tofu, or "Soy-bean cheese"), shoyu ("Under the name of 'Soy sauce' and other fanciful names it has formed the basis of most of the important sauces of Europe for many years."), roasted soy beans as a coffee substitute, soy beans in diabetic diets. Trade (exports of Soy bean from Manchuria to England). Price.

"The plant was introduced into the United States of America in 1854 and was grown to a small extent in the Southern States, but from the year 1885 its cultivation as a forage crop has gained in importance in all the agricultural centres. Within the last two or three years a great deal of interest has been taken in the cultivation of Soy, and experiments are in progress in Government Farms in Cape Colony, Natal [South Africa], East Africa, Gambia, Mauritius and Australia.

Contains a good early history of the soybean in India: "It is difficult to ascertain the date of the introduction of Soy beans into India. There is no doubt that certain hill tribes, mostly of Mongolian origin, have cultivated the bean for a long time. At the Punjab Exhibition held at Lahore [later divided between India and Pakistan] in 1864 Soy beans identified by Dr. Cleghorn, were sent from the Hill States. This is the first record of the beans being exhibited in this country, and shows that the cultivation was on a insignificant scale.

"Experiments in India. In 1882 Messrs. Jardine, Matheson & Co. of Hong-Kong sent a sample of Soy beans for experimental cultivation in the Saidapet Experimental Farm, Madras. The plants raised from these seeds were healthy but the yield of the crop was small.

"In 1897 Surgeon-Colonel W.G. King, Sanitary Commissioner, Madras, strongly advocated the cultivation of Soy bean as a valuable food worthy of the attention of the people. In two experiments carried on at Saidapet during 1897-98, the yield of seed per acre was 468 to 495 lbs., respectively. Recent enquiries in Madras resulted in the opinion that the cultivation in the Presidency is still in an experimental stage.

"In 1882 some Japanese Soy beans were sent by the Government of India for trial to Saharanpur. In 1885 very good results were obtained, the black seeded variety giving a yield of 1,124 lbs. per acre, and the white seeded variety giving a yield of 561 lbs. per acre. In 1886 the acclimatised seed was widely distributed; in some cases the crop failed and in others it was fairly successful, but as a rule where seed was harvested it was said that the pulse was not popular in any form. The Botanical Gardens grew the crop for a few years longer but as there was no demand for the seeds the cultivation was abandoned. An interest in Soy bean, however, seems to have revived for the Agricultural Department has this year sent to the Reporter on Economic Products samples of the black variety of Soy beans from forty villages of the United Provinces.

"At the Experimental Farm at Nagpur, Central Provinces, the bean was grown experimentally from

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Japanese seed first planted in 1885. The yield at the end of the first year was at the rate of 180 lbs. per acre, but taking the average of five years the result was 88 lbs. per acre. In the Report for 1908-09 it is stated that Soy beans were grown on a small area under field conditions and the yield was fair, but there was little local demand for the seed. It was, however, ground and formed an excellent addition to the diet of the farm cattle. Last year only 43 lbs. were obtained on light soil on the Nagpur Farm, the crop being practically a complete failure; on heavier soil 380 lbs. of seed were raised.

"Soy beans have been grown at Poona for nine or ten years with varying results, and they have also been tried at Nadiad in Gujrat [Gujarat] and elsewhere in the Bombay Presidency. In the Experimental Farm Report for 1901 a large yield was chronicled, but next year the crops at Poona and Surat failed. In 1904 a yield of 300 lbs. per acre was obtained in light land. One year later nineteen plots were under trial but with unpromising results, for only five yielded seed enough to repay the cost of cultivation. The yield varied from 50 to 293 lbs. per acre, and it was found that only when the yield exceeded 200 lbs. was the crop profitable. In 1905-06 the Manjri Farm, Poona, grew nineteen plots with better results, probably due to better soil. The yield of some of the plots was on an average of 680 lbs. per acre–a highly remunerative return. A year later it was reported by Mr. Fletcher, Deputy Director of Agriculture, that an experiment made on the edge of black cotton soil gave a yield of 1,166 lbs. per acre, while adjacent plots gave from 395 to 650 lbs. per acre.

"In the Agri.-Horticultural Gardens at Lahore Soy bean planted on a small area in 1894 yielded an estimated crop of 349 lbs. of seed per acre and 349 lbs. of fodder. Evidently it varies greatly in suitability to different soils and climates and does not seem to be adapted to the sea level plains of India.

"Gollan observed that the Japanese plant is erect, attaining a height of 12 to 15 inches, while the Himalayan form is a trailing plant. So far this vigorous growing plant does not appear in India to have been attacked by any insect or parasitic fungus.

"With regard to Burma, Mr. Burkill remarks: 'The Burmese grow it under the names of Pe-nga-pi and Pe-kyat-pyin, sowing it never in great quantities along with other beans on the mud banks as the falling rivers leave them bare in October, or more sparingly still away from the rivers. The Kachins and other hill tribes grow a little of it on their hill clearings, the Kachins call it Lasi. The Khasis, the Nagas and other tribes between the Brahmaputra and Upper Assam cultivate it similarly... In the Brahmaputra Valley it is grown as far as known only towards Barpeta in the Kamrup District.'

"Soy beans are called 'Bhut' in the Punjab, 'Bhat', 'Bhatwas' or 'Bhatmas' in the United Provinces and in the hills as far as Darjeeling, and 'Rymbai ktung' in Shillong and the Khasi Hills. Mr. B.C. Basu gives the Assamese name for *Glycine* as 'Patani jokra' and the corresponding Bengali name as 'Chhai.' In the Naga Hills it is called 'Tsudza' or 'Sudza.' It is grown by the Lepchas in Sikkim and is called by them 'Salyang' or 'Silliangdun.' 'Pe-nga-pi' is the usual name for Soy bean in Burma, but it has been received under the name of 'Lasi shapre tum' from Bhamo, and as 'Lasi N'Loi' and 'Lasi N'Hti' from Myitkyina. The Santali name appears to be 'Disom Horee.'"

"Dr. J.W. Leather in 1903 analysed the seeds of seven samples of Soy bean from Japanese seeds cultivated at Manjri, near Poona. The amount of oil in them varied from 14.92 to 23.05 per cent. being on the dry weight 15.97 to 24.41 per cent. with an average of 19.99. In 1902 Dr. Leather examined five samples grown on the Dumraon Farm. They yielded from 14.27 to 19.72 per cent of oil on the air-dried seeds.

"Fourteen samples of the seeds grown from Japanese seeds at the Manjri Experimental Farm were again analysed last year by a leading European firm. The percentage of moisture varied from 9.90 to 12.06, and the percentage of oil from 16.80 to 22.48...

"The following analyses of Indian-grown Soy beans were made in the laboratory of the Indian Museum in 1909 and 1910." Gives names and composition (oil [as is and on a dry basis], water, and ash) for 17 varieties from Burma, 21 from the Hill Tracts, 11 from the United Provinces [black seeds], and 15 varieties from Poona. "An attempt in 1903 to extract oil from these beans with the country *ghani* or indigenous oil-mill was a failure in Bombay."

Note: This is the earliest English-language document seen (April 2013) that uses the term "soy-bean cheese" to refer to tofu.

1534. Inaba, Riotaro [sic, Ryôtarô]. 1911. Ueber die Ernaehrung der Landarbeiter Japans [On the food and nutrition of the peasants of Japan]. Tokyo. 81 p. [Ger]

• ***Summary:*** Contents: 1. Introduction. 2. Preparation and conduct of the experiments. 3. Method of analysis of the foodstuffs, urine, and excrement / feces. 4. Result of the experiment. 5. Reflections upon the results of the experiment (1. On the worth of the peasant food in connection with the nutritional needs. 2. On the reabsorption {digestibility?} of the peasant food. 3. On the volume of the peasant food, distribution of the food among the individual meals. 4. On the quantity of urine and feces and individual constituents of the same among the Japanese, especially those who work the land).

Note 1. Why is a Japanese researcher doing nutritional and chemical research on Japanese peasant diets in Japan, writing in German? There are probably two reasons: (1) His professor at the Japanese or German university probably spoke and taught in German. (2) German was the language of science before World War I, largely because German scientific research was the most advanced in the world.

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Note 2. Since we have seen only the first 3 pages of this report, we do not know whether any soyfoods are mentioned. However it seems likely that either miso, soy sauce (shoyu) and/or tofu would be mentioned. Address: Oberstabarzt, kommandiert zum medizinisch-chemischen Institut der medizinishen Fakultaët [Fakultaet] der Universitaët Tokyo [Regimental Medical Officer, commanded by the Medical-Chemical Institute of the Medical Faculty, Univ. of Tokyo].

1535. Jingu Shicho. 1911. Koji ruien [Encyclopedia of early references to things Japanese]. Tokyo: Koten Kokyusho. Revised editions publ. in 1931 and 1971 by Yoshiko Bunkan; 51 volumes. Key volumes are Inshoku (#39) and Shokubutsu (#50). [50+ ref. Jap]

• ***Summary:*** Koji means "ancient things" or "origins." Rui means "varieties" or "description." En means "dictionary." This is one of the best books for doing historical research on Japanese culture, including foods. The book is divided into 30 major subject areas, such as Food and Drink. Within that section all basic Japanese foods and beverages are listed. After each one is listed many of the important early works in which that food is mentioned, with a quote of what is said. Furigana are used liberally to assist with pronunciations of hard-to-pronounce early document names and terms. Compiled from 1896 to 1914, volume 1 of the original edition is dated 1908. The works cited are from ancient times to 1867. The final volume is an index to the whole.

The volume on Food and Drink is titled *Inshoku-bu* (Vol. 51). Whole soybeans, p. 229-35. Black soybeans, p. 235-36. Green soybeans (*ao-daizu*), p. 236-37. Green vegetable soybeans (*edamame*), p. 239-40. Soybean cultivation, p. 240-42. Soybean utilization, p. 243-47. Daizu-ko Mochi, p. 555. Amazake, p. 695-97. Shirozake, p. 697-98. Hishio (Chiang), p. 836-40. Shoyu, p. 840-49. Miso, p. 851-68. Kuki (fermented black soybeans), p. 868-71. Natto, p. 871-74. Tofu (incl. Dengaku), p. 984-1005. Yuba, p. 995-96.

1536. King, F.H. (Franklin Hiram). 1911. Farmers of forty centuries, or permanent agriculture in China, Korea and Japan. Madison, Wisconsin: Mrs. F.H. King. ix + 441 p. Preface by Dr. L.H. Bailey. Portrait. Illust. Index. 20 cm. Reprinted in 1927 by Harcourt & Brace (NY, 379 p.). Facsimile reprint by Rodale Press, 1972.

• ***Summary:*** A superb, classic work which Wendell Berry called "one of the richest sources of information about peasant agriculture... one of the pioneer books of organic farming." Dr. Franklin Hiram King (lived 1848-1911; his portrait photo faces the title page) was former chief of USDA's Division of Soil Management. This is his journal, filled with many fine photos, of a voyage in the early 1900s through coastal China, Korea, and Japan. King was impressed by the productivity and efficiency of Chinese agriculture, and the strength and hardiness of the people.

In Japan: "How the fields are crowded with crops and all the land is made to do full duty... even the narrow dividing ridges but a foot wide, which retain the water on the rice paddies, are bearing a heavy crop of soy beans" (p. 31, photo p. 33).

In China, in printing blue on white cotton calico cloth, a thick paste of lime and freshly-ground soy bean flour was used. A stencil was placed on top of the cloth. "The paste was then deftly spread with a paddle over the surface and thus upon the cloth beneath wherever exposed through the openings in the stencil... The paste is permitted to dry upon the cloth and then the bolt has been dipped into the blue dye the portions protected by the paste remain white. In this simple manner the printing of calico has been done for centuries" (p. 122-23). A photo (p. 122) shows a stone mill, pulled by a blindfolded donkey, "in common use for grinding beans and various kinds of grain."

"Sprouted beans and peas of many kinds and the sprouts of other vegetables, such as onions, are very generally seen in the markets of both China and Japan, at least during the late winter and early spring,..." (p. 134).

In a section titled "Economy of Vegetable Diet" (p. 134-35) the author notes that these people "are vegetarians to a far higher degree than are most western nations, and the high maintenance efficiency of the agriculture of China, Korea, and Japan is in great measure rendered possible by the adoption of a diet so largely vegetarian." From every 100 lb of dry substance (feed) eaten by various kinds of livestock, only 4 pounds of flesh is returned for human food from cattle, only 5 lb from sheep and 11 lb from swine. "In view of these relations, only recently established as scientific facts by rigid research, it is remarkable that these very ancient people came long ago to discard cattle as milk and meat producers; to use sheep more for their pelts and wool than for food; while swine are the one kind of the three classes which they did retain in the role of middleman as transformers of coarse substances into human food."

Pages 145-48 describe how cotton seed is crushed and pressed to make cotton seed oil and cotton seed cake–one of the most common family industries in China. Page 226 notes that small farmers in Shantung province grow wheat, barley, large and small millet, sweet potatoes and soy beans or peanuts. Shelled peanuts are sold in gunny sacks. Pages 256-57 give a similar description for soy beans and peanuts used to make oil and cakes in Shantung, China, with a photo of the large stone mill. The "bean and peanut cakes," also used for fertilizer in Japan and China, are about 18 inches in diameter and 3-4 inches thick.

The section titled "Rotation of Crops" (p. 309) states of Nara, Japan: "To secure green manure for fertilizing, soy beans are planted each year in the space between the rows of barley, the barley being planted in November. One week after the barley is harvested the soy beans, which produce a yield of 160 kan per tan, or 5,290 pounds per acre, are turned under and fitted for rice."

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The chapter titled "Manchuria and Korea" notes of Lwanchow, Manchuria (p. 348-49): "The planting here, as elsewhere, is in rows but not of one kind of grain. Most frequently two rows of maize, kaoliang or millet alternated with the soy beans and usually not more than 28 inches apart, sharp high ridge cultivation being the general practice." A photo shows carts pulled by donkeys or horses piled high with sacks of soy beans at Lwanchow, Chihli, China, ready for export.

Note: As of Jan. 2013, Lwanchow is in Hebei province, in northeastern China.

When King's train reached Sinminfu [Xinmin in Liaoning province on the Mukden-Tientsin railroad] he saw "the first extensive massing of the huge bean cakes for export, together with enormous quantities of soy beans in sacks piled along the railway and in the freight yards or loaded on cars made up of trains ready to move." They soon arrived at "another station where the freight yards and all of the space along the tracks were piled high with bean cakes and yet the fields about were reflecting the impoverished condition of the soil through the yellow crops and their uneven growth on the fields.

"Since the Japanese-Russian war [1904-05], the shipments of soy beans and of bean cake from Manchuria have increased enormously. Up to this time there had been exports to the southern provinces of China where the bean cakes were used as fertilizers for the rice fields, but the new extensive markets have so raised the price that in several instances we were informed they could not then afford to use bean cake as fertilizer" (p. 357).

In Japan (p. 378-79): "Where bean cake is used as a fertilizer, the applications may be at the rate of 496 pounds per acre, carrying 33.7 pounds of nitrogen, nearly 5 pounds of phosphorus and 7.4 pounds of potassium." A table shows that typical fertilization for each crop of paddy rice, in pounds per acre, is: Manure compost 5,291. Green manure from soy beans 3,306. Soy bean cake 397. Superphosphate 198. The soy bean cake provides the most nitrogen (27.8 lb/acre). A photo (p. 420) shows peanuts being grown in the Tokyo plain (Chiba prefecture, July 17). "Peanuts, sweet potatoes and millet were the main dry land crops then on the ground, with paddy rice in the flooded basins" (p. 422). Address: Former Prof. of Agricultural Physics, Univ. of Wisconsin, and Chief of the Div. of Soil Management, USDA, Washington, DC.

1537. Lafar, Franz. 1911. Technical mycology: The utilization of microorganisms in the arts and manufactures. Vol. II. Eumycetic fermentation. Translated from the German by Charles T.C. Salter. London: Charles Griffin & Co. ix + 558 p. Illust. Index. 23 cm. [3240* ref. Eng]

• ***Summary:*** An extensive bibliography (3,240 references) for both this volume and volume I appears at the back of this volume (p. 417-518). The opening chapter begins: "Already in the first volume (sect. 22) the algae and the fungi were arranged in a single group. that of the Thallophytes, in contradistinction to all other plants, the latter being classed in the group Cormophytes." The latter group has "an articulation of the body of the individual organism into leaf and stem."

Chapter 43, titled "Morphology and systematology of the Mucors (p. 48+) contains sections on "Subdivision of the Mucor family" (p. 49-51), "The genus Mucor" (p. 51-53; The genus was established by Micheli as far back as 1729. It contains *Mucor Rouxii* and *Mucor mucedo*), and "Rizopeæ" (p. 53-56). An illustration (p. 55) shows *Rhizopus nigricans* (After Brefeld). *Rhizopus nigricans* is the best and longest known member of this family. In 1818 it was described by Ehrenberg under the name *Mucor stolonifer,* which is still used by several workers." "The name *Rhizopus oryzae* has been given by Went and Prinsen Geerligs (I.) to a fungus discovered by them in Ragi (sect. 241), the sporangia and spore of which organism are considerably smaller than those of *R. nigricans.*

Chapter 44, is titled "Fermentation by Mucors" (p. 57-62). Chapter 45, titled "The use of Mucoreæ in the spirit industry" (p. 63-71) has three sections: Sect. 240. "Mucor rouxii and other species of Amylomycetes" (p. 63-67) states: "For the preparation of rice spirit there is produced in China, Cochin China, and neighboring countries, an article known as Chinese Yeast, and put on the market in the form of flat mealy balls, about the size of a half-crown. Its preparation, composition, and application were first described in 1892 by E. Calmette (I.), whose reports were extended and supplemented by C. Eijkman (II.) in 1894." The method of preparation is given. More important than its bacteria are "the yeast cells, which must be regarded as the exciting agents of the alcoholic fermentation; and certain Mucors, which affect the saccharification of the starch. Of the last-named organisms, which concern us here,. Calmette isolated a species which, in honour of his teacher and colleague, E. Roux, he named *Amylomyces Rouxii."* Two illustrations show this organism, which produces a "diastatic enzyme" (p. 65). The so-called amylo process and the work of Colette and Boidin with *Beta-Amylomyces* and α-*Amylomyces* in this process are discussed (p. 65-66).

Sect. 241 titled "Ragi and tapej" [tapé or tapeh] (p. 67-69) states that "Tapej... is prepared from rice by the aid of a secondary auxiliary material, which the Malay natives of Java term Ragi or Raggi, and the Chinese settlers call Peh-Khah." A.G. Vorderman (1893) describes the preparation of Ragi. According to Eijkman (1894) Tapej, which is also called Tsao, is prepared with the aid of Ragi, by boiling husked Mochigome rice (*Oryza glutinosa* [*Oryzae sativa glutinosa*], known as "Ketan" in Java) in water until soft. The flora of Ragi and Tapej comprises three groups of microorganisms; bacteria, budding fungi, and fungi belonging to the family *Mucoraceæ.*

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Sect. 242, titled "The so-called Amylomyces process," (p. 69-71), or Amylo process for short, states that "this is the name given to the process for the industrial utilisation of the diastatic activity of *Mucor Rouxii* and several allied fungi. A company, the *'Société d'Amylo,* was founded by A. Collette and A. Bodin (I, 1897), who also, in 1897, took out in the name of this company a German patent for a 'process for producing alcohol from starchy materials, by means of aseptic saccharification and fermentation with *Mucedineæ,...'"*

Fernbach (II, 1899) has given a lucid description of the practical performance of this process in the patentees' works, the maize distillery at Seclin near Lille, France. This description is summarized. "An English patent for the mechanico-technological modification of the process was also taken out by Collette and Boidin (III.) in 1898." See also two other 1897 English patents by Collette and Boidin No. 19858 and No. 1155. "The reader interested in this matter will find more precise data in the review published by M. Delbrück (III, 1899). The chief advantage of the Amylomyces process is the abolition of the expensive additions of malt requisite in the older method of saccharification, the amount formerly needed being up to 15 per cent. in the case of maize, and 2 to 3 per cent. in the case of potatoes. With regard to the yield furnished by the Amylomyces process, it is stated that in the Seclin works, 37.8 litres of absolute alcohol are obtained per 100 kilos. of maize containing 57.5 p, a yield corresponding to 66.2 litres per 100 kilos of starch. Owing to the large amount of mycelial hyphae, the residue filters easily." "Finally it should be said that, since 1898, the aforesaid patentees have replaced *Mucor* (*Amylomyces*) *Rouxii* by another species, namely, so-called *Beta-Amylomyces,* or *Mucor Beta.* This organism is capable of dealing with more highly concentrated mashes than the other, and enables a charge of 25,000 kilos. of maize to be mashed to 1000 hl (22,000 gallons) of goods. per cent. of starch

Page 213 states that *Pichia farinosa* (Synonym: *Saccharomyces farinosus* Lindner, a film yeast) has been found by K. Saito (II, 1905, *Botanical Magazine,* Tokyo) in Japanese Soja sauce.

Chapter 51 discusses the genus *Aspergillus* (p. 228-31) with many fine illustrations, including conidiophores, conidia, ascospores, different stages of *A. oryzae* and *A. glaucus.* Page 228-29 state: *"Aspergillus Wentii,* Wehmer, was observed by Went in the preparation of Tao Yu (*see* vol. 1, p. 248) according to the method practised in Java, and was described by Wehmer (XIX.) in 1896. It appears spontaneously on the boiled Soja beans that have been covered with *Hibiscus* leaves, and affects a loosening and disintegration of the firm tissue of the bean. The species forms a pale coffee-coloured, dense mold vegetation (Fig. 167)."

In Chapter 57 titled "Chemical activity of the Aspergillaceæ," by Prof. Dr. C. Wehmer, page 270 states: "Two species, *Asp. oryzæ* and *Asp. Wentii* are reported as able to grow through the substance of soft-boiled rice and Soja beans..." The "enzyme mixture from *Asp. oryzae* (the so-called 'Takadiastase')" is also mentioned.

Chapter 62 titled "The Monillæ and Oidia," by Dr. H. Wichmann mentions *Monilia javanica* (occurring in association with others in Ragi, p. 333)., *"Monilia sitophila* (Mont.), Saccardo, is said by Went (IV.; reference missing) to be used by the natives in West Java in the preparation of a sweetmeat known as 'ontjom' composed of the seeds of the ground-nut or earth-nut (*Arachis hypogæa*). The ground-nuts, which are thoroughly permeated by the fungus, are made up in the form of small, orange-colored cakes, the surface of which is covered with the conidia, whilst the interior is both chemically altered and loosened in structure by the mycelium." Sect. 315 (p. 336-39) is titled "Oidium lactis and allied species." Also discusses *Oidium lupuli,* Matthews and Lott (p. 338). Address: Prof. of Fermentation-Physiology and Bacteriology, Imperial Technical High School, Vienna.

1538. Ministry of Agriculture and Commerce, Farm Bureau (Nôshômushô Nômukyoku). 1911. Nihon naichi ni okeru shuyô shokuryô-hin kome mugi oyobi daizu juyô kyôkyû no genzai oyobi shôrai [The present and future of the supply of and demand for the main foods (rice, barley and soybeans) in mainland Japan]. Tokyo: Seisan Chôsakai (Production Investigation Group). 91 p. 22 cm. [Jap]*
Address: Japan.

1539. Mori, Rintaro. 1911. Japan und seine Gesundheitspflege [Japan and its health care]. Tokyo: Rikugunsho, Imukyoku. 417 p. 28 cm. [Ger]*
• ***Summary:*** See part 3, titled *Japanische Soldatenkost* ("Japanese soldiers' rations"). Rintaro Mori was born in 1860.

1540. Okurasho Shuzeikyoku. 1911. Naikokuzei isan 53 [Domestic tax; treasure from the past 53]. Tokyo: Tokyozeimu Kantoku-kyoku. 1 vol. 23 cm. [Jap]*
• ***Summary:*** This is a Japanese government publication.
Note: This is the 3rd earliest book in WorldCat / OCLC that has miso as a subject or title word. Address: Japan.

1541. Pammel, Louis Hermann. 1911. A manual of poisonous plants: Chiefly in eastern North America, with brief notes on economic and medicinal plants, and numerous illustrations. Cedar Rapids, Ohio: The Torch Press. viii + 977 p. See p. 520. Illust. 24 cm.
• ***Summary:*** The chapter on Leguminosae, under "Economic plants" (p. 520) states: "The seed of the Adzuki bean (*Phaseolus mungo,* var. *glaber*), is used as a food in Japan. The soy bean... is used in large quantities by the Japanese and Chinese for food, but is little used in the United States,

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being here cultivated as a forage plant.

"Soy beans can only be fed in moderate quantities to cattle because of their purgative properties. A loss of a considerable number of cattle occurred in England recently where soy bean cake has been used. When fed mixed no trouble was caused, but when fed alone it caused poisoning." An illustration (line drawing, p. 520) shows the upper part of a soja bean plant with pods. L.H. Pammel was born in 1862. Address: Ph.D., Prof. of Botany, Iowa State College of Agriculture and Mechanic Arts.

1542. Porter, Robert P. 1911. The full recognition of Japan: Being a detailed account of the economic progress of the Japanese empire to 1911. London, New York, Toronto & Melbourne: Henry Frowde, Oxford University Press. x + 789 p. See p. 745-57. Maps. Index. 23 cm.

• ***Summary:*** Chapter 47, titled "The Soya Bean," begins: "The history of the growth of the bean trade in Manchuria is a captivating as the story of the rise of Jack's famous beanstalk of our nursery days. It reads more like a fairy tale than a page from the Board of Trade Returns. Only after one has travelled through the region where the Soy Bean reigns supreme, and has seen the wharves and the warehouses, the stations and the platforms, laden with bags of Beans, and noted the thousands of queer-looking stacks with pagoda-like roofs with which the country is dotted, and which serve as temporary storehouses for the produce while awaiting shipment, does one realise that it is not a fable, but a veritable fact in the history of international commerce... And the manifold uses, agricultural and industrial, as well as dietary, to which the bean can be put, invest this generous vegetable with increasing importance, and the future of the Bean crop with romantic mystery."

Maps show: (1) The journey round the world. (2) Chosen (Korea). (3) Taiwan (Formosa). (4) The Siberian railways. (5) The Japanese empire. Japan and Hokkaido. Inset map of Karafuta (Japanese Saghalien). (6) Administrative divisions and chief railways of Japan. (7) The industries of Japan. Address: 108 Banbury Rd., Oxford, England.

1543. Sawer, E.R. 1911. Cedara memoirs on South African Agriculture. Vol. II. Containing reports on feeding crops and livestock experiments in South Africa. Natal/ Pietermartizburg, South Africa. 371 p. See p. 131, 177, 183-218. Report X. The Legumes as Grain and Oil Crops: Soya Beans. [15 ref]

• ***Summary:*** A superb, early overview of soybeans and their uses in South Africa and England. Contents: An agricultural romance. Early experiments with the soya bean [in Europe and South Africa]. Export trade from Manchuria. The course of prices. Consumption in Great Britain. Botanical character. The commercial aspect. History of the oil market during 1910. The adaptability of the bean. Germination of seed. Climatic requirements. Classification of varieties. Variety tests at Cedara: Black seeded (Buckshot and Nuttall tested in 1906), brown seeded, green seeded (Samarow and Guelph), yellow seeded (Mammoth and Hollybrook, planted Nov. 1908). The cultivation of the crop. Times of planting. Distances of planting. Manure experiments at Cedara. Nodule formation and composition of the plant. Harvesting soya beans. Storage of seed. Comparative yields of grain. Soya bean oil. Uses of the oil [for cooking, paint, soap, etc.]. Soya beans as human food (incl. natto, tofu, miso, yuba, shoyu {p. 209-11}). Digestion experiments [on humans in Japan]. Milling experiments. Soya beans as stock food and fertiliser. Live-stock experiments. Soya cake as fertiliser. Soya bean as green forage.

Concerning industrial utilization: The Vice-Consul-General at Yokohama writes that "the annual value of fertilisers employed in this country (Japan) amounts on an average to about £8,000,000 represented in equal proportions by artificial fertilisers and soya bean cake." The year 1908 was exceptional, however, in that the value of the bean cake was 3.5 times that of the artificial fertilizers.

During 1910 the linseed oil reached its highest price in 50 years. Soya oil, now produced in large amounts in Manchuria after the Russo-Japanese war took its place. It was used in making paints, candles, and soaps. "Soya bean oil has been found eminently suitable for the soap-makers' purpose on account of its low content of free fatty acids and of unsaponifiable matter or impurities. In the latter respect it has been shown superior to any of the other oils or fats of commerce, whether of vegetable or animal origin. The glycerine, which is secured as a by-product of soap and candle manufacture, is subsequently distilled for explosives, such as dynamite, blasting gelatine, cordite, etc., and for various purposes in the arts, for filling gas-metres, for the manufacture of inks, printers' rollers, etc. The residue from the distillation of glycerine is used in the manufacture of boot blacking."

Concerning germination (p. 191): At Cedara: "The first crop was planted in 1903, and a maximum yield of 920 lb. of grain obtained per acre. In the following season, characterized by unfavourable weather conditions, the heaviest yield on a new series of plots was 780 lb. per acre. A third season's trial on the same ground, however, witnessed a marked increase with local seed, the heaviest crop totalling 1,252 lb. of grain."

Concerning soybean cultivation in British colonies in Africa (p. 192): "Early last summer the late Sir Alfred Jones shipped to West Africa soya beans for experimental purposes, and it was subsequently reported by Mr. A.G. Turner, who was entrusted with a special mission to encourage this culture on the west coast, that the soya bean could be successfully cultivated throughout the Gambia, Sierra Leone, Nigeria, and the Gold Coast Colony, but that the yield to the first experiment had only been from six to

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eight bushels per acre, there having been a considerable loss owing to faulty germination. Later results, however, were phenomenally successful."

Concerning soybean trials in South Africa (p. 192-93): "During the past year favourable results have been received from Umzinto [from Messrs. Archibald and Co., 52 miles south of Durban; elevation 300 feet], Nel's Rust Estate [64 miles north of Durban; elevation 2,710 feet], Nottingham Road [elevation 4,807 feet], and Naval Hill [Mr. J.R.T. Clouston of Garrow planted a few acres in 1908], Colenso [elevation 3,200 feet], and Cedara [82 miles by rail from Durban; elevation 3,540 feet; a number of varieties were tested in 1906] in Natal; and from Barberton and Pretoria in the Transvaal."

Concerning comparative yields (p. 203): "As a grain producer, the soya bean compares very favourably with other leguminous crops, such as field beans, peas, etc. At Cedara no other legume has produced, with chemical manures only, so heavy a yield of seed; and no other legume, except the lupine, has showed itself so much to be depended upon as a grain producer." "Land that will produce 10 muids of maize per acre should yield at least six muids of beans after the second year's cultivation,..."

Concerning human digestion experiments (p. 212): "The general opinion of Japanese investigators, and others familiar with Oriental dietetics, is that the protein in articles of food prepared from soya beans is in a very available form, and that these preparations are most valuable foods."

Five photos show various men standing in a crop of soya beans and in some of the variety plots at Cedara (1909-11). An illustration (line drawing) shows a curing frame for soya beans.

Tables show: (1) Yields in lb. per acre of soya beans sown at different times, during 3 years (19-3-04 to 1905-06). For each year is given: Date of sowing, date of harvest, yield of grain and straw, and manures used (superphosphate, gypsum, and potash). The variety tested was Henderson's Early Green (Guelph) (p. 198). (2) Results of manure experiments with soya bean (Early Green) in lb. per acre. Sown 4 Nov. 1904. Harvested 13 March 1905. Increasing yields "may be attributed to the association of nitro-bacteria, the benefits of constant cultivation, and the accumulation of humus and residues of fertilizers" (p. 200). (3) Feeding value of soya bean cakes for manure, based on experiments by Messrs. Lever Bros., Port Sunlight, Liverpool (p. 215).

Note 1. This is the earliest document seen (June 2004) that mentions the use of a soy oil derivative (glycerine) in printing inks.

Note 2. This is the earliest document seen (May 2004) that mentions the use of soy oil to make candles (one of two documents).

Note 3. This is the earliest document seen (June 2004) concerning the use of soy oil (or the glycerine derived from it) to make explosives.

Note 4. The next section of this report (p. 218+) is about ground nuts (*Arachis hypogoea*). Address: Director, Div. of Agriculture and Forestry, Natal; Principal, Cedara School of Agriculture; Formerly Asst. Secretary of Agriculture, Southern Rhodesia.

1544. Stuart, George A. 1911. Chinese materia medica: Vegetable kingdom. Shanghai, China: American Presbyterian Mission Press. 558 p. See p. 189-96, 411. 23 cm. Reprinted in 1928 in Shanghai at the Presbyterian Mission Press. [6 ref]
• ***Summary:*** Below the title is written: "Extensively revised from Dr. F. Porter Smith's work." This excellent book contains good summaries of the information on soyfoods found in the famous *Pen-ts'ao kang-mu* (1578-1597) by Li Shih-chen. Rev. Stuart, a physician (M.D.), minister, and missionary in China, adds a number of observations on medicinal properties ascribed to these foods by the Chinese. He began to write this revision of Dr. Smith's 1871 work in 1900 when the Boxer trouble (movement) drove him to Shanghai. He died shortly before the work was published and before he was able to finish the Preface. The section on the soy bean (p. 189-96) begins: "Glycine hispidia [sic, hispida].–(Ta-tou), (Shu), (Jên-shu), (Jung-shu), (Shih-tou), (Hei-tou), (Huang tou) (Chinese characters given before each term). This is the same as *Soja hispidia* [sic, *hispida*] and *Dolichos soia* [sic, *soja*], and is the Chinese and Japanese *soy bean.* It has been known in China from ancient times, and has always been considered by the Chinese as the most important of the cultivated leguminous plants. A very large number of varieties is found throughout the Empire, especially in the north. The name 'great bean' applies to the plant, not to the seeds, as these are quite small. It is employed in China and Japan in the preparation of three products which are of almost universal use in oriental cookery. These are 'bean oil,' 'bean-curd,' and 'soy.' There are many varieties of this bean, which the Chinese distinguish by the color of the seeds; these being black, white, yellow, gray, azure, and spotted."

"The black sort [of soybean] is used in medicine, and the yellow is especially valued in the preparation of bean-curd [tofu] and soy [sauce]. The black kind is not used much as food as it is thought to render the body heavy. The Chinese regard those things which give lightness to the body with more favor than those which promote flesh and sluggishness. The characters (Shu) (three separate Chinese characters are given) are the classical name, while (Jên-shu) and (Jung-shu) (Chinese characters given before each) are equally ancient compound names for this plant. (Chinese characters given) (Shih-tou), 'bean-relish bean,' indicates its use in making the bean relish and soy [fermented black soybeans and soy sauce].

"Medicinally, the black beans are considered to have much value. Their frequent use is thought to have a most beneficial effect upon the body, giving strength and vigor,

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albeit with heaviness. This latter fact is the only objection offered to the use of these beans. They are regarded as an admirable counter-poison against most of the vegetable poisons, such as *Aconite* and *Croton tiglii.* Carminative and quieting properties are also ascribed to them. They are prescribed in a large number of difficulties, notably post-partum and sexual disorders; but as they are always in combination with other active drugs, it may be readily supposed that the beans play no very important part in these prescriptions. The green bean hulls, 1317, chewed into a pulp, are applied to small pox ulcers, corneal ulcer, and the excoriation produced in children by urine. The bruised leaves of the plant are used as a local application in snake bite. The flowers, 1310, are used in blindness and opacity of the cornea."

"The *bean sprouts,* called (Ta-tou huang-chüan) and (Tou-nieh) (Chinese characters are given before each term) are also mentioned in the *Pentsao.* Bean-sprouts (Chinese characters are given, Tou-ya) are a common article of diet with the Chinese, but these former are made with the black bean and are especially used in medicine. Li Shih-chen gives the following method of preparation: "On a water day (Three Chinese characters) soak black beans in clear water, and after the sprouts have grown, take off the hulls and dry the sprouts in the shade." Their medical properties are considered to be laxative, resolvent, and constructive. They are reputed to have special influence upon the growth of the hair, and to be curative in ascites and rheumatism.

Note 1. This is the earliest English-language document seen (Jan. 2013) that uses the term *Ta-tou huang-chüan* or the term *Tou-nieh* to refer to soy sprouts.

Note 2. *Webster's Dictionary* defines ascites (pronounced uh-SAIT-ez, and first used in the 14th century) as "accumulation of serous fluid in the spaces between tissues and organs in the cavity of the abdomen."

"The yellow variety of beans is also given a separate discussion in the *Pêntsao.* As was before said, these are used for the most part in the preparation of bean oil, bean-curd, and soy [sauce]. The beans and pods of this variety are larger than those of the black kind, and in the green state they are highly esteemed by the Chinese as an article of food [green vegetable soybeans]. But they are also considered 'heavy,' and if partaken of too freely they are thought to produce jaundice. They are considered to be carminative and deobstruent, and are recommended in ascites. Locally they are applied to smallpox ulcers. The ashes of bean stalks are specially recommended as an application to unhealthy granulations in hemorrhoids (possibly fungous growths of the anus).

"The [soy] oil, (Chinese characters for bean + oil) (Tou-yu), is considered to be very slightly deleterious, and is used as a local application to ulcers and skin diseases, and for removing bandoline (defined by the *Oxford English Dictionary* as "a gummy preparation for fixing the hair or a moustache" and in use by 1846) from the hair. This oil is manufactured in large quantities, especially in Manchuria, and is shipped to every part of China. It is used as food, chiefly by the poorer people, and was formerly used as a burning oil; but kerosene has now almost superseded it for this latter purpose. It is usually dark colored, and has a not very pleasant odor."

On page 411 we read: "Soja hispida–(Chinese characters for white + bean) (Pai-tou). Also called (Chinese characters are given) Fan-tou. This is a small bean, a variety of *Glycine hispidia* [sic, hispida], the stalks of which, when young, are eaten as a pot-herb. The bean is sometimes used to make soy [sauce] and bean-curd, and is eaten boiled and as a congee. It is considered to belong to the kidneys, therefore those suffering from diseases of this organ should use it. The bean is regarded as very nutritious, and both it and the leaves benefit the viscera."

Note 3. Congee is rice cooked with excess water to make a porridge. In China, there are many types of medicinal congee (*jook*) containing grains, vegetables or herbs, eggs, meat, etc. See: Flaws, Bob. 1995. *The Book of Jook: Chinese medicinal porridges.* Boulder, Colorado: Blue Poppy Press. $16.95. Address: Rev., M.D., Shanghai, China.

1545. Takenob, Y. 1911. Japan Year Book. Tokyo: Japan Year Book Office. 800 p. See p. xii, 48, 133, 319-20, 368-69, 390-92, 412, 548, 554-55, 559, 583, 591-92, 606, 695, 723. Sixth annual issue. [Eng]

• ***Summary:*** This issue gives statistics for the Japanese empire: Japan Proper, Korea, and Formosa.

Page 320. In the chapter on "Agriculture." A table shows production of soy beans, potatoes, and sweet potatoes, 1904-1908 (in 1,000 koku). Production of soy beans increased from:

3.710 million *koku* in 1904
3.261 million *koku* in 1905
3.517 million *koku* in 1906
3.667 million *koku* in 1907
3.842 million *koku* in 1908. Address: Japan.

1546. Takushoku Kyoku, Japan. 1911. Daizu ni kansuru chôsa [Survey of soybeans]. Tokyo: Takushoku Kyoku. 2 + 6 + 406 p. 23 cm. Series: Takushoku Kyokuhô no. 25. [Jap]*

• ***Summary:*** This survey was conducted in Manchuria, Chosen (Korea), and Japan. *Takushoku* means "colonization," so the survey was conducted and published by the colonization office. Includes bibliographic references.

1547. Tsuyutani, Heiji. 1911. Tôfu no goyô [An order for tofu]. Kobe: Tsuyutani-dô. 71 p. 19 cm. [Jap]*

• ***Summary:*** In the olden days (as late as the 1950s), tofu vendors peddled their wares down every street in major cities. They would wait outside for potential customers to come out and buy. Address: Kobe, Japan.

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1548. Zavitz, C.A. 1911. The professor of field husbandry and director of field experiments. *Ontario Agricultural College and Experimental Farm* (*Guelph*)*, Annual Report* 36:169-247. For the year 1910. See p. 217-18.
• ***Summary:*** The section titled "Varieties of soy beans" (p. 217-18) states: "Soy beans or Japanese beans have been advertised in seed catalogues under the name of Soja beans. During recent years, a considerable interest has been taken in this crop in England, the United States, and in Canada... Probably thirty varieties in all have been under experiment in our college, but only a few of these ripen their seed. The two varieties that have become the most prominent in our experiments at Guelph are Early Yellow and Medium Yellow. [Note: The Guelph variety was not developed in Canada.] The Early Yellow variety has proven to be one of the best for most parts of the Province as it yields very well and matures early. In the average results of growing the Early Yellow Soy Beans at the College in each of fifteen years we have obtained exactly 15 bushels of threshed seed per acre.

"In 1909 and again in 1910, no less than sixteen varieties of Soy Beans were grown in the Experimental Department. A number of these were tested in 1909 for the first time, several of them being obtained from Dr. Piper, Department of Agriculture, Washington [DC]."

In 1910 soybean trials, the greatest yields were obtained by the following varieties: Chernie 23.5 bushels/acre, Habara [Habaro] 21.6 bu, Buckshot 21 bu, Tsurunoko 19.6 bu, Akasaya 17.5 bu, and Early Yellow 17.2 bu. All other varieties gave 15 or less bushels per acre. Address: Guelph, Ontario.

1549. Nishimura, Torazô. 1912. Shôyu moromi oyobi shôyu ni shôzuru sanmakusei kôbo kinrui (zoku ni shôyu no kabi to shôsu) ni kansuru kenkyû [Species of film-building yeasts on shoyu]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 113. p. 1-45. Jan. 5. [Jap]
• ***Summary:*** In the English-language table of contents, shoyu is called "Soya." Address: Nôgaku-shi, Japan.

1550. *Boston Daily Globe.* 1912. Artificial milk: Japs make excellent imitation from soja beans. Jan. 14. p. 34.
• ***Summary:*** This article is very similar to one that appeared about two months earlier: *Washington Post.* 1911. "Manifactured [sic, manufactured] milk: Tid bits." Nov. 26. p. MS2.

1551. Hooper, David. 1912. Soy bean in India: Glycine hispida. *Tropical Agriculturist* (*Ceylon*) 38(1):11-15. Jan. 15; 38(2):99-103. Feb. 15. [1 ref]
• ***Summary:*** This is a reprint of an article by the same author with the same title published in 1911 in *Agricultural Ledger* (Calcutta) No. 3. p. 17-33. Address: Australia.

1552. Howland, John A. 1912. The week's progress: Substitute from rubber from bean. *Chicago Daily Tribune.* Feb. 4. p. E4.
• ***Summary:*** "One of the many proposed substitutes for rubber is obtained from the soya or Manchurian bean, which resembles the kidney bean, and is being introduced from Japan and the East Indies into other countries. A rubberlike product that can be vulcanized is obtained by treating the bean with nitric acid, alkalies, and great heat."

1553. Horne, H. 1912. China (Manchuria). Bean trade. *Board of Trade Journal* (*London*) 76:489. Feb. 29.
• ***Summary:*** "Something like a deadlock has recently been experienced in the staple export trade of this district as a consequence of over-trading and speculation on forward contracts. The radical cause of the trouble is the non-existence of any custom which demands earnest money from buyer or seller at the time of transacting forward business...

"Increased prosperity has enabled the Chinese farmer, who is still mindful of the high prices ruling at the close of the last two seasons, to hold up his stocks. As a result of this action high prices ruled, and the smaller dealers, who speculated on normal conditions, were not able to fulfil their forward contracts with the market against them. Speculation was not confined to bean dealers alone; the local oil and cake millers acted on similar lines.

"As a remedy for the disturbance three measures were proposed, two of which are, indeed, already in operation. The first was the suspension of all forward contracts; the second, a compulsory deposit, upon definite terms, of guarantee money ranging from 10 per cent. to 50 per cent. from buyer and seller. These measures were proposed by a Committee of the Staple Produce Dealers' Association. The third measure was a proposal for the settlement of prices on forward contracts then falling due by a committee composed of the Civil Administrator of Dairen, and representatives of the Yokohama Specie Bank and the Mitsui Bussan Kwaisha.

"Up to the end of January the exports of beans to South China showed a decrease of 65 per cent. on the figures for the corresponding period of last year; exports to Japan maintained their position; Europe has taken about 15,500 tons." Address: British Acting Consul, Dairen.

1554. Li, Yu-ying; Grandvoinnet, L. 1912. Le soja [The soybean]. *Agriculture Pratique des Pays Chauds* (*Bulletin du Jardin Colonial*) 12(107):120-32. Feb. [12 ref. Fre]
• ***Summary:*** Contents (continued): 2. Soy flour and its derivatives: Soy flour (preparation, chemical composition), soy bread (*pain de soja*), wholemeal bread (*pain complet*), other products based on soy flour (as biscuits and cakes for diabetic diets). 3. Soy oil and by-products of the oil mill: Soy oil (physical and chemical properties, usage, price), residue of the oil mill: the cake (price, uses). 4. Use of the soybean as a legume: Whole soybeans (composition, digestibility),

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soy sprouts (*germes de soja*), green vegetable soybeans (*le soja frais*). 5. Fermented soy condiments–Solid condiments from Japan: Tokyo natto (*Le Tokio-Natto,* whole fermented soybeans, without salt) and Ping-Ming natto. (*Le Ping-ming-Natto;* fermented black soybeans with salt, ginger, orange rind, etc. A similar product is made in China and called *tao-tche*).

Note 1. This is the earliest French-language document seen (Feb. 2004) that uses the term *Tokio-Natto* to refer to natto.

Note 2. Footnote 2 under Soy bread (p. 122) states: "M. Dujardin-Beaumetz, *L'Alimentation et les Régimes;"* Soy bread constitutes a major step forward in the feeding of diabetics; it has a long shelf life and a relatively agreeable flavor.

Note 3. The book referred to here is probably: Dujardin-Beaumetz, Georges Octave. 1889. "L'hygiène alimentaire: Aliments, alimentation, régime alimentaire dans les maladies. Deuxième édition revue, corrigée et augmentée" [Food hygiene: Foods, feeding, special diets for illnesses. 2nd ed., revised, corrected, and expanded]. Paris: Octave Doin. viii + 239 p. Series: Conférences de Thérapeutique de l'Hopital Cochin, 1885-1886. Illust. Address: 1. Counseiller de 1ere classe au Ministère de l'Agriculture de la Chine; 2. Ingénieur agricole (G.).

1555. Williams, C.G.; Welton, F.A. 1912. The soybean and cowpea. *Ohio Agricultural Experiment Station, Bulletin* No. 237. p. 239-61. Feb.

• ***Summary:*** Contents: Uses: As grain, hay, silage, a soiling crop, pasture, and for soil renovation. Culture: Soils, fertilizers and inoculation, seedbed, cultivation, time of seeding, rate of seeding, manner of seeding. Harvesting: Hay, silage, seed, threshing. Varieties: Table III (p. 252) describes 32 varieties of soybeans including their weight, color, manner of growth, date of bloom, color of bloom, and average height of plants. Table IV (p. 253) gives the yield of grain and straw for 32 varieties and includes the average date of maturity, average number of days to maturity (112-135), average yield per acre of beans (1908-11, plus 2 year and 4 year averages; highest 2 year average was 25.5 bu/acre) and of straw (highest 2 year average was 2,275 lb/acre), pounds of straw per bushel of grain (63-116), and retention of beans (Good, fair, or excellent), and enemies of soybeans ("So far as this Station is aware, there are no enemies of economic importance to the soybean in the state."). Table V (p. 255) shows many varieties of soybeans grouped into early (116 days or less), medium (117-126 days), and late (127-132 days). For each variety is given: Average date of maturity in Ohio, average number of days to maturity, two-year average yield per acre of beans and straw, and weight per bushel of seed.

"Within the last twenty or twenty-five years it [the soybean] has gained considerable prominence in the agriculture of several states, notably Massachusetts and Kansas, into both of which states the seed was imported direct from Japan. The wide variations in different varieties as regards time of maturity, permit it to be grown pretty generally throughout the United States. Roughly speaking, the earliest varieties can be grown successfully as far north as corn. In Ohio the acreage at present is not large, but is rapidly increasing. The Ohio Experiment Station has been growing soybeans continuously in a small way since 1894. From year to year the acreage has been gradually increased, until now about fifteen acres are grown annually."

Harvesting: The harvesting of soybeans for hay is "the most difficult work connected with the growing of the crop. No satisfactory machinery especially adapted to handling them has as yet been placed on the market... For the harvesting of soybeans for seed, probably the best machinery available is either the ordinary mower with side delivery attachment, or the old-time self-raking reaper.

"Threshing: While it is essential to have soybeans well cured before threshing, yet at the time of threshing it is desirable that they be damp or 'tough.' In this condition they can be threshed in an ordinary threshing machine with very little cracking of beans, providing the machine be run slowly and with blank concaves."

Photos show: A field of soybeans, July 27, 47 days after planting (oval photo on cover). A soybean plant with leaves removed and many pods visible (p. 242). Soybean roots with and without nodules (p. 246, from *First Principles of Soil Fertility,* by Vivian).

Note 1. This is the 2nd earliest English-language document seen (July 2003) with the word "soybean" or "soybeans" in the title. Note that this is an experiment station publication.

Note 2. This is the earliest English-language document seen (Aug. 2001) that uses the term "enemies" (or "enemy") in connection with soybean pests.

Note 3. This is the earliest document seen (Jan. 1998) that mentions the use of a reaper (self-raking reaper) for soybean production. Address: 1. Chief, Agronomy; 2. B.S., Asst., Agronomy. Both: Wooster, Ohio.

1556. Nishimura, Torazô. 1912. Shôyu oyobi miso ni kansuru kenkyû seiseki hôkoku [Results of studies on shoyu and miso]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 115. p. 1-10. March 5; No. 116. p. 1-31. April 5. [Jap]
Address: Nôgaku-shi, Japan.

1557. Li, Yu-ying; Grandvoinnet, L. 1912. Le soja [The soybean]. *Agriculture Pratique des Pays Chauds* (*Bulletin du Jardin Colonial*) 12(108):213-23. March. [7 ref. Fre]

• ***Summary:*** Contents (continued): Products and condiments based on fermented soybeans. 5. Condiments in paste form (*Condiments pâteux*)*:* Miso (preparation, different varieties

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including white miso, Yeddo miso, Sandai [Sendai] miso or red miso, composition of miso {a table based on studies by Kellner and König}), Tao-Tjiung (Tou-chiang, doujiang) or Chinese-style miso (preparation, properties, composition {a table based on analyses by Prinsen-Geerligs}).
Sauces: Shoyu (Schoyou, soyou, schoyu, or Phek-sze-You in Chinese; preparation, raw materials used and their proportions, formation of molds and koji, fermentation, perfection of the fermentation process in an aseptic environment using soymilk or soy bouillon inoculated with pure cultures), properties of shoyu, chemical composition of shoyu (tables show: (1) Composition based on analyses by Kellner, Stift, Belohoubeck, Tahara & Kitao. (2) Composition and forms of nitrogen according to Suzuki, Azo [sic, Aso], and Mitarai (3 tables)), aroma of shoyu (2 tables based on analyses by Tahara and Kitao; Belohoubeck found two types of microbes in shoyu; the Saccharomyces and the bacteria). *Chiang-yu* (*Tsiang-yeou;* Chinese soy sauce), Ketjap (soy sauce from Java).

Note: This is the earliest French-language document seen (April 2012) that uses the word *Schoyou* or the term *Phek-sze-You* to refer to soy sauce. Address: 1. Counseiller de 1ere classe au Ministère de l'Agriculture de la Chine; 2. Ingénieur agricole (G.).

1558. Yoshida, T. 1912. Seisei shôyu no kôbo ni tsuite oyobi sono seibun ni oyobosu sayô [On the yeast of shoyu and its influence on constituents]. *Sapporo Norin Gakkaiho* (*J. of the Society of Agriculture and Forestry, Sapporo*) No. 13. p. 1-27. March. [Jap]
Address: Nôgaku-shi.

1559. Kuriyama, Masao. 1912. Shôyu oyobi mirin-chû ni ganyû suru tôbun no kenshutsu-hô [A method for the detection of sugars in shoyu and mirin]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 116. p. 25-31. April 5. [Jap]
Address: Japan.

1560. Maynard, Lester. 1912. Manchurian trade notes. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 15(87):172-73. April 12.
• ***Summary:*** "The new bean-oil mill of Kiosensha & Co. (Japanese), at old Harbin, has been completed, inspected, and passed by the technical and sanitary committee of the Chinese Eastern Railway, and will soon be in operation."

"The soya bean market of Harbin is inactive now and has been for three weeks. This may be partially accounted for by the Chinese new year, but the main cause was the heavy purchases prior to the holidays by Mitsui & Co. These purchases totaled about two-thirds of the available stocks, and forced the price so high that it was impossible to ship. The heavy purchases were apparently made in an effort to corner the market... The price has gradually dropped to 64 kopecks (33 cents) per pood (36.112 pounds), but no sales are being recorded." It is reported that "Mitsui & Co. have a stock of 1,000 cars at Vladivostok."

"Two bean-oil tank cars constructed at the railway workshops, Dalny, were subjected to a trial run with satisfactory results. Each car has 27 tons capacity and is partitioned into four chambers for transporting oil in small consignments."

Note: This the earliest document seen (Jan. 2010) that uses the term "tank cars" (or "tank car") to refer to a railroad car with a tank mounted on top for carrying liquids–in this case [soy] bean oil. Address: Consul, Harbin, China.

1561. *Agricultural J. of India* (*Calcutta*). 1912. Soy beans. 7(2):207-08. [1 ref]
• ***Summary:*** "The Report on the Agricultural Stations in the Central Provinces and Berar for the year 1910-11 contains a few notes on the experiments with the cultivation of Soy Bean at the Powarkhera and Nagpur College Farms." At Powarkhera, a small-seeded Japanese variety grew splendidly and gave a yield of about 800 pounds of beans per acre. But analysis showed that these beans contained only 10% oil and are thus more suited for forage purposes. On the Nagpur College Farm, the farm variety, introduced in 1882, was grown on an extended scale this year with and without superphosphate: 10 acres were sown... Some 15 new varieties were tried this year. At Pusa, too, soy beans obtained from Nagpur were tried, with the result that a yield of nearly seven maunds per acre was obtained, which is not sufficient to pay for the cultivation and for the occupation of the land for two seasons.–[Editor].

1562. Eichenger, A. 1912. Ueber Leguminosenanbau und Impfversuche [Regarding legume cultivation and inoculation experiments]. *Pflanzer* 8(4):190-219. April. English-language summary in USDA Experiment Station Record 27:419. [8 ref. Ger]
• ***Summary:*** Soy beans are discussed extensively on p. 210-15. Experiments were made to determine the value at Amani, German East Africa, of inoculating soils with nitrogen-fixing bacteria, with and without fertilizers, for the growth of various crops including soy beans, cowpeas, *Desmodium tortuosum,* and *Canavalia ensiformis* [jack bean], and the value of these crops for green manuring purposes. Eichinger observed that superphosphate increased the production of nodules, whereas sodium nitrate inhibited nodule formation.

Eight soybean varieties were tested–with all but the first obtained from Yokohama. Chinese white type (2). Natsu-Mame (white). Shiro Daizu (white). Kuro Teppo (black). Kuro Mame (black). Ao Mame (white). Gogatsumame (white). Daizu (white). Soy beans require a special type of bacterium for inoculation. However these studies seemed to indicate that the production of soy beans is not profitable in

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this area.

Note 1. As of Jan. 2000, Amani is in Tanzania.

Note 2. This is the earliest document seen (Aug. 2009) concerning soybeans in Tanzania, or the cultivation of soybeans in Tanzania.

Note 3. This is the earliest English-language document seen (Oct. 1999) that uses the term "sodium nitrate" (as a fertilizer) in connection with soybeans. It was often previously named "nitrate of soda." Address: Dr., Amani [German East Africa].

1563. *J. of the Board of Agriculture* (*London*). 1912. Cultivation of soy beans in Britain. 19(1):33-35. April.
• ***Summary:*** "Previous to 1909 a few attempts to grow the crop [soy bean in England] had been made, but without any great success; at best, the plants obtained grew up to the flowering stage, but no seed was formed. The Board, thinking it possible that the seeds previously tried might have come from hotter climates and have been of varieties quite unsuited to this country, obtained from an Experiment Station in North Japan, seed of sixteen varieties of soy bean, along with a small quantity of soil in which the crop had been grown. These were grown in 1909 by Mr. Jay Golding at the Midland Agricultural College, and Professor [Roland] Biffen at Cambridge.

"In the autumn of 1909 Mr. Golding reported that the seeds were sown on May 6th, and many of them grew well and vigorously, but none flowered. Even some lifted and placed in a greenhouse refused to do so. The plants were, however, strong and healthy, and the roots were covered with an abundance of large nodules. At Cambridge the results were similar..."

"These experiments appeared to suggest that Japanese varieties were not suited for conditions here, so in the following year the Board obtained, through the Seed Crushers' Association, some Manchurian soy beans. One sample had been grown in North Manchuria, the other in the South, and each clearly contained several distinct varieties. These were grown as before by Mr. Golding and Professor Biffen. The former reported that again, though the crop had grown vigorously with abundant formation of root nodules, no seed matured. At Cambridge the test was more successful, the plants, though not growing very vigorously, flowered about mid-August and ripened a small quantity of seed about the end of September. This seed was sown in April, 1911, but the crop made very little growth, and in spite of the hot season no seed was produced.

"These results soon to prove fairly conclusively that none of the varieties of soy bean yet tried can be relied on to produce seed... Apart from seed-production, the plant has, however, a considerable value as a forage crop, and it is quite possible that in some cases it may be found useful for that purpose in this country... Mr. Golding has supplied the following analyses of the green forage produced by the two varieties of Manchurian bean in 1910."

1564. Yokohama Nursery Co., Ltd. 1912. Descriptive catalogue... Bulbs, plants seeds. 1912-1913. Yokohama, Japan. 112 p. April. Illust. Index. 26 cm. [Eng]
• ***Summary:*** On the cover of this English-language catalog is an illustration of leguminous flowers. In the section on "Seeds" (p. 90+) is a subsection (p. 97) titled "Some vegetable seeds." The contents (incl. the entry for "soy bean") is identical to that in the 1911 catalog. Address: P.O. Box No. 72. 21-35 Nakamura, Yokohama, Japan. Phone: 509.

1565. Pontius, Albert W. 1912. Soap from soya beans. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 15(107):494. May 6.
• ***Summary:*** "A good portion of the many thousand tons of Manchurian beans exported to Europe returns to the Far East in various forms of manufactures, such as soap (bean oil constituting an important ingredient), refined oil, soya biscuits, etc.

"The merits and economy of bean oil as a substitute for coconut oil and tallow have been scientifically established. For this purpose, however, the crude bean oil, as produced by the crushing mills here, must undergo a refining process. This is still a technical experiment at the local central laboratory, which seeks to provide a process commercially feasible and available to those with small capital. The few soap factories in Dalny and elsewhere in Manchuria must now mix other fats, such as coconut oil, to the bean oil to secure the proper solidity.

"About one and one-half years ago Lever and other large British soap makers became interested in Manchurian beans as a desirable material. It is understood that Lever will establish a soap factory at Kobe for utilizing Manchurian bean oil, notwithstanding that soda, another important soap ingredient, is not yet produced in Japan..."

A note appended by the Bureau of Manufacturers states that American soap factories imported $2,685,596 worth of soya bean oil in 1911. Address: Consul, Dalny, Manchuria.

1566. Hanzawa, Jun. 1912. Ueber Pilze und Zusammensetzung des japanischen Tamari-koji [On the mold and composition of Japanese tamari-koji]. *Mycologisches Centralblatt* 1(6):163-66. June 8. [9 ref. Ger]
• ***Summary:*** There are three types of Tamari-Shoyu: Kibiki- (the best, made by short cooking of the soybeans), Niira- (made by long cooking of the soybeans), and Ban-Tamari-Soja (made by cooking the residue from one of the first two types in salt water).

Note: The author was in Hannover, Germany, when he finished this paper in May 1912. Address: Lab. for Applied Mycology, Agricultural Institute of the Tohoku Imperial Univ., Sapporo, Japan.

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1567. Suyama, Kenei. 1912. Miso chû no jiasutaaze no bunryô ni tsuite [On the diastase of miso]. *Seiikai Geppo* No. 364. p. 236-39. June. [Jap]
Address: Infectious Disease Research Lab. (Densenbyô Kenkyujo Kagakushitsu, Jisen Igakushi).

1568. Sawamura, Shin. 1912. Nattô-kin ni tsukite [On the "Bacillus natto"]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 120. p. 1-5. Aug. 5. [Jap]
Address: Nôgaku hakase, Japan.

1569. Pontius, Albert W. 1912. Manchurian trade notes. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 15(205):1100-01. Aug. 30.
• ***Summary:*** A table shows the exports of [soya] beans, bean oil, and bean cake from Dairen, for the four years from 1908-09 to 1911-12. The export season starts in November and closes in May of the following year.

Soya beans rose from 348,878 tons in 1908-09 to a peak of 357,166 in 1909-10, then fell to 258,731 in 1910-11, and even further to 161,285 tons in 1911-12.

Soya bean cake fell from 285,546 tons in 1908-09 to a peak low of 146,688 tons in 1909-10, then rose to 351,119 in 1910-11, and even further to a peak of 370,490 tons in 1911-12.

Soy bean oil rose steadily from 8,957 tons in 1908-09, to 13,552 in 1909-10, then to 28,669 in 1910-11, and finally to a peak of 33,574 tons in 1911-12.

Upon first glance at the foregoing figures one might infer that the export trade in staple produce might be seriously affected by the steady decline in export of beans. It can be shown, however, that the contrary is actually the case. Apart from bean cake, which is merely a by-product obtained in the manufacture of bean oil exported during the foregoing respective seasons may be had by calculating at the rate of 12½ pounds of beans to 1 pound of oil.

"In the following table the exports of oil have converted to beans on the basis stated, and these, added to the exports of beans as given in the preceding table, show the actual total exports."

Total exports of bean equivalents rose from 466,840 tons in 1908-09, to 526,566 in 1909-10, reaching a peak of 617,103 in 1910-11, then falling 6% to 581,060 in 1911-12.

"At the beginning of the 1911-12 season there were 45 bean-oil mills in operation in Dairen, all under the control of either Japanese or Chinese owners." The manufacture of soya bean oil is the most important local industry. Address: Consul, Dalny.

1570. Carlyle, W.L.; Iddings, E.J. 1912. Hog raising for the Idaho farmer. *Idaho Agricultural Experiment Station, Bulletin* No. 74. 31 p. Aug.
• ***Summary:*** A table (p. 4) shows results of a test by the Missouri Agric. Exp. Station of the pork producing capacity of various pastures. Soy beans gave poorest results in terms of both pounds of pork per acre of pasture (183.1, vs. 598.5 for alfalfa) and value of pork from an acre of pasture ($10.99 vs. $35.71 from alfalfa). The Idaho station has conducted three of its own experiments for finishing hogs for market during the last 2 years. A table (p. 6) shows that one of the feeds used was "Soy bean meal (Proteina)" costing $1.90 per 100 lb on average. Note 1. This Proteina brand meal was probably made by Pacific Oil Mills in Seattle, Washington, starting in 1911.

Some of the meal was "imported from Japan and cost $38.00 per ton (2,000 lb) laid down in Moscow, Idaho. It is the ground form of the cake left after the extraction of oil from the soja or soy bean. It is guaranteed by dealers to contain 50 per cent protein."

Note 2. There is no mention in this publication of soybeans being grown in Idaho. Address: 1. Director of the Station; 2. Animal Husbandman, Dep. of Animal Husbandry, Moscow, Idaho.

1571. *New York Times.* 1912. Gives out secrets of making ammonia. Sept. 12. p. 6.
• ***Summary:*** An overview of the Eighth International Congress of Applied Chemistry, held in New York City at the Horace Mann Auditorium.

The section titled "Natto, a cheese" states: "S. Muramatsu of the College of Agriculture, Morioka, Japan, read an interesting paper on natto. Natto is a vegetable cheese much used in Japan. It is made by fermenting boiled soya beans wrapped in rice straw and set in a warm cellar for one or two days. It is consumed as 'an accessory,' (by which Dr. Muramatsu apparently means a relish or condiment,) after having been mixed with table salt and several stimulants 'amongst others the powdered mustard is preferred.'

"It is, according to the Doctor, a very good and economical foodstuff, rich in protein, and particularly valuable to the Japanese because of their large dependance on rice, which is almost entirely carbohydrate."

1572. Ito, Teiji. 1912. Shôyu jôzô oyobi seihin ni kansuru shoseibun ichiran [On the constituents of the raw materials and products of shoyu brewing]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 367. p. 934-56. Sept. [Jap]

1573. Kita, Genitsu. 1912. Haupthefe der Sojamaische [Major yeasts in soy sauce moromi (mash)]. *Eighth International Congress of Applied Chemistry, Original Communications* 14:99-106. Section VIb: Fermentation. Held 4-13 Sept. 1912 in Washington and New York, USA. [1 ref. Ger]

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• ***Summary:*** Includes a discussion of *Saccharomyces Soja,* a yeast that forms a film on the surface of shoyu. Address: Technological Faculty, Imperial University, Tokyo [Japan].

1574. Li, Yu-ying; Grandvoinnet, L. 1912. Le soja: Sa culture. Ses usages alimentaires, thérapeutiques, agricoles et industriels [The soybean: Its culture. Its food, therapeutic, agricultural, and industrial uses]. Paris: Augustin Challamel (Rue Jacob 17). 150 p. Illust. Index. 25 cm. Translated into French and expanded from the Chinese edition, published by la Societé Biologique d'Extréme-Orient (1910). [151 ref. Fre]

• ***Summary:*** One of the earliest, most important, influential, creative, interesting, and carefully researched books ever written about soybeans and soyfoods. Its bibliography on soy is larger than any published prior to that time. It was first published as a series of eight articles in *Agriculture Pratique des Pays Chauds* (*Bulletin du Jardin Colonial*) from September 1911 to April 1912. Before being published as a book, it was revised slightly by adding a table of contents at the back, dividing the material into 5 parts with 19 chapters, and adding several photos (p. 16-17), a world map showing the distribution of soybean cultivation (p. 21), and an interesting 2-page table (p. 66-67).

Contents: The soybean: Origin and history. Part I: Soybean culture. 1. Species and varieties of soybeans: Botanical characteristics, species, varieties (Chinese, Japanese, Indian, Indochinese, Hawaiian, USA, European). 2. Needs of the soybean: Climatic, geographical area of the soybean by region worldwide, agrological/soil needs, fertilizers, soil preparation, the place of the soybean in crop rotations. 3. Soybean seeds: Study of seeds (by weight, by germination rate, selection of seeds), time of planting, plant spacing, depth of seeding, rate of seeding per hectare, method of seeding (broadcasting, in rows, in mounds). 4. The soybean during its vegetative stage: Germination, transplanting, types of care (e.g., second dressings), irrigation, flowering and fruiting, enemies of the soybean (e.g., insects). 5. Harvest of soybeans: Time for harvest (forage or grain), methods of harvesting (forage or grain; mechanical mower), threshing (use of machine), yields of soybeans (forage and grain in various countries, ratio of seeds harvested to straw is about 1 to 2, yield of nutrients). 6. Fixation of atmospheric nitrogen by soybeans, and improvement of the soil. 7. The soybean in mixed cultures and alternate rows: With corn, cowpeas, rice, sweet sorghum, or millet.

Part II: Chemical composition of the soybean. 1. Composition of the plant: Minerals in the leaves and total plant. 2. Study of the seed: Composition, chemical composition, microscopic comparisons, table of analyses by 28 previous researchers, albumins, sugars, starch, dextrin or dextrine, diastase, lipids, ash/minerals.

Part III: The soybean as human food and animal feed. 1. The soybean as feed for animals: Green forage and hay. 2. The soybean in human feeding: From the viewpoints of physiology, economy, and gastronomy. The role of soya in special diets: Vegetarianism, remineralization, diabetic, and lactose intolerant.

Part IV: Food products based on soya. 1. Soymilk and its derivatives: Soymilk (Methods of manufacture, Chinese and modern at l'Usine de la Caséo-Sojaïne, nature and properties [physical and chemical] and composition of the milk, action of ferments and diastases (enzymes) on the milk, uses of the milk, the residue from the soy dairy [okara], condensed soymilk, powdered soymilk, fermented soymilk (kefir, yogurt, etc.)), tofu (called Caséo-Sojaïne, or fromage de soya; methods of production, coagulants, yield of tofu, storing tofu, composition and comparison with various meats, digestibility, culinary preparations made from tofu (smoked tofu, tofu pâté, tofu sausages)), Soy casein (food and industrial uses). 2. Soy flour and its derivatives: Soy flour, soy bread, wholemeal bread, other products based on soy flour (as biscuits and cakes for diabetic diets). 3. Soy oil and its by-products: Soy oil, physical and chemical properties, usage, residue of the oil mill: the cake, price, uses. 4. Use of the soybean as a legume: Whole soybeans (composition and digestibility), soy sprouts (*germes de soja*), green vegetable soybeans (*le soja frais*). 5. Fermented soy condiments: Solid condiments from Japan: Tokyo natto (*Le Tokio-Natto*) and Ping-Ming natto or tao-tche (*Le Ping-ming-Natto;* fermented black soybeans with salt, ginger, orange rind, etc. A similar product is made in China and called tao-tche). Paste condiments: Miso (four types and composition), tao-tjung (Chinese miso). Sauces: Shoyu (its production, varieties, properties, composition), chiang-yu (*tsiang-yeou*), ketjap [kechap, from Java], tuong (from Annam, with rice or corn), tao-yu (widely used in China and Japan, described by Prinsen Geerligs). 6. Confectionery products: Comparison with chestnuts, roasted soy flour to replace chocolate. 7. Soy coffee (with analysis by Kornauth). 8. Special fermented products: Kiu-tsee (a special commercial ferment from Canton described by Thiersant), fermented soymilks.

Part V: Industrial uses of soybeans. Oil based: soap, wax candles (*bougie*), and paint oils. Protein based: sojalithe or soy stone which corresponds to lactite, insulators for electrical apparatus, glue, etc. Conclusion. Addendum (*Complément*) to Part III, Chapter 1: Soybean straw and stems. Composition of various seeds, including soybeans. Soy flour. The cakes from oil mills. Soymilk and the cake from soy dairies (*tourteau de laiterie,* okara).

A very interesting table (p. 66-67, which does not appear in the original 8 articles) shows earlier nutritional analyses of the composition of soybeans by Steuf (from Hungary, Mongolia and China), Schroeder, Caplan, Pellet (from China, Hungary, Etampes), Muntz, Nikitin (black soybeans from Russia, 2 samples), Lipski [Lipskii] (yellow, from Russia), Giljaranski (yellow from Russia, China and Japan; black

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from China and Japan; green), König (*Hispida platycarpa* black, Tumida yellow, brown and black), Prinsen (white from Java and China), Goessmann, Kellner, USDA, Chemiker Zeitung (white from Java and China, 29 Jan. 1896), Scuff (misomame; miso soybeans), Zulkovski (yellow from China, reddish brown from Mongolia), Institut Agr. de Vienne (Austria; yellow from Vienna, reddish brown from Tirol), Ecole Imp. et Roy d'Ag. Hong (yellow from Mongolia and China, reddish brown from China), Chez M. Olivier Lecq (from Moravia), Lechartier (Etampes and black), Joulie (yellow), Stingl and Morawski, Bloch (yellow, green, and black), Balland, Cavendish Evelyn Liardet (yellow, brown, green, black, and white), Jardin Colonial (Laos, Tonkin, China), Aufray (Tonkin, Yun-nan), Homes Laboratory (black from China, or white). Photos and illustrations are the same as those referenced in individual sections of the book, except for the following: A field of soybeans (p. 16). A soybean plant growing in Europe (p. 17). Color illustrations appear facing pages 12, 22, and 64. Address: Li is from Societe Biologique d'Extreme-Orient (Chine). Grandvoinnet is from Ingenieur Agricole (G.).

1575. Muramatsu, S. 1912. Preparation of "natto." *Eighth International Congress of Applied Chemistry, Original Communications* 18:251-63. Section VIIIb: Pharmaceutical Chemistry. Held 4-13 Sept. 1912 in Washington and New York, USA.

• ***Summary:*** Contents: Introduction. Soya beans. Rice straw. Cellar. The preparation of natto. The microbes of natto: Bacillus no. 1, bacillus no. 2, bacillus no. 3. The application of cultured bacteria for the preparation of natto. Natto as a food accessory.

Natto is "a kind of vegetable cheese made by fermenting boiled soy beans wrapped in rice straw and set in a warm cellar one or two days. Thus the product becomes white and mucliageous [mucilaginous] by the development of bacteria. *Natto* is consumed as an accessory after having been mixed with table salt and several stimulants, amongst others the powdered mustard is preferred. It is chiefly consumed in Tokyo and the north-eastern districts of Japan and for the production of it Aizu is the noted place. It is chiefly consumed in Tokyo in the summer time, but in the north-east during the winter time, as these are rather poor in vegetables at that season." The author prepared natto with the different types of soya beans grown in Japan "and could not find a more suitable kind than the small yellowish white bean."

The straw serves to flavor the product as well as to permit ventilation and so keep down the content of free ammonia. The various organisms found in the samples examined were isolated and described. "I express many thanks to Dr. Satô, Director of our College." Address: College of Agriculture, Morioka, Japan.

1576. Sawamura, S. 1912. On *Bacillus natto. Eighth International Congress of Applied Chemistry, Original Communications* 14:145-47. Section VIb: Fermentation. Held 4-13 Sept. 1912 in Washington and New York, USA. [1 ref. Eng]

• ***Summary:*** Natto is prepared by wrapping boiled "soya-beans" in rice straw then leaving them in a warm place overnight to ferment. The author formerly isolated two species of bacteria from natto obtained in Tokyo. Over the years, he has examined bacteriologically many natto samples obtained from various places and found that all contain "Bacillus natto," which produces natto of good flavor and strong viscosity. He then gives a detailed bacteriological description of this bacillus, including: Form, mobility, spore-formation, Gram's method decolorization, oxygen needs, scum in bouillon, scum in pepton water, agar plate culture, gelatine plate culture, agar streak culture, gelatine streak culture, agar stab culture, gelatine stab culture, soya bean agar, potato, gas, azolithmin-milk, indol, hydrogen sulfide gas formation, etc. Address: College of Agriculture, Imperial Univ., Tokyo [Japan].

1577. Takahashi, Teizô; Yukawa, Matao. 1912. On the budding fungi of "shoju-moromi." *Eighth International Congress of Applied Chemistry, Original Communications* 14:155-71. Section VIb: Fermentation. Held 4-13 Sept. 1912 in Washington and New York, USA. [22 ref. Eng]

• ***Summary:*** In the title, and throughout this paper, the word "shoju" should be spelled "shoyu," meaning soy sauce. The following budding fungi were isolated from 52 samples of shoyu-moromi of different ages (2-24 months) collected from 11 different factories: 1. *Zygosaccharomyces major,* nov. spec. 2. *Zygosaccharomyces Soja,* nov. spec. 3. *Zygosaccharomyces japonicus,* Saito. 4. *Zygosaccharomyces Salsus,* nov. spec. 5. An asporogenic species of *Zygosaccharomyces* (?). 6. A species of *Mycoderma.* 7. A species of *Pichia.* 8. Several species of *Torula.* 9. A species of *Monilia.*

The following shoyu breweries granted samples to the author: Those owned by Sh. Magi [Mogi] and S. Mogi in Noda, province of Shimôsa. Those owned by Mr. Hamaguchi, G. Tanaka, and J. Iwasaki in Choshi, Shimosa province. One owned by K. Nakamura at Gaju, Owari province. The Asahi, Maruo, and Kikuchi breweries, and that owned by Mr. Takano, all at Tatsuno, Harima province. Kagawa shoyu brewery experimental station at Shôtoshima [Shodoshima], Sanuki province.

Zygosaccharomyces species Nos. 1, 2, and 5 did not form films on shoyu, whereas Nos. 3 and 4 did form films. *Zygosaccharomyces major* was the main yeast isolated from mature samples of moromi, whereas *Zygosaccharomyces soja* was the main species isolated from young samples. There is no doubt that these two species play an important role in the ripening of shoyu. *Zygosaccharomyces japonicus* and *Zygosaccharomyces salsus* easily produce greyish-white

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films resembling crepe-paper on top of even concentrated shoyu. Moreover these two species easily form a large number of sporulated cells. Thus they are harmful when storing shoyu.

Note: This is the earliest English-language document seen (June 2011) with the word "moromi" in the title. Address: College of Agriculture, Imperial Univ., Tokyo [Japan].

1578. Tokyo Plant, Seed & Implement Co. (Tokyo Konoen). 1912. Wholesale price list of seeds, plants, bulbs, etc. No. 45. 1912-1913. Tokyo, Japan. 22 p. Sept. 23 cm. [Eng]
• ***Summary:*** The section titled "Garden and agricultural seeds" (p. 5+) includes: "Beans, soy, $0.08 per lb., 7.00 per 100 lbs." (U.S. gold dollars).

Also gives prices for Japanese buckwheat and Japanese giant hemp. Cable address: "Watase, Tokyo." Branch store: 2 & 5, Tameike, Akasaka, Tokyo, Japan. Telephone: Shimbashi 2421. Address: 26-32 Miyamasu, Shibuya, Tokyo, Japan. Phone: Shiba 1058.

1579. Barrett, O.W. 1912. Soya soap. *Philippine Agricultural Review* 5(10):565-66. Oct.
• ***Summary:*** "The vast area planted with 'Manchurian beans' in northeastern China and the contiguous portion of Siberia may in the near future be greater still. A new field for bean oil has been found and the new factories in Mukden and Dalny are now turning out very large amounts of both laundry and toilet soaps.

"It is understood that the Lever Bros. Ltd., of Port Sunlight, England, will also establish a monster soap factory at Kobe; the only drawback thus far is the lack of alkali in Japan and northern China. According to the Bureau of Manufactures of the United States Department of Commerce and Labor, the United States uses considerably over 5,000,000 Philippine pesos worth of bean oil annually.

"Soya oil affects the price of copra. Soya soap relieves the overproduction tendency of bean oil and thus becomes a long-distance enemy of the Philippine coconut, although it directly assists in a degree in keeping up the price of soya oil." Address: [Chief of the Div. of Experiment Stations, Philippines].

1580. Hawthorne, H.L. 1912. An official visit to the Japanese army. *J. of the Military Service Institution of the United States* 51(179):156-72. Sept/Oct.
• ***Summary:*** The first Appendix, titled "Schedule for carrying out theoretical and practical studies of the recruits in the first term, 1911-1912. By the 2d [2nd] Company, the 3d [3rd] Battalion, Engineers" states (p. 172) under "Bills of fare. Prepared by the 1st Battalion, the 68th Regiment, Infantry. (Extract)."

Sunday (March 10, 1912). Breakfast includes: *Moritsuki,* with Soy, 2 shaku. Tiffin includes: *Furofuki* radish [daikon] with Miso (bean paste), 13 momme. Supper includes: *Shitashi,* with Soy, 15 sai. Cost of fish and vegetables per man, Yen 0.11 7/10.

Monday (March 11, 1912). Breakfast includes: Miso soup with Fried bean-curd 1/3 piece. Bean curd 1/4 piece. Miso, 18 momme. Tiffin includes: *Nimame* with Black [soy] bean, 4 shaku. Soy, 1 shaku. Supper includes: Fresh beef, 10 momme.

"Note: Momme–about 3.8 gram. Shaku–0.004 gallon. Sai–1/10 shaku." Address: Lieut-Col., U.S. Army, Military Attache, Tokyo, Japan.

1581. Muramatsu, S. 1912. On the preparation of natto. *J. of the College of Agriculture, Tokyo Imperial University* 5(1):81-94. Oct. Journal name also written as Tokyo Noka Kiyo. Also published in 8th International Congress of Applied Chemistry, Orig. Comm. 18:(251-63). [Eng]
• ***Summary:*** Contents: Introduction. Soya beans. Rice straw. Cellar. Preparation of natto. The microbes of natto; Bacillus no. 1, 2, and 3. The application of cultured bacteria for the preparation of natto. Natto as a by-food (incl. table of nutritional composition of fresh and fermented natto).

"There are several kinds of *natto* prepared in Japan, but here I mean common natto, which is a kind of vegetable cheese made by fermenting boiled soya beans wrapped in rice straw and set in a warm cellar for one or two days. Thus the product becomes white and mucilageous [sic, mucilaginous] by the development of bacteria. Natto is consumed as a by-food after having been mixed with table salt and several stimulants, of which amongst others powdered mustard is preferred. It is chiefly consumed in Tokyo and the north-east districts of Japan, and for the production of it Aizu [in Fukushima prefecture] is the noted place. It is consumed in Tokyo in the summer time, but in the north-east districts during the winter time, as these are rather poor in vegetables at that season."

In Section "V. The microbes of natto," after summarizing the published findings of Dr. Yabe and Dr. Sawamura, Muramatsu continues:

"Mr. Nonzen isolated several kinds of bacteria, among them on bacillus to which Dr. Omori gave the name of *Bacillus viscosus natto* and which, he said, is the principal microbe that produces strong viscosity. The two kinds of bacilli, which he named *Bacillus odorans natto 1,* and *Bacillus odorans natto 2,* produce good aroma in natto; and another one which he named *Pseudomonas odorans natto,* produces also good aroma. The latter three did not produce good natto, unless the material is inoculated also with *B. viscosus natto.* Thus the author [Monzen] concluded that there are necessary for the preparation of natto at least two kinds of bacteria, one producing the peculiar aroma and the other strong viscosity.

"Mr. Muto [1905] isolated several bacteria and concludes that only one bacillus belonging to the *B. subtilis*

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group is necessary for the production of natto.

Muramatsu investigated several kinds of natto prepared in Tokyo, Aizu, and Morioka. He found that they all contained the same microorganisms, among which three bacilli (which he described) were the principal ones. He learned that the three bacilli were similar to those isolated previously by Sawamura, Muto and others. He also agreed with Muto that only one bacillus was necessary for natto fermentation, and that any one of the three would do the job. He agreed with Sawamura that the organism similar to *B. natto* Sawamura did not yield enough viscosity, however Muramatsu discovered that whenever the fermentation was carried out at high temperature (45ºC), the Bacillus No. 1 "produces the best quality of natto, providing much mucilage [high viscosity] and good aroma. For each of the three bacilli about 18 characteristics are examined and described.

For example: Bacillus No. 1. "Enzyme: Diastase and proteolytic enzyme of tryptic nature are recognized." Note: All three bacilli produce diastase (which hydrolyzes starches to make sugars) plus trypsin-like proteolytic enzymes. This bacillus [Muramatsu's No. 1] may be the same as those which Dr. Sawamura represented as Bacillus No. 2 and *Bacillus viscosus Omori,* and also that which Mr. Muto thought was the only bacterium which produces natto, though there are several differences in its behaviour investigated by these author."

"Bacillus No. 2. This bacillus develops more energetically at high temperature and produces natto of the best quality, forming much mucilage and a rather higher aroma than Bacillus No. 1."

"Bacillus No. 3. This bacillus develops most energetically at 40ºC, and when it is developed on boiled soya beans at this temperature it produces good natto with strong viscosity and good aroma; but its mucilage is somewhat less than Bacillus No. 1 and Bacillus No. 2."

Note 1. This is the second report (after Sawamura) of separating *Bacillus natto* from natto.

Note 2. This is the earliest document seen (Jan. 2012) that mentions the word "enzyme" (or "enzymes") in connection with natto, or that describes the specific types of enzymes produced by the natto bacteria. Address: College of Agriculture and Dendrology, Morioka, Japan.

1582. Sawamura, Shin. 1912. Ueber den Bacillus Natto [Concerning the Bacillus Natto]. *Chemiker-Zeitung* 36(134):1306. Nov. 7. [Ger]
• ***Summary:*** Contains a brief description of how natto is made and details of its chemical composition after 14 hours and 7 days. Address: Tokyo.

1583. Takahashi, Teizô; Yukawa, Matao. 1912. Die Pilze von "Shoju-Moromi" [The molds of "shoyu moromi"]. *Chemiker-Zeitung* 36(134):1307. Nov. 7. Summarized in Zentralblatt fuer Bakteriologie, Series II. 41:257 (1914). [Ger]
• ***Summary:*** Japanese understand the term "shoyu-moromi" to refer to a semi-solid liquid that is made from shoyu-koji, salt, and water. Shoyu koji is made from steamed soybeans and roasted wheat in much the same way that saké koji is made from rice. In the brewing (*Brauen*) of shoyu, three species of Torula yeasts seem to play a significant role: *Torula shujo, T. Shujo var. minuta,* and *T. Turbinata.* The authors have made a plate culture using shoyu-koji-agar as a culture medium after purifying the resulting colonies through the Lindner Drip Culture Method (*Tröpfchenkulturmethode*) and obtained 9 different molds, from which they isolated five *Zygosaccharomyces* (yeast) species. Address: Tokyo.

1584. Yada, Naganosuke. 1912. Honpô shôyu shôkyô hôkoku no ken [The Japanese shoyu market in Vancouver, British Columbia, Canada]. Vancouver, BC, Canada. 10 p. Nov. 22. Handwritten unpublished manuscript. Requested by Mogi Shichirouemon of Noda, Chiba-ken. [Jap; eng]
• ***Summary:*** This is a market report from Mr. Yada at the Japanese consulate in Vancouver, BC, Canada, to Mr. Yasunari Uchida at the Japanese Ministry of Foreign Affairs.

There are about 9,000 Japanese living in Canada. Japanese shoyu imports were about 15,400 taru (249,500 liters) a year, and it was used almost entirely by Japanese. The best selling brand is Kikkoman. Address: Japanese Consulate, Vancouver, BC, Canada.

1585. Kuijper, J. 1912. Soja [Soya]. *Departement van den Landbouw, Suriname, Bulletin* No. 29. p. 24-29. Nov. [Dut]
• ***Summary:*** In recent years, since 1908, soya has become a product of great importance on the world market. There are few products whose exports have risen so dramatically in just a few years. The reason for the great expansion of trade in soya can be found in the great demand by industry for oilseeds. For more than 30 years, experiments have been conducted on growing soybeans in Europe, but the results have not been very promising. Some people have suggested that soya might be able to be grown in Suriname. It is grown in many tropical countries, including Siam, British India, and Java. Requirements for cultivation and yields are discussed. Japan reports the highest yields, 2,500 kg/ha, compared with 1,000 to 1,400 kg/ha from the USA. Soybeans produce more protein and oil per unit area of land than any other farm crop. The seed is used mainly for human consumption but the plant also yields, fresh or dried, an excellent livestock feed, which is why so much research on it is now being conducted in Australia and America. It is important for Suriname that soya can be used as a green fodder, for example interplanted and fed with corn.

From soya one can make numerous products such as soymilk (*soyamelk*), soy cheese [tofu] (*soyakaas,* whose food value is higher than that of meat), soy flour, soy bread (*soyabrood*), oil (*olie*), various sauces (soya sauce, Worcester

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sauce, etc.), and various substitutes for coffee and chocolate, etc. (*surrogaten voor koffie en chocolade enz.*).

In Suriname soya is cultivated on a small scale by the Javanese, for example in Lelydorp and in the settlements of Johan and Margaretha. Many experiments with Soya have already been conducted in the experimental garden (*Cultuurtuin*). Seeds imported from America did not give good results; the plants remained small, yielded few fruits, and died quickly thereafter. It is a common occurrence that plants from temperate or subtropical regions do not grow well in the warm tropics in the rainy season. Of the seeds cultivated in Suriname, two varieties give good results. Those cultivated by the Javanese give hardy plants and a lot of seed though exact yield figures are not available; the planted area is still quite small. But the yield is about 1,000 kg/ha. Apparently the necessary bacteria are present in the soil, for the roots show nodulation.

In the experimental garden two beds of soya were planted on May 24. The first seeds ripened after 3 months and within 4 months all was harvested. Thus the plants developed during the rainy season, and they probably got too much water. The results would probably be better if this season could be avoided. Soya is sold in Suriname for hfl 30 per bag, a considerably higher price than that paid in Europe. On the plantations Peperpot and Jaglust experiments with soya have also been conducted. The European seed that was used gave very limited results. The experiments will be conducted again using Suriname seeds.

With the market price at hfl 10 per bag, it seems very unlikely that the cultivation of soya in Suriname will ever be profitable, unless high yields can be obtained. As mentioned above, this seems unlikely. Small scale cultivation for sale in Suriname, however, seems advantageous at present, while in areas where cattle are raised the use of soya as a green feed to replace more expensive secondary feeds will likely give good results.

Note 1 This is the earliest document seen (May 2009) concerning soybeans in Suriname, or the cultivation of soybeans in Suriname.

Note 2. This is the earliest Dutch-language document seen (Nov. 2012) that uses the term *surrogaten voor koffie* to refer to soy coffee.

Note 3. This is the earliest Dutch-language document seen (Aug. 2013) that uses the term *soyamelk* to refer to soymilk.

Note 4. This is the earliest Dutch-language document seen (April 2013) that uses the term *soyakaas* to refer to tofu. Address: Surinam.

1586. Maynard, Lester. 1912. Notes from Manchuria. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 15(283):1134-35. Dec. 2.

• ***Summary:*** "The [soya] bean crop of South Manchuria is believed to be below the average, and therefore it may be expected that beans from North Manchuria will be supplied to the Japanese oil mills in the south... The railway is planning to haul about 550,000 tons of beans and 430,000 tons of grain of all kinds [incl. wheat, barley, millet, kaoliang, etc.], or a total of 980,000 tons. It is expected that between 35,000 and 40,000 tons will be transported via the Sungari River [Songhua River in Chinese] before the close of navigation." Address: Vladivostok.

1587. Nishiwaki, Yasukichi. 1912. Kôji-kin no hatsuiku narabini tôka sosei no saiteki ondo ni tsuite [The optimum temperature for growing the koji mold, *Aspergillus oryzae*]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 15(178):1295-98. Dec. [2 ref. Jap]

1588. Yabuta, Teijiro. 1912-1913. On koji acid, a new organic acid formed by *Aspergillus oryzae. Eighth International Congress of Applied Chemistry* 25:455-62. Held 4-13 Sept. 1912 in Washington, DC, and New York. [1 ref. Eng]

• ***Summary:*** Volume 25 (of 29 volumes total) is "Appendix: Section I to Section Ve." Contents: Introduction. Isolation of koji acid. The copper salt. The acetyl derivative. The benzoyl derivatives (di- and tetra-benzoate).

The 1st page begins: "Dr. K. Saito * has recently isolated a new organic acid from *Aspergillus oryzae.* * = Footnote: K. Saito. The Botanical Magazine (Tokyo). Vol. XXI, No. 249 [Oct. 1907].

Note: There is no article by Saito in issue No. 249 of *The Botanical Magazine.*

On the last page (p. 462) we read: "Different culture media behave also differently upon the production of this acid. Thus, the latter is produced when the aspergillus has grown on certain cereals, such as maize wheat, barley, rye, oats and italian millet, but not on leguminous peas as peas, beans, horse beans, broad beans, soja beans, Indian beans, black beans, quaial beans, etc." Address: College of Agriculture, Imperial Univ., Tokyo.

1589. Ito, T. 1912. Yo no kôan ni kakaru nyûsan ôyô shôyu oyobi tamari jôzô ippô [On the application of lactic acid to shoyu and tamari brewing]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 7(10):21-24. [Jap]
Address: Hiroshima Zeimu Kantoku Kyoku Gishi.

1590. Ito, Teiji. 1912. Shôyu jôzô-yô genryô ni tsuite (2) [On the raw materials used in brewing shoyu. II.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 7(1):6-10. [Jap]
Address: Hiroshima Zeimu Kantoku Gishu.

1591. Kinoshita, Asakichi. 1912. Shôyu jôzô-yô iri-mugi no funsai [On the shattering or pulverizing of roasted wheat for

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making shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 7(3):20-24. [Jap]
Address: Japan.

1592. Kinoshita, Asakichi. 1912. Shôyu hiire ni tsuite [On the pasteurization of shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 7(6):36-43. [Jap]

1593. Kinoshita, Asakichi. 1912. Shôyu "kabi" dome sôchi [An apparatus for preventing mold growth on shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 7(12):12-17. [Jap]

1594. Kochi, Genichiro. 1912. Shôyu jôzô ni kansuru danpen-teki kenkyû (I) [Fragmentary studies on shoyu brewing. I.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 7(7):31-37. [Jap]

1595. Nishimura, Torazô. 1912. Shôyu oyobi miso ni kansuru kenkyû seiseki hôkoku [Results of studies on shoyu and miso]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 7(4):1-8; 7(5):5-14; 7(6):16-24. [Jap]

1596. Beltzer, Francis J.-G. 1912. Industries du lactose et de la caséine végétale du soja [Industries producing lactose and soy vegetable casein]. Paris: Librairie Bernard Tignol. 144 p. Undated. (Bibliotheque des Actualites Industrielles, No. 144). [17 ref. Fre]
• ***Summary:*** Contents: Preface. Part 1: The lactose industry (p. 9-95; 4 chapters). Part II: Vegetable milk, vegetable casein, and products from soybean seeds. Introduction. 1. Vegetable milk (*Le lait végétal;* soymilk), microscopic examination of vegetable milk. 2. Vegetable cheese (*Le fromage végétal;* tofu). 3. Industrial uses of vegetable casein, proximate analysis of soybean seeds, quantity and dosage determination, the price of soybeans, price of recovery of vegetable casein, industrial production of vegetable casein, cleaning the soybeans, extraction of soy oil, extraction of soy casein. 4. Plan and installation of a factory for processing (10 tons/day of) whole soybeans [to make industrial vegetable casein], estimate and specifications for special materials, general materials, the buildings, price of recovery of vegetable casein, industrial uses of vegetable casein. Illustrations (line drawings) show: (1) Microscopic view of soymilk globules. (2) Microscopic view of soya bean tegument (exterior). (3) Schematic drawings (cross section and overview) of a factory for making vegetable casein.

Matagrin (1939, p. v) states that with this book, Francis G. Beltzer, a practical chemist, became a major force in visualizing new industrial uses for the soybean in the West.

The Preface notes that in Indochina, vegetable milk and vegetable cheese made from the soybean form the base of the people's nutrition. Cow's milk is largely unknown, and the people raise and nourish their children largely with soymilk. Tofu serves equally for the current nourishment of the poor (p. 6).

The Introduction (p. 101-07) notes that soy protein is a globulin, called glycinin or vegetable casein (*caséine végétale*). Osborne & Clapp submitted this substance to acid hydrolysis and found its composition, which is very rich in glutamic acid (p. 102). Soy flour (*farine de Soja*) contains little starch but a large amount of nitrogenous materials, similar to gluten; it is widely used in making bread for diabetics. It can also be used as the basis of foods that are rich in protein and very nutritious, as for colonial or European troops (p. 103).

Soy sauce (*Soja fermenté*) is made in Japan from a mixture of soy and wheat (*koji*). The number of brewers (*brasseurs*) of soy sauce exceeds 12,000 in the entire Japanese Empire, furnishing more than 2,500,000 hectoliters of this condiment (p. 103).

A Chinese factory has been founded on the outskirts of Paris (at Vallées, near Colombes) for the production soy-based food products (*produits alimentaires à base de soja*). This factory currently makes *Caséo-sojaïne* [tofu] and the following food products: Soy flour (*Farine de soja*), soy bread (*Pain de soja*), soy sauce (*Sauce de soja*), soymilk (*Lait de soja*), fermented soymilk (*Lait de soja fermenté*), soy cheese [tofu] (*Fromage de soja*), soy confections (*Confitures de soja*), etc. The Journal, in its issue of 9 Jan. 1911, under the title *"Une usine chinoise fonctionee dans la banlieue parisienne* [A Chinese factory is operating on the outskirts of Paris]" gives some details (p. 106).

In our colonies in Indo-China, the indigenous people have long prepared soymilk, tofu, and several other foods. Soymilk is used like regular milk for feeding babies. Soy cheese, when cooked, is analogous to gruyere cheese; fresh soy cheese resembles our goat cheese. Many Europeans are now preoccupied with making the best of the abundant nutritive principles found in the soybean. One can eat green vegetable soybeans (*Les fruits verts*) like green peas (*pois verts*). In Annam and Japan a sauce is also made from soybeans; its use has spread from East Asia just like that of tofu (*fromage végétal*) (p. 107).

The introduction into Europe and France of soyfoods (*aliments retirés du Soja*), especially soymilk and tofu, will enable us to combat periods of scarcity of animal milk and periods when the prices of certain foods are high. Will the substitution of vegetable casein for milk casein enable us to likewise conserve milk for food use instead of delivering it to industry? (p. 107).

Chapter one, "Soymilk" (p. 108-13), discusses the work of the Japanese chemist T. Katayama (1906) with soymilk and notes that it can be homogenized and condensed. Illustrations show a microscopic view of the globules of soymilk and of okara. The absence of starch in soybeans is a very positive characteristic.

Chapter two, "Tofu" (p. 114-18), notes that in Cochin-

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China, calcium sulfate is called *Tchack-kao,* and there are three main varieties of tofu: (1) The fermented variety, which is gray or yellow in color, has a piquant taste and resembles Roquefort cheese. (2) The white salted variety resembles goat's cheese. (3) The baked (*cuite*) or smoked variety resembles gruyere cheese and keeps as well as the salted variety.

Chapter three, "Industrial uses of vegetable casein" (p. 119-32), observes that the oil in soybeans must first be removed by pressing or extraction. A table (p. 120) gives the chemical composition of soybeans from Laos and Cochin China, Tonkin, and China and Manchuria. They contain 17.64 to 18.28% oil. In Indochina a food which Beltzer calls *La caséine végétale en lames* ("vegetable casein in sheets" = yuba) has a rather high oil content–about 25-28%. There follows a section (p. 126-32) which contains details on industrial production of soy casein. Chapter four, "Design and installation of a factory for processing soybeans into industrial vegetable casein," describes each piece of equipment and its cost, itemizes the costs of general and special materials plus, buildings and working capital. Also includes a detailed schematic diagram (p. 136-37) with three production lines, and both top and side views. Finally, it lists expenses, income, and profit (p. 139). The last section, applications of industrial vegetable casein, includes paints, paper coatings, silk and artificial textiles, Galalith, and waterproofing of textiles and straw hats. The book contains no bibliography, few footnotes, and no mention of the work of Li Yu-ying–from whom the author appears to have borrowed much.

Note: Although this book is undated, all major sources (except a Seattle Public Library bibliography) give its date as 1912. Address: Ingenieur-Chemiste-Expert, Professeur de Chimie Industrielle.

1597. Davis, Nathan Smith, Jr. 1912. Food in health and disease. 2nd ed. Philadelphia, Pennsylvania: P. Blakiston's Son & Co. xii + 449 p. Illust.

• ***Summary:*** This book is an extensive and practical guide to general dietetics. It discusses both vegetarian and fruitarian diets. It is divided into two main parts: (1) General principles of diet and diet in health; (2) Diet in disease. The author says that the preservation of health is as important as the treatment of the sick. Nathan Smith Davis, Jr. lived 1858-1920. His father, Nathan S. Davis, lived 1817-1904. Chapter 5, "Quantity and kinds of food needed in health" contains a section titled "Diet, Japanese" which states (p. 60): "The diet of the Japanese has been carefully studied by competent men of that country. Beef, mutton, pork and their products are scarcely eaten and were not at all until very recently, but fish is eaten by all who can afford it. The laborers in the country, however, do not average a meal of fish oftener than twice a month. They are vegetarians because they cannot afford meat and fish. They derive the protein which they need from cereals, beans and vegetables. Rice, barley and soy-beans are the staple articles of food of all classes. Wheat, millet, buckwheat and vegetables are also eaten but in smaller quantities. Fish is the staple meat, though poultry and eggs are eaten in small amounts and other meats in insignificant quantities."

On page 59, vegetarian and fruitarian diets are compared.

Chapter 8, "Vegetable foods," contains a section titled "Peas and beans" (p. 117-18) with a table showing the "Composition fresh and dried legumes compared with that of other foods." Among the dried legumes are: Soy beans, lima beans, navy beans, frijoles, lentils, dried peas, cowpeas, chick-pea, peanuts, and St. John's bread (carob bean). Soy beans have the highest protein content (34.0%). Peanuts have the highest fat content (38.6%).

In Chapter 12, "Diet in disorders of nutrition," in the section on "Diabetes," a table (p. 411-12) gives the composition (carbohydrates and sugar, fat, protein) of substitutes for flour products, including: Soya bread, gluten bread, almond cakes, cocoanut, and peanut. Also mentions: Sea kale (p. 119). Taka-diastase (p. 210).

Note: The first edition of this book is not listed at OCLC (Sept. 2007). Address: Chicago, Illinois.

1598. Fairchild, David. 1912. Plant introduction for the plant breeder. *Yearbook of the U.S. Department of Agriculture.* p. 411-22. For the year 1911. See p. 416.

• ***Summary:*** The article begins: "It is now nearly two centuries since the first successful attempt to hybridize plants was made by an English gardener."

The section titled "Extent of the work of the Office of Foreign Seed and Plant Introduction" states: "To stimulate this research and make it possible for a growing number of enthusiasts to breed plants with intelligence, the Office of Foreign Seed and Plant Introduction has been importing from various parts of the world the wild relatives of our cultivated plants and such promising wild forms as seem to offer a chance for domestication.

"When one canvasses the whole world for the varieties of one of our cultivated plants it is surprising to find how many forms there are. In 1907, for example, when the systematic work of bringing in soybean varieties for the Office of Forage-Crop Investigations first began, there were known in this country only 23 varieties. In a recent bulletin of the Bureau of Plant Industry 300 are mentioned as having been tested (Footnote: Piper & Morse. 1910. "The soy bean: history, varieties, and field studies." *USDA Bureau of Plant Industry, Bulletin* No. 197. See p. 24). These forms have been gathered since 1907 from the bazaars of oriental villages or bought from peasants in Japan, India, China, Siberia, Chosen (Korea), and the Dutch East Indies by trained explorers, American consuls, missionaries, or special correspondents." Address: Agricultural Explorer in Charge of

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Foreign Seed and Plant Introduction.

1599. Giles, Herbert Allen. 1912. A Chinese-English dictionary. 2nd ed., revised & enlarged. 2 vols. Shanghai, China: Kelly & Walsh, Ltd.; London: Bernard Quaritch. 33 x 26 cm. Reprinted in 1964, 1978. [4 ref. Eng; chi]
• ***Summary:*** These two massive volumes, each weighing about 9½ lb, contain more than 1,800 pages and 13,848 Chinese characters. Contents of Vol. I: Part I. By the same author (25 books). Dedication. Preface. Extracts from preface to first edition. Dialects (The romanized pronunciation of each character is given in Cantonese, Hakka, Foochow, Wênchow, Ningpo, Peking, Mid-China, Yangchow, and Ssuch'uan {Szechwan} dialects, as well as in Korean, Japanese, and Annamese, each being distinguished by its initial letter). Tables: Insignia of official rank, the family names, the Chinese dynasties, topographical, the calendar, miscellaneous (the Chinese digits, the Chinese decimal system). The 214 radicals. Radical index. Part II. A Chinese-English dictionary (p. 1-1711, in two volumes). Examples of soy-related characters:

Chiang (p. 149, No. 1220). "A soy made by mixing salt with bean flour. Sauce." Fourteen compounds using this character are given, including: Bean sauce, soy. Pickled bean curd. Bean sauce. Soy is of two kinds, the clear and the thick. Dry relishes. Soy [sauce] colour–a dark reddish drab. He won't use money for vinegar to buy soy.

Ch'ih (p. 249, No. 1996). "Salted fruits, etc., dried and used as relishes." Four compounds incl.: Salted beans. Soy, sauce.

Fu (p. 458, No. 3686). "Rotten; putrid; worthless." Eleven compounds and sayings include: Bean curd, see No. 11,417. Bean curd officials–a term of contempt applied to certain of the poorer classes of official servants who are compelled to feed largely on this cheap food. Also explained as flabby or unenergetic officials. A Mongol name for cheese. A kind of milk made from beans (milk + fu) [Note: Probably fermented tofu].

Huang (p. 635, No. 5124). Yellow. Compounds: Yellow beans.

Mao (p. 955, No. 7,679). "Hair, down, feather." But the word *Maodou* ("Hairy beans") = edamame does not appear here.

Ta (p. 1,294-96, No. 10,470). "Great." But the word "Great bean" = soybean does not appear here.

Tou (p. 1,412, No. 11,417). "Beans; pulse." See also No. 11,412. Thirty compounds, incl.: Bean-sprouts. Bean-curd. A cheap restaurant (a bean-curd restaurant). Like making bean curd–very tedious. A tongue like a knife, but a bean-curd heart (soft). Bean-cake. Bean oil. Big bean, black bean, or yellow bean = the soja or soya bean (*Glycine hispida,* Max.), used for making bean-curd, soy, oil, etc. Ground-nuts.

Yu (p. 1,661, No. 13,409). "Oil, fat, grease." 45 compounds incl. Oil, salt, soy, and vinegar = condiments generally. Sesamum-seed oil. Linseed. Wood oil. An oil factory. Oil dregs. But "bean-oil" = soybean oil does not appear here.

Note 1 (see p. vii): Other earlier important Chinese dictionaries are: Morrison (1819, English). Medhurst (1843, English). Williams (1874, American). Giles (1892, English). Giles lived 1845-1935.

Note 2. Unfortunately, the pronunciation of the compounds is not given (as in Mandarin). Address: Prof. of Chinese, Univ. of Cambridge, Cambridge, England; and sometimes H.B.M. Consul at Ningpo.

1600. Hashimoto, Yojizaemon. 1912. The dairy industry in Japan. MSc thesis, University of Wisconsin. [2] + 67 p. See p. 41-42 [3 ref. Eng]
• ***Summary:*** Chapter X, "The manufacture of tofu," states: "Three gallons of Soya beans soaked in pure, cold water about 10 hours so that the beans absorb water until [they] become of soft texture. Then grind the beans with a stone mortar, adding water little by little until you have 10 gallons of water. Then boil with water from about 20 to 30 minutes. If it boils over, add a little rape oil in order to prevent foam. After 20 or 30 minutes, pour into a hemp cloth bag and press with the hydraulic press so that a milky substance [soymilk] is squeezed out of the bag which is collected. The deposit remaining in the bag is cooled and is known as Kirazu [okara]. This is very palatable and is eaten by the people and domestic animals.

Note 1. This is the earliest English-language document seen (Aug. 2013) that uses the term "milky substance" to refer to soymilk.

"To this boiling, milky substance is added, little by little, saturated magnesium sulphate (obtained from sea salt) until about 1/20 of a gallon is added. Then cover about ten minutes without disturbing. This curd is poured into a wooden mold, which has a hoop of cheese cloth, and pressed about 30 minutes with light weights.

"The Tofu is a little firmer in texture than junket, which can be handled easily without breaking. Tofu has a mild, pleasant flavor and smooth texture. It is prepared economically and conveniently throughout the Japanese empire and is a most digestible food. It is cut into blocks about four or five inches square, weighing about one pound, which are sold for about one half cent each to consumers. It is eaten fresh or may be frozen and kept for a year or more."

\ Two tables (p. 42) give the "Chemical composition of tofu" and "Digestibility" [of tofu]. Digestibility: Crude protein: 2.7. Carbohydrates: 7.1? Fat 1.2.

\ Chapter XII (p. 63), "Future development of dairying in Japan" begins: "Some of the reasons why dairying has developed slowly in Japan are as follows:

"1. After introduction of Buddhism the slaughter of animals was forbidden under a severe penalty.

"2. Comparatively, our country is more thickly

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populated than any other civilized country, so that the entire area of fertile soil is cultivated and there are few pastures and meadows.

"3. Because our country is surrounded by oceans, fish are an abundant source of protein supplies.

"4. Tofu made out of soy beans is an economical, digestible food high in protein and is widely made by farmers and tofu makers throughout Japan.

"5. The native cattle are poor milk producers.

"In studying the future growth of the dairy industry in Japan, we have to consider, from an economical standpoint, (1) Whether there is room enough for the further development of the dairy industry in the island empire? (2) What quantities of dairy products will be consumed by the whole nation? (3) To what countries we might export dairy products? (4) What influence the dairy Industry would have on general agriculture?"

Note 2. This thesis was submitted for the Degree of Master of Science in Agriculture.

Note 3. At this time, the word "kirazu" appears to have been more popular than "okara" or "unohana."

1601. Hawaii Shimpo-sha (The Hawaii Shimpo). comp. 1912. Hawai Nihonjin nenkan [Hawaiian-Japanese annual. No. 10]. Honolulu, Hawaii: Hawaii Shimpô-sha (The Hawaii Shimpo). [Jap]*

• ***Summary:*** Name of company with diacritics is: Hawaii Shimpô-sha. Address: Los Angeles.

1602. Hiroshima Kenritsu Nôji Shikenjô. 1912. Kansaku daizu [Intercropped soybeans]. Hiroshima-ken, Japan: Hiroshima Kenritsu Nôji Shikenjô. 15 p. 23 cm. [Jap]* Address: Japan.

1603. Iinuma, Yokusai [Chôjun]. 1912. Zôtei sômoku zusetsu. Kusa-bu Sômoku-dzusetsu; or an iconography of plants indigenous to, cultivated in, or introduced into Nippon (Japan). Part I. Herbaceous plants. Revised and enlarged by Omitaro Makino. 3rd ed. III (Vol. 11-15). Tokyo: Seibidô (Tôri 3-chôme, Nihonbashi-ku). See vol. XIII, p. 929, 945-51, 964 (p. 1, 17-23, 36 in this volume's pagination). [Jap; eng]

• ***Summary:*** This work consists of 20 volumes bound in 4 physical volumes. Volume I (containing vols. 1-5) was published in 1907, Vol. II (vols. 6-10) in 1910, Vol. III (vols. 11-15) in 1912, and Vol. IV (vols. 16-20) also in 1912. Soybeans are discussed only in Vol. III (vol. 13).

The English-language title page lists the author's name as Yokusai Iinuma but it is often catalogued as Chôjun Iinuma; he lived 1782-1865. Omitaro Makino was a "Lecturer in Botany in the Science College, Imperial University of Tokyo." The text, a taxonomy of the soybean and its varieties, is mostly in Japanese, but with key terms romanized and simple illustrations (line drawings) describing the various varietal shapes. For each species, the text is on pages with Arabic page numbers, while the illustrations (line drawings) are on pages with only Japanese page numbers. Three main species of soybeans are listed, all members of the genus *Glycine* and the family Leguminosae:

(1) *Glycine Soja* Benth. (the cultivated soybean; *ômame, mame*). Text: p. 945-51. Illustration: (Ch. 13, Pl. XVII, p. 793). Also called: Dolichos Soja or *Japansche Slingerboon.* It has 15 forms, each based on the seed shape and color, and first named by Makino. Two simple illustrations (line drawings) show the shape, and hilum size and location, of each soybean form. Note that *mame* means "bean" in Japanese: Forma Gogatsu-mame (5th month bean), Forma Wase-mame, Forma Nakate-mame, Forma Okute-mame, Forma Maru-mame, Forma Shiroteppo-mame, Forma Kuro-mame (black soybean), Forma Kuroteppo-mame, Forma Goishi-mame, Forma Aomame (green soybean), Forma Kage-mame, Forma Aka-mame (red soybean, with 4 additional forms and colors), Forma Chamame (brown soybean, with 2 additional forms and colors), Forma Kurokurakake-mame, Forma Akakurakake-mame, Forma Fuiri-mame [speckled].

(2) *Glycine Soja* Benth. *forma lanceolata* Makino. (*midzu-kugiri*). Text: p. 951. Illustration: p. 794 (Ch. 13, Pl. XVIII, p. 794).

(3) *Glycine ussuriensis* Regel et Maack. (wild soybean; *Tsuru-mame*). Text: p. 964. Illustration: p. 808 (Ch. 13, Pl. XXXII, p. 808).

Vol. III also discusses: *Pueraria lobata* (kudzu; *kuzu*). Text: p. 954-55. Illust.: p. 798. *Arachis hypogaea* (the peanut; *rakkase, nankin mame*). Text: p. 971. Illust.: p. 816. *Sesamum indicum* (sesame seeds; *goma*). Text: p. 854-56. Illust.: p. 696. *Phaseolus radiatus* L. *var. aureus* Prain. (*adzuki*). Text: p. 956-58. Illust.: p. 800. Forma Natsuadzuki Makino. Forma Akiadzuki. Forma Oadzuki. Forma Udzuraadzuki. Forma Hokorikadzuki. Forma Shiroadzuki. Forma Akaadzuki. *Phaseolus radiatus* L. *var. flexuosus* Matsum. (*tsuru adzuki*). Text: p. 959. Illust.: p. 801. *Dunbaria villosa* Makino. (*no-adzuki*). Text: p. 964. Illust.: p. 809.

Note: The is the earliest document seen (Oct. 2004) that uses the word "Forma" in connection with soybean variety names. Address: Japan.

1604. Kantô Totokufu Minseibu; Shomuka. 1912. Manshû daizu ni kansuru chôsa [Survey of Manchurian soybeans]. Dairen: Kantô Totokufu Minseibu; Shomuka. Tokyo: Ryûkei Shosa. 117 p. 23 cm. Series: Meiji Kôki Sangyô Hattatshi Shiryô No. 525. Reissued in year 2000. [Jap]

• ***Summary:*** Name of organization with diacritics is: Kantô Totokufu; Minseibu; Shomuka. In 1905 the Kwantung Leased Territory was leased to Japan. Located at the southernmost tip of Manchuria, this mountainous peninsula contains the two ports of Dalian (Dairen) and Lüshun (W.-

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G. Lü-shun, Jap. Ryojun, traditionally Port Arthur). After the Russo-Japanese (1904-05), victorious Japan, through the Portsmouth Treaty, became the lessee of the Kwantung Leased Territory (1,337 square miles), the southernmost point of Manchuria. It contained the greater part of the southern branch of the Chinese Eastern Railway, which is now known as the South Manchuria Railway. This was Japan's first foothold on Manchuria–long before the Manchurian Incident of 1931. This survey was conducted 7 years after the Japanese began to lease the peninsula. Address: Manchuria.

1605. Kawakami, Kiyoshi Karl. 1912. American-Japanese relations: An inside view of Japan's policies and purposes. New York, Chicago, Toronto, London and Edinburgh: Fleming H. Revell Co. 370 p. Index. 22 cm.
• ***Summary:*** The author argues for naturalization rights for Japanese in America. Contents: Introduction. Book I: The Manchurian question (p. 23-142). Book II: The Korean question (p. 143-284). Book III: The immigration question.

In Chapter 4, titled "Chinese diplomacy in Manchuria," Kawakami argues that by defeating Russia in the Russo-Japanese war of 1905, Japan (at great sacrifice) saved China from dismemberment by foreign powers (p. 81): "Suppose Japan had not dared to combat Russia, what would have become of Manchuria, and indeed of China? With the Three Eastern Provinces irretrievably lost to China, other powers would not have hesitated to follow the suit of Russia and slice for themselves such regions as they had fixed their covetous eyes on. The defeat of Russia at the point of the Japanese bayonet, therefore, meant the prevention of the dismemberment of China, which would have become imminent had the Muscovite been allowed to stay in Manchuria."

In Chapter 6, titled "Japan's commercial advance in Manchuria and the 'Open Door' (p. 113-20), Kawakami discusses soybeans and Japan's policy in Manchuria. He argues convincingly that, since May 1906, Japan has followed an "Open Door" policy toward Manchuria, "... that China's sovereignty should be respected and the principle of equal opportunity for all nations should be adhered to with the utmost sincerity. In spite of all the harsh judgments passed by foreign critics, I do not hesitate to assert that Japan has been faithful to this fundamental policy sanctioned by the throne." Japan has promoted her own interests in the "Three Eastern Provinces" and allowed other nations to do likewise. Indeed: "Japan has subsidized her steamship lines to Manchuria, installed commercial museums in various important Manchurian towns in order to advertise her merchandise, sent commercial agents to inquire into the Manchurian markets, and, what is more important, has become a most liberal purchaser of Manchurian products, thus establishing close business relations with the native producers and merchants. These, reinforced by the advantage which she enjoys over Western nations in geographical position and the cost of production and transportation, have enabled her to push her trade in Manchuria with remarkable success.

What is the secret of Japan's secret of commercial success in Manchuria? This question Westerners usually answer with the hackneyed two words–cheap labor." This is true, however, the main reason is "that Japan, of all foreign nations, has been the only customer for Manchurian products..."

Kawakami believes that the only man who perceives the crux of the Manchurian question is George Bronson Rea, as described in his article of March 1910 titled "Beans: The solution of the commercial situation in Manchuria," published in his periodical the *Far Eastern Review* (Shanghai).

"The real basis of Japan's success in Manchuria is, Mr. Rea believes, the operation of the fundamental economic law, that the country consuming the major portion of the exports of another country holds the most advantageous position in supplying its necessary imports. Now Japan has for years been the chief consumer of Manchuria's principal export, consisting of [soy] beans and bean cake." Before the Russo-Japanese war, Chinese traders controlled this trade. But since Japan's victory in the war, all that has changed. "Japan began an aggressive campaign to gain control of the Manchurian trade, and success soon crowned her efforts. Says Mr. Rea:

"Under these conditions the foreign merchants and their agents in the interior are placed at a disadvantage from the outset. As they could not penetrate into the interior and purchase beans by an exchange of commodities, they are reduced to selling their wares for cash–the one thing the nation was short on."

"Not a few critics have been at pains to create in Europe and America the impression that Japan discriminates against foreigners in Manchuria in shipping and railway rates. The subsidized shipping of Japan, as one of such critics insinuates, carries Japanese goods at a minimum charge, subject to further rebates as quantities rise, from the place of manufacture to the port of Tairen [Dairen], thence the goods are carried at special rates to their selling place over the tracks of the South Manchuria Railway. In Mr. Rea's opinion, such charges and insinuations fall short of the mark in explaining the loss of the Manchurian market for American and European products, and he sums up the whole situation in these words:

"It is a far cry from high diplomacy to the humble soya bean, yet we hold to the belief that the past and present commercial situation and ultimate solution of the vexatious Manchurian question are bound up in the control of this one product."

In the next sentence, Mr. Kawakami writes: "That really furnishes the key to the Manchurian question."

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Note 1. In the index, the soya bean is indexed under "Manchurian bean," and not under "soy" or "soya."

Note 2. Kiyoshi "Karl" Kawakami (1873-1949) was a Japanese Christian journalist who was born in Yonezawa, educated in the law in Japan, and was for a short time involved in newspaper work in that country. In 1901 he came to the United States and studied at the universities of Iowa and Wisconsin. In 1905, engaged in journalism, he traveled extensively in China, Siberia, and Russia. He was a correspondent for leading newspapers in Tokyo and a frequent contributor to American magazines and newspapers. (Continued).

1606. Kawakami, Kiyoshi Karl. 1912. American-Japanese relations: An inside view of Japan's policies and purposes (Continued–Document part II). New York, Chicago, Toronto, London and Edinburgh: Fleming H. Revell Co. 370 p.
• ***Summary:*** Continued: Book III (p. 285+): The immigration question. 18. Japanese immigration before the exclusion agreement. 19. Denis Kearnyism once more–I. 20. Denis Kearnyism once more–II. 21. Japanese immigration after the exclusion agreement. 22. The Japanese in California. 23. The naturalization of Japanese.

Chronology of Japanese in California, and anti-Japanese activities. Most of this chronology is summarized from Kawakami (1912), but key events after 1912 have been added from other reliable sources.

1790 March 26–Naturalization Act of 1790 provides the first rules to be followed by the U.S. in granting citizenship. It limits naturalization to aliens who are "free white persons" and thus leaves out slaves, native Americans, indentured servants, free African-Americans, and later Asians.

1866–The first Japanese immigrants enter the USA, 7 in number vs. 278,916 European immigrants the same year. From 1866 and 1885 the peak number of Japanese immigrants to the USA is 78 in 1871, compared with 648,000 European immigrants in 1882.

1882 May 6–Chinese Exclusion Act, barring Chinese immigration, is passed by Congress.

1884–Amendments to the 1882 Exclusion Act tightened the provisions that allowed previous immigrants to leave and return, and clarified that the law applied to ethnic Chinese regardless of their country of origin. This facilitated the introduction of Japanese labor into California. Large landowners in California tried to encourage Japanese immigration by offering alluring terms.

1886–Japanese immigration to the USA begins to rise. From 1886 to 1898 the number of Japanese immigrants rose from 194 to 2,230.

1890–The U.S. census reports 2,039 Japanese residents in the U.S., including 1,147 in California, mostly student-laborers in San Francisco.

1892 May–The first anti-Japanese movement on American begins in San Francisco, led by local three newspapers: *Morning Call, San Francisco Examiner,* and *San Francisco Bulletin.* It culminated on 10 June 1893 in the San Francisco Board of Education resolution relegating Japanese students to the segregated Chinese school. After intervention by the Japanese consul, the resolution was soon rescinded, ending this early chapter of anti-Japanese agitation.

1899–Japanese immigration figures jump to 12,635 (still insignificant compared with 297,000 European immigrants) for two reasons: (1) This is the first year that Japanese immigration to Hawaii is included in immigration statistics to the USA. In fact, more than half of the total Japanese immigrants stayed in Hawaii. (2) Western U.S. railroads, finding that Japanese made excellent section workers, used every possible means to attract them to the USA.

Note: By the late 1900s, the word "unassimilable" (or "inassimilable") was being applied to both Japanese and Chinese immigrants on the west coast of the United States by Caucasian writers."

1900 April 30–The Organic Act is signed by President McKinley, incorporating Hawaii as a territory of the United States. The act went into effect on June 14, after which date contract labor was no longer legal. As a result, more than 8,000 laborers took part in 20 strikes within a month, calling for higher wages, reduced working hours, and hiring of Japanese overseers.

1900–The U.S. census reports 24,326 Japanese / Nikkei in the U.S., with 10,151 living in California and 1,781 in San Francisco.

1900–The first anti-Japanese protest rally in California takes place in San Francisco, instigated by local labor groups and led by Mayor James D. Phelan, who later became State Senator. In response, the Japanese Deliberative Council of America is formed.

1905 May 14–The Asiatic Exclusion League is formed in San Francisco, marking the official beginning of the organized anti-Japanese movement. Among those attending the first meeting were labor leaders (and European immigrants) Patrick Henry McCarthy and Olaf A. Tveitmoe of the Building Trades Council of San Francisco and Andrew Furuseth and Walter McCarthy of the Sailor's Union. Tveitmoe was named the first president of the organization.

1906 April 18–The Great Earthquake and Fire devastates San Francisco. Japanese enclaves in Chinatown and South of Market are devastated but South Park and Western Addition survives and thrives. The Japanese government contributes $246,000 to the City of San Francisco for earthquake relief, more than all other foreign nations combined. The Japanese community relocates to the present Japantown (*Nihonjin Machi, Nihonmachi*)–which celebrated its 100th anniversary in 2006 as the first and oldest Japanese community in the continental United States.

1906–The Japanese population of the United States (incl. Hawaii) first tops 75,000.

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1906 Dec. 23–A mass meeting is held in Walton Hall, San Francisco, to demonstrate the animosity of the laboring class against the Japanese. It is presided over by Olaf A. Tveitmoe. Continued. Address: Japan.

1607. Komai, Tokuzô. 1912. Manshû daizu ron [Treatise on Manchurian soybeans]. Sapporo, Hokkaido, Japan: Yuhi Kaku Shobo Hatsubai, Kamera Kai. 4 + 8 + 5 + 260 p. 22 cm. Series: Keizaigaku Nôseigaku Kenkyû Sôsho, dai-ni satsu. [Jap]*
• ***Summary:*** A bibliography appears on pages 1-5 (3rd group). The author was born in 1885 [and died in 1961]. Address: Japan.

1608. Komai, Tokuzô. 1912. Manshû daizu ron [Treatise on Manchurian soybeans]. [Sendai], Japan: Tôhoku Teikoku Daigaku Nôka Daigaku Nai Kamerakai. 260 p. 22 cm. Series: Keizaigaku Nôseigaku Kenkyû Sôsho no. 2. [Jap]*
• ***Summary:*** The author lived 1885-1961. Address: Japan.

1609. Korea. Industrial Model Farm. 1912. Chôsen zairai daizu oomugi komugi awa hinshu chôsa [Survey of common Korean species of soybean, barley, wheat, and millet]. Suigen, South Korea. 140 p. [Jap]
Address: Korea.

1610. Neumann, Hermann. 1912. Die Sojabohne, ihre Bedeutung fuer den gesunden und kranken Menschen und ihre Verwertungsform [The soybean, its significance for people in good and poor health, and the forms in which it is used]. *Zeitschrift fuer Physikalische und Diaetetische Therapie* (*Leipzig*) 16:129-51. [26 ref. Ger]
• ***Summary:*** "In my own medical practice, since 1908, I have served soybeans in various forms (as soup, vegetables, or bread) to many dozens of people, of all ages and degrees of ill health. In almost every case they have praised them and been helped by them." The author reported splendid results in treating diabetics with soybean bread and a patented preparation named "Soyap." Tables show the composition of various beans, including the soybean.

A Chinese establishment, Caséo-Sojaïne [founded by Li Yu-ying] near Paris, has undertaken to make soyfoods suited to French tastes (p. 149). Address: M.D., Potsdam.

1611. Okurasho Shuzeikyoku. 1912. Naikokuzei isan 55 [Domestic tax; treasure from the past 55]. Tokyo: Tokyozeimu Kantoku-kyoku. 161 p. 23 cm. [Jap]*
• ***Summary:*** This is a Japanese government publication. Note: This is the 4th earliest book in WorldCat / OCLC that has miso as a subject or title word. Address: Japan.

1612. Okurasho Shuzeikyoku. 1912. Naikokuzei isan 56 [Domestic tax; treasure from the past 56]. Tokyo: Tokyozeimu Kantoku-kyoku. 133 p. 23 cm. [Jap]*
• ***Summary:*** This is a Japanese government publication. Address: Japan.

1613. Shin Sekai-sha. 1912. Zaibei Nippon-jin kan [Directory of Japanese in the USA]. San Francisco, California: Shin Sekai-sha. [Jap]*
• ***Summary:*** The 1912 edition is at Waseda University in Tokyo. Address: San Francisco, California.

1614. Tanaka, S. 1912. Saibai kakuron [Details on cultivation. Revised ed.]. Tokyo. [Jap]*
• ***Summary:*** Nagata (1960, p. 75-76) states that Tanaka was the first to write on summer vs. autumn soybeans after the Meiji period. He emphasized that these two kinds of soybeans should be distinguished by the length of their growing period; the summer soybeans have a short growing period and the autumn soybeans a longer one. Tanaka also emphasized that vining and twining characteristics appear to be an important criterion for botanical taxonomy of soybeans.

1615. Tibbles, William. 1912. Foods: Their origin, composition and manufacture. London: Baillière, Tindall and Cox. viii + 950 p. See p. 372, 476, 529, 531-33, 535, 537-39, 776. Index. 23 cm. [5 soy ref]
• ***Summary:*** In the chapter on "The legumes or pulses," the section on "Beans" (p. 529) lists ten species of beans (including the soy bean) that "are used in dry condition in many parts of the world."

The section titled "The Soy Bean (*Dolichos soja,* or *Glycine hispida*) states (p. 531-33): "The soy bean is a native of Cochin-China, Java, and Japan, where it has been cultivated from the remotest antiquity. It is said to be the *shu* mentioned in the writings of Confucius, although the modern name is *ta-tou.* Its introduction into India is comparatively modern. It was introduced into Southern Europe and America in 1880, where it is now cultivated chiefly as a forage plant. There are numerous varieties of the plant, but, excepting in colour, the seeds do not differ much from each other in size and appearance. Those sold in the Chinese markets of Australia and Western America are either yellow or black. The seed resembles a pea, but the botanical characteristics of the whole plant are those of the bean. The seeds are one of the most important beans of China, Japan, and some other Oriental countries, where they are eaten like other beans–viz., boiled or baked. But in China and Japan they are elaborated into a variety of products, all of which are valuable for their high proportion of protein, and, when eaten with rice–the staple food of the people–make a fairly well-balanced dietary. Some of these articles are eaten at every meal by rich and poor alike, particularly in the interior of China. Some of these preparations are as follows:

"Soy Sauce, or Shoyu, is prepared from a mixture of cooked beans, roasted wheaten flour, and salt, which are put

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into a cask and allowed to undergo a prolonged fermentation. The result is a thick brown liquid, of pungent and agreeable taste. It is used in Europe as a basis for various proprietary sauces.

"2. Bean Cheese, or Tao-hu [Tofu].–There are several preparations. According to Prinsen-Geerligs, bean cheeses are made from white beans, which are soaked in water for three hours, afterwards being reduced to a paste and cooked. The milky fluid is then strained through a coarse cloth to remove starch and fibre, and when cool is precipitated by the addition of crude salt–i.e., salt containing calcium and magnesium as well as sodium chloride. The precipitate, which is rich in protein and fat, is then kneaded and pressed into cakes, called fresh Tofu, or 'Taahuor tofu.' They are then dipped into an alkaline solution of curcuma. An analysis of fresh tofu gives the following composition: Water 81.35, protein 11.46, fat 5.19, carbohydrate 0.81, ash 0.79, per cent. There are several varieties of the cheese, known as 'Natto,' 'Miso,' and 'Tofu.' Natto is made from beans which have been boiled for several hours until they are soft. The hot mass is then pressed into small cakes, wrapped in bundles of straw, and kept in a warm, tightly-closed cellar for twenty-four hours, when the action of minute organisms from the air or straw work a change in the mass, and produce an agreeable flavour. Miso is made by boiling the beans until they are soft, when they are beaten to a pulp, mixed with concentrated sea-brine or crude salt, and boiled rice. The substance is then put into a barrel which has previously contained a fermented liquor, and allowed to ferment. It is ready for use in two months, and is eaten like butter. Soy Milk: When beans have been boiled until they are soft, and beaten to a pulp, a considerable portion of the vegetable casein passes into solution, and forms a milky-looking liquid. It further resembles milk by a thin pellicle or skin [yuba] forming on its surface when it is boiled, just as in the case of boiled cow's milk, and the casein can be precipitated from solution by rennet or acids. Such milk has many uses. Tofu is also prepared from soy milk by the addition of sea-brine, which precipitates the casein by virtue of the calcium and magnesium salts. The coagulum is then pressed into tablets, which are snow-white. Tofu made in this way is prepared fresh daily, and therefore but little bacterial action occurs. Moreover, dried cheeses are made in China and Japan by freezing such cakes, afterwards thawing them and drying them in the sun."

Section 4 (p. 535) titled "The legumin of soy beans" mentions glycinin, legumelin, proteose, and vegetable casein.

A table (p. 537) gives the chemical composition of the following: Soy beans (black, or yellow). Soy cheese (*tao-hu*)*:* Tofu (fresh, frozen, dry matter). Natto. Miso (white, red, or Swiss). Soy sauce (Tao-yu): Shoyu. Three sources for these figures are cited.

On page 537-38 is information about the fats, carbohydrates, and minerals of soy beans and other legumes.

In the section on "Sauces" (p. 776) we read: Many of these sauces, or relishes, consist of a basis of vinegar, with Indian soy, mushroom ketchup, walnut ketchup, cayenne pepper, allspice, garlic, and other condiments and aromatic spices, to give flavour, pungency, and aromatic properties. A notable example is *Worcestershire Sauce,* which is composed of the following ingredients: Soy–1 quart. Malt vinegar–7 pints. Lime-juice–3/4 pint. Tamarind–1 pound. Chillies–1¼ ounces. Cloves–1¼ ounces. Garlic–3 ounces. Shallots–6 ounces. Anchovies–3 ounces.

"These substances are prepared by peeling and bruising the garlic and shallots with the anchovies. They are then mixed with the vinegar, soy, and spices, boiled together for twenty minutes, allowed to get cold, and strained. There are many other examples; most of the ingredients have been described in the foregoing pages.

"An imitation [soy sauce]. called English soy, is made by heating together 10 parts treacle, 16 parts extract of malt, 4 parts mushroom ketchup, and 9 parts common salt; it is allowed to stand twenty-one days, and afterwards clarified." Recipes for Mushroom ketchup and Walnut ketchup are also given (p. 776).

The section on "Rice as a food" (p. 475-76) notes that rice is poor in protein and fat and rich in carbohydrates. "It is consumed enormously by the inhabitants of Eastern countries... It should not be overlooked, however, that the same people consume the soy bean and its preparations, especially soy cheese and sauce, which largely compensate for the deficiency of protein. The deficiency of rice in stimulating properties, infinitely less than those of oats and oatmeal, accounts to some extent for the indolence and apathy of many Orientals, and it is a significant fact that the advance of the Japanese as a nation [incl. winning two major wars] is contemporaneous with the larger consumption of flesh foods."

The section on "Common Wheat" (p. 372) states: "The Chinese grew wheat 2700 B.C., and considered it a special gift from Heaven. It was classed with rice, sorghum, and the soy-bean, which the Emperor Chin-nong [Shen-Nung] ordered to be sown annually with sacred rites."

Note: William Tibbles lived 1859-1928. Address: LL.D., M.D. (Hon. Causa) Chicago, L.R.C.P. Edin., M.R.C.S. Eng., L.S.A. Lond. Medical Officer of Health, Fellow of the Royal Institute of Public Health, etc.

1615a. Product Name: Solite (Liquid Water-based Paint Containing Soy Protein. Also named Solight).
Manufacturer's Name: Solite Manufacturing Co.
Manufacturer's Address: Dairen, Manchuria.
Date of Introduction: 1912.
New Product–Documentation: Hoshino, Tokuji. 1920. Economic history of Manchuria. Seoul, Chosen: Bank of Chosen. x + 303 p. See p. 144-45. "Two novel uses of soya beans have been discovered by Mr. Suzuki of the Central

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Laboratory of the South Manchuria Railway Company. The one is the making from it of a new sort of paint, named solight,... A joint-stock company was established in Dairen to manufacture these articles in 1912, and it is now doing a prosperous business. The merits of solight are enumerated thus: it may be applied as it is; it dries quickly, that is, in about half an hour; it has no bad odour like paint; its easy combination with any colour; its cheapness."

Sadakichi Satow. 1921. Tohoku Imperial University, Technology Reports (Sendai, Japan) 2(2):1-124 (41-164). Oct. p. 5. "Researches on oil and proteids extraction from soy-bean." "In Japan, a new use of the soy-bean meal for the purpose of a water-color paint called 'Solite' was discovered by Mr. Y. Suzuki. This consists in subjecting the soy-bean meal to fermentation, mixing caustic lime with the meal, and thus causing the disintegration of fibrous material through fermentation and making the whole mass homogeneous." It can also be used as a nutritious food called "Legumon." Note 1. This is the world's earliest known commercial soy protein product–i.e., one made with soy protein isolates or concentrates; it is an industrial product. Note 2. This is the earliest known commercial soy product (with a brand name) made in Manchuria. Note 3. This is the earliest known commercial water-based paint made from soy protein.

Light of Manchuria. 1922. No. 17. p. 2-24, 29-31. Jan. 1. "Central Laboratory of South Manchuria Railway Co. I. Its history. II. Results of work. V. Beans and products." Includes a discussion of Solite water based paint containing soy protein. "It is being manufactured and sold at the Solite Manufacturing Co., Dairen."

H. Komatsu. 1922. Light of Manchuria. No. 23. p. 20-27. July 1. "Tantalus from bean oil." The author is Works Mgr., Dairen Solite Co. Ltd., Dairen, Manchuria. Thus the Solite Co. was in business by July 1922.

South Manchuria Railway Co. 1926. "Soya beans in Manchuria." Dairen: SMRC Agricultural Office. 40 p. Nov. See p. 17-18. Solite is a water-based paint, invented by Mr. T. Suzuki and manufactured and sold by the Dairen Solite & Co. until a few years ago.

South Manchuria Railway Co. 1937. Bean oil industry in Manchuria. p. 24. "Bean cake in manufacturing liquid paint. The Solite is a paint produced by mixing the protein content of [soy]beans with lime. It was invented by Mr. Yosei Suzuki and was manufactured and sold by the Solite Company at Dairen. The future of this industry is believed to be a hopeful one."

Contemporary Manchuria 1937. "Bean Oil Industry in Manchuria." p. 33. Note: Most soy-based paints used soy oil, but this one uses soy protein.

1615b. Product Name: Tantalus (Waterproofing Material Made from Soybean Oil. Also named Tantalse).
Manufacturer's Name: Solite Manufacturing Co.
Manufacturer's Address: Dairen, Manchuria.
Date of Introduction: 1912.
New Product–Documentation: Hoshino, Tokuji. 1920. Economic history of Manchuria. Seoul, Chosen: Bank of Chosen. x + 303 p. See p. 144-45. "Two novel uses of soya beans have been discovered by Mr. Suzuki of the Central Laboratory of the South Manchuria Railway Company. The one is the making from it of a new sort of paint, named solight, and the other, a chemical composition called tantalse, which imparts its waterproof characteristic to the cement, mortar, or concrete with which it is mixed, or to paint upon which it is applied. A joint-stock company was established in Dairen to manufacture these articles in 1912, and it is now doing a prosperous business."

H. Komatsu. 1922. Light of Manchuria. No. 23. p. 20-27. July 1. "Tantalus from Bean Oil." Tantalus is a substance used for waterproofing mortar, cement, or concrete, developed from soybean oil by Mr. T. [or Yosei] Suzuki, then in the service of the South Manchuria Railway Co.

Contemporary Manchuria 1937. "Bean Oil Industry in Manchuria." p. 26. "Waterproof Material. Mr. Yosei Suzuki, noticing that the aluminum soap of fatty acid has a waterproofing quality, invented an aluminum soap made of bean oil and named it Tantalus. It was manufactured until recently by the Solite Company at Dairen and its future seems to be interesting."

1616. Kondo, M. 1913. Der anatomische Bau einiger auslaendischer Huelsenfruechte, die jetzt viel in den Handel kommen [The anatomical structure of some foreign legumes, now widely used in commerce]. *Zeitschrift fuer Untersuchung der Nahrungs- und Genussmittel* 25(1):1-56. Jan. 1. See p. 1-12, 50-56. [7 ref. Ger]

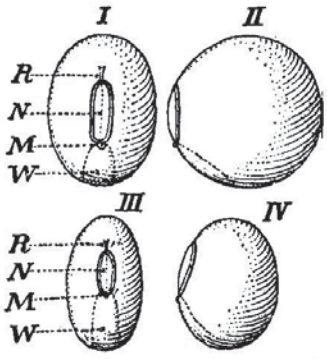

FIG. 50.—Soybean seed. I, II. A yellow variety from Japan. III, IV. Another variety. *N*, hilum; *R*, chalaza; *M*, micropyle; *W*, outline of hypocotyl seen through the testa. (*After Kondo.*)

• ***Summary:*** This is the second earliest microscopic study of the structure of the soy bean seed. Good summaries with details in English and clearer line drawings are given by

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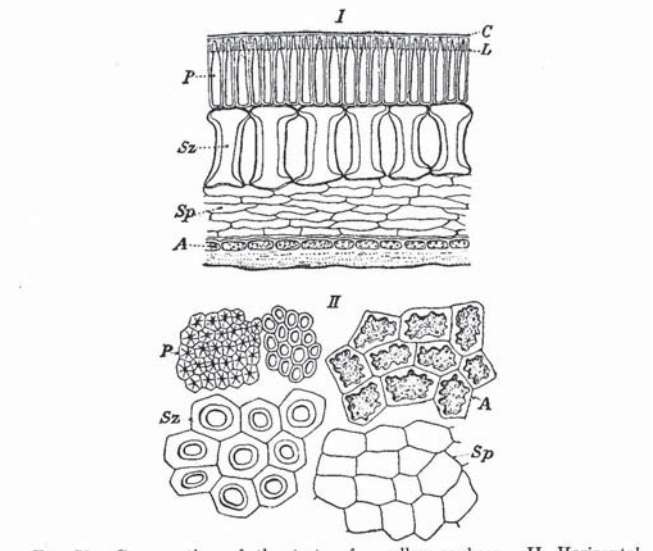

Fig. 51.—Cross-section of the testa of a yellow soybean. II. Horizontal section of same. *C*, cuticle; *L*, light-line; *P*, palisade cells; *Sz*, hour-glass cells; *sp*, spongy parenchyma. *A*, aleurone layer. (*After Kondo.*)

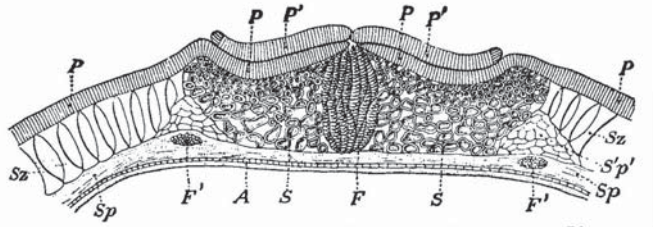

Fig. 52.—Cross-section of hilum of a yellow soybean from China. *P'*, outer palisade layer; *P*, inner palisade layer; *S*, asteroid parenchyma; *Sp*, spongy parenchyma; *F'*, fibro-vascular bundle; *F*, fibro-vascular bundle of the testa; *A*, aleurone layer; *Sz*, hour-glass cells. (*After Kondo.*)

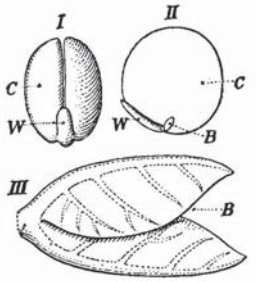

Fig. 53.—Embryo of a yellow soybean seed from Japan. I. Whole embryo from the ventral side. II. Half of embryo seen from the inner side. III. The two leaves of the plumule. *C*, cotyledons; *W*, hypocotyl; *B*, leaves of plumule. (*After Kondo.*)

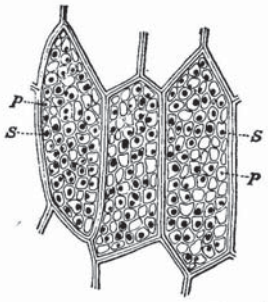

Fig. 54.—Soybean. Cells of the cotyledon filled with fat, protein and starch; *P*, protein; *S*, starch. (*After Kondo.*)

Piper and Morse (1923, p. 187-89), and Winton and Winton (1932, p. 513-15).

The cellular structure of the seed coat or spermoderm consists of 4 layers of cells. Moving from outside inward, below the surface cuticle and its underlying light-line are the palisade cells, hour-glass or column cells, the spongy parenchyma, and the protein-rich aleurone layer. The cells of the cotyledon are filled with fat, protein, and starch.

Detailed illustrations show: (1) Two yellow soybean seeds (one from Japan, one from China) showing the seed coat and a front and side view (ventral, facing the hilum) of each and with each part labeled (Fig. 1, p. 3): R = chalza (*Samennaht*), a small linear groove at one end of the hilum, the point where the seed coat was joined to the body of the ovule. N = hilum (*Nabel*) or seed scar, which is linear-elliptical in shape and nearly flat. M = micropyle (*Keimmund*), at the opposite end of the hilum from the chalza, it is a minute orifice in the seed coat through which the primary root of the young seedling emerges in germination. W = outline of hypocotyl seen through the seed coat / testa (*Würzelchen*), visible in many, but not all, varieties. Note: This is the earliest document seen (March 2009) that contains the word "micropyle."

(2) Cross section of the testa (the seed coat; "the hard external coating or integument of a seed") and horizontal section of the testa of a yellow soybean from China with each part labeled (Fig. 2, p. 5): C = cuticle (*Cuticula*). L = light-line (*Lichtlinie*). P = palisade cells (*Palisadenzellen*). Sz = hour-glass cells (*Säulenzellen*). Sp = spongy parenchyma (*Schwammparenchym*). A = aleurone layer (*Endospermüberreste*).

(3) Cross-section of hilum of a yellow soybean from China, with each part labeled (Fig. 3, p. 8): P' = outer palisade layer (*Aeussere Palisadenschicht*). P = inner palisade layer (*Innere Palisadenschicht*). S = asteroid parenchyma (*Sternparenchym*). Sp = spongy parenchyma (*Schwammparenchym*). F' = fibro-vascular bundle (*Gefässbündel des Nabels*). F = fibro-vascular bundle of the testa (*Gefässbündel der Samenschale*). A = aleurone layer (*Endospermüberreste*). Sz = hour-glass cells (*Säulenzellen*).

(4) Cross-section through the chalza of a green soybean from Japan (Fig. 4, p. 10): P = palisade cells. Sz = hour-glass cells. S = Process, appendix or process of the parenchyma? (*Fortsatz des Nabelsternparenchyms*). F = Fibro-vascular bundle. Sp = Spongy parenchyma. A = Aleurone layer.

(5) The embryo of a yellow soybean seed from Japan (Fig. 5, p. 10): I. Whole embryo from the ventral view; II. Half of the embryo seen from the inner side. III. The two leaves of the plumule. C = Cotyledons (*Keimblätter*). W = Hypocotyl (*Würzelchen*). B = Leaves of the plumule (*Blatterfederchen*).

(6) Soybean cotyledon cells filled with fat, protein, and starch (Fig. 6, p. 12): P = Protein (*Protein*). S = Starch (*Stärke*), the black points. The material between the protein bodies is fat/oil.

An interesting chart (p. 50-51) gives an analytical comparison of the morphological characteristics of the seeds of seven plants. A table (p. 52-56) makes a similar comparison in more complex terms. Address: Tokio.

1617. Pontius, Albert W. 1913. Modern [soya] bean mill for Manchuria. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*)

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16(8):172. Jan. 10.
• ***Summary:*** "The South Manchuria Railway Co. proposes to establish a new bean mill for the experimental manufacture of bean cake and bean oil on a most up-to-date system. The railway has decided to set apart the sum of $125,000 for such experimental work. The construction of the building will commence early in 1913 and the plant will be ready for operation in 1914. The machinery is reported to have been purchased in Germany at a cost of about $40,000 and is due to arrive at the beginning of 1912. The plant will have a capacity of 50 tons of beans per day, with a resultant oil output of approximately 7 tons.

"The chief object of the experimental plant will be to resolve by chemical process fatty substances at present still remaining in the bean cake, with a view to extracting ultimately from beans the maximum amount of oil of finer quality than any now put out in South Manchuria. The same process of manufacture is in vogue in Europe with splendid results, and the proposed plant is expected to entirely change the bean-milling industry in Manchuria."

The absence of fatty substance in the cake is likely to permit the safe export of the cake to Europe and America, whereas under present conditions fermentation en route is only too likely to occur.

The modern bean will replace the Santai mill which burned in late 1912, as described in the following report from Dalny (Dairen) that appeared in the *London and China Telegraph* (London). "Destruction of big mill: Fire broke out at the Santai bean mill above the Dairen wharves on November 13. The flames, feeding on the combustibles at the mill and fanned by the gale, defied all attempts at control. They razed to the ground the bean mill containing the oil expressing department and oil refinery, and spread to the oil-tank depot, standing at the east of the mill. The ill-fated mill was constructed in 1906. The plant is capitalized at $250,000 gold, of which the Mitsui Bussan Kaisha invested $150,000, and the balance was divided among a few of the leading Chinese merchants. The mill was one of the few best appointed factories in South Manchuria."

"The Formosan Government intends to purchase 70,000,000 pieces of Manchurian bean cake during the coming year as fertilizer for the Formosan sugar cane. A tender for the shipping of 150,000 pieces has been recently secured by the Mitsui Bussan Kaisha." Address: Consul, Dalny, Japanese Leased Territory.

1618. Fisher, Fred D. 1913. Commercial activities in Manchuria. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 16(11):225-32. Jan. 14. See p. 227.
• ***Summary:*** This article begins: "While Manchuria was not an active field in the political unrest [revolution] of 1911, these Provinces felt many ill effects from the turbulent conditions further south."

The section titled "Most important articles of foreign trade" states: "The exportation of soya beans and their products from the ports of Manchuria in 1910 and 1911 were, respectively, as follows: Beans, 828,924 tons and 818,108 tons; bean cake, 621,927 tons and 911,881 tons; bean oil, 44,083 tons and 65,992 tons. About 280,000 tons of beans and 32,000 tons of bean oil were exported to Europe. The average export prices for the year were about $19 per ton for beans, $16 for bean cake, and $72 for bean oil. Two of the largest British houses exporting beans suspended in 1911 because of difficulties in securing delivery on forward contracts. On the other hand, one of the largest Japanese firms is rapidly increasing its proportion of the bean export trade." Address: Consul General, Mukden.

1619. *New York Times.* 1913. Latest customs rulings. Seaweed is not shellfish–Amasake assessed as miso. Jan. 28. p. 13.
• ***Summary:*** "The Board of United States General Appraisers yesterday overruled the Asia Company, who contended that bottled seaweed could be duty free under the Tariff act of 1909 as shellfish. The commodity was assessed by the Collector at 40 per cent ad. valorem under Paragraph 252 as prepared vegetables."

"Amasake, a Japanese beverage imported by Okada and Ischida [Ichida], was properly assessed at 40 per cent. ad valorem under Paragraph 252 of the present law as being a product similar to miso. Amasake is composed of rice yeast [koji], combined with boiled rice."

Note 1. This is the earliest English-language document seen (April 2004) that uses the term "amasake" to refer to amazake.

Note 2. This is the earliest document seen (April 2004) showing amazake in the United States.

1620. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*). 1913. Vegetable-oil industry and trade. 16(35):737-44. Feb. 11. See p. 740.
• ***Summary:*** The section titled "Ceylon" states: "The cultivation of the soya beans is not making very much headway in Ceylon, according to the Times of Ceylon, whereas in Java, Burma, Japan, and Manchuria cultivation is carried on on a very extensive scale. Some time ago the Ceylon Agricultural Society ordered beans from Java for a few members, the beans from that country being found more suitable to Ceylon. At first the beans were obtained on successfully in Jaffna, Kalutara, and Puttalam, and even in the Kandy district, and at present the beans are being used as a vegetable and for making green manure. It is claimed they are a good specific for diabetes, and the oil that is expressed from them is equal to olive oil. It has an agreeable flavor and is known as sweet oil. It is a formidable rival to coconut oil for the purpose of soap manufacture, but its cultivation

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in this island does not seem to have 'caught on.' It can be interplanted with coconuts and as it is a nitrogenous plant the larger trees would benefit."

1621. Tanret, Georges. 1913. Sur la présence du stachyose dans le Haricot et les graines de quelques autres Légumineuses [On the presence of stachyose in kidney-beans (haricots) and in seeds of some other legumes]. *Bulletin de la Societe Chimique de France* (*Paris/Bayeux*) 13-14(4):176-82. Feb. 20. 4th Series. [10 ref. Fre]
• ***Summary:*** As is well known, stachyose is a crystalline sugar that Schulze and von Plata discovered in 1890 in *Stachys tuberifera,* an edible tuber (Labiate) from Japan. Here the author reports the isolation of sucrose and a tetrasaccharide stachyose from soybeans.

1622. Kita, Genitsu. 1913. Some properties of koji-diastase. *J. of Industrial and Engineering Chemistry* 5(3):220-22. March. [3 ref. Eng]
• ***Summary:*** "I have lately been occupied in a series of investigations relative to Soya or Shoyu (Japanese [soy] sauce fermented from beans, wheat and salt) making, and incidentally cleared up certain" points about the saccharifying enzyms [enzymes] of koji."

"Summary: I. Though koji may contain two different saccharifying enzyms, *viz.,* amylase and glucase, the total quantity of glucose saccharified solution could not be produced from maltose by the action of glucase alone; hence, koji must contain some other kind of diastase which produces glucose directly from starch without the aid of glucase.

"II. Common salt has a protecting action on koji-diastase under heating but not on malt-diastase, while sodium hydrogen phosphate (Na_2HPO_4), asparagine and sulfuric acid impair its activity more quickly.

"III. The inhibitory action of salt on koji-diastase has a certain relation to the concentration of diastase. In a dilute enzymic solution it is very strong but not in a concentrated enzymic solution. It is therefore necessary in every case to note concentration of diastase when we consider the influence of some salt upon it.

"IV. The activity of koji-diastase is conserved in brine for a long time." Address: Dep. of Applied Chemistry, Tokyo Imperial Univ.

1623. Lemarié, Charles. 1913. Les plantes alimentaires du Tonkin [The food plants of Tonkin]. *Bulletin de la Societe d'Acclimatation* 60:367-76. March. See p. 371. [Fre]
• ***Summary:*** In the section on legumes, we read: *"Glycine hispida* Moench.–Soybeans (*Les Sojas*) are cultivated everywhere for the preparation of purées or of kinds of cheeses [probably tofu], or else for the production of sprouts, a food of which the indigenous people are fond. They are not used as a source of oil.

"Varieties from Japan, distributed by the Colonial Garden (*Jardin colonial*) in 1910, to Tonkin, as well as to the Sudan, have given nothing but poor results. These varieties were not adapted to the soil or the climate.

"But the improvement of local varieties and, if possible, the introduction of better varieties, continues to be studied."

Note: The term "Sudan" refers imprecisely to a region (not a political unit) that extends across the African continent from the west coast to the mountains of Ethiopia. Much of it was under French rule from 1898 as part of French West Africa, and included Dahomey (*Dahomey*), French Guinea (*Guinée*), French Sudan (*Soudan français*), Ivory Coast, Mauritania (*Mauritanie*), Niger, Togo (*Territoires Militaires du Niger et Togo*), Senegal (*Sénégal*), & Upper Volta (*Haute-Volta*). It is not clear to which part of the Sudan the soybeans were introduced, nor whether or not they were cultivated there, nor with what results. Address: Director of Agriculture, Tonkin [Vietnam].

1624. Sawamura, Shin. 1913. On bacillus natto. *J. of the College of Agriculture, Tokyo Imperial University* 5(2):189-91. March. [1 ref. Eng]
• ***Summary:*** "Natto is an article of food prepared by leaving boiled soy-beans wrapped in rice straw in a warm place for a night, and thus making them ferment. Soy-beans of natto are coated with a characteristic slimy substance. The author separated formerly two species of bacilli from natto obtained in Tokyo, No. 1 of which produced good flavored natto when inoculated to boiled soy-beans, and No. II strongly slimy one. The former bacillus was considered to be the chief actor in natto fermentation and received the name of *'Bacillus natto.'* In later years the author examined bacteriologically many samples of natto obtained at various localities, and found that the producer of natto is the same in all cases, viz. *'Bacillus natto.'* This bacillus can produce natto of good flavor and strong viscosity, and the presence of other microbes is not necessary in the fermentation of natto." A detailed bacteriological description of *Bacillus natto* is then given. "It was confirmed by the previous investigation that *Bacillus natto* produces a trypsin-like enzyme, and decomposes protein of soy-beans... *Bacillus natto* produces diastase, but reducing sugar was not found in natto thus prepared."

When *B. natto* acts on boiled soy beans at 35ºC for 14 hours and for 7 days, the following results are obtained, respectively: Total nitrogen, 7.36, 7.42; insoluble albuminoid nitrogen, 5.89, 2.10; soluble albuminoid nitrogen, 1.48, 5.31; soluble coagulable nitrogen, 0.31, 0.18; soluble non-coagulable nitrogen, 0.32, 0.48; nitrogen, of peptone and polypeptides, 0.21, 0.41; nitrogen, of arginine, histidine and lysine, 0.07, 0.09; nitrogen of purine bases, 0.09, 0.14; nitrogen precipitated by phosphotungstic acid, 0.11, 2.11; soluble organic matter, 21.95, 41.55. Carbohydrates of soy beans are mainly galactans, not much starch being present.

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Note: This is one of the key early research articles in understanding *Bacillus natto,* the natto bacterium.

Note 2. This is the earliest English-language document seen (July 1998) that mentions polypeptides in connection with soybeans. Address: Japan.

1625. Takahashi, Teizô; Yamamoto, Takeharu. 1913. On the physiological difference of the varieties of *Aspergillus oryzae* employed in the three main industries in Japan, namely saké-, shôyu-, and tamari-manufacture. *J. of the College of Agriculture, Tokyo Imperial University* 5(2):153-61. March. Previously published in *Jozo Shiken-jo Hokoku* (Report of the Brewing Inst., Tokyo), March 1911. [6 ref. Eng]

• ***Summary:*** "The physiological differences between the fungus of saké koji, shôyu koji and tamari koji are remarkable, especially in the formation of amino-acids, sugars, esters, ammonia and the liquefaction of gelatine... The formation of sugars is more conspicuous in the varieties of the fungus customarily used in the brewing of saké than in that of the varieties of shôyu or tamari, and vice versa in regard to the peptonification on the formation of amino-acids or ammonification.

"Still further, the formation of large quantities of amino acids at the stage of the spore formation of the fungus, in spite of their being less of them at the mycelium stage, explains why we use koji at spore stage in shôyu or tamari industry, and at the mycelium stage in saké brewing."

Contents: Introduction. Varieties [of Aspergillus oryzae] used in the experiments. The preparation of koji and the method of analysis. The content of sugar in the whole mass of the prepared koji, namely the growth on 100 g. of rice. The amounts of organic acids. The esters. The amino-acids and ammonia. The liquefaction of gelatine in the culture of the fungus in koji gelatine. Summary. Address: Tokyo Imperial Univ., Japan.

1626. Takahashi, Teizô; Abe, Goro. 1913. Preliminary notes on the chemical composition of miso. *J. of the College of Agriculture, Tokyo Imperial University* 5(2):193-98. March. Published in 1908 in *Tokyo Kagaku Kaishi* 29(2). Feb. [5 ref. Eng]

• ***Summary:*** This article begins: "'Miso' is a food very common in Japan. The raw materials used in making it are soy beans, rice or barley, common salt, and water. In preparing 'Miso,' rice or barley is changed first into 'Koji'..."

A full-page table compares the chemical composition of Hatsuchô-miso [Hatcho miso], Sendai-miso, and Inaka-miso, including amino acid content. "Assuming 37.5 grams to be the least quantity daily consumed per head and that 30 million out of the 50 millions of the whole population eat 'miso' every day, the annual consumption of 'miso' would amount to nearly 45 million kilograms."

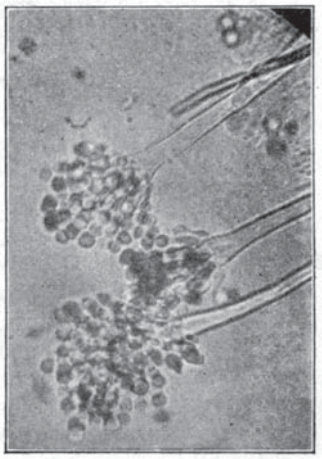
Note: This is the earliest document seen (March 2009) that mentions "Hatsuchô-miso" [Hatcho miso]–a type of miso made with soybean koji. Address: Japan.

1627. Yokohama Nursery Co., Ltd. 1913. Descriptive catalogue... Bulbs, plants seeds, etc. 1913-1914. Yokohama, Japan. 110 p. March. Illust. Index. 26 cm. [Eng]

• ***Summary:*** On the cover of this English-language catalog is an illustration of 3 flowering plants. In the section on "Seeds" (p. 90+) is a subsection (p. 97) titled "Some vegetable seeds." The contents (incl. the entry for "soy bean") is similar to that in the 1912 catalog except that soy bean costs $0.15 per lb., or $4.00 per 100 lbs. (U.S. gold). Address: P.O. Box No. 72. 21-35 Nakamura, Yokohama, Japan. Phone: 509.

1628. Kita, Gen-itsu. 1913. Einige japanische Schimmelpilze [Some Japanese molds]. *Zentralblatt fuer Bakteriologie. Series 2.* 37(17/21):433-52. April 30. [7 ref. Ger]

• ***Summary:*** Contents: Introduction. *Aspergillus tamarii,* new species. Morphological. Physiological. Affinity. Diagnosis. Incidence of mold parts isolated from soybean koji used to make tamari soy sauce. *Aspergillus glaucus,* varieties α, Beta, gamma. For each of the three varieties the same categories of information are given as for *Aspergillus tamarii.* A new white *Aspergillus* species. Comparison with *A. Okazaki*, *A. candidus,* and *A. albus.*



Kita named the species *Aspergillus tamarii.* Twenty-one photos and illustrations (see next page) show: Spores of the mold magnified x 370. Sterigmata and spores. Conidio bearers and spores. Hyphae. *Aspergillus glaucus.* "The moist wind and warm climate of Japan enable the flora, and especially the microorganisms, to grow very luxuriantly."

(1-3) *Aspergillus tamarii* x 370. (5) Spores. Address: Aus dem Techn. Institut d. Kaiserl. Universitaet zu Tokio, Japan.

1629. *Tropical Life* (*England*). 1913. More soya beans wanted: Restricted supplies and high prices–The English industry declining for want of raw material. 9(4):71-72.

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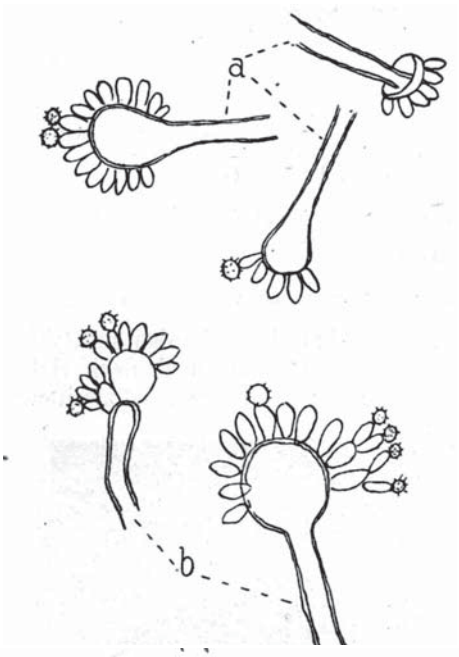

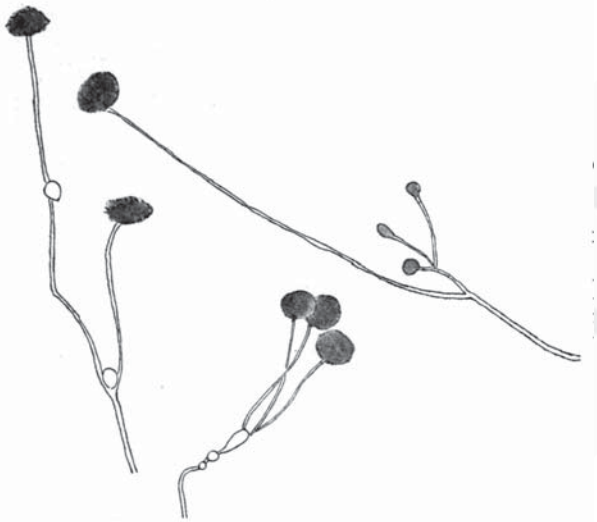

April. [5 ref]
• ***Summary:*** This is a summary of articles and reports from five different sources (only the following citations are given): *Indian Trade Journal, Times of Ceylon, Manchester Guardian, Progress Report of the Ceylon Board of Agriculture,* two London correspondents (writing in Sept. and Oct. of 1912), and Prof. Wyndham Dunstan, Director of the Imperial Institute.

1630. Winkler, Gustav. 1913. Die Sojabohne: Vortrag gehalten in der Monatsversammlung des Gartenbau- und Verschoenerungsvereins Fechenheim [Mainkur] am 17. April 1913 [The soybean: Lecture presented at the monthly meeting of the Gardening and Beautification Society of Fechenheim {Mainkur} on 17 April 1913]. Frankfurt am Main, Germany: Published by the author. 14 p. [Ger] Address: Mainkur bei Frankfurt am Main, Kreis Hanau, Waldstrasse 55.

1631. Yokohama Nursery Co., Ltd. 1913. Wholesale trade list. 1912-13. Yokohama, Japan. 34 p. April. Illust. Index. 26 cm. [Eng]
• ***Summary:*** On the cover of this English-language catalog is an illustration of a lily flowers. In the section on "Seeds" (p. 28+) is a subsection (p. 32) titled "Some vegetable seeds." The wholesale price of soy bean is $0.10 per lb or $2.50 per 100 lb. This is the earliest wholesale catalog seen from Yokohama Nursery Co. Marrow peas are listed for the first time. Address: P.O. Box 72. 21-35 Nakamura, Yokohama, Japan. Phone: 509.

1632. Bertrand, Gabriel; Rosenblatt, Mr.; Rosenblatt, Mme. 1913. Recherches sur l'hydrolyse comparée du saccharose par divers acides en présence de la sucrase de kôji [Research on the comparative hydrolysis of saccharose by various acids in the presence of the sucrase of koji]. *Annales de l'Institut Pasteur* 27(5):366-72. May. [10 ref. Fre]
• ***Summary:*** Discusses *Aspergillus niger* and *A. oryzae.* Conclusion: It is the great difference in the concentration of hydrogen ions (pH) that determines the maximum activity of the three kinds of sucrases.

A portrait photo shows Gabriel Bertrand.

Note: In 1906-1910 Li Yu-ying left Montargis for Paris where he enrolled in courses in chemistry and biology at the Sorbonne and worked as an intern in the laboratory of Gabriel Bertrand at the Pasteur Institute.

1633. Seattle (Washington) passenger and crew lists, 1882-1957. Immigration and emigration: Saizo Ota. 1913.
• ***Summary:*** Name of ship: S.S. Minnesota, sailing from Yokohama, Japan. Name of passenger: Saizo Ota. Birth: 1881–Japan. Departure: Yokohama, Japan. Arrival: 24 June 1913–Seattle, Washington.

Note: The correct name of this document may be: List or manifest of alien passengers for the United States. Required by the regulations of the Secretary and Labor of the United States, under Act of Congress approved February 20, 1907,...

1634. Seattle (Washington) passenger and crew lists, 1882-1957. Immigration and emigration: Shina Ota. 1913.
• ***Summary:*** Name of ship: S.S. Minnesota, sailing from Yokohama, Japan. Name of passenger: Shina Ota. Birth: (?)–Japan. Departure: Yokohama, Japan. Arrival: 24 June 1913–Seattle, Washington.

Note 1. Saizo and Shina Ota, husband and wife, traveled together on this ship from Yokohama to Seattle. Note 2. The correct name of this document may be: List or manifest of alien passengers for the United States. Required by the regulations of the Secretary and Labor of the United States, under Act of Congress approved February 20, 1907,...

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1635. Pontius, Alfred W. 1913. Manchurian soya bean trade and industry. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 16(147):1560-61. June 25.

• ***Summary:*** "The export season of beans commences usually in October and ceases early in the May following. The present season closed rather early. A table shows exports of [soya] beans, bean cake, and bean oil in 1911-12, and 1912-13 to Japan, China, Europe, and total.

"New model bean mill–Its effect on other mills: The local bean mills, which formed a union to adjust their output to the demand in order to prevent prices from falling abnormally low, face a new danger in the chemical extraction process, whose merits will be tested thoroughly by the South Manchuria Railway, which will erect an experimental bean mill. This modern scientific process is used in the bean mill established, during the past year near Osaka, Japan, by Lever Bros., English soap manufacturers. The bean consumption of this factory is estimated to be 100 tons per day, while the new Dairen mill is designed upon a scale half as large. As previously noted the two chief advantages of this new process is that 12 to 14 per cent of oil may be extracted against only 8 to 9 per cent now obtainable. The residue suits better for fertilizing purposes and for feeding stock, as it is in meal form, thus avoiding the expense of grinding the cake.

"Local millowners have another worry. One cause of the recent depression in the South Manchurian bean-mill industry was the establishment of rival mills in Japan, which is said to be more advantageously situated."

"Soy [sauce] breweries in South Manchuria: While reliable statistics are lacking regarding the manufacture of soy from Manchurian beans, it is claimed locally that the total output in South Manchuria has been increasing steadily year after year while imports from Japan have deceased. Annual imports from Japan and outputs in South Manchuria are estimated as follows:"

A table shows that in 1910 imports of soy sauce were 2,264 tons and total output in South Manchuria was 875 tons. Total: 3,139 tons. In 1911 imports were 1,871 tons and local output was 1,125 tons. Total: 2,996 tons. In 1912 imports were 1,683 tons and local output was 1,625 tons. Total: 3,308 tons.

"The demand for soy [sauce] has increased as the Chinese have gradually learned to like it. Of the total consumption of soy of superior and medium quality each takes up about 20 per cent, the remaining 60 per cent being of inferior quality. The steady increase of the South Manchuria output in recent years signifies that the imported product will be entirely supplanted by the local manufactured article. Japanese have $65,000 invested in these local soy breweries, apportioned as follows: Dairen, $30,000; Port Arthur, $18,000; Newchwang, $10,000; and five smaller places $7,000. Present prices for the product are $1.40 to $1.80 per 50 pounds wholesale, and $1.60 to $2 per 50 pounds retail." Address: Consul, Dalny (Dairen), Japanese Leased Territory.

1636. Curtice, Raymond S. 1913. Dairen. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 16(177):597-608. July 31. See p. 604-05.

• ***Summary:*** This is part of a larger article on "Commerce and industries of southern Manchuria" (p. 593+). The section on Dairen begins: "The Dairen (Dalny) consular district compromises the southern end of the peninsula of Liaotung, the southernmost part of Manchuria, and embraces the whole of the Kwantung Leased Territory, which was originally leased to Russia by China in 1898. The unexpired term of the lease was ceded to Japan by Russia at the close of the Russo-Japanese War."

The section titled "Bean trade" (p. 604) notes that there has been a marked decrease in the trade of soybeans and products from Dalny. The reasons for this have already been given. A table shows exports for the calendar year 1912 of bean cake, [soy] beans, and bean oil (in tons of 2,000 lb) to various countries. Most of the bean cake (302,402 tons) is sent to Japan. Most of the [soy] beans are also exported to Japan (101,903), followed by Hong Kong (9,694), Great Britain (5,700), Dutch Indies [today's Indonesia] (2,829), and Netherlands (1,108). The largest amount of [soy] bean oil is sent to Belgium (13,550), followed by Japan (7,636), and Great Britain (1,116). Small amounts of beans and/or products are exported to: United States (oil only), Singapore / Straits, etc., Sweden, Germany, France, Russia (Pacific ports), and Chosen (Korea). For bean cake: Total to foreign countries 302,551. Total to Chinese ports 76,172. Grand total (1912) 378,723. For [soy] beans: Total to foreign countries 121,3241. Total to Chinese ports 61,304. Grand total (1912) 182,629. For [soy] bean oil: Total to foreign countries 23,493. Total to Chinese ports 13,973. Grand total (1912) 37,467. Corresponding totals are given for 1910 and 1911. "The fact that share taken by the Chinese ports was so much greater proportionally in 1912, in all three items, was due to the lessening of the European demand." "It is expected that a new factor in the export trade of bean cake will be introduced when the new chemical process of extracting the oil is put into operation, for the residue, now in the form of bean cake, will be in a powder, and will be capable of shipment through the tropics without decaying. This should open up profitable markets in America and Europe for this article."

The section titled "Bean milling the chief industry" (p. 605) begins: "The industries of this consular district center around the [soy] bean trade and the South Manchuria Railway Co. Gives statistics by bean mills on production of bean cake and oil in 1910, 1911, and 1912. The Chinese have 40 [soy] bean mills in operation with a combined capital investment of $528,500, while the Japanese with their six mills of most modern construction total $1,687,000.

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Although most of the Chinese mills are operated by crude methods, still it is significant that their combined output during the season just past (October–April) was $8,308,098. The output of five modern Japanese mills (one having been destroyed by fire) during the same period was $2,360,170." Address: Vice consul.

1637. Kent, William P. 1913. Newchwang. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 16(177):608-13. July 31. See p. 611.
• ***Summary:*** This is part of a larger article on "Commerce and industries of southern Manchuria" (p. 593+). The section titled "Soya beans and products–Exports" states (p. 611): "The soya bean and its products of oil and bean cake continue to hold first place in the commerce of the port, but there was a falling off in the export of all of these articles during 1912. Competition with Dairen is probably more clearly defined in this trade than in any other of those referred to in this report. The progressive decline in exports year by year in beans, oil, and bean cake can be accounted for in no other way than that these are being diverted to Dairen, where the berthing of ships and a port open throughout the year, as well as railway competition in transportation, give advantages to shippers. None of these products go directly from Newchwang to the United States. Whatever beans or oil is imported come through reshipment at the ports of Japan or from Shanghai. Neither is it possible from any available statistics to know to what countries of Europe, or in what quantities, beans or oil shipments originating at Newchwang are finally destined." Address: Consul.

1638. *Derniere Heure* (*La*) (*Brussels, Belgium*). 1913. Huile de soya, de pression [Soybean oil, pressed]. Aug. 28. Business section (*la mercuriale*). [Fre]*
• ***Summary:*** The price is understood to be, for 100 kg net, barrels / containers included, on board the wagon at Antwerp / Anvers, total weight checked at Antwerp, tare [weight of the container] of origin, to be paid within 30 days and discounted at the rate of the National Bank, rate for discounted drafts. Commission to be paid by the seller. 25 cents (*centimes*). Japanese: available 71 francs 50 cents.

Note: These are the terms of a contract to buy pressed soybean oil. This price is higher than that of linseed oil and almost as high as that of colza / rapeseed oil.

1639. Takahashi, Teizô; Yukawa, Matao. 1913. Shôyu kôji oyobi shôyu moromi-chû no gaseikin ni tsuite (2) [Studies on the budding fungi of shoyu koji and shoyu moromi (mash) (2)]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 133. p. 1-25. Sept. 5. [Jap]
Address: 1. Nôgaku-Hakushi (Doctor of Agriculture), Japan; 2. Nôgaku-shi, Japan.

1640. Winkler, Gustav. 1913. Die Sojabohne: Vortrag gehalten in der Monatsversammlung des Gartenbau- und Verschoenerungsvereins Fechenheim-Mainkur am 17. April 1913. 2 Auflage [The soybean: Lecture presented at the monthly meeting of the Gardening and Beautification Society of Fechenheim-Mainkur on 17 April 1913. 2nd ed.]. Fechenheim bei Frankfurt am Main, Germany: Published by the author. 16 p. 22 cm. [Ger]*
Address: Mainkur bei Frankfurt am Main (Germany).

1641. Myers, M.S. 1913. Trade year at Mukden. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 16(237):177-84. Oct. 10. See p. 183-84.
• ***Summary:*** The section titled "Trade of Changchun" states: "In 1909 the East Asiatic Co., Samuel & Co., the Manchurian Co., L. J. Healing & Co., and Jardine, Matheson & Co. established branches at Changchun and erected spacious premises on yards leased from the South Manchuria Railway Co. containing railway sidings, but with the exception of the last-mentioned firm, which uses its branch for the distribution of Shanghai-made piece goods and Hongkong sugar, all have withdrawn."

"The withdrawal of the firms mentioned is the direct result of certain changes which have taken place in the bean trade of South Manchuria. The export of the soya bean from this district, which three or four years ago developed so rapidly, has, as far as Europeans are concerned, ceased for the present to possess any interest, the trade being in the hands of Japanese and Chinese dealers who confine their operations to supplying the Dairen market, where the beans are to a great extent either crushed at the local mills or shipped to Japanese or South China ports.

"Among the principal reasons why the exportation of beans from this district has ceased to attract European attention are the following: As Changchun is in direct railway connection with Dairen, prices run as much as 5 to 10 per cent higher than rates ruling along the northern Russian lines, the cause being the daily demand in Dairen for crushing purposes and in Far Eastern markets, in contrast to the absence of such demands at Vladivostok, and the smaller number of Japanese buyers in the north; the impossibility of making forward contracts with native suppliers, an embarrassment which also exists in the north; the instability of the Kirin currency, the Tiao paper; and the greatly increased prices which the Chinese are demanding, as compared with a few years ago, which have caused beans to compare unfavorably for crushing purposes with either flaxseed or cotton seed.

"The trade at Changchun in the hands of European merchants is now confined almost entirely to a few lines of imports, the larger export trade having been lost to Japanese and Chinese concerns."

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A table (p. 183) shows "Declared exports from Manchuria to the United States." They were declared through the American consular offices at Mukden, Harbin, Dairen, Newchwang, or Antung. For [soy] bean oil, the value was $73,359 in 1911, and $19,945 in 1912. Address: Vice Consul General, Mukden, China.

1642. Bickford, Geo F. 1913. Manchurian soya bean market. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 16(238):216. Oct. 11.

• ***Summary:*** "At present there is little activity in the local soya bean market. Of the 17 mills at Newchwang, 5 of the large and 6 of the small are in operation, and those at reduced capacity–about 70 per cent of their average shown below." A table shows the number of mills at the port of Newchwang, with the maximum daily capacity and average output of each of cake and oil. One piece of cake weighs about 67 pounds; 1 catty is 1.33 pounds.

For the 7 large mills, the maximum daily capacity is 5,000 pieces of cake and 22,000 catties of oil. But the average daily output is 4,000 pieces of cake and 18,000 catties of oil.

For the 10 small mills, the maximum daily capacity is 1,500 pieces of cake and 6,600 catties of oil. But the average daily output is 1,400 pieces of cake and 5,280 catties of oil.

"The chief reason for closing mills is the shortage and resultant high price of supplies... Last year's [soya] bean crop in Manchuria fell below the average.

"Prices and crop prospects. The average price last year per picul (133.33 lb) was 13 taels ($8.55); now the price is 14.30 taels ($9.58) per picul." Last year the average value of a "transfer tael" was $54 local currency; now it is about $62.

The shortage of beans "has induced a number of millers to move into the Japanese Railway Zone, where sufficient supplies can be obtained by rail, as it is with difficulty that heavy-laden junks can navigate the upper reaches of the Liao River on account of its increasing shallowness." Address: Vice Consul, Newchwang, China.

1643. Kita, Gen-itsu. 1913. Japanische Sojaindustrie [Japanese shoyu industries]. *Wochenschrift fuer Brauerei* 30(42):549-52. Oct. 18; 30(43):559-61. Oct. 25. (Chem. Abst. 8:984). Summarized in Zentralblatt fuer Bakteriologie, Series II. 41:257 (1914). [8 ref. Ger]

• ***Summary:*** An excellent and very detailed description of how shoyu is made in Japan, with many photos. Contents: Introduction. Overview of the process. The raw materials. Preparing the koji: Pre-preparation, mixing the beans with the wheat, the koji room (*muro*), handling the mass of koji, characteristics of koji. Part II: The fermentation process. Pressing. Scientific investigations of soy sauce brewing. Summary.

The author calls soy sauce *Soja* and *Sojasauce.* The two basic types of shoyu are made with soybeans and wheat, or just with soybeans. But some special sauce is also made with fish meat, such as Lintenfish. The addition of sugar and other sweeteners, and of colorings such as molasses to low-grade shoyu is not rare.

Preparation of soy sauce: The fermentation usually takes 6 to 12 months or more. Some years ago the "quick method" was widely introduced but after several years it unfortunately fell into ruin. The shoyu process has never been developed with modern processes like the sake processes, because sake must be a certain way when finished but shoyu is acceptable in many ways. The aroma from the roasted wheat adds a special component to Japanese shoyu, not found in Chinese soy sauce. The roasted wheat is coarsely ground (using a roller miller or, earlier, a granite mill), and the meal produced thereby serves to enrobe the steamed soybeans, while the larger particles hold the beans, thus aiding aeration. So the wheat must not be ground too fine. The beans are steamed, usually at a pressure less than 2 times atmospheric pressure; higher pressure creates a bad aroma. If the beans are cooked in an open kettle, a bamboo mat is placed in the bottom to prevent the beans from browning. The liquor left after cooking is called *amé.* The beans and wheat koji are then mixed. The beans, after being removed from the kettle, are spread out on the koji floor in front of the koji room (*koji-muro*) to a depth of about 3 cm. They are stirred from time to time until cooled to about 30-35ºC. The spores (*keim*) of *Aspergillus oryzae,* when they are used, are then sprinkled on. The mixture is put into wooden koji trays (*kojibuta*) each about 60 by 30 by 10 cm deep (24 by 12 by 4 inches), and holding 18 liters of raw material. In some places (such as Shozushima) a wide straw mat (80 by 180 cm) is used in place of these koji trays. The koji room is typically 10 by 3.5 by 2.2 meters high. The walls are thick. A modern room is of tiles in order to prevent changes of temperature from the outside. For cleanliness, the walls should be made of cement, with a door at one end and a window at the other. The room contains many vents to remove moisture and carbon dioxide. Steam pipes are laid in the floor, or a fire-pot is used instead. As noted above, the koji mold spores are either mixed in, or they settle from the air in the koji room, or come from the koji trays. The koji trays are stacked in a zigzag fashion to allow ventilation, which is necessary for shoyu koji but not for sake koji. Dampness and lack of oxygen favor the growth of Mucor molds and undesirable bacteria. After 20 hours, the koji is mixed well in the trays, and the upper trays are placed on the bottom–and vice versa. Stir again after 7-10 hours; the temperature is now 38-40ºC. After 10-15 hours conidia formation begins. The koji is usually ready in 3 days. Good koji has yellow-green conidia, very numerous on the inside. The surface is white and the mass dry. Contaminants: *Mucor, Rhizopus* and bacteria due to too much moisture, especially with heat. Black koji has a bad aroma from the disease *kurotoko,* which is caused mostly by excessive moisture.

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During fermentation about 20% of the original mass is lost; starches are changed to sugars, which are used up by the koji mold. The goal is to obtain koji which is rich in enzymes.

The brewing process: The ingredients are mixed in a vat to make the mash (moromi), which contains enzymes. The vats are made of sugi wood (*Cryptomeria japonica* Don.) with bamboo hoops. In the large shoyu factories they usually have a capacity of 4,000 to 4,500 liters (1,057–1189 gallons). The proportions of raw materials are as follows: Soybeans (2,700 liters = 1,875 kg), wheat (2,700 liters = 2,025 kg), salt (NaCl, 2,700 liters = 1,690 kg), and water (5,400 liters = 5,400 kg). The salt may be dissolved in hot or cold water, usually to 20º baume. Less salt gives better quality. The mash is mixed with a pole or with compressed air. The mash must usually ferment for a year before it can be pressed. A longer fermentation improves the color and aroma, but the flavor becomes weaker. Where a 2 or 3 year mash is used, it is mixed with 1-year mash to improve the quality. In order to shorten the fermentation time, the mash is sometimes warmed; this and other suggestions for improving the process will be discussed later. The mash contains microbes, especially yeasts and bacteria.

Pressing: The mash, after it finishes aging, is pressed in cotton bags that have been dipped in tannin from astringent persimmons (*kaki-shibu*). Each bag holds about 2 liters. More than 2 liters may causes the bag to tear in the *fune* (literally "boat"), which is about 230 by 73 by 91 cm and which holds about 800 such bags. Formerly a log was used in the form of a lever press, but now screws and hydraulic presses are widely used. The yield of shoyu is about 70-80% of the volume of the moromi. The remaining presscake still contains soluble constituents, which are extracted by mixing the presscake (*Der Presskuchen*) with water. The remaining cake is sold as fodder.

Treatment of the pressed liquid: This liquid is heated in an iron kettle in order to partially pasteurize it, separate the coagulable constituents, and darken the color. Better grades are heated at a lower temperature (never above 70-80ºC), and poorer grades at a higher temperature, mainly to concentrate and darken the color. For good grades, darkening of the color is seen as a disadvantage, as is the resulting change of aroma. Kita then gives a detailed analysis of both shoyu and the second-pressed liquid. Shoyu contains 30-32% solids, has a specific weight of 1.189 to 1.234, and contains 16.15 to 18.61% minerals.

Scientific investigations and various proposals for the shoyu brewery: Kita experimented with the use of defatted soybean meal. He notes that koji contains a powerful proteolytic enzyme. Cooking under pressure and defatting promote decomposition. Pressure cooking is more and more widely used. Defatting of the beans proved to be disadvantageous since it lowered the quality of the final shoyu, but he thinks the problem lay in the improper treatment of the beans during defatting. He proved this hypothesis with coarse beans defatted with benzine (*Benzin*) to make flawless shoyu. Sake koji has stronger diastatic and weaker proteolytic enzymes than shoyu koji. The proteolytic and diastatic power of mold enzymes are inversely related. There are different varieties of *A. oryzae* with different morphologies. Photos (p. 550-51) show equipment used in making shoyu in a factory: (1) Presses for pressing the sauce from the aged moromi. (2) Brick roaster for the wheat, with a belt-driven mechanical stirrer. (3) Wooden fermentation vat. (4) Many wooden moromi fermentation vats, held together by braided bamboo hoops, with a wooden plank across the top of each. (5) A man in a white coat, with a moromi stirrer in one hand, standing among many tall fermentation vats. Address: Technical Inst., Tokyo Imperial University.

1644. Nishiyori, Rohuhachi. 1913. Daizu-yu sekken-gyô chôsa-sho [Soybean oil soap industry research paper]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) No. 1. p. 445-85. Oct. [5 ref. Jap]

• ***Summary:*** Contents: Preface. 1. Soap industry in Japan and China. 2. Soap industry in Europe and the United States. 3. Future demand for soap in Asia. 4. Future of the Japanese soap industry. 5. Dairen [Dalian] as the place of soap manufacturing for the Chinese market (Main chapter). 6. Soap manufacturing method. 7. Criticism of fatty acid soap. 8. Hydrolysis method. 9. Prices of soy oil fatty acids and glycerin.

Note: This is the earliest document seen (Sept. 2001) concerning industrial uses of fatty acids from soybean oil. Address: Rigaku-shi, Manchuria.

1645. Okada, Teppei. 1913. Daizu-yu no seibun ni tsuite [Components of soybean oil]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) No. 2. p. 57-65. Oct. [2 ref. Jap]
Address: Manchuria.

1646. W. 1913. Die Sojabohne und ihre Verwendung in der Naehrmittelbranche [The soybean and its use in food-service departments]. *Konserven-Zeitung* 14(48):377-78. Nov. 28. [4 ref. Ger]

• ***Summary:*** A brief account of the history, nutritive value, and utilization of the soy bean. One of the earliest food uses of soybeans in the West was in the use of Japanese soy sauce in Worcestershire sauce, in England. The soybean was also used secretively, unbeknownst to food chemists and experts, as a popular coffee substitute until it was exposed in 1912 in Weller-Darmstadt (see *Chemiker-Zeitung*). This substitute, made from roasted soybeans, was used to extend coffee at levels of up to 33%. It was shown that this soy-extended coffee was much richer in nutrients than real coffee.

In Paris, France, Bergey roasted soybeans and added

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molasses or grape sugar to make a coffee substitute, or he added vanilla, sugar, and cocoa-butter (the fat in butter) to make a chocolate substitute.

"As far as we know from the literature, the soybean has been used heretofore, with the exception of Worcestershire sauce and other sauces and soup seasonings, only as coffee or chocolate substitutes. However the real superiority of this plant lies in its high nutritional value and therefore it should be used directly as a food, as it is in the countries of its origin." Address: Germany.

1647. Keimatsu, Katsuzaemon. 1913. Daizu-yu no seibun ni tsuite [Components of soybean oil]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) No. 1. p. 67-77. Nov. [8 ref. Jap]
Address: Manchuria.

1648. *Weekly Commercial Appeal* (*Memphis, Tennessee*). 1913. U.S. Department of Agriculture: Organized in 1847, when Congress appropriated $1,000 for distribution of seeds and plants–Has grown steadily and now spends $25,000,000 annually. Able and practical men at its head. Dec. 2. p. 7.
• ***Summary:*** At the center of this article are individual portrait photos of 13 men who are at the head of the USDA. These include (from upper left to lower right): Beverly T. Galloway (Asst. Secretary of Agriculture), William A. Taylor (Chief, Bureau of Plant Industry), David Fairchild (Agricultural Explorer in Charge of Foreign Seed and Plant Introduction), A.C. True (Director of Agricultural Experiment Stations), Bradford Knapp (Head of Farmers' Co-operative and Demonstration Work), David Franklin Houston (Secretary of Agriculture), C.V. Piper (In Charge of Forage Crop Investigation). William J. Spillman. Accompanying each photo is a description of the office, the man himself, and his work and philosophy.

"The work of Mr. Taylor is ably seconded by that of Mr. Fairchild, who is searching the whole world for plants which may be of value to American farmers. In this work, he has been around the world three times, has faced fever and famine and discomfort in every form and has brought us not hundreds, but thousands, of new plants, many of which are now adding greatly to our comforts and profits. He has brought us new cow peas and soys from Japan, plums from Siberia and semi-tropical fruits from all parts of the world. During the last 19 years more than 35,000 varieties of seeds and plants have been collected by the department, and the larger part of this has been done by Mr. Fairchild."

1649. Sly, H.E. 1913. China (Manchuria). Soya bean crop in North Manchuria. *Board of Trade Journal* (*London*) 83:596. Dec. 11.
• ***Summary:*** "The quantity of soya beans available for export from North Manchuria this season will be approximately the same as in the 1912-13 season, when the total amount exported *viâ* Vladivostok amounted to 297,063 tons, of which 219,438 tons were exported to Europe, 53,567 tons to Japan, and 24,013 tons to Dairen. The total exported in 1912-13 was 56,897 tons less than that of the previous season." Address: British Consul, Harbin.

1650. Ito, Teiji. 1913. Sho-kôji seizô-chû kôso no kenkyû [Enzyme production during koji-making for shoyu]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 382. p. 1237-47. Dec. 26. [Jap]
Address: Hiroshima, Japan.

1651. Pontius, Albert W. 1913. Manchurian soya bean production. *Daily Consular and Trade Reports* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) 16(305):1518. Dec. 31.
• ***Summary:*** "Investigations made by the South Manchuria Railway show the 1913 season crop of soya beans about Changchun, Kungchuling, Kaiyuan, Taolu, Shanchengtzu to be of fine quality, this zone having experienced favorable weather. On the other hand, the belt lying between Liaoyang and Tashihchiao and along the Mukden-Antung Railway suffered to a considerable extent from drought."

"Output of bean cake: The daily combined output of bean cake at the Dairen mills has heretofore been estimated at 70,000 pieces. The establishment of four new mills and the reconstruction of the Santai bean mill [which was destroyed by fire on 13 Nov. 1912 near the Dairen wharves] will increase the daily output to 100,000 pieces. During 1912 a total of 10,503,595 pieces of bean cake was produced at the local mills, and as each piece weighs approximately 62 pounds, the output was in excess of 325,000 short tons. About 300,000 tons were shipped to Japan, the remainder finding its way to south China ports. Of the 51 bean mills now in operation, 6, owned and operated by Japanese, produce two-thirds of the total output.

"Motive power for mills: Two Japanese and seven Chinese bean-oil mills at Dairen have recently altered their motive power from petroleum to steam. Hitherto electricity, gas, and petroleum were in more popular use than steam, but a comparative study of the cost of machinery operation by different kinds of motive power, instituted within the past year, showed that for each 62-pound piece of bean cake manufactured, the net cost of electricity and gas was" highest (7 mills U.S. currency) and steam was the least expensive (2½ mills). "As the use of power other than steam necessitates the installation of special equipment for steaming beans, this feature gives steam a decided advantage over other kinds of motive power." Address: Consul, Dalny, Japanese Leased Territory.

1652. Keimatsu, Katsuzaemon. 1913. Daizu no ôyô hômen ni tsukite [Problems of application of soy-bean]. *Chosen*

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Igakkai Zasshi (*Korean Medicine*) No. 8. p. 1-5. Dec. [Jap]
Address: Yakugaku Hakase.

1653. Ishiwara, G. 1913. Shôyu sokujô-hô ni tsuite [Rapid brewing of shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 8(2):31-36. [Jap]
Address: Sanjo Kaiin, Hiroshima Zeimu Kantoku Kyoku Gishu.

1654. Kinoshita, Asakichi. 1913. Shôyu no aji ni tsuite [On the taste of shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 8(3):37-39. [Jap]

1655. Kinoshita, Asakichi. 1913. Shôyu jôzô ni kansuru daizu no kenkyû [Studies on soybeans used for shoyu brewing]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 8(8):45-50. [Jap]
Address: Jozo Shikensho Gishi.

1656. Matsuo, Rikitarô; Tanaka, Y. 1913. Ni, san no kinrui to shôyu [Several microorganisms and shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 8(3):62-69. [Jap]
Address: Kumamoto Zeimu Kantoku Kyoku.

1657. Nagaki, G. 1913. Shôyu no kômi [Flavor and taste of shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 8(8):63-66. [Jap]

1658. Nagaki, G. 1913. Shôyu no chômiryô ni tsuite [Seasoning ingredients that can be added to shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 8(9):71-78; 8(10):68-78. [Jap]

1659. Nishimura, Torazô; Inoue, K. 1913. Shôyu jôzô keika-chû (ichi nenkan) ni okoru kagaku-teki henka no gaiyô [Summary of the chemical changes in moromi during fermentation of shoyu for 12 months]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 8(8):28-44. [Jap]

1660. Takahashi, Teizô. 1913. Sprosspilze von syoyu koji und syoyu moromi [Sprouting fungi or blastomyces in shoyu koji and shoyu moromi]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 8(11):18-. [Ger]*

1661. Togano, Meijiro. 1913. Saikin junyô shôyu sokujô-hô [Rapid brewing of shoyu using trained or domesticated microorganisms]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 8(2):28-31. [Jap]

1662. Griffis, William Elliot. 1913. The Mikado's empire. 2 vols. New York, NY: Harper & Brothers, Publishers. 754 p. Illust. Index. Map. 23 cm.
• ***Summary:*** The material in this book up to page 578 is identical (page for page) to that in the 1876 edition. Thereafter begins "Book III: Supplementary chapters, including history to the beginning of 1912"–about 129 pages of new information in the following chapters:

1. Japan in 1883. 2. Japan in 1886. 3. Japan in 1890. 4. Japan in 1894. 5. War with China (Sino-Japanese War, 1894-1895). 6. Facing the twentieth century. 7. Japan a world power (including a detailed description of the Russo-Japanese War, 1904-1905). 8. Japan on the Asian continent. A separate index covers this supplementary material; soy is not mentioned.

The author reveals his basic viewpoint on the last page of this book (p. 734) by expressing his fervent hope that all of Japan's traditional religions will be "transformed by the spirit of Christ." Address: D.D., L.H.D., Late of the Imperial Univ. of Tokio; presently in New York.

1663. Kin, Choshi. 1913. Shôyu enkaku-shi. ed. 3 [History of shoyu production. ed. 3]. Choshi, Japan. 186 p. First edition was 1909. 28 cm. [Jap]
• ***Summary:*** Contents: 1. Overview (p. 1): Shoyu as a special East Asian product, shoyu as superlative seasoning, relationship between shoyu and sauce, shoyu as an influence in life. 2. Origins of Japanese shoyu (p. 7): About Chinese jiang, Japanese shoyu in history, origin of the shoyu industry in Japan, trends and growth of shoyu production (output), the shoyu industry and taxation, household makers of shoyu and changes in home usage, the Japanese government's attitude toward shoyu, overseas demand for shoyu, the development of shoyu in the Kantô (Tokyo/eastern Japan) region.

3. Choshi shoyu (p. 117): Shoyu in the Kantô region, the shoyu makers guild in Choshi, the development of the shoyu-makers' union (or cartel) in Choshi and Noda, names and identification of the best quality shoyu brands, current varieties of shoyu, Choshi shoyu and raw materials (ingredients), Choshi shoyu and the local topography, Choshi shoyu and transportation, Choshi shoyu and micro-climate, Choshi shoyu's trademarks and brands. 4. Higeta shoyu (p. 151): The origins of Higeta shoyu, how to judge good-quality shoyu, the raw materials for Higeta shoyu, a chemical analysis of Higeta shoyu, the handling of Higeta shoyu, shelf life (period of freshness) of Higeta shoyu, awards received by Higeta shoyu. 5. Conclusions (p. 174). A table (p. 35-36) shows national production statistics for shoyu for the years 1885-1910, including the amount and number of makers. Appendixes: 1. The reputation and names of Japanese shoyu in Europe (in English, French, and German) according to various early documents (p. 175). Historical documents in Asian languages about raw materials (soybeans and wheat) used for shoyu (p. 182).

Notes and observations by Mark Fruin: Kin Choshi was the pen name of Genba Tanaka XIII, the head of an important shoyu brewing family in Choshi during the Tokugawa and Meiji periods. Forty percent of the book is early shoyu

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history and 60% is the history of Choshi Shoyu–Higeta.

Yuasa shoyu appears to be the first true shoyu in Japan; it gradually separated from miso production. Yuasa shoyu was sold throughout Japan by Osaka merchants and it benefited as well from the political protection of the Daimyo of Wakayama. The Osaka shoyu trade developed gradually and it was not important until the 17th century. Yet shoyu developed somewhat independently in Western Japan (Yuasa) and Eastern (Noda and Choshi).

The earliest record of an Osaka merchant (one Komatsuya Ibei) handling Yuasa shoyu dates from 1535; some 50 years later some Osaka merchants had certain ships earmarked for the exclusive task of carrying Yuasa shoyu to and from market, which by this time had spread from Osaka to the Inland Sea trade area.

In 1908 shoyu was the fifth most important export from Wakayama prefecture [to other parts of Japan]; there were 59 makers in a locally organized cartel producing 52,700 koku with a value of 850,000 yen.

Tatsuno shoyu began its history some 319 years ago (from the year 1913) when in 1594 a local farmer in the Tatsuno area, Yokoyama Gorobei, began to make sake as a sideline to his farming. Later he added shoyu to his household industries. In 1596 Yokoyama turned over his sake making activities to a branch household established for that purpose and concentrated his own efforts on farming and shoyu manufacture. By the late Tokugawa Period (1600-1868) the Yokoyama family sold its shoyu business to the Kataoka family and the latter merged with the Nakahara family in 1893 to form Kikuichi Shoyu.

Shodoshima shoyu began being made in the middle of the Tokugawa period. In 1882 production stood at 34,000 koku and in 1908 at 98,832 koku. In 1901 many of the various shoyu makers in numerous villages on the island amalgamated into a cartel and in 1908, the first corporation for making shoyu in Japan was formed. Later, three other forms merged to establish Marukin Shoyu. p. 35-36 gives Japanese national statistics for total shoyu production and the number of manufacturers each year from 1885 to 1910. In 1,176,535 units? were produced by 10,971 companies. In 1910 some 2,205,574 units were produced by 14,364 companies.

1664. *Pharmazeutische Zentralhalle fuer Deutschland.* 1913. 8. Internationaler Kongress fuer angewandte Chemie in New-York [8. International Congress for Applied Chemistry in New York (Abstract)]. 54:62-65. See p. 65. [Ger]
• ***Summary:*** On p. 65 is an article titled "Ueber die Darstellung von 'Natto.'" This is a German-language summary of the following English-language article: Muramatsu, S. 1912. "Preparation of 'natto.'" *Eighth International Congress of Applied Chemistry, Original Communications* 18:251-63. Section VIIIb: Pharmaceutical Chemistry.

1665. Saitamaengei & Co., Ltd. 1913. Wholesale trade list... bulbs, plants, seeds: 1913. Saitama prefecture, Japan. 36 p. Illust. Index. 27 cm. [Eng]
• ***Summary:*** The section titled "Vegetable seeds" (p. 34-36) gives the price of 38 plants in U.S. gold dollars per pound and per 100 lbs. However 3 plants are given less detailed treatment: "Rice, Soja Bean, Japan peas: Special lowest price will be quoted on application." Many varieties of Japanese climbing cucumber, radish (*daikon*), turnip (*kabu*), and glutinous yam are listed.

Photos and illustrations show these other plants. Note: Saitama prefecture is just northwest of Tokyo. Address: Toyono, Nr. Kasukabe St., Saitama prefecture, Japan.

1666. Takenob, Y.; Kawakami, K. 1913. Japan Year Book. Tokyo: Japan Year Book Office. 702 p. See p. 163-64, 230, 351, 356, 358, 438, 654, 659, 672, 690. Eighth annual issue. [Eng]
• ***Summary:*** In chapter 11, "Agriculture" (p. 155-77) is a table titled "Beans, sweet potato and potato (p. 163) which gives "Soy bean" production in Japan for 1906-1910 (in *koku*).

On page 164 we read: "The three daily articles of diet for all classes, viz. soy [sauce], *miso,* and *tofu* are manufactured from this bean..."

In chapter 15, "Industry," is a paragraph titled "Soy" (p. 230) on the patented Suzuki process for brewing soy [sauce]. "For soy the prefecture of Chiba, which is contiguous to Tokyo municipality, heads all other places on the list. Parched wheat mixed with salt and beans is a principal ingredient. The process is still far from scientific, requiring about 12 months before the liquid is ready for sale. It is also costly, as it does not admit so much labor-saving appliances. To obviate these advantages, several patented processes, notably that by Mr. Suzuki, have been tried, but they do not seem to have attained ideal perfection. It was on the strength of the Suzuki process that a company backed with yen 2,500,000 paid up was started, in 1907, and the 2-months' brewing, the chief merit of the invention, was started. It is to be regretted that this first machine-brewing has failed to produce the soy which can compare with the old process soy in taste and flavor, and that the company has been wound up."

In Chapter 25, "Home trade" is a table (p. 351) titled "Prices of principal commodities in Japan," which includes prices for 1905-1911 in yen for soy beans (per *koku*), soy [sauce] (per *koku*), and miso (per *kwan*).

In Chapter 26, "Foreign trade" is a table (p. 356-58) titled "Imports" (in 1,000 yen). Under the heading "Staples articles of over yen 1,000,000" (p. 356) is given the value of soja bean imports for 1908-1912. Under the heading "Trade with China (p. 359) is given the value of imports of "beans" and of "oil-cakes" for 1906-1911.

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In chapter 30, "Finance," is a paragraph (p. 438) titled "Tax on Japanese soy" [sauce].

In chapter 34, "Chosen (Korea)," a table (p. 654) on "Exports (in 1,000 yen), under the heading "Foreign trade" has data on exports of beans and peas for 1906-1912 (in yen).

In the same chapter, under the heading of "Agriculture" is a paragraph (p. 659) which states: "Barley and soya bean.– Barley covers 421,828 cho, yielding 4,194,425 koku. Beans are exported chiefly to Japan for manufacturing soy. The acreage is 358,000 cho and the yield [production] 1,925,000 koku. Export to Japan amounted to about 3,500,000 yen in 1909."

In Chapter 35, "Taiwan (Formosa)," under the heading "Agriculture," a table (p. 672) titled "Agricultural products" has production data on "Beans and peas" (in 1,000 *koku*) for 1905-1909.

In Chapter 37, "South Manchuria," is a paragraph (p. 690) titled "The soya bean" which states: "The fame of Soya bean has spread all over the world since 1906 when the Mitsui Bussan first shipped a trial consignment to England. As substitute of cotton seeds for extracting oil the bean met with a favorable reception not only in England but in Germany, France and elsewhere, and the following year the enterprising firm received large orders. The yield [production] of [soya] bean in Manchuria is between 1,500,000 and 2,000,000 tons and the output of bean-cakes about 1,000,000 tons. In 1909 the export amounted to 800,000 tons of which about 50% went to Europe, 30% to China and 20% to Japan. The export is made through Dairen, Newchang (which monopolized it before the export to Europe began), and Vladivostock, the first claiming about one half and the other half is divided between the two ports." Address: Prof. at Waseda Univ. and Late of the *Japan Times*, Japan.

1667. Togano, Meijiro. 1913. Saishin shôyu jôzô-ron [Principles of modern shoyu brewing]. Tokyo: Nippon Takujo Co. Ltd. 1040 p. Two supplements to the first edition were published. The 7th edition, published in 1919 was 1088 pages long; the 8th edition, 1921, was 1181 pages. Illust. 23 cm. [Jap; eng+]

• ***Summary:*** Contents: 1. Outline (p. 1): Preface, microbiology outline, outline for how to treat and examine microorganisms, general theory of shoyu fermentation. 2. Raw material outline (p. 85): Raw materials for shoyu, soybeans, wheat, salt, water, storing raw materials, coal. 3. Preparation of raw materials (p. 175): Making salt water, preparing raw soybeans, preparing wheat, mixing cracked wheat and cooked soybeans, koji starter (*tane koji*).

4. Making koji (p. 293): The purpose and need for making koji, how to make koji, the koji room (*koji mura*), improving the koji room, koji for shoyu. 5. Shoyu moromi or mash (p. 383): The fermentation room (*shikomi-gura*) and fermentation vats (*shikomi oke*), fermentation, shoyu moromi, chemical and physical changes in shoyu moromi, microorganisms in moromi, ripening (*jukusei*) of moromi, warm temperature-controlled fermentation (*on-jôzo*), quick fermentation (*sokujôzo*). 6. Shoyu (p. 489): Pressing the liquid sauce from moromi, heating the shoyu (*shoyu no hiire*), clarification (*seichô*), history of one generation of shoyu, components of shoyu, the flavor and fragrance of shoyu, relationship between the quality of shoyu and its components, methods of testing the quality of shoyu, the value of shoyu as a raw material for sauces, (*bansui*) and (*bankasu*), mold on shoyu, containers for shoyu.

7. The theory of marketing shoyu (p. 639): History of marketing / selling shoyu, selling shoyu, outlook for selling shoyu, precautions in selling shoyu. 8. Constructing and running a shoyu factory (p. 653): Building the plant, equipment and labor, the economics of building and running the factory. 9. The method of testing the microorganisms (p. 693): The need for testing microorganisms, the method of testing the microorganisms found in water, method of testing the microorganisms found in the air, method of testing the microorganisms found in koji starter and koji, method of testing the microorganisms found in moromi.

10. The method of analysis (p. 725): The need for analysis, general method of analysis, method of analyzing raw materials, method of analyzing koji, method of analyzing moromi, method of analyzing shoyu, method of analyzing shoyu presscake (*shoyu kasu*), method of detecting saccharin, qualitative analysis of formalin, method of qualitative analysis and measurement of salicylic acid (*sarichiru-san, saruchiru-san*), method of analyzing coal. 11. Conclusion (p. 809): Brewing and exporting, improvement of quality, quick fermentation of shoyu, application of machinery, the necessity of having a shoyu fermentation laboratory. Appendix (p. 825): The Togano method and equipment for moromi stirring. 12. Fifteen charts and tables concerning shoyu fermentation (mostly scientific information on physical and chemical properties). A portrait photo (located just after the title page) shows Meijiro Togano, formally dressed.

Note: This book was also published in 1914 by Otani Shoten in Tokyo. The same publisher republished the book in Jan. 1999 as a three-volume set. In the USA, this 1999 reprint is owned by the East Asian Library at Yale University in Connecticut.

1668. Wilson, James. 1913. Report of the Secretary: Special work on forage crops. *Yearbook of the U.S. Department of Agriculture.* p. 9-259. For the year 1912. See p. 121.

• ***Summary:*** "Renewed interest has been awakened in the soy bean by the establishment in general use of new varieties secured from China and Japan. These varieties have proved far superior to those originally grown."

"Sudan grass, a wild form of sorghum, although

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introduced only four years ago, is now greatly in demand in the southern portion of the Great Plains region on account of its ability to produce an abundance of good forage under conditions of low rainfall." Address: Secretary of Agriculture [USDA], Washington, DC.

1669. Morse, W.J. 1914. Re: Smooth varieties of soy beans cultivated in Japan. Letter to Prof. C.V. Piper [Agrostologist in Charge, BPI, USDA, Washington, DC], Jan. 21. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "Dear Prof. Piper: During the last summer I was advised by a Japanese student who was visiting at Arlington Farm that there are four or five smooth varieties of soy beans cultivated in Japan. He also advised me that the growing of the soy beans in Japan was affected to a considerable extent by weevil attack and the only varieties immune to the weevil attack were the smooth ones.

"Thus far we have obtained only one smooth variety, No. 22876, in our introductions, and that one from Japan. I wonder if it would not be possible for you to obtain some of the smooth varieties from some of your correspondents in Japan.

"Very truly yours,..."

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 92–Morgan-Morse.

Sent to Soyinfo Center by Matthew Roth of Rutgers Univ., March 2012. Address: Forage-Crop Investigations, Bureau of Plant Industry, USDA, Washington, DC.

1670. Togano, Meijiro. 1914. Shôyu no hiire ni kansuru kenkyû [On the pasteurization of shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 52. p. 503-27. Jan. [Jap]
Address: Jozo Shikensho, Gishi.

1671. Turner, A. Grenville. 1914. The soy bean. *Agricultural J. of the Union of South Africa* 7(1):67-77. Jan.
• ***Summary:*** This report was sent to South Africa by the Union Trades Commissioner in London, Mr. C. du P. Chiappini. Contents: Botany and habitat. Varieties. Conditions of growth. Methods of culture and soil inoculation. Harvesting: Yield per acre, yield of forage, as a grain crop, thrashing. Manurial value (as a green manure). Storing soy bean seed. Feeding value: For sheep, dairy cows, or hogs. Experiments in South Africa (conducted by Mr. Turner during the 1910-1911 season). Chemical analyses. The commercial aspect. The bean (utilization). The oil (utilization).

"Up to the year 1907 the export of soy beans from Manchuria did not exceed 120,000 tons, of which the bulk was absorbed by Japan" (p. 68)

"As a commercial oilseed, however, the soy bean was undoubtedly first introduced to the notice of the British and Continental manufacturer towards the end of the year 1908, when the export commenced to Europe through Vladivostock [Vladivostok]; the cargo was nearly all carried in British bottoms and destined to oil mills in the United Kingdom."

"Experiments in the cultivation of the soy bean are being conducted in practically every British colony; during the year 1909 experiments were conducted in the Argentine Republic, Mr. A. Grenville Turner, the soy bean expert, reporting that a crop of beans may be secured in about thirteen weeks, as against six months in Manchuria. World-wide interest now was evinced in the culture of the soy bean; the late Sir Alfred Jones, K.C.M.G., entrusted Mr. Turner with a mission to introduce the cultivation of the bean throughout West Africa; on his return Mr. Turner reported that he had travelled 12,000 miles through the Gambia, Sierra Leone, Southern and Northern Nigeria and the Gold Coast Territories; the results of experiments being successful: on sowing the seed the plants made their appearance above ground in about four days, ultimately attaining a height of two feet, and reaching maturity in six, eight, or ten weeks, according to zone and climatic conditions. On his return from the coast, Mr. Turner was entrusted with a mission by Messrs. Lever Brothers, Limited, to encourage the cultivation of the soy bean throughout the Union of South Africa, during the season 1910-1911 the scheme was taken up by the farmers with enthusiasm, a large quantity of seed, together with descriptive pamphlets, was distributed by Messrs. Lever, the result of the experiments proving that South Africa can raise a crop of soy beans equal, if not superior, to Manchuria."

At the Government Experiment Farm in South Africa, where 80 varieties were tested (there are over 300 varieties of soy beans), yields of seed "as high as 2,000 lb. per acre were recorded, while in many instances the yield was well over 1,000 lb. per acre. In Manchuria the yield per acre is from 1,100 to 1,600 lb. per acre." If grown for forage, yields as high "as 12 to 13 tons of fresh fodder may be produced per acre, which may be used for hay or for silage purposes." "Growing soy beans for the grain is distinctly profitable, owing to the large demand in the United Kingdom and Europe" (p. 71).

When Mr. Turner conducted soybean cultivation experiments in South Africa during the 1910-1911 season, the "scheme enjoyed the hearty support of the Union Government Agricultural Department, the Agricultural Union, and Messrs. Lever Brothers, Limited, by whose assistance, through Mr. Turner, see for the planting of three to five acre plots was distributed to over three hundred farmers in all parts of the Union, together with printed report forms, and descriptive bulletins" (p. 72). Natal experience the worst drought in 40 years took at this time, but the soybeans resisted the drought and were able to grow under conditions that would probably in many instances be too

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severe for even maize. Soybeans were also grown in the Transvaal, Orange Free State, and Cape Province.

The highest recorded oil content in soybeans was 23.20% from beans grown by Mr. Turner in Sierra Leone.

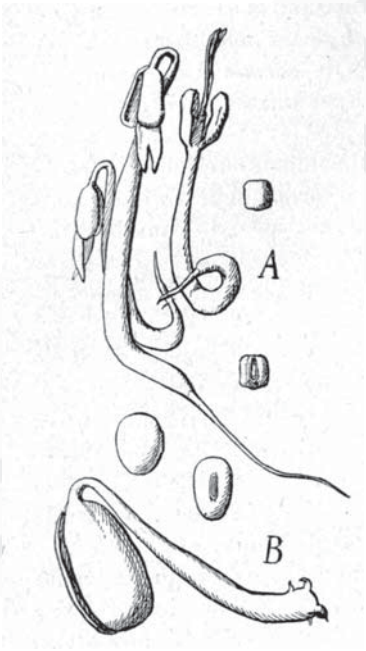
"The oil mills of Great Britain crush annually upwards of 1,000,000 tons of oil seeds,... Great Britain is the heaviest importer of oil seeds in Europe, and is, in fact, after the United States of America, the most important manufacturer of oils in the world."

Great Britain imports and crushes about 600,000 tons of cotton seed and about 350,000 tons of soy beans; the balance is linseed. Recently, however, these soy bean imports have been decreasing, since Germany has rescinded the import duty and installed soy bean crushing plants in their oil mills.

"It is estimated that Great Britain and Europe can take ten million tons of soy beans per annum in the event of the beans being used for human as well as for animal consumption and for industrial purposes, so there is a large market for South Africa to ship all the beans she can produce..."

Note: This document contains the second earliest clear date seen for soybeans in Argentina, or the cultivation of soybeans in Argentina (1909). The source of these soybeans is unknown, but might have been Great Britain.

1672. Bois, D. 1914. Germes de soja et germes de haricot mungo: Un produit alimentaire faussement dénommé [Soy sprouts and mung bean sprouts: A food product falsely named]. *Bulletin de la Societe d'Acclimatation* 61:334-36. Feb. [Fre]



• ***Summary:*** In November 1911, the *Journal des Halles et Marchés* reported the appearance in Paris of a vegetable designated under the name *Yamado* and considered new. The author identified it as mung bean sprouts (*germes du Haricot Mungo*), a green seed well known to the Society and described by Paillieux in the 3rd edition of his book *Le Potager d'un curieux* on p. 222. The mung bean/mung bean sprouts are known as *Lou teou/Ghia* in China and *Yaye nari/ Moyashi* in Japan. The sprouts are called Taugé in Java.

"We see them appear now every winter, sold in Paris by a certain number of food merchants, who also sell the ungerminated mung beans.

"But, perhaps to facilitate the sale of these products, the shopkeepers have seen fit to offer them to the buyers under the names 'soy sprouts' and 'soybeans' (*germes et de graines de Soja*), a confusion that would not be appropriate to perpetuate."

Footnote: "A circular has been printed and is distributed to the buyers, titled *Le Soja, alimentation économique et hygiénique. Une légume nouveau importé de Chine: Le Soja frais en germes* ['The soybean, an economic and hygienic food. A new vegetable imported from China: Fresh soya sprouts']. It contains some recipes using the sprouts, also falsely named."

"The soybean (*Le Soja*), whose products are coming to be used more and more in Europe, has seeds which are completely different from those of the mung bean, not only in their form and volume, but also in their special chemical composition, which requires that they be used quite differently. I must add that all the sprouts I have seen in Paris under the name of soy sprouts (*germes de Soja*) actually came from the mung bean."

"Since I have introduced the subject of soybeans, I will say that the seed of this precious legume is presently imported into Europe in considerable quantities. The Information Leaflet of the Ministry of Agriculture announced recently, according to the *Molkerei Zeitung,* that an organization named "Soyama-Werke" has been established at Bockenheim (Germany) for the production of milk, cream, butter, and cheese from this seed.

One can see from the accompanying illustration the great difference that exists between the seeds of the mung bean and those of the soybean, and between their respective sprouts.

An illustration (line drawing, p. 336) shows the seeds and sprouts of the Mung bean (A, top) and soybean (B). Mung beans, which are smaller than soybeans, give ready-to-use sprouts in 4 days, compared with 8 days from the larger soybeans. "Because of this difference, the soybean seems to me absolutely unsuited to the production of etiolated sprouts."

Messrs. Li and Grandvoinnet have published in the *Journal d'Agriculture pratique des pays chauds,* 1911-1912, a series of articles about the soybean, and they mention the sprouts among the products obtained from this plant. But the sprout in the illustration (fig. 21, p. 130, of 1912) is that of the mung bean. Address: France.

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1673. Sahr, C.A. 1914. Report of the Assistant Agronomist. *Hawaii Agricultural Experiment Station, Annual Report.* p. 43-49. For the year 1913. March 16. [1 ref]
• ***Summary:*** In this report's only section, titled "Experiments with leguminous plants," all crops are grouped into three types based on the length of their growth period. The soy bean appears in both the first group (quick rotation, short season, 3 to 4 months) and the second group (medium time, 4½ to 6½ months). The importance of inoculation is emphasized.

The subsection on "Soy bean" (p. 46-49) states: "Soy beans were grown more or less extensively by Japanese farmers in Kona to defray expenses while their coffee trees came into bearing, finding a ready market for culinary purposes and also among local soy sauce brewers. Since the coffee orchards now demand the entire attention of the growers, the soy brewers depend upon soy beans imported from Japan for their supply.

"The brewing of Japanese soy sauce having become a well-established industry in Hawaii, a visit of inspection to several of the largest factories was made to ascertain the method of manufacture, which is given here briefly..." Equal parts of boiled soybeans and roasted California wheat are mixed, "poured into molds, and left to stand for 3 or more days, or until slightly covered by mold fungi. The molds are then emptied into large cedar vats of 500 to 800 gallons capacity. A starter made from cass [soybean presscake] and brine is then added, and the mass is left to ferment for a period ranging from 6 months to a year or 18 months, the mass being thoroughly stirred twice each day. The fermented mass is then transferred into a large press and the liquid sauce is pressed out, boiled 2 or 3 hours, and put in cedar tubs of 4½ to 6 gallons capacity... The ferment starter is made of a small quantity of soy-bean cake, or cass, sprinkled over a few handfuls of parboiled soy beans and left in a warm place for several days. The cass is sold for 20 cents per 100 pounds to rice planters as a fertilizer, and contains about 20 per cent salt. It is also fed to hogs, after soaking in water to draw out the salt. The brewers buy imported soy beans at $72 per ton in Honolulu, wheat at $40, and salt at $10. The tubs in which the soy sauce is put up are made of Japanese cedar, shipped knocked down from Japan, and put together as wanted. The cost per tub is from 40 to 70 cents, according to their capacity, which ranges from 4½ to 6 gallons. Soy sauce is eaten by all classes of Japanese as a table sauce, with their rice, fish, and meats. It has the color of strong black coffee.

"Miso, another Japanese table sauce, is brewed from soy beans and rice. The brewed liquid is clear white. The climate of Hawaii is too warm for its manufacture."

A table (p. 48) shows five soybean varieties (each with an "Agronomy accession number, three also with an S.P.I. number–20798, 19183, and 14953) and their yields as hay, fodder and/or seed, and stages of growth in Hawaii. The only named variety, Otootan [black seeded], was "grown from seed received from the College of Hawaii in May 1911. This variety is undoubtedly the coarsest, rankest soy bean ever grown by this station. It is also most tolerant of both dry and wet conditions, but only makes a rank growth during a cool and moist growing period." Trials of this variety were made at the Hilo and Glenwood substations.

No. 698, a Russian soy bean, was received from S.R. Cope of London, England. Seven varieties were received from the College of Hawaii. Eight varieties were received from the Bureau of Plant Industry (USDA) under the [S.P.I.] numbers 19183, 22379, 32906, 32907, 34857, 34934, 34924, 34987, and 34123; they were planted in May. "Four varieties, said to be rich in oil content, were received from an eastern paint and oil company for trial by this station. Samples of these will be analyzed and the oil content determined."

A photo shows two Otootan variety soy bean plants, valuable for forage and green manuring; one is bigger than the other and both are hanging up-side down.

Other leguminous plants tested: Kulthi or horse gram, cowpeas, sunn hemp (*Crotolaria juncea*), a variety of Cuban peanut, asparagus bean (*sasagi;* probably yardlong cowpea) and sesbania.

Note 1. This is the earliest document seen (July 2013) that mentions the soybean variety Otootan.

Note 2. This is the earliest document seen (March 2004) that mentions the asparagus bean (*Vigna sesquipedalis*).
Address: Asst. in Agronomy.

1674. Nishimura, Torazô. 1914. Shôyu moromi no kaiire ni kansuru chôsa [Examination of the stirring of shoyu moromi (mash)]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 53. p. 561-71. March. [Jap]
Address: Jozo Shikensho, Gishi.

1675. Yoshimura, Kiyohisa; Kanai, M. 1914. Shokubutsu-tai chû yûkienki tokuni betaine, purin enki oyobi korin no bunpu ni tsuite: II. [On the distribution of organic bases, especially betaines, purine bases and choline, in plants. II. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 35(3):268, 279-82. March. [2 ref. Jap]
• ***Summary:*** A section on dehulled soybeans (*kôtaku daizu*) starts on page 279.

1676. Oshima, Kintaro; Ariizumi, Katamatsu. 1914. Mame-rui shujitsu-chû kureachinin no sonzai ni tsuite [On the presence of creatinine in beans]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 35(4):383-91. April. [4 ref. Jap]
• ***Summary:*** Includes analyses of azuki beans, black soybeans, and yellow soybeans. He discusses previous research by Sullivan (1911), Skinner (1912), Jaffé, Weyl, and Salkowski.

Note: *Webster's Dictionary* defines creatinine, a

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term first used in 1851, as "a white crystalline strongly basic compound $C_4H_7N_3O$ formed from creatine and found especially in muscle, blood and urine." Address: 1. Nôgakuhakushi; 2. Nôgakushi. Both: Japan.

1677. Yokohama Nursery Co., Ltd. 1914. Descriptive catalogue... Bulbs, plants seeds, etc. 1914-1915. Yokohama, Japan. 106 p. April. Illust. Index. 26 cm. [Eng]
• ***Summary:*** On the cover of this English-language catalog is an illustration of a bird sitting in a tree on one of its fruits or flowers. In the section on "Seeds" (p. 88+) is a subsection (p. 96) titled "Some vegetable seeds." The contents (incl. the entry for "soy bean") is similar to that in the 1913 catalog except that the cost of soy bean has risen to $4.70 per 100 lbs. (U.S. gold). Two large photos on this page show: (1) Shôgoin mammoth turnip. (2) Chinese white cabbage.

The company has a new branch office in Tokyo at 10, Shin-Ogawa-machi, Ushigome-ku. Address: P.O. Box No. 72. 21-35 Nakamura, Yokohama, Japan. Phone: 509.

1678. Hanson, George C. 1914. Manchuria's soya-bean trade. *Daily Consular and Trade Reports* (*U.S. Bureau of Foreign and Domestic Commerce, Department of Commerce*) 17(115):921-23. May 16.
• ***Summary:*** A table (p. 922) shows exports of soybeans, bean cake, and bean oil from the principal ports of South Manchuria (Antung, Dairen, and Newchwang), a from 1909 to 1913, inclusive. Vladivostok is the principal port of export for North Manchuria. Figures supplied by the Chinese Maritime customs for the calendar year 1913 are now available. "The Maritime Province crop is reported from Vladivostok to be less than in 1912-13 when it was 540 tons. This relatively small amount shows that the beans shipped from Vladivostok are mainly of Manchuria production. The Manchurian crop for 1913-14 probably totals 1,054,500 tons.

"Vladivostok's export figures for [soy] beans the years 1912 and 1913 amounted to 338,451 tons and 319,410 tons, respectively. Adding these quantities to the exports from South Manchuria gives 654,705 tons for 1912 and 599,278 tons for 1913, figures which may be taken as representing the total amount of beans exported from Manchuria for these two years."

"Dairen is the chief milling center. Beans sent to Vladivostok are principally consigned for export to Europe, although a few shipments have recently been made from that Siberian port to Dairen. There is but one bean-crushing mill in Vladivostok, hence the shipments of bean cake and bean oil are practically nil. The beans reaching Antung, Newchwang, and Dairen are for the most crushed in the mills at those places."

In 1913 the 49 power mills in Dairen produced 309,159 tons of bean cake and 25,223 tons of bean oil. The 15 power mills in Newchwang produced 167,643 tons of bean cake and 14,679tons of bean oil. The 15 power mills in Antung produced 43,550 tons of bean cake and 4,340 tons of bean oil. "Besides the power mills, there are numerous hand and animal-driven mills in these places. The power mills in Dairen are operated largely by kerosene engines imported from Osaka, Japan. In the city of Mukden there are 32 horse mills but no power mills." Address: Vice Consul, Dalny (Dairen), Japanese Leased Territory.

1679. *Tropical Life* (*England*). 1914. Coco-nut products, &c. 10(5):97. May. [2 ref]
• ***Summary:*** The section titled "Soya oil.–Hull" gives statistics (from the *Public Ledger*) for prices on May 15th. The unit of weight or volume is not given. The section titled "Soya oil beans" gives additional statistics for soya bean prices.

A table from the *Indian Trade Journal* gives reliable statistics for exports (in tons) of soy beans from the port of Vladivostock [Vladivostock] (Siberia) from 1909 to 1913 inclusive to Europe, Japan, China, and Total. Exports to Europe rose from 214,185 in 1909 to a peak of 407,213 in 1911, then decreased to 221,099 in 1913. Exports to Japan leaped from 1,161 in 1909 to a record 77,186 in 1913. Exports to China jumped from 106 in 1909 to a record 16,909 in 1913. Total exports from Vladivostock [Vladivostok] rose from 215,752 in 1909 to a peak of 430,310 in 1911, then decreased to 315,194 in 1913.

1680. Kita, Gen-itsu. 1914. Einige japanische Schimmelpilze. II. Ueber die Aspergullusarten aus "Katsuobushi" und Vergleichung von vier A. ochraceusartigen Pilzen [Some Japanese molds. II. On the *Aspergillus* varieties in katsuobushi and comparison with four *A. ochraeus* types of molds]. *Zentralblatt fuer Bakteriologie. Series 2.* 41(11/17):351-63. June 6. [2 ref. Ger]
• ***Summary:*** Katsuobushi is the dried flesh of the bonito fish. It is widely used in Japan in the preparation of soups, sauces, and in cooking together with soy sauce (*Soja*). The amount produced in Japan is enormous. The author isolated numerous Aspergillus molds from katsuobushi, including the following: *A. glaucus,* a white Aspergillus variety, *A. candidus, A. Wentii, A. sulfureus var. A. oryzae, A. tamarii, A. ochraceus* plus Rhizopus Delemar. He grew these out on various substrates (including rice and defatted soybean meal), then measured their diastatic power. Address: Technical Inst., Tokyo Imperial Univ.

1681. Kita, Gen-itsu. 1914. Ueber die Asporogenitaet der Sojahefen [On the asporogenity (non-spore-bearing development) of soy sauce yeasts]. *Zentralblatt fuer Bakteriologie. Series 2.* 41(11/17):364-65. June 6. [6 ref. Ger]
Address: Technical Inst., Tokyo Imperial Univ.

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1682. Oshima, K.; Ariizumi, M. 1914. On the occurrence of creatinin in leguminous seeds. *J. of the College of Agriculture, Tohoku Imperial University* 6(2):17-25. June. [7 ref. Eng]
• ***Summary:*** "The presence of creatinin was confirmed for the first time, in the seeds of Adzuki bean, black soy bean, yellow soy bean, kidney bean, horse bean and green peas. The amounts of creatinin in the seeds of Adzuki bean, kidney beans and soy beans are apparently in much larger quantity than in horse bean and green peas, though its absolute amount seems to be very small." Address: Japan.

1683. Thompson, Erwin W. 1914. Cottonseed products and their competitors in Northern Europe. I. Cake and meal. *Special Agents Series* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) No. 84. 93 p. [1 ref]
• ***Summary:*** Contents: Letter of submittal. Introduction. Germany: The need of more protein, Germany as a customer, future competition of Egyptian cake, suggestions for increasing American exports, competing feedstuffs (incl. soya-bean meal and schrot), theoretical valuation of feedstuffs, prevalent methods of feeding, adulteration of feedstuffs, methods of purchase and sale, list of addresses. United Kingdom: Oil-cake feeding (incl. soya beans), theoretical valuation of feedstuffs, list of addresses (incl. Lever Bros. [Liverpool], J. Bibby & Sons [Liverpool], and Liverpool Seed Oil & Cake Trade Association [A. Grenville Turner, secretary, Liverpool]). The Netherlands: Promoting cottonseed cake, oil-mill methods, succulent feeds, experiment stations. Denmark: Sunflower cake, Russian transportation, purchase and sale, bulk cake, cake versus meal, valuation and choice of cake, ordinary cattle rations, cooperative societies, government supervision, list of addresses [p. 86, incl. "Dansk Sojakage Fabrik [Dansk Sojakagefabrik], Islands Brygge: Soya-bean oil mill; belongs to East Asiatic Co...; Hofmann Bang: Director Agricultural Experiment Laboratory."] Sweden: Prof. Hansson's experiments, feeding in the Skane district, competition of other feedstuffs, list of addresses. Norway: List of addresses.

"No nation excels Germany in the application of science to agriculture and in the dissemination of practical scientific information to the remote and small farms. The yield per acre in Germany of the principal food crops is now two to three times that of the United States, though 20 to 50 percent below that of Belgium, which is the highest in the world" (p. 9).

A table (p. 15) shows the kinds of oil cakes and meals consumed in Germany in 1912. Of the 1,417,920 metric tons (MT) consumed, 332,839 were cotton seed cake, 275,000 rape and similar cake, 200,000 linseed cake, 150,000 sesame cake, 150,000 poppy and sunflower cake, 120,000 palm kernel cake, 100,000 peanut cake, 50,000 soya cake, 30,000 copra cake, and 10,081 other. Thus soya cake is only 3.5% of the total.

A section titled "Soya-Bean Meal and Schrot" (p. 30) states that in Germany "Soya-bean cake is a product that has sprung into prominence within the past five years... Some of the first cake imported from Manchuria was moldy and contained too much oil, but now the principal imports are from England, where the oil is well extracted and there is not enough moisture to cause molding during the short journey. However, there is a general feeling that even small quantities of soya oil is [sic, are] not good for cattle, and so the preference is growing for the flakes, or 'schrot,' resulting from the treatment of the beans by the extraction process. This product contains only 1 or 2 per cent oil and is fast becoming popular. Some is imported from England, but more and more of it is being made in Germany."

Dr. "Kellner is the leading authority on feeds in Germany... The foundation stone on which most of the valuation theories are built is his celebrated feed unit 'Staerkewert,' which may be translated 'starch equivalent'..." A table (p. 35) shows the German feed units, or starch equivalents, of the constituents of 23 feedstuffs. Corn has the highest value at 81.5 starch equivalent, followed by sesame (79.4), copra (76.5), peanut (75.7), then soya (74.7). Another table (p. 36-37) shows that soya cake is one of the least expensive feedstuffs per feed unit.

In the UK, the main oilseed crushed is cottonseed (about 50% of the total), followed by linseed. A table (p. 50) shows the imports, exports, and production of various seeds, oils and cakes for 1912 for the UK. An illustration (p. 69) shows a pair of large "edgestones" and the beveled gears which turn them. Called "kallergang" on the European continent, these stones are used for crushing cottonseed in most parts of the world except the United States. They grind the cottonseed hulls more finely and greatly improve the appearance of the cake and meal. "SoyaBeans:... At one time it was predicted that soya beans would predominate the crush [in the U.K.], but they reached their maximum in 1910 with 413,267 tons and have been declining ever since, the receipts [imports] for 1913 being only 76,452 tons. Reasons assigned for this decrease are: The increase in freight rates, the increase in crushing in China and Japan, the growing competition from Denmark and from Germany (whose import duty was lately removed from these beans), and the slow demand for the cakes among English feeders. This last seems the most important reason, and it is involved with some of the others.

"Denmark (p. 74): Producers of oil cake the world over owe a debt of gratitude to Denmark for demonstrating the superlative value of this product [cottonseed cake] for making butter. This strictly agricultural country has been continuously concentrating its energy on those products that could be exported at the highest prices." The main export is butter, followed by milk, cream, and cured meats [i.e. value-added products]. In 1912 butter, valued at $40 million, accounted for nearly one-third of the country's exports.

In Sweden, within the past 5 years the Swedish

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Agricultural Department has been giving great attention to cattle breeding and feeding. "This experimental department is under the direction of Prof. Nils Hansson, a student of the celebrated German Kellner. Prof. Hansson has been making some extensive experimental studies in dairy-cattle breeding and feeding." Kellner's theories were mainly formulated for feeding cattle for beef. Prof. Hansson has clearly demonstrated that the Kellner valuation for nitrogen is too low when applied to milk production.

Norway's principal exports are fish and fish products (worth $27.8 million in 1912), followed by lumber, wood pulp, paper, and other forest products ($23,000,000). Address: Special Agent, Bureau of Foreign and Domestic Commerce.

1684. Hanson, George C. 1914. Commerce and industries of Kwantung. *Daily Consular and Trade Reports* (*U.S. Bureau of Foreign and Domestic Commerce, Department of Commerce*) 17(153):7-17. July 1. See p. 11-12, 15-16.
• ***Summary:*** "The Dairen (Dalny) consular district embraces the Kwantung Leased Territory (Japanese), comprising the tip of the Liaotung Peninsula and the islands adjacent thereto... Its area is 1,221 square miles and its population in 1913 was 517,147, of whom 469,651 were Chinese [90.82%], 47,381 Japanese [9.16%], and 115 foreigners."

A table (p. 8) of "Foreign trade by countries" shows that the lion's share of its imports (71.5% of gross value) come from Japan, followed by Germany, UK, Belgium, and USA.

A table (p. 11) shows "Shipments from Manchuria into Kwantung during 1912 and 1913, including: Bean cake 103,787 / 127,690 tons. [Soy] beans 553,438 / 622,205 tons. Beans (small=azuki) 16,794 / 16,297. Sauce, bean and soy 50 / 78 pounds.

The export trade in soybeans and products expanded. A table (p. 12) shows the "native exports" (to within China; quantity and value), including bean cake, [soy] beans, and bean oil.

The section titled "Last year's improvement in bean trade–unfavourable outlook" includes a table which shows exports (incl. reexports) of [soy] beans and bean oil "in 1913, by countries of destination. Exports of bean cake to foreign countries increased in 1913 to 527,507 short tons, of which 520,947 tons went to Japan and the remainder to Chosen [Korea]. The amount shipped to Chinese ports was 38,629 tons in 1913, as against 76,172 in 1912." "A large proportion of the bean oil shipped to Japan is transshipped to the United States." Address: Vice Consul, Dalny (Dairen), Japanese Leased Territory.

1685. Boulter, R. 1914. Soya bean export trade of Dairen. *Board of Trade Journal* (*London*) 86:97-98. July 9. Summarized in the Bulletin of the Imperial Institute. 1914, p. 621.
• ***Summary:*** The export of soy beans from Dairen decreased slightly in 1913, owing to the demands of the local mills. These mills, 50 in number, consume about 450,000 tons of beans annually, producing over 50,000 tons of oil. The exports of bean cake amounted to 555,428 tons in 1913, compared with 469,089 tons in 1912: over 80% of this was sent to Japan, for use there or for transshipment to the United States. The exports of bean oil in 1913 increased by about 3000 tons; the export to Japan fell from 10,889 tons in 1912 to 3,964 tons, and the export to China increased to 22,487 tons; heavy freight rates and high prices contributed to curtail the exports.

"Recently there have been some changes in the receptacles used for transporting bean oil, drums made of mild steel being used. The cost of sending oil to Europe in drums in £1 10*s.* [1 pound 10 shillings] per ton higher than in secondhand kerosene oil tins–the original practice–but this is compensated by the absence of leakage...

"The experimental mill erected by the South Manchuria Railway Company at Dairen was not expected to start work before the middle of the year. The capacity of the mill is to be 50 tons of beans in 24 hours and the oil is to be extracted by the benzine process. This mill and the new Santai oil mill [owned by Mitsui & Co.], which was erected in 1913 to replace the one burned down the year before, are the only ones in Dairen which extract oil by this process, all the others having adopted the crushing method. It is contended that by the benzine process more oil of a better quality is extracted from the beans, while the cake, though proportionately less in weight, is richer in fertilising matter." Address: Acting British Consul, Dairen.

1686. *San Francisco Chronicle.* 1914. Harbor news. July 22. p. 16.
• ***Summary:*** The *Nippon* arrived in San Francisco harbor only one day behind schedule. "Principal items in the liner's cargo of 2613 tons measurement were:... 371 cases of cigars, 6,665 sacks of rice, 885 tubs of shoyu [soy sauce], 700 bags of shelled peanuts,..."

Note the large amount of shoyu being imported into the United States in 1914.

1687. Thompson, Erwin W. 1914. Cottonseed products and their competitors in Northern Europe. II. Edible oils. *Special Agents Series* (*U.S. Bureau of Manufactures, Department of Commerce and Labor*) No. 89. 31 p. [1 ref]
• ***Summary:*** Contents: Letter of submittal. Introduction. The margarin industry: Germany, Netherlands, United Kingdom, Denmark, Norway, Sweden. Ingredients of margarin: Soft fats (sesame oil, colza and rape oils, soya-bean oil, peanut oil, cottonseed oil), hard fats (copra oil, palm oil and palm-kernel oil, shea-nut oil, summary of hard fats), artificially hardened fats (linseed oil, fish oils, soya-bean oil, peanut and cottonseed oils). Addresses.

Denmark (p. 11-12) "is one of the few countries where

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exact statistics are kept of the margarine made and the ingredients used. The Danes claim to make and export the best butter in the world, and they take every precaution to render it impossible in any way to adulterate or falsify it... All margarine must contain enough sesame oil to insure the prescribed color reaction." The main three "soft fats" used in Danish margarine (in descending order of importance, 1910-1912) are sesame oil, American cottonseed oil, and peanut oil; soya-bean oil is not mentioned. Margarine production grew from 34,320 metric tons (tonnes) in 1910 to 39,620 tonnes in 1912.

Ingredients of margarine: Soya-bean oil. A table (p. 15) shows the approximate net import and crush of soybeans in the United Kingdom, Germany, Netherlands, and Denmark from 1908 to 1913. The U.K. first imported soybeans in 1908 (40,600 tonnes). Germany first imported soybeans in 1909 (8,000 tonnes). The Netherlands first imported soybeans in 1911 (14,400 tonnes). Denmark first imported soybeans in 1911 (20,000 tonnes), rising to 36,900 tonnes in 1912 and 45,000 in 1913. The total soybean crush in these four countries peaked at 355,100 tonnes in 1912, falling to 246,300 tonnes in 1913. "The decline of the [soya-bean] industry in Europe is attributed to the advance in freight rates, to the difficulty of selling the cakes, especially in the United Kingdom, and to the resumption of normal oil milling in Manchuria since the close of the Russo-Japanese War. In Germany and Denmark the cake is growing in favor, especially the [solvent] extracted kind, which contains very little oil. The crush will probably continue to increase in those countries, and to decrease in the United Kingdom, where the cake is not liked. Meanwhile there is a disposition to import [soya-bean] oil from Japan and Manchuria. The United Kingdom imported 3,000 tons of oil in March, 1914. China exports to all countries about 100,000 tons of oil every year. In Denmark and Germany this oil is chiefly used for soap, but latterly in Germany, and even more so in the United Kingdom, it is being deodorized and exported to the Mediterranean to blend for salad oil. Margarin makers are taking it sparingly (not over 6,000 tons altogether). Perhaps the refiners may learn how to prepare it to suit them; but its most logical use seems to be as a salad oil as it is a natural winter oil containing oily 10 to 15 per cent stearin compared with 20 to 25 per cent for cottonseed oil."

"Peanut oil (p. 16): "Peanut oils vary greatly in quality, the best grades being made in Bordeaux, France, and Delft, Netherlands, from peanuts (*Arachis hypogaea*) that arrive in the shell from West and Southwest Africa, and to some extent from shelled nuts from China. The lowest grades are made in Marseille [Marseilles], France, from shelled peanuts shipped from the Coromandel, or east, coast of India." The present European supply of peanut oil is 184,000 tonnes, of which 135,000 tonnes (73.3%) are made in France.

Pages 26-27 discuss "Artificially hardened oils." "The combined capacity of the hydrogenating plants of Europe is estimated for 1914 at 250,000 tons (1,375,000 barrels), which is two or three times as much as has ever been treated. These plants are in England, Norway, Germany, and France, and are engaged at present chiefly on fats for soap and candles. They are hardening linseed, whale, soya-bean, and cottonseed oils.

Note: This is the earliest document seen (Dec. 2005) indicating hydrogenation of soya-bean oil to make candles.

"Edible oils: The great increase in the demand for margarin in Europe, for compound lard in the United States and for hard soap all over the civilized world has resulted in closely crowding the supply of natural hard fats, while liquid oils are relatively abundant."

Pages 30-31 give addresses of major edible oil processors and margarine manufacturers in Germany (incl. Berliner Pflanzen Butter Margarine Fabrik), Denmark (incl. Otto Monsted of Copenhagen, margarin), Norway, Sweden, Netherlands (incl. Van den Berg Margarin Works, Jurgens Margarin Works), and the United Kingdom (incl. Maypole Dairy Co.–affiliated with Otto Monsted of Copenhagen–makes margarin; Lever Bros. of Liverpool–oil mill, soap works, hardeners of oils; Crossfields [sic, Crosfield] Ltd. of Warrington–oil mill, soap works, hardeners of oils). Tables show: Total production of edible oils in the European countries (p. 7). Imports and exports for various countries and oils.

Note 2. This is the earliest document seen (Sept. 2007) stating that soybean oil is used as a salad oil in the Western world. Address: Commercial Agent, Bureau of Foreign and Domestic Commerce.

1688. *Board of Trade Journal* (*London*). 1914. Foreign trade of China in 1913. 86:355-61. Aug. 6. See p. 360.
• ***Summary:*** In 1913, exports of beans from China were 10,326,000 piculs. A picul weighs 133.33 lb on average. The original export to all destinations from Manchurian ports and marts, which has steadily declined since 1909, underwent a further reduction of 1,236,000 piculs. There was an increase in the quantity sent abroad of 3,655,000 piculs, nearly all to Japan and Formosa. And though shipments of bean oil have declined in recent years, the bean and its products yield a total value of 52,000,000 taels, which is fully up to the average. The average value of a Haikwan tael is 3 shillings and ¼ pence in 1913. 100 Haikwan taels = 111.40 Shanghai taels.

1689. Parlett, H.G. 1914. China (Manchuria): New bean oil extracting mill at Dairen on the benzine system. *Board of Trade Journal* (*London*) 86:385. Aug. 6. Summarized in the Bulletin of the Imperial Institute. 1914, p. 621.
• ***Summary:*** A new experimental bean-mill belonging to the South Manchuria Railway Company "started operations in the middle of April last. The mill is situated at Ji-ji-ko, about two miles from the Dairen wharves, and cost about £30,000,

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of which the plant cost about £20,000. The manager of the mill received part of his training in Germany." Except for two British-made boilers, the whole "plant consists of the most modern type of German extracting machinery.

"There are about 50 bean mills in Dairen, but this is the only one which extracts the oil by the benzine process... The maximum capacity of the mill is 80 tons of beans per day of 24 hours. At present only 50 tons are used daily, producing 7 tons of oil, 40 tons of meal, and 3 tons of moisture, dirt, etc...

"The crude oil is tainted with benzine and therefore unsuitable for edible purposes–its chief use in China; for this reason it has fetched smaller prices than the oil from the crushing mills. The oil must therefore be refined and deodorised before being put on the market, and it will probably be necessary to find a market in Europe or America...

"As far as the residue is concerned, it fetches a higher price by 20 per cent. than bean cake; but against this must be set the fact that from equal quantities of beans the residue obtained is 20 per cent. less than the amount of bean cake obtained by the crushing method, whilst there is the additional expense of providing bags for packing."

Note: This is the earliest document seen (Jan. 2009) that contains statistics concerning the processing capacity or storage capacity of individual soybean crushing plants. Address: British Consul, Dairen, Manchuria.

1690. Piper, C.V.; Morse, W.J. 1914. Five Oriental species of beans. *USDA Bulletin* No. 119. 32 p. Sept. 2. [22 ref]
• ***Summary:*** The five beans are the adsuki [adzuki, azuki] bean, the rice bean (*Phaseolus calcaratus*), the mung bean (*Phaseolus aureus*), the urd (*Phaseolus mungo*), and moth bean (*Phaseolus acontifolius*). Soy is mentioned only briefly.

"The adsuki bean (*Phaseolus angularis* (Willd.) W.F. Wight; Pl. I) is much cultivated for human food in Japan and Chosen [Korea] and to a less extent in China and Manchuria, but is apparently unknown in India and elsewhere in Asia. No mention of its cultivation in Europe has been found in agricultural literature. Next to the soy bean it seems to be the most important legume grown in Japan." In 1910 345,634 acres of adsuki beans were grown in Japan, compared with 1,171,438 acres of soy beans.

The first knowledge of the adsuki, or atsuki [azuki] bean to Europeans is the brief description by Kaempfer (1712). Kaempfer's drawing of the plant was later published by Banks (Kaempfer, 1791). This illustration is excellent and unmistakable. Willdenow (1801), named the plant *Dolichos angularis* on the basis of Kaempfer's description and illustration.

The adsuki bean was grown at Arlington Farm, Virginia, in 1906 (6 varieties), 1908, 1909, 1912, and 1913 (8 varieties).

Use in Japan: In Japan the adsuki commands a higher price than any other bean, the varieties with maroon-colored seeds being most widely used. "Adsuki-bean meal is sometimes prepared simply by grinding the dry beans and then removing the seed coats with sieves. More commonly, however, a wet process is employed. The wet process seems to vary somewhat in different parts of Japan, but consists essentially of 4 stages: 1. Boiling the beans until soft, usually after a preliminary soaking. 2. Crushing the cooked beans. 3. Removing the skins by forcing the mass through sieves or by putting the bean paste in cold water, when the skins are easily separated. 4. Drying the bean paste. The fresh, undried bean paste is called *an* and the dried product *sarashi-an.*

In whatever way prepared, the bean meal is eaten in soups and gruels of various kinds, often sweetened. It is also used for making various kinds of cakes and confections. Adsuki beans are also eaten popped like corn, as a coffee substitute, and candied by boiling in sugar. The last product is called *amanatto.* The flour is also used for shampoos and to make facial cream. "The use of beans to make sweetmeats seems to be purely a Japanese invention."

"Among the seed brought back from Japan by the Perry expedition in 1854 was a 'red-seeded bean.' (Browne, 1855, p. XV.) The identity of this bean has never been definitely determined, but it was doubtless the most common form of adsuki bean.

"Two varieties of the adsuki bean were tested at the Kansas Agricultural Experiment Station in 1891 by Prof. C.C. Georgeson (1891). Both of these had red seeds, one having the pods 'white,' the other 'black.' The white-podded variety yielded 16.3 bushels per acre; the black-podded, 8.7 bushels. In thrashing, the beans were found to crack easily, and so they were flailed. The beans were tested only as human food. 'These beans have been submitted to several housekeepers for trial, who all, with two exceptions, give them most favorable recommendations.' The professor of household economy, in a letter to Prof. Georgeson, praised the beans highly both for use in soups and baked."

"S.P.I. No. 226. A maroon-seeded variety from North China, March, 1898, under the name 'wei-tou (vay-do).' No cultural notes." Address: 1. Agrostologist in Charge; 2. Scientific Asst., Forage-Crop Investigations, Bureau of Plant Industry, USDA, Washington, DC.

1691. Hanson, George C. 1914. Manchurian bean-crop prospects. *Daily Consular and Trade Reports* (*U.S. Bureau of Foreign and Domestic Commerce, Department of Commerce*) 17(233):75. Oct. 5.
• ***Summary:*** "The [soy] bean-crop prospects in South Manchuria are improving daily everywhere under the good weather condition since the end of the long drought in June... The regions about Old Newchwang, Haicheng, and Newchwang, which had poor crop returns last year, have a fine outlook." Address: Vice Consul, Dalny (Dairen), Japanese Leased Territory.

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1692. Hathaway, Charles M., Jr. 1914. Foreign trade at ports of Humber. *Daily Consular and Trade Reports* (*U.S. Bureau of Foreign and Domestic Commerce, Department of Commerce*) 17(233):65-69. Oct. 5.
• ***Summary:*** Hull, a port on the River Humber, stands 3rd in foreign trade in the United Kingdom. A table shows the five main oilseeds crushed are cotton seed, soya beans, linseed, rapeseed, and castor beans. A table (p. 63) shows that imports of soya beans to Hull decreased from 147,317 long tons in 1912 to 63,046 in 1913. "The outlook for the soya bean is not thought to be bright."

A table (p. 69) shows the value exports to the United States. The leading vegetable oil exported was rape oil, worth $208,704 in 1912, increasing to $268,057 in 1913. Exports of soya bean oil were small: $314 in 1912 increasing to $2,485 in 1913. Address: Consul, Hull, England.

1693. Bishop, Crawford M. 1914. Trade of North Manchuria. *Daily Consular and Trade Reports* (*U.S. Bureau of Foreign and Domestic Commerce, Department of Commerce*) 17(237):145-50. Oct. 9. See p. 145-46.
• ***Summary:*** During 1913 for Harbin (including the Chinese city of Fuchiatien), there was a decrease in the exports of [soy] beans by rail, but the average market price of these beans was higher than during the previous year. During the year five major factors, which are discussed, caused a sharp financial crisis.

The section titled "Export of soya beans and hempseed" (p. 146) states: "The exports of beans and other grains by the Chinese Eastern Railway (Russian) to the East during the winter of 1913 amounted to 18,439 carloads, an increase of nearly 2,000 carloads over the corresponding period of 1912. By far the major portion of this increase was shipped to the Ussuri district, the increase in shipment to Vladivostok being much smaller in comparison." The Ussuri district is becoming an increasingly good market for these Manchurian products.

"The total export of beans in 1913 was 334,992 tons, of which 247,344 tons were shipped to Europe, 72,864 tons to Japan, and 14,784 tons to Dairen (Dalny). Of the foregoing total, 15,000 tons were shipped via Nikolaiefsk.

"There were one Japanese and two Chinese bean-oil mills in operation in 1913, and the total quantity produced was 1,214 tons. The average price of bean oil was 5 cents per pound." Address: Vice Consul, Harbin.

1694. Takamine, Jokichi. 1914. Enzymes of *Aspergillus oryzae* and the application of its amyloclastic enzyme to the fermentation industry. *Chemical News* 110:215-18. Oct. 30. [11 ref]
• ***Summary:*** Originally published in *Journal of Industrial and Engineering Chemistry* 6:824-28 (Oct., 1914).

1695. Takamine, Jokichi. 1914. Enzymes of *Aspergillus oryzae* and the application of its amyloclastic enzyme to the fermentation industry. *J. of Industrial and Engineering Chemistry* 6(10):824-28. Oct. [11 ref]
• ***Summary:*** This is the first review of the early history of the application of East Asian fungal fermentations to modern industrial processing, which began in the 1880s. A principal impetus for the development of the fungal enzyme industry was the discovery that *Aspergillus oryzae,* the fungus involved in the shoyu, miso, and saké industries, produced amylases that could be used to saccharify starch in place of barley malt in the production of distilled spirits. The first commercial enzyme was Takadiastase (a white to yellowish powder rich in amylases) produced by precipitating an aqueous extract of *Aspergillus oryzae* koji with 70% v/v ethanol. The precipitate was then dehydrated with strong alcohol and pulverized.

Though *Aspergillus oryzae* plays an important role in the national economy of Japan, "its utilization in Occidental countries is singularly lacking. Calmette and Bodin's investigation on amylomyces with a view of utilizing it in the spirit industry is an isolated instance in Europe, and their process, known as the amylo-process, has been in operation in France since 1891.

"In 1891, I made an arrangement with the Distilling and Cattle Feeding Co. [popularly known as the "Whiskey Trust"], of Peoria, Illinois, and carried out on a practical scale the application of the *Aspergillus oryzae* to the American Distillery. My experiments, which ran for a couple of months on a 2,000 bushel scale at the Manhattan Distillery, were partially successful, but unfortunately the process did not attain general recognition of its merit..."

Aspergillus oryzae has been used in Japan for many centuries to make products such as Sake or rice beer, Soy [sauce], and Miso. In 1912 the tax on fermented sake in Japan contributed the $41,974,630 to the national treasury. "The tax on the production of Soy (Bean sauce) amounted to $2,048,141" [only about 5% as much as sake]. The total cost of all articles produced with the aid of the *Aspergillus oryzae* fungus is put at roughly $200 million.

"To the growth of *Aspergillus oryzae* on wheat bran as a culture medium I gave the convenient name of Taka-Koji and have employed it for a number of years to distinguish it from that known in Japan as Koji which is a culture on steamed rice.

"Taka-Koji is designed for a substitute for malt as an amyloclastic agent in varied fermentation and other allied industries. Its proposed use is encouraged by the fact that the cost of malt is subject to fluctuations according to the crop conditions of barley while bran is exempt from similar market conditions. Besides, the transformation of bran into Taka-Koji can be accomplished in 48 hours, while malting needs three or four times as long for completion of the process."

The author made his Taka-Koji in a revolving drum with

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up to 70 kg capacity. Then he ordered a drum of about 4,800 pounds capacity–the size of an 8-ton malt drum. The cylinder turned at 1 revolution per minute. This resulted in an 83% saving in labor costs as well as a considerable saving in space. The "process promises well for furnishing a substitute for malt in alcoholic fermentation and other industries where amyloclastic enzyme is required." The process was tested by Dr. Niels Ortved, Chief Chemist of Hiram Walker & Sons of Walkerville, Ontario, Canada. In his results, which were presented in a paper at the last Congress of Applied Chemistry (held in New York), and published, he noted: "Takamine was the first to introduce the Koji process to America. As far back as 1899 he advocated the use of Koji in the distilling industry... Lately, I understand, he has succeeded in adapting a modification of the Galland-Henning malt drum system to his process. This should be a great improvement over the old floor system..."

"Taka-Diastase: An aqueous extract from the Taka-Koji can be easily made by percolation and an enzyme can be precipitated by adding alcohol to such an extent as to contain 70 per cent by volume of same in the mixture. The precipitate is dehydrated by means of strong alcohol, dried and powdered. It is a white or yellowish white powder or hygroscopic nature. It is marketed in this form for medical use under the name Taka-Diastase. Though known as an amyloclastic agent, it contains various enzymes; nevertheless, amyloclastic and proteolytic enzymes predominate." Taka-Diastase is a Koji extract whose function is to transform starch directly into glucose.

The paper closes: "The author extends his thanks to Mr. Wooyenaka for his untiring and valuable assistance and to Parke, Davis & Co. for affording every facility for carrying out the 'Drum Experiments." Address: 552 West 173rd St., New York.

1696. Williamson, A.A. 1914. Larger bean crop in Manchuria. *Daily Consular and Trade Reports* (*U.S. Bureau of Foreign and Domestic Commerce, Department of Commerce*) 17(265):699. Nov. 11.

• ***Summary:*** "While there is no regular, organized method of estimating the bean and cereal crops in Manchuria, the reports of persons interested based on their observations are of interest and generally approximately near the mark."

"It now seems that the bean crop will be larger than usual" due to weather conditions. "In ordinary years the proportion is generally put at about 40 per cent kaoliang, 30 per cent other cereals; but this year it is said the ratio will be reversed, beans taking 40 per cent, kaoliang 30 per cent, and other cereals 30 per cent."

"Bean meal versus bean cake: Local papers expatiate on the fact that bean meal is meeting with increased favor in Japan. Bean meal is the by-product of extracting oil from soya beans with chemicals, while the cake is obtained from the expression process. The extraction process gives a higher yield of oil and the resultant meal is better suited for fertilizer, as it contains less oil (and is therefore more quickly absorbed by the soil) and does not require to be broken and pulverized–a process through which cake must be put and which adds to the cost of the fertilizer to the consumer.

"There are said to be only three mills operated on the extraction principle in the East, one, the Lever Bros. mill at Amagasake, Japan, another at Nagoya (owned by a Japanese corporation), and the experimental bean mill of the South Manchuria Railway Co.'s central laboratory at Dairen." Address: Consul, Dalny (Dairen), Japanese Leased Territory.

1697. Williamson, Adolph A. 1914. South Manchurian notes. *Daily Consular and Trade Reports* (*U.S. Bureau of Foreign and Domestic Commerce, Department of Commerce*) 17(292):1149. Dec. 14.

• ***Summary:*** "Standard weights for bags of staples established: The Manchurian Staple Products Dealers' Association has established standard weights for bags of cereals and legumes as follows: [Soya] Beans, 150 kin (1 kin = 1.32277 pounds);... red beans [azuki] 160 kin; kaoliang (tall millet), 154 kin," millet 166 kin, sesame 113 kin, linseed 134 kin, wheat 136 kin, buckwheat 118 kin, peanuts 50 kin. The containers are generally gunny bags.

"Depression in soya-bean business: The business depression in the countries affected most by the present war on account of lack of shipping, markets, etc., has brought about... Exchange is very favorable to buyers paying in gold, being to-day (Oct. 26) 79 gold yen to 100 silver yen.

"An attempt has recently been made to organize a bean millowners' union, modeled after the cotton spinners' union about Osaka, Japan, to regulate the output of oil and cake and keep prices up, but a number of Chinese owners would not join and the attempt failed. The promoters estimated the daily potential output at 90,000 pieces (cakes) and the daily demand at about 50,000."

Note: This is the earliest document seen (Jan. 2009) concerning World War I and soya beans. Address: Consul, Dalny (Dairen) [Japanese Leased Territory].

1698. Agricultural Bureau, Dep. of Agriculture and Commerce Japan (Norinsho, Nomukyoku). 1914. Outlines of agriculture in Japan. Tokyo: Agricultural Bureau, Department of Agriculture and Commerce. 20 + 35 p. Dec. No index. 15 x 22 cm. [Eng]

• ***Summary:*** Name of organization with diacritics is: Nôrinsho, Nômukyoku. The structure of this book is unusual. The table of contents (p. 1-3) is followed by a list of "illustrations" [all photographs] (p. 1-2), a colored map of Japan and pie chart, 20 unnumbered pages of black-and-white photos, and finally the text in four chapters (p. 1-34).

The pie chart (average of the 3 years 1910-1912, excluding Chosen, Taiwan, and Karafuto) shows the percentage of agricultural products in value; Rice has about

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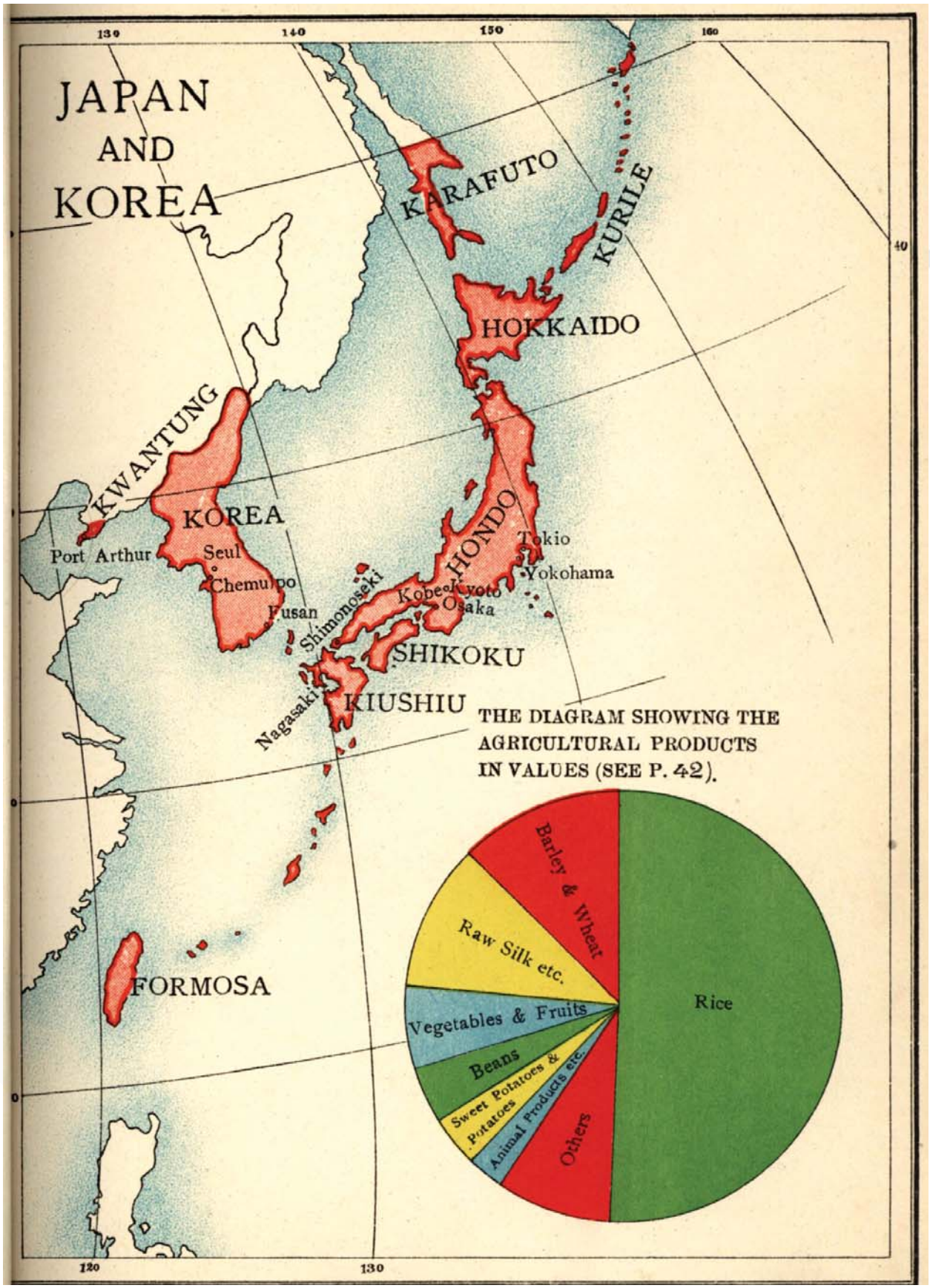

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60% of the total value, followed by barley, naked barley and wheat, cocoon and silk worm eggs, and vegetables. Leguminous beans are one of the smallest categories.

Interesting photos include:

(1) The hall [building] of the Imperial Department of Agriculture and Commerce. (2) The Agricultural College of Tokyo University (fields, with buildings in the background). (3) The Agricultural College of Tohoku University (trees and walkways, with buildings in the background). (4) The Imperial Agricultural Experiment Station. (13) Interior of filiature at Okaya, Nagano prefecture (many women kneeling in two long rows like machines behind silk spools). (15) Silk conditioning house. (16) The sericulture institute. (20) Shibuya live-stock breeding farm, and long-tailed fowl (on a perch with a 9-foot tail).

Chapter 1–Condition of agriculture. At the end of 1912 about 60% of all households in Japan are farming households. Of these 5,510,000 farming households, 32% have occupations in addition to farming–primarily sericulture, followed by making items from straw (fancy matting, braids), tea manufacture, then chicken raising. There are three classes of farmers: Land-owners, peasant proprietors (32% of total number of farmers; cultivate their own land), and tenants (28% of total number; rent farms from land-owner). Both peasant proprietors and tenant farmers (40% of total). About 15% of Japan's land is under cultivation. Of this, about half is taken up by paddy fields (for raising irrigated rice) and half by upland fields. Many paddy fields give two crops a year. Soja beans are mostly grown as a summer crop on upland fields in rotation (p. 5). Because of the smallness of its scale, Japanese agriculture traditionally relied mostly on human labor. But in recent years the number of farm animals has increased. In late 1912 there were 2,290,000 of which 1,220,000 were horses, 1,070,000 cattle, and 300,000 swine. About 20 years ago, fertilizer meant mainly human excrement, weeds, and stable manures, plus small amounts of oil-cake [soja bean cake], fish-guano, and rice bran. Today the value is three times what it was 10 years ago, and now includes soylees [okara]. "Of these market manures, the bean cake, which is imported from China and Kwantung Peninsula, is most important and demanded the sum of 25 million yen [25% of the value of all fertilizers]. Next came the various composition manures [chemical fertilizers], the material of which is imported in large quantities, and super-phosphates of lime" (p. 8). There are more than 10,400 agricultural cooperatives in Japan with 1.16 million members; they are promoted by the Co-operative Societies Law of 1900. There are four types: Credit, Purchase, Sales, and Productive Societies (p. 9).

Chapter 2–Agricultural products. The value of all agricultural products is estimated at 1,720 million yen for the 3 years preceding 1912. These fall into six groups (value shown in million yen): 1. Cereals (incl. soja beans)–1,246 (72.4% of total). 2. Industrial crops (incl. tea, rape, tobacco, sugar cane)–65.3 (3.79%). 3. Horticultural products (fruits, vegetables, and flowers)–196.8 (11.4%). 4. Livestock and poultry–42.27 (2.45%). 5. Cocoons and silkworm egg cards–164.2 (9.5%). 6. Miscellaneous–5.1 (0.03%). Looking now at the value of individual cereals in million yen: Rice 966.4 (56.2% of total of 6 groups). Naked barley 74.2.

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Barley 63.3. Wheat 52.5. Soja beans 35.95 (2.1% of total). Indian millet 15.84. Miscellaneous 38.1.

A table (p. 12-13) shows the acreage of the principal crops (in units of 1,000 *cho*) at 5-year intervals from 1887 to 1912. For soja beans: 466 in 1887, 443 in 1892, 435 in 1897, 466 in 1902, 471 in 1907, 475 in 1912. Thus, the are planted to soja beans was roughly static. For small red bean [azuki] it was: 109 in 1897, 129 in 1902, 135 in 1907, 136 in 1912. So azuki area was about 25-28% of soja bean area.

Another table (p. 13-14) shows the yield of the principal crops (in units of 10,000 *koku*) at 5-year intervals. For soja beans: 325 in 1887, 311 in 1892, 310 in 1897, 313 in 1902, 366 in 1907, 351 in 1912. Again, fairly static. By comparison, between 1887 and 1912 the average yield of wheat increased by 70%, naked barley by 39%, barley by 38%, and rice by 26%–but only 8% for soja beans.

Japan's top three export items (value on 1,000 yen) are raw silk (166,963), tea (12,639), and sugar (10,384). The main imports are cotton (193,735), rice (32,128), soja bean cake (for manure; 27,469), sugar (20,694), wool (14,531), and soja beans (8,571). Peanuts are exported to the USA.

Chapter 3–Agricultural administration. The highest organ is the Department of Agriculture and Commerce, which is divided into five sections. The highest organ of agricultural research is the Imperial Agricultural Experiment Station; there are 39 local agric. exp. stations. Agricultural statistics are compiled at the Section of Correspondence in the Secretariat of the Department. A statistical report on all matters concerning agricultural products is issued once a year.

Chapter 4–Outline of agriculture in the colonies. I. Agriculture in Formosa. Rice is the principal crop, followed by sugar cane, sweet potatoes, tea, beans, and peanuts. No statistics are given. II. Agriculture in Chosen [Korea]: A table (p. 32-33) shows area (in 1000 *cho*) and production (in 1,000 *koku*) in 1912: Rice 980 / 8,969. Indian millet 403 / 3,118. Barley 386 / 4,293. Soja bean 375 / 2,452. Wheat 169 / 1,094. Small red bean (azuki) 165 / 835. The largest export from Chosen in 1912 was rice, followed by soja beans. But the largest export from Chosen to Japan was soja beans, worth 4,917,000 yen. III. Agriculture in Karafuto (the Japanese name for Sakhalin Island). In 1875 it came entirely under Russian control when Japan ceded it in exchange for the Kuril / Kurile Islands. It was occupied by Japan in 1905, and the southern half (below 50ºN) was granted to Japan by the Treaty of Portsmouth, which ended the Russo-Japanese War. It was returned to the USSR in 1945 after the Allies defeated Japan in World War II. It is too far north to grow soybeans. But barley, naked barley, wheat, oats, rye, and rape grow well. Address: Tokto, Japan.

1699. Shibukawa, Kôzô; Nakanishi, Kinzaburô. 1914. Kyokushi seizô narabini seizôhô-chû ni okeru kagakuteki seibun no henka ni tsuite [On the chemical change during the manufacture of kyokushi]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) No. 2. p. 25-53. [Jap]

1700. Kinoshita, Asakichi. 1914. Nidan shikomi shôyu jôzô-hô anshutsu no yurai [The origin of the idea of the two-step method for brewing shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 9(11):39-42. [Jap]
Address: Jozo Shikensho Gishi.

1701. Nishimura, Torazô; Inoue, T.; Kimura, K. 1914. Shôyu jôzô yô en. Enshitsu hikaku shiken seisei [Comparative examination of the quality of salt used for making shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 9(3):24-60. [Jap]
Address: 1. Jozo Shikensho Gishi; 2-3. Senbaikyoku Gishi.

1702. Suzuki, U.; Sera, S.; Sasaki, Y. 1914. Dobutsu no eiyô-jô sekkai no kôka ni tsuite [The effect of limestone (calcium) on the nutrition of animals]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 35:1035-91. [Jap]
Address: 1. Nôgaku Hakase; 2-3. Nôgaku-shi.

1703. Togano, Meijiro. 1914. Togano-shiki jidosei kôji sochi no kansei [Togano's perfected automatic koji making machine]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 9(6):3-9. [Jap]
Address: Jozo Shikensho Gishi.

1704. Bosse, Sara; Watanna, Onoto. 1914. Chinese-Japanese cook book. Chicago and New York: Rand, McNally & Co. 120 p. Index. 17 cm.
• ***Summary:*** A remarkable and pioneering East-Asian cookbook. It may well be the earliest Japanese cookbook seen published in America. It is one of the earliest Chinese cookbooks published in America. The cover illustration shows a well dressed Japanese woman in a Japanese room kneeling and cooking over a brazier. Contents: Preface. Part I: Chinese recipes (12 sections, p. 9-64). Part II: Japanese recipes (7 sections, p. 74-110). List of Chinese and Japanese groceries.

The Preface begins (p. 1): "Chinese cooking in recent years has become very popular in America, and certain Japanese dishes are also in high favor. The restaurants are no longer the resort of curious idlers, intent upon studying types peculiar to Chinatown, for the Chinese restaurants have pushed their way out of Chinatown and are now found in all parts of the large cities of America." "There is no reason why these same dishes should not be cooked and served in any American home."

Concerning shoyu, or Japanese-style soy sauce (p. 2-3): "Syou, sometimes called Soye, is similar to Worcestershire and similar European sauces. In fact, the latter are all said to be adaptations of the original Chinese syou, and most of

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the European sauces contain syou in their makeup. It lends a flavor to any meat dish, and is greatly esteemed by the Oriental peoples."

Note 1. This is the earliest English-language document seen (April 2012) that uses the word "syou" to refer to shoyu or soy sauce.

Syou (soy sauce) is an ingredient in at least 55 recipes in this book, both Chinese and Japanese–starting with Chinese soups (p. 12-17). When first mentioned here it is called "syou (Chinese sauce)," but thereafter simply "syou."

"Miso paste" appears in 5 Japanese recipes: Satsuma soup ("one quarter pound of aburage {oil-fried Tofu}; one quarter pound of miso paste {soy bean and rice cheese}," p. 71-72). Uwo shiru (Fish soup) ("one pound of miso paste {bean and rice paste}; one half cupful of syou sauce," p. 73-74). Shika shiro (Pot-roasted venison) ("one cupful of syou sauce;... one quarter pound of miso paste," p. 80). Tamago bolan (Peony eggs) ("finely mashed miso," p. 91-92). Shiro uri (Stewed squash) ("syou sauce... two tablespoons of miso," p. 95).

"Aburage (oil-fried Tofu)" and regular tofu appears in Satsuma soup (p. 71, see above). Yaki zakana (Fried fish) (with "oil-fried Tofu... Note: Tofu is made from a mixture of syou bean [soy bean] and rice. It is mashed and rolled into a thin cake, and fried in oil, very much like pancakes," p. 77-78). Note 2. A poorer definition of tofu would be hard to find. Yaki udzura (Broiled quail or pigeons) ("aburage {bean cheese paste}" and "Tofu cakes," p. 79). Fried squab (with "fried Tofu," p. 81). Tamago tofu (a tofu-like custard made with eggs and syoyu sauce, but no real tofu, p. 89-90).

Bean sprouts are used in many recipes, but we are never told what type of beans are sprouted [probably mung beans]; a recipe for homemade bean sprouts (p. 109) calls for "ordinary white beans, or dried lima beans." Other interesting ingredients include: "Adzuki (purple beans)" (mentioned once in Yohan candy). Goma seeds [sesame] or goma-seed oil (mentioned 15 times). Kudzu starch (6 times, misspelled once as "kudze"). Peanut oil (at least 10 times). Seaweed (1 can of seaweed; small piece of seaweed), seaweed jelly or gelatine, or Kanton [kanten, agar] (15 times). Sweet rice [mochigome].

The authors, "Winnifred and Sara Eaton were sisters, daughters of a Chinese-born mother and an English-born father, and grew up in a large family in Montreal, Canada. Winnifred Eaton was a very successful fiction writer who, by taking on a Japanese identity, both exploited the public's craze for 'Japonica' at the time, and obscured her Chinese heritage during an age of anti-Chinese sentiment and policies. This cook book was her first collaboration with Sarah, who may have done very little of the writing. A painter, Sarah (1868-1940) lived out her life with her German artist husband, Karl Bosse, in New York. Winnifred (whose Japanese pseudonym was Onoto Watanna) lived 1879-1954, knew almost nothing about Japanese cooking. Winifred's biographer and granddaughter, Diane Birchall, says that the authors' claim in the Preface that the Chinese recipes are "... secret recipes handed down from Vo Ling, worthy descendant of a long line of noted Chinese cooks...' is just a hoax. "According to Birchall, Eaton was awful at cooking Chinese dishes" (MSU introduction and biography).

1705. Davison, Mrs. 1914. Domestic economy in Japan. [Tokyo, Japan]: Kyo Bun Kwan (Methodist Publishing House). Tokyo Katei Mondai Kenkyu Kurabu. v + 73 + [16] p.; 17 + 1157 + 6 p. No index. 19 cm.

• ***Summary:*** On the title page: "Compiled by the Home Problem Club, Tokyo." Contents: Soups. Fish. Meats and substitutes. Vegetables. Salads. Puddings. Pudding sauces. Sweets. Cakes. Breads. Native cereals. Preserves. Jams. Pickles. Suggestions. Japanese disinfectants. Useful addresses. Menu-maker (from *Ladies Home Journal*).

The front part of this book (p. v + 73 p.) is in English. The back part (17 + 115 + 6 p., reading from back to front) is in Japanese, and numbered separately. In the middle is a 16-page "Advertising section," mostly in English, on unnumbered pages. Each recipe is numbered sequentially, from 1 to 1-186, in each part. The recipe numbers in the English part correspond exactly to the numbers in the Japanese part.

Soy related recipes: "Tofu" (bean curd) soup (p. 2). [Soy] Bean roast (p. 12). "Tofu" roast (3 types; calls for 1 *cho* or 1 square of tofu, p. 12-13). "Tofu" and celery stew (p. 14). In the chapter on vegetables: "Daizu" (p. 23): "Soja or Soy bean. There are white, green and black soy beans. This bean is used in the preparation of *miso, tofu,* etc. A drink is made from the black soy bean and unhulled barley. These are parched and then boiled in a tea, sweetened with sugar ad used in the summer time." Soya beans (p. 24): "Hull and boil; remove the skins and dress like lima beans. *Azuki* a little red bean may be prepared in many ways. One way, boil, place in center of a mound of rice, and serve with a curry sauce made with apple and onion in it."

Tofu (p. 26-29): "Tofu is a most nourishing inexpensive curd made from the bean. It may be served in many ways. The process of preparation takes away part of the bean difficult to digest and leaves one of the most wholesome of foods. It is especially good for diabetic patients. It may be bought in any part of Japan. Always pour boiling water over it before using." These recipes follow: Scrambled "tofu". "Tofu" and cheese. "Tofu" croquettes (3 recipes). "Tofu" box. "Tofu" and tomatoes. "Tofu" and peanut butter. "Tofu" and cheese (2 recipes). "Tofu" and corn.

"Tofu" (bean-curd) salad (with 2 *cho* [= cakes] of "tofu," p. 38). "Tofu" custard (p. 40).

This book also calls for peanuts in many recipes. A few recipes call for *goma* (sesame seeds), *kanten* ("a kind of gelatine made from seaweed. A substitute for gelatine," p. 61). in a few. Pudding sauces and sweets include many

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recipes for "mizu-ame" ("1 pint of golden-colored mizu-ame." Some is made from millet, and some from rice). "Health food" is mentioned on p. 52. Address: Tokyo, Japan.

1706. Fujikuro, Kosaburo. 1914. Taiwan baiyô shokubutsu no kiseikin mokuroku. II. [List of parasites on plants cultivated in Taiwan. II.]. *Botanical Magazine* (*Tokyo*) 28:423. See entry No. 80. [Jap]
• ***Summary:*** Under *Glycine Soja* Bth [Bentham] are listed: *Hypochnus centrifugus, H. Sasakii, Peronospora trifoliorum, Phacospora sp., Sclerotinia Libertiana.* Address: Taiwan.

1707. Fujimoto, Taizo. 1914. The nightside of Japan. London: T. Werner Laurie, Ltd.; Philadelphia: Lippincott. xii + 233 p. Plus 40 p. plates on unnumbered pages. Illust. No index. 21 cm.
• ***Summary:*** "Howling of a 'oinarisan' pedlar [peddler] (oinarisan is a kind of sushi, and its pickled rice is wrapped with a piece of fried bean-curd flavoured with sugar and soy [sauce]) and flute of a Chinese buckwheat seller are faintly heard in a distant street" (p. 39).

"To classify the labourers who are staying in these lowest lodging-houses, according to the kinds of their work or business, one half of them are stall- keepers who sell... amé (wheat gluten),... *shiruko* (a dish made of rice cake [mochi] and sugared beans), *inarisushi* (another name of *oinarisan,* which is a mass of pickled rice wrapped up with a piece of fried bean curd),..." (p. 44-45).

Note: This is the earliest English-language document seen (April 2013) that contains the word *inarisushi* (one word without hyphenation).

"Consequently, every night till midnight the streets in the vicinity of these lowest inns are full of small shops and stalls of cheap food and drinks, awaiting the customers from those *kichinyado.* Stalls of hot wine and *oden, inarisushi, shiruko, mochi* (rice-cake), *tsukeyaki pan* (pieces of bread toasted and flavoured with soy [sauce]),..." (p. 47). Note: Mochi is also mentioned on pages 172, 173, and 202.

"In this book you read often of stalls of *odenya,* but the Marugin is a large house situated at the cross-roads of Sudachô, and though it belongs to the eating-houses of the lowest class, it may probably be the first and largest *odenya* in Tokyo. The room, lighted with electric lights, is furnished with tables and chairs, in place of mats and futon, very common in the shops of the lower rank. Oden is, as previously explained, a special kind of food boiled down with soy, its chief materials consisting of fish, bean-curd, konnyaku, and taro" (p. 63-64).

"You often find little boys of nine or ten years at the temple, and their true object of the visit seems not to be prayer to the temple, but they are ambitious to taste the sweet *amazake* (hot beverage made of fermented yeast [sic]), which the temple entertains to the visitors" (p. 153).

1708. Gulick, Sidney L. 1914. The American Japanese problem: A study of the racial relations of the East and the West. New York, NY: Charles Scribner's Sons. 349 p. Index.
• ***Summary:*** The author believes that Japanese in America are being treated unfairly, and that they are a real asset to the United States. He tackles each of the accusations against Japanese head-on and very effectively. Of special interest are his summaries of the report of J.D. Mackenzie (p. 29, Appendix B).

Dedication: "To Andrew Carnegie and the host of loyal workers for universal peace and the friendship off the East and West this book is dedicated."

Page 29: "Fortunately, the State of California itself has conducted such an investigation, an appropriation of $10,000 having been made for this purpose in 1909. Much to the surprise of those who had inside information, the report proved unexpectedly favorable to the Japanese. No appropriation, however, was made for its publication. Some assert that it was purposely suppressed. We are, accordingly, dependent for our knowledge of its contents on a brief 'Summary for the Press' furnished by J. D. Mackenzie, Labor Commissioner, May 30, 1910.1 As it is impossible, advantageously, to condense further the material there summarized, the entire summary is reproduced" in Appendix B. Footnote: "Portions of the statistical tables were subsequently published in the Biennial Reports for 1911 and 1913 of the State Department of Labor."

Appendix B: "Summary by Labor Commissioner J. D. Mackenzie of the report of the "Special State Investigation of 1909" of Japanese in California. Given to the press May 30, 1910.

"In 1909 the legislature of California appropriated $10,000 to provide for a "drastic investigation of the Japanese question... This covered free-hold and lease-hold lands, the estimation of Japanese by their neighbors, their value and need of them as farm laborers, their moral relations to society and the industrial, financial, and social effect of their presence here. This exhaustive inquiry was ordered in the language of the act authorizing it, 'to inform the legislature and the President and Congress.' The investigation was made by the State Labor Commission, and the testimony taken by him, names of witnesses, and all facts went into his report. The result was that this investigation so thoroughly disproved the ground upon which anti-Japanese legislation demanded by the legislators who promote it, that our State Government has suppressed the report and it has never been published."

"Quotation from the letter of the Delta Association of California to Hon. William J. Bryan, April 24, 1913, on the occasion of his visit to California to confer with Governor Johnson and the State legislature in regard to the proposed anti-alien legislation."

"The investigation of Japanese in agriculture covered visits to 4,102 farms scattered over thirty-six counties

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and growing almost every crop common to the State of California. Of this total number of farms visited, 1,733 were operated by Japanese farmers as owners, cash lessees and share lessees. The remaining 2,369 farms were operated by white farmers, being equally distributed between those employing white help exclusively and those employing mixed races, including Japanese. These 4,102 farms contained 697,236 acres and produced crops valued approximately at $28,000,000 annually. On these farms there were employed during the past year an aggregate of 80,982 persons of all races, 9,452 of whom were women, the length of employment varying from a few days to a year. On the 2,369 farms operated by white farmers, employing a total of 63,198 persons, 53.4 per cent of the labor employed was white, 36.4 per cent Japanese, and 10.2 per cent various other races, including Chinese, Mexicans, Hindus, and Indians. On the 1,733 farms operated by Japanese farmers, employing 17,784 persons, 96 per cent of the labor employed was Japanese, while 872, or 4 per cent, was equally divided between male and female white; in other words, on the basis of numbers employed, the Japanese furnished practically 50 per cent, or one half, of the labor necessary to grow and harvest the crop, valued at $28,000,000, produced on the farms visited in this investigation.

"The farms on which Japanese were not employed were, as a rule, much smaller than those on which they were employed, the former averaging 159 acres, the latter 357, demonstrating the necessity of a class of temporary laborers on large acreages. Another important fact developed by this investigation was the relation between the character of the crop grown and the employment of Japanese. On the farms where whites were employed exclusively, no berries or nursery products were grown and very little vegetables outside of beans."

There are sections on average wages paid Japanese vs. white farm workers, "Japanese farms," Landownership by Japanese," "Leasing by Japanese," "Japanese in commercial pursuits," "Japanese population," and Japanese school children."

Japanese in Commercial Pursuits.–That part of the investigation relating to Japanese in business and activities other than agriculture is practically complete. 2,548 establishments [such as tofu shops] were visited throughout the State. 1,934 were owned by individuals, 550 by partnerships, and 64 by corporations. 19.4% have been in business less than one year, 24.2% for one year, 17.2% for two years, and 15.9% for three years, making a total of 76.7% of the total established since 1906. Only 58 establishments, or 2.3% of the total, have been in existence for ten years or more. The capital invested in most instances was very small, 68.7% of the total having a capital of less than $1,000. The total aggregate cash invested amounted to over $4 million. The total annual transactions of these Japanese establishments amounted to $16,114,407, of which $5,938,012 or 36.8% was with white people. The total annual rent paid by these firms was over $900,000. 6,556 persons were engaged in the conducting of these establishments, of which number 2,546 were males and 562 females (principally wives of owners) were employers and 3,214 males and 234 females employees. In addition there were employed by these Japanese firms 35 male and 20 female white persons.1,410, or 55.3% of the total establishments, were conducted entirely by the owners. In 1,782 establishments, or 69.9%, the employees lodged at the place of work.

The sanitary conditions of the places of work were: Good 81.8%. Fair 16.8%. The sanitary conditions of the places of lodging were: Good 68.5%. Fair 27.3%. Bad 4.2%.

1,568, or 61.5% of the total number of establishments were located in seven principal cities of the State, as follows: Los Angeles 505, San Francisco 497, Oakland 178, Sacramento 154, Fresno 100, San José 79, Stockton 54.

Although San Francisco did not contain the largest number of establishments, 34% of the entire investment was represented there and 40.2% of the total amount of business transacted therein.

The prevailing number of hours worked per day was ten and over, and the prevailing wages paid were from 25 to $35 per month with board and $40 to $50 without board. Address: M.A., D.D., Prof. in Doshisha Univ. and Lecturer in the Imperial Univ. of Kyoto, Japan; also author of 4+ books incl. The White Peril in the Far East.

1709. Kawakami, Kiyoshi Karl. 1914. Asia at the door: A study of the Japanese question in Continental United States. New York, Chicago, Toronto, London and Edinburgh: Fleming H. Revell Co. 263 p. With a prologue by Doremus Scudder and an epilogue by Hamilton W. Mabie.

• ***Summary:*** The author responds to the charges of nonassimilability and economic competition, while recording the achievements and prominent Japanese and discussing the 1913 California Alien Land Law.

Page 106: "The habit of intensive cultivation, which he must perforce acquire in such a country [Japan], he naturally brings with him to the new country whither he emigrates. It is, therefore, but natural that the Japanese farmers in California should show unique skill and fastidiousness in cultivating their lands. Because of the care which they lavish on the soil, the farm rented to a Japanese commands an unusually high price. This fact is unreservedly recognized in the special report on the Japanese prepared a few years ago by the commissioner of labour of California, Mr. J. D. Mackenzie. The charge that the Japanese abuse the soil finds no endorsement either in the annual report of the Bureau of Labour of California or in the voluminous reports of the United States Immigration Commission, of which Senator Dillingham was chairman."

"When Mr. John D. Mackenzie, commissioner of labour

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statistics of California, instituted at the direction of the State legislature a special investigation into the conditions of Japanese in the Golden State [including their commercial enterprises, such as tofu shops] one of the surprising facts disclosed was that almost every Japanese, whether a farmer or a farmhand, had in his possession English-Japanese dictionaries and conversation books. All were eager to learn English, and through the knowledge of the language American customs and institutions. Many of them subscribed to local English papers, while their favourite magazines were not fiction magazines, but such substantial publications as the *Outlook,* the *Independent,* the *Review of Reviews,* and the *Literary Digest.* The United States census states that fifty-five per cent. of those Japanese who have been in this country less than five years can speak English. Among those who have lived here more than five years the rate of illiteracy is very small."

1710. Takenob, Y. 1914. Japan Year Book. Tokyo: Japan Year Book Office. 740 p. See p. 334, 400, 433-34, 439-40, 442, 689, 692, 705, 718. Ninth annual issue. [Eng]

• ***Summary:*** This annual book was first published in 1905. Facing the Preface is a table of Japanese weights, measures and moneys. In chapter 16, "Agriculture" (p. 337-57) is a table titled "Beans, sweet potato and potato (p. 345) which gives "Soy bean" production data in Japan for 1908-1912 (in *koku*).

3.892 million *koku* in 1908
3.766 million *koku* in 1909
3.396 million *koku* in 1910
3.693 million *koku* in 1911
3.511 million *koku* in 1912.

The next paragraph contains information on soy [sauce], *miso,* and *tofu* similar to that in the 1913 year book.

In chapter 20, "Industry," is a table on soy [sauce] production in Japan from 1908-1911, and a paragraph (p. 400) on the patented Suzuki process for brewing soy [sauce].

In Chapter 22, "Trade" is a table (p. 433-34) titled "Prices of principal commodities in Japan," which includes prices for 1907-1912 in yen for soy beans (per *koku*), soy [sauce] (per *koku*), and miso (per *kwan*).

In Chapter 23, "Foreign trade" is a table (p. 439) titled "Imports" (in 1,000 yen). Under the heading "Staples articles of over yen 1,000,000" (p. 438) is given the value of soja bean imports for 1911-1913. In a table titled "Soja bean" (p. 442), under the heading "Staple exports and destinations (in 1,000 yen)" (p. 440) is given the value of soja bean exports to China, Kwantung, India, and other places for 1911-1913.

In chapter 35, "Chosen (Korea)," under the heading "Agriculture" (p. 691) is a paragraph (p. 692) titled "Barley and soja bean," which gives acreage and yield for soja (year not specified) with the value (in yen) of exports to Japan in 1912.

In Chapter 36, "Taiwan (Formosa)," under the heading "Agriculture," a table (p. 705) titled "Agricultural products" has production data on "Beans and peas" (in 1,000 *koku*) for 1911-1912.

In Chapter 38, "South Manchuria," is a paragraph (p. 718) titled "The soya bean" which has information on South Manchuria's soya bean yield, [soya] bean-cake output, amount exported for specific years, and production of various milling centres.

In the advertisements at the rear (p. xiii) is a full page ad for Higeta Shoyu, showing many medals: "Patronized by the Imperial Household. Trade mark. The celebrated Japanese sauce. Established in 1616. Manufactured by G. Tanaka, Chioshi [Choshi], Chiba-ken, Japan." Address: Prof. at Waseda Univ. and Late of the *Japan Times,* Japan.

1711. Terry, Thomas Philip. 1914. Terry's Japanese empire: Including Korea and Formosa, with chapters on Manchuria... A guidebook for travelers. Boston and New York: Houghton Mifflin Co.; London: Constable & Co., Ltd.; Tokyo: Kyo-Bun-Kwan, Ginza, Shichome. cclxxxiii + 799 p. See p. 515. Maps. Index. 16 cm. [75 ref]

• ***Summary:*** This guidebook, after its 283-page introduction, is organized geographically into: 1. Central Japan. 2. Northern Japan. 3. Yezo, the Kuriles, and Saghalien. 4. Western Japan. 5. Kyushu and the Loochoo and Goto islands. 6. Korea, Manchuria, ad the Trans-Siberian Railway. 7. Formosa (Taiwan) and the Pescadores. Abbreviations (p. ix). List of maps (13).

In the Introduction: Japanese inns (p. xxxvi, xxxix-xl): The best food is not always to be had in the most pretentious places. In certain modest inns, where the rooms are as bare as a monk's cell, and the general appearance of austerity might argue a strict economy, there will often come, as an agreeable surprise, dainty food served in dishes that delight the lover of beautiful porcelain or lacquer. Later the traveler may learn that the place enjoys fame for some savory specialty–eels boiled in soy, broiled crayfish, stewed octopus, buckwheat-macaroni, or the like."

"Food is served in the guest's room on a lacquered tray... One of the soups may be made of... lobster, or seaweed, in which case it is amazingly thin and unpalatable; the other of beans [miso], bean curd or something of that nature. Salt is not provided unless asked for. Many of the dishes are cooked in soy; a tiny dish of which is supplied for dipping bits into before eating them."

Japanese food (p. xliii-xlvii): "Rice is a luxury with thousands of the peasants; it takes the place of bread with the well-conditioned; and wherever it is eaten to the exclusion of other foods it produces (because the thin phosphorous skin is polished off it) the prevalent beriberi. The proportion of animal food is small. Beans eaten in a variety of ways occupy a conspicuous place in the food of all classes and they supply the nitrogenous matter essential to those who rarely eat meat and who do not get the casein obtained by

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cheese-eating peoples. The soy-bean (*daizu; omame*) ranks first in extent, variety of use, and value among the pulse of Japan, and in point of nutriment is quite near to meat. It contains nearly two fifths of its weight in legumin, nearly one sixth in fat, and is rich in nitrogen. It is to the Nipponese what frijoles are to Mexicans and garbanzos (chick-peas) to Spaniards. Of the numerous varieties some are made into curd [tofu], and into the widely celebrated bean-sauce (the Worcestershire of Asia) called shoyu (sho, soy; yu, oil), and which is almost as indispensable as rice. It forms the daily relish of the rich man and the beggar, and is in as general use as tea and tobacco."

Fish (sakana)... Teriyaki: Fish in a sauce of soy, mirin, and sugar... Sashimi: raw fish cut in thin slices and eaten after being dipped in shoyu.–Kabayaki: fish which is first steamed then dipped into soy and roasted (or eels cut open on the dorsal line, covered with soy mixed with sugar, and roasted). The latter dish, usually called Unagi-no-kabayaki, is a favorite with the Japanese,..."

"Rice:... Azuki-meshi: rice and red pea-beans mixed (boiled).–Mochi: small dough-cakes made of rice and sold throughout Japan.–Sushi: a general name for food of boiled rice and fish, eggs, vegetables, etc., seasoned with vinegar and soy...–Inari-zushi: fried tofu stuffed with chirashi-zushi.

Note: This is the earliest English-language document seen (April 2013) that contains the term *Inari-zushi.*

- Maki-zushi: boiled rice and other vegetables rolled and wrapped in a sheet of the sea weed called Asakusa-nori...–Kombu-zushi: fish seasoned with vinegar and wrapped in a piece of the edible seaweed known as Laminaria japonica. A differentiation of this popular food is the Kombumaki: baked or roasted fish wrapped in kombu, then tied, and boiled in sugar and soy.

Various:... Tsukudani: small fish boiled in soy and used as a relish or condiment (named for Tsukudajima, a place in Tokyo famous for its preparation).–Oden: a stew (greatly enjoyed by the proletariat) of fried bean-curd, lotus-roots, potatoes, etc." Ame and midzu ame.

"Soup (shiru): Tôfu-jiru: bean-curd soup.–Miso-shiru: bean-soup with vegetables."

Railways–Dining cars (p. lxxxiv): Discusses "The unique and not unpalatable bento,–a sort of national sandwich,–put up (usually cold) in thin, flat, twin boxes (bento-bako) of dainty white wood (1 in. high, 5-7 in. long), along with a paper napkin (kuchifuki) and a pair of chop-sticks (hashi), and sold at many stations, is distinctively Japanese and widely popular... Besides the full box of plain boiled rice, the ordinary (15 sen) bento contains usually... a few boiled black beans (nimame)... seaweed (kobu)..." Rice cakes (mochi) with the kernel of yokan, or sweet [azuki] bean paste, which usually forms their center.

Buddhism (cxc): Again the rice-flour cake [mochi] is offered at the domestic altar. It now takes the form of a lotus-petal with capsule of [azuki] bean-paste." (an).

Yokohama (p. 13): "The return gifts from the emperor and princes included...jars of soy [sauce]; coral and silver ornaments;..."

Tokyo (p. 199): "The hill beyond the intersecting roadway is called Suribachi-yama because of the similarity in shape to a suribachi–an earthenware vessel in which bean-soup [miso soup] is prepared."

Nikko–Shops: "... the kuri-yokan (so-called from the chestnuts mixed with the sweetened bean-paste [azuki]) is good and cheap (10 sen)."

Kyoto–The Shinto Shrine of Inari. There are many local festivals, the most important of which is the Inari-matsuri which usually falls on June 5. There are trick riders on horseback and decorated sacred cars [carts] are "placed in the procession, and the day is devoted to general jollity–and pocket- picking. On this occasion the people eat Inari-zushi, or fried tofu stuffed with boiled rice, since tofu [fried, as aburage] is the favorite food of the fox popularly believed to be the messenger of Inari (and by extension, the God of Rice)."

Kyoto–Miidera (p. 504-05): Travelers visit Benkei's Iron Pot (*Benkei-no-shiru nabe*), a very old, rusted, and broken contraption (about 5 ft. wide and 3 deep) resembling a soap-boiler, and from which Yoshitsune's devoted servitor (and popular hero) is supposed to have eaten his bean-soup [miso soup]–which may well be doubted."

Kyôto to Kôya-San (p. 515): For the Western traveler there is "a tiny kitchen, a blessed refuge wherein, if he is making a prolonged stay, he may cook his un-Christian food without the vegetarian priests knowing (or caring) that such a sacrilege is being committed! Meals are served in one's apartment; the food is purely vegetable, and after the second day distressfully unpalatable. Fish, flesh, fowl, butter, cheese, eggs, milk, bread, coffee, and other necessaries of life are absent, and are replaced by seaweed, greens, bamboo-shoots, cabbage, daikon in various unappetizing forms, and other garden-truck which one eats as a novelty the first meal and rejects with an involuntary tightening of the throat when it is offered at the second and third. In addition there are flabby mushrooms boiled in very thin water without seasoning; the omnipresent boiled rice without sugar, milk, or salt; a bean-curd (*tofu*) for which one acquires a liking only after much patient effort; a yellow substance (known as *yuba*) made of the skin of bean-curd, and looking and tasting like thin sheet rubber;..."

Kobe excursion–The Tansan Hotel (p. 630): The strawberries and other ground fruits and vegetables, which grow nearly all the time in this favored spot, are enriched with [soy] bean-cake only [no human excrement is used] (as a precaution against typhoid)."

Korea (p. 725): "Among the dishes dear to the native heart are pounded capsicum, bean curd [tofu], various sauces of abominable odors, a species of sour kraut (kimshi [kimchi]), seaweed, salt fish, and salted seaweed fried in

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batter."

Manchuria and the Trans-Siberian Railway (p. 756): "Considerable [soy] bean-cake and furs, and vast quantities of lumber, etc., come down the river from upper Manchuria and Siberia."

Also discusses edible seaweed (p. xliv, 330): Japanese food: "Seaweed in almost endless variety enters largely into foodstuffs. Not only are the giants of the marine flora taken up and utilized in various ways, but also the more delicate red and green sorts–the use of which has been adopted by other nations. Most of the edible green and red algae bear the generic term nori, while the words *umi-kusa,* or *kai-so* (which also means *bêche-de-mer*), are used for algae in general. Many of the weeds are eaten fresh, others in soup. Some are dried or pickled and eaten in vinegar. They usually appear in commerce in the form of little packages, to the sale of which special stores are dedicated. Certain varieties are converted into jelly."

Yezo–fisheries: "Certain of the many varieties of edible seaweed which flourish along the Japanese coast are found in Yezo, particularly the circumpolar tangle (*Laminaria*) and seawracks (*Fucus* species), which prefer cold water and a heavy surf. For this reason sea-algae add considerably to the value of the Yezo exports."

Note: The author resided for almost 12 years in Japan and made repeated journeys on foot (and otherwise) from one end of the country to the other. Address: F.R.G.S. [Fellow of the Royal Geographical Society, England].

1712. Togano, Meijiro. 1914. Saishin shôyu jôzô-ron [Principles of modern shoyu brewing]. Tokyo: Otani Shoten. 1040 p. Illust. 23 cm. [Jap; eng+]*

• ***Summary:*** This book is the same as the 1913 edition, except that the publisher is now Otani Shoten.

1713. Yokoi, Yokiyoshi. 1914. Agricultural economy of Japan: Principal features, present conditions of production. *Monthly Bulletin of Agricultural Intelligence and Plant Diseases* (*International Institute of Agriculture*) (*Rome*). p. 331-36.

• ***Summary:*** The section on "Cultivation of grain crops" (p. 322-23) states: "Leguminous products such as peas, soy-beans, kidney-beans, and red beans (*Phaseolus radiatus* [azuki beans]) are among the important crops." "Among textile plants hemp retains its importance... no forage of crop of importance is produced."

A table (p. 335) gives data on the twenty principal crops for the year 1910. For each is given the acreage (in *cho* and acres) and production (in *koku* and bushels or pounds). Soy-bean: On 1,171,436 acres, some 16,857,562 bushels are produced. Red bean [azuki]: On 345,631 acres, some 4,793,149 bushels are produced. Hemp: On 30,177 acres, some 20,049,232 lb are produced.

Note: This is the earliest document seen (Dec. 2001) concerning the International Institute of Agriculture and soy. Address: Prof. of Agricultural Science, Imperial Univ. of Tokyo, Japan.

1714. *Japan Weekly Mail* (*Yokohama*). 1915. Oil milling in Japan. 63(3):12. Jan. 11. Supplement.

• ***Summary:*** Oil milling is one of the few Japanese industries that has been favorably influenced by the war. Before the war, Germany and Russia were two leading oil milling countries, and both looked to China, especially Manchuria, for their supply of raw materials. But Germany's supply was cut off as soon as she started hostile actions against her neighbors. This extra supply, and lower prices, has made it easy for the Japanese to buy [soy] beans from China. After refining the oil, the Japanese sold it to Great Britain, where it was used to fight the Germans.

In Japan, milling of rape-seed is conducted mainly in Kyushu, while the milling of other seeds in conducted in and around Nagoya. However Chinese [soya] bean and seed oil milling is conducted mainly in and around Kobe; the Kobe industry has been most favored by the war, for they have been able to store up inexpensive materials.

1715. *New York Times.* 1915. Latest customs rulings. Jan. 12. p. 14.

• ***Summary:*** "C.S. Bush & Co., Los Angeles [California] and other Pacific ports, were sustained in a claim that Japanese shoyu is an unenumerated article within the meaning of that term as used in the Tariff acts of 1909 and 1913... The action of Collector in assessing the shoyu at higher rates was reversed."

1716. *USDA Bureau of Plant Industry, Inventory.* 1915. Seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from October 1 to December 31, 1912. Nos. 54426 to 54676. No. 33. 60 p. Jan. 23.

• ***Summary:*** Soy bean introductions: *Soja max* (L.) Piper. (*Glycine hispida* Moench.)

Note: This is the earliest document seen (Aug. 2011) in which the scientific name of the soybean is given as "*Soja max* (L.) Piper." This indicates that the name "*Soja max* (L.)" was first given by Dr. Charles V. Piper of the USDA. This name continued to be used in this publication and by the USDA Bureau of Plant Introduction until at least June 1940 (Inventory No. 126, p. 18).

"34643-34654. From Kioto [Kyoto], Japan. Presented by Miss E.R. Scidmore, Seoul, Chosen (Korea). Received November 29, 1912. Quoted notes by Miss Scidmore:

"34645. The soy bean has been listed in previous inventories as *Glycine hispida* Moench. Mr. C.V. Piper has recently shown (Journ. Amer. Soc. Agron., vol. 6, p. 75-84, 1914) that the earliest name given by Linnæus to this plant was *Phaseolus max,* that the generic name should be Soja,

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and that the correct name is therefore *Soja max* (L.) Piper.

"'Kuro [meaning "black" in Japanese]. Used for making sweet paste, but more usually boiled with a pinch of salt and a pinch of sugar added when the water is poured off or shoyu poured on and kept hot until saturated. Served as a relish or accompaniment to each meal and always found in lunch boxes sold at railway stations.'

"34654. '*Shiroi daiozu* [*daizu*] [meaning "white soybean" in Japanese]. Used for making tofu or bean curd.'

"34700/34702. From Shantung Province, China. Grown by Dr. William R. Faries, Coachella, Cal. [California]. Received December 17, 1912. Quoted notes by Dr. Faries:

"34702. 'The yellow bean with the hairy pods (soya) I sent to the department in December, 1894, I think, from Pacific Grove, California, as 'Manchuria beans,' and they were sent to Maine station. This would result in failure, I think. They did not do well in Orange County, California, but grow well here. They are fine for green shelled beans.'"

Note 2. This is the earliest English-language document seen (June 2009) that uses the term "green shelled beans" to refer to shelled green vegetable soybeans. Address: Washington, DC.

1717. Kinoshita, Asakichi. 1915. Nidan shikomi shôyu jôzô-hô yobi shiken no seiseki hôkoku [The double brewing of shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 55. p. 165-76. Jan. [Jap]
Address: Jozo Shikensho, Gishi.

1718. Togano, Meijiro. 1915. Shôyu, miso, tamari sokujô-hô [The quick process for brewing shoyu, miso or tamari]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 55. p. 121-51. Jan. [Jap]
Address: Jozo Shikensho, Gishi.

1719. Fruwirth, C. 1915. Die Sojabohne [Soybeans]. *Fuehlings Landwirtschaftliche Zeitung* 64(3/4):65-96. Feb. 1 and 15. [65 ref. Ger]

• ***Summary:*** Contents: Introduction (work in East Asia and Europe from 1905-10). History. Botanical aspects. Varieties. Breeding. Needs of the plant (incl. "heat units," *Wärmesumme*). Utilization (incl. in German *Tofu, Miso, Chiang, Schoyu* or *Sojatunke* (shoyu, p. 83), *Natto, vegetabilische Milch* (soymilk), soy sprouts). Measures and precautions in cultivating soybeans (incl. yields). The soybean as a crop in central Europe. Conclusion.

Note 1. On p. 83 the term "Sojas" is used to refer to soybeans

Note 2. This is the earliest German-language document seen (April 2012) that uses the term *Sojatunke* to refer to soy sauce.

In 1905 the Japanese made the first attempt to import soybeans from Manchuria to Europe, but it failed because they did not arrive in good condition. The repetition of the attempt in 1908, however, gave good results. Then imports of soybeans grew, followed by imports of soybean cake (*Sojabohnenkuchen*). Major importers today are England, France, Germany, Denmark, Italy, Belgium, Netherlands, Sweden. The high import duty hinders imports to Austria-Hungary.

Toward the end of the 1800s in Russia, Owinsky took early-ripening soybean varieties from China and Japan and requested the expansion of soybean cultivation. In 1899 in Kiev, Owinsky wrote the name of the soybean as Soja hispida praecox (p. 67). Owinsky in Derajne [Derazhne?] grew Podolie soybeans (p. 77). Sempolowsky in Derebzin, Russian Poland, also grew soybeans. European Russia gets soybeans overland (probably from Manchuria). Russia was one of the first countries to take an interest in growing soybeans after 1908. Russia now grows large amounts of soybeans in Podolia. In Germany, Prof. Kallo in Wiesbaden was a pioneer who recommended soybeans as an inexpensive food for the people. North America first started to import lots of soybeans as a source of oil because of a bad cottonseed harvest.

"Since the start of my teaching activities, I have had an interest in the soybean plant and have carried on my own investigations." In 1900 the author received 7 soybean varieties from L.V. Jurdiewicz from Deraznia in Podolia; these had been imported by Owinsky. In 1901 at Hohenheim he began to study the time needed for soybeans to mature; He found it ranged from 141 to 163 days. He continued this research at Hohenheim from 1901 to 1903, getting soybean seed yields of up to 1,560 kg/ha. From 1910 to 1914 he continued at Waldhof-Amstetten, with 5 varieties. The maturity range there was 112-166 days and the yields were up to 1,500 kg/ha (about 23 bushels/acre), but the yields of many varieties were low, about 300 to 500 kg/ha (4.5 to 7.5 bu/acre). Yields of soybean straw, however, were up to 3,600 kg/ha. Fruwirth uses three terms to refer to soybeans: (1) Die Sojabohne; (2) Die Soja; and (3) Sojas, as "Zuechtung von Sojas" or "Sojas, meist gemahlte." There are now a proposal to establish a joint stock company for growing soybeans in central Europe (probably in Germany), using big money. But it may not succeed because soybean yields in Germany and Austria are low. Seedsmen who sell soybeans commercially in 1915 include: Haage and Schmidt (Erfurt, Germany), Vilmorin Andrieux (Paris, France), Dammann & Co. (St. Giovanni at Tedaccio, near Naples, Italy), and Wood and Son (Richmond, Virginia, USA). The main soybean varieties sold by each of these companies are described in detail (p. 73-74).

Utilization (p. 82): Since soybeans are rich in protein and fat, they can be used as a good meat substitute. In Europe the use of soybeans for food is still very small. "In Europe, the first foods from soybeans were made in France, at Vallées near Asnieres: Flour, bread, and cakes for diabetics, and cheese. In Germany not long ago the Soyama-Works at Frankfurt am Main likewise began the production

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of such foods. Similar foods were also made in Romania. Soybeans sprouted in the dark yield a bitter-tasting salad. Production of vegetable milk started in France at 'Caséo Sojaine' at Vallées (Seine); and is now being studied by the Synthetic Milk Syndicate in England. Using the process developed by Fritz Goessel, this Syndicate made 100 liters of soymilk from 10 kg of ground soybeans at a factory at Liverpool." "It is in no way certain that soybeans will ever be widely used in human foods."

A fairly large amount of soybeans are ground for use as fodder. The main use is for oil extraction. Yet Haberlandt considered that since the soybean contained only about 18% fat (range: 13-22%), its use as a source of oil would not be economical. The main use of soy oil is in soaps, for which it is highly prized. It is also used in making paints as a partial substitute for linseed oil. The best quality may be used as food. In England soy oil is used for margarine production.

Conclusion: The soybean originated in central Asia and is now widely cultivated in China, Japan, Manchuria, and India. Its seeds are rich in protein and, unlike most other legumes, also rich in fat. The plant is used in its homeland mostly as a source of human foods and seasonings, made by fermentation; the oil is used mostly for industrial non-food purposes. In recent years soybean production has expanded significantly in the southern part of the United States. There it is used mainly as green fodder, hay, silage, and soil building. The main expansion of soybean cultivation in Europe has been in Italy, southern France, Hungary, and southern Russia. Good early varieties give yields of 1,100 to 1,300 kg/ha. A large expansion of soybean production in central Europe is possible only in southern Austria and Hungary, and maybe in a few other places where it is warm. But late-maturing soybeans may be grown for forage and silage in the cooler parts of Germany and Austria. Address: Prof., Dr., Wien (Vienna).

1720. Morton, William. 1915. Soya bean situation in North Manchuria. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 18(48):809. Feb. 27.

• ***Summary:*** "The soya bean crop of North Manchuria in 1914 was estimated to be 15 per cent larger than that of the preceding year. The total exports of beans from North Manchuria from November 1, 1913, to November 1, 1914, amounted to 415,000 tons, of which about 33,000 tons were exported via the Sungari and Amur Rivers, 100,000 tons to Dalny and Japan, and the remainder to England, Germany, the Netherlands, and Denmark.

"Shortly after the outbreak of war in Europe the transportation of Russian troops over the Chinese Eastern and Trans-Siberian Railways began, and so interfered with the shipment of commercial freight that not more than one-third of the bean cargoes have reached Vladivostok, the remainder being stored at the various stations of the Chinese Eastern Railway. Now that the transportation of troops has ended it is expected that there will soon be enough freight cars for carrying the beans to Vladivostok. [The names of Harbin firms engaged in the soya-bean trade may be had from Bureau of Foreign and Domestic Commerce or its branch offices.]

"Modern and Native Mills–Oil Containers:

"There are three small modern bean-oil mills in North Manchuria, one of which belongs to a Japanese and the other two to Chinese. The full capacity of these mills is about six short tons of oil daily. Besides these three mills, a large modern mill (oil) has been built by the Anglo-Chinese Trading Co. at Harbin, but it is not working yet, as its machinery is not complete. There are numerous small Chinese oil mills operated either by hand or by horse power scattered throughout the town and villages of North Manchuria, but no statistics are available as to the total output from these mills.

"Baskets are used for transporting oil from the surrounding country to Harbin, but wooden boxes and tins packed in wooden boxes are used for containing oil for export abroad. One wooden box contains about 252 pounds of oil and one tin contains about 36 pounds of oil, two tins being packed in one box. The tins and boxes are of local manufacture. No empty tins were imported into North Manchuria in 1914." Address: Deputy Consul, Harbin.

1721. *Good Health* (*Battle Creek, Michigan*). 1915. Vegetable protein not inferior to animal protein. 50(2):92, 93 + 10a. Feb.

• ***Summary:*** "For many years a stock argument against the non-flesh dietary has been the claim that animal protein is much more readily and completely assimilated than vegetable protein. At best this argument would be only a matter of economy and would amount to nothing, since the cost of vegetable protein is not more than one-fifth to one-tenth the cost of animal protein, so that one could easily afford to lose five to ten per cent of the raw material while making a saving of three hundred to four hundred per cent in cost.

"But a review of the supposed experiments of comparative indigestibility of protein has shown that there is no real foundation for the claim that vegetable proteins are less digestible than animal proteins. In the earlier experiments it was observed that when a large amount of protein of the diet was derived from peas or beans, only three-fourths to four-fifths of the protein was assimilated, whereas in the case of animal proteins in the form of eggs or meat eighty-eight to ninety per cent was assimilated.

"Experiments made by an eminent Japanese physiologist with the pure protein of the soy bean have shown it to be digestible to the extent of ninety-six per cent, a degree of digestibility fully equal to that of any animal protein. It appears that the only reason why animal proteins have

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seemed to be more digestible than vegetable protein has been the fact that vegetable proteins are combined with various substances, especially cellulose, which is indigestible, so that digestion is hindered.

"These experiments have been repeated in this country by Doctor Mendel of the Yale University laboratory [Connecticut] and with practically identical results. Doctor Mendel does not hesitate to state that vegetable proteins are equally as digestible as animal proteins."

1722. Heintzleman, P.S. 1915. Soya bean situation in South Manchuria. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 18(50):863. March 2.
• ***Summary:*** "The soya-bean crop of the Mukden district amounted to some 1,200,000 tons in 1913 and approximated 1,150,000 tons in 1914; of this production, 639,200 tons in 1913 and 603,548 tons in 1914 were transported by rail to South Manchurian seaports.

"Of the beans exported, 150,000 tons went to Europe, 70,000 tons to Japan, and 80,000 tons to South China. Bean cake, the total production of which was 800,000 tons, was shipped mainly to Japan (500,000 tons) and South China (200,000 tons). Of the 70,000 tons of bean oil produced last year, 10,000 tons went to America, 10,000 tons to Europe, and 500 tons to Vladivostok, all being transshipped via Japan. Japan itself took 15,000 tons and South China 10,000 tons. Five firms, all Japanese, are engaged in the export business at present [their names being obtainable from the Bureau of Foreign and Domestic Commerce or its branch offices], other foreign firms having suspended trade in beans and bean products.

"Since the war the exportation of all these products has been reduced, but local mills continue working at their full capacity." Address: Consul General, Mukden.

1723. Scidmore, George H. 1915. Oil milling in Japan. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 18(54):941. March 6.
• ***Summary:*** The following is an extract from the *Japan Mail* of 11 Jan. 1915. "One of the few lines of industry which has been favorably influenced by the war is seed oil milling. On account of the withdrawal of Germans, because of the war, the laying in of beans in China has become very easy for the Japanese in China. Particularly the decline of prices has offered to them a vast chance of underselling even Russian millers in their own country, while the demand for various descriptions of vegetable oil has been inflated both at home and abroad, due to the increased requirements of the navies of the different countries. Though at one time the trade with Europe was suspended at the fall of Antwerp [at port city Belgium, conquered by Germany], soon the trade was resuscitated and now is unusually active. The only drawback is the inadequacy of shipping to take the goods to the consuming countries.

"The industry in this country may be divided into three lines, namely, seed oil milling in and around Nagoya, rape-seed oil milling principally conducted in Kyushu, and Chinese bean [soya] and seed oil milling conducted in and around Kobe. Millers engaged in the former two lines have never been favored by the war, for they have been unable to obtain cheap materials, which in their cases are home produced... It is the last line which has been most favored by the war." Address: Consul General, Yokohama, Japan.

1724. Akaghi, Tasuku; Nakajima, I.; Tsugane, K. 1915. Researches on "Hatsucho-Miso." *J. of the College of Agriculture, Tokyo Imperial University* 5(3):263-69. March. Journal name also written as Tokyo Noka Kiyo or Tokyo Teikoku Daigaku Nogaku-bu Kiyo. [12 ref. Eng]
• ***Summary:*** "Hatsucho-miso" is a special variety of "miso" chiefly manufactured in Mikawa Province. Its chemical composition was reported by T. Takahashi and G. Abe in 1908.

In preparing "Hatsucho-miso," the cleaned soy-bean is steeped in water and boiled for 6 to 7 hours. The boiled soy-bean is crushed and then moulded in a round or cylindrical mass suitable to lay on the floor of the "koji" -chamber. "Koji" ripens after 20-40 days. It is then mixed with salt and water and is introduced into a fermenting vat covered by straw mats, weighted with a large number of stones to ensure the materials ripening en masse. The ripening of "Hatsucho-miso" is generally attained in from 3 to 5 years.

Lists the ten species of mould fungi found in almost every matured "koji." The species of fungi predominating during the stages of preparation differ in accordance with the season in which the preparation is carried on.

3 species of yeast were isolated from "koji": *Torula, Willia anomala and Mycoderma.*

"Hatsucho-miso" is reported to have a special flavor and aroma. "The nature of the aroma is not explained at present, but the taste is ascribed to the water soluble matter beside protein-matters, so that part of it at least must consist of the decomposed substances derived from protein matters." Address: Japan.

1725. Ide, Hayamizu. 1915. Daizu shushi-chû no jiyasutaze ni tsuite. I. [On the diastase of soybean seeds. I]. *Chosen Sotokufu Chuo Shikenjo Hokoku* (*Korean Governor-General's Central Research Laboratory, Report*) 1(1):2-1 to 2-19. March. [Jap]
Address: Gishu [Japan].

1726. Kinoshita, Asakichi. 1915. Shôyu no kaon jôzô ni okeru moromi dennetsu no jôtai [On the heat conductivity in moromi (mash) during "heated brewing" of shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment*

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Station) No. 58. p. 447-69. March. [Jap]
Address: Jozo Shikensho, Gishi.

1727. Nishimura, Torazô. 1915. Shôyu jôzô-yô en enshitsu hikaku shiken. II. [On common salt and its quality as a raw material for shoyu production. II.]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 57. p. 331-62. March. [Jap]
Address: Jozo Shikensho, Gishi.

1728. Nishimura, Torazô. 1915. Komugi, daizu ni kansuru 2, 3 no kenkyû [Several studies on wheat and soybeans for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 58. p. 425-45. March. [Jap]
Address: Jozo Shikensho, Gishi.

1729. Takahashi, Teizô; Yukawa, Matao. 1915. On the budding fungi of "shôyu-moromi" and "shôyu-koji." *J. of the College of Agriculture, Tokyo Imperial University* 5(3):227-61. March. [10 ref. Eng]
• ***Summary:*** "Up to now several studies on the budding fungi of 'shôyu-moromi' and 'shôyu-koji' have been published, but with regard to the botanical classification all these studies have very little merit, as we cannot derive any systematic classification from them."

The author gathered 52 samples of moromi, aged for 2 to 24 months, from 11 shoyu factories in various parts of Japan. The factories were: 1. Shichirouemon Mogi's shoyu brewery at Noda, Shimousa province. 2. Saheiji Mogi's shoyu brewery at Noda, Shimousa prov. 3. Hamaguchi's shoyu brewery at Choshi, Shimousa prov. 4. G. Tanaka's shoyu brewery at Choshi, Shimousa prov. 5. J. Iwasaki's shoyu brewery at Choshi, Shimousa prov. 6. K. Nakamura's shoyu brewery at Goyu, Owari prov. 7. Asai shoyu brewery at Tatsuno, Harima prov. 8. Maruo shoyu brewery company at Tatsuno, Harima prov. 9. Kikuichi shoyu brewery company at Tatsuno, Harima prov. 10. Tatsuno shoyu brewery company at Tatsuno, Harima prov. 11. Kagawa shoyu brewery experimental station at Shôtoshima, Sanuki prov.

The following budding fungi were isolated from the samples: 1. *Zygosaccharomyces major* [a yeast] nov. spec. 2. *Zygosaccharomyces soja,* nov. spec. 3. *Zygosaccharomyces japonicus,* Saito. 4. *Zygosaccharomyces salsus,* nov. spec. 5. An asporogenic species of *Zygosaccharomyces* (?). 6. Two species of *Mycoderma.* 7. *Pichia alcoholophila,* Kloecker var. 8. Several species of *Torula.* 9. A species of *Monilia* [Note 1. The mold *Monilia sitophila* is used to make onchom in Indonesia].

"General conclusions: The occurrence of *Zygosaccharomyces* in 'shôyu'-mash furnishes us with a very interesting field for future researches in microbiology. The application of pure cultures of *Zygo. major* and *Zygo. soja* must naturally result in the future improvement of our 'shôyu.' The two species of *Zygosaccharomyces* i.e. *japonicus* and *salsus,* and the species of *Torula* and *Monilia* must be regarded as harmful or damaging fungi for 'shôyu', but their common property of decolorizing 'shôyu' may sometimes be utilized for the preparation of the colorless or 'shiro-shôyu', by taking the precaution of lessening the deteriorating effect of the fungus. The *Mycoderma* species in 'shôyu-koji' will be more appreciated in future on account of its energetic generation of a pleasant aroma."

Note 2. This is the earliest document seen (June 1999) that mentions the shoyu yeasts *Zygosaccharomyces major Zygosaccharomyces salsus.*

Note 3. This is the earliest English-language document seen (April 2012) that uses the term "shiro-shôyu" [regardless of hyphenation or diacritics] to refer to clear shoyu, which has the lightest color of the five basic types of Japanese shoyu. Actually, the color of shiro-shoyu resembles that of honey. Address: Tokyo, Japan.

1730. Yukawa, Matao. 1915. The fate of tyrosine in "shôyu-moromi". *J. of the College of Agriculture, Tokyo Imperial University* 5(3):291-99. March. [8 ref. Eng]
• ***Summary:*** When the proteins from soy beans and wheat are hydrolyzed by enzymes during the ripening process of shoyu moromi, a significant amount of tyrosine and a number of amino acids are always obtained. "Both tyrosol and tyrosamine were isolated from 'shôyu' and 'Tamari-shôyu' [Tamari shoyu], whilst p-hydroxyphenyllactic acid was never found in them. 'Shôyu' contains more tyrosol and less tyrosamine compared with 'Tamari-shôyu.' The occurrence of tyrosol in 'shôyu' or 'Tamari-shôyu' is partly or entirely due to the decomposition of tyrosine by the budding fungi dwelling in 'moromi.' The experimental results, according to which the cultured budding fungi have never produced tyrosamine from tyrosine, led me to presume that tyrosamine in 'shôyu' or 'Tamari' is certainly produced from tyrosine or its decomposed products formed by *Aspergillus Oryzae* or directly from protein matters by the actions of the same bacteria in 'moromi.'...

"In our country 'shôyu' or 'Tamari-shôyu' are used in cookery as a necessary seasoning on account of their content of amino-acids, carbohydrates, sodium chloride, etc. Moreover, they seem to act as stimulants. The occurrence of tyrosamine in 'shôyu' or 'Tamari-shôyu' makes me easily recognize this. According to the descriptions of Barger, Dale and Dixon, and Bickel and Pawlow p-hydroxyphenylethylamine (tyrosamine) causes a contraction of the blood vessels and a rising of blood pressure. Judging from the pharmacological significance of this compound, the consumer of 'shôyu' or 'Tamari-shôyu' receives a moderate stimulation on his blood circulation."

Note: This is the earliest English-language document seen (April 2012) that contains the term "tamari shôyu" (or "tamari shoyu"). Address: Tokyo Imperial Univ.

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1731. *Bulletin Economique de l'Indochine* (*Hanoi*). 1915. Surface cultivée et production du Soja au Japon de 1904 à 1913 [Area cultivated and production of soybeans in Japan from 1904 to 1913 (and in Korea from 1909 to 1912)]. 18(112):260. March/April. [Fre]

• ***Summary:*** This table for the years 1904 to 1913 inclusive in Japan gives for each year: Area cultivated (in *cho;* 1 *cho* = 2.451 acres). Soybean production (in *koku;* 1 *koku* = 180 liters = 47.6 gallons). Average yield (in *koku* per *tan;* 1 *tan* = 0.245 acre). The cultivated area rose from 446,843 *cho* in 1904 to a peak of 495,802 *cho* in 1908, then fell to 475,284 *cho* in 1913. Production rose from 3,710,459 *koku* in 1904 to a peak of 3,892,934 *koku* in 1908, then fell to a low of 2,993,095 *koku* in 1913. Yield fell from a peak of 0.830 in 1904 to a low of 0.629 in 1913.

A second table gives statistics for soybean production in Korea from 1909 to 1912. The area cultivated rose dramatically from 280,090 *cho* in 1909 to a peak of 375,340 *cho* in 1912. Production also rose sharply from 1,533,027 *koku* in 1909 to 2,452,203 *koku* in 1912. Address: Hanoi.

1732. Meyer, Frank N. 1915. Re: Condensed soybean milk, made in Japan and sold in China. In: Letters of Frank N. Meyer. 4 vols. 1902-1918. Compiled by Bureau of Plant Introduction, USDA. 2444 p. See p. 2068-69. Letter of 21 May 1915 from Peking, China, to David Fairchild of USDA.

• ***Summary:*** "I am also enclosing a can of so-called condensed milk, as sold here in China under the name of 'The Eagle Brand.' I strongly suspect this stuff to have been made in Japan from Soybeans, with something added. It is of a brown color, quite lumpy, not very sweet and it dissolved but poorly. One also gets effects of flatulency from it, especially when taken on an empty stomach. Do you consider it worth while to have it analysed by the Bureau of Chemistry?"

In a letter of 15 Dec. 1915 (p. 2166, from Washington, DC) to Fairchild we read: "Morse soy beans are desired, especially from southern China. Prof. Tracy at Biloxi got a mutant among his soybeans which is of extremely great value to the Gulf Coast sections... The *Kudzu vine* is not as desirable as was first thought; it occupies the land too long and does not always make a dense stand."

Location: University of California at Davis, Special Collections SB108 A7M49. Address: USDA Plant Explorer.

1733. *Edison Monthly* (*The*). 1915. The Nippon Club. 7(12):474-76. May.

• ***Summary:*** The Nippon Club was formed about ten years ago and now has about 100 members. "The present house [club building, on West 93rd St. in New York City], begun three years ago, speaks the prosperity of the organization, whose membership has grown proportionately. The present officers are: president, Dr J. Takamine;..." Architecturally, the building and decor combine both Western and Japanese features and styles; in it, East and West meet.

"There remains but to speak of the 'Sukiyaki,' an apartment unknown to Americans in use as in name. This is the chafing-dish room, taking its name from a favorite dish of meats and vegetables prepared, by preference, individually. Ranged on each of five broad tables are a dozen or more of the native chafing-dishes, sufficient to supply an ordinary dinner company. The ingredients, sent up from the kitchens by electric lift, are flavored as each diner–and each an accomplished cook–prefers.

"The club, apropos of ingredients, is itself a glorified Sukiyaki–in substance evident, but in flavor fascinating and indescribable.

Note: This is the 2nd earliest document seen (Aug. 2010) that mentions sukiyaki; it gives only a minimal description.

1734. Brewer, Lucile; Canon, Helen. 1915. Beans and similar vegetables as food. *Cornell Reading Courses* (*New York State College of Agriculture*) *Food Series* 4(89):181-200. Food Series No. 16. June 1. [20 ref]

• ***Summary:*** The section titled "Long and extensive use of legumes as food" states (p. 182): "The cowpea and the soy bean have only within recent years come into common use in this country." "The first reference to the soy bean in American literature was in 1829; it had been grown in the botanical garden at Cambridge, Massachusetts and was referred to as 'a luxury, affording the well-known sauce, soy, which at this time is only prepared in China and Japan.' About twenty-five years later [1854], seed of the soy bean, or Japan pea as it then was called, was brought from Japan to California, and thence to Illinois and Ohio. Within the last twenty-five years, it has come to be a crop of great economic importance in the United States."

"The peanut, properly classed with the nuts, is thought to be a native of tropical America. It has long been grown in Africa, the East Indies, China, and Japan. It is said that in the seventeenth century it had become so important an article of food in Africa that the slave dealers loaded their vessels with it as food for their captives. Since the Civil War, the peanut has become important in the Southern States as a human food, a forage crop, and a fertilizer."

The section titled "Digestibility" (p. 184) states: "In Japan the soy bean is grown almost entirely for human food. According to Mr. Oshima, next to rice in the Japanese diet are the legumes, which are universally used.

In the section on "The cooking of legumes" we read (p. 188) that the use of a small amount of baking soda (sodium bicarbonate; ¼ teaspoon to 1 quart of water) serves to loosen the skins of legumes, "to render their protein more digestible, and to soften water of average hardness..." "Soft water, either distilled or rain water, is the best in which to soak and cook the legumes. Hard water interferes with their becoming soft

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and also with their digestibility. Hardness of water caused by the carbonate of lime or magnesium, may be remedied for use in the cooking of legumes by boiling the water, pouring it from the sediment, and adding a small amount of soda; when the hardness is caused by the sulfate of lime of magnesium, boiling has no effect, but soda may improve it for this purpose.

This publication contains many recipes for "beans" but without any specific reference to soy beans in a recipe.

1735. Schieber, W. 1915. Die Sojabohne und deren volkswirtschaftliche Bedeutung als Nahrunsmittel [The soybean and its economic significance as a food]. *Seifensieder-Zeitung* 42(22):471-72. June 2. (Chem. Abst. 10:1558). [Ger]
• ***Summary:*** Descriptions and nutritional analyses are given of a number of different food products prepared from the unfermented and the fermented soy bean. Unfermented: soya milk, tofu (*Sojakäse*), soy flour ("because of its composition it can be recommended as a first class food for diabetics and vegetarians"), soya bread, soya confections (resembling marzipan), soya chocolate, soya coffee, soy grits, whole dry soybeans, and soy sprouts ([*Soja*] *Schoten, Bohnen, und Keime*). Fermented: Solid seasonings such as Japanese natto, pastes such as Japanese miso, sauces (in Japan each year 10,000 factories make 700 million liters of soy sauce), a new German fermented soyfood product is made by a secret process; its contains 45% protein, 6% nutritional salts, and about 2% lecithin.

Note. This is the earliest German-language document seen (Jan. 2013) that uses the term [Soja] Keime to refer to soy sprouts. Address: Dr.

1736. Nishimura, Torazô. 1915. Shôyu kôji oyobi kôji-kin ni kansuru bubun-teki kenkyû [Limited research on shoyu koji and the koji mold *Aspergillus oryzae*]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 60. p. 1-9. June. [Jap]
Address: Jozo Shikensho, Gishi.

1737. Ueno, Seiichi. 1915. [On the hardening {hydrogenation} of oils]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 18(208):545-564. June. [Jap; eng]
• ***Summary:*** The author conducted experiments with various oils, including: The hydrogenation of sardine oil on a semi-industrial scale. Examination of the intermediate products of hydrogenation. Durability of the activity of nickel catalyst and the revitalization of spent catalyst. Hydrogenation of oils and unsaturated fatty acids at low temperatures. Relation of the catalytic activity of nickel-kieselguhr-catalyst to the proportions of nickel and its carrier (kieselguhr). Soy oil is mentioned on p. 553 and 554.

1738. *New York Times.* 1915. Latest customs rulings. July 15. p. 14.
• ***Summary:*** "Importers of Japanese shoyu and nigari [a traditional Japanese tofu coagulant] were sustained yesterday by the Board of General Appraisers in the claim for lower duty on these products." A list of the many protesting importers is given.

Paragraph 606 specifies the duty on "soya beans."

1739. Parlett, H.G. 1915. China (Leased Territory of Kwantung). Bean trade of Dairen in 1914. *Board of Trade Journal* (*London*) 90:334-35. July 29.
• ***Summary:*** "The value of beans exported during 1914 was £1,779,865, an increase of £800,568, of bean cake £2,347,098, a decrease of £249,475, and of bean oil £763,370, and increase of £43,293. The year's export of beans amounted to 255,112 tons, being 100,533 tons in excess of that for 1913. Japan was the heaviest purchaser with 139,222 tons, followed by South China with 65,498 tons. Exports to Europe amounted to 25,806 tons, an increase of 23,644 tons as compared with 1913. In bean cake there was a decrease of 32,605 tons compared with the year previous."

Note: According to *Webster's New Geographical Dictionary* Kwantung Leased Territory (also Kwanto) was located in the southern part of the mountainous Liaotung Peninsula, in today's Liaoning Province. Its capital is Dairen and its other major port is Port Arthur. In 1898 it was leased to Russia by China under pressure. In 1905 it was taken over by Japan by the Treaty of Portsmouth and the lease extended in 1915 to 99 years. In 1945 it was again leased to the USSR by treaty. In 1950 it was returned to China and in 1955 Soviet forces were withdrawn. Address: British Consul, Dairen.

1740. Parlett, H.G. 1915. China (Leased Territory of Kwantung). Bean trade of Dairen in 1914. *Board of Trade Journal* (*London*) 90:334-35. July 29.
• ***Summary:*** Reports the value of the exports of soya beans, bean cake, and bean oil during 1914. "The year's export of [soya] beans amounted to 255,112 tons, being 100,533 tons in excess of that for 1913. Japan was the heaviest purchaser with 139,222 tons, followed by South China with 65,498 tons. Exports to Europe amounted to 25,806 tons, an increase of 23,644 tons as compared with 1913." Address: British Consul, Dairen.

1741. Williams, C.B. 1915. Soy-bean growing in North Carolina. *North Carolina Agricultural Experiment Station, Circular* No. 31. 8 p. July. Reprint.
• ***Summary:*** Contents: History. The growing plant. Distribution in North Carolina. Suitable varieties (for seed production and for hay production). Selecting and preparing the soil. Inoculation essential. Fertilization. Seeding and cultivation. Soy beans in mixtures (with cowpeas, sweet

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sorghum, or millet). Harvesting for hay. Soy beans for soil improvement. Soy beans for soiling purposes. Soy beans for pasturage.

"The soy bean is probably a native of tropical Africa and was introduced into the southeastern part of Asia more than 3,000 years ago by ancient travelers between Zanzibar and India or Ceylon... The bean was carried to England in 1790 and was introduced into the United States from Japan in 1860. It has been successfully cultivated in the Southern States for many years, where it has been grown for soil improvement and as a forage crop. In Japan and China it is grown chiefly as a human food. It is also known as Soja Bean, Coffee Berry and Japan Pea."

In North Carolina, the soy bean "is grown more or less from the seashore to the western boundary, but at the present time is chiefly produced in the northeastern part of the State." Commercial cultures for inoculation may now be secured at very reasonable prices.

Fertilization: If "the soil is poor, it will pay to make an application of barn-yard manure or add sufficient cotton-seed meal, dried blood, fish scrap, or other commercial carriers of nitrogen to give the fertilizer mixture used on the beans 1 to 2 per cent nitrogen. Ordinarily, from 200 to 400 pounds of 16 per cent acid phosphate and 25 to 50 pounds of muriate of potash will supply the necessary amount of phosphoric acid and potash needed by this crop when grown on average soils in the eastern part of the State."

Photos show: (1) Soy beans drilled in corn rows (p. 1). (2) A man standing in a field of soy beans sown broadcast on "black land" for hay (p. 3). (3) A field of soy beans with two barns in the distance (p. 5). Address: Chief, Div. of Agronomy, NCES, Raleigh and West Carolina.

1742. *Los Angeles Times.* 1915. Alliance–Japanese beans for Germans: The soy and soja said to be valuable foods. Experiments are to be made to determine if they can be used in the prison camps–together they yield flour, meal, milk, cheese, coffee and fodder. Aug. 8. p. III25.
• ***Summary:*** This article, via A.P. [Associated Press] foreign correspondence, is very similar to one published a week earlier (Aug. 1) in the *Washington Post* titled "'Soy' bean as war food: German dieticians experiment with it in many prison camps." (p. M8).

The last sentence in the article, however, is new: "Exhaustive experiments with the soja bean have already been made at the agricultural station of the University of Wisconsin, all tending to bear out, it is said, the contention of German dieticians in favor of the bean."

1743. Arita, Hachirô. 1915. Honoruru ni okeru shôyu juyô jôkyô ni kansuru ken [The demand for Japanese shoyu in Honolulu]. Honolulu. 11 p. Aug. 12. Handwritten unpublished manuscript. [Jap; eng]
• ***Summary:*** This is a market report from Mr. Arita at the Japanese consulate in Honolulu, to Mr. Shigenobu Okuma at the Japanese Ministry of Foreign Affairs.

Shoyu imports from Japan are 80,807 taru (1.309 million liters). Production by 4 Japanese companies in Hawaii is about 4,200 koku (756,000 liters). Domestic production is up by 20% over last year. Address: Japanese Consulate, Honolulu, Hawaii.

1744. *New York Times.* 1915. From here and there. Oct. 24. p. SM11.
• ***Summary:*** "The usual Japanese breakfast consists of rice, miso soup, pickles, and occasionally fish. Tea is always served with meals, and is drunk clear, without sugar. Miso soup consists of strips of radishes, seaweed, eggplant, or other vegetables cooked with bean curd and water. The cooking is not continued for a long, and so few vegetables are used that the soup partakes only slightly of the flavor of the ingredients."

1745. *Bulletin Economique de l'Indochine* (*Hanoi*). 1915. Les exportations du Soja en Mandchourie [The exports of soya from Manchuria]. 18(115):773. Sept/Oct. Extract from Echo de Chine. [1 ref. Fre]
• ***Summary:*** "The quantities of soybeans forwarded from Dairen to the South China Sea by ships / vessels which offer regular service between Dairen, Shanghai, and Hongkong, to be expedited again to other destinations, increase significantly each year. The quantities in 1913 attained 3,061,336 kg; in 1914 they were only 2,976,049 kg, and for the year 1915, the quantities already exported rose to 6,667,000 kg."

A table shows the imports of soybeans (in million kg) at the following ports in 1914 and 1915: Singapore (1.460 / 1.426), Hongkong (4.760 / 0.923), southern Chinese ports (36.946 / 13.580), Dairen (2.976 / 6.667), and Japanese ports (1.503 / 1.060). Note 1. In 1914 southern Chinese ports imported 77.5% of the total imports of 47.645. In 1915 the total imports dropped to 23,656, and southern Chinese ports imported 57.4% of that total.

"The Indies (*Les Indes*) had exported 49,705 kg to these different places in 1913, but since then, no new exportation has been done, the Indies sending all available soybeans into the city (*dans la Métropole*)."

"In the South China Sea, mainly in Malaysia and Oceania (*les Iles Océanique*), soybeans are used to prepare Chinese food sauces from certain special farms, and the residue is used as fertilizer on sugarcane plantations." Address: Hanoi.

1746. Negoro, Motoyuki. 1915. Hawaii hôjin katsuyaku-shi, Meiji 41-42 [Japanese activities in Hawaii, 1908-09. 2 vols.]. Tokyo: Bunsei Shoin. 23 cm. http://ci.nii.ac.jp/ncid/BA65947911. [Jap]*
• ***Summary:*** In the section on soy sauce brewers, it lists:

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1. Fukushima Shoyu Jozo-sho. 2. Terada Shoyu Jozo-sho, founded by Tajiro Terada, as a brewer of Kikko-ki brand soy sauce, located on King St., Palawa, Honolulu. 3. Hawaii Shoyu K.K. as a soy sauce brewer on King St., Palawa, Honolulu. The ad on page 39 states that in 1915 this company produced 166,600 gallons of shoyu.

1747. Tsujimoto, Mitsumaru; Ueno, Takeo. 1915. Shôyu no abura oyobi seishû no abura ni tsuite [On "soy" and "saké" oils]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 18(212):1072-76. Oct. [Jap]
• ***Summary:*** "Soy" oil is a mixture of soy bean and wheat oils obtained as a by-product in the brewing of soy (i.e. soy sauce, yield 0.25-0.3% by volume). It is a dark red to brown liquid or semi-solid mass with an aromatic odor of soy. "Saké" oil consists chiefly of rice oil and is found floating on the surface after the fermentation of saké (yield 0.01-0.02% by volume). It is an orange-yellow liquid with an odor of saké. Samples of soy oil (2 samples) and saké oil (values in parentheses) had the following characteristics: Specific gravity at 15ºC, 0.9000, 0.9835, and (0.9031); solidification point, -5ºC, -13ºC, and (turbid at 0ºC); acid value, 59.24, 55.03, and (22.56); saponification value, 184.12, 182.81, and (179.11); iodine value (Wijs), 127.79, 133.22, and (101.56); refractive index at 20ºC, 1.4650, 1.4633, and (1.4660); % unsaponifiable matter, 2.88, 2.72, and (-).

Soy oil, which is best refined by reduction with zinc dust and sulfuric acid, followed by treatment with Kambara earth, is a commercial product used in the manufacture of low-grade soaps. Saké oil is not yet a commercial article. Address: Kôgaku hakase, Japan.

1748. Williamson, A.A. 1915. Marketing the new soya bean crop in Manchuria. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 18(260):518. Nov. 5.
• ***Summary:*** "Cooperative selling–Fall shipments: At Kaiyuan a produce dealers' association and trust company has been formed, modeled after that at Dairen. Kaiyuan is a promising bean center. It is likely that an exchange will be established at Changchun also.

"North Manchuria beans, which are considered superior to those grown in South Manchuria, have been brought to Dairen in considerable quantities both by train and by steamer...

"Nevertheless the export of beans to Europe, notably Holland, has kept up remarkably, considering conditions there. These shipments have to be covered by documents guaranteeing their ultimate consumption in order to avoid capture at sea by belligerent cruisers.

"At present, the local trade is depressed, as Japan, the principal market, is suffering from overproduction of rice, as noted above, and European markets are not what they were, despite some shipments that have gone there. A few mills have begun work, but only in a small way. One of the largest was driven to making peanut oil during the summer."

"More crushing mills: The experimental mill built by the South Manchurian Railway Co. at Dairen, which uses the chemical extraction process, has been sold to Messrs. Suzuki & Co., of Kobe, the seller stipulating that the purchaser should enlarge the mill to double its capacity. Suzuki & Co. will spend about 200,000 yen (about $100,000) on the mill; but it is said the railway will aid the new owners financially. The fatty acid factory attached to the mill will also be operated by Suzuki & Co. This firm intends to establish two more mills, using the same benzine extraction process, at Kobe and Moji, in all probability. The fatty acid and glycerine factory is only used when the price of bean oil is too low for profit."

Note: This is the earliest document seen (Jan. 2014) concerning the work of Suzuki & Co. with soybeans. The Japanese company, which built the first solvent extraction mill for soybeans in Manchuria (Dairen), later became Hohnen Oil Co. Address: Consul, Dairen, Manchuria.

1749. *Los Angeles Times.* 1915. Japanese breakfasts. Nov. 27. p. II6.
• ***Summary:*** From the *Boston Transcript:* This article is identical to the following, published about a month earlier: *New York Times.* 1915. "From here and there." Oct. 24. p. SM11.

1750. Hori, Shôtarô. 1915. Byôgai-roku. Senchû no kisei yori okoru daizu kenchi-byô (churo-byô) [Phytopathological notes. V. Sick soil of soybean caused by the nematodes]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 2:927-33. Nov. [Jap]
• ***Summary:*** This document reports the discovery of the soybean cyst nematode. The author stated that the parasitic nematode is a species allied to *Heterodera Schachti,* according to the determination of Mr. S. Uchida. *Heterodera* sp. was found in soils causing a serious disease of soybeans at Shirakawa Prov., Iwaki, in Honshu, Japan. Soil treatment with calcium cyanamide is recommended. Note: Katsufuji (1919) stated that he believes this to be the earliest document seen describing nematode injury to soybeans in Japan. Address: Nôgaku-shi, Rigakushi.

1751. Williamson, A.A. 1915. Dairen soya-bean market becomes animated. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 18(298):1132. Dec. 21.
• ***Summary:*** "The local market for soya beans and products has become somewhat animated, after a long period of stagnation on account of the European war, and the consequent lack of shipping facilities to Europe, the dullness

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of the manure market in Japan, and other influences, among which high freights may be reckoned. New beans are now coming down to Dairen in small quantities, but the real outflow will not begin until the advent of winter causes the roads in the interior to freeze.

"The direct cause of the present animation is the arrival of orders for a large quantity of bean cake from Formosa, for the sugar plantations there. On the 23rd, 17,000 pieces were bought at $0.57 each, while on the following Monday 38,000 cakes were bought at an advance to $0.59 each." Address: Consul, Dairen, Manchuria.

1752. Tsujimoto, M.; Ueno, T. 1915. "Soy" and "saké" oils (Abstract). *J. of the Society of Chemical Industry* (*London*) 34(24):1259. Dec. 31. [1 ref]
• ***Summary:*** An English-language summary of the following Japanese-language article: Tsujimoto, Mitsumaru; Ueno, Takeo. 1915. "Shôyu no abura oyobi seishû no abura ni tsuite [On 'soy' and 'saké' oils]." *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 18(212):1072-76. Oct. Address: [Japan].

1753. Hemmi, Takewo. 1915. A new brown-spot disease of the leaf of Glycine hispida Maxim. caused by *Septoria glycines* sp. n. *Transactions of the Sapporo Natural History Society* 6(1):12-17. Dec. [Eng; Jap]
• ***Summary:*** This article begins: "*Glycine hispida* Maxim. or soy bean is one of the most important leguminous crops in the Far East. In Hokkaidô it is most extensively cultivated, as the climate is well suited for its production. There are many destructive diseases which attack the soy bean in our country and of which the investigations have already been done to a greater or lesser extent. But we have not yet heard of a destructive Septoriose on this important crop in our country. The only species of Septoria, which has been recorded as a causal fungus of a leaf-spot disease of the soy bean plant in mycological and pathological literatures, is *Septoria sojina* Thüm.* (Von Thümen, III p. 63 (1879)).

"It was in the early summer of the last year that my attention was first drawn to a diseased appearance of the leaves of this plant in the experimental plots of our college and in the adjoining fields. The microscopical examination showed at once that it was die to a kind of Septoriose."

Describes the symptoms of the disease and the morphology of the causal fungus. The difference between *Septoria glycines* and *S. sojina* are tabulated. Address: Nôgakushi, Sapporo, Japan.

1754. Ito, Teiji. 1915. Ban shôyu seizô-hô no kenkyû [Studies on making No. 2 shoyu (ban-shoyu) using shoyu presscakes]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 10(8):23-36; 10(9):15-24. [Jap]
• ***Summary:*** Ban-shoyu is that made by refermenting the shoyu press cakes after it they have been pressed once. It is a term like "ban-cha" or No. 2 tea. Ban is an abbreviation for "ni-ban" or "number 2."

1755. Kinoshita, Asakichi. 1915. Nidan shikomi shôyu jôzô-hô no gainen [The concept of the two-step method of brewing shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 10(1):24-29. [Jap]

1756. Kinoshita, Asakichi; Kishimoto, M. 1915. Shôyu no kaon jôzô ni okeru moromi dennetsu no jôtai [On the heat conductivity in moromi during "heated brewing" of shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 10(3):25-36. [Jap]

1757. Kinoshita, Asakichi. 1915. Kenkyû-chû no shôyu jôzô-hô [Research on shoyu brewing]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 10(8):37-39. [Jap]

1758. Nishimura, Torazô. 1915. Shina shôyu moromi oyobi shôyu no futsû seibun bunseki kekka [Analysis of the typical composition of Chinese moromi and shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 10(5):1-9. [Jap]

1759. Nishimura, Torazô. 1915. Kôji-kin no chisso yôgen to shite "amino" san o kyôkyû suru baai to "peputon" a kyokyû suru baai to ni okeru "anmonia" seisei jôtai [Formation of ammonia when amino acid or peptone is used as a nitrogen source for koji molds]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 10(7):33-37. [Jap]

1760. Togano, Meijiro. 1915. Tamari kôji no kairyô shiken [A test for improving tamari koji]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 10(9):1-8. [Jap]

1761. Hopkins, Albert Allis. ed. 1915. Scientific American cyclopedia of formulas: partly based upon the twenty-eighth edition of *Scientific American Cyclopedia of Receipts, Notes and Queries.* 15,000 formulas. New York, NY: Munn & Co. vii + 1077 p. See p. 752, 772, 768. Illust. Index.
• ***Summary:*** In Chapter 21, titled "Preserving, and canning, condiments, etc. (p. 735+) is a section on "Catsups" (p. 752) which includes: Anchovy catsup. Cucumber catsup. Horseradish catsup. Mushroom catsup. Soy, Indian. Soy, Japanese. Tomato catsup. Walnut catsup.

"Soy, Indian.–This sauce is usually bought ready prepared. It is imported from China and Japan, where it is made from a small bean, the produce of Dolichos Soja. Japanese soy is usually preferred to that of China, because it is free from the sweet treacly flavor which distinguishes the latter. When well made it has a good brown color, thick consistency, and is clear.

"Soy, Japanese.–An equal weight of beans, coarse barley meal and salt. Wash the beans well, boil them in water until

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tender, and pound them in a mortar, adding the barley meal gradually. Put the mass into an earthenware bowl, cover with a cloth, and let it stand in a warm place for several days, until it is sufficiently fermented, but not moldy. To each pound of salt add 4 pt. of water, stir until the salt is dissolved, then stir into the fermented mass. Keep the bowl or pan closely covered for 3 months, during which time it must be daily stirred for at least 1 hour. At the end of this time strain through fine cloths, pressing the insoluble portion well, in order to extract as much of the moisture as possible. Let it stand again until quite clear, then drain off and bottle for use. In making Chinese soy, the liquid extracted is boiled and reboiled with a varying amount of sugar, mace, ginger and pepper until it acquires the desired consistency."

On pages 771-72 is a section on "Vinegars" are two formulas for "Camp vinegar." The first calls for 3 tablespoonfuls of soy [sauce] (plus 1½ pints walnut catsup); the second calls for 4 oz. soy sauce.

On pages 767-68 is a section on "Sauces and salad dressings," which begins with home-scale recipes for various sauces including: Anchovy butter. Anchovy essence. Anchovy paste. Anchovy sauce. Fish [sauce]. Gravies. Harvey sauce. Herb sauce. Soy [sauce]. Tomato sauce. Vegetable butters. Worcestershire sauce.

The formula for Harvey sauce begins: "Good vinegar, 1 qt.; anchovies, 3; soy, 1 tablespoonful; walnut catsup, 1 tablespoonful; finely chopped shallot,..."

The formula for "Soy" states: "Genuine soy sauce is a species of thick black sauce, imported from China, prepared with white haricots, wheat flour, salt and water; but a spurious kind is made in England as follows: Seeds of dolichos soja (peas or kidney beans may be used for them), 1 gal.; boil till soft; add bruised wheat, 1 gal.; keep in a warm place 24 hours; then add common salt, 1 gal.; water, 2 gal.; put the whole thing into a stone jar, bung it up for 2 or three months, shaking it very frequently; then press out the liquor; the residuum may be treated afresh with water and salt for soy of an inferior quality."

Likewise: "Worcestershire Sauce.–There are many concerns, we believe, who make a sauce which they call Worcestershire. That made in England by Lea & Perrin is considered the best and many have tried to imitate it, but with indifferent success. Of the many formulas appearing in print, the following will serve as an example; Vinegar, 1 qt.; powdered pimento, 2 dr.; powdered cloves, 1 dr.; powdered black pepper, 1 dr.; powdered mustard, 2 oz.; powdered Jamaica ginger, 1 dr.; common salt, 2 oz.; shallots, 2 oz.; tamarinds, 4 oz.; sherry wine, 1 pt.; curry powder, 1 oz.; capsicum, 1 dr. Mix all together, simmer for 1 hour, and strain. Let the whole stand for a week, strain it, and fill in bottles. Worcestershire sauce is never quite clear; straining to remove the coarser particles is all that is necessary."

Note: The publication date printed on the title page is 1915, however the copyright for this edition is 1910. Address: New York, Query Editor of the "Scientific American".

1762. Kôno, Nakanosuke. 1915. Manshû daizu oyobi sono kakôhin [Manchurian soybeans and their products]. Kwantung Leased Territory, Manchuria: Minseibu, Shomuka. 328 p. [Jap]*
Address: Kwantung Leased Territory, Manchuria.

1763. Matsumura, Jinzô. 1915. Shokubutsu-mei-i. Revised and enlarged. Tokyo, Osaka, Kyoto, Fukuoka: Maruzen Co. Ltd. x + 405 p. + 78 p. (of character index) + 19 p. (of alphabetic Japanese terms). See Part I–Chinese names of plants. p. 158-59. [Jap; Lat]
• ***Summary:*** The author lists two Glycine species: (1) *Glycine hispida,* Maxim. = G. Soja, Bth. [Bentham] (Leguminosae) daizu. Chinese characters for ten different soybean varieties from Japan, China, Manchuria, and Formosa are given.

(2) *Glycine ussuriensis,* Reg. et Maack. (G. Soja, S. et Z.) tsuru-mame. Chinese characters for three different soybean varieties from Manchuria and China are given.
Address: Sc.D., LL.D., Prof. of Botany and Director of the Botanic Gardens in the Imperial Univ., Tokyo Univ., Japan.

1764. Morita, Sakae. 1915. Hawai Nihonjin hatten-shi [History of progress of Japanese in Hawaii]. Hawaii: Waipahu Shin Eikan. 866 p. See p. 260-65. Jozo-gyo (Brewing/fermentation industry) section. 23 cm. A second edition was published in 1919 under the title Hawai gojûnen-shi. [Jap]
• ***Summary:*** "The first Japanese who lived in Hawaii and brewed shoyu there was Haruhachi Shimada, who originally came from Yamaguchi-ken, Japan. He started in June 1891 and tried to make shoyu on a large scale. But bad transportation made it difficult for him to expand his market. This plus lack of capital forced him to quit."

Note: It is not clear where the soybeans used to make this shoyu were grown. They were probably either grown in Hawaii (probably on Oahu) or imported from Japan. If they were grown in Hawaii, this document would contain the earliest date seen for soybeans in Hawaii, or the cultivation of soybeans in Hawaii (June 1891). Address: He had a photo shop in Hawaii.

1765. Okayama Prefectural Agricultural Research Station (Okayama Kenritsu Nôji Shikenjo). 1915. Rinji hôkoku. 2, Aogari daizu no saibai [Special Report No. 2. Cultivation of soybeans that are cut green, not for their beans but for their stems and leaves for use as fodder and green manure]. [Takamatsu-machi, Okayama prefecture, Japan]: Okayama Prefectural Agricultural Research Station. 25 p. 23 cm. [Jap]*
Address: Okayama, Japan.

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1766. Porter, Robert P. 1915. Japan, the new world power: Being a detailed account of the progress and rise of the Japanese empire. London, New York, Toronto, Melbourne & Bombay: Humphrey Milford, Oxford University Press. xxiv + 789 p. See p. 745-57. Maps. Index. 23 cm.
• ***Summary:*** Chapter 47 is titled "The Soya Bean." This book and its information on the soya bean is basically the same as that found in the 1911 edition titled "The Full Recognition of Japan." Address: Oxford, England.

1767. Porter, Robert Percival. 1915. Japan, the new world-power: Being a detailed account of the progress and rise of the Japanese empire. London, New York, Toronto, Melbourne and Bombay: Humphrey Milford, Oxford University Press. xxiv + 789 p. Illust. Seven colored maps. Index. 23 cm. [soy ref]
• ***Summary:*** Japan (regardless of race and colour) intervened in the Great War on the side of her ally Great Britain. They worked together successfully against Germany in the siege of Tsing-Tau in 1914 from Oct. 31 to Nov. 7.

Near the front of the book is a table of "Weights, measures and moneys, for Japan, Great Britain, and the USA."

Page 149-50: "The annual average number of immigrants from Japan is about 20,000. Roughly, half go to China and the United States of America... Since 1907 two batches of Japanese emigrants, under 2,000 in all, have gone to Brazil, the majority of which have been under contract with the Sao Paulo Government to work in the coffee plantations." There are now about 155,000 Japanese in the United States. Since a 1907 agreement between Japan and the USA, immigration of Japanese labour to the USA has been restricted. Some Japanese have tried to enter the USA by going first to Mexico. There are not more than 2,000 Japanese in Canada at present.

Page 232: In Japan: "The necessity for increased military and naval expenditure, which rose in connection with Korea in 1881, called for considerable additional revenue. Fresh military taxes were therefore levied; income-tax was introduced along with indirect imposts [taxes] on soy [sauce], tobacco, confectionery, and stamps, and the tax on *sake* was raised, augmenting the receipts to such an extent that the Government was able in 1886 to reduce the land-tax again. But following the war with China [1894-95] it became necessary to establish occupation and registration taxes, to raise again the *sake* tax, and to create a Government monopoly of leaf tobacco."

A table (p. 233) shows how the ordinary State revenue of Japan was derived in the financial years 1898-99 and 1909-10. The two main sources of revenue were: Land tax (38.4 and 85.7 million yen respectively) and liquor tax (33.0 and 91.5 million yen). By comparison, the soy tax was relatively small: 1.54 and 4.73 million yen.

Page 235-36: "The tax on liquors is levied upon (a) brewers of *shurui* (alcoholic liquor), which is divided into five classes, viz. *seishu,* or refined *sake, dakushu,* or unrefined *sake, shirozake,* or white *sake, mirin,* or sweet sake, and *shochu,* or distilled sake; (b) brewers of beer; and (c) wine and alcohol and alcoholic liquors other than sake or beer."

"Soy tax: The soy tax is levied upon manufacturers of this sauce at the rate of about 1 3/4 yen per *koku.* A tax on soy for household use was introduced in 1900, and ranges from 50 sen to 4 yen per *koku,* according to the amount manufactured. No more than 5 *koku* of soy per annum may be made for household use."

Page 240: A full-page table shows the "Budget for financial year 1911-12." The main sources of "Ordinary revenue" are liquors tax (88.7 million yen), land tax (75.1 million), customs duties (50.5 million), and tobacco monopoly (50.5 million yen). Revenue from the soy [sauce] tax is 4.6 million yen. The sugar excise is 14.7 million yen.

Page 261-62: "The upland fields, being for all intents and purposes unirrigable, are only to a very limited extent utilized for the cultivation of rice. Rotation crops are, however, raised twice a year, usually barley, 'naked barley,' and wheat as winter crops, and soya (more properly soja), sweet potatoes, and millets as summer crops." A key unit of area in agriculture is one *tan* = 0.245 acre. On [lowland] paddy fields, nationwide over the past 10 years, the average yield per *tan* is 7.913 bushels of rice and 6.668 bushels of barley, which may be considered a representative winter crop. "Upland fields, upon the same basis, produce 6.638 bushels of barley as a summer crop and 3.756 bushels of soya bean."

Another key (larger) unit of area in agriculture is one *cho* = 2.45 acre.

A table (p. 263) shows the total area, production, and yield of 17 major crops in Japan in 1897 and in 1910. Both years, the leading crop (by far) in area was rice, followed (in 1897) by barley, naked barley, wheat, and soya bean. For 1897 the three figures for soya beans were: 1,067,000 acres under cultivation, 15,381,000 bushels total production, and 14.41 bushels per acre yield. For 1910 the three figures for soya beans were: 1,137,000 acres, 18,834,000 bushels total production, and 16.56 bushels per acre yield.

Statistics for "small red bean" [azuki] are also given: For 1897 268,000 acres under cultivation, 3,069,000 bushels total production, and 11.45 bushels per acre yield. Thus, in 1897 and 1910 the production of soybeans was roughly 5 times the production of azuki beans.

Chapter 15, "Agriculture," contains a section titled "Soya bean" (p. 264-65): The soya, or soja, bean is well enough known in England as a cattle-food, but in Japan its application is by no means limited to this use. It is the basis of the Japanese sauce, soy, of which enormous quantities are brewed; of *miso,* or bean cheese [sic], used extensively for

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soup and in cookery in general; and of *topu* [sic, tofu], or bean curd, a cheap, highly nutritious and very popular article of diet. The residue from these manufactures is used both as fertilizer and as cattle food, or, alternatively, an oil of some value may be obtained from it. It is the principal summer crop of the upland fields, and its cultivation, which requires less fertilizer and less labour than other products, is general throughout Japan and particularly in Hokkaido. But the supply is far from equal to the demand, and a large quantity of beans and bean cake is imported from Chosen and Manchuria, the value of the present importation amounting to £3,000,000 annually.

"Among other beans the small red bean is largely cultivated, especially in Hokkaido, and is used for cakes and confectionery, and boiled with rice on occasions of ceremony. The Japanese are very fond of peas, horse-beans, and kidney-beans, which are grown as a stolen crop after rice in the paddies and just before it in the upland fields."

Page 269: "A comparison of the relative positions of human and animal labour in paddy fields and upland farms for the years 1903 and 1908 (the latest year for which figures are available) shows that the area tilled exclusively by human labour still forms a very large proportion of the total, though it tends steadily to decrease." "Manual labour is plentiful and it is chiefly by reason of its abundance that the intensive system can be carried on. Rice-growing requires, for instance, the labour of 17 men and 9 women per *cho* (2.45 acres), barley and wheat 11 men and 6 women, tobacco 25 men and 23 women, soya bean 7 men and 5 women, and so on. Farmers, in the vast majority of cases, are their own labourers, and those who may be distinguished as 'professional labourers' are a very small class."

Page 292: Sea-weeds: "Chief among the sea-weeds used as food is that known as 'Kombu' (*Laminaria*). It grows mostly on the shores of Hokkaido and the south-east of Honshiu [Honshu], and is eaten sliced into very thin shreds. 'Kanten' is made by dissolving the weed Tengusa in water and exposing the resulting gelatinous infusion to the action of cold by night and the sun by day. Only the Chinese use it as food, however; in the West it is a substitute for gelatine, isinglass, starch, and the like. Other sea-weeds are used as paste." Address: Queen Anne's Mansions, London, England.

1768. Takenob, Y. 1915. Japan Year Book. Tokyo: Japan Year Book Office. 789 p. See p. 349, 391, 401-02, 436, 634, 714, 716-17, 730, 743. Tenth annual issue. [Eng]

• ***Summary:*** This book gives statistics for the Japanese empire: Japan Proper, Korea, and Formosa.

The population of Japan Proper (based on the census taken every 5 years) was:

1898–45.4 million.
1903–48.5 million.
1908–51.7 million.

A table of "Weights, measures and moneys" is on p. xxxii (near the front).

Page 349. In the chapter on "Agriculture," a table shows production of soy beans, sweet potatoes, and potatoes, 1911-1913 (in 1,000 koku). Production of soy beans decreased from:

3.69 million *koku* in 1911, to
3.51 million *koku* in 1912, to
2.99 million *koku* in 1913.

Note: The decrease of soy bean production in Japan during this period was due mainly to imports of soy beans from Manchuria and Korea (see below).

The text below the table states: "Among subsidiary farm crops there is perhaps nothing which plays so important a part in the Japanese kitchen as soy beans. The three daily articles of diet for all classes, viz. *soy, miso,* and *tofu* are manufactured with this bean either in part or wholly, The tofu (bean curd) is one of the most popular articles of diet, being cheap and highly nutritious; the miso makes Japanese soup and is used in various other ways. The soy is indispensable in Japanese cooking. Then for extracting oils, as manure, and food for horses, beans are equally important. The supply being insufficient, quite a large quantity comes in from Manchuria and Korea. In Japan Hokkaido is the principal centre of production. Red beans [azuki], also very extensively produced in the northern island, are used for making confectionery, are boiled with rice on ceremonious occasions, and for other purposes. Peas and horse-beans, whether green or fully ripe, are favorite food-stuffs in Japan, and they are extensively cultivated as a second crop after rice and as a forerunner to rice, indigo, etc. on upland farms. Groundnuts are among a few subsidiary farm produce that go abroad, mostly to U.S.A. In Japan they are used by confectioners and also for pressing oil..."

Pages 390-91. A table titled "Industrial companies classified by amount of investment" states for "Soy and miso." Number of companies: 251. Paid up capital: 5.9 million yen. Reserves: 580,000 yen.

Page 401-02. In the chapter on "Industry" under "Brewing industry" we read: "The brewing industry in Japan comprises sake, beer and soy, for wine is still insignificant and as yet enjoying the benefit of non-taxation, The two indigenous industries of sake and soy are still primitive in process, and various new methods, several of them patented, have so far failed, especially as regards soy.

Page 402. "Soy.–For soy the prefecture of Chiba, which is contiguous to Tokyo municipality, heads all other places on the list as to output. Parched wheat mixed with salt beans is a principal ingredient. The process is still far from scientific, requiring about 12 months before the liquid is ready for sale. It is also costly, as it does not much admit labor-saving appliances. To obviate these advantages have been tried several patented processes, but most of them have failed. The collapse of the short-lived Nippon Soy Co., started in 1907 near Osaka with 2,500,000 yen paid up, has

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dampened the cause of scientific process of soy brewing."

A table shows annual production of sake, beer, and soy (in koku) from 1912-13 to 1914-15 (three years). Note: Since all three of these are taxed by the federal government, careful records are kept. Sake averaged 4.32 million *koku* (the largest output). Soy averaged 2.37 million *koku* (roughly half of sake). Beer averaged about 0.219 million *koku* (by far the smallest).

A 2nd table gives exports of these three products during the same years. Sake averaged 3.61 million *sho* (100 *sho* = 1 *koku* = 47.6 gallons). Soy averaged 3.15 million *sho.* Beer exports (in 1914) were by far the smallest: 117,000 pints, 377,000 quarts, and 22,000 casks of 1 *sho* each. Note: "Beer brewing first started about 1876 in Hokkaido. The brewing was at first under the tutelage of German experts... At present there are four or five breweries, the Dai Nippon, Kirin, and Kabuto."

Page 465. A table titled "Prices of commodities in Japan" (1911-1913) includes the following for 1913:

Rice 21.01 yen per koku.
Barley 7.93 yen per koku.
Soja beans 11.54 yen per koku.
Red bean [azuki] 16.02 yen per koku.
Soy [sauce] 23.85 yen per koku.
Miso 0.37 yen per kwan [kan; 1 kwan = 3.75 kg].

Page 518. A table titled "Carrying trade on main routes" shows that China was exporting a lot of Soja beans and [soja] bean can to Japan. China (including Manchuria) had exports to Japan worth 142.3 million yen and imports from Japan worth 80.5 million yen.

Page 634. In the chapter on "Finance" under "6. Tax on Japanese soy" we read: "The tax is assessed both on the soy manufactured for sale and on that for home consumption. In the former the tax is yen 1.75 [per koku] for refined soy and yen 1.65 for the unrefined soy and in the latter it ranges between the two extremes of yen 4.00 and yen 0.50 according to quality.

Page 714. In chapter 35, "Chosen (Korea)," under the heading Foreign Trade," is a table on "Staple exports" (in 1,000 yen) which has data on "Beans and peas" for 1910-1914.

Page 717. In the chapter on "Chosen (Korea): Agriculture," under "Barley and Soja Bean" it is stated that "Soja and other beans are exported chiefly to Japan for manufacturing soy [sauce]. Acreage of soja beans in Korea is 553,077 *cho* and the yield 3,345,472 *koku.*" Note: 1 *cho* = 2.45 acres and 1 *koku* = 47.6 gallons or about 6 gallons. Thus, in English units, in Korea 1,355,039 acres produce 20,072,832 bushels, for a yield of 14.8 bu/acre.

Note: This is the earliest document seen (Jan. 2005) that gives soybean production or area statistics for Korea (which has been a "province" of Japan since 1910).

Note: Japan was importing a lot of soybeans from its colony, Korea, in 1912. Korea had exports to Japan worth 20.9 million yen and imports from Japan worth 27.1 million yen (p. 518).

Page 730. In Chapter 36, "Taiwan (Formosa)," under the heading "Agriculture," a table (p. 730) titled "Agricultural products" has production data on "Beans and peas" for 1912-1913. The beans were probably mostly soy beans.

102,000 *koku* in 1912
137,000 *koku* in 1913

In Chapter 38, "South Manchuria," is a paragraph (p. 743) titled "The soya bean" which has information on South Manchuria's soya bean yield, [soya] bean-cake output, amount exported for specific years, and production at various milling centres (almost same wording as 1914 Year Book). Address: Japan.

1769. Woll, Fritz Wilhelm. 1915. Productive feeding of farm animals. Philadelphia, Pennsylvania: J.B. Lippincott Co. xi + 362 p. Illust. (96 in text). Index. 22 cm. Series: Lippincott's Farm Manuals. [10 ref]

• ***Summary:*** Soybeans are mentioned on pages ix, 9, 11, 12, 68, 90, 96, 114, 125, 127, 157, 161, 175, 176, 202, 221, 275, 308, 327, 332, 337, 339, 340-43, 349, 350-52, 361.

Chapter 1, "The composition of feeding stuffs," contains a section on "Classification of proteins" which states (p. 9): "Protein substances are generally classified as (1) simple, (2) conjugated, and (3) derived proteins... *b. Globulins* are insoluble in water, but soluble in a 10 per cent sodium chloride solution. The globulins are abundant in plant materials and have been identified in many seeds of plants. The following are present in the cereals and other common seeds: Maysin in corn kernels, edestin in corn, wheat, cotton seed, hemp and flaxseed, avenalin in oats, legumin and vicilin in leguminous seeds (peas, lentils, horse beans), glycin in soybeans, and conglutin in lupines."

Page 11: Concentrates (p. 11): "Peanut cake meal, containing about 48 per cent protein; cotton-seed meal and soybean meal, 40 to 45 per cent; gluten meal, 34 to 36 per cent; soybeans and linseed meal, 34 to 36 per cent; dried distillers' grains, 32 per cent; malt sprouts and dried brewers' grains, 26 per cent."

"Fats are organic compounds consisting largely of mixtures of fatty acids, combined with glycerine (so-called glycerides). The more common fats are stearin, palmitin, and olein... Lineoleic [sic, Linoleic] and linolenic acids are also found in the seeds of some plants, like flaxseed and soybeans; on exposure to the air in a thin layer, they take up oxygen and 'set,' i.e., they dry and harden. This difference in the behavior on exposure to the air is characteristic of drying and non-drying oils.

A bar chart titled "Fats in common feeding stuffs, in per cent," based on the ether extract of these foods, shows: Flaxseed 34%. Soybeans 17%. Dried distillers' grains 12%. Cotton-seed meal 10%. Linseed meal 8%.

A section on "The siloing process" states (p. 68): "From

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what has already been said, we should not expect that the siloing process will appreciably affect the digestibility of feeding stuffs, since the heat generated in the silo fermentation will rarely exceed 60º C. (140º F.). The following average digestion coefficients for three kinds of silage will show the influence of the siloing process as regards digestibility:" Included in the table are soybeans and soybean silage. The coefficient for the dry matter of both is 67%.

Part II, "Description of feeding stuffs" begins with "Coarse feeds." Chapter 12, "Green forage and hay crops," begins with a section on "Pastures" which notes that in the Cotton Belt, the main grasses and clovers are "Cowpeas, Johnson grass, soybeans, Bermuda grass, crab grass, Japan and crimson clover."

The section on "Soiling crops" notes (p. 96): "Among crops that have proved satisfactory soiling crops may be mentioned: Indian corn, alfalfa, clover, vetch, sorghum, peas, oats, winter grains (cut before blooming), soybeans, cowpeas, rape, millet, etc."

The section on "Hay from leguminous crops" states (p. 114): "The most important species of legumes adopted for feeding farm animals are clover (red, mammoth, alsike {pronounced AL-sak}, white, crimson, Japan), cowpea, soybean (Fig. 15) vetch, pea, bean, beggar weed, and peanut." A brief description is given of each in the following pages.

"Soybean (*Glycine hispida,* Fig. 21) is of greater importance for seed production than for forage purposes, except in the South, where its value as a forage plant, for feeding green, as hay or as silage, is about as great as for production of seed. It is grown for the sake of the seed throughout the United States about as far north as corn will mature. In the Gulf States it will usually yield six to ten tons of green forage or silage to the acre and one and one-half to three tons of hay. Soybean fodder is a high-protein feed that can be produced under practically the same conditions as can Indian corn. The composition of the soybean plant is quite similar to that of alfalfa, as will be seen from the following table." A gives the composition of the soybean plant in the forms of green fodder, hay, straw, silage, and seed, compared with "Alfalfa hay."

Chapter 15, "Silos and silage," says (p. 157): "The fact that corn silage is relatively low in protein has led to the suggestion that leguminous crops be placed in the silo with the corn. The most successful crops for this purpose are cowpeas or soybeans grown in the corn, both being cut for the silo at the same time. Cowpeas mature at about the same time as corn in the South, and furnish large yields of feed; they make a valuable mixed silage for southern stock farms. Soybeans may be successfully used for the same purpose and can be grown farther north; grown together with Indian corn, they make a good quality of silage that is considerably richer in protein than corn silage alone (p. 340)." Page 161: "Corn-soybean silage gave better results with dairy cows than straight soybean silage, in experiments by Professor Humphrey and the author at Wisconsin station (9)."

In chapter 16, "The concentrates," the section on "Leguminous and oil-bearing seeds" notes (p. 175): "The leguminous seeds, like peas and beans, soybeans and cowpeas, are valuable concentrated feeds, and their use for feeding farm animals is increasing every year, as farmers come to realize their value and appreciate that they can greatly reduce their feed bills by growing high-protein forage and grain crops on their farms. At the same time the fertilizer bills may be reduced, since these crops render available for plant use the free nitrogen of the air through symbiosis with certain soil bacteria, and leave the soil richer in this expensive fertilizer element than it was before the crop was grown thereon (p. 113). These grains have a high digestibility and contain two or three times as much digestible protein as the cereal grains." A table (p. 176) gives the chemical composition of four leguminous seeds: Canada field pea, horse bean, soybean, and cowpea.

The section on "Oil meals" states (p. 202): "Soybean meal is the ground residue obtained in the manufacture of soybean oil. The meal fed in this country is imported from either Japan, China, or Manchuria; so far as is known, none is manufactured here, although soybeans are now grown quite extensively in various sections of the United States. It is a valuable concentrate for farm stock, and is one of the richest nitrogenous feeds on the market, containing about as much protein and fat as cotton-seed meal (41.4 per cent and 7.2 per cent, respectively); it has a lower fiber content (5.3 per cent) and a higher digestibility than this meal. According to Kellner, only 3.4 per cent of the protein is present in amide form, and the protein has a digestibility of 97.7 per cent. The soybean meal is, therefore, a highly digestible feed, well adapted for feeding young stock, dairy cows, steers, and other farm animals. It is fed in this country almost entirely on the Pacific coast, where it is used largely for poultry feeding. It makes a good substitute for linseed meal, pound for pound, for dairy cows, and is one of the most promising concentrates available for stock feeding; the only objection to its use, so far as is known, is its cost, which is, as a rule, considerably above that of linseed meal or cotton-seed meal."

Chapter 21, "Calf feeding," says (p. 221): "Some feeds cannot, on the other hand, be used for calf feeding with skim milk, or must be fed with great care, for the reason that they tend to increase the danger of scouring; examples are cod-liver oil, molasses, soybeans, and oil meal."

Chapter 23, "Feeding beef cattle," states (p. 275): "Excellent forage crops, like alfalfa, cowpeas, velvet beans, sorghum, soybeans, etc., together with cotton-seed meal, are the main feeds which will enable southern farmers to raise and fatten beef cattle cheaply and which will lead to a gradual development of the cattle industry in the South."

Chapter 25, "Feeding swine" has a table (p. 308) titled

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"An approximate ration for pigs intended for breeding purposes" based on the elaborate system of Dietrich. The pounds of feed per 100 pounds live weight per day is based on the age of the pigs in months (2 to 8 months). Corn increases from 2.7 to 2.9. Soybeans (seed) from 0.4 to 0.7. Skim milk decreases from 6.0 to zero. Water varies in the range 4.4 to 9.2.

Illustrations: (15) A soybean nitrogen factory (p. 114). (21) A field of soybeans (p. 126). (32) Corn and soybeans grown for silage (p. 160).

Note: Fritz Wilhelm Woll lived 1865-1922. Address: Prof. of Animal Nutrition, Univ. of California at Davis; formerly Prof. of Agricultural Chemistry, Univ. of Wisconsin.

1770. *Times* (*London*). 1916. The grain trade: A strong opening in wheat. Government intervention. Jan. 21. p. 15.
• ***Summary:*** The section titled "Minor crops" notes that beans and peas are now [during World War I] quite expensive, and the imported kinds even more so. The price per qr. [quarter of a hundredweight, or 28 lb] is: "53*s.* for Indian chick peas, 48*s.* for Chinese and Manchurian [soy] beans, 105*s.* for Rangoon [Burma] haricot beans, and 47*s.* for Japanese soya beans. The last named are a good bargain, but the trade is a very wholesale one, and sellers expect the buyer as a rule to take not less than a ton, for which 10 guineas is the price, ex London warehouse." Address: [London].

1771. Puig y Nattino, Juan. 1916. El cultivo de la soya [The cultivation of soybeans]. *Revista del Ministerio de Industrias* (*Montevideo, Uruguay*) 4(19):78-91. Jan. [7 ref. Spa]
• ***Summary:*** Describes variety trials conducted in Uruguay using seeds supplied by the USDA. The varieties harvested in March 1915 included Peking, Arlington, Pinsu [Pingsu], Jaba, and Mammoth. A table (p. 79) shows that the yields of seed were very small, but that Mammoth gave by far the largest seed yield, 320 kg/ha. Discusses the many ways that soybeans (*las habas de soya*) are used as food in Japan, including soy sauce (*Shoryu* [*sic, shoyu*]), cooked whole soybeans, tofu or soybean cheese (*Tofú ó Queso de habas de Soya*), and soymilk. They used Mammoth variety soybeans, grown in Uruguay, to make soymilk. Seven tables (p. 84-90) give the nutritional composition of five different soybean varieties tested in Uruguay, planted in 1914 or 1915. An 8th table (p. 91) gives the nutritional composition of soymilk.

Note 1. This is the earliest document seen (May 2009) concerning soybeans in Uruguay, or the cultivation of soybeans in Uruguay.

Note 2. This journal is published in Uruguay by the *Ministerio de Industrias y Trabajo.*

Note 3. This is the earliest Spanish-language document seen (April 2013) that uses the word *Tofú* or the term *Queso de habas de Soya* to refer to tofu. Address: Ing. Agrón., Director del Laboratorio Agronómico en la Inspección Nacional de Ganaderia y Agricultura.

1772. *San Francisco Chronicle.* 1916. From coast ports. Feb. 1. p. 17.
• ***Summary:*** "Seattle. Special dispatch to The Chronicle... January 31..." "The Japanese freighter *Kumi Maru,* under charter of Osaka Shôsen Kaisha, after a stormy voyage of twenty-one days from Kobe [Japan], via Hakodate, arrived at 2 P.M. with 4,666 tons of cargo, consisting of [soy] bean-oil cake, matting, bamboo goods and toys. She will load at Tacoma and Vancouver, B.C."

1773. Davis, John K. 1916. Foreign bean production and trade: Manchuria–Antung export statistics. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 19(42):694-705. Feb. 19. See p. 703-04.
• ***Summary:*** "It is impossible to secure estimates of the acreage of beans in this district that sufficiently approximate accuracy to be worth recording. The only available figures from which estimates can be made are the customs statistics of the total exports of beans of all kinds from this port, which of course include soya as well as purely edible beans."

A table shows direct exports of beans from Antung directly to foreign countries from 1912 to 1914. Only soya beans and "red beans" [azuki] are exported in large amounts. For "Yellow (soya)" beans: 4,899,866 pounds in 1912. 8,404,533 pounds in 1913. 21,025,4666 pounds in 1914. Clearly a huge increase. For "Red" [azuki] beans. 4,175,600 pounds in 1912. 4,647,200 pounds in 1913. 3,344,533 pounds in 1914. A decrease.

"While there are no figures showing exactly the destination of the beans exported from Antung it is commonly known that the larger part of the edible as well as the soya beans exported is sent to Japan and Korea (Chosen)." Address: Consul, Antung, China.

1774. Latham, F.P. 1916. Soy beans as a cereal: Soy beans a great crop for southern farmer. *Progressive Farmer* 31(8):254-55. Feb. 19. See also p. 286 (Feb. 26) and p. 342 (March 4).
• ***Summary:*** "The first mention of the soy bean in this country was in the early part of the 19th century; however, it attracted little attention prior to 1854, when 2 varieties were brought to this country from Japan by the Perry expedition. It followed that other varieties were found and introduced, among them that 'old standard,' the Mammoth Yellow, which came to our shores sometime previous to 1882. The success with Mammoth furnished an encouraging lead to our diligent research workers, resulting in the importation into this country by the Department of Agriculture of some 800 distinct varieties."

As a cereal, it is widely produced in Japan, China,

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Korea, and Manchuria. "By certain processing of the ground beans a milk is extracted which is not such a poor substitute for the real article; from this a cheese [tofu] is made that resembles in texture and nutrient value, our cottage cheese. Another product is a heavy, rich sauce [miso], similar to our peanut butter, which is consumed in large quantities. Soys occupy the place in the diet of these people that navy and lima beans do in our own, and are prepared in a like manner. They furnish the brown man his 'peanut.' By the simple process of soaking in salt water, then roasting they at once become a close competitor of the famous American delicacy."

"So far as I have been able to ascertain there is but one mill in the United States built for and operating exclusively on soy beans. The Pacific Oil mills, of Seattle, Washington, have build up a lucrative business in this line and only get foreign beans for crushing, its output of both oil and meal meeting a ready demand in the West. That such can be done profitably in the South is no longer a question. The fact has already been demonstrated by several cotton oil mills in eastern North Carolina... If these satisfactory results can be obtained in mills not constructed for the purpose of handling beans, it is entirely reasonable to suppose that specially constructed machinery will in time be installed that will further enhance the profits accruing from such operations."

A portrait photo shows F.P. Latham.

Note 1. This is the earliest document seen (Aug. 2011) that mentions Pacific Oil Mills of Seattle, Washington.

Note 2. This is the earliest of many articles seen (Aug. 2011) that likens tofu to cottage cheese, or roasted soybeans to peanuts. Address: Belhaven, North Carolina.

1775. Moser, Charles K. 1916. Foreign bean production and trade: Manchuria–Varieties of beans in north Manchuria–Exports and prices. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 19(42):694-705. Feb. 19. See p. 703.

• ***Summary:*** "Two different classes of edible beans are cultivated in northern Manchuria, viz, Siao-tou [*xiaodou,* azuki beans] and Leu-tou [*lüdou,* mung beans]. The Siao-tou, which means small beans, are divided into the following three kinds: Red beans, which are considered to be the best in quality; white beans; and mixed beans, which may have red, black, white, marble, and other colors mixed together. All these beans are used for food. The second class of beans, the Leu-tou, which means green beans, are used principally in the manufacture of vermicelli and starch.

"In northern Manchuria edible beans are not grown in such quantities as the soya bean, on account of the small demand for export purposes, but large quantities are grown for native use, and the majority of Chinese farmers plant them as a regular crop. It is not possible to secure figures of the extent to which they are actually cultivated."

"The Siao-tou [azuki beans] beans are exported principally to Japan and the Leu-tou [mung beans] to the interior cities of China." Address: Consul, Harbin, China.

1776. Scidmore, George H. 1916. Foreign bean production and trade: Japan. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 19(42):694-705. Feb. 19. See p. 700-01.

• ***Summary:*** Tables show: (1) Four major varieties of beans grown in Japan in 1911-1913 based on statistics published by Japan's Department of Agriculture and Commerce. For "Daidzu (soya bean)." In 1911–1,198,919 acres and 18,318,236 bushels. In 1912–1,165,401 acres and 17,416,861 bushels. In 1913–1,164,445 acres and 14,865,751 bushels. Thus, both soya bean acreage and production are decreasing. For "Azuki, small bean (*Phaseolus radiatus*)." In 1911–345,682 acres and 4,740,262 bushels. In 1912–334,920 acres and 4,697,839 bushels. In 1911–345,442 acres and 2,976,388 bushels. Thus, azuki bean acreage is static while production is declining. Statistics are also given for "Endo mame (pea)" and "Sora mame, broad bean (*Vicia faba*)."

(2) Exports and imports of beans in 1914 based on customs returns: Exports–Soya beans: 972,615 pounds valued at $22,333. Imports–Soya beans: 332,625,247 pounds valued at $5,079,787. "Of the soya-bean exports in 1914, more than one-half went to the United States, British America, and Hawaii; the imports nearly all came from China." Address: Consul General, Yokohama [Japan].

1777. Williamson, Adolph A. 1916. Foreign bean production and trade: Manchuria. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 19(42):694-705. Feb. 19. See p. 701-02.

• ***Summary:*** Many kinds of beans are grown in Manchuria. The soya bean is not one of the four "edible" beans that are well known in America. "No crop statistics are prepared by the Chinese and even the acreage of soya bean plantings is never well known. The nonedible oil-producing soya bean is planted on a large scale, whereas edible beans are planted by the Chinese farmers for their own use only, as a rule..." "Beans are sold here by the Japanese picul of 132.277 pounds."

The climatic and other conditions of northern and southern Manchuria are well suited to bean culture, as is shown by their general production everywhere and by the soya-bean crops. It is possible that the soya bean, which has not yet been shown to be a profitable crop and business to all concerned, will in a few years be replaced by other kinds of beans..."

"Beans do not figure in the statistics of trade, and information about them is hard to obtain. The Japanese do not seem to know anything about them. The only edible

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beans about which Japanese seem to have information are what they call 'mungo beans,' several varieties of which (red, white, red and white) are sold locally." Some Mungo beans are known at Dairen as 'azuki.'" Address: Consul, Dairen [Manchuria].

1778. Suzuki, Tozaburo. 1916. Process of making foods. *U.S. Patent* 1,175,839. March 14. 1 p. Application filed 2 Sept. 1913.
• ***Summary:*** In the process of making soymilk, after boiling, a centrifugal machine is used to removed the lees [okara, or pulp]. Then the milky liquid [soymilk] is condensed by evaporation into a dough-like mass, which is placed on flat trays, fully dried, then powdered or molded into any desired forms.

Note: The author, a citizen of Japan, was also an inventor and innovator in the manufacture of soy sauce. Address: No. 401, Jineishinden, Sunamura, Minami-Katsushika, Japan.

1779. Ishikawa, Tatsutaro. 1916. Taishô yonen-chû kenka ni hasseiseru shuyô byôchû-gai [Principal insect pests and diseases occurring during the fourth year of Taisho]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 3(3):196-200. March. See p. 197. [Jap]
• ***Summary:*** Section II (p. 197) is titled "Occurrence of 'moon night' and wilt disease of soybean." Moon night disease is probably soybean cyst nematode. Katsufuji (1919) stated that in March 1916 Ishikawa reported that "soy bean at Shomengahara, Echigo Prov., in Honshu, Japan, was attacked by Nectaria, a larva of beetle and nematode." Address: Niigata-ken Nôji Shikenjô, Japan.

1780. *J. of the Board of Agriculture* (*London*). 1916. The soya bean. 22(12):1286-87. March. Summarized in the Bulletin of the Imperial Institute. 1916. 14:293-95. [1 ref]
• ***Summary:*** "Experiments with soya bean cake tend to show that, when fed in moderation, it is a useful feeding stuff; otherwise it is apt to prove distinctly laxative. For this reason it is usually given along with undecorticated cotton cake. At present prices it is one of the cheapest feeding stuffs on the market. (See also p. 1277 of this *Journal*)." In 1912, some 188,760 tons of soya beans were imported to England, worth £1,567,960. Imports were 76,452 tons in 1913, then 71,161 tons in 1914, and 175,136 tons in 1915.

Discusses early attempts to grow soybeans in Great Britain. "Previous to 1909 a few attempts had been made to grow the crop in England, but without any success; at best, the plants grew up to flowering stage but formed no seed. About this time, with the object of securing the hardiest sorts in cultivation, the Board obtained from an experiment station in North Japan, seed of 16 varieties, together with a small quantity of soil in which the crop had been grown. These were sown at the Midland Agricultural and Dairy College and on the Cambridge University Farm. At both centres the results were similar–many of the varieties grew well, but none formed flowers. Where the Japanese soil had been applied the nodule formation was all that could be desired, but where no inoculation had taken place, no nodules were formed.

"In 1910 the Board obtained seed of several varieties from Manchuria. These were grown at the same centres as before. At the Midland College the crop grew vigorously, but formed no seed, while at Cambridge the plants ripened a small quantity of seed. This seed was sown in 1911, but the crop made little growth, and in spite of the hot season no seed was produced.

"These results prove conclusively that the Japanese and Manchurian varieties hitherto tested cannot be relied upon to produce seed in this country. As the plant appears to be a very variable one, however, it is not impossible that a variety suited to conditions in this country may yet be produced.

"In some experiments at Wye College, Kent, with seed supplied by the Macdonald College, Quebec [Canada], well-filled pods were produced in 1910, from a variety known as "Early Tennessee," when the soil was inoculated.

"Apart from seed production the plant might have some value in this country as a forage crop. It appears to resist drought well, and is largely grown in the United States for green fodder, which appears to be liked by all classes of farm stock. In general composition the green plant resembles clover." Address: London, England.

1781. Nishiyori, Rokuhachi. 1916. Daizu-yu hôwa shibôsan [The saturated fatty acids of soybean oil]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) 5:17-20. March. [Jap]

1782. Togano, Meijiro. 1916. Shôyu kôji no hinpyô-hô [A method for evaluating the quality of shoyu koji]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 63. p. 231-41. March. [Jap]
Address: Jozo Shikensho, Gishi.

1783. Togano, Meijiro. 1916. Ryûsan "mangan" no shôyu moromi ni oyobosu kôka ni tsuite [The effect of manganese sulfate on shoyu moromi (mash)]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 62. p. 190-203. March. [Jap]
Address: Jozo Shikensho, Gishi.

1784. *Washington Post.* 1916. Uses of soya bean: Merits not sufficiently appreciated, food experts point out. April 3. p. 10.
• ***Summary:*** "The general value of the soya bean has not attracted the general attention it deserves, according to experts who are bringing it to the attention of the American

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people. The Japan Society Trade Bulletin points out that the secret of the soya bean is its universal usefulness. Almost more remarkable than the rise of the bean trade itself is the number of discoveries of the uses to which it can be put. The trades commissioner for the government of South Africa gave the following list of soya bean products: Vegetable (like marrowfat peas) soups, meat substitute, chocolate substitute, macaroni preparation, flour, artificial milk, coffee substitute, cheese [tofu], biscuits, [soy] sauce, meal for cattle, oil, oilcake, fertilizer, beancake.

"The oil extracted from the soya bean, he pointed out, was used in the manufacture of the following articles: Dynamite and high explosives, soaps, linoleum, rubber substitute, margarine, paints and varnishes, toilet powder, waterproof cloth, paper umbrellas and lanterns, salad oil, lubricating oil, lamp oil, preserving sardines, lard substitute."

1785. *San Francisco Chronicle.* 1916. A British view of the yellow peril. April 30. p. 26.
• ***Summary:*** The author of this article is given as "O.B. Server." "If the people who are senselessly alarming themselves over the possibility of a war with Japan would take the trouble to read a very comprehensive account of the progress and rise of the Japanese empire, by Robert P. Porter [1915], their apprehensions would probably be allayed."

"As Porter points out, the backbone of Japan's industrial system is agriculture... Modern methods of tillage are almost unknown... This result represents a degree of intensive farming unmatched except in China. Japan is a land of small farms. Only three farmers in a hundred cultivate as much as 8 acres each, and 70 percent of the farms do not exceed two and a half acres each. Manual labor is so abundant that for rice growing seventeen men and nine women are spared for cultivating and harvesting 2.45 acres;... and the soya bean, the cheapest of all Japanese agricultural products, seven men and five women. Wages, as may be imagined, are low, ten yen (about $5) a year being the prevailing rate in many sections."

Note: The phrase "yellow peril" was common in the U.S. newspapers (such as the rival *San Francisco Examiner*) owned by William Randolph Hearst.

1786. Beille, L. 1916. Le Soja [Soya]. *Gazette Hebdomadaire des Sciences Medicales de Bordeaux* 37(9):67-70. May 7; 37(10):73-76. May 21. [4 ref. Fre]
• ***Summary:*** "The question of the soybean (*haricot Soya or Soja*) reappears in our scientific and medical journals from time to time; the importance that this grain has acquired in the diet of the essentially vegetarian peoples of the Far East, and its richness in oil, albuminous materials, and minerals, have long called it to the attention of hygienists. Some authors have wanted to portray the soybean as an ideal food, a little jewel with a nutritive power comparable to that of eggs and meat; others have extolled the milk-like emulsion, obtained by grinding soybeans with water, as an advantageous substitute for cow's milk.

A factory, established on the outskirts of Paris, at Vallées (Seine), was able to supply French consumers with flour, cheeses [tofu], sauces, and many other soy-based preparations used in China and Japan.

"Leaving aside the inevitable exaggerations that accompany a product which is new to us, but which already has an established reputation elsewhere, it is necessary to recognize that the chemical composition of the soybean is of real interest. The Parisian clientele promptly abandoned the sauces, cheeses, and milk made from soya, but they appreciated the sprouts, which are still selling well as vegetables in the markets of Paris and its suburbs; soy-based flour and biscuits are very well adapted for use in diabetic diets."

The author then gives an overview of the soybeans from a medical viewpoint, including a brief history and review of worldwide production and nutritional studies. "In 1779 this plant was introduced to France and cultivated in Paris at the Jardin du Roi. Since that period, despite the laudable efforts of the National Society for Acclimatization, the cultivation of the soybean has not gone beyond botanical gardens and some experimental fields. Nor has it had any more success in England or Italy. However in North America it is cultivated in all the southern parts of the United States, but as a forage plant."

Through the merchant and importer Mr. A. Denis of Bordeaux, the author obtained two varieties of soybeans, one from Manchuria and one from Japan. He conducted a nutritional and microscopic analysis of these.

The author concludes that the soybean has great potential as both a food and an in industrial uses, where the precipitated protein for example, can be used in place of milk casein to make Galalith, artificial ivory, glue, and paper coating.

Part II of this article discusses more about the general nutritional value of soybeans. He then discusses soy flour (*farine de soja;* he has a sample produced by the factory at Valées), soy milk (*lait de soja*), tofu (*fromage de soja*), shoyu and various soy-based sauces (such as *Tao-Tjung* of China, or *Touong* of Indo China).

"In summary the soybean is of great interest from the industrial point of view. The place that it occupies in the oil mills of Europe is already important... Its oil, for food or industrial uses, and its by-product, soy casein, are likely to receive a host of diverse applications. On the other hand, the future of the soybean as a food substance in Europe would seem to be more modest: its disagreeable taste removes it from daily consumption and enables it to be used only as an ingredient in mixtures."

"If, in Europe, with a few reservations, we can include soya in the diet of healthy people, then there will be even stronger reasons to give it to sick people. At first glance

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soya, which is rich in fats and protein, with little or no carbohydrates, appears to be a food of choice for diabetics. And we must recognize that it has attained the greatest success among these sick people. But, here again, it would be appropriate to give soya in the form of rusks/zwieback (*biscottes*), or mixed with vegetables or fruits; if it is not tolerated by sick people in these forms, then we should not hesitate to stop using it." Note: In Europe, rusks are widely given to sick people, like chicken soup in the USA. Both are considered to be good medicinal foods that are easy to digest. Address: Professeur â la Faculté de médecine et de pharmacie de Bordeaux.

1787. *Washington Post.* 1916. Admiral Togo, 'Nelson of Nippon,' 'simple life' model, servants say. May 21. p. ES14.
• ***Summary:*** Admiral Togo, the victor of Tsu Shima, has never been interviewed and he never speaks about himself. Note: Tsushima Strait was the site of a naval battle in May 1905 in the Russo-Japanese War in which the Russian fleet was destroyed or captured by the Japanese fleet under Admiral Togô Heihachiro.

So the *Katei Zasshi,* a popular monthly magazine, sent reporters to "interview the count's butcher and baker and candlestick maker, his barber and fishmonger and man at the corner." By paying attention to his monthly housekeeping bills, they were able to conclude that the hero led a simple, frugal life–which all the tradespeople sincerely admired.

The man at the sake (spirits) shop said: "I get no orders for sacke [saké] nowadays and only send in some soy (sauce) and miso (a curd [sic] made from beans and eaten for breakfast) of the commonest quality, occasionally."

1788. Takimoto, S. 1916. Daizu byôgai nishu ni tsuite [Two soybean diseases]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 3:368-69. May. [Jap]
• ***Summary:*** Records downy mildew and another disease due to mite injury. Address: Chosen Kangyo Mohanjo.

1789. Nemzek, L.P. 1916. The soya bean and soya oil. *Paint Manufacturers' Association of the U.S., Educational Bureau, Scientific Section, Circular* No. 37. 8 p. June 10. [1 ref]
• ***Summary:*** This address was presented on May 18, 1916 (during World War I) at the meeting of the Mississippi Cotton Seed Crushers' Association, New Orleans, Louisiana. Accompanied by three exhibits, it states: "As early as 1907 the Bureau interested itself in a campaign to promote the increased production of flaxseed in the United States. The rapidly increasing demand for linseed oil, by the industries in this country, indicated that we should soon face a shortage of his commodity. It remained for the 1910 flaxseed crop failure to demonstrate what a menace to the pain trade such a shortage meant. Due almost entirely to the resultant scarcity of linseed oil, the price commenced to soar during the latter part of 1910. Linseed oil reached the high price of $1.00 per gallon during 1911 and high prices prevailed throughout most of the year 1912. This condition forcibly showed the necessity for a more profound investigation of oils which might find application as substitutes for linseed in the different industries which use the oil in large quantities. In view of the fact that the work which was done toward promoting an increased production of flaxseed had been so marvelously effective, it was decided to do work of similar magnitude with miscellaneous oils."

"A series of practical paint exposure tests were begun on test fences located at Washington, D.C., in connection with the Institute of Industrial Research. The paints were exposed in May, 1911. The repainting tests were made during the latter part of 1914. This series of tests is referred to in Circular No. 30, 'Repainting Tests on Paint Oils,' issued by the Educational Bureau during December, 1914.

"Soya oil was one of the oils decided upon for the experiments largely because it was already available in quantities and could readily be imported. After looking into the matter it was found that the production of it might be developed on a satisfactory basis in this country. Soya beans were already being grown in considerable quantities, but up to that time domestic oil on a commercial scale had not been produced.

"Soya oil is crushed from the bean bearing that name. The bean is commonly referred to by the agriculturists in this country as 'Soy,' but the oil, ever since it was first imported, has been known as 'Soya Bean Oil' or 'Soya Oil.' Largely for the sake of convenience the title 'Soya Oil' has been adopted and is coming into general use. The title 'Soya' was, very likely, introduced from Manchuria, where the bean is grown in enormous quantities, and is a derivation from the Japanese 'Shoyu' or 'Soja.' 'Soya' is replacing 'Soy' when used in reference to the bean as such, even in the language of the agriculturist, and it is only a question of time when the word 'Soya' will be adopted generally."

"The first step in connection with the Bureau's endeavor consisted of the importation of soya beans from Manchuria for oil-extraction tests and the distribution of this seed, together with seed from a number of varieties already grown in this country, and the soliciting of the assistance of the State Agricultural Experiment Stations and other interested persons to urge the farmer to grow more soya beans for seed. While soya beans had been grown in this country for a good many years, this was done as a forage crop and for fertilization purposes. Only enough seed was being harvested to take care of the succeeding year's planting. The far-reaching propaganda, through the active co-operation of the State Agricultural Experiment Stations and the different Bureaus of the U.S. Department of Agriculture, was solely for the purpose of inducing the farmer to increase his population."

The Bureau reached farmers through the State Agricultural Experiment Stations. "While growing tests

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during 1911 and 1912 were limited to North Dakota, Minnesota, Missouri, New Jersey and Kentucky, they were extended in 1913 to every State, with the exception of a few where conditions are unfavorable from an agricultural standpoint.

"The tests were also extended to the Philippine Islands and to several places in Canada. It is noteworthy in this connection that there are at least two varieties which can be successfully matured as far north as the southern portions of Quebec.

"During 1912, forty-eight varieties were experimented with, including four imported from Manchuria. This number was greatly increased in 1913, so that all available types would be included."

By 1916 the number of varieties had been reduced to about fifteen (see Exhibit No. 1), which were already popular: "Mammoth, Medium Yellow, Ito San, Holly Brooks [Hollybrook], Haberlandt, Peking, Wilson, Auburn, Black Eye Brow [Black Eyebrow]. Arlington, Tokio, Mikado, Virginia, Chiquita, Sable and the Yellow Manchurian bean...

"No sooner were the farmers interested in the larger growth of soya beans than they began to ask for information as to how and where the beans could be disposed of to be converted into oil.

"It was soon evident that the cotton seed mills in the South were best situated for crushing the beans. The location of the hundreds of these mills is fortunate, inasmuch as the South is naturally adapted to become the great soya bean-producing section of the country. Definite plans have not been evolved in sections where the cotton seed mills are not located, but in the northern section of the country the linseed oil mills will, very likely, crush the beans as soon as the production is large enough to warrant their going into the matter. In some sections, notably Tennessee, it was suggested that the farmers in a certain locality club together and conduct their own mill, disposing of the oil in the regular manner, and each farmer to use the cake from his crop for feeding purposes. In this way there would be returned to the land the full fertilizing values of the crop. The promoters of successful agriculture see in this a means to increase the production of soya beans, mainly because of the value which the farmer obtains by the improvement of his soil.

"During August and September, 1913, I made a trip of nearly twenty-four thousand miles, visiting most of the Agricultural Experiment Stations, to discuss matters relating to the increased production of beans for oil-crushing purposes and to determine whether or not the cotton seed mills were in a position to handle the crop without materially altering the machinery they use for the crushing of cotton seed or going to the expense of installing new equipment. Most of my time was spent in the States growing cotton and where cotton seed mills were already established."

Also discusses the oil-bearing properties of different varieties of soya beans (the oil content averages 19% and ranges from 16 to 25%), and the drying properties (see Exhibit No. 2). "During the past six or seven months there has been produced in this country in the neighborhood of one hundred thousand gallons of soya oil. The largest part of this quantity has been produced by the Elizabeth City Oil & Fertilizer Co., Winterville Cotton Oil Co. and the New Bern Cotton Oil & Fertilizer Mills."

Discusses prices at which soybeans should be purchased for profit in the oil industry, and opportunities for disposing of the oil and meal. The author points out the limited uses of soy bean oil in paints; in 1916 some 98,171,275 lb of soy bean oil were imported into the United States. The five samples of soybeans analyzed had an average iodine number of 125.8. But iodine value and drying power do not necessarily go hand in hand, although such is often the case.

"In those sections of the South where the cotton fields are infested by the boil weevil, the growers may find it to their advantage to produce soya beans on a large scale. The Alabama Cotton Seed Crushers' Association has the matter under careful consideration at the present time. The cotton crop of certain sections of that State has been seriously affected by the disastrous results which accompany the boil weevil.

"It is at once apparent that it is to the advantage of the cotton seed mills to take up the crushing of soya beans. In the first place it will help to give the mills a longer season and thereby shorten the period of idleness. This period generally varies from four to six months every year with different mills.

"The crushing of soya oil has advantages over cotton seed; it is a cleaner and easier material to handle preparatory to crushing, and the bean releases its oil as freely, at least, as cotton seed.

"Soya oil can be disposed of just as readily, at least, as cotton seed. The A.M. Parks Company, Philadelphia, commencing with the May issue of 'The Oil Miller,' advertise for domestic soya oil. This is the first ad to appear, and opens up what is likely to prove the most satisfactory outlet for the product of so many mills... In some cases the consumers who could handle it in tank cars would be able to deal direct with the crushers. The A.M. Parks Company was one of the first to import soya oil, and still imports it in large quantities. Two or three years ago the Company distributed an interesting pamphlet entitled 'Soya,' in which the commercial possibilities of the oil are referred to in some detail."

"While practical tests started in 1911 have not yet been completed, and the Bureau, in line with its adopted policy, does not intend to make a definite report until the investigation has been finished, the writer feels safe in stating that large quantities of soya oil will eventually be consumed in the manufacture of paint and varnish. Because of the inferior drying properties of soya oil as compared with linseed oil it cannot entirely displace linseed, and its use in

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connection with linseed oil will be limited to from 25 to 50 per cent., depending on the product in which it is used."

Note 1. This is the earliest English-language document seen (Nov. 1999) with the term "soya oil" in the title.

Note 2. This is the earliest document seen (July 2013) that mentions the soybean variety Chiquita. Address: Special Technical Representative, Educational Bureau, Paint Manufacturers' Assoc. of the United States, Philadelphia, Pennsylvania.

1790. Kawakami, K.K. 1916. The people's safety valve (Letter to the editor). *San Francisco Chronicle.* July 17. p. 14.

• ***Summary:*** "The Chronicle disclaims responsibility for the utterances in this column."

"Japanese influence on the Asian continent has benefited and will continue to benefit American trade." For example, since the "inauguration of the Japanese regime in Korea," American exports to Korea have expanded dramatically. They increased 20 times in the decade from 1902 to 1913. "This is all the more remarkable considering that America buys practically nothing from Korea." In short, Japan did not slam closed Korea's doors.

The situation in Manchuria is somewhat different. "Though Manchuria, after Japan's advent there, bought a great deal of American rails, rolling stock, kerosene and flour, Japanese cotton goods have to a considerable extent replaced American cottons. This, however, is due mainly to the fact that Japan has been almost the sole buyer of Manchuria's premier product, beans, and their by-products, bean cake and bean oil, amounting in value to some $20,000,000. The secret of Japan's commercial success in Manchuria lies chiefly in the operation of the fundamental economic law that the country consuming the major portion of the exports of another country holds the most advantageous position in supplying its necessary imports." Address: San Francisco.

1791. Davis, John K. 1916. China: Antung. *Supplement to Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) No. 52c. p. 1-12. Aug. 16.

• ***Summary:*** The section titled "Increased exports of beans and bean products"(p. 9) states: "The value of the exports of [soya] beans, bean cake, and bean oil amounted to 24 per cent of the total value of exports from Antung, and showed an increase of 40 per cent in 1915, as compared with 1914. The increase in quantity in these exports is seen from the following figures: Beans exported in 1913, 15,233,200 pounds, and in 1915, 45,132,400 pounds; bean cake in 1913, 72,644,400 pounds, and in 1915, 100,509,200 pounds; bean oil in 1913, 384,133 pounds, and in 1915, 1,044,400 pounds.

"The increased exports in 1915 were due to the excellent crops of 1914, to the demand in Japan for bean cake as a fertilizer for the rice fields, and to the strong demand in South China ports for 'raw' beans."

The next section, titled "Several bean mills closed at end of year" (p. 9-10) begins: "In 1915 there were 11 small bean-oil mills, 10 Chinese and 1 Japanese, in operation in Antung, each of which employed 15 to 30 workmen. In these mills the oil is pressed from the soya bean and the residue is then made into large, round, flat cakes, which are exported to China ports and to Japan for use as cattle feed and as fertilizer.

"The bean-cake trade is highly speculative, since the market demand is contingent on two factors, the bean crop and the price of rice in Japan. When the bean crop is good and the price of rice in Japan is high, the owners of the bean mills are able to make large future contracts for bean cake to be used as fertilizer on Japanese rice fields. When, however, it is anticipated that the price of rice in Japan will be down, Japanese farmers do not feel warranted in the purchase of fertilizer and the market for bean cake becomes slack."

"Anticipating still further increases in price, holders of beans refused to sell, with the result that the last months of 1915 saw only a few of the local mills in operation." Address: Consul, Antung, Manchuria.

1792. Moser, Charles K. 1916. China: Harbin. *Supplement to Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) No. 52c. p. 32-43. Aug. 16.

• ***Summary:*** The section titled "Soya beans the leading export" (p. 40) notes that soya beans are by far the leading export from northern Manchuria. "From Nov. 1, 1914, to Nov. 1, 1915, the close of the beans season, the quantity exported amounted to 512,236 tons." The total annual production is about one millions tons. "The balance is retained by the growers and the local market for domestic purposes.

"Of the exports, 411,236 tons were sent through the ports of Vladivostok and Nikolaiefsk (via the Sungari and Amur Rivers), and 101,000 tons by way of Changchun and Dairen. The whole of the shipments through Changchun and Dairen went to Japan, as well as 209,236 tons of the beans shipped by way of Nikolaiefsk and Vladivostok. The remainder, 202,000 tons, went to England, Denmark, and the Netherlands. The striking feature of the year's trade was the great share taken by Japan as compared with former years, when Japan bought but a small share of the exports through Changchun and no part of the other shipments. But in 1915, on account of the extraordinarily high freight rates to Europe, Japan was able to buy the beans at a much cheaper rate than Europe and to resell them to considerable advantage."

The next section, titled "Bean prices and freights–Uncertain prospects" (p. 40-41) begins: "At the beginning of 1915 the bean business was almost paralyzed, owing to the closing of certain European markets, the congestion of the

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local railway lines with war materials, and the uncertainties of ocean freights. Prices dropped to the lowest level known in the local market, and a period of great deprivation threatened the Chinese population. Then conditions changed for the better."

The "outlook for 1916 is considered very uncertain in view of the high freights, the scarcity of transportation facilities, and the difficulty of securing sufficient labor to handle shipments."

Note: This is the earliest document see (Jan. 2009) that gives general information about the transportation of mature soybeans to market within a particular country or region. Address: Consul, Harbin, Manchuria.

1793. Williams, Adolph A.; Dickover, Erle R. 1916. China: Dairen. *Supplement to Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) No. 52c. p. 13-32. Aug. 16.

• ***Summary:*** Of the 77,153 inhabitants of Dairen, 55.0% are Chinese and 44.8% are Japanese. The remaining 0.2% are foreigners. Trading and shipping are now largely in the hands of Japanese and Chinese. "Dairen is a free port, and therefore the Japanese authorities keep no accurate record of imports and exports. But as it is also the principal seaport of southern Manchuria as well as of the Japanese Leased Territory, and is the southern terminus of the South Manchuria Railway, it is the entrance port and distributing center for a large share of the commodities going into and coming out from those parts of Manchuria lying outside the Leased Territory. Therefore the Chinese Maritime Customs maintain an office in Dairen, and it is from their returns that the accompanying tables of statistics were compiled."

"The decrease in exports to the United States [in 1914 and 1915], which was never large, was due to a depression in the bean and bean-oil trade during the early part of 1915." However, this trade has increased again (p. 15).

Although economic changes were brought about by the European War, the principal exports–"soya beans, bean oil, bean cake, corn, and coal"–still moved out steadily. A table (p. 20-21) shows the quantity and value of these commodities exported to foreign countries and to Chinese ports in both 1914 and 1915.

One section, titled "Soya-bean industry–The storage problem" (p. 27-28) begins: "The soya bean, which has been responsible for much of the prosperity of the port, sustained its reputation in 1915. In spite of loss of some European markets and the difficulties attending shipping to others, the volume of business was large and more beans were handled at this port than ever before." "At Dairen the storage capacity of the wharves was taxed to its uttermost, and could not contain the produce arriving in a ceaseless stream.

"While beans may be stored in the open, piled up in bags and covered with tarpaulins, or in temporary ozier [osier] bins, bean cake can not be stored, as its value depends largely upon its weight, which would be affected by snow or rain; hence bean cake must be stored under cover. The railway authorities warned the bean mill union that their output should be decreased or the cake would have to be stored in the open while awaiting shipment" (p. 28).

The next section, titled "Condition of bean market" (p. 28) begins: "The large crop of rice in Japan brought down the prices of beans so that the purchasing power of the farmer and the broker was severely weakened. The large supply of beans, the rise of freight rates to more than double the usage charge, the loss of certain markets in Europe, and difficulties connected with guaranteeing delivery into the hands of neutrals, all worked against beans, as did the low price of silver and the scarcity of containers, both for beans and for oil. Beans were shipped in larger quantities than heretofore to Java, which appears as almost a new market."

The next section, titled "Mixed storage of bean cake" (p. 29) begins: "During 1915 several plans for assisting the bean trade were brought up. The mixed storage of bean cake is now an accomplished fact, while the mixed storage of beans (not in bulk, but in bags) is accepted in principle. Produce exchanges were nearly arranged for at Kaiyuan and at Changchun by the end of the year and will be opened early in 1916. The South Manchurian Railway changed its standard carload of cake to 1,000 pieces, or about 30½ tons per car for a 30-ton car.

"There are three kinds of cake on the market–mixed storage cake, rejected cake, and train cake. The first named is the best, being standard at 46 kin (61 pounds) each, while the others may be several pounds or ounces over or under the standard. In 1915 so much cake was stored that the cakes came out considerably lighter than they went in. This loss was due to the evaporation of water absorbed in the process of manufacture... Mixed storage works to the advantage of owner, buyer, and railway by facilitating the financing of owners and the making of shipments, as well as the securing of sellers and buyers. The cake put out at Dairen is the best on the market." Address: 1. Consul; 2. Vice consul. Both: Dairen, Manchuria.

1794. Murakami, Kamekichi. 1916. Bean-curd and the process for making same. *U.S. Patent* 1,195,843. Aug. 22. 3 p. Application filed 11 March 1916. 5 drawings.

• ***Summary:*** The inventor, a citizen of Japan, describes the process and apparatus for making "bean cubes" from "beans known as the 'soy' bean, raised largely in Korea and Japan and to some extent in California." Illustrations (line drawings) show: (1) Two views of one of the cubes. (2) A vertical sectional view of the stone grinder or mill, in which the soaked beans are ground with water. (3) A similar view of a lever press for pressing the soymilk from the pulp. (4) A box in which the "bean jelly" is formed; it has drainage holes in the sides and bottom. (5) Detailed views of the bottom and

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one side of the forming box.

The ground beans are slowly poured into boiling water; the mass of bean paste is kept in a boiling condition for 15-20 minutes. During boiling a mixture of 3 parts slaked lime and 7 parts edible vegetable oil is added, causing the foam on the surface to sink. Salt water or nigari is used as the coagulant, and it is added in 4 steps.

Note: The person who wrote the final patent apparently had difficulty understanding the process Mr. Murakami was describing. He wrote "skins" instead of okara or pulp, and wrote "pulp" instead of soymilk. Address: Seattle, Washington.

1795. Tanaka, Katsuhirô; Katashima, Hideo. 1916. Kabi o shôsezaru shôyu no shisei [Test production of mold-free shoyu]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 414. p. 757-58. Aug. [Jap]
Address: 1. Zeimu Kantoku Kyoku Gishi; 2. Zeimu Kantoku Kyoku Gishu.

1796. Cunningham, Edwin S. 1916. China's production of beans, bean oil, and bean cake. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 19(209):886-87. Sept. 6.
• ***Summary:*** "The soya or soy bean in recent years has become an important article of trade. It grows on a plant from 2 to 3 feet in height and is contained in pods about 2 inches long. The plant is cultivated everywhere, in fields by itself, around rice and similar crops, and as an undercrop to maize and sorghum. There are 25 to 50 varieties of the soya bean, but in commerce only 3 are ordinarily recognized–yellow, green, and black.

"The yellow bean, which is of greatest importance, is found generally throughout Manchuria, and it is reported that the finest crops come from the highlands to the north of Mukden. The green variety comes from the Liaotung district and the Yalu basin, and the black bean from Liaoyang and the south of Mukden. There are two other varieties, the brown bean and the mottled bean, which are grown to some extent in the Yangtze Valley, but these varieties are of little importance.

"Grown largely for its oil in Manchuria: The Soya bean is put to many uses in the Far East. It is cooked and eaten as a vegetable, made into a sauce or soy, preserved as a pickle, ground into a flour and made into vermicelli, and employed extensively in the manufacture of vinegar. One particular variety, having small yellow seeds, is used in making bean curd. In Manchuria, however, the soya bean is grown almost exclusively for its oil properties and for the residual material called bean cake.

"The soya bean contains about 18 per cent oil. When the hydraulic-press method is employed only 11 to 12 per cent of the oil can be extracted, but with the use of benzene in the chemical process 17 per cent is obtainable. This oil is used as an illuminant, a lubricant, for culinary purposes, and in the manufacture of soap. In southern China it is also used in the making of waterproof cloth, paper umbrellas and lanterns, and when mixed with lacquer is employed in the manufacture of varnish and printing ink.

"Dairen is the center for the bean-oil industry, exporting more than eight times as much as Hankow, its nearest competitor. The oil mills, which are to be found in every town throughout the bean district, are growing in numbers and becoming more modern all the time. The old crush-stone mills worked by animals are rapidly giving way to up-to-date hydraulic, steam, and oil-motor plants. Hankow has about 10 such mills. During 1914 the local exportation of bean oil was 4,714 tons, valued at $393,759 gold, and during 1915 there were 6,882 tons, valued at $482,694.

"Japan takes practically all bean cake exported: After the oil has been pressed from the bean, the residue is pressed into the round, flat cakes known as bean cake. The product is very valuable as a fodder for animals, and as a fertilizer... Japan takes practically all the bean cake exported, and the United States none.

"The greatest original exporting center for bean cake is Dairen; Newchwang is second, and Hankow a poor third..."
Address: Consul General, Hankow.

1797. Ohira, Chugo. 1916. The open door. *Los Angeles Times.* Sept. 8. p. II4.
• ***Summary:*** "In a country like Japan, with an ever-increasing population and yet with very limited resources, a policy that does not aim at industrial and commercial expansion is unthinkable... It is natural, therefore, that Japan is reaching out for markets in China, as elsewhere.

"Does this Japanese ambition come in conflict with the Hay doctrine, commonly known as the 'open door' policy? Does this Japanese policy menace American trade in China?"

Note: In Sept. 1899, U.S. Secretary of State John Hay issued his first Open Door notes advocating equal opportunity trade with China and equal taxation of foreign trade in all treaty ports, inside as well as outside the new 'spheres of influence.' By 1900 China's survival as a state seemed more dubious than ever. Hay's second note, a circular of July 1900, sought to preserve the integrity of China. Open Door became the established U.S. Policy toward China.

"It is unmanly, more than unjust, to quote as do certain critics the falling off of American trade in Manchuria as an instance of Japan's interference with the full and free course of commerce in that Japanese sphere of influence. The decrease, as was found by an American investigating committee sent over there, is not due to unfair methods employed by the Japanese but to the following reasons: the Japanese are practically the sole consumers for the soya bean–Manchuria's premier product–which gives Japan the

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most advantageous position to supply the necessary imports of Manchuria;..." Address: Editor, East and West News; Member of the Law School at Tokio Univ. [Japan].

1798. *Atlanta Constitution* (*Georgia*). 1916. The future of the domestic cow has been jeopardized by certain Japanese savants. Sept. 10. p. A12.
• ***Summary:*** "Owing to the scarcity of cattle in that country and the consequent scarcity of milk, these investigators of the secrets of nature have had recourse to the soja bean, and, after treating it with water, sugar, and phosphate of potash, they have been able to produce a compound that is scarcely distinguishable from fresh milk."

1799. Gallagher, Patrick. 1916. Japan's policy in China as viewed by the British press, with some recent comment by Japanese writers (Letter to the editor). *New York Times.* Sept. 30. p. 10.
• ***Summary:*** Argues that the Chengchiatun incident of 13 Aug. 1916 was provoked by Japanese troops in Manchuria largely because of Japan's desire to control Manchurian soya beans. Chengchiatun is a town in Manchuria near the border of Mongolia. Address: Editor, The Far Eastern Bureau.

1800. Saito, Kendo. 1916. Ueber die chemischen Bedingungen der Askenbildung bei *Zygosaccharomyces major* Takahashi et Yukawa (Vorlaeufige Mitteilung) [On the chemical conditions of spore formation of *Zygosaccharomyces major,* the shoyu yeast]. *Botanical Magazine* (*Tokyo*) 30:249-56. In back half of journal. [Jap]
• ***Summary:*** This article, written in Japanese, has both a Japanese title (*Shôyu jôbokin no shinô keisei ni yôsuru kagaku-teki jôken ni tsuite* (*yohô*)) and a German title (shown above). This is the first of a 3-part series published in this journal. Parts 2 and 3, written in German, were published in 1918–32(373):1-13, and 32(374):15-25.

1801. *American Food Journal.* 1916. Soya beans for incombustible celluloid. 11(10):520. Oct.
• ***Summary:*** "Tokio papers state that a Japanese professor has invented an incombustible celluloid which can be made from soya bean cake, and is superior to all others of the kind, in that its cost is only about 20 yen, or 10 cents, per pound, as compared with the normal cost $5 and $6. It is also stated that a valuable lacquer varnish is obtained as a by-product."

1802. Scidmore, George H. 1916. Oriental production of beans–Japanese production of beans. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 19(262):504-06. Nov. 7. See p. 506. Submitted Sept. 25.
• ***Summary:*** "In 1914, 464,889 *cho* (1,138,978 acres) were devoted to the cultivation of soy beans in Japan, and 130,003 cho (318,507 acres) to the cultivation of red beans [azuki]. No later figures of the extent of the acreage devoted to the cultivation of beans are available.

"Dairen, Manchuria, is the principal port of shipment of beans in the Orient." Address: Consul General, Yokohama, Japan.

1803. Piper, C.V.; Morse, W.J. 1916. The soy bean, with special reference to its utilization for oil, cake, and other products. *USDA Bulletin* No. 439. 20 p. Dec. 22. [9 ref]
• ***Summary:*** Contents: Introduction. Soy beans in Manchuria. Soy beans in Japan. Soy beans in Europe. Soy beans in the United States. Methods of oil extraction. Soy-bean meal as human food. Soy-bean meal as stock feed. Soy-bean meal as fertilizer. Uses of soy-bean oil. Analysis of important varieties of soy beans. Possibility of developing a manufacturing industry with American-grown soy beans.

"Analyses of important varieties of soy beans (p. 16-17):... In determining the range in the oil and protein contents of over 500 varieties grown in the variety tests at Arlington Farm, Virginia, the percentage of oil was found to range from 11.8 to 22.5 [Tokyo had 20.7% and Biloxi had 20.3% oil] and of protein from 31 to 46.9 [Chiquita had 46.9% protein]... At the present time the Mammoth Yellow variety is the most generally grown throughout the South and is the one used in the production of oil. The yellow-seeded varieties, which are most suitable for the production of oil and meal, contain the highest percentage of oil.

"Environment has been found to be a potent factor in the percentage of oil in the same variety. Considerable differences occur in oil content when soybeans are grown in different localities. The Haberlandt variety grown in Mississippi, North Carolina, Missouri, Virginia, and Ohio gave the following percentages of oil, respectively: 25.4, 22.8, 19.8, 18.3, 17.5; while the Mammoth Yellow variety grown in Alabama, South Carolina, Tennessee, North Carolina, and Virginia gave, respectively, 21.2, 19.6, 19.5, 18.4, and 18.8. Variety tests conducted in various parts of the country indicate a higher percentage of oil with the same variety for southern-grown seed. Similar results have been obtained in Manchuria, the North Manchurian beans showing an oil content of 15 to 17 percent and the South Manchurian beans from 18 to 20 percent."

Photos (both by Frank N. Meyer) show: (1) A fleet of junks carrying soy beans to Newchwang, Manchuria.

(2) Coolies at Newchwang, carrying loads of soy beans from junks to big stacks.

An outline map of the USA (p. 8) shows the area to which the soy bean is especially adapted for growing for oil production. The area of double hatching shows that it is especially well suited to the Deep South. The northern boundary of the area were it is "less certain of profitable production" includes the southern one-third of Ohio, Indiana, and Illinois, and most of Missouri. On the west, the "less

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certain" area includes the eastern one-third of Nebraska, Oklahoma, and Texas.

Tables show: 1. "Exports of soy beans, bean cake, and bean oil from the principal ports of South Manchuria (Antung, Dairen, Newchwang), 1909 to 1913, inclusive." 2. "Quantity and value of exports of soy beans and soy-bean oil from Japan to foreign countries, 1913 and 1914." The countries are: China, United Kingdom, France, Germany, Belgium, United States, Hawaii, British America, Australia, other countries. 3. "Quantity of imports of soy beans, soy-bean cake, and soy-bean oil from Dairen, Manchuria, into Japan, 1911 to 1914, inclusive. The greatest imports were of soy-bean cake, followed by soy beans, with only small amounts of oil.

(4) "Quantity and value of imports of soy beans, bean cake, and bean oil by European countries, 1912 to 1914, inclusive." The countries are: Austria, Belgium, France, Germany, Italy, Netherlands, Russia, Sweden, United Kingdom. In 1912, the UK imported the most soy beans, while Netherlands imported the most cake and oil. (5) "Quantity and value of imports of soy beans, soy-bean cake (Footnote: Includes bean cake [perhaps fermented tofu or canned regular tofu], or bean stick [probably dried yuba sticks], miso, or similar products, with duty, 40 per cent) and soy-bean oil into the United States, 1910 to 1915, inclusive." The quantity of soy bean imports was greatest in 1915 with 3.837 million lb. The quantity of soy-bean cake imports was greatest in 1913 with 7.005 million lb. The quantity of soy-bean oil imports was greatest in 1911 with 41.106 million lb. "Prior to 1914 soy beans were not classified separately in the customs returns" (p. 9). (6) "Composition of soy-bean flour in comparison with wheat flour, corn meal, rye flour, Graham flour, and whole-wheat flour."

(7) "Value of a short ton of soy-bean cake and other oil cakes in the principal European countries" (Incl. cottonseed, linseed, peanut {Rufisque}). Countries: Germany, United Kingdom, Netherlands, Denmark, Sweden. (8) "Analyses [nutritional composition] of soy-bean meal and other important oil meals." (Incl. Cottonseed, linseed (old and new processes), peanut (decorticated), sunflower seed). (9) "Fertilizing constituents [nitrogen, ammonia, phosphoric acid, potash] of soy beans, soy-bean meal, and cottonseed meal."

(10) Analyses for protein and oil of important varieties of soy beans grown at Arlington Farm (Virginia), Newark (Delaware), and Agricultural College (Mississippi). The varieties are: Mammoth, Hollybrook, Manchu, Haberlandt, Medium Yellow, Ito San, Chiquita, Tokyo, Lexington, Guelph, Black Eyebrow, Shanghai, Peking, Wilson, Biloxi, Barchet, Virginia. Note 1. "At the present time, the Mammoth Yellow variety is most generally grown throughout the South and is the one used in the production of oil" (p. 16). (11) "Acreage, production, and value per ton of cottonseed in the boll-weevil states." "Since the boll weevil first entered Texas in 1892," it has steadily decreased production of cottonseed. The soy beans offers a good replacement. (12) "Comparative prices per ton of cottonseed and soy beans on the European market, 1911 to 1914, inclusive." Soy beans are usually slightly more expensive.

Note 2. This is the earliest published document seen that contains soy-related photos by Frank. N. Meyer.

Note 3. This is the earliest document seen in which William Morse describes soy milk, or mentions natto, or correctly mentions tofu.

Note 4. This is the earliest document seen (Aug. 2013) that mentions the soybean variety Lexington. Address: 1. Agrostologist in Charge; 2. Scientific Asst. Forage-Crop Investigations, USDA, Washington, DC.

1804. Piper, C.V.; Morse, W.J. 1916. The soy bean, with special reference to its utilization for oil, cake, and other products: Soy beans in Japan, in Europe, and in the United States (Document part). *USDA Bulletin* No. 439. 20 p. Dec. 22. [2 ref]

• ***Summary:*** "Soy beans in Japan (p. 4):... In many districts it is cultivated not in fields by itself, but in rows along the edges of rice and wheat fields. Although not grown to any considerable extent as a main crop by the Japanese farmer, the average annual production is about 18,000,000 bushels. In quality the beans raised in Japan are said to be superior to those of Manchuria and Chosen [Korea] and are used exclusively in the manufacture of food products. The imported beans, of which very large quantities are obtained from Manchuria and other Asiatic countries, are used principally in the manufacture of bean cake and oil."

"The soy bean forms one of the most important articles of food in Japan. It is one of the principal ingredients in the manufacture of shoyu (soy sauce), miso (bean cheese), tofu (bean curd), and natto (steamed beans). The beans are also eaten as a vegetable and in soups; sometimes they are picked green, boiled, and served cold with soy sauce, and sometimes as a salad. A 'vegetable milk' is also produced from the soy bean, forming the basis for the manufacture of the different kinds of vegetable cheese. This milk is used fresh and a form of condensed milk is manufactured from it. All of these foodstuffs are used daily in Japanese homes and for the poorer classes are the principal source of protein. To a limited extent, soy beans are used as a horse or cattle feed, being sometimes boiled and mixed with straw, barley, and bran."

"Soy beans in Europe (p. 6): The soy bean was first introduced into Europe about 1790 and was grown for a great number of years without attracting any attention as a plant of much economic importance. In 1875 Professor Haberlandt, of Vienna, begun an extensive series of experiments with this crop and strongly urged its use as a food plant for man and animals. Although interest was increased in its cultivation during the experiments, the soy bean failed to become of

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any great importance in Europe. At the present time it is cultivated only to a limited extent in Germany, southern Russia, France, and Italy."

"Soy beans in the United States (p. 7): Although the soy bean was mentioned as early as 1804 (Footnote: Willich, A.F.M. American Encyclopedia, 1st Amer ed., v. 5, p. 13. Philadelphia, 1804), it is only within recent years that it has become a crop of importance in the U.S. At the present time the soy bean is most largely grown for forage. In a few sections, such as eastern North Carolina, however, a very profitable industry has developed from the growing of seed... The yields of seed to the acre in various sections of the United States range from about 15 bushels in the Northern States to about 40 bushels in the northern half of the cotton belt. The average yield in eastern North Carolina is about 25 bushels, although many fields produce 35 bushels or more to the acre..." Note: This is the earliest U.S. document seen (June 2003) that cites the 1804 publication by Willich [and James Mease] concerning the soybean in Philadelphia. Note that this article appeared 112 years after 1804.

"The first extensive work in the U.S. with the soy bean as an oil seed was entered upon about 1910 by an oil mill on the Pacific coast. The beans, containing from 15-19% of oil, were imported from Manchuria, and the importations, most of which are used in the manufacture of oil and cake, have gradually increased, as shown in Table V. The oil was extracted with hydraulic presses, using the same methods employed with cottonseed and linseed. It found a ready market, as a good demand had been created for this product by soap and paint manufacturers, which up to this time had been supplied by importation from Asiatic countries and England. The soy cake, ground into meal, was placed on the market under a trade name and was soon recognized as a valuable feed by dairymen and poultrymen. The use of the cake has been confined almost wholly to the Western States, owing principally to the high cost of transportation."

"An industry which promises to be of importance in a further utilization of the soy bean is the manufacture of 'vegetable milk.' At the present time a factory in New York State is being equipped for this purpose." Address: 1. Agrostologist in Charge; 2. Scientific Asst. Forage-Crop Investigations, USDA, Washington, DC.

1805. Combe, Ad. 1916. Comment se nourrir en temps de guerre? Troisième partie [Where can one find proper nutrition in time of war? Part III]. *Bibliothèque Universelle et Revue Suisse* 84:446-73. Dec. See p. 450-51. [Fre]
• ***Summary:*** Vegetable milk (*Le lait végetal*)–For a long time in infant medicine we have used Lahmann's vegetable milk (*Le lait végetal de Lahmann*) which is nothing more than concentrated almond milk, sterilized and preserved in tin cans. It was formerly widely used by German pediatricians to prepare an artificial milk. But its high price does not recommend it as a war food.

Soymilk (*Le lait de soya*)–We will not say as much about other artificial milks, widely used in Germany since the war, as about that prepared from soybeans (*fève de soya*). But there is no need to get excited about a German discovery; soymilk comes from Japan where it has been used for a long time to replace natural milk; it has been used only rarely in France. It is prepared as follows: Soybeans are cooked until the liquid becomes white [sic], then sugar is added along with phosphates and potash [potassium]. It is then condensed into a creamy liquid analogous to condensed milk; this is soy butter [sic]. By diluting it with water, one obtains an artificial milk which somewhat resembles regular milk in taste and appearance.

Apparently inspired by this [Japanese] method, soymilk has been prepared in Germany for some years in ever larger amounts–so much so that in 1913 Germany imported 125,448 metric tons (tonnes) of soybeans a year, from which they obtained that year 18,000 tonnes of soy oil and soymilk. This artificial milk, it must be said in passing, is the ideal milk for diabetics, for whom it is suited because of its high content of fats and protein and its low content of carbohydrates. A table show the content of protein, fat, carbohydrates and calories in whole soy flour, soymilk, and cow's milk.

Soymilk is used with great advantage is times of war. Because of its high fat [vegetable oil] content, it can replace butter in the diet, to which it adds calories, for it is easy to digest and inexpensive. Address: Prof. of children's clinical studies, Univ. of Lausanne (Professeur de clinique infantile à l'Université de Lausanne).

1806. Williams, C.B. 1916. Soy-bean products and their uses. *North Carolina Agricultural Experiment Station, Circular* No. 34. p. 1-7. Dec.
• ***Summary:*** Contents: Introduction. First commercial crushing from domestic beans (started on 13 Dec. 1915 by the Elizabeth City Oil and Fertilizer Company of Elizabeth City, North Carolina). Soy-bean oil. Uses for the oil. Soy-bean meal. Composition and exchange value of the meal. Prices paid for beans by the oil mills. Soy-bean oil industry in England, Manchuria, and Japan. Importation of oil. Soy-bean meal as feed. Soy beans and products for human food.

The article begins: "In order that any people may maintain their soils in the highest state of productivity in an economical way it will be necessary that proper systems of crop rotation are used, and in these rotations it will be necessary to bring in leguminous crops at as frequent intervals as practicable. For North Carolina conditions one of the crops of this nature that may be used to good advantage in all parts of the State is the soy bean. If properly handled, this crop may be used as the means of adding to the productivity of the soils as well as to increase the net returns from the farm. Recently there has been a marked interest throughout this State and the South in the growing of soy

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beans." A "new outlet for the beans has developed from the crushing of the seed by a number of oil mills of the State..." The spread of the boll weevil should lead to increased interest in the soy bean.

"This crop was introduced into the State something like thirty-five years ago, yet very little was heard of it, outside of very limited areas, until quite recently, when a campaign was begun to induce the cotton oil mills of the State to use beans for crushing purposes in the same general way that cotton seed had been used for many years before. This campaign not only opened the eyes of the oil crushers to the possibilities of the soy bean in a commercial way, but of the farmers, also, to the great opportunities of this crop.

"During the spring of 1915 farmers, particularly in the Eastern part of the State, were casting about to find a crop or crops that might be substituted, satisfactorily, for cotton, as the price of this latter crop during the previous fall had been, in many cases, below the cost of production. Many farmers increased their acreage of soy beans, and as a result of this increase at least a million bushels or more of beans were produced last year." Something like 80,000 to 100,000 bushels of soy beans were used by the cotton oil mills of the State during the past fall, winter, and spring.

"The first commercial manufacture of soy-bean oil and meal from domestic soy beans in the United States was started on December 13, 1915, by the Elizabeth City Oil and Fertilizer Company of Elizabeth City, North Carolina.

"From the start this mill operated night and day solely on soy beans until it had crushed it supply of about 20,000 bushels. This mill was able to crush about twenty tons during each twenty-four hours...

"It is understood that before the mill had ground a single bean they had contracted their entire output of oil to one of the leading manufacturers of the country at fairly reasonable prices. It, too, had no difficulty in selling its entire output of soy-bean meal, most of it going to a fertilizer manufacturer. From a ton of the beans this mill was able to secure something like 32 to 35 gallons of oil and about 1,650 pounds of meal... Other oil mills in North Carolina that crushed more or less soy beans during the past season were those located at New Bern, Hertford, Winterville, Washington, Wilson, Farmville, Lattimore, and at a few other places."

"Uses for the oil: At the present time the oil is used in this country chiefly in the manufacture of soaps, varnishes, paints, enamels, linoleums, and water-proofing materials. It has entered, also, to some extent in the manufacture of edible salad oil and butter substitutes" (p. 3). "Soy-bean meal: The meal secured from crushing the beans is the most valuable product and will have the widest usefulness. That secured from the crushing of yellow-colored beans is of a bright yellow color... Meal, too, that has been treated with ordinary solvents, employed for this purpose to remove the oil, is of a brighter color than are those meals from which the oil has been removed by heating and pressure. The oil, however, secured by a solvent process would be of a darker color... The soy-bean cake secured by expression methods, has a pleasant taste, not unlike malted milk, and when ground into meal may be used, at the present time, chiefly for feeding to livestock or for fertilizing purposes. The meal as a feed is highly concentrated and nutritious, and all kinds of stock seem to relish it when fed to them properly. It should not be fed in large quantities for any great length of time, because of its highly concentrated nature. As a fertilizer it acts satisfactorily. Much of the meal produced by the oil mills of the State during the past year seems to have been sold, without any difficulty, to manufacturers for the making of mixed fertilizers."

"... during 1913 and 1914 the British Oil Mills, located mainly at Hull, England, paid from $1.00 to $1.17 per bushel for Asiatic beans. During 1915 the price paid at the mills at Hull varied from $1.04 per bushel in January to $1.82 per bushel at the end of the year.

"In England, the oil from the soy bean is extracted largely by a secret process owned by an oil extracting company of Hull. By this process the seed are ground finely and are then treated directly by means of a solvent, which is thought to be benzine. Afterwards the oil is removed from the solvent by distilling off the latter, the solvent being used over and over again in the extractive process."

"By use of gasoline extraction the whole of the oil may be secured, the oil being of a clear, pure color, and hardly bearing any resemblance at all to the dark, muddy oil secured by the old hand-press method.

"The machinery used by the larger operators of England, Continental Europe, as well as of Japan, Korea, Manchuria, and China, is of Anglo-American manufacture, which is the kind ordinarily used in the expression of oil from cotton seed. In 1910 Stewart and Chard secured patents in England for a special machine which was particularly adapted for breaking up the beans. This machine has been very useful in solving some of the difficulties experienced in the soy-bean crushing industry in England.

"In England soy-bean oil for general purposes is not refined, as is cotton-seed oil in America, by the use of caustic soda, but by means of sulphuric acid and fuller's earth.

"Processes of refining soy-bean oil for edible purposes have been devised, but these, like those used for extracting the oil from the seed, have been kept secret; but they are thought in most cases to be by means of superheated steam."

"Importation of oil: In this connection it may be of interest to know that for the five years ending with 1916 there were imported into this country more than 174,000,000 pounds of soy-bean oil, which represented crushings amounting to more than 12,000,000 bushels. Of these, 47.6 per cent came through the port of New York; 36.1 per cent through Seattle [Washington]; 9.6 per cent through San Francisco [California]; 2.2 per cent through Philadelphia

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[Pennsylvania]; 1.6 per cent through Boston [Massachusetts]; 1.1 per cent through Chicago [Illinois]; and 1.3 per cent through all other ports of the United States. In 1916, 75 per cent of the importations came through the ports of Seattle and of San Francisco, the chief port of entry being Seattle, with 62.9 per cent of the total importation. During 1916 more than 98,000,000 pounds of soy-bean oil came in from other countries, 99.9 per cent of the total coming from Asia. Of the total amount imported from Asia, almost 72 per cent were shipped from Japanese ports. The total importations during 1916 wore valued at little more than $5,000,000."

"Soy beans, before crushing, and the meal secured by crushing, seem to have great possibilities in the way of different human foods. They are not only rich in food nutrients, but when properly prepared make very appetizing products...

"In this country some enterprising manufacturers are putting out prepared pork and beans, part of all of the beans being soy beans. A regular preparation of these which the writer has tried proved to be of as high grade as could be desired...

"Muffins made from soy-bean flour have been found to be very palatable [a recipe is included]...

"The chief value of the flour lies in its high content of protein (muscle-forming material) and mineral matter, one pound of it containing as much protein as two pounds of meat. Bread made from the soy-bean flour in Germany, where it is being largely used at the present time, secures about the same amount of food value as six dollars spent for meat. The flour seems to have especial value in the preparation of foods for delicate infants which have difficulty with digesting cows' milk, and for persons suffering with diabetic troubles." A diagram (p. 7) shows "Products secured from the crushing of a ton of soy beans by the oil mill, and the material made from these products." One ton yields 1,650 lb of meal, 32 gallons of oil, and 120 lb of trash and moisture. From the meal one can make food (human and animal), fertilizer, and celluloid. The human food can be macaroni, flour, sauce, milk, cheese, coffee, and lard. From the oil one can make food (cooking oils, butter [margarine?]), paints, enamels, blown oil (linoleum, India rubber substitutes, varnishes), and soap stock (soaps, glycerine). Note: This is the earliest English-language document seen (August 1996) that contains a diagram of this type. Address: Chief, Div. of Agronomy, North Carolina Agric. Exp. Station.

1807. Ito, T. 1916. Shôyu no seisei oyobi seihin-hô no kenkyû [Studies on the manufacture of shoyu and its products. I-VI.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 11(7):33-43; 11(8):28-36; 11(9):19-29; 11(10):14-30; 11(11):14-25; 11(12):24-35. [Jap]

1808. Tanaka, Katsuhirô; Katashima, Hideo. 1916. Kabi o shôzezaru shôyu no shisei [Studies on mold-free shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 11(6):27-28. [Jap]
Address: Hiroshima Zeimu Kantoku Kyoku Gishi.

1809. Togano, Meijiro. 1916. Shôyu jôzô ni okeru san dai yôten [Three main principles of shoyu brewing]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 11(7):11-33. [Jap]
Address: Jozo Shikensho Gishi, Nôgaku-shi, Japan.

1810. Togano, Meijiro. 1916. Miso no sokujô ni kansuru nidai kairyô yôten [Two major improvements in rapid manufacture of miso]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 11(4):1-6. [Jap]
Address: Jozo Shikensho Gishi, Nôgaku-shi, Japan.

1811. Hawaii Shimpo-sha (The Hawaii Shimpo). comp. 1916. Hawai Nihonjin nenkan, dai 13-kai [Annual directory of Japanese in Hawaii. 13th ed]. Honolulu, Hawaii: Hawaii Shimpô-sha (The Hawaii Shimpo). 380 + 22 p. Plus 22 unnumbered leaves of plates. Illust. 23 cm. Reprinted in 2007 in Japan by Bunsei Shoin (edition: Denshi Fukkokuban). Edited by Eizaburo Okuizumi and Yoshishige Onuma. [Jap]*
• ***Summary:*** Company name with diacritics is: Hawaii Shimpô-sha. Address: Honolulu, Hawaii.

1812. Nihon hyakka daijiten: Tôfu [Encyclopedia Japonica: Tofu]. 1916. Tokyo: Sanseido. See vol. 7, p. 885. [Jap]
Address: Tokyo, Japan.

1813. Piper, Charles V. 1916. Forage plants and their culture. Revised edition. New York, NY: Macmillan Co. xxi + 618 p. Illust. Index. 20 cm.
• ***Summary:*** The table of contents of Chap. XXII–Soybeans (p. 513-38) is identical to that in the 1914 edition. The same fifteen soybean varieties are still handled by seedsmen. A black-and-white photo (facing p. 510) shows the seeds of ten soybean varieties.

Also includes discussions (identical to those in 1914 ed.) of: Lupines (*Lupinus* spp., p. 487-88). Square-pod pea (*Lotus tetragonolobus,* p. 489-90). Cowpeas (Vigna sinensis, p. 491-512). Peanut (*Arachis hypogœa,* p. 546-48). Adzuki bean (*Phaseolus angularis,* p. 554-55). Kudzu (*Pueraria thunbergiana,* p. 563-65). Chufa (*Cyperus esculentus,* p. 596-97). Address: Agrostologist in Charge of Forage Crop Investigations, Bureau of Plant Industry, USDA.

1814. Shin Sekai-sha. 1916. Zaibei Nippon-jin kan [Directory of Japanese in the USA]. San Francisco, California: Shin Sekai-sha. [Jap]*
• ***Summary:*** The 1916, 1928, and 1936 editions are at University of Washington (Seattle). Several other universities

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(UCLA, Univ. of Oregon) also have the 1936 edition. Address: San Francisco, California.

1815. Sornay, Pierre de. 1916. Green manures and manuring in the tropics, including an account of the economic value of leguminosæ as sources of foodstuffs, vegetable oils, drugs, etc. Translated from the French by F.W. Flattely. London: John Bole, Sons and Danielson, Ltd. xvi + 466 p. Illust. 26 cm. [12 soy ref]

• ***Summary:*** This book is dedicated "To my esteemed Master and Friend M.P. Bonâme. A token of deep gratitude and sincere admiration." It "was awarded a gold medal by the *Société Nationale d'Agricole de France."* The translator is from the International Institute of Agriculture, Rome, and the Dep. of Zoology, University College of Wales, Aberystwth. In the introduction H. Pellet states (p. viii) "M. de Sornay, who for a number of years has been a member of the Agronomic Station of Mauritius, had already published, some time ago, in the *Bulletin* of the Station, a short treatise on the Leguminosæ." This volume is a major expansion of that work. The author was one of the first to study intercropping of sugar cane with legumes. Working in Mauritius, he found that legumes used in mixed cultivation with sugar prevented the growth of weeds and retained the soluble salts which would have been washed away by rain. A trailing variety of peanut was used. He also suggested soybean as an intercrop because "it does not interfere in any way with the small canes; the soybean may be used on a mixed cultivation and may even be sown in two rows in interspaces of canes" (p. 184). Also includes concise information about the cultivation and yield of soybeans.

Chapter 1, "General remarks" (p. 1-9) begins: "The family of the Leguminosæ, which numbers not less than 7,000 species distributed over every portion of the globe, contains, according to Van Tieghem, 430 genera." "The Leguminosae are generally divided into three great sub-families: Cæsalpineæ, Mimoseæ, and Papilionaceæ." The first two sub-families prefer tropical climates, whereas the Papilionaceæ "adapt themselves to every climate and are found distributed from the Equator [Ecuador] to the Poles." The Papilionaceæ are divided into eleven tribes; a table shows these and the subtribes or genera they contain. The genus Glycine is in the tribe Phaseoleæ, subtribe Glycina.

Chapter 2 is an "Account [history] of the theories on the absorption of nitrogen from the air by the leguminosæ." Chapter 3 (p. 9-46) is a "Description of the various leguminous plants of agricultural value." The 37 species discussed include the peanut (p. 47-70), Bambarra ground-nut or Voandzou (p. 70-72, native of Madagascar), *pois carré* [winged bean] (*Psophocarpus tetragonolobus*), and Soja, or Soy bean (p. 182-92).

The rambling treatment of the soy bean discusses bits and pieces of its history, botany, and yields in India, South Africa, and Mauritius. Nineteen tables show its composition. Concerning uses: "The seed of the soy bean is eaten as a vegetable by the majority of Chinese and Japanese, and they make numerous other uses of it." The chief ones are: Soy milk, soy cheese [tofu], and shoyu. "The roasted seeds of the soy bean are used in the United States and Switzerland as a substitute for coffee. Not containing any starch, these breads are used in the manufacture of breads and biscuits for people suffering from diabetes. They are found on the European market... The seeds are pressed in order to extract the oil, the oil resulting from the first expression being used in the manufacture of soap, whilst that from the second is used as machine oil. The cake is given to cattle mixed with other nutriments of lower nitrogen content. The trade in soy has increased considerably during the last five years." Trade statistics (exports of soy beans from Manchuria and imports to Europe) and prices on the London market (of soy beans, oil, and cake) are given.

Chapter 7, "Starch in the leguminosæ" (p. 246+) discusses the "Characters of the principal starches in the Leguminosæ." It contains an illustration (line drawing) of the starch in Soja hispida (Fig. 42, p. 251), and a description (p. 255) as follows: "Soja hispida.–Soy contains very little starch. The shape of the grains is fairly uniform, whilst their size is very variable. All the grains polarize clearly. The hilum is linear, occasionally stellate, but of rather rare occurrence. The striations are only visible at the edges and are very close together. Starch only very slightly homogeneous." Address: Chemist, Ex-Asst. Director of the Station Agronomique of Mauritius, Laureate of the Association des Chimistes de Sucrerie et de Distillerie de France et des Colonies, Laureate of the Société Nationale d'Agriculture de France.

1816. Todorovich, D.N. 1916. Iapono-russkaia torgoliia [Japanese-Russian trade]. *Doneseniia Imperialisticheskogo Rossisskogo Konsul'stva* (*Reports of the Imperial Russian Consulates*). See p. 30-31, 42-43, 48-49. [Rus]

• ***Summary:*** Tables give import-export data by category from 1877 to 1914, from 1912 to 1914, and for the first 7 months of 1915. Address: Russian Consul in Kobe.

1817. Woodroffe, Joseph Froude; Smith, Harold Hamel. 1916. The rubber industry of the Amazon and how its supremacy can be maintained. London: Fisher Unwin Ltd.; Bale, Sons & Danielson, Ltd. xlviii + 435 p. Illust. Index.

• ***Summary:*** Title page: This book is based on the experience of Joseph F. Woodroffe, author of "The Upper Reaches of the Amazon," edited and with additions by Harold Hamel Smith, editor of *Tropical Life.* Note: Woodroffe does not mention soya beans in his book, but Smith mentions and recommends them repeatedly as a valuable new crop for Brazil.

Pages 122-23: Brazilians should clear new ground and plant young rubber trees. "The ground round about the new shoots should be kept clear of weeds, &c., by a judicious

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planting of sweet potatoes, soya beans, groundnuts, or other suitable pasture grasses. This is really the only practical and profitable method of raising plantation rubber along the Amazon."

Chapter 10, titled "The Japanese as planters, artizans, &c." recommends attracting both Japanese and Chinese to Brazil to raise rubber trees, soya beans, and rice (p. 163-64). "... the introduction of the Orientals to the Amazon region would ensure her rapidly becoming one of the world's chief producers, and not of rice only but of soya beans and other foodstuffs as well" (p. 176).

The Chinese have a great love of progeny (which has led to over-population in many large districts), and they are very hard working. "All these circumstances combine to make the Chinese frugal and thrifty and so cause them to be even more ideal as a colonizing and populating people in Brazil. Again, rice is cultivated by them, in face of great natural disadvantages, on a scale which no other race has attempted, and I have more faith in the rice field and soya-bean gardens for resuscitating the people of Brazil and its various industries than all the 'Defesas' ever thought of. Like the Japanese, and perhaps more so, they are practised in all branches of farming and agriculture,..." (p. 188).

An industry of wood-pulp and paper-making would be very profitable along the Amazon. After the unwanted brush and shrubs are removed, ground-nuts, soya-beans, maize, sugar, cotton, etc. could be planted (p. 249).

"If in choosing a site for extensive cultivation one of these large *playas,* as the sandbanks are called, were selected, huge quantities of mandioca [cassava], maize, soya and other beans, ground-nuts, and other quick crops could be grown without any of the charges incidental to clearing ground;..." (p. 265).

"Then we come to soya-beans (*Glycine hispida*), which have already been tried in the neighbourhood of Manaos [Manaus, Brazil] and are doing well, whilst the *Review of River Plate,* some time back, was recommending its cultivation in Argentina, urging as a reason for so doing that present supplies are not equal to the demand. Acclimatized seed gave 869 lb. to the acre (in Argentina), and I understand that the bean can be harvested there within 110 to 115 days after sowing, against 150 to 180 days in Manchuria.

"'For the following reasons,' wrote my friend, Mr. E. H. Heron [of Mozambique], who has had great experience in the production and introduction of economic products in several tropical centres, 'the soya-bean has, during the past few years, since the Russo-Japanese War in particular, risen from comparative insignificance in European countries to being a product of great importance. The beans contain a high percentage of oil, which can be used for edible purposes or in the manufacture of soap; whilst the residue is used in the manufacture of cattle cake and meal. As a fodder plant it is rich in nitrogen, albuminoids and fat, and is fed in the green state as hay and silage. Under favourable conditions the plant may reach a height of 4 ft. or more, rising 3 to 5 ft. high, as a rule, and bears prolifically, say 1,100 to 1,600 lb. per acre, whilst at the Government Experimental Farms in South Africa an output as high as 2,000 lb. has been recorded, a good average yield of pods per plant being forty, whilst some are said to yield 100 pods. As a forage crop it gives, under favourable circumstances, 12 tons of fresh fodder to the acre, but since there are supposed to be over 300 varieties, it behoves [behooves] the planter to see that he secures the one most suited to his soil, climate, &c., putting down experimental plots here and there, in the first place.'"

"A report was issued in 1913 by the Trade Commissioner of the Government of the Union of South Africa, with a view of encouraging the cultivation of this useful crop out there. It would be a good thing for Brazil to secure a copy of this and, translating it into Portuguese, have it widely distributed throughout the Republic. Anything and everything contained in its seven pages (foolscap size) is worth noting, and at the same time it gives enough information for anyone to start on."

"Stock-raisers of cattle, pigs, poultry, &c., will find both soya-beans and ground-nuts of great value as a feed, either as a green forage or as cake or meal. Both, and especially soya-beans, can be grown satisfactorily with maize, and if grown for silage the two can be cut together. The percentage of the oil (in soya-beans) varies greatly: some talk of as low as 10 per cent., others of over 20 per cent., but with 12 per cent. to 15 per cent. its cultivation should still pay well" (p. 316-19). Soya beans are also mentioned in passing on pages 324 and 347.

1818. *Washington Post.* 1917. Putting it over on the cow: Japanese manufacture artificial milk from vegetables. Jan. 26. p. 6.

• ***Summary:*** From the Youth's Companion: "The milk problem is by way of being solved in Japan, where cows are scarce, by an extensive use of artificial milk derived from the soy bean. First, the Japanese soak the beans, then boil them [sic, after grinding] until the liquid turns white, when [after filtering] they add sugar and phosphate of potash. The boiling is resumed until a fluid results very similar in consistency and appearance to ordinary condensed milk. When water is added, soy milk is hardly to be distinguished from fresh cow's milk.

"In composition also the artificial milk is almost like genuine milk. Its proteins, fats and sugars are in very nearly the same proportion, although, of course, they are wholly vegetable in origin.

"Whether the substitute is equal to real cow's milk as a form of nourishment is not quite clear, for much of the value of milk as a food comes from the enzymes or vitamines it contains. The Japanese, however, declare that it serves all the purposes of cow's milk, and that it has the advantage of being less liable to infection when properly and carefully

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manufactures."

1819. *Oil, Paint and Drug Reporter.* 1917. Market for other vegetable oils. Prices highest in years–Production increased–Soya imports enormous. 91(7):74-75. Feb. 9. Annual review–Extra edition.
• ***Summary:*** The section titled "Soya bean oil" begins (p. 75): "Imports of soya bean oil into the United States for the calendar year amounted to approximately 250,000 barrels, the largest in the history of the trade. In 1915 the total importations amounted to but 50,000 barrels, and in 1914 the arrivals were even smaller. The tremendous increase in imports during 1916 was inspired by the shortage in fats and vegetable oils and the entire quantity was readily absorbed, consumers paying comparatively high prices for the material. Practically all of the oil imported came from Japan. Owing to the success of the 1916 season even greater quantities will be shipped to these shores over the coming year. Trade authorities predict that in 1917 the importations of soya bean oil will amount to approximately 500,000 barrels."

Heavy speculation in this commodity was a factor in the large imports and high prices. "The shortage in the supply of cottonseed oil made consumers look around for other oils and fats to fulfill their needs. Soya bean oil, being the lowest in price of all competing oils, importers and consumers immediately took advantage of the situation. Owing to the unusual conditions prevailing in the freight market arrangements were entered into whereby large shipments could come to this country via Seattle [Washington] and other Pacific coast points. This arrangement proved satisfactory, especially to Western consumers. The soapmakers were the principal buyers, but large quantities also were taken by manufacturers of edible oils and lard compound. Through the perfection of the hydrogenation process lard compound makers were enabled to consume large quantities."

"The year opened with soya bean oil quoted in the New York market, spot delivery, at 7.75@8c. per pound, in barrels." The price rose steadily during the year and "in December sellers were asking from 11½c. [cents] to 12c. per pound, cooperage basis, spot delivery" [= available for immediate delivery after sale].

"Early in the year paint makers bought soya sparingly, owing to the comparatively low market [price] for linseed oil." But demand increased in the fall, as linseed oil prices rose.

A table shows the high and low prices for soya bean oil (per pound in barrels) each month from Jan. 1914 to Dec. 1916.

1820. *New York Times.* 1917. Japan's Copper King owes fortune to father. March 4. p. X8.
• ***Summary:*** Japan ranks 2nd, after the USA, among the world's copper producing countries. Japan's Copper King is Baron Furukawa, whose father, Ichibei Furukawa, was a self-made man. Ichibei was born in Kyoto's suburbs. When his father, a sake brewer, sank into poverty through business reversals, young Ichibei turned from brewing sake "to selling tofu, or bean curd." One day, while working as a "peddler of tofu... he collided with a palanquin bearing a stately samurai or nobleman, and his stock of bean curd was thrown into the street. Refusing to be overawed by the splendor of the nobleman, the boy requested that he be compensated for his loss, but the bearers of the palanquin, filled with a sense of their master's importance, scornfully refused to heed his request and continued on their way." From that moment, he made up his mind to rise in life. Yet he peddled tofu for at least 2 more years to save up his money.

1821. *San Francisco Chronicle.* 1917. From coast ports. March 5. p. 9.
• ***Summary:*** "Seattle–Special dispatch to The Chronicle. March 4. With a cargo consisting principally of 1,130 bales of raw silk, 847 cases of silk goods, 9,500 cases of firecrackers and 80 barrels of soya bean oil, the O.S.K. [Osaka Shosen Kaisha] liner Canada Maru arrived early this morning from the Orient. She brought eight first-class passengers and thirty-eight steerage passengers."

1822. Morse, W.J. 1917. Re: Soybean varieties obtained by Cromer / Indiana directly from Japan. Letter to Prof. C.O. Cromer, Associate in Crops, Purdue University, Lafayette, Indiana, March 6. 1 p. Typed, without signature (carbon copy). [1 ref]
• ***Summary:*** "Dear Prof. Cromer: In looking over my notes taken on the soy bean variety tests at your station the past season I find reference to a number of new varieties which were obtained by you directly from Japan. I should like to obtain, if possible, an ounce or two of seed of each of these different varieties, if you find it convenient to spare this amount of seed. I wish to test them out in comparison with some of our introductions from Japan and Korea in our variety tests at Arlington Farm [Virginia].

"I should also like to obtain a one or two ounce sample of the Chestnut, Mongol, Black Champion, and Sable varieties.

"Inclosed is a franked tag which may be used in sending this seed and which requires no postage."

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–Correspondence with State Agric. Exp. Stations, 1899-1923. Box 12–Illinois-Indiana. Folder–Indiana Experiment Station–#6.

Sent to Soyfoods Center by Jacob Jones of Purdue Univ., Aug. 1998. Address: Scientific Asst., Bureau of Plant Industry, Washington, DC.

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1823. *Christian Science Monitor.* 1917. Soya bean oil from the Orient. March 17. p. 19.
• ***Summary:*** "Tacoma, Washington–Soya bean oil from Japan, worth $2,000,000, has been received in two cargoes and forwarded to one of the large soap manufacturers of the country by a special train of 30 tank cars. Soya bean oil, which is growing in favor with soap manufacturers in America, is used in England as part of the process of manufacturing lard, or is used without being mixed as a lard or cooking oil. The consignment just shipped is the largest ever received in the United States."

1824. *Wall Street Journal.* 1917. Oil from Orient. March 17. p. 2.
• ***Summary:*** Except for a slight difference in title, this article is identical to that published on this same date in the *Christian Science Monitor* (p. 19).

1825. *International Review of the Science and Practice of Agriculture* (*International Institute of Agriculture, Rome*). 1917. International trade in feeding stuffs: Annual Review No. 3. 8(4):489-551. April 1. See p. 490-91, 502-05, 535-43. [29 ref]
• ***Summary:*** The Introduction begins: "This third *Annual Review* gives the *International Trade in Feeding Stuffs* up the end of 1916 as far as the present conditions allow, and according to the scheme established in the send Review (1).

"Two new headings have been introduced: soya and soya-cake, brewing residues; for these are given, under the heading *coefficients,* the factors used to calculate the production of concentrates on the basis of the available supply of raw materials."

The section titled "Production of concentrated foods for livestock," under coefficients (p. 491), states: "Soya cakes–For countries importing soya, the production of cakes has been estimated at the rate of 80% of the net importation."

Three tables (p. 502-04) give figures in metric tons for 1912 to 1916. The first table, titled "Trade in soya [soybeans]" (p. 502) gives figures as follows: (a) Producing countries: China (exports), Korea (exports), and Japan (production, imports, exports). (b) Importing countries: Germany, Belgium, Denmark, United States, France, Netherlands (imports and exports), United Kingdom (imports and re-exports), Russia, and Sweden. The largest exporter of soybeans in 1912 is China (661,004 tonnes), followed by Korea (98,674). The largest importer in 1912 is United Kingdom, followed by Germany, Netherlands, Denmark.

The second table, titled "Trade in soya cake" (p. 503) follows the same format with the same countries as the first table. The largest exporter of soya cake in 1912 is China (493,477 tonnes), followed by Korea (1,063). The largest importer is Japan (518,056), followed by Netherlands (23,852).

The third table, titled "Production of soya cake in importing countries" (p. 504) gives estimated figures for Germany, Belgium, Denmark, United States, France, Netherlands, United Kingdom, and Russia. The largest producer in 1912 was the United Kingdom (143,431 tonnes), followed by Germany (77,014) and Denmark (27,185).

1826. *Los Angeles Times.* 1917. Grow soya beans: Movement to start a new and profitable industry at Tacoma [Washington]. April 8. p. III22.
• ***Summary:*** From Philadelphia Public Ledger: "An attempt to inaugurate an entirely new and profitable industry in Tacoma and the Puyallup Valley [both in Washington state], in the growth of the soya bean, with the probability that the experiment will prove successful and result in the erection in Tacoma of an oil-extracting plant to cost from $50,000 to $75,000, is announced.

"The soya bean is one of the most valuable imports of the United States from Japan, and a product which may be put to more uses than probably any other." Many uses are listed.

"Some time ago W.H. Paulhamus of the Puyallup and Sumner Fruit Growers' Association suggested that the Keystone Cereal Company of this city, which imports an enormous quantity of the bean in cake form, make an effort to obtain some seed. The agents of the company in Japan, after lengthy negotiations, were finally able to purchase a quantity of seed, the concession being made by the Japanese only because of the trade the local company gave them. This seed will be distributed free of charge to farmers of the Puyallup Valley and Western Washington by the growers' association and cereal company. The seed will be sown in January, and it is expected a good crop will result, as the Puget Sound climate is very similar to that in Japan."

"Two shipments of the cake form of the beans are due here next week, each amounting to 1,000 tons. All of the beans received in America have passed through an oil-extracting mill, where from 16 to 18 per cent. of their oil has been extracted, and the cake is then sold at from $35 to $38 a ton. If the bean could be grown in this country an immense profit would result to the grower and manufacturer, it is said.

"Previous attempts have been made to get seed of the bean and test it in this country, but a sufficient quantity has never been obtained, the Japanese merchants being unwilling to jeopardize their trade in the commodity.

"The soya bean is very common in Japan,... Cakes made from the bean [probably tofu] form one of the delicacies in the diet of the common people."

1827. *J. of Home Economics.* 1917. The soy bean. 9:183-84. April.
• ***Summary:*** "The soy bean, already one of the most important crops of Asia, promises to take an important place in the agricultural industry of the United States. It is said that it may be utilized in a greater number and a greater variety

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of ways than almost any other agricultural product. Not only are the beans, and the oil expressed from them, available as food, but soy bean oil is used for making paints, varnishes, soaps, rubber substitutes, linoleum, waterproof goods, and lubricants, besides its use in the Orient for lighting and other purposes.

"In Japan the soy bean is one of the principal ingredients in the manufacture of shoyu (soy sauce), miso (bean cheese), tofu (bean curd), and natto (steamed beans). The beans are eaten also as a vegetable and in soups; sometimes they are picked green, boiled, and served cold with soy sauce, and sometimes as a salad. A 'vegetable milk' is also produced from the soy bean, not only forming the basis for the manufacture of the different kinds of vegetable cheese, but used fresh, while a form of condensed milk is also made from it. All of these food stuffs are used daily in Japanese homes, and for the poorer classes are the principal source of protein.

"Soy bean oil resembles that of cotton seed in many ways. The meal remaining after the oil is extracted from the beans has become important during the last few years as a food of low starch content, and so adapted to the use of diabetic patients.

"Soy bean flour enters as a constituent into many of the so-called diabetic breads, biscuits, and crackers manufactured as food specialties. The flour or meal may be used successfully in the household as a constituent of muffins, bread, and biscuits in much the way in which corn meal is used.

"An artificial milk like that manufactured in the Orient has been produced in small quantities in the United States, and recently a factory has been equipped to make this product. Such milk may be used for cooking in the household, and by bakers, confectioners, and chocolate manufacturers. Such products must, of course, be properly labeled.

"The soy bean has also been utilized as a substitute for the coffee bean. When roasted and prepared, it makes an excellent substitute for coffee."

1828. Yukawa, Matao. 1917. Daizu no tansuikabutsu oyobi sono shôyu jôzô to no kankei ni tsuite [Soybean carbohydrates and their relation to shoyu fermentation]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 38(4):318-58. April. [12 ref. Jap]
• ***Summary:*** The author found the following carbohydrates in matured soy-bean seeds: Total carbohydrates (in anhydride form): 21.69%. Cane sugar [sucrose]: 5.90%. Stachyose: 3.52%. Araban: 3.80%. Galactan: 4.64%. Fiber (crude): 3.85%.

Note: According to Oshima (1922) an English-language translation was made by Dr. W.T. Swingle, USDA Bureau of Plant Industry.

1829. Yukawa, Matao. 1917. Shôyu moromi no jukusei ni okeru chiroshin no hen'i [Changes in tyrosine during aging of shoyu moromi]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 38(4):358-73. April. [Jap]

1830. Prinsen Geerligs, H.C. 1917. Ueber die Anwendung von Enzymwirkungen in der Ostasiatischen Hausindustrie [On the application of enzymes in East Asian cottage industries]. *Zeitschrift fuer Angewandte Chemie, Wirtschaftlicher Teil* 30(3):256-57. May 8. [Ger]
• ***Summary:*** Paper read before the *Niederlaendische Chemische Vereinigung* (Dutch Chemical Union), General session in The Hague, December 28, 1916.

This paper is on the domestic application of enzyme actions in Eastern countries, and describes, among other things, the making of fermented and non-fermented soybean food products. "To make soymilk (*Milchersatz*), only white soybeans are used, softened in water for 3 hours until they have swollen to 3 times their original size. Then, while water is added continuously, they are milled between two hard stones and fall through a hole in the bottom stone into a pail. A very small amount of the thin soybean slurry is set aside; through the proliferation of lactic acid bacteria it quickly becomes so sour that after several hours that lactic acid content has risen to 1.5%. The above mass is cooked in a large pan. The now pasteurized liquid is filtered through a large sieve to remove the hulls and hard pieces. The filtered milk-white liquid has, in appearance and chemical composition, the greatest similarity with animal milk. A sample contains 6.9% solids, 3.13% protein, and 1.89% fat. It gives an alkaline reaction and contains a solution of legumin bound to potassium phosphate, while the fat is emulsified in the thick protein solution. Unfortunately this soymilk (*Bohnenmilch*) tastes very much like raw French-beans (*Schneidebohnen*), so that people who are accustomed to cow's milk do not enjoy it much. But infants should be very content with it.

"If cheese is to be made from this milk, a small amount of the slurry soured with lactic acid is added to it. Thereby, the legumin (protein) is dissolved from the potassium phosphate and coagulated, then settles out with the fat with which it is emulsified. When the milk, through several hours mixing with the coagulation liquid, has become fully firm, it is packed in cloths and pressed between boards, in order to remove any excess water. Then the cakes are cut into square pieces; if they are to be eaten raw, it must be done quickly, lest they continuing souring and spoil. In order to impart a pleasant color to the cakes, they may be placed for several moments in a Curcuma [turmeric] decoction. Mostly the cakes of cheese (*Kaesekuchen*) are dried in the sun or fried (*gebraten*). They then keep better and acquire a pleasant flavor."

"Of much greater significance is the preparation of the most popular and prevalent soybean preparation, soy

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sauce (*der Soja*), which in East Asia is an indispensable seasoning for a variety of dishes, and is produced and used in unbelievably large quantities. There are various types, some of which contain wheat flour. But here we will consider only the type that is made [in the Dutch East Indies] with soybeans plus some added ingredients to improve the flavor.

Note: This is the earliest German-language document seen (April 2012) that uses the term *der Soja* to refer to soy sauce.

For the preparation of soy sauce, brown or black soybeans are cooked for several hours. After pouring off the cooking water, the beans are placed in flat trays (*Hürden* [*tampah*]) of woven bamboo and dried for half a day in the sun, then cooled in the shade. When they are cooled, the beans are covered with leaves of *Hibiscus tiliaceus,* a species of mallow, and they are soon covered with a layer of Aspergillus mold, which is usually found on the tiny hairs or cilia on the underside of the hibiscus leaves and so is transferred to the beans. The mold filaments or hyphae penetrate between the tough and thick cell walls, dissolve these through hydrolysis, and thus make the cell contents accessible to the influence of the molds. The mold is allowed to work until it forms spores (*Fruchtstaende*). The beans then appear to be covered with a brownish green felt. The beans are then dried in the sun and placed in a strong, cold salt solution. The mixture is placed in the sun for several days and then cooked. The brine solution, which contains the soybean extract, is poured off and the beans are cooked several more times until they have lost their salty taste. The various cooking extracts are mixed, filtered through a fine sieve, then mixed with palm sugar, aniseed [*Pimpinella anisum*], and an herb extract, which one can buy at a druggist's shop, and finally cooked until salt crystals appear. The soy sauce (*Soja*), which is now ready to use, is a dark brown, thick, very salty liquid, in which a viscous sediment forms. By diluting with water, it becomes turbid. But the solution again becomes clear with the addition of salt. This thorough investigation has shown that the mold hyphae branch out into the cell walls, hydrolyze and dissolve the pectin substances, and likewise break down the protein content of the cells to leucine, tyrosine, asparagine, and other decomposition products of legumes.

"But this action and result is of secondary importance. The main point is the dissolution of the cell walls, whereby the protein becomes free and can be dissolved in the concentrated salt solution. The composition of soy sauce, except for the salt content, is very similar to that of meat extract, so that it can completely replace meat in the largely vegetarian diets of the people of the East.

"In a similar way, various other foods are obtained, whereby a mold dissolves the cell wall and so fulfills the function otherwise accomplished by cooking. We mention here only the bean paste (*Bohnenbrei*) [*tao-tjo*], for the preparation of which, dehulled white soybeans are cooked and then mixed with rice flour and glutinous rice flour (*Kleereismehl*). The mixture is placed in a small basket that is lined with the same hibiscus leaves mentioned above, and the Aspergillus molds growing on the leaves are allowed to develop. This saccharifies the rice starch flour and dissolves the bean cell walls. Thereby, the mixture becomes sticky and glutinous, and tastes sweet. It is dried and placed in a pot with saltwater. There it remains until each bean is permeated with salt and a sample tastes salty. Palm sugar is added to taste and it is ready for use without further cooking. Microscopic analysis showed that the cell walls were completely dissolved and the contents lay free, so that the mold growth had greatly improved the digestibility of the beans.

"In Java, soybeans are also cooked and made into flat cakes on a flat bamboo lattice. A small piece of an old cake is added and the mass is covered with banana leaves. One soon observes a rise in temperature and the development of moisture. The mass is penetrated by hyphae of *Rhizopus Oryzae,* which again dissolves the cell walls and frees their contents. The cake [tempeh, though the term is not mentioned] with its covering of mold, is consumed without further processing, raw or fried (*gebraten*).

Also discusses the preparation of onchom from peanut press-cake. Address: PhD, Netherlands.

1831. *Argus* (*Petaluma, California*). 1917. Hay, grain and feed market. May 12. p. 4, col. 3.

• ***Summary:*** Includes: "Soyo bean meal–$2.75."

"Cotton seed meal–$2.75."

"Oil cake meal–$3.25."

Note: "Soyo" seems to be a brand name, and "bean meal" clearly means "soybean meal." It is possible (even likely) that this meal was made in Petaluma by the *Daizu Seisan Gaisha* (Soybean Food Products Co.), which has a full-page ad that appeared on 1 Jan. 1919 in the *Japanese-American Directory* (*Nichibei Jushoroku*), published in San Francisco on page 40 near front. One of the items that they make is soybean meal, listed in the ad as *Mamekasu* [Soybean presscake, probably left over from making soybean oil]. However the brand name "Soyo" is not mentioned in the ad. Petaluma had a large poultry industry at the time, that supplied San Francisco and the Bay Area with chickens and eggs.

The 1919 Sanborn fire insurance map for Petaluma (p. 22) shows the "Soy Bean Co. Soy bean meal mill" was located on Weller St., near the corner of Weller and Adams.

1832. Williamson, A.A. 1917. Soya beans for American mills. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 20(125):795-99. May 29. [1 ref]

• ***Summary:*** Discusses the Manchurian soybean industry with reference to the possibility of soybean imports for use

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in American mills. Contents: Introduction. Trade developed originally with England. Special regulations established. Arrangements for settling future deals. Advisable course for American buyers. Production in the Harbin consular district. Varieties of soya beans. Put to many uses in Far East (in central and western China it is ground into a flour to be made into vermicelli, and employed extensively in the manufacture of vinegar and bean curd). Dairen a center for oil industry. Places of production–export figures. Differences in quality of oil.

"Soya beans have never been shipped from Dairen to the United States so far as is known at the American consulate. Certainly they have never been among the declared exports, although they may have gone by way of a Japanese port...

"The soya bean first became known to world trade in 1908 when shipments to England were made by the Mitsui Bussan Kaisha, although it has long been an article of everyday use among the Chinese. In the boom that followed many evil practices arose, as a result of which losses of considerable amounts were sustained by firms interested in the business and not engaged in speculation, largely through the failure of some dealers and speculators to deliver merchandise contracted for in advance. By 1910 things had come to such a condition that whenever a ship came in to load for Europe the price of beans would soar far above the normal market prices, as it was known that several of the foreign firms had contracted to deliver beans but had not been able to obtain delivery of the 'future' beans they had bought. So it came about that the date of a ship's arrival was kept secret by its agents as long as possible to enable the charterers or special clients quietly to get together their cargo before the market began to rise. Several firms became bankrupt as a result of their losses, and the soya-bean business itself began to fall into bad repute.

"Japanese officials sought a remedy, and as a result the Dairen Staple Products Exchange and the Dairen Trust & Guaranty Co. were formed in June, 1913. By the regulations then put into force, all deals had to be made between licensed dealers, and both parties were protected...

"Beans are generally shipped in gunny bags holding 150 kin (198.42 pounds). The 100-pound bag favored by the American trade is not known here... The picul (133 1/3 pounds in China) is a standard weight in the Far East, 100 kin or catties making a picul...

"Soya beans, under the 1909 tariff, were subject to an import duty in the United States of 45 cents per bushel of 60 pounds. Oil was duty free. Under the 1913 tariff both are on the free list...

"The Dairen wharves are good and are well equipped to handle large ships. Although elevators and loading machinery are not employed here because of the cheapness of coolie labor and for other reasons, the work is done expeditiously, 17,000 tons having been loaded in one day, while about 10,000 tons may be put down as the average, without night work...

"Dairen is the center of the bean-oil industry, shipping about eight times as much each year as Hankow which is its nearest competitor... Japan takes practically all the bean cake exported. The United States takes none...

"The exports of soya beans from Hankow during 1915 were: Black 8,927 tons, green 10,513 tons, and yellow, 52,218 tons." Exports for 1916 are also given in a table. Address: Consul, Dairen, Manchuria.

1833. *Hartford Courant* (*Connecticut*). 1917. The soy bean. June 12. p. 8.
• ***Summary:*** "At last the motive for urging the cultivation of soy beans has been discovered, it being nothing less than to increase the available supply of soap. which is doubtless a praiseworthy purpose. News comes by way of Seattle, Washington, from which port Mitsui & Co. have shipped in one lot forty tank cars, each carrying 8,000 gallons of soy bean oil, to Ivorydale, Ohio, the location of a soap factory [Procter & Gamble Co., makers of Ivory Soap].

The oil was made in Japan and the shipment is said to be the shipment is "said to be the largest on record."

1834. Iguchi, Juji. 1917. Nattô no saikingaku-teki narabini kagaku-teki kenkyû [Bacteriological and chemical research on natto]. *Sapporo Norin Gakkaiho* (*J. of the Society of Agriculture and Forestry, Sapporo*) 9(41):195-216. June. [13 ref. Jap]
Address: Nôgaku-shi, Japan.

1835. Ishii, Eiichi. 1917. Mamekasu-sei pate [Paste from soy bean refuse]. *Japanese Patent* 31,331. July 19. 2 p. [Jap]
Address: Manchuria (probably); Kanto-shu, Ryojun-shi.

1836. *Christian Science Monitor.* 1917. Little known foods from sea and shore. July 21. p. 18.
• ***Summary:*** "Squid is another fish little known in America. It is a common food in Japan,... Frequently it is served raw, cut in very thin slices and eaten with soy beans, sometimes with both soy beans and vinegar."

Seaweeds (which include kelp. kombu, and dulse) are much eaten in Japan.

1837. *Hartford Courant* (*Connecticut*). 1917. The case of the soy bean. July 21. p. 10.
• ***Summary:*** That the soy bean "will become forthwith an article of food for New England folk is very unlikely even though the National Emergency Food Garden Commission is now urging the public to can the beans.

"The strange campaign for the introduction of this new article of diet has moved W.P. Brooks of the Massachusetts Agricultural Experiment Station to publish a fairly conclusive statement upon the matter. He says the advocates of the soy bean say something like this about it: -

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"'The soy bean is a very rich food; it can be successfully grown in Massachusetts and will give a large yield; it is palatable prepared and served in similar ways to those employed in the cooking of ordinary field and garden beans. The last statement is, I believe, absolutely incorrect, and the others require qualification. The fact that I have had unusual opportunities of observation and experience with this crop leads me to ask space for this article since I hope it may be the means of preventing discouragement and disappointment. I lived for twelve years in Japan. In that country the soy bean has for many hundreds of years been an important crop. The Japanese made practically no use of it as a vegetable prepared by ordinary methods of cooking. They are very largely vegetarians, and if it were adapted to such use there can be no doubt they would so employ it.'

"Then Mr. Brooks goes on to say that since coming to this country he has tried baking the soy bean and the members of his family were a unit in agreeing that it was nowhere near as desirable as the native varieties. He had roasted and ground the bean and used it as a substitute for coffee and found it a trifle less worse than when baked.

"He says that the bean is rich in protein and fat but he adds that it is much too rich to be palatable. While the Japanese do not use it as a cooked food they contrive to make a cheese [tofu] of it, but this they do not prepare in the family but buy it of manufacturers. They also use the bean in preparing a sauce [soy sauce] and make extensive use of it as a food for cattle. Finally he says that while he does not wish to discourage experiments he does not think it will be regarded as useful as an article of food.

"The most productive varieties, he says, are not likely to mature in Massachusetts but several varieties will generally produce a crop. They need, he says, a season a little longer than the larger sorts of field corn and they will produce from twenty to twenty-five bushels to the acre. Do Connecticut people care to raise soy beans with this outlook, especially when it is considered desirable to inoculate the soil with a certain bacteria before attempting to get a crop?"

1838. *San Francisco Chronicle.* 1917. Milk of the soy bean. July 27. p. 16.
• ***Summary:*** From Philadelphia Public Ledger: "The milk from soy beans, which cannot be distinguished from cows' milk by taste or by chemical analysis, is wholly practical, asserts Dr. Arao Itano, of the Massachusetts Agricultural College at Amherst. Dr. Itano, who is a native of Japan, and studied at European universities before coming to the United States, says that the soy bean is identical with cow's milk in composition. In Manchuria soy bean milk is in general use. Dr. Itano has improved upon the Manchurian process so that the slight bean flavor has been wholly eliminated. Soy bean milk can be produced at low cost, and Dr. Itano believes that it can be made to yield butter and other products. Members of the New England Milk Producers' Association, which has announced the intention of boosting the price of milk 2 cents a quart this month, says that while soy beans are rich in protein, the beans needed to produce a given amount of milk would produce more if fed to high-bred dairy stock."

1839. Matsumura, Shonen. 1917. A list of the Aphididae of Japan, with description of new species and genera. *J. of the College of Agriculture, Tohoku Imperial University* 7(pt. 6):351-414 + plates. July. See p. 387-88. [Eng]
• ***Summary:*** Section 25, titled *Aphis glycines* n. sp. (presented as a new species), discusses the hosts, distribution, and morphology of these aphides (insects). Its body is 1.6 mm long. Its habitat is Hokkaido, Japan. It feeds on soybeans (*Glycine hispida*). Its Japanese name is *Daizu-abura.* Address: Prof. College of Agriculture, Tohoku Imperial Univ.

1840. *National Geographic Magazine.* 1917. Russia's man of the hour: Alexander Kerensky's first speeches and proclamations. 32(1):24, 35. July.
• ***Summary:*** A full-page photo (p. 35, from the Boston Photo News Company) shows a bustling scene with many men and large sacks of soybeans. The caption states: "Soy-beans on the docks at Dalny, destined for Russian armies on the European battle front." Below that: "The soy-bean takes the place of meat in the diet of the Japanese and its nutritive properties are gradually being recognized by the peoples of occidental nations. It has been grown for centuries in China and Japan, and has recently been introduced into America and Europe as an important food and forage plant."

Note: This is the earliest article seen in *National Geographic* magazine that mentions the soy-bean.

1841. Williamson, A.A. 1917. Soya beans as an Oriental product. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 20(181):457-60. Aug. 4.
• ***Summary:*** "In response to requests from the United States for estimates of the quantities of soya beans and bean oil produced in this part of the world, the American consulate at Dairen, which is the center of the soya-bean industry in Manchuria, has prepared figures of exports of beans, bean oil, and bean cake for five years from the Chinese customs reports. It is generally understood that Manchuria's annual production of beans is between 1,500,000 and 2,000,000 tons.

"It is generally considered at Dairen that 48 kin of beans should produce one cake weighing 46 kin and 4 kin of oil. This kin is the Japanese measure of weight, which is equal to 1.3227 pounds avoirdupois, and 100 kin make 1 Japanese picul (132.27 pounds), which is the ordinary measure used by the bean trade here. This picul, however, is slightly different from the Chinese customs picul, which is 133 1/3 pounds. The latter is the picul used in the tables presented

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with this report, and 15 of them make 1 short ton of 2,000 pounds...

"It may seem strange that 48 kin of beans should produce 50 kin of products; but the 2 extra kin are taken up by the beans when, after being rolled, they are steamed before pressing...

"One mill at Dairen is using the extraction (benzine) process. This produces, of course, not bean cake but bean meal."

According to statistics compiled from Chinese customs reports, exports of soybeans from Manchuria rose from 1,724,292 tons in 1911 to 2,076,688 tons in 1915, as shown in a table. During the same period, exports of soya-bean oil rose from 65,919 tons to 81,863 tons, and exports of soya-bean cake rose from 911,821 tons to 1,112,661 tons.

Statistics (in tons) are also given for average annual production of soya beans at each of the main stations along the South Manchuria Railway. Changchun in the north is by far the largest at 300,000 tons. The total is 1,300,000 tons.

Note: This is the 2nd earliest English-language document seen (Feb. 2000) that uses the term "bean meal" to refer to ground, defatted soybeans. Address: Consul at Dairen, Manchuria.

1842. Langdon, William R. 1917. Bean and pea crops in the Hokkaido. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 20(193):654-55. Aug. 18. Submitted June 15.

• ***Summary:*** "The island of Hokkaido is Japan's principal producing district for beans and peas. An increased foreign demand for these products, which resulted from the war [World War I], stimulated production in Hokkaido enormously. The high prices that foreign purchasers are willing to pay for beans and peas, it is said, have created large fortunes for some of the Hokkaido growers.

"The areas under cultivation for the growing of these products in Hokkaido during 1916 were: Soya beans, 207,344 acres; small red beans, 107,539."

"Last year's production and prices: The production of beans and peas in Hokkaido in 1916 in long tons of 2,240 pounds each, by varieties was: Small red beans (*akashozo* or *adzuki*), 27,000; medium red beans (*dainagon*), 2,200; soya beans (*daizu*), 89,000...; large red beans (*kintoki*) 18,000...; total production of all kinds of beans and peas, 219,460 tons. These statistics were compiled by the local administration of Hokkaido."

A substantial increase in area cultivated to beans and peas in Hokkaido is expected next year, but the "1917 crop of soya beans in Hokkaido and the mainland of Japan is expected to be about the same as that of 1916."

"The total beans and peas for Japan proper, excluding Chosen [Korea] and Taiwan, in 1915, according to the official statistics of the Japanese Department of Agriculture and Commerce was: Soy beans, 18,848,283 bushels, valued at $16,247,118; small red beans [azuki], 4,771,183 bushels, valued at $5,002,667..."

A table shows total exports of beans and peas from Japan in 1915 and 1916. Exports of soya beans were 1,056,616 pounds worth $25,009 in 1915, and 1,715,347 pounds worth $38,823 in 1916. Address: Vice Consul, Yokohama, Japan.

1843. Frazer, Robert, Jr. 1917. Kobe's position in the bean trade. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 20(199):748-51. Aug. 25. Submitted June 26.

• ***Summary:*** Some soya beans and small red beans [azuki] are grown in the Kobe consular district, which comprises the central and western part of the main island of Japan. "The local trade, however, is by no means confined to beans grown in Japan, as very large quantities of soya beans, colored beans of various kinds, and a few white beans are brought here from Manchuria, North China, and Korea. The soya beans are bought chiefly for the extraction of their oil. When so used, drawback of duties is granted, and they do not appear in the customs statistics of imports." Note: It is not clear whether "white beans" refers to white azuki beans (probably) or white soybeans.

A table, based on statistics from the Department of Agriculture in Tokyo, shows production of various beans from 1913 to 1915. For soya beans: For 1913–Area planted: 1,043,058 acres. Production: 15,314,646 bushels. Value: Unknown. For 1914–Area planted: 1,138,282 acres. Production: 18,762,414 bushels. Value: Unknown. For 1915–Area planted: 1,153,577 acres. Production: 19,495,316 bushels. Value: $16,296,006.

Exports of soya beans from Japan in 1916 were 857 tons (1 ton = 2,000 lb) valued at $38,938. Imports of soya beans to Japan the same year were 80,691 tons valued at $2,270,000. Two great shipping ports in Japan are Kobe and Yokohama. The beans are graded by women pickers who earn the equivalent of 12½ to 15 cents a day. Address: Consul, Kobe, Japan.

1844. Tanaka, Soichiro. 1917. Shokubutsu hai o genryô to suru kasei kari eki seizô oyobi sono wara mushi kaihô ni okeru ôyô ni tsuite [On the manufacture of potash-lye from vegetable ashes and its application for the straw boiling process in the paper-making industry]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 20(234):844-50. Aug. English abstract. p. a32-33. [Jap; eng]

• ***Summary:*** "Various kinds of vegetable ashes were analyzed, but in the experimental preparation of KOH [potassium hydroxide], only the soybean pod ash and chestnut ash were used, owing to the deficiency of the other ashes. On lixiviating the soy bean pod ash containing

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16.19% of potassium carbonate with water and adding CaO [calcium oxide] to the filtered liquor a yield of 52.7% KOH was obtained. On adding water to the same ash and heating, and then adding CaO without filtering, the yield of KOH was 42.2%; chestnut ash containing 13.96% potassium carbonate similarly treated, but with 3 lixiviations, yielded 75.5% KOH; after 4 lixiviations, 85.6%. The yield of the lye apparently depends upon the filtering process. The lye obtained from the soy bean pod ash was used for boiling straw and the straw thus treated was further bleached with bleaching powder, the results being satisfactory...” Address: Kôgaku-shi, Japan.

1845. *USDA Bureau of Plant Industry, Inventory.* 1917. Seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from April 1 to June 30, 1914. Nos. 37647 to 38665. No. 39. 139 p. Sept. 15.
• ***Summary:*** Soy bean introductions: *Soja max* (L.) Piper. Fabaceæ. (*Glycine hispida* Maxim.)

“37684. From Peking, China. Received at the State Department in a pouch from Peking, China. Received March 20, 1914. ‘This variety is probably the kind asked for in your letter under the name of the “white-eyed” soy bean. It is known as “the large white eyebrow bean” among the Chinese where it is grown.’ (*Source unidentified.*)

“38213/38228. From Tokyo, Japan. Presented by the director, Japanese Imperial Department of Agriculture. Received May 15, 1914.

“38213-38220.

“38213. *Tsurunoko.*

“38214. Var. *Aksaya.*

“38215. *Gowari.*

“38216. *Hadaka.*

“38217. *Aotsurunoko*

“38218. *Kôsuirasu.*

“38219. Var. *Juningonomi.*

“38220. *Aoniûdô.*

“38228. *Shirashaya*

“38435/38472. From China. Collected by Mr. Frank N. Meyer, Agricultural Explorer for the Department of Agriculture. Received June 8, 1914. Quoted notes by Mr. Meyer.

“38450-38452. From Sianfu, Shensi, China. Collected January 24, 1914

“38450. ‘(No. 2029a.) A large variety of yellow-seeded soy bean. Chinese name *Ta huang tou,* meaning “large yellow bean.”’

“38451. ‘(No. 2030a.) A medium-large variety of yellow-seeded soy bean. Chinese name *Ta huang tou,* meaning “large yellow bean.”’\ “38452. ‘(No. 2031a. Puchowfu, Shansi, China. February 10, 1914.) A large, yellow-seeded variety of soy bean. Chinese name *Ta huang tou,* meaning “large yellow bean.”’

“38453-38457. From Sianfu, Shensi, China. Collected January 24, 1914.

“38453. ‘(No. 2032a.) A small, yellow-seeded variety of soy bean. Chinese name *Hsiao huang tou,* meaning “small yellow bean.”’

“38454. ‘(No 2033a.) A small, yellowish seeded variety of soy bean. Chinese name *Huang tou,* meaning “yellow bean.”’

“38455. ‘(No. 2034a.) A very small, yellow-seeded variety of soy bean. Chinese name *Hsiao huang tou,* meaning “small yellow bean.”’

“38456. ‘(No. 2035a.) A variety of soy bean with light-green seeds. Chinese name *Ch’ing tou,* meaning “green bean.” Used pickled in brine as appetizer with meals.’

“38457. ‘(No. 2036a.) A variety of soy bean with dark-green seeds. Used like No. 2035a. [S.P.I. No. 38456]. Chinese name *Ch’ing tou,* meaning “green bean.”’

“38458. ‘(No. 2037a. Kwanyintang, Honan, China. December 20, 1913.) A rare variety of soy bean, of dark olive-drab color. Said to be very productive. Chinese name *Huai toi.’*

“38459. ‘(No. 2038a. Lingpao, Honan, China. December 24, 1913.) A rare local variety of soy bean, having reddish seeds. Chinese name *Ta tzû tou,* meaning “large violent bean.”’

“38460-38462. From Sianfu, Shensi, China. Collected January 24, 1914.

“38460. ‘(No. 2039a.) A black-and-brown striped variety of soy bean, used mainly roasted as a delicacy. Chinese name *Hu p’i tou,* meaning “tiger-skin bean.”’

“38461. ‘(No. 2040a.) A large, black-seeded variety of soy bean. Chinese name *Ta hei tou,* meaning “large black bean.”’

“38462. ‘(No. 2041a.) A small, black-seeded variety of soy bean, used mainly boiled as a feed for hard-working draft animals. Chinese name *Hsiao hei tou,* meaning “small black bean.””””

37699–*Botor tetragonoloba* (L.) Kuntze. Fabaceæ. Goa bean. (*Psophocarpus tetragonolobus* DC.) “*Seguidilla.* Climbing bean with 4-winged pods, which, used as string beans when they are tender, are of excellent quality. They should be of great value in Porto Rico and Panama, but the soil is too poor in Florida. I tried them for two seasons in Miami, Florida, but they were not a success. The seed should be planted in April or May. The plant does best in rich, rather moist, but well-drained land.’”

Note: This is the earliest English-language document seen (Aug. 2007) that uses the word “Seguidilla” to refer to the winged bean.

Adzuki bean (*Phaseolus angularis*)*:* 38442-43, 38446. Chinese name is *Hung hsiao tou,* meaning “red small bean.” Address: Washington, DC.

1846. Saito, T.; Matsuyama, M. 1917. Shôyu moromi no kôso ni tsuite [The enzymes of shoyu moromi]. *Sapporo*

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Norin Gakkaiho (*J. of the Society of Agriculture and Forestry, Sapporo*) 9(42):291-316. Sept. [Jap] Address: 1-2. Nôgaku-shi, Japan.

1847. Stoddard, William Leavitt. 1917. Soy: The coming bean. *Good Housekeeping* 65:77, 126-28. Sept. [4 ref]
• ***Summary:*** *"Good Housekeeping* asked the Department of Agriculture to tell its readers the truth about the soy bean. This article is the department's answer. In the [Good Housekeeping] Institute Kitchen new recipes and methods of using the soy bean were evolved and tested. These recipes will be found at the end of this article. A list of dealers in various sections of the country who carry a supply of soy beans will be mailed upon request accompanied by a stamped addressed envelope.

"'The soy bean, also called the soja bean, is a native of southeastern Asia, and has been extensively cultivated in Japan, China, and India since ancient times... The beans are there grown almost entirely for human food, being prepared for consumption in many different ways. Their flavor, however, does not commend them to Caucasian appetites and thus far they have found but small favor as human food in either Europe or America.' Thus declared a bulletin of the Department of Agriculture [Piper and Nielsen. 1909. Farmers' Bulletin 372] before the war. Less than three months after our entrance into the war–and the entrance of the United States as a nation for the first time into a food moderation and conservation campaign–this same authority stated that 'the soy bean has already reached a place of high economic importance in America and Europe as a foodstuff... During the past season the demand for seed by food manufacturers has resulted in greatly increased prices.' The soy is a coming bean if not *the* coming bean."

Sold in some American markets under the name Togo bean, the soy bean "now flourishes in an increasingly large acreage in Tennessee, North Carolina, Virginia, Maryland, Kentucky, and the southern parts of Illinois and Indiana. The earlier varieties even mature in Ontario [Canada] and our Northern states."

The American housewife probably does not care "that there is a factory in New York is making a 'vegetable milk' of soy beans; the "flour or meal [okara] which remains after the milk is manufactured is valuable both as a stock for feed and for human consumption; that soap manufacturers and paint manufacturers are using the oil of soy beans to replace more expensive oils; and that the substitute butter makers are using the fat of the soy bean in products which thousands of consumers are using all unwitting of its true nature.

"The thing that the American housewife wants to know today is where soy beans can be bought and what are the simplest uses of them... Probably the easiest and commonest method of cooking soy beans is to use them either for soup or to bake them."

Eight recipes are given; all but two call for "soy beans." Soy-bean bread (containing 20% of the flour in the form of "soy-bean meal" [a full-fat soy flour]), Soy beans and rice (with "1 tablespoonful Worcestershire sauce"), Soy-bean loaf with tomato sauce, Vegetable roast (baked), Savory baked soy beans, Soy-bean soup, Soy-bean muffins (with "1 cupful cold baked soy-bean pulp"), and Salted soy beans (deep fried).

Photos show: (1) Muffins made with soy-bean meal. (2) Soy-bean meal ground at the Good Housekeeping Institute; the hand-turned mill and two small piles of soy beans are shown. (3) A dish of soy beans and rice. (4) A soy bean plant. (5) A vegetable roast with soy beans as an ingredient.

Note 1. Theodore Hymowitz writes (12 Feb. 1990): "I have no idea if William Leavitt Stoddard was related to Illinois soybean pioneer William Hoyt Stoddard. William Hoyt had one brother named Charles Lumas Stoddard."

Note 2. This is the 2nd earliest document seen concerning soybeans in connection with (but not yet in) Togo.

Note 3. This is the earliest English-language document seen (Dec. 2012) that uses the term "Salted soy beans" to refer to soynuts. It is also the earliest document seen in any language describing the frying or deep-frying of whole soybeans to make soynuts. Previously soynuts had always been dry roasted.

Note 4. This is the earliest article on soy seen (Aug. 2002) in *Good Housekeeping* magazine.

Note 5. In the recipe for Soy-bean muffins the meaning of the ingredient "1 cupful cold baked soy-bean pulp" is not completely clear. This is the earliest document seen (June 2013) that uses the term "soy-bean pulp" (regardless of hyphenation). It probably refers to whole soybeans that have been baked then ground or mashed to a pulp and allowed to cool. However, the writer discusses okara earlier in this article, and this recipe may be calling for okara as an ingredient. If it is, this would be the earliest English-language document seen (June 2013) that calls for okara as an ingredient in a recipe. Address: [Macoupin Co., Illinois].

1848. Furukawa, Seiji; Tomizawa, Zenjirô. 1917. Kôryô no shôyu bôfu sayô ni tsuite [On the action of spices/perfumes as preservatives for shoyu. I & II.]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 182. p. 708-720. Oct. 5; No. 183. p. 781-83. Nov. 5. [Jap]
• ***Summary:*** Some 35 different *"koryo"* (spices) were tested. Most of these are not commonly known substances. They include menthol, folmarin, etc. Address: Itô Kochôen Kenkyû-bu.

1849. Satow, Sadakichi. 1917. Vegetable proteid product and process of making the same. *U.S. Patent* 1,245,975. Nov. 6. 3 p. Application filed 25 Nov. 1916.
• ***Summary:*** "The object of this invention is to provide commercial products utilizing vegetable proteids which

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products possess a high degree of transparency, flexibility and elasticity, and a simple, efficient, and economical process of manufacturing the same.

"A further object is to provide a non-inflammable celluloid-substance as a condensation product of vegetable proteids..." "Proteids possess amphoteric properties..." For example glycinin, which forms the chief constituent of soya beans, has strong acid properties and has a strong tendency to form complex salts with alkaline reacting agents. The author calls these "alkali compounds," and they differ in properties from the original proteids in many commercially important respects: They have (1) greater adhesiveness and are therefore easier to mold; (2) a high degree of elasticity and flexibility; (3) only a moderate speed of condensation; (4) no tendency to crack while drying; (5) a transparent color. The "vegetable proteidal substances" or "refined proteidal matter" can be coagulated or "glutenized" and are then usually immersed in a formaldehyde solution. They may then be molded and dried. They are good insulators of electricity and may be used as a substitute for ebonite, celluloids, bakelite, ivory, or marble. Address: Sendai, Japan.

1850. Satow, Sadakichi. 1917. Proteidal composition and process of making the same. *U.S. Patent* 1,245,984. Nov. 6. 3 p. Application filed 17 May 1917.
• ***Summary:*** "The object of the invention is to provide a vegetable proteidal composition suitable for use in the manufacture of various commercial products, such as linoleum, wood carpet, floor coverings, boards, tiles, insulating compounds, rubber substitutes, celluloid-like articles, and the like." Seven types of coagulants (called glutinizing agents) for the protein(s) are listed: "(1) inorganic acids, such as phosphoric acid, sulfurous acid, and the like; (2) fatty or oxy-fatty acids, such as formic, acetic, propionic, phenyl-propionic, malonic, lactic, tartaric, citric, matic, and the like; (3) aromatic acids, such as salicylic, benzoic, or the like; (4) phenols, such as carbolic acid, cresol, resorcin, nitro-creosol, and the like; (5) organic bases, such as pyridin, urea, analin, glycin, naphthylamin, or other amino compounds, or the like; (6) organic bases such as caustic alkali, ammonia, or the like; or (7) alkali salts of weak acids, such as borax, sodium phosphate, and the like." "The properties of the mass are still further improved if a small quantity of alkali is added thereto."

The result is a "plastic composition." Soybeans are not specifically mentioned. Address: Sendai, Japan.

1851. Satow, Sadakichi. 1917. Celluloid-like substance and process of making the same. *U.S. Patent* 1,245,976. Nov. 6. 3 p. Application filed 11 Dec. 1916.
• ***Summary:*** "This invention related to the condensation products of vegetable proteins... Example 1: The proteid or soja bean, glycinin, is dissolved in formic acid at a low temperature. If necessary to effect the solution of the proteid the temperature may be raised to about 50º C. The excess of the formic acid and water is evaporated under a high degree of vacuum. The viscid mass thus obtained is molded into the desired shape and dried after which the molded article is hardened by being immersed in a solution of formaldehyde.

"The product obtained as above described is a celluloid-like substance, is non-inflammable, waterproof and acid proof. It is a good insulator of electricity and may be used as a substitute for ebonite, celluloids, bakelite, ivory, marble or the like."

Note: This is S. Satow's first U.S. patent relating to soja beans. Address: Sendai, Japan.

1852. Satow, Sadakichi. 1917. Insulating compound and process of making the same. *U.S. Patent* 1,245,980. Nov. 6. 3 p. Application filed 30 Dec. 1916.
• ***Summary:*** To obtain insulation for electricity, the author uses "vegetable proteids or proteidal substances... such as beans, peas, wheat, corn or other leguminous cereal or grain products." After the oil is removed with a solvent such as "benzin," the benzin is removed and from the resulting meal a refined proteid product is produced. This is processed in various ways, including with formaldehyde.

Note: Although soybeans are not mentioned in this patent, Satow did extensive research on soybeans, and he mentions "beans" as his first source of vegetable proteids; he was clearly referring to soybeans.

Note: This is the earliest English-language document seen (Aug. 2003) that uses the word "proteidal" in connection with the soybean–to refer to its protein. Address: Sendai, Japan.

1853. Satow, Sadakichi. 1917. Lacquer and process of making the same. *U.S. Patent* 1,245,981. Nov. 6. 4 p. Application filed 30 Dec. 1916.
• ***Summary:*** "The objective of the invention is to utilize vegetable proteids in the manufacture of lacquer." An oil solvent such an benzin may be used to remove the oil. Raw materials include soja bean or corn. One process consists of glutinizing vegetable proteids with cresol. Address: Sendai, Japan.

1854. Satow, Sadakichi. 1917. Lacquered product and process of making same. *U.S. Patent* 1,245,982. Nov. 6. 3 p. Application filed 1 Feb. 1917.
• ***Summary:*** "This invention relates to lacquered products such as tile, glass, brick boards, and the like... The objective of the invention is to utilize vegetable proteids in the manufacture of lacquered products..." Raw materials include beans, peas, wheat, corn, etc. When the lacquer has dried, it may be polished to produce a desirable luster. "Very beautiful ornamental effects are produced by applying differently colored coating liquids to different parts of such surface..." Address: Sendai, Japan.

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1855. *Board of Trade Journal* (*London*). 1917. Japan (Corea). Inspection of rice and soya beans for export. 99:326. Nov. 8.

• ***Summary:*** There are new regulations concerning the inspection of soya beans exported from Corea, or from one province of Corea to another. "H.M. Consul-General at Seoul (Mr. A.H. Lay C.M.G.) has forwarded a translation of amended regulations (published in the 'Official Gazette' of 8th September) for the inspection of rice for export to foreign countries or to Japan or for conveyance from one province of Corea to another. These regulations (Order No. 62 of the Government-General of Corea), which take effect from 1st October, 1917, are more detailed than those they replace (i.e., Order No. 4- of 1915), and provide for the grading of rice into five classes, viz.–superior, first, second, and third class, and that which does not come up to standard and the exportation or conveyance of which is consequently prohibited. The Order does not for the time being apply to the Provinces of Kogen (Kong-won) and North and South Kankyo (Hambyeng), the three divisions of the country in which the production of rice is less than elsewhere.

"H.M. Consul-General has also forwarded a translation of Order No. 63 of the Government-General, which applies to the whole of Corea and takes effect from 1st October, 1917, making regulations for the inspection of soya beans, these regulations being practically identical with those contained in the above-mentioned Order referring to rice.

"The above-mentioned translations may be consulted by British firms interested at the Department of Commercial Intelligence, 73, Basinghall Street, London, E.C. 2." Address: British Consul-General at Seoul.

1856. Davis, John K. 1917. China. Antung. *Supplement to Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) No. 52f. p. 1, 4, 8-9. Dec. 4.

• ***Summary:*** Discusses: 1. Exports of beans and bean products. A table shows that soybean exports from Antung rose from 15.2 million lb in 1913 to a peak of 45.1 million lb in 1915, falling to 36.2 million lb in 1916. Exports of bean cake rose from 72.6 million lb in 1913 to a peak of 100.5 million lb in 1915, falling to 98.6 million lb in 1916. Exports of bean oil from Antung rose from 384,133 lb in 1913 to a peak of 5,034,933 in 1916.

2. Bean cake sent to Japan and oil to United States. Most bean cake is used in Japan as fertilizer. "A strong American demand for bean oil caused an unusually large proportion of the product of southern Manchuria to pass through Antung to Japan, whence it was ultimately shipped to United States Pacific ports. During 1916, there were 12 small bean-oil mills, 11 Chinese and 1 Japanese, operated in Antung. The output of these represents but a small part of the bean oil and bean cake exported through Antung." 3. Trade with the United States. Soya-bean oil and pongee silk are shipped from Antung to Japan and then to America. Chinese firms are not equipped to export to western countries. Address: Consul, Antung, Manchuria.

1857. Davies, W.J. 1917. Oil industry of Japan. *Board of Trade Journal* (*London*) 99(1,100):675-80. Dec. 27.

• ***Summary:*** Since the outbreak of the war, "the trade in coconut oil has expanded tremendously. The export of [soy] bean oil and rape oil has also developed,..."

Before the war, the oil industry in Japan was not considered a lucrative one, and only the very largest factories, which processed several types of oilseeds, were able to make a profit. The increase has taken place despite the loss of the German market; before the war, Germany imported large quantities of oil from Japan.

"The main reason for the former unprosperous condition of the Japanese oil trade was due to the existence of innumerable small oil companies struggling against each other with old-fashioned and non-efficient methods." Moreover, most of the oilseeds had to be imported and processors situated at or near a port had a strong advantage. Kobe and Osaka emerged as the key port cities for Japanese oil mills.

"While the soap industry was in its infancy in Japan, there was not much opening for the use of vegetable or animal oils at home. Now, however, the industry is in a flourishing condition; large quantities of soap being exported annually to China, there is a more extensive home consumption of oils than was formerly the case. The residue, too, finds a wider home market."

There are now in Japan 10 companies with a capital of £10,000 and over; they are located in Nagoya (3), Osaka (2), Otaru (2), and Kobe (2). Several new oil companies are being planned. One, founded in Osaka with a £50,000, will build a new factory at Fukai Bay to make coconut and soya bean oils, and [soy] bean cake. Plans are also in process to establish a company with £100,000 to harden [hydrogenate] oil, to manufacture candles for export. "In Dairen experiments in connection with the hardening of bean oil have been so successful that a company has been formed to exploit the discovery on a commercial scale." It could be used as a substitute for tallow in the manufacture of soap and candles, or for making margarine and other food products.

"Methods of oil expression–In Japan the primitive wedge press is fast giving way to the more up-to-date hydraulic press which is to be found installed in all the large mills in the Osaka and Kobe districts. Even in the smaller mills the circular press, which is merely a more efficient modification of the wedge-press, is to be found. Hot expression is generally used.

"Vegetable oils: The vegetable oils produced in Japan in their natural classification according to properties are:– Drying: Linseed, perilla, hempseed, tung. Semi-drying: [Soy]

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bean, rape (or Colza), cotton seed, sesame. Non-drying: Coconut, peanut, camellia, castor. There follows a long discussion of most of these.

"Soya bean oil.–There was a great increase in the export from Japan of bean oil during 1916.

"The present prosperous condition of the soya bean oil trade owes a great deal, of course, to the general shortage abroad of fats of all descriptions, especially in the soap-boiling trade, and, in addition, the failure of the cotton crop in the United States in 1915 caused a brisk demand from that country for bean oil. The chief buyer had been, of course, the United Kingdom, but a remarkable feature off the oil trade of Dairen during the last three years has been the growth of the exports to the Netherlands. As showing the developments referred to, the following figures for the export of soya bean oil from Dairen may be given:–To the United Kingdom, 204 tons in 1913; 8,495 tons in 1914; and 16,498 tons in 1915. To the Netherlands, 211 tons in 1913; 1,064 tons in 1914; and 9,600 tons in 1915.

"Most of the factories in Japan which are engaged in the expression of oil from seeds include the manufacture of bean oil in their operations, whilst many soap factories express the oil for their own purposes.

"In Dairen their are two large mills, one with a capacity of 6,000 cakes daily, and the other of 4,000 cakes capacity. In addition there are 40 or so native mills producing over 5,000 cakes daily. These mills are primarily intended for cake manufacture and the oil is shipped to Japan for transhipment [transshipment] to Europe. The cake is also shipped to Japan. As a fertiliser bean-cake enjoys a great vogue, and it is also occasionally fed to horses on account of its muscle-forming properties. The cake is also, after pounding, treated in Japan by solvent methods for the extraction of the residue of oil.

"The following figures show the enormous increase in the export of bean-oil from Japanese ports during the last three years:–1914, 236,797 yen; 1915, 255,655 yen; and 1916, 921,292 yen."

Also discusses vegetable wax (obtained from the berry of the "Haze" tree, and widely used to make candles for Japan), fish oil, whale oil, glycerine (sold to arsenals) from fish oil, and tallow (though there are few live stock in Japan). Address: H.M. [British] Consular Service in Japan.

1858. Frazer, Robert, Jr. 1917. Japan. Kobe. *Supplement to Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) No. 55c. Dec. 31. p. 15-40.
• ***Summary:*** Goods shipped from Osaka to all countries: Pea cheese (miso): In 1915 612,517 lb worth $16,379 was exported; in 1916 this rose to 886,245 lb worth $23,268. Soy sauce: In 1915 80,977 gallons worth $32,157 were exported; in 1916 this decreased to 73,261 gallons worth $29,881.

Imports at Kobe from other countries included soya beans and oil cake. Tables summarize imports to and exports from Osaka for the years 1915 and 1916. Address: Consul, Kobe, Japan.

1859. Scidmore, Geo. H. 1917. Japan. *Supplement to Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) No. 55c. 40 p. Dec. 31.
• ***Summary:*** One "important item of import is bean-oil cake, which comes practically all from Kwangtung Province and China. These imports were valued at $17, 234,382 for 1916 and the quantity amounted to 1,727,079,733 pounds." In the table of articles imported, bean-oil cake is listed under fertilizers, and is by far the largest value. Cottonseed and rapeseed oil-cake were also imported for use as fertilizer in 1916, but the value of each was only about 4% that of bean-oil cake. Small amounts of manures and bone dust were also imported as fertilizers. Of the $2,263,504 worth of soya bean imported, 74% came from China [including Manchuria], 19% came from Kwangtung Province [controlled by Japan], and 7% came from Asiatic Russia. But of the $17,234,382 worth of bean-oil cake, 57% came from Kwangtung Province, 25% came from China, and 2% came from Asiatic Russia.

Exports of "soy" (soy sauce) from Japan were worth $491,596 in 1915 and $533,545 in 1916. Of the 1916 amount, 34% went to the United States, 26% went to Hawaii, and 13% went to Kwangtung Province. A small amount was exported to the Philippine Islands. The volume exported is not given; "soy and vinegar" are grouped together.

Within the report from Japan is a report from Kobe by Consul Robert Frazer Jr.

Note: This is the earliest document seen (Feb. 2001) concerning soybeans in the former USSR after it was established in Nov. 1917. This document contains the earliest date seen for soybeans in the USSR (1917). Address: Consul General, Yokohama.

1860. Williamson, A.A. 1917. Methods of making soya-bean oil in Manchuria. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 20(305):1227-29. Dec. 31.
• ***Summary:*** "Two processes are employed at Dairen for making oil from soya beans. One, known as the 'extraction process,' is a chemical method which, by the use of benzine, extracts the greatest amount of oil from the beans. When it is employed, not cake but bean meal is produced, and this is said to be preferred to cake for fertilizer, as it requires no breaking before it is used on fields. The oil, however, is said to sell for less than that produced by the 'expression process,' as it is difficult to remove all traces of benzine from the oil. The term soya-bean oil is generally understood to mean expressed oil.

"Only one mill at Dairen uses the extraction process. It

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was built as an experiment by the South Manchuria Railway, and was subsequently sold to the firm of Suzuki & Co., at Kobe, Japan. The machinery was brought out in sections from Germany, set up by German experts, and operated by them for some months. It is not possible to visit this plant, as it is closed to the public, and those who wish to inspect it must obtain permission from the head office at Kobe."

"Fifty-odd mills, large and small, are using the expression process at Dairen... Vertical presses of four columns of about 25 cakes per column are used, some mills having double presses–presses on two floors, one directly above the other and built as one machine, with the power applied at the same time in one operation. It is customary to work these presses by hydraulic power. They are displacing the old hand-power screw press."

A detailed description is then given of how the soybeans are pretreated, the forms are made, and the oil is expressed and then strained and the sediment allowed to settle out. The oil is not refined. The presses used at Dairen are made chiefly by the Osaka Iron Works, Osaka, Japan; and by the workshops of the South Manchuria Railway at Shakako, a suburb of Dairen.

Note: This is the earliest document seen (Feb. 2001) concerning Suzuki & Co. (*Suzuki Shoten*), which later became Hohnen Oil Co., Ltd. Address: Consul, Dairen [Manchuria].

1861. Tadokoro, Tetsutarô. 1917. Shôyu moromi no kôso sayô ni taisuru en-rui no sokushin genshô ni tsuite [The stimulating action of salts on the enzyme action of shoyu moromi]. *Sapporo Norin Gakkaiho* (*J. of the Society of Agriculture and Forestry, Sapporo*) 9(43):416-30. Dec. (Chem. Abst. 23:1932). [Jap]
Address: Tohoku Teikoku Daigaku Noka Daigaku, Nogei Kagaku Jikken-shitsu, Nôgaku-shi.

1862. Kinoshita, Asakichi. 1917. Shôyu no hiire ni tsuite [Pasteurization of shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 12(2):21-25. [Jap]
Address: Jozo Shikensho Gishi, Japan.

1863. Kinoshita, Asakichi. 1917. Daizu yori yubun o chûshutsu shitaru mame kasu shôyu jôzô ni tsuite [Shoyu brewing with defatted soybean cakes]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 12(5):1-9. [Jap]
Address: Jozo Shikensho Gishi, Japan.

1864. Tadokoro, Tetsutarô. 1917. Shôyu moromi no kôso sayô ni taisuru en-rui no sokushin genshô ni tsuite [Stimulating action of salts on the enzyme action of shoyu moromi. II.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 12(11):23-28; 12(12):21-28. [Jap]

1865. Yukawa, Matao. 1917. Shôyu moromi no jukusei ni okeru "chiroshin" no heni [Transformation of tyrosine in the ripening of shoyu moromi]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 12(6):15-30. [Jap]

1866. Yukawa, Matao. 1917. Daizu no tansuikabutsu oyobi sono shôyu jôzô to no kankei ni tsuite [The relation between the carbohydrates in soybeans and shoyu brewing]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 12(7):23-34. [Jap]

1867. Combe, A.D. 1917. Les succédanés du beurre [Butter substitutes]. *Bulletin de la Societe Scientifique d'Hygiene Alimentaire et d'Alimentation Rationelle* 5(3):183-84. [Fre]
• ***Summary:*** Vegetable butters, made from cocoa butter or coconuts, are very useful as butter substitutes. There are many kinds of artificial milk; they are easily digested and low in cost. Vegetable milk is the concentrated milk of almonds, sterilized and sold in cans. It is used as a medicine for infants, but it's high price makes it unsuited as a wartime food.

Soya milk (*Le lait de soya*), a milk extracted from soya beans, comes from Japan where it has long replaced natural milk that is very rare in that country. It is easy to digest and inexpensive. In times of war, it can be used advantageously to replace butter. In 1913 Germany was already importing 125,448 tonnes of soybeans, from which it extracted 18,000 tonnes of oil and milk. A table shows the nutritional composition of soy flour, soymilk, and cow's milk.

1868. Couling, Samuel. 1917. Encyclopaedia Sinica: Bean, Soya. London: Oxford University Press, Humphrey Milford; Shanghai: Kelly and Walsh. See p. 46. 28 cm. [2 ref]
• ***Summary:*** "*Glycine hispida,* Monch. or *Dolichos soja,* L. This bean, so valuable for the oil which is expressed from it, has come into great prominence of recent years, owing to the enormous dimensions of the export trade in it since the Russo-Japanese War... The oil-yielding variety par excellence is the yellow bean, of which nearly 15 million piculs, or not far short of one million tons, were exported in 1915, 90% of this being from Manchuria, and the balance from Chihli, Hupei and Kiangsi... For several generations beans, but more especially beancake, had been sent to South China as manure for the sugar plantations; exportation abroad was prohibited until 1869, when shipments were made to Japan, which soon became a large customer both for beans and bean oil... In the Far East soya beans are used, as human foodstuffs, for making soy [sauce], bean paste, or *chiang,* as *tou fu* or beancurd, in soups, etc.; in cooking instead of rapeseed and sesamum oil; and the cake is employed as a fertilizer and for fattening hogs... Besides the Soya Bean there are many other kinds of bean cultivated in China, and entering largely into the diet of the people. The chief of these is *Phaseolus mungo* L, the green bean Lü Tou [mung bean], which contains little oil but is used in the manufacture of vermicelli.

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"The annual export of vermicelli, principally from Chefoo, is considerable–amounting in both 1913 and 1915 to nearly Hk. Tls. [Haikwan Taels] 3,000,000; it goes to Chinese emigrants abroad." Address: M.A. (Edin.), Lately honorary secretary and editor, North China Branch, Royal Asiatic Society.

1869. Fuerstenberg, Maurice. 1917. Die Soja, eine Kulturpflanze der Zukunft und ihre Verwertungsmoeglichkeiten [The soybean, a cultivated plant of the future, and possibilities for its utilization]. Berlin: Paul Parey. 40 p. Illust. No index. 21 cm. [59 ref. Ger]

• ***Summary:*** Dedicated to the Prof. Friedrich Haberlandt, who introduced the soybean to Central Europe. Contents: Foreword. Introduction: The soybean. Ways of using the soybean in its homeland (East Asia, especially Japan and China). Shoyu or soy-sauce. Miso (vegetable cheese). Natto. Tofu of the Japanese or Tao-hu of the Chinese (bean cheese). The soybean as an oilseed. Soybean meal (and flour). Soy as a coffee substitute or extender. Soybean milk. Soy meat substitutes. Soybeans as a chocolate substitute. Soy rubber substitute. The utilization of the soybean in agriculture: As cow fodder. Summary. Bibliography.

Photos show: (1) A field of soybeans (p. 6). (2) A soybean plant with the leaves removed to show the pods (p. 12). (3) Soy beans and pods from inoculated and uninoculated plants (p. 13).

Contains numerous tables, most without captions and mostly from other sources–See pages 11, 16-17, 19, 25, 27, 30, 35-37. Contains one of the best early European bibliographies on the soybean.

The author wrote this book during World War I. In his first book, published one year earlier in 1916 and titled "The Introduction of Soya, a Revolution in the Food of the People," he discussed what he believed to be the great agricultural and nutritional value of the soybean. He uses two terms, *Die Soja* and *Die Sojabohnen* to refer to soybeans.

Chapter 1 (p. 5-7): In 1908 England started to import large quantities of soybeans; in 1909 these increased to 400,000 tonnes and in 1910 to 800,000 tons. Also in Germany, in the years just before World War I, imports of soybeans climbed in an unexpected way, reaching 43,500 tonnes in 1910, 90,600 tonnes in 1911 and 125,200 tonnes in 1912. Note: These units are given in dz. One dz (*doppelzentner*) = 100 kg.

The first manufacture of soyfoods in Europe took place in France, at Valees near Asnieres, where they made flour, bread, cakes, cheese [tofu], and soymilk (*Mehl, Brot, Kuchen und Käse, vegetabilischer Milch*)–though only in small quantities and, above all, for diabetics. In England, soy flour has been used for a long time in the preparation of cakes (p. 5-6).

However it was in Germany that the utilization of soybeans for food took place on a large scale; this began shortly before the war. The supply of foods to Germany was almost completely cut off during the war, so general attention soon turned to the new foods prepared from soybeans and people quickly became aware of their great nutritional value. Thus, in the middle of the war, a soybean industry was built in Germany. Unfortunately this youngest twig of the food industry was left crippled due to lack of raw materials. However one can predict that this industry has a bright future because of the great encouragement given to these products in so short a time. For example, in October 1914 the *Agumawerke* (Aguma Works) located in Harburg (near Hamburg) on the Elbe, first began mass production of a soy flour according to its own process. During the next few years it made many thousands of tonnes of this meal, until the production had to be stopped for lack of raw materials (p. 6).

Equally gigantic sales of soy products were made by the *Soyamawerke* (Soyama Works) in Frankfurt am Main; this company made only soy food products. In addition to a meal (flour), it also produced a meat substitute (*Fleischersatz*), and, largely from soybeans, fresh and dried milk (*Frisch- und Trockenmilch*) as well as a fresh and dried cream preparation (*ein Frisch- und Trockenrahm-Präparat*). Likewise, this firm had to cease production of most of its soy products because of difficulties in soybean procurement, and concentrate only on the production of meat substitutes (*Fleischersatz*). These articles likewise entered all classes of the population splendidly as is seen from the large demand for them. Within 3-4 weeks this firm had orders for more than 1½ million pound cans, of which unfortunately it was able to satisfy only a small part. In addition to these two well-known firms, there are in Germany still a number others that are occupied with the production of foods from the soybean.

In Austria [the Austro-Hungarian empire], there exists a unique firm, the food factory Santosa in Prague [in the Czech Republic as of Sept. 2002], which is still processing soybeans. They introduced soy coffee into commerce. I understand that in Austria a large-scale soy processing venture is now being planned.

Certainly the soy processing industry finds itself in a beginning state and, like all young industries, in need of improvement. Remember the sugar-beet industry was also once young but it made improvements and went on to great success, as will be expected of this new twig on the food industry. In any case, the beginning of utilization of the soybean as food for the people has been made, and in the foreseeable future the soybean may, as in China and Japan, become an indispensable part of our people's food.

It is different with the introduction of the soybean as a cultivated plant in Central Europe. Forty years ago Friedrich Haberlandt showed (and after him countless others have shown) that the soybean grows well in Central Europe. Although additional new tests verify this, there are still those who object to soybean culture. One objection is the long time

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required by the soybean to come to maturity; the answer is the development of new varieties. Another is the relatively low yield compared with other beans; the answer lies in the use of inoculation. The author then discusses nutrient yield per acre and per unit of money, showing both to be high for soybeans.

Pages 10-11: It is well know that legumes possess the ability to transform and fix free nitrogen from the air. In 1886 Prof. Hellriegel discovered that this capability is due to certain bacteria that live in the soil and move through the root hairs into the root, where they cause nodule formation. The nitrogen-fixing bacteria living in the nodules nourish the plant. The author then talks about inoculation using either soil from a previous planting or "Nitragin," a pure culture of root bacteria, which is well known and has recently been improved. Dr. Kuehn of Berlin-Grunewald showed that soil inoculated with Nitragin gave a 3- to 4-fold increase in yield, plus an increase in protein in the roots and leaves. He then discusses improved cultural practices. Winkler says that transplanting improves yields. Continued. Address: Frohnleiten, Steiermark [Austria].

1870. Fuerstenberg, Maurice. 1917. Die Soja, eine Kulturpflanze der Zukunft und ihre Verwertungsmoeglichkeiten [The soybean, a cultivated plant of the future, and possibilities for its utilization. Part II (Document part)]. Berlin: Paul Parey. 40 p. 28 cm. [59 ref. Ger]

• ***Summary:*** Continued on p. 14. Ways of using the soybean in its homeland (East Asia, especially Japan and China): Note: In this section, starting on p. 15, the author repeatedly uses the word *Sojaspeisen* meaning "soyfoods." The soybean probably originated in India. The Chinese and Japanese used it to fortify their rice-based, protein-poor diet. The practice came before the theory. The author says (incorrectly, p. 15) that all the basic soyfoods are fermented. He then gives a long description of koji and how it is made.

Shoyu or soy sauce (*Shoju oder Soja-Sauce*) (p. 15-17): In Japan, 540-720 million liters are manufactured each year so each Japanese uses 60-100 ml/year. The fermentation time is 8 months to 5 years. The best soy sauce is fermented for 3 to 5 years. He explains how, as soy sauce is fermented, the protein is broken down into amino acids such as leucine, tyrosine, and members of the "Xanthin" group.

Miso (vegetable cheese, p. 17-18): Miso is widely used in soups. More than half of the yearly Japanese soybean harvest is used for making miso. This is 30 million kg per year. Types of miso include *shiro miso* and Sendai miso. Winkler, in his small work titled "The Soybean of Manchuria," mentions two other types of miso: Aka or red miso and nuka miso. Kellner investigated five types of miso; a table shows their composition. Loew reports that this vegetable cheese (miso) is consumed either raw or in soups. Kellner, Nagasaka and Kurashima report that, based on their investigations, the amount of amino-nitrogen increases 3-fold and the quantity of carbohydrates is significantly diminished through lactic acid and alcoholic fermentation. The carbonic acid created thereby rises significantly during fermentation (Loew).

Natto (p. 18): Discusses the findings of Yabe.

Japanese tofu or Chinese Tao-hu (p. 18-20): This is the so-called "bean cheese" (*Bohnenkäse*). A table (p. 19, from König) shows the nutritional value of fresh tofu (84.8% moisture) and frozen tofu (17.0% moisture). E. Senft studied frozen tofu, a Japanese military preserved food (*Militärkonserve*) that is not canned; he found it had a beige color and a unique, slightly sour aroma which was at times reminiscent of dextrin. It has a uniform texture throughout, with many tiny pores. Winkler refers to five other types of soy cheese. Concerning the military preserved foods, they were highly regarded during the Russo-Japanese War and (according to Senft) played a key role in the war. (Footnote: The descriptions of the various preparations made from soya make E. Senft's treatises (1906 and 1907) valuable; in them he published his investigations of a number of Japanese vegetable foods and military preserved foods or conserves). The well-known food manufacturer Maggi in Kempttal, Switzerland, has tried for many years to introduce a commercial miso-like product, but was not successful.

The soybean as an oil plant (p. 20-26): Winkler, in his brochure, discusses the uses of soybeans in Manchuria. After 1908, soybeans were sold in Europe at incredibly low prices which resulted in the expansion of imports and production. Then tariffs were levied on soybeans. There were some major problems in the Austrian oil industry.

Soybean flour (*Sojabohnenmehl;* p. 26-28): In recent years, various processes have been patented. One manufacturer is Soyamewerke in Frankfurt am Main, which makes *Soyama Kraftmehl*. Yellow soybeans are mechanically cleaned, washed, dried, and dehulled according to the process of Dr. Fritz Goessel. Agumawerke in Harburg also makes soy flour.

The soybean as a coffee substitute and extender (p. 28-31): Coffee is known to be detrimental to good health and void of nutrients. Rye, for example, has been used since the 17th century as a coffee substitute. Barley also plays a major role, especially as malt. A table (p. 30) shows the nutritional composition of ten coffee substitutes, including chicory, figs, lupin, and carob. Soy coffee tastes remarkably similar to real coffee. In Istria (*Istrien*), in the Austrian alps, in Switzerland as well as in Alsace (*Elsass*), the soybean has been used since its introduction as a coffee substitute. Haberlandt reported in his work that a teacher from Capo d'Istria told him that the soybean was used as a coffee substitute in Istria, and a friend told him that there was no difference between the flavor of the two. The Thunschen is used to make good soy coffee. The soybeans are mechanically cleaned, put into a trommel, agitated with water at 65-70ºC,

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brushed and thereby freed of a large number of impurities which can leave a burned smell. The aroma of soy coffee can be improved by impregnation with an extract of largely decaffeinated coffee. It has roughly twice the nutrients of regular coffee and no harmful constituents.

Soybean milk (*Sojabohnen-Milch,* p. 32-33): The most popular vegetable milk is Dr. Lahmann's Vegetable Milk (*Lahmannsche Vegetabile Milch*), an emulsion made from almonds and nuts. In Japan, they make milk from soybeans; he describes the process, inaccurately, based on information from Winkler. This milk is also used to make cheese [tofu]. Also in Europe there have been successful attempts to make a soymilk adapted to European tastes, as in France by the Caseo-Sojaine at Vallées near Asnieres, and in England by the Synthetic Milk Syndicate. Using the process of Dr. Fritz Goessel, the latter company has a factory in Liverpool; it makes 100 liters of soymilk from: 10 kg ground soybeans plus 5 gm sodium phosphate, 2.4 kg lactose, 2 kg sesame oil, 6 gm common salt, and 60 gm sodium carbonate. Also the Soyamawerke in Frankfurt makes a soybean milk, named Soyama, as mentioned above (fresh and dried milk and cream). Recently Prof. Melhuish developed a new method using soybean, peanuts, and added coconut milk fat.

Soy meat substitutes (*Soja-Fleischersatz;* p. 33): Soyamawerke makes a product named *Soyama-Fleisch-Ersatz.*

Soybean as a chocolate substitute (p. 34): Haberlandt reports such a product.

Soya rubber substitute (p. 34): Goessel and Sauer have developed a rubber substitute made from soybean oil.

The utilization of soya in agriculture (p. 34-38): Use as fodder for cows. In 1880 Blascowicz [Blaskovics], Assistant at the Royal Hungarian Academy in Hungarian Altenburg, conducted fodder tests, whose results are given in various tables.

Conclusions (p. 38).

Note: This is the earliest document seen that uses the word *Ersatz* or the word *Fleischersatz.* They mean "artificial or inferior substitute" and "meat substitute" respectively. Though often associated with World War I, the word "ersatz" (which means simply "substitute" in German) was actually adopted into English as early as 1875, in reference to the German army's "Ersatz reserve," or second-string force, made up of men unqualified for the regular army and drawn upon only as needed to replace missing soldiers. Hence the meaning "inferior substitute." Address: Frohnleiten, Steiermark [Austria].

1871. Fuji, Shôzô; Endô, Kôtarô. 1917. Tokubetsu hôkoku. 1, Ryokuhi daizu no kenkyû Special report no. 1: Research on soybeans as a green manure crop]. Nagaoka, Niigata prefecture, Japan: Niigata prefecture Agricultural Research Lab (Niigata-ken Nôji Shiken-jô). 6 p. 23 cm. [Jap]*

• ***Summary:*** Nagaoka is a city located in the central part of Niigata Prefecture, Japan. It is the second largest city in the prefecture, after the capital city of Niigata. Address: Japan.

1872. Kinoshita, Asakichi. 1917. Shôyu seizô ni kansuru kôjô keisû [On the yield of products in the production of shoyu]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 20(236):1124-43. [Jap]

• ***Summary:*** Gives figures on the amount of ingredients used in "shoyu" and the amount of finished product resulting.

The proportion of ingredients employed are as follows: Soy beans, 0.5 koku (1 koku = 180.39 liters); wheat, 0.5 koku; common salt, 0.5 koku; and water, 1.0 koku. The beans when washed, steeped, and steamed, gain about an equal amount in weight and volume compared with the original. The wheat, when parched/roasted and crushed, increases to about 1.8 times its original volume and loses about 0.16 of its original weight. The mixture of beans and wheat is transformed into "koji," the yield of koji being about 1.6 by volume and 0.9 by weight. The koji is mixed with a salt solution (specific gravity 1.143-1.152) and stirred occasionally. When the summer comes, active fermentation sets in and after one year, finished "moromi" is obtained, its weight being 85 kwan (1 kwan = 3.75 kg). This moromi is pressed, and the liquor is pasteurized, yielding about 1 koku of Japanese soy.

1873. Lyman, Benjamin Smith. 1917. Vegetarian diet and dishes. Philadelphia, Pennsylvania: Ferris & Leach. 416 p. See p. 155-58. Index. Portrait. 21 cm. [3 ref]

• ***Summary:*** Discusses the physiological, economical, and ethical advantages of a vegetarian diet, with recipes and principles of preparation. The author, who wrote mostly about geology, lived 1835-1920.

A large table titled "Composition of foods" (p. 44-47) gives the percentage of protein, fat, carbohydrates, and ash (on a dry basis) for many foods, including natto, fresh tofu, soy bean–dried, Swiss miso, soy [shoyu] No. 1 and 2, and white miso (all figures from Abel 1900), plus peanuts–dried.

In the chapter titled "Foods of vegetable origin" (p. 141-267), the section on "Pulse" (p. 152-78) contains a subsection titled "Soy bean" (p. 155-58), which begins: "The soy bean of China and Japan is perhaps the most important food plant there, next to rice. The bean is eaten to a small extent boiled like other beans; but is generally elaborated into a variety of products remarkably rich in protein and fat and therefore going well with rice so deficient in those constituents." The following soy-related subjects are discussed, based largely on the writings of others: Soy sauce (Abel), natto (Abel), miso (R. Takahashi), tofu (Abel), *aburage, koritofu,* substitutes for milk and cheese, and nutritional comparison with eggs, milk and cheese (Abel, Atwater).

The section titled "Substitutes for milk and cheese" states: "The Chinese in Paris [probably Li Yu-ying] have

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been urging the culture of the soy bean. The seeds, when boiled, mashed, and pressed, yield both milk and cheese; if thinned with water, a very good substitute for animal milk; and if coagulated with mineral salt, a cheese that is usually eaten fresh, though it may be preserved by salting or smoking, after being cooked. Three varieties of the cheese are common in the oriental markets; a fermented kind [fermented tofu], white, yellow, or gray in color, with a piquant taste, like roquefort; a salty and white kind, like goats' milk cheese; and a third kind, smoky and resembling Gruyére. The soy cheese costs about a fiftieth as much as animal cheese; and in nutritive value, like the vegetable milk, compares very favorably with the ordinary products of the cow. ('Phila. Ledger,' Sept. 27, 1906)."

Note 1. No such article in the *Philadelphia Ledger* or the *Public Ledger* (Philadelphia, Pennsylvania), of this date, can be found.

Note 2. The idea of "Three varieties of cheese" came from Li Yu-ying (1905-1912) and in this case, where they are common in oriental markets, almost certainly refers to fermented tofu, and not to a Western-style cheese made from fermented tofu.

Note 3. This is the earliest U.S. document seen (Dec. 2008) that mentions smoked tofu.

The section on peanuts (p. 158-62) includes roasted peanuts, peanut butter, peanut taffy, and "Terralac or peanut-milk (here first published)." Details on how to make peanut-milk at home are given, followed by many recipes for its use–each preceded by the word "Terralac." Thus: Terralac custards, Terralac punch. Terralac cream, salad dressing, sauce, cream sauce, creams, blanc-mange [blancmange], cream pie, Bavarian cheese, Terralac in soup, "Ice-Terralac, or peanut ice-cream," peanut soup, salted peanuts.

There are also sections on the cowpea (p. 163+), almonds (p. 263-65; incl. salted almonds, marchpane, macaroons, nougat or almond cake, almond milk, orgeat syrup, burnt almonds, replacing almonds), vegetable-gelatine (p. 384-87, incl. carrageen or carragheen [carrageenan], Irish moss, and kanten), sesame oil or gingelly oil (p. 388), peanut oil or groundnut oil (p. 388), almond oil (p. 389), and sago and sago recipes (p. 390-91, incl. three sago puddings).

Note 3. *Merriam-Webster's Collegiate Dictionary* (1998) defines orgeat (a word first used in 1754) as "a sweet almond-flavored nonalcoholic syrup used as a cocktail ingredient or food flavoring."

1874. Morse, Edward S. 1917. Japan day by day, 1877, 1878-79, 1882-83. 2 vols. Boston & New York: Houghton Mifflin Co. Vol 1, xiv + 441 p.; Vol. 2, 453 p. Illust. (Color frontispieces + sketches). Index. 22 cm. [20+* ref]

• ***Summary:*** These charming books, illustrated with 777 illustrations from sketches in the author's journal, is a diary (to avoid the duplication of home letters; subjects are treated chronologically rather than topically), filled with detailed observations about most aspects of Japanese life and the author's pioneering work there as a professor. It gives a vivid picture of daily life in Japan in the late 1870s. Morse quickly grew to admire and love the Japanese people; his greatest problem was learning to enjoy Japanese food.

Volume 1: "Almost everything in the sea furnishes food for the masses... Seaweed, a thin green leaf, is also eaten; it is dried and put up in tin boxes," apparently a species of ulva. "I have mustered courage enough to taste a few of the dishes, and have succeeded in swallowing but one of them, and that was a kind of soup... Water was boiled in a tin vessel with a sauce [shoyu or miso] made from fermented bean [sic, beans], dark in color like Worcestershire sauce; into this were put slices of what looked like a cucumber, and then followed large blocks of a substance which resembled new white cheese [tofu], fresh from the press; this was cut into triangular slices. This last substance was made from [soy] beans, strained to remove the skins, and then made into a paste-like block. This soup was certainly nourishing and with a little practice one might come to like it. Another common article of food is made from seaweed an is known as *tokoroten"* (p. 87-88).

"It was delightful... to sit down again to a dinner of rare roast beef, real butter, and good bread. It is difficult to understand a country in which there is no milk, butter, cheese, bread, or coffee, and never has been. Butter is so distasteful to the Japanese that they cannot eat cake or other article of food in which composition butter is used" (p. 120).

A famous preparation is "cold raw fish, cut in this slices from the fish while fresh and alive. The idea of eating raw fish is particularly repulsive to our taste, though we eat raw oysters; nevertheless, foreigners soon get accustomed to it. The sauce [soy sauce] made of fermented [soy] bean, barley, and some other grain seems to have been specially created for this kind of food. I ate a great deal of it and must confess that my first experience was fairly good,... (p. 143-44).

"The tail of the fish was cut off and flung overboard... the [raw] fish was chopped into small pieces, head, eyes, bones, and all, and this hash was put into a wooden bowl... From a box was added a substance [miso] that had a very sour odor, something made of beans and allowed to ferment, a little water was added, and it was all stirred up together, and such an unsavory-looking mess I never saw before. The gusto, however, with which the man ate it to the last grain, showed that it was palatable to him at least" (p. 185).

"I have lived on rice, sweet potatoes, egg plant, and fish for two weeks. I would give all my old shoes, and new ones too, for a good slice of bread-and-butter, a bowl of bread-and-milk, or any other thing you are enjoying at home" (p. 227).

"The cakes had a stamp of the chrysanthemum on top; these were red and white and were made of [azuki] bean paste and sugar. The Japanese are very fond of them, but they are rather insipid in taste" (p. 395).

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"I have finally resigned myself to the Japanese food of this region [Yezo {Hokkaido} near Hakodate]... And of all places to start such an experiment in this village! It required some courage and a good stomach to eat for dinner the following: fish soup, very poor; bean paste [miso?], which was not so bad;... and holothurian, or sea cucumber,... by no means agreeable. It was eaten with Japanese sauce, *shoyu,* which renders everything more or less palatable... On the whole, I am keeping body and its animating principle together, but long for a cup of coffee and a slice of bread-and-butter. I am the only outside barbarian in town" (p. 440-41).

Volume 2: The New Year's food included "a bean pickle in sugar syrup and Japanese sauce" [probably black soybeans (*kuromame*)] (p. 93). A detailed description of mochi and its pounding are given, with two illustrations (p. 95).

As they left Izumi and entered the Province of Kii [today's Wakayama], "I saw the process of manufacture of a curious kind of food one often sees in certain soups. It has a bright-yellowish color, as thin as paper, and has no definite flavor. The substance is made from soya beans by a curious and simple process. The beans are boiled in a large boiler till they are very soft; they are then ground in a mill to a fine paste, and mixed with water and colored by some stuff that is imported from abroad (fig. 675). This material is then put into a shallow trough divided by square partitions, beneath which is a charcoal fire which keeps the stuff gently boiling. The surface coagulates as it does on boiled milk, or on a cup of cocoa, and the film that forms is taken off very skillfully with slender bamboo sticks and hung up to dry (fig. 676). Other films form and are promptly removed by a girl who is kept busily at work" (p. 286-88).

In Kawagoe [a city in today's Saitama prefecture, about 20 miles northwest of Tokyo]: "It is a common custom... to eat grasshoppers as a relish... The Japanese prepare them by boiling them in shoyu, sugar, and a little water, till the water has nearly all boiled away" (p. 324-25).

At New Year's "our old cook brought me a box of *yokan* (made of sugar and [azuki] beans)... (p. 393).

Edward Sylvester Morse, a marine biologist specializing in Brachiopods, lived 1838-1925. Address: Salem, Massachusetts; Former Prof. of Zoology, Imperial Univ., Tokyo.

1875. Tadokoro, Tetsutarô. 1917. Shôyu moromi no kôso sayô ni taisuru en-rui no sokushin genshô ni tsuite [Stimulating effect of salts on the enzyme action of shoyu moromi]. *Kogyo Kagaku Zasshi* (*J. of Industrial Chemistry*) 20(236):1114-24. [Jap]

• ***Summary:*** The enzymic activities of Japanese soy have a very important effect on the formation of its proper odor and taste during fermentation. These activities are very much checked by the presence of a large quantity of common salt, such as is usually added in the preparation of the "shoyu." They may, however, be stimulated either by decreasing the quantity of salt or by increasing the temperature during fermentation. The author has found yet another method whereby the inhibitive effect of the salt may be controlled, by the antagonistic action of other neutral salts. Potassium chloride, aluminum chloride, calcium chloride and magnesium chloride are good antagonistic agents; aluminum chloride and calcium chloride show a powerful stimulating effect on amylase and pepsin in "shoyu-moromi." Better results are obtained by using a mixture of 2 or more salts together than with a single salt. When the concentration of common salt is 3 normal, a beneficial result is obtained by adding 0.0001-0.002% of a mixture of antagonistic salts to the common salt, whereby the enzymic activities of the shoyu-moromi are increased by 20%. Address: Nôgaku-shi, Tohoku Teikoku Daigaku, Noga Daigaku, Nogei Kagaku Jikkenshitsu.

1876. Tsujimoto, Mitsumaru. 1917. Nihon shokubutsu yushi [Japanese vegetable oils and fats]. Tokyo: 712 + 27 p. See p. 161. Index. 23 cm. [Jap]*

• ***Summary:*** Gives a detailed discussion of the physical and chemical characteristics of soy oil. Address: Japan.

1877. Yukawa, Matao. 1917. Shôyu moromi no jukusei ni okeru chiroshin no hen'i [Transformation of tyrosine during the ripening of shoyu moromi]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 38:358-73. [3 ref. Jap] Address: Nôgakushi.

1878. Whittle, Charles A. 1917? Why soy beans? *Southern Fertilizer Association, Soil Improvement Committee, Circular* No. 3. 4 p. Undated. But it was received by the USDA National Agricultural Library on 24 May 1918.

• ***Summary:*** "If the boll weevil takes from 30 to 50 per cent of the cotton crop then something else must be grown to supplement cotton. Soy Beans can lay strong claims for a place. The demand for its oil and meal is rapidly increasing." Contents: For human food: Soya biscuits (containing soya flour), soy bean milk (used for centuries in Japan and China "Because of its food value and for sanitary reasons, it is of greatest importance to bakeries and confectioners"). For stock feed. For industrial uses: Soap and paint. Wide adaptation to soil and climate. The increasing demand. Varieties. Yields and returns. Fertilization. Address: Atlanta, Georgia.

1879. *Board of Trade Journal* (*London*). 1918. Japan (Corea). Soya beans. 100:778. Jan. 3.

• ***Summary:*** "H.M. Consul-General at Seoul writes that the 1917 crop of soya beans in Corea is estimated at 14,094,545 bushels, as compared with 14,668,197 bushels in 1916. The decrease in the crop is attributed to scarcity of rain in the spring." Address: British Consul-General at Seoul.

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1880. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*). 1918. Shipments of bean oil from Manchuria. 21(6):87. Jan. 8.
• ***Summary:*** "Extract from the *Manchuria Daily News,* forwarded by Consul A.A. Williamson, Dairen, Nov. 14.

"The Mitsui Bussan Kaisha is now exploiting the Dairen-Seattle service with half a dozen steamers, including four chartered vessels, the aggregate deadweight tonnage of which is put at about 70,000. During the past five months the following consignments of bean oil have been shipped exclusively to Seattle from Dairen: June, 140,000 cases; July, one full cargo; August, 5,400 tons by one steamer and 100,000 cases by another; September, 8,000 tons by one steamer, 6,747 tons by a second, and 100,000 cases by a third; and October, 5,500 tons.

"Another slump has been experienced in the steamer freight on bean cake from Dairen to Japanese ports. The Dairen-Kobe 'tramp' rate has finally declined as low as 40 sen per picul from 60 sen quoted toward the latter part of September, and threatens to go lower (sen=½ cent United states currency; picul=133.33 pounds)."

1881. Hori, S.; Bokura, U. 1918. Soy bean cake as a substitute for peptone in the preparation of the nutrient media. *Nippon Shokubutsu Byori Gakkaiho* (*Annals of the Phytopathological Society of Japan*) 1(1):27-31. Jan. Summarized in Experiment Station Record 42(4):334. March 1920. [3 ref. Eng]
• ***Summary:*** "Since the outbreak of the present European war, the importance of peptone, indispensable in the preparation of the nutrient media for the culture of fungi and bacteria, has been checked and the price has risen to about eight or ten times its former figure; even the home made peptone is actually sold at present at the high price of ¥ 15 per lb. Thus the cost of preparing the culture media in mycological and bacteriological laboratories has greatly increased."

"This led one of the authors to investigate some economic material as a substitute for peptone in the preparation of the nutrient media." After experiments with ammonium sulphate, Kinako powder, and soy bean cake, "it was found that pulverized soy bean cake gives the most satisfactory results, 30 grams of which (for 1 liter of water) may be substituted for 20 grams of peptone... Thus since 1915, the soy bean cake extract has come into general use in our laboratory as media for the culture of fungi and bacteria, except for some special investigations, and the said media are now almost universally employed for the culture of mouse typhus bacteria throughout the country." Information is furnished regarding the preparation and expense of this medium. "Soy bean cake is largely imported every year from China as a nitrogenous fertilizer. In 1916 it reached the amount of 760,000 tons valued at 34,500,000 Yen. One cake weighs about 59 pounds and costs about 1½ Yen."

Note 1. This is the earliest publication seen on the use of soybeans to make cultural media, as for bacteriological use.

Note 2. This is the earliest English-language document seen (Nov. 2012) that uses the term "Kinako powder" to refer to roasted soy flour. Address: Phytopathological Lab., Imperial Central Agric. Exp. Station, Nishigahara, Tokyo, Japan.

1882. Terao, H. 1918. Maternal inheritance in the soy bean. *American Naturalist* 52(613):51-56. Jan. [3 ref. Eng]
• ***Summary:*** Discusses the inheritance of cotyledon- and seed-coat color. Contents: Introduction. Transmission of the color of the cotyledons. Transmission of the color of the seed coat. Explanation of these phenomena. Conclusions.

"The soy bean, *Glycine hispida* Maxim., shows as different types two cotyledon colors, yellow and green. The beans with yellow cotyledons have two types of seed-coat colors, namely, green and yellow, while the beans with green cotyledons have always green seed-coats. The inheritance of these types of cotyledons and of seed-coats has been proved by the author's experiments [since 1910] to be maternal." That is, these colors are transmitted by the female plant only.

The author also studied the behavior of artificial hybrids in Japan. Although there are a large number of soybean varieties in East Asia, it is clear that they are the results of natural crossing and selection.

Note: This is the earliest document seen (Dec. 2006), published in Japan, on soybean genetics, and one of the world's first comprehensive studies. Address: Imperial Agric. Exp. Station, Tokyo, Japan.

1883. Suzuki & Co. 1918. Established 1887. Manufacturers and general merchants (Ad). *Times of India* (*The*) (*Bombay*). Feb. 12. p. 9.
• ***Summary:*** The company's head office is in Kobe, Japan. They have offices in London and New York. This large ad lists: Branches or agencies (in what cities). Dealers in (what goods, incl. "soya bean oil"). Factories and refineries and refineries for (what commodities, incl. [soya] "Bean oil). Managing agents for (what other manufacturers). "Sakura" brand beer (made in what cities and countries). Agents for (what manufacturers).

Note: This ad also appeared in the Feb. 19 (p. 2), Feb. 26 (p. 4), and March 5 (p. 2) issues of this newspaper.

1884. Howell, E.V. 1918. Soy beans and soy bean oil. *J. of the American Pharmaceutical Association* 7(2):159-63. Feb. [14 ref]
• ***Summary:*** "This bean is a native of southeastern Asia. It is at present the most important legume grown in China and Japan, where it is grown almost exclusively for human food. It has been cultivated from a remote period, each

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district having its own distinct variety, some two hundred kinds in all... The bean was introduced into England in 1790. Apparently the first mention of soy beans in American literature was in the *New England Farmer,* October 23, 1829, in an article by Thomas Nuttall." There follows a summary of this article and several other early U.S. documents that mention the soy bean.

"Importance: I think the soy bean is the most important plant introduced into the South within a hundred years. This opinion is based on the range of the plant, the value as a soil improver, and the numerous uses of the seed and oil, together with the fact that the present cottonseed oil mills can produce the oil with practically no change in machinery and thus double their mill season. The beans can be stored, as they are practically immune to insects. Especial emphasis is placed on this statement in the present demand for food on account of the war. In Japan the bean forms one of the most important articles of food, by nature a meat, to go with the starch of rice. The Chinese make from the beans a cheese resembling our own cheese, while the Japanese make the well-known sauce for rice or fish, soy or suey sauce. It is one of the principal ingredients in 'Tofu' (bean curd), natto (steamed beans), and white and brown miso, which is like our molasses brown bread."

"A factory for the production of this [soy] milk has recently been established in America. This can be used in cooking, by bakers, confectioners, and chocolate manufacturers. I have before me the following food articles in which soy bean meal is the principal ingredient: Egg substitute No. 1, egg substitute No. 2, colored cocoanuts, coffee substitute, cocoa substitute, roasted malted nuts, coloring curry powder, cutlet powder, soy and navy beans with pork, the equal of any pork and beans.

"The use of the soy meal for soups, for proportional use in muffins, cookies, fritters, croquettes, biscuit, and loaf bread is unlimited. Its use is checked only by our prejudice for certain customary flavors, just as northern people and Europeans do not use corn meal. In other words, North Carolina, if forced to by war conditions, could largely exist on the soy beans crushed in the State this year, including the imported and native beans crushed, the oil from which I estimate to yield this year 400,000 gallons. This oil can be used for frying, and for a salad oil in French dressing or in mayonnaise. I fried a partridge in the crude unrefined oil, and found it delicious.

"While the chief use, so far, of the oil has been for soaps and paints, the particular object of this paper has been to call attention to the use of soy oil in pharmaceutical preparations."

Tables show: (1) The specific gravity, saponification value, and iodine for three samples of Manchurian soy oil purchased in New York. (2) The chemical composition of soy bean meal (8.77% fat), compared with the meal of five other seeds (including cottonseed, linseed {old and new process}, decorticated peanut, and sunflower seed). (3) Four chemical constants of seven samples of domestic and imported soy oils (from L.P. Nemzek). (4) The food values (nutritional composition) of soy beans and six other foods, including lean beef, milk, and eggs.

Because of World War I: "During the past six or seven months there has been produced in this country in the neighborhood of one hundred thousand gallons of soy oil. The largest part of this quantity has been produced in North Carolina by the Elizabeth City Oil & Fertilizer Co., Winterville Cotton Oil Co., and the New Bern Cotton Oil & Fertilizer Mills. Samples from the different crushings have been examined in comparison with the imported oil."

"Medicinal use: In England a diabetic biscuit is manufactured. In this country an infant's food from the soy bean is on the market. The enzyme in the bean is also attracting attention and opening a field for investigation."

Note 1. This paper was presented at the Scientific Section, American Pharmaceutical Assoc., Indianapolis meeting, 1917.

Note 2. This is the earliest English-language document seen (Oct. 2008) that contains the word "crushings."

1885. Makino, Magotaro. 1918. Soy-bean food (tofu). *U.S. Patent* 1,258,427. March 5. 2 p. Application filed 5 Dec. 1916.

• ***Summary:*** Soy bean flour is mixed with water and a small quantity of an edible oil, the mixture is heated, filtered, and the proteins in the filtrate are precipitated/coagulated with Epsom salts and separated from the liquid.

Note: This is the earliest document seen (Sept. 2011) with the term "Soy-bean food" (or "soy bean food") in the title. Address: San Francisco, California.

1886. Satow, Sadakichi. 1918. Procédé pour l'extraction de matières protéiques de substances contenant de la protéine végétale, pour emploi dans les arts industriels [Process for extraction of proteins from substances containing vegetable protein for use in the industrial arts]. *French Patent* 486,190. March 14. 5 p. Application filed 30 June 1917. [Fre] Address: Japan.

1887. Itano, Arao. 1918. Soy beans (Glycine hispida) as human food. *Massachusetts Agricultural Experiment Station, Bulletin* No. 182. 10 p. March. [16 ref]

• ***Summary:*** Contents: Introduction. Chemical composition and digestibility. Human food prepared from soy beans (practical recipes for making Japanese foods at home; names in parentheses indicate the Japanese name). Soy bean milk (*Toniu*)*:* The ordinary method employed in Japan, toniu from soy bean meal (made by grinding soybeans in a wheat flour mill or fine coffee mill), author's method [from soy bean meal, plus inoculation with *Bacillus coli* and *B. lactis aerogenes*], synthetic toniu, condensed soy bean milk

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(condensed toniu). Evaporated soy bean milk (yuba). Soy bean curd (tofu): Fresh curd (tofu), frozen tofu (*kori tofu*), fried tofu (*abura-age*). Baked beans. Boiled beans. Roasted beans.

"Powdered beans–Roasted: 1. Roast as in the roasted beans [either in an oven or in an ordinary corn popper]. 2. Let them stand until cool to harden them. 3. Grind them in a coffee mill or any other suitable grinder. Note.–The powder can be used as a salad dressing or cooked with cookies like peanuts or other nuts, or employed as a substitute for coffee."

Powdered beans, raw (soy bean meal). Green beans. Soy bean pulp (*kara*). Fermented boiled beans (natto). Ripened vegetable cheese (miso; discusses koji). Soy bean sauce (shoyu). Vegetable butter, ice cream, oil (table use) and lard (cooking): "The manufacture of these articles from soy beans needs further investigation." How to make "Evaporated soy bean milk (Yuba)" at home (p. 5): "1. Boil the soy bean milk until a film is formed on the surface. 2. Collect the film and cut it into any shape desired. Note.–The film consists of coagulated albuminoids and fat. It may be used as an article of food, cooked in soup, etc."

Note 1. Even though it is very brief and inadequate, this is the earliest document seen (Oct. 2012) that contains a description of how to make yuba at home.

How to make "Baked beans" at home: (p. 7). "1. Soak the beans, suspended in a cloth bag, in a large quantity of hot water over night. (Soaking for twenty-four hours in ice-cold water which is changed occasionally will give the same result.) 2. Change the water, when hot water is applied, in the morning and an hour or two before cooking. 3. Add 1 teaspoonful of soda [sodium bicarbonate] per quart of beans and boil until the beans become soft. 4. Bake like other beans. Note.–The characteristic strong flavor of the beans is removed by soaking before cooking; the addition of soda [sodium bicarbonate] makes the beans soft. Cooking with salt pork, potatoes, onions, molasses and other substances makes the beans more palatable to some tastes."

Concerning the "Roasted beans" (p. 7). "1. Roasting can be done either in an oven or in an ordinary corn popper. 2. Roast until the skin of the bean is burst by popping. Note.–The beans can be kept soft by immersing them in a syrup while they are hot. Thus very wholesome candy is prepared."

Concerning the "Powdered beans: Roasted" (p. 7). "1. Roast as in the roasted beans. 2. Let them stand until they cool to harden them. Grind them in a coffee mill or other suitable grinder. Note.–The powder can be used as a salad dressing or cooked [baked] with cookies like peanuts and other nuts, or employed as a substitute for coffee." Note 2. This is the earliest English-language document seen (Nov. 2012) that uses the term "Powdered beans: Roasted" to refer to roasted soy flour.

Concerning "Green beans: 1. Pick them when the beans are three-fourths to full grown. Boil them in salt water. 3. Discard the pods. 4. Serve the beans with butter or milk. Note–The pods are tough and they can be removed easily on boiling."

Concerning "Soy bean pulp (kara): 1. This is the residue after the milk is extracted in the process of preparation of soy bean milk. 2. Cooked like any other vegetable with proper seasoning. Note.–Makes a very rich dish; an addition of green onions, cabbage or parsnip may improve it."

Tables contain analyses of the chemical composition of each of the basic foods discussed.

Note 3. This is the earliest English-language document seen (Sept. 2013) concerning soy ice cream, which it calls simply "ice cream." This is also the earliest document seen (Sept. 2013) concerning the etymology of soy ice cream.

Note 4. This is the earliest English-language document seen (June 2013) that uses the term "soy bean pulp" to refer to okara.

Note 5. This is the earliest English-language document seen (June 2013) that describes how to use okara in a recipe.

Note 6. This is the earliest English-language document seen (Aug. 2013) that uses the word "toniu" to refer to soymilk; the Japanese word is *tônyû*. Address: Amherst, Massachusetts.

1888. *Wall Street Journal.* 1918. The stock market: Better sentiment prevails. April 4. p. 4.

• ***Summary:*** The section titled "Chemicals" states: "It is worth noting that Japan is finding a tremendous market in the United States for vegetable oils. New business enterprises on the Pacific coast have started up and made millions in the last twelve months. Cocoanut oil, soy bean oil, castor oil, and similar products are finding a big market."

Note: A similar article titled "War favorites record gains" appeared on this same day in the *Washington Post* (p. 11).

1889. *USDA Bureau of Plant Industry, Inventory.* 1918. Seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from January 1 to March 31, 1915. Nos. 39682 to 40388. No. 42. 123 p. April 17.

• ***Summary:*** Soy bean introductions: *Soja max* (L.) Piper. Fabaceæ. (*Glycine hispida* Maxim.)

"39967-39982. From Soochow, China. Presented by Mr. N. Gist Gee, Soochow University. Received February 11, 1915. Quoted notes by Mr. Gee, except as otherwise indicated. "39967-39972.

"39967. '(No. 1. *Kua shu tou* (*Kwa zoh*). Melon-ripe bean.) This is so named because of its time of ripening. Seeds are sown about the first of May and cropped late in June when melons are ripe. Used only as a vegetable.'

"39968. '(No. 2. *Chia chia san tou* (*Kah kah sen*). Pod pod three bean.) Planted in the middle of May and reaped during September. Used as a vegetable and for manufacturing of oil.'

"39969. '(No. 3. *Hung hsiang chih tou* (*Ong sing*

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sze). Red familiar bean.) These are "Loving beans," as the characters suggest. Planted in the middle of May and harvested about September. Used both as vegetables and in the manufacture of oil.'

"39970. '(No. 4. *Hei tou* (*Huk*). Black bean.) Owing to their color, these are called "Black beans." Planted in the first part of June and reaped in the middle of October. Used as a vegetable and in the manufacture of oil.'

"39971. '(No. 5. *Ku li ch'ing* (*Kwa lea ching*). Bone inside green.) Planted early in June and harvested in late October. Used only in making oil.'

"39972. '(No. 6 *Shih tzû ho tou* (*Zee tee 'ah*). Persimmon-seed bean.) Planted in the first part of June and cropped in the middle of September. They are largely used as vegetables.'

"39974-39977.

"39974 '(No. 8 *Pa yüeh pai tou* (*Gee buh*). Eight-month white bean.) The combined meaning of its color and its time of ripening indicates the name. Planted in May and harvested in September, which is the eighth month of the Chinese calendar. Used to make oil. This and No. 9 [S.P.I. No. 39975] are the best two for oil manufacture.'

"39975. '(No. 9. *Shui pai tou* (*Gee buh*). Water white bean.) Planted in late May and reaped in September. Used to manufacture oil; one of the best two for oil manufacture.'

"39976. '(No. 10. *Niu t'a pien* (*Nue duh pea*). Cow crush flat.) Its use and time of harvesting are the same as those of the *Gee buh* [S.P.I. No. 39975]. The beans are trodden out by cows; hence the name.'

"39977. '(No. 11. *Wu ch'iao tou* (*Oh tsah*). Sparrow's cackling (or magpie) bean.) Planted about the last part of June and cropped in mid-October. Used largely to make oil.'"

"39982. '(No. 16. *Lü tou* (*Loh*). Green bean [mung].) Planted in the early part of June and cropped early in September. Used the same as the *Ch'ih tou* [S.P.I. No. 39980]. Called "green bean" because of its color, probably.'"

"40106/40138. From Wakamatsu, Iwashiro, Japan. Presented by Rev. Christopher Noss. Received March 8, 1915. Quoted notes by Mr. Noss. 'From an exhibition in Kawamata, near Fukushima City.'

"40106-40127.

"40106. '*Mochidaizu* (*dai*, large; *zu*, bean [daizu = soybean]), used in *mochi* (glutinous rice boiled and pounded in a mortar).'

"40107. 'No. 2. *Nakatedaizu* (second early), used in *miso* (beans, etc., pickled in salt and made into soup), *tofu* (bean curd).'

"40108. 'No. 3. *Shichi-ri-korobi-daizu* (20-mile rolling), used for *tofu, soy, and miso.*'

"40109. 'No. 4. *Yuki-no-shita-daizu* (under the snow), used for *tofu, soy, and miso.*'

"40110. 'No. 5. *Wasedaizu* (early), used for *tofu, soy, and miso.*'

"40111. 'No. 6. *Misodaizu.*'

"40112. No. 7. *Ko-tsubu-daizu* (small grain), used for *miso* and *natto* (buried, fermented, and eaten as a relish).'

"40113. 'No. 8. *Kinako-daizu,* made into *kinako* (a flour used in cooking) and also *natto.* Said to have been brought by soldiers from Manchuria.'

"40114. 'No. 9. *Tamazukuridaizu* (name of a country near Sendai), used boiled.'

"40115. 'No. 10. *Asahidaizu* (morning sun), used for *natto.*'

"40116. 'No. 11. *Darumadaizu* (Dharuma [Bodhidharma], whose image was a roly-poly, can not be upset), used boiled and for *tofu.*'

"40117. 'No. 12. *Taiwandaizu* (Formosa), used boiled.'

"40118. 'No. 13. *Hato-koroshi-daizu* (dove killer), used boiled.'

"40119. 'No. 14. *Usu-ao-daizu* (light green), used for *kinako* and boiled.'

Note 1. This soybean and the *Ao-daizu,* below, might give naturally greenish kinako.

"40120. 'No. 15.

Ao-daizu (green), used for *kinako* and boiled.' Note 2. This is the earliest English-language document seen (Nov. 2012) which states that green soybeans are used to make kinako.

"40121. 'No. 16. *Aka-kuki-daizu* (red stalk), used for *natto* and *miso.*'

"40122. 'No. 17. *Fuku-shiro-daizu* (clothing white), used for *tofu.*'

"40123. 'No. 18. *Hachi-ri-han-daizu* (21 miles), used boiled. The name *Hachi-ri-han-daizu* involves a curious play on words. *Hachi-ri-han-daizu* means "eight ri (a ri is 2.5 miles) and a half," which is just a little short of *ku-ri.* Now *ku-ri* means nine ri, and *ku-ri* also means chestnut, so the expression in question means that the beans so named are almost equal to chestnuts.'

"40124-40127. 'Beans are used boiled.'

"40124. 'No. 19. *Yoshiwaradaizu* (harlot quarters in Tokyo).'

"40125. 'No. 20. *Chadaizu* (tea, alluding to the color [brown]).'

"40126. 'No. 21. *Kichidaizu* (lucky).'

"40127. 'No. 22. *Kurodaizu* (black).'"

"40370-76. From Wakamatsu, Iwashiro, Japan. Presented by Rev. Christopher Noss. Received March 27, 1915. Quoted notes by Mr. Noss.

"40370. 'No. 33. *Hikagedaizu* (shade), produces in shady places; used for *miso.*'

"40371. 'No. 34. *Dekisugidaizu* (excessive yield); used for *miso.*'

"40372. 'No. 35. *Kurodaizu* (black); eaten boiled and sugared.'

"40373. 'No. 36. *Nakatedaizu* (medium early); used for *miso.*'

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"40374. 'No. 37. *Hishidaizu* (water caltrop, alluding to the flattened shape); eaten parboiled and seasoned with shoyu and salt.'

"40375. 'No. 38. Name unknown, cultivated from ancient times in Soma County, Fukushima Ken; used for *miso.'*

"40376. 'No. 39. *Hakodate-nishiki-daizu* (Hakodate brocade); used for *miso.'"* Address: Washington, DC.

1890. Baker, E. Carleton. 1918. Marketing the bean crop in Mukden district. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 21(98):366-68. April 26.

• ***Summary:*** Owing to a severe drought in the upland districts and to floods along the Liao River, the soya bean crop of 1917, compared with the 1916 crop, decreased by about 20 per cent in some districts and as much as 40 per cent in others. In North Manchuria, where weather conditions were more favorable, a 90 or 100 per cent crop is reported, and in South Manchuria the 1917 harvest is estimated to be about 60 per cent of the normal crop. In the Liao River districts the drought was not so damaging as the floods, which destroyed a large part of the crops on the west bank of the river at such places as Kwangning, Chinchow, and Hsinmintun. In the first of the above-mentioned places the white bean is largely grown, and in the two latter named places the black bean is produced. There is consequently a shortage in those varieties. In the upland districts the crops were affected by drought soon after planting and by floods at about harvesting time.

"Marketing methods: There have not been any radical changes in the methods of marketing the beans. Most of the bean dealers at Changchun make their purchases in the outlying bean districts of the Kirin Province and in different districts southeast of Manchouli. In some cases the growers themselves convey their beans to the most convenient markets. About 80 per cent of the buyers purchase their beans in the growing districts, the remaining 20 per cent purchasing in the various markets.

"At Mukden the beans are mostly brought in by the growers themselves, and those not already contracted for before the harvest are, sold to the highest bidders.

"There appears to be a growing tendency to establish collecting centers for accumulating the beans. In most of the growing districts there are already certain places recognized as collecting centers to which the bean growers bring their products by carts for selling to the collectors (local traders or agents of large dealers) who transport the beans (usually by rail) to the large dealers at Changchun, Tiehling, Kaiyuan, Hsinminfu, etc., where the beans growing in the surrounding districts of those places are collected. A number of the middlemen are innkeepers, who receive the beans from the farmers and pass them along to the buyers.

"In South Manchuria beans generally pass through only a few hands–from the growers to the collectors located in the producing districts and from the collectors to the large dealers, who may sell them to the bean mills or to exporters. But beans from distant districts or North Manchuria may-pass through many hands; for instance, the beans from Manchouli are sold to the collectors there, then at Harbin, Changchun, or Kaiyuan, and finally at Newchwang or Dairen.

"Money advanced on growing crops: In some instances money is advanced by the buyers on growing crops. In most cases such advances are made to the farmers who cultivate rented lands and are therefore not well off financially. In return the farmer contracts to sell his beans at from 10 to 20 cents less than the normal market value on each 'tow' or 40 pounds.

"Native dealers in the larger bean markets, such as Mukden, Newchwang, and Changchun, are inclined to speculate in beans. In some cases the buyers collect large quantities and hold them in the hope of selling at higher prices, and in other cases they speculate in growing crops by selling on forward contract, often agreeing to sell beans for future delivery at a price cheaper than the market price prevailing at the time the contract is made. In forward-contract deals the buyer is generally required to pay 80 per cent or the full contract price for the beans, the sellers in return furnishing the buyers with adequate guaranties for delivery. These methods of buying and selling beans are confined to the large dealers and do not, as a rule, directly affect the growers. The large dealers who make forward contracts generally endeavor to secure an option on certain amounts of the growing crops in order to be sure that they will be able to procure enough beans to meet their forward-contract obligations. For these options they will sometimes advance the grower as much as 50 per cent of the estimated value of his crop. Even a larger proportion of the value may be advanced when the buyer is convinced, by scrutiny of the title deeds, that the farmer is the owner of the land upon which the beans are growing.

"The sale of beans in the interior is conducted as a rule on a strictly cash basis. Some branches of the larger bean firms sell foreign and Chinese goods, these goods often being sold on credit against the growing bean crops. The prices of the goods thus furnished are somewhat higher than the ruling market quotations, as the buyers wish to obtain sufficient profits to cover the interest on the money invested in the goods.

"Currency used in transactions: In bean transactions, several kinds of money are used. In the Fengtien Province small silver coin notes are generally used, in Heilungkiang Province copper cash notes, in Kirin tiao notes, in the Chinese Eastern Railway zone rubles, and in the South Manchuria Railway zone silver yen notes are used. The high rate of silver has not affected the prices of beans very much,

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except where they are purchased in gold standard currencies, such as rubles and gold yen. However, the prices of beans are raised proportionately with the discount of the paper money, based on silver, in which most transactions are made. The strong foreign demand during the year, owing to shortage of foods, minimized to a great extent the exchange difficulties.

"As a general rule the larger bean dealers visit the growing districts just before the harvest in order to ascertain the conditions of the crop. The Mitsui Bussan Kaisha, the Kodera Co., and the Tung Ho Co. (all Japanese companies) have a large number of traveling agents who visit the bean districts from time to time, from the planting season until harvest.

"The early freezing of the roads facilitated the transportation of the last crop of beans to the various markets and enabled the growers to dispose of their products. No important changes have been made in the routes over which beans are brought to market. The charges for transporting the beans were increased considerably in some cases. The native cartage increased by more than 100 per cent and freight charges on the Chinese Eastern Railway by more than 400 per cent; the charges of the South Manchuria Railway and the river transportation charges remained about the same. The fall in the value of the ruble accounted for the enormous increase in the freight rate.

"Bean mills in district–Exports from Newchwang: There are about 100 bean mills, large and small, in Mukden and the immediate vicinity. No statistics are available as to their annual output, as most of the mills are small and do not operate regularly. There are about 30 mills in Liaoyang, 13 in Haicheng, 10 in Changchun, and 8 in Newchwang. There are also mills located at Kaiyuan and Tiehling, but at present their number is not known.

"The mills at Newchwang have the following monthly capacities (given in piculs of 133.33 pounds): A table with 4 columns gives the names of 8 Chinese mills, with the number of presses, and the soya bean oil and cake output capacity (in piculs) for each. The largest (Tung Yung Mao) has 100 presses, 3,600 piculs of oil, and 90,000 piculs of cakes; the smallest has 20 presses. "Exports of beans and bean products from Newchwang were as follows for 1916 and 1917, respectively: Beans, 98,905 and 41,000 tons; bean cake, 194,089 and 151,127 tons; and bean oil, 5,050 and 1,414 tons. The decreases were due to the shortage in the 1917 crops, and, it is believed (though no statistics are yet available), to the diverting of the trade to Dairen.

"At Newchwang the beans arrived by three routes–by river, by rail, and by carts–from the southeast districts. The beans are sold by measure; those arriving by boat and by train are carefully leveled off by the seller, and those bought from the carts (generally a mile or two out of the town, where the buyers meet the carts) are smoothed off by the buyer, who naturally gives himself a slight benefit by heaping the measures. This custom is also said to prevail upcountry. Beans brought by train by middlemen and bought at the Japanese station are always paid for in sycee [silver money in the form of ingots]. Those brought for sale by boats are sold from the boats alongside the bund.

"(A list of bean dealers In the Mukden consular district may be obtained from the Bureau of Foreign and Domestic Commerce or its district or cooperative offices. Refer to file No. 99483)." Address: Consul General, Mukden, China.

1891. Dorsey, Henry. 1918. Growing soybeans. *West Virginia Univ., College of Agriculture, Extension Dept., Circular* No. 204. p. 1-8. April. [1 ref]
• ***Summary:*** "Within the last five years soybeans have assumed, due to their many desirable qualities, an important place in West Virginia agriculture and their importance is quite likely to increase. Less than a decade ago the crop was practically unknown. A conservative estimate derived from county agents' annual reports indicates an acreage of more than 6,000 in 1917. This acreage is almost equal to that of clover alone according to the census figures of 1910."

Contains sections on the importance of the crop, harvesting, yields, suitable varieties, special uses, human food, and in crop rotations.

The section on human food uses states: "The scarcity of meats will doubtless lead to a wider use of soybeans in the human dietary. For centuries they have supplied a large proportion of the nitrogenous part of the food of the Chinese and Japanese. In the Orient the whole beans are not eaten directly but soy sauce, bean milk, bean curd, and vegetable cheese are made from them. Americans would doubtless object to many of these products. The whole beans have often been used like other beans–boiled, baked, or with pork. They need to be soaked several hours to remove the strong flavor. Soybean flour has great possibilities as a substitute for part of the constituents of various breads. When Americans learn to use the products of the seed, then there will be a ready market for the crop and it will take a regular place in our cropping scheme." Address: Asst. Prof. of Agronomy, West Virginia Univ., Morgantown.

1892. Kanzawa, T. 1918. Daizu royô ni tsuite [On the soybean pod gall midge]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 5(4):283-85. April. [Jap]
• ***Summary:*** Discusses *Asphondylia*. Address: Yamanashi ken-ritsu, Noji Shikenjo (Agric. Exp. Station).

1893. Takahashi, Teizô. 1918. Re: Design of koji trays. Letter to Dr. Charles Thom, Washington, DC, May 17. 2 p. Handwritten. [Eng]
• ***Summary:*** Takahashi has Dr. Thom's letter of May 18th and he is very pleased to see Miss Church working on this problem [of how to make shoyu using koji]. If Miss Church comes to visit him, she should come to Rutland, Massachusetts (c/o Mrs. Brown); he moved there from

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Boston a little while ago.

"I imagine that the apparatus needed for this problem is a wooden tray." He sketches a three-dimensional wooden koji tray, 1.5 feet long, by 8-9 inches wide, by 2-3 inches deep, with short legs on the bottom. "This tray is used for the preparation of 'kôji,' which is mentioned in my former letter. Other apparatus, such as steaming, roasting and crushing, I suppose are easily obtained in your Bureau." Address: 82 St. James Ave., Boston, Massachusetts.

1894. Gray, Olive. 1918. The new. Latest view in stores and homes. Novelties, ideas, and practical suggestions. *Los Angeles Times.* May 19. p. III-15, III-15.
• ***Summary:*** The section titled "Soy dairy products" states: "At a Japanese place, where groceries and produce popular with the orientals are always in stock, I was interested in observing the 'soy bean milk,' 'soy bean cottage cheese'– maybe it is pagoda cheese [probably tofu]. Soy bean flour [probably roasted] is also there, and recipes are issued which teach many ways of utilizing this so-nutritious food product."

1895. *Chemische Umschau auf dem Gebiete der Fette, Oele, Wachse und Harze* (*Germany*). 1918. Technologie: Fettgewinnung, Fettwirtschaft [Technology: Obtaining fats and oils, and their economics]. 25(5):53-54. May. [Ger]
• ***Summary:*** Soybean oil: During the years 1912-1914 England imported 192,000 tonnes (metric tons), 78,000 tonnes, and 72,000 tonnes of soybeans, and Germany imported 96,000, 106,000, and 64,000 tonnes of soybeans. In 1915, naturally [due to World War I], German imports came to an end, while English imports amounted to 174,000 tonnes. In 1913, Japan's soybean production was about 5.4 million tonnes; exports [of soybeans] from China were 624,000 tonnes and from Korea 95,000 tonnes.

1896. Thurston, Azor. 1918. Soya bean oil. *Midland Druggist and Pharmaceutical Review* 52(5):202-03. May. [3 ref]
• ***Summary:*** This oil is called *huile de soja* in French, *Sojabohnenoel* in German, and *olio di Soia* in Italian. "Soya beans are cultivated in Russia, Japan, China and the Southern part of the United States. Constants: Refractive index at 20ºC, 1.4768; specific gravity at 25ºC, 0.9194; solidification value, -15 to -16ºC; saponification value, 191 to 194; iodine value, 130 to 135; Reichert-Meissl value, 0.45 to 0.69. Principal components: Glycerides of oleic, linolic, stearic and palmitic acids." After discussing the oil's preparation, properties, and tests of purity, the author describes its uses: "Soya bean oil is used in soap making, in paints and varnishes as well as in making waterproof clothing. It is used as an edible oil in the manufacture of lard substitutes and oleomargarine. It is used to a limited extent as a lubricant and burning oil. 'German Coffee Berry' is a species of soya bean the seed of which, being parched and ground, is used as coffee. As a by-product the soya-bean meal is a valuable stock food." He then discusses natto, based on a 1912 article by S. Muramatsu. He adds, incorrectly, that "Tofu is a liquid preparation resembling cow's milk and manufactured from soya beans."

Note: Azor Thurston lived 1861-1922. Address: Ohio State Univ.

1897. Tu, Chow-Tien. 1918. Zhiwuxue daci dian [Botanical nomenclature: A complete dictionary of botanical terms]. Shanghai, China: Commercial Press. 1590 + 48 p. Illust. Index. 23 cm. [Chi]
• ***Summary:*** The text is in Chinese, with scientific names in Roman letters and Japanese names in *katakana.* Many plant descriptions, including that of the soybean, are accompanied by an excellent, original illustration, as indicated by an asterisk (*) below. The soybean is discussed in several places: Yellow soybean* (*Glycine hispida,* Maxim.) Daizu, mame. (p. 1133, 1239). Green soybean (*Glycine hispida,* Maxim.) Ao mame. (p. 1286-87). Wild soybean (*Glycine soja,* S. et Z.). Tsuru mame, no mame (p. 1335-36).

Also discusses: White azuki* (*Phaseolus radiatus,* L. var.). Shiro azuki. Shyapon mame (p. 294). Sesame seeds* (*Sesamum indicum,* L.). Goma (p. 674, 676). Kuzu (*Pueraria thunbergiana,* Benth.) (p. 1135). Kuzu. Peanut* (*Arachis hypogaea,* L.) Nankin mame. (p. 1197).

Other authors of this book are: Kong Qinglai, Wu Deliang, Li Xianglin, Du Yaquan, Du Jiutian (Tu Chow-Tien), Zhou Yueran, Zhou Fan, Chen Xueying, Mo Shulue, Xu Jiaqing, Huang Yiren, Ling Changhuan, and Yan Baocheng. Address: China.

1898. *Los Angeles Times.* 1918. The last of the House of Honda. June 2. p. MF4-5.
• ***Summary:*** In this short story (fiction), an American traveler finds himself on the island of Luchu (perhaps Okinawa, in today's Ryukyu Islands, which extend in a 600-mile-long arc between Kyushu {Japan} and Taiwan). He is taken, at night, to the home of a stranger–a Japanese aristocrat–on a large estate. There, the servant "set before me more awamori and a dish of bean curd and bamboo root" (p. 2, col. 1.4).

1899. *Board of Trade Journal* (*London*). 1918. Exploitation of vegetable oils [in Japan]. 100:778. June 20.
• ***Summary:*** According to H.M. Consulate at Shimonoseki, the Japanese oil industry is still in its infancy, but it should have an important future. Imports of Manchurian bean oil are valued at over 1,000,000 yen annually. A new company for the exploitation of vegetable oils, formed in June 1917, with a capital of one million yen, has completed the first section of its works at Wakamatsu, and manufacturing operations will soon be commenced. The consumption of soy beans will, it is stated, be 100 tons/day, and when the second section of the works is completed, 150 tons/day, with a yearly yield of 37,000 tons of bean-cake, and 6300

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tons of oil. The output of the works will be all taken by Mitsui Bussan Kaisha under a contract. The refined oil will be exported to the United States, and the bean-cake sold to farmers in Japan.

1900. *Board of Trade Journal* (*London*). 1918. Imports and exports of fertilisers in 1917. 100(1125):778. June 20.
• ***Summary:*** "Oil-seed fertilisers. Imports of oil-seed fertilisers (bean cake, rape-seed cake, cotton-seed cake, etc.) during 1917 amounted to 1,066,660 tons, valued at 55,967,822 yen, as compared with 835,681 tons (37,540,214 yen) and 402,190 tons (39,249,341 yen) in 1916 and 1913 respectively. The average price for bean cake in Japan in 1917 was 2.0 yen per cake (approximately 60 lb.); for rape-seed cake 4.30 yen per picul (133 1/3 lb.)." Address: British Commercial Attaché, Yokohama, Japan.

1901. *Bean-Bag* (*The*) (*St. Louis, Missouri*). 1918. Improvement of soy beans in Manchuria. 1(1):21. June.
• ***Summary:*** "The *Manchuria Daily News* states that the South Manchuria Railway's agricultural station has been experimenting on the improvement of Manchurian beans for several years. Ssupingkai special have been distributed to different places.

"The results in 1917 were favorable on the whole, and about 20 per cent increase in the yield was realized. Moreover, the new output is superior in weight, percentage of oil, luster, etc. These seeds are to be more widely distributed in 1918.

"The exports of soya bean-oil from Dairen, Manchuria, to the United States increased from 44,966,930 pounds, valued at $3,057,370 for 1916, to 198,534,626 pounds, valued at $19,740,640, for 1917."

1902. *Bean-Bag* (*The*) (*St. Louis, Missouri*). 1918. Shipments of bean oil from. 1(1):45. June.
• ***Summary:*** The Mitsui Bussan Kaisha [of Japan] is now exploiting the Dairen-Seattle service with half a dozen steamers, including four chartered vessels, the aggregate deadweight tonnage of which is put at about 70,000. During the past five months the following consignments of [soy] bean oil have been shipped exclusively to Seattle [Washington] from Dairen: June, 140,000 cases; July, one full cargo; August, 5,400 tons by one steamer, 6,747 tons by a second, and 100,000 cases by a third; and October, 5,500 tons.

"Another slump has been experienced in the steamer freight on bean cake from Dairen to Japanese ports. The Dairen-Kobe 'tramp' rate has finally declined as low at 40 sen per picul from 60 sen quoted toward the latter part of September, and threatens to go lower (1 sen = ½ cent United States currency; 1 picul = 133.33 pounds)."

1903. Onodera, I. 1918. Genge oyobi daizu kasu no suitô seiiku ni oyobosu eikyô [The influence of soy-bean cake and Chinese milkvetch (*genge* or *renge, Astragalus sinicus*) on the growth of rice plants]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 191. p. 786-827. July 5. [Jap]

1904. Norton, Jeanette Young. 1918. National dishes the world over: Favorite foods in all the principal kitchens of the Earth,... *San Francisco Chronicle.* July 7. p. SM5.
• ***Summary:*** "A well known Japanese dish is gyunabe ["beef + pot"]. The dish is made with vegetables stewed in shoyu sauce and mirin, a cooking wine. Chicken or meat cut in small thin slices is cooked on top of the stew.

"Chinese chop suey served in China has soy beans and pork in it that are used in place of the more expensive chicken and mushrooms that appear in the American version."

Note: We know of no other source stating that soy beans are used in chop suey in China. Soy sauce is used, although chop suey is much better known in the USA than in China.

1905. Hahto: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1918. Seed color: Yellow (olive), hilum black.
• ***Summary:*** Sources: Morse, W.J. 1918. "The soy bean: Its culture and uses." *USDA Farmers' Bulletin* No. 973. 32 p. July. See p. 14. "Hahto.–This variety recently introduced from Japan is a large producer of seed and forage, and the seeds when from three-fourths to full grown make an excellent green vegetable, similar to the Lima or butter bean. Plants stout, erect, maturing in about 135 days; pubescence tawny; flowers purple; seeds olive yellow, with a black seed scar, much flattened, very large, about 75,000 to the bushel; oil, 14.8%; protein, 40.6%."

Madison Survey (*Madison, Tennessee*). 1919, "Beans." 1(2):5. March 5. "The soy bean lima, or *Hito,* [most likely Hahto] is an exceptionally good garden vegetable, making a very heavy yield of seed."

Piper, Charles V.; Morse, William J. 1923. *The soybean.* New York, NY: McGraw-Hill Book Co. xv + 329 p. March. See p. 52, 53, 111, 152, 154, 165-66, 171, 192-93, 222, 259. "Introduced from Wakamatsu, Japan, 1915. Plants stout, erect, bushy, maturing in about 130 days; pubescence tawny; flowers purple, 55 to 60 days to flower; pods brown, 60-80 mm. long, 13 to 15 mm. wide, 6 to 7 mm. thick, shattering little; seeds olive yellow, 10 to 12 mm. long, 8 to 9 mm. wide, 5 to 6 mm. thick; hilum black; germ yellow; oil 17.9 per cent.; 74,800 to the bushel."

Morse, W.J. 1927. "Soy beans: Culture and varieties." *USDA Farmers' Bulletin* No. 1520. 34 p. April. See p. 7. "Hahto–Introduced under S.P.I. No. 40118 from Wakamatsu, Japan, in 1915. It is commonly known in Japan as 'dove killer,' and is said to be used boiled in the green stage... Especially valuable as a green vegetable bean when three-

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fourths to full grown."

Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (*USDA*). p. 1154-89. For the year 1937. See p. 1163. "In Japan, certain varieties of soybeans were found that were used solely as green shelled beans... The vegetable soybean offers an excellent food of high nutritional value, especially in the fall when other green beans are lacking... As a result of selection, cooking tests, and adaptation studies, eight green vegetable varieties... have been introduced in various sections of the country." One of these is Hahto. See p. 1187. Hahto: Origin: Introduction, Japan. Year: 1915. Days to mature: 130. Flower color: Purple. Pubescence color: Tawny. Seed coat color: Olive yellow. Germ color: Yellow. Hilum color: Black. Seeds per pod: 2-3. Seeds per pound: 1,250. Use: Green vegetable, or dry edible beans. Note: This is the first of many documents in which Morse classified the Hahto as a "green-vegetable" soybean, one of a limited number of "edible varieties of soybeans."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 10-11. Hahto is in the USDA Germplasm Collection. Maturity group: VI. Year named or released: 1918. Developer or sponsor: USDA. Literature: 04. Source and other information: 'Hato Koroshi Daizu' from Kawamata, Fukushima, Japan, in 1915. Prior designation: PI 40118.

Note: This is the earliest large-seeded vegetable-type soybean introduced into the United States. The second was Easycook in 1919. Address: USA.

1906. Morse, W.J. 1918. The soy bean: Its culture and uses. *Farmers' Bulletin* (*USDA*) No. 973. 32 p. July. Superseded by Farmers' Bulletin 1520. [27 ref]

• ***Summary:*** Contents: Summary. Commercial importance. Climatic adaptations. Soil requirements. Preparation of the seed bed. Fertilizers. Inoculation. Time of planting. Depth of planting. Rate of seeding. Method of seeding. Cultivation. Varieties (22): Barchet, Biloxi, Black Eyebrow, Chiquita, Early Brown, Elton, Guelph ("also known as Medium Green, Early Green, Medium Early Green, and Large Medium"), Haberlandt, Hahto, Hollybrook, Ito San ("has been known under the names of Japan Pea, Yellow, Medium Yellow, Dwarf Yellow, Early Yellow, Early White, and Coffee Berry"), Lexington, Mammoth, Manchu, Medium Yellow ("has been grown under the names Early Yellow, Mongol, Banner, and Roosevelt"), Mikado, Peking ("In variety tests the Peking, Sable, and Royal varieties appear to be identical, and it is quite evident that the latter two are selections from the Peking."), Shanghai ("has been grown in North Carolina under the name of Tarheel Black"), Tokyo, Virginia, Wilson-Five [black seeded], Yokotenn [Yokoten].

Soy beans in rotations. Soy beans in mixtures: With cowpeas, corn, sorghums, or Sudan grass. Soy beans for seed: Yields of seed, feeding value, for human food, for oil and meal, viability of soy-bean seed, cost of production, soy-bean straw. Soy beans for hay: Time of cutting, curing soy-bean hay, feeding value of soy-bean hay, yields of soy-bean hay. Soy beans for soiling. Soy beans for pasture. Soy beans for ensilage. Soy beans for soil improvement. Enemies of the soy bean: Rabbits, root-knot caused by a nematode, cowpea wilt due to a Fusarium, caterpillars, and black blister beetles.

"Commercial importance: The soy bean, also called the soya bean, the soja bean, and in North Carolina the stock pea, is an annual leguminous plant, a native of southeastern Asia. It has been cultivated in China, India, and Japan for more than 5,000 years and in extent of use and value is the most important legume now grown in these countries."

"The soy bean was introduced into the United States as early as 1804, but it is only during the last decade that it has become a crop of much importance. At the present time it is most largely grown for forage. In many sections, especially southward and in some parts of the corn belt, a very profitable industry has developed from that growing of seed. During the past few years the acreage has increased to a very considerable extent. The large yield of seed, the excellent quality of forage, the ease of growing and harvesting the crop, its freedom from insect enemies and plant diseases, and the possibilities of the seed for the production of oil and meal and as a food all tend to give this crop a high potential importance and assure its greater agricultural development in America" (p. 3).

Concerning the variety Hahto (p. 14): "This variety recently introduced from Japan is a large producer of seed and forage, and the seeds when from three-fourths to full grown make an excellent green vegetable, similar to the Lima or butter bean. Plants stout, erect, maturing in about 135 days; pubescence tawny; flowers purple; seeds olive yellow, with a black seed scar, much flattened, very large, about 75,000 to the bushel; oil, 14.8%; protein, 40.6%." Note 1. This is the earliest English-language document seen (May 2003) that uses the term "butter bean" to refer to the lima bean.

Uses for human food (p. 22-23): "Until 1916 the soy bean had been used but little in the United States for food and only as a special diet for persons [diabetics] requiring foods of a low starch content. Much interest has been shown during the last two years in the possibilities of the soy bean for food. The United States Department of Agriculture and many schools of cookery and domestic science have conducted successful experiments in utilizing the dried beans in the manner of the navy bean and the green beans when three-fourths grown to full grown as a green-vegetable bean. The variety and palatability of the forms in which the bean can be served make it a very desirable article of food, and undoubtedly it will grow in favor as it becomes better known. Soy-bean meal or flour may be used as a constituent of bread and muffins and in pastry."

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Photos show: (1) A man standing in a field of soy beans (front cover). (2) A typical mature soy-bean plant (p. 4).

(3) Roots of a soy-bean plant with abundant development of nodules (p. 7).

(4) Cultivating soy beans. Cultivation should begin as soon as the seedling plants appear. Two horses pull a man on a harrow or weeder. (5) A field of the Biloxi variety of soy beans in Mississippi (p. 13). (6) A field of the Black Eyebrow variety of soy beans in South Dakota. (7) Plats of the Mammoth and Virginia varieties of soy beans at Arlington Farm, Virginia (p. 15). (8) A man standing in a field of the Peking variety of soy beans grown in 24-inch rows. (9) A field of soy beans and corn grown for ensilage (p. 17). (10) A field of soy bean and Sudan grass grown in mixture for hay (p. 22).

(11) Opened pods of Hahto variety soy beans on a plate, showing the large seeds (p. 23). (12) Soy-bean hay on frames (p. 25).

A diagram (p. 5) shows 67 different ways in which soy bean plants and seeds are utilized. The plants are used for green manure, forage (hay, ensilage, soiling), and pasture. The seeds are used to make oil, meal, and food products. The oil is used to make various non-food industrial products (glycerin, explosives, enamels, varnish, waterproof goods, linoleum, paints, soap stock {for hard or soft soaps}, celluloid, rubber substitute, printing inks, lighting oil {illuminants}, and lubricating oil), and four food products (butter substitute, lard substitutes, edible oils, and salad oils). Food products include dried beans and green beans. From dried beans are made soy sauce, boiled beans, baked beans, soups, coffee substitute, roasted beans, breakfast foods, and vegetable milk (from which is made soy cheese {fresh, dried, smoked, or fermented}, condensed milk, fresh milk, confections, and casein). The green beans are used as green vegetables, canned, or in salads.

An outline map of the United States (p. 6) shows the areas to which the soy bean is especially adapted, as to varieties and purpose. The eastern half of the country is divided horizontally into 3 zones: Southern, for later and larger varieties for seed production; Central, for medium and medium-late varieties for seed and the same varieties and later varieties for forage; Northern (the line runs through central Ohio, Indiana, and Illinois, and southern Iowa) for very early varieties for grain production and the medium and medium-late varieties for forage and ensilage.

Note 2. This is the earliest document seen (July 2013) that mentions the soybean varieties Hahto, Yokoten, or Wilson-Five.

Note 3. This is the earliest document seen (June 2009) that describes a vegetable-type soybean variety (Hahto), or says that a specific variety makes an excellent "green vegetable."

Note 4. This is the earliest English-language document seen (June 2009) that contains the term "green-vegetable bean." Address: Scientific Asst., Forage-Crop Investigations, USDA Bureau of Plant Industry, Washington, DC.

1907. *San Francisco Chronicle.* 1918. Incombustible celluloid. Aug. 11. p. SM2.

• ***Summary:*** "Great interest has been aroused by the announcement that a professor in one of the Japanese universities had invented a successful incombustible substitute for celluloid, to be manufactured from soya bean cake. The new product has been given the trade name of 'Satolite,' derived from the name of the inventor, Prof. S. Sato, and a company for its manufacture has been started with a capital of 2,000,000 yen ($1,000,000).

"Satolite is described as a galalith made of the glycine of soya bean, coagulated by formaline."

1908. Satow, Sadakichi. 1918. Process of manufacturing vegetable proteid substances. *U.S. Patent* 1,275,308. Aug. 13. 3 p. Application filed 25 Nov. 1916.

• ***Summary:*** "The object of the invention is to provide vegetable proteid substances of improved quality and a simple, efficient, and economical process of manufacturing the same from vegetable substances, such as cereals, leguminous products or other material for food purposes or for use in the manufacture of celluloid-like substances, linoleum-like substances, lacquer, varnish, artificial rubber, artificial leather and the like."

Soja bean is the main protein source used. The beans are first dried and, where a light-colored material is desired, the hulls are removed prior to flaking by the use of rollers. One efficient way to remove the oil is by treating the mass of flattened beans with a suitable solvent for oil, such as benzin [benzine]. The solvent-extracted meal is treated by dry-heated air (not over 40ºC) with agitation or by vacuum to remove any remaining benzine. Steam treatment should be avoided since it denatures the protein.

The "meal" obtained is then treated with an aqueous solution of sodium, potassium, or ammonium hydride (or carbonate) and the protein extract separated by filtration, centrifuging, or by other means (physico-chemical or chemical). From the liquid obtained, the protein (glycinin) is precipitated by dilute acids, such as sulfuric, sulfurous, phosphoric, acetic, or lactic. The precipitate is allowed to settle, the supernatant liquid is drawn off, and the settled precipitate is then pressed into cakes, and, if desired, dried and pulverized. "The product obtained is termed hereinafter 'refined proteid,' and is employed as food material either alone or as a component of food preparations, or in the manufacture of a great variety of [non-food] articles..." "It is easily rendered transparent, is adhesive, and can be easily molded into permanent shape." Address: Sendai, Japan.

1909. *Board of Trade Journal* (*London*). 1918. Japan (Corea). Bean crop, 1917. 101:262. Aug. 22.

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• ***Summary:*** "According to a report received from H.M. Consul-General at Seoul, the bean crop of Corea for 1917 amounted to 19.366,124 bushels. Of this total soya beans accounted for 14,583,159 bushels, being a decrease of 5 per cent. as compared with the previous year.

"The official figures of the bean and pea crop of the island of Hokkaido (Japan) for 1917 have also been announced. The yield of beans was 1,016,666 koku (5,042,663 bushels), valued at yen 22,305,661, and that of peas 612,973 koku (3,040,346 bushels), valued at yen 13,307,662.

"Compared with the preceding year, the output of beans shows an increase of 549.856 koku (2,727,286 bushels), valued at yen 11,983,243, and that of peas 317,075 koku (1,572,692 bushels), valued at yen 4,962,639. (Yen = 2*s.* 0*d.* at par)." Address: British Consul-General at Seoul.

1910. Frazer, Robert. 1918. Foreign bean news: The bean industry in Japan. *Bean-Bag* (*The*) (*St. Louis, Missouri*) 1(3):36-37. Aug.
• ***Summary:*** This is a reprint of an article by the author published under the title "Kobe's position in the bean trade" in *Commerce Reports* [USA] (Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce) (21 Aug. 1917, p. 748-51). Address: Consul, Dairen [Manchuria].

1911. Ueno, Seiichi. 1918. [On the velocity of the hydrogenation of oils]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 21(246):898-939. Aug. [15* ref. Jap; eng]
• ***Summary:*** The velocity of these reactions, with a nickel catalyst, can be expressed by the following linear equation: (dk/dt) = k(a-x). Soy oil is mentioned on p. 904, 905, 910, 934-36, etc.

1912. Ueno, Seiichi. 1918. [On the velocity of the hydrogenation of oils]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 21:749-62. Aug. [15* ref. Jap; eng]
• ***Summary:*** The velocity of these reactions, with a nickel catalyst, can be expressed by the following linear equation: (dk/dt) = k(a-x). Soy oil is mentioned on p. 757-58.

1913. Williamson, A.A. 1918. Bean oil: Methods of making soy bean oil in Manchuria. *Bean-Bag* (*The*) (*St. Louis, Missouri*) 1(3):34-35. Aug.
• ***Summary:*** This is a reprint of an article by the author published under the title "Methods of making soya-bean oil in Manchuria" in *Commerce Reports* [USA] (Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce) (31 Dec. 1917, p. 1227-29). Address: Consul, Dairen [Manchuria].

1914. *J. of Agriculture and Horticulture* (*Quebec*). 1918. Soy beans as food. 22:48. Sept. 1.
• ***Summary:*** "The housewife of to-day who desires to patriotically conserve needed foods for overseas and at the same time provide adequately for her own household is naturally on the lookout for new articles to add to her dietary list. Such a one which has much to recommend it is soy beans...

"Most varieties require a longer season for maturity than our northern climate provides but there are one or two that appear to thrive in Quebec and a number of people are trying them this year. They are said to produce abundantly so it is probable that many housewives will be giving them a trial this season for the first time, and a few suggestions as to their treatment may be welcome.

"In Japan and China soy bean milk is prepared and used extensively. This milk is also sold in a condensed form and as curd [tofu]. Other preparations are vegetable butter and cheese, and the extracted oil is sold for table use and for cookery.

"The Food Preservation Demonstrations of the Canada Food Board form an interesting feature of the fall fairs this year."

Describes the preparation of: (1) Green soybeans. "If cooked when about three-fourths grown as green beans the water should be changed once during cooking". (2) Dry soybeans. Long soaking in a large quantity of water improves the flavor by assisting "in the removal of any disagreeable principle." To serve as baked beans, in a crock, add to 2 cups cooked beans, ¼ teaspoon mustard, salt, a few grains of cayenne pepper, ½ cup tomato catsup, or if desired a few drops of onion juice, or 2-3 tablespoons molasses, or a teaspoonful of Worcestershire sauce. (3) Soy flour. "The raw soy beans may be ground into meal and combined with flour for bread, biscuits, or muffins. In the bread 1/3 soy bean meal may be used, in the biscuits and muffins a larger proportion." The meal tastes best if slightly browned.

Note 1. This is the 2nd earliest document seen (Jan. 2010) concerning soybeans in Quebec province, Canada, or the cultivation of soybeans in Quebec province (one of two documents).

Note 2. This is the earliest English-language document seen (June 2013) that contains the term "raw soy beans" (or raw soy-beans). Address: Canada.

1915. Frazer, Robert, Jr. 1918. Japan's output of vegetable oils. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 21(207):867. Sept. 4.
• ***Summary:*** "Owing to the tremendous increase in demand for vegetable oils in the United States during the past 2 years, the soya-bean and coconut-oil mills in and about Kobe have enjoyed remarkable prosperity. At present there is an output, in all Japan, of 223,500 cases (7,550 long tons [there are 29.60 cases per long ton]) of oil per month, divided as: Soya-bean oil 92,500 cases, coconut oil 68,000 cases, rapeseed oil

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44,000, cottonseed oil 16,000, peanut oil 3,000 cases.

"There are 25 large vegetable oil mills in the Kobe consular district, producing approximately 75 per cent of the vegetable oil manufactured in Japanese. All except three, I believe, use the pressure system of oil expressing, the other three use the benzine extraction process. Three types of pressure mill are generally used: (1) The round type, with a bed about 18 inches in diameter, used for crushing beans and rapeseed; (2) the oblong flat-bed type, about 30 by 14 inches, used for pressing copra, and (3) the bowl type, in which a stone bowl is pressed into a mass of seed pulp held by iron hoops, used in second and third pressings of peanuts and beans. One mill in Japan–the Kashiwara Oil Mill–is using the latest type of American rotary screw oil expressor. When filtering is necessary, the usual clay filter presses are used."

Existing mills are being enlarged and new ones built to meet the demand for oil, and American or Japanese-American cottonseed oil machinery is being installed. Address: Consul, Kobe [Japan] (July 15).

1916. Registration card: For Heiji Ohta. 1918.
• ***Summary:*** Serial number: Illegible. Order number: A4765. Permanent home address: 86½ 5th North, Portland, Oregon. Age in years: 45. Date of birth: Sept. 22, 1874. Race: Japanese.

U.S. Citizen–Native born: No. Naturalized: No. Citizen by father's naturalization before registrant's majority: No. Alien- Delinquent: No. Present occupation: Grocery. Employer's name: (blank = self employed). Nearest relative–Tayo Ohta. Address: 86½ N. 5th, Portland, Oregon. "I affirm that I have verified above answers and they are true." Signed: Heiji Ohta.

Registrar's report: 36-1-10 "C." Description of registrant: Height: Medium. Build: Medium. Color of eyes: Brown.

"I certify that my answers are true..." Signed: N.J. Tochio, Sept. 12th 1918.

Stamp of local board, Portland, Oregon.

1917. Registration card: For Saizo Ohta. 1918.
• ***Summary:*** Serial number: Illegible. Order number: A2553. Permanent home address: 223½ Madison, Portland, Oregon. Age in years: 38. Date of birth: April 14th 1881. Race: Japanese.

U.S. Citizen–Native born: No. Naturalized: No. Citizen by father's naturalization before registrant's majority: No. Alien–Delinquent: No. Present occupation: Hotel. Employer's name: (blank = self employed?). Nearest relative–Shina Ohta. Address: Okayama, Japan. "I affirm that I have verified above answers and they are true." Signed: Saizo Ohta.

Registrar's report: 36-1-10 "C." Description of registrant: Height: Medium. Build: Medium. Color of eyes: Brown Black.

"I certify that my answers are true..." Signed: N.J. Tochio, Sept. 12th 1918.

Stamp of local board for Division No. 1, City of Portland, State of Oregon. 316 Mo...

Note: This document relates to the Ota Tofu Co. of Portland, Oregon. From this we can almost surely conclude that Saizo and Shina are married and that she is in Okayama, Japan; why she did not come to the USA with him we do not know. Since Saizo and Heiji were registered by the same person on the same date at the same place, they probably traveled to Portland from Japan together; why, we do not know.

1918. Satow, Sadakichi. 1918. Varnish and process of making the same. *U.S. Patent* 1,280,861. Oct. 8. 3 p. Application filed 25 Nov. 1916.
• ***Summary:*** "It is among the special purposed of my present invention to utilize vegetable proteids in the manufacture of varnish and to thereby produce a varnish which possesses many important and valuable advantages over hitherto known varnishes." Raw materials include beans, peas, wheat, corn, etc. The process involves glutinizing vegetable proteids. Address: Sendai, Japan.

1919. *Board of Trade Journal* (*London*). 1918. Trade of Seattle in Oriental vegetable oils. 101:528. Oct. 24.
• ***Summary:*** "The growth in the volume of vegetable oil imports from the Orient (Japan and China) has made Seattle [Washington] the leading port in the United States in handling vegetable oils...

"The bulk of the oils imported is the product of the soya bean, which is grown largely in Japan, Corea [Korea], China proper, and Manchuria, the last-named locality having the largest area of productivity, besides being very accessible, the beans being moved to the sea in two directions, part going over the Eastern China Railway to Vladivostok, part via the South Manchurian Railway to Dalny... At Vladivostok, the beans are transported to Japanese mills for treatment."

The world war has had a major effect on trade and use of oils and fats. The west coast has become the major arena of trade since the European war effects trade on the east coast. In Feb. 1916 a Japanese ship arrived in Seattle with 100,000 cases of oil and from that time oil has flowed to the Pacific coast in a constantly increasing stream. U.S. imports of soya bean oil (which is duty free) for each year ended June 30, are as follows: 1916 = 98,119,695 lb. 1917 = 162,690,235 lb. 1918 = 336,824,646 lb. Soya bean oil was the main oil imported to the USA during these years, followed by coconut oil. Address: British Consul, Portland, Oregon, USA.

1920. Dickover, E.R. 1918. The vegetable-oil industry of Kobe (Japan). *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic*

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Commerce, Department of Commerce) 21(255):403-12. Oct. 30.

• ***Summary:*** The process of crushing seeds for oil has been used in Japan for centuries; the art was probably brought from the Asiatic mainland during the 7th and 8th centuries, when Chinese and Korean civilizations were introduced to Japan. Rapeseed oil has long been used for frying fish and lobsters, and is to-day the principal fat in the Japanese diet.

The production of vegetable oils in sufficient quantities to enter largely into Japan's foreign trade began during the last 10-12 years, or since the Russo-Japanese War. "One of the first fields to attract the attention of Japanese capitalists in Manchuria after the war was the soya-bean oil industry. Large power mills were established in Dairen, and their success encouraged the capitalists to build mills in and about Kobe, where skilled labor could be easily obtained and where the subsidized Japanese steamship lines could bring soya beans from all of north China and Siberia. The industry was more or less successful, but suffered severely at times from the low price of bean cake, upon which the millers depend for their profit.

"The real prosperity of the vegetable-oil industry in the Kobe consular district did not begin until about 1916, when the world scarcity of oils brought on by the war [World War I] created a demand which it was difficult to fill and raised the price until the mills became nearly independent of the sale of bean cake. The factories have been steadily enlarging their plants and increasing the variety of oils extracted, until to-day the Kobe district has become one of the world's centers of vegetable-oil production.

"There are two principal causes for the remarkable development of the vegetable-oil industry in this section of Japan–a supply of cheap labor and adequate shipping facilities. Japan's excellent steamship lines converge at Kobe," bringing soya beans from Dairen, Newchwang, Vladivostok, or Antung; peanuts from Tsingtao and Tientsin, etc. "The oil, moreover, can be loaded at Kobe on ships going to any part of the world. This does away with the necessity of transshipment, and thus prevents large additional leakage."

The output of oils from the Kobe consular district is now about 5,783 long tons per month divided approximately as follows:–Soya 2,100 tons, coconut 1,734, rapeseed 1,400, cotton seed 534 long tons. Soya beans are usually shipped in jute or straw bags containing about a picul (133.3 pounds) each.

A table (p. 406) shows the value of the various oilseeds imported to Japan during 1917. The total value of the three leading seeds (entered through customs or at temporary warehouses) was as follows (in million dollars): Soya beans $9.965, Copra $4.126, and Rapeseed $2.141. The figure for soya beans has grown 65% since 1913.

The Kobe oil mills vary in size from a productive capacity of 10,000 to 360,000 gallons per month, they are all located on the coast and all except one use the pressure system, the one exception uses the benzine extraction method at Imazu, near Kobe. The principal advantages of the benzine process "are that practically all of the oil is extracted from the material and that the residue is in the form of a meal, instead of hard cakes, and therefore is in condition for use as a fertilizer or as cattle food without further treatment.

"To offset these advantages, however, it has been found that, although fewer men are required to operate a benzine extraction plant than a pressure plant, labor is higher, owing to the fact that more skilled men are required. The overhead is also considerably higher, as the first cost of a benzine extraction plant is rather large. Other disadvantages are that the flash point of the extracted oil is lower than that of the oil obtained by the pressure system, owing to the benzine remaining in the oil after distillation; and that the process is not adapted to oil seeds other than soya beans, as the loss of the solution is greater with seeds which have a large oil content. At the present time, also, the mills using the benzine process are suffering from the high price of benzine, due to reduced imports from the United States. Effort to use Japanese benzine have not proved very successful, as it does not have a uniform flash point, and consequently the loss in distillation is very large. Experiments are now being made to substitute carbon bisulphide and other volatile chemicals for benzine."

The flat bed rectangular presses give a higher yield of oil per crushing but the oil needs more refining. One plant [probably Kashiwara] is using the latest type of rotary screw expeller mill with great success. The benzine extraction process is at present suffering from the high cost of spirit. Perilla oil obtained from the seed of an Asiatic mint (*Perilla ocymoides*) is made in considerable quantity; it is a drying oil used largely in Japan as a substitute for linseed oil.

The oils are generally shipped from Kobe in secondhand tins which have previously been used for kerosene or petrol. This usually entails a leakage loss of about 5 per cent. The importance of oil cake prices is shown by the fact that at the June prices of this year, 70% of the proceeds realized from soya beans came from the cake and only 30% from the sale of the oil.

One table (p. 412) gives the weight (pounds) and value (U.S. dollars) of exports of vegetable oils from Japan; coconut oil is the leader in both categories (34.9 million lb and $3.558 million), followed by soya bean oil in weight (22.6 million lb) but rapeseed oil in value ($1.996 million). A second table (p. 412) gives the declared value in 1915, 1916, and 1917 of vegetable oil exports from Kobe; coconut oil was the leader in 1915, but soya bean oil was the leader in 1916 and 1917. Address: Vice Consul, Kobe, Japan.

1921. Winkler, Gustav. 1918. Die Sojabohne: Aus einem Vortrage... gehalten in der Hauptversammlung der Gartenbau-Gesellschaft Frankfurt a.M. am 17. April 1914.

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Zweite Auflage [The soybean: From a lecture... presented at the main meeting of the Gardening Society of Frankfurt am Main, on 17 April 1914. 2nd ed.]. Mainkur bei Frankfurt am Main, Germany: Published by the author. ii + 28 p. Illust. 22 cm. [4 ref. Ger]

• ***Summary:*** On the cover: "Die Sojabohne der Mandschurei [The soybean of Manchuria]. Much of this lecture (as stated on the title page) was based the following English-language article, translated into German by Werner Winkler (Gustav's son) in 1913: Shaw, Norman. 1911. "The soya bean of Manchuria." *Shanghai, Statistical Department, Inspectorate General of Customs. China Imperial Maritime Customs. II. Special Series* No. 31. 32 p.

Contents: A 2-page insert at the front. Photos show: (1) The author (with a large white beard and moustache) with a many-branched soybean plant, stripped of its leaves, mounted on a 2 x 3 foot wooden board, from his beanfield (*Winklers Bohnenfeld*) at Mainkur. This one plant grew from May 10 to Oct. 15, 6 months, producing 242 pods containing 503 completely mature soybeans. This line was acclimatized for 6 years and cultivated in the soil for 5 years. (2) The author standing and holding (with the roots facing upward) one soybean plant in each hand. In his right hand is an acclimatized soybean which produced 58 beans in 100 days. In his left hand is a plant grown from Chinese seeds of 1912-13 which produced 224 flowers and no seeds in 100 days. (3) A many-branched soybean plant, stripped of its leaves, from Winkler's beanfield, affixed to a board. Grown from Chinese seeds harvested in 1911/12. It grew from 15 May 1917 until Oct. 1, five months. 105 pods produced about 250 completely mature soybeans. From seeds that were not yet acclimatized grown on cultivated soil. (4) A similar looking plant from Winkler's beanfield. Grown from Chinese seeds harvested in 1911/12. It grew from 15 May 1918 until Oct. 15, five months. 160 pods produced about 350 soybeans. The seeds were not yet completely ripe because of bad, raw weather in 1918.

Foreword to the 2nd edition. Introduction. Diagram in the shape of a rhombus / diamond, showing how the various colored soybeans change from one color into another (adapted from Shaw 1911, p. 2). Description of the diagram: Discusses: (1) Ball, Carleton R. 1907. "Soy bean varieties." *USDA Bureau of Plant Industry, Bulletin* No. 98. 30 p. + 5 plates. May 27. (2) Hosie, Alexander. 1910. *Manchuria: Its People, Resources, and Recent History.* London: Methuen & Co. xii + 293 p. Hosie describes 3 types of soybeans: Yellow, with 3 subvarieites. Green, with 2 subvarieites. Black, with 3 subvarieites.

The rest of the contents is fairly similar to that of the 1st edition (1914), but the details within many sections are greatly expanded. On the rear cover is a photo of two soybean plants attached to a board, one month after planting the seed, Summer 1917; 15 May to 15 June. In the Supplement (p. 26-28), the author summarizes the results of his 8 years of soybean cultivation in Frankfurt; he concludes that it can be grown with good results in southern Germany. Frankfurt am Main is about midway between the northern and southern tips of Germany. Address: Mainkur bei Frankfurt am Main, Germany.

1922. *Christian Science Monitor.* 1918. Manchuria's soy bean oil industry: Expansion of manufacture of product said to have transformed country into land of thrift and opulence. Nov. 14. p. 10.

• ***Summary:*** "Seattle, Washington–Manchuria, through expansion of the soy bean oil industry as reflected in the abnormal increase in the movement through this port since 1915, is enjoying an industrial reconstruction similar to that of the United States, according to figures presented by M. Ogawa, an export official of the largest soy bean mills in the Orient, who is looking over shipping conditions here on the eve of the season's annual movement.

The growth of this vegetable and its manufacture into commercial products has transformed Manchuria from an obscure, poverty-stricken province into a land of thrift and opulence, Mr. Ogawa asserts, and the demand for the oil is increasing so rapidly that thousands of acres of unbroken land will be put under cultivation in 1919. Production of the oil this season will be 2,000,000 tons, to be increased next year to 50,000,000 tons."

The industry has been in the process of development for 20 years. Before the war the chief export was to Europe. When the war began the American trade was entered and the shortage of vegetable oils in the United States was so great that the demand for the product exceeded the supply."

Many new oil mills "have been established in Manchuria or are in the process of construction." The beans are imported to Japan from Manchuria, for although the soy bean "grows in Japan, the quality is secondary to that grown in Manchuria."

1923. Vantine (A.A.) & Co., Inc. 1918. Oriental delicacies: Vantine's–The Oriental store (Ad). *New York Times.* Nov. 24. p. 38.

• ***Summary:*** "Toothsome tidbits from Oriental lands, for your Thanksgiving Dinner, or to send to the boys in the Service, including an almost unlimited selection of specially packed 'goodies' for Christmas gifts."

"Imported Japanese shoyu or soy sauce. A delicious sauce for flavoring gravies, meats, fish, etc.–Prices 55¢, 85¢, $1.35."

"Japanese 'Midzuame' or rice candy. Made from rice, barley, malt, sugar and gelatine." 4 flavors–Price 35¢.

1924. *Christian Science Monitor.* 1918. Kei Hara cabinet: New Japanese Prime Minister heads ministry of self-made men, whose policy is for economic advancement of the nation. Nov. 28. p. 7.

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• ***Summary:*** "Mr. Utaro Noda, Minister of Communications, is one of the best-known characters of Japanese public life. His very humble parents lived in a village near Nagasaki, where his young manhood was passed as a vendor of 'tofu,' or bean-curd, a staple food of the poor of his native district. Tramping the country roads with his tofu stick over his shoulder, he found time to study sufficiently to give himself quite a fair education,..."

1925. *Chemische Umschau auf dem Gebiete der Fette, Oele, Wachse und Harze* (*Germany*). 1918. Technologie: Fettgewinnung, Fettwirtschaft [Technology: Obtaining fats and oils, and their economics]. 25(11):126-28. Nov. See p. 128. [Ger]
• ***Summary:*** The section titled Soybean oil (*Sojabohnenöl*) (p. 128) states: In Makamatsu [sic, Wakamatsu; Seaport city, Fukuoka prefecture, Northern Kyushu. Merged into Kitakyushu in 1963], Japan, a new oil factory (oil mill) has begun operation, with a processing capacity of 45,000 tonnes (metric tons) of soybeans per year; it is expected to produce 6,300 tonnes year of soybean oil. A small amount of this oil is expected to be exported to the USA.

On the same page are similar entries for sunflower seed oil, olive oil, peanut oil, and coconut oil.

1926. *International Institute of Agriculture, Bureau of Statistics* (*Rome*)*, Review.* 1918. International trade in concentrated cattle foods. No. 4. 72 p. Nov. [1 ref]
• ***Summary:*** This is the IIA's fourth review on concentrated cattle foods. "The first three reviews were published in the *International Review of the Science and Practice of Agriculture,* in the numbers of April 1915, 1916, and 1917." This publication is divided into six chapters. In Chapter 4, titled "Oil seeds and oilcake" the section on "Soya beans and soya cake" contains statistics on three subjects: Production, trade, and prices. Tables show: (1) "Produce in soya cake in the importing countries (estimated on the basis of the quantities of soya beans available) (p. 51). Figures are given in quintals for the years 1913-1917 for the following countries: Denmark, Great Britain and Ireland, Netherlands, Russia (including Asiatic provinces), China, Formosa, Japan, Dutch India (Java and Madura), and New Zealand. The top 3 countries in 1917 are: Japan 727,418. Denmark 284,000, and Great Britain and Ireland 223,969. However in 1915 Great Britain and Ireland produced 1,513,059. Note: 1 quintal = 100 kg.

(2) "Foreign trade in soya cake" (p. 51). Statistics are given in quintals for the years 1913-1917. Import figures are given for Denmark, Canada (incl. soya beans), Formosa, and Japan. Japan was by far the biggest importer, with 9,912,850 quintals in 1917. Export figures are given for Denmark, Great Britain, and China. China was by far the biggest exporter with 7,034,459 quintals in 1916.

Canadian imports of soya cake (including soya beans) was as follows (in quintals) for each financial year (p. 51): 2.345 in 1913. 2.412 in 1914. 1.121 in 1915. 1.358 in 1916. 4.730 in 1917. Note: This is the earliest document seen (Jan. 2010) that gives Canadian trade statistics for soybeans or soy products. This document contains the earliest date seen (1913) for trade of such products to or from Canada.

(3) "Foreign trade in soya beans" (p. 51). Statistics are given in quintals for the years 1913-1917. Import figures are given for Denmark, Great Britain and Ireland, Netherlands, Russia (incl. Asiatic provinces), Sweden, Formosa, Japan, and Dutch India (both Java and Madura, and Other possessions). The biggest importers in 1917 were: Japan 841,942, and Great Britain and Ireland 254,510. Export figures are given for Netherlands, China, Formosa, and Japan. China was by far the biggest exporter with 5,315,324 quintals in 1916.

(4) Foreign trade in sundry and unspecified oilcakes (p. 62). Gives imports statistics for soya cake by Roumania [Romania]: 79,378 quintals in 1913, 36,650 quintals in 1914, 5,554 quintals in 1915. Gives export statistics for soya cake by Russia: 54 quintals in 1913.

(5) "Prices of sundry oilcakes at the close of each week" (p. 55-56). For soya cake, the prices are given at Copenhagen, Denmark, for 1917 and 1918 in gold francs. The price rose by about 41% between Jan. 1917 and Jan. 1918 from 46.47 to 62.16 gold francs.

(6) "Other vegetable products" (p. 71). In 1913 Denmark exported 1,390 quintals of soya meal.

This document also contains extensive information on groundnuts and groundnut cake, sesamum and sesamum cake, etc.

Note 1. This is the earliest English-language document seen (Aug. 2000) that contains the word "oilcakes." Note 2. This is the earliest English-language document seen (Jan. 2001) that uses the word "quintals" (or "quintal") in connection with soybeans. Address: Rome, Italy.

1927. Satow, Sadakichi. 1918. Improvements in process of recovering proteids from vegetable proteid containing material for use in the industrial arts. *British Patent* 121,141. Dec. 12. 5 p. Application filed 28 June 1917.
• ***Summary:*** The object of this invention is to produce "pure undenatured proteids from suitable vegetable raw materials containing them." Such proteids are transparent and have other desirable characteristics. The Japanese soya bean is a particularly rich source of vegetable proteids.

Efforts to utilise these proteids have been hampered by the fact that the processes which have been used for extracting the proteids have also extracted deleterious impurities, or changed the natural state of the proteids. The use of heat or alcohol can change the natural state and may cause decomposition. In this new process the soybeans are crushed, the oil removed by use of a solvent, then the solvent separated from the oil. The oil-free meal is white or slightly

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yellow in color. The proteids are then precipitated by use of an acid such as sulphuric acid or acetic acid. Address: Chemist, Imperial Univ., Sendai, Japan.

1928. Holman, Charles William. 1918. Preliminary confidential report of the soya bean industry of Manchuria, China... Covering some phases of the production, manufacture and export of soya beans, soya bean oil and soya bean cake. 44 p. Unpublished typescript.
• ***Summary:*** This report contains observations made by the author during a 4-month trip (which ended 23 Sept. 1918) to Manchuria. Manchuria is divided in two large divisions, North and South. North Manchuria was, for all practices, a Russian-controlled territory until the recent dissolution of the Russian government. South Manchuria may be considered Japanese territory.

Contents: Introduction. Japanese trade policy. Acreage of soya beans. Production of soya beans in 1917. Details of crop production in 1911 (by districts). Estimates of soybean beans production, North Manchuria in former years (1906-1909). Primitive farming methods. Exports of soya beans (incl. cake and oil; 1911-1917). Export tariff. Storage at export points. Stocks on hand. Condition of stocks. Sack shortage in North Manchuria. The milling capacity of beans of Manchuria. Bean mills of Harbin. Bean mills of Dairen (Nisshin, Santai, Fushungheng, and Kodera all produce 110,000 or more pieces of cake per month). Bean mills of Antung. Bean oil mills of Newchwang. Oil factories in Japan and their capacities (Suzuki is biggest bean oil producer). Method of manufacture. The contents of soya beans. Future of milling industry. How the war affected soya bean trade (incl. unsuccessful attempt by Suzuki & Co. to corner the bean cake market). How the soya bean is marketed. How the beans change hands. Selling bean products on exchange (produce exchanges are located at Harbin, Changchun, Kaiyuan, and Dairen; in June 1913 Japanese officials set up the Dairen Staple Products Exchange and Dairen Trust and Guarantee Company to control unscrupulous speculators). The fluctuating money market. The bean market 1917-1918. Transportation of beans. Preparing soya beans for ocean shipment. Containers for oil. Trade policy of the Japanese. Trade control of beans and bean products. How to buy beans for the Government.

Page 32 notes: "Speculation. The attempt of Suzuki and Company to corner the bean cake market. This began in the summer of 1917, and extended through the present time. The bean cake is one of the principal fertilizers in use in Japan and Suzuki and Co. made a wrong guess as to the size of the bean crop and the stocks and undertook to corner the market. In order to maintain the corner it was necessary for Suzuki and Co. to enter the market and buy beans heavily. This led to a frenzied speculation on the part of all the members of the trade at Dairen which shot the prices of beans and beancake up to exorbitant figures. The attempt to corner the market failed because of two main factors: A. The price of fertilizer was beyond the reach of the Japanese farmers and they refused to purchase in the usual quantities. B. The stock of soya beans on hand in Manchuria proved unusually large due both to the large crop and to the accumulated surplus which ordinarily would go to Europe."

Page 43 notes: "Without doubt Mitsui and Co. handle the greatest quantity of bean oil and possibly beans, at the present time. Suzuki, Kodera, Yoko, T. Yuasa Masuda, and the Nisshin Oil Mills comprises the principal Japanese firms. They do an all Manchurian business. In Dairen the firm of Thomson and Hannan is the largest foreign buying firm; they are closely associated with Vassard and Co. In North Manchuria, (another name for the Danish East Asiatic Company) Danish Soshin Brothers Russian and Klemantaski-Bates and Co. British are the chief competitors of the Japanese."

Tables show production, exports, movements, and chemical composition of soy beans, bean cake, and bean oil. Note: According to Manchurian expert David Wolff of Princeton University, Holman originally went to Russia with John Stevens (an American railway builder), to work for the Russian railway system to help the war effort (1917). After the Russian Revolution in 1917, he stayed on under Stevens to work for the technical board of the Interallied Railway Corps headquartered in Harbin. Address: USA.

1929. Yamazaki, Eiichi. 1918. Ureaaze = Nyôsokei no kagaku hannô ni tsukite [The chemical reaction of the urease-urea system]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 39:125-84. [Jap]
Address: Rigaku Hakase.

1930. Bell, Archie. 1918. Sunset Canada: British Columbia and beyond. Boston, Massachusetts: The Page Company. xii + 320 p. Illust. Index. Series: See America First.
• ***Summary:*** Chapter 10, titled "The Royal City," is about New Westminster in British Columbia, Canada. In 1859, New Westminster was selected as the first capital of the new Colony of British Columbia by Queen Victoria, who named the city after part of London. It soon became known as "The Royal City." Located on the north bank of the Fraser River, 12 miles southeast of Vancouver City, it was the only freshwater harbor of any consequence in Western Canada.

Yet the Canadian Pacific Railroad bypassed New Westminster (a crushing disappointment to the city's people) and went instead to Vancouver. Still its location "is strikingly similar to that of New Orleans on the Mississippi river or Shanghai above the mouth of the Yangtzu-Kiang. Both of the latter compelled the commerce of the world to come up the river to them.

Across the Fraser river one soon arrives at Steveston, which is almost an Oriental City; most of the inhabitants are Japanese fisherman, and they live much as if they were still

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in Japan. On Lulu Island at Steveston, "the native instinct for beauty and love for the picturesque has prompted the planting of shrubs and flowering plants. Sometimes they are in painted tin cans, in [wooden] soy kegs or in China urns; the idea is the same, the beautification of the dooryard, which is as noticeable among Nippon's very poor, where the dooryard may not be more than two square yards in area, as among the rich and noble who can build extensive parks and landscape gardens." Address: Author, Cleveland, Ohio.

1931. Chalmers, Thomas Wightman. 1918. The production and treatment of vegetable oils: Including chapters on the refining of oils, the hydrogenation of oils, the generation of hydrogen, soap making, the recovery and refining of glycerine, and the splitting of oils. New York: D. Van Nostrand Co.; London: Constable & Co., Ltd. 152 p. See p. 9-10, 87, 107. Illust. Index. 29 cm. Series: The Engineer.
• ***Summary:*** The chapters in this book "Originally appeared as a series of articles in *The Engineer...* "Eighteen articles, February 9 to June 29, 1917." Chapter 2, titled "The principal vegetable oils" contains a section on "Soya bean oil" (p. 9-10) which notes that the bean and its oil were almost unknown in Europe until after the Russo-Japanese war. Now the oil rivals cotton seed oil in Europe and, at least on the Continent, soya bean cake rivals linseed and cotton seed cake for use as a food for milch cows. The oil belongs to the semi-drying class, but can also be used for edible purposes.

In Chapter 11, "Extraction of oils by chemical solvents," soya beans are mentioned in passing (p. 87).

Chapter 13, titled "The hydrogenation or hardening of oils," begins (p. 106) by noting that "Fatty vegetable and animal oils may be described as consisting of a glycerine part and an acid part." The glycerine part is the same for each, but the composition of the acid part differs from oil to oil. In the acid parts of soya-bean oil and cotton-seed oil, four hydrogen atoms are missing. If these missing atoms are replaced by adding hydrogen, through hydrogenation, the liquid oil will become a solid fat. This is important because natural hard fats are in short supply and expensive, whereas liquid oils are very abundant and relatively inexpensive.

If the soap maker, for example, uses hardened whale oil, soya-bean oil, or the like, he can obtain a soap practically identical in quality to that made with more expensive tallow. The main oil hardened at present is whale oil, but increasing amounts of cotton-seed, linseed, soya-bean, cocoa-nut, and other oils are being subjected to hydrogenation. The result is an oil that is white, tasteless, and odorless, and has a tallow-like consistency. There are signs that producers of soya-bean oil in Japan and Manchuria may harden it before exporting it (p. 107). Address: B.Sc., A.M.I.Mech.E. (On the editorial staff of "The Engineer").

1932. Crevost, Charles. 1918. Plantes oléifères de l'Indochine [Oil-bearing plants of Indochina]. In: Congrès d'Agriculture Coloniale, Gouvernement Générale de l'Indochine. 1918. Hanoi-Haiphong: Impr. d'Extrême-Orient. 57 p. Series: Hanoi No. 6. See p. 26-27. [100* ref. Fre]
• ***Summary:*** Following an overview, the various oil-bearing plants are described in detail, organized by family. The section on Soja (p. 26-27) states: Indigenous names in Cochin China, Annam and Tonkin: Dau nanh, Dau tuong. Cambodia: Sandek sieng. China: Teou [dou]. Japan: Daizu mame. The plant is widely cultivated in Indochina for its seeds which, although not consumed directly as food, are used nevertheless to make various other foods: cheeses (dau phu and dau oc [tofu]), and a condiment sauce [soy sauce] (tuong).

In Indochina there is only one variety of soybean, which has oblong yellowish-white seeds, slightly flattened, more or less large according to its place of origin, whereas in China and Japan soybeans come in various colors and colorations.

The best seed in the colony come from Cambodia and the province of Lang-son in Tonkin.

It is well known that soy protein (*graine de soja à base de caséo-sojaïne*) serves as the basis for numerous food preparations; but the seeds are now most widely used in the manufacture of an oil, used for illumination [in lamps] or food; it tends to replace cotton oil in the soap industry, whereas soybean cakes (*les tourteaux de soja*) are considered excellent for use as a fertilizer or for fattening cattle.

A table shows nutritional analyses of soybeans from three locations, conducted at the colonial garden of Nogent-sur-Marne: Laos, Tonkin, and Manchuria. For each the moisture, protein, oil, carbohydrate, and mineral content are given.

Also discusses: Peanuts (p. 25-26, with illustration facing p. 25, and 9 references), sesame (p. 29-30, with illustration facing p. 29), perilla (p. 30).

Note the interesting phrase *graine de soja à base de caséo-sojaïne,* based on the work of Li Yu-ying near Paris, France. Address: Inspecteur des Services agricoles et commerciaux; Conservateur du Musée [Maurice Long] agricole et commercial de Hanoi.

1933. Kodama, Suisei. 1918. Shôkôgyôjô yori mitaru Manshû no daizu [A look at Manchurian soybeans from the viewpoint of commerce]. [Dairen]: South Manchuria Railway Co., Regional Dept. (Minami Manshû Tetsudô Kabushiki Kaisha Chihôka). 3 + 101 p. 22 cm. Series: Shôkô chôsa no. 2. [Jap]*
Address: Dairen, Manchuria.

1934. Morse, W.J. 1918. The soy-bean industry in the United States. *Yearbook of the U.S. Department of Agriculture* p. 101-11. For the year 1917. See p. 101-06. Contains many photographs by Frank N. Meyer.
• ***Summary:*** Contents: Early history of the soy-bean industry.

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Soy beans in the United States. Cultural requirements. Varieties. Soy beans as forage. Soy beans for oil. Soy-bean meal. Soy beans for human food: Dried beans, green beans, soy-bean milk, soy-bean cheese, soy sauce, soy-bean sprouts. Possibilities of the soy-bean industry in the United States.

"The annals of Old China set forth the fact that the soy bean was an important food fully 5,000 years ago. When the ports of China were first opened to foreign commerce, the trade in [soy] beans and bean products was found to have been a long-established and flourishing institution. In value and in extent and in variety of uses the soy bean is the most important legume grown in Asiatic countries." Note: This is the earliest document seen (May 2003) which gives the age of the soybean as "5,000 years."

"Near the close of the eighteenth century the soy bean found its way its way to Europe, its cultivation being recorded in England in 1790. It is mentioned in the United States as early as 1804. For several decades, however, it was regarded more as a botanical curiosity than as a plant of much economic importance. In 1875, Prof. Haberlandt began an extensive series of experiments in Austria with the soy bean and strongly urged its use as a food for both man and beast. Although considerable interest was aroused during the experiments, the soy bean failed to attend the success hoped for by the experimenter.

"Previous to the Russian-Japanese war [1904-05] China and Japan were not only the greatest producers but also the greatest consumers of the soy bean and its products. During the war the production of the crop was greatly increased throughout Manchuria. After the war, however, it became necessary to find new markets for the surplus beans, and trial shipments were made to Europe. The first attempts to introduce the soy bean and its products into European markets were generally unsuccessful because of the unsatisfactory condition in which the beans and cake were received, owing to poor shipping facilities. About 1908 a large trial shipment made to the English oil mills was received in much better condition than previous shipments, and the results obtained were so satisfactory that larger imports were made."

"Soy beans in the United States. As previously stated, the soy bean was introduced as early as 1804, but it is only within recent years that it has become a crop of much importance in the United States. Until the present season it has been grown primarily as a forage crop, though a constantly increasing demand for seed for food and planting has led to the development of a very profitable soy-bean seed industry in many sections of the South and the corn belt. The large yield of seed, the ease of growing and handling the crop, the value of the beans for both human and animal food, and the value of the oil and meal all tend to make this crop one of great potential importance and to assure its greater agricultural development in America."

"Varieties:... At the present time about 20 varieties are handled commercially by growers and seedsmen, although more than 500 distinct varieties are known and have been grown by the Department of Agriculture on its testing grounds. The yellow-seeded sorts are preferred for food and the production of oil and metal and include the following: Mammoth (late), Tokyo (late), Hollybrook (medium late), Haberlandt (medium late), Medium Yellow (medium), Mikado (medium), Ito San (early), Manchu (early), and Elton (early). For forage, the black and brown seeded varieties are most suitable and include Barchet (late), Biloxi (late), Peking (medium), Wilson-Five (medium [black seeded]), Virginia (medium late), Early Brown (early), and Black Eyebrow (early).

"Soy beans for oil: The soy bean was first utilized for the production of oil and meal in the United States about 1910 by an oil mill on the Pacific coast. The beans were imported from Manchuria, and the success of the industry is indicated by the continued production of the oil and meal and the increasing imports of soy-bean seed from Manchuria.

"American-grown seed was first crushed for oil the latter part of 1915 by a few cottonseed-oil mills in North Carolina. A shortage of cottonseed and a surplus of soy-bean seed led to a rather extensive use of domestic-grown seed for this purpose. However, during the season of 1916-17 no domestic-grown beans were utilized for oil, owing to the extremely high price of seed. The cottonseed-oil mills of the South saw the possibilities of the soy bean as an oil seed, and many mills throughout the cotton belt contracted with planters for seed of the 1917 crop. This led to a considerable increase of acreage. Large quantities of Manchurian beans have been imported during the past few months and utilized by southern mills in the production of oil and meal.

"The utilization of the soy bean as an oil seed has not required any extensive changes in the equipment of the modern oil mills. The methods are similar to those employed with other oil seeds, such as cottonseed and linseed. According to data obtained from different mills, 1 ton of soy-bean seed yields from 28 to 31 gallons of oil and about 1,600 pounds of meal.

"The oil extracted from the soy bean in many respects resembles cottonseed oil, though it dries more rapidly. This oil has a good color, has but a faint odor, and is rather palatable. New trade uses are being constantly found for soy-bean oil, and it has become an important competitor of other vegetable oils. It was first used in the United States in its crude state, principally in the manufacture of soft soaps. In the search for new oils to replace linseed oil for paint purposes, partly or wholly, soy-bean oil was found most suitable. Paint grinders are using successfully large quantities of this oil in the manufacture of certain types of paint. Manufacturers of butter and lard substitutes are using considerable amounts of soy-bean oil in their products. Other uses for which this oil is employed are in the manufacture of explosives, linoleum, varnish, and foodstuffs.

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"Soy-bean oil has been studied with other oils by the Office of Home Economics and found to compare favorably with the more common table oils with respect to digestibility. In view of the rapid improvement in the process of refining this oil, there seems to be scarcely any use to which oil is put in the manufacture of foodstuffs in which soy-bean oil may not eventually be found to have an important place" (p. 104).

"Soy-bean meal:... The meal or flour produced from American-grown yellow varieties is bright yellow in color when fresh and has a sweet, nutty flavor. Samples of meal from different sources range from 46 to 52 per cent protein and from 5 to 8 per cent oil. As a human food, soy-bean flour has been used in the United States principally as a special article of diet and sold by companies manufacturing special foods of low starch content. The flour or meal can be successfully used as a constituent of bread, muffins, biscuits, or pastry. Extensive tests have been conducted by the United States Department of Agriculture with soy-bean flour in the making of bread and pastry. In these various food products about one-fourth soy flour and three-fourths wheat flour has been found to be the proper proportion. In some of the pastry products, however, as much as one-half soy flour can be used. During the past year the use of soy-bean meal has gained in popularity on account of the many palatable products that may be made from it" (p. 105). Photos are described in Part II. Continued. Address: Scientific Asst. in Forage-Crop Investigations, Bureau of Plant Industry, USDA, Washington, DC.

1935. Morse, W.J. 1918. The soy-bean industry in the United States (Continued–Document part II). *Yearbook of the U.S. Department of Agriculture* p. 101-11. For the year 1917. See p. 106-10. Contains many photographs by Frank N. Meyer. • ***Summary:*** Continued from p. 106. "Soy beans for human food: In Asiatic countries, especially China and Japan, the soy bean and the various food products made from it are so largely consumed that it is second only to rice in importance as a food crop. The soy bean is eaten only to a very small extent like other beans, but in China and Japan it is elaborated into a great variety of products, all having a high percentage of protein and making a well-balanced diet when eaten in connection with the staple food, rice. Some of these products are said to be eaten at every meal and by rich and poor alike. Of these numerous preparations, only one, 'shoyu,' or 'soy sauce,' has been introduced to any extent in other countries. It is quite possible that some of these products would appeal to the American taste and with proper exploitation become established on the American market.

"Although the soy beans as an article of food has attracted attention from time to time in the United States, thus far it has been used but little except as a special food for invalids. The beans contain only a trace of starch and are highly recommended as a food for persons requiring a diet of low starch content. During the past year, however, much interest has been manifested in the possibilities of the soy bean as a staple food.

"Many schools of cookery and domestic science throughout the country have conducted experiments rather successfully, utilizing the dried beans in the manner of the navy bean. As a result, the dried beans can now be purchased in the markets in nearly all of the large cities. The variety and palatability of the forms in which the bean can be served make it a very desirable article of food, and it may be expected to grow in favor as it becomes better known (p. 107)."

"Dried beans:... During the season of 1916 about 100,000 bushels of American-grown soy beans were packed as baked beans by several canning companies in the Central and Eastern States." Properly roasted, the dried beans "make a good coffee substitute. Those fond of cereal beverages pronounce it equal to many of the preparations on the market. In China, the beans are soaked in water and roasted, the product being eaten after the manner of roasted peanuts. This method of preparing the beans is improved by soaking the beans for about twelve hours in a 10 per cent salt solution, boiling slowly for about 30 minutes, and then roasting to a light-brown color. The yellow-seeded and green-seeded varieties are preferable, as they make a product of better appearance.

"Green beans: When soy beans are three-fourths or more grown, the seed makes a most palatable and nutritious green vegetable. As such it may be used much as is the green pea or the Lima bean. The pods are somewhat tough and not desirable to eat. The green beans are rather difficult to shell, but after cooking in the pods for about five minutes, they shell out very easily."

"Soy-bean milk:" If dried soy beans are soaked, crushed, and boiled "a milky emulsion is obtained which is very similar in appearance and properties to cow's milk. This liquid, separated out by means of a very fine sieve or through a cloth filter, is the soy-bean or 'vegetable' milk used so extensively in China." "Soy-bean milk has a rather strong characteristic taste and odor which may be masked by the addition of a small quantity of coumarin or vanillin. This 'vegetable milk' can be used in numerous preparations, such as breads and cakes, in creaming vegetables, in milk chocolate, and in custards. If allowed to remain in a warm place the milk becomes sour, like animal milk, and in that form may be employed just like sour milk or buttermilk...

"After separating the milk from the solid material, the residue [okara] is still very rich in nutritive substances. It can be dried and used for cattle feed or possibly made into a meal or flour for human consumption."

"Soy-bean cheese: "The addition of magnesium or calcium salts (about a 1 per cent solution) to soy-bean milk when hot precipitates some of the proteid substances, forming a grayish white curd which settles out, leaving a yellowish watery liquid. This curd, after being drained

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and pressed, represents the tofu, or bean curd, which is so extensively eaten and forms the basis of numerous fermented, smoked, and dried cheeses in China and Japan (Plates III and IV). Tofu is made fresh daily and is a staple article of diet of oriental peoples. In many cities of the United States having a large Asiatic population, fresh bean curd generally may be found in the Chinese markets. Although the fresh curd, or tofu, is tasteless, it is a highly nutritious food and no doubt could be elaborated by the American housewife into a variety of palatable dishes.

"Soy sauce: Soy or shoyu sauce is a dark brown liquid prepared from a mixture of cooked and ground soy beans, roasted and pulverized wheat (barley is sometimes used), salt and water. This mass is inoculated with a culture known as rice ferment (*Aspergillus oryzae*) and left in casks to ferment from six months to a year and sometimes longer (Plate V)... This product may well serve as the basis of sauces of the Worcestershire type... The manufacture of soy sauce is conducted on a large scale in China and Japan, and to some extent in India. The yearly production of Japan is said to amount to nearly 2,000,000 barrels. The brewing of this sauce has also become a well established industry in Hawaii. Although there are no factories in the United States, considerable quantities of the sauce are imported annually, and it can be obtained at Chinese stores in most of our cities."

"Soy-Bean sprouts: Several species of beans are sprouted and used as a green vegetable by the Chinese (Plate VI). Soy beans are used to a very considerable extent for this purpose, as these sprouts are larger and firmer than those of most other legumes. Bean sprouts can be used as a home winter vegetable, for the dried beans are sprouted easily in a short time under proper conditions of heat and moisture. It is quite possible that sprouted soy beans utilized in various vegetable dishes would appeal to the American taste."

Note 1. This is the earliest English-language document seen (Jan. 2013) that uses the term "sprouted soy beans" (or "sprouted soy bean") to refer to soy sprouts.

A table (p. 111) shows the "Quantity and value of soy beans, soy-bean cake, and soy-bean oil imported into the United States, 1910-1917, inclusive.

Photos on unnumbered pages show: (1) A typical soy bean plant. (2) A field of the Biloxi soy bean grown at Biloxi, Mississippi. (3) Pods and seeds of 7 common varieties of soy beans.

(4) "Large blocks of freshly made bean curd, 'tofu' [on a round wooden table], ready to be cut up into squares and sold to the housewife."*

(5) "Large bamboo tray of various kinds of soy-bean cheese of the drier type" [pressed tofu sheets].*

(6) "A dark room of even temperature where wooden trays, full of bean curd [tofu] are piled. This is another method of preparing soy-bean cheese" [fermented tofu].*

(7) "Large earthen jars full of squares of bean curd, which are covered with spiced brine and soy sauce. After several months' curing a bean cheese [fermented tofu] is formed, which can be kept for many years."*

(8) A "courtyard full of covered pots of fermented soy beans and brine from which soy sauce is made."*

(9) The basket on the left contains "sprouted soy beans, which are sold and used as a green vegetable" [in China]* * = Photographed by Frank N. Meyer, Agricultural Explorer, USDA.

Note 2. This is the earliest published document seen (Jan. 2001) that contains photos of soyfoods by Frank. N. Meyer. Most of the photos appear to have been taken in China.

Note 3. This is the earliest document seen (Jan. 2013) in which William Morse describes "soy-bean sprouts" or "soy-bean cheese" (tofu).

Note 4. This is the earliest English-language document seen (Oct. 2011) that uses the term "soy-bean cheese" to refer to fermented tofu.

Note 5. This is the earliest English-language document seen (May 2005) that uses the term "masked" (or any other form of that verb) in connection with the undesirable taste or odor of soyfoods (soy-bean milk) or soy beans.

Note 6. This is the earliest document seen (June 2013) that gives statistics for the amount of whole soybeans used as food in the United States, or that gives a figure (about 100,000 bushels) for the amount of soybeans canned in the USA in 1916–the first time they are known to have been canned. Address: Scientific Asst. in Forage-Crop Investigations, Bureau of Plant Industry, USDA, Washington, DC.

1936. Saito, Kendo. 1918. Ueber die chemischen Bedingungen der Askenbildung bei *Zygosaccharomyces major* Takahashi et Yukawa [On the chemical conditions of asci formation in *Zygosaccharomyces major* Takahashi et Yukawa]. *Botanical Magazine* (*Tokyo*) 32(373):1-13. Jan.; 32(374):15-25. Feb. [Ger]

• ***Summary:*** *Zygosaccharomyces major* (later renamed *Saccharomyces rouxii*) is an important yeast that grows in soy sauce and was later found to contribute to its flavor. Asci are small sacs which some yeasts, under certain conditions, produce to contain their sexual spores.

Contents: Introduction. Preliminary remarks concerning materials and methods (soy sauce is mentioned on p. 4). The need for a definite salt solution for ascospore formation. Theory concerning the effect of salt. The need for a carbon source for the development of the ascospores.

Note 1. Yeasts have been defined as fungi in which the usual dominant, or conspicuous form in unicellular (single-celled). This unicellular form gives yeasts two advantages over the mycelial (multi-cellular) form of molds: (1) There is greater surface to volume ratio which allows greater metabolic activity; (2) The unicellular form is more readily

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distributed than the mycelial form. On the basis of their method of reproduction, the yeasts can be divided into four groups. Only two of these groups contain yeasts involved with foods. One group produces sexual ascospores in asci (small sacs) and is in the class Ascomycetes. These are the so-called true yeasts. For most yeasts, the maximum number of spores per ascus is four, but a few yeasts can produce eight. The usual form of vegetative (asexual) reproduction is by budding; all yeasts can reproduce asexually. The yeasts in the other group form no sexual spores and have no sexual life cycle; they are the false yeasts, Fungi Imperfecti, or Deuteromycetes (See Banwart, G.J. 1979. *Basic Food Microbiology,* p. 97-98).

Note 2. This yeast *Zygosaccharomyces major* was renamed *Saccharomyces rouxii* by the late 1950s (see Sakaguchi 1959). It is halotolerant (can tolerate high salt concentrations), and contributes to the flavor and aroma of soy sauce, in part by producing ethyl alcohol.

Note 3. Part 1 of this 3-part series was written in Japanese and published in this journal in 1916.

1937. Takenob, Y. 1918. Japan Year Book. Tokyo: Japan Year Book Office. 784 p. See p. 303, 492-93, 514, 530-31, 574, 584-85, 606-07, 611-12, 614, 691, 713, 721, 736, 782. 13th annual issue. [Eng]

• ***Summary:*** This book gives statistics for the Japanese empire: Japan Proper, Korea, and Formosa. The Preface is dated 31 Aug. 1918.

At the front of the book are 34 pages of large ads on pages enumerated with Roman numerals. At the rear of the book are 49 pages of large ads on pages similarly enumerated.

Near the front is a page of "Weights, measures, and moneys." 1 koku = 10 to = 100 sho = 4.65389 gallons (liquid) (U.S.A.) = 180.39 liters.

Page 303 shows how inflation in Japan during the great European war is making it difficult for regular families to make ends meet. The price of common foods such as "Sugar, soy, etc." has increased by 50% from June 1914 to Feb. 1918.

Page 584-85. The section on "Brewing industry" gives information about soy sauce plus production statistics for sake, beer, and soy [sauce] from 1913 to 1916.

Page 493. A table titled "Prices of principal commodities," 1914-1916 shows that the price of soja beans decreased from 11.55 yen per koku in 1914 to 10.28 yen per koku in 1916. The price of red [azuki] beans and miso also decreased. But the price of soy [sauce] increased from 24.91 yen per koku in 1914 to 25.05 yen per koku in 1916.

Page 492. A section titled "Guilds of stable commodities" lists: "The principal production guilds as classified according to the kind of commodities handled were as follows at the end of the year 1913:–Raw silk, 238; Rice, 68; Artificial fertilizers, 30; Paper, 24; Porcelain, 22; Medicines, 23; Weaving, 138; Timber, 32; Soy and miso, 31; Charcoal, 26; Matting, 20; Total, incl. others, 975."

Page 530-31. In the chapter on "Agriculture." A table shows production of soy beans, potatoes, and sweet potatoes, 1912-1916 (in 1,000 koku). Production of soy beans increased from:

3.511 million *koku* in 1912
2.993 million *koku* in 1913
3.664 million *koku* in 1914
3.807 million *koku* in 1915
3.750 million *koku* in 1916

The text immediately after the table (p. 531) states: "Among subsidiary farm crops there is perhaps nothing which plays so important a part in the Japanese kitchen as soy beans..."

Pages 573-74. A table of industrial companies classified by amount of investment states for "Soy and miso." Number of companies: 281. Paid up capital: 6.653 million yen. Reserves: 552,000 yen.

Pages 606-07 show record tax revenues in 1917-18, including 5.28 million yen from soy [sauce].

Pages 611-12. Discuss the history of taxation in Japan, including the tax on soy. The system is said to be irrational, and excises taxes applied to daily necessities, such as soy, place an unfairly heavy burden on the poor.

Page 614 repeats basic information about "6. Tax on Japanese soy [sauce]."

Page 691. The chapter on "Chosen (Korea)" states (p. 691): "Barley and soya bean.–Barley covers 584,664 cho, yielding 4.600,000 koku. Soya and other beans are exported chiefly to Japan for manufacturing soy, the export amounting to about 5,000,0O0 yen annually; the acreage is 553,077 cho and the yield 3,200,000 koku [415,252 metric tons]." Address: Prof. at Waseda Univ. and Late of the *Japan Times,* Tokyo, Japan.

1938. *Virginia Department of Agriculture and Immigration, Bulletin.* 1918. Soy bean useful crop. May be utilized in greater number of ways than almost any other agricultural product. No. 126. p. 174-76.

• ***Summary:*** "In addition to its availability as a food, soy-bean oil has found important uses in the markets of the world for making paints, varnishes, soaps, rubber substitutes, linoleum, waterproof goods, and lubricants. It is also used in the Orient for lighting and in the manufacture of printing ink. In Japan the soy bean forms one of the most important articles of food in use. It is one of the principle ingredients in the manufacture shoyu (soy sauce), miso (bean cheese), tofu (bean curd), and natto (steamed beans). The beans are eaten also as a vegetable and in soups; sometimes they are picked green, boiled, and served cold with soy sauce, and sometimes as a salad. A 'vegetable milk' is also produced from the soy bean, forming the basis for the manufacture of the different kinds of vegetable cheese. This milk is used fresh, and a

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form of condensed milk is manufactured from it. All of these foodstuffs are used daily in Japanese homes, and for the poorer classes are the principle source of protein."

"An artificial milk like that manufactured in the Orient has been produced in small quantities in the United States, and recently a factory has been equipped to make this product." Photos show: (1) Soy beans as a forage crop, arranged in stacks. (2) Lime spreader at work. Address: Virginia.

1939. *Yearbook of the U.S. Department of Agriculture.* 1918. Origin of principal farm products imported into the United States, 1914-1917. p. 797. For the year 1917.
• ***Summary:*** This table shows that in 1916 some 98,119,695 pounds of soya-bean oil were imported to the USA. Of this 70,384,049 lb came from Japan, 187,772 lb from the United Kingdom, and 27,547,924 lb from other countries. In 1917 an estimated 162,690,235 lb will be imported. In 1915 some 19,206,521 lb were imported, and in 1916 some 16,360,452 lb.

1940. Takahashi, Teizô. 1919. Re: Sample of shoyu sent by his brother to Margaret Church. Letter to Margaret B. Church, Bureau of Chemistry, USDA, Washington, DC, Jan. 18. 2 p. Typed, with signature. [Eng]
• ***Summary:*** "Yours to hand and very much pleased to know that you received 'shoyu' from my brother [of Pacific Trading Co., in San Francisco, California]. I hope that you will order the same to my brother at any time. An interesting news is that you have an organic chemist working on the chemistry of 'shoyu.'

"If press cake of peanut may be utilized for 'shoyu' manufacture, it is a great progress in this business. A further culture material from Dr. Thom's mycological collection is deeply appreciated. Respectfully yours,..."

On the back of the letter are 3 illustrations (his sketches) of small wooden implements, apparently related to making shoyu. One appears to be a stirrer. Address: Agricultural College, Tokyo Imperial Univ., Tokyo, Japan.

1941. Albers Bros. Milling Co. 1919. Importers of Oriental beans, peas, peanuts, seeds and grains of all kinds (Ad). *Bean-Bag* (*The*) (*St. Louis, Missouri*) 1(8):47. Jan.
• ***Summary:*** "Offices: New York, Seattle, Tacoma, Bellingham, Spokane, Lewiston, Salt Lake [City, Utah], Portland [Oregon], San Francisco Francisco [California], Oakland, Los Angeles, Kobe, Japan. Address all import and export communications to the Seattle office. Cable address, 'Albers'–all codes."

1942. *Bean-Bag* (*The*) (*St. Louis, Missouri*). 1919. Soy beans arrive on Japanese ship. 1(8):23. Jan.
• ***Summary:*** "Seattle, Washington–The first large consignment of soy beans from the 1918 fall crop was delivered in port the middle of the month by the Osaka Shosen Kaisha liner Kofuku Marun [probably *Kofuku Maru*]. She had 1,500 tons.

"Last season 1,000,000 tons of soy beans were imported from Manchuria and Japan and several months were consumed in moving the consignment. The shortage of the domestic crop and the high market prices were responsible for the big import.

"Importers are somewhat skeptical about market futures for soy Oriental beans. American crops have improved. The probable size of imports from Manchuria will be difficult to forecast. It is not probable that the output through Puget Sound will be as large as last year."

1943. *Bean-Bag* (*The*) (*St. Louis, Missouri*). 1919. Trade in soy bean oil in Kobe [Japan] in 1917. 1(8):24. Jan.
• ***Summary:*** "The amount of soy bean oil, largely originating or manufactured in the Kobe, Japan, district and exported in 1917 was slightly less than in 1916, but its value was far higher, and there was a greatly increased trade in the oil from the mainland and South Seas transshipped and marketed at Kobe.

"Causes tending to make Kobe a large vegetable oil market are: (1) The great decrease of all but Japanese merchant tonnage in the Pacific, as the Japanese lines converge and carry on their principal trans-shipment business here; (2) the high rate and rapid fluctuations of silver exchange in China, of which Japanese buyers can take quicker advantage than the representatives of purchasers in more distant countries; (3) the great increase in oil mills owned and operated by Japanese, both in Japan and in the mainland. October, 1917, saw the beginning of the largest buying season yet known in Japan, it being estimated by exporters that between the beginning of that month and the end of the year about $25,000,000 worth of vegetable oils were sold for future shipment to the United States alone. Quotations rose very rapidly during that period. Soy oil that was worth $8.90 per hundred pounds landed net weight c. i. f. Pacific coast ports at the beginning of the year was quoted at $15.50 at the end of the year.

"Soy bean oil, which originates principally in Manchuria, is almost entirely controlled by Japanese. The supply of beans last year was very large, and the amount of oil turned out was limited only by the capacity of the mills. A number of large new plants were started both in Manchuria and Japan and most of the already established mills increased their capacity."

1944. *Bulletin des Matieres Grasses de l'Institut Colonial de Marseille.* 1919. L'industrie des matières grasses au Japon [The oils and fats industry in Japan]. No. 1. p. 26-31. [Fre]
• ***Summary:*** A translation into French of a report by Mr. W.J. Davies, British consul in Japan, published in the *Board of Trade Journal,* 27 Dec. 1917.

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1945. Oriental Products Co., Inc. 1919. We specialize in all varieties of imported beans, peas and peanuts (Ad). *Bean-Bag* (*The*) (*St. Louis, Missouri*) 1(8):39. Jan.
• ***Summary:*** A 1/16th page ad. "Import. Export. 25 California Street. Kobe, Japan. San Francisco, California." Address: 25 California St.

1946. U.S. Department of Commerce, Far Eastern Div. 1919. Oil and oilseeds of the Orient. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 22(33):611-16. Feb. 8.
• ***Summary:*** Contents: Introduction. Method of cultivation [and harvesting] in China. Bean curd a Chinese delicacy. Domestic methods of marketing oil in China. Japanese production of vegetable oils [and exports to the United States]. China's production of oil steadily growing.

Tables show: (1) Total quantity and value of Chinese vegetable-oil exports, and the value of exports to the United States, including transshipments [from Manchuria], in 1917. Of total oil exports, coconut oil is by far the leader in quantity and value, followed by soya bean oil. But of oil exports to the USA, soya bean oil is by far the leader. Dairen exported 90% of the soya bean oil in 1917.

(2) Exports of vegetable oil from China in 1915, 1916, and 1917 (the quantities are expressed in piculs of 133.33 pounds and the values in Haikwan taels worth $0.62 in 1915, $0.79 in 1916, and $1.3 in 1917). Soya bean oil was by far the largest oil export in both quantity and value all three years. The quantity increased from 1.017 million in 1915 to 1.566 million in 1916 to 1.891 million in 1917.

(3) Exports of oil-bearing seeds and beans from China in 1915, 1916, and 1917. Soya beans were by far the largest bean or seed export in both quantity and value all three years. The quantity was 10.235 million in 1915, then 6.732 million in 1916, rising to 7.927 million in 1917.

"No single vegetable product has developed such importance in the Far East as the soya bean... As a food it is the principal ingredient of soy sauce, bean curd, and steamed beans. The bean cake, containing a high percentage of nitrogen, is a valuable fertilizer and is used extensively in Japan, and recently bean oil temporarily replaced petroleum for lighting in China when lack of shipping facilities kept that product off the market. The center of soya-bean production is Manchuria, and Japan is the chief crusher and producer of oil and cake, though the manufacture of bean oil and cake is also a very important industry of Dairen, Kwantung Leased Territory. Mukden is the center of the bean trade and the beans are there bought for cash from the farmers."

"Bean curd a Chinese delicacy: Bean curd is made mostly from the two kinds of oil beans described [Eighth Month White Bean and Water White Bean], although all varieties may be used in its preparation. As a rule, however, the other varieties of beans are not planted for oil or curd, but are eaten steamed when the bean is young and tender.

"Bean curd is prepared by first steeping the beans in cold water for 6 or 7 hours in summer or 24 hours in winter, and, after washing, grinding with cold water to form a bean milk. This milk is cooked in a large kettle and the film removed from the surface after a quarter of an hour and dried. This film or skin is known as Tou Fu Yi [doufu pi, usually called "bean curd skin" in English; yuba in Japanese] and 20 or 30 films can be obtained from a kettle without thinning the milk too much. After boiling half an hour the remaining milk is poured into a jar and a gypsum or salt solution added to curdle it. The proportion is 6 ounces of salt to 1 picul (133.33 pounds) of beans.

Note 1. This is the earliest English-language document seen (Oct. 2010) that uses the term "doufu pi" (regardless of hyphenation or spacing) to refer to yuba.

Note 2. Yuba is described as an early step in the tofu-making process. Viewed in this way, the word "bean curd skin" makes more sense.

"After standing 15 minutes a curdled substance called Tou Fun No [bean curd brain] is the result. This product is molded in wooden frames by a heavy block of wood for 15 minutes and is then cut into small pieces with a dull brass knife. A piece 2 inches square and half an inch thick retails for 5 cash (0.5 cent). This curd forms the basis for numerous Chinese articles of food and is prepared in various ways. Perhaps the most usual form of serving is to press the curd, wrapped in cloth, for six hours in a box 1 foot square and 8 inches high and then cook in oil. It is also boiled, after such preparation, with pork or cabbage."

"Japanese production of vegetable oils: The present estimated production of Japanese oil mills is 90,600 long tons of vegetable oils annually and is made up as follows: Soya-bean oil, 37,509 tons; coconut oil, 27,542 tons; rapeseed oil, 17,848 tons; cottonseed oil, 6,433 tons; and peanut oil, 1,268 tons. Seventy-five per cent of this crush is made in the Kobe district and is handled by 25 oil mills, modernly equipped." In 1917 Japan exported (including transshipments) 34,916,260 lb of coconut oil, 22,643,623 lb of soya bean oil, and 19,677,825 of rapeseed oil. He concludes that "American importers of Far Eastern products may well investigate the domestic market for Far Eastern oilseeds with a view to supplying oil mills in the U.S. with raw material." A table shows import and export data. Address: Asia.

1947. *Wall Street Journal.* 1919. Oiling the way. Feb. 22. p. 2.
• ***Summary:*** Besides fuel oil, there "are other kinds of oil, hitherto little exploited, of which the United States imports vast quantities. Japan sends about $10,000,000 worth every year, mostly soya bean oil, and the Philippines more than

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that of cocoanut oil alone. China is the principal producer of these raw materials [esp. soya beans]. Even Japan buys from her, then presses and ships the oil.

Profitable "exports are conditioned upon full return cargoes. The Orient wants our goods. It has unlimited supplies of oilseeds. We have 278 cottonseed mills and the civilized world is calling for vegetable oil as well as for fuel oil. Logic of the situation seems to be to bring back oil seeds, crush them here, and consume or sell the oil and meal. Foreign trade means goods going and coming."

1948. *Bean-Bag* (*The*) (*St. Louis, Missouri*). 1919. The home of Oriental beans. 1(9):12-13. Feb.
• ***Summary:*** "From Tsitsihar, westward to the Hingan Range along the river, the plain narrows down and is alternate with land under cultivation and pasturages. Beyond the Hingan Range, a boundless plain spreads itself on high levels, and in point of climate and soil it reminds one of being an extension of the Mongolian desert land. The plain is employed as sheep farms in a good portion.

"The Bean Belt in North Manchuria extends over Hulan Prefecture or the Hulan Uchimi Valley are carried out to the station of the selfsame name. Harbin is not particularly suited geographically as a bean center, but it attracts produce in considerable quantities by reason of the liberal financing facilities with which the city is equipped.

"Anta used to be only a small hamlet of about a dozen buildings some years ago. Its growth dated only a few years back. It has now a population of some 16,000.

"The beans are transported to Harbin either by carts or by train during winter when the ground is frozen hard. However, a good quantity is sent westward to either Anta or Tuichingshan. Anta Station holds now about 1,500 (C.E.R.) carloads of beans, inclusive of products of 1916."

A large photo shows: "Beans–acres of them–in sacks and in bean cake, awaiting shipment at Dairen, the great shipping port and terminal of the South Manchuria railway. According to recent statistics, Dairen now ranks fourth among the shipping ports of Asia. The beans, as shown above, constitute an important part of her exports, whose value amounts to millions annually. As shown in the engraving, the docks are modern and allow ocean carriers to lay alongside and take cargo. The railway company's cars are brought directly to the piers for unloading."

"Dairen was originally built by the Russians under the name of Dalny, a corruption of the Chinese name Talien. It has wide streets which radiate like the spokes on a wheel from a park called 'Central Circle.' Around this circle many substantial and modern buildings have been built by the Japanese, including the famous Yamato Hotel, the finest of the South Manchuria Railway Co.'s chain. The railroad operates over several hundred miles of track along the most advanced lines. It has been a potential factor in developing this city and the territory reached by its rails."

1949. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*). 1919. Improved seed beans for cultivation in Manchuria. 22(61):1232. March 14.
• ***Summary:*** Source: Clipping from the *Manchuria Daily News,* 21 Dec. 1918, transmitted by Consul A.A. Williamson, Dairen. The South Manchuria Railway Co. Agricultural Experiment Station "succeeded in improving the seed [soy] beans a few years ago, and has been distributing 30 to 40 koku (154 to 205 bushels) of the improved beans throughout Manchuria, and the new variety is now very favorably received. This year at Szupingkai 400 koku (2,048 bushels) were harvested and shipped to Kobe where they were so well received that advance orders for next year's crop are coming in.

"The improved variety has the advantage of containing more oil and being uniform in shape and size. It possesses a very fine luster. Furthermore, the raising of this variety is known to bring in about 15 to 20 per cent greater crop from the same area of land. At the place of production it fetches 20 sen (10 cents) more per koku than other varieties. Naturally there is now an increasing demand for the seeds of the new bean, which the experimental station is unable to supply. Some newspapers warn that the new variety is a strong rival to the Chosen [Korean] or Hokkaido beans, but the Manchurian beans are produced for the purpose of obtaining oil, and the new variety is specially fitted for that purpose, while the Chosen or Hokkaido beans are used for food." Note: Hokkaido, Japan's northernmost main island, has long been a leader in soybean production in Japan.

1950. Kita, Genitsu. 1919. Re: Okazaki fungus not suited for soy sauce production. Letter to Miss Margaret B. Church at Bureau of Chemistry, Washington, DC, March 20. 1 p. Handwritten. [2 ref. Eng]
• ***Summary:*** "'Okazaki fungus' is described under the name of *Asp.* [*Aspergillus*] *Okazaki* in the *Zentralblatt für Bakteriologie* [Series] II, Vol. 19, p. 481-85 (1907) & I have once studied it (Ibid, Vol. 37, p. 441, 1913). But now I have no culture and it is not sold as usual 'Tanekôji.' I think you can get [it] from Dr. K. Saito.

"I can however inform you that I have never heard of it applied in soy sauce making. According to my experience it is impossible to use for that purpose. Besides others it is difficult to get sound koji at first. Respectfully..." Address: 113 Gainsboro St., Boston, Massachusetts.

1951. Katsufuji, Koichi. 1919. "Yellow Dwarf," a new nematode disease of soy bean. *Nippon Shokubutsu Byori Gakkaiho* (*Annals of the Phytopathological Society of Japan*) 1(2):12-16. March. [12 ref. Eng; jap]
• ***Summary:*** The symptoms, distribution, and hosts of the disease are described, and the causal organism is said to be

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Heterodera schachtii. "Soy bean (Glycine hispida Maxim.) is one of the most important and most extensively cultivated leguminous plants in our country. In Hokkaido (northern Japan), the crop is affected annually by many parasitic fungi, viz. Sclerotinia, Septoria, Peronospora and Cercospora." Address: Hokkaido Agric. Exp. Station, Sapporo, Japan.

1952. Nakano, Katsuyoshi. 1919. Daizu no yôgyô-byô (ichimei daizu shôhanten-byô) (Shinshô) [Leaf scorch in soybean]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 6:217-21. March. [Jap]
• ***Summary:*** An account of the symptoms and the causal organism which is named *Pseudomonas glycines* n. sp. Address: Noji Shikenjo Kyushu Shijo.

1953. Holland, J.H. 1919. Food and fodder plants. *Kew Bulletin of Miscellaneous Information* Nos. 1&2. p. 1-84. April 16. See p. 11-12. [5 ref]
• ***Summary:*** Great Britain imported large quantities of soy oil before World War I to make up for the shortage of cottonseed oil needed to manufacture soaps: 875,526 hundredweight from Manchuria, 816,032 hundredweight from China, and 43,209 hundredweight from Manchuria. Note: A hundredweight is 112 pounds weight.

"Considerable interest has been taken in the cultivation in England, but results of experiments made at Cambridge, Midland Agricultural College, South Eastern Agric. College, Wye, &c., go to show that no variety so far has been found that can be relied on to produce seed here.

"In Japan and China they [soy beans] are largely known in the preparation of the sauce known commercially as 'Soy,' and they make there a preparation used as a substitute for milk, and from this a food product call 'Tofu,' which in turn forms the basis of the bean cheeses of Japan. The meal [flour] in this country is used in the manufacture of biscuits and in making a bread for special use in diabetes; but the principal use here is for the extraction of the oil of which the beans contain about 18 per cent., suitable for soap-making and in general as a substitute for cotton seed oil, the residue being a valuable cattle feed.

Also discusses the adzuki bean (*Phaseolus angularis,* Wight). "This bean appears to have been coming into the market recently in quantity. Trade samples have been submitted to Kew for name as 'Dainagon Azuki Beans.'" They are important human food in Japan, Korea, China, and Manchuria, cultivated for the purpose.

1954. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*). 1919. Commercial items from Japan. 22(121):973-74. May 23.
• ***Summary:*** "Japan exports bean oil chiefly to Australia, England, and the United States, and the amount exported has greatly increased during the past five years. In 1914 exports were valued at $724,284, while in 1918 they were valued at $3,430,483"–a 4.7-fold increase.

"The amount of Japan's bean cake output during the past year was valued at $6,100,000."

1955. *Times of India* (*The*) (*Bombay*). 1919. Import manifests [at Bombay harbour]. May 24. p. 10.
• ***Summary:*** "S.S. Tokyo Maru, from Kobe [Japan]. Agents N.Y. Kaisha.–250 cases safety match,... 10 cases Japanese miso; 23 cases Japanese soy; 71 cases window glass plain;..."

Note 1. These imports of Japanese seasonings are probably for one or more Japanese communities or stores in Bombay or western British India.

Note 2. World War II recently ended in Europe; Japan and India are at peace.

1956. *J. of the Society of Chemical Industry* (*London*). 1919. The vegetable oil industry of Kobe (Abstract). 38(3):45R-46R. May 31. [1 ref]
• ***Summary:*** A summary of: Dickover, E.R. 1918. "The vegetable-oil industry of Kobe" [Japan]. *Commerce Reports* (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*). No. 255. p. 403-12. Oct. 30.

1957. *Bean-Bag* (*The*) (*St. Louis, Missouri*). 1919. Hahto soy bean brought to U.S. by missionary. 1(12):43. May.
• ***Summary:*** "An American missionary in Japan, interested in the introduction of good crops from the Land of the Rising Sun into the domain of Uncle Sam, sent a sample of Hahto soybeans, which he had purchased at an agricultural fair, to the United States Department of Agriculture about three years ago. This bean has since been grown successfully at the department's Arlington (Virginia) experimental farm, and has been tested in other parts of the country. Although the Hahto bean, which produces excellent green vegetables similar to lima or butter beans, is preferably adapted for culture in the southern states, the variety also produces profitable yields of green beans during favorable seasons in the corn belt.

"The Hahto soybean is a bush variety which grows high enough to produce abundant forage, yielding nearly as large hay crops as the Mammoth Yellow, and is believed to be superior in seed production to that variety. When the seeds are from three-fourths to full grown they make, an excellent green vegetable. A number of residents of the District of Columbia and several states grew the bean in their gardens last summer and canned the product, which has been pronounced by epicureans to be at least the equal if not the superior of the ordinary butter or lima bean.

"Dried Hahto beans cook up easier than any other variety of 'soys' and have a more pleasant flavor than most of the other sorts which have been used in this way. A growing season of approximately 130 days is required to produce mature beans, while the green beans are ready for

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harvest at least two weeks earlier. During the current season a Michigan canning company is to test out the Hahto bean for commercial canning purposes. The department will not be able to comply with requests for seed, as arrangements have been made for the distribution of all the seed that is available among boys' and girls' garden clubs of the South, where the variety is best adapted."

1958. *Bulletin des Matieres Grasses de l'Institut Colonial de Marseille.* 1919. Fabrication des huiles végétales au Japon [Manufacture of vegetable oils in Japan (Abstract)]. No. 5. p. 216. [1 ref. Fre]
• ***Summary:*** A French-language summary of the following English-language article: Frazer, Robert, Jr. 1918. "Japan's output of vegetable oils." *Commerce Reports* (Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce) No. 207. p. 867. Sept. 4. Address: France.

1959. USDA Bureau of Chemistry. 1919. Inspection of imported foods: Label for samples. San Francisco. 1 p. each.
• ***Summary:*** These three inspection forms have been filled out to show that samples of red miso (shipped from Yokohama), white miso (shipped from Kobe), and bean paste (made by Suruqaya & Co. in Wakayama), all imported from Japan, were inspected in San Francisco by the USDA Bureau of Chemistry. The 3 samples arrived on May 26 and 27 on the steamers Shimpu Maru and Nippon Maru. On June 4 and 5 they were forwarded to Margaret B. Church, Microanalyst at the Microbiological Laboratory. Address: San Francisco.

1960. *Good Health* (*Battle Creek, Michigan*). 1919. Vegetarian Orientals. 54(6):307. June.
• ***Summary:*** "Confucius, the great Chinese philosopher, said: 'I have never known the taste of meat.' And through all the centuries the Chinaman has known from this fact that meat is not essential for the development of mind or body, and so has eaten little meat. Millions of Chinese are consistent Buddhists and refuse to eat flesh of any sort."

A Chinese poem, titled "The Cow's Lament," reads: "When I'm a man and you a cow.

"Then I'll treat you as you treat me now."

"The Chinese and the Japanese, as well as our own learned chemists and physiologists, have demonstrated the competency of the soy bean to take the place of meat."

1961. Nakajima, Iwao. 1919. Shina shôyu no futsû seibun ni tsuite [Typical components of shina shoyu]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Experiment Station, Report*) 5:179-86. June. [Jap]

1962. Phelps, J.K. 1919. Re: Analysis of Japanese miso and bean paste conducted for Miss Margaret B. Church, Microbiological Laboratory. Letter to Miss B. [sic] Church, July 1. 1 p. Typed, with signature on letterhead.
• ***Summary:*** The products are designated White Miso, Red Miso, and Japanese Bean Paste [probably azuki bean paste]. Each was analyzed for percentage of moisture, total ash, protein, fat, sucrose (Clerget), reducing sugars as invert before inversion, reducing sugars as invert after inversion, crude fiber. The Japanese Bean Paste "evidently contains agar-agar as the microchemical examination showed the presence of diatoms." J.F.B. adds in a handwritten note: "This total ash is doubtless too low, probably heated too far." Address: Chemist in Charge, Food Control Lab., Bureau of Chemistry, USA, Washington, DC.

1963. *Times of India* (*The*) (*Bombay*). 1919. Import manifests [at Bombay harbour]. July 3. p. 10.
• ***Summary:*** "S.S. Kifunezan Maru No. 2, from Japan ports, Agents: N.Y. Kaisha.–5 cases cotton hosiery goods,... 5 packages Japanese wine, 5 cases Japanese soy [sauce], 9 cases lead pencils,..."

1964. Oka, Takeo. 1919. Nippon in New York. *New York Times.* July 6. p. 34.
• ***Summary:*** An estimated 5,000 to 7,000 Japanese now live in New York City, including about 300 Japanese women. "Dr. Jokichi Takamine of the Takamine Industrial Company has broken into the company of 'Who's Who.'"

"The metropolis boasts no less than a dozen Japanese restaurants. Your casual visit will introduce you to fresh sliced fish taken raw [sashimi], seasoned bamboo shoots, and lotus root and pickled radish served on the same table with 'sukiyaki,' palatable at least to the Japanese. 'Sukiyaki,' a compound word still unauthorized in any standard English dictionary, is the Japanese 'quick lunch,' eaten while being cooked on a small charcoal table stove.

"Beef, onions, cabbage, beancurd [tofu], and other vegetable additions, not forgetting Japanese soy [sauce], sugar, and a little sake, are ready to be prepared in a shallow pan à la japonaise on the fire. The rest devolves upon you and your company, ladies not honorably excluded! A great time saving it is for the proprietor, this having his guests prepare their own meals!"

Note: This is the earliest document seen (Aug. 2010) stating correctly that the basic ingredients in sukiyaki include tofu and soy sauce.

1965. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*). 1919. Far Eastern press notes. 22(157):110. July 7.
• ***Summary:*** "Owing to the demand from the United States, the price of soya beans some time ago reached $12.25 per 100 pounds, but they are now selling for $11 per 100 pounds. The average consumption of soya beans in the oil factories of

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Kobe, Yokohama, and Shimizu had been about 20,000 tons per month."

1966. *Millard's Review* (*China Monthly Review*). 1919. Dr. Yamei Kin returns to America. 9(7):281. July 19.
• ***Summary:*** "Dr. Yamei Kin, who lately visited in Shanghai, accompanied by Miss Lily Crane, niece of the Hon. Charles R. Crane, and who spent considerable time at different ports in China, sailed for America on the s.s. China on July 6 from Yokohama [Japan]. Dr. Kin was doing investigation work among the industrial Chinese women workers in China and also obtaining data on the soya bean. She has said that America is her adopted country as it was when she was a small child that she was taken there by Dr. McCartee, a physician who was travelling in the East who sent her to America for an education. She is a graduate of a medical college in New York City.

"Dr. Kin has gained wide prominence in America as an intelligent Chinese woman physician working in cooperation working in cooperation with her own country the entire time. She has spent most of her time lecturing in various cities in the States on behalf of China and her lecture and picture has appeared many times in the leading American magazines. At the same time Dr. Kin has held an appointment from the Chinese government to promote better relations between America and China. She and Miss Crane accompanied Charles R. Crane to the Orient when he was sent on tour of investigation in China by the United States government, and when Mr. Crane was recalled on the signing of the armistice Miss Crane remained in China with Dr. Kin as companion. She has spent most of her time in the study of the Chinese language and is a student at Vassar College." Address: Shanghai, China.

1967. *Times of India* (*The*) (*Bombay*). 1919. Import manifests [at Bombay harbour]. July 24. p. 14.
• ***Summary:*** "S.S. Kosoku Maru, from Yokohama [Japan], Agents N.Y. Kaisha.–312 cases silk goods,... 22 cases Japanese provision, 15 cks [casks] Japanese miso, 15 cks Japanese soy [sauce], 9 cases nails,..."

1968. Williams, C.B. 1919. Soy-bean products and their uses. *Pure Products* (*New York*) 15(7):339-45. July.
• ***Summary:*** Contents: Introduction. A wider usefulness for soy-beans. First commercial crushing from domestic beans. Soy-bean oil. Uses for the oil. Soy-bean meal. Composition and exchange value of the meal. Prices paid for beans by the oil mills. Soy-bean oil industry in England, Manchuria and Japan. Importation of oil. Soy-bean meal as a feed. Soy beans and products for human food.

The soy-bean was introduced into North Carolina about 35 years ago (i.e. in about 1884). "During the spring of 1915 farmers, particularly in the Eastern part of the State, were casting about to find a crop or crops that might be substituted, satisfactorily, for cotton, as the price of this latter crop during the previous fall, in many cases, below the cost of production. Many farmers increased their acreage of soy beans, and as a result of this increase at least a million bushels or more of beans were produced last year."

"The first commercial manufacture of soy-bean oil and meal from domestic soy beans in the United States was started on December 13, 1915, by the Elizabeth City Oil and Fertilizer Company of Elizabeth City, N.C. From the start this mill operated day and night solely on soy beans until it had crushed its supply of about 20,000 bushels. This mill was able to crush about 20 tons during each twenty-four hours. The change from the manufacture of cotton-seed oil to soy-bean oil was made by them without any expense as to extra machinery and with but little expense for adjustment... It is understood that before the mill had ground a single bean they had contracted their entire output of oil to one of the leading manufacturers of the country at fairly reasonable prices. It, too, had no difficulty in selling its entire output of soy-bean meal, most of it going to a fertilizer manufacturer."

"Other oil mills in North Carolina that crushed more or less soy beans during the past season were those located at New Bern, Hertford, Winterville, Washington, Wilson, Farmville, Lattimore, and at a few other places."

"At the present time the oil is used in this country chiefly in the manufacture of soaps, varnishes, paints, enamels, linoleums, and water-proofing materials. It has entered, also, to some extent in the manufacture of edible salad oil and butter substitutes." Address: Chief, Div. of Agronomy, North Carolina Agric. Exp. Station.

1969. Takahashi, A. 1919. Re: Response to request for sample of miso. Letter to Miss Margaret B. Church at Bureau of Chemistry, Washington, DC, Aug. 12. 1 p. Typed, with signature on letterhead. [Eng]
• ***Summary:*** In her letter of May 27, Miss Church asked him to please send a sample of miso. She received his sample of shoyu. "There are two or three kinds of Miso manufactured in Japan, but we usually import only one kind–*shiro miso. Shiro* means 'white' in English. I am sending sample bottle under separate cover, and this is the best quality of shiro miso manufactured in Japan; this is a fresh sample, only having been made four or five months, as it is a commodity that is easily manufactured."

He is also trying to find her a sample of *aka miso* or Red Miso, "which requires a considerable time to manufacture."

Note: The writer is the younger brother of Teizo Takahashi, who is a lecturer at the "Imperial University of Tokyo." Address: Pacific Trading Co., 331-343 Battery St., San Francisco, California. Phone: Sutter 270.

1970. *Chemische Umschau auf dem Gebiete der Fette, Oele, Wachse und Harze* (*Germany*). 1919. Technologie: Fettgewinnung, Fettwirtschaft [Technology: Obtaining fats

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and oils, and their economics]. 26(10):130-31. Aug. 25. [Ger]
• ***Summary:*** Japan: Japan imports soybeans from Manchuria. In and around Kobe, about 210 tonnes (metric tons) per month of soybean oil are produced.

Soybean oil: In Dalny [Dairen, Dalian], Manchuria, the Japanese firm Mitsui & Co. has built seven storage tanks / reservoirs with a capacity of about 6,750 tonnes of soybean oil (*Bohnenoel*). They are made of prefabricated steel and are connected to the harbor via pipes.

1971. Yamamoto, Yoshitaro. 1919. Process of deodorizing and decoloring bean-flour. *U.S. Patent* 1,314,298. Aug. 26. 1 p. Application filed 21 May 1919.
• ***Summary:*** "This invention relates to a process of preparing deodorized and decolorized bean flour from raw bean, or deoiled bean and consists in steeping in a weak solution of an organic acid bean coarsely broken and deprived of its bran, until it has swelled and lost all of its offensive smell, and color; then removing all the traces of the acid by carefully washing the material with water, and then drying and grinding it. The object of this invention is to obtain bean flour suitable for use as material for making sweetmeats, as a substitute of powdered milk, or for preparing bath powder."

Note: This is the earliest English-language document seen (Sept. 2010) that contains the word "deoiled" (spelled as one word) in connection with soybeans.

In detail: Steep the bean powder in a solution of 1-2 liters of vinegar mixed with 100 liters of water, heat the mixture to a temperature not exceeding 60ºC, remove the powder from said solution and wash it with water, then steep the powder in a solution of 140-200 gm of bicarbonate of soda mixed with 100 liters of water. Remove the powder again, wash it in water, then dry it at a low temperature. This process will not cause "condensation of the albumin, matters which give out the offensive smell and color of the bean, are decomposed and removed, such matters being changed into soluble substances. Thus the product obtained by my process is almost pure white in color, and retains it albuminous components unaltered, that is, in the condition they exist in raw bean. Thus the bean flour produced by my process can be used in place of wheat flour or rice flour in making sweetmeats, as a substitute of powdered milk for drinking purpose and as food stuff for other purposes. It can be also used as material for preparing bath powder, and also as body of soap." Address: No. 5 Zitchome, Taikaidori, Hyogo city, Kobe, Japan.

1972. *Christian Science Monitor.* 1919. Japanese children. Aug. 28. p. 14.
• ***Summary:*** "The Japanese also have... wafers [rice crackers] which are made of rice paste, dipped into 'shoyu' and dried in the sun. 'Shoyu' is a sauce with a salty taste, which is the Japanese equivalent of Worcester sauce."

Also discusses a sweet called "ame," which is made from malt, and "'yokan' consisting of mashed [azuki] beans and sugar, which is made in the mountain districts of Japan. It is much nicer than it sounds and looks so attractive packed in its long, narrow, white, wooden boxes and wrapped in a single big bamboo leaf."

1973. Arnold, Julean. 1919. Commercial handbook of China. 2 vols. Washington, DC: Government Printing Office. 629 p. + 472 p. Dep. of Commerce, Bureau of Foreign and Domestic Commerce, Miscellaneous Series No. 84.
• ***Summary:*** In Vol. 1: The "Letter of submittal" from the Department of Commerce, Bureau of Foreign and Domestic Commerce, states that the Bureau "realizes keenly the desirability of an immediate, vigorous, and systematic effort to promote American trade with this great friendly nation in the east of Asia. Such an effort... must be based on the most recent and dependable economic information. To supply that information is the purpose of this handbook.

"This handbook, the most detailed publication of its kind ever issued by the Department of Commerce, will appear in two volumes." The basic organization will be by each of the 17 American consular districts.

Digital searches for "soy" or "soya" or "beans" or "bean curd" or "bean cake" or "bean oil" will result in many hits and a vast amount of information. For example:

Pages 42, 45: A table titled "Commercial statistics for China as a whole," under "Exports, sundries" includes:

"Bean cake" (pounds). For 1913. Quantity: 1,575,792,400 pounds. Value: $18,197,871.

"Bean cake" (pounds). For 1918. Quantity: 2,182,241,744 pounds. Value: $35,650,215.

"Bean curd" (pounds). For 1913. Quantity: 4,846,543 pounds. Value: $144,849.

"Bean curd" (pounds). For 1918. Quantity: 3,765,591 pounds. Value: $265,141.

"Beans" (black, green white, yellow, other kinds) (pounds). For 1913. Quantity: 1,376,795,200 pounds. Value: $16,983,422.

"Beans" (black, green white, yellow, other kinds) (pounds). For 1918. Quantity: Yellow (#1): 849,479,313 pounds. Value: $17,106,454. Values are also given for Other kinds (#2), White (#3), Green (#4), and Black (#5): 13,481,033 pounds. Value: $295,796.

"Oil, Bean" (pounds). For 1913. Quantity: 65,575,600 pounds. Value: $2,720,637.

"Oil, Bean" (pounds). For 1918. Quantity: 393,621,508 pounds. Value: $29,802,630.

"Soy" (pounds). For 1918. Quantity: 820,531 pounds. Value: $45,871.

Page 115: "Canton Consular District." "Other native industries of Canton that give employment to large numbers of people in the aggregate are:... The making of a Chinese sauce called 'soy,' which is made from a certain bean which

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as been boiled slowly and to which wheat or barley flour is added (soy is exported for the use of Chinese living abroad and also for the making of certain foreign sauces and condiments);" [such as Worcestershire sauce?].

Page 200: "Export trade:... The leading products shipped from Hongkong to all parts of the world are:... beans,...soy, tapioca flour, tea..." Pages 202-03: Trade between Hongkong and the United States during 1918. Hongkong Consular District. Value in 1913: Soy. Shipped to the United States: $51,595. Shipped to the Philippine Islands: $1,430. Shipped to Hawaiian Islands: $1,140.

In the section on "Mukden Consular District" under "Agriculture" we read: (p. 216): "Soya beans furnish material for bean oil, bean curd, and bean sprouts, besides serving as a food when boiled. Bean oil is used locally for cooking and as an illuminant; the bean oil for export is employed in soap and olive-oil manufacture, while in the mixing of paints it serves as a substitute for cotton and linseed oils. Bean cake is used as fertilizer and as food for cattle. About 70 per cent of the output of beans is annually exported, the rest being consumed locally. The annual production of bean cake and bean oil in the Mukden consular district is estimated at 433,992 and 54,279 tons, respectively.

"It is estimated that one-eighth of the beans exported are shipped to Hongkong, the Straits Settlements, and Europe, three-eighths to South China ports, and the remaining four-eighths to Japan. Of bean oil, Europe, China ports, and Japan are buyers in about equal proportions. A somewhat smaller quantity goes to the United States. Bean cake exported from Manchuria is marketed almost exclusively in Japan, Taiwan, and South China."

Page 365-66: "Amoy Consular District." Manufacturing and other industries. The Amoy Tinning Co. (Ltd.) and The China Canning Co. (Ltd.): The output of these two factories includes "soy and soy sauce."

Page 380. The section on Agriculture in Antung states: "Soya beans and their products, bean oil and bean cake, are exported, principally to Japan, Chosen (Korea), and South China ports."

Page 391. The section on Antung, Beans states: "The value of the beans and bean products exported from Antung during the year 1918 constituted 27 per cent of the total value of exports and amounted to $4,941,982. The bean that constitutes the great bulk of this export is known commercially as the soya bean and is grown practically throughout this entire district.

"The bean crop ripens earlier in the southern section of the district than in the northern but is practically all harvested in normal years by the end of September. However, because of the superior transport facilities enjoyed during the winter, when roads and rivers are firmly frozen, it is at this time that the bean harvest is assembled at the various interior towns which serve as collection centers and from which it is forwarded to Antung in the spring.

"The soya bean is exported in three forms–as 'raw beans' (natural condition), as bean oil, and as bean cake.

"The proportion of the export of beans, cake, or oil that goes to any given destination varies from year to year according to several determining factors. However, the following statement, which can only be regarded as approximate and not as exact, gives a general idea (through average percentage) of the destinations of the soya bean products exported from Antung: Beans–Japan, 76 per cent; Shanghai, 6 per cent; Chosen (Korea) 5 percent; other Chinese ports and Dairen, 13 per cent. Bean cake–Japan, 72 per cent; Shanghai, 20 per cent; Chosen, 1.8 per cent; other Chinese ports and Dairen, 6.2 per cent. Bean oil–Japan, 31 per cent; Shanghai, 36 per cent; Chosen, 21 per cent; other Chinese ports and Dairen, 12 per cent. It will be seen that Japan and Chosen (Korea) receive eight-tenths of the beans, almost three-fourths of the bean cake, and slightly more than one- half of the bean oil exported.

"Beans are exported packed in gunny bags which, when filled, weigh about 175 pounds; bean cake in the form of large, round, flat cakes weighing on an average 75 pounds; and bean oil in empty 5-gallon kerosene oil cans, two of which are packed in a wooden case.

"Most of the beans exported are doubtless milled and transformed into cake and oil on reaching their destination. Bean oil is put to many uses, but one that is of common interest is as the base of practically all table sauces. Bean cake is principally used as a fertilizer for rice and in China as a cattle food.

"The trade in beans is a highly speculative one, since the market is contingent on two factors, the bean crop and the price of rice in Japan. When it is anticipated that the price of rice in Japan will be high, brokers will buy 'forward' beans from the large Chinese firms in Antung. This form of speculation is one that has great charm for Chinese merchants, and there are few firms in Antung that do not 'take a flier' occasionally in beans."

Page 394. The section on "Antung–Import trade" states: "Four circumstances have combined to raise the city of Antung to its present importance as a port for the importation of foreign merchandise into Manchuria: (1) The completion of the Chosen Railway, which, through Chosen, connects the Yalu River with Japan; (2) the opening of Antung as a port for foreign trade in 1907; (3) the completion of the standard-gauge railway from Antung to Mukden in 1911; and (4) the erection of the 3,100-foot steel bridge across the Yalu River in the same year, by means of which the Chosen and South Manchuria Railways now furnish a through service from Fusan to Changchun. When this system of railways was completed Antung at once became the natural gateway through which all rail-borne merchandise from Japan enters Manchuria. When the one-third reduction in duty on goods imported into Manchuria from or through Chosen went into effect in 1913 the rail route through Antung became cheaper

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for the Japanese exporter than the water route through Dairen or Newchwang. This advantage of the Antung route was further enhanced when, in 1914, the South Manchuria Railway granted a special discount, amounting to 30 per cent, on 11 specific through imports from Japan via Chosen when carried over its Antung-Mukden branch."

Note: As of Jan. 2014 Antung (now known as Dandong), is in China, a prefecture-level city in southeastern Liaoning province, and is the largest Chinese border city. It is a port city on the Yalu River, which divides China and North Korea. The population is more than 1 million people.

Page 397. Antung Consular District. Exports include soy.

Page 478: "Shantung Province is the original home of the soya bean and the bean-crushing industry in this part of the world, and until the possibilities of Manchuria were discovered and developed this Province led the industry." "Manufacture of vermicelli: The principal crude native industry is the manufacture of Chinese vermicelli from a small green bean known as the 'lu tou' [mung bean]. This vermicelli is manufactured not only in large factories but also by individual farmers and in the homes of the natives in all parts of the Province."

Page 517-19: Dairen Consular District, Agriculture. The principal crops and their yield per acre: soya bean, 4.5 bushels. "The principal fertilizers are manures and bean cake (the residue after the oil has been pressed from soya beans)." "Soya beans, and the bean oil and bean cakes manufactured therefrom are the principal agricultural products exported from this district... The soya beans raised in this district are of four kinds, the yellow soya, the small green soya, the black soya, and the red mungo. They are not considered as edible beans in their natural states. Some of them are exported raw to Japan, to be manufactured either into 'soy' (a sauce largely used by the Japanese) or into bean oil (used in making soap and for various other purposes) and bean cake (largely used as fertilizer on rice and sugar-cane fields). However, the greatest proportion of the bean products are manufactured in Dairen and other parts of the Leased Territory, and the subject will be considered later under 'Industries' and 'Exports.'" Address: Commercial Attaché, Peking, and various American Consular Officers, China.

1974. Bowers, William G. 1919. Some studies on the nutritive value of the soy bean in the human diet. *North Dakota Agricultural Experiment Station, Special Bulletin, Food Department* 5(13):278-328. Aug. Reprint of his 1919 PhD thesis, Ohio State Univ. 28 cm. [65 ref]

• ***Summary:*** Contents: Part I: Introductory. Extent of production. Human food preparation made from the soy bean. Varieties and chemical composition. Character of the carbohydrates of the soy bean and its bearing on nutrition. Character of the fats of the soy bean and its bearing on nutrition. Character of the protein and its bearing on nutrition. Vitamines of the soy bean. Minerals of the soy bean. The soy bean compared to some other legumes used as human food as to fuel value and organic nutrients. Digestibility of soy bean products.

Part II: Experimental part. The character of the materials used in the experiments. Digestibility of soy cake meal baked into bread. Digestibility of soy cake meal mush. A study of the nutritive value of the nitrogen free contents of the soy bean. Malt digestion. One per cent HCl [hydrochloric acid] extract (incl. pentosans, galactans, true cellulose). Milling of the soy bean: Composition of parts (incl. "the bran"), digestibility of the bran, the nitrogen-free extract, crude fiber, physical effects of a diet solely of a mush made from the bran, the calcium oxide and phosphorus pentoxide content of the soy bran and soy meal. Toxic and disagreeable or unpalatable substances of the soy bean: Some investigations as to the possible poisons, location and elimination of the disagreeable and unpalatable substances (20 experiments, incl. soy and navy bean bran, benzine extracted soy and navy bean meal, alcohol extracted soy and navy meal, a steam distillation for the purpose of separating objectionable flavor). Discussion of results. Summary.

Introductory: Only within the last 35 years "has the soy bean been considered with much favor as a food for stock. Only within the last ten or fifteen years has it met with any favor at all as a food for man" (p. 279). "Soy milk and soy milk products are being made in the United States now" (p. 280). "Roasted beans. Soy beans may be roasted in an oven or ordinary corn popper. They are heated until the beans are burst like popcorn. The beans thus roasted may be softened by immersing in a syrup while they are hot. This is said to make a wholesome candy. The roasted beans may be powdered and used as a salad dressing or employed as a substitute for coffee" (p. 281). "The fresh green beans, those that have been dried without being allowed to ripen thoroly [sic, thoroughly], or those that have ripened on the vine after the vine has been pulled show slight amounts of starch" (p. 282).

"Experimental part (p. 287): "In our experimental work we propose to inquire into the digestibility of soy cake meal. We shall then determine the digestibility of the different carbohydrates as found in a representative variety of the soy bean. After passing some of the beans thru a milling process we shall study the composition and digestibility of the meal and bran and determine their relative amounts of calcium and phosphorus, and locate any possible poisons or objectionable substances that my be present in either of these. This will make it possible, then, to determine whether or not it would be profitable to carry on the milling process and eliminate certain products, or whether by the use of certain extractives we can get rid of the objectionable constituents."

Recalling the fact that "navy bean bran is so indigestible and is responsible for fermentation and discomforting gas in the digestive system, we were led to the effort to separate the

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bran and the meal of the soy bean and make determinations of each separately... we found the bran to constitute 8% of the whole bean." The germ was 1½% and the remainder was cotyledon. "The bran consisted of very large flakes. We had to grind it thru a burr mill three times before it would pass thru a twenty mesh sieve" (p. 301-02). The bran can be easily separated from the soy bean by milling. It is composed of about 37% crude fiber and 43% nitrogen free extract. "Digestibility experiments on the bran showed that the nitrogen free extract, including the hemicelluloses and waxes, is about 84% digestible, which is much less than that of the whole bean. (p. 323).

"In order to see what would be the physical effects of a day's diet on the bran alone, we made three meals of 30 grams each for one day. Next day we were a little uncomfortable on account of a slight amount of gas in the bowels. We were a little weak and very hungry but not sick. The next day the stool was voluminous but not so very soft. The diet had neither a laxative nor a constipating effect that could be noticed" (p. 304).

"In most of the Japanese foods made from the soy bean the disagreeable flavor is avoided by the nature of the preparation made. These, of the most part, involve some sort of fermentation which changes the flavor entirely. The Domestic Science Department of the Ohio State University [under the leadership of Dr. J.F. Lyman, with help on milling from Dr. Park of the Farm Crops Dept.], has carried on considerable experimentation making different preparations, combinations and extractions, as well as making use of different methods of cooking soy bean preparations, to avoid the disagreeable flavor."

The calcium oxide content of the bran was found to be 0.8% and the phosphorus pentoxide content 0.27%. No salicylic acid was found in the bran, and no hydrogen cyanide or cyanates in the samples tested. There was no trace of tannin in the bran and only a slight trace of alkaloids.

"As far as flavor is concerned there is no point gained in removing the bran from either the soy bean or the navy bean. The beany flavor and some of the disagreeable taste can be easily removed from the soy bean by steam distillation, but the disagreeable flavor in the oil cannot be removed in this way."

Nineteen tables (all but one without captions) show compositional percentages of soy beans, and a summary of results. An illustration (line drawing; p. 297) shows the apparatus for extracting meal with 95% alcohol. Three bar charts (p. 316-18) gives a summary of experimental results.

Note 1. Although this document was reprinted as a Special Bulletin by the Food Department of the North Dakota Agricultural Experiment Station, it has nothing to do with North Dakota per se, and makes no mention of soybeans being used or grown in North Dakota.

Note 2. This is the earliest English-language document seen (June 2013) that mentions soy bran, which it calls "soy bran." It is also the earliest document seen concerning the etymology of soy bran.

1975. Tanaka, Katsuhide. 1919. [Cold test of blended oils]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 22(258):633-44. Aug. [Jap; eng]
• ***Summary:*** Petroleum-derived mineral oil, used to lubricate axles, tends to solidify at low temperatures (below -20ºC) in very cold climates such as that of North Manchuria. This can cause the axles of trains to overheat during the cold winter months. Experiments with vegetable oils such as rape seed oil, soya bean oil, earthnut [peanut] oil, and hemp seed oil showed that they are thoroughly miscible with mineral axle-oils and do not separate at all, even on long exposure to temperatures as low as -34ºC. By mixing the proper quantity of each oil with mineral axle-oils, the fluidity of the axle-oil can be maintained at temperatures as low as -30ºC. The best vegetable oil for this purpose is hemp seed oil (40-50% of the total), followed by rape seed oil (30-35% of the total). Includes a detailed discussion of the physical and chemical characteristics of soy oil. Tanaka obtained his oil from Nisshin Oil Mills, Ltd., Dairen.

1976. *Times of India* (*The*) (*Bombay*). 1919. Import manifests [at Bombay harbour]. Sept. 2. p. 11.
• ***Summary:*** "S.S. Tenshin Maru, from Japan, Agents, N.Y. Kaisha.–727 bales cotton shirting,... 10 cases penholder, 40 cks [casks] Japanese soy [sauce], 20 cks Japanese miso, 5 cases watch glass,..."

1977. *Chemische Umschau auf dem Gebiete der Fette, Oele, Wachse und Harze* (*Germany*). 1919. Technologie: Fettgewinnung, Fettwirtschaft [Technology: Obtaining fats and oils, and their economics]. 26(11):143. Sept. 10. [Ger]
• ***Summary:*** Soybean oil: In Dairen [Dalian], Manchuria, there are about 50 large and small oil mills. Only one uses the solvent extraction process (*Benzin*), and these machines come from Germany. All the others use hydraulic presses, which come mostly from the Osaka Iron Works in Japan, but also from workshops of the Manchurian Railway in Shakaha. Source: *Ausl. Ber. R.A.*

1978. Yamamoto, Yoshitaro; Mizusawa, I.; Kano, T. 1919. [Deodorized and bleached soybean flour]. *Japanese Patent* 34,949. Sept. 15. [Jap]*

1979. Takahashi, Yoshinao; Fukuyama, Jinnosuke. 1919. Daizu no tokusei ni kansuru chôsa oyobi shiken seiseki [Morphological and genetic studies on the soy bean]. *Hokkaido Nogyo Shikenjo Hokoku* (*Hokkaido Agricultural Experiment Station, Report*) No. 10. 100 p. Sept. 25. [46 ref. Jap]
• ***Summary:*** This is a genetic analysis of several characters. K. [Kokichi] Oshima is currently director of the Station in

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Sapporo, Hokkaido, Japan.

Note: This is Japan's second earliest publication seen on soybean genetics. Address: Sapporo, Japan.

1980. Morse, W.J. 1919. Re: Report on inspection tour to Mississippi. Letter to Prof. C.V. Piper [Agrostologist in Charge, BPI, USDA], Washington, DC, Sept. 26. 2 p. Handwritten, with signature on letterhead.

• ***Summary:*** Morse is writing from Gulfport, a coastal city west of Biloxi, Mississippi. "Dear Prof. Piper: Have just returned from a visit to Mr. [G.A.] Swan's place near Lyman [Mississippi]. I saw a very considerable acreage of soya, mostly Biloxi, some Barchet and some Otootan (Laredo–our black). The varieties all appeared very promising and no doubt Mr. Swan will have considerable of the Biloxi. He has ordered one of the Carolina Harvesters.

"Spent Thurs. with Mr. Abbott, Mobile, Alabama. I like Mr. Abbott's plantation very much. He also will have considerable Biloxi seed and also some Bush Velvet [a variety of velvet bean].

"The soys at all places visited thus far look very good. Am very much pleased with the Victor cowpea. At Raleigh [North Carolina] and Monetta [South Carolina] it appeared very promising in comparison with other sorts. At Athens, Georgia, the Victor led in hay yield, 2.07 tons to the acre, and the next day the Brabham, with 1.87 tons. The seed yields have not yet been calculated or rather weighed at the time of my visit. Am sure we have a good thing in this new variety.

"I do not remember whether I told Mr. Lee to order 30 cylinder teeth or spikes for the harvesters at Arlington or not. Will you please have Lydenberg look the matter up and if they have not been ordered, to order them from Hardy & Newsome [Newsom], La Grange, North Carolina–Little Giant Bean Harvester. Very truly yours,..."

Note: This is the earliest document seen (July 2013) that mentions the soybean variety Laredo.

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 92–Morgan-Morse.

Sent to Soyinfo Center by Matthew Roth of Rutgers Univ., March 2012. Address: Forage-Crop Investigations, Bureau of Plant Industry, USDA, Washington, DC.

1981. *Bulletin Mensuel des Renseignements Agricoles et des Maladies des Plantes* (*Rome*)*.* 1919. Diverses études sur la production des matières grasses dans différents pays du monde [Various studies on the production of oils and fats in different countries of the world (Abstract)]. 10(7-9):923-25. No. 888. July/Sept. [1 ref. Fre]

• ***Summary:*** A French-language summary of the following French-language article: *Bulletin des Matieres Grasses de l'Institut Colonial de Marseille.* 1919. Diverses études sur la production des matières grasses dans différents pays du monde [Various studies on the production of oils and fats in different countries of the world]. No. 1. 39 p.

1982. Nishimura, Torazô; Kawakami, T. 1919. Daizu oyobi shôyu ni kansuru 2, 3 kenkyû hôkoku [Several studies on soybeans and shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 78. p. 209-305. Sept. [Jap] Address: 1. Jozo Shikensho, Gishi; 2. Ditto, Gishu.

1983. Phelps, J.K. 1919. Re: Analysis of Japanese White Miso conducted for Miss Margaret B. Church, Microbiological Laboratory. Letter to Miss M.B. Church, Oct. 8. 1 p. Typed, with signature on letterhead.

• ***Summary:*** This white miso product contained: Moisture 19.18%. Total ash 6.70%. Protein 10.20%. Fat 2.72%. Sucrose–none. Reducing sugars as invert before inversion 21.75%. Reducing sugars as invert after inversion 22.03%. Total acids (as acetic) 1.44%. Starch (diastase method) 3.59%. Alcohol–none.

"Microchemical of whole sample showed the presence of a little starch although whole rice kernels were found."

Margaret Church adds in a handwritten note: "Shiro (white) miso–finest grade, rec'd [received] from A. Takahashi summer of 1919." Address: Chemist in Charge, Food Control Lab., Bureau of Chemistry, USA, Washington, DC.

1984. *Christian Science Monitor.* 1919. The window of the world. Oct. 13. p. 3.

• ***Summary:*** The section titled "Climbing prices in Japan" states that "Japan finds herself in the same economic fix as other nations," with prices that continue to climb; "'the high cost of living threatens the livelihood of the majority of the Nation.'" Figures show that "compared with August, 1918, the cost of rice just before the rice riots last spring had risen by 9.1 per cent, sugar by 34.5 per cent, miso by 21.1 per cent, soy [sauce] by 11.7 per cent,..." Citizens of all nations of "the world sympathize with each other because they are all in the same boat."

About 30 newspapers have been suppressed by the government for "expressing incendiary thoughts on the subject of rice."

1985. *San Francisco Chronicle.* 1919. Japan-European trade. Oct. 14. p. 20.

• ***Summary:*** From Japan Chronicle: "It is reported in the vernacular press that a considerable demand for Japanese goods has begun to flow from Greece and Turkey of late, large exporters such as the Kuhara and the Suzuki firms exporting large quantities of rice (doubtless in view of the embargo upon export), [soy] beans, oils, matches and other various goods directly to Constantinople and Smyrna" [both now in Turkey; Smyrna was later (ca. 1930) renamed Izmir].

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1986. *Chemische Umschau auf dem Gebiete der Fette, Oele, Wachse und Harze* (*Germany*). 1919. Technologie: Fettgewinnung, Fettwirtschaft [Technology: Obtaining fats and oils, and their economics]. 26(14):178. Oct. 25. [Ger]
• ***Summary:*** Soybean oil: The soybean harvest in Manchuria was 1.75 million tonnes (metric tons) in 1916, 2.09 million tonnes in 1917, and 2.20 million tonnes in 1918. The price of the beans and the oil rises continuously. The leading Japanese firms in Kobe, including Mitsui, Suzuki, etc. have joined to form a Soybean-Syndicate.

1987. Satow, Sadakichi. 1919. Daizu tanpakushitsu no kenkyû oyobi sono kôgyô-teki ôyô ni tsuite [The proteins of sojabean and their industrial applications]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 22(260):851-77. Oct.; 22(261):953-68. Nov.; 22(262):1045-58. Dec. (Chem. Abst. 14:2682). [Jap]
• ***Summary:*** Soybean meal may be used to make a mixed phenol-formaldehyde-protein type of plastic. Continued from Jan. to Sept. 1920. 23(263):1-25. Jan.; 23(264):109-35. Feb.; 23(265):219-36. March; 23(266):321-42. April; 23(267):425-39. May; 23(268):527-43. June; 23(270):811-30. Aug.; 23(271):905-10. Sept. Address: Kogakushi; Tohoku Teikoku Daigaku, Rika Daigaku oyobi Dodaigaku Rinji Rikagaku Kunkyujo Daiichi-bu, Kôgaku-shi, Japan.

1988. Satow, Sadakichi. 1919. Process of manufacturing vegetable proteid substances. *U.S. Patent* 1,321,479. Nov. 11. 3 p. Application filed 25 Nov. 1916.
• ***Summary:*** This patent is quite similar to the author's U.S. patent 1,275,308, patented Aug. 13, 1918, but it is somewhat longer. "The object of the invention is to provide vegetable proteid substances of improved quality and a simple, efficient and economical process of manufacturing the same... for use in the manufacture of celluloid-like substances, linoleum-like substances, lacquer, varnish, artificial rubber, artificial leather and the like." The main raw material used is "the soja bean," which is placed in a revolving cylinder and the outer skin removed (to produce a light-color finished protein). It is crushed between rollers and the oil is removed by a solvent, such as benzin. When removing the benzine from the crushed mass, the use of moisture and high temperatures should be avoided; use either dry air of moderate temperature or a vacuum, keeping the mass below 40ºC and circulating the air through a condenser to remove the solvent. The resulting "meal," which should be light in color and have a pleasant odor, is placed in a suitable vessel and treated with an alkaline solution, such as a dilute solution of caustic or carbonated alkali or ammonia. The resulting liquid containing the proteids together with impurities may be further purified (by filtration or centrifuge, etc.) or subjected to direct precipitation using lactic or acetic acid. The precipitate is allowed to settle and the supernatant liquid is drawn off. The precipitate is then pressed into cakes; if desired the cakes may be dried and powdered. The result is "refined proteid," which may be employed as a food material or used in the manufacture of a great variety of non-food, industrial products. "It is easily rendered transparent, is adhesive, and can be easily molded into permanent shape." Address: Sendai, Japan.

1989. Satow, Sadakichi. 1919. Process of manufacturing vegetable proteid substances. *U.S. Patent* 1,321,480. Nov. 11. 3 p. Application filed 25 Nov. 1916.
• ***Summary:*** This patent, based on "the soja bean," is very similar to the author's U.S. Patent No. 1,321,479. Address: Sendai, Japan.

1990. Baker, E. Carleton. 1919. Marketing the Far Eastern bean crop. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 22(279):1170-73. Nov. 28.
• ***Summary:*** Contents: Introduction. Shipments of beans and bean oil. Marketing methods. Packing for export. Chinese weights employed in the bean trade. Method of buying bean oil from Chinese mills. American purchasing organization method.

By George H. Scidmore, Consul General, Yokohama: Statistics of bean crop in the Hokkaido. Exports of beans for two years [from Hokkaido]. Total exports of chief varieties [species] of 1918 crop. Speculation a strong factor in bean trade.

"Manchuria is essentially an agricultural country, about 70 per cent of the people being directly or indirectly dependent upon the land. Soy beans form the staple crop of Manchuria, and upon them the prosperity of the people depends."

"The Mukden consular district comprises the greater part of South Manchuria and produces an enormous quantity of soy beans. This crop is given preference to others because it yields the surest and greatest profit." I 1918, the following shipments were made from the principal bean markets along the South Manchuria Railway. A table (p. 1170) gives, for each station, the tons of soy beans and bean oil shipped: Liaoyang, Fushen, Mukden, Tiehling, Kaiyuan (178,050 #2 for beans), Changtu, Shuang Miaotzu, Szuping Kai, Kuochiatien, Kungchuling, Fanchiatun, Changchun (706,000 #1 for beans).

Hokkaido, Japan: "Practically all of the beans destined for export from Japan are grown in the Hokkaido. The total crop for 1919 it is estimated will amount to 318,000 long tons, of which about 277,000 long tons [87%] will be obtainable for export." The beans are sold in bags of 100 *kin* (132 pounds) each. Varieties of beans produced in Hokkaido: Shozu [azuki], Dainagon shozu, Other shozu. Daizu (soybeans; with number of bags produced in Hokkaido in 1916) 615,114, Akita daizu 754,996, Tsurunoko daizu

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52,970, Sodefuri daizu 77,673, Kuro daizu [black] 143,152, Other daizu (No data until 1919). Daifuku, Chufuku, etc.

Another table (p. 1172) shows which foreign countries imported the exportable surplus of the Hokkaido bean crop in 1916 and 1917. The biggest customer for soy beans by far, in both years, was the USA, followed by Canada. Canada's imports from Hokkaido, Japan, were as follows: In 1916: 131,421 *kin* (173,476 pounds weight or 77.44 long tons of 2,240 pounds per ton). In 1917: 256,042 *kin* (337,974 pounds weight or 150.88 long tons). Note: These two years were during World War I, when Japan and Canada were allies. Canada probably used these soybeans as a source of both oil (for soap) and meal (probably fed mostly to hogs to increase bacon production).

The USA also imported large amounts of small red [azuki] or white beans (*Phaseolus subtrilobata*). Address: Consul General, Mukden, China.

1991. Cromwell, Richard O. 1919. Fusarium blight of the soy bean and the relation of various factors to infection. *Nebraska Agricultural Experiment Station, Research Bulletin* No. 14. 43 p. Nov. Based on his PhD thesis, Univ. of Nebraska. [32 ref]

• ***Summary:*** The blight of soy beans is due to *Fusarium tracheiphilum.* The first report of this soy bean disease appeared in a publication by the author in 1917. "The disease is characterized by a chlorosis and shedding of the leaves or leaflets, followed by the death of the plants, and is herein called 'blight.' Soy bean blight has been observed in several localities within North Carolina on soils infested with cowpea wilt..." The physical structure of soils under natural conditions is not the limiting factor in the infection of the disease, but acidity under certain conditions has some influence. The nematode (*Heterodera radicicola*) also has some influence.

The section titled "Economic importance of the soy bean" (p. 6-7) states: "Its culture in England was begun in 1790. The plant was introduced into the United States from Japan in 1860. Since that time its cultivation as a soil-improving and a forage crop has been confined for the most part to the Southern States. North Carolina is probably foremost among these States in the production of soy beans. The yield in 1909 was only 13,313 bushels (29, p. 632), and in 1915 was estimated as approximately 1,000,000 bushels. Within the last three or four years, and especially since the war began, this crop has become increasingly important because of the large variety of products manufactured from the oil and meal and because of its introduction in the United States as a human food.

"The following is a list of the most important products obtained from soy beans or in which soy beans enter: Soy bean milk, vegetable cheese, meal or flour, macaroni preparation, soups, pork and beans, meat substitutes, toilet powder, fertilizer, and cattle feed from the meal, and high explosives, soaps, linoleum, rubber substitutes, margarine, Japanese sauce, paints, varnishes, water-proof cloth, salad oil, lubricants, and lard substitutes from the oil."

The section titled "Other soy bean diseases" (p. 7) mentions nine, including Heterodera, and "Chlorosis and crinkling (cause?)."

The section titled "History, occurrence and importance of the disease" (p. 8) states that in 1900 Orton conducted tests for disease caused by *Fusarium* on soy beans at Edisto Island and at Monetta, South Carolina (see Orton 1902, p. 16-19). Eight varieties of soy beans [planted on 29 May 1901 in Monetta] were tried on ten plats. "The varieties tested were Tokio, Buckshot, Yosho, Ito San, Manhattan, Guelph, and Amherst [Footnote: The names in use for these varieties in 1890 were respectively as follows: Best Green, Early Black, Yoshoka [sic, Yoshioka], Rokugatsu, Gosha, Black Round, Green Medium, and Bakaziro]. Orton reported that at Edisto Island the soy bean made a heavy growth, 3 or 4 feet high, and was free from the wilt disease. It may be said that a very considerable proportion of the several varieties of cowpeas grown in adjacent plots succumbed to wilt. The results of these tests accord with the observations of others who have had opportunity to observe these crops when they were grown on soil known to be infested with cowpeas wilt."

The section titled "Field experiments to determine the susceptibility of varieties" (p. 38-40) states that the following soybean varieties were planted in May 1916 in Red Springs, North Carolina: Black Eyebrow, Brown, Haberlandt, Mammoth Yellow (which suffers greatly from *Fusarium* blight), Medium Yellow, Pekin, Tar Heel Black. and Virginia. Black Eyebrow seems to show some evidence of resistance.

A larger number of varieties were tested in this field in 1917, including the following not tested in 1916: Arlington, Auburn, Austin, Barchet, Chiquita, Early Dwarf Green, Guelph, Jet, Manchu, Peking (spelled differently this time), Tokio, and Wilson Black. Again, Black Eyebrow showed resistance. "The Brown variety, altho as badly infected by the nematode and *Fusarium* as any of the other varieties, deserves special mention because of its tolerance to these parasites." Address: Extension Plant Pathologist, Iowa State College. Formerly Asst. Plant Pathologist, North Carolina Agric. Exp. Station.

1992. *Algemeen Landbouwweekblad voor Nederlandsch-Indie.* 1919. Verbeterde Soyaboonen [Improved soybeans]. No. 25. p. 871. Dec. 19. [1 ref. Dut]

• ***Summary:*** This one-sixth-page article, which is a summary of an article from *Oliëen en Vetten,* discusses improved soybean varieties from Manchuria and Japan.

1993. Maki, Moichiro. 1919. Taiwan mamehanmyo ni kansuru chiken [Information concerning the Formosan blister beetle]. *Taiwan Ringyo Shikenjo Hokoku* (*Report of the Forest Expt. Station, Taiwan*) 6:115-28 + plate. Dec. 20.

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[Jap]
• ***Summary:*** In Taiwan, the Formosan blister-beetle, *Epicauta hirticornis,* Haag (?), attacks cultivated plants such as the soy bean (*Glycine hispida* Max., p. 117) and kudzu (*Pueraria Thunbergiana* Benth., p. 118). A full-page illustration at the end of the article shows 13 views of the beetle, including various stages of growth and body parts. Address: Taiwan.

1994. *Times of India* (*The*) (*Bombay*). 1919. Import manifests [at Bombay harbour]. Dec. 20. p. 16.
• ***Summary:*** "S.S. Shingo Maru, from Osaka [Japan], Agents, N.Y. Kaisha.–350 bundles, 100 bales, 25 packages and 5 cases stram board,...–12 bundles, 19 cases, 8 casks and 27 packages Japanese provision; 25 casks and 1 tub Japanese soys, 20 casks Japanese miso; 10 cases wine;..."

Note: This is the earliest document seen (Aug. 2010) that uses the word "soys" in this way–perhaps to refer to types of Japanese soy sauce or fermented soy products.

1995. Frazer, Robert, Jr. 1919. Japan. Kobe. Exports to United States and possessions. Trade in vegetable oils. *Supplement to Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) No. 55b. Dec. 22. p. 15-18.
• ***Summary:*** The quantities and values of soya bean oil invoiced at the Kobe consulate for the United States for the past two years were as follows: In 1917: 64,932,091 lb worth $4,947,962; In 1918: 71,493,264 lb worth $7,399,096.

Trade in vegetable oils: The quantities and values of rapeseed (colza), coconut, and peanut (groundnut) oils shipped from the port of Kobe increased very greatly in 1918. "The amount of soya-bean oil exported, however, decreased slightly in amount although the value increased... Business in soya-bean oil in 1918 was somewhat limited by the difficulty of bringing the beans out of Manchuria, owing to the military use of the railways and the lack of cargo space [on ships] for Europe. Pacific coast prices, which are considerably below those obtained in Europe, ruled from $14 to $16 per 100 pounds from the beginning of 1918 until November, when they began to fall, reaching $10 early in 1919, but they recovered rapidly and in April and May stood at $15 to $15.50.

Practically all the groundnut (peanut) oil shipped at Kobe comes from North China. The following are the amounts of oils, in pounds, exported from Kobe during 1917 and 1918 (in parentheses): Rapeseed oil 17,585,000 (25,268,129); coconut oil 21,809,996 (36,510,831); soybean oil 5,221,931 (4,975,932). Note: The figures in the first and second tables are dramatically different; it is not known which is correct. Address: Consul, Kobe, Japan.

1996. Thom, Charles. 1919. [The Aspergilli]. Paper presented before the American Bacteriological Society, Dec. 1919. 9 p. Handwritten. Unpublished manuscript.
• ***Summary:*** The paper begins: "The specific name *Aspergillus oryzae* is generally recognized in Japan as belonging to such molds of the genus *Aspergillus* as are used for their enzymatic activity in the preparation of sake, shoyu or soy sauce, etc." "The rice overgrown with mold and therefore fermented thru the agency of the mold activity is called a koji or more specifically sake-koji." "The Takamine patents have incorporated in them this specific name, *A. oryzae.* Because of such current usage we wish to state emphatically before this group of scientific workers that *A. oryzae* Ahlburg having narrow and easily delineated boundaries can not be used to identify the entire group of yellow-green Aspergilli.

"Our studies have proved to us that the species name, *Aspergillus oryzae* as used in Japan applies (1) to such yellow-green Aspergilli as come with the description *A. oryzae* Ahlburg, (2) to such green, shorter-stalked forms as we are sure justly come under the name of *A. flavus* Link in the sense of Brefeld, (3) to innumerable yellow-green forms morphologically between these two descriptions, (4) to brown Aspergilli as *A. tamari* Kita having spores similar to *A. niger,* and spore-bearing structures similar to the yellow-green forms and even (5) to a certain brown Aspergillus (*A. oryzae* var. fulvus) which does not at present seem to us as belonging to the group at all." Address: USDA.

1997. Hanzawa, Jun. 1919-1921. Nattô. I-III gô [Natto. I, II, and III.]. Sapporo, Hokkaido, Japan: Sapporo Nattô Yôki Kairyôkai. [Jap]*
• ***Summary:*** In 1919 Dr. Jun Hanzawa, of Hokkaido University's Department of Agriculture, published the first of three key reports which helped to bring natto production in Japan out of the "Dark Ages." Serving simultaneously as a microbiologist, and extension worker, and a pilot plant operator, Dr. Hanzawa began by making a pure-culture bacterial inoculum for natto; this enabled commercial natto manufacturers, for the first time, to discontinue the use of rice straw as a source of inoculum.

Secondly, disliking the use of rice straw even as a wrapper, he developed a simple, low-cost method for packing, incubating, and selling natto wrapped in paper-thin sheets of pine wood (*kyogi*) or small boxes of pine veneer (*oribako*).

A third important improvement followed shortly; the development of a new incubation room design (*bunka muro*), which had an air vent on the ceiling and substantially decreased the natto failure rate. These three developments laid the basis for modern industrial, sanitary, scientific natto manufacture.

Commercial natto makers filled his classes and he worked as a consultant for them. Like Dr. Muramatsu before him, Dr. Hanzawa sold his "University Natto" from his

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research lab, promoting it as a rival to cheese. He was given the appellation of "the father of modern natto production."

In 1971 he was given the honor of addressing the emperor of Japan on the subject of natto. Address: PhD, Dep. of Agriculture, Hokkaido University.

1998. *Trans-Pacific* (*The*). 1919-1940. Serial/periodical. Tokyo, Japan. B.W. Fleisher. Vol. 1, No. 1. Sept. 1919–Vol. 28, No. 45 Nov. 7, 1940. Frequency: Monthly Sept. 1919–March 1923; Weekly 12 May 1923–7 Nov. 1940 (Published by The Japan Advertiser). 30-39 cm. [Eng]*
• ***Summary:*** This newspaper includes Chinese and Japanese sections. "A financial and economic magazine of international service." Merged with Japan Times Weekly (Tokyo, Japan, 1938) to form: Japan Times Weekly & Trans-Pacific.

1999. **Product Name:** [Sendai Miso].
Foreign Name: Sendai Miso.
Manufacturer's Name: Sendai Miso Shoyu K.K.
Manufacturer's Address: Furujiro 1-5-1, Sendai-shi 982, Japan.
Date of Introduction: 1919.
Ingredients: Water, rice, soybeans, salt.
How Stored: Shelf stable.
New Product–Documentation: The present owner is the ninth generation. Letter from Mitsuo Miyazawa. 1988. Jan. This company, Sendai Miso Shoyu K.K. was founded in 1919, as an amalgamation of many smaller miso and shoyu companies in the area. The first miso made was called Sendai Miso, and the first Shoyu was called Josen Shoyu. The Josen brand originated in 1919.

2000. **Product Name:** [Josen Shoyu].
Foreign Name: Jôsen Shôyu.
Manufacturer's Name: Sendai Miso Shoyu K.K.
Manufacturer's Address: Furujiro 1-5-1, Sendai-shi 982, Japan.
Date of Introduction: 1919.
Ingredients: Water, wheat, soybeans, salt.
New Product–Documentation: The present owner is the ninth generation. Letter from Mitsuo Miyazawa. 1988. Jan. This company, Sendai Miso Shoyu K.K. was founded in 1919, as an amalgamation of many smaller miso and shoyu companies in the area. The first miso made was called Sendai Miso, and the first Shoyu was called Josen Shoyu. The Josen brand originated in 1919.

2001. Calvino, Mario. 1919. La soya [The soybean]. *Informe de la Estacion Experimental Agronomica* (*Santiago de las Vegas, Cuba*). p. 98-103. For the years 1917-1918. [1 ref. Spa]
• ***Summary:*** This report, which describes the first soybean experiments in Cuba, begins by discussing the composition of the seed, and its various uses in China, Japan, and Europe (including for manufacture of soaps and as a drying oil in paints, and as foods such as whole dry soybeans, soy coffee, roasted soybeans [soynuts] {*"Se comen también tostados..."*}). In China they are sprouted in darkness and the white sprouts, up to 3 cm long, make an excellent green vegetable."

Note. This is the earliest Spanish-language document seen (Jan. 2013) that mentions soy sprouts, which it calls *sus gérmenes blancos.* From soybeans the Chinese also make a special soy cheese (*un queso especial*), a type of milk (*una especie de leche*), and other drinks. The author then states: "We thought it would be useful to test varieties of soya suited for hot/tropical countries, and we were able to obtain two types of Japanese soybeans, those that gave satisfactory results without having been inoculated.

"Since these soybean types did not find suitable bacteria for the purpose of being inoculated naturally in our terrain, I asked the Mulford house (*casa de Mulford*) for a special bacterial strain for soy (Soya) and proceeded with the artificial inoculation of the seed. The result has been magnificent, as one can see in the accompanying photographs.

"Now we have inoculated land, with which we have been able to ensure the most success for our crop. The harvest [yield] during this first year in Cuba was 2,000 kg/ha of seed. We have also found that it is best to cultivate soya in rows 60 cm apart, with the seeds planted 10 cm apart in each row. This is very dense planting, but it is better to thin the plants than to transplant in others to get the desired plant density. Transplanting is often unsuccessful, and if a crop is not planted evenly the first time, it is difficult to make it even later by transplanting.

"I have had a chemical analysis done of the soybean seeds from our crop. The report prepared by the Department of Chemistry shows that they contain 10.4% water, 41.95% protein, 17.5% oil, 2.45% carbohydrates, 2.5% fiber, and 5.2% ash. The analyst was F. Dominguez." An analysis is also given of assimilable or digestive elements in the soybean from a book by R. Gouin titled *Alimentation rationelle des animaux domestique* [*Rational feeding of domestic animals*]. Three full-page photos show soybean plants: (1) Root nodules on a soybean plant grown in Cuba without the use of inoculant (p. 99). (2) Two soybean plants grown at the agronomic station that contain many pods (p. 101). (3) Four soybean plants with roots; two were inoculated and bear nodules (p. 103).

Note 1. This is the earliest Spanish-language document seen that refers to soynuts. Note 2. This experiment station is under the Secretary of Agriculture, Commerce and Labor (*Secretaria de Agricultura, Comercio y Trabajo*). This 515-page report is published in Havana by Alvarez López y Cie. Address: Director, Estacion Experimental Agronomica, Doctor en Ciencias Agricolas de la Universidad de Pisa

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[Italy].

2002. *Kangyo Mohanjo Kenkyu Hokoku* (*Bulletin/Research Report of the Industry Model Station*). 1919. Gaichu ni kansuru chôsa [Researches on injurious insects]. No. 2. 82 p. + plates. (Suwon, Korea). [Jap]*
• ***Summary:*** An English-language summary states that this report describes the life-histories of, and preventive measures for dealing with various insects in Korea. "*Serica* sp. occurs once a year, the adult beetles occurring from April to June. It hibernates in the larval stage or occasionally as an imago. It attacks barley, tobacco, cotton, hemp, soja bean, cabbage, peach and mulberry."

2003. Ministry of Agriculture and Commerce, Farm Bureau (Nôshômushô Nômukyoku). 1919. Daizu sonota no mamerui ni kansuru chôsa [Survey of soybeans and other beans]. Tokyo: Nôshomu-sho, Nômu-kyoku. 3 + 16 + 305 p. Illust. Color maps. 27 cm. [Jap]
• ***Summary:*** This survey by Japan's Bureau of Agriculture, in the Department of Agriculture, includes a statistics on soybean imports and exports (trade). Address: Japan.

2004. Mitchell, Wesley C.; Goldsmith, Margaret I.; Middaugh, Florence K. 1919. History of prices during the war: International price comparisons. *War Industries Board, W.I.B. Price Bulletin* (*USA*) No. 2. xii + 395 p. See p. xii, 108, 379-81.
• ***Summary:*** This bulletin, "prepared in cooperation by the Department of Commerce and the War Industries Board, forms part of the History of Prices During the War [World War I, 1914-1918], planned by the latter agency" (p. 1).

A table titled "Commodities quoted for which no United States equivalents were found" (p. xii) includes the following from Japan: (1) Beans, Soja, Hokkaido, medium (p. 376). (2) Miso (sauce (soy bean, rice, water)), red, common (p. 378). (3) Soy (condiment, bean juice), Noda (p. 380).

A table titled "Wholesale prices in Japan, by months, quarters, and years, 1913-1918" in Yokohama, includes: (1) Beans, soja, Hokkaido, medium (p. 376-77, in yen per koku): Base price: 10.85. Increased from 10.5 in Jan. 1913 to 18.70 in Oct. 1918.

(2) Miso, red, common (sauce) (p. 378-79, in yen per kwan): Base price: 0l.34. Increased from 0.38 in Jan. 1913 to 0.60 in Nov. 1918.

(3) Soy (condiment, bean juice), Noda (p. 380-81, in yen per koku): Base price: 18.25. Increased from 17.00 in Jan. 1913 to 44.00 in Oct. 1918.

The source of all these statistics from Japan was *Chamber of Commerce Journal, Yokohama* (p. 385, 390, 393). Address: War Industries Board.

2005. Rouest, Leon. 1919. Contribution à l'Étude sur le soja [Contribution to the study of the soybean]. *Genie Rural* (*Le*) 11(99-100):23-26. (New Series Nos. 39-40). Continued: See Rouest 1920. [Fre]
• ***Summary:*** Gives a brief overview of the history of the soybean in Europe and France, starting at the top left of page 24: It was introduced into Europe, where it has been cultivated at the Museum of Natural History since 1779.

In 1855 M. de Montigny sent, from China, several soybean varieties to the National Society for Acclimatization (France), which used them for trials in various localities in France.

At the Vienna World Exposition of 1873 there were soybeans from Japan, China, and Mongolia.

In 1874 soybean cultivation was undertaken at Etampes.

In 1875, and during the following years, experimented with its culture in Austria.

In 1888 it was introduced into the United States and adopted as a forage crop in the southern states. From 1880 to 1896 it was discussed in many agricultural bulletins in the USA. The soybean was also studied in Russia.

In 1905 Mr. Li Yu-ying foresaw the use of soya in France as a commercial food. He established a laboratory and a factory named *La Caséo-sojaine* was established at Colombes (Seine).

Also discusses: Dr. Bloch, the Soyanna [sic, Soyama] Werke near Bockenheim, Messrs. Paillieux, Sagot, Raoul, and Jumelle, and the various soyfoods from China and Japan that they describe (Miso, shoyu {*Shoyua*}, tofu {*Tofou*}, dried frozen tofu {*Kouri Tofou*}, yuba {*Uba*}), and the potential threat of soya to the French cheese industry. "Finally in 1910-11 numerous soy products were presented at the expositions in Brussels [Belgium], Turin [France], and Dresden [Germany]."

Describes work on the *Ferme Expérimentale de Néoculture du Sud-Est,* at Villardonnel, Aude. Mr. Semichon, Director of the wine station at Aude, sent this experimental farm some soybean seeds which he received from the USDA accompanied by a bulletin written by William Morse (probably "The soy bean: Its culture and uses," 1918). Rouest translates the Bulletin into French (p. 25-26). The most important varieties mentioned are: Mammoth, Hollybrook, Ito San, Guelph, Haberlandt, Medium Yellow, Wilson, Peking, Tokio, Manchu, Black Eyebrow, Barchet.

Rouest was born on 11 Nov. 1872 in Paris; he died on 27 Feb. 1938 in Chartres, France. Illustrations (line drawings, both non-original) show: (1) Soja hispida plant, with close-up of a cluster of pods. (2) Soja Hato [Hahto] soybean plant. Address: Director, *Ferme Expérimentale de Néoculture du Sud-Est,* at Villardonnel (Aude), France.

2006. Sanborn Map Company. 1919. Sanborn fire insurance map of Petaluma, California. New York City, New York. See p. 22.
• ***Summary:*** At 28 Weller St., near the corner of Wellar and Adams in Petaluma, is a fairly large rectangular

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building, inside the outline of which is written: "Soy Bean Co., Soy Bean Meal Mill & W. Hu. Power: Elec. (Runs Occasionally)."

Note 1. A map of Petaluma shows that Weller St. is near the center of town and on a railroad siding. It is located next to and runs parallel to the Petaluma River which flows into San Pablo Bay–part of San Francisco Bay. As of April 2009, the building is no longer there.

Note 2. This is probably the *Daizu Seisan Gaisha* (Soybean Food Products Co.), which has a full-page ad that appeared on 1 Jan. 1919 in the *Japanese-American Directory* (*Nichibei Jushoroku*), published in San Francisco on page 40 near front. One of the items that they make is soybean meal, listed in the ad as *Mamekasu* [Soybean presscake, probably left over from making soybean oil]. Petaluma had a large poultry industry at the time, that supplied San Francisco and the Bay Area with chickens and eggs. The soy bean meal was probably used as the protein source in chicken feeds.

2007. Sawada, K. 1919. Taiwan-san kinrui chôsa hôkoku o tôsai suru [Survey and report on the fungi in Formosa. Part I.]. *Taiwan Noji Shikenjo, Tokubetsu Hokoku* (*Government of Formosa, Agricultural Experiment Station, Special Bulletin*) No. 19. 695 p. See p. 225, 406, 481. [Jap]
• ***Summary:*** Including descriptions of the following fungi on soybean: *Hypochnus centrifugus, H. sasakii, Sclerotinia libertiana* (=Whetzelina sclerotiorum). Address: Taiwan Sôtoku-fu Nôji Shikenjô.

2008. Smith, Joseph Russell. 1919. The world's food resources. New York, NY: Henry Holt and Company. 634 p. See pages 326-27, 360-65. [1 ref]
• ***Summary:*** Contains a brief overview of the soybean, soybean production, and soybeans as a food product, with several long excerpts from Dr. J.H. Kellogg, and the *USDA Year Book of Agriculture* (about food uses, including shoyu or soy sauce).

A photo shows "Soy bean curds and cheeses in a Japanese factory," in large earthenware containers (p. 362). Note: This photo of "curds and cheeses," taken by Frank N. Meyer, shows the production of fermented tofu, probably in a Chinese factory (See: {1} Morse 1918. "The Soy-bean Industry in the United States." Plate IV, fig. 2; {2} Piper & Morse. 1923. *The Soybean.* p. 242).

Concerning use of food resources, in the USA and Canada, the chief goal of agriculture is not to feed humans but to feed animals. This was true even in the food crisis of 1918 [at the end of World War I]. About 5,191 million bushels of grain are now grown in the USA; in descending order of importance (in million bushels) they are corn (2,863), oats (1,422), wheat (643), barley (195), rye (54), and buckwheat (14). Of this total of 5,191 million, the American people eat less than 550 million (14.1%). Adding the 340 million bu exported, the total amount used for human food was 900 million bu (17.3%). "The rest, 4,300 million, went to our four-footed brethren, who outnumber us and whose food requirements, because of their greater size, are several times our own.

"In addition to the grain, they get all of the 85,360,000 tons of hay grown on 54,618,500 acres. (More than ten per cent of the half billion acres under cultivation in the United States). They also roam over millions of acres eating all the grass. It is therefore plain that more than four-fifths [80%] of the produce of American agriculture, even in 1918 [a war year], went to feed beasts." Address: Prof. of Geography, Columbia Univ., New York.

2009. Yoshimura, Kiyohisa. 1919. Shokuyô shokubutsu no kenkyû. Dai ju-san (Glycine Lispida [sic], Max.) [Chemical studies of food plants. 13. Soy beans (Glycine hispida, Max.)]. *Kagoshima Kotonorin Gakko Gakujutsu Hokoku* (*Bulletin of the College of Agriculture, Kagoshima*) 3:4-7. [Jap]

2010. Noda Shoyu. K.K. 1919? Noda Shôyu Jôzô Kumiai-shi [History of the Noda Shoyu Brewers Association]. Noda, Japan. 350 p. Undated. Handwritten unpublished manuscript. A translation of pages 5-15, Rules and Regulations of the Noda Shoyu Brewers' Association is given in W.M. Fruin, 1983, p. 309-312. [Jap]*
• ***Summary:*** In the 1870s a group of soy sauce manufacturers in Noda formed a cartel named Noda Shoyu Brewers' Association. In 1917 some of them formed a new company Noda Shoyu K.K., which later became Kikkoman. In about 1919 it was decided to write a history of the former association. This key early document is widely cited by Mark Fruin in his 1983 history of Kikkoman, as follows: Anonymous, Noda Shoyu Kumiaishi (n.p., 1919?).

Talk with Mark Fruin. 1991. Oct. 22. The chapters on the clan and carter business in his book on Kikkoman are largely from this rare, old, valuable manuscript. Copies of this manuscript exist at the Kikkoman archives at Noda, and with Mark Fruin in Palo Alto, California. Address: Noda, Japan.

2011. Sato, H. 1920. Jôzô enkaku-shi [Chronology of brewing in Japan]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 209. p. 61-107. Jan. 5; No. 210. p. 119-42. Feb. 2; No. 211. p. 189-208. March 5; No. 214. p. 469-82. June 5. [Jap]
Address: Nôgaku-shi, Japan.

2012. *Market Reporter* (*The*) (*USDA*). 1920. Price of soy beans advances in Japan. 1(2):32. Jan. 10.
• ***Summary:*** The droughts during the summer damaged soy-bean crops in Manchuria and Chosen [Korea]. "Spot cargo is still quoted at 9.4 to 9.5 yen per picul of 133.33 pounds (about $0.036 per pound). Forward quota range up to 9.64

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yen per picul ($0.037 per pound).

"Old crops are much preferred by buyers because they are of a better quality, and, although they are quoted at higher figures, their sale is brisker than that of the new crop. The soy-bean oil trade is dull and inactive, as European buyers do not buy and only consignments to the United States are now being made from Dairen." Address: Bureau of Markets, Washington, DC.

2013. Wile, Frederic W. 1920. Japan takes lead in import trade: Unnoticed, yellow nation bounded into first place among nations from which the United States imports goods. *Atlanta Constitution* (*Georgia*). Jan. 11. p. 11A.
• ***Summary:*** The value of imports from Japan ("Nippon") have risen from $107.4 million in 1914, to $284.9 million in 1918, to a record $304.0 million in 1919.

In 1914, the U.S. import figures from the three leading European countries were: Great Britain $294 million. France $141 million. Germany $20 million.

"Next to raw silks the principal American purchases from Japan in 1919 consisted of soy bean oils, $8,994,776; tea, $13,420,067, and silk fabrics, $10,959,396." In recent years, American exporters have also been increasing their sales in Japan.

Note: Similar information, under the title "Importation of Japanese goods" appeared in the *Christian Science Monitor* on Feb. 24 (p. 9).

2014. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*). 1920. Review of Far Eastern commercial press. 23(13):312. Jan. 16.
• ***Summary:*** "Soya bean market in Japan becomes more steady: The market for soya beans which has been subject to violent fluctuations in the past months became more quiet during the second week of December, says the *Japan Advertiser* [an English-language newspaper published in Japan] of December 13."

2015. Itano, Arao. 1920. Re: Comments on the first batch of shoyu made by Margaret Church. Letters to Miss M.B. Church at Bureau of Chemistry, Washington, DC, Jan. 24 and Feb. 4. 1 p. Typed, with signature. [Eng]
• ***Summary:*** "I received your letter of Jan. 16th and also a bottle of 'Shoyu.'" He and his wife "both agree in stating that your Shoyu is very good for the first attempt... (1) It tastes like the Shoyu which is often found in the country [countryside] in Japan. (2) It lacks the ester which gives the fine flavor. (3) The flavor of Moromi is prominent. This and (2) may be due to the young age... I should be very much obliged to you if you would kindly send me your culture of *Aspergillus oryzae* at your convenience."

Miss Church sends him the desired culture and asks several questions concerning his opinions of her shoyu. He answers (Feb. 4) that she has generally interpreted his comments in his first letter correctly. Her Moromi had an immature flavor. "The common rule that the quality of fermented products improves with age, holds true with Shoyu." Address: Dep. of Microbiology, Massachusetts Agricultural College, Amherst, MA.

2016. Parry, Charles A. 1920. Travel sketches, LXXXIII–Bean that made Manchuria famous: A factory at Shimizu–The bean of many qualities. *Japan Advertiser* (*Tokyo*). Jan. 25. p. 7. [Eng]
• ***Summary:*** Contents: Introduction. Sweet and nasty. "Not now." The tea port. History of a bean. Substitutes. Big business. Japanese place names. On 26 Nov. 1919 the author traveled by train from Tokyo to the port city of Shimizu, on Suruga Bay, in Shizuoka prefecture (about 90 miles southwest of Tokyo). "Shimizu is one of the 36 treaty ports, and it was opened along with now fewer than 26 others, in 1899. The name means 'clear water'... My chief object in coming to Shimizu is to visit the Suzuki Company's Bean Oil Factory, for which I have obtained permission by courtesy of the Japan Tourist Bureau. This consists of several large buildings, erected three years ago, including a central office and two mills which being built in a castellated Gothic style, make a picturesque adjunct to the scenery as they rise by the calm waters of Shimizu Bay. The mills deal at present with two only of the many products of the wonderful manchurian [sic] or soy bean, called in Japanese daizu (glycerine [sic, Glycine] hispida) the crushed bean and the oil." The two mills are capable of treating 300 tons of beans per day. The process is secret. "I am informed that factories for the extraction of this oil exist only in Japan and Manchuria; but the Suzuki Co. has a branch office in New York, and the business is rapidly extending."

"The oil is used for frying, for lubricating, for water-proofing clothes, for medicine, as a butter substitute, and in the manufacture of soap, candles, guncotton, and artificial rubber; though it can hardly yet be said to be on the market." For culinary purposes it is not as good as the ordinarily used goma (sesame) oil, being much lighter and requiring the use of a deep saucepan. Yet it costs only about 62% as much as sesame oil; the latter costs ¥1.60 per sho (1.58 quarts).

"At present its chief use is for making soap, for which it is taken at a less refined stage, of a dark brown color while the finished product is light yellow. The oil is at present little used in Japan because little known; its retail sale seems to be limited to the neighborhood of the factories. Of these there are three, the two others being at Yokohama and Kobe, both established only last year.

"One large shed is devoted to storing the crushed beans (*kasu*) after the oil has been extracted, large piles of which lie about... The chief use of this at present is for cattle-food; but it is now to be manufactured into flour, useful for mixing in various proportions with wheat flour."

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"The daizu [soy] bean has long been known in Japanese cookery in the form of 'kiriako' [sic, kinako] ('yellow powder') to make which the entire bean is slightly roasted and pulverized; then used for mixing with flour to make light cakes, for giving savor to boiled rice, etc. The prices are not yet determined, the cost of manufacture not being known; but it will be cheaper than flour, as well as more nutritious, and will help to relieve the scarcity of rice.

"Substitutes: Other products of the bean are: tofu, the white bean-curd, used universally in Japan and, until recently, almost absurdly cheap; also used in the forms of age-dofu (fried in cottonseed oil), yake-dofu (baked) [yaki-dofu (grilled)], and the curious gori-dofu [kori-dofu], 'frozen tofu,' also called koya-dofu (from koya-san), tofu sprinkled with hot water, frozen, dried, and cut into small cakes; miso, the cheap condiment made of daizu beans fermented with yeast and barley; and soy, Japan's only sauce. A later addition to the list has been to-nyu, or tofu-milk [sic, "bean milk], a very passable substitute for cow's milk at half the price; and still more recently tofu-butter. The whole bean, parched and boiled, is an excellent coffee-substitute, yielding when parched just to the right degree, much of the aroma of that fascinating drink without any of its deleterious effects."

Note 1. This is the earliest English-language document seen (Aug. 2013) that uses the word "to-nyu" or the term "tofu-milk" to refer to soymilk; the Japanese word is *tônyû*.

Note 2. This is the earliest English-language document seen (April 2013) that uses the term "gori-dofu" or the term "koya-dofu" to refer to dried-frozen tofu.

"The present demand for been cake in Japan is met by the three factories of the Suzuki Co. that at Shimizu supplying central Japan, Yokohama Northern and Kobe Southern.

"There are several varieties of the bean known as white, yellow green and black, the first two being the most used. The plant is as yet little grown in Korea and Japan.

"Big Business: The Shimizu factory, which is the largest of the three, employs about 300 workpeople on day and night shifts. This new bean-industry is, however, only the latest among many activities of the Suzuki Co. which ranks among the great industrial concerns of the world, the third largest in Japan, standing next to the Mitsui and the Mitsubishi, and employing a total of over 3,000 clerks and 100,000 workpeople. It deals also in rice, wheat flour, sugar, sake-brewing, coal, timber, metals, camphor, wool, cloth and manure besides numerous small lines. It has three dockyards, at Harima, Toba and another; a coal-mine in Kyushu; copper mines at Hibi (Okayamaken) Hiroshima (Yamaguchiken) and Dairi (Fukuoka ken) also mines of zinc and iron; while its steel works (*seikojo*) at Kobe are the largest in Japan."

"Shimizu is well situated for growth being midway between the ports of Yokohama and Yokkaichi and serving a prosperous hinterland. Its chief exports are tea and oranges and its imports coal and timber." Address: Japan.

2017. *Times of India* (*The*) (*Bombay*). 1920. Import manifests [at Bombay harbour]. Jan. 26. p. 7.

• ***Summary:*** "S.S. Totomi Maru, from Yokkaichi [in today's Mie Prefecture, central Japan], via Colombo [Ceylon], Agents: N.Y. Kaisha.–2,524 cases safety matches,... 7 cases pencil, 10 casks and 1 case Japanese soy [sauce], 21 cases perfumery,..."

2018. Greenbie, Sydney. 1920. Saké and song. *Dial* (*The*) 68:33-46. Jan. See p. 40.

• ***Summary:*** The writer, who lives in a house overlooking the city of Kobe, Japan, goes with his Japanese friend (Mr. Suzuki) to a restaurant, where geisha girls typically serve and entertain the male customers, who pay them. Mr. Suzuki's wife did not approve of her husband's going, but he prevailed. "The geisha takes the place of the club and no woman will dare deny that to her husband. The geisha is not his companion–she is merely a specialist in the entertainment of men. The wife entertains him at home, the geisha, abroad, and if he wants a concubine or two, there is no law prohibiting it. The present Emperor, himself the son by a side wife, the lady Yanagiwara, is the first to have adopted monogamy, but his father had five wives."

When they arrived at the chosen place, Mr. Suzuki selected several girls he knew and liked from the roughly 800 who were listed. "When the girls my friend favored arrived, we were well into the feast. The normal length of a Japanese meal is about three and a half hours. I sat with my friends watching the meat and the greens sizzling on the brazier, eating little pieces at set intervals. It was tantalizing. I could have devoured the whole of it post-haste, but had to wait each time for someone to take a chopstickful first. It was a delicious torture, for each mouthful was worth the waiting for. Sukiyaki, it is called, which means 'enjoyable fry' [sic].

"Six geisha came in and sat. Two of them talked, and my stammering Japanese formed part, if not all, of the amusement; but there was no dancing, playing, or singing. What they were being paid for under these circumstances I could not tell. It only indicated the real evil of the geisha habit. They were neither friends nor entertainers, just simply parasites, or, let us give them some place in life, wall flowers." Address: Kobe, Japan.

2019. Satô, Sadakichi. 1920. Daizu tanpakushitsu no kenkyû oyobi sono kôgyôteki ôyô ni tsuite. IV. [Studies on soybean proteins and their industrial applications. IV]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 23(263):1-25. Jan. (Chem. Abst. 14:3299). [Jap]

• ***Summary:*** Continued from Oct. to Dec. 1919. Soybean meal may be used to make a mixed phenol-formaldehyde-protein type of plastic.

The English-language abstract of this article is found in the Sept. 1920 issue of this magazine. Address: Kôgakushi,

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Japan.

2020. Satô, Sadakichi. 1920. Daizu tanpakushitsu no kenkyû oyobi sono kôgyôteki ôyô ni tsuite. V. [Studies on soybean proteins and their industrial applications. V]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 23(264):109-34. Feb. [Jap]
Address: Kôgakushi, Japan.

2021. *SoyaScan Notes.* 1920. Companies importing Japanese beans to the United States as seen in the pages of *The Bean-Bag* (St. Louis, Missouri) (Overview). Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** By Feb. 1920 many companies were advertising that they imported soy beans or "Oriental beans" to the United States. The main port of entry seems to have been Seattle, Washington. These included: Rogers Brown & Co. (Seattle, Washington; Oct. 1919, p. 45).

Nozaki Bros. (227 Broadway, New York, N.Y. "Importers of Oriental beans and peas;" Feb. 1920, p. 57).

Suzuki & Co.: (400 Colman Building, Seattle, Washington. "General importers and exporters, Rice, peas, beans,...;" Feb. 1920, p. 58). A.U. Pinkham & Co., Inc. (Colman Building, Seattle; "Oriental beans"; Feb. 1920. p. 58).

2022. Satow, Sadakichi. 1920. Sauce and process of making the same [from soya bean]. *U.S. Patent* 1,332,448. March 2. 2 p. Application filed 5 May 1917.
• ***Summary:*** A mixture of soya bean, roasted grain, water, and koji is "fermented," alcoholic or other harmful fermentations being prevented, e.g. by addition of common salt, and the filtered liquid is evaporated to dryness *in vacuo.*
Address: Sendai, Japan.

2023. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*). 1920. Review of Far Eastern commercial press. 23(59):1406-07. March 11.
• ***Summary:*** "Compiled from clippings made by the Far Eastern Div., Bureau of Foreign and Domestic Commerce."

According to the periodical *Trans-Pacific,* the general opinion prevails that the soya bean crop "was better than normal in South Manchuria."

The section titled "Japanese soya bean market" states that the market is becoming more steady–according to the *Japan Advertiser* (31 Jan. 1920). The bean-cake market showed signs of slackness last week. The "bean-oil market showed signs of picking up."

2024. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*). 1920. Far Eastern trade notes. 23(66):1572-73. March 19.
• ***Summary:*** "Vegetable-oil industry at Harbin, China: There are 25 vegetable oil mills in the vicinity of Harbin which consume annually about 250,000 long tons of the estimated 800,000 tons of soya beans produced in the Harbin consular district and make 20,000 long tons of oil. The rest of the bean output is exported through the firms regularly engaged in export trade. There are no refineries in the district, but it is possible that one may be erected in the near future. The production of hemp seed approximates 20,000 long tons annually, very little of which is crushed in the local mills."

Peking University is planning to establish a well-equipped agricultural school and experiment station.

2025. Oriental Show-You Co. 1920. Display ad: Learn to cook Chop suey. *Chicago Daily Tribune.* March 28. p. C13.
• ***Summary:*** This large square ad shows the company name written in front of a full moon and dark sky, with pine branches to the right. At the lower right is an illustration of a large bottle of Oriental Show-You. Across the bottom of the ad: "Note–Oriental Show-You is the genuine imported Japanese sauce. Observe the full name and spelling to avoid imitations."

2026. Adolph, W.H.; Kiang, P.C. 1920. The nutritive value of soy bean products. *National Medical J. of China* (*Shanghai*) 6(1):40-49. March. [15 ref. Eng]
• ***Summary:*** "One of the problems of science has been the search for a perfect food. Though eggs and milk are presently considered to be "perfect foods," the authors believe that the soy bean should also be considered. "The recent world shortage of food, and the demand for foods which are high in nutritive value has turned the attention of dietitians to the possibilities of the soy bean." It is a distinctly well-balanced food.

"During the last few years, the soy bean has found application in the West in the infant dietary, frequently with an admixture of some cereal for additional carbohydrate (Ruhräh 1915), and in summer diarrhea (Sinclair 1916). It is one of the recognized diabetic foods. One of the most satisfactory forms of artificial milk is made from soy beans. The bread used by the French army in the recent war was made essentially from soy bean flour."

"Soy bean products in China: History–The use of the soy bean in China dates back to the beginning of China's agricultural age under the emperor Shen Nung. It is mentioned in the *Ben Tsao Gang Mu* [*Bencao gangmu*] written by Shen Nung in the year 2838 B.C."

Note 1. This is the second earliest English-language seen (Aug. 2002) that treats Shen Nung as a real, historical figure, or that says the first written record of the soybean appears in a book written by him. The *Bencao Gangmu* (The great pharmacopoeia) was actually written by Li Shizhen in +1596.

"Tradition says that the manufacture of soy bean curd

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[tofu] originated in China in 164 B.C. during the reign of Han Wen Di, by a man named Liu An, the duke of Hwai Nan [Huai Nan]. The colloquial name for soy bean curd is *Do Fu,* and the classical name, *Li Chi,* probably meaning 'the morning prayer.' Its exact derivation, however, could not be traced. It is interesting to note that in China, at the present day the bean curd is made in the early hours of morning, and sold at daybreak."

"Liu An was a great friend of the Buddhist monks, and it is quite probable that he invented this bean curd in order to provide a change or a delicacy to break the monotony of the monastic ration. As a matter of fact, the bean curd is a real delicacy if carefully made and well cooked. Chinese who are connoisseurs on the subject assert that when so prepared it has the taste of pig's brain. The foreigners eating Chinese food often eat carefully prepared bean curd thinking it pork. With sugar it produces a dish like custard. Prepared with salt it resembles scrambled eggs."

"Application–The Chinese people make practically no use of dairy products, and the bulk of the people consume only very meager amounts of meat. Yet in spite of this they have lived for centuries on what appears to be a remarkably well-balanced diet by use of the soy bean."

"A number of interesting examples are found in China of the use of bean products as an agent for growth. One of us has observed in Anking that dealers in birds employ bean curd as the sole food for infant birds. The birds are robbed away from their nests immediately after they are hatched, and are then fed bean curd to tide over the infantile period till able to feed themselves. Possibly more interesting is the case of the true Buddhist monk who from birth is consecrated to the priesthood, and is carried through the period of childhood growth on a rather heavy diet of bean curd. The apparently normal growth of these monks would seem to be paralleled by the experiments of Osborne and Mendel (1917) on the promotion of growth in rats by both the water-soluble and fat-soluble vitamines contained in the soy bean. The country monastic diet is noted for its high content of soy bean products."

"The Chinese coolie... in spite of the scanty intake of meat and the constant exposure to overwhelming sources of infection, still does possess a wonderful resistance. The diet of the average coolie contains a surprisingly large amount of beans and bean products."

"A common saying in some parts of China terms *bean milk the poor man's milk,* and *bean curd the poor man's meat...* It is commonly stated that a meat diet is characteristic of the most aggressive peoples of the world. Has the protein of the soy bean replaced meat in the Orient?

"Bean milk is another bean product which is in composition not far different from cow's milk. In many places in China bean milk is a food drink. It is usually drunk sweetened with sugar. Western countries employ a number of patented methods for removing the 'beany taste' objectionable from the point of view of the Western consumer."

"It would be almost impossible to make a complete list of all the products manufactured from the soy bean in China. The best known and most important are the bean milk, bean curd, bean sauce (soy), and bean oil. In addition to this are the different forms of bean curd preparations, bean sprouts, and a large variety of sauces and condiments into which the soy bean enters as one of the constituents."

Details are then given on bean milk and bean curd. In making bean milk, the "bean residue [okara] which does not pass through the sieve is used as feed for hogs. On coagulation of this solution the soy bean curd (tofu), often called Chinese cheese, separates. As far as is known to the authors there are at present four agents employed in China to effect this coagulation. These are: (1) *lu,* the residue from the crystallization of salt, (2) gypsum; (3) *swan giang,* the soured bean milk whey remaining from the previous coagulation of bean curd; and (4) vinegar."

Table 1 gives the average chemical composition of the yellow soybean [*huangdou*] common throughout Shantung. Table 2 gives the chemical composition of two samples of soy bean curd purchased on the streets of Tsinan and made with *lu* [nigari] as a coagulating agent: The composition of the first sample is: protein 10.22%, fat 3.66%, water 80.90%, ash 1.09%, nitrogen-free extract 4.13%. This composition is compared with that of cottage cheese. Table 3 compares analyses of the ash of soy bean curd with that of soy bean. When it is made by coagulating soybean milk with bittern (from sea salt) the curd is rich in all the inorganic essentials (especially calcium, sodium, and chlorine) missing from the soy bean itself. The authors suggest that some of the racial characteristics of the Japanese people can be traced to their dependence largely on vegetable protein.

Table 4 gives analyses of 2 samples each of [soy] bean milk, cow's milk, bean milk whey, and bean residue [okara]. The chemical composition of the first sample of bean milk is: protein 4.22%, fat 1.87%, ash 0.40%.

Note 2. This is the second earliest document seen (Jan. 2002) that mentions Liu An of Huai Nan in connection with tofu.

Note 3. This is the earliest English-language document seen (April 2013) which states that *Li Chi* was an early or classical name of tofu.

\ Note 4. This is the earliest English-language document seen (April 2013) that uses the term "poor man's meat" to refer to tofu. Address: Lab. of Chemistry, Shantung Christian Univ., Tsinan, China.

2027. Kinoshita, Asakichi. 1920. Shôyu kabi-dome ni kansuru shiken [Studies on the prevention of mold in shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 81. p 797-827. March. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Kenshuin.

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2028. Satô, Sadakichi. 1920. Daizu tanpakushitsu no kenkyû oyobi sono kôgyôteki ôyô ni tsuite. VI. [Studies on soybean proteins and their industrial applications. VI]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 23(265):219-36. March. [Jap]
Address: Kôgakushi, Japan.

2029. *Los Angeles Times.* 1920. Be on the lookout for "coffee" beans. April 4. p. IX6.
• ***Summary:*** "The Department of Agriculture warns buyers against two so-called coffee beans–the 'South American coffee bean,' the other as 'new coffee bean,' which are being exploited by extravagant statements in advertisements. The former is the jack bean, the latter the soy bean. Both are well-known plants and there is no justification, says the department, either for extravagant advertising under new names nor for exorbitant prices for the seed.

"The use of the seeds of various legumes and cereals as coffee substitutes is not new. Legumes which have been used or exploited as coffee beans include the soy bean, cowpea, chick pea, horse bean and jack bean... The seeds of a few of these legumes, especially the soy bean, possess some merit as coffee substitutes, but the desirability of any is a matter of individual taste. This use has led to extensive advertising of such seed... and even to their large use as adulterants of the true coffee.

"The soy bean, almost since its introduction into America, has been exploited at different times as 'coffee berry,' 'coffee bean,' 'new coffee plant,' 'domestic coffee berry,' and now 'new domestic coffee berry.' For many years the soy bean has been used to a slight extent in Europe, especially Switzerland, as a substitute for coffee.

"In Japan and Southern Russia the soy bean is prepared as a coffee substitute and placed on the market. This product is ground very fine and has much the same appearance as coffee.

"For those who desire a substitute for coffee as a drink, the dry beans of any variety of soy bean, when properly roasted and prepared, may be used. Prepared as coffee, the soy bean gives a liquid which in color and aroma is similar to coffee, but has no stimulating effect. Many people, fond of cereal drinks, think the soy bean coffee fully equal to the cereal coffee substitutes."

Note: This is the earliest document seen (Jan. 2011) that uses the term "new coffee plant" or "new domestic coffee berry" to refer to the soy bean in connection with soy coffee.

2030. Church, Margaret B. 1920. Re: Request for information on and samples of fermented foods in China. Summary of research on these foods in the USA. Letter to Dr. Y.S. Djang, Chichi Industrial Inst., Tientsin, China, April 6. 2 p. Typed, without signature (carbon copy).
• ***Summary:*** Church was given Dr. Djang's name by Carl Fellers, who is presently a member of her Bureau and stationed in San Francisco, California. "We are studying in this office food products produced from soy beans by controlled fermentation processes, and also red rice (ang-kak). As it happens we have studied the Japanese process of making soy sauce most specifically." Church requests samples of Chinese soy sauce not found on the U.S. market, "or sauce flavored with decoctions of such things as Perilla or Ceirela... We are interested in knowing to what extent sweetening such as molasses, caramel or sugar is used in Chinese soy sauce. Is the practice of sweetening soy sauce local, or confined to broad areas as southern China and not Central China?"

Note: This is the earliest document seen (April 2012) that contains the term "Chinese soy sauce."

"At times we have attempted to make fermented bean cheese. It would be of value to us if you could send us one or more of those little to-fu cheeses as they might be secured in the middle of the process, when they are covered with an inch or so of white mold..." Address: Microanalyst [Biological Laboratory, Bureau of Chemistry, USDA, Washington, DC].

2031. Kline, Charles E. 1920. Oil-bearing seeds and nuts in the Shanghai District of China. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 23(98):519-22. April 26.
• ***Summary:*** The chief plants yielding vegetable oils in China are [soy] beans, cotton seed, peanuts, rapeseed, sesamum seed, tea seed, and woodnuts (filberts).

The number of oil mills in China is increasing, and those in northern China treat mainly soya beans, while those in central China produce the other varieties of oil mentioned. The oil mills do not work year round, since there is not sufficient seed available, and also since the high summer temperatures cause the oil to become rancid.

The total capacity of oil mills in Shanghai is 5,400 piculs/day (321 tons/day).

Tables show: (1, p. 520) The quantities of oil, oilseeds, and oil cake exported from the port of Shanghai during the years 1917 and 1918. 1 picul = 133.33 lb. For [soy] bean oil: In 1917–2,351 piculs worth $26,482. In 1918–5,771 piculs worth $71,601. For [soy] bean cake: In 1917–11,213 piculs worth $27,246. In 1918–282 piculs worth $800.

(2, p. 520) The quantities of oil and cake exported from China to the countries of destination; the year (or years) is not given. Both the weight (in piculs; 1 picul = 133.33 lb) and value (in dollars) are given for each destination. In descending order of weight exported:

[Soy] bean oil–United States (incl. Hawaii) 2,136,746 piculs. Japan (incl. Formosa [Taiwan]) 87,673. Korea 23,611, Russia 19,802. Canada 4,001. France 2,132.

[Soy] bean cake: Japan (incl. Formosa) 15,150,706

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piculs worth $33,383,750. Korea 635,362 piculs worth $1,292,174. Russia 578,960 piculs worth $968,829. Siam 1,412 piculs worth $4,625. United States (incl. Hawaii) 27 piculs worth $54. Canada 9 piculs worth $17.

(3, p. 521) Ocean freight rates from Shanghai to various ports. Figures are given for bean oil and bean cake in 1917, 1918, and 1919 shipped to San Francisco [California], London, and Marseille, Naples & Venice. Present prices (total) are about five times as great as those at the beginning of the war. Address: Vice Consul, Shanghai [China].

2032. Fairchild, David. 1920. Foreign Plant Introduction Medal: Memorial to the late Frank N. Meyer presented to Mr. Barbour Lathrop "for distinguished service in the field of Foreign Plant Introduction." *J. of Heredity* 11(4):168-73. April.
• ***Summary:*** "Frank N. Meyer, Agricultural Explorer of the Office of Foreign Seed and Plant Introduction, who lost his life in the waters of the Yangtze River, left a bequest of a thousand dollars... This was Mr. Meyer's touching tribute to the organization with which he was connected for thirteen years as its agricultural explorer in China, Turkestan and other parts of Asia." The members of the office decided to put the bequest into a permanent tribute to his memory in the shape of a medal which should be awarded for distinctive service in the field of foreign plant introduction. The medal was designed by the well-known sculptor Theodore Spicer-Simson. On one side is a facsimile of the bas-relief which Queen Hatshepsut of the 18th Dynasty [of Egypt] (1570 B.C.) had executed upon the wall of her palace at Thebes to commemorate the first introduction of a foreign plant–the incense tree from the land of Punt. On the reverse side of the medal is the name of Frank N. Meyer, with the inscription from a poem by Chi K'ang, a poet of the Tang Dynasty, 618 A.D., which freely translated carries the thought that "In the glorious luxuriance of the hundred plants he takes delight."

Page 172 states that Mr. Barbour Lathrop's last expedition ended in the summer of 1903. Although he has conducted no long expeditions since then, "his interest in the work of plant introduction has continued. During his travels he has sent us many valuable things, including a most complete account, with photographs, of the soy-bean products of Japan,..."

The first medal was awarded to Mr. Barbour Lathrop of San Francisco, California, on 3 May 1920 in the Homer Building, Washington, DC. Address: President of the American Genetic Assoc.

2033. Kawatsuka, K. 1920. Daizu no saikin- byô [Bacterial disease of soybean]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 7:220-21. April. [Jap]

2034. Muramatsu, Shunsuke. 1920. Daizu tanpakushitsu no kagakuteki oyobi seirigakuteki kenkyû [Chemical and physiological studies on the proteins of the soy bean]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 41(4):311-54. April. (Chem. Abst. 14:3265). [25 ref. Jap]
• ***Summary:*** The author extracted successively from dry ground soybeans from Japan the following percentages of protein using the solvents named: Water 65.2 to 90%. Salt solution 3.97 to 6.40%. Alkali 1.64 to 3.49%. The residual nitrogen calculated a protein was 3.51 to 24.91%. The total globulin consisted of 78.5% of glycinin and 21.5% of phaseolin, the total albumin of 78.5% of legumelin and 21.21% of soylegumelin. He proposes the factor of 5.82 for calculating the protein from the nitrogen. Note: Nakajima (1932) cited this work extensively. Address: Nôgaku-shi, Japan.

2035. Satô, Sadakichi. 1920. Daizu tanpakushitsu no kenkyû oyobi sono kôgyôteki ôyô ni tsuite. VII. [Studies on soybean proteins and their industrial applications. VII]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 23(266):321-42. April. [Jap]
Address: Kôgakushi, Japan.

2036. Yamasaki, Eiichi. 1920. Studies on the chemical kinetics of catalase. II. Catalase from a germinated bean: Glycine hispida Maxim. *Science Reports of the Tohoku Imperial University. First Series* (*Mathematics, Physics, Chemistry*) 9(2):59-73. (Chem. Abst. 14:3679).
• ***Summary:*** Contents: Introduction. I. Experimental details: 1. The ferment. 2. Comparison of the enzyme activity at four different temperatures. 3. Calculation of experimental results.

II. Theoretical part: 1. Explanation of experimental results. 2. Temperature coefficient of constants. 3. The general mean value of constants k and k'. Conclusion.

It seems probable that: (1) Catalase is a common name of a group of enzymes which have the power of catalysing H_2O_2. (2) They have different stabilities to be indentified respectively. (3) They probably have different physical properties. Address: Tohoku Univ., Sendai, Japan..

2037. *San Francisco Chronicle.* 1920. Japanese exports show huge gains. May 12. p. H3.
• ***Summary:*** "The industrial development of Japan has caused an increase in importations of oils, except illuminating oils, says the Guaranty Trust.

"Japan's trade since the armistice shows increases in exportations of buttons, fancy matting, raw silk, habutae, hosiery, cotton, tissues, brushes and camphor; decreases in rice, wheat flour, beans, colza oil, soy bean oil, mineral oils, hides and leather, copper, sulphur, starch, zinc and antimony."

2038. *Rural New-Yorker.* 1920. [The soy bean crop in Manchuria and America, editorial]. 79(4586):974. May 15.
• ***Summary:*** "Some years ago the R.N.-Y. [Rural New-

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Yorker] began talking about the Soy bean crop. We were led to it by reading about what this bean did for Manchuria. At the time of the war between China and Japan [1894-95] this province was poverty-stricken in soil and in people. Apparently it had no distinct and popular crop which could bring in money. The Japanese introduced the culture of Soy beans, and the industry grew. The crop brought nitrogen and humus to the soil, and the oil and feed in the bean made the province rich. There are few more striking instances in history where the introduction of a new crop has brought a country from poverty to affluence. We believed that something of the same thing would work out in parts of our own country through the use of Soy beans, and that is evidently happening... Before many years the process of producing Soy bean oil, with the crushed beans for stock food, will become a great industry, and where it is started you will find a rich community."

2039. Calvino, Mario. 1920. Estudio sobre el cultivo de la soya en Cuba [Studies on soybean culture in Cuba]. *Revista de Agricultura, Comercio y Trabajo* (*Cuba*) 3(4):124-31. May. [Spa]
• ***Summary:*** Calvino conducted extensive tests with varieties from the United States relative to their adaptation, culture, yields and nutritive value. "We have continued our experimentation with Soya, having obtained from the office for the introduction of new plants of the Department of Agriculture in Washington, DC, a magnificent collection of varieties: S.P.I. 40125, Wilson Five, Barket [Barchet], Early Brown, Pekin, Arlington, Biloxi, Black Eyebrow, Virginia.

"The varieties that we already had are the following: Soya amarilla [yellow] Nakasawa (obtained via Mr. Nakasawa of Japan), Soya Gigante [Giant Soy] imported from the USA. Soya Negra [black]: This seed arrived mixed in with some others, and having observed some plants in our fields, we propagated its seeds. Hahto, an excellent variety obtained from the USDA in Washington." Most seeds were first planted on 14 March or 11 Aug. 1919. They germinated about 6 days later, and were harvested on 9 June or 28 Oct. 1920. The yields (in bushels/acre, in descending order by yield) are follows: Peking, 21.3; Early Brown, 17.1; Black Eyebrow, 16.4; Biloxi, 14.5; Hahto, 14.4; Virginia, 13.7; Wilson-Five, 13.6; Amarilla Nakasawa, 13.3; Arlington, 12.1; Mammoth 8.1; Barchet, 7.6. The percentages of oil ranged from 15.6 (Arlington) to 19.2 (Biloxi) while the percentages of protein ranged from 28.1 (Virginia) to 39.1 (Hahto).

Photos show: (1) Comparison of inoculated and uninoculated soy bean plants with roots exposed. (2) A man standing in an experimental field of soy beans in 1919. (3) A man in a field of tall Biloxi variety of soy beans. (4) A ruler showing the size of soy-bean pods and beans. (5) Eleven different varieties of soy beans lined up next to rulers to show the relative size of each. (6) Biloxi variety of soy bean plant with roots. (7) Giant variety of soy bean plant with roots. (8) Soy bean plants with pods, grown at the Agronomic Station. (9) Close-up of inoculated soy bean plant roots, with small nodules. Also contains many tables.

Note: From 1910 to 1914 Prof. Calvino was at the National School of Agriculture in Mexico giving a course on the multiplication of plants. He may have learned of soybeans in Mexico at that time. Address: Doctor en Ciencias Agricolas de la Universidad de Pisa, Cuba.

2040. Kimura, Jirô. 1920. Tôfu oyobi kôri-dôfu tanpakushitsu-chû no jiamino-san no teiryô [Determination of diamino acids in tofu and dried-frozen tofu]. *Tokyo Kagaku Kaishi* (*J. of the Tokyo Chemical Society*) 41(5):413-20. May. (Chem. Abst. 14:2813). [4 ref. Jap]
Address: Nôgaku-shi, Japan.

2041. Nishimura, Torazô; Kinoshita, A.; Kawakami, T.; Oikata, R. 1920. Mamekasu oyobi Sakuramame shiyô shiken seiseki hôkoku. I. Sakuramame oyobi mamekasu shiyô shiken [Shoyu brewing with soybean cake and Sakuramame]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 80. p. 739-95. May. [Jap]
• ***Summary:*** Sakuramame is a type of defatted soybean meal specially developed for use in making shoyu. Address: Jozo Shikensho. 1. Gishi; 2. Gishi; 3. Gishu; 4. Ko (Yatotta = Hired).

2042. Satô, Sadakichi. 1920. Daizu tanpakushitsu no kenkyû oyobi sono kôgyôteki ôyô ni tsuite. VIII. [Studies on soybean proteins and their industrial applications. VIII]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 23(267):425-39. May. [Jap]
Address: Kôgakushi, Japan.

2043. List or manifest of alien passengers for the United States: Heiji Ohta, Saizo Ohta, Shina Ohta. 1920.
• ***Summary:*** Ship: S.S. Afurica Maru. Passengers sailing from Yokohama, Japan, on 16 June 1920. Arrival at: Seattle, Washington.

Passenger #1: Ota, Heiji. Age: 48 years, 6 months. Sex: Male. Married or single: Occupation: Bean cake [tofu]. Married. Able to–Read: Yes (?). Write: Yes. Nationality–Country: Japan. Race or people: Japanese. Last permanent residence: Portland, Oregon. The names and complete relatives of nearest relatives: Mother. Mrs. M. Ohta, Shiraishimura, Okayama-ken. Final destination–State: Oregon. City: Portland.

Passenger #2: Ota, Saya (?). Age: 48 years, 9 months. Sex: Female. Occupation: Housewife. Everything else is the same as for Heiji (#1).

Passenger #3: Ota, Shina. Age: 25 years, 5 months. Sex: Female. Occupation: Housewife. Everything else is the same as for Heiji (#1).

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2044. Satô, Sadakichi. 1920. Daizu tanpakushitsu no kenkyû oyobi sono kôgyôteki ôyô ni tsuite. IX. [Studies on soybean proteins and their industrial applications. IX]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 23(268):527-43. June. [Jap]
Address: Kôgakushi, Japan.

2045. *Algemeen Landbouwweekblad voor Nederlandsch-Indie.* 1920. De Chineesche productie en uitvoer van Sojaboonen-olie en-koeken [Chinese production and exportation of soybean oil and cakes (Abstract)]. 5(2):277-78. July 9. [1 ref. Dut]
• ***Summary:*** A Dutch-language summary of an article said to be from *Die Weltwirtschaft.* Discusses exports of soybeans and soybean cake from 1901-1917, the Dairen Staple Exchange, the Dairen Trust & Guaranty Company, soybean oil mills in Harbin, Dairen, Newchwang, Antung, and Mukden, the Bean Cake and Bean Oil Factory in Dairen (South Manchuria), owned by Suzuki & Company of Kobe, Japan, soybean oil exports from 1911 to 1919, Mitsui & Co.

Note: We have been unable (Oct. 1999) to find the original article in any of the following: (1) *Weltwirtschaft* (1918-1920). (2) *Weltwirtschaftliches Zeitung* (July 1919 to June 1920) (3) *Weltwirtschaftliche Nachrichten* (Looked through 1919 and the first half of 1920). (4) *Weltwirtschaftliches Archiv* (Kiel) (two issues).

2046. Kirjassoff, Max D. 1920. Vegetable-oil-bearing materials of Manchuria. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 23(161):180-85. July 10.
• ***Summary:*** Contents: Introduction. Manchurian production of soya beans–exports of soya beans and products. All materials produced by cultivation–local consumption. Marketing raw materials–inspection–shipments. Methods of purchasing raw materials–brokerage. Storage–transportation methods and costs. Prices paid producers–economic conditions of farmers. Crushing of raw materials–prices paid at crushers. Production capacity of oil mills–types of mills and methods of operation. Quality of oil produced–production of bean oil and cake at Dairen. Fuel used in mills–activity of mills. Number of employees–wages. Marketing of products–Dairen exports of bean cake and oil. Prices of bean oil and cake. Ocean freight rates–export charges, insurance, etc. Increased United States demand–market for oil machinery.

"The oil-bearing materials produced in Manchuria are soya beans, perilla seed, peanuts, hempseed, castor beans, sesame seed, flaxseed, sunflower seed, and rapeseed." Estimates indicate that "about 1,500,000 tons of soya beans are produced in South Manchuria and about 800,000 tons in North Manchuria, or a total of 2,300,000 tons for the whole Province."

Tables show: (1) Exports of soya beans, bean cake, and bean oil each year from 1914 to 1919 (p. 180). (2) Exports of bean-cake each month from Oct. 1918 to Sept. 1919 from Dairen (Manchuria) to Japan (by far the largest), United States, Straits Settlements, China, Korea, and total (p. 184). (3) Exports of bean-oil each month during the same time to Japan (by far the largest), Europe, United States, China, Korea, and total. (4) The prices (in silver yen per picul or piece of cake) of beans, cake, and oil during the same period. Mentions the increasing demand for the oil in the United States. Address: Consul, Dairen [Manchuria].

2047. *USDA Bureau of Plant Industry, Inventory.* 1920. Seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from April 1 to June 30, 1916. Nos. 42384 to 43012. No. 47. 96 p. July 12.
• ***Summary:*** Soy bean introductions: *Soja max* (L.) Piper. Fabaceæ. (*Glycine hispida* Maxim.) "42880-42887. From Tokyo, Japan. Presented by Dr. H. Terao, botanist, Imperial Agricultural Experiment Station. Received May 31, 1916."

42885-42887. Address: Washington, DC.

2048. Morse, W.J. 1920. The soy bean in Manchuria. *Rural New-Yorker* 79:1208. July 17.
• ***Summary:*** "Relative to the editorial article, page 974 [May 15], on the Soy bean in Manchuria, the facts are somewhat different from those stated.

"It is stated that at the time of the war between China and Japan, Manchuria was poverty-stricken in soil and in people, and that the Japanese introduced the culture of Soy beans, and the industry grew. Although the exact date of the introduction of the Soy bean into Manchuria is unknown, the probability is that it came north from the Central Provinces of China many centuries ago. The bean trade was of ancient standing when the first Westerner visited 'Manchoo Tartary.' At the time the first British consul took up his residence at Newchwang, Manchuria, trade in beans, bean oil, and bean cake was an ancient and flourishing institution. Newchwang since 1832 had been a growing port of shipment for the great coastal trade in beans, bean oil and bean cake, on which Manchuria's prosperity has always depended. It is thus seen that long before the Chinese and Japanese war the Soy bean occupied an important part in the agricultural industry of Manchuria. During the Russian-Japanese war [1904-05] vast armies which occupied the whole of southern and central Manchuria depended for their cereals largely upon local supplies, and a great impulse was given to Manchurian agriculture at that time, but after the withdrawal of the troops the cessation of local demand called for the discovery of a new market, and especially so for the money crops of wheat and beans. Japan offered the first market, but with the post-bellum wave of depression sweeping over Japan it became necessary to find other markets.

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"Japanese merchants were the first to try to introduce the Soy bean into Europe. In 1908 shipments of Soy beans were made to England by Japanese firms... During 1909 over 400,000 tons of beans were exported to Europe from Manchuria. At first nearly all of the exportations went to England, but within a short time Germany took the lead in importing Soy beans, Soy bean oil and Soy bean cake. The article referred to states that on the Pacific Coast, in parts of the Central West, and also in some sections of the South, the crop is working in. The Soy bean is grown only to a very limited extent on the Pacific Coast. However, large importations of Soy beans are coming into the Pacific Coast States, most of which seed is handled by oil mills in Seattle [Washington], Portland [Oregon] and a few other coast cities." Address: Asst. Agrostologist [USDA, Washington, DC].

2049. Dill-Crosett Inc. 1920. Beans: Importers, exporters, factors in (Ad). *Bean-Bag* (*The*) (*Lansing, Michigan*) 3(2):35. July.
• ***Summary:*** A ¼-page ad. They handle 10 varieties of California beans and 16 varieties of Oriental (Japanese and Korean) beans including Daifuku, Kintoki, and Soya. Also peas. Address: 235 Pine St., San Francisco, California.

2050. Muramatsu, Shinsuke. 1920. Daizu no denpun ni tsuite [On the starch of soy bean]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 216. p. 637-46. Aug. 5. [Jap]
Address: Nôgaku-shi, Japan.

2051. *Matieres Grasses* (*Les*) (*Paris*). 1920. A propos des graines de Soja [Concerning soybean seeds]. 12(148):5614-15. Aug. 15. [16 ref. Fre]
• ***Summary:*** A two-page summary of information on soybeans from 16 sources, most of them in French. Soybeans are widely used in Manchuria and Japan. Soybean seeds from Cambodia and lower Laos are superior to those from Manchuria. A table gives the composition of three soybeans from Laos, Tonkin, and Manchuria. Soybeans in Indo-China and their use during World War I in England and France. Vegetable milk made by Li Yu-ying in France. A table gives the composition of three soybeans from Yun-Nan, Tonkin (Lang-Son), and Tonkin (Delta). Mr. Fr. de Roux recommends that soybean be more widely used in France and its colonies. Summarizes soybean research in Connecticut and New Jersey, and soybean production and yields in Ohio. More than 500 soybean varieties have been tested in the USA; the yellow varieties generally work best for human foods, oil and flour, while the brown and black are used for animal feeds. In 1917 cotton seed mills also used soybeans grown locally or in Manchuria. Milk made from soybeans is similar to animal milk and can be used to make cheeses. Soybean oil is used in the USA and England for making paints, but of greatest interest is its use in margarine and other food uses. In Japan, a society was founded with capitalization of 100,000 yen to extract soy protein for use as a substitute for celluloid. Conclusion: "In view of these many uses, it seems interesting to us to pursue in our colonies some cultural trials with this interesting legume. Could it perhaps be developed in certain temperate regions? É.D.W."

2052. *Japan Advertiser.* 1920. Tokyo a city of many kinds of specialty restaurants: All sorts of food can be found at all sorts of prices if one knows where to go. No. 9,307. Aug. 22. p. 5, cols. 1-3. Sunday. [Eng]
• ***Summary:*** This introduction to the many types of restaurants in Tokyo mentions various soyfoods. Better class houses serve beef. The centerpiece is the "nabe"–"the iron skillet in which the food is cooked. The cooking is done by the customer, no skill being required as the secret of good 'nabe' is in the tenderness of the meat and in the sauce which is prepared by the house. Onions, either Bermuda or the long leek variety, tofu, konnyaku (a stringy preparation made out of a root), and sometimes cabbage leaf are the usual ingredients which are put in the nabe along with the thin slices of meat. Sake can be had if ordered. A reasonable meal at a beef house now costs about ¥1.50, although the nabe alone is probably listed at only 60 or 70 sen.

"Another name by which this dish is usually known outside of Tokyo, is sukiyaki. This is derived from *suki,* which means a spade, and *yaki,* to cook. The reason for this unusual derivation is that when meat we first introduced into Japan as food for humans, there was a very great prejudice against it. Those who wished to indulge in this 'unclean' food were forced to go into the mountains, far from any habitation and conveniences, and they made use of the farmer's broad spade on which to cook the meat. Another reason, aside from the fact that Buddhism preached abstinence from the flesh of animals, that the Japanese did not look with favor upon meat as a food was the flesh has always been eaten by the Eta, or the outcast class of the country."

"In contradistinction to meat, eels have always been looked upon as a delicacy. Eel restaurants are numerous in Tokyo, but they are not cheap... The customer is served in private rooms at these eel houses... Eels are considered very nutritious and are eaten by all classes. It is a favorite dish with coolies when they have the price... The first 'ox' day of the summer doyo, or period of greatest heat, is set aside as a special day to eat eels.

"There is not much choice in the way in which eels are prepared. Kaba-yaki is the name of one style. The bones are all removed, the eel is laid out flat and broiled over a charcoal fire with a special shoyu sauce and served on a big flat plate. Rice is also served..." One serving typically costs 1-3 yen.

"A very cheap kind of food, yet one whose 'social standing' is as good as any, is soba or udon... Cold soba is

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known as mori, and is eaten by being dipped into shoyu sauce and is flavored with sea-weed." "Tempura soba is served in a bowl with a piece of tempura placed on top. This is a very nutritious dish. Soba is served is served in the same way with onions or a piece of abura-age or fried tofu and is known as okame soba."

"A typical Japanese restaurant where a table d'hote is served is known as a kaiseki restaurant." One popular dish is "onuko, or fish mixed with miso and flavored with vinegar."

In Tokyo, pork "is eaten more than any other kind of meat, but as it is the cheapest it is found only in the poorest restaurants." Surprisingly large quantities of horse-meat are consumed at cheap restaurants. Tempura, which is very popular, "means a certain way of cooking–namely, dipping in this wheat-flour batter and frying in deep oil, usually goma-abura, or sesame oil, although almost any vegetable oil can be used." Also discusses sushi. Rice comes at the end of the meal. Sake is not supposed to be drunk after rice is consumed, as it produces indigestion. Address: Tokyo.

2053. Hemmi, Takewo. 1920. Beitraege zur Kenntnis der Morphologie und Physiologie der japanischen *Gloeosporien* [Contributions to an understanding of the morphology and physiology of the Japanese *Gloeosporien*]. *Journal of the College of Agriculture, Hokkaido Imperial University* 9:1-159. Aug. [148 ref. Ger]
• ***Summary:*** This the first description of soybean anthracnose. Discusses fungi, Colletotrichum glycines (=C. dematium f. truncata), Gloeosporium. Describes the morphology of *Colletotrichum glycines* and *Gloeosporium* sp. on soybean pods. Address: Nôgakuhakushi.

2054. Satô, Sadakichi. 1920. Daizu tanpakushitsu no kenkyû oyobi sono kôgyôteki ôyô ni tsuite. X. [Studies on soybean proteins and their industrial applications. X]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 23(270):811-30. Aug. [Jap]
Address: Kôgakushi, Japan.

2055. Div. of Research, Bureau of Foreign and Domestic Commerce. comp. 1920. Japanese trade in vegetable oils and vegetable-oil material. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 23(213):1174-75. Sept. 10.
• ***Summary:*** Japanese imports and exports of vegetable oils and oil-bearing material in 1919 were valued at about £5,328,801 and £2,273,372, respectively. The amounts imported and exported are given in pounds. Soya-bean oil was the leading import in 1919, at 3,692,646 lb (worth 724,707 yen); soy oil imports were 2,633,769 lb in 1918 and 1,024,182 lb in 1917. In 1919 some 3,862,297 lb of it were exported, compared with 6,518,554 lb in 1918 and 7,307,582 lb in 1917. Coconut oil was the leading export in 1919 at 23,395,329 lb; 476,773 lb of it were imported.

For oil-bearing materials (seeds) in 1919, the leading import was soya beans (377,639,051 lb imported, 1,456,212 lb exported.) The leading export was linseed (19,126,759 lb; 19,253,750 lb imported). A table summarizes the commodities and countries from which imported or to which exported, quantities, and values for the years 1917-19.

2056. Maruyama, Yojiro. 1920. [Plastic material from soy bean]. *Japanese Patent* 37,159. Sept. 24. (Chem. Abst. 15:3730). [Jap]*

2057. Satô, Sadakichi. 1920. Daizu tanpakushitsu no kenkyû oyobi sono kôgyôteki ôyô ni tsuite. XI. [Studies on soybean proteins and their industrial applications. XI]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 23(271):905-10. Sept. (Chem. Abst. 14:3299). [Jap]
Address: Kôgakushi, Japan.

2058. Burr, R.A. 1920. The bean that made Manchuria famous: Chinese produce it; Americans consume it; Japanese control the business. *Trans-Pacific* 3(4):57-60. Oct.
• ***Summary:*** Surveys the Manchurian soybean industry, whose largest customer is said to be the United States. Suggests extensive importations of raw materials into the U.S. as the solution for making the return trip profitable in trade with the East Asia, and the investigation of the soybean as an American article of diet. Photos show: (1) Pyramid-shaped piles of soya beans in bags awaiting shipment at Changchun Railway Station. (2) A Japanese-owned mill at Dairen for extracting soya bean oil. (3) The Dairen Staple Products Exchange building. (4) More acres of piled-up bags of soya beans awaiting shipment at Dairen. Address: Manager, Chun Mei News Agency, Peking, China.

2059. Kameoka, Seiji. comp. 1920. Manshû daizu no kenkyû [A study of the soybeans of Manchuria]. Fou-t'ou: South Manchuria Railroad Incorporation. 156 p. Oct. Illust. 21 cm. [Jap]
• ***Summary:*** This is a collection of three articles, written in Japanese, on three aspects of soybean production in Manchuria: its cultivation, its botanical and chemical analyses, and its production and marketing. Appended are regulations and notices relating to the storage, packing, and transportation of soybeans, issued by the South Manchuria Railway Co.

Note: As of Feb. 2012, this book is digitized on the Web.
Address: Manchuria.

2060. Kyoshin Yoko, Ltd. 1920. According to investigation made by Hokkaido Produce Association,... *Bean-Bag* (*The*) (*Lansing, Michigan*) 3(5):54. Oct.
• ***Summary:*** A half-page table compares the acreage of respective commodities between 1919 and 1920, which is

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approximately as follows (1 chobu = about 2.5 acres):

Soya bean 1919–57,761 chobu. 1920–80,094 chobu. Up 39%.

Kuro [black] soya bean 1919–4,386 chobu. 1920–5,308 chobu. Up 21%.

Azuki bean 1919–35,190 chobu. 1920–47,440 chobu. Up 35%.

Dainagon [large azuki] bean 1919–10,166 chobu. 1920–14,642 chobu. Up 44%.

Kintoki red [azuki] bean 1919–13,882 chobu. 1920–11,775chobu. Down 16%.

Also gives statistics for: Daifuku bean. Chufuku bean. Tenashi bean. Nagauzura bean. Maruuzura bean. Address: P.O. Box 251, Kobe, Japan.

2061. *Bean-Bag* (*The*) (*Lansing, Michigan*). 1920. Kyoshin Yoko, Ltd., Kobe, Japan. 3(6):38. Nov.

• ***Summary:*** "Owing to remarkable decrease in export demand and to a certain drop in its prices compared with what prevailed during the war-time which farmers experienced last two years, the output on such items for export as beans, peas, potatoes etc., etc., have been shown a great deal of decrease this year, leaving the acreage used for same to planting such commodities for use of domestic consumption as soya beans, azuki beans, rice, wheat, barley, rye, oats, linseeds, etc.

"Due to a very little demand offered abroad and low price prevailed on oversea market last season the quantities moved for export up to the present moment was hardly to reach to half of the output last year. Under the circumstances, many of the farmers have changed their field to plant soya beans and other kinds of cereals this year Instead of kotenashi beans, and therefore the output this year for this commodity is expected to be about one-third of last year. Anticipated output will be about 3,000 tons against 8,000 tons last year."

2062. *Bean-Bag* (*The*) (*Lansing, Michigan*). 1920. Soya bean oil trade big. 3(6):50. Nov.

• ***Summary:*** "Tacoma, Washington–Importation of soya bean oil from the far east through Puget sound ports has reached such proportions that both in Seattle and Tacoma port commissions and private companies have erected special huge tanks to handle the trade. A few years ago soya bean products were a novelty in commercial circles here.

"Soya bean oil is used in the manufacture of soap, paint, varnish and toilet preparations and a residue is sold as food for cattle. Most of the oil comes from Kobe, Japan. It is brought here in old kerosene cans or in wooden receptacles and is shipped east in tank cars."

2063. Segawa, Rinjiro. 1920. [Estimation of total solid substance in soy-sauce by means of specific gravity]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 465. p. 940-73. Nov. (Chem. Abst. 15:1360). [Jap]

2064. Yamazaki, Momiji. 1920-1925. Shinasan hakkô kinrui oyobi hakkô seihin no kenkyû [Fermentable fungi and fermentation products of China]. *Shina Kenkyu* (*Reports of the Study of China*) No. 1. p. 1-219. Aug.; No. 2. p. 1-105; No. 3. p. 1-104; No. 6. p. 1-144; No. 7. p. 1-158; No. 8. p. 1-168; No. 9. p. 1-193. [Jap]

• ***Summary:*** In No. 1 (Aug. 1920), soybeans and soyfoods are discussed in the following sections (p. 218-19): (7) Yellow soybeans. (8) Fermented black soybeans or shi (explanation, about the name). (9) Jiang or shô (explanation, about the name). (14) Fermented tofu. Since the text is written in Chinese characters, it is hard to tell the meaning of sections 10-13.

No. 2 was published in Nov. 1921. No. 3 in May 1922. No. 7 in March 1924. No. 8 in Sept. 1924. No. 9 in Oct. 1925. Address: Kyôju Nôgakushi, Tôadôbunsho-in Shina Kenkyû-bu.

2065. Dep. of Finance (Okurashô). 1920. Financial and Economic Annual of Japan (20th). Tokyo, Japan: Government Printing Office. 199 p.

• ***Summary:*** The section on "Food problem, adjustment of prices, etc." (p. 6) begins: "Amidst this general activity of economic market, the balance of trade for the first time since 1915 was returned against Japan, and it seemed as if a dark, ominous cloud appeared in the horizon. In practice, however, the economic circles, spoiled by continued prosperity, did not take heed of this warning, but persisted in viewing the situation through rose-coloured spectacles. Speculative mania, luxury in living and abnormal rise of new enterprises were [the] order of the day, together with further advance in prices of commodities" [inflation]. The price of rice rose so high there were rice riots last year. "In November an Imperial ordinance was issued to exempt till November 1920 soy beans, raw beef, eggs and cotton fabrics and yarns from import duties, and also to restrict the export of cotton yarns."

Table 1 (p. 8) gives statistics on the tax on soy [sauce]. In 1920-21 it is estimated to be 5.83 million yen, compared with an estimated 5.25 million yen in 1919-20. This is an increase of 79,685 yen.

Table 3 (p. 14-15) gives the Japanese government revenue from the tax on soy sauce each year from 1907-08 (5.47 million yen) to 1920-21 (estimated 5.83 million yen).

In the section "Tax on liquors" we read (p. 20): "VI. Soy [sauce] tax: The tax is levied at the following rates upon persons manufacturing soy (Japanese sauce): -

"Soy yen 1.75 per koku of Moromi.

"Tamari yen 1.65 per koku manufactured.

"In 1900, the tax on soy for household use was created, the rates of which range from sen 50 to yen 4 according to the amount of manufacture. No person whatever is permitted to manufacture for household use more than five koku of soy

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per annum."

Page 24: "In view of the advance of prices and the consequent unrest as to living, such daily necessaries as soy beans, raw beef, eggs, cotton yarn and cotton fabrics were further placed on free import list, effective till November 30th, 1920."

Table 19 (p. 46) gives annual area (in *chô*) and production (in *koku*) of soy beans (and of "small red beans" [azuki]) from 1909 to 1918. (Note: 1 *koku* = 44.8 gallons = 180 liters. 1 *chô* = 2.45 acres = 0.992 hectares. 1 *kwan* [*kan*] = 8.72 lb). Sample figures were as follows:

1909–479,771 *chô* and 3,766,962 *koku*.

1913–475,284 *chô* and 2,993,095 *koku*.

1918–482,207 *chô* and 3,451,820 *koku*.

Table 33 (p. 62) gives the index number (relative amount) of wages by profession. A "soy-maker" earns 155.6, which is about average among food and drink workers.

A table (p. 67) gives the amount of various manufactured goods made in Japan from 1909 to 1918. The amount of Soy [sauce] increased from 2,197,708 *koku* in 1909 to 2,630,498 *koku* in 1918.

Table 53 (p. 94) gives the value (in yen) of "Chief commodities exported" from 1906 to 1919. For Soy [sauce] the export value increased from 952,840 yen in 1906 to 968,819 yen in 1919.

Table 54 (p. 96-97) gives the "Value of chief commodities imported" (in yen) from 1906 to 1919. For Soja-beans the import value increased from 9,018,173 yen in 1906 to 22,042,824 yen in 1919.

Table 56 (p. 102) gives the "Value of chief commodities imported from various countries" (in yen) from 1913 to 1919. For Soja beans in 1913 the value of imports were: From China: 3,828,508 yen. From Kwantung [Guangdong] province (in southern China): 2,988,212 yen. From Asiatic Russia: 326,874 yen. From other countries: 80 yen. By 1919 Kwantung province was by far Japan's biggest source (14.7 million yen), followed by China. Asiatic Russia, and Other countries.

Table 73 (p. 140) gives the prices of principal commodities from 1912 to 1919. During this period, the price of

Soja beans increased from 10.49 yen per *koku* to 20.81 yen per *koku.*

Red beans [azuki] increased from 14.49 yen per *koku* to 36.60 yen per *koku.*

Soy [sauce] decreased from 88.18 yen per *koku* to 40.61 yen per *koku.*

Miso increased from 0.44 yen per *kwan* to 1.02 yen per *kwan.*

Seed-oil [mainly rapeseed] increased from 46.34 yen per *koku* to 105.24 yen per *koku.*

Oil-cake [mainly rapeseed] increased from 2.72 yen per 10 *kwan* to 5.70 yen per 10 *kwan.*

Table 74 (p. 141) gives the index number of prices of commodities from 1912 to 1919; the index number for each commodity in 1912 is 100. During this period, the price of

Soja beans increased in price by 98%.

Red beans [azuki] increased by 158%.

Soy [sauce] decreased by 68%.

Table 75 (p. 141) gives the prices of principal commodities in Tokyo from 1909 to 1918, including Soja beans, red beans, and soy [sauce].

Table 76 (p. 143) gives the index numbers of prices of commodities in Tokyo from 1909 to 1918.

Miso increased by 182%.

The section on Chôsen [Korea], under "Agricultural products" states (p. 174): "Chosen is a wholly agricultural country, and farming is its most important industry. The fields of Chosen are almost always cultivated on a small scale and are owned by the Yan-pan and richer classes. Rice is the staple agricultural product, followed by barley, Italian millet, soy beans, wheat, and red beans. There are also such special products as cotton, tobacco, hemp, and ginseng. The cultivation of fruit-trees has of late produced very good results; and the area of their cultivation is gradually extending. Silk culture which had hitherto been in a very poor condition, is now, in consequence of official encouragement, being carried on everywhere. Both these are engaged as subsidiary industries by the agricultural class. Live stock is also raised as a by-product of agriculture, and cattle, horses, goats, and pigs are found everywhere in the country; but stock farming is not pursued as an independent enterprise. The cattle are well known for their great size and good quality; and a large number of them are annually exported to Japan Proper and Asiatic Russia."

According to Piper & Morse (1923, p. 13) a table in this document (which we cannot find) gives five-year averages of acreage, production and yield of soybeans in Japan for the following years: 1897-1901, 1902-1906, 1907-1911, 1912-1916, and 1917-1919. The average annual production of soybeans is about 18 million bushels, grown on 1.1 million acres, with a yield of 15-16 bushels per acre. Address: Japan.

2066. Nagaki, G. 1920. Shôyu moromi shikomi ni nyûsan no ôyô ni tsuite [Application of lactic acid with moromi fermentation in making shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 15(8):26-29. [Jap]

2067. Oikata, R.; Kitaura, T. 1920. Shôyu no hinshitsu to gantoryô to no kankei ni tsuite [The relation between the quality of shoyu and its sugar content]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 15(3):12-14. [Jap]

2068. Calvino, Mario. 1920. La soya [The soybean]. *Informe de la Estacion Experimental Agronomica* (*Santiago de las Vegas, Cuba*). Part 15. p. 179-92. For the years 1918-19 and 1919-20. [2 ref. Spa]

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• ***Summary:*** Lists and describes briefly nine soybean varieties received from the office of new plant introduction of the U.S. Department of Agriculture ("A magnificent collection of varieties.") and four varieties already owned by the Station in Cuba. They were first planted in March 1919 (a second lot of four of these varieties were planted at this time–Wilson Five, Peking, Black Eyebrow, and Amarilla Nakasawa) and again in August 1919. The varieties and their yields (in kg/ha) in descending order of yield for the first planting are as follows: Pekin [Peking] (1435.9 + 790 / -). Early Brown (1153.9 / -). Biloxi (1153.9 / -). Virginia (923 / -). Unknown (976.6 / -). Black Eyebrow (1153.9 + 1140 / -). Wilson 5 [Wilson-Five] (920.5 + 1230 / 277.7). Arlington (820.5 / -). Soya S.P.I. 40125 (615.3 / -). Barket [Barchet] (513.0 / -).

The four varieties already owned by the station and their yields during these first two plantings were: (1) Amarilla Nakasawa / Nacasawa (from Mr. Nakasawa of Japan; 897.4 + 1100 / 1375). (2) Gigante (imported from the USA; 551 / -). (3) Negra. "This is not a variety name. Rather this seed came mixed with other seeds. We noted some of these plants in our fields and we propagated them." Note: This is said to have been the first Cuban soybean selection. (4) Hahto, from the USDA. "This is the most interesting soybean variety for Cuba for use as either green seeds (*grano verde;* green vegetable soybeans) or whole dry seeds (1000.0 / -).

For each variety the following information is given. Color of seed, date of start of germination in petri dishes (14 March 1919) and laboratory temperature, percentage germination, number of days to germination in lab, date of germination, date of harvest in fields (9 June 1919), yield, observations. There is a special section on the Hahto variety; sown on 10 June 1919, it yielded 1,000 g/ha. A table (p. 190) shows the nutritional composition of 12 the 13 varieties (all but Negra). Hahto had the highest protein content (39.12% protein, 11.90% water, and 17.36% fat), whereas S.P.I. 40125 had the highest oil content (28.91% protein, 10.60% water, 19.60% oil). A second such table (p. 191) shows assimilable nutrients of all 13 varieties.

The article concludes: "According to Dr. E. Babe, Chief of the Dept. of Chemistry at Santiago de las Vegas, in China and Japan the soybean is used to prepare very nutritious foods including a special bread for diabetics and a milk that is widely appreciated." Note: Dr. Babe, who never went to Asia, is said to have acquired this information from the literature on soybeans.

Photos show: (1) A field of variety trials in 1919. (2) 11 soybean varieties, with 10 samples of seeds from each variety. (3) A field of mature Biloxi soybeans. (4) An uprooted Biloxi soybean plant. (5) The Hahto soybean: Pods, green seeds, and dry seeds. (6) An uprooted Hahto soybean plant with many pods.

Note: This is the earliest Spanish-language document seen (June 2009) that uses the term *grano verde* to refer to green vegetable soybeans. Address: Delegate of the Secretary of Agriculture, Commerce, and Labor, and Acting Director, Cuba.

2069. Hoshino, Tokuji. comp. 1920. Economic history of Manchuria. Seoul, Chosen: Bank of Choshin. x + 303 p. Illust. Portraits. Folded color map. 20 cm.

• ***Summary:*** A digital version of this book is available on HathiTrust. The word "soya" appears on 19 pages: p. 146 (7 times), 137 (5 times), 138 (4 times), p. x, p. 142, 145 (3 times), p. 72, 138, 140, 148, 216, 303 (2 times), p. vi, 18,, 52, 124, 134, 144, 217 (1 times each).

In the chapter on Agriculture (p. 124-60), the long section on "Soya beans" appears on pages 137-148. In this section the terms "bean cake" and "bean oil" appear many times. A large table (p. 147-48) shows the export of soya beans, [soya] bean cake, and [soya] bean oil from Dairen, Newchwang, and Vladivostok from 1908 to 1917.

The term "bean cake" or "bean cakes" appears on 26 pages: p. 144 (4 times), p. 18, 19, 142, 183, 184 (3 times), 20, 28, 140, 143, 186, 187, 215, 216, 218 (2 times), p. vii, 137, 138, 147, 148, 177, 186, 219, 224, 294, 299 (1 time each).

The word "soy," referring to soy sauce (Japanese shoyu) appears only on p. 142, where we read: "(6) Uses of Beans, Bean Cake, and Bean Oil in the Far East: (a) Beans: Perhaps the Japanese are the greatest consumers of beans in the world as an article of diet. Every morning they take soup made of miso which is prepared from beans. For the seasoning of their food they seldom use salt, using instead bean sauce, the chief ingredients of which are beans and salt. Thus the Japanese eat beans in one form or another at least three times a day. An extensive use is also made of beans by the Chinese, who make them into the Chinese paste *chiang* which they habitually eat with fish, meat, and vegetables. But the more expensive Chinese soy, which corresponds to the Japanese shoyu, is only used by wealthy families and restaurant keepers, and is not consumed by the very poor. Another product of beans which is widely used in both Japan and China is tou-fu [tofu, doufu] or bean-curd."

"(b) Bean oil is used extensively in cooking Although it is inferior to rape and sesamum oils for this purpose, these oils cannot compete with it in point of price; the recent advance in price, due to the foreign demand, may however–if sustained, as seems certain–go far to change the positions of the oils relatively to each other. In spite of its unpleasant characteristic odour and unpalatability, the poorer classes in China consume it in its crude state, but among the rich it is boiled and allowed to stand until it has become clarified.

"As a lubricant bean oil is used for greasing axles and parts of the native machinery in use in the arts and crafts. Other uses in South China are for the making of waterproof cloth, and paper umbrellas and lanterns, and the oil is also mixed with lacquer for the manufacture of varnish and

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printing ink.

"(c) Bean Cake: Bean cake, which is but the residue after the oil has been expressed from the beans, was of comparatively little value to the Manchurian farmers, who used to feed their stock with it, before the discovery of its great value as a fertilizer. First in the sugar plantains in the provinces of Fukien and Kwangtung, and then in the plantations in Java and the South Sea Islands, it was used as a fertilizer, and for centuries it has been an important article of trade with those places. But the great importance it has since attained in Manchuria's foreign trade dates from the conclusion of the Sino-Japanese War, when it began to be exported to, Japan for use in the paddy fields there. Soon it was found that it possessed fertilizing qualities superior to those of the fish manure of past ages which, containing too high a proportion of oil for the purpose for which it was used, was liable to breed insects hurtful to the crops, and so great grew the demand for it in Japan that the relative position of the oil and the cake was changed at one time, the cake becoming the principal product and the oil a by-product, though the tendency now is for the oil to regain its former position, owing to the growing demand for it in the Western markets. The results of the analyses made of bean cake in three different places show the following chemical composition." Analyses were conducted by: (1) Government laboratory, Japan. (2) Agricultural Institute, Scotland. (3) South Manchuria Railway Co. Composition: Water 11.0 to 15.3%. Albuminoids [proteins] 42.1 to 45.2%. Fat 5.2 to 9.6%.

"The Chinese farmer does not yet use bean-cake in his rice field, and in Manchuria it is only used for vegetable-growing. Thus Japan owes much to Manchurian bean-cake for the productiveness of its naturally sterile soil.

"As cattle feed bean cake is used in Manchuria for horses and mules–only, however, when very hard work is being done, and is mixed with bran and *kaoliang* stalk. Its use as cattle feed in Japan still belongs to the experimental stage. Two novel uses of soya beans have been discovered by Mr. Suzuki of the Central Laboratory of the South Manchuria Railway Company. The one is the making from it of a new sort of paint, named Solight, and the other, a chemical composition called Tantalse, which imparts its waterproof characteristic to the cement, mortar, or concrete with which it is mixed, or to paint upon which it is applied. The merits of Solight are enumerated thus: it may be applied as it is; it dries quickly, that is in about half an hour; it has no bad odour like paint; its easy combination with any color; its cheapness.

"Beans are also used in soap-making, and there are already several soap factories in Dairen which use beans as the chief material. The uses of beans are studied by many Japanese institutions and individuals, and many new discoveries have been made; indeed there seems to be no end to their uses."

2070. Minami Manshû Tetsudô K.K. (South Manchuria Railway Company). 1920. Manchurian soy bean and its uses, with export figures, dealers, &c. Dairen, South Manchuria. 8 p. *

• ***Summary:*** Name of company with diacritics is: Minami Manshû Tetsudô K.K.

2071. Page, Thomas Walker; Lewis, D.J.; Culbertson, W.S.; Costigan, E.P. 1920. Survey of the American soya-bean oil industry. Washington, DC: U.S. Government Printing Office. Prepared by the United States Tariff Commission and printed for use of Committee on Ways and Means, House of Representatives. 22 p. 24 cm.

• ***Summary:*** Contents: Summary. Summary table. General information: Description, uses, methods of production (domestic production and consumption), domestic exports, foreign production and international trade, imports, prices, competitive conditions, and tariff history. Production in the United States (alternative). Imports by country. Imports for consumption (soya bean oil cake). Domestic exports. Prices: Soya bean oil (Dairen, Manchuria), soya bean oil (New York), soya bean oil cake (Dairen). Rates of duty. Miscellaneous.

Tables show: (1) Domestic soya-bean oil production, imports for consumption, domestic exports and value of imports for consumption for the calendar years 1910-1920 (p. 8). (2) Soya-bean oil production in the United States in pounds, 1914, 1916-1919 (p. 16). (3) Soya-bean oil imports by countries 1912-1920. Statistics on quantity and value of imports to the USA from Belgium, England, China, Japan, Canada, Manchuria, all others (p. 16). (4) Revenue on soya-bean oil imports for consumption, 1910-1920 (p. 17). (5) Revenue on soya bean oil cake imports for consumption, 1912-1919. (6) Quantity and value of domestic exports of soya bean oil for 6 months ending Dec. 31, 1919. Exported to: Austria-Hungary, Belgium, Denmark, France, Germany, Italy, Netherlands, Sweden, United Kingdom, Canada, all other (p. 17). The largest amount was exported to the United Kingdom. (7) Spot prices of wholesale soya-bean oil at Dairen, Manchuria, 1918 and 1919. (8) Prices of Manchurian soya-bean oil in New York, 1913-1919. Data from *War Industries Price Bulletin* No. 49. (9) Prices of soya-bean cake in Dairen, 1918-1919. Data from *Manchuria Daily News.* (10) Rates of duty on soya-bean oil, 1883-1913 (p. 18). (11) Consumption of fats and oils by the lard-substitute industry, 1912, 1914, 1916, 1917. Includes soya-bean oil and peanut oil. (12) Consumption of fats and oils by the soap industry, 1912, 1914, 1916, 1917. Includes soya-bean oil and peanut oil (p. 19-20). (13) Consumption of fats and oils by the oleomargarine industry, 1912, 1914, 1916-1918. Includes soya-bean oil and peanut oil (p. 20). (14) Approximate net import and crush of soya beans in Europe, 1908-1913. Incl. United Kingdom, Germany, Netherlands, Denmark. (15)

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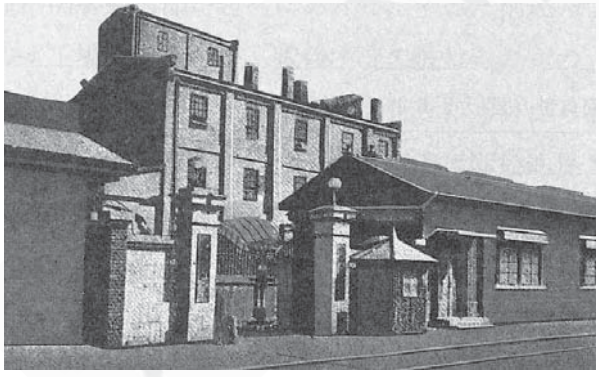
Exports of soya beans (international trade), 1911-1918. (16) Imports of soya beans (international trade), 1911-1919. (17) Exports of soya bean oil (international trade) 1911-1919. (18) Imports of soya bean oil (international trade), 1911-1919 (p. 21). (19) Foreign exports of soya bean oil from the United States, 1912-1919. Gives quantity and value exported to Canada, Mexico, British West Indies, Belgium, Netherlands, Sweden, France, England, Austria-Hungary (p. 22). In 1919, 2,060 pounds worth $258 were exported to Mexico. Note: This is the earliest document seen (Feb. 2009) that gives statistics for trade (imports or exports) of soybeans, soy oil, or soybean meal to Mexico or Central America. Address: Chairman, U.S. Tariff Commission, Washington, DC.

2072. Photograph of a pile of soybeans covered with hemp sheeting at Suzuki Shoten (Suzuki & Co), Dairen, Manchuria. 1920.

• ***Summary:*** This digital photo was sent to Soyinfo Center by Mr. Y. Komura of the Japan Oilseed Processors Association (Aug. 2013).

2073. Photograph of soybean oil mill of Suzuki Shoten (Suzuki & Co), Dairen, Manchuria. 1920.



• ***Summary:*** This digital photo was sent to Soyinfo Center by Mr. Y. Komura of the Japan Oilseed Processors Association (Aug. 2013).

2074. Settai, Hatsurô; Itô, Bunjûrô. 1920. Manshû daizu [Manchurian soybeans]. Dairen: Man-Mo Bunka Kyôkai. 12 + 234 + 158 p. Plus 6 unnumbered pages of plates. Illust. 23 cm. [Jap]

Address: South Manchuria Railway, Dairen.

2075. Takenob, Y. 1920. Japan Year Book. Tokyo: Japan Year Book Office. 810 p. See p. 528, 545, 604, 635, 711, 744. Tenth annual issue. [Eng]

• ***Summary:*** The full title of this book is: "The Japan Year Book: Complete cyclopedia and general information and statistics on Japan and Japanese territories for the year 1920-21."

This book gives statistics for the Japanese empire: Japan Proper, Korea, and Formosa.

Page 545. In the chapter on "Agriculture." A table shows production of soy beans, potatoes, and sweet potatoes, 1914-1918 (in 1,000 koku). Production of soy beans increased from:

3.664 million *koku* in 1914
3.807 million *koku* in 1915
3.750 million *koku* in 1916
3.695 million *koku* in 1917
3.451 million *koku* in 1918. Address: Prof. at the Waseda Univ. and Late of the *Japan Times*.

2076. U.S. Tariff Commission. 1920. Summary of tariff information, 1920; prepared for the use of the Committee on Ways and Means, House of Representatives. Washington, DC: Government Printing Office. 1004 p. See p. 320-22, 779-80, 990. [7 ref]

• ***Summary:*** Contains a description of the soybean, its uses, production, and quantities imported, and the tariff regulations applicable to the various soy products.

Paragraph 200, page 321: "The provision in this paragraph for 'bean stick [dried yuba sticks] or bean cake, miso, and similar products,' covers a Japanese food product made from ground soja (soya) beans and water, known as frozen tofu or koya-dofu, and fried tofu or hoshi aburage, the frozen tofu or koya-dofu being in the shape of small, porous, yellow cakes about one-half inch thick, from 1½ to 2 inches square, and the fried tofu or hoshi aburage being in thin cakes one-quarter inch thick and 2½ to 5 inches in diameter, which have been fried in some kind of oil or grease. Even if not bean cake it is dutiable as a product similar to bean cake, bean stick, and miso. (G.A. 8045, T.D. 37079, of 1917, following Abstract 29577, T.D. 32780, of 1912.) *'Amasake,'* made from rice yeast (30 per cent) and boiled rice (70 per cent), used as a drink among the Japanese, was likewise classified as a 'similar product,' apparently as similar to miso. (Abstract 31147, of 1913).

Oil cake produced from the soya bean is free of duty as oil cake provided for in paragraph 560. (Abstract 23794, T.D. 30828, of 1910)."

Paragraph 201, p. 321-22: In the Act of 1909, sauces of all kinds were subject to a 40% ad valorem duty; this decreased to 25% in the Act of 1913. Thick sauces include dressings and condiments such as chutney. "Thin *Chinese*

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soy made by mixing cooked soy beans with wheat flour, salt, and water and exposing to the sun for about three months, used to flavor and color soups, fish, and meats, about 80 per cent being used in the kitchen and about 20 per cent on the table, is dutiable as a sauce hereunder and not as a nonenumerated manufactured article under paragraph 385. (9 Ct. Cust. Appls., -; T.D. 37976, of 1919.) *Japanese shoyu* is also classified as a sauce under this paragraph. (T.D. 37574, of 1916; Abstract 43496, of 1919.)"

Paragraph 606, p. 779-80. A duty is first levied on soya beans in the Act of 1913.

"Description and uses.–*Soya beans* used in oil mills, the important consumers, are chiefly imported. Soya-bean cake, or meal, a by-product of oil manufacture, is a valuable cattle feed and enters extensively into international trade. (See pars. 560 and 561.) In China and Japan the beans, cake, and oil are elaborated into a large number of food products, such as milk, cheese, flour, bean cake, and soya sauce... Except by resident Asiatics there is only a limited use of soya beans for food purposes.

"Production.–Soya-bean culture has recently developed rapidly... Imports of *soya beans,* too small to be listed separately prior to 1914, rose from about 2,000,000 pounds in 1914 to about 32,000,000 pounds in 1918; during the same period imports of soya bean *oil* rose from 16,000,000 to nearly 337,000,000 pounds.

"Soya beans cooked and salted, but not enough to so change them as to prevent their identification as soya beans, and packed in tins, jars, bottles, or similar packages, do not thereby lose their status as soya beans and are free of duty under this paragraph rather than dutiable under paragraph 199. (6 Ct. Cust. Appls., 415, of 1915.) *Soya beans* in stone jars and hermetically sealed tins, invoiced as *bean sauce,* were likewise classified, and not dutiable as prepared beans under paragraph 199, nor as sauce under paragraph 201. (G.A. 8217, T.D. 37860, of 1918.) *Beans* and *bean sauce* prepared or preserved in tins, jars, bottles, or similar packages, were also held free of duty under this paragraph, analysis of the samples showing them to be soya beans, either natural or prepared. (Abstract 41021, of 1917.)... A *black bean* known to the Japanese as *Kuromame,* was held not to be free of duty under this paragraph, the evidence being insufficient to prove that the merchandise was soya beans. (Abstract 42852 of 1919)." Address: Washington, DC.

2077. Johnson, Wynonah B. 1921. Dining 'round the world in Los Angeles. *Los Angeles Times.* Jan. 1. p. VI9.
• ***Summary:*** The section titled "In Chinatown's alleys" describes it as appealing to the tourist, inscrutable, and intriguing. "Of course the main standby of the oriental cafe is chop suey, in one of its fifty-seven disguises. Don't ask me. I don't know what it's made of... I leave it to luck and the almond-eyed chef, and proceed to mix it with the mound of snowy rice in its companion dish, and drench the whole with soy-sauce, and get a firm hold on the chop-sticks–and we're off." "The long slender black ones [chopsticks] give a final flavor of the celestial kingdom to these mysterious dishes..."

The section titled "In Little Tokyo" begins: "... there is something very different about Chinese and Japanese eating places. Heavy carvings and somber hangings give place to lighter and more artistic furnishings, and the inscrutable waiter is replaced by a smiling boy or glossy-haired maiden who will serve you just as deftly, but somehow with a subtle difference." Some of the delicate little confections "are made right here in the Japanese district, where they are in big demand. These centers look and taste like chocolate, but they are made, the polite clerk assures us, of [azuki] bean-paste, which also forms the foundation of many others." Seaweed is on the menu and "each plate is a delight to the eye, at least. The surroundings are immaculate;..."

2078. Adkins, Dorothy Margaret. 1921. The soya-bean problem. *Science Progress* (*London*) 15(59):445-51. Jan. [9 ref]
• ***Summary:*** This is a popular article. Contents: Introduction. Practical applications of the bean: Food uses include Tofu, or bean cheese (Japanese), Miso similar to chiang (Chinese), Shoyu (Japanese) and chiang-yu (Chinese), Natto (Japanese), whole dry soya-beans, soya-beans canned as a green vegetable (see description below), vegetable milk, soya-beans roasted, ground and used as a coffee substitute in Switzerland and the USA, soya flour, soya in diabetic diets and macaroni. Utilisation of soya-bean oil: In Italy, China, Manchuria. Utilisation of soya-bean cake and meal: As fertilizer in China and Japan, for feeding stock. Food value of the bean. The cultivation of the soya bean: China, Japan, United States, Australia (New South Wales), South Africa, West Indies, British East Africa, West Africa, Burmah [Burma], England.

"In Japan beans are germinated until the sprouts are about five inches long, and eaten with vinegar; beans, germinated and treated with brine, have also been noted in Spain." Note: It is not stated clearly that these beans in Japan or Spain are soya beans.

"Soya-beans may be cooked and used in the same way as haricot-beans, and may also be picked when young and treated like green peas, in which condition they may be canned."

"In South Africa success has been achieved in growing the plant; in 1910 the outlook was so hopeful that a project for constructing oil mills was suggested. Unfortunately the bean was not taken up by farmers, who preferred to cultivate maize, as it was an easier crop to produce. Thus no extensive culture of the bean was attempted, and the subject was dropped.

"In other parts of the Empire, for example the West Indies, British East Africa and West Africa, trials of soya-beans have proved successful, but in no district have

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promising early experiments been followed by tests on a larger scale."

"In certain parts of India, for example Burmah, soya-beans are grown on a large scale and are consumed by the natives."

Note: "Lower Burma is a historical region, referring to the part of Burma annexed by the British Empire after the Second Anglo-Burmese War, which took place in 1852... Lower Burma was centered at Rangoon, and composed of all of the coast of modern Burma, and also the lower basin of the Irrawaddy River, including Prome. The area was also known as British Burma" (Source: Wikipedia, Oct. 2010). Address: Royal Holloway College, London.

2079. Oshima, Kokichi. 1921. Re: Description of Japanese foods pickled in miso or shoyu, imported to New York. Letter, probably to Margaret B. Church, Bureau of Chemistry, USDA, Washington, DC, Feb. 12. 2 p. Handwritten. [Eng]

• ***Summary:*** Mentions daikon misozuke (white radish), taimiso (sea bream), youkizuke (Miscellaneous vegetables in shoyu).

Note: According to Dr. Charles Thom's personal papers from about 1922-23, Kokichi Oshima spent 7-8 months at the Microbiological Laboratory of the USDA Bureau of Chemistry doing research related to food fermentation, such as quantitative determination of industrial mold enzymes. Oshima was a graduate of Hokkaido Imperial University (Sapporo, Japan). In Dec. 1922 and Feb. 1923 Oshima was back in Sapporo. Address: Apt. 42, 604 W. 139th St., New York City, NY.

2080. Armstrong, Robert B. 1921. Wants tariff on soy bean: American growers seek bar against Orient, Japanese control Manchuria and undersell. *Los Angeles Times.* Feb. 15. p. I4.

• ***Summary:*** The National Board of Farm Organizations asked the government's Ways and Means Committee for permanent high protection against "all oriental vegetable oils, especially the soya bean of Manchuria and its products." Charles W. Holman, chairman of the tariff committee of this farm organization, made this plea in behalf of American producers. He presented a long list of facts and figures about "the soya bean industry" which he gathered first hand by investigations in Manchuria and Japan. These included historical statistics on production and trade of soya beans, soya bean oil, and soya bean cake.

He said that about 90% of the soya bean oil from all of China comes from the Manchurian territory. During the war [World War I], the USA imported nearly all of that oil. Manchurian production of soya beans has already reached a point "where it taxes the mills of Japan and Manchuria to crush the beans."

Manchuria is rapidly falling under the domination of the Japanese due to their successful policy of controlling transportation, and establishing Japanese town settlements all along the rail lines. The Japanese imperial government cooperates closely with Japanese bankers and traders, and with the network of purchasing agents, located even in remote villages.

Japanese control the ports of Dairen, Antung, Fusan, and (to some extent) Vladivostok. "Their virtual seizure and operation of the Chinese Eastern Railway, the Russian Railway through Northern Manchuria, connecting with the Japanese-owned South Manchurian Railway at Chang Chun (Changchun), gives them control over the inland transportation of the beans and makes it exceedingly difficult for European or American firms to compete with Japanese firms in interior transactions."

Chinese farmers are paid little for their raw soya beans, and Japanese traders can lay down oriental oils on America's Pacific Coast ports at prices low enough to depress the market and discourage production by U.S. farmers.

2081. Meekins, Lynn W. 1921. Favorable outlook for American trade in Manchuria. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 24(41):983-93. Feb. 18. See p. 989-91.

• ***Summary:*** "The South Manchuria Railway Co., the largest purchaser of American products, proposes to spend more than $200,000,000 gold upon improvements and extensions of its enterprises within the next five years... In spite of Japan's special advantages in Manchuria there is an excellent opportunity for the marketing of many lines of American goods,..." Manchuria is made up of three provinces having an area of some 365,000 square miles.

"American trade with Dairen–Dairen versus Vladivostok: The share of the United States in the trade of Dairen is much larger than that shown by the Maritime Customs statistics, owing to the extensive shipments of goods to and from the United States credited to Japan as the country of immediate destination and origin. The direct trade between Dairen and the United States exceeded $38,000,000 in 1919, of which imports [to Dairen] comprised two thirds and exports one third."

"As between Dairen and Vladivostok, at present a greater risk is involved in using the Vladivostok route. Costs of handling cargo at that port are higher than at Dairen; there is no market at Vladivostok itself for produce shipped there, wharves and warehouses are inadequate, and shipping services are irregular. Until these conditions are improved Dairen will probably continue to handle most of the exports of Manchurian products, as well as the imports of American goods for sale in Manchuria.

"If Vladivostok were made a free port and provided with facilities which Dairen now enjoys, full advantage could be taken of it as a real open door to Manchuria. Vladivostok, rather that Dairen, offers the more promising outlook to

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American firms seeking non-Japanese business in Manchuria and eastern Siberia."

"It is estimated that 2,500,000 tons of soya beans are produced annually in the three Provinces of Manchuria. The wheat and millet crops generally approximate 1,000,000 tons each. The Japanese firm of Suzuki & Co. has sold 100,000 tons of Manchurian wheat to the United Kingdom and 50,000 tons to Italy during the last few months."

"The products of the soya bean include bean curd [tofu], flour, milk, cheese, soy sauce, oil, and cake. The Chinese are concerned chiefly with the food products mentioned and the Japanese use large quantities of the cake for stock feed and fertilizer. The United States is the principal purchaser of the oil, a substitute for cottonseed and linseed oil employed in the manufacture of soap and paint and also as a lubricant."

"How bean trade is conducted: In Tiehling and Sunkiatai (Fengtien) and Kwanchengtze (Kirin) there are about 300 Chinese wholesale bean companies whose capital averages from $100,000 to $200,000 Mukden currency. Four Chinese banks–the Bank of China, the Bank of Communications, the Government Bank of the Three Eastern Provinces, and the Hsing Yeh Bank of Mukden–negotiate loans upon the joint guarantee of two of these companies without security; other Chinese banks require in some cases that the beans be pledged. Such loans are for three months or six months, sometimes one year, and the rate of interest has been less that 10 per cent. The Japanese banks lending money to bean dealers are the Yokohama Specie Bank and the Bank of Chosen [Korea], the former issuing Newchwang notes and the latter gold notes. It is estimated that between 60 and 70 per cent of the loans made by the Japanese banks is to Chinese and between 30 and 40 per cent to Japanese companies.

"The bean business may be said to commence in September, when buyers visit the producing districts and pay from 10 to 20 per cent of the stipulated price in advance. To the towns mentioned above, from 1,000 to 2,000 cartloads of beans are brought daily from November to January. The average price during the past two years has been $2 Mukden currency per 27 catties (36 pounds), exclusive of the production tax and the cost of transportation to Dairen and Newchwang. Mukden currency–that is, small coin dollars–exchanges for Mexican dollars at an average value of $1.40 to $1. At the present rate they are equivalent to about 40 cents in United States currency.

"Owing to the lack of good roads in Manchuria the beans must be carried to the market centers during the winter months, when the fields and streams are frozen. By March the crop has been collected and stored and exports become most active.

"Through the system of mixed storage, the South Manchuria Railway Co. has effected a great improvement in the handling of beans. When brought to the railway stations the beans are examined and graded according to quality and size. A certificate issued to the depositor entitles him to draw from the mixed-storage depot at Dairen or Newchwang an equivalent amount of beans of the same quality and size. The bags used in packing are also examined, and when the grade of bags deposited and that of the bags delivered is different the loss or gain thereon is adjusted by paying to or collecting from the depositor the difference in value. The new system saves the railway the trouble of transporting and storing each consignor's cargo separately. It also saves the shipper from the risks attending delay in transportation and from searching for his goods after they have arrived at their destination.

"Production of oil: The 60 bean mills at Dairen produce daily nearly 400 tons of oil and 3,700 tons of cake. Newchwang and Harbin are next in importance as oil-mill centers. The most widely used method of production is the expression system, by which one picul (133.33 pounds) of beans yields about 12 pounds of oil and 122 pounds of cake (in two equal pieces of 61 pounds each). By the chemical extraction system one picul of beans yields an average of 17 pounds of oil and 116 pounds of meal. The specific gravity of the oil is from .922 to .930.

"Sapan-wood, hemp seed, sesamum, and bean oil are being used by the Manchuria Paint Factory in Dairen, organized in February, 1920, with a capital of 1,000,000 yen, to manufacture paints for the South Manchuria Railway Co. and for various markets. The daily output is about 7,000 pounds, or 250 tins containing 28 pounds each. The colors produced include white, 'iron rust' red, and brown.

"The Japanese initiated the export trade in soya beans from Manchuria and developed the business to its present proportions. These middlemen, conversant with oriental ways, studied occidental needs and learned enough about western business methods to deal successfully with American and European firms. their strong position is due to their control of railways, their banking connections, their oil mills, and, in general, their special organization in South Manchuria for handling the business. Eventually it may be possible by exporting beans and oil through Vladivostok for Chinese sellers and American buyers to deal directly with each other. Meanwhile the most effective methods to be employed involve the development of selling and buying organizations able to cope with the situation now existing."

"About two thirds of the population of Manchuria is in the Province of Fengtien, which composes, in general, South Manchuria." Address: Trade Commissioner, Peking.

2082. Morse, W.J. 1921. Hahto soy bean a promising new variety for food. Washington, DC. 2 p. Unpublished manuscript. Feb. 23. 28 cm.

• ***Summary:*** "Attention farmers in the Southern and Central States is being attracted to the Hahto variety of soy beans as a most palatable and nutritious green vegetable similar to lima and butter beans. A small packet of seed of this variety was obtained by a missionary at a county agricultural

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exhibition in Japan about five years ago and sent to the Department. In the variety trials it appeared exceedingly promising for use as a green vegetable and was found very prolific. During the past two years it has been grown extensively by the boys' and girls' canning clubs of the Southern states and the past year was in general distribution. Reports indicate a large number of successful results with the Hahto 'both for man and beast' as stated in many of the reports. Its popularity has caused it to be listed the present season by two large seed houses in the Eastern States.

"Although the Hahto is best adapted to the Southern States and the southern part of the corn belt, it may be successfully produced as a green vegetable much further North. As a green vegetable, the pods should be picked when the seed is almost full grown. These beans may be canned like green peas and make an excellent green vegetable for the winter.

"The Hahto is a bush variety, very prolific and suitable for forage and produce. It requires about one hundred and thirty days to reach full maturity but may be used as a green vegetable in about one hundred and fifteen days. In addition to its use as a green bean, the mature seeds make an excellent dried bean more easily cooked and a better flavor than the varieties of soy beans ordinarily obtained on the market."

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 92–Morgan-Morse.

Sent to Soyinfo Center by Matthew Roth of Rutgers Univ., March 2012. Address: Agronomist, Forage-Crop Investigations, Bureau of Plant Industry, USDA, Washington, DC.

2083. Suzuki, Keiko. 1921. Daizu no shihan ryû o shôzuru genin ni tsuite [Studies on the cause of "shihan" (purple speck) of soybeans]. *Chosen Nokaiho* (*Chosen* [*Korean*] *Agricultural Association Report*) 16(2):24-28. Feb. [Jap]
• ***Summary:*** Suzuki believed that the cause of the purple speck [stain] disease of soybeans might be due to the mechanical stress exerted by the pod in consequence of unequal growth between pod and seed. Thus, climatic conditions were considered the chief cause of the disease. Note 1. Suzuki was wrong. Kikuchi soon showed that the real cause of the disease was a fungus of the genus *Cercospora.*

Note 2. This is the earliest document seen (Feb. 2006) concerning the purple stain of soybeans. Address: Korea.

2084. Thom, Charles; Church, Margaret B. 1921. *Aspergillus flavus, A. oryzae,* and associated species. *American J. of Botany* 8(2):103-26. Feb. [54 ref]
• ***Summary:*** Introduction. "The numerous strains align themselves into groups of closely related forms which may for convenience be considered here under three series names."

Aspergillus flavus-oryzae series. The saké industry of Japan is based upon the diastatic power of *A. oryzae* (Ahlb.) Cohn. When "numerous cultures from the soy or shoyu industry of Japan and China are brought together, a whole series of forms are found which bridge the gap morphologically between *A. oryzae* as the saké organism and *A. flavus* as described and distributed also by Wehmer. Material taken directly from fermenting vats in China by Dr. Yamei Kin, formerly of the Bureau of Chemistry, shows strains of this character. Inoculating material furnished by Dr. Teizo Takahashi for experimental work on the fermentation of soy sauce or shoyu proved to be a member of this series. Dr. Takahashi had selected his strain for this type of fermentation from among several recognized and studied by him in Tokyo... All of these strains are regarded by him as varieties of *Aspergillus oryzae*, not *A. flavus."*

Aspergillus oryzae series. "In the Oriental industries in which it has been long used, the separateness of this form is largely lost. It becomes, therefore, a gigantic race in a group in which other members possess the same habits, the same essentials of structure, but differ slightly in color and greatly in size... *Aspergillus flavus* was first described by Link (1809) in terms vague enough to baffle any attempt at certain identification."

Aspergillus Wentii and related forms. "The Java culture originally sent by Went to Wehmer was used in rice and soy fermentation on that island by Chinese workmen." *Aspergillus tamari* and allies. "A second brown series of forms is more closely associated in occurrence and in habit with *A. flavus* and its allies than is *A. Wentii.* Many cultures in this series have been obtained in forage and feeding stuffs, from the Oriental soy fermentations... In size of colony, habit, and appearance aside from color, these forms resemble *A. flavus.* In the markings of conidia they suggest *A. niger*... Kita (1913) described as *A. tamari* a culture discovered as a contamination in a Japanese fermented product, tamari-koji."

A photo (photomicrograph) shows the wide variety of heads in a species and in a strain of *Aspergillus tamari.* Includes a calyptrate head. Note: This is the second earliest study seen of a fermented food published by USDA researchers. Address: USDA Bureau of Chemistry, Washington, DC.

2085. *Agricultural News* (*Barbados*). 1921. The soya-bean problem. 20(492):73. March 5. [4 ref]
• ***Summary:*** Begins by summarizing articles from three other publications on the importance of having root nodule bacteria in the soil if the soybean plants are to bear root nodules and give a good yield of soybeans. Concludes by summarizing the many uses of the soybean, especially in Japan and China, including vegetable milk, oil, meal, and non-food industrial uses, as in the manufacture of linoleum, explosives, water-

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proof goods, rubber substitutes, and printing inks. "If vegetable milk is kept for several days, it turns sour, and can be used as butter milk. One firm in England is engaged in the production of a vegetable condensed milk, which is prepared from soya beans." Address: Barbados, West Indies.

2086. *Bean-Bag* (*The*) (*Lansing, Michigan*). 1921. Bean trade reports from the Orient. 3(10):34. March.
• ***Summary:*** Source: Commerce Reports. Discusses the effects of World War I on the trade of soya-beans, soya-bean oil, and [soya] bean cake from Manchuria.

There was a decline in shipments of soya bean oil due to "the high rate of exchange in Dairen and the low rate of exchange between the United States and Europe." Much of the oil imported from Manchuria "by the United States was shipped to Europe in the form of sauces, etc. Moreover, when the armistice was declared, large stocks of soya-bean oil were accumulated in the United States.

"Bean oil and bean cake industries: At present there are 20 bean-oil mills in Antung, with an estimated total capital of $1,077,000 and a daily capacity of 22,100 bean cakes (weighing about 62 pounds each) and 160,251 pounds of bean oil. These mills employ 1,100 men, paying to the great mass of laborers an average monthly wage of $8.60 with food and lodging and to some of the expert workmen operating hydraulic presses, etc, as much at $36.40 per month with food and lodging and to some of the expert workmen operating hydraulic presses, etc. as much at $36.40 per month with food and lodging.

"At present there are 20 [soya] bean-oil mills in Antung, with an estimated total capital of $1,077,000 and a daily capacity of 22,100 bean cakes (weighing about 62 pounds each) and 160,251 pounds of bean oil. These mills employ 1,100 men, paying to the great mass of laborers an average monthly wage of $8.00 with food and lodging and to some of the expert workmen operating hydraulic presses, etc. as much at $36.40 per month with food and lodging.

"Of the 20 mills operating in 1919, 2 were equipped with locally-made hydraulic presses and the remainder with native hammer and wedge presses and hand-operated screw presses. All the mills are equipped with steam or oil driven rollers for crushing beans, most of the engines being of Japanese make with a few large engines of English make. The new mills are obtaining equipment in Darien from a Chinese machine shop which specializes in bean-oil presses and allied material. Until the world trade in vegetable oils has settled into its new post-war channels, there is small likelihood of supplanting present equipment in Antung mills by more modern machinery.

"Bean cake as fertilizer: The local bean-oil market was greatly stimulated by the war; and while local trade will probably suffer a setback from post-war readjustments, the trade in bean cake seems more certain, as Chosen (Korea) and Japan are using increasingly large quantities for fertilizing rice fields, the high prices for rice strengthening this demand. In urging its use by farmers, the Japanese Government estimates that Korea's rice output may be increased 40 per cent, thus assisting materially in solving Japan's food problem."

2087. Matsumoto, K. 1921. Shôyu seibun-chû yûki-san-rui no kenkyû. I. [On the organic acids in shoyu. I.]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 85. p. 381-412. March. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Gishi; 3. Gishu; 4. Ko (Yatotta = Hired).

2088. Nishimura, Torazô; Kinoshita, A.; Inoue, T. 1921. Shôyu jôzô yô enshitsu hikaku shiken [Comparative examination of salts for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 84. p. 325-42. March. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Gishi; 3. Gishu.

2089. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*). 1921. Japanese trade and economic notes. 24(84):252-53. April 12.
• ***Summary:*** "Export of beans and bean products from Dairen during 1920:" A table shows the exports (in piculs) of [soya] beans, bean cake, and bean by destination. The three leading destinations are Japan, England, and Egypt. Others are Hongkong, Dutch East Indies, Sweden, Denmark, Holland, France, Korea, United States.

2090. *Bean-Bag* (*The*) (*Lansing, Michigan*). 1921. A line on how China [soya] bean trade is conducted. 3(11):25. April.
• ***Summary:*** "In Tiehling and Sunkiatai (Fengtien) and Kwanchengtze (Kirin) there are about 300 Chinese wholesale bean companies whose capital averages from $100,000 to $200,000 Mukden currency. Four Chinese banks–the Bank of China, the Bank of Communications, the Government Bank of the Three Eastern Provinces, and the Hsing Yeh Bank of Mukden–negotiate loans upon the joint guarantee of two of these companies without security; other Chinese banks require in some cases that the beans be pledged. Such loans are for three months or six months, sometimes one year, and the rate of interest has been less than 10 per cent. The Japanese banks lending money to bean dealers are the Yokohama Specie Bank and the Bank of Chosen [Korea], the former issuing Newchwang notes and the latter gold notes. It is estimated that between 60 and 70 per cent of the loans made by the Japanese banks is to Chinese and between 30 and 40 per cent to Japanese companies.

"The bean business may be said to commence in September, when buyers visit the producing districts and pay from 10 to 20 per cent of the stipulated price in advance. To the towns mentioned above, from 1,000 to 2,000 cartloads of beans are brought daily from November to January. The average price during the past two years has been $2

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Mukden currency per 27 catties (36 pounds), exclusive of the production tax and the cost of transportation to Dairen and Newchwang. Mukden currency–that is, small coin dollars–exchanges for Mexican dollars at an average value of $1.40 to $1. At the present rate they are equivalent to about 40 cents in United States currency.

"Owing to the lack of good roads in Manchuria the beans must be carried to the market centers during the winter months, when fields and streams are frozen. By March the crop has been collected and stored and exports become most active.

"Through the system of mixed storage, the South Manchurian Railway Co. has effected a great improvement in the handling of beans. When brought to the railway stations the beans are examined and graded according to quality and size. A certificate issued to the depositor entitles him to draw from the mixed-storage depot at Dairen or Newchwang an equivalent amount of beans of the same quality and size. The bags used in packing are also examined, and when the grade of bags deposited and that of the bags delivered is different the loss or gain is adjusted by paying to or collecting from the depositor the difference in value. The new system saves the railway the trouble of transporting and storing each consignor's cargo separately. It also saves the shipper from the risks attending delay in transportation and from searching for his goods after they have arrived at their destination."

2091. *Bean-Bag* (*The*) (*Lansing, Michigan*). 1921. Soy bean makes its way north to colder climes. 3(11):51-52. April.
• ***Summary:*** "The soy bean, an Asiatic importation, popularly associated with the South, is making its way north, and is being well received.

"Most of the varieties first brought to this country were from parts of Asia, whose climate corresponded more nearly to the southern states. Within the last seven or eight years the department [USDA] has obtained about 300 introductions of soy beans from Manchuria, Korea and Japan, some of which grew as far north as the 52d parallel. The most promising northern varieties are the Black Eyebrow, the Mandarin, and the Manchu, all native to a latitude of about 46 degrees, on account of which they are adapted to our most northern states. A large number of samples of Black Eyebrow soy bean were sent to northern farmers last year, and out of 551 reports returned more than 400 were favorable. Reports promise a great increase in acreage in northern states this year. Seedsmen are laying in supplies of these more northern varieties; but many farmers, if unable to obtain northern seed, will plant old varieties, such as Ito San. From 90 to 95 per cent of soy beans are raised for hay, silage and pasture, although they are prolific seed producers."

2092. Dickver, E.R. 1921. Hydrogenation of oils in Japan. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 24(114):972. May 17.
• ***Summary:*** "The hardening of fish and vegetable oils by hydrogenation is a comparatively recent industry in Japan, having been started in 1912, with one factory under foreign management. Originally the industry was intended to furnish hardened oils for soap making, but... there is now a small surplus for export."

Eight plants in Japan now hydrogenate oils; their combined capacity is 62 tons per day. "The raw materials used by most of these plants are whale and fish oils, although a few also harden vegetable oils (principally coconut and soya bean), or fish and vegetable oils mixed."

The future depends on the soap industry (both toilet soaps and laundry soaps), which has tripled in size during the past 10 years.

2093. Miura, Michiya. 1921. Manshû shuyô nôsakumotsu no byôgai [Diseases of Manchuria's principal agricultural crops]. *Minami Manshu Tetsudo K.K. Nôji Shikenjô Ihô* (*South Manchuria Railway Co., Agricultural Experiment Station Bulletin*) No. 11. 56 p. English abstract in Japanese Journal of Botany 1(1):9. (1923). [Jap]
• ***Summary:*** The first section (p. 1-29) is about soybean diseases. This is the world's earliest document seen (April 2002) that mentions downy mildew on soybeans. Discusses: Peronospora trifoliorum, Mitiya, Bacterial blight, downy mildew, Sclerotinia rot, ring spot, silk rot, rust, gray spot, brown spot, frog-eye leaf spot (*Cercospora daizu* Miura), yellows, soil sickness, Minami Manshu Tetsudo K.K. Noji Shikenjo Iho. Address: Minami Manshu Tetsudo K.K. Nôji Shikenjô (South Manchuria Railway Co., Agric. Exp. Station).

2094. Takimoto, S. 1921. Daizu no saikin-sei hanten-byô [Bacterial spotting disease of soybean]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 8:237-41. May. [Jap]
• ***Summary:*** This preliminary note calls attention to a spotting bacterial disease of soybean in Japan. The disease is said to be caused by a new bacterium which is not identical to *Bacterium glycineum, B. soyæ,* or *Pseudomonas glycineum* Nakano. The name of the causal bacterium is not given. Address: Chosen Kangyo Mohanjo.

2095. *Times of India* (*The*) (*Bombay*). 1921. The chemical industry. June 3. p. A5. Indian Engineering Supplement.
• ***Summary:*** The section titled "Hydrogenation of oils" states: In Japan, the new process was first used "for hardening fish oils (whale oil chiefly), but it subsequently extended to soya bean oil and other oils. The Dairen Oil and Fat Industry Company was formed in 1916 at Dairen, with a capital of 1,000,000 yen, for hardening soya bean oil, most of the shares being held by the Manchurian Railway Company (Japanese). The process is particularly adapted for

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the manufacture of artificial tallow, and the new company at Dairen hope to sell large quantities of this tallow in the Fat East. The well-known firm of Suzuki & Co., of Kobe, among numerous other interests, are also interested in fat-hardening They are the principal shareholders in the Hodogaya Soda Works and are now utilizing the hydrogen from these works for fat-hardening purposes. Other firms largely engaged in the new industry are Lever Brothers... and Nihon Glycerine Company."

2096. Butts, Halleck A. 1921. Edible oils and bean cake in Japan. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*) 24(139):1558-59. June 16.
• ***Summary:*** The Asano Bussan Co., of Tokyo, which operates its own mills and does an extensive import and export business, "states that practically all the soya beans used in Japan by the Japanese mills are imported from Manchuria and the local beans are scarcely used in the manufacture of oil.

"The [Japanese] Department of Agriculture and Commerce lists 21,304 vegetable oil mills in Japan, employing 28,663 persons. These figures, however, include the vast umber of small hand-powered mills using primitive crushing methods and scattered throughout the country districts. Accurate statistics from these mills are practically impossible to obtain. There are about 40 oil mills in Japan of commercial importance; (the Department of Agriculture and Commerce lists 33). Of these, 20 are located in the Kobe consular district... The 34 largest mills have a capacity of about 3,570,200 gallons of oil per month. The production of oil for 1918,... which was a banner year for the industry and the mills were practically working at full capacity, was 547,671 koku (1 koku = 47.6 gallons)." So 26,069,139 gallons in 1918.

A table (p. 1558) shows production by type of oil (in koku): Coconut 181,121. Rape seed 156,455. Soya bean 147,188. Perilla 21,514. Sesame seed 18,358. Cottonseed 16,152. Peanut 12,883. Total: 547,671.

"Of the 33 mills listed by the Department of Agriculture and Commerce, 14 use the pressure method, 17 use the benzine extraction method, and 2 use both processes." The many small mills do not obtain oil from soya beans. Address: Trade Commissioner, Tokyo.

2097. *Commerce Reports* [*USA*] (*Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce*). 1921. Chinese trade and economic notes. 24(151):1844-45. June 30.
• ***Summary:*** "Reduction in railroad freight rates to Dairen: In order that Dairen may be able to compete with Vladivostok for the purchase of produce, the South Manchuria Railway Co. has announced that the freight rate on beans, bean cake, bean oil, wheat, and flour, if these products represent through traffic from stations north of Tao Lai Chao, on the Chinese Eastern Railway, to either Dairen of Newchwang, has been reduced approximately 34.2 per cent, writes Consul Kirjassoff.

"Conditions in Dairen bean trade: In the weekly commercial report of the Nisshin Oil Mills (Ltd.), Dairen, dated May 14, 1921, which was forwarded by Consul Karjassoff, attention is drawn to the serious effect upon Dairen of the formidable rivalry of Vladivostok, to which port beans and bean cake from the interior markets are being forwarded and exported to Japan at lower quotations that in Dairen. The stocks of beans at the Dairen wharf godown of May 12 are given as 82,992 short tons, compared with 139,554 short tons at the same time in 1920."

2098. Henmi, H. 1921. Nattô no kôso ni tsuite [The enzymes of natto]. *Sapporo Norin Gakkaiho* (*J. of the Society of Agriculture and Forestry, Sapporo*) 13(57):121-38. June. [5 ref. Jap]
Address: Sapporo, Japan.

2099. Hoshino, T. 1921. Wealth of Manchuria not in beans alone: Yields of various crops being greatly increased as vast areas become cultivated. *Trans-Pacific* 4(6):72-76. June.
• ***Summary:*** "Soy beans and kaoliang are by far the two most important products of Manchuria. Broadly speaking, the latter feeds the people while the former fetches them money, so they may be well compared with silk and rice in Japanese economy. But beans do perhaps more for Manchuria than silk does for Japan, for, without beans, the trade of Manchuria would shrink at once to one-half its actual amount...

"According to one authority a total of no less than 5,126,655 acres or about 19 per cent of all the cultivated land in Manchuria is devoted to the cultivation of beans, and the yield, averaging 21 bushels per acre, amounts to something like 108,000,000 bushels, of which 70 per cent is produced in South Manchuria. Though South Manchuria thus produces far more beans than North Manchuria, they are mostly grown in its northern part, the districts bordering on North Manchuria... Something like 2,000,000 bushels are added to the crop every year...

"The most important food-stuff of the native population, kaoliang, ranks next to beans even as an article of trade, though, last year for once, it was ousted from the position by wheat. It is also the principal grain food of the numerous animals so important in Manchurian agriculture. Out of it is made kaoliang spirit, the most popular drink in the country. The stalk is used for fuel and roofing material, and is also women into Chinese mats, indispensable in native households.

"Before soya beans attained their present importance, half the total area of the cultivated land in Manchuria is said to have been devoted to Kaoliang."

The main livestock animals in Manchuria are pigs

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(5,298,647), horses (1,769,968), oxen (888,374), sheep (586,128), mules (552,018), and donkeys (508,596).

Photos show: (1) Endless sacks of soybeans at Changchun. (2) New Dairen Wharf Office, opened Nov. 1920. (3) Exterior of Suzuki company's chemical [solvent] extraction bean mill. (4) A junk wharf at Dairen; the junks have very tall rectangular sails. Address: Research Manager, Bank of Chosen, Seoul, Korea.

2100. *San Francisco Chronicle.* 1921. Chronicle shipping news. July 14. p. 18.
• ***Summary:*** The section titled "Siberia Maru from Orient" states: "With 320 passengers on board in all classes, the Japanese liner Siberia Maru made port yesterday from Oriental ports. The vessel carried... general cargo, including [soy] bean cake, brush, bamboo, baskets, [soy] beans, gunny sacks, wood oil, rattan furniture, 1,200 bales of raw silk and 388 bags of mail."

2101. *Los Angeles Times.* 1921. The American Farm Bureau Federation has enlisted the support of the swine breeders' associations... Aug. 14. p. VIII6.
• ***Summary:*** "... in its campaign for a high tariff on vegetable oils, which are pouring into the Pacific states from China and Japan in great quantities. During the past year 85,000,000 pounds of cocoanut and soy bean oils were imported."

2102. Hemmi, Takewo. 1921. Nachtraege zur Kenntnis der *Gloeosporien* [Addenda toward a knowledge of the *Gloeosporien*]. *Journal of the College of Agriculture, Hokkaido Imperial University* 9(Part 6):305-46. Aug. See p. 315, 317-18, 327, 330, 337. [24 ref. Ger]
• ***Summary:*** Discusses: Gloeosporium sp., Colletotrichum glycines (=C. dematium f. truncata). Cultural studies on the influence of sulfuric acid, boric acid, sodium hydroxide, and different concentrations of sugar and pepton on the growth of *Gloeosporium* sp. and *Colletotrichum glycines.* Address: Nogakuhakushi.

2103. Ito, Seiya. 1921. Daizu iôbyô ni kansuru chôsa [Notes on plant diseases and weeds in Hokkaido. V. Studies on "yellow dwarf" disease of soybean]. *Hokkaido Nogyo Shikenjo Hokoku* (*Hokkaido Agricultural Experiment Station, Report*) No. 11. 59 p. Aug. See p. 47-59. [Jap]
• ***Summary:*** Soybean-cyst nematode is named "soybean yellow dwarf disease". Address: Phytopathologist, Sapporo, Japan.

2104. *Light of Manchuria.* 1921. Manchuria Enlightening Society. Whose organ the "Light of Manchuria" is. Sept. 1. p. 54-55.
• ***Summary:*** "What actuates us in our endeavours to open up Manchuria and Mongolia lies in realizing our ultimate ideal in the enlightenment and development of Manchuria and Mongolia. It will not do only to develop the natural and industrial resources, but the ethical and intellectual culture of the inhabitants must also be carefully husbanded and nourished, so that both mind and matter may be developed in harmony.

"It is urgently important that the truths regarding Manchuria and Mongolia should be made known clearly not only to Japan and China, but also to Europe and America. On this account, the establishment of the Manchuria Enlightening Society is bound to have a serious significance of international character."

The Society also helps travelers and observers wishing to visit Manchuria, Mongolia, Siberia, Chosen (Korea), China, etc. All officials of the Society are Japanese.

2105. Tsugawa, Fukuichi. 1921. [Soluble protein extracted from soy bean]. *Japanese Patent* 39,827. Sept. 9. [Jap]*

2106. Berczeller, Laszlo. 1921. "Manna" food. Products of the soya bean. Bread, flour, and milk. *Times* (*London*). Sept. 28. p. 11-12.
• ***Summary:*** Contents: Preface. Introduction. Animal experiments. An ideal food. "Manna" milk. Children's food.

"We give below a statement which Dr. László Berczeller, a young Hungarian who was assistant to the late Professor Franz Tangl, has made to our Vienna Correspondent on the new foodstuffs which are being made from the soya bean. Dr. Berczeller is working in a laboratory specially placed at his disposal by the Austrian Minister of Public Health, and his studies are being watched with lively interest by the British Minister and the American High Commissioner in Vienna.

"It was in 1913, in Berlin [Germany], that I first turned my attention to the soya as a food. I was the guest of the Japanese Club and a Japanese professor showed me soya food and told me that a milk was made from the bean in Japan... Professor Riegler, also in Hungary, had invented a synthetic milk made from the gluten of wheat. I saw these products were not satisfactory as they only had qualities in the sense of the old theory of calories and protein value of foods."

Note: This is the earliest English-language document seen (Sept. 2011) that contains the term "soya food" or the term "soya as food."

"We have fed white rats on beans, peas, and lentils, and we have found that animals fed on beans live shortest and those on lentils longest." When animals are allowed to follow their instinct, and choose between "the several kinds of legumina... they eat most lentils, less peas, and least beans."

"It is well known that in the time of the Greeks men still used, of cereals, chiefly barley. Barley was followed by rye, especially in the Middle Ages, and both barley and rye were supplanted by wheat, as in England, as is the case today on

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the Continent."

"An ideal food–We now endeavored to apply this knowledge to the soya bean with a view to the food shortage problem. In the chemical sense, the soya is an ideal food. It contains 40 percent albumen and 20 percent fat, and at the same time can be obtained very cheaply. In Japan and China the soya is worked up into a number of very valuable foodstuffs by small industrialists. These foodstuffs do not meet European taste. Probably the Mongolian race has accustomed itself to this food.

"The European foodstuffs industry has made repeated efforts to produce out of the soya a good and palatable food, but every attempt has failed, because the biological factor has been ignored. We could show that most of the processes used for this purpose and for which patents were also taken out, such as for extraction and roasting, only lead to one result; the rats fed with this food have a much shorter life than even those fed with the raw soya.

"We have been successful in creating three foods: bread, flour and milk, in which these principles were taken into account. These foods have been tested not only in the laboratory, but also on man; man, because one does not even yet know to what extent of certainty one may conclude from animal experiments to human beings."

"The new 'Manna' bread which has been produced by Mr. Robert Graham and myself–Mr. Graham's technical and scientific experience in bread making rendered it alone possible to work out this problem–is the solution of the old standard bread controversy. We do not use the bran, which is already disintegrated by the milling process. We use better proteids than those contained in the bran and we introduce a great quantity of fat into the bread. The bread is cheaper than any other at present on the market."

"Manna flour contains 40 per cent proteid and 20 percent fat. In the raw state it has a sweet and pleasant taste. It can be used for soups and cooking vegetables."

"'Manna' Milk–If we give animals the choice between the best milk powder and manna flour, their instinct leads them to eat largely of the later; and if we feed them on eggs or meat and manna flour in a similar colloidal state, they consume more manna flour and less eggs or meat. We deduce therefrom that human beings will find it pays them better to use manna flour. Manna milk is in its proteid, carbohydride, and fat contents, and in its colour, very similar to cow's milk. It has an almond-like taste. Used with tea, cocoa, or puddings, ice creams and pastry, one cannot detect any difference from fresh milk. It is now being manufactured and its cost in Vienna will be six times less than fresh milk. It is merely a question of scientific research and manna milk will be biologically perfect also."

"It is indisputable that the food of the white race is very costly, especially when one compares it with the food which the yellow race is accustomed to. We observe the evil consequences of this difference above all in the United States. It is therefore a matter of the highest political importance that the West should learn the lesson of cheaper living as taught them by the East in the adaptation of the soya bean as an article of food."

"For fighting the Russian famine the aforementioned foodstuffs commend themselves for widely different reasons: -

"1. They can be produced very cheaply.

"2. No other albuminous food can be transported in such concentrated form.

"3. In the form of rusks it would obviate all difficulties arising out of a shortage or stoppage of fuel.

"4. To make a beginning, the foodstuffs could be very quickly produced in Vienna.

"5. The diffusion of these foodstuffs would lead to the permanent cultivation of the soya bean in Ukraine. This would be of great importance to the future provisioning of the whole of Europe."

Note: "The Russian famine of 1921, also known as Povolzhye famine, which began in the early spring of that year and lasted through 1922, was a severe famine that occurred in Bolshevik Russia. The famine, which killed an estimated 6 million, affected mostly the Volga and Ural River region.

"The famine resulted from the combined effect of economic disturbance, which had already started during World War I, and continued through the disturbances of the Russian Revolution of 1917 and Russian Civil War" (Source: Wikipedia, Russian famine of 1921, Nov. 2013). Address: Vienna, Austria.

2107. *Times* (*London*). 1921. "Manna" food. The soya bean in England. Sept. 29. p. 7, col. 6.

• ***Summary:*** "Experiments in the growing of the soya bean–the 'manna food' which formed the subject of an article in *The Times* yesterday–in this country have been made by the Board of Agriculture, but one of the varieties tried so far appears to be suitable for the English climate."

"The following is an account of the experiments of growing the bean in England given by the Ministry of Agriculture.

"'Previous to 1909 a few attempts had been made to grow the crop in England, but without any success... With the object of securing the hardiest sorts in cultivation the Board of Agriculture obtained from an experimental station in North Japan seed of 16 varieties, together with a small quantity of the soil in which the crop had been grown. These were sown at the Midland Agricultural and Dairy College and on the Cambridge University Farm. At both centres the results were similar–many of the varieties grew well, but none formed flowers. Where the Japanese soil had been applied, the nodule formation was all that could be desired, but where no inoculation had taken place no nodules were formed. In 1910 the Board obtained seeds of several varieties

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from Manchuria. These were grown at the same centres as before. At the Midland College the crop grew vigorously, but formed no seed, while at Cambridge the plants ripened a small quantity of seed. This seed was sown in 1911, but the crop made little growth, and in spite of the hot season, no seed was produced.'"

"The conclusion come to from these experiments by the Ministry of Agriculture is that the Japanese and Manchurian varieties of the soya bean cannot be relied on to produce seed in this country. But it is admitted that, as the plant appears to be a very variable one, it is not impossible that a variety suited to the climate and agricultural conditions of this country may yet be produced.

"Apart from the production of beans for use as human food, the plant might have some value in this country as a forage crop."

2108. Grinenco, Ivan; Capone, Giorgio. eds. 1921. Produits oléagineux et huiles végétales: Etude statistique sur leur production et leur movement commercial [Oleaginous products and vegetable oils: Statistical study on their production and trade]. Rome, Italy: Institute Internationale d'Agriculture, Service de la Statistique Générale. xxxii + 421p. See p. XX-XXI, 140-41, 144-47, 442-43, 480-81. Sept. 15. Index in front. [Fre]

• ***Summary:*** In Sept. 1921 the IIA (*Institute Internationale d'Agriculture*) published this monograph in French. Two years later, by popular demand, an updated English-language edition was published. Contents: Introduction. Northern hemisphere: Europe, America, Asia, Africa, Oceania (Hawaii, Guam). Southern hemisphere: America, Asia, Africa, Oceania. Recapitulative tables of commerce, 1910-19. Note 1. All import and export statistics are given in quintals. 1 quintal = 100 kg.

The soybean (introductory information, p. xxii-xxiii, xxxii). Northern hemisphere–Europe. Germany (imports of soybean and soy oil 1910-14, p. 4). Denmark (production of soy oil in 1917, p. 17; imports and exports of soybeans and soy oil 1910-19, p. 18-20). France (imports and exports of soybeans and soy oil 1910-19, p. 28-31). Great Britain and Ireland (treated as one country; imports, exports, and reexports of soybeans and soy oil 1910-19, p. 32-35). Norway (imports of soybeans 1910-19, p. 47). Netherlands (Pays-Bas, imports and exports of soybeans and soy oil 1910-19, p. 49-52). Romania (In 1915 production of soybeans on 3 hectares was 3,600 liters). Russia (in Europe and Asia, imports of soy oil 1909-17, p. 70-71). Sweden (imports and exports of soybeans and soy oil 1910-19, p. 74-76).

Note 2. This is the earliest document seen (Jan. 2009) that gives soybean production or area statistics for Eastern Europe.

America: Canada (imports of coconut, palm, and soy oil {combined} for the production of soap {in hectoliters} 1915-19, p. 88-89). Cuba (various attempts have been made to introduce the soybean, p. 94).

United States (area and production in 1909 {659 ha}, then from 1917-1920, p. 97-98). An overview of soybeans in the USA (p. 103, 105) states that the soybean, known in the USA since 1804, has become of great economic importance during the past few years. It is becoming popular mainly as a forage plant, but also for its seeds, for extraction of oil, and for making other products. Statistics have been published regularly since 1917. The census for 1909 showed 659 hectares cultivated in soybeans. During the years from 1917 to 1919 the cultivated area surpassed 60,000 ha. The three main states for soybean cultivation are North Carolina, Virginia, and Mississippi, which in 1919 cultivated respectively 33,185, 12,141, and 3,238 hectares; this was almost 75% of the total cultivated to soybeans in the USA. In 1910, the seeds were used for the extraction of oil in the USA, and for the first time the seeds were imported from Manchuria. In 1915, domestically grown soybean were used as a source of oil. This industry is developing rapidly, because the extraction of the oil is easily adapted to existing facilities that press oil from cottonseed and linseed. A table (p. 106) shows production of 16 vegetable oils in the USA from 1912 to 1917. Soybean oil production (in quintals) has increased from 12,537 in 1914, to 44,996 in 1916, to 190,843 in 1917. Figures are also given for peanut oil, sesame oil, etc. Other tables (p. 108-10) show imports, exports, and reexports of soybeans and soy oil from 1910 to 1919.

Asia: China (exports of soybeans and soy oil 1910-19, p. 161-62). French Indo-China (overview, esp. Cambodia and Tonkin, p. 187). Japan (area planted and production of soybeans 1877-1919, p. 190; overview, p. 191; production of soy oil 1909-18, p. 192; imports and exports of soybeans and soy oil 1910-19, p. 192-93). Korea (area planted and production of soybeans 1909-1918, p. 194; imports and exports of soybeans and soy oil 1909-11, p. 195). Formosa [Taiwan] (area planted and production of soybeans 1901-06, p. 196; imports and exports of soybeans and soy oil 1909-17, p. 197. In 1901 10,888 ha produced 8,056,400 liters of soybeans. In 1904 21,960 ha produced 24,401,700 liters of soybeans). Note 3. This is the earliest document seen (Jan. 2005) that gives soybean production or area statistics for Formosa (Taiwan; ceded to Japan in 1895 after Japan won the Sino-Japanese War).

Kwantung [Kwantung Leased Territory in Manchuria] (area planted and production of soybeans 1911-17, p. 198. In 1911 14,627 ha of soybeans produced 102,112 quintals. In 1916 29,902 ha produced 153,995 quintals of soybeans).

Africa: Algeria (in recent years, trials have been made to introduce soybean culture to Algeria, p. 238). Egypt (imports of soy oil 1919, p. 244-47).

Southern hemisphere–America: (Note 4. Soy is not mentioned at Argentina, Brazil, or any other South American country). Asia: Netherlands Indies. (A) In Java

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and Madura, the area planted to soybeans was 162,800 ha in 1916, 175,696 ha in 1917, and 157,844 ha in 1918. Gives imports of soy oil (1,085 quintals in 1914) and exports of soybeans (46 quintals in 1913) (p. 297-98). (B) In outlying territories, gives imports of soybeans from 1913 to 1919 (p. 299). Africa: Southern Rhodesia (attempts have been made to introduce soybeans and several other oil plants from temperate climates, p. 317). Oceania: Soy is not mentioned at Australia, New Zealand, British New Guinea, former German New Guinea [later Papua New Guinea], or any other country in southern Oceania. (p. 297). Recapitulative tables–Imports and exports from 1910-1919. Soybeans, p. 368-69. Peanuts, p. 370-75. Sesame seeds, p. 376-79. Palm fruits (*Amandes de palme,* from which palm oil is obtained), p. 392-93. Peanut oil, p. 414-17. Corn oil, p. 416-17. Sesame oil, p. 418-19. Soy oil, p. 420-21. Other oils covered in detail by this book are: Cottonseed, hempseed, linseed, rapeseed (*colza* and *navette*), poppy (*pavot* or *oeilette*), castor, olive, coconut, palm, and other–non-specified. Address: 1. Doctor of Agronomics; 2. Doctor of Economics. Both: IIA, Rome, Italy.

2109. Nagai, Isaburo. 1921. Daizu hinshu no yô menseki to seisanryoku to no kankei [Relationship between the leaf area and productivity of soybean varieties]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 228. p. 603-24. Sept. [9 ref. Jap]

• ***Summary:*** The author did an early scientific experiment using many soybeans gathered throughout Japan. He pointed out that soybeans grown in northern Japan have larger seeds and leaves than those from southern Japan.

2110. Wester, P.J. 1921. The food plants of the Philippines. *Philippine Agricultural Review* 14(3):211-384. Third quarter. See p. 360.

• ***Summary:*** "Soya. *Glycine max* M. Leguminosae. An erect, annual herb 35 or more cm tall, the beans of which are made into flour or otherwise prepared in various ways for the table in India, China and Japan, and from which a valuable culinary oil is obtained. Of limited distribution and rarely cultivated. Has proven very productive in Bukidnon and Lanao below 700 meters altitude. A crop of undoubted value for the Philippines, both for human food and as a stock feed. Said to have been introduced during the Spanish régime. The Soy bean."

Note: The Spanish ruled the Philippines for about 100 years (putting down many revolts) until Dec. 1898 when the Spanish-American War brought the archipelago under American control; the revolts continued. Address: Agricultural Advisor.

2111. *Light of Manchuria.* 1921. Present Manchuria and Mongolia, Series II. Oct. 1. p. 12-14, 30-31, 46-47.

• ***Summary:*** This article, continued from the September number, notes that one of the principal agricultural products of Manchuria and Mongolia [probably Inner Mongolia] are soya beans. "Yellow (Soya) Beans belong to the most common species. They contain a good percentage of oil and are also good as an article of food and also for the expression of oil. The Manchurian (Soya) Beans have become widely known all over the world. Hitherto they used to be used by Manchurian inhabitants as a food-stuff and for the expression of oil as a source of light. The residue left after oil was obtained served as cattle feed. Since the residue popularly known as Bean Cake came to awake demand in Japan as fertilizer, and Bean Oil began to be exported to the Western countries as industrial material, a marvellous development has been noted in the cultivation of Soya Bean. This belongs to only a recent date...

"The Chinese not only use Beans and Bean Oil in their daily cooking, but also *tofu* (bean curd palatable also to the Western palate and pronounced by the qualified chemist as similar in its composition to cow's milk), *miso* (an article of the staple food to both Japanese and Chinese), and *soy* are also made from Beans...

"Beans put out in Manchuria and Mongolia are put at about 20,000,000 *koku* (1 *koku* being equivalent to 4.96 bushels), but the outputs are increasing rapidly year by year, and there is a vast area of territory awaiting cultivation."

Page 30, under "Manufacturing Industry," notes that "Bean milling ranks foremost in manufacturing industry... Bean milling is best developed at Dairen, which is now possessed of sixty mills. In the interior of the country, the old primitive system by which a few head of mules or donkeys and a few hands do the work of expressing oil from Beans is still found in vogue. Such is only a domestic bye-industry. However, such extensive mills as use steam engines and express oil by hydraulic pressure are mostly found at Dairen. The Suzuki Bean Mill at Dairen is operated on the chemical extraction system which is the latest scientific method. The round-shaped cake left after the expression of oil weighs 46 *kin* a piece, which is the standard weight for export cake. In the fiscal year 1919, 19,693,000 piculs valued at 43,029,000 *Hk. taels* [Haikwan taels] were exported to Japan. Bean Meal, which is put out at the Suzuki Mill, is good for use as it is. Bean Cake is used by the Chinese for cattle-feed, and by the Japanese as fertilizer."

On pages 46-47 are tables giving exports and imports at Dairen. The three exports with the greatest value (in Haikwan Taels) were Bean Cake (36,851,244), Beans (Soya) (24,750,377), and Bean Oil (17,369,655). Imports included Miso and soy [sauce] (97,305).

2112. South Manchuria Railway Co. 1921. Manchuria-Japan trade and Japanese customs tariff. *Light of Manchuria.* Oct. 1. p. 1-12.

• ***Summary:*** Includes a discussion of Manchurian Beans [soybeans], Bean Oil and Bean Cake (p. 1-5). Photos show:

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(1) Erection shop (South Manchuria Railway Workshops) at Shahokou. (2) Second wharf at Dairen Wharves, with line of breakwater seen just beyond. (3) Junks in Yingkou (Newchwang) Harbour.

2113. North, J.L. 1921. To solve the cost-of-living problem? A magic bean. *Illustrated London News* (*The*)**.** Oct. 8. p. 476-77. [1 ref]

• ***Summary:*** "The leading article and letter in the *Times* of Sept. 28 from its Vienna correspondent about Manna flour, manna bread, and milk substances made from the Soya bean, are likely to do good if they help us to realise how much we are losing by our neglect of this, the most valuable–for the uses to which it can be put–of all legumes.

"In the letter giving the details of the researches of Dr. László Berczeller of Vienna, there is no reference to the fact that these 'Manna' or Soya bean products were first made in England before the war. Samples of the flour and biscuits are to be seen in the cases of the London Institute of Hygiene, and Manna milk has been for years–and, no doubt, still is–sold here under the name of 'Solac' at a price considerably lower than that charged for milk by dairymen. The appearance and rapid rise into importance of the Soya bean is one of the most remarkable commercial events of modern times."

"In 1790 the [soy] bean was brought to Europe when its cultivation was first attempted by Young [Arthur Young, lived 1741-1820 in England], the father of British Agriculture, though without success. In 1878 an Austrian professor, Haberlandt, tried it, but failed [Note 1. Haberlandt did not fail; he successfully cultivated soybeans in Austria as early as 1875, and many times thereafter.] When the bean came here in 1908 there was an immediate rush to grow it both in Europe and America. Experiments were started by our Board of Agriculture, the Royal Agricultural Society, and many semi-public bodies. The early experiments failed completely, for the reason that they were made with seed whose climatic origin was unknown, as well as the orthodox Chinese methods of growing it. Later, this was remedied..."

By 1918 Europeans were aware of 500 different soybean varieties that were growing experimentally at Arlington, Virginia.

"My interest in the Soya bean began in 1913 with a visit from an agent of a German cultivator at the office of the Royal Botanical Society at Regent's Park. He was, he said, trying to form a syndicate to grow what he called an acclimatised Soya bean, brought from China in 1910, and already in cultivation in Germany. He refused seeds for testing, but sent from Hamburg a plant which had been carefully cleared of the seed, though the *empty* pods, nearly sixty in number, were left. The syndicate never materialised, and I thought no more of the matter, until later on, whilst examining the dried plant, I noticed a tiny pod, scarcely half an inch long, which contained a seed no bigger than a pin's head. Going over the plant I found other pods which evidently had been thought too insignificant to be of use, and from these I obtained thirteen seeds. These were sown in 1914 and resulted in thirteen plants, which produced four hundred and forty seeds. From thirty-three plants in 1915 one thousand seeds resulted, and in 1916 no less than twelve thousand. Many experiments as to the value of different methods of growing them were made in several countries, and with no less than twenty-one different foreign varieties. One thing came clear throughout the tests, and that was that the original variety started with was by far the best. It says a good deal for German astuteness that they should have gone to Manchuria and, from hundreds of varieties, chosen the one best for them and for us."

The future of the Soya bean in England is uncertain. "Natural selection helps the plants that mature earliest produce most seed; those that mature late die out. It is noticeable that the plants experimented with in England fruit earlier now than they did at first, and this is a very hopeful sign. Another satisfactory fact is that there is no lessening in the number of pods produced, but rather a gain. This year there are plants with three times the number of pods shown in a photograph of the best German-grown specimen of 1912."

In China and Japan the Soya bean "enters into the composition of most dishes, and in one form or another, as Soy sauce, bean paste, bean cheese, bean curd, bean milk, bean wafers, bean cakes and confectionery, is used everywhere. For a hundred years Soy sauce has been imported–the principal ingredient in the well-known Worcester [Worcestershire] sauce."

Apart from its value as a food, it is used in the manufacture of glycerine, explosives, enamels, varnish, varnish, waterproofs, linoleum, paints, soaps, celluloid, printing inks, and as a lubricant."

Photos (all but #1 by Frank N. Meyer of the USDA) show: (1) A typical pod from a soya bean plant grown by Mr. J.L. North at Chiswick, England, in 1921. (2) Two large, thin "blocks of tofu (bean curd)" on a round, wooden table. "Soya bean cheese for human food... Ready to be cut up into squares for sale to the public. Tofu, or Soya bean curd, is made by adding magnesium or calcium salts (about a 1 per cent. solution) to hot Soya bean milk; the product is drained and pressed. (3) "Varieties of soya bean cheese on a bamboo tray. Tofu, or Soya bean curd, forms the basis of many fermented, smoked, and dried cheeses in China and Japan." (4) "Soya bean cheese [fermented tofu] in preparation: A pile of wooden trays full of bean curd in a dark room of even temperature." (5) "Used by the Chinese as a green vegetable: A basketful of sprouted soya beans." (6) Soy bean plant with leaves, many pods and roots, grown at Chiswick.

Note 2. This is the earliest document seen (March 2002) written by Mr. J.L. North, the pioneer in cultivating soybeans in England.

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Note 3. This is the earliest English-language document seen (April 2013) that uses the term "soya bean cheese" or the term "soya bean curd" to refer to tofu.

Note 4. This is the earliest English-language document seen (July 2007) that uses the term "magic bean" or that uses the word "magic" as an adjective to refer to the soybean.

Note 5. This is the earliest English-language document seen (Jan. 2013) that uses the term "sprouted soya beans" to refer to soy sprouts.

Note 6. Concerning Arthur Young. He was the author of many books on agriculture, which were very influential in their day. He was an important advocate for the progressive agricultural practices of his time, advocating such innovations as the seed drill, improved crop rotations, the use of marl as fertilizer, and the enclosure of open fields. In 1767 he undertook the management of a farm in Essex. He conducted various experiments and published the results in *A Course of Experimental Agriculture* (1770). In 1784 he began the publication of the *Annals of Agriculture,* a periodical which was continued for 45 volumes and had many contributors. Young traveled to France during 1787-89 and in 1792 published an important book about his travels and observations there. The soybean was first grown in Paris, France, perhaps as early as 1740, definitely by 1779. So he may have learned about soybean from fellow agriculturalists in Paris while on this trip. Address: Curator of the Royal Botanic Society of London.

2114. Togano, Meijiro. 1921. Quick method for brewing soy. *U.S. Patent* 1,394,236. Oct. 18. 2 p. Application filed 19 Feb. 1920.

• ***Summary:*** Soy-bean or its cake is first soaked in water for about 8 hours and then boiled for about the same length of time. It is cooled to 30ºC, then the spores of *Aspergillus oryzae* are mixed with it. If desired, about 20% of wheat or other grain may be added to this mixture. The mixture is kept for 3 days at 30ºC in a warm, damp chamber. During the latter period the soy-bean becomes covered with a soft, greenish-yellow mycelium, produced by germination and development of the *Aspergillus oryzae.* The result is "soy-bean koji." To this soy-bean koji is added an equal volume of salt water having a temperature of about 60ºC and a specific gravity of 20 degrees Baumé (SG = 1.16). This mixture is then kept at a temperature of from 30 to 70ºC and stirred 1-3 times a day. By this treatment, the albumin of the soy-bean "is properly decomposed in a period of less than 10 days from the time the salt water was added to the soy-bean koji, and the soy-mash will produce the particular flavor of soy. Therefore, after the albumin is decomposed, soy is squeezed out or extracted from the soy-mash and the product thus produced is heated by means employed in the ordinary process, for the purpose of preparing the soy for use and sale." Address: No. 1686 Sugamomachi, Tokyo, Japan.

2115. Nakayasu, Kyoichi. 1921. Gyûnyû-chû no tônyû no kani kanshiki ni tsuite [On the simple detection of soymilk in cow's milk]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 476. p. 880-87. Oct. 26. (Chem. Abst. 16:1469). [Jap]

• ***Summary:*** On adding 4-5 drops of 28% potassium hydroxide solution to 10 cc of milk, a yellow color develops if soybean protein is present; 5% of the protein can be detected. To render the test more definite, the albumins may be precipitated from the milk by acetic acid, filtered off, and treated in a dish with 2-3 drops of the alkali. A light yellow color indicates the presence of soybean protein; the protein from pure milk gives a yellow color only on heating.

2116. Kubota, Seikou; Ikeuchi, Kôki. 1921. Nihon shôyu no kenkyû: Nihon (Kikkôman) chû ni beta-iminazoriiru, echiramin no kagakuteki oyobi seiriteki shômei ni tsuite [Studies on Japanese shoyu. 1. Biological and chemical detection of beta-imidasol and ethylamine in "Kikkoman"]. *Nanman Igakkai Zasshi* (*J. of South Manchurian Medicine*) 9:142-51. Oct. [6 ref. Jap]

Address: 1. Igaku Hakase. Both: Nanman Igakudô Yakubutsugaku Kyôshitsu.

2117. Satow, Sadakichi. 1921. Researches on oil and proteids extraction from soy-bean. *Tohoku Imperial University, Technology Reports* (*Sendai, Japan*) 2(2):1-124 (41-164). Oct. 28 cm. [Eng]

• ***Summary:*** Contents: 1. General description of the soy-bean: The use of the soy-bean (as a food-stuff [shoyu, miso, tofu, natto], soy bean oil [for the manufacture of soap, hydrogenated oils, paints, varnishes, oil-cloth, and rubber substitutes], and bean cake or waste residue from the manufacture of soy-bean oil [nitrogenous fertilizer, as a cattle food, Solite–a water-based paint]). 2. Classification and analysis of soy beans and their standardization: By color, by protein / proteid content, conclusion of analysis (the best soy-beans are Tsurunoko and Kauro grown in Hokkaido): Standardization of the raw material, content of proteids, color of the raw material, moisture, regularity of the grain, specific gravity of the soy-bean, impurities. 3. Microscopical observations of soy-beans: Colour reactions of cellular substances, distribution of proteids and fatty acids, distribution of fatty oils. 4. Oil extraction (p. 17): Influence of hulls, influence of moisture, influence of oxidation, comparison of the dissolving power of various solvents, to find the best conditions for the extraction of oil by means of benzine, how to extract the oil technically without denaturing the proteids and how to remove the retained solvent, on the apparatus employed in oil extraction, working of the extracting apparatus, recovery of solvent by application of the vacuum system, separation of oil from the solvent and oil refining, reserving the oil-freed soy-bean meal.

5. Isolation of proteids out of oil-freed soy-bean (p. 35):

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General discussion, necessary and sufficient conditions for the extraction of proteids (on the quality of isolated proteids [plasticity, solubility, coloration], on the purity of isolated proteids, to obtain a maximum yield). 6. The extraction of proteids by means of water (p. 41): General properties of bean meal, on gummy substances and their properties (saccharo-colloids, incl. stachiose [stachyose], araban, galactan; p. 43), quantitative estimation of water-soluble proteids and carbohydrates, determination of the volume of water necessary for the extraction of soluble carbohydrates, relation of the duration of extraction to the quantity of extractable proteid and carbohydrates, effect of the process of water-extraction. 7. On the extraction of proteids by means of alkaline reagents: General properties of glycinin against alkaline reagents, classification of alkaline reagents, comparisons of dissolving power of alkaline reacting compounds, relations of the plasticity and coloration of the proteid to various kinds of extracting agents, standardization of plasticity of isolated proteid, on the relations between plasticity and chemical reagents, comparative experiments relating to the extracting process by means of sodium sulfite and sodium hydroxide.

8. The determination of the concentration, quantity, and other factors of Na_2SO_3 [sodium sulfite] in the process of extraction (p. 69): Determination of the concentration of sodium sulfite, the determination of the relation between the plasticity of the protein and the concentration of sodium sulphite, to determine the relation between the yield and the time of extraction, to find out the actual yield of proteid, as well as the volume of sodium sulfite solution provided the bean meal is previously extracted by water, then extracted with sodium sulphite, conclusion of this chapter. 9. Extraction of proteids by means of caustic alkalies [alkalis] (p. 80): To determine the concentration of the caustic soda [sodium hydroxide] solution, determination of the relation between the time of extraction and the yield of proteid, to determine the volume of caustic soda, the systematic extraction of proteids (using water, sodium sulphite, or alkali). 10. Clarification of extracted proteid solution and precipitation thereof (p. 86): Precipitation of proteids, precipitation by means of alkaline earth metals (such as magnesium sulphate), by means of colour base (such as malachite green, methyl violet, brilliant green, auramine, or new fuchin), by means of alcohol, by means of heating, by means of formaldehydes, by means of fermentation, by means of acids (choice of acid, yield of precipitated proteid, quality of proteid). 11. Quantitative investigations on the precipitation of proteids (p. 101, 11 experiments with summary of conclusions). 12. Effect of heating on the yield of proteid (p. 115). 13. Separation of excess water from the proteidal precipitate (p. 118). 13A. Process for drying the proteidal mass and for drying the residue (p. 121). 14. Pulverizing the dried proteid (p. 122). 15. Recovery of carbohydrates from waste liquid (p. 123).

World soybean production (in short tons): Manchuria 1,850,000 (25% is used in Manchuria as food; 75% is exported to all parts of the world in the form of "bean cakes or bean meal"). Japan 450,000. Korea 322,500. Kantoshu 15,400. Total of the above: 2,640,000 tons valued at more than 200 million Japanese yen (p. 2).

The author investigated the use of soy-bean proteins in plastics. There are upwards of 30 varieties of soybeans which may be classified into yellow, blue, and black. The first contain the most protein and oil, the last the least. The protein content varies from 35-40.5% and the oil content from 15.4 to 20.9%. The mean analysis of 16 different varieties was: Water 10.2%, proteins 37.8%, oil 18.9%, carbohydrates 23.5%, fiber 5.2%, and ash 4.4%. The carbohydrates consist mainly of non-reducing sugars with little or no starch. The cell membrane consists of galactan or hemicellulose, with a little free cellulose. The presence of the hulls in the crushed bean reduces the speed of extraction of the oil and the yield, and gives the oil and protein a brown color. Note: This is the earliest document seen (May 2004) containing the word "hemicellulose." *Webster's Dictionary* defines hemicellulose, a word first used in 1891, as "any of various plant polysaccharides less complex than cellulose and easily hydrolyzable to simple sugars and other products." The sugar molecules in this polymer each contain 5 carbon atoms.

Oil extraction: Benzene is the most suitable commercial solvent; the solvent must not be recovered by direct steaming of the meal, but by the use of a vacuum.

Protein extraction: The soluble carbohydrates are removed from the meal by washing with very dilute acetic acid. The protein is then extracted in 3 stages, i.e. with water, with 0.2-0.4% sodium sulphite solution, and with 0.2% sodium hydroxide solution. 20-30% of the total available protein is extracted in the first stage, a further 50% in the second, and the total yield is about 95%. The protein is finally dried at the lowest temperature and highest vacuum and in as short a time as possible. The dry protein is very tenacious and can only be ground in high-speed disintegrators; it is then suitable for the manufacture of plastic materials, lacquer, enamel, or imitation leather. The soluble carbohydrates, which amount to 10-12% of the meal treated, can be worked up into syrup or converted into alcohol or lactic acid by fermentation. The bean residue consists of fiber, galactan, and protein and can be used for cattle feed or as an ingredient of linoleum-like products.

Note: This is the earliest document seen (Sept. 2010) concerning isolated soy proteins (other than simply isolation as part of nutritional research).

Continued. Address: Kôgakuhakushi.

2118. Satow, Sadakichi. 1921. Researches on oil and proteids extraction from soy-bean: Illustrations and tables (Continued). *Tohoku Imperial University, Technology*

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Reports (*Sendai, Japan*) 2(2):1-124 (41-164). Oct. 28 cm. [Eng]

• ***Summary:*** Continued: Illustrations show: (1) The cells of the soy-bean (after Winton, p. 55). (2) The effect of various chemicals on soy-bean cells (8 figures, after p. 16). (3) A rotary drum extractor used with solvent and a vacuum system (p. 68). (4) An endless belt system for drying proteid precipitate.

Tables show: (1) Percentage of proteids and fat found in 23 samples of beans. The varieties are: Akakiji bean, Nagaaneko bean, Kintoki bean, Shônembo bean, Biruma ingen bean, Chûnembo bean, Maru uzura bean [speckled], Naga uzura bean, Kumamoto ingen bean, Azuki, Chûnaga uzura bean, Aneko bean, Shiromarufuku bean, Green pea, Dainenbô bean, Daifuku bean, Chûfuku bean, Red pea, Black soy-bean (38.61%), Yellow soy-bean from Manchuria {2 samples, 38.65% and 39.12%}, Yellow soy-bean from Korea (41.00%, and 22.826 fat–the highest fat of any bean tested), Yellow soy-bean from Hokkaido, Japan (41.92%–the highest proteid of any bean tested) (p. 6-7). (2) Previous analyses of the chemical composition of 16 soybean samples from Manchuria, Korea, and Japan. For each, gives the district, variety (mostly yellow but one "Blue variety"), water, proteids, fat, carbohydrate, fiber, ash, name of analyst (an organization) (p. 8). (3) Analyses by Sato of the chemical composition of 14 soybean varieties from Manchuria, Korea, and Hokkaido (Japan). For each, gives the varietal name, growing region, "moisture, total protein, soluble proteose, available protein, non-proteidal nitrogenous matter, fat, nitrogen-free extract, fiber, ash, color and shape (all yellow), producing organization (Korean Central Experimental Station or Sapporo), date of production. Named varieties include: Harupin, Shoshu bean, Utsuzan bean, Ampen bean, Chogei bean, Ryusan bean, Turunoko [Tsurunoko], Kanro, Yoshioka, Otanizi [Otaniji] (41.92% total protein and 37.53% available protein, both the highest of any bean tested) (p. 11). (4) Effect of hulls on solvent extraction of soy-bean oil with 3 varieties: Kanro, Otaniji, Yoshioka (p. 18). (5) Influence of moisture on solvent extraction (ether) of soy-beans (p. 19). (6) Effect of using benzine in place of ether in solvent extraction of soy-bean oil. The best moisture content is 7.5% to 12.5% (p. 20). (7) Substitution of vacuum drying for open air drying in removing moisture. Shows that the smaller the quantity of moisture contained in the bean, the greater the yield of oil, provided that the oil is protected from oxidation (p. 22). (8) Effect of different solvents on oil extraction: Carbon bisulphide (flammable and expensive), ether (flammable and expensive), benzine (boiling point 75ºC), carbon tetra chloride [tetrachloride]. (9) Separation / distillation of benzine from oil solution (p. 34).

(10) Chemical composition of "soy bean meal" from which the hull and oil have been removed (p. 42). (11) Composition of carbohydrates or saccharo-colloids, based on S. Yukawa (p. 43). (12) Composition of para-galacto-araban / gummy substances in 9 varieties (p. 44-45). (13) Percentage of water-extractable substances and reducing sugars in flattened and powdered soy-beans (p. 46-47). (14) Sugars in soy-beans (p. 48). (15) Proteids and soluble carbohydrates in soy-beans (p. 49). (16) Effect of acetic acid in retarding dissolution of the globulins (p. 50). (17-18) Dissolving power of alkaline reagents on proteids in bean meal (p. 54-56). (19) Effect of reagent on plasticity and coloration of proteids (p. 56).

(20-22) Amount of proteid extracted in 3 consecutive extractions, or with pressure (p. 63-65). (23) Effect of 4 consecutive washings in removal of ash (p. 66, 68). (24-26) Percentage of proteid extracted with sodium sulfite after 1 or 2 hours (p. 70-71). (27) Concentration of sodium sulfite, mark of plasticity [rating], and color of precipitate (p. 73). (28) Relation between time of extraction and yield of nitrogen and proteid (p. 74). (29-30). Yield of proteid with water or sodium sulfite and 5 or 6 consecutive extractions (p. 76).

(31) Test to maximize yield of proteid using sodium sulphite solvent; the weight of the solution must be 16 times that of the meal, and the yield will be 52.20 (p. 78). (32) Effect of adding acetic acid on yield (p. 79). (32-33). Effect of caustic soda (sodium hydroxide) on percentage of proteid extracted (p. 81) (34-37) Relation between time of extraction and yield of proteid using caustic soda (p. 82-83). (38) Volume of caustic soda consumed by different volumes of bean meal solution (p. 83). (39) Volume of caustic soda solution needed in three extraction processes: water, sodium sulphite, or alkali (p. 85).

(40) Extraction with magnesium sulphate for 1, 2, or 3 hours (p. 90). (41) Percentage of proteids precipitated by different precipitants; "isolated proteid," "glutinizing chemicals" (p. 95) (42). Effects of sulphurous acid, formaldehyde, and formalin (p. 96). (43) Effect of different precipitants on quality of precipitate; "sulphurous acid gives proteid of the whitest and best quality, and most suitable for the manufacture of plastic products" (p. 100). (44) Yields of proteid with different volumes of sulphurous acid; all yields are very unsatisfactory (p. 103). (45-47) Effect of adding sulfur dioxide to sulphurous acid at various concentrations; remarkable increase in yield (p. 104-06). (48-51) Precipitation of water extracted protein using acetic acid (p. 107-10). (52-55) Effect sulphuric acid for precipitation of proteids (p. 111-14). (56-57) Effect heating on yield of proteids (p. 116-17).

Note: Horvath (1937) states: "The extraction of protein from soybean meal, its subsequent precipitation and properties, as well as its industrial applications have been extensively studied by S. Satow, and the results published (in English) in 1921-23 in two voluminous reports [*Technology Reports, Tohoku Imperial University* (Japan): 2(2) and 3(4)]. These reports continue to serve as an unsurpassed source of information on this subject, and a number of discoveries

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during the last 15 years can be traced to the researches of Satow." Horvath then summarizes many of Satow's key findings. Address: Kôgakuhakushi.

2119. Agricultural Experiment Station, Kunchuling, South Manchuria Railway Co. 1921. Bringing up new breeds of soya beans in Manchuria. *Light of Manchuria* No. 15. p. 24-42. Nov. 1.
• ***Summary:*** Soya beans were first cultivated in Manchuria less than a century ago. At first they were "grown only to meet the need of making Bean Oil for household use. Subsequently, with the advance of chemical and manufacturing industry, uses for oil steadily increased. After the Sino-Japanese War, Bean Cake, being the residue left after the expression of Bean Oil, began to be exported from Manchuria to Japan, and the demand for Beans, Bean Oil, and Bean cake rose by leaps and bounds."

"The principal varieties of Beans cultivated in Manchuria may be roughly classified into the kinds of yellow, blue [green], and black beans." The yellow soybeans are produced in the greatest abundance; only a nominal quantity of black soybeans are produced. Kaiyuan and Changchun are the two largest soybean-producing areas along the South Manchuria Railway lines. The Experiment Station started breeding experiments in 1915, and after 6 years three pure stocks of superior quality were obtained. Photos show: 3 improved breeds of soy beans, No. 2213, 738, and 1103 (p. 25). Improved breed of soy bean, with pods and roots exposed (p. 41). Address: Manchuria.

2120. Nakao, M.; Ikebe, S. 1921. Bean oil as merchandise. *Light of Manchuria* No. 15. p. 1-23. Nov. 1. [18 ref]
• ***Summary:*** "Bean Oil is made from Soya (Manchurian) Beans (Glycine hispida Maxim) which originated in China..." Contents: Introduction. Kinds of beans and bean oil. Expression of oil and bean oil. Expression method: Wedge method, screw method, hydraulic pressure method. Extraction method (Suzuki Mill, Dairen). Indices of bean oil produced in Manchuria: Free fatty acid of bean oil, moisture and bean oil, receptacles and bean oil, precipitations and bean oil Publications on bean oil. Conclusion.

Poor-quality photos show: (1) Receptacles of [soy] bean oil outdoors at Dairen mill compound; drums, tin cans and baskets (p. 3). (2) Large bean oil tanks outdoors at Dairen Branch, Mitsui Bussan Kaisha (p. 5). (3) Oil tanks inside a Dairen Mill (p. 6). (4) Oil tank cars in Nisshin Oil Mills Compound (p. 8). (5) Filling drums with bean oil at Dairen mill (p. 13). (6) Storage of beans in osier bins on Dairen wharves (p. 16). (7) Measuring of colour of bean oil at General Laboratory, South Manchuria Railway Co., Dairen (p. 17). (8) Balance room, General Laboratory, Dairen (p. 19). (9) Gauging of specific gravity of bean oil, General Laboratory, Dairen (p. 21). (10) Gauging of free fatty acid in bean oil at General Laboratory, Dairen (p. 23). Address: General Lab., South Manchuria Railway Co.

2121. Nagai, Isaburo. 1921. A genetico-physiological study on the formation of anthocyanin and brown pigments in plants. *J. of the College of Agriculture, Tokyo Imperial University* 8(1):1-92. Nov. 5. See p. 48-78. [21 ref. Eng]
• ***Summary:*** Under "Genetical Study," part 2 is titled "The mode of inheritance of anthocyanin and brown pigment in the seed coat of *Glycine soja.*" The author discusses the color types of the seed coat, a cross between blue tinged yellow x brown, and the reciprocal, and a cross between buff and black.

Table 21 is titled "Chromogen content in the extract of unripe, green seed, and leaf of *Glycine soja.*" For each entry is given: Name of variety, colour of seed when mature, chromogen in seed (incl. oxidation colour), and chromogen in leaf. The two basic types of chromogenic substance are P (abundant) and F (very scarce or absent). Seed colors include solid black, brown, red brown, black mottled brown, black patched, green, and yellow. The variety names are: "Kurodaidzu-ko, Goishi (incl. with flower purple), Nedzumi-meta, Akazuka, Cha, Haiiro, Beni-iro-daidzu, Akanedzumi, Madara, Juseita, Kura-kake, Achumuri, Tanishi, Tora-mame, Goku-ao, Aobishi, Uma-daidzu, Goyo, Ao, Toyo-naga, Dateao, Yoshioka, Shakujo, Shiro sota, Omejiro, Yuki-no-shita, Chogetsu, Kimusume, Sennari, Kariya-takiya, Shiro-nedzumi, fukui-shiro, shonai-wase, shiro-hachikoku, abura mame."

Note 1. This is the earliest document seen (July 2012) concerning anthocyanin (or anthocyanins) in soybeans or in black soybeans (soybeans with a black seed coat).

Note 2. Anthocyanins (also anthocyans; from Greek: anthos = flower + kyanos = blue) are water-soluble vacuolar pigments that may appear red, purple, or blue depending on the pH. They belong to a parent class of molecules called flavonoids synthesized via the phenylpropanoid pathway; they are odorless and nearly flavorless, contributing to taste as a moderately astringent sensation. Anthocyanins occur in all tissues of higher plants, including leaves, stems, roots, flowers, and fruits. Anthoxanthins are their clear, white to yellow counterparts occurring in plants. Anthocyanins are derivatives of anthocyanidins, which include pendant sugars. (Source: Wikipedia, at anthocyanin, July 2012).

Note 3. A vacuole is a membrane-bound organelle which is present in all plant and fungal cells and some protist, animal and bacterial cells. Vacuoles are essentially enclosed compartments which are filled with water containing inorganic and organic molecules including enzymes in solution,... (Source: Wikipedia, at vacuole, July 2012). Address: Imperial Agric. Exp. Station, Japan.

2122. *Commerce Reports* (*U.S. Dep. of Commerce*). 1921. Bean-oil shipments from Dairen. 24(10):583. Nov. 7.
• ***Summary:*** "Consul Max D. Kirjasoff, at Dairen, reports

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that for the first six months of the current year there was a total of 61,839,000 pounds of bean oil shipped from that post. Of this amount, the United States received 15,507,000 pounds; the Netherlands, 12,516,000 pounds; the United Kingdom, 6,336,000 pounds; Belgium, 5,136,000 pounds; and Japan, 5,051,000 pounds."

2123. Yamamoto, Yoshitaro; Mizusawa, I. Tokyo Takushoku K.K. (The). 1921. [Imitation powdered milk]. *Japanese Patent* 40,711. Nov. 24. Addition to 34,949. [Jap]*
• ***Summary:*** Bitter principles could be removed by soaking beans in vinegar or dilute acetic acid.

2124. *Olien, Vetten en Oliezaden* (*Amsterdam*). 1921. Wereldproductie van Sojaboonen [World production of soybeans]. 6(22):254. Nov. 26. [Dut]
• ***Summary:*** The most recent [1920] annual statistics for world production of soybeans are (in metric tons): China 3,352,400. Japan 430,933. Korea 348,000. United States 58,000. Total 4,189,333 tons.

In 1918, Japan absorbed 77% of the Chinese production, American and Europe 7%, and China itself 16%.

During the last 10 years the amount of soya oil exported from China has risen from 25,000 tons to about 400,000 tons. Before the World War, this oil was sent to England, the United States, Belgium, Japan, and Russia. During this same decade, exports of soya-cake have increased from 400-500 tons to over 1 million tons.

2125. Tanaka, T. 1921. Daizu senchû (kamei) ni tsuite [On soybean nematodes: Preliminary identification]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 8:551-53. Nov. [Jap]
• ***Summary:*** Describes the morphology of *Heterodera schachtii* with suggestions for its control. Address: Ibaraki Kenritsu Noji Shikenjo, Gishi.

2126. *Trans-Pacific.* 1921. Making bread from Manchuria's beans. 5(5):43-44. Nov.
• ***Summary:*** "In a recent speech in London Mr. Winston Churchill insisted that 'it is a matter of the highest political importance that the West should learn the lesson of cheaper standards of living which is taught them by the peoples of the East in the adoption of the soya bean as an article of food.' He then went on to say that in a recent statement to the Times' Vienna correspondent by Dr. Berczeller, a young Hungarian, the latter professed to have succeeded in making both flour and milk from the soya bean, and that the bread made from soya bean flour is both palatable and easily digested and can be placed on the market at a price below that of any other kind."

Note: This is the earliest document seen that mention's Winston Churchill's speech about the soya bean. Address: Tokyo.

2127. Akita, M. 1921. Bean oil and its products: I-V. *Light of Manchuria* No. 16. p. 10-58. Dec. 1. [8 ref. Eng]
• ***Summary:*** Contents: 1. Material (varieties of soy beans). 1. How to make Bean Oil: By expression (oil making methods in Manchuria, bean expressing method in Japan), by extraction (conditions regarding extraction of oil). 3. How to refine Bean Oil: Refining by means of sulfuric acid, of soda, of clay, of sunlight, refining by heat, precipitation method and sunlight bleaching method, refining by means of acids, of alkali, bleaching by means of clay, by means of oxidation, settlings produced from Bean Oil while refined by means of sulphuric acid. 4. Characteristics of Bean Oil: Physical characteristics (specific gravity, freezing point and melting point, refractive value, viscosity, dryness), chemical characteristics (saponifying value, Reichert Meissl value, Hehner value, acid value, other Polenske values). 5. Composition.

The "extraction method was first invented in Germany. The South Manchuria Railway Company, alive to the promising character of the new invention, sent Mr. G. Uyehata of the Company's General Laboratory, Dairen, to Germany to investigate it on the ground. In March, 1914, the Company established an experimental mill at Jijiko at the east end of Dairen. The new plant proved industrially and commercially workable, and on September 1, 1915, it was transferred to Messrs. Suzuki & Co., to be maintained as a private enterprise." The solvent is benzine. The Suzuki Bean Mill is the only one in Manchuria using solvent extraction.

Photos show: (1) Interior of a "Bean Noodle Factory, Dairen" with workers (p. 13). (2) The South Manchuria Railway Co. General Laboratory at Dairen (p. 14). (3) Junk wharves, Dairen (p. 15). (4) Exterior of the Dairen Produce Exchange building (p. 16). (5) Exterior of Chinese Bean Mills, Dairen (p. 17). (6) Wind mill at salt fields, Pulantien (p. 18). (7) South Manchuria Railway Co.'s wharf at Newchwang (p. 22). (8) Chinese maritime customs at wharf in Newchwang (p. 24). (9) "Mountains of beans" in sacks in Changchun Station Yard (p. 35). (10) Chinese customs at wharf in Antung (p. 42). Tables show experimental results, chemical compositions and characteristics of bean oil and its products. Address: Late of the South Manchuria Railway Co., General Laboratory.

2128. Furusawa, J. 1921. Present and future of bean milling industry in Manchuria. *Light of Manchuria* No. 16. p. 1-10. Dec. 1.
• ***Summary:*** "The Chinese have been accustomed from early times to use vegetable oils as food and also as a source of light. The expression of oil from soya beans has therefore been carried on practically throughout the whole country on a small scale, to meet local needs."

"About the time the South Manchuria Railway was placed under the present management, the port of Yingkow [Yingkou], or Newchwang, drew most of the Manchurian

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products, and it was the main entrepot of Manchurian trade. Consequently, the bean milling industry was first established there and about the time of the Chino-Japanese War [Sino-Japanese War, 1894-95], there were already more than 30 mills at that place. But then donkeys were used to turn the stone mills for grinding beans, and the beans thus ground were steamed and then put under the hand press.

"After the close of the war, Messrs. Butterfield & Swire, the British firm, foresaw a great future in bean milling. They installed a steam roller and expressed oil by means of a screw turned by hand. This was perhaps the first mechanical appliance brought into use in Manchuria for the purpose.

"Then came the Russo-Japanese War, and not a few Japanese visitors to Manchuria became interested in this industry. On the close of the war, Mr. F. Kodera, now on the directorate of the Kodera Bean Mill, Dairen, founded a bean mill worked by hydraulic pressure at Yingkow. He was the first Japanese to start mechanical milling in South Manchuria.

"As the railways passed under the management of the South Manchuria Railway Company, it planned to make Dairen the chief gateway of trade and has taken measures to execute its plan. It was under such circumstances that bean mills began to come into being at Dairen as well as in other places.

"The first local mill was the Shuanghochan Mill established at Hsiaokangtsu-Chinese Quarter of Dairen-in 1906. In 1908, the railway company announced a system of specific tariffs to seaboard ports, and this induced a number of Japanese to follow suit. The Mitsui Bussan Kaisha organized the Santai Bean Mill conjointly with some Chinese capitalists. About the same time, Okura & Co., jointly with Mr. K. Matsushita of Yokohama, founded the Nisshin Oil Mills, Ltd. The Kodera Mill, at Yingkou, erected another factory at Dairen, followed by Mr. K. Saito with still another mill. In the course of a few years, the mills maintained by Japanese and Chinese numbered about 20. This industry has kept developing, and now the local mills total 60."

Also discusses industrial uses of soybeans. Photos show: (1) Piles of beans in sacks, covered with tarps, on Dairen wharves. (2) Loading of goods at Atung Wharves. (3) Exterior of good sheds and warehouses at Dairen Wharves. (4) Men loading round bean cakes and beans into a steamer ship on Dairen wharves. Address: Managing Director, Nisshin Oil Mills Ltd., Dairen.

2129. Nisshin Oil Mills. 1921. The Nisshin Oil Mills, Ltd. Exporters & Crushers (Ad). *Light of Manchuria* No. 16. p. 60 (Rear cover). Dec. 1.
• ***Summary:*** A full-page ad. "Capital: Six million yen. Soya beans. Bean oil. Perilla oil. Peanut oil. Hempseed oil. Refined castor oil–and all Manchurian cereals. Shipment in tight barrels, our specialty. J. Furusawa, Director. We buy any quantities of hempseed & hempseed oil." Address: Dairen, Manchuria.

2130. *Oil and Colour Trades Journal* (*London*). 1921. The soya bean industry of S. Manchuria: Consular news. 60(1207):2080. Dec. 3.
• ***Summary:*** "The annual production of soya beans in Manchuria is estimated at 2,500,000 tons, of which about three-fourths is exported, 30 per cent. in the form of beans, and the balance in the form of bean cake or bean oil." A table shows the weight (in piculs) of these three products exported in 1919 and 1920. For 1920: Beans 10,224,437. Bean cake 21,479,033. Bean oil 1,805,107. The total value of exports in 1920 was approximately 92,350,000 taels.

Until the Russo-Japanese War of 1904-05 [soya] beans were only exported from South Manchuria in the form of bean cake and bean oil, and the sole market for them was in China, the cake being used as a fertiliser in the sugar-cane fields of the Canton and Fukien [Fujian] Provinces, and the oil chiefly as a food and an illuminant. The valuable properties of bean cake as a fertiliser were then discovered in Japan, to which the market for the product extended, the demand from Japan soon exceeding that from China. In 1908 a trial shipment of beans to England also opened the eyes of British oil-seed manufacturers to the value of the soya bean for the same purposes for which cotton and linseed oil were used, with the result that in that year 400,000 tons of beans were shipped to England. Since then the trade has never looked back. The demand soon extended to the Continent of Europe, and finally to America, which for a time became the chief market for bean oil, though the exports to that country have laterally declined."

A second table shows the destination and amounts of beans, bean cake, and bean oil exported from South Manchuria in 1920. The destinations (listed alphabetically) are: Denmark, Dutch Indies, Egypt, Germany, Great Britain, Hong Kong, Japan and Korea, Netherlands, United States, Chinese ports, other countries. The top four importers (in piculs) of soya beans are Japan and Korea (5,637,882), Chinese ports (2,490,727), Denmark (682,297), and Dutch Indies (546,186). The top four importers (in piculs) of bean cake are Japan and Korea (17,781,698), Chinese ports (3,430,483), United States (182,669), and Denmark (83,285). The top four importers (in piculs) of soya bean oil are Netherlands (616,204), United States (460,379), Japan and Korea (279,823), and Chinese ports (167,598).

This "table includes the exports by steamer from Dairen, Newchwang, and Antung and across the Korean frontier through Antung, Hunchun, and Lungchingtsun, but excludes those by native jung which were also considerable and went almost entirely to South China. All the exports to Europe and America and the bulk of those to Japan were shipped from Dairen, while Newchwang was the chief port of shipment for the exports to Chinese ports. The export of bean oil to the Netherlands is a new trade. It is possible that the ultimate

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destination of the bulk of the oil was Germany."
Source: *British Consular Report.*

2131. Oniki, M. 1921. Rice for manufacturing soy. *U.S. Patent* 1,400,374. Dec. 13. 5 p. Application filed 18 April 1918.
• ***Summary:*** A culture of *Aspergillus Onikii* on a cereal medium is treated with a mixture of steamed beans and roasted wheat, and formed into soy, the liquid being subsequently separated from the solid residue and sterilized and clarified.

Illustrations (line drawings) show: (1) Microscopical view of the conidiakeria. (2) Like view of sterigmas growing upon the head of the conidiakeria. (3) Like view of conidiophore fully ripened. (4) Side elevation of an approximately natural sized grains of rice planted with the *Aspergillus-onikii.* (5) Different germinating stages of the conidiophore. (6) Longitudinal sectional elevation of the conidiophore, already ripened. (7) Side elevation of the conidiophore, shown on a smaller scale. (8) Over-ripened conidiophore. (9) Detailed view of the primary sterigma bearing 4 secondary sterigmas thereon. (10) Detailed view of the conidia. (11) Young, enlarged and partly deformed mycelium. Address: Fukuoka-ken, Japan.

2132. Mitsunaga, Masasuke. Assignor to The Mitsubishi Kogyo K.K. 1921. [Briquets]. *Japanese Patent* 41,237. Dec. 22. [Jap]*

2133. Nishimura, Torazô; Kawakami, Tojiro; Matsumoto, Tyui. 1921. [Utilization of waste liquors from soy beans]. *Japanese Patent* 41,259. Dec. 27. [Jap]*

2134. Kobayashi, Kiuhei. 1921. Ni, san shokubutsu oyobi kôyu yori jinzô sekiyu seizô shiken [Artificial petroleum from soyabean oil, cocoanut oil, and stearine]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 24(12):1421-24. Dec. (Chem. Abst. 16:2983). [Jap]
• ***Summary:*** The first section discusses tests on soy oil (*Daizu abura ni taisuru shiken*). A mixture of the sample and finely powdered Japanese acid clay is charged into an iron retort and covered with the same clay. The retort is gradually heated under ordinary pressure, the distillation being completed at about 700ºC. The product has a greenish fluorescence and an odor very similar to that of the artificial petroleum obtained from fish oils. Soy bean oil (specific gravity 0.9268, saponification value 192.3) gave 55% distillate, which was further fractionated into 10% light oil (boiling point below 150ºC, specific gravity 0.7380, saponification value 7.7); 17.3% illuminating oil (boiling point 150º-250ºC, specific gravity 0.8173, saponification value 18.8); and 27.7% neutral and heavy oil (boiling point above 280ºC, specific gravity 0.8903, saponification value 22.3).

Note: This is the earliest document seen (April 2007) concerning artificial petroleum made from soybean oil. M. Sato and others investigated this subject in great depth starting in 1922. Address: Kôgaku hakase, Japan.

2135. *Gyomu Kotei–Shiga Kenritsu Noji Shikenjo* (*Progress of Operations, Shiga Prefecture Agricultural Experiment Station, Otsu*). 1921. [Studies on the causal organism of purple speck ("Shihan") of soybeans]. 10:132-35. [Jap]*
• ***Summary:*** Discusses purple stain.

2136. Hotta, I. 1921. Shôyu jôzô-jô ni okeru jikken kenkyû [Some experiments in shoyu brewing. I-XI.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 16(11):21-23; 16(12):18-22; 17(2):20-22; 17(4):20-24; 17(5):35-38; 17(7):20-27; 17(8):16-23; 17(9):35-41; 17(10):16-17; 17(11):31-35; 17(12):22-25. [Jap]

2137. Kinoshita, Asakichi. 1921. Shôyu no kabi-dome- zai ni tsuite [Preservatives used to stop mold growth on shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 16(7):23-24. [Jap]
Address: Jozo Shikensho Gishi, Japan.

2138. Muramatsu, Shunsuke. 1921. Tôfu no seizô ni kansuru kenkyû [Studies on tofu production]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 227. p. 585-96. [Jap]
Address: Morioka Koto Norin Gakko, Nogei Kagaku Jikken-shitsu.

2139. Nakagawa, S. 1921. [Robinia urease and soy urease]. *Tokyo Igakkai Zasshi* (*J. of the Tokyo Medical Society*) 35(9): (Chem. Abst. 16:3912). *

2140. Bank of Chosen, Seoul, Korea. 1921. Economic history of Manchuria, compiled in commemoration of the decennial of the Bank of Chosen. Seoul, Korea: Bank of Chosen. x + 303 p. See p. 140. Illust. No index. 20 cm. [Eng]
• ***Summary:*** In Chapter 5, titled "Agriculture," the section on "Population" (p. 140) notes that Manchuria has a population of 20,112,110, which averages about 53 per square over the whole country. A table compares this with population densities of 618 in England and Wales, 589 in Belgium, 374 in Japan (Mainland), and 31 in the USA. However Manchuria's population is growing rapidly; it increased by at least 6 million during the 10 years ending in 1916. A table (p. 135) shows that [soy] beans are typically used in the second year of a four-year rotation on large farms. In 1916 and 1917 an experimental agricultural station of the South Manchuria Railway Company asked some "dozen farmers in the neighbourhood of Szupingchieh and Kungchuling to cultivate native seeds of soya beans according to the purely native method, and the result was in 1916, 4.104 bushels,

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and in 1917, 3.724 bushels per *tan* (0.245 acres). Now the average bean crop in Korea is about 2.978 bushels, and in Japan 4.02 bushels per *tan..."*–quite similar. In Japan, intensive methods are carried to the extreme, however "in Japan the farmer does not generally devote their best land to bean cultivation" (p. 135).

The section on "Agricultural products" (p. 135) begins: "Of the cereals and pulse which Manchuria produces the principal are [soy] beans, *kaoliang,* and millet, and these are followed by maize, sorghum, buckwheat, wheat, rice, and peas." Other products include sesamum seeds. A table (p. 136) shows the amount (in bushels) of each of these major crops produced in 1915 in Mukden, Kirin, Amur, and total. For soybeans this was 39.2, 17.6, 17.1, and 74.0 million bushels, respectively. Exports of soybeans are 79.11 million bu from South Manchuria, 29.67 million bu from North Manchuria, and 108.78 million bu total. Note: Chinese characters are given with every place name.

The subsection titled "Soya Beans" (p. 137-48) has the following contents: The importance of beans and their products. Cultivation of soya beans. Amount of production. Different species [sic, colors, and varieties]. Composition of different varieties. Uses of the soya bean. Uses of beans, bean cake, and bean oil in the Far East. Uses of beans and their products in Europe and America.

The section titled "Manufacturing products of Manchuria" contains a subsection (p. 183-87) on [soya] "Bean oil and bean cake" which begins: "The industry has a very remote origin and we have it on record that, as early as 1860, Swatow, a port in South China, imported from Manchuria bean cake to the amount of 379,009 piculs, valued at $783,762 (Chinese)."

The oil-mill (*yufang*) is found almost everywhere in Manchuria. The traditional method of making soya bean oil and cake involves steaming the beans then pressing out the oil. The modern method involves using a solvent, benzene. "Then, by heating the compound, the oil is separated from the benzene. By this method nearly all the oil in the beans is extracted, and not only is there no waste of oil, but the residue, in this case not in the form of cake but in bulk, is better fitted for manure, since the small quantity of oil remaining in it makes its absorption underground so much the easier; moreover, the trouble of breaking it up into pieces before using it is spared. The drawbacks to the new method lie in its requiring a greater working capital, and the necessity for packing the residue for shipment, thereby greatly adding to the shipping expenses. The new method is at present employed by only one company in Dairen, Suzuki & Co., which firm by the way operates the largest bean-mill in Manchuria."

A table (p. 185) gives statistics for the following in four locations in Manchuria: No. of soya bean mills. Capital (1,000 yen). No. of workmen. Production of bean cake (1,000 pieces, value in 1,000 yen). Production of bean oil (1,000 pieces, value in 1,000 yen). The four locations are: Dairen, Kwantung Province (Dairen excluded), Railway Zone, Total of the above three. More than half of the 105 mills are in Dairen.

Photos (between p. 138-39) show: (1) A field of soya beans. (2) Piles of soya beans in the open air, Kaiyuan. (3) Soya beans awaiting shipment at Dairen wharves. Tables show: (1) Composition of yellow and green soy beans (p. 141). (2) Composition of bean cake based on analyses by laboratories in Japan, Scotland, and South Manchuria Railway Co. (p. 144). (3) Exports of soya beans, bean cake, and bean oil from 1908 to 1917 from Dairen, Newchwang, Vladivostok, and total (p. 147-48).

Photos (between p. 184-85) show: (1) The Suzuki Bean Oil Factory at Dairen. (2) Casks of bean oil awaiting shipment on Dairen wharves.

Note: This book, like others in this series, was written by Mr. Tokuji Hoshino, manager of the Research Department, Bank of Korea; however his name does not appear on the title page, but only in the Foreword. Also published in 1920. Address: Korea.

2141. Jumelle, Henri Lucien. 1921. Les huiles végétales: Origines, procédés de préparation, caractères et emplois [The vegetable oils: Origins, processing methods, characteristics, and use]. Paris: Librairie J.-B. Baillière et Fils. 496 p. Illust. 18 cm. [Fre]

• ***Summary:*** In the section titled "Huile de soja," soybean oil is discussed on pages 346-351. The great center of production for the exportation of seeds, oil and cakes is Manchuria, although there are still large crops in many provinces of the New China (Chan Toung [Shandong / Shantung], Kiang Sou [Shanxi / Shansi], Hou Pé [Hebei / Hopei], Ho Nan [Henan / Honan], etc.).

The soybean is known as *teou* in China, *daizu* in Japan, *dau nanh* or *dau tuong* in Indochina, *katjang kadele* in China, and *pak tau* in Hong Kong.

The author was born in 1866. An illustration (line drawing by Thiebault) shows a soy bean plant, with an inset of the pods. Address: Prof., Faculté des Sciences de Marseille, Directeur du Musée Colonial.

2142. Kameoka, Seiji. 1921. Manshû daizu no kenkyû [A study of the soybeans of Manchuria]. Dairen: South Manchuria Railroad KK, Futô Office (Minami Manshû Tetsudô Kabushiki Kaisha Futô Jimusho). [2] + 160 p. Illust. 23 cm. [Jap]*

• ***Summary:*** This may be the same as the Oct. 1920 book with the same author and title, and of almost the same length. Address: Manchuria.

2143. Kellogg, John Harvey. 1921. Soy bean milk (Document part). In: J.H. Kellogg. 1921. The New Dietetics: What to Eat and How... Battle Creek, Michigan: The Modern

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Medicine Publishing Co. 950 p. See p. 302-03. 24 cm.
• ***Summary:*** "In Japan infants are sometimes nourished artificially on milk prepared from the soy bean by methods for a long time kept secret. Soy milk is now well known and quite extensively in use in France and England, and likely soon to be introduced into this country. The writer has prepared, experimentally, a quite palatable milk from the soy bean, and has for twenty-five years made use of milk prepared from the almond and other nuts.

"The beans may be prepared either by grinding to a fine flour or by soaking over night and crushing to a pulp between rollers. The dry meal is most convenient. Add to the dry meal sufficient water to a little more than saturate. Allow to soak for two hours. Add five times the quantity of boiling water. Boil for ten minutes, stirring. Filter through a fine cloth. The milky liquid thus obtained has properties very closely resembling cow's milk. It is rich in protein and fats. The fat is well emulsified and easily digestible, and the protein very closely resembles that of milk, being what is known to chemists as a complete protein which may replace the casein of milk as food. The soy milk is rather deficient in salts, both lime and iron. It contains vitamins but less than milk, and it contains no carbohydrates. To be used as milk it should be sweetened by the addition of 2 per cent of cane sugar or 4 per cent of milk sugar. To suit most palates a little salt should be added also. The flavor is different from that of cow's milk, but it is wholesome and not unpalatable and may to a considerable extent take the place of cow's milk by persons who are sensitized to milk or when milk is not available. A similar preparation may be made from peanuts.

"Soy bean milk, according to Adolf and Kiang, has the following percentage composition: Protein 4.22, fat 1.87, salts 0.40, water 93.51.

"The composition of the milk will vary, of course, with the amount of water used in its preparation. It will be noted that soy milk contains no sugar and is very poor in salts, containing only half the amount of salts found in cow's milk. All these may be easily added, however, and so soy milk is a possible resource for lacteal food in case of scarcity of the bovine product; but it seems to the writer doubtful that soy milk will ever be able to compete with cow's milk as a nutrient for human beings, and especially the feeding of infants." Address: Battle Creek, Michigan.

2144. Kinoshita, Asakichi. 1921. Jitsuyô miso jôzô-hô [Practical miso fermentation]. Tokyo: Meibundo. 411 p. [30+ ref. Jap]
• ***Summary:*** Contains the most complete description of miso preparation published during the first quarter of the 20th century.

2145. Masakadu, I. 1921. [Preparation of petroleum from fatty oils. I.]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 42:1065-72. (Chem. Abst. 16:2025 {1922}). [Jap]
• ***Summary:*** Obtained oils resembling petroleum by the dry distillation of the soaps of sardine, linseed, cottonseed, soy bean, and grape-seed oils.

2146. Minami Manshu Tetsudo, Noji Shikenjo, Kung-chu-ling. [South Manchuria Railway, Agricultural Experiment Station, Kung-chu-ling]. 1921. Manshû daizu narabini mamekasu [Manchurian soybean and soybean cake]. Kung-chu-ling, Manchuria. 145 p. [Jap; eng+]
• ***Summary:*** Name of company with diacritics is: Minami Manshû Tetsudô, Noji Shikenjo, Kung-chu-ling. Consists of four chapters: 1. Cultivation of Manchurian soybeans, by K. Hisatake. 2. Appraisal of Manchurian soybeans, by K. Adachi. 3. About soybean cake, by K. Tsukunaga. 4. Short training course on soybeans and soybean cake at Kunchuling, China, 1921. Address: South Manchuria Railway, Manchuria.

2147. Morse, Hosea Ballou. 1921. The trade and administration of China. 3rd revised ed. Shanghai, China: Kelly and Walsh. xv + 505 p. Illust. Index. 22 cm.
• ***Summary:*** One of the most important early books on this subject. The "Preface to the Third Edition" notes that "China is everywhere in a disturbed state, divided against itself, with a weak government dominated by a lawless soldiery;..." Contains much interesting information about Chinese history, including the complex history of the currency (taels) and weights (piculs, catties, and taels). The author (lived 1855-1934) is an American, who was sometimes Commissioner of Customs in China. He arrived in China in about 1874 with three friends, shortly after graduating from Harvard University (Massachusetts).

Listed in the index under "Beans, bean-cake and bean-oil," soybeans are discussed extensively–especially in Chapter 8, "The provinces and the treaty ports (p. 225-296). "China Proper is divided into eighteen provinces, and to distinguish it from the rest of the Empire this part is commonly and even officially referred to by the Chinese as 'The Eighteen Provinces.' The events of the last few years, since 1894, have brought into commercial and political prominence the region which we call collectively Manchuria, divided for administrative purposes into three provinces; these are called by the Chinese 'The Three Eastern Provinces,' lying east of the eastern end of the Great Wall, where it comes to the sea at Shanhaikwan, built to protect the Eighteen Provinces forever from invading hordes from the north, whether Mongol or Manchu." The population of the 18 Provinces is about 385 million. Most early trade with China was conducted at Canton. "The British Treaty of Nanking (1842) opened the first "treaty ports," five in number: Canton, Amoy, Foochow, Ningpo, and Shanghai. These five ports have now grown to over forty..." (p. 226-27).

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Manchuria: Of the three eastern provinces, two, Heilungkiang and Kirin are not very important. "The southern province, Shengking [Lioaning], is the most important, and contains, probably, nine-tenths of the total population of Manchuria;" an estimated 10-25% of these people are the original stock of the conquering Manchus, but the great majority are "immigrants from Shantung and Chihli, and their descendants. The western part of this province is made up of the plain of the Liao and the valleys of its tributaries, and grows wheat and durra for food, and beans from which are made an esculent and illuminating oil, and bean-cake shipped to restore exhausted fertility to the fields of Japan and of Kwangtung."

Newchwang: "This port, situated 13 miles above the mouth of the Liao River, was opened officially in 1861, but actually in 1864, at Yingtze or Yingkow [Yingkou], 30 miles below the unimportant city of Newchwang. Recently the port has been distinguished as Yingkow, but Newchwang is and has been the name officially given to the Treaty Port, the Custom House, and the Post Office." A table shows the value of its imports and exports from 1864 to 1918. "Of products of the district finding their outlet at Newchwang the principal are [soy] beans (value in 1904 Tls. [Haikwan or Custom taels] 6,577,000), bean cake (Tls. 4,589,000), bean-oil (Tls. 2,133,000), silk (Tls. 2,005,000)..." (p. 230).

"Moukden [Mukden] is the Manchu name of what in Chinese is known as Shengking (the Sacred Capital), and administratively was from A.D. 1625 called Shenyang, and is now officially termed Fengtien. The old capital of the Manchus before they marched to the conquest of China and migrated to Peking, it still (as of 1906) remains a sleeping capital..." It is situated in the heart of the plain of the Liao valley, 100 miles from Newchwang (p. 231). Note: As of Feb. 2000 it is officially called Shenyang.

"Harbin, the junction of the railways from Irkutsk to Vladivostock [Vladivostok], and from Harbin to Kwanchengtze, where it joins the Japanese line to Dairen, has been made the seat of a Custom House to control the railway traffic" (p. 231). Dairen has been under Japanese control since 1905, but a Chinese Custom House controls its trade under regulations similar to those in force at Tsingtau [Kiaochou] (q.v.) (p. 232).

The major farm products of Shantung are [soy] beans, opium, silk, wheat, and millet (p. 241). Confucius was born in Shantung. "Within its limits are the treaty port of Chefoo and the foreign 'leased territories' of Kiaochow and Weihaiwei. Chefoo, "the treaty port, opened in 1863, is not at Chefoo, which is on the north side of its harbor, but at Yentai on the south side." A table shows the value of its imports and exports from 1864 to 1918. Among the principal exports in 1904 were [soy] beans and bean-cake (Tls. 2,794,000), wild silk (Tls. 4,803,000), straw braid, and vermicelli. Kiaochow is at the head of a wide, shallow bay. Among its important exports are yellow silk, bean-oil, and ground-nut oil. In Nov. 1914 Japanese troops occupied the port and forts of Tsingtau (p. 245).

In Hupeh ("North of the Lake") province, Hankow opened as a treaty port in 1861; the British were given the original concession, 62 acres. A table shows the value of its imports and exports from 1864 to 1918. In 1905 the principal exports originating in Hankow were tea (Tls. 9,729,000), [soy] beans (Tls. 7,089,000), bean-cake (Tls. 868,000), wood-oil (from seeds of *Aleurites cordata,* Tls. 3,320,000), sesamum seed (Tls. 3,172,000), etc. "Of the steamers entered and cleared at Hankow during 1905, a total of 3,715,710 tons, 50 per cent. was under the British flag," 17% under the Chinese, 16% under the Japanese, and 13% under the German." An important product of Kiangsi province is hemp. Important natural products of Kiangsu province are silk, rice, opium, and [soy] beans (p. 260). In Kiangsu province, Chinkiang was opened to foreign trade in 1861. A table shows the value of its imports and exports from 1864 to 1918. The principal exports in 1904 were [soy] beans (Tls. 535,000), bean-cake (Tls. 781,000), ground nuts (Tls. 1,804,000), ground nut-oil (Tls. 911,000), sesamum oil (Tls. 876,000), etc. (p. 262).

"Shanghai, 'By-the-Sea,' is now far removed from salt water, but is the first point on entering the Yangtze at which a port can be established." "Shanghai is mentioned in history 2,150 years ago, and 900 years ago was a mart of sufficient importance to be made a Customs Station. It was occupied in 1842 by the British forces on their way to Nanking, and, having been declared a treaty port by the Treaty of Nanking, was formally opened to trade on November 17th, 1843." Not long thereafter, the French (1849) and Americans established foreign residences and settlements in Shanghai (p. 263-64). Address: LL.D., Camberley [England].

2148. Rouest, Leon. 1921. Le soja et son lait végétal: Applications agricoles et industrielles [The soybean and its vegetable milk. Agricultural and industrial applications]. Carcassone (Aude), France: Lucie-Grazaille. 157 p. Illust. No index. 25 cm. [42 ref. Fre]

• ***Summary:*** Contents: Preface, by Louis Forest. Introduction–What is soya? 1. History of the dissemination of soya: In 1712 the naturalist Kaempfer introduced soya, introduction of soya to France and Europe, soya is cultivated in Austria in 1875 by Prof. Haberlandt, soya is the object of many trials in France from 1876 to 1881, the study and acclimatization of soya becomes widespread, the causes of setbacks in the cultivation of soya.

2. Cultivation of soya: Botanical characteristics of soya, the varieties of soya, Chinese varieties and soya in China, Japanese varieties and soya in Japan, American varieties and soya in America (varieties: Mammoth, Hollybrook, Ito San, Guelph, Haberlandt, Medium Yellow, Wilson, Peking, Tokio, Mandchu [Manchu], Black Eyebrow, Barchet), soya in Europe–France and Italy, seven varieties of soya tested

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in France, soya in the experimental farms for new crops (*les Fermes Expérimentales de Néoculture;* Many varieties from the USA were tested, including Manchu, Wilson Five, Haberlandt, Tokio, Virginia, Hato [Hahto], Early Medium Green), the cultural and geographical appearance of soya, its production worldwide, planting soybeans, heat units (*degré thermique*) and the germination of soya, the importance of spacing between plants, number of seeds per hectare, soya during its vegetative stage, the vegetation of soya compared with that of the haricot at high altitudes, rolling the seeds and types of crop maintenance, growth of the plant, acclimatization, the enemies of soya.

3. Composition of the soybean plant. 4. Soya forage: Green soya forage, soya hay, soya as a plant for soil improvement. 5. Harvesting soybean seeds: Maturity of the seed, harvesting soya, the food value and composition of soya seeds. 6. Soya as an oil plant: Richness in oil, defatted soybean cake, imports and exports of soya cake from 1915 to 1919 (Imports to: Sweden, Canada, Korea, Japan, Formosa. Exports from: England, China, Korea), production of soya cake from 1915 to 1919 (Denmark, Great Britain and Ireland, Netherlands, Sweden, USA, Japan, Formosa, Korea, Java and Madura).

7. Soymilk: Its manufacture (in 1910-1913 Li Yu-ying installed a factory named "La Caséo-Sojaïne" at Vallées {Asnière-Seine} near Paris. Rouest visited this factory and saw them make soymilk, which was filtered using a filter-press resembling those used in sugar refineries), its properties and composition, composition compared to other types of milk, powdered soymilk, soymilk in the nursing and feeding of animals, soymilk related to tuberculosis in animals and in humans, soymilk would allow the milk and butter from animals to be reserved exclusively for human foods and could be used for raising many piglets, manufacture of non-dairy milk in Canada (a factory is now under construction). 8. Soya in Industry: Soymilk and soy casein, Sojalithe (like Galalithe).

9. Soya in human nutrition: Soy flour and its applications (incl. Li Yu-ying's usine de la Caséo-Sojaïne, and bread made of soya and wheat), soya compared to dry legumes (such as lentils, haricots, peas, beans), soya used as a legume (whole soybeans), the food value of soy sprouts, preserves and confections made from soya, soya chocolate and coffee, the amount of nutrients produced by soya and other crops from a unit of land, a meal of soya served in France (prepared and served some years ago by Li Yu-ying's soyfoods plant La Caséo-Sojaïne for the major print media, the medical press, the National Society for Acclimatization, etc.; it consisted of 2 soups {one with 'soya meat' and one with soymilk}, 2 entrees {an omelet with smoked soya ham, and fritters stuffed with soy meat}, soy [actually mung bean, *lüdou*] sprouts in a salad and sauteed, 3 desserts {soya cake, biscuits, and confection}, and soy coffee; a recipe for each is given; soya meat is smoked tofu).

10. Use of soya in East Asia: Tofu (*fromage végétal*), soy-based condiments (such as natto {Ping ming Natto and Tokio-Natto}, miso, Chinese miso or tao-tjiung [doujiang], and shoyu {Soyou or Schozou}), making soy sauce in Kwantung, China (from Groff).

11. The opinions of several authors concerning soya (from the French medical and hygienic press): Introduction–E. Maurel. Soya and soy bread in diabetic diets–Dr. Dujardin-Beaumetz, Dr. Bloch, Dr. J. Le Goff, L. Beille, M. Gautier. Soya used as a bean–M. Gautier. Soy sauce used in place of meat extracts. The state of cheese. The popularization of soya in Europe–A. Paillieux.

Conclusions: The influence of cultural technology on variation. Appendix: Advice to experimenters on the acclimatization of soya in France. Other methods of obtaining early-maturing soybeans.

The author concludes (p. 140): We must make every effort to acclimatize soya in France. We must develop the will and learn from past mistakes. Most soybean varieties now available in France are too late. We must get varieties from Manchuria, whose climate is similar to that of southeastern France, and from the northeastern USA. It is urgent that, in the near future, we start a Soybean Experiment Station to take responsibility for this work. The setbacks since 1830 can be overcome by present science and genetics. The first step is to introduce better varieties.

On the last page is a full-page advertisement for various seeds sold by Mr. Rouest, including 30 varieties of soybeans (*Soja hispida*)*;* the names of the individual varieties are not given.

Illustrations show: (1) A soy bean plant with many pods (title page). (2) Flowers and pods of the soy bean plant (p. 29). (3) Soy pods and beans (p. 30). (4) A soy bean plant drawn by a Chinese artist (p. 32, from Li Yu-ying). (5) Pods of the Hato [Hahto] variety of soy bean (p. 51). (6) Germinating soy bean seeds (p. 54, from Li Yu-ying). (7) Soy bean roots with nodules (from a photo by Dr. Le Goff; p. 73). (8) Soy bean pods, opened to show 3 beans in each (p. 82).

Tables show: (1) Production of soybeans by color in China in 1916 and 1917 (p. 35, in quintals, from the International Yearbook of Rome, Vol. 1, 1919): In 1917: Yellow 4,069,822. Other 953,012. Green 181,190. White 71,234. Black 40,066. Total: 5,315,324.

(2) Percentage composition of various oilseed cakes (p. 95, from Kellner). (3) Imports and exports of soybean cake, by country, from 1915 to 1919 (in quintals, p. 96). Imports are given for Sweden, Canada, Korea (from 1916), Japan, and Formosa [Taiwan]. Exports are given for England (6 quintals in 1915), China (including Manchuria, by far the biggest exporter, from 1916), and Korea (from 1916).

(4) Production of soybean cakes, by country, from 1915 to 1919 (p. 97, in quintals, based on statistics from the International Bureau of Agriculture, Rome, 1919). In

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descending order of production in 1915 (in quintals): Japan 5,439,337. Korea 3,209,238. Great Britain and Ireland: 1,513,059. Denmark 921,782. Java and Madura 503,025. Note that China is not listed. Netherlands 144,523. Formosa [Taiwan] 62,131. Sweden 1,733. USA 0, but 501,822 in 1916.

Note: When Alsace was occupied by the Germans during World War I, the Rouest family moved from Alsace to Paris. Mr. Rouest brought soybeans from Africa and adapted them to France. He paid for the publication of this book. Address: Directeur des Fermes Expérimentales de Néoculture, Carcassonne (Aude), France.

2149. Rouest, Leon. 1921. Le soja et son lait végétal: Applications agricoles et industrielles [The soybean and its vegetable milk. Agricultural and industrial applications]. Carcassone (Aude), France: Lucie-Grazaille. 157 p. Illust. No index. 25 cm. [42 ref. Fre]

• ***Summary:*** This is a summary of interesting points throughout this book. The main early use of soy in Europe was more therapeutic than nutritional (p. 3); it was used mainly in diabetic diets.

Nothing remains of the early trials conducted 20 years ago in France and Austria. The reasons for the crop's failure were lack of understanding of the laws of acclimatization and genetics, and the fact that soya (*soja*) was introduced as a new food legume, when actually it can only be utilized as a forage plant and industrially (for oil, cakes, and casein). Later, when the plant has been adapted, when it is understood that soya is not being propagated to competed with other dry legumes, that it is not being cultivated to extract from the seeds a vegetable milk for people, but simply as a forage plant–and the most remarkable one that exists (p. 3).

The English are trying to acclimatize soya to their colonies, especially those in southern Africa. In 1908 some 200,000 tonnes (metric tons) of soybeans were exported from China [including Manchuria] to Europe, followed by 500,000 tonnes in 1909. One can extract from soybean seeds a vegetable milk (*lait végétal*) which has the same value as animal milk for use in raising young animals. Its seeds and forage are also fine for raising farm animals and for industrial products. The author thanks all those who have helped him to acclimatize the soybean to France and to create new varieties of soya in France (p. 4).

Introduction of the soybean to France and to Europe (p. 6-7): A good but brief review of the literature on this subject. In 1739 Buffon was made director of the Jardin des Plants in Paris. Shortly thereafter, Christian missionaries in China sent him specimens of seeds and plants. The soybean must have been among them. The soybean has very probably been cultivated at the Museum since 1779, certainly in 1779 and later from 1834 to 1880. In 1855 Baron de Montigny was charged by the Society for Acclimatization to distribute five varieties of soya sent from China by Mr. Montigny; these were from northern China. The plants first bore seeds in France in 1854; their acclimatization is assured. In 1857 Mr. Lachaume transmitted to the Society for Acclimatization details of the success he obtained at Vitry-sur-Seine with soy culture. The seeds were planted in 1856. In 1858 a report to the Society for Acclimatization indicated that the acclimatization of the soybean was complete. In 1859 Mr. de Vilmorin reported on cultural trials sent from China by Mr. Perny. The varieties matured too late. The same year Dr. Turrel harvested soybeans at Toulon. In 1862 the Society for Acclimatization received seeds from Mr. Guillemin; the yellow soybean was said to be used for making tofu. Following the events of 1870, the cultivation of the soybean in France was apparently discontinued. Note 1. The brief war of 1870 between France and Bismark's Germany ended in France's defeat and the ceding to Germany of Alsace-Lorraine.

In the long section on Prof. Haberlandt's work with soya, starting with his cultivation of it there in 1875, is a quotation from him: "I don't know, in this history of cultivation, any example of a plant which has, in so few years and to such a high degree, excited such general interest" (p. 8).

From 1876 to 1881, the soybean was the object of numerous trials in France by the Society of Horticulture at Etampes (Seine-et-Oise). During this same period, one Dr. H. failed with varieties sent from Japan but succeeded in cultivating a yellow soybean sent from China, and used the latter to make his own tofu (*fromage végétal*) for use at home. In 1880 Messrs. Vilmorin-Andrieux introduced in their catalog a species cultivated in Austria-Hungary (p. 17-18).

In 1878, Japan, China, and the Indies (*les Indes*) presented all the varieties of Soya at the Universal Exposition, and their seeds filled more than 20 boxes. In 1880 the National Society for Acclimatization was able to distribute soy in France and tests were conducted in 24 regions; they were largely successful, especially in central and southern France (p. 19-22).

Tests were then abandoned from this time until about 1888, when the soybean started to grow in the southern states of the USA. That same year Messrs. Lecerf and Dujardin-Beaumetz first had the idea of using soy bread in diabetic diets (p. 22).

Causes of setbacks in soybean culture (p. 24-27): First, the varieties used matured too late and were not acclimatized in a progressive manner. We must choose varieties from northern China and adapt them to the south of France (*le Midi*) [which is on the same latitude as Toronto, central Wisconsin, or southern Minnesota]. From these, we must develop hybrids, and gradually move them northward.

The soybean has been ostracized in France. Major commercial, financial, and social interests have viewed with terror the production of an inexpensive food and have

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retreated into the egotistical "Malthusian agriculture." This is the truth! (p. 26).

Soy cheese is even feared by the cheese industry in France. They ask if they should abandon their excellent cheeses in order to adopt a vegetal cheese (*fromage végétal*).

A long quotation from the *Chinese Imperial Encyclopedia of Agriculture* (p. 34) gives the various colors of soybeans, including black, white, grey, and even some speckled / mottled with blue. The black ones can be used for medicine. And they are used as an ingredient in the condiment called fermented black soybeans (*Chi* [*douchi*]), made of soybeans, ginger, and salt.

In 1910-1913 a factory named "La Caséo-Sojaïne" was installed near Paris. I (Rouest) visited this factory in which were installed all the modern conveniences (*tout le confort moderne*), and presented the best guarantees of hygiene. The milk was filtered using a filter press similar to those used in sugar factories (p. 99).

Note 2. Rouest has borrowed a great deal of material from earlier publications by Li Yu-ying, usually without acknowledgment and often arriving at very different conclusions, especially on the question of using soya to make human foods (Li) vs. foods and milk for animals (Rouest).

Rouest strongly recommends the use of soymilk to feed young domesticated animals. For us, soy will not replace green beans, milk or cheese. During World War I, the Germans were actively involved with the study of soymilk. A translation of an article from the *Schweizerische Milchzeitung* (Nov. 1918) tells how to make soymilk and tofu (p. 102). By using soymilk, there is no fear of transmitting tuberculosis. Address: Directeur des Fermes Expérimentales de Néoculture, Carcassonne (Aude), France.

2150. South Manchuria Railway Co., Transportation Bureau. 1921. Daizu mamekasu komugi kongô hokan benran [Handbook for storing the mixture of soybean meal and wheat]. Dairen?: South Manchuria Railway Co., Transportation Bureau (Minami Manshû Tetsudô Kabushiki Kaisha. Un'yubu). 7 + 96 p. Illust. 19 cm. [Jap]* Address: Japan.

2151. Suzuki, K. 1921. Daizu shihan byogen ni kansuru kenkyu [Studies on the cause of "shihan" (purple speck) of soybeans]. *Shiga-ken Noji Shikenjo Kyomu Kotei* (*Shiga Prefecture Agricultural Experiment Station Study Process*) No. 6. p. 132-35. [Jap]

2152. Vlachos, William N.; Vlachos, Conrad A. 1921. The fire and explosion hazards of commercial oils. Philadelphia, Pennsylvania: Press of Otto Jones Co. 292 p. See p. 39-40, 270. Index.

• ***Summary:*** Soy bean oil is discussed in Chapter II, on drying oils. A table shows it has a flash point of 556ºF (the highest listed on p. 270). "Soy bean oil, also known as Soya Bean Oil, Soja Bean Oil, Chinese Bean Oil and Bean Oil, is imported into this country from Manchuria, Japan, China and Korea. In 1917 we imported 265,000,000 pounds, at a cost of about $27,000,000. More soy bean oil is imported by us than any other vegetable or animal oil. It is largely shipped from the Orient in metal cans packed in wooden cases. With us, its production is a comparatively undeveloped industry, but it will doubtless grow very rapidly. In fact, in 1914, we produced 2,764,000 pounds, and in 1917, 42,074,000 pounds, which certainly indicates a healthy growth.

"Soy beans, from which the Soy Bean Oil is expressed, have been cultivated in China since 2800 B.C., and are the world's most important oleaginous seeds. The beans (there are over 500 varieties) contain 18% to 20% of oil, but by pressing, only 10% to 13% is expelled. Extracting with solvents to obtain the remainder of the oil is done quite extensively, but it spoils the presscake, which is a very valuable cattle food.

"In recent years quite a large quantity of soy beans have been imported and soy beans have been planted to a considerable extent in the South. As the beans keep quite well, they can be pressed *after* the cottonseed oil season is over, which is an economic factor of considerable importance. Ordinary cottonseed oil machinery is excellently adapted for soy bean pressing, and the refining process is also quite similar.

"Chemically speaking, Soy Bean Oil lies midway between Linseed Oil and Cottonseed Oil. Its iodine value varies from 137 to 143, which is rather close to that of Linseed Oil, 173 to 201. It is classed by Lewkowitsch as a *drying* oil, that is, a film will dry in four days, but even then it is still tacky. It is mixed with tungstates and cobalt driers to accelerate the drying process.

"In this country it is mainly used as an adulterant of, or substitute for linseed oil, and, like linseed oil, it is boiled and blown. Soy bean oil is also used extensively in soap and candle making.

"It is also an excellent edible oil, but it has to be deodorized, as its beany flavor is objectionable. Soy bean oil is now hardened for use in butter substitutes."

2153. *Light of Manchuria.* 1922. Central Laboratory of South Manchuria Railway Co. No. 17. p. 2-24, 29-31. Jan. 1.

• ***Summary:*** Includes a discussion of the history of the laboratory, its research division (which is studying "bean oil," i.e. soybean oil) and the constituents of soya bean press cake. Section V, titled "Beans and Bean Products," discusses the benzine extraction method, hardened oil, and Solite (a water based paint "manufactured by use of the albumen contained in Bean Cake" with calcium hydroxide and pigments added. It is being made and sold at the Solite Manufacturing Co. in Dairen).

The Central Laboratory was originally established by the Government General of Kwantung [Leased Territory]

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in July, 1908, and was taken over by the Railway Company in May, 1910. Its organization was then resolved into eight divisions. A Bean Mill (for soybeans) was founded on the chemical extraction system, and a fatty acid factory was appended to it. The above-mentioned Experimental Bean Mill, with its Fatty Acid Factory, was transferred to private management in September, 1915, upon the completion of the series of experiments, for which it had been established. Also improved koji for sorghum alcohol was based upon the laboratory's investigations.

Photos show: (1) A large, 2-page spread of the Central Laboratory (present premises). (2) Central Laboratory (old premises). (3) Electro-Chemical laboratory (of Research Division). (4) Bacteriological room (of Research Division) (5) Exhibition room.

2154. Lasseter, Dillard B. 1922. Depression of bean trade of Antung. *Commerce Reports* (*U.S. Dep. of Commerce*) 25(1):8-9. Jan. 2.
• ***Summary:*** "The [soya] bean industry of the Antung district has gradually lapsed from the condition of unequaled prosperity which began in the early months of 1919 to a present state of depression that would be serious had not the demand for bean cake as a fertilizer for rice and sugar cane in South China and Japan continued brisk throughout the year. The trade in bean oil, which was formerly the foundation of the industry, has now given place to the exportation in cake form of the residue after the oil is extracted. The total shipments of bean oil in 1920 were only 601,000 pounds, as compared with 4,802,000 pounds in 1919, whereas exports of bean cake amounted to 247,774,000 pounds in 1919 and 240,300,000 pounds in 1920.

"The output of Antung bean oil for 1921 is estimated at 89,000,000 pounds. The oil produced locally is greener in color than and of inferior quality to that produced in Dairen and other ports, requiring more refining."

"The export phase of the industry is, with the exception of one British firm, in the hands of the Japanese."

"The port of Swatow, in South China, has been the principal destination of the bean cake exported from Antung this year, with Japanese ports second."

"Beans constitute 35 per cent of the field crops produced in this district. The crop for 1921 has been quite good, being estimated at 95 per cent of a record year. Of the different varieties produced, only the soya and the yellow beans are pressed into cakes, the others being used for food purposes alone.

"Red beans [azuki] are still produced in large quantities, owing to their popularity with Japanese consumers, but recent exports do not compare favorably with those of 1919. The total amount of beans exported in 1920, of which the red and yellow varieties constitute the largest single item, decreased from 71,509,000 pounds in 1919 to 44,971,000 pounds in 1920. An even larger decrease is indicated for the 1921 export figures." Address: Vice Consul, Antung, China.

2155. Evans, Edward E. 1922. Some soy bean experiments. *Bean-Bag* (*The*) (*Lansing, Michigan*) 4(8):31-32. Jan.
• ***Summary:*** Source: Michigan Farmer [periodical]. "My soy bean trials cover a period of more than a quarter of a century, during which I have grown more than one hundred and thirty varieties. Many of these proved of no value in Ogemaw county (latitude 44), and some would not mature in the southern tier of the state. Of the varieties included in the 1920 trials I have had Early Black since 1897; Ogemaw and Ito San, 1898; Merko, 1909; Manchu and Black Eyebrow, 1912; Wilson has been grown four times within ten years. All the numbered varieties, Peking and Wisconsin Black were grown for the first time in 1920.

"The land on which the trials were made consists of a surface soil of eight to fifteen inches of clear sand. Under this did lay a stratum of hard brown hardpan, varying in thickness from ten to twenty-four inches. This hardpan was broken up shortly before planting, by the use of a stick of dynamite every fifteen feet. Under this lies a heavy clay subsoil. The previous crop on this land was corn. It had grown three previous crops of soys since 1911. It is thoroughly impregnated with the bacteria of many species of legumes. The fertilizer used was four hundred and eighty pounds of bone black per acre. Planting was made on May 28, or about ten days later than usual. Had I been able to plant on May 14 or 15 the period of growth would have been shortened fifteen to twenty days on all these varieties which did not reach maturity before September 15, because of the cloudy weather and great humidity later.

"In the following table, 'Maturity' refers to the time when the plants have attained their maximum growth and development, at which time they contain the maximum amount of protein and are at the correct stage for the silo. The weight at maturity was taken at this stage. Air-dry weight was taken when the preceding had attained a consistency approximating tinder. The weight of seed is from the crop after becoming thoroughly ripe and dry. The wide variation in the per cent of moisture at maturity is in some measure due to the variety; also to the amount of humidity in the atmosphere on different days; and to the presence or absence of large numbers of capillaries on the stalks, pods and leaves.

"Of the seeds planted Merko, Manchu, Black Eyebrow, Ito San, Ogemaw and Early Black were grown in Ogemaw county and are thoroughly acclimated. Wilson No. 5 and Peking were Virginia grown. Mandarin and the numbered varieties, though originally from northern Manchuria, a considerably colder climate than Ogemaw county, had been grown at the United States trial grounds at Arlington, Virginia, thus in a measure lengthening their period of growth. From past experience I believe that two or three seasons here in Michigan will very materially shorten their

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growing time. It seems probable that both Mandarin and No. 30600 will be among the earliest of the species, while the others will probably ripen along with Manchu, Ito San and Medium Green.

"Bearing in mind that one season's trial is not conclusive proof in any instance, nevertheless some of the figures obtained are quite startling. No. 30600, though attaining a height of only twenty-eight to thirty inches, was so widely branched as to create a square flat head, overlaid by clusters of pods. This variety is one of the erect, rigid type, as distinguished from the slender, willowy Ito San and the decumbent Merko. It seems probable that several of the numbered varieties may in future displace a number of our standard sorts. Ten to twelve tons of soy ensilage per acre, from rows three feet apart, certainly looks good. The seed is not available as yet and should not be distributed until more thoroughly tried out.

"The trials very forcibly illustrate the necessity of knowing where one's soy seed was grown. Home-grown Merko matured its crop fully. Maryland-grown Merko seed, while it produced large healthy plants, still lacked two weeks of maturity when killed by the frost, the last week in October. Wilson also matures here, occasionally, when Michigan seed is planted. This variety was just forming pods when killed by frost. While the bulk or weight of these late or undeveloped soys is often great, it should be remembered that they simply make bulk in the silo and do not balance the ration, as the protein content is low at that stage. I very much doubt if the 21,050 pounds of green Pekings contained anywhere near the amount of protein that was in the 8,900 pounds of fully developed and practically ripe Early Blacks. The varieties that are densely covered with capillaries (fine hairs) have the greatest resistance to both extremes of temperature, but the ripening up process requires longer.

"Of the standard varieties included in the trials Ito San (my introduction of 1901) has been longer in cultivation. It is probably the most widely disseminated variety, having been grown in nearly all agricultural countries of the world. It seems to be a general favorite, though inferior to Manchu and Black Eyebrow. These are both a little earlier and during eight years' trials have continuously produced heavier crops of both forage and seed than Ito San. Manchu produces the heavier crops of seed and Black Eyebrow a slightly heavier crop of forage. During the past three years Manchu has given very satisfactory results in Michigan, Wisconsin, Iowa, Nebraska and South Dakota. When acclimated Mandarin will prove earlier than my Ogemaw, which it far outyields in both forage and seed. Mandarin, in common with all the numbered varieties, retained their foliage until fully ripe. Mandarin had not shed any leaves thirty days after all the pods were dry.

"Several old standard sorts were not included in these trials for various reasons. Medium Green, introduced from Japan by Dr. Brooks, of Amherst, Massachusetts, in 1888, still remains the favorite in the New England states. It was grown continuously in Michigan from 1897 to 1915. It is a superb variety for the silo, but in this state shatters seed badly. By crossing this variety with Dr. Brook's dwarf brown I produced (1898) Olive Medium (Evans No. 13). By crossing Olive Medium with Medium Green the Ohio Station produced Ohio No. 9035, very popular in central and southern Ohio, Indiana and Illinois, but too late for Michigan. Medium Early Yellow, introduced from Japan by Prof. Georgeson, of Kansas, about 1890, was included in my trials from 1896 to 1899, but never passed the blossom stage before killing frosts. Ebony (Black Beauty) still occasionally grown, at one time very widely, was generally discarded because of inferior crop production. Hollybrook or Mongol, also occasionally called "Medium Early Yellow," has never been popular north of latitude 39, but is still a favorite in central Indiana and Illinois. It is too late for Ogemaw county."

A table shows maturity dates and yields of numerous soy bean varieties–some named, the rest numbered. The table contains five columns: Maturity date, weight at maturity (of one acre), air dry weight, weight of seed per acre. The named varieties and maturity dates are: Ogemaw–Aug. 25. Early Black–Sept. 1. Mandarin–Sept. 5. Wisconsin Black–Sept. 15. Ito San–Oct. 1. Manchu–Oct. 1. Black Eyebrow–Oct. 5. Merka (Michigan)–Oct. 5. Wilson No. 5–Did not mature. Peking–Did not mature.

2156. Oshima, Kokichi. 1922. Promising development of soya bean sauce: Studies on the protease of the *Aspergillus oryzae-flavus* group and its role in shoyu brewing. *American Food Journal* 17(1):30-31. Jan. [10 ref]

• ***Summary:*** "Editor's note.–The author of this article has been engaged for some time in experimental work in the laboratories of the Pathological Division of the Bureau of Animal Industry and the Microbiological Laboratory of the Bureau of Chemistry, U.S. Department of Agriculture. He is studying in Europe at the present."

The article begins: "Shoyu (soya bean sauce) is a most important seasoning in Japan and China, where it is widely used instead of vegetable or meat extract and salt. It is a fermented product made from soya beans, wheat and salt which are acted upon by *Aspergillus flavus* and related forms. The finished product contains about 20 per cent sodium chloride, 5 per cent glucose and 3 per cent protein cleavage products. Being highly palatable, nutritious and cheap, it will probably be used more and more extensively in many countries."

Note. This is the earliest English-language document seen (April 2012) that uses the term "soya bean sauce" to refer to soy sauce.

From "analysis of 'moromi' at different ages and from the fact that *Aspergillus flavus* and related forms which are used in 'shoyu-koji' preparation, produce a very strong

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proteolytic enzyme, it may be assumed that the protease from such *Aspergilli* is the most important one."

A table (p. 30) shows three different species of *Aspergillus* and their characteristics: *Aspergillus oryzae.* Amylase production: strong. Growth: quick. *Aspergillus effusus.* Amylase production: very weak. Growth: slow. *Aspergillus parasiticus.* Amylase production: very weak. Growth: quickest.

"Influence of cooking on glycinin digestibility [by protease enzymes]: In 'shoyu' brewing soya beans are generally cooked 2 to 3 hours in open kettles. Cooking in the autoclave [pressure cooker] at 15 pounds pressure for 1½ to 2 hours is coming into vogue."

"Summary: 1. Proteolytic enzymes prepared from *Aspergillus oryzaeflavus* group can digest native proteins such as beef muscle, egg white, glycinin, edestin and casein as well as paoepton [peptone?] with the production of amino acids... The glycinin is favored by the presence of sodium of sodium chloride because the salt keeps the protein in solution..."

Acknowledgment: "The author is greatly indebted... to Drs. William N. Berg, Margaret B. Church and Charles Thom.

"Many thanks are due to Dr. Jokichi Takamine, in whose laboratory many practical experiments were made on Taka-diastase." Address: Was at USDA Bureau of Chemistry Microbiological Lab. Now studying in Europe. By 23 Feb. 1923 he is in Sapporo, Japan.

2157. Sato, Masanori. 1922. Daizu abura shibô-san sekkai no kanryû ni yoru sekiyu ruiji nenryô no seihô ni tsuite [Preparation of a liquid fuel resembling petroleum. I. Distillation of the calcium salts of soya-bean oil fatty acids]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 25(287):13-24. Jan. [5 ref. Jap; eng]
• ***Summary:*** By the dry distillation of 100 gm of the calcium salts of soybean oil fatty acids, about 73 cc of oily distillate and about 8 liters of combustible gas were obtained. The oily distillate has an odor resembling that of cracked petroleum and a pale greenish-yellow color with a fluorescence similar to that shown by petroleum. Its characteristics are as follows: Specific gravity = 0.8261 at 15ºC, iodine value = 117.4, acid value = 0.3, refining loss with concentrated sulfuric acid (15% by volume) and sodium hydroxide (specific gravity 1.555, 5% by volume) = 22.0%, calorific value = 9956 calories. The gas contains 2.4% (by volume) carbon dioxide, 4.0% oxygen, 18.1% heavy hydrocarbons, 10.3% carbon monoxide, 1.4% hydrogen, 50.7% methane, and 12.3% nitrogen.

Note: He gives his company's name (p. 4) as "S. M. R. Co." [South Manchuria Railway Co.]. Address: Kôgakushi, Manshû Tetsudô Chûô Shikenjo (Central Lab. of South Manchuria Railway Co.).

2158. Sato, Masanori. 1922. Manufacture of artificial petroleum from [soy] Bean Oil. *Light of Manchuria* No. 18. p. 36-51. Feb. 1. [3 ref]
• ***Summary:*** Contents: Introduction. Laboratory experiments: Characteristics of distillation crude oil, characteristics of fractionated oil, constituents of dry distillation gas, dry distillation residue and water distilled out. Conclusion.

When 100 gm of the calcium salt of Bean Oil fatty acids is dry distilled at about 500ºC, a maximum of 67 cc of distillation crude petroleum will be obtained, together with about liters of dry distilled gas. The average calorific value of this crude petroleum is 9,965 calories, so it compares well with that of petroleum and heavy petroleum, and renders it available for sundry uses as a liquid fuel. The dry distillation gas resembles natural gas in having methane for its principal compound. When distillation petroleum is fractionated, about 20% light oil, 60% middle oil, and 10% heavy petroleum can be obtained. The main obstacle to making this process on a commercially viable is the high price of Bean Oil. Address: Central Lab., South Manchuria Railway Co., Dairen, Manchuria.

2159. Yamamoto, Yoshitaro; Mizusawa, Isoma. 1922. Procédé de préparation d'huile de fèves [Process for preparation of oil from beans]. *French Patent* 533,107. Feb. 22. 2 p. Application filed 30 March 1921. [Fre]
• ***Summary:*** Describes how to prepare an odorless and colorless oil and flour from soya beans (*fèves de soja*) by treating them with a dilute solution of organic acid.

For details in English see their 1922 U.S. Patent No. 1,433,168. Address: Japan.

2160. Omura, Magosaburo; Okada, Teppei. 1922. [Soluble protein]. *Japanese Patent* 41,853. Feb. 23. (Chem. Abst. 18:449). [Jap]*
• ***Summary:*** An early patent concerning the development of an adhesive from soybeans.

2161. *Bean-Bag* (*The*) (*Lansing, Michigan*). 1922. Growth of soya bean industry. 4(9):16. Feb.
• ***Summary:*** "Ten years ago the exports of bean cakes from Manchuria totaled 400,000 to 500,000 tons, but the latest reports show that these figures have been increased to over 1,000,000 tons.

"Bean oil exports totaled 20,000 to 30,000 tons a decade ago, but of late they have been increased to 400,000. Prior to the outbreak of the war Great Britain, America, Belgium, Japan and Russia divided the exports, but now America and Japan are the only two foreign buyers.

"The following table of the last annual production of soya beans in the world is given by the *Bankers' Weekly* (Chinese): 1918 (in piculs)–China 50,286,000. Japan 6,464,000. Korea 5,220,000. United States of America 870,000. Total 62,640,000.

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"According to the 1918 figures, Japan absorbed 77 per cent of the Chinese soya beans available for export, American and European markets took 7 per cent and the remaining 16 per cent were distributed throughout the various provinces of China."

2162. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*). 1922. Daizu iô-byô ni kansuru chôsa [Investigations on chlorosis of soybeans]. 9:101-05. Feb. [Jap]
• ***Summary:*** The history of chlorosis was traced to Frank in 1881. Chlorosis is caused by *Heterodera schachtii.* Note that Heterodera is also the genus name of some nematodes. Address: Hokkaido Noji Shikenjo.

2163. Akita, M. 1922. Bean oil and its products. VI-X. *Light of Manchuria* No. 19. p. 5-45. March 1. [18 ref]
• ***Summary:*** Continued from the September 1921 number. 6. Bean oil and comparison with a few other kinds of fat (cottonseed oil, rapeseed oil). 7. Method of detection– Mixture of bean oil and olive oil. 8. Oil obtained from bean cake. 9. Denaturation of bean oil. 10. Uses of bean oil: Substitute for India Rubber, soap, hardened oil, speed of hardening [hydrogenating] bean oil. Conclusions. Contains 12 photos related to Manchuria (mostly tourist attractions) but not to soy. Address: Central Lab., South Manchuria Railway Co., Dairen, Manchuria.

2164. *San Francisco Chronicle.* 1922. Chronicle shipping news. March 11. p. 19.
• ***Summary:*** The section titled "Shipping notes" states: "The peanut market was flooded yesterday with the arrival of 2,600 bags of peanuts from the Orient on the steamer Melville Dollar. Other items of the cargo were 1,130 bags of linseed cake, 2,900 bundles of rattan, and camphor, soya beans and dried fish.

"The Japanese steamer Hague Maru, arriving here from the Orient, brought 1,000 cases of tea and a miscellaneous cargo of oil, gum damar, soy [sauce], dried fish, bamboo ware and porcelain."

2165. *USDA Bureau of Plant Industry, Inventory.* 1922. Seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from April 1 to June 30, 1917. Nos. 44446 to 44934. No. 51. 100 p. March 15.
• ***Summary:*** Soy bean introductions: *Soja max* (L.) Piper. Fabaceæ. (*Glycine hispida* Maxim.)

"44500-44517. From Yihsein, Shantung Province, China. Presented by Rev. R.G. Coonradt. Received April 10, 1917. Quoted notes by Mr. Coonradt.

"44507-44513.

"44507. 'No. 2. large red bean; used for baking or boiling. Planted in the spring.'

"44508. 'No. 3. Large black bean; used for baking and boiling. Planted in the spring.'\ "44509. 'No. 4. Large yellow bean; used for baking and boiling. Planted in the spring.'

"44510. 'No. 5. Large blue bean; used for baking and boiling. Planted in the spring.'

"44511. 'No. 11. Small yellow bean; used for oil curd [?] and animal feed.'

"44512. 'No. 12. Tea-colored bean [brown]; used for oil curd and animal feed. Planted in June.'

"44513. 'No. 17. Used for soup.'"

"44597-44599. From Japan. Presented by Rev. Christopher Noss, Wakamatsu, Iwashiro, Japan. Received April 23, 1917.

"'Under date of November 24, 1916, you asked that I should obtain for you a quantity of the *Hato-koroshi-daizu* soy bean for experimental planting. I inquired at Kawamata, the town where I first found this variety, and asked our Japanese pastor to make a thorough search. No one could be found who knew anything about a bean called *Hato-koroshi-daizu* or who could exactly match the sample. Finally the pastor sent me 6 quarts of a variety which, he said, seemed to be about the same. This variety is called *Uba-no-kantsu-bushi* (nurse's mastication), referring to its flattened shape, as though mashed between the teeth of a nurse for a little child. (Japanese mothers and nurses are accustomed to masticate food that is hard before feeding it to their little ones.)

"'I appealed to another of my Japanese workers, who is a graduate in agriculture and has served the government as an agricultural expert. He undertook to find the bean for me and made one special trip to look it up. He, too, reported that he could not find *Hato-koroshi-daizu,* and that the variety which seemed to be identical with it was in his district called *Shiroishi* (white stone, the name of a noted river in northern Japan). Of this variety he sent me about 4 quarts which he said was all that he could find.

"'I wrote to the chief agricultural school in my province and to the leading seedsmen of Sapporo, the place from which we generally buy seeds for use in the north, and could find no trace of *Hato-koroshi-daizu.* "I judge that the bean must have come from the south."' (*Noss.*)

"44597. From Wakamatsu.

"44598. From Odaka.

"44599. From Kawamata." Address: Washington, DC.

2166. *Times of India* (*The*) (*Bombay*). 1922. Korean progress: Agriculture and farming. March 24. p. A7.
• ***Summary:*** "It is in southern Korea and especially in the South-Western district that agriculture has prospered, the climate being comparatively mild. The cultivated area is only 10,640,000 acres, being about one-tenth of the total area. About 36 per cent. of this is rice paddy and the remainder farm-land. There is enormous scope for extending cultivation if the difficulty of irrigation, which is the greatest obstacle, is surmounted. Since 1907 [Korea is now a Japanese protectorate], Government have adopted a policy of encouraging the exploitation of state-owned

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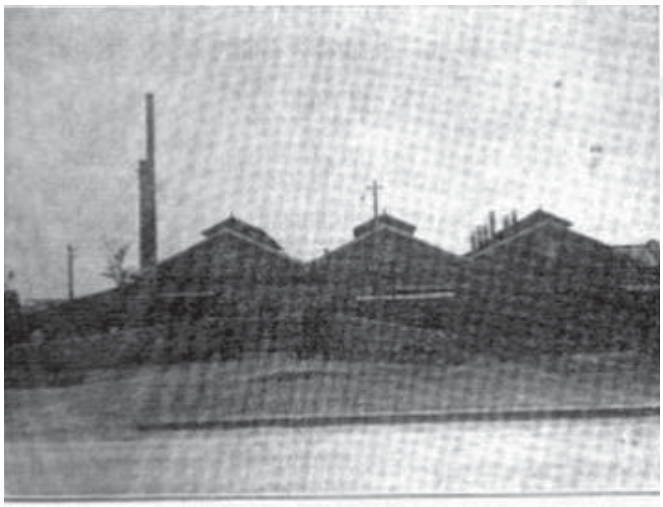
uncultivated lands, by renting them from the state to anyone regardless of nationality for a term of not more than ten years, for tillage, stock-raising, afforestation [planting seeds or trees to make a forest on land which has not been a forest recently, or which never has been a forest; different from reforestation], etc. Rice is the main food of the Korean and is the staple product,... the annual produce being about 60 million bushels. Wheat is another crop. But that of Soya beans is important." In 1918, about 30 million bushels were produced, twice as much as in 1910. Soya oil and soap are made from these soybeans "in Japan to which they are chiefly exported."

2167. Nakao, M.; Ikebe, S. 1922. Soya bean oil. *Far Eastern Review* (*Shanghai*) 18(3):180-85. March. [18 ref. Eng]

South Manchurian Railway's Experimental Bean Mill



Nisshin Oil Mill, Dairen

• ***Summary:*** Contents: Introduction. Classification of beans and bean oil. Expression of oil and bean oil: Expression, extraction method ("... a solvent is used for the extraction of oil from beans"). Literature on bean oil (produced in Manchuria. Note: Filled with errors!). Free fatty acid of bean oil. Moisture and bean oil. Receptacles and bean oil. Bean oil, 2 inches deep, measured by Robibont Tintometer. Precipitations and bean oil. Conclusion.

Interior of the Nisshin Oil Mill, Dairen

The article begins: "Bean oil is made from soya (Manchurian) beans (glycine hispida maxim) which originated in China and have been transplanted in Japan, Chosen (Korea), India, etc. Manchuria is highly suited to the cultivation of beans, the aggregate production being estimated at between 12,000,000 and 18,000,000 *koku* (1 *koku* is equivalent to 4.96 bushels), of which, half is consumed by the bean mills, and the oil exported. The mills at Dairen consume over 500 tons a day."

Tables show: (1) Composition of seven different colors of soybeans (p. 180). "The yellow varieties are commonest and yield the greatest percentage of oil." (2) Three different types of bean cake and meal: Round bean cake, found everywhere in Manchuria. Oblong bean cake is made at the Kabalkin Mill in Harbin. Bean meal is made at the Suzuki Mill in Dairen. For each type is given: Maximum pressure per square inch of surface. Percentage of oil left in residue. Moisture content of residue. (3) Free fatty acids.

Photos show: (1) South Manchurian Railway's experimental bean mill. (2) Kodera Bean Mill (Dairen). (3) Works of the Dairen Oil and Fat Industry Company at Dairen, where the oil is hardened [hydrogenated], and glycerine, etc., manufactured. (4) Nisshin Oil Mill, Dairen. (5) Interior of the Nisshin Oil Mill, Dairen. (6-7) Interior of the Santai Bean Mill, Dairen (2 views). (8) Interior of the extraction room. (9) The filter presses. Address: General Lab., South Manchuria Railway Co.

2168. Nishimura, Torazô; Kawakami, Tojiro. 1922. Shôyu jôzô-jô shiyo seraruru kôji-kin tane no hatsuiku ni yorite daizu oyobi komugi-chû ni ganyu seraruru kaku shu tanpakushitsu no ukeru henka [On the decomposition of protein in soybeans and wheat by the koji mold, *Aspergillus*

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oryzae, during shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 87. p. 527-46. March. [6 ref. Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Gishu.

2169. Nishimura, Torazô; Kinoshita, A.; Inoue, T. 1922. Miso jôzô-yô enshitsu hikaku shiken hôkoku [Comparative test on salts used to manufacture miso]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 87. p. 579-86. March. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Gishi; 3. Gushu.

2170. Sato, Y. 1922. Bean industry and its scientific study. *Light of Manchuria* No. 20. p. 1-33. April 1.
• ***Summary:*** Contents: Introduction. 1. Bean [soya bean] industry: Utilization of fat and bean oil, refining of bean oil (clarification of bean oil by precipitation, bleaching of bean oil {bleaching by clay, by carbon, by sun's rays, by heat, by chemicals}, refining by alkali, deodorizing), manufacture of derivatives (bean oil for paint manufacture, making of water proof from bean oil, substitute of India rubber from bean oil, substitute for hardened oil, lard and butter, manufacture of liquid fuel [petroleum] from bean oil). 2. Chemical industry using legumin: Industrial uses of bean cake, manufacture of plastic substance from legumin. 3. Beans as a food stuff: Introduction, bean milk (artificial milk; Melhuish 1915 British Patent, Goessel 1917 Dutch Patent, Japanese Patent no. 28,346), bean coffee and bean chocolate, food made from bean flour (bean powder or flour, roasted bean flour, and fat-free bean flour), hints on manufacture of food from nutritive point of view. Conclusion.

"What is now in the highest demand in Europe and the United States is not [soya] Beans themselves, but Bean Oil or various products made therefrom." "It may be said that the rapid development of the economic Manchuria has been accelerated by [soya] Beans. The future of the Manchurian industry may well be said to depend a good deal on Beans." Address: South Manchuria Railway Co., Agricultural Office.

2171. Berczeller, L. 1922. Die Untersuchung des Sojamehles [Investigations on soy flour]. *Biochemische Zeitschrift* 129:313-19. April 17. See also p. 239. (Chem. Abst. 16:2532). [Ger]
• ***Summary:*** Since Haberlandt introduced the soybean to Europe in 1878, there have been many experiments to try to make this wonderful plant (according to its chemical composition) useful to the white race. All of these efforts remain without success, due to a lack of biological research on the soybean. The ideal that this plant represents with respect to its protein and calorie content, is not attained by its other biological qualities–a supposition that must first be proved.

In Japan and China, where the soybean has been used as a food for thousands of years, its production for food lies in the hands of an extensive industry of small processors, which acquired their experience, as is the case in Europe with bakers and brewers, from generation to generation. But because Europe tastes did not accept each of those foods, in their various forms, their popularity did not spread. The European food industry had the same negative results in trying to make use of the soybean. This failure is not surprising since our food industry, partly only practical, partly borrowing its requirements from chemistry, is just becoming able to determine how one should manufacture a new food, but is not good at judging when one food is good and another is not. In these respects, dietetics could also do nothing differently... In the following laboratory experiments, the primary goal is to clarify the circumstances with respect to animals, and from these to draw some conclusions with respect to humans.

The soybean must, above all, be a food for the people, like the potato, and it seems to be called to this role when its biological shortcomings are eliminated.

Rats, given the choice of soy beans, soy bean flour (*Sojamehl*), and a new soy bean flour with almond flavoring (designated *Sojamehl O*), consumed the latter in the largest amount and the soy bean flour hardly at all.

Berczeller concludes: It should be noted that for its low cost per high nutritional value, and extreme ease of use in cooking, the soybean meets all requirements which could be placed on a food today. It now rests on practical research to decide if it can prove itself in human nutrition. The scientific prospects are most probable that it can. Address: Physiologischen Inst. der Universitaet Wien.

2172. Furusawa, J. 1922. Manchurian industry is based on beans: Milling for oil and cake is being improved and allied enterprises established. *Trans-Pacific* 6:79-83. April. [1 ref]
• ***Summary:*** "This article is part of a much longer one on the "Present and Future of Bean Milling Industry in Manchuria" in the December [1921] issue of *Light of Manchuria*–which see.

Photos show: (1) Junks on the Liao River at Newchwang. (2) Piles of round bean cakes–many of which used to come to Japan via Vladivostok. (3) The Suzuki Mill at Dairen–the only one using the chemical extraction method. (4) A scene typical of the principal railway centers of Manchuria–Bags of soya beans and piles of round cakes. Address: Managing Director, Nisshin Oil Mills Ltd., Dairen.

2173. Hirayama, S. 1922. Uses of bean oil and its improvement. *Light of Manchuria* No. 21. p. 1-11. May 1.
• ***Summary:*** Contents: Bean oil as industrial material. Edible vegetable oils (and their use in oleomargarine, "artificial butter" and "artificial lard"). Tendency of increase in consumption of vegetable oils (especially in lard substitutes and artificial butter–also called "substitute butter and substitute lard"). Values of different kinds of vegetable oil.

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Quality of Manchurian bean oil. Graduating standards for bean oil. American standards. To unify and improve quality of bean oil. Mixed storage system of S.M.R. Co.

Before World War I, the two principal uses of "Bean Oil" (soybean oil) were as material for paint and soap making. Its price of the oil was very low. "Originally the bean milling industry was founded for the production of Bean Cake mainly to supply Japan as fertilizer. And on occasion, with the brisk export of Bean Oil, Bean Cake was produced quite in excess of demand. But, it is to be regretted that the disposal of Bean Cake has always exercised a restraining influence upon the production of Bean Oil." One table (p. 6) shows production of lard and "substitute lard" in the USA from 1914 to 1920. Production of lard increased from 826,000 tons to 968,000 tons. Production of substitute lard decreased from 568,500 tons to 500,000 tons. About 93% of this substitute lard was made from vegetable oil. A second table (p. 6) shows production of butter and "artificial butter" in the USA from 1914 to 1920. Production of butter decreased from 853,000 tons to 721,200. Production of artificial butter [margarine] increased from 71,950 tons to 185,500 tons. A third table shows that the amount of artificial butter made in the USA from vegetable oil only skyrocketed from 971 tonnes in 1916 to 95,760 tons in 1920.

Photos show: (1) South Manchuria Railway Library, Dairen. (2) Bean oil tanks at the Dairen branch of Mitsui Bussan Kaisha. (3) Loading bulk oil into a steamer at the Inflammable Goods Pier, Dairen. (4) A bean oil tank car owned by the Mitsuis (Mitsui) at Seattle, Washington.

Note: This is the earliest English-language document seen that uses the term "artificial lard" to refer to shortening. Address: Mitsui Bussan Kaisha, Dairen, Manchuria.

2174. *San Francisco Chronicle.* 1922. Shipping notes. May 1. p. 19.

• ***Summary:*** "The principal items of cargo arriving here on the Japanese steamer Persia Maru from the Orient were 750 gunnies, 1,745 rolls of matting, 150 barrels of oil, 215 bales of raw silk, 13,029 mats of rice, 63 packages of silk goods, 968 packages of shoyu, 651 cases of canned crab, 306 cases of firecrackers, 133 cases of tea and 108 packages of tin."

2175. Yamamoto, Yoshitaro; Mizusawa, Isoma. 1922. A process for preparing odourless and colourless oil and flour from soya bean. *British Patent* 179,776. May 18. 2 p. Application filed 1 April 1921.

• ***Summary:*** The raw bean, coarsely broken and deprived of its bran, is steeped in a weak solution of an organic acid, such as acetic acid, to remove the substances to which the odor and color are due. The beans are then washed free from acid and dried, the oil is extracted, and flour is manufactured from the residue. The acid solution may be warmed slightly, and the washed beans may be treated with a dilute solution of sodium bicarbonate to neutralize any remaining acid. The pulverized bean, after the oil has been extracted, may be warmed with steam to a temperature below the coagulating temperature of the albumin contained in it. Address: 1. Miller, No. 22, Shyofuku-ji, Takata-mura, no-Uchi, Ako Gun, Hyogo Ken, Japan; 2. Banker, No. 8, Otani, Nishidai, Kobe-Shi, Japan.

2176. *USDA Bureau of Plant Industry, Inventory.* 1922. Seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from October 1 to December 31, 1918. Nos. 45221 to 45704. No. 57. 54 p. May 20.

• ***Summary:*** Soy bean introductions (From China, Japan, or Africa. Presented by Rev. G.D. Schlosser, Honan, China. Quoted notes by Mr. Schlosser): *Soja max* (L.) Piper. Fabaceæ. "46687-46691.

"46687. 'Seeds flat, light yellow.'

"46688. 'Seeds round, green.'

"46689. 'Seeds small, flat, yellowish green.'

"46690. 'Seeds small, flat, black.'

"46691. 'Seeds large, round, black. The Japanese export much of this variety to Seattle' [Washington]. Also on p. 19 are listed adsuki bean (Phaseolus angularis–46679) and sesame (a black-seeded Chinese variety–46686).

"46770/46780. From Canton, China. Presented by Mr. G. Weldman Groff, Canton Christian College. Received November 26, 1918. Quoted notes by Mr. Groff.

"46770/46779. 'A collection of beans procured on the Canton markets.'

"46770. 'No. 15036a. *Haak pei tseng tau.* One of the common beans of Kwangtung; said to be very nutritious. Planted in Kwangtung in March and April and again in August and September.'

"46776. 'No. 15036g. *Wong tau.* Used to make various bean products. Planted in Kwangtung in March and April.'"

No. 46779 (p. 32) is Adsuki bean (*Phaseolus angularis*). It is planted in Kwangtung in March and April. Note: Kwangtung is a province in southeast China containing the city of Canton. In pinyin it is written Guangdong. Address: Washington, DC.

2177. Sanka, I. 1922. Import of Manchuria bean oil into the United States and its uses. *Light of Manchuria* No. 22. p. 29-53. June 1.

• ***Summary:*** Contents: History of Manchurian Beans [soybeans] in the United States. Output of Manchurian Beans. Beans as an oil yielding agent. Output of Manchurian Bean Oil. Exports of Manchurian Bean Oil to the United States: Exports from Dairen (from 1915-1920) to various countries and total, exports from Yingkou, and from Antung, exports from Japan to the USA, channels of import, principal deals (in Manchuria, Japan, and the USA), importers and commission merchants in the USA by city, rules for regulating business of soya bean oil, market fluctuations.

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Quality of bean oil: Indices (constants and properties), method of detection. Uses of Bean Oil in the U.S.A.: As soap-making material, as paint making material, as edible oil, other uses (e.g., glycerine for gun powder).

A table (p. 38) lists the cities in Manchuria where soybean mills are located; after each is given the number of mills, the daily capacity of Bean Cake, and the total output of Bean Cake and Bean oil in 1919. The cities with the most mills are Dairen (60), Harbin (24), Liaoyang (22), Yingkou (21), and Antung (18).

In the West, Bean oil is used mostly in making soaps, but also in the manufacture of paint, varnish, linoleum, substitute for ebonite, candles, machine oil, oleomargarine, salad oil, oil for packing sardines, glycerine, substitute for lard, etc.

Photos show: (1) Exterior of the Santai Bean Mill (with a tall smokestack; owned by Mitsui & Co.) in Dairen (p. 31). (2) Hydraulic presses at the Nisshin Oil Mills in Dairen (p. 35). (3) Bean crushers at the Nisshin Oil Mills in Dairen (p. 37). Address: South Manchuria Railway Co., Agricultural Office.

2178. Remy, E. 1922. Ueber Sojabohnenmilch [On soymilk]. *Zeitschrift fuer Untersuchung der Nahrungs- und Genussmittel* 43(12):380-81. June 15. (Chem. Abst. 16:3714). [2 ref. Ger]

• ***Summary:*** Gives a chemical analysis of soymilk and compares it with cow's milk. A sample of soy bean milk, yellowish-white in color and having a sickly sweet taste and a faintly acid reaction, gave the following results on analysis: 88.93% water, 11.07% dry matter, 3.06% fat, 8.01% non-fatty solids, 2.96% protein, 0.57% starch, 2.48% glucose, 0.63% mineral matter, 6.44 cc of 1 normal acid alkalinity of ash, 4000 germs per cc. The gross energy content was 54 calories (cow's milk 70 calories). Content of food- units was 27 (cow's milk 34). The price of the soy bean milk at the time of the investigation was the same as that of cow's milk. It cannot therefore be considered to be an economical substitute for cow's milk. Address: Chemical Dep., Hygienic Inst., Univ. of Freiburg.

2179. Ockel, Reinhold. 1922. Die Oelindustrie Japans und der Mandschurei [Oil industry of Japan and Manchuria]. *Chemische Umschau auf dem Gebiete der Fette, Oele, Wachse und Harze* 29(26):201-02. June 28. (Chem. Abst. 16:3005). [Ger]
Address: Dipl.-Ing.

2180. Guillaumin, A. 1922. Les variétés de soya d'Extrème-Orient: Origine probable du soya [The varieties of soybeans in East Asia: The probable origin of the soybean]. *Revue de Botanique Appliquee & d'Agriculture Coloniale* 2(10):254-58. June 30. [10 ref. Fre]

• ***Summary:*** "The soybean (*Le Soya; Glycine Soja* Sieb. et Zucc., *Dolichos Soja* L, *Soja hispida* Moench, *S. angustifolio* Miq.) has been cultivated in the Far East since antiquity. Shen-Nung (*le Shénon*), written up by Houandi in about 3,000 to 3,500 years before Jesus-Christ, already mentioned the soybean. Since then, its culture has expanded to Indochina, India, Malaysia, Europe, America, and Africa.

"Long ago, in Austria and in France, varieties such as *Soja d'Etampes,* were selected for their high yield. In America, efforts have long been made to obtain, for the diverse climates, both forage varieties and seed varieties. And the U.S. Department of Agriculture has assembled in its test fields more than 500 varieties, of which about 20 are currently in commerce. Among the forage varieties are (Ball 1907): Early Brown, Black Eye Brown, Peking, Wilson Five, Virginia, Barchet, Biloxi, Laredo, Atoo San [sic, Ito San?], Tarheel Black, and Wisconsin Early Black. Among those grown for their seeds are: Ito San, Manchu, Elton, Medium Yellow, Mikado, Hollybrook, Haberlandt, Mammoth, Tokyo, Guelph, Austin, Easy Cook, Morse, Hahto, Early Medium Green, Mandarin, and Chiquita.

Note 1. This is the earliest document seen (Aug. 2013) that mentions the soybean variety Black Eye Brown. However, it does not appear in Ball (1907) as stated, nor does any name even vaguely resembling it appear. The Black Eye Brown variety is mentioned in only 3 known documents, all published in France in 1922.

"Note that the forage varieties all have black- or dark-colored seeds, whereas the seed varieties have yellow or greenish seeds.

"In Turkestan it seems that the only varieties are ovoid (5.7 x 3.7 mm), brilliant yellow, with brown hilum and traversed longitudinally by a bright line." Note 2. Turkistan or Turkestan is an historical region of Central Asia, usually thought to comprise Turkmenistan, Uzbekistan, Kyrgyzstan, Tajikistan, southern Kazakhstan, western China, and northeast Afghanistan.

Note 3. This is the earliest document seen (April 2008) concerning soybeans in Turkestan, or the cultivation of soybeans in Turkestan (not including Chinese Turkestan). This document contains the earliest date seen for soybeans in Turkestan, or the cultivation of soybeans in Turkestan (not including Chinese Turkestan) (1922). The source of these soybeans is unknown. Unfortunately, it is not clear in which part of Turkestan the soybeans were grown.

"In India, soybeans are cultivated in the United Provinces and at the foot of the Hamalayas from Kashmir to Darjeeling." David Hooper (1912) distinguished five different soybean races in India.

"In Cambodia, the only known variety is ovoid (6.3 x 4.2 cm), dull yellow, brown hilum, with a long, clear white line, known as *Sandek sieng* in Cambodian and *dau nanh in Annamite.* It is cultivated along the steep banks of the Mekong River.

"In Cochin China, the soybean is cultivated only on the

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red soils of the provinces of Chau-doc, Baria, and Bien-Hoa; in the western provinces, cultivation is insignificant and the seeds come from Cambodia. It seems that there is only one variety, closely related to that of Cambodia, called *dau nanh* or *dau-xa,* but it is not well established / widely grown, for it bears black or brown seeds.

"In the province of Baria one can obtain two harvests in a wet year–one in September, the other in December-January. In the province of Bien-Hoa, there is only harvest.

"In Annam, there is one variety similar to that cultivated in the lower parts of the provinces of Bin-dinh, Thua-hien, Dong-hoï, and Tanh-hoa.

In Tonkin, the soybean is known as *dau tuong;* in the [Mekong] delta, one can distinguish a small, ovoid variety (5.1 x 3 mm), with a yellow seed coat and a hilum surrounded by a brownish black aura that sometimes overflows the sides. In the region of Lang-son, on the plateaus 100-500 meters in height, it is replaced by a larger variety, ovoid (7.1 x 5 mm), dull yellow, and a hilum that is uncolored [pale] or brownish; one variety is also cultivated at Lao-kay.

"In Laos, the soybean is known as *Mok toua kon* and *Ta tone,* according to Dr. Spire, but precise information is lacking.

In the territory of Kwang-cho-wan (French: *Kouang-tchéou-wan,* in southeast China) the soybean is cultivated in the region of Taï ping, at an altitude of 30 meters. It is planted in the spring and harvested in the summer. One can distinguish two varieties here. One is very elongated (8 mm x 4.6 mm), dull yellow with a very clear brown hilum, called *Wong tao* or *Wong tao tsaï* in Cantonese. The other is small, flat (6.4 mm x 3.7 mm), dull black, with a large hilum, called *Hat tao* in Cantonese; it is absolutely the same as the variety Nigra cultivated at the botanical gardens of Cluz (Romania), and in Trieste (Italy), but different from that which is cultivated under this name at the botanical gardens of Cracow / Krakow (French: *Cracovie*) (Poland), Tabor (Czechoslovakia), and Delft (Netherlands), which is fatter, more round (7 mm x 4.8 mm) and of a velvety black color.

Note 4. This is the earliest document seen (Feb. 2005) concerning the cultivation of soybeans in Czechoslovakia (which became a country in 1918). This document contains the earliest date seen for the cultivation of soybeans in Czechoslovakia (June 1922). The source of these soybeans is unknown.

"In China, in Szechwan, only the yellow and green varieties are known. In the region of Shanghai, R.P. Courtois, of the Museum of Zi-ka-wei, has assembled an important collection of soybean varieties. Descriptions are given of varieties with the following colors and names: (1) Yellow: *Ta hoang téou* (large, yellow, almost round), *Kiu hoang téou* (ovoid, brilliant yellow). (2) Green: *Tsing pi téou* (roundish, 7.1 x 5.5 mm, clear green with clear hilum). (3) Brown: Large, ovoid (9.1 x 6.4 mm), reddish brown, with a slightly clearer hilum; no name given. (4) Black: Many varieties. (4A) Large ovoid seeds (9 x 4.3 mm), with large hilum; indigenous name unknown; (4B) A little smaller and bulging (8.3 x 5.4 mm), with ornate hilum and a longitudinal white line, named *Ta hé téou;* (4C) Ovoid (8.1 x 4.7 mm) with a wide hilum traversed by a white line, called *Hé téou;* (4D) Small (6.7 x 3.1 mm) and brownish black named *Siao hé téou;* (4E) And finally a very small, flat (6 x 2.7 mm), brownish black named *Ni téou.* By their shape, form, and color, the seeds of these last appear very similar to the American variety Laredo."

"In Europe, soya has its apostles, but it will never amount to anything more here than a small-time vegetable. Despite the Caséosojaïne at Vallées near Paris, France (Li Yu-ying, 1911) and the Soyama Werke at Bockenheim, Germany (1914), the milk, cream, butter, and cheese [tofu] made from soya will never be more than ersatz. The "soy bread" is only good for diabetics and the "soy ham" (*jambon de Soja*) in nothing but a weak imitation of pork. Soybeans themselves are indigestible and require a very long time to cook–even the yellow or white varieties. Soy sprouts (*germes de Soja*), which enjoyed some popularity before the war and deserved it, for they are a nice hors d'oeuvre, are actually nothing but mung bean sprouts."

Based on other sources (most of which are cited), the writer also discusses the soybean varieties of Manchuria (Hosie 1901), and Japan (Lemarié 1910), and discusses soybeans briefly in Korea, Philippines, Netherlands Indies.

In Europe, the soybean has its apostles: Caséosojaïne at Vallé near Paris (1911), and Soyama werke at Bockenheim (Germany) (1914). The latter makes milk, cream, butter and cheese (*le fromage de Soja* [tofu]), which are nothing but imitations. Soy bread has a good taste, especially for diabetics. Soy ham (*jambon de Soja*) is but a vague imitation of the pork product. The seeds, themselves, are hard to digest and take a very long time to cook, even the yellow or white varieties. As for the soy sprouts (*germes de Soja*), which enjoyed some popularity before the war, which they deserved as an agreeable hors d'oeuvre, they are nothing but young mung bean sprouts (*de jeunes germinations du Haricot Mungo*).

Also mentions foods such as soy sauce, fermented tofu, and tofu, made from soybeans in India, Indo-China, China, and Japan. Tofu is known as *dau phu* in Annamite, *tao fou* in, Cantonese, *téou fou* in Chinese, and *to fou* in Japanese. A significant amount was being exported from China before the war. In Manchuria soybeans occupy 1/5 of the cultivated land. Speculates on the origin of the soybean. Address: Asst. to the Crop Service, Museum of Natural History (Assistant du Service de culture au Muséum d'histoire naturelle).

2181. Ishikawa, T. 1922. Manufacture of hardened oil in Manchuria. *Light of Manchuria.* July 1. p. 12-19.
• ***Summary:*** The manufacture of hardened [hydrogenated]

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oil has advanced the furthest in Great Britain and Germany. The industry in the United States made remarkable strides during the War, and American products dominated the oil market at London during the War.

Although Manchuria is a major world center of vegetable oil production, it makes almost no hardened oil–largely because a lack of interest in chemical industry. Mr. T. Okada (formerly on the staff of the South Manchuria Railway Company Central Laboratory) applied to Manchurian Beans [soybeans] a chemical process developed by himself after years of research. In 1915 he decided to organize an enterprise on an industrial scale. In May 1916 a company was established for the manufacture of hardened oil on the basis of his investigations. This company is known as the Dairen Oil & Fat Industry Co. The factory was completed in December 1916 and was opened for trial operation in Jan. 1917. However many technical problems were encountered. At present, the plant has a capacity of 400 tons/month of hardened oil. From March to July 1921 some 420,000 *kin* [1 *kin* = 1.323 lb] were exported to Europe for sale on commission, and 210,000 *kin* were shipped to Japan–where an import duty of 20% *ad valorem* is imposed. In Europe the business depression since 1920 has hurt exports. Yet in the long run there are many good reasons that an efficient hydrogenation plant in Manchuria should thrive. Address: South Manchuria Railway Co., Commercial & Industrial Office.

2182. Komatsu, H. 1922. Tantalus from bean oil. *Light of Manchuria* No. 23. p. 20-27. July 1.
• ***Summary:*** Tantalus is a substance used for waterproofing mortar, cement, or concrete, developed from soybean oil by Mr. T. Suzuki, then in the service of the South Manchuria Railway Co. The chief constituent of Tantalus is fatty acid of aluminum, and it is a pale yellow liquid of somewhat viscous consistency, giving a very weak alkaline reaction to litmus paper. "When mixed in water, it readily forms an emulsion. If this Tantalus solution is used instead of water in kneading up cement, mortar, and other calcareous substances, the particles of cement, sand, and lime are enveloped by fatty acid of aluminium which has a strong repelling power against water, and so once the mixture has grown hard and got dried, the permeation of water among the particles will be absolutely stopped. Besides the mortar is not at all coloured."

The author also discusses how Tantalus is manufactured, its many applications or uses, characteristics, how much and how to use it, and results of testing. It is presently manufactured and sold throughout East Asia by the Dairen Solite Manufacturing Co. Address: Works Manager, Solite Manufacturing Co., Dairen, Manchuria.

2183. Seki, K. 1922. Bean cake exporters and bean mills at Dairen. *Light of Manchuria* No. 23. p. 1-12. July 1.
• ***Summary:*** About 96% of the Bean Cake exported from Manchuria is shipped to Japan proper and Formosa [a Japanese colony since 1895] for use as manure by the farming classes. The demand for Bean Cake in Japan is increasing partly because the comparative advantage of Bean Cake fertilizer has come to be more widely appreciated by the farmers, and partly because, during war time, it is difficult and expensive (due to the rise in silver) to import chemical fertilizers. Of the bean mills in Dairen only 7-8 are under Japanese- or Sino-Japanese management, and they have a total capacity of about 30,000 pieces of bean cake per day. The majority of the mills, about 61, are under Chinese management (mostly Chinese from Shantung), and they have an output of about 110,000 pieces of bean cake per day. Chinese policies therefore control the market. The Gold Standard replaced the Silver Standard on the Dairen Exchange in the autumn of 1921; the Chinese mills did not like this.

"Prior to the great World War, there were only a small number of the first class Japanese capitalists such as the Mitsuis (Santai Mill), the Okuras (Nisshin Oil Mills), the Koderas, etc., who had a good hang of the trade. As to the others, they have come after the Russo-Japanese War with practically empty hands."

2184. *San Francisco Chronicle.* 1922. Chronicle shipping news. July 20. p. 20.
• ***Summary:*** The section titled "Shipping notes" states: "The cargo of the Japanese steamer Mandasan Maru, arriving from Yokohama, consisted in pat of 6,586 chests of tea, 1,041 packages of groceries, 2,560 tubs of shoyu, 1,478 cases of canned crab, 2,420 sacks of beans [probably soy beans], 1,875 sacks of linseed cake, 3,808 bags of bean cake."

2185. *USDA Bureau of Plant Industry, Inventory.* 1922. Seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from April 1 to June 30, 1919. Nos. 47349 to 47864. No. 59. 77 p. July 20.
• ***Summary:*** Soy bean introductions: *Soja max* (L.) Piper. Fabaceæ. (*Glycine hispida* Maxim.)

"47436-37. From Wakamatsu, Japan. Presented by Rev. C. Noss. Received April 29, 1919.

"47436. Received as *Ogon daizu.* Seeds large, nearly spherical, golden yellow. The seeds, however, agree with those of S.P.I. No. 40371, *Dekisugi.*

"47437. Received as *hato koroshi daizu.* The seeds agree, however, with those of S.P.I. No. 40119, *Usuao.*"

No. 47510 is Botor tetragonoloba (L.) Kuntze. Fabaceæ. Goa bean. (*Psophocarpus tetragonolobus* DC.). From Zamboanga, Philippine Islands. Presented by Mr. P.J. Wester, agricultural adviser. Received May 12, 1919. Quoted notes by Mr. Wester. *"Seguidilla.* A climbing bean with 4-winged pods which, when used as string beans while tender, are of excellent quality. They should be of great value in Porto Rico and Panama." Address: Washington, DC.

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2186. Keimatsu, K. 1922. Bean cake as cattle-feed, instead of fertilizer. *Light of Manchuria.* Aug. 1. p. 1-4.
• ***Summary:*** The soybean complex in Manchuria is in bad shape due to high prices. The author hopes that soybean cake will be used more as cattle feed in the future, rather than as fertilizer, as has previously been the case. "Now at Dairen alone, more than 110,000 pieces of Bean Cake are being put out daily, and their chief utility has been as fertilizer in Japan. If they should be made into cattle-feed, the market therefore may be extended from Japan to Europe and America." He would also like to see new solvent extraction equipment installed to replace the old mechanical presses, and the quality of soy oil improved. And "it is heartily hoped that bean milling in the future will be founded with the production of Bean Oil for the primary object and that of cattle-feed for the secondary one, and this on a more comprehensive scale, amalgamating a number of minor mills."

"At the same time, the manufacture of hardened oil, as now carried on by the Dairen Oil & Fat Industry Co., makes another enterprise having great possibilities. The hardened oil of this Company has not yet earned a wide and high reputation, but the Company is now turning out an excellent product. Soap, margarine, glycerine, and several other chemical products are made from hardened oil. Moreover, shipment in the form of hardened oil is far more convenient than in the form of crude oil." Address: Ex-superintendent-general, South Manchuria Railway Co. Central Lab.

2187. Satow, Sadakichi. 1922. Process of manufacturing vegetable proteid substances (from the soybean or other proteid containing substance). *U.S. Patent* 1,427,645. Aug. 29. 4 p. Application filed 20 Aug. 1918.
• ***Summary:*** "The object of the invention is to provide vegetable proteid substances of improved quality and a simple, efficient and economical process of manufacturing the same from vegetable substances, such as cereals, leguminous products or other material for food purposes or for use in the manufacture of celluloid-like substances, linoleum-like substances, lacquer, varnish, artificial rubber, artificial leather and the like." Address: Sendai, Japan.

2188. Kinugasa, Yutaka; Tatsuno, Shojiro. 1922. Shôyu, seishu sono-ta no inshokubutsu chû betanafutooru no kenshutsu-hô ni tsuite [Detection of beta-naphthol in shoyu, sake and other foods and drinks]. *Eisei Shikenjo Iho* (*Bulletin of the Imperial Hygienic Laboratories*) 18:181-87. Aug. [1 ref. Jap]
Address: 1. Gishi; 2. Gishu. Both: Tokyo Eisei Shikenjo.

2189. Onuki, Motoi. 1922. Daizu tanpaku-chu ni beta-okishigurutamin-san no sonzai ni tsuite [On the presence of beta-hydroxy glutamic acid in the proteins of soybeans]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 43(9):737-43. Sept. 28. (Chem. Abst. 17:1983). [1 ref. Jap]
• ***Summary:*** Following Dakin's butyric acid method, Onuki isolated from 100 gm of dry protein matter, 5.47 gm of Beta-hydroxyglutamic acid, but was unable to determine from which individual protein it was derived and the full amount present. Address: Nôgakushi, Shoyu Kenkyusho-in.

2190. *Christian Science Monitor.* 1922. Japanese finance conquers rich province of Manchuria: Practical monopoly of soya bean oil secured, while Bank of Chosen [Korea] issues most of paper money. Oct. 4. p. 4.
• ***Summary:*** "Harbin, Manchuria, Sept. 1–What Japan has accomplished in the peaceful pursuit of conquering Manchuria is eloquently shown in the statement of the companies operating and their aggregate capital. At the end of July, according to official figures, there were 458 companies with a subscribed capital of 634,230,000 yen, of which 408,480,000 was paid up.

"With the practical suzerainty that has been obtained over the Chinese Eastern railroad by the rate agreement now in effect, there will doubtless be a decided impetus given to the investment of capital in North Manchuria. The stock in the Russian steamship companies that ply the Amur has been bought by the Japanese, and they are being operated under the names of dummies..."

"Soya bean monopoly: Should diplomatic pressure cause the withdrawal of the rate that has caused so much concern, Japan will still have much of the best of the business and financial situation in the best province in all of China. The oil that comes from soya beans is almost exclusively in Japanese hands, for the reason that they control the cake, which is 90 per cent of the total output. They have some competition in the raw beans, as the Danes are heavy purchasers, shipping them to Copenhagen [via the East Asiatic Company] to be milled. The Chinese oil mill owners are unprogressive and the use of obsolete machinery gives them a kind of cake that can only be used in Japan, the oil remaining therein causing sourness [rancidity] in long shipments.

"Many of the best buildings in Harbin are falling into Japanese hands through mortgage foreclosures." "Most of the business of Manchuria is done with Bank of Chosen paper money,..."

2191. Takahashi, Teizô; Sano, Yonesaburo. 1922. On the budding fungi of "shoyu-moromi." *J. of the College of Agriculture, Tokyo Imperial University* 7(2):119-55. Oct. 15. [45 ref. Eng]
• ***Summary:*** Contents: Introduction. The film-forming Zygosaccharomyces. Non-film forming Zygosaccharomyces. Asporogenic Zygosaccharomyces (?): Fermenting faculty. Torula: Film-forming variety, non-film forming varieties (7 varieties). Red yeast. Willia. Mycoderma. Saccharomyces. Oidium and Sachsia. Summary.

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The author claims to have found two new varieties of film forming zygosaccharomyces and one new variety of non-film forming zygosaccharomyces. He proposes to call the latter *Zygosaccharomyces soja var. saccharoraffinosum.* He has also isolated four new varieties of asporogenic zygosaccharomyces. Of the various organisms studied, zygosaccharomyces produce the most alcohol. This paper was submitted in Jan. 1915. Ten photos (plate VII; last page) show the budding fungi of *Shoyu-Moromi,* including asporogenic *Zygoasaccharomyces, Mycoderma,* and *Torula.*
Address: Japan.

2192. Yamamoto, Yoshitaro. Assignor to Isoma Mizusawa and Tatsuzo Kano. 1922. Process of preparing odorless and colorless oil and flour from [soja] bean. *U.S. Patent* 1,433,168. Oct. 24. 2 p. Application filed 26 Nov. 1919.
• ***Summary:*** Yamamoto assigns one-fourth to Isoma Mizusawa, of Hyogo Ken (Prefecture), Japan, and one-fourth to Tatsuzo Kano. of Kobe, Japan.

"The object of this invention is to obtain bean flour suitable for use as material for making bread, cake, and the like, or as material for preparing washing powder, soap and the like, for which purposes the flour thus manufactured is best adapted as it has no disagreeable odor and is almost white. The oil extracted during the process is also almost colorless and retains no trace of the disagreeable odor inherent in the bean."

First "soja bean is broken into coarse meal, and the bran removed therefrom. Then the bean meal is steeped in an aqueous solution containing .025–.075% of organic acid. A solution that has been found to produce good results is a mixture of 200 to 600 c.c. of table vinegar in 20 litres of water or of 7½ to 15 grams of glacial acetic acid in the same quantity of water. The liquid may then be heated, if desired, to a temperature not exceeding 60ºC..." Address: No. 5, Zitchome, Taikaidori, Hyogo, city of Kobe, Japan.

2193. Kato, Naosaburo. 1922. Daizu ureaze no kôsô sayô kenkyû. I. Gurikokôru no daizu ureaze kôso sayô ni oyobosu eikyô ni tsuite [Investigations on the enzymatic action of soy urease. I. Influence of glycocolls on the enzymatic action of soy urease]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 488. p. 867-93. Oct. (Chem. Abst. 17:2719). [5 ref. Jap; ger]
Address: Japan.

2194. Kinoshita, Asakichi; Katsuyama, M. 1922. Dasshi daizu no mushini no hôhô oyobi teidô hikaku shiken [Comparative tests on steaming methods and amount used for defatted soybeans]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 89. p. 1-28. Oct. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Ko (Hired).

2195. Kinoshita, Asakichi; Ohno, T.; Fukui, S.; Kumo, A. 1922. Shôyu no bôbaizai toshite jinkô kihatsu karashi-yu no shiyô shiken [Experiment with artificial mustard oil as an anti-mold substance for shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 87. p. 561-78. Dec. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2-4. Moto Kenshuin.

2196. Nakao, Manzo; Ikebe, Shigeori. 1922. Daizu-yu shiken ni tsuite [Experiments on soybean oil]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) No. 7. p. 17-58. Dec. [Jap]
Address: Yakugakushi, Manchuria.

2197. Muramatsu, Shunsuke. 1922. Daizu no denpun oyobi hoka no isseibun ni tsuite [On the starch and other components of soy bean]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 243. p. 1030. [Jap]
Address: Morioka Koto Norin Gakko, Nogei Kagaku Jikken-shitsu, Morioka, Jaspan.

2198. Niki, E. 1922. Tsuboi hakase hakken no jiyô miso ni tsuite [The nutritious miso discovered by Dr. Tsuboi]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 17(7):8-10. [Jap]
Address: Naigai Jozo K.K., Japan.

2199. **Product Name:** [Nishii Super Shoyu, and Miso].
Foreign Name: Nishii Super Shoyu, and Miso.
Manufacturer's Name: Nishii Super Shoyu.
Manufacturer's Address: Renovacion 101-A, La Victoria, Lima 13, Peru.
Date of Introduction: 1922.
Ingredients: Water, soybeans, wheat, salt.
Wt/Vol., Packaging, Price: 750 ml bottle.
How Stored: Shelf stable.
New Product–Documentation: Nishii Shoyu, located in the Victoria district of Lima, Peru, is owned by Mr. Shinji Kawakami, age 75, the second-generation Japanese owner. The outside and inside of his shop, and the process by which he makes 5 tonnes/week of shoyu in the traditional hand-made way, are shown. He also makes miso. A close-up shows the 750 ml bottle and its colorful label, orange, blue, and green on yellow. One bottle costs the equivalent of about 300 yen.

Talk with Mr. Kawakami by phone. 1991. March 21. His uncle founded this company at this location in 1922. He is the second generation owner. He runs it as an "individual business" so there is no real company name. His address is shown above. His phone is 14-31-81-05.

Letter from Marco Kamego of Kikko Corporation S.A. in Peru. 1998. Feb. 13. The present manager of this company is Mr. Cesar Kawakami.

Note 1. This is the earliest known commercial soy

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product made in Peru, or in South America, or in all of Latin America.

Note 2. This is the earliest document seen (May 2009) concerning soybean products (shoyu and miso) in Peru. This document contains the earliest date seen for soybean products (shoyu and miso) in Peru (1922); soybeans as such had not yet been reported by that date.

2200. Noda Shoyu K.K. 1922. [Report on activities, 1921-1922]. Mimeographed. 6 p. Unpublished manuscript in Kikkoman Corporation Archives. [Jap]*
• ***Summary:*** For a list of many other early documents in the Kikkoman Company Archives, see Fruin (1983), Notes. For 1918-1929, see especially p. 333. Address: Noda, Japan.

2201. Ri-Koheki. 1922. Chôsen shôyu miso oyobi tôfu no seihô ni tsuite [The processes for manufacturing shoyu, miso, and tofu in Korea]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 17(11):45-46. [Jap]
Address: Chosen Sotokufu Iin Yakuzai-shi.

2202. Togano, Meijiro. 1922. Shôyu miso no sokujô ni tsuite [Rapid manufacture of shoyu and miso. I-III.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 17(3):7-9; 17(4):4-8; 17(5):14-16. [Jap]
Address: Nihon Jozo Kogyo K.K., Senmu Torishimari Yaku, Nôgaku-shi, Japan.

2203. Fritsch, Jean. 1922. Fabrication et raffinage des huiles végétales: Manuel à l'usage des fabricants, raffineurs, courtiers et négociants en huiles. Troisième édition entièrement refondue [Manufacture and refining of vegetable oils: A manual for the use of manufacturers, refiners, brokers, and wholesale merchants. 3rd ed., completely reset]. Paris: Desforges–Librairie Générale Scientifique et Industrielle. xiv + 723 p. Illust. Index. 25 cm. [16 ref. Fre]
• ***Summary:*** Chapter 2, "Drying oils (*Huiles siccatives*)" contains a section on "Soybean oil (*Huile de Soja hispida; Huile de pois"*) (p. 368-76). Its contents: Origin (Incl. miso, shoyu, tofu). Manufacture (China, Japan, above all Formosa). Physical and chemical properties. Table showing such properties, with 16 references. Applications and uses. Residues (soybean cake remaining after the oil is pressed from soybeans; *le tourteau de soja*).

Also discusses: Margarine (p. 232-33). Peanut oil (*Huile d'arachide*, p. 238-48, 699-701). Colza oil (Coleseed oil, *Huile de colza*), rapeseed oil (*Huile de navette*), and rubsen oil (*Huile de rabette*) (p. 265-72, 652). Sesame oil (*Huile de sésame*, p. 273-81, 705-06).

Note 1. The first edition of this work was published in 1905, and the second edition in 1914.

Note 2. This is the earliest document seen (March 2005) that uses the English word "coleseed" or the term "coleseed oil" to refer to rapeseed or to rapeseed oil, respectively. Address: Ingénieur-Chemiste.

2204. Hawaii Shimpo-sha (The Hawaii Shimpo). comp. 1922. Hawai Nihonjin nenkan [Hawaiian-Japanese annual. No. 18]. Honolulu, Hawaii: Hawaii Shimpô-sha (The Hawaii Shimpo). [Jap]*
• ***Summary:*** Company name with diacritics is: Hawaii Shimpô-sha. Address: Los Angeles.

2205. Hearn, Lafcadio. 1922. The writings of Lafcadio Hearn, in 16 volumes: Volume V. Glimpses of unfamiliar Japan, in two volumes. Vol. 1. Boston and New York: Houghton, Mifflin Co. 394 p. Illust. 23 cm.
• ***Summary:*** Chapter 15, titled Kitsune [Foxes] (p. 358-94). In front of the many Shinto shrines throughout Japan, the is usually a pair of seated foxes, in stone, on either side, facing one another. Such shrines and temples are dedicated to Inari, the God of Rice.

At Matsue there is the God of Coughs and Bad Colds. "And those who are cured of their coughs and colds after having prayed to him, bring to his temple offerings of tofu" (p. 362).

"At the rear of almost every Inari temple you will generally find in the wall of the shrine building, one or two feet above the ground, an aperture about eight inches in diameter and perfectly circular. It is often made so as to be closed at will by a sliding plank. This circular orifice is a foxhole, and if you find one open, and look within, you will probably see offerings of tofu or other food which foxes are supposed to be fond of" (p. 365).

"Strange is the madness of those into whom demon foxes enter. Sometimes they run naked shouting through the streets. Sometimes they lie down and froth at the mouth, and yelp as a fox yelps. And on some part of the body of the possessed a moving lump appears under the skin, which seems to have a life of its own. Prick it with a needle, and it glides instantly to another place. By no grasp can it be so tightly compressed by a strong hand that it will not slip from under the fingers. Possessed folk are also said to speak and write languages of which they were totally ignorant prior to possession. They eat only what foxes are believed to like–tofu, aburagé,* azukimeshi, etc.; and they eat a great deal, alleging that not they, but the possessing foxes, are hungry. *Footnote: "Aburagé is a name given to fried bean-curds or tofu. Azukimeshi is a preparation of red beans [azuki] boiled with rice" (p. 374).

Note 1. This is the earliest English-language document seen (April 2013) that uses the word "aburagé" to refer to deep-fried tofu pouches.

"It not unfrequently happens that the victims of fox-possession are cruelly treated by their relatives–being severely burned and beaten in the hope that the fox may be thus driven away. Then the Hôin or Yamabushi is sent for–the exorciser [exorcist]. The exorciser argues with the

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fox, who speaks through the mouth of the possessed. When the fox is reduced to silence by religious argument upon the wickedness of possessing people, he usually agrees to go away on condition of being supplied with plenty of tofu or other food; and the food promised must be brought immediately to that particular Inari temple of which the fox declares himself a retainer... As soon as the possessed has been freed from the possessor, he falls down senseless, and remains for a long time prostrate. And it is said, also, that he who has once been possessed by a fox will never again be able to eat tofu, aburagé, azukimeshi, or any of those things which foxes like" (p. 375).

"Indeed, the richest and the most successful farmer of Izumo, worth more than a hundred thousand yen–Wakuri-San of Chinomiya in Kandegori–is almost universally believed by the peasantry to be a kitsune-mochi. They tell curious stories about him. Some say that when a very poor man he found in the woods one day a little white fox-cub, and took it home, and petted it, and gave it plenty of tofu, adzukimeshi, and aburage–three sorts of food which foxes love–and that from that day prosperity came to him. Others say that in his house there is a special zashiki, or guest-room for foxes; and that there, once in each month, a great banquet is given to hundreds of Hito-kitsune. But Chino- miya-no-Wakuri, as they call him, can afford to laugh at all these tales. He is a refined man, highly respected in cultivated circles where superstition never enters" (p. 381-82).

"Curious advantages have been taken of the superstitions relating to the Fox-God.

"In Matsue, several years ago, there was a tofuya which enjoyed an unusually large patronage. A tofuya is a shop where tofu is sold–a curd prepared from beans, and much resembling good custard in appearance. Of all eatable things, foxes are most fond of tofu and of soba, which is a preparation of buckwheat. There is even a legend that a fox, in the semblance of an elegantly attired man, once visited Nogi-no-Kuriharaya, a popular sobaya on the lake shore, and ate much soba. But after the guest was gone, the money he had paid changed into wooden shavings.

"The proprietor of the tofuya had a different experience. A man in wretched attire used to come to his shop every evening to buy a cho of tofu, which he devoured on the spot with the haste of one long famished. Every evening for weeks he came, and never spoke; but the landlord saw one evening the tip of a bushy white tail protruding from beneath the stranger's rags. The sight aroused strange surmises and weird hopes. From that night he began to treat the mysterious visitor with obsequious kindness.

"But another month passed before the latter spoke. Then what he said was about as follows: Though I seem to you a man, I am not a man; and I took upon myself human form only for the purpose of visiting you. I come from Taka-machi, where my temple is, at which you often visit. And being desirous to reward your piety and goodness of heart, I have come tonight to save you from a great danger. For by the power which I possess I know that to-morrow this street will burn, and all the houses in it shall be utterly destroyed except yours. To save it I am going to make a charm. But in order that I may do this, you must open your go-down (*kura*) that I may enter, and allow no one to watch me; for should living eye look upon me there, the charm will not avail.

"The shopkeeper, with fervent words of gratitude, opened his storehouse, and reverently admitted the seeming Inari, and gave orders that none of his household or servants should keep watch. And these orders were so well obeyed that all the stores within the storehouse, and all the valuables of the family, were removed without hindrance during the night. Next day the kura was found to be empty. And there was no fire" (p. 384-85). Address: Matsue, Japan.

2206. Kakizaki, Yôichi. 1922. Niigata-ken ni okeru daizu no hinshu [Soybean varieties in Niigata prefecture]. *Niigata-ken Noji Shiken-jo, Tokubetsu Hokoku* (*Niigata prefecture* (*Japan*) *Agricultural Experiment Station, Special Report*) No. 14. p. 1-50. [Jap]*

• ***Summary:*** The author emphasized that vining and twining characteristics appear to be an important criterion for botanical taxonomy of soybeans.

Note: Also cited as "Niigata Agric. Exp. Station, Bulletin 14." Address: Niigata prefecture, Japan.

2207. Klautke, Paul. 1922. Nutzpflanzen und Nutztiere Chinas [China's useful plants and animals]. Hannover, Germany: Hahnsche Buchhandlung. 160 p. 25 cm. [11* ref. Ger]

• ***Summary:*** The section on Beans (p. 32-35), discusses 12 different types, including the soybean–which is considered China's most important bean. An illustration (line drawing) shows the soybean plant, with a close-up of the pods. The *China Year Book* of 1914 notes that large amounts of soybeans are grown and crushed in Manchuria. In Newchwang there is 1 Japanese hydraulic mill, 7 large Chinese steam mills, 5 small mills driven by gasoline motors, and 9 stone mills powered by animals. A table shows Manchuria's large exports of soybeans, soy oil, and soybean meal from 1908-1912. The different varieties are listed. Address: Lehrer fuer Biologie an der Tung Chi Medizin- und Ingenieurschule fuer Chinesen in Woosung.

2208. Kobayashi, Denshirô. 1922. Nihon ni okeru daizu aburakasu jukyû no taisei [The general trend of supply and demand of soybean cake (or meal) in Japan]. Tokyo: Dainihon Dojô Hiryô Kôkyûkai. 38 p. 23 cm. [Jap]* Address: Japan.

2209. Kodama, Shintaro. 1922. Arudehido no kagaku. IV. Shôyu-chû ni sonzai suru 1, 2 no shin arudehido ni tsuite [The chemistry of aldehydes. IV. On 1 or 2 new aldehydes in

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shoyu]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 43:956-81. (Chem. Abst. 17:2881). [Jap]
Address: Rigakushi, Tokyo Teikoku Daigaku, Rigaku-bu, Kagaku Kyoshitsu.

2210. Kodama, Shintaro. 1922. Iwayuru seishu oyobi shôyu no furoforu hannô ni tsuite [On the so-called furfurol reaction in sake and shoyu]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 43:948-56. (Chem. Abst. 17:2881). [Jap]
Address: Rigakushi, Tokyo Teikoku Daigaku, Rigaku-bu, Kagaku Kyoshitsu.

2211. Loew, D. 1922. Einige Bemerkungen ueber die Ernaehrung der Japaner [Some remarks on the food and nutrition of the Japanese]. *Zeitschrift fuer Physikalische und Diatetische Therapie* 26:44. [Ger]*

2212. Mori, Tamezô. 1922. An enumeration of plants hitherto known from Corea. Seoul, Corea: Government of Chosen. xiv + 372 p. + 174 p. See p. 215. Index. 23 cm. 5 plates. [Eng; Jap; Kor; Chi]
• ***Summary:*** The section titled Leguminosae mentions two species of Glycine. Glycine Soja, Bentham, is called daizu or mame in Japanese, and Kong in Korean. It is cultivated.

Glycine ussuriensis, Regel et Maack, is called tsuru-mame in Japanese and Tolkong in Korean. It grows wild in Korea. The names of 4 places that it grows are listed in Chinese characters: Jizhoudao, Jinzhou, Shuiyuan, Jiangjie. The author was born in 1884.

2213. Nakagawa, Satosu. 1922. Studien ueber Fermente. II. Mitteilung. Ueber die Labilitaet der Soja-Urease und zur Frage der sogenanten Auxoureasen und des Koenzyms [Studies on enzymes. II. Lability of soy urease and the question of auxoureases and coenzymes]. *Mitteilungen aus der Medizinischen Fakultaet der Kaiserlichen Universitaet zu Tokyo* 28:383-427. (Chem. Abst. 18:1133). [12 ref. Ger]
• ***Summary:*** Includes 35 tables. Aji-no-moto- is mentioned on p. 406. Address: Dr., from the medical Clinic of Prof. Dr. R. Inada, Univ. of Tokyo, Japan.

2214. Nakagawa, Satosu. 1922. Studien ueber Fermente. III. Ueber die Wirkungsweise der Robiniaurease und einige vergleichende Untersuchungen ueber Soja- und Robiniaurease [Studies on enzymes. III. Mechanism of the action of Robinia urease and some comparative investigations of soya- and Robinia urease]. *Mitteilungen aus der Medizinischen Fakultaet der Kaiserlichen Universitaet zu Tokyo* 28(3):547-74. [6 ref. Ger]
Address: Dr., from the medical Clinic of Prof. Dr. R. Inada, Univ. of Tokyo, Japan.

2215. Nôshômu-sho, Nômu-kyoku, Japan. 1922. Daizu sono-ta no mame-rui ni kansuru chôsa [Survey of soybeans and other beans]. Tokyo: Nôshomu-sho, Nômu-kyoku. 33 p. 22 cm. Series: No. 21. [Jap]
• ***Summary:*** A short survey by Japan's Bureau of Agriculture, in the Department of Agriculture. Address: Japan.

2216. Shin Sekai-sha. 1922. Zaibei Nippon-jin kan [Directory of Japanese in the USA]. San Francisco, California: Shin Sekai-sha. See p. 19, 41, 50-51, 207-08, 234, 238, 346, 357, 409. [Jap]
Address: San Francisco, California.

2217. South Manchuria Railway Co. (Minami Manshû Tetsudô Kabushiki Kaisha). 1922. Manchuria: Land of opportunities. New York, NY: South Manchuria Railway Co. ix + 113 p. + 25 leaves of plates on unnumbered pages. Illust. Index. 24 cm. "Compiled and published by Thomas F. Logan, inc., New York"–Title page verso. [Eng]
• ***Summary:*** "Preface: This handbook of the resources of Manchuria has been prepared for American readers in response to many requests for accurate and concise information concerning the opportunities for overseas trade and the facilities for travel in this ancient land of the Manchus.

"Perhaps nowhere else in the world today is there presented so amazing a transition from primitive agricultural life to twentieth century industry and scientific organization. Manchuria, since the close of the Russo-Japanese War [1905], when the policy of the Open Door was inaugurated, has gone forward with great strides, absorbing Western ideas and developing her rich material resources.

"The record of this fifteen-year achievement in colonial enterprise is here set forth in facts and figures, with a careful avoidance of debatable questions of international politics.

"In the preparation of this book, the South Manchuria Railway has made use of all available official and authoritative sources of information, and has drawn freely from the *Economic History of Manchuria,* published in 1921 by the Bank of Chosen."

Contents: 1. Geography, history and government. 2. Natural resources of Manchuria: Agriculture, forestry, fisheries, mining. 3. Development of manufacturing (incl. bean oil and bean cake). 4. Commerce and finance: Foreign trade of Manchuria, facilities for commerce. 5. The South Manchuria Railway and its work: A modern railway in an ancient land, the railway, harbors and ships, coal mines and steel works, gas an electricity, hotels (A modern hotel system–The Yamato Hotels), scientific research institutions (The Dairen Central Laboratory, agricultural experiment stations, farm improvement work), civic administration. 6. The open road in Manchuria.

Soya beans are mentioned on the following pages: p. 16 (11 times), p. 17 (6 times), p. 19 (7 times), p. 20, 40, 112 (5

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times), p. 41, 109 (4 times), p. vii, 28, 38, 55, 57, 111, 113 (2 times).

Bean oil is mentioned on pages 19 (4 times), p. 40 (2 times), p. iv, 12, 16, 41, 47, 57, 66, 109.

Bean cake(s) is mentioned on pages 40 (3 times), p. 41 (2 times), p. iv, 12, 19, 20, 55, 57, 59, 66, 83, 87, 109.

Soy [sauce] is mentioned only on p. 17 (diagram of the many uses of soya beans).

2218. U.S. Tariff Commission. 1922. Summary of tariff information, 1921, relative to the bill H.R. 7456. Washington, DC: Government Printing Office. 1625 p. See p. 152, 786-87, 802-03.

• ***Summary:*** "The principal sources of information have been the commodity surveys and reports of the Tariff Commission, especially the 'Summary of Tariff Information, 1920.' The material in the latter has been amplified and brought up to date."

Soybeans are more specifically dealt with in the 1920 Summary. Soybean oil, however, is considered in H.R. 7456.

The section titled "Soya-bean oil" (p. 152-53) states: "Description and uses... This oil "is a semi-drying oil used in paint either as a substitute for or mixed with linseed oil. Its greatest use is in soap making, for which it has largely replace cottonseed oil, but the purified oil is edible. After the oil is expressed the cake becomes a feed for dairy cattle or a fertilizer.

"*Production* of soya beans has increased greatly, but only a small portion of the crop is used for oil. In 1915 approximately 100,000 bushels of American-grown beans were pressed for oil. The domestic output of oil (inedible and edible) increased from 2, 764,000 pounds in 1914 to 42,074,000 pounds in 1917 and 79,861,000 pounds in 1918. Reports of the Bureau of the Census show that no crude soya-bean oil has been produced either from domestic or imported beans in this country from 1919 to September 30, 1921, inclusive. The oil is imported in the crude state and refined in this country.

"*Imports* have increased from 16,360,452 pounds in 1914 to 336,824,646 pounds in 1918, the great bulk coming from China and Japan. Imports since 1917, almost wholly from Kwangtung, China proper, and Japan, have been as follows:"

A table shows that imports fell rapidly after 1918 (and the end of World War I) to 195.8 million lb in 1919, 112.5 million lb in 1920, and only 16.3 million lb in the first 9 months of 1921. The value per pound plunged from $0.11 in 1918 to $0.04 in 1921.

Exports since 1918 have been chiefly to Italy, France, and Austria. A table shows the quantities: 27.7 million lb in the last 6 months of 1919, 43.5 million lb in 1920, but only 1.93 million lb in the first 9 months of 1921.

"Important changes in classification.–Soya-bean oil was exempt from duty under the Act of 1913 (par. 561); it is dutiable under the emergency tariff act of 1921 (par. 11)."

The next section, titled "Hempseed oil" (p. 152) states that this oil is obtained from the seeds of the hemp plant, cultivated in France, Belgium, Germany, southern Italy, Turkey, Algeria, North America, India, Manchuria, and Japan. It is used mainly in paint as a drying oil.

Soya beans are also mentioned under "Beans" (p. 786). Under "Beans, prepared or preserved" (p. 787) we read: "Soya beans are also made into various food preparations, especially for use by orientals." A table shows that imports of such soya beans increased from 1.43 million lb in 1918 to 3.4 million lb in the first 9 months of 1921.

The section on "Vegetables prepared or preserved" (p. 802-03) states: "Bean stick [probably dried yuba sticks] or bean cake is an oriental food product made from ground and fermented soya beans. Miso is a cooked and fermented combination of rice and soya beans, generally used in making soup." "Imports of bean stick or bean cake and miso were valued at $73,097 in 1914, soya bean cake constituting about 40%. Edible bean cake and miso are imported to meet the demand of the oriental population." A table shows that there was a 25% duty on such products and imports and value dropped from 1918 to 1921. Address: Washington, DC.

2219. *Atlanta Constitution* (*Georgia*). 1923. Dairen rivals Boston as great bean city: Japan's ice-free port in Manchuria, all-year-round shipping point for soy product of vast fields has grown from mud village. Jan. 21. p. 54.

• ***Summary:*** "Dairen and Boston–the world's premier bean towns." Dairen lives not on but by beans; it is the port of the greatest bean country in the world."

"Steamers come in an endless procession to Dairen wharves to carry away countless tons of [soy] beans, thousands of gallons of [soy bean] oil and the sauce you eat on your chop suey when you visit 'Chinatown,' and shiploads of great cartwheel-like disks of bean cake from the oil mills. The thousands of gallons of soy bean oil which leave Dairen annually, compete actively in world markets with American cottonseed oil as an olive oil substitute."

"To the Chinese it is Talien-wan; the Russians, who thought in 1899 they had established there their long-sought ice-free Pacific port, called it Dalny." The Chinese (and Japanese) characters mean "great connections," and "it is truly a connecting link between the China that was and the Japan that is."

"Russia, great power of the West, left Dalny at the end of the Russo-Japanese War an unhealthy, overgrown village with streets of mud. Japan, apt pupil of a more western West than Russia, gave the newly christened town paved streets, 20th century sanitation, forest-clad hills, electric lights and street cars, and an efficient municipal government.

"Politically, Dairen is the seat of administration of Japan's 99-year lease over the Kwang-tung or Liaotung peninsula [1,220 square miles], which forms the southern

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extremity of Manchuria,... It would be difficult to conceive of a port in a relatively undeveloped region of the world more strategically situated."

Japan "also has a 99-year concession for the South Manchurian Railway, which extends several hundred miles to the north through the center of Manchuria's almost matchlessly fertile plains. 'Railway' must be taken in something of a Pickwickian sense... In addition to its road it operates a line of ocean steamers and great warehouses, develops power, runs mines and manages lands." The railroad has all the conveniences of U.S. trains; it even has all-Pullman trains.

2220. Masakazu, Inouye. 1923. [Preparation of petroleum from fatty oils. II.]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 44(1):78-110. Jan. (Chem. Abst. 17:2953). [Jap]
• ***Summary:*** Obtained oils resembling petroleum by the dry distillation of the soaps of sardine, linseed, cottonseed, soy bean, and grape-seed oils.

2221. Miyake, Koji; Ito, Mitsuji. 1923. On the lethal temperature of koji-diastase in aquatic solution and the recovery of its action after heating. *J. of Biochemistry* (*Tokyo*) 2(2):255-70. Jan. [15 ref. Eng]
• ***Summary:*** The first real scientific study of the diastatic enzyme was made by Payen and Persoz (1833) who named it diastase. We have observed that the diastatic quality of Koji-extract was not destroyed by boiling the extract. Its lethal temperature was described by T. Takahashi to be 80-83ºC. Koji-diastase was killed by heating for 25 minutes at 70ºC. It seemed that the diastatic power of Koji-extract injured by heating at a temperature lower than lethal may recover its power to some extent by preserving it at room temperature. Address: Lab. of Agricultural Chemistry, Hokkaido Imperial Univ., Japan.

2222. Nakai, T. 1923. Inshokuhin toku ni shôyu-chû no beeta nafutooru no shin kenshutsu-hô [A new method for detection of beta-naphthol in foods and especially in shoyu]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 491. p. 17-26. Jan. (Chem. Abst. 17:3059). [Jap]
• ***Summary:*** About 1 part of Beta-naphthol in 500,000 can be detected with a reagent prepared by dissolving molybdic acid (5 gm) in concentrated sulfuric acid (100 cc). The naphthol is extracted from soy sauce by shaking the sauce (100 cc) with 200 cc of a mixture of ether and petroleum spirits (1:1) for 30 minutes, evaporating the solution to dryness, and dissolving the residue in warm water (7 cc); or better by distilling the sauce (100 cc) and collecting the distillate in fractions of 7 cc, the third and fourth fractions being used for the test. On adding the molybdic acid reagent to the solution along the wall of the vessel in a thin stream, a violet-red zone is developed between the two solutions when Beta-naphthol is present. α-naphthol gives no coloration with this reagent.

2223. Oshima, Kokichi; Church, Margaret B. 1923. Industrial mold enzymes. *Industrial and Engineering Chemistry* 15(1):67-70. Jan. [13 ref]
• ***Summary:*** "A new method for quantitative estimation of protease is described in this paper. Many strains of the *Aspergillus flavus-oryzae* group, which were separated from tane-koji used in shoyu manufacture and related industries, showed individually the production of amylase and protease of widely different strengths... Even on soy-bean flour, which contains no starch, strong amylase is produced."

The molds were cultivated on various media, including "soy-bean milk agar." "Experiments here show that extracellular and intracellular enzymes are the same, and after a certain period of growth all enzymes are excreted."

On page 68 is a reproduction of an interesting label, written in both Japanese and English, on an envelope containing "commercial mold ferment." The English-language portion reads: "Pure Cultured Aspergillus Soja. Registered Trade Mark." Illustrations show conidiophores of Aspergillus.

Photos show: (1) A worker in or near a koji room with koji trays inoculating the ingredients for making soy sauce with the mold ferment, *Aspergillus flavus.* (2) A series of modern, brick-walled koji rooms with wooden doors. Address: 1. Hokkaido Imperial Univ., Sapporo, Japan; 2. Bureau of Chemistry, USDA, Washington, DC.

2224. Shiba, Tokitaka; Koyama, Manshi. 1923. Rakkasei oyobi daizu tanpaku no eiyô-ka ni tsuite [On the nutritive value of the proteins in peanuts and soybeans]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 44(1):58-68. Jan. (Chem. Abst. 17:2732). [Jap]
Address: Suzuki Seibutsu Kagaku Kyoshitsu.

2225. Oshima, Kokichi. 1923. Re: Their journal article and friendship. Letter to Margaret Church at USDA in the United States, Feb. 6. 2 p. Handwritten, with signature. [1 ref. Eng]
• ***Summary:*** Margaret Church sent him a copy of their joint paper titled "Industrial Mold Enzymes" published in *Industrial and Engineering Chemistry* (Jan. 1923). "It is the best memory of our friendship.

"Last summer I met with Mr. S. Konno, who is making commercial mold spore." When collecting the mold spores, many laborers got very sick (just like fever) due to the spore dust. "The sickness is caused by the spores of *Aspergillus flavus* and mostly by *Asp. ochraceus.* And when it is severe, a man vomits blood." Address: Kita-1, Higashi-1, Sapporo, Japan.

2226. Piper, Charles V.; Morse, William J. 1923. The soybean. New York, NY: McGraw-Hill Book Company, Inc. xv + 329 p. Feb. Illust. Index. 24 cm. Reprinted unrevised in

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1943 by Peter Smith Publishers, New York. [563 ref]
• ***Summary:*** This is the first comprehensive book about the soybean written in English, and the most important book on soybeans and soyfoods written in its time. Contains an excellent review of the world literature on soybeans and soyfoods with a bibliography on soy that is larger than any published prior to that time (563 references), a good description of the present status of the soybean worldwide based on the authors' extensive contacts, and a great deal of original information. It quickly became a key source for people and organizations working with soybeans and soyfoods in all countries, and a major factor in the expansion of the soybean in the western world. Because of its scope and influence, Soyfoods Center considers the year of its publication to mark the end of the "Early Years" of the soybean worldwide. It remained in print until about 1986.

Contents: Preface. 1. Introduction: Name of the plant, origin, literature, use by the Chinese and Japanese, present importance, future prospects in the U.S., recognition of the possibilities. 2. The commercial status of the soybean: Manchuria and China, Japan, Europe, U.S., other countries, summary of imports and exports of soybeans and soybean oil. 3. Botanical history of the soybean: History prior to Linnaeus' "Species Plantarum" 1753, Linnaeus' misunderstandings of the soybean, Prain's elucidation, other and the correct botanical name.

4. Agricultural history of the soybean: Vernacular names of the soybean, China, Korea, and Japan, India and neighboring regions, Cochin China, Malayan region, early introduction into the United States, later U.S. introductions, the early introduced varieties (grown in the USA by 1898–Ito San, Mammoth, Buckshot, Guelph or Medium Green, Butterball, Kingston, Samarow, Eda, Ogemaw or Ogema), soybean in Europe, varieties grown in Europe and identification, Hawaiian Islands, Australia, Africa, Argentina (p. 50), Canada ("Soybeans are grown in very small quantities in Canada and then usually as a forage crop"), Philippines, Egypt, Cuba (p. 52), British Guiana, Mauritius (p. 53), present culture distribution. 5. Culture of the soybean: Climatic adaptations, soil preferences, water requirement, preparation of seed bed, time of planting, methods and rate of seeding, seeding for pasturage, depth of seeding, inoculation, fertilizer reactions, cultivation, soybeans in mixtures (with cowpeas, sorghums, Sudan grass, Johnson grass, millet, corn, or sunflowers and corn).

6. Harvesting and storage of soybeans: harvesting soybeans for hay, silage, for the seed, seed yields, proportion of straw to seed, storing seed, separation of cracked from whole soybean seed, viability of soybean seed, pedigreed, inspected, registered, and certified seed. 7. Composition of the soybean: Proportions of stems, leaves and pods, composition of plant and seed, nutritive and mineral constituents, forms of nitrogen in soybean nodules, factors affecting oil content of seed. 8. Utilization of the soybean: Diversity of uses (a chart, p. 129, shows 59 products that can be made from soybean seeds, and 6 more that can be made from soybean plants), soybeans for green manure, pasturage, soiling, ensilage, hay, straw.

9. Varieties: Japanese classification of varieties, classification of varieites in Manchuria (3 yellow, 2 green, 3 black), botanical classifications, vital characteristics, descriptions of important varieties (43 varieties and 7 synonyms), key for identification, breeding and improvement, genetic behavior, oil content.

10. Structure of soybean seeds. 11. Soybean oil: Methods of extraction [Manchurian, and solvent], American oil mills, methods of shipping and marketing, prices, utilization in soap manufacture, food, paint manufacture, miscellaneous. 12. Soybean cake or meal: Feeding value, composition, use for feeding for dairy cows, cattle, swine, sheep, poultry, digestibility, injurious effects, fertilizer.

13. Soybean products for human food: Food value of the soybean, digestibility of the soybean and its products, mature or dry soybeans, immature or green soybeans (a "nutritious green vegetable"), soybean flour, digestibility of soybean flour, soybean bran (p. 225-26), soybean sprouts, soybean coffee, soybean or vegetable milk [soymilk] (preparation, composition, residue from the manufacture of vegetable milk [okara], utilization of soybean milk, condensed vegetable milk, vegetable milk powder, fermented vegetable milk), vegetable casein, tofu or soybean curd (names and brief history, method of manufacture, coagulating agents, manufacturing yields, digestibility, utilization of bean curd and manufactured products, bean curd brains or *tofu nao,* dry bean curd or *tofu khan,* thousand folds {*chien chang tofu*}, fried bean curd {*tza tofu*}, Fragrant dry bean curd {*hsiang khan*}, frozen tofu {*kori tofu*}, Chinese preparation, various dishes), natto, hamananatto [hamanatto], yuba, miso, shoyu [soy sauce], confections. 14. Table dishes of soybeans and soybean products: mature or dry beans, flour, tofu, sprouts (86 recipes). 15. Enemies of the soybean: bacterial, mosaic, fungous [fungus], and nematode diseases, insects, rodents. This last chapter is a comprehensive review of the literature on soybean diseases and insects published before 1922.

The Preface begins: "The soybean, also known as soya or soja bean, has assumed great importance in recent years and offers far-reaching possibilities of the future, particularly in the United States. It is, therefore, desirable to bring together in a single volume the accumulated information concerning this crop...

"The aim has been to present the information so as to make it useful from both agricultural and commercial standpoints, not omitting, however, much that is mainly of historical or botanical interest..."

The introduction begins: "There is a wide and growing belief that the soybean is destined to become one of the leading farm crops in the United States."

Note 1. C.V. Piper lived 1867-1926. Note 2. This is the

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earliest English-language document seen (July 2003) that uses the term "soybean bran" to refer to soy bran.

Note 3. This is the earliest document seen (July 2003) in which Piper or Morse describe natto, Hamananatto [Hamanatto], yuba, or miso.

Note 4. This book was published by March 1923 (See *Ohio Farmer,* 10 March 1923, p. 313). Address: 1. Agrostologist; 2. Agronomist. Both: United States Dep. of Agriculture, Washington, DC.

2227. Katô, Naosaburo. 1923. Studien ueber den Einfluss des Glykokolls auf die Fermentwirkung eines Soja-ureasepraeparates. I. Ueber die Beziehungen zwischen Harnstoffkonzentration und Ureasewirkung und den Einfluss des Glykokolls auf dieselben [Influence of glycine on the fermentative action of soya-bean urease. I. On the connection between urea concentration and urease activity and the influence of glycine on these]. *Biochemische Zeitschrift* 136:498-529. March 24. (Chem. Abst. 17: 3192). [7 ref. Ger] Address: Kanazawa, Japan. Aus der biochemischen Abteilung des Staedtischen Krankenhauses am Urban zu Berlin [Germany].

2228. Kamiha, Toyosaburo. 1923. Nihon shoyu ni taisuru ni san no bôbi shochi ni tsuite [Some antibiotics in Japanese shoyu]. *Nihon Biseibutsu Gakkai Zasshi* (*J. of the Japanese Microbiological Society*) 17(3):467-84. March. [12 ref. Jap] Address: Kyoto Imperial Univ. (Kyoto Teikoku Daigaku, Igakubu, Eiseigaku Kyôshitsu, Toda Kyôju shidô.

2229. Kinoshita, Asakichi; Kishimoto, M.; Oikata, R.; Katsuyama, M. 1923. Moromi kakuhan no hôhô oyobi teido hikaku shiken [On the methods and amount of stirring for shoyu moromi (mash)]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 91. p. 199-231. March. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Shokutaku; 3-4. Hired.

2230. Kinoshita, Asakichi; Katsuyama, M.; Oikata, R. 1923. Komugi daiyôhin shiyô shiken [The use of substitutes for wheat in shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 90. p. 93-134. March. [Jap] Address: Jozo Shikensho. 1. Gishi; 2-3. Hired.

2231. Kinoshita, Asakichi; Katsuyama, M. 1923. Dasshi daizu to komugi no daiyô genryô shiyô shiken [The use of defatted soybeans and substitutes for wheat in shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 90. p. 73-92. March. [Jap] Address: Jozo Shikensho. 1. Gishi; 2. Hired.

2232. Nishimura, Torazô; Kawakami, T. 1923. Shôyu no hinshitsu kanhyô ni tsuite [On the discrimination of quality in shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 91. p. 143-98. March. [Jap] Address: Jozo Shikensho. 1. Gishi; 2. Gishu.

2233. Piper, Charles V.; Morse, William J. 1923. Introduction of the soybean to Europe (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 45-47.

• ***Summary:*** "The soybean has been grown experimentally at least in most of the European countries but in general the climatic conditions are not well suited to its culture. Some measure of success has been had however in south Europe, but the crop has never become of much importance.

"France: Paillieux (1880) has traced in detail the records of early attempts to introduce the culture of the soybean into France. Packets of soybean seeds from missionaries in China were received at the Jardin des Plantes, Paris, in 1739 and at frequent later dates beginning with 1834. The plants were very probably grown at the botanical garden since 1740, certainly so in 1779, and from 1834 to 1880 without interruption. In 1821, an unusually warm season, a Chinese variety had matured seed at Champ-Rond near Etampes. Beginning with 1855 the *Société d'Acclimatation* distributed numerous packets of seed, but did not succeed in establishing a permanent culture of the plant. In 1868 M. Chauvin cultivated several varieties at Cote d'Or, and the culture there has since continued. In 1874 the Society of horticulture of Etampes began experiments that continued until 1880. In 1879 a Chinese variety matured well at Marseilles. In 1880 Vilmorin-Andrieux & Company introduced into France one of the varieties tested by Haberlandt in Austria, which variety has proven well adapted to French conditions. This variety is presumably that now known in France as 'Yellow Etampes' which is the same as that known in the United States as 'Ito San.'

"The soybean is now rather widely grown in France but apparently is not an important crop. No definite statistics of its culture seem to have been published. Presumably it is grown more as a garden vegetable than as a field crop. Apparently only four varieties were cultivated in France before 1910 namely: Yellow Etampes (= Ito San); Early Black from Podolia (= Chernie); Brown (= Ogemaw); and Extra Early Black (= Wisconsin Black). All of these are short season varieties, indicating that the later sorts will not mature in France.

"Italy: The cultivation of the soybean in Italy dates from about 1840. [Question: What is the source of this date?] At the present time it is grown sparingly in the compartments of Liguria, Emilia, Marches, and near Naples. In no part of Italy does it seem to be a crop of prime importance.

"Austria and Germany: A great impetus was given to the culture of the soybean in Europe by the experiments of Prof. Friedrich Haberlandt (1878) of Vienna, in 1875 and subsequent years. Haberlandt obtained seed of nineteen

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varieties at the Vienna exposition in 1873. These were as follows:" Five yellow-seeded, three black-seeded, three green-seeded, and two brown-red-seeded varieties from China. One yellow-seeded and three black-seeded varieties from Japan. One black-seeded variety from Trans-Caucasia. One green-seeded variety from Tunis.

"Of these only four varieties matured at Vienna in 1875, namely, two yellow-seeded, one black-seeded and one brown-red-seeded, all from China. The black-seed sort was so late that it matured but few seeds. Of the other varieties some did not even come into bloom, while the remainder produced blossoms or young pods too late in the fall to mature.

"In 1876 the two yellow and the brown varieties were tested by cooperators in Hungary, Bohemia, Steirmark [Steiermark, Austria], Bukowina [an area divided between Romania and the USSR after 1945], Moravia, and Silesia, favorable results being secured in each case.

"In 1877 seeds of all four varieties were distributed to 148 cooperators, mostly in Austria-Hungary, but some in Germany and Russian Poland, and one each in Switzerland and Holland. Most of the tests gave promising results.

"Haberlandt (1878) published the results of his investigations in much detail, and his results had great influence in stimulating further investigations. All of the varieties that Haberlandt was able to mature were short season varieties, which in general are far less productive than later sorts.

"England: According to Aiton (1812) the soybean was grown as early as 1790 at the Royal Botanic Gardens, Kew, but merely as a botanical curiosity. The soybean has apparently never been grown as a crop in England, where indeed only the earliest varieties would be expected to mature.

"Investigations on the adaptability of the soybean have been carried on by Dr. J.L. North of the Royal Botanic Gardens during recent years. Early varieties were introduced from numerous sources. With careful selections two or three quite promising early strains have been obtained which mature fully and give good yields of seed under English conditions."

2234. Piper, Charles V.; Morse, William J. 1923. Vernacular names of the soybean (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 35-36.

• ***Summary:*** Name–Locality.

An-ing–Naga Hills, Assam.
Bhat–United Provinces, India.
Bhatmas–United Provinces, India.
Bhatnas or Bhatwas–Nepal.
Bhatwan–Ceylon.
Bhatwas–United Provinces, India; Nepal.
Bhetmas–Bengal, India.
Bhut–Punjab, India.
Botumash, Bhativas or Bhatmais–Buthia, India.
Buncae–Ceylon.
Cadelee–Amboina.
Chlai–Bengal, India.
Coffee Bean–United States.
Dau nanh–Annam; Cochin China; Tonkin.
Dau tuong–Tonkin, French Indo-China.
Daidzu–Japan; Tonkin.
Disomhorac–Santhal, India.
Gari-kalai–Bengal, India.
Hoam teu–Cochin China.
Japan pea–United States.
Kajuna–Nepal.
Kajang koro–Celebes.
Katjang boelec–Java; Sunda.
Katjang-djepoen–Java; Sunda.
Khujoon–N. W. [North-West] Provinces, India.
Kije–Naga Hills, Assam.
Lasi–Kachin, Burma.
Lasi Shapre turu–Bhamo, Burma.
Lasi N'Loi–Myitkyina, Burma.
Lasi N'Hti–Myitkyina, Burma.
Mame–Japan.
Patani–India.
Patani-jokra–Assam.
Pe-kyat-pyin–Burma.
Pe-nga-pi–Burma.
Pois oléagineux de Chine–France.
Ram kurthi–Bengal, India.
Ryambai-ktung–Khasi Hills, Burma.
Salyang (Selliyang)–Sikkim.
San-dek-sieng–Cambodia, French Indo-China.
Sandek an gen sar–Cambodia.
Silliangdun–Sikkim.
Soia–France; Italy.
Soja–France; United States.
Sojaboon–Holland.
Sojabohn–Germany.
Sou–China.
Soy–United States.
Soya–United States; England.
Stock pea–United States.
Sudza–Naga Hills, Assam.
Ta teou–China.
Teou–Tonkin.
Tzuda–Naga Hills, Assam.
Yeou–China.

Geographical notes: Assam: A state in northeast India bordering to the north on Bhutan and Arunachal Pradesh. Bengal: A former province in northeast British India, now a region encompassing West Bengal (in India), and Bangladesh; the capital is Calcutta. United Provinces (in full United Provinces of Agra and Oudh) are now called Uttar

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Pradesh, a state in north India bordering to the north on Nepal.

2235. Piper, Charles V.; Morse, William J. 1923. Soybeans in the Philippines (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 50-51.
• ***Summary:*** "Philippines: The soybean is not a native crop in the Philippines. Varieties imported from the United States, China and Japan, Java and India have been tried out at various times at the different experiment stations in Luzon. Variety trials at Singalong and Batangas gave returns of forage and seed that were unsatisfactory. At Alabang and Lamao, the plants grew normally in every way, but were one-third smaller than plants of the same variety in Virginia. Layosa (1918) and Norona (1919) have done considerable successful breeding work with strains of this crop. At the present time the soybean is not recommended for general culture in the Philippines."

2236. Piper, Charles V.; Morse, William J. 1923. Soybean coffee (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 227-28. [1 ref]
• ***Summary:*** "When properly roasted and prepared, the dried beans of any variety of soybeans make an excellent coffee substitute. As such the soybean has been used to a slight extent for many years in Europe, especially Switzerland, and in the United States. It is recorded that during the period of the Civil War the soybean was used rather extensively in the southern states as a coffee substitute. For a considerable while seedsmen sold the Ito San variety under the names Coffee Berry and Coffee Bean. In Japan and southern Russia soybean coffee is prepared and put up in small packages for the market. This product is ground very fine and has much the appearance of coffee essence.

"Prepared as coffee, the soybean gives a liquid of the same color and odor as coffee and somewhat the flavor of a cereal beverage. Those fond of cereal drinks pronounce the soybean beverage equal to the best of the preparations on the market. According to Li Yu Ying and Grandvoinnet (1911-1912) the soybean dried and roasted, such as is used in Switzerland, has the following composition: Water, 5.27; cellulose, 4.97; carbohydrates, 34.76; fat, 18.01; total materials soluble in water, 49.07."

Note 1. This is the earliest document seen (Nov. 2012) which states that soybeans were used as a coffee substitute during the Civil War in the United States. The source of this information is not given–and that is very surprising, since Piper and Morse are so careful about citing their sources in this book. Why did they omit this citation? Perhaps they had heard the story several times but were unable to find an early document to prove it.

Our 30-year search for documentation to verify the above statement has been unsuccessful. Soybeans had been cultivated in 9 southern states by 1865, however none of those states grew a significant acreage of soybeans in 1909–when soybean acreage statistics were first recorded. Therefore its hard to know where to start looking.

Note 2. This is the earliest English-language document seen (Nov. 2012) that uses the term "soybean coffee" to refer to soy coffee.

Note 3. This is the earliest English-language document seen (Aug. 2013) that contains the term "soybean beverage" which is used to refer to soy coffee.

2237. Piper, Charles V.; Morse, William J. 1923. The commercial status of the soybean in Europe (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 16-19.
• ***Summary:*** "While many earlier attempts had been made to introduce the soybean and its products into European countries, it was not until about 1908 that the bean received serious consideration as a product of economic importance. About 1900, however, soybeans were imported by an English firm as, on account of their being practically free from starch, it was thought they would make an excellent food for patients suffering with diabetes. Germany and Holland also imported small amounts of soybeans for the same purpose and many special food products were manufactured by firms in these countries.

"Growth of the trade.–Owing to the inferior quality of the product received, due principally to the poor shipping conditions, the first attempts to introduce the soybean as an oil seed were generally unsuccessful. The first large importation of beans, 400 to 500 tons, was made in 1907 by a crusher at Liverpool, the beans being shipped from Hankow [China] and delivered at Liverpool at a cost of $50.00 per ton. It was found that an oil valuable to soap manufacturers could be produced and that the by-products, cake and meal, both high in protein, could be utilized by manufacturers of mixed feeds.

"After 1907 importations gradually increased and the beans were received in much better condition than those of the first trial shipment. At this time also, impetus was given to the manufacture of soybean products by a shortage of cottonseed and linseed. In February 1908, a cargo of 9,000 tons of beans was received at Hull, the selling price of the beans being $32.00 per ton, C.I.F. It was found by importing in cargo lots, the price was lowered to $4.40 per ton. In June 1909 beans sold for $28.75 per ton but by January 1910 had risen to $41.00 per ton.

"At first England enjoyed the monopoly of trade in soybeans. nearly all of the first large importations of beans were taken by England where many of the large oil mills devoted their plants entirely to the crushing of soybeans. Several of these mills conducted series of tests, demonstrating the value of the cake, meal and oil.

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"Utilization of the soybean as an oil seed extended rapidly to other European countries. The fact that they were called beans, prevented them from having a wider market at the beginning of the large importations, since in Germany, France and Austria, oil seeds were on the free list, but beans were subject to a tax. These countries realizing the importance of the bean, soon placed it on the free list and the monopoly in the trade of soybean products was taken from England.

"Extent of the trade.–The importations of beans from Manchuria and Japan soon reached enormous proportions. In 1909, 412,757 tons; in 1910, 442,559 tons; and in 1911, 321,940 tons of beans were imported by European countries...

"Utilization.–The principal use of soybean oil at first was in the manufacture of soft soaps, as it was found that the oil did not chill easily and was difficult to handle in making hard soap... However, some European soap manufacturers soon claimed to have found a secret process by means of which they could utilize the oil in the manufacture of the best grades of hard soap. Other uses were found for the oil and it entered largely into the manufacture of butter and lard substitutes and edible oil.

"Soybean cake or meal in the beginning of the trade found its largest outlet in Denmark, about 150,000 tons having been purchased from English oil mills in 1910. The trade in the cake or meal extended rapidly to Sweden, Norway, Holland and the northern part of Germany. The United Kingdom is not a large user of the bean cake. It is however used to a considerable extent by Scotch farmers and to a small extent by Irish [from Eire / Ireland] and English farmers. The cake manufactured into a flour, has gradually assumed an important place as a foodstuff and as such is utilized in many European countries."

2238. Piper, Charles V.; Morse, William J. 1923. Miso (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 247-50.
• ***Summary:*** "In extent of use miso is said to surpass all other preparations from the soybean in the Orient. It forms an indispensable part of the daily menu of the rural population and wage earners but it is used somewhat less extensively among the people living in cities. It is the general custom of the people in rural districts to prepare miso for their own use. It has been estimated that the daily consumption of miso per person in rural districts of Japan is about 40 grams.

"The preparation of miso depends primarily upon the action of a fermenting agent known as *kojii* [sic, koji], containing certain forms of fungi, of which *Aspergillus oryzae* is the principal one. The *kojii* also contains diastatic and inverting ferments which change the carbohydrates of the raw material into maltose, glucose, etc., and a proteolytic ferment which acts upon the nitrogenous bodies, converting them into simpler and more soluble materials."

Describes the method of preparing miso in Japan, and two of the most important kinds of Japanese miso. The soybeans "are usually steamed for about 25 hours first with strong heat and later very gently." "White miso, which contains but little salt, is fermented with rice koji for 3 or 4 days only, and may be preserved for about 10 days. Red miso is red in color and contains a relatively large amount of salt. It is fermented usually with barley koji for 1½ to 2 years, and may be kept for several years." A table (from Kellner 1889) compares the composition of these two types of miso.

Photos show: (1) Five Japanese men making miso in a commercial shop; shows the steamer and a large miso fermentation vat. (2) Four men working at the "mill used for crushing the soybeans, yeast [koji] and salt mixture in the manufacture of miso. (3) Two Japanese men shoveling "early cured miso" out of a large vat and packing it into small wooden tubs, each ringed by 5 bamboo hoops.

Note: This is the earliest document seen (June 2004) in which Piper or Morse describe miso.

2239. Piper, Charles V.; Morse, William J. 1923. Natto (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 244-45. [1 ref]
• ***Summary:*** "Natto, a sort of vegetable cheese prepared from soybeans, has long been used by the Buddhists and is now used extensively by the Japanese. Although it is made throughout Japan, the method of manufacture varies somewhat with the locality, the different kinds being associated with the place of manufacture such as Tokyo natto, Kyoto natto, etc.

"In preparing natto, the soybeans are boiled in water for about five hours to render them exceedingly soft. The material while still hot, is wrapped in small portions (about a handful) in rice straw and the bundles tied at both ends (Fig. 70) are placed in a cellar or room (Fig. 71) heated by hot water or charcoal. The room is then closed for about 24 hours, the temperature ranging from 35 to 40ºC., this allowing the cooked beans to ferment in the warm, moist atmosphere.

"Another method is to put the cooked beans in a box with cut straw placed over and closed with a lid. The box is then placed in a stove for 24 hours at a temperature of 35 to 40ºC. The fermented product is a thick viscid mass having a peculiar but not offensive odor. The amount of natto produced is about double the quantity of beans used.

"Although the moderate heat of the cellar or rooms acts for only 24 hours, there is evidently a considerable bacterial fermentation. Yabe (1897) [sic, 1894 or 1895] made a rather extensive study of the microorganisms and chemical composition of natto. This investigator found one species of bacillus and three of micrococcus present...

"In addition to being a highly nutritious food, it is quite probable that Natto is more easily digested than the soybean, as it is very soft and contains more peptone. The average

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composition of natto is as follows: Water, 61.84%; albumen, 19.26; fat, 8.17; carbohydrates, 6.09; cellulose, 2.80; ash, 1.84.

"Natto is used commonly as a side dish and also as a material for confections. It is usually eaten with drops of soy sauce.

A table (p. 245, based on Yabe 1894) compares the nitrogenous substances in soybeans and natto made from those same soybeans. Unfortunately the table was reproduced incorrectly so that most of the values are wrong. For the correct values see Yabe 1894, "On the vegetable cheese, natto."

Photos show (p. 243): (1) About ten Japanese women and men sitting on bundles of straw in a room, "packing a handful of boiled soybeans into fresh rice straw wrappers in preparation of natto." (2) Two Japanese men in a brick-walled natto fermenting room. One is looking in through the small, low entrance door. Each holds a bundle of the straw wrappers.

Note: This is the earliest document seen (Jan. 2012) in which Piper or Morse describe natto.

2240. Piper, Charles V.; Morse, William J. 1923. Hamananatto (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 245. [1 ref]

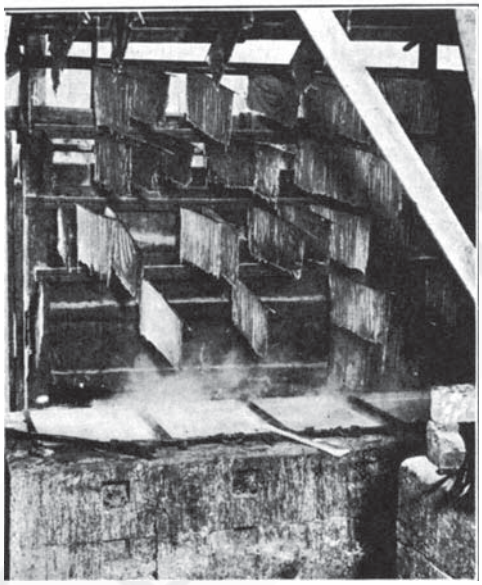
• ***Summary:*** "Hamananatto, a kind of vegetable cheese prepared from soybeans, is manufactured principally in the central provinces of Japan. Although prepared much like miso and natto, it has a somewhat different flavor and texture from either of these. It has an agreeable salty taste and a peculiar odor somewhat resembling that of the fresh crust of brown bread. The soybeans composing it form no compact mass and are of a brown color with a thin layer of a salty taste and a somewhat sticky consistency.

"In preparing Hamananatto the soybeans are thoroughly washed, boiled to softness, spread on straw mats and mixed with wheat flour (6 liters of flour to 10 liters of soybeans). Molds soon develop, after which the mixture is exposed to direct sunlight for 3 days, probably to kill the fungi, and then is put in flat tubs. After about 12 days some salt and ginger are added. The entire mass is then kept in tubs under pressure for about 30 days.

"Sawa [1902, citation not in bibliography] in his investigations found that at least three different kinds of bacteria are present in this product. According to this investigator [Sawa] Hamananatto has the following composition [sic, composition of dry matter only]: Albuminoid nitrogen 3.57%. Fat 3.44%. Fiber 6.87%. Total carbohydrates, excluding cellulose 8.40%. Total ash, including salt added 18.54%. Moisture of fresh sample 44.73%."

Note: This is the earliest document seen (Nov. 2011) in which Piper or Morse describe Hamananatto [Hamanatto].

2241. Piper, Charles V.; Morse, William J. 1923. Yuba (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 246-47.



• ***Summary:*** "When soybean milk is boiled, a film forms on the surface. This film, known as yuba, has been prepared since ancient times in China and Japan, and is a very popular foodstuff. It is very brittle and is sold in sticks, sheets, or small flakes. In cooking, yuba is used as a wrapper, cut into ribbons, or small pieces and either fried or used in soups.

"In the preparation of yuba, soybean milk of the best quality is boiled for about one hour in a copper pan over a slow fire. A small quantity of auramine [a bright yellow ketonimine dye] is added which tends to produce a thick film. The film is removed from the milk by passing a stick underneath the surface, the film thus hanging on in two-fold (Fig. 72). It is dried slowly on a galvanized net over charcoal fire, resulting in a thin yellowish sheet.

"The best quality of yuba is glossy and of a cream-yellow color. The first film is the best and the quality of the succeeding films gradually becomes inferior.

"The milk obtained from 3 lb. of beans is said to produce about thirty sheets of yuba. The [rather thick, semisolid] residue of the milk after the films are removed is still rich in nutrients, and is used mostly for food. It may also be used as animal feed.

"Yuba is valued chiefly on account of its high content of protein. It consists mainly of albuminoids and fat. The composition of yuba is shown in the following table" [Sources: Oshima / Nagao]: Water 18.31 / 22.85. Protein 49.65 / 51.60. Fat 18.00 / 15.62. Carbohydrates 11.82 / 7.31. Ash 2.22 / 2.82. Note: The source of the information from Nagao is not cited.

A photo (p. 246) shows "the boiling of soybean milk in copper pans over a mild fire in the manufacture of yuba."

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About 25 sheets of yuba are hanging in two-fold over sticks several feet or more above the pans.

Note 1. This is the earliest known photo of yuba being made commercially. It may well have been taken by Frank N. Meyer during one of his early trips as a USDA agricultural explorer to Japan or China.

Note 2. This is the earliest known practical and useful description of how yuba is made on a commercial scale.

Note 3. This is the earliest document seen (Oct. 2012) in which Piper or Morse describe yuba.

2242. Piper, Charles V.; Morse, William J. 1923. Tofu or soybean curd (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 234-44, 273-78. [6 ref]

• ***Summary:*** Contents: Introduction. Method of manufacture. Coagulating agents. Manufacturing yields. Composition of soybean curd. Digestibility of soybean curd. Utilization of bean curd and manufactured products. Bean curd brains or *tofu nao.* Dry bean curd or *tofu khan.* Thousand folds (*chien chang tofu*). Fried bean curd (*tza tofu*). Fragrant dry bean curd (*hsiang khan*). Frozen tofu (*kori tofu*). Chinese preparation. Various dishes.

Tofu, "a sort of white cheese or curd,... is called "Teou fu' by the Chinese, 'Tofu' by the Japanese, and 'Dan Phu' by the Annamites [in today's Vietnam]. It is said to have been originated by the Chinese philosopher, Whai Nan Tze, before the Christian Era, and was undoubtedly introduced into Japan from China by the Buddhists."

"The coagulating agents most generally employed throughout the Orient are the concentrated mother liquid obtained from the manufacture of salt from sea water, burned powdered gypsum, and magnesium chloride... The junior author (Morse) has obtained successful results with rennet and 1 per cent. solutions of acetic, tartaric, and lactic acids. Sour milk has also given satisfactory results as well as the water [whey] drawn from the bean curd after coagulation. By the use of pure salts or rennet the bitter taste which is generally found in the curd made by Oriental methods is avoided."

Yields: In commercial tofu production, 1 pound of beans is said to yield about 3.57 lb of tofu (i.e., the yield is 3.57). Champion (1885) got a yield of 1.53 and Paillieux (1880) got a yield of 1.50. Morse conducted many tests to determine the yield of curd from 19 different soybean varieties. His yields ranged from 0.686 to 0.282–extremely low.

Different types of Chinese tofu: (1) Dry bean curd or *tofu khan:* bean curd squares are dipped in burnt millet-sugar sauce until rich brown in color. "Fine salt also has been rubbed on them. This form of cheese can be kept for several days and is generally eaten in soups."

Note 1. This is the earliest English-language document seen (April 2013) uses the term "bean curd squares" to refer to Chinese-style pressed tofu. And this is the earliest English-language document seen (April 2013) that uses the term "soybean curd" to refer to tofu, or that uses the term "Teou fu" (or "Teou-fu"), or the term "Dan Phu" (or "Dan-Phu") to refer to Chinese-style tofu.

(2) "Thousand folds (*chien chang tofu*)*:* This product is prepared by placing very thin layers of the bean curds on cloths, on top of one another, and subjecting them to considerable pressure and allowing them to dry for a short time. The layers of bean curd are then removed and rolled together like a jamroll. It is said to be eaten cut into strips, like noodles, in soups. When allowed to mold for several days it is fried in sesame oil and has a meat like flavor."

(3) "Fried bean curd (*tza tofu*)*:* The fresh bean curd is cut into small squares and fried in deep fat. After a few minutes the bean curd pieces float on the surface and they are taken out. This product is often fastened on bamboo fibers (Fig. 65) and may be kept for several days. They may also be eaten with syrup as fritters." (4) "Fragrant dry bean curd (*hsiang khan*) [*wu-hsiang toufu kan*]*:* This form is made like the ordinary bean curd but great pressure is applied to drive out as much water as possible. The squares (Fig. 66) are first soaked in a weak brine or bean sauce to which powdered spices and burnt millet-sugar have been added and then are thoroughly dried out. The curd becomes very hard and can be kept indefinitely. It is said to be eaten sliced in soups and in various vegetable dishes."

(5) "Frozen tofu (*kori tofu*)*:* Frozen bean curd is an excellent example of the application of the freezing process for the drying or concentration of a food. Fresh bean curd contains rather a high per cent. of water and is therefore a very unstable product. The fresh bean curd is cut into small pieces and exposed to severe cold weather. By freezing, the vegetable proteid shrinks and forms a porous cake permeated with ice crystals. This frozen cake can be readily thawed out and dried. It forms a product much resembling gluten bread in appearance. If the tofu is not frozen, it is difficult to dry and the resulting material is dense and horn-like..." (6) "Chinese preparation:... Tofu is quite generally preserved in loaves (100 to 150 grams) which are cooked in a decoction of turmeric roots. It is also preserved with salt. Often the curd is cut into small pieces and preserved in rice brandy [to make fermented tofu]. When smoked, the curd also keeps very well and can be wrapped in tinfoil for the market. Smoked curd is prepared by cooking the curd in a sauce diluted with water (80 per cent. and 20 per cent. soy sauce) and after cooking the curd is smoked in the same manner as meat."

Various American- and European-style recipes: "When cut into small pieces and cooked with an egg, it furnishes an excellent omelet. It also may be used as the principal ingredient in baked stuffed peppers. The fresh tofu makes an excellent salad or sandwich filling if the curd is chopped finely and chopped olives, pepper, salt, and mayonnaise dressing are added. When cut into small pieces and cooked in

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tomato sauce or similar sauces, a very good meat substitute is obtained. Cooked with meat broth, the curd takes the flavor of the meat. It is readily seen that the fresh bean curd can be utilized in many ways and when the people of the western world become better acquainted with this simple method of manufacture, it will no doubt, become more generally utilized."

Nineteen tofu recipes are given on pages 273-78.

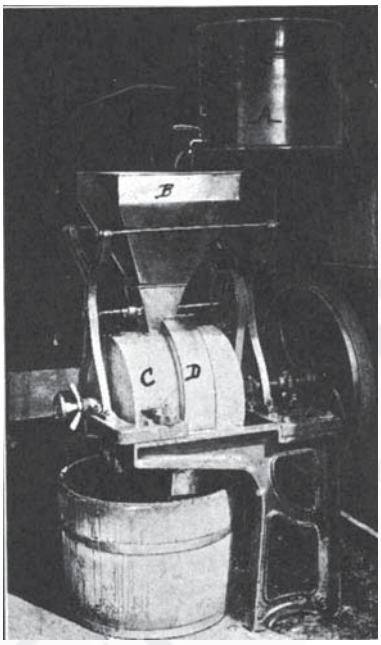
Photos show: (1) "Large blocks of freshly made bean curd 'Tofu' ready to be cut up into squares and sold for breakfast." (2) "A large bamboo tray full of various kinds of bean curd. In the little wooden tubs on the ground the watery sorts of curd are kept immersed in saline water." (3) "Squares of fresh bean curd fried in oil and put on a string of bamboo fiber. Called tza tofu (fried bean curd) and said to supply a 'snack' in between meals for hard working Chinese laborers." (4) "A semi-dry bean curd of the consistency of smoked sausage, called 'Hsiang khan' (fragrant dry) which is eaten sliced in soups, and with vegetable dishes." Two squares, each bearing a stamped mark, are shown next to an open pocket knife for size comparison. (5) "A semi-dry fresh bean curd, called 'Lao to fu' (old bean curd) said to be used by the poorer classes of Chinese for breakfast." One square (with a cloth-like texture on the surface) on a small plate, and a broken half square are shown. (6) A room in which fermented tofu is being made. "A dark room of even temperature where wooden frames, full of squares of bean curd are piled, one on the other, the lowest resting on a layer of somewhat damp rice straw." One tray is open, showing the rows of tofu cubes, each covered with a white mycelium. (7) "Large earthen jars, full of squares of bean-curd, which are covered over with spiced brine and soy-sauce. After several months' curing a new product has been formed, called 'Foo-yu'–Bean cheese [fermented tofu], which can be kept for many years and becomes better with age."

Note 2. This is the earliest English-language document seen (Oct. 2011) that uses the term "Foo-yu" to refer to fermented tofu.

Note 3. Each of these 7 photos was taken (probably in China) by Frank N. Meyer, Agricultural Explorer, USDA.

Tables show: (1) Yields of bean curd obtained by William Morse from different varieties of soybeans. Variety #37062 gave the highest yield of tofu. 50 grams of soybeans yielded 34.3 gm of tofu and 30.5 gm of "Cake" [okara]. Note 4. This yield of 0.69 is very low; it should be at least 2.5. Variety #38462 gave the lowest yield, 0.28. (2) Composition of tofu and tofu products, compiled from various sources: Five samples of fresh tofu (6.0% protein on average), one frozen tofu (48.65% protein and 28.65% fat), and one fried tofu (21.96% protein and 18.72% fat).

2243. Piper, Charles V.; Morse, William J. 1923. Photographs and illustrations (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p.



• ***Summary:*** Photos show: (Fig. 1) Typical soybean plant (p. 1). (2) Plant of wild soybean (p. 2). (3) A fleet of junks engaged in carrying soybeans to Newchwang, Manchuria, from different points in the interior, taking away bean oil and bean cake to other places * (p. 6). (4) Soybeans in sacks brought to a bean center by horses in winter in Manchuria (p. 8). (5) Chinese bean cart loaded with beans in wicker containers in Manchuria (p. 8).

(6) Type of cart and method of hauling soybeans with a horse in Manchuria (p. 10). (7) Manchurian farmers hauling the bean crop to market in winter on sleds (p. 10). (8) Plants of a soybean variety from India (p. 38). (9) Plants of the wild soybean from Soochow, China, grown at the Arlington Experimental Farm, 1908 (p. 38). (Fig. 15) Soybeans grown on the edges of a rice field in southern China * (p. 58).

(16) A man in a field of the Peking variety of soybean grown in rows and cultivated (p. 61). (17) A broadcast field of soybeans showing how weeds have overrun the field (p. 61). (18) The ordinary grain drill furnishes a most convenient method of seeding in rows or broadcast (p. 63). (19) Soybeans and corn grown in alternate rows for pasturage; a man in a hat stands between the rows (p. 65). (20) The roots of a soybean plant, showing abundant development of nodules (p. 66).

(21) A man standing in a plat of soybeans without inoculation (in the foreground) and an adjacent plat which had been inoculated, in the background (p. 67). (22) A man seated on a cultivator pulled by two horses doing the last cultivation on a field of soybeans (p. 79). (23) Soybeans and sorghums grown in mixture for forage purposes (p. 80). (24) A field of soybean and Sudan grass grown in mixture for hay (p. 81). (25) A field of soybeans and corn grown in the same row for ensilage (p. 82).

(26) Soybean hay on frames. Under favorable weather

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conditions, hay can be successfully cured in this manner (p. 86). (27) A field of mature soybeans ready to cut for seed (p. 90). (28) Harvesting soybeans for seed with a bunching attachment on the mower (p. 90). (29) Self-rake reaper used in cutting soybeans for seed (p. 91). (30) Soybeans cut for seed with binder and soybeans placed in shocks for curing (p. 92).

(31) The ordinary gasoline threshing outfit which may be used in threshing soybeans (p. 92). (32) A special bean harvester used in gathering the soybean seed from the standing mature plants and also cleaning it (p. 94). (33) A special bean harvester by which the plants are cut, thrashed, and cleaned (p. 94). (34) A special soybean harvester used to gather soybean seeds from the standing mature plants, and which can be adjusted to level or ridged cultivation. On one side is written "The Little Giant Bean Harvester," manufactured by Hardy & Newsom, La Grange, North Carolina (p. 95). (35) Method of storing soybean seed awaiting shipment in Manchuria. The beans in sacks are stacked under Chinese mats (p. 98).

(37) Pasturing a corn and soybean mixture with sheep (p. 133). (38) Thrashing soybeans from the field and baling the straw (p. 141). (39) The larger plant is the Guelph or Medium Green which is very pubescent, while the smaller plant is a nearly smooth variety from Japan (p. 149). (40) Pods of soybeans showing the range in size and shape (natural size; p. 151).

(41) Seeds of the most important varieties of soybeans now grown in the United States showing the wide range in size and shape of seed. The name of each of the 20 varieties is given. A side view and a ventral view of each pair of seeds is given (p. 152). (42) Seeds of a black and white variety (Widower) from Korea. The white is due to the splitting of the outer later of the testa. A side view of six varieties is shown (p. 155). (43) A field of the Biloxi soybean, which requires a long season to mature (p. 163). (44) A man standing in a field of the Virginia variety of soybeans (p. 170). (45) Seeds of a natural soybean hybrid showing peculiar types of coloration (p. 175). (46) Pods of soybeans, hairy and smooth (p. 176). (47) A sterile soybean plant obtained from a natural hybrid (p. 176). (49) Seeds of an artificial soybean hybrid, showing peculiar types of coloration (p. 181). (56) An old style Chinese oil bean press, Manchuria (p. 195). (57) Coolies at Newchwang, Manchuria, carrying loads of soybeans from the junks to big stacks, where they are kept until the factory needs them for oil manufacture * (p. 196). (58) "Seeds and pods of the Hahto variety of soybeans, the seeds being especially valuable as a green vegetable" (p. 222). (59) Baskets of sprouted, small yellow soybeans and sprouted mung beans * (p. 226). (60) Men making soymilk, working with machinery with which the soybeans are ground and the milk strained. Note the 2 grinding stones and the cloth strainers suspended from the ceiling over the tub. The cabinet with rack for bottles is noted in the background (p. 228). (61) Motor stone mill for grinding soybeans in preparing tofu with brass water tank (A), funnel reservoir (B), stones (C), and brass guard (D) (p. 229). (62) Delivery coolies holding baskets full of bottles showing the way soybean milk is delivered by the factory in Changsha, China (p. 231). (76) A courtyard filled with large earthenware containers with cone-shaped wicker tops for ripening soy sauce mash [in Ichang (I-ch'ang or Yichang), Hupe / Hupeh / Hubei province, China]; a small, strong basket is placed into each, with its rim just above the surface of the mash. The soy sauce collects or accumulates in each basket and is then dipped out, ready for consumption * (p. 251). (77) A man standing next to an iron cauldron in which soybeans are boiled for the manufacture of soy sauce (p. 252). (79) Fermenting room for yeast and soybeans in preparation of soy sauce (p. 253). (80) Rows of pots with cone-shaped wicker lids filled with soybean and wheat mixture for soy sauce * (p. 254). (81) A box press in which sacks of fermented soybeans are placed for pressing out the liquid forming soy sauce * (p. 254). (82) A man next to a kettle for boiling the soy sauce. After it is boiled, the sauce is ready to be placed in kegs at left side (p. 255). (83) Rows of soybean sauce in jars ready for shipment (p. 255). (84) Root of a soybean plant showing rootknot caused by the nematode (*Heterodera radicicola*) (p. 285).

Note: * means photo by Frank N. Meyer in China or Manchuria.

Illustrations (line drawings) show: (Fig. 48) Flower of the soybean enlarged. Front view. Side view. Parts of the corolla, standard, wing, one of the keel petals. Stamens. Pistil (p. 177). Figures 50-55, from Kondo (1913) are described at Kondo.

Maps show where the soybean is extensively and successfully grown in: (Fig. 10) The Orient (p. 51). (11) North and South America (p. 52). (12) Europe and Africa (p. 53). (13) A map of Manchuria shows the soybean districts and seed production of different localities (p. 56). (14) An outline map of the United States shows the areas with shading to which the soybean is especially adapted as to varieties and purposes (p. 57).

A diagram (Fig. 36, p. 129) shows the various ways in which the plants and seeds of soybeans are utilized. Level 2: The first two categories are seeds and plants.

Level 3: Under seeds: Food products, oil, and meal. Under plants: Hay, ensilage, soiling.

Level 4: Under food products: green beans and dry beans. Under oil: Glycerin, explosives, enamels, varnish, food products, waterproof goods, linoleum, paints, soap stock, celluloid, rubber substitute, printing inks, lighting [illumination], lubricating. Under meal: Human food, stock feed, fertilizer. Under forage: Hay, ensilage, soiling.

Level 5: Under green beans: Green vegetables, canned, salads. Under dried beans: Soy sauce, boiled beans [from whole dry soybeans], baked beans [whole], soups, coffee

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substitute, roasted beans, vegetable milk, breakfast foods. Under soap stock: Soft soaps, hard soaps. Under oil–food products: Butter substitute, lard substitutes, edible oils. salad oils. Under meal–human food: Breakfast foods, diabetic foods, flour, infant foods, macaroni, crackers, [soy] milk.

Level 6: Under dried beans–vegetable milk: Cheese, condensed milk, fresh milk, confections, casein. Under meal–human food–flour: Bread, cakes, muffins, biscuit.

Level 7: Under cheese: Fresh, dried, smoked, fermented.

2244. Piper, Charles V.; Morse, William J. 1923. Seed yields. Proportion of straw to seed (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 95-97. Chap. VI. [1 ref]

• ***Summary:*** "In regard to the seed yield of the soybean, there is considerable variation in the figures given by authorities in different countries. In Manchuria experts estimate the yield from 1,100 to 1,600 lb. to the acre, commercial authorities from 1,600 to 1,800 lb., and Japanese agricultural experts from 400 to 2,000 lb. In the best bean-producing districts the average yield is said to be more than 1,800 lb. to the acre. The average yield of soybeans to the acre in Japan for the decade 1904-1913 is 15.7 bu. The highest average yield, 21.6 bu. is recorded on the west or Japan Sea coast, while the lowest average yield, that of the Soochoo Islands, is 8.48 bu.

"In South Africa at the Government Experiment farms as high as 2,000 lb. per acre were recorded, while in many instances the yield was well over 1,000 lb. to the acre.

"When grown alone for seed, the best varieties under proper culture in the United States yield from 30 to 40 bu. of seed to the acre. A maximum yield of 50 bu. to the acre has been reported from North Carolina."

Table 31 (p. 96) shows soybean seed yields (in bushels to the acre) of the more important varieties grown in the United States as reported by investigators at various Experiment Stations. "It will be seen that the yields vary greatly with the same variety at different stations. This in most cases may be attributed to the adaptability of the variety to certain localities for seed production. In general the figures given represent the average yield for a number of years, and indicate the best seed-producing sorts."

The varieties shown in Table 31 are: Aksarben, Black Eyebrow, Biloxi, Chiquita, Ebony, Elton, Habaro, Haberlandt, Hamilton, Ito San, Mammoth, Manchu, Midwest, Mikado, Medium Green, Morse, Mandarin, Peking, Tokio, Tarheel Black, Wilson, Virginia. The states are: Alabama, Arkansas, Connecticut, Delaware, Georgia, Illinois, Indiana, Kansas, Kentucky, Maryland, Minnesota, Mississippi, Missouri, Nebraska, New Jersey, North Carolina, Ohio, Pennsylvania, South Carolina, South Dakota, Tennessee, Virginia, Washington, West Virginia, Wisconsin.

In the section titled "Proportion of straw to seed," Table 32 (p. 97) gives the relative yields of straw to seed for different varieties of soybeans at the Ohio Experiment Station (5-year average). For each variety the average 5-year yield of seed (bushels) and straw (pounds) is given. The varieties are: Sable, Taha, Cloud, Yosho, Hamilton, Mikado, Amherst, Auburn, Midwest, Ito San, Ebony, Medium Green, Habaro, Ohio 9001, Ohio 9016, Elton. The four varieties with the top 5-year average seed yields are: Ohio 9016 (29.22 bushels/acre). Elton (26.51). Midwest (24.06). Ohio 9001 (24.00).

2245. Piper, Charles V.; Morse, William J. 1923. Structure of soybean seeds (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 187-193. Chap. X. [3 ref]

• ***Summary:*** Contents: Introduction. The structure of the soybean seed: The seed coat (incl. hilum, chalaza, micropyle, hypocotyl), microscopic structure of the seed coat, microscopic structure of the hilum, the embryo, microscopic structure of the cotyledons, identification of soybean meal, differences in structure of the seed varieties.

"The seed coat is smooth, often shiny, rather firm in texture, and closely enveloping the embryo. The *hilum* or seed scar is linear-elliptical in shape and nearly flat (Fig. 50). At one end is a small linear groove marking the *chalaza,* or point where the seed coat was joined to the body of the ovule. At the other end of the hilum is the *micropyle,* a minute orifice in the seed coat, through which the primary root of the young seedling emerges in germination. In many varieties of soybean the outlines of the *hypocotyl* may be seen through the seed coat" or testa.

"The cellular [microscopic] structure of the seed coat or *spermoderm...* consists of four layers of cells."

Illustrations (line drawings) show: (Fig. 50) Soybean seed (yellow variety from Japan and another variety) showing the hilum, chalaza, micropyle, and an outline of hypocotyl seed through the testa (p. 187, after Kondo 1913). (51) Cross-section of the testa of a yellow soybean. Horizontal section, showing the cuticle, light-line, palisade cells, hour-glass or column cells, spongy parenchyma, and aleurone layer (p. 188). (52) Cross-section of the hilum of a yellow soybean from China, showing outer palisade layer, inner palisade layer, asteroid parenchyma, spongy parenchyma, fibro-vascular bundle, fibro-vascular bundle of the testa, aleurone layer, and hour-glass cells (p. 189).

(Fig. 53) Embryo of a yellow soybean from Japan. Whole embryo from ventral side. Half of embryo from the inner side. The 2 leaves of the plumule, with cotyledons and hypocotyl (sprout; p. 189). (54) Soybean. Cells of the cotyledon filled with fat, protein, and starch (p. 189). (55) Cellular structure found in soybean flour and meal. Palisade and hour-glass cells in sections and surface views from above and below. Aleurone cells within seed-coat. Same with compressed parenchyma in section. Surface view of epidermal cells near the hilum. Parenchyma near the hilum. Tracheids from hilum furrow. Epidermis and underlying

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cells from flat and round sides of cotyledon. Epidermis and palisade cells in transverse section of cotyledon. Epidermis and mesophyll cells from rounded face of cotyledon. Oil drop. Crystal. Aleurone grains (p. 190).

Table 83 (p. 192) shows the "Variations in the cooking qualities of seed of different varieties of soybeans." For each of the 18 varieties (9 with names and 9 with numbers) is given: Weight of 100 beans (dry, in gm). Weight of 100 beans after soaking (gm). Amount of water taken up by 100 beans (gm). Texture of beans after cooking. The named varieties are: Tokio, Chiquita, Midwest, Manchu, Haberlandt, Ito San, Mammoth, Easycook, Hahto. One hundred seeds of each variety were used. The seeds were weighed dry then after soaking for 17 hours were weighed again. Each sample was cooked for 2 hours. The varieties with the largest seeds are Hahto and 37264: 100 dry beans weigh 35.95 gm. These two varieties also weighed the most after soaking: 92.80 gm and 86.70 gm, respectively. The 3 varieties with the softest texture ("Very soft") after cooking were Easycook, Hahto, and 37305.

"Studies on the structure of the seed of several of these varieties by Dr. Albert Mann, of the United States Department of Agriculture, showed that there was an appreciable difference in the structure of the Easy cook and other varieties. The most important difference was the much greater permeability of the skin or integument of the Easycook variety. This permeability is due to a very great looseness in the cells comprising the various layers of the integument; particularly so of the outer or palisade layer. The walls of all the cells of the integument are more delicate and, therefore, more permeable than those of the Mammoth Yellow, which does not cook up easily. The palisade cells on account of their external position doubtless play the most conspicuous part in this particular."

"In general, those varieties absorbing a large amount of water cooked rather easily, but in a very few instances varieties absorbing small amounts of water cooked quite easily. It was found that in addition to difference in structure, the varieties as the Easycook, Hahto and Tokio contained more starch, which was scattered more or less through the cotyledons."

Note: This is the earliest English-language document seen (Oct. 2004) that uses the word "chalaza" in connection with soybeans. An illustration (p. 187) shows that the chalaza, located at one end of the hilum on a soybean seed, is a small linear groove which marks the point where the seed coat was joined to the body of the ovule.

2246. Piper, Charles V.; Morse, William J. 1923. Soybean varieties (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 144-86. Chap. IX.

• ***Summary:*** Contents: Introduction. Japanese classification of varieties. Classifications of varieties in Manchuria: Yellow (*Pai-mei* or white eyebrow, *Chin-huän* or round golden bean, and *Hei-chi* or black navel), green (*Ching tou*), black (*Wu tou*). Botanical classifications: *Soja elliptica* Martens (*S. elliptica nigra, S. elliptica castanea* [*brown*], *S. elliptica virescens, S. elliptica lutescens*), *Soja sphærica* (*S. sphærica nigra, S. sphærica minor, S. sphærica virescens, S. sphærica lutescens, S. sphærica minima*), *Soja compressa* (*s. compressa nigra, S. compressa parvula, S. compressa virescens, S. compressa zebrina*). Varietal characteristics: Habit of growth, foliage, pubescence, flowers, pods, size and weight of seeds, color of seeds, frost resistance, period to maturity, disease resistance, classifications by lengths of life period, desirable characteristics in varieties, descriptions of important varieties, key for identification of varieties (Yellow group, green group, brown group, black group, bicolored group), breeding and improvement (pollination, mutations, natural hybridization, artificial hybridization), genetic behavior (flower color, pubescence, color of pods, color of seeds, color of cotyledons, oil content).

The section titled "Classification by lengths of life period" [maturity] states: "Based on the data from variety tests at the Arlington Experimental Farm, the varieties may be classified into seven groups according to their life periods:

"Very early–Maturing in 81 to 90 days.
"Early–Maturing in 91 to 100 days.
"Medium early–Maturing in 101 to 110 days.
"Medium–Maturing in 111 to 120 days.
"Medium late–Maturing in 121 to 130 days.
"Late–Maturing in 131 to 150 days.
"Very late–Maturing in more than 150 days."

Note 1. This is the earliest document seen (Aug. 2011) in which soybean varieties are classified into groups based on their maturity (number of days to mature) or "life periods."

The following 43 varieties (not including synonyms) are described in the section titled "Descriptions of important varieties" (p. 162-70): A.K., Aksarben, Barchet, Biloxi, Black Eyebrow, Chestnut, Chiquita, Columbia, Early Brown, Easycook, Ebony (same as Black Beauty), Elton, Guelph (same as Medium Early Green, Medium Green), Hoosier, Haberlandt, Hamilton, Habaro, Hahto, Hollybrook, Ito San (same as Medium Early Yellow), Laredo, Lexington, Mammoth Yellow, Mammoth Brown, Manchu, Mandarin, Merko, Minsoy, Midwest (same as Medium Yellow and Mongol; appears identical with Roosevelt, Banner, and Northern Hollybrook), Mikado, Morse, Ogemaw, Otootan, Peking (same as Sable), Pinpu, Tarheel Black, Tokio, Virginia, Wilson, Wilson-Five, Wisconsin Black, Wea, Yokotenn [Yokoten].

Note 2. This is the earliest document seen (Oct. 2013) that mentions the soybean variety Hamilton (one of two documents).

2247. Piper, Charles V.; Morse, William J. 1923. Early introduction of the soybean into the United States (Document

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part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 39-41.
• ***Summary:*** "There are fortunately fairly complete records for the early history of the soybean in the United States. The facts emphasize the difficulties with which a new crop wins its way to recognition.

"The earliest records.–The first mention of the soybean in American literature is by Mease (1804), who writes 'The soybean bears the climate of Pennsylvania very well. The bean ought therefore to be cultivated.'

"Thomas Nuttall (1829) grew a variety with red flowers and chocolate brown seeds in the botanic garden at Cambridge, Massachusetts, and from his observations wrote a brief account concerning it. He writes:

"'Its principal recommendation at present is only as a luxury, affording the well-known sauce, soy, which at this time is only prepared in China and Japan.'

"In the same journal two years later, November 23, 1831, is an account of the successful culture of the plant at Milton, Massachusetts, the seed having been obtained from Nuttall.

"No further mention of the plant in America literature appears until 1853, when a brief account appeared under the name 'Japan pea' by Ernst [of Ohio] (1853), as follows:

"'The Japan pea, in which so much interest has been manifested in this country for a year or two past, from its hardihood to resist drought and frost, together with its enormous yield, appears to be highly worthy of the attention of agriculturists.'"

"The Perry Expedition to Japan.–The Perry expedition in the year 1854 brought back two varieties of 'soja bean' from Japan, one 'white' seeded, the other 'red' seeded. These, together with the Japan pea, were distributed by the Commissioner of Patents in 1854, (Browne 1854) and, thereafter frequent references to the plant occur in agricultural literature under such names as Japan pea, Japan bean, and Japanese fodder plant. Most of these articles speak of the plant as the Japan pea, none of them as the soy or soja bean. It is apparent from the early accounts that there were at least two Japan peas, one early enough to mature in Connecticut (Patent Office Report, 1854, p. 194), the other very late (American Agriculturist, 1857, vol. 16, p. 10). Judging from all the accounts, we suspect that the early Japan pea may be the Ito San variety, which, however, has red flowers, while the late variety may be the Mammoth. The Ito San is still occasionally called the Japan pea, while the introduction and source of the Mammoth has never been definitely determined. From these early accounts the Mammoth may well be the 'white-seeded' soja bean obtained by the Perry expedition. The 'red-seeded soja bean' was, probably, the adsuki bean (*Phaseolus angularis*), as no red-seeded soybean is known.

Later Introductions.–Prof. G. H. Cook, of New Brunswick, New Jersey, obtained seed of the soybean at the Bavarian Agricultural Station [in Germany] in 1878. In the same year Mr. James Neilson obtained seeds of several varieties at Vienna, Austria. Both of these gentlemen planted the seeds and gathered crops of the different varieties in 1879. These varieties were without doubt some of those grown and distributed through Europe by Professor Haberlandt of Vienna.

"A yellow-seeded soybean was grown at the North Carolina Agricultural Experiment Station in 1882 and reported on in some detail. The source of the variety is not given, but by implication it is the same as the variety stated to be grown by a number of persons in the State, and is probably the Mammoth.

"Two varieties, one black seeded, the other with white seeds, were grown at the Massachusetts Agricultural Experiment Station in 1888.

"In 1890 Prof. C. C. Georgeson (1890) secured three lots of soybeans from Japan which were grown at the Kansas Agricultural Experiment Station in 1890 and subsequently.

"Prof. W. P. Brooks, (1890) of Amherst, Massachusetts, brought with him from Japan in 1889 a number of soybean varieties, including the Medium Green or Guelph, and the Ito San. It is quite certain that other importations of soybeans from Asia were made by others, but no definite records have been found.

"Since 1890 most of the agricultural experiment stations have experimented with soybeans and many bulletins have been published dealing wholly or partly with the crop."

2248. Piper, Charles V.; Morse, William J. 1923. Composition of the soybean: Carbohydrates (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 109-12. [14 ref]
• ***Summary:*** "Many investigators have studied the nitrogen-free extract of the soybean from various points of view. In many cases, the published analytical data are somewhat conflicting. The soybean has a variety of carbohydrates, altogether amounting to from 22 to 29 per cent., depending on the variety and maturity of the bean. The most complete quantitative separation of the carbohydrates existing in the soybean has been made by Street and Bailey (1951).

"Considerable differences of opinion have existed among investigators with regard to the presence of starch in soybeans." Some found none, whereas others found small amounts. "Japanese chemists have not identified starch in the native soybean. Undoubtedly the discrepancies relative to starch content have been due to the maturity of the beans or rather the method in which they are allowed to mature." Harz (1885) found that mature soybeans generally contain little or no starch.

"Thoroughly mature seed of sixteen varieties of soybeans grown quite generally throughout the United States were submitted by the authors to Dr. Albert Mann of the United States Department of Agriculture for investigation

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as to starch content. Dr. Mann reported that in all cases where starch reaction was obtained, it appeared upon the inner (approximate) surfaces of the two cotyledons. It was intensest at the middle part of the line of separation and extended immediately under or behind the epidermal layer of these two surfaces. In the majority of cases only a trace of starch extended back into the thicker portion of the cotyledons, that is, midway the inner and outer surfaces. One variety, the Hahto, showed a distribution of starch throughout most of the cotyledon, although the color reaction was nowhere intense. No starch was found in the seed coats of any of the varieties and only a mere trace in the embryos. It will be noted in the following table that those varieties with black or brown seed coats (with the exception of the Black Eyebrow variety) are practically starch free while a general tendency toward relatively high starch content is exhibited by the yellow-seeded sorts."

Table 45, titled "Starch content of commercial varieties of soybeans in the United States" (p. 111), has three columns: Variety, seed color, and amount of starch, as follows: Peking, black, no starch. Virginia, brown, no starch. Wilson, black, no starch or merest trace. Biloxi, brown, trace. Early Brown, brown, small amount. Hollybrook, straw yellow, small amount. Guelph, green, small amount. Midwest, straw yellow, thin area covering 3/4 of inner surface. Ito San, straw yellow, similar to Midwest but the areas heavier in starch. Manchu, straw yellow, strong starch areas in inner surface of each cotyledon. Mammoth, straw yellow, decided starch band on inner surface of each cotyledon. Black Eyebrow, black and olive, pronounced starch band on inner surface of each cotyledon. Hahto, olive yellow, starch grains more or less through the cotyledons. Chiquita, straw yellow, very strong starch band on inner side of each cotyledon. Haberlandt, straw yellow, very strong starch bands on inner side of each cotyledon. Tokio, olive yellow, strongest starch reaction of all varieties tested. Easy Cook [Easycook], straw yellow, decided starch bands on inner surface of each cotyledon; more or less starch to outer side of cotyledons also; starch more or less distributed through the tissue of the bean.

2249. Piper, Charles V.; Morse, William J. 1923. Soybean cake or meal (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 204-17. Chap. XII.

• ***Summary:*** Contents: Feeding value, composition, use for feeding for dairy cows, cattle, swine, sheep, poultry, digestibility, injurious effects, fertilizer.

"Feeding value: In Manchuria, soybean cake or meal, mixed with bean and kaoliang (sorghum) stalks, is used as a feed for horses and mules, but only when very hard work is done. It is also recognized in Japan as a valuable feed for work animals and as a fattening feed for animals not employed in farm work."

"The use of the meal in America thus far has been confined almost entirely to the Pacific Coast states. It is considered a valuable feed not only by dairymen, but also by poultrymen. The meal has been used to some extent by kennel owners who have found it to be a highly satisfactory dog feed."

2250. Piper, Charles V.; Morse, William J. 1923. Agricultural history of the soybean: China, Korea and Japan (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 36-37.

• ***Summary:*** "The soybean is a plant of very early cultivation in China. According to Li-Yu-Ying and Grandvoinnet (1911-1912) the soybean is described in the book of Materia Medica 'She-non' written over 5,000 years ago. Note 1. This is probably the *Shennong Bencao Jing* (abbreviated *Benjing*) [Classical Pharmacopoeia of Shennong, the Heavenly Husbandman], which appeared in about AD 100.

"The celebrated dictionary of Sui Sham describes the plant under the name of *'tchouan.'* Note 2. This is the earliest document seen (July 2007) that mentions the name "Sui Sham." We have been unable to find any dictionary compiled by a man who name sounds even vaguely like his.

In another ancient dictionary, the 'Kouang-ia' [sic, *Guangya,* by Zhang Yi, AD 230] dating from the time of the Christian era, the soybean is called *ta-teou* or grand pea and also *sou.* It seems very probable that the names soi, soy, soya and soja are all derived from the ancient Chinese name sou.

"In Manchuria the soybean is grown to a greater extent than in any other country, and its culture there is doubtless ancient. From Korea there have been sent to the United States Department of Agriculture many distinct varieties, the large number indicating long cultivation in that country. The culture of the soybean in Japan is likewise very old and many species peculiar to that country are in cultivation.

"No comprehensive account of the agricultural history of the soybean in any of these countries has yet been attempted, but doubtless much information is contained in ancient Chinese and Japanese literature.

"Several varieties different from any secured elsewhere have been introduced into the United States from Formosa, and the plant has probably been cultivated there for a considerable period."

2251. Piper, Charles V.; Morse, William J. 1923. Tables (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p.

• ***Summary:*** Tables: (1) Acreage, production and yield of soybean seeds in the United States. Gives statistics for each for 1918, 1919, and 1920 for 14 states, other, and total. The states are listed in descending order of soybean acreage in 1921, as follows: North Carolina, Virginia, Alabama, Illinois, Ohio, Kentucky, Missouri, Tennessee, Wisconsin, Indiana, Georgia, Pennsylvania, S. Carolina, Mississippi.

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(2) Estimates of soybean production of Manchuria for various years (in million tons): 1906 = 0.6. 1907 = 0.6 to 0.9. 1908 = 1.150. 1909 = 1.150. 1910 = 1.4. 1913 = 1.2 1921 = 4.52.

(3) Cost of production of soybeans per acre in Manchuria, 1910. (4) Monthly capacity of steam oil mills at Newchwang, Manchuria, 1917. (5) Export of soybeans, bean cake, and bean oil from the principal ports of South Manchuria, 1909 to 1913, inclusive. (6) Five-year averages (1897-1919, inclusive) of acreage, production, and yield per acre of soybeans in Japan. (7) Amount and value of soybeans imported by Japan. (8) Importations of soybean cake and bean oil into Japan. (9) Quantity and value of exports of soybeans and soybean oil from Japan to foreign countries, 1913 and 1914.

(10) Quantity and value of exports of miso (bean cheese) and shoyu sauce, 1903 to 1907, inclusive. (11) Quantity and value of imports of soybeans, bean cake, and bean oil by European countries, 1912 to 1914, inclusive. (12) Comparative prices per ton of cottonseed and soybeans in European markets, 1911 to 1914, inclusive. (13) Quantity and value of soybeans, soybean cake, and soybean oil imported into the United States, 1910 to 1920, inclusive. (14) Quantity of imports of soybeans in the world's trade, 1920-1919 inclusive. (15) Quantity of imports of soybean oil in the world's trade, 1910-1919 inclusive. (16) Quantity of exports of soybean oil in the world's trade, 1910-1919 inclusive. (17) Quantity of exports of soybeans in the world's trade 1910-1919 inclusive. (18) Acre yields of seed and hay of soybeans at different dates of planting at Arlington Farm, Virginia. (19) Yields of soybeans variously spaced.

(20) Acre yields of soybean hay and seed when planted at different rates. (21) Germination of soybeans at different depths of planting at Arlington Farm, Virginia. (22) Influence of nodules on the composition of seed. Michigan Experiment Station. (23) Effect of various nitrogenous fertilizers on the yield of soybeans. Massachusetts Experiment Station. (24) Effects of different phosphatic fertilizers with and without lime. Rhode Island Experiment Station. (25) The influence of different potash salts on yields of soybeans. Massachusetts Experiment Station. (26) Effects of different kinds of lime on the yield of soybeans. Massachusetts Experiment Station. (27) Effect of fertilizers on soybeans. Delaware Experiment Station. (28) Composition of hay of Mammoth soybean at different stages of development. Arlington Farm, Virginia. (29) Comparison of the loss in moisture in 10-lb. samples of green forage of ten varieties of soybeans when air dried. Arlington Farm, Virginia.

(30) Tons of soybean hay to the acre at different experiment stations in the United States. (31) Bushels of soybean seed to the acre at different experiment stations in the United States. (32) Relative yields of straw to seed in different varieties of soybeans. Ohio Experiment Station. (33) Viability of soybean seed. (34) Proportions of stems, leaves, and pods. (35) Nutritive constituents contained in each part of the soybean plant. After Lechartier. (36) Composition of the different parts of the soybean plant at different stages of growth, at Arlington Farm, Virginia. (37) Total weights of mineral materials in 1,000 kilos of dry forage. After Lechartier. (38) Mineral Materials in 1,000 kilos of dry forage. After Joulie. (39) Percentages of nitrogen, phosphoric acid and potash contained in different parts of the soybean plant at different stages of growth, at Arlington Farm, Virginia.

(40) Composition of soybean seed compared with that of other legumes. (41) Composition of common American varieties of soybeans. (42) Percentage composition of the different parts of soybean seed. After Lechartier. (43) Percentage composition and comparison of the amino acids of the protein of the soybean and of cow's milk. (44) Percentage composition of the nitrogen-free extracts of the soybean. (45) Starch content of commercial varieties of soybeans in the United States. (46) Maximum, minimum, and average of the more important constants of soybean oil from 48 varieties, compared with those of other well-known oils. (47) Comparison of the more important constants of soybean oil by different observers. (48) Constants for soybean oil. (49) Composition of the ash of the soybean seed. After Pellet.

(50) Mineral content of the soybean seed compared with those of cowpea, navy bean, and peanut. (51) Oil content of soybeans gathered at various stages of maturity. (52) Oil content of soybeans as affected by partial defoliation. (53) Oil content of soybeans as affected by partial removal of very young seed pods. (54) Oil content of soybeans of large and small size seed from the same plant. (55) Oil content of soybeans planted at intervals of two weeks in 1911, at Arlington Farm, Virginia. (56) Varietal differences in the oil content of soybeans grown at Arlington Experiment Farm, Virginia, in 1907, 1908 and 1910. (57) Oil content of soybeans grown under different environmental conditions. (58) Oil and protein content of soybean varieties grown under different environmental conditions. (59) Fertilizing constituents of soybeans contained in crop and roots on one acre. Connecticut (Storrs) Experiment Station.

(60) Yields of hay of different legumes and content of fertilizing ingredients. Michigan Experiment Station. (61) Fertilizing constituents of soybeans cut at different stages of growth. Arlington Farm, Virginia. (62) Data and results of soiling experiments with milch cows. Iowa Experiment Station. (63) Soybean soiling experiment with milch cows, Pennsylvania Experiment Station. (64) Analyses of soybean, soybean and corn, and corn silages. (65) Digestibilities of soybean and other silages. (66) Digestible nutrients in 100 lb. of air-dry substance. (67) Digestible nutrients in 100 lb. of soybean straw and in other roughages. (68) Fertilizing constituents of soybean straw compared with those of wheat, oats, barley, and rye. (69) Number of seeds per bushel and

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weight in grams of 100 seeds of the most important varieties.

(70) Results of planting a single variety of soybean at different dates. Vienna, Austria, 1877. (71) Results of planting different varieties of soybeans at different dates at Knoxville, Tennessee. (72) Life period of soybean varieties grown at the Arlington Experimental Farm, Virginia, for eight seasons. (73) Life periods of American varieties of soybeans grown at Sabour, India, 1911 (from Woodhouse and Taylor, 1913). (74) Life period of soybean varieties planted at intervals of two weeks in 1911 at the Arlington Experimental Farm, Virginia. (75) Behavior of flower color in natural hybrids. (76) Behavior of pubescence colors in natural hybrids. (77) Behavior of amount and colors of pubescence in an artificial hybrid. (78) Behavior of the color of pods in natural hybrids. (79) Behavior of seed colors in natural hybrids.

(80) Soybean crosses in the study of seed color. (81) Behavior of cotyledons in natural hybrid selections. (82) Behavior of cotyledons in soybean crosses. (83) Variations in the cooking qualities of seed of different varieties of soybeans. (84) Consumption of vegetable oils by the soap industry in the United States. (85) Consumption of vegetable oils in the production of lard substitutes and oleomargarine in the United States (incl. coconut oil, cottonseed oil, peanut oil, soybean oil, and corn oil). (86) Composition of soybean cake, meal, and other important oil feeds. (87) Two 17-week comparisons of soybean meal with other supplements for fattening pigs. (88) Growth and nitrogen elimination of chicks fed varying amounts of meat scrap or soybean meal or both, in addition to a corn ration. (Indiana Experiment Station). (89) Comparison of the digestibility of soybean meal and other oil meals.

(90) Digestion coefficients of soybean meal obtained with sheep. Massachusetts Experiment Station. (91) Fertilizing constituents of soybeans, soybean meal, and cottonseed meal. (92) Analyses and calories of soybeans compared with those of other legumes and foods. (93) Composition of soybean flour in comparison with wheat flour, corn meal, rye flour, graham flour, and whole wheat flour. (94) Composition of the sprouts from the soybean and mung bean. (95) Composition of soybean milk compared with cow's milk. (96) Yields of bean curd obtained from different varieties of soybeans. (97) Compositions of tofu and tofu products. (98) Nitrogenous substances in natto. (99) Composition of hamananatto. After Sawa.

(100) Composition of yuba. (101) Composition of red and white miso. (102) Composition of shoyu or soy sauce. (103) Composition of soybeans of the same variety dried, soaked, and roasted.

2252. Piper, Charles V.; Morse, William J. 1923. Varieties: Japanese classification of varieties (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 144-46.

• ***Summary:*** "In Japan varieties of soybeans are distinguished largely according to the color, shape and size of seed, period of maturity; also according to use, as those which serve principally in making shoyu, tofu, miso, and those used for ordinary purposes.

"(A) The white (pale yellow) called in Japanese *Shiro-mame* or *Hakudaidzu,* includes the following important varieties:

"*Goguwatsu-mame* (five-months kind) also called *Tofu-mame,* because it is used chiefly in making tofu, is an early ripening sort with very small seeds.

"*Wase-mame* is another small-seeded early-ripening variety used in making tofu, and is also termed *Tofu-mame.*

"*Nakate-mame* (middle late bean) matures between the early and late varieties and has round seeds somewhat larger than the above early sorts.

"*Okute-mame, Maru-mame,* and *Teppo-mame,* or *Aka-mame* are late maturing varieties with round seeds which become harder and longer than the early ones. The *Teppo-mame* is used largely in making shoyu, while *Maru-mame* is valuable as horse feed.

"(B) The black varieties, Japanese *Kuro-mame* or *Kodu-daidzu,* are for the most part eaten boiled, with sugar, as a relish to rice. *Kuro-mame* is a middle-late variety with round or ellipsoid seeds and is somewhat similar to *Kuro-teppo-mame* which has large round seeds. There is also a late maturing sort with flat ellipsoid seeds known under several names.

"(C) The brown-seeded varieties, Japanese *Katsu-daidsu,* are much less grown than the white and black sorts, and are used like the latter. Varieties with reddish-brown, round seeds are called *Aka-mame,* while three light-brown sorts of small importance are termed *Cha-mame* (tea beans).

"(D) Greenish or bluish-green varieties, Japanese *Aô-mame* or *Seidaidzu* are mostly boiled with sugar like the brown and black varieties. Similar to the brown sorts, they are much less widely grown than the black and white varieties. The Japanese distinguish the following sub-varieties:

"1. *Sei-hito.* Epidermis green with yellow germ.

"2. *Nikuri-sei.* Epidermis green with green germ. Both of these sorts range from round-ellipsoidal to a bullet roundness and are of medium size.

"3. *Kage-mame.* Epidermis pale green, round with yellow germ.

"(E) The speckled or bicolored varieties. Japanese *Fuiri-mame* or *Han-daidzu,* is a group of small importance and their cultivation is confined to a small area in a few provinces. The following sub-varieties are recognized:

"1. *Kuro-kura-kake-mame.* Seed greenish, flat, ellipsoid with a black spot on the scar.

"2. *Aka-kura-kake-mame.* Seed yellowish green, flat, long with a brown spot on the scar.

"3. *Fuiri-mame* or *Udzura-mame.* Seed yellowish-green,

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spotted with many dark flecks. This is a rare variety grown only in a few localities."

2253. Piper, Charles V.; Morse, William J. 1923. The commercial status of the soybean: Japan (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 13-16.

TABLE VI.—FIVE-YEAR AVERAGES OF ACREAGE, PRODUCTION AND YIELD PER ACRE OF SOYBEANS IN JAPAN[1]

Five-year periods	Acreage, acres	Production, bu.	Yield per acre, bu.
1897–1901	1,129,000	17,112,000	15.16
1902–1906	1,124,000	17,137,000	15.26
1907–1911	1,183,000	18,268,000	15.42
1912–1916	1,153,000	17,584,000	15.25
1917–1919	1,072,000	18,163,000	16.46

TABLE VII.—AMOUNT AND VALUE OF SOYBEANS IMPORTED BY JAPAN

Year	Quantity, tons	Value
1903[1]	146,971	$3,184,540
1904[1]	144,231	3,558,133
1905[1]	193,479	4,915,128
1906[1]	176,040	4,504,086
1907[1]	177,365	4,792,161
1911[2]	162,703	
1912[2]	103,416	
1913[2]	90,651	
1914[2]	139,222	

TABLE VIII.—IMPORTATIONS OF SOYBEAN CAKE AND BEAN OIL INTO JAPAN

Year	Soybean cake			Soybean oil
	Quantity, tons	Value	Percentage of import of bean cake against the total import of other fertilizers	Quantity, tons
1903[3]	216,198	$3,807,685	57.8	
1904[3]	70,595	1,629,100	32.3	
1905[3]	225,180	4,525,043	40.5	
1906[3]	289,459	6,458,330		
1907[3]	367,210	8,715,489	44.8	
1911[4]	357,362	.....	....	9,340
1912[4]	357,752	.....	....	10,889
1913[4]	492,985	.....	....	3,964
1914[4]	447,080	.....	....	4,107

• ***Summary:*** In production and utilization, the soybean occupies a most important position among the various legumes grown for seed in Japan. It is extensively cultivated from Hokkaido province in the north, to Formosa in the south. The data relative to the production and commerce of the soybean and soybean products in Japan are more extensive than for China and Manchuria, and furnish rather valuable information concerning the importance of this crop.

"Acreage and Production: The soybean is grown by the Japanese farmers mainly for grain and not to any considerable extent as a green manure crop. The average annual production of seed is about 18,000,000 bu. The following table shows the acreage and production in Japan during the decade [sic] 1897 to 1919. The principal bean-producing provinces are Hokkaido, Ibaraki, Saitama, Iwate, Niigata, Nagasaki and Kumamoto, but there is no province where the annual production does not exceed 50,000 bu. The province of Hokkaido has the largest acreage and produces the highest quantity and best quality of beans.

Utilization: The soybean forms one of the most important articles of food in Japan. It is one of the principal ingredients of soy sauce, miso, tofu and natto. The beans are eaten boiled or baked or in powder form for soups. Sometimes they are picked green, boiled and served cold with soy sauce, and sometimes as a salad. A vegetable milk is also produced from the bean forming the basis for the manufacture of vegetable cheese. The milk is not only used in the fresh state, but a form of condensed milk is also manufactured from it. All these foodstuffs are used daily in the Japanese homes. For the poorer classes they are the principal source of protein and considered indispensable as articles of food in the diet. Owing to their large utilization as human food, the domestic soybeans are used only to a limited extent in the feeding of live stock. To supply the protein ration for animals deficient in that nutrient, the beans are sometimes boiled and fed mixed with straw, barley and bran. The beans, especially those imported from China and Manchuria, are used extensively in the production of oil and cake. The oil is used as an article of diet and for various technical uses, while the residue or bean cake is used extensively as a fertilizer and as a cattle feed.

"Cost of production and market prices: Accurate data as to cost of production are not available, but estimates made by Japanese agricultural experts, place it about $10.00 per acre, exclusive of taxes, or about 65 cents per bushel. The beans produced in Japan are considered to be superior in quality to those of Manchuria and Chosen (Korea) and are used exclusively in the manufacture of food products. Prior to 1914 the prevailing wholesale price of domestic beans in Japan was about $1.00 per bushel while for imported beans it was about 70 cents per bushel.

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TABLE IX.—QUANTITY AND VALUE OF EXPORTS OF SOYBEANS AND SOYBEAN OIL FROM JAPAN TO FOREIGN COUNTRIES, 1913 AND 1914[1]

Country of destination	Soybeans		Soybean oil			
	1914		1913		1914	
	Quantity, lb.	Value	Quantity, lb.	Value	Quantity, lb.	Value
China	62,820	$ 1,372	220,155	$11,328	184,104	$ 10,198
United Kingdom	589	21	214,491	11,570	1,019,854	48,687
France	.....	.....	73,890	3,907		
Germany	.....	.....	66	2	10,979	588
Belgium	.....	.....	69,057	3,405	333,735	16,573
United States	421,011	10,125	658,393	34,386	365,478	19,393
Hawaii	203,560	5,296				
British America	246,175	4,540	56,218	3,234	69,652	3,196
Australia	18,070	475	587,413	30,101	120,240	748
Other countries	20,967	504	.....	.....	274,080	18,542
Total	973,192	22,333	1,879,683	97,933	2,378,122	117,925

TABLE X.—QUANTITY AND VALUE OF EXPORTS OF MISO (BEAN CHEESE) AND SHOYU SAUCE, 1903 TO 1907 INCLUSIVE[2]

Year	Miso (bean cheese)		Shoyu sauce	
	Quantity, lb.	Value,	Quantity, lb.	Value
1903	2,204,521.00	$ 34,647	5,922,357	$204,959
1904	4,884,691.68	88,880	7,892,802	276,837
1905	7,503,650.00	132,652	12,506,892	440,076
1906	5,923,855.00	111,020	12,425,367	476,176
1907	6,863,953.00	135,833	13,210,743	541,425

"Imports: Japan has always been a large consumer of soybeans from China and Manchuria, the greater part of the beans being used in the manufacture of oil and bean cake. In amount and value the importation of soybeans is second only to rice. The amounts and values of soybeans imported are shown in table VII for the years 1903 to 1907 inclusive, and 1911 to 1914 inclusive.

The bean cake manufactured in Japan forms only a small proportion of the total used by Japanese farmers. Large amounts of bean cake are annually imported as shown in the following table. Previous to 1903, bean cake was the largest in amount among imported fertilizers.

Exports: In addition to supplying domestic demands, Japan has exported beans, bean oil, miso (bean cheese) and soy sauce in large quantities to American and European countries as shown in the following tables. The exports of beans and bean oil have only become of importance since the development of the American and European trade. Prior to 1914, soybeans were not listed separately.

2254. Radoslavov, Al. 1923. Soiata (Glycine soja, iaponskii bob) [Soybean (Glycine soja, the Japanese bean)]. *Priroda* (*Sofia*) (*Nature*) 23(6):100-02. Feb. [1 ref. Bul]

• ***Summary:*** "In Bulgaria soybeans have been planted in small quantities in Panagyurishte, Gorna, Oryakhovitsa, and other places. Dr. As. Zlatarov carried out successful experiments in the village of Sestrimo (40 km west of Pzardzhik). He got 360 kg of soybeans from 2½ kg of seeds sown on two decares of arable land. [Note: 1 decare, a metric unit of area = 0.1 hectare or 10 ares or 0.2471 acres]. In Bulgaria more of the yellow variety is grown; it is richer in oil and better for... (*?dobra za ogoiavano*). It seems that in our country soybeans will be cultivated as an oil-bearing and forage plant. Soybeans are also grown in mixed (hybrid) cultures, most often with corn (maize). It is planted when the corn stalks reach a height of 20 cm. One kg of soybeans is planted with 6 kg of corn; the more a field is planted with soybeans, the more suitable it becomes for good soybean crops, because the roots are implanted with bacteria that enrich the soil with nitrogen.

"Footnote: According to the editors, a large quantity of soybeans was produced last year, and now the seed is being sold by 'Ganzin' Agricultural Bureau in Nova Zagora. This is for the information of those wishing to do experiments with soybeans."

A photo shows a single soybean plant growing. An illustration (labeled) shows 3 soybean leaves, 4 pods, 3 views of a seed, and soybean flowers.

Note: The first few pages give general information about soybeans; Bulgaria is not mentioned. The author does not say where his soybeans came from, but the title suggests Japan. Address: Bulgaria.

2255. *USDA Bureau of Plant Industry, Inventory.* 1923. Seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from April 1 to May 31, 1920. Nos. 49797 to 50647. No. 63. 99 p. March.

• ***Summary:*** Soy bean introductions: *Soja max* (L.) Piper. Fabaceæ. (*Glycine hispida* Maxim.)

49828-49833. "From Yokohama, Japan. Beans presented by Robert Fulton & Co. Received April 2, 1920. Quoted notes by Mr. Fulton:

"49828. *'Kuro mame* (black soy bean).'

"49829. *'Kuro Teppo mame* (round, middle-late, black soy bean).'

"49830. *'Nakate mame* (middle-late, white soy bean), seed larger than *Wase mame.'*

"49831. *'Okute mame* (late white soy bean).'

"49832. *'Shiro daizu* (white soy bean).'

"49833. *'Wase mame* (summer bean), small seeded early white.'

"49834. From Aizu Wakamatsu, Japan. Beans presented

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by Rev. Christopher Noss. Received April 2, 1920. *'Ogon daizu* (golden soy bean).' (*Noss.*)

"The oil of the bean is used for frying, as a butter substitute, for lubricating, for water-proofing clothes, for medicine, and in the manufacture of soap, candles, guncotton, and artificial rubber. The residue after the oil has been extracted has been used for cattle feed, but is now mixed with wheat flour for food purposes. The entire bean is slightly roasted, pulverized [to make kinako], and mixed with flour to make light cakes and to give flavor to boiled rice; it is cheaper and more nutritious than flour. (Adapted from *Parry, Travel Sketches, Japan Advertiser, January 25, 1920.*)'

"49911/49921. From Techow, Shantung, China. Seeds presented by Miss Alice Reed through Prof. Henry Conrad, Grinnel College, Grinnel, Iowa. Received April 21, 1920. Quoted notes by Miss Reed.

"49918-49920.

"49918. 'Black bean.'

"49919. 'Yellow bean.'

"49920. 'Large green bean.'

"50382/50387. From Foochow, Fukien [Fujian], China. Seeds collected by C.R. Kellogg. Received May 27, 1920. Quoted notes by Mr. Kellogg.

"50385. 'Yellow bean from Hokchiang (Futsing).'

"50440-50441.

"50440. *'Deu tz* (bean). The only yellow soy bean known here and the one referred to when beans are spoken of unless some other variety is definitely mentioned. A field crop; clay preferred. Usually planted right after rice is reaped, making a rotation of rice in the spring and beans in the fall.'

"50441. *'U deu* (black bean). The only other type of soy bean grown here. Rather heavier yielder and more vine than the yellow, but not grown very much. A field crop preferring medium-heavy clay soil. Collected at the farm of Lee U. Ken.'

"50522-50524. From Mukden, China. Seeds presented by Albert W. Pontius, American consul general. Received June 7, 1920. Market beans requested for the Office of Forage-Crop Investigations.

"50522. *'Hei tou* (black).' 'A small flat shining black bean used when boiled, salted, and fermented as the main ingredient in a sauce; also fed, when boiled, to water buffaloes.' (*Frank N. Meyer.*) For previous introduction, see S.P.I. No. 45294.

"50523. *'Hsiao chin huang tou* (small golden yellow bean).'

"50524. *'Pai mei tou* (white-crested bean).' A late maturing bean, yellow with a 'white eyebrow.' For previous introductions, see S.P.I. No. 30745.

"50531/50539. From Keijo, Chosen (Korea). Seed presented by Miss Katherine Wambold. Received June 21, 1920.

"50535-50536.

"50535. *'Kong* Bean.' For previous introductions, see S.P.I. No. 42059.

"50536. *'Kong* bean; this is used for making sauce.'" Address: Washington, DC.

2256. *Christian Science Monitor.* 1923. Manchuria raises big soy bean crop: Capital alone needed to develop industry, which has possibilities almost illimitable. April 24. p. 12. • ***Summary:*** Manchuria's 1919 soybean crop was estimated at 2,333,330 tons by the South Manchurian Railroad. Forecasts of the 1922 crop are over 3,500,000 tons. Yet such estimates are difficult to make for two reasons: (1) Statistics are not kept on crop production in China; (2) Handlers of soy bean are opposed to dissemination of any statistics concerning quantity.

"That there has been an almost sensational increase in soybean growing in Manchuria in the past two years is shown in the swelling receipts and shipments at and from Dairen, Vladivostok and Yingkou." The latter port plays only a small role in total exports of soy beans, bean oil, and bean cake.

"Soy beans have been the chief factor in making Dairen [run by Japan] the second port in China. There are 74 soy bean oil mills in Dairen alone, all fairly good size. Some of them are huge. Harbin has 54 bean oil mills, only one of which is modern, while the Dairen mills are almost all equipped with late machinery. The oil turned out by the Harbin mills is dirty in the extreme, and the cake is so poorly pressed that it will not stand shipment to a greater distance than Japan. The one foreign owned mill in Harbin is the exception and finds ready sale for its output in the United States and Europe; there are modern soy bean mills in Copenhagen (Denmark) and Hamburg (Germany).

The "Chinese mill owners, who inherently dread changes of any kind, are kept on the ragged edge of bankruptcy all the time, only managing to exist by reason of cheap labor and operating costs."

"If this were a technical story, details might be given of the nonuse of press cloth in the [Harbin] presses, grass serving the purpose, how the beans are not hulled or cooked, the unscientific rehandling of the beans, leaving in the cake 15 per cent of the oil, and how crudely the oil is handled.

"Why the soy bean industry has not attracted more attention from American capital interested in the manufacture of soap and in making lard substitutes is difficult to understand. The first reaction... is that the tariff runs against the importation of soy bean oil." This import tax shuts out soy bean oil from successful competition with cotton seed and peanut oil.

"This investigator makes the claim that the soy bean industry is where the crude petroleum business was when the chemists began separating it into its present many constituent parts." Japanese chemists have shown that soy bean oil can

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be many into many valuable products, which are listed.

2257. Katô, Naosaburo. 1923. [Action of soy urease. II]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 494. p. 228-47. April. (Chem. Abst. 17:2719). [Jap] Address: Japan.

2258. Church, Margaret B. 1923. Soy and related fermentations. *USDA Department Bulletin* No. 1152. 26 p. May 12. [27 ref]

• ***Summary:*** This long and very informative paper, with its excellent bibliography and review of the literature, is the third earliest study seen of a fermented food published by a USDA researcher. The focus is on Japanese fermentations because of the laboratory's contact with Japanese researchers, such as Dr. T. Takahashi and Dr. G. Kita. "The experimental work reported here was conducted under the direction of Charles Thom, mycologist in charge, Microbiological Laboratory, Bureau of Chemistry."

Contents: Introduction. Work of previous investigators. Experimental work: Apparatus, material, preparation of ingredients, shoyu-koji, peanut press cake koji, shoyu-moromi. Proportions of ingredients. Yields. Chinese soy sauce. Peanut sauce. Relation of enzymic activity to soy processes. Manufacture in the United States. Related fermentations (Miso, soy cheese [fermented tofu], natto). Summary. Bibliography. "Soy sauce is a dark-brown salty liquid made by the fermentation of soy beans with, as a rule, some additional starchy component. It is widely used as a seasoning throughout Japan, China, and Java [Indonesia], and has been introduced into the Philippines and Hawaii* (* = See letter from C.W. Carpenter, Sept. 23, 1918). Where the occidental would use a vegetable or meat extract and salt, the oriental daily uses soy sauce. Americans are familiar with soy sauce as it is used in the Chinese-American restaurants and as an ingredient which produces the characteristic flavor of the Worcestershire type of sauce." In Japan, the process of preparing "shoyu-koji," a mold-fermented product made from "tane-koji," takes 3 to 4 days. "The mold-fermented material is emptied into a strong brine, thus producing a mash. Constant daily attention is given to aeration, even distribution, and stirring of the solid ingredients. Progressive changes take place over a period of from six months to several years, until at last the mature 'moromi,' as the mash is designated by the Japanese, is produced. These changes are due partially to the activity of bacteria and yeasts, but chiefly to the enzymes of the mold introduced into the mash with the koji."

"Experimental work: The Department of Agriculture had certain strains of the *Aspergillus flavus-oryzae* group of molds known to be used in making soy sauce. Through the courtesy of W.T. Swingle, of the Bureau of Plant Industry, a can of commercial Japanese rice *tane-koji* designed for shoyu manufacture was also received. Dr. Gen-itsu Kita brought additional samples of shoyu *tane-koji* under sterile conditions directly from Japan. Provided thus with soy beans, wheat, and the mold ferment, experiments with soy sauce were undertaken by the Bureau of Chemistry in 1918.

(1) "Apparatus: The apparatus was made according to specifications drawn by Doctor [T.] Takahashi, of the Imperial University of Tokyo, who worked in the bureau for a month." "The usual Japanese koji room (fig. 2) is 32½ feet long, 11 feet wide, and 7 feet high. The walls are thick, and in the more modern factories are built of brick, which does away with fluctuations in the temperature from without. At one end of the room is an entrance and at the opposite end a window. In the ceiling several openings provide means of escape for the carbon dioxid [dioxide] and the damp air. Steam pipes along the floor make it possible to warm the room in cold weather. The ceiling is built with many layers of straw in order that the condensing moisture may be absorbed. One disadvantage of such a ceiling is that infection always occurs in the wet straw. A large area of infection directly over the piles of koji trays is detrimental to the production of sweet koji. In modern buildings, therefore, the surface of the ceiling is coated with cement. When a cement ceiling is used the condensed water drops on the trays of koji, which also is harmful... The burning of sulphur is useful in combating any infection of a koji room" (p. 5).

Material: "The mold ferment employed in shoyu-koji manufacture is *Aspergillus flavus* Link, occasionally *A. oryzae* (Ahlb.) Cohn, or strains intermediate between the two species." "Certain Japanese manufacturers add cultures of pure yeast belonging to the genus *Zygosaccharomyces* at the time of placing the first mold-fermented material in the brine."

Preparation of ingredients: While soaking the soy beans, the water should be changed at intervals of several hours to prevent the formation of spore-forming rods, which cause heating and souring. The spores of these bacilli are on the beans as they come from the field. "After being soaked for 20 to 24 hours the swollen beans are cooked in an open kettle or under pressure until they are soft enough to be easily pressed flat between the thumb and finger. This desired softness can be obtained by autoclaving at 15 pounds pressure for 50 minutes and also by much longer cooking in an open kettle. Autoclaving under pressure has the advantage of sterilizing the material." After roasting, the wheat is crushed or cracked. It is important to "reduce some portions of the kernel to a fine powder or dust." The cooked beans and cracked wheat are "mixed in large trays or on mixing tables." Hot beans "may be cooled with a draft of air directed over a thinly spread layer." These "two ingredients need to be thoroughly mixed, so that the wheat dust may form a coat over each bean. The lower water content thus induced on the exterior of the beans makes them better adapted to mold growth than to bacterial growth."

"Shoyu-koji–Ripening: After the beans and wheat

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are thoroughly mixed, a very small quantity of previously molded material, such as mature rice koji (tane-koji), some shoyu-koji, or a pure mold culture, is thoroughly mixed into the ingredients. The whole mass is then distributed into the small flat koji trays (Plate II, inserted between pages 4 and 5) which are immediately placed into the koji fermentation room before they cool further. Each tray holds about 1.8 liters, or about 2 quarts of raw material. The koji trays are placed in tiers along the wall of the room (Fig. 3)." They are usually stacked in a zigzag fashion to ensure adequate aeration. This is extremely important "because moisture and the lack of oxygen induce the development of mucors and bacteria, and are said to cause the diastatic enzyme to develop at the expense of the proteolytic enzyme. In some localities in Japan no such trays are used, but a broad straw mat with which very good koji can be secured." "The koji room or compartment is kept at a temperature of 24º to 25º C., with a definite humidity." Continued. Address: Microanalyst, Microbiological Lab., Bureau of Chemistry [USDA].

2259. Church, Margaret B. 1923. Soy and related fermentations (Continued–Document part II). *USDA Department Bulletin* No. 1152. 26 p. May 12. [27 ref]
• ***Summary:*** Continued from p. 9. Shoyu-koji: Ripening. The temperature of the koji starts at 24-28ºC. Eighteen hours after the trays have been stacked in the koji room, they should be examined; the temperature inside the koji should be 27 to 29ºC. "Any higher temperature is due to serious bacterial contamination, or to unsatisfactory conditions of temperature and humidity in the koji room. At the end of 18 hours the koji is stirred, the bottom being brought to the top and the beans are broken apart. Thorough stirring is necessary, for the beans and wheat are now bound by the mycelium or white threads produced by the shoyu-mold." Sporulation must not have begun. "This immature koji should be spread out and exposed by stirring until it has cooled down to 24º or 25º C. (70-72ºF) or lower." The koji should now be heaped in two piles extending the length of the tray (Plate II, B). "The material should come in contact with the sides of the tray as little as possible, since condensed water on the surface of the saturated wood induces bacterial growth when absorbed by the tray or retained by the beans and wheat."

The trays are left undisturbed in the koji room for 6-7 hours. The temperature of the room should be just under 30ºC while that of the koji should be 27-29ºC. "The mycelial growth is now heavier but no sporulation should be evident. At the end of this second incubation period, the koji is stirred thoroughly a second time, the beans and what being broken apart. The mass is cooled below 24ºC. After this stirring, four furrows, running the short way of the tray and forming three heaps, are made (Plate II, C). The trays of koji are again placed in the koji room."

"When examined at the end of 40 hours, 12 to 14 hours after the second stirring, the surface of the koji should be a clear 'flavus' or yellow color from the fruiting heads of Aspergillus... The temperature of the best koji should now be not much above 35ºC, although 35º to 36ºC is permissible... Mature koji has a clear yellow to yellow-green color on the surface and throughout the whole mass. If well ripened, it may be lifted from the tray as one entire block.

"The koji may become infected with *Rhizopus nigricans* if the atmosphere of the koji chamber is moist to the point of condensation as drops. A little Mucor or Rhizopus is disregarded in the material, unless a bad flavor or odor is also present. It is poor practice, however, to allow the Rhizopus to enter..."

Proportion of wheat: Japanese shoyu requires "at least one part of prepared wheat to three parts of prepared beans. This proportion of wheat is somewhat less than equal parts of the unprepared ingredients by volume."

"Color: Mold-ripened soybeans and wheat are usually clear yellow when prepared by the Japanese method for shoyu-koji. This coloration is due to pigments of the spores or seedlike bodies of the mold. Occasionally the color of the mass of beans and wheat is yellowish green. The reason for this variation is not easily defined."

"Bacterial count: Condemnation of batches of koji may be readily based on the presence or absence of an ammoniacal odor or evidence of putrefaction. Any odor of ammonia or of putrefaction, any sticky condition, or any appearance of rottenness in koji is due to bacterial and not mold activity. The bacteria involved in the ripening of shoyu-koji in these experiments belong to the *Bacillus mesentericus* and *B. vulgatus* groups." These are aerobic spore formers. The spores of these bacteria, which grow if the bean soaking water is not changed, can survive pressurized cooking at 15 pounds for 30 minutes."

The author successfully made koji from "commercial peanut press cake."

"Shoyu-moromi: The shoyu koji when mature is emptied into a tub of brine. In the experimental work conducted in cooperation with Dr. T. Takahashi one-half of a 65-gallon wooden cask was used for the tub or vat. The brine was a solution of commercial salt at a strength of 20º to 22º B [Baumé, a measure of specific gravity]... Each tub of moromi was inoculated on the first day with four flasks (450 cubic centimeters of wort extract broth and 5 per cent sodium chlorid in each) of a yeast culture of Zygosaccharomyces sp... In Japan sea salt is used. It is said that one part of the sea salt to two parts of water by volume gives a brine from 20º to 22º B., presumably because of the coarseness of the native Japanese sea salt."

Three different batches of experimental shoyu-moromi were made. Two were kept at the ambient temperature of the laboratories (20-24ºC). Mash C was made with a weaker brine and kept at a higher temperature. These mashes were stirred daily for 1 hour. "Also a blast of air was

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bubbled into the material in order to supply oxygen for the microorganisms present." The ripening lasted 10 months. Mash C was of inferior quality. "Doctor Takahashi stated that shoyu A compared favorably with the best commercial shoyu of Japan, while others thought that it resembled the heavy soy made by Japanese housewives in the country districts... The highest quality of shoyu in Japan is said to go under the label 'Mogi' or 'Kikkoman,' but chemical analyses in König (1904) and in the Bureau of Chemistry records indicate no consistent chemical composition."

Bacteriological examination: The main bacteria in this shoyu-moromi seemed to be *Bacillus mesentericus.* "In January 1920 two lots of sauce were started. One was composed of soy beans and wheat and the second of peanut press cake and, for the most part, wheat as a starchy substance." Dr. Edwin LeFevre of the Bureau of Chemistry helped with the bacteriological analyses.

Proportions of ingredients: Table 3, prepared by Dr. Takahashi, shows the proportion of ingredients by volume used in Japan to make 3 grades of shoyu: Best, good, and common. For the best grade use 100 parts (by volume) each of soy beans and wheat, 90 parts of Japanese sea salt, and 180 parts of water.

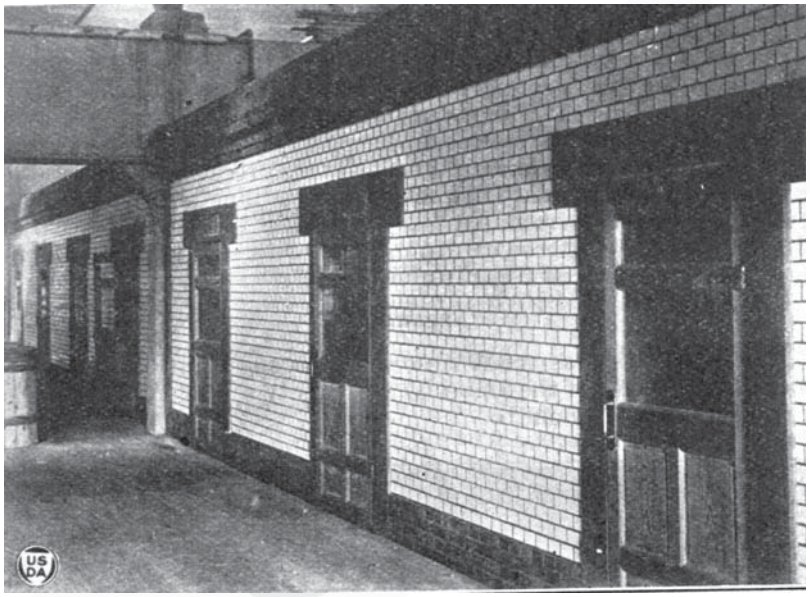
Yields: When pressed in sacks with a hydraulic press under 1,250 pounds per square inch for 23 hours, 100 liters of moromi yields, on average, 78.7% shoyu and 21.3% residue.

Note: This is the earliest document seen (April 2012) that describes how to make fermented soy sauce on a commercial scale–that will actually work. All known previous descriptions omitted the "mold culture" or koji stage. Address: Microanalyst, Microbiological Laboratory, Bureau of Chemistry [USDA].

2260. Church, Margaret B. 1923. Soy and related fermentations: Chinese soy sauce (Document part). *USDA Department Bulletin* No. 1152. 26 p. May 12. See p. 18-19. [27 ref]

• ***Summary:*** "The primary difference between the soy sauce of Japan and that of China, judging from the department's contact with Japanese and Chinese scientists and travelers, is that Japan has a generally standardized commercial product, while the soy of China is made on a smaller scale, varying with the locality and the producer to a much greater extent. Small-scale production, however, gives a choice product of uniform quality from certain factories or localities. The underlying principles of the Japanese and Chinese soy industries are the same. The Chinese soy-sauce manufacture has been discussed by Prinsen Geerligs" (1896) and Groff (1919). A long summary of Groff's article is given. Address: Microanalyst, Microbiological Lab., Bureau of Chemistry [USDA].

2261. Church, Margaret B. 1923. Soy and related fermentations: Photos (Document part). *USDA Department Bulletin* No. 1152. 26 p. May 12. [27 ref]



• ***Summary:*** Photos show: (1) Experimental koji room (wooden cabinet type) used in Bureau of Chemistry with doors, trays on racks, electric plate, thermometers, and tube for blast of cool air (p. 3).

(2) Exterior of Japanese koji room (brick-walled with large doors) (p. 4; see next pages).

(3) Large wooden tubs of shoyu-moromi in Japan, with beans floating on the surface of the mash (inserted between pages 4 and 5).

(4) A courtyard filled with large earthenware containers with cone-shaped wicker tops for ripening soy sauce mash in Ichang (I-ch'ang or Yichang), Hupe [Hupeh / Hubei], China; a small, strong basket is placed into each, with its rim just above the surface of the mash. The soy sauce collects or accumulates in each basket and is then dipped out, ready for consumption.

(5) Three different stages of shoyu-koji in wooden trays, each 17 by 8 by 2½ inches deep. This koji, "overgrown with a white mycelium of mold ferment," must be stirred and heaped at regular intervals (plate 2).

(6) Interior of a Japanese koji room, with many wooden trays stacked one upon the other (p. 5).

(7) Comparison in volume of two piles of beans, before and after soaking (p. 7).

(8) A man inoculating soy beans and wheat with mold ferment for shoyu-koji in a large wooden mixing table in a traditional koji room in Japan (p. 8; photo courtesy of G. Kita). Address: Microanalyst, Microbiological Lab., Bureau

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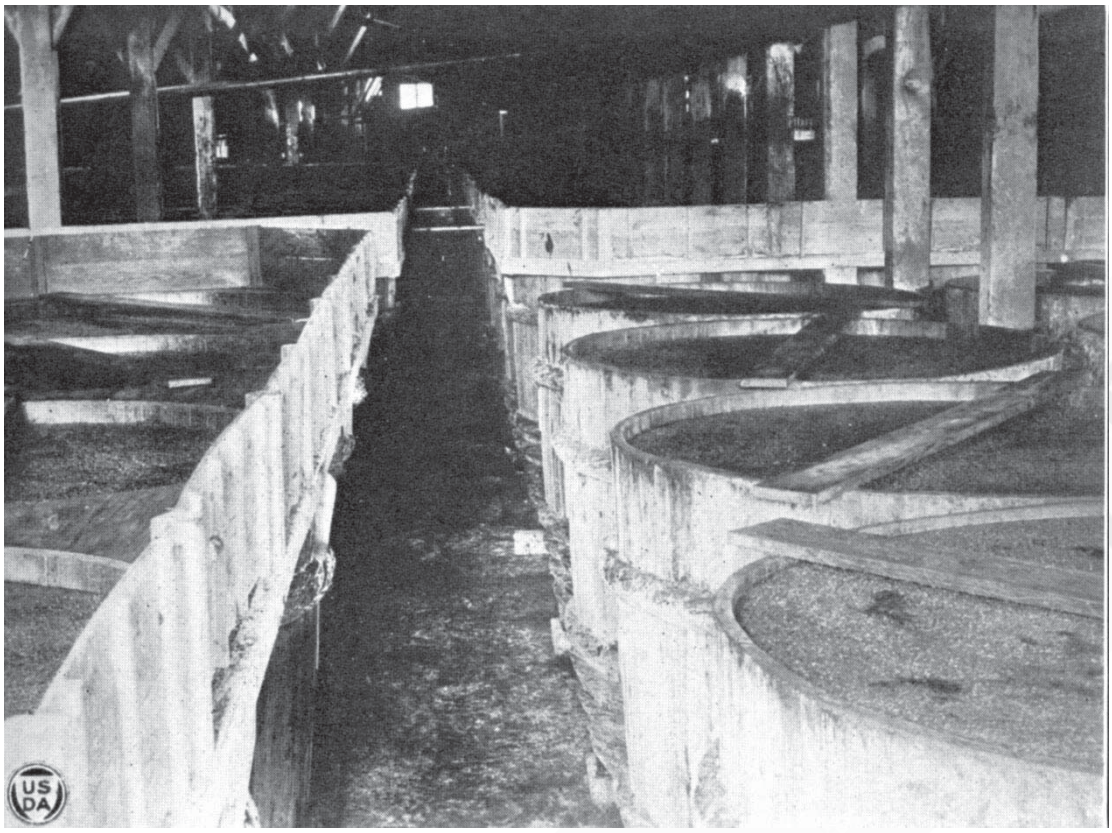

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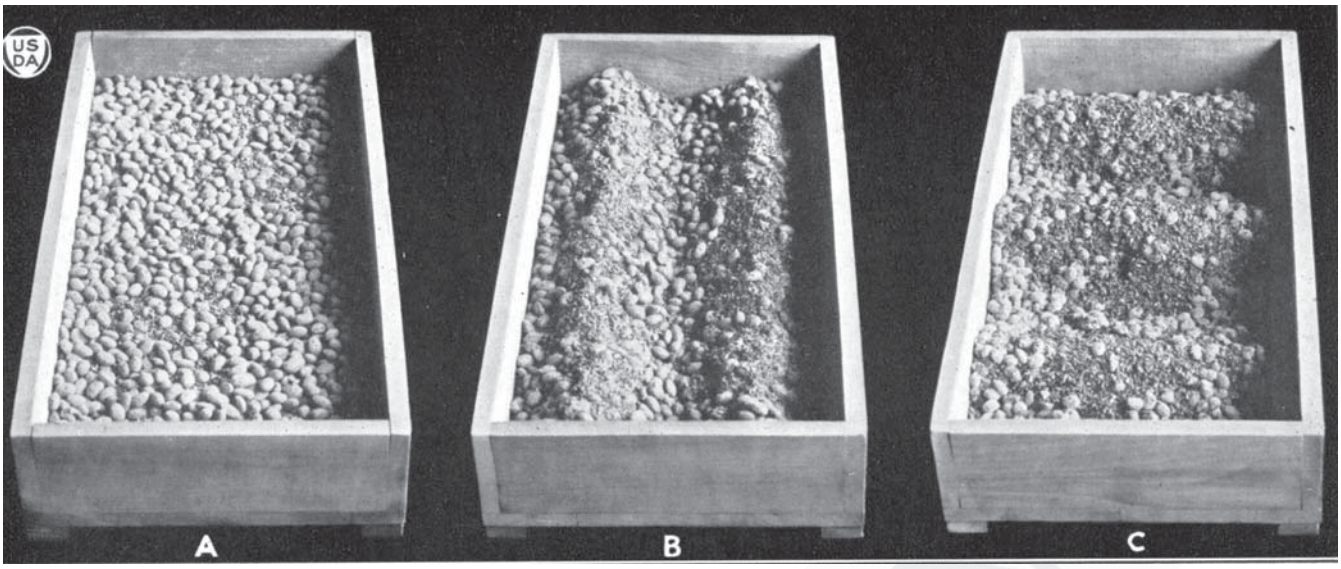

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of Chemistry [USDA].

2262. Church, Margaret B. 1923. Soy and related fermentations: Related fermentations–Miso (Document part). *USDA Department Bulletin* No. 1152. 26 p. May 12. See p. 23.
• ***Summary:*** "Soy sauce is only one of the mold-fermented food products originating in the Orient, the majority of which are ripened by means of the molds represented by the yellow-green group of Aspergilli.

"Miso, one of these products, is one of the most common breakfast foods for children. There are two types of miso, white or shiro miso and red miso. Miso is prepared from a koji ripened by means of the *A. flavus oryzae* group of molds. The soy beans are cooked in miso before the fermentation is undertaken. The treatments subsequent to the cooking and preparatory to the fermentation doubtless varies in different localities. It is said that the beans may be made into a paste before being ripened by the mold. As bought in this country, however, miso shows the beans intact. White miso is said to be made from a koji of soy beans or soy beans and a starchy material, as rice or barley. The koji is ripened as is shoyu-koji and placed in a weak brine for 10 days. Unfinished rice wine may be added to improve the flavor and to preserve the product, which is rather perishable. Red miso is prepared in the same way as the white miso, but is ripened for from one to three months in a stronger brine. White miso has been bought in the United States in two forms. One type is very salty and therefore less perishable than the other. Probably because of longer fermentation red miso is dark red. It is very cheap, whereas white miso is expensive."
Address: Microanalyst, Microbiological Lab., Bureau of Chemistry [USDA].

2263. Nishii, Y. 1923. Henmi shôyu to seisei ni tsuite [On the putrefaction of shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 1(10):820-23. May. [Jap]
Address: Gishi-cho (Head technician), Izumi Shoyu K.K.

2264. Oshima, Kokichi. 1923. Kôji-kin nado no denpun tôka kôso oyobi tanpakushitsu bunkai kôso no teiryô-teki sokutei-hô [A quantitative method for determining the starch saccharifying enzymes and proteolytic enzymes of koji mold]. *Sapporo Norin Gakkaiho* (*J. of the Society of Agriculture and Forestry, Sapporo*) 14(63):373-92. May. [Jap]
Address: Hokkaido Daigaku Suisan Senmon-bu Kagaku Kyoshitsu, Japan.

2265. *New York Times.* 1923. Drop in nation's foreign trade still leaves a gain in growth. June 10. p. XX19.
• ***Summary:*** The section titled "Silk leads from Orient" states: "American imports from Japan consist principally of raw silk, which is manufactured [into finished goods] in American mills. The next item is tea. These two constitute 70 per cent. of our purchases. The remaining 30 per cent. is made up of toys, some manufactured silk goods, Soy bean oil, canned crab meat and a number of miscellaneous items.

"The United States pays for these Japanese goods principally with exports of raw cotton... This trade has been the great balance wheel which kept Japan from financial chaos during several years when its Chinese markets were practically destroyed by the 'passive resistance' policy.

American trade with China has been increasing (it was $134,000,000 last year), despite the fact that China has been in a state of upheaval, with a bad financial situation, which grew steadily worse under four or five successive governments. The most important U.S. import from China is raw silk, followed by hides, skins, furs, and Mahjongg [mahjong] equipment. China's main import from the USA is machinery, such as cotton mill equipment and oil crushing machinery.

2266. Hamburger's 1923. To tempt the summer appetite (Ad). *Los Angeles Times.* June 15. p. I8.
• ***Summary:*** This large ad is an abbreviated menu without prices. "Fish and meat sauces: "Crosse & Blackwell's Harvey Sauce, mushroom and walnut catsup. A.I. and H.P. English Sauce. Crosse & Blackwell's Bengal Club Chutney.

"Shoyu Sauce, prepared at Choshi, Japan–delicious with chop suey, meat and fish or for soup flavoring."

Note: It is unclear which brand of "Shoyu Sauce" this is, made in Choshi, Japan. It could have been either Higeta or Yamasa.

"Hamburger's. Established 1881. Imported and domestic delicacies. Phone your order. Have it charged." An large illustration shows a man and wife dining in luxury, with a servant carrying in a platter of food. Yet Hamburger's is apparently not a restaurant. Address: Broadway, Eighth and Hill [Los Angeles]. Phone: Broadway 3940.

2267. *Los Angeles Times.* 1923. Japanese "Bean Town." June 17. p. XI38.
• ***Summary:*** "Dairen, a Japanese city in Manchuria, according to reports, is the port of what is becoming the greatest bean-raising country of today. The product, also used in making soy-bean sauce and soy-bean oil, is exported to various markets. The soy-bean sauce is familiar to patrons of 'Chinatown' restaurants."

2268. Brook, Harry Ellington. 1923. Care of the body. *Los Angeles Times.* July 8. p. XI30-35. Sunday magazine.
• ***Summary:*** The section titled "What workers eat" begins (p. 32): "Dr. Josiah Oldfield, an eminent English physician, has been investigating the diet of the world's workers. He obtained the following information from foreign legations in London:"

"From the Consulate General of Japan: Rice, barley,

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wheat, vegetables, miso soup (miso is prepared from the soya bean), sou [soy; soy sauce or shoyu] (Japanese sauce which is indispensable for cooking purposes), fish (fresh or salt, wet or dried), vegetables are chiefly cooked with soy, salt, sugar, etc. Rice is taken in the place of bread. Flesh-meat does not form an important part of the Japanese dietary."

After discussing food consumption information from 13 countries, Brook concludes: "These people are better nourished than the Americans, who subsist mainly on lean meat, bread made from refined white flour and refined white sugar, with tea and coffee and little vegetables"

2269. Katô, Naosaburo. 1923. Studien ueber den Einfluss des Glykokolls auf die Fermentwirkung eines Soja-urease-praeparates. II. Ueber den stabilen Bestandteil des Soja-urease-praeparates. I. [Influence of glycine on the fermentative action of soya-bean urease. II. Stable constituents of soya-bean urease. I.]. *Biochemische Zeitschrift* 139:352-65. July 15. (Chem. Abst. 18:405). [6 ref. Ger]

• ***Summary:*** The presence of 2 constituents in urease is confirmed. The urease system consists of a thermo-labile constituent which possesses fermentative properties, and a thermo-stable constituent with no fermentative action which the author calls "Stable component X." This last, at urea concentrations above the "equivalent urea concentration," increases the activity of the urease, but has no influence at substrate concentrations below this value; its action resembles that of glycine. The action of "Stable component X" is not due to alteration of the hydrogen ion concentration nor to the presence of mineral salts. Address: Kanazawa, Japan. Aus der biochemischen Abteilung des Staedtischen Krankenhauses am Urban zu Berlin [Germany].

2270. Miyake, Koji; Nakamura, Koji. 1923. On the effect of calcium oxide and calcium carbonate upon the decomposition of soy-bean cake and herring cake in two different soils. *J. of Biochemistry* (*Tokyo*) 3(1):27-54. July. [14 ref. Eng]

• ***Summary:*** Gives the results of experiments using these two cakes as a fertilizer at the Institute of Agricultural Chemistry of Hokkaido Imperial University, Sapporo. Conclusions: Calcium oxide and calcium carbonate stimulate the decomposition of organic matter, and stimulate the ammonification and nitrification of organic matter. The effect of lime differs according to the kinds of soil (loam or acid soil) but not according to the character of the organic matter (soy-bean cake or herring cake). "To ammonify the same amount of nitrogen of organic matter, twice the amount of organic carbon of soy-bean cake or of herring cake which was decomposed in loam had to be decomposed in acid soil to carbonic acid. On the other hand, to ammonify the same amount of nitrogen of organic matter, 1.5 times the amount of organic carbon of soy-bean cake which was decomposed to carbonic acid in loam or in acid soil had to be decomposed in the case of herring cake in the same soil." Address: Inst. of Agricultural Chemistry, Hokkaido Imperial Univ., Sapporo, Hokkaido, Japan.

2271. Church, Margaret B. 1923. Re: USDA research on mold cultures. Letter to Kokichi Oshima [Hokkaido Imperial Univ., Sapporo, Japan], Aug. 28. 2 p. Typed, without signature (carbon copy).

• ***Summary:*** "We received the cultures that you spoke of sending in your letter of May 23... we have every intention of continuing careful studies of Aspergilli, Penicillia, and other common saprophytic molds. Above all we were pleased to receive the cultures as they assured us that you still had within you the same spirit of open generous cooperation as we had learned to appreciate in you in the States."

"You spoke of Mr. Konno telling you of a fever-like sickness occurring among workers where *Aspergillus flavus* and *A. ochraceous* were prevalent. Would you keep your ears open for such reports and when possible run down the truth of such instances? Molds are being used in this country more than previously in their limited way and fields, and they are used more extensively in your country than mine because of shoyu and katsuo-bushi." Address: Microanalyst [Biological Lab., Bureau of Chemistry, USDA, Washington, DC].

2272. Naemura, Tokuji. 1923. Floor-cover composition. *U.S. Patent* 1,466,241. Aug. 28. 1 p. Application filed 30 Nov. 1921.

• ***Summary:*** "This invention relates to a floor cover something like linoleum, and consists of ordinary mat covered with a mixture of powdered soya bean or the like albuminous substances, ammonia, water, fibres as binding material, and any desired pigment, and the object thereof is to obtain a covering for floor which is cheap, rich in elasticity and hard to burn." Address: 138 Isobe-Dori, Sanchome, Kobe, Japan.

2273. Ishio, M.; Endo, Y. 1923. Shôyu to forumuarudehiido to no kankei ni tsuite [On the relation between shoyu and formaldehyde]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 498. p. 628-37. Aug. (Chem. Abst. 18:298). [Jap]

• ***Summary:*** The small amount of formaldehyde present in soy sauce, either intentionally added or derived from the caramel used for coloring the sauce, gradually decreases on keeping, and at last entirely disappears. This is attributed to combination of the aldehyde with amino acids present in the sauce. The decrease is proportional to the amount of amino acids in the sauce. Address: 1. Igakushi, Japan.

2274. Katô, Naosaburo. 1923. [Action of soja-urease. III. Its thermostable constituent]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 498. p. 659-77. Aug.

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(Chem. Abst. 18:405). [1 ref. Jap]
Address: Japan.

2275. Osaki, Masao. 1923. Shôyu genryô daizu kasu no shiyo-hô ni tsuite [On the application of defatted soybean cake for shoyu brewing]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 1(2):91-95. Sept. 15. [Jap]
Address: Osaka Koto Kogyo Gakko, Kyoju, Japan.

2276. Hotta, Imakazu. 1923. Kôji-kin no baiyô kyôgû ni yoru jidai naiteki henka ni tsuite [The inner change of next generation of koji mold by cultural condition]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 1(2):96-99. Sept. [Jap]
Address: Marukin Shoyu K.K., Moto Gishi-cho, Japan.

2277. Slosson, Edwin E. 1923. Catching up with China. *Scientific Monthly* 17:283-85. Sept.
• ***Summary:*** The soy bean "was first introduced to America in 1804, but it was a hundred years before we could be induced to take it seriously... But in the last ten years it has rapidly come to the front as one of our major crops and is likely in the next ten years to go ahead of oats in acreage in some of our states... The latest bulletin of the Department of Agriculture lists fifty different uses for soy products, and doubtless Yankee ingenuity can and will add more when we get our minds to working on it.

"Even the Japanese have not exhausted their ingenuity in this field, long as they have been at it. A Japanese scientist named Sato has invented a new plastic which he has called, according to American precedent, 'Satolite.' It is made by precipitating the protein with sulphite, hardening it with formaldehyde, and molding it under heat and pressure into combs, buttons and whatever we make from hard rubber or celluloid or the casein of milk.

"The soy bean is rich in protein and fat, and lacking in starch; in that more like animal than like vegetable food. You can make a milk out of it by simply soaking the dried beans till soft, then crushing fine in a meat grinder, boiling in three times the volume of water for half an hour and straining through cloth. If you do not like the flavor you can add vanillin or something else. This vegetable milk sometimes agrees with children when cow's milk does not. It can also be used for cakes and custards.

"The soy milk may be made into curds and cheeses of various sorts which form a large part of the diet of orientals, but for which we have not yet acquired a taste. Soy meal has come into common use in America, not only as a cattle food, but also for bread and pastry mixed with three parts wheat flour.

"Soy sauce has long been familiar but quite unknown to us. We did not recognize it under its aristocratic English name and its added flavors. But when the high cost of living drove us to the chop sueys, we became acquainted with the cruet of brown salty sauce called 'shoyu,' and we found, as the Chinese had found thousands of years before, that a sprinkling of it would make tasty a large lot of rice and serve as substitute for meat, both in taste and nutriment. Soy sauce is of several sorts. If you want it strong take the Korean. If you want it sweet take the Japanese. It is made by fermentation and the flavor depends upon the way it is brewed and the length of time it is left to ripen. To suit the palate of a Korean connoisseur the jars must be exposed to the sunshine by day and covered by night for a period of thirty years. We Americans, when we get to making it, will undoubtedly speed up the process.

"So far the oil is the most in demand of the soy products. The beans contain from 18 to 20 percent. of a fine palatable oil, which we have imported at the rate of a hundred thousand tons in a year, but which we are now growing for ourselves. It can take the place of cottonseed oil in vegetable substitutes for lard and butter, and of linseed oil in paints. Formerly the oil went mostly to Germany and England, but the war made a shift in the currents of Pacific trade, and we learned to appreciate its value. But we have a lot to learn yet before we catch up with the orientals in the utilization of this multifarious bean."

2278. **Product Name:** [Satolite (Soybean Plastic)].
Foreign Name: Satolite.
Manufacturer's Name: Solite Manufacturing Co.
Manufacturer's Address: Japan.
Date of Introduction: 1923 September.
New Product–Documentation: Edwin E. Slosson. 1923. Scientific Monthly. 17:283-85. "Catching up with China." "A Japanese scientist named Sato has invented a new plastic which he has called, according to American precedent, 'Satolite.' It is made by precipitating the protein with sulphite, hardening it with formaldehyde, and molding it under heat and pressure into combs, buttons and whatever we make from hard rubber or celluloid or the casein of milk."

South Manchuria Railway Co. 1926. "Soya beans in Manchuria." Dairen: SMRC Agricultural Office. 40 p. Nov. See p. 18. Protein products made from bean residuum [protein-rich soybean meal] include Satolite.

2279. Katô, Naosaburo. 1923. [Action of soy urease. I. Influence of glycocoll on the action of urease]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 488. p. 867-93. Oct. 26. (Chem. Abst. 17:2719). [4 ref. Jap; ger]
Address: Japan.

2280. Oshima, Kokichi. 1923. Kôji-kin nado no denpun tôkaso oyobi tanpakushitsu bunkai kôso no teiryô-teki sokutei-hô [A quantitative estimation of starch saccharifying enzyme and proteolytic enzyme of koji mold]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 1(3):204-18. Oct. [Jap]
Address: Hokkaido Teikoku Daigaku, Jokyoju, Japan.

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2281. *USDA Bureau of Plant Industry, Inventory.* 1923. Seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from July 1 to September 30, 1921. Nos. 53896 to 54425. No. 68. 65 p. Oct.
• ***Summary:*** Soy bean introductions: *Soja max* (L.) Piper. Fabaceæ. (*Glycine hispida* Maxim.)

"53930-53939. From Harbin, Manchuria, China. Seeds procured by Douglas Jenkins, American consul. Received July 22, 1921. 'A collection of soy beans from the Grace-American International Corporation.' (*Jenkins.*) For experiment by the Office of Forage-Crop Investigations.

"53930. *No. 1.*
"53931. *No. 2.*
"53932. *No. 3.*
"53933. *No. 4.*
"53934. *No. 5.*
"53935. *No. 6.*
"53936. *No. 7.*
"53937. *No. 8.*
"53938. *No. 9.*
"53939. *No. 10.*

"53987. From Aizu-Wakamatu [Wakamatsu], Japan. Seeds presented by Rev. Christopher Noss. Received August 17, 1921. 'One of the largest seeded soy beans that has yet come into the department. Very similar to the *yachi* variety from Japan.' (*W.J. Morse*) For previous introduction, see S.P.I. No. 49834.

"54353/54384.
"54374-54379.
"54374. '(No. 34.) Large yellow *tou.'*
"54375. '(No. 35.) Large black *tou.'*
"54376. '(No. 36.) Parm-skin large *tou* (large tou is soy bean).'
"54377. '(No. 37.) Blue (green) skin large *tou.'*
"54378. '(No. 39) Small black *tou.'*
"54379. '(No. 40.) Small yellow *tou.'"* Address: Washington, DC.

2282. Katô, Naosaburo. 1923. [Action of soy urease. IV. Effect of phosphate on the thermostable constituent of soy urease]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) No. 501. p. 796-805. Nov. (Chem. Abst. 18:1508). [2 ref. Jap]
Address: Japan.

2283. *USDA Bureau of Plant Industry, Inventory.* 1923. Seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from January 1 to March 31, 1922. Nos. 54677 to 54968. No. 70. 37 p. Nov.
• ***Summary:*** Soy bean introductions: *Soja max* (L.) Piper. Fabaceæ. (*Glycine hispida* Maxim.) "54791-54795. From Luxey, Landes, France. Seeds presented by L. Rouest, agronomist, Experimental Farm. Received January 17, 1922. Quoted notes by M. Rouest.

"54794-54795.

"54794. *'Very early Japanese.* A variety growing even farther north than Paris, very productive, and maturing in 90 to 100 days.'

"54795. *'very early brown.* A variety growing in Pas de Calais and in eastern France.'

"54806-54888. From Harbin, Manchuria. Seeds presented by B.W. Skvortzow. Received February 28, 1922. Introduced for experimental work by department specialists.

"54806. No. 90.
"54807. No. 91.
"54808. No. 95.
"54809. No. 96.
"54810. No. 98.
"54811. No. 99
"54812. No. 101.
"54813. No. 102.
"54814. No. 106.
"54815. No. 111.
"54816. No. 114.
"54817. No. 115.
"54818. No. 118.
"54819. No. 119.
"54820. No. 120.
"54821. No. 122.
"54822. No. 123.
"54823. No. 125.
54824. No. 124.
"54825. No. 126.
"54826. No. 127.
"54827. No. 128.
"54828. No. 129.
"54829. No. 130.
"54830. No. 132.
"54831. No. 133.
"54832. No. 134.
"54833. No. 135.
"54834. No. 136.
"54835. No. 137.
"54836. No. 141.
"54837. No. 142.
"54838. No. 143.
"54839. No. 144.
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"54850. No. 159.

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"54851. No. 160.
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"54862. No. 181.
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"54865. No. 186.
"54866. No. 187.
"54867. No. 190.
"54868. No. 191.
"54869. No. 192.
"54870. No. 193.
"54871. No. 194.
"54872. No. 195.
"54873. No. 196.
"54874. No. 198.
"54875. No. 199.
"54876. No. 200.
"54877. No. 213.
"54878. No. 214.
"54879. No. 215.
"54880. No. 216.
"54881. No. 217.
"54882. No. 219.
"54883. No. 220.
"54884. No. 224.
"54885. No. 225.
"54886. No. 227.
"54887. No. 298.
"54888. No. 421.

"54968. From Harbin, Manchuria. Seeds presented by B.W. Skvortzow. Received February 28, 1922. Introduced for experimental work by specialists of the Department of Agriculture." Address: Washington, DC.

2284. Yoshida, Hisao. 1923. Shôyu no nôdo ni tsuite [On the concentration of shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 1(4):313-16. [Jap]
Address: Osaka Koto Kogyo Gakko, Koshi, Japan.

2285. *USDA Bureau of Plant Industry, Inventory.* 1923. Seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from April 1 to June 30, 1922. Nos. 54969 to 55568. No. 71. 62 p. Dec.
• ***Summary:*** Soy bean introductions: *Soja max* (L.) Piper. Fabaceæ. (*Glycine hispida* Maxim.)

"55069-55070. From Omagari, Akita-Ken, Japan. Seeds presented by Isabura Nagai, director of substation, Rikuu Branch, Agricultural Experiment Station. Received April 29, 1922. 'It has been our experience that the smooth or "Hadaka," varieties of soy beans from Japan do not shatter their seed nearly so easily as the hairy sorts.' (*W.J. Morse.*) 'The pods of the first variety are smooth and of the second variety slightly hairy. Both varieties were grown at our experiment station.' (*Nagai.*)
"55069. *Hadaka* No. 3.
"55070. *Hadaka* No. 260.
"55424/55441. From Harbin, northern Manchuria. Presented by B.W. Skvortzow. Received May 10, 1922. Quoted notes by Mr. Skvortzow. A collection of seeds from northern Manchuria.
"55437-55441. Introduced for forage-crop experiments.
"55437. 'Black soy beans.'" Address: Washington, DC.

2286. Konstantinov, P.F. 1923-1935? Hokuman daizu no shijô mihon ni taisuru hinshitsu no kenkyû [Research on a market sample of North Manchurian soybeans]. [Harbin]: South Manchuria Railway Co., Harbin Office Survey Dept. (Minami Manshû Tetsudô Kabushiki Kaisha Harubin Jimusho Chôsaka). 27 p. Plus 8 unnumbered leaves of plates. Undated. Illust. 23 cm. [Jap]*
• ***Summary:*** The research concerns soybean quality. Address: Dairen, Manchuria.

2287. Kinoshita, Asakichi. 1923. Nidan shikomi shôyu sokujô shiken hôkoku [The quick double brewing of shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 91. p. 232-48. [Jap]
Address: Jozo Shikensho, Gishi.

2288. Kinoshita, Asakichi. 1923. Nidan shikomi shôyu sokujô no seiseki [Results of quick two-step brewing of shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 18(2):4-8. [Jap]
Address: Jozo Shikensho Gishi, Japan.

2289. Kinoshita, Asakichi. 1923. Shôyu genryô to shite dasshi daizu (sakura mame) no shiyo-hô [Use of defatted soybean and wheat substitutes as ingredients for brewing shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 18(3):13-16. [Jap]
Address: Jozo Shikensho Gishi, Japan.

2290. Oshima, Kokichi. 1923. Kôji-kin nado no denpun toka kôso oyobi tanpakushitsu bunkai kôso ryoku no teiryô-hô [New quantitative methods for the estimation of amylase and protease produced from molds such as the koji mold (*Aspergillus oryzae*) etc.]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 26:685-98. English abstract. p. 70-71. [4 ref. Jap; eng]

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Address: Nôgaku-shi, Chemical Dep., College of Fisheries, Hokkaido Imperial Univ., Hokkaido, Japan.

2291. Oshima, Kokichi. 1923. Kôji-kin nado no denpun tôka kôso oyobi tanpakushitsu bunkai kôso ryoku no teiryô-hô [A method for determining the starch saccharifying enzyme and proteolytic enzyme activity of koji mold]. *Kogyo Kagaku Zasshi* (*J. of the Chemical Society of Japan, Industrial Chemistry Section*) 26:685-98. [Jap]
Address: Hokkaido Daigaku Suisan Senmon-bu, Kagaku Kyoshitsu, Nôgaku-shi.

2292. Bottari, Fulvio. 1923. La soja nella storia, nell'agricoltura e nelle applicazioni alimentari ed industriali [The soybean in history, in agriculture, and in food and industrial applications]. Torino & Genova, Italy: S. Lattes & Co. 243 p. Preface by Prof. Oreste Mattriolo (R. Università di Torino). With 34 illust. 22 cm. [25 ref. Ita]
• ***Summary:*** Contents: Preface. Reason for the work; its scope and limits. Part I: The origin and history of the soybean. Reason for this history, the origin of the soybean and its early dissemination, soya (including production statistics) in Oriental countries (China, Manchuria, Japan, Formosa, Korea, French Indochina), how the soybean was introduced to Europe, the cultivation of soya in France, Soya in England, Austria, Germany, Denmark, Holland, Russia, Sweden, Alsace-Lorraine (now in northeast France), Spain, Italy, America, Conclusion.

Part II: Cultivation of soya. Part III: Soya in the feeding and nutrition of humans and animals. 1. The analysis and physiology of metabolism as an element in the study of nutrition. 2. Soybean forage in the feeding of animals. 3. Soybeans (*il grano di soja*) and soy products in the feeding of humans and animals: Commercial and nutritional value and digestibility of the soybean, how to prepare and cook whole soybeans, soy broth, thick soups, salads, and meat dishes, soy purée (*puré di soja*), soybean cakes (*torté di soja*), soybean sprouts (*germi di soja*), roasted soybeans (*grano di soja come frutta secca*), soy coffee (*caffé di soja*), soy chocolate (*cioccolata di soja*), soy confections (*confetture di soja*), special soy sweets and chocolates for diabetics and tuberculosis patients, the soybean as a feed for animals.

Note: This is the earliest Italian-language document seen (Nov. 2012) that mentions soy chocolate, which it calls *caffé di soja.*

4. Flour, pasta, and bread in feeding. 5. Soymilk (*il latte di soja*) and its use in the feeding of animals and humans. 6. Tofu (*il formaggio di soja*). 7. Soy oil and oil-cakes (*panelli*). 8. Condiments and sauces: Natto, miso, soy sauce (*le salse,* called *Schogon* [sic] in Japan, *Tsinag-Yeou* [sic] or *Tao-yu* in China, *Ketjap* in Java, and *Tuong* in Annam). 9. Enzymes (I fermenti, incl. urease). 10. Conclusions.

Part IV: Industrial applications of soya.

Part V: General conclusions.

The first test of the lactation of calves with soymilk was conducted in the winter of 1916-17 by the Bonafous Institute in Turin. The results were splendid, and have encouraged eminent pediatricians such as Dr. Casalini, Prof. Dr. Alberto Muggia (teacher of clinical pediatrics at the University of Turin), and Dr. Enrico Gasca (vice director general of infants at Turin) to extend their experiments (p. 6).

In Italy vegetable oil production has decreased steadily from 1870 to 1920. Attempts were made to grow sesame, peanuts, and rapeseed, and to import oils from abroad. During World War I, unrefined soy oil was introduced to the market in large quantities, but its unappealing taste disgusted consumers and for a while nothing more was heard of it. Then in 1921 it began to be introduced again, but this time it was refined at Italy's national oil works. The good results obtained encouraged the Italian oil milling company, Sairo, and other oil works to make great progress in soy oil production. Several thousand quintals (i.e., several hundred metric tons) of the best soy oil, sold under the name "refined oil from seeds," were introduced in the first half of 1922 by the national oil works of Genoa.

Returning to the early history of soya in Italy, we find that in 1848 some missionaries brought soybean seeds and a little soil to Italy from Japan. They waited for the cultivation for several years, then nothing else was said. In 1880 the Italian Ministry of Agriculture recommended the cultivation of soybeans as a fodder crop for the future, as was being done in the USA, but their suggestion received no attention. In 1918, according to Mattei, a test of soybean culture was done at the Colonial Garden of Palermo on a parcel of 300 square meters.

Since 1912, after seeds had been brought by foreign delegates to the International Exhibition at Turin in 1911, repeated experiments with soybean cultivation have been conducted at the Bonafous Agricultural Institute in Turin, with the goal of developing two well adapted varieties, one for fodder and one for seed. Their green variety is for fodder and their yellow one for seed.

From 1920 the directorship of the cultural work was given to the head professor at the Institute, Venanzio Manvilli, also professor of the Germano Sommeiller Technical Institute, professor the faculty of agriculture, University of Turin. They worked with seeds already selected from the institute and with those obtained from Prof. Don Ricaldone, and from Tientsin, China, directly. Others who have done important work with soya in Italy are Paolo Bottari (with soymilk at the Bonafous Institute), Tamanini Guido, Mossello and Bellia, Prof. Cav. Giov. Batt. Allaria, Dr. Mose Miccinelli

A table (p. 31) shows soybean and cotton hectarage and production in Korea from 1909 to 1917. Soybean hectarage increased from 277,776 ha to a record 487,134 ha. Soybean production grew from 1,991,126 quintals (1 quintal = 100 kg

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or 0.1 metric tons) to a record 3,816,498 quintals.

Page 35: "Prof. Rouest of Luxey (Landes) in France wrote us on 30 Nov. 1921. 'I have finished only the period of acclimatization of the soybean. It remains for me to propagate it a little everywhere. The experiments of 1921 were extended in all the Departments, being viewed from an industrial and commercial point of view. I must now study which variety adapts among those I am cultivating. Soy flour will not be able to be made until we have many thousands of hectares under cultivation, and then we will be able to think of other applications as well... Actually the firm Hendebert de Lion sells its flour, originating in China, at 10 French francs per kg, a prohibitive price.'"

Page 206: At the pediatric congress held in Milan in Sept. 1922, the question of lactation (feeding children) with vegetable milk was discussed in a favorable way, proposed by Prof. Muggia and sustained by the illustrious Prof. Berghius, Director of the Pediatric Clinic of the University of Padua, and by Prof. Francioni of Bologna. We can also add that experiments on lactation are proceeding in Italy at the pediatric clinics of Turin, Bologna, Padua, Genoa, and Florence, and also at the Infant's Dispensary in Turin.

Photos show: (0) An infant fed soymilk in Turin in 1921, together with a table showing its weight gain from 18 July 1921 until 14 Jan. 1922 (p. 7). (1) Three different varieties of soybean plants (p. 70). (2) 2 soybean plants up close (p. 71). (3) The leaves of 3 different varieties of soybean plants (p. 72). (4) Close-up of the stem and pods of a soybean plant (p. 73). (5) Beans and pods of soybeans (p. 74).

(6) Different stages of germinating soybean seeds (p. 75). (7) Close-up of soybean roots (p. 76). (8-9) Field of soybeans at the "Istituto Bonafous" (p. 106, 108, 113). (10-11) Field of soybeans grown with corn (p. 122, 123). (12) Cellular transverse section through a soybean (facing p. 152). (13-14) Soy flour and wheat flour, each in a sack and loose (p. 177). (15) Pasta made from soy (p. 181). (16-21) Bread made from soy (p. 183-89). (22-23) Soy bran and wheat bran, each in a sack and loose (p. 191). (24) Two bottles of soymilk (p. 194). (25) Two bottles of soy oil (p. 214).

A diagram (p. 227) compares the chemical composition of animal casein and vegetable casein.

Note 1. Quite a bit of the historical and non-Italian information in this book comes from Léon Rouest's 1921 book *Le soja et son lait végétal: Applications agricoles et industrielles.*

Note 2. This is the earliest Italian-language document seen (Jan. 2012) that mentions natto, of which it says: "il *Natto* in Giappone che corrisponde al *Tao-Teche* della Cina."

Note 3. This is the earliest Italian-language document seen (Jan. 2013) that mentions soy sprouts, which it calls *germi di soja.* Address: Dr. of Economic and Commercial Science, Turin [Torino], Italy.

2293. Capone, Giorgio; Grinenco, Ivan; Costa, Mario. eds. 1923. Oleaginous products and vegetable oils: Production and trade. Rome, Italy: International Institute of Agriculture, Bureau of Statistics. 545 p. See p. XX-XXI, 140-41, 144-47, 442-43, 480-81. No index. 24 cm. [Eng]

• ***Summary:*** In Sept. 1921 the IIA published a monograph on this subject in French. By popular demand, this English edition was published 2 years later. Contents: Introduction (p. VII-XXXII): General scope, general survey of the 9 principal crops (including soya beans) plus others, final points of consideration. Part I (p. 1-402) is an analysis by region, and within each region by country, countries of vegetable oil production and trade. Regions are Europe, North and Central America, South America, Asia, Africa, and Oceania.

Major countries: Denmark (p. 20-23; oil production 1916-1921, oil imports 1910-1922). France (p. 26-34). Germany (p. 35-40). Great Britain and Ireland (p. 41-43). Netherlands (p. 65-68). Norway (p. 69-70). Russia–European and Asiatic (p. 84-93). Sweden (p. 100-03). Canada (p. 111-15). United States (p. 131-47). Argentina (p. 179-85; no soy). Brazil (p. 187-90; no soy). Ceylon (p. 218-21; no soy). China (p. 222-26). Dutch East Indies (Java & Madura, Other islands; p. 229-33). Formosa (p. 238-39; gives soybean production and acreage from 1900 to 1921). Japan (p. 259-64; gives Japanese soybean production and acreage from 1877 to 1921, and production of soya oil from 1909 to 1920. Japan's leading oil produced domestically from 1895 was rapeseed oil). Korea (Chosen, p. 265-67). Kwantung Leased Territory (p. 268). Hawaii (p. 388; Hawaii produced 17 long tons of soybeans on 20 acres in 1909, and 10 tons on 15 acres in 1919).

Part II (p. 403-506) is recapitulatory tables for both soya beans and soya bean oil: Area and production by crop (1909-1922), Trade by crop (1909-1921). Cottonseed (p. 410-11). Linseed (p. 414-15). Soya beans (p. 442-43, 480-81).

Pages XX-XXI state: "In the absence of data from China, the chief grower of soya beans, it is impossible to make even the roughest estimate of the world's yield of this product. Among the few countries of any moment as producers of soya beans, we may mention: Japan, where this crop increased rapidly between 1877 and 1887 and then became nearly stationary at about 500,000 long tons [2,240 lb per long ton] per annum, although in the last few years some further increase has been noticeable; Korea, with a continuous increase in area and yield, from 1910 onwards, (the crop of 1920 was about 600,000 long tons); and United States, where from 1909 to 1921, the area under soya beans increased from about 1,600 to 186,000 acres with a production of about 70 thousand long tons. It may be observed that the increase of this crop during the last twenty years is supplemented by attempts already made and in progress for its introduction into countries with a favourable climate, especially into Africa."

"Exports are exclusively from China and Korea. The

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Chinese exports have increased very greatly during the last thirty years. Before 1890 they were insignificant, in 1901 they had reached a total of more than 100 thousand tons, and during the decade from 1909 to 1918 they averaged about 600 thousand tons and reached their maximum in 1919 with about 1 million, declining in the two following years to 600 thousand long tons.

"With regard to Korea although we have not a complete series of data for the period 1909-1918, the ever-increasing importance of its exports of soya beans may be emphasized; during the last few years these have been double the average of the years 1909-1911, and in 1921 they already equalled one third of the Chinese exports."

"The chief importers, in Europe are Great Britain, Denmark, and Holland, and, in Asia, Japan, and the Dutch East Indies. To these must also be added Russia-in-Asia as the Chinese Customs register large exports destined for the Russian Pacific ports."

"England, which at one time constituted the greatest market for the soya bean, has continually reduced its imports: these were 420 thousand long tons in 1910, 76 thousand in 1913, and about 60 thousand in the two years 1921-1922... In the Asiatic market, represented in this case by Japan and the Dutch East Indies, imports have continuously increased especially in the last few years of the period under consideration.

"The trade figures of *soya oil* (see tables on pages 480 and 481) indicate that China is the principal exporter, having quadrupled its shipment during the period from 1914 to 1919, attaining in the latter year a total of over 140 thousand long tons."

Other countries unrelated to soy (some no longer in existence): Europe: Esthonia [Estonia], Luxemburg [Luxembourg], Serb-Croat-Slovene State. North and Central America: British Honduras [named Belize after about 1975]. South America: Curaçao [Curacao], Falkland Islands, British Guiana, French Guiana. Asia: Aden [became part of independent Yemen in 1967], Andaman and Nicobar Islands, Bahrein Islands [Bahrain], Borneo (British Protectorates), Dutch East Indies, Federated Malay States, Formosa, French Settlements in India, Indo-China, Persia, Portuguese India [annexed in 1962 by India; became Union territory of Goa, Daman, and Diu], Protected Malay States, Russia, Japanese Saghalin (Karafuto), Siam [later Thailand], Straits Settlements [later Singapore], Timor and Cambing, Wei-Hai-Wei [Weihai, Wei-hai, or Weihaiwei; seaport in northeast Shandong province, northeast China]. Oceania: Australia, Fiji Islands, French Settlements in Oceania, Gilbert and Ellice Islands, Hawaii, Island of Guam, New Caledonia, New Hebrides, Papua, Samoan Islands (American Samoa), Solomon Islands, Territory of New Guinea (*Later German New Guinea*), Tonga, Western Samoa (*Formerly German Samoa*).

Note: This document gives a clear definition of the geographical region named "Oceania." A "quintal" is probably 100 kg. Address: 1. Doctor of Economics; 2. Doctor of Agronomics. Both: IIA, Rome, Italy.

2294. Capone, Giorgio; Grinenco, Ivan. 1923. Kwantung (*Leased Territory*) (Document part). In: G. Capone & I. Grinenco, eds. 1923. Oleaginous Products and Vegetable Oils: Production and Trade. Rome, Italy: International Institute of Agriculture, Bureau of Statistics. 545 p. See p. 268. [Eng]

• ***Summary:*** Area and production: Table 1, based on Japanese statistics, shows area and production of oil-yielding crops from 1911 to 1919. Soya was the leader by far in both categories throughout this period. Soya area increased from 36,145 acres in 1911 to a peak of 77,024 acres in 1913, falling to 55,538 acres in 1919. The only other crop shown is groundnuts (15,832 acres in 1919).

Soya bean production grew from 10,050 long tons in 1911 (Note: 1 long ton = 2,240 lb) to a peak of 19,251 long tons in 1912, decreasing to 9,373 tons in 1919. Groundnut production grew from 2,457 tons in 1911 to 7,034 tons in 1919.

"Trade: Since 1917 the territory of Kwantung has formed a Customs district under the Chinese Imperial Customs. The figures showing the imports and exports of this territory are included in the figures we have furnished for China." This data is based on the annual agricultural statistics of Japan–*Statistical Report of the Department of Agriculture and Commerce.* Address: 1. Doctor of Economics; 2. Doctor of Agronomics. Both: IIA, Rome, Italy.

2295. Capone, Giorgio; Grinenco, Ivan. 1923. Formosa (Document part). In: G. Capone & I. Grinenco, eds. 1923. Oleaginous Products and Vegetable Oils: Production and Trade. Rome, Italy: International Institute of Agriculture, Bureau of Statistics. 545 p. See p. 238-39. [Eng]

• ***Summary:*** Area and production: A table (p. 238) of Japanese statistics shows that the soya bean was the leader of 4 oil-yielding crop produced in Formosa (Taiwan) from 1900 (6,427 tons grown on 27,239 acres) to 1918 (18,414 tons grown on 86,306 acres). Note: 1 long ton = 2,240 lb. In 1919 groundnuts became the leader and held an increasing lead to 1921. Small amounts of sesamum and rapeseed were also produced.

Production of vegetable oils: In 1917 groundnut was the leader (1,552 tons), followed by sesamum oil (589 tons) and other (193 tons).

Imports of oleaginous products: The main such product imported was soya beans, which increased from 1,588 tons in 1909 to 10,421 tons in 1920. Also in 1920, 337 tons of groundnuts and 262 tons of sesamum were imported.

Imports of vegetable oils: These were small but increasing. In 1920 the main oils imported were wood oil, tea oil, soya beans oil, and rapeseed oil.

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Exports of oleaginous products: In 1909 the leader had been sesamum [sesame seeds; 827 tons], followed by groundnuts (123 tons, including a small quantity of soya beans). Small amounts of groundnut oil and sesamum were also exported.

Sources of statistics. Production: *The Statistical Summary of Taiwan* (1912), *The 35th Statistical Report of the Department of Agriculture and Commerce of Japan,* and *Taiwan Nôji-hô,* No 178, Sept. 1921, and No. 191, Oct. 1922. Trade: *Returns of the Trade of Taiwan* (*Formosa*) for the 25 years from 1896 to 1920. Address: 1. Doctor of Economics; 2. Doctor of Agronomics. Both: IIA, Rome, Italy.

2296. Capone, Giorgio; Grinenco, Ivan. 1923. Japan (Document part). In: G. Capone & I. Grinenco, eds. 1923. Oleaginous Products and Vegetable Oils: Production and Trade. Rome, Italy: International Institute of Agriculture, Bureau of Statistics. 545 p. See p. 259-64. [Eng]

• ***Summary:*** Production: Table 1 shows cultivated area under oil-yielding crops from 1877 to 1922. In 1877 soya was the only crop whose acreage was recorded (461,298 acres). In 1887 soya was still the acreage leader (1,142,788 acres), followed by rapeseed (409,986 acres), cotton (241,241 acres), hemp (36,367 acres), and linseed (62 acres). Acreage for groundnuts was first reported in 1905-07 (14,130 acres). Soya remained by far the acreage leader throughout this period. The figures for 1921 are: Soya 1,1260,384 acres, rapeseed 262,561 acres, linseed 76,421 acres, groundnuts 27,370 acres, hemp 25,560 acres, and cotton 5,667 acres.

Table 2 shows production of oil-yielding crops from 1877 to 1922. Again, soya was the leader throughout this period, with soybean production increasing from 240,618 long tons in 1887 (Note: 1 long ton = 2,240 lb) to a peak of 545,869 tons on 1920. In 1921 Japanese oilseed production was: Soybeans 544,735 tons, rapeseed 95,135 tons, unshelled groundnuts 16,555 tons, linseed 15842 tons, cottonseed 2,207 tons. Note that no production figures are given for hempseed.

Concerning individual crops: "Soya.–The cultivation of this plant has been carried on extensively since early times and continued to develop during the decade 1877-87; it attained its maximum extension [acreage] in 1908-1912, while in the following years it shows a tendency toward shrinkage, while remaining much the most important oil-yielding crop in the country. It is to be noticed, however, that soya is used as a food of the people as well as for oil production. The principal producing districts are in the department of Hokkaido, Ibaraki, Saitama, Iwate, Niigata, Nagasaki and Kumamoto." Rapeseed, introduced to Japan centuries ago, was more fully developed after 1600 A.D. Acreage has steadily decreased since 1887, as has production, though to a lesser degree. Linseed was introduced to Japan from America in 1874 as an experimental crop. Groundnuts were exported from Japan for the first time in 1890 (about 83 tons), and cultivation of the crop has steadily increased. Hemp has been cultivated since a very early date, mostly for its fibre. There are no data on production of the seed.

Production of vegetable oils in Japan: Since 1895, rapeseed oil has been the leading vegetable oil produced in Japan. Production was 38,711 long tons in 1895-97, decreasing to 28,213 tons in 1920. Figures for soya oil production are first given for the year 1909 (4,416 tons); the amount produced has increased steadily until by 1920 it was the second leading oil produced in Japan (26,436 tons). Other leading oils in 1920 are: Groundnut oil 22,779 tons, cottonseed oil 4,335 tons, sesamum oil 4,317 tons, coconut oil 2,445 tons, linseed oil 1,801 tons, and wood oil 728 tons.

Imports of oleaginous products: Soya beans have been by far the leading import from 1909 (213,960 tons) to 1922 (303,250 tons). Other imports in 1922 are: Rapeseed (including mustard seed) 45,558 tons, cottonseed 17,798 tons, sesamum seed 14,770 tons, groundnuts 12,982 tons, hempseed 7,617 tons, copra 4,978 tons, and linseed 3,475 tons.

Imports of vegetable oils: Only small amounts of vegetable oils are imported, but the leading one for most of this period was soya oil (4,072 tons in 1912 and 5,346 tons in 1921). Next most important was coconut oil, followed by castor oil and linseed oil.

Exports of oleaginous products: The leading export in 1909 was groundnuts (2,976 tons). The leaders in 1922 were rapeseed (2,889 tons), soya (1,994 tons), groundnuts (494 tons), and linseed (351 tons).

Exports of vegetable oils: The leader for most of this period has been rapeseed oil, with soya oil a close second. In 1909 4,077 tons of rapeseed oil were exported. Soya oil first passed rapeseed in 1911, with 3,819 tons. The leaders in 1922 were: Soya oil 5,911 tons, rapeseed oil 924 tons, cottonseed oil 138 tons, and linseed oil 108 tons. Address: 1. Doctor of Economics; 2. Doctor of Agronomics. Both: IIA, Rome, Italy.

2297. Capone, Giorgio; Grinenco, Ivan. 1923. Korea (Chosen) (Document part). In: G. Capone & I. Grinenco, eds. 1923. Oleaginous Products and Vegetable Oils: Production and Trade. Rome, Italy: International Institute of Agriculture, Bureau of Statistics. 545 p. See p. 265-67. [Eng]

• ***Summary:*** Area and production: Table 1 (p. 265) shows Japanese statistics for area and production of oil-yielding crops in Korea (Chosen) from 1909 to 1922. Soya was the leader by far in both categories throughout this period. Soya area increased from 686,409 acres in 1909 to 1,858,971 acres in 1919. The crop with the next largest area was cotton followed by hemp (which had 40,407 acres in 1909, increasing to 69,731 acres in 1921), then sesamum.

Soybean production grew from 195,967 long tons in 1909 (Note: 1 long ton = 2,240 lb) to 612,459 tons in 1920.

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The crop with the second largest tonnage was cottonseed (44,807 tons in 1920), followed by sesamum (4,000 tons in 1920). *Perilla ocymoides* is cultivated in almost all the provinces of Korea, where it is used for the manufacture of oil. In 1920 about 35,000 acres were devoted to this crop. About half of the seed produced is exported to Japan.

Imports of oleaginous products and vegetable oils: Small amounts of sesamum seed (2,772 tons in 1922) and groundnuts (1,063 tons in 1922) are imported. Smaller amounts of vegetable oils are imported. Imports in 1922 were: Soya bean oil 500 tons, rapeseed oil 391 tons, and linseed oil 155 tons.

Exports of oleaginous products: The main product exported by far is soya beans. In 1909 some 90,108 tons of soya beans were exported. Exports of this crop apparently ceased from 1912 to 1917 (during World War I), then rose from 122,471 tons in 1918 to a peak of 225,417 tons in 1921. The second largest export was cottonseed (2,602 tons in 1922), followed by very small amounts of sesamum. Address: 1. Doctor of Economics; 2. Doctor of Agronomics. Both: IIA, Rome, Italy.

2298. Capone, Giorgio; Grinenco, Ivan. 1923. Oceania (Document part). In: G. Capone & I. Grinenco, eds. 1923. Oleaginous Products and Vegetable Oils: Production and Trade. Rome, Italy: International Institute of Agriculture, Bureau of Statistics. 545 p. See p. 379-402. [Eng]

• ***Summary:*** Australia (p. 381-83). Table 1 shows cultivated area and production from 1903-1923; both were very small. In 1903-06 the leader in production was linseed (73 long tons; 1 long ton = 2,240 lb), followed by cotton (15 tons). Statistics for sunflower seeds were first given in 1910, and groundnuts in 1911. During the 1920s the main oilseed by far was cottonseed. A table of imports of oleaginous products and vegetable oils shows that the main oleaginous product imported was always copra (38,896 long tons in 1920-21); in 1920-21 it was followed by linseed and coconuts. The main vegetable oils imported in 1920-21 were linseed (1,619 tons) and rapeseed (522 tons).

Fiji Islands (p. 384-85): They grew mostly coconuts and small areas of cotton, and exported significant amounts of copra.

French Settlements in Oceania (p. 386) grew mostly coconuts on the Pacific islands and Marquesas Islands. Large amounts of coconuts and copra were exported.

Gilbert and Ellice Islands (p. 387) grew coconuts and exported copra. Note: The Gilbert and Ellice Islands Colony was a former British colony in the western Pacific Ocean consisting of the Gilbert Islands, Ellice Islands, Ocean Island, and three islands (Fanning, Washington, and Christmas) of the Line Islands, and the Phoenix Islands. Area: 238 square miles. Capital: Tarawa (later capital of Kiribati). 1978 population: About 56,213. Brief history: 1892–The two main groups were proclaimed a British protectorate. 1915–Made a colony. 1916–Fanning Island, Washington Island, and Ocean Island added. 1919-Christmas Island added. 1937–Phoenix group added. 1971–New constitution inaugurated. 1976–Divided between Gilbert Islands and Ellice Islands. -

Hawaii (p. 388): Table 1 shows area and production of oil-yielding crops compiled by the Bureau of the Census in 1909 and 1919. Concerning area in 1909, Hawaii had 32,777 coco palms in bearing, plus 37 acres of cotton, 20 acres of soya, and 20 acres of groundnuts. In 1919, Hawaii had only 7,197 coco palms in bearing, plus 14 acres of cotton, 15 acres of soya, and 275 acres of groundnuts.

Concerning production, in 1909 Hawaii produced 136,827 coconuts plus 17 long tons of soya (1 long ton = 2,240 lb), 16 tons of groundnuts, and 5 tons of cottonseed. In 1919 Hawaii produced 161,123 coconuts plus 10 tons of soya, 55 tons of groundnuts, and 10 tons of cottonseed.

Island of Guam (p. 389) grew coconuts. New Caledonia (p. 390-91) grew cotton, coconuts, and olives. Exports of copra are given from 1896-1919. The main import and the main export is copra.

New Herbrides (p. 392-93) grew mostly coconuts, followed by cottonseed, and exported copra.

New Zealand (p. 394-95) keeps statistics on only one oilseed, linseed. Production grew from 53 long tons in 1903 to 4,552 tons in 1920-21. The main imports of oleaginous products are whole coconuts and copra, and of vegetable oils are linseed oil, plus small amounts of castor oil.

Papua (p. 396). The main crop produced is coconuts, followed by small amounts of cotton. The main export is copra.

Samoan Islands (American Samoa–p. 398): The chief crop is coconut, which provides the only article of export in the form of copra. Solomon Islands (p. 398): The principal industry is copra. A table shows exports of coconut and copra from 1910 to 1922. Territory of New Guinea (Later German New Guinea–p. 399): One table shows the total area under coconuts from 1909 to 1922. A second shows exports of copra from 1912 to 1922.

Tonga (p. 400): Copra is the main industry of this group of islands. A table shows exports of copra from 1909 to 1919. Western Samoa (Formerly German Samoa–p. 401): The main crop of these islands is coconuts, and copra is the main export. Address: 1. Doctor of Economics; 2. Doctor of Agronomics. Both: IIA, Rome, Italy.

2299. Chinese Eastern Railway, Economic Bureau. 1923. The Chinese Eastern Railway and its zone. Harbin, Manchuria: C.E.R. Economical Bureau. 32 p. Illust. 27 cm. [Eng]

• ***Summary:*** Section III titled "Agriculture" contains a bar chart showing that [soy] beans comprise 20-30% of the total cultivated area in the seven districts along the rail lines; the 30% is in the southern districts. Yellow [soy] beans yield

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22.2 bushels/acre or 90.0 poods per dessiat. 39% of the total cultivated area is taken up by marketable crops for export; 22% by soybeans and 17% by wheat; the remaining 61% is taken up by Chinese native grains (p. 12).

About half of all soybeans exported from North Manchuria go to Japan, where bean-cakes constitute one of the most popular fertilizers for fields. The remaining 50% of these exported beans are either consumed in Asiatic markets (China, Netherlands East Indies) or shipped to oil mills in Europe (United Kingdom, Germany, Scandinavian countries). The demand for Manchurian [soy] beans is growing.

Flour milling is the biggest manufacturing industry along the railway zone, followed by oil milling. "The value of the output from oil-mills equals about 1/2 value of the value of products of flour mills. Bean oil and bean-cakes are in great demand on both the interior and the foreign markets. Exports of bean oil and bean cakes are made partly to Europe and mostly Japan."

Two graphs (p. 27) show transportation by the railway of [soya] "bean-oil" and [soya] "beancakes" (in 1,000 tons) from 1913 to 1922. Transportation of oil rose rapidly to a peak of 30,000 tons in 1919, dropped precipitously to 6,000 tons in 1921 (after the Great War [World War I]), then jumped to 22,000 tons in 1927. Transportation of beancakes rose rapidly to a peak of 140,000 tons in 1917, fell to 80,000 tons in 1918, then leaped to a record 230,000 tons in 1922. Address: Harbin, Manchuria.

2300. Fujiwara, Kyoyetsuro. 1923. Isolierungsversuche mit Soja-Aagglutinin und Antiagglutinin [Isolation of soy agglutinin and anti-agglutinin]. *Biochemische Zeitschrift* 140:113-31. (Chem. Abst. 18:1013). [4 ref. Ger]
• ***Summary:*** A study of the effect of soya extracts (*Sojaextrakten*) on animal organisms and the fate of soya urease in animal organisms. Soya agglutinin is absorbable by various absorptive substances: Kaolon, aluminum hydroxide, and calcium phosphate. The agglutinating effect of soya agglutinins is enhanced, after being brought to a boil, by boiling temperature. Through repeated injections of soya extract, one obtains from rabbits an antiserum which limits the effect of the agglutinins. Address: Niigata, Japan; From the Biochemical Lab. of the Moabit Hospital in Berlin [Germany].

2301. Itô, Bunjûrô. 1923. Manshû ni okeru daizu igai no yuryô shijitsu [Oilseed crops other than soybeans in Manchuria]. Dairen: South Manchuria Railroad KK (Minami Manshû Tetsudô Shachôshitsu Chôsaka). 235 p. 26 cm. Series: Chôsa hôkokusho no. 18. [Jap]*
Address: Manchuria.

2302. Kellogg, John Harvey. 1923. The natural diet of man. Battle Creek, Michigan: The Modern Medicine Publishing Co. 386 p. Illust. Index. 20 cm. [50+* ref]
• ***Summary:*** This classic of vegetarian literature contends that a vegetarian diet is the natural diet of man. Contents: 1. Man not naturally a flesh-eater: Modern civilized life unnatural and unbiologic, animal dietaries, lessons from the monkey, porcine wisdom in diet, animals classified by diet, the ancient family of primates, all mammals originally vegetable feeders, when germ diseases were unknown, kinship of higher apes and men, flesh-eating never a universal human custom.

2. Twenty popular delusions about flesh foods: D-1. That meat is superior as a blood-making food, and, hence, is needed in anemia. D-2. That meat is essential as a flesh-building food. D-3. That a flesh diet is essential to support severe or prolonged activity; that is, promotes endurance. D-4. That flesh-eating is necessary to produce physical courage. D-5. That vegetarian races are inferior physically and mentally to races using a mixed diet. D-6. That flesh foods are more refined and more easily digested and, hence, more nutritious than are foods of vegetable origin. D-7. That man is naturally omnivorous. D-8. That flesh foods are stimulating and thus supply an element needed especially by brain workers. D-9. That beef tea is a useful nutrient. D-10. That a meat diet is required to prevent or cure gastric acidity. D-11. That a meat diet is desirable in tuberculosis. D-12. That a meat diet is necessary in diabetes. D-13. That a flesh diet is essential in the treatment of obesity. D-14. That meat is required in beri-beri. D-15. That meat is essential as a "building-up" or restorative food. D-16. That meat is needed by growing children. D-17. That meats are needed as a stimulus to appetite. D-18. That the beef industry is a necessary part of our national economic system. D-19. That a meat diet is necessary to insure reproductive activity. The law of diminishing returns versus flesh-eating. D-20. That meat is a harmless luxury.

3. Scientific objections to the use of meat: Human liver not adapted to meat diet; important differences between meat and milk; meat deficient in vitamins and food lime; Eskimos eagerly seek vegetable food; ill effects of meat diet on Arctic explorers; meat saturated with tissue poisons; meat readily putrefies, natural foods do not; the poisons of meat; meat extracts; why viscera are especially objectionable; bacteriology condemns meat as food; vast numbers of bacteria in meat; putrefactive products of meat; why physicians forbid meat in cases of kidney disease and high blood pressure; how flesh-eating causes constipation ("partly because the flesh diet is lacking in the roughage or indigestible material required to stimulate the intestine to action").

4. Diseases due to flesh eating: Tuberculosis in animals, cancer from meat eating, cancer rare and appendicitis unknown among flesh abstainers, meat-eating causes disorders of nutrition, acidosis from a flesh diet, a meat diet and scurvy, meat eating and arteriosclerosis, pernicious

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effects of a meat diet experimentally proven, recognized meat contraindications, the peregrinations of a deadly parasite, typhoid germs in meat products, flesh poisoning, no protection for meat-eaters, oyster poisoning, converting sewage into food.

5. Experimental evidence against flesh eating: McCollum's experiments, Dr. S. Weir Mitchell endorses the meatless regimen, an eminent scientist on meat diet, Fauvel's observations, greater endurance of flesh-abstainers, the death rate reduced by meatless diet, flesh-eating does not develop intelligence, meat-eating and race degeneracy, meat-eating a city habit, non-meat diet best even for carnivorous animals, the Scotchman's dog, the effects of a meat diet on rats, the effects of a flesh diet on rabbits, flesh-eating animals short lived. 6. The ethical argument.

7. Historical facts and authoritative opinions: Biblical teaching about flesh eating, apostles who were flesh abstainers, the Essenes were flesh-abstainers, the diet of the ancient Greeks, King Cyrus a flesh-abstainer, Julius Caesar's army ration, diet of Peruvian soldiers, diet of athletes of ancient Greece, ancient philosophers were flesh-abstainers, Plutarch's essay on flesh-eating, fleshless diet of a Roman emperor, meatless diet endorsed by Gautier, views of Seneca, diet of the ancient Sumerians [today's Iraq], eminent modern flesh abstainers, vegetarian monks, Thoreau on the fleshless diet, a Chinese statesman's experience, the views of two great naturalists, the poet Shelley a food reformer, a child's natural repugnance to meat, Liebig on the advantages of a non-flesh diet, Sylvester Graham's diet reform movement.

8. Interesting facts concerning the dietary habits of various peoples. 9. The marvelous adaptation of the natural diet to human needs. 10. How to discard meats comfortably and safely.

11. Is the disuse of meat advisable from a practical standpoint? The U.S. Department of Agriculture shows the use of less meat to be safe and economic, the importance of planting nut trees, avoidance of meat is necessary to change the intestinal flora, vegetable substitutes for meat, the recent low protein movement in the United States, the half century experience of the Battle Creek Sanitarium with a fleshless diet.

12. Newspaper and magazine misinformation: An "eat-more-meat" campaign, Professor Fisher of Yale University [Connecticut] refuses to support the "eat-more-meat" campaign of the [Chicago, meat] packers, pernicious piffle.

Soy is mentioned in many places. The section titled "Flesh-eating never a universal custom" states (p. 33-34): "According to Mori, the Japanese peasant of the interior is almost an exclusive vegetarian. He eats fish once or twice a month and meat once or twice a year... The soy bean is held in high esteem and used largely in the form of *miso,* a purée prepared from the bean and fermented; also *to-fu,* a sort of cheese; and *cho-yu* [shoyu, soy sauce], which is prepared by mixing the pulverized beans with wheat flour, salt, and water and fermenting from one and a half to five years. The Chinese peasant lives on essentially the same diet, as do also the Siamese, the Koreans, and most other Oriental peoples. Three-fourths of the world's population eat so little meat that it cannot be regarded as anything more than an incidental factor in their bill of fare."

Page 45: Complete "proteins are found in milk and eggs as well as in most nuts, peanuts, and the soy bean..."

Page 73: "The protein of milk, of the soy bean, and of nuts is known to be superior to meat as a source of body nitrogen." Address: Superintendent of the Battle Creek Sanitarium, Battle Creek, Michigan.

2303. Kellogg, John Harvey. 1923. The natural diet of man (Continued). Battle Creek, Michigan: The Modern Medicine Publishing Co. 386 p. Illust. Index. 20 cm. [50+* ref]
• ***Summary:*** Continued: Page 74: "Vegetable extracts (yeast extracts and soy sauce) are now prepared which are finer in flavor than the best meat extracts..."

Page 191: "Complete proteins are found in the almond and also in the soy bean and the peanut, a fact which accounts for the large use of the soy bean and the peanut in China and other Oriental countries as a supplement to a diet of rice and green vegetables."

Page 198: "The soy bean contains more protein than does beef, and 20 per cent of oil."

Page 282: G. Yukawa reports that the diet of Japanese monks "consists exclusively of vegetable products, rice being the staple, supplemented with soy beans and vegetables. The diet contained an average of 70 grams of protein, 15 grams of fat, 514 grams of carbohydrates, an average energy intake of 2,500 calories. The experimenter concluded that the absolute vegetarian diet of the Buddhist monks of Japan is entirely adequate to maintain perfect health."

Page 285: "Some years ago (1899) the Emperor of Japan appointed a commission to determine by investigation whether it was necessary to add meat to the national dietary to improve the physique of the race, especially to increase their stature. As regards the use of meat, the commission reported 'that the Japanese had always managed to do without it, and that their powers of endurance and their athletic prowess exceeded that of any of the Caucasian races. Japan's diet stands on a foundation of rice.' The rice diet of the Japanese is supplemented by the free use of peanuts, soy beans, and greens, which supply all that rice lacks to constitute a wholly sufficient bill of fare."

Page 306: "The experiments of McCollum and numerous others have in recent years demonstrated the entire feasibility of living exclusively upon a diet of purely vegetable origin. It is only necessary to make such a selection of foodstuffs as will supply the body with all the elements necessary for complete nutrition; and this may be easily done, as has already been indicated. It has also been

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shown that two widely used legumes, the soy bean and the peanut, as well as nuts, supply complete proteins and may be used in supplementing the incomplete proteins of cereals and vegetables. This fact explains the great rôle played by the soy bean in the bills of fare of the Orientals."

Pages 313-14: "Certain proteins known as complete proteins, when taken into the body in proper quantities may be wholly utilized in tissue building, because they contain exactly the elements needed, no more and no less, for the building of muscles, nerves, glands, and other nitrogenous tissues." "The protein of the soy bean, the peanut, the almond, and various other nuts has, however, been shown to be of high quality, practically equal to the protein of flesh... When meat is discarded, it is evidently necessary that care be taken to supply in its place an adequate amount of protein derived from the soy bean, the peanut, the almond, or other nuts, or from milk or eggs. Four or five ounces of soy beans, peanuts, or almonds afford an abundance of protein for a day's ration. See also p. 320.

Page 322: "But even in the absence of milk and eggs, an abundant supply of protein could be readily secured by the planting of peanuts and the soy bean, two remarkable legumes which, pound for pound, supply more nourishment than beef or pork and of finer quality." "Nuts, together with the peanut and the soy bean, afford a protein which is equivalent to that of meat at a cost far below the cost of meat proteins. For example, an acre of very ordinary ground will produce twenty bushels, or twelve hundred pounds of soy beans, which contain 40 per cent, or four hundred and eighty pounds of excellent protein. It takes an acre of ground and two years to produce seventy-five pounds of dried protein in the form of beef. The same land will produce in the same length of time nearly one thousand pounds of soy bean protein. In other words, an acre of ground devoted to soy beans will produce more than thirteen times as much protein as the same ground used as a pasture for fattening steers..."

Page 338: The section titled "The recent low protein movement in the United States," notes that the daily protein requirement for a person weighing 120 pounds could be "provided by 2½ pints of milk or by 6 ounces of almonds, 5 ounces of peanuts, 6 ounces porterhouse steak, 6 ounces navy beans, 4 ounces soy beans, 5 ounces lentils, 5 ounces black walnuts."

Page 359: "Animals furnish us a good object lesson on this subject. Compare the agility, alertness, curiosity and intelligence of the fruit-eating chimpanzee with the dull stupidity of the lion and the tiger; or the vivacity and progressiveness of the rice- and soy-eating Japanese, with the dull-witted, decaying Eskimo."

Nuts are discussed favorably on pages 56, 297, 327-31 but neither peanuts nor peanut butter are mentioned specifically.

Dr. Kellogg was a pioneer in promoting the importance of dietary fiber. The following terms appear: Bran or wheat bran (p. 40, 155, 157, 201, 301). Bulk, bulky, or bulky diet (referring to "roughage") (p. 70, 135). Cellulose (p. 57, 70, 297, 303). Constipation (p. 10, 66, 135-138, 148, 157, 161, 332, 382). Roughage (p. 57, 135, 297, 301). But none of the following terms appears in the index: Laxative, laxatives.

The author lived 1852-1943.

Note: This is the earliest English-language document seen (June 2004) that contains the term "natural foods" and that also discusses soy. Address: Superintendent of the Battle Creek Sanitarium, Battle Creek, Michigan.

2304. Kempski, Karl E. 1923. Die Sojabohne: Geschichte, Kultur und Verwendung unter besonderer Beruecksichtigung der Verhaeltnisse in Niederlaendisch-Indien [The soybean: History, culture and use, with special attention to the situation in the Netherlands-Indies]. Berlin: Paul Parey. 88 p. Illust. Index. 22 cm. [101 ref. Ger]

• ***Summary:*** Contents: Introduction. Some remarks on the soybean's early history (p. 8). Overproduction of soybeans in Manchuria after the Russo-Japanese War–English oil mills make their first trials (p. 9). Soybean production in Manchuria (p. 10-11). Soybean production in Korea (p. 11-12). Soybean production in Japan (p. 13-15). Soybean production in America–Soybean meal and soybean milk are introduced (p. 16-22). Soybean production has also expanded in Africa, British India, and the Philippines (p. 22-23). The introduction of soybean cultivation to Europe (p. 23-25). The many uses of the soybean in Europe (p. 25-26). The many uses of soy oil (p. 26-27). Old and new methods of obtaining soy oil (p. 27-31). Soybean production and use of soybeans in the Netherlands-Indies (*Niederländisch-Indien*) (p. 31-61).

Appendix: Descriptions of how the most important soybean products are manufactured: In Java (tao-hoe [tofu]), tempeh, ketjap [soy sauce], tao-tjiong [or tao-jiung, a term, and perhaps a product, between *doujiang* and *tao-tjo,* Indonesian-style miso] (p. 62-65), in China and Japan (soy sauce, miso, tofu, frozen tofu, natto, soymilk) (p. 65-68). Supplements: I: Soybeans in Manchuria (p. 69-75). II; Hansamuehle [Hansa Muehle] in Hamburg, Germany. III: *The Soybean* by Piper and Morse (p. 75).

Note the extensive, early bibliography. Unfortunately, it contains many errors.

This book is largely a review of the literature, but with some original information, especially on Indonesia and Germany. In 1923 Java imported 150,000 to 200,000 tons of soybeans and had a population of 35 million. The area of soybeans planted in Java (including Madura) increased from 157,600 ha in 1918 to 164,700 ha in 1922 (p. 32). In 1921, 67.3% of Java's soybean acreage was in Central Java, 20.7% was in East Java, and only 5.7% was in West Java. (p. 35). Large quantities of soybeans are imported to the Netherlands-Indies from Manchuria: 35,105 metric tons (tonnes) in 1920, rising to 95,742 tonnes in 1922. From these and local soybeans are made tempeh [spelled like this!], tofu

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(*tahoe; Bohnenkäse*), soy sauce (*Ketjap, Sojasauce*), etc. In Java, mostly black soybeans are grown. To make tofu yellow, it is cooked in an extract of the *Curcuma* root / rhizome. Sometimes it is also sun-dried or fried/roasted (*gebraten*). Tempeh is inoculated with a piece of tempeh from a previous fermentation, and often fried in coconut oil. Detailed descriptions are given of the production of soy sauce (*ketjap;* which is made from black soybeans) and Indonesian miso (*taucho; tao-tjiong*). The author (p. 64) states that ketjap and tao-tjiung are both inoculated using *Hibiscus tiliaceus* (hibiscus) leaves, called *waroe* in Java. Today Germany, like America, produces fresh and dried soymilk, fresh and dried soya cream, meat analogs, and soy sauce (p. 25).

This book contains 17 interesting, old photos. Descriptions of those reproduced from other periodicals are omitted. (1) A soybean field on the farm Kikai Nojo near Sempo-Station, Korea, owned and run by Mr. Moegling (p. 12). (2) A combine used for harvesting regular beans in California in 1918 (p. 19). (3) Many hydraulic presses in a modern American oil factory (p. 29). (4) The equipment used in steaming the soybeans before they are crushed in an American "steam mill" type oil mill (p. 31). (5) The interior of a British oilmill (p. 33). (6) The electrical generators in a modern oilmill (p. 34). (7) Soybeans being harvested manually at Madioen [Madiun, in East Java], Java (p. 48). (8) Harvested soybeans being dried on racks in a field in Java, and carried away by one worker (p. 48). (9) Workers dividing up the harvest in Java (p. 50). (10) Threshing soybeans with bamboo flails in the courtyard of a small farmer in Java (p. 51). (11) Selling soybeans in a small market in Central Java (p. 51).

Tables show: (1) Imports of soybeans to Germany from 1910 (43,500 tonnes) to 1912 (more than 125,200 tonnes) (p. 24). (2) Soybean acreage in Java (including Madoera) from 1918 (157,600 ha) to 1922 (164,700 ha) (p. 32). (3) A breakdown of soybean area in Java in 1921 (of 226,186 bouws) into West Java (12,980 bouws), Central Java (152,154 bouws), and East Java (61,082 bouws) (p. 35). Note: 1 bouw = 1.754 acres (Johnstone 1975). (4) Imports of Manchurian soybeans to Java (including Madoera) and other parts of the Dutch East Indies (mainly Sumatra) from 1920 to 1922 (p. 36). (5) Yields (average or range) of soybeans in various countries: Germany, Italy, British Indies, Manchuria (incl. China and Korea), Japan, America (up to 2,700 kg/ha), Java (p. 52). (6) Comparison of the nutritional composition of soybeans, peas, and regular beans (Phaseolus varieties) (p. 53). (7) Comparison of the nutritional composition of soya cheese (*Sojakäse,* tofu), beef, and lean pork (p. 53). (8) The prices of white and of black soybeans in Java during January and December 1922 and the same two months of 1923 (in Gulden) (p. 56). (9) Comparison of yields, price, costs, and profit for peanuts (*Katjang tanah*) and soybeans in Java (p. 57-58). (10) Nutritional composition of canned frozen tofu (based on E. Senft) (p. 68). (11) Exports of soybeans from five Manchurian ports (Dairen, Antung, Newchwang, Suifenho [Suifenhe], and Sansing) in 1919, 1920, and 1921 (p. 70). (12) Exports and value of soybeans from all of China to four countries (Netherlands, Russia, Japan, Dutch East Indies) in 1919, 1920, and 1921 (p. 72). (13) Exports of soybean oil from five Manchurian ports (Dairen, Antung, Newchwang, Suifenho [Suifenhe], and Harbin) in 1919, 1920, and 1921 (p. 72). (14) Exports and value of soybean oil from all of China to five countries (England, Netherlands, Belgium, Japan, USA) in 1919, 1920, and 1921 (p. 72). (15) Exports of soybean meal from four Manchurian ports (Dairen, Antung, Newchwang, Suifenho [Suifenhe]) in 1919, 1920, and 1921 (p. 73). (16) Exports and value of soybean meal from all of China to three countries (Japan, Russia, USA) in 1919, 1920, and 1921 (p. 73). (17) Names of the five major railway lines in Manchuria (South Manchuria Railway, Chinese Eastern Railway, Peking Mukden Line, Kirin-Changchun Line, Saupingkai-Taonan Line) (p. 74). (18) Amounts (in tons) of soybeans, soybean cake, and soy oil (*Sojaöl*) shipped over the South Manchuria Railway, and the Chinese Eastern Railway in one year (p. 74). (19) Railway transport and production amounts of the mills (in tons) in Dairen and Newchwang of soybeans, soybean cake, and soy oil (*Sojaöl*) during the year 1921 (p. 74). Address: Agricultural Expert in Poerbasari te Pengalengan, Java.

2305. Kung, C.M. 1923. Some experiments about the purple patch of soybean. Dissertation, Japan. *
• ***Summary:*** Discusses purple stain. Address: Japan.

2306. Lewis, William S.; Murakami, Naojiro. eds. 1923. Ranald MacDonald: The narrative of his early life on the Columbia under the Hudson's Bay Company's regime; of his experiences in the Pacific Whale Fishery; and of his great adventure to Japan; with a sketch of his later life on the western frontier, 1824-1894. Spokane, Washington: Published for The Eastern Washington State Historical Society by The Inland-American Printing Co. 336 p. 25 cm. [127* ref]
• ***Summary:*** Ranald MacDonald was born on 3 Feb. 1824 at Fort George, a great trading post located at the mouth of the Columbia River, owned by the Hudson's Bay Company, and formerly called Astoria; this area is now in Oregon. His mother was an Indian (he believed that she was a daughter of the great Chinook Chief Com-comly) and his father, Archibald, was a Scotch highlander; he was born a British subject. His mother died a few months after his birth and he was raised by his mother's sister. In Sept. 1825 his father remarried and he was raised by a stepmother, Jane Klyne. He worked with the Hudson's Bay Company, of which his father was chief trader and chief factor. The Oregon Treaty of 1845 made him a citizen of the United States.

"In March 1833 a Japanese junk laden with crockery..., blown across the Pacific, was wrecked about 15 miles south

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of Cape Flattery [on the northwest coast of Washington] and all of the seventeen men on board lost except three who were seized and held as slaves by the local Indians... These Japanese were subsequently rescued from the Indians in May, 1834, by Captain William McNeil–the Boston skipper–on board the Hudson's Bay Company ship 'Llama' and taken to Fort Vancouver." Numerous primary sources for this information published in the 1830s are cited.
The kind Dr. John McLoughlin attempted to return these shipwrecked Japanese to Japan via London (England), and Macao, China–but Japan would not accept them. These were apparently the first Japanese in the U.S.A. and the incident inspired MacDonald to travel to Japan to learn more about the Japanese. At age 24, in July 1848, he arrived in the Japan Sea on the American whale ship 'Plymouth' under captain Edwards. He then left the whale ship alone in a small boat. After going ashore on 3 small islands (Teure, Yankeshiri, Rishiri) inhabited by Ainu off the coast of Yesso (Yeso, now called Hokkaido), he landed at Soya on the northernmost tip of Hokkaido. Then, treated as a prisoner, he was sent on the ship Tenjinmaru to Nagasaki and saw the small island of "Dessima" (Deshima, Dejima) in the harbor. He was confined to a sort of prison which he was never allowed to leave and made to wait about 7 months until the next Dutch ship arrived. During this time he taught English to various eager pupils and interpreters. He was the first English instructor in Japan. His best student was the brilliant Yeanosuke Murayama, who was already fluent in Dutch. He stayed in Japan until 26 April 1849 when he was removed on the American ship 'Preble' under commander James Glynn.

While in Japan MacDonald compiled a glossary or dictionary of about 550 Japanese words and their English equivalents. Among these were tofu (he wrote "tove"; see p. 288), and shoyu [soy sauce] (he wrote "shon" or "son"; see p. 297). After further travels to China, India, Australia and Europe, he returned to America in 1853 to live his later years in his native homeland near the Columbia River, in the Pacific Northwest.

Note: This book is extremely well written and carefully documented, with extensive scholarly footnotes. There are numerous appendixes, a glossary, and two bibliographies. One of the appendixes (II-C, p. 280-84) is a deposition taken by commander Glynn on 30 April 1849; it tells of MacDonald's life and the story of his stay in Japan up to that time. It appears in U.S. Senate, Executive Docket, 32nd congress, 1st session, No. 59, p. 25-28.

An illustration (p. 208) shows Maruyama and Tokojiro, two Japanese men in Edo period dress. Both pupils of Ranald MacDonald, they were the chief interpreters in negotiations with Commodore Perry.

Footnote 238 (p. 209) states: "During the period of exclusion, Occidental knowledge of Japan was derived through the Dutch. Three physicians attached to the Dutch factory at Nagasaki contributed principally to this knowledge of Japan: Englebrecht [Englebert] Kaempfer (Japan 1690-1692), author of a *"History of Japan and Siam,"* London, 1727; Charles Peter Thunberg (Japan, 1775-1776), author of *Travels in Europe, Africa and Asia;* and Philip [sic, Philipp] Franz von Siebold (Japan 1822-1830), author of *Nippon, an Archive towards the description of Japan.* In addition to these, three directors of the Nagasaki factory, Isaac Titsingh, J. F. van Overmeer Fisscher and G. F. Meijan, furnished further information. Additional information was received through Russian sources from the published account of Georg Heinrich von Langsdorff, a German physician attached to the Reasanoff expedition (1804), and from Captain Vasili M. Golownin's *Memoirs of His Captivity in Japan, 1811-1813.*

"In like manner whatever Japan received of the material civilization of the Occident during these years was obtained principally through the Dutch." Address: 2. Head, School of Music, Imperial Univ., Tokyo. Formerly head of the Dep. of Foreign Languages at the Imperial Univ.

2307. Muramatsu, Shinsuke. 1923. Daizu-chû ni sonzai suru sekken ni tsuite [On the natural soaps in soybeans]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 44:1035-49. (Chem. Abst. 19:742). [Jap]
Address: Nôgaku-shi, Morioka Koto Norin Gakko, Nogei Kagaku Jikken-shitsu.

2308. Nagai, Isaburo; Saito, Shuichi. 1923. Linked factors in soy-bean. *Japanese J. of Botany* 1:121-36. [2 ref. Eng]
• ***Summary:*** Discusses the connection of seed coat color with pubescence in the soy bean. "Glabrous is a simple dominant over pubescent. A linkage relation exists between the factor for glabrousness *P* and the factor for the mottling pattern in the seed coat *M."*

Note 1. *Webster's Dictionary* defines glabrous (pronounced GLAY-brus), a word first used in 1640, as "smooth or bald, especially having a surface without hairs or projections."

Note 2. This is the earliest English-language document seen (Dec. 2009) that uses the word "glabrous" in connection with soy beans. Address: Agric. Exp. Station, Omagiri, Japan.

2309. Nakajima, Fumio. comp. 1923. Konsaisu Wa-Ei jiten [Sanseido's new concise Japanese-English dictionary]. Tokyo: Sanseido. 965 p. 16 cm. [Jap; eng]*
Address: Japan.

2310. Photos showing the process of making shoyu at Noda Shoyu Co. (later Kikkoman) in Noda, Japan. 1923.
• ***Summary:*** (1) Wheat being roasted in a shallow round metal container (like a large wok) over a wooden fire.

(2) Soybeans being steamed in a large wooden steamer set over a caldron.

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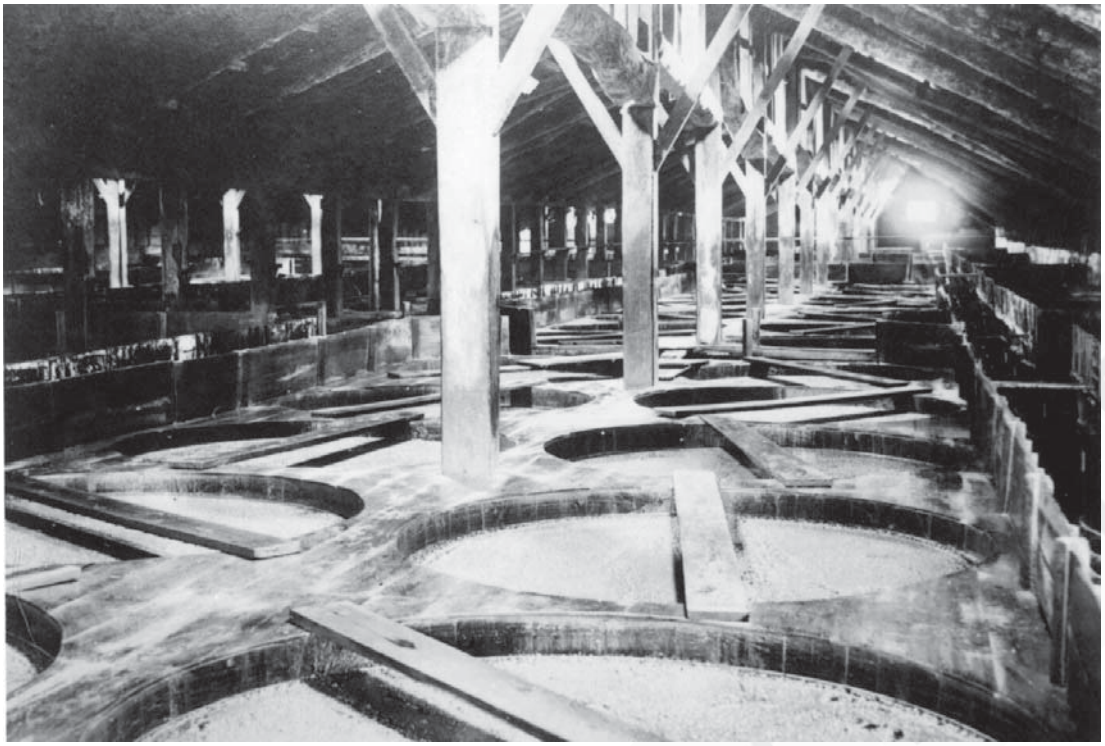

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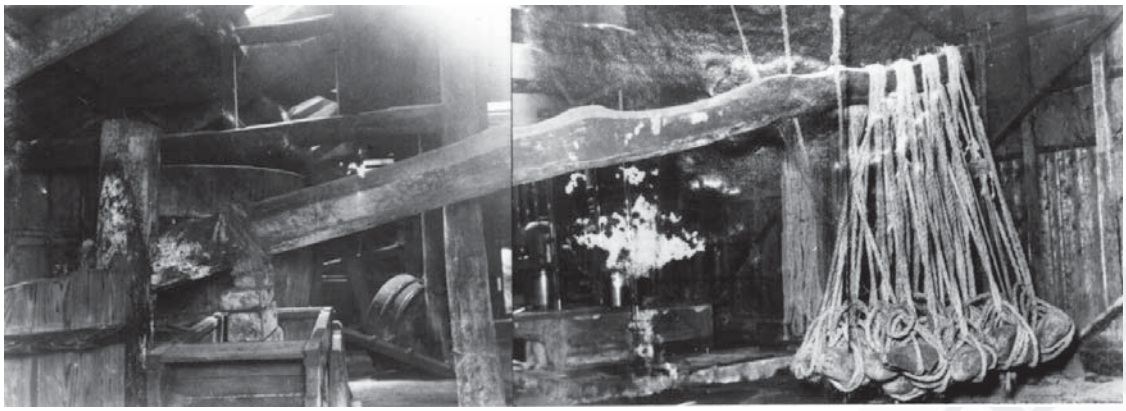

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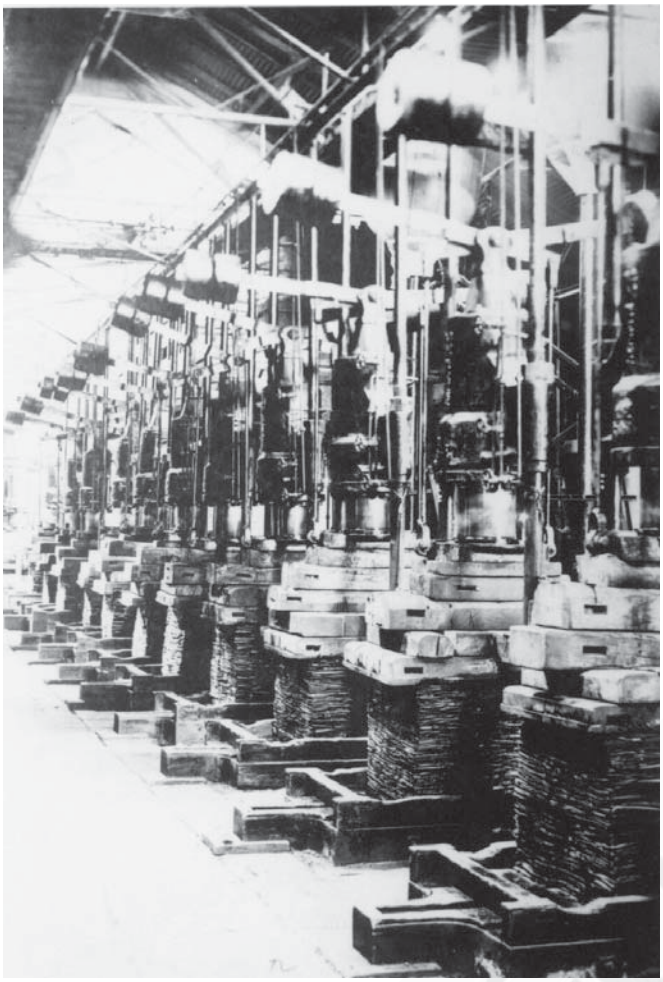

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(3) "Fermentation room: wooden vats holding fermenting soy sauce; note the planks on which the moromi stirrer would stand to perform his task."

(4) Running the mature moromi (mash) into strong sacks in preparation for pressing out the sauce.

(5) An older method of extraction and pressing, using many large stones at the end of a long wooden lever press; bags filled with moromi are in the porous-bottom wooden box near the fulcrum.

(6) Another method of pressing: "a windless type of device for applying pressure to a porous-bottom box (*age-fune*) in order to separate sauce from lees" (residue).

(7) Yet another method of pressing using a sort of windlass turned under foot.

(8) A modern method of pressing using hydraulic presses. Taken in 1923.

(9) A room partly filled with the presscake or residue remaining after the soy sauce has been pressed out.

(10) Soy sauce being run into wooden kegs to be sold.

(11) A line of bottles being filled with soy sauce. Bottles [and cans] were introduced by Noda Shoyu in 1923.

(12) Shallow wooden boats on the Tone River waiting to carry shoyu downstream to Tokyo. A railway had largely taken over this function, starting in 1911.

(13) Typical homes of factory workers in Noda.

These photos were sent by W. Mark Fruin (via Kikkoman) to Soyfoods Center in 1983 with permission to publish them. The photos are from the Kikkoman archives in Noda, Japan. Mark thinks that some of them may have been taken at Kikkoman's small *Goyo Gura* where the shoyu made for the Imperial Household was always made by hand. Several of the photos appeared in Fruin's classic history of Kikkoman titled *Kikkoman: Company, Clan, Community* (1983, Harvard University Press). See p. 32, 34.

2311. Sato, Masanori. 1923. Daizu abura shibô-san sekkai no kanryû ni yoru sekiyu ruiji nenryô no seihô ni tsuite [Preparation of a liquid fuel resembling petroleum. II. Distillation of the calcium soap of soya bean oil]. *Kogyo Kagaku Zasshi* (*J. of Chemical Industry, Japan*) 26:297-304. [Jap; eng]

• ***Summary:*** By dry distillation of the calcium salt obtained by treating soy bean oil with lime, a liquid fuel was obtained. The yield of "crude oil" was about 70% by volume of the soy bean oil. The product contained a little oxygen and yielded on distillation 20.6% light oil, boiling point below 150º C; 58.5% middle oil, boiling point 150º-300ºC; and 20.3% heavy oil, boiling point above 300ºC. By refining the middle oil with sulfuric acid, it was found to contain 60% unsaturated hydrocarbons; the remaining saturated hydrocarbons were a mixture of paraffins and naphthenes. The "crude oil" contained about 4.4% acidic compounds in which naphthenic acids and phenols were detected. The heavy oil contained about 5% solid paraffin. Address: Manshû Tetsudô Chûô Shikenjo.

2312. Satow, Sadakichi. 1923. Manufacture of plastic products from proteid of soy bean. *Tohoku Imperial University, Technology Reports* (*Sendai, Japan*) 3(4):199-267. (Chem. Abst. 17:3574). [15 ref]

• ***Summary:*** Contents: Preface. 1. Properties of soy bean proteid. 2. On the relations between hydrolised proteid and its glutinization. 3. Effect of coagulation of proteid upon glutinization. 4. On the process of glutinizing. 5. Reactions of proteids with formaldehyde or other active methylene compounds. 6. Process of moulding. 7. Effect of other chemicals and ingredients on the product. 9. Properties of the plastic materials made from soy bean proteid and their physical and chemical tests. 10. Application of products manufactured from soy bean proteid.

The properties of the protein from soy beans, which is termed glycinin, are described, and its reactions with neutral salts, alkaline and acid reagents of various types enumerated. Phenols, naphthols, and the condensation products of formaldehyde with phenols and with other chemicals have the property of dissolving the glycinin with the formation of a thick viscous fluid, which is converted by heating into a hard, strong, insoluble and infusible substance. If the wet protein is used instead of the dry powder, a white, sticky substance is produced, which under the influence of heat and pressure gives a rigid, semi-transparent substance. Potassium bichromate glutinizes the wet protein into a very viscid adhesive paste of a reddish brown color, which is converted into an insoluble hard substance by autoxidation at the ordinary temperature. A transparent plastic material may be manufactured by subjecting the hydrolyzed protein directly to the action of formaldehyde, omitting the glutinizing process. Formaldehyde reacts with the protein in 2 stages, the first being almost instantaneous, but the second occurring slowly over the lapse of months. The result of the second reaction is an increase in the tensile strength of the substance.

Note: This is the earliest document seen (Oct. 2001) concerning hydrolyzed soy protein. Address: Kôgakuhakushi, Sendai, Japan.

2313. *Wochenschrift fuer Brauerei.* 1923. Ueber die Zerstoerungstemperatur der Koji-Diastase in waesseriger Loesung und die Wiederherstellung ihrer Wirksamkeit nach dem Erhitzen [On the lethal temperature of koji diastase in aquatic solution and the recovery of its action after heating (Abstract)]. 40(26):156. [1 ref. Ger]

• ***Summary:*** A German-language summary of the following English-language article: Miyake, Koji; Ito, Mitsuji. 1923. "On the lethal temperature of koji-diastase in aquatic solution and the recovery of its action after heating." *J. of Biochemistry* (Tokyo) 2:255-70.

2314. Yamaguchi, Hirô. 1923. Kôchô shiryô. 10, Daizu

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aburakasu no naichi ni okeru shôhi no genzai to shôrai [Harbin Investigation Document, No. 10. Present and future consumption of soybean meal after the extraction of oil on the mainland / interior]. Harbin, Manchuria: South Manchurian Railway Co., Harbin Office, Research Dept. 68 p. 22 cm. [Jap]*

• ***Summary:*** Note: In the title, it is not clear whether the word "mainland" refers to Japan or Manchuria. Address: Japan.

2315. Loew, Oscar. 1924. The soy bean, a superior crop. *Porto Rico Agricultural Experiment Station, Agricultural Extension Notes* No. 64. p. 1-2. Jan. 15.

• ***Summary:*** "The soy bean originated in Eastern Asia and has been introduced during the past 30 years into different countries of the world. It can be grown successfully even in a rather poor soil, in the absence of nitrogenous manure, provided the specific root-nodule bacteria are present. This plant is far superior to other leguminous crops, even those very rich in protein, as the lupin, which it equals in protein and highly surpasses in fat content. In fact, the soy bean is richer in fat than all other leguminous crops and is, therefore, sometimes called the oil bean. The soy bean does not contain alkaloids and bitter tasting matters like the lupin..."

A table compares the nutritional composition of the pea, common bean, lupin, and soy bean. "From the analyses it would appear to be of great advantage for the people of Porto Rico to replace the common bean now serving as an essential part of the daily food, by the soy bean, it providing a higher percentage of protein and fat... Since the Soy bean needs prolonged boiling until it reaches a sufficient degree of softness, it is best soaked for a day in water to which some soda and common salt are added (about a teaspoonful of each to half a liter) followed by washing two to three times with fresh water and then boiling for an hour or so. The taste of this dish is very agreeable.

"In Japan the soy bean serves for several preparations, called 'tofu,' 'yuba' and 'miso,' which might be prepared in Porto Rico. Also, a dressing or condiment similar to the English Worcestershire sauce, is prepared from the seeds." The preparation of tofu is described. It is "generally fried like cakes and represents an excellent food."

"The milky liquid can also doubtless be used as a suitable nutrient, but it can never replace the mother's or cow's milk for children, since the lime content is exceedingly small and the protein differs widely from the casein of the milk.

"In our trials with soy beans at the Experiment Station, Mayaguez, the results at first were disappointing. This was found to be due to the fact that the soil was not inoculated with the proper bacteria for assimilating nitrogen for the roots. We now have inoculated soil, and before planting on ground new to this crop inoculating material should be secured from the Station for mixing with the seed at the time of planting. When the soil is once inoculated it will remain so for all succeeding crops."

Note: Who was Dr. Oscar Loew and how did he learn about soyfoods? From 1897 to 1906 he was a Professor of Agricultural Chemistry at the Imperial University of Tokyo, Japan, where he wrote articles about soy sauce, tofu, soymilk, and yuba. In 1911 he was in Munich, Germany, where he wrote an article about soymilk. When he speaks of "our trials with soy beans at the Experiment Station, Mayaguez," he seems to indicate that he was living at the Station in Porto Rico in about 1924. Address: Mayaguez, Porto Rico.

2316. Slosson, Edwin E. 1924. Soy. *Scientific Monthly* 18:109, 111. Jan.

• ***Summary:*** "The recent rise in restaurant prices has sent economical Americans flocking to the chop sueys, where a savory and satisfying meal can still be obtained for a small sum. The Chinese, in their efforts to keep three hundred million people above the starvation point for three thousand years, have been forced to figure closely on food values... With us Americans meat has been the main part of the meal with vegetables on the side. With the Chinese this is reversed, and meat has in many cases been reduced to a condiment...

"The chief difficulty of a vegetarian diet is to get a sufficient amount and variety of proteins. Beans and peas are the richest in proteins, but they are not of the sort and proportion found in meats and needed for our muscle-making.

"But there is one exception and that is the soy-bean... The soy bean resembles animal foods in being rich in fat and protein and devoid of starch. What is more remarkable, the soy bean contains a dozen kinds of protein compounds that are the same as those found in milk. In fact a 'vegetable milk' can be made from soy beans and from this vegetable curds and cheese. These form a large part of the diet of Chinese and Japanese who abstain from animal food either because they are Buddhists or because they are poor. By milking the soy bean they can get ten times as much lacteal fluid per acre as if they pastured cows on the land. Italian physicians who used soy milk as infant food during the war report that it was better tolerated than cow's milk by some of the babies.

"The soy milk products have not yet come into use with us, but the American patron of the chop suey has acquired a taste for another product of the bean, the little glass cruet of brown sauce that seasons the rice. It looks and tastes like meat extract, such as we use in making beef tea, and is really much like it in composition and nutritive value. This shoyu or soy sauce is made by long fermentation and ripening of a mixture of beans and wheat in brine. The longer the process the better the product. Six months or a year may suffice for the masses, but to suit the taste of the Oriental connoisseur

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it must be sunned for five years or even thirty, the jars being patiently uncovered every day and covered every night or whenever it rains. Over two million barrels of soy sauce are made in Japan every year."

2317. Omega. 1924. Soya bean oil: Its production, properties, and applications. *Chemical Trade Journal and Chemical Engineer* (*London*) 74(1917):187-89. Feb. 15. [17 ref]
• ***Summary:*** Contents: Introduction. The extent of the soya bean industry: Japan, Manchuria, The United Kingdom trade: Imports of soya beans and soya bean oil, exports of soya oil and soya bean cake. Methods of production. Solvent extraction processes. Composition of soya bean oil. Properties of soya bean oil. Identification of the oil. Uses and applications of soya oil. Future of the industry.

Tables show: (1) Imports of soya bean oil to the USA (1918-1921). (2) Exports of soya beans, soya bean cake and soya bean oil from Manchuria (1915-1919). (3) Imports of soya beans to the UK from Russia, China, and Japan (tons and value, 1913, 1922, 1923) (4) Exports of soya oil from the UK (tons and value, 1913, 1922, 1923). (5) Exports of soya bean cake from the UK (tons and value, 1913, 1922, 1923). (6) Prices per ton of soya beans and soya bean oil in the UK (1914, 1920-24).

2318. Hamburger's 1924. The Lenten menu... (Ad). *Los Angeles Times.* March 6. p. 8.
• ***Summary:*** This ad features the "Delicatessen Department." Under fish sauces: "Harvey's Sauce, Japanese Shoyu Sauce, Oyster Cocktail Sauce, Tartar Sauce, Escoffier Sauce Diable,... Lee [sic, Lea] and Perrin's Genuine Worcestershire Sauce."

An illustration shows two people dining at a table with candles.

Note: Hamburger's was renamed "The May Co." (at the same location) by Sept. 1924. Address: Broadway at Eighth–Groceries–Fourth Floor. Phone: Broadway 3940.

2319. Nishimura, Torazô; Kinoshita, A.; Katsuyama, M. 1924. Kôji-kin shu haigô shiken hôkoku [Mixing test for koji starter used in shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 92. p. 479-564. March. [Jap]
Address: Jozo Shikensho. 1. Moto Gishi; 2. Gishi; 3. Joshu.

2320. Tanaka, Yasujiro. 1924. Shôyu kôji no saikô ondo ni tsuite [Maximum temperature during the process of shoyu koji manufacture]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 1(8):625-28. [Jap]
Address: Kumamoto Zeimu Kantoku Kyoku; Ken Sagaken, Gishi, Japan.

2321. Miyake, Koji; Tamachi, Ishio. 1924. On the nature of the acidity appearing after the addition of soybean cake to a rice field. *J. of Biochemistry* (*Tokyo*) 3(3):305-23. April. [18 ref]
• ***Summary:*** It is said that plants grow best in a neutral medium or soil. Therefore the effect of decomposing organic manure on the soil reaction has been examined by many researchers.

When soybean cake is added to a rice field, the soil water becomes more acidic, largely because of organic acid and carbon dioxide. "However, titratable acidity is due mainly to soluble iron, aluminium and manganese compounds combined with these acids." However, since the large amount of organic acid is largely combined with ammonia and other bases, the titratable acidity of the soil solution is not significantly affected. Address: Inst. of Agricultural Chemistry, Hokkaido Imperial Univ., Sapporo.

2322. F.H.H. 1924. A spring week-end at Choshi on the Cape Cod of Japan. *Christian Science Monitor.* May 6. p. 9.
• ***Summary:*** Describes a trip from urban Tokyo to rural Choshi. The tip of the promontory that juts out into the Pacific Ocean is crowned by a tall lighthouse of white stone, constructed 50 years ago. The pride of the neighborhood, the emblem "figures on all Choshi products, from the labels on the bottles of the excellent shoyu (soy sauce) to the bath towels that the Japanese inn presents to each departing guest."

Note: Choshi is a city located near the tip of a promontory on the Pacific Ocean, in Chiba prefecture, Japan. It lies almost due east of Central Tokyo, and is the easternmost city in the Greater Tokyo Area. The Tone River runs through it. Address: Special to the Monitor.

2323. Kodama, Renichi. 1924. Nature of the oil of soy bean miso. *Industrial and Engineering Chemistry* 16(5):523. May.
• ***Summary:*** This article begins: "Miso, a soy bean paste made by fermentation, is one of the most staple and nutritious food products of Japan. All the people like it, and it is used as a soup stock and seasoning in every home." Miso is made from polished rice fermented with *Aspergillus oryzae,* mixed with steamed soy beans, salt, and water. The yearly consumption amounts to about 400,000,000 kan (1 kan = 8.27 pounds), and its value is about 360,000,000 yen, or $180,000,000. There are two varieties of miso–the Edo or Tokyo miso, and the Sanshu or Haccho miso.

The preparation of both types of miso is described and the properties of the extracted oil studied. "The Sanshu miso is produced chiefly in the central part of Japan. It is made by inoculating the steamed soy bean with Koji mold and mixing with salt and water. This is also packed down under weights and kept for 1 or 2 years to ferment. The result is a dark brown paste with a salty taste."

The oil was extracted from the vacuum-dried miso of the two different varieties. Tables show: (1) The composition of

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"Edo miso" and "Sanshu" miso–in terms of the amount of rice, soy beans, salt, and water used to make each. (2) The properties of miso oils for the two types of miso. (3) The constants of soy bean oil, including specific gravity, melting point, solidification point, acid value, saponification value, iodine value, Hehner value, and R.M. value [Reichert-Meissl value].

The appearance of ordinary soy bean oil and of the oil of soy bean miso is practically identical. The decolorization of the oil with animal charcoal materially altered the above characteristics; the iodine value was greatly decreased, and the saponification and Hehner values were increased, the oil becoming nearly solid. The miso oil shows a greater Reichert-Meissl value and a smaller iodine value than soy bean oil.

Note: This is the earliest English-language document seen (March 2009) that uses the term "soy bean paste" to refer to miso, or that mentions "Edo miso" or "Sanshu miso." Address: Iwasaki Food Research Lab., Tokyo, Japan.

2324. *Chinese Economic Monthly.* 1924. Manchurian beans. 1(9):12-19. June. [Eng]

• ***Summary:*** "The principal export of Manchuria, and indeed of the whole of China, is the soya bean, which in its raw and manufactured states amounts to over 75 per cent of the value of the total exports of the Three Eastern Provinces. It would be no exaggeration to say, therefore, that the entire industry in this territory is concentrated on [soya] beans, their production, manufacture and barter. It is mainly the bean that provides the buying power of Manchuria, and stimulates its economic progress. From a primitive agricultural region Manchuria has developed along industrial lines mainly as a result of its stupendous [soya] bean resources."

Manchuria is "almost the sole supplier of soya beans to world markets. All attempts to cultivate beans out of China on any extensive scale have failed. 'Beans' is therefore always associated with Manchuria, and *vice versa.*

There are many soya bean varieties, but the yellow oliferous one (*huang-tou*) is the dominant variety; it is "subdivided into a number of kinds. The experimental field of the Manchurian Rural Economy Society cultivates no fewer than 200 varieties."

Chinese official statistics, which are usually low, estimate the area under soya beans in the whole of China [including Manchuria] at 12 million acres. Statistics from the Economic Bureau of the Chinese Eastern Railway, in the C.E.R. zone (Heilungkiang and a part of Kirin province), yellow soya beans are planted over an area of not less than 4.3 to 4.4 million acres, or 25% of the entire cultivated area, while in all 3 of the provinces of Manchuria the Bureau estimates that there are 8 million acres under cultivation. On average in Manchuria, 1 acre yields about ½ ton of soya beans. Thus, the total average production of soya beans in the whole of Manchuria may be estimated at more than 4 million tons, of which about 2.4 million tons (about 60%) are exported in raw and manufactured articles.

Owing to the density of the inner provinces of China, almost all the soya beans there are consumed locally. "Inner China looks not so much to the oil content of the bean as to the azotic stuffs [nitrogen] it contains. The export of soya beans and products from Inner China is very small and decreasing (5.5 million piculs in 1920 and 4.6 million piculs in 1922) while the exports from Manchuria continue to grow dramatically.

The world is now looking to the soya bean as one solution to its future food problems. Dr. Berczeller, a well-known Hungarian scientist, says: "It is a matter of the highest political importance that the West should learn the lesson of cheaper living as taught to them by the East in the adaptation of the soya bean as an article of food." After prolonged investigation, he claimed to have succeeded in creating from the yellow soya bean bread, milk, and flour, which were both inexpensive and palatable. Yet the taste of many soybean products (such as "bean flour" and "bean cheese") is unknown to Europeans.

"The extraction of oil from [soya] beans has as ancient an origin as the cultivation of the beans themselves. In the native Chinese mills it is still effected by means of the wedge press, the invention of which dates from the early days of the history of technics. The first steam bean-oil mill was opened toward the end of the last century at Yingkow [Yingkou]. At present such mills are counted in hundreds. Almost the entire bean oil export comes from steam mills. Several years ago the South Manchuria Railway Company erected a mill at Dairen for the extraction of oil with the aid of benzine. It is now under private management." Using the solvent method, 12% of the weight of the bean is extracted as oil, using the steam mill only 19%, and using the wedges presses less than 10%. Recently, due to perfected methods of refining, an oil named "Atzetko, made at Harbin by the Anglo-Chinese Company, has begun to be used in food by Europeans.

Before World War I, the price of soya beans was much lower than today. Today the main consumer of beancakes is Japan, were they are used as fertilizer on the rice fields. "However, there is one dark side of the picture" of soya beans in northern Manchuria. Manchurian bandits (*hunghutze*) are terrorizing and plundering the peasants.

Note 1. This is the earliest document seen (Nov. 2012) that uses the term "dark side" in connection with soya beans.

Tables show: (1) Soya bean cultivated area and production in the three provinces of Manchuria in 1923: Kirin province (center east): 1.6 million shan (1 shan = 1.8 acres) produced 1.5 million tons. Heilungkiang province (furthest north): 1.2 million shan produced 1.5 million tons. Fengtien province (later renamed Liaoning, furthest south): 1.2 million shan produced 1.5 million tons. Totals for Manchuria: 4 million shan (7,200,000 acres) and 3,700,000 tons.

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Note 2. This is the earliest document seen (March 2001) that gives statistics on soybean production in East Asia. (2) Export of soya beans and soya bean products from China proper. Source: 1922 Chinese Maritime Customs report. For the 3 years 1920, 1921, and 1922, gives the weight in millions of piculs (1 picul = 133.33 lb) and value in Hk. Tls. [Haikwan Taels; a monetary unit] of each of the following: Yellow [soya] beans: Grain [beans / seed], beancakes, bean oil, total. Black [soya] beans. Green [soya] beans. White [soya] beans. Other kinds. Total exclusive of yellow beans. Gross total. In percentages relative to 1920. (3) Exports from Manchuria only: Exactly the same years and products as Table 2. Note 3. One Haikwan Tael in 1920 equaled 6 shillings 6½ pence or $1.24 in gold coin; in 1922 it equaled 3 shillings 9 pence or $0.83 in gold coin.

(4) Re-import of soya beans and products into China in 1922. Yellow beans–4.9 million piculs worth 17.6 million Hk. Tls. Beancakes–6.3 million piculs worth 16.6 million Hk. Tls. Oil [soya]–0.2 million piculs worth 1.7 million Hk. Tls. Other [soya] beans–2.1 million piculs worth 7.1 million Hk. Tls.

(5) Net export of yellow soya beans from China in millions of piculs each year from 1920 to 1922: To Japan, To Dutch Indies, To Turkey, Persia, Egypt, etc. To Europe. To other countries. Via Vladivostok. Total. Note 4. Soya beans exported via Vladivostok are mostly directed to Europe (about 3 million piculs), with about 2.5 million piculs to Japan.

Note 5. In Table 5, "Turkey, Persia, Egypt, etc." is treated as one unit or geographical area. In 1920 this area imported from China 0.4 million piculs of soybeans, followed by 0.7 million in 1921 and 0.3 million in 1922. Although we know the amount of soybeans imported to the area, we cannot say for sure to which specific countries the soybeans were imported in this area (Turkey and/or Persia). Therefore, this may be the earliest document seen (Dec. 2007) concerning soybeans in Turkey. This document may contain the earliest date seen for soybeans in Turkey (1920-1922).

Note 6. This may be the earliest document seen (Dec. 2007) concerning soybeans in Persia (today's Iran). This document may contain the earliest date seen for soybeans in Persia (1920-1922).

Note 7. This is the earliest document seen (Dec. 2007) concerning soybeans in the Middle East / Near East (Persia, and/or Turkey–today's Iran). This document contains the earliest date seen for soybeans in the Middle East / Near East (Persia and Turkey) (1920-1922).

(6) Net export of [soya] beancakes from China in millions of piculs each year from 1920 to 1922: To Japan, To other countries, Via Vladivostok. Total. "Beancakes exported *via* Vladivostok are directed almost exclusively to Japan."

(7) Net export of [soya] bean oil from China in thousands of piculs each year from 1920 to 1922: To Japan, To Dutch Indies, To Turkey, Persia, Egypt, etc. To Europe. To United States of America. To other countries. Via Vladivostok. Total. A note states that Bean oil exported via Vladivostok is mostly directed to Europe and to countries of Asia Minor. All the other kinds of beans are distributed mostly in Japan, Korea, and along the coasts and islands of the Pacific Ocean.

(8) Chemical composition [as-is basis] of the three main soya bean varieties cultivated in North Manchuria: White Eyebrow (*pai mei*). Round Gold (*chin-yuan*). Dark Belly (*hei chi*). (9) Weight (in millions of poods) of soya beans and products carried on the Chinese Eastern Railway in 1920, 1921, 1922, and 1923. Also: Percentage of total carried. Weight of each exported to the South Manchurian Railway, and to the Ussuri Railway. Soya beans and their products are the principal cargo of the Chinese Eastern Railway; in 1923 they accounted for 49.0% of its total cargo, compared with only 24.6% in 1920.

2325. Tang, Chi Yu. 1924. An economic study of Chinese agriculture. PhD thesis, Cornell University, Ithaca, New York. 514 p. June. See p. 420-23. [2+ ref]

• ***Summary:*** In Part V, Chief Agricultural Enterprises, chapter 24 is titled "Soy beans." It begins: "China leads the world in the production of soy beans. Statistics on acreage and production of soy beans in China proper are lacking. The soy beans acreage in Manchuria, however, was estimated at 7,200,000 acres, and production 3,700,000 tons" (see *Chinese Economic Bulletin* No. 156, p. 9 {16 Feb. 1924}). "During the period 1891-1904, exports of soy beans and soy bean products were almost entirely absorbed by Japanese markets. The Russo-Japanese war in 1904 and 1905 stimulated the production of soy beans in Manchuria, After the war, the surplus beans had to be disposed of in some markets, and for the first time trial shipments were made by Japanese firms to English mills in 1908... During the period 1909-1922, acreage and production of soy beans increased by leaps and bounds" [in the USA].

The chapter then lists five major reasons that soy beans have become so important in China: "1. Soy beans thrive in a variety of climatic conditions. They do well in dry seasons and at the same time do not reduce greatly in yield in a wet season. 2. Since they are a leguminous crop, soy beans are grown to maintain soil fertility... 3. Soy beans have a high food value in comparison with other foods. They are especially rich in protein... 4. Many by-products are made from soy beans, including bean oil cake, bean meal, bean flour, bean bran, bean sprouts, bean coffee, bean milk and bean curd. Because of the large range of by-products that have been made, the price of soy beans has become stabilized... 5. Further expansion of soy bean production possible when North Manchurian lands are brought under cultivation."

Table 45 (p. 422) shows China's exports of soy beans,

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bean cake, and bean oil for the years 1913, 1920, 1921, and 1922 in piculs (133.33 lb) and taels (a monetary unit). Each of the three increased during this period which included World War. I. In 1922 exports of bean cake were worth the most, followed by soy beans and bean oil. Soy bean exports grew from 7,419,511 piculs in 1913 to 12,462,350 piculs in 1922. [Soy] bean oil grew from 49,817 piculs in 1913 to 12,294,006 piculs in 1922.

Table 46 (p. 423) shows the weight and value of these three products exported to various countries. Beans are mostly exported to Russia, Japan, and the Dutch Indies (in that order). Bean cake is mostly exported to Japan (86% of the total) and Russia. Relatively little bean oil is exported: it goes mainly to the "Turkey, Persia, Egypt, etc." [grouped as one unit] (380,000 piculs), Russia (250,000 piculs), Great Britain (246,000 piculs), the Netherlands (201,000 piculs), and the United States (116,000 piculs).

Note: This is the earliest English-language document seen (June 2013) that uses the term "bean bran" to refer to soy bran. Address: Cornell Univ., Ithaca, New York.

2326. Tomoyasu, R. 1924. Daizu no shihan-ryû no byôgenkin ni kansuru kenkyû-hô [The causal fungus of purple seed of soybean]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 11:310-15. June. [6 ref. Jap]
• ***Summary:*** The fungus was identified as *Cercosporina* sp. (Cercospora sp.). Address: Morioka Koto Norin Gakko.

2327. Osaki, Masao. 1924. Shôyu jôzô-hô ni tsuite. I-V. [On the method of shoyu brewing. I-V.]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 2(1):54. Aug. 15; 2(2):127, 2(3):274-81, 2(4):359-65, 444. [Jap]
Address: Osaka Koto Kogyo Gakko, Kyoju, Japan.

2328. *Ministerio de Agricultura de la Nacion* (*Buenos Aires, Argentina*), *Circular.* 1924. La soja: Conferencia con ilustraciones [The soybean: Illustrated lecture with 50 lantern slides]. No. 307. 16 p. Aug. 16. Reissued in Feb. 1932. [Spa]
• ***Summary:*** This is a Spanish translation of USDA Syllabus No. 35–Illustrated lecture on soy beans by W.J. Morse and H.B. Hendrick (1919). The slides and their captions are identical. The opening sentence, a mistranslation, reads: "The soy bean originated in the southeast of Africa [the original says "Asia"], and has been cultivated in China, Korea, and Japan since ancient times." Address: Seccion Propaganda e Informes, Buenos Aires, Argentina.

2329. Kinoshita, Asakichi. 1924. [Time and temperature of pasteurization of bottled shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 2(1):11. [Jap]*

2330. Piper, Charles V. 1924. Forage plants and their culture. Revised edition. New York, NY: Macmillan Co. xxv + 671 p. Aug. See p. 571-96. Illust. Index. 19 cm. [9 ref]
• ***Summary:*** Contents of Chapter 27, "Soybeans": Agricultural history. Botany. Description. Soil preferences. Climatic relations. Importance. Statistics. Desirable characters in soybean varieties. Commercial varieties. Preparation of soil and cultivation. Rate of seeding. Time of seeding. Method of seeding. Depth of seeding. Inoculation. Life period. Time to cut for hay. Hay yields. Fertilizers. Soybean mixtures. Silage. Rotations. Feeding value of soybean hay. Pasturage. Seed production. Storage. Pollination. Seed yield. Feeding the seed. Seeds. Pests. Breeding. Soybeans and cowpeas compared.

"The soybean was first cultivated in the United States in 1804, but it apparently attracted but little attention until 1854, when two varieties were brought back from Japan by the Perry expedition. Other varieties were introduced from time to time, among them the Mammoth, which was introduced previous to 1882. It is largely due to the introduction of this variety that the soybean has become an important crop in the Southern States and a large percentage of the acreage there is still planted to this variety. Between the years 1900 and 1920, the United States Department of Agriculture introduced about 800 varieties from all portions of the Orient."

Chapter 7, "The statistics of forage crops for the United States," gives the following statistics for soybeans: (1) "Relative importance of major crop plants producing harvested forage according to the number of cattle each would support for one year, 1919" (p. 129): The top 10 are corn (50% of total), oats, alfalfa, timothy, clovers, wheat, wild hays, sorghums, misc. tame hays, barley. Soybeans are no. 15 (0.2% of total). (2) Major crops pastured off... 1919 (p. 130): In descending order of production (1,000 tons)– Corn 3,525, cowpeas 800, velvet beans 800, peanuts 750, soybeans 160. (3) Annual legumes cut for hay (1,000 acres, p. 133): Cowpeas 750, soybeans 550, peanuts 400, vetch 150. (4) Silage crops (p. 133-34): Probably more than 90% of the total silage preserved was corn. Very small quantities of sunflowers, cowpeas, soybeans etc. make up that balance. (5). Major hay crops in the United States, 1919 (million tons produced, p. 137). The top 10 are timothy 25.47, alfalfa 18.8, clovers 16.8, wild grasses 15.6, sorghums 7.9, oats 2.4, wheat 1.8, barley 1.3, sudan grass 1.0, millet 1.0. Soybeans are no. 14 at 0.5.

The chapter titled "Vetches and vetch-like plants" contains a section (p. 547) on Square-pod pea (*Lotus tetragonolobus*–later known as winged bean, *Psophocarpus tetragonolobus*).

The chapter titled "Other warm season annual legumes" contains a section (p. 602-05) on Florida velvet bean (*Stizolobium deeringianum*). It was introduced into Florida prior to 1875. An earlier maturing selection is called the Georgia velvet bean. Note: This book does not mention the regular velvet bean (genus *Mucuna*). Address: Agrostologist in Charge of Forage Crop Investigations, Bureau of Plant

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Industry, USDA.

2331. *Japan Magazine* (*The*)*: A Representative Monthly of Things Japanese.* 1924. Japanese child games: The "Oden-ya." 15(1):10-11. Sept.
• ***Summary:*** Page 10: "*Oden* is a kind of Japanese popular food." Among the many things it contains are *yaki-dofu* (broiled beancurd), *ganmodoki* (bean-curd fried with condiments), potatoes, etc., which are cooked in a soup of soy [sauce], after which they are skewered and eaten, usually with mustard. The seller of *oden* is called *oden-ya.*

In this game, "boys and girls imitate this familiar food hawking in their play. It is an outdoor game [played] by at least 6 or 7 children.

"There are two taggers chosen at first. One hawks *oden* and another buys, the rest forming the *hanpen, chikuwa, konnyaku, yaki-dofu, ganmodoki* and potatoes respectively. The *oden-ya* arranges in a line these foods beside him, waiting for one coming to buy them..."

Note 1. This is the earliest English-language document seen (April 2013) that contains the term *yaki-dofu* or the term "broiled beancurd." Both refer to grilled tofu.

Note 2. This is the earliest English-language document seen (April 2013) that contains the word *ganmodoki* (written as one word); it refers to deep-fried tofu burgers.

Note: This remarkable periodical was founded by Baron Hirayama, P.C., in 1910.

2332. Matsuoka, Chokichi. 1924. Japanese soy and method of making the same. *U.S. Patent* 1,514,554. Nov. 4. 3 p. Application filed 3 Dec. 1923.
• ***Summary:*** Crushed soy bean is extracted with boiling water, and the extract is treated with salt and *Aspergillus* and fermented at 30º-50ºC for 3 weeks. The product is filtered and sterilized by heating at 100ºC. Address: Los Angeles, California.

2333. Nishiwaki, Yasukichi. 1924. Soja-Bereitung mit *Oidium lupuli*, *Aspergillus oryzae*, und *Rhizopus japonicus* [Preparation of soy sauce with cultures of *Oidium lupuli*, *Aspergillus oryzae*, and *Rhizopus japonicus*]. *Zentralblatt fuer Bakteriologie. Series 2.* 63(1/8):28-30. Nov. 27. [2 ref. Ger]
• ***Summary:*** The author reports experiments concerning the production of soy sauce using three different types of mold: Oidium [one of the early names for Neurospora before the sexual stage was described in 1927], Aspergillus (the mold generally used in soy sauce production in Japan), and Rhizopus (the mold widely used to make tempeh). Surprisingly, the soy sauce fermented with Oidium was considered to be the best quality. It can also be used to make good quality miso. The quality of soy sauce made with Rhizopus molds was considered to be poor, and the yield of soy sauce was low. Onchom is not mentioned. Address: Professor, Technischen Hochschule zu Osaka, Japan.

2334. Nishiwaki, Yasukichi. 1924. Biologische Untersuchungen ueber den Koji-Pilz des Okazaki-Hatchomiso-Koji und der Kaboch-Bana des Tome-Koji [Biological investigations on the koji mold of Okazaki Hatcho miso koji and the "orange flowers" of "tome koji"]. *Zentralblatt fuer Bakteriologie. Series 2.* 63(1/8):25-28. Nov. 27. [2 ref. Ger]
• ***Summary:*** "On Tome-Koji, a type of koji produced during the warmer times of the year, one can often observe that the surface is covered with a red- to reddish-yellow mycelium of mold. Because of its yellowish-red [orange] coloring, which is reminiscent of the Japanese cucurbit [pumpkin] named Kabocha, this koji is usually called *Kabochabana* ("Kabocha flower"). Japanese koji manufacturers ascribe no significance to the appearance of this mold and consider it harmless since the quality of the Tome or Miso made from this koji is not found objectionable. In the production of koji for Okazaki Hatcho Miso, a large quantities of this yellowish-red mold appear and, in fact, the manufacturers consider this type of koji as the best, since the Okazaki Hatcho miso made from it is regarded as the best.

"In 1911, through the friendliness of manufacturers Aoki, Hayakawa, Hattori, and Ito, I obtained samples of *Kabochabana,* which I investigated. I became convinced that the mold in question was a type of fungi imperfecti, the *Oidium lupuli* Matthews & Lott = *Monilia sitophila* Mont. (Saccardo)." Note: The genera Oidium and Monilia were later renamed Neurospora.

The author concludes that this mold is especially found on Hatcho miso koji. He notes that in 1901 Went reported that in Java, this mold plays an important role, because of its enzymes, in the production of ontjom, a good-tasting cake made by fermentation of peanuts. Address: Prof., Technischen Hochschule, Osaka, Japan.

2335. Muramatsu, Syunsuke [Shunsuke]. 1924. On the composition of the soy bean. *Bulletin of the Imperial College of Agriculture and Forestry, Morioka* No. 7. 52 p. Nov. [15 ref. Eng]
• ***Summary:*** Contents: I. Chemical studies on the soy bean proteins (p. 1-23; 15 ref).

II. On the starch of soy bean (p. 25-30; 0 ref). Illustrations show (after p. 26): (1) Section of a green seed stained with iodine solution. (2) Section of a ripened seed stained with iodine solution. (3) Section of an imperfectly ripened seed stained with iodine solution. (4) Ditto. (5) Spermoderm of a green seed stained with iodine solution, showing that its palisade cells contain starch granules. (6) Spermoderm of a ripened seed stained with iodine solution. ps = Palisade cell. ed = Endosperm. (7) Section of a cotyledon of a green seed stained with iodine solution, showing the starch granules in it. (8). Ditto, a ripened seed.

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(9) Section of a cotyledon of a green seed showing the mode of aggregation of starch granules in the cell. (10). Starch granules X 1000 magnification.

III. On the natural soap occurring in soy bean (p. 31-41; 0 ref). Illustration (p. 38): Crystals of hispidic acid X 450 magnification.

IV. On the preparation of tofu (p. 43-52; 0 ref). Contents of part IV, "On the preparation of tofu." Introduction." Introduction. Raw materials: Soy bean, nigari (the composition of each is given). The method of preparation of tofu. An improvement for the preparation of tofu (using calcium chloride as a coagulant to increase the calcium content and quality). Conclusion.

It is said the method for preparing tofu was developed in China during the Han dynasty, and was brought to Japan during the rule of Toyotomi Hideyoshi (1585) from Korea. The author analyzed the composition of 7 varieties of soybeans used to make tofu. They contained on average 12.29% moisture, 43.18% crude protein, and 18.72% crude fat. The smaller beans contained more protein and gave higher yields of tofu. Address: Morioka Koto Norin Gakko, Nogei Kagaku Jikken-shitsu, Morioka, Japan.

2336. Slosson, Edwin E. 1924. Soy. *School Science & Mathematics* 24(8):855-56. Nov. Whole No. 208. [2 ref]
• ***Summary:*** This article is reprinted from *Scientific Monthly* (Jan. 1924, p. 109, 111).

2337. Dorsett, P.H.; Dorsett, Jim H. 1924-1927. Agricultural explorations–Japan, Korea, Manchuria and Northeastern China, 1924-26.
• ***Summary:*** This set of microfilms, located in the National Archives, is part of a larger collection titled "Expedition Reports of the Office of Foreign Seed and Plant Introduction of the [U.S.] Department of Agriculture 1900-1938." The records reproduced in the microfilm publication are from *Records of the Bureau of Plant Industry, Soils and Agricultural Engineering, Record Group 54*–also known as Microfilm M840.

The set is occasionally cited incorrectly as "Plant hunting in northeastern China." However, so far as we know, no book or PhD thesis, other than the report in the National Archives Record Group 54, has ever been published. Note: We highly recommend this important USDA expedition to East Asia as the subject of a PhD thesis or book. Many new soybean varieties were introduced by this expedition.

Dorsett kept a daily log of his activities during the years 1924 to 1927; the logs are in the custody of the National Archives and microfilm copies may be found on Microfilm M840.

An index to Microfilm M840, found in the National Archives & Records Administration (US) (NARA) microfilm catalog is available in PDF format.

The microfilms concerning the 1924-26 Dorsett expedition are found in RG-54 on Rolls 11-15, Volumes 40-54, and Roll 20, Volume 73.

Another part of this expedition is: "Clips from Motion Pictures Made by P. Howard Dorsett and Jim Dorsett, compiled 1925-1926.

"ARC Identifier 516517 / Local Identifier 54-FSD.

"Series from Record Group 54: Records of the Bureau of Plant Industry, Soils, and Agricultural Engineering, 1853–1977.

"Scope and Content: These surveys, conducted over several years by P. Howard Dorsett and W.J. Morse, respectively, resulted in the collection of some 3,000 new varieties of soybeans from China, Manchuria, Korea, and Sakhalin Island, U.S.S.R. The images in this series are a reference file, apparently produced by the Motion Picture Laboratory of the Department of Agriculture, from motion pictures produced during the surveys of P. Howard Dorsett. His son, Jim, accompanied his father on these surveys and shot the motion picture footage. After the 1926 survey, Jim Dorsett joined the staff of the National Geographic Society as a photographer; he died in 1927. The series consists of 1 to 4–frame opening segments from each film, with accompanying caption for the subject contents of each film. Covering the years 1925 and 1926, the films documented the Dorsetts' journeys to Manchuria, China, Ceylon, Java, and Sumatra. In addition to footage of different varieties of soybeans found during the surveys, these film clips also show examples of indigenous flowers, plants, and trees, including wild peony (500), sorghum (313), Dutchman's Pipe (331), the King Coconut (405), and the Cannon Ball Tree (480).

"The camera used 35mm film wound onto special cartridges, and produced 18 x 24mm images. Duplicate positives, negatives, and contact prints have been made from these film clips. The cellulose nitrate and cellulose acetate film (probably made in the 1950's as a copy) are unstable and should not be used. The whereabouts of the motion pictures, from which these clips were taken, are unknown."

2338. Dorsett, Palemon Howard. 1924-1930. Photographs, notes, and observations on vegetables and seasoning plants of northern China, Manchuria, and Japan compiled almost wholly from agricultural exploration reports, 1924-26 and 1929-30. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. *
• ***Summary:*** One microfilm copy is at the National Archives in Washington, DC, in Records of the Bureau of Plant Industry, Soils, and Agricultural Engineering, Record Group 54. See: "National Archives Microfilm Publication No. M840. Expedition Reports of the Office of Foreign Seed and Plant Introduction of the Department of Agriculture, 1900–1938." Roll 20, volume 73. This microfilm roll may also be available for viewing or duplication at one of the

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various regional branches of the National Archives (e.g. San Bruno, California). Address: Agricultural Explorers, USDA, Washington, DC.

2339. Chôsen Shokusan Ginko Chôsa-ka. 1924. Chôsen no daizu [Korea's soybeans]. Keijo [Seoul], Korea: Chôsen Shokusan Ginko Chôsa-ka. 80 + [2] p. Illust. 23 cm. Series: Chosen Shohinshi. [Jap]*
• ***Summary:*** About the soybean industry in Korea.

2340. Fujii, M. 1924. [Studies on Japanese shoyu. Influence of shoyu (Kikkoman) on digestion of foods]. *Minami Manshu Igakukai* (*South Manchuria Medicine*) 12:243-. [Jap]*

2341. Kikuchi, R. 1924. On a disease of the soybean caused by *Cercosporina*. *Utsunomiya Agricultural College, Bulletin* No. 1. p. 1-19. *
• ***Summary:*** A purple-spot disease caused by *Cercosporina* sp. was found on soybean seeds in Japan. The morphology of the fungus is described.

2342. Kinoshita, Asakichi. 1924. [Relation between the ripening of tastes and bacteria of shoyu]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 256. p. 151-55. [Jap]*

2343. Kinoshita, Asakichi. 1924. Shôyu jôzô ni wa ikanaru shio ga mottomo tekitô de aru ka [What salt is most suitable for shoyu brewing?]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 19(10):14-16. [Jap]
Address: Jozo Shikensho Gishi, Japan.

2344. Kodama, -? 1924. Soja miso oel [Soy miso oil?]. *Chemische Umschau auf dem Gebiete der Fette, Oele, Wachse und Harze* 31:217. [Ger]*

2345. Matsumoto, K. 1924. Shôyu no chûwa oyobi hiire ni yotte chinden suru rinkagôbutsu [Phosphorus compound precipitate from neutralization and pasteurization of shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 19(6):14-18. [Jap]
Address: Jozo Shikensho Gishi, Nôgaku-shi, Japan.

2346. Matsumoto, K. 1924. Shôyu jôzô ni funmatsu kôbo ôyôbi nyûsan kinrui no ôyô [Application of powdered yeast and lactic acid bacteria for shoyu brewing]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 19(8):15-68. [Jap]
Address: Jozo Shikensho Gishi, Kôgaku-shi, Japan.

2347. *Minami Manshu Tetsudo K.K., Shomubu, Chosaka, Chosa Shiryo* (*South Manchuria Railway Co., Survey Research Documents*). 1924. Beikoku no daizu to mameabura [American soybeans and soy oil]. No. 29. 169 p. [30+ ref. Jap]*
Address: Dairen, Manchuria.

2348. Nishimura, Torazô; Kinoshita, A.; Katsuyama, M. 1924. Sanrui shinseki daizu sei kôji shiyô shiken [A test manufacturing soy sauce with koji that was made using soybeans submerged in acidic water]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 92. p. 372-80. [Jap]
Address: Jozo Shikensho. 1. Moto Gishi; 2. Gishi; 3. Joshu.

2349. Osaki, Masao. 1924. [Pale-colored and dark-colored of shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 1:584. [Jap]*

2350. Sanko, I. 1924. [Soybean culture]. *South Manchuria Railway Co., Bureau of Plant Industry, Mem.* No. 20. 510 p. References on p. 353-98. [20+ ref. Jap]*

2351. Tanaka, Y. 1924. Shôyu koji no saikô ondo ni tsuite [Maximum temperature during the production of shoyu koji]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 19(4):43-46. [Jap]
Address: Kumamoto Zeimu Kantoku Kyoku Gijutsukan, Japan.

2352. Tochinai, Gingoro. 1924. [The soy bean and its cultivation in Manchuria]. *Industrial Materials, Bureau of Agriculture, South Manchuria Railway Co.* 20:1-2, 1-20, 1-510. 14 plates. [Jap]*

2353. Yasumori, Matsunosuke. 1924. Manshû ni okeru yubôgyô [The oil producing industry in Manchuria]. *Minami Manshu Tetsudo K.K., Shomubu, Chosaka, Mantetsu Chosa Shiryo* (*South Manchuria Railway Co., Survey Research Documents*) No. 23. 788 p. [Jap]*
Address: Manchuria.

2354. Aston, W.G. trans. 1924. Nihongi: Chronicles of Japan from the earliest times to A.D. 697. 2 vols. in 1. London: Kegan Paul, Trench, Trubner & Co., Ltd.; New York: E.P. Dutton & Co. xxiii + 443 p. See p. 32-33. Illust. Index. 24 cm. [Eng]
• ***Summary:*** This is a reissue (two volumes in one) of the original 1896 edition published by the Japan Society.
Address: C.M.G., England.

2355. Hawaii Shimpo-sha (The Hawaii Shimpo). comp. 1924. Hawai Nihonjin nenkan [Hawaiian-Japanese annual. No. 19]. Honolulu, Hawaii: Hawaii Shimpô-sha (The Hawaii Shimpo). [Jap]*
• ***Summary:*** Name of company with diacritics is: Hawaii Shimpô-sha. Address: Los Angeles.

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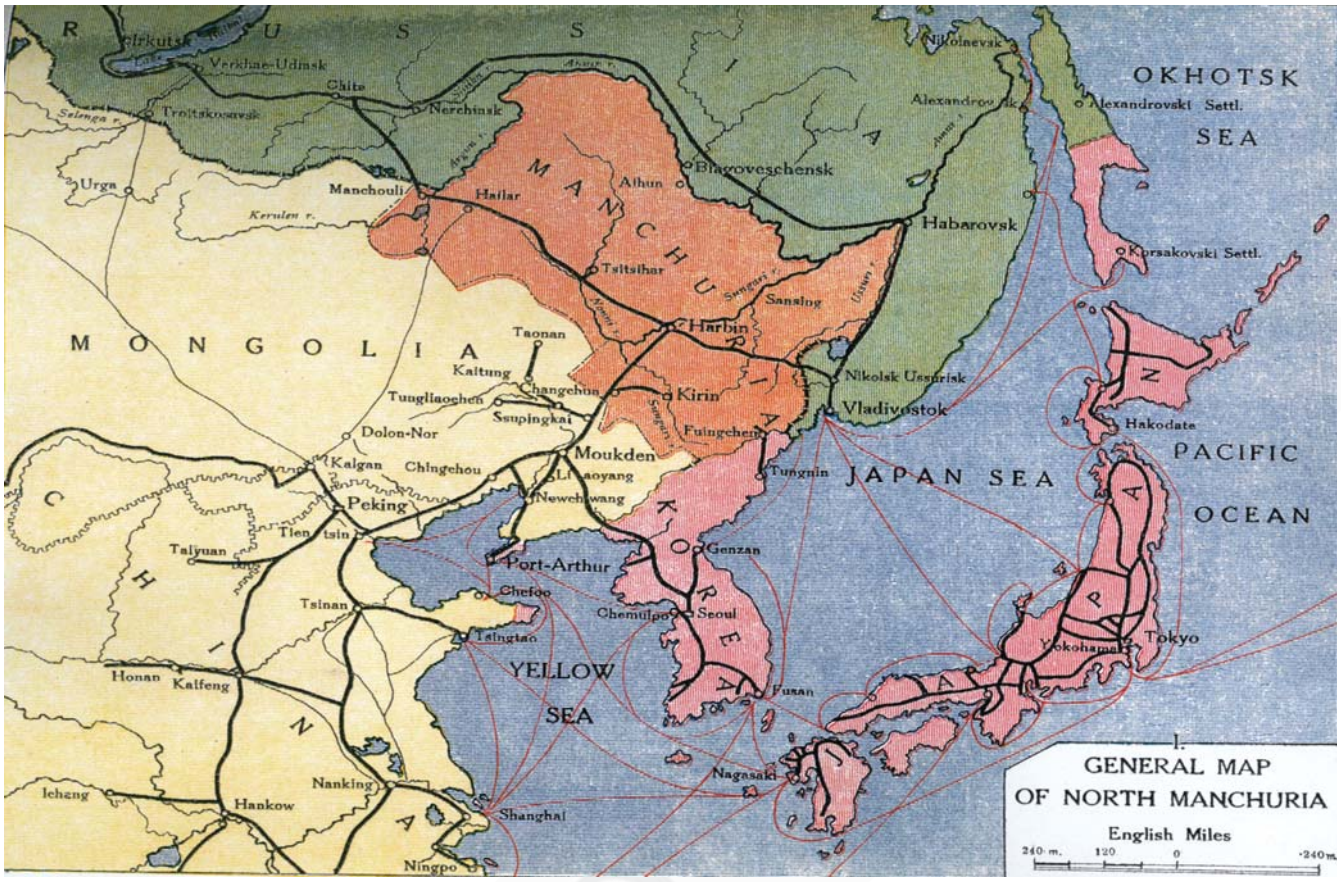

2356. Mikhoilov, I.A.; Lilliestrom, T.L.; Skerst, A.G. 1924. North Manchuria and the Chinese Eastern Railway. Harbin, Manchuria, China: Chinese Eastern Railway Printing Office (Economic Bureau). xvii + 454 p. Illust. Maps. No index. 30 cm. Reprinted in 1982 by Garland Publishing Co.

• ***Summary:*** Partial contents: Preface. 1. North Manchuria. 2. Economic structure. 3. Administrative division. 4. A brief history of the railway. 5. Agriculture. 6. The cereal trade. 7. Horses and cattle... 14. The [soy] bean oil industry... 16. Outline of the evolution of trade in North Manchuria. 17. Present status of the foreign trade. 18. The interior trade. 19. The currency system. 20. Credit. 21. Ways of communication. 22. The Chinese Eastern Railway.

Chapter 5: "Beans [soy], kaoliang and corn are usually sown by hand, the seeds being planted at certain intervals along the ridges." Beans are harvested at the beginning of September (p. 53).

In the section on "Field crops" is a long subsection which begins: "Beans: Soya beans unquestionably hold the foremost position among all the field crops" (p. 54-55).

A table (p. 63) shows the distribution of wheat, soybeans, and other crops in the seven regions of North Manchuria. The area of soybeans (in 1,000 acres) is as follows: Tsitsihar (165), Anta (1,230), Harbin (635), Lower Sungari (460), Potune (440), Southern (1,030), and Eastern (360). On average, 24.7% of the total area in each region is planted to soybeans. The total soybean area is 4.32 million acres.

Chapter 6: "Beans [soy] have been cultivated in North Manchuria for a long time, but the entire production of beans was formerly consumed locally. It was only after beancakes, in the middle of the 19th century, came into use for fertilizing purposes that beans found a wide market."

In the 1870s, the export of soybeans from all of Manchuria (South and North), according to Chinese customs figures, was limited to a yearly average of 100,000 tons of beans, 65,000 tons of beancakes, and 1,000 tons of bean oil, at a total value of approximately 1,350,000 gold dollars. After the Sino-Japanese War (in 1895), "beans and beancakes penetrated into Japan, and after the Russo-Japanese War (1904-1905), when the work of the Chinese Eastern Railway was already under way, these products found even more distant markets.

"The European war [1914-1918] served as a new impetus to the growth of the production of beans and the bean oil industry; the demand for bean oil became particularly strong" (p. 75).

Another section on [soy] beans (p. 111-14) discusses their important role as a export crop.

[Soy] beans and their changing price are also discussed in the sections on "Wheat" and on "Kaoliang" in Chapter 6

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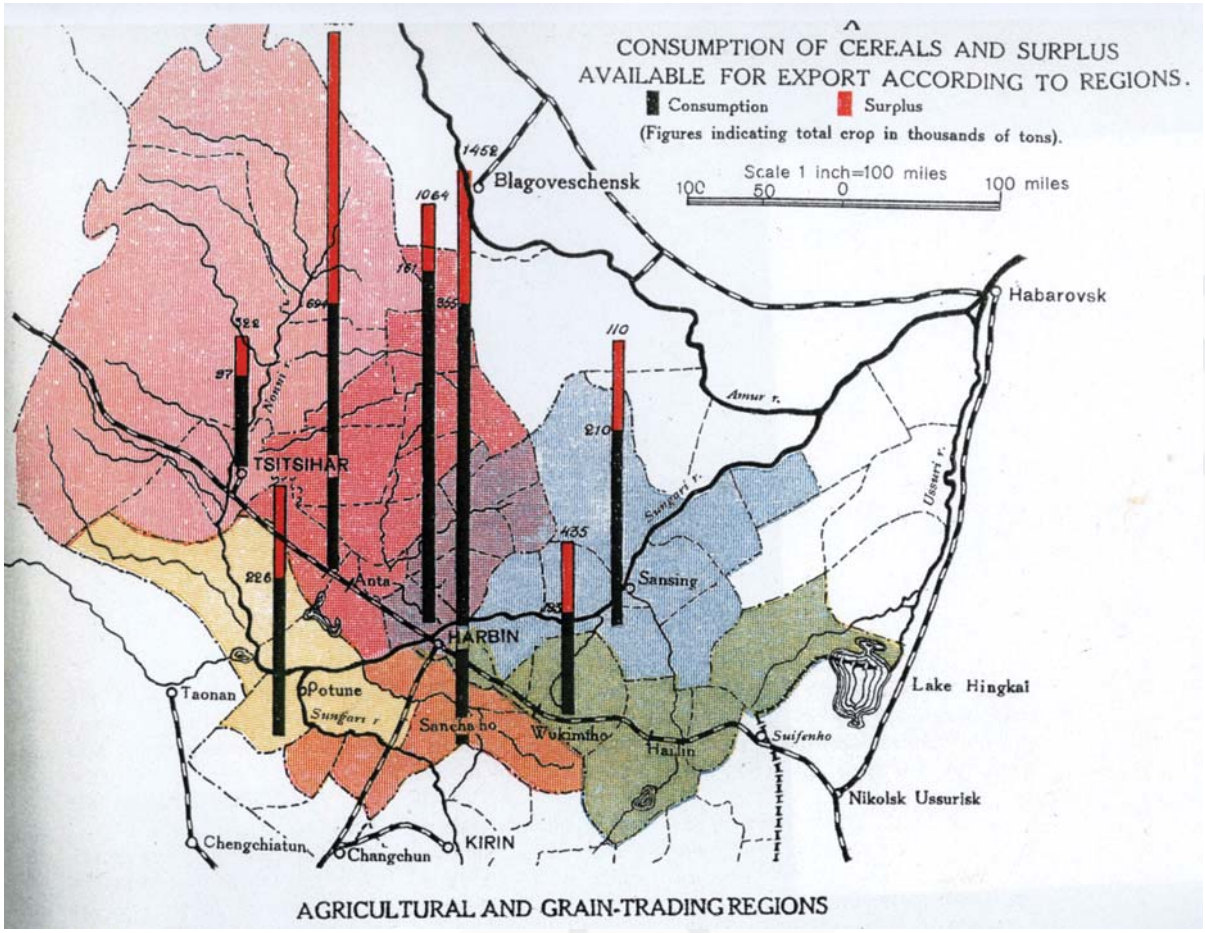

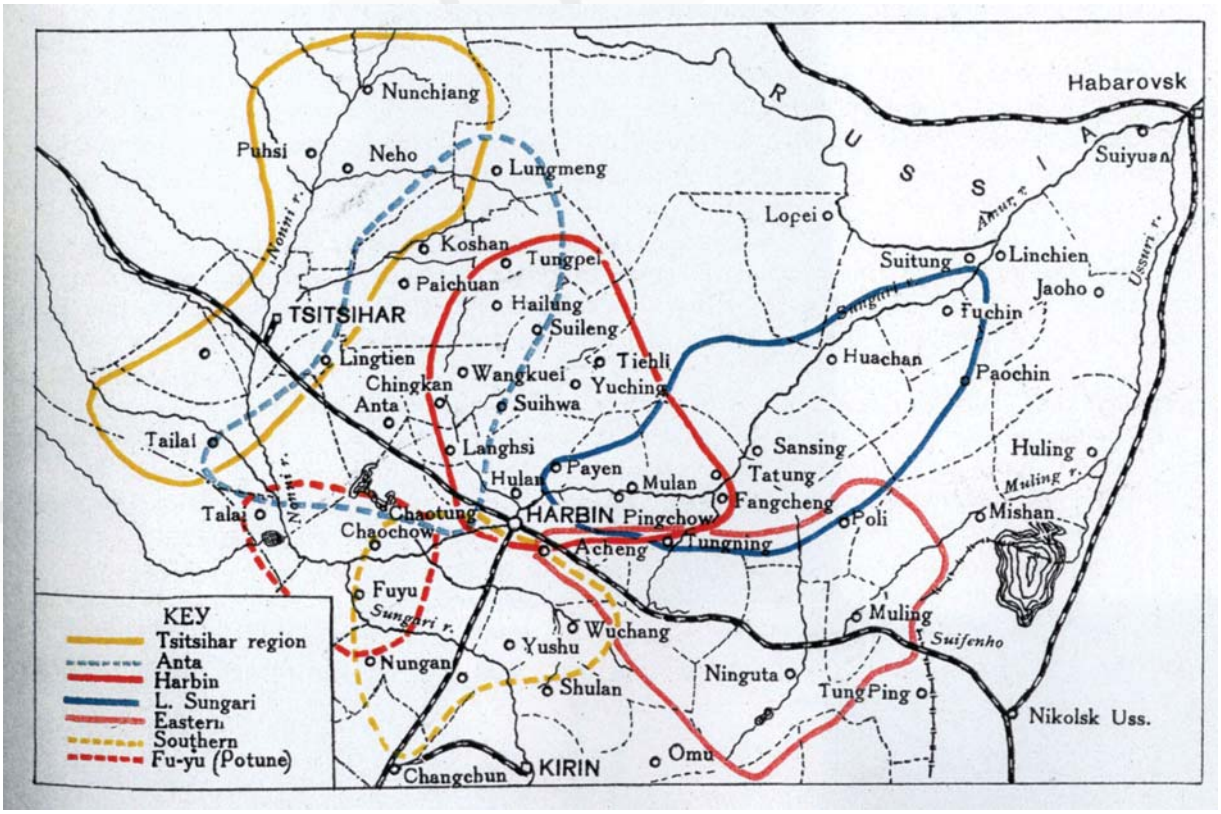

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on pages 117-22.

In Chapter 22, the section titled "General development of the country" states (p. 408-09): "With the above in view three *agricultural experimental farms* were opened:

"1. At Harbin, in the neighborhood of Old Harbin, with a total area of 220 acres;

"2. At *Echo* station, with a total area of 270 acres,...

"In 1923 the cultivated area of these fields amounted to 177 acres at the Harbin farm, 208 acres at Anta and 143 acres at Echo station.

"Many hundreds of agricultural plants are being experimented with, such as: wheat, [soy] beans, rice, Indian corn (maize), flax and others with a view to selecting the best varieties.

"Special attention is given to the developing of beans yielding a maximum of oil, with a short growing period,..."

Note 1. The Echo Station, which was located near the Muktan Kiang valley in Manchuria, is also mentioned on other pages: The upper course of the Mutanchiang River flows from the city of Ninguta to its confluence with the Chinese Eastern Railway (C.E.R.) at station Echo (p. 384). A photo shows the apiary of the C.E.R. at Echo (p. 427). A photo shows the railway bridge over the river "at station Echo" (p. 433). A summer resort has been arranged on the C.E.R. at Echo (p. 434).

Note 2. There are many pages of large ads at the front and rear of this book. There are also some useful maps: A general map faces p. 8, an economic map faces p. 16, and an agricultural map faces p. 80. Address: Harbin, China.

2357. Minami Manshû Tetsudô K.K. Kôgyô-bu. Nômu-ka. [South Manchuria Railway Co., Industrial Div. Bureau of Agriculture]. 1924. Daizu no kakô [Soybean processing]. Dairen, Manchuria: SMRC. 777 p. 30 cm. (Sangyo Shiryo 21). [250 ref. Jap]

• ***Summary:*** Name of company with diacritics is: Minami Manshû Tetsudô K.K. Kôgyô-bu. Nômu-ka. This important, major work was written by Yoshitane Satô. Contents: Photos (on unnumbered pages at the front of the book) show 16 scenes of soybean transportation, storage, and processing in Manchuria, as follows: (1) Mule drivers whipping mules trying to pull carts loaded with large sacks of soybeans over muddy roads. (2) Cylindrical osier storage bins for soybeans. (3) Row upon row of sacks of soybeans piled high in storage near docks. (4) Soy sauce being made in a courtyard; each earthenware jar is covered with a woven conical lid. (5) The inside of a huge and modern soy sauce plant. (6) Wooden kegs and glass bottles of Yamasa shoyu. (7) Soy sprouts (*daizu moyashi*) growing in round woven baskets. (8-11) Soy oil being pressed using vertical screw presses [as an alternative to hydraulic presses]–four views. (12) Boilers used in a soybean mill. (13) A wooden barrel of soybean oil being sealed. (14) Soy oil packaged in many small containers, each surrounded by a wicker basket. (15) Round soybean cakes stacked high on railway flatcars. (16) The inside of a modern soy oil factory.

Note 1. This is the earliest Japanese-language document seen (Jan. 2013) that uses the term *daizu moyashi* to refer to soy sprouts.

Contents: 1. Current status of soybean production and consumption: A. Production: Overview (p. 2), Japan (p. 4), Korea (p. 12), Manchuria (p. 16), China (except 3 eastern provinces, but including Eastern Inner Mongolia, p. 31), USA (p. 34), British colonies (p. 37), European countries (p. 40). B. Consumption: Japan (p. 41), Korea (p. 52), Manchuria (p. 57), China (p. 59), Dutch East Indies (Indonesia, p. 60), USA (p. 61), European countries (p. 63).

2. Characteristics of soybeans: A. From a physical sciences viewpoint (p. 67): Structure (overview, cotyledons, hypocotyl, seed coat), contents of each system (p. 70), appearance (p. 73; color, gloss, shape, size, hilum (*fusuma*) color, young plumule leaf color, ratio of seed to seed coat). B. From chemical viewpoint (p. 82): General composition, structure of each component (p. 109; protein, oil, carbohydrate, ash/minerals, vitamins). C. Appearance and relationship between oil and protein content (p. 126): Oil and protein color related to color, glossiness, shape, size, hilum color, young plumule leaf color. D. Evaluating soybean quality (p. 140): Overview, key points (sizes, shapes, colors, glossiness, hilum color, young plumule leaf color, ratio of seed coat to seed, dryness of seed, volume, weight, smell, mixing of different varieties, ratio of imperfect seeds, amount of other types of seeds), collection of materials for testing, testing and evaluating commercial soybeans.

3. Soybean usage and processing (p. 175). A. One view of main usage of soybeans. B. Nutritional value of soybeans as food (p. 183): Nutritional value of soy protein. C. Processed soyfoods (p. 208): Soy sprouts (p. 208), natto (*itohiki nattô,* p. 212, Hamanatto, p. 224), types of tofu (regular tofu [*nama-dôfu,* p. 226], *kori-dofu* or *koya-dofu,* p. 240, aburaage, p. 245, tofu curds [*tofu nô,* p. 247], hard tofu [*tofu-kan,* p. 247], fragrant hard tofu [*kô-kan,* p. 248], *senchô tofu,* p. 249, fermented tofu [*nyûfu or funyû,* p. 249]), *tofu-p'i* or yuba (p. 256), soymilk and artificial cow's milk, p. 259, soybean flour raw, or roasted (kinako, p. 263), shoyu (p. 266; overview of miso and shoyu, Japanese traditional regular shoyu, p. 267, Japanese traditional special shoyu and tamari, p. 269, Chinese soy sauce, p. 272, recent shoyu research and development, p. 274), miso (p. 280; Japanese traditional regular miso, Japanese traditional special and processed miso, p. 282, Chinese miso, recent miso research and development, p, 285). D. Soybeans as feed or fodder (p. 287; green soybeans as feed, p. 290): Fresh forage, dried forage or hay. E. Soybeans as manure or fertilizer (*hiryô,* p. 297; in the Kaijô area of Manchuria, have been roasted and steamed, and mixed with compost, and used for green manure (*ryokuhi*) or soybean cake (*daizu kasu*). This method has also been used in the northeastern provinces (*Tohoku Chiho*) of Japan in rice

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fields). F. Soybeans as oilseeds (p. 302). G. Use of soybean protein in industrial products (p. 304).

4. The soy oil extraction industry (p. 305): A. Methods of removing the oil (origins, traditional methods, hydraulic pressing, extraction method, p. 340). B. Advantages and disadvantages of each method (p. 348). C. The soy oil industry in Manchuria (p. 357): History of development, important places for soy oil on the Manchurian Railway, economic condition of the Manchurian oil industry (p. 420), oil extraction in Japan (history, p. 437, commercial factories, p. 442, development of these factories, p. 451).

5. Soybean meal or cake and its composition (p. 464). A. The varieties of soybean meal or cake and the composition of each. B. Evaluation of quality (p. 473). C. Soybean meal or cake as a fodder (p. 478): Feeding value and digestibility, incorrectness of the theory that there are bad effects from feeding soybean meal or cake (p. 479). D. Soybean meal or cake as a fertilizer (p. 490). E. Soybean meal or cake as food (p. 504): Use as a raw material for shoyu production (p. 506), use to make soy flour (p. 509). F. Soybean meal or cake as a source of protein in industrial products.

6. Soy oil and its processing (p. 526). A. Characteristics of soy oil: Composition, physical characteristics (p. 535), chemical characteristics, testing and evaluating soy oil (p. 564), the quality of commercial soy oil products (p. 577). B. Refining soy oil (p. 587). C. The use and processing of soy oil (p. 631): Overview, refined soy oil as a food, substitute for salad oil, or for deep-frying oil, as an illuminant, as a cutting oil, lard substitute, margarine, in paints, soap, hardened oil, for waterproofing, substitute for petroleum oil, glycerin, fatty acids, stearine.

7. Exports and imports of soybeans, soybean meal or cake, and soy oil (p. 708). A. Manchuria. B. Manchurian exports. C. China. D. Japan. E. Korea. Appendix: Bibliography of soybeans (Japanese-, German, and English-language works; p. 748). List of photos.

Note 2. This is the earliest Japanese-language document seen (Oct. 2011) that mentions fermented tofu, which it calls *nyûfu* or *funyû.*

Note 3. This is the earliest Japanese-language document seen (Feb. 2012) that uses the term *itohiki nattô* to refer to natto. Address: Dairen, Manchuria.

2358. Nagai, Isaburo. 1924. Observations on the somatic segregation in soy beans. *Japanese J. of Botany* 2(1):63-70. [7 ref. Eng]

• ***Summary:*** "Progenies of the hybrids in soy beans often manifest a marked fluctuation with respect to the colour characters of the seed coat, even in those seeds which are produced by a single individual. Breeding tests have been conducted and have proved that somatic segregation actually occurs both in homozygous and heterozygous plants."

Records 5 cases showing a marked fluctuation in seed coat color, which are considered to depend on gene mutations. The following words are used: Chromogen, chromogenic substances, homozygous. Address: Agric. Exp. Station, Omagiri, Japan.

2359. Piper, Charles V. 1924. Adzuki bean (*Phaseolus angularis*) (Document part). In: Charles V. Piper. 1924. Forage Plants and their Culture. Revised edition. New York, NY: MacMillan Co. xxv + 671 p. See p. 612-13.

• ***Summary:*** In Japan about 350,000 acres of adzuki beans are grown annually. "In Japan and Manchuria the adzuki bean is grown entirely for human food, and as a producer of seed it excels any other bean adapted to the region in which it will grow, excepting the soybean. On account of its heavy yield of seed it is likely to become of some importance in the United States, either for human food or for growing to feed animals. The plants are smaller than cowpeas or soybeans, so the yield of herbage is but moderate."

Note: The chufa (*Cyperus esculentus*) is described on p. 641. "Chufas are grown mainly in the Southern States. Practically all of the seed is produced in Georgia, the product in 1909 of 481 acres being 12,531 bushels." Address: Agrostologist in Charge of Forage Crop Investigations, Bureau of Plant Industry, USDA.

2360. Sanka, Isao. 1924. Daizu no saibai [Soybean cultivation]. Dairen, Manchuria: Minami Manshû Tetsudô Kôgyôbu Nômuka [South Manchuria Railway Co. {SMRC}, Bureau of Agriculture. 532 p. 22 cm. Series: Sangyo Shiryo 20. [Jap]*

Address: Dairen, Manchuria.

2361. May Co. (The). 1925. Grocery store (Ad). *Los Angeles Times.* Jan. 23. p. 8.

• ***Summary:*** "Listed below are many of the rare, out-of-the-ordinary delicacies to be found in this complete Grocery Store–helpful suggestions for the discriminating hostess."

"China and Japan: Jasmine tea. Hong Kong ginger in crocks. Shoyu sauce. Boiled bamboo shoots."

"Imported health foods–from Dr. Huedebert, Paris; Dr. Charasse, Marseilles; Brusson Jeune, Ville Mur–for diabetes, dyspepsia, constipation, indigestion and reducing weight." Includes Aleurone bread muffins, Gluten bread, Levulose powder, Mignonettes of gluten–small bread balls for soup.

"Battle Creek Sanitarium Health Foods [Michigan]. These famous preparations will also be found in our Health Food Section, and include Colax, an agar biscuit; Lacto auxiliary food; Lacto Dextrine, antitoxic food; Casein-Gluten Flour, a superior food; Canned fruits, vegetables for restricted diet; Charcoal tablets; Vegex–the wonderful vitamine food." Address: Broadway at Eighth. Grocery store–Fourth Floor [Los Angeles].

2362. Kurono, Kanroku. 1925. [On the future of shoyu brewing]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural*

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Chemical Society of Japan) 1(13):1011-22. [Jap]

2363. Yamamoto, W. 1925. Daizu no isshin byôgai ni tsuite [A new disease of soybean]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 12:97-99. Feb. [Jap]
• ***Summary:*** A new leaf spot was found in Japan. The causal fungus was tentatively referred to as *Mycosphaerella sojae.* Address: Morioka Koto Norin Gakko.

2364. Toriyao, Yoichi. 1925. Nattô no enkaku ni tsuite [History of natto]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 2(8):736-39. [Jap]
• ***Summary:*** An excellent history of natto in Japan. Address: Osaka Koto Kogyo Gakko, Japan.

2365. *Crops and Markets* (*USDA*). 1925. Foreign crops and markets: British oilseed, oil, and fat trade. 3(15):240. April 11.
• ***Summary:*** "That the vegetable oil crushing industry of the United Kingdom has experienced a marked development since 1913 is evidenced by the increase in British imports of seeds, nuts, and kernels for crushing purposes. The oil crushed from such imports during 1924 amounts to 603,000 short tons as compared with 434,000 tons in 1913. The principal items in the British import trade in seeds, nuts, and kernels are linseed from Argentina, palm kernels from West Africa, cottonseed from Egypt, and copra from the Straits Settlements and the Dutch East Indies."

"In addition to its imports of seeds, nuts, and kernels, the United Kingdom imports large quantities of refined and unrefined oil. Palm oil from Nigeria is the most important of such imports. Other oils imported in important quantities are soya-bean oil from Japan, coconut oil from Ceylon and the Netherlands, and cottonseed oil from Egypt." Address: Washington, DC.

2366. Kinoshita, Asakichi. 1925. Y-ji gata shôyu sokujô-hô [Y-form method of quick shoyu brewing]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 2(9):797-99. [Jap]
Address: Jozo Shikensho, Gishi, Japan.

2367. Ito, Taro. 1925. The soya bean in Manchuria. *Far Eastern Review* (*Shanghai*) 21:236-37. May. [Eng]
• ***Summary:*** Contents: Production and trade of soya beans in Manchuria. Statistics on soya beans carried by the South Manchuria Railway (SMR), and export tonnage. Mixed storage system now in operation on railroads; adopted in 1919. Examination and grading of soya beans by examiners appointed by the SMR. Details of grading. Method of packing and storing; projected elevator system.

China now produces about 80% of the world's soya beans, and 70% of China's output is grown in Manchuria. Manchuria is therefore the world's leading producer of soya beans, with annual production estimated at 3,500,000 kilolitres. Note: 1 kilolitre = 1,000 litres.

In 1923 the South Manchuria Railway (SMR) carried 2,000,000 metric tons of soya beans. "Of this tonnage, 400,000 tons were exported to Japan, 150,000 tons to China proper, 80,000 tons to the South Sea Islands and Australia and 1,000 tons to America, chiefly to the port of Seattle [Washington] in the Pacific area, and 120,000 tons to Europe and Africa." These exports, which total 751,000 tons, amount to about 37% of the soya beans carried by the SMR; they were shipped by steamers from Dairen, the southern terminal of the railroad.

But what happened to the remaining 63%, or 1,250,000 metric tons carried? "They were consumed in oil factories called by the Manchurians *Yu-Fang,* factories which flourish in Dairen and Yingkou for the manufacture of oil and cakes." In 1923 about 140,000 metric tons of [soya bean] oil and 1,300,000 tons of bean cake were exported. The oil went mainly to Europe and America, and the cake to Japan for use as fertilizer.

The examination and grading of soya beans "is ordinarily carried on in the railroad yards by drawing a certain number of samples from one consignment which comprises 350 bags, each bag weighing not less than about 85.2 kg. (142 kins). The method now in use is practical, based upon the appearance of the beans to the naked eye and their moisture content as estimated by chewing between the teeth. The authorities have under consideration the introduction of a more scientific method by which all the complaints arising from the examination and grading will be eliminated.

"The standards are fixed at a certain time of the year annually by experts in agriculture at the agricultural experimental station of the company, who collect beans from different parts of Manchuria and take into consideration many conditions necessary to the standardization. The standards now in operation have three grades, A.B.C. Beans which come below C are not to be accepted as freight under the mixed storage system... Bags used as containers of soya beans are gunny-bags, mostly imported from India–needless to say, some are imported from Japan. The annual import reaches 20 million bags on the average, comprising, of course, old ones as well as new.

"The bags in which beans are packed are examined and graded together with the beans. The standards thereof are also three."

The SMR's "mixed storage system" has resulted in improvement of quality and facilitated the sale of beans.

Photos show: (1) South Manchuria Railway's experimental bean mill. (2) Mukden railway station. (3) Acres of bean cake stored in the open on Dairen wharves. (4) Small part of Dairen wharves showing warehouses and open storage. Address: Manchuria Railways Co., Manchuria.

2368. Tsuchida, Takeo. 1925. Shôyu kôbo no kenkyû. I. and

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II. [Studies on shoyu yeasts. I and II.]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 2(10):965-70; 2(11):1078-97. [Jap]
Address: Tsuchida Jozo Joshu, Japan.

2369. Tsugano, Akijirô. 1925. Y-ji gata shôyu sokujô-hô [Y-form method of quick shoyu brewing]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 2(10):904-07. [Jap]
Address: Nôgaku-shi, Japan.

2370. Horvath, A.A. 1925. Soybean oil as soap making material. *J. of the Association of Chinese and American Engineers* 6(7):65-69. July.
• ***Summary:*** "We differentiate between hard soaps (soda soaps) and soft soaps (potash soaps) according as to whether the base used for the saturation of the fatty acids be soda or potash." The vegetable drying oils and semi-drying oils are best for making soft soaps. Solid fats are used mainly for making hard soaps.

"In the manufacture of soft soap, soybean oil serves as an almost complete substitute for linseed oil. In the manufacture of hard soaps it can replace cotton seed oil to some extent only, as the soap is softer than one made from cotton seed oil."

"Most of the soybean oil which is exported from China to Europe, in particular to Great Britain, is now being imported again into the Orient in the form of soap. Lever Bros. (Port Sunlight) started in early years to use soybean oil, and the well known Sunlight soap contains a certain per cent of saponified soybean oil." This shows how backward the soap industries are in the Orient. "At the Lever Bros. soap factory at Amagasaki (Japan), soybean cake is crushed into powder, and the oil contained therein is extracted by means of benzine, using the oil so extracted as soap-making material. This soap is available on the market also as Sunlight soap and is of high quality."

Methods of making the various soaps from soybean oil and their characteristics are described. Note 1: This is the earliest document seen (Jan. 2001) that mentions Sunlight soap.

Note 2. This is the earliest document seen (May 2011) by or about Dr. A.A. Horvath in connection with soybeans.
Address: Peking Union Medical College.

2371. Murata, J. 1925. Daizu mozeikku byô ni tsuite [Soybean mosaic]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 12(8):451-52. Aug. [1 ref. Jap]
Address: Nagano-ken Nôshi.

2372. Yamaha, G.; Sinotô, Y. 1925. On the behavior of the nucleolus in the somatic mitosis of higher plants, with microchemical notes. *Botanical Magazine* (*Tokyo*) 39(464):205-19. Aug. [74* ref. Eng]
• ***Summary:*** The diploid chromosome number of the soybean (Glycine Soja, Benth.) was found to be 38 (2n = 38). Illustrations 1-13 (p. 208) show changes in the nucleolus during somatic mitosis in various Japanese soybean varieties. The peanut is shown in figs. 22-23. Address: Dep. of Plant-Morphology and of Genetics, Botanical Inst., Faculty of Science, Tokyo Imperial Univ.

2373. Meharry, Charles L. 1925. Sixth annual field meeting: Washington, D.C.–September 1, 2 and 3, 1925. *Proceedings of the American Soybean Association* 1:52-54.
• ***Summary:*** "Soybean growers, representing eighteen states and Canada, convened at the Arlington Experimental Farm, Virginia, September 1, 1925, for their Sixth Annual Field Meeting." The "growers were welcomed to Arlington Experimental Farm by Dr. W.A. Taylor, Chief of the Bureau of Plant Industry." There followed two papers presented by Dr. C.V. Piper and Mr. E.C. Butterfield. After the meeting was adjourned for lunch, "the visitors had an opportunity of inspecting an extensive exhibit of soybean products, showing the numerous soybean products from the Orient and those manufactured in the United States. Charts were displayed illustrating the value of the soybean and its various products and enlarged pictures showed the manufacture of products in China and Japan, and the various ways in which the soybean is grown and harvested in the United States."

"After lunch, the growers were taken to the fields to inspect the variety tests, new introductions, inoculation plots, time of planting tests, breeding work and method of culture plots. Demonstrations were given of the various methods commonly used in the culture of the soybean."

"The evening meeting was called to order at 7:30 in the auditorium of the New National Museum..." The program included three motion pictures and seven papers. The second motion picture is titled "Four men and the soybean." The other two are "Uncle Sam, World Champion Farmer" and "Sheep in Psalm and Sage." Note: This is the earliest document seen (Nov. 2004) that mentions a motion picture about soybeans. Nothing is known about this movie except the title.

"On the second day, September 2, the growers assembled on Union Farm, near Mount Vernon, Virginia. This farm was originally part of George Washington's estate and played an important part in the early agricultural development of this country. It was on this farm that Washington carried on his experiments in soil improvement and practical methods of farming far in advance of his time. Union Farm is now owned by Mr. Harvey S. Clapp, a prominent breeder and grower of soybeans. The growers inspected Mr. Clapp's extensive variety, inoculation, and breeding plots, and fields of different varieties for seed production."

Five papers were then presented: Welcome to Virginia, by T.B. Hutcheson, Virginia. Soybeans in the Eastern states, by Nicholas Schmitz, Pennsylvania. Fertilizers for soybeans, by G.L. Schuster, Delaware. Relation between the grower

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and the oil mill, by F.A. Wand, Illinois. Seed frauds in soybean varieties, by R.W. Hamilton, South Carolina.

"The after noon was devoted to demonstrations of field machinery used by Mr. Clapp in the culture and harvest of the soybean. The broadcast soybean harvester, an invention of Mr. Clapp's proved an interesting feature of the demonstration. About 3:00 p.m. the growers adjourned to visit Mount Vernon, the home of George Washington.

On the third day, September 3, the growers met at the Maryland Experiment Station, College Park, Maryland. Dr. A.F. Woods, President of the Maryland State University, welcomed the visitors to Maryland."

Six papers were then presented: Community growing, handling and sale of soybean seed, by J.T. Smith, Illinois. Soybeans in Georgia, by W.J. Davis, Georgia. Soybeans in the Mississippi Delta, by W.E. Ayres, Mississippi. Small grains after soybeans, by W.E. Riegel, Illinois. Putting soybeans on the hoof, by Taylor Fouts, Indiana. The soybean mottling problem, J.B. Park, Ohio.

Long summaries of the welcome address by W.A. Taylor, and of the many papers presented are given on pages 54-129. Address: Secretary.

2374. Piper, Charles V. 1925. How we got our soybeans. *Proceedings of the American Soybean Association* 1:58-59. Sixth annual field meeting. Held 1-3 Sept. at Washington, DC.

• ***Summary:*** "In 1907, Dr. C.R. Ball of the United States Department of Agriculture, described twenty-three varieties of soybeans, all that were then known in the United States introduced up to 1905. These included fifteen introductions by the Department between 1900 and 1905, the remainder secured by miscellaneous individuals from the Orient, and several indirectly by way of Europe. Up to this time varieties had been called by such names as Early Yellow, Medium Yellow, Late Yellow, etc.; but with only twenty-three varieties this system of naming broke down hopelessly and a different system was adopted, which has been followed since. The naming of varieties mainly by the color of the seeds by oriental writers had disguised the fact that the varieties are not few but very numerous. This began to become clear about the time Ball's paper was published, and vigorous efforts were inaugurated to get additional varieties with the help of the Office of Seed and Plant Introduction. We got them through consuls, missionaries, seedsmen, etc., until by 1909 we had 175 varieties; by 1913, 427 varieties; by 1919, 629 varieties; by 1925, 1,133 varieties; and we probably have not half of them yet. Our records show that every Chinese village had its own distinct series of varieties. There is no seed trade in China; consequently, local varieties are never widespread. These were all tested at Arlington [Farm, Virginia], the poorer ones being continuously discarded.

"About 1914, we tried to get several experiment stations to test three hundred varieties, as we did not like to discard them purely on the basis of Arlington Farm tests; but at that time no experiment station was willing to take more than about twenty of the varieties which we considered the best. In late years we have checked over as far as possible the series that we discarded, and we do not believe we made any serious mistake, though at that time we had very inadequate knowledge of the behavior of each variety in different latitudes. Today many experiment stations are so interested that each wants to test every new soybean secured. Out of the agriculturally unexplored villages of China, Manchuria, and Japan will yet come many varieties some of which will likely replace the ones now used in the United States.

"With few exceptions, the varieties valuable in the United States today are all Department introductions. One important variety, the Mammoth Yellow, is of unknown origin; it was introduced as early as 1882. In the more than one thousand lots introduced since, this variety has never yet turned up again. Usually, when several varieties are obtained from the same village, they are much alike in habit; but exceptions to this rule are not rare.

"The results that have been secured by this wholesale search for new soybeans, notwithstanding its very considerable cost, have justified the work many times over. When the Department work began, the soybean was a very minor crop, and of importance only where the Mammoth Yellow variety matured. Today, its culture, due to varieties adapted to each region is widespread, and lends substantial basis to the belief that the soybean will yet become one of our major crops." Address: USDA, Washington, DC.

2375. *Far Eastern Review* (*Shanghai*). 1925. The Dairen bean oil industry. 21:666-67. Oct.

• ***Summary:*** "The first oil mill in Dairen, Shwang Ho Chan, located in the Chinese quarter, or Shikangtze Section, was started in 1906. This was followed by Chung Sheng Ho and Nisshin on the Wharves in the ensuing year, Nisshin being a Japanese concern with a capital of ¥3,750,000. In 1908, Chang Pen-ching a leading shipping merchant of Manchuria, started the Chingkee Mill. In the same year the South Manchuria Railway Company fixed the same freight rates for goods from any part of Manchuria to Dairen, Newchwang and Antung, with the object of making Dairen the trade center. Since then, oil mills in Dairen have grown in number, and Dairen has become the center for the distribution of beans and the center of export for beancakes and bean oil.

"A shortage of mill hands was felt when the industry started to develop, and the competition for men led to the organisation of the Dairen Oil Mill-Owners Association, in 1912 so as (1) to prohibit such competition, (2) to restrict the mill output, and (3) to limit the number of mills. Japanese authorities in Dairen rendered support to the Association in not granting any land for new oil mills without` the Association's concurrence. Restriction in output was

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enforced for a certain period of time, but the enforcement was not easily maintained. At present, any member of the Association can freely increase the output of his mill to any extent to suit his own requirements. Originally, the Association aimed at all possible means of developing the industry and protecting the mutual benefit of its members; but now, it is functioning merely to facilitate transportation and to conduct negotiations with other bodies. Since June, 1923 all mills, except seven, have joined the Association.

"Among the seven non-members, only the Dairen Oil Mill Co. and the Jih Hwa are operating regularly, while the other five operate only at irregular intervals... Of the 84 mills, only 60 are operating,, 58 by Chinese and 11 by Japanese, 15 having been suspended. The industry thrived during the World War [I], but has somewhat declined during later years."

"Oil is obtained by extraction with benzene, the most up-to-date method, only in the Susuki [Suzuki] mill. The other 32 mills, chiefly Japanese owned, employ hydraulic pressure machines, while 51 Chinese mills employ hand screw presses.

"Oil mills in Manchuria operating on a small scale date back nearly half a century, their output being sufficient only for local consumption. Modern mills appeared in Newchwang after the Sino-Japanese War in 1894. Newchwang was the center of the bean oil industry in Manchuria before the rise of Dairen. Mills in Newchwang have again increased during recent years, owing to the limitation of their number in Dairen. Two other important bean oil centers next to Dairen are Putung and Harbin."

Photos show: (1) "A busy day at the Bean Wharf at Dairen." (2) A front view of Nisshin Oil Mill, Dairen. (3) Interior of the Nisshin Oil Mill, Dairen. (4) The filter presses.

2376. Oshima, Kokichi. 1925. Nattô-kin no koso kagaku-teki kenkyû. I. Nattô-kin tanpakushitsu bunkai kôso no seishitsu (1) [Enzymatic study on natto bacteria. On the properties of the proteolytic enzyme of natto bacteria (1)]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 3(3):287-300. [18 ref. Jap]
Address: Hokkaido Teikoku Daigaku, Suisan Senmon-bu, Kyoju; Ken Hokkaido Teikoku Daigaku Jokyoju, Japan.

2377. *Times of India* (*The*) (*Bombay*). 1925. Imports [at Bombay harbour]. Nov. 24. p. 6.
• ***Summary:*** "S.S. Toyooka Maru [Toyôka Maru] from Yokohama [Japan], Agents: N.Y. Kaisha.

"From Osaka.–15 cases shell buttons;... 100 casks red lead; 20 casks Japanese soy [sauce]; 18 cases cotton hosiery under shirts..."

2378. Yoshida, Toru. 1925. Honpo shôyu kôgyô rôdô jijô [Labor situation in the Japanese shoyu industry]. *Shakai Seisaku Jiho* (*Social Policy Review*) 62:127-30. Nov. [Jap]*

2379. Goto, K. 1925. Morioka byôgai zakki [Miscellaneous notes on the plant diseases found in Morioka. I.]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 12:677-82. Dec. [4 ref. Jap]
• ***Summary:*** Records the occurrence of a *Phomopsis* on soybean pods. The fungus resembles the imperfect stage of *Diaporthe sojae*. Address: Morioka Koto Norin Gakko.

2380. Kuwayama, Satoru. 1925. Daizu mame shinku higa ni kansuru kenkyû [Studies on the soybean pod borer]. *Sapporo Norin Gakkaiho* (*J. of the Society of Agriculture and Forestry, Sapporo*) 17(75/76):290-92. (On p. 88-90 in this issue). Dec. [Jap]
Address: Hokkaido Nogyo Shikenjo, Japan.

2381. Hikosaka, I. 1925. Shôdoshima shôyu-gyô no keizai-teki kenkyû. II. [Economic research on the shoyu industry in Shodoshima. II.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 21(1):69-73. [4 ref. Jap]
• ***Summary:*** Shodoshima is an island in the inland sea of Japan off the coast of Okayama. It has long been known as a traditional center of shoyu brewing. During the 1970s and early 1980s its shoyu was imported to the USA by natural foods companies. This article contains no production or financial statistics. Address: Nagoya Koto Shogyo Gakko Seito, Japan.

2382. Ishida, A. 1925. Shôyu-chû no isseibun ni tsuite (roishin) [One component of shoyu: Leucine]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 20(6):33-35. [Jap]
• ***Summary:*** The beautiful crystal that was extracted from shoyu was an unpure form of leucine, an amino acid.
Address: Jozo Shikensho, Japan.

2383. Ito, Takeo. 1925. Nattô no seibun ni tsuite [On the constituents of natto]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 266-71. p. 85-86. [Jap]

2384. Kaku, T. 1925. [Analysis of miso of Korea]. *Chosen Ikai* 55:317-; 56:495-. [Jap]*

2385. Kinoshita, Asakichi; Matsumoto, K.; Takada, R.; Onoie, S. 1925. Shôyu moromi ni nyûsan-kin no tenka shiken [Addition of lactic acid bacteria to shoyu moromi (mash)]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 93. p. 237-45. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Gishi; 3. Joshu; 4. Shokutaku.

2386. Kinoshita, Asakichi; Katsuyama, M.; Takada, R. 1925. Dasshi daizu shiyô shiken [Shoyu brewing with defatted soybean meal and soybean cake]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 93. p. 167-

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87. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2-3. Joshu.

2387. Kinoshita, Asakichi. 1925. Anka genryô shôyu jôzô-hô. V-XV. [Shoyu brewing using inexpensive materials. V-XV.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 21(2):41-45; 21(3):56-62; 21(4):56-59; 21(5):37-39; 21(6):58-61; 21(7):38-41; 21(8):29-31; 21(9):32-36; 21(10):48-51; 21(11):41-43; 21(12):55-57. [Jap]
• ***Summary:*** The articles in this series examine mostly carbohydrate sources: Barley and rye, oats, wheat bran, kaoliang (*koryan*), corn, broomcorn millet (*kibi*) and barnyard millet grass (*hie*), long grain rice, ground rice, rice bran. They also examine protein sources: defatted soybean presscake (*mame kasu*), raw peanut presscake. The last two sections are general ideas about soybean presscake, and how to process soybean presscake. Address: Jozo Shikensho Gishi, Japan.

2388. Kurono, K. 1925. Jôzôgyô no shôrai. Fu: Shôyu no kagaku [On the future of the brewing industry. Addendum: The chemistry of shoyu]. *Sapporo Norin Gakkaiho* (*J. of the Society of Agriculture and Forestry, Sapporo*) 17(75):229-43. [Jap]
Address: Nôgaku Hakase, Japan.

2389. Kurono, K. 1925. Jôzô-gyô no shôrai. Fu: Shôyu no kagaku [On the future of the brewing industry. Addendum: The chemistry of shoyu]. *Nogaku Kaiho* (*J. of the Scientific Agricultural Society, Japan*) No. 276. p. 328-39. [Jap]
Address: Nôgaku Hakase.

2390. Matsumoto, K. 1925. Shôyu seibun-chû no yûki-san rui no kenkyû [Studies on organic acids in shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 20(2):23-29; 20(3):10-18; 20(4):23-30; 20(5):12-21. [Jap]
Address: Jozo Shikensho Gishi, Japan.

2391. Matsumoto, K. 1925. [On the molds used in soy sauce fermentation]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 99. p. 1-178. [Jap]*
Address: Japan.

2392. Nishimura, Torazô; Kinoshita, A.; Katsuyama, M. 1925. Daizu no shinseki-sui oyobi kôeki shiyô shiken [Brewing shoyu using the soybean soak water and cooking liquid]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 93. p. 152-60. [Jap]
Address: Jozo Shikensho. 1. Shokutaku; 2. Gishi; 3. Joshu.

2393. Oshima, Kokichi. 1925. Nattô-kin no kôso kagakuteki kenkyû. I. Nattô-kin tanpakushitsu bunkai kôso no seishitsu (1) [Chemical research on the enzymes from natto bacteria, *Bacillus natto.* I. Properties of the protease (1)]. *Sapporo Norin Gakkaiho* (*J. of the Society of Agriculture and Forestry, Sapporo*) 16(71):387-405. [17 ref. Jap; eng]
Address: Sapporo, Japan.

2394. Oshima, Kokichi. 1925. Nattô-kin no kôso kagaku-teki kenkyû. I. Nattô-kin tanpakushitsu bunkai kôso no seishutsu [Enzymic study on *Bacillus natto.* I. The properties of protease A, the proteolytic enzyme of natto bacteria]. *Sapporo Norin Gakkaiho* (*J. of the Society of Agriculture and Forestry, Sapporo*) No. 71. p. 7-23, 24-25 (16(71):387-403). English-language summary. p. 404-05. [17 ref. Jap]
• ***Summary:*** Sawamura (1907) was the first to isolate Bacillus natto from natto. He was followed by Muramatsu (1912) and Iguchi (1917). This bacterium much resembles *Bacillus subtilis* morphologically and physiologically, but it produces a distinct flavor and mucilaginous substance on cooked soybeans. The analysis of natto shows the increase of soluble nitrogenous matter and the formation of strong protease, which makes soybeans more nutritive. This study analyzes the bacillus from the viewpoint of enzymic chemistry. Address: Hokkaido Teikoku Daigaku, Suisan Senmon-bu, Kagaku Kyoshitsu.

2395. Saito, K. 1925. [On the microbes of shina shoyu]. *Minami Manshu Tetsudo K.K. Shiken* (*South Manchuria Railway Co. Experiment Station*) 10:397-. [Jap]*

2396. Yamada, Masakazu. 1925. Yûki enki bunri ni "nafutooru" ô no ôyô ni tsuite ("jiamin" no shin bunri-hô) [Application of naphthol yellow to the isolation of organic bases (a new method for isolation of diamine)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 20(12):23-30. Continued in 1926. [Jap]
Address: Jozo Shikensho Gishu, Japan.

2397. Kikkawa, S. 1925. Shokuyô sakumotsu kakuron [Details on edible crops. Revised ed.]. Tokyo. [Jap]*
• ***Summary:*** Nagata (1960, p. 70) notes that Kikkawa described the vining and twining habit as the character transmitted from the wild soybean. He further states (p. 75-76) that Kikkawa points out that the differentiation of summer and autumn soybean types was found in Nara, Hiroshima, and Saga prefectures. It also suggests that soybeans in the northern part of Japan have a thinner seed coat than those in the south.

2398. Matsumoto, Takashi; Tomoyasu, Ryoichi. 1925. Studies on purple speck of soybean seed. *Nippon Shokubutsu Byori Gakkaiho* (*Annals of the Phytopathological Society of Japan*) 1(6):1-15. [7 ref. Eng; jap]
• ***Summary:*** First explanation of the cause of purple stain disease on soybeans, *Cercosporina Kikuchii.* Growth of a fungus on the seed coats. The symptoms and the morphology

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of the causal fungus, *Cercosporina kikuchii,* are described. The fungus turns glucose media purple and its mycelial extract in water contains a purple pigment which is insoluble in a number of solvents.

Suzuki (1921) believed that the cause of the disease might be due to the mechanical stress exerted by the pod in consequence of unequal growth between pod and seed. Thus, he considered climatic conditions to be the chief cause of the disease. R. Kikuchi, working with the same disease, expressed his opinion in a private letter sent to the senior author on 21 Nov. 1922, that the cause of the disease might be a fungus parasite belonging to the genus *Cercospora.* Subsequently Kung (1923) confirmed the responsibility of a fungus parasite. Address: Japan.

2399. Mogi family creed (16 articles) adopted (Early event). 1925.

• ***Summary:*** Reprinted with permission of the UMass Family Business Center, online at www.umass.edu/fambiz. This is another translation of the other creed we have; this has 16 articles whereas the other has 17–including one about patriotism and loyalty.

"Article 1. All family members desire peace. Never fight, and always respect each other. Ensure progress in business and the perpetuation of family prosperity.

"2. Loving God and Buddha is the source of all virtue. Keeping faith leads to a peaceful mind.

"3. All family members should be polite to each other. If the master is not polite, the others will not follow. Sin is the result of being impolite. Families–young and old, masters and workers–govern themselves by politeness; then peace will be brought of their own accord.

"4. Virtue is the cause, fortune the effect. Never mistake the cause for the effect. Never judge people on whether they are rich or not.

"5. Keep strict discipline. Demand diligence. Preserve order–young and old, masters and workers.

"6. Business depends upon people. Do not make appointments or dismissals using personal prejudices. Put the right man in the right place. Loving men who do what they should brings peace to their minds.

"7. Education of the children is our responsibility to the nation. Train the body and mind with moral, intellectual, and physical education.

"8. Approach all living beings with love. Love is fundamental to human beings and the source of a life worth living. Words are the door to fortune and misfortune. A foul tongue hurts oneself and others. A kind tongue keeps everything peaceful. Be careful in every word you speak.

"9. Keep humbleness and diligence, which have been handed down over the years from our forefathers. Make every effort to do as much as you can.

"10. True earning comes from the labor of sweat. Speculation is not the best road to follow. Don't do business by taking advantage of another's weakness.

"11. Competition is an important factor in progress, but avoid extreme or unreasonable competition. Strive to prosper together with the public.

"12. Make success or failure clear, judge fairly punishment and reward. Never fail to reward meritorious service, and don't allow a mistake to go unpunished.

"13. Consult with family members when starting a new business. Never try anything alone. Always appreciate any profit made by your family.

"14. Don't carelessly fall into debt. Don't recklessly be a guarantor of liability. Don't lend money with the purpose of gaining interest, because you are not a bank.

"15. Save money from your earnings and give to society as much as you can. But never ask for a reward or think highly of yourself.

"16. Don't decide important affairs by yourself. Always consult with the people concerned before making a decision. Then employees will have a positive attitude in their work."

2400. Mogi family creed (17 articles) adopted (Early event). 1925.

• ***Summary:*** In "The Kikkoman Chronicles" (1998, p. 37-38) author Ronald Yates states: "More than 70 years ago, the Mogi families and the Takanashi and Horikiri families adopted a written family code of business. It is an informal 17-pount document that has played an important role in Kikkoman's corporate governance since eight families merged to create the company [Noda Shoyu Co.] in 1917. This creed "is evidence of tradition and loyalty–qualities still highly regarded in Japan and Asia,..."

"The Mogi family creed is much more ambitious than one of those pithy vision statements that so many companies create... it remains a document that members of the Mogi family still conduct their professional and private lives by. It reads:

"1. Family members should recognize that harmony is of utmost importance. Harmony fosters mutual respect which permits family members to focus on prosperity in business and on the longevity of the fortunes of the families.

"2. Worshipping and respecting a Supreme Being is the foundation for nurturing virtue. Keeping faith nourishes your own mind.

"3. Loyalty and patriotism are an obligation. Respect and serve your country and observe the fundamental character of your country.

"4. Family members should recognize that courtesy is a fundamental element, If, as a senior member, you lack courtesy, junior family members will not give allegiance to you. If junior members lack courtesy, there may be serious repercussions. Mutual courtesy will result in a self-governing, peaceful family.

"5. Always keep in mind that virtue is the origin and wealth is its product. Do not judge a person by his wealth or

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lack of wealth.

"6. Strict discipline should be maintained. valuate each employee with fairness. Demand the utmost in diligence. The hierarchy in any organization must be maintained.

"7. Human resources are the most valuable treasure of a company. Each employee should be treated without personal prejudice and be placed in the most appropriate position according to his capability and achievements. Each employee should be respected and his self-worth should be maintained or enhanced.

"8. The education of our children is our responsibility to our nation and to our community. The body and the mind should be trained with moral, intellectual, and physical education.

"9. Benevolence should be extended to all living things. Benevolence is the source for discipline and the mother of virtue. Words are the door to both fortune and misfortune. A harsh tongue can hurt others and also yourself. A kind demeanor will make you feel at ease, even in times of turmoil. Be careful of each word you speak.

"10. Simplicity and frugality have been the time-honored tradition of the family for generations. Live within your means.

"11. True profit comes from hard work and maximum effort. Speculation is not the best road to follow. Business which is done contrary to social order and by taking advantage of others' weakness should be prohibited.

"12. Competition is essential to progress. Excessive and unethical competition should be avoided.

"13. Any judgment should be made clearly and fairly. Rewards and penalties should be fully recognized. Rewards will encourage challenges and penalties will discourage thoughtless mistakes.

"14. When beginning a new business, consult with family members. Do not make decisions by yourself. You should recognize that absence of a business loss is akin to making a profit.

"15. Do not fall into debt carelessly. Do not act as a guarantor for any loan. Never lend money to make a profit.

"16. Give as much money from your personal earnings as possible. Never ask for a reward or think highly of yourself.

"17. Do not decide important maters by yourself. Always consult with the people who have a direct interest in the subject matter prior to making a decision. Shared decision-making results in people having a positive attitude toward their work."

Letter (e-mail) from Kikkoman corporate office via Kikkoman Sales USA. 2012. May 14. The Mogi 17-point family creed was written in 1925.

Note: Article 3, whose content does not appear in the 16-point creed, may have been added at a later date.

2401. Ossendowski, Ferdinand; Palen, Lewis Stanton. 1925. From president to prison. New York, NY: E.P. Dutton & Co.; London: Allen and Unwin. viii + 338 p. No index. 21 cm. • ***Summary:*** Antoni Ferdynand Ossendowski was a Pole by birth, a chemist by training, and an adventurer by inclination. Known to lie and deceive quite frequently, he was a chemical engineer with the Russian railway in Manchuria in about 1902. When the Russo-Japanese war started in 1904, the Russian government asked him to organize at Harbin a central laboratory for the military area, where he was to work not only for the Chinese Eastern and Ussuri railways, but directly for the General Staff of the army. His principal occupation was to study thoroughly the supply of local raw materials, so that they could be used instead of similar materials that would have to be imported over the single line of railway 4,000 to 6,000 miles long. While in St. Petersburg, gathering supplies for his lab, he witnessed the birth of the Russian Revolution of 1905 in the massacre of peaceful demonstrators on 9 Jan. 1905 (p. 14-15).

Returning to Harbin in the spring of 1905, he finished organizing his lab to help produce supplies for army. "Orders from the General Staff ordered me to search out some local supply of oil for use as a lubricant in the artillery, for the transport wagons in the field and for the axles of the railway carriages, as well as for the manufacture of soap. The problem was shortly resolved by the discovery in the oil extracted from the soya bean of the qualities necessary for these purposes. Also these beans were produced in such a really fabulous amount in northern Manchuria that the question of quantity production for military purposes was thus taken care of. After having worked out a new method of manufacture, I organized and opened a factory at Harbin which turned out all sorts of oils and soaps by a cold press that was very simple and quick, and in such quantities as to meet all the needs in the war area and thus save the railway from the necessity of transporting these supplies from Europe...

"In the meantime my voracious soap factory was always demanding more and more of the soya bean oil. As it was then not available in sufficient quantity on the Harbin market, I determined to start out in search of a district where the oil was plentiful and from which it could be readily transported to Harbin. With my assistant and two Cossacks I journeyed up the Sungari River..." He eventually found large supplies of soya bean in the neighborhood of Hsin Ch'eng Fu or Petuna on the Sungari. His inventiveness gained him acclaim from the Army and promotion to the post of Chemical Expert of the General Staff.

The soya bean oil lubricants were actually used during the Russo-Japanese War. The author lived 1876-1944.

2402. Paris, John. 1925. Banzai! (Hurrah!). London: W. Collins Sons & Co., Ltd. 302 p. See p. 73. 21 cm. 1st American edition (New York: Boni and Liveright, May 1926, 313 p.); see p. 69.

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• ***Summary:*** "In the public park of Takaoka, among the ruins of the Maeda castle, an old pedlar [peddler] used to sell to the schoolboys the famous cakes called *Inari-sushi,* which were a specialty of the town. They were made of fried bean-curd with rice and various condiments inside;..." (p. 73).

Note: This is the earliest English-language document seen (April 2013) that contains the term *Inari-sushi.* Address: Author.

2403. **Product Name:** Tofu.
Manufacturer's Name: Tanaka Tofu Mfg.
Manufacturer's Address: Between Dunlevy and Jackson streets, Vancouver, BC, Canada.
Date of Introduction: 1925?
New Product–Documentation: Ito, Kazuo. 1973. *Issei: A history of Japanese immigrants in North America.* Translated by Shinichiro Nakamura and Jean S. Gerard. Seattle, Washington: Executive Committee for Publication of Issei, c/o Japanese Community Service, 1414 S. Weller St., Seattle, WA 98144. xxviii + 1016 p. The map of the old Japanese district of Vancouver, British Columbia, Canada, at the front of the book (unnumbered pages) shows "Tanaka Tofu Mfg." Page 780 states this map is from the 1920s.

2404. **Product Name:** Tofu.
Manufacturer's Name: Wakamatsu Tofu Mfg.
Manufacturer's Address: Between Dunlevy and Jackson streets, Vancouver, BC, Canada.
Date of Introduction: 1925?
New Product–Documentation: Ito, Kazuo. 1973. *Issei: A history of Japanese immigrants in North America.* Translated by Shinichiro Nakamura and Jean S. Gerard. Seattle, Washington: Executive Committee for Publication of Issei, c/o Japanese Community Service, 1414 S. Weller St., Seattle, WA 98144. xxviii + 1016 p. The map of the old Japanese district of Vancouver, British Columbia, Canada, at the front of the book (unnumbered pages) shows "Wakamatsu Tofu Mfg." Page 780 states this map is from the 1920s.

2405. *Chicago Daily Tribune.* 1926. Japan to ease tax burden on common people. Jan. 5. p. 6.
• ***Summary:*** "Tokio, Jan. 4.–Possibly with an eye to the ten million recently enfranchised voters who are to join the heretofore three million in the next general election, the present government will revise radically the taxation system," or at least try to by introducing measures "that will greatly lessen the taxation upon the masses and correspondingly increase it upon the wealthy classes."

The finance minister proposes doing away with "the tax upon shoyu, the sauce used every day by every Japanese, the income tax on small incomes,..."

2406. Ito, Takeo. 1926. Nattô no seibun ni tsuite [On the composition of natto]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 2(1):32-38. Jan. [8 ref. Jap]
Address: Nôgaku-shi, Japan.

2407. *Official Record of the U.S. Dept. of Agriculture* (*The*). 1926. Dr. Charles V. Piper. 5(7):4. Feb. 17.
• ***Summary:*** Dr. Charles Vancouver Piper died Thursday evening, Feb. 11, at Emergency Hospital, Washington, DC. For some time he had been in poor health, but continued to carry on his work. He suffered a light stroke of paralysis at his office the previous Monday morning, was taken to his home, and then to the hospital the following day.

In charge of the Office of Forage Crop Investigations, Dr. Piper was connected with the USDA for 23 years, during which time he made a world-wide reputation as an authority on forage crops and grasses. Through his efforts, many plants and grasses of inestimable value to American agriculture were introduced from foreign countries and established in the United States.

Dr. Piper was probably best known to the general public through his work in developing the creeping bent grasses for use on golf greens. In 1919 he discovered a clump of bent grass growing on a green at the Washington Golf and Country Club. By the vegetative method of propagation he secured a quantity of roots of this grass and in 1921 distributed the stolons or roots to various gold associations for trial. "The grass has since become known as the Washington creeping bent and is now found growing on thousands of golf greens throughout the northern section of the United States. At the time of his death Doctor Piper was chairman of the greens committee of the United States Golf Association, which he was largely instrumental in organizing, and editor of the monthly publication issued by the association. Through its columns he brought about the use of these improved grasses for greens and by his efforts created golfing conditions enjoyed by thousands of golfers everywhere. Through this medium he also found an outlet for his characteristic philosophy, which he expressed under a monthly contribution called 'Meditations of a Peripatetic Golfer.'

"The contributions which Doctor Piper made to the forage and grass industry of practical agriculture are so numerous that it is difficult to single out the most outstanding achievement. However, it was the work of Doctor Piper that secured the introduction and establishment of the now widely known Sudan grass, which is native to Africa. In a comparatively short time this grass has become one of the very valuable hay and pasture grasses over a large part of the United States. Likewise the rapid spread of soy beans in this country can be credited to his introductions and investigations.

"Doctor Piper is the author of more than a hundred papers and books on botany, agriculture, and allied subjects."

"In his search for new forage plants and other crops

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Doctor Piper has traveled widely, having spent much time in Japan, China, India, Java, Egypt, the Philippines, and Alaska." Doctor Piper was born on 16 June 1867 at Victoria, British Columbia, Canada. In 1885 he received his B.S. degree at the University of Washington, and his M.S. in 1892. He remained at that institution as professor of botany until 1903, when he received his appointment to the U.S. Department of Agriculture in Washington, DC.

He was a member of the American Society of Agronomy, of which he was president in 1913-14; the Botanical Society of Washington and its president in 1908-09; the Biological Society of Washington; and the Society for the Promotion of Agricultural Science.

2408. Kuwayama, Satoru. 1926. Daizu no gaichû to sono bôgyo-hô [The principal insect pests of the soy bean (in Hokkaido) and ways of protecting against them]. *Hokkaido Nogyo Shikenjo Iho* (*Hokkaido Agricultural Experiment Station, Bulletin*) No. 39. 100 p. Feb. [Jap]
• ***Summary:*** The main insect enemies in Hokkaido, Japan, include the cyst nematode, *Heterodera schachtii.* Address: Hokkaido Nôji Shikken-jo [Hokkaido Agricultural Exp. Station].

2409. Togano, Meijiro. 1926. [On rapid brewing of shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 3(7):691. [Jap]*

2410. *Times of India* (*The*) (*Bombay*). 1926. Imports [at Bombay harbour]. March 6. p. 7.
• ***Summary:*** "S.S. Hakata Maru, from Tokyo [Japan], Agents: N.Y. Kaisha.

"From Osaka.–96 cases and 11 bales Japanese yarn... 11 cases cotton goods, 20 cks. [casks] Japanese soys, 11 pkgs [packages] match paper,..."

2411. Goto, K.; Takahashi, K. 1926. Morioka byôgai zakki. II. [Miscellaneous notes on the plant diseases found in Morioka. II.]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 13:154-58. March. [Jap]
• ***Summary:*** Records the occurrence of a new stem blight caused by *Peckia* sp. The symptoms and the morphology of the fungus are briefly described. Address: Morioka Koto Norin Gakko.

2412. Kawamura, M. 1926. Byôchûbu: Daizu shihan byô teikô-sei hinshu shiken [Diseases and insects: Studies on purple speck of soybean seed]. *Shiga-ken Agricultural Experiment Station, Report* For the year 1924. March. p. 151-52. [Jap]
• ***Summary:*** Discusses: Shiga Kenritsu, Purple stain.

2413. Kinoshita, Asakichi; Kanamori, Kichiro. 1926. Shôyu no "jiasutaaze" ni kansuru kenkyû [Studies of shoyu diastase]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 3(8):753-64. [Jap]
Address: 1. Gishi; 2. Kenshu-in. Both of Jojo-shi Shokusho, Japan.

2414. Nojima, T. 1926. Fusarium zokukin no kisei kiin suru daizu saya no ichi byôgai ni tsukite [On a disease of soybean pods due to the parasitism of a Fusarium fungus. Preliminary report]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 13:138-47. March. [6 ref. Jap]
• ***Summary:*** A species of *Fusarium* with white to light pinkish mycelium produced numerous salmon-pink spots on the pods of soybean. Infection occurred chiefly through wounds. The fungus was unable to attack the roots, leaves and stems. Address: Kyoto Teikoku Daigaku, Shokubutsu Byori-gaku Kenkyushitsu.

2415. Sato, Masanori; Tseng, K.F. 1926. Daizu abura shibô-san sekkai no kanryû ni yoru nenryô- yu no seihô ni tsuite. III. Daizu abura mata wa sono shibôsan ni arukarido-rui kinzoku no sankabutsu, tansan-en nado o kuwaete kanryû suru baai [Preparation of a liquid fuel resembling petroleum. III. Experiments using oxides and carbonates of alkaline-earth metals as saponifying agent]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 29(3):109-15. March. [3 ref. Jap]
• ***Summary:*** A mixture of lime or calcium carbonate, or magnesia or magnesium carbonate, with the crude fatty acids of soy bean oil or with the oil itself, may be used instead of the purified calcium soap of soy bean oil (Sato 1922; Sato 1923). The fuel oil is obtained more easily than by the earlier method, and there is no notable difference between the properties, yield, and composition of the products resulting from the 2 methods. The amount of saponifying agent used should be more than 20% of the oil or fatty acids. For equal amounts of saponifying agent the magnesium compounds produce a better fuel oil than the calcium compounds. With the carbonates of the metals a longer time is required for the distillation than with the oxides, but there is no noteworthy difference in the properties of the distillates. By using the retort residue of the distillation instead of fresh saponifying agents the distillation time is shortened, but the quality of the product is slightly inferior. Address: Manshû Tetsudô Chûô Shikenjo.

2416. Hirose, Masao. 1926. Jinzô gyûshi ni tsuite. II. Kôka daizu abura sekken no seijô to daizu abura no suiso tenka shinkôdo to no kankei [Artificial beef tallow. II. Relation between properties of the soap and the degree of hydrogenation of the oils used]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 29(4):203-12. April. (Chem. Abst. 20:3356). [9 ref. Jap]
• ***Summary:*** The surface tension and lathering power of various soaps prepared from hydrogenated soy bean oils were studied for the purpose of comparing the oils with

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beef tallow. Hydrogenated soy bean oil having an iodine value of 60-69 is the best substitute for beef tallow for the manufacture of soap, although it differs somewhat in composition. The drop number and lathering power of the soap solutions vary with the progress of hydrogenation of the fatty oils used. Drop number and specific volume of lather diminish during the first stage of hydrogenation, then rise gradually to a maximum when the oil has iodine value 60-69, beyond which they again gradually fall until the iodine value of the oil becomes zero. Iso-oleic acid formed during the hydrogenation has no injurious effect on the properties of the soap. Soaps made from unsaturated fatty acids show a fall of drop number with rise of temperature, whereas those made from saturated acids of high melting point show the reverse effect, the maximum being generally at the temperature at which the solution becomes quite transparent. Address: Tokyo Kogyo Shikenjo, Dai 2 bu, Yushi Jikken-shitsu.

2417. Mashino, M. 1926. Daizu tanpakushitsu no bunkai ni kansuru kenkyû. I. Ensan ni yoru bunkai ni tsuite [Decomposition of soya-bean protein. I. Decomposition by hydrochloric acid]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 29(4):179-86. April. (Chem. Abst. 20:3302). [Jap]
• ***Summary:*** Soya beans from four different sources were treated with light petroleum and the resulting proteins decomposed by hydrochloric acid. With 38.5% acid at 100ºC, 9.1-9.7% ammoniacal nitrogen (calculated on total nitrogen) was obtained after 30 minutes treatment; and 67.4-68.9% of amino-nitrogen after 12 hours. 20% acid yielded at 100ºC about 10% ammoniacal nitrogen after 30 minutes and about 62% amino-nitrogen after 12 hours; and at 40ºC, 9.4% ammoniacal nitrogen after 38-48 hours, and 9.7% amino-nitrogen after 48 hours. About 1% of ammoniacal nitrogen and 4.3% of amino-nitrogen were formed by 0.4% acid at 40ºC after 48 hours. Address: Tokyo Kogyo Shikenjo, Dai 2 bu, Kogyo Yakuhin Kenkyu shitsu.

2418. Mashino, M. 1926. Daizu tanpakushitsu no bunkai ni kansuru kenkyû. II. Ryûsan ni yoru bunkai ni tsuite [Decomposition of soya-bean protein. II. Decomposition by sulfuric acid]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 29(4):187-90. April. [Jap]
• ***Summary:*** Sulfuric acid (20%) yielded 8-9% ammoniacal nitrogen after ½-1 hour and 9-10% after 2-12 hour, and 52-54% amino-nitrogen. Address: Tokyo Kogyo Shikenjo, Dai 2 bu, Kogyo Yakuhin Kenkyu shitsu.

2419. Yamada, Masakazu. 1926. Yûki enki bunri ni nafutooru o no ôyô ni tsuite (jiamin no shin bunri-hô) [Application of naphthol yellow to the isolation of organic bases. (A new method for the isolation of diamines)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 2(4):246-67. English abstract bound in the back. Vol. 2, No. 4. p. 39-41. [10 ref. Jap]
• ***Summary:*** The author applied to sake and shoyu the method proposed recently by A. Kossel and K.E. Gross (*Z. Physiol. Chem.*, 135, 167-74, 1924) for the isolation of arginine and aphthol yellow. He was able to obtain much crystalline precipitate in the shoyu, but none in the sake. This precipitate was easily recrystalized from boiling water in beautiful rosettes, which were found to be the mixture of the double salts of putrescine and cadaverine with the naphthol yellow. The precipitation in shoyu was caused by "salting out." The author also used naphthol yellow to precipitate bases (cadaverine picrate) from tamari shoyu, Hatcho miso, inaka miso, and natto. Address: Nôgaku-shi, Japan.

2420. Yamada, Masakazu. 1926. A new method for the isolation of diamines. *J. of the Agricultural Chemical Society of Japan* 2(4):39-41. April. Whole issue no. 19. [Eng]
• ***Summary:*** 1.08 g kadaverin pilerat is obtained from 1 kg of natto.

Note: At the top of p. 39 is written: "Abstracts from original papers."

2421. Mashino, M. 1926. Daizu tanpakushitsu no bunkai ni kansuru kenkyû. III. Kasei sooda ni yoru bunkai ni tsuite [Decomposition of soya-bean protein. III. Decomposition with sodium hydroxide {caustic soda}]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 29(5):248-251. May. [Jap]
• ***Summary:*** Soya-bean protein obtained from 4 different sources was decomposed by treating with 19.65% sodium hydroxide at 100ºC for 0.5-12 hours, and the amounts of ammoniacal and amino-nitrogen liberated were determined. The amount of ammonia liberated increases during the first 4 hours, but then remains almost constant. Ammoniacal nitrogen (4-12 hours) is 16.5%, 18.6%, 19.5%, and 17% in the 4 cases, respectively, of the total nitrogen. The rate of decomposition of the protein is nearly the same for the 4 samples. Amino-nitrogen (12 hours) is 65.6%, 68%, 68.6%, and 67.6% in the 4 cases, respectively, of the total nitrogen. Address: Tokyo Kogyo Shikenjo, Dai 2 bu, Kogyo Yakuhin Jikken Shitsu.

2422. Mashino, M. 1926. Daizu tanpakushitsu no bunkai ni kansuru kenkyû. IV. Bunkai ni kansuru chiken (hoi) [Decomposition of soya-bean protein. IV. Addendum on knowledge of decomposition]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 29(5):252-254. May. [Jap]
• ***Summary:*** A discussion of previous work (Mashino 1926). The violet color of the biuret reaction for soya-bean protein is apparently related to ammonia in protein. When all the ammonia is evolved, no violet color is observed. The free carboxyl group in the protein molecule may be present in combination with an amino-group. The rate of decomposition

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of soya-bean protein is little affected by pre-treatment with superheated steam. Oil-extracted soya-bean cake is therefore used for producing amino acids. Address: Tokyo Kogyo Shikenjo, Dai 2 bu, Kogyo Yakuhin Jikken Shitsu.

2423. *Times of India* (*The*) (*Bombay*). 1926. Imports [at Bombay harbour]. July 10. p. 7.
• ***Summary:*** "S.S. Tacoma Maru, from Nagoya [Japan], Agents:–O.S. Kaisha.

"From Osaka–90 bales grey cotton sheeting... 125 cases red lead, 20 cases soys, 20 cases Japanese soys, 5 cases glass tubes..."

2424. Wolf, Frederick A.; Lehman, S.G. 1926. Brown-spot disease of soy bean. *J. of Agricultural Research* 33(4):365-74. Aug. 15. [6 ref]
• ***Summary:*** This disease was first described in Japan in 1915 by Hemmi, and later in North Carolina (USA) in 1922 by the authors. The causal fungus, *Septoria glycines,* reproduces by conidia; no ascogenous stage is known. Brown spot causes brown or reddish spots upon the blades of the leaves and sometimes also upon the stems and pods. It appears to be seed-borne and attacks the cotyledons and then the foliage. The disease has been established by artificial inoculation. The spores may pass through the stomata and the mycelium is intercellular. Address: 1. Office of Fruit Diseases, Bureau of Plant Industry, USDA; 2. North Carolina Agric. Exp. Station.

2425. *Jozogaku Zasshi* (*J. of Brewing, Osaka*). 1926. Shojo: Seimai, daizu, komugi, mugiyasu, ômugi, seishu, shoyu, miso, tsukemono [State of commerce: Prices of rice, soybeans, wheat, rye, barley, refined sake, shoyu, miso, pickles]. 4(1):88-91. Aug. [Jap]
• ***Summary:*** Soybeans are used mainly in making tofu and fermented foods. Gives the price of soybeans at various places in Japan. Likewise gives prices of shoyu and miso at various locations.

2426. Kuwaki, Seiichi. 1926. Tamari koji seizo-jo narabini kanso-jo kaizen [Improvements in the production and drying of tamari koji]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 4(1):53-56. Aug. [Jap]
Address: Osaka Jozo Gakkai, Riji, Japan.

2427. Nishiwaki, Yasukichi. 1926. "Tapioka" oyobi tômorokoshi o komugi daiyo genryô toshite shiyô suru shôyu jôzô shiken hôkoku [Shoyu brewing using tapioca and corn as substitutes for wheat]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 4(1):34-37. Aug. [Jap]
Address: Osaka Jozo Gakkai, Kaicho, Japan.

2428. Associated Press (AP). 1926. 'Sukiyaki' appears chop suey's rival. *Hartford Courant* (*Connecticut*). Sept. 27. p. 8.
• ***Summary:*** "Boston–The American public long ago accepted chop suey, chow mein, and even foo young (with various spellings) but sukiyaki has still to make itself generally known."

Boston [Massachusetts] has one Japanese restaurant (opened within the last 3 months, on the South End) compared with more than 20 that serve Chinese dishes. Ingredients in sukiyaki include "squares of yellow bean cake" [tofu] and some "soy bean sauce." Later the hostess brings "toasted crackercakes with a seaweed leaf wrapped about each as a special delicacy."

2429. Horvath, A.A. 1926. The soybean as human food. *Chinese Economic Monthly* 3(9):392-400. Sept. [Eng]
• ***Summary:*** Contents: Introduction. 1. General ingredients [composition] of the various Manchurian beans. 2. Composition of some Japanese soybeans and of the common American varieties. 3. Value of the soybean as food.

Introduction: "The soybean is a plant of very early cultivation in China. Its use dates back to the beginning of China's agricultural age under the Emperor Shen Nung. It is mentioned in the *Ben Tsao Gang Mu* [*Pen-ts'ao kang-mu*], the ancient materia medica, written by Shen Nung himself in the year 2838 B.C. The celebrated dictionary of Sui Sham describes the plant under the name of *tchouan.* In another ancient dictionary, the *Kouang-ia* [*Guangya,* 230 AD], dating from the time of the Han dynasty, the soybean is called *ta-teou* [*dadou*], or grand pea, and also *sou.* It seems very probable that the names soi, soy, soya, and soja are all derived from the ancient Chinese name *sou.*

Note 1. This brief history of the soybean in China (above) is largely borrowed from Piper and Morse. 1923. *The Soybean.* p. 36-37.

In numerous ancient books the philosopher Hamintze [Lord Liu An of Huai-nan], a prince of the Han dynasty, is given as the inventor of soybean curd. The soybean and the soybean curd (*tofu*) are mentioned in many of the ancient Chinese poems, as for example in the rhymes of the great poet Sou, of the 2nd century: 'The tender jade* gets perfumed by it in the kettle' and 'to boil the pea to milk and the seed to butter' (Li Yu-ying et Grandvoinnet)." (Footnote: *"The poet emphasizes the resemblance of the fresh *tofu* with jade.")

"In 1921 China produced 80 per cent of the world's soybean production, 70 per cent of the latter being harvested in Manchuria. The 1921 crop of soybean in Manchuria was approximately 4,500,000 tons. The total acreage of soybean in the three provinces was 8,000,000 acres, covering 25 per cent of the total cultivated area."

In the section titled "General ingredients of the various Manchurian beans," four long tables give the nutritional composition of some of the roughly 500 different varieties of Manchurian soybeans, including black soybeans. The Chinese names of the varieties are given. Most of the

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analyses were conducted by the South Manchuria Railway Co. Table 1 gives the names (all are Chinese names), composition (water, fats, and protein) of 26 Chinese soybean varieties. The averages are: Water 8.60%. Fatty substance 19.90%. Protein 42.84%.

Table II gives the composition of 15 soybeans grouped by color, including the Chinese name, place of production, water, protein, fat, carbohydrates, fibrous tissue, "ashy substance," and analyst (incl. Fengtien Experimental Farm, Mantetsu Experimental Farm, and Mantetsu Central Exp. Farm). "Generally speaking, yellow beans are richest in protein and fat, especially the latter, then comes green beans with black beans last.

In Table III the "Kung Chu Ling Experimental Station classified the different kinds of yellow soybeans produced in Manchuria by the colours of navel [hilum] and compared their chemical composition. No significant differences were found. Table IV shows the composition of mixed soybeans stored in Manchuria during 1919 and 1920. A Manchurian grading system is described based on five factors: Shape and size (15 points), weight of 1 *sho* (10 points), lustre (15 points), dryness (25 points), purity (cleanness) (30 points). Soybeans receiving a score of 90-100 points are graded as a Special Class, those with 80-90 points as First Class, and those with 70-80 points as Second Class (Nakao and Usami). This table shows the average composition to be: water 8.5%, fatty substance 18%, protein 40%, soluble non-nitrogenous substance and fibrous tissue 28%, ashy substance 5.5%. The higher grades contain more oil and protein.

In the section titled "Composition of some Japanese soybeans and of the common American varieties," table V (p. 397) gives the composition of four leading Hokkaido soybeans: Tsuru-no-Ko, Kanro, Yoshi-Oka, and Oh-Ya-Gi. The water content averages 16.47%, the protein content ranges from 39.34 to 36.86% (average 37.62%), and the fat content ranges from 19.08 to 17.86% (average 18.66%). Table VI gives the composition of six leading American soybean varieties: Mammoth, Ito San, Haberlandt, Guelph, Midwest, and Kingston. The water content averages 7.74%, the protein content ranges from 36.59 to 32.99% (average 35.00%), and the fat content ranges from 22.72 to 18.96% (average 20.37). Note that the Hokkaido soybeans contain more than twice as much moisture, 7% more protein, and only 91.6% as much fat.

The section titled "The value of the soybean as food," states: "One of the certain evidences that the soybean is making god headway in the Occident is the fact that about 10 years ago [during World War I] the French army replaced a large portion of the meat powder in the army ration pottage by soybean products, and has used it in several forms as part of the regular ration. Germany and Austria also tried to compensate the poor protein diet of their army and population during the Great War by using soybean products."

"The soybean contains a double amount of the protein and of calories present in beefsteak. Therefore, in Peking, where the retail price for soybean in 1925 averaged 4 cents (Mex.) per one pound, half of a pound, costing 2 cents, may provide for an adult the necessary protein minimum, which otherwise would have to be purchased in the form of one pound of meat, costing at least 20 cents. According to Li Yu-ying, author of the well-known monograph (in French), 'Le Soya,' and now connected with the Kai Cheng Bean Products Company in Peking, the market prices for an equivalent of 100 calories in soybean were, in Paris in 1912, thirty times cheaper than for the same 100 calories in beef." In Germany, Ehrhorn (a well-known soybean food specialist, formerly of the Aguma factories in Harburg, Germany) calculates that 500,000 tons of soybean residue [meal and cake] are available every year. Soybean protein in Germany is now 25 times cheaper than beef protein. In China, where undernutrition is found on a large scale and famine is a common occurrence, soybean cake is used mainly as a fertiliser for rice fields and sugar plantations–rather than as a low cost source of protein. Numerous famine relief committees in China "have come to the conclusion that one key to the famine relief problem in China is to stop the waste of precious soybean cake for fertiliser." Note 2. This is the earliest English-language document seen (Nov. 2002) that uses the word "undernutrition."

Reprinted in 1927 as part of an 86-page monograph titled "The Soybean as Human Food" (Peking, China).

Note 3. This is the earliest document seen (May 2011) in which Dr. Horvath gives his title as "M.D.

Note 4. This is the earliest document seen (June 2013) that mentions the soybean variety Kanro, or any other large-seeded variety–but only outside the United States. Address: M.D., Peking Union Medical College, China.

2430. Kawakami, Tojiro. 1926. Shôyu jôzô genryô toshite mugi tokuni komugi no garasu-shitsu funshitsu-shu no tokusei ni tsuite [On the special glass-type of wheat used as a raw material in shoyu brewing]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 4(2):107-13. Sept. [Jap]
Address: Hiroshima Jozo Shikenjo, Gishi, Japan.

2431. *Chinese Economic Bulletin.* 1926. Soy industry in Foochow. 9(301):316-17. Nov. 27.
• ***Summary:*** Soy manufacturers in Foochow [pinyin: Fuzhou], the capital of Fukien [pinyin: Fujian] province, "total about 250, including 100 in the city and suburbs and 150 in the surrounding villages. The leading ones are Kwo Pen-yi (Cc = Chinese characters given), Tang Sen-hsing (Cc), and Tung An (Cc), the first two capitalized at upward of $100,000, and the third a little below $50,000. Mr. Kwo is an experienced soy manufacturer of Yuki (Cc), and Mr. Tang of Kwantow (Cc [pinyin: Guantou]). The former started the Foochow branch manufactory at Shangtuwei (Cc), Nantai (Cc), in 1920, and the latter at Tientangchieh (Cc) in 1925.

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Tung An is the oldest establishment in Foochow, having been operated at Howyangli (Cc), Nantai, by a Chuanchow (Cc) man for about half a century."

"These manufacturers are organized into two guilds: The City Guild (Cc) and the Nantai Guild."

The small manufacturers try to compete with the large manufacturers by offering a better product, but so far they have not been successful.

"Soy is a sauce manufactured from soya beans. The name 'soy' is derived from the Japanese *shoyu*, the Chinese name being *shi yiu* (Cc [for fermented black soybean sauce]) *chiang yiu* (Cc [for soy sauce]). The raw material used, especially by the manufacturers in Kwantow, is the green [soy] bean from Newchwang, sold in Foochow at $10 per 100 catties. The Foochow manufacturers, however, prefer the yellow [soy] beans from Tengchow (Cc), Shantung province, where they are cheaper than the green variety by several hundred cash per hundred catties.

"The method of manufacture is briefly as follows. The beans are first cooked, then mixed with wheat flour and table salt, and put in a slightly closed wooden jar. The contents of the jar are afterward sprinkled with salt solution, and then transferred into a porcelain *kong* [earthenware vessel], in which they are hard pressed. Finally they are heated in the sun: the longer they are exposed to sunlight, the better the taste of the soy produced.

The soy [sauce] produced in Foochow is inferior in quality to the Kwantow product. The general processes of manufacture are practically the same, the only difference being in details, which remain a commercial secret among the manufacturers."

Other reasons for the superiority of Kwantow soy sauce "may be enumerated as follows: (1) Absence of adulterants. Soy [sauce] is generally divided by its color into two kinds, the light color soy and the dark color soy. The former is pure and has a pleasant taste; it is sold at 1,280 cash per catty. The latter is adulterated with molasses, so as to reduce the cost of manufacture; it is therefore much cheaper in price, not exceeding 32 cash per oz.

(2) Longer exposure to the sun. The Foochow manufacturers are less spacious and less sunny than the Kwantow manufactories. The soy in the former is exposed to the sun for eight or nine hours a day, while the soy in the latter is exposed from sunrise to sunset." This partly accounts for the superior quality of the Kwantow soy.

(3) Long period of preservation. Having been prepared, the soy should remain in the sun for a year before being sold. Old soy is better than fresh soy, as old wine is better than new. However, small manufacturers cannot afford to keep their output for such a lengthy period and often sell it after a few months.

"While Tang Sen-hsing and Kwo Pen-yi confine their business to soy, the Tung An also deals in the following: Table salt; chiang [jiang] (Cc) a semi-solid soy, distinguished from *chiang-yiu*, which is a liquid soy; distiller's grain; vinegar; dried bean curd [probably Chinese-style pressed tofu, *doufu-gan*], pickled bean curd [probably fermented tofu]; salt eggs; salt vegetables and melons; prawn oil; samshu; sesame seed oil; salt turnip; &c. Tang Sen-hsing and Kwo Pen-yi are the best soy makers in Foochow, while Tung An produces excellent pickles.

"Soy and pickles in store are kept in porcelain *kongs* or sometimes wooden barrels. Soy to be transported to other cities is packed in glass bottles or bamboo bottles, the former having a capacity between half a catty and two catties, the latter between three catties and ten catties.

"Owing to the increase in the price of salt from $6 to $8 per 10 catties, soy manufacturers in Foochow have raised the price of soy by 16 cash per catty in May. Prices of other products have also been advanced by the following rates. Dried bean curd, from 8 cash to 10 cash a catty. Pickled bean curd, from 20 cash to 24 cash a catty..."

2432. Horvath, A.A. 1926. The soybean as human food. *Chinese Economic Monthly* 3(11):513-18. Nov. [Eng]

• ***Summary:*** Contents: Soybean oil for food: Refined soybean oil, crude soybean oil. Refined soybean oil: As substitute for salad or frying oil, as substitute for hardened oil or lard (hydrogenation), in oleomargarine and vegetable butters.

Until quite recently, the line between edible oils and industrial oils has been quite clear. "Originally soybean oil was used as an edible oil by the Chinese, but its strange smell has repelled Japanese and Western palates (Sato)." "The advance of science in recent times has quickened the development of methods of refining, deodorizing, decolouring, and hydrogenating oils. As a result, the partition that used to divide food oils from industrial oils has collapsed. Whale oil and fish oil, as well as soybean oil, are now in use in Europe and America as a regular constituent of edible oils and fats."

"The aggregate production of the bean mills in Manchuria is in the region of 200,000 tons of bean oil and over 50 million pieces of bean cake. All the bean mills in Manchuria, excepting the Suzuki Bean Mill, Dairen, which is worked on the so-called extraction system, are worked by the expression system." The process of pressing, however, leaves about 45% of the soybean oil remaining unused in the bean cakes, each of which weighs 61 lb. In Europe, and especially in England, the solvent method is used. In the 'Hanseatische Muhlwerke' [Muehlenwerke], Hamburg, Germany, pressing and extraction methods are combined. Extracted soybean oil generally for ½ to 1 cent per pound less than the expressed oil.

Soybeans contain the highly valuable fat-soluble vitamin. "In 1925 Hornemann showed that if the oil is taken from the beans by pressure, all the fat-soluble vitamin remains in the cake and the oil is free from it... But in case

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the extraction method is used, the soybean oil contains, according to Hornemann, all the fat-soluble vitamin... Moderate hydrogenation of soybean oil does not destroy the fat-soluble vitamin. Rancidity destroys it.

"Fresh soybean oil has a sweet smell, but, when the impurity is contained in a large quantity, it will emit a disagreeable odour. As time goes by, the change will grow more pronounced... In the case of the temperature being high, the same change occurs more quickly, and the colour of the oil becomes darker, the oil itself tasting also less palatable." Filtered oil is more resistant to undesirable influences. "At the present time the Harbin market includes only the filtered oil produced by the Anglo-Chinese Company. All the other oils are merely such as have settled."

Soybean oil as a substitute for salad or frying oil. "The improved methods of deodorizing and bleaching soybean oil have tended to remove a former prejudice against its use as a table oil. Several firms in Europe and America are packing soybean oil for sale to the retail trade, and it is claimed that a satisfactory market has been found (Piper and Morse)... The Nisshin Oil Mills Company, Ltd., at Yokohama and Dairen, purchased some modern oil refining machines from the U.S.A. in 1921 and a refined bean oil (salad oil) is being made which is claimed by the Japanese to be better in quality than the European or American make, by means of improved scientific methods and special skill... It is said that about 20 tons of the refined bean oil (superior salad oil) is manufactured every day at Dairen. In 1923 the refining of special soybean oil was also successfully begun in Harbin by the Anglo-Chinese Eastern Trading Company, Ltd., which had installed special equipment. The resulting product, known as 'Acetco,' is sold to the local preserve factory, is exported to Transbaikal [Transbaikalia or Zabaikal; a former Russian government located east of Lake Baikal–which is in southern Siberia], which is adjacent to Manchuria, and gradually appears to be conquering the local market as a substitute for the more expensive vegetable oils and animal fats. Acetco salad oil has been used at the Peking Union Medical College Hospital for a year and has been found in quality to be equal to Wesson oil, being at the same time much cheaper" (costing only 60% as much).

Frying oil is widely used in Japan to make "Tempura." "Fried *tofu* especially is made everywhere. Sesame-oil or refined rape-oil was formerly used in Japan for frying purposes but a few years ago the demand for bean-oil began to increase as a substitute for the above mentioned oil. (Footnote: In China refined soybean oil partly replaces the very expensive sesame oil in the diet)." "It is partly because the soybean oil manufactured in Japan cannot compete with that made in Manchuria for purpose of export and, consequently, the Japanese are obliged to extend the market at home."

Concerning lard substitutes: "The commercial lard substitutes consist chiefly of a mixture of lard or 'lard stearine' with 'beef stearine', cotton seed stearine and some vegetable oil... In the United States half of the total amount of all vegetable oils produced in that country is used as substitute for lard. Cotton-seed oil stands first in this respect... In hydrogenation, deodorization is practically complete. Therefore, the product made from cotton-seed oil has no intrinsic superiority over that made from soybean oil. The hydrogenation of soybean oil has tended to remove a former prejudice against its use for the kitchen. In 1918 the consumption of soybean lard substitutes in the United States amounted to over 56 million pounds."

"In oleomargarine and vegetable butters: The industry of butter substitutes owes its origin to experiments made by Mege-Mouries which were worked out to a manufacturing process in Paris in 1870. This industry duly spread to Italy, England, Holland, and other countries in Europe... Cow's milk is sometimes replaced by an emulsion prepared from the kernels of almonds or from soybeans, so that it is possible to prepare a margarine from vegetable products exclusively (Lewkowitsch)."

Note 1. This is one of the most important, original, and creative publications on soyfoods written in English before World War II. It is especially unique and valuable for the information it presents about soyfoods in Europe.

Note 2. This is the earliest document seen (March 2002) that refers to shortenings made with soy oil as "soybean lard substitutes."

Reprinted in 1927 as part of an 86-page monograph titled "The Soybean as Human Food" (Peking, China).

Note 3. In Jan. 1927 this journal merged with and became the *Chinese Economic Journal***.** Address: M.D., Peking Union Medical College, China.

2433. South Manchuria Railway Co. 1926. Soya beans in Manchuria. Dairen: SMRC Agricultural Office. 40 p. Nov. 26 cm. [Eng]

• ***Summary:*** Contents: 1. How Manchurian beans are produced: Soybean production in the world (Japan, Chosen {Korea}, Manchuria, China proper, United States), bean cultivation in Manchuria (how production has been increased, Manchuria suited for bean production {meteorological peculiarities, Manchurian soil and bean cultivation, local adaptability}). 2. World-wide demand for Manchurian beans: Supply and demand in Manchuria, bean demand in destination countries (demands in Japan, in China proper, in Java {Dutch East Indies}, in European countries). 3. Uses of beans: Introduction (gives uses as food, cattle feed, and fertilizer, and uses for the oil), general uses of beans (beans, bean oil, bean cake, food), value of beans as food (from general constituents, food value of beans from new dietetic point of view, conclusion), uses of bean oil (properties of bean oil, miscellaneous uses of bean oil {direct uses (native), refined bean oil for table use, substitute for lard, substitute for butter, paint solvent, soap,

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glycerine and fatty acid, candles, water proof, substitute for petroleum, substitute for India Rubber, etc.}), uses of bean cake (as fertilizer, bean cake as cattle feed, bean powder [probably defatted soybean flour] made from bean cake & its uses, "soy" made from bean residuum, "Aji-no-moto" made from bean residuum, water-paint made {Solite, invented by Mr. T. Suzuki and manufactured and sold by the Dairen Solite & Co. until several years ago}, protein products made from bean residuum {such as paper sizing, celluloid substitutes, and Satolite [soybean plastic]}). 4. Bean milling in Manchuria: History of development, oil milling processes (expressing process, by process of operation, by kinds of expressing devices, by chemical / benzine extraction at Honen Bean Mill, Dairen), advantages & disadvantages of different processes (wedge, screw, & hydraulic systems compared; round cake, plate cake, & extraction system compared {advantages & disadvantages of extraction system, advantages & disadvantages of bean plate, advantages & disadvantages of hydraulic pressure system}), bean mills in Manchuria. 5. Accumulation & distribution of beans, bean cake & oil: Produce movements in South Manchuria, produce movements in North Manchuria. 6. Business in Manchurian produce: Business on the Exchange (Japanese Exchanges, Chinese Exchanges), business outside the Exchanges (spot deals in beans {river beans, market beans, osier bin beans, train beans}, by forward contract {by future contract, business in the green field, by speculation}, business in bean cake & oil). 7. Export staple produce: Staple produce in Manchurian trade, exports of staple produce in South & North Manchuria compared, position of custom houses in Manchuria concerning export of staple produce.

In Chapter 4, "Bean milling in Manchuria," section 1 titled "History of development" states: The [soya] Bean milling industry was established in China a few hundred years ago. In Manchuria, hemp oil mills used to be practically all that existed up until about 60 years ago [i.e., until about 1866]. Around Tiehling and Changchun, which were important [soya] bean markets, the process for expressing oil from hempseed was applied to Beans with excellent results; this was the origin of the bean milling industry in Manchuria. As the demand for bean oil kept rising, hempseed oil found its uses gradually reduced, and in time the term "oil mill" came to refer to a bean oil factory. At that time, the object of the mills lay chiefly in producing Bean Oil; Bean Cake was regarded as a by-product, good only for cattle feed. Most of the demand was local and the milling process was primitive and on a small scale, often conducted by hand or by means of a donkey.

Phase II: The Sino-Japanese War (1894-1895) marked the start of Bean Cake exports to Japan. As its fertilizing value came to be recognized, demand for to Japan expanded rapidly. Starting at this time, Bean Cake came to be seen as the main product and Bean Oil as the by-product.

Phase III: In recent years, with the worldwide shortage of oils and fats, Manchurian Bean Oil has come to be exported worldwide; exports to the West have begun and increased dramatically. Demand reached its zenith during the Great War [World War I].

Photos show: Seed-bean field (Agricultural Experiment Station, Kunchuling). Soya beans in pods. Sowing of seed beans. Bean plant in harvesting season. Weeding in bean field. Beans being threshed in farm-yard. Beans harvested & carted away. Beans stored in Osier Bins in the yard of the local merchant. Bean carts wending their way the Market in the Interior. Old screw patterned presses in Manchuria. Hills of bags of beans in Changchun Station Yard. Train loads of bean cake to be shunted to quay of shipment. Hydraulic pressure system in Manchuria.

The section titled "'Aji-no-moto' made from bean residuum" (p. 17) states: "In the amino acid that constitutes [soy] bean protein is contained much glutamic acid that serves as the chief source of 'ajinomoto,' a very popular flavor at Japanese table. Thus, be decomposing the constituents of bean residuum [defatted soybean meal], the manufacture of glutamic acid soda will be easily accomplished." Note: This is the earliest document seen (Jan. 2014) concerning "aji-no-moto" / "ajinomoto" (mono-sodium-glutamate) made from soybeans.

2434. Stewart, Ralph T.; Wentz, John B. 1926. A recessive glabrous character in soybeans. *J. of the American Society of Agronomy* 18(11):997-1009. Nov. [4 ref]
• ***Summary:*** Soybeans are normally pubescent (hairy), however a number of smooth (glabrous) varieties are known to exist in Japan and the USA. A glabrous character is reported "which is thought to have arisen from a mutation in the germ cells in one of the parents in a cross between two varieties of soybeans. The inheritance seems to be due to a single pair of Mendelian factors, glabrousness being recessive." Nagai and Saito (1923) reported a dominant glabrous character. The reason for this discrepancy is not yet clear. Address: Iowa State College, Ames.

2435. Ishida, S. 1926. Shôyu-chû no isseibun ni tsuite (Roishin) [On a component of shoyu (Leucine)]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 94. p. 342-45. [Jap]
Address: Jozo Shikensho, Joshu.

2436. Iwasaki, K. 1926. Muon shitsu de kome kôji jikayô shôyu miso seizô-hô [Making rice koji, shoyu, and miso without using warm incubation rooms]. *Dainippon Nokaiho* (*J. of the Agriculture Society of Japan*) No. 549. p. 47-49. [Jap]
Address: He is head of the village. Kagawa-ken Sanpo Gunasa Mura.

2437. *Jozogaku Zasshi* (*J. of Brewing, Osaka*). 1926.

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Zappo 2. Dai 3 kai Osaka Shoyu Hinpyokai [Miscellaneous reports 2: The third competitive shoyu exhibition in Osaka]. 4(4):355. [Jap]

2438. *Jozogaku Zasshi* (*J. of Brewing, Osaka*). 1926. Shojo: Seimai, daizu, komugi, mugiyasu, ômugi, seishu, shoyu, miso, tsukemono [State of commerce: Rice, soybeans, wheat, rye, barley, refined sake, shoyu, miso, pickles]. 4(4):360-61. [Jap]

2439. Kinoshita, Asakichi; Takeda, R. 1926. Komugi daiyôhin to shite enbaku shiyô shiken [The use of oats as a substitute for wheat in shoyu manufacture]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 94. p. 152-63. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Joshu.

2440. Kinoshita, Asakichi; Matsumoto, K. 1926. Shôchû kasu riyô shiken [The utilization of shochu cake in shoyu manufacture]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 94. p. 126-33. [Jap]
• ***Summary:*** Shochu is a type of cheap/low-class distilled alcoholic beverage, sometimes made from potatoes. Address: Jozo Shikensho. 1. Gishi; 2. Gishi.

2441. Kinoshita, Asakichi; Takada, R. 1926. Shôyu jôzô shiken. I. Seikôji teire dosû hikaku shiken [Brewing test of shoyu. Comparative tests on stirring the koji]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 94. p. 97-108. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Joshu.

2442. Kinoshita, Asakichi; Seko, M. 1926. Shôyu shin jôzô-hô. Baiyô saikin oyobi baiyô kôbo ôyô no ikô [A new shoyu brewing method: Excellent results with the application of cultured bacteria and yeasts]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 21(7):18-27. [Jap]
Address: 1. Jozo Shikensho Gishi; 2. Jozo Shikensho Kenshu-in, Japan.

2443. Kinoshita, Asakichi; Kanamori, Y. 1926. Shôyu-chû no "jiasutaase" ni kansuru kenkyû [Studies on the diastase in shoyu. I.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 21(3):27-41. [Jap]
Address: 1. Jozo Shikensho Gishi; 2. Jozo Shikensho Kenshu-in, Japan.

2444. Kurono, Kanroku; Katsume, E. 1926. Shôyu no kagaku ôyôbi sono ôyô. Shôyu shikiso no kagaku-teki sosei [The chemistry of shoyu and its application. On the chemical composition of shoyu pigments]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 21(1):23-28; 21(2):13-18; 21(3):8-14; 21(4):50-55. [25 in part I ref. Jap]
• ***Summary:*** Note the relatively early use of references in this Japanese journal article. Address: 1. Jozo Shikensho Gishi, Nôgaku Hakase; 2. Jozo Shikensho Kenshu-in, Kôgaku-shi, Japan.

2445. Matsumoto, K. 1926. Shôyu seibun-chû no yuki-san-rui no kenkyû. II. [On the organic acids in shoyu. II]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 94. p. 260-302. [Jap]
Address: Jozo Shikensho, Gishi.

2446. Matsumoto, K.; Kubota, K. 1926. Kôji "jiasutaaze" no saiteki suiso "ion" nôdo to sono kettei-hô [On determining the optimum hydrogen ion concentration for the activity of koji diastase]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 94. p. 237-59. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Kenshuin.

2447. Matsumoto, K.; Chin, K.; Sano, Z. 1926. Shôyu jôzô ni kansuru saikin-rui ni tsuite [On the bacteria in shoyu brewing]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 21(10):28-33; 21(11):23-30; 21(12):27-38. [Jap]
Address: 1. Jozo Shikensho Gishi, Nôgaku Hakase; 2-3. Jozo Shikensho Kenshu-in, Japan.

2448. Matsumoto, K.; Kakegawa, K. 1926. Shôbo ôyô shôyu sokujô-hô ni tsuite [Application of yeast to rapid brewing of shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 21(6):27-32. [Jap]
Address: 1. Jozo Shikensho Gishi, Nôgaku Hakase; 2-3. Jozo Shikensho Shokutaku, Japan.

2449. Nagai, Isaburo. 1926. Daizu no iden ni tsuite [On the heredity of the soybean (1)]. *Nogyo Oyobi Engei* (*Agriculture and Horticulture*) 1(1):4-14; 1(2):107-18. [11 ref. Jap]
• ***Summary:*** His first, pioneering comprehensive study. On inheritance of fasciation, branching habit, cotyledon color, leaf color, seed coat color, dehiscence of pods, flower color, seed size, yield, number of leaflets, cracking on seed surface, etc. Also discusses *Glycine javanica, Glycine ussuriensis, Glycine tabacina, Glycine tomentosa.*

2450. Nishimura, Torazô. 1926. Shôyu jôzô sôdan (95-96). No. 262-63. Daizu ni taisuru shochi to "fuichin" shûkakuryô [Shoyu fermentation: Treatment of soybeans and yield of phytin]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 21(2):46-48; 21(3):63-65. [Jap]
Address: Moto, Jozo Shikensho Gishi, Japan.

2451. Shita, K.; Yanagigawa, T. 1926. [Proteins. I. Amino acids of soy bean meal]. *Osaka Kogyo Gijutsu Shikenjo Hokoku* (*Report of the Government Industrial Research Inst., Osaka*) 7(9):1-16. (Chem. Abst. 21:430). [Jap]*

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• ***Summary:*** The nitrogen distribution of soy bean meal, hydrolyzed by hydrochloric acid, was: amide-nitrogen 10.00%, humin-nitrogen 4.83%, diamino-nitrogen 26.43%, monoamino-nitrogen 58.74%. Glutamic acid, aspartic acid, leucine, proline, and phenylalanine were isolated.

2452. Taira, T. 1926. Shôyu kôki busshitsu no kenkyû [Research on flavoring substances in shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 21(11):31-37. [6 ref. Jap]
Address: Taikei (Taiwan Keizai?) Sotokufu Chuo Kenkyujo, Taiwan.

2453. Takagi, M. 1926. On the frequency of the spontaneous hybridization in soybean. *Korea Agricultural Experiment Station Notes* 4:323-24. Abstract in Japanese Journal of Botany 3:68 for 1927. *

2454. Tsugano, Akijiro. 1926. Shuzoka wa shoyu-gyo o kengyo subeshi (Suzoka hokenho) [Owners of sake breweries should also be able to also make shoyu (Sake brewers' insurance law)]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 4(4):279-82. [Jap]
• ***Summary:*** Note: On four pages (unnumbered) from the front of this issue are two interesting photos: Top half of page: Many Japanese students from an Osaka technical school, celebrating its anniversary, standing behind a table with a labeled bottle in front of each. Based on the sampling containers in front of each, the students on the left appear to have sake bottles, whereas those on the right seem to have shoyu bottles. Lower left: A pyramid-shaped stack of labeled wooden shoyu kegs, each tied with rice straw ropes. The labels include 11 different brands, including Yamasa.
Address: Nihon Jozo Kogyo Kabushikigaisha Senmu Torishimariyaku Shacho Nogakushi, Japan.

2455. Yamada, Masakazu. 1926. Yûki enki bunri ni "nafutooru" ô no ôyô ni tsuite ("jiamin" no shin bunri-hô. II.) [Application of naphthol yellow to the isolation of organic bases (a new method for isolation of diamine)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 21(1):40-42; 21(2):23-33; 21(3):42-45; 21(4):27-31; 21(5):19-22. [11 ref. Jap]
Address: Jozo Shikensho Gishu, Nôgaku-shi, Japan.

2456. Yamada, Masakazu. 1926. Yûki enki bunri ni "nafutooru" ô no ôyô ni tsuite (jiamin no shin bunri-hô) [Application of naphthol yellow to the isolation of organic bases (a new method for isolation of diamine)]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 94. p. 302-41. [11 ref. Jap]
Address: Jozo Shikensho, Gishu.

2457. Yoshimura, K. 1926. Shokubutsu taichû gan-chisso yûki-butsu tokuni yûki enki ni tsuite [Organic materials containing nitrogen in the bodies of plants, especially organic bases]. *Nihon Gakujutsu Kyokai Hokoku* (*Report of the Japanese Society for the Advancement of Science*) 2:88-93. [Jap]
• ***Summary:*** Includes a study of the organic bases in soy sprouts. Address: Kagoshima, Japan.

2458. Hattori, Shichirô. 1926. Shokutsû no yorokobu tôfu to tamago ni chinryôri [Delicious tofu and hen's egg cookery that would make a gourmand joyous]. Tokyo: Sakamoto Shoten. 85 + 86 p. 19 cm. Series: Katei Ryôri Sôsho. [Jap]
Address: Japan.

2459. International Institute of Agriculture. Bureau of Statistics. 1926. Production et commerce des produits oleagineux de huiles vegetales [Oleaginous products and vegetable oils–Production and trade]. Rome, Italy: Institut International d'Agriculture. Service de la Statistique Generale. 192 p. Index 24 cm. [30+ ref. Fre; Eng]
• ***Summary:*** The Introduction begins: "This volume is a continuation of a the monograph on oleaginous products (*produits oléagineux*) and vegetable oils, published in 1921 in French, then in 1923, with numerous amplifications and modifications, in English.

Soya is discussed in detail in English on pages 70-73. Tables show: (1) World production of soybeans in 1909-13, 1921, 1922, 1923, and 1924 in the following countries (in thousands of quintals): China (incl. Manchuria), Korea, Japan, United States, Java & Madura, and Kwangtung (French: Koung-Toung; today's Guangdong province in southern China). In 1923, China was by far the leading country (22,680), followed by Korea (6,466), Japan (4,378), USA (2,434), and Java and Madura (973). (2) Exports of soybeans worldwide (during the same 5 years as (1) above). (3) Exports of soy oil worldwide (during the same 5 years as (1) above). Note: This same basic information is given in French on pages 24-27.

Pages 60-63 give a worldwide overview in English. Tables show: (4) World production of primary oleaginous products (during the same 5 years as (1) above). The eight products are: Groundnuts, rapeseed, linseed, hempseed, cottonseed, sesamum, soya and copra. For sesamum, soya, and copra, values are given only for the year 1924. (5) World production of primary oleaginous products (expressed in terms of oil, in thousands of quintals). (6) World exports of primary oleaginous products (in thousands of quintals). (7) Excess of imports (+) or of exports (-) of primary oleaginous products terms of oil (in thousands of quintals). For the eight products for the years 1909-1913 and 1924 for: Europe, North and Central America, South America, Asia, Africa, Oceania. (8) World exports of vegetable oils (in thousands of quintals during the same 5 years as (1) above).

There are also detailed sections in English on

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groundnuts (p. 64-68), and sesamum (p. 68-71). Address: Rome, Italy.

2460. Japan Transportation and Operation Bureau (Un'yukyoku). 1926. Daizu, kome, zakkoku ni kansuru chôsa [Survey of soybeans, rice, and small grains]. Japan. See p. 1-59. (Juyo Kamotsu Jokyo dai 1 hen). [Jap] Address: Tokyo, Japan.

2461. Kirtland, Lucian Swift. 1926. Finding the worth while in the Orient. New York, NY: Robert M. McBride & Co. xii + 462 p. See p. 77. Illust. Index. 20 cm.
• ***Summary:*** This is guidebook to Asia–but with the author's favorites clearly expressed. In Chapter 1, "Japan, Land of the Rising Sun," the author is discussing Nara and its many festivals year-round. However, certain dates are of major importance (p. 77). On the nights of February 2 and 3 all three thousand lanterns in the Park are lighted. On the second of these two nights the townspeople go "to the Kasuga-no-Miya shrine for the ceremony known as 'bean scattering,' everyone taking the precaution to be present as he or she becomes safeguarded against harm from evil spirits for a year."

Note: This is the earliest English-language document seen (Sept. 2011) that uses the term "bean scattering" to refer to *mame maki* (in Japan at the lunar New Year).

In the section titled "The Japanese menu," soy sauce is mentioned (p. 23).

Chapter 3 (p. 113-28) is titled "Manchuria, the kingdom of the soya bean." Page 113 states: "Manchuria's three provinces never were part and parcel of the Chinese empire. China 'proper' stops at the Great Wall. When the Manchu dynasty seized the Dragon Throne of China, it retained Manchuria as a private affair. The emperors did not lump their ancestral provinces in the common pool... They sought to keep the Chinese and everybody else out."

2462. Mallory, Walter H. 1926. China: Land of famine. *American Geographical Society, Special Publication* No. 6. 199 p. See p. 112-14. Foreword by Dr. John H. Finley.
• ***Summary:*** "A striking example of the introduction and utilization of new crops may be seen in the case of the soy bean. Until recent years, beans and bean products have not occupied a place of importance in commerce, although they have been used as an article of food by the Chinese for centuries past. It is chiefly due to experiments of the Japanese that the value of the by-products has been established... Modern Manchuria may be said to have been built on the soy bean." Discusses the merits of soy flour, and the work on its behalf of Dr. A.A. Horvath of the Peking Union Medical College, and by Dr. L. Berczeller, the Hungarian food physiologist. Address: Secretary, China International Famine Relief Commission.

2463. Mayerhofer, Ernst; Pirquet von Cesanatico, C. eds. 1926. Lexikon der Ernaehrungskunde [Dictionary of dietetics]. Vienna, Austria: J. Springer. viii + 1205 p. Illust. 25 cm. [Ger]*
• ***Summary:*** Included in the long list are: Akamiso, miso, shiromiso, tofukasu [okara], daizu [soybeans], fu [dried wheat gluten cakes], kingyo-fu, kiri-fu, kiri-mochi [frozen and dried rice cake], ame [malt extract], mirin, aburage [tofu fried in vegetable oil], natto–Bohnenkäse, Tofu–Sojatopfen, Tonyu–Sojamilch [soymilk], azuki [small red beans], kwansen-fu, kinako–Sojabohnenmehl, geröstet, amasake [amazake]–unvergorener Sake, umeboshi, koritofu [frozen and dried tofu], midzuame [soft ame = rice syrup], shoyu–Sojasauce, yuba–eine Bohnenspeise. Note that a number of these terms are Japanese.

Note 1. This is the earliest German-language document seen (Nov. 2005) that mentions amazake, which it calls "amasake."

Note 2. This is the earliest German-language document seen (April 2013) that uses the term *Sojatopfen* to refer to tofu.

Note 3. This is the earliest document seen (Aug. 2002) in any language that uses the term *tonyu* (or tônyû) to refer to soymilk.

Note 4. This is the earliest German-language document seen (Nov. 2102) that mentions kinako, which it defines as *Sojabohnenmehl, geröstet.*

2464. Saeki, Tadasu. ed. 1926. Progress of the science of nutrition in Japan. Geneva: League of Nations Health Organization. 387 p. Illust. 25 cm. *

2465. Saito, Akio. 1926. [Chronology of soybeans in Japan, 1900 to 1926, last half of the Meiji period and all of the Taisho period] (Document part). In: Akio Saito. 1985. Daizu Geppo (Soybean Monthly News). Feb. p. 12-14. [Jap]
• ***Summary:*** 1901–Crushing of soybeans starts in Japan. Owada Seisakusho of Tsuruga, Fukui prefecture, Japan, starts making soy oil and soybean cakes using the press method (*assaku-ho*).

1901–Nakahara Kota is issued a patent on his process for making dried-frozen tofu indoors in a freezer (*jinko kôri-dofu*). This makes it possible to produce a good-quality product year round. This year there are 453 makers of dried-frozen tofu in Nagano. Nagano prefecture encouraged production of this product during the Russo-Japanese War as a side home industry.

1901–Soybean production in Japan reaches 525,000 tonnes, topping 500,000 tonnes for the first time.

1905–After Japan's victory in the Russo-Japanese War, it is said that maybe, because of the victorious mood, tofu makers start to blow a horn while selling tofu.

1905–At about this time, soybean cake (*daizu kasu*) passes fish cake to become the main fertilizer for crops in

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Japan.

1905–Shin Sawamura (lived 1865-1931) discovers the main natto bacteria and names it *Bacillus natto* Sawamura.

1906–Neda Tadamasa of Akita prefecture develops a new type of soybean. Named the Akita, it is a cross between Shirosaya and Itoi's Ani.

1907 March–Nisshin Mamekasu is founded (initial capitalization is 3,000,000 yen). The next year its soybean crushing plant in Dairen, Manchuria, starts to operate. In 1918 the company merged with Matsushita Mamekasu to become Nisshin Seiyu K.K.

1908–At about this time the retail price of tofu in Tokyo is 1 *sen.* The average cake of tofu weighs over 100 monme (1 monme = 3.7656 gm or 0.1325 oz), so over 376 gm. In 1982 the average price of tofu is 100 yen per cake and the average cake weighs 300 gm.

1914–The Mogi Saheiji family in Noda starts to sell shoyu in 1-sho bottles (1 *sho* = 1.805 liters or 3.81 pints). Before this time a ceramic sake bottle (*tokkuri*) was used.

1914–Yamada Hikozaburo of Nagano prefecture succeeds in making dried-frozen tofu (*Koya-dofu*) for the first time in the *Shimi-dofu* area.

1915–From this year until 1919, the soybean oil industry in Japan is in a period of prosperity. In 1914 Japan produces 7,105 tonnes of soy oil and 92,325 tonnes of soybean cake. Just 5 years later, in 1919, these figures have risen to 30,658 tonnes of soy oil and 353,288 tonnes of soybean cake. Soybean cake becomes very widely used in Japanese agriculture.

1918–The mayor of Tokyo, Tajiri Inataro, recommends that people eat low-fat soybean cake cooked with rice (*mamekasu meshi*) to protect themselves from the rapidly increasing price of rice; he himself eats this dish every day. Hiroetsu? Takako (a woman educator, lived 1867-1949) cooked soybean cake and rice (*mamekasu gohan*). Dr. Saei Tadasuke (1876-1959, a nutritionist) introduces an inexpensive meal (it costs 3 *sen* 5 *rin* for 5 people) using tofu and fish bones for breakfast and dinner at the Inexpensive But Nutritional Cookery Seminar (*Eiyo Anka Ryori Koshukai*). This year 30-50% of Japanese don't have enough to eat. The demand for beef tendons and okara increases. The price of high-quality meat increases faster than the price of tofu.

1919–Artificially cultured pure-culture natto starts to be used. Hanzawa Jun of Hokkaido University (1879-1972), using this method, invents a new "Sanitary Natto Container" (*Eisei Natto Yoki*) made of thin slabs of wood (*kyogi*). He also founds the "Natto Container Improvement Association" (*Natto Yoki Kairyo-kai*)

1919–Soybean production in Japan reaches 502,200 tonnes, and soybean imports rise to 168,000 tonnes. Production of soybean oil reaches 8,853,600 gallons or 33,573,000 liters, equal to that of rapeseed oil.

1919–A machine or kit for making tofu or soymilk easily at home (*kateiyo tonyu-ki*) is marketed.

1920–Soybean production in Japan reaches a record 559,000 tonnes.

1920–Tsugano Akisaburo of Tokyo invents a quick method for fermenting shoyu (*shoyu sokujo-ho*). By adding salt water to soybean koji to make moromi, he is able to make shoyu in less than 10 days.

1922 April–The oil production department of Suzuki Shokai [which went bankrupt in 1922] becomes independent and founds Hohnen Oil Co., Ltd. (*Hohnen Seiyu*).

1923 Sept.–The Great Kanto / Tokyo Earthquake (*Kanto Daishinsai*) strikes. 70% of the miso factories in the area are burned down, causing a shortage of miso. But miso makers in other parts of Japan use this opportunity to ship their miso to Tokyo, and the people of Tokyo come to realize the good taste of miso made elsewhere in Japan.

1924–Kodama Shizutoshi? (or Shintaro) invents another quick method for fermenting shoyu (*shoyu sokujo-ho*) using acid or alkali to hydrolyze soybeans or soybean cake to make shoyu.

Note: This is the earliest document seen (April 2001) that mentions shoyu made by acid hydrolysis. Address: Norin Suisansho, Tokei Johobu, Norin Tokeika Kacho Hosa.

2466. Stevenson, John Albert. 1926. Foreign plant diseases: A manual of economic plant diseases which are new to or not widely distributed in the United States. Washington, DC: USDA, Office of the Secretary. viii + 198 p. See p. 171-72. 23 cm. [soy ref]

• ***Summary:*** Pages 171-72, under "Soja," list 19 diseases attacking *Soja* spp. which are new to or not widely distributed in the U.S.: "*Aecidium glycines* P. Henn. Leaf rust on *S. max* in Tanganyika and Uganda." Note: This is the earliest document seen (Aug. 2009) concerning soybeans in Uganda, or the cultivation of soybeans in Uganda.

"*Ascochyta* sp. On *S. max* in Japan.

"*Bacterium* sp. A leaf-spotting disease of *S. max,* said to be due to a bacterium distinct from other species on this host, is reported from Japan.

"*Cercospora daizii* Miura. Leaf spot on *S. max* in Manchuria.

"*Cercospora glycines* Cke. Definite dark-brown leaf spots on *Glycine clandestina* in Australia.

"*Colletotrichum glycines* Hori. Anthracnose on stems and pods of *S. max* in Japan and Chosen.

"*Fusarium* sp. Causes ring spot disease of *S. max* in Manchuria.

"*Hypochnus centrifugus* Tul. Causes cankers on stems, blighting infected plants of *S. max* in Manchuria.

"*Hypochnus cucumeris* Frank. See Cucumis.

"*Mosaic.* Mosaic disease of *S. max* reported from Japan is probably the same as the mosaic and crinkling reported from the United States.

"*Mycosphaerella phaseotarum* Siem. See Phaseolus.

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"*Peronospora manshurica* (Naoum) Syd. (*P. trifoliorum* De B. var. *manshurica* Naoum.) Downy mildew on leaves of *S. max* in Siberia, India, Formosa, and Manchuria, causing premature leaf fall.

"*Phyllosticta sojaecola* Massal. (*Phaeosphaerulina sojaecola* Miura.) Subcircular, dull-brown leaf spots on *S. max* in Japan, Russia, Manchuria, and Italy.

"*Pseudomonas glycines* Nak. Circular yellow leaf spots, becoming brown to dark-brown with yellow margins on *S. max* in Japan. The spots may be as numerous as 70 to 80 per square centimeter, causing death of infected leaves.

"*Septoria glycines* T. Hem. Brown leaf spots on *S. max* in Japan and Manchuria.

"*Septoria sojina* v. Thuem. Irregular yellowish leaf spots on *S. max* in Italy, Japan, and Austria.

"*Trotteria venturioides* Sacc. Black mildew on leaves of *S. max* in the Philippines.

"*Uredo vignae* Bres. See Vigna.

"*Uromyces sojae* (P. Henn.) Syd. Brown rust pustules on leaves of *S. max* in Japan, Java, China, India, Formosa, Manchuria, and the Philippines." Address: Chief Pathological Inspector, Federal Horticultural Board.

2467. Takenobu, Y. 1926. Japan Year Book. Tokyo: Japan Year Book Office. 626 + 162 p. See p. 447, 449, 514. 22nd annual issue.
• ***Summary:*** The total area of Japan proper is 147,652 square miles (382,861 square kilometers). Japan's population (as of Oct. 1925) was 59,736,704. A large area of Japan is very mountainous, and it is estimated that the cultivated area is about 6 million hectares. According to Prof. Shimizu of Keio University the population density per square kilometer of cultivated area in Japan is much larger than various European countries. Japan 969. Belgium 394. Italy 305. Netherlands 273. England 226. Germany 195. Switzerland 168. France 108. Spain 90.

In chapter 29, Agriculture, the section titled "Beans, potatoes and sweet potatoes" (p. 449) begins with a table showing the production (in koku; 1 koku = 180 liters) of these crops from 1921 to 1923, inclusive. Soybean production decreased from:

4.261 million *koku* in 1921
3.628 million *koku* in 1922
3.434 million *koku* in 1923.

The text continues: "Among subsidiary farm crops there is perhaps nothing that plays so important a part in the Japanese kitchen as soy beans..."

In the section on "Breweries" (p. 512+) the subsection titled "Soy" [meaning shoyu or soy sauce] (p. 514) states: "For soy the prefecture of Chiba, which is contiguous to Tokyo municipality, heads all other places on the list as to output. Parched wheat mixed with salt and beans is a principal ingredient. The process is still far from scientific, requiring about 12 months before the liquid is ready for sale. It is also costly, as it does not much admit labor-saving appliances. To obviate these disadvantages have been tried several patented processes, but most of them have failed. In 1917 the leading soy manufactures of Chiba-ken combined and formed the Noda Soy Co., capital ¥7,000,000 p.u. with capacity of about 250,000 'koku' i.e. about 60 per cent. of the total output of the Prefecture."

A table (p. 514) shows production of sake, beer, and soy from 1919 to 1922 (year ending in March). Production of soy (in 1,000 koku) grew from 2,940 in 1919 to 3,268 in 1922. Address: Prof. at the Waseda Univ. and late of the "Japan Times".

2468. Tetsudo Shounyukyoku. 1926. Shio satô shôyu miso ni kansuru chôsa [Survey concerning salt, sugar, shoyu, and miso]. Tokyo: Tetsudo Shoun'yu Kyoku. 1 vol. 23 cm. Series: Juyo Kamotsu Jokyo, no. 9. [Jap]*
• ***Summary:*** This is a Japanese government publication. Address: Japan.

2469. Thom, Charles; Church, Margaret B. 1926. The Aspergilli. 1st ed. Baltimore, Maryland: Williams & Wilkins Co. ix + 272 p. See p. 64, 198-207. [250* ref]
• ***Summary:*** In this work, with its good bibliography, the authors "sought to bring together all of this taxonomic literature, as published before that date, and to present a critical opinion as to the proper relationship of the species described, whether retained in the genus or placed elsewhere. Some 350 names were thus accounted for, but the actual number of species accepted as known in culture or probably determinable from existing literature was given as 69 (p. 252). These were more or less arbitrarily considered in 11 groups."

Chapter 6 titled, "Enzymic and fermentative activities of Aspergilli and their industrial significance" (p. 58-75) includes sections on koji (incl. Takamine, Taka diastase), diastase, protease, soy fermentation (incl. soy sauce), and miso (with 7 references). Address: Microbiological Lab., Bureau of Chemistry, USDA.

2470. Togano, Meijiro. 1926. Saishin shôyu miso jôzô-hô [Principles of modern shoyu and miso brewing]. Tokyo: Jôzô Hyôron-sha. 1052 p. [Jap]*

2471. United States Tariff Commission. 1926. Certain vegetable oils. I. Costs of production. II. Economic study of the trade in and the prices and interchangeability of oils and fats. Washington, DC: U.S. Government Printing Office. 174 p. See Part I, p. 55-71, 77; Part II, p. 114-17, 138-40, 159-61. [6 ref]
• ***Summary:*** This document gives the best picture of the soy oil industry and market in the U.S. and worldwide up to this time. Part 1. Costs of production, Section 4, titled "Soya-bean oil" has the following contents: Rates

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of duty. Uses. Raw material and its sources: Foreign production, domestic production. Joint products. Domestic production and consumption: History, production statistics, geographic distribution of mills, domestic consumption. Imports. Principal competing country (Manchuria). Exports of domestic and foreign oil. Foreign production and consumption: Production (China [Manchuria], Japan, Europe), consumption. Costs of production: United States (proportion of the industry covered, cost data by companies, shipping charges), China (Manchuria; Introduction, verification of cost data, Dairen, shipping charges from Dairen to the U.S., Harbin, Newchwang, Antung), Japan, Great Britain, comparison of these cost data.

The Act of 1921, an emergency tariff that went into effect on 28 May 1921, placed the first tariff on soya-bean oil, at the rate of 20 cents per gallon (2.67 cents per pound). The Act of 1922 (which went into effect on 22 Sept. 1922) reduced this slightly to 18.75 cents per gallon (2.5 cents per pound). "For a number of years prior to 1921 soya-bean oil was used in the United States chiefly in the manufacture of soaps, and to a lesser extent in paint, varnish, and lard compounds... Since 1921 the domestic consumption of soya-bean oil has been chiefly in the manufacture of paints and varnishes and in foundry core oils. In lesser quantities it finds use in the manufacture of linoleum and of printing inks" (p. 55)

"Foreign production.–Chinese official statistics estimate that the area under soya beans in the whole of China in recent years has been 12 million acres (*Chinese Economic Monthly,* June 1924). Generally accepted show that China produces about 80 per cent of the world's production of [soya] beans, or from 3 to 4 short tons annually, of which Manchuria produces from 2 to 3 million tons. Japan and Chosen [Korea] grow the beans in about equal quantities, each producing approximately 600,000 tons per year or about 15 per cent of China's production. Some soya beans are grown in Central European countries, but there, as in the United States, they are used mainly for forage. Japan, Chosen, and the interior of China consume practically all of the beans they produce, but Manchuria, which is less densely populated, exports in the raw state or as manufactured products about 60 percent of its production. It is from Manchuria that the other nations of the world obtain their supply for crushing.

"Domestic production [USA].–The domestic soya bean crop is grown primarily for forage. The chief States harvesting soya beans in 1923 and 1924 were North Carolina, with 2,675,000 and 2,560,000 bushels, Illinois, with 1,722,000 and 1,548,000 bushels, and Indiana, with 790,000 and 650,000 bushels, respectively. Sixteen other States, of which Ohio and Missouri were the most important, produced soya beans in much smaller quantities... The total harvest in the United States was 8,944,000 bushels (268,320 short tons) in 1923 and 9,567,000 bushels (287,010 short tons) in 1924. Only about 20 per cent of the acreage planted is harvested, and of the quantity harvested less than 2 per cent is crushed for oil. This is because the seed necessary for the next crop of beans requires nearly all the beans that are harvested" (p. 55).

Note: This is the earliest document seen (Jan. 2005) that gives total soybean production or area statistics worldwide. However the information lacks detail, except for the USA.

Table 82 (p. 56) shows that the amount of soya beans crushed in the U.S. increased from 2,978 tons in 1922 (1.70% of the total soya beans harvested), to 3,724 tons in 1924 (1.3% of the total). Imported soya beans were first crushed in about 1910 on the Pacific Coast.

Table 83 (p. 57) shows that production of crude soya-bean oil in the U.S. rose from 751,108 lb in 1922 to 1,406,112 lb in 1925. "Domestic production has at all times been small compared with imports. In 1923 the domestic output was 4 per cent of imports; in 1924 and 1925 about 8.5 per cent."

The soy oil tariff of 1921 led to a rapid increase in soybean crushing in the U.S. "The commission's investigators interviewed the managers of eight domestic oil mills–all that had produced soya-bean oil since 1921. Four of these mills were located in Illinois, three in Indiana, and one in North Carolina. Of these, two had used the benzine extraction process and after extracting a few tons of beans had closed down because of mechanical difficulties, high cost of operation, and high cost of beans. Nearly all the other mills used Anderson expellers, although a few of them used hydraulic presses."

Table 86 (p. 58) shows imports of soya-bean oil into the U.S. by countries, 1918-1925. In 1918, the peak year for imports (335,984,143 lb), 68.7% came from the Kwantung Leased Territory (principally from Dairen on the southern tip of the Liaotung Peninsula in South Manchuria), 27.2% came from Japan, and 4.0% came from other parts of China. In Japan 19 mills are known to be crushing soya beans. Their production of soya-bean oil in 1922 was 44,714,000 pounds.

Table 88 shows imports of soya beans into Germany, United Kingdom, Denmark, and Holland 1919-1925. In 1925 Germany was by far the largest importer (370,585 short tons), followed by the UK (181,420), Denmark (121,389), and Holland (39,301).

Part I, Section 5, titled "Interest on capital invested in crushing vegetable oils," has a passage on soya-bean oil which gives that information for 1924.

Part 2. Economic Study of the Trade in and Prices and Interchangeability of Oils and Fats, includes references to the domestic production of soybean oil, net imports of oils, including soybean oil, into the United States 1910-1924; and 1916-1924; international supply and consumption of soybeans and soybean oil; price changes of soybean oil and beans; statistics of these price changes. The Interchangeability of Oils and Fats in Consuming Industries has scattered references to soybean oil, and a special section

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on soybean oil giving data received from questionnaires on the interchangeability of oils and fats.

This is the earliest document stating that soy oil, itself, is used in printing inks. Address: Washington, DC.

2472. Horvath, A.A. 1927. The soybean as human food. *Chinese Economic Journal* 1(1):24-32. Jan. [17 footnotes. Eng]

• ***Summary:*** Contents: The whole soybean as food: Immature or green soybeans, mature or dry soybeans, the digestibility of the boiled soybean seeds, boiled soybeans as a food of predominant importance in China, soybean coffee, soybean chocolate, soybean sprouts.

Concerning mature or dry soybeans: "In China the green seeded variety is soaked in fresh water or salted water and roasted, the product being eaten after the manner of roasted peanuts. In Japan the black soybeans are used chiefly for cooking, with sugar and soy sauce; the green variety is also used in this way, either in the fresh state or after being dried (Oshima). Generally speaking, the use of whole soybeans has not been attended with much success either in the Orient or Western countries, because, with the ordinary method of cooking, they remained hard and unpalatable. It has been found that cooking at a temperature somewhat above boiling breaks up the cellulose structure and develops a richness of flavor that is not obtainable at the lower temperature. Although this result can readily be secured in high pressure steam cookers [pressure cookers], the problem is to know how to accomplish this with ordinary household equipment."

Dr. J.H. Kellogg cooks the beans in a saturated solution of salt at about 107ºC. "The method of Durand does not require a special jar. The soybean seeds are soaked overnight in salt water and boiled in fresh water to which some sodium bicarbonate is added. If the foam is not allowed to flow over, the seeds will be ready for consumption in two hours. Lachaume claims that the removal of the skin of the beans after five minutes of immersion in hot water increases markedly the speed of boiling.

"Experiments by the Office of Home Economics, U.S. Department of Agriculture, and by the home economics departments of many colleges, have shown that mature or dry soybeans can be used satisfactorily after the manner of navy or other beans. Soybeans are very palatable. The lighter colored varieties, yellow and green, are best for food, as the dark ones usually have a stronger, less pleasant taste [sic]; some of the light brown varieties have a very agreeable flavor. Because of their high fat content and compactness, most varieties of soybeans do not cook soft as readily as the navy or field beans. The method of cooking, however, may cause the beans to remain hard and tough. If cooked properly, soybeans do not require much longer soaking and cooking than ordinary beans. One variety, the Easycook, has been found by the U.S. Department of Agriculture to cook fully as soft as the navy bean in less time after the preliminary soaking of 12 hours."

"Professor Haberlandt, the soybean pioneer of Central Europe, fifty years ago prepared a nourishing food, mixing boiled soybeans with potatoes or rice. This food was called *sojenta,* in analogy to the name of the Italian national food, *polenta.* At present in Central Europe boiled soybeans are mixed with boiled potatoes in the proportion of one to two, to which are added table salt and onions. Boiled soybeans may be also added to cereal gruels. In this way a food is obtained which is rich in protein and fat, and which can be completely substituted for products of animal origin.

"The digestibility of the boiled soybean seeds is, according to Lipsky, 80.5 per cent for protein and 80.8 per cent for fat. Goessman's figures of digestibility for protein and fat are on the average 90 per cent (Li Yu-ying). Oshima conducted two digestion experiments, which continued for three days. The diet consisted of cooked dried beans (outer skin not removed), eaten with a considerable amount of sugar and some shoyu (soy sauce). The per cent digested was: protein, 61.8-69.1 per cent; fat, 34.7-37.8 per cent; and carbohydrates (including fiber), 81.4-89.9 per cent."

"Liebig said that the method of preparing the food is of no less importance than its chemical composition. According to von Noorden and Salomon, the proteins of the beans give with calcium an insoluble compound; that is why hard water (rich in calcium) cannot be used for the boiling of leguminous seeds. It makes them hard and kernelly. If soft water is not available, it is necessary to add a little sodium bicarbonate, which precipitates the calcium salts. Richter demonstrated that from peas (the proteins of which behave toward calcium like those of the soybean) boiled in soft water, 10.2 per cent of the nitrogen and 19 per cent of the ash were eliminated in the stools. If boiled in hard water (the method of cooking remaining the same) the corresponding values for protein and ash in the stools were 16.6 and 42 per cent.

"The digestibility of the soybeans depends largely on the thoroughness of cooking and also on the state of division. The protein of boiled beans eaten as such is digested to 60 per cent, but if given in a state of fine division (puree) it rises to 90 per cent."

"According to von Noorden and Salomon: 'It will be correct to connect a satisfactory digestion of food with the presence and co-operation of a corresponding bacterial flora and it makes it clear why, especially in leguminous seeds, habit plays such a large and evident role.'"

"The water in China is known to be hard as a rule and this may be the chief reason why the Chinese are not using boiled soybeans in a noticeable amount. If soda [a natural product of China, being collected in Mongolia from soda lakes] were used in China for boiling the soybean seed soft, thus doubling the digestibility, it may revolutionize the nutrition of the Chinese population" (p. 31-35).

Concerning soybean coffee (p. 30-31): "During the

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period of the Civil War in America, the soybean was extensively used in the southern states as a coffee substitute. For a considerable time seedmen sold the Ito San variety under the name of Coffee Berry and Coffee Bean (Piper & Morse [1923]). Soybean coffee has been used in Western Europe, in Switzerland, and in the Alpine Provinces of former Austria since the introduction of the soybean to Europe. Horvath [probably the writer's father], 50 years ago [i.e., about 1877], was the first to prepare soybean coffee for the market in South Russia. In 1913 Marschner (Bohemia) put on the market a soybean 'coffee without caffein' [caffeine] under the trade mark 'Santosa.' In Germany, Fischer and Follmann (Dresden) also manufactured soybean coffee for the market... In China an 'artificial bean coffee' is prepared by the Kai Cheng Bean Products Company, Peking. (Note: Li Yu-ying is connected with the company). It is claimed to be 'a good substitute for real coffee, cures constipation, and improves the appetite."

Concerning soybean chocolate (p. 31): "In recent years the demand for cocoa has risen sharply and the supply has run short... Li Yu-ying's soybean products factory in the vicinity of Paris* succeeded in preparing a chocolate from soybeans, sugar, and cocoa butter. The chemical composition, the aspect and the taste are close to that of real chocolate (Footnote: *"Formerly *L'usine de la Caseo-Sojaine* [*Caséo-Sojaïne*], now *Société Française pour l'exploitation du soja et de ses dérivés,* 48 Rue Denis-Papin, Les Vallées-Colombes.)" Note: This is the earliest document seen (July 1996) that mentions Li's *Société Française...*

Concerning soybean sprouts: "Soybeans soaked in water and allowed to sprout are much relished as a vegetable by the Chinese." One kg of soybeans yields about 4 kg of sprouts. The yellow- or green-seeded varieties are generally used for growing sprouts.

Reprinted in 1927 as part of an 86-page monograph titled "The Soybean as Human Food" (Peking, China). Address: M.D., Peking Union Medical College, China.

2473. *Los Angeles Times.* 1927. Tokio sees odd pilgrimage: Young tradesmen parade to shrine in cold, clad only in thin garments and bathe in ice water. Feb. 9. p. 5.

• ***Summary:*** In Fukugawa, the ancient annual *kan-mairi* or pilgrimage to the Buddhist Fudo Temple is being celebrated in Tokio, Japan. The young pilgrims pour pails of ice water over their bodies as they patiently chant their prayers.

"Later, the devotions over, they leave the temple compound and partake of piping hot amazake, or unrefined sweet sake, which is served free of charge at a dingy little inn just outside the [temple] gates."

2474. Horvath, A.A. 1927. The soybean as human food. *Chinese Economic Journal* 1(2):175-92. Feb. [25 footnotes. Eng]

• ***Summary:*** Contents: Soybean cake, soybean meal, and soybean flour for food: Soybean press cake, soybean extraction meal, soybean flour (Berczeller, *Soyama, Aguma, Ehrhorn*), *Sojawurze* (*Suppenwurze,* Maggi cubes), digestibility of soybean flour, value for infants, some medical aspects of the use of soybean flour, soybean flour in diabetes (incl. Sarton).

Concerning soybean extraction meal (p. 177-79): This meal is shipped in bags and traces of benzine are easily removed. The process used at the Suzuki extraction plant in Dairen (the only extraction plant in Manchuria) is described; the solvent is benzine. "A new extraction plant (at the Borodin-Takata Alcohol Factory) is now under construction at Imienpo, in North Manchuria. By the new process, beans are first pulverized, then operated upon with alcohol, for the extraction of the oil content... The owner claims that 'there is no foreign taste left which would make the oil or the bean cakes unsuitable for human food.'" Analyses conducted at the S.M.R. Co. Central Laboratory, Dairen, show that this "bean meal" contains: water 7.90%, protein 57.04%, oil 3.41%, carbohydrates 16.92%, coarse fibre 8.63%, and ash 6.69%.

"The solvent method of extraction, involving the use of benzine or gasoline, is used by many of the large oil mills in European countries, especially England." Mills in the USA do not yet use the solvent method; they use traditional hydraulic and expeller processes. "The new process used by the Hansa Mill at Hamburg (Germany) called the Bollmann process, is so economical that the profits of bean milling can be enormously increased. By this process the beans are first pressed and then extracted. The extracted meal is utilized for the manufacture of a highly valuable soybean flour for food (Footnote: But extracted soybean meal (flour) does not contain any fat soluble vitamin, as shown by Hornemann [1925]). The oil is submitted to refining, during which crude lecithin is extracted. It is purified and sold in a form of pure lecithin.

(Footnote: "The soybean contains 1.64 per cent lecithin (an organic phosphorus compound), the price of which in China is about $18.00 (Mex.) per pound. It shows that the value of the lecithin contained in soybeans is greater than the market price of the beans themselves. Extracted soybean meal is therefore deprived of lecithin, which is a highly valuable food constituent, especially for the nervous system. Ordinary beans (navy beans, etc.) contain only 0.81 per cent lecithin)" (p. 178).

Note 2. This is the earliest English-language document seen (March 2001) that contains the term "crude lecithin."

Page 182 states: "Soybean flour is also utilized in the manufacture of breakfast foods and can be used in the preparation of vegetable milk and bean curd."* (Footnote: *"In the United States some very good breakfast foods and an excellent finely powdered soybean milk powder "Soy Lac" is made by J.A. Chard, Soy Products, 263 W. 12th St., New York City, who has been experimenting for some time

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with soybeans.)" Note 3. This Soy Lac appears to be the first commercial soymilk made in America.

Berczeller (p. 183-84): "A few years ago the Hungarian food physiologist, Prof. L. Berczeller, elaborated a process for manufacturing a soybean flour containing a large percentage of fat. This does not become bitter if kept for over a year, and has a very pleasant taste. The process is patented in nearly all the countries of the world. Its chemical composition is given in the above table and its food value in a previous chapter. This flour contains the expensive fat-soluble vitamin which is deficient in the food of the white race. It is of yellow colour, has a sweet, agreeable nutty taste, and does not produce obesity, notwithstanding the fact that it contains a high percentage of fat. According to Berczeller, the uses of this soybean flour "O" are as follows:

"1. As roasted flour, with an equal part of wheat flour for soups or vegetables;

"2. For pastry, 10-15 per cent soybean flour is mixed with wheat flour. In this case no eggs or only a few need be added. The soybean flour gives to the dough a beautiful yellow colour;

"3. As an addition to meat, 25-50 per cent of soybean flour can be mixed with chopped meat for meat balls, sausage stuffing, etc.

"4. All sorts of flour dishes can be baked with the addition of soybean flour. The taste of the dishes thus prepared becomes better and the nutritive value higher (besides the economy in butter, eggs and sugar);

"5. The addition of even 5 per cent soybean flour in making wheat bread causes a much longer keeping capacity of the bread in a fresh state, the fat preventing the bread from getting stale;

"6. The soybean flour can be used also on a large scale in the foodstuff industry, and in different ways; e.g., in the manufacture of paste products (as a substitute for eggs), cakes, biscuit products, milk-bread (10-16 per cent soybean flour instead of milk), sausages and pastry products (as a substitute for meat).

"Berczeller's soybean flours can be manufactured with little trouble in rice mills or pea mills, where they are decorticated. Eighty-five per cent of soybean flour can be recovered from soybeans. The residue forms a valuable food for animals. According to Berczeller, the cost of production of soybean flour in a European country is as follows:

"One ton of soybeans: 245 shillings. Ten per cent milling expenses: 25 shillings. Total: 270 shillings. Subtracting the value of the bran: 20 shillings. Cost of 850 kg of soybean flour: 250 shillings. Or one ton costs: 294 shillings.

"According to Berczeller, soybean flour is an ideal concentrated food for soldiers, sailors, tourists, etc., in the form of biscuits, etc., because it furnishes a substitute for animal foodstuffs which spoil easily. Berczeller points out that soybean flour is not a substitute for wheat flour but a natural vegetable complement to wheat flour, and one which can be substituted for expensive animal foodstuffs for lowering the living rates [cost of living] of humanity to a degree that could not be reached either by potatoes, maize, or by intensive farming. Austria and Hungary are planning to start a very intensive utilization of Berczeller's soybean flour. This flour, being cheap and easy to manufacture in native rice mills, may be of great importance to China."

Note 1. This is earliest document seen (May 2010) showing that Dr. A.A. Horvath was aware of the work of Prof. Berczeller, who patented a process for improving the flavor / palatability of soya flour.

Page 185 states, in a discussion of soybean flours: "In Bollmann's process the oil is completely removed from the soybean material and the flour is therefore deprived of both the lecithin and the fat soluble vitamin."

Sojawurze (p. 187-88): "The profit from Ehrhorn's process could be much increased if part of the soybean flour were used for the manufacture of products similar to beef extracts, called in German 'Suppenwurze.' They are able to give to soup the taste and flavour of beef bouillon. They are used extensively in Germany, e.g., the well-known 'Maggi' cubes, and were manufactured in large quantities in pre-War and War time from soybean flour at the Aguma factory under Ehrhorn's supervision."

Reprinted in 1927 as part of an 86-page monograph titled "The Soybean as Human Food" (Peking, China). Address: M.D., Peking Union Medical College, China.

2475. Horvath, A.A. 1927. The soybean as human food. *Chinese Economic Journal* 1(3):298-309. March. [24 footnotes. Eng]

• ***Summary:*** Contents: Soybean milk for food: Introduction. Preparation of soybean milk. Properties (Yu-P'i is Chinese for yuba; Laxa). Market prices. Composition. Nutritive value. New methods in the manufacture of soybean milk (Prof. Laxa in Prague [Czechoslovakia], Li Yu-ying, Soyama). Some dietetical advantages and applications of the soybean milk. Condensed soybean milk and milk powder (Soy Lac soybean milk powder made in America by Chard). Soybean cake, soybean meal and soybean flour as material for soybean milk. Yu p'i and yu ba (yuba; also fu chu).

"In 1905, Li Yu-ying submitted a paper on the subject [of soybean milk] to the 2nd International Milk Congress in Paris, in which he emphasized that the introduction of soybean milk to Western countries 'will be highly beneficial to public health as well as to the budget of the poor.' Also by those who advocate and urge a vegetarian diet, a very strong case can be made for this Oriental substitute" (p. 298).

According to Prof. Laxa: "Soybean milk, supplemented with lactose and inoculated with a culture of yoghurt [yogurt] bacteria, coagulates at 40º C. in 4 hours and gives a curd-like acid mass" (p. 300).

"Market prices. In Peking soybean milk is sold in small bottles in portions of about 200-220 cc. labeled 'Bean milk,

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a Chinese product, the most nourishing food, made by...' For such a bottle, delivered daily, the big factories of Peking asked in 1925 $1.00 (Mex.) per month. One liter of such milk costs, therefore, about 15 cts. (Mex.)... A fine soybean milk powder, called *Soy Lac,* has recently been prepared in America by Chard" (p. 300-01). Note: This company (Chard) was first referred to by Piper and Morse in 1916 in *USDA Bulletin* No. 439, "The soy bean, with special reference to its utilization for oil, cake, and other products." Soy Lac is mentioned again by Horvath on p. 307.

A table (p. 302) compares the composition of soymilk made in 3 locations (Tsinanfu, China; Peking, China; and Japan) with that of human, cow, and goat milk. Human milk has the lowest protein content (1.25%) and ash content (0.25%); soymilk has about the same protein content as cow's milk (3.3%) but an ash content (0.40%) which is higher than that of human milk but lower than that of cow's milk. Footnote: "To supplement the deficiency of the soybean milk in mineral constituents [such as calcium], it is recommended by von Noorden and Salomon to add to it the salt mixture of Pirquet, which consists of: sodium chloride, 0.3 gm.; potassium chloride, 1.1 gms.; calcium glycerophosphate, 1.7 gms.; magnesium lactate, 0.5 gm.; ferrum glycerophosphate, 0.1 gm. This mixture is called *Nemsalz.* If diluted in 1 liter of water it gives the same percentage of salts as in women's milk" (p. 302).

"In Germany the Soyama factory (in Frankfurt) manufactures soybean fresh milk (mostly from soybeans), soybean normal cream, and also condensed bean milk and cream. Soyama bean milk looks like cow's milk, contains the same constituents, even in larger amount and in a state of finer dispersion. Only its taste is different. According to Fuerstenberg, Soyama milk can be qualified as a special, very valuable dietetic nutrient. The high lecithin content of this preparation adds to its value too" (p. 306). A table (p. 306, based on the analyses of Dr. G. Popp of Frankfurt) shows the nutritional composition of 6 types of Soyama milk and cream preparations: Normal milk. Milk for diabetics. Milk for baking purposes. Normal cream. Cream for diabetics. Cream extra rich in fat (especially for diabetics). "According to von Noorden and Salomon, Soyama preparations may be kept as long as almond milk and Paranut milk. Soyama milk looks just like cow's milk. By keeping, cream separates and it must be shaken before using" (p. 306).

"In using Soyama milk and cream preparations, v. Noorden confirms the following statement of Fischer (for vegetable milk in general): '1. In the stomach soybean milk gives a much finer flocculent precipitate than does cow's milk, produced by acid or even rennet. 2. The ingestion of soybean milk results in a feebler (smaller) secretion of gastric juice; the period of secretion is also shorter. 3. The period of stay in the stomach of the finely flocculent precipitate of the soybean milk is shorter than that of the casein-fat coagulum of cow's milk. 4. The peristaltic motion of the stomach is less after the ingestion of soybean milk and more coordinated than in the case of cow's milk, as shown by X-ray investigation'" (p. 307).

"On the basis of these observations soybean milk is recommended by v. Noorden in cases of gastric and duodenal ulcer, states of peritoneal irritation, hypersecretory conditions of the stomach, disturbances of the motility of the stomach, uric acid diatheses, kidney disturbances, conditions with edema where a food poor in sodium chloride is required, Basedow's disease, cholecystitis, cirrhosis of the liver, diabetes, and in cases where a very nutritious diet is required" (p. 307).

"Soybean milk powder will undoubtedly have a successful future in the Orient as well as in European countries and the United States. Its great advantage in comparison with cow's milk powders is its cheapness. Soybean milk powder can be easily stored and transported... It is believed that at present some of the commercial milk powders contain an admixture of soybean milk powder" (p. 307-08).

"*Yu P'i* and *Yu Ba* are the Chinese and Japanese names of the pellicula formed on the surface of soybean milk when the latter is gently heated. Good *Yu Ba* has a bright yellow color when properly dried. The best *Yu Ba* is that obtained after the first heating. In repeating the heating of the remaining soybean milk, pellicules of gradually inferior quality and color are obtained. As much as 30 pellicules can be secured from the same portion of soybean milk. In China, a product called *Fu Chu* is manufactured in a way similar to *Yu Ba* (Footnote: See this journal, Vol. VIII, 1926, p. 179). Recently an improved method for the manufacture of *Yu Ba* was patented in Japan, consisting in the use of an electric fan adjusted over the surface of a kettle containing the soybean milk heated to a temperature of 90ºC.

"*Yu Ba* has a great nutritive value, as it contains a high percentage of protein and fat,..."

A table (p. 309) gives the nutritional composition of five types of yuba: Common yuba, Kyoto yuba, Shimada yuba, Peking yuba, and Fu chu.

Note: The values for Fu chu are based on those previously reported by Adolph. Fu chu contains much more water (53.68%) than any of the other four types of yuba; common yuba contains only 21.85% and Peking yuba only 9.15%. So it is either fresh or reconstituted.

"In Japan, Kyoto and Nikko are noted for *Yu Ba. Yu Ba* is in much demand in China and Japan and is used in numerous ways as an essential ingredient in many very palatable dishes. Its price is high and therefore yuba is used only by the rich."

Reprinted in 1927 as part of an 86-page monograph titled "The Soybean as Human Food" (Peking, China). Address: M.D., Peking Union Medical College, China.

2476. Yokogi, K. 1927. Daizu shiroginu-byô no kenkyû

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narabini daizu otsubu shiroginu byôkin to inemon byôkin to no idô ni tsukite [On the Hypochnus disease of soybeans and its comparison with that of rice plants]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 14:146-58. March. [15 ref. Jap]

• ***Summary:*** Both *Hypochnus sasakii* and *H. centrifugus* are known to be pathogenic to soybeans in Japan. Morphological studies and cross inoculation tests on the two fungi from both rice and soybean revealed no significant difference, and accordingly it was considered that only one species was involved. Optimum temperature for the growth of the fungus was found to be 30º C., for sclerotial development 28º C. Address: Moto Kyoto Teikoku Daigaku, Shokubutsu Byorigaku Kenkyushitsu.

2477. Horvath, A.A.; Liu, Shin-Hao. 1927. The effect of soy sauce on blood sugar and phosphorus. *Japan Medical World* 7(4):105-08. April 15. [18 ref]

• ***Summary:*** "Introduction: Shoyu, or soy sauce, is a dark-brown, moderately thick liquid, very popular in China and Japan as relish or condiment to increase the flavor and palatability of the diet (Footnote: The now famous Lea and Perrins Worcestershire Sauce is a highly spiced soy sauce). In order [sic, odor] and taste it is not unlike a beef extract of good quality."

"Summary: 1. In rabbits, subcutaneous injections of Taka-Diastase gives no definite results for conclusions, but seems to be capable of affecting the blood sugar in both directions. 2. In men the results of oral administration of soy sauce are varying and at present no definite conclusion concerning the effect of soy sauce on blood sugar and phosphorus can be drawn. But in some cases soy sauce seems to be capable of affecting the blood sugar and blood phosphatides." Address: Dep. of Medicine, Peking Union Medical College, Peking, China.

2478. Horvath, A.A. 1927. The soybean as human food. *Chinese Economic Journal* 1(4):415-25. April. [34 footnotes. Eng]

• ***Summary:*** Contents: Soybean curd (tofu) for food: Preparation and types ("The Chinese classical name for *tofu* is *li chi,* probably meaning 'the morning prayer'"), historical, present state (of tofu in China), chemical composition, digestibility, utilization (incl. frozen tofu and fried tofu).

Fermented soybean products for food. Soy sauce: Kibiki and sobiki tamari, composition of various soy sauces. Natto. Miso. Conclusion. Bibliography.

Tofu–Historical (p. 416): "The manufacture of soybean curd (*tofu*) was started in China in 164 B.C., during the reign of the Emperor Han Wen, by a man named Liu An, the duke of Hwai Nan. Liu An was a great friend of the Buddhist monks, and it seems quite probable that he made this bean curd to provide a change or delicacy to break the monotony of the monastic ration (Adolph). *Tofu* was introduced into Japan from Korea for the first time during the Toyotomi government, and Buddhist priests and some other people used it for their daily food among others before it was generally used in Japan.

Tofu–Utilization (p. 418-19): "Both the composition and the digestibility of *tofu,* therefore, prove it to be a very nutritious food material. In the Orient *tofu* forms a very popular and almost indispensable dietary article for the Buddhist priests, as well as the strict adherents to Buddhism, who eat no animal food [i.e., are vegans]. A common saying in some parts of China terms 'bean milk the poor man's milk, and bean curd the poor man's meat.' *Tofu* is also called 'the meat without the bones.'

Note: This is the earliest English-language document seen (April 2013) that contains the phrase "the meat without the bones" (or a similar phrase containing the words "meat" and "bones"); it is used to refer to tofu, not to soybeans.

In Indo-China the daily consumption of *tofu* by an adult is about 3/4 of a pound. *Tofu* in its various forms is also used very extensively by all classes of Japanese. In the interior of the country where fish cannot be easily obtained, it is a most important source of protein.

"In the Orient *tofu* is eaten in a fresh condition simply with a little *shoyu,* though it is also frequently cooked in soup. Fried *tofu* is also a very popular article of food. Rape-seed oil, sesame oil or soybean oil are generally used in frying.

"*Tofu* may also be prepared for preservation and transportation. For this purpose fresh *tofu* is cut into smaller pieces and exposed to severe cold weather, to remove the water by freezing, and is then dried in an oven. As thus prepared it can be preserved for several years. When the *tofu* is frozen the water collects in fine needles of ice distributed throughout the mass. When the ice melts and the water runs out, it leaves the *tofu* porous and it may be easily dried. If it is not frozen, it is difficult to dry and the resulting material is dense and horn-like. The *tofu* also cooks very well if cooked in diluted soy sauce and smoked in the same manner as meat. The resulting product forms in the Orient the basis for the manufacture of various 'artificial meat' preparations.*" Footnote: * "In Germany, the Soyama factory prepared during the Great War [World War I] a meat supplement from soybeans. It was cheaper than beef, contained less carbohydrates and had a nutritive value of about 1500 Calories in 1 kilo."

"In Peking, at the Kai Cheng Bean Products Company, various preparations manufactured from tofu may be purchased, such as different kinds of soybean meat, soybean sausages, etc. The company has established a restaurant in Peking (at 86 Morrison Street, the name is written in Chinese characters) where one can get a Chinese dinner of numerous dishes prepared mostly from soybean products (chicken meat, pork, ham and beef, manufactured from *tofu*). Also discusses Dr. Yamei Kin.

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A note at the end of this April issue states: "A reprint of Dr. Horvath's paper in booklet form may be obtained from the Bureau of Economic Information. Price $1, Peking Currency.–Ed." Thus, these six articles were reprinted in 1927 as part of an 86-page monograph titled "The Soybean as Human Food" (Peking, China). Address: M.D., Peking Union Medical College, China.

2479. Morse, W.J. 1927. Soy beans: Culture and varieties. *Farmers' Bulletin* (*USDA*) No. 1520. 34 p. April. Revised 1939 and 1949. Supersedes Morse 1918b. The Soy Bean. USDA Farmers' Bulletin No. 973. [36 ref]

• ***Summary:*** Contents: History of the soy bean. Climatic adaptations. Soil preferences. Varieties: Descriptions of varieties (59 varieties and 44 synonyms). Varieties recommended for different areas. Preparation of seed bed. Fertilizers. Inoculation. Time of seeding. Methods of seeding. Rate of seeding. Depth of seeding. Cultivation. Soy beans in rotations. Soy beans in mixtures: Soy beans and corn, cowpeas, Sudan grass, millet. Insect enemies of soy beans: Grasshoppers, blister beetles, Mexican bean beetle, other beetle enemies, leaf hoppers, army worms and other caterpillars, the green clover worm, chinch bugs. Diseases of the soy bean: Bacterial blight, bacterial pustule, mosaic, fusarium blight or wilt disease, stem rot, pod and stem blight, sunburn, downy mildew, anthracnose, root knot (caused by a tiny eelworm or nematode, *Heterodera radicicola*). Other enemies of soy beans (rabbits, woodchucks).

The soy bean is "also called the soja bean, the soya bean, and in North Carolina the stock pea." "Previous to 1908 the trade in soy beans was largely confined to oriental countries, particularly China, Manchuria, and Japan. Since that time the value of the soy bean and its products has gradually been realized in other countries, and during the last decade they have attained considerable importance in the world's commerce. At the present time the soy bean is cultivated principally in China, Manchuria, Japan, Chosen (Korea), and the United States, but it is also of more or less importance in northern India, Indo China, and the Malayan Islands. Soy beans are grown also in Italy, France, southern Russia, Hungary, Hawaii, Egypt, South Africa, and in a few countries of South America, but the acreage in these countries is very limited.

"The soy bean was introduced into the United States as early as 1804 and for several decades was regarded more as a botanical curiosity than as a plant of economic importance. Since 1890 nearly all of the State Agricultural Experiments have experimented with soy beans and many bulletins have been published dealing wholly or partly with the crop."

"The soy bean has been used mainly for forage purposes in the United States, but as a forage crop alone it would not likely become one of the major field crops. The acreage in soy beans has increased very rapidly during the last decade. Previous to 1917 considerably less than 500,000 acres were grown. In 1924 there were more than 2,500,000 acres, of which 1,000,000 were grown for hay, 932,000 for pasture and silage, and 613,000 for the production of seed. More than 10,000,000 bushels of soy-bean seed and about 1,360,000 tons of soybean hay were produced in 1924."

The 103 soy bean varieties and synonyms described on pages 5-11 are as follows (in alphabetical order): A.K., Aksarben, Arlington, Austin, Banner–same as Midwest, Barchet, Biloxi, Black Beauty–same as Ebony, Black Eyebrow, Black Sable–same as Peking, Bopp–same as Chernie, Brown–same as Mammoth Brown, Chernie, Chestnut, Chiquita, Columbia (from China), Columbian–same as Columbia, Dixie, Dunfield, Early Brown, Early Green–same as Medium Green, Early Virginia Brown–same as Virginia, Early Wilson–same as Wilson, Early Wisconsin Black–same as Wisconsin Black, Early Yellow–same as Ito San, Easycook (from Shantung province, China in 1894), Ebony, Elton, Essex–same as Peking, Extra Early Black Eyebrow–same as Black Eyebrow, Extra Select Sable–same as Peking, Giant Brown–same as Mammoth Brown, Goshen Prolific, Green–same as Medium Green, Guelph–same as Medium Green, Habaro, Haberlandt, Hahto ("Introduced under S.P.I. No. 40118 from Wakamatsu, Japan, in 1915. It is commonly known in Japan as 'dove killer,' and is said to be used boiled in the green stage... Especially valuable as a green vegetable bean when three-fourths to full grown"), Hamilton, Herman, Hollybrook, Hongkong, Hoosier, Illini, Ilsoy, Indiana Hollybrook–same as Midwest, Ito San, Jet, Laredo, Large Brown–same as Mammoth Brown, Large Yellow–same as Mammoth Yellow, Late Yellow–same as Mammoth Yellow, Lexington, Mammoth–same as Mammoth Yellow, Mammoth Black–same as Tarheel Black, Mammoth Brown, Mammoth Yellow, Manchu, Manchuria–same as Pinpu, Mandarin, Medium Early Green–same as Medium Green, Medium Early Yellow–same as Ito San, Medium Green, Medium Yellow–same as Midwest, Merko, Midwest, Mikado, Minsoy, Mongol–same as Midwest, Morse, Ogemaw, Ohio 9035–same as Hamilton, Old Dominion, Otootan, Peking, Perley's Mongol–same as Midwest, Pinpu, Red Sable–same as Peking, Roosevelt–same as Midwest, Roosevelt Medium Early Yellow–same as Midwest, Royal–same as Wilson Five, Sable–same as Peking, Shanghai–same as Tarheel Black, Sooty, Southern–same as Mammoth Yellow, Southern Prolific, Soysota, Tarheel–same as Tarheel Black, Tarheel Black, Tarheel Brown–same as Mammoth Brown, Tokyo, Virginia, Virginia Early Brown–same as Virginia, Wea, White Eyebrow, Wilson, Wilson-Five, Wisconsin Black, Wisconsin Early Black–same as Wisconsin Black, Wisconsin Pedigreed Black–same as Wisconsin Black, Yoko–same as Yokoten, Yokoten, Yellow–same as Mammoth Yellow.

Note 1. This is the earliest document seen (Aug. 2013) that mentions the soybean varieties Black Sable, Early Virginia Brown, Extra Early Black Eyebrow, Giant Brown,

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Large Brown, Tarheel Brown, Virginia Early Brown, or Wisconsin Pedigreed Black.

Note 2. This is the earliest document seen (Aug. 2013) which states that Black Sable is the same as Peking, or that Brown, Giant Brown, Large Brown, and Tarheel Brown are the same as Mammoth Brown, or that Early Green is the same as Medium Green, or that Early Virginia Brown and Virginia Early Brown are the same as Virginia, or that Early Wisconsin Black and Wisconsin Early Black and Wisconsin Pedigreed Black are the same as Wisconsin Black, or that Extra Early Black Eyebrow is the same as Black Eyebrow, or that Mammoth Black is the same as Tarheel Black, or that Yellow is the same as Mammoth Yellow.

Photos show (unless otherwise stated): (1) A typical soy-bean plant growing alone. (2) "Outline map of the United States showing by numerals the areas to which the soy bean is especially adapted. The varieties suited to the various areas for different purposes are discussed on page 11. Outside the unnumbered areas the soy bean either can not be grown profitably or it is in the experimental stage." A vertical line shows that the soybean grows east of the 99th meridian. The area east of this line is divided into 5 zones by 4 lines parallel to the latitudes. Soybeans can also be grown in small parts of Arizona, New Mexico, and California, where extremely hot weather prevails during the period when the seed is forming. (3) Roots of a soy-bean plant showing abundant development of nodules.

(4) Soy beans and corn planted in alternate rows; two men and waist-deep among the plants. (5) "The ordinary grain drill may be used for sowing either in rows or in close drills." It is pulled by horses and a man, seated on top, is looking backward. (6) Seeds of the 22 more important varieties of soy beans now grown in the United States showing the wide range in the size of the seed. Soybeans range from 1,250 seeds to the pound for the Hahto (large) to 9,950 seeds to the pound for Barchet.

(7) "The rotary hoe is an excellent implement for either solid or row plantings." This one is pulled by two horses; a man is seated on top. (8) "Soy beans seeded in the same row with corn. They are more generally grown with corn than with any other crop." A man is standing in front of the tall plants. (9) "A field of soy beans and Sudan grass grown in mixture for hay." (10) Roots of a soy-bean plant showing galls caused by the nematode *Heterodera radicicola.* Address: Agronomist, Office of Forage Crops, Bureau of Plant Industry, USDA, Washington, DC.

2480. Sato, Masanori. 1927. Daizu abura shibô-san sekkai no kanryû ni yoru nenryô yu no seihô ni tsuite. IV. Kudo sekken to no kanryû seiseki hikaku [Preparation of a liquid fuel resembling petroleum by dry distillation of the calcium soap of soya bean oil. IV. Comparison with the magnesium soap]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(4):242-45. April. [Jap]

• ***Summary:*** The use of the dry distillation products of the magnesium and calcium soaps of soy bean oil in the preparation of fuel oil has been investigated. The best result was obtained by heating either of the soaps at temperatures below 450ºC for several hours, followed by distillation above 500ºC. The time required for completing the distillation of the magnesium soap was less than that for the calcium soap at the same distillation temperature; similarly, the specific gravity of the distillate of the magnesium soap was somewhat greater than that of the calcium soap. Address: Manshû Tetsudô Chûô Shikenjo.

2481. Sato, Masanori; Matsumoto, H. 1927. Daizu abura shibô-san sekkai no kanryû ni yoru nenryô yu no seihô ni tsuite. V. Kanryû yu no suiso tenka to seibun [Preparation of a liquid fuel resembling petroleum by dry distillation of the calcium soap of soya bean oil. V. Hydrogenation of the distilled oil]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(4):245-52. April. [5 ref. Jap]

• ***Summary:*** The light oil (100-175ºC) and middle oil (175-300ºC) obtained earlier (Sato 1927, Part IV) were hydrogenated in liquid or vapor phase, using nickel reduced at about 370ºC as catalyst, and the products examined. The hydrogenation of the light oil began at about 60ºC and was rapid at 80ºC. In vapor phase it was readily reduced to saturated hydrocarbons at 190ºC, forming a colorless oil having no disagreeable odor. The middle oil could be hydrogenated in liquid phase at 140ºC with 2% nickel, its iodine value being decreased to about 60; similar results were obtained in vapor phase at 320ºC. Heptane, octane, and nonane were isolated from the hydrogenated light oil. The existence of aromatic hydrocarbons, such as benzene, toluene, and xylene, could not be confirmed. From the hydrogenated middle oil were isolated those constituents which had the boiling point and ultimate composition analogous to those of 11-, 13-, and 14-carbon paraffin (saturated) hydrocarbons, but the specific gravity of each fraction was greater than that of the corresponding hydrocarbon. It is inferred that some hydrocarbons of the naphthene series accompany the paraffin hydrocarbons, which are the main constituents of the oil. Address: Manshû Tetsudô Chûô Shikenjo.

2482. Sato, Masanori. 1927. Daizu abura shibô-san sekkai no kanryû ni yoru nenryô yu no seihô ni tsuite. VI. Sekkai-en yori keton e no bunkai kikô to ondo [Preparation of a liquid fuel resembling petroleum by dry distillation of the calcium soap of soya bean oil. VI. Reaction mechanism of thermal decomposition of the calcium and magnesium salts of some higher fatty acids]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(4):252-60. April. [8 ref. Jap]

• ***Summary:*** Calcium and magnesium stearates were heated at 450-480ºC in a partial vacuum (5-7 mm of mercury). By the isolation of stearone from the distillates obtained, the

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formation of the ketone by the thermal decomposition of the stearates is confirmed. By similar experiments the formation of oleone from the corresponding oleates was confirmed. The decomposition temperatures of these salts were measured, the results being expressed as curves relating acetone-soluble matter (%) and temperatures. Address: Manshû Tetsudô Chûô Shikenjo.

2483. Sato, Masanori; Ito, C. 1927. Daizu abura shibô-san sekkai no kanryû ni yoru nenryô abura no seihô ni tsuite. VII. Keton yori tanka suiso e no bunkai kikô to ondo [Preparation of a liquid fuel resembling petroleum by dry distillation of the calcium soap of soya bean oil. VII. Reaction mechanism of thermal decomposition of the calcium and magnesium salts of some higher fatty acids]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(4):261-67. April. [6 ref. Jap]
• ***Summary:*** Rates of thermal decomposition of calcium and magnesium stearates and oleates at 400ºC have been measured, and the results are expressed by graphs. Analysis of the gases formed by the decomposition of stearone and oleone at different temperatures showed that the rate of formation of carbon monoxide from the ketones was very small at 300-350ºC, and increased gradually with temperature. Thus, the carbon monoxide formed during 1 hour from stearone and oleone heated at 500-550ºC and 550-600ºC, respectively, was 48.10% and 66.96% of the theoretical quantity. Saturated and unsaturated hydrocarbons and small quantities of hydrogen and carbon dioxide were also formed by the thermal decomposition of the ketones. Address: Manshû Tetsudô Chûô Shikenjo.

2484. Horvath, A.A. 1927. The soybean as human food. Peking and Shanghai, China: Chinese Government Bureau of Economic Information. Booklet Series No. 3. 86 p. May. Reprinted from Chinese Economic Journal, Sept. and Nov. 1926, and Jan. to April 1927. No index. 21 cm. [38 ref]
• ***Summary:*** A very original and important book. Contents: Preface by Macey F. Deming, Tappan New York, from an address at a meeting of the National Soybean Growers', held at Washington, DC, Sept. 1925. Introduction. 1. General ingredients of the various Manchurian beans. 2. Composition of some Japanese soybeans and of the common American varieties. 3. Value of the soybean as food. 4. Soybean oil for food. 5. Refined soybean oil: As substitute for salad or frying oil, as substitute for hardened oil and lard (hydrogenation), in oleomargarine and vegetable butters. 6. Whole soybean as food: Immature or green soybeans, mature or dry soybeans, the digestibility of the boiled soybean seeds, boiled soybeans as a food of predominant importance in China, soybean coffee, soybean chocolate, soybean sprouts.

7. Soybean cake, soybean meal and soybean flour for food: Soybean press cake, soybean extraction meal, soybean flour (Berczeller, Soyama, Aguma, lecithin, Ehrhorn), Sojawurze (Suppenwurze, Maggi cubes), digestibility of soybean flour, value for infants (p. 53, based on the research of Dr. Ruhrah in the USA), some medical aspects of the use of soybean flour, soybean flour in diabetes. 8. Soybean milk for food: Introduction, preparation of soybean milk, properties (incl. inoculation with a culture of yoghurt [yogurt] bacteria to give a curd-like acid mass), market prices, composition, nutritive value, new methods in the manufacture of soybean milk (Prof. Laxa in Prague [Czechoslovakia], Li Yu-ying, Soyama), some dietetical advantages and applications of the soybean milk, condensed soybean milk and milk powder (Soy Lac soybean milk powder made in America by Chard), soybean cake, soybean meal and soybean flour as material for soybean milk, yu p'i and yu ba (yuba; also fu chu).

9. Soybean curd (tofu) for food: Preparation and types (classical name is *li chi*), historical, present state (of tofu in China), chemical composition, digestibility, utilization. 10. Fermented soybean products for food. Soy sauce: Kibiki and sobiki tamari, composition of various soy sauces. Natto. Miso. Conclusion. Bibliography.

On page 9 we read: "An industry which promises to be of importance in a further utilization of the soy bean is the manufacture of 'vegetable milk.' At the present time a factory in New York State is being equipped for this purpose." Address: Peking Union Medical College, China.

2485. Kurono, Kanroku; Katsune, Ei. 1927. Shôyu no shikiso no kagaku-teki sosei [Chemical composition of coloring matter of shoyu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 3(5):594-613. May. [25 ref. Jap]
• ***Summary:*** Includes a discussion of Soyamelanin acids (*Soyamelaninsaeure*). Address: Okura-sho Jôzô Shiken-jô.

2486. Shirakura, N. 1927. Heian-nando ni okeru daizu hinshu no chôsa [Survey of soybean varieties in Heian-nando, Korea]. Heijo, Korea: Heian Nando Shubyojo, Special Report No. 3. 50 p. May. [Jap]
• ***Summary:*** Note: As of 2011, Heijo is named Pyongyang, the capital of North Korea. Address: Heijo, Korea.

2487. Ueno, Seiichi; Yamashita, Matasaku; Ota, Yasuo; Okamura, Zensaku. 1927. Kôkayu no eiyô kachi ni tsuite. I. [On the nutritive value of hydrogenated oils. I.]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(6):378-85. June. (Chem. Abst. 22:804). [3 ref. Jap]
• ***Summary:*** "The authors intend to ascertain whether or not the hardened oils retain their nutritive value when they have been hydrogenated under conditions which would be suitable for retaining vitamin A." Soybean oil is included. Address: Kôgaku hakase, Japan.

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2488. Yamamoto, Yoshihiko. 1927. Nattô-kin no kataraase ni tsuite [The catalase enzyme from natto bacteria]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 4(11):922-39. [31 ref. Jap; ger]
• ***Summary:*** The German abstract is titled "Ueber Katalase von Bacillus natto." This laboratory is headed by Dr. Jun Hanzawa. Address: Hokkaido Teikoku Daigaku, Nôgaku-bu (Sapporo), Japan.

2489. Gallagher, Patrick. 1927. Deadly blow held aimed at American industries in China: Quick action is indicated to safeguard huge United States tobacco trade. Increase in impost tariff is announced. *Washington Post.* July 17. p. 4.
• ***Summary:*** "Chinese are rapidly overtaking Americans as cigarette consumers." Most of China's imports of cigarettes and leaf tobacco are from America. The United States how has on the scene two officials thoroughly capable of dealing with this American trade crisis. One is Julean Arnold, doyen of American envoys of commerce and United States commercial attache in China.

"Meanwhile the practical Japanese have resumed physical possession in Shantung. One reason is Shantung's salt deposits. Japan needs that salt for her Sakhalin fish industries and her Manchuria soya industries."

2490. Gonzalez, B.M. 1927. Education and agricultural promotion in Japan. IV. Promotion of agriculture. *Philippine Agriculturist* 16(2):67-71. July. [1 ref. Eng]
• ***Summary:*** Contents: Introduction. Intensification of culture. Land reclamation. Land adjustment. Price regulation. Rice conservation. Agricultural experiment stations.

The Central Experiment Station was first organized in 1890 as an experimental farm of the Department of Agriculture. Address: Delegate from the Univ. of the Philippines and the Government of the Philippine Islands to the Third Pan-Pacific Science Congress.

2491. Nagaki, Kyosaburo. 1927. Shôyu no kabi ni tsuite [On the mold of shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 4(12):1048-51. [Jap]
Address: Okayama-ken Shoyu Jozo Dogyo Kumiai, Gishi, Japan.

2492. Dorsett, P.H. 1927. Soybeans in Manchuria. *Proceedings of the American Soybean Association* 1:173-76. Eighth annual field meeting. Held 9-12 Aug. 1927 in North Carolina.
• ***Summary:*** "Mr. W.J. Morse, soybean specialist of the United States Department of Agriculture, is responsible for my being with you on this occasion, and I am delighted that such is the case, for it affords me an opportunity to learn a great deal about the progress of the soybean industry in America. You will also have to hold Mr. Morse responsible for the valuable time I consume, not only in connection with the few remarks I have to make concerning our agricultural explorations in the Orient, but also that taken up in showing you the motion pictures we secured of the Chinese practices employed in the growing and handling of this important crop in Manchuria.

"On account of our personal friendship for Mr. Morse, supplemented by his enthusiastic letters about the success of the soybean at home, we were impelled to give this crop special attention. We not only made observations and notes and secured seed samples where possible, but also visualized as best we could by means of still and motion pictures, the methods and practices followed in the growing and handling of soybeans in Manchuria, a country which leads the world in their production.

"Manchuria, in extreme northeastern China, is embraced practically between the 39th and 53rd degrees North latitude. Between these same lie the portions of the United States north of an imaginary line passing Carson City, Nevada; Colorado Springs, Colorado; Kansas City, Missouri; and a little south of Baltimore, Maryland. The natural features of the two regions are, in many respects, quite similar, and on this account, it is logical to expect that much of the plant material in our two-and-a-half years' explorations of northeastern China may find a congenial home throughout the region noted, and it is hoped, after naturalization, that some of them may prove not only interesting, but also of real value and economic importance to American farmers.

"The total area of Manchuria is given as 365,000 square miles, and its cultivated area as something over 27,000,000 acres. It is estimated that of this amount something like 8,000,000 or 9,000,000 acres are devoted to the cultivation of soybeans.

"The soybean is the cash money crop of the country. The yield from the immense acreage planted is handled primarily as a grain crop for export and crushed for oil and bean cake. Almost the entire output of bean cake is consumed in Japan for fertilizer. The climate of Manchuria is classed as 'continental' The country is subject to decided extremes of temperature, with hot summers and long, severe winters, the mercury sometimes falling 40 to 50 degrees Fahr. below zero.

"Manchuria has been classed as the 'Garden Spot of China' and also as 'The most favored spot for agriculture in the Far East.' From our observation and experience in connection with our work of general agricultural explorations from Shanghai almost to the Mongolian border, we feel safe in saying that it surely is a land of opportunity with very great potential possibilities.

"The principal staple farm crops of Manchuria and their yield as given for 1920 areas follows:"

A table shows:

"Kaoliang, a species of sorghum, 6,730,000 tons.

"Millet 5,128,900 tons.

"Soybeans 3,789,500 tons.

"Corn 1,724,000 tons.

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"Barley 1,552,000 tons.

"Wheat 1,093,100 tons.

"Small beans, primarily mung beans, 361,200 tons.

"Seeing is believing, but as it is quite probable that few, if any, of you have visited Manchuria and seen for yourselves, you will have to take my word for it that all of the above crops, as well as all others grown, are harvested with a small harvest hook, threshed with rolling stones, and cleaned by the wind.

"Through the cooperation of American government officials, Chinese authorities, fruit growers and farmers, and especially that of Prof. W.E. Chamberlain, then in charge of the agricultural work of the Peking University, we were successful in securing a fine collection of seed and plant material from Peking and vicinity for trial in America. In Harbin, Manchuria, we not only had the cooperation and assistance of those in the same walks of life, but also that of Russian scientists, scientific institutions, the Chinese Eastern Railway, and the Postal Commissioner and his assistants.

"The officials of the Chinese Eastern Railway supplied us with a special car, without expense either for the car and attendant or for transportation. In this car we were sidetracked at the stations along their lines in the regions where we wished to explore, and, using it as headquarters, worked out into the country in any direction. When our work there was finished, we were taken to another station and repeated the operation. By this means we were able to visit localities and to accomplish results which, under the existing conditions, otherwise would not have been possible.

"The Postal Commissioner and his assistants at Harbin became interested in our undertaking and worked hand in hand with us in our endeavor to obtain four ounce samples of seed of four of the staple farm crops of Manchuria:– wheat, barley, soybeans and mung beans. The first two are staple crops in America and the other two are promising new crops of very great economic importance. Through this channel seed samples were secured from the majority of the five hundred rural post offices scattered through the two north provinces of Manchuria-Kirin and Heilung Kiang [Heilongjiang]. The expense to our Government, incident to securing this collection of upwards of 1200 to 1500 seed samples exclusive of postage, was a bill from one Chinese farmer for 14 cents Mex., about 7 cents in United States gold.

"Through the activities of the officials of the Manchurian Research Society, which is supported by the Chinese Eastern Railway, we obtained something over 500 seed samples of commercial soybeans, from their railway stations in the principal soybean-growing sections in North Manchuria. The value to the farmers of the United States of this large collection of something like 1500 numbers of soybean introductions, from nearby and far-distant regions of northeastern China, remains for Mr. Morse's work and the future to determine, but we hope for the best and sincerely trust that some of them will prove to be of economic importance. As to the interest and value of the motion pictures visualizing soybean production in Manchuria, its native home, which will now be shown, it remains for you to judge." Address: United States Dep. of Agriculture.

2493. Mashino, M.; Shishido, T. 1927. Daizu tanpakushitsu no bunkai ni kansuru kenkyû. V. Kaenka ni okeru ryûsan ni yoru bunkai [Decomposition of soya-bean protein. V. Decomposition of soya-bean protein by sulfuric acid]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(8):552-60. Aug. (Chem. Abst. 22:1602). [1 ref. Jap]

• ***Summary:*** Soya bean from which oil had previously been extracted with light petroleum was treated for 6 hours with dilute sulfuric acid (1-20%) at 4.7 atmospheres pressure. The action of the acid was much more rapid and the amounts of ammonia and amino-nitrogen formed were much larger than at atmospheric pressure. The amount of nitrogen appearing as ammonia increased with increasing time of treatment, reaching 11.63-20.05% of the total nitrogen at the end of 6 hours. With 20% sulfuric acid the amount of amino-nitrogen formed increased rapidly at first, reached a maximum (about 80% of the total nitrogen), and then decreased gradually to about 60% at the end of 6 hours. With more dilute acid no maximum was found. Address: Tokyô Kôgyô Shikenjo, Dai 2 bu, Tanpakushitsu Kenkyu Shitsu.

2494. Mashino, M.; Shishido, T. 1927. Daizu tanpakushitsu no bunkai ni kansuru kenkyû. VI. Kaenka ni okeru yûki-san ni yoru bunkai [Decomposition of soya-bean protein. VI. Decomposition of soya-bean protein by organic acids]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(8):561-64. Aug. [7 ref. Jap]

• ***Summary:*** When soya-bean protein was treated with acetic, lactic, citric, tartaric, or oxalic acid for several hours at 2.66-5.8 atmospheres, the ammonia-nitrogen liberated was nearly the same in every case (10-13% of the total nitrogen). The amino-nitrogen liberated varied from 3.1 to 25.1% of the total nitrogen, according to the acid used, and increased in the order given above (from acetic to oxalic acid). Address: Tokyo Kogyo Shikenjo, Dai 2 bu, Tanpakushitsu kenkyu shitsu.

2495. Mashino, M.; Shishido, T. 1927. Daizu tanpakushitsu no bunkai ni kansuru kenkyû. VII. Sansei hakudo ni yoru bunkai [Decomposition of soya-bean protein. VII. Decomposition by Japanese acid clay]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(8):565-68. Aug. [4 ref. Jap]

• ***Summary:*** When soya-bean protein was heated under pressure with acid clay and water, or with acid clay and sodium chloride solution, the ammonia-nitrogen and amino-nitrogen liberated was about 8.5% and about 5% of the total

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nitrogen, respectively. With acid clay and hydrochloric acid the amount of amino-nitrogen liberated was somewhat less than with the acid alone. Address: Tokyo Kogyo Shikenjo, Dai 2 bu, Tanpakushitsu kenkyu shitsu.

2496. Morse, W.J. 1927. The present outlook of the soybean industry in the United States. *Proceedings of the American Soybean Association* 1:167-71. Eighth annual field meeting. Held 9-12 Aug. in North Carolina.
• ***Summary:*** "In 1907, the soybean was considered but a minor crop in America, less than 50,000 acres being devoted to its culture. North Carolina had the largest acreage at that time, and produced at least 90 per cent of the seed, possibly more."

Note: This is the earliest document seen (May 2008) that gives statistics for soybean production in the USA before 1909. It is also the earliest document seen (May 2008) that mentions the number "50,000 acres" in connection with the year 1907–statistics that were repeated by many subsequent publications. Yet we have been unable to find Morse's source for these earliest baseline statistics. He may have somehow derived the figures from those in: U.S. Department of Commerce, Bureau of the Census. 1913. Thirteenth census of the United States taken in the year 1910. Volume V. Agriculture, 1909 and 1910.

"Not more than six varieties were being grown [in America]. The most important of these were the Mammoth Yellow, Ito San, Ogemaw, and Medium Green, varieties limited as to soil and climatic conditions, and also as to purpose. At this time, it seemed unlikely, to all except a few soybean enthusiasts or 'soybean cranks' as they were then called, that the soybean would ever amount to much more than a minor or emergency crop. Several experiment stations had conducted tests with the crop as pasture, hay and silage, and with the seed as a concentrated feed... One soybean enthusiast, the late Dr. C.V. Piper, then Chief of the Office of Forage Crops, United States Department of Agriculture, had a remarkably clear vision of the great potential value of the soybean as a major crop in American agriculture. After studying the soybean in the Orient, it seemed to Dr. Piper that more and better varieties were essential to meet the widely diverse conditions found in the United States... Through the Office of Foreign Plants, therefore, numerous introductions were made from the soybean regions of China, Manchuria, Korea, and Japan."

"The soybean undoubtedly will be utilized primarily for forage purposes, and by forage purposes is meant as hay, pasture, ensilage, and soilage."

"To me, the production of soybean seed for oil and oil mill appears to be one of the bright spots in the future of the soybean which will firmly establish it as a major crop. Increasing imports of soybeans, soybean oil, and soybean cake from China and Japan, in spite of a tariff on the beans and oil, indicate a ready market for these products in the United States. Soybean oil is a strong competitor of other vegetable oils and is used extensively in the manufacture of butter and lard substitutes, paints, enamels, waterproof goods, rubber substitutes, linoleum, and edible oils; and constantly new uses are being found for this valuable oil."

"Soybean seed is employed for various other purposes and its uses, no doubt, will further increase. There are established in the United States several factories for the manufacture of soy sauce, which in previous years was imported in large quantities from China and Japan." Address: USDA, Washington, DC.

2497. Haga, Soji. 1927. Kassei tanso ni yoru yushi no bunkai [Catalytic decomposition of soy bean oil by active carbon]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(9):618-24. Sept. (Chem. Abst. 22:1245). [Jap]
• ***Summary:*** Soy bean oil was decomposed by heating with Merck's animal charcoal as catalyst. The cracked oil produced was yellow, had density 0.812, acid value 11.5, refractive index 1.4551, and was composed of gasoline, 14.7-23% (containing 71.7% saturated hydrocarbons, 3.7% aromatic hydrocarbons, and 24.6% unsaturated, non-benzenoid hydrocarbons); kerosene, 34.7-38% (containing 72% paraffin [saturated] hydrocarbons, 5% aromatic hydrocarbons, and 22% unsaturated, non-benzenoid hydrocarbons); and neutral oil, 38-46.6%. Address: Kôgaku-shi. Waseda daigaku Oyo Kagaku, Dai-3 Kenkyu Shitsu.

2498. Mashino, Minoru; Nishimura, Shunsuke. 1927. Daizu tanpakushitsu no chisso bunpu jôtai ni tsuite [Nitrogen distribution of soya-bean protein]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(9):607-10. Sept. (Chem. Abst. 22:1602). [1 ref. Jap]
• ***Summary:*** The nitrogen distribution of several varieties of soya-bean protein has been determined by the Van Slyke method. Address: Tokyo Kogyo Shikenjo, Dai 2 bu, Tanpakushitsu kenkyu shitsu.

2499. Mashino, Minoru. 1927. Daizu tanpakushitsu no seisei ni tsuite. I. [Purification of soybean protein. I.]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(9):610-17. Sept. (Chem. Abst. 22:1602). [Jap]
• ***Summary:*** Soya bean, from which oil had previously been extracted with light petroleum, was treated with various solvents to remove constituents other than the protein. Methyl alcohol proved best. The amount of extraction increased with temperature. Extraction by methyl or ethyl alcohol (ethanol) at 67-68ºC or at 82-83ºC was almost complete in 1 hour. Soya-bean protein purified with methyl alcohol is no longer hygroscopic, is odorless, and has only a light color.

Note: This is the earliest document seen that mentions the use of ethyl alcohol for solvent extraction of soybeans. Address: Tokyo Kôgyô Shikenjo, Dai 2-bu Tanpakushitsu

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Kenkyû-shitsu.

2500. Fukai, Tôshi. 1927. Shôyu no shikiso no hishoku teiryô-hô ni tsuite [Comparative determination of shoyu pigment. Biological formation chemical synthesis]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 3(10):1206-14. Oct. [Jap]
• ***Summary:*** Discusses: Arabinose, melanin, raffinose, soyamelanin, soyamelanin saeure, tyrosin, tyrosinase, xylose, Zygosaccharomyces soya. Address: Jôzô Shiken-jô.

2501. Kurono, Kanroku; Fukai, F.; Kanno, S. 1927. Shôyu shikiso no seiri-teki seiin ni tsuite [Biological origin of shoyu pigment]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 3(10):1193-1205. Oct. [11 ref. Jap]

2502. Suzuki, Bunsuke; Yokoyama, Yoshikuni. 1927. 145. On the separation of glycerides: Part II. Soy bean oil. *Proceedings of the Imperial Academy* (*of Japan*) 3(8):529-30. [Eng]
• ***Summary:*** The previous paper was about linseed oil; soy bean oil was treated in the same way. "The following brominated glycerides were isolated and identified: 1. Dilinoleo-linolenin bromide. m.p. [melting point] 78ºC. 2. Linoleo-dilinolenin bromide. m.p. 118ºC. 3. Trilinolenin bromide. m.p. 166ºC. 4. Dilinoleo-olein bromide. m.p. oil." The experimental method used for isolating each bromide is described. Address: [Biochemical Lab.] Faculty of Agriculture, Kyoto Imperial Univ., Japan.

2503. Takimoto, S. 1927. Daizu no saikin-sei hanten-byô [Bacterial spotting disease of soybean]. *Byochu-gai Zasshi* (*J. of Plant Protection, Tokyo*) 14:559-66. Oct. [13 ref. Jap]
• ***Summary:*** The disease occurred in Japan and Korea. Its causal organism is named *Bacterium sojae* var. *japonicum* n.var. (=Pseudomonas glycinea), and morphology and cultural characters are described in detail. Address: Kyushu Teikoku Daigaku, Nôgaku-bu, Shokubutsu Byori-gaku Kyoshitsu.

2504. Zavitz, C.A. 1927. Forty years' experiments with grain crops. *Ontario Department of Agriculture, Bulletin* No. 332. 98 p. Oct. See p. 36-37, 49-51, 84-87.
• ***Summary:*** The section titled "Dates of seeding soy beans" (p. 36-37) contains a table showing the results of sowing three varieties (Early Brown, Early Yellow, and O.A.C. No. 211) on four different dates from May 8 to May 28 during the three years 1924, 1925, and 1926. For each variety is given the date of maturing and the yield of grain. The highest yield came from O.A.C. No. 211, sown on May 14 and matured on Oct. 8; it yielded 27.91 bu/acre.

The section titled "Soy beans, Dent corn and sunflowers grown alone and in combination for grain and fodder" (p. 49-51) "The highest total yield of green crop per acre was obtained from the Soy beans, Dent corn and sunflowers when grown in combination, the average being 18.8 tons or 1.7 tons per acre more than sunflowers when grown alone." An interesting phase of this line of investigation is the value of a combination of Soy beans and Dent corn. The average 7 years for the following crops were: Soy beans, 7.9; Dent corn, 13.8; Soy beans and dent corn, 13.8. The average for the 7 years gives exactly the same total weight for corn alone as for corn and Soy beans combined. The Soy beans being rich in albuminoids will make a much richer and better balanced ration for feeding purposes when mixed with corn.

When everything is taken into consideration for grain production, it is preferable to grow Dent corn and Soy beans separately rather than in combination. Three acres of corn and 2 acres of Soy beans would give a greater total production of each crop than if 5 acres of the 2 crops were grown in combination.

The section on "Soy beans grown with millets, sorghums, etc., for fodder (p. 51) notes that in each of the past two years the O.A.C. 211 variety of Soy bean has been grown alone and with seven other fodder crops, whose names are given. The results are unclear.

The section titled "Varieties of Soy beans" (p. 84-87) states: "We have tested in all fully one hundred varieties of soy beans, most of them for five years or over. The Early Yellow variety has been under test for thirty-one years [i.e., since about 1896], during which time it gave an average annual yield of grain per acre of 16.78 bushels, or 1,006.8 pounds. In a twenty-two-year test the average annual yield of grain per acre was 1,055 pounds for the Early Yellow Soy, and 950 for the Ito San. In another test, running twenty-two years, the Early Yellow gave 5.9 and the Ito San 7.5 tons of green crop per acre per annum. It will be seen that... the Early Yellow was higher in production of grain and the Ito San in production of fodder.

"Eight varieties, which have been grown under similar conditions in each of the past fourteen years. The following table gives the average results for the fourteen-year period." For each variety is given the average height (inches), weight per measured bushel (lbs), yield per acre of green fodder (tons), and of grain (bushels by weight). The eight varieties are listed in descending order of grain [seed] yield: Habaro No. 20405 (20.38 bu/acre), O.A.C. No. 111 (19.92), Tsurunoko (19.91), Early Yellow (19.81), Quebec No. 92 (18.64), Brown (17.94), Ito San (17.30), Medium Green (13.51).

"The Habaro was imported from the United States Department of Agriculture at Washington. It was first introduced in 1906 from Khabarovsk, Siberia. The O.A.C. No. 111 was obtained through selection work from the Early Yellow variety, the latter being originally obtained from Dr. C.C. Georgeson, then connected with the Agricultural Experiment Station at Manhattan, Kansas. This was one of

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the leading varieties imported by Dr. Georgeson from Japan a few years previous.

"The Tsurunoko variety, third on the list, was started 19 years ago, from 4 ounces of seed obtained directly from the College of Agriculture, Sapporo, Japan. The Quebec No. 92 was originated by selection by Dr. Leonard S. Klinck, when in charge of the agronomy work at Macdonald College, Quebec. The Medium Green has been growing at the College for a long time, but owing to its late maturity does not give satisfactory results as a grain producer."

A second table (p. 85) gives the average yields of fodder and seed of thirteen varieties grown at the College in the last five years. These include the eight listed above plus (in descending order of seed yield): O.A.C. No. 211, Manchu, Habaro, Minnesota No. 167, Early Soja (Steele, Briggs), Early Soja (Bruce). The top six varieties in seed yield are: O.A.C. No. 211 (28.1 bu/acre), Manchu (27.38), Tsurunoko (26.43), O.A.C. No. 111 (25.97), Habaro (25.97), Early Yellow (25.82). Note that O.A.C. No. 211 has the highest average seed yield. "This variety has now been accepted as eligible for registration by the Canadian Seed Growers' Association. It is the only variety of soy beans which has been so honoured."

The Manchu was imported in the U.S. in 1913 from Niguta, Manchuria, and was entered into the College tests in 1922... The Manchu has a black, and the O.A.C. No. 211 what is usually termed a yellow eye. Other than the color of the eye, both of these varieties are of a beautiful yellow appearance."

A table (p. 87) shows 26 varieties of soy beans that have been under test at the Ontario Agricultural College experimental grounds in the three years 1924, 1925, and 1926. Those not mentioned above are (in descending order of seed yield): North's, Black Ontario, Mandarin, Black Eyebrow (Jeffrey), Black Manchurian (Jeffrey), Oyaji, Shiro Kotsubu, Kuro-otsubu aka, Argyle (Jeffrey), Ogemaw, Hollybrook (Jeffrey), Chagara, Wasa-Otsura, Washe Otuku. The top eight varieties in seed yield are: O.A.C. No. 211 (1,821 lb/acre), Manchu (1,746), North's (1,737), Black Ontario (1734), Mandarin (1,699), Black Eyebrow (Jeffrey) (1,670), Habaro No. 20405 (1,629), O.A.C. No. 111 (1,618). "It will be seen that the O.A.C. No. 211 variety stands at the head of the list in yield of grain, and second highest in yield of green fodder."

Photos show: (1) The Field Husbandry Building at O.A.C. (cover). (2) Soy bean plants growing with Dent corn for fodder (p. 50). (3) A man standing in an acre plot of O.A.C. No. 211 Soy Beans grown for grain (p. 86).

Note: This is the earliest document seen (Oct. 2013) that mentions the soybean variety Black Ontario. Address: B.S.A., D.Sc., Prof. of Field Husbandry and Director of Plant-Breeding and Field Experiments, Ontario Agricultural College, Guelph.

2505. Millard, Bailey. 1927. Awakening of Manchuria: II. *Los Angeles Times.* Dec. 8. p. A4.

• ***Summary:*** "Standing upon the treaty rights by which they acquired long lease-holds of large railroad, mining and agricultural property in Manchuria, the Japanese will not permit the irresponsible Chinese war lords to abrogate or in any way violate those historic agreements under which Japan began the development of the country after the Russian evacuation."

Manchuria owes much to Japan in terms of development of natural resources, welfare work, education, and construction. Manchuria has entered a new industrial era. "There is no question that Japan would like to annex Manchuria, and may do so in time; but at present she would have the powers to reckon with... though most economists consider it would be better all around if Japan were in possession."

"Japan is offering every encouragement to American trade and industry in Manchuria." The population as increased greatly, largely due to immigration from other parts of China in part to escape the wars devastating those areas. Though there is much cheap labor, Japan is short on capital. In Manchuria's three provinces, there are nearly 30 million acres of primeval forests. When John Muir went there 20 years ago from California to study these forests, he was astonished at the height and bulk of the trees.

Milling of soya beans ranks foremost among Manchuria's new industries. "Products of the Manchurian soya bean–oil and bean cake–have become of importance in world trade." About 4,000,000 tons of soya beans are now raised annually in Manchuria.

2506. Hashi, Koro. 1927. Daizu abura kenkyû. I. Daizu abura shibôsan no seibun [Studies on soya bean oil. I. The composition of fatty acids]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(12):849-855. Dec. (Chem. Abst. 22:2478). [7 ref. Jap]

• ***Summary:*** The fatty acids of soya-bean oil were separated into a solid (10.6%) and a liquid (85.4%) part by means of Twitchell's lead salt-alcohol method. The solid fatty acids were esterified with methyl alcohol and the esters fractionated. They were found to consist of much palmitic acid, an appreciable amount of stearic acid, and a little arachidic acid. Bromination of the liquid fatty acids shows the presence of linolenic acid, 2.9%; linoleic acid, 51.5%; oleic acids, 35.6%; and solid fatty acids, 11.1%. Address: Kyoto Teikoku Daigaku, Kogyo Kagaku Kyoshitsu, Kita Kenkyu Shitsu.

2507. Hashi, Koro. 1927. Daizu abura kenkyû. II. Daizu abura ni parumitoorein no bunri [Soya bean oil. II. Isolation of dipalmitolein]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(12):856-58. Dec. [9 ref. Jap]

• ***Summary:*** The dipalmitolein was extracted with acetone

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from soya-bean oil and purified by 10 recrystallizations from the same solvents. Address: Kyoto Teikoku Daigaku, Kogyo Kagaku Kyoshitsu, Kita Kenkyu Shitsu.

2508. Fukai, Tôshi. 1927. Shôyu no kagaku ôyôbi sono ôyô. Shôyu shikiso no hishoku teiryô-hô ni tsuite [The chemistry of shoyu and its application. I. Comparative determination of shoyu pigment. II. Physiological origin of shoyu color pigment. III. Chemical biosynthesis of shoyu oil pigment]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 22(7):11-20; 22(8):12-25; 22(9):9-19. [Jap]
Address: Jozo Shikensho Gishu, Nôgaku-shi, Japan.

2509. Iriyama, Y. 1927. Experimentelle Untersuchung ueber die pathologische Veraenderung des Gehoerorgans bei der Fuetterung mit "Tofukasu" (aus bohnen bereitet) [Experimental investigations on the pathological changes in the hearing organs [of animals] from feeding okara (made from beans)]. *Journal of Oriental Medicine* (*S. Manchuria*) 6:55-56. [Ger]
• ***Summary:*** Dr. Kumagaya, Dr. Ozu and other have stated that the so-called Barowsche disease (which in humans is characterized by considerable reduction in body weight, bleeding, diarrhea, etc.) can be induced experimentally by feeding guinea-pigs with okara (*Tofukasu*). The author conducted feeding experiments with 30 guinea-pigs for 18-15 days; They showed no "Preyersche" reaction toward the end of the experiments. Address: Dr., Aus der oto-rhino-laryngo-pharyngologischen Abteilung der Mandschurischen Medizinischen Hochschule, Mukden, China.

2510. Kuriyama, M. 1927. [Antimold substance for shoyu]. *Kyushu Kaigaku Kogyo-iho* 2:129-. [Jap]*

2511. Kurono, Kanroku; Kinoshita, A.; Fukai, T.; Tateno, M. 1927. "Pentoosu" tenka shiken [The addition of pentose to shoyu moromi (mash)]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 96. p. 120. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Gishi; 3. Gishu; 4. Joshu.

2512. Kurono, K.; Katsume, E. 1927. Shôyu shikiso no kagaku-teki sosei [Chemical composition of the coloring matter of shoyu (Soja melanin)]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 95. p. 1-30. [25 ref. Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Kenshuin.

2513. Matsumoto, K.; Kakegawa, I.; Takada, R. 1927. IV. Funmatsu nyûsan-kin ôyô sokujô shiken. V. Shôbo ôyô onjo shiken. VI. Kôryan to oomugi to no hikaku shiken [IV. The application of powdered lactic acid bacteria for making quick shoyu. V. The use of shoyu yeasts in heated shoyu fermentation. VI. Comparison of kaoliang and barley as raw materials for shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 96. p. 121-52. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Shokutaku; 3. Joshu.

2514. Matsumoto, K.; Chin, K.; Sano, Z. 1927. Shôyu jôzô ni kansuru saikin-rui ni tsuite. IV-XII. [On the bacteria in shoyu brewing. IV-XII.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 22(1):27-34; 22(2):19-25; 22(3):27-33; 22(4):17-21; 22(5):25-28; 22(6):14-17; 22(7):21-24; 22(8):26-29; 22(9):30-37. [Jap]
Address: 1. Jozo Shikensho Gishi, Nôgaku Hakase; 2-3. Jozo Shikensho Kenshu-in, Japan.

2515. Suzuki, Bunsuke; Yoshikumi, Y. 1927. On the separation of glycerides. II. Soy bean oil. *Proceedings of the Imperial Academy* (*Tokyo*) 3:539-30. [Eng]*
Address: Biochemical Lab., Faculty of Agriculture, Kyoto Imperial Univ., Japan.

2516. Yu-niti-ei. 1927. [Enzymes of natto-pilz]. *Chosen Ikai* 75:284-. [Jap]*

2517. Horvath, A.A. 1927. The soybean as stock feed and human food. *Vestnik Manchzhurii* (*Manchuria Monitor*) No. 8. p. 5-7. English edition. p. 13-23. Russian edition. [19 ref. Eng; Rus]
• ***Summary:*** A brief but good introduction to soybeans and soybean products including soybean meal, soybean flour, soybean oil, bean milk [soymilk], to-fu, frozen to-fu, soy sauce, and mizo [sic, miso] or tsiang [jiang].

"When boiled with gypsum or chlorate of magnesia bean milk curdles, and is known as 'to-fu.' Its constitution varies dependent upon the method of preparation employed. Fresh soy curd contains on the average, 8% protein and 3% fat. 'To-fu' when smoked or fried, owing to loss of water, becomes somewhat allied to meat, thereby substantiating the Chinese proverb that–'to-fu is meat without bones.'"

"Frozen 'to-fu' prepared during the cold season contains up to 50% protein. Bean curd is almost totally assimilated, and may be used in the preparation of a considerable number of European dishes, the recipes for which have been published by the U.S. Department of Agriculture. The Chinese prepare an unlimited number of dishes based upon this comestible, including artificial meat. In order to obtain the specific taste of meat, smoking soybean sauce is used."
Address: Manchuria.

2518. Morse, W.J. 1927. Soy-bean varieties newly developed for U.S. farms. *Yearbook of Agriculture* (*USDA*) p. 676-79. For the year 1926.
• ***Summary:*** "The acreage of soy beans in the United States increased from about 500,000 acres in 1917 to over 2,500,000 acres in 1924. This enormous increase in the use made of soy beans in this country has been largely due to

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the development of better-adapted varieties. The number of real or supposed varieties has increased very rapidly in the United States during the past few years, resulting in much confusion concerning varietal names and characters. In many instances disapointment and loss have been caused to the grower by the lack of reliable information, and the soy bean brought into disfavor in some localities. At the present time about 60 varieties of soy beans are handled by growers and seedsmen in the United States. Varietal names greatly exceed the number of true varieties, for different varieties are often sold under the same name and different names are often applied to the same variety. It is therefore essential not only to know the name of a desired kind, but also its varietal characteristics in order to prevent substitution in purchasing seed. Varieties of soy beans are differentiated largely by the color and size of seed, though they also differ in time of maturity, habit of growth, disposition to shatter their seed, disease resistance, oil and protein content, and in yield of forage and seed. They vary also in their adaptation to climate and soil. Some varieties are especially suitable for fertile land, others for less productive land; some for early planting, others for late planting; some for a seed crop, others for forage; some for planting with corn, others for planting with Sudan grass and sorghum. One may find a few varieties or even a single variety adapted to the climate of a certain section which will fill all the local requirements of the crop. No single factor has greater influence upon the success of the crop than the selection of the right variety to meet the needs and the conditions of the section where it is to be grown.

"Only Eight Varieties Grown in 1898: Previous to the numerous introductions made by the United States Department of Agriculture, beginning in 1898, there were not more than 8 varieties of soy beans grown in the United States, namely, Mammoth Yellow, Ito San, Butterball, Guelph or Medium Green, Eda, Ogemaw, Buckshot, and Kingston. All of these varieties were rather limited in adaptation, and at present the Ito San and Mammoth Yellow are the only ones grown to any appreciable extent. In 1907, 23 varieties of soy beans were being grown, and of these 15 were introductions made by the department prior to 1905. Vigorous efforts were inaugurated about 1907 to obtain additional varieties through consuls, agricultural explorers, foreign seedsmen, and extensive correspondence with missionaries and others until in 1909 the department had in its trials about 200 distinct varieties; by 1913, 400 varieties; by 1919, 600 varieties, and by 1925, about 1,200 varieties.

"The records of introduction indicate that every Chinese village has its own distinct varieties. There is no seed trade in China, consequently local varieties are never widely disseminated. Undoubtedly numerous varieties are yet obtainable from the agriculturally unexplored villages of China, Manchuria, Korea, Japan, and India.

"When new introductions are received they are thoroughly tested at Arlington Experiment Farm the first year, and if mixed, single plant selections are made for the second year's test. After three years' work with these selected strains, those giving the best results in comparison with standard varieties are disseminated among the State experiment stations, where they are grown again under careful observation and test conditions. Finally seed is distributed among farmer cooperators who assist the department in its practical field investigations. Varieties that appear promising in these field trials ultimately are assigned suitable varietal names and made available for general use and distribution in the localities to which they are adapted.

"One thousand varieties introduced: During the past 20 years more than 1,000 varieties have been introduced into the United States from China, Japan, Manchuria, India, Korea, Siberia, and the East Indies. Several of these have become established in American agriculture, either as direct introductions or as selections from introductions. Others, introduced in the past year have proven so valuable in trials that they are deemed important acquisitions and doubtless will become widely grown. It is universally appreciated and acknowledged by all soy-bean authorities that the annual introductions of soy beans into the United States have been of fundamental importance in the rapid rise of the crop in public favor.

"The soy bean lends itself readily to improvement. Considerable breeding work is being carried on by the department, several State experiment stations, and a few soy-bean growers. Although the Orient abounds with varieties, it is evident that they are the result of natural crossing and selection, as very little breeding work has been done. Introductions, for the most part, are admixtures, containing two or more varieties. The progeny of individual plants has shown decided differences in yield of forage and seed, in tendency to shatter, in maturity, and in oil and protein content. Many new varieties have been introduced into the seed trade of the United States as a result of selection work. Some of these varieties originated from natural hybridization and a few are almost certainly mutations or sports. The most important of such varieties are Chestnut, Dixie, Goshen Prolific, Hamilton, Herman, Illini, Ilsoy, Lexington, Mikado, Minsoy, Peking, Sooty, Soysota, Virginia, Wilson-Five, and Wisconsin Black. Introductions without selection have given us the following important varieties: Biloxi, Black Eyebrow, Chiquita, Columbia, Haberlandt, Hahto, Hoosier, Laredo, Manchu, Mandarin, Morse, Old Dominion, Otootan, Southern Prolific, Tarheel Black, Tokio, Wea, and Yokoten.

"Work justified by results: The results that have been obtained by this wholesale search have justified the work and expense many times over. When the department work began, the soy bean was a very minor crop, and of importance only in limited areas, owing primarily to the lack of suitable varieties. To-day, its culture, due to a wide range of excellent varieties, is widespread and lends substance to the belief that the soy bean will become one of our major crops.

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"Table 24 shows the total value of soy-bean seed and hay produced in 1924 by varieties introduced and developed by the department. These data, which do not include the value of the soy beans pastured or fed as silage, indicate that over half (52 per cent) of the total soy-bean hay and seed produced in the United States was obtained from these new varieties. The wide use that is being made of these varieties shows most conclusively the effect this introduction and breeding work has exerted on the development of the soy-bean industry in the United States."

Photos show: (1) Field trials of varieties of soy beans at Clemson College, South Carolina. (2) Two men standing in a "field of Otootan soy beans, one of the newer introductions by the United States Department of Agriculture."

Table 24 has six columns: 1. Variety (18 varieties). 2. Year introduced. 3. Estimated value as seed. 4. Estimated value as hay. 5. Estimated value, total. 6. Percent of value of all soybean hay and seed. Those with the highest percent of value are: Midwest 11.4%. Manchu 6.8%. Virginia 6.7%. Wilson 6.2%.

The 18 varieties, listed alphabetically, are: Biloxi, Black Eyebrow, Ebony, Hamilton, Haberlandt, Laredo, Lexington, Manchu, Midwest, Minsoy, Mandarin, Morse, Peking, Tarheel Black, Tokio, Virginia, Wisconsin Black, Wilson. Address: USDA, Washington, DC.

2519. Skvortzow, B.V. 1927. The soy bean–Wild and cultivated in Eastern Asia. *Vestnik Manchzhurii* (*Manchuria Monitor*) No. 11. p. 1-4. English edition. (From materials furnished by the M.R. S-ty). [Eng]

• ***Summary:*** The soy bean has been subjected to many classifications. Contents: Classification of soybeans by the Chinese: 1. Seeds yellow, named "Huan-tou." A. White hilum, named "pai-mei" or white eyebrow. A. Golden hued hilum, named "chin-huan" or golden round bean. C. Black hilum, named "hei-chi" or black navel. 2. Seed coat green, cotyledons yellow, named "P'i-ch'ing tou." 3. Seeds, epidermis, and cotyledons green, named "Ching-tou" [Ch'ing-tou]. 4. Seeds black, cotyledons yellow, named "Hei-tou." 5. Seeds black, cotyledons green, named "Wu-tou." 6. Seeds tawny, named "Chi-tou." 7. Seeds spotted, variegated, named "Pan-tou."

Classification by Martens (1869) divides the Soya hispida Moench species into three sub-species by seed shape, and 13 varieties by seed color. Classification by Harz (1880) based upon the form of the pod and the structure and color of the seeds. He divides the soybean into two species (pods flat, and pods swollen), and numerous sub-species. Classification by Tanaka (Japanese), 13 species based upon the color of the pods and seeds plus the period of maturity. Classification by Jamasito Vakindo (Japanese), who divided soybeans into 3 main groups (pure forms, mixed, abnormal) and 150 species. Novel classification by the author, based on the structure of the stem, leaf, flower clusters, blossoms, pods, and seeds, plus pubescence. This yields 31 varieties, each of which is described. Address: Harbin, China (Manchuria).

2520. Takenobu, Y. 1927. Japan Year Book. Tokyo: Japan Year Book Office. 670 + 62 + 200 p. See p. 467, 449, 593, 662. 23rd annual issue.

• ***Summary:*** The Taisho era has ended; the Showa era has begun. A full page near the front of this volume is about the late emperor Yoshihito, who died on 25 Dec. 1926. It contains a portrait photo and a statistical review of his reign, including: Territorial expansion. Population growth. Industrial progress. Expansion of trade. Specie reserve. Currency. Finance. Education. Transportation (railways, shipping), and Electric generation.

The next full page is about his son and successor, His Imperial Majesty Hirohito, and H.I.M. Empress Nagako. There is a portrait photo of each.

Page 467. In the chapter on Agriculture, a table titled "Beans, potatoes and sweet potatoes" shows the production (in koku; 1 koku = 180 liters) of these crops from 1923 to 1925, inclusive. Soybean production increased from:

3.434 million *koku* in 1923
3.242 million *koku* in 1924
3.609 million *koku* in 1925.

The text below the table is the same as in the 1926 Japan Year Book.

Page 593. A table shows the value of imports in yen, including Beans and peas, and "oil materials."

Page 662. In the section on Manchuria, a table titled "Principal crops" shows the production of soya beans from 1922 to 1924. Figures for 1922 and 1923 are in Chinese koku; 1 Chinese koku = 1.7 Japanese koku.

On the same page, under "The South Sea Islands," we read: "Japan acquired through the Treaty of Peace the mandatory right over the former German South Sea Islands north of the Equator... It consists of three groups of Mariana, Marshall, and Caroline, covering altogether an area of 960 square miles with 49,576 natives." Address: Prof. at the Waseda Univ. and late of the "Japan Times".

2521. Horvath, A.A. 1928. Soybean feeding and blood calcium. *Japan Medical World* 8(1):1-5. Jan. 15. [32 ref]

• ***Summary:*** "It is a general belief that soybeans are poor in calcium. This belief is supported by Forbes (1909), Osborne and Mendel (1917), Adolph (1922) and others." Yet various chemical analyses show that the soybean seed contains about 0.25% of calcium oxide, which is higher than most foods, including whole cow's milk. Rabbits were fed a diet of raw yellow soaked soybeans for 4 weeks, and of other soybean preparations ("sprouted soybeans" and "soybean curd" made with calcium sulfate) given for three weeks more. The blood calcium level generally fell. Possible reasons for this are discussed.

"In China the black soybean has been used for feeding

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animals since ancient times and is thought to be more suitable than the yellow variety. It is known that the black variety contains much less fat than the yellow soybean."

Note: This is the earliest English-language document seen (Jan. 2013) that uses the term "sprouted soybeans" (or "sprouted soybean") to refer to soy sprouts. Address: Dep. of Medicine, Peking Union Medical College, Peking, China.

2522. Fukai, Tôshi. 1928. Shôyu shikiso ni kansuru chiken [On the knowledge of shoyu pigment]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 5(6):451-80. [23 ref. Jap]
Address: Jozo Shikenjo, Japan.

2523. Hashi, Koro. 1928. Daizu abura kenkyû. III. Shûso tenkahô ni yoru daizu abura guriserido no bunri [Soy bean oil. III. Separation of its glycerides by bromination]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 31(2):117-23. Feb. (Chem. Abst. 23:4839). [Jap]
• ***Summary:*** From the bromination product of soy bean oil 3 bromides, melting points 154ºC, 147ºC, and 74-75ºC, respectively, have been separated by means of various solvents. From an examination of the properties of these bromides and their derivatives, the author considers them to be, in the above-mentioned order, linoleodilinolenic bromide, a mixture of oleodilinolenic bromide with dilinoleolinolenin bromide or with linoleodilinolenic bromide, and a mixture of trilinoleic bromide with oleolinoleolinolenic bromide. Address: Kyoto Teikoku Daigaku, Kogyo Kagaku Kyoshitsu, Kita Kenkyu Shitsu.

2524. Matsuoka, Komakichi. 1928. [A declaration concerning the Noda labor strike]. Feb. 2. Mimeographed. 3 p. Unpublished manuscript. [Jap]*

2525. Sato, M.; Matsumoto, H. 1928. Preparation of fuel oil by dry distillation of the calcium soap of soya bean oil. IV. Comparison with magnesium soap. V. Hydrogenation of the distilled oil (Abstract). *British Chemical Abstracts–B.* 47:179. March 16. [2 ref]
• ***Summary:*** An English-language summary of two Japanese-language articles: (1) Sato, Masanori. 1927. "Daizu abura shibô-san sekkai no kanryû ni yoru nenryô yu no seihô ni tsuite. IV. Kudo sekken to no kanryû seiseki hikaku [Preparation of a liquid fuel resembling petroleum by dry distillation of the calcium soap of soya bean oil. IV. Comparison with the magnesium soap]." *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(4):242-45. April.

(2) Sato, Masanori; Matsumoto, H. 1927. "Daizu abura shibô-san sekkai no kanryû ni yoru nenryô yu no seihô ni tsuite. V. Kanryû yu no suiso tenka to seibun [Preparation of a liquid fuel resembling petroleum by dry distillation of the calcium soap of soya bean oil. V. Hydrogenation of the distilled oil]." *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(4):245-52. April. Address: Japan.

2526. Sato, M.; Ito, C. 1928. Preparation of fuel oil by dry distillation of the calcium soap of soya bean oil. VI, VII. Reaction mechanism of thermal decomposition of the calcium and magnesium salts of some higher fatty acids (Abstract). *British Chemical Abstracts–B.* 47:179. March 16. [2 ref]
• ***Summary:*** An English-language summary of two Japanese-language articles: (1) Sato, Masanori. 1927. "Daizu abura shibô-san sekkai no kanryû ni yoru nenryô yu no seihô ni tsuite. VI. Sekkai-en yori keton e no bunkai kikô to ondo [Preparation of a liquid fuel resembling petroleum by dry distillation of the calcium soap of soya bean oil. VI. Reaction mechanism of thermal decomposition of the calcium and magnesium salts of some higher fatty acids]." *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(4):252-60. April.

(2) Sato, Masanori; Ito, C. 1927. "Daizu abura shibô-san sekkai no kanryû ni yoru nenryô abura no seihô ni tsuite. VII. Keton yori tanka suiso e no bunkai kikô to ondo [Preparation of a liquid fuel resembling petroleum by dry distillation of the calcium soap of soya bean oil. VII. Reaction mechanism of thermal decomposition of the calcium and magnesium salts of some higher fatty acids]." *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 30(4):261-67. April. Address: Japan.

2527. Makino, Tomitaro; Tanaka, Koichi. 1928. Nippon shokubutsu–Kazoku kensaku [A manual of the flora of Nippon]. Japan. 13 + 53 + 15 + 864 p. See p. 291. Illust. 19 cm. [Jap]
• ***Summary:*** Contains 212 illustrations. On page 291, under the genus *Glycine,* are mentioned two species: *Glycine Soja* Benth. (Japanese: *daizu, ômame, miso mame, mame*) and *Glycine ussuriensis* Reg. et Maack. (Japanese: *tsurumame, nomame*).

See also: Peanuts (*Nankin mamé, Tojin mamé,* p. 282). Lupins (p. 282). Azuki (p. 293). Pueraria (*kuzu, mamekuji, makuzu,* p. 299). Sesame (*goma,* p. 529). Address: Japan.

2528. Ohta, Kiyoshi. 1928. Shôyu bôfuzai toshite zettai-teki no kôryoku o yûsuru. "Fueniiru gurikooru," "fueniiru aranin" ni kansuru kenkyû yohô [On the preservatives of shoyu which are absolutely effective: Phenylglycol and phenylalanine]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 5(8):584-88. [Jap]

2529. Oshima, Kokichi. 1928. Protease and amylase of *Aspergillus oryzae. J. of the College of Agriculture, Hokkaido Imperial University* 19(3):135-244. March. [109 ref. Eng]
• ***Summary:*** Contents: Introduction. Methods used for the

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quantitative estimation of amylase and protease, a formula to determine digestibility, and precautions in the use of Van Slyke's method. Enzymes found in *Aspergillus oryzae.* Conditions influencing enzyme production. Properties of protease from *Aspergillus oryzae.* Properties of amylase from *Aspergillus oryzae.* Disinfectants for preserving the amylase solution of *Aspergillus oryzae.* General summary.

"There are at least four large manufacturing industries in Japan, in the manufacturing process of which *Aspergillus oryzae* is of the first importance... The total yearly quantities of these products are approximately as follows: Sake (rice wine) 4,500,000 'koku' (=813,000 kilolitres). Shoyu (soy sauce) 5,000,000 'koku' (=902,000 kilolitres). Miso (soy cheese [paste]) 450,000,000 'koku' (=1,690,000 kilograms). Shochu (distilled alcoholic liquor calculated as 95% alcohol) 220,000 'koku' (=39,700 kilolitres)." Address: Chemical Lab., School of Fishery, Hokkaido Imperial Univ., Japan.

2530. Yabuta, Teijirô; Kôbe, Katsuji. 1928. Furfural no riyô ni kansuru kenkyû. I. Shôyu kabidome-zai toshite Furanacrylic acid no kôryoku narabini sono seizô-hô ni tsuite [Studies on use of furfural. I. Furanacrylic acid as an anti-mold substance for shoyu–its effectiveness and preparation]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 4(3):214-20. March. [8 ref. Jap] Address: Rikagaku kenkyu-jô, Suzuki (Ume) Kenkyû-shitsu.

2531. Yamamoto, Yoshihiko; Tamura, Yoshisuke. 1928. Nattô seisei-kin ni kansuru kenkyû. I. Ichi nattô-kin no saikin gaku-teki kenkyû [Studies on the natto bacillus. I. Bacteriological studies of *B. natto*]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 5(8):589-609. [20 ref. Jap; eng]
• ***Summary:*** The English-language summary states: "Our nattobacillus is the one bacillus of the bacilli which produce 'natto' from boiled soy-bean. We have examined the details of the bacteriological character of this microorganism and determined the position in the classification of the genus Bacillus, according to Chester's and Bergey's manuals (Table d and Table III). Our strain differs from Sawamura's Bacillus natto in size, spore formation, and H_2S formation, and differs from Matsumura's Bacilli in size and gelatine liquefaction or H_2S formation. The specific name of our bacteria shall be determined in future after our comparative study of the known nattobacilli." A detailed 3-page description of these rods is given, with a page of illustrations. Address: Institute of Applied Mycology, Faculty of Agriculture, Hokkaido Imperial Univ., Sapporo, Japan (Hokkaido Teikoku Daigaku, Nôgaku-bu (Sapporo), Japan).

2532. Ishimaru, Yoshio. 1928. Shôyu sando no denki-teki sokutei ni tsuite [Electrical determination of acidity of shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 5(9):653-68. [Jap]

2533. Kinoshita, Asakichi; Tanigawa, Sei. 1928. Mamekasu shiyô shôyu jôzô shiken seiseki [Brewing shoyu with soybean cake]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 5(9):700-10. [Jap]

2534. Nakazawa, Ryoji. 1928. Nanyô-san ontjom, tempeh o tsukuru shijôkin ni tsuite [On the filamentous fungi used to make ontjom and tempeh in the South Pacific (Java and Sumatra)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 4(4):252-63. April. See also Zentralblatt fuer Bakteriologie. II. 80:114 (1930) and Biological Abstracts 4:25213 (1930). [13 ref. Jap]
• ***Summary:*** Discusses *Mucor, Aspergillus, Rhizopus,* and *Penicillium* molds.

Onchom is made from peanuts and tempeh from soybeans. The author notes that Prinsen Geerligs (1896) had reported that these foods were fermented using *Rhizopus oryzae,* whereas Went (1901) had said they were fermented using *Monilia sitophila.*

In 1912 Nakazawa had asked a person from Southeast Asia to bring him samples of tempeh and ontjom (made from peanut presscake). He analyzed their microorganisms and repeatedly found *Penicillium,* a grayish-brown mold, to be the predominant genus.

In 1924 Yoshito Takeda, Nakazawa's co-worker, obtained more samples of these foods from Southeast Asia, and again found *Penicillium* to be predominant. *Monilia* (which in 1901 Went had said was the predominant microorganism) was not found; Takeda assumed it had died during transport.

In April and May of 1926 (Taisho 15) Nakazawa took a research trip to Java and Sumatra and carefully collected (in sterile containers) 59 samples of soy tempeh and onchom from various markets and small manufacturers. Tempeh was collected from Medan, Semarang, and Soerabaya [Surabaya], while ontjom was collected from only Buitenzorg and Medan. Nakazawa and Takeda analyzed the microorganisms in these fermented foods and in this document reported that they found the onchom microorganisms to be almost exclusively *Penicillium* and the tempeh microorganisms to be mostly *Penicillium,* but with substantial amounts of *Mucor, Rhizopus* (all light grayish-brown) and *Aspergillus* (dark green) as well. No *Monilia* was found and no species names were reported. Dr. Grounewege at the Buitenzorg Agricultural Research Laboratory confirmed that these were the predominant species.

Note 1. This is the 2nd earliest document seen (Sept. 2011) worldwide which uses the spelling "tempeh" to refer to this fermented Indonesian soybean food. This word, written in roman letters, appears throughout the publication and by the 1960s had become the standard spelling in English and most other European languages.

Note 2. This is the earliest Japanese-language document seen (Sept. 2011) (one of two documents) that mentions

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tempeh.

Note 3. Today most tempeh is made with *Rhizopus* species and most ontjom with *Monilia* species.

Note 4. Dr. Nakazawa never made tempeh, probably for lack of a suitable inoculum. Address: Taiwan Sotokufu Chuo Kenkyujo, Kogyo-bu Hokoku.

2535. Nakazawa, Ryoji; Takeda, Yoshito. 1928. Nanyô-san ontjom, tempeh o tsukuru shijôkin ni tsuite [On the filamentous fungi used to make onchom and tempeh in the South Pacific (Java and Sumatra)]. *Taiwan Sotokufu Chuo Kenkyujo, Kogyobu Hokoku* (*Report of the Industrial Section, Central Research Institute, Taiwan Governor-General's Office*) 4(4):252-63. April. See also Zentralblatt fuer Bakteriologie. II. 80:114 (1930) and Biological Abstracts 4:25213 (1930). [13 ref. Jap]
Address: Taiwan Sôtokufu Chûô Kenkyûjo, Kôgyô-bu.

2536. Yabuta, Teijirô; Shimose, Rinta. 1928. Furfural no riyô ni kansuru kenkyû. II. Furfural no denkai sanka ni yoru maleic acid, fumaric acid oyobi kohaku-san no seizô ni tsuite [Studies on use of furfural. II. Preparation of maleic acid, fumaric acid and succinic acid with electric oxidation of furfural]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 4(4):304-09. April. [15 ref. Jap]
Address: Rikagaku kenkyu-jô, Suzuki (Ume) Kenkyû-shitsu.

2537. Houck, Bertha Anne. 1928. Gastronomic adventures. *Los Angeles Times.* May 13. p. K12.
• ***Summary:*** About the many restaurants of foreign-born Americans visited by the writer in Los Angeles. "The last compromise which foreign groups make to the customs of an American city is in their food."

Chinese restaurants are found on San Pedro street, south and east of the Plaza. "A vegetable soup is safe to start with, being a watery, peculiar dish with strange and delightful vegetables and soya bean curd it. Each dish is prepared to be eaten with rice as American eat bread, for soya bean sauce, which is used extensively, is too strong to be pleasant without it."

"Japanese food is similar to Chinese, but, because of the Buddhistic laws against the taking of life, no meat except fish, is eaten. As with the Chinese, soya is the important flavoring. Suimono, a bean-curd soup, a broiled fish and an omelette, or boiled chestnuts and rice, form the typical Japanese dinner." Japanese restaurants are "found in the Japanese section on First street, east of Los Angeles street, or on Weller street, just south of First street."

2538. Grey, Egerton Charles. 1928. The food of Japan. Geneva: League of Nations, Health Organisation. 161 p. May. Index. 24 cm. [82 ref. Eng; fre]
• ***Summary:*** Detailed information and analysis. Contents: Preface. 1. Quantity of food in Japan: Exports, imports, production and consumption of food in Japan in the year 1925. 2. Quality of food in Japan: Definition of quality. 3. Distribution of food in Japan: Natural and artificial distribution. 4. Chemical composition of Japanese foods as consumed: Methods of analysis. 5. Chemical composition of Japanese food as purchased. Appendices: I. Literature relating to the chemical and physical properties of the food of Japan, with list of authors. II. Food materials and the plants and animals serving as sources of food in Japan.

The Preface begins: "This work... was carried out in the Imperial Institute of Nutrition, Tokyo (director, Dr. Tadasu Saiki). It comprises statistical data relating to the food supply of Japan and analytical data derived from the writer's personal examination of the food materials."

Table 7 (p. 25) shows the amounts of major foods consumed in Japan. The percentage of the total food consumed is: Rice 50.83%, barley 10.15%, potatoes 8.63%, wheat 6.63%, soy bean 4.76%, other beans 3.71%, other cereals 3.24%, fish 1.72%, seaweed 1.23%.

On page 54, the author discusses the "Alkalinity of the ash [of foods]. This figure is of considerable importance as indicating the capacity of the food material to produce alkali in the body." On pages 61-111 the author lists the nutritional composition of all major Japanese foods, grouped by food type: 1. Cereals and cereal products. 2. Legumes, pulses, and legume products. 3. Roots, greens, and other vegetables. 4. Mushrooms and seaweeds. 5. Fruits, nuts, and seeds. 6. Vegetable oils. 7. Other vegetable products. 8. Dairy products. 9. Eggs. 10. Meat and animal fat. 11. Fish. 12. Condiments, beverages, etc. The name of each food is given in both English and French, usually with a brief explanation.

In a table (p. 65-69), in category "II. Legumes, pulses, and legume products," the section titled "Fresh legumes" includes (p. 64-65): Edamame (Soy bean in pod) = *Fève de soya en cosse.* The section titled "Dry legumes (pulses)" includes (p. 64-67): Azuki (Small red bean) = *Petit haricot rouge.* Dainagon (Small red bean) = *Petit haricot rouge* Ao daizu (Soy bean [with green seed coat]) = *Fève de soya.* Kuro daizu (Black soy bean) = *Fève de soya noire.* Shiro Daizu (White soy bean) = *Fève de soya blanche.* Rakkasei (Pea nut) = *Pistache de terre.*

The section titled "Bean products" includes (p. 66-69): Aburage (Fried-bean curd) = *Pâte de haricots frite.* Aka miso (Soy-bean paste) = *Pâte de fèves de soya.* Gammodoki (Fried-bean curd) = *Pâte de haricots frite avec mixture d'algues marines.* Kinako (Soy-bean powder) = *Poudre de fèves de soya.* Kori dofu = *Pâte de haricots séchée.* Namaage (Fried-bean curd) = *Pâte de haricots frite.* Natto (Fermented soy bean) = *Fève de soya fermentée.* Sarashian (Red-bean powder) = *Poudre de haricot rouge* [Sarashi-an from azuki beans]. Shiro miso (White soy-bean paste) = *Pâte blanche de fève de soya.* Tofu (Soy-bean curd) = *Pâte de fèves de soya.* Tofu kasu (Soy-bean residue) [okara] = *Déchets de fèves de soya.* To nyu (Soy-bean milk) = *Lait de fève de soya.* Yuba.

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Note 1. This is the earliest English-language document seen (April 2013) that contains the word *gammodoki,* which refers to deep-fried tofu burgers, or that contains the word *namaage,* which refers to deep-fried tofu cutlets.

Also: Mushrooms and seaweeds includes (p. 73-75): Arame, Asakusanori [Asakusa nori], aonori, hijiki, kanten, kombu, mozuku, ogonori, tororo kombu, wakame. Fruits, nuts and seeds includes (p. 77): Asanomi (Hemp seed), Goma (sesame, white and black). Vegetable oils includes (p. 79): Daizu yu (Soy bean oil) = *Huile de fève de soya.*

Condiments includes (p. 92-93): Hamana natto [fermented black soybeans]. Kiriboshi (Dried daikon). Misozuke [miso pickles]. Narazuke. Shoyu [soy sauce]. Takuan (Pickled radish). Umeboshi (pickled plum) = *Prune confite.* Beverages includes (p. 92-93): Amazake. Mirin (fermented rice). Sake (Rice wine).

For each food, the following values are given in both English and French: Water, protein (N x 6.25), fat, carbohydrate, ash, calories, alkali value, total nitrogen, water-soluble nitrogen, phosphoric acid (anhydrous), sodium chloride (salt), water-soluble ash, water-insoluble ash, alkalinity due to soda and potash, alkalinity due to lime and magnesia, calcium oxide, ferric oxide, factor for converting to dry food.

Note 2. In Japan, the typical person is well aware of which foods are alkaline (*arukari-sei*) and which are acidic (*san-sei*). The alkaline foods are generally considered more healthful and health-protecting. For the alkaline values given by Grey for many basic Japanese foods, see SoyaScan Notes. 1991. Sept. 20.

Note 3. This is the earliest English-language document seen (March 2009) that uses the term "soy-bean paste" to refer to miso.

Note 4. This is the earliest English-language document seen (June 2009) that uses the term "Edamame" to refer to [green] soy beans in their pods.

Note 5. This is the earliest English-language document seen (April 2013) that uses the term "kori dofu" to refer to dried-frozen tofu.

Note 6. This is the earliest English-language document seen (Dec. 2006) that uses the term "pickled plum" to refer to umeboshi salt plums.

Note 7. This is the earliest English-language document seen (Nov. 2011) that uses the term "Hamana natto" to refer to fermented black soybeans. Address: M.A., D.Sc., F.I.C., M.R.C.S., etc..

2539. Kurono, Kanroku; Fukai, Tôshi. 1928. Shôyu no kôki seibun ni kansuru kenkyû [On the flavorous substances of shoyu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 5(4):361-83. May. [Jap]
Address: Jozo Shikensho.

2540. Sasaki, T. 1928. Hatsuga no rikagakuteki kenkyû. I. Daizu no hatsuga no sai ni okoru chisso kagô-butsu no henka ni tsuite [Chemico-physical study on germination. I. Changes of nitrogenous compound in germination of soybean]. *Bulletin of the Agricultural Chemical Society of Japan* 4(5):394-99. May. Bound in the back of Nippon Nogei Kagaku Kaishi (J. of the Agricultural Chemical Society of Japan). [8 ref. Jap]
Address: Nôgaku-shi, Japan.

2541. *Foreign Crops and Markets* (*USDA Bureau of Agricultural Economics*). 1928. Oils and oilseeds: The soy bean situation in Manchuria. 16(26):947. June 25.
• ***Summary:*** "Latest reports of the 1927 production of soy beans in Manchuria are for a crop not greatly in excess of the 1926 crop of about 4,000,000 short tons, according to a report to the Foreign Service of the Bureau of Agricultural Economics from Paul O. Nyhus, Agricultural Commissioner in the Orient. Early reports for 1927 had predicted an increase as high as 40 per cent, but subsequent unfavorable weather reduced prospects considerably.

"A slow market for bean cake and smaller takings by Japan reduced milling operations considerably in the latter part of 1927, but improvement has been shown in recent months. The lack of demand was attributed more to the low prices of rice and silk in Japan than to a sudden increase in the use of mineral fertilizers. The gold equivalents of Manchurian bean and bean oil prices have been somewhat higher than a year ago. Bean cake prices, which were below last year during the early months of the season, increased during 1928 and in March surpassed the corresponding quotations for last year, due largely to the approach of the period for supplying fertilizer to the Japanese fields and a consequent increase in Japanese demand. See Foreign Service releases, F.S./FO-29 and 30, dated June 18 and 22 respectively."

2542. Kurono, Kanroku; Fukai, Tôshi. 1928. Shôyu no kôki seibun ni kansuru kenkyû (Zokunô) [On the flavorous substances of shoyu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 4(6):415-36. June. [24 ref. Jap]
• ***Summary:*** Discusses Soyanal. Address: Jozo Shikensho.

2543. Mazume, T. 1928. Kôkayu kenkyû. VII. Daizu abura suiso-ka ni okeru iwayuru isoorein san no shôchô [Hydrogenation of fatty oils. VII. Formation of isooleic acid by the hydrogenation of soybean oil]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 31(6):467-69. June. (Chem. Abst. 23:534). [5 ref. Jap]
• ***Summary:*** Formation of isooleic acid was less when the temperature of hydrogenation was low, and increased with the amount of catalyst used. When the nickel catalyst contained a small amount of copper (0.3%), the formation of the acid was very great; large amounts of copper (4%)

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considerably reduced the amount of acid formed. Nickel catalysts that had, after reduction, been exposed to air at a low temperature produced more isooleic acid than those exposed at high temperatures. Address: Kyoto Teikoku Daigaku, Kogyo Kagaku Kyoshitsu, Riken Kita Kenkyu-shitsu.

2544. Mazume, T. 1928. Kôyaku kenkyû. VIII. Orein-san oyobi rinôru-san mechiru esuteru no suiso-ka [Hydrogenation of fatty oils. VIII. Hydrogenation of the methyl esters of oleic and linoleic acids]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 31(6):470-72. June. [1 ref. Jap]
• ***Summary:*** During the hydrogenation of methyl oleate a large amount of isooleic acid was formed at the beginning of the process, and the acid so formed was gradually transformed into oleic acid by further hydrogenation. In the case of the methyl ester of linoleic acid the transformation was linoleic acid to oleic acid to isooleic acid to stearic acid. Soy oil is mentioned. Address: Tokyo Teikoku Daigaku, Kogyo Kagaku Kyoshitsu Riken Kita Kenkyushitsu.

2545. Nakazawa, R.; Takeda, Y. 1928. Ueber die Schimmelpilze welche sich bei der Herstellung des Leckerbissens "Ontjom" und "Tempeh" (Java und Sumatra) mitwirken [Molds that assist the production and fermentation of the delicacies "ontjom" and "tempeh" in Java and Sumatra]. *Bulletin of the Agricultural Chemical Society of Japan* 4(4/6):86. April/June. [2 ref. Ger]
• ***Summary:*** "Ontjom" and "Tempeh" are the names of foodstuffs which the indigenous people of the aforementioned islands make. According to a communication from Prinsen Geerligs, *Rhizopus Oryzae* is used for making Ontjom from peanuts and for making Tempeh from soybeans. Went observes, however, that both these foods are made from *Monilia sitophila.* Address: [Japan].

2546. Suzuki, Kozo; Misikawa, Tetusaburo. 1928. Shôyu kasu no shôka shiken [Digestibility of 'shoyu' cake]. *Nippon Chikusan Gakkaiho* (*Japanese J. of Zootechnical Science*) 3(1):28-33. June. [Jap; eng]
Address: Imperial Zootechnical Exp. Station, Chiba, Japan.

2547. Tadokoro, Tetsutarô; Yoshimura, Katsuji. 1928. On the differences in physico-chemical properties of various proteins in plant seeds. III. On the differences in the physico-chemical properties of the different kinds of soy-bean proteins. *J. of the College of Agriculture, Hokkaido Imperial University* 20(5):355-362. June. (Chem. Abst. 22:3672). [2 ref. Eng]
• ***Summary:*** The ash and phosphorus contents decrease, and the nitrogen content increases, in the order legumelin, glycinin, glutelin. The free amide-nitrogen decreases in the order glycinin, glutelin, legumelin. The melanin-nitrogen is highest in glycinin, the histidine-nitrogen in legumelin, and the lysine-nitrogen in glutelin. Glycinin is the most highly condensed protein present. "Glycinin, which is the main protein of soy bean, has the highest pH value, greatest specific rotatory power, nitrogen, free amino and melanin nitrogen content. From these chemical properties, glycinin seems to be the most polymerized amongst these proteins." This research was funded by the South Manchuria Railway Co. Address: Sapporo, Japan.

2548. Yamamoto, Yoshihiko. 1928. Nattô seisei-kin ni kansuru kenkyû. III. Gerachin ekika-ryoku ni tsuite [Studies on natto microorganisms. III. On the liquification power of gelatin]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 5(11):819-26. [9 ref. Jap]
Address: Hokkaido Teikoku Daigaku, Nôgaku-bu (Sapporo), Japan.

2549. Oota, Kiyoshi. 1928. Shôyu no bôbai-ryoku to kagaku kôzô ni kansuru shiken [Relation between the antiseptic action and chemical structure of shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 5(12):914-29. (Chem. Abst. 23:1697). [16 ref. Jap]

2550. Togano, Meijiro. 1928. Shôyu, miso oyobi kyarameru seizô-hô [Production methods for shoyu, miso, and caramel]. *Kojo Kenkyu-kai, Sokki-roku* (*Factory Research Society, Collected Notes*) No. 38. 46 p. July. [Jap]
• ***Summary:*** On this document, Kôjô Kenkyu-kai is translated as "Japan Workshop Committees Association;" They published this lecture. The author's last name is romanized as "Tsugano."

2551. McCoy, Frank. 1928. Health and diet advice. *Los Angeles Times.* Aug. 8. p. A6.
• ***Summary:*** The section titled "Cheese without pie" notes that cheeses from which the cream [fat] has been partly removed are most easily digested. "Cottage cheese is very wholesome, and is often used by vegetarians as a substitute for meat."

"Even the Japanese, who are too crowded in their picturesque island islands to raise cows, have a kind of cheese [tofu] manufactured in much the regulation manner by souring soy bean milk." Note: Tofu is made by coagulating soy bean milk with a salt (such as magnesium chloride and/or calcium sulfate), not by souring it. Address: Dr., author of "The Fast Way to Health".

2552. *Far Eastern Review* (*Shanghai*). 1928. Soy bean casein, Japan. 24:381. Aug. *
• ***Summary:*** This news item describes an attempt to produce soybean casein commercially in Japan.

2553. Oshima, Kokichi. 1928. Shôyu kôji daiyô-hin toshite

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no kani kanzô ni tsuite [Liver of crab as a substitute for shoyu koji]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 6(1):21-24. [Jap]
Address: Hokkaido Teikoku Daigaku, Suisan Senmon-bu, Kyoju Nôgaku hakase, Japan.

2554. Kuwayama, Satoru. 1928. Notes on *Laspeyresia glycinivorella* Matsumura, the soy bean pod borer. *J. of the College of Agriculture, Hokkaido Imperial University* 19(5):261-82. Sept. [19 ref. Eng]
• ***Summary:*** "The soy bean pod borer (*Laspeyresia glycinivorella* Matsumura) is probably the most serious pest of more than 70 species of insects destructive to the soy bean culture of Japan. The larvae injure the seeds of the soy bean prior to harvest."

"The earliest reference to this insect appeared in 1898, when Matsumura issued a report in which he states that the larvae are considered as a serious pest to soy beans in Hokkaido, and described it as a new species under the name of *Grapholitha glycinivorella.* In Honshu, the main Island, injury to soy beans was not noticed until recent years. However, Matsumura in the same report recorded it as it occurs on that Island. It is probable that this insect has occurred in Japan for a long time."

2555. Izume, Seiichi; Yoshimaru, Y.; Komatsubara, I. 1928. Studies on experimental rickets. II. The influence of ultra-violet irradiation on the antirachitic value of soybean oil. *J. of Biochemistry* (*Tokyo*) 10(1):177-82. Oct. [10 ref. Eng]
• ***Summary:*** "The purpose of the present investigation was to determine the value of soybean oil for its antirachitic property and to ascertain whether its antirachitic value could be increased by means of irradiation with the ultra-violet light, and furthermore, to see whether the phytosterol isolated for the unsaponifiable constituents of the oil could acquire the antirachitic property by irradiation."

Oil extracted by pressure has the highest, and by alcohol the lowest, antirachitic value; petroleum affords an oil of intermediate value. Refining does not appreciably destroy the vitamin content. The antirachitic potency of the oil is much increased by ultraviolet irradiation. Phytosterol isolated from the oil was rendered antirachitic by irradiation, and exhibited the ergosterol absorption band in the ultraviolet. Address: Central Lab., South Manchuria Railway Co., Dairen, Manchuria.

2556. Matsumoto, Takashi. 1928. Beobachtungen ueber Sporenbildungen des Pilzes, *Cercosporina kikuchii* [Observations on spore formation in the fungus *Cercosporina kikuchii*]. *Nippon Shokubutsu Byori Gakkaiho* (*Annals of the Phytopathological Society of Japan*) 2(2):65-69. Oct. [1 ref. Ger; jap]
• ***Summary:*** Temperatures between 15º to 20º C. and potato dextrose agar were found to be most suitable for the production of conidia in culture. Address: Japan.

2557. Dorsett, P.H.; Morse, W.J. 1928. Agricultural explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon (Log–unpublished). Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished typescript log. Illust. Partially indexed. 28 cm.
• ***Summary:*** Also called the "Log of the Dorsett Morse Expedition to East Asia" and (by the National Archives) "Dorsett-Morse Expedition to the Far East, 1929-31," this is one of the most important documents ever produced on soybeans and soyfoods. Covering the period from late 1928 until 1932, it consists of 17 volumes of typewritten unpublished manuscript plus handwritten notebooks.

The two explorers, who were gone on the expedition for a little more than two years, initially planned to be gone for about three years. They took 3,369 photos of which 95% appear in the report; the original prints are pasted on the pages, each with a number and a caption. The first negative number is #43196 (p. 238) and the last is #46514. The last numbered page of the report is #8818, but most of the index pages are not numbered and some special reports at the end of the main report each start with page 1.

The first quarter of the pages (to about page 2,500) are indexed, using 4 separate indexes. The only original and 2 microfilm copies were at the American Soybean Assoc. (St. Louis, Missouri), however as of Aug. 2011 they are on permanent loan to Rare and Special Collections at the National Agricultural Library (Beltsville, Maryland)–which also has 7 photograph albums that accompany the 7 log books. A list of the missing pages has been compiled. One photocopy of a microfilm copy is at the Soyinfo Center (Lafayette, California). One microfilm copy is at the National Archives in Washington, DC, in Records of the Bureau of Plant Industry, Soils, and Agricultural Engineering, Record Group 54. See: "National Archives Microfilm Publication No. M840. Expedition Reports of the Office of Foreign Seed and Plant Introduction of the Department of Agriculture, 1900–1938." Rolls 16-20, volumes 56-73. These microfilm rolls may also be available for viewing or duplication at one of the various regional branches of the National Archives (e.g. San Bruno, California).

A brief itinerary of the trip is as follows: 1929 Feb. 18–The party of 5 people leaves Washington, DC, for Los Angeles by train. It consists of Morse, his wife Edna, their daughter Margaret (age 7), Dorsett, and his daughter-in-law Ruth (Bobbie; the widow of Dorsett's son, she served as Dorsett's secretary and general helper).

March 1–They sail from San Francisco to Yokohama on the S.S. *President Grant* of the Dollar Steamship Lines. March 29–Arrive in Yokohama, proceed directly to Tokyo, establish headquarters with rooms at the Imperial Hotel, and

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hire an interpreter, Mr. Suyetake, who works with them for the next 2 years. May 21–The Morses go to Hokkaido, the Dorsetts to Kyoto, by sleeper train. Morse returns to Tokyo.

Aug. 17–The entire party arrives in Hokkaido and establishes headquarters in Sapporo to study soybeans. Oct. 8–Leave Hokkaido for the Northeast Provinces, then arrive in Tokyo on Oct. 15. Oct. 22–Arrive in Keijo (Seoul), Korea, then take many side trips. Note: 1929 Oct. 29–Great Depression begins in USA with stock market crash. Dec. 8–Return to Japan via Kyushu, then to Tokyo to study soyfoods. They buy and photograph many!

1930 April 1–Travel by steamer to Dairen, Manchuria, where they set up headquarters. Dorsett very sick from April 11 to June 11; taken to a Japanese hospital in Dairen, he almost dies of double pneumonia. Morse does the work of both men and does not inform USDA of Dorsett's critical condition. June 24–Morse takes a quick trip to northern Korea, via Mukden and Antung (Tan-Tung), to look for Zoysia grass.

July 1–Returns to Manchuria via Mukden. July 21. Dorsetts leave for Peking by train; Morses and Mr. Suyetake stay in Dairen. Aug. 21–Morse party travels to northern Korea, staying in Heijo (Pyongyang / P'yongyang); takes a 4-day side trip to Seoul. Sept. 28–Morse returns to Dairen, Manchuria.

Oct. 19–Morse party leaves Dairen, arriving in Peking the next day. Nov. 9–Morse party returns to Dairen. Nov. 30–Morse arrives in Harbin, north Manchuria, then passing through Mukden, returns to Dairen. Dec. 18–Morses leave Dairen for Japan, passing through Kobe on Dec. 21 and arrive in Tokyo on Dec. 23.

1931 Jan. 12–Travel to Kyoto, Himeiji, and Tatsuno Shoyu. Jan. 16–Visit Okazaki and Hatcho miso. Jan. 17–Return to Tokyo. Feb. 17–Morse party leaves Tokyo by boat for the USA, arriving in San Francisco on March 4. March 15–Dorsett party leaves Peking for Tientsin, Shanghai, and Hankow. March 27. Dorsetts sail from Shanghai to San Francisco.

Note 1. The title of this report is puzzling since the expedition never went to Taiwan, Singapore, Java, Sumatra, or Ceylon. It was proposed several times that they visit these places, but the plans did not work out.

Note 2. This is the earliest log (unpublished) seen (Oct. 2001) that mentions soy. Address: Agricultural Explorers, USDA, Washington, DC.

2558. Dorsett, P.H.; Morse, W.J. 1928. Foreign agricultural explorations: Introduction (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 5. No author, date or place are given. "The United States has perhaps accomplished more in this important field of agricultural research than any of our sister countries, and yet she has but yet touched the fringe of its possibilities, both as to plant introduction and adaptation.

"It has been stated on good authority that more than 90% of the cultivated plants now being grown in the United States, are directly or indirectly the result of plant introduction. Under these conditions it is self evident that Foreign Plant Introduction is one of the most important lines of research investigations now being pushed by the United States Department of Agriculture."

Page 8. "Through plant introduction, selection and breeding, soybean culture in the United States is being rapidly extended throughout both the cotton belt of the South and the corn belt of the North. The acreage devoted to the growing of this plant alien in the United States has increased from 500,000 acres in 1917 to approximately 4,000,000 acres for the year 1928. The Virginia, Manchu and Laredo soybean selections made from introductions made by the late Mr. Frank N. Meyer, Agricultural Explorer of the Office of Foreign Plant Introduction, in 1906, 1911 and 1914 respectively, returned in the aggregate in money value, to their adopted country in 1924, for hay and grain alone upwards of $7,700,000.00" [$7.7 million].

Note: The soybean was probably the most import and best known of the many plants introduced to the United States.

Pages 9-10. "... there are two principal objectives which it is hoped the expedition can accomplish. They are First to round up, in so far as possible, the work of observation, investigation and seed collection of desirable varieties, strains, etc. of the Soyabeans in the Orient, and also to secure data and photographs not alone of field operations but also of practices and methods of the utilization of the soybean for food and all other byproducts, especially those industrial. Second, to study the persimmon industry of the Orient..."

Pages 11-12. "The work of agricultural exploration in northeastern China during the period from August 1924 to December 1926 [by P.H. Dorsett] resulted in the introduction of valuable types of soybeans, mung beans, wheat, rice, barley, chestnuts, pears, jujubes, persimmons, and other deciduous fruits, vegetables, forest trees, and ornamental shrubs and vines. All were adapted for trial in the temperate regions of the United States..."

"The observations made, data, and still and motion pictures secured, concerning the Chinese practices of growing, harvesting, handling, and storing soybeans in a country which leads the world in its production has materially stimulated the interest in N.E. China, Japan, Korea & Formosa."

A similar paragraph (p. 12) discusses the importance of agricultural exploration in 1924-1926 on the Chinese persimmon, and has helped to make the persimmon an

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important crop in California.

"Regions to be covered [by this expedition]: Japan, Chosen (Korea), Taiwan (Formosa), and Northeastern China..."

Page 13. "Objectives: It is proposed to conduct extensive agricultural investigations in the previously mentioned regions, primarily on the following crops:

"1. Soybeans: No one factor has contributed more to the increase of the soybean in America than the development of new varieties through introductions from the Orient. The soybean is a crop of local adaptation, as shown by the numerous varieties in Asiatic countries and the results of extensive tests in the United States. Although grown primarily for forage in the United States, many sections are looking forward to the production of soybeans as a cash crop for oil and oil meal, and for human food and industrial uses. It is quite generally predicted that the soybean will become one of our major crops, particularly in the South of the boll weevil sections and in the Corn Belt states through the menace of the corn borer. To attain this importance in American agriculture high yielding varieties for different uses and adapted to a wide range of soil and climatic conditions are essential..."

Pages 14-15. 2. Mung bean: 3. Kudzu: 4. Persimmon. 5. Forage, green manure, and cereal crops; fruits, vegetables, trees, and other crops and plants of potential value to American agriculture.

Personnel: The Office of Foreign Plant Introduction plans to send on the proposed Agricultural Explorations to Japan, Chosen, Northeastern China and Formosa in 1929, Mr. W.J. Morse, Agronomist in the Office of Forage Crop Investigations–in charge of Soybean, Mung Bean, Kudzu and other Oriental leguminous crops, and Mr. P.H. Dorsett, Horticulturist in the Office of Foreign Plant Introduction. leader of the Agricultural Exploration work in N.E. China in 1924 to 1927.

Pages 26-28: Regions to be explored: "... provided conditions are favorable, a short time will be spent in the Dutch East Indies, especially Java and Sumatra [Note: This never happened]. Manchuria: Chosen (Korea): Japan: Formosa (Taiwan): Dutch East Indies:"

Pages 28-29: "Prospective crops: Soybeans: The rapid expansion of soybean culture has been one of the outstanding developments in the recent history of American agriculture." "While the soybean is primarily grown for hay and forage its use for oil is also increasing and oil mills are being erected (see map 2). In Manchuria and Japan the soybean oil meal ranks first in importance as a soybean product, being especially valuable for animal feed and fertilizer. Soybean oil, now imported, is being used in lard and butter substitutes, paints and varnishes, glue, linoleum, rubber substitutes and also is refined as an edible oil.

"Varieties for expanding present area: The area in which soybeans are grown in this country can be greatly expanded provided drought resistant types can be found for the southwest and early maturing types for the northern and northwestern regions. The prevalence of the soybean throughout the widely varying districts of Manchuria and Japan gives ample promise of supplying these types.

"Soybeans are being extensively cultivated throughout Java for food and green manure. It is a highly important article in the products of the country. It is believed that types can be found here that will be successful in the milder, moist-summered southern states."

"Leaf, stem, and root diseases are gradually increasing in some of our older soybean production regions. In the event these diseases [become] prevalent, a special study and selection of resistant strains is highly desirably." Address: Agricultural Explorers, USDA, Washington, DC.

2559. Kinoshita, Asakichi; Isawa, Shinobu; Tanigawa, S. 1928. Shôyu to tamari no setchû jôzô shiken [Intermediate method of brewing, shoyu and tamari]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 6(4):277-89. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2-3. Joshu (Assistant).

2560. Ryerson, Knowles A. 1928. Re: Memorandum for W.A. Taylor (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. See p. 61-64. Dec. 19. Unpublished log.
• ***Summary:*** This letter, dated Dec. 19, begins: "In accordance with tentative plans discussed at various times during the past month, I wish at this time to ask formal approval for the proposed expedition of Mr. Dorsett and Mr. Morse to Manchuria, China, Chosen, Japan and also the Dutch East Indies."

"Of the plant material to be sought, new soybean varieties are the most important. The extension of the area where they can be grown in this country, both in the northwest and southeast, depends upon securing drought resistant strains."

According to reports of workers in Japanese Experiment Stations and to Consular reports, there are at least 500 varieties of soybean in Japan. Not more than 50 of these have been introduced into this country. Breeding work has been under way at the Japanese Experiment Stations for the past decade. Few of the new types developed have been obtained. On the North of the Island of Hokkaido, 250,000 acres of early maturing varieties are grown. Experience of a cooperator in Canada indicated that these varieties are better suited to the northern conditions than any of the varieties grown in the United States.

"Manchurian varieties vary from 90 to 130 days in the time required for maturity. In China, exclusive of Manchuria,

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the time to maturity ranges from 125 to 175 days. Many introductions have been made from Northern Manchuria but better varieties with a longer maturing period are needed in the southern part of the corn belt and the northern part of the northern part of the cotton belt. Japanese Experiment Stations in Korea have carried on extensive breeding work. At least 300 varieties are known in that country, many of which appear promising for the southern corn belt and adjacent cotton belt. Late maturing varieties are also grown extensively in the Island for Formosa."

Page 62. "According to various Dutch reports, soybeans are extensively grown in Sumatra and Java, principally for green manure purposes. There are many varieties of the late, yellow-seeded type which are of low oil content and are grown for forage, pasture, and soil improvement."

Page 63. "Personnel: It is proposed to head the expedition by Mr. P.H. Dorsett, Office of Foreign Plant Introduction, who led the expedition to Northeastern China and Manchuria in 1924 to 1927. He would be accompanied by Mr. W.J. Morse, a Bureau specialist in soybean and other Oriental legumes. In addition it is desired to send Mr. C.C. Thomas, of the Office of Foreign Plant Introduction who as specialized in the study of Oriental persimmon varieties, culture and storage problems, to spend six months, either in the fall of 1929 or 1930, to cooperate with Dorsett in the study of Korean varieties and the root stock problem in both Japanese and Chinese persimmon districts."

"Mr. Morse has planned to have Mrs. Morse accompany him and Mr. Dorsett has tentatively planned for his daughter-in-law also to go on the trip. This is a matter, however, which I wish to talk over with you.

"If approved, it is hoped to have the expedition sail from San Francisco, March 1, 1929, to be gone for two to three years."

"Expenses: The salaries of the men will be carried by the Offices concerned. Field expenses for the remainder of the fiscal year, 1928 and 1929, are estimated at $4,025 for the two men. Of this sum, the Office of Forage Crops will contribute $1,000 and the Office of Foreign Plant Introduction the balance."

"Concurred in (Signed) A.J. Pieters, Acting in Charge of Forage Crops." Address: Senior Horticulturist in Charge [Div. of Foreign Plant Introduction, USDA].

2561. Ishimaru, Yoshio. 1928. Shôyu shikiso no seisei to saikin to no kankei ni taisuru ichi kôsatsu: Shôyu moromi-chû*Bacillus mesentricus* [*sic, mesentericus*] *niger* shu no sonzai oyobi igi [Relation between pigment formation and bacteria: Presence of *Bacillus mesentericus niger* in shoyu moromi and its significance]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 6(4):235-42. Dec. [10 ref. Jap]

2562. Sato, Masanori; Sakai, Hiroshi; Yokochi, Mitsuo; Sato, Iwawo. 1928-1929. Experiments on extraction of soy oil with alcohol. II. *Abstracts of Reports, Central Laboratory, South Manchuria Railway Co.* (*Dairen, Manchuria*) 13:46; 14:1, 3, 5. *
• ***Summary:*** Describes solvent extraction using ethyl alcohol.

2563. Takata, Riohei. 1928-1929. Miso jôzô no eiyô gakuteki kôsatsu. I. Miso gan chisso seibun no yôka teiretsu to sono riyû [Nutritional observations on miso fermentation. I. The inferior nutritional value of miso's nitrogen compounds and the reason therefor]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 31(9):811-20; 31(10):983-89. Sept/Oct; 32(4):495-97. May. English abstracts on p. 196B-199B, 233B-235B. (Chem. Abst. 23:5221). [2 ref. Jap]
• ***Summary:*** Describes nutritional experiments with rats.
Address: Naimu-sho Eiyô Kenkyûsho, Kakô Shokuhin Kenkyûshitsu, Japan.

2564. Fukai, Tôshi. 1928. Shôyu shikiso no hishoku teiryô-hô ni tsuite [On the determination of shoyu color by colorimeter]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 97. p. 76-89. [Jap]
Address: Jozo Shikensho, Gishu.

2565. Hara, Kanesuke. 1928. [Notes on fungi of eastern Asia]. *Bulletin of the Agricultural Association of Shizuoka* No. 360. Appendix. [Jap]*
• ***Summary:*** Discusses *Mycosphaerella sojae* found in China.

2566. Hara, Tetsukazu; Takada, Ryohei. 1928. Miso ni kansuru kenkyû [Studies on miso]. *Eiyo Kenkyujo Hokoku* (*Report of the Imperial Government Institute for Nutrition*) 2:262-339. [Jap]
Address: 1. Gishi; 2. Gishu. Both: Eiyo Kenkyusho.

2567. Ishimaru, Yoshio. 1928. Shôyu shikiso no seisei to saikin to no kankei ni taisuru ichi kôsatsu (Shôyu moromi-chû Bacillus messentricus niger no sonzai oyobi igi) [Relation between pigment formation and bacteria in shoyu. Presence of *Bacillus mesentericus niger* in shoyu moromi and its significance]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 23(11):19-27. [10 ref. Jap]
Address: Nôgaku-shi, Japan.

2568. Kinoshita, Asakichi; Isawa, S.; Tanigawa, S. 1928. Shôyu to tamari no secchû jôzô shiken [Test of the intermediate method of brewing shoyu and tamari]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 23(12):7-20. [Jap]
Address: 1. Jozo Shikensho Gishi; 2. Jozo Shikensho Shokutaku; 3. Jozo Shikensho Kenkyu-in, Japan.

2569. Kinoshita, Asakichi; Tanigawa, S. 1928. Mamekasu shiyô shôyu jôzô shiken seiseki [Results of brewing shoyu

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made with soybean cake]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 23(4):22-31; 23(5):35-41; 23(6):34-39; 23(7):45-53. [Jap]
Address: 1. Jozo Shikensho Gishi; 2. Jozo Shikensho Kenshuin, Japan.

2570. Kinoshita, K.; Tanigawa, S. 1928. Kuki kakuhan teido hikaku shiken [On the degree of stirring of shoyu moromi (mash) with air]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 98. p. 158-69. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Joshu.

2571. Kinugawa, Y. 1928. [Antiseptic test of arcylic acid and paraamido azobenzol for shoyu]. *Eisei Shiken* 32:147-. [Jap]*

2572. Kurono, Kanroku; Fukai, T.; Tateno, M. 1928. Shôyu shikiso oyobi kôki no seiri-teki seiin ni tsuite [On the physiological formation of color and aroma during shoyu manufacture]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 97. p. 90-109. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Gishu; 3. Joshu.

2573. Kurono, Kanroku; Fukai, Tôshi. 1928. Shôyu no kôki seibun ni kansuru kenkyû [On the flavor components of shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 97. p. 1-75. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Gishu.

2574. Kurono, Kanroku; Fukai, Tôshi. 1928. Shôyu shikiso no kagaku-teki gôsei [Chemical synthesis of the colors of shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 97. p. 110-25. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Gishu.

2575. Kurono, Kanroku; Kinoshita, A.; Fukai, T.; Tateno, M. 1928. "Pentoosu" shiki shôyu jôzô shiken. I-IV. [The use of pentose as raw material in shoyu. I-IV.]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 97. p. 126-37, 138-55, 156-75, 176-93. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Gishi; 3. Gishu; 4. Joshu.

2576. Kurono, Kanroku; Fukai, T.; Tateno, M. 1928. "Pentoosu" seizô shiken [The production of pentose as raw material for shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 97. p. 194-226, 227-78. [Jap]
• ***Summary:*** This article has 2 parts. E. Katsune is an additional author in Part II. Address: Jozo Shikensho. 1. Gishi; 2. Gishu; 3. Joshu.

2577. Kurono, Kanroku; Fukai, T.; Katsune, E.; Tateno, M. 1928. "Soya meranin" seizô shiken [The production of Soja melanin (coloring matter of shoyu)]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 97. p. 279-305. No. 100. p. 1-21. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Gishu; 3. Shokutaku. 4. Joshu.

2578. Matsumoto, K.; Chin, K.; Sano, Z. 1928. Shôyu jôzô ni kansuru saikin-rui ni tsuite. XVI-XXII. [On the bacteria in shoyu brewing. XVI-XXII.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 23(1):30-37; 23(5):19-25; 23(6):30-33; 23(7):42-45; 23(8):15-18; 23(9):37-40; 23(10):29-36. [Jap]
Address: 1. Jozo Shikensho Gishi, Nôgaku Hakase; 2. Jozo Shikensho Kenshu-in; 3. Jozo Shikensho Kenkyu-in, Japan.

2579. Matsumoto, K.; Kakegawa, I.; Tanigawa, S. 1928. Shôbo ôyô sokujô shiken [Application of yeast to the accelerated brewing of shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 98. p. 120-30. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Shokutaku; 3. Joshu.

2580. Matsumoto, K.; Chin, K.; Sano, Z. 1928. Shôyu jôzô ni kansuru saikin-rui ni tsuite [On the bacteria involved in shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 99. p. 1-187. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Kenshuin; 3. Joshu.

2581. Muramatsu, S. 1928. [Special constituents of the soya bean]. *Memorial Publication Morioka Agric. College* p. 1-15. *
• ***Summary:*** The following compounds were isolated: A hydroxy acid of the formula $C_{50}H_{50}O_{20}$, melting point 240ºC; lecithin (from the oil from skin and cotyledons, 0.64%; from the residue after extraction with ethyl alcohol, skin 0.07%, cotyledons 0.78%); a sterol, and an alcohol of formula $C_{24}H_{32}O_8$, melting point 235ºC.
Note: Later researchers showed that the hydroxy acid was a mixture of saponins (Daubert 1950, p. 375).

2582. Oshima, Kokichi. 1928. Shin gyo-shôyu ni tsuite [A new fish shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 23(4):2-6. [Jap]
Address: Hokkaido Teikoku Daigaku, Suisan Senmon-bu, Kyoju Nôgaku hakase, Japan.

2583. Sawada, K. 1928. [Descriptive catalogue of Formosan fungi. Part IV.]. *Taiwan Sotokufu Chuo Kenkyujo, Nogyo-bu Iho* (*Bulletin of the Agricultural Section, Central Research Institute, Taiwan Governor-General's Office*) 33:1-123. [Jap]*
• ***Summary:*** Including descriptions of *Taihoku, Colletotrichum glycines* (=C. dematium f. truncata), *Phakopsora sojae* (=P. Pachyrhizi) n. comb. on soybean.

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2584. Yamamoto, Yoshihiko; Tamura, Yoshisuke. 1928. Nattô no saikingaku-teki kenkyû. II. Nattô-kin hôshi no yakuhin narabini netsu ni taisuru teikôsei [Studies on natto microorganisms. II. On the resistance of natto bacteria spore to drugs and heat]. *Sapporo Norin Gakkaiho* (*J. of the Society of Agriculture and Forestry, Sapporo*) 19(86):327-29. [Jap]
• ***Summary:*** A bacillus was isolated from natto but no name was assigned to it. It was related to bacilli isolated by previous researchers, but it differed in spore formation, H.S. formation, and size from Sawamura's *Bacillus natto.*

2585. Hanzawa, Jun. 1928. Nattô seizô-hô [Natto production methods]. Sapporo, Hokkaido, Japan: Sapporo Nattô Yôki Kairyô-kai. 178 p. 19 cm. [Jap]*
• ***Summary:*** Jun Hanzawa was born in 1879. Note: This is the earliest book in WorldCat / OCLC that has natto as a subject or title word. Address: Sapporo, Japan.

2586. Hikosaka, Itarô. 1928. Hompô shôyu-gyô no hattatsu to sono rôdô mondai: Noda rôdô sôgi no ichi kenkyû [Development of Japan's shoyu industry and its labor problems: A study of the great Noda strike (1927-28)]. Noda: Tamotsu Kato. 44 p. Series: Noda Rodo Daisogi Shiryo Shusei. Reprinted 1973 by Ron Shobo in Nagareyama, Chiba prefecture, Japan. [Jap]

2587. Matsuoka, Komakichi. 1928. Noda dai rôdô sôgi [The great Noda strike]. Tokyo: Kaizosha. 415 p. [Jap]*
• ***Summary:*** This is the most detailed account ever written of the strike against the Noda Soya Sauce Co., today's Kikkoman.

2588. Matsuoka, Komakichi. ed. 1928. Noda sôgi no shin'in keika oyobi genjô. Kaisha no kodai [?] ni kyôkô no sen?? o ??su [The Noda strike]. Japan: Nihon Rodo Sodomei Kanto Rodo Domeika. 24 p. Series: Noda Rodo Daisogi Shiryo Shusei. Reprinted in 1973 by Ronshobo in Nagareyama, Chiba prefecture, Japan. [Jap]*
• ***Summary:*** A summary account of the strike against the Noda Soya Sauce Co., today's Kikkoman.

2589. Namiki, Shigetarô. ed. and pub. 1928. Noda sôgi no tenmatsu [Detailed account of the great Noda strike]. Noda, Japan: Published by the author. 374 p. 19 cm. With support from Noda Shoyu K.K. [Jap]*
• ***Summary:*** The author was the labor relations specialist for the Noda Shoyu Company, today's Kikkoman. This is one of the two most detailed accounts of the strike ever written. It discusses events from the management's viewpoint. Address: Noda, Japan.

2590. Namiki, Shigetarô. ed. and pub. 1928. Noda sôgi no keika nichiroku [Daily record of the development of the great Noda strike]. Noda, Japan: Published by the author. 15 + 172 p. 19 cm. With support from Noda Shoyu K.K. [Jap]*
• ***Summary:*** Mr. Namiki was the labor relations specialist for the Noda Shoyu Company, today's Kikkoman. This is one of the two most detailed accounts of the strike ever written. It discusses events from the management's viewpoint. Address: Noda, Japan.

2591. New World (The)? 1928. [Directory of Japanese Americans in the United States]. San Francisco, California? The New World? 624 p. 25 cm. [Eng]*
• ***Summary:*** Listing of individuals, businesses and organizations for cities in California, Arizona, Colorado, Idaho, Nebraska, Nevada, Oregon, Utah, Washington, Wyoming, Alabama, Connecticut, Delaware, Iowa, Illinois, Indiana, Kansas, Minnesota, Michigan, Montana, North Dakota, New Jersey, New York, Ohio, Pennsylvania, Texas, Washington, DC, and Mexico. Address: San Francisco, California.

2592. Nihon Shakai Mondai Kenkyujo [Japan Social Problems Research Center]. ed. 1928. Roda sôgi Noda kessenki [The Noda strike: A record of the bloody battle]. Tokyo. 8 + 442 p. Illust. 19 cm. [Jap]*
• ***Summary:*** About the major Noda Shoyu (Kikkoman) strike of 1927-28. Address: Tokyo, Japan.

2593. Nippon Joyukai. 1928. Jôzô ronbun-shû [Collected dissertations on fermentation]. Tokyo: Nippon Joyukai Shuppan-bu. 943 p. [Jap]*

2594. Nippon Jozo Kyokai Chubu Shibu. 1928. Shôyu tamari jôzôhô kôgi [Lectures on shoyu and tamari fermentation]. Nagoya: NJKCS. 369 p. [Jap]*

2595. Nippu JiJi-sha (The Nippu Jiji). comp. 1928. Hawai nenkan [Hawaiian Japanese annual and directory]. Honolulu, Hawaii: Nippu JiJi-sha (The Nippu Jiji). [Jap; Eng]*
• ***Summary:*** This periodical was published from 1927 to 1941. Address: Los Angeles.

2596. Noda Shoyu Kabushiki Kaisha. 1928. Noda sôgi no keika nichiroku [A daily record of the development of the Noda strike (1927-28)]. Nodacho, Chiba prefecture. 15 + 172 p. 19 cm. [Jap]*
• ***Summary:*** See S. Namiki, 1928. About the major Noda Shoyu (Kikkoman) strike of 1927-28. Address: Noda, Japan.

2597. Noda Shoyu Kabushiki Kaisha. 1928. Noda sôgi no tenmatsu [A detailed account of the Noda strike (1927-28)]. Nodacho, Chiba prefecture. 374 p. [Jap]*
• ***Summary:*** See S. Namiki, 1928. This was the bitterest strike in the history of the company that was later named

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Kikkoman, Inc. Address: Noda, Japan.

2598. Shin Sekai-sha. 1928. Zaibei Nippon-jin kan [Directory of Japanese in the USA]. San Francisco, California: Shin Sekai-sha. [Jap]*
• ***Summary:*** The 1916, 1928, and 1936 editions are at University of Washington (Seattle). Several other universities (UCLA, Univ. of Oregon) also have the 1936 edition. Address: San Francisco, California.

2599. Suzuki, Umeshiro. 1928. Noda no rôshi sôgi [The conflict between labor and management at Noda]. Japan: Jitsuseikatsusha. 140 p. Reprinted in 1973 by Ron Shobo in Nagareyama, Chiba prefecture, Japan. Series: Noda Rodo Daisogi Shiryo Shusei. [Jap]*
• ***Summary:*** About the great Noda Shoyu Strike of 1927-28.

2600. Tadokoro, Tetsutarô; Yoshimura, Katsuji. 1928. [Chemical studies on the denaturing of proteins]. *J. of the College of Agriculture, Hokkaido Imperial University* 25:117-32. (Chem. Abst. 23:2997). [Jap]*

2601. Yashnoff, E.E. 1928. Krizis sbyta man'chzhurskikh zhmykhov v Yaponii [Crisis in the market for Manchurian beans in Japan]. *Vestnik Manchzhurii* (*Manchuria Monitor*) No. 4. p. 10-17. Russian edition. [Rus]

2602. Kinjiro Aoyagi scattering soybeans on Setsubun in Tokyo, Japan (Photograph). 1928? Undated.
• ***Summary:*** In Japan, setsubun is celebrated each year on Feb. 3, which is the eve of the beginning of spring, therefore at the very end of the dark, cold period (winter) and just before the beginning of the season of rebirth. Through its association with the Lunar New Year, setsubun can be thought of (as indeed was previously thought of) as a sort of New Year's Eve, and so was accompanied by a special ritual to drive away evil spirits and bring in good luck for the new year. This special ritual, called *mamemaki* (lit. bean scattering), is always performed with roasted soybeans.

This black-and-white undated photo (see next page) is of Akiko Aoyagi's grandfather. Born 1 Oct. 1890 (Meiji 23) in Shiba, Tokyo, Japan, he is about 38 years old here. He is about to scatter roasted soybeans (*irimame*) with his right hand from a wooden measure (*masu*) on a tray (*sanbo*) held in his left hand. On the wooden measure is written "Akabane Assoc."–of which he was one of the founders. The photo was taken at Akabane in central Tokyo.

As a "specially chosen / famous" man (*toshi otoko;* or the "man of the house," or the men who are born in the animal sign [one of 12 in Chinese astrology; tiger, rabbit, dragon, snake, etc.]) of the coming year he is wearing the only traditional clothing suited for the occasion: A light-colored *kamishimo* (with wing tips at the shoulders) over a dark, wide-sleeved kimono on top, and a man's formal divided skirt called a *hakama* on the bottom. On his feet are tabi (white, split-toed cotton socks) on *zori* sandals.

At age 19, Mr. Aoyagi started selling fresh produce as a street vendor. At age 31 (1921, Taisho 10) he became one of the founders of Produce Association, a new concept. He soon became a high ranking officer in the Tokyo Produce Association (*Tokyo-Fu* (*Shi*) *Seika Jitsugyo Kumiai Rengokai*). This became part of a larger organization, which is now the famous Tsujiki fresh produce market. In 1941 (Showa 16) he became the first director of the Tsukiji branch of this organization. Fresh fish are also now sold in the market, which is a major tourist attraction in Tokyo. Throughout his life he was known for his selfless service to others. During World War II he brought food from the countryside and distributed it among the hungry in Tokyo.

In April 1955, at big public ceremony at the Tsukiji market in Tokyo, he was given a special award by the Tsukiji Market Association in the unveiling of metal statue of his portrait (bust, from the waist up) on a stone base (*Juzo Jomakushiki*). This statue still stands in Tsukiji.

On 7 June 1957 he received an even more important honor, an award (*kunsho*) from the Emperor of Japan; it was called the Yellow Ceremonial Cord Medal of Honor (*Ooju hôshô*). He received the actual medal at home from a member of the Prime Minister's Office, when he was quite weak, just one month before he passed away. This medal is usually presented by the Japanese emperor himself in a ceremony at the Imperial Palace in Tokyo. Kinjiro Aoyagi died on July 4, 1957 (Showa 32) in Tokyo at age 67 of cancer.

At his funeral, held in Tsukiji Market and sponsored by the Tsukiji Market Association, more than 1,000 people filed past to offer incense and pay their respects. It took more than an hour. Nichiren Buddhist (*Hokke-shu*) priests were invited to conduct the ceremony. The mayor of Tokyo and many important leaders from government and industry were present.

2603. Dorsett, P.H. 1929. Re: Letter notifying Mr. Matsumoto of forthcoming trip to East Asia (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Jan. 25. Unpublished log.
• ***Summary:*** Page 113. This letter dated 25 Jan. 1929 is to Mr. H. Matsumoto, Central Laboratory, South Manchuria Railway Co., Dairen, Manchuria.

"Dear Mr. Matsumoto. I greatly appreciate the receipt of your kind favor of December 1928, and was delighted to learn of your safe arrival back in Dairen after your visit to the United States..."

"Mr. Morse and I plan on sailing from San Francisco on

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March 1 for Yokohama, Japan. After a year spent there and in Chosen (Korea), we expect to get over into Manchuria and will probably, at least for a time, make our headquarters at Mukden, and later get down to Dairen. We are looking forward with pleasure to meeting you then.

"If in the meantime, you, for any reason, desire to get in touch with us, address your communications in care of the American Embassy, Tokyo, Japan. We plan, while in Japan, to receive our mail through that source.

"With kindest personal regards, I remain very truly yours,..." PHD/p. Address: Agricultural Explorer, USDA, Washington, DC.

2604. Jardine, William M. 1929. Re: Letter of introduction for William Morse, Agricultural Explorer, Bureau of Plant Industry, USDA–to be used on trip to East Asia. Letter to whom it may concern, Jan. 26. 1 p. Typed, with signature on letterhead.

• ***Summary:*** "Be it known that Mr. William J. Morse, Agricultural Explorer, in the Bureau of Plant Industry, of the United States Department of Agriculture, whose signature appears on the margin hereof, will, in the immediate future, visit Japan, Ceylon, Formosa, Manchuria, China, Chosen, the Dutch East Indies, and other foreign countries, in connection with the work of this Department.

"He is hereby introduced and cordially commended to all persons with whom he may come in contact, whose good offices on his behalf are earnestly requested."

Morse's signature does indeed appear in the margin, and document is signed and sealed by Mr. Jardine.

Note: William M. Jardine of Kansas was secretary of agriculture (1925-29) under President Calvin Coolidge. William Marion Jardine (seventh president of Kansas State University) served as U.S. Secretary of Agriculture (1925-1929) under President Calvin Coolidge.

This digital image (see next page) was sent to Soyfoods Center by Joyce Garrison (William Morse's granddaughter) of West Hartford, Connecticut (July 2004). Address: Secretary of Agriculture.

2605. Jardine, William M. 1929. Re: Letter of introduction for Mr. William J. Morse. 1 p.

• ***Summary:*** A letter of introduction for William Morse, dated 26 January 1929. "Be it known that Mr. William J. Morse, Agricultural Explorer, in the Bureau of Plant Industry, of the United States Department of Agriculture, whose signature appears on the margin hereof, will, in the immediate future, visit Japan, Ceylon, Formosa, Manchuria, China, Chosen, the Dutch East Indies, and other foreign countries, in connection with the work of this Department.

"He is hereby introduced and cordially commended to all persons with whom he may come in contact, whose good offices on his behalf are earnestly requested."

Morse's signature does indeed appear in the margin, and document is signed and sealed by Mr. Jardine. Note: William M. Jardine of Kansas was secretary of agriculture (1925-29) under President Calvin Coolidge. Address: Secretary of Agriculture [USA].

2606. Matsumoto, Kenji. 1929. Shôyu jôzô ni kansuru saikin-rui ni tsuite [On the bacteria in shoyu brewing]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 24(1):23-31. Jan.; 24(2):18-23. Feb.; 24(3):32-36. March; 24(4):25-30. April; 24(5):25-30. May; 24(6):26-30. June. [Jap]
Address: Jozo Shikensho Gishi.

2607. U.S. Department of Agriculture, Office of Information, Press Service. 1929. Plant explorers of the United States Department of Agriculture start for the Orient. Release immediately (News release) (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. See p. 223. Feb. 18. Unpublished log.

• ***Summary:*** Page 223. P.H. Dorsett veteran agricultural explorer of the United States Department of Agriculture, and W.J. Morse, soybean specialist of the department, left Washington [DC] February 18 on a two year expedition to the Orient. They will sail from San Francisco March 1, going direct to Tokyo, Japan.

"The soybean culture of Japan, Chosen [Korea], Manchuria and Java will be one of the main features of the exploration program. New varieties will be sought for expanding the present acreage of the United States, methods of handling and preparation of a wide variety of by-products will be investigated.

"The varieties of the Oriental persimmon of Chosen will be sought."

2608. Rea, George Bronson. 1929. [Soy] beans: Their relation to Manchuria's prosperity and new railway construction. *Far Eastern Review* (*Shanghai*) 25:56-57, 79. Feb. [Eng]

• ***Summary:*** "For many years, Japan has relied largely upon bean cake imported from Manchuria, as the chief fertilizing material for her rice farms. In fact the prosperity and development of Manchuria is based upon the cultivation of the soya-bean, the extraction of its oil and the use of the residue [soybean cake] for fertilizing and other purposes. Before the Japanese created a market in Europe for this product in 1907, Manchuria was a sparsely populated waste land with no economic outlook."

"The Manchurian bean crop for the last three years has averaged over 5,000,000 tons per year, valued at 450 to 500 million Mexican dollars. The disposition of the 1926 crop

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The United States of America,

DEPARTMENT OF AGRICULTURE.

To all who shall see these presents, Greeting:

Be it known that Mr. William J. Morse, Agricultural Explorer, in the Bureau of Plant Industry, of the United States Department of Agriculture, whose signature appears on the margin hereof, will, in the immediate future, visit Japan, Ceylon, Formosa, Manchuria, China, Chosen, the Dutch East Indies, and other foreign countries, in connection with the work of this Department.

He is hereby introduced and cordially commended to all persons with whom he may come in contact, whose good offices on his behalf are earnestly requested.

W. J. Morse

In witness whereof I have hereunto subscribed my name and caused the seal of the Department of Agriculture to be affixed. Done at the City of Washington, District of Columbia, this twenty-sixth day of January, A. D. 1929, and of the Independence of the United States of America the one hundred and fifty-third.

W. M. Jardine

Secretary of Agriculture.

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was approximately as follows:

"Crop: North Manchuria, 3,300,000 tons [60%]; South Manchuria, 2,200,000 tons. Total crop, 5,500,000 tons.

"Export of beans 1,900,000 tons.

"Export of bean cake 2,250,000.

"Export of oil 150,000.

"Local consumption 242,000.

"Local fodder 363,000.

"Seeding 495,000 tons.

"Carried over 100,000 tons.

"Total 5,500,000 tons.

"These figures show that approximately one-half of the total bean crop of Manchuria is passed through the local bean mills..."

"The Chinese are reluctant to admit that Japanese initiative opened up an export market for soya beans that has made possible the tremendous development and enrichment of North and South Manchuria during the past twenty years. In denouncing Japan for 'exploiting Manchuria and attempting to annex the territory under cover of economic necessities,' the Chinese give no consideration of the operation of economic and industrial laws that may once more change the entire aspect of the Manchurian problem. They fail to realize that the prosperity of Manchuria is erected upon a foundation laid by Japanese masons and that what Japan has so carefully built up, she can just as easily demolish. For, unless all sign fail, China will soon have to find other uses and markets for her soya bean oil and cake or face economic ruin in Manchuria.

"The handwriting is writ large upon the wall. Within the next five years, Japan will have little further use for bean cake as fertilizer. Unless new markets are found for the cake, the oil milling industry n China is doomed. Extraction of the oil alone is not enough to justify the continual operation of the mills." Address: Shanghai.

2609. Shimo, K.; Harada, T. 1929. Daizu kasu no hakkô ni tsuite [Fermentation of soybean meal]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 32(2):125-30. Feb. (Chem. Abst. 23:4765). [Jap]
• ***Summary:*** A study of the constituents of soybean meal before and after fermentation. It has been found more profitable to ferment the meal when used as fertilizer for certain plants. Address: 1. Rigakushi; 2. Nôgaku-shi, Dai Nihon Jinzo Hiryo Kabushiki Gaisha Kenkyu-ka, Japan.

2610. Taira, Tomotsune. 1929. Shôyu no sarichiru-san kenshutsu-hô ni tsuite [Detection of salicylic acid in shoyu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 5(2):156-58. Feb. [11 ref. Jap]

2611. Tamiya, Hiroshi; Morita, Shinkichi. 1929. Bibliographie von Aspergillus 1729 bis 1928 [Bibliography of Aspergillus from 1729 to 1928]. *Botanical Magazine* (*Tokyo*) 43(506):60-71. Feb.; 43(507):145-56. March; 43(508):179-89. April; 43(509):237-49. May; 43(510):281-91. June; 43(511):321-32. July; 43(512):371-81. Aug.; 43(513):427-38. Sept.; 43(514):501-15. Oct.; 43(515):577-89. Nov.; 43(516):625-33. Dec. [2424 ref. Ger]
• ***Summary:*** A superb bibliography of 2,424 citations listed chronologically by year, and within each year alphabetically by author. Part 1, 1929, covers the years 1729 to 1920 and contains 1,655 references. At the end of the last installment (1930) there is a complete author index. Continued in the Jan. 1930 issue. Address: Japan.

2612. Dorsett, P.H.; Morse, W.J. 1929. Re: Letter notifying Mr. Peter Liu in China of trip to East Asia including China (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. March 12. Unpublished log.
• ***Summary:*** Pages 343-45. Neither the address, title or affiliation of Mr. Liu are given. However, Peter Liu was Mr. Dorsett's Chinese interpreter on his 1924-25 trip in China.

"Dear Liu: Well here we are on the way back to the Orient. We left Washington [DC] February 18th, and came by way of Los Angeles, California to San Francisco, California and left there March 1st. We are now about half way between Honolulu and Yokohama, Japan where we are scheduled to arrive on the morning of the 18th. As soon as practicable after landing we will go to Tokyo and arrange for making headquarters there at least until we can get acquainted officially and learn what part of the country we should first get to work in.

"Our present plans contemplate a stay of a full year in Japan and Chosen (Korea) and in the spring or early summer of 1930 we will get into Northeastern China and make headquarters there in Mukden, at least for a while. Later in the season we will likely move headquarters to Dairen and remain there until fall and then hope to get over to Peking and be there during the winter of 1930-31. From there we will likely work south to Nanking, Shanghai, Han Kow (Hankow; pinyin Hankou, as of Aug. 2011 part of Wuhan), Hong Kong and then to Taiwan (Formosa) where we may spend the winter of 1931-32. From there we will likely go to Singapore, Penang, Java, Sumatra, and Ceylon then back to America by England.

"We are wondering if you and the other two boys, Yey and Gow, would like to be with us while we are in China at least until we are ready to start South from Peking. Please let us know.

Page 345. "I copy the following from a letter from Mr. Julian Arnold under date of January 16, 1929, which I consider a high compliment and feel sure that you will appreciate.

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"'I wish to commend the expeditious and thorough manner in which Mr. Liu handles this whole matter. His work and attitude were most commendable.'

"We are wish that you could speak Japanese for if you could we would have arranged to have had you meet us in Yokohama and helped us with our work in Japan and Korea.

"All of the party joins me in kindest regards. Very truly yours, Dorsett and Morse." Address: Agricultural Explorers, USDA, Washington, DC.

2613. *Japan Advertiser* (*Tokyo, Japan*). 1929. Fruit and beans lure scientists: American botanists here to study persimmon and lowly soy bean. Would popularize them. State most American flowers and ornamental shrubbery foreign in origin. March 24.
• ***Summary:*** "Mr. P.H. Dorsett and Mr. W.J. Morse, two American botanists who know as much about certain plants and seeds as any other men alive, have set up their headquarters in Tokyo and are ready to commence an extensive examination of Japan's flora and fauna."

"Mr. Dorsett is known officially as the persimmon expert of the Bureau of Foreign Seed and Plant Introduction of the United States Department of Agriculture, and Mr. Morse is the soy bean expert of the same bureau."

Mr. Morse hopes to find and send back to the United States many new soybean varieties. He also hopes to learn new ways of using the soybean, especially as human food.

Note: This is the earliest document seen (July 2009) with the adjective "lowly" in the title, used to describe the soy bean.

2614. Kinugasa, Y.; Hattori, Y. 1929. Shôyu bôfuzai anzen-jô no shôyu ni taisuru bôfu kôryoku shiken seiseki hôkoku [Effect of a preservative "Anzen" tablet on the preservation of shoyu]. *Eisei Shikenjo Iho* (*Bulletin of the Imperial Hygienic Laboratories*) No. 33. p. 187-88. March. [Jap] Address: Tokyo Eisei Shikenjo. 1. Gishi; 2. Gishu.

2615. Noda Shoyu K.K. 1929. Noda Shôyu Kabushiki Kaisha annai [Introduction to Noda Shoyu, Inc.]. Noda-machi: Japan. 43 p. March 5. Illust. [Jap]
• ***Summary:*** This book contains many interesting photos. Address: Noda, Japan.

2616. *Japan Advertiser.* 1929. Farm experts talk to Pan-Pacific Club: W.D. Morse and T.H. Dorset [sic, P.H. Dorsett] are here to study agricultural conditions. April. 13. [Eng]
• ***Summary:*** At this talk in Tokyo, Morse notes that has been working at the USDA on the soybean and other Oriental crops for 22 years. He is interested in their utilization and adaptation. Soybean cultivation in the United States has increased tremendously during the last ten years. One of Morse's principal tasks in the Orient is to find soybean varieties with a low oil content, which will not produce soft pork.

"I doubt if we will ever use the soy bean as you use it here. We are using the soy sauce; we have a Japanese who has established a factory, and his shoyu sauce is becoming quite popular all over our country. He is also canning little bean sprouts, as we can peas and beans."

Note 1. Reprinted in the Log of the Dorsett Morse expedition to East Asia, p. 628-29. The Japanese date on this article is Taisho 13, first month, 9th day.

Note 2. The Japanese man to whom Morse is referring is probably Mr. Shinzo Ohki of Oriental Show-You Company in Columbia City, Indiana. The "bean sprouts" he made were mung bean sprouts.

2617. Dorsett, P.H.; Morse, W.J. 1929. Soy sauce (shoyu) in Japan, China, and Manchuria (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.
• ***Summary:*** Page 655 (16 April 1929). "A representative of a Shoyu Sauce Company called on us and wished to give us a demonstration of a new process of soy sauce manufacture. This company had developed a chemical compound which when added to the regular soy sauce doubles the amount and makes an excellent soy sauce." However, in exchange, the company wanted the Americans' endorsement to use in advertising. He was politely refused.

Page 847 (May 2). Visited the soy sauce and rice wine experiment station [*Jozo Shikensho*] at Nishigahara. Met Prof. Dr. K. Kurono, who was said to be in charge. His young assistant took them through the soy sauce factory and rice winery. "We were able to get considerable data about the making of soy sauce as all the various steps involved were in operation and we were able to obtain seed of the soybeans and wheat used especially in making soy sauce.

Page 1222 (May 27). Dr. Ito made arrangements for Morse to visit a large soy sauce factory on the outskirts of Sapporo, Hokkaido. The Tomoe Shoyu Factory consisted of several large buildings covering several acres. Morse was shown through the entire plant. The wheat and soybeans are grown in Hokkaido, but each consists of a mixture of varieties; samples were sent to the USA. This factory uses the most modern machinery and methods. "In one of the large vat rooms more than 120 vats were counted in which the wheat and bean mash [moromi] is cured for about 18 months. The mash from which the soy sauce was pressed out is sold as cattle and hog feeds around Sapporo. The manager was interested in the possibility of selling soy sauce in the United States." A photo shows the outside of the factory's headquarters in Sapporo.

Note 1. This is the earliest English-language document

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seen (July 2011) that contains the term "bean mash" or the term "wheat and bean mash." The latter almost certainly refers to *moromi*.

Page 3341 (24 Dec. 1929). "Today [in Tokyo] Morse and Suyetake went to call upon soy sauce and natto manufacturers for the purpose of getting acquainted and also if possible to arrange for getting still and motion pictures of their places, equipment, and operations."

Page 3499 (9 Jan. 1930). They got six good photos of steps in the making of soy sauce at the Noda Shoyu Co. It is probably "the first time that such a picture has been made." "Detailed notes and descriptions of these soybean products will be found in the special report on soybean and soybean products which is a part of this report."

Page 4341 (March 11). A photo (neg. #45026) shows numbered specimens of various ingredients (in bottles) used in the manufacture of soy sauce, including soybeans, wheat, soy mash [moromi], malt from curing tub, soy sauce, soy sauce oil, and a small wooden cask. Purchased in Tokyo.

Page 4356. Photo (neg. #45033) of "a small quantity of mash left after the sauce has been pressed out. It is known locally as 'shoyu kasu.' It is used for feeding hogs and cattle and also for a fertilizer."

Page 4357 (March 17). "About 11 a.m. we went to the Yamasa Shoyu Factory at 576 Nakano-machi, Tokyo, Japan. There we met Mr. S. Yamaguchi, the manager, who allowed us to make pictures in the factory culture room and storage and curing sheds."

Pages 4358-4366. Photos (negatives #45034-42) of Yamasa Shoyu Sauce Factory in Tokyo. 1. Hydraulic press with thin bags for pressing out the sauce. 2. Factory interior, incl. cookers, pump, large casks. 3. Interior of wheat roasting and preparation room, with roaster, pile of small [koji] trays, huge wooden rafters. 4. Interior of culture room, with lines of small boxes [koji trays] on both sides. 5. Large iron double-boilers in which soy sauce is cooked [pasteurized?]. 6. Storing and aging room containing 4 rows of 16 casks each, taken at level of rim of casks. Each cask is about 8 feet across and 8-10 feet deep. The company has 8 such rooms and all are kept at full capacity. 7. Storage and curing shed (same room), taken from ground level. 8. Pile of "roasted wheat mixed with bacterial germs for shoyu sauce." Note 2. Actually, this contains soybeans and koji mold spores, about to be put into trays to make koji. Morse failed to understand these two basic facts. 9. Small wooden casks "ready for filling with shoyu sauce."

Page 5649-50 (28 Aug. 1930). Heijo, Chosen [Pyongyang, North Korea]. Morse visited the branch office of the Grain Inspection Office of the Neian Nando Prefecture to learn about soybeans. Last season (1 Nov. 1928 to 1 Nov. 1929) some 263,090 bags of soybeans (of 2 bushels each) were inspected and shipped out from various points in the prefecture. "The Noda Soy Sauce Co. obtains most of its soybeans from here. The beans are shipped entirely to the Main Island [Honshu, Japan] for miso, soy sauce, and natto. Note 3. Chosen has been a Japanese colony since 1910.

Pages 6339-43 (3 Nov. 1930). In Peiping [Beijing], China. After tiffin they visited the Lan Hsin Chai "soy sauce, soy jam [chiang / jiang], and pickle" factory of Mr. Wang in the outer city to the southwest–not far from Hsuan Wumen Street. It is about 300 years old and many of the large earthen glazed jars are the same age as the establishment.

Note: This is the 2nd earliest English-language document seen (Nov. 2011) that uses the word "jam" to refer to *chiang / jiang*.

Pages 6341-45 (negatives #46157-61) show photos of this factory. 1. Side view "of one of a number of old Chinese lever soy sauce presses." 2-3. Other views of soy sauce press, with jar in foreground. 4-5. Many large earthen jars, some covered with reed grass matting, in outdoors compound / courtyard.

Page 6802 (16 Dec. 1930). At Dairen, Manchuria, Morse met Dr. Kato at the Central Laboratory of the South Manchuria Railway Co. Concerning Japan, Dr. Kato said Ajimoto [a type of HVP] was made from wheat proteins, not soybean proteins. However, in and around Kyoto a product named Soyamint was very similar to Ajimoto but was made from soybeans.

Pages 7008-09 (21 Jan. 1931). In Tokyo, Morse visited the Institute of Physical and Chemical Research, where he met Dr. U. Suzuki, Prof. of Biological Chemistry at Tokyo Univ. "With reference to Soyamint, Dr. Suzuki advised that it is a soy sauce substitute–one half chemical and one-half fermentation" [i.e., a mixture of equal parts HVP and fermented shoyu].

Pages 7035-36 (24 Jan. 1931). In Tokyo, Morse "learned that soy sauce is prepared in nearly 12,000 establishments throughout the Japanese Empire and in addition it is made in private homes, especially farm homes. When 5 koku [1 koku = 47.6 gallons or 180 liters] (liquid measure) of soy sauce are made, a permit must be obtained from local authorities. Various sections in Japan are noted for brands of soy sauce such as Noda, Chiba Prefecture, for its "Kikkoman' and 'Higeta' soy sauces. In the Kwansei [Kansai, Osaka-Kyoto] district the 'Marukin' soy sauce is made while in the Tatsuno district [in western Japan's Hyogo Prefecture] the light colored [*usukuchi*] soy is made. The various brands are made in slightly different ways regarded as trade secrets by the various companies. Many experiments by chemical laboratories are being conducted to make artificial soy sauce and also to shorten the period of fermentation.

"Considerable quantities of Japanese soy sauce are exported, China being the chief market. Recently America and Europe have made increasing demands. In shipping to some countries, especially America, condensed soy sauce is exported, then water added and bottled."

Pages 7066-67 (30 Jan. 1931). In Tokyo, Morse has been trying for some time to locate the company that makes

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Soyamint. Finally, Mr. Suyetake found that it was made by the Japan Fertilizer Co. Morse visited the main office and met one of the directors, Mr. Koshiro Horie, who said that "his company supplies 65% of the commercial fertilizers used in Japan. One of the principal by-products of the manufacture of fertilizers is used with soybean oil meal in producing an artificial soy sauce. The process of manufacture is more or less secret so that it is not possible to visit the factory. As yet 'Soyament' is not on the market in large quantities as it is of only recent manufacture. It is said that soy sauce can be made in slightly over one month with this process, allowing one month for curing. It has quite a different flavor from that of soy sauce and it may take some time to establish it on the market. It can be produced much more cheaply than the ordinary soy and being cheaper may help it to take more quickly with the poorer classes." Mr. Horie gave Morse some literature about Soyament and promised to send samples of two grades of commercial products which differ principally in specific gravity. Address: Agricultural Explorers, USDA, Washington, DC.

2618. Morse, W.J. 1929. Re: Travels in Japan. Letter to Dr. A.J. Pieters, USDA, April 17. 4 p. Typed, without signature.
• ***Summary:*** Thoughts about Japan and Japanese culture, incl. Buddhism. Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 93–Morse-Napier. Folder–Morse, W.J.-#4 F.C.I.

Sent to Soyfoods Center by Jacob Jones of Purdue Univ., Aug. 1998. Address: Tokyo, Japan.

2619. Morse, W.J. 1929. Re: Soybeans and Japan. Letter to R.A. Oakley, USDA, Washington, DC, April 27. 3 p. Handwritten, with signature on hotel letterhead.
• ***Summary:*** "Have been thinking about writing you for more than two weeks but just couldn't get around to it. Sure do keep busy night and day... As we are sending our first lots of seed, bulbs, etc. in which are many soybeans, adsuki, etc., thought I had better write about the planting.

"Before leaving Washington, I explained to Mrs. Donavan about taking small samples of each number as it came for our sample cases. All of the soybeans can be grown at Arlington Farm [Virginia] even if they are not planted before June 20." He gives planting instructions for the adsuki beans, mung beans, cowpeas, hyacinth beans (*Dolichos lablab*), jack beans and sword beans; they "can be planted at the Sandhill in Columbia, South Carolina, and also at McNeill, Mississippi."

"This trip has more than opened my eyes on the soybean plan. Soy sauce, the green vegetable bean, and possibly miso are the only products now used extensively in the Orient that have possibilities in the United States as foods. The oil industry, of course, will be our great development... I just saw an article in one of the daily papers here where soybean oil meal led all fertilizers used in the Japanese Empire and is the largest imported one... The main object in the Orient as I see it is to obtain as many varieties as possible to fit in our diversified conditions and then work out the other problems so they fit in with the sections.

"I have taken about 500 feet of motion picture films with the DeVry which Dr. Pieters bought for me and have had very good results."

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 93–Morse-Napier. Folder–Morse, W.J.-#4 F.C.I.

Sent to Soyfoods Center by Jacob Jones of Purdue Univ., Aug. 1998. Address: The Imperial Hotel, Tokyo, Japan.

2620. Dorsett, P.H.; Morse, W.J. 1929. Green vegetable soybeans and Edamame varieties in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.
• ***Summary:*** Pages 802-03 (24 April 1929). While in Tokyo, Dorsett purchases from T. Sakata & Co. in [Yokohama] Japan eleven varieties of soybeans (8 oz each), one variety of Dainagon Azuki, and 2 varieties of swordbeans. Vegetable soybean varieties are: Edamame Wase Aosakigake, Edamame Wase Kurome Oxaya, Otsubu Wase Aojiro Edamame, Daikoku Edamame, Edamame Wase Higanmame, Tsurunoko Daizu, Edamame Wase Kurosakigake, Edamame Wase Chamame.

Page 892 (7 May 1929). A photo shows two commercial retail bunches of soybean vines and pods, bound at the bottom with rice straw. The soybeans are "used as a green vegetable."

Pages 1201-02 (26 May 1929). While visiting the Hokkaido Agricultural Experiment Station at Kotoni, Sapporo, Mr. Morse notes: "The soybeans grown in Hokkaido are used entirely for food purposes, such as natto, bean curd, green vegetable bean, soy sauce, miso, bean paste and roasted beans."

Page 1270 (30 May 1929). In Hakodate, Hokkaido, in northern Japan, the authors visited a store where pickles were sold. There they saw "a tub of pickled soybean pods, the seeds of which were about full grown. These pods were pickled in the same manner as we pickle cucumbers and sauerkraut, that is by salting down. This is the first time we have ever heard of or seen this kind of soybean product. According to Mr. Suyetake [their guide], this form of soybean product is eaten along with refreshments, the

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kind we no longer have at home [alcoholic beverages]. It seems rather ironical that we should come to study soybean products for the United States and find so many that, to enjoy them most, they should be eaten along with the refreshments of the pre-prohibition era of our country, but such is fate."

Pages 1869, 1871, 1878-79 (15 July 1929). "Left the hotel about 7:45 for a day's agricultural exploration in one of the trucking areas in the vicinity of Tokyo, where the growing of soybeans as a vegetable is an important industry." From Nishiaria they set out cross country on foot. "Saw many plantings of soybeans from just coming up to ready to pull for market. It is extremely interesting to note how they are planted for succession. We saw many plantings of beans ready for pulling for market with rows interplanted as seedlings or transplants just coming into bloom. One photo shows "Vegetable soybeans only recently transplanted. The light color between the rows is caused by fertilizing with liquid night soil." Two other photos show soybeans "quite probably planted for use as a vegetable."

Page 1897-98 (17 July 1929). They learn from the officers of the agricultural association at Kitasenju station that "around Takenotsuka [near Tokyo] soybeans were grown extensively for green vegetable beans." At a village agricultural fair they saw and photographed forty bundles of soybean plants, "30-50 plants to the bundle representing several varieties used only for green vegetable beans. The two most common varieties use for green vegetable beans were the Sodefuri and the Chamame. The bundles were judged by color, size and shape of pod, and size and yield of each plant. Pods should be bright green and plump, that is the seed full grown. The size of the bundle for market purposes depends on the desire of the individual farmer. Three crops of vegetable soybeans are grown during the season–early, medium and late season. Perilla spikes and plants were also seen.

Pages 1925-26 (19 July 1929) show photos of "A native Japanese woman pulling soybeans to be bunched and sold as a fresh green vegetable." Page 1927 (19 July 1929) shows two photos from the village of Hanabata: (1) "Children with their hands and aprons full of soybeans which have been boiled in the pod; they are eating them like we eat peanuts." (2) Details of how a farmer, sitting on the ground in his yard, bundles vegetable soybean plants for market and ties them with a grass string using a frame for support. See also page 2065 (Black and white movie film, DeVry camera, spool 23, description of 8 shots of vegetable soybeans taken in Japan; undated). Also Page 2071. Page 2080 (July 1929) shows a photo whose caption reads: "Piled bundles of soybeans, one of the commonest vegetables in the market. They are to be found at every turn."

Pages 3501-02 (10 Jan. 1930). The authors leave Tokyo for Urawa, the capital of Saitama prefecture in Japan, where they visit the Saitama Prefecture Experiment Station. The horticulturist explains that they have "three varieties of vegetable soybeans. These are grown especially as green vegetables. Plant seed in hot in hot beds about the middle of April and transplant to the field when danger of frost is over."

Page 3683 (24 Jan. 1930) state that at the Shizuoka Agricultural Experiment Station the authors "secured considerable information about vegetable and green manure soybeans for the Shizuoka prefecture."

Page 6911 (3 Jan. 1931). Morse writes from Tokyo: "At one of the department stores, in the vegetable market section, we found small bundles of soybean sprouts and also some bundles of green vegetable soybean plants. There were only 6 plants to a bundle, about 8 inches long and with 6 to 8 pods per plant. The seed in rather large pods seemed only about one half developed.

Pages 6931-32 (7 Jan. 1931). Morse went to the Imperial Department of Agriculture in Tokyo and met the director, Mr. A. Manabe, who provided information, statistics, and recent publications on soybean acreage, production, utilization, and industries in Japan, Chosen [Korea], and Taiwan. The beans from Japan proper and Chosen are utilized primarily for food, such as bean curd (Tofu), confections, flour and green vegetable beans [edamamé]. A table shows that less than 1% (0.8%) of the soybeans used in Japan are consumed in the form of "Green vegetable beans."

Pages 7102-03 (2 Feb. 1931). Morse is in Urawa, capital of Saitama prefecture. "The green vegetable soybean work, so much of which has been done at Urawa, has been transferred to the branch station at Koshigawa. A very extensive acreage of green vegetable soybeans is grown in the Saitama Prefecture. The beans are started in hot beds about March 1 and when warm weather sets in the plants are transplanted in the fields."

Note 1. This is the earliest English-language document seen (June 2009) that uses the term "Vegetable soybeans" (entry of 15 July 1929), or "green vegetable soybean" (3 Jan. 1931) or "green vegetable soybeans" (Feb. 1931).

Note 2. No mention is made of "edamame" (except in variety names; Apparently Dorsett and Morse don't yet understand the meaning of this word) nor of "vegetable-type soybeans" or "edible soybeans" as a larger category of soybeans. Address: Agricultural Explorers, USDA, Washington, DC.

2621. Morse, W.J. 1929. Re: Impressions of Tokyo, Japan. Letter to Lena and John Morse (his parents), Washington, DC, May 10. 10 p. Typed, without signature (carbon copy).
• ***Summary:*** "Dear Folks, Well things have been going so fast since I last wrote that I hardly know where to begin and so much that to tell it all would take a book, seems to us that there is always some festival going on, a holiday or something.

"On May 5 was the boy's festival and one sees fish, paper or cloth, flying from houses where there is a boy."

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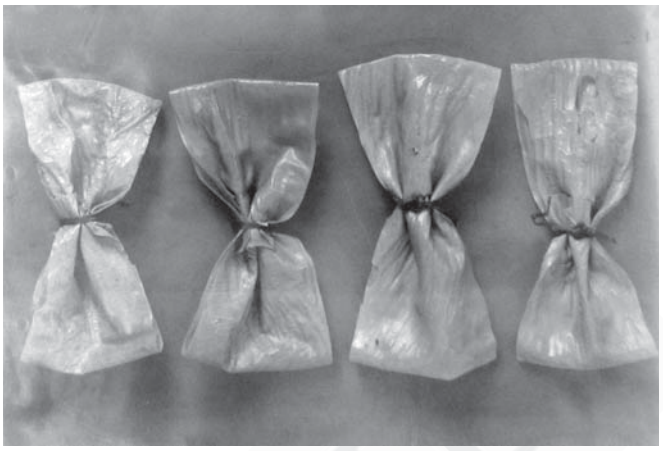
Describes a visit to an experiment station to see the manufacture of soy sauce (experiments carried on in a small factory size) and many journeys in the Japanese countryside. Morse is struck by the beauty of the countryside, temples, gardens, and flowers, and by the strong smells in villages from the "manure pits" containing well-rotted night soil (human excrement). Signed: Will, Edna and Margaret– Morse, is wife and daughter. Address: Imperial Hotel, Tokyo, Japan.

2622. Dorsett, P.H.; Morse, W.J. 1929. Yuba in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Pages 1009-10 (14 May 1929, Tokyo). "Copied from Mr. Morse's diary... We were also quite surprised to find a bean vermicelli made from soybean flour, as we did not know soy flour could be used for this on account of the small starch content. The number of adsuki [azuki] bean products seemed unlimited and we plan to collect these later. We were also able to collect three kinds of yuba, a thin skin-like product (very rich in protein) obtained in the boiling of soybean milk."

Page 1061. "One-half natural size picture [photo] of a package of yuba rolls. Beside the picture are some of the rolls showing character of the bean-curd skin (Yuba). This form of yuba is known as 'Maki-yuba' [as written on the label]. Meaning yuba rolls and is used in making soups and in other dishes" (neg. #43666).

Page 1066. "Between ½ and ¼ natural size picture [photo] of a package of yuba sheets, rich creamy yellow in color. Beside the package is a tied small bundle of the yuba sheets which after being moistened are used to wrap rice in



for lunches. Yuba is very rich in protein" (neg. #43671).

Page 1069. "Natural size picture [photo] of a package of yuba in ribbon-like rolls. Beside the package are rolls showing the manner of rolling the thin narrow sheets of yuba. This form is used in soups" (neg. #43674).

Page 3480. "Small dried sheets of soybean 'Yuba' arranged in the shape of bow ties. Purchased at small grocery store in Tokyo, Jan. 6, 1930. Native name is 'Yuba.' Yuba is the film obtained when boiling soybean milk. Used most commonly in soups. This is a natural size picture" (neg. #44740).

Pages 3555 to 3560. (15 Jan. 1930). "Today we visited a yuba factory for the purpose of getting information as to how this soybean product is made, and also to try and get still and motion pictures of the equipment and processes... Details as to the method of making yuba will be found in the special report on soybeans and soybean products." A boiler was used in this yuba factory. Bamboo trays placed over a heater were used to dry the yuba. Photos taken in Tokyo show:

Page 3557. "An interior view of a yuba factory showing at the left the mill surrounded by a hopper and an extending small pipe to supply a small stream of water for grinding to the right in the cooker, also tube and long handle knife" (neg. #44771).

Page 3558. "An interior view of the portion of the factory where the bean milk is evaporated. A part of the furnace is shown in the foreground; across this lays two bamboo trays with bits of broken yuba on them. Back of these can be seen four evaporating trays or pans" (neg. #44772).

Page 3559. "A nearby view of two half-sheets of yuba hanging across a small bamboo strip. The sheets before being cut are just the size of the evaporating pan (neg. #47773).

Page 3560. "A nearby view of broken pieces of yuba on a bamboo tray. This is a little nearer than [neg.] #44772, otherwise the same (neg. #47774).

Page 3585. "Two packages of yuba and two rolls and sections of a roll which is sold commercially in this manner. Length of packages: 9 inches. D & M. #3292.

Page 3590. "The sheets of Yuba as they come from the

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pan measure about 16 x 20 inches and are put up in various forms for the market. This view shows folded and sectional views of Yuba (neg. #44782).

Pages 3595-97 (17 Jan. 1930, Tokyo). "Went out to the Yuba making plant this morning to try and get some still and motion pictures... We found the owner and his wife were busily occupied. He was taking up the sheets (17 x 21 inches) of Yuba from the evaporating pans and hanging them up to dry. The pans are of copper, about 3 inches deep by 17 inches wide and 21 inches long. The evaporating pans are filled from ½ to 2/3 full of soybean milk, and evaporated over a slow fire. As the Yuba or layer of scum forms over the surface of the heated milk, it is loosened at the edges by running a small bamboo knife around the sides. A small split stick of bamboo is then run under the film the long way, and the scum or sheet of Yuba, which laps down over the stick like a wet sheet of paper, is lifted and the stick stuck into a crack so that the sheets hang over the evaporating pans to dry.

"Do understand that as many as 25 or 30 sheets of Yuba may be taken from one pan of milk. However, from 10 to 15 is the usual amount taken. Those taken in excess of these amounts are not considered to be of very good quality." Photos show:

Page 3597. Tokyo. These sheets of Yuba have just recently been lifted from the evaporating pan and hung up to dry. They are about 17 by 21 inches" (neg. #46786). The sheets shown from a different angle (neg. #44787).

Page 3639. Tokyo. "A nearby view of a tray of broken pieces of Yuba. Not quite so close a view as #44744 (neg. #44803).

Pages 6924-25. Notes by Mr. W.J. Morse, Tokyo, Japan. Today was set aside for studying miso. However, in the process: "At several stores we found Yuba in abundance, more so than last season. A number of different forms of miso [?] Yuba were found at one store, among which was one we had not observed before." Address: Agricultural Explorers, USDA, Washington, DC.

2623. Dorsett, P.H.; Morse, W.J. 1929. Miso in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Pages 1009-10 (14 May 1929, Tokyo). "Copied from Mr. Morse's diary. In the afternoon we went to Matsuzakaya store to look over bean products and as a result we secured seventeen different soybean products. We found that they had 20 different forms of miso, a product which we think may have possible value at home."

Page 1053 (16 May 1929, Tokyo, Japan). A photo shows a natural sized picture of a small wooden box of miso. The Japanese name is given but is illegible.

Page 1054. "Natural sized picture of a small wooden box of miso. Native name: "Kansai miso." It is made in the Kansai district [the Kyoto-Osaka area] and is used in making miso soups (neg. #43659).

Page 1068. Photo of a "small wooden box of 'Edomiso' [Edo miso] which is made in the Tokyo District. Miso which is quite salty is used in making soups. In the city, miso soup is used for breakfast, which in the country miso soup is used for lunch and supper."

Page 1070. Photo of a small wooden box of "Shiromiso" [shiro miso], meaning white miso. "This form contains rice and is used in making miso soup."

Page 1202 (26 May 1929, Sapporo, Japan). Mr. Morse visited the Hokkaido Agricultural Experiment Station at Kotoni. Mr. Takatsugo Abiko explained that "The soybeans grown in Hokkaido are used entirely for food purposes such as natto, bean curd, green vegetable bean, soy sauce, miso, bean paste and roasted beans."

Page 2004 (29 July 1929). Morse visited the Saitama Experiment Station at Urawa, Saitama prefecture. Met Mr. Tadashi Hashigawa, who is in charge of the soybean work of this prefecture, which is third in soybean acreage in the Japanese Empire. His main work is developing varieties to be used for making soy sauce, tofu, miso, and natto. This station grows about 50 varieties, nearly all yellow-seeded and medium in size.

Page 2445-46 (19 Sept. 1929). Visited the Tokachi Branch Experiment Station in Hokkaido. Met Mr. Seiji Kawase and Yoshio Fujine. 60% of the crops grown in Hokkaido are legumes; of these, field beans are first, followed by soybeans, then field peas. The Tokachi district is very well adapted to soybean culture. There are five grades of soybeans plus a special grade for beans that will be used for soy sauce, miso, etc. Of the 1,837,325 bushels of soybeans produced in Hokkaido, 58% is exported [to outside of Hokkaido] and 42% is consumed in Hokkaido as follows: Miso 9%, soy sauce 9%, seeding 6%, tofu and other products 18%. In 1923 Hokkaido was Japan's leading soybean producing region with 17% of the nation's production, followed by Ibaragi [Ibaraki] 5%, Saitama 5%, Nagano 4%, Kumamoto 4%, Aomori 4%, Niigata 4%, etc. Address: Agricultural Explorers, USDA, Washington, DC.

2624. Dorsett, P.H.; Morse, W.J. 1929. Roasted soybeans in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 1051, 1059 (16 May 1929). "Slightly larger than natural size picture [photo, taken in Tokyo] of a package of roasted soybeans imbedded in very small rice

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flour cakes... This article of food is known as *mame tarô.* The skin of the bean is dyed green. These are eaten as confections and may be had at all confectionery stores.

Page 1060. "Natural sized picture of rice flour cakes in which are imbedded small black seeded soybeans (roasted). Native name is *Mameiri abura age kaki mochi."*

Page 1065. "Natural sized picture of a sample of sugared soybeans (native name *Sato Daidzu*) and of a sample of roasted soybeans (native name *Nori-mame* or *daidzu*) over which, during the last stage of roasting finely cut seaweed [nori] is scattered. Both products are used as confections and are had at all confectionery stores.

Page 1067. "Natural size picture of roasted soybeans imbedded in very small rice flour cakes. The skins of the beans are dyed green."

Page 3469, 3485 (8 Jan. 1930). Photo: "Box of sugar coated roasted soybeans purchased at a small confectionery store, Tokyo, Japan, December 24, 1929. The beans are first soaked for 12 hours, partially dried, roasted and then covered with sugar syrup of various colors. Box [with decorative cover] measures 3½ inches long, 5½ inches wide."

Page 3515. Photo of a bag of "Candied soybeans. Soaked and roasted soybeans sugared. The bag measures 5 inches across. This is a pretty good product which might take pretty well in the States."

Note: This is the earliest English-language document seen (Dec. 2012) that contains the term "Candied soybeans" or the term "roasted soybeans sugared" or the term "sugar coated roasted soybeans."

Page 3529. Photo: "Roasted soybeans imbedded in small round rice cake balls used as a confection." Packages 10½ inches long, 2½ inches diameter.

Page 3538. Photo: "Soybean candy. Small cylindrical pieces of candy in which are imbedded medium small roasted soybeans."

Page 3583 (16 Jan. 1930). "Soybeans in candy. Photo of box 7 by 9¼ inches. Small white sugar cakes in which there are roasted soybeans and also small rice flour cakes with roasted soybeans. These forms of confections are generally mixed with other forms with rice, sorghum, and peanuts."

Page 3584. "Iri-mame. Ama-natto. The coated beans are brown and red.

Note: This is the earliest English-language document seen (Dec. 2012) that uses the term "Iri-mame" to refer to Japanese dry-roasted soybeans.

Page 3589. Photo of 9-inch box. "Small oblong pieces of soybean candy, made of sugar syrup and roasted soybeans. Some pieces are of small round black soybeans (green or yellow germ) and others with medium small greenish yellow soybeans. Soybean candy is generally mixed with other kinds, rice, sorghum, peanut and white beans."

Page 3591. Photo: "Sugar coated roasted soybeans, some of which are covered with finely ground seaweed. This product can be found at nearly all confectionery stores and stands. Length of paper bag: 9 inches."

Page 3592. Photo: "Mame-cha." Roasted and cracked soybeans mixed with tea leaves and stems. Before using the material is generally heated slightly so as to bring out the full flavor. Size of tin box: 3½ by 7½ inches. Also sold in paper bags."

Page 3593. Photo of same product sold in 10-inch paper bags.

Page 3634. Photo: A decorative bag of "soybeans roasted and cooked with dough, the beans are also covered with seaweed."

Page 3638. Photo of an open 8-inch-long paper bag. "These are roasted and puffed soybeans on which are pieces of seaweed."

Page 3711 (28 Jan. 1930). Photo: "Kasutera." "Roasted soybeans made into patties with sugar syrup."

Page 3713. Photo of "Soybean and puffed rice candy."

Page 3716. Photo of bag (7 by 11 inches) of Tajimaya "Roasted soybeans, sugar covered. They are pink and green colored."

Page 3723 (29 Jan. 1930). Photo: "Rice cookies in which roasted soybeans (black variety) have been baked. Soy sauce is brushed over the cakes immediately after they are taken from the oven."

Page 3724. Photo: "Small balls of puffed rice and also millet, in which are mixed roasted black soybeans."

Page 3742. Photo: "Soybean stems and small twigs of holly with thorny leaves. Sardines are impaled on a couple of the soybean branches, and near the base of the plants are some roasted soybeans. This combination is supposed to keep away evil spirits and also to bring good luck to the family. 'Devil chasers.'" Address: Agricultural Explorers, USDA, Washington, DC.

2625. Dorsett, P.H.; Morse, W.J. 1929. Tofu and other soybean products in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 1051, 1056 (16 May 1929). Tokyo, Japan. A photo shows: "Nearly natural sized picture of a package of dried bean curd or tofu. Native name is 'Koya tofu.' The fresh bean curd is first frozen and then dried. This dried form of curd is used in general cooking with vegetables and meats." The front label on the rectangular package is attractive (neg. #43661).

Page 1057. A photo shows: "Section of a large bamboo culm [the round, hollow stem] which has been transformed into a package for holding (for sale commercially) vegetable pickles. The handle is of kudzu vine. The stopper is of cedar [*hinoki*], *Cryptomeria japonica* (neg. #43662).

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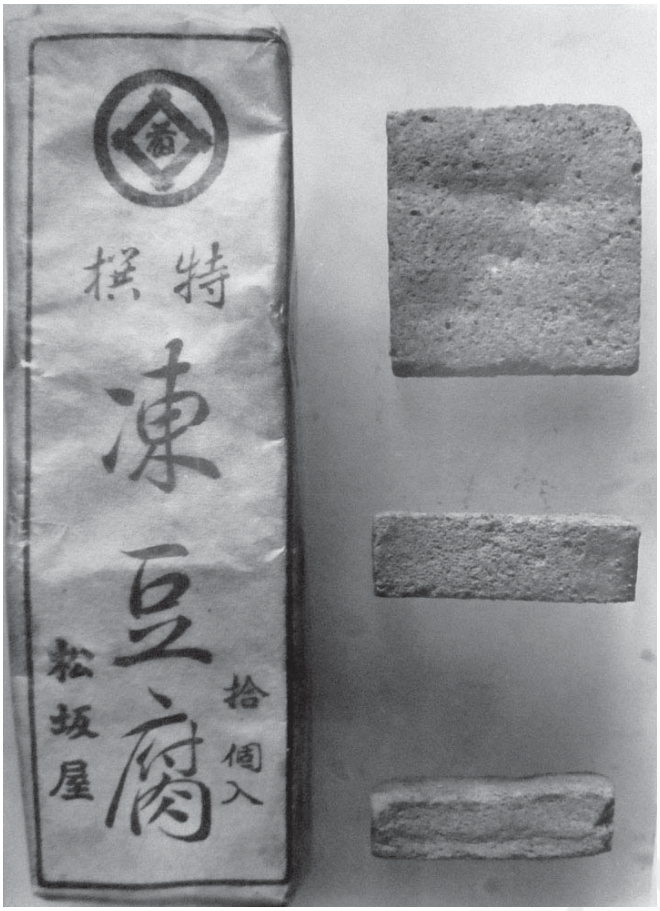

Page 1059. "Slightly larger than natural sized picture [photo] of a package of roasted soybeans imbedded in very small rice flour cakes. Beside the package are some of the beans in the rice cakes. This article of food is known as "Mame taro" [as written on the label]. The skin of the bean is dyed green. These are eaten as confections and may be had at all confectionary stores" (neg. #43664).

Page 1060. "Natural sized picture of rice flour cakes in which are imbedded small black seeded soybeans. Native name is 'Mameiri abura age kaki mochi.' Meaning roasted beans on fried rice cakes" (neg. #43665).

Page 1064. Two packages of mungbean noodles or vermicelli obtained from the Matsuzakaya Department Store. The vermicelli is known in Japanese as 'Tomen'" [sic, Harusame] (neg. #43669).

Page 1065. "Natural sized picture [photo] of a sample of sugared soybeans (native name 'Sato Daidzu') and of a sample of roasted soybeans (native name 'Nori-mame' or daidzu) over which, during the last stage of roasting, finely cut [nori] seaweed is scattered. Both products are used as confections and are to be had at all confectionary stores" (neg. #43670).

Page 1067. "Natural sized picture of roasted soy beans imbedded in very small rice flour cakes. The skins of the beans are dyed green" (neg. #43672).

Pages 1201-02 (26 May 1929). While visiting the Hokkaido Agricultural Experiment Station at Kotoni, Sapporo, Mr. Morse notes: "The soybeans grown in Hokkaido are used entirely for food purposes, such as natto, bean curd, green vegetable bean, soy sauce, miso, bean paste and roasted beans." Address: Agricultural Explorers, USDA, Washington, DC.

2626. Dorsett, P.H.; Morse, W.J. 1929. Roasted soy flour in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 1058 (16 May 1929, Tokyo, Japan). "Nearly natural size picture [photo] of a package of soybean flour [kinako] purchased at the Matsuzakaya Department Store. Beside the package is a small sample of the flour which is known in Japanese as 'Kinako' meaning yellow flour. Before being made into flour the beans are roasted which gives an excellent nutty flavor. The flour is used extensively as a covering for rice cakes" [confections] (neg. #43663)."

Page 2669 to 2670 (16 Oct. 1929, Tokyo). "We were advised of a special soybean flour and confection made in Kumagaya [in Saitama prefecture, northeast of Tokyo]. We took time on our return to visit a factory making and selling the confection. The flour made from a special variety of soybean, 'Gokushin,' is roasted and is used to cover a small roll of puffed steamed rice. This product is called 'Gokabo' and is made in large quantities by two factories in Kumagaya. A sample of the roasted flour (D. & M. #1602) and two boxes of 'Gokabo' were obtained for the soybean exhibit."

Page 3514 (11 Jan. 1930). "Soja max. Soybean flour and rice confection. Cover and box of puffed sugared glutinous rice covered with a greenish roasted soybean flour paste, short cylinders, and rolled in the roasted soybean flour. Size of box top over all 7½ x 9 by 2½ inches deep (neg. #44749)."

Note 1. This is the earliest document seen (Nov. 2012) which contains the term "roasted soybean flour paste," or which states that roasted soybean flour is made into a paste.

Page 3517. "Soybean flour. These small paper packages covered with thin waxed paper, retail at about 10 sen each. These packages measured, tied 9 inches, untied 9½ inches in length. The flour is of a dull golden yellow color (neg. #44752)."

Page 3518. "Soybean flour and rice confection. Rolls of puffed sugared glutinous rice covered with roasted soybean flour paste or dough and then rolled in roasted soybean flour. Only made in Kusagaya. The round cylindrical packages measure 7½ inches in length. D. & M. #3094 (neg. #44753)."

Page 3691, 3702A (25 Jan. 1930, Shizuoka). "Soybean

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product #3741, Rice paste balls, white, sprinkled with brown roasted soybean flour. Package of sugar at left in which the balls are dipped... Native name 'Abekawa mochi.' Purchased at a confectionary store in Shizuoka, Japan, Jan. 24. (neg. #44848)."

Page 3702B. A package of "'Abekawa," commonly called 'rice dumplings" or soft rice paste. This is one of Shizuoka's noted products. Purchased in Shizuoka, Japan, Jan. 24, 1930 (neg. #44849)."

Page 3732 (31 Jan. 1930, Tokyo). "Adzuki bean cakes covered with green colored soybean flour. The box measured 4 by 7 inches. D. & M. #3760 (neg. #44864)."

Page 3821 (8 Feb. 1930). "Soybean flour purchased in a store in Yokohama, Japan, Feb. 7th, 1930. The native name is 'kinako.' It is used in sprinkling over adzuki bean paste. The size of the bags is 3½ inches by 5¼ inches. D. & M. #3789 (neg. #44897)."

Page 3870 (13 Feb. 1930). "Green soybean flour made from the 'Sakochin' variety of soybean. This variety is grown in the northern section and is used especially for making this flour. The flour is used in making soybean confections. Native name 'Kinnaki' [sic, kinako]. Purchased at Kumagaya, Japan. D. & M. #3811 (neg. #44904)."

Page 3876 and 3877 (13 Feb. 1930). "Round pieces of curled, roasted soybean flour paste separated by rice paste, also oblong pieces twisted. Also soybean and soybean flour. Purchased in Omiya, Japan. Native name is 'shigatami' D. & M. #3817-18 (neg. #44910). Page 3877 is a different of the objects on page 3876 (neg. #44911)."

Page 3889. "Small blocks of red adzuki bean sweet paste between thin layers of sweetened roasted soybean flour paste. Purchased in Tokyo, Japan, February 13, 1930. Native name is 'Ita mame.' D. & M. #3824 and 3825 are the same but with different sugar designs on them (neg. #44919)."

Note 2. This is the earliest document seen (Nov. 2012) that contains the term "Sweetened roasted soybean flour."

Page 3891. "Triangular pieces of red adzuki bean sweet paste between two layers of sweetened roasted soybean flour. Purchased at Tokyo, Japan, February 13, 1930. Native name is 'Wakamatsu.' They sell at 60 sen a pound. D. & M. #3831 (neg. #44920)."

Page 3891. "Small cylindrical pieces of rice dough covered with sesame seed. Within the rice dough is sweetened roasted soybean flour. The native name is 'Tomoshirama.' Purchased at Tokyo, Japan, February 13, 1930. They sell at 80 sen a pound. D. & M. #3832 (neg. #44921)."

Page 3892. "Small balls of sweetened roasted soybean flour paste pierced with small sticks [wooden skewers]. The balls are brown, tan and green. Purchased at Tokyo, Japan, February 13, 1930. Sell at 10 sen each. D. & M. #3847 (neg. #44922)."

Page 3893. "Soybean wafers (14 Feb. 1930). Sweet roasted soybean flour paste between thin layers of baked rice dough. Different designs burned on one side. Purchased at Tokyo, Japan, February 13, 1930. Sell at 70 sen a pound. D. & M. #3846 (neg. #44923)."

Note 3. This is the earliest document seen (Nov. 2012) that contains the term "Sweet roasted soybean flour."

Page 3894. "Soybean wafers. Sweet roasted soybean flour paste between thin layers of baked rice dough. Different designs burned on one side. Purchased at Tokyo, Japan, February 13, 1930. Sell at 70 sen a pound. D. & M. #3843 is 'Shikishi suwama' (neg. #44924)."

Page 3898. "Three bamboo sheath packages, each containing a slab of sweet roasted soybean flour paste. The native name of this is 'Suwama.' These packages sell for 15 sen each. Purchased at Tokyo, Japan, February 13, 1930. D. & M. #3830 (neg. #44928)."

Page 3946. "Thin wafers (similar to Nabisco) with layers of sweetened roasted soybean flour between two layers of rice flour. Purchased in a confectionary store in Tokyo, Japan, February 18, 1930. Price 8 for 10 sen. Native name 'Suwama.' The dish of soybeans measured 3 inches across (neg. #44945)."

Page 4036. "A nearby picture of small paste confection made of sweetened roasted green soybean flour, coated on sides with sugar frosting (white). Purchased at Tokyo, Japan, February 22, 1930. Native name "Hisago." Price two sen each (neg. #44981).

Note 4. This is the earliest document seen (Nov. 2012) that contains the term "roasted green soybean flour," or that describes "roasted soybean flour" which is green in color.

Page 4038. "Nearby picture of small confections made of sweetened roasted soybean flour (brown) between two thin layers of roasted rice flour (paste, white). Purchased at Tokyo, Japan, February 22, 1930. Native name 'Shiro zennai.' Price one sen each. Dishes measure 3 inches across (neg. #44983).

Pages 4039 and 4040. Very similar to the previous page but with a different arrangement (neg. #44984 and #44985).

Page 4041. "A nearby view of small cylindrical rolls of sweetened roasted green soybean flour, inside of which is a small core of red adzuki paste. Purchased in Tokyo, Japan, February 22, 1930. Native name 'Tamasudare.' Price 2 sen each (neg. #44986).

Page 4042. "A nearby picture of small cakes of rice flour, sugar and coarsely ground roasted soybeans. molded in forms of various masks. Purchased in Tokyo, Japan, February 22, 1930. Native name 'O-mea Rakugan.' Price 20 sen a pound. (neg. #44987).

Note 6. This is the earliest document seen (Aug. 2011) that contains the term "ground roasted soybeans" or the term "coarsely ground roasted soybeans." Thus there is a continuum in Japan from "roasted soybeans" (*irimame*) through "coarsely ground roasted soybeans" to "roasted soy flour" (*kinako*).

Page 4043 is very similar to the previous page but with

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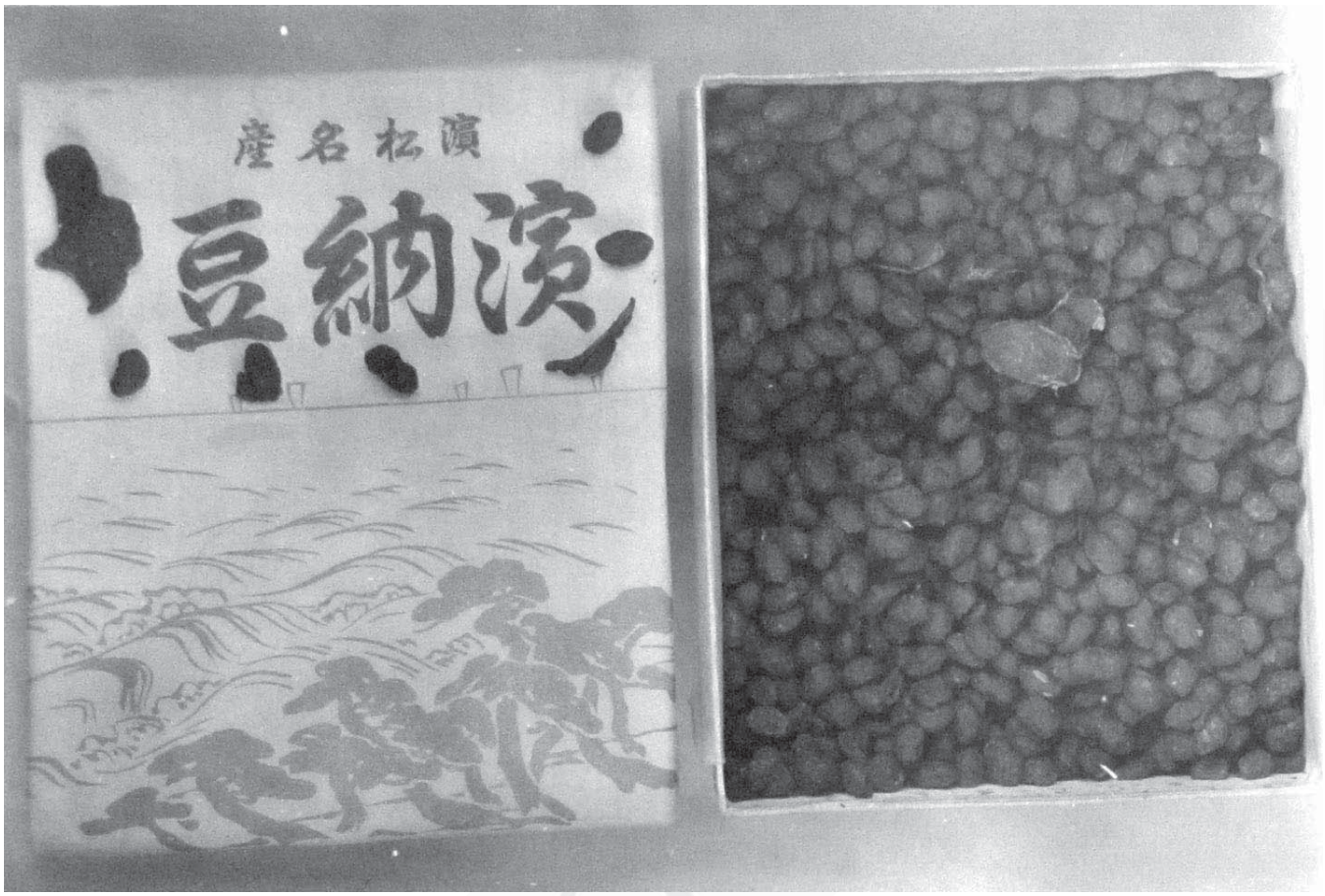

a different arrangement of the items (neg. #44988). Address: Agricultural Explorers, USDA, Washington, DC.

2627. Dorsett, P.H.; Morse, W.J. 1929. Hama Natto and Daitokuji Natto in Japan and salted soybeans in Peiping, China (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 1053 and 1055 (16 May 1929). Tokyo, Japan. A photo shows: "A little more than one-half sized picture of a box of Natto–native name 'Hama Natto.' It is made in the Hamamatsu District [Shizuoka Prefecture, central Japan]. It is known as dry natto. The beans are soft and of a flavor like dill pickles. The beans are eaten as a relish. D. & M. #246" (neg. #43660).

Note 1. This is the earliest English-language document seen (Nov. 2011) that contains the term "Hama Natto" (unhyphenated, regardless of capitalization); it refers to a type of traditional Japanese fermented black soybeans.

Pages 3229, 3230, and 3231 (10 Dec. 1929, Kyoto). Contains long lists of the vegetables and fruits seen in the Kyoto morning market. "We got two nice soybeans, one a fine large black one, the other as nice a yellow one as we've seen."

"We then went to a Natto manufacturing place near an old temple known as Daitokuji. Here we tried out a kind of natto [Daitokuji natto = fermented black soybeans] which we think might take with the American people, also miso, both are different from any we have previously seen. A detailed account of the manufacture of these products is to be found in our special report concerning the soybean and its products."

Note 2. This is the earliest document seen and the earliest English-language document seen (Nov. 2011) that mentions Daitokuji as a place that manufactures fermented black soybeans in Kyoto, Japan, near the old temple named Daitokuji. Daitokuji is a Rinzai Zen Buddhist temple in northern Kyoto. Here "Daitokuji natto" have long been made as both a seasoning in the vegan diet of the monks and as a well-known souvenir for tourists.

Page 3231. "We left Kyoto on the 10:14 p.m. train and are due to arrive in Tokyo about 9:00 a.m. tomorrow morning, Wednesday, December 11, 1929." Pages 3469 and 3483 (8 Jan. 1930). Tokyo, Japan. A photo shows: "Box of dried form of Natto sold under the name of 'Hama-natto.' Purchased at the railway station of Hamamatsu, Japan, December 11, 1929. This form is only made in the

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Hamamatsu district. Eaten as it is, when one drinks tea. Box 7½ inches long and 4¼ inches wide. D. & M. #3442" (neg. #44743).

Page 3484. "Box of soybean 'Natto' purchased from a Natto factory in Kyoto, Japan, December 10, 1929. Native name 'Tsubunatto' [Tsubu-natto; slightly crushed natto] or 'Daitokuji' Natto. This is a dried form of Natto, commonly known as 'Hamanatto,' and is only made in Kyoto and Hamamatsu, Japan. The name 'Daitokuji' Natto is taken from the Daitokuji Temple, of which a priest first made this product. Generally eaten when drinking tea. Box is 7 inches long and 4 inches wide D. & M. #3071" (neg. #44744).

Page 3486. Box of Natto, known as 'Hamanatto,' purchased at a small store in Tokyo, Japan, December 24, 1929. This is a dried form of Natto and is made in Hamamatsu, Japan. Hamanatto is eaten when one drinks tea. Box 6 inches wide; 7½ inches long. D. & M. #3073" (neg. #44746).

Page 6264 and 6274 (24 Oct. 1930). Peiping, China. P.H. Dorsett. A photo shows: "Soja max. Salted soybeans... Life sized pictures. Dry form, D. & M. #47531; moist form D. & M. #47530. Dry form consists of small flat black beans cured like string natto and then dried. Moist form, soybeans cured like string natto" (neg. #46124). Note 3. Natto (stringy natto) is unknown in modern China. The salted black soybeans may well be fermented black soybeans (fermented, salted black soybeans).

Page 6945 and 6946 (13 Jan. 1931). Kyoto, Japan. "Notes by Mr. W.J. Morse... We were taken to the Chemical Laboratory where Mr. Katagiri is doing some work on soybean products, especially soy sauce. Concentrated soy sauce is shipped to the United States in rather large amounts and then diluted and bottled. We were shown a sample of soyamint which is a practical soysauce product and made in about three months. It is said that the soybeans are treated with an acid solution, then neutralized and rice Koji added. After three months of curing, the soy sauce is ready for use.

Note 4. This is the earliest English-language document seen (April 2012) that contains the word "soysauce" (spelled as one word).

"After lunch we went to the Taitokuji [sic, Daitokuji] Temple where the famous Taitokuji Natto [sic, Daitokuji Natto] is said to have been originated by one of the Temple priests more than 400 years ago.

"Mr. Sekkai Ota, one of the temple priests, very kindly explained the history of the dried form of Natto as well as the whole process of its manufacture. This form of Natto will keep indefinitely and is eaten when sprinkled with a mustard sauce or sweet liqueur. The Hamamatsu Natto is made in the same manner but is allowed to dry more."

Page 6947 (13 Jan. 1931). Soybean Natto. Photo shows: "Group at the Kyoto Imperial College of Agriculture: Prof. Matsumoto, Prof. Kamikawa, W.J. Morse, U.S. Department of Agriculture, Washington, D.C. and Mr. Sekkai Ota, Priest of the Taitokuji [sic, Daitokuji] Temple at Mr. Morse's right, who explained the method of manufacture of Taitokuji [sic] Natto. A dried form of Natto originated at the Temple more than 400 years ago" (neg. #46446). Address: Agricultural Explorers, USDA, Washington, DC.

2628. Dorsett, P.H.; Morse, W.J. 1929. Soybean cultivation in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 1147-48 (22 May 1929, Tokyo). "Copied from Mr. Morse's diary:... At Ichinoseki we purchased from a lunch boy, some soybean products. This place is said to be a center of production of a large number of soybean food products. It is in the Iwate-ken prefecture which is second in soybean acreage and production in the Japanese Empire."

"This mountainous section soon gave way to a general farming region, more or less hilly, but extensively cultivated in soybeans, adsuki beans, rice, barley... The beans were planted in rows on ridges about 18 inches apart and after planting the ridges were packed by tramping as indicated by the close foot prints the entire length of the rows."

Page 1201-02 (Sunday, 26 May 1929). "Copied from Mr. Morse's diary: Sapporo, Japan. In the morning we went to the Hokkaido Agricultural Experiment Station at Kotoni, where we met Dr. Takatsugu Abiko, chief of the Agronomy and Horticultural Sections. He explained to us in detail, by maps, the different sections of Hokkaido where soybeans are grown extensively. He advised that most of the soybean experimental work is carried on at the Tokachi Branch Station, one of the northern stations.

"We were shown the exhibit of various crop products grown in Hokkaido, and also the seed of new varieties of crops developed by the Kotoni station. This station is working with about 50 varieties of soybeans, and has developed two large very fine looking yellow varieties. We were also shown samples of about 275 varieties being grown at the station. Dr. Abiko informed us that we can obtain seed of all these varieties after harvest this fall.

The principal insect enemy of the soybean, and one which does much damage to the mature seed in the field is the 'Mame shinkui ga' (moth into bean), a moth *Laspeyresia* (*grapholitha*) *glycinivorella.* It is a small moth, the larva of which cut into the mature bean. In general it causes about 10% loss to the Hokkaido soybean crop. The early plantings are injured about 40% while the late plantings are only injured about 10%.

"The principal soybean diseases which cause much damage to the crops, are a leafspot, *Peronospora manshurica* and a mosaic *Heterodera schachtii.*

"The soybeans grown in Hokkaido are used entirely

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for food purposes such as Natto, bean curd [tofu], green vegetable bean, soy sauce, miso, bean paste and roasted beans."

Page 1236-37 (28 May 1929). "After breakfast we made two rounds of seed stores and small grocery stores, and succeeded in obtaining several varieties of soybeans, garden beans, and more flower seed."

"We visited Sapporo's large department store seeking food products. Tokyo's large stores to us seem to have about everything under the sun, but today's store has everything. We found some new soybean products and quite a variety of other bean products."

Page 1692 A photo shows (negative #43941): "Inspecting soybeans which are about to be plowed or dug."

Page 1759 (30 June 1929). A photo shows (neg. #44008 and #44009) "In the vicinity of Shojiko. Turning under soybeans which are 10 to 12 inches in height in preparation for planting rice, the men and horse approaching the camera."

Page 1760. A photo shows (neg. #44010) "In the vicinity of Kofu, Japan. Cutting out the ripe barley and leaving the soybeans to be plowed under. Neg. #44011. "In the vicinity of Kofu, Japan. A nearby view of a Japanese woman harvesting barley and leaving the soybeans to be turned under in the preparation of the land for planting rice.

Page 1761 (neg. #44012). "In the vicinity of Kofu, Japan. Two Japanese women cutting barley and leaving soybeans to be plowed under in the preparation of the land for the planting of rice. Neg. #44013. "In the vicinity of Kofu, Japan. Two Japanese women planting soybeans on rice paddy ridges.

Page 1762 (neg. #44014). "In the vicinity of Kofu, Japan. A somewhat different view of the two Japanese girls planting soybeans. See picture #44013. Neg. #44015. "In the vicinity of Kofu, Japan. A farmer turning under wheat or barley straw and soybeans in preparation of the land for planting rice.

Page 1763 (neg. #44016). "In the vicinity of Kofu, Japan. A Japanese farmer hoeing in soybeans and wheat or barley straw preparatory to planting to rice in the near future.

Page 1762 (neg. #44014). Neg. #44017. "In the vicinity of Kofu, Japan. A Japanese farmer and helper, perhaps his wife, threshing grain with a foot power machine. See #44018.

Page 2183 (22 Aug. 1929) We "left for the Hokkaido Agricultural Experiment Station." We arrived at Kotoni, The Station is located within about 5 minutes walk of the train station. On arriving at the experiment station we met Mr. Tambo, the specialist in soybean investigations, who with the soybean expert and another man went with us over the station" which covers 108 acres. They are conducting a "very large varietal test of soybeans. The time spent thus from about 9:30 to after 2:00 p.m. was most interesting and instructive.

Page 2215 (26 Aug. 1929). "Went to the office this a.m. between 7 and 8 and attended to work there. At 10:00 a.m. we went over to the Hokkaido Imperial University to call on Dr. Ito relative to conditions at the various Hokkaido Experiment Stations and the best time for us to visit them to inspect the soybean planting to best advantage. We also submitted a list of plants in the Botanical Garden of which we would like to get seed or other plant propagating material.

Page 2417 (14 Sept. 1929). At 8:30 they "met Mr. Yutaka Tamayama, of the Hokkaido Agricultural Experiment Station, chief Director of the Kamikawa Branch Agricultural Experiment Station, and spent several hours talking with him about soybeans and other crops."

"We were much interested in the soybean work at the Station, but especially in the two non-hairy late forms growing there. Of one of these we secured a motion picture. We also got motion pictures and still picture shots showing soybeans growing on paddy ridges and of harvesting and racking rice for curing.

"We left Asahigawa at 5:39 p.m. and arrived at Sapporo at 10:27 p.m."

Page 2425 (neg. #44263). "Soybeans as they appear on the ridges of rice paddies in this region. This is a common practice of growing soybeans throughout many regions of Japan. Nagoya-mura, Japan."

Page 2445 to 2447 (19 Sept. 1929). "Between 8 and 9 this morning we walked out to the Tokachi Branch Agricultural Experiment Station. We met Mr. Seiji Kawase, the director, and Mr. Yoshio Fujine, the soybean expert, and spent a very pleasant forenoon with them in the reception room at the laboratory.

"We were informed that in Hokkaido there are about 1,000,000 cho of land suitable for cultivation and that of this amount 130,250 acres are actually under cultivation. Of the important agricultural crops grown, legumes are rated as 60%; grain (except rice) 17%; rice (paddy) 7%, root crops 6%; miscellaneous farm crops 11%. Of the legumes, field beans stand first, soybeans second and field peas third.

"The climatic and soil conditions of the Tokachi district or region are better adapted to soybean culture than other parts of Japan.

"Here a family of four handle by hand 38 acres of soybeans and other crops.

"The soybeans of the Tokachi region and elsewhere in Hokkaido are utilized almost entirely for export" [since Japan has huge soybean imports from Manchuria].

"Soybeans are of five grades and those which fall without the fifth grade are what is known as waste grade, and are used locally for stock feed. These five grades are for commercial handling. Beans for special purposes such as for soy sauce, miso, etc., are of special grades and not necessarily of the ones noted.

"After the beans are cut they are permitted to lay on the ground for about ten days before being taken in to be

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threshed. Soybeans are, as a rule, flailed or beaten out. The beans are cut when fully ripe but just before the seed shatters. Harvesting usually begins about September 15th and may continue until about October 15th.

"Beans are planted in shallow furrows, 17 to 18 inches apart in the rows and covered with the feet.

"There are two cultivations during the season, the first about June 2nd, and the second about the middle of July. Hand hoeing and horse cultivation are employed, depending upon conditions.

"Acid phosphate is used (when used) at the rate of about 30 to 40 pounds per quarter of an acre once every three or four years.

"Farmers receive six yen per hundred pounds for their soybean seed.

"The beans are sold to merchants or are handled through agricultural societies and of the 1,837,325 bushels of soybeans produced in Hokkaido 58% is exported and 42% consumed at home [in Japan].

"The domestic use of the non-export beans is as follows: for Miso 9%; soy sauce 9%; seeding 6%; tofu and other products 18%." "Soybean production of Japan in 1923 amounted to 3,433,908 koku, which is equivalent to about 17,000,000 bushels.

"The following table gives the percent of this production within the noted regions: Hokkaido 17%; Miyagi 9%; Ibaragi 5%; Saitama 5%; Nagano 4%; Kumamoto 4%; Aomori 4%; Niigata 4%; Chiba 4%; Fukushima 3%; Nagasaki 3%; all others 28%.

"Soybeans are stored in bags in storage ware houses. Nine varieties are grown commercially in the Obihiro region [of Hokkaido]. These are in two colors, black and yellow. Of the black varieties, they have the Early black, Midseason black (cheese [tofu]) and Black. Of the yellow they have, Ayachi, Ishikarishiro, white; small white bean; Akazaya, red pod; Yoshioka, large; Kanro, sweet dew.

"Soybeans in Hokkaido are troubled more or less with several leaf diseases and at least one insect, the pod borer moth. Sometimes the pod moth injury amounts to 40%.

"The Experiment Station has a collection of 240 varieties on which they are working." Continued. Address: Agricultural Explorers, USDA, Washington, DC.

2629. Dorsett, P.H.; Morse, W.J. 1929. Natto, and soybean cultivation in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.
• ***Summary:*** Page 1179 and 1180 (25 May 1929). Sapporo, Japan. "Copied from Mr. Morse's diary:..." "After our visit with Dr. Ito we went to the Natto Laboratory of which Dr. [Jun] Hanzawa is in charge. We were given bulletins regarding the history, making and varieties of Natto, and served bottles of different sizes of Nattokin [Natto bacteria] (liquid pure culture) for the making of different kinds of Natto. We were then shown the various forms of Natto and taken through the various rooms and given detailed information on the various steps involved in the production of natto."

Page 1202 (26 May 1929). Sapporo, Japan. Mr. Morse visited the Hokkaido Agricultural Experiment Station at Kotoni. Mr. Takatsugo Abiko explained that "The soybeans grown in Hokkaido are used entirely for food purposes such as Natto, bean curd, green vegetable bean, soy sauce, miso, bean paste and roasted beans."

Pages 2003 and 2004 (29 July 1929). "I (Dorsett) worked at the office changing herbarium specimen, packing plant material and writing official letters. Mr. Suyetake and Mr. Morse went to look over the section near Tokyo where soybeans are quite extensively grown as a grain crop."

A letter from Mr. Ryerson dated 3 June 1929 noted that at least some of the colored motion pictures were good. "He wrote as follows: 'The last material received from Vitacolor was a great improvement. The azalea scenes were gorgeous.'"

"We were deeply grieved to note in the same letter the following paragraph concerning Dr. Galloway: 'Dr. Galloway has had to give up and go home. He will be leaving for a cooler section within a week. His nerves have gone back on him and he is facing the same siege that he had 10 years ago, much to the regret of all of us.'"

Mr. Morse added: "A visit was first made to the Saitama Experiment Station located at Urawa, Saitama Prefecture. We met here Mr. Tadashi Hashigawa, Agricultural Engineer, who is in charge of the soybean work of the Saitama Prefecture, which is the third in acreage of soybeans in the Japanese Empire. The work with soybeans consists mainly of developing varieties for seed to be used in making soy sauce, tofu, miso, and natto. This station is growing about 50 varieties nearly all yellow-seeded sorts with seed of medium size. In looking over these varieties in the trial grounds we found some very excellent varieties that no doubt will have value in the United States from southern Virginia southward. Especially North Carolina, Tennessee, and the upper delta of Mississippi. Mr. Hashigawa promised to send us samples of seed of all the varieties being grown at the station."

"We were told by Mr. Hashigawa that soybeans were grown very extensively about Kumagaya to which place we went. We found, however, that soybeans were not grown very extensively about Kumagaya. Soybeans had given way to mulberry plantings. The reason given by the farmers was that the continuous growing of soy beans made the soil to rich. About half way between Kumagaya and Fukiage [in Saitama Prefecture] soybean plantings were very extensive and extended well past Fukiage. This will be an excellent place to come a get [film] harvesting scenes in the fall. By

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getting off at Fukiage the best observations can be made. At the present time the plants are just in bloom and it will be at least October before the beans are ready for harvest." At the Imperial Government rice station at Kokosu they are "doing some work with soybean varieties for green manure, and it will be possible to obtain varieties."

Page 3341 (24 Dec. 1929). "Today Morse and Suyetake went to call upon soy sauce and natto manufacturers for the purpose of getting acquainted and also if possible arrange for getting still and motion pictures of their plants, equipment and operations."

Page 3479 (8 Jan. 1930). Tokyo, Japan. *Soja max.* soybean. Photo of: "Three specimens of 'String Natto' [itohiki natto], one package (made of rice straw) unopened; one opened; and the natto without the package. These were purchased at a Natto factory, Tokyo, Jan. 6, 1930. The [rice-straw] packages are 15 inches long and 2½ inches wide. String natto is eaten after having mixed it with a mustard paste" (neg. #44739).

Note: This is the earliest English-language document seen (Jan. 2012) that uses the term "String Natto" to refer to natto or *itohiki natto,* or that uses the word "string" in connection with natto.

Pages 3925, 3929 (18 Feb. 1930). "It is one year ago today since we left Washington for Japan... We have found much of interest in connection with our special line of work, much more even than we expected, and therefore the time has passed all too quickly..."

"Morse and Suyetake searched for soybean products today, and were successful in bringing in a collection of two dozen things slightly or entirely different from those previously secured."

Page 3929. Photo shows: "Small triangular packages, one as purchased, the other unwrapped. They contain string Natto. The native name is 'Hygienic Miyako Natto.' There is at one side a small triangular paper containing dried mustard; this is inclosed [sic] with the Natto. Purchased in Tokyo, Feb. 16, 1930. Soybean dish measures 3 inches across" (neg. #44937).

Pages 6822-23 (22 Dec. 1930). Kyoto, Japan. Mr. Morse's notes. At the Imperial Agricultural College they met Isawo Namikawa, Professor of Horticulture, who said that Kyoto is noted for several special soy products such as white miso, soy sauce, and natto.

Page 6937 (10 Jan. 1931). Tokyo. Notes by Mr. Morse. Spent most of the day in the Shinjuku district looking up soybean products. "More String Natto in rice straw packages was observed in this section than any we have visited." Address: Agricultural Explorers, USDA, Washington, DC.

2630. Fukai, Tôshi. 1929. Shôyu hakkô to shiyu no kankei. I. Shôyu abura ni ganyû serareruru shibô-san echiiru esutaa narabini yûri shibô-san ni tsuite [On the relation of fat and brewing shoyu. I. On the ethylester of fatty acid and free fatty acid in shoyu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 5(5):458-70. May. [7 ref. Jap]
Address: Jozo Shikensho.

2631. Morse, W.J. 1929. Japan travel notes, April 5 to May 17. Handwritten manuscript. 27 p. Unpublished manuscript.
• ***Summary:*** Morse wrote these notes by hand in ink, early in the trip to East Asia, in a personal unlined notebook that was about 9 cm (3.62 inches) wide and 14.5 cm (5.75 inches) high. Most of the pages are unnumbered, no date or place is given for many of the entries, and the handwriting is occasionally faded or hard to read.

The purpose of this notebook and how Morse used it is unclear. These may have been his field notes that he used each evening as the basis for his official typewritten USDA trip report. Or was this a personal diary in which he kept personal observations that would not become part of the official report? This seems less likely.

This is apparently the first notebook in a series of many that Morse wrote. He kept the notebook after the trip and in April 1986 his daughter, Mrs. Walter A. Thalman (22 Interlaken Dr., Eastchester, New York 10709), who kindly photocopied it for Soyfoods Center.

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Here are some quotations: "After a few minutes, we were served tea and cigarettes. Dr. Anda told us where the soybean work is being conducted. The soybeans are grown mostly in northeastern Japan, and specially on the island of Hokkaido where considerable breeding work is being done. At the Imperial Station in Tokyo, much chemical work is being done in the study of the manufacture of shoyu sauce and miso.

"After a visit to the Exper. Station we went to Ueno Park to visit and look over the cherry trees. The trees are in bud and should be in full bloom in about one week. Many of the trees are very large and quite old."

Food show: The International Food Show was being held in the large building in the park [Ueno]. A small admission fee was charged. The show lasts from April...

"Soybean products: The manufacture of shoyu or soy sauce was shown in several different booths. In one booth, samples of soy sauce made by the various soy manufacturers was shown in various sized bottles and kegs. In another booth, the ingredients used and the method of manufacture were shown. Large yellow soybeans were shown, a bottle of wheat, a bottle or jar of the rice ferment [sic, wheat ferment, koji], the product consisting of roasted wheat, cooked soybeans, after addition of the ferment. Then a jar of the product after the addition of salt and water, and curing for a certain length of time [shoyu moromi]. Then a jar of the sauce was shown which was pressed out of the preceding jar. The cake or ___ which was left after pressing out the liquid was shown.

"Tofu or bean curd: The different materials used in the manufacture of bean curd were shown. 1st were shown a bushel tub of large yellow soybeans (sample sent to Washington as coming from the national food show). 2nd was shown the beans soaking in water. 3rd was shown the bean milk. 4th was shown a jar of magnesium sulfate water used in precipitating the protein of the tofu milk (as it is called in Japan)... salts in precipitating the protein. Then were shown the blocks of tofu or bean curd. Many kinds of bean curd are made, depending on the amount of pressing. The soaking of beans in warm water or longer soaking in cold water. The amount of the water added in making the bean milk. Tofu is not made in large factories, but in small factories or stores scattered throughout the city. Small dealers or hucksters with the two tubs one at each end of a pole slung over their shoulder. Tofu (blocks) are in these tubs and the huckster has his route passing along blowing a horn which has a peculiar sound. He also passes back in alleys to his customers, leaving his tubs on the street. He cuts off from the slabs of bean curd whatever amount his customer desires."

"Buddha's Birthday. Hibiya Park, Tokyo. April 8, 1929." "... it is quite generally agreed that the Buddha was born in the sixth century B.C. The birthday is known as Hanamatsuri or Floral Festival..." Address: USDA, Washington, DC.

2632. Takata, Ryôhei. 1929. Miso jôzô no eiyogaku-teki kôsatsu. VI. Daizu no shisuchin ganyû teido [Nutritional observations on miso fermentation. VI. Cystine content of soybean]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 32(4):495-97. May. [2 ref. Jap]
• ***Summary:*** Nutritional experiments with rats. Address: Naimusho Eiyo Kenkyusho, Kako Shokuhin Kenkyushitsu, Japan.

2633. Pieters, A.J. 1929. Re: Ryerson, money for fiscal year running low, Dorsett a big spender. Letter to Mr. W.J. Morse, c/o American Consulate, Tokyo, Japan, June 8. 2 p. Typed, without signature (carbon copy).
• ***Summary:*** "Mr. Ryerson as just been up to see me in the matter of your needs for the balance of this fiscal year. We didn't expect to be called on for any more funds but, fortunately, we are able to help Mr. Ryerson out to some extent." "... to the extent of three or four hundred dollars, which I hope will enable you folks to get along until the end of the fiscal year. I gather from Mr. Dorsett's letter than you need $500 and could use $800... it is imperative that we provide against the very likely event of your authorization's being overdrawn at the end of the fiscal year."

"... Dorsett is notoriously a heavy spender. It's hard to hold him down."

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 93–Morse-Napier. Folder–Morse, W.J.-#4 F.C.I.

Sent to Soyfoods Center by Jacob Jones of Purdue Univ., Aug. 1998. Address: Senior Agronomist, USDA, Washington, DC.

2634. Seattle (Washington) passenger and crew lists, 1882-1957. Immigration and emigration: Saizo Ota. 1929.
• ***Summary:*** Name of passenger: Saizo Ota. Birth: 1881–Japan. Departure: 11 June 1913–Yokohama, Japan. Arrival: 4 Nov. 1929–Seattle, Washington.

2635. *Chemist and Druggist* (*London*). 1929. The soya bean industry. An exhaustive survey dealing with the cultivation, production and commerce of the soya bean and its oil, cake meal and its applications to manufactured products. 110(26):839-42. June 29. Special issue.
• ***Summary:*** Contents: Introduction. Brief history of soya bean exports from Manchuria to Europe. Soybean production and crushing in Manchuria. The South Manchuria Railway Co. (SMR). Current exports from Manchuria. The soya bean plant and its cultivation in Manchuria and Hokkaido, Japan. Chemical composition of the beans. Station Anda on the SMR. The soya bean industry in Dairen. The growth of soya bean consumption worldwide. Soya bean trade of the United

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Kingdom and the United States. Soya bean production in the USA. The uses of soya, both food and industrial.

Photos show: (1) Soya beans transported in the interior of Manchuria in carts pulled by mules or horses. (2) Railway transport of bean cakes. (3) Oil pressing using hand-turned screw mills. (4) Hydraulic oil pressing. (5) Many paper lined bamboo baskets for carrying soya oil.

Tables show: (1) Composition of soya cake, cotton cake, and linseed cake (which contains more protein than soya cake). (2) U.K. imports (1916-1922) of soya beans and soya oil, and exports of soya oil. (3) U.K. imports of soya beans (1923-1927) from Russia (actually Vladivostok, China, Japan, and other foreign countries). (4) U.K. imports of soya bean oil (1923-1927) from Russia, Holland, China (#2), Japan (#1), USA, other. (5) Imports of soya beans (1926-1928) by Germany (#1), Holland, Denmark (#2), Sweden, Italy, Belgium, France. (6) Imports of soya bean oil (1926-1928) by Germany, Holland (#1), Denmark, Sweden, Italy (#2), Belgium, France. (7) Imports of soya-bean oil, soya-bean cake, and soya beans (1925-1928) into the USA. (8) U.S. production (crude or refined, consumption, imports and exports of soya bean oil). Address: UK.

2636. Sasaki, T. 1929. Hatsuga no kenkyû. II. Daizu no anshitsu ni oite hatsuga suru sai ni shôzuru denpun ni tsuite [Chemico-physical study on germination. II. On the starch produced in soybean germinated in dark room]. *Bulletin of the Agricultural Chemical Society of Japan* 5(6):491-97. June. Bound in the back of Nippon Nogei Kagaku Kaishi (J. of the Agricultural Chemical Society of Japan). [12 ref. Jap] Address: Nôgaku-shi, Japan.

2637. Sato, Masanori; Ito, Chiyomatsu. Assignors to Minami Manshu Tetsudo K.K. (South Manchuria Railway Co.) (Dairen, Manchuria, China). 1929. Extraction of oil, etc., from soy-beans. *British Patent* 336,273. June 10. (Chem. Abst. 25:2016). *

• ***Summary:*** Extraction with a solvent such as ethanol is done at a temperature above the boiling point of the solvent (preferably at about 85ºC) but below 120ºC. The mixture of solvent and oil [miscella] is drawn off and cooled to below 50ºC to separate the oil and obtain a liquid residue containing lecithin, coloring matter, and sugars. Address: Dairen, China.

2638. Sato, Masanori; Ishida, Y. Assignors to Minami Manshu Tetsudo K.K. (South Manchuria Railway Co.) (Dairen, Manchuria, China). 1929. Extraction of oil, etc., from soy-beans. *British Patent* 336,274. (Chem. Abst. 25:2016). *

• ***Summary:*** The oil from soybeans can be extracted with a solvent such as alcohol mixed with benzine or benzene of such concentration and quantity that the water in the resulting liquor is less than 10%. The extraction temperature is above 65ºC and the oil is separated by cooling. Address: Dairen, China.

2639. Dorsett, P.H.; Morse, W.J. 1929. Soybean oil and cake in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Pages 1899-1900 (17 July 1929). At a fertilizer exhibit the authors see: "Herring fish bone meal, German phosphate, ammonium sulfate, soybean oil cake, mustard seed oil cake, flaxseed cake. The oil cakes ground into meal are used almost entirely for fertilizing rice. For soybeans liquid night soil and raw ammonium phosphate are used" [as fertilizer].

They also see perilla spikes (small bundles which are used for garnishing), perilla plants with purple foliage (10 bundles, which are used for dyeing pickled plums [umeboshi], ginger, etc.) and perilla plants (white; which are used for pickling and as greens).

Pages 2278 to 2280 (31 Aug. 1929). The authors visit the Otoguro Oil Company in Garugawa, Japan. This small oil mill makes Brassica oil (from *Brassica japonica*), mustard seed oil and sesame oil. They pack and sell soybean oil from a supply secured in Manchuria. It "is apparent that Japanese grown soybeans are much too valuable as human food and green manure to be used for oil production. Soybean oil is considered more or less a by-product with the oil cake the more important product. The oil is imported from Manchuria by Japanese firms having oil mills in the leased territory or by oil firms distributing various kinds of oils. The oil is refined, put up in different types of glass or tin containers, branded with the firm's trade mark, and distributed to various parts of the Japanese empire. The Nisshin Oil Company, Tokyo, Japan, has branches throughout Japan, and even a branch in Seattle, Washington, U.S.A. This firm places on the market a pure soybean salad oil." Address: Agricultural Explorers, USDA, Washington, DC.

2640. Dorsett, P.H.; Morse, W.J. 1929. Tofu in Tokyo, Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 1929 (19 July 1929). Tokyo, Japan. A photo shows: "A soybean curd man with his two wooden tubs of soybean curd, which he is peddling from house to house in the rural district of Tokyo." He is walking along a road with a row of tall trees to the left (neg. #44094).

Page 1929. "The same man shown in picture #44094

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placing a piece of bean curd which he has just sold, into a vessel of water. We have a motion picture of this" (neg. #44095).

Page 2335-37 (4 Sept. 1929). Tokyo. "We were out this morning at 4:00 a.m. and visited a tofu and soybean curd factory. We spent a most interesting 2½ hours observing the various operations. The soybeans are put to soak about 5:00 p.m. the day before they are to be used, and about 4:00 a.m. the" next day "they are ground. This is accomplished by means of a special apparatus which grinds the beans very fine while a small stream of water is running on the beans in the chopper.

"It looks as though they grind about half a bushel of beans for each batch of curd. After grinding it is put into a large open kettle and brought to a foaming boil. The foaming mass is stirred down several times. In one of the foaming processes a small amount of mustard [rapeseed] oil and some kind of flour (we were unable to learn what kind) is sprinkled over the foaming mass and while foaming, about two gallons of water (cold) is added to the mixture. It is then strained through a bolting cloth sack into another receptacle in which there is two bolting cloth bags. A rather light pressure is

applied to the first bag of solid matter and after it is drained for a time, 15 or 20 minutes, the solid portion is put back into the kettle, a little water is added, and it is again put into the bolting cloth bag and the liquid portion pressed out into the other two bolting cloth bags.

"The solid portion is then put to one side and later utilized in other food products or for cattle feeding period."

Page 2336. "To the white liquid bean milk, which by the way is pretty good, about a gallon and a half of water, to which has been added a solution–we could not learn the proportions because of its being a trade secret–three cups, we should say (guessing) about a quart of a solution of sulphate of magnesia [sic, magnesium, i.e., magnesium sulphate] is added to the soybean milk. The solution is added slowly and well distributed through the hot bean milk. By rule of thumb the operator tests with his ladle the coagulation of the milk and just before it is finished he adds about a teacup of the sulphate of magnesia solution to the mixture. He then places a bamboo or wicker basket in the tub and dips off all the liquid (whey) that he can.

"Nearby, which has been previously fixed, is a false bottom box about 12 inches wide, 24 inches long, and 6 inches deep. There is an addition [wooden frame] of about 2 inches added to [the height of] the first box and over the whole a piece of bolting cloth is placed. The curd in the large tub is carefully transferred by means of a ladle from the tub to the box, which is large enough to hold the batch. The liquid is gradually pressed out by rather light weight and in a short time the 2 inches added height to the box is taken away. The bolting cloth is then laid back and with a flat broad knife the rough edge around the sides and ends are sliced off and placed in a row along the center. The cloth is then folded back smoothly and a board and weights are placed on the box of curd. In about half an hour this box of curd is cut through into squares something like 6 inch bricks.

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The box and contents is lifted off and placed upside down in cool water. It is readily slipped out of the box and the bolting cloth is removed. These blocks of curd [tofu] can then be disposed of as is or can be cut into still smaller squares.

"Another operation in this establishment is the frying of the curd.

"We watched them cut 1- by 6- by 6-inch blocks up for frying in deep fat (Mustard oil). Some of the 1 by 6 by 6 inches were cut into three pieces each about 1 by 2 by 6 inches and these in turn were split in two to make two pieces each about ¼-inch by 2 by 6 inches. Other 1 by 6 by 6-inch pieces were cut into squares about 1 by 2 by 2 inches and these were split. They used two frying kettles and transferred the curd from the first to the second, cooking it about half done in the first and completing the cooking in the second.

We tried some of this hot tofu (curd) with a little soy sauce and found it quite good.

"This concern works up five bushels of soybeans daily into curd and tofu.

"About 6:30 a.m. we went out to 23rd street and walked through the farmers open market."

Page 2371 (8 Sept. 1929). Tokyo. "Soybean harvest in Hokkaido is supposed to begin about September 15th so from now on we plan to spend the greater part of our remaining time in this region, in the field..." We leave tomorrow morning and "expect to be away about a week."

Page 2693-95 (18 Oct. 1929). Left Ueno station in Tokyo en route to Kagemori in the mountains, where we hope to see soybeans and get motion and still pictures of their harvesting in that region. We arrived at Kagemori at 10:45 and conferred with the village committee who advised that we were about two weeks too early to see the harvesting of soybeans."

Page 2695. Two photos show: "Mr. Masoi, a Japanese bean curd man, slicing and laying bean curd on a bamboo rack for pressing." Kagemori (neg. #44392 and #44393).

Page 2696. Photos: (1) A Japanese farmer bending over in a field, pulling up soybean plants. "This is the way they are harvested in this region, and putting them in small piles, roots up." (2) The same man "has just finished setting up a small shock of soybeans and is on his way to pull up more" (negs. #44394-95). Address: Agricultural Explorers, USDA, Washington, DC.

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2641. Matsumoto, Kenji. 1929. Shôyu jôzô ni kansuru saikin-rui ni tsuite [On the bacteria in shoyu brewing]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 24(7):27-33. July; 24(8):5-9. Aug.; 24(9):13-18. Sept.; 24(10):18-24. Oct.; 24(11):25-31. Nov.; 24(12):11-19. Dec. [Jap]
Address: Jozo Shikensho Gishi, Japan.

2642. Suzuki, Bunsuke. 1929. On the separation of glycerides. VI-IX [Linseed oil, soy bean oil, whale oil, herring oil]. *Proceedings of the Imperial Academy* (*Tokyo*) 5(7):265-68. [Eng]
• ***Summary:*** Lists bromides produced when linseed, soya-bean, and whale oils are brominated in light petroleum, and the soluble bromo-glycerides are separated by fractional precipitation with alcoholic calcium chloride solutions of increasing concentrations. The compounds listed for soya-bean oil are bromides of linoleo-diolein, freezing point 5ºC; and oleo-dilinolenin bromide, freezing point 6ºC. Address: Biochemical Lab., Faculty of Agriculture, Kyoto Imperial Univ., Japan.

2643. Takata, Ryôhei. 1929. Miso no kaihatsu-sei seibun [On the volatile substances in miso]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 32(7):628-29. July. [Jap]
Address: Naimusho Eiyo Kenkyusho, Kako Shokuhin Kenkyushitsu, Japan (Kôgaku-shi).

2644. Pieters, A.J. 1929. Re: Finances. Kudzu. Letter to Mr. W.J. Morse, c/o American Consulate, Tokyo, Japan, Aug. 14. 3 p. Typed, without signature (carbon copy).
• ***Summary:*** The money for this trip is coming from Foreign Plant Introduction. It is very important to stay within budget. If the occasion comes up, you might suggest to Dorsett "that some of things he sent in are absolutely useless to us and have been had a number of times before."

"I have just had a call from Dr. L.W. Fort, Great Falls, South Carolina. Dr. Fort is enthusiastic about Kudzu and he wants to find some seed in quantity. He advises me that last year a Eugene Ashcraft of Monroe, South Carolina, imported about fourteen hundred pounds and sold it out at about four dollars a pound." Please "advise us what firms handle Kudzu seed and how much they charge" for several hundred pounds.

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 93–Morse-Napier. Folder–Morse, W.J.-#4 F.C.I.

Sent to Soyfoods Center by Jacob Jones of Purdue Univ., Aug. 1998. Address: Senior Agronomist, USDA, Washington, DC.

2645. *Times* (*London*). 1929. Japanese wrestling: Sumo and its champions. Aug. 29. p. 14, col. 4.
• ***Summary:*** From a correspondent. "In professional wrestling all the wrestlers engaged in any particular contest belong to one or other of the great wrestling companies or schools. In addition to fees, these schools are financed by generous admirers, and even during a match there are frequent interruptions while it is announced that this or that patron has given to a favorite giant or to the school in general, say, 10 bottles of *saké,* five sacks of rice, a barrel of *Shoyu* sauce, a few legs of pork,..."

2646. Dorsett, P.H.; Morse, W.J. 1929. Plans for further exploration (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.
• ***Summary:*** Pages 2273-75 (30 Aug. 1929) "In view of the number of soybeans we have already collected and the large number which we have been promised by Japanese Experiment Stations this fall, as well as the very rapid increase of the soybean industry in the United States, Morse does not feel that it will be advisable or possible for him to remain in the field away from his work at Washington [DC] for more than two years. Dorsett does not have any special work which needs his attention at Washington and can remain in the Orient for another year or two if that appears necessary or desirable by those in authority at Washington.

"We are considering the following two plans of operation for the remainder of the time Morse feels that he can spend in the foreign field.

"1. Complete the work in Hokkaido which will possible require a month or six weeks longer then return to Tokyo and as soon thereafter as practicable make a trip into Chosen (Korea), and do what we can there within a week or ten days. Return to Tokyo and complete operations there by not later than December 15th or January first, 1930. Then leave for Formosa (Taiwan) and spend the remainder of the winter there. In early spring, April or not later than May 15th, proceed to Dairen and our headquarters there for the remainder of the time Morse can remain in the Orient. From Dairen work southern Manchuria and as far north as Mukden [now Shenyang], even making a short trip up to Harbin and vicinity. Also go from Dairen into Chosen during the spring or summer season and in the fall or early winter of 1930 get over to Peking to clean up the work of soybean milk production and other soybean products, in time for Morse and Dorsett too, if it is deemed advisable, to leave for America so that they will reach there in time for Morse to take up his spring work with soybeans.

#2. Complete our work here within the next six weeks or two months if possible. At any rate return to Tokyo as soon

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this fall as the work here is completed. Then at the earliest possible opportunity get over to Chosen (Korea) and do what we can there this fall, Return to Tokyo and complete our work there with soybean products, making when practicable excursions of a week or so into other parts of Japan for the purpose of picking up information and seed and pictures where possible or persimmons, green manure and cover crops as well as other features of Japanese horticulture.

"In early spring move headquarters to Dairen and work South Manchuria and the central portion as far north as Mukden and Chen Chung [Changchun], the region which was not worked by the Dorsetts in 1925-26. Chosen (Korea) might also be given additional attention throughout the summer and fall as opportunity permits. Dairen is perhaps the best place in the Orient to data if all kinds on soybean storage, handling, and by-products. Complete this work then get over into Peking to work up soybean products, especially soybean milk production. In the early winter go to Taiwan and work that region until Morse feels its time for him to leave for the states. If it is deemed advisable, Dorsett can return then or he could remain and finish up the work in Taiwan (Formosa) in case that was not done before Morse left. He could get in touch with McClure at Canton, which is nearby Canton, and together they might handle the *Placanea cornea,* edible Chinese acorn, and Tonkin cane proposition. Dorsett could then go to Java and look after the soybean and green manure and cover crop work..." Address: Agricultural Explorers, USDA, Washington, DC.

2647. Morse, W.J. 1929. Letter from Dr. [sic] Morse. Tokyo, Japan, July 20, 1929. *Proceedings of the American Soybean Association* 2:50-52. Tenth annual field meeting. Held 22-23 Aug. at Guelph, Ontario, Canada.

• ***Summary:*** This letter from W.J. Morse was read before the 1929 convention of the American Soybean Association at Guelph, Ontario, Canada. This is the first annual ASA meeting he has missed. He begins with a brief description of the "Oriental Agricultural Exploration Expedition" headed by Mr. P.H. Dorsett and himself. They plan to study soybeans in Japan first. "The largest soybean section is the Island of Hokkaido which has an acreage of 215,212 [planted to soybeans] and produces 3,184,245 bushels of beans" [yield = 14.8 bushels/acre].

"On our arrival and after establishing headquarters in Tokyo, we first began to look up varieties which we might send back to the United States for the 1929 planting. We succeeded in packing up about 100 lots which are now growing in the variety plots at Arlington Farm [Virginia]. In hunting out this seed, we were very much surprised to find the soybeans listed with the garden beans and as garden beans. For the most part these are grown as green vegetable beans. These sorts are black, brown, greenish yellow, and yellow seeded varieties of early, medium, and late types. Some of the yellow seeded varieties are listed as most suitable for bean curd, soy sauce, miso, natto, and confectionery purposes, such as sweet bean paste, candied beans, roasted beans (like our peanuts), and sugared beans."

Note 1. Azuki beans, rather than soybeans, are usually used to make "sweet bean paste" in Japan.

"It is amazing, the extent to which the soybean is used for food in Japan. Whether or not it can be used in the United States in all of the ways used here is extremely doubtful, that is for human food." There is no doubt that American soybeans will be used mostly to produce oil and oil meal. "It may interest you to know that the beans produced in Japan are used entirely for human food, green manure, and planting purposes. The grain varieties have seed of higher quality than those produced in Manchuria and are not used for oil and oil meal production as [are] the beans of Manchuria. The great soybean oil and meal production of the Orient is confined almost entirely to Manchuria.

"Another thing which surprised us greatly was the extent to which soybeans are used for green manure purposes in the rice paddies." The plants are turned under in the mud after water has been run into the paddies.

"Another extensive use of the soybean is for bean curd, or tofu, which is manufactured only... in small shops scattered about the cities and country villages. This curd is used in many ways, being the meat of the poorer classes. It is used, however, quite generally in making bean-curd soup [miso soup with tofu] which is sometimes served at breakfast and nearly always at supper. The bean curd is peddled about from house to house by men with two tubs suspended from a bamboo pole over their shoulders. The sound of the little horn of the bean curd man as he announces his coming has become quite a familiar sound to our ears as we go along the streets or hear him pass under our office windows.

"Soy sauce is manufactured on a very large scale and is universally used by the Japanese, rich and poor. We have had the pleasure of visiting the large experimental laboratory of an experiment station given wholly to soy sauce and saké experiments. In Hokkaido we visited a soy sauce factory, the buildings of which covered several acres. In one of the curing vat buildings where the mash is allowed to cure for about 18 months, we counted ninety large vats.

"Soybeans are used to a very considerable extent for confectionery purposes. The large black, brown, and green seeded varieties are used in making sweet bean paste which is put up in small thin slabs and then done up in very attractive packages. Roasted beans, similar to our roasted peanuts, may be found at nearly all confectionery stores. Roasted beans are also sugar coated and others are sprinkled with small pieces of sea-weed during the roasting, which gives an appearance of mottled beans (rather a familiar sight to our mid-west farmers). Then, there are the candied beans, that is, beans which have been boiled in syrup.

"Miso and natto are two forms of bean foods in which the beans are first cooked and then treated with certain

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bacteria [sic, microorganisms]. Miso is used largely in soups which are consumed at breakfast. Both of these foods are quite largely used.

"Other products used for food are roasted soybean flour, soybean vermicelli, pickled green beans in the pod, yuba–the film produced by boiling soybean milk, and dried frozen bean curd."

Note 2. This is the earliest English-language document seen (April 2013) that uses the term "dried frozen bean curd" to refer to dried-frozen tofu.

Note 3. This is the earliest English-language document seen (Nov. 2012) that contains the term "roasted soybean flour."

"Another surprising thing is the very extensive use of the soybean as a green vegetable bean. As early as May, small bundles of plants with full grown pods were seen on the market. At the present time the market is virtually flooded with bundles of plants with full grown pods, the seeds of which are also full grown. The pods are boiled in salt water and the beans eaten from the pods.

"During the past two weeks we have visited large sections near Tokyo where soybeans are grown for green vegetable purposes. The beans are grown in rows 2 feet apart and in 95 per cent of the cases there are other crops planted between the bean rows, such as early cabbage, onions, lilies (for the edible bulbs), late varieties of soybeans, late plantings of soybeans, and other early truck crops." Address: USDA, Washington, DC.

2648. Squirrell, W.J. 1929. Experience with soybeans in Ontario. *Proceedings of the American Soybean Association* 2:43-44. Tenth annual field meeting. Held 22-23 Aug. at Guelph, Ontario, Canada.

• ***Summary:*** "The soybean crop has been grown experimentally at the Experiment Station at Guelph since 1894 and variety material has been distributed for co-operative experiments to farmers since 1900. In all over one hundred varieties of soybeans have been under test at this station, in addition to experiments in dates of seeding, rates of seeding, methods of cultivation and mixture experiments. The O.A.C. No. 211 variety, which is a plant selected strain of the Habaro variety which latter variety was imported direct from Japan by the Ontario Agricultural College, has been the outstanding variety under test... It is now grown to a limited extent in southwestern Ontario and is the only variety eligible for crop registration in Canada...

"In order to bring this crop into greater prominence and to convince farmers of the value of both the forage and the grain a number of demonstrations under the direction of Dr. G.I. Christie were planned in the spring of 1929. These demonstrations were placed in the principal counties of central and southwestern Ontario, in most cases three in each county. Each demonstration consisted of an area of two acres, one acre growing the O.A.C. 211 and the other acre the Manchu varieties. One-half of each variety was cut for forage and the other half cut for seed...

"One of the factors effecting the increase in area of the soybean crop in Ontario is the lack of machinery to remove the oil from the soybean. A greater appreciation of the value of this crop by farmers and industrialists will before many years undoubtedly result in a greatly increased acreage of soybeans in Ontario." Address: Prof., Dep. of Field Husbandry, Ontario Agricultural College [O.A.C.].

2649. Dorsett, P.H.; Morse, W.J. 1929. Soybean cultivation in Japan. Homemade soybean wine or juice (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Continued. Page 2449 (19 Sept. 1929) (negative #44272). "A nearby view of the early and late non-hairy soybeans. The late variety is to the left of the stake, the early variety, now ready to harvest is to the right. Obihiro, Japan." Neg. #44273. "Obihiro, Japan. Tokachi Branch Agricultural Experiment Station. A nearby view of the ends of two rows of Oyachi soybeans, now ripe enough to harvest."

Page 2450 (neg. #44274). "Obihiro, Japan. Tokachi Branch Agricultural Experiment Station. A nearby view of late and early non-hairy varieties of soybeans, The late variety is to the left, early to the right."

Neg. #44275. "Obihiro, Japan. Tokachi Branch Agricultural Experiment Station. View showing to the left medium early, in the center early, and to the right late non-hairy varieties of soybeans. Morse has been trying to get the mid-season and late varieties for a number of years and is only now succeeding. Plants to the left are 31 inches high, center about 12 inches, and right about 28 inches."

Page 2451 (neg. #44276). "Obihiro, Japan. Tokachi Branch Agricultural Experiment Station. Looking across selections of non-frost variety of soybeans. At the left Mr. [?], center Mr. Suyetake, and Right Mr. W.J. Morse, the latter making notes on the variety."

Neg. #44277. "Nearby view of the end plants of three rows of Oyachi soybeans of selected strains. 70% of the soybeans grown in the Obihiro section are of this variety."

Page 2452 (neg. #44278). "Obihiro, Japan. Tokachi Branch Agricultural Experiment Station. Looking across plots of 6-7 rows of selected Oyachi variety of soybeans, now ready to harvest."

Page 2453 (20 Sept. 1929). "Set out to the Experiment Station between eight and nine o'clock this morning and spent the entire day there making notes, motion and still pictures."

"The director of the Station and his assistant arranged for a complete planting scene. Laying off soybean rows

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with a four tooth marker, distributing fertilizer, dropping the beans, and covering as dropped with the feet, also covering with the weeding harrow, all of which we made black and white motion pictures. We also secured motion pictures of cutting and shocking soybeans as well as special scenes." A line drawing at bottom of page, with dimensions in inches, shows a "horse" soybean market. See also photo #44285.

Page 2454. "The rows when finished for soybean seeding are 21 inches in center and about 3 inches deep, beans are dropped in hills three or four beans in each hill, about 12 inchees apart in the rows.

"Looking over the various experiments our attention was attracted to an open air cooking demonstration near the main building of the station. As this was the first demonstration of this kind we had seen since coming to Japan, curiosity impelled us to see just what sort of foods were being prepared. Noticing a large bamboo basket of black soybeans (very large seeds), we asked the use to be made of them. We were told that wine or soybean juice was being made. This is a product not made commercially but made only in the homes.

"Generally a bushel (or smaller quantity if desired) of black soybeans and twice the amount of water are used. The beans are boiled for about an hour. The juice, a blackish purple liquid, is drained off. A small amount of citric acid is added and sufficient sugar is added (sufficient sugar to suit the taste of the individual). When soybean wine is desired, more sugar is added, and the juice is placed in a warm room to ferment. The fermented juice is then treated as that of other fermented juices.

"This is the first instance we have come across of soybeans being used to make a home brew. The juice is very generally used without fermentation. Taking it all in all we spent a most interesting and valuable day.

"Dr. Seiji Kawase, the director, and Mr. Fujine joined us at a restaurant in the city at 7:00 p.m. for dinner."

Page 2455 (neg. #44279). Small shocks of "non-frost" soybeans. "(Non-frost does not mean resistance to frost, but that the variety matures before frost). The beans are cured in these small shocks before being threshed." Neg. #44280. "Obihiro, Japan. Tokachi Branch Agricultural Experiment Station. Harrowing land preparatory to the sowing of soybeans."

Page 2456 (neg. #44281; photo is missing). "A rear view of a soybean power thresher used at the Tokachi Branch Agricultural Experiment Station, Obihiro, Japan."

Page 2457 (neg. #44283). "Man and horse approaching the camera off rows in which soybeans are to be planted. Tokachi Branch Agricultural Experiment Station, Obihiro, Japan." Neg. #44284. "Man and horse leaving the camera marking off rows in which soybeans are to be planted."

Page 2458 (neg. #44285). "A nearby view of the marker and horse shown in the previous two pictures. Obihiro, Japan. Tokachi Branch Agricultural Experiment Station. Neg. #44286. Three Japanese women distributing fertilizer in rows where soybeans are to be planted.

Page 2450 (neg. #44288). "A Japanese woman setting up a small shock of non-frost variety of soybeans being harvested on this date. Obihiro, Japan. Tokachi Branch Agricultural Experiment Station."

Page 2460 (neg. #44289). "A nearby view of a woman harvesting non-frost soybeans at the Tokachi Branch Agricultural Experiment Station, Obihiro, Japan." Neg. #44290. "A rather distant view of two Japanese women harvesting non-frost soybeans."

Page 2461 (neg. #44291). "A nearby view of two women harvesting non-frost soybeans at the Tokachi Branch Agricultural Experiment Station, Obihiro, Japan." Neg. #44292. "A nearby view of a woman setting up a small shock of non-frost soybeans. Obihiro, Japan."

Page 2462 (neg. #44293). "Three Japanese women and the man who helped prepare land for soybean planting and the actual planting of the beans for still and motion pictures. Tokachi Branch Agricultural Experiment Station, Obihiro, Japan." Neg. #44294. "Mr. [?] and Mr. Suyetake examining Oyachi soybeans in one of the experimental plots at the Obihiro Station."

Page 2463 (neg. #44295). "Mr. Suyetake examining the early variety of non-hairy soybeans and Mr. [?] examining plants of the mid-season non-hairy soybean." Neg. #44296 (photo is missing). "Mr. W.J. Morse getting a close up black and white motion picture of non-hairy varieties of soybeans. Tokachi Branch Agricultural Experiment Station, Obihiro, Japan."

Page 2464 (neg. #44297). "Small shocks of non-frost soybeans protected by rice straw rope from being blown down by the wind. Tokachi Branch Agricultural Experiment Station, Obihiro, Japan." Neg. #44298. "Threshing scene by flailing soybeans. Tokachi Branch Agricultural Experiment Station, Obihiro, Japan."

Page 2465 (neg. #44299). "A nearby view showing two types of flails, one with the fingers of the flail close together, the other with them spread. With the exception of the hub, the flails are of bamboo. Tokachi Branch Agricultural Experiment Station, Obihiro, Japan."

Page 2471 (neg. #44304). "Threshing scene. Three men and four women flailing our soybeans. Tokachi Branch Agricultural Experiment Station, Obihiro, Japan."

Page 2477 (22 Sept. 1929). "We rode northward about 12 miles to the Tokachi Table-Land Experimental Farm. "There are 15 cho, a cho is equal to about two and a half acres American measurement."

"The principal crop in the region passed through today is by far field beans. We were surprised at the small amount of soybeans seen in the twelve mile bus trip through the valley to the Table-land Experiment Farm." Note: That is because most of the soybeans used in Japan are now imported from Manchuria.

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Page 2483 (23 Sept. 1929). "We left Obihiro by train at 7:50 a.m., arrived at Ikeda at 8:41 a.m.," changed cars "and arrived at Nokkeushi [Hokkaido], our destination, at 3:38 p.m. Went to the Kurobe Hotel."

"From Takashima until about two hours before arriving at Nokkeushi we saw very many more soybeans than we have previously seen on this trip. The last one and a half or two hours was spent in running through rice paddies."

Page 2505 (27 Sept. 1929). "Morse with the interpreter went to the Kotoni Agricultural Experiment Station to make observations and take notes as to the progress of soybeans and other crops. Dorsett got the Vitacolor motion picture camera and his 3¼ x 4¼."

Page 2605 (9 Oct. 1929). "We left the Yamagataya Hotel about 7:00 a.m. among many 'sayonaras' from the management and nesans ["older sisters" in Japanese], and 'goodbyes' from us. We found... in the six weeks or more we have been here that we have become very much attached to the place and to the nesans."

"We really felt keenly the leaving of our friends, but also hated to leave Sapporo and especially Hokkaido, because we have only pretty well completed but one feature of agricultural activity 'That of soybean Culture.' The other branches of agricultural activity and the field of general agricultural explorations, we have scarcely had time to do more than touch." Address: Agricultural Explorers, USDA, Washington, DC.

2650. Coville, Frederick V. 1929. Soybean cheese. *Science* 70(1812):282-83. Sept. 20.

• ***Summary:*** Describes fermented tofu and its preparation. "It is probable that the Chinese are the best empirical dieticians in the world... At any Chinese restaurant one may obtain, by asking for it with sufficient diligence, a cheese made not from the animal protein of milk but from the vegetable protein of the soybean. Persistence in the asking is usually required, because the Chinese manager of the restaurant keeps this food on hand for his own use. It is only in rare instances that his American customers know or ask for it.

"Soybean cheese is highly salted and its use by the Chinese corresponds very closely to our use of Roquefort cheese. The Chinese do not serve salt on their own tables, but they salt and at the same time season their food by the addition of one of two substances, soybean cheese and soybean sauce... Soybean cheese is excellent when served with salad, meats, vegetables or bread."

"Protein is extracted from the soybean in the form of a milky liquid by a process of grinding, boiling and straining." The protein in this "soybean milk" is coagulated or precipitated to form white curds by adding brine made from impure salt [nigari] containing as impurities magnesium chloride and calcium chloride, in much the same way that cheese curds are precipitated from dairy milk by adding rennet.

From the firmly pressed soybean curds, soybean cheese is made through the process of fermentation described in a forthcoming paper titled "A New Species of Monomucor, *Mucor sufu,* on Chinese Soybean Cheese." The author of this paper, Mr. Nganshou Wai, chief chemist of the National Hygienic Laboratory, Shanghai, is a native of Chekiang Province, China, and was graduated in 1924 from the Japanese Imperial University, Kyoto, where he became especially interested in biochemistry." He then worked for two years in Kyoto in the laboratory of Professor Genitsu Kita, whose studies of fermentation are well known.

"Mr. Wai has isolated from soybean cheese [fermented tofu] a mold which uniformly accompanies the proper fermentation of this cheese." He "has grown the mold in pure culture, and by inoculating fresh soybean curd with it, he has produced soybean cheese of characteristic flavor and texture.

"The original account of the experiments was published in Chinese, with illustrations, in December, 1928, in the Agricultural Journal of the Agricultural College, National Central University, Nanking. Mr. Wai's paper, an abstract of the original, is the first presented in English."

Note 1. See the next issue of the this journal, Sept. 27, p. 307-08.

Note 2. This is the earliest published English-language document seen (Oct. 2011) that uses the term "soybean cheese" to refer to fermented tofu.

2651. Wai, Nganshou. 1929. A new species of mono-mucor, *Mucor sufu*, on Chinese soybean cheese. *Science* 70(1813):307-08. Sept. 27. [1 ref]

• ***Summary:*** "The utilization of fermentation micro-organisms was known so early in China that we can trace it back to the Hsia Dynasty, 2000 B.C... From the scientific point of view, the old manufacturing methods seem to be fundamentally sound. For example, the regulation of temperature, the purity of the culture and the means of pasteurization and preservation are conducted so skillfully that we can not but be impressed with the painstaking and accurate observations on natural phenomena in the past. The application of mono-mucor in the manufacture of 'sufu' is such an example.

"'Sufu' or 'tosufu' is a well-known dish in the Chinese dietary. It is made from soybeans and sold everywhere in groceries." Soymilk is coagulated with brine to make tofu. "The tofu is pressed in wooden molds into blocks of desirable sizes, which are then arranged on bamboo trays and left in the fermentation chamber for about a month. The manufacture of sufu begins in December and ends in February. The average temperature of the fermentation chamber is found to be 14ºC. After this treatment these blocks are transferred to large earthenware barrels, each having a volume of seven hectoliters. Then salt and Shoushing wine are added one after the other to the blocks, mainly for the purpose of preservation. The barrels are

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finally closed, covered with wooden plates and left unopened for about three months. After this procedure the blocks, having acquired a peculiar flavor, are ready for sale. The products seen on the market are usually red or white blocks 2 to 4 cm square and 1 to 2 cm in thickness. The white ones are untreated, while the red ones are colored with 'hung chu' *ch'ü,* which is derived from the culture of another mold, *Monascus purpureus,* on rice.

"Sufu is manufactured in large quantities in the region of Shoushing [Shaoxing] in Chekiang Province [Zhejiang, a coastal province in central eastern China] and Soochow [Suzhou], Wushih [Wuxi], and Changchow [Changzhou] in Kiangsu Province [Jiangsu, a coastal province in central eastern China]. The native manufacturers know how but not why such flavored sufu is produced. They believe that the fermentation is controlled by one of the gods, to whom they make prayers for its success.

"Early in my research on sufu I found in the fermentation chamber of a factory in Shoushing gray mycelium about 2 cm in height covering the whole surface of the blocks. As I deemed this mycelium to be valuable for scientific research, I made a culture of it on the spot and brought the culture back to Nanking. The mold which produces this mycelium was isolated. It appears to be an undescribed species of Mucor for which the name *Mucor sufu* is proposed...

"From the observations recorded above I conclude that the transformation of tofu into sufu is due to the growth of this Mucor. It is also interesting to note that the mono-mucor on sufu manufactured in Shoushing in Chekiang Province and that in Soochow, Wushih, and Changchow in Kiangsu Province is all of the same species. In ancient times traveling was handicapped by lack of railway connections between Chekiang and Kiangsu nearly three hundred miles apart. It is remarkable that the mold on sufu manufactured in these two provinces should be of the same species, a coincidence of historical as well as biological importance."

Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the word "sufu" or the word "tosufu" to refer to Chinese-style fermented tofu.

Note 2. Usage of these terms seems to be largely confined to the area in and around Shanghai. In Mandarin, this product is widely called *doufu-ru* or *furu* (*pinyin*), *fu-ju* (Wade-Giles), *rufu,* or *dou-ru.* In Cantonese (and in most Western tofu shops run by Chinese–who come from Canton) it is called *fuyu, fu yu* or *funan.* The first Westerner to use the term *sufu* was Walter T. Swingle (1945), a brilliant plant pathologist and plant physiologist with the USDA–as well as an agricultural explorer and sinologist. The first Western microbiologist or food scientist to use the term was Dr. C.W. Hesseltine in his classic 1965 paper "A millennium of food, fungi, and fermentation." From that paper and from the ongoing research on this food by Hesseltine and his co-workers, the term spread rapidly among Western scientists and writers. We feel this is unfortunate, since few Chinese know the meaning of the term *sufu.*

Note 3. Frederick V. Coville, in his article titled "Soybean Cheese" (*Science,* 20 Sept. 1929, p. 283), states, in reference to this journal article, that "Mr. Nganshou Wai, chief chemist of the National Hygienic Laboratory, Shanghai [the same city where the term *sufu* is most widely used!], is a native of Chekiang Province, China, and was graduated in 1924 from the Japanese Imperial University, Kyoto, where he became specially interested in biochemistry. He then worked for two years in the laboratory of Professor Genitzu [Gen-itsu or Genitsu] Kita, at Kyoto, whose studies of fermentation are well known... The original account of the experiments was published in Chinese, with illustrations, in December, 1928, in the Agricultural Journal of the Agricultural College, National Central University, Nanking. Mr. Wai's present paper, an abstract of the original, is the first presentation in English."

Note 3. The mold *Mucor sufu* was renamed (actually, first reported as being identical to) *Actinomucor elegans* in 1965 (See Hesseltine, C.W. 1964. "A millennium of fungi, food, and fermentation"). Address: National Hygienic Lab. [Shanghai], China.

2652. *Chinese Economic Journal.* 1929. Soya beans and bean oil industry in Manchuria. 5(3):791-805. Sept.
• ***Summary:*** "According to their order of importance, the agricultural products of Manchuria are as follows: soya beans, *kaoliang* millet, corn, wheat, barley, rice, buckwheat, hemp, tobacco, cotton, sugar beets and other minor crops."

The yellow bean (*Huang Tou*) is by far the most common, growing in abundance in North and South Manchuria. When the hilum and seed scar is colored white, it is called *Pai Mei* (meaning white eyebrow) *Huang Tou.* When the hilum is golden hued, it is called *Chin Huang tou.* The seed of this variety is almost globular. When the hilum is black, it is called *Hei Chi Tou* or black belly. All the three varieties produce oil and fat, the first two named being specially good for the preparation of bean-curd [tofu], one of the most palatable vegetable dishes of the Chinese.

"The green bean (*Ch'ing Tou*) has two varieties. When the seed is green and the cotyledon is yellow, it is called *Pi Ch'ing Tou.* It is said that this variety yields more legumine in the preparation of bean curd than the two varieties of the yellow bean, but of inferior quality. When the seed, the epidermis and the cotyledon are all green, it is called *Ch'ing Tou.* The hilum of this variety is generally tawny or black.

"The black bean (Hei Tou or Wu Tou) has three varieties: When the epidermis is black and the inside green, it is called *Ta Wu Tou.* It yields oil or fat, and when boiled with millet or rice it is used for food. When the epidermis is black and the inside yellow and of much smaller size, it is known as *Hsiao Wu Tou.* It yields oil, and is used for horse feed, and the refuse for pig feed. When the epidermis is black and the

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inside yellow, the bean assuming a flattened and elliptical shape, it is called *Pien Wu Tou,* and is used for horse feed, and when pickled for human food."

"Yellow or green soya beans are used in the manufacture of bean curd, a product of universal consumption in China. The by-product, bean milk, which is highly nutritious, is drunk as milk by many Chinese in the morning. The bean-curd skin [yuba], or the scum of the bean milk, is used for culinary purposes, and is greatly relished on the table."

"The most important product of the beans is bean oil, which has contributed in no small measure to the prosperity of Manchuria. It has attracted foreign capital, and the annual export of oil is enormous. there are altogether more than 300 bean oil mills in South and North Manchuria, including steam mills and oil-fashion, small plants. In Dairen there are 60 bean oil mills, of which only two are Japanese owned, the rest being Chinese. While other manufacturing industries have passed into Japanese hands with the acquisition of the Leased Territory of Kwantung. Chinese still retain a firm hold on the bean oil industry. Harbin has about 50 oil mills, two of which belong to Russians, the rest being entirely operated by Chinese. Other centers like Mukden, Antung, Newchwang and cities along the Chinese Eastern Railway, the South Manchuria Railway and fourteen other railways have bean oil mills in varying numbers, which go to make the total number of 300 oil mills. Beans harvested in the C.E.R. and the S.M.R. regions and even in the remote hinterland where only mule carts can go, are finally transported to various destinations in freight cars. Each car contains 52,000 catties of beans, which can produce about 5 thousand catties of oil and 1,000 bean cakes, every cake weighing 46½ catties. The 50 oil mills in Harbin consume annually about 490,000 tons of beans, valued at $35,000,000."

"The steam oil-mill and the old-fashioned mill differ from each other in mechanical equipment and in the number of presses employed. The old-fashioned mill has only one or two presses, while the steam mill has over twenty press machines. The largest having as many as a hundred. The screw press much in use in the former mill consists of a primitive wedge, that is now being replaced by the metal screw. The screw is turned by hand by the man in charge of the machine. In modern steam mills a steam pump operates a hydraulic press that puts great pressure on the prepared beans underneath. As the hydraulic presses are of larger dimensions, the cakes produced are greater in diameter and thickness than those made from screw presses."

2653. Sumiki, Yusuke. 1929. Studies on the saponin of soy-bean. I. *Bulletin of the Agricultural Chemical Society of Japan* 5(6-9):27-32. June/Sept. [Jap]
• ***Summary:*** The author received a large quantity of the alcoholic extraction of soy-bean from the Central Manchurian Research Lab. (*Mantetsu Chûô Shikenjo*). By neutralizing a 70% ethanol solution of free saponin with sodium hydroxide, he isolated from soybeans the sodium salt of a saponin, melting at 222-224ºC and corresponding to the formula $C_{55}H_{80}C_{21}$. The hemolytic power (against horse's blood) of the free soybean saponin was found to be relatively weak compared to standard Merck saponin. Hydrolysis of the saponin yielded the equivalent of one molecule of sapogenin melting at 228-241ºC and corresponding to the formula $C_{32}H_{50}O_3$, together with one molecule each of glucose, rhamnose, arabinose, and an acid which was presumed to be mesoxalic acid.

Note 1. This is the earliest English-language document seen (July 2009) concerning the presence of saponins in soybeans. The author has not yet clearly identified their uniqueness and chemical composition.

Note 2. *Webster's Dictionary* defines saponin (derived from the French *saponine,* which is from the Latin *sapon-, sapo* = soap, and first used in 1831) as "any of various mostly toxic glucosides that occur in plants (as soapwort or soapbark) and are characterized by the property of producing a soapy lather; esp: a hygroscopic amorphous saponin mixture used esp. as a foaming and emulsifying agent and detergent."

Note 3. *Webster's Dictionary* defines glucoside (a term first used in 1857) as a glycoside that yields glucose on hydrolysis. A glycoside (first used in 1930) as any of numerous sugar derivatives that contain a nonsugar group attached through an oxygen or nitrogen bond and that on hydrolysis yield a sugar (as glucose).

The saponin consists of 1 molecule each of sapogenin, dextrose, rhamnose, arabinose, and another substance, possibly mesoxalic acid. Address: Agricultural Chemical Lab., Tokyo Imperial Univ., Japan.

2654. Sumiki, Yusuke. 1929. Daizu saponin no kenkyû. I. [Studies on soybean saponins. I.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 5(9):737-53. Sept. English-language summary in Bulletin of the Agricultural Chemical Society of Japan 5:27-32, bound in Nippon Nogei Kagaku Kaishi. [7 ref. Jap]
• ***Summary:*** Note: This is the earliest document seen (Sept. 2007) that mentions saponins from soybeans. Address: Nogakushi, Japan.

2655. Morse, W.J. 1929. Re: Kudzu. Travels in Hokkaido. Letter to Dr. A.J. Pieters, Office of Forage Crops, USDA, Oct. 6. 2 p. Typed, with signature on USDA letterhead.
• ***Summary:*** T. Sakata Seed Co. in Yokohama, Japan, sells Kudzu seed in quantity. So does the Yokohama Nursery Co. "We have now finished up our work in Hokkaido and expect to leave here Tuesday for Akita, the soybean section of northwestern Japan."

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and

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Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 93–Morse-Napier. Folder–Morse, W.J.-#4 F.C.I.

Sent to Soyfoods Center by Jacob Jones of Purdue Univ., Aug. 1998. Address: Sapporo, Hokkaido, Japan.

2656. Yoshida, K. 1929. [Extracting oils such as soybean oil by pressure]. *French Patent* 682,987. Oct. 9. [Fre]*

2657. Dorsett, P.H.; Morse, W.J. 1929. Soybean cultivation in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 2621-2622 (10 Oct. 1929). On Oct. 9 they arrived in Akita City, Akita Prefecture, Japan, in northeastern Japan. "We got out to the Agricultural Experiment Station between 9 and 10 o'clock, and met the director, Mr. K. Adachi. He is an expert on soybeans as well as director of the Station [at Akita]. He spent something like 8 years in Manchuria studying the soybean there and has published a volume of 1000 pages or so on the results of his work. The title of the book is 'Soybean: Its Cultivation and Industry,' by K. Adachi.

"Mr. Adachi advised that we were in time for the harvesting of soybeans, but that the crop is not yet an extensive one here and that it will be necessary to go out some distance to see farmers harvesting and even then it will not be possible to see the harvesting on as extensive a scale as could be done in a region where soybean growing is more important than it is here.

"Much of the detailed information acquired today in regard to soybean varieties and soybean growing and harvesting is omitted from this report because it will be incorporated in a special soybean report which is in the course of preparation.

"Mr. Adachi is of the opinion that Japan, as in the past, will of necessity have to obtain her proteins from vegetable sources and especially the soybean, for the reason that she does not have the space to produce animals enough to produce animal protein for her population. We are wondering if this to a very large extent is not false reasoning.

"From our observations, during our limited stay and travels in northern Japan, Main Island, and in the Island of Hokkaido, there appears to be immense areas, in the hill and mountain districts, apparently not well or not at all adapted to the cultivation of farm products, but from appearances most admirably suited to animal husbandry.

"We are also wondering if a mixed vegetable and animal protein diet might not be most advantageous to the Japanese nation."

"Mr. Shimade gave us considerable detailed information concerning their trials with soybeans as a green manure in orchard plantings. This information in considerable detail will be incorporated in the special soybean report" [which, so far as we can determine, was never completed].

Page 2629 (11 Oct. 1929). In "Mr. Adachi's room, after the accustomed bowing and greeting, we preceded to get the information on soybeans for which the interview was granted." Previously soybeans were planted after the planting of rice, which normally was the second week in June. This date, however, "proved to be too late as the beans require a longer season for maturing... Largely through the efforts of this experiment station, the farmers growing soybeans have been prevailed upon to plant their beans before they do their rice.

"By planting the first or second week in May the growing season has been sufficiently lengthened to enable the beans to fully mature before frost, which frequently was not the case when the planting of the beans was delayed until after the rice was planted.

"When the old method of planting was in vogue, the yield of beans was from 2½ to 3 bushels to the quarter of an acre. Under the new practice of planting before the rice is planted, the increase in the crop frequently amounts to as much as 30%.

"Planting: Formerly beans were planted thickly in rows about 25 inches apart. The rows now are about the same distance but the beans are dropped so as to stand 4 or 5 inches apart in the row. As a usual practice the rows are opened with a hoe, the beans dropped by hand and covered with a hoe to depth of about one inch.

"Cultivating and weeding: The first cultivation and weeding is when the beans are from two to three inches in height. The second weeding and hoeing is when the plants are 6 to 8 inches in height. The third and final weeding and hoeing is in late June to the first of July. All the weedings and cultivation are by hand.

"Fertilizing: Cow and horse manure are the only fertilizers used in this region in connection with the planting of soybeans. This is used at the rate of 40 to 50 kan (1 kan = 8.27 lbs.) per quarter of an acre. The manure is spread in the rows by hand before the beans are dropped and covered.

"Condition of the beans at time of harvest: In this region, the beans are fully ripe when harvested. The time for harvesting may be determined by the [?]anking of the plants. If the beans rattle in the pod when the plants are shaken, they are in condition to harvest. In the Akita district, soybeans are pulled and laid in small piles on the ground where they are allowed to remain for two or three days depending on the condition of the weather.

"When sufficiently dried, the pile of beans are taken in and stored in a building or under temporary cover, where they remain until after the rice is harvested, threshed, and cleaned. The beans are then threshed. The practice followed in threshing soybeans in the Akita district is primarily that of

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flailing or beating them out. The farmers do not use rollers in connection with threshing their beans. All litter from the threshing of soybeans, except the pods, which are fed to stock, is burned.

"Diseases and insect pests: Thus far, there is little or no injury resulting to soybeans in the Akita district either by insect pests or fungus diseases.

Storage (p. 2631-2632): Soybeans, in the Akita district, are stored in rice straw bags the same as are used for rice. The weight of a bag of beans is 17 kan [140.6 lb], about 2 to 2½ bushels. Farmers sell their beans direct to merchants and receive for them about Yen 17.00 to 18.00 for 5 bushel. This price, however, depends on the quality, season, and the prevailing price of rice.

Page 2669 (16 Oct. 1929). "This morning Mr. Morse and Mr. Suyetake went to the soybean district outside of Tokyo to get a line on conditions. Dorsett worked at the laboratory with plant material, herbarium specimen and in writing legends and numbering the still pictures made while in Hokkaido, Japan.

"Copied from Mr. Morse's diary: At the Saitama Prefecture Experiment Station located at Urawa, it was found that the soybeans had been harvested. About forth [?] varieties or middle season types are grown at this station and Mr. Hasegawa, in charge of soybean and sweet potato investigations, promised us seed of these varieties.

"It was thought that possibly we might obtain soybean harvesting and threshing scenes in the vicinity of the Tamai Branch Experiment Station which is a breeding station. We went by train to Kumagaya and then by bus to Tamai; along the way no soybeans were noted. In August during a trip numerous fields of soybeans were noted." They were told by Mr. Morihara Nomura that all the soybeans had been harvested. "The farmers in this region get the soybeans out of the way before rice harvest. This is quite different from Akita region" where the soybeans are harvest after the rice. "Mr. Nomura is quite an expert on soybeans and adsuki beans." Address: Agricultural Explorers, USDA, Washington, DC.

2658. Dorsett, P.H.; Morse, W.J. 1929. Whole dry soybeans used as beans in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.
• ***Summary:*** Page 2640 (11 Oct. 1929, Yotsugaya, northeast Japan). "One of the principal forages used on the farm is soybean hay and bush clover (*Lespedeza bicolor*). We also learned from the director that soybeans are largely used by the farmers of this prefecture for the feeding of horses in place of oats. For this purpose the beans are soaked over night and 4 or 5 pounds fed to each animal during the day; in addition the horses are also given a ration of [soy] bean hay or some other forage.

Page 3478 (8 Jan. 1930, Tokyo). "This soybean product is sold in tubs in Tokyo small stores. It is named 'Gomoku Mame.' It consists of a mixture of five cooked products, namely: soybeans, lotus root, fish sausage, seaweed and burdock roots. Purchased at a small grocery stand in Tokyo, Jan. 6, 1930. It is eaten just as it is. Product is on bamboo leaf which measures 8 inches long and 5 inches wide" (neg. #44738).

Page 3516 (11 Jan. 1930, Tokyo). Glass jars of soybean and other vegetable mixture. The jars are 5 inches deep overall" (neg. #44751).

Page 3530 (11 Jan. 1930, Japan). "Cooked, sugared and canned yellow soybeans. Yellow soybeans canned in a sweet syrup. Can 4½ inches high and 3 inches in diameter" (neg. #44756).

Page 3531 (11 Jan. 1930, Tokyo). "Black soybeans cooked and canned in a sweet sauce. Can 4½ inches high and 3 inches in diameter. This variety (black) is also sold in bulk form and is more generally used than the yellow variety for this purpose (neg. #44757).

Page 3535. "Candied soybeans and other products. Sticks of candy in which are imbedded black soybeans (green germ), yellow soybeans, peanuts, peas and sorghum seed. Box 8 inches long and 6 7/8 inches wide" [Native name 'Kawayanagi'] (neg. #44761).

Page 3586 (16 Jan. 1930, Tokyo, Japan). "A nearby view of whole and sectioned cakes which are made of rice flour and have soybeans imbedded in them. The two outside ones measure 2¼ inches, the other 2 3/4 inches across" (neg. #44778).

Page 3712 (28 Jan. 1930, Tokyo). "Life size picture of rice flour cakes in which there is a liberal supply of cooked soybeans. Immediately after baking, soy sauce is brushed over the cakes" (neg. #44851).

Note. This is the earliest English-language document seen (June 2013) that uses the term "cooked soybeans" to refer to whole soybeans that have been cooked and ground.

Page 3713. "Soy bean and puffed rice candy. Size of package is 7½ by 10 inches" (neg. #44852).

Page 3715. "Small rice flour cookies thickly covered with yellow and black soybeans" (neg. #44854).

Page 3730 (30 Jan. 1930). "Two classes of pickled soybeans and perilla. The glasses are 2½ inches across the top and 4 inches long" (neg. #44863).

Page 3734 (Jan. 30, 1930, Tokyo). "Small rice cakes with black soybeans imbedded and cooked in them. The size of the bag is 7 inches across and 11 inches deep" (neg. #44866).

Page 3736. "Sugar coated soybeans." The resulting product is white and brown in color. "The bag measures 7 inches by 11 inches long" (neg. #44868).

Page 3741. "Soybeans uncooked and imbedded in rice flour dough and sliced thin, ready for frying. The bag

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measures 5¼ inches across and 6¼ inches long" (neg. #44873).

Page 3797 (Feb. 5, 1930, Tokyo). "Today we spent some little time getting pictures of feeding soaked soybeans, sometimes mixed with rice, at Asakusa Park [Koen] and Temple. Here there are a half dozen or so women sitting behind small tables, selling the soaked soybeans.

A nearby view of Japanese woman and her stand with its tin plates of soaked soybeans, which are sold to individuals for feeding to the pigeons. Many bushels of soybeans are disposed of in this way during the year (neg #44885).

Two photos each, taken at Asakusa Park, showing Japanese women at their tables and people feeding the pigeons are found on pages 3798, 3799, and 3800 (negs. #44886-44890).

Page 3939 (19 Feb. 1930, Tokyo). "Wheat flour cakes in the form of a child's face with black soybean for eyes. Purchased in wholesale confectionary store in Tokyo, Japan, February 18, 1930. Native name is 'O-Menkoshi' [honorable face candy]. Wholesale price is 8 for 5 sen. Actual measurement of face 4 inches long" (neg. #44938).

Page 3941 (19 Feb. 1930, Tokyo). "Wheat flour cakes in the form of fish with black soybean for eyes. Purchased in a wholesale confectionary store in Tokyo, Japan, February 18, 1930. Native name is 'Taikoshi' [seabream candy]. Wholesale price is 8 for 5 sen, Dish of soybeans measures 3 inches across" (neg. #44940).

Page 3942 (19 Feb. 1930, Tokyo). "Wheat flour cakes in the form of rabbits with black soybeans for eyes. Purchased in wholesale confectionary store in Tokyo, Japan, February 18, 1930. Native name is 'Usagikoshi' [rabbit candy]. Wholesale price is 8 for 5 sen. The dish of soybeans measures 3 inches across" (neg. #44941).

Page 4028 (23 Feb. 1930, Tokyo). "Soaked soybeans flattened and covered with dough and baked. Small pieces of [nori] seaweed distributed over the surface. Native name 'Noritsuke mame.' Purchased in confectionary store in Tokyo, Japan, Feb. 22, 1930. Sell for 20 sen per pound" (neg. #44973).

Page 4037 (25 Feb. 1930, Tokyo). "Soybean product #3878. A life sized picture of soaked soybeans flattened, covered with rice dough and baked. Covered with ground seaweed. Purchased in Tokyo, Japan, Feb. 24, 1930. Native name 'Noritsuke mame.' Price 28 sen a pound" (neg. #44982).

Page 4342 (15 March 1930, Tokyo). "A nearby view of soybean products left to right bottom row; #4242, pink color; #4243, white color; #4244, brown color. Images made of millet in the colors noted. The millet is sugared and the eyes are of black soy beans. The images measure 3 inches across and 3½ inches high. The upper row (back view) is of pink and white colored images. Purchased at a stand in the Tamelike Temple grounds. Native name 'Daruma Okashi.' (neg. #45027). Note: Daruma is the Japanese name for Bodhidharma, the Buddhist monk who lived during the 5th/6th century CE and is traditionally credited as the transmitter of Ch'an (Sanskrit: Dhyana, Japanese Zen) to China.

Page 4343. "Life sized picture of small and large images made of sugared millet with soybean eyes... Native name 'Daruma okoshi'" (neg. #45028).

Page 6826 (24 Dec. 1930, Tokyo). "During the day we visited different sections to see if there are any special soybean products put out for the Christmas and New Year celebrations. We found no new special products but did learn that large quantities of the black soybeans which are soaked in syrup are used by the Japanese on New Year's day. This product is eaten at the first meal and is supposed to bring good health during the coming year." Address: Agricultural Explorers, USDA, Washington, DC.

2659. Hollowell, E.A. 1929. Re: Meeting with Dr. Burlison in Urbana, Illinois. Interest in soy bean utilization. Letter to Mr. W.J. Morse, c/o American Consul, Tokyo, Japan, Oct. 23. 1 p. Typed, without signature (carbon copy).

• ***Summary:*** "On a recent trip to the Middle West I had occasion to stop at Urbana, and while there I had some discussion with Doctor Burlison about soy beans. Next year the National Soy Bean Association [ASA] is going to meet at Urbana, and it appears that utilization of the soy bean is the phase of the industry which should be stressed.

"Doctor Burlison is asking our cooperation in assisting him to secure as complete an exhibit as possible of soy bean products. I told him I should be glad to send him the names of all the different manufacturers of the different products we have on file here, and in addition write you asking that you send him as many of the soy bean products as you can secure in Japan. Doctor Burlison is anxious to secure a permanent museum of soy bean products and told me that he would be glad to pay for them, if it is possible to secure them. Of course, we are willing to loan him any of the products which we now have here at the office. However, Doctor Burlison is anxious to secure products which might remain their property."

"With best personal regards, I remain, Very truly yours,..."

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 93–Morse-Napier. Folder–Morse, W.J.-#4 F.C.I.

Sent to Soyfoods Center by Jacob Jones of Purdue Univ., Aug. 1998. Address: Associate Agronomist, USDA, Washington, DC.

2660. Han, John E.S. 1929. Monosodium glutamate as a chemical condiment. *Industrial Engineering and Chemistry* 21(10):984-87. Oct. [9 ref]

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• ***Summary:*** Contents: Glutamic acid. Properties of monosodium glutamate. Uses as a condiment. Commercial production. Problems of Chinese manufacture.

All proteins yield amino acids when hydrolyzed. When any given protein is hydrolyzed, whether by acid, alkali, or steam, the same amino acids are produced and in the same proportion. *d*-Glutamic acid was discovered by Ritthausen in 1866, when he hydrolyzed wheat gluten with sulfuric acid. It is one of the main constituents of meat and vegetable broths. Ikeda, during his research on the seaweed *Laminaria japonica* (*Jap: kombu*), found that the univalent ion of glutamic acid has a decidedly meatlike taste. It has such an intense taste, that 1 part of monosodium glutamate dissolved in 3,000 parts water is just perceptible to human taste. Thus its flavoring power is 15 times stronger than cane sugar and 7 times stronger than table salt. In 1908 the first patent was issued to Ikeda and Suzuki. In 1909 they applied for a U.S. patent, which was issued in 1912. The inventors emphasized the superiority of monosodium glutamate over shaved bonito (*katsuobushi*), which is widely used in Japanese cooking.

"In China and Japan monosodium glutamate is manufactured on a commercial scale and consumed as a condiment." In East Asia it is widely used to season foods by housewives, restaurants, Buddhists, vegetarians, etc. Monosodium started to be manufactured in China about 8 years ago. In 1928, the Chinese alone used $1,130,000 worth of this condiment. Today monosodium glutamate is sold as "Ajinomoto," which means "the basis of flavor," and is made on a large scale by S. Suzuki & Co. In China, trade names include "Ve-tze-sin," "Gluta," "Aji," and "Chuyu." Substantial and increasing amounts of Chinese-made monosodium glutamate are now exported to the Dutch Indies [later Indonesia], Singapore, the Philippines, etc. Pure monosodium glutamate is currently made in the USA and Europe.

Ikeda pioneered the commercial production of solid monosodium glutamate. "Gluten and soy bean are the preferred proteins and hydrochloric or sulfuric acid the hydrolyzing agent."

Photos show: (1) One of the three plants of the Tien-Chu Factory in China. (2) Furnaces for heating oil at the Tien-Chu Factory. (3) Stoneware vessels for hydrolyzing gluten, China Chemical Works.

A table shows the value of "chemical condiment" imported from Japan and manufactured in China, from 1924 to 1928. "The figures also include a special sauce made from the mother liquor after the crystallization of glutamic acid hydrochloride." The value of the amount made in China increased from $200,000 in 1924 to $630,000 in 1928. The value of the amount imported from Japan increased from $300,000 in 1924 to a peak of $700,000 in 1925 to 1927, then dropped to $500,000 in 1928 due to a boycott of Japanese goods. Address: Y-1065c North Szechuen Road, Shanghai, China.

2661. Kyonggi. Kokumotsu Kensajo. 1929. Chôtan daizu [Chotan soybeans]. *Kyo-koku Panfuretto* (*Cooperative Grains Pamphlet*) No. 6. 64 p. Oct. (Keikidô Grain Investigation Office, Jinsen, Chosen [Korea]). [Jap]
• ***Summary:*** Chotan soybeans are a variety of soybeans that come from Chotan prefecture in Korea. Address: Kyonggi-do, Seoul, Korea.

2662. Lovell, John H. 1929. Soy bean as a honey plant. *Gleanings in Bee Culture* 57(10):646-48. Oct.
• ***Summary:*** The soy bean "belongs to the same family as the pea, bean, and clovers, plants which produce their seeds in a legume or pod."

"Up to the present time it has been cultivated chiefly as a hay or forage crop; but, with our population increasing twenty times faster than the food production, it must soon become important as a food for the human race.

"Soy beans, before they have fully ripened, may be shelled and used as a green vegetable like green peas. A few hills might well be planted in every garden. They may also be canned and used in winter, or they may be sprouted and the sprouts used like asparagus tips, to which, however, they are much inferior. The dried beans when cooked also make a palatable dish, and more than 100,000 bushels are packed annually by American canning factories. As the seeds are used as a substitute for coffee, soy bean is often called coffee berry."

"By boiling the crushed beans in water a vegetable milk may be obtained, which may be used in making cakes and custards... From the milk a curd or cheese [tofu] is prepared, which is on sale in the Chinese markets of America. This may be flavored with fruits and jams and made into puddings, and used for sandwiches and luncheon novelties.

"But of all the preparations made from the soy bean, none is more widely distributed or better known than soy sauce, a dark brown liquid which in odor and taste resembles a good meat extract. In Japan alone the annual production is more than 2,000,000 barrels. While it is largely consumed by the Chinese and Japanese it has been introduced into both Europe and America and may be purchased at all Chinese markets."

There is conflicting evidence as to whether or not soybean flowers are a source of sugar-rich nectar from which bees make honey. The soy bean plants "grown in my garden, had small inconspicuous flowers, with the corolla hardly visible. They were odorless and apparently nectarless and wholly unattractive to bees. Plants under glass from which all insects were excluded formed pods in great abundance which were well filled with large seeds. The soy bean is self-fertile and not dependent on bees for pollination.

"The flowers, the young leaves, and the stems are densely hairy as can be seen in the illustration [photo], but the older leaves are smoother. The specific name *hispida* was

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evidently selected because of the roughness of the stems. But this coating of hairs is not sufficient to defend the plants from insect attack."

"If it is honeydew which is stored by the bees from soy bean, then the erratic, scattering and infrequent reports of honey flows would be fully explained." Note: Honeydew is a sugar-rich sticky substance, secreted by aphids and some scale insects as they feed on plant sap.

"Therefore without more reliable evidence than is at present available, the writer does not think that soybean should be ranked as a honey plant."

A photo shows the upper part of a soy bean plant with stems, leaves, and blossoms. Address: Waldboro, Maine.

2663. Yoshida, K. 1929. Extracting oils such as soybean oil by pressure. *British Patent* 341,079. Oct. 29. *

2664. *Daily Advance* (*The*) (*Elizabeth City, North Carolina*). 1929. Story of how soy beans were introduced here is told by Mrs. Outlaw, Sr. C. Wilson Hollowell recalls how they were planted at Bayside; Production of soy beans as farm crop increasing tremendously in America. Nov. 2. p. 1.
• ***Summary:*** "The production of soy beans, first grown as a farm crop in this country in North Carolina 50 years ago, is increasing tremendously according to an article by Harry R. O'Brien in the November [1929] issue of the Country Gentleman.

"In 1917 it was estimated that there was a total acreage of 500,000 which by 1928 had grown to 3,000,000...

"The story of the introduction of the first soy beans into the Albemarle is told by Mrs. E.R. Outlaw, Sr., of Riverside Drive [Elizabeth City], whose husband received some which had come from Japan in the 1880's, and began to raise them on his farm in Bertie County. Japan peas is what they were called then and Captain Outlaw sent a flour bag full of them to C.W. Hollowell of Bayside [on "Dec. 23, 1886" is penned in by hand by Margaret Hollowell].

"C. Wilson Hollowell of this city [Elizabeth City] remembers when his father first received the seed and planted them on his farm. He thinks that it was in about 1885. Mr. Hollowell raised soy beans every year afterward, and as there were no harvesting machines for them then they were cut and threshed in a cradle, and the beans used for feeding the farm mules through the winter, it being found that with the beans it was unnecessary to use corn."

Note: At the bottom of the article pasted in her scrapbook titled "Who am I?" Margaret Hollowell has written: "Lucy R. Outlaw (now Mrs. Samuel Wheeler Worthington) brought the bag of 'Japan peas' to C.W. Hollowell when she came to spend Christmas holidays with Mr. H."

2665. Morse, W.J. 1929. Re: Impressions of Korea. Agricultural exhibition. Suigen experiment station and Dr. Nagai. Letter to R.A. Oakley, Office of Forage Crops, USDA, Washington, DC, Nov. 3. 3 p. Typed, with signature on USDA letterhead.
• ***Summary:*** "Just a few word to let you know that I am still in the land of this living but this is sure a strenuous life." Morse arrived in Keijo (Seoul), Chosen, the morning of Oct. 23. "The conditions in Korea, or Chosen, as they now call it, are quite different from those we have observed in other parts of Japan. This is surely one poor country, not only from the point of view of soils but also the people... at first it was very interesting to us to see the men in their funny 'happy Hooligan' hats and both the men and women dressed all in white.

"The Korean Agricultural Exhibition was still on when we reached here so we spent two days studying the agricultural products of the different prefectures of Chosen as well as some of the products from other parts of Japan... We also found a very large exhibit of soybean varieties from all over Chosen. It was the largest and nicest collection that I have ever seen. There were between four and five hundred samples and as many more of adsuki beans, mung beans, sorghums and millets." Through the American Consul–"We went to see the Japanese in charge of the agriculture exhibits and we were promised the seed desired. Mighty busy times ahead for several folks.

"We have been down to see the Suigen experiment station which is about an hour's run on the train from Keijo. This is the main station of Korea and surely is a fine one. We found that they are doing a very large amount of work with soybeans and have in the past few years tested out about one thousand varieties."

"We do not know just how long we will be in the 'Hermit Kingdom' but it is getting rather cold..."

"We are stopping at the Chosen Hotel which is a government railway place. When coming in the lobby the other night a man rushed up to me and called me by name. It was Dr. [Nikolai] Vavilov, Director of Applied Botany, Leningrad, Russia and whom I had met two or three times in Washington. He was touring Japan and had spent time in China and Turkestan... We went out to the Suigen [agricultural experiment] station with him and had quite a visit.""

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 93–Morse-Napier. Folder–Morse, W.J.-#4 F.C.I.

Sent to Soyfoods Center by Jacob Jones of Purdue Univ., Aug. 1998. Address: Keijo (Seoul), Chosen / Korea.

2666. *Nature* (*La*) (*Paris*). 1929. Le lait végétal japonais [Japanese vegetable milk]. 57(Part 2):476. Nov. 15. [Fre]
• ***Summary:*** Describes how to make soymilk in three steps. 1. Soak the soybeans for 24 hours, in pure water, free of

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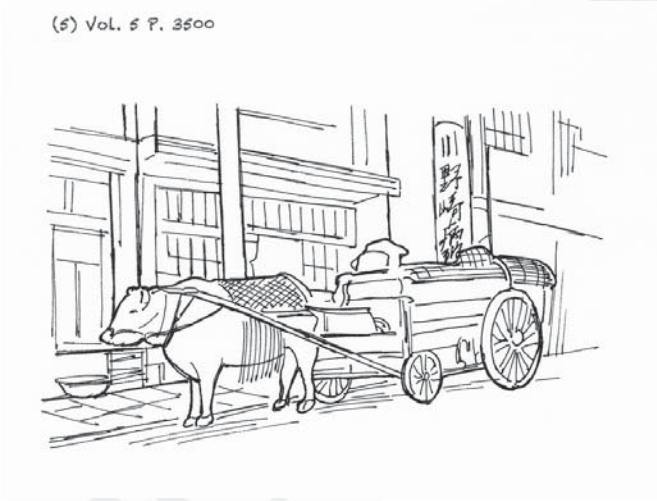
limestone / calcium, stirring often.

2. Grind the soybeans (made soft through soaking) coarsely using a wood mill, then put the ground material (*ce mortier*) back in the soaking liquid where it must be stirred often for the next 24 hours.

3. Finally, press this paste (*pâte*) hard with a filter-press; the extracted liquid resembles milk and smells like malt; the product, that by its physical properties to cow milk, contains 3.13 percent casein and 9.89 percent lipids (*matière grasse*) which, however cannot be churned / whipped (*le battage*) into butter (Note 1: *barrate* is an old French term indicating a pot with a stick in it to stir the milk and make butter). It however can be made into cheese which, through special ferments, can be assigned the desired flavor. Further more, this soya milk (*lait de Soja*), being rich in phosphates, is particularly recommended for the feeding of children, according to a German Doctor.

Note 2. This is a poor description of how to make soymilk.

2667. Dorsett, P.H.; Morse, W.J. 1929. Okara in Chosen [Korea] and Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.



• ***Summary:*** Page 3043-3044 (21 Nov. 1929). In Keijo, Chosen [Seoul, Korea]. A photo (p. 3045) shows a metal pan piled high with round white "Balls of the refuse after making Tofu" [okara] (neg. #44610).

Page 3499-3500 (9 Jan. 1930). Tokyo, Japan. A photo (p. 3500) shows: "A wagon load of Tofu curd residue being carted off for stock feed. View on a street near the Sankaido Building."

Note: This is the earliest document seen (June 2013) that uses the term "refuse after making Tofu" or the term "Tofu curd residue" to refer to okara. Address: Agricultural Explorers, USDA, Washington, DC.

2668. Morse, W.J. 1929. Re: Collection of soybean products. Dr. Burlison. Korea. Soybean variety collections. Letter to Dr. E.A. Hollowell, Office of Forage Crops, USDA, Washington, DC, Nov. 21. 2 p. Typed, with signature on USDA letterhead.

• ***Summary:*** "Dear Holly: I have your letter of October 23 with reference to your visit to the Middle West and the discussion with Dr. Burlison concerning soybean products. I note that you say we are willing to loan him the products which we have at the office. Holly, I have had quite a bit of experience in the loaning of products and also enlarged pictures for special exhibits and I must say that most of such experiences have not been very pleasing, in spite of the many promises made. Many of the products and even the pictures were never returned, and more were broken or spoiled through lack of proper care. I have taken quite a little trouble to collect the various products we have on hand and it would be extremely difficult to duplicate many of them. Therefore, I think it the best plan not to loan out our products, for I have in mind to have in our office one of, if not the best, collection of soybean products in the world..."

"With regard to the products that I have sent in so far from the Oriental trip, I have written Oakley that he have Mrs. Donavan [Verna; Morse's secretary] and Miss Cruickshanks place them in the case in their room as the products are received. I am sending them in tins as much as I am able to or in other sealed boxes. I have asked that they be set aside thus so that they will not be opened until my return. After my return I want to have uniform containers to place the various products in and properly labeled... I wish, therefore, that you would also keep a kindly eye on these various products coming in from time to time to see that they are taken care of as I wish until my return. when I can fix them up for a permanent exhibit. I am sending duplicates of all, for if I sent only one there would be sure [sic] something happen to it. I wish the duplicates taken care of the same as the other."

"If Dr. Burlison, we can send him numerous products from Japan for Tokio seems to be quite a center for the manufacture of soybean products."

"We are finding Korea one big soybean country and we are getting so loaded up with the native varieties that I do not know 'where I am at.' The station at Suigen will already have for us on the 25th inst. samples of one thousand numbers. The station at Shariin is going to send us more than two hundred numbers. Various stations in Japan are sending in their best varieties this winter so I do not know where this variety business will end."

"In Korea one sees very few horses, for bulls are used almost entirely as beasts of burden. My point is that boiled soybeans are used as feed for these animals. The

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boiled beans are mixed with chopped rice or millet straw or sometimes kaoliang stalks. In fact the whole mixture is boiled. In Japan soybeans are rarely used for cattle feed. In the northern prefecture [sic] the boiled beans are quite extensively used for horse feed, especially the stallions. I do not know how many note books I have full of soy notes and only hope that I can find time to get them in ship-shape. We also have a great collection of movie film and still pictures from the planting to harvesting, threshing, marketing, and shipping, and also on to the manufacture of many products."

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 93–Morse-Napier. Folder–Morse, W.J.-#4 F.C.I.

Sent to Soyfoods Center by Jacob Jones of Purdue Univ., Aug. 1998. Address: Agricultural Explorer, Keijo (Seoul), Chosen / Korea; c/o American Consulate, Tokio, Japan.

2669. Dorsett, P.H.; Morse, W.J. 1929. Year's end in Tokyo, Japan. Early 1930 in Korea (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 3341 (24 Dec. 1929). "Today Morse and Suyetake went to call upon soy sauce and natto manufacturers for the purpose of getting acquainted and also if possible arrange for getting still and motion pictures of their plants, equipment and operations.

"Dorsett worked at the office packing seed and making packages to go in the next outgoing diplomatic pouch..."

"The streets of Tokyo are a-blaze with colored banners, price lists, decorations and gaily dressed women and children." All this in preparation for the New Year. "The streets and stores are packed from early morning until late at night.

"At the Matsuya Department store on the Ginza, they have a spruce Christmas tree in the stairway well which looks to be fully... 50 feet or more in height. It is really very attractive and beautiful."

Page 3369 (31 Dec. 1929). "Introduction cards were finished on the 1,003 samples of soybeans secured from the Suigen Agricultural Experiment Station, Suigen, Chosen [Korea]. These samples showed a wide range in size, color and shape of seed, and also in the color of the hilum. Some most excellent and interesting varieties are included in this collection.

"One of the most interesting is a very small seeded yellow sort, the seed being about the size of a mung bean. This is the smallest seeded variety of soybean we have ever seen and it should prove valuable as a bean for sprouting. We are in hopes that in this collection will be found the high oil strains for our oil mills and low oil strains for our hog and cattle feeders in the United States. All in all we consider the collection the most interesting and valuable in our exploration work thus far." Address: Agricultural Explorers, USDA, Washington, DC.

2670. Chung, H.L.; Ripperton, J.C. 1929. Utilization and composition of Oriental vegetables in Hawaii. *Hawaii Agricultural Experiment Station, Bulletin* No. 60. 64 p. Dec.

• ***Summary:*** Soybeans are discussed as follows: (1) Large or soybean sprouts (*Glycine hispida*) (p. 3-4). Chinese name: Dai-tau-nga. Japanese name: Not given. A photo shows these sprouts, together with "Small or mungo bean [mung bean] sprouts (*Phaseolus aureus*). The stem and root are 3 to 3½ inches long. "The large bean sprouts are prepared daily for the vegetable market in Honolulu. The sprouts are obtained by germinating the soybean" for 4-6 days. "The beans are washed, submerged in water in a container for 24 hours, and then drained. A damp cloth, sack or grass-woven mat is placed over the container. A fresh supply of water is added to the container at 6-hour intervals during the 24 hour period to prevent the beans from heating. In the market the sprouts are kept submerged in water so that they may retain their crispness and succulency." A recipe is given for "large bean sprouts" with pork.

Green soybeans in the pods (p. 42-43). Chinese name: Chang-wong-tau. Japanese name: Daizu or soya mame. This "is a rather unusual Orient-grown vegetable. Unlike the snap bean, green soybeans are sold in their pods attached to the plant. The plants with their pod-laden branches are tied in bunches of 4 to 10. Each plant is about 15 inches long and has very hairy stems and leaves. The pods also are hairy and are borne in clusters. Each pod contains three to four seeds. The soybean is an all-season crop in Hawaii. It makes its best growth, however, in April. It requires about 75 days from the date of planting to reach the green-pod stage."

"*To cook plain.*- Wash one-half pound fresh soybean pods, and boil until they are soft. Season with soy sauce and sugar, and serve in the pod. The beans are removed for the pods when eaten."

A photo shows two uprooted soybean plants with pods attached.

Other vegetables of interest are also described, each with a photo: Ginger bracts (*Zingiber mioga*). Japanese name: Mioga (p. 12). Mugwort (*Yomogi,* p. 19). Perilla (*Perilla frutescens*). Japanese name: Shiso (p. 20). Cowpeas (*Vigna sinensis*). Japanese name: Sasage. Goa beans (*Psophocarpus tetragonolobus*). "Although the Goa bean, also known as asparagus pea and winged bean, has long been known and used in the Orient, it has only recently been introduced into Hawaii, where it is as yet little known" (p. 40). Chinese name: See-kok-tau. Japanese name: Not given. Note:

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This is the earliest document seen (Aug. 2006) giving the name "winged bean" as one of the names of *Psophocarpus tetragonolobus.*

Kudzu (*Pueraria thunbergiana, P. hirsuta, Dolichos japonica*). Chinese name: Fan-kot. Japanese name: Sasage. Oriental radish (*Raphanus sativus longipinnatus*). Chinese name: Loh-bak choi. Japanese name: Daikon. Yam (*Dioscorea batatas*). Also known as Chinese yam, Chinese potato, and cinnamon-vine. Chinese name: Tai-sue. Japanese name: Naga-imo.

In the section titled "Composition" (p. 57-63), tables give nutritional analyses of all foods discussed in this bulletin, including calcium, phosphorous, iron, and "alkalinity" (expressed as cubic centimeters of normal acid solution required to neutralize excess of base per 100 grams of fresh vegetable). The analysis of the green soybeans is with the pods removed. Address: 1. Agronomist; 2. Chemist. Both: Honolulu, Hawaii.

2671. *Gazette* (*Indiana, Pennsylvania*). 1929. Soybeans.
• ***Summary:*** This article seems to be based on a USDA press report of early 1929: "W.J. Morse, forage-crop specialist, Bureau of Plant Industry, U.S. Department of Agriculture, who has been in Japan for several months collecting new varieties of soybeans, reports that to date he has collected more than 5,000 lots, representing every type of soybeans grown in Japan."

"Samples from every lot of seed collected by Mr. Morse will be planted at the United States experiment farm at Arlington, Va. [Virginia], this spring, and when the seed is harvested tests will be made for oil content. In this way it is hoped that selections may be made which will ultimately develop into varieties with a wide range of oil content.

"Mr. Morse writes that the Japanese use the soybean in a number of ways in their diet. They grind the beans and make flour, they serve the green beans as we would green lima beans, and they cook the dried beans in a manner similar to navy beans. Besides this, they make soy sauce, soybean curd [tofu], beverages, and bean sprouts from the soybean. He believes that the use of soybeans as a human food in this country will increase steadily.

"Mr. Morse is now spending the winter in Tokio [sic], studying the Japanese methods of utilizing soybeans. While he expects soybeans to grow in favor as a feed for livestock and food for people, he feels that the largest future development of the crop in the United States will be in the utilization of the oil and meal in industry.

"Samples of the seed collected in Japan will be sent to some of the State experiment stations for trial, but will not be available for distribution to individuals."

2672. Kinoshita, Asakichi; Tanigawa, S. 1929. Yushutsu muke shôyu jôzô shiken [Tests on brewing shoyu for export]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 105. p. 22-28. Dec. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Joshu.

2673. Kinoshita, Asakichi; Tanigawa, S. 1929. Komugi daiyô-hin shiyô shiken [Shoyu brewing using substitutes for wheat]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 105. p. 13-21. Dec. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Joshu.

2674. Kinoshita, Asakichi; Tanigawa, S. 1929. Shôyu no roka to chozô-sei ni tsuite [The effect of filtration on shoyu preservation]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 105. p. 1-14. Dec. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Joshu.

2675. N.I. Vavilov's collection of soybeans in 1927 and 1929. 1929.
• ***Summary:*** From 1927 to 1929 N.I. Vavilov collected soybeans in four countries; these soybeans are now at the VIR (N.I. Vavilov Research Institute of Plant Industry, St. Petersburg, Russia). Information about these trips and soybean collecting was sent to Soyinfo Center Irina Seferova, Soybean Collection Curator at the VIR.

(1) Trip to Italy on business. Vavilov obtained 1 accession from Japan (number k-602).

In early June 1929 Vavilov left on a trip for East Asia. "In a whirlwind tour of western China, Japan, Formosa (now Taiwan) and Korea, he collected 3,500 kilograms of seed and Herbarium samples and also several thousand photographs of the farming and geography. He did not return until December. He concluded boldly that the crop diversity in these countries was 'wholly unique, that the cultivated plants were absolutely atypical, that the cultivation techniques were unmatched and that the ancient cultural center of East Asia was completely independent with its uncommon plants species and genera..." (Pringle 2008, p. 150)

(2) On his trip to Chinese Turkestan (western China), Vavilov, who was head of the expedition, collected 15 soybean seeds (numbers k-2944–2946; 3017-3028). The table also states: "Coll. Popov M.G."–meaning that M.G. Popov (Mihail Grigor'evich Popov) was a member of the expedition and also collected soybean seeds.

(3) On his trip to Korea, Vavilov collected 41 soybean seeds (numbers k-2949–2989).

(4) On his trip to Japan, Vavilov collected 30 soybean seeds (numbers k-2990–3016).

In total, on these four trips, he collected 87 soybean accession from East Asia.

The sequence of these trips was as follows (Irina Seferoa, Dec. 2010, personal communication): "Vavilov visited Japan in October 1929. Then he visited Korea and Taiwan (China). In November he returned to Japan, then left for the USSR. It was a business trip or expedition." Address: St. Petersburg, USSR.

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2676. Takagi, Fumi. 1929. On the inheritance of some characters in Glycine soja, Bentham (Soy-bean). *Tohoku Imperial University, Science Report, Series 4, Biology* 4(4):577-90. Dec. [6 ref]
• ***Summary:*** Discusses fasciation of the stem, flower color, hilum color, saddle-pattern on the seed coat, chlorosis, and size of seeds. Address: Biological Inst., Tohoku Imperial Univ., Sendai, Japan.

2677. Pierson, J.L. trans. 1929-1963. Man'yoshu. Leiden (Leyden): E.J. Brill Ltd. 20 Vols. See vol. 16, p. 44. [Eng]
• ***Summary:*** This is the only translation of the entire Man'yoshu.

2678. Fukai, Tôshi; Katsume, E. 1929. Shôyu genryô "pentoosu" oyobi "meranin" shikiso seizô shiken [Preparation of pentose and melanin as raw material of shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 24(7):43-48; 24(8):20-24; 24(9):28-31; 24(10):24-29; 24(11):32-36; 24(12):19-24. [Jap]
Address: 1. Jozo Shikensho Sishu, Nôgaku-shi; 2. Jozo Shikensho Shokutaku, Kôgaku-shi, Japan.

2679. Fukai, Tôshi; Ono, S. 1929. Shôyu hakkô to shiyu no kankei. I. Shôyu abura ni ganyu serareru shibôsan "echiru esutaa" narabini yûri shibôsan ni tsuite [On the relation of fat and shoyu brewing. I. On the ethylester of fatty acid and free fatty acid in shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 24(1):37-41; 24(2):34-41; 24(3):47-50. [Jap]
Address: 1. Jozo Shikensho Gishi, Nôgaku-shi; 2. Moto Jozo Shikensho Kenshu-in, Nôgaku-shi, Japan.

2680. Fukai, Tôshi. 1929. Shôyu hakkô to shiyu no kankei. I. Shôyu ni ganyû seraru shibôsan "echiru esutaa" narabini yûri shibôsan ni tsuite [The relationship of oils to shoyu fermentation. I. Fatty acid and its ethyl ester contained in shoyu oil]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 102. p. 214-33. [Jap]
Address: Jozo Shikensho, Gishu.

2681. Ikebe, S.; Yamada, S.; Fujieda, S. 1929. Manshû daizu hinshitsu tokyu satei ni kansuru chôsa [Survey on the quality ranking of Manchurian soybeans]. *Minami Manshu Tetsudo K.K. Rinji Keizai Chosa Iinkai, Shiryo* (*Economic Documents*) No. 4. 197 p. [Jap]*
Address: Dairen, Manchuria [South Manchuria Railway Co.].

2682. Kakimoto, Y. 1929. [Preparation of reclaimed rubber with soy-bean oil]. *Osaka Kogyo Shikenjo Hokoku?* (*Report of the Osaka Industrial Research Institute, Japan*) Vol. 19. No. 9. [Jap; eng]*
• ***Summary:*** "The method of preparing reclaimed rubber with soy-bean oil under various conditions was studied. The material was prepared by vulcanizing F.A.Q. smoked sheet with acid-free S (90:10 ratio) under proper conditions. Reclaimed rubber was prepared by the usual method, i.e., by mixing the vulcanizate with soy-bean oil. The mixture of vulcanizate and oil was vulcanized with S(60:30:10 ratio) under various conditions..."

2683. Kinoshita, Asakichi. 1929. [Necessity of amydase enzyme in shoyu moromi]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 7:127. [Jap]*
Address: Jozo Shikensho, Gishi.

2684. Kinoshita, Asakichi. 1929. [Amylolytic enzyme and proteolytic enzyme in shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 7:44. [Jap]*
Address: Jozo Shikensho, Gishi.

2685. Kinoshita, Asakichi. 1929. Shôyu moromi-chû no "amidaaze" sei kôso no kôyô [Necessity of amydase enzymes in shoyu moromi]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 24(9):26-27. [Jap]
Address: Jozo Shikensho Gishi.

2686. Kinoshita, Asakichi. 1929. Kagaku shôyu ni tsuite [On chemical shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 24(9):8-12. [Jap]
Address: Jozo Shikensho, Gishi.

2687. Kinoshita, Asakichi; Isawa, S.; Mitsuhashi, K. 1929. Shôyu-chû no tôka kôso oyobi tanpakushitsu bunkai kôso ni kansuru kenkyû [Amylolytic enzymes and proteolytic enzymes in shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 24(8):14-19. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Shokutaku; 3. Kenshu-in.

2688. Kinoshita, Asakichi. 1929. Shôyu no genryô to shite Sakuramame shiyô no yôketsu [The keys and secrets to using Sakuramame as raw material in brewing shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 24(10):13-17. [Jap]
• ***Summary:*** Sakuramame is soybean flakes made by crushing selected soybeans between rollers. It is not clear whether or not the flakes are defatted. Address: Jozo Shikensho, Gishi.

2689. Kinoshita, Asakichi; Isawa, S.; Tanigawa, S. 1929. Kansho shiyô shiken [The use of sweet potato as raw material of shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 103. p. 151-60. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Shokutaku; 3. Joshu.

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2690. Kinoshita, Asakichi; Inoue, E.; Aomori, Y. 1929. Miso oyobi miso-yo kome kôji no futsû seibun narabini sono tôkaryoku [The nutritional composition of miso and of rice koji used in miso, and the saccharifying power of the latter]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 24(7):77-79. [Jap]
Address: Jozo Shikensho 1. Gishi 2-3. Kenshu-in.

2691. Kinugasa, Y.; Hatsutori, Y. 1929. Shôyu bôfuzai "anzen" jô no shôyu ni taisuru bôfu kôryoku shiken hôkoku [Results of an experiment on antiseptic power of "anzen," a shoyu preservative (Abstract)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 24(9):71. [Jap]
• ***Summary:*** The word "anzen" means "safe."

2692. Kinugasa, Y. 1929. [Detection of furfuracrylic acid in shoyu]. *Eisei Kagaku* (*J. of Hygienic Chemistry*) 1:3-. [Jap]*

2693. Kinugasa, Y. 1929. [Detecting method of beta-naphthol in shoyu]. *Eisei Kagaku* (*J. of Hygienic Chemistry*) 1:197-. [Jap]*

2694. Kurono, Kanroku; Kinoshita, A.; Fukai, T. 1929. "Pentoosu" shiki shôyu jôzô shiken. Dai go-kai yobi shiken [Test of the pentose system for shoyu brewing]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 24(5):16-25. [Jap]
Address: Jozo Shikensho. 1. Gishi, Nôgaku Hakase; 2. Gishi; 3. Gishu, Nôgaku-shi.

2695. Kurono, Kanroku; Kinoshita, A.; Fukai, T.; Tateno, M. 1929. "Pentoosu" shiki shôyu jôzô shiken. V. [The use of pentose as a raw material for shoyu. V.]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 102. p. 50-62. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Gishi; 3. Gishu; 4. Moto Joshu.

2696. Kurono, Kanroku; Kutou, Tatsuma. 1929. Shôyu no aji no chôjuku ni tsukite [Modification of the taste of shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 102. p. 234-41. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Kenshuin.

2697. Mashino, I.M. 1929. Soybean oil extraction. *J. of the Society of Chemical Industry, Japan* 32:256B. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]*
• ***Summary:*** The residue after the extraction of soybean oil with an azeotropic mixture of hydrocarbons and lower alcohols is suitable for the raw material of foodstuffs. After extraction at 40-50ºC with a mixture of gasoline and methyl alcohol, the azeotropic mixture separates into two layers: The upper, gasoline, layer contains soybean oil; the alcohol layer contains carbohydrates, phosphatides, coloring matter, and other impurities. The lowering of the separation temperature increased the concentration of the oil in the upper layer, which process is also aided by the water content of the soy bean.

Talk with Walter Wolf, PhD. 2002. July 28. Lower and higher alcohols depend on the chain length. The following are the first seven in the series, from lower-chain to higher-chain length: As the chain length increases, so does the boiling point. 1. Methanol–a single carbon alcohol. Methane is the hydrocarbon gas. 2. Ethanol is a two-carbon alcohol. 3. Propanol. 4. Butyl alcohol. 5. Pentyl alcohol. 6. Hexanol. 7. Heptanol.

2698. Mashino, Minoru. 1929. The purification of soybean protein. II. Influence of water on the purification by lower alcohols. *J. of the Society of Chemical Industry, Japan* 32:312B-23B. (Chem. Abst. 24:2152). Supplemental binding to Kogyo Kagaku Zasshi. [4 ref. Eng]*
• ***Summary:*** The amount of carbohydrate extracted from crude soya-bean protein by aqueous methyl or ethyl alcohol increases with increasing dilution until it reaches a maximum at 70% or at 40% alcohol, respectively. The crude protein extracted also increases with increasing dilution, about threefold and tenfold with the respective solvents.

2699. Mihori, S. 1929. [Digestive enzyme of hamanatto]. *Eisei Kagaku* (*J. of Hygienic Chemistry*) 1:7-. [Jap]*

2700. Muto, M. 1929. Nattô no saikingakuteki kenkyû [Bacteriological research on natto]. *Eisei Densen Byogaku Zasshi* (*J. of Hygiene and Infectious Diseases*) 25:708-46. [Jap]*

2701. Okano, V.K.; Ninomiya, M. 1929. [Denaturation of the protein in soy beans during the extraction of oil with alcohol]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) 14:7-9. (Chem. Abst. 25:1694). [Jap]*
• ***Summary:*** The protein matter is denatured by the action of alcohol, heat, and steam, the latter being blown into the grains to recover the solvent. The relative proportions of protein soluble in water, in 10% sodium chloride solution, and in 0.2% caustic soda, contained in soy bean after extraction with alcohol, benzine, or alcohol-benzine mixtures have been determined. It is shown that the water- and brine-soluble fractions decrease, while the alkali-soluble and the insoluble fractions increase. The change produced by steaming is similar and is proportional to the duration and the temperature of the steaming. No change in the amino-acid partitions of the raw bean and the grist could be detected, and digestion of the purified protein with pepsin and trypsin revealed no significant differences in the various preparations.

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2702. Otomo, Sajiro. 1929. [Soy beans]. *Manimi Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Company, Central Laboratory Report*) 15 p. *

2703. Otomo, Sajiro. 1929. [Occurrence of vitamins A and B in soybean oil and cake]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) 14:13-15. [Jap]*
• ***Summary:*** Soybean oil has been shown to contain a definite amount of vitamin A, although it is less effective than cod-liver oil. Oil obtained by extraction was richer than the expressed oil. The vitamin is destroyed by bleaching. Soybean cake does not contain any appreciable amount of vitamin A, but does contain vitamin B.

2704. Otomo, Sajiro. 1929. [Nutritive value of soybean cake and purified soybean cake]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) 14:10-12. [Jap]*
• ***Summary:*** Although the protein constituent of soy beans is denatured by the extraction of oil, it has been found that the cake still possesses nutritive value. Solvent-extracted cake is of less value than the expressed, and purified cake than the original. Artificial digestion with pepsin and trypsin showed that the nutritive value is lowered by alcoholic extraction.

2705. Otomo, Sajiro. 1929. [The proteins and vitamins in the embryo of the soybean (Abstract)]. *Manimi Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Company, Central Laboratory Report*) p. 15-17. (Chem. Abst. 25:1871). *

2706. Sasaki, S. 1929. [Mummy disease of black spot of soybean]. *Annals of the Agricultural Experiment Station, Government-General of Chosen* 4:1-28. [Jap]*
• ***Summary:*** The disease is due to a *Phomopsis,* the imperfect stage of *Diaporthe sojae* (=D. paseolorum var. sojae). Symptoms and morphology of the fungus are fully described.

2707. Sato, Masanori; Seto, I. 1929. Separation and recovery of phosphatides and carbohydrates from alcoholic extract of soya bean (Abstract). *Abstracts of Reports, Central Laboratory, South Manchuria Railway Co.* (*Dairen, Manchuria*) p. 6. *

2708. Sato, M.; Sakai, H. 1929. [Extraction of soybean oil with alcohol. II. (i) Solubility of soybean oil in alcohol]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) 14:1-3. [Jap]*
• ***Summary:*** The optimum concentration of alcohol for the extraction is 92 weight-% or over and the temperature should be near the critical solution temperature. After extraction, cooling to 30ºC gives the most efficient separation of oil.

Note: This is a very early article on alcoholic extraction of oilseeds. One of the authors made measurements on the mutual solubilities between soybean oil and ethyl alcohol, and developed a new idea of the oil extraction process, in which the oil is extracted in the hot state and separated into two layers upon cooling the miscella. Address: Dep. of Organic Chemistry, The Central Laboratory, South Manchuria Railway Co., Dairen.

2709. Sato, M.; Yokochi, M. 1929. [Extraction of soybean oil with alcohol. II. (ii) Extraction of soybean oil with alcohol]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) 14:3-6. [Jap]*
• ***Summary:*** Extraction is best carried out with 96 volume-% of alcohol at temperatures above 75ºC, the extract being cooled to 25Cº to separate the oil. An apparatus for large-scale operation is described.

2710. Sato, M.; Seto, I. 1929. [Extraction of soybean oil with alcohol. II. (iii) Separation and recovery of phosphatides and carbohydrates from alcoholic extract of soy beans]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) 14:6-7. [Jap]*
• ***Summary:*** On cooling after extraction with alcohol, the alcoholic layer contains 1.07% phosphorus, 1.27% nitrogen, and 27.53% carbohydrates (as invert sugar), the total representing about 6% of the soy bean. As methods of recovery, alcoholic extraction, alcoholic distillation, and coagulation with sulfuric acid and with calcium chloride were tried. Distillation with added alcohol gave the best recovery (carbohydrates 91.5%, phosphatides 96.8%), but coagulation by calcium chloride was probably the most practical (carbohydrates 82.7%, phosphatides 90.8%).

2711. Terao, H.; Nakatomi, S. 1929. Daizu no shiyô oyobi shuhi no yôryokutai ni kansuru iden ni tsuite [On the inheritance of the chlorophyll colorations of cotyledons and seed-coats in the soybean]. *Idengaku Zasshi* (*Japanese J. of Genetics*) 4:64-80. [4 ref. Jap; eng]
Address: 1. Norinsho Noji Shikensho, Japan; 2. Kantocho Noji Shikensho.

2712. Usami, S. 1929. [Determination of sandy matter in soybean cakes]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) 14:23-24. [Jap]*
• ***Summary:*** A sample (10 gm) of air-dried soybean cake ground to pass 20-mesh is shaken with 50 cc of carbon tetrachloride (relative density at 21ºC = 1.58). After a few minutes the volume of settled sand is measured in a special wedge-shaped vessel. The sand may be filtered, dried, and

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weighed.

2713. Yoshino, E. 1929. [Reports on brewing shoyu]. *Minami Manshu Tetsudo K.K.* (*South Manchuria Railway Co. Experiment Station*) 14:75-, 95-. [Jap]*

2714. Yoshino, E.; Seki, K. 1929. [Preparation of soy sauce from soybean cake. II]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) 14:21-22. [Jap]*
• ***Summary:*** As a potential outlet for soybean cake, an attempt has been made to prepare soy sauce. The product brewed from the cake and kaoliang, wheat bran, etc. at 24-32ºC for 100 days was comparable to the commercial material. At room temperature the rate of decomposition was too low to be practicable. The yield was improved by the addition of soybean oil.

2715. Yoshino, E.; Seki, K.; Yamamoto, K. 1929. [Preparation of soy sauce from soybean cake. III. Composite Y-type fermentation]. *Minami Manshu Tetsudo K.K., Chuo Shikenjo Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) 14:22-23. [Jap]*
• ***Summary:*** Koji was prepared from soybean cake and wheat separately, and the fermentation products of different ages were united to form a material of satisfactory color, flavor, etc.

2716. Dairen Shoko Kaigisho. 1929. Dairen tokusan shijô fushin no genin to sono taisaku [The origin of the slump in the Dairen (Manchuria) specialty products market and countermeasures to correct it]. Dairen. 162 p. [Jap]*
Address: Dairen, Manchuria.

2717. Ferrée, Christian Johan; Tussaud, J.T. 1929. The soya bean and the new soya flour. London: William Heinemann (Medical Books) Ltd. xi + 79 p. Illust. No index. 22 cm. Revised translation from the Dutch by C.J. Ferree and J.T. Tussaud of Die Sojaboon en Duurzaam Sojameel. [29 ref]
• ***Summary:*** Contents: Foreword, by Sir Wm. Arbuthnot Lane, President of The New Health Society. Preface, by C.J. Ferrée (London). 1. Introduction. Literature. Name of the plant. Origin. Botanical particulars. Assimilative power of the soya plant. Inoculation. Soil requirements. Production and cost. 2. General ingredients of the various Manchurian beans. Composition. The value of soya protein. Vitamin in the soya bean. Digestibility of the soya bean and its products. 3. Use in China and Japan: Bean sauce, soy, or shoyu, Chinese chiang (paste), tou-fu or beancurd, beans consumed as a table vegetable, bean refuse and bean cake are used as a fertiliser and for fattening hogs, bean oil is used as an illuminant (where it has not been superseded by kerosene), as a substitute for lard in cooking, and as a lubricant for greasing axles and parts of native machinery, miso and natto. First imports into Europe. Exports during the last five years from China and Japan. Imports during the last five years into Europe and America. The increasing rate of its cultivation. Manchuria–Production. Estimate of the world's production of the soya bean. London the principal market. Future importance.

4. America. Australia. South Africa. Other British possessions and protectorates. Java (Dutch East Indies). Europe. 5. Unsuccessful experiments with soya flour. Ordinary soya flour. Extracted soya flour. Dr. L. Berczeller's discovery. The new soya flour. Comparison with other cereal flour and other foods. Comparison in price with other cereal flour and other foods. Comparison in price of soya protein compared with other cereal foods. Comparative analysis of cereals. 6. Soya milk. Vegetable casein. Lecithin. 7. Increase in food value. Savings. Industrial application in foodstuffs. The importance of Dr. L. Berczeller's soya flour for the food industry. Soya flour and the food laws. Uses of soya flour in: Bread, pastry, cake, biscuits, confectionery, sausages, infant foods and food for invalids, cocoa, chocolate, soup cubes, pudding flour. Uses in the kitchen. Soya flour recipes (for flour made using the Berczeller process), soya flour for diabetics, recipes for diabetics.

The Preface states: "In the following pages the writer has endeavoured to give an account of the numerous uses to which the soya bean has so far been put, and to visualise its future service to humanity through the means of a totally new and practical process by which this legume... may in future be used as an important article of food for general consumption throughout every quarter of the globe.

"In compiling the details relative to the soya bean flour, with which this brief summary principally deals, he trusts that he has succeeded in giving sufficient data to enable the reader to fully realise its value as a staple food from the economic point of view, as well as from the more domestic standpoint, so that the important fact may be fully realised that a new foodstuff of a very valuable nature... has now been brought within the reach of all nations to serve them in a most practical manner as an economic article of food."

The book includes statistics on the imports and exports from 1923 to 1927 of "soya beans, soya oil, and soya cake in various countries including China, Japan, England, France, Germany, Holland, Norway, Denmark, Sweden, and USA.

The "new soya flour" is that developed by Dr. Berczeller. This book repeatedly praises that flour. "A few years ago Dr. Laszlo Berczeller, a Hungarian physiologist in Vienna, succeeded scientifically in finding a method which enables us to prepare from the soya bean a digestible and pleasantly flavoured flour without detracting from its nutritive value, and this method entirely succeeds in preserving all the good qualities contained in the bean itself. Physiological experts and analysts withhold no praise, as the following extracts will show: -" There follow words of praise from: (1) Dr. Alfred Schwicker, M.P., Royal Hungarian

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State Institute, Central Depot for Experimental Chemistry. (2) Dr. Stefan Weisser, King's Counsellor, Royal Veterinary Physiological Experimental Station, Budapest. (3) Prof. A. Durig., The Physiological Institute, University of Vienna.

Marakujew (1928) estimates the production of soya beans in "Manchuria at 6 million tons at the utmost, the production of the whole of China at 16 million tons, and he is led to this figure by the conclusions of the Economic Bureau of the South Manchuria Railway, which estimates that the Manchurian crop in 1927 amounted to 37.1 million kobu (5.88 million English tons), of which 2.6 million tons originated from South Manchuria, 3.3 million tons from North Manchuria" (p. 32). A table (p. 33) gives estimated world production of soya beans from 1923 to 1929 (6.6 million tons, forecast). The leading producers in 1929 (in million tons) are: China 5.250. Japan 0.580. USA 0.250. Java and Dutch East Indies 0.120. Other Asiatic countries 0.400. A soya milk factory was recently established in Denmark (p. 54). Although this book contains a bibliography of 29 references, most are very incomplete.

Photos show: (1) A soybean plant with roots, pods, and leaves. (4) Nodules growing on soybean roots. (5) One pod and seed each from inoculated and uninoculated soybean plants. (7) An immense field of soya beans in Manchuria. (8) Soya beans awaiting shipment, in house-shaped stacks under tarps, at Dairen. (13) Seeds of the most important varieties of soya beans now grown in the United States. (10) Two horses and a farmer cultivating a field of soybeans. (11) Harvesting soya beans. (12) Well selected, clean soybean seeds.

A map (frontispiece) shows where soybeans are cultivated worldwide. An illustration (facing p. 2) shows "Shen-Nung. Emperor [of China] in 2838 Before Christ, called 'The Heavenly Farmer.' Reproduced from a print in a Vienna museum."

One bar chart compares the nutritional composition of soya flour with that of cereals and animal products, and other foodstuffs (p. 13), another compares the calories (p. 46), and a third compares the cost of 1,000 calories (p. 48). Marakujew (probably spelled Marakiev or Marakuyev), in "The Export of Manchurian Soya Beans and its Finance" (1928, in Russian, probably an article rather than a book) "estimates the production of Manchuria at 6 million tons at the utmost, the production of the whole of China at 16 million tons, and he is led to this conclusion by the Economic Bureau of the South Manchuria Railway, which estimates that the Manchurian crop in 1927 amounted to 37.1 million kobu (5.88 million English tons), of which 2.6 million tons originated from South Manchuria, 3.3 million tons from North Manchuria. According to the calculations of this bureau, the home consumption of North Manchuria is something like 40 per cent. of the production, viz., 1.3 million tons; the remaining 2 million tons are for export. The exports of South Manchuria were estimated at 1 million tons" (p. 32). Address: London.

2718. Hirota, Torao. 1929. Daizu benran [Soybean handbook]. Dairen: South Manchurian Railway, Central Research Lab. 427 p. [Jap]
Address: Central Laboratory of the South Manchurian Railway, Dairen, Manchuria.

2719. Machida, Tatsujirô. 1929. Rôdô sôgi no kaibô [An analysis of labor strikes]. Tokyo. [Jap]*
• ***Summary:*** This book gives special attention to the strike against the Noda Shoyu Co. (today's Kikkoman). The author was a member of the board of the Harmonization Society and was directly concerned with the conciliation of the dispute. Address: Japan.

2720. Matsuura, Hajime. 1929. A bibliographical monograph on plant genetics (Genic analysis): 1900-1925. *Tokyo Imperial University, Faculty of Science, Botanical Institute. Contrib. Cytology and Genetics* No. 82. 499 p. See p. 59-64. 2nd ed., 1933. [1341* ref. Eng]
• ***Summary:*** The section on Glycine Soja is basically a review of the world literature on soybean genetics. In the annotated bibliography, arranged chronologically and containing 1,341 references are 10 references on Glycine soja and Soja max numbers 139, 394, 590, 822, 859, 1060, 1100, 1201, 1233, and 1333. Of these, 5 are by Japanese, 4 by American and 1 by German researchers.

Contents: Foreword by K. Fujii. Author's preface. Genic analysis in plants (p. 1-317). Bibliography on genic analysis in plants, with brief comments, arranged in chronological order (p. 319-467). Index of subjects (p. 469). Index of authors, with the genera investigated by each author (p. 477). Index of species (p. 491). Index of families, with the species investigated (p. 497). Address: Prof. of Botany, Second Higher School, Sendai, Japan.

2721. Oregon Bureau of Labor. comp. 1929. Census: Japanese population in Oregon. October 1, 1928. Salem, Oregon: Oregon Bureau of Labor.
• ***Summary:*** The names are listed alphabetically, and grouped together under the head of household.

Ota–Saizo (husband), 86½ N. 5th, Portland. Sex: Male. Married or single: Married. Occupation: Food Mfgr. [Manufacturer]. Born in: Japan. Date of birth: April 13, 1881. [?] March, 1905.

Ota, Shina (wife). Female. Married. Japan. Jan. 31, 1895. June 1913.

Ota, Matsuno (daughter). Female. Single. Born in Portland, Oregon. Date of birth: July 23, 1916. Address: Salem, Oregon.

2722. Seoul Woman's Club, Home Economics Dep. 1929. The Seoul women's cook book. [Seoul, Korea]: Seoul Woman's Club. 313 p. Index. 22 cm. *

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• ***Summary:*** Title on cover also in Korean. Recipes in English and Korean. Also includes Japanese recipes, since Korea is now part of the Japanese empire. Address: Korea.

2723. World Engineering Congress. 1929. Industrial Japan: A collection of papers by specialists on various branches of industry in Japan. Tokyo: Kokusa–Shuppan Insatsusha, International Publishing and Printing Co. 7 + 584 p. First World Engineering Congress. Illust. 23 cm. [Eng]
• ***Summary:*** Page 572: "... which is taken for breakfast in almost all houses of the country, and is very nutritious. Now, in this country, about 57,000,000 kwanme of miso are produced in the miso-making factories a year, and its value is estimated at about 32,000,000 yen. Miso is white or reddish brown..."

Page 578: "In strict signification, however, miso is distinguished into two classes, in one of which kome (rice) -koji or mugi (barley or rye) -koji is used with steamed soya bean and salt as raw material, and in the other soya-bean, koji and salt only are used. The former is ordinary miso, called *kome-miso* or *mugi-miso* respectively according to the use of *kome-koji* or mugi-koji, and Edo-miso and Sendai-miso belong..."

2724. *Economist* (*London*)**.** 1930. Japan.–Gold standard–Prices–Foreign trade–Money. 110(4,506):23-24. Jan. 4.
• ***Summary:*** "From our correspondent. Tokyo, December 10." Japan is preparing to return to the gold standard. Wholesale prices continued to move downward last month. But Japanese prices are still about 20% higher than British or American prices. "The higher Japanese price level is accounted for largely by such 'sheltered' goods as red beans [azuki], miso, dried bonito, Japanese paper, mattings and tobacco (Government monopoly), prices of which, in most cases, are kept high for special reasons" (p. 24, col. 1).

2725. Dorsett, P.H.; Morse, W.J. 1930. Visit to the Noda Shoyu Company, Ltd. in Chiba, Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.
• ***Summary:*** Pages 3465-67 (7 Jan. 1930). "Today we really got started on our work of looking up and getting information about soybean products. In accordance with plans made yesterday, we left Tokyo this morning (Ueno Station) at 8:15 for Noda-Machi, Japan, where we arrived at 9:45. We went direct to the office of The Noda Shoyu Company, Ltd., of Noda-Machi, Prefecture of Chiba, Japan, makers of the famed Kikkoman Shoyu.

"This company embracing 19 plants, is one of, if not the largest plants in the world brewing shoyu sauce. According to their literature, Kikkoman Shoyu was first brewed by Mr. Saheiji Mogi, in the second year of Meiwa [sic, Hoei?] (corresponding to the year 1704) in Noda-Machi, Japan.

"We met Mr. Ota, one of the assistant directors, we also met Mr. Hichizaemon [Shichizaemon] Mogi, President and Director, also a Mr. Jutaro Namiki. We spent about 1½ hours with these gentlemen in the office. Then Mr. Ota and Mr. Namiki showed us over one of their large plants. It impressed us as an up-to-date modern institution. We were in the grading and mixing room. They have 30 incubating chambers or curing rooms where the germ on the 50-50 mixture of soybean and wheat mash is grown.

"The cement vats, or aging vats, of which there are 1,500 under one roof, are made of cement and are 12 feet square and about 8 feet in depth.

"In the manufacture of shoyu sauce, this concern uses annually about 20,000 bushels of soybeans, primarily from Manchuria, and also 20,000 bushels of wheat, Japanese grown when available. They import from Australia. This year, however, they are getting their supply of wheat from Canada.

"They have 200 square (about 4 ft. by 4 ft.) hydraulic presses and 200 oblong ones about 4 ft. by 6 ft. They age their shoyu sauce 1½ years in the curing vats."

Page 3466-68. Photos show: (1) Racks of small trays, outdoors, each about 2 inches deep, 18 inches long, and 10-12 inches wide, used to cure soybean and wheat mash [koji] for making shoyu sauce (neg. #44709). (2) A nearby view of the interior of one of the small trays (neg. #44710). (3) Many round bundles of cask stock of spruce, stored outdoors. The wood will be used to make kegs for storing shoyu sauce. A part of one warehouse of the Noda Shoyu Co. is in the background (neg. #44711). (4) A horse pulling a cart on a railroad track. On the cart are bundles of spruce stock that will be used to make soy sauce casks (neg. #44712). (5) A nearby view of portions of ricks or bundles of short pieces of spruce for staves, tops and bottoms of small casks for shoyu sauce (neg. #44713).

Page 3474. A 5 by 7-inch photo (taken Jan. 9) shows: 1. Small bottle (with label) of soy sauce made by Noda Shoyu Co., and materials used in its manufacture. 2. Salt from Formosa. 3. Mixture of boiled beans and crushed roasted wheat with white mold [shoyu koji]. 4. Mixture of boiled soybeans and cracked wheat after one day in fermentation room. 5. Cracked roasted wheat. 6. Roasted wheat. 7. Wheat (Canadian). 8. Soybeans (Manchurian variety). (neg. #44734).

Page 3475. Photo of *Pueraria Thunbergiana.* Kudzu. Five "small packages of kudzu flour purchased in a store in Tokyo, Japan, December 24, 1929. This flour is made from kudzu roots and is used in making soups." Each package is 7/8 inches wide; 3½ inches tall.

Page 3482. A photo shows three identical bottles of Kikkoman brand soy sauce, each from a different angle so

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that all parts of the label are visible. Each bottle is 7½ inches tall and 2 inches in diameter, and holds one-fifth liter of sauce. Obtained on Jan. 7 from the Nodashoyu Co. [Noda Shoyu Co.]. D&M item #3074. This company is the largest in the Orient (neg. #44742). Address: Agricultural Explorers, USDA, Washington, DC.

2726. Dorsett, P.H.; Morse, W.J. 1930. Miso in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** * = Best photos. Page 3487 (8 Jan. 1930). Photos of the side and top of a small wooden tub (6 inches diameter, 4 inches high) of *Kairyo Hishio,* made by the Takagawa Co., Noda, Japan. "This form of miso is mixed with rice and eaten." The tub is bound with strips of bamboo and tied with three strands of rice straw rope. Note: Hishio is a seasoning with a consistency somewhat like that of applesauce–much softer than that of miso. Page 3488. Photos shows the same product in small jars 2½ inches in diameter and 3½ inches high.

Page 3596 (17 Jan. 1930, Tokyo). "Went to the Chikuma Miso Factory, one of the largest concerns of this kind we have seen. They use 200 bushels of dry soybeans and an equal amount of rice per day." Pages 3598-3601. Photos show: Catties or casks of miso in front of Chikuma Miso Factory. Same view showing paper covering cask. Loading casks of miso onto truck in front of factory. "Ricks of just recently returned empty catties in front of Chikuma Miso Factory ready for cleaning and refilling." Two Japanese men standing by empty and filled catties of miso. Inside Chikuma Miso Factory, two men standing by a tall vat of miso with four casks on the floor in front of them. One man is holding a long pole.*

Pages 3633-36 (21 Jan. 1930, Tokyo). Photos show: Miso ingredients on a bamboo sheathe/culm. Five different kinds of miso on a bamboo sheathe. Miso as sold wrapped in a bamboo sheathe plus the Japanese label measuring 4.6 by 7 inches. Pages 3733, 35, 38-39 (31 Jan. 1930, Tokyo). Photos show: (1) A cylinder of commercial miso (3 inches diameter, 8 inches long) with labels, side and top views. (2) Miso (which contains turtle blood) in a small eight-sided wooden box (3¼ inches across), with label. (3) Two glass jars containing miso, with labels; side and top views. (4) Two small square boxes (4 by 4 inches) containing miso, one closed the other with top off to show miso. Page 3818. Photo of miso wafers with package, purchased in a confectionary shop in Yokohama, Feb. 7. "These wafers are very good." Page 3820. Photo of two packages of Okazaki Miso [Hatcho Miso], "said to be a famous brand." One is wrapped (apparently in bamboo sheath, showing label), one unwrapped. Package is 3½ inches wide and 8 inches long. Page 3895. Photo of glass jar of Rikyu miso with label, purchased in Tokyo Feb. 13 for 50 sen a jar. Page 3897. Photo of small jar of Kinzanji Miso (3 views with label). Sells in Tokyo for 30 sen each. Page 3902. Photo of small wooden box of "Tori [chicken] Miso." Sells in Tokyo for 35 sen each.

Page 3974-75 (Feb. 21). Visit Sendai Miso Jozo Jo, Sendaitenai, Oimachi, Tokyo. "Learned that much of their miso for local consumption is only aged for a week or ten days to two weeks, but that Miso for export trade to Canada, the United States and other countries is aged much longer, a year or more. This concern uses annually about 50,000 bushels of soybeans and an equal amount of rice for making Miso–plus 25,000 pounds of salt. Their yearly output is about 12,000,000 pounds. The wooden casks used to pack the Miso contain 200 pounds net weight and sell wholesale at Yen 10.00 to 13.00 per cask. For shipment abroad they use the standard 4½ gallon soy sauce wooden cask. It has a capacity of about 40 pounds and sells delivered at San Francisco at Yen 2.50 to 3.00 per cask."

Pages 3978-79. Photos taken at Sendai Miso Jozo in Tokyo show: (1) Steamed rice spread on out rice straw mats in a wave pattern covering the entire floor of a large room.* After cooling, rice bacteria (Koji [sic, koji starter]) is added, and after three days the malted rice is mixed with boiled or steamed soybeans in the making of soybean miso. (2) Miso mashing tubs (*usu*) used for mashing boiled soybeans when making miso.* Each tub is made from a hollowed tree trunk and first used by Lord Governor Date in the "Year of Kaiei" about 300 years before the start of the Meiji Period (in 1868). Note: Daté Masamune (DAH-tay Mah-sah-MU-nay; lived 1567-1636) of Sendai was the first Japanese to make miso in a factory, starting in the early 1600s.

Page 4022, 4024 (Feb. 23). Photos: A slice of large white Japanese radish (*daikon*) which has been preserved in soybean miso. Thin sugared cookies [rice crackers] named *Satou Miso Senbei,* in which soybean miso has been mixed.

Pages 4082-86. Photos of handsome boxes of miso with labels each purchased in the food department of a large department store in Tokyo. (1) Box (4½ by 6 inches) of Kinzanji Miso. "Kinzanji is the name of a temple in Kyoto and this miso was first concocted by a priest in this temple." (2) Box (4½ by 6 inches) of Saikyo Miso. "A form of white miso sweetened, and containing a large amount of rice." (3) Box of *Wasabi miso,* Japanese horseradish mixed with miso. (4) Box of *Tori miso,* which has chicken meat in it. (5) Box of *Goma miso,* which has sesame seeds mixed in.

Page 4140. Photo of rice bacteria (koji [sic, koji starter]) from T. Aseda Miso Factory, Tokyo, Feb. 28. Name: *Kuroban Moyashi.* Used in the production of miso malt [rice koji]. The contents of this package will inoculate 5 koku (25 bushels) of rice. Price: 0.35.

Pages 4313-22 (12 March 1930). Went to Shimbashi

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Station and took the electric tram for Oimachi, Tokyo, to visit the Sendai Miso Jozojo Miso factory. Photos: (1) Interior of miso mixing room. Bean crusher and mixer were invented by this company. (2) Shipping room, where casks of miso are weighed and loaded into trucks for delivery.* (3) Large soybean steamer with live steam. (4) 300 year old *usu* for crushing soybeans. (5) View of a room full of wooden miso tanks/casks [vats] curing from above the top of the vats.* The top of each vat is weighted with rocks. Each room contains more than 80 vats. Each cask is about 7 feet high and 8-10 feet in diameter. The miso is aged here for a year or more. The company has several such rooms. (6) Soybean steamer in operation. (7) A large pile of rice koji ready to mix with an equal amount of cooked soybeans. To the right is a portion of a small wooden mixing tub with bamboo hoops. (8) Two wooden casks [kegs] of miso, packed and ready to ship to San Francisco, California.* "They have considerable trade there for this product." (9) A cooper at the Sendai Miso Factory seated on the ground and making bamboo hoops for hooping miso casks.*

Page 4344-45 (March 10). Photos: (1) Small box and label of white miso (*Shiro miso*) made from polished rice and soybeans. Purchased from Mikonaya Miso Co., Tokyo. The three characters are written horizontally from right to left. White miso is not used as extensively as red miso. It is "used on special occasions in soups and eaten as cheese with other foods. White miso is much more expensive than red and has more rice in it." (2) Small circular box of rice koji from Mikawaya Miso Co. Can be used to make white miso or sake–rice wine.

Page 4390-91 (20 March 1930, Tokyo). Photos: (1) Boxes of the various ingredients used in making Sendai Miso. From left to right: Dry soybeans, soaked soybeans, polished rice, steamed rice, steamed rice with koji and salt, rice mould (koji), salt mixed with steamed soybeans and moulded rice, finely ground soybeans, coarse miso one week old, coarse miso one year old. "These were received from the Sendai Miso Factory, Tokyo, Japan, March 20, 1930." (2) Vegetables preserved in red soybean miso. The vegetables are Japanese white radish (*daikon*), cucumber, burdock root, small vegetable melon [*uri*] and egg plant [eggplant].

Page 4444-45 (23 March 1930). Photos at the Sendai Miso Factory, Tokyo: (1) Steamed soybeans cooling on a floor in a wave pattern. "After the beans are cooled, they are mixed thoroughly with molded rice [koji] and salt (shown in the background in a mixing machine). The mixture is placed in large curing vats and allowed to cure for about three months." (2) A second view of the same room from a different angle. Address: Agricultural Explorers, USDA, Washington, DC.

2727. Dorsett, P.H.; Morse, W.J. 1930. Tofu in Tokyo, Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 3469 (8 Jan. 1930). Tokyo, Japan. "Worked at the office until about 10 or 10:30 then took our camera and went out to get pictures and information about Tofu, soybean curd.

"We visited a place not more than half a dozen blocks from the Sankaido Building and got a nice lot of information about making tofu. Also secured a few pretty good pictures.

An elderly Japanese lady fried (or seared as we would say) the cakes about 3 by 9 by ½ to ¼ of an inch in thickness, over a charcoal fire [to make grilled tofu or *yakidofu*] on the street or side walk in front of their house.

"Detailed information about the making of this tofu will be found in the special report on soybeans and soybean products, which will be a special report added at the end of our exploration work.

"We saw for the first time fried Tofu which had had chopped carrots added to it [ganmodoki]. We had not prior to this known of vegetables of any kind being added to or mixed with the bean curd or Tofu before frying.

Pages 3470 to 3471. Photos show: (1) "Soja max. Tofu, bean curd. Tokyo, Japan. A nearby view of an elderly Japanese lady frying Tofu on the street. Children and Mr. W.J. Morse are looking on." (2) An elderly Japanese lady frying or searing Tofu. To the right, children are watching the operation, and so are Mr. Morse and Suyetake, in the background. (3) "A fairly nearby view of an old Japanese lady fanning a charcoal fire over which she is frying or searing tofu." (4) "Cakes of soybean curd piled upon bamboo strip supporters [arranged on bamboo mats] and weighted to express the surplus moisture before frying. A metal two prong piece [skewer] is run through each to handle them with" (negatives #44714 to #44717).

Pages 3472 to 3473. Tofu in Tokyo. Photos show: (1) "A fairly nearby of an old Japanese lady turning the cakes of Tofu she is frying [sic, grilling] over a charcoal fire." Note 1. The rectangular charcoal brazier appears to be about 14 inches long, 8 inches wide, and 8 inches deep. This is the same old Japanese lady described on pages 3470-3471. (2-3) "An old Japanese lady fanning a charcoal fire and frying [grilling] Tofu on the street, not far from the Sankaido Building.

(4) A nearby view of five large cakes of skewered tofu being grilled on a brazier over a charcoal fire. (negs. #44718 to #44721).

Page 3476. "Oblong piece of fresh soybean curd which had been toasted over a charcoal fire... This is used in soups and also cooked with vegetable mixtures. Purchased from a bean curd factory, Tokyo, Jan. 8. The piece is 7½ inches long and 2½ inches wide" (neg. #44736).

Page 3477. "*Phaseolus angularis.* Adsuki bean.

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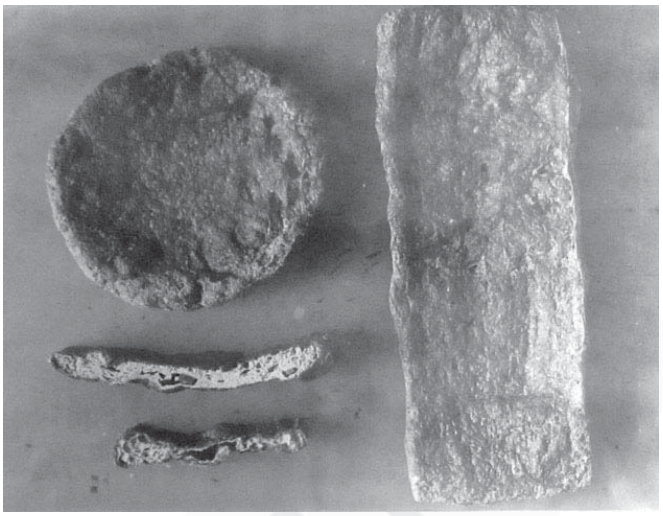
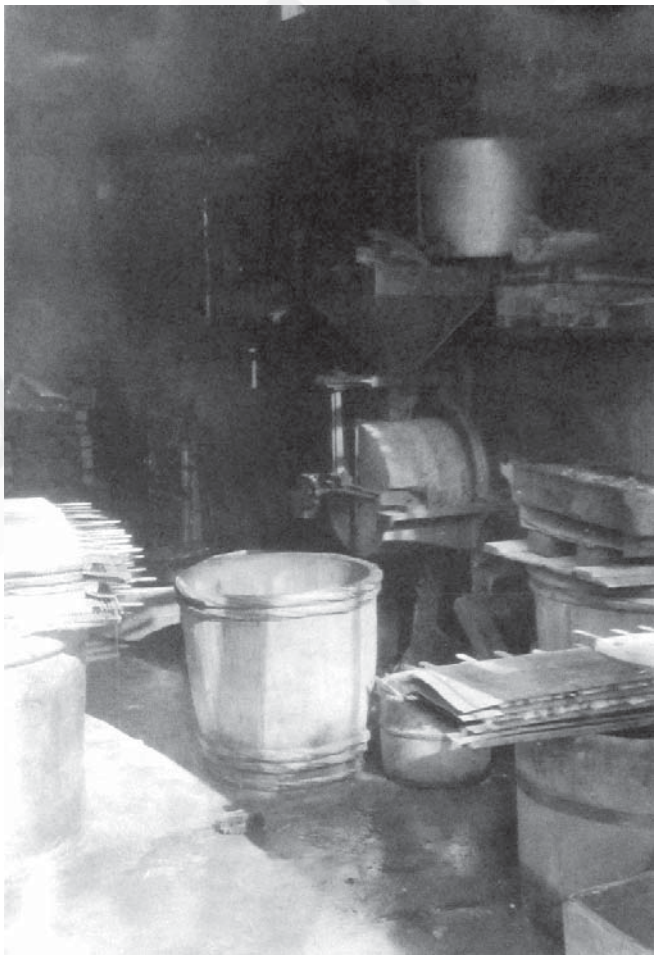
Packages of adsuki bean flour purchased in a store, Tokyo, December 24, 1929. This is a sweet flour used in making sweet bean soup. Package 3 1/8 inches long; 1½ inches wide. D. & M. #3100 (neg. #44737).

Page 3478. Soybean. This soybean product is sold in tubs from Tokyo small stores, and is known as 'Gomoku Mame.' It consists of a mixture of five cooked products, namely: soybeans, lotus root, fish sausage, seaweed and burdock roots." Purchased at a small grocery stand in Tokyo, Jan. 6. "It is eaten just as it is. Product is on bamboo leaf which measures 8 inches long and 5 inches wide" (neg. #44738).

Page 3481 (8 Jan. 1930). "Fried soybean curd cakes. The round cake (D. & M. #3096) is known as 'Ganmodoki,' and is fresh bean curd mixed with chopped carrots. The cakes





are fried in mustard [rapeseed] oil until brown and sell for three sen each. Each cake is 4½ inches in diameter and 3/8 inch thick. The oblong cake (D. & M. #3097) is known as 'Aburage.' It is a fresh bean curd mixed with chopped carrots and fried in mustard oil until brown. The cake is 8½ inches long, 3 inches wide, and 3/8 of an inch thick. Sell for three sen. These forms of fried bean curd are eaten when dipped in soy sauce and also in soups" (neg. #44741).

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Note 2. This is the earliest English-language document seen (April 2013) that contains the term "Fried soybean curd" or the term "Fried soybean curd cakes."

Page 3532 (11 Jan. 1930). "A soybean preparation used as a health drink, 'Almen: The Health Food Drink.'" Sold in a can whose front and back are shown. "Manufactured from soybeans by the Nippon Almen Shokuryo Co., Ltd., near Kobe, Japan. This form of flour is also used in making confections. Packages of 3 1/8 inches high and 2 1/8 inches wide" (neg. #44758). Note 3. Soy flour is apparently used to make the canned health drink.

Page 3533. "Dried and frozen bean curd. The fresh bean curd is cut into small blocks, frozen and then dried. Used commonly in soups. Packages 2 5/8 inches high and 2 1/8 inches across" (neg. #44759).

Note 4. This is the earliest English-language document seen (April 2013) that uses the term "Dried and frozen bean curd" to refer to dried-frozen tofu.

Page 3534. Photo of a package of cooked and sugared adsuki beans, 7½ inches long and 3¼ inches wide (neg. #44760).

Page 3535. "Candied soybeans and other products. Sticks of candy in which are imbedded black soybeans (green germ), yellow soybeans, peanuts, peas and sorghum seed. Box 8½ inches long and 6 7/8 inches wide" (neg. #44761).

Page 3537 (13 Jan. 1930). "Got down to the office pretty early and got the pictures made yesterday jacketed and the legends written.

"About 10 a.m. went to the American Consulate with 8 packages to go forward today in the diplomatic pouch to the office. Six of these 100 to 106, contain seed, 107 contains pamphlets and other publications.

"About noon we went down the street and made a few pictures at a soybean curd factory. A little later we developed those, they were only fair, but are about as good as we can get in view of the conditions.

"In the afternoon we packed and sewed up two parcels of soybean products to go forward to Washington [DC] at the first opportunity. We are having really wonderful weather, not very cold and sunshiny and bright."

Page 3538. "Soybean candy. Small cylindrical pieces of candy in which are imbedded medium small roasted soybeans. This picture is natural size" (neg. #44762).

Page 3539. Adsuki bean flour. Box containing 24 small papers of sweetened adsuki bean flour which is used in making sweet soup" (neg. #44763).

Page 3540. "Bean curd factory (soy). "View showing furnace and boiler where ground soybeans are being boiled for making soybean milk. To the left of the furnace is a tub, into which the milk is strained and made into curd. Tokyo" (neg. #44764).

Page 3541. "Bean curd factory. View showing a stack of oblong blocks of fresh bean curd which are to be slightly roasted over a charcoal fire [to make grilled tofu / *yakidofu*] (neg. #44765).

Page 3542. Bean curd factory. View showing stone mill for grinding soaked soybeans into a mash for making soybean milk and bean curd. Above the hopper is a small round tank of water from which flows into the hopper of beans, a small stream of water while the beans are being ground" (neg. #44766).

Page 3543. Soybean curd factory. View showing the furnace and boiler where the ground bean mash [*gô*] is boiled in making soybean milk. To the left of the furnace is the wooden tub into which the milk is strained, and where the magnesium sulphate solution is added to form the bean curd. To the extreme left is the partitioned rectangular box into which the bean curd is dipped and pressed into blocks" (neg. #44767).

Page 3544. "View inside soybean curd factory showing in background stone mill for grinding the beans; on the right the oblong charcoal fire box for roasting blocks of the fresh bean curd; and in the foreground and on the left stacks of blocks of bean curd ready to be roasted. The tub in the center is where the blocks of bean curd are placed" (neg. #44768).

Page 3545. "Inside the bean curd factory showing a stack of oblong blocks of fresh bean curd with long handled forks [skewers with several prongs] in one end. These blocks are ready to slightly roast over a charcoal fire" (neg. #44769). Address: Agricultural Explorers, USDA, Washington, DC.

2728. *Prairie Farmer* (*Indiana Edition*). 1930. Our pioneer soybean grower: Adrian A. Parsons experimented with soys forty years ago. 102(2):6, 26. Jan. 11.

• ***Summary:*** This story was published about five months after Adrian Parsons died. "The man who probably exerted the greatest influence on the early development of the soybean industry in Indiana was the late Adrian A. Parsons of Hendricks county. He it was, as nearly as I can learn, who first imported soybean seed from Japan to Indiana, and grew the crop–first in a garden, and later on a scale so large that he sold beans by the carload. He experimented with the crop for years, and as he learned he wrote up the results of his work for the farm papers. He firmly believed that he had found one of the best legume crops that could be grown in Indiana, and he wanted other farmers to learn about it.

"Mr. Parsons had an insatiable curiosity regarding plant life, and his experiments with corn and soybeans and other plants gave him pleasure and recreation. A severe gunshot wound, sustained during his Civil War days, had left him far from robust, and the fact that he was unable to stand a heavy day's work in the field gave him more time for studying and writing.

"One of his sons, Norman E., who is a large farmer and soybean grower in Hendricks county, says that as nearly as he can figure out, it was in 1886 or '87 that his father

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bought his first batch of seed, and it is his impression that he imported them from Japan. It was believed that soybeans could be used as a substitute for coffee, among other things, and Mr. Parsons' curiosity was thoroughly aroused.

"The new plant did well. Mr. Parsons read everything he could find on the subject of soybeans, and as he enlarged his acreage he was delighted to find that both the hay and the beans were eagerly eaten by all classes of livestock. He began to grow the crop in earnest.

"During all of the early years he was forever experimenting, and his writings indicate that he was familiar with all problems of inoculation, cultivation and utilization of the crop. It was unfortunate that clippings were not kept of his articles on soybeans, but among his effects there was found a collection of manuscripts, a number of which doubtless appeared in the farm press."

One manuscript revealed that Parsons had tried for a number of years, unsuccessfully, to get red clover bacteria to grow on and inoculate soybeans. "His work with soybeans led to acquaintance and friendship with the late Joseph E. Wing, the 'apostle of alfalfa.' In later years he began to grow alfalfa, probably through Mr. Wing's influence, and in a clipping from 'The Ohio Farmer' which unfortunately is not dated, Mr. Parsons went on record as listing the soybean second to alfalfa, which he characterized as 'king of the legumes.' That by no means meant that he had lost his enthusiasm for soybeans, as he continued to grow this crop in large quantities. He sold seed by the carload to the Wing Seed Company of Ohio."

Another undated manuscript, which was marked 'For the Department of Agriculture,' was written after he had grown 24 successive crops of soybeans. His highest yield had been 30 bushels/acre and his lowest 10 bushels. He grew one acre of soybeans the first year he tried them and 140 acres the year this manuscript was written.

"In another manuscript, which was apparently written in 1902, and which was marked 'for the Farmer's Guide,' Mr. Parsons stated that the seed should be covered very lightly, that he found that drilling in rows gave best results, and the early cultivation was exceedingly important.

"Mr. Parsons passed away last August. He lived to see the soybean develop to a crop almost of major importance in Indiana, and his satisfaction in seeing his own community become a leader in soybean production must have been great. He was a prophet who was recognized in his own community. The entire state may well give him credit for the big part he played in developing soybean growing into an industry which is destined to add millions to the wealth of Indiana."

A photo shows: "Adrian Parsons of Plainfield, Indiana, pioneer soybean grower of the Middle West. Originator of Mikado soys. He was past 80 when this picture was taken."

Letter from Lee Parsons, great-grandson of Adrian Parsons. 2000. April 4. "I believe it was *Prairie Farmer* writer Dave Thompson who wrote this article. Dad remembered Thompson's visit and interviewing people in Hendricks County about Adrian."

2729. Morse, W.J. 1930. Re: Soybean products collected. Trip to Manchuria and China. Letter to Dr. E.A. Hollowell, Office of Forage Crops, USDA, Washington, DC, Jan. 12. 2 p. Typed, with signature on USDA letterhead.

• ***Summary:*** "Dear Holly: I have your letter of December 16 with reference to the soybean products and the more I collect over here the less inclined I am to loan them out... In my last such experience, I fitted up a soybean product exhibit for some sort of health food show in New York City and I never did get it back although we had considerable correspondence about it. As I recall I even took it up with the Secretary [of Agriculture] because they wanted it for a permanent exhibit and so I was out a nice exhibit which it took me considerable time to get up. After that I would not let anything go out unless I had several products of the same kind but it cured me of fixing up exhibits for any one or letting out products or pictures that I could not easily duplicate.

"Therefore, even with Dr. Burlison I do not know of any of the products we have in the office that I care to let out..."

"Last week we visited a large soy sauce factory [almost certainly Kikkoman] at Noda-Machi, about a three hours' run from Tokio... They use twenty thousands of bushels of soybeans annually and the same amount of wheat."

"I was rather anxious about the work but as you state if the Arlington [Farm in Virginia] work can be arranged, you and Lee can hold things until I return. I think that this can be arranged so that Lee will not be over-loaded with the work now on hand and the new introductions we are sending in...

"Dorsett is making pictures of the various [soybean] products as they are collected and making pictures that can not be beat.

"The beancurd, miso and natto factories are mighty interesting and we are getting lots of good data and pictures as well as samples of the varieties of beans used. The beancurd factories are only small places but they are very numerous and each has its own way of making the curd."

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 93–Morse-Napier. Folder–Morse, W.J.-#4 F.C.I.

Sent to Soyfoods Center by Jacob Jones of Purdue Univ., Aug. 1998. Address: Tokio, Japan.

2730. Dorsett, P.H.; Morse, W.J. 1930. Work in Tokyo, Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant

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Industry, USDA. 8,818 p. Unpublished log.
• ***Summary:*** Page 3553 (14 Jan. 1930, Tokyo). "Worked at the office today preparing, packing and sewing up five parcel post packages of soybean and other plant products to go to Washington [DC].

"We will have a good sized shipment for the diplomatic pouch about two weeks hence.

"Got the five backs for our picture albums finished up tonight. By tomorrow night we think we can use them to cover the leaves on which we have already mounted our pictures.

"Today Ruth [Dorsett's daughter-in-law; the widow of Dorsett's son] completed our field trip report for October and expects to page it tomorrow.

"We got behind in our trip report for October, November and December on account of not developing the pictures made in Chosen [Korea] until after our return to Tokyo. However we hope to get this work pretty well up to date before we transfer over to Dairen, Manchuria, this coming March." Address: Agricultural Explorers, USDA, Washington, DC.

2731. Dorsett, P.H.; Morse, W.J. 1930. Soybean oil and cake in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.
• ***Summary:*** Page 3270 (28 Jan. 1930). A photo (neg. #44859) shows the front of a half-gallon can of Nisshin Salad and Frying Soybean Oil, sold by Nisshin Oil Mills Ltd. of Tokyo.

Pages 3555 and 3556 (15 Jan. 1930). The authors visited the Office of the Nisshin Oil Mills Ltd. of Tokyo and met the Director, Mr. L. Sera. "The output of their small mills in Japan are used at home, and all the bulk of that made by their 19 mills in Manchuria. Mr. Sera admitted that they are very much interested and concerned about what the American Congress will finally do about putting a tariff on soybean oil and cake. He told us that their company sends considerable oil cake to America. Japan proper imports from Manchuria upwards to 15,000,000 tons of oil and cake. He also told us that Manchurian oil cake brings $40.00 per ton f.o.b. Seattle." Address: Agricultural Explorers, USDA, Washington, DC.

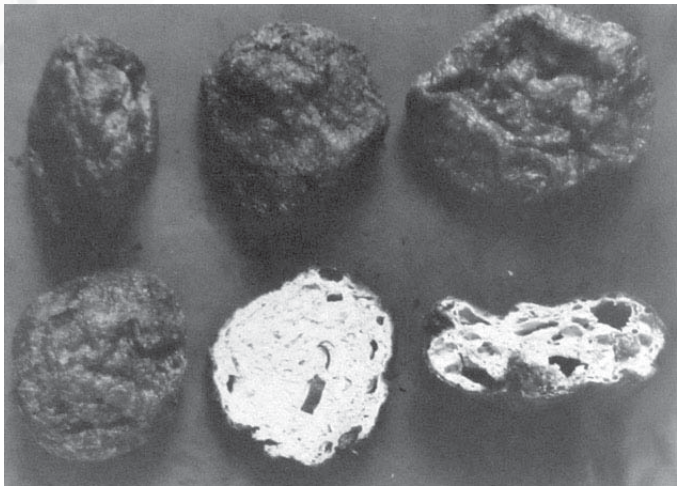
2732. Kinoshita, Asakichi. 1930. Shôyu no roka to chozô-sei ni tsuite [On filtration and preservatives of shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 8(1):54-63. Jan. 15. [Jap] Address: Jôzô Shikenjo gishi.

2733. Dorsett, P.H.; Morse, W.J. 1930. Work in Tokyo, Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.
• ***Summary:*** Page 3617 (20 Jan. 1930, Tokyo). "Got parcels 118, 119, 120 and 121 over to the post office early this morning so as to be sure that they would be there when the truck called about noon for the packages to go on the commercial steamer calling Tuesday 21st from Yokohama."

"During the day, a bag containing 200 or 300 samples of soybeans came in from the Tokachi Agricultural Experiment Station, Obihiro, Hokkaido, so we went to work on writing them up and as soon as this has been accomplished we will get them packd for shipment.

"We also wrote Mr. Ryerson detailed letters concerning shipments made Saturday and today" [Monday]. Address: Agricultural Explorers, USDA, Washington, DC.

2734. Dorsett, P.H.; Morse, W.J. 1930. Tofu in Tokyo, Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.
• ***Summary:*** Page 3717 (28 Jan. 1930). Tokyo. "Long thin fried cakes of Tofu [aburage], also angular thick cakes. D. & M. #3751-52 (neg. #44856).



Page 3718. Fresh soybean curd in a block. The piece at the [left] end was cut off to show the thickness of the block (neg. #44857).

Page 3719. Soybean tofu in small fried cakes. Vegetables of several kinds have been added to and cooked with these tofu cakes" (neg. #44858).

Page 3786 (3 Feb. 1930). "Kudzu starch used for making thin gruel for invalids. It is also used as a covering for confections. The box measures, actually, 1¼ by 3

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inches." On the front is written "Ryusuki Kuzu. Delicious and nourishing" (neg. #44877).

Page 3787. "Dried and frozen bean curd used in soups and mixed in vegetables when cooking. Box measures 2 3/8 inches by 6 7/8 inches" (neg. #44878).

Page 3823 (5 Feb. 1930). "Inarisushi" [Inarizushi]. "Pieces of fried rice-stuffed bean curd, (about life size) the pieces of curd are about 4 inches over all. This was purchased at a food stand in Tokyo, Japan, Feb. 8th, 1930. D. & M. #3787 (neg. #44899).

Page 3868 (13 Feb. 1930). Tokyo, Japan. "This picture shows the ingredients used in making bean curd and a fresh piece of bean curd. Top row, from left to right: The by-product [okara] which makes a good stock feed; soybean milk; coagulator [coagulant]. Middle row: piece of fresh bean curd; ground soybeans thinned for boiling. Bottom row: dry soybeans; soaked soybeans; ground soybeans" (neg. #44902). Address: Agricultural Explorers, USDA, Washington, DC.

2735. Horvath, A.A. 1930. The soybean oil of China and its manifold uses. *Chinese Economic Journal* 6(1):33-57. Jan.; 6(2):153-84. Feb. Also published as Booklet Series No. 13. Shanghai, Bureau of Industrial and Commercial Information, Ministry of Industry, Commerce and Labor. 57 p. 28 cm. [Eng]

• ***Summary:*** Contents: Part I. Introduction. Physico-chemical properties of soybean oil: Changes in specific gravity, changes in viscosity, changes in colour, changes in acidity, changes in saponification value, variation of the oxy-acids-content of the soya bean oil, changes of the R.-M. [Reichert-Meissl] and the Polenske values, changes in the refractive properties of the soya bean oil (Refractive Index), changes in taste and odour, changes of the unsaponifiable matter content, changes of the iodine value, the influence of low temperature and of the old sediments from the factory tanks upon the soya bean oil. The refining of crude soybean oil: Clarification (incl. removal of heavy impurities or foots), bleaching by clay, deodourizing. Hardened (hydrogenated) bean oil.

Part II. The uses of soybean oil for food: Refined bean oil, lard substitutes, oleomargarine, vegetable butters (consisting of fats exclusively of vegetable origin). Soybean oil as a lubricant. Soybean oil for lighting purposes. Soybean oil as soap-making material (incl. Lever Bros. makes Sunlight Soap from soy oil {p. 157}, and soap factory at Amagasaki, Japan; and Yamaguchi Co. bath soap made in Port Arthur). Soybean oil in making waterproof cement (similar to "Tantalus" of Suzuki). Glycerine from soybean oil. Rubber substitutes from bean oil. Bean oil as a paint-making material. Artificial petroleum from bean oil ("In 1908 the theory was advanced that the petroleum found in nature was produced underground by the decomposition of organic fat and oil combined with limestone. In the last decade M. Sato, a prominent bean oil chemist of the Central Laboratory, Dairen [in Manchuria], devoted his attention to the manufacture of artificial petroleum from bean oil with very good results"). Address: M.D., China.

2736. Morse, W.J. 1930. Soybean utilization. *Farmers' Bulletin* (*USDA*) No. 1617. 27 p. Jan. Revised 1932.

• ***Summary:*** Contents: Introduction. Soybeans for human food: Dried beans ("The Easycook and Hahto varieties, however, cook fully as soft as other beans." Also used as a substitute for coffee or for salted peanuts), green or vegetable beans ("The Hahto and Easycook varieties have been found especially valuable for use as green beans"), soybean flour, soybean oil, soy sauce, soybean sprouts, soybean vegetable milk ("used so extensively in China." Also mentions the residue [okara]), soybean curd. Soybeans for livestock: For swine, dairy cattle, beef cattle, sheep, poultry. Soybeans for oil: Methods of processing beans for oil, utilization of soybean oil. Soybean meal: Soybean meal for human food, soybean meal for stock feed, for swine, for dairy cattle, for beef cattle, for poultry. Soybean meal as a fertilizer. Miscellaneous uses of soybean meal. Soybeans for hay: Soybean hay for dairy cattle, for beef cattle, for horses and mules, for sheep, for swine, for poultry. Soybeans for pasturage: Swine, sheep, or poultry on soybean pasturage. Soybeans for silage. Soybeans for soilage [green crops for feeding confined animals; a term first used in 1928]. Soybeans for soil improvement. Soybean straw: Feeding value, and fertilizing value of soybean straw.

"Soybean milk in the form of a powder is a commercial product in some European countries, and in parts of the United States it has been used in special feeding cases" (p. 5). "In many cities in the United States having a large oriental population fresh bean curd may be found in the Chinese and Japanese markets" (p. 6).

Photos show: (1) Six men steaming soybeans while making miso in Japan. (2) Muffins made from wheat flour and soybean flour. (3) Making soy sauce in a Chinese courtyard. (4) Grinding soybeans with a stone mill to make soybean milk in China. (5) "Blocks of freshly made bean curd, 'tofu,' as sold in the markets of the Orient." (6) Loading soybean oil in tanks at a soybean oil mill, Harbin, Manchuria. (7) Soybean cakes awaiting shipment at a Manchurian port. (8) Hogs in a field of soybeans. (9) "Pasturing soybeans and corn with sheep is a common practice in the Corn Belt states." (10) Corn and soybean plants growing together for use as silage; a boy is standing by the plants. (11) "A fine growth of soybeans to be used for soiling." Address: Senior Agronomist, Office of Forage Crops and Diseases, Bureau of Plant Industry, Washington, DC.

2737. Tamiya, Hiroshi; Morita, Shinkichi. 1930. Bibliographie von Aspergillus 1729 bis 1928 [Bibliography

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of Aspergillus from 1729 to 1928]. *Botanical Magazine* (*Tokyo*) 44(517):1-7. Jan.; 44(518):79-89. Feb.; 44(519):139-50. March; 44(520):209-18. April; 44(521):251-61. May; 44(522):305-16. June (Supplement 1794-1928, refs. #2293-2424); 44(523):375-86. July (Author index I–A-L); 44(524):421-31. Aug. (Author index II–M-Z). [2424 ref. Ger]

• ***Summary:*** This is the 1930 continuation of a superb bibliography of 2,424 citations listed chronologically by year, and within each year alphabetically by author. Part 1, 1929, covers the years 1729 to 1920 and contains 1,655 references. At the end of the last installment (1930) there is a complete author index. Address: Japan.

2738. *Unknown Tokyo newspaper.* 1930. Ancient bean-throwing rite will be observed tomorrow: Many who still believe in practice to take part in traditional ceremony in their homes and at shrines and temples. Feb. 2. p. 1-2.

• ***Summary:*** In his personal scrapbook, Morse included with this English-language article with no date or newspaper name: "All the streets in towns and cities of the Empire, will, according to tradition, be infested with devils tomorrow and many persons will attempt to drive them out of their houses with a time-honored ceremony of bean-throwing known as tsuina."

Note: Setsubun rituals include *tsuina* and *mame-maki* (bean-scattering), also known as *mame-uchi. Tsuina* (also referred to by other names like "oniyarai," is an exorcism rite. Introduced from Tang China, tsuina was originally held on the eve of the New Year. Mame-maki, the custom of scattering roasted beans to expel evil spirits, seems to have begun in the Muromachi Period {1392-1573}. Although members of the court and upper classes maintained a distinction between tsuina at the end of the year and bean-throwing at setsubun, commoners in many locations often blended the two customs. Source: *Encyclopedia of Shinto,* at Setsubun).

"Dried [soy] beans are roasted during the day and prepared for use in the evening.

"When dusk sets in the head of the family may be heard shouting 'Oni was soto, fuku wa uchi. Oni was soto, fuku wa uchi,' throwing beans as he shouts. This means 'Out with devils; come in good luck.' Then children are heard shouting and running about in an effort to gather the greatest possible amount of beans as their father throws them at the devils in each corner of the rooms in the house."

One of the most prominent Shinto shrines at which the bean-throwing will take place is the Kompira Shrine (*Konpira Jinja*) in Toranomon, about one mile north of Shiba Park, Tokyo. "At this shrine more than 2 bales of [soy] beans are expected to be thrown at the crowds which will throng in front of the shrine. Several professional wrestlers, well known actors and musicians will act as *toshi-otoko* (bean throwers).

"The bean-throwing ceremony at the Gojo Tenjin Shrine in Kameido is extremely interesting. It preserves the most primitive form of the custom." The custom is said to date back to 706 A.D. when a deadly epidemic swept Japan.

On the same page as article, Morse included several photographs: (1) 1931–W.J. Morse feeding deer in Nara, Japan. (2) K. Murochi, W.J. Morse and K. Matsushima at a soybean seed fair in Kung Chuling, Manchuria. Note: Kungchuling, Chilin -> Gongzhuling, Jilin. (3) 1930 July–Suyetake, W.J. Morse, and P.H. Dorsett in Dairen, Manchuria.

2739. Dorsett, P.H.; Morse, W.J. 1930. Setsubun and roasted soybeans in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 3785 (3 Feb. 1930–Tokyo). "Today is 'Setsubun' or 'Division of Seasons' and is to all Japanese a change of seasons according to the lunar calendar. Spring begins tomorrow and winter ends today. It is also known as 'Mame-Maki' or 'Bean Scattering Day.' In the evening, every Japanese home practices a traditional and peculiar ceremony called 'Mame-Maki' or 'Bean Scattering.'"

Note 1. This is the earliest English-language document seen (Dec. 2012) that uses the term "bean scattering" (or "bean-scattering ceremonies") to refer to the Japanese practice of *mame-maki.*

"The people in the house scatter parched soybeans in and out of the houses loudly shouting 'Fortune in, Devils out,' thus calling in the year's fortune and driving out any probable misfortune from the household. Bean-scattering ceremonies (it is considered a religious rite) were held in all temples and we understand a large temple in Shiba Park used twenty-five bushels of parched soybeans in the bean scattering ceremony. So we will have to score another use of the soybean as 'Devil Chasers!'"

All of the following describe photos unless otherwise stated: Page 3788. "Twisted oblong pieces of white sugar candy with greenish yellow roasted soybeans. This candy is made after the manner of peanut candy at home. Size of paper bag is 7 by 9½ inches."

Page 3789. "Twisted pieces of molasses candy [each about 3 inches long] with small roasted soybeans (yellow)."

Pages 3790-91. Small puffed rice and roasted soybeans." Bag is 6 by 9 inches.

Page 3792. Puffed and roasted soybeans which are used on Scattering Day, February 1st."

Page 3819. Bag of "candy made of sesame, puffed rice and black roasted soybeans. Purchased at a confectionery store.

Page 3822. Box of pine needle tea ("Matsunocha"). It

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consists of pine needles, roasted barley and soybeans, plus several herbs." Packages: 4.37 by 7.62 inches.

Page 3869 (12 Feb. 1930–Tokyo). Photo of "Mame hoito," soybean candy in large triangular pieces. Made of roasted soybeans and sugar.

Page 3871. "Oblong pieces of soybean candy. The soybeans have been roasted before using. Made after the manner of peanut candy [peanut brittle?]. Purchased at Kumagaya, Japan, Feb. 11, 1930."

Page 3873. Small cakes, on the top of which is a white sugar frosting and small pieces of roasted soybeans. Purchased in Akabane, Japan, a section of Tokyo, Feb. 11, 1930. Native name is 'Mame boro.'"

Page 3875. "Mixed sugared beans (seven kinds) of which some are soybeans... Local name is 'Shichi-fuku mame.'"

Page 3883. "Roasted soybeans incased [encased] in small balls of rice dough and baked. They are grayish-white in color. The native name is 'Karin mame.' Sell at .40 *sen* per pound."

Page 3885. "Paper bags of sugared puffed rice, sugared puffed rice balls, sugared roasted soybeans (black and greenish yellow varieties)... Used by little Japanese girls on *O-Hina Matsuri,* the Girls' Festival, March 3. Native name 'Hina arare.'"

Note 2. This is the earliest English-language document seen (Dec. 2012) that uses the term "sugared roasted soybeans" to refer to soynuts.

Page 3886-3887. "Roasted soybeans incased in slightly salted rice dough an baked. Color: Brownish-white. Native name: 'Iso-arare.'" They sell at 20 *sen* a pound."

Page 3888. Photo shows: "A general view of the soybean products collected in one day in suburbs of Tokyo, Japan, February 13, 1930 (neg. #44918).

Page 3896. Cans of powdered seaweed ("Ajitsuke Aonori") which is used on roasted soybeans.

Page 3899. "Wheat flour cakes or cookies with finely chopped peanuts and roasted soybeans with white sugar frosting spread over the top of each. Native name is 'Mame koshi.'"

Page 3900. "Wheat flour cookies in which are coarsely ground roasted soybeans. Native name is 'Kawara senbei.'"

Page 3901. "Clusters of candied roasted soybeans and small squares of baked rice dough. Native name: 'Sakura okoshi.' Sell at 18 *sen* a pound."

Pages 3925-28 (18 Feb. 1930). Morse and Suyetake searched for soybean products today." They brought back more than 24 new items. Two small bamboo baskets containing a mixture of sugared puffed rice, square puffed rice balls, and sugared black, green and yellow soybeans. Named "Hina arare." Small squares of greenish candy with roasted green soybeans. Native name: "Amegashi."

Page 3940. Tea mixture named "Jiyo hoji cha" consisting of legume leaves, pods, and seeds, roasted black soybeans, seaweed and roasted barley.

Page 3941. Wheat flour cakes in the form of fish with black soybeans used for eyes. Native name: "Taikoshi."

Page 3943. Triangular pieces of black sugar candy with roasted yellow soybeans. Native name: "Kuro sankaku mame ita."

Page 3944. "Slightly twisted oblong pieces of sweetened rice paste with sesame seed and roasted green soybeans. Native name: 'Gomaneji.'"

Page 3945. "Small cakes of sweetened rice flour and coarsely ground roasted soybeans in the form of the face of Ebisu. Price: 15 for 15 *sen."*

Page 3947. "Oblong rice flour cakes in which are imbedded roasted black soybeans. Native name is 'Kuro-mame karinto.'"

Page 3948. "Thin oblong pieces of candied roasted green soybeans. Each piece is wrapped in oblate (gelatinous paper). Native name is 'Aomame.'"

Page 3949. "Thin triangular pieces of candid roasted soybeans. Each piece is wrapped in oblate. Native name is 'Sankaku mame ita.'"

Page 3950. "Round green sugar candy cakes with roasted yellow soybeans. Native name is 'Aomame ita.'"

Page 3951. "Salted roasted soybeans purchased in wholesale bean store, Tokyo, Feb. 18. Native name is 'Shio daizu' [literally salt + soybeans]. Round medium sized yellow soybeans are soaked in water for two hours and then roasted." The beans are then dipped in strong brine and dried. Wholesale price: 9 *sen* for 1 lb. (Note 3. Most of the roasted soybeans in Japan are sweetened rather than salted).

Note 4. This is the earliest English-language document seen (Dec. 2012) that uses the term "Salted roasted soybeans" or the term *Shio daizu* to refer to soynuts.

Page 3952. "Roasted green soybeans incased in balls of wheat flour and baked. The color is bright red. Pieces of seaweed on the outside. Native name: 'Takura mame.'"

Page 3953. "Small cookies of wheat flour with roasted black soybeans imbedded on top." Purchased in confectionery store in Tokyo. Native name: "Chin myoto." 20 *sen* per pound.

Page 3954. Karu mame." Used when sugared in a mixture of confections for the Dolls Festival Day, March 3.

Page 3955. "Round cakes of black sugar candy with roasted yellow soybeans. Native name: Mametaroshi."

Page 3956. "Twisted oblong pieces of sweetened rice paste (pink) in which are imbedded roasted black soybeans. Native name is 'Akamedama.'"

Page 3957. "Shiro medama."

Page 3958. "Sugared roasted black and yellowish-green varieties of soybeans. Native name is Satô mame."

Page 3959. "Neji mame."

Page 3960. "Sankaku mame."

Page 3961. "Small cakes of sweetened rice flour and coarsely ground roasted soybeans in the form of the face

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of Okame-san (Goddess of Happiness). Native name is 'O-kame mame rakugan.'"

Page 3962. "Kuronegimame." Address: Agricultural Explorers, USDA, Washington, DC.

2740. Dorsett, P.H.; Morse, W.J. 1930. Soybean sprouts in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Pages 3801 to 3802 (5 Feb. 1930). "We had some difficulty in finding the soybean sprout man, but finally succeeded in locating him in the village of Zoshiki. He has transformed one of the rooms in his house into a forcing chamber, and is sprouting soybeans in flats. This method we haven't seen before.

"The bottom of a flat, about 12 by 18 inches, is covered to a depth of about half an inch with [soy] beans, which have been soaked until plump, about 10 or 12 hours. These trays are then placed on shelves and covered with burlap. The room is kept at a temperature of about 70º [F.]. The beans sprout and are ready to market in 10 or 12 days. They are ready to dispose of when they get about even with, or a little above, the sides of the two flats, which are about three of four inches high. Photo: "Soja max. Soybean sprouts. A fairly nearby view of two flats of soybeans, the one in the foreground containing soaked soybeans, the one in the background sprouted soybeans, but past the marketing stage– they are too far advanced. On the edges of the two flats at the center are three small bunches of sprouted soybeans. This is the way Mr. Katakura puts them up for the market (neg. #44892).

Page 3802. "A nearby view of the same two flats... The picture really shows how the sprouts should *not* be treated. Mr. Katakura sprouts his mung beans in tubs, and he occasionally handles his soybeans in this way. He told us that it required more attention to grow bean sprouts in tubs than in flats" (neg. #44893). Page 3824 (5 Feb. 1930) Tokyo. "A nearby (about life size) picture of a commercial bunch of long stem soybean sprouts. This bunch is over all about 4 inches wide and 11 inches long. Purchased at a vegetable stand in Komato, Japan, Feb. 7th, 1930. D. & M. #3786 (neg. #44900).

Page 3825, "About a three-quarter life size picture of a commercial bunch of rather short stemmed soybean sprouts. Purchased at a vegetable stand in Komato, Japan, Feb. 7, 1930. D. & M. #3785 (neg. #44901).

Page 3865. (12 Feb. 1930). "Morse and Suyetake were all smiles when they reached the office this morning, for they had great success yesterday. They corralled nine different soybean products."

"After lunch we called on Dr. T. Nakai, Botanist at the Tokyo Botanical Garden. We talked with him about soybeans of Quelpaert Island [*Jeju-do* in Korean. As of Aug. 2011 it is part of Korea; it lies in the Korea trait between South Korea and Kyushu, the southernmost of Japan's four main islands]. He told us that there they grow small soybeans only about the size of mung beans. He thinks it is a case of stepping down (degeneration) in place of up.

Page 6911 (3 Jan. 1931). Morse writes from Tokyo: "At one of the department stores, in the vegetable market section, we found small bundles of soybean sprouts..."

Page 7071 (31 Jan. 1931). Morse writes from Tokyo: "After our visit to the Botanic Gardens, we visited some market sections. At some we found soybean sprouts (6 inches long) in small bundles." Address: Agricultural Explorers, USDA, Washington, DC.

2741. *Guardian* (*England*). 1930. Miscellany: Chemical "meat." Feb. 10. p. 7.

• ***Summary:*** A correspondent writes: The movements to "Eat more meat" and "Eat more fish" may soon be followed by an "Eat more monosodium glutamate" campaign. "A few years ago this queer chemical, made by hydrolysing gluten [sic] of soy beans with hydrochloric or sulphuric acid, was a mere academic fact."

Lately, however, it has come to be manufactured on a huge scale in China and Japan because of its meatlike taste. In Japan, where it is called "Ajinomoto" (the Element [Basis] of Taste) it has come to be used almost as commonly as sugar or salt. Restaurateurs in China find they can substitute it for meat flavoring or extracts (it is much cheaper) without diners knowing the difference. Perhaps the meatless sausage or the fishless rissole have already begun to appear in our own teashops.

2742. Dorsett, P.H.; Morse, W.J. 1930. Re: Zoyzia / zoysia. Collecting soybean products in Japan. Letter to Dr. A.J. Pieters, Office of Forage Crops, USDA, Feb. 15. 2 p. Typed, with signature on hotel letterhead.

• ***Summary:*** "Oftimes [Ofttimes] in the midst of our strenuous times in chasing down soybean products, we bear in mind *Zoyzia pungens.* We came across a clue today." Dr. Nakai, Botanist of the Imperial Botanic Gardens, Tokyo, knows Zoysia grass well. Being tender, this "grass does not even survive the winter at Tokyo and is found only in the southern parts of the Japanese empire."

The species of Zoyzia that is hardy and grows well in Korea is *Zoyzia Japonica*, a native of Korea. The seed is not viable. The plant is propagated with the plant roots.

"Our efforts in collecting soybean products are yielding excellent results and by the time we return home we should be able to open a candy store, bakery, drug store, meat shop, feed store and voodoo shop. The voodoo shop needs a little explaining.

"'Setsubun' or 'Division of the Seasons' falls on

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February 3rd and spring commences according to the lunar calendar. In the evening of the 3rd a traditional and peculiar ceremony called 'Mame-Maki' or 'Bean Scattering' is practiced in every home. The people in the house scatter parched soybeans in and out of the house shouting loudly, 'Fortune in and Devils out...' While the person is scattering the beans he or she holds in one hand a small bundle of threshed soybean plants and holly branches. To the holly branches are attached small sardines or herring. After the devils are driven out of the house by the scattering of the beans, the bundle of straw and holly with the dried fish is placed over or at the side of the house door to keep the devils out. The devils are said to be quite fond of herring or sardines. When they are about to enter the house, they see the fish and quite naturally stop to get a bit of their favorite food. In trying to get the fish, however, the spines of the holly stick in their eyes and blind them. Thus blinded, the devils cannot find their way into the house, so there you are, a cheap and easy way of ridding your house of devils. We have, therefore, scored another use for the soybean.

"Rather elaborate bean-scattering ceremonies are held at all of the shrines and temples. One of the large temples in Shiba Park, not very far from the hotel, used twenty-five bushels of parched soybeans in their bean-scattering ceremony. We are told that each house uses about one pound of soybeans for devil-chasing. We obtained a package of the 'devil-chasing' beans and sent them in with our products."

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 93–Morse-Napier. Folder–Morse, W.J.-#4 F.C.I.

Sent to Soyfoods Center by Jacob Jones of Purdue Univ., Aug. 1998. Address: Agricultural Explorers, The Imperial Hotel, Tokyo, Japan.

2743. Dorsett, P.H.; Morse, W.J. 1930. Re: Miso. Letter to Mr. Knowles A. Ryerson, Foreign Plant Introduction, Bureau of Plant Industry, USDA, Feb. 15. 2 p. Typed, without signature (carbon copy).

• ***Summary:*** A detailed discussion of the importance of miso in Japan. Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 93–Morse-Napier. Folder–Morse, W.J.-#4 F.C.I.

Sent to Soyfoods Center by Jacob Jones of Purdue Univ., Aug. 1998. Address: The Imperial Hotel, Tokyo, Japan.

2744. Morse, W.J. 1930. Re: Exports of soybeans from Manchuria. Proposal of trip to Europe. Collecting soybean products in Japan. Letter to Mrs. Verna M. Donavan, Office of Forage Crops, B.P.I., USDA, Feb. 15. 2 p. Typed, with signature on hotel letterhead.

• ***Summary:*** "Dear Mrs. Donavan: At the head office of one of the large soybean oil companies in Tokyo we recently received considerable information concerning the export of soybeans from Manchuria to European countries, especially Germany, France, and England. It seems that these countries are taking so many soybeans that the Chinese government is considering the placing of an export duty on the seed in order to protect the soybean oil industry of Manchuria... we think it might pay us to return by way of Europe and look into the soybean industry.

"In our soybean files and also in our general letter files, I think we have the names of firms and people interested in soybeans in several European countries. I wish that you would look up the names and addresses of such firms and persons so that I can write them and obtain some detailed information about the soybean situation in Europe."

"There is a Dr. J.L. North in London, England, with whom I have had considerable correspondence during the past several years."

Morse thinks that his collection of soybean products from Japan will number about 200 products ore more.

"Received Mr. Lee's letter recently which you typed for him in the winter and I am glad to hear that everything is going along so nicely. I feel now that the work is going along so fine that I can at least stay over here three or four more years. The soybeans are calling in the U.S. and I suppose that a year from now we will be on our way home or getting packed up to go."

P.S. [handwritten]. It has occurred to me that the products being sent in should be placed in the large tin boxes in which we store seed to keep it away from the mice. If the mice are as bad as formerly, I am afraid that unless the products are stored in the tin boxes, the mice will play havoc with them..."

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 93–Morse-Napier. Folder–Morse, W.J.-#4 F.C.I.

Sent to Soyfoods Center by Jacob Jones of Purdue Univ., Aug. 1998. Address: The Imperial Hotel, Tokyo, Japan.

2745. Dorsett, P.H.; Morse, W.J. 1930. Roasted soybeans in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 3971 (20 Feb. 1930–Tokyo). "Packed such of the soybean products as it is believed will carry to Washington [DC] in small packages." All of the following

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describe photos unless otherwise stated:

Page 4023. "Thin sugared wafers or cookies with coarsely ground roasted soybeans mixed in." Purchased in confectionery store in Tokyo. Sell for 1 *sen* each.

Page 4025-4026. "Candied puffed rice in which are distributed roasted black soybeans, Native name 'Dagashi.'"

Page 4027. "Small balls of baked rice dough within which are roasted soybeans. Pieces of seaweed are distributed over the surface of the rice balls. Native name 'Noritsuke jiyo mame.'"

Page 4029. "Roasted soybeans, dyed green, and partially imbedded in small rice cakes. The soybeans represent 'Momotaro,' the son of a peach, and the rice ball, the peach. Native name 'Ko Momotaro.'"

Page 4033. "Small cookies in which are roasted flattened black soybeans. Native name 'Keitaku senbei.'"

Page 4034. "Mixture of various kinds of roasted soybean confection. Native name 'Okoshiki mame.'"

Page 4035. "Roasted soybeans covered with thin rice dough and then sugar coated in different colors (white, brown, and green). The green consists of ground tea leaves. Native name 'Mokari [Hokari?] mame.'"

Page 4044. Small yellow soybean roasted and coated with sugar. "Maru satômaze."

Page 4046 (25 Feb. 1930). "Sugared roasted soybeans. The sugar was of different colors, pink, white, green, and brown."

Page 4220. "White sugar candy coated roasted soybeans of different colors, white, brown (cinnamon), pink and green (tea). Native name 'Asahi mame.'"

Note 1. This is the earliest English-language document seen (Dec. 2012) that uses the term "candy coated" or the term "sugar candy coated" to describe dry-roasted soybeans or soynuts.

Page 4221. Brown cakes made of roasted yellow soybeans.

Page 4222. "Small round pieces of candy. Some contain raisins, others roasted soybeans (yellow), adsuki [azuki] beans and roasted peas or peanuts."

Page 4223. "Round pieces of soybean candy in which are embedded roasted greenish yellow soybeans. Native name 'Ita mame.'"

Page 4224-26. "Two small wooden tubs with bamboo hoops (or small Japanese lanterns, or a throne and steps), filled with sugared puffed rice and sugared roasted soybeans." Used at the Girls' Festival, March 3.

Page 4227. "Irregular pieces of clear brown syrup candy with roasted yellow soybeans mixed in."

Page 4417. "Rice flour bread with roasted soybeans scattered through it. Slices are brushed with soy sauce when the bread is nearly baked. Native name 'Fukuwa uchi.'"

Page 7071 (31 Jan. 1931). Tokyo. W.J. Morse's notes: "After our visit to the Botanic Gardens, we visited some market sections... At present there is a great abundance of puffed roasted soybeans in the various markets. These are used on bean-scattering day (Mame-Maki [sic, Setsubun]) which comes on February 4th this year. We found many posters announcing bean-scattering ceremonies at many shrines and temples in and around Tokyo."

Note 2. This is the earliest English-language document seen (Dec. 2012) that uses the term "puffed roasted soybeans" to refer to dry-roasted soybeans (*irimame*). Address: Agricultural Explorers, USDA, Washington, DC.

2746. Dorsett, P.H.; Morse, W.J. 1930. Soybean cultivation in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 3973 (21 Feb. 1930). "Today we visited the Imperial Agricultural Experiment Station at Oji or Nishigahara [in northern Tokyo], Japan.

"We spent a couple of hours with Dr. Hiroshi Terao, the director, who is in charge of the plant breeding of all of Japan. He has visited the United States and studied at Harvard. He speaks very good English and is a fine fellow.

"The principal plant breeding work of the country relates to upland and paddy field rice, wheat, barley, and only recently rape, for oil production, has been added to the list."

"Relative to soybeans the Doctor said that their growth in the South and West are almost wholly limited to green manure types. He thinks, and quite probably it will prove to be true, that the soybean growing area in Japan will decrease in proportion to increased land values [and imports from Manchuria]. Farmers will be forced to grow crops which will return them on high price land more than is returned by the growing of soybeans."

Page 4419 (23 March 1930). Tokyo, Japan. "There is to be a big celebration tomorrow to celebrate the reconstruction of Tokyo after the great earthquake of 1923" [Sept. 1; in Japanese *Kantô daishinsai.* This was the deadliest earthquake in Japanese history]. Address: Agricultural Explorers, USDA, Washington, DC.

2747. Dorsett, P.H.; Morse, W.J. 1930. Roasted soy flour in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 4077 (25 Feb. 1930, Tokyo, Japan). "A life sized picture of small rounded rectangular cakes made from roasted green soybean flour, they are browned on top. Purchased in Oji section, Tokyo, Japan, Feb. 24, 1930. Native name 'Murasame.' Price, 40 sen a pound" (neg.

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#44991).

Page 4078. "A life sized picture of small brown sugar coated macaroons made of wheat flour and coarsely ground roasted soybeans. Purchased at a confectionary store in Oji section, Tokyo, Japan, Feb. 24, 1930. Native name 'Daizu makoron.' Sell at 50 sen a pound" (neg. #44992).

Page 4079. "A life sized picture of a small dish of soybeans and soybean flour, also small round twisted cakes about 3 inches long made of sweetened roasted green soybean flour. Purchased at a confectionary store in Oji section, Tokyo, Japan. Native name 'Koborematsuda.' The sell for 20 sen a pound" (neg. #44993).

Page 4080. "A life sized picture of a small dish of soybeans and one of soybean flour, also irregular confections of sweetened roasted green soybean flour and shaped like large broad beans. Purchased in a confectionary store in Nipporo section, Tokyo, Japan, February 25, 1930. Native name 'Mame kinto.' The sell for one sen each" (neg. #44994).

Page 4081. "Sweetened puffed rice (pink and white) coated on sides with sweetened roasted green soybean flour. Native name 'Gokabo.' Purchased at a confectionary store in Konese, Japan, February 25, 1930. They sell for 20 sen a package. Package measures 3¼ x 7 3/8 inches. This picture also shows small dishes of soybeans and soybean flour" (neg. #44995).

Page 4218. "A life sized picture of a mixture of small thin cakes made of rice flour and chopped or coarsely ground roasted soybeans. Native name 'Wanairo sebei' [Wanairo senbei]. Purchased in a confectionary store Tokyo, Japan, March 1, 1930. Price 55 sen a pound" (neg. #45006).

Page 4219. "A life size view of small cookies made from roasted yellow soybean flour. Purchased at a confectionary store Tokyo, Japan, March 1, 1930. Native name 'Fukube.' Very light yellowish brown in color. Price 1½ sen each (neg. #45007).

Page 6874 (31 Dec. 1930, Tokyo, Japan). W.J. Morse's notes. "During the day we visited different sections of Tokyo looking up soybean products. Although we found a great variety of products in the forms of candies, cakes and candied beans, we found only one new product–powdered coffee. This is made from coffee beans, soybeans, corn, etc., by the Aihara Co. of Tokyo. It seems to be an excellent product but is ground too finely, giving it a form too much like coffee essence." Address: Agricultural Explorers, USDA, Washington, DC.

2748. Mashino, Minoru. 1930. Daizu tanpakushitsu no seisei ni kansuru kenkyû. III. Kiyaku? teikyû arukooru suiyôeki ni yoru seisei ni oite san oyobi arukari no eikyô [On the purification of soya bean protein, III. Influence of acid or alkali on the purification of dilute lower alcohols]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 33(2):147-52. Feb. An English-language summary is given on pages 55B-56B of this issue. [3 ref. Jap; eng]

2749. Mashino, Minoru. 1930. On the purification of soya bean protein. III. Influence of acid or alkali on the purification of dilute lower alcohols. *J. of the Society of Chemical Industry, Japan* 33(2):55B-56B. (Chem. Abst. 24:3025). Feb. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]

• ***Summary:*** Addition of 1 part of 0.1 normal hydrochloric acid to 4 parts of 60% methyl alcohol reduces the amount of crude protein dissolved by the latter medium to 0.41%. With 60% ethyl alcohol (4 parts) and 0.25 normal hydrochloric acid (1 part) the figure is 2.24%. Address: Japan.

2750. Dorsett, P.H.; Morse, W.J. 1930. Re: There is just too much to do and see concerning soybeans in Japan. Letter to Mr. Knowles A. Ryerson, Principal Horticulturist in Charge, USDA, March 5. 3 p. Typed, without signature (carbon copy).

• ***Summary:*** "I have been kept rather busy writing up and packing the material that has been coming in from many sources in Japan, Hokkaido and Chosen (Korea) in spite of the opinion that the Japanese are better receivers than givers. We think... that exactly the opposite is true. If you do not think that we have been busy, please note the number of packages that have been sent in since the first of the year. These are merely a start, for in winding up our work in Japan, we expect to send in quite a few packages.

In regard to plans for the coming year,... So many new things keep coming up during the work in Tokyo and adjacent districts that our plans change almost daily in trying to get the most out of our work for the soybean industry in the United States... We simply can not do it all and to do the most important that is of the most value to the new soybean industry in our country, we must change our plans from time to time to meet the new conditions constantly arising."

"We think it would be well worth our time to return by way of the Trans-Siberian to Germany, France and England as a sort of clean-up of our Manchurian investigations."

"Mr. Lee, who is bearing the brunt of testing the new introductions, writes us to keep up the good work."

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-29. Box 93–Morse-Napier. Folder–Morse, W.J.-#4 F.C.I.

Sent to Soyfoods Center by Jacob Jones of Purdue Univ., Aug. 1998. Address: Tokyo, Japan.

2751. Dorsett, P.H.; Morse, W.J. 1930. Visit to the Nippon Jojo Kogyo & Co. Ltd. and Mr. Togano in Tokyo, Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java,

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Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.
• ***Summary:*** Pages 4337-39 (15 March 1930, Tokyo, Japan). "In our study of soy sauce manufacture, we received information about a factory manufacturing an artificial soy sauce. A visit was made to this factory which is known as Nippon Jojo Kogyo & Co., Ltd., 102 Omoto-cho, Koishigawa-ku, Tokyo. We were taken to the office of the President, Mr. Togano, who was a student at the Nishigahara Agric. Experiment Station Soy Sauce Laboratory. Mr. Togano made a special study of soy sauce brewing under Dr. Kurono, Chief of the Soy Sauce Laboratory, and is recognized as an expert on the brewing of this sauce.

"It was learned through Mr. Togano that his method of manufacture is not an artificial one but merely a different method whereby only one-sixth of the time is required in the curing, and less wheat is required. Mr. Togano in his investigations found that by certain changes in the old method of making soy sauce, economy in time or curing and in amount of wheat used could be gained. In the old method, the cracked roasted wheat and steamed soybeans are mixed and treated with the rice culture. In the improved method the cracked roasted wheat and the steamed soybeans are treated separately with the culture, and then mixed. The treatment of the roasted wheat is a secret process and has been patented in Japan and the United States.

"After the mixing of the treated soybeans and roasted cracked wheat, salt and water are added. This mixture is then placed in the curing vats, and only 20 days of curing are required for a good quality of soy sauce. However, the mixture is left in the tubs for 60 days before being removed for pressing out the sauce. This time is one-sixth of that used by other soy sauce factories, as most of them cure the mash for at least one year and in some cases, a year and a half is allowed.

"Three grades of the ordinary sauce are manufactured by the Nippon Jojo Kogyo & Co. A special brand known as "Marujo Kanro Shoyu" [a brand of saishikomi] is also made. This sauce is much heavier than the common sauce and is made by adding to the soybean-roasted wheat mixture, the ordinary sauce instead of salt and water. Note: This is the earliest document seen (April 2012) that mentions "Kanro Shoyu" or "Marujo Kanro Shoyu" or any type of saishikomi shoyu. Yet the word "saishikomi" is not used.

"The Nippon Jojo Kogyo Co. soy sauce sells much cheaper than that of other factories. A two litre bottle sells for 45 sen, whereas the soy sauce of other companies sells for 60 sen for two litre bottle. This company has four factories in the Tokyo District, and has several more distributed about in different parts of the Japanese Empire. There is also a large factory near Hongkong, China. This company uses about 150,000 koku (750,000 bushels) of soybeans yearly in the manufacture of soy sauce at its four Tokyo factories.

"Mr. Togano asked much about the soy sauce and soybean situation in the United States. He advised that he sells considerable rice culture for soy sauce manufacture in Los Angeles, Chicago and San Francisco. From information gathered, he evidently has looked into the proposition of starting a soy sauce factory in the United States.

"The advertising of products by this firm is the most extensive of any of the firms putting out soybean products we have yet seen in Japan. Attached herewith is a folder used in advertising. The wrestler represents the health and strength of the Japanese people while the cask of soy sauce he is holding represents the health and strength of Japanese foods for the people."

A label of the company's Maru-Jo soy sauce (in a wooden keg) appears on p. 4339. A sumo wrestler is holding a large keg of the product over his head. On his right leg is written "miso" and on his left leg, "shoyu." Address: Agricultural Explorers, USDA, Washington, DC.

2752. Pickford, Mary. 1930. Mary completes world tour: Homeward bound, Mary and Douglas [Fairbanks] celebrate two Christmases in 48 hours, and fall in love with Hawaii. *Washington Post.* March 30. p. SM11.
• ***Summary:*** Of all the places Mary and Douglas visited on their trip around the world, "Honolulu is the most beautiful and alluring." After departing: "We celebrated our second Christmas with chopsticks. The ship gave a sukiyaki party on deck... while our table steward prepared the national dish of his country in a chafing dish before us." The ingredients (beef, bamboo sprouts, onions, mushrooms) are listed but neither tofu nor soy sauce are mentioned. "A sukiyaki dinner on deck in one of the regular events on every Japanese liner... I must confess that, except for rice, most Japanese dishes are an acquired taste."

2753. *Fortune.* 1930. House of Mitsui. 1(2):72-81. March.
• ***Summary:*** A good analysis and history of Mitsui Bussan, the giant Japanese conglomerate and trading company, including a photo of their modern headquarters at Suruga-cho No. 1 in Tokyo. "There is no business enterprise anywhere which is at once so vast and so diverse as the House of Mitsui in Japan. Its agencies abroad outnumber the embassies and consulates of the Empire... A quarter of Japan's commerce, both import and export, is handled by the Mitsui Trading Company... The House of Mitsui is thus a merchant empire. It has been prosperous for thirteen hundred years and conspicuously rich for more than a quarter of a millennium–roughly since Shakespeare's time. Today the House is ruled by the Senior Baron Hachiroyemon, 14th Baron Mitsui. He does rather less work than the King of England. His prime minister of trade is Baron Takuma Dan, sometimes called the 'Morgan of Japan.'"

The Cereals and Fertilizers Department handles soybeans. "They shipped the first Manchurian soy beans to

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Europe in 1907. Today the beans, bean oil, and bean cake are international staples. Everyone who has sailed past Port Arthur and into Dairen has seen the batteries of Mitsui bean oil tanks bulking houses high. Sacks of beans piled twenty deep stretch away illimitably along the quays, crisscrossed by railways... War has always proved a good tonic for Mitsui Bussan. After a long swig of the Russo-Japanese fight brew, the company not only quadrupled its business but became so sanguine of future profits as to increase its capital one hundredfold, from yen 200,000 to yen 20,000,000 ($10,000,000). Most of the Great War was fought upside down on the other side of the globe from Japan. But it once more quadrupled the business of Mitsui Bussan, and the capital was promptly quintupled to its present figure of yen 100,000,000 ($50,000,000)."

Note: This is the earliest article on soy seen (Aug. 2002) in *Fortune* magazine.

2754. Miura, Michiya. 1930. Manshû shuyô nôsakumotsu no byôgai [Diseases of Manchuria's principal agricultural crops]. *Minami Manshu Tetsudo K.K.* (*South Manchuria Railway Co., Agricultural Experiment Station Bulletin*) No. 11. 56 p. Ed. 2. [Jap]

• ***Summary:*** The first section (p. 1-36) is about soybean diseases. Symptoms, causes, and control measures are given for diseases caused by the following pathogens: Bacterium sojae var. japonicum (=Pseudomonas glycinea), Peronospora manshurica, Sclerotinia libertiana (=Whetzelinia sclerotiorum), Gibberella sp., Hypochnus centrifugus, Uromyces sojae (=Phakopsora pachyrhizi), Septoria glycines, Cercospora sojina, Cercosporina (=Cercospora) kikuchii, Heterodera schachtii, Pleosphaerulina sojaecola, and Cuscuta chinensis. Other diseases not occurring in Manchuria are also noted. Address: Minami Manshu Tetsudo K.K. Nôji Shikenjô (South Manchuria Railway Co., Agric. Exp. Station).

2755. Dorsett, P.H.; Morse, W.J. 1930. In Dairen, Manchuria (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 4525 to 4526 (10 April 1930, Dairen, Manchuria). "This morning we called at the office of Mr. K. Matsushima and a little later, in company with Mr. Yoshitane Sato of the Bureau of Agriculture of the South Manchuria Ry. [Railway Co.; S.M.R.] we visited the soybean exchange.

"Here, as in all other grain exchanges, of which we have had an opportunity to see everything, pandemonium raged on the floor of the chamber.

"The room looked to be 40 feet or more in width and 75 or so in length, with a gallery extending around the entire room." Of the 100 members, 60 are Chinese, 30 Japanese and 10 are of other nationalities–Russian, Danes, British, etc.

Page 4526. "From the exchange, we went to one of the research laboratories of the Agricultural Branch of the S.M.R., where we met Mr. Takamori, also the assistant director of the Bureau of Economic Research, Mr. Igarashi. These gentlemen offered to assist in any way possible; both speak good English and understand a good deal. We next visited Dr. Y. Nakanishi, Secretary of the Soybean Oil Association."

"After lunch we visited a good sized shoyu sauce factory and looked over the plant, including culture chambers and ageing mash vat rooms. They demonstrated for us their method of vat mash stirring by compressed air. It is a simple method. The air passes through a one-inch pipe to the bottom of the tank, as the pipe is moved about over the bottom the air expelled from the pipe forces its way up through the mash, which gives the impression of boiling. The practice appears to be much more effective and easier than the hand or paddle method of stirring the mash which is pretty generally followed.

"The refuse left after pressing out the soy sauce is sold for cattle feed (we understand primarily for hog feeding). It is also resoaked and used for making a much inferior and cheaper grade of soy sauce, for which this concern has quite a demand."

Page 4541 (15 April 1930, Dairen). In the morning visited Mr. Satoh of the S.M.R. with reference to soybean oil mills and soap factories using soybean oil in Dairen. Arrangements were made to visit the oil mill of the Mitsubishi Trading Co."

"This Oil Company crushes about 300,000 tons of soybeans yearly, producing about 270,000 tons of bean cake and about 30,000 tons of bean oil."

Page 4542. "For Japanese trade, where bean cake is used chiefly for fertilizer, and to a slight extent for poultry feed, the cakes are ground into a very coarse meal. Permission was given to take any pictures we might wish within the mills or mill yard."

Page 4543 (16 April 1930, Dairen). "In the morning visited the Mangylku Soap Mfg. Co. where crude soybean oil and hydrogenated soybean oil are used in the manufacture of soap."

"Mr. Satoh suggested that we get in touch with Dr. Satoh, botanist and author of the bulletin [on wild legumes which shows 28 genera and 102 species] as he might be of assistance to us in our collections of wild legumes in Manchuria, North China, and Chosen" [Korea].

Page 4546. "The wild soybean is very abundant throughout this vicinity." "Mr. Nakatomi assured us of his hearty cooperation in our studies of Manchurian agriculture."

Page 4558 (21 April 1930, Dairen). "This morning we went to the office of Mr. Satoh of the S.M.R. and found a package of fifteen varieties of soybeans that had been sent

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to us from the S.M.R. Experiment Station at Kungchuling. This station is the principal soybean breeding station and the varieties sent us represent selected varieties from their 1929 variety test of over five hundred varieties." A table gives the D. & M. number, varietal name, and use of each of the 15; the three uses are grain, forage, and pasture.

"In the afternoon samples of different forms of soy bean oil cake and oil cake meal were received from Mr. Yoshida, manager of the Mitsubishi Soybean oil Mills." They are: (1) "Coarse flakes. Made for export to Japan for cattle feed and fertilizer. Moisture 11%. Protein 44%. Fat 7.5%." (2) Finely cracked like cracked corn. Made for export to Japan for cattle feed; 10%, 44.5%, 7%. (3) Coarse meal for export to the United States for cattle feed. 9.11%, 45.6%, 7%. (4) Finely ground meal for export to the United States. 9.10%, 45.6%, 7%. (5) Medium coarse flakes for export to Japan for poultry feed. 10%, 44.5%, 7%. (6) Coarse flakes for export to Japan for fertilizer. 11%, 44%, 7.5%.

Page 4565 and 4566 (25 April 1930, Port Arthur, Manchuria). "We then visited the museum and looked over the agricultural exhibits of the Kwantung Province. The Nisshin Oil Mills of Dairen has rather an extensive exhibit of various forms of soybean oil and oil cake. The Manchuria Paint Co. has a very good exhibit of many kinds of paints, enamels, varnishes and plastic paints in the manufacture of which soybean oil was used." Address: Agricultural Explorers, USDA, Washington, DC.

2756. Takamine, Jokichi; Takamine, Jokichi, Jr.; Fujita, Nobuchika. Assignors to Takamine Ferment Company (New York, NY; a corporation of West Virginia). 1930. Vitamine product and process of obtaining the same. *U.S. Patent* 1,756,574. April 29. 5 p. Application filed 18 April 1924.
• ***Summary:*** The 1st inventor is: Jokichi Takamine, deceased. The patent application was filed, after his death on 22 July 1922, by his wife and administratrix, Caroline Takamine, of New York, N.Y.

This invention related to obtaining water-soluble vitamines, in a chemically pure state, from the propagation of vegetable fungi.

"A further object is to combine protein containing materials such as cereals, grains, soya beans, and the like, or the husks, brans, germs, and other portions thereof..."

"1. The process of obtaining vitamines which consists in developing and propagating vegetable fungus of the genus Aspergillus upon a culture medium, then extracting the vitamine product and other water soluble products contained in the resulting mass."

Note: The term "soya beans" appears several more times in this patent. They are used as one ingredient in a "culture medium upon which the vegetable fungus is propagated..." Address: 1. Deceased, late of Passaic County, New Jersey; 2. Administratrix; 3. Clifton, New Jersey; 4. Tokyo, Japan.

2757. Washizu, Shakuma. 1930. Zaibei Nihonjin shi kan [A history of Japanese in America]. Los Angeles, California: Rafu Shimpo-sha. [31] + 295 + [88] p. Plus 32 unnumbered leaves of plates at end. April 1. See p. 36-38. Illust. 23 cm. [Jap]
• ***Summary:*** Page 36-37. "Pioneers of tofu and konnyaku production in America. A person named Chieto HIRATA, who lived in Sacramento, California, imported konnyaku from Japan. He came to the USA in about 1891. He is one of the old timers who transmigrated Hawaii. A native of Hiroshima prefecture in Japan, he was very clever and business-minded. In 1893 his wife began a company making konnyaku in Sacramento, California. Shortly after that she started making tofu.

"Footnotes: (1). Mr. Hirata is presently engaged in business in Korea. (2) Since the Chinese were the most skilled in making tofu, only recently [in the last 20 years] have Japanese started specializing in its production. There are many who claim to be the first; I am afraid of making any errors."

2758. Ishimaru, Yoshio. 1930. [Studies of pH buffer action of quinhydron electrode method]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 8(5):335-63. May. [1 ref. Jap]
• ***Summary:*** Contents: Introduction. Part 2: The relationship between ripening of shoyu moromi and the buffer action (p. 336-39). Part 3: The effect of buffering action on yeasts in shoyu moromi (p. 339-42). Part 4 The effect of buffering action on bacteria in shoyu moromi (p. 432-).

2759. Morse, W.J. 1930. Utilizacion de la soya [Utilization of soya]. *Cuba* (*Santiago de las Vegas*). *Estacion Experimental Agronomica, Circular* No. 69. 40 p. May. Translation by Emma L. Sena of USDA Farmers' Bulletin 1617. [Spa]
• ***Summary:*** In the introduction, Ing. Francisco B. Cruz, Director of the Agronomic Experimental Station, E.C., praises an imported soy oil named "Aceite comestible de Soya." A full-page ad for this product (just before p. 36), apparently with the brand name Excelsior, is also shown.

Contents: Introduction. Soybeans for human food: Dried beans (*Los frijoles secos.* Also used as a substitute for coffee or like roasted peanuts), green or vegetable beans (*Los frijoles verdes*), soybean flour (*harina de soya*), soybean oil (*aceite de soya*), soy sauce (*salsa de soya*), soybean sprouts (*vastagos de soya*), soybean vegetable milk (*leche vegetal de soya,* including the solid material or residue {*la materia sólida, el residuo*} [okara] which is separated from the liquid soymilk), soybean curd [tofu] (*cuajada de soya*).

Note 1. This is the earliest Spanish-language document seen (Jan. 2013) that uses the term *vastagos de soya* to refer to soy sprouts.

Note 2 This is the earliest Spanish-language document seen (June 2013) that mentions okara, which it calls *la*

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materia sólida, el residuo.

Note 3. This is the earliest Spanish-language document seen (April 2013) that uses the term *cuajada de soya* refer to tofu.

Soybeans for livestock (*la soya para el ganado*)*:* For swine, dairy cattle, beef cattle, sheep, poultry. Soybeans for oil: Methods of processing beans for oil, utilization of soybean oil. Soybean meal: Soybean meal for human food, soybean meal for stock feed, for swine, for dairy cattle, for beef cattle, for poultry. Soybean meal as a fertilizer. Miscellaneous uses of soybean meal. Soybeans for hay: Soybean hay for dairy cattle, for beef cattle, for horses and mules, for sheep, for swine, for poultry. Soybeans for pasturage: Swine, sheep, or poultry on soybean pasturage. Soybeans for silage. Soybeans for soilage [green crops for feeding confined animals; a term first used in 1928]. Soybeans for soil improvement. Soybean straw: Feeding value, and fertilizing value of soybean straw.

Address: USDA, Washington, DC.

2760. Dorsett, P.H.; Morse, W.J. 1930. Re: Request for photographic supplies from Eastman Kodak Co. (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. June 16. Unpublished log.

• ***Summary:*** Page 5176. Letter dated 16 June 1930 from Dairen, Manchuria, to Eastman Kodak Co., Shanghai, China. "Gentlemen: Please forward to us, at your earliest convenience, by express, the following photographic supplies:

"15 spools Eastman No. 10 Cartridge Motion Picture Film, length 100 foot, perforated, for use in standard (35 mm.) Automatic Motion Picture Camera.

"100 Packs Eastman Kodak Films No. 518, 3¼ x 4¼ for use in Eastman Graflex Camera.

"25 spools film No. 122, 3¼ x 5½, 10 exposures for use in Eastman No. 34 Panoramic Kodak.

"Please ship the above material addressed to Dorsett and Morse, c/o U.S. American Consulate, Dairen, Manchuria. Upon receipt of goods and invoice, we will send you a post office money order for the amount of your bill.

"Very truly yours, Dorsett & Morse." PHD/rd. Address: Agricultural Explorers, USDA, Washington, DC.

2761. *Fortune.* 1930. Soy beans: Which may be glue, milk, cheese, sauce, varnish, axle grease, fertilizer, soap, soup, buttons, artificial leather, enamel. 1(5):102, 104. June.

• ***Summary:*** Discusses the history of the soybean in various countries. Its uses in the United States are outlined. A plastic named Satolite is used to make combs and buttons. In "Paris there is a cheese factory that makes Rocquefort [Roquefort] from soy bean curd." Soy bean "milk has more proteins than cow milk and little danger of contamination. Its flour contains four and one-half times more fat, four times more proteins, half as much water, and nearly half as many carbohydrates as the flour of wheat. These chemical ingredients make it a food, more interesting, perhaps, than palatable. Though the milk is supposed to be good for one (it arrests cases of retrogression, causes normal growth), it has generally to be drunk sweetened with sugar. Soy bean sauces are better spiced. (For the Chinese taste Lean & Perrins Worcestershire is too hot. The Chinese themselves make their sauces by exposing the crushed bean to sunlight and actually melting it. Certain Korean sauces are thus matured thirty years before they are considered palatable.) But if the bean's chemical make-up only indirectly contributes to its success as human food, it is nevertheless the basis of the bean's industrial importance. Because of its nitrogen, the bean is valuable as fertilizer and also as poultry and stock feed. And the bean's hereinbefore mentioned oil has proved of value to many a manufacturer of paints, enamels, lacquers, and even explosives."

The Anglo-Chinese Company at Harbin and the Suzuki Mill at Dairen, both of which use chemical solvent extraction, have succeeded in extracting virtually all of the oil from the soybean; Manchuria's traditional crude stone presses were able to extract only about half the soybean's oil content.

"Perhaps the greatest economic and industrial triumph of the soy bean occurred, oddly enough, in Denmark. Until some thirty years ago this pleasant country was more than self-supporting in the production of cereals, especially wheat. But U.S. mass production and low prices made for perilous and in some cases disastrous competition, even in Denmark's home markets. The Danes bethought themselves of raising live stock, imported the soy bean (using the oil for its usual purposes), and used it as feed for their live stock and poultry. Today 70 per cent of Denmark's export trade consists of live stock and animal products: milk, butter, cheese, bacon, ham, eggs, and the like. And for their country's regained economic health Danes give thanks to the soy bean...

"In the United States the paramount importance of soy bean is still its agricultural use. But it is significant that 75 per cent of the soy bean oil consumed in United States is being used by paint and varnish industries and in manufacture of linoleum, oil cloth, artificial leather. Lesser quantities are utilized in printer's ink, liquid soaps. Few soy beans are imported into this country."

Note: This is the earliest English-language document (Feb. 2007) seen that contains the term "mass production."

2762. Kawakami, J. 1930. Mame-ka shokubutsu senshokutai sûhyô [Chromosome numbers in Leguminosae]. *Botanical Magazine* (*Tokyo*) 44(522):319-28. June. [2 ref. Jap; eng]

• ***Summary:*** The author examined 35 horticultural varieties

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of soybeans, and found the diploid chromosome number to be 40. Address: Kyushu Teikoku Daigaku, Nôgaku-bu, Sakumotsu-gaku Kyoshitsu, Kyushu, Japan.

2763. Dorsett, P.H. 1930. Re: He tires easily after illness. Plans have been materially changed (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. July 2. Unpublished log.

• ***Summary:*** Pages 5086-5087. This letter from Dairen, Manchuria, is a reply to Mr. Paul Russell. Assistant Botanist, Foreign Plant Introduction, Bureau of Plant Industry, USDA, Washington, DC.

"This is a belated reply to your kind letter under date of March 20th, which arrived in Dairen on the day that I was taken to a Japanese hospital [in Dairen], and where I remained in a critical condition for approximately two months."

"I am beginning to feel in pretty good shape, but find that I tire rather quickly under exertion. Our plans for work during the remainder of the year, as you may already know, have been materially changed. Morse will remain with headquarters at Dairen and continue his research work with soybeans. I plan to leave Dairen shortly after July 15th for Peiping, for the purpose primarily of exploring in that region for wild legumes. At present Mr. Morse is in northern Chosen [Korea] getting seed and plants of what is supposed to be Zoysia" grass.

"I can do light work here in the laboratory and gradually getting such supplies packed as I am to take with me to Peiping."

Page 5090 to 5091. A letter of July 2 from Dairen to Mr. George M. Darrow, Senior Pomologist, Horticultural Crops and Diseases, Bureau of Plant Industry, repeats much of the above information in more or less detail. "I was taken sick with double pneumonia on the night of April 11th, and on the 14th was taken to a Japanese hospital, where I remained critically ill for the greater part of two months. I left the hospital on June first but am still under the doctor's care, though going to the laboratory and doing light work part time." Address: Agricultural Explorer, USDA, Washington, DC.

2764. Dorsett, P.H. 1930. Re: How he caught double pneumonia in Dairen, Manchuria (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. July 5. Unpublished log.

• ***Summary:*** Pages 5122-5124. This letter from Dairen, Manchuria, is a reply to Dr. A.J. Pieters, Senior Agronomist, Acting in Charge, Forage Crops and Diseases, Bureau of Plant Industry, USDA, Washington, DC.

"I trust that you and other officials at the Department of Agriculture will not be too severe in your censure of Mr. Morse for not advising the office of my illness. He has had worries enough at this end of the line without causing him more from Washington. I can readily understand how Morse felt when I went down so suddenly and was so severely ill. He had to pick up the details of my work and carry them on at the laboratory and in the field to the best he could without any advice or assistance. In addition to these numerous troubles, he was worried almost sick on account of my condition."

"On arrival in Dairen on April first, we went several days searching for a suitable laboratory room and finally found one in the Cohin building. As it was near Spring, the heat had been turned off in the building and the room was quite chilly and sometimes really disagreeable. However we went to work fitting it up with a temporary darkroom and shelves. On the 11th our official baggage was received and we got it unpacked and practically put away on that day. During the afternoon I spoke to Mr. Morse who was not feeling at all well, and cautioned him about over-doing. Just after quitting, between four and five o'clock but before leaving the office, I felt a shiver run up my spinal column, but felt no pain and had no symptoms of a cold (as far as I know).

"That night I took a couple of Aspirin and the next day called in a physician. On the 13th Dr. K. Kondo, the Japanese doctor who was attending me, pronounced my trouble as double pneumonia, and on the 14th I was taken to the Doctor's private hospital where I remained for practically two months. During the major part of the time I was more or less delirious and critically ill. In fact the doctor for a week or more did not give me any hope of recovery. However, I was pulled through and on June first I left the hospital and went to the Yamato Hotel... to recuperate. I spent ten days there, returning to the Yamato Hotel in Dairen where we are stopping, on the evening of the 10th of June."

Knowles Ryerson has developed new plans for Dorsett and Morse, which Dorsett describes. Address: Agricultural Explorer, USDA, Washington, DC.

2765. Sakuma, Futoshi. 1930. Studies on glyoxalase. *Journal of Biochemistry* (*Tokyo*) 12(2):247-79. July. [20 ref]

• ***Summary:*** There as been great interest in the question "as to the importance of methylglyoxal in the sugar metabolism of plant and animal bodies." The enzyme glyoxylase has been found in both plants (including soy-beans) and animals.

In order to examine how the glyoxalase content of seeds might change during germination, soy-beans were kept moistened at 25ºC and the glyoxylase content of the

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bud, bean-rest and whole bean including bud and root were examined daily (p. 250). Chart 1 (p. 21) shows the results during 9 days of germination. The glyoxalase content of the bud increased rapidly until the 6th or 7th day of germination; then it began to decrease. "This increase in glyoxalase may be attributed to the increase of co-enzyme rather than to that of the enzyme itself."

Pages 265-66 discuss the effect of co-enzyme on soybean glyoxalase. Table 7 shows that the co-enzyme causes a greater decrease in methylglyoxal.

Note: The glyoxalase system is a set of enzymes that carry out the detoxification of methylglyoxal and the other reactive aldehydes that are produced as a normal part of metabolism (Source: Wikipedia, Oct. 2008). Address: Dep. of Biochemistry, Niigata Medical School, Niigata, Japan.

2766. Suzuki, Bunsuke; Nishimoto, U. 1930. The kephalins [cephalins] of the soybean. *Proceedings of the Imperial Academy* (*Tokyo*) 6(7):262-65. July. [Eng]

• ***Summary:*** Details are given for the extraction of the kephalins [cephalins] from the oil-free alcoholic extract of soya bean. Hydrolysis of these with 3% sulfuric acid gives cholamine, stearic, linoleic, linolenic, and Beta-glycerophosphoric acids. Treatment of the cephalins with bromine in light petroleum affords (a) soluble and (b) insoluble fractions, hydrolyzed to (a) stearic and tetrabromostearic acids, and (b) stearic and hexabromostearic acids. The original mixture contains, therefore, α-stearo-gamma-linoleo- and α-stearo-gamma-linoleno-Beta-cephalins. Address: Biochemical Lab., Faculty of Agriculture, Kyoto Imperial Univ., Japan.

2767. Morse, W.J. 1930. Re: Heat and humidity in Manchuria are unbearable. Keeping good notes (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Aug. 3. Unpublished log.

• ***Summary:*** Pages 5458 to 5461. This letter dated Aug. 3, is from W.J. Morse in Dairen, Manchuria to P.H. Dorsett in Peiping, China. "With regard to the hot weather... In all of our tramps about Fuji and other places [in Japan] I did not suffer nearly as much from the heat as I have here in Manchuria. The heat from the sun seems to be so much more intense and seems to go right through one. Suyetake made the remark how hot it is here compared to the main island [Honshu, Japan]. The humidity also seems to be rather high and our clothes, suit-cases and other leather goods have to be cleaned of mold about every other day. My experience thus far with the Manchurian weather is quite different from that which I expected to find after reading volumes on Manchuria agriculture."

"In South Manchuria soybeans are planted mostly with corn although I have seen many fields of sorghum and soybeans, and millet and soybeans. It is quite likely that I may come across this practice between Mukden and Antung and also between Mukden and Changchun for soybeans are grown more or less with sorghums in these regions. I have picked up so much information and seed [sic, seen] so many things along the soybean line that I have never read or heard of during my trips that it almost bewilders me. With such conditions, Dorsett, I am indeed thankful that I am not burdened with the collection of much other material and can devote my short time here in this wonderful soybean country wholly, at least almost wholly, to my friend the soybean. Little do the people back in Washington [DC] realize just what there is in the soybean line over here. The references in letters the past winter and spring to the effect that we have gathered sufficient seed samples and products has made me rather worry."

"With reference to my field notes and pictures, I still try to keep up with you. As to office routine I will omit that and confine my notes to my field activities along with the pictures. I do not care for the notes after they are typed as I keep full notes every day in my daily note-book [notebook] and would not have any use for the notes sent you as I take them out of my books. So just destroy these after you have finished with them."

"Very sincerely, W.J. Morse." Address: Agricultural Explorer, USDA, Washington, DC.

2768. Dorsett, P.H.; Morse, W.J. 1930. Roasted soybeans and soy coffee in Manchuria (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 5353 (5 Aug. 1930–Dairen, Manchuria). W.J. Morse's notes. "During our visit with Mr. Arakawa in Hsiungyaocheng [Manchuria], July 31, he served us a cold drink which he said was made from roasted soybeans and barley. The product was manufactured in Germany and he bought several boxes at a Russian store in Mukden [Manchuria]. He could not remember the name of the product but he said it came in a green paper package."

"At a Japanese food store we found an instant coffee substitute known as 'Health Coffee' made from soybeans and [word omitted] by a Japanese farmer living outside of Dairen. The same store also had another coffee substitute made from 50 per cent roasted soybeans, and the remainder, coffee and chicory. We were advised to try a Chinese food store for the German soybean coffee. At a large Chinese store we found the same kinds of coffee substitute as at the Japanese store." Address: Agricultural Explorers, USDA,

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Washington, DC.

2769. Dorsett, P.H.; Morse, W.J. 1930. Tofu, soybeans in the pod, and soybean sprouts in Peiping, China (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.
• ***Summary:*** Page 5431 and 5432 (13 Aug. 1930). "We visited an open street market in the northwestern part of the city this morning." Vegetables include: (1) "Soybeans in the pod, quite abundant." Also: "Pea sprouts. Soybean sprouts." "In the afternoon we went to the Temple of Heaven grounds and got more seed..."

Page 5434. Vegetable market scene. Hei Tan Pai Lou, Peking. Cucumbers, eggplants, soybeans,... displayed on the ground for sale" (neg. #45540). At the same market, photo of bean curd. "This Chinese bean curd looks firmer than the Japanese curd" (neg. #45541).

Page 5435. "Peiping. Square cakes of brown bean curd. The cakes of white curd are put into cold soy sauce and when the combination is brought to a boil the cakes are of a brown color" (neg. #45543).

Pages 5436 and 5437. Four photos taken in an open-air show: "Southern soybean curd, Peiping. This curd appears quite firmer than the ordinary curd. The curd, that is the grain, appears to be finer and is considered much better than ordinary curd. It also sells for more money." (2) "White and brown cakes of soybean curd in a Chinese market." (3) "To the left is a pile of shredded soybean curd, on the right a pile of the sheets of curd from which the shredded curd is made" (negs. #45544-46). Note: Pressed tofu sheets are called (in Wade-Giles transliteration) *pai-yeh* or *ch'ien-chang p'i.* Pinyin: *Qian zang pi.* Tofu is pressed into very thin sheets that look like a 6-to-12-inch square of canvas.

Page 5455 and 5456. Letter dated 14 Aug. 1930 written by P.H. Dorsett in Peiping to W.J. Morse. c/o Yamato Hotel, Dairen, Manchuria. "Yesterday we visited an open street fruit and vegetable market which extends for several blocks along Chien-men [Chienmen] Street. It was surely an interesting experience. We saw bean curd at quite a number of stands, also soy sauce. The curd was in several different forms. The white, in somewhat thinner and smaller pieces, small pieces in different forms fried, also round and square brown cakes which they call dry curd [*doufu-gan*]. It is not really dry but is pressed much dryer than the ordinary curd and can readily be handled without breaking, The brown color, we learned, is the result of putting the curd in cold soy sauce and bringing the sauce to a boil."

Pages 5779 and 5780 (18 Aug. 1930). Letter from Mr. W.J. Morse in Dairen, Manchuria, to Mr. P.H. Dorsett, c/o U.S. Legation, Peiping, China. "Today by mail I sent you all of the negatives of pictures that I have taken up to date. The negatives were sent in two lots–one of the 3¼ by 4¼ and the other of the panoramas. Tomorrow I will send you the field reports to date which may be destroyed after they are copied in the report.

"I am planning to go to Korea for two to three weeks in the very near future to complete our movie story of the soybeans as well as the still picture story. We lack the connecting links–scenes of varieties, fields, methods of culture and harvesting–and I hope to get these if possible in a short time to complete the whole soybean story of Korea. I also desire to get some data on the growing varieties for you will recall that we did not see the beans growing at all. The Manchurian maturing season soon will be here and again I want to take notes on varieties and make a complete story of the Manchurian soybean. You can rest assured that I am going to collect all possible data, seed and products of the crop. I trust that my allotment holds out for I do not want to miss anything."

"I regretted very much to learn of Dr. Harvey Wiley's death [on 30 June 1930] as I knew him very well. Several years ago he came to see me about soybeans for his dairy farms up at Bluemount [Note: After leaving government in 1912, Wiley raised dairy cows became head of the laboratories at *Good Housekeeping* magazine]. I started him with the Virginia as a silage bean and it was a great success. He became quite a soybean man and occasionally came around to talk soybeans with me.

"Your comments on the bean-curd at the Chinese market are very interesting and I hope to be able to see some of these different things when I come down to [China] some time this fall. I doubt if I will find anywhere in the Orient such a collection of products as we picked up in Japan last year. You will note in the field reports being sent you that lately we have stumbled across a few new products and we are always on the lookout for new ones." Address: Agricultural Explorers, USDA, Washington, DC.

2770. Hanzawa, Jun; Tamura, Y. 1930. Nattô seisei-kin ni kansuru kenkyû. V. Chissogen to no kankei [Research on natto bacteria. V. Seen as a source of nitrogen]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 6(8):751-53. Aug. [Jap]
Address: Hokudai Nôgaku-bu.

2771. Kimura, Wasaburo. 1930. Anwendung der Rhodanzahl. IV. Analyse der Linolensaeure enthaltenden oele. 2. Ueber die Zusammensetzung des Sojabohnenoels [Use of the thiocyanogen value. IV. Analysis of oils containing linolenic acid. 2. On the composition of soybean oil]. *J. of the Society of Chemical Industry, Japan* 33(8):325B. Aug. Supplemental binding to Kogyo Kagaku Zasshi. [Ger]
• ***Summary:*** The specimen of soybean oil (thiocyanogen value 79.7; other properties also given) contained 0.54%

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unsaponifiable matter and 95.7% fatty acids (thiocyanogen value 83.1, iodine value 139). Solid fatty acids were determined by the lead salt-alcohol method, and the following composition was calculated: saturated fatty acids 11.8%, oleic acid 25.9%, linoleic acid 58.8%, linolenic acid 3.8%. Address: Chemischen Inst. der Kaiserlichen Universitaet, Kyoto.

2772. Dorsett, P.H. 1930. Re: Collecting seeds and herbarium specimens (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Sept. 9. Unpublished log.
• ***Summary:*** Pages 5775 to 5778. This letter dated Sept. 9 is from P.H. Dorsett in Peiping, China to W.J. Morse, c/o Yamato Hotel, Dairen, Manchuria.

"Dear Morse: Come on over, the weather is cool and it is fine here."

"We spent a week in the vicinity of Hankou, the Chinese Great Wall, Ming Tombs and Tang Shan [Tangshan, a city in today's Heibei province], and secured some seed, a few pictures, and quite a number of herbarium specimens. We also spotted quite a number of plants of which we hope to get seed later."

Page 5776. "In a recent letter from Ben... he voices the opinion that all think I should return to Washington [DC] in December. Oh well, I guess I can stand it!

"Perhaps we had better give some consideration to the time and arrangements for our making the trip home. If you will, as soon as you conveniently can, let me know when you will be ready to sail and whether or not you will leave via Peking or Shanghai, Kobe or Yokohama. I will arrange my affairs so as to take the same steamer" with you are Margaret.

"One evening last week we took dinner with Dr. Yamei Kin, and during the course of the conversation, which drifted, among other things, to soybeans and soybean products, the Doctor challenged my statement to the effect that I thought the Japanese utilized soybeans as human food more extensively than do the Chinese. She said the Chinese have a large number of soybean jams [jiang] and other products which are used extensively. Well, when you get to Peking, you will have to look these matters up. The Doctor may be right about this matter but I have my doubts."

Page 5777. "I am pleased to learn that you are there and are getting along so nicely in filling in the gaps of our Chosen [Korea] work last fall where additional data and pictures are required to round out a complete story of the soybean work in that region.

"We, to my surprise, find that throughout the regions we have visited about Peiping, that the soybean is grow here in conjunction with practically all other farm crops, but primarily with kaoliang, corn, millet, sesame, peanuts, etc. Jim and I did not observe this when we were here in 1924-25."

"I suppose you will get seed of the large wild soybean. We expect to get seed here of the large leaved tall growing form."

Page 5778. "We will arrange to collect as many small samples of soybeans as is possible from the regions we visit... Very sincerely yours." PHD/rd. Incls. [Inclosures]. Address: Agricultural Explorer, USDA, Washington, DC.

2773. Dorsett, P.H.; Morse, W.J. 1930. Soybean milk in Heijo (Pyongyang), Chosen [Korea] (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.
• ***Summary:*** Pages 5905-06 (22 Sept. 1930, Heijo, Chosen). W.J. Morse's notes. "After lunch we went to the Prefecture Seed and Nursery Farm. On the way we found mature seed of the wild soybean and collected a fair sized sample.

"At the station we met the director, Mr. Shiramura, and asked concerning the harvesting of soybeans. He thought we would have a better chance of seeing the harvest of beans around Junsen, which is an extensive soybean section and is in a mountainous region. When the soybeans are grown alone, the plants are allowed to become fully mature before harvesting.

"After returning from the Seed and Nursery Farm we visited a soybean curd factory. In addition to selling bean curd this factory sells about five gallons of soybean milk daily during the summer months. This factory runs two stone grinders and uses 4-5 bushels of dry beans daily. Various forms of fried bean curd are also sold by this factory. The same process of making bean curd and milk is used on the Main Island. In the milk, however, less water is used, thus giving a higher quality of milk. The milk is used only by the Japanese and sells for 4 sen per bottle (5 bottles to the quart)." Address: Agricultural Explorers, USDA, Washington, DC.

2774. Kellogg, John Harvey. 1930. Soybeans as human food. Paper presented to the American Soybeans Grower's Association, Sept. 11. 20 p.
• ***Summary:*** Dr. Kellogg shows that he has an excellent knowledge of the world literature on soybeans and soyfoods, much of which he summarizes in this speech. "Many years ago (1899), the United States Department of Agriculture, called upon me to undertake the preparation of a vegetable meat. The Assistant Secretary, Dr. Charles Dabney, wrote me, suggesting that the navy bean might be used for the purpose. I found, however, as I expected, that this legume

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was not suited to the purpose. At that time the soybean was not grown to any extent in this country, I was wholly unacquainted with it, and so naturally sought to find in nuts, especially the peanut, a solution of the problem, and succeeded in producing a vegetable meat, Protose, of which several thousand tons have since been made and consumed. But the introduction of the soybean renders quite unnecessary any other substitute for flesh meats." The author discusses his belief that primitive man subsisted wholly upon plant products (i.e. ate a vegan diet "according to Prof. Elliot of Oxford University, Prof. Ami of Montreal, and other distinguished paleontologists"), and the nutritional value of soybeans and their basic-ash quality. "All meats yield a highly acid ash. The excess of acid in these foods produces a lowering of the alkalinity of the blood and tissue fluids when they are freely used, a condition which is known as acidosis." He also discusses soya sauce (which is now being manufactured in the USA), miso (which like soy sauce has a flavor resembling that of the osmazomes found in meat and meat sauces), roasted soy nuts (resembling roasted peanuts), pressure cooking whole soybeans, adding soy meal (flour) to breads, soy milk (which, in certain parts of China and Japan, "is made in quantities and distributed in bottles like milk in this country"), soy cheese [tofu], and the many health benefits of soy milk described in the medical literature, the many health problems caused by consuming flesh foods.

"Von Noorden, the world famous German physician, has demonstrated that the soy bean is of very great service in changing the intestinal flora." Note 1. This is the earliest document seen (June 2003) concerning soy and changing the intestinal flora. It is also the earliest document seen (June 2003) that uses the phrase "changing the intestinal flora" in connection with soy.

"In spite of the frantic efforts of vested interests to promote the uneconomic live-stock industry, it will no doubt gradually disappear as a true science of agriculture is developed and the country becomes more densely populated. The conversion of vegetable into animal protein by feeding to steers and pigs, is one of the most wasteful of all human activities. Armsby has shown that 100 pounds of digestible vegetable protein are required to produce 3 pounds of meat protein..."

Discusses Stefansson's absurd so-called meat-eating experiment, which was really a publicity stunt. Stefansson took no more than 20% of his calories in the form of lean or muscle meat. The rest of his diet was fat. "Excessive meat consumption is one of the begetting sins of the people of this country. Our per capita meat consumption is 5 ounces per day, just 5 times that of Italy (1.0 oz.) and ten times that of North China (0.5 oz.), while the average native of South China eats no meat at all, and is one of the hardiest and most industrious of workers."

"Thanks to the efforts of our efficient Plant Introduction Bureau, the soybean is beginning to get a start toward recognition and appreciation in this country; but it is evident that a plant possessed of such superlative values and such astonishing versatility and adaptability should receive far more serious attention than has heretofore been given it by the agriculturalists of this country... There can be no doubt that it is destined to play a large part in the feeding of America's millions..."

Note 2. This is the earliest English-language document seen (Dec. 2012) that uses the term "soy nuts" or the term "roasted soy nuts" to refer to soynuts. Address: Battle Creek, Michigan.

2775. Morse, W.J. 1930. La utilizacion de la soja en diversas industrias [The utilization of soya in various industries]. *Hacienda* (*La*) (*Buffalo, New York*) 25:298-301. July; 25:347-49. Aug; 25:394-96. Sept. [1 ref. Spa]
• ***Summary:*** This is a translation of USDA Farmers' Bulletin 1617, but with excellent new illustrations. Contents: Introduction. Soybeans in the human diet: Whole dry soybeans, green vegetable soybeans, soy flour, soy oil, soy sauce, soy milk, tofu (*cuajada de soja*). Soybeans in the feeding of domestic animals. Soy oil: Extraction, use. Soybean cake: as a human food, as a livestock feed, as a fertilizer. The value of soybean forage. Soybean in silage. Soya as green forage. Soybeans for the improvement of soils. Soybean straw.

This article contains many interesting photos: 1. A man with a hand turned stone mill in China grinding soybeans to make soymilk. 2. Soybean cakes stacked and partly covered with tarpaulins at a port in Manchuria. 3. Earthenware vats used for making soy sauce in a courtyard in China. 4. Steamed soybeans being cooled to make miso in Japan. 5. Soybeans intercropped with corn. 6. Manchurians outside a soy oil factory in Dairen. The equipment was installed by the French Oil Mill Machinery Co. 7. Carrying round soybean cakes in a cart at the same factory. 8. A soybean mill at Yokohama, Japan. 9. An Anderson Expeller for the extraction of soy oil. 10. A tractor pulling rotary disks for cultivating soybeans in the USA. 11. Harvesting soybeans with a tractor in the USA. 12. A tractor pulling a harvester-thresher combine in the USA. Address: USDA, Washington, DC.

2776. Morse, W.J. 1930. Soybeans in the Orient. *Proceedings of the American Soybean Association* 3:96-100. Eleventh annual field meeting. Held 10-12 Sept. 1930 in Illinois.
• ***Summary:*** This letter (which appears on pages 5196 to 5199 of the unpublished Dorsett-Morse Log) was written by William Morse on 20 July 1930 from Dairen, Manchuria, to Dr. W.L. Burlison, President of the American Soybean Growers Assoc. at the University of Illinois. It describes the travels of Dorsett and Morse as agricultural explorers for the USDA, studying soybeans and soyfoods, in Manchuria, Japan (Hokkaido and Tokyo), and Korea (Seoul).

"It is recalled that last season the use of the soybean as

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a green vegetable was described. Throughout the season, it was found that the green vegetable was a very popular food with the Japanese from one end of the Japanese Empire to the other. The vegetable soybean is classed as a garden bean and as such is extensively grown by the Japanese truck farmers."

The authors were in Hokkaido from mid-August until early October, and they visited all the principal soybean sections. "The Obihiro station in the eastern part of the island [of Hokkaido] is conducting the most extensive work in breeding and variety testing. We succeeded in collecting a very large number of varieties and selections of this northern region as well as information on culture, harvesting, threshing, insect pests, and diseases. To supplement this material, we obtained a large number of still and motion pictures of very interesting scenes of the Hokkaido soybean industry."

They arrived in Korea on 20 Oct. 1929 and established headquarters at Keijo (Seoul). "We found Korea to be a most interesting country and different from anything we had seen in Japan. One of the most amazing things was the extent to which soybeans are grown. Almost equally amazing was the large number of native Korean soybean varieties we found in the various sections and at the experiment stations. At the Suigen Experiment Station, they have more than one thousand native Korean varieties and selections under test. The authorities were very generous and gave us samples of each. In addition to this collection, we obtained a few hundred samples from Korean farmers, grain merchants on village market days and from village and city grain dealers. The Korean Department of Agriculture added about 300 samples to our collection by obtaining seed of the principal varieties from the village agricultural societies in each of the prefectures of Korea.

"Altho the Koreans do not use the soybean as extensively for food as do the Japanese, considerable quantities are used and in quite different ways. The beans are used principally boiled with other grains such as millet or kaoliang. They are also used in making miso and soy sauce, but these products are made quite differently from those of Japan or China. Soybean sprouts are found very abundantly in all of the markets and at all of the small food stores. The beans produced in Korea are for the most part excellent quality and are largely shipped to Japan for the manufacture of miso, soy sauce, bean curd, and natto. Soybeans when soaked with chopped millet or kaoliang straw are used universally for feeding oxen and cows, the common work animals of Korea.

"We left Korea about the first week of December [1929] for our Tokyo headquarters and collected seed samples and products as we went along. From the latter part of December until the latter part of March, we put in full time collecting soybean products and learning of their use and manufacture. We succeeded in collecting a large number of interesting products, as the Japanese use the soybean very extensively in their daily diet. In the making of cakes, candies, and numerous other confections, the roasted soybean is used in a similar manner to the peanut in America. Of course, soy sauce, miso, bean curd, and natto are the principal soybean products and the ones most extensively used. As an example of the large use of miso, which is used as a breakfast soup with vegetables and also in preserving fish, vegetables, and meat, we visited three large miso factories in the Tokyo district and found that each produced about one million pounds of miso yearly. In addition to these three large factories, there were numerous small factories scattered thrughout the same district.

"As the planting time was approaching in Manchuria, we left Tokyo the latter part of March and arrived in Dairen, Manchuria, the first of April... This country is the real land of the soybean and Dairen, the real city of the soybean. In 1929, 29.2 percent of the total cultivated area of Manchuria was devoted to the growing of soybeans, producing more than 178,000,000 bushels of seed, thus leading all other crops in acreage and production. The Port of Dairen handles about eighty (80) percent of the exports of beans, bean cake, and bean oil.

Note: This is the earliest document seen (Aug. 2011) that uses the term "land of the soybean" in connection with or to refer to Manchuria.

"The planting season for soybeans in Manchuria begins about the first of May and extends to about the 25th of May in some northern sections. We, therefore, had an opportunity before the planting season, to study the methods of grading, storage and transportation of [soy] beans, bean cake and bean oil in the oil mills. The storage yards and warehouse yards of the South Manchurian Railway cover several hundred acres and the immense quantities of bags of beans and bean cakes stored in the open storage yards and in the warehouses are well worth seeing..."

"We had rather expected to find a large number of products made from beans, bean cake, and bean oil but our findings thus far have been very meager. The oil is used in the manufacture of soaps, paints, lard substitutes, and salad oils, but only a very few factories are engaged in producing these products. The beans are used chiefly for oil and oil cake, but during the last three or four years, the demand of European mills for beans has had a serious effect, not only on the Dairen soybean oil mills, but also on the oil mills throughout North and South Manchuria. In Dairen, at the present time, only about forty-five soybean mills are active during the crushing season, whereas four years ago there were about ninety. The oil cakes are for the most part shipped to the Japanese Islands for feed and fertilizer (chiefly fertilizer), to China and the East Indies for fertilizer, and to America and Europe for cattle and poultry feed."

"Our experience in the field up to the present time has been the study of methods of planting and cultivation

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practiced in different sections of North and South Manchuria."

"We have collected quite a large number of seed samples during our travels thus far in Manchuria and have obtained some very interesting types. It may interest the members to know that we have visited Yingkou (Newchwang), the source of the Virginia and Wilson varieties... At the Kunchuling Experiment Station, more than one thousand varieties and selections have been tested but at the present time only five hundred are under test. The Manchurian varieties do not succeed in the Japanese Islands or Korea and neither do the Japanese varieties succeed in Manchuria or Korea..."

"With this letter we are sending some lantern slides illustrating various scenes of the soybean industry in oriental countries... With best wishes for a most interesting and successful 1930 meeting."

Note 2. This is the earliest English-language document seen (Feb. 2004) that uses the term "vegetable soybeans" (not preceded by the word "green") to refer to green vegetable soybeans.

Note 2. This letter was reprinted in *Soybean Digest* (April 1945, p. 11-12). Address: USDA, Washington, DC.

2777. Tsao, Lien-en. 1930. The marketing of soya beans and bean oil. *Chinese Economic Journal* 7(3):941-71. Sept.
• ***Summary:*** A brilliant and very informative article. The amount of Manchurian soybean production as compared with the other leading soybean producing countries, and a discussion of the marketing of soybeans, cake and oil on the world market, are included. "Tea and silk once dominated the world market and today, from China's Three Eastern Provinces (Manchuria) have created a world demand" (p. 941).

"The cake saturated with from 7 to 9 per cent. of oil is of no industrial use except as cattle feed and fertilizer in the fields. The oil thus obtained is still crude. Although some large and modern mills at Harbin and Dairen produce purified and refined oil for table use, the bulk wanted by Europe is the crude variety, which is there to be made into margarine butter, gun-powder, and other industrial articles. The cake in the very early days of the industry was shipped to Ceylon for trial as fertilizer in the tea fields as remarked before, but owing to the presence of the large percentage of oil it softened and became damaged when crossing the tropics" (p. 956).

Page 969 states: "Experiments are now being made to cultivate soy beans in the French and British Sudans of Africa [later named Mali and Sudan], in unreclaimed areas of Australia, in Europe, South America, and by the time the trials will bear fruit, the Manchuria market will be irretrievable... The beancake as a fertilizer will also lose its market in Japan, now that industrialized Europe is thrusting out a chemical fertilizer in the form of powder sold at much lower prices than the beancake... Chinese oil manufacturers naively believe that the chemical as fertilizer is not suitable for the soil in Japan, but poisons it, so that the crops become of inferior quality year by year." Once continued application of chemical fertilizer assures good results, "the market for Manchurian beancake is doomed."

Note: This is the earliest document seen (Aug. 2009) concerning the cultivation of soybeans in Sudan.

An appendix (p. 970-71) lists in Chinese characters the names of the oil mills in Manchuria, by city: Dairen (41 mills), Harbin (28), Antung (20), Newchwang (19), Dairen west suburb (11), Dairen east suburb (7), Anta (7), Ashihi (3), Mankou (2), Maotangkiang (2), Angangchi (2), Tsitsihar (2), Changchun (1), Fularki (1), Imienpo (1).

2778. Mashino, Minoru; Shishido, Tadao. 1930. Effect of carbohydrates and other impurities on the crystallization of glutamic acid hydrochloride from decomposition products of soy bean protein. *J. of the Society of Chemical Industry, Japan* 33(10):421B-22B. Oct. (Chem. Abst. 25:746). Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** The addition of the methyl alcohol extract from soybean cake considerably reduces the yield of glutamic acid hydrochloride obtainable on recrystallization; the addition of carbohydrates does not reduce the yield so much. By purifying soybean cake with methyl alcohol before decomposition, a high yield (90%) of the salt is obtainable, whereas an unpurified cake yields only small amounts of the crystalline product. Address: Tokyo Imperial Industrial Research Inst., Yoyohata, near Tokyo, Japan.

2779. Nakazawa, R; Takeda, Y. 1930. Ueber die Schimmelpilze welche bei der Herstellung des Leckerbissens "Ontjom" und "Tempeh" (Java und Sumatra) mitwirken [Molds that assist the production and fermentation of the delicacies "ontjom" and "tempeh"] (Abstract). *Biological Abstracts* 4(10):2379 (Abst. #25213). Oct. [1 ref. Ger]
• ***Summary:*** Tempeh and ontjom are the names of foods produced by the natives of Java and Sumatra. Tempeh is made from soybean and ontjom from groundnuts (peanuts). Geerligs reported that *Rhizopus oryzae* is the mold used to produce both these foods, but Went reported it was *Monilia sitophila.* However Nakazawa and Takeda identified *Penicillium brevicaule* as the main mold involved, together with small quantities of *Rhizopus, Aspergillus,* and *Mucor.*

2780. Suzuki, Bunsuke; Yokoyama, Y. 1930. Soy bean lecithins. I. The separation of α- and β- series. *Proceedings of the Imperial Academy* (*Tokyo*) 6(8):341-44. Oct. [4 ref. Eng]
• ***Summary:*** Experimental details are given for the isolation of lecithins from an alcoholic extract of soya beans as cadmium chloride double salts, from which fatty acids (saturated 44%, unsaturated 56%), α- and Beta-glycerophosphoric acids, and choline are obtained. The

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saturated acid is palmitic acid, and the unsaturated fraction contains oleic acid (47% of total acids), and smaller quantities of 2 acids which, on bromination, yield hexa- and tetra-bromostearic acids, melting points 177-178ºC and 112-113ºC, respectively. Separation of the cadmium chloride salts of the α- and Beta-lecithins is effected by acetone, in which the α-complex is far less soluble. From the α-lecithins palmitic, di-, tetra-, and hexa-bromostearic acids have been obtained in the proportions 24.3, 32.4, 44.2, and 1.1%, while in the Beta-series the proportions are 20.1, 53.8, 24.8 and 1.4%.

Note: This is the earliest English-language document seen (Oct. 2003) that contains the word "choline" in connection with soy bean lecithin. Address: Biochemical Lab., Faculty of Agriculture, Kyoto Imperial Univ., Japan.

2781. Suzuki, K.; Hatano, Tadashi. 1930. Manshû daizu kasu (maru kasu) no yokei shiryô toshite no kachi [Nutritive value of round Manchurian soy-bean cake for hens. II.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 6(10):900-09. Oct. Also published in Proceedings IV World's Poultry Congress, 1930, 288-91. [5 ref. Jap]
• ***Summary:*** "Soy-bean oil cake was given as protein source of the feed. Twelve parts of bone powder, 4 parts of calcium carbonate and 4 parts of NaCl for 100 parts of the cake were supplied. The nutritive value was similar to that of fish meal. It gives results on egg production and weight of eggs similar to those of other animal feeds... The chicks hatched from the eggs as above mentioned were also fed with soy-bean oil cake. No abnormal signs were noted."

2782. Suzuki, Kôzô. 1930. Buta no shiiku shiryô toshite no manshû-san daizu kasu (maru kasu) no kachi [The value of round Manchurian soy-bean cake for fattening swine]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 6(11):975-86. Nov. [45 ref. Jap]
• ***Summary:*** "Soy-bean oil cake as 20% and 30% was added to a feed consisting of korean 47%, maize 30%, bone powder 2%, and NaCl 1%. The nutritive value of the feed with soy-bean oil cake was as good as that with fish meal. The results in fattening were rather superior. Vitamin A, C1, Na and Ca should be supplied."

2783. Suzuki, Shigekiyo. 1930. Tanpaku-shitsu no kenkyu. VIII. Daizu tanpaku-shitsu no kenkyu (1) [Proteins. VIII. Proteins from soy beans (1)]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 51(11):729-37. Nov. (Chem. Abst. 26:484). [12 ref. Jap]

2784. *USDA Plant Inventory.* 1930. Plant material introduced by the Office of Foreign Plant Introduction, Bureau of Plant Industry, April 1 to June 30, 1929 (Nos. 80019 to 80810). No. 99. 46 p. Nov.
• ***Summary:*** Soybean introductions: *Soja max* (L.) Piper (*Glycine hispida* Maxim.). Fabaceae.

No. 80455-80498. "From Japan. Bulbs and seeds collected by P.H. Dorsett and W.J. Morse, Agricultural Explorers, Bureau of Plant Industry. Received May 27, 1929.

No. 80459-80498 are all soybeans. Six of these PI numbers came to have special significance; all were large-seeded and were introduced in the USA.

"80472. No. 38. From the Yamato Seed Co., Takadacho, Tokyo, April 15, 1929. *Chusei O Saya Eda Mame.* A large yellow-seeded variety said to be the largest soybean used for garden purposes and to have a sweet flavor. It is said to be used principally as a green bean, being cooked in the pod. Note: Renamed "Chusei" by 7 March 1936.

"80473. No. 39. From the Yamato Seed Co., Takadacho, Tokyo, April 15, 1929, and originally from the Tokyo district. *Cha Mame.* A large brown-seeded variety, said to be used as a green bean when boiled in the pod. Note: Renamed "Chame" by April 1936.

"80475. No. 41. Obtained from the Yamato Seed Co., Takadacho, Tokyo, April 15, 1929, and originally from the Tokyo district. *Higan mame.* A rather late yellow-seeded variety, said to have white sweet meat and to be used as a green bean, being cooked in the pod. Note: Renamed "Higan" by April 1936.

"80476. No. 32. Obtained from the Imperial Seed Co., Takinogawa, Tokyo, April 15, 1929, and originally from the Tokyo district. *Sousei O Saya Eda Mame.* One of the earliest varieties of garden soybeans with large pods and large yellowish-green seeds. It is said to be very sweet as a green bean, being cooked in the pod. Note: Renamed "Sousei" by April 1936.

"80480. No. 63. From the Tokyo Seed, Plant & Implement Co., Konon, Tokyo, April 19, 1929, and originally from the Saitama Ken. *Gokuwase Daihosan Shinbon Daizu.* One of the earliest varieties with an abundance of pods containing yellow seeds. It is said to be used especially as a green vegetable and is the earliest of the varieties used for that purpose. Note: Renamed "Goku" by April 1936.

"80481. No. 64. From the Tokyo Seed, Plant & Implement Co., Konon, Tokyo, April 19, 1929. *Rokusun Daizu.* Six-inches soybean, meaning that 10 beans equal six inches. A large, flat, yellow-seeded variety used as a green vegetable like the green lima bean." Note: Renamed "Rokusun" by April 1936.

Japanese names of other soybeans in this set, arranged by P.I. Number: *Maru Kuro, Mimame* [*sic, Nimame*]*, Wase Eda Mame, Furisode, Tsurunoko, Hira Sata Kuro Daizu, Chusei O Saya Eda Mame, Okuro Maru Daizu, Ao Daizu, Tsurunoko Daizu, Kuro Maru Daizu, Souseikurome O Saya Daizu, Sousei Kuro Sakigake, Shiro Tsubu, Sousei Ao Sakigake, Chusei O Saya Daizu, Shikoku Obbikuri Daizu, Sousei O Saya Daizu, Sato Daizu, Chusei Hattoku Daizu, Bansei Gokudai Tsukimi Daizu, Shin Honen Daizu, Eda Mame Uase Chaurame, Eda Mame Uase Ao Sakigake,*

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Tamba Otsubu Daizu, Eda Mame Uase Kuro Sakigake, Eda Mame Uase Kurome Dzaya [*Daizu?*]*, Daikoku Eda Mame, Tsurunoko Daizu, Otsubu Murinabe, O Tsuba Uase Aoshiro Eda Mame, Yedamame Uase Higanmame, O Tsubu Aojiro Daizu.*

Note: The word "Uase" would now (June 2011) be spelled "Awase," and "Yedamame" would probably be spelled "Edamame." Address: Washington, DC.

2785. [Introduction of soybeans to Cuba from Manchuria (via Chile) on 29 Nov. 1930 (Document part)]. 1930. In: *Introductiones,* 1928 to 1933-34. Unpublished register of seeds received by the Agricultural Experiment Station (*Estacion Experimental Agronomica*) at Santiago de las Vegas, Cuba. 134 p. See p. 53, no. 216. Unpublished manuscript. 41 cm. [Spa]*

• ***Summary:*** These soybeans were sent by the Cuban Ambassador in Chile to Alfredo Herrera at the Department of Agriculture experiment station at Santiago de las Vegas, Cuba. The ambassador in Chile had received the seeds from Southern Manchuria, which was under Japanese administration. Planted in Cuba on 13 Jan. 1931, the seeds did not germinate. The varieties are: Yellow Gem = Nyoi Gem. Ssupingkai Black Novel = White Flower Tsotzu. White Flower = Mukden White Eyebrow (Eyeiou). Address: Estacion Experimental Agronomica, Santiago de las Vagas, Cuba.

2786. Dorsett, P.H.; Morse, W.J. 1930. Miso in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 6820 (21 Dec. 1930, Kobe, Japan. Mr. Morse's notes). "Mr. Saito at Dairen had advised us that there were many places in Kobe where meat was preserved in soybean miso." Had no difficulty in finding three such places, where "we found the men busy in packing meat in white miso. In the Kobe and Kyoto districts white miso is manufactured quite extensively. Small meat shops are the only establishments putting up the miso-preserved meat. For this product beef is used and white miso. Small slices of beef about the size of the palm of the hand and about ¼ inch thick are placed on a layer of miso (about ¼ inch thick), then a layer of miso and another layer of meat. About 1½ pounds of beef are packed with miso in each tub which sells for two yen. The meat is best after being preserved in miso about 7-10 days and does not keep well after two weeks except in rather cold weather. Miso preserved meat is always boiled. White miso is always used for preserving fish and meat (beef) while red miso is used for preserving vegetables, the red miso being considered too salty for meat. Several meat shops were visited and we always found the same products and same methods of preserving the beef. Apparently this product is very popular in the Kobe district. At one of the shops we were advised that there are some miso-meat preserving places in the Tokyo district." Photo: Small tubs of miso preserved meat displayed in front of a meat shop in Kobe.

Pages 6822-23 (22 Dec. 1930, Kyoto, Mr. Morse's notes). At the Imperial Agricultural College they met Isawo Namikawa, Professor of Horticulture, who said that Kyoto is noted for several special soy products such as white miso, soy sauce, and natto. Kyoto soy sauce is lighter in color, not so heavy, and not quite as salty as soy sauce made in other parts of Japan. "In looking around Kyoto in our little spare time we saw no places where meat is preserved in miso."

Pages 6931-32 (7 Jan. 1931). Morse went to the Imperial Department of Agriculture in Tokyo and met the director, Mr. A. Manabe, who provided information, statistics, and recent publications on soybean acreage, production, utilization, and industries in Japan, Chosen [Korea], and Taiwan. These are the most complete yet received. Mr. Manabe stated that soybean acreage and production is gradually decreasing in Japan proper. This is due mainly to the increased acreage of more intensive farming, especially truck crops and rice. However the acreage of soybeans for green manuring purposes is increasing rapidly, especially in the southern half of the main Island and Kyushu Island.

Japan proper produces more than 2,500,000 koku of soybeans but uses over 7,500,000 koku; the difference is imported from Chosen and Manchuria. The soybeans imported from Manchuria are "are of much lower quality than beans from Japan proper and Chosen and are used primarily for the manufacture of soy sauce, miso, bean oil and bean cake. The beans from Japan proper and Chosen are utilized primarily for food, such as bean curd (Tofu), confections, flour and green vegetable beans. The following table gives the ratio in percent of soybean utilization in Japan:

Miso 22.7%. Soy sauce 22.7%. Bean oil and bean cake 21.6%. Bean curd [tofu] 15.4%. Green vegetable beans 0.8%. All other food uses 6.0%. Feeding purposes 6.2%. Green manure 2.5%. For planting [seed] 1.6%. Miscellaneous uses (other than food) 0.5%. Note: These figures total 100%. Thus, 22.7% of the soybeans used in Japan are used to make miso, 22.7% are used to make soy sauce, 21.6% are crushed to make soybean oil and cake, etc.

Page 6937 (10 Jan. 1931, Tokyo, Notes by Mr. Morse). Spent most of the day in the Shinjuku district looking up soybean products. "More String Natto in rice straw packages was observed in this section than any we have visited. At the stores we found considerable quantities of fish preserved in white miso and also fish preserved in sake mash. The latter is said to keep much longer than the miso preserved fish and if it keeps long enough might afford a good article of export

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to the United States, for undoubtedly it would prove far less harmful than some of the products [alcohol] now used in violation of the 18th amendment... Nearly all food stores carried a variety of vegetables preserved in red miso."

Page 6943 (12 Jan. 1931, Kobe). Visited a large miso meat preserving place that packs 5,000 to 6,000 tubs of miso preserved meat yearly. The proprietor said that about 3,000,000 tubs are sold each year in the Kobe district. The small tubs, costing 70 sen each, hold about 2 pounds of beef. The Kobe district is noted for its fine quality of beef. Photos (p. 6946-47) show these small flat tubs.

Page 6945-46 (13 Jan. 1931). Kyoto, Japan. Visited a large miso factory, where both red and white miso are made. White miso is manufactured quite extensively in the Kyoto and Kobe districts; it keeps only about 1 month in the summer, but about 3 months in the winter. A table shows the most famous forms of miso made in Japan: Sendai miso–red. Kanto miso–red. Okazaki miso–black. Country miso–red. Kinzanji miso–red. White miso–white.

Pages 7003-04 (19 Jan. 1931). Tokyo, Japan. Morse's notes. "At evening supper we had for dinner beef preserved in white miso. After broiling, the flavor of the meat reminded one of that of the sugar cured hams of the Southern States. The meat had been cured just eight days and was well flavored through."

Page 7116 (29 Jan. 1931). In a letter to Dorsett in Peking, Morse states that the broiled, miso preserved beef was "delicious" and tasted like ham. "I also had some white miso preserved fish. Although it was good, I did not care nearly so much for it as I did the beef." Address: Agricultural Explorers, USDA, Washington, DC.

2787. Matsumoto, K. 1930. Shôyu jôzô ni kansuru saikin-rui ni tsuite. IV. Tokuni shôyu jôzô genryô ni fuchaku seru saikin-rui [Microbes involved in shoyu brewing. IV. Especially those adhering to basic raw materials]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 109. p. 1-87. Dec. [7 ref. Jap]
Address: Jozo Shikensho, Gishi.

2788. Abe, K. 1930. [Changes of protein under processing]. *Morioka Kono Dosokai Gakujutsu iho* (*Bulletin of the Scientific Researches of the Alumni Association of the Morioka College of Agriculture and Forestry, Morioka*) 6:1-7. [Jap]*

2789. Fukai, Tôshi; Nakajima, W. 1930. Shôyu hakkô to shiyu no kankei. II. Kôkyû shibosan-rui no kôbo no zôshoku hakkô yokusei sayô ni tsuite (1) [Relation between oil and shoyu brewing. II. On the influence of first-class fatty acids on the growth of yeast and fermentation]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 25(1):34-36; 25(2):42-44; 25(3):43-47; 25(4):45-50; 25(6):36-43. [Jap]
Address: 1. Jozo Shikensho Gishu, Nôgaku-shi; 2. Jozo Shikensho Kenshuin, Nôgaku-shi.

2790. Fukai, Tôshi; Katsume, E. 1930. Shôyu genryô "pentoosu" oyobi "meranin" shikiso seizô shiken (15) [On the preparation of pentose and melanin as raw materials for shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 25(10):40-42; 25(11):29-33; 25(12):37-43. [3 ref. Jap]
Address: 1. Jozo Shikensho Gishu, Nôgaku-shi; 2. Jozo Shikensho Shotaku, Nôgaku-shi.

2791. Fukai, Tôshi; Nakajima, W. 1930. Shôyu no "nafutooru" hannô ni tsuite. II. Kôjisan no shin teiryô-hô narabini shôyu moromi ni okeru unmei [On the reaction of naphthol in shoyu. II. A new quantitative method for determination of kojic acid, and its fate in shoyu moromi]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 25(10):42-44; 25(11):18-21. [Jap]
• ***Summary:*** Naphthol (1849) is (1) either of two isomeric derivatives of naphthalene found in cola tar or made synthetically and used as antiseptics in the manufacture of dyes. (2) any of various hydroxy derivatives of naphthalene that resemble the simpler phenols. Address: 1. Jozo Shikensho Gishu, Nôgaku-shi; 2. Jozo Shikensho Joshu, Nôgaku-shi.

2792. Fukai, Tôshi; Nakajima, W. 1930. Shôyu hakkô to shiyu no kankei. II. Kôbo no zôshoku narabini hakkô ni oyobosu daiichiretsu kôkyû shibôsan no eikyô [The relation between oil and shoyu brewing. II. The influence of first class fatty acids to the growth of yeast and fermentation]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 106. p. 186-210. [Jap]
Address: Jozo Shikensho. 1. Gishu; 2. Kenshuin.

2793. Fukai, Tôshi; Nakajima, W. 1930. Shôyu no nafutôru hannô ni tsuite. I. "beeta nafutooru" to ruiji hannô o teisuru shôyu seibun (chiramin, kôji-san) ni tsuite. II. Kôji-san no teiryô-hô narabini shôyu moromi ni okeru unmei [On the naphthol reaction in shoyu. I. Components of shoyu which present a reaction resembling beta-naphthol (tyramine, kojic acid). II. Quantitative method of kojic acid and its fate in shoyu moromi]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 106. p. 211-27, 228-36. [Jap]
• ***Summary:*** Nakajima was an author only on part II.
Address: Jozo Shikensho, Gishu.

2794. Fukai, Tôshi. 1930. Shôyu kasu no okeru "shitosuterin" narabini "puro bitamin" D no sonzai ni tsuite [On the detection of mitosterin and provitamin D in shoyu-cake and oil. I.]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 110. p. 158-68. [Jap]

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Address: Jozo Shikensho, Gishu.

2795. Hirose, M.; Shimomura, T. 1930. Polymerized soybean oil and its soap. *J. of the Society of Chemical Industry, Japan* 33:169B-72B. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]*
• ***Summary:*** The characteristics of soybean oil polymerized by heating at 290-295ºC in carbon dioxide are given. The rate of decrease of iodine value is considerably smaller than in the case of fish oils, but in both cases this rate decreases with the duration of heating. The yields of hexabromide and solid tetrabromide decrease to nil as polymerization progresses, but the amount of viscous brownish-black bromide insoluble in light petroleum (which is regarded as an unsaturated polymerized product of linolenic acid) increases to an amount nearly equal to that of the hexabromide in the original oil. The increase in molecular weight (Rast) of the fatty acids is smaller than that of the original glycerides. The surface tension of a solution of the soap increases, and the (Hillyer) drop number and the lathering power (Stiepel) decrease with increasing polymerization. Thus polymerization reduces the detergent power of the soap, but as the soap does not deteriorate on keeping and has remarkable tenacity, it may with advantage be added to soaps of better washing power but of a brittle nature, e.g. hydrogenated soybean oil soap.

2796. Kaetsu, Hideji. 1930. Hokuman chihô ni okeru tokusanbutsu no torihiki oyobi saisan [Business, trade and profitability of special products in the province of North Manchuria]. *Minami Manshu Tetsudo K.K., Shomubu, Chosaka, Mantetsu Chosa Shiryo* (*South Manchuria Railway Co., Survey Research Documents*) No. 143. 76 p. [Jap]*
Address: Dairen, Manchuria.

2797. Kakinuma, S. 1930. [Detection of furfuracrylic acid in shoyu]. *Eisei Kagaku* (*J. of Hygienic Chemistry*) 36:1-. [Jap]*

2798. Kakinuma, S. 1930. [Detection of naphthol-resembling substance in shoyu]. *Eisei Kagaku* (*J. of Hygienic Chemistry*) 2:34-. [Jap]*

2799. Kinoshita, Asakichi. 1930. [Again, on chemical shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 8:16. [Jap]*

2800. Kinugasa, Y. 1930. [Method for detection of beta-naphthol in shoyu]. *Eisei Shiken* 36:7-. [Jap]*

2801. Kinugasa, Y. 1930. [Mustard oil as an antimold substance for shoyu]. *Eisei Shiken* 36:171-. [Jap]*

2802. Kobasi, S. 1930. [Studies on mannase of microorganisms]. *Chosen Igaku / Igakkai* (*Korean Medicine*) 20:1221-; 1330-. [Jap]*

2803. Kurono, Kanroku; Kinoshita, A.; Fukai, T.; Katsume, E. 1930. Pentoosu shiki shôyu jôzô shiken [The use of pentose as a raw material for shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 106. p. 90-100. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Gishi; 3. Gishu; 4. Shokutaku.

2804. Matsumoto, K.; Sano, Z.; Tanigawa, S. 1930. Shôyu jôzô shiken. I. Saikin-rui tenka shiken. II. Sakana kasu tenka shiken [Shoyu brewing tests. I. Adding bacteria during shoyu brewing. II. Adding fish cake]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 108. p. 180-95, 196-210. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2-3. Joshu.

2805. Matsumoto, K.; Misawa, K. 1930. Kôeki no kenkyû. I. Koeki o shôyu kôbo baiyô ni shiyô suru kiso-teki shiken [Studies on soybean cooking liquid. I-VI.]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 107. p. 1-15. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Kenshuin.

2806. Miyaji, K. 1930. [On the action of bacteria separated from brewing shoyu]. *Kagami Ken* 9:1-. [Jap]*

2807. Morse, W.J. 1930. Hokubei gasshû-koku ni okeru nô- seisan narabini riyô no genkyô [The present situation of soybean production and utilization in the USA]. Tokyo: Daizu Kogyo Kenkyu-kai (Soybean Industry Research Institute). 18 p. Translated by Yoshi Takamori. [Jap]
• ***Summary:*** Based on a lecture by Morse on soybean in Dairen, Manchuria. Address: USDA, Washington, DC, USA.

2808. Muramatsu, Shinsuke. 1930. Nattô ni kansuru jikken [Experiments with natto]. *Gakujutsu Kyoho* 5:340-. [Jap]*

2809. Nakashima, S. 1930. [The separation of shoyu-oil]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 8(2):141. [Jap]*

2810. Oota, Kiyoshi; Sugawa, E. 1930. Shôyu no kabi-dome-zai ni tsuite. Inshokubutsu bôfuzai no kenkyû (1) [On the anti-mold substances for shoyu. Research on preservatives for beverages (1)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 25(8):2-11; 25(9):9-14. [35 ref. Jap]
Address: 1-2. Igaku hakase.

2811. Sumiki, Yusuke. 1930. Studies on the saponin of soybean. II (Abstract). *Bulletin of the Agricultural Chemical Society of Japan* 6(6-9):49-51. May be bound in the back of Nippon Nogei Kagaku Kaishi (J. of the Agricultural

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Chemical Society of Japan). Original article on pages 737-53. [Eng]
• ***Summary:*** This appears to be an English-language summary of the Japanese-language article by Y. Sumiki (1929, p. 27-32)–which see. The author "has been able to isolate the saponin easily as crystals" from a large quantity of alcoholic extract of soy-bean received from the Central Research Laboratory of the South Manchuria Railway Company (*Mantetsu Chûô Shikenjo*). The sodium salt of saponin, decomposing at 259-60º, crystallizes as hexagonal plates by neutralization with sodium hydroxide from the 70% alcoholic solution of free saponin.

Note: This is the earliest English-language document seen (Sept. 2007) uses the word "saponin" (or "saponins") in connection with soybeans. It is also the earliest English-language document seen (Sept. 2007) that uses the word "haemolytic" (or "hæmolytic" or "hemolytic") in connection with soybeans. Address: Agricultural Chemical Lab., Tokyo Imperial Univ., Tokyo, Japan.

2812. Takayama, Y. 1930. Utilization of soy beans. III. *J. of the Society of Chemical Industry, Japan* 33:91B-92B. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]*
• ***Summary:*** Results are summarized of the experiments previously described (Takayama 1928) on the separation of glutamic acid (as the dibasic calcium salt) from the products of hydrolysis (with 25-50% sulfuric acid) of crude soybean protein. Hydrolysis with more concentrated acid gave greater yields. The solubility of dibasic calcium glutamate in water was found to be 1.322, 1.928, 1.979, 3.943, and 5.698 gm of anhydrous salt per 100 gm of solution at 0ºC, 19ºC, 21ºC, 61ºC, and 100ºC, respectively. Incipient decomposition, with liberation of ammonia (as sulfate), was observed on prolonged heating of pure glutamic acid with 10 normal sulfuric acid at 100ºC and 135-145ºC.

2813. Yamada, M. 1930. Seishu, shôyu-chû "arugin" no sonzai ni tsuite [The existence of arginine in sake and shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 25(8):31-32. [5 ref. Jap]
• ***Summary:*** Arginine (German: arginin) is a crystalline basic amino acid derived from guanidine. Address: Jozo Shikensho Gishu, Nôgaku Hakase (Hakushi) (Doctor of Agriculture).

2814. Yamada, M. 1930. Shôyu kabi ni taisuru "arudehaido" rui no shiyô [The action of aldehydes on the molds of shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 106. p. 136-40. [4 ref. Jap] Address: Jozo Shikensho, Gishu.

2815. Yamada, M. 1930. Seishu, shôyu-chû "aruginin" no sonzai ni tsuite [The existence of arginine in sake and shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 106. p. 141-44. [5 ref. Jap]
• ***Summary:*** Arginine (German: arginin) is a crystalline basic amino acid derived from guanidine. Address: Jozo Shikensho, Gishu.

2816. Yamamoto, Yoshihiko. 1930. Nattô-kin no katalase ni tsuite [On the katalase of Bacillus natto]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 4(11):922-39. [31 ref. Jap; ger] Address: Applied Mycology Lab., Faculty of Agriculture, Hokkaido Imperial Univ., Sapporo, Japan [Hokkaido Teikoku Daigaku, Nôgaku-bu].

2817. Capus, Guillaume. 1930. Les produits coloniaux d'origine végétale [Colonial products of vegetable origin]. Paris: Larose. 499 p. See p. 80-83. 26 cm. [Fre]
• ***Summary:*** The soybean (*soja*) is mentioned on 11 pages in this book: p. 1, 74, 78 80-83, 420, 484. 488, 496.

Contents: Introduction. Uses of the soybean (industrial uses and food uses): oil, cake, soymilk, tofu, fermented tofu, sauce, coffee substitute, green vegetable soybeans, whole dry soybeans, soy flour used to make bread for diabetics. The leaves and stems make an excellent green forage. Finally, in the USA, the soybean is cultivated as a forage plant, for use as silage, and also as green manure to enrich the soil for other plants.

Capus Guillaume lived 1857-1931. Address: Doctor of Science, former Director General of Agriculture in Indochina.

2818. Hara, Kanesuke. 1930. Pathologia agriculturalis plantarum [Diseases of agricultural plants]. Tokyo. 950 p. [Jap]*
• ***Summary:*** Includes descriptive accounts of the following soybean diseases: *Peronospora manshurica, Cercospora sojina, Colletotrichum glycines, Gloeosporium* sp., *Septoria glycines, Ascochyta* sp. causing leaf spot, *Phakopsora pachyrhizi, Fusarium roseum, Bacterium glycines, Bact. sojae* var. *japonicum, Ascochyta* sp. causing pod blight, *Hypochnus centrifugus, Cercosporina kikuchii,* brown spot of seeds of unknown cause, *Macrophoma mame, Mycosphaerella sojae, Phyllosticta sojaecola, Ascochyta sojae, Phomopsis sojae, Peckia* sp., *Ophionectria sojae,* mosaic, *Heterodera schachtii,* and *Cuscuta chinensis.*

2819. Shôyu seizô no hajimari: Yamamori Kôhei [The origin of shoyu production (by Japanese in America): Yamamori Kohei]. 1930. In: Shakuma WASHIZU, ed. 1930. Zaibei Nihonjin Shikan (History of Japanese in America). Rafu Shinpo-sha, 1619 Laguna St., San Francisco, California. See p. 38. [Jap]
• ***Summary:*** In about 1897 Mr. Kohei Yamamori started making shoyu in San Jose, California (on North 6th St.). The prospects looked good since good quality wheat, soybeans, and salt could be purchased inexpensively. But he ran into business problems and had to work in a Japanese grocery

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store in San Francisco to earn some money while continuing to run his shoyu business. Eventually the business failed, but in about 1907 many other shoyu makers started in various other parts of the country. This time, some succeeded, but others failed. Address: San Francisco, California.

2820. Tupikova, G.P. 1930. Soya [Soya]. Leningrad, USSR: All Union Academy of Agricultural Sciences. 154 p. 23 cm. [53 ref. Rus]
• ***Summary:*** Contains 88 illustrations. Page 12 states: In the Caucasus (see Wuchino) the first commercial cultivation of soybeans dates from the 1880s. The soybeans were sent by Sturua from Japan to the Tblisi Botanical Garden [in Georgia]. In 1927 the soybean started to be processed for its oil. Note: Tupikova is a woman. Address: USSR.

2821. *Los Angeles Times.* 1931. Why import soy? We can grow this bean to perfection. Jan. 11. p. J6.
• ***Summary:*** This article seems to be based on: Morse, W.J. 1927. "Soy beans: Culture and varieties." *USDA Farmers' Bulletin* No. 1520. 34 p. April. It begins: "Californians are accustomed to thinking of the soy bean as a cover crop. It is interesting to note that in its native land, Manchuria, this use of the soy bean is of small importance." There the soy bean is used mainly as a food product; only the by-products, such as bean cake and straw, are used as fertilizer.

Food products include a paste [jiang], fermented for about 2½ months, soy [sauce], bean curd [tofu], dry bean curd cakes, bean curd wafers, flour, and "milk." The expressed oil is used locally mainly for illumination [in lamps]. The better grades are used for cooking and the poorer grades for lubricating, for making printer's ink and varnish, and "as a waterproofing material in the manufacture of cloth, paper umbrellas, and lanterns.

The bean cake is used to fatten pigs and cattle. In Japan, the cake is used as a fertilizer for mulberry trees and rice fields. "In Manchuria the cake is crushed and mixed with oil and arsenic and placed on the roots of trees to poison insect pests." This insecticide is used to kill the pests that injure the wild trees where silkworms live.

The soy bean was grown in the United States as early as 1804, but only as a curiosity. In Europe it was mentioned as early as 1790. The soy bean first became known worldwide during the war between Russia and Japan [1904-05]. During the war, the may troops quartered in Manchuria created a large demand for soybeans as food. Local farmers increased their acreage. But after the war they found they had a surplus that was for too great for the demand in the local market or the Orient. The price dropped and a trial shipment was sent to London. The timing was perfect, since English vegetable oil mills were running part time because of a small crop of cottonseed and the failure of linseed in the USA and the Argentine. For the rest of that season, the English mills ran full time on soy beans.

2822. Morse, W.J. 1931. Visit to Kyuemon Hayakawa Miso Co. in Okazaki, Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. See p. 6997-7000. Unpublished log.
• ***Summary:*** W.J. Morse took notes and photos of his visit to Okazaki on 16 Jan. 1931. He was told by an innkeeper in Okazaki that there a "two factories in Okazaki making the famous Okazaki black miso... We found the Kyuemon Hayakawa Miso Co. factory about 3 miles from the inn. The master of the factory took us through the plant and explained each step of manufacture. Okazaki miso is made entirely from soybeans while other forms of miso are made from rice and soybeans. It takes twenty months to cure black miso. This company sells about 50,000 kan yearly.

"Okazaki miso keeps indefinitely and is used in making soups and preserving vegetables. At breakfast at the inn this morning we had black miso soup and found it had a much better flavor than red miso soup. The black miso is also sometimes used in making forms of soy sauce [tamari] by adding water."

Photos (p. 6999-7000) show: A large wooden cask or tub filled with Okazaki black miso and held together by many wide braided bamboo hoops. The cask is several feet taller than the miso maker (wearing an apron with a crest symbol or *mon* on the front) standing next to it. The top of each cask is piled high with about 1,200 pounds of stones to weight the miso (3 photos).

Page 7031 (17 Jan. 1931, Tokyo). In a letter to Dorsett in Peiping, China, Morse comments on the two factories making black miso in Okazaki.

Page 7053 (27 Jan. 1931). Morse notes in a cover letter accompanying two parcels sent from the American Consulate in Tokyo to Mr. K.A. Ryerson, Foreign Plants, B.P.I. [Bureau of Plant Industry], Washington, DC: "Of the products the most interesting is the famous Okazaki Black Miso under [product] numbers 6670 and 6671 which were obtained on a recent trip to Okazaki to learn the process of manufacture. This form of miso is the only one made wholly from soybeans as other forms are made with soybeans and rice. Black miso has been made at the same factory for about three hundred years and no improvements have been made in the methods of manufacture." Address: Agricultural Explorers, USDA, Washington, DC.

2823. Morse, W.J. 1931. Re: Money. Returning home (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant

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Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Jan. 28. Unpublished log.
• ***Summary:*** Pages 7112 and 7113 (28 Jan. 1931). Letter from Mr. W.J. Morse in Tokyo, Japan to Mr. P.H. Dorsett, c/o U.S. Legation, Peiping, China.

"I have gone over the expenses thus far and figured what it would take to get me home and I figure roughly that it will cost about $1000 more than I was assigned... I owe much to Mr. Sato of Dairen for assistance in this work for if I had left Dairen immediately for the U.S., as I thought I would do, I would have missed a very important part of the soybean work though it has been rather nerve-racking in collecting the data."

Page 7113: "When I think of the amount of soybean data I have to assemble, I almost get cold feet for I recall what work it takes to write a small bulletin and here are two years' data to assemble.

"In your letter to Ryerson, a copy of which you sent to me, you state you desire to have the glory, etc., accorded to the first return. If that is your idea, I am going to hide somewhere along my journey home and wait until you are in Washington [DC] and then return. Glory, honor, etc., have not been in my mind for all I ask is to settle down with my soybean and other legume work and work quietly and in peace. Others can have the glory, but give me simply soybeans."

Mrs. Morse reminds her husband to than Mr. Dorsett for the clippings he has sent from time to time.

"In Ryerson's letter I notice he advises you not to throw rocks at St. Peter's gates... I think in the spring, Dorsett, you threw [roasted] soybeans [mame-maki] and St. Peter didn't hear you or thought it was hailing."

"We trust this finds you all well and with best wishes from all to all, I am

"Very truly yours,..." Address: Agricultural Explorer, USDA, Washington, DC.

2824. Dorsett, P.H.; Morse, W.J. 1931. Soybean cultivation in Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.
• ***Summary:*** Page 7062 (29 Jan. 1931). "Genge clover is grown as a winter crop on the rice paddies while the soybean is grown as a summer crop in the uplands and also in the rice paddies in certain sections.

"The acreage of genge clover occupies about 65 per cent of the total area of all green manure crops in Japan."

"Soybeans are planted in may between rows of wheat or barley when the wheat or barley are just heading. When the bean plants are in bloom, they are turned under, generally the middle part of June." Address: Agricultural Explorers, USDA, Washington, DC.

2825. Takayama, Yoshitaro. 1931. Utilization of the soybean. IV. Electrolytic oxidation of the hydrolysate of proteins. I. *J. of the Society of Chemical Industry, Japan* 34(1):31B-32B. Jan. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** Crude soybean protein was hydrolyzed with sulfuric acid and the filtered hydrolysate electrolyzed with a peroxidized lead anode and a lead cathode in an undivided cell and then steam-distilled. The volatile acids of the distillate (9.6% of the crude protein) contained formic, acetic, and isovaleric acids, and probably also propionic and butyric acids in small amounts. Ammonium chloride was the only base recoverable from the residue of distillation. Small amounts of other volatile materials present were probably benzoic acid and an acetone-like substance. Formic, acetic, and valeric acids were obtained similarly from the gluten hydrolysate. Address: Chemical Lab., Suzuki & Co., Ltd.

2826. William Morse examining four wooden boxes of Okazaki miso [Hatcho miso] at Hayakawa Kyuemon Shoten in Okazaki, Japan, 16 Jan. 1931 (Photograph). 1931.
• ***Summary:*** See next page. This 6½ by 8½ inch black-and-white photo has been dated from the log of the Dorsett-Morse Expedition (p. 6997). There are three rectangular wooden boxes and one round wooden box. Three of the four are closed and on the front of each is an illustration showing a man with a raised sword on a bridge in Japan; a young boy is at his feet. On one pillar of the bridge is written in large Japanese characters "Yahagi Hashi," since the Yahagi River flows underneath it.

Note 1. According to *The Book of Miso* (Shurtleff & Aoyagi, 1976, p. 219): "A Kabuki drama tells of how Hideyoshi Toyotomi (1536-1598), the child of poor farmers in central Japan's Aichi prefecture, rose to become one of Japan's most powerful feudal lords. When only ten years old, the child is said to have fallen asleep one night on a bridge near his home, wrapped only in a straw mat. A famous robber passing over the bridge scornfully kicked the urchin, who awoke and intrepidly grabbed the man's spear commanding him to stop such cruelty. The robber, impressed with the boy's courage, decided to raise him as his own son. In the play, the straw mat bears the trademark of one of the nearby Hatcho miso shops where it was used to prepare koji. Historians cite the incident to prove that Hatcho miso was being made as early as 1546." On one pillar of the bridge is written in large Japanese characters "Yahagi Hashi."

Note 2. No trademark can be seen on the straw mat on the front of the Hatcho miso boxes in this photo. Perhaps the story was created after 1931.

2827. Yokoyama, Yoshikuni; Suzuki, Bunsuke. 1931. Soy bean lecithins. II. Lecithins of α-series. *Proceedings of the Imperial Academy* (*Tokyo*) 7(1):12-14. Jan. [4 ref. Eng]

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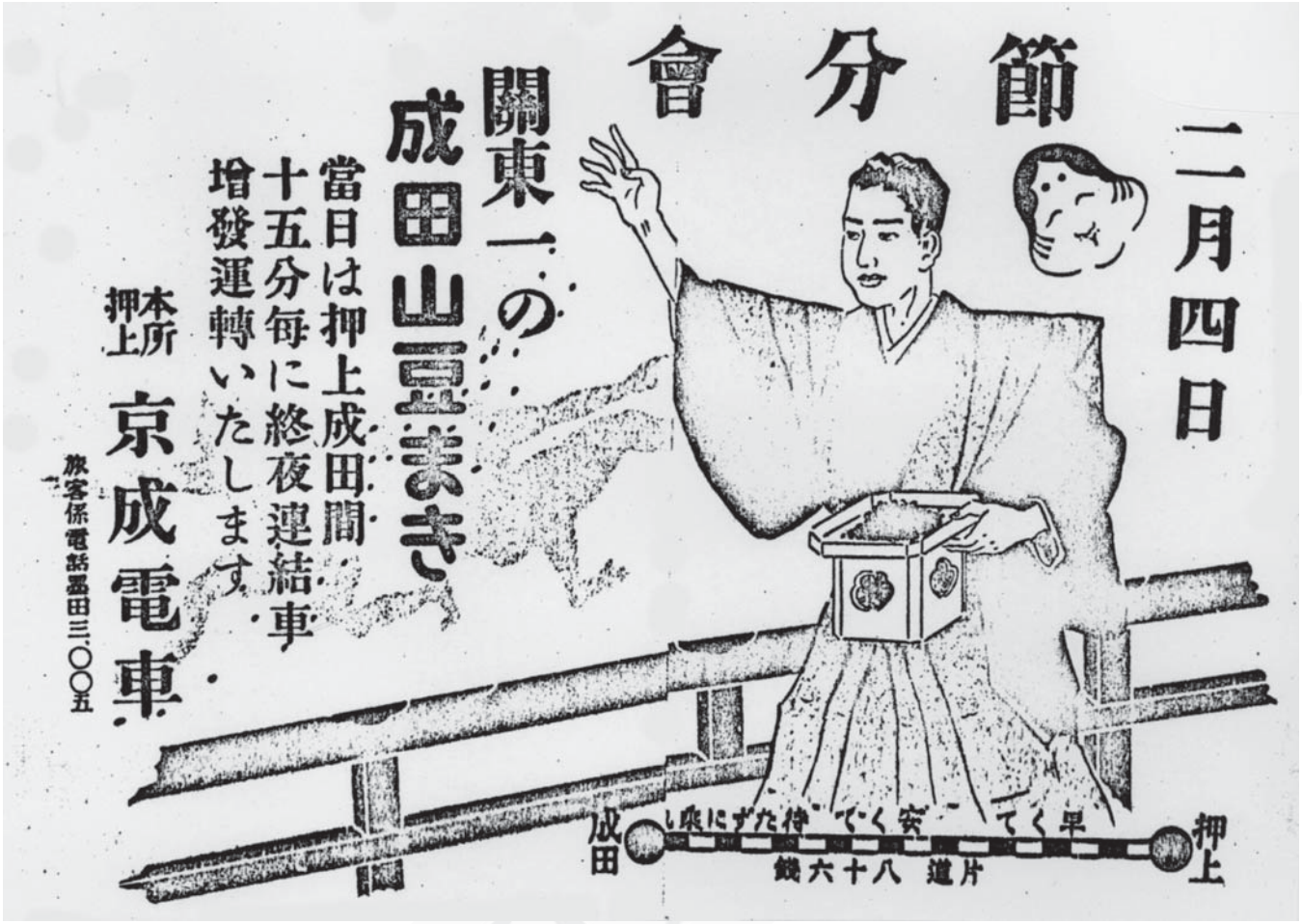

• ***Summary:*** The bromides of palmito-linoleo-, oleo-linoleo-, dioleo-, and dilinoleo- (melting point 113-114ºC) -α-lecithin are isolated by fractional extraction (with various solvents) of the brominated α-lecithins of the soya bean (separated as their double salts with cadmium chloride; Suzuki 1930). The structures are proved by hydrolysis to tetrabromostearic and palmitic; di- and tetra-bromostearic; dibromostearic; and tetrabromostearic acids, respectively. Address: Biochemical Lab., Faculty of Agriculture, Kyoto Imperial Univ., Japan.

2828. Dorsett, P.H.; Morse, W.J. 1931. Roasted soybeans and bean-scattering ceremonies in Tokyo (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 7104 (3 Feb. 1931–Tokyo). W.J. Morse's notes: "We succeeded in collecting several fancy colored posters put out by street car companies and railroads announcing bean scattering ceremonies at several big shrines in Tokyo, Nikko and some nearby places. If all the homes, temples and shrines celebrate this day, throughout Japan, the amount of soybeans must run into a considerable item."

A sample leaflet, in Japanese, is included. An illustration (line drawing) shows a man scattering soybeans with his right hand from a small tray held in his left hand, two stations on a street car line (Narita on the left, Oshigami on the right), and the face of Okame, a symbol of fun and happiness. This "specially chosen / famous man" (*toshi otoko*) is wearing the only traditional clothing suited for the occasion: A wide-sleeved *kamishimo* on top and a man's formal divided skirt called a *hakama* on the bottom. Shadowy devils run away. An illustration of street car line is shown.

The text of the leaflet, an ad printed by the railroad line, reads: Feb. 4. Setsubun get-together. The No. 1 place in the greater Tokyo area for scattering soybeans (*mame-maki*) is Narita Mountain. A train will leave from Oshigami station to Narita station every 15 minutes all night long. The number of connecting trains has been increased for the occasion. For more information, contact the person in charge of customer relations at Keisei Railway's Oshigami branch office at Sumida 3005. Fast. Cheap. No waiting. 86 sen one way.

Page 7129 (7 Feb. 1931–Tokyo). "During the day we visited the Shiba district and found several stores dealing in beans and bean products. For the most part the soybean

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products were roasted beans, sugared roasted beans, roasted soybeans in cakes and candies and roasted soybeans in balls of baked rice dough. The greenish yellow variety was used, the beans being soaked until fully swollen before being roasted." Two photos (p. 7130) related to Setsubun, show: "A small bundle of dry soybean straw or stems and holly-like plant branches above a door of a home. To a stem of the soybeans is attached a fish head. This is used to keep out the devils which were chased from the home on the night of "Mame Maki" bean scattering night. Parched soybeans were scattered about to chase devils out of the house." The second photo includes Mr. Suyetake–their Japanese interpreter. Address: Agricultural Explorers, USDA, Washington, DC.

2829. Dorsett, P.H. 1931. Re: The real work. Some advice. Congratulations (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Feb. 7. Unpublished log.

• ***Summary:*** Page 7132 to 7133 (7 Feb. 1931). Peiping, China. Letter from Dorsett to Morse, c/o Imperial Hotel, Tokyo, Japan. "Many thanks for the letter of January 31st... Shortly after this, the real work of gleaning the grain from the chaff and preparing it for use begins.

"By the time we get back it will be... just two years, lacking a day, from the time you left Washington [DC] for the Orient until you leave the Orient on your return home.

"In the past two years we have seen much, learned a lot, accumulated much interesting and valuable data, and made many pictures. I gamble, dear fellow and friend, that it has been the most interesting, greatest and grandest two years of your life.

"Please, Morse, listen to one who has been through the experience and do not continue the pace until you board the ship."

"You have done a wonderfully nice piece of work, Morse, and I congratulate you most heartily on the results of your efforts. And remember, if I can help you here, or in any way in Washington after our return, call on me and I will be delighted to do what I can."

"We wish you all a delightful ocean voyage, a pleasant visit with the Oakleys and a safe and pleasant trip across country back to Washington and Home in Takoma Park. With sincere good wishes from all to all, as always. Sincerely yours..."

Note: During the expedition a strong friendship and deep mutual respect grew up between Morse and Dorsett, 22 years his senior. Address: Agricultural Explorer, USDA, Washington, DC.

2830. Dorsett, P.H.; Morse, W.J. 1931. Sending parcels. Translating soybean documents in Tokyo, Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Unpublished log.

• ***Summary:*** Page 7166 (10 Feb. 1931, Tokyo). Morse's notes: "We took parcels numbered 241, 242, 243 and 244 to the Embassy to send by diplomatic pouch on today's boat, President Taft.

"During the day worked with Mr. Suyetake on translations of soybean and data from Japanese publications from Manchuria, Korea and Japan." Address: Agricultural Explorers, USDA, Washington, DC.

2831. Morse, W.J. 1931. Re: Sayonara. Outline for part of a "special report" on soybeans in the Orient (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Feb. 16. Unpublished log.

• ***Summary:*** Pages 7231 and 7232. Letter dated 16 Feb. 1931 from Mr. W.J. Morse, c/o American Consulate, Tokyo, to Mr. P.H. Dorsett, c/o Wagons-Lite Hotel [Wagons Lit Hotel, or *Grand Hotel des Wagons-Lits*], Peiping, China.

"Our last night in Japan and this is my 'Sayonara' letter in the Orient. Two years tomorrow or rather day after tomorrow we left Washington, DC, and embarked on agricultural exploration work. After two years I agree with the words I often heard you say:

"It's a great life"–if you don't weaken. Morse quotes the entire poem.

Note: This poem was created by cartoonist Gene Burns and syndicated by the *New York Evening Telegram* from 1915 to 1919; the phrase became a rallying cry for American soldiers during World War I.

"At odd times I have been raking over the accumulation of data collected in Japan, Korea, Hokkaido and Manchuria and written up tentative outlines which I want to revise somewhat going back [to the USA]. I am enclosing a copy of the one on Manchuria which you may glance over to see the kind of data I have been collecting. It is not for the report (quarterly) but merely an outline for separate reports and I thought you might be interested. I may have gotten myself in 'Dutch' [in trouble] getting so detailed information on the soybean in the soybean country of the world (and where they look on America as their soybean enemy), but I secured it here, there and everywhere."

Note 1. The "Agricultural Report on Manchuria" mentioned above was finished by Morse in 1932 and titled "Soybeans–Manchuria." It contains 181 pages (28 cm = 8½

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x 11 inches), 174 numbered photos with excellent captions, and 28 tables. Typewritten, but never published, it was attached to the end of this long log. A detailed description is given. This report on Manchuria is probably only a part of the "special report" referred to on pages 3230, 3497, 3555, and 6196 of this main report, since that "special report" promised to contain detailed information on the processes used to make different soyfoods such as miso, shoyu, yuba, and tofu. Morse apparently was never able to find the time or will to write the complete "special report," however this part of it is very detailed, useful, and impressive.

Note 2. Talk with Knowles A. Ryerson. 1983. Aug. 28. W.J. Morse definitely did not write the entire special soybean report he intended to after returning from his trip to the Orient. Why? He got swept up in the growth of the U.S. soybean production and processing industries and had no one to help him with his work during the Great Depression. He was swamped! Address: Agricultural Explorer, USDA, Washington, DC.

2832. Dorsett, P.H. 1931. Re: Outline for an "Agricultural Report on Manchuria" (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: Foreign Plant Introduction and Forage Crop Investigations, Bureau of Plant Industry, USDA. 8,818 p. Feb. 23. Unpublished log.

• ***Summary:*** Pages 7228 to 7230. This letter Feb. 23 is from P.H. Dorsett in Peiping, China to Mr. W.J. Morse, Forage Crops and Diseases, Bureau of Plant Industry, USDA, Washington, DC.

"Dear Morse: When we came up from breakfast this morning we were handed your 'Sayonara' letter from Japan [written on Feb. 16 from Tokyo]. It sure is a great one, and is most heartily appreciated."

"Your tentative outline for an 'Agricultural Report on Manchuria' is very broad and exceedingly complete, but a lot of work will be required to whip it into shape. However, when completed it will be most interesting and no doubt very valuable."

"My dear good friend, I hardly know how to begin or what to say to you on account of the death of Lee [Charlie Lee], your friend and trusted assistant for so many years... a trusted, honored and able assistant in your life's work.

"Be brave and bear the shock and loss as the man I am sure you will prove yourself to be under this almost breaking load of sorrow, and in the end all will be well." Address: Agricultural Explorer, USDA, Washington, DC.

2833. Found, N. 1931. A cheap substitute for milk. *China Medical Journal* 45:144-46. Feb.

• ***Summary:*** This review of five articles on soybean milk was originally contributed to the *Mansen no Ikai,* June 15, 1930.

"Only in 1900 was it scientifically studied and found to have a high protein content, reaching 44% in the soy bean flour.

"In Japan it was found that nitrogen from this source was easily absorbed, especially if taken in a mixed dietary.

"John Ruhrah of Baltimore first recommended and used it as a supplementary infant food in 1909.

"Dr. Ernest Tso (Peiping Union Medical College) used soy bean milk as the main diet of an infant six weeks old for eight months and showed that this allowed the occurrence of rickets, which, however, could be cured by adding calcium and cod liver oil to the diet.

"In Peiping in 1928 he made metabolic studies on two such infants and confirmed chemically the lack of calcium, sodium and chlorine as well as vitamines other than A and B. He also showed that the phosphorus content was adequate. The nitrogen absorption is up to 90% of the intake and nitrogen retention is from 17% to 26% of the intake. His conclusion was that soy bean milk proteins are easily digested by a young infant and are capable of producing continuous growth. For best results calcium must be added and cod liver oil fed for vitamines.

"Following this, formulae were made out to correct the deficiencies.

"Dr. VanBuskirk has shown that the mortality rate per 1000 Korean children during the first five years of life are, 180, 127, 102, 59 and 39, which is especially high for the second and third years as compared with most other countries.

"Recently at the Evangelistic Center, Seoul, a practical experiment has been made in feeding large numbers of children with this milk and it is found that the cost per feeding is only about three sen as compared with 10 sen for canned cream.

"The method of preparation used is as follows:

"Soak the beans over night in 8 times their weight of water.

"In the morning remove the shells [hulls] and grind in a mill.

"Boil for five minutes.

"Filter through a sieve.

"For 1000 grams of the filtrate:

"Add 20 grams of starch, previously made into a paste with a little of the filtrate and add 60 grams of sugar.

"Add 1.5 grams of calcium lactate.

"Add 1 gram of salt.

"This gives a mixture with 4.4% protein, 1.8% fat and 1.5% carbohydrate, the pH is 6.8.

"Codliver oil [Cod liver oil] must also be given.

"Drs. Hill and Stuart in Boston have also worked out a formula for a dried powder which gives good results in cases where cows milk is not tolerated. They report the main protein in soy bean as *glycinin* and give a detailed chemical analysis." Address: Severance Union Medical College,

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Seoul, Korea.

2834. Izume, Seiichi; Yoshimaru, Yoshitoku. 1931. Iwayuru shusei chûshutsu-hô ni yorite seizô saretaru daizukasuko no eiyôteki narabini shokuhinteki kachi ni kansuru kenkyû. I. Yushi chûshutsu kôtei no daizu tanpaku no shôkaritsu ni oyobosu eikyô [Soy-bean oil cake as a food and its nutritive value. I. The oil extracting process and the digestion coefficient of the protein. II. The nutritive value of the alcohol-extracted bean oil cake]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 7(2):87-111. Feb. [18 ref. Jap]
• ***Summary:*** I. Extraction with hot ethanol denatured the protein, the solubility of which fell from 88% to 24%; that of the benzine-extracted cake was 82% and of the pressed cake 45%. There is little change, however, in digestibility of the protein of various cakes.

II. No significant differences in nutritive value of the proteins were observed. The vitamin A and D contents of the ethanol-extracted cake are low; the vitamin B content is less than that of the fresh bean.

2835. Izume, S.; Komatsubara, I. 1931. Daizu kasuko no eiyôteki narabini shokuhinteki kachi ni kansuru kenkyû. III. Kokuko no eiyô kachi ni oyobosu daizu kasuko tenka no eikyô ni tsuite [Research on the value of low-fat soy flour nutritionally and as a food. III. The effect of the addition of the low-fat soy flour to other grains]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 7(2):111-20. Feb. [21 ref. Jap]
• ***Summary:*** The incomplete nutritive value of cereals is supplemented by addition of ethanol-extracted soybean cake.

2836. Kellogg, John Harvey. 1931. Soybeans as human food. II. *Good Health* (*Battle Creek, Michigan*) 66(2):20-22. Jan.
• ***Summary:*** Contents: Introduction. How to cook the soybean (in a stone jug in salt water under pressure). The extraordinary supporting qualities of the soybean (nutritional value, gives stamina). The soybean combats acidosis (basic-ash quality). A wonderful vegetable milk from the soybean (relieves food allergy caused by dairy milk). The great value of soy milk as a remedy. The easy digestibility of soy milk ("The author finds that plant milk is digested more easily than cow's milk"). The soybean, the vegetable analogue of meat ("The soybean differs from other legumes and cereals in the fact that it contains practically no starch. Its food values are protein and fat, as is the case with meat").

Note: This is the earliest English-language document seen (Aug. 2013) that contains the word "plant milk" (or "plant milks").

A large photo (p. 21) shows soybean sauce being made commercially in Japan. Address: M.D., Battle Creek, Michigan.

2837. Omura, Osamu. 1931. Shôyu no gurutamin-san ni tsuite [On glutaminic acid of shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 9(2):81-82. [2 ref. Jap]
Address: Kyûshû Teikoku Daigaku Nôgaku-bu, Yukawa Kyôju Kenkyû-shitsu.

2838. United States Department of Agriculture (USDA), Office of Information, Press Service. 1931. U.S. plant explorer collects new soybean varieties in Orient (News release). Washington, DC. 2 p. March 28.
• ***Summary:*** "After a two-year search for new varieties of soybeans in Japan, Korea, and Manchuria, Wm. J. Morse of the U.S. Department of Agriculture has returned from the Orient with a collection of about 4,000 lots of seed and more than 300 samples of products made from soybeans.

"Mr. Morse, who is in charge of soybean investigations for the Bureau of Plant Industry, hopes that some of the many varieties represented in his collection will meet the needs of the wide range of industries using soybeans in this country."

Note: This is the earliest document seen (Aug. 2011) stating that W.J. Morse is "in charge of soybean investigations" (or "head of soybean investigations" or "director of soybean investigations") at USDA.

"Oil manufacturers, he says, want soybeans with high oil content, whereas farmers who feed hogs want low oil content. Packers discriminate against hogs fed or pastured on soybeans because of the soft pork which results from the oil. Few varieties of soybean grown on a large scale in this country have an oil content less than 15 per cent or more than 20 per cent. Some of those grown in Manchuria, however, run as high as 22 per cent in oil...

"The manufactured products in Mr. Morse's collection range from high-quality oils to beans specially treated to drive devils away during certain religious festivals [*mame-maki* at *Setsubun*].

"'Next to rice,' he says, 'the soybean is the principal food crop in the Far East, and it is the principal source of protein in the Oriental diet. No one variety is adapted to all parts of the Orient, nor is any one variety suited to all the many uses to which the beans are put. For instance, certain varieties are grown solely for oil, those that thrive in Manchuria being noteworthy for their high oil content. Other varieties are planted with a view to making soy sauce, a condiment already in favor in the United States, bean curd, used by Buddhists as a meat substitute, or miso, a common ingredient of Japanese soups. Some varieties are grown to provide a green vegetable that is to the eastern table what green peas are to the western table. Part of the crop in certain sections is roasted for use as a coffee substitute or in confections where it answers the same purpose as peanuts in American candy and cakes.'

"The beans were gathered from a wide territory varying greatly in climate and in cultural conditions. As soon

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as they reached Washington [DC] they were sent to the experiment farm at Arlington, Virginia, for observation and quarantine. When it has been determined that they harbor no insect pests or plant diseases the beans will be grouped and sent to the department's field stations, each group to the section best suited to its growing requirements, and planted. Recommendations for their ultimate introduction into the United States will depend on the results of these field tests. If they do as well here as in their native fields, Mr. Morse says, some of these new introductions will probably become staple sorts here." Address: Washington, DC.

2839. Kinoshita, Asakichi; Tanigawa, S. 1931. Yushutsu muke shôyu jôzô shiken [Tests on shoyu brewing for export]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 111. p. 173-80. March. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

2840. Kinoshita, Asakichi; Tanigawa, S. 1931. Assaku mamekasu-rui shiyô shiken [The use of various soybean presscakes as a raw material for shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 111. p. 181-89. March. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

2841. Rokusho, B. Assignor to South Manchuria Railway Company. 1931. [Seasoning material]. *Japanese Patent* 90,551. March 3. [Jap]*
• ***Summary:*** A material similar to Japanese sauce is prepared by partially hydrolyzing soy-bean cake with diluted acids or alkalies, mixing with other ingredients for the sauce and keeping it under proper conditions for formation of amino acids, etc.

2842. Yamasaki, Morimasa. 1931. Sakumotsu hinshu no ensosan-kari ni taisuru kô dokusei no genin ni tsuite [On the cause of varietal distinctions in certain crop plants in regard to the resistance to the toxic action of potassium chlorate]. *Noji Shikenjo Iho* (*J. of the Imperial Agricultural Experiment Station, Nishigahara, Tokyo*) 1(4):305-26. March. Plus 6 pages of plates at end. [17 ref. Jap; eng]
• ***Summary:*** Sodium chlorate is an herbicide. Soybeans and vetch are relatively resistant to injury from it. Address: Nishigahara (near Tokyo), Japan.

2843. McCoy, Frank. 1931. Health and diet advice: The Oriental vegetable meat. *Los Angeles Times.* April 7. p. A6.
• ***Summary:*** For centuries Chinese and Japanese have been living on a diet that contains very little meat. They have been able to do this by using the soy bean to supply a large amount of the protein in their diets. "This bean is superior to all other dried beans inasmuch as it contains little or no starch and a very large amount of balanced protein." A table shows the high food value of soy bean flour by comparing its composition with that of spring wheat and lean beef. Soy beans almost always contain less than 2% starch, "the mature beans having no starch. This is one of the reasons why soy bean flour is often preferred over other flours in the diet of those suffering with diabetes." It is not possible to make bread of "entire soy bean flour" because it tends to agglutinate instead of forming a paste.

"The Chinese make a kind of cheese [tofu] of the soy curd which closely resembles our cheese in appearance and food value, but has an entirely different flavor. The Japanese prepare a vegetable milk by grinding the soaked beans and boiling thirty minutes in three times their bulk of water and then straining. This milk compares favorably with cow's milk and is often used for feeding infants."

Soy beans tend not to cause flatulence "because they do not contain much of the hemicelluloses which are abundant in other beans. The carbohydrates of the soy bean seem to be much more digestible."

Also from soy beans the Japanese manufacture a sauce known as shoyu. "This is made by mixing cooked and ground soy beans with salted water and inoculating the mixture with a rice ferment. The sauce tastes a good deal like a salty meat extract."

There follows a recipe for making soy bean muffins using soy bean flour, baking powder, salt, egg, and milk. No wheat flour is used. Address: Dr., author of "The Fast Way to Health".

2844. Satow, Teikichi. 1931. Apparatus for treating soy beans. *U.S. Patent* 1,799,256. April 7. 3 p. Application filed 23 Jan. 1926.
• ***Summary:*** In order to preserve the proteins in the cake, the (cracked) seed is dried by hot air until the water content is reduced to 12.5-13% before extracting with light petroleum solvent (such as benzine or carbon tetrachloride) at not above 45ºC in a steam-heated rotary drum (details given). The solvent is removed from the extracted meal by hot dry air, the temperature being raised to 115-120ºC. Address: Tokyo, Japan.

2845. South Manchuria Railway. 1931. Soya beans. *Report on Progress in Manchuria.* Second, to 1930. 307 p. See p. 4, 5, 8, 40, 76, 137, 144, 152, 154-55. (Dairen, Manchuria). [1 ref. Eng]
• ***Summary:*** "The soya bean, to-day commanding a world market, and kaoliang, used as the staple food of the native population and also as cattle fodder, are the most important among agricultural products. The production of soya beans, amounting at present to about 221,000,000 bushels, or 5,300,000 tons, annually, has doubled during the last 14 years... The commercial importance of the soya bean and its products–oil and cake–has made Manchuria famous. They are so predominant that they now constitute more than 60 per cent. in value of the entire export trade of Manchuria.

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Of 4,721,000 tons of beans and bean products exported in 1929, more than 41% went to Japan, about 44% to Europe, 13% to China, and the rest to the United States and other countries. Next to beans, millet is now the most important crop producing 171,000,000 bushels every year."

"Manchuria is often described as the 'granary of Asia,'... But its agricultural destiny was not generally realized until the South Manchuria Railway Company, running through the valley of the Liao River, brought large supplies of Manchurian [soy] beans to Dairen, whence they were shipped to waiting markets in Europe.

Soya beans (Chapter 94) is one of ten chapters in section VII titled agriculture. "The story of the Manchurian bean is a striking romance in economic history. The Japanese, though naturally regretting the loss of the Liaotung, the 'legitimate fruit' of the Sino-Japanese war, found some compensation in the discovery of the Manchurian bean, which revolutionized the fertilizer industry and became a substitute in the Japanese rice-field for the dry-herring fertilizer then extensively used. Ever since, the Japanese have been the heaviest purchaser of the Manchurian bean. The first trial shipment of this legume was made in 1908 by the Mitsui Firm of Japan, being sent from Dairen to Liverpool, and this was the beginning of a new industry in England, Germany, Denmark and Holland. The major portion of the beans destined for Europe was for the mills at Liverpool and Hull, England; for those at Copenhagen, Denmark, and Rotterdam and Amsterdam, Holland. Germany's consumption subsequently became greater than all, and this, though interrupted during the European war, is recovering. At the time of the universal shortage of food during the great war, the Manchurian bean played a very important part in the world's food supply."

"The influence of the Manchurian bean on national economy is remarkable. Denmark was more than self-supporting in the production of cereals, specially wheat, until 30 years ago. But Danish products found themselves unable to compete with American large-scale production, even in the home market. Aided by the Manchurian bean, the Danes turned extensively to stock breeding. The bean is imported, the oil extracted and used for manufacturing margarine (vegetable butter), soap, etc., while the residue of cake is extensively used as feed for live-stock, which totaled as many as 18,524,000 head in 1926, besides many million run of poultry. The consequence was the development of an enormous export trade in animal products, butter, cheese, bacon, ham, eggs, and also live-stock. The value of this great trade is some 1,027 million kroner [krone], or more than 70% of Denmark's total export. Holland, to some extent, is in a similar position."

Total world production of soybeans in 1928-29 was estimated at 353,842,000 bushels, of which Manchuria accounted for 63% (22 bushels/acre), China proper 25% (16 bu/acre), Korea 6% (12 bu/acre), Japan 5% (19 bu/acre), and the USA 1% (16 bu/acre).

Manchurian soya beans are divided into 4 classes according to color–yellow, white eye-brow [yellow with white hilum], green, and black. The chemical composition of these beans, according to analyses made in 1927 by the Central Laboratory at Dairen is: Yellow (18.19% crude fat/39.94% crude protein), black (14.74/41.00), green (18.96/40.12). Thus the green are highest in oil and the black are lowest. The black are highest in protein and the yellow are lowest. Address: Dairen, Manchuria.

2846. Udo, S. 1931. Shôyu no aji ni kansuru kenkyû. I. [Studies on the taste of shoyu. I.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 7(4):322-27. [12 ref. Jap]

2847. *USDA Plant Inventory.* 1931. Plant material introduced by the Office of Foreign Plant Introduction, Bureau of Plant Industry, July 1 to Sept. 30, 1929 (Nos. 80811 to 81619). No. 100. 44 p. April.

• ***Summary:*** Soybean introductions: *Soja max* (L.) Piper (*Glycine hispida* Maxim.). Fabaceae.

No. 81008-81051. "From Japan. Bulbs and seeds collected by P.H. Dorsett and W.J. Morse, Agricultural Explorers, Bureau of Plant Industry. Received July 2, 1929.

No. 81021-81045 are all soybeans. Three of these PI numbers came to have special significance; all were large-seeded.

"81029. No. 271. From the Yamato Seed Co. *Chuseikurome daizu.* A middle-season, black-eyed soybean used as a green vegetable."

"81031. No. 274. From the Yamato Seed Co. *Banseiosayada mame.* A large-podded late variety used as a green vegetable." Note: Renamed Bansei by March 1936.

"81042. No. 299. From the Sapporo Engei & Co. *Kurakake daizu* (saddle soybean). Used as a green vegetable." Renamed Kura by April 1936. Address: Washington, DC.

2848. Horvath, A.A. 1931. The soy bean as human food. *Industrial and Engineering Chemistry, News Edition* 9(9):136. May 10.

• ***Summary:*** Contents: Historical background. Properties and uses. Growing interest in soy bean preparations in different countries. Soya foundation proposed.

This article begins: "The soy bean is a plant of early cultivation in China. Its use dates back to the beginning of China's agricultural age under the Emperor Shen Nung. It is mentioned in the *Ben Tsao Gang Mu,* the ancient 'Materia Medica' written in the year 2838 B.C. This bean is remarkable for its richness in oil (average 20 per cent), protein (average 40 per cent), and ash (average 5.5 per cent), and the almost complete absence of starch.

"Since time immemorial the soy bean has been the most universal article in the Chinese dietary. It is also extensively

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used for food in Korea, Japan, Indo-China, the Philippine Islands, the Dutch Indies, Siam, and India. The Chinese make practically no use of dairy products, and the bulk of the people consume a very meagre amount of meat. Yet, in spite of this, they have lived for centuries on what appears to be a remarkably well-balanced diet by the use of the soy bean."

"Soy bean milk has been extensively used throughout the Orient since its discovery by the Chinese philosopher Whai Nain Tze long before the Christian era. This milk does not coagulate on boiling, but acids and rennet produce a curd-like precipitate. According to Fisher, soy bean milk gives a much finer flocculent precipitate in the stomach than cow's milk. Its period of stay in the stomach is shorter. Its ingestion results in a feebler secretion of gastric juice; the period of secretion is also shorter. The peristaltic motion of the stomach is less after the ingestion of soy bean milk and more coordinated than in the case of cow's milk.

"If soy bean milk is boiled with a solution containing magnesium chloride or calcium sulfate its proteins are precipitated. The cheese-like product obtained by pressing this precipitate is generally known as bean curd and is called in China 'tofu.' If fresh, it contains approximately 8 per cent of protein and 3 per cent of fat, and is digested, according to Oshima, to an extent of over 95 per cent. Fried tofu resembles beef in its content of protein and fat, and is called in China "the meat without the bones."

"In the Orient tofu forms a very popular and almost indispensable dietary article." Also discusses: Miso, chiang, Worcestershire sauce ("liquid soy sauce... when spiced, is sold under the label 'Worcestershire sauce.'"), W.J. Morse of the USDA, soy bean foods in Europe, Prof. Berczeller, and work at the Physiological Institute of the University of Vienna under Prof. Durig and Dr. Wastl.

"In Russia, the soy bean is fondly called 'our young revolutionary Chinese ally.' 'Plant soy beans and you plant meat, milk, egg omelets,' is the newspaper cry. Efforts have been made all year to introduce soy bean dishes to restaurants and homes. A Soy Institute was recently organized in Moscow, as well as a special exhibition of soy foods at which 130 varieties of soy dishes, including cutlets, pastry, salads, candy, and beef, were shown. A dinner, prepared entirely of soy beans, was served to representatives of trade unions, factories, Red Army, and the Soviet press. The food was unanimously declared excellent...

"Soya foundation proposed: There are reasons to expect that the United States will become the leader in introducing the soy bean in the daily diet of the white race. An important step should be the establishment of a soya foundation in order to promote the creation of a national soya food research institute." Address: Health Section, Bureau of Mines, Pittsburg, Pennsylvania.

2849. Eguchi, Yû; Kamishiro, Nobutoshi. 1931. B gata parachifusu kin hoyû-sha no ichi chiken. I. [Cure of a paratyphoid B patient by eating *Bacillus natto*]. *Kaigun Gun-ikai Zasshi* (*Bulletin of the Naval Medical Association*) 20(3):245-47. June (Roman numbering: p. 83-85). [Jap]
• ***Summary:*** In this first report on the effect of natto on bacteria, the author describes the use of natto to cure a patient with paratyphoid. Address: 1. Kaigun Guni Chûsa; 2. Kaigun Guni Taii. Both: Saseho Kaigun Byôin (Saseho Naval Hospital), Japan.

2850. Kurosawa, T. 1931. Sake, biiru, kôbo oyobi ni nattô-kin ni yoru gyôshû soshitai genshô [Antiagglutination or anticoagulation phenomena by sake, beer, yeast, and natto microorganisms]. *Hokkaido Igaku* (*Hokkaido J. of Medical Science*) 9(6):1108-23. June. [19 ref. Jap]
• ***Summary:*** Nakazawa (1950-1964, at Natto Bacteria) gives the title as "Antiagglutination phenomena of yeast and natto bacteria." Address: Hokkaido Teikoku Daigaku, Igaku-bu, Hôigaku Kyôshitsu (Shunin Yamagami Kyôju).

2851. Kinney, C. 1931. The omnipotent bean. *Canadian Geographical Journal* 3(1):46-56. July.
• ***Summary:*** This is an excellent study, with many original photographs, of soya beans and soy products in Manchuria. The author, an American journalist, has been associated for some years with the South Manchuria Railway, and has made a study of economic conditions in Manchuria.

Manchuria, a huge region of about 382,000 square miles, includes 3 of China's wealthiest provinces: Mukden (Fengtien), Kirin, and Amur (Heilungkiang). Sometimes known as the "North-Eastern Provinces of China," Manchuria is ruled by Chang Hsueh-liang, popularly known as the "Young Marshal." He is progressive and wants to see the 3 provinces developed.

The original soya bean "producing centres are said to be Cochin China and Java. The beans were first grown in China Proper about 4,000 years ago and were used locally to feed the natives and animals. To-day the chief zones are Manchuria, China, Japan and Korea, but the amount of soya beans produced in Manchuria alone is much greater than the product of the three other countries combined."

After the Russo-Japanese was (1904-05), victorious Japan, through the Portsmouth Treaty, became the lessee of the Kwantung Leased Territory (1,337 square miles), the southernmost point of Manchuria. It contained the greater part of the southern branch of the Chinese Eastern Railway, which is now known as the South Manchuria Railway. Note: The key ports of Dairen (Dalian) and Port Arthur (Lüshun) are in this Leased Territory.

In about 1905 the last remnants of the Chinese ban on immigration of Chinese into Manchuria were removed. Few came, however, until the early 1920s, "when warfare broke out on a large scale in China proper, and hundreds of thousands of Chinese fled from the famine, war-stricken and bandit infested areas of that country into the peaceful and

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undeveloped, yet fertile provinces of the Manchus." Today it is said that about 70% of Manchuria's population are working directly or indirectly on cultivation of soya beans. "There is no doubt in the minds of all that were it not for the soya bean, Manchuria would be an insignificant country."

The origin of soya bean cultivation in Manchuria is unclear, although most agricultural experts believe the soya beans were brought from districts of Central China. The question as to why they thrive in Manchuria, while in other parts of the world with similar climatic conditions, they fail to give good results, has never been fully answered.

European and U.S. buyers of Manchurian soya beans have long complained that they are not properly cleaned or graded. Soil, poor quality beans, and even large stones have been found mixed with Grade One beans. This problem must be fixed quickly if Manchurian dealers expect to continue to sell their beans to Occidental countries. In 1930 an association was formed, with inspectors placed at major centers to see that soya beans are graded correctly.

Genetic improvement of Manchurian soya beans began shortly after 1905 when the Japanese established the Agricultural and Experimental Station at Kungchuling. Soon Japanese scientists developed a larger soya bean with a much higher oil content. It was widely planted by farmers and prices rose accordingly. The Russians, followed by the Chinese, have founded several soya bean and agricultural stations, where material and advice can be obtained by local farmers. The Central Laboratory of the South Manchuria Railway Co. at Dairen is a leading scientific institution for studying soya beans; it has discovered many new uses for the beans, and developed a process for extracting the oil using alcohol as a solvent. The uses of the soya bean, its oil ("bean oil") and its cake ("bean cake") are discussed, as is its composition.

In Manchuria today there are 465 soya bean mills for extracting the oil and making bean cakes. They are located as follows: In Dairen 59, Yingkou 22, Antung 21, and Harbin 46. Along the South Manchuria Railway Line 252. Along the Chinese Eastern Railway Line 28. Along the Ssupingkai-Taonan- Anganchi Line 37.

"The latest statistics gathered by the South Manchuria Railway Co. for the year 1929 show that:–10,065,370 acres of land in Manchuria were planted to soya beans; 5,320,555 tons of soya bean were produced... 3,087,320 tons of soya beans, 133,854 tons of soya bean oil, and 1,568,552 tons of soya bean cakes were exported during 1929."

As "soon as the business depression that is sweeping the entire world is over," soya beans are expected by experts to be in great demand in Europe and America.

The captions to the various photos read as follows: "(1) An aerial view of the Port of Dairen, showing many ships at anchor awaiting their turn for berth space. The city of Dairen is in the background. (2) Soya beans in [osier] bins [12-15 feet high and cylindrical in form] at Kaiyuang, one of the produce centers of Manchuria. Many native carts carrying bags of soya beans are shown among the bins. (3) Bags of soya beans are brought on carts from the interior to the railway stations or marketing places. Due to bandits, Chinese guards are hired [one is shown standing on the cart with a rifle] to protect the beans from being stolen. (4) Coolies carrying bean cakes [that look like cartwheels about 2 feet in diameter and 3 inches thick, in high stacks] from the South Manchuria Railway Company warehouse to the freight steamers. (5) Open storage for soya beans near Dairen wharves [in shapes like houses, each covered with a tarpaulin]. During the busy season, beans are brought down from the interior in large quantities, and are placed in the open storage to await shipment. (6) Interior of a soya bean mill. Presses, or oil compressors, crush the beans, which have first been heated, and oil is extracted. The crude oil is pumped into a large vat where the impurities are removed. [The resulting cakes look like cartwheels] (7) Dumping soya beans into [osier] mat bins, North Manchuria. (8) Due to civil warfare, bandits, high taxation and famine, hundreds of thousands of Chinese immigrants have migrated to peaceful Manchuria. Most of the newcomers are farmers and the majority of them cultivate soya beans. (9) A section of the Kungchuling Agricultural Experimental Station, the largest in Manchuria. For years this organization has experimented on the bean and has succeeded in giving the world a larger and better oil producing bean. This station was established and is still financed by the South Manchuria Railway Company, for the betterment of agricultural products in Manchuria. (10) Primitive method of sorting soya beans [they are flailed on mats in a courtyard]. (11) Oil tanks [and barrels] where soya bean oil is placed prior to shipment. Over 133,000 tons of oil are manufactured annually by the various bean oil mills in Manchuria. (12) Hoisting bags of soya beans from Dairen wharves into the holds of the ships. (13) Soya beans in open storage, awaiting shipment at Ssupingkai station, one of the produce centres in Manchuria. (14) Modern railway tank cars bring bean oil to the wharves where it is deposited into large sea-going oil tankers. (15) Unloading soya beans [from railroad flatcars] at Dairen wharves. The bags of beans are brought from the interior of Manchuria to Dairen, the largest port in Manchuria, the beans are then transported by steamers to various parts of the world." Address: American journalist.

2852. Takata, Ryohei. 1931. Miso jôzô no eiyôgaku-teki kôsatsu. VII. Shihan miso-chû no kô tahassei shinkei-en B bitamin [Nutritional studies on miso fermentation. VII. Vitamin B, the antipolyneuritis factor, in commercial miso]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 9(8):584-87. Aug. [10 ref. Jap]
Address: Kôgaku-shi, Japan.

2853. The Manchurian Incident (also called the Mukden

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Incident) used by the Japanese as an excuse for occupying Manchuria (Important event). 1931.
• ***Summary:*** "Manchurian Incident," also called the "Mukden Incident," was provoked by Japanese military officers in order to justify a Japanese takeover of Manchuria. The incident took place on the night of 18 September 1931. A bomb exploded on the tracks of the Japanese railway north of Mukden. A Japanese Colonel "ordered a full-scale attack against the Chinese troops in Mukden, and General Honjô, hearing of the crisis, called out the whole Kwantung Army"– which proceeding to take over Manchuria.

"By early 1932 the conquest of all Manchuria had been completed. In March 1932 Manchuria was proclaimed an independent state [named Manchoukuo or Manchukuo] under the last Ch'ing ruler (P'u-yi).

"The Lytton Commission of the League of Nations visited Manchuria in the spring of 1932 and condemned Japan as an aggressor. The report was adopted by the League of Nations, from which Japan withdrew in protest the following year. By this time the Japanese armies had already moved west from Manchuria to occupy about 5,000 square miles of the Inner Mongolian province of Jehol."

Source: Fairbank, Reischauer, and Craig. 1973. *East Asia: Tradition and Transformation.* p. 707-08.

2854. Satow, Teikichi. 1931. Waterproof glue. *U.S. Patent* 1,824,448. Sept. 22. 2 p. Application filed 23 Jan. 1926.
• ***Summary:*** "The object of my invention accordingly includes the preparation of a water-proof glue composition in a powdered form which will not deteriorate under normal conditions, and which becomes active and quickly available with the addition of water.

"It has heretofore been proposed to use the residue obtained from de-oiled soy-beans or from soy-bean cake, and an ingredient in glue, on account of the adhesive qualities of the soy-bean protein when glutenized. I have discovered that the adhesive qualities of the soy-bean product is [sic, are] greatly enhanced and is rendered more effective by the action of an enzyme [such as powdered papaia / papaya milk] having protein digestive powers. I have also found that my improved glue composition is rendered practically impervious to water by the addition of an oxidizing agent" [such as sodium fluorid / fluoride, calcium hydroxid / hydroxide, and/or potassium chromate].

Note: This is the earliest English-language document seen (Sept. 2010) that uses the word "de-oiled" to refer to "defatted" in connection with the soy-bean. Address: Tokyo, Japan.

2855. Saito, Kendô. 1931. Shôyu kôji yori bunri seru Endomyces kin ni tsuite [Endomyces fungi isolated from shoyu koji]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 9(9):632-33. [Jap]
Address: Rigaku Hakase, Osaka Kôgyô Daigaku, Jôzôgaku Kyôshitsu, Osaka, Japan.

2856. *USDA Plant Inventory.* 1931. Plant material introduced by the Division of Foreign Plant Introduction, Bureau of Plant Industry, January 1 to March 31, 1930 (Nos. 82600 to 86755). No. 102. 111 p. Sept.
• ***Summary:*** Soybean introductions: *Soja max* (L.) Piper (*Glycine hispida* Maxim.). Fabaceae.

No. 84569-85023. "From Chosen [Korea] and Japan. Seeds collected by P.H. Dorsett and W.J. Morse, agricultural explorers, Bureau of Plant Industry. Received January 20, 1930.

No. 84578-85023.

No. 84578-84904. Collected at the Suigen Agricultural Experiment Station, Dec. 2, 1929.

No. 86002-86154. "From Japan. Seeds obtained by P.H. Dorsett and W.J. Morse, agricultural explorers, Bureau of Plant Industry. Received February 26, 1930."

Note: PI numbers with special significance. "No. 84928. No. 3224. *Kanro.* A medium-sized, nearly round, dull yellow bean, slightly mottled with brown with a pale to dark-brown hilum." The name "Kanro" was continued in the USA.

No. 85666. No. 3085. *Hokkaido Tsurunoko.* Obtained in a grocery store, January 6, 1930. A very large oval yellow bean with a pale hilum. This is one of the largest seeded yellow varieties and is used only for food purposes." Later given the name "Hokkaido."

No. 85053-85673 (p. 56). "From Chosen [Korea] and Japan. Seeds collected by P.H. Dorsett and W.J. Morse, agricultural explorers, Bureau of Plant Industry. Received January 30, 1930.

No. 85053-85671 are all soybeans. 85053-85660 are from the Agricultural Experiment Station, Suigen, Chosen, December 2, 1929.

"No. 86038. No. 3538. *Kurodaizu* ["Black soybean"]. Large, oval, slightly flattened, black." Later renamed "Hiro."

"No. 86129. No. 3684. Toiku Shichigo (Station No. 7). Medium large, nearly round, light yellow, with russet-brown hilum." Later renamed "Toku."

Note: On 22 April 1931 the Office of Foreign Plant Introduction was renamed the Division of Foreign Plant Introduction. This is the 2nd earliest known issue containing soy introductions to reflect that change of names. Actually, No. 101 of June 1931 was the very first. Address: Washington, DC.

2857. Geneva Research Center. 1931. The League and Manchuria: the first phase of the Chinese-Japanese conflict, September 18-30, 1931. Geneva, Switzerland: Geneva Research Information Committee. 34 p. Oct. 28 cm. Geneva special studies, Vol. 2, No. 10. *
• ***Summary:*** About the Mukden Incident, in 1931 in Manchuria. "The Manchurian Executive Council had issued a proclamation declaring the name of the independent State

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to be Manchukuo, with its capital at Changchun. Its ruler, the former Chinese Emperor, Hsuang Tung... crab meat, decorated china, silk fabrics, straw for hats, dried beans, certain flowering bulbs and seeds..."

Cover title: "Prepared under the supervision of the Geneva Research Information Committee."

2858. Mashino, Minoru; Nishimura, Shunsuke. 1931. Studies on the improvement of soy bean oil extraction. II. Relation between the boiling point of gasoline and the optimum proportion of gasoline and methanol in the mixture. *J. of the Society of Chemical Industry, Japan* 34(10):402B-04B. Oct. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** Mixed with methanol, the optimal proportions of gasolines of boiling point 60-70ºC, 70-80ºC, and 80-90ºC are 54, 52, and 50 weight-%, respectively; as the boiling point rises, the solubility of the gasoline in the methanol decreases and the two layers separate more easily. Address: Tokyo Imperial Industrial Research Inst., Yoyohata, near Tokyo, Japan.

2859. Mashino, Minoru; Nishimura, Shunsuke. 1931. Studies on the improvement of soy bean oil extraction. III. Effect of the boiling point of gasoline on the extraction with azeotropic mixture of gasoline and methanol. *J. of the Society of Chemical Industry, Japan* 34(10):404B-05B. Oct. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** Results of extractions with azeotropic mixtures of boiling point 69.6 to 112.6ºC are tabulated. The weight of gasoline in the azeotropic mixture at the transition point is 31%; under such conditions the solvent separates into two layers after the extraction, if the boiling point of the gasoline is below 104ºC. Address: Tokyo Imperial Industrial Research Inst., Yoyohata, near Tokyo, Japan.

2860. Herbette, François. 1931. L'expérience du soja et la situation en Mandchourie [The experiment with soybeans and the situation in Manchuria]. *Revue Politique et Parlementaire* (*Paris*) 149(444):275-81. Nov. 10. [1 ref. Fre] Address: France.

2861. Mashino, Minoru; Nishimura, Shunsuke. 1931. Studies in the composition of soy bean protein: Butyl alcohol extraction method. *J. of the Society of Chemical Industry, Japan* 34(11):433B. Nov. (Chem. Abst. 26:1319). Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** Fat-free soya-bean, purified with methanol, was decomposed by 25% concentrated sulfuric acid; tyrosine crystallized from the neutralized concentrated product. Extraction of the filtrate by butyl alcohol yielded arginine, histidine, and lysine; leucine and phenylalanine were separated from the soluble part, and proline from the insoluble part of the butyl alcohol extract. Dibasic amino acids were not extracted by butyl alcohol. Omission of the methanol purification prevented the extraction and crystallization of the components. Address: Tokyo Imperial Industrial Lab., Yoyohata, near Tokyo, Japan.

2862. Mashino, Minoru; Shishido, Tadao. 1931. Studies in the composition of soy bean protein: Ester method. *J. of the Society of Chemical Industry, Japan* 34(11):433B-34B. Nov. (Chem. Abst. 26:1319). Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** The authors have studied the composition of soy bean protein by the ester method and "tried to distil the methyl esters of amino acids of soy bean protein." An unknown substance was crystallized suddenly when an "ether solution of methyl esters of amino acids was evaporated."

On evaporation of the ethyl ether solution of the methyl esters of the amino acids from purified soy bean protein, a crystalline (monoclinic) substance was obtained with formula $C_{10}H_{16}O_8$, and melting point 78ºC (soluble in water, ethyl ether, methanol, and benzene, and insoluble in light petroleum). The glutamic acid isolated had a specific rotation at 2ºC of +12.4º. Valine, leucine, proline, and phenylalanine were isolated by the ester method.

Note: This is the earliest English-language document seen (Sept. 2007) that uses the term "methyl esters" (or "methyl-esters" or "methyl ester") in connection with soy beans or soy bean protein. Address: Tokyo Imperial Industrial Lab., Yoyohata, near Tokyo, Japan.

2863. Andrews, A.E. 1931. Tells of first soy-bean tests. *Indiana Farmers' Guide* (*Huntington, Indiana*) 87(43):18. Dec. 1.
• ***Summary:*** The story of soy beans in Hendricks country, Indiana, goes back to the Civil War. Near the battlefield of Franklin, Tennessee, Adrian A. Parsons, a young man of high-school age with the Union cavalry, was wounded when a bullet entered his right side and clipped a piece from his spine. Taken to a log house and left to die, he made a miraculous recovery, but never became robust and rugged again. "Though a farmer, much of his time was devoted to the lighter tasks, to his garden, study and experiment.

"Forty-five years ago [i.e., in 1886], Parsons sent to Japan for soy-bean seed. For years he raised soys in his garden, and the sons of the family, Norman, William, Chester, Lester and Bert, can recall those early experiments and the derision of men who thought him visionary. The United States Department of Agriculture for a long time kept in touch with Mr. Parsons.

"Mammoth Yellow soys were obtained and, after much thought and detailed work, a strain of this bean was acclimated to Hendricks county. Later Ito Sans were used for the farm crops. A strain finally was developed by Mr. Parsons known as the Mikado, and these beans were sold in Iowa and Ohio through seed houses.

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"Many years ago Mr. Parsons recognized the soy bean as an excellent hay plant. He also found it a good soil builder, and practiced the theory of inoculation while most men scoffed at it."

"Soy beans were a joke in former years, but they are no joke in Hendricks county to-day, with the acreage devoted to them larger than the area sowed to wheat..."

"Mr. Parsons was like many a man of the best and most practical intentions–he was criticized by those who did not fully understand him; but to-day his county follows the path he blazed; and who can measure his influence on the nation's agriculture?"

2864. *Washington Post.* 1931. Japan held to need food of Manchuria for her existence: Native writer says Nippon must have territory to assure edibles. Starvation threatens if expansion is denied. Nation is fighting for life and property of citizens in conflict zone. Dec. 27. p. M13-14.
• ***Summary:*** Japan is fighting for a stable food supply for her 67 million people who live in Japan proper–so says Kinnosuke Adachi, the first Japanese to attain a desk position on an American newspaper. Mr. Adachi recently explained Japan's position to a *Washington Post* reporter. Japan is fighting "bandit gangs" who threaten to destroy Manchuria's peace and decent Japanese administration. Japan has no interest in colonizing Manchuria. After 20 years of government encouragement and subsidies, there are today only 240,000 Japanese in Manchuria, and most of them are merchants or officials–not farmers. So what Japan wants are stable conditions in Manchuria so Chinese farmers can produce their crops in peace. But for the past 20 years, the "warlord" government that rules Manchuria has threatened this stability. The governors of each of Manchuria's three provinces (Kirin, Heilungkiang, and Jehol) and of Taonan are "all eminent graduates of the 'warlord' school; children of the wild, untainted by the effete touch of lettered culture." The warlords rule Manchuria only to enrich themselves.

The peak of warlord exploitation started a little less than a decade ago, when the warlords started printing money, the fengpiao or Mukden notes, which had no backing in silver or gold. Then they organized a governmental purchasing bureau or agency, which compelled the farmers to sell their entire soya bean crop to this new agency and "forbade them to sell to any other individuals or corporations, under heavy penalty." The warlords then turned around and sold the same beans to the Japanese and European exporters for real money–gold and silver. In 1920, 100 fengpiao bought 100 Japanese yen. At the beginning of 1931 it took more than 13,000 fengpiao to buy 100 Japanese yen. This has ruined Manchurian farmers, who now face starvation, and it is destroying Japan's food and fertilizer imports from Manchuria.

Japan now imports more than 27 million tons of Manchurian bean cakes, the residue of Manchurian soya beans after the oil has been pressed out, to fertilize her rice fields. But it is not enough; Japan now has to import 30 million bushels of rice each year (even from California) to feed its people. Food shortage is Japan's most serious problem. 67 million people must survive on a mountainous island that is smaller than California and only 15% of which is arable. Japan values American public opinion infinitely more than Americans realize. New York is Japan's best source of capital, and the USA is a crucial market for Japanese silk. A photo shows Mr. Adachi.

2865. Harada, Taichi. 1931. Preparation of *Aspergillus oryzae* enzymes. *Industrial and Engineering Chemistry* 23(1):1424-27. Dec. [29 ref]
• ***Summary:*** *Aspergillus oryzae* enzymes are widely used in the food and textile industries in the Far East. They are used to make soy (Shoyu) sauce, miso, and saké. The source of the enzymes [koji] contains two important enzymes–diastase and protease. This paper describes "certain properties of *Aspergillus oryzae* enzymes which were obtained by Takamine's method" (described in this journal, 1914). Address: Dep. of Biochemistry, New York Post-Graduate Medical School, Columbia Univ., New York, N.Y.

2866. Itami, Kungo; Higashi, Saburo. 1931. Ueber die antirachitische Wirkung von Okara aus Sojabohnen [The antirachitic effect of okara from soy beans]. *Arbeiten aus der Medizinischen Universitaet Okayama* 2(4):566-71. Dec. (Chem. Abst. 26:2222). [6 ref. Ger]
• ***Summary:*** There is an antirachitic substance in okara. It belongs to the unsaponifiable portion. Address: 1. Paediatrischen Klinik; 2. Physiologisch-chemischen Institut. Both: Universitaet Okayama.

2867. Morse, W.J. 1931. Utilization of soybeans and soybean products in Oriental countries. *J. of the American Society of Agronomy* 23(12):1067. Dec. Presented as part of Symposium on Soybeans. Leader: W.J. Morse.
• ***Summary:*** Manchuria, the largest soybean-producing country in the world, had a production of more than 5,000,000 tons of which more than 400,000 tons were used for food, 253,000 tons for feed, and 225,000 tons for seed. The remainder, more than 4,000,000 tons, was used in the production of oil and oil meal and for export. Japan in 1929 used over 39,000,000 bushels of soybeans of which only 13,000,000 bushels were grown in Japan proper, the difference being imported from Manchuria and Korea. The following shows the various ways in which this large amount of beans was utilized by the Japanese people: Miso, 22.7%; soy sauce, 22.7%; soybean oil and oil cake, 21.5%; bean curd, 15.4%; confections [roasted whole soy flour], 6.1%; forage, 6.2%; green vegetable beans, 0.8%; green manure, 2.5%; seed, 1.6%; miscellaneous, 0.5%.

Note: This is the earliest document seen (Oct. 2001)

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that gives industry or market statistics on green vegetable soybeans by geographical region. Address: USDA, Washington, DC.

2868. Nippu JiJi-sha (The Nippu Jiji). comp. 1931-1933. Hawai nenkan [Hawaiian Japanese annual and directory]. Honolulu, Hawaii: Nippu JiJi-sha (The Nippu Jiji). [Jap]*
• ***Summary:*** This periodical was published from 1927 to 1941. Address: Los Angeles.

2869. *Manchouko* (*Manchuria*) *Yearbook.* 1931-1934. Serial/periodical. Tokyo: East-Asiatic Economic Investigation Bureau (Toa-Keizai Chosakyoku). Annual. [Eng]

2870. Photographs of the Amano Brothers / T. Amano Co. soy sauce factory in Vancouver, British Columbia, Canada. 1931-1937. Vancouver, British Columbia, Canada.
• ***Summary:*** These four photocopies of black-and-white photos were sent to Soyfoods Center in 1981 by T. Amano Co. of British Columbia, with permission to reprint.

(1) Ca. 1928-31 showing the end and roof of a building (at far left) with a sign that reads "Amano Brothers. Shoyu Bean Sauce." A street is in the foreground.

(2) A sign about 12 feet long in the lower window of a building, ca. 1935. The three lines read: "T. Amano Co. Manufacturer of soya bean sauce. Bean & rice products."

(3) The inside of the shoyu plant in 1937 showing many wooden vats and koji trays. A board walkway along the side of three tanks is used by the person stirring the moromi. A wooden ladder leans against a fourth vat. No people are present.

(4) Five Japanese men working in the shoyu plant. Three are standing on top of or near the top of the vats, apparently stirring the moromi. A fourth, wearing suspenders, is standing on the floor. Address: Vancouver, British Columbia, Canada.

2871. Fukai, Tôshi. 1931. Shôyu no "bitamin" ni kansuru kenkyû. II. Shôyu kasu abura ni okeru "shitosuterin" narabini "purobitamin" D no sonzai ni tsuite (2) [Research on vitamins in shoyu. II. On the detection of mitosterin and provitamin D in shoyu-cake and oil (2)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 26(11):22-28. [Jap]
Address: Jozo Shikensho Gishu, Nôgaku-shi.

2872. Fukai, Tôshi; Komatsu, S. 1931. Shôyu hakkô to shiyu no kankei. VI. Kakushu hakkô kinrui no hanshoku ni oyobosu kapurin-san no seiri sayô [The relation between shoyu brewing and fatty oils. VI. The toxic action of capric acid on the propagation of several fermentation microorganisms]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 119. p. 219-29. [Jap]
Address: Jozo Shikensho. 1. Gishu; 2. Kenshuin.

2873. Kaetsu, Hideji. 1931. Dairen ni okeru tokusanbutsu no torihiki oyobi saisan [Business, trade and profitability of special products in Dairen]. *Minami Manshu Tetsudo K.K., Shomubu, Chosaka, Mantetsu Chosa Shiryo* (*South Manchuria Railway Co., Survey Research Documents*) No. 158. 152 p. [Jap]*
Address: Dairen, Manchuria.

2874. Kagawa, Aya. 1931. Shuju honpô shokuhin no bitamin B ganyûryô narabini kore ni oyobosu chôri no eikyô. II. [Vitamin B content in Japanese foods and the influence of it on cooking. II]. *Tokyo Igakkai Zasshi* (*Tokyo J. of Medical Sciences*) 45(10):1561-82. [Jap]*

2875. Kinoshita, Asakichi; Tanigawa, S.; Nakajima, W. 1931. Assaku mame kasu rui shiyô shiken [Shoyu brewing using soybean presscake]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 26(5):18-24. [Jap]
Address: 1. Jozo Shikensho Gishi; 2. Jozo Shikensho Moto Joshu; 3. Jozo Shikensho Joshu Nôgaku-shi.

2876. Matsumoto, K. 1931. "Bakuteriumu, rakuchisu, ashide, raihiman" henshu [Bacteria from shoyu brewing (4).]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 112. p. 51-56, 57-60. [Jap]
Address: Jozo Shikensho, Gishi.

2877. Matsumoto, K. 1931. Genryô yori bunri seru "fuakarutateibu bakuteria" ni tsuite [Facultative bacteria isolated from the raw materials of shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 112. p. 27-50. [Jap]
Address: Jozo Shikensho, Gishi.

2878. Ninomiya, M. 1931. Daizu tanpakushitsu no ichi seisei-hô [A method of preparing protein from soybeans (Abstract)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 26(12):69. [Jap]
Address: Minami Manshu Shikensho.

2879. Rokusho, B. 1931. [Preparation of shoyu with hydrolysis method]. *Minami Manshu Tetsudo K.K.* (*South Manchuria Railway Co. Experiment Station*) 15:119-. [Jap]*

2880. Tanaka, T. 1931. Chôsen no jimbun chishi gaku teki kenkyû [Anthropogeographical studies on Korea]. *Chiri Kyoiku* 15:105, 11, 226-30, 346-49. [Jap]*

2881. Tao, Wei-Sun; Komatsu, Shigeru. 1931. Biochemical studies on the soy bean. I. Chemical changes of the protein during the germination of the soy bean in darkness. *Memoirs of the College of Science, Kyoto Imperial University, Series A* 14A:287-92. (Chem. Abst. 26:1640-41). [Eng]*

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• ***Summary:*** Germination results in loss of weight, mainly due to decrease in fat and nitrogenous matter, in hydrolytic fission of part of the protein, especially globulin, and in liberation of small amounts of ammonia and urea. During germination, some proteoses in the seeds are converted into soluble nitrogen compounds. When the seeds germinate in the dark, some of the proteins, especially globulin, are converted by partial hydrolysis into simpler forms, such as proteose and peptone.

2882. Tao, Wei-Sun. 1931. Biochemical studies on the soy bean. II. Action of the enzymes in soy-bean seedlings on glycinin. *Memoirs of the College of Science, Kyoto Imperial University, Series A* 14A:293-96. (Chem. Abst. 26:1640-41). [Eng]*
• ***Summary:*** The changes in nitrogen distribution are due to the action of proteolytic enzymes on glycinin, the protein of the beans. Seedlings exhibit a urease activity greater than that of the seeds.

2883. Togano, Meijiro. 1931. Shôyu sokujô-hô ni kansuru kenkyû [Research on quick shoyu fermentation]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 26(1):1-4; 26(2):1-6; 26(3):1-3; 26(4):1-4; 26(5):1-3; 26(8):1-4; 26(9):1-6; 26(10):1-3; 26(11):1-4; 26(12):1-3. [Jap]
Address: President (shacho) Nihon Jozo Kogyo K.K., Nôgaku Hakase.

2884. Udo, S. 1931. Shôyu no aji ni kansuru kenkyû. II. Shôyu-chû no yûki enkirui ni tsuite [Studies on the taste of shoyu. II. On the organic bases in soy sauce]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 7:852-58. (Chem. Abst. 26:783). [5 ref. Jap]

2885. Yamamoto, K.; Abe, J. 1931. [Decolorization of oils by Japanese acid clay: Decolorizing powers of acid clays on cottonseed and soy bean oils]. *Waseda Oyo Kagaku Kaiho* (*Waseda Applied Chemical Society Bulletin*) No. 15. p. 1-6. (Chem. Abst. 26:1146). [Jap; eng]*

2886. Yokoyama, Yoshikuni; Suzuki, Bunsuke. 1931. Soy bean lecithins. III. The separation of β-series. *Proceedings of the Imperial Academy* (*Tokyo*) 7(6):226-29. [3 ref. Eng]
• ***Summary:*** Lecithins of the Beta-series were brominated and fractionated by successive solvents: palmito-oleo-, dioleo-, oleolinoleo-, palmitolinoleo- (bromide, melting point 85ºC), and palmitolinoleno- (bromide, melting point 105ºC) -Beta-lecithins were isolated in the form of their bromo-derivatives. Address: Biochemical Lab., Faculty of Agriculture, Kyoto Imperial Univ., Japan.

2887. Yosino, E. 1931. [Trials of brewing shoyu]. *Minami Manshu Tetsudo K.K.* (*South Manchuria Railway Co. Experiment Station*) 15:85-. [Jap]*

2888. Chiritescu-Arva, Marin. 1931. Soia såu fasolea japoneză [Soya or Japanese beans]. Bucharest, Romania: Institutul de Arte Grafice "Bucovina" I.E. Toroutiu. 98 p. [179 ref. Rom]
Address: Bucarest, Romania.

2889. *Hokkaido Teikoku Daigaku, Nogakubu* (*J. of the Faculty of Agriculture, Hokkaido Imperial University, Sapporo, Japan*). 1931. Mentions red rice koji. Vols. 30-31. [Eng]*
• ***Summary:*** In an English-language article we read (p. 258): "(7) The relation between each diastatic power of white earthy Koji, red rice Koji and polished rice Koji and their ash containing ingredients, is as follows The order of the saccharifying power of the diastase prepared from the three kinds of Koji stated above is highest in polished rice Koji, next in red rice Koji and lowest in white earthy Koji."

2890. Kanzô, Ishii. 1931. Misoshiru [Miso soup]. Hita-Machi, Oita-ken: Nakayama Jôzôjô Shuppanbu. [Jap]*
Address: Tokyo, Japan.

2891. Kihara, Hitoshi; Yamamoto, Y.; Hosono, S. 1931. A list of chromosome-numbers of plants cultivated in Japan. Tokyo: Yokendo. 352 p. 23 cm. Reprinted from Shokubutsu senshokutaisû no kenkyû (Studies on chromosome numbers of plants). [Eng]*

2892. Saeki, Tadasu; Higuchi, T.; Mitsuyuki, K.; Matsuzawa, K. 1931. [The chemical analysis of food in Japan]. Tokyo: Nankodo. 286 p. [Jap]*
• ***Summary:*** Reported determinations of calcium, phosphorous, iron, and other nutritive constituents in raw green soybeans.

2893. Takenobu, Yoshitaro. ed. 1931. Kenkyusha's new Japanese-English dictionary. 2nd ed. Tokyo: Kenkyusha. iv + 2280 p. 19 cm. Title also in Japanese: *Shin Wa-Ei Daijiten.*
• ***Summary:*** Food words that are not related to soy:
akameshi: see sekihan.
amanatto: sugared red beans [a very popular snack of cooked azuki beans coated with sugar].
ama-zake: sweet liquor (made from fermented rice).
an: bean jam. [an no haitte iru]: stuffed with bean jam. [an o ireru]: to stuff (a cake) with bean-jam. [an ni kurumu]: to cover (a cake) with bean-jam.
anko: bean-jam = an.
anko: not listed.
azuki: a red bean; an India bean. [azuki-iro no]: reddish brown, russet. [azuki meshi] = sekihan.
beni-shôga: not listed.
goma: a sesame; a gingelly (plant); *Sesamum orientale;*

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a sesame seed. [goma abura]: gingelly oil. [goma-suri]: a flatterer, a toady, a sycophant. [goma o suru]: to pound sesame seeds; to flatter.

gomashio: not listed.

kaiseki: not listed (at least not using modern characters).

kaisô: seaweeds, marine plants; algae.

kombu: a tangle; a tang; a devil's apron. *Laminaria.*

konbu: not listed.

mochi: rice-cake. [mochi-tsuki]: rice-cake making. [mochi o tsuku]: pound boiled [glutinous] for rice-cake. [mochi ni tsuku]: cannot manage (handle); do not know what to do with. [mochitsuki saichû-datta]: we were in the middle of pounding [rice to make] mochi. [mochi wa mochi-ya]: Every man has his forte = Every man to his trade.

nankin-mame: a groundnut; a peanut; a monkey nut.

nori: laver, sloke. [hoshi (ajitsuke) nori]: dried (seasoned) laver.

okowa: not listed.

sekihan: rice boiled together with red beans [azuki beans].

sembei: a cracknel [of wheaten flour]; a rice-cracker; a wafer.

senbei: not listed.

shiruko: red-bean soup with rice cake. [shiruko-ya]: a *shiruko* shop.

shôjin (3): abstinence from animal food; religious abstinence; lenten fare; vegetable diet; maigre food. [shôjin ryôri]: a vegetable diet. [Nihon no sôryo wa taitei shôjin o suru]: Japanese priests usually eat vegetarian food. [Uchi de wa kinyôbi wa shôjin de gozaimasu]: At my home we eat vegetarian meals on Friday.

soramame: A broad bean; a horse bean; a straight bean.

wakame: *Undaria pinnatifida.*

zôni: rice-cake boiled with vegetables. [zôni on iwau]: take the New Year's breakfast of rice cakes boiled with vegetables [to celebrate New Year's Day with zoni (mochi soup)]. Address: General editor, Japan.

2894. Takenobu, Yoshitaro. ed. 1931. Kenkyusha's new Japanese-English dictionary. 2nd ed. Tokyo: Kenkyusha. iv + 2280 p. 19 cm. Title also in Japanese: *Shin Wa-Ei Daijiten.* [Eng; jap]

• ***Summary:*** The first edition of this dictionary (titled *Takenobu's Japanese-English Dictionary*) was published in 1918. In 1931, Kenkyusha undertook a major revision in the dictionary by expanding upon former entries and adding newer ones. The British diplomat George Sansom, who later became a renowned historian of Japan, was a major contributor to and editor of this 2nd edition.

Soy related words:

abura[a]ge = aburaage or aburage: fried bean-curd. [Tonbi ni aburaage o sarawareta yôni]: with a stupid look of surprise. [literally, as when a kite {a bird of prey} snatches away your aburaage]. This is the earliest English-language document seen (April 2013) that uses the word *aburaage* to refer to deep-fried tofu pouches.

atsuage: not listed.

age [tôfu]: fried bean-curd.

ama-miso: not listed.

Daitokuji-natto: not listed.

daizu: a soya (soy) bean. [daizu kasu]: a [soy] bean cake [a co-product of soy bean oil].

daizu abura: not listed.

dengaku: baked bean-curd daubed with miso. [dengaku-zashi ni sareru]: to be transfixed; be pierced through (with a spear).

eda-mame: green soy-beans.

ganmo: not listed.

ganmodoki: not listed.

Hamana-natto: not listed.

Hama-natto: not listed.

hiryozu: not listed.

[inari-zushi]: a kind of 'sushi' (fried bean-curd stuffed with boiled rice).

kinugoshi no: strained through silk cloth [no mention of tofu].

kogori-dôfu: not listed.

koi-kuchi [shoyu]: not listed.

kôji: malt (mugi); yeast; leaven (kôbo); [kôji-ya]: a maltster [a maker of kôji]. [kôji ni suru]: [to] malt.

kôri-dôfu: frozen bean-curds.

kuro-mame: a black soy-bean.

miso (chomiryô = seasoning): bean paste; miso.

[miso shiru]: miso soup.

[miso o kakeru]: to put miso on (some food); (shuppai asuru): to make a mess (sad work) of it; put one's foot in it.

[]: mash the miso.

[]: to speak meanly of (a person); speak of (a person) in the most disparaging terms; say everything bad about (a person); denounce scathingly (roundly).

[]: a pretty mess you have made of it. [miso mo kuso mo isshoni suru]: his ideas are confused; He confuses one thing with another. [miso no miso kusaki wa, jô miso ni arazu]: The secret of art lies in concealing art [Akiko never heard this saying].

misokoshi: a miso strainer. [misokoshi de mizu o sukuu]: weave a rope of sand; attempt impossibilities [literally, to try to scoop up water with a miso strainer].

miso-mame: a soja (soy) bean.

miso-zuke: anything pickled in miso.

momen: cotton [no mention of tofu].

nama-age: not listed.

nattô: fermented soy-beans.

nigari: bittern, brine.

nori: [nori no tsukudani]: laver boiled down in soy [sauce].

oboro: not listed.

okabe: not listed.

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okara: not listed.

saishikomi [shoyu]: not listed.

shimi-dôfu: not listed.

shiro-shoyu: not listed.

shitaji: soy [shitaji sosogi]: a soy pot [soy sauce dispenser].

shôyu: soy [sauce].

suki-yaki: sukiyaki: slices of beef cooked *à la japonaise.* Note: Grilled tofu is an essential ingredient in sukiyaki but is not mentioned in the definition.

tamari: (a kind of) soy.

tôfu: bean-curds; tôfu.

[tofu itcho]: a piece (cake) of bean-curds.

[tofu-ya]: a bean-curds dealer (seller).

[kare ni iken shita totte, tôfu ni kasugai da]: advice to him is like water sliding off a duck's back. It is a mere waste of words (It is just as well to pour water into a sieve) to advise him.

[tofu-ya e ni ri, saka-ya e san ri to iu tokoro da]: there is no human habitation within five miles of the place. [It's out in the boondocks].

unohana: (1) Flowers of the *Deutzia scabra.* (2) [tofu no kara]: bean-curd refuse.

usukuchi shoyu: not listed.

yaki-dôfu: broiled bean-curd.

yuba: dried bean-curds [sic, the film that forms atop soy milk when it is heated].

Note: This is the earliest English-language document seen (April 2013) that uses the term "broiled bean curd" to refer to grilled tofu. Address: General editor, Japan.

2895. Takenobu, Yoshitaro. 1931. Japan Year Book. Tokyo: Japan Year Book Office. 508 + 12 + 192 p. See p. 406, 348, 504-05, 27th annual issue.

• ***Summary:*** The Preface (by Mume Takenobu, his wife) begins: "It is my sad duty to announce the death on the 26th of April last of my husband, Professor Yoshitaro Takenobu, who has edited this work for twenty-five years since it was started by him in 1905."

"Arrangements are in progress now with every prospect of a successful issue for perpetuating the publication of this work. This makes me feel very happy, because I know how much time and energy my lamented, husband so ungrudgingly bestowed upon this favourite offspring of his active mind." Dated: December, 1930,

Page 348. In the chapter on Agriculture, a table titled "Beans, potatoes and sweet potatoes" shows the production (in koku; 1 koku = 180 liters) of these crops from 1926 to 1928, inclusive. For soya beans:

2.999 million *koku* in 1926

3.263 million *koku* in 1927

2.977 million *koku* in 1928

Other crops whose production is shown in the table are red [azuki] bean, pea, horse bean (broad bean, *soramame*), sweet potato, and Irish potato. In 1928 production of red bean is 24.7% of the production of soya bean, and Irish potato is 27.1% of the production of sweet potato.

Page 496, in the chapter on "Industry" is a table titled "Statistics on Sake, beer & soy" [sauce] in koku for the year ended in March 1926-1928. For soy sauce:

2.826 million *koku* in 1926

2.304 million *koku* in 1927

2.384 million *koku* in 1928

In 1928 production of soy sauce in Japan was 46.3% that of saké, and production of beer was only 17.5% of saké.

Above this table is a long paragraph titled "Soy" which states: "In 1917 the leading soy manufacturers at Noda combined and formed the Noda Soy Co., [Noda Shoyu Co.] capital ¥7,000,000 p.u. [paid up] with capacity of about 250,000 "koku" i.e. about 60 per cent. of the total output of the Prefecture. The Company has now a capital of 30 million yen and produces 500,000 "koku" a year. The commodity is recently exported to European countries and China to the extent of about 18,000 koku (¥1 million) annually. The number of factories is about 12,600 throughout the country."

Page 504. In the chapter on South Manchuria, a long paragraph on "Soya beans" states: "The yield of beans in Manchuria amounts to about 28,000,000 "koku" (4,000,000 tons) including all species and the output of bean-cakes about 60,000,000 pieces valued at ¥110,000,000. In the Leased Territory and the railway zone alone bean cakes and oil were produced to the amount of 50,000,000 pieces and 250,000,000 "kin" respectively in 1927, the bulk going to Europe, Japan and China through Dairen and Newchwang.

"The principal industries in the Leased Territory and the railway zone are bean-oil making and flour milling, followed by iron foundry, cotton spinning and weaving, hemp dressing, soap, glass, and bricks"

The text below the table is the same as in the 1926 Japan Year Book.

Page 593. A table shows the value of imports in yen, including Beans and peas, and "oil materials."

Page 662. In the section on Manchuria, a table titled "Principal crops" shows the production of soya beans from 1922 to 1924. Figures for 1922 and 1923 are in Chinese koku; 1 Chinese koku = 1.7 Japanese koku.

On the same page, under "The South Sea Islands," we read: "Japan acquired through the Treaty of Peace the mandatory right over the former German South Sea Islands north of the Equator... It consists of three groups of Mariana, Marshall, and Caroline, covering altogether an area of 960 square miles with 49,576 natives.

Page 505. A 1-page section gives basic information and statistics about "The South Manchuria Railway Co." As part of the Russo-Japanese War (1904-05) the existing railway was ceded by Russia to Japan as on 5 Sept. 1905 as part of the Treaty of Portsmouth, which formally ended the war. "It was renamed the South Manchuria Railway by the Japanese

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Government which issued regulations for converting it into a semi-private concern, and with the formal organization of the company in Sept. 1906 the Field Railway Office transferred the railways and all belongings to the Company on April 1, 1907."

The total length of the lines operated by the company is 698 miles, as follows:

Dairen-Changchun main line–438.5

Antung-Mukden main line–161.7

Port Arthur branch line from Choushuitzu [a suburb of Dairen]–31.6

Yingkow branch line from Tashihchiao–13.9

Yentai Colliery branch line–9.7

Fushun branch line from Hunho–32.9

Total–698.0 miles. Address: Prof. at the Waseda Univ. and late of the "Japan Times".

2896. Tawada, Shinjun. 1931. Okinawa yakuyo shokubutsu yakukôzan [Medicinal uses of Okinawa pharmaceutical plants. 1st ed.]. Naha, Okinawa: Okinawa Shoseki. 205 p. See p. 102. Illust. [Jap]

• ***Summary:*** Page 102 mentions *Glycine soja* Benth. This book is in Japanese, with the names of the plants given in Latin. It discusses the uses of many species, which are systematically arranged. Mimeographed in Okinawa.

2897. Togano, Meijiro. 1931. Saishin shôyu miso jôzô-hô [Brand-new methods of brewing shoyu and miso]. Tokyo: Jôzô Hyôron-sha. 1052 + 13 p. Illust. 22 cm. [Jap]*

• ***Summary:*** This is apparently a revision of the 1926 edition, with 13 additional pages, separately numbered.

2898. William Morse examining soybeans in Japan (Photograph). 1931.

• ***Summary:*** This digital photo (see next page), with date, was sent to Soyfoods Center by Joyce Garrison (William Morse's granddaughter) of West Hartford, Connecticut (July 2004).

2899. Kurosawa, T. 1932. Saccharomyces sake, myceloblastanon Sapporo A oyobi Bac. nattô ni yoru kôchaku genshô ni tsuite. II. [Agglutinization by Saccharomyces sake, myceloblastanon Sapporo A, and Bacillus natto. II.]. *Hokkaido Igaku* (*Hokkaido J. of Medical Science*) 10(1):30-45. Jan. [22 ref. Jap]

Address: Hokkaido Teikoku Daigaku, Igaku-bu, Hôigaku Kyôshitsu (Shunin Yamagami Kyôju).

2900. Takata, Ryohei. 1932. Miso jôzô no eiyôgaku-teki kôsatsu. VIII. Miso jôzô-chû bitamin B-1 no henka [Nutritional studies on miso fermentation. VIII. Changes in vitamin B-1]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 10(1):35-42. Jan. [5 ref. Jap]

Address: Kôgaku-shi, Japan.

2901. Liu, P.W. 1932. Nyûfu seizô-chû ni okeru kagaku henka ni tsuite [Chemical studies on the manufacture of fermented tofu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 8(2):162-72. Feb. [9 ref. Jap]

• ***Summary:*** A very early Japanese study on fermented tofu which is called *nyûfu* (milk + spoiled; the *fu* of tofu) in Japanese, but written "Su Fu, bean curd preserved" in roman letters. From both red and white *nyûfu* (preserved, fermented tofu) obtained from Hankow, the author found some species of *Aspergillus, Penicillium, Alternaria, Cladosporium, Saccharomyces, Bacillus,* and *Streptococcus.* He showed that the ripening of fermented tofu is caused by enzymes produced by the mold during the fermentation process. Address: Hokkaido Imperial Univ., Japan.

2902. Manners, Marian. 1932. Today's menu. *Los Angeles Times.* March 14. p. A7.

• ***Summary:*** "Luncheon: Sukiyaki*. Boiled rice. Tea. Cookies. * Recipes appear in Requested Recipe column today."

2903. Liu, P.W. 1932. Kabi-dôfu no kôso ni tsuite [About the enzymes of fermented tofu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 8(3):273-79. March. [Jap]

• ***Summary:*** Note: This is the earliest Japanese-language document seen (Oct. 2011) that uses the term "Kabi-dôfu" to refer to fermented tofu. Address: Hokkaido Teikoku Daigaku Nogakubu, Nosan Seizogaku Kenkyushitsu, Japan.

2904. Liu, P.W. 1932. Kabi-dôfu no kôso ni tsuite [On the enzymes of mold-fermented tofu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 8(3):273-79. March. [Jap]

• ***Summary:*** A detailed study of the enzymes of *fu-yu,* or preserved, fermented tofu. Address: Dep. of Agricultural Chemistry, Hokkaido Imperial University.

2905. *USDA Plant Inventory.* 1932. Plant material introduced by the Division of Foreign Plant Introduction, Bureau of Plant Industry, April 1 to June 30, 1930 (Nos. 86756 to 88432). No. 103. 51 p. March.

• ***Summary:*** Soybean introductions: *Soja max* (L.) Piper (*Glycine hispida* Maxim.). Fabaceae.

No. 87523-87636. "From Japan and Chosen [Korea]. Seeds collected by P.H. Dorsett and W.J. Morse, agricultural explorers, Bureau of Plant Industry. Received May 6, 1930.

"No. 87613-87621. From Kankyo Hokudo."

Note: PI number with special significance. "No. 87615. No. 4891. *Shirobana* (large white flower), from Dojogun. A very large, oval, glossy, yellow bean with pale hilum." It was later renamed "Jogun." Address: Washington, DC.

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2906. Lovell, Philip M. 1932. The care of the body. *Los Angeles Times.* April 24. p. I20. Sunday magazine.
• ***Summary:*** In the section titled "Soy bean" (p. 21) the following letter is reprinted in full: "Torrance, California. Dear Dr. Lovell. In the health section of the Los Angeles Times Magazine several weeks ago I read an article about soy beans.

"As a Japanese farmer I raised and used soy beans for many years but since coming to this country I have not seen soy beans grown. I believe this is too bad, as I believe soy beans are a valuable crop.

"For many centuries the people in Japan used this product for their main supply of protein. They also used it for nitrogen for their lands.

"Contrary to common belief, the Japanese have not used much fish for their diet and no animal meat at all, for Buddhism does not recommend its followers to kill and eat their fellow animals.

"Many due to Buddhism or the difficulty in transporting fresh fish, did not use much fish. The only thing they could depend upon for the protein was a cake made of soy beans, called tofu. We also make a sauce of the soy beans [soy sauce].

"In the Orient this is a staple crop. The farmers raise it as one of the rotating crops. I should really like to see more soy beans raised here but on account of the lack of popular usage there is not much demand for them.

"Could you give me more information about the use of this product which would appeal to the popular taste? I would appreciate it very much.

"Sincerely yours, Tatsuo Inouje [Inouye].

Lovell responds that, as he has stated before, 80% of the people worldwide are "vegetarians, either by religion or economic necessity." The Japanese are a progressive race. What they have accomplished during the past 70-80 years is "a miracle of the century. Yet they have done it essentially on a vegetarian diet."

The soy bean has replaced animal protein for the Japanese and for most followers of Buddhists and Confucianism. "It is the roast beef of the Orient. It contains twice as much protein as the richest of meats. It is a very fine food indeed. The health food stores are slowly building up a sale for it. Recently I ran across a soy bean bread. I believe the average health food store can procure it." Address: N.D. [Naturopathic Doctor].

2907. Sasaki, K. 1932. Daizu no yûki enki-rui ni tsuite [Organic bases of soya bean]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 8(4):417-20. April. (Chem. Abst. 26:4307). [3 ref. Jap]
• ***Summary:*** Korean soya bean (1930) contained 11.2% water, 16.6% crude fat, 7.03% total nitrogen, 6.48% protein nitrogen, 0.55% non-protein nitrogen. 5 kg yielded 1.40 gm adenine (picrate), 0.31 gm guanine, 0.62 gm histidine (dichloride), 9.55 gm arginine (nitrate), 25.36 gm choline (gold salt), 0.33 gm trigonelline (hydrochloride), and 0.80 gm of an unidentified base (from the lysine fraction; melting point 214ºC; platinum salt, melting point 235ºC; picrate, melting point 206-208ºC).

2908. *USDA Plant Inventory.* 1932. Plant material introduced by the Division of Foreign Plant Introduction, Bureau of Plant Industry, July 1 to September 30, 1930 (Nos. 88433 to 89210). No. 104. 35 p. April.
• ***Summary:*** Soybean introductions: *Soja max* (L.) Piper (*Glycine hispida* Maxim.). Fabaceae.

No. 89101-89172. "From China, Chosen [Korea], and Manchuria. Seeds collected by P.H. Dorsett and W.J. Morse, agricultural explorers, Bureau of Plant Industry. Received September 12, 1930.

"No. 89127-89172.

"No. 89127-89166 are from the Kankyo Hokudo Prefecture Seed and Nursery Farm, Kyojyo, Chosen [Korea], August 8, 1930.

Note: PI number with special significance. "No. 89126. No. 6108. *Tsurunoko.* Large, very light yellow with pale hilum; used largely for confectionery purposes." Later renamed "Suru." Address: Washington, DC.

2909. Ishimaru, Yoshio. 1932. Shôyu jôzô ni kansuru saikin no kenkyû [On microbes for brewing shoyu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 8(5):581. May. [Jap]
Address: Yamasa Shoyu, Japan.

2910. Takata, Ryôhei. 1932. Shôyu jôzô no eiyôgaku-teki kôsatsu. I. Shôyu-chû no vitamin B-1 [Nutritional investigation of shoyu brewing. I. Vitamin B-1 in shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 10(5):355-60. May. [15 ref. Jap]
Address: Kôgaku-shi, Osaka Kôgyô Daigaku, Jôzôgaku Kyôshitsu, Osaka, Japan.

2911. Yukawa, Matao; Omura, Osamu. 1932. Shôyu no okishigurutamin-san ni tsuite [On oxyglutaminic acid of shoyu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 8(5):584. May. [Jap]
Address: Kyûdai Nohaku [Kyushu Univ., Dr. of Agriculture], Japan.

2912. Krauss, F.G. 1932. Soybeans, their culture and uses in Hawaii. *Hawaii Agricultural College, Extension Service, Agricultural Notes* No. 24. 4 p. June 21.
• ***Summary:*** Contents: Introduction. Cultural methods. Fertilization. Inoculation. Time to plant. Distances to plant and rate of seeding. Varieties. Harvesting. Soy beans for soil improvement.

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"The soy bean is destined to become an important supplementary crop in Hawaii's increasingly diversified agriculture." "As human food, the soy bean may be cooked either green or dried like snap or shell beans, and as such offer possibilities for canning commercially. The mature seeds are also ground into culinary meals and bolted for flour. The Orientals utilize vast quantities of soy beans for the manufacture of a number of nutritious and highly-priced foodstuffs, including the well-known tofu, miso, and soy sauce. The Japanese of Hawaii import about $70,000 worth of the beans annually from Japan for the above purposes, the manufacture of which could be greatly extended if the soy bean were grown locally. A considerable amount of soy bean cake meal is also imported for poultry and dairy stock feeding. It is estimated that Hawaii could consume to advantage at least a half million dollars worth of soy bean products annually if the crop were grown extensively enough."

2913. South Manchuria Railway. 1932. Soya beans. *Report on Progress in Manchuria.* Third, 1907-32. 235 p. June. See p. 1-5, 35, 117-18, 130, 135-36, 141, 156, 159. (Dairen, Manchuria). [1 ref. Eng]
• ***Summary:*** Subtitle: "The 25th anniversary number containing a survey of the Manchurian Incident and League Council's Proceedings."

Note: The "Manchurian Incident," also called the "Mukden Incident" took place on the night of 18 September 1931. A bomb exploded on the tracks of the Japanese railway north of Mukden. A Japanese Colonel ordered a full-scale attack against the Chinese troops in Mukden, and General Honjô, hearing of the crisis, called out the whole Kwantung Army–which proceeding to take over Manchuria. "By early 1932 the conquest of all Manchuria had been completed. In March 1932 Manchuria was proclaimed an independent state under the last Ch'ing ruler (P'u-yi). The Lytton Commission of the League of Nations visited Manchuria in the spring of 1932 and condemned Japan as an aggressor. The report was adopted by the League of Nations, from which Japan withdrew in protest the following year. By this time the Japanese armies had already moved west from Manchuria to occupy about 5,000 square miles of the Inner Mongolian province of Jehol." (Fairbank, Reischauer, and Craig. 1973. *East Asia: Tradition and Transformation.* p. 707-08). Address: Dairen, Manchuria.

2914. Korigawa, K. 1932. Shihan miso-chû no gurutamin-san [Glutamic acid content of commercial miso]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 10(7):543. July. [1 ref. Jap] Address: Osaka Kogyo Daigaku, Jozo-gaku Kyoshitsu, Takada Kenkyushitsu, Japan.

2915. Suzuki, Tsuneya. 1932. Miso jôzô-chû ni okeru gan chisso-butsu nakanzuku gurutamin-san no zôgen ni tsuite [The increase and decrease of nitrogenous substances, especially glutamic acid, during miso fermentation]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 10(7):536-42. July. [8 ref. Jap]
Address: Kôgaku-shi, Japan.

2916. Richardson, J.W. 1932. La soja y el conflicto Sinojaponés [Soya and the Sino-Japanese conflict]. *Hacienda* (*La*) (*Buffalo, New York*) 27(8):294-95. Aug. [Spa]
• ***Summary:*** It is said that this plant, which plays such an important role in nourishment and in modern industries, forms the axis around which revolves the struggle for dominance of Manchuria. Slight reference is made to the increasing soybean importance in the United States. Photos show: (1) Round soybean cakes piled on the docks at Dairen. (2) An interesting Chinese hand-turned stone mill, with a metal hopper on top, being used by a Chinese man to grind soaked soybeans for soymilk. The slurry falls into an earthenware pot.

2917. Shikazono, Naohara; Tomoda, Yoshinori. 1932. Daizu kasu kasuibunkai butsu to shôyu no hikaku kenkyû [Comparative studies on shoyu and the hydrolytic product of soybean cake, "Soyament"]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 35(8):892-94. Aug. English abstract in Supplemental Binding 35(8):368B-69B. Aug. [Jap; eng]
• ***Summary:*** Soya and "Soyament" (obtained by hydrolysis of soybean cake with concentrated hydrochloric acid, neutralization, and fermentation with wheat koji) contain, respectively, moisture 68.42%, 57.53%; ash 17.24%, 20.87%; fat 2.34%, 1.42%; protein 6.94%, 15.25%; carbohydrate 5.06%, 4.93% Analysis of total, protein-, and amino-nitrogen shows that Soyament contains more amino-acids than does soya. Address: Dep. of Applied Chemistry, Faculty of Engineering, Tokyo Imperial Univ., Japan.

2918. Sokolsky, George E. 1932. Manchuria: A new act in the world drama. With the formal recognition of the State of Manchukuo by Tokyo and the Report of the League by the Lytton Commission, the riddle of the Far East will again demand the attention of nations. *New York Times.* Sept. 11. *
• ***Summary:*** A year ago next Sunday, during the night, a section of track of the South Manchuria Railway was blown up in the vicinity of Mukden. This act of aggression against Japanese property was attributed to Chinese troops. The next day the Japanese army stationed in Manchuria was set in motion.

2919. Eastman, Whitney H. 1932. Soybean oil and meal in industry. *Oil, Paint, and Drug Reporter* 122(11):17, 34. Sept. 12.
• ***Summary:*** An address given before the annual convention of the American Soybean Assoc., Washington, DC, Sept. 2. A

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table titled "Soybean meal consumed in Japan for fertilizer" shows that it increased from 1,262,250 tons in 1921 to a peak of 1,525,538 tons in 1923, then by 1930 had fallen to 1,087,476 tons.

A second table shows factory consumption of soybean oil in 1929 and 1931. In 1929 the main uses were soap (6,396,000 lb), paint and varnish (5,815,000 lb), linoleum and oilcloth (3,229,000 lb), miscellaneous (2,032,000 lb), textiles (267,000 lb), [lard] compounds and vegetable shortenings (82,000 lb), printing ink (71,000 lb), and oleomargarin (11,000 lb). By 1931 these had changed dramatically: Compounds and vegetable shortenings (10,869,000 lb), paint and varnish (6,256,000 lb), soap (3,816,000 lb)... oleomargarin (623,000 lb).

A third table shows soybean oil consumption in the USA from 1920-21 to 1931-32. It decreased steadily from a peak of 5,324,644 gallons in 1920-21 to only 1,339,521 gallons in 1927-28, then began to rise, reaching 4,193,352 gallons in 1930-31. Address: President, National Soybean Oil Manufacturers' Assoc.

2920. Satow, Teikichi. 1932. Plywood board and process of making the same. *U.S. Patent* 1,877,202. Sept. 13. 5 p. Application filed 24 April 1930. 2 drawings.
• ***Summary:*** "The object of my invention is to produce a composite or plywood board consisting of a plurality of sheets secured together in a flatwise relation by the use of dry glue and the application of heat and pressure." This process avoids the typical use of two drying operations. "I have found that vegetable proteidal substances, such as soya bean proteid,... when treated with an active methylene compound,... may well serve the purposes of my invention."

"To, say, 100 pounds of soya bean meal is added a few pounds of diluted solution of ammonia or caustic soda, to serve as a glutinizing agent therefor. To this mass is added from 5 to 15 pounds of beta naphtholor its sodium salt to impart a desirably high degree of thermo plasticity thereto. Then I add from 8 to 15 pounds of formaldehyde solution or its equivalent. The whole mass is then thoroughly kneaded into homogeneity and is finally dried into powder form." Address: Tokyo, Japan.

2921. Itano, Arao; Arakawa, Sachiyo. 1932. Yûki-shitsu hiryô ni kansuru biseibutsugaku-teki kenkyû. II. Daizu kasu no bunkai ni tsuite (1) [Microbiology of organic manures. II. On the decomposition of soy-bean cakes by various stock cultures (a)]. *Nippon Dojo Hiryogaku Zasshi* (*J. of the Science of Soil and Manure, Japan*) 6(3):301-11. Sept. [7 ref. Jap]
• ***Summary:*** In flooded soil ammonification, and in dry soil nitrification and ammonification, were observed. Decomposition was effected respectively by bacteria and by *Actinomyces.* Address: Ohara Nogyo Kenkyujo.

2922. Ishimaru, Yoshio; Kodama, Renichi. 1932. Miso no seibun, tokuni sono yushi ni tsuite (yohô) [On the components of miso, especially its lipids (prediction or forecast)]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 10(10):803-05. Oct. [Jap]

2923. Lothrope, Leon. 1932. Soya beans. Alleged cause of war in Manchuria and soft pork in Ontario, interest in Western Canada now centres around growing them on prairies. Their strong points and weaknesses are recorded herein. *Nor'-West Farmer and Farm & Home* (*Canada*) 51(18):8-9, 29. Oct.
• ***Summary:*** Discusses the possibilities of the soybean crop in western Canada, the value and importance of soybeans in various countries, their uses, amount of production in the United States, and the prices which might be expected if soybeans are grown in western Canada.

"There was something over a million pounds of soya bean oil imported into Western Canada last year which is about 35 tank carloads. It is largely used in the manufacture of soaps, shortening and salad oil. Contrary to popular opinion, only very small amounts are utilized in paints and varnishes, due to its slow drying qualities and lack of hardness...

"It is not surprising, then, that when the National Government in Great Britain imposed a ten per cent tariff on soya bean oil, cake and meal imported from foreign countries, and they are without duty from Empire countries, that the industries affected would look around for new sources of supply. Nor is it surprising that Canadian railroad officials and other business interests would evince some enthusiasm in the establishing of a new industry in Canada that has such potentialities as to cause a war in Manchuria and to be directly responsible for placing the Japanese Merchant Marine in third place among the nations. If Canada could 'horn in' on such an industry it should be all to the good.

"This accounts for the visit of a member of the Corn Exchange, of Liverpool, to Canada in recent months whose firm deals in soya beans and soya bean products, and owns large warehouses along the South Manchuria Railway. His visit was for the express purpose of seeing if Canada could supply soya beans for the European trade."

"The Manitoba Agricultural College commenced work with soya beans fifteen years ago [about 1917]. Professor Southworth, who is now in England, developed a strain of Ogema [Ogemaw], known as Manitoba Brown, that consistently ripens seed at the College and in several other parts of the West where they have been grown. The only other strain that has shown much promise in the Prairie Provinces are selections of Wisconsin Black. Some success has been obtained with this latter variety at the Dominion Experimental Farm, Brandon [Manitoba] and by Don Bark of the C.P.R. [Canadian Pacific Railway] Demonstration Farm

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at Brooks, Alta. [Alberta; Brooks is a town located 100 miles southeast of Calgary]. The three stations mentioned above are the only ones that report at all favorably on this crop and we have had communications from most government institutions in the West... The returns received from the three Dominion Experimental stations in British Columbia are neither more nor less encouraging than from the Prairie Provinces.

"Dr. McRostie of the Manitoba Agricultural College, who was formerly in charge of all the forage crop work for Dominion Experimental Farms system, has probably done as much on the growing of soya beans as anyone, states that 'fifteen bushels to the acre is a reasonably good yield to expect under field conditions in Manitoba with the early varieties so far developed.'"

"A World Crop: The best argument in favor of endeavoring to grow soya beans in Western Canada lies in the fact that it is a world crop and if we can grow it in competition with the world as we do wheat it is worth trying as it will give us greater diversification. The Agricultural Section of the Winnipeg Board of Trade is making arrangements to distribute small amount of soya bean seed to different districts in the Province of Manitoba. They hope to have in 100 acres next year for a trial. Mostly home grown seed of the black and brown types will be used."

A photo shows 5 products that contain soya bean oil or meal, including Vi-Tone Malt Chocolate Flavor, Domestic brand Shortening (purely vegetable), MacDowell's Soy Bean Flour (Brockville, Ontario), Pearl White Naptha [Naphtha] Soap, and Jif Flaked Soap.

Note 1. This is the earliest English-language document seen (March 2000) that uses the word "shortening" to refer to such a product made from soy oil.

Note 2. This is the earliest document seen (Oct. 2013) that mentions the soybean variety Manitoba Brown. Address: Canada.

2924. Nishikawa, H. or Eijirô. 1932. Shijô-kin no seikagaku. 1. Benikôji-kin (*Monascus purpureus* Went) no shikiso [Biochemistry of filamentous fungi. I. Coloring matters of *Monascus purpureus* Went. 1.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 8(10):1007-15. [9 ref. Jap]

• ***Summary:*** The pigment in beni koji (ang-khak, ang-ouac [ang-kak]) was found to consist of two pigments, monoascorubrin, a red coloring material with the formula $C_{22}H_{24}O_5$ and monascoflavin, a yellow pigment ($C_{17}H_{22}O_4$). Address: Nôgaku-shi.

2925. Katsunuma, Seizo; Nakamura, Hirosi. 1932. Iron distribution in the earlier stages of growth of soja and in chick embryo. *Nagoya J. of Medical Science* (*The*) 6(3):107-12. Nov. 20. [2 ref. Eng; jap]

• ***Summary:*** The tegument and embryo of soya-bean contained much, and the cotyledon little, iron. During sprouting the largest amount of iron was found in the root, most being in the lower and least in the middle portion. During the development of hen's eggs the iron content of the embryo increases 20 times at the expense of iron in other portions.

2926. *New York Times.* 1932. Japan, by vigorous measures, binds Manchuria more closely. Strong organizations are put to work to develop resources and to harmonize the life of the new state with that of Japan. Nov. 27. *

• ***Summary:*** "Eight Manchukuo school children, on one of many good-will missions,... on the indirect side, such benefits as cheaper soya bean fertilizer and foodstuffs..."

2927. Sato, Masanori; Ito, Chiyomatsu. Assignors to Minami Manshu Tetsudo K.K. (South Manchuria Railway Co.) (Dairen, Manchuria, China). 1932. Method of extracting fatty oil [from soya bean]. *U.S. Patent* 1,892,366. Dec. 27. 1 p. Application filed 20 June 20 1929.

• ***Summary:*** Ethyl alcohol is used as a solvent. Address: Dairen, China.

2928. Stewart, C.L.; Burlison, W.L.; Norton, L.J.; Whalin, O.L. 1932. Supply and marketing of soybeans and soybean products: Tables 1-19 (Document part). *Illinois Agricultural Experiment Station, Bulletin* No. 386. p. 425-544. Dec.

• ***Summary:*** Tables show: (1) Value of the soybean crop in Illinois, 1928-31. (2) Soybean production in selected countries, average 1909-13, annual 1920-31 (in tons of 2,000 lb). The countries: Manchuria, Korea, Dutch East Indies, Japan, United States, total for these 5 reporting countries. (3) Soybean production in the United States by geographic divisions, 1929. The greatest production was in the "East North Central" states; 4.977 million bushels comprising 57% of total U.S. production.

(4) Production of gathered soybeans in selected states and in the United States, 1922-1931 (thousand bushels). In 1922 the top six soybean producing states were North Carolina (1,600), Illinois (812), Ohio (465), Indiana (240), Virginia (208), and Missouri (165). Total USA: 4,333. In 1924, Illinois (1,380) passed North Carolina (1,160) to become the leading U.S. producer. In 1931 the top six states were Illinois (6,055), Indiana (3,062), North Carolina (1,498), Missouri (1,080), Iowa (578), and Ohio (560). Total USA: 14,917.

(5) Total equivalent solid acreage of soybeans grown in selected states and in the United States in 1922-1930 (thousands of acres). In 1922 the top 4 states were North Carolina (224), Illinois (169), Tennessee (154), and Indiana and Alabama (113, tie). Total USA: 1,226. In 1923 Illinois passed North Carolina to take first place. In 1930 the top 4 states were Illinois (719), North Carolina (478), Iowa (463), and Indiana (402). Total USA: 3,758. (6) Yield per acre of

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gathered soybeans in selected states and in the United States, 1922-1931 (bushels per acre). In 1922 the U.S. average was 13.8 bushels. Iowa had the highest: 22 bushels. In 1931 the U.S. average was 15.6 bushels. The top 4 states were Ohio (20), Indiana (17.8), Illinois (17.5), and Iowa (17).

(7) Proportion of soybean acreage gathered for beans, cut for hay, and interplanted with other crops, Illinois, 1922-1931. Gathered for beans rose from 32.1% in 1925 to 55.7% in 1930. Cut for hay rose from 41.4% in 1922 to 54.4% in 1931. Interplanted with other crops dropped from 20.1% in 1922 to 1.3% in 1931. (8) Production of soybeans in twelve leading Illinois counties, with rank by years, 1929-1931. The top four counties were Christian (692,200 bu in 1931), Champaign, Piatt, and Moultrie. (8A) Soybean varieties in Illinois: Varieties gaining favor: Illini, Manchu, Dunfield, Mansoy, Laredo. Holding their own: Ebony, Virginia, Ilsoy, Peking, Black Eyebrow, Wilson V [Wilson-Five], Hurrelbrink. Losing favor: Haberlandt, Mammoth Yellow, Hamilton (Ohio 9035), Ito San, A.K., Midwest.

(9) Varieties of soybean seed offered for sale by growers, in order of frequency of offers printed in Farm-Bureau publications, Illinois, 1921, 1925, and 1931. For each year the varieties are listed under nine crop reporting districts, and also for the entire state. In 1921 for the entire state, in descending order of frequency: Midwest, Ebony, A.K., Peking, Ohio, Ito San. In 1925: Manchu, Midwest, A.K., Ebony, Virginia, Ilsoy, Ohio, Black Eyebrow, Haberlandt, Peking, Wilson, Ito San. In 1931: Illini, Manchu, Virginia, Ilsoy, Ebony, A.K., Mansoy, Dunfield, Peking, Wilson, Midwest, Black Eyebrow, Haberlandt. (10) Average cost of producing soybean in Illinois and Indiana for specified periods, 1921-1930. The highest return above computed cost per acre (profit) is from soybeans gathered for seed using a combine: $9.55/acre. When soybeans are cut for hay, a loss usually results.

(11) Imports of soybean oil, soybean oil meal and cake, and soybeans, United States, 1915-1931. (12) Duties levied on soybean oil, soybean oil meal and cake, and soybeans under recent tariff acts, United States, 1909-1930. In 1909 and 1913 all three commodities were on the "Free list." In 1921 oil the tariff on oil was 20 cents per gallon (2.67 cents per lb); the other two were free. In 1922 the tariff on oil was reduced to 18.75 cents per gallon (2.5 cents per lb), the tariff on soybeans was ½ cent per lb (30 cents per bushel), and meal was free. In 1930 the tariff on oil was increased to 26.25 cents per gallon (3.5 cents per lb, not less than 45% *ad valorem*), the tariff on meal and cake was $6/ton, and the tariff on soybeans was increased fourfold to $1.20/bushel.

(13) Domestic production of soybean oil and other vegetable oils from domestic materials, United States, 1912-1931 (thousands of pounds). Statistics are given for cottonseed oil (the leader by far during the entire period), peanut oil, olive oil, corn oil, linseed oil, soybean oil, and total vegetable oil. Soybean oil rose from 751,000 lb in 1922 (the first year for which figures are given) to 39,129,000 lb in 1931. The ranking in 1931 was: Cottonseed oil (1,417,226 x 1,000 lb), linseed oil (203,613), corn oil (113,145), soybean oil (39,129), peanut oil (13,730), and olive oil (1,509).

(14) Imports of foreign vegetable oils, oil equivalent being used for oil-bearing materials, United States, 1910-1931 (thousands of pounds). Statistics are given for soybean oil, coconut oil and copra, peanut oil, olive oil (edible), olive oil (inedible, including olive oil foots), palm oil (incl. palm kernel), linseed oil and flaxseed, all other vegetable oils and materials, total vegetable oils and materials. For net soybean oil imports, the earliest figure is 24,784 in 1912; it peaked at 335,439 in 1918, and had fallen to 4,018 in 1931. Total vegetable oils and materials imported increased from 440,412 in 1910 to 1,525,114 in 1931.

(15) Exports of soybean oil and five other leading vegetable oils, United States, 1919-1931 (thousands of pounds). Statistics are given for soybean, cottonseed, coconut, linseed, corn, and peanut. The leading export throughout this period was cottonseed oil. For soybean oil exports, the figure for the last half of 1919 is 27,715 and fir 1920 it is 43,512. Thereafter the amount exported each year is very small, rising from 1,944 in 1921 to 5,448 in 1931.

(16) Total production, imports, exports, and net balance of vegetable oils and animal fats, exclusive of butterfat but inclusive of fish oils, United States, 1912-1931. (17) Use of soybeans, by acreage, United States, 1915, 1929, and 1930 crops. The percentages of the entire crop acreage in 1915 are: Hay 52%, grazed 15%, plowed under 4%, and gathered for beans 29% (of which: Seed 18.2%, human food 0.9%, and feed 9.9%). In 1930: Hay 56%, grazed 14%, plowed under 4%, and gathered for beans (11,975,000 bushels) 30% (of which: Seed 10.5%, crushed or ground 11.5%, and feed 8.0%).

(17A) Commodities in which soybeans or soybean products are used (p. 460): Food products (USA and Canadian), feed products, industrial products. (18) Soybean oil meal produced and imported into the United States, 1922-1930 (tons of 1,000 lb). Domestic production increased from 3,811 tons in 1922 to 110,000 tons in 1930. Imports increased from 15,612 tons in 1922 to 55,107 tons in 1930. Total of domestic production + imports increased from 19,423 tons in 1922 to 165,107 tons in 1930.

(19) Adaptability of soybean oil to use in various products (p. 464): The products are: Drying products (paint, varnish, linoleum and oil cloth, waterproof goods), soap products (hard and soft soaps), edible products (Lard compounds, cooking oils {if odor permanently eliminated}, salad oils, fountain drinks, candy, mayonnaise, margarin), miscellaneous (core oil, printer's ink). Four levels of adaptation and a maximum percentage are given for each use: Probable, inferior, satisfactory, and superior. The two superior adaptations are paint (to prevent yellowing), and soft soaps. Note: "The margarin industry was one of the first

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to use considerable amounts of soybean oil and at present it absorbs in the United States approximately 750,000 pounds annually."

2929. Stewart, C.L.; Burlison, W.L.; Norton, L.J.; Whalin, O.L. 1932. Supply and marketing of soybeans and soybean products: Tables 20-49 (Document part). *Illinois Agricultural Experiment Station, Bulletin* No. 386. p. 425-544. Dec.
• ***Summary:*** Tables show: (20) Total industrial utilization of soybean oil and percentages used in specified industries, United States, 1916-1931. The total pounds used rose from 143.34 million in 1916 to a peak of 335.44 million in 1918, then fell to a low of 7.53 million in 1924, rising slowly to 35.50 million in 1931. In 1917 (the peak year) soybean oil comprised 10.3% of all oils used in soap industry. In 1918 it comprised 4.6% of all oils used in the lard-substitute industry and 2.6% of all oils used in the margarin industry.

(21) Iodin [iodine] numbers, saponification numbers, acid numbers, and uses of oils and fats (p. 471). Values are given for: Chinese tung or wood oil, coconut oil, corn oil, cottonseed oil, fish oil, linseed oil, palm oil, palm kernel oil, peanut oil, soybean oil, tallow, whale oil. For soybean oil: Iodin number 124-148. Saponification number 189-194. Acid number 2-7. Uses: "Considerable quantities go into paint, varnish, enamel, linoleum, and waterproofing products. Used in soaps. Utilized in a large variety of food products. Used in core oils."

(22) Utilization of soybeans and soybean products by amounts, United States, 1930 crop: Beans (bushels)–Feed, seed, ground (for food {200,000 bu}, for feed), crushed, total (11.975 million bu). Oil (lbs): Edible purposes (Oleomargarine {750,000 lb}, lard substitutes {500,000 lb}, other food products {4,750,000 lb}), paint and other industries (paint and varnish, linoleum and oil cloth, other uses), soap kettle, increased stocks including oil equivalent, total (37.2 million lb). Meal (tons): Feed (commercial feeds, other feeds), food (flour {850 tons}, infant and diabetic foods {50 tons}), other uses including glue, total (110,000 tons).

(23) Estimated distribution of gathered soybeans according to use, Illinois, 1926-1931 crops. The four categories for each year are (with figures for 1931): Used by oil mill and feed manufacturers (50%), used for seed in state (22%), used for seed outside state (13%), used for feed on farm (15%).

(24) Extent to which soybeans came from local sources or were shipped in from outside the locality, and extent to which beans sold went to local purchasers or were shipped out of the locality, 151 identical country elevators and local seed dealers, Illinois, 1930 and 1926 crops. (25) Soybeans purchased by 151 country elevators and local seed dealers, Illinois, 1931 crop. Gives figures for 10 crop reporting districts. (26) Proportion of soybean crop leaving growers' hands that was out of their hands by middle of November, December, and January, Illinois, 1922-1932 (crop storage). Typically about 60% (range 30-70%) was out of their hands by Jan. 15.

(27) Estimated proportion of soybean seed shipped out of the locality by wholesale dealers and jobbers before specified dates in January, selected states and United States, 1919-1931 crops. The states are: Illinois, Indiana, Missouri, and North Carolina. For the USA, 38.9% on average had been shipped by Jan. 26. (27A) Soybean varieties marketed in different sections of Illinois, 1926 crop (11 localities) and 1930 crop (13 localities). The leading varieties of soybeans marketed in Illinois are Illini, Manchu, Midwest, A.K., Virginia, and Ebony.

(28) Estimated costs (cents per bushel) of handling soybeans for all purposes by 166 identical country elevators and local seed dealers, Illinois, 1930 and 1931 crops. For 9 crops reporting districts gives the percentage recleaned (23-30%) and the costs of recleaning and other costs. (29) Costs of handling soybeans other than cleaning by identical country elevators and local seed dealers in leading producing counties, Illinois, 1926, 1930, and 1931 crops. Costs 3.2 to 4.4 cents per bushel.

(30) Costs of raw materials and other items of soybean oil production, United States and selected foreign countries, 1923-1924 (per bushel of soybean crushed). The foreign countries are Manchuria (All Manchuria, Dairen only), Japan, Great Britain. The total cost is lowest in all Manchuria (6.26 cents) and highest in the USA (10.21 cents). (31) Estimated cost of handling soybeans used mainly for seed, 151 identical country elevators and local seed dealers, Illinois, 1926 and 1930 crops. (31A) Cost per bushel of moving soybeans from central Illinois on board boat at New Orleans [Louisiana], 1931 crop.

(32) Carloads of soybean federally inspected in leading soybean producing states, 1928-1932. The states are Illinois, Missouri, Indiana, North Carolina, Ohio, and Virginia. The most carloads were inspected in Illinois (in Peoria (2,412) and Chicago (1,284)). (33) Federal grade requirements for yellow, green, brown, black, and mixed soybeans (Grades 1-4 plus sample grade and Extra No. 1).

(34) Digestible nutrients in feed products of soybeans (soybean hay, seed, straw, seed and straw, oil meal; incl. yield per acre and digestible protein). (35) Digestible nutrients in soybean oil meal and other protein feeds (Incl. linseed meal {old process}, cottonseed meal {41%}, gluten meal, wheat middlings, wheat bran, tankage). Only tankage has a higher "feeding value" than soybean meal. (36) Total gross value of products obtained from a bushel of soybeans at different prices of oil and meal. Gives figures when the price of a pound of soybean oil ranges from 2½ cents to 10 cents per pound, and the price of meal ranges from $15 to $40 per ton.

(38) Average farm prices of soybeans by seven selected crop reporting districts, Illinois, January-May, 1925-1931. The average price over the years ranges from $1.70 to $2.07

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per bushel. The lowest price in one year was $0.97/bu in 1931 in Champaign. (39) Average monthly farm prices of soybeans in three crop reporting districts important in soybean production, Illinois, October-June, 1925-1930 crops. The price is always lowest in October and highest in June. So storage pays.

(40) Average prices paid to producers for soybeans by 151 identical country elevators and local seed dealers, Illinois, October-July, 1930 and 1926 crops (Dollars per bushel). (41) Average yearly wholesale selling prices of soybean seed, selected markets; quotations given for first five months of the following year, 1919-1931 crops. The places are: Chicago, Illinois; Louisville, Kentucky; Kansas City, Missouri; Minneapolis, Minnesota; and Baltimore, Maryland. The average price of the ten year period at various cities ranged from $2.25 (Baltimore) to $2.80 (Minneapolis). Prices were highest in 1920, lowest in 1932.

(42) Retail selling price of good-quality soybean seed in selected states, March-May, 1926-1932. The states are: Illinois, Indiana, Iowa, Kentucky, Missouri, Ohio, Tennessee. (43) Average prices paid to producers for thresher-run soybeans and average wholesale and retail selling prices, Illinois, 1925-1931 crops. Prices were highest in 1925, lowest in 1930. In 1925 the average price paid to farmers was 63.6% of the retail price, and the average wholesale price was 90.9% of the retail price.

(44) Average advertised price of soybean seed offered for sale by producers, by varieties, Illinois, March-June 1920-1930. The varieties are: Illini, Manchu, A.K., Midwest, Ebony, Virginia, Wilson, Black Eyebrow, Peking, Ito San, Ilsoy, Haberlandt, Ohio, Dunfield, Mansoy.

(45) Exports of soybeans from eight selected exporting countries, 1923-1930. Gives figures (1,000 lb) for total, China, Japan incl. Chosen [Korea], and Netherlands. (46) Imports of soybeans into selected countries 1913, and 1919-1931. Gives figures (1,000 lb) for total, Denmark, Japan incl. Korea, France, Germany, Netherlands, United Kingdom, United States. Figures in footnote for Sweden and Italy. The leading importers are now Germany, Denmark, and United Kingdom.

(47) Imports of soybean oil into seven selected countries, 1913 and 1919-1931. Gives figures (1,000 lb) for total, Denmark, Japan (incl. Chosen), France, Germany, Netherlands, United Kingdom, United States. Gives figures in footnote for Algeria, Austria, and Sweden. (48) Exports of soybean oil from eight selected countries, 1913 and 1919-1931. Gives figures (1,000 lb) for total, China, Denmark, Japan incl. Chosen, France, Germany, Netherlands, United Kingdom, United States. Figures in footnote for Algeria, Sweden, Austria, and Italy.

(49) Exports of soybean cake from Manchuria as a whole and from the port of Dairen, with destination of bean cake from Dairen, 1926-1931 (tons of 2,000 lb). Exports from Dairen to Japan, Korea, Europe, United States, China, Other destinations.

2930. Toa-Keizai Chosakyoku (East-Asiatic Economic Investigation Bureau). 1932. Manchuria year book 1932-33. Tokyo, Japan: Toa-Keizai Chosakyoku. 530 p. [Eng]

• ***Summary:*** The Preface begins: "Those who have been following the development of events in Manchuria since the fateful September of 1931 will not fail to understand in what circumstances we have compiled this volume... The last issue, which was the first published, appeared in November, 131, while Manchuria was in a chaotic condition, but the manuscripts for it were completed before the Sino-Japanese dispute over Manchuria occurred in September." There was the establishment of Manchuokuo in March, the signing of the Japan-Manchuokuo protocol in September, and the despatch [dispatch] of the League [of Nations] Commission of Enquiry and the publication of its report."

Chapters 2 and 3 give a Japanese version of the history of Manchuria, in four periods, from 311 B.C. to the present, and of its administration.

In Chapter 7, "Agriculture," the section on "Agricultural products" contains tables: (2) Agricultural production of 9 major crops in 1930 (incl. soya beans) in three provinces, total, Kwantung Leased Territory and South Manchuria Railway (S.M.R.) Zone, and grand total. (3) Cultivated area classified by crops, 1930. (4) Production of ordinary crops, 1924-1930. (5) Cultivated area of ordinary crops, 1924-1930. (6) Production index of ordinary crops, 1924-1930. (7) Index number of cultivated area of ordinary crops, 1924-1930. (8) Percentage of production and cultivated area of ordinary crops, 1924-1930. (9) Production and cultivated areas of ordinary crops classified by districts, 1930. (10) Value of exports of agricultural products (Haikwan taels), raw products and manufactured goods. (11) Exports of agricultural products (metric tons and Haikwan taels), 1921-1930. (12) Exports of principal agricultural products classified by destination (metric tons and Haikwan taels), 1930. (13) Amount of soya beans and cereals consumed in the three eastern provinces, 1930 (as food, fodder, or seed; in South and in North Manchuria). (14) Percentage of agricultural products shipped to the markets (in South and North Manchuria). Map of distribution of crops [and railways] in Manchuria (p. 111). Sub-section titled "Soya beans" (p. 110-12). A photo (facing p. 112) shows Soya bean at Tailai, piled in sacks near a railway. The soybean is the principal resource of Manchuria in terms of both production and acreage. In recent years, the annual production has reached more than 5 million tons, which is 60% of world soybean production.

Chapter 12, "Industry," includes table (6) Manufacturing production in the Kwantung Lased Territory and the S.M.R. Zone, 1926-1930 (both volume and value). Products include [soya] bean oil, [soya] beancakes, miso, and soy [sauce]. In Section 2, "Oil and fat industry" is a subsection (p. 188-

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97) titled "Oil milling" with these contents: Introduction. Diagram of utilization of soya beans. History. oil extraction methods, table (7) "Beancake producing capacity of oil mills per 24 hours, 1925-1931" (in major cities), table (8) "Beancake production in Manchuria (1,000 pieces), 1926-1930, in major cities and regions, table (9) "Exports of beans and bean oil from Dairen, Antung, Yingkow and Vladivostok, 1920-1931," table (10) "Exports of soya beans, beancake and bean oil (1927-1931)," table (11) Exports of beancake classified by ports, 1929-32," table (12) "Export of beancake classified by destination, 1929-1931" (Japan gets 62%), table (13) "Export of bean oil, 1931, by destination, "Solidified bean oil industry" [hydrogenated], table (14) "Production of solidified bean oil (by the Dairen Oil Fat Manufacturing Co., established 1916)." Miso and soy [sauce] manufacture (p. 230).

In Chapter 15, "Foreign trade, table (9) shows the "Quantity and value of exports at Manchurian ports (Value in H.K. taels). The main exports are soya beans, other beans, maize, kaoliang, and millet. The ports are Antung, Dairen [the main port for soya beans], Newchwang, Harbin, Aigun, Hunchun, and Lungchingtsun. The main destination countries are British Empire, USA, Germany, France, Russia, Other countries, Total, Chinese ports, Grand total. Note that Japan is not mentioned; it is probably concealed within "Other countries." The source of the statistics in table 9 is: Research Office of S.M.R. Co. *Trade Returns of North China,* 1930 and previous issues.

A large fold-out map at the end of the book shows all of Manchuria, incl. province boundaries, railways, steamer routes, and cables.

2931. Fukai, Tôshi; Komatsu, S. 1932. Shôyu hakkô to shiyu no kankei. III. Kôbo no zôhanshoku narabini hakkô ni oyobosu 2, 3 shibôzoku kôkyû arukoru-rui no eikyô [The relation between shoyu brewing and the fatty oils. III. Influence of several higher fatty alcohols on propagation and fermentation of yeast]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 115. p. 142-54. [Jap]
Address: Jozo Shikensho. 1. Gishu. Kenshuin.

2932. Fukai, Tôshi; Nagahashi, K.; Komatsu, S. 1932. Shôyu hakkô to shiyu no kankei. IV. Kôbo no seikatsu saibô narabini sono kôjô sayô ni oyobosu kapurin-san no seiri-teki sayô ni tsuite [The relation between shoyu brewing and fatty oils. IV. The physiological action of capric acid on the living yeast cell and its enzyme action]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 115. p. 155-74. [8 ref. Jap]
Address: Jozo Shikensho. 1. Gishu; 2. Joshu; 3. Kenshuin.

2933. Hara, T. 1932. [Studies on the utilization of rice bran]. *Eiyo Ken* 2:483-. [Jap]*

2934. Kobayast, S. 1932. [Studies on the antimold of mustard oil in shoyu]. *Osaka Shiritsu Kogyo Kenkyujo Hokoku* (*Bulletin of the Osaka Municipal Technical Research Institute*) 7:1-, 30-, 35-. [Jap]*

2935. Matsumoto, K.; Dei, S. 1932. Saikin-rui tenka shôyu jôzô shiken [The application of the pure culture of several kinds of bacteria in shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 115. p. 189-92. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Joshu.

2936. Matsumoto, K.; Dei, S. 1932. Kôji-kin shu hikaku shôyu jôzô shiken [The comparison of several kinds of *Aspergillus oryzae* in shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 115. p. 193-207. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Joshu.

2937. Matsumoto, K.; Dei, S. 1932. Shobo ôyô shôyu jôzô shiken [Brewing trials of shoyu with moto mash. The special culture of lactic acid bacillus and shoyu yeast]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 115. p. 175-81. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Joshu.

2938. Nagasaka, K.; Sahara, S. 1932. Miso seizô ni okeru papayochin no riyô ni tsuite [Use of papain in the manufacture of miso]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 27(4):21-23. [Jap]
Address: 1. Todai Nôgaku-bu, Joshu Nôgaku-shi; 2. Ootomo, Miso Kenkyusho Gishi, Nôgaku-shi.

2939. Nagasaka, K.; Sahara, S. 1932. Miso kôji no kôso-ryoku to seihin to no kankei ni tsuite [The relation between the enzymic power of miso koji and the finished miso]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 27(2):23-26. [Jap]
Address: 1. Todai Nôgaku-bu Nogei Kagaku Kyoshitsu, Nôgaku-shi; 2. Ootomo, Miso Kenkyusho Gishi, Nôgaku-shi.

2940. Nakajima, K. 1932. Studies on the proteins and oil of soy bean. *J. of the Faculty of Agriculture, Hokkaido Imperial Univ.* (*Hokkaido Teikoku Daigaku Nogakubu Kiyo*) 31(3):165-356. (Chem. Abst. 27:2053). [88 ref. Eng]
• ***Summary:*** Glycinin is denatured almost completely into a glutelin-like protein, soluble in 0.2% sodium hydroxide, by the oil-extraction process. The rates of digestion of natural and denatured glycinin by enzymes, and the action of papain and castor-seed powder on the oil, were studied. Viscosities of mixtures of the oil with organic solvents were measured.

Thanks to Mr. K. Sugiyama, president of Honen [Hohnen] Oil Co. Address: Hokkaido Imp. Univ., Sapporo,

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Japan.

2941. Obata, Y.; Matsuno, N.; Tamura, U. 1932. [Biological value of tofu and miso]. *Kokuritsu Eiyo Kenkyusho Kenkyu Hokoku* (*Research Report of the National Institute of Nutrition*) 20:20-27. [Jap]*
• ***Summary:*** The biological value of non-salty miso and low-salt miso is 73.2 and 70.7 respectively, compared with casein which has a biological value of 80.1.

2942. Sakurai, Yoshito. 1932. Miso no seibun. I. Shibô no ippan seijô ni tsuite [The constituents of miso. I. On the general properties of the oils]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 8:1312-13. (Chem. Abst. 27:1059). [Jap]

2943. Shirahama, K.; Shimizu, G. 1932. [Iodine contents of the important agricultural products in Japan]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 8:527-31. (Chem. Abst. 26:4388). [Jap]*

2944. Shoji, Kenjiro; Konuki, H. 1932. Poraroguraf u ni yoru hakkô seisei butsu no kenkyû. VI. Shôyu kôki ni kansuru chiken [Studies on fermentation products with a polarograph. VI. On the flavor of shoyu]. *Rikagaku Kenkyujo Hokoku* (*Report of the Institute of Physical and Chemical Research*) 11(2):277-83. (Chem. Abst. 26:5377). [6 ref. Jap]

2945. Tanaka, Shinjiro. 1932. Miso seizô-hô [Method of making miso (Abstract)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 27(6):56. [1 ref. Jap]
• ***Summary:*** A 4-line summary of his 1932 patent on the manufacture of miso.

2946. Tanaka, Shinjiro; Ashikawa, T.; Nakamatsu, M. 1932. Miso seizô-hô [Method of making miso]. *Japanese Patent* 800. In Toku Ko, 800. [Jap]
• ***Summary:*** Note: This is the earliest document seen (Jan. 2010) concerning commercial miso manufacturing. Address: 1. Tokyo-shi, Koishikawa-ku, Otsuka, Sakashita-cho 167, Japan; 2. Kobe; 3. Tokyo.

2947. Tanaka, S. 1932. [Miso manufacture]. *De Ko* 2222. [Jap]*

2948. Tanaka, T. 1932. Chôsen no jimbun chishi gaku teki kenkyû [Anthropogeographical studies on Korea]. *Chiri Kyoiku* (*Geographical Education*) 16:587-92. [Jap]*

2949. Udo, S. 1932. Shôyu no aji ni kansuru kenkyû. IV. Shôyu-chû no seibun to shôyu no aji ni tsuite [Studies on the taste of shoyu. IV. Chemical components and the taste of soy sauce]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 8:675-84. (Chem. Abst. 27:1059). [7 ref. Jap]
Address: Nôgaku-shi, Japan.

2950. Udo, S. 1932. Shôyu no aji ni kansuru kenkyû. III. [Studies on the taste of shoyu. III. Change in succinic acid during soy sauce fermentation]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 8:673-75. (Chem. Abst. 27:1084). [7 ref. Jap]*
Address: Nôgaku-shi, Japan.

2951. Abadal, D. Jose; Soroa, Jose Maria. 1932. Cultivo y aplicaciones de la soja [Cultivation and applications of the soybean]. Madrid: Patronato Central para la Proteccion de Animales y Plantas. 44 p. Illust. [Spa]
• ***Summary:*** Contents: Introduction (preliminary notes). Part I: Cultivation and applications of soya. Chart of utilization of the soybean seed. Agronomic notes and details on soybean cultivation. Part II: Soya as a food. Nutritional value, soya as a vegetable (green vegetable soybeans; *Soja, como verdura*), soy sauce (*salsa de soja*), soymilk (*leche*), condensed soymilk (*leche concentrada / condensada*), powdered soymilk (*leche en polvo*), fermented soymilk (*leche fermentada*), soy cheese (*queso de soja*) [tofu], soy casein (*caseina de soja*), soy flour (*harina de soja*), soy bread (*pan de soja*), Soyolk (soy flour made by Dr. Berczeller), whole-grain soy bread (*pan integral*), soy flour tablets (*comprimidos*), pastries, biscuits, puddings, etc. (*pasteles, bizcichos, puddings*), soy oil (*aceite de soja*), fermented soy products (*productos de la soja fermentada: natto, miso, shoyu*), confectionery products (*productos de confiteria*), chocolate (*chocolate*), coffee (*café*), soy ferments/enzymes (*fermentos de soja*), products made by Caséo-Sojaïne (*Caseo-Sojaina de Paris*). Soy as a livestock food. Appendix.

"As early as 1918 a Spanish public official, Don Julio de Palencia, the Spanish Consul in Shanghai, sent the State Department (*Ministeria de Estado*) a magnificent report specifying the great attention that representatives of the principal countries of the world were giving to this crop [the soya bean], and the relevance that it would have in the agricultural economy of the future. What a pity that Spain has been the only civilized country to ignore the study of the soya bean and its exploitation on a large scale" [p. 5].

"Finally we must make public our thanks to the spokesmen of this foundation/board (*Patronato*) for the special work they have done in writing this booklet: Don José Maria de Soroa, secretary of the Special School for Agricultural Engineers (*Escuela Especial de Ingenieros Agrónomos*), and Dr. Don José Abadal, chief of the Bureau for the Inspection of Pharmaceutical Services of the Ministry of War (*Negociado de la Inspección de Servicios Farmaceuticos del Ministerio de la Guerra*)" [p. 6].

"In 1917 the Spanish Consul in Shanghai, Don Julio Palencia, sent to the State Department a study on cultivation of soya, proposing that tests be done to acclimatize this

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valuable crop to our country.

"In Motril and later at the southern agricultural station of Malaga, the agricultural engineer D. Arsenio Rueda has been cultivating soya for the past 10 years [i.e. since 1923] in plots of 5 ares [1 are = 100 square meters], obtaining 60 liters (each liter weighing 780 gm) in each one.

"The white as well as the black varieties give good results, though the white ones do best. The seeds have been distributed to farmers who have noticed that, even though at first the goats that were given them as food rejected them, after a few days of getting used to this grain preferred them to such an extent that one must avoid growing this plant near the herd's path lest the herd be attracted and devour it all.

"Although soya is a legume which draws many nutrients out of the soil (*esquilmante*), it has according to Mr. Rueda, sufficient interest since it allows usage of terrains where field beans cannot be used due to the invasion of the pest called *Orobanche speciosa,* commonly called 'Jopo.' This parasite does not attack soya...

"Besides the quoted trials, it has been more than 25 years since soy has been grown in Spain with success due to the interest and zeal that in their patriotic work, the agricultural engineer Mr. Eduardo Noriega undertook with his partner, Mr. Ortiz, on the farm of 'Jerez.'

"He was successful during many years using the yellow and black varieties, later on also cultivating it in the Spanish central region.

"We think it useful also to state in writing the following data about soy grown by Dr. D. Jose Abadal in Lerida during the years of 1925-1926.

"The experiment was done only out of curiosity, with the intention of seeing if it could be grown in said province. Japanese seeds of the hirsute soy variety, yellow seed, used as food for diabetes, were used. The planting was done in a garden with seeds that had been soaked for ten hours, with no more care or fertilizers than those used for all the existing plants of that garden. The terrain of course was one of easy irrigation and located in Lerida where it is very hot all during the summer.

"This brief essay demonstrates that soy can be grown in irrigated terrain in very hot places and with little care.

"Fifteen years ago, the agricultural Engineer D. Jesus Andreu, in the province of Pontevedra [in the northwest corner of Spain, just north of Portugal, bordering the Atlantic ocean], did some tests with good results on growing soy as a forage plant.

"We also have news, though not concrete, of other successful tests done in the provinces of Madrid and Toledo." Address: 1. T.C. Farmaceutico Militar; 2. Ingeniero Agronomo e Ingeniero Sanitario, Spain.

2952. Chamberlain, Basil H. 1932. Translation of "Ko-ji-ki" or, "Records of ancient matters." 2nd ed. Tokyo: J.L. Thompson & Co. lxxxv + 495 p. 22 cm. *

• ***Summary:*** With annotations by W.G. Aston. Kobe, Pub. with permission of the Asiatic Society of Japan, Tokyo, by J.L. Thompson & Co. (Retail) ltd. Note: The Kojiki first appeared in Japan in 712 A.D.

2953. Heibonsha. 1932. Dai hyakka jiten [Japanese encyclopedia]. Tokyo: Heibonsha. 15 vols. [Jap]
• ***Summary:*** For roasted soybeans (irimamé), see Vol. 1, p. 1025. For green vegetable soybeans (Edamamé) see Vol. 2, p. 237. For soynuts and mamé-maki, see Vol. 4, p. 899. For tofu, see Vol. 9, p. 284-85. For soymilk, see Vol. 9, p. 1169. Address: Tokyo, Japan.

2954. Japan Tourist Bureau. 1932. Pocket guide to Japan. Tokyo: Japan Tourist Bureau (Kokusai Kankôkyoku; Tetsudôchô). xi + 153 p. See p. 12. Illust. (some color). Maps (some fold-out). Index. 19 cm. [160+* ref]
• ***Summary:*** "Mame-maki or 'Bean Scattering Ceremony' (Feb. 4th). In the evening every house practises a traditional and peculiar ceremony of bean scattering. Then people in the house scatter parched beans in and out of the house loudly shouting 'Fortune in, Devils out,' thus calling in the year's fortune and driving out any probably misfortune from the household" (p. 12).

Contents includes: Chosen (Korea). Cities and noted places along the S.M. [South Manchurian] railway. Taiwan. Address: Tokyo, Japan.

2955. Manshu Daizu Shiryo Koenkai. Manshu Daizu Shiryoka Zadankai. Minami Manshu Tetsudo K.K. Chihobu Shokokuka. 1932. Manshû daizu kasu to sono shiryôka ni tsuite [Manchurian soybean cake and its use in feeds]. Dairen, Manchuria. 143 p. Includes three separate sections. [Jap]*
• ***Summary:*** Name of company with diacritics is: Manshû Daizu Shiryo Koenkai. Manshû Daizu Shiryoka Zadankai. Minami Manshû Tetsudô K.K. Chihobu Shokokuka. Address: Dairen, Manchuria.

2956. Morse, W.J. 1932. Soybeans–Manchuria (Continued–Document part II). Attached to: Dorsett, P.H.; Morse, W.J. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon (Log of Dorsett-Morse Expedition). 181 p. Illust. 28 cm.
• ***Summary:*** Continued from page 80: (76) After cleaning, the seed is measured. (77) After cleaning and measuring the seed is often bagged ready for the market. (78) Home-made implements used in cleaning seed from threshed material (79) Rake commonly used in separating the coarser material in seed cleaning. (80) Broom made from kaoliang stalks used in scraping up seed on threshing ground. (81) Native cart used in transporting produce [including soybeans] to market. (82) Cartload of bags of soybeans in the yard of a Chinese

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inn, North Manchuria. (83) View of a Chinese inn on the outskirts of Harbin, North Manchuria. (84) Arrival of farmer with cartload of soybeans in a Chinese inn yard. (85) View of Chinese inn yard showing accommodations for horses. (87) Manchurian farmer at a Chinese inn near Harbin, North Manchuria. (86) Chinese storage merchants either purchase the soybeans direct from the farmers at the Chinese inns or arrange through the master of the inn for the purchase of seed as the farmer comes in from the country. (88) Manchurian farmers selling cartloads of soybeans in the open soybean market at Kaiyuan, Manchuria. (89) Soybean seed stored in sacks in open storage in railway yards in North Manchuria. (90) Unloading from farm carts and storing soybean seed in osier bins in Chinese merchant's storage yard. Kungchuling, Manchuria. (91) Cartload of soybeans in storage yard of Chinese grain merchant. North Manchuria. (92) Soybeans lumped in piles in a railway yard in North Manchuria. (94) Uncovered rick of bags of soybeans in railway yards in North Manchuria. (93) Open storage in bulk of soybean seed in a railroad yard in North Manchuria. (95) Ricks of bags of soybeans covered with matting and tarpaulin in railway yards, North Manchuria. (96) Cartload of bags of soybeans in Chinese merchant's storage yard, North Manchuria. (97) Beans are sometimes transported in bulk by the farmer. (98 & 99) placed in bags, and dumped in osier bins (100-105). (98) Measuring and bagging beans in Chinese grain merchant's storage yard. (99) Wooden measure used for measuring beans by Chinese grain merchants. (100) Osier bin half filled with soybeans, North Manchuria. (101) Osier bins filled with beans. (102) Filling osier bins with beans. (103) Close-up view of osier bin just filled with beans. (104) Osier bin filled with beans and capped. (105) General view of Chinese grain merchant's storage yard showing storage of soybeans in osier bins. Kaiyuan, Manchuria. (106) "River beans" at Tingkow, Manchuria, on the Liao River. (107) Manchurian farmers carting soybeans to Harbin across the frozen Sungari River, December 2, 1930. (108) "Train beans" stored in railway yards, Dairen, Manchuria. (109) "Cart beans" stored in osier bins in Chinese grain merchant's storage yard. (110) Coolies unloading a car of soybeans in railway yards. (111) Bags of soybeans are shipped in open cars along the Chinese Eastern Railway in North Manchuria. (112) Train-load of sacks with soybean seed being moved from storage yards in North Manchuria over the Chinese Eastern Railway to Changchung, Manchuria. (113) Beans and bean cake being loaded in large freighter at Yingkow [Yingkou] for shipment to Japan. (114) Soybeans are shipped in closed box cars on the South Manchuria Railway. (115) The foundation of the osier bin consists of logs or heavy pieces of timber over which is laid a matting of closely-woven kaoliang stalks. (116) The sides of the osier bin of matting 15 inches wide, unrolled as the bin is gradually filled. (117) Filling osier bin with beans. (118) Osier bin half filled with beans. (119) Two osier bins nearly filled with beans. (120) Osier bin filled with beans. (121) Osier bin filled with beans and being capped with bundles of millet straw. (122) Filling osier bins with beans and capping a completely filled bin. (125) Side view of bags of beans stacked under matting cover in grain merchant's storage yard, Harbin, Manchuria. (123) Soybeans stored in osier bins in the storage yard of a Chinese grain merchant. Kaiyuan, Manchuria. (124) Scene in the storage yards of a Chinese grain merchant during the soybean marketing season. Kaiyuan, Manchuria. (126) End view of stacks of bags of soybeans covered with matting. Harbin, Manchuria. (127) Stack of bags of beans completely covered with matting and tarpaulin. Harbin, Manchuria. (128) Sacks of soybeans stored under tarpaulin in a Chinese merchant's storage yard. Harbin, Manchuria. (129) General view of sacks of soybeans stored under matting in a Chinese merchant's storage yards. Harbin, Manchuria. (130) Bags of beans stored in warehouse of South Manchuria Railway yards. Dairen, Manchuria. (131) Looking down aisle between stacks of soybeans in warehouse of South Manchuria Railway yards. Dairen, Manchuria. (132) Coolies unloading bags of soybeans for open storage in South Manchuria Railway yards, Dairen. (133) Covered stack of bags of beans in open storage. (134) Inspector drawing sample of beans for inspection in railway storage yard. (135) Inspecting soybeans in railway storage yards. (136) Weighing in bags of beans during inspection in railway storage yards. (137) Inspecting beans in storage yards of Chinese soybean oil mill. Dairen, Manchuria. (138) Wagon load of soybean oil cake on way from Chinese oil mill to oil cake warehouse. Dairen, Manchuria. (139) Coolies unloading wagons of oil cakes at one of the warehouses of the South Manchuria Railway. (140) Millions of soybean oil cakes are piled high in the warehouses of the South Manchuria Railway, Dairen. (141) Close-up view of soybean oil cakes in a warehouse, Dairen. (142) Coolie carrying soybean oil cakes from warehouse to flat car, Dairen. (143) Loading flat cars with oil cakes from warehouse for shifting to wharves. (144) Train of flat cars loaded with oil cakes to be shifted to wharves for export. (145) Coolies unloading flat cars of oil cakes at wharves for export. (146) Coolies unloading oil cakes from box cars at wharf warehouse, Dairen. (147) Oil cakes unloaded from wagons and stacked on wharf for export, Dairen. (148) Soybean oil cakes stacked under covering in storage yards of a soybean oil mill, Dairen. (149) Coolies stacking soybean oil cakes in railway storage yards. (150) Close-up view of coolies stacking soybean oil cakes in railway yard open storage. (151) Soybean oil cakes stacked under cover and in open wharf storage yard. (152) Soybean oil cakes stacked along wharf, Dairen, Manchuria. (153) Unloading and stacking soybean oil cakes at Chinese Junk Wharf, Dairen, Manchuria. (154) Stacks of soybean oil cakes awaiting shipment at Chinese Junk Wharf, Dairen, Manchuria. (155) Broken, molded soybean cakes are spread out on tarpaulin to dry, Dairen. (156) After broken, molded

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cakes are thoroughly dried in the sun, the material is bagged and sold for fertilizer. (157) General view of the soybean oil inspection laboratory of the South Manchuria Railway showing drums of soybean oil brought from Chinese oil mills for inspection and grading. (159) Drums of soybean oil being delivered at the oil testing laboratory of the South Manchuria Railway. (158) Chinese soybean oil mill with oil storage tanks and osier bins for storage of seed. Kungchuling, Manchuria. (160) Train of tank cars filled with soybean oil from points in North Manchuria. (161) Attaching pipe line from tank to freighter, Dairen, Manchuria. (162) Filling the tanks of a freighter with soybean oil, Dairen, Manchuria. (163) Bundles of grass used in the pressing of soybean oil. (164) Screw type of press [manual] commonly used by Chinese oil mills in Manchuria. Said to have been first used by the Tarkoyuan Mill, Yingkow (Newchwang) in 1896. (165) Soybean flakes being steamed over a vat in preparation for pressing. (166) Soybean oil cakes being carted from oil mills to warehouse in South Manchuria Railway Storage Yards, Dairen. (167) Unloading soybean oil cakes at the warehouse to which they have just been brought from the oil mills. (168) Loading bags of soybean on a German freighter at Dairen. (169) Bags of soybeans being loaded on a German freighter, Dairen, Manchuria. (170) Soybeans being loaded on a German freighter, Dairen, Manchuria. (171) Soybeans are exported to many Chinese ports by junk. (172) Loading Japanese freighter with bean cakes at Dairen, Manchuria. (173) Loading bean cakes on junks for export to Chinese ports. (175) Filling a tank on an English freighter with soybean oil. (174) View showing the filling of the oil tanks of a British freighter with soybean oil at the oil wharf in the South Manchuria Railway yards. (176) General view of Dairen wharves showing steel drums and oil paper lined baskets of soybean oil ready for shipment to Chinese ports. Address: USDA, Washington, DC.

2957. Morse, W.J. 1932. Soybeans–Manchuria (Continued–Document part III). Attached to: Dorsett, P.H.; Morse, W.J. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon (Log of Dorsett-Morse Expedition). 181 p. Illust. 28 cm.

• ***Summary:*** Continued: The "History" section of this book (p. 30) states: "According to Chinese literature, the soybean was grown as a farm crop in China proper more than 5,000 years ago. The origin of soybean culture in Manchuria is not definitely known but is supposed to have been brought from Central China districts many centuries ago. At first the beans were grown only for food but when they became a source of oil, production gradually increased. The production of soybeans, however, was more or less localized until after the Chinese-Japanese war [first Sino-Japanese war, Jan. 1894 to Jan. 1895] at which time Japan began to import the oil cake for fertilizing purposes, resulting in a sudden expansion of demand for this product. The Japanese-Russian War [Russo-Japanese war, 1904-05] brought about a wider interest in the soybean and its products, successful shipments being made to Europe about 1908, and the soybean soon assumed world-wide attention. Acreage and production increased by leaps and bounds so that the soybean became one of the most important staple crops and exports of Manchuria.

"Importance: The soybean is the most important agricultural crop in Manchuria today and business circles depend to the greatest extent upon the market situation of the soybean and its products oil and oil cakes. Soybeans make up more then one-fourth of the staple crop acreage of Manchuria, the annual production of seed being around 180,000,000 bushels. As the big cash crop of the region providing fully one-half of the farm income in northern Manchuria and more then one-half of the total volume of freight handled by Manchurian railways, the soybean is a dominating factor in the economic life of the country. From two-thirds to three-fourths of the soybean crop is exported."

Maps: Map of Manchuria (p. 2).

Tables: (1) Climatic conditions in the most important regions in Manchuria. These are: Dairen, Mukden, Changchun, Harbin, Tsitsihar. For each region is given: Latitude. Temperature in July and in August. Growing season (days). Rainfall (inches). Warm season rainfall * (percent). * Period from May to August inclusive.

(2) Area, total population, and population per square mile of the Three Northern Provinces. They are: Liaoning (Fengtien), Kirin, and Heilungkiang [Heilongjiang]. The latter has by far the largest area (211,385 square miles), but by far the smallest population (5.134 million), and by far the lowest population density (24 people per square mile).

(3) Total acreage of cultivated and uncultivated land in the Three Northeastern Provinces. Liaoning 19.1% cultivated. Kirin 22.9% cultivated. Heilungkiang 6.9% cultivated.

(4) Percentage of production and cultivated area of ordinary crops in Manchuria, 1930. Source: Manchuria Yearbook, 1932-33. Gives both sets of figures each year from 1924 to 1930 for soybeans, other beans, kaoliang, millet, maize, wheat, and other cereals. In 1926 production of soybeans first passed production of kaoliang to become the leading crop in Manchuria.

(5) Percentage of principal crops by agricultural regions in North Manchuria for 1929 and 1930. The agricultural regions are: South of Harbin, Harbin, East of Harbin. Below Sungari River, Hu-hai, West of Harbin. other places. Soybeans are the leading crop for both years in most of these regions. Data furnished by R. Kadono, Research Office, South Manchuria Railway, Harbin, Manchuria.

(6) Acreage of principal crops by agricultural regions in Manchuria, 1929. Figures are given for 15 regions; most are not the same as those in Table 5.

(7) Agricultural production in Manchuria in 1930.

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Figures are given for the three provinces, the total of the three, and for the Kwantung Leased Territory & South Manchuria Railway (SMR) Zone. Kirin province is by far the leading soybean producer with 2.364 million metric tons. Total soybean production in this area in 1930 was 5.318 million metric tons.

(8) Estimated production of soybeans by districts in Manchuria, 1931 (in bushels). Manchuria is divided into South Manchuria (where 79.783 million bu were produced) and North Manchuria (where 116.952 million bu were produced). Each of the two parts of Manchuria is divided into about 8 districts. By far the biggest soybean producing district is the Chinese Eastern Railway–eastern section in North Manchuria (41.361 million bushels).

(9) Soybean introductions [to the USA] from China, Japan, Manchuria, and Chosen (Korea) classified according to seed color. Fifteen different seed colors are given. By far the most common seed color (2910 out of 4578 total, or 63.5%) was straw yellow. The total number of introductions from each country were: Chosen (Korea) 3379 (or 73.8% of the total). Japan 577. Manchuria 511. China 111.

(9a, p. 39) Named native varieties of soybeans grown in different sections of Manchuria. Thirty-six names are given, in alphabetical order.

(9b, p. 42), Criteria for soybean plant selection each fall at Kaiyuan Experiment Station. Seven criteria, each of which is record for each selection.

(9c, p. 45). Time of planting soybeans. Ranges from April 25 to May 10 at Changchun to May 15 to May 20 at Laiyang.

(10) Number of labor units expended for staple crops of Manchuria. Gives figures for soybeans, wheat, kaoliang, millet, and corn. For each crop gives: Labor units per acre. Value of crops per acre in 1922, 1923, and 1924. Return per "labor unit" in 1922, 1923, and 1924. Soybeans usually gave the highest return per "labor unit"–but sometimes wheat gave the highest return.

(11) Future and spot transactions of the produce exchanges in Manchuria under Japanese supervision. Gives figures for the years 1913, 1918, 1923, 1928, and 1929. For each year gives: Amount of future delivery in silver yen. Amount of spot delivery in silver yen. Total. The total increased from 41.3 million in 1913 to 16,538 million in 1929. Part of this increase was clearly due to inflation.

(12) Soybean inspection grades of the South Manchuria Railway, 1923-1929, inclusive. Figures are given for each year. The three main categories are perfect seed, imperfect seed, and dirt. Under perfect seed, the two subcategories are yellow and colored. Under each of those are Excellent, 1st grade, and 2nd grade. Under imperfect seed, the two subcategories are injured and immature. Under each of those are Excellent, 1st grade, and 2nd grade.

(13) Physical analysis of standard samples from mixed storage soybeans for 1931-32.

(14) Physical analysis of standard samples for 1931-32. There are five classes of soybeans: Special, 1st class, 2nd class, 3rd class, and 4th class. For each class there is a column for yellow beans, green beans, brown beans, black beans, worm-eaten beans, unripe beans, and foreign matters.

(15) Physical analysis of soybeans in mixed storage for the year 1930-31. The five classes and seven columns are the same as for table 14.

(16) Results of physical analysis of Manchurian soybeans during the last ten years. Starts with 1923-24 and ends with 1931-32. The eight columns given for each year are the seven in table 14 plus one for "discolored beans."

(17) Amounts of bean oil and bean cake obtained from 100 kin (132.2 pounds) of soybeans by different milling systems. The 3 systems are round cake system, plate cake system, and [solvent] extraction system.

(18) Composition of bean cake or meal produced by three different milling systems.

(19) Total production of bean cake (pieces) in Manchuria in 6 localities for 1926-1930 inclusive. Source: The Manchuria Yearbook, 1932-33, p. 194.

(20) Location, number, systems, and production of soybean oil mills in 6 localities in Manchuria, 1926.

(21) Bean cake (pieces) producing capacity of oil mills in 6 localities in 24 hours, 1925-1931.

(22) Principal Manchurian exports for 1929, value in Haikwan taels. Soybeans are #1 with 40% of the total value. Ban cake is #2 with 15%. Ban oil is #4 with 5%.

(23) Exports of staple products through Dairen during the first 7 months of 1930, 1931, and 1932. Both quantity (short tons) and value (dollars).

(24) Exports of soybeans, soybean cake, and soybean oil from Manchuria to foreign countries, 1909-1930.

(25) Amount of soybeans of 1929 crop rejected for various reasons by the Chinese Eastern Railway. Eight different reasons are given with the amount rejected in tons for each reason. No. 1 reason is "Mixture of earth," followed by "short weight."

(26) Comparison of bean cake exports from Dairen, Newchwang, and Vladivostok from Oct. 1929 to March 1930, with same previous season. Figures given for the following countries: Japan proper, China proper, Formosa, Chosen (Korea), and other countries.

(27) Bean cake (pieces) exports according to destination (same destinations as in Table 26).

(28) Exports of soybean oil according to destination, 1931 (same destinations as above). Address: USDA, Washington, DC.

2958. Ryerson, Knowles A. 1932. Plant explorers bring valuable new species and varieties to U.S. *Yearbook of Agriculture* (*USDA*) p. 297-302. For the year 1930. See p. 298.

• ***Summary:*** "In the spring of 1931, P.H. Dorsett, of the

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Division of Foreign Plant Introduction, and W.J. Morse of the Division of Forage Crops and Diseases, returned from the Orient after a search of more than two years for new varieties of soybeans. Their travels took them to Japan, including Hokkaido, the northernmost island, the peninsula [sic, island] of Saghalin [Russian: Sakhalin; Japanese: Karafuto], to Manchuria, Chosen (Korea) and China. Almost 3,000 soybean varieties were obtained in these great soy-producing areas.

"Special attention was also paid to other legumes of possible value to American agriculture, and important collections of mung beans, lespedeza, alfalfas, and Melilotus varieties were made. Other valuable field-crop introductions resulting from this expedition include collections of barleys, wheats, and grasses.

"A number of valuable horticultural contributions were also obtained. A special study was made of the oriental persimmon and about 200 introductions were made from Japan, China, and Chosen. In Peiping the expedition discovered the fruit being processed on a large scale to remove astringency, and made a thorough study of the methods used. Investigations of the outdoor storage of this fruit, begun during a previous expedition, were continued." Address: Bureau of Plant Industry, USDA.

2959. *Times* (*London*). 1933. Official record of dealings. Jan. 12. p. 19, col. 5.
• ***Summary:*** The section titled "Banks and discount companies" contains the following entry: "Indust. of Japan (SOY), 43/-++." Note: The meaning of this is not clear. This entry last appeared on 22 June 1938 (p. 27, col. 5).

2960. Sakurai, Yoshito. 1933. Miso no seibun (yohô). Sendai miso jukusei-chû no henka ni tsuite [The constituents of miso (Preliminary note). On the changes during ripening of Sendai miso]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 9(1):5-6. [Jap]
• ***Summary:*** A table shows the nutritional composition for 13 nutrients of Sendai miso at the start of fermentation, and after 1, 3, 6, 9, and 12 months. Address: Nôgaku-shi, Japan.

2961. *Commerce and Finance.* 1933. Jap and the bean-stalk. 22(6):147. Feb. 8.
• ***Summary:*** Discusses the soy bean in East Asia, soy bean oil, soy bean milk ("fed to thousands of Chinese and Japanese babies"), tofu, soy bean coffee, and soy bean flour. "It is not generally known that the soya bean was used during the American Civil War as a coffee substitute."

"Soya bean flour is a concentrated food... In soups it resembles beef extract; one of the most famous European brands of soup cubes has a soya bean base.

"For troops in the field the bean is almost indispensable. Soya bean oil is used in the manufacture of explosives. Bean soups, curd, flour, meal and coffee can be a field diet in themselves. Many a city besieged by bandits has survived on stores of bean cake originally intended as fertilizer." Note: This is the earliest English-language document seen (June 2008) which states that bandits survived on soybeans–in this case bean cake in a besieged city.

2962. *Foreign Crops and Markets* (*USDA Bureau of Agricultural Economics*). 1933. The Manchurian soy bean situation. 26(7):184-88. Feb. 13.
• ***Summary:*** "The Manchurian soy bean acreage for 1933 probably will be no larger than that of 1932, according to Assistant Agricultural Commissioner Fred J. Rossiter at Shanghai. Unsettled political conditions are expected to continue to restrict the acreage. A large number of farmers have left their homes, while others have lost their work animals and will leave the land uncultivated."

"The amount of soy beans and bean products available for export during the crop year ending September 30, 1933 is considered to be about 30 per cent less than the amount available in 1931-32."

"Review of the 1931-32 season: While the United States disposed of [exported to Europe] over two million bushels of soy beans in Europe during the crop year, which ended September 30, 1932, Manchuria shipped to the same destination fifty-six million bushels of beans and the equivalent of over fifteen million bushels in the form of bean oil."

Tables show: (1) Manchuria: Exports of soy beans, bean cake and bean oil, by countries, year ended September 20, 1932. Includes exports from Dairen, Newchwang, Vladivostok and Manchuli. The exports are to Europe, Leningrad, Japan (incl. Chosen [Korea] and Taiwan), China, East Indies [Indonesia], United States, Others, and Total. Soy bean exports totaled 2,993,923 short tons, with the largest amount going to Europe (1,477,033). Soy bean cake exports totaled 1,503,395 short tons, with the largest amount going to Japan (980,911). Soy bean oil exports totaled 154,418 short tons, with the largest amount going to China (101,784).

(2) Manchuria: Average monthly price of soy beans and soy bean products at Dairen in silver yen and United States currency, 1929-30 to 1932-33.

2963. Hansen, Louis A. 1933. The soy bean as human food. *Life and Health* 48(2):21-23, 27. Feb. Also in J. of the Jamaica Agric. Soc., March 1933, p. 147-50.
• ***Summary:*** This is a good introduction to the soybean, based largely on information provided by Dr. A.A. Horvath (until recently of the health section, U.S. Bureau of Mines) and William J. Morse (senior agronomist at the USDA Bureau of Plant Industry). Discusses: History of the soy bean in Asia (especially China), nutritional benefits, soy bean flour, soy bean milk, and soy sauce.

Photos show: (1) Two men standing in a field of tall soybeans. (2) A person grinding soybeans with a stone mill

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to make soy bean milk in China. (3) A "Chinese courtyard with pots of fermented soybeans and brine from which the well-known soy sauce is made." (4) Steamed soy beans about to be made into miso in Japan.

Note: In 1968 Hansen wrote a book titled *From So Small a Dream,* about Madison College (Madison, Tennessee), which pioneered soyfoods in the United States.

2964. Honen Seiyu, K.K. 1933. [Adhesive for wood]. *Japanese Patent* 99,595. Feb. 16. (Chem. Abst. 28:2481). [Jap]*

2965. Okano, M. 1933. Daizu moyashi [Soybean sprouts]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 9(2):115-19. [5 ref. Jap]

2966. Sasaki, Shûiku. 1933. Daizu moyashi no yûki enki-rui ni tsuite [Organic bases in germinated soybeans]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 9(2):115-19. Feb. (Chem. Abst. 27:2711). [5 ref. Jap]
• ***Summary:*** The mother-liquor after removal of asparagine from an aqueous extract of soya beans germinated in the dark afforded (per kg from 2 species): adenine 0.52, 0.42; guanine 0.12, 0.08; histidine 1.60, 2.01; arginine 3.33, 3.09; choline 1.44, 1.71; cadaverine 1.22, 1.16 (gm?). Address: Nôgaku-shi, Japan.

2967. Satow, S. 1933. [Adhesive]. *Japanese Patent* 99,757. Feb. 24. (Chem. Abst. 28:2481). [Jap]*

2968. Suzuki, Kozo; Yazaki, Ataru. 1933. Daizu kasu no shiryô-teki kachi [Nutritive value of soy-bean cakes for feed or fodder]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 9(2):145-51. Feb. (Chem. Abst. 27[12]:2985). [11 ref. Jap]
• ***Summary:*** "The cake... is not adequate for normal growth. The minimum amount of protein in the soy-bean cake which is necessary for the growth of young rats is little inferior to that of the eggwhite protein."

The cake obtained in removing the oil by pressure contains more vitamin A than that obtained by extraction of the oil with solvents.

2969. Suzuki, Tsuneya. 1933. Miso jôzô-chû ni okeru gan chisso-butsu nakanzuku gurutamin-san no zôgen ni tsuite (zoku) [The increase and decrease of nitrogenous substances, especially glutamic acid, during miso fermentation (appendix)]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 11(2):135-38. Feb. [4 ref. Jap]
Address: Kôgaku-shi, Japan.

2970. Izume, Seiichi; Yoshimaru, Y.; Hidaka, T. 1933. Vitamin D ni kansuru kenkyû. IV. Shôyu abura-chû ni okeru Ergosterol no sonzai, narabini Vitamin D no shigen to shite kan taru shôyu abura no keizaiteki kachi [Research on vitamin D. IV. Ergosterol in soy-sauce oil and the economic value of soy-sauce oil as a source of vitamin D]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 9(3):246-54. March. [14 ref. Jap]
• ***Summary:*** The sterol, melting point 136-137ºC (acetate, melting point 131-132ºC), contains 19.8-20.0% (by absorption spectrum) ergosterol.

2971. Kurono, Kanroku; Iwashita, N.; Toriyama, S. 1933. Paraokishi ansoku kôsan oyobi sono esuteru no seishu bôfusei narabini shôyu bôbai-sei ni tsuite (Ueber die Wirkung der Paraoxybenzoesaeure und ihren Estern als Schuetzmittel auf das Saké und Schoyu) [On the effect of para-oxy benzoic acid and its esters as a preservative for sake and shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 117. p. 1-5. March. [2 ref. Jap]
• ***Summary:*** A German-language translation of the title appears below the Japanese title: Über die Wirkung der Paraoxybenzoesäure und ihren Estern als Schützmittel auf das *Sake* und *Schôyu.* Address: Jozo Shikensho. 1 Gishi; 2. Joshu; 3. Kenshuin.

2972. L'Heureux, L. 1933. Le soja [Soya]. *Congo: Revue Generale de la Colonie Belge* 1(2):214-36. Feb.; 1(3):365-83. March. (Bulletin de l'Office Colonial, Bruxelles). [14 ref. Fre; eng+]
• ***Summary:*** This early publication on soyfoods in Africa describes food uses and methods of preparing soymilk, in both condensed and powdered forms. Tunisia was a French protectorate from 1881 to 1956, when it became independent. France grew soybeans there, apparently at about the same time it started growing them in Algeria (p. 214).

At the exposition of Nanking in 1910 some 400 varieties of soybeans were assembled (p. 214).

In 1908 the firm of Mitsui was the first to try to transport, by sea, soybean seeds from Dairen to Liverpool. It was the beginning of a new industry in England (Liverpool and Hull), in Germany, Denmark (Copenhagen), and Holland (Rotterdam & Amsterdam).

A former Belgian missionary in Jehol (West Mongolia), Father De Preter (*Le T.R.P. Fl. De Preter, Supérieur de la Maison des Pères de Scheut à Yvoir*) has corresponded with the author about soybeans, tofu, and soybean cake in that city. Soybeans are not cultivated on the best soils, which are reserved for wheat. One of his colleagues at Jehol, Father Cyr. De Puydt has worked to improve the soybean crop (p. 219).

Father De Preter has often helped in making tofu (*fromage de soja*), using magnesium chloride as a coagulant. If one uses calcium sulfate, the tofu is softer and the taste seems better. Father de Puydt has improved the manufacture

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of tofu by using magnesium salts (probably Epsom salts) in place of magnesium chloride. The tofu is eaten after being boiled in water or fried in fat. It is best when fresh. In winter, it is allowed to freeze [frozen tofu in northeast China] so that it can be kept for a long time; it becomes spongelike. But fresh tofu has a special aftertaste to which the European palate finds it difficult to get accustomed. This taste does not come from the coagulant but from the soybeans. When one eats more than two pieces of tofu in succession, one experiences indigestion. It does not produce gas like the beans. Notes that the factory of the Caséo-Sojaïne near Paris, of which Mr. Li Yu-ying is the director, makes tofu and various tofu products. Cooked with eggs, tofu makes an excellent omelet. Cooked with the juice of meat, it takes on entirely that flavor. It can be used to make patés or smoked. Use firm tofu and cook in a mixture of 4:1 water to soy sauce. Then smoke it like meat. This can, for example, replace ham or bacon in an omelet. Tofu paté has much the same consistency and taste as paté de foi gras. Thus, there are many ways that tofu can replace meat (p. 221-24).

Using caséine or légumine of soymilk, the French pioneered industrial soy protein isolates in 1911 (see Beltzer). They were used in various glues, and in coating paper (p. 224-25).

The margarine industry employs only the finest quality oils. Soy oil was not introduced to margarine manufacture in Europe until about 12 years ago [i.e., 1921], but it has rapidly taken an important place on account of its good properties and low cost. Describes how to make synthetic rubber from soy oil. One of the main uses of soy oil in Europe is in making soaps. Some is also used to make explosives. Mr. Tihon is the distinguished director of the Laboratory of Industry and Commerce at Leopoldville, Belgian Congo (p. 227-28).

Soybean cake (*Tourteau*)*:* Father de Preter in Jehol has assured me that soybean cake is used there to nourish and fatten beasts. For horses, this cake has a surprising effect. If a horse, returning from a trip lean and exhausted, is put on a regimen of soybean cake, it will return to normal in 15 days (p. 230).

Just like the oil, the cake is more and more in demand in Europe, and in certain countries the effect of soybeans on the economy is quite remarkable. Until about 30 years ago, Denmark was a super producer of wheat. But Dutch products were defeated by the lower prices of American goods. Aided by soybeans, the Danes were able to expand their livestock. Soybeans are now imported, the oil is extracted and used to make margarine, while the cake is used to feed livestock–some 18.5 million heads in 1926, not including poultry The result has been the development of an enormous trade in animal products, butter, cheese, ham, bacon, lard, eggs and even livestock–all accounting for about 70% of Danish exports. Holland is in a similar position (p. 230-31).

In 1912 the "Dairen Mill Owners Association" was founded, By June 1923 all but 7 of the mills in Dairen were members of the association. The oil in the Suzuki mill is extracted using benzine solvent, the most modern method. 32 of the mills, mostly owned by Japanese, use hydraulic presses, while those owned by the Chinese generally use hand-turned screw presses (p. 231-32).

A large table (p. 323) shows exports of soybean seeds, cake, and oil from the ports of Dairen, Newchwang, Vladivostok, and total, from 1908 to 1917. During this time, because of Manchurian mills, the amount of seed decreased, while the exports of cake and meal increased.

Condiments: Shoyu (*shoyou*) is the main one. Several processes for making soy sauce are described in detail. Lea & Perrins Worcestershire Sauce is nothing but a highly seasoned soy sauce (p. 234).

Continued (p. 365): Mr. L. L'Heureux is director of the chemical service of the Belgian Congo. Let's see what the soybean is doing in the Congo. M. Tihon of Leopoldville, said in an interesting report titled *A propos du soja hispida:* Encountered 30 years ago [i.e., about 1903] at Stanleyville by commander Lemaitre, it figured in the collection of the botanical garden of Eala and was the object of experiments at Sankuru in 1914-15 (p. 365).

In this report, Tihon analyzed 3 varieties of soybeans from the plantations of Eala. The soybean would be good for all our [Belgian] colonies; it could replace meat and be used in the rations of black workers (p. 366-67).

Soymilk: Describes how to prepare it and its properties. According to Prof. Laxa of Prague, fresh soymilk has an acid reaction. Mentions the work of Li Yu-ying. Notes that by adding lactose and a bacterial culture, Yogourth [yogurt] can be made from soymilk (p. 370).

In Peking, soymilk is sold in small bottles of 200-220 cc carrying the title *Lait de pois–Un produit chinois. La nurriture la plus nourrissante. Préparé par ___.* In 1925 one bottle of soymilk daily cost 1 dollar Mex per month. In 1919 in Shanghai, Peking and Dairen, Chinese companies furnished hospitals and private individuals 8-10 oz of concentrated soymilk in bottles (p. 371-72).

A table (p. 373) compares the composition of 3 types of soymilk with mother's milk, cow's milk, and goat's milk; all but the cow's milk (87.00%) contain 90.71% water. The soymilks are: (1) From Tsinan fu, China. (2) From Peking, China. 3. From Japan. The soymilk from Peking was low in fat, so yuba had probably first been removed from it (p. 372).

In China, soymilk is habitually drunk sweetened with sugar. Li Yu-ying reports that one of his parents was nourished from birth with soymilk and for 37 years he has always been in excellent health (p. 374).

A new method for making soymilk. In 1916 Prof. Laxa of Prague develop a method for making soymilk in homes in Europe. The cost of a liter of soymilk in Prague in 1916 was estimated by Laxa as being about 40 centimes if it was homemade. Before the war, there was in London a soymilk

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factory which intended to place its products regularly on the market. Plans were made to construct two other plants, one in Manchester and one in Liverpool. The synthetic milk syndicate launched a soymilk on the market that was adapted to European tastes. The syndicate's factory, established in Liverpool, used the method of F. Goessel to make 100 liters of soymilk using the following formula (which is given). A Dutch patent (No. 2122 of Sept. 1917) and a Japanese patent (No. 28346) are also cited (p. 375-77).

A table shows the composition of 6 types of Soyama soymilk according to the analyses of Dr. G. Popp of Frankfurt. The protein ranges from 2.5% to 3.77%. Normal soy cream contained 11.5% fat, whereas that which was extra rich for diabetics contained 30% fat. It is very difficult to tell the difference between tea, coffee or chocolate to which one has added Soyama soy cream compared with regular dairy cream (p. 379).

In using the Soyama milk and cream, von Noorden confirms the following statement of Fischer, who studied vegetable milks in general: 1. In the stomach, soymilk gives a flocculent precipitate which is finer [smaller clumps] than that produced by cow's milk. 2. The digestion of soymilk requires only a weak secretion of gastric juice; the period of secretion is therefore short. 3. The time that soymilk protein resides in the stomach is shorter than that of cow's milk protein. 4. The peristaltic action of the stomach is less after ingestion of soymilk and better coordinated. Therefore, based on these observations, von Noorden recommended soymilk over cow's milk (p. 380).

Hatmaker made powdered soymilk. A table shows its composition, as analyzed by a laboratory in Paris (p. 380).

Yu P'i and Yu Ba are the Chinese and Japanese names of yuba, respectively. Recently a new method for making yuba has been patented in Japan. It consists in the use of an electric ventilator [or fan] placed above the surface of the cooking pot containing soymilk that is not heated above 90ºC. A table (based on analyses of the Tokyo Laboratory of Hygiene, of Embrey, and of Adolph) then gives the nutritional composition of 5 types of yuba, including Fu Chu (dried yuba sticks) which (surprisingly) contain 53.68% water.

Note: Maybe this Fu Chu was either fresh or reconstituted yuba. Address: Directeur du Service Chimique du Congo Belge.

2973. Meade, Mary. 1933. Sukiyaki party is novel idea in entertaining: Japanese dishes are still as much of thrill to the hostess as to guests. *Chicago Daily Tribune.* April 30. p. D1.
• ***Summary:*** Among Nipponese foods, Sukiyaki is "the greatest temptation of all." One key ingredient is "soy sauce (sometimes known as chop suey sauce)." "Japanese diners are much nearer being vegetarians than we are." The writer gives a detailed recipe for Sukiyaki; the Otsuyu (soup) includes: "4 cups boiling water, ½ teaspoon ajinomoto {a powdered seasoning on the market}, ½ tablespoon soy sauce, etc.

Note: Tofu is not mentioned anywhere in this article.

2974. Sakurai, Yoshito. 1933. Miso no seibun ni tsuite. II. Sendai miso (ichi nen jukusei) no yûki enki ni tsuite [On the constituents of miso. II. Organic bases in Sendai miso which has been aged for one year]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 9(4):347-51. [Jap]
• ***Summary:*** Discusses the purine fraction, picric acid, picrate, flavian, diamine, and arginine. Address: Nôgaku-shi, Japan.

2975. *China Weekly Review* (*Shanghai*). 1933. Manchukuo will monopolize beans, opium, and cigarettes. 64:422-23. May 13. *
• ***Summary:*** Note: This is the earliest English-language document seen (May 2011) that uses the word "Manchukuo" to refer to the Japanese puppet state of Manchuria, and also the earliest document seen with the word "Manchukuo" in the title.

2976. *Food Manufacture* (*London*). 1933. The manufacture of soy in Japan. 8(5):161-63. May.
• ***Summary:*** Describes the process for making soy sauce, with 4 photos.

2977. *Foreign Crops and Markets* (*USDA Bureau of Agricultural Economics*). 1933. The Manchurian soy bean situation. 26(24):686-88. June 12.
• ***Summary:*** Contents: Introduction. Prices. Exports: Soy beans, soy-bean cake, soy-bean oil. Two tables show statistics related to exports of soy beans and products: (1) By quarters. (2) By destination: Japan, Europe, USA, Malay ports, China, others.

2978. Remy, W. 1933. Die Sojabohne in Japan [The soybean in Japan]. *Ernaehrung der Pflanze* (*Die*) 29(12):234-36. June 15. [Ger]
Address: Tokyo.

2979. Iinuma, Toru; Mashino, Minoru. 1933. On the properties of soya bean protein. I. The influence of the preceding treatments on the solubilities of protein. *J. of the Society of Chemical Industry, Japan* 36(6):310B-11B. June. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** Pretreatment of the bean with solvents, e.g. benzine, benzine-methanol mixtures, has little effect on the solubility of the soybean protein in water, 10% sodium chloride, 1% sodium hydroxide, 30% calcium chloride, or 30% calcium thiocyanate solutions. Preheating of the bean at 120ºC has a more marked effect on the solubilities. Address: The Tokyo Imperial Research Inst., Hatagaya, Shibuya-ku,

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Tokyo.

2980. Ishimaru, Yoshio. 1933. Shôyu jôzô ni kansuru saikin no kenkyû. I. [Research on the bacteria involved in shoyu fermentation. I.]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 11(6):439-65. [Jap]
• ***Summary:*** Discusses 28 species of bacteria involved in shoyu fermentation. The main genera involved are *Bacillus, Pediococcus, and Micrococcus* species. Part I discusses: 1. *Bacillus mesentericus vulgatus var. Soya* No. 1. 2. *Bacillus mesentericus vulgatus var. Soya* No. 2. 3. *Bacillus mesentericus vulgatus var. Soya* No. 3. 4. *Bacillus mesentericus fuscus var. Soya.* 5. *Bacillus mesentericus niger var. Soya.*

Note: This is the earliest document seen (Jan. 2009) which mentions that *Pediococcus* bacteria are involved in the shoyu fermentation. Address: Nôgaku hakase, Japan.

2981. Mashino, Minoru. 1933. Studies on the improvement of soya bean oil extraction. IV. The extraction with azeotropic mixtures adding lower alcohols before or after extraction. *J. of the Society of Chemical Industry, Japan* 36(6):309B-10B. June. Supplemental binding to Kogyo Kagaku Zasshi. [1 ref. Eng]
• ***Summary:*** Azeotropic mixtures of aliphatic or aromatic hydrocarbons with methanol or ethanol can be used for the extraction of soybean oil, if lower alcohols are added to the azeotropic mixture before or after the extraction, and the azeotropic mixture is evaporated off from the miscella, which separates into two layers after cooling, so that oil and alcohols can be recovered. The purest and palest oil is obtained by using methanol in the mixtures.

Note: This is the earliest English-language document seen (Feb. 2010) that contains the word "miscella" which refers to a mixture of unrefined oil and solvent, usually from a solvent extractor. Address: The Tokyo Imperial Industrial Research Inst., Hatagaya, Shibuya-ku, Tokyo.

2982. Asari, T. 1933. [Preservation of soybeans]. *Japanese Patent* 101,895. July 7. [Jap]*

2983. *Christian Science Monitor.* 1933. Popular dishes of Japan. July 7. p. 6.
• ***Summary:*** "These Japanese recipes comes to us by way of a resident in the legation quarter of Peiping, China. We have been told that American and European residents in China enjoy Japanese food and often patronize Japanese restaurants there. Japanese food is nourishing yet light. The mainstays of their diet are fish and vegetables" [sic, rice].

The recipe for "Suimono, or Japanese consomme" calls for: "Soy sauce, which is easily obtainable from Japanese and Chinese grocers or other importers. If not, any good fish-and-meat sauce such as Worcestershire will produce a similar effect if desired."

The recipe for Teriyaki states: "(A fish recipe whose name means merely 'Broiled' [sic, it means 'shining broiled' or 'glazed broiled']).

"Wash thoroughly and cut into pieces: 1 piece tunny fish or salmon of medium size. Soak [marinate] for about 10 hours in a mixture of: 1½ cups sweet white wine-flavoring (non-alcoholic) [perhaps mirin] and

"¼ cup soy sauce or other fish sauce, such as Worcestershire. Then broil the same liquid mixture over a slow fire for about 15 minutes, or until the fish appears done when poked lightly with a fork. The recipe need not be salted unless desired, as the soy or other sauce contains salt flavoring."

The recipe for "Mitsu mame ('Honeydew beans')" states: "The sweet red beans known as *adzuki,* which are similar to our dried [kidney] beans and dried peas, are a predominant ingredient in many Japanese sweets."

Note 1 The main ingredient in this teriyaki dish is fish, not beef or poultry.

Note 2. The teriyaki [sauce] is extremely simple compared with later recipes.

Also contains recipes for: Rice–Japanese style. Chawan mushi.

2984. Iinuma, Toru; Mashino, Minoru. 1933. On the properties of soya bean protein. II. Solubility of soya bean protein in calcium thiocyanate solution. *J. of the Society of Chemical Industry, Japan* 36(7):373B. July. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** 69% of the protein in soy bean is dissolved by treatment for 3 hours at 98ºC with 30% aqueous calcium thiocyanate, and under these conditions the cellulose remains undissolved. The total nitrogen in solution is equal to that dissolved by successive treatments with water, ethanol, 10% aqueous sodium chloride, and 1% aqueous sodium hydroxide, and almost the whole is precipitated by ethanol. Address: Tokyo Imperial Research Inst., Hatagaya, Shibuya-ku, Tokyo.

2985. Iinuma, Toru; Mashino, Minoru. 1933. On the properties of soya bean protein. III. Shearing strength of soya bean protein as adhesive. *J. of the Society of Chemical Industry, Japan* 36(7):373B-75B. July. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** "The authors have wished to explain a reason why the soya bean protein has not been used in generally for adhesive as well as casein. Moreover the authors have studied to use the soya bean protein as adhesive." Glue prepared from the soybean protein remaining after extraction of the oil with benzene plus methanol has a shearing strength equal to that of casein glue. Address: The Tokyo Imperial Industrial Inst., Hatagaya, Shibuya-ku, Tokyo.

2986. Ishimaru, Yoshio. 1933. Shôyu jôzô ni kansuru saikin

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no kenkyû. II. [Research on the bacteria involved in shoyu fermentation. II.]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 11(7):576-96. [4 ref. Jap]
• ***Summary:*** Part II discusses: 6. *Bacillus subtilis var. Soya.* 7. *Bacillus noudiastaticus var. Soya* No. 1. 8. *Bacillus noudiastaticus var. Soya* No. 2. 9. *Bacillus alcaligenes var. Soya.* 10. *Bacillus megatheroides var. Soya.* 11. *Bacillus citreus var. Soya alpha.* 12. *Bacillus citreus var. Soya Beta.* Address: Nôgaku hakase, Japan.

2987. *Jozogaku Zasshi* (*J. of Brewing, Osaka*). 1933. Shojo: Shoyu, daizu,... [State of commerce: Prices of shoyu, soybeans, etc.]. 11(7):649-51. July. [Jap]
• ***Summary:*** Gives the price of shoyu and soybeans at various places in Japan.

2988. Nakamura, Mitsuo. 1933. Antioxygens of fatty oils. XII. Action of β-naphthol on the oxidation of soy-bean oil. *J. of the Society of Chemical Industry, Japan* 36(7):408B-10B. July. Supplemental binding to Kogyo Kagaku Zasshi. [11 ref. Eng]
• ***Summary:*** The addition of 0.05-0.2% of a 10-carbon organic acid (I) to soybean oil accelerates oxidation during insolation; at concentrations of 0.6-1% (I) acts as a pro-oxidant in the early stages of insolation, but later retards oxidation. The inversion of the catalytic effect occurs the sooner, the greater is the concentration of (I) and the higher the velocity of the oxidation (e.g., in thinner layers).

Note: *Webster's Dictionary* defines insolate (derived from the Latin *insolatus,* past participle of *insolare,* from *in-* + *sol* = sun) as "to expose to the sun's rays." Address: Dep. of Applied Chemistry, Faculty of Engineering, Tokyo Imperial Univ.

2989. Sasaki, Shûiku. 1933. Daizu hatsuga no sai ni okeru tansui kabutsu no shinchin taisha ni tsuite [Carbohydrate metabolism of the soya-bean during germination]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 9(7):693-96. July. [14 ref. Jap]
• ***Summary:*** Reducing sugar, produced after germination in the dark, decreased after one week; sucrose and stachyose decreased gradually. Dextrin and starch were found in the germinated seeds and increased considerably. During germination araban and cellulose increased, while galactan decreased. Address: Kyushu Teikoku Daigaku, Nôgaku-bu, Nogei Kagaku Kyoshitsu.

2990. Shinozaki, Shûichi; Sato, Masanori. 1933. Daizu reshichin no suiso tenka ni tsuite. I. [Hydrogenation of lecithin isolated from the soybean. I.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 9(7):728-32. July. [12 ref. Jap; eng]
• ***Summary:*** The product of hydrogenation (Paal) with colloidal palladium has melting point 85ºC and is insoluble in methyl acetate. The hydrolecithin contains stearic, palmitic, and glycerophosphoric acids (70.2% of Beta-glycerophosphate).

2991. Suzuki, Tsuneya. 1933. Hakko to vitamin. V. Nattô-kin wa vitamin B-1 o gôsei suru ya [Fermentation and vitamins. 5. Do natto bacteria synthesize vitamin B-1?]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 11(7):605-07. [2 ref. Jap] Address: Osaka Teikoku Daigaku, Kôgaku-bu, Jôzôgaku Kyôshitsu, Takada Kenkyûshitsu, Osaka, Japan.

2992. Hosokawa, Takahide. 1933. Mame-ka shokubutsu zappô. I. [Miscellaneous notes on Leguminosae. I.]. *Taiwan Hakubutsu Gakkai Kaiho* (*Transactions of the Natural History Society of Formosa*) 23(126-127):241. Aug. [7 ref. Jap]
• ***Summary:*** Discusses Glycine max, Glycine soja, Dolichos soja, Glycine ussuriensis.

2993. Iinuma, Toru; Mashino, Minoru. 1933. On the properties of soya bean protein. IV. Properties of the protein as water paint. *J. of the Society of Chemical Industry, Japan* 36(8):455B. Aug. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** Protein obtained from soy oil cake by extraction with sodium hydroxide and coagulation with sulfuric acid is inferior to casein as a binder, due, it is considered, to residual impurities from the method of preparation. Extraction with the azeotropic mixture of benzine and methanol gives a protein of improved adhesive properties, comparable with casein. Extraction with methanol increases the hygroscopicity of the protein and its tendency to become moldy. Address: Tokyo Imperial Industrial Inst., Hatagaya, Shibuya-ku, Tokyo.

2994. Iinuma, Toru; Mashino, Minoru. 1933. On the properties of soya bean protein. V. Reactivities with formaldehyde. *J. of the Society of Chemical Industry, Japan* 36(8):455B-56B. Aug. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** Reaction products of formaldehyde with soybean protein extracted from the oil cake by various methods were examined. Protein extracted by methanol alone or in azeotropic mixture with benzine gives most promise in this connection, being hard and semi-transparent. Address: Tokyo Imperial Industrial Inst., Hatagaya, Shibuya-ku, Tokyo.

2995. Ishimaru, Yoshio. 1933. Shôyu jôzô ni kansuru saikin no kenkyû [Research on the bacteria involved in shoyu fermentation]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 9(8):859-904; 9(9):953-1004; 9(10):1143-83. [3 ref. Jap]
• ***Summary:*** Discusses 28 species of bacteria involved in

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shoyu fermentation. The main genera involved are *Bacillus, Pediococcus, and Micrococcus* species. Sixteen aerobes and 12 anaerobes have been studied. Most of the bacteria produce ethanol, acetaldehyde, acetone, furfuraldehyde, ammonia, fusel oil, and methyl acetate.

Note: Part II (p. 1143+) is titled: The significance of shoyu bacteria in practical applications. It has two parts: (1) Shifting paths and the rise and fall of shoyu bacteria during brewing.

At the end of this 3-part article (after p. 1174) are several large tables, many numbered microscopic round photographs of the bacteria, and photos of the bacteria on a culture medium in 28 different test tubes.

Note: A similar if not identical series of articles was published in *Hakko Kogaku Zasshi* in 1933. Address: Nogaku Hakase, Japan.

2996. Ishimaru, Yoshio. 1933. Shôyu jôzô ni kansuru saikin no kenkyû. III. [Research on the bacteria involved in shoyu fermentation. III.]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 11(8):689-701. [Jap]
• ***Summary:*** Discusses: 13. *Micrococcus Soya liquifaciens nov. sp.* 14. *Micrococcus percitreus var. Soya.* 15. *Micrococcus aurantiacus var. Soya.* 16. *Micrococcus flavus tardigradus var. Soya.* Address: Nôgaku hakase, Japan.

2997. Takata, Ryôhei. 1933. Shôyu jôzô no eiyôgaku-teki kôsatsu. II. Shôyu jôzô-chû no vitamin B-1 no henka [Nutritional investigation of shoyu. II. Changes in vitamin B-1 during shoyu fermentation]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 11(8):680-88. [5 ref. Jap]
Address: Jokyôju, Kôgaku Hakase, Osaka Teikoku Daigaku, Osaka, Japan [Osaka Imperial Univ].

2998. *Foreign Crops and Markets* (*USDA FAS Bureau of Agricultural Economics*). 1933. The world situation in oils and oilseeds. 27(13):314-31. Sept. 25.
• ***Summary:*** "The term lard substitutes is used here... to refer to all lard compounds, vegetable shortenings, and other lard substitutes."

"European interest developed last year in soybean oil lost ground in 1933. An important contributing factor has been the restrictions under which the German margarine industry is now working. The oriental export trade in soybeans to Europe lagged behind 1932 figures for the first 7 months of 1933. Indications are for a new crop of Manchurian beans larger than the flood-damaged crop of last year."

Soybean oil (crude and refined) is also mentioned in the following tables:

U.S. factory consumption of animal and vegetable fats and oils, 1929-1933 (p. 322).

U.S. factory production of animal and vegetable fats and oils, 1929-1933 (p. 323). The leading vegetable oil by far is cottonseed oil.

U.S. stocks of animal and vegetable fats and oils, 1928-1932 (p. 324).

Wholesale price per pound of some of the principal animal and vegetable fats and oils, by month Jan. 1931 to July 1933 (p. 326).

U.S. imports of animal and vegetable fats and oils, 1928-1932 (p. 327).

Imports of vegetable oils and oil materials, by countries, 1913, 1928-1932 (p. 330-31). For soybean oil, the main importers in 1928 were Japan, China, Kwantung, and "Other countries."

2999. Abe, Zyubei [Jubei]. 1933. Bread and butter for Manchuria. *Rotarian* (*The*) 43:9-10. Sept.
• ***Summary:*** It was in the autumn of 1907, following the Russo-Japanese War (1904-06), that Mitsui & Co. made a trial shipment of several hundred tons of soybeans to Hull, England. So well received was it that in the following year the export increased to 500,000 tons at one bound. Recent yearly export of soybeans from Manchuria has been in the neighborhood of 2,500,000 tons, of which about 1,500,000 tons are sent to Europe; while that of bean cake is about 1,500,000 tons, Japan taking nearly two-thirds of it. Thus stimulated, the export of soybeans and cake, meal, and oil has become the most important business of Manchuria."

"Soybeans have high nutritive value, containing 38 per cent protein and 18 per cent fat. It was natural, therefore, that Orientals, who live chiefly on vegetables, particularly the Japanese–in deference to the Buddhist doctrine, should regard soybeans with favor. They are prepared in various ways, and anyone who has lived in Japan must have had experience with bean curd, bean milk, soy (Japanese sauce), fermented beans [natto], bean paste [miso], bean flour [kinako], bean candy, and other foods in which this versatile legume is an ingredient.

Photos show: (1) The writer, Mr. Jubei Abe, seated at his desk in Dairen. He says that Mitsui & Co. is the largest commercial enterprise [*zaibatsu*] in Japan. (2) Acres covered by bags of soybeans in open storage at Kaiyuang awaiting local consumption or export to foreign ports. (3) Soybeans stored in huge round storage bins, under conical tops, in the native manner at Kungchuling. (3) Batteries of giant [hydraulic] presses crushing the beans for their oil. The residue becomes the valuable meal or cake. Address: Manager of local branch, Mitsui and Co., Dairen, Manchuria.

3000. Iinuma, Toru; Mashino, Minoru. 1933. On the properties of soya bean protein. VI. Supplementary studies of the properties of soya bean protein. *J. of the Society of Chemical Industry, Japan* 36(9):506B-07B. Sept. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** The inferiority of soybean protein to casein is due to denaturation and to the presence of oil or of methanol

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extractives, and extraction of the oil with azeotropic mixtures of hydrocarbons and lower alcohols is therefore sound. Address: The Tokyo ImperialIndustrial Inst., Hatagaya, Shibuya-ku, Tokyo.

3001. Ishimaru, Yoshio. 1933. Shôyu jôzô ni kansuru saikin no kenkyû. IV. [Research on the bacteria involved in shoyu fermentation. IV.]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 11(9):778-97. [Jap]
• ***Summary:*** Part IV discusses: 17. *Bacillus mycoides var. Soya.* 18. *Bacillus Soya gasformans nov. sp.* 19. *Bacillus panis var. Soya.* 20. *Bacillus Soya nonliquifaciens nov. sp.* 21. *Bacillus Delbrücki var. Soya.* 22. *Bacterium Soya var. Ishimaru.* Address: Nôgaku hakase, Japan.

3002. Takata, Ryôhei. 1933. Shôyu jôzô no eiyôgaku-teki kôsatsu. III. Shôyu oyobi tanpakushitsu sanbun kaibutsu-chû no ganchisso seibun no eiyôka [Nutritional investigation of shoyu. III. Nutritional values of the nitrogenous material in the substances from acid hydrolysis of shoyu and protein]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 11(9):764-71. [2 ref. Jap]
Address: Jokyôju, Kôgaku Hakase, Osaka Teikoku Daigaku, Osaka, Japan.

3003. *Foreign Crops and Markets* (*USDA FAS Bureau of Agricultural Economics*). 1933. Oils and oilseeds: Manchuria has larger soy bean crop. 27(14):348-50. Oct. 2.
• ***Summary:*** "Since mid-July the movement of [soy] beans to Europe has been unusually small in view of the German restrictions on imports of the bean and its products."

Tables show: (1) "Manchuria: Exports of soy beans and bean products, by quarters, seasons 1931-32 and 1932-33." Shows [soy] beans, bean cake, bean oil, and total. These exports are from Dairen, Newchwang, Vladivostok, and Manchouli [W.-G. Man-chou-li, Manzhouli]. Note: Manzhouli is an inland port in Nei Monggol {Inner Mongolia}, northern China, near the border with Russia. As of Jan. 2008 Manzhouli is China's busiest land port of entry, and is responsible for 60% of all imports from and exports to Russia and Eastern Europe. They apparently travel by rail on an east-west axis.

(2) "Manchuria: Exports of soy beans and bean products by countries of destination, Oct. to June, 1931-32 and 1932-33." The countries are Japan [incl. Korea and Formosa], Europe [incl. exports via Manchouli to Leningrad], China, America [USA], Malaysia, and Others. Europe buys the most whole soy beans, Japan the most bean cake, and China the most bean oil.

3004. *Foreign Crops and Markets* (*USDA FAS Bureau of Agricultural Economics*). 1933. The world situation in oils and oilseeds. 27(14):352-76. Oct. 2.
• ***Summary:*** German trade in soy beans has increased. Two full page tables show: (1) Netherlands: Imports of fats and oils, 1928-1932 (includes 20,000–54,000 short tons of soybeans and large amounts of soybean oil). (2) Netherlands: Exports of fats and oils, 1928-1932 (includes 231–344 short tons soybeans and 11,000–17,000 short tons of soybean oil).

The section titled "Soy beans" states: (p. 367) "The total production of soy beans last year in the five leading soy bean producing countries: Manchuria, Chosen [Korea] and Dutch East Indies, each shows a substantial increase, Chosen producing 677,326 short tons against 634,506 in 1931 and Dutch East Indies 165,345 short tons compared with 141,602 during the previous year. In the United States, on the other hand, 397,350 short tons were harvested, a reduction of about 13 per cent from that of 1931 but about 8 per cent larger than the quantity harvested in 1930. The amount produced by Japan during the past year is not available at the present time. See table, page 374."

A 3rd table (p. 368) shows the production of oilseeds in terms of oil in major producing countries from 1929-30 to 1932-33. The amount stayed about constant during this period, ranging from 1.24 to 1.37 million pounds.

A 4th table, titled "Soybeans" (p. 368) shows the production of soybeans in major producing countries in 1909-1913 (average), 1921-1925 (average), and yearly from 1929-30 to 1932-33 (estimate). The amounts in 1931-32 were (in short tons): Manchuria 3,289,657. Chosen [Korea]: 634,506. USA 458,130. Japan 381,551. Dutch East Indies (today's Indonesia): 141,602.

3005. Ishimaru, Yoshio. 1933. Shôyu jôzô ni kansuru saikin no kenkyû. V. [Research on the bacteria involved in shoyu fermentation. V.]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 11(10):882-902. [Jap]
• ***Summary:*** Part V discusses: 23. *Pediococcus acidi lactici var. Soya* α. 24. *Pediococcus acidi lactici var. Soya Beta.* 25. *Pediococcus albus var. Soya* α. 26. *Pediococcus albus var. Soya Beta.* 27. *Micrococcus acidi lactici var. Soya nov. sp.* 28. *Micrococcus candicans var. Soya.* Address: Nôgaku hakase, Japan.

3006. Ishimaru, Yoshio. 1933. Shôyu jôzô ni kansuru saikin no kenkyû. VI. [Research on the bacteria involved in shoyu fermentation. VI.]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 11(11):986-1002. [Jap]
Address: Nôgaku hakase, Japan.

3007. Iwamura, Iwao. 1933. Biochemical studies on miso, fermented soybean paste. I. *Bulletin of the Agricultural Chemical Society of Japan* 9(7-9):118-31. Bound in the back of Nippon Nogei Kagaku Kaishi (J. of the Agricultural Chemical Society of Japan). [Eng]
• ***Summary:*** The author conducted experiments with Sendaimiso, then with Shiromiso, Yedomiso, Inakamiso, and Hatchomiso. Miso protein, when added to a rice diet,

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has a high supplementary value. It has a somewhat higher supplementary value than "kôridôfu (frozen soy-bean curd)" but somewhat lower than fish protein.

Note 1. This is the earliest English-language document seen (March 2009) that uses the term "soybean paste" to refer to miso, or that mentions Sendaimiso, Yedomiso, Inakamiso, or Hatchomiso (spelled that way).

Note 2. This is the earliest English-language document seen (April 2013) that uses the term *kôridôfu* to refer to dried-frozen tofu. Address: Agricultural Chemical Lab., Tokyo Imperial Univ., Komaba, Tokyo, Japan.

3008. Miller, Carey D. 1933. Japanese foods commonly used in Hawaii. *Hawaii Agricultural Experiment Station, Bulletin* No. 68. 43 p. Nov. See p. 1-10, 28-43. [18 ref]

• ***Summary:*** Contents (p. 1-10): Introduction. Soybean products. Edamame (green soybeans). Tofu (soybean curd). Kirazu (tofu residue) [okara]. Tonyu (soybean "milk"). Aburage (fried soybean curd). Miso (fermented rice and soybeans). Natto (fermented soybeans). Shoyu (soybean sauce). Koji (fermented rice). Pages 24-15: Kinoko (mushrooms). Fu (gluten cakes). Goma (sesame seeds).

Pages 28-43: Recipes with the nutritional composition of each: Miso soup with tofu. Miso soup with wakame. Miso soup with daikon. Miso soup with [cow's] milk. Tofu soup with lemon. Tofu shoyu soup. String bean shirae [shira-ae] (with tofu and miso). Carrot shirai. Konnyaku shirai. Eggplant with miso. Green onions with miso. Fish cakes with miso. Sesame seed sauce for vegetables (with shoyu). Nishime (with shoyu). Nigome (with aburage and shoyu). Kirazu with vegetables (with okara, aburage, shoyu). Noodles (somen or udon, with shoyu). Vinegar sauce for sushi. Inari-sushi (with aburage and shoyu). Maki-sushi.

Note: This is the earliest English-language document seen (June 2013) that calls for okara [which it calls *kirazu*] as an ingredient in a recipe.

Appendix: Composition of some Japanese foods used in Japan.

Concerning edamame: "The Japanese use several varieties of fresh green soybeans. In Honolulu whole plants are purchased from the vegetable market. The pods are removed from the plants, placed in boiling salted water, and boiled for about 25 minutes. They are then drained and cooled, and the beans are kept in the pods until eaten. Often children eat them out of bags as they would candy. The fresh green soybeans appear to be an excellent food. They are good sources of calcium, phosphorus, and iron, yield a basic ash, and, as compared with other fresh vegetables and fruit, have a remarkably high protein content. Vitamin tests in progress at the nutrition laboratory of the Hawaii Agricultural Experiment Station show that the cooked beans are very good sources of vitamins A, B, and G. The more general use of green soybeans should be encouraged in the home, and their consumption may be increased by selling them in school cafeterias."

Concerning Kirazu (tofu residue) (p. 5): "Kirazu, or the residue of the soybeans left when tofu is made, has a crude fiber content of 3 to 4 percent, contains 4 to 5 percent of the protein of the beans, more than 1 percent of the fat, and 5 to 6 percent of the carbohydrate. Only a small part of kirazu is used for human food in Hawaii, by far the greater part being used as hog feed. Kirazu, however, is a utilizable, inexpensive food and might be more generally used than it is... Kirazu is used in combination with vegetables, or with fish, or dried shrimp, and seasonings."

Concerning Tonyu (soybean "milk"): The milky liquid obtained by grinding soybeans with water and heating and straining off the insoluble residue has the appearance of skim milk. Early reports from China and from Japan stated that soybean milk may be used as a substitute for cow's milk for children, but Wan (16, p. 360), in more recent scientific reports from China, indicated that, whereas soybean milk is richer in vitamin B than is cow's milk, soybean milk is lower in vitamin A and still lower in calcium content. The biological value of the protein of the soybean milk is not comparable with that of the protein of cow's milk. Chemical analyses of local soybean milk obtained from the tofu-manufacturing shops showed it to be low in fat and in carbohydrates. Chang and Tso (3, p. 199) demonstrated that, when properly supplemented with the necessary minerals, vitamins, fat, and carbohydrates, soybean milk can be used successfully for infant feeding where cow's milk is not available or where the infant is anaphylactic to the protein of cow's milk. In Hawaii there is no need to use soybean milk as a substitute for cow's milk and, considering its dietary qualities, it should not be so used without the needed supplements"

Concerning natto: Describes the process for making natto on a commercial scale in Honolulu. After cooking (without soaking) for about 8 hours in a large iron kettle, the "beans are thoroughly drained and placed on paper plates covered with wax paper. The plates are stacked one above another in large wooden boxes, covered with rice straw mats, and kept at a temperature of approximately 30ºC. for 35 to 36 hours, when the product is ready for use... The fermented product is covered with a gray, slimy substance that forms strings or threads when the beans are pulled apart, indicating good quality... Although no molds or yeasts are added to the cooked soybeans, O.N. Allen, of the botany department of the University of Hawaii, who examined several samples of fresh natto from Honolulu, found 2 molds, 4 bacteria, and an aspergillus present. The enzymes of some of these organisms probably caused the conversion of a small part of the protein to simpler substances."

Concerning Inari-sushi (p. 37): The "ingredients required for this dish are rice, water, salt, aburage, carrots, mushrooms, string beans, gobo, flaked bonito, water, sugar, shoyu, and vinegar sauce." A detailed recipe is given.

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Photos show the following (each food accompanied by its Japanese name written in both Chinese characters and *katakana*)*:* Edamame, in the pods on the plant, and shelled in a dish. Tofu kasu [okara] on a plate. Tofu on a dish. Tonyu (soybean "milk") in a glass. Three triangles of aburage on a dish. Miso on a dish. Natto in a white rectangular commercial paper tray about 3½ by 6 by 1 inch deep. Koji on a plate.

Note 1. This is the earliest English-language document seen (June 2009) that uses the term "fresh green soybeans" to refer to green vegetable soybeans.

Note 2. This is the earliest document seen (July 2003) that mentions commercial natto production in Hawaii.

Note 3. This is the earliest English-language document seen (Jan. 2012) that uses the term "tofu residue" to refer to okara.

Note 4. This is the earliest English-language document seen (Jan. 2012) that uses the word "strings" or "threads" in connection with natto. Address: Specialist in Nutrition, Honolulu.

3009. Okamo, Koji; Ohara, Iwao. 1933. Daizu no ni shu no saponin ni tsuite [Two saponins from soya beans]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 9(11):1249-58. Nov. [9 ref. Jap]
• ***Summary:*** A crystalline saponin (with chemical formula $C_{48-50}H_{77-81}O_{18}$, melting point 225-227ºC), and an amorphous saponin (formula $C_{45-51}H_{79-83}O_{19}$, melting point 216-218ºC) were obtained. On hydrolysis the former yields a sapogenin, formula $C_{30-32}H_{48-52}O_3$, glycuronic acid, galactose, and rhamnose. The amorphous saponin yields a sapogenin, formula $C_{31-33}H_{50-54}O_4$, and glycuronic acid, galactose, and rhamnose. Five sapogenin isomerides, melting point 201ºC, 235ºC, 239ºC, 260ºC, and 248-249ºC, were isolated according to the duration of hydrolysis. When heated with copper oxide or lead chromate, the saponins and sapogenins yield methane and ethane. The saponins have no hemolytic power. Address: Nôgaku-shi, Minami Manshu Tetsudo K.K. (South Manchuria Railway Co.), Chuo Shikenjo, Nosan Kagaku-ka, Jikkenshitsu.

3010. Okano, Kôji; Ohara, Iwao. 1933. Daizu no nishu no saponin ni tsuite [Two varieties of soybean saponins]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 9(11):1249-58. Nov. English-language summary in Bulletin of the Agricultural Chemical Society of Japan 9:177-80, bound in Nippon Nogei Kagaku Kaishi. [9 ref. Jap]
• ***Summary:*** The authors examined the ethanol extract of soybeans, from which the oil was removed, with the object of identifying the soluble glycosidic materials, or glycosides. A crystalline saponin was obtained which melted at 225-227ºC and corresponded to the formula $C_{48-50}H_{77-81}O_{18}$. On hydrolysis, there was obtained a crystalline sapogenin corresponding to the formula $C_{30-32}H_{48-52}O_3$, glucoronic acid, galactose, and rhamnose.

Eventually 5 isomeric sapogenins were obtained, depending on the degree of hydrolysis of the original saponin. Neither of the original saponins exhibited any hemolytic power.

3011. Chachin, Toshio. 1933. Shôyu no vitamin B oyobi sono jôzô kôtei-chû no henka ni tsuite [Vitamin B and its change during the process of brewing shoyu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 9(12):1297-1319. Dec. [17 ref. Jap]
• ***Summary:*** The quantity of vitamin B-1 decreased with progress of fermentation, becoming zero after the third month.

3012. Ishimaru, Yoshio. 1933. Shôyu jôzô ni kansuru saikin no kenkyû. VII. [Research on the bacteria involved in shoyu fermentation. VII.]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 11(12):1076-1101. [Jap]
Address: Nôgaku hakase, Japan.

3013. Okano, Koji; Ohara, Iwao. 1933. On the two kinds of saponin of soya bean. *Bulletin of the Agricultural Chemical Society of Japan* 9(10-12):177-80. Oct/Dec. Bound in the back/front of Nippon Nogei Kagaku Kaishi (J. of the Agricultural Chemical Society of Japan). [3 ref. Eng]
• ***Summary:*** The authors studied the crystalline saponin of the soybean (already investigated by Y. Sumiki), developed its molecular [chemical] formula, and found that the products of hydrolysis are sapogenin (formula given), glucuronic acid, galactose, and rhamnose. They also isolated an amorphous saponin and developed its chemical formula.

3014. Sakurai, Yoshito. 1933. Miso no seibun ni tsuite. III. Yûri shibô-san oyobi saponins [On the constituents of miso. III. Free fatty acids and saponins]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 9(12):1326-30. Dec. [4 ref. Jap]
• ***Summary:*** Free oleic, linoleic, linolenic, stearic, and palmitic acids are present. Nine kg afforded 4 gm of the calcium salt, melting point 264-266ºC, of a saponin, melting point 232ºC, identical with soybean saponin. Address: Nôgaku-shi, Tokyo Daigaku Nôgaku-bu, Nôgei Kagaku Suzuki Kenkyû-shitsu.

3015. Sasaki, Shûiku. 1933. Studies on the germination of seeds. III. Transformation of carbohydrates during germination of soy-bean seeds. *Bulletin of the Agricultural Chemical Society of Japan* 9(10-12):181-82. Oct/Dec. Bound in the back/front of Nippon Nogei Kagaku Kaishi (J. of the Agricultural Chemical Society of Japan). [3 ref. Eng]
• ***Summary:*** The course of germination of the seeds is marked by an initial increase (5 days) and a subsequent

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decline in reducing sugar content, a steady decrease in sucrose, stachyose, and galactan, and an increase in starch, dextrin, pentosan, and crude fiber. The total carbohydrate content of the seeds did not change appreciably during the first 10 days of germination. Address: Biochemical Lab., Dep. of Agriculture, Kyûshû Imperial Univ.

3016. Bailey, Ethel Zoe. 1933-1966. Glycine soja–Foreign sources. Part I. Ithaca, New York: L.H. Bailey Hortorium. 3 cards. Unpublished.

• ***Summary:*** *Glycine soja* is the scientific name for the wild soybean, an annual plant. This name has never been used for the cultivated soybean.

These three hand-written index cards are in the Bailey Hortorium's index system of nursery catalogs and/or botanic garden seed lists developed by Ethel Zoe Bailey. In this index system, there are eleven major cards and eight minor cards related to the soybean. On each card are two-part coded entries referring to botanic gardens or nurseries.

Part 1 is the code for the name of the botanic garden, and part 2 is the last two letters of the earliest year in which the plant for that card appeared in this garden's catalog. For example "Buit 33" refers to the 1933 catalog from Buitenzorg, Java. [LR 1982] means that a list of seeds and plants (whether or not it contained soy) was "Last Received" from that source [Buitenzorg] in 1982. There are 72 listings for *Glycine soja* from foreign sources. As of Nov. 1997 most of the catalogs and seed lists mentioned below are available in the Bailey Hortorium, located in Mann Library, Cornell University, Ithaca, New York.

(1) Buit. 33–'s Lands Plantentuin Gov. Bot. Garden, Buitenzorg [later renamed Bogor], Java, Indonesia, 1933 [LR 1977; now known as Botanic Gardens, Kebun Raya, Bogor, Indonesia]. (2) Saig. 36–Hortus Botanicus Saigonensis, Saigon, Vietnam, 1936 [LR 1964]. (3) Turc. 37–Hortus Botanicus Turcomanicus, Turkonen Botanical Garden, 744012 Ashkhabad, Turkmen S.S.R. [later Turkmenistan], 1937 [LR 1976]. (4) Wey. 38–Michael A. Weymarn, 20 Grodekoosky Blvd., Harbin, Manchuria, 1938 [Later part of China]. (5) Lenin. 39–Botanical Garden (Botanitschesky Institut), Leningrad, Russia, USSR, 1939 [LR 1976].

(6) Buc. 40–Hortus Botanicus Universitatis Bucurestiensis "C.I. Parhon," Sos. Cotroceni nr. 32, R.P.R., Bucharest 15, Romania, 1940. (7) Mort. 39–La Mortola (Giardino Botanico Hanbury), Ventimiglia 18036, Italy, 1939 [LR 1975]. (8) Co. 41–Hortus Botanicus Conimbrigensis, Coimbra, Portugal, 1941 [LR 1982]. (9) Port. 42–Estacao Agronomica Nacional, Oeiras (Lisboa), Portugal, 1942 [LR 1982] (10) Dach. 43–All Union Scientific Research Institute of Medicinal Plants, Lenino-Dachnoe, Moscow District, Russia, USSR, 1943 [LR 1943]

(11) Brux. 40–Nationale Plantentuin van Belgie (formerly named Hortus Botanicus Bruxellensis), Dienst Levende Verzamelingen, Domaine van Bouchot, B-1860 Meise (Brussels), Belgium, 1940 [LR 1981]. (12) Gater. 49–Institut für Kulturpflanzenforschung, DDR-4325 Gatersleben, Kr. Aschersleben, Bezirk Halle, East Germany, 1949 [LR 1981]. (13) Camb. 48–University Botanic Garden (formerly named Horto Cantabrigiensis Academiae), Cambridge, England, 1948 [LR 1981]. (14) B.A. 51–Division de Exploraciones e Introduccion de Plantas, Ministerio de Agricultura de la Nacion, Buenos Aires, Argentina, 1951 [LR 1958]. (15) Jena 52–Botanischen Gartens der Friedrich Schiller Universitaet, Jena, Germany, 1952 [LR 1977].

(16) Modena 53–Istituto ed Orto Botanico [Botanical Garden] dell'Universita di Modena, Modena, Italy, 1953 [LR 1979]. (17) Munchen 55–Botanischer Garten Muenchen-Nymphenburg, Menzi ger Str. 63 BRD, D-8000 Muenchen [Munich] 19, Germany, 1955 [LR 1981]. (18) Tar. 56–Villa Taranto Gardens, Pallanza, Italy, 1956 [LR 1974]. (19) Berl. 55–Botanischer Garten, Berlin-Dahlem, Germany, 1955 [LR 1975]. (20) Ruzy. 57–Research Institute for Plant Production, Ruzyne at Prague, Czechoslovakia [in the Czech Republic since Jan. 1993], 1957 [LR 1957].

(21) Kohr. 57–Gerhard Kohres, Bahnstrasse 101, D-6101 Erzhausen, Darmstadt, Germany, 1957 [LR 1973]. (22) Szeg. 57–Hortus Botanicus Universitatis Szeged, Szeged, Hungary, 1957 [LR 1976]. (23) Brno. 58–Botanika Gardeno de Veterinara Universitato, Brno 12, Czechoslovakia [in the Czech Republic since Jan. 1993], 1958 [LR 1968]. (24) Zurich 59–Botanischer Garten der Universitaet Zuerich (and Parco Botanico del Cantone Ticino, Isole di Brissago, Lago Maggiore), Zollikerstrasse 107, CH-8008 Zurich, Switzerland, 1959 [LR 1977]. (25) Gott. 58–Botanischer Garten der Universitaet Goettingen, Gottingen, Germany, 1958 [LR 1981].

(26) Erl. 58–Botanischer Garten der Universitaet Erlangen, Schlossgarten 4, Erlangen, Germany, 1958 [LR 1977]. (27) Hohen. 58–Botanischer Garten der Landwirtschaftlichen Hochschule Stuttgart-Hohenheim, Stuttgart-Hohenheim, Germany, 1958 [LR 1981]. (28) Kassel 58–Botanischer Garten der Stadg. Kassel, Bosestrasse 15 (Park Schonfelf), Kassel, Germany, 1958 [LR 1965]. (29) Marb. 58–Botanischer Garten der Philipps-Universitaet, Auf den Lahnbergen, 3550 Marburg 1, Germany, 1958 [LR 1981; Formerly located at Pilgrimstein 4]. (30) Bonn U. 58–Botanischer Garten der Universitaet Bonn, Meckenheimer Allee 171, Bonn, Germany, 1958 [LR 1979].

(31) Glasgow 60–Botanic Gardens, Glasgow W. 2, Scotland, UK, 1960 [LR 1982]. (32) Lond. 60–University of London, Botanical Supply Unit, Elm Lodge, Englefield Green, Surrey, England, UK, 1960 [LR 1981]. (33) Liv. 61–University of Liverpool Botanic Gardens, Ness, Neston, Wirral, Cheshire, England, UK, 1961 [LR 1982]. (34) Kew 61–Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB, England, UK, 1961 [LR 1982]. (35) Monpl. 62–Jardin des Plantes, Universite de Montpellier, Faubourg St. Jaumes,

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Montpellier, France, 1962 [LR 1978].

(36) Komen. 62–Botanicka Zahrada Univerzity Komenskeho, Bratislava, Czechoslovakia, 1962 [LR 1965; Bratislava has been the capital of Slovakia since 1992]. (37) Humb. 63–Institut für Botanik der Landwirtschaftlich-Gaerternischen Fakultaet der Humboldt Universitaet zu Berlin, Invalidenstrasse 42, Berlin 4, Germany, 1963, [LR 1964]. (38) Hok. 64–Botanic Garden of the Faculty of Agriculture, Hokkaido University, Sapporo, Japan, 1964 [LR 1982]. (39) Padova 63–Istituto Botanico dell'Universita, Via Orto Botanico 15, Padova [Padua], Italy, 1963 [LR 1980]. (40) Kosice 63–Botanicka zahrada University P.J. Safarika, Kosice, Slovakia, 1963 [LR 1981].

(41) Pal. 64–Hortus Botanicus Universitatis Palackianae, Olomouc, Leninova 26, Czechoslovakia, 1964 [LR 1979]. (42) Cluj. 63–Hortus Botanicus Clusiensis, Universitas "Babes-Bolyai," Str. Republicii Nr. 42, 3400 Cluj Napoca, Romania, 1963 [LR 1981]. (43) Pecs 63–Hortus Botanicus Pecs, Ifjusag Utja 6, Pecs, Hungary, 1963 [LR 1976]. (44) Vasak 63–Vladimir Vasak Agricultural Research Station, Sumperk-Temenice, Czechoslovakia [in the Czech Republic since Jan. 1993], 1963 [LR 1963]. (45) Bud. 64–Hortus Botanicus Universitatis Hungariae, Illes u. 25, Budapest VIII, Hungary, 1964 [LR 1981].

(46) Trieste 64–Universita degli studi di Trieste, Trieste, Italy, 1964 [LR 1964]. (47) Nijm. 65–Hortus Botanicus Universitatis Noviomagensis, University of Nijmegen, Driehuizerweg 200, Nijmegen, Netherlands, 1965 [LR 1981]. (48) Gob. 66–Prachi Gobeson, Narendra Nager (Dunlop Bridge), P.O. Belgharia, Calcutta-56, India, 1966 [LR 1966; Formerly located at Anandrapuri, P.O. Barrackpore, Calcutta]. (49) Ferr. 65–Hortus Botanicus Ferrariensis, Istituto ed Orto Botanico dell'Universita di Ferrara, Ferrara, Italy, 1965 [LR 1976]. (50) Rouen 66–Jardin Botanique de la Ville de Rouen, 7 Rue de Trianon, Rouen, France, 1966 [LR 1981]. Continued. Address: L.H. Bailey Hortorium, 462 Mann Library, Cornell Univ., Ithaca, New York 14853-4301. Phone: 607-255-7981. Fax: 607-255-7979.

3017. Bailey, Ethel Zoe. 1933-1982. Glycine max–Foreign sources. Ithaca, New York: L.H. Bailey Hortorium. 2 cards. Unpublished.

• ***Summary:*** These two hand-written index cards are in the Bailey Hortorium's index system of nursery catalogs and/or botanic garden seed lists developed by Ethel Zoe Bailey. In this index system, there are eleven major cards and eight minor cards related to the soybean. On each card are two-part coded entries referring to botanic gardens or nurseries.

Part 1 is the code for the name of the botanic garden, and part 2 is the last two letters of the earliest year in which the plant for that card appeared in this garden's catalog. For example "Kew 33" refers to the 1933 catalog of the Royal Botanic Gardens at Kew, England. [LR 1982] means that a list of seeds and plants (whether or not it contained soy) was "Last Received" from that source [Kew] in 1982. There are 55 listings for *Glycine max* from foreign sources. As of Nov. 1997 most of the catalogs and seed lists mentioned below are available in the Bailey Hortorium, located in Mann Library, Cornell University, Ithaca, New York.

(1) Kew 33–Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB, England, UK, 1933 [LR 1982]. (2) Taih. 34–Taihoku Botanic Garden, Taihoku, Formosa [Taiwan], 1934. (3) Adel. 50–Adelaide Botanic Garden, Adelaide, South Australia, 1950 [LR 1982]. (4) Tar. 50–Villa Taranto Gardens, Pallanza, Italy, 1950 [LR 1974]. (5) Upps. 50–Universitets Botaniska Tradgard, P.O. Box 123, Uppsala, Sweden, 1950 [LR 1979].

(6) Port. 51–Estacao Agronomica Nacional, Oeiras (Lisboa), Portugal, 1951 [LR 1982]. (7) Camb. 51–University Botanic Garden, Cambridge, England, UK, 1951 [LR 1981]. (8) Copen. 50–Universitetets Botaniske Have Kobenhaven, ø Farimagsgade 2B, DK-1353, Copenhagen K, Denmark, 1950 [LR 1981]. (9) Wien 54–Botanischer Garten der Universitaet Wien, Rennweg 14, Wien III, Austria, 1954 [LR 1976]. (10) Modena 53–Istituto ed Orto Botanico [Botanical Garden] dell'Universita di Modena, Modena, Italy, 1953 [LR 1979].

(11) P.I. 53–Bureau of Plant Industry, Dep. of Agriculture, Manila, Philippines, 1953 [LR 1953]. (12) B.A. 55–Division de Exploraciones e Introduccion de Plantas, Ministerio de Agricultura de la Nacion, Buenos Aires, Argentina, 1955 [LR 1958]. (13) N.H.L. 56–National Institute of Hygienic Sciences (formerly: National Hygienic Laboratory), Kasukabe Experiment Station of Medicinal Plants, No. 30 Kasukabe-shi, Saitama-ken, Japan, 1956 [LR 1963]. (14) Co. 57–Hortus Botanicus Conimbrigensis, Coimbra, Portugal, 1957 [LR 1982]. (15) Gater. 56–Institut für Kulturpflanzenforschung, DDR-4325 Gatersleben, Kr. Aschersleben, Bezirk Halle, East Germany, 1956 [LR 1981].

(16) Prag. 56–Hortus Botanicus Universitatis Carolinae Pragensis, Prague, Czechoslovakia, 1956 [LR 1977]. (17) Hamburg 58–Botanischer Garten Hamburg, Jungiustr. 6, Hamburg 36, Germany, 1958 [LR 1973]. (18) Milan 58–Hortus Botanicus Mediolanensis, Istituto Orto Botanico dell'Universita di Milano, Via Guiseppe Colombo 60, Milan, Italy, 1958 [LR 1980]. (19) Read. 59–Agricultural Botanic Garden, University of Reading, Reading, Berkshire, England, UK, 1959 [LR 1974]. (20) Rabat 63–Institut National de la Recherche Agronomique, B.P. 415, Rabat, Morocco, 1963 [LR 1971; Formerly: 99 Avenue de Temara].

(21) L'zig 63–Botanischer Garten der Karl Marx Universitaet, Leipzig, Germany, 1963 [LR 1976]. (22) Jena 63–Botanischen Gartens der Friedrich Schiller Universitaet, Jena, Germany, 1963 [LR 1977]. (23) Tap. 63–Institutum Agrobotanicum, Orszagos Agrobotanikai Intezet, Tapioszele, Hungary, 1963 [LR 1978]. (24) Brux. 64–Nationale Plantentuin van Belgie (formerly named Hortus Botanicus

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Bruxellensis), Dienst Levende Verzamelingen, Domaine van Bouchot, B-1860 Meise (Brussels), Belgium, 1964 [LR 1981]. (25) Berg 65–Hortus Botanicus Bergianus (Bergianska Tradgarden), Stockholm 50, Sweden, 1965 [LR 1981].

(26) Pecs 65–Hortus Botanicus Pecs, Ifjusag Utja 6, Pecs, Hungary, 1965 [LR 1976]. (27) Essen 66–Botanischer Garten Essen, Hortus Botanicus Assindiensis, Essen, Germany, 1966 [LR 1977]. (28) Bonn U. 65–Botanischer Garten der Universitaet Bonn, Manesova ul. 13, Meckenheimer Allee 171, Bonn, Germany, 1965 [LR 1979]. (29) Kosice 68–Botanicka zahrada University P.J. Safarika, Kosice, Slovakia, 1968 [LR 1981]. (30) S.C. 68–Jardin Agrobotanico de Santa Catalina, Llavollol FNGR, Argentina, 1968 [LR 1974].

(31) Barc. 70–Institut Botanic de Barcelona, Av. Muntanyans, Parc de Montjuic, Barcelona 4, Spain, 1970 [LR 1981]. (32) Munchen 71–Botanischer Garten Muenchen-Nymphenburg, Menzi ger Str. 63 BRD, D-8000 Muenchen [Munich] 19, Germany, 1971 [LR 1981]. (33) Hohen. 72–Botanischer Garten der Landwirtschaftlichen Hochschule Stuttgart-Hohenheim, Stuttgart-Hohenheim, Germany, 1972 [LR 1981]. (34) Frank. 72–Botanischer Garten der Johann Wolfgang Goethe Universitaet, Siesmayerstrasse 72, 6 Frankfurt am Main, Germany, 1972 [LR 1980]. (35) Oxf. 73–Botanic Garden, University of Oxford, Rose Lane, Oxford, England, UK, 1973 [LR 1981].

(36) Koln 73–Botanischer Garten und Arboretum der Stadt Köln [Cologne], Ave. Botanischen Garten, 5000 Koeln 60, Germany, 1973 [LR 1981; Formerly at Amsterdammer Strasse 36]. (37) Hal. 74–Hortus Botanicus Universitatis Halensis, Halle, Germany, 1974 [LR 1982]. (38) Gen. 73–Conservatoire et Jardin Botaniques de la Ville Geneve, Case postale 60, CH. 1292 Chambesy / Geneva, Switzerland, 1973 [LR 1981]. (39) Zurich 74–Botanischer Garten der Universitaet Zuerich (and Parco Botanico del Cantone Ticino, Isole di Brissago, Lago Maggiore), Zollikerstrasse 107, CH-8008 Zurich, Switzerland, 1974 [LR 1977]. (40) Amst. 73–Jardin Botanique de l'Universite Amsterdam, Amsterdam, Netherlands, 1973 [LR 1975].

(41) Bes. 73–Jardin Botanique de la Ville et de l'Universite (de Besancon), Place Marechal Leclerc, 25000 Besancon, France, 1973 [LR 1981]. (42) Dijon 73–Hortus Botanicus Divionensis, Jardin Botanique, 1 Avenue Albert-Premier, 21000 Dijon, France, 1973 [LR 1981]. (43) Wars. 75–Hortus Botanicus Universitatis Varsaviensis, Warsaw, Poland, 1975 [LR 1981]. (44) Berl. 75–Botanischer Garten, Berlin-Dahlem, Germany, 1975 [LR 1975]. (45) Cluj. 76–Hortus Botanicus Clusiensis, Universitas "Babes-Bolyai," Str. Republicii Nr. 42, 3400 Cluj Napoca, Romania, 1976 [LR 1981].

(46) Glasgow 77–Botanic Gardens, Glasgow W. 2, Scotland, UK, 1977 [LR 1982]. (47) Monpl. 78–Jardin des Plantes, Universite de Montpellier, Faubourg St. Jaumes, Montpellier, France, 1978 [LR 1978]. (48) Erl. 77–Botanischer Garten der Universitaet Erlangen, Schlossgarten 4, Erlangen, Germany, 1977 [LR 1977]. (49) Groz. 80–Hortus Agrobotanicus Instituti Agronomici "Dr. Petru Groza," Cluj, Romania, 1980 [LR 1980]. (50) Duss. 79–Botanisches Institut der Universitaet Duesseldorf, Christophstrasse 82, Dusseldorf, Germany, 1979 [LR 1981].

(51) Tubin. 80–Botanischer Garten der Universitaet Tuebingen, Tubingen, Germany, 1980 [LR 1980]. (52) Vac. 82–Research Institute for Botany, Hungarian Academy of Sciences Botanical Garden, 2183 Vacratot, Hungary, 1982 [LR 1982]. (53) Graz 82–Botanischer Garten der Universitaet Graz, Holtei-Gasse 6, A-8010 Graz, Austria, 1982 [LR 1982]. (54) Jo. 81–Botanical Garden, Univ. of Joensuu, P.O. Box 111, SF-80101 Joensuu, Finland, 1981 [LR 1981]. (55) Utr. 82–"Hortus Botanicus" Utrecht & "Cantonspark" Baarn of the State University of Utrecht, Utrecht, Netherlands, 1982 [LR 1982]. Address: L.H. Bailey Hortorium, 462 Mann Library, Cornell Univ., Ithaca, New York 14853-4301. Phone: 607-255-7981. Fax: 607-255-7979.

3018. Fukai, Tôshi; Komatsu, S. 1933. Shôyu hakkô to shiyu no kankei. IV. Kôbo no seikatsu saibô narabini sono kôso sayô ni oyobosu kapurinsan no seiri teki sayô ni tsuite (1) [The relation between oil and shoyu fermentation. IV. Living cells of yeast and the biological action of capric acid on its enzymatic action]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 28(5):22-29; 28(6):25-34. [8 ref. Jap]
Address: Jozo Shikensho.

3019. Ishimaru, Yoshio. 1933. Kôshuha onpa ni yoru shôyu kôbo sakkin no kokoromi [On the sterilization of shoyu yeasts with high frequency waves]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 28(7):8-9. [5 ref. Jap]
Address: Nôgaku-shi, Japan.

3020. Ishio, M.; Endo, Y.; Wada, K. 1933. Kikuna to shôsuru mono no shôyu ni taisuru bôbai kôryoku shiken seiseki hôkoku [Antimold effect of "Kikuna" on shoyu (Abstract)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 28(7):101. [Jap]

3021. Ishio, M.; Tsuboi, R.; Endo, Y. 1933. Ichi kamaboko bôfuzai no kamaboko ni taisuru bôfu kôryoku shiken seiseki hôkoku. Fu: Tannin-san no shôyu ni taisuru bofu koryoku shiken seiseki hôkoku [Antiseptic effect of tannic acid for kamaboko and shoyu]. *Eisei Shikenjo Iho* (*Bulletin of the Imperial Hygienic Laboratories*) No. 41. p. 153-59. [2 ref. Jap]
Address: 1. Gishi; 2-3. Gishu.

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3022. Ishio, M.; Endo, Y.; Wada, K. 1933. Kikunaa to shôsuru mono no shôyu ni taisuru bôbai kôryoku shiken seiseki hôkoku [Antimold effect of "kikunaa" for shoyu]. *Eisei Shikenjo Iho* (*Bulletin of the Imperial Hygienic Laboratories*) No. 41. p. 149-52. [Jap]
• ***Summary:*** Kikunaa is not the plant (a cypsela); not clear what it is. Address: 1. Gishi; 2. Gishu; 3. Joshu.

3023. Iwamura, Iwao. 1933. Miso no eiyô-ka ni kansuru kenkyû. I. Kome no tanpakushitsu ni taisuru miso no tanpakushitsu no hosoku-teki kachi [Nutrition value of miso. I. Supplementary value of miso protein for rice protein deficiency]. *Ryoshoku Kenkyu* (*J. of the Institute of Dietary Science*) No. 84. p. 377-90. [17 ref. Jap]

3024. Izume, S. 1933. [Existence of ergosterol in shoyu; economical value of shoyu as a source of vitamin D]. *Minami Manshu Tetsudo K.K.* (*South Manchuria Railway Co. Experiment Station*) 17:1-. [Jap]*

3025. Minami Manshu Tetsudo K.K. Keizai Chosa-kai. Dai-2-bu. 1933. Manshû daizu seisan kankei taisaku an sankô shiryô [Reference materials related to plans for Manchurian soybean production]. Nôhyô oyobi Ishokuminhan. [Jap]*
• ***Summary:*** Name of company with diacritics is: Minami Manshû Tetsudô K.K. Keizai Chôsa-kai. Dai-2-bu. Address: Manchuria.

3026. Ohga, Ichiro. 1933. Manshû daizu ni tsuite [On Manchurian soybeans]. *Nihon Gakujutsu Kyokai Hokoku* (*Report of the Japanese Society for the Advancement of Science*) 8:320-24. [Jap]
Address: Rigaku Hakase.

3027. Sakurai, Yoshito. 1933. Miso no kagaku-teki kenkyû. I. Sendai miso jukusei-chû no henka ni tsuite [Chemical analysis of miso. I. On the changes in Sendai miso during fermentation]. *Ryoshoku Kenkyu* (*J. of the Institute of Dietary Science*) No. 81. p. 187-89. [Jap]

3028. Sakurai, Y. 1933. Miso no kagaku-teki kenkyû. III. Miso no yûki-san ni tsuite [Chemical analysis of miso. III. On the organic acids in miso]. *Ryoshoku Kenkyu* (*J. of the Institute of Dietary Science*) No. 81. p. 191-96. [Jap]

3029. Sakurai, Y. 1933. Miso no kagaku-teki kenkyû. II. Shibô no ippan seijo ni tsuite [Chemical analysis of miso. II. On the general condition of oils and fats]. *Ryoshoku Kenkyu* (*J. of the Institute of Dietary Science*) No. 81. p. 189-91. [Jap]

3030. Shikazono, N.; Tomoda, N. 1933. Daizu kasu kasui bunkai butsu "soyamento" to shôyu no hikaku kenkyû [Comparative studies on the hydrolysate of soybean presscake called "Soyament" and original shoyu (Abstract)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 28(1):84. [Jap]

3031. Simose, Rinta; Aoyama, Isao. 1933. Ringo-san sôda o karami shuseibun to suru shôyu ni tsuite [Sodium malate as a salting substance for shoyu]. *Rikagaku Kenkyujo Hokoku* (*Report of the Institute of Physical and Chemical Research*) 12(7):609-13. [13 ref. Jap]

3032. Tanaka, T. 1933. Chôsen no jimbun chishi gaku teki kenkyû [Anthropogeographical studies on Korea]. *Chiri Kyoiku* (*Geographical Education*) 17:40-45, 256-63, 376-82. [Jap]*

3033. Wakayama, Harutarô. 1933. Chihô-teki ichi miso no bunseki hôkoku [Report on an analysis of miso from various parts of Japan]. *Ryoshoku Kenkyu* (*J. of the Institute of Dietary Science*) No. 88. p. 629-31. [Jap]
Address: Zaidan Hojin Ryoshoku Kenkyu-kai.

3034. Fukai, Tôshi. 1933. Bankin shôyu jôzô kakôron [Modern shoyu manufacturing]. Tokyo: Chômi Kenkyûkai [Chomi Kenkyukai]. 2 + 3 + 8 + 571 p. Illust. 23 cm. [Jap]*
• ***Summary:*** The author was born in 1888. Address: Japan.

3035. Fukuda, Yasona. 1933. Cyto-genetical studies on the wild and cultivated Manchurian soy beans (Glycine L.). *Japanese J. of Botany* 6(4):489-506. [15 ref]
• ***Summary:*** Contents: Introduction: Three *Glycine* species are treated in this paper: 1. *Glycine hispida* Max (*Glycine Soja* Benth.). 2. *Glycine gracilis* Skvortzow. 3. *Glycine Soja* Siebold et Zuccarini (*Glycine ussuriensis* Regel et Maack). Material and methods. Number and morphology of chromosomes. Development of the pollen grains. Weight of seeds of the *Glycine* species. Genetical difference among the *Glycine* species. Origin of soy beans. Summary. Literature cited. Explanation of plates XXI-XXII.

Describes the first reported cross between *Glycine* species made by Nakatomi and Nibe around 1917–and not yet published. They crossed the soybean (*Glycine soja*) with the wild soybean (*Glycine ussuriensis*), making hybrids of these two species with the object of making a new commercial form; their observations reached the F-4 generation. Fukuda considers *G. gracilis* to be the intermediate species between the domesticated soy bean and *G. ussuriensis,* the wild annual soybean which grows in Manchuria and has 40 somatic chromosomes.

Fukuda suggests that soybeans originated in Manchuria, probably from the wild species, and he argues strongly for a soybean gene center in Manchuria, where soybeans were first domesticated. His reasons are as follows: (1) *Glycine gracilis,* the weedy form is distributed widely in Manchuria but less frequently in other regions of China; (2) Numerous

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soybean varieties are grown in Manchuria; (3) Many of the soybean varieties in Manchuria appear to have primitive characteristics. Hymowitz (1970, p. 417) attempts to refute Fukuda's theory. Address: Manchuria Medical College, Japanese Concession, Mukden, Manchuria.

3036. Hattori, Kenzô; Ogimura, M.; Okumura, M. 1933. Daizu no saponin ni tsuite [Soybean saponins]. *Nippon Eisei Kagaku Kaishi* (*J. Hyg. Chem. Society of Japan*) (*Eisei Kagaku*) 5:313-22. [Jap]
• ***Summary:*** The authors isolated two saponins from soybeans which they designated saponins I and II. Saponin I melted at 265ºC and gave, on hydrolysis, a sapogenin melting at 249ºC, whereas saponin II melted at 217-218ºC and gave a sapogenin melting at 241ºC. Address: Tokyô Teikoku Daigaku, Igaku-bu, Yakugaku-ka, Eisei-gaku Kyôshitsu (Tokyo Imperial Univ.).

3037. Inahara, K. ed. 1933. Japan Year Book. Tokyo: The Foreign Affairs Association of Japan. 18 + 1383 + 51 p. See p. 201-223. 21 cm.
• ***Summary:*** This book has a new editor and a new publisher. The Preface states: "This Year Book has no connection with that published by the late Prof. Tukenobu under the same title, which is now defunct. Both in selection and classification of material, an attempt has been made to incorporate in this book some of the best features of similar publications throughout the world, together with certain original ideas as to modern requirements in a Year Book. The book thus represents an entirely new venture, breaking, in some respects, entirely new ground.

"Such being the case, it is feared that some of the overlappings and wiser defects which seem, despite the greatest editorial vigilance, inseparable from the first issue of a publication of the kind, may have crept in. Every effort will be made in subsequent issues of the Year Book to remedy such defects.

"Tokyo, November, 1933. K. Inahara, Editor."

Chapter 6 (p. 201-223) is a detailed account of the "Manchurian Incident" of 18 Sept. 1931 (which the Japanese government used as an excuse for taking control of Manchuria and renaming it Manchoukuo)–told from the Japanese point of view. When the League of Nations rejected Japan's explanation for its aggression, Japan promptly withdrew from the League.

3038. Japan. Nôrinshô, Beikokubu. 1933. Shina ni okeru Gisô oyobi Shasô, shimin seikatsu, kôchi seido, kokumotsu no meishô no kenkyû [A study of the Giso and Shaso storage houses, and the life of the Shimin people, the cultivated field system, and the names of grains]. Tokyo: Dai Nihon NoÄkai 212 p. See p. 148, 166. Series: Beikoku shiryô No. 19. [Jap]*
• ***Summary:*** Page 148 states that "shu" includes both soybeans and azuki beans, and page 166 states that before the 6th century, both soybeans and azuki beans were cultivated. The "Five Grains" always includes "shu." Address: Japan.

3039. *Japan Times Year Book.* 1933. Serial/periodical. Published by The Japan Times, Tokyo. 27 cm. [Eng]
• ***Summary:*** Merged with: Japan Year Book (Tokyo, Japan: 1905), to form: Japan-Manchoukuo Year Book. This book has a larger format than the Japan Year Book. On the title page is printed "(Third Edition). Near the front are nine maps (black and white): Japan (incl. Chosen [Korea] and Manchokuo) [sic] with each of Japan's provinces numbered and named, Karafuto (southern half), Hokkaido, Northern Hondo [Honshu], Central Hondo, Western Hondo, Kyushu, Taiwan, and Chosen [Korea].

Facing p. 72 is Appendix XII: Japanese weights and measures. 1 koku = 1.80391 hectolitres.

Page 140. A table shows the "Principal agricultural crops" of Japan and the quantity and value produced in 1928-30. For "soya beans":

5.370 million hl [hectoliters] in 1928
4.789 million hectoliters in 1929
5.473 million hectoliters in 1930.

Production of "azuki beans" was 24.6% that of soya beans in 1928.

Another table (p, 141) shows cultivated area, production, and value for soya beans, azuki beans, and foxtail millet in 1929 and 1930. For soya beans:

4.789 million hectoliters in 1929
5.478 million hectoliters in 1930

Page 213. In the section on the foreign trade of Japan in 1931, important items include "Beans" (worth 37.677 million yen compared with 49.734 million yen in 1930, a decrease of 12.1%) and "Bean cakes" (worth 44.179 million yen compared with 66.417 million yen in 1930, a decrease of 22.2%).

Page 221. About agriculture in Chosen [Korea]. "Soya beans are exported chiefly to Japan for manufacturing soy [sauce], the export amounting to 4.490 million koku valued at 17.554 million yen in 1930.

Page 301. Chapter 43 is titled " Kwantung Leased Territory and Railway Zone." Japan believes that it now (since 1931) controls these two parts of Manchuria. The latter is officially known as the "South Manchuria Railway Zone."

Page 307. Contains a table that lists the principal agricultural products in the Kwantung and the Railway Zone. They are (in descending order of total production in both areas: peanuts (1.032 million koku), maize (921,071 koku), kaoliang (270,529 koku), millet (216,644 koku), soya beans (156,895 koku). Note that soya beans are much less important than they were 20 years ago.

Page 308. "The most important Manchurian industry is the [soya] bean oil industry, and in this field, the Kwantung territory occupies a very important position. The capacity of

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bean oil produced at Dairen is nearly 70 percent of the entire bean oil producing capacity of Manchuria." A table gives the number of oil mills at Dairen (1924-1931), their capacity in terms of [soy] bean cakes, and the percentage of the total Manchurian capacity controlled by Dairen. The number of mills increased from 82 in 1924 to a peak of 84 in 1926, then decreased to 53 in 1931. The capacity in bean cakes increased from 285,000 cakes in 1924 to a peak of 297,400 cakes in 1931. The percentage of total capacity increased from 55% in 1924 to 69% in 1931.

A second table [which makes no sense] gives the actual production of cakes in Dairen mills from 1924 to 1931: It increased from 27.087 million cakes in 1924 to a peak of 40.939 million cakes in 1926, then decreased to 22.980 million in 1930.

3040. Kincaid, Zoë. 1933. Tokyo vignettes. Tokyo & Osaka: The Sanseido Co., Ltd. [8] + 284 p. See p. 101. Illust. No index. 23 cm.
• ***Summary:*** Page 2: When the author is at her home in Tokyo: "Into the morning's routine comes the call of the bean-curd seller, announcing to every household that he is at hand to supply its wants;..."

Page 67: "My hostess served me with soba... which the farmer had made himself, together with relish of seaweed, and soy [sauce] of their own manufacture."

Pages 100-103: At the Kwannon Temple in Tokyo, seven old women sell soaked or sprouted beans and rice for a few small coins, and the visitors to the temple throw the food to the birds. "Well the doves know the ways of their benefactors, and divine prospective distributors of largess, for they watch with bright eyes for the bean scattering and fly from all directions to be in on the banquet! The charge for the contents of one bean tray is two sen."

Page 209: "For breakfast there is soup made from slightly fermented beans, miso, thick with vegetables, tasty and hot. Later the tofu vendor runs thorough the streets calling out that he has white bean curd to sell."

Page 212: Among the ingredients of oden were "fried bean curd." Address: Tokyo, Japan.

3041. Matsuura, Hajime. 1933. A bibliographical monograph on plant genetics (Genic analysis; 1900-1929). 2nd ed. Sapporo: Hokkaido Imperial University. 787 p. 2077 references total. [24 soy ref. Eng]
• ***Summary:*** For soybeans, see p. 100-10, 779. A very complete and interesting treatment of all early papers, worldwide, on soybean genetics. The Japanese took an early lead in research on soybean genetics (especially Nagai). This is the first comprehensive study. Only 2-3 groups in the USA were interested, especially at the University of Illinois. Not much practical use was made of soybean genetics before about 1930.

Contents of soybean section: Seed color and pattern. Cotyledon color (it is either green or yellow; green is dominant). Pubescence on the plant surface. Other characters (See Table VIII. Flower color, pod color, hair color, leaf color, leaf form, number of leaflets, plant height, fasciation of stem, branching habit, dehiscence of pods, maturing time, seed coat surface, hilum character, seed size, sterility). List of genes and linkage relations.

The "Foreword to the First Edition," by K. Fuji (Emeritus Professor of Botany, Tokyo Imperial University) begins: "With the rediscovery of Mendel's laws in the year 1900 opened a new era in the development of the science of heredity and variation, and there is nothing in the history of biology comparable to the rapidity with which the new principle has spread and the enormous influence it exerted on other principles of biology, other than the case witnessed in the years following 1859 on the appearance of Darwin's 'Origin of species by means of natural selection.' In these respects Mendelism and Darwinism show a singular coincidence." Address: Prof. of Botany, Hokkaido Imperial Univ., Sapporo, Japan.

3042. Morimoto, Rokuji. 1933. Kokurui o dashita tateana [The pit from which grains were excavated]. In: Rokuji Morimoto, ed. 1933. Nihon Genshi Nogyo (Japanese Primitive Agriculture). Tokyo: Tokyo Kokogakkai (Tokyo Archaeology Society). 135 p. See p. 132-33. [Jap]*
• ***Summary:*** According to Taichi Fukazawa's report, naturally carbonized soybeans were found in a pit at the Komoriyama ruins, Senya Village, Senhoku-gen, Akita prefecture, Japan. These soybeans, dating from the first to second centuries A.D., were the second oldest ever found in Japan. They were dated by Dr. Nobuo Ito of Tohoku University. Address: Japan.

3043. Morse, W.J. 1933. Soybeans now a major crop in United States; Few grown before 1898. *Yearbook of Agriculture* (*USDA*) p. 198-205. For the year 1933.
• ***Summary:*** Contents: Variety adaptation. Variety utilization (incl. bean curd, bean milk, soy sauce, miso (bean paste), bean sprouts, green vegetable beans, bean flour, roasted beans, bean confections [made using roasted whole soy flour], beverages, oil and meal, special fermented bean products). Soybean oil and meal industry. Soybean meal. Soybean oil. Soybeans for human food. Soybeans as an export crop.

"Variety adaptation: The Virginia, Laredo, Manchu, and Biloxi have a greater range than most other varieties. The Virginia, Mansoy, and Harbinsoy varieties excel on the less productive types of soil, while on better soils the Mansoy and Harbinsoy give inferior results.

"Since the Department of Agriculture began to introduce soybean varieties more than 7,000 samples of beans have been collected from Japan, Chosen [Korea], Manchuria, China, Taiwan (Formosa), Java [in today's Indonesia],

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Sumatra, and India. There are more than 2,000 distinct types in this large collection, ranging from 75 to more than 200 days in reaching maturity. At present about 40 varieties are generally grown in the United States."

"In Japan, where the soybean is used extensively as a green vegetable, more than 60 varieties, ranging in maturity from 75 to 160 days and differing in flavor, are grown solely for this purpose. The soybean in used in the United States primarily as forage, being preserved either as hay or silage, or cut and fed green as soilage, and is also pastured extensively with hogs and sheep."

"Soybeans for human food: In Asiatic countries the soybean is grown primarily for the beans, which are used largely in the manufacture of numerous food products that supply the principal source of protein in the Asiatic diet as that in the diet of western people is furnished chiefly by meat and dairy products. "Oriental people use very few dairy and meat products, yet for many centuries they have lived on an apparently well-balanced diet of which the protein is derived largely from the soybean.

"The most commonly used soybean foods in the Orient are soy sauce, miso or bean paste, bean curd, bean milk, bean flour, roasted-bean confections, green-vegetable beans, bean sprouts, roasted bean flour, boiled beans (with rice, millet, or sorghum), coffee substitute, and health drinks made from roasted soybeans.

"In the United States the soybean and its products have attracted attention as an article of food at various times, but only within the last three or four years have there been any extensive investigations along this line by commercial interests. Soybean flour, made by grinding either the whole bean (preferably yellow-seed varieties) or the press cake after the oil has been removed from the beans, is finding increasing favor in the manufacture of various products, such as malted milk, macaroni, vermicelli, spaghetti, noodles, crackers, cookies, ice-cream cones, breakfast foods, health foods, diabetic foods, and infant foods. Within the last year several large baking companies have began using 15 to 20 per cent of soybean flour in making bread and cakes." Address: Bureau of Plant Industry, Washington, DC.

3044. Nakayama, Shuhei. 1934. Miso jôzô no eiyô kagaku-teki kosatsu. IX. Miso gan-chisso seibun no hakumai tanpakushitsu ni taisuru hosoku kôka [Nutritional studies on miso fermentation. IX. Supplementary effect of miso protein on the protein deficiency in rice]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 12(1):6-14. Jan. [8 ref. Jap]
Address: Osaka Teikoku Daigaku Kogakubu, Jozogaku Kyoshitsu, Takada Kenkyushitsu, Japan.

3045. Narahara, Hanbei. 1934. Shôyu moromi no jukusei ni tsuite [On ripening of shoyu moromi]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 12(1):57-63. [Jap]

3046. *Times of India* (*The*) (*Bombay*). 1934. Baroda Gaekwar visits H.O.H. fete: Tribute to Japanese. Feb. 26. p. 4.
• ***Summary:*** The importance of the soya bean as a potential food for India was brought to the attention of visitors to the Bombay H.O.H. Fete when the Gaekwar of Baroda visited the Fete on Sunday night.

"During his visit to the Japanese Village, he inspected the stall which has been erected there to show the public what can be done with soya beans, a crop which His Highness is encouraging in Baroda." The Gaekwar recently made a tour of Japan.

3047. Tetsumoto, -. 1934. Chômiryô no chô-chifusu-kin oyobi korera-kin ni taisuru sakkinryoku [The sterilizing power of various seasonings toward typhoid Salmonella bacteria and cholera bacteria]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 10(2):123-27. [1 ref. Jap]
• ***Summary:*** Worcestershire sauce, an important constituent of which is soy sauce, is reported to have a strong sterilizing action.

3048. *Foreign Crops and Markets* (*USDA Bureau of Agricultural Economics*). 1934. Manchurian soybean output larger than last year. 28(11):288-92. March 12.
• ***Summary:*** Tables show: (1) "Manchuria: Estimated soy bean acreage and production, 1927 to 1933." Final statistics are given for each year. Production was 4,899,560 short tons in 1927. It rose to a peak of 5,838,197 short tons in 1930, then fell gradually to 5,736,000 short tons in 1933. Source: South Manchuria Railway. (2) "Manchuria: Soybean production and distribution, 1929-30 to 1933-34." For each of the five crop years is given: Production, carryover from last crop year, total supply, total exports, carryover at end of crop year, home consumption and seed. Note: Home consumption and seed is about 20% of production.

"The demand for beancake during 1933-34 is not expected to improve substantially. In Japan low prices of agricultural products and cheap commercial fertilizers will no doubt prevent increased takings." "South China boycott restrictions have been relaxed..."

(3) "Manchuria: Total exports of soy beans and bean products, 1927-28 to 1932-33." For soy beans, exports grew from 2,534,000 short tons in 1927-28 to a peak of 3,014,859 in 1931-32, then fell to 2,491,681 in 1932-33. For soy-bean cake and meal, exports rose from 1,822,000 short tons in 1927-28 to a peak of 1,900,000 in 1930-31, then fell to 1,054,965 in 1932-33. For soy-bean oil, exports rose from 136,000 short tons in 1927-28 to a peak of 170,000 in 1930-31, then fell to 73,379 in 1932-33.

There follows a review of the 1932-33 crop year.

(4) "Manchuria: Exports of soy beans and products by countries of destination, 1931-32 and 1932-33." Each year, statistics are given for soy beans, bean cake, and bean oil.

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Destinations are: Europe, Leningrad, Japan, China, East Indies, United States, Other, Total. Europe imported the most soy beans, Japan the most soy bean cake, and (in 1931-32) China the most soy bean oil. But in 1932-33 China imported only 31% as much [soy] bean oil as in 1931-32. This was because of the "Manchurian incident" of 18 Sept. 1931, in which Japanese troops occupied Manchuria. In response, in 1932, China boycotted Manchurian goods. (5) "Manchuria: Average monthly price of soy beans and soy bean products at Dairen, in silver yen and United States currency and price of crude soy-bean oil at New York, 1931-32 to 1933-34."

3049. Howell, G.C.L. 1934. The soy bean: A dietary revolution in China. *China Journal* 20(3):140-46. March.
• ***Summary:*** A Chinese proverb states that "Bean-milk is the poor man's milk, bean-curd is the poor man's meat." The Chinese "use practically no dairy products and the bulk of the nation eats little meat. The meat consumption of China is estimated at about 20 grams per head per day, as against 149 grams in the United States of America, 130 in Great Britain, 92 in France, 29 in Italy, and 25 in Japan." But the author contends that the Chinese have never learned to make sanitary products which keep well. "The flour, oil, and milk made in China quickly become rancid and unpalatable." Thus China is starving in the midst of plenty. No country in the world has had less benefit from the soy bean as treated by modern methods as that of its origin. In northern China, soy flour is used in a ratio of 2 or 3 to 8 with millet flour to make wo-tou steamed bread, and in a ratio of 1:5 with wheat flour to make man-tou steamed bread. A modern factory, such as the Aguma Works in Germany, could be established in China to make these products on a large scale at low cost. High quality soy-fortified macaroni, rice flour, soy oil and soya milk should also be produced. "Research has done its work. And China only awaits the pioneer, a commercial man, who will use the discoveries of science on a commercial scale. His coming is certain. The time of his coming rests on the knees of the gods."

3050. Kouda, Seihei. 1934. Keizai saibai kara mitaru edamame no kenkyu [Research on green vegetable soybeans from an economic perspective]. *Nogyo Oyobi Engei* (*Agriculture and Horticulture*) 9(3):705-12. March. [Jap] Address: Yamagata Kenritsu Nôji Shikenjô Saijô Bunjô, Japan.

3051. Suzuki, Umetaro; Nakahara, W.; Sahashi, Y. 1934. The occurrence of vitamin E in soy bean oil. *Scientific Papers of the Institute of Physical and Chemical Research* (*Japan*) 23(491):270-73. March. [1 ref. Eng]
• ***Summary:*** In a feeding experiment with rats, incorporation of a liberal amount of soya-bean oil to a synthetic diet deficient in vitamin E prevents the development of testicular degeneration characteristic of vitamin E deficiency.

Note: This is the earliest document seen that is primarily about vitamin E in soybeans or soybean oil. Address: Japan.

3052. Tomiyama, Tetsuo; Hanada, Minoru. 1934. The distribution of methionine in several proteins of feeding-stuffs and casein. *J. of Biochemistry* (*Tokyo*) 19(2):345-51. March. [9 ref. Eng]
• ***Summary:*** Methionine is a sulphur containing amino acid that was discovered by Müller (1921) and has been found to be present in casein, etc.

"As far as we know, this amino acid has not yet been isolated in a pure state from the proteins of feeding-stuffs such as muscle," silk-worm pupae, or soy bean.

The writers isolated methionine in crystalline form from these feeding-stuffs and from casein, and identified it by elementary analysis of both the free amino acid and of its derivatives, i.e., copper salt and alpha-naphthylisocyanate.

Its distribution was as follows:
Muscle protein of sardine 0.52%.
Muscle protein of whale 0.37%.
Protein of silk-worm pupa 0.43%
Protein of soy bean 0.08
Casein 0.41%.

Note: The soybean has long been known to be a poor source of methionine and cysteine–both essential sulfur-containing amino acids. Address: Imperial Fisheries Inst., Tokyo.

3053. LeClerc, J.A. comp. 1934. Partial list of processes for removing the bitter taste from soybeans. Washington, DC: Food Research Div., Bureau of Chemistry and Soils, USDA. 1 p. April 9. Revised 1938, 2 p. Unpublished manuscript. [22 ref]
• ***Summary:*** This is a list of 21 patents and 1 article in *Chemiker Zeitung* on this subject related to production of soy flour. The following countries have the following number of patents: USA 12, Britain 3, Austria 2, France 1, Japan 1, Switzerland 1, and Yugoslavia 1.

Note: Joseph Arthur LeClerc was born in 1873. Address: Food Research Div., Bureau of Chemistry & Soils, USDA.

3054. Adolph, W.H.; Kao, Hsueh-chung. 1934. The biological availability of soybean carbohydrate. *J. of Nutrition* 7(4):395-406. April. [26 ref. Eng]
• ***Summary:*** Approximately 40% of the carbohydrate in soybean is utilizable by rats. The three soy materials investigated were ground yellow soybean (Peking variety), fat-free soybean (the meal "was defatted in a Soxhlet apparatus"), fat-free soybean curd (soybean cheese, which is essentially soybean protein–glycinin). The four methods used to estimate the biological availability of soybean carbohydrate give values ranging from 27 to 50 for the fraction of total carbohydrate used by the animal body. Experiments with phlorhizinized rates gave a utilization

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coefficient of 38%, which was "somewhat higher than the figure obtained by in vitro digestion with taka-diastase."

Note: This is the earliest English-language document seen (April 2004) that contains the word "defatted." Address: Dep. of Chemistry, Yenching Univ., Peiping, China.

3055. Iguchi, T.; Sato, M. 1934. Studies on soy-bean lecithin. III. Coagulation of lecithin sol by electrolytes. *J. of the Society of Chemical Industry, Japan* 37(4):198B-99B. April. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** The Couette viscosity of the sol (2 gm per 100 cc) decreases on the addition of electrolytes, giving a minimum value at the end-point of coagulation, which can be more accurately determined by this means than by visual observation. The lecithin particles are negatively charged in colloidal solution, and the coagulation value decreases with increased valency of the cations of the electrolyte.

Note: *Webster's Dictionary* defines sol (derived from *solution* and first used in 1899) as "a fluid colloidal system; esp: one in which the continuous phase is a liquid." Address: Dep. of Organic Chemistry, Central Lab., South Manchuria Railway Co.

3056. Minatoya, S.; Kurahashi, N. 1934. Daizu reshichin no gomu ryûka ni taisuru eikyô oyobi daizu reshichin ni yoru gomu funmatsu-ka to sono riyô [The effect of soya-bean-lecithin on the vulcanization of rubber, and the manufacture and uses of powdered rubber prepared by the use of soya-bean-lecithin]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 37(4):477-79. April. English-language summary in Supplemental Binding, p. 207B-08B. [1 ref. Jap; eng]
• ***Summary:*** Soya-bean lecithin has the same effect as the lipin of Hevea latex on the vulcanization of rubber. Soft rubber articles made from raw rubber powder prepared with the aid of this lecithin are inferior in physical properties to those manufactured from standard raw rubber, e.g. smoked sheet, but ebonite so prepared compares favorably with that from ordinary rubber except in electrical qualities... Powdered rubber by the use of soya-bean lecithin has various uses in the construction of filters, diaphragms, and the like, and in the preparations of paint, chlorinated rubber, etc. Researches are now in progress in this sphere. Address: Government Electrochemical Laboratory, Tokyo.

3057. Nishida, Kôtarô. 1934. Kagoshina-ken Oshima-chihô tokusan no sotetsu denpun oyobi sotetsu miso [On cycad miso or sotetsu miso, a specialty product of the Oshima area of Kagoshima prefecture, made from the starch of the sago palm]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 12(4):271-77. [6 ref. Jap]
• ***Summary:*** The tree called cycad or sago palm in English (*Cycas revoluta Thunb.*), is called sotetsu in Japanese. Address: Nôgaku-shi, Kagoshima Koto Norin Gakko Nogeikagaku Kyoshitsu, Japan.

3058. Uchida, S. 1934. Shôyu abura no seibun. II. Esuteru to shite sonzai suru fuhôwa shibô-san seibun [Constituents of shoyu oil. II. Composition of unsaturated fatty acids existing as esters]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 37(4):444-47. April. [Jap]
Address: Tokyo Kogyo Daigaku, Oyo Kagaku-ka, Kenkyu-shitsu.

3059. Uchida, So; Shimoyama, K.; Kyocho, S.; Toyota, E. 1934. Shôyu abura no seibun. I. Ippan seishitsu, fuken kabutsu narabini esuteru to shite sonzai suru hôwa shibô-san seibun [Constituents of shoyu oil. I. General properties, unsaponifiable substances, saturated fatty acids, esters]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 37(4):442-44. April. [Jap]
Address: Tokyo Kogyo Daigaku, Oyo Kagaku-ka, Kenkyu-shitsu.

3060. Uchida, So; Shimoyama, K.; Hsu, T.T.; Toyoda, E. 1934. Constituents of waste fatty oil from soy-manufactory. I-II. *J. of the Society of Chemical Industry, Japan* 37(4):195B-97B. April. Supplemental binding to Kogyo Kagaku Zasshi. [2 ref. Eng]
• ***Summary:*** In the production of soy [sauce], "fatty oils contained originally in the soy-bean and wheat separate out as an almost black coloured layer. This is called 'soy-oil,' and owing to its dark colour and strong odour characteristic to soy, it is less valued on the market. It is used chiefly as a raw material for manufacturing detergent soap, especially powdered soap. The other use is found in the mechanical workshop as a cutting oil."

The dark, mobile, odorous waste oil from soy [sauce] production consists largely of ethyl esters of higher fatty acids. The orange oil obtained after refining with concentrated sulfuric acid and Japanese acid clay deposited a white precipitate (ethyl esters of saturated fatty acids) on keeping at 0ºC, and this had acid value 32.3, saponification value 193.2, unsaponifiable matter 1.4%, including a sterol, melting point 137-137.5ºC (corrected). Hydrolysis yielded glycerol 2% and ethanol 9% (on the oil). Palmitic, stearic, arachidic (very little), oleic, linoleic, and linolenic (small amount) acids were identified. Address: Dep. of Applied Chemistry, Tokyo Technical Univ., Tokyo-Okayama.

3061. Wilson, J.K. 1934. Longevity of *Rhizobium japonicum* in relation to its symbiont on the soil. *Cornell University Agricultural Experiment Station, Memoir* No. 162. 11 p. April. [11 ref]
• ***Summary:*** "The larger part of our knowledge concerning the root-nodule bacteria and their relation to leguminous plants has been gradually developed during the past seventy-five years. Lockmann observed that the cells of nodules from

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leguminous plants are filled with small, elongated bodies. Woronin described these bodies more fully, noting certain changes which they underwent when suspended in water. Eriksson made drawings of these bodies, which today are recognized as the nodule bacteria, while Beijerinck isolated and cultivated these bacteria from a number of species of leguminous plants. The role that these soil bacteria play in the nitrogen nutrition of the Leguminosae was studied by Hellriegel.

"Since these bacteria are found in the soil where leguminous plants are growing, and because they play such an important role in the nitrogen nutrition of the plant, methods were devised for their distribution to other fields where the symbiont of the nodule bacteria was to be grown. The first method was probably the transfer of soil from a field where a certain legume had grown, to another field which was to be seeded to the same legume. Perhaps Salfeld was the first to do this in a practical way...

"When soybeans were first grown on the farms at Cornell University, no nodules were ever observed on their roots. Following Salfeld's method, Professor L.A. Clinton, who, with the Director of the College of Agriculture, I.P. Roberts, had charge of the work, asked Professor G.W. Gilmore, who was visiting Japan in 1901, to send him a sample of soil from a field in Japan which was growing soybeans. In response to this request, Professor Gilmore mailed about 700 grams of soil. This was used by Professor Clinton as an inoculum for soybeans which were 6 to 8 inches high at the time of inoculation. The soybeans were growing in seven large earthenware containers embedded in the ground... The treatment was so successful that the inoculated soil from the four containers was carefully saved to be spread over larger areas the following year...

"Although a growing crop may liberate in the soil a very large bacteria population when the nodular tissue decomposes, this population is transitory and probably does not exist for as long a period as one year. The root-nodule bacteria dwindle almost to extinction in certain cases." Address: Ithaca, New York.

3062. Yamada, Teikichi. 1934. Removal of solid components from fatty oils and drying properties of the residual oils. I. On soya-bean oil. *J. of the Society of Chemical Industry, Japan* 37(4):190B-92B. April. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** The more saturated components of soya bean oil were removed by repeated fractional crystallization from acetone at -20ºC; after 10 extractions the soluble portion had iodine value 152.

3063. *Christian Science Monitor.* 1934. Manchoukuo soya bean trade has steadily declining trend: Hit by competition from artificial fertilizers, drop in buying power of Japanese peasant and by silver currency stabilization. May 17. p. 13.
• ***Summary:*** On 4 Sept. 1933, Japan's Ministry of agriculture announced that it would subsidize imports of sulphate of ammonia–an artificial fertilizer. This subsidy has "struck a very severe blow to the oil-mill industry of Manchuria..." A table shows exports of soya beans, cakes and oil from Manchoukuo from 1927 to 1933 (in 1,000 tons). Exports of soya beans were up 38.9%, but export of bean cakes had dropped to only 31.7% of its 1927 level, export of soya bean oil had dropped to only 79% of its 1927 level, and the total tonnage had fallen to only 50.9% of its 1927 level.

Exports of soya bean cakes to the Netherlands, Formosa, and Europe fell; sulphate of ammonia is taking the place of bean cakes as a fertilizer. Increasingly, European countries are buying soya beans from Manchuria and crushing them in their own mills.

3064. Hanzawa, Jun; Tamura, Hiroshi. 1934. Nattô seisei-kin ni kansuru kenkyû. VI. [Research on natto fermentation bacteria. VI.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 10(5):520-21. [Jap] Address: 1. Nôgaku hakase.

3065. Sakurai, Yoshito. 1934. Miso no seibun ni tsuite. IV. San ni tsuite [On the constituents of miso. IV. Acids]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 10(5):486-95. [Jap]
• ***Summary:*** Acetic, lactic, and succinic acids are identified. Amounts of ethyl ether-soluble free acid were small. Acidity is probably due to acid phosphates. Address: Tokyo Teikoku Daigaku, Nôgaku-bu.

3066. Shinozaki, Yoshiro. 1934. Manshû daizu bôraku to sono taisaku [Decline of Manchurian soybeans and remedies therefor]. Tokyo: Nichi-Man Jitsugyo Kyokai. 82 p. May. 22 cm. [Jap]

3067. Abe, K. 1934. [Mucilaginous substance of "natto," a Japanese food. I. Alcohol soluble nitrogenous compounds in the substance]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 10(6):545-49. [10 ref. Jap]

3068. Hibino, T. 1934. Tanpakushitsu no kenkyû. XIII. Daizu tanpakushitsu ni taishite [Studies on proteins. XIII. On soybean proteins]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 55(6):655-92. June. (Chem. Abst. 28:6447). [44 ref. Jap]
• ***Summary:*** The isolation of albumin, glycinin, and glutelin is described. The hydrolysis of glycinin at different temperature and pH yields varying proportions of soluble protein, proteose, and peptone, and of insoluble substances. Minimum amounts of soluble matter are obtained at 120ºC at the isoelectric point. The reaction at 150ºC is reversible. Address: Kyoto Teikoku Daigaku.

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3069. South Manchuria Railway. 1934. Soya beans. *Report on Progress in Manchuria.* Fourth, to 1934. 294 p. June. See p. 22, 33-34, 194, 196, 200-01, 203, 205-06, 216, 219-21. (Dairen, Manchuria).
• ***Summary:*** The average soybean yield is 20 bushels/acre in Manchuria, 16 bu/acre in Japan, 15 in China, and 10 in Korea. Address: Dairen, Manchuria.

3070. *Industrial and Engineering Chemistry, News Edition.* 1934. Personalia. 12(14):266. July 20.
• ***Summary:*** "Minoru Mashino, a research chemist in the Tokyo Imperial Industrial Research Laboratory, has been awarded the medal for special merit in research of the Society of Chemical Industry, Japan. Dr. Mashino has made many valuable investigations of soy bean proteins and some 25 papers on the subject have been published by him since 1925 in the Reports of the Tokyo Imperial Industrial Research Laboratory."

3071. Inaba, T.; Kitagawa, K.; Sato, M. 1934. Studies on the alcohol-extracted soy-bean oil. II. Changes of properties and compositions by ultra-violet light. *J. of the Society of Chemical Industry, Japan* 37(7):372B-74B. July. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** The changes, due to polymerization and oxidation (if access of oxygen is permitted), observed in expressed (crude and refined) oils and oils extracted by ethanol and benzine on exposure for 60-100 hours to ultraviolet light are recorded in detail. Address: Central Lab., South Manchuria Railway Co., Dairen.

3072. Inaba, T.; Kitagawa, K.; Sato, M. 1934. Studies on the alcohol-extracted soy-bean oil. III. Effect of ultra-violet light in the atmosphere of oxygen, hydrogen and nitrogen. *J. of the Society of Chemical Industry, Japan* 37(7):374B. July. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** Bleaching occurred if hydrogen or oxygen was passed through the oil, but not when nitrogen was used. Address: Dep. of Organic Chemistry, The Central Lab., South Manchuria Railway Co., Dairen.

3073. Komatsu, Shigeru; Hibino, T.; Yamaguchi, Saburô. 1934. Tanpakushitsu no kenkyu. XIV. Daizu glycinin ni kanetsu-sui no sayô [Studies on proteins. XIV. Action of superheated water on glycinin from soya beans]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 55(7):791-801. July. (Chem. Abst. 29:484). [4 ref. Jap]
• ***Summary:*** Hydrolysis of glycinin at 120-150ºC yielded meta-protein, proteose, peptone, and polypeptides, the proportion of soluble products increasing with rise of temperature. At 150ºC part of the amino- and diamino-nitrogen changed to amide-nitrogen. The nitrogen distribution of meta-protein and proteose resembled that of the original protein. Proteose had more amide-nitrogen and less diamino-nitrogen. The composition altered considerably when proteose was converted into peptone.

Note: Diamino nitrogen is created by the hydrolysis of proteins. Address: Kyoto Teikoku Daigaku.

3074. Shinozaki, Yuichi; Sato, Masanori. 1934. Studies on the alcohol extracted soy-bean oil. I. Changes due to heat-treatment. *J. of the Society of Chemical Industry, Japan* 37(7):372B. July. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** Expressed and benzine-extracted oils show a "break" due to coagulation of phosphatides on heating above 180ºC, while oils extracted by ethanol alone become clearer and paler, and show less heating loss. Address: Central Lab., South Manchuria Railway Co., Dairen.

3075. Takata, Ryôhei. 1934. Shôyu jôzô no eiyôgaku-teki kôsatsu. IV. Shôyu-chû no kôkyû gan chisso seibun [Nutritional investigation of shoyu. IV. Nitrogenous compounds in shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 12(7):497-503. [7 ref. Jap]
Address: Osaka Teidai Kôgaku-bu, Jôzôgaku kyôshitsu, Takada Kenkyû-shitsu, Osaka, Japan.

3076. Takei, T. 1934. Shôyu abura no shuseibun ni tsuite. I. [Principal constituents of shoyu oil. I.]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 37(7):831-33. July. [Jap]
Address: Raion Sekken K.K. Kenkyujo (Lion Soap Research Lab.).

3077. Takei, Toshiro. 1934. On the composition of "soy" [sauce] oil. I. *J. of the Society of Chemical Industry, Japan* 37(7):356B-57B. July. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** "Soy oil is obtained as a by-product of soy [sauce] brewing. The oil is found floating on the surface of soy after pressing. It has dark brownish red colour and appears opaque on reflected light. Its odour bears resemblance to that of soy. It has hitherto been considered to be very difficult to bleach the color and remove the objectionable odour by either chemical or physical processes.

"Soy oil finds its chief industrial applications in lubricants and in manufacture of powdered soaps of low grade. Hitherto it has been believed that the oil is a mixture of the oils of soy-bean and wheat which are the chief raw materials of soy and contains some decomposition products."

Three samples of the oil had acid value 39.15-45.19, saponification value 186.12-186.66, iodine value 102.13-132.12, density at 15ºC 0.89266, refractive index at 20ºC 1.4630, relative viscosity 13.155/16ºC, flash point 76.5ºC. The oil is soluble in ethanol at room temperature and consists chiefly of ethyl esters of various fatty acids with about 16%

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free fatty acids and a small amount (0.29%) of glycerol. It can be refined by distillation, typical fractionations being detailed. Address: Lab. of Lion Soap Co.

3078. *Times of India* (*The*) (*Bombay*). 1934. Agricultural topics: Exploring. Aug. 11. p. 12.
• ***Summary:*** Dr. David Fairchild of the USDA was recently awarded the Marcellus Hartley Gold Medal for the year 1934 for excellence in the application of science for the public welfare.

The following is a quotation from the speech he gave upon receiving the medal: "It is with a thrill that I remember, each time I drink a glass of soybean milk, that in 1898, before we knew how to grow soybeans in this country [USA], I sent to Tokyo for soil with which to inoculate the root systems of our experimental plantings of them, little thinking that I should see the day when four million acres of soybeans would be grown in America."

3079. *Arkansas Gazette* (*Little Rock*). 1934. Soybean experts in national meet: Delegates from every producing area in U.S. at opening session. Value as food shown. Convention will adjourn to Stuttgart today and will conclude Saturday at Marianna. Aug. 23. p. 1, cols. 3-5.
• ***Summary:*** "Representatives from every section of the soybean producing area of the United States attended the opening session of the 1934 meeting of the American Soybean Association at the Hotel Marion last night."

"Special interest in the soybean as human food is being shown at this time because of the shortage of grain crops, Dr. P.A. Webber of the Nashville Agricultural Normal Institute at Madison, Tennessee, secretary-treasurer of the association, said before last night's meeting.

"He had several samples of products from the soybean, such as meat substitutes, crackers and flour. Dr. Webber said the production of soybeans is his hobby. He spent several years in Japan doing educational work and at this time studied the production of soybeans."

"Walter Godchaux of New Orleans, La. [Louisiana], vice president of Godchaux Sugars Inc., said he has been using soybeans on his sugar plantations for the past 10 years for a cover crop and for fertilization purposes. Mr. Godchaux has approximately 15,000 acres planted in sugar. Last year, he said he purchased approximately 3,000 bushels of soybeans."

"Chikayoshi Nagakura of Tokio, Japan, representative of the South Manchuria Railway Co. in New York city, attended last night's meeting to obtain information on the production of the American soybean. He said that practically the entire tonnage of his railway in Manchuria consisted of soybeans."

"Lunch will be served at Stuttgart. Speakers there will include: Jacob Hartz of Stuttgart and Dr. J.E. LeClerc Sr., chemist of the Bureau of Soils and Chemistry of the Department of Agriculture, Washington, D.C."

Photos show: Walter Godchaux and Chikayoshi Nakagura.

3080. Ishimaru, Yoshio. 1934. Shôyu no chozô-sei ni tsuite [On the preservability of shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 12(8):610-16. [Jap]
Address: Nôgaku hakase, Japan.

3081. Shinozaki, Yuichi; Sato, Masanori. 1934. Studies on the soy-lecithin. II. The hydrogenation under high pressure. *J. of the Society of Chemical Industry, Japan* 37(8):432B-33B. Aug. Supplemental binding to Kogyo Kagaku Zasshi. [1 ref]
• ***Summary:*** Hydrolecithin containing 3.82% phosphorus, 2.23% nitrogen, 0.1% amino nitrogen, 64.63% carbon, 11.33% hydrogen, iodine value 0.38, and melting point 84ºC can be prepared successfully by hydrogenating soya lecithin with a nickel catalyst under a pressure of greater than 80 atmospheres. Experiments on partly hydrogenated products show that hydrolecithin has a greater effect than lecithin in lowering the interfacial tension of cacao butter towards water (Donnan drop method), the advantage increasing with the saturation of the hydrolecithin. The increase in relative viscosity of cacao butter (at 60-70ºC) is proportional to the amount of added hydrolecithin and its degree of saturation, when the amount added is > 1%; if < 1% is used the relative viscosity is decreased.

Note: This is the earliest English-language document seen (March 2001) that uses the term "soy-lecithin."
Address: Dep. of Organic Chemistry, The Central Lab., South Manchuria Railway Co., Dairen.

3082. Suzuki, Umetaro; Nakahara, W.; Sahashi, Y. 1934. Further evidence for the occurrence of vitamin E in soy bean oil. *Scientific Papers of the Institute of Physical and Chemical Research* (*Japan*) 24(517):283-86. Sept. 1. [1 ref. Eng]
• ***Summary:*** Rat breeding tests indicated that soybeans contain the antisterility vitamin, E. The vitamin E content is low, since pregnancy in female albino rats with soybean oil as sole source of vitamin E is frequently terminated by abortion. Address: Japan.

3083. Adriano, F.T.; Oliveros, S.B.; Santos, D.S.; Villanueva, E.R. 1934. The physical characteristics and chemical composition of various brands of toyo (soy sauce) sold in the Philippines. *Philippine J. of Agriculture* 5(3):171-86. July/Sept. [14 ref. Eng]
• ***Summary:*** Gives detailed descriptions of methods of manufacture of soy sauce, and an analysis of 21 samples (18 from Philippine factories, two from China, and one from Japan). Table 3 (p. 179) gives the brand name, and the name and address of the manufacturer of these 21 sample products. Most Philippine soy sauce is made in and around

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Manila using traditional Chinese methods, including large earthenware jars with conical, woven bamboo covers; these jars are left in the open for sunning. Most of the soy beans used are imported from China, the yellow variety being the most commonly used. When ready, the "brown liquid is siphoned off with a foot valve made out of bamboo at the intake end of the siphon. The drawn sauce may be boiled, but generally it is bottled without heat treatment to be sold as first-class toyu. The residue is brined and sunned again to obtain succeeding lower grades of toyo. The practice of admixing molasses is widespread. Of the 21 samples analyzed, 12 contained reducing sugars analyzing about 10%.

Toyo is not as widely used in the Philippines as it is in other Oriental countries because in the Philippines there is a counterpart of toyo, the native *patis* (a Tagalog word), which is a high protein extract from brine-fermented small fish and shrimps. But "with the growing consciousness of the real nutritive value of the soy bean as a human food, the increasing popularity of the properly made toyo is assured."

Table 4 gives the physical characteristics and chemical composition of each of the 21 samples tested. The average specific gravity at 28ºC is 1.2624. Total solids: 37.31%. Proteins: 4.56% (N x 6.25). Sucrose: 0.59%. Sodium chloride: 19.90%. Address: Labs. of Agricultural Chemistry, Bureau of Plant Industry, Manila.

3084. Mogi, Masatoshi. 1934. Miso jôzô ni kansuru saikin no kenkyû ni tsuite. I. [Research on the bacteria involved in the manufacture of miso. I.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 10(9):983-96. Sept. English-language summary in Bulletin of the Agricultural Chemical Society of Japan 12:52-53, bound at the back of Nippon Nogei Kagaku Kaishi. [20 ref. Jap; eng]
• ***Summary:*** The value of miso production in Japan in recent years is more than 20 million yen per year. Address: Brewing Laboratory, Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

3085. Mogi, Masatoshi. 1934. Miso jozo ni kansuru saikin no kenkyu ni tsuite. I. [Studies on the microorganisms in the manufacture of "miso." I.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 10(9):983-996. [20 ref. Jap]
• ***Summary:*** All the organisms isolated appear to play a part in the maturation of miso. Address: Kikkoman.

3086. Ueno, Sei-ichi. 1934. On the negative catalysers [catalysts] of hydrogenation of oils. X. On the inhibiting influences of dyestuffs at a lower temperature. *J. of the Society of Chemical Industry, Japan* 37(9):497B-505B. Sept. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** Inhibition of hydrogenation (nickel) of soy-bean oil by dyes (1%) is less at a low than at high temperature. Basic and sulfur dyes are most effective. Amino- or nitro-groups, but not both together, confer anticatalytic properties. Address: Dep. of Applied Chemistry, Faculty of Engineering, Imperial Univ. of Osaka.

3087. Kahn, Dorothea. 1934. Marko can cook in many languages: As chef of the International House, University of Chicago, he feeds students of 47 nationalities from his 'melting pot of menus.' *Christian Science Monitor.* Oct. 10. p. WM10.
• ***Summary:*** About Mr. Marko Yerkovitch, who ancestry goes back to Yugoslavia. A recipe is given for Egg foo yung, which includes "Soy bean sauce to flavor."

"Now it wouldn't do to give a Chinese recipe without a Japanese one to follow... Miss Doris Foresman, who is in charge of the catering department of the House, says she has learned to be very careful to serve Japanese soy bean sauce at Japanese parties, and Chinese soy bean sauce at Chinese parties." There follows a recipe for Tempura (served with "Japanese soy bean sauce").

3088. Inaba, T.; Kitagawa, K.; Sato, M. 1934. Studies on soy-lecithin. IV. Emulsifying action for oil-water mixture. V. Properties of lecithin soap solution. *J. of the Society of Chemical Industry, Japan* 37(10):595B. Oct. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** With increasing concentration, the viscosity of lecithin solution increases and the drop volume against soya-bean oil falls. Lecithin added to sodium soap solution increases surface tension, foam number, stability, and gold number; it lowers the turbidity and clearing temperature by 3-5ºC. The drop number against kerosene passes through a maximum at 0.25% lecithin. Address: Dep. of Organic Chemistry, Central Lab., South Manchuria Railway Co.

3089. Koerber, Lili. 1934. Japanese banquet: Translated from the *Prager Tagblatt,* Prague German Language Daily. *Living Age* (*The*) 347:117-20. Oct. See p. 118.
• ***Summary:*** "At this point the girls begin preparing the main dish, the *skiaki* [sukiyaki]... Then they put a frying pan on the stove, cover it with a generous layer of fat and add green onions, beans that look like earth worms, sugar, soya-bean sauce, and finally pieces of meat." Note 1. This is the earliest English-language document seen (April 2012) that uses the term "soya-bean sauce" to refer to soy sauce.

Note 2. This is the third in a series of three articles in this issue titled "A Mirror to Japan."

3090. Sato, M.; Inaba, T.; Kitagawa, K. 1934. On the alcohol extraction process of fatty oils. I. Mutual solubilities of some vegetable oils. *J. of the Society of Chemical Industry, Japan* 37(11):718B-21B. Nov. Supplemental binding to Kogyo Kagaku Zasshi. [1 ref. Eng]
• ***Summary:*** This is an early article on alcoholic extraction of

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oilseeds. "One of the authors [M. Sato] made measurements (Report of this Laboratory 1929, Vol. 14, 1) [See: *Nan Manshu Tetsudo K.K., Chuo Shikensho Hokoku* (*South Manchuria Railway Co., Central Research Institute, Report*) 1929. vol. 14, p. 1-9] of mutual solubilities between soy-bean oil and ethyl alcohol, and developed a new idea of the oil extraction process, in which the oil is extracted in hot state and separated into two layers on cooling the miscella. This paper is the sequel of the above experiment." Address: Dep. of Organic Chemistry, The Central Lab., South Manchuria Railway Co., Dairen.

3091. Shinozaki, Y.; Kubo, H. 1934. Studies on the high pressure hydrogenation of soy bean oil. I. On the reaction products by copper catalyst. *J. of the Society of Chemical Industry, Japan* 37(11):677B-78B. Nov. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** The iodine, saponification, acid, and acetate values have been determined for the products obtained by reduction (under 125 kg/square cm pressure) of soya-bean oil at various temperatures, using copper carbonate on infusorial earth as catalyst. At less than 250ºC hydrogenation of unsaturated linkings is the chief reaction; at 300-325ºC the acid value increases sharply, indicating the formation of free fatty acids. Alcohol formation predominates at 300-350ºC, but above 375ºC alcohols are reduced to hydrocarbons. Address: Dep. of Organic Chemistry, The Central Lab., South Manchuria Railway Co., Dairen, Manchuria.

3092. Shinozaki, Y.; Kubo, H. 1934. Studies on the high pressure hydrogenation of soy bean oil. II. On the properties of the sodium salt of sulphuric ester of higher fatty alcohol. *J. of the Society of Chemical Industry, Japan* 37(11):678B-79B. Nov. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** Comparison of aqueous solutions of the crude sodium salts of the sulfuric esters of the higher alcohols produced from soya-bean oil and of the sodium salt of pure octadecyl sulfuric ester indicate that impurities in soya-bean oil reduce the colloidal properties of the solutions (e.g. surface tension against kerosene or air), but such effect is negligible in solutions more dilute than 0.025%. Address: Dep. of Organic Chemistry, The Central Lab., South Manchuria Railway Co., Dairen, Manchuria.

3093. Takei, Toshio; Tomiyama, Shin-ichi. 1934. On the composition of Tamari soy oil. *J. of the Society of Chemical Industry, Japan* 37(11):650B. Nov. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** "Tamari soy oil is obtained as a by-product of Tamari soy [sauce] brewing. The oil is found floating on the surface of Tamari soy after pressing. Tamari soy is a sort of soy which is made from soy bean only. A large quantity of tamari soy is brewed in the prefectures of Aichi, Gifu, Miye [Mie], Shizuoka and Nagano. Tamari soy oil resembles soy oil in colour and in odour, yet these oils differ considerably from each other in viscosity. On account of its dark colour and strong odour Tamari soy oil is estimated at a low price."

A sample, consisting of glycerides, ethyl esters of fatty acids, and free fatty acids (50%) yielded approximately 2.13% crude glycerin and 2.46% ethanol, and had (values for ordinary soy oil in parentheses) acid value 105.9 (41.9), saponification value 185.6 (186.3), iodine value 149.4 (102.1), refractive index at 20ºC 1.4749 (1.4630), density at 15ºC 0.9172 (0.8926), flash point 218ºC (76.5ºC), Redwood viscosity (50 cc at 20ºC) 5 feet 57 inches (1 foot 17.6 inches).

Note 1. This is the earliest English-language document seen (Jan. 2000) with the term "soy oil" in the title. However it refers to the dark oil that rises to the surface during soy sauce fermentation, rather than to the clear vegetable oil to which it refers today.

Note 2. This is the earliest English-language document seen (March 2012) that uses the term "tamari soy" to refer to tamari soy sauce. Address: Lion Soap Co., Ltd.

3094. Shinozaki, Y.; Kubo, H. 1934. Studies on the high pressure hydrogenation of soy bean oil. III. On the formation of wax-ester. *J. of the Society of Chemical Industry, Japan* 37(12):780B-81B. Dec. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** High-pressure hydrogenation of soy bean oil at greater than 300ºC (350ºC) with a copper-chromium catalyst gives octadecyl stearate. Above 350ºC an unsaponifiable substance is the chief product. Address: Dep. of Organic Chemistry, The Central Lab., South Manchuria Railway Co., Dairen, Manchuria.

3095. *Japan-Manchoukuo Year Book.* 1934-1941. Serial/periodical. Published by The Japan-Manchoukuo Year Book Co., Tokyo. 26 cm. [Eng]
• ***Summary:*** Formed by the union of: Japan Year Book, and: Japan Times Year Book. Continued by Orient Year Book. Each year book is divided into two main parts: Japan, and Manchuokuo.

3096. Yamaguchi, H.S.K.; Garis, Frederic de; Sakai, Atsuharu. 1934-1950. We Japanese: Being descriptions of many of the customs, manners, ceremonies, festivals, arts and crafts of the Japanese, besides numerous other subjects. Yokohama, Japan: Yamagata Press. 592 p. 889 illust. Index. 21 cm.
• ***Summary:*** "Written with great style, this work brings traditional Japan to life in a way that no contemporary guide book can, explaining all the curious features of daily life in Japan." This is a combination of 3 books. Book I (p. 1-183), written by Frederic de Garis for H.S.K. Yamaguchi, was first published in Dec. 1934. Book II (p. 183-375), written

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by Atsuharu Sakai for H.S.K. Yamaguchi, in June 1937. Book III (p. 377-592), with the same authorship as Book II, was first published in June 1949. All contain entertaining information on Japanese culture and foods.

They discuss: Red rice (*sekihan,* with azuki beans, p. 36). The Broken Needles Mass or Hari-Kuyo (p. 160, needles are stuck into tofu on Feb. 8 or Dec. 8), Sukiyaki (p. 264-66, incl. its origin and history), sembei (p. 267, senbei or rice crackers, incl. shoyu), Miso or bean-paste (p. 269-70), Shoyu or Japanese soy (p. 271-73, incl. Kikkoman, Higeta, Yamasa, Kagi-Yamasa, and Marukin logos and wooden kegs), Sekihan and hot water (p. 292, azuki beans as part of a taboo for Japanese girls), Setsubun or Bean-Throwing Ceremony (p. 554-55, mame-maki held on setsubun).

Note: This is the earliest English-language document seen (March 2009) that uses the term "bean-paste" (not preceded by the word "soy" or "soya") to refer to miso.
Address: Manager, Fujiya Hotel, Miyanoshita, Japan.

3097. Fukai, Tôshi. 1934. Shôyu hakkô to shiyu no kankei. V. Shibô-zoku esuteru-rui no shôyu bôbai-sei ni tsuite [The relation between shoyu brewing and fatty oils V. The toxic action of several fatty esters on the shoyu mold yeast]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 119. p. 209-17. [Jap]
Address: Jozo Shikensho. 1 Gishu; 2. Kenshuin.

3098. Hara, Tetsukazu; Wada, Fuki. 1934. Miso ni kansuru kenkyû. II. Jukusei katei ni okeru miso tanpakushitsu yôka no hendo [Studies on miso. II. Changes in the nutritional value of miso proteins during ripening]. *Eiyo Kenkyujo Hokoku* (*Report of the Imperial Government Institute for Nutrition*) 6(2):29-41. [9 ref. Jap]
Address: Eiyo Kenkyusho: 1. Gishi; 2. Gishu.

3099. Hara, Tetsukazu; Wada, Fuki; Wachi, Teru. 1934. Miso ni kansuru kenkyû. III. Shokuen oyobi ekisu-ben o jokyo shitaru miso o motte suru miso tanpakushitsu no eiyô shiken [Studies on miso. III. Nutritional investigation on miso protein using miso from which the salt (NaCl) and an extract were removed]. *Eiyo Kenkyujo Hokoku* (*Report of the Imperial Government Institute for Nutrition*) 6(2):42-49. [2 ref. Jap]
Address: Yoei kenkyusho: 1. Gishi; 2. Gishu.

3100. Hara, Tetsukazu; Wada, Fuki. 1934. Miso ni kansuru kenkyû. II. Jukusei-chû ni okeru miso genryô bitamin no henka [Studies on miso. IV. Changes of vitamins during miso ripening]. *Eiyo Kenkyujo Hokoku* (*Report of the Imperial Government Institute for Nutrition*) 6(2):50-54. [1 ref. Jap]
Address: Eiyo Kenkyusho: 1. Gishi; 2. Gishu.

3101. Hara, Tetsukazu; Wada, Tomikazu. 1934. Kome nuka no riyô ni kansuru kenkyû. IV. Kome nukamiso-chû no bitamin B-1 [Research on the utilization of rice bran. IV. Vitamin B-1 in miso made with rice bran]. *Eiyo Kenkyujo Hokoku* (*Report of the Imperial Government Institute for Nutrition*) 6(2):55. [Jap]
• ***Summary:*** This is about using rice bran (nuka) with soybeans as ingredients in miso. Address: Eiyo Kenkyusho: 1. Gishi; 2. Gishu.

3102. Hara, Tetsukazu; Wada, Tomikazu. 1934. Kome nuka no riyô ni kansuru kenkyû. V. Kome nukamiso-chû no bitamin B-1 hoi [Research on the utilization of rice bran. V. Vitamin B-1 in rice miso. Addendum]. *Eiyo Kenkyujo Hokoku* (*Report of the Imperial Government Institute for Nutrition*) 6(2):64-69. [4 ref. Jap]
Address: Eiyo Kenkyusho: 1. Gishi; 2. Gishu.

3103. Iwamura, Iwao. 1934. Miso no jukusei ni oyobosu ondo no eikyô [Influence of temperature on miso ripening]. *Ryoshoku Kenkyu* (*J. of the Institute of Dietary Science*) No. 93. p. 945-51. [7 ref. Jap]

3104. Kankito, ? 1934. [Hygienic investigation of mustard miso]. *Chosen Yakugaku* (*Korean Pharmacology*) 131:46-. [Jap]*

3105. Kurono, Kanroku; Toriyama, S. 1934. Suiso ion nôdo chôsetsu shôyu jôzô yobi shiken [Preliminary brewing experiment of shoyu regulating the hydrogen ion concentration in the moromi (mash)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 29(11):2-8. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Kenshuin.

3106. Kurono, Kanroku; Nagahashi, K.; Toriyama, S. 1934. Papain tenka shôyu jôzô skin [Brewing trial of shoyu by the addition of papain]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 119. p. 351-59. [Jap]
Address: Jozo Shikensho. 1 Gishi; 2. Moto Joshu; 3. Moto Kenshuin.

3107. Kurono, Kanroku; Toriyama, Shiro. 1934. Suiso ion nôdo chôsetsu shôyu jôzô yobi shiken [Preliminary shoyu brewing experiment regulating the hydrogen ion concentration in the moromi (mash)]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 119. p. 361-67. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Kenshuin.

3108. Kurono, Kanroku; Takisawa, S.; Toriyama, S. 1934. Kôji-kin no tanpaku bunkai kôso ni kansuru kenkyû. III Shôyu moromi-chû no tanpaku bunkai kôso ryô (Ueber die proteolytische Enzyme des Aspergillus oryzae. III. Proteolytische Enzymmenge in die Maischen von Schoyu) [On the proteolytic enzyme of koji mold. III. The amount of proteolytic enzyme in shoyu moromi]. *Jozo Shikensho*

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Hokoku (*Report of the Brewing Experiment Station*) No. 119. p. 53-54. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Joshu; 3. Moto Kenshuin.

3109. Kurono, Kanroku; Iwashita, N. 1934. Paraokishi ansoku kôsan oyobi sono esuteru no seishu bôfu-sei narabini shôyu bôbai-sei ni tsuite (Ueber die Wirkung der Para-oxybenzoesaeure und ihren Estern als Schuetzmittel auf Sake und Schoyu). II. [On the effect of para-oxy-benzoic acid and its ester as anti-mold agents for sake and shoyu. II.]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 119. p. 37-. [Jap]*
• ***Summary:*** P-oxy-benzoic acid or para-hydroxybenzoic acid exists and is probably a preservative. Address: Jozo Shikensho. 1. Gishi; 2. Joshu.

3110. Matsumoto, K.; Aomori, Y. 1934. Miso-chû no saikin-rui ni tsuite. I. Miso-chû no saikin-rui no gakujutsu-teki shiken [On bacteria in miso. I. Scientific research]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 119. p. 71-108. [11 ref. Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Kenshu-in.

3111. Matsumoto, K.; Mitsuhashi, K. 1934. Miso seizô ni saikin-rui ôyô shiken. Miso-chû no saikin-rui ni tsuite. II. [The application of bacteria to miso manufacture. On the bacteria in miso]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 119. p. 369-79. [Jap]
Address: Jozo Shiken. 1. Gishi; 2. Moto Kenshuin.

3112. Matsumura, T. 1934. [Experimental works for patient with application of antagonism. I. Studies on natto]. *Kyoto Furitsu Ika Daigaku Zasshi* (*J. of the Kyoto Prefectural University of Medicine*) 12:38-52. [Jap]*
• ***Summary:*** In three studies in 1934 the author demonstrated that *Bacillus natto* was antagonistic to the typhus organism, either when they were started together or after typhus had been grown earlier. In mice, if inoculated at the same time, the mice died, but if the *B. natto* was injected 24 hours before the typhus, then the mice lived. Address: Bacteriologist, Tokyo Univ., Japan.

3113. Matsumura, T. 1934. [Experimental works for patient with application of antagonism. II. Antagonism between *Bacillus natto* and typhus *in vitro*]. *Kyoto Furitsu Ika Daigaku Zasshi* (*J. of the Kyoto Prefectural University of Medicine*) 12:54-89. *

3114. Matsumura, T. 1934. [Experimental works for patient with application of antagonism. III. Antagonisms between *Bacillus natto* and typhus *in vivo*]. *Kyoto Furitsu Ika Daigaku Zasshi* (*J. of the Kyoto Prefectural University of Medicine*) 12:1185-1210. *

3115. Minatoya, S.; Kurahashi, N. 1934. [Pulverization of rubber by the use of soybean lecithin, and applications of the products therefrom]. *Nippon Gomu Kyokaishi* (*J. of the Society of Rubber Industry of Japan*) 7:272-77. [Jap; eng]*
• ***Summary:*** Crude soybean lecithin accelerated the vulcanization of rubber in the presence of zinc oxide and sulfur. Milling of rubber with soybean lecithin gave particles which adhered in a sponge-cake form. Applications of this material are discussed.

3116. Miyata, K. 1934. [On anti-mold substances]. *Aichi-ken Kogyo Shikenjo* 6:85-. [Jap]*

3117. Nakaya, K. 1934. [Studies on the treatment of soybean for the soy sauce fermentation]. *Noda Soy Sauce Co. Ltd., Report* 4:83-108. [Jap]*

3118. Nomura, H. 1934. [Studies on natto. 2. 3. Change of protein during the manufacturing process]. *Kanagawa Ko-Shi* 4:22-. [Jap]*

3119. Okazawa, Taroku. 1934. Kôbo riyô miso sokujô-hô [Accelerated fermentation of miso using yeast (Abstract)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 29(4):74. [Jap]
• ***Summary:*** Original in Ryo-Yuu (1934). No. 9, p. 3.

3120. Okazawa, Taroku. 1934. Kôbo riyô miso sokujô-hô [Accelerated fermentation of miso using yeast]. *Ryo-Yuu* No. 9. p. 3. Abstract in Nippon Jozo Kyokai Zasshi (J. of the Brewing Society of Japan). 1934. Vol. 29. No. 4, p. 74. [Jap]*

3121. Oota, Kiyoshi. 1934. Shôyu no kabi-dome-zai ni tsuite. Inshokubutsu bôfuzai no kenkyû, sono san no ichi [On the anti-mold substances for shoyu. Research on preservatives for beverages, 1 of 3]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 29(1):23-49; 29(2):22-29; 29(3):18-29. [12 ref. Jap]
Address: Igaku Hakase.

3122. Oota, Kiyoshi. 1934. Shôyu no kabi-dome-zai ni tsuite [On the anti-mold substances for shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 29(8):19-27; 29(9):24-37; 29(10):18-27; 29(13):10-20. [86 ref. Jap]
• ***Summary:*** This research on preservatives for beverages is particularly interested in biodipal B ("biojiparu"). Address: Nôgaku Hakase.

3123. Ota, K. 1934. [Studies on the preservatives for foods. III-I. Chemical preservatives for soy sauce]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 29(1):23-49. [Jap]*

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3124. Park, Y.R. 1934. [Bacteriological studies on Korean doenjang and kochojang]. *Chiba Igakukai Zasshi* (*J. of the Chiba Medical Society*) 13:2671-2708. [Jap]*

3125. Sakurai, Yoshito. 1934. Miso no seibun yushi to san ni tsuite [Constituents of miso: fats and acids]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 29(7):90-96. [Jap]

3126. Suzuki, T. 1934. Hakkô to bitamin. V. Nattô kin wa bitamin B-1 o gôsei suruya [Fermentation and vitamins. V. Synthesis of vitamin B-1 by *Bacillus natto*]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 11:605-07. [2 ref. Jap]
Address: Osaka Imperial University (Osaka Teikoku Daigaku).

3127. Takahashi, Noboru. 1934. Daizu ni okeru yôkei inshi to ikkyo ryûsû inshi to no rensa kankei [Linkage between the genes for the forms of leaves and the number of seeds per pod of soybeans]. *Idengaku Zasshi* (*Japanese J. of Genetics*) 9(4):208-25. [12 ref. Jap; eng]
Address: Chosen Sotokufu Noji Shikensho Nishi Sen Shijo (Sariin), Korea.

3128. Watari, S. 1934. [Anatomical studies on some leguminous leaves with special reference to the vascular system in petioles and rachises]. *J. of the Faculty of Science, Imperial University of Tokyo, Section III. Botany* 4:225-365. *

3129. Adachi, Isamu; Sakurai, Shigeru. 1934. Nihon shokumotsu-shi [History of Japanese foods]. Tokyo: Yuzankaku. 480 p. [Jap]
• ***Summary:*** This is the best book seen on the history of Japanese foods. The following soyfoods are discussed: Firm tofu, soymilk and okara (p. 290-91; discusses the *Teikun Orai* by Iseno Teijo, tofu-kan, tofu-jiru = soymilk, setsurun-sai = okara), yuba (p. 336), shoyu and tofu (p. 370-71), unohana (okara, p. 377), tofu and natto (p. 382-83).

3130. Blunden, Edmund Charles. 1934. The mind's eye: Essays. London: Jonathan Cape. 284 p. See p. 108-09. No index. 21 cm. Life and Letters series, no. 80.
• ***Summary:*** This book is divided into 4 parts. Part two, "Japan," contains essays written during the 1920s and 1930s; most have been previously published in periodicals. The chapter titled "On some humorous prints by Hiroshige" (written in 1926), contains a description of two apprentices, one from a "fried-*tofu* shop" and one a fishmonger's boy, fighting each other in the street. One boy hits the other on the nose, while his opponent pulls out a handful of his hair. But "whichever wins, both have lost, for a dog is slinking away with the fishmonger's *bonito,* and two hawks have raided the *tofu."* Address: [Sussex, England].

3131. Dominion Bureau of Statistics, Ottawa, Canada. 1934. Imports into Canada for consumption, years ended 31 March 1929 to 1933. *Trade of Canada.* Fiscal year ended March 31, 1933.
• ***Summary:*** Under Imports–Sauces–Soy, Soya (Table 36, p. 285), statistics are given from 1929-1932 for gallons and dollar value from United Kingdom, Hong Kong, China, Japan, Syria, United States. Japan was the leading supplier for all four years. In 1929, the peak year, 104,606 gallons were imported worth $45,359. The leading supplier by far was the Japan (67,541 gallons), followed by Hong Kong (33,396 gallons). No statistics are given for soy sauce imports from Syria for 1929, 1930, 1931, or 1932. However, for total imports and for general tariff, under *montant,* a figure of 132 gallons is given for Syria.

Imports of peanut oil and soya bean oil [grouped together as one, so we cannot tell how much was soya bean oil] (p. 300). The United Kingdom was the leading supplier for all four years. In 1931, the peak year, 197,753 gallons were imported worth $129,581. The leading supplier by far was the United Kingdom (118,480 gallons), followed by China (38,941 gallons).

Imports of soya beans, soya bean cake and soya bean meal, for use exclusively in the manufacture of cattle food and of fertilizers (p. 338, in cwt = hundredweights; 1 cwt = 112 lbs). China was the leading supplier for all four years. In 1933, the peak year, 46,129 cwt were imported worth $57,097. The leading supplier was China (25,491 cwt), followed by the United States (15,899 cwt).

Imports of peanut oil and soya bean oil for the manufacture of soap, and peanut oil for canning fish [grouped together as one, so we cannot tell how much was soya bean oil] (p. 342). The United States was the leading supplier for all four years. In 1929, the peak year, 941,072 gallons were imported worth $652,323. The leading supplier by far was the United States (743,866 gallons), followed by the UK (100,590 gallons) and China (96,616).

Note: This is the earliest document seen (Dec. 2007) concerning soybean products (soy sauce) in Syria. This document contains the earliest date seen for soybean products in Syria (1932); soybeans as such had not yet been reported by that date. Address: Ottawa, Canada.

3132. Inahara, K. ed. 1934. Japan Year Book. Tokyo: The Foreign Affairs Association of Japan. 29 + 1356 p. See p. 1083, 1168, 1172.
• ***Summary:*** Page 454. "Leguminous plants:... During the past decade area has been pursuing a slow, downward movement, while a sharp reduction was experienced by production. More than 72% of the total area and 67% of the total production were occupied by soy-beans and red beans."

Soy-beans were planted on 341,752 ha which produced

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4,351,806 hectoliters worth 31,724,890 yen.

Red [azuki] beans were planted on 119,101 ha which produced 1,002,988 hectoliters worth 9,752,490 yen.

Page 1083. The section on Chosen [Korean] agriculture [Korea is a Japanese colony] states that rice and barley plus wheat are the two most important crops. "Third in importance comes the soy bean. In earlier times it was far from being an important produce owing to ignorance on the part of Korean farmers of the proper method of preparation, such as drying and assorting. It is now, however, in high esteem on the Japanese market where there is a demand for it not only as food, but for chemical industrial purposes, and thus the amount exported to Japan is yearly on the increase. In 1930 the total area under cultivation was 803,000 cho and the amount produced reached 4,410,000 koku, which was an increase of more than six times, compared with the year 1910.

"Millet is for most Koreans What rice is for the Japanese people. They depend more upon it than upon rice on account of its cheapness in price. The Korean farmers sell their rice, but use their millet crops for their daily diet,..." Note: Do they voluntarily sell their rice?

Page 1168. In the section on Manchoutikuo [sic] agriculture, the great majority of exports go to Japan, with China a close second. The principal export commodities include soy beans (worth 143.899 million Haikwan taels in 1932; #1 in value), bean cakes (66.311 million HT; #2 in value), and soy bean oil (24.511 million HT; #4 in value after coal).

Page 1172. A large table shows "Export of agricultural crops, 1929-1931" from Manchuria. For each is given the quantity in piculs (1 picul = 133.33 lb) and value in yen. For soya beans:

46.012 million piculs in 1929
33,536 million piculs in 1930
46.897 million piculs in 1931

The first section below this table states: "Soy beans: Manchoutikuo produces about three-fifths of the total production of soy beans in the world. The beans contain about 10 per cent. of oil, and the cake which is obtained in pressing the beans is exported as fertilizers. The latest figure for production of soy beans in Manchoutikuo was 4,430,000 tons and its total plantation area 3,878,000 hectares. The average crop [yield] per hectare was 1,122 kg.

Kaoliang comes next in importance after soy beans. "It serves as the diet of the people. Its production is 3,722,000 tons a year..."

3133. Japan-Manchoukuo Year Book. 1934. Tokyo, Japan: Japan-Manchoukuo Year Book Co. 26 cm. First annual issue. [Eng]

• ***Summary:*** Each year book is divided into two main parts: Japan, and Manchoukuo. The Preface begins: "The far reaching political and economic changes which have taken place in the Far East within recent years have created the need for a year book covering the Japanese Empire and Manchoukuo [pronounced mahn-CHO-ku]. Especially to be noted is the growing relationship between Japan and Manchoukuo; hence any volume which discusses one, without consideration of the other, would be incomplete."

A table near the front gives "Weights, measures, and moneys." 1.80391 hectoliters = 1 koku = 5.11902 dry bushels (USA). 1 yen = $0.4984 dollars (USA) = 2.583 French francs = 2.0924 German marks.

A large color map (2-page spread) shows Japan, Manchoukuo, Chosen [Korea], Karafuto, and Taiwan–as well as the railways in each country.

Page 360: A large table shows the yield (in koku per tan) of 15 major Japanese crops, from 1904-08 to 1931–including rice, barley, naked barley, wheat, soya beans, red beans, etc. The yield of soya beans increased from 0.77 in 1904-08 to 0.86 in 1930.

Page 364. A table shows the production (in hectoliters) of beans, potatoes, and sweet potatoes in Japan from 1927 to 1931. For soya beans:

5.886 million hectoliters in 1927
5.370 million hectoliters in 1928
4.780 million hectoliters in 1929
5.473 million hectoliters in 1930
4.481 million hectoliters in 1931.

Production of red [azuki] beans in 1931 was 25.2% of soya beans.

Pages 626-34. The chapter on Agriculture in Manchoukuo begins: Widely different views are entertained as to the possibilities of Manchoukuo as a field of agricultural enterprises. Undoubtedly, they are immensely greater than those of mountainous Japan or Korea, but to liken them to those of the great agricultural regions found in North and South America seems to have no ground. The soil is not in general so rich, and in many places has been much exhausted, nor is the area of arable land so extensive, nor the climate so moderate. One great advantage it has had over most other countries in Eastern Asia is the comparative thinness of its population, but this advantage is fast being diminished by the constant influx of Chinese immigrants from the South. Taking all these things into consideration, Manchoukuo is yet the most favored spot for agriculture in the Far East, and its opportunities may well be termed 'immense,' which epithet is often met with in Japanese publications on that country.

"The great mass of level land, extending over the whole of Central Manchuria and comprising the basins of the Liao, Sungari, Nonni, and Hulan, the productiveness of which can compare favorably with any part of Japan or Korea, is by itself as large as the whole of the Chosen Peninsula or of the mainland of Japan,..." The forecast for soya bean production in Manchoukuo in 1933 is 5.216 million metric tons. Manchuria is divided into north and south. About half of the

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total crop production is grown in each area.

Page 627. A table shows "Production of crops in Manchoukuo, 1931." For soya beans:

1.175 million metric tons in Mukden.
2.414 million metric tons in Kirin.
1.637 million metric tons in Heilungkiang.
5.227 million metric tons total.

Soya beans had the largest production of any crop in the country in 1931, followed by kaoliang (4.497 mmt) then millet (2.960 mmt).

Page 628. A large table gives "Crop output in Manchoukuo," 1922-1931. For soya beans:

3.088 million metric tons in 1922.
3.088 million metric tons in 1923.
3.448 million metric tons in 1924.
4.173 million metric tons in 1925.
4.775 million metric tons in 1926.
4.816 million metric tons in 1927.
4.834 million metric tons in 1928.
4.849 million metric tons in 1929
5.297 million metric tons in 1930.
5.227 million metric tons in 1931.

Page 629. A large table shows "Cultivated area in Manchoukuo classified by crops, 1931. (Hectares)." For Soya beans:

Mukden 960,030
Kirin 1,902,210
Heilungkiang 1,338,350
Total: 4,200,590 ha

Previous year 4,118,450. "In one of the publications of the Chinese Maritime Customs" [*The Soya Bean of Manchuria,* 1911, p. 6] we read: "But when the Manchurian farmer pulls out the whole plant by the roots, or, having cut the crop with his sickle, proceeds to cut up the roots with a mattock for fuel, he is preventing the work of the bacillus radicicola from bearing its fruit and depriving his land of the provision made for it by nature. Thus, the soil in South-west Manchuria, where agriculture has been carried on for 400 years, has been bereft of all vegetable and organic matter and no longer bears harvests. The wonderful natural loaminess of the soil in the newer regions further north–for instance, at Shwangchengpu, where it is said that no manure is or ever has been used by the farmers in the 40 years since the land has been cultivated–this loaminess will assure good harvests for many years to come; but in the course of time even the richest soil will become exhausted, and to prevent such a disaster steps should be taken to inform the ignorance of the peasants who are at present deriving such great profits from their crops. If they could be shown the value of the process of 'turning under' the green bean plants after the harvest, the fertility of the land might be preserved."

Page 630. In this chapter on Agriculture, a section on "Soya beans" appears on pages 630-34. Contents: Introduction. Cultivation of soya beans. Different species. Uses of the soya bean. Bean oil. Bean cake. Near the start of the Introduction we read: It was the soya bean that introduced Manchuria into world trade, "and it is still the soya bean that makes Manchuria famous. So predominant is the position of the soya bean and its products, bean oil and bean cake, in the trade of Manchoukuo, that these three articles now constitute nearly one-half the value of the entire exports of the country. Sir Alexander Hosie called them, 'the Wealth of Manchuria.' They are indeed the wealth of the country, which has been growing ever since the time of Sir Alexander, and is still growing. Without the 'three articles,' by which term [soya] beans, bean cake, and bean oil are collectively called by the Japanese, the trade of Manchoukuo would, at a stroke, shrink to one-half its present amount, not only in export but most probably in import also, for experience has shown that Manchoukuo seldom buys more than it sells."

A large table (p. 630) titled "Soya bean output in Manchoukuo: Classified according to districts" is divided into South and North Manchuria. It shows how many metric tons were produced in each district in 1931 and 1932.

On page 634 is a long, interesting discussion of: "Kaoliang: Apart from its trade value, kaoliang or tall millet may be considered even more important than soya beans, in that it is the staple food of the native population, and the principal grain food of the numerous animals engaged in the farm-work and in the immense carrying trade of the three provinces.

"Before soya beans attained their present importance, half the total area of the cultivated land in Manchuria was devoted to kaoliang, and a large amount of it was exported to the provinces of China. Of late, however, the cultivation of kaoliang has given place to that of [soya] beans in many places, so that at present, in the northern part of South Manchuria, where beans are cultivated most extensively, about 50 per cent. of the whole cultivated area is devoted to beans, and only 20 to 30 per cent. to kaoliang. It is said that 8 pounds of seed suffice to sow an acre of land, producing in good years 10 to 12 cwt. [hundredweight] of grain. In a bad year or on poor soil, only a third of this quantity will be harvested. The crop is easily affected by climatic and soil conditions, and for this reason its cultivation is confined chiefly to Mukden Province, and in that province, too, it does not grow well in the Liaotung Peninsula or in the mountainous south-east.

"Kaoliang is not only used as a food-stuff for man and beast in Manchoukuo, but the native spirit is also made out of it. Nor are the grains the only useful part of it; the stalks play a very important role in Manchoukuo. The outer leaf layers, are woven into mats, so much required in the trade of the country, for roofing ricks and packing loads of grain and beans, and for numerous other purposes. The stalks are also utilized for fencing, bridging, and housebuilding, and where wood and coal are unobtainable or dear they are used for

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fuel.

"Kaoliang spirit, extensively used in both Manchoukuo and Mongolia, is colorless and transparent, and possesses a strong flavor, which peculiarly appeals to the taste of the natives.

"Kaoliang used to be an article of home consumption, and its market outside Manchuria was at most confined to China proper, but after the outbreak of the European War a trial shipment was made to Europe as grain food for horses, and being successful it has since continued to be exported. It is also exported to Japan, and the demand for it there is constantly increasing."

3134. Lee, Frank Herbert. 1934. A Tokyo calendar: with impressions of an impressionable. Tokyo: The Hokuseido Press. 288 p. Illust. 20 cm. 2nd ed. 1937 (290 p.).

• ***Summary:*** In the chapter titled "February," *Mamemaki* is discussed on pages 42-45. In Japan, the Japanese people, regardless of socio-economic class, generally spend their holidays in the same way.

"The most important event celebrated in February is the *Setsubun,* which falls on the third or fourth of the month. On this day takes place the household ceremony, known as the *mamemaki.* About one thousand years ago, that is to say, in the Encho era, the ceremony was in great favour at the Imperial court. Devils were held to have a special aversion to beans and sardines (*iwashi*), so that by throwing showers of beans it was easy to expel any devils which might have taken up their abode in the house. As it was inadvisable to throw sardines on the spotless tatami, it became customary to place them just outside the entrance, together with a small holly tree, as an additional precaution against the possibility that the devils, having once been driven out by the beans might endeavour to return.

"This old court ceremony has been extended to the general public and to-day in every house the head of the family takes a handful of beans and scatters them, with a downward motion of the arm, in each room, repeating in loud, commanding tones, *'Fuku wa uchi, oni wa Soto,'* which apparently is an invocation to the spirit of happiness to enter and an order to the devils to depart. It is further customary for each member of the family to pick up and eat as many of the beans as are his or her years of age.

"The *mamemaki* is also practised in the temples and in various streets by the *'toshi-otoko'* many of whom are famous actors, and who wear on this occasion an old-fashioned dress with wide shoulder pieces and long flowing sleeves. Such then is the outward and visible ceremony in connection with the *Setsubun,* but that day has a far deeper inward and spiritual meaning. It is the day believed to mark a change in the lives of men and women.

"There is something portentous about it, just as in the old days in Europe when the astrologer cast the horoscope of a child he marked down certain days in certain years, which he described as critical, so in the same way the *Setsubun* being the last day of winter in the lunar calendar, starts a critical new year, for a man in his 25th, 42nd, or 61st year and for a woman in her 19th, 33rd, and in her 37th. Such years are known as *yakudoshi,* or fateful years, and are so critical that there have been cases, so I have been told, where a cabinet has resigned when the premier reached his *yakudoshi,* and officials in the service of the government have been transferred to other posts under similar circumstances.

"Anyhow, putting aside all these deeply-rooted convictions, the most that I can say is that in the calendar the *Setsubun* marks the ending of the *daikan* or great cold and ushers in spring, though I must also say, and I am sure no one will contradict me, that February is the coldest and most unpleasant month in the year."

An illustration (p. 42) shows a man scattering soybeans while a small devil flees.

Note: The author is an Englishman who has lived in Japan since 1919 and taught English. Address: Kojimachi, Japan.

3135. *Manchoukuo Year Book* (*The*)**.** 1934. 1934. xxix + 852 p. See p. 234-35, 256-59, 267-79, 350-51, 396-97, 399-409, 466. Published by Minami Manshu Tetsudo Kabushiki Kaisha, Toa-Keizai Chosakyoku (South Manchuria Railway Co., East-Asiatic Economic Investigation Bureau), Tokyo. [Eng]

• ***Summary:*** Chapter 10, "Agriculture," discusses soya beans in detail. Some 34% of the "value of the manufacturing products represent the products of bean oil mills using soya beans as raw material" (p. 234).

Table 1 shows that agricultural products occupy about 50% (of the value in Haikwan taels) of total exports from Manchuria during 1929, 1930, and 1931. Of the manufactured products, [soy] beancake, [soy] bean oil and bran, which are directly produced from agricultural raw materials, constitute 80% of the total (p. 235).

The South Manchuria Railway (S.M.R.) has played a leading role in developing Manchurian agriculture (especially [soy] bean production) and expanding exports. A table (p. 256) shows the SMR's revenues from passengers and freight for selected years from 1907-1931. Freight revenues are, overall, about seven times as large as passenger revenues. The main source of freight revenues is coal, followed by [soy] beans and beancake (Source: SMRC Business Report). "The export of soya beans, beancake, and bean oil has increased three to four times in the past twenty years." The SMRC as established an Agricultural Experiment Station where crops (such as beans) and animals have been improved, bringing much benefit to Manchurian farmers. SMRC's work has contributed both directly and indirectly to the agricultural development of Manchuria by Han Chinese and by Korean settlers (p. 256).

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Before the Manchurian incident, Japanese farmers were oppressed by the Northeastern military leaders and found it practically impossible to farm outside the South Manchuria Railway zone. Thus, before the Manchurian incident, only 730 Japanese households were engaged in agriculture in Manchuria. "The contribution made by Koreans to the development of agriculture in Manchuria cannot be overlooked... their entrance into the interior of Manchuria began only after the Russo-Japanese War" [1904-05]. A table (p. 257) shows the number of Japanese settlers and Korean settlers in Manchuria from 1908 to 1930. The number of Japanese settlers increased from 56,433 in 1908 to 288,784 in 1930. The number of Korean settlers increased from 51,070 in 1910 to 607,119 in 1930.

The Wanpaoshan incident happened just before the Manchurian incident (p. 257). Note: The Wanpaoshan Incident (Jap: *Manpozan jiken*) was a minor dispute between Chinese and Korean farmers which occurred on 1 July 1931, prior to the Mukden Incident [best known in Japan as the Manchurian Incident]. Although the issue was trivial, it was highly sensationalized in the Japanese and Korean press, and used with considerable propaganda effect to increase anti-Chinese sentiment in the Empire of Japan prior to the invasion of Manchuria [in Sept. 1931] (Source: Wikipedia, May 2009). As of May 2009 Mukden is known as Shenyang.

"The agricultural development in Mongolia was suddenly brought about after the Russo-Japanese War, and particularly after the establishment of the Republic of China [on 1 Jan. 1912], as the former policy of protecting the ancient kings of Manchuria was abolished, and the settlement of the Han [Chinese] race was encouraged. The Mongolians were more and more oppressed and obliged to retreat gradually to the inner desert districts, and the barren fields of Mongolia came to be rapidly cultivate by the Han settlers.

"Manchuria was made a great agricultural country by the joint efforts of the Hans, Japanese, Koreans, and Russians, with the Hans as the main factor; Manchuria came to have intimate relations with the world economy through its export agricultural products."

Agricultural products in the three provinces of Fengtien, Kirin, and Heilungkiang: Among the legumes are soya beans, Indian beans, and green peas. Table 13 shows the cultivated area (hectares) and production (metric tons) of these crops: (1) In the three provinces: Soya beans: 4,102,990 ha and 5,124,760 metric tons. Other legumes: 353,190 ha and 54,467 metric tons. (2) In the Kwantung Leased Territory and South Manchuria Railway Zone: Soya beans: 31,923 ha and 17,595 metric tons. Other legumes: 54,467 ha and 160,193 metric tons. Statistics are also given in Table 13 for Kaoliang (#2 crop after soya beans in area and production), millet (#3), maize (#4), wheat (#5), etc. Soya beans account for nearly 30% of the total acreage (p. 258-59).

Table 22 (p. 267) shows that area and production of soya beans in 1933 was larger Northern Manchuria than in Southern Manchuria. A long section titled "Soya beans" (p. 267-70) gives details about all aspects of soya beans, bean oil, and beancake, including exports.

Table 23 (p. 278), titled "Exports of principal agricultural products," gives statistics from 1922 to 1931 for quantity exported and value (in H.K. Taels) for 9 major products. The leading every year is either soya beans or beancake; bean oil is also important.

A section titled "Export of soya beans, beancake, and bean oil in recent years" (p. 279) includes Table 24, "Export of soya beans, beancake, and bean oil through the four ports of Dairen, Yingkow, Antung, and Vladivostok," total tons and relative index from 1926-27 to 1932-33.

The Dairen Agricultural Company, established in 1929, brings Japanese immigrants to Manchuria and helps them to become land-owning farmers; it does not operate any farms directly (p. 300).

The origin of Japanese administration on the Liaotung peninsula, the southern end of Manchuria, started in 1905 during the Russo-Japanese War. In Nov. 1906 Japanese first began to administer agricultural programs in Manchuria by issuing the regulations for the Kwantung Government Agricultural Experiment Station, and the establishment of the agricultural experiment station at Dairen. This station is now located at Chinchow (Chin-chou, or Jinzhou, in Liaoning province, as of 2009) (p. 300-01). On p. 302 is a full page of references to Japanese documents that served as the sources for the tables in this chapter on agriculture in Manchuria. Almost all were compiled and published by the South Manchuria Railway Co. (SMRC).

Chapter 14, "Industry," begins with a "General outline" (p. 350-51). Although Manchuria is rich in natural resources, modern industry did not develop until about 30 years ago. Before that, small enterprises supplied the needs of immediate neighborhoods. With the eastern advance of Russian influence and the establishment of Russian administration in Manchuria near the end of the 19th century, several modern industries appeared. "Before any general industrial development could take place, however, the Russo-Japanese War (1904-05) broke out, and as the result of the war, Japan came to administer the Kwantung Leased Territory and the railway zone. Since that time modern industry has developed in Manchuria"–including oil milling. Industry in North Manchuria [where Harbin is located] is inferior to that in South Manchuria in capital and equipment. Discusses the North Manchuria Railway.

A section on "Chemical industry" (p. 396-409) discusses oil milling in great detail.

Page 466 shows miso and soy sauce production in Manchuria. The 17 Japanese-run plants make 2,800 tonnes of miso and 4,550 tonnes of soy sauce. The 44 Manchurian-run plants make no miso and 1,381 tonnes of soy sauce. The number of factories in each major city and the capital

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assets of the companies are listed. Dairen is the main center of Japanese miso and soy sauce production, followed by Mukden, then Port Arthur. Hsinking is the main center of Manchurian soy sauce production.

Note: This Year Book was published from 1931 to 1941 by Japanese interests (SMRC) to justify the Japanese occupation and development of Manchuria after the "Manchurian incident."

3136. Matveeff, G.N. 1934. [Varieties of soybeans in Georgia]. Tblisi, Georgia: Georgian Press. 146 p. Scientific Research Works, Series A, Issue No. 1. [51 ref. Geo]
• ***Summary:*** Table 1 (p. 8-9) shows the increase in the area planted to soybeans in Georgia from 1930 to 1933. Part 1 shows the area planted to soybeans only ("pure sowings"); this value increased from 626 ha in 1930 to 1,653 ha in 1933. Part II shows the mixed plantings converted to pure sowings; this value decreased from 49,544 ha in 1930 to 28,878 ha in 1933. Part III shows the total planted area (pure + mixed); this value decreased from 50,170 ha in 1930 to 30,531 ha in 1933. Part 4 shows soybean area as a percentage of total area; this figure decreased from 5.09% in 1930 to 3.05% in 1933. A note (p. 9) explains that this table is based on statistical data received from the Narcomzem (Agricultural Department) of Georgia.

Page 10 states that in 1932 a soymilk manufacturing plant was established in Tblisi. Page 11 states that soybeans exported from the port of Batumi (Georgia, on the Black Sea) to Germany and Denmark sold for ¼ to ½ to price of soybeans purchased from Manchuria.

Table 2 (p. 12) shows soybean production in Georgia in 1931 and 1932, and how these soybeans were utilized. Soybean production was 10,760 tons in 1931, and 3,611 tons in 1932. For the two years (respectively), 32.6% and 48.8% were exported (outside the USSR), 21.2% and 22.5% were exported to other countries inside the USSR, 27.9% and 2.6% were delivered to various organizations in Georgia for use in making edible oils and confections.

Page 10 states that G. Struev [G. Sturua] (1882) gave the names of some varieties he obtained from Japan. According to G. Japardize, S. Timofeev, and E. Wuchino, soybeans were introduced to Georgia during the 1870s.

Page 20 states: The first information about the soybean in Russia was from the year 1874 (See G. Tupikova). Address: Georgia.

3137. Mukai, Seizo. 1934. Manshû daizu oyobi sono seihin [The soybean of Manchuria and its products]. Tokyo: Iwamatsudo Shoten. xvii + 340 p. Illust. 28 cm. [Jap]
• ***Summary:*** Contents: Preface. Part I: Introduction. The position of soybeans in the world and in Manchuria. Soybeans in Manchuria and Japan.

Part II: Soybeans: Outline, varieties, cultivation, character, quality and appraisal, usage of soybeans, packaging and shipping, demand of the production and foreign trade (Manchuria, Japan, Korea, Taiwan, China, South Pacific Ocean, Europe and USA), the custom of selling and buying.

Part III: Soybean cake and soybean oil. Outline, varieties, method of production, quality and appraisal, usage (Cake: Fertilizer, fodder, raw material for foods, for drugs, and for the chemical industry. Table of soybean cake usage. Oil: Table of soybean oil use), packaging and shipping (pulp and oil), production, consumption, and trade (supply and demand in Manchuria, Japan, Korea, Taiwan, China, South Pacific and India, Europe and USA), the custom of selling and buying.

Part IV: Remarks. Bibliography.

Appendix: Table of equivalents in Manchuria, money system, rate of exchanging money, about the money the Central bank makes in Manchuria, money exchange, amount of exporting, soybean and soybean cake related exchange rate table, important Japanese & Manchurian market weight and volume exchange rates, general or Manchurian abbreviation of words. Address: Manchuria.

3138. Takahashi, Eiji; Iguchi, K.; Mitamura, K.; Shirahama, K. 1934. The influence of soy bean cake upon milk production and the quality of butter. Dairen?: South Manchuria Railway Co. 66 p. [59 ref. Eng]
• ***Summary:*** Soya-bean cake fed to stock at the rate of 20, 35, and 50% of the production ration (calculated on the Hansson standard) caused progressive increase in milk yield and no ill effects on quality of milk or health of the cow, but at the highest level the butter was too soft.

"About 1,500,000 tons of soy bean cake are imported into Japan proper every year from Manchuria. Hitherto this has been mainly for the purpose of manure. But recently the value of nitrogen in soy bean cake has risen above that of ammonium sulphate by about 30-60%. The result has been that the manurial value of soy bean cake is now less than that of ammonium sulphate...

"The Manchurian Railway Company allocated the study of the feeding value of soy bean cake... to a number of institutions in Japan proper. This experiment was begun at the farm of this Imperial University in Sept. 1931 and was ended in April, 1933."

3139. Woodhead, Henry George Wandesforde. ed. 1934. China year book. Shanghai, China: North China Daily News & Herald. xxvi + 854 p. Vol. 16. Index. 22 cm.
• ***Summary:*** In Chinese, the title of this book is *Chung-hua nien-chien.* In chapter III, "Soy-beans and bean products are discussed on pages 41-42.

A table (p. 55) shows exports of vegetable oils from China in 1931. In descending order of weight (thousand piculs) they are: [Soy] bean oil 1,463. Wood oil 865. Groundnut oil 814. Unclassified 36. Tea [seed] oil 21. Castor

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oil 14. Sesamum seed oil 3.

The three most valuable oils in descending order of value (1,000 H. Taels) are: Wood oil 20,416. [Soy] bean oil 16,991. Groundnut oil 12,734.

In Chapter 5, a multi-paged table titled "Principal exports, 1932 and 1933," shows (p. 129): Exports of yellow [soy] beans to Egypt (incl. Anglo-Egyptian Sudan), Formosa, Germany, Great Britain, Hongkong, Italy, Japan, Korea, Netherlands, Netherlands India [Dutch East Indies; Dutch: *Nederlands-Indië*], Philippine Islands, Straits Settlements and F.M.S. [Federated Malay States], U.S.S.R. (Russia) Asiatic Routes, Other countries. The five leading importers of yellow [soy] beans, in descending order of weight imported (in million piculs), are: U.S.S.R. (Russia) 4.479. Japan 3.331. Germany 3.222. Korea 0.759. Netherlands India 0.555. Total: 17.269.

On the same page are exports of beancake to Japan, Korea, Norway, USA, U.S.S.R. (Russia) Asiatic Routes, Other countries. The three leading importers, in descending order of weight imported (in million piculs) are: Japan 5.854. U.S.S.R. (Russia) 2.119. Other countries 1.979.

In Chapter 7, a table (p. 153) shows the foreign and domestic trade at seven major Manchurian ports: Aigun, Harbin, Hunchun, Lung-Chingtsun, Antung, Dairen, Newchwang. Dairen does by far the largest volume of trade, followed by Harbin, then Newchwang.

On page 153 a table shows the quantity (piculs) of [soya] beans, bean oil, and beancake exported from (1) China including Manchuria, and (2) Manchuria alone. For each of the three products and two categories the amount sent to Japan, Europe, and Other countries is given. Europe imports almost all of the bean oil. Other countries get the largest amount of the beans and the beancake.

Also discusses Mongolia: Religious organization (Chapter 4, p. 70-71), including Lamaist Buddhism and "Living Buddhas." Also discusses Tibet (Chapter 4, p. 88-91). This section begins: "Geography: Tibet, sometimes called the 'Roof of the World,' consists of (1) the Lama kingdom of Tibet with its provinces and dependencies; (2) the semi-independent native states of Kam, under Chinese protection; and (3) the Kokonor [Koko-nor / Koko Nur] Territory, under the control of the Chinese Amban [a Manchu word meaning "high official"] residing at Hsi Ling, in Kansu. Note: Wikipedia states (June 2008): "The Qing Emperor appointed the amban in Tibet, who represented Qing suzerainty over the Buddhist theocracy of Tibet, and commanded over 2,000 troops stationed in Lhasa. The chief amban was aided by an assistant amban (Bangbàn Dàchén) and both of them reported to the Qing Court of Colonial Affairs. Their duties included acting as intermediary between China and the Hindu kingdom of Nepal (Ghorkhas Country); a secretary (Yíqíng zhangjing) dealt with native affairs. Three Chinese commissioners (liángtái), of the class of sub-prefects, were stationed at Lhasa, Tashilumbo and Ngari.

"The Qing imperial resident in Tibet was introduced in 1727 and most ambasa [high officials; A Manchu word, plural of amban] were appointed from the Manchu Eight Banners, a few were Han Chinese or Mongol. The Emperors used ambasa to influence Tibetan politics, and the Qianlong, Jiaqing and Daoguang Emperors each decreed that the Dalai Lama and Panchen Lama were bound to follow the leadership or guidance of the ambasa in carrying out the administration of Tibet."

A brief biography of Li Yu-ying (Courtesy name: Shih-tseng) appears on p. 693. Address: 1. B.A., formerly editor of the "North-China Daily News"; 2. M.J.I., Editor of the "Peking and Tientsin Times".

3140. Yamaguchi, H.S.K.; Garis, Frederic de. 1934. Oddities in Japan. "Believe It or Not." Memorial services. Broken Needles Mass (Hari-Kuyo) (Document part). In: H.S.K. Yamaguchi. 1934. We Japanese. Yokohama, Japan: Yamagata Press. 592 p. See p. 160. Book I.

• ***Summary:*** "Yearly, on December 8th, but more generally on February 8th, services for broken needles are held in many girls' schools, and in some private homes, to comfort the spirits of needles broken during the year–the needle being regarded as a living thing whose body has been sacrificed in service. An altar consisting of two or three steps is set up. In front of it is the Sacred Staff and Rope, *gohei* (cut-paper strips) being suspended from it. On the top step offerings of cake and fruit are placed. On the second step is a plate on which is a cube of *tofu* (bean-curd)–a jelly like substance–into which the broken and crooked needles are thrust, the idea being to give the needles a soft rest after their hard work. Sewing accessories are displayed on the lowest step. In a Buddhist school a sutra is read to calm the spirit of the needles. In Tokyo, the *tofu,* with its needles, is offered to a Awashima shrine: at Asakusa, Shimo-Kitazawa, and elsewhere.

"The ceremony, or ones nearly similar, is one of the traditional services observed by girls in Japan, which, with some lapses, can be traced back for about 1600 years to the time of Emperor Nintoku, and the Awashima shrines of the land are chosen for the offerings because it is said that the main Awashima Shrine, in the province of Kii (Wakayama) is dedicated to Emperor Nintoku." Address: Manager, Fujiya Hotel, Miyanoshita, Japan.

3141. White, William C. 1935. The Japanese in America: A close-up. Citizens or aliens, it is hard for them to join in the life of the country. *New York Times.* Jan. 6. p. SM9.

• ***Summary:*** Begins by describing "Little Tokyo," the Japanese section of Los Angeles–which is just 3 blocks from the main business section of Los Angeles. Includes a description of the chrysanthemum festival, drug, stores, newspapers, and restaurants which "serve hamburgers and hot dogs as well as soya bean curd [tofu] and rice."

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About 135,000 Japanese live in America, and 97,000 of those (72%) live in California. Only about 6,000 live in New York. More than 45,000 live in or near Los Angeles, where they are considered a problem. They live by themselves in certain sections and have no social contacts with white Americans–except that their children attend public schools.

Significant numbers of Japanese began to arrive in California after 1880. By 1910 more than 80,000 had entered as immigrants. The 1906 "gentleman's agreement" stopped almost all Japanese immigration and the Congressional act of 1924 stopped it entirely. But all Japanese born in the USA (*nisei*) are American citizens, and this latter group now slightly outnumbers those immigrants born in Japan [*issei*]–who are barred by law from becoming naturalized citizens.

The average age of the *issei* in America is less than 45, yet they are prevented by law from owning land in most Western states. "The laws which prohibit marriages between any two races apply to them." Children offer one way of getting around the land laws. The parents simply buy land and register their children as the legal owners. Unlike German immigrants, for example, they make little effort to assimilate, yet they also take care of themselves and rarely appear on charity rolls.

The feeling in California against Japanese is based primarily on two issues: (1) They are believed (incorrectly) to have a high birth rate, which could lead to the "yellow peril." (2) They can live more simply than whites and therefore "undersell the whites" in goods and labor. There is growing conflict between Japanese-American youth, educated in American schools and often wanting to become part of American culture, and their parents–who want to keep Japanese culture alive.

"Within recent weeks there have been terroristic raids on Japanese families settled around Phoenix, Arizona. There have been similar affairs at various times in California. There have been night riders, occasional bombs. Part of the Arizona terror is directed at the fact that the Japanese, 750 of them, half of them born in this country and therefore American citizens, are making a living on land where white farmers, settlers from Oklahoma and Texas, have failed."

Note 1. See also interview: Tadano, Mary; Tadano, Michiko. 2002 "History of Showa Shoyu Brewing Co.: Sept. 17.

Note 2. This is the earliest document seen (Feb. 2012) that concerns the Tadano family (later makers of soy sauce) near Phoenix, Arizona–however it does not mention the family by name.

Photos show: (1) A Japanese religious ceremony in Los Angeles. (2) Japanese children in a Los Angeles classroom. Address: Los Angeles.

3142. Gray, George Douglas. 1935. The soya bean in international trade. *Foreign Affairs* 13(2):340-42. Jan.
• ***Summary:*** This article begins: "The soya bean has been described as unquestionably the most important food plant in the world." The soya bean is Manchuria's principal crop. "Under Japanese management [in part, since shortly after 1905], its culture has been developed and its uses extended. It has had a dominant part in drawing 30,000,000 Chinese to Manchuria, and it has aided them in building there a prosperous community. The profit from its transport and sale has in large measure supported the Japanese adventures on the mainland of Asia.

Table 1 gives "World soya bean production." Manchuria, with 10,184,928 acres under cultivation produces 208,298,428 bushels or 20.4 bushels/acre, which is 59.3% of world production. China proper, with 5,635,000 acres under cultivation produces 89,340,000 bushels or 15.8 bushels/acre, which is 25.4% of world production. Japan, with 913,836 acres under cultivation produces 15,238,873 bushels or 16.6 bushels/acre, which is 4.3% of world production. Korea (a province of Japan since 1910), with 1,942,922 acres under cultivation produces 20,431,754 bushels or 10.5 bushels/acre, which is 5.8% of world production. The U.S.A., with 1,373,000 acres under cultivation produces 18,146,000 bushels or 13.2 bushels/acre, which is 5.2% of world production. The world, with a total of 20,049,686 acres under cultivation produces 351,355,046 bushels of soybeans.

Note: This is the earliest document seen (Jan. 2005) that gives detailed total soybean production or area statistics worldwide.

Table 2, "Trade of Manchuria (in millions of Haikwan taels)" shows Manchuria's imports, exports, total trade, and balance of trade for the years 1907, 1917, and 1927-1932. In 1907 Manchuria had a negative balance (-8.6). In 1917 the balance began to be positive (+2.5), but by 1927 the balance was strongly positive (+139.0) rising to +255.0 in 1931.

Table 3, "Exports of Manchuria (in millions of Haikwan taels)" shows Manchuria's 5 main exports (both value and percentage of total) from 1927 to 1932. In descending order of value in 1932 they are soya beans, coal, kaoliang, millet, and pig iron. In 1927 soya beans, with a value of 219.5 accounted for 54.5% of exports. In 1932 soya beans, with a value of 234.6 accounted for 60.8% of exports.

Table 4, "Imports of soya bean and soya bean oil" [from Manchuria] shows the imports of each, in tons, in 12930 and 1930, by the following countries: United Kingdom, United States, France, Holland, Denmark, Germany, Italy, Belgium, and Japan. In 1932 the world's top 4 importers of soya beans were Germany (1,168,300), Japan (481,600), Denmark (288,864), and the UK (159,938). In 1932 the world's top 4 importers of soya bean oil were Japan (72,240), UK (27,343), Belgium (5,600), and Germany (3,739).

3143. Iwamura, Iwao. 1935. Biochemical studies on "miso", fermented soybean paste. II. Influence of temperature upon the ripening of "miso". *Bulletin of the Agricultural Chemical*

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Society of Japan 11(1):1-7. Jan. Bound in the back or front of Nippon Nogei Kagaku Kaishi (J. of the Agricultural Chemical Society of Japan). [8 ref. Eng]
• ***Summary:*** "In order to ascertain the influence of temperature upon the ripening of 'miso,' 5 series of samples were kept for fermentation at 55º, 35º, 27-32º, 25º and 15-25ºC respectively. The samples taken at different intervals were analyzed and at the same time the chemical changes during the steeping and boiling of the soybeans were determined.

"It has been confirmed that the fermentation at 55ºC proceeds most rapidly, attaining the maximum after 8-12 days; at a lower temperature the fermentation proceeds more slowly, thus needing 15-25, 20-30 and 40-60 days of ripening at 35º, 25º and 15-25ºC respectively. The amount of ammoniacal nitrogen and free acid was comparatively large at 35ºC.

"It has also been observed that the ripening of 'miso' is much accelerated by the enzyme action of 'koji.' By the steeping of the soybeans the increase of reducing sugars and free acids is noticeable and by boiling them some proteins, reducing and non-reducing carbohydrates are dissolved in water." Address: Agricultural Chemical Lab., Tokyo Imperial Univ., Komaba, Tokyo.

3144. Shinozaki, Yûichi [Sinozaki, Yûiti]; Kubo, Hiraki. 1935. Studies on the high-pressure hydrogenation of soybean oil. IV. On the formation of hydrocarbon. *J. of the Society of Chemical Industry, Japan* 38(1):21B. Jan. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** The ester wax which was formed at 325-350ºC with the copper-chromium catalyst (Shinozaki 1934) was decomposed completely at greater than 410ºC with the formation of octadecane, while at about 450ºC a light oil (yield greater than 70%) of density 0.74 was produced. Address: Dep. of Organic Chemistry, The Central Lab., South Manchuria Railway Co., Dairen, Manchuria.

3145. Turner, F. 1935. Soya beans and soya bean oil. *Oil and Colour Trades Journal* (*London*) 87(1894):311, 313-14. Feb. 1.
• ***Summary:*** Contents: Introduction. The soya plant. The plant as a fertiliser (and green manure; enormous quantities of "soya bean cake are used as fertilisers for the sugar plantations of Southern China and rice fields of Japan"). Analyses of beans. Extraction of the oil. Crushing by Anglo-American press. Solvent extraction processes. Separation of proteins. The protein and paints. Lecithin. The oil. As a paint oil. Fatty acids compared. Hydrogenated oil.

Blowing of a stand oil is claimed to improve its drying properties. Address: England.

3146. Inaba, T.; Kitagawa, K. 1935. Reports on the Manchurian oil seeds. I-III. *J. of the Society of Chemical Industry, Japan* 38(2):73B-77B. Feb. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** Contents: I. Perilla, flax and hemp. II. Sunflower, soybean and sesame. III. Cottonseed, pea nut, castor bean and China jute seed. Analytical data are tabulated for these seeds and their oils.

Concerning soya bean: "Improvements on the varieties have been endeavoured for many years at the Kung-chiu-ling Agricultural Experimental Station of the Company, and now 23 varieties are cultivated there. We examined here 13 varieties and 4 sub-species, yellow, green, black and red, and the results obtained are shown in the following table." The oil content is highest for yellow (19.79%) and lowest for green (16.70). Black soybeans contain 18.27% oil. Address: Dep. of Organic Chemistry, The Central Lab., South Manchuria Railway Co., Dairen, Manchuria.

3147. Monnier, Emile. 1935. Les préparations à base de graines de soja dans l'alimentation des Annamites [Preparations based on soybeans in the diet of the Annamites (of Central Vietnam)]. *Bulletin Economique de l'Indochine* (*Hanoi*) 38:66-86. Jan/Feb. Also in Annales de Medecine et de Pharmacie Coloniales (1935) 33. p. 34-57. [11 ref. Fre]
• ***Summary:*** An excellent, very precise and detailed discussion of the subject. Contents: Introduction, botany of the plant, nutritional composition, and utilization. Soymilk (used to make tofu–*le fromage de soja–dau-phu*). Tonkin soy sauce (*La sauce de soja = dau-tu'o'ng.* It is made by fermentation of a mixture of glutinous rice and roasted soybeans {*graines de soja grillées*}. It is made on a family level. It corresponds roughly to Japanese shoyu and Chinese soy sauce (*téou-yeou*). Describes exactly how it is made). Soy cream [yuba] (*La crème de soja = dau-phu-chuc;* [dried yuba sticks]). It comes in the form of sheets.

Note. This is the 2nd earliest French-language document seen (Dec. 2012) that mentions roasted soybeans, which it calls *graines de soja grillées.* Address: Chef du Laboratoire de Chimie de l'Institut Pasteur, Hanoi.

3148. Otomo, Sajiro. 1935. Daizu kasu no kabi ni tsuite [The molds on soybean cake (Aspergillus, Penicillium, Monilia)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 11(2):124-46. Feb. [11 ref. Jap] Address: Tokyo Daigaku Nôgaku-bu, Nogei Kagaku Kyoshitsu, Tokyo, Japan (Agricultural Chemical Lab., Imperial Univ. of Tokyo).

3149. Satow, Teikichi. 1935. Waterproof glue product and method of making the same. *U.S. Patent* 1,994,050. March 12. 3 p. Application filed 9 Jan. 1930.
• ***Summary:*** In making a "glue from soya bean meal, if the glycinine [glycinin], which is the main constituent of soya bean proteid, is converted into methyl compounds a maximum binding or adhesive strength, as well as a

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maximum water resisting property, is imparted...” Methylene glycinate gives much stronger and more water resistant glues than calcium glycinate. Address: Tokyo, Japan.

3150. Koide, Y. 1935. [Powdered casein]. *Japanese Patent* 109,812. March 1. (Chem. Abst. 29:4856). [Jap]*

3151. MacConkey, C.A. 1935. Soybeans. Ottawa, Canada: Div. of Research Information, National Research Council, Ottawa. 93 p. March. 28 cm. [152 ref]

• ***Summary:*** A very important and interesting book. In 1932 the first two sections of this report were prepared; in 1934 the third section was added in order to bring it up to date. Contents: Summary of Part I. Summary of Part II. Summary of Part III. Part I (p. 14): Cultivation, utilization and trade. Introduction. Cultivation: Varieties, differences, maturity, hardiness, color of bean, climate, soil, seeding, harvesting. Production of oil and cake. Applications: Introduction, the plant (forage, hay, pasturage, silage, soilage, straw, soil improvement and fertilizer), the bean (grain, flour, soy sauce, bean curd [tofu], vegetable beans, other uses), the cake (cattle feed, flour, fertilizer, other uses), the oil (general, the soap industry, the paint and varnish industry, the food industry). The soybean industry in the United States: Importance of the crop, history and development (incl. Henry Ford who is said to have 10,000 acres under cultivation), standards (classes of soybeans), production of oil and cake, consumption of soybean oil, export trade in soybeans. Statistics of world trade: Beans (production, exports, imports [statistics, pre-war average {1909-13} + 1926-1931 for Germany, Japan, Denmark, UK and British Empire countries, Dutch East Indies, Sweden, Italy, Formosa, and Holland], consumption [net imports], prices), oil (production, exports, imports, consumption, prices), cake (production, exports and imports). Statistics of the German oil seed industry: Oil seeds in Germany [by far the world’s largest soybean importing country and largest European producer of soybean oil] (imports and exports), vegetable oils (production, consumption and value), oil cake and meal (production, imports, exports, consumption and relative values), soybean experiment stations in Germany.

Part II (p. 56): Development in Canada. The difference between growing soybeans for forage and for seed. Present status of soybean cultivation in Canada. The future for soybeans on the Prairies. Extent of Canadian Experimentation. Varieties suitable for Canada. The climates of Manchuria and Canada. Planning the development of soybeans in Canada. Consumption of vegetable oils in Canada by industries. Consumption of oil cakes in Canada. Firms engaged in the soybean industry in Canada. Casein in Canada.

Part III (p. 69): Survey of the Literature, 1931-34. Cultivation. Green manure. Breeding. Germination of seeds. Diseases and parasites. Soil. Manufacture of oil cake. Composition of the soybean. Properties and composition of soybean oil. Feedstuffs. Edible products. Detection in food (e.g. detection of soybeans in wheat flour, pasta, meat products, etc.). Inedible products. Economics. Table (p. 79-80)–Imports of soy products into Canada: Soy sauces (1931-1933), edible peanut and soyabean oil, peanut and soyabean oil for the manufacture of soap and peanut oil for canning fish, soybeans, soyabean cake and soyabean meal for use exclusively in the manufacture of cattle food and of fertilizers. References (102). Other references (Nos. 103-117). References not consulted (35).

The section titled “Development in Canada” (p. 56-62) states: “Soybeans are at present being grown for seed on a commercial scale in southern Ontario, chiefly in Kent and Essex Counties [the Niagara Peninsula]. Prior to 1931 the acreage under soybeans was about 1000 or 1500. The efforts of persons interested in establishing oil mills increased this to about 5000 in 1931 and to 6000 or 7000 in 1932. The average yield of seed has been about 23 bushels per acre, which is quite equal to yields in the U.S., while another variety, the A.K., has yielded at the rate of nearly 40 bushels per acre during a six-year test at Harrow, Ontario.”

“T.B. Macaulay, President of the Sun Life Assurance Company of Canada has been experimenting for a number of years on the growing of soybeans in the hopes of being able to make the western farmer more free from his dependence on wheat, and believes that he is near to discovering suitable varieties...

“A statement appearing in the *Montreal Financial Times* (Nov. 18, 1932) reports that a number of varieties introduced from Urbana [Illinois] and tried in various parts of Alberta made an excellent growth of forage...

“The work being carried out at T.B. Macaulay’s experiment farm at Hudson Heights, Quebec, is particularly worthy of mention. Here the testing of varieties has been in progress for 8 years. Mr. Macaulay’s method of approaching the problem consists in obtaining samples of hitherto untried varieties from the most northerly regions where soybeans grow and the earliest varieties from Asia and elsewhere... Mr. Macaulay has a new variety which he calls Toyanaga. It matures 5 days to a week earlier than the variety called Manchu, which is being grown to a small extent in southern Ontario.”

“Varieties suitable for Canada: Besides O.A.C. 211 which is the one outstanding variety that has shown itself suitable for cultivation in Canada albeit only in southern Ontario, a number of other varieties have been tried and experimented with such as Mandarin, Manchu, Wisconsin Black, Quebec 92, Quebec 537, Early Yellow, Early Brown, and Manitoba Brown, but none of these have been very satisfactory.”

Table 29 (p. 60) gives a summary of current (1932) Canadian experiments with soybeans: Ontario Agricultural College (Guelph), grown for 39 years (i.e. since 1893), tested

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125 varieties. Dominion Experimental Farms (Ottawa and Harrow, Ontario), 9 years, 100 varieties. Macdonald College (Quebec), 20 years, 16 varieties. Manitoba Agricultural College (Winnipeg), 10 years, 12 varieties. University of Alberta, Edmonton, 3 years, 7 varieties. Brooks (Canadian Pacific Railway Irrigation Experimental Station, Alberta), unknown number of years and varieties. Pointe Platin (Quebec, by J. deLothinière [deLothiniere]), unknown number of years and varieties. Hudson Heights (Quebec, by T.B. Macaulay), 8 years, 100 varieties. University of Saskatchewan, 10 years, 25 varieties.

Page 65 lists "Firms Engaged in the Soybean Industry in Canada." The Soy Bean Oil and Meal Co-operative Company of Canada, Ltd., Chatham, Ontario; Canadian Soyabeans Ltd., Milton, Ontario; The Vitone Co., Hamilton, Ontario; Dominion Soya Industries, 355, Place Royale, Montreal, Quebec.

Note 1. In *Shepherd's City of Chatham* (*Ontario*) *Directory 1934-35* (p. B-166) we read: "Soyabean Oil & Meal Co-operative Co Ltd, G E Biles, mgr, Colborne n, w cor Adelaid."

Note 2. This is the earliest document seen (Jan. 2010) that mentions Dominion Soya Industry, Ltd. (Montreal, Quebec, Canada) in connection with soybeans.

Table 33 (p. 67) gives "Consumption of oilseed cake and meal in Canada" for the calendar years 1926 to 1931. Figures (taken from *Trade in Canada*) are given for cottonseed, linseed, palm nut, soya and total. Consumption of soya cake and meal (in tons) were: 200 in 1926 (0.6% of total); 680 in 1927; 560 in 1928; 1,560 in 1929 (5.0% of the total); 1,190 in 1930; and 2,500 in 1931. The value in dollars role from $8,000 in 1926 to about $50,000 in 1931. Apparently all of this soyabean cake and meal was imported.

Note 3. This is the earliest English-language document seen (Dec. 2005) that uses the term "soyabean meal" to refer to ground, defatted soybeans. Address: Div. of Research Information, National Research Council, Canada.

3152. Kawahara Co. 1935. Sundried Kelp: Also kelp vermicelli (Ad). *California Health News* (*Hollywood, California*). April 19. p. 11.
• ***Summary:*** "Imported." Address: 511 East First St., Los Angeles [California]. Phone: MUtual 5975.

3153. *Manchester Guardian* (*England*). 1935. The soya bean. April 20. p. 10.
• ***Summary:*** The new Budget puts a 10% duty on soya beans, which were previously on the free list. Mr. Chamberlain [Neville, Chancellor of the Exchequer, 1931-37] has not given an explanation. In Feb. 1932, when the tariff was being debated, "the Government accepted the pleas of the agricultural members that the soya bean should be put on the free list because they are used in the feeding of stock."

Last month, however, the Liverpool Chamber of Commerce argued that the reasons for opposing a duty are no longer valid. They contend that the increasing imports of soya beans from Manchuria, China, and Japan have decreased the use in Britain of palm oil and groundnuts, which come from Britain's West African colonies.

If the government agrees with Liverpool, then this new tariff "is nothing but a roundabout way of helping British West Africa by punishing Japan and her puppet State Manchukuo, to say nothing of China. If in the process the British Farmer finds himself squeezed he should be the last person to complain."

3154. *Los Angeles Times.* 1935. Foreign "atmosphere" and fine food at home: Novel cafes discovered. April 25. p. B5.
• ***Summary:*** In the Japanese quarters of Los Angeles, several cafes specialize in sukiyaki–the "national dish that Americans know best. At one of the best, a Japanese girl, wearing a kimono, escorts you into a private room, separated by sliding panels in the true oriental fashion.

At one end of the table is a glowing brazier, surrounded by platters of sukiyaki ingredients. "Soon the pungent odor of soy bean sauce pervades the atmosphere as a dainty Japanese maid mixes the beef, soy bean cakes [tofu, probably grilled tofu], bamboo shoots, Japanese horse-radish, green onion, etc., in the brazier." Warm saki [sake] is served soon after the food. The girls will be more than happy, if encouraged, to return after the meal to play Japanese music on their peculiar stringed instrument.

Note. This is the earliest English-language document seen (April 2013) that uses the term "soy bean cakes" to refer to regular tofu or to grilled tofu.

3155. Chin, -; Lin, -. 1935. [The Togano or Y-type process of soy sauce fermentation]. *Kung Yeh Chung Hsin* (*Industrial Research, Nanking, China*) 4(4):170-73. April. [Chi]
• ***Summary:*** Most of the soy sauce research in recent years as been dedicated to finding a way to shorten the fermentation process. The one that deserves special mention is Togano's process which has been widely used in Japan and which is recently introduced to China under the name of 'Y-type' process. Address: China.

3156. Ishimaru, Yoshio. 1935. Shôyu kôbo ni tsuite [On shoyu yeasts]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 13(4):295-318. April. [Jap]

3157. Sakurai, Yoshito; Iwamura, Iwao. 1935. Miso no seibun. V. Bitamin B ni tsuite [The constituents of miso. V. Vitamin B]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 11(4):272-83. April. [12 ref. Jap]
• ***Summary:*** The vitamin B-1 and B-2 contents are determined. During ripening B-2 remained unchanged. Address: Tokyo Teidai Nogakubu (Inst. of Dairy Science),

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Konai Ryoshoku Kenkyukai.

3158. Sasaki, Shûiku. 1935. Monoamino acids of soy-bean protein. *Bulletin of the Agricultural Chemical Society of Japan* 11(4):78. April. (Chem. Abst. 29:6616). Bound in the back or front of Nippon Nogei Kagaku Kaishi (J. of the Agricultural Chemical Society of Japan). [Eng]
• ***Summary:*** The following amino acids, expressed as weight-% of protein, have been obtained: glycine (0.23), alanine (4.12), valine (2.56), leucine (10.02), iso-leucine (2.38), proline (3.94), phenylalanine (5.21), tyrosine (3.82), aspartic (15.09), glutamic (16.50), and Beta-hydroxyglutamic (13.20) acids. Address: Biochemical Lab., Dep. of Agriculture, Kyûshû Imperial Univ.

3159. Gay, H. 1935. La culture et les usages du soja [The cultivation and uses of the soybean]. *Revue de Botanique Appliquee & d'Agriculture Tropicale* 15(165):309-24. May; 15(166):447-53. June. [15 ref. Fre]
• ***Summary:*** Contents: Introduction. Geographical area and climatic requirements. The plant and its varieties: Taxonomy, anatomy, physiology. Soybean cultivation: Place in the crop rotation, preparation of the soil, manure and fertilizer, sowing (the seeds, time of sowing, details of sowing), vegetation and the points of [crop] maintenance / management, harvest (of seeds, of forage), grain storage, yields (of seeds in kg/ha {3,500 in Manchuria, 2,700 in China, 1,700 in France, 1,200 in Japan}, of forage in quintals/ha {in America they range from 163 to 168}), enemies. Note: 1 quintal = 100 kg.

Technology of soya: Soymilk (production, properties, uses), soy cheeses (*Fromages de soja,* called "tofu" in Asia), soy oil and cake, soy flour and products made from it (bread, rusks {*biscottes*}, cakes, and pancakes {*galettes*}). Soya as livestock feed: Soya forage, soya hay, soymilk for calves, soybeans seeds and cake.

Economic data: Hectares planted to soya in 1929-30: Northern China and Manchuria (11,800,000), USA (500,000), Japan and Korea (400,000), Russia (300,000), Sunda or Soenda Isles (100,000 ha);

Note: The *Iles de la Sonde* are the islands of the Malay Archipelago divided into two groups: (1) Greater Sunda Islands, comprising Java, Sumatra, Borneo, Celebes, and adjacent islands; (2) Lesser Sunda Islands, comprising the chain of islands east of Bali to and including Alor and Timor, but not Wetar.

Exports of soya from China in 1929-30 (in tons): To Japan 1,700,000, to Europe 1,500,000, to southern China 600,000, to the Netherlands Indies [Indonesia] 100,000, to other countries 100,000. Address: France.

3160. Ishimaru, Yoshio. 1935. Shôyu kôbo ni tsuite [On shoyu yeast (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 11(5):116A-17A. May. [Jap]

3161. Sakurai, Yoshito. 1935. Miso no seibun. VI. Futatabi jukusei-chû no henka ni tsuite [The constituents of miso. VI. On the changes during the fermentation of twice-fermented miso]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 11(5):349-54. [3 ref. Jap]
• ***Summary:*** Discusses Edo miso. The acid taste of miso is due to organic acids soluble in ethyl ether. Address: Tokyo Teidai Nogakubu (Inst. of Dairy Science), Konai Ryoshoku Kenkyukai, Nôgaku-shi.

3162. Chamberlin, William Henry. 1935. A tale of two capitals: Tokyo and Moscow compared–II. *Christian Science Monitor.* June 12. p. 16.
• ***Summary:*** The "Japanese enjoy fish, rice, beancurd in various combinations and preparations..."

3163. Fukai, Tôshi. 1935. Shôyu ni konnyû seraretaru sosei amino-san no kenshutsu ni tsuite [On the detection of hydrolyzed vegetable protein (HVP) mixed into soy sauce]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 122. p. 67-71. June. [Jap]
• ***Summary:*** Nakazawa, in his bibliography on fermented foods, translates the title as "On the detection of the decomposed liquid of protein-containing materials added to soy sauce." Note: This is earliest publication seen on HVP soy sauce. Address: Jozo Shikensho, Gishu.

3164. Fukai, Tôshi. 1935. Sosei amino-san eki no shûki-seibun ni tsuite. I. Rebyurin-san sono ta no yûki-san rui [On the component of odor in the decomposed liquid of protein containing materials I. On levulinic acid and other organic acids in HVP liquid]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 122. p. 59-65. June. [17 ref. Jap]
• ***Summary:*** This is earliest Japanese document seen that uses the term "amino-san-eki" (regardless of hyphenation), meaning "liquid hydrolyzed vegetable protein (HVP)," in connection with soy sauce. Address: Jozo Shikensho, Gishu.

3165. Matsumoto, K.; Dei, S. 1935. Shôbo ôyô shôyu jôzô shiken [The application of cultured yeast for the rapid brewing of shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 122. p. 175-91. June. [Jap] Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

3166. Matsumoto, Kenji; Dei, Shinpei. 1935. Nuno doko shiki tane kôji seizô to sono ôyô shiken [The manufacture of koji starter on cloth and its applications for soy sauce brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 122. p. 193-204. June. [Jap] Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

3167. Satow, Teikichi. 1935. Building material and method

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of making the same. *U.S. Patent* 2,007,585. July 9. 2 p. Application filed 22 Aug. 1930.
• ***Summary:*** The building material includes "wall boards, floor coverings, tiles, wood carpets," etc. The invention "includes the use of vegetable proteidal substances such as soy bean meal, castor seed meal, sesame meal, linseed meal and the like, as a binding base..." The preferred waste material is "hog fuel which is a waste wood product of lumber mills and veneer plants..." "I use the cellulose fibres of hog fuel thoroughly mixed with a soy bean plastic as the binding base and pressed under high pressure in molds. The soy bean plastic has strong adhesive properties..." Address: Tokyo, Japan.

3168. Mashino, Minoru. 1935. Studies on the soya-bean proteins. *J. of the Society of Chemical Industry* (*London*). *Chemistry & Industry Transactions and Abstracts* 54(28):236T-38T. July 12. (Chem. Abst. 29:6326). [Eng]
• ***Summary:*** "This paper is a summary of the studies of the author and collaborators, T. Shishido, S. Nishimura, and T. Iinuma, carried out in the Tokyo Industrial Research Institute, and published in the Reports of the same Institute, and also in the Journal of the Society of Chemical Industry, Japan, issued between 1926 and 1933, in the following order: (1) The purification of soya-bean oil cakes. (2) The improvement of soya-bean oil extraction. (3) The decomposition and decomposition products by hydrolysis of soya-bean protein. (4) The properties of soya-bean proteins."

Note: This is the earliest English-language document seen (Aug. 2003) that contains the term "soya-bean proteins" (or "soya-bean protein"). Address: Tokyo Industrial Research Inst., Hatogaya-Honmachi, Shibuya-ku, Tokyo, Japan.

3169. Chin, -; Lin, -. 1935. [The Togano or Y-type process of soy sauce fermentation]. *Kung Yeh Chung Hsin* (*Industrial Research, Nanking, China*) 4(7):384-89. July. [Chi]
• ***Summary:*** Most of the soy sauce research in recent years as been dedicated to finding a way to shorten the fermentation process. The one that deserves special mention is Togano's process which has been widely used in Japan and which is recently introduced to China under the name of 'Y-type' process. Address: China.

3170. Morse, W.J. 1935. Green vegetable soybeans. *Proceedings of the American Soybean Association* p. 44-45. 15th annual meeting. Held 21-22 Aug. 1935 at Evansville and 23 Aug. at Lafayette, Indiana.
• ***Summary:*** "The green, immature soybean is used extensively as a green vegetable in oriental countries. Experiment stations in Japan have developed many varieties solely for use as green beans which are classified by growers and seedsmen as garden beans. About 60 such varieties have been collected during agricultural explorations in Japan by the U.S. Department of Agriculture. These varieties, which range from 75 to 170 days in maturity, have been found to differ markedly in flavor, ease of cooking, and soil and climatic adaptations. Cooperative studies with state experiment stations and special cooperators during the past two years indicate some very promising early, medium, and late green vegetable types for regions adapted to the soybean. The most valuable of these varieties are being increased by several state experiment stations for more extensive studies.

"For green vegetable beans, the soybean should be picked when the beans have reached full size and are still green and succulent. The green beans resemble young, tender Lima beans but they have a richer and more nutty flavor... The immature beans are difficult to shell but if first boiled for about 3 minutes they shell quite readily... The usual oriental way of cooking green soybeans is to boil the beans in the pods, in water flavored with soy sauce or salt and serve them to be eaten from the pod. Many people prefer to cook the beans in the pods, boiling them in salted water for 20 to 30 minutes. The beans then shell readily and may be used as a vegetable, in salads or in soups.

"When soybeans are planted in the garden for table use, it is best to use varieties recommended for green beans. One may, however, use the common varieties although they are smaller, not so easily cooked, and usually lack the distinctive flavor of green vegetable varieties. Green soybeans are not available before midsummer and for continued use, a succession of plantings of the same variety or of varieties of different periods of ripening would be desirable. The Hahto, a medium variety, is the only green vegetable variety at present handled by growers. The Rokusun, a late type, and two or three early Japanese varieties are being increased rapidly and should be in the hands of growers and seedsmen in the near future."

Note 1. This is the earliest document seen (June 2013) that mentions the soybean variety Rokusun, or any other large-seeded soybean variety in the United States.

Note 2. This is the earliest English-language document seen (June 2009) that uses the term "vegetable types" or "green vegetable types" or "green, immature soybeans" to refer to green vegetable soybeans. It is also the earliest English-language document seen (June 2009) that with the term "Green vegetable soybeans" in the title. Reprinted in *Good Health,* Oct. 1937. Address: Bureau of Plant Industry, USDA, Washington, DC.

3171. Rokusun: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. Occasionally misspelled Rokusum. 1935. Seed color: Yellow (straw), hilum brown.
• ***Summary:*** Sources: Morse, W.J. 1935. "Green vegetable soybeans." *Proceedings of the American Soybean Assoc.* p. 44-45. See p. 44. "The Rokusun, a late type, and two or three early Japanese varieties are being increased rapidly and should be in the hands of growers and seedsmen in the near

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future."

Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 1. F.P.I. No. 80481. Name: Rokusum [sic, Rokusun]. Seed color: Straw yellow. Maturity: 140 days. Use: Green vegetable or dry edible bean. States grown: Southern.

Morse, W.J. 1938. "Edible varieties of soybeans." *Proceedings of the American Soybean Assoc.* p. 30-33. A table (p. 32) shows: F.P.I. No.: 80481. Days to ripen: 140. Seed color: Straw yellow. Hilum: Brown. Seeds per lb: 1,584. Oil and protein content (moisture-free basis): 18.07% and 43.18%. Use: Dry edible or green vegetable.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 16-17. Rokusun is in the USDA Germplasm Collection. Maturity group: VI. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Rokusun Daizu' from Tokyo, Japan, in 1929. Prior designation: PI 80481. Address: USA.

3172. Honda, Shigejiro. 1935. Shiro-miso seizô-hô [Method of making white miso]. *Japanese Patent.* Sept. 30. Toku Ko (Published Examined Patent Applied), No. 4096, Sept. 30. [Jap]
Address: Kojima-cho 12 Banko, Muromachi-dori Ichi-jo agaru, Kamikyo-ku, Kyoto-shi, Japan.

3173. Bailey, L.H.; Capen, R.G.; LeClerc, J.A. 1935. The composition and characteristics of soybeans, soybean flour, and soybean bread. *Cereal Chemistry* 12(5):441-472. Sept. Condensed in Soybean Digest. Dec. 1940. p. 4-5. [75 ref]
• ***Summary:*** Contents: Introduction. Acreage, production, and price of soybeans in the United States (Table II shows production in Manchukuo, Chosen [Korea], Japan, and the Dutch East Indies from 1929-1934). Uses for soybeans (incl. in ice cream, ice cream cones, candies, puddings, salad dressings, sausage filler). Chemical composition of soybeans. Processes for the removal of the bitter taste from soybeans. Extraction of soybean oil (by hydraulic pressure, Anderson expeller, or new European solvent process). Yield of oil and meal from soybeans. The method of analysis of soybean flour. Chemical composition of soybean flours: Soybean flour output in the United States, minerals, carbohydrates, quality of the protein, vitamins, lecithin and fats in soybean flour. Soybean flour in the diet: Cost of protein and fat, calcium, and carbohydrates in soybean flour. The use of soybean flour in baking. Effect of enzymes of soy flour on bread: Digestibility of soybean bread, increased absorption claimed for soybean flour, cost of soybean bread. Conclusions.

"The most expensive food constituents are minerals, vitamins, proteins, and fats. Soybeans flour is rich in all of these food constituents and yet relatively cheap. The moderate cost of soybean flour makes it possible for people of small incomes to obtain the maximum of these essential nutritional constituents required by the body which in the form of other foods might be beyond their reach."

"The first successful attempt to prepare a soybean flour which would be free from the disagreeable beany taste, which would remain fresh almost indefinitely (that is, not develop rancidity), and which would retain, practically unchanged, the original composition of the bean is described in the Berczeller patent (1924). This process consists in subjecting the cleaned soybeans to the action of saturated steam for 10 to 15 minutes. The beans are then dried, cracked in order to remove the hulls, and ground into flour. Such flour has a sweet, pleasant, nut-like taste (a characteristic of most flours obtained from soybeans which have been subjected to a special beany-taste removing treatment) and may be kept for many months without spoilage due to the development of rancidity. A later patent (1932) issued to this inventor consisted in subjecting soybeans (dry or soaked) to steam distillation (see also Berczeller, 1933). In making soybean flour by this process in this country, the beans used, generally the yellow variety, are first treated to destroy insects and insect eggs. The beans are then cleaned or freed from impurities, washed to remove the dirt, and subjected to the patented process. The beans are then dried and passed through cutting machines and the hulls are removed by aspirators and bolting machines. The cut beans are then aerated with warm air and ground in a special air-cooled mill, the fine flour being bolted through a special bolting machine" (p. 446).

Soybean oil mills in ten U.S. states now have a total annual crushing capacity of about 10 million bushels (p. 448).

Tables show: (1) Acreage, production, and average price per bushel of soybeans (1932-33, for 10 leading states and the USA total). (2) Annual soybean production, in bushels, in 5 countries (USA, Manchukuo, Chosen [Korea], Japan, Dutch East Indies, 1929-34). (3) Chemical composition of soybeans (minimum, maximum, and average). (4) Fat and protein content of soybeans grown in 15 different U.S. localities. (5) Mineral content of various legumes and grains (air-dry basis). (6) Composition of the component parts of soybeans (cotyledons, embryo, seed coat). (7) Composition of many soybean flours. (8) Composition of high fat, press cake, and solvent-extracted soybean flours. (9) Composition of solvent-extracted soybean flour and other legume flours (bean, pea, lentil). (10) Mineral content of selected foods, incl. soybean flour. (11) Composition of the mineral portion of grains and other seeds. (12) The composition and the mineral and vitamin content of selected foods. (13) Composition of selected foodstuffs. (14) Retail cost of foods and their components [soybean flour is by far the least expensive source of protein and calcium]. Formula and method for making soybean bread (using 20% soybean flour). Formula and method for making whole wheat bread.

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(15) Composition of representative flours. (16) Composition of representative types of bread. (17) Correlation of loaf volume and urease content of soybean flour used in making bread. Address: Food Research Div., Bureau of Chemistry and Soils, USDA.

3174. Hatano, Tadashi. 1935. Effect of feeding vegetable protein [soy bean cake] on copulation and fertilization in the fowl. *Bulletin of the Agricultural Chemical Society of Japan* 11(9):125-28. Sept. Bound in the back or front of Nippon Nogei Kagaku Kaishi (J. of the Agricultural Chemical Society of Japan). [Eng]
• ***Summary:*** The test ration was composed of 45% yellow corn, 30% soybean cake, 17% rice refuse, 15% rice bran, and 3% mineral mixture. Compared with a ration containing animal protein, number of copulations per day by a cock was much less, number of fertilized eggs per day was less by 0.9, and time during which fertilized eggs were laid by a hen was shorter by 2.5 days. Address: Imperial Zootechnical Experiment Station, Japan.

3175. Iwamura, Iwao. 1935. Biochemical studies on "miso", fermented soybean paste. III. On the effect of cystine upon the nutritive value of miso. *Bulletin of the Agricultural Chemical Society of Japan* 11(9):128-34. Sept. Bound in the back or front of Nippon Nogei Kagaku Kaishi (J. of the Agricultural Chemical Society of Japan). [8 ref. Eng]
• ***Summary:*** The nutritive value of the miso-protein, when used as a supplement to a rice diet for albino rats, is increased by addition of cystine. For young rats the optimum amount of cystine is about 0.1% (> 0.5% is harmful), but for adult rats 0.5% is favorable. Address: Agricultural Chemical Lab., Tokyo Imperial Univ., Komaba, Tokyo.

3176. Kobata, Yotarô. 1935. α-oxycaprinsaeure no shôyu bôbai sayô ni tsuite [The antiseptic action of α-oxycapric acid on shoyu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 11(9):789-90. Sept. [4 ref. Jap]
Address: Kyôdai Nôgaku-bu Seibutsu Kagaku Kenkyû-shitsu (Kyoto Univ.), Japan.

3177. Miyaji, Kenji; Kaneko, Mamoru. 1935. Tamari abura-chû no fukenka-butsu tokuni suchirooru ni tsuite [Unsaponifiable substances, especially sterol, in tamari oil]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 11(9):715-19. Sept. [6 ref. Jap]
Address: Agricultural College of Gifu, Japan.

3178. Nakamiya, Ziro. 1935. Gadusene, an unsaturated hydrocarbon occurring in animal and vegetable oils. *Scientific Papers of the Institute of Physical and Chemical Research* (*Japan*) 28(597):16-26. Sept. [6 ref. Eng]
• ***Summary:*** The hydrocarbon gadusene was isolated from the non-saponifiable fraction of soy oil, rice germ oil, and some fish liver oils. It had the same absorption spectrum as the samples that Tsujimoto and Drummond et al. had prepared from other sources.

Table 1, titled "Saturated hydrocarbons and perhydrocarbons," gives constants for Shoyu oil. These are further detailed on pages 19 and 21. Address: Japan.

3179. Tomiyama, Tetsuo. 1935. Chemical studies of the proteins of feeding-stuffs. V. The contents of cystine and tryptophane. *J. of Biochemistry* (*Tokyo*) 22(2):341-42. Sept. [7 ref. Eng]
• ***Summary:*** "In the first report (1934), it was shown that the protein of soy bean contained a far smaller amount of methionine than does either protein of silk-worm pupa or that of sardine. As regards lysine- and histidine-content, the second report (1934) showed that there was practically no difference among the proteins except that the lysine content of soy bean protein was little lower than the others.

"The present work has been carried out in order to compare these three proteins with one another as to their contents of the other indispensable amino acids, namely cystine and tryptophane. The role of cystine in nutrition can be replaced without fail by methionine (1932), so that it is necessary to take the sum of these two sulfur containing amino acids as a criterion for the comparison of nutritional value of proteins."

Table 1 (p. 342) shows the results: C+M = cystine + methionine; T = tryptophane.

Protein of silk-worm pupa: C+M = 3.83; T = 1.50.

Protein of sardine: C+M = 3.90; T = 1.40.

Protein of soy bean: C+M = 3.01; T = 1.35. Address: Imperial Fisheries Inst., Tokyo.

3180. Wilson, Judith. 1935. Ingenuity makes novel dishes of simple ones. *Gazette* (*The*) (*Montreal, Quebec, Canada*). Oct. 18. p. 9.
• ***Summary:*** The section titled "Sukiyaki" describes this as a delightful and economical "Japanese stew." "The unusual items called for are bamboo sprouts and soya bean sauce, but these can be found at most delicatessens and in many ordinary grocery stores." Place an electric grill on the table. Bring in the colorful uncooked ingredients on a large platter. Describes how to make sukiyaki. A "mound of lean beef cut into thin shavings" is one ingredient. Tofu is not mentioned.

3181. A.J.F. 1935. La culture du soja en Roumanie [Soybean culture in Romania]. *Agronomie Coloniale* (*L'*) (*Paris*) 24(214):119. Oct. [Fre]
• ***Summary:*** According to the Romanian review *Bursa* (16 June 1935), a campaign is being actively conducted by the well-known personalities of Romania to intensify the cultivation of soya in that country. The soybean seeds have been planted on 25,000 ha in all the counties of Romania,

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as follows: Bessarabia 9,500 ha, Dobrogea [Dobruja or Dobrudja] 6,100 ha, Valachie [Vilcea] 5,350 ha, Moldavie [Moldavia, Moldova] 2,600 ha, Oltenia [Olt, Aluta] 1,000 ha, Transylvania 450 ha.

This crop is spread over more than 100 communes and employs nearly 17,000 workers. In a brochure published about 4 years ago [1931], a Romanian specialist M. Chiritescu-Arva gave interesting details on the resistance of Japanese soybeans. "The promoters of soybean culture in Romania have every reason to be satisfied with the results of their efforts."

3182. *Bulletin Economique de l'Indochine* (*Hanoi*). 1935. L'extraction des dérives du haricot "Soya" [The extraction of soybean derivatives]. 38:823-24. July/Oct. [Fre]
• ***Summary:*** From the monthly communication of the French commercial attache in Tokyo. Address: D'apres la chronique mensuelle de l'Attache commercial de France a Tokio.

3183. Takeda, Yoshito. 1935. Rhizopus-zoku shijô-kin no kenkyû. III. Nanyô-san Rhizopus-zoku mo bunri gakuteki kenkyû oyobi saidai tôka-ryoku kin no kensaku [A study on filamentous molds of the genus *Rhizopus:* III. Research on classification of *Rhizopus* species from tropical regions and investigation of the microorganisms possessing maximum saccharification capability]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 11(10):845-920. Oct. [26 ref. Jap]
• ***Summary:*** Contains extensive information on tempeh and onchom. In April and May 1926, samples of tempeh were gathered at Semarang and Medan, shoyu koji and ketjap koji were gathered at Buitenzorg, and ragi was gathered at many places in Indonesia. The tempeh, shoyu koji, and ketjap koji were all found to have *Rhizopus* as the dominant microorganism. But a shoyu koji collected at Semarang was found to have *Aspergillus* as the main microorganism. Address: Taiwan Sôtoku-fu Chûô Kenkyû-jo Hakkô Kôgyô-ka (Central Research Inst., Taiwan Governor General's Office).

3184. Haskin, Frederic J. 1935. Questions of readers answered. *Hartford Courant* (*Connecticut*). Nov. 4. p. 6.
• ***Summary:*** "Q. What is natto? G.B.R.

"A. Natto, commonly called cheese, is a Japanese fermented food product prepared from soy beans. Although its manufacture varies, probably with the locality, it is a common practice to boil the soy beans until tender and then leave them in a warm place for 24 hours until they have fermented."

3185. Kanehira, Ryôzô. 1935. An enumeration of Micronesian plants: Glycine. *J. of the Department of Agriculture, Kyushu University* 4(6):237-464. Nov. 30. See p. 334, 340. [15* ref. Eng]
• ***Summary:*** Page 334 reports *Glycine clandestina,* distributed from Australia to Formosa, and in Tinian, Pangan [Pagan], and Saipan. Note: Tinian and Saipan are islands in the Mariana Islands.

Page 340 reports *Glycine lucida* found in forests at medium altitudes from Ceylon to Polynesia.

Note: This is the earliest document seen (March 2010) concerning soybeans (but only wild perennial relatives of soybeans) in the Mariana Islands; cultivated soybeans have not yet been reported. Address: Kyushu Imperial Univ., Japan.

3186. Iwasaki, Kazuo. 1935. Shôyu no kanshô sayô ni tsuite. I. Fuki–Shôyu tekitei sando sokutei-hô ni taisuru ichi ginmi [On the buffer action of shoyu. I. Additional note–One study on the method of measuring shoyu acidity]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 13(11):1087-99. [Jap]

3187. Okabe, Kenzo; Titani, Toshizo. 1935. Isotopenaustauch in Sojabohnen [Isotope exchange in soya beans]. *Bulletin of the Chemical Society of Japan* 10(11):552-54. Nov. [5 ref. Ger]
• ***Summary:*** The exchange of hydrogen in soya beans by deuterium has been observed by leaving the beans in contact with dilute deuterium oxide (heavy water, D_2O). The exchange corresponds with a water content of 25%, whereas analysis gives 10%, probably because of the replacement in the beans of hydrogen other than those of water by deuterium. Address: Physikalisch-Chemisches Laboratorium der Kaiserlichen Universitaet zu Osaka, and Schiomi Institut fuer Physikalische und Chemische Firschungen.

3188. *Manchester Guardian* (*England*). 1935. Mould and foodstuffs: Research work on activities of fungi. Dec. 7. p. 17.
• ***Summary:*** The section title "Ripening cheese" states: Moulds "were widely used in Japan and China for the conversion of starch into sugar before alcoholic fermentation, and in the fermentation of soya bean during the manufacture of soya sauce."

3189. Kellogg, John Harvey. 1935. Re: Growing and canning shell soy beans. Making condensed soy milk and soy acidophilus milk. Letter to Mr. William J. Morse, Bureau of Plant Industry, USDA, Washington, DC, Dec. 9. 3 p. Typed, without signature (carbon copy).
• ***Summary:*** "We have been doing some experimenting this year with growing and canning shell soy beans. I am having a couple of cans sent you so you can see what our product is like. We think it is very fine. The few thousand cans we put up went off like hot cakes.

"We are thinking of doing rather extensive planting this year. We shall not have any seed to sell but may need to buy some more seed.

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"Here are some points on which I should like information: 1. Do you know of anyone in this country who is putting up shell soy beans? 2. Are shell soy beans canned in Japan and China, and if so can they be purchased there and brought to this country?..."

"I should also be glad to know if you have other varieties of shell beans of good quality with a growing period of about the same length.

"I am also having sent to you samples of our condensed soy milk. Diluted with two or three times its volume of water, it is, I think you will agree, a very palatable product. We supply this to people who are interested in soy acidophilus milk and willing to take the trouble to make it at home. We supply them with the culture. They simply put the condensed milk into a clean fruit jar, add hot water, let it cool to body temperature and then add the culture and wrap it up in a blanket and set it on the kitchen table and the next day the buttermilk is ready.

"Soy milk produces a much more vigorous growth of the bacillus acidophilus than does cow's milk. The organism is more than twice as large and it grows twice as fast and does not require the long training, 25 to 30 transfers, required when cow's milk is used for the culture medium. In other words, the bacillus acidophilus seems to like vegetable products for a culture medium better than animal.

"I shall be glad to know how you like the milk. If you would like to try making it at home, I will have some more cans and cultures sent to you. The process is so simple any housewife can do it. Slight contamination occurs, of course, but by using a large inoculum this does not matter for the first culture; but a fresh pure culture has to be used every time. If an attempt is made to make a culture from a home made culture it will be likely to fail because of the contamination likely to occur.

"Thanking you in advance for any information you may be able to give me, I remain, dear Sir, Very sincerely yours,

"P.S. Soy acidophilus milk has become so popular at my institution here that dairy milk rarely appears on the table. Everybody likes the soy milk better, and of course when people have been properly informed they want the soy acidophilus milk to change their flora and to get rid of intestinal putrefaction and to encourage bowel action. The effect of the soy acidophilus milk in this particular is very remarkable. In cases of very chronic constipation I have observed complete recovery with two or three normal bowel actions daily.

"The Canadian quintuplets are taking soy acidophilus milk at every feeding and have been doing so since last September when they had an attack of bowel trouble which disappeared as soon as they began taking the soy acidophilus milk which I sent them and have supplied to them ever since.

"I am accumulating evidence to the effect that the soy bean encourages the growth of the protective organisms in the human intestine to a very pronounced degree and by producing acids not only prevents putrefaction but encourages bowel action.

"I think every effort possible ought to be made to spread information among the people respecting the value of the soy bean, which I am sure is some time destined to become one of the most important staple foods in this country as well as in China and Japan.

"Here is another question: One of the difficulties in the way of the soy shell bean business is the expense of picking from the vines and shelling the pods. Do you know of any machinery that is used for either of these purposes?"

Note 1. This is the earliest English-language document seen (June 2009) that uses the term "shell soy beans" to refer to shelled green vegetable soybeans.

Note 2. This is the earliest document seen (June 2009) that mentions machinery or equipment for picking / harvesting or shelling green soybeans in the pods. However it only asks a question about this machinery.

Source: Bentley Historical Library, University of Michigan, Ann Arbor. J.H. Kellogg Collection, Box 2, Correspondence.

3190. Kajizuka, Susumu. 1935. The nutritive value of soybean oil treated with methanol. *J. of the Society of Chemical Industry, Japan* 38(12):746B. Dec. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** Extraction of the oil with methanol plus petroleum benzine gave a slightly greater nitrogen than extraction with benzine alone. No decrease in viscosity was observed and the vitamin A content of the oil was not sufficient for normal rat growth. After methylation at 20ºC, nitrogen is less than that of the original. No ill-effects were noted on feeding oils containing 0.67% and 6.7% methanol. Address: Tokyo Imperial Industrial Inst., Hatagaya, Shibuya-ku, Tokyo, Japan.

3191. Kajizuka, Susumu. 1935. The nutritive value of soybean powder treated with methanol. *J. of the Society of Chemical Industry, Japan* 38(12):745B. Dec. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** The nutritive value of the powder treated with methanol and petroleum benzine was greater than that treated with benzine alone. No methanol nor any increase in methoxy groups could be detected in the product. No physiological effects were noted in rats on diets containing 0.1% and 1% of methanol. Address: Tokyo Imperial Industrial Inst., Hatagaya, Shibuya-ku, Tokyo.

3192. Fukai, Tôshi; Nagahashi, K. 1935. Bôfusei shôyu jôzô shiken [Brewing trial using a preservative in shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 122. p. 229-37. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

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3193. Fukai, Tôshi; Shirai, S. 1935. San ni yori taishoku sezaru shôyu chakushoku-zai gôsei shiken [On the manufacture of coloring materials for soy sauce which is stable in the presence of acids]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 122. p. 73-77. [Jap]
Address: Jozo Shikensho. 1. Gishu; 2. Moto Kenshuin.

3194. Fukai, Tôshi; Nagahashi, K. 1935. Sangen-shiki shôyu sokujô shiken [A new special quick method of soy sauce manufacture]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 122. p. 234-47, 249-58. [Jap]
Address: Jozo Shikensho. 1. Gishu; 2. Moto Joshu.

3195. Hama, Masakazu. 1935. Ichijuku miso no seizô-hô [Method of making fig miso]. *Japanese Patent* 113,099. In Toku Ko, No. 2704. July 1. [Jap]
Address: Miyawaki-cho 426-1, Takamatsu-shi, Japan.

3196. Ide, M. 1935. [Culture media from natto and polytamin as substitute of peptone]. *Saikin* (*Bacteria*) 470:298-. [Jap]*

3197. Ishimaru, Yoshio. 1935. Shôyu hinshitsu jo ni okeru sanrui tenka no kôka [The effect of adding acid to improve shoyu quality]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 30(5):421-24. [8 ref. Jap]
Address: Nôgaku Hakase, Japan.

3198. Ishio, M. 1935. [Antiseptic actions of nipagin A, nipagin M, nipasol M on shoyu]. *Eisei Shiken* 45:171-. [Jap]*

3199. Iwamura, Iwao. 1935. Miso no eiyô-ka ni taisuru kenkyû. II. Kome no tanpakushitsu ni taisuru miso no tanpakushitsu no hosoku-teki kachi ni oyobosu shisuchin no eikyô [Research on the nutritional value of miso. II. Effect of cystine on the supplementary value of miso protein for rice protein]. *Ryoshoku Kenkyu* (*J. of the Institute of Dietary Science*) No. 105. p. 151-58. [7 ref. Jap]
• ***Summary:*** The amount of cystine in 100 gm of fresh miso was: Shiromiso (sweet white miso) 64.2-67.2 mg, Yedomiso 45.4-85.6 mg, Sendai miso 50.9-86.6 mg, and Hatcho miso 93.4-103.2 mg.

3200. Iwasaki, Kazuo. 1935. Shôyu sando ni taisuru ironteki ikkôsatsu [Theoretical investigation on the acidity of shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 30(11):1095-1104. [Jap]
Address: Iwasaki Shoyu-ten Jikkenshitsu, Japan.

3201. Kan-Kito. 1935. [Detection of dulcin in shoyu]. *Eisei Kagaku* (*J. of Hygienic Chemistry*) 7:321-. [Jap]*

3202. Kinoshita, Asakichi; Matsumoto, K.; Nagahashi, K. 1935. Sei-kôji ondo hikaku shôyu jôzô shiken [The comparison of temperature of koji manufacture in brewing soy sauce]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 122. p. 205-11. [Jap]
Address: Jozo Shikensho. 1. Moto Gishi; 2. Gishi; 3. Moto Joshu.

3203. Matsumoto, K.; Dei, S. 1935. Saikin-rui tenka hikaku shôyu jôzô shiken [The application of several kinds of pure culture bacteria in shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 122. p. 165-73, 175-91. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Gishu.

3204. Matsumoto, K.; Dei, S.; Misawa, K. 1935. Kô tenka shôyu jôzô shiken [On the addition of soybean cooking liquid during soy sauce brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 122. p. 221-227. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu; 3. Moto Kenshuin.

3205. Matsumoto, K.; Nagahashi, K. 1935. [The comparison of two kinds of *Aspergillus oryzae* for the brewing of soy sauce]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 122. p. 213-20. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

3206. *Minami Manshu Tetsudo K.K., Keizai Chosakai, Ritsuan Chosa Shorui* (*South Manchuria Railway Co., Economic Survey Div., Economic Survey Documents*). 1935. Manshû daizu kôgyô hosaku [Plans and policies for the Manchurian soybean industry]. No. 6-hen, No. 14-kan. 253 p. [Jap]*
Address: Shinkyo (Ch'ang Ch'un), Manchuria.

3207. *Minami Manshu Tetsudo K.K., Keizai Chosakai, Ritsuan Chosa Shorui* (*South Manchuria Railway Co., Economic Survey Div., Economic Survey Documents*). 1935. Manshû tokusan shochi hosaku [Plans and policies for the disposition of Manchurian special products]. No. 8-hen, No. 3-kan. 610 p. [Jap]*
Address: Shinkyo (Ch'ang Ch'un), Manchuria.

3208. Nomura, H. 1935. [Studies on natto. 2. 3. Change of protein during the manufacturing process]. *Kanagawa Ko-Shi* 5:8-. [Jap]*

3209. Oota, Kiyoshi. 1935. Shiro miso jukusei-chû no seibun no henka narabini sono sanpai genshô ni tsuite [On the changes of constituents during ripening of sweet white miso (shiro miso) and on the sour putrefaction]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 30(8):73-

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74. [Jap]

3210. Oota, Kiyoshi. 1935. Shiro miso jukusei-chû no seibun no henka narabini sono sanpai genshô ni tsuite [On the changes of constituents during ripening of sweet white miso (shiro miso) and on the sour putrefaction]. *Kwa* No. 16. p. 13-. [Jap]*
• ***Summary:*** An abstract of this article appeared in *Nippon Jozo Kyokai Zasshi* (*Journal of the Brewing Society of Japan*) 30(8):73-74 (1935).

3211. Sato, M.; Inaba, T.; Kitagawa, K. 1935. Studies on the alcohol-extracted soy-bean oil. *J. of the Society of Chemical Industry, Japan* 38:50B. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]*
Address: Dep. of Organic Chemistry, The Central Lab., South Manchuria Railway Co., Dairen.

3212. Sekiguchi, H. 1935. [A study on anticorrosion steel for shoyu]. *Kinzoku* 12:67-78. [Jap]*
• ***Summary:*** Corrosion is small in steels containing > 7% chromium. Steel having 25% nickel is not corroded.

3213. Shoji, Kenjiro. 1935. Shôyu no kôki. I. [Flavor of shoyu. I.]. *Rikagaku Kenkyujo Hokoku* (*Report of the Institute of Physical and Chemical Research*) 14(9):872-77. [Jap]

3214. Burkill, I.H. 1935. A dictionary of the economic products of the Malay Peninsula. 2 vols. Published for the Malay Government by Crown Agents, London. 2,400 p. See p. 1080-86.
• ***Summary:*** These two densely-written volumes might be described as updates to the works of Sir George Watt. In the Malay peninsula, the soy bean is generally known as *Kachang bulu rimau* or *Kachang jepun* [the Japan bean]. In Java it is called *Kachang kedele, Dele, Gadele, Dekeman,* or *Dekenan;* in Sundanese, *Kachang bulu, Kachang jepun,* or *Kedele;* in Sumatra, *Kachang rimau* or *Kachang ramang;* and in Siam, *Tua luang* or *Tua praluang* [accents are included by Burkill].

"The word 'soy' came from a Japanese name for this plant, through the Dutch, who made it [the word 'soy'] known to Europeans. The first account was a result of the residence of their embassy surgeon, Kaempfer, in Japan, in 1691 and 1692; the second of the long service of their merchant, his contemporary, Rumpf, in Amboina."

The soy bean "is frequently cultivated in Siam, and seems to be a familiar plant in Kelantan [a state of Malaysia bounded on the north by Thailand]. Repeated experiments have been made with it elsewhere in Malaya; the Chinese, indeed, continually make them, usually without success, their failure being conspicuous when any available seed is used, instead of seed of races known to stand more or less tropical conditions. In 1918 advantage was taken of experiments in the Philippine Islands, to try, in Singapore, races which succeeded there and grew well. Races from the warmer parts of the United States were on trial in Selangor [Malaysia] in 1922. In 1924 a Chinese race was successfully grown by settlers in villages in the southern parts of Pahang [a state of Malaysia, bounded on the north by Kelantan and Trengganu].

"The soy bean has long been cultivated in Java, and in recent times this cultivation has become almost universal except at the western end of the island, where the climate is most uniformly humid. Probably it came to Java from India, for the name by which it is most known is Tamil and the seed is flattened as are North Indian races, while the Manchurian races have round seeds."

Note: Roxburgh (1832), in discussing the earliest known date for cultivation of soybeans in India states: "Reared in the Honourable Company's Botanic garden [across the Hooghly / Hugli River from Calcutta] from seeds received from the Moluccas [in today's Indonesia] in 1798.

"In Java a soy crop immediately follows rice, and this was the rotation apparently which Spring found the Chinese to use in Pahang."

The seed of the soy bean is rich source of nutrients. It "replaces meat very largely among the Chinese; and as rations for Japanese troops has played a large part." Because the ripe seed contains little or no starch, it is widely used in diabetic diets. "A kind of artificial milk can be made from the seed, and is in common use in Japan and China... This milk has only three-quarters of the full nutritive value of cow's milk." Soy-bean coffee, made from roasted soy beans, "is sold regularly in Japan, and into the coffee can be put soy-bean milk. The Chinese germinate the beans and eat the seedlings.

Legumin, or vegetable casein is best made commercially from defatted soy beans. The casein is precipitated from the milky fluid [soy-bean milk] by calcium sulphate. "The liquor is strained through muslin, and the precipitate treated with soda lye, which dissolves the casein; filtering gets rid of the impurities and acetic acid precipitates the casein from the filtrate in a more or less pure state. This casein is fit for use in all the industrial processes for which casein from cow's milk is used."

Soy beans can also be fermented to make témpé or "flavourings used in small quantities to make uninteresting dishes appetizing... Témpé is a food product made in Java from soy beans. It occupies a very important place in the diets of those who live in central and east Java." Detailed descriptions are given of two methods of preparation. (1) Initially, the seeds are parboiled then left soaking in water for 2-3 days. The "mush" [sic, cooked beans] is spread upon frames in flat cakes and inoculated with the fungus *Aspergillus oryzae* by the addition of some of the previous preparation. The cakes are wrapped in banana leaves; (2) This method requires greater care and time. "Meanwhile,

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a preparation of the fungus has been made in a somewhat elaborate manner, as follows: a portion of an older preparation is wrapped in a rather young teak leaf freely punctured with holes; this preparation is allowed to dry for two days, during which the fungus spreads to the teak leaf. Next, the soy-kernel mush [sic, the cooked soybeans] being ready, the teak leaf is emptied of its contents and sprinkled over the mush in order to convey the fungus. The mush is now put up in packets in banana leaves, heaped together, and covered up for twenty-four hours, after which it is exposed again to the air and cooled; the packets are then ready for sale." Note: This is the second English-language work to contain information about tempeh.

"The Chinese, throughout their own country and those domiciled in Malaysia, make a yet greater variety of preparations. Chief among these is teou-fu [tofu, usually precipitated with imported calcium sulphate]. "The 'teo-fu' does not keep well in a moist state, but can be treated for preservation. First, the cakes are colored yellow by a solution of turmeric or Gardenia flowers, then they are wrapped in cotton cloth and submitted to pressure. Thus made drier, they keep better. The use of this preparation is spreading."

The Chinese also make tao-cho and soy kechap (each fermented with an *Aspergillus* mould). K. Heyne describes how kechap is made in Java using black soy beans, hibiscus leaves, and *Aspergillus oryzae* mold. Finally the sauce is boiled with Arenga sugar, star anise, and other flavourings until the solution is so thick that the salt begins to crystallize.

Large amounts of soy-bean oil ("kachang oil" [perhaps soy sauce]) are imported to Malaya. "In the East [East Asia] it is used chiefly as food, but has other uses such as lubricating, varnish-making, making printer's inks, waterproof goods (Chinese umbrellas and lamps) and also for illumination. A process was patented 20 years ago for making artificial rubber, starting with soy oil. Note: Burkill was a British authority on the flora of southern and southeastern Asia.

"Criminal use: The hairs on the pods seem to be capable of causing a certain amount of irritation within the digestive tract. Gimlette (Malay Poisons, ed. of 1929 p. 169) records a case of administration of them with food in a criminal attempt to poison. He calls them a substitute for bamboo hairs in such circumstances.

"Joss-sticks: Ash of the stem, mixed with resin of *Canarium,* is said to make joss-sticks in Indo-China (Crevost and Lemarié, Cat. Prod. Indochine, 1917 p. 106)."

3215. Japan-Manchoukuo Year Book. 1935. Tokyo, Japan: Japan-Manchoukuo Year Book Co. Index. 26 cm. Second annual issue. [Eng]

• ***Summary:*** Each year book is divided into two main parts: Japan, and Manchoukuo. On the title page, just below the title but in small letters we read: "Cyclopedia of General Information on the Empires of Japan and Manchuokuo." Below that is a small map showing the Japanese empire, circled, as part of East Asia–under which is printed: "Neither is Understandable Without the Other." Below that are listed the cities and names of 15 agents worldwide. This book was published in mid-December 1934.

In the Japan and Manchoukuo parts of the book, soya beans are most widely discussed in the respective chapters on Agriculture (p. 353 and 713). In each case, information given the previous year is updated one year: See p. 359, 363 (Soybean production in Japan in 1932 was 4,351,814 hectolitres).

Page 716. Soybean production in Manchoukuo in 1933 was 4.601 million metric tons on 3.747 million hectares.

Page 717. Export of soya beans in 1932 was 42.536 million piculs [1 picul = 133.33 lb weight Avdp] worth 144.304 million Hk. Tl. [Haikwan taels]. Export of soya beans in 1933 was 39.111 million piculs worth 169.095 My [Manchoukuo yen?].

A large table (p. 717) shows "Staple exports as classified by destinations in 1932 (in piculs). Soya beans were exported to the following countries–in descending order of amount exported:

Germany 10.474 million piculs
Soviet Russia 7.520 million piculs
China 7.246 million piculs
Egypt 6.997 million piculs
Japan 5.568 million piculs
Great Britain 1.348 million piculs
Chosen [Korea] 0.905 million piculs.
Netherlands India [today's Indonesia] 0.849 million piculs
Netherlands 0.369 million piculs
Hongkong 0.355 million piculs
Denmark 0.340 million piculs
Italy 0.212 million piculs
Belgium 0.145 million piculs
Central America 0.125 million piculs
France 0.030 million piculs
Straits Settlements 0.022 million piculs
Philippines 0.0088 million piculs
Norway 0.0082 million piculs
British India 0.0028 million piculs
Sweden 0.0024 million piculs
United States 0.0012 million piculs
Siam [today's Thailand] 0.00028 million piculs.

Other major export crops were kaoliang, maize, millet, groundnuts, wheat and buckwheat.

Page 714 is all about "Soya beans" which are the most important staple product of the country and has been grown for many years before the opening of Newchwang while some had been exported to the ports of South China. At the time of the Russo-Japanese war (1904-05) the Japanese became aware of the value of the bean, especially of the bean cake for use as fertilizer, but the article did not enter upon its

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career as an important factor in international trade until 1910 when the Mitsui Bussan Co. made a trial shipment of 100 tons to England. Since then, mainly through the continued experiments of the Central Laboratory, maintained in Dairen by the S.M.R. [South Manchuria Railway], many new uses, have been found for soya bean until today the articles manufactured either wholly or partially from beans, bean oil and bean cake include more than thirty items, among which the following may be mentioned: soy [sauce], sauces, soups, condensed milk, casein, cheese, salad oil, crackers, macaroni, flour, confectionary, glycerine, explosives, enamels, varnishes butter and lard substitutes, edible oils, salad oils, water-proof material, linoleum; paints, soap, celluloid, rubber substitutes, printing-ink, lighting and lubricating oils, etc. Bean cake is also used extensively for fodder and as fertilizer.

"The S.M.R. Agricultural Experiment Station at Kunchuling and elsewhere have through continuous experiments and distribution of superior seeds to Manchurian farmers increased the crops by 10 to 20 percent 'while the oil content of such improved beans have been increased by more than ten percent. The use of these improvements is being advocated by means of poster campaigns and other forms of propaganda, while demonstrations are being carried out to instruct the farmers in new methods. At the same time a new industry of manufacturing beans into oil and cakes has sprung up, the modern methods rapidly replacing the old-fashioned presses.

"Soya bean output in 1934 is as follows:

A large table (p. 718) titled "Output of soya bean" [in Manchoukuo, according to districts] is divided into South and North Manchuria. It shows the following for each district in 1934: Cultivated area (hectares). Output per hectare (kgs.). Output in 1934 (metric tons). Actual output in 1933 (metric tons). Increase or decrease (metric tons). Rate of increase (1933 = 100).

3216. Makino, Tomitaro; Nemoto, Kanji. 1935. Nippon shokubutsu sôran [Flora of Japan]. Tokyo: Shunyô-dô. xix + 1936 p. See p. 571-72. Illust. 23 cm. [Jap]
• ***Summary:*** Early or first proposal of Manchuria as center of soybean origin. "A manual of the flora of Nippon." Note: Tomitaro Makino lived 1862-1957.

3217. Morphy, Marcelle. comp. and ed. 1935. Recipes of all nations. New York, NY: William H. Wise & Company. 824 p. 22 cm. Index at the end of each nation.
• ***Summary:*** Contains recipes from 18-20 nations–each with a thumb cut or thumb index or cut-in index. Soy is mentioned frequently in the chapter on Japan (p. 751-69). "One sauce reigns supreme in Japan–*Shoyu,* which replaces salt in many dishes and which is used in the cooking of almost everything: soup, fish, poultry, meat, and vegetables. It is the popular condiment with cold fish or meat and is added to salad dressing. It is made from the Soya bean seeds, wheat, and pure salt, and has a pleasant and distinctive flavor, unlike that of any of our European bottled sauces."

Soy-related recipes include: Nan yoy kow yook (Broiled pork steamed with Chinese cheese [fermented tofu], p. 737). Misoshiru (miso soup with tofu and miso, p. 755). Misozuke (fish with red or white bean curd and red or white miso, p. 758). Seki han (with azuki beans, p. 759). Suki yaki [Sukiyaki] (beef and vegetables, with tofu and shoyu, p. 761). Yokan (Japanese cakes with azuki beans, p. 762). Misso (miso, homemade with soya beans, malt, and salt, p. 763). Tofu (dried bean curd, p. 763).

Miso is said to be made as follows: "The proportions are 1 bushel of Soya beans, 1 bushel of malt, and 3 bushels of salt. The beans are squeezed and mixed with the malt and salt and kept in a cask for 6 months to mature."

Concerning tofu: "Cubes of tofu are frequently mentioned in Japanese recipes. Tofu is made by soaking the dry beans in water for a day, pounding them in a stone mortar, straining into square molds and mixing with brine. They are then boiled till they become hard and firm." Address: Countess.

3218. Murasaki, Lady (Shikibu). 1935. The tale of Genji. A novel in six parts. Translated from the Japanese [Genji Monogatari] by Arthur Waley. 2 vols. Boston and New York: Houghton Mifflin Co. 1135 p.
• ***Summary:*** Lady Murasaki Shikibu's brilliant 11th century novel colorfully describes the florescence of art and literature in Japan during the Heian period (794-1185). More specifically, these "amorous adventures of the peerless prince Genji" describe the life of Heian court nobility. Reischauer and Fairbank (1960, p. 516-17) call this "the greatest work of all Japanese literature." Fairbank, Reischauer, and Craig (1973) state: "The greatest work [of Heian literature] was the massive *Tale of Genji* by Lady Murasaki [born ca. 978], which recounts with great psychological subtlety and aesthetic sensitivity the life and loves of the imaginary Prince Genji, and in the process gives us a detailed picture of the court life of the time. The *Tale of Genji* has exerted immeasurable literary influence throughout Japanese history and in Arthur Waley's masterful translation has become one of the great world classics."

The Kodansha Encyclopedia of Japan says of the *Genji Monogatari* "By general repute the supreme masterpiece of Japanese prose literature. Written in the early 11th century, when prose literature scarcely existed in the West, it has been called the first great novel in the literature of the world. A very long work, upwards of 1,000 pages in translation, or some three-quarters of a million words, it has an essentially simple plot, describing the life and loves of an erstwhile prince known, from his family name, as 'the shining Genji,' and, after his death, the less successful loves of a youth who passes before the world as his son, but is in fact the grandson

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of his best friend.

"The earliest surviving texts are fragmentary, from late in the Heian period (794-1185), and it is only from the medieval period (13th -16th centuries) that complete texts can be put together. The absence of a holograph manuscript and the absence as well of detailed information about the author, a court lady known as Murasaki Shikibu, means that no final answers can be given to questions concerning the circumstances of composition. From evidence in the work known as *Murasaki Shikibu nikki* (Murasaki Shikibu Diary), it does not seem possible to deny that at least a part of the work is from the hand of Murasaki Shikibu, or that at least a part of it was written before she entered court service, in the first decade of the 11th century. From the Sarashina Nikki, the diary or memoirs of another court lady, it seems equally certain that a long prose work, approximately the length of the present *Genji,* had been completed and widely circulated by the end of the first quarter of the 11th century." Address: Kyoto, Japan.

3219. Nagata, Hisajirô. 1935. Doitsu to Manshû daizu [Germany and Manchurian soybeans]. Dairen, Manchuria: Minami Manshû Tetsudô K.K., Chihobu, Shokokuka. 166 p. [Jap]*
Address: Minami Manshu Tetsudo K.K., Dairen, Manchuria (South Manchuria Railway Co.).

3220. Nippu JiJi (Honolulu). 1935. Golden jubilee of the Japanese in Hawaii. Honolulu, Hawaii: Nippu JiJi. 10 + 142 p. Illust. [Eng; Jap]*

3221. Ikkyuji. 1935? Ikkyuji ryaku den engi [Ikkyuji fermented black soybeans]. Kyoto, Japan. 3 p. Unpublished manuscript. Undated. [Jap]
• ***Summary:*** At some time during the 1930s, these three documents were donated (apparently by Ikkyu-ki) to the Kyoto Prefectural Library and Archives (Call No. K272 188.85 Sh 99). Since all three were from the same source, the library decided to catalog them together under one call number.

Makiko Kageura, who found these documents for Soyinfo Center, says the they are written in the "old style" and thus a difficult for her to translate into English. She writes: "Shu oh an, or ikkyuji is a sister temple of Daitokuji. So it is said that the Daitokuji natto was originated from ikkyu-ji natto, or takigi natto (the area name of ikkyuji). I can't see the name Daitokuji natto in any of the three documents but I can see 'ikkyuji natto' or 'takigi natto.'" Address: Kyoto, Japan.

3222. *Foreign Crops and Markets* (*USDA Bureau of Agricultural Economics*). 1936. Manchurian soybean situation. 32(3):80-86. Jan. 20.
• ***Summary:*** Contents: Introduction. Quality of the crop. Prices. Destination of exports. Domestic consumption. Outlook for soybean production. Review of the 1934-35 crop year.

Tables show: (1) Soybeans: Area and production in Manchuria, 1929-1935. Production has fallen since a peak of 5,908,493 tons (of 2,000 lb) in 1930. Sources: SMR [South Manchuria Railway] Crop Estimates for 1929 to 1932. The Manchurian Agricultural Crop Investigation Association 1933 to date.

(2) Soybeans in Manchuria, 1929-30 to 1935-36: For each year has six columns: Production. Carry-over from last crop year. Total supply. Exports. Carry-over end of crop year. Home consumption and seed. Source: Shanghai Office, Foreign Agricultural Service.

(3) Soybeans and products: Exports from Manchuria 1929-30 to 1934-35. For each crop year (Oct. to Sept.) has five columns: Soybeans, soybean meal and cake, soybean oil, total exports. Total exports reached a peak of 4,749,958 tons (of 2,000 lb each) and have been decreasing since. Sources: "Compiled in Shanghai office, Foreign Agricultural Service from Chinese Maritime Customs Quarterly Trade Returns 1939-30 to 1931-32; American Consular Reports, Dairen, 1932-33 to 1934-35."

(4) Soybeans and products: Exports from Manchuria, by countries, 1931-32 to 1934-35. Countries: Europe, Japan, China, United States, Others, Total. Europe is the leading importer of soybeans from Manchuria, Japan of [soy] bean cakes, and China of [soy] bean oil.

(5) Soybean and products: Average monthly prices at Dairen in silver yen and United States currency, Oct. 1932 to Nov. 1935. Source: *Finance and Commerce* (a Shanghai weekly trade journal).

3223. Shinozaki, Yuichi; Kagawa, S.; Sato, M. 1936. Studies on the high pressure hydrogenation of soya bean oil. V. On the preparation of light hydrocarbon oil. *J. of the Society of Chemical Industry, Japan* 39:22B. Jan. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]
• ***Summary:*** A catalyst was essential for the production of a transparent light oil at > 430ºC by this process. Higher initial pressures of hydrogen favored the reaction, which was complete in 1 hour. Experiments with stearic acid and various catalysts (zinc, copper, nickel, iron, and chromium salts) showed that nickel (not less than 3%) gave the best results, the product having density less than 0.7 and 90% of it distilling at < 200ºC. Address: Dep. of Organic Chemistry, The Central Lab., South Manchuria Railway Co., Dairen, Manchuria.

3224. Kita, Gen-itsu. 1936. Amino-san chômiryô seizô ni kansuru kenkyû. 7. Daizu kasu o genryô to suru gurutamin-san no seizô [Preparation of amino acid seasoning. 7. Preparation of glutamic acid from soybean presscake]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 14(2):123-29. Feb.

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[15 ref. Jap]

3225. Bansei: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Yellow (straw), hilum pale/colorless to light brown.
• ***Summary:*** Sources: Morse, W.J. 1936. Re: Chusei and Bansei soybean varieties, and making soy milk. Letter to Dr. John Harvey Kellogg, Miami Springs (Miami), Florida, March 7. "I have your letter of February 13... Concerning variety 81031, which I wrote you had given such good results in making a high quality milk, we have given the varietal name Bansei to this number. I think that we shall be able to furnish you with 4 or 6 pounds of seed and I feel that it should mature in ample time at Battle Creek."

Morse, W.J. 1936. "Re: Evaporated soymilk, soybean varieties, and green vegetable soybeans." Letter to Dr. John Harvey Kellogg, The Miami-Battle Creek, Miami Springs, Florida, March 26. 2 p. "I have your letter of March 9 and with reference to the Bansei soybean, I will say that we will try to spare you as many pounds as possible." There are no longer large sources of either the Chusei or Bansei soybean in this country at present... we obtained the seed from The Yamato Seed Co., Tokyo, Japan. The Bansei was obtained from them under the name *Bansei O Sayada Mame* [probably *Bansei O Saya Eda Mame*] and the Chusei under the name *Chusei O Saya Eda Mame.* Note 1. In Japanese, *Bansei* and *Chusei* mean "late grower or late development" and "medium grower or medium development" respectively. Interestingly, Morse (1938, p. 32) reported that both varieties mature in the same time–110 days. *O Saya* means "large pod." *Eda Mamé*–pronounced ay-dah-MAH-may–means "green vegetable soybean." Note 2. Kellogg apparently wrote Morse first on 9 March 1936 to ask about the Bansei soybean.

Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 1. F.P.I. No. 81031. Name: Bansei. Seed color: Straw yellow. Maturity: 110 days. Use: Green vegetable and dry edible bean. States grown: Northern and North Central.

Morse, W.J. 1938. "Edible varieties of soybeans." *Proceedings of the American Soybean Assoc.* p. 30-33. A table (p. 32) shows: F.P.I. No.: 81031. Days to ripen: 110. Seed color: Straw yellow. Hilum: Pale. Seeds per lb: 1,936. Oil and protein content (moisture-free basis): 21.72% and 39.12%. Use: Dry edible or green vegetable.

Lloyd, J.W.; Burlison, W.L. 1939. "Eighteen varieties of edible soybeans: Their adaptability, acceptability, culture and characteristics." *Illinois Agric. Exp. Station, Bulletin* No. 453. p. 385-439. March. See p. 394-97, 413, 423.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 8-9. Bansei is in the USDA Germplasm Collection. Maturity group: II. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Banseiosayada Mame' from Sapporo, Japan, in 1929. Prior designation: PI 81031. Address: USA.

3226. Chusei: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Yellow (straw), hilum yellow.
• ***Summary:*** Sources: Morse, W.J. 1936. Re: Chusei and Bansei soybean varieties, and making soy milk. Letter to Dr. John Harvey Kellogg, Miami Springs (Miami), Florida, March 7. "I have your letter of February 13 with regard to the variety of soybean which you have been increasing at Battle Creek [Michigan] for the past three or four years. The sample of beans was recently received from Battle Creek and in checking it over with our samples I find that it is identical with the type we are now calling Chusei. I may say that the seed is now being distributed under this varietal name.

Morse, W.J. 1936. "Re: Evaporated soymilk, soybean varieties, and green vegetable soybeans." Letter to Dr. John Harvey Kellogg, The Miami-Battle Creek, Miami Springs, Florida, March 26. 2 p. "I have your letter of March 9 and with reference to the Bansei soybean, I will say that we will try to spare you as many pounds as possible." There are no longer large sources of either the Chusei or Bansei soybean in this country at present... we obtained the seed from The Yamato Seed Co., Tokyo, Japan.

Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 1. F.P.I. No. 80472 (19976). Name: Chusei. Seed color: Straw yellow. Maturity: 110 days. Use: Green vegetable and dry edible bean. States grown: North and North Central.

Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (*USDA*). p. 1154-89. For the year 1937. See p. 1163. "In Japan, certain varieties of soybeans were found that were used solely as green shelled beans... The vegetable soybean offers an excellent food of high nutritional value, especially in the fall when other green beans are lacking... As a result of selection, cooking tests, and adaptation studies, eight green vegetable varieties... have been introduced in various sections of the country." One of these is Chusei.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 8-9. Chusei is in the USDA Germplasm Collection. Maturity group: III. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Chusei O Saya Eda Mame' from Tokyo, Japan. Prior designation: PI 80472. Address: USA.

3227. Kellogg, John Harvey. 1936. Re: Bansei soybean and making soy milk. Letter to Mr. William J. Morse, Bureau of Plant Industry, USDA, Washington, DC, March 9. 2 p.

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Typed, without signature (carbon copy).
• ***Summary:*** Dr. Kellogg thanks Morse for his letter or March 7. "I am very glad to know about the Bansei bean. I shall be greatly pleased if you will send me as many pounds as you can of this seed and tell me if it is possible for me to get a larger quantity for planting this year.

"We are using very considerable quantities of soy beans for milk and at the rate it is increasing will soon be requiring about a ton a week.

"I am anxious to get started with your new bean as raw materials as soon as possible. I should also like to know whether the bean you call Chusei can be obtained in quantity for seed. I am hoping to plant two hundred acres of this bean this year to be used chiefly as a shell bean for canning. Can this be obtained in quantity either in this country or in Japan? Can the Bansei bean be obtained in Japan? I should also like to know if you can give me information about a bean which I am purchasing through a local agency here under the name of Tokyo. It comes from Norfolk here and I am informed that it is imported direct from Japan."

"I consider the soy bean one of the most remarkable of the world's food products and expect to make increasingly large use of it. I have been experimenting with it for many years, but have made rather slow progress because of the multiplicity of other matters requiring my attention. I think from now on I shall make much more rapid progress.

"Could you tell me if anyone has succeeded in making a satisfactory dry evaporated soy milk which will keep?

"Hoping I am not troubling you too much, I am

"Sincerely yours," Address: Miami, Florida.

3228. Morse, W.J. 1936. Re: Evaporated soy milk, soybean varieties, and green vegetable soybeans. Letter to Dr. John Harvey Kellogg, The Miami-Battle Creek, Miami Springs (Miami), Florida, March 26. 2 p. Typed, with signature.
• ***Summary:*** "I have your letter of March 9 and with reference to the Bansei soybean, I will say that we will try to spare you as many pounds as possible." There are no longer large sources of either the Chusei or Bansei soybean in this country at present... we obtained the seed from The Yamato Seed Co., Tokyo, Japan. The Bansei was obtained from them under the name *Bansei O Sayada Mame* [probably *Bansei O Saya Eda Mame*] and the Chusei under the name *Chusei O Saya Eda Mame."*

Note: In Japanese, *Bansei* and *Chusei* mean "late grower or late development" and "medium grower or medium development" respectively. *O Saya* means "large pod." *Eda Mamé*–pronounced ay-dah-MAH-may–means "green vegetable soybean."

"The sample of seed which you enclosed is the Tokyo variety and has been grown in this country for many years. During the past two or three years it has increased to a considerable extent especially in North Carolina, Tennessee, and Mississippi. It is not imported from Japan. All of the seed which is in this country was grown in the states mentioned above. It may interest you to know that in North China and southern Manchuria this light, greenish yellow bean is used in the manufacture of bean milk and bean curd. I am quite sure that you will have no difficulty in obtaining almost any quantity of Tokyo through North Carolina growers and seed dealers... In North Carolina and Virginia you can obtain the Tokyo through the following: T.W. Wood & Sons, Richmond, Virginia, Geo. Tait & Sons, Norfolk, Virginia, The Buxton White Seed Co., Elizabeth City, North Carolina, and F.P. Latham, Belhaven, North Carolina."

"Mr. J.H. Strawser of the Washington Sanitarium, Takoma Park, Maryland, sent me one of the nicest samples of evaporated soy milk that I have ever seen... I understand that Dr. Miller, who is associated with the Missionary College and now stationed in China, has one or two factories producing this soy milk powder. While Mr. Strawser was experimenting with the milk I understood that the soy milk was evaporated through the regular process used in evaporating cow's milk."

Note: This is the earliest document seen (Aug. 2013) concerning the work of Dr. Harry Miller with soyfoods or soy milk.

"The Seaboard Airline Railway, at its experimental farm near Hamilton, North Carolina, has been testing some of our green vegetable soybean varieties. Last year they froze some of the beans and have been sending samples to various places. From all reports it is evident that the frozen bean is a most excellent food product."

Note: This is the earliest document seen (March 2001) concerning the work of a small Seventh-day Adventist food company (the Washington Sanitarium, Takoma Park, Maryland) with soyfoods. Address: Senior Agronomist, Div. of Forage Crops and Diseases, Bureau of Plant Industry, USDA, Washington, DC.

3229. Narahara, Hanbei. 1936. Usukuchi shôyu to tanshoku shôyu ni tsuite [On usukuchi shoyu and usuiro shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 14(3):263-64. [Jap]

3230. Chame: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Brown, hilum brown.
• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 1. Chame. P.I. 80473 (19977). Seed color: Brown. Maturity: 125 days. Use: Green vegetable. States grown: Southern.

Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (USDA). p. 1154-89. For the year 1937. See p. 1187. Origin: Introduction, Japan. Year: 1929. Days to mature: 125. Flower color: White. Pubescence color: Tawny. Seed coat color: Brown. Germ color: Yellow.

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Hilum color: Brown. Seeds per pod: 2-3. Seeds per pound: 1,904. Use: Green vegetable beans. Address: USA.

3231. Fuji: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Green, hilum black.
• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 1. F.P.I. No. 81029. Name: Fuji. Seed color: Olive yellow. Maturity: 115 days. Use: Green vegetable or dry edible bean. States grown: North and North Central.

Lloyd, J.W.; Burlison, W.L. 1939. "Eighteen varieties of edible soybeans: Their adaptability, acceptability, culture and characteristics." *Illinois Agric. Exp. Station, Bulletin* No. 453. p. 385-439. March. See p. 394-97, 413, 423.

Morse, W.J.; Cartter, J.L. 1939. "Soybeans: Culture and varieties." *USDA Farmers' Bulletin* No. 1520 (Revised ed.) 39 p. Nov. See p. 9. "Fuji–Introduced under F.P.I. No. 81029, native name 'Chusei Kuro Me Daizu,' from Sapporo, Hokkaido, Japan, in 1929. A middle-season blackeye variety said to be used as a green shelled bean. Maturity, about 115 days; pubescence, tawny; flowers, both purple and white, appearing in 45 to 500 days; pods, two- to three-seeded; seeds, olive yellow with black hilum, about 1,456 to the pound; germ, yellow; oil, 18.45 percent; protein, 42.34 percent."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 10-11. Fuji is in the USDA Germplasm Collection. Maturity group: III. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Chuseikurome Daizu' from Sapporo, Hokkaido, Japan, in 1929. Prior designation: PI 81029. Address: USA.

3232. Goku: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Yellow (straw), hilum yellow.
• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 1. F.P.I. No. 80480. Name: Goku. Seed color: Straw yellow. Maturity: 110 days. Use: -. States grown: North and North Central.

Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (*USDA*). p. 1154-89. For the year 1937. See table p. 1187. Origin: Introduction, Japan. Year: 1929. Days to mature: 110. Flower color: White. Pubescence color: Gray. Seed coat color: Straw yellow. Germ color: Yellow. Hilum color: Brown. Seeds per pod: 2-3. Seeds per pound: 3,216. Use: Green-vegetable beans.

Morse, W.J. 1938. "Edible varieties of soybeans." *Proceedings of the American Soybean Assoc.* p. 30-33. A table (p. 32) shows: F.P.I. No.: 80480. Days to ripen: 110. Seed color: Straw yellow. Hilum: Brown. Seeds per lb: 3,216. Oil and protein content (moisture-free basis): 14.55% and 45.51%. Use: Green vegetable.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 10-11. Goku is in the USDA Germplasm Collection. Maturity group: II. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Gokuwase Daihosan Shinbon Daizu' from Saitama, Japan, in 1929. Prior designation: PI 80480. Address: USA.

3233. Hakote: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Yellow (olive), hilum black.
• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 1. F.P.I. No. 81039. Name: Hakote. Seed color: Olive yellow. Maturity: 115 days. Use: Green vegetable. States grown: North Central.

Morse, W.J. 1938. "Edible varieties of soybeans." *Proceedings of the American Soybean Assoc.* p. 30-33. A table (p. 32) shows: F.P.I. No.: 81039. Days to ripen: 115. Seed color: Olive yellow. Hilum: Black. Seeds per lb: 1,440. Oil and protein content (moisture-free basis): 18.43% and 43.80%. Use: Green vegetable.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 10-11. Hakote is in the USDA Germplasm Collection. Maturity group: II. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Aoshiro Daizu' from Sapporo, Hokkaido, Japan, in 1929. Prior designation: PI 81039. Address: USA.

3234. Higan: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Yellow (straw), hilum brown.
• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 1. F.P.I. No. 80475 (19978). Name: Higan. Seed color: Straw yellow. Maturity: 135 days. Use: Green vegetable or dry edible bean. States grown: Southern.

Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (*USDA*). p. 1154-89. For the year 1937. See p. 1163. "In Japan, certain varieties of soybeans were found that were used solely as green shelled beans... The vegetable soybean offers an excellent food of high nutritional value, especially in the fall when other green beans are lacking... As a result of selection, cooking tests,

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and adaptation studies, eight green vegetable varieties... have been introduced in various sections of the country." One of these is Higan.

Lloyd, J.W.; Burlison, W.L. 1939. "Eighteen varieties of edible soybeans: Their adaptability, acceptability, culture and characteristics." *Illinois Agric. Exp. Station, Bulletin* No. 453. p. 385-439. March. See p. 394-97, 413, 425.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 12-13. Higan is in the USDA Germplasm Collection. Maturity group: IV. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Higan Mame' from Tokyo, Japan, in 1929. Prior designation: PI 80475. Address: USA.

3235. Hiro: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Black.

• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 2. Hiro. P.I. 86038. Seed color: Black. Maturity: 115 days. Use: Green vegetable. States grown: North Central.

Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (USDA). p. 1154-89. For the year 1937. See p. 1187. Origin: Introduction, Japan. Year: 1930. Days to mature: 115. Flower color: White. Pubescence color: Tawny. Seed coat color: Black. Germ color: Yellow. Hilum color: Black. Seeds per pod: 2-3. Seeds per pound: 1,312. Use: Green vegetable beans, dry edible beans. Address: USA.

3236. Hokkaido: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Yellow, hilum colorless.

• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 2. F.P.I. No. 85666. Name: Hokkaido. Seed color: Straw yellow. Maturity: 115 days. Use: Green vegetable or dry edible bean. States grown: North Central.

Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (*USDA*). p. 1154-89. For the year 1937. See p. 1163. "In Japan, certain varieties of soybeans were found that were used solely as green shelled beans... The vegetable soybean offers an excellent food of high nutritional value, especially in the fall when other green beans are lacking... As a result of selection, cooking tests, and adaptation studies, eight green vegetable varieties... have been introduced in various sections of the country." One of these is Hokkaido.

Lloyd, J.W.; Burlison, W.L. 1939. "Eighteen varieties of edible soybeans: Their adaptability, acceptability, culture and characteristics." *Illinois Agric. Exp. Station, Bulletin* No. 453. p. 385-439. March. See p. 394-97, 413, 423.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 12-13. Hokkaido is in the USDA Germplasm Collection. Maturity group: IV. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Hokkaido Tsurunoko' from Tokyo, Japan, in 1930. Prior designation: PI 85666. Address: USA.

3237. Iwasaki, Kazuo. 1936. Shôyu no kanshô sayô ni tsuite. II. [On the buffer action of shoyu. II.]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 14(4):347-64. [Jap]
Address: Iwazaki Shôyu-ten Jikkenshitsu, Japan.

3238. Kanro: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Yellow (straw), hilum pale to brown.

• ***Summary:*** Sources: Horvath, A.A. 1926. "The soybean as human food." *Chinese Economic Monthly* 3(9):392-400. Sept. See p. 397. In the section titled "Composition of some Japanese soybeans and of the common American varieties," table V (p. 397) gives the composition of four leading Hokkaido soybeans: Tsuru-no-Ko, Kanro, Yoshi-Oka, and Oh-Ya-Gi. The composition of Kanro is: water 18.59%, protein 36.86% (the highest), fat 18.98%, ashy substance 4.71%.

Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 2. F.P.I. No. 84928. Name: Kanro. Seed color: Straw yellow. Maturity: 110 days. Use: Green vegetable or dry edible bean. States grown: North and North Central.

Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (*USDA*). p. 1154-89. For the year 1937. See p. 1163. "In Japan, certain varieties of soybeans were found that were used solely as green shelled beans... The vegetable soybean offers an excellent food of high nutritional value, especially in the fall when other green beans are lacking... As a result of selection, cooking tests, and adaptation studies, eight green vegetable varieties... have been introduced in various sections of the country." One of these is Kanro.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 12-13. Kanro is in the USDA Germplasm Collection. Maturity group: II. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Kanro' from Pyongyang [P'yongyang], North Korea, in 1930. Prior designation: PI 84928. Address: USA.

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3239. Kura: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Black plus olive yellow. Hilum black.
• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 1. F.P.I. No. 81042. Name: Kura. Seed color: Olive yellow & black. Maturity: 118 days. Use: Green vegetable. States grown: North Central.

Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (USDA). p. 1154-89. For the year 1937. See p. 1163, 1188. "In Japan, certain varieties of soybeans were found that were used solely as green shelled beans... The vegetable soybean offers an excellent food of high nutritional value, especially in the fall when other green beans are lacking... As a result of selection, cooking tests, and adaptation studies, eight green vegetable varieties... have been introduced in various sections of the country." One of these is Kura (p. 1163). Origin: Introduction, Japan. Year: 1929. Days to mature: 118. Flower color: White. Pubescence color: Tawny. Seed coat color: Black + olive or greenish yellow. Germ color: Yellow. Hilum color: Black. Seeds per pod: 2. Seeds per pound: 1,456. Use: Green vegetable beans (p. 1188).

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 12-13. Kura is in the USDA Germplasm Collection. Maturity group: III. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Kurakake Daizu' from Sapporo, Hokkaido, Japan, in 1929. Prior designation: PI 81042. Address: USA.

3240. Morse, W.J. 1936. Soybean introductions named in January 1936 (Leaflet). Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7.
• ***Summary:*** A table (p. 1-2) lists the following 25 soybean varieties, sorted by F.P.I. numbers. For four varieties, the FC (forage crop) number is given in parentheses after the F.P.I. number: Georgian, Palmetto, Monetta, Creole, Waseda, Osaya, Chusei (FC 19976), Chame (FC 19977), Higan (FC 19978), Sousei (FC 19979), Goku, Rokusum [Rokusun], Fuji, Bansei, Shiro, Hakote, Sato [black seeded], Kura [black], Kanro, Hokkaido, Hiro, Toku, Jogun, Suru, Nanda.

For each variety the following information is given: F.P.I. Nos., seed color, days to maturity, use, and states grown (such as southern, north and north central, etc.). Use codes: G = Grain. F = Forage. G.V. = Green vegetable. D.B. = Dry edible bean. Color codes: S.Y. = Straw yellow. O.Y. = Olive yellow. Gr. = Green. Bl. = Black. Br. = Brown. Note: Black soybean varieties are Sato, Kura, and Hiro.

An attached page, titled "Soybeans named in January, 1936," by W.J. Morse, lists 21 soybean varieties in a 3-column table, along with the F.P.I. numbers and (in some cases) the FC [forage crop] number in parentheses. All of these varieties appear among the 25 varieties listed above.

Note 1. This is the earliest document seen (Aug. 2013) that mentions the following soybean varieties: Chame, Fuji, Goku, Hakote, Higan, Hiro, Hokkaido, Jogun, Kanro (in USA), Kura, Nanda, Osaya, Sato, Shiro, Sousei, Suru, Toku, and Waseda.

Note 2. This is the earliest document seen in which soybeans are classified by use as "green vegetable" or "dry edible bean" or both. The difference between the two is not explained. Eight varieties are classified as "green vegetable" only: Chame, Hakote, Hiro, Kura, Nanda, Sato, Sousei, and Waseda. Twelve varieties are classified as both: Bansei, Chusei, Fuji, Higan, Hokkaido, Jogun, Kanro, Osaya, Rokusun, Shiro, Suru, and Toku. No varieties are classified only as "dry edible bean." By "dry edible bean" Morse apparently means that this variety is suited to be made into various types of food. The next year, in the 1937 *USDA Yearbook of Agriculture* Morse and Cartter, in an article titled "Improvement in Soybeans" state (p. 1163): "Experiments by commercial firms have shown that these varieties are superior to commercial varieties for the manufacture of food products, such as bean flour, roasted beans, bean milk [soy milk], and bean curd [tofu]." Address: Div. of Forage Crops & Diseases, Bureau of Plant Industry, USDA [Washington, DC].

3241. Osaya: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Yellow (straw), hilum yellow.
• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 1. F.P.I. No. 80465. Name: Osaya. Seed color: Straw yellow. Maturity: 115 days. Use: Green vegetable or dry edible bean. States grown: North Central.

Morse, W.J. 1938. "Edible varieties of soybeans." *Proceedings of the American Soybean Assoc.* p. 30-33. A table (p. 32) shows: F.P.I. No.: 80465. Days to ripen: 115. Seed color: Straw yellow. Hilum: Brown. Seeds per lb: 1,792. Oil and protein content (moisture-free basis): 18.14% and 46.30%. Use: Dry edible or green vegetable.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 16-17. Osaya is in the USDA Germplasm Collection. Maturity group: III. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Chusei O Saya Eda Mame' from Tokyo, Japan, in 1929. Prior designation: PI 80465. Address: USA.

3242. Russell, John. 1936. The culture of the soya bean in

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England. *J. of the Ministry of Agriculture* (*Great Britain*) 43(1):24-30. April. [4 ref]

• ***Summary:*** Cultivation of maize and the soya bean in England began at a relatively late date. "Much important work on selection and hybridization of these crops has been done by Professor W. Southworth, formerly of the Manitoba Agricultural College [in Canada], and now of the Rothamsted Experimental Station." Some 30 years ago [about 1906-10] Professor [James] Hendrick tried to grow the soya bean at "Aberdeen [Scotland], using Manchurian seed; in the greenhouse a few plants grew and even flowered, but they never produced seed, while in the open the seeds hardly germinated.

"Further south, at Kingston and Kegworth in the Midlands, Mr. Golding obtained better results with Japanese seed, and indeed he used the plant for some of his pioneering investigations on nitrogen fixation by leguminous plants, working with a culture supplied by Hiltner, then of Munich [Germany]. Although it was useful for laboratory investigations the crop held out little promise to the practical farmer. Similar negative results were obtained by Sir Rowland Biffen at Cambridge. A summary of these tests was given in this Journal in April, 1912 (p.33). A little later in the summer of 1912 and 1913, soya bean was tried at the Woburn experimental farm, but although the seed germinated satisfactorily and the plant grew, as in Mr. Golding's experiments, only a few pools were produced, and it was clear that the varieties tested were useless to this country. Still further south, in the old Royal Botanic Society's Gardens, Regent's Park, Mr. J. L. North, the Curator, was more successful than any of his predecessors: he began in 1914 and within a few years was growing a number of varieties and found some that ripened seed ready for harvesting in September. A brown variety seemed so promising that by 1929 it was taken up for further trial by the National Institute of Agricultural Botany and by Messrs. Sutton and Sons. Meanwhile Mr. North received other varieties from Professor McRostie, of Ontario [Canada], and these were included in his trials-but they all failed.

"This brown variety had been obtained by Professor Southworth about 1916 at the Manitoba Agricultural College, and was fully tested and ready for distribution by 1922. It was a selection from Ogemaw, a hybrid between an early black and a dwarf brown variety produced by E.E. Evans at West Branch, Michigan, in the opening years of the present century. Like all hybrids, it is variable, and Professor Southworth's selection differed in such important respects from the parent material that it was issued as a distinct variety under the name Manitoba Brown. This was sent to Mr. North and grown by him: he described it in the *Quarterly Summary* of the Royal Botanic Gardens, for April, 1929, as having 'in the course of seven years' trials here proved to be not only the most reliable cropper, but the earliest of any of the sixty varieties of soya tested by me for growth in this country for the last fourteen years.' Although Mr. North gives no estimate of yields he quotes Messrs. Chivers' estimate of 12 to 15 cwt. [1 cwt = hundredweight = 112 pounds] of grain per acre, and soya beans sold at that time at £13 per ton. Mr. North states also that the soya bean has been grown successfully in the Home Counties, Oxfordshire, Hampshire and the Channel Islands, but gives no figures of yields in any of these places. The National Institute of Agricultural Botany grew it in 1924, 1925, and 1926 from Mr. North's seed, and each year had a fair crop of seeds: in 1928 large plots were grown and the yield was estimated at 900 lb. per acre without inoculation and 1,150 lb. per acre with inoculation. The results seemed so promising that half an acre was sown in 1929, but the plants ripened irregularly and produced little seed. The trial was then discontinued."

Mr. North continued his trials and "was fortunate in enlisting the sympathy of Mr. Henry Ford, who in 1932 had purchased some 2,000 acres of agricultural land at Boreham in Essex and proceeded to sow some Michigan varieties of soya bean. These failed, but in the meantime Mr. Ford discovered Mr. North, who furnished him with the above variety and three others, and these have been grown since 1933... Meanwhile in 1932 Professor Southworth, the originator of the most successful of these varieties, had retired from the Manitoba Agricultural College and joined the Rothamsted Staff. He started growing his best selection at the Woburn Experimental Farm... Professor Southworth himself has been growing the crop both at Rothamsted and at Woburn since 1934." Cultures for inoculating soya beans are obtainable from Messrs. Allen and Hanbury, 3 Colts Lane, Bethnal Green, London, E.2.

Note 1. This is the earliest document seen stating that the soya bean was grown at Rothamsted, the world's first agricultural experiment station, established in 1843.

Note 2. This document contains the earliest date seen for soybeans in Scotland, or the cultivation of soybeans in Scotland (About 1906-1910). The source of these soybeans is unknown (One of two documents).

Note 3. This is the 2nd earliest document seen (March 2010) concerning soybeans in the Channel Islands, or the cultivation of soybeans in the Channel Islands. This document contains the 2nd earliest date seen for soybeans in the Channel Islands, or the cultivation of soybeans in the Channel Islands (April 1936). The source of these soybeans was Mr. North. Address: Sir, D.Sc., F.R.S., Director, Rothamsted Experimental Station [England].

3243. Sato: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Black, hilum black.

• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 1. F.P.I. No. 81041. Name:

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Sato. Seed color: Black. Maturity: 115 days. Use: Green vegetable. States grown: North Central. Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans: Appendix–Table 4. Soybean varieties: Origin and varietal characteristics" (Document part). *Yearbook of Agriculture* (USDA) p. 1154-89. For the year 1937. See p. 1187-89.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 16-17. Sato is in the USDA Germplasm Collection. Maturity group: IV. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Kuro Daizu' from Sapporo, Hokkaido, Japan, in 1929. Prior designation: PI 81041. Address: USA.

3244. Shiro: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Yellow (olive), hilum brown or black.
• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 1. F.P.I. No. 81036. Name: Shiro. Seed color: Olive yellow. Maturity: 115 days. Use: Green vegetable or dry edible bean. States grown: North Central.

Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (USDA). p. 1154-89. For the year 1937. See p. 1189. Origin: Introduction, Japan. Year: 1929. Days to mature: 115. Flower color: White. Pubescence color: Tawny. Seed coat color: Olive yellow. Germ color: Yellow. Hilum color: Brown, black. Seeds per pod: 2-3. Seeds per pound: 1,623. Use: Green vegetable beans.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 16-17. Shiro is in the USDA Germplasm Collection. Maturity group: IV. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Aoiiro Daizu' from Sapporo, Hokkaido, Japan, in 1929. Prior designation: PI 81036. Address: USA.

3245. Sousei: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. Synonym: Super Quick (Morse 1948). 1936. Seed color: Yellow (olive), hilum brown.
• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 1. F.P.I. No. 80476 (19979). Name: Sousei. Seed color: Olive yellow. Maturity: 115 days. Use: Green vegetable. States grown: North Central.

Woodruff, Sybil. 1937. "Edible varieties of soybeans." *Proceedings of the American Soybean Assoc.* p. 19-22. See p. 22. Late named varieties include Funk's Delicious [Funk Delicious], Sousei, and Higan (they are best used by Sept. 11-21).

Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (*USDA*). p. 1154-89. For the year 1937. See p. 1163. "In Japan, certain varieties of soybeans were found that were used solely as green shelled beans... The vegetable soybean offers an excellent food of high nutritional value, especially in the fall when other green beans are lacking... As a result of selection, cooking tests, and adaptation studies, eight green vegetable varieties... have been introduced in various sections of the country." One of these is Sousei.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 16-17. Sousei is in the USDA Germplasm Collection. Maturity group: II. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Sousei O Saya Eda Mame' from Tokyo, Japan, in 1929. Prior designation: PI 80476. Address: USA.

3246. Suru: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Yellow (straw).
• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 2. Suru. P.I. 89128. Seed color: Straw yellow. Maturity: 115 days. Use: Green vegetable, dry edible bean. States grown: North Central.

Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (USDA). p. 1154-89. For the year 1937. See p. 1187. Origin: Introduction, Japan. Year: 1930. Days to mature: 115. Flower color: Purple, white. Pubescence color: Gray. Seed coat color: Straw yellow. Germ color: Yellow. Hilum color: Yellow. Seeds per pod: 2-3. Seeds per pound: 1,320. Use: Dry edible beans. Address: USA.

3247. Toku: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Yellow (straw), hilum brown.
• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 2. F.P.I. No. 86129. Name: Toku. Seed color: Straw yellow. Maturity: 115 days. Use: Green vegetable or dry edible bean. States grown: North Central. Morse, W.J.; Cartter, J.L. 1937. Improvement in soybeans: Appendix–Table 4. Soybean varieties: Origin and varietal characteristics (Document part). *Yearbook of Agriculture* (USDA) p. 1154-89. For the year 1937. See p. 1187-89.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY

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Series No. 30. p. 18-19. Toku is in the USDA Germplasm Collection. Maturity group: II. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Toiku No. 7' from the Tokachi Branch ES (Experiment Station), Obihiro, Hokkaido, Japan, in 1930. Prior designation: PI 86129. Address: USA.

3248. Waseda: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1936. Seed color: Yellow (straw), hilum pale to brown.
• ***Summary:*** Sources: Morse, W.J. 1936. *Soybean introductions named in January 1936.* Washington, DC: USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. 2 p. April 7. See p. 1. F.P.I. No. 80461-1. Name: Waseda. Seed color: Straw yellow. Maturity: 110 days. Use: Green vegetable. States grown: North and North Central.

Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (USDA). p. 1154-89. For the year 1937. See p. 1189. Selection by Arlington Experiment Farm, 1929.

Morse, W.J.; Cartter, J.L. 1939. "Soybeans: Culture and varieties." *USDA Farmers' Bulletin* No. 1520 (Revised ed.) 39 p. Nov. See p. 16. "Waseda–Selection (80461-1) made in 1929 at Arlington Experiment Farm from F.P.I. No. 80461, native name, "Wase Eda Mama," introduced from Tokyo, Japan, in 1929. Maturity, about 110 days; pubescence, tawny; flowers, purple, appearing in 45 to 50 days; pods, two- to three-seeded; seeds, straw yellow with pale to brown hilum, about 2,016 to the pound; germ, yellow; oil, 18.52 percent; protein, 43.40 percent."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 18-19. Waseda is in the USDA Germplasm Collection. Maturity group: II. Year named or released: 1936. Developer or sponsor: USDA. Literature: 07, 11. Source and other information: 'Wase Eda Mame' from Tokyo, Japan, in 1929. Prior designation: PI 80461-1. Address: USA.

3249. Karasawa, Kotaro. 1936. Crossing experiment with Glycine soja and *G. ussuriensis. Japanese J. of Botany* 8(2):113-18. May 31. With 3 photos. [5 ref]
• ***Summary:*** The cultivated soy bean might have been derived from the wild soybean (*Glycine ussuriensis*) through the accumulation of qualitative and quantitative changes due to gene mutation, unaccompanied by any chromosomal change. *Glycine soya* has 40 chromosomes. Address: Biological Inst., Furitsu Koto-Gakko, Muguro, Tokyo.

3250. Iwata, Hisayoshi. 1936. [Comparison of nutritive value of fodder protein]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 12(5):415-20. May. (Chem. Abst. 30:7153). English language summary bound in the front of this volume, p. 58. [19 ref. Jap; eng]
• ***Summary:*** "The nutritive value of proteins in protein rich fodders, such as sardine cake, soy bean cake, extracted soy bean [meal], rape seed cake, sesam [sesame] cake, wheat bran and rice bran and their mixtures, were experimentally compared by feeding young albino rats." For the purpose of finding the correlation between the nutritive value of protein and its amino acid composition, the latter was also examined. Address: Imperial College of Agriculture and Forestry, Morioka, Japan.

3251. Mogi, Masatoshi. 1936. Miso jôzô ni kansuru saikin no kenkyû. II. [Studies on the microorganisms in the manufacture of "miso." II.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 12(5):367-77. May. English-language summary in Bulletin of the Agricultural Chemical Society of Japan 12(5):54-55, bound at the front of Nippon Nogei Kagaku Kaishi. [1 ref. Jap; eng]
• ***Summary:*** The soluble breakdown products of starch and protein in miso may be produced equally well by bacteria or by koji molds. Three experiments were made using the aerobic bacteria isolated from miso: (1) Diastatic and starch liquefying power. (2) Liquefying power of gelatine (all the bacteria liquefy gelatine). (3) Liquefying power of "Tofu" (The degrees of liquification are not always parallel to the liquefying power of gelatine). Address: Nôgakushi, Brewing Laboratory, Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

3252. Udo, Shigezo. 1936. Nattô no seibun ni tsuite. I. Nattô-chû ni jibikorin-san no sonzai to sono eikyô [Studies on the constituents of natto. I. On the occurrence of dipicolinic acid produced in natto and its influence]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 12(5):386-94. May. (Chem. Abst. 30:6887). English-language summary in Bulletin of the Agricultural Chemical Society of Japan 12(5):55-56, bound in the back of Nippon Nogei Kagaku Kaishi. [8 ref. Jap; eng]
• ***Summary:*** Udo isolated an organic acid from the ether soluble fraction of natto and identified it as dipicolinic acid. He also found that this acid did not exist in the soybean and was produced by *B. subtilis* (*natto*) at concentrations of 0.3% to 0.8% and that this acid prevented the growth of many microorganisms.

Accumulation of dipicolinic (pyridine-2,2'-dicarboxylic) acid to a concentration of 1.2-1.5% completely suppresses the growth of *Bacillus natto,* which is also partly inhibited by the viscous substance produced around the soya-bean grains. The growth of *B. subtilis* and of *Penicillium glaucum* is also inhibited by dipicolinic acid. Address: Morioka Koto Norin Gakko, Nogei Kagaku Kyoshitsu (Agricultural College of Morioaka, Japan).

3253. Breedlove, L.B. 1936. Soy bean–The magic plant: Picturing its multiple industrial and economic uses. Article II. *Chicago J. of Commerce and La Salle Street Journal.*

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June 4. p. 11.

• ***Summary:*** Contents: Introduction and early history in China. Teaches proper methods. Clipper first to export soybeans. Civil war "coffee." Introduced as a legume. Extra dividend.

"How far back man began to cultivate the soybean plant no one knows–one authority estimates 25,000 years. Ethnologists tell us that the original Chinese wandered down from the Tarim basin and settled in the fertile valleys of the Yangtze and Huai rivers. There, where wild soybeans grew in abundance, flourished for centuries a family type of civilization which consistently repelled the attack of hungry barbarians from the south and north.

"This fact alone typifies the breadth of soybean usage.

"The 'little honorable plant,' in which Chinese legend places one of the invisible Gods, provided food products to serve all the needs of the family group and made it possible for the Chinese to enter into agricultural society without going through a pastoral stage of development. Chinese students tell us their civilization was in existence for centuries before Sin Jen, the 'fire-producer' who learned to kindle fire from watching a bird make sparks by pecking at a tree (and by the discovery got himself accepted as king about three thousand years before Christ), began to teach his people the arts of pastoral life–hunting, fishing, gathering of fruits and domestication of animals.

"About two hundred years later Emperor Shen Nung, the third of a line firmly seated in the king's chair through a series of inventions (as musical instruments, a system of writing, a counting method and a calendar), branched out a bit to write the first Chinese remedy book. This materia medica contained over 300 remedies made from soybeans and is the earliest written record of the soya max."

"Clipper First to Export Soybeans: In 1804, a wandering New England clipper ship, whose Presbyterian master canvassed the Chinese sea coast for a return cargo without success, bunkered several bags of soybeans for a coffee substitute and a food reserve. This was the first time the soybean went abroad. Note: This is the earliest document seen (Aug. 2002) that embellishes the myth of the "clipper ship" with phrases like "Presbyterian master" "canvassed the Chinese coast for a return cargo" "bunkered several bags of soybeans for a coffee substitute and a food reserve"–all supposedly in connection with the introduction of the soybean to the United States.

"The seeds found their way into the hands of botanists who were very much interested in the trifoliate leaves of the plant. Soon every self-respecting botanical garden–which were the fad of those days–exhibited at least one 'oriental' plant. Apparently, no interest was taken in the cultivation of the soybean, which is not surprising, for the American pioneer was ever reluctant to experiment with new crops. Several of the plants indigenous to the Americas were first cultivated in Europe and the seeds imported years later when the crop began to find acceptance in its homeland.

"When, following the religious missionaries, traders came looking for the products which only China then could produce, as tea, opium and silk, the soybean was completely overlooked.

"Two years after the first group of foreign treaties were signed, near the middle of the last century, an English captain of a Danish tramp freighter, filled the voids in his hold with a few bags of beans and a quantity of soybean cakes, then a commodity regularly traded in the street markets of China."

"No one in England would take any interest in the meal much less in the yellow beans and the captain set about planting some of the beans with, as it has been reported, a Scottish oath to demonstrate the merits of the crop to all England. But his garden was gone for decades before any real interest was taken by Englishmen."

"Civil War 'Coffee': During the Civil War, Union soldiers were fed a coffee which they disliked. It tasted like coffee but did not stimulate or keep them awake as the black coffee which they had back home. The substitute coffee was made from soybeans smuggled through the lines of a blockade by the English who, through their shipping facilities, then controlled the movement of coffee from South America.

"Most of the Union soldiers returned from the war with a hatred of the 'so-so' beans which was only exceeded by their dislike of the quarter-master's department. A Union veteran, now ninety-four years old, recently said, when asked about the soybean, 'I won't have them on my farm. I still can taste that darn coffee we had to drink in the army.'

"When the Japanese, just newly initiated to western methods and under the press of food needs, invaded the Asiatic continent near the end of the last century, one of the first spoils of war sent home, consisted of quantities of soybean seeds and the food products of the plant.

"The production of soybeans in Japan rose so rapidly that, by the time of the Boxer uprising and the crash of the Manchus, the versatile bean was one of the principal food crops of the island empire and exports of the derived products had absorbed enough of the foreign market to bring hard times to Chinese farmers." Address: Staff member, Chicago Journal of Commerce.

3254. Hokubei Jiji-sha. comp. 1936/10. Hokubei nenkan [The North American Times year book]. Shiatoru [Seattle], Washington: Hokubei Jijisha. [84] + 113 + 324 + 12 p. June 10. Illust. Index. 23 cm. [Jap]

• ***Summary:*** Contents: Black-and-white photographs of Japanese in America with captions on glossy paper, back to back (84 unnumbered pages = 42 unnumbered leaves.). The yearbook (113 p.). The directory (324 p.). Large advertisements (12 unnumbered pages).

This book has the best coverage of companies in Seattle, the rest of Washington state, and Vancouver, BC, Canada.

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In the directory, most entries consists of: Company name in English, then in Japanese characters. The address and phone number in English. Address: 215 5th St., Seattle, Washington.

3255. Lajtha, Edgar. 1936. 5-cent ration for Japan: Scientist works it out for 500 daily menus after analyzing 6,000 foods. *New York Times.* June 28. p. X9.
• ***Summary:*** "Professor Tasasu Saiki, director of the Imperial Government Institute for Nutrition in Tokyo, broadcasts recipes for concentrated food, and he is paving the way for a peaceful revolution in Japan, the revolution of nutrition." "Dr. Saiki also is preparing for time of war." Recipes include Grasshoppers "served with soy-bean sauce..." He was formerly attached to the League of Nations Health Office at Geneva.

3256. Kaltenbach, D.; Legros, J. 1936. Soya: Selection, classification of varieties, varieties cultivated in various countries: Western Europe (Document part). *Monthly Bulletin of Science and Practical Agriculture* (*International Institute of Agriculture, Rome*) 27(6):216T-28T. June.
• ***Summary:*** "1. Germany. In spite of numerous attempts extending over a long period of time, and particularly since 1920, soya cultivation in Germany has remained in the experimental stage. From a practical standpoint it cannot be said that economic cultivation of soya exists...

"All the varieties introduced for trial have failed as they were not adaptable to the climatic conditions of the country. Certain growers, however, (Schurig at Stedten; Brandt at Gierdorf; Heinemann; Winkler, etc.) and several professors of State Institutions (Professor Riede of the Bonn University; Professor Sessous of the Giessen University; Professor Berkner of the Breslau University; Dr. Heinze of the Chamber of Agriculture of Halle) have carried out breeding work and have obtained lines superior to the varieties which were used as the point of departure. These lines are at present being tested in various regions in Germany.

"Several varieties have been obtained by the botanical station of the Higher School of Agriculture of Bonn-Poppelsdorf:

"Yield per hectare of Bonn 373 is 20.9, and yield per hectare of Bonn 456 is 19.1.

"2. Austria. Soya cultivation was introduced in 1870 by F. Haberlandt. Since that time breeding work and tests in acclimatisation have been carried out at various times. The most important work of this kind was started in 1923 by Dr. Fritz Drahorad and his assistant M.F. Brillmayr [Brillmayer]. Trials were made with 28 varieties in various parts of the country and the results centralized at Platt (Lower Austria) at the Leguminous Plant Breeding Station dependent from the Federal Station of Plant Cultivation and Seed Selection. In this way early varieties were bred at Platt with a growth period of 110-125 days.

"The principal varieties bred are: Platter Schwarze Soja, Platter Kleine Gelbe Soja, Platter Gelbe Riesen.

"In Austria the only varieties that may be cultivated with success are those selected in the country which have a growth period of from 130 to 145 days at the most.

"3. France. Soya was introduced into the Botanical Garden at Versailles in 1740. Several trials in cultivation have been made since 1855. L. Rouest in Aude and Charles de Carbonnières, in Tarn, carried out test of some importance from 1918 to 1925. But it was not until 1932 that the first scientific investigations were made on the possibilities of acclimatising soya in France. These researches were carried out chiefly by M.H. de Guerpel, in Basse-Normandie. The results obtained in the first year were so encouraging that it was decided to sow 5 hectares of soya in ten communes in Normandy, the principal being: Cagny, Saint-André-sur-Orne, Vieux-Fumé, Percy-en-Auge, Villons-le-Buissons, Saint-Contest, Beny-sur-Mer. The seed was taken both from the harvest of the previous year and also from seed from Poland... Yields varied from 1400 to 1800 kg per hectare.

"Another trial was made with a variety with yellow seed from Manchuria.

"In 1934 trials were made in the Department of Eure with the variety Tokio with black seeds.

"4. Great Britain (and Colonies). One of the first tests in acclimatisation of soya in Great Britain took place at the Royal Botanical Garden, Regents Park, in 1914. During these tests Mr. North found that certain varieties were sufficiently early to mature at the end of September. By careful selection with these varieties for several years lines were obtained which were particularly early. In 1928, a hybrid was introduced from Canada which proved to be earlier than any of the 60 varieties tested up to that time. By sowing the seed the first week in May it was possible to harvest the beginning of September. Good results were obtained in Middlesex, Essex, Berkshire, Oxfordshire and Hampshire.

"The most important researches were made at Boreham in Essex in 1933 where 47 varieties were grown originating from North America, Canada, Manchuria and Japan. Trials were also made with the varieties already bred by Mr. North. Interesting results were obtained.

"The investigations were continued in 1934 with the 4 best varieties acclimatised, known as Jap, 'C,' 'O,' and 'J.'

"6. Italy. Sporadic trials in soya growing were made in Italy from 1740 to 1880, but it was chiefly at the beginning of this century that an attempt was made to introduce this crop into the national economy. Soya has been the object of patient and continuous research at the Bonafous Institute in Turin, where two varieties were selected, well adapted to the region, one with yellow and the other with green seeds, large and spherical in shape. In the district of Spoleto, the Marquis G. Marignoli obtained good results, in 1926, with this plant and is of the opinion that soya cultivation for seed production would be completely successful in Puglia and the

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South. He found that the American variety Mammoth Yellow is easily acclimatised in Central Italy and he has undertaken mass selection of this variety which is of great importance on account of its precocity and yields. In respect of forage production, he has successfully experimented with a variety with green seeds which, owing to its great development, is doubtless the same as the variety that gave good results in Piedmont. According to information received from the Director of the Travelling Chair of Agriculture of Cagliari, similar trials have been made in the Sanluri farm and certain other private farms. In 1928, a Yellow Japanese variety gave 3.3 quintals of seed per hectare at Sanluri. This same variety, grown at Santa Margherita di Pula, only gave 2.3 quintals. At Simacis, in 1919, a light coloured variety of soya yielded 3 quintals per hectare. In the experimental plots of the Faculty of Agriculture of the Perugia University, small trials have been made with 4 varieties of soya which had already been tried and selected before the war by Professor Bottari at the Bonafous Agricultural Institute. Note: 1 quintal = 100 kg.

"Soya was grown for the first time at the Agricultural Station of Bari in 1921. Seeds obtained from Professor Borzi were used. This variety proved to be very productive, but rather late. In the following years Professor Pantanelli, Director of the Station, procured 45 varieties from the United States and India.

"7. Netherlands. Soya growing is not widespread in the Netherlands and only small trials in acclimatisation are carried out. It is not yet known whether soya can be grown on a remunerative basis in the humid climatic conditions of this country.

"10. Switzerland. The first trials in soya growing in Switzerland date back to the time of the Universal Exhibition of Vienna in 1873, in fact, a great quantity of soya seeds belonging to different Manchu varieties were shown. In 1878, Professor Haberlandt, who had carried out cultivation trials in various countries in Europe, made a few tests in the town of Coire [Chur]. A little later, Professor Kraemer made a few trials in Zurich for three years and published a pamphlet in 1880 giving the results obtained. In practice, soya growing had not developed and it is only recently that further efforts in soya cultivation have been made.

"At present trials are carried out solely by the Establishment of Agricultural Research of Oerlikon-Zurich, foreign varieties being the principal object of study. There are no native Swiss varieties. The first varieties tried were those obtained by the German breeder Dieckmann at Hamburg. Late an Austrian variety was introduced: Platter Gelbe Riesen, and a whole series of American varieties obtained from Professor Wiggans of the Cornell University, Ithaca. Finally, 3 Polish varieties from Vilna were introduced which, it appears, came from the Botanical Garden of Basle [Basel, Switzerland]...

"*Soya grown for seed:* There are also wide variations in seed yields. With the 22 varieties tested in 1935, they varied from 1.5 to 16.5 quintals per hectare.

"In Switzerland, forage production is the principal object of soya growing. There are, however, factories which are interested in soya for the production of foods for persons suffering from diabetes. Local production of soya cannot compete with the present imports from abroad." Address: Rome, Italy.

3257. Sano, Kunio. 1936. Miso jôzô no eiyôgaku-teki kôsatsu. X. Miso jukusei-chû no shisuchin no shôchô [Nutritional studies on miso fermentation. X. Increase and decrease of cystin during miso ripening]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 14(6):499-505. June. [14 ref. Jap] Address: Osaka Teikoku Daigaku, Kôgaku-bu, Jozogaku Kyoshitsu, Takada Kenkyu-shitsu (Hokoku #49), Japan.

3258. Breedlove, L.B. 1936. Soy bean–The magic plant: Grower, elevator, transportation and processing cost. Article XVI. *Chicago J. of Commerce and La Salle Street Journal.* July 9. p. 14.

• ***Summary:*** Contents: Introduction (profitability and acreage expansion from 1921 to 1930). Costs of soy bean production. Elevator costs. Transportation costs. Cost of processing. Capital costs of plant.

"From 1921 to 1930 soy beans were less profitable on the better land of the corn belt than were corn, wheat, alfalfa, or red clover...

"During the 20's the expansion in soy bean acreage occurred largely at the expense of the two less profitable crops–timothy and oats...

"Since 1930 the mill demand for soy beans steadily has grown. The fall in farm labor and power costs, the decline in land values, the use of higher yielding varieties and improvement in cultural methods have combined to reduce the costs of production sufficiently to make soy beans for the crushing or commercial market profitable to the farmer even in the face of the tremendous increase in acreage due largely to federal limitations of acreage for the growing of our usual grain crops."

"Cost of processing: Cost of processing a bushel of beans was reported by the United States tariff commission to be in 1923-1924 27.1 cents (factory costs 17.1 and general expense 10.0 cents). The processing cost in the Japan mills was 17.8 cents, at the mills of Great Britain 15.3 cents and at the mills of Dairen, Manchuria, 8.5 cents [by far the lowest, and only 31% of the U.S. processing cost]. The import duties of $6 per ton for meal, $1.20 a bushel for beans and $0.03½ a pound for oil, established by the traffic law of 1930 have been continued in the latter traffic schedules." Address: Staff member, Chicago Journal of Commerce.

3259. Iwamura, Iwao. 1936. Biochemical studies on "miso," fermented soy-bean paste. IV. On the effect of cystine upon the nutritive value of "miso-protein" when fed to albino rats

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as a supplement to rice. *Bulletin of the Agricultural Chemical Society of Japan* 12(7):78-88. July. (Chem. Abst. 30:7153). Bound in the front of Nippon Nogei Kagaku Kaishi (J. of the Agricultural Chemical Society of Japan). [16 ref. Eng]
• ***Summary:*** "The amount of cystine in 100 gm of fresh miso was as follows: Shiromiso 64.2, Yedomiso 45.5, Sendaimiso 50.9, Hatchomiso 93.4 mg." The content of cystine in various kinds of fresh "miso" is 0.064-0.10% and in polished rice 0.037-0.055%. The "miso" diet is slightly deficient in cystine for growth of rats. Address: Agricultural Chemical Lab., Tokyo Imperial Univ., Tokyo.

3260. Iwamura, Iwao. 1936. Determination of cystine in "shoyu." *Bulletin of the Agricultural Chemical Society of Japan* 12(7):89. July. Bound in the front of Nippon Nogei Kagaku Kaishi (J. of the Agricultural Chemical Society of Japan). [2 ref. Eng]
• ***Summary:*** "Shoyu" contains 0.0424-0.0544% cystine. Address: Agricultural Chemical Lab., Tokyo Imperial Univ., Tokyo.

3261. Miyaji, Kenji; Oguri, Motozo. 1936. Shôyu abura, tamari abura, tamari kôji abura nado fuken kabutsu-chû no bôkabi seibun ni kansuru kenkyû [Studies on antimold substances in the unsaponifiable substances of oils of shoyu, tamari, tamari koji, etc.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 12(7):661-74. July. [10 ref. Jap]
Address: Gifu Koto Norin Gakko, Nôgaku Hakase, Japan.

3262. Takata, Ryôhei. 1936. Daizu seihin no eiyô gakuteki kenkyû. I. Kôri-dôfu tanpakushitsu no eiyô-ka [Research on soyfoods nutrition. I. Nutritional value of the protein in dried-frozen tofu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 14(7):549-53. [3 ref. Jap]

3263. Sasaki, Shûiku. 1936. Studies on some constituents of soybean seeds and their transformations during germination. *J. of the Department of Agriculture, Kyushu Imperial University, Fukuoka* 5(2):51-116. (Chem. Abst. 31:4697). Aug. 3. [99 ref. Eng]
• ***Summary:*** Contents: Introduction. Methods of germination of soy-bean seeds. General analysis of nitrogenous compounds of the seeds and the seedlings by general analysis. Quantitative determination of amino-acids in the proteins of the seeds and the seedlings by the Van Slyke method. Amino-acids isolated from the hydrolysate of the protein of the seeds. Organic bases of the seeds. Monoamino-acids and acid-amide in the juice of the etiolated seedlings. Organic bases in the juice of the etiolated seedlings. Transformation of carbohydrates during germination. Starch produced during germination. Transformation of oil during germination.

Sasaki investigated the changes in composition occurring in Japanese and Korean soybean varieties during germination up to 12 days. There was no change in total nitrogen at the end of 5 and 10 days. However after 5 days, a decrease of 21% in protein nitrogen and a corresponding increase in non-protein nitrogen was observed. After 12 days of germination, 5% of the starting soybean weight was isolated as asparagine; this is in agreement with the results obtained by Dunn et al. (1948).

The total carbohydrates increased from 22.6% in the seed to 25.8% by the 5th day, based on the starting weight of the seed, and then decreased slightly to 25.1% by the 10th day. Stachyose and sucrose were used up during the first 5 days, at which time reducing sugars reached a maximum of 4.7% and then decreased. Starch and dextrin increased steadily from 0.4to 9.0%, based on the starting seed weight, during the first 10 days of germination. Petroleum ether extractables [fat] had decreased 17.0% by the 5th day and 37.0% by the 8th day of germination. From this study it appears that during the first 5 days of germination the loss in oil weight is equivalent to the gain in carbohydrate weight. Address: Dep. of Agriculture, Kyushu Imperial Univ., Japan.

3264. *Literary Digest.* 1936. Invading bean: Soya crops exported from America give Japanese case of jitters. 122:14-15. Aug. 8.
• ***Summary:*** The increase in American production of soybeans and their exportation at lower prices than the Manchukuo product are discussed. The uses for the crop in American industry are brought out, and it is said that "Manchukuo's production has dropped from 5,227,000 tons in 1931 to 3,822,00 tons in the last twelvemonth; and even the America's invasion of the world market may be, as the Japanese hope, only temporary, it has shaken them terribly."

3265. Arima, Shizuka. 1936. Nattô-kin to sekiri-kin to no kikko sayo ni kansuru jikken-teki kenkyû. I. Shiken-kan nai jikken [Investigations on the antagonistic relationship between natto bacteria and dysentery bacteria. I. In vitro (test-tube) experiments (Abstract)]. *Kaigun Gun-ikai Zasshi* (*Bulletin of the Naval Medical Association*) 25(8):509-27. Aug. 15. [27 ref. Jap]
• ***Summary:*** Describes studies on the antagonism between *Bacillus natto* and *Shigella.* Address: Kaigun Guni-Gakkô, Bôekigaku Kyôshitsu (Shunin Shibata Kyôkan).

3266. Akabori, Shiro. 1936. Shôyu no kôki seibun ni tsuite. I. [On the aroma of soy sauce. I.]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 57(8):828-31. Aug. [7 ref. Jap]
Address: Osaka Teikoku Daigaku, Rigaku-bu, Kagaku Kyoshitsu.

3267. Kaltenbach, D.; Legros, J. 1936. Soya: Selection, classification of varieties, varieties cultivated in various

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countries: Netherlands Indies (Document part). *Monthly Bulletin of Science and Practical Agriculture* (*International Institute of Agriculture, Rome*) 27(8):288T-89T. Aug.
• ***Summary:*** "In Java, the black varieties of soya are predominant; those with light coloured seeds are of importance only in a few districts, namely Tegal, Brebes, Demak, Koedoes, Loemadjang. The majority of native varieties have black seeds and mature, on an average, in 80 to 90 days.

"It appears that the predominance of black seeded varieties is due to the nature of the soil and extent of the rainfall; the varieties with light coloured seed require more water and therefore are generally found in regions with considerable rainfall, or in irrigated zones. In addition, trade is an important factor in the distribution of varieties.

"Since 1915 seeds of Buitenzorg have been selected in the Selection Garden, and native varieties have been improved. Their distribution throughout the island, from West to East, is as follows:

"Only black seeded varieties are grown in the Regency of Banojemas, Regency of Zuid-Bagelen, Regency of Salatia, Government of Djokjakarta, Government of Soerakarta, Regencies of Madioen and Ponorogo, Regencies of Ngandjoek and Kediri. Attempts are being made to introduce white seeded varieties into the last two sets of regencies. Mostly black seeded varieties are grown in the Regencies of Pati, Grobogan, and Blora (Mentik, black, is the most widely grown variety), and in the Regencies of Bangil and Pasoeroean. Both black and white seeded varieties are grown in the Regency of Pekalongan, the Regencies of Djombang, Madjokerto, and Sidoardjo, and the Regency of Djember. Most of the native varieties have white or light colored seeds in the Regency of Loemadjang (Lumadjang; in East Java), and the Regencies of Demak and Koedoes.

"Improvement trials with native varieties not having been satisfactory, trials were carried out with varieties imported from other countries and particularly from Japan, Formosa, and the United States. On the other hand, the Formosa varieties have been successful, and it is from these varieties that the selected varieties No. 27 with black seeds, No. 29 with white seeds were obtained. As has already been said, these varieties are now grown throughout the whole island.

"In 1928, the Selection Station again undertook breeding work with native varieties. With the help of experts, 82 samples of soya seed have been collected from various centres of cultivation; 52 being black, 38 white, and 2 green. Comparative trials in cultivating these varieties are being carried out at present at Buitenzorg.

"Table XXVII indicates the characteristics of the 5 principal improved varieties, bred from varieties introduced from Formosa.

"In the course of trials all the selected varieties have proved to be superior to the native varieties. Varieties No. 27 and No. 29 are superior to No. 16 and No. 17. The black seeded variety No. 27 is the best of all.

"In other parts of the Netherlands Indies, native varieties with black or white seeds and either early or late are generally grown: but in certain districts selected varieties are being increasingly cultivated, No. 27 in particular. It gives a yield higher by 3 to 5 quintals than those of native varieties, unfortunately it is not early (growth period: 90 to 95 days). The cultivation of Nos. 17-28-29 is also increasing, chiefly No. 29. These varieties give high yields, but the seeds are considered too small." Note: 1 quintal = 100 kg. Address: Rome, Italy.

3268. Kaltenbach, D.; Legros, J. 1936. Soya: Selection, classification of varieties, varieties cultivated in various countries: Oceania (Document part). *Monthly Bulletin of Science and Practical Agriculture* (*International Institute of Agriculture, Rome*) 27(8):294T-97T. Aug.
• ***Summary:*** "1. Commonwealth of Australia: A. Southern Australia. Apart from a very few trial plots, soya growing is not practised in this State as the conclusion has been reached that local climatic and soil conditions are not suitable for this crop.

"B. New South Wales. Several years ago, the Department of Agriculture tried to introduce soya into the agricultural economy of the State, either as a green manure or forage or for the multiple uses of the seed. During the last 20 years, numerous varieties have been introduced and many trials have been carried out in all parts of the country. Generally speaking, the results were not satisfactory and efforts to introduce soya into the economy of the country were not successful. The growth of the soya plant was very poor and the yields in seed low. One of the reasons why soya does not succeed seems to be the absence of the bacteria of root nodules in the soil of this State. Utilised as a spring green manure, soya is inferior to cow peas in the coastal regions. In the Table-lands soya cultivation appears to give better results.

"C. Queensland. Soya has been grown experimentally in this country for a great number of years, but the results were more or less negative and the areas now cultivated with soya are almost negligible.

"A few very tall varieties, such as Biloxi and Otootan, have proved to be suitable as forage, but they have not been adopted by farmers, who obtain forage more easily in cultivating cow peas or other leguminous plants.

"Trials in inoculating soya seeds do not appear to have given any results though other trials should be carried out in the agricultural districts before this crop can be said to be quite unsuited to this State.

"The internal market for soya and its derivatives is limited as it is supplied by imports from Manchuria and Japan.

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"Owing to the abundant production of all kinds of feeds for live-stock, the use of soya will be difficult to establish unless it is utilised in crop rotation with cotton or maize.

"D. Victoria. No systematic attempts have yet been made to introduce soya growing into this State. Various trials previously made for experimental purposes showed that this crop was not of sufficient economic interest to replace the existing crops of leguminous plants.

"In 1933, however, the Department of Agriculture undertook a series of trials in soya growing in East Gippsland...

"Imports into Australia are of no great importance. In 1932-1933, 40,808 gallons of soya [soy sauce] were imported; value £1778. Of these imports 90% came from China. During the same period 12 tons of seed were imported from Japan; value £148.

"3. New Caledonia. Soya cultivation was introduced in 1928. No native varieties are grown, only foreign varieties, seeds of which were introduced on two occasions by the Chamber of Agriculture and the Administration. The principal variety is *Soja hispida.* Medium yields are obtained. There appears to be no future for soya as New Caledonia is abundantly provided with similar products which are in current use."

Note: This is the earliest document seen (March 2010) concerning soybeans in New Caledonia, or the cultivation of soybeans in New Caledonia. This document contains the earliest date seen for soybeans in New Caledonia, or the cultivation of soybeans in New Caledonia (1928). The source of these soybeans is unknown. The history and present status of the cultivated soybean, *Glycine max* is unclear. Address: Rome, Italy.

3269. Okano, Koji; Ohara, Iwao; Kato, Jiro. 1936. Daizu abura kasu no seibun kenkyû. I. Sutakiosu oyobi isshu gotai (shibô–rinshitai–shibôsan–haibun–budo-to) no bunri, narabini sono kô-shitsu kagaku-teki seijô ni tsuite [Studies on the composition of soy-bean oil foots. I. On the isolation of stachyose and an organic complex / polymer (fat–phospholipids–fatty acids–ash–glucose) and the chemical properties of the colloidal substance]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 12(8):714-20. Aug. [7 ref. Jap]

• ***Summary:*** The foots consist of water (11%), oil (16%), stachyose (45%), and a loosely bound organic complex (24%); the last-named contains phosphatides, fatty acids (probably myristic acid), fats, inorganic acids (mainly phosphoric and silicic acid), and glucose.

Note: *Webster's Dictionary* defines silicic acid (a term first used in 1817) as "any of various weakly acidic substances obtained as gelatinous masses by treating silicates with acids." Address: Minami Manshu Tetsudo K.K. (South Manchuria Railway Co.), Chuo Shikenjo, Nosan Kagaku-ka, Kenkyu-shitsu.

3270. Ramsbottom, J. 1936. The uses of fungi. *British Association for the Advancement of Science, Annual Report.* Sept. 9-16. p. 189-218. See p. 206-08, 212. 106th year.

• ***Summary:*** This was an address to Section K (Botany) of the British Association for the Advancement of Science at Blackpool, Sept. 10, 1936. Discusses: Koumiss (effervescent drink), Egyptian Leben, Arrack, Japanese koji, shoyu, tamari, and miso, fermented tofu.

"There is a wide range of oriental foods produced by fermentation with *Aspergillus.* Chinese curd, To-fu, is made from soy-bean milk fermented with mould and ripened in brine. The curd is cut into squares which soon become covered with fungus. They are then placed in brine for further ripening. The curd is canned as white or red squares in a salty liquid."

In Japan, four large industries are built on the use of *Aspergillus oryzae.* Their approximate total yearly output is as follows: Saké (rice wine) 812,000 kiloliters, shoyu (soy sauce) 902,000 kiloliters, miso (soy cheese) 1,690,000 kilograms, and shocho (distilled alcoholic liquor) [sic, shochu or shôchû, cheap spirits] 39,700 kiloliters. The annual value of all the fermentation industries is approximately £40,000,000.

"Molds of the genus *Penicillium* play a large part in the ripening of the Camembert-Brie, and the Roquefort-Gorgonzola-Stilton series of cheeses. Milk is first coagulated with rennet or dried calf-stomach linings." Also: Mycorrhiza, Takadiastase, production of glycerin and yeasts in Germany during World War I. Address: O.B.E., President of the Botany Section.

3271. Desai, Mahadev. 1936. Soya bean for the poor. *Harijan* 4(33):259. Sept. 26.

• ***Summary:*** "Sir Courtney Terrell, Chief Justice of the Patna High Court, had a long interview during his visit to Japan with Prof. Saiki, Director of the Japanese Bureau of Nutrition, who showed him the various processes of making simple food products from soya bean for the poor people of India. Sir Courtney, it is interesting to note, writes with special reference to Bihar. The first is the preparation of *satu* [which resembles roasted soy flour] and the second is the preparation of milk. About the *satu* preparation he writes:

"'About two seers [i.e. 4 pounds] of bean preferably of the large white hard Manchurian variety, were heaped upon an iron or earthenware dish and this dish was placed over a fire, the dry beans being continuously stirred with a wooden spoon. When they assumed a golden brown colour they were allowed to cool and then ground in a small stone hand mill of the kind commonly seen in Indian prisons for preparing *atta.* The beans were reduced to a fine soft powder and the entire bean was ground without any waste. The flour so produced is already cooked and it may be used in any of the ways now known in India in connection with *satu.'*

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"The process of preparing milk that Sir Courtney describes is rather elaborate. Far simpler is the recipe by Benjamin Hansen, the well-known Viennese Food Scientist." Address: India.

3272. Nippu JiJi-sha (The Nippu Jiji). comp. 1936. Hawai nenkan [Hawaiian Japanese annual and directory (1936-1937)]. Honolulu, Hawaii: Nippu JiJi-sha (The Nippu Jiji). [Jap]

• ***Summary:*** This directory (see next page) is mostly in Japanese characters with very little English or romanization. It is read from back to front. Unlike all other directories of Japanese in the USA, this one does not give any business names. Rather it (Part II) is a directory of Japanese living in the Hawaiian Islands; for each person it gives, in Japanese, his or her name, prefecture of origin in Japan (e.g., from Hiroshima-ken; *-ken* means prefecture), and occupation in Hawaii. Thus, there are many entries for the occupation of "tofu maker." But it is not clear how we should interpret this. In 1936-37 Hawaii, a territory of the United States, was in the midst of the Great Depression. Tofu makers in Japan have traditionally lived under the same roof where they made tofu. In Honolulu (on Oahu) there are 20 entries for "Tofu maker," one for "Tofu merchant," and one for "Tofu shop" (p. 222). Many of the addresses given for tofu makers were probably the addresses of their tofu shops. Although we cannot be sure, we will assume that each tofu maker owned and operated his or her own tofu shop. There were probably 18-21 Japanese-owned tofu shops in Honolulu in 1936-37.

In smaller towns outside Honolulu (on both Oahu and the other islands), many of which were quite distant from any other town, its seems even more likely that the address of the tofu maker was also the address of his tofu shop; we will assume that it was.

We have one other powerful tool for analysis–86 existing records in this database for the names and addresses of tofu shops in Honolulu from 1923 to 1984. We have tried to match up those names and/or addresses to the names and addresses given in this 1936-37 Hawaiian directory in order to link a name here with an existing shop.

Contents: Four unnumbered pages of ads. Fold-out maps of Honolulu and of the Hawaiian Islands. Pages 1-7: Table of contents. 12 unnumbered pages of monochrome photos.

Part I: Pages 1-274: Overview of economy of Honolulu. Geography, history, population and occupations, elections, military, law, jails, budget, taxes, sanitation, industries, fishery, airline industry, construction industry, import / export, banks and financial institutions, insurance industry, air time, radio, transportation, postal ad telephone information, religions, churches, athletics / sports, literature, entertainment. Organizations on various islands: Honolulu, Oahu, Hawaii, Maui, Kauai, Molokai, Lanai. Newspapers and magazines (Honolulu), list of people who died last year, information about regulations and laws, Japanese council members on various islands, holidays, time, phone rates, gas and water prices, Japanese holidays, Japanese year names, etc.

Part II: Directory of Japanese in Hawaii. Honolulu (p. 1-228). Island of Oahu (p. 1-54). Island of Maui (p. 1-52). Islands of Lanai and Molokai (p. 1-8). Island of Kauai (p. 1-44). Island of Hawaii (the big island, p. 1-96). Kona and Kau, on the Island of Hawaii (p. 1-20). Publication information (p. 21). Hotel ads on p. 22-24. Address: 920-928 Nuuanu St., Honolulu, Territory of Hawaii.

3273. Ishimaru, Yoshio. 1936. Shôyu jôzô-jô kûki-chû no kinga ni tsuite [Microorganisms in the air in shoyu breweries]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 14(9):737-50. [Jap]

3274. Kibi, Masajiro. 1936. Shôyu jôzô-yo kôji-kin ni tsuite. I. Kakuchi jôzô-jô shiyô-kin no keitai [On the koji molds used in shoyu fermentation. I. Morphology of Aspergilli used for brewing in several provinces]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 12(9):885-97. Sept. English-language summary in Bulletin of the Agricultural Chemical Society of Japan 13(8):130-31, bound at the front of Nippon Nogei Kagaku Kaishi. [12 ref. Jap]

• ***Summary:*** The author isolated 54 strains of molds from many samples of koji, the starter used in manufacturing shoyu (Japanese soy sauce). Morphological and physiological investigations show that these molds belong to 28 varieties of *Aspergillus oryzae.* A table shows the morphological characteristics of these 28 varieties, including length of stalk in mm, and diameter of conidia in micrometers. General characters: Colonies green. Stalks colorless and not septate. Outer walls of stalks pitted or rough (except No. 6). Vesicles globose or subglobose. Sterigmata in 1 series. Conidia globose. Conidial wall smooth at first (except No. 6). Address: Yamasa Shoyu K.K. Kenkyusho, Biseibitsu Jikkenshitsu, Japan (Microbiological Lab. of Yuasa Shoyu Co.).

3275. Morse, W.J. 1936. Soybeans in the United States: In relation to world production and trade. *Proceedings of the American Soybean Association* p. 55-64. 16th annual meeting. Held 14-16 Sept. in Iowa. [2 ref]

• ***Summary:*** The slow advance of soybean "cultivation in Western Countries was undoubtedly due to the lack of adapted varieties for various soil and climatic conditions. Increase of acreage and production in the United States is closely correlated with the introduction of varieties from the Orient. In less than thirty years the acreage of soybeans in the United States has increased a hundred fold–from about 50,000 acres in 1907 to nearly 5½ million acres in 1935. During this period the United States Department of Agriculture has brought about 10,000 introductions of

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soybeans from the soybean regions of the Far East and the culture of the crop has spread from a few states in the early days to twenty-seven states at the present time.

"In Manchuria, often called 'the land of beans,' the soybean is grown to a greater extent than in any other country. It occupies about 25 per cent of the cultivated area and is relied on by the Manchurian farmer as a cash crop. With its rise as an international trade commodity, it is truly the 'Wealth of Manchuria.' Chosen [Korea] and Japan are large producers and southward from China the soybean is cultivated to some extent in India, Siam [later renamed Thailand], the Philippines, Cochin China, and during the past decade the production has nearly doubled in the Dutch East Indies. In Siberia extensive experiments have been under way to extend the cultivation of the crop but progress has been slow and Siberian beans have not yet been a factor in international trade.

"The production of soybeans in the Western World is concentrated largely in the Corn Belt States of the United States. Beginning with the experiments of Haberlandt in Austria in 1877, the soybean has been grown experimentally in most of the European countries but in general the climatic conditions are not well suited to its culture with the possible exception of certain regions, such as the Ukraine in the U.S.S.R. Varying degrees of success have been obtained in different regions of Africa, especially South Africa where yields of 25 to 35 bushels per acre have been obtained. Experiments in nearly all South American countries and Mexico have shown some successful results [as] in Argentina and Cuba but acreage is not extensive. In Canada, considerable interest had been shown in the crop but its culture–about 15,000 acres–is confined chiefly at present to the Province of Ontario. The future trend of the crop for commercial purposes undoubtedly will be concentrated largely in the United States, Canada, and certain regions of the U.S.S.R."

A table (p. 56) shows the increase in production of soybeans (in million bushels) during the 10-year period from 1925 to 1935 in the world's top five producing countries: Manchuria 92.67 -> 140.4. United States 5.190 -> 39.64. Chosen (Korea) 18.72 -> 21.96. Japan 18.31 -> 13.31 (1933). Netherland India [later Indonesia] 3.536 -> 6.676 (1934).

"Bean trade was an ancient and flourishing institution when the ports of China were first opened to the commerce of the Western World. In 1835, Newchwang (Yingkow, Yingkou), in South Manchuria, was an important port of shipment for the great coastal trade in beans, bean cake, and bean oil to the ports of southern Chinese provinces and other oriental regions. Manchuria is still the chief source of world trade in soybeans and from here the beans and bean products oil and cake move principally to other provinces of China, Japan, the Philippines, the East Indies, and to other countries of Northwest Europe. In 1908, about 7,000,000 bushels of beans were shipped out through the port of Dairen, chiefly to Chinese and Japanese ports. For the period 1925-1929, the average annual shipments to China, Japan, and European countries were 62,353,566 bushels. The first successful shipment from Manchuria to Europe was made to an English oil mill in 1907, and as an important source of vegetable oil and animal feed the beans soon found a market not only in English oil mills but in other European countries and America. Since 1931, when American-grown soybeans were first exported to European markets, chiefly to the oil mills of Germany, there has been an open European market to the American farmer. With economical methods of production and high quality beans, America is in a position to compete for the 50,000,000-bushel trade in European markets."

Two tables (p. 58) show international imports and exports of soybeans by major trading countries for an average 5-year period (1925-29) and for 1934. The leading importers in 1934 (preliminary, with imports in million bushels) are: Germany 33.57. Japan 20.29. Denmark 9.910. United Kingdom 6.615. Netherlands 4.695. Sweden 3.426. Italy 0.739. United States 0.006. The leading exporters in 1934 are: Manchuria 44.21 (down from 62.35 in 1925-29). Japan 0.025. Netherlands 0.0009.

"In recent years, the oil milling industry of Manchuria has declined quite markedly. During the height of processing beans for oil and cake, more than 90 mills were in operation, while late in 1930 not more than 25 mills were crushing beans. The decline in this industry has been due chiefly to a decreased demand for bean cake as fertilizer, the low price of silver, and almost the entire suspension of bean oil export due to the development of the oil extraction industry in Europe. In European countries it has become more profitable to import soybeans than to import bean oil."

Two tables (p. 59) show international imports and exports of soybean oil by major trading countries for an average 5-year period (1925-29) and for 1934. The leading importers in 1934 (preliminary, with imports in million lb) are: Netherlands 44.00. Belgium 27.60. United Kingdom 24.13. Austria 22.07. Morocco 20.28. Sweden 12.55. Also listed are: Norway 8.701. Algeria 0.004. The leading exporters of soybeans in 1934 (preliminary, with imports in million lb) are: Manchuria 122.6. Denmark 41.80. Netherlands 26.05. Germany 24.99. Sweden 8.98. Japan 7.95 United States 2.040.

"Practically all exports of soybean cake and meal have originated in Manchuria and average about 1,375,000 tons for the five-year period 1926-31. About 70 per cent of this exportation went mainly to Japan, Chosen, and China. Cake and meal shipments to European countries went chiefly to Germany, although considerable quantities were exported to Denmark, Sweden, the Netherlands, and Finland. The average importation of soybean meal and cake into the United States for the five-year period 1930-1935 was 31,726 tons."

"The rise of the soybean to a crop of special importance

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in the world's commerce and in the industry of the United States is one of the most remarkable agricultural developments of recent times." Address: Bureau of Plant Industry, USDA, Washington, DC.

3276. Slawson, H.H. 1936. Agriculture's Jack of all trades: Introducing the versatile soybean with which you may either build automobiles or run them and in which many people see possibilities for farm relief without benefit of subsidy. *Nation's Business* 24(9):24-26, 94. Sept.

• ***Summary:*** Contents: Introduction. A program for soybeans (Regional Soybean Laboratory, Urbana, Illinois). Wood glue from soybeans (I.F. Laucks). Helps bread stay fresh. A twenty-year development.

Five years ago at the Univ. of Illinois soybean researchers searched the USA and Canada for commercial soy products; they collected about 100. "Today that list numbers more than 300 and the ball seems just beginning to roll."

On 1 July 1936 a systematic research program on soybeans was started at the University of Illinois at Urbana. Funded by the federal government, with 12 midwestern state agricultural colleges cooperating, an industrial research laboratory as been established in Urbana. Dr. O.E. May of USDA's Bureau of Chemistry has been placed in charge, with the "help of Dr. W.J. Morse, government scientist, who has made the study of soybeans his life work." The program will have three objectives: "1. Improvement of present industrial uses and development of new industrial uses for soybeans." 2. Research on the effects of different processes on the quality and quantity of soybean processes. "3. Facilities for testing different varieties as to adaptability for industrial use."

In 1930 a research chemist in a private laboratory developed a new method for improving the head of foam on beer–using soy flakes. "Today soybean beer flakes are being made on a commercial scale in Chicago and from there they are pouring into many of the country's biggest breweries."

In the Pacific Northwest, five new fir plywood factories (making a total of 23) have been constructed this year–because glue made from soybeans is less expensive than and superior to (incl. more water resistant) traditional plywood glues. Together with several pine plywood factories in California and British Columbia, they are using tons of the new soybean glue each day.

The initial impulse for this new industry came from automobile manufactures who complained that the plywood they were buying was not sufficiently water resistant. So the Pacific Coast Plywood Manufacturers Association sponsored a contest to find a new glue. A newcomer, I.F. Laucks, Inc., of Seattle [Washington], won with some soupy stuff that did not look like glue at all. And "today this soybean glue–its formula a trade secret–is the standard glue of the plywood industry. Mr. Laucks discusses the reasons for the success of this new glue: (1) Most important is its low cost. (2) Since soybeans are an annual crop, "production can be increased as the demand grows. This is not true of casein or blood, which are by-products of other industries more or less fixed in their production." (3) It is more uniform. (4) It is more "foolproof" than other water-resistant bases.

At Iowa State College, Dr. O.R. Sweeney is producing gasoline from soybean oil; he cracks it by heating to 350ºC using animal charcoal as a catalyst. He then distils one of the fractions. The first person to make petroleum from soybean oil was the Japanese scientist Satow, who made a calcium soap from the oil then subjected it to destructive distillation to get light, middle, and heavy grades of petroleum. Forty gallons of soybean oil yielded about 25 gallons of soybean petroleum, 33 pounds of glycerine (for use in explosives), and 480 cubic feet of combustible gas.

The U.S. paint industry was one of the first to make large use of soybeans–especially in Illinois. Soybean flour helps bread to stay fresh longer. Soybean lecithin is used by confectioners. Tanners use soybeans to increase the grease-absorbing properties of chrome leather. Textile manufacturers use it to make their fabrics soft, supple, and lustrous. It is also used by rubber makers, linoleum makers, soap makers, and sausage and wiener makers. Doctors prescribe soybean 'milk' (which is practically free of starch) for some babies and many diabetics. Even the family dog now consumes soybeans, which are less expensive than meat and make his [or her] coat sleek and shiny.

"Not half the story of this amazing development has been told here. U.S. soybean production jumped from around 5 million bushels in 1925, to 18.6 million in 1934 and 39.6 million in 1935. Illinois is the leading sate.

"Almost two decades ago, when the first president of the American Farm Bureau Federation, James R. Howard, was beginning that organization's constructive efforts to aid agriculture by other means than politics, he made a remark which is just beginning to be appreciated at its full significance.

"'The surest relief for agriculture,' Mr. Howard said, 'will come from the production of new agricultural output that will go to industry rather than to the human stomach.'

"The response to that, so far as soybeans are involved, is seen in a recent government statement that at present more than 120 industrial concerns are making soybean products. They include about 35 soybean mills in ten states and a number of cottonseed mills which crush soybeans for oil and meal; 15 soybean flour mills; 20 soybean food products factories and more than 50 plants where various industrial commodities are fabricated from the magic soybean.

"It looks as if industry is beginning to know its beans."

Photos show: (1) A tractor in a field of piles of soybean hay pushing a device designed to speed the job of getting the hay to the baler. (2) A warehouse in Manchukuo filled with piles of round soybean cakes. Two men are carrying

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3-4 each on one shoulder up a wooden ramp. (3) A workman standing by a vat filled with a thick white liquid. "The first step in making auto parts is to feed the [soy] bean fibers into the rills that mix them." (4) Black auto parts grown on the farm, with a pile of some soybean powder that has not yet gone to the press. (5) "Powdered soybean fibers fed into this press come out in the form of distributor terminal plates for automobiles."

3277. Chamberlin, William Henry. 1936. Youth to improve living in Japan's poorest area: Courses for youthful farmers help to develop Tohoku. *Christian Science Monitor.* Oct. 21. p. 5.
• ***Summary:*** "... the customary simple Japanese breakfast of rice, beancurd soup and pickles..." A map shows northern Japan, including Hokkaido.

3278. Kondo, K.; Mori, S. 1936. Daizu no shitosuterin d-gurushido ni tsuite [Sitosterol-d-glucoside of soybeans]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 57(10):1128-31. Oct. [5 ref. Jap]
• ***Summary:*** The authors isolated this sitosterol from soybeans.

3279. Matsumoto, K.; Takahashi, T. 1936. Beikoku riyô shôyu jôzô shiken [The utilization of rice for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 124. p. 329-42. Oct. [Jap]
Address: Nôrinshô Itaku Shôyu Jôzô Shiken.

3280. Matsumoto, K.; Takahashi, T. 1936. Genmai oyobi fusuma shiyo shikomi shôyu jôzô shiken [The utilization of rice and wheat bran for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 124. p. 343-53. Oct. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

3281. Lehmann (R.) Co., Ltd. 1936. Display ad: The finest appetiser you can include in any meal: Kikkoman. *Observer* (*London*). Nov. 22. p. 21.
• ***Summary:*** "A product of the wonderful Soya Bean, rich in Vitamins A, B and D. Kikkoman assists the gastric juices in correct assimilation of food. It induces healthy appetite, nourishes the blood stream, and tones up the system..."
Note: This is the last mention of Kikkoman seen (Sept. 2008) in the *Observer* (London) or *Manchester Guardian* until Nov. 1981. Address: Peninsular House, Monument St., London, E.C. 3.

3282. International Institute of Agriculture (IIA). 1936. Use of leguminous plants in tropical countries as green manure, as cover and as shade. Villa Umberto 1, Rome: IIA. 262 p. See p. 124-25, 130-31, 209-10. Index. 24 cm. [50+* ref]
• ***Summary:*** In the Belgian Congo, Lupins and *Soja hispida* are practically the only plants used in Kivu as soil improvers in coffee plantations. "*Soja hispida* was introduced in 1931, it gives very good results in the coffee plantations as green manure. This plant yields 25,000 kg. of green material per hectare, and sows itself in such a degree as to ensure the establishment of the crop. It gives results even in districts where the lupin will not grow" (p. 124-25).

Page 131 notes, in the chapter on "Tea," that in about 1905, on the suggestion of Dr. H.H. Mann, the first Scientific Officer employed by the India Tea Association, Mr. Claud Bald of Tukvar Tea Estate, Darjeeling [as of 1994 in West Bengal, India], introduced *Glycine soja* as a green crop in the hill districts. It is listed as one of the leguminous plants (ground crops) now commonly used for shade and green manure in tea cultivation.

Pages 209-10 describe the use of *Glycine max* Merr. in 10 tropical countries: "India: In Assam, it is grown as a garden crop in the hills, has been tried as a green manure for sugarcane in limed soil with success. It is used as a rotation crop with sugarcane, and also as a green manure in Bihar. In Patna, it is cultivated as a fodder crop and green manure plant, grown in rotation with spring cereals. In the United Provinces, it is sparingly cultivated for its pods which are used as green vegetable. Introduced within comparatively recent times into Bombay; not used as a green manure, established in an acclimatisation station, but has not got beyond that stage of introduction. Only sparingly cultivated in Punjab for its fruit, not used in any other way. Grown only for seed in Burma, never as a cover or green manure plant, date of introduction unknown, probably indigenous. Used for green manuring of tea in the Darjeeling districts. At Tocklai, the plant was found to do best in shady places; it is considered very effective in keeping down weeds and preventing soil erosion.

"Ceylon: A white-seeded variety is reported to have made good growth at Peradeniya, but on another occasion, the crop was completely destroyed by Kalutara snails.

"Netherlands Indies: Has long been cultivated in Java, and is now almost universally grown in the drier parts of the island. It is to be recommended as a green manure for rubber and also for perennial plants. Experiments are being carried out on its use as a green manure for irrigated rice at high altitudes, where other green manure plants (*Crotalaria juncea, C. anagyroides, Tephrosia candida*) have not such a vigorous growth. It is too soon to obtain any results.

"Philippines: It has long been grown in the Batangas Province and is of considerable local value as a food. Its use as a green manure and as a temporary cover crop is of recent date. When grown on rich soils, covers spacings of 60 cm. The crop was found very productive in Bukidnon and Lanao, below 700 metres altitude.

"Mauritius: Introduced many years ago, but not much grown in the island; not utilized as a green manure.

"Nyasaland: Used as a rotation crop with tobacco and

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cereals, and also in various other ways; good results are obtained.

"Sierra Leone: It was introduced from Russia in 1913 and from England in 1928, but without success. Note: This document contains the earliest clear date seen for soybeans in Sierra Leone, or for cultivation of soybeans in Sierra Leone (1913) (one of three documents). The source of these soybeans was Russia.

"Belgian Congo: Introduced into Kivu in 1931; gives very good results when utilized as a green manure for coffee. It furnishes about 25 tons of green material per hectare; it is self-sowing; results are obtained where even the lupin will not grow. At Uele, it was found to be of little value, being too susceptible to disease and it is also a host plant for *Helopeltis.*

"Trinidad: Occasionally cultivated as pulse, but is not used at all for other purposes.

"Peru: Experiments are now being carried out for the acclimatisation of this species."

At the end of this book is an excellent "Index of leguminous plants" with scientific names only listed alphabetically. Includes: *Arachis hypogea* Linn, p. 155, 178. *Psophocarpus tetragonolobus* D.C., 237. *Pueraria Thunbergiana* Benth, see *P. hirsuta* Schneider. p. 238.
Address: Rome, Italy.

3283. Nishino, Ryûtarô. 1936. Daizu seihin no eiyôgaku-teki kenkyû. II. Daizu fuosufuachiido no eiyô-ka [Studies on the nutritional value of soybean products. II. Nutritional value of soybean phosphatides]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 14(11):918-21. [7 ref. Jap]
Address: Osaka Teikoku Daigaku, Kôgaku-bu, Jôzôgaku Kyôshitsu, Takada Kenkyûshitsu, Osaka, Japan.

3284. Russell, Lindsay. 1936. Beneficent soybean. *New York Times.* Dec. 6. Section 4. p. 8.
• ***Summary:*** Russell believes that "John Havens, a miller in Beaufort County, was the first to bring the soybean to North Carolina, and the experiments of August Heckscher resulted in bringing the soybean to the attention of the Midwest." Note 1. Russell (who is probably wrong) does not say when Havens first brought soybeans to North Carolina or from whom he obtained his soybeans. Note 2. The city of Washington is the capital of Beaufort County, in eastern North Carolina on the Pamlico River. The Havens Oil Co. in Washington, North Carolina, first crushed soybeans in 1916 (C.B. Williams, Dec. 1916; E.G. Funk, 1949).

Although the soybean originated in China, "it remained for Japan to vastly extend the use of the soy bean and introduce it to the world... In 1905 Japan turned the South Manchurian Railway into a Department of Agriculture and started a drive to develop the soy bean..." Also mentions tofu (also called "milk curd") and "mesu" (probably miso) "a six-month ferment and substitute for lactic acid milk." Address: Wilmington, North Carolina.

3285. *Detroit News.* 1936. Perry first to bring soybean to America. Dec. 13. Section 1. p. 25, col. 4.
• ***Summary:*** "In 1853 when Commodore Matthew Perry sailed from China with the American fleet, he had in his sea chest a vegetable which, some 60 years later, was to prove of extraordinary character–the soybean." It was long treasured in the Orient for use as a food. Today it is used to make shortenings, baked goods, confectionary, cereal, beverages, paper, animal foods, cosmetics, and countless other products. "The oil from this bean is used extensively [in the USA] in the production of paints and varnishes."

3286. Akabori, S.; Kaneko, T. 1936. Shôyu no kôki seibun ni tsuite. II. Shôyu-chû no ganryû kôki busshitsu no bunrui oyobi gôsei [On the aroma of soy sauce. II. Isolation of (r-methylmercapto)-propyl alcohol and its synthesis]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 57:832-36. [6 ref. Jap]

3287. Fukai, Tôshi; Takahashi, T. 1936. Anmoniumu en-rui tenka shôyu jôzô shiken [Brewing trials of soy sauce with the addition of several ammonium salts]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 124. p. 261-67. [Jap]
Address: Jozo Shikensho. 1. Gishu; 2. Moto Joshu.

3288. Fukai, Tôshi; Takahashi, T. 1936. Sangen-shiki shôyu jôzô shiken. III. [A new special method of soy sauce manufacture III.]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 124. p. 246-56, 257-60. [Jap]
Address: Jozo Shikensho. 1. Gishu; 2. Moto Joshu.

3289. International Association of Seed Crushers. 1936. Copenhagen congress 1936. Reports from various countries... London: William Brown & Co. Ltd., printers. 51 p. [Eng; Fre]*
• ***Summary:*** Information on imports and/or exports of peanuts are given for the following countries: Belgium, Denmark, Egypt, France, Germany, Great Britain, Holland, Japan, Sweden, Switzerland.

3290. Iwamura, I. 1936. Shôyu-chû no shisuchin no teiryô [Determination of cystine in shoyu (Abstract)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 31(10):84. [1 ref. Jap]
• ***Summary:*** Abstracted from the *Bulletin of the Agricultural Chemical Society of Japan* 12(7):79 (1936). Cystine (German: cystin) is a crystalline amino acid that is widespread in proteins (as keratins) and is a major metabolic sulfur source.

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3291. Iwamura, Iwao. 1936. Daizu ?? o hakkô shita miso no seikagaku kenkyû [Biochemical study on miso made with soybean cake (Abstract)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 31(10):85. [Jap]
• ***Summary:*** Abstracted from the *Bulletin of the Agricultural Chemical Society of Japan* 12(7):78-88 (1936).

3292. Iwata, Hisaaki; Kumaya, Jiro. 1936. Tochi miso oyobi nara miso ni tsuite. Kyûko shokuhin no eiyô-gaku-teki kenkyû. VI. [Miso from the seeds of the horse chestnut and Japanese oak. Nutritional studies on famine-relief foods. VI.]. *Ryoshoku Kenkyu* (*J. of the Institute of Dietary Science*) No. 121. p. 459-67. [5 ref. Jap]
• ***Summary:*** The horse chestnut (also called buckeye or Chinese chestnut; *Aesculus hippocastanum*) has large glossy brown seeds that can be used to make miso, called Tochi Miso. The acorns of the Japanese oak (*Quercus glandulifera*) can be used to make Nara Miso. Address: 1. Nôgaku Hakase.

3293. **Product Name:** Soyalex (Lecithin).
Manufacturer's Name: Manchuria Soya Bean Industry Co.
Manufacturer's Address: Dairen, Manchuria.
Date of Introduction: 1936.
New Product–Documentation: Akagi, Roy. 1936. Bean Oil Industry in Manchuria. South Manchuria Railway Co. 1937. Bean Oil Industry in Manchuria. p. 2. "A new process of extracting oil by using alcohol as solvent was recently discovered by the Central Laboratory of the South Manchuria Railway Co. This method is now utilized by the Manchuria Soya Bean Co. at Dairen." p. 4. This method produces the largest amount of oil of fine quality, and the best quality cake for use as food or feed. It is the only method that "produces priceless lecithin as a by-product."

W.J. Morse. 1940. Proceedings of the American Soybean Assoc. p. 74. "A sample of 'Soyalex' recently received from Japan was said to contain not less than 60% pure lecithin."

3294. Matsumoto, K.; Takahashi, T. 1936. Genmai shiyô shôyu jôzô shiken [Utilization of unpolished brown rice for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 124. p. 225-34. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

3295. Matsumoto, K.; Takahashi, T. 1936. Genmai oyobi fusuma shiyô shikomi shôyu jôzô shiken [Use of unpolished brown rice and wheat bran for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 124. p. 343-53. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

3296. Matsumoto, K.; Takahashi, T. 1936. Genmai shiyô-ryô hikaku shôyu jôzô shiken [Comparison of various quantities of unpolished brown rice used for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 124. p. 355-67. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

3297. Matsumoto, K.; Takahashi, T. 1936. Shôbo ôyô moromi renyô shiken [Use of the yeast and bacteria from shoyu moromi (mash) for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 124. p. 235-40. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

3298. Matsumoto, K.; Takahashi, T. 1936. Daizu, genmai, shiro nuka shiyô shôyu jôzô shiken [Utilization of soybeans, unpolished brown rice, and its white rice bran for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 124. p. 369-75. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

3299. Matsumoto, K.; Takahashi, T. 1936. Kôryan shiyô shôyu jôzô shiken [Use of kaoliang as raw material for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 124. p. 241-47. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

3300. Matsumoto, K.; Takahashi, T. 1936. Genmai niji shikomi shôyu jôzô shiken [The application of unpolished brown rice for shoyu brewing, using it partially as steamed rice and as koji]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 124. p. 335-42. [Jap]
• ***Summary:*** This method uses equal amounts of steamed brown rice and brown rice koji. The meaning of *niji shikomi* (double brewed) is not clear. Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

3301. Matsumoto, K.; Takahashi, T. 1936. Genmai shiyô koikuchi shôyu jôzô shiken [Utilization of unpolished brown rice for the manufacture of regular (*koikuchi*) shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 124. p. 383-87. [Jap]
Address: Jozo Shikensho. 1. Gishi; 2. Moto Joshu.

3302. Michioka, Taro. 1936. Hokuman ni okeru kansô furyô daizu torihiki jôtai [The business and trade situation with poorly dried soybeans in northern Manchuria]. *Minami Manshu Tetsudo K.K., Hokuman Keizai Chosajo. Hokkei Keizai Shiryo* (*South Manchuria Railway Co., North Manchuria Economic Survey Office, Economic Documents*) No. 29. 41 p. [Jap]*
Address: Dairen, Manchuria.

3303. *Minami Manshu Tetsudo K.K., Keizai Chosakai, Keicho Shiryo* (*South Manchuria Railway Co., Economic Survey Div., Economic Survey Documents*). 1936. Chûgoku daizu seisan tôkei hyô [Chinese soybean production statistics]. No. 110. 43 p. (Shanghai Office). Includes 32

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color maps. [Jap]*
Address: Shinkyo (Ch'ang Ch'un), capital of Kirin [Jilin] province, Manchuria.

3304. *Minami Manshu Tetsudo K.K., Keizai Chosakai, Ritsuan Chosa Shorui* (*South Manchuria Railway Co., Economic Survey Div., Economic Survey Documents*). 1936. Tokusan torihiki no tôsei oyobi kaizen hosaku [Plans and policies for the regulation and improvement of business and trade in Manchurian special products]. No. 8-hen, No. 2-kan. 226 p. [Jap]*
Address: Shinkyo (Ch'ang Ch'un), Manchuria.

3305. Miyata, K. 1936. [Pilot test of miso-tamari with special microorganisms]. *Aichi-ken Kogyo Shikenjo* 8:67-. [Jap]*

3306. Nagata, Hisajiro. 1936. Ooshû shijô ni okeru Manshû daizu no chii [The place of Manchurian soybeans in the European market]. *Minami Manshu Tetsudo K.K., Chihobu, Shokoka. Rondon Chuzaiin Chosa Hokoku* (*South Manchuria Railway Co.*) No. 2. 93 p. [Jap]*
Address: Dairen, Manchuria.

3307. Nishida, Kotaro. 1936. ni, san tokushu jôzô butsu no kagaku-teki kenkyû: Sotetsu shôyu [Chemical studies on several specialty fermented products: Cycad shoyu]. *Kagoshima Koto Norin Gakko Gakujutsu Hokoku* (*Bulletin of the Kagoshima Imperial College of Agriculture and Forestry*) 11:209-224. [Jap]*

3308. Oota, Kiyoshi. 1936. Shôyu no kabi-dome-zai ni tsuite. Inshokubutsu bofuzai no kenkyû, sono roku kara kyû [On the anti-mold substances for shoyu. Research on preservatives for beverages, 6-9]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 31(1):20-29; 31(2):90-101; 31(3):102-14; 31(4):127-48. [81 ref. Jap]
Address: Igaku Hakase.

3309. Shioiri, Eiji. 1936. [The enzymatic studies of miso, amylase of miso]. *Kanagawa Ko-Shi* 6:3-. [Jap]*

3310. Shoji, Kenjiro. 1936. Shôyu no kôki. II and III. [Flavor of shoyu. II and III.]. *Rikagaku Kenkyujo Hokoku* (*Report of the Institute of Physical and Chemical Research*) 15(3):166-70; 15(4):223-29. [11 ref. Jap]

3311. Shoji, Kenjiro. 1936. Shôyu no kôki. III. [Flavor of shoyu. III.]. *Rikagaku Kenkyujo Hokoku* (*Report of the Institute of Physical and Chemical Research*) 15(4):223-29. [11 ref. Jap]

3312. Soma, Z. 1936. [Detection of dulcin in shoyu]. *Nippon Eiseikagaku* 1:12-. [Jap]*

3313. Suminoe, K. 1936. Shôyu kabi-dome-zai no hikaku kenkyû [Comparative studies of anti-mold substance of shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 31(11):990-94. [Jap]
Address: Nodai Kyoju, Nôgaku Hakase.

3314. Takahashi, Teramasu. 1936. Kyû Toshi Tetsudô o chushin to seru Hokuman daizu [Northern Manchurian soybeans with focus on the Old Eastern Branch Railway]. *Minami Manshu Tetsudo K.K., Hokuman Keizai Chosajo. Hokkei Chosa Kankosho* (*South Manchuria Railway Co., North Manchuria Economic Survey Office*) No. 3. 142 p. [Jap]*
Address: Manchuria.

3315. Wang, Tiao-Hsin; Ni, Sung-Mou. 1936. Chemical studies on the manufacture of soy bean sauce by the Kwantou process. *Hua Hsueh Kung Ch'eng* (*J. of Chemical Engineering, Tientsin*) 3:284-96. [20 ref. Eng]
• ***Summary:*** Based on a thesis presented by Mr. Ni to the Faculty of Fukien [Fujian] Christian University in partial fulfillment of BA degree, January 1936. Because the importance of soy sauce, both economically and in the human diet, many scientific studies on its method of production have been carried out in recent years, in both Japan and China. "However the major amount of research on soy bean sauce was confined to the finding of means by which time for fermentation might be shortened, since either by the original Chinese of by the Japanese methods the time required to carry out fermentation was about 1 year. As a result of these efforts, about 120 new modifications on the process have been proposed and 110 of them patented. A critical study made by Togano (1931-34) on these modifications revealed that nearly all of them have but little practical value. The one that deserves special mention is Togano's process which has been widely used in Japan and which is recently introduced to China under the name of 'Y-type' process."

"The Kwantou process of soy beans sauce manufacture uses soy bean alone as its raw material and carries out the fermentation at room temperature for not more than 3 months, yielding a product of high quality and of a flavor superior to that obtained by Togano's method. In spite of all these superiorities, the Kwantou process is little known and it has not received the attention it deserves."

In the first stage of manufacture using the Kwantou process (the preparation of koji), the main changes are hydrolysis of the protein and carbohydrate of the bean meal by molds. The subsequent washing and soaking of the koji (unique to the Kwantou process) results in the removal of mold mycelia which would, if retained, give an unpleasant flavor to the sauce. The loss of enzymes is regained in the second fermentation. In the final fermentation, when the koji is mixed with common salt (NaCl) in wooden vats,

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further protein and carbohydrate decomposition occurs. Concentration of raw soy bean sauce by heating was accompanied by chemical changes which will be of much interest for further study. The fat constituent of soya beans has no important role in the processes of manufacture. Address: Dep. of Chemistry, Fukien [Fujian] Christian Univ., China.

3316. Akabori, Shiro. 1936. Shôyu no kôki seibun ni tsuite. I. [On the aroma of soy sauce I. (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 12:A286. [1 ref. Jap]
• ***Summary:*** Abstracted from *Nippon Kagaku Kaishi* 57(8):828-31 (1936).

3317. Akagi, Roy Hidemichi. 1936. Bean oil industry in Manchuria. New York, NY: South Manchuria Railway Co., Nyuyoku Jimusho. 38 p. English section. See also April 1937 edition with same author and title. [Eng]*
Address: New York.

3318. Arima, Gen. 1936. Nattô-kin to sekiri-kin to no kikko sayô ni kansuru jikken-teki kenkyû. I. Shiken-kan nai jikken [Investigations on the rival or antagonistic relationship between natto bacteria and dysentery bacteria. I. Test tube experiments (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 12:A260. [1 ref. Jap]
• ***Summary:*** Abstracted from Kaigun Gunikai Zasshi 25:509-527 (1936, Aug). Describes studies on the antagonism between *Bacillus natto* and *Shigella.*

3319. Colegrove, Kenneth W. 1936. Militarism in Japan. Boston and New York: World Peace Foundation. 78 p. See p. 45. Series: World Affairs Books No. 16. 21 cm.
• ***Summary:*** "General Sadao Araki is, in many respects, the symbol of the movement that has pressed so strongly toward a military dictatorship... He came from a most humble home, and he worked as a boy for a manufacturer of *shoyu* (a Japanese sauce)." Address: Prof. of Political Science, Northwestern Univ.

3320. Hanzawa, Jun. 1936. Nattô seizô-hô [Natto production methods]. Sapporo, Hokkaido, Japan: Sapporo Natto Yoki Kairyo-kai. [Jap]*

3321. Hindmarsh, Albert Edward. 1936. The basis of Japanese foreign policy. Cambridge, Massachusetts: Harvard University Press. x + 265 p. See p. 169. 22 cm. [100+* ref]
• ***Summary:*** Page 169: In Japan "the necessities of life are relatively low in price and existence is simple. The laborer's diet of rice, fish, and soya bean curd [tofu] comes easily and directly from the soil and sea, and his yen is relatively more effective than our dollar. 'A Japanese worker can live just as happily and comfortably as an American workman who receives six times his wage" (Eldridge 1934).

The excellent chapter on Japan's problem of population pressure contains two very interesting graphs (p. 46-47). The first shows the number of births and deaths each year from 1877 to 1932. The difference between the two is the "natural increase" in population, which was largest from 1918 to 1932, as deaths decreased steadily and births rose dramatically.

The second shows the "Rate of population increase in Japan proper" from 1873 to 1929. This rate showed a general increase from 5 in 1873 to about 14 in 1911–but with sudden, sharp decreases as follows: From cholera in about 1879, 1887, and 1891. From the Russo-Japanese War in 1904 and 1905 (Japan won). And (the biggest decrease of all) from influenza in 1918 (the international Spanish Flu pandemic, which killed an estimated 390,000 Japanese). Address: Asst. Dean of Harvard College, Instructor and Tutor, Dep. of Government, Harvard Univ., Asst. Prof. of International Law, Fletcher School of Law and Diplomacy.

3322. Inahara, K. ed. 1936. Japan Year Book. Tokyo: The Foreign Affairs Association of Japan. 1389 p. See p. 464-65, 478, 1081, 1178-79, 1182.
• ***Summary:*** Page 1081. The section on Chosen [Korean] agriculture states that the soy bean is one of the most important crops, after rice, barley, wheat and rye. "In 1934 the total the total area under cultivation was 795,000 cho and the amount produced reached 3,813,000 koku, which was an increase of more than five times compared with the year 1910."

Pages 1178-79. The pages on "Foreign trade" show that in 1933 imports to Manchoukuo first surpassed exports, and this new trend has continued until the most recent year, 1935, when imports were valued at 604 million Haikwan taels, compared with exports of only 421 million.

Page 1182. A large table gives production of major crops in Manchoukuo, 1929-1935 in metric tons. For soy beans:

4.849 million metric tons in 1929.
5.298 million metric tons in 1930.
5.227 million metric tons in 1931.
4.268 million metric tons in 1932.
5,205 million metric tons in 1933.
3.841 million metric tons in 1934.
3.822 million metric tons in 1935.

Other crops in the table are other legumes, kaoliang, millet, maize, wheat paddy-field rice, upland rice, and other cereals.

In 1935 soy beans were grown on 3.249 million ha with a yield of 1,180 kg/ha.

The country now has an abundance of food to feed the roughly 30 million inhabitants. The surplus crops are exported every year.

A large table shows "Exports of agricultural products,

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1931-1935." Exports of soy beans in 1935 were 29.203 piculs worth 130.053 million yen.

At the end is a large, colored fold-out map of the Japanese empire. There are many ads on unnumbered pages.

3323. Institut International d'Agriculture (International Institute of Agriculture). 1936. Le soja dans le monde [The soybean in various countries of the world]. Rome, Italy: Imprimerie de la Chambre des Deputes, Charles Colombo. viii + 282 p. Bibliography, p. 276-82. No index. 25 cm. [90 ref. Fre]

• ***Summary:*** A superb early work, containing extensive original information, looking at developments with soybeans and soyfoods country by country, worldwide. Contents. Preface (p. 1). A. Culture of soy (*soja;* p. 4): 1. Botanical description, selection, classification of the varieties. 2. Culture properly said. 3. Enemies and illnesses.

4. Culture in the various countries: 4a. The Americas (p. 38): Antigua, Argentina, Bermuda, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, USA (gives details on all varieties grown, and describes production, history, varieties, and cultural practices in North Carolina, Illinois, Indiana, Iowa, Maryland, Massachusetts, Mississippi, Missouri, New York, Ohio, West Virginia, Wisconsin, Conclusion), Guadeloupe, Guatemala, British Guiana, Dutch Guiana, British Honduras [Belize], Jamaica, Barbados, Martinique, Mexico, Montserrat, Peru, Puerto Rico, El Salvador, Trinidad and Tobago, Uruguay.

4b. Europe (p. 101): Germany, the Danubian countries, Austria, Spain, France, Great Britain, Hungary, Italy, Netherlands, Poland, Romania, Switzerland, Czechoslovakia, Turkey, USSR.

4c. Asia (p. 128): Ceylon, China and Manchuria, Cyprus, Federated States of Malaysia, British India (incl. Punjab, Bihar and Orissa, Burma, Berar, Madras Presidency, Bombay Presidency, Bengal (incl. Nepal, Bhutan, Sikkim, and the district of Darjeeling), Assam, North-West Frontier Province, United Provinces), Netherlands Indies, Indochina (incl. Tonkin, Annam, Laos, Cambodia, and Cochinchine), Japan, Palestine, Siam.

4d. Africa (p. 146): French West Africa, Algeria, Belgian Congo, Cyrenaica, Egypt, Eritrea, Madagascar, Morocco, Mauritius (Ile Maurice), Reunion (Réunion), Rhodesia, Anglo-Egyptian Sudan, Tripolitania, Tunisia, Union of South Africa.

4e. Oceania (p. 153): Australia, Fiji Islands, Hawaii, New Caledonia, New Zealand, Philippines.

B. Utilization of soya (p. 158): 1. The soybean in human nutrition and in industry: Whole soybeans, chart of the uses of whole soybeans, use of soya in the green state (green vegetable soybeans), soy sauce (*dau-tuong* of the Annamites, or *toyo,* named shoyu by the Japanese, or *chau-yau* or *chiang yoo* by the Chinese), condiments and sauces based on soya in the Netherlands Indies (*tempe, ontjom, tempemori* and *tempe kedele* [various types of tempeh and onchom, p. 168-70]), *tao tjo* [Indonesian-style miso], *tao dji* [fermented black soybeans], *ketjap, ketiap benteng* [Indonesian-style soy sauce], soymilk (*le lait de soja*), yuba (*crème de lait de soja*), tofu (*le fromage de soja*) and fermented tofu (*des fromages fermentés,* made by Li Yu-ying near Paris), soymilk casein (*caséine du lait de soja,* for industrial use, including vegetable albumin, or galalithe [galalith]" [isolated soy protein], and artificial wool), soy lecithin (*lécithine de soja*), soy flour (*la farine de soja,* incl. soy bread, soy pastries, and soy cocoa).

Note 1. This is the earliest document seen (Sept. 2010) that uses the term *benteng ketiap benteng* to refer to an Indonesian-style soy sauce.

2. Soy oil (p. 194): Food uses, industrial uses (including soaps, products resembling petroleum, paints, varnishes, linoleum, and artificial rubber), extraction, directory of U.S. manufacturers of materials and equipment for soybean processing, directory of U.S. and Canadian manufacturers of food products based on soya (*produits alimentaires à base de soja,* p. 205-06), directory of U.S. manufacturers of industrial soy products (p. 206-07).

3. Soybean in the feeding of domestic animals (p. 207): Forage, hay, silage, pasture, soybean seeds, the minerals in soybeans, soya as a feed for dairy cows, cattle, buffaloes, sheep, hogs, horses and mules, poultry.

4. Use of soya as fertilizer (p. 257). C. The trade of soya and of its by-products (p. 363): Production of soybeans in the principal countries, economic importance of soybean culture in the USA, soybean trade/commerce including tables of the major importers and exporters, and amounts traded annually in 1931-1934, price of soybeans, cost of production.

List by region and country of people and organizations that responded to a questionnaire sent by IIA (p. 273-76). Bibliography of main publications consulted, listed by region and country of publication.

Reunion (*Ile de la Réunion*)*:* "The soybean (Le Soja) is only cultivated as an experimental crop, on a few square meters at the agronomic station" (p. 148).

Fiji (*Iles Fidji*)*:* Soybean cultivation is not yet practiced in this colony; however soybean seeds are currently being imported in order to conduct a trial.

New Caledonia: In 1928 soybean cultivation was introduced to New Caledonia.

Note 2. This is the earliest document seen (Dec. 2007) concerning soybeans in Bhutan, Costa Rica, Dominican Republic, El Salvador, Guatemala, Israel, Jamaica, Madagascar, Morocco, New Caledonia, Palestine, Peru, or Réunion, or the cultivation of soybeans in Bhutan, Costa Rica, Dominican Republic, El Salvador, Guatemala, Israel, Jamaica, Madagascar, Mexico, the Middle East. Morocco, New Caledonia, Palestine, Peru, or Réunion. It is also the earliest document seen (Dec. 2007) concerning soybeans in connection with (but not yet in) Cyprus; it is stated that

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soybeans are not grown on the island of Cyprus. Soybean culture is not practiced in the Italian colonies of Eritrea (Erythrée, now part of Ethiopia) or Cyrenaica (Cyrénaïque, now part of Libya).

Note 3. This document contains the earliest date seen for soybeans in Bhutan, New Caledonia, or Réunion, or the cultivation of soybeans in New Caledonia (1928), or Bhutan or Réunion (1936) (One of two documents).

Note 4. This is the earliest French-language document seen (Sept. 2011) that mentions tempeh, which it calls "tempe" (p. 168). It notes that, in general, the indigenous people of the Netherlands Indies use soybeans mainly to make *tempe,* a product which, throughout central and eastern Java, takes the place reserved for *ontjom* in western Java. Tempeh is found in two forms: either in large flat cakes which are cut at the time of sale into small square morsels, or wrapped in folded banana leaves. A detailed description of the preparation of each of these two types of tempeh is given as well as another type of tempe, called *tempemori,* which is made with soybeans and coconut presscake.

Soybean culture is not known to be practiced in the following countries or colonies: Antigua, Barbados, British Honduras (renamed Belize in about 1975), Trinidad and Tobago. Address: Rome, Italy.

3324. Ishimaru, Yoshio. 1936. Shôyu jôzô-jô kûki-chû no kinga ni tsuite [Microorganisms in the air in shoyu breweries (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 12:A261. [1 ref. Jap]
• ***Summary:*** Abstracted from *Jozogaku Zasshi* 14(9): (1936).

3325. Iwasaki, Kazuo. 1936. Shôyu no kanshô sayô ni tsuite. I. Fuki, shôyu teki teisando sokuteihô ni taisuru ichi ginmi [On the buffer action of shoyu. I. Additional remark: A close examination of a method of measuring the acidity of shoyu by titration (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 12:A50. [1 ref. Jap]
• ***Summary:*** Abstracted from Jozogaku Zasshi 13(11):1087-99 (1935).

3326. James, Grace. 1936. Japan: recollections and impressions. London: George Allen & Unwin Ltd. 285 p. See p. 140, 155. Illust. No index. 22 cm.
• ***Summary:*** This book has three parts: I. Reflections of Tokyo (1885-1895). II. Japan revisited 1934. III. Impressions and conclusions. The author's father was an officer of the British Navy. She was born in Japan.

In Part II, Chapter 6, titled "Otsuka San," refers to Miss Shiwo Otsuka, who gave her Japanese lessons. "... I knew from the significance of his long-drawn cries if it was the *tofu* (bean curd) seller, the flower-seller, the scissors-grinder, the pipe-cleaner, or the gold-fish vendor, who was coming down our lane" (p. 140).

"*O Sushi* consists of cold boiled rice, delicately flavored with *shôyu* or vinegar and with various additions, such as shreds of [pickled] ginger, chopped pickled melon or cucumber, or fragments of raw fish. The honourable *Sushi* is made up into rolls or balls convenient for handling and covered with edible wrapping. *Inari Sushi..."* "... a thin coating of *abura tofu* (oiled bean curd) and *nori maki,* as their name denotes, are wound in seaweed" (p. 154-55).

3327. Japan-Manchoukuo Year Book. 1936. Tokyo, Japan: Japan-Manchoukuo Year Book Co. xii + 1258 p. Index. 26 cm. Third annual issue. [Eng]
• ***Summary:*** Each year book is divided into two main parts: Japan, and Manchoukuo. On the title page, just below the title but in small letters we read: "Cyclopedia of General Information on the Empires of Japan and Manchuokuo. Appendices: Who's Who Business Directory." Below that is a small map showing the Japanese empire, circled, as part of East Asia–under which is printed: "Neither is Understandable Without the Other." Below that are listed the cities and names of 18 agents worldwide. This book was published in late-December 1935.

In the Japan and Manchoukuo parts of the book, soya beans are most widely discussed in the respective chapters on Agriculture. In each case, information given the previous year is updated one year.

Page 359. A large table gives the yield of rice and other cereals in koku per tan from 1904-08 to 1933. For soya beans the yield in 1933 was 0.86.

Page 364. Table 29 shows production of "Beans, potatoes and sweet potatoes" in hectolitres from 1929 to 1933. 1.80391 hectolitres = 1 koku = 5.11902 dry bushels (USA). For soya beans:

4.789 million hectoliters in 1929
5.473 million hectoliters in 1930
4.481 million hectoliters in 1931.
4.352 million hectoliters in 1932.
5.053 million hectoliters in 1933.

Page 767. A large table shows "Crop output" (metric tons) in Manchoukuo yearly from 1922 to 1935* (* = estimate). For soya beans:

3.088 million metric tons in 1922
3.262 million metric tons in 1923
3.448 million metric tons in 1924
4.174 million metric tons in 1925
4.776 million metric tons in 1926
4.817 million metric tons in 1927
4.834 million metric tons in 1928
4.849 million metric tons in 1929
5.298 million metric tons in 1930
5.227 million metric tons in 1931
4.268 million metric tons in 1932
5.205 million metric tons in 1933

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3.500 million metric tons in 1934
3.995 million metric tons in 1935

The other principal crops shown in the table are other beans, kaoliang, millet, maize, wheat, rice, and other crops (incl. groundnuts).

Page 788. A large table gives a crop forecast for 1935. Production of soya beans is expected to increase 17%.

On p. 788-89 is a long section of text on "Soya beans" identical to that in the 1935 Year Book. Soybean production in Manchoukuo in 1933 was 4.601 million metric tons on 3.747 million hectares.

Page 717. Export of soya beans in 1932 was 42.536 million piculs [1 picul = 133.33 lb weight Avdp] worth 144.304 million Hk. Tl. [Haikwan taels]. Export of soya beans in 1933 was 39.111 million piculs worth 169.095 My [Million yen? / Manchoukuo yen?].

A large table (p. 717) shows "Staple exports as classified by destinations in 1932 (in piculs). Soya beans were exported to the following countries–in descending order of amount exported:

Germany 10.474 million piculs
Soviet Russia 7.520 million piculs
China 7.246 million piculs
Egypt 6.997 million piculs
Japan 5.568 million piculs
Great Britain 1.348 million piculs
Chosen [Korea] 0.905 million piculs.
Netherlands India [today's Indonesia] 0.849 million piculs
Netherlands 0.369 million piculs
Hongkong 0.355 million piculs
Denmark 0.340 million piculs
Italy 0.212 million piculs
Belgium 0.145 million piculs
Central America 0.125 million piculs
France 0.030 million piculs
Straits Settlements 0.022 million piculs
Philippines 0.0088 million piculs
Norway 0.0082 million piculs
British India 0.0028 million piculs
Sweden 0.0024 million piculs
United States 0.0012 million piculs
Siam [today's Thailand] 0.00028 million piculs.

Other major export crops were kaoliang, maize, millet, groundnuts, wheat and buckwheat.

Page 714 is all about "Soya beans" which are the most important staple product of the country and has been grown for many years before the opening of Newchwang while some had been exported to the ports of South China. At the time of the Russo-Japanese war (1904-05) the Japanese became aware of the value of the bean, especially of the bean cake for use as fertilizer, but the article did not enter upon its career as an important factor in international trade until 1910 when the Mitsui Bussan Co. made a trial shipment of 100 tons to England. Since then, mainly through the continued experiments of the Central Laboratory, maintained in Dairen by the S.M.R. [South Manchuria Railway], many new uses, have been found for soya bean until today the articles manufactured either wholly or partially from beans, bean oil and bean cake include more than thirty items, among which the following may be mentioned: soy [sauce], sauces, soups, condensed milk, casein, cheese, salad oil, crackers, macaroni, flour, confectionary, glycerine, explosives, enamels, varnishes butter and lard substitutes, edible oils, salad oils, water-proof material, linoleum; paints, soap, celluloid, rubber substitutes, printing-ink, lighting and lubricating oils, etc. Bean cake is also used extensively for fodder and as fertilizer.

"The S.M.R. Agricultural Experiment Station at Kunchuling and elsewhere have through continuous experiments and distribution of superior seeds to Manchurian farmers increased the crops by 10 to 20 percent 'while the oil content of such improved beans have been increased by more than ten percent. The use of these improvements is being advocated by means of poster campaigns and other forms of propaganda, while demonstrations are being carried out to instruct the farmers in new methods. At the same time a new industry of manufacturing beans into oil and cakes has sprung up, the modern methods rapidly replacing the old-fashioned presses.

"Soya bean output in 1934 is as follows:

A large table (p. 718) titled "Output of soya bean" [in Manchoukuo, according to districts] is divided into South and North Manchuria. It shows the following for each district in 1934: Cultivated area (hectares). Output per hectare (kgs.). Output in 1934 (metric tons). Actual output in 1933 (metric tons). Increase or decrease (metric tons). Rate of increase (1933 = 100).

3328. Kale, F.S. 1936. Soya bean: Its value in dietetics, cultivation and uses. With 300 recipes. Baroda State, India: F. Doctor & Co. xxxi + 375 p. Illust. Index. 22 cm. 2nd ed. 1937.

• ***Summary:*** Contents: Preface. 1. Deficiencies in the Indian diet and soya bean as a means to rectify them. 2. History of the origin and growth of soya bean. 3. The use of soya bean. 4. World trade in soya bean. 5. Botany of the soya bean plant. 6. Classification of soya bean. 7. Cultivation of soya bean. 8. Diseases and pests of soya bean. 9. Cultivation of soya bean in India. 10. The constituents of soya bean. 11. Soya bean milk. 12. Soya bean flour. 13. Industrial uses of soya bean. 14. Enriching soil by addition of nitrogen and use of soya bean as fodder. 15. Food requirement of the human body. 16. European and American soya bean recipes. 17. Diabetic dishes, Mahatma Gandhi's experiments at Magan Wadi and opinion of scientists on soya bean. 18. Chinese and Japanese soya bean dishes. 19. Indian soya bean dishes: Hindustani dishes, Moglai dishes, Gujarati dishes, Maharashtrian dishes,

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Bengali dishes, Goa dishes, Tanjore dishes. Appendix.

For a more detailed table of contents and summary of the work, see the 2nd edition (1937).

Photos on unnumbered pages show: (1) H.H. the Maharaja Gaekwar of Baroda, the first Indian ruler to inaugurate the soya bean planting ceremony in his state–24 Nov. 1933. (2) H.H. The Maharaja of Baroda, seated in a chair, lecturing on the dietetic and industrial importance of soya bean. (3) The mature soya bean pods of Mammoth Yellow variety grown in Baroda territory. (4) Map of Baroda state showing areas of soya bean cultivation. (5) Map of Baroda state showing local distribution of soya bean. (6) A field of soya bean in rows grown by Patel Hargovan Bavabhai of Achisara Baroda District (with two white bullocks) who has been awarded the first prize for his good cultivation.

(7) Bavabhai B. Patel, a farmer age 65 who is interested in cultivation of soya bean; dressed in white, he is standing in a field of soya beans behind two large white bullocks. (8) The author's own child, three months old, fed on soya bean milk.

(9) Mahatma Gandhi who uses soya bean at Maganwadhi; he is seated in a chair reading.

Note 1. This is the earliest English-language document seen (Sept. 2006) that uses the term "soya bean" in a new way–as a singular noun, like the words "corn" or "wheat," not preceded by "the." Examples: "2. History of the origin and growth of soya bean. 3. The use of soya bean. 4. World trade in soya bean... 6. Classification of soya bean. 7. Cultivation of soya bean. 8. Diseases and pests of soya bean." This usage originated in developing countries.

Note 2. This book was written as the princely state of Baroda was studying the possibility of growing the soya bean plant for food, feed, and fodder. It looked promising, but little headway was actually made in either production or utilization. Address: Food Survey Officer, Baroda State, India.

3329. New World-Sun Daily. 1936. [The New World-Sun Daily year book, 1936]. San Francisco, California: New World-Sun Daily. 438 p. 22 x 30 cm. [Jap; Eng]*

• ***Summary:*** Directory of Japanese American businesses and individuals for California, Arizona, Nevada, Utah, Colorado, Wyoming, Nebraska, Texas, New Mexico, Illinois, Michigan, New York, New Jersey, Washington, D.C., Ohio, Wisconsin, Florida, Oregon, Washington, Mexico, Cuba and Panama. Address: San Francisco, California.

3330. Nishida, Kotaro. 1936. Ni, san tokushu jôzô butsu no kagaku-teki kenkyû: Sotetsu shôyu [Chemical studies on several specialty fermented products: Cycad shoyu (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 12:A324 (at rear of volume). [1 ref. Jap]

• ***Summary:*** Abstracted from Kagoshima Koto Norin Gakko Gakujutsu Hokoku 11:209-224 (1936). Address: Kagoshima.

3331. North, James L. 1936. Introductory chapter. In: G.D. Gray. 1936. All About the Soya Bean: In Agriculture, Industry and Commerce. London: John Bale, Sons & Danielsson Ltd. 144 p. See p. 1-9.

• ***Summary:*** This is the story of early attempts by Dr. North and others to grow soybeans in England. "In 1913 chance put in my hands thirteen small seeds of a variety of soya bean said to have come from North China in 1910 and to have ripened pods in Germany for two successive years. Sown by me the following May the plants grew to a height of 1½ feet and ripened seed in October. This took place at the Gardens of the Royal Botanic Society, of which I was then Curator. I was aware that of the many attempts to grow soya which had taken place in this country, all had failed, also that no others were being attempted, since it was the considered opinion of the Ministry of Agriculture and the Royal Agricultural Society that the soya bean was quite unsuited for growth here, as it required heat that would ripen maize.

"The podded beans were brought to the notice of Professor Bottomley, of King's College, and Professor Greenish, of the Pharmaceutical Society, and both considered the matter to be important. They pointed out that this country possessed no oil plant and was importing soya from Manchuria to the extent of half a million tons per annum... They advised me to increase my stock as rapidly as I could.

"The result of the first year's crop was four hundred seeds from the original thirteen seeds; the second year four thousand and the third twelve thousand. In 1917 it became a question of finding space to grow them and it was decided to have part grown by a firm of market growers at Uxbridge, Middlesex and the rest on a farm at Manningtree, Essex, belonging to Mr. C.P. Ogilvie. Both were failures." The first crop failed because the land had been too heavily manured and the seeds were sown too far apart. The second crop, sown in the middle of a field of wheat, had been eaten by rabbits. Rabbits are still a major pest for soya beans.

Since little was known about the soya bean, Mr. North tried to gain experience by sending seeds to the Chelsea Botanic Gardens, the Horticultural Society at Wisley, the Cambridge Botanic Gardens, Messrs. Sutton and Sons, Reading, and to a friend in Hampshire. But the reports received were not encouraging. "That same year I got in touch with the United States Department of Agriculture at Washington [DC], I received from it not only soya bulletins and seeds of a number of American soya varieties for trial in England, but the promise of further assistance. I owe a very great debt of gratitude to that department and to Dr. W.J. Morse, its agronomist and soybean expert, the man who, more than any other, has made the United States the soya bean centre of the world and now a growing competitor with Manchuria as world exporter.

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"The results of 1917 were better than those of the previous year and in 1918 I had sufficient seed of my one variety to plant half an acre on land lent by Mr. Clark at Virginia Water. These were sown in company with 12 American varieties, half being inoculated with a nodule culture supplied by Professor Bottomley."

Following some poor years, 1921, a drought year, was the best year to date. "Accounts of my success appeared in the Press and I wrote an article which came out in the *Illustrated London News* in October. As a result many applications for seed reached me and I sent samples to over one hundred places, among others to Professor Southworth of Manitoba College, Winnipeg [Canada]. He found my variety better than anything he had had there, both for fodder and seed, but not early enough in seasons with early frost. In return he sent me seed of a brown variety 'Manitoba Brown,' a selection from a well-known American variety 'Ogemaw.'"

1922 was a wet year and at his plot and not one person to whom North had sent seed reported success. On his own plot at Chiswick, where he had twenty varieties under test, only one, "Manitoba Brown," succeeded.

"In 1923 appeared Messrs. Piper and Morse's encyclopædic work, 'The Soybean,' in America; it solved a good many of my problems and I determined to follow American practice in future. From it I learned that two-thirds of the American crop was consumed as fodder upon the farm; that every variety had a fixed time ranging from 80 to 160 days for maturing; that in industry the chief value of the bean rested upon its oil content; and that the plant possessed what is now called 'local limitations,' meaning that a variety that grew well in one place could not be depended upon at another and that in American agricultural practice it was usual to test two or more varieties before growing it as a crop. This last was particularly interesting to me because it explained the erratic behaviour of some of my varieties when sent to other places.

"Convinced by the failure of my 1922 trials that soya was not yet ready to put forward as a crop plant, I extended my search to new sorts and with the help of friends abroad obtained many varieties from China, Manchuria, Japan, South Africa and India." North then began to specialize in short season varieties. "My friend Dr. Morse approved the plan and from then onward sent me only varieties which in America took less than one hundred days to mature... Using Manitoba Brown Soya as a standard I was able to select several varieties as early or even earlier than it." In 1930 Messrs. Sutton and Sons of Reading [seedsmen] decided to put the variety Brown C in their catalogue.

"In 1931, Mr. A.F. Secrett, a Twickenham market grower, offered the use of a piece of land at Brentford, Middlesex; it enabled me to grow on a larger scale than had been possible previously. In September the same year a photograph of the crop appeared in the *Evening News.* By chance it was seen by Sir John Davis, a Director of the Ford Motor Co. and manger of the Ford Estate at Boreham, Essex, who at the request of Henry Ford had tried to grow soya with American seed and had failed. At his request I agreed to supply acclimatized seed and to superintend its growing. All my four varieties of soya were used and under field conditions the crop was a success. From 2 acres the first year it was increased to 12 acres in 1934 and to 20 in 1935, the last two crops being grown without assistance. The Boreham trials were visited by farmers from every part of the United Kingdom and visitors from America pronounced the crops to be as good as any grown in that country. The seed was distributed in 1935 and that year saw it being grown in quantity in some hundreds of places throughout the British Isles."

A photo facing page 1 shows Mr. J.L. North standing in a field with soya bean plants which he has grown. Address: 60, Grove Park Terrace, Chiswick, London, W.4, Engalnd. Late curator, Royal Botanic Gardens, Regent's Park, London.

3332. Read, Bernard E. 1936. Chinese medicinal plants from the "Pen ts'ao kang mu" of 1596. 3rd edition of a botanical, chemical and pharmacological reference list. Peking, China: Peking Natural History Bulletin. Sales Agent: The French Bookstore. xvi + 391 p. See p. 114-18. Index of romanized Chinese plant names. Index of common English plant names–Foreign names are in italics. Index of Latin plant names. 27 cm. [180*+ ref]

• ***Summary:*** This book is largely one huge table (p. 1-288) titled "Chinese medicinal plants." It has seven columns: (1) Latin name. (2) Chinese name. (3) Part used. (4) Constituents. (5) Habitat. (6) References (highly abbreviated). (7) Remarks.

Contents: Introduction in Chinese. Introduction to the third edition (Shanghai 1935). Provincial abbreviations. Abbreviations for parts of plants. Bibliographical abbreviations (journals and books). Secondary references helpful to a study of Chinese materia medica. Comparative table of Western, Japanese, and Chinese dates (1868-1935). Table of classes, general, and species for which references are listed.

References related to soybeans are subdivided as follows (p. 114-18, 256): Soybeans, black variety (var. *nigra;* the fresh hulls used in medicine are known as *Ta Tou P'i*). Soybean sprouts, black variety (Ta Tou Huang Chüan). Bean relish, black variety (Ta Tou Ch'ih). Bean ferment, black variety (Tou Huang ["bean yellow"]; Natto in Japanese [sic]). Yellow soybean (Glycine soja S. et Z., var. flava; Huang Ta Tou). Soybean oil (Tou Yu). Soybean sauce, yellow variety (Chiang Yu; thick or thin). Soybean paste (Chiang). Bean curd, yellow variety (Tou Fu). White soybean (Glycine soja, S. et Z., var. alba). Soy sauce made with wheat flour (p. 256).

References for azuki beans (red mung bean, P. mungo, L. var. subtrilobata, Fr. et Sav. [HN. Br.]) are given on page

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122. References for wheat gluten (Mien Chin) are given on page 256.

This book is largely a list of references relating to plants listed in the Pen Ta'ao Kang Mu. It is not a translation or summary of the latter work.

Note: This is the earliest English-language document seen (June 2013) that uses the term "the fresh hulls" to refer to soy bran. Address: PhD, Head of the Div. of Physiological Sciences, Henry Lester Inst. of Medical Research, Shanghai, China.

3333. Rouest, Leon; Guerpel, Henry de. 1936. Le soja français et ses applications agricoles et industrielles [The French soybean: Its agricultural and industrial applications]. Chateauroux, France: G. Langlois. xxiii + 99 p. 28 cm. [42 ref. Fre]

• ***Summary:*** Contents: Preface, by L Brétignière (Prof. at Grignon, Member of the Academy of Agriculture). Preface to the first edition, by Louis Forest (1921). Introduction to this new edition: Soviet Russia and the soybean (*le Soja;* includes the story of Rouest's stay in the Northern Caucasus, Russia, from 1930 to 1933), Germany and Poland take up the soya question, the canons [guns] of Germany versus the Manchurian soybean, a secret contract to provide the weapons of war, organization of a Polish bank in Manchuria, Germany cultivates soybeans in Romania and Bulgaria in preparation for the war, France and the cultivation of soybeans.

1. What is soja? 2. History of the propagation of soja: Introduction of the soybean into France and Europe, the soybean is cultivated in central Europe, in Austria, in 1875, in France the soybean is the object of numerous trials from 1876 to 1881, its cultivation worldwide, the study and acclimatization of soya become generalized.

3. Botanical characters of the soybean: And the varieties of soybeans. 4. Chinese varieties: The soybean in China, the production of soya in China in 1916 and 1917, production of soya in the Far East during the year 1928, exportation of soya from the Far East to Europe.

5. Japanese varieties: The soybean in Japan, varieties of soya from Indochina and from other Asian countries. 6. The soybean in America: American varieties, cultivation of soybeans in Ohio, selection of soya using pure lines in Connecticut.

7. The soybean in Europe: Italy, Russia, France, French climatic zones for the cultivation of Soja hispida, the Atlantic zone, the continental zone, the Mediterranean zone and climate, can the soybean be cultivated in all the French climates including those in the north, northeast, and northwest, speedy production of soybeans in view of agricultural production and of the creation of early varieties for the regions in north and northeast France.

8. Instruction for growing soja in France. 9. Soja in Manchuria. 10. Soja seeds. 11. Selection of soja. 12. Varieties of soja. 13. Different ways of planting soya seeds. 14. Soy yield. 15. Nitrogen fixation in soya seeds. 16. Tilling and preparing the earth. 17. Soja fodder. 18. Soja, striking and improving. 19. Harvesting soja grain. 20. Soja oil. 21. Soja oil-cake for animal feeding. 22. Vegetable milk, soja milk and industrial casein.

23. Soja in human food: Soy flour and its applications, soy bread with wheat, nutritional composition of soja compared to dry legumes, soy viewed as a dry legume to replace meat, comparative production of nutritive elements among the various legumes used for human food, comparative value in calories of the usual foods and of soja, preparation of soy soups and meals in compressed tubes, what varieties of soy can serve the special needs of human nutrition, Sojenta, potatoes stuffed with soy, force meat balls (*boulettes*) of rice and soy, bread of rice and soy, pudding of soy and rice, soy sprouts and their food value, fresh soy sprouts in a salad, soy sprouts with vegetables, soy preserves and confections, soy chocolate, soy coffee, soybeans conserved in containers, soy with smoked fish, soup with soy vegetable meat, soymilk soup, omelet with smoked soy vegetable ham, green soy sprouts, soy cake, soy force-meat fritters.

24. The utilization of soja in the Far East: Vegetable cheese (tofu), soy-based condiments, Japanese natto (2 types), Japanese miso, Chinese miso, soy sauce (*soyou* or *schoziou*), making soy sauce in Kwantung, China, making soy sauce in Japan, koji or molded rice.

25. The culture of soja in North Africa (Rouest has varieties that would grow and yield well in the French colonies of Tunisia, Algeria, and Morocco). 26. Opinions of some authors on soja. Conclusions. Bibliography on soja.

A small photo on the "Dedication" page shows Léon Rouest (born in Paris on 11 Nov. 1872).

Concerning soy in Russia (USSR) (p. 52-53): In Russia, the soybean has been known for quite a long time, specially in the Ukraine and Bessarabia, but it was never grown over a large area, and was given a back seat (low priority) in agriculture until after the revolution of 1917. It was not until 1926-27 that cultural trials were conducted on farms in the state of Northern Caucasus (*d'Etat du Caucase du Nord*). In the regions of Rostov-on-Don (*Rostow-sur-Don; Rostov-na-Donu*), Eisk (near Krasnodar), Stavropol, Prim-Koumsk, Yessentuki / Essentuki in the Kuban and Kuban River area of the North Caucasus region of southern Russia, the yields were 11 to 16 quintals.

In 1927 there were 600 ha planted to soybeans, increasing to 17,000 in 1928, in the *kolkhoz* (collective) farms or the *sovkhoz* (state owned) farms.

In 1929-1930 and until 1932-1933 there were very laudable / praiseworthy efforts to propagate soybeans in favorable regions, especially in the North Caucasus, but the soils of this region, although they are very rich and well suited to soybeans are also very rich in bad weeds and the

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results obtained up to the present do not seem favorable. As I said earlier, the soybean is a technical plant of the intensive cultivation type. It is very well suited to the soil and climate of Russia, but it is less well suited to the indolent character of people who are accustomed to cultivating only small parcels and who are suddenly, through collectivization, thrown into cultivating immense fields. In spite of the remarkable efforts at mechanization, the peasants who submit to collectivization and who do not yet understand it very well, the cultivation of soybeans does not assume the importance hoped for (p. 52).

Note: This is Rouest's first book about soy since 1930. Address: France.

3334. Sano, Kunio. 1936. Miso jôzô no eiyôgaku-teki kôsatsu. X. Miso jukusei-chû no shisuchin no shôchô [Nutritional observations on miso fermentation. X. Increase and decrease of cystin during ripening of miso (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 12:A216. [1 ref. Jap]
• ***Summary:*** Abstracted from *Jozogaku Zasshi* 14(6): (1936).

3335. Shin Sekai-sha. 1936. Zaibei Nippon-jin kan [Directory of Japanese in the USA]. San Francisco, California: Shin Sekai-sha. [Jap]*
• ***Summary:*** The 1916, 1928, and 1936 editions are at University of Washington (Seattle). Several other universities (UCLA, Univ. of Oregon) also have the 1936 edition. Address: San Francisco, California.

3336. Shoji, Kenjiro. 1936. Shôyu no kôki. I. [The flavor of shoyu. I. (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 12:A9-A10. [1 ref. Jap]
• ***Summary:*** Abstracted from *Rikagaku Kenkyu Hokoku* 14(9):872 (1935).

3337. Tezuka, Kaneko. 1936. Japanese food. Tokyo: Maruzen Co. Ltd. 84 p. See p. 28. 20 Cm. Half-title: Tourist Library: 14. [Eng]
• ***Summary:*** The chapter titled "Common everyday food" (p. 22+) notes that the three breakfast dishes are boiled rice, *misoshiru* (bean-paste soup [miso soup]), and *kô-no-mono* (pickles). With them are served "shell-fish *tsukudani* (foods boiled down in soy [sauce]), *shiokonbu* (the laminaria boiled in brine and soy), *nori* (laver), *nimame* (boiled beans [soy]), various kinds of bean-paste [miso] dishes, pickled plums [umeboshi], etc." A brief description of how to make miso and miso soup is given (p. 24). Under "Dinner dishes" we read: The most simple of foods is bean-curd." Fresh raw fish, "cut into shining thin slices (*sashimi*) is served with fresh grated radish or horse radish, and eaten dipped in vinegar or soy."

The section titled "How Bean-curd is Made" (p. 28) states: "Tôfu (bean-curd) is made by soaking soy beans in water, mashing them, straining the mass through cloth and solidifying with the addition of magnesium chloride. It is a very nutritive food. The mush left over after straining *tôfu* is called *u-no-hana* (deutzia flowers) [okara] and is used in cooking vegetables." A photo shows a "Vendor cutting bean-curd."

A photo (p. 64) shows a hall full of Buddhist priests dining at Soji-ji temple, Tsurumi, Japan. In Japan, March 24 and Sept. 24 are national holidays–Spring and Autumn Worship of the Imperial Ancestors. To worship all the Imperial Ancestors, the people hang out the Japanese flag and "to honor the spirits of their own ancestors, make *Inari-zushi* (vinegar-spiced rice wrapped in fried bean-curd) and *botan-mochi* (boiled rice slightly kneaded and covered with [azuki] bean jam). They offer these to the spirits of the dead by placing them before the Buddhist altar in the home and sending them to the family temple and the homes of relatives."

The chapter titled "Japanese Cakes" notes that the two basic types are *higashi* (dried cake) and *namagashi* (undried cake). *"Namagashi* is made of [azuki] bean-jam for the most part. Bean-jam is just like a cream made of red beans and sugar. *Namagashi* is divided into *yôkan* and others." Yôkan is made of bean-jam gelled with agar (Japanese isinglass). A photo (p. 83) shows a bean-jam factory and show case of products.

Note 1. Editorial note signed: Board of Tourist Industry, Japanese Government Railways.

Note 2. This is the earliest English-language document seen (June 2013) that uses the word "mush," or the term *u-no-hana,* or the term "deutzia flowers" to refer to okara.

Note 3. This is the earliest English-language document seen (March 2009) that uses the term "bean-paste" to refer to miso.

Note 4. This is the earliest English-language document seen (March 2006) that uses the term "bean jam" (or "bean-jam") to refer to sweet azuki bean paste [*azuki-an*]. Address: Prof., Japan.

3338. The people's tribune. 1936. Shanghai: China United Press. See p. 420. *
• ***Summary:*** Page 420: "... aniseed bean, cold jellied meat, fried beancurd, and spiced blue fish." "Whenever I come back, I laugh at myself," he said with a slight smile, his cigarette held in one hand, and a cup of wine in the other. "When I was young and saw an insect at rest,..."

Note: This is the earliest English-language document seen (April 2013) that contains the term "fried beancurd."

3339. Shih, You-Kuang. 1937. Study on the molds concerned in the fermentation of wheat gluten in China. *Lingnan Science Journal* 16(1):27-38. Jan. 13. [21 ref. Eng; chi]
• ***Summary:*** The author begins by discussing the research of others on "the well known foodstuff *Fu-Yu* [fermented

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tofu, 2 Chinese characters are given] or preserved soy bean curd. Wei (1930) isolated the same species of *Mono-Mucor* from different samples obtained from Shaoshing of Chekiang [province] and Suchow of Kiangsu Province.

He adds that P.W. Liu, in his unpublished work, "isolated a species of *Mucor* from Mei-Tou-Cha [meitauza; Chinese characters are given], or naturally fermented dregs of soy bean curd [i.e., naturally fermented okara], which is a common foodstuff in Wuchang and Hankow." It is prepared by frying in vegetable oil or animal fat.

"No mention of the so-called Minchin [W.-G. *mien chin,* pinyin *mianjin*] fermentation has been made as yet in literature. Minchin is, chemically speaking, the gluten of wheat." Rich in protein, it has a delicious taste. In some districts it is commonly eaten as a substitute for meat by Buddhists who do not eat meat. It is also occasionally used as a palatable dish at banquets. "Although we do not know definitely when it came to be used as an article of diet, it probably was at least hundreds or even thousands of years ago. Recently it has become a canning industry in large cities, San-Loh Wusih Minchin of Kiangsu province being a well-known example."

The author then gives a detailed description of how raw wheat gluten is made in China. To the high-protein wheat flour, about 0.5% to 1% by weight of table salt is added before any water is added in a large earthen jar. The dough is allowed to stand for 1-2 hours under water before the starch is removed in a strainer. A high grade of minchin is one that is almost free of starch content, pale in color, and very sticky and flexible.

Raw wheat gluten is typically made into one of four end products: (1) Fresh minchin: The raw minchin is kneaded into desirable shapes then boiled and seasoned for eating. When prepared for sale at a market in hot weather, it is usually preserved in water to prevent rapid spoilage by bacteria; (2) Roasted minchin is prepared by roasting raw minchin in a flat pan over a fire. A small mass of raw minchin will bubble up into a large globose shape with a very loose and porous texture. It is usually used to prepare soups, or cooked with other foods, and can be purchased even in small grocery stores in some localities; (3) Fried minchin is prepared by frying raw minchin with vegetable oil and seasoning. Recently the preparation of this kind of minchin has become a canning industry, as noted above. It has an excellent taste and is especially appropriate for travelers; (4) Fermented minchin (fermented wheat gluten) is made by putting fresh minchin into a suitable container, usually an earthen jar, and covering it tightly. After 2-3 weeks at room temperature, it will be overgrown with molds and bacteria. Then an excess amount of table salt (sodium chloride), more than 10% by weight of the molded minchin is added. After thoroughly mixing the salt into the minchin, it is allowed to stand for 2 more weeks to age. It is then commonly cut into thin strips and used as a condiment with other foods. Usually the fermentation is carried on during the winter because in hot weather it spoils rapidly due to bacteria.

Minchin is most commonly eaten by the people in northern China, however fermented minchin is rarely heard of except in Wuchang, Hankow and Hanyang of Hupeh Province so far as the author knows. According to the "Investigation of diet nutrition of Chinese in Manchuria" by Lu (1934), the average amount of Minchin consumed a day by one person of different classes, and its nutritive value are as follows (Table 1): Physicians 14.4 gm of minchin, 3.2 gm of protein; Members of the bank 13.8 gm, 3.1 gm of protein; Officials 11.2 gm, 2.5 gm of protein; School teachers 3.7 gm, 0.8 gm of protein; Middle class families 1.8 gm, 0.4 gm of protein.

Minchin appears to contain a mixture of molds including *Paecilomyces varioti, Aspergillus flavipes, Cladosporium elegans, Fusarium orthoceras, Syncephalastrum racemosum, Trichothecium roseum,* and *Penicillium* species.

Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the term "Fu-Yu" to refer to fermented tofu.

Note 2. This is the earliest document seen (Sept. 2011) concerning okara tempeh (which it calls Mei-Tou-Cha), and the earliest English-language document seen (Sept. 2011) that uses the term "Mei-Tou-Cha" to refer to okara tempe. Address: Lab. of Applied Mycology, College of Agriculture, Hokkaido Imperial Univ., Sapporo, Japan.

3340. Akabori, Shiro; Kaneko, Takeo. 1937. Shôyu no kôki seibun. III. Beta-methylmercapto-propionaldehyd ni tsuite [On the aroma of soy sauce. III. Beta-methylmercapto-propionaldehyde]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 58(2):236-37. Feb. [4 ref. Jap]
Address: Osaka Teikoku Daigaku, Rigaku-bu, Kagaku Kyoshitsu.

3341. Iwasa, Yosaburo. 1937. Daizu no shusei chûshutsu kôgyô fukusan-butsu no kenkyû. I. Daizu tômitsu no tô-rui ni tsuite no kenkyû [Utilization of the by-products of soybeans. I. Studies on the sugars of soybean syrup]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 13(3):225-30. March. (Chem. Abst. 31:5607). English-language summary in Bulletin of the Agricultural Chemical Society of Japan 13:24-25, bound at the back of Nippon Nogei Kagaku Kaishi. [6 ref. Jap; eng]
• ***Summary:*** Soybean oil was prepared by the alcohol extraction method. Gives an analysis of the sugars of soybean syrup (which is an industrial by-product of soybean oil produced by alcohol extraction). This syrup contains 17.4% water, 5.2% protein, 2.3% fat, 70.1% carbohydrate, and 5.0% ash. The carbohydrates were found to contain: Direct reduced sugar (glucose) 2.86%. Indirect reduced sugar (invert sugar) 41.73%. Other carbohydrates 25.50%

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consisting of fructose, galactose, rhamnose, arabinose, glucuronic acid, and stachyose. Sucrose (a disaccharose) and stachyose (a tetrasaccharose) were present in the ratio of 3.5 to 1.9. In addition, the author found a monosaccharose [monosaccharide] among the carbohydrates. Address: Dep. of Food Chemistry, Osaka Municipal Hygiene Lab., Osaka, Japan.

3342. Iwasa, Y. 1937. Daizu no shusei chûshutsu kôgyô fukusanbutsu no kenkyû. II. Daizu tômitsu-chû no saponin no kenkyû [Utilization of the by-products of soybeans. II. Studies on a saponin in soybean syrup]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 13(3):231-32. March. English-language summary in Bulletin of the Agricultural Chemical Society of Japan 13:24-25, bound at the back of Nippon Nogei Kagaku Kaishi. [8 ref. Jap; eng]
• ***Summary:*** The author examined the saponin obtained as a by-product in the alcohol extraction method for the production of soy-bean oil. The product was a crystalline substance that decomposed at 220-225ºC and yielded, on hydrolysis with sulfuric acid, rhamnose, arabinose, glucuronic acid, and a sapogenin. Address: Dep. of Food Chemistry, Osaka Municipal Hygiene Lab., Osaka, Japan.

3343. Iwasa, Y. 1937. Daizu no shusei chûshutsu kôgyô fukusan-butsu no kenkyû. III. Daizu tômitsu no shusei hakkô ni tsuite [Utilization of the by-products of soybeans. III. Studies on the fermentation of soybean syrup]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 13(3):233-35. March. English-language summary in Bulletin of the Agricultural Chemical Society of Japan 13:24-25, bound at the back of Nippon Nogei Kagaku Kaishi. [3 ref. Jap; eng]
• ***Summary:*** The soy-bean syrup was then fermented using eight different microorganisms. Some alcohol was produced, especially by yeast. Address: Dep. of Food Chemistry, Osaka Municipal Hygiene Lab., Osaka, Japan.

3344. *Los Angeles Times.* 1937. Japan: Japanese make ritual of dining–Harmony of color stressed in dainty servings. April 21. p. B16.
• ***Summary:*** "Soya beans provide shoyu, the favorite sauce which replaces salt in many dishes and which is used in the preparation of meat, vegetables, soup, fish and poultry."

Gives six Japanese recipes including: Vegetable soup (*Misoshiru*) (with "tofu {dried bean curd}"). Beef and vegetables (Suki Yaki) (with "tofu {dried bean curd}" and shoyu).

3345. *Los Angeles Times.* 1937. Japanese serve fish at main meals. April 21. p. B16.
• ***Summary:*** A typical Japanese home menu is show. "Breakfast: Misoshiru [miso soup] and rice. Tamago-yaki [fried eggs]. Baked fish. Nori (seaweed). Pickles."

At the bottom of the menu is a separate item (a filler) titled "Rice and red beans (Seki Han [sekihan])." Note: These red beans are azuki beans.

3346. *Contemporary Manchuria.* 1937. Bean oil industry in Manchuria. 1(1):15-42. April.
• ***Summary:*** Contents: Methods of oil extraction: Wedge system (round cake), screw system (round cake), hydraulic system (round cake or plate cake; the plate cake system, which is the most advanced method of pressure extraction, is used only by Nisshin Oil Mills at Dairen and Anglo-Chinese Trading Company {Kabalkin Oil Mills} at Harbin), benzine-benzol system, alcohol system (recently developed by Central Laboratory of the SMRC and now utilized by the Manchuria Soya Bean Industry Company at Dairen). Characteristics of the various extraction methods (merits and demerits): The hydraulic system is gradually displacing the screw system, the alcohol extraction system is the best and it produces priceless lecithin as a by-product, most of the soybean oil mills in Europe use the benzine system. Varieties of bean cake: Round cake (6 types), plate cake, flake cake [soybean meal], refined bean cake (Soyalex; extracted with pure alcohol. Its use as a raw material for shoyu, miso, candy, or noodles adds a high degree of nutritive value). Utilization of soya beans (a chart on page 27 shows many uses): Uses of soy beans, uses of bean cake (as fertilizer, for manufacturing shoyu, for making bean flour {*kinako*}, as raw material for Ajinomoto, in making liquid paint {Solite as invented by Mr. Yosei Suzuki and manufactured by the Solite Company at Dairen}, as a raw material for various protein products {including sizing for paper}), uses of bean oil (food oil, lard substitute, butter substitute or margarine, paint diluent, soap, glycerine and fatty acid, waterproof material {Tantalus}, petroleum substitute, gum substitute and other), lecithin. Factory construction expenses.

In the Far East, the solvent extraction system is used by only 3 firms: (1) The Honen [Hohnen] Oil Manufacturing Company with mills at Dairen (capacity 200 tons/day), Naruo (200 tons), and Shimizu (610 tons); (2) the Nikka Oil Manufacturing Company with its mills at Wakamatsu (200 tons); and (3) the Manchuria Soya Bean Industry Company with its mills at Dairen (100 tons). The total capacity of these 3 companies is 1,310 tons/day, of which Honen has 77%. Their combined annual production of Flake Cake [soybean meal] is about 270,000 tons, which is negligible in comparison with the total amount of round-cake production in Manchuria.

The latest method of extracting oil from soya beans is by the use of benzine or benzol as chemical solvents. The Honen Oil Mills at Dairen is the only one which uses this method at present.

Candies and noodles are already being manufactured from soybean flour. An experimental station of the

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Department of Agriculture and Commerce has experimented with the use of Flake Cake in the manufacture of shoyu and obtained encouraging results in terms of cost and quality.

3347. Go, Yukichi; Nakamura, Seiji. 1937. Saikin no nenshitsu-butsu seisei ni kansuru kenkyû. I. Kakushu nattô seisei-kin no bunrui [Studies on the creation of mucilaginous matter by microorganisms. I. Classification of natto microorganisms]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 13(4):295-304. April. [7 ref. Jap]
Address: Osaka Teikoku Daigaku, Rigaku-bu, Japan.

3348. Miyasaka, Munemaro. 1937. Daizu saponin no agurikon ni tsuite. I. [On the aglycone of soybean saponins. I.]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) 57(4):464-74. April. [6 ref. Jap]
• ***Summary:*** This article has a translation of the title in German: "Ueber die Aglykone des Sojasaponin." The author demonstrated that the apparently homogeneous saponin derived from soybeans could yield at least three different sapogenins (Sojasapogenol-A, B, or C), depending on the conditions of hydrolysis. He assigned formulas corresponding to C_{29}, C_{27}, and C_{23} to his products. Address: K.K. Takeda Chôbei Shôten Kenkyû-shitsu.

3349. South Manchuria Railway Co. 1937. Bean oil industry in Manchuria. South Manchuria Railway Co., English Section. 37 p. April. 29 cm. See also original 1936 edition with same author and title. [Eng]
• ***Summary:*** Contents: I. Methods of bean oil extraction: Wedge system (round cake; the most primitive and small scale but still extensively used in remote interior districts), screw system (round cake; the most widely used method in Manchuria), hydraulic system (round or plate; the latter allows application of much greater pressure. Used only by the Nisshin Oil Mills at Dairen [capacity 150 tons/day of soybeans] and the Anglo-Chinese Trading Co. [Kabalkin Oil Mills] at Harbin, capacity 220 tons/day), benzine-benzol system (only used by Honen [Hohnen] Oil Mills at Dairen), alcohol system (a new process discovered by the Central Laboratory of the South Manchuria Railway Co. and now used by the Manchuria Soya Bean Industry Company at Dairen).

II. Characteristics of various extraction methods: 1. Comparison of wedge, screw, and hydraulic systems. 2. Comparison of round cake (hydraulic), plate cake, benzine extraction, and alcohol extraction systems: Constituent elements of bean cakes, merits and demerits of each type. Alcohol is considered the best. It gives the best quality oil and meal, and is the only system that "produces priceless lecithin as a by-product. The only demerit of this system at present is the high cost of production as compared with other systems. This is due to the large amount of capital required in the installation of machinery and plant and the necessity of using expensive alcohol as solvent." p. 5.

III. Varieties of bean cake. 1. Round cake: This is the original Chinese bean cake, which comes in several specialized forms: Fodder bean cake used as feed, "Pien Ping" (untrimmed cake), "Kuang Ping" (junk wharf cake), dried round cake (patented by the Dairen Soya Bean Industry Research Inst.), crushed cake, miscellaneous cakes. 2. Plate cake (rectangular). 3. Flake cake (from solvent extraction). In East Asia only 3 companies and 5 mills use solvent extraction. Daily capacity of these mills is as follows: Honen [Hohnen] Oil Manufacturing Co.–Dairen 200 tons, Naruo 200 tons, Shimizu 610 tons. Nikka Oil Manufacturing Co.–Wakamatsu 200 tons. Manchuria Soya Bean Industry Co.–Dairen 100 tons. The total annual production of flake cake is about 270,000 tons and is negligible in comparison with round cake production. 4. Refined bean cake ("Soyalex"). Resulting from alcohol extraction, it is considered to be the best quality for use in foods (shoyu, miso, candy, noodles) or feeds.

IV. Utilization of soya beans. 1. Uses of soya beans (a chart shows many uses): Foodstuff, animal feed, refined oil, lecithin. 2. Uses of bean cake: Directly as fertilizer (it contains nitrogen, phosphoric acid, and potassium, put is being replaced by ammonia sulphate), and as or animal feed. Processed for making foods such as shoyu, miso, bean flour ("kinako"). To make Ajinomoto, Solite liquid paint, and various protein products such as paper sizing, celluloid substitute, or medicine. 3. Uses of bean oil: "The bean oil was used originally by the Chinese people for cooking, lighting, and lubricating (carts) purposes and the demand was limited within China. In less than 30 years, however, it began to occupy an important place in the world market." The chief reasons are its relatively low cost and many potential uses for foods (lard substitute, butter substitute) or industrial products such as soap or paint, glycerine or fatty acids, waterproof material, petroleum substitute, gum substitute, etc. 4. Lecithin: Used for making leather, margarine, or restoratives. The alcohol extraction process produces lecithin, vitamins, and saponins as by-products. The yolk of an egg contains 7-10% lecithin. "The soyalex lecithin, obtained through the alcohol extraction method, is the most excellent lecithin produced through applied chemistry. It contains 3 to 10 times more lecithin than egg yolk and is more economical for general use.

V. Factory construction expenses: Machinery, installation, and building for a plant that can process 100 tons of soya beans per 24 hours. Screw system round cake, 102,880 yen. Hydraulic system round cake, 111,856 yen. Alcohol or benzine extraction, 719,365 yen.

Tables of statistics: Exports of soya beans, bean cake, and bean oil from 1926-1935: A. From individual ports (Dairen [by far the largest], Yingkou, Antung, Vladivostok, total). B. To various countries (Japan, Europe, China,

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USA, others, total). Value of exports in 1935 (M. yen; p. 36): Soya beans 130,053,055, beancakes 51,370,086, bean oil 20,132,208. Soya bean crop area and production in Manchoukuo, 1924-1935 based on statistics compiled by the Manchoukuo Dept. of Industry.

On the last page is written, Dr. Roy H. Akagi, S.M.R. Co., as if he were author.

Note: This is the earliest English-language document seen (March 2002) that uses the word "beancakes" to refer to ground, defatted soybeans.

3350. Chamberlin, William Henry. 1937. The wide horizon: Oh, to be in Japan–! *Christian Science Monitor.* May 1. p. 18.
• ***Summary:*** "The innumerable street vendors who sell noodles, sweet potatoes, beancurd soup and fish in the streets, each provided with his special cry or horn, gather more open-air customers, will to pay two or three sen for a bowl or soup or a hot sweet potato." Spring has come.

3351. Holmes, Marie. 1937. Cooking chat: Artistic dishes delight Occidental when dining in Japanese manner. *Toronto Daily Star* (*Canada*). May 20. p. 36.
• ***Summary:*** Several weeks ago, the writer was served a complete, authentic Japanese meal at a Japanese restaurant in New York City. Sukiyaki was cooked at her table. Over the simmering vegetables, the waiter poured "some soy or shoyu sauce,..." Floating in her delicious soup was "a little flower of pink bean curd, and a slice or two of white mushroom." She finds that Japanese food is the most artistic in the world, and artistically served. "Since modern hostesses are turning more and more to dishes of other countries and, in fact, placing before their guests whole foreign menus," now is a good time to start learning about the dishes of Japan. The recipes for a Japanese menu are given, including: Beef sukiyaki (with "¼ cup soy sauce" and "1 square piece bean curd") prepared in a frying pan. Japanese directions for Miyako sukiyaki (seasoned with "shoyu sauce").

A small portrait photo shows Marie Holmes.

3352. Nozoye, T.; Katsura, S. 1937. Daizu no saponin ni tsuite [Saponins in soybeans]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 58(5):570-71. May. [Jap]
• ***Summary:*** The authors reported the isolation of four different sapogenins from soybean saponin. They assigned C_{30} formulas to all four.

3353. *Popular Mechanics.* 1937. The bean that made good. 67:660-62, 120A, 122A. May.
• ***Summary:*** Photos show: (1) William Morse in his office at USDA in front of shelves of soybean food products. (2) Native 2-wheeled carts drawn by horses or mules (and widely used to carry soybeans) in front of storage silos in Manchuria. (3) "Soybeans from Japan used as green vegetables"–their pods. (4) A soybean storage yard Manchuria, with many horse-drawn wooden carts and tall cylindrical storage containers. (5) William Morse inspecting candied soybean products. (6) Two men in a hay-strewn field. (7) Boiled soybeans being crushed in a wood mortar in Japan. (8) Earthenware jars for making soy sauce in China; each is topped with a conical woven bamboo lid. (9) Two men, possibly including Morse, examining the root systems of soybean plants.

A chart (p. 120A) is titled "Soybean Utilization."

This digital photo, with caption and date, was sent to Soyfoods Center by Joyce Garrison (William Morse's granddaughter) of West Hartford, Connecticut (July 2004).

3354. Matsuyama, Masanori. 1937. Hatcho miso no shiro hanten ni tsuite [The white spots on Hatcho miso]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 15(6):453. [Jap]

3355. Murakami, R. 1937. [Influence of monochromatic light on the action of soy urease. II]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 13(6):439-

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43. June. (Chem. Abst. 32:1723). [1 ref. Jap]

3356. Ohtani, Yoshio. 1937. Nihon kôji-kin ni kansuru kenkyû. I. Keitai oyobi seiri no hikaku kenkyû [Studies on Japanese koji molds. I. Comparative studies on classification by morphology and physiology]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 15(7):535-37. [15 ref. Jap]
Address: Osaka Teidai, Kôgaku-bu, Jôzôgaku Kyôshitsu, Osaka, Japan.

3357. Shih, You Kuang. 1937. Untersuchungen ueber eine neue *Mucor*-Art auf "Meitauza" aus China [Investigations on a new type of *Mucor* mold on meitauza from China]. *Transactions of the Sapporo Natural History Society* 15(1):13-23. July. [51 ref. Ger]
• ***Summary:*** Contents: Introduction. 1. On the material to be investigated and its preparation. 2. Morphological. 3. Physiological: Properties of the culture, influence of temperature, influence of hydrogen ion concentration [pH], influence of the carbon source, influence of the nitrogen source, investigation of the fermentation of sugars, formation of alcohol and acids, saccharification of starches. 4. Diagnosis (conclusion).

Meitauza is okara, fermented with a *Mucor* mold. The product is traditionally made in many places in China such as Wuchang, Hankow, and Hanyang, preferably in winter, as follows: Form okara into round cakes 4½ to 5 inches in diameter, 1 inch thick at the center and 3/8 to ½ inch thick at the edges. Place the cakes in a vessel of the same size and allow to ferment in a room with moderate aeration until, after 10-15 days they are covered with a white mycelium of *Mucor meitauza* Shih. It is said that the best meitauza cannot be prepared in hot weather; it is usually prepared in winter. At higher temperatures bacteria can grow faster than the desired mold, and thus spoil the fermentation. Dry the cakes in the sun for several hours, then sell. Meitauza is served either fried (*gebraten*) in vegetable oil or cooked with vegetables then seasoned; it is widely considered to be tasty and nutritious.

"I received the research material [cakes] by post from Wuchang. It was still covered with a thick mycelium, which was downy and grayish white. Its form and size were about the same as described above. Through the usual culture methods, I isolated a type of *Mucor.* I then investigated its morphological and physiological characteristics."

Shih (working in the laboratory of Professor Dr. Jun Hanzawa in Hokkaido, Japan–with assistants Y. Tamura and S. Yoshimura) described the *Mucor* mold he isolated as a new species. He tried growing it on tofu (*Soja-Bohnenkäse*) but found that it grew best on moist rice and okara. The optimal temperature is 27-32ºC, and pH 5-6.

A full page of illustrations shows at least 9 views of *Mucor meitauza,* including the sporangiospores, columella, branching of the spore-carrying parts, and chlamydospores.

Note 1. Hesseltine (1965, p. 190) noted that from the fresh product, Shih isolated a *Mucor* which he carefully studied and described as a new species, *M. meitauza.* However a comparison of his species illustration and his observations indicate it is a synonym of *Actinomucor elegans,* already noted as one of the principal fungi involved in the preparation of fermented tofu.

Note 2. This is the earliest document seen (Sept. 2011) that contains the word "meitauza" (spelled like this, without hyphens).

Note 3. Meitauza is apparently a type of (or close relative of) okara tempeh. Address: Laboratory for Applied Mycology, Agricultural Institute, Hokkaido Imperial Univ., Sapporo, Japan.

3358. True, Alfred Charles. 1937. A history of agricultural experimentation and research in the United States 1607-1925, including a history of the United States Department of Agriculture. *USDA Miscellaneous Publication* No. 251. 321 p. For soybeans, see p. 91, 94, 100, 115, 146, 222, 227. July. With subject index. [327* ref]
• ***Summary:*** Contents: Agricultural research in the United States. Beginnings in the American Colonies and early States: Significant contributions resulting from individual efforts and colonial subsidies, Washington and Jefferson among the leaders of their time in observations and experiments relating to agriculture, influence of agricultural societies in promoting agricultural investigation and improvement during the post-revolutionary period, improvement of agricultural implements. Early State geological and agricultural surveys. Relations of the National Government to agriculture, 1796-1835: Early congressional action, advancement through executive branches of the government. Agriculture promoted through the Patent Office, 1836-62: The first Commissioner of Patents (Henry Leavitt Ellsworth). Movement for a United States Department of Agriculture (USDA).

The United States Department of Agriculture, 1862-88: Administration of Commissioner Isaac Newton (1862-67), Commissioner Horace Capron (1867-71), Commissioner Frederick Watts (1871-77), Commissioner William Gates LeDuc (1877-81), Commissioner George Bailey Loring (1881-85), Commissioner Norman Jay Colman (1885-89).

Movement in the States toward the establishment of institutions for agricultural research, 1840-75: New York, Connecticut, California, Maryland, Pennsylvania, Michigan, New Jersey (Rutgers, p. 75-76), Massachusetts, Maine, Kansas, Illinois, Minnesota, Wisconsin, Iowa.

State agricultural experiment stations without federal aid, 1875-88: Connecticut Experiment Station, California (E.W. Hilgard, p. 87-89), North Carolina (soy, p. 91), Massachusetts (soy, p. 94), Cornell University (Ithaca, New York), New Jersey (Rutgers), New York, Ohio, University of Tennessee (soy, p. 100), Alabama, Wisconsin, Maine

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Fertilizer Control and Agricultural Experiment Station, Louisiana Experiment Stations, Kentucky, Vermont.

Agricultural experiments in States not having experiment stations, 1875-1888: Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Mississippi, Missouri (soy, p. 115), Nebraska, New Hampshire, Pennsylvania, South Carolina, Houghton Farm. History of the Hatch Experiment Station Act of 1887. Agricultural experiment stations in the States and Territories under the Hatch Act, 1888-1905: Relation of the Federal Government to the stations, relations of the stations with associations, organization of the stations, income of the stations, equipment of the stations, lines of work of the stations (agronomy, soy, p. 146). Movement for increased Federal aid, culminating in the Adams Act, 1902-6: History of the act elevating the United States Department of Agriculture to Cabinet rank, the United States Department of Agriculture under the act of February 9, 1889, 1889-97. Large development of research relating to agricultural production, 1897-1913: United States Department of Agriculture, agricultural experiment stations, 1906-1913. Development of research in agricultural economics and sociology, 1913-21: United States Department of Agriculture (Bureau of Plant Industry, soy, p. 222; Bureau of Chemistry, soy, p. 227), agricultural experiment stations as affected by the Smith-Lever Extension Act and the World War, 1914-1920. Agricultural research during the agricultural depression, 1921-25: United States Department of Agriculture, agriculture experiment stations, 1921-25. Bibliography: Biographical references. Subject index. Name index.

Photos show: Edwin West Allen (1864-1929, frontispiece). Henry Leavitt Ellsworth (p. 23). Isaac Newton (p. 41). First main building of the Department of Agriculture (p. 46). Norman Jay Colman (p. 61). Samuel William Johnson (p. 69). Eugene Woldemar Hilgard (p. 72). Wilbur Olin Atwater (p. 83). William Henry Hatch (p. 124). Henry Cullen Adams (p. 167). James Wilson (p. 186). New main building of the Department of Agriculture (p. 189).

The first move to aid agriculture in the United States was inaugurated by George Washington in his message to Congress of 1790, and more elaborately in his last message of 7 Dec. 1796 (p. 18-19). Organizations were established to collect and diffuse information. In 1797 a House of Representatives committee recommended the creation of an American Society of Agriculture, funded by the federal government, with headquarters in Washington, DC; it never happened.

Meanwhile agriculture was promoted through the patent office from 1836 to 1862. The first commissioner of patents, Henry L. Ellsworth, was very active and helped to lay the foundations of the present USDA. As commissioner (1835-1845) he immediately began to collect new and valuable seeds and plants, and to distribute these with the aid of congressmen and others. "Naval officers, consuls, and private citizens traveling abroad were frequently bringing to this country seeds and plants which might be used in our agriculture but which were largely lost because there was no agency for their preservation and distribution. In his report for 1837 Ellsworth therefore suggests the creation of a public depository for such articles, 'whence they may be dispensed to every part of the Union'" (p. 24). "In 1840 more than 30,000 packages of seeds were distributed. That year the Commissioner urged 'the importance of an annual report of the state of the crops in different sections...'" (p. 25) In 1845 Ellsworth resigned. "In 1847 more than 60,000 packets of seed were distributed, including some contributed by the French minister of agriculture commerce" (p. 27). Subsequent commissioners continued Ellsworth's work. "In 1852 Congress gave special authority for the purchase of seeds, and in 1854 included cuttings" (p. 28).

From June 1853 to 1860 the Agricultural Division of the patent office was in the charge of Daniel Jay Browne, son of a New Hampshire farmer. He emphasized the importance of the "introduction and naturalization of new and useful vegetable products, hitherto unknown in the United States," and justified the distribution of many small seed packets to encourage propagation (p. 29).

"Beginning in 1856 the language of the agricultural appropriation item was broadened to include 'the collection of agricultural statistics, investigations for promoting agriculture and rural economy and the procurement and distribution of cuttings and seeds'" (p. 31).

"In 1858 preparation was made for a propagating garden on five acres of land between Missouri Avenue and Four and a Half and Sixth Streets in Washington. This was tile drained and a hothouse was erected. Primarily it was intended to grow there the tea seeds from China and cuttings of grapevines collected in the United States" (p. 31-32).

In 1850 the Agricultural Division of the Patent Office received its first funds, $5,000, appropriated by Congress, increasing to $10,000 in 1854. "Up to that time the money had been taken out of the Patent Office fund, but in 1855 reimbursement was made to the extent of $40,078.78. After that, the agricultural appropriation was paid directly from the Treasury. Between 1856 and 1862 the appropriation varied from $30,000 to $75,000" (p. 34).

Note: Browne distributed Admiral Perry's seeds (including soybeans) from Japan. And in the Report of the Commissioner of Patents, Agriculture, he wrote numerous articles about new plants, including one about soybeans in 1855.

In the early 1860s a movement started to form a U.S. Department of Agriculture as a separate organization, outside the Patent Office. The idea became a Act which was approved by President Abraham Lincoln in 1862 (p. 37-40). Its first era was 1862-1888, with Isaac Newton as the first commissioner of agriculture in 1862, and again in 1867. He was promoted from chief of the agricultural section of the

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patent office.

"The initial appropriation for the department was $60,000... For the fiscal year 1867 the appropriations aggregated to $199,000. The Department [USDA] had six rooms in the basement of the Patent Office building [in Washington, DC], which had formerly been occupied by the agricultural division, and gradually acquired possession of the property of that Division, including the propagating garden at Sixth Street and Missouri Avenue NW. There was also assigned to it a tract of land, lying between Twelfth and Fourteenth Streets from B Street SW to the canal (now Constitution Avenue), which was being used by the War Department as a yard for army animals. This tract, now forming the Department grounds, did not come into its possession until April 1865, when it was made an experiment farm" (p. 42). Tests were made that summer. Continued. Address: USDA, Washington, DC.

3359. Horvath, A.A. 1937. The chemistry of soybean protein extraction. *Chemistry and Industry* (*London*) 56(33):735-38. Aug. 14. [27 ref]

• ***Summary:*** "The extraction of protein from soybean meal, its subsequent precipitation and properties, as well as its industrial applications have been extensively studied by S. Satow, and the results published (in English) in 1921-23 in two voluminous reports [Technology Reports, Tohoku Imperial University (Japan): 2(2) and 3(4)]. These reports continue to serve as an unsurpassed source of information on this subject, and a number of discoveries during the last 15 years can be traced to the researches of Satow." Horvath then summarizes many of Satow's key findings. Address: Chemist, Agric. Exp. Station, Newark, Delaware.

3360. *Contemporary Manchuria.* 1937. Studies on the alcoholic extraction of soya bean oil. 1(3):83-101. Sept.

• ***Summary:*** Contents: General remarks. Principle of the oil extraction method. The solubility of soya bean oil in alcohol. Experiments on the alcoholic extraction of soya bean oil. Conclusion.

Before World War I, pressure was used to extract soybean oil in Manchuria. When the war ended, "a grave crisis threatened the bean oil industry [in Manchuria] owing to the development of the nitrogen fixation industry and to the increased popularity of sulphate ammonia as fertilizer throughout the world. Bean-cake, which had been occupying the premier position in the Japanese fertilizer market, was compelled to yield its place to sulphate of ammonia, resulting in a decline of the bean-oil industry. Thus the need of a technical improvement of the oil extraction industry came to be keenly felt in order to extend the uses of bean-cake as foodstuffs and materials for industries.

"It was under such circumstances that the Central Laboratory of the South Manchuria Railway Company in Dairen commenced in April, 1927, researches and experiments on the alcoholic extraction of soya bean oil in an effort to contribute to the development of the oil extraction industry." It was found that soya bean oil dissolves rapidly in ethanol at temperatures above 60ºC. If benzine is added to alcohol, the rate of solubility increases according to the amount added. In practice, the suitable concentration of alcohol is around 96% by volume. The temperature for oil extraction must be over 75ºC and the cooling temperature below 25ºC. The oil extracted by the circulating alcohol method and the meal are both light in color and do not have the odor peculiar to soya beans. "They can be used as raw materials for the manufacture of food. Furthermore the oil contains very little fatty acid and is similar to semi-refined oil."

The new process developed by the SMRC laboratory is now used commercially by the Manchuria Soya Bean Industry Company in Dairen.

Note: This is the earliest document seen describing the commercial use of ethanol as a solvent for soybean oil. The plant in Dairen, Manchuria, uses a batch extractor.

3361. Funk Delicious: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. Also spelled Funk's Delicious. 1937. Seed color: Yellow (straw), hilum pale.

• ***Summary:*** Sources: Woodruff, Sybil. 1937. "Edible varieties of soybeans." *Proceedings of the American Soybean Assoc.* p. 19-22. See p. 22. Table 1, titled "Superior varieties of soybeans for food use" (p. 22) shows that Funk's Delicious was a late maturing green soybean. Trials in 1936 showed that the date for best use was Sept. 10 to 25.

Morse, W.J. 1938. "Edible varieties of soybeans." *Proceedings of the American Soybean Assoc.* p. 30-33. A table (p. 32) shows: F.P.I. No.: None. Days to ripen: 125. Seed color: Straw yellow. Hilum: Pale. Seeds per lb: 1,600. Oil and protein content (moisture-free basis): 17.40% and 41.31%. Use: Dry edible or green vegetable.

Lloyd, J.W.; Burlison, W.L. 1939. "Eighteen varieties of edible soybeans: Their adaptability, acceptability, culture and characteristics." *Illinois Agric. Exp. Station, Bulletin* No. 453. p. 385-439. March. See p. 394-97, 413, 425.

Morse, W.J.; Cartter, J.L. 1939. "Soybeans: Culture and varieties." *USDA Farmers' Bulletin* No. 1520 (Revised ed.) 39 p. Nov. See p. 10. "Funk Delicious–Introduced by the Funk Seed Farms, Bloomington, Ill., in 1932. Maturity, about 125 days; pubescence, gray; flowers, purple appearing in 50 to 55 days; pods, two-seeded; seeds, straw yellow with pale hilum, about 1,600 to the pound; germ, yellow; oil, 17.40 percent; protein, 41.31 percent. Suitable as a green shelled bean and a dry edible bean."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 10-11. Funk Delicious is in the USDA Germplasm Collection. Maturity group: IV. Year named or

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released: 1932. Developer or sponsor: Funk Brothers Seed Company, Bloomington, Illinois. Literature: 11. Source and other information: From Japan by 1932. Prior designation: None. Address: USA.

3362. Giant Green: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1937. Seed color: Green, hilum black.

• ***Summary:*** Sources: Ridgway, Frank. 1937. "Day by day story of the experimental farms: Edible soy beans." *Chicago Daily Tribune.* Aug. 11. p. 24.

Woodruff, Sybil. 1937. "Edible varieties of soybeans." *Proceedings of the American Soybean Assoc.* p. 19-22. See p. 22. Table 1, titled "Superior varieties of soybeans for food use" (p. 22) shows that Giant Green was the earliest maturing green soybean that was studied. For this reason it was included in the table, even though it did not rank among the 17 superior varieties. In 1936 it was at its peak of flavor and texture before Aug. 26

Woodruff, Sybil; Klaas, Helen. 1938. "A study of soybean varieties with reference to their use as food." *Illinois Agric. Exp. Station, Bulletin* No. 443. p. 421-67. May. See p. 430, 466. "Altho not ranked with the superior varieties, Giant Green is included in the table because it was the earliest maturing green soybean" (p. 430). In the green stage, it was rated Fair in 1935 and Good in 1936. In the dry stage, it was rated Fair in 1935 and 1936. Its color, texture, and flavor were not very good.

Lloyd, J.W.; Burlison, W.L. 1939. "Eighteen varieties of edible soybeans: Their adaptability, acceptability, culture and characteristics." *Illinois Agric. Exp. Station, Bulletin* No. 453. p. 385-439. March. See p. 394-97, 413. "The only year in which Giant Green was included in all collections it was singled out as the most satisfactory variety, in reports from counties in the north, west, east, and southern parts of the state [Illinois], thus indicating its adaptation to all parts of the state. Some specific reasons given for preferring this variety, besides its good quality and extreme earliness, were that it was especially drouth-resistant, that it developed before the bad weather came, and that it was ready to use before grasshoppers arrived in destructive numbers."

Morse, W.J. 1941. "Shanghaied... a super food." *Soybean Digest.* July. p. 4-5, 10. See p. 5. Giant Green is an early variety, maturing in 101-110 days.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 10-11. Giant Green is in the USDA Germplasm Collection. Maturity group: I. Year named or released: 1938. Developer or sponsor: J.W. Lloyd, Illinois AES (Agric. Exp. Station). Literature: 09, 10, 13, 14. Source and other information: From the Takii Seed Company, Kyoto, Japan, to the Illinois AES (Agric. Exp. Station) in 1935. Prior designation: None. Address: USA.

3363. Morse, W.J. 1937. Soybean variety studies of the United States Department of Agriculture. *Proceedings of the American Soybean Association* p. 16-18. 17th annual meeting. Held 14-16 Sept. at Urbana, Illinois.

• ***Summary:*** "One of the outstanding results of soybean improvement work in the United States has been, the realization of the importance of varietal adaptation... Varietal adaptation is obviously the reason why practically every locality in the soybean regions of the Orient has its own local varieties... Of the large number of introductions obtained from Asia, the same variety rarely has been secured a second time unless introduced from the same locality... Before numerous introductions were made by the Department, beginning in 1898, there were not more than eight varieties of soybeans grown in this country, and the culture of these varieties was confined to limited areas in a few states... Seed samples were obtained through consuls, missionaries, seedsmen, government agencies, and foreign explorers until by 1909 we had 175 varieties; by 1913, 427 varieties; by 1919, 629 varieties, by 1925, 1133 varieties, and at the present time more than 2,500 distinct types. Since 1989 the Department of Agriculture has made more than 10,000 introductions of soybeans from China, Manchuria, Japan, Chosen [Korea], Java, Sumatra, Siberia, and India. This large collection, ranging in time of maturity from 75 to 200 or more days, has show wide differences in adaptation to soil and climatic conditions..."

After preliminary testing at Arlington Farm, Virginia, the introductions are sent to various experiment stations for cooperative studies...

"The soybean has been used chiefly as a forage crop in the United States and for many years breeding work tended largely toward the development of varieties for hay, silage, and pasture. With the rapid development during the past few years of the soybean for oil, food and industrial purposes, acreage for bean production has increased greatly. The improvement and development of varieties adapted to a wide range of conditions and uses undoubtedly has been one of the most important factors in increased acreage and seed production."

"Extensive cooperative investigations with more than 3,000 introductions and selections of soybeans have been carried on during the last three or four years with experiment stations and special cooperators in 44 states and the insular possessions, Hawaii and Puerto Rico. Many of these selections gave outstanding results when compared with standard varieties in different sections and are being increased for more extensive field tests. Several of the varieties in different sections were found especially suitable for use as green shelled beans, dry edible beans, or beans of high oil and protein content, as commercial beans.

"In 1936, more than 5,000 individual soybean plant selections from introductions and natural hybrids were under test at Arlington Farm. Although improvement

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work at Arlington has been largely plant selection, some hybridization work has been started, especially with the wild soybean and the most promising cultivated types. Oil and protein studies have been conducted along with the breeding work, analyses being made of introductions grown in the same and under different environmental conditions. An extensive series of varieties, introductions and selections at Arlington Farm ranged from 12 to 26 per cent oil and from 28 to 50 per cent protein... In view of the interest in soybean oil for paint purposes, studies were conducted to show the range in iodine number. The results of these investigations showed a range from 118 to 143 for domestic varieties and 155 for the wild soybean.

"The increasing use of soybeans for food has resulted in a demand for varieties especially suited for various food purposes. Extensive cooperative cooking experiments with the Bureau of Home Economics of the Department of Agriculture and with several state experiment stations have shown considerable variation in flavor and cooking quality in both the green and dry beans of edible varieties from the Orient. The most promising of these have been named and distributed to special cooperators by several state experiment stations. Some of these varieties are especially valuable as green shelled beans, flour, dry edible beans, roasted salted beans [soynuts], bean curd, bean milk, and bean sprouts." Address: Bureau of Plant Industry, USDA, Washington, DC.

3364. Ohtani, Yoshio. 1937. Nihon kôji-kin ni kansuru kenkyû. II. San keisei-ryoku no hikaku [Studies on Japanese koji molds. III. Comparison of acid formation capability]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 15(9):812-13. [Jap] Address: Osaka Teidai, Kôgaku-bu, Jôzôgaku Kyôshitsu, Osaka, Japan.

3365. Ochiai, Eiji; Tsuda, Kyosuke; Kitagawa, Seikichi. 1937. Ueber Sojabohnen-Saponin. I. [Soybean saponins. I.]. *Berichte der Deutschen Chemischen Gesellschaft* 70B(1):2083-92. Oct. [13 ref. Ger]
• ***Summary:*** A comprehensive investigation of the saponins in soybeans which can be obtained after removing the oil and lecithin. They are of two forms: one crystalline and the other amorphous. Hydrolysis of each type shows, by analysis of the hydrolyzed products, that saponins are built up from rhamose and galactose as the sugar components, coupled with glucoronic acid and neutral sapogenols.

Most of the research focused on investigating the chemical origin of the soybean sapogenols, since these are the essential and characteristic component of the saponins. Four different sapogenols were identified, their only chemical difference being in their oxygen content. Their chemical reactions and the composition of their oxidation and reduction products show that they are triterpene alcohols. This relates them chemically, and as plant products, to the great class of terpenes and terpenoids which includes turpentine, camphor, and many essential oils from which flavors and perfumes are made. It also settles the question as to whether soy bean saponins were derived from sterols or from terpenoids, and will be helpful for directing the research into uses of saponins as soybean products (From: *Food Industries.* Dec. 1937, p. 739).

The authors also isolated the phenolic glycoside genistin and reported it to have a melting point of 298-300ºC.

Note: Previous to its isolation from soybeans, genistein was synthesized by Baker and Robinson (1926, 1928), who established it to be identical with prunetol and 5:7:4'-trihydroxyflavone. Address: Pharmaceutical Institute, Imperial Univ. of Tokyo, Japan (Aus d. Pharmazeut. Institut d. Kaiserl. Universitaet Tokyo, Japan).

3366. Ochiai, E.; Tsuda, K.; Kitagawa, S. 1937. Ueber Sojabohnen-Saponin. II. [Soybean saponins. II.]. *Berichte der Deutschen Chemischen Gesellschaft* 70B(10):2093-96. Oct. [8 ref. Ger]
• ***Summary:*** The authors reported the results of dehydrogenation of the four saponins described in the previous pages of this journal (p. 2083-92). They concluded that the sapogenins obtained from soybean saponin by acid hydrolysis were triterpenoid alcohols, genetically related to one another and to many similar sapogenins belonging to the hederagenin series. Address: Aus d. Pharmazeut. Institut d. Kaiserl. Universitaet Tokyo, Japan.

3367. Rokusho, B.; Tanaka, R.; Miyahara, C. 1937. Gurutamin-san no seizô ni kansuru kenkyu. I. [Preparation of glutamic acid. The condition of acid hydrolysis of alcohol-extracted soybean cake (Soyalex)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 13(1):916-22. Oct. (Chem. Abst. 32:1245). [Jap]

3368. Rokusho, B.; Tanaka, R.; Miyahara, C. 1937. Gurutamin-san no seizô ni kansuru kenkyu. II. [Preparation of glutamic acid. II]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 13(1):923-35. Oct. (Chem. Abst. 32:1245). [Jap]

3369. Rokusho, B.; Tanaka, R.; Miyahara, C. 1937. Gurutamin-san no seizô ni kansuru kenkyu. III. [Preparation of glutamic acid. III]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 13(1):936-43. Oct. (Chem. Abst. 32:1245). [Jap]

3370. Rokusho, B.; Tanaka, R.; Miyahara, C. 1937. Gurutamin-san no seizô ni kansuru kenkyu. IV. [Preparation of glutamic acid. IV]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 13(10):944-53. Oct. (Chem. Abst. 32:1245). [Jap]

3371. Gray, George Douglas. 1937. Brown bread versus

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white (Letter to the editor). *British Medical Journal* ii:996-97. Nov. 13.
• ***Summary:*** The writer acknowledges the nutritional deficiencies of white bread then goes on to state: "May I enter a plea for closer consideration of the benefits which can be gained from adding 20 per cent. flour milled form soya beans to 80 per cent. wheat flour? This mixture possesses all the physiological characteristics of dark whole-meal flour, and bread made from it surpasses the nutritive value of bread made from whole wheat as well as being more palatable and tasty. These qualities are due to the large amount of soya protein (glycinin), which is a complete protein containing all the essential amino-acids necessary for the building up of proteins of the human organism. In the above proportions of soya flour with white flour the protein of ordinary bread is increased by over 60 per cent." Soy flour is also a good source of vitamins A and B, and of lecithin.

"The ash of soya is alkaline while that of cereals is acid; the ash is rich in phosphorus, calcium, and magnesium. Because of this alkaline value, soya flour is especially useful in combating the fatigue of muscular exertion, and herein lies the Oriental's ability to do a long day's work at low cost. The yield of protein pound for pound is more than twice that of beefsteak; four times that of eggs, wheat, and cereals; twice that of lima beans; and twelve times that of milk.

"The soya flour most commonly used in England is made in accordance with the formula of Professor Berczeller of Vienna [Austria]... The widespread use of soya food in Japan and China down the ages, and the example of other countries that consume it in annually increasing quantity, are factors that should lead us to a better appreciation of the high nutritional qualities of this legume." Address: Edinburgh [Scotland; M.D., Scotch physician].

3372. Nippu JiJi-sha (The Nippu Jiji). comp. 1937-1938. Hawai nenkan [Hawaiian Japanese annual and directory]. Honolulu, Hawaii: Nippu JiJi-sha (The Nippu Jiji). [Jap]*

3373. Fujikawa, Fukizawa. 1937. [On the anti-mold action of phenol carbonic acid from lichen]. *Nippon Eisei* 9:262-. [Jap]*

3374. Kazuno, T. 1937. [On unsaponifiable substance in shoyu]. *Gakujutsu Kyoho* 12:530-. [Jap]*

3375. *Manshu Tokysan Chuokai, Tokusan Shiryo.* 1937. Tokusan torihiki jijô [The business and trade situation for special products (in Manchuria)]. B. No. 11. 890 p. (Manshukoku Kyujitsugyo-bu Rinji Sangyo Chosa Kyoku). [Jap]*
Address: Shinkyo (Ch'ang Ch'un), Manchuria.

3376. Oota, Kiyoshi. 1937. Shôyu no kabi-dome-zai ni tsuite. (Toku ni "biojiparu" no jitsugaku-teki igi. Inshokubutsu bôfuzai no kenkyû) [On the anti-mold substances for shoyu. Especially the practical significance of biodipal. Research on preservatives for beverages]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 32(6):118-29; 32(8):136-40; 32(9):149-52. [24 ref. Jap]
Address: Igaku Hakase.

3377. Togano, Meijiro; Arimura, H. 1937. Beikoku o shiyô suru shôyu jôzô shiken hôkokusho [Shoyu brewing trials using rice]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 32(3):70-73; 32(4):98-101; 32(5):106-11; 32(6):116-17; 32(7)141-; 32(8):153-; 32(10):156-58. [Jap]
Address: 1. President, Nihon Jozo Kogyo Kabushiki Gaisha, Nôgaku Hakase; 2. Gishi cho.

3378. Agate: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1937. Seed color: Yellow (straw) and brown, hilum brown.
• ***Summary:*** Sources: Morse, W.J.; Cartter, J.L. 1937. "Improvement in soybeans." *Yearbook of Agriculture* (USDA). p. 1154-89. For the year 1937. See p. 1187. Origin: Introduction, Japan. Year: 1929. Days to mature: 90. Flower color: Purple white. Pubescence color: Tawny. Seed coat color: Straw yellow + brown. Germ color: Yellow. Hilum color: Brown. Seeds per pod: 2-3. Seeds per pound: 2,816. Use: Green vegetable beans.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 8-9. Agate is in the USDA Germplasm Collection. Maturity group: 00. Year named or released: 1937. Developer or sponsor: USDA. Literature: 08, 11. Source and other information: 'Kurakake Daizu' from Sapporo, Hokkaido, Japan, in 1929. Prior designation: PI 81037. Address: USA.

3379. Descartes de Garcia Paula, Ruben. 1937. A soja como materia prima para industria [The soybean as a raw material for industry]. Rio de Janeiro, Brazil: Instituto Nacional de Technologia (Ministerio do Trabalho, Industria e Commercio). 21 p. 24 cm. [4 ref. Por; fre]
• ***Summary:*** Contents: Introduction. Names of the soybean in different languages. Table showing production of soybeans in leading countries: Manchuria, China, Japan and Korea, United States, Russia, Netherlands Indies. Chemical composition of soybeans in China and Japan, Russia, Hungary, England, and USA (tables {p. 9-11} showing chemical composition, based on research in USA and Brazil); for each variety is given the percentage composition of water, oil, protein (*proteinas*), carbohydrates, cellulose, and ash. Analyses of 7 soybean varieties (made in the USA by USDA): Austin, Ito San, Kingston, Mammoth, Guelph, Medium Yellow, Samarow. Analysis of 11 varieties grown in Sao Paulo, Brazil: Peking, Wilson Five, Minsoy, Dunfield, Mandarin, Haberlandt, Virginia, Habaro, Dixie, Mammoth

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Yellow. Analysis of 6 varieties grown in Parana (Aksarben, Edano, Hermann, Mammoth Yellow, Mammoth Brown). Brief studies of the chief soybean products: oil (*oleo*), cake (*torta*), flour (*farinha de soja*), lecithin (*lecithina*), and casein (*caseina de soja*). List of potential industrial products. List of food products. French summary.

Highlights the importance of the soybean in the general economy and especially as a raw material for industry. The possibilities of the crop for Brazil are considered.

Note 1. This is the earliest Portuguese-language document seen (Sept. 2006) that mentions soy oil, which it calls *oleo.*

Note 2. This is the earliest Portuguese-language document seen (Aug. 2003) that uses the term *caseina de soja* or *proteinas* to refer to protein in connection with soybeans. Address: Rio de Janeiro, Brazil.

3380. Dominion Bureau of Statistics, Ottawa, Canada. 1937. Imports for consumption: Agricultural and vegetable products. *Trade of Canada.* Fiscal year ended March 31, 1936. See p. 283, 289, 299, 335, 340. [Eng; Fre]

• ***Summary:*** Table No. 37 (p. 283) gives figures (gallons and dollar value) for imports of soy sauce to Canada each year from 1932 to 1935 from United Kingdom, Hong Kong, China, Japan, Syria, and the United States. Total soy sauce imports (in gallons) were as follows: 1932 = 78,581. 1933 = 72,389. 1934 = 89,249. 1935 = 79,321.

Page 289 shows imports of soya beans in 1935 only from United Kingdom, Hong Kong, Japan, and United States. Some 259,460 lb of soybeans were imported worth $7,822. The main source country was Japan, followed by the USA.

Page 299 gives import figures for soybean oil in 1934 and 1935 from United Kingdom, China, Germany, Japan, Netherlands, and the USA.

Page 335 shows imports of soya bean cake and meal from 1932 to 1935 from United Kingdom, China, and USA.

Page 340 shows imports of soya bean oil (and peanut oil) for the manufacture of soap in 1934 and 1935 from the United Kingdom, China, Denmark, Germany, Netherlands, and United States. Address: Ottawa, Canada.

3381. Fuji, Fugoro. 1937. Dainihon kaigai iminshi [Great history of Japanese immigration overseas]. Japan: Kaigai Chôsa-kai. See vol. 2, p. 21-22, 95. [Jap]*

• ***Summary:*** Pages 21-22 repeat the information from Morita 1915 about Haruhachi Shimada being the first to brew shoyu in Hawaii.

Page 95 in the "people" section states: "Nobuyuki Yamagami was born in 1882 and came from Fukuoka prefecture. He studied in Fukuoka and also in Tokyo. Later he developed ambition and traveled to England, France, Germany, and other European countries for several years. Next he went to Australia, and finally to the USA. In San Francisco he opened a seafood products store and studied foods. In 1905 in Honolulu, Hawaii, he founded Yamakami/Yamagami Shoyu Jozo-sho, which was successful. Later he changed the company's name to Hawaii Shoyu Kaisha. He delegated the work to Tashiro Kumataro, and went to China for fun. In Korea he founded a soap factory and succeeded in getting orders from the army and navy. His shoyu was developed based on his original research, and suited for the tastes of modern people. He called it 'kenfu,' which means 'wise wife/women.' It became very popular. His elder brother, Sogen Yamakami/Yamagami, was a great Zen monk/priest. Also he was very famous for his great kindness to his parents."

3382. Inahara, K. ed. 1937. Japan Year Book. Tokyo: The Foreign Affairs Association of Japan. 1240 + 32 p. See p. 474-76, 625, 987, 1071-72, 1076-78.

• ***Summary:*** The Preface indicates that this book was published in about Sept. 1937.

Pages 475-76. "Leguminous plants:... During the past decade area planted has been pursuing a slow, downward movement, while a sharp reduction experienced by production was more than made good by the increase of 1933. Soya beans and azuki (red) beans are predominant both in area and production.

Soy-beans were planted on 335,345 cho which produced 2.261 million koku worth 34,333,000 yen.

Azuki beans were planted on 109,389 cho which produced 5.333 million koku worth 10,620,000 yen.

Note: It is surprising that Japan produced a much larger volume of azuki beans than of soy-beans. Perhaps azuki bean production should be 0.533 million koku.

Page 625. A large table shows production of vegetable oils in Japan (in yen) from 1936 to 1935. In 1926 rapeseed oil was the most valuable oil in Japan (13.474 million yen) followed closely by soya bean oil (13.386 million yen). The same general relationship existed in 1935; rapeseed oil was still the most valuable oil in Japan (20.019 million yen) followed by soya bean oil (15.329 million yen).

Next in value in 1935 were perilla oil (10.494 million yen), cottonseed oil (7.129 million yen), other oils (6.743 million yen), copra oil (5.376 million yen), sesameseed oil (2.835 million yen), linseed oil (3.691 million yen), groundnut oil (0.595 million yen), camellia oil (0.439 million yen), and paulownia oil (0.227 million yen).

A second table shows production of animal oils and tallow (in yen) from 1926 to 1935. These were much less important than vegetable oils, being worth only about one-sixth as much in total. Beef tallow and cod oil were the two most important animal oils in 1935.

Page 987. The section on Chosen [Korean] agriculture states that the soy bean is one of the most important crops, after rice, barley, wheat and rye. "In 1935 the total the total area under cultivation was 791,857 cho and the amount

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produced reached 4,375,278 koku, which was an increase of more than five times compared with the year 1910."

Page 1071. A large table shows "Values of principal articles exported abroad (in Manchoukuo yuan)," in 1935 and 1936. The export item of greatest value was soy beans, which increased from 130.053 million yuan in 1935 to 216.474 million yuan in 1936.

The item of 2nd greatest value was [soya] beancake, which increased from 51.370 million yuan in 1935 to 53.126 million yuan in 1936.

The export item of 4th greatest value (after coal) was [soya] bean oil, which increased from 20.132 million yuan in 1935 to 21.282 million yuan in 1936.

Page 1072. A large table on "Quantities of principal articles exported abroad" (from Manchoukuo in piculs; 1 picul = 133.33 lb) are: The export item of greatest weight was soy beans, which increased from 9.203 million piculs in 1935 to 32.539 million piculs in 1936.

The item of 2nd greatest weight was [soya] beancake, which decreased from 16,925 million piculs in 1935 to 14,026 million piculs in 1936.

Another important export item was [soya] bean oil, which decreased from 1.479 million piculs in 1935 to 1,109 million piculs in 1936.

Page 1076. Two large tables show "Cultivated area and production of cereals" (in hectares and metric tons), 1929-1935. For soy beans:

3.822 million metric tons in 1935–grown on 3.249 million ha.

Other crops in the table are other legumes, kaoliang, millet, maize, wheat paddy-field rice, upland rice, and other cereals.

Page 1077 gives "Crop forecast by provinces (metric tons)." Soy beans is the first crop on the list. The provinces are:

Pinkiang 1,083,886 metric tons
Fengtien 985,362 metric tons
Kirin 980,789 metric tons
Lungkiang 464,940 metric tons
Sankiang 260,592 metric tons
Antung 154,664 metric tons
Chinchow 151,108 metric tons
Chientao 91,383 metric tons
Heiho 2,729 metric tons
Total 4,175,453 metric tons.

Also on p. 1077 a table shows "Exports of agricultural products, 1933-1935." (Quantity in piculs, value in yen). Soy beans was by far the leading export:

39.111 million piculs in 1933
41.308 million piculs in 1934
29.230 million piculs in 1935

Page 1078. "Soy Beans: Manchoukuo produces about 60 per cent of the total production of soy beans in the world. The beans contain about 10 per cent of oil, and the cake which is obtained in pressing the beans is exported as fertilizer. The latest figure for production of soy beans in Manchoukuo was 3,820,000 metric tons and its total plantation [planted] area 3,249,000 hectares. The average crop per hectare was 1,180 kg."

3383. Japan-Manchoukuo Year Book. 1937. Tokyo, Japan: Japan-Manchoukuo Year Book Co. 32 + xiii + 1304 p. Index. 26 cm. Fourth annual issue. [Eng]

• ***Summary:*** Each year book is divided into two main parts: Japan, and Manchoukuo. On the title page, just below the title but in small letters we read: "Cyclopedia of General Information on the Empires of Japan and Manchuokuo. Appendices: Who's Who Business Directory." Below that is a small map showing the Japanese empire, circled, as part of East Asia–under which is printed: "Neither is Understandable Without the Other." Below that are listed the cities and names of 18 agents worldwide. This book was published in mid-November 1936.

In the Japan and Manchoukuo parts of the book, soya beans are most widely discussed in the respective chapters on Agriculture. In each case, information given the previous year is updated one year.

Page 359. A large table gives the yield of rice and other cereals in koku per tan from 1904-08 to 1935. For soya beans the yield in 1935 was 0.67.

Page 369. Table 27 shows production of "Beans, potatoes and sweet potatoes" in hectolitres from 1929 to 1934. 1.80391 hectolitres = 1 koku = 5.11902 dry bushels (USA). For soya beans:

3.902 million hectoliters in 1934

Page 846. Two large tables show "Area under various crops (in hectares)" and "Amount of crops (metric tons)" in Manchoukuo yearly from 1924 to 1935. For soya beans: 3.822 million metric tons in 1935

The other principal crops shown in the tables are other beans, kaoliang, millet, maize, wheat, rice, upland rice, and other cereals.

Page 847. The section on "Soya beans" has a new paragraph on the end: "Soya beans are exported to Japan, China, Europe, the South Seas and almost al other countries of the world. Their exports for the last few years are given below:

2.207 million metric tons in 1930
2.834 million metric tons in 1931
2.562 million metric tons in 1932
2.523 million metric tons in 1933
1.976 million metric tons in 1934
1.892 million metric tons in 1935

Page 915. A pie chart shows principal exports from Manchoukuo in 1935. In descending order of importance they are: Soya beans 30.9%. [Soya] bean cake 12.2%. Coal 9.6%. [Soya] bean oil 4.8%. Groundnuts 3.6%. Other beans 3.1%, etc.

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Page 893 is all about soya beans in Industry in Manchoukuo. In recent years, exports of bean cakes have "been hard hit by the world-wide economic depression and the growth of the sulphate of ammonia [ammonium sulfate fertilizer] industry.

"There are more than 3,000 bean oil mills throughout Manchoukuo, but those with worthy equipment are 402 in number as may be seen from the following table (as shown by the returns of the Dairen Bean Oil Association).

The large table, titled "Bean oil mills" shows the number of mills in each locality for each for the following localities: Dairen 50, Yinkow 20, Antung 23, Harbin 43, South Manchuria 238, North Manchuria 28. Total: 402. Also given for each locality are the number of pressing machines (hydraulic or screwing [screw presses]) and the production capacity per day of beancake (pieces) and bean oil (kin).

A small table (p. 893) shows the "Output of bean-cake and oil" in 1932. Bean cake was worth 72.1 million yen whereas bean oil was worth 31.6 million yen.

Four large tables (p. 893-94) show "Exports of bean oil and bean-cake by countries, 1932-1935. About 70% of the soya bean oil (by weight) is exported to China, whereas about 48% of the bean-cake is exported to Japan & Chosen [Korea] and about 34% is exported to China.

Page 897. A long section titled "Soy" [sauce] states: "In sympathy with the rapidly increasing number of Japanese residents since the foundation of the country [Manchoukuo], the soy industry has made marked developments. The output of soy in Kwantung Province, which was as limited as 14,500 koku in 1931, increased to 22,000 koku in 1932, to 25,000 koku in 1933 and to 27,000 koku in 1934. It is observed that 30 per cent. of the output is exported to Manchoukuo and 10 per cent. to China. The shipments to the former have of late begun to shrink in contradistinction to the increase in the local consumption. This is due to the growing development of soy brewing in Manchoukuo. Prior to the 1931 incident there was almost no production of soy in Manchuria, but at present it is produced to the extent of about 30 per cent. of the output of Kwantung Province. Thus, the Manchoukuoan soy is gradually invading the market along the S.M.R. line hitherto monopolized by the Kwantung brewers. The import of soy from Japan is reckoned at 10,000 koku a year. In 1935 the Kwantung Province Soy Brewing Association was composed of fifteen members. Principal soy breweries in whole Manchoukuo are the Dairen Soy Co., the Ikeda Shoten and the Shimaki Shoten, Dairen, and the Mukden Shoten and the Iyokoku Shoten, Mukden the Manshu Shoyu, Hsinking; and the Okada Shoten, Liaoyang.

"According to the Manchurian Industrial Statistics, in 1932 there were 79 soy breweries, which were responsible for the production of 105,778 hectolitres, valued at ¥1,599,548."

3384. Kale, F.S. 1937. Soya bean: Its value in dietetics, cultivation and uses. With 300 recipes. 2nd ed. Baroda State, India: Baroda State Press. xxx + 375 p. Illust. (35 leaves of plates, described in a separate record). Index. 22 cm. 2nd ed. 1937. [66 ref]

• ***Summary:*** Contents: 1. Deficiencies in the Indian diet and soya bean as a means to rectify them. 2. History of the origin and growth of soya bean: Derivation of the word soya bean, origin of soya bean, literature, primitive man and soya bean, name of the plant, home of soya bean and its expansion, varieties of soya bean, the culture of soya bean is very remote (It "has been the chief article of diet in China for over 7,000 years."), reference of soya bean in old Chinese records, how and when soya bean became known to Europeans, soya bean in England (from 1890; J.L. North and Henry Ford), soya bean in France (from 1739), soya bean in Italy, soya bean in other countries of Europe, soya bean in United States of America, India and soya bean.

3. The use of soya bean: Importance of soya bean, dietetic importance, industrial importance, agricultural importance (Russia, Mussolini in Italy), medical importance, soya bean is alkalising in its effect ("Soya bean milk as well as its flour is used in foods for invalids and infants, like Nestle's food"), longevity and soya bean.

4. World trade in soya bean: Imports to Europe, production of soya bean in Manchuria (58% in North Manchuria), exports from Manchuria, oil and cake industry in Manchuria, soya bean production in Japan, in America, in Africa, in Australia, in Europe, in Java, in India, in other British possessions, estimate of world production of the soya bean, the desirability of the expansion of soya bean cultivation, imports and exports of soybeans, soya bean oil, and soya cake–1913-1927: Denmark, Holland, United States, Great Britain, Japan, France, Russia, China, Germany, Norway, Korea. Source: International Institute of Agriculture, Bureau of Statistics, 1921, p. 420-21. A table (p. 38) shows statistics for world production of soybeans "as estimated by the leading firm of London soya bean dealers" for various years from 1923 to 1929. This includes individual statistics each year for China [incl. Manchuria], Japan, and USA. The world totals in tons are: 3,095,000 (for 1923-25). 3,397,000 (for 1926). 4,325,000 (for 1927). 6,000,000 (for 1928), and 6,570,000 (for 1929; incl. China 5,250,000; Japan 550,000; USA 250,000; Java & Dutch East Indies 120,000; Other Asiatic countries & Africa 400,000).

5. Botany of the soya bean plant. 6. Classification of soya bean. 7. Cultivation of soya bean. 8. Diseases and pests of soya bean. 9. Cultivation of soya bean in India. 10. The constituents of soya bean. 11. Soya bean milk. 12. Soya bean flour. 13. Industrial uses of soya bean. 14. Enriching soil by addition of nitrogen and use of soya bean as fodder. 15. Food requirement of the human body. 16. European and American soya bean recipes. 17. Diabetic dishes, Mahatma Gandhi's experiments at Magan Wadi and opinion of scientists on soya bean. 18. Chinese and Japanese soya bean dishes:

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Toffu [tofu] or soya bean curd: Digestibility, utilization, toffu khan, toffu nao [doufu nao], tze toffu (fried bean curd), chien chang toffu (thousand folds), hsiang khan, kori toffu (frozen toffu), preservation of toffu. Natto. Tokio natto and Kyoto natto etc. Hamanan natto [Hamanatto]. Yuba. Misso [miso]. Soya sauce. Soya bean confectionery. Roasted beans (Chinese).

19. Indian soya bean dishes: Hindustani dishes, Moglai dishes, Gujarati dishes, Maharashtrian dishes, Bengali dishes, Goa dishes, Tanjore dishes. Appendixes. 1. Acreage of soya bean in Manchuria during the last 5 years. 2. Total figures of export during last 5 years. 3. Bibliography. 4. Some opinions about the first edition of this book.

The preface begins (p. iii): "This little book is written in response to innumerable inquiries I have had from time to time after the inauguration of the plantation ceremony of Soya Beans at the State Agricultural Experimental Station by H.H. the Maharaja Gaekwar of Baroda in November 1933.

"A few months after this a food exhibition was held in Baroda where many Soya Bean dishes–Indian, European and Chinese–were exhibited. The leading papers and journals all over the country spoke in very glowing terms about the Soya Bean dishes that were exhibited... Later on at the request of Messrs. Mitsui Bussan Kaisha Ltd., a leading Japanese Firm in Bombay, a Soya Bean Exhibition and Restaurant were run in the Japanese village at the H.O.H. fete. So keen was the interest and enthusiasm evinced by the cosmopolitan public of Bombay that seats in the restaurant had to be reserved in advance. The presence of H.E. the Governor and Lady Brabourne and many Indian princes was an additional evidence of the ever growing popularity of the tasty Soya Bean dishes served there.

"At the closing of the H.O.H. fete many prominent people of Bombay requested me to continue the restaurant at a convenient place in the city, and asked me to open soya-bean milk centres for the children of the poor who could not afford to buy cow's milk. Many were ready to finance any scheme that I would propose, but unfortunately my time was not my own as I had to attend to my duties in the State and could not take advantage of their generous offer.

"The Departments of Agriculture of the various provinces of India as well as many Indian States asked me to supply them with literature regarding the cultivation and the uses of this most useful bean. The Department of Commerce and Industry of the Government of Bombay inquired if I could furnish them with information about the machinery for the extraction of Soya-bean milk. Letters of inquiries from private individuals kept pouring in daily from all parts of India. All this has induced me to undertake the preparation and the publication of this book...

"From the number of experiments carried on in the Baroda territories and outside it, I feel sure that the Indian soil is most suitable for the cultivation of soya bean...

"The leading thought of the day in India is, 'Village uplift,' and 'Rural reconstruction.'

"Baroda, 7th January 1936, F.S.K. (p. iv)

"Preface to the Second Edition: I feel grateful to the public for having given such a hearty reception to the first edition of my book. It is running into a second edition within a year...

"Now, Soya Bean Bakeries and Restaurants have been started in the city of Bombay and in many other towns in India, and Soya Bean products are exhibited in almost all the exhibitions...

"I feel highly thankful to His Highness the Maharaja of Baroda who gave me an opportunity last year of visiting Russia, where I have seen that seven to ten per cent. of Soya Bean flour was being added to the wheat flour in order to enhance the nutritive value of the bread. The Soya Research Institute at Moscow is making researches into the nutritive, industrial and economical values of Soya Bean. I have seen there the actual working of the Soya-bean milk extracting plant. They make casein out of Soya-bean milk. Soya-bean cream is sold in the market.

"I visited the dietetic clinics in England, France, Germany, Austria and other European countries, where doctors prescribe Soya Bean bread for diabetic patients. In Russia, rickets and consumption are treated by Soyolk extracted out of Soya Bean...

"France is growing Soya Bean on côlt de jura [sic, Côte d'Azur, on the Mediterranean?]. In England, through the efforts of Mr. J.L. North, Soya Bean is realised as a field crop for the last two years.

"Paris, 3rd April 1937. F.S.K. (p. ix)." Address: Food Survey Officer, Baroda State, India.

3385. Kale, F.S. 1937. Soya bean: Its value in dietetics, cultivation and uses. With 300 recipes. 2nd ed. Photos and illustrations (Continued–Document part II). Baroda State, India: Baroda State Press. xxx + 375 p. Illust. (35 leaves of plates). 22 cm. 2nd ed. 1937. [66 ref]

• ***Summary:*** Photos (mostly original) show: (1) "H.H. the Maharaja Gaekwar of Baroda the first Indian Ruler to inaugurate the soya bean plantation ceremony in his State 24th November 1933" (frontispiece, facing the title page). (2) "Dedicated to my noble master, His Highness the Maharajah Sir Sayajirao Gaekwar, G.C.S.I., G.C.I.E., Farzande-Khas-e- Daulate-Englishia (p. 1). (3) Soya bean ready for shipment at port Dairen, South Manchuria (p. 28). (4) View of Dairen harbour with bags of soya bean ready for shipment (p. 30). (5) Transport of soya beans [on sleds] on the frozen Liao-ho River near New-chwang [Newchwang, later Yingkou], North Manchuria (p. 31). (6) The Maharaja of Baroda seated in a chair, lecturing on the dietetic and industrial importance of soya bean (p. 37). (7) The Indian method of interculturing; two bullocks in a field (p. 80). (8) Bavabhai B. Patel, 65-year-old farmer interested in the cultivation of soya bean, in a field of soya beans with two

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bullocks (p. 82). (9) A field of soya beans grown [in 1934 or 1935] by Hargovan Bavabhai Patel, of Achisara, Taluka Sinor, Baroda District; he has been awarded the first prize for his good cultivation (p. 84). (10) A soya bean plant having more than 500 pods, fodder type variety grown at the Agricultural Experiment Station, Baroda (p. 86). (11) Poona fodder type green variety grown at the Agricultural Experiment Station, Baroda (p. 89). (12) Bags of soya bean seeds grown as Baroda State crop of 1935 (p. 91). (13) The luxuriant growth of the fodder type variety at the Baroda Agricultural Experiment Station (p. 103). (14) "The biggest soya bean milk factory at Moscow (Russia)." Four small photos show the plant at work, "Milking the earth" (p. 138). (15) "The author's own child 3 months' old fed on soya bean milk" (p. 144). (16) "Soya bean oil pressing mill worked by hydraulic power" (p. 158). (17) The Palace Bakery–"The first soya bean Bakery in India" (p. 196). (18) "Mahatma Gandhi who uses soya bean at Maganwadi" (p. 251). (19) Many people seated at tables in the "Soya Bean Preparation Restaurant" at the H.O.H. Fete, Bombay (p. 278). (20) Many Indian men standing at the "Soya Bean Restaurant at the Rural Life Exhibition, Baroda, on the occasion of H.H.'s Diamond Jubilee, 7 Jan. 1936 (p. 332).

Illustrations show: (1) "Shen-Nung. The Chinese emperor 2838 B.C. called 'the heavenly farmer.' He used to plant Soya bean every year with great ceremony" (p. 17). (2) A plant with branches showing the various ways in which the soya bean plants and seeds are used (p. 23). (3) Cartoon (from the American Medical Assoc. cartoon series) of a skeleton raising a glass of milk in one hand; he is standing behind a table on which is a bowl labeled "impure milk." The caption: "'I drink to the death of the whole table'–the dangers of contaminated milk" (p. 132). Address: Paris, France; Formerly: Food Survey Officer, Baroda State, India.

3386. Matsuyama, Masanori. 1937. Hatchô miso no shiro hanten ni tsuite [The white spots on Hatcho miso (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 13:A159. [1 ref. Jap]

• ***Summary:*** Abstracted from Jozogaku Zasshi 15:453 (1937).

3387. Morse, W.J.; Cartter, J.L. 1937. Improvement in soybeans. *Yearbook of Agriculture* (*USDA*) p. 1154-89. For the year 1937. [67 ref]

• ***Summary:*** Contents: History of the soybean. World distribution and production. Utilization of the soybean (with chart). Improvement of soybean varieties. Methods in breeding: Natural and artificial crossing, mutations. Inheritance studies and cytology: Plant characters (flower, stem, pubescence, and foliage; height of plant and maturity; pod-bearing habit and pod characters; sterility, growth habit), seed characters (color of seed coat, hilum, and cotyledon; other seed characters), yield of seed. Disease resistance. Identification of genes and chromosomes. Selected references on genetics of the soybean. Appendix: 1. Workers identified with soybean improvement: United, States, foreign countries. 2. List of soybean genes (table). 3. Linkage of soybean characters (table). 4. Soybean varieties: Origin and varietal characteristics (table listing 101 named soybean varieties; for each is given the place and date of introduction or origin, days to mature, flower color, pubescence color, and seed characters {coat color, germ color, hilum color, seeds per pod, seeds per pound}, uses {dry-edible beans, forage, green-vegetable beans, grain}).

The section titled "History of the Soybean" states: "The early history of the soybean is lost in obscurity. Ancient Chinese literature, however, reveals, that it was extensively cultivated and highly valued as a food for centuries before written records were kept. It was one of the grains planted by Hou Tsi, a god of agriculture. The first record of the plant is contained in a materia medica describing the plants of China, written by Emperor Sheng Nung [sic, Shen Nung] in 2838 B.C. The crop is repeatedly mentioned in later records and it was considered the most important cultivated legume and one of the five sacred grains essential to the existence of Chinese civilization. Seed of the plant was sown yearly with great ceremony by the Emperors of China, and poets extolled its virtues. The records of methods of culture, varieties for different purposes, and numerous uses indicate that the soybean was perhaps one of the oldest crops grown by man."

Note 1. This is the earliest English-language document seen (Nov. 2013) which states that: (1) The soybean was one of the "five sacred grains." (2) "The early history of the soybean is lost in obscurity." (3) The soybean was planted at an early date by "Hou Tsi, a god of agriculture." (4) The "soybean was perhaps one of the oldest crops grown by man." It is also the earliest document seen (June 209) in which William Morse mentions the mythical Chinese emperor "Sheng Nung" in connection with soybeans.

More broadly, this entire story linking Shen Nung with the earliest written record of the soybean, is completely incorrect. Yet because the story was written by Morse (highly regarded as America's leading authority on the soybean) in a USDA publication, it has unfortunately been repeated, and this source cited, again and again down to the present day (see Hymowitz 1970; Hymowitz and Shurtleff 2005).

Note 2. This is the earliest document seen (June 2003) in which the emperor's name is spelled "Sheng Nung."

Note 3. This is the earliest document seen (July 2007) in which William Morse tries to write an early history of the soybean in China. Unfortunately, he does not cite his sources.

The section titled "Improvement of soybean varieties" states: "In the United States, more than 50 percent of the acreage devoted to soybeans is used for forage and pasture; breeding work, therefore, has tended largely toward the development of varieties for hay, silage, and pasture. The

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development of such varieties as Virginia, Laredo, Otootan, Wisconsin Black, Manchu, Wilson-Five, Kingwa, Peking, and Ebony by selection from introductions has been the principal factor in the increased use and acreage.

"Beginning with 1929, the use of soybean seed by oil mills has led to a demand for yellow-seeded varieties of high oil content. Agronomists and plant breeders have attempted to meet this demand by making large numbers of selections from foreign introductions and locally grown varieties and by analyzing these for oil content. This has brought about the development of several superior oil varieties and has resulted in a large increase in production of beans for milling purposes. The most popular of these varieties are Illini, Dunfield, Mukden, Mandell, Scioto, Mansoy, Manchu, Mamredo, Delsta, and Mandarin. Results of analyses with more than 1,000 selections and varieties have shown a range of from 12 to 26 percent in oil content. From studies of the oil content of varieties grown in a given locality, it seems possible, from the breeding standpoint, to produce varieties high or low in oil, at least within the known ranges of variation exhibited by common varieties." (p. 1161-62).

Soybean varieties that have excellent flavor and become soft in less than 2 hours of cooking include Easycook, Bansei, Rokusun, Jogun, Chusei, and Sousei. These are "now in the hands of growers and seedsmen. Experiments by commercial firms have shown that these varieties are superior to commercial varieties for the manufacture of food products, such as bean flour, roasted beans, bean milk, and bean curd [tofu].

"In Japan, certain varieties of soybeans were found that were used solely as green shelled beans. Ranging in maturity from 75 to 170 days, many of these introductions, and selections from them, have been found especially promising for the various sections of the United States. The vegetable soybean offers an excellent food of high nutritional value, especially in the fall when other green beans are lacking and in sections where the Mexican bean beetle prohibits the growing of garden beans. As a result of selection, cooking tests, and adaptation studies, eight green vegetable varieties–Hahto, Kura, Kanro, Hokkaido, Higan, Chusei, Sousei, and Jogun–have been introduced in various sections of the country" (p. 1163).

Photos show: (1) "The late Charles Vancouver Piper, agronomist, United States Department of Agriculture, 1902-26. Pioneer in the introduction and development of soybean varieties for United States conditions." (2) "Storage yard of a Chinese grain merchant near Kungchuling, Manchuria. More than 80 osier bins, each holding four cartloads of soybeans, were in this yard." (3) A Manchurian farmer and how he harvests, threshes and cleans soybeans by methods learned from his ancestors; comparison with modern U.S. machine harvesting. (4) "Millions of soybean oil cakes are stored in warehouses in Manchuria awaiting shipment to Japan, Chosen, China, and the East Indies, where they are used for fertilizing purposes and for cattle feed." A person looks up at the towering stacks. (5) Coolies loading large sacks of soybeans on a freighter for shipment to the oil mills of Europe. One man has hoisted a huge sack onto his back. (6) Five Manchurian farmers who have been awarded certificates and prizes for producing high-quality soybeans. (7) Twenty seeds of a natural soybean hybrid showing peculiar types of coloration. (8) Illustration (line drawing) of a soybean flower and its parts enlarged. Front view, side view, parts of the corolla (standard, wing, one of the keel petals), stamens, pistil. (9) A. Stems and pods of fasciated soybean plants; B. Determinate pod-bearing type; C. Indeterminate pod-bearing type. 10. Chromosome chart showing four groups of linked genes in soybeans.

A table (p. 1157) shows: "Increase in production of soybeans over an 11-year period, 1924-25 to 1935-36, inclusive, in the principal producing countries of the world" (Manchuria, Chosen [Korea], Japan, United States, Netherland India).

Soybean seed size (p. 1177): "The range in size of soybean seed varies according to the variety, each variety having its own typical seed size. Varieties and introductions tested at the Arlington Experiment Farm ranged in average weight of 100 seeds from about 4 grams for the smallest to about 40 grams for the largest." Address: 1. Senior Agronomist; 2. Assoc. Agronomist. Both: Div. of Forage Crops and Diseases, Bureau of Plant Industry [USDA, Washington, DC].

3388. Morse, W.J.; Cartter, J.L. 1937. Improvement in soybeans: Appendix 1–Workers identified with soybean improvement in the United States and abroad (Document part). *Yearbook of Agriculture* (*USDA*) p. 1154-89. For the year 1937. See p. 1184-85.

• ***Summary:*** In the United States: (1) USDA Bureau of Plant Industry, Division of Forage Crops and Diseases: W.J. Morse, Washington, DC. W.M. Stuart, Jr., and C.H. Brinkley, Arlington Experimental Farm, Arlington, Virginia. J.L. Cartter, Urbana, Illinois. M.G. Weiss, Ames, Iowa. J.L. Stephens, Tifton, Georgia. T.F. Akers, West Point, Mississippi. R.E. Stitt, Statesville, North Carolina. H.A. Schoth, Corvallis, Oregon.

(2) State agricultural experiment stations (32): Alabama, Auburn: H.B. Tisdale. Arkansas, Fayetteville: C.K. McClelland. Stuttgart: G.C. Banks. California, Berkeley: W.W. Mackie. Colorado, Fort Collins: D.W. Robertson, A. Kezer. Delaware, Newark: G.L. Schuster. Florida, Gainesville: G.E. Ritchey. Belle Glade: A. Daane. Quincy: J.D. Warner. Georgia, Athens: J.R. Fain. Experiment: R.P. Bledsoe. Illinois, Urbana: C.M. Woodworth, W.L. Burlison, J.C. Hackleman, L. F. Williams. Indiana, La Fayette: G.H. Cutler, R.R. Mulvey, K.E. Beeson, A.H. Probst. Iowa, Ames: H.D. Hughes, J.B. Wentz. Kansas, Manhattan: J.W. Zahnley. Kentucky, Lexington: E.J. Kinney. Louisiana, Baton Rouge:

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J.P. Gray. Maryland, College Park: J.E. Metzger, R.G. Rothgeb. Michigan, East Lansing: C.R. Megee. Minnesota, St. Paul: A.C. Arny, W.M. Myers.

Mississippi, State College: W.R. Perkins, J.F. O'Kelly. Stoneville: H.A. York. Poplarville: J.C. Robert. Missouri, Columbia: W.C. Etheridge, C.A. Helm, B.M. King. New Hampshire, Durham: F.S. Prince. New Jersey, New Brunswick: H.B. Sprague. New York, Ithaca: R.G. Wiggans. North Carolina, Raleigh: C.B. Williams, R.L. Lovvorn. North Dakota, Fargo: A.F. Yeager. Ohio, Columbus: J.B. Park, P. Preston. Wooster: L.E. Thatcher. Oklahoma, Stillwater: B.F. Kiltz. Pennsylvania, State College: C.F. Noll, C.E. Myers. South Carolina, Florence: E.E. Hall. Tennessee, Knoxville: H.P. Ogden. Texas, College Station: E.B. Reynolds. Virginia, Blacksburg: M.S. Kipps. Williamsburg: R.P. Cocke. West Virginia, Morgantown: J.A. Rigney. Wisconsin, Green Bay: E.J. Delwiche. Madison: G.M. Briggs, B.D. Leith.

Foreign countries (6):

Australia (4): Department of Agriculture, New South Wales: Glenn Innes, S.L. Macindoe. Traftor: W.H. Darragh. Richmond: N.S. Shirlow. Sydney: H. Wenholz.

Canada (3, all in Ontario province): Central Experimental Farm, Ottawa: F. Dimmock. Dominion Experiment Station, Harrow: C.W. Owen. Agricultural College, Guelph: O. McConkey.

England (1): Royal Botanic Gardens, London: J.L. North.

Germany (3): Kaiser Wilhelm Institute, Manchberg: W. Rudorf. Südd. Soya-Institut, München: K. Baumeister. Soya-Institut, Mannheim: L. [Lene] Mueller.

Japan (Incl. Chosen/Korea) (6 stations): Imperial Agricultural Experiment Station, Tokyo: H. Terao. Hokkaido Imperial Agricultural Experiment Station, Kotoni: V. Fujine and T. Hoshino. Saitama Agricultural Experiment Station, Ageo: T. Hasegawa. Central Agricultural Experiment Station, Suigen (Chosen [Korea]): I. Nagai. Central Agricultural Experiment Branch Station, Shariin (Chosen [Korea]): Y. Takahashi. Akita Agricultural Experiment Station, Akita: K. Adachi.

Manchuria (6 workers at 3 South Manchuria Railway Agricultural Experiment Stations). Kungchuling: Y. Nakamoto, S. Tsuda, M. Ishikawa, and K. Adachi. Hsiungyocheng: K. Hisatake. Kaiyuan: S. Kofuku. Address: 1. Senior Agronomist; 2. Assoc. Agronomist. Both: Div. of Forage Crops and Diseases, Bureau of Plant Industry [USDA, Washington, DC].

3389. Morse, W.J.; Cartter, J.L. 1937. Improvement in soybeans: Appendix–Table 4. Soybean varieties: Origin and varietal characteristics (Document part). *Yearbook of Agriculture* (*USDA*) p. 1154-89. For the year 1937. See p. 1187-89.

• ***Summary:*** This table lists 101 named soybean varieties; for each is given the place and date of introduction or origin, days to mature, flower color (pink or white), pubescence color (gray or tawny), and seed characters (coat color {black, black (dull), brown, green, olive yellow, straw yellow, plus combinations such as black and brown}, germ color {green, yellow}, hilum color {black, brown, pale to brown, yellow, yellow to brown}, seeds per pod {2-3 or 2-3-4}, seeds per pound {ranges from 1232 for Hokkaido to 9950 for Barchet}), uses (dry-edible beans, forage, green-vegetable beans, grain).

For example, the first variety listed is Agate. Origin: Introduction, from Japan. Year: 1929. Days to mature: 90. Flower color: Purple white. Pubescence color: Tawny. Seed coat color: Straw yellow + brown. Germ color: Yellow. Hilum color: Brown. Seeds per pod: 2-3. Seeds per pound: 2816. Use: Green vegetable beans.

The following varieties are listed alphabetically. All varieties are introductions from East Asia unless otherwise noted. (* = green vegetable; ** = dry edible): Agate*, A.K., Aksarben, Arlington, Arksoy, Avoyelles (Selection by Gray, Louisiana, 1932), Bansei*, Barchet, Biloxi, Black Eyebrow, Cayuga, Chame*, Chernie, Chestnut (Selection by Arlington Experiment Farm, 1907), Chiquita, Chusei*, Columbia, Creole, Delnoshat (Selection by York, Mississippi, 1925), Delsta (Selection by York, Mississippi, 1925), Dixie (Selection by Arlington Experiment Farm, 1914), Dunfield, Easycook**, Ebony, Elton, Fuji**, George Washington (Selection by Clapp, Virginia, 1921), Georgian, Goku*, Habaro, Haberlandt**, Hahto*, Hakote*, Harbinsoy (Selection by Arlington Experiment Farm, 1922), Hayseed, Herman (Selection by Herman, North Carolina, 1915), Higan*, Hiro*, Hokkaido*, Hollybrook (Selection by Wood, Virginia, 1902), Hongkong, Hoosier, Hurrelbrink (Selection by Hurrelbrink, Illinois, 1902), Illini (Selection by Woodworth, Illinois, 1921), Ilsoy (Selection by Smith, Illinois, 1913), Ito San, Jogun*, Kanro*, Kingwa (Selection by Garber, West Virginia, 1921), Kura*, Laredo, Lexington (Selection by Arlington Experiment Farm, 1907), Mammoth Brown (Selection, North Carolina, date unknown), Mammoth Yellow, Mamredo (Selection by York, Mississippi, 1925), Manchu, Mandarin, Mandell (Selection by Cutler, Indiana, 1926), Mansoy (Selection by Arlington Experiment Farm, 1915), Medium Green, Merko, Midwest, Mikado (Selection by Parsons, Indiana, 1905), Minsoy (Introduction, from France, 1910), Monetta, Morse, Mukden (Selection by Arlington Experiment Farm, 1920), Nanda*, Nanking, Norredo (Selection by unknown person, date unknown), Ogemaw (Selection by Evans, Michigan, 1902), Old Dominican, Oloxi (black seeded; Cross by Wilds, South Carolina, date unknown), Osaya*, Otootan, Ozark, Palmetto, Pee Dee (black seeded; Cross by Wilds, South Carolina, date unknown), Peking (Selection by Arlington Experiment Farm, 1907), Pine Dell Perfection (Selection by Grisenauer, Virginia, date unknown), Pinpu, Rokusun*, Sato*, Scioto (Selection by Park, Ohio, 1925), Shiro*, Sooty (Selection

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by Arlington Experiment Farm, 1907), Sousei*, Southern Prolific, Soysota (Introduction, from Italy, 1910), Suru**, Tarheel Black, Toku**, Tokyo**, Virginia (Selection by Arlington Experiment Farm, 1907), Waseda* (Selection by Arlington Experiment Farm, 1907), White Biloxi (Selection by York, Mississippi, 1925), Wilson, Wilson-Five (Selection by Arlington Experiment Farm, 1912), Wisconsin Black (Selection by Wisconsin Experiment Station, 1898), Yelredo (Cross by Wilds, South Carolina, date unknown), Yokoten.

Note: This is the earliest document seen (June 2013) that mentions the soybean varieties Agate, Oloxi, Pee Dee, or Yelredo. It is also the earliest that describes the Haberlandt as a "dry edible" soybean variety. Address: 1. Senior Agronomist; 2. Assoc. Agronomist. Both: Div. of Forage Crops and Diseases, Bureau of Plant Industry [USDA, Washington, DC].

3390. Woertge, Karl Heinz. 1937. Entwicklung und weltwirtschaftliche Bedeutung der Sojabohnenerzeugung und -verarbeitung [Development and international economic significance of soybean production and processing]. Thesis, Friedrich Alexander University, Erlangen, Coburg, Germany. 119 p. 28 cm. [112 ref. Ger]

• ***Summary:*** Contents: Foreword. Part I: History and culture of the soybean. 1. History, natural requirements and technology of soybean production; chemical composition of the soybean. 2. Occurrence of the soybean and methods of production in various countries: Asia (Manchuria and China, Japan, Korea, Formosa, Dutch East Indies, other Asian countries incl. British India, Cochin China, Ceylon), America, Europe (Southeast Europe, Austria, USSR, France, Italy, England, Poland, Switzerland, Czechoslovakia, Germany), Africa and Australia.

Part II. Scale and global economic significance of soybean production in the main producing areas. 1. General overview of world soybean production: Production for seeds, for fodders. 2. Scale of soybean production in the main producing areas: Asia (Manchuria, Japan, Korea, Formosa, Dutch East Indies [Java and Madura/Madoera]), America, Europe (Southeast Europe, USSR).

Part III. Development and global economic significance of soybean processing. 1. Soybean processing possibilities: A. Processing soybeans to make foods: Asia (general, methods used in China and Japan to make vegetable-type soybeans and salads, koji, soymilk, shoyu [soy sauce], miso, natto, tofu, methods used in the Dutch East Indies), Europe (general overview, preparation of soybean meal, soymilk, coffee- and chocolate substitutes). B. The soybean as an oilseed: General, methods of obtaining the oil (in Asia, Europe, USA), use of soy oil (as human food, other). C. Obtaining lecithin from the soybean. D. Use of soybean press-cake for livestock feed. E. Use of the soybean meal for fertilizer. 2. World trade in soybeans, soy oil and soybean cake/meal (*Sojakuchen/Sojaschrot*)*:* World trade in soybeans (Manchuria, Asia, Europe, USA), world trade in soy oil, world trade in soybean meal.

Closing remarks: The state of the world soybean market with special consideration for the current German conditions. Appendixes and tables. Address: Nuerenberg, Germany.

3391. Yamaguchi, H.S.K.; Sakai, Atsuharu. 1937. Shoyu or Japanese soy (Document part). In: H.S.K. Yamaguchi. 1937. We Japanese. Yokohama, Japan: Yamagata Press. 592 p. See p. 271-73. Book II.

• ***Summary:*** "Neither the origin of shoyu nor the date of its invention is known for sure, but it is first mentioned in a record found in the Shoso-in, of the Totai-ji [Todai-ji] Temple, where the personal belongings of the Emperor Shomu (the 45th) and some other emperors are preserved. Also, it is mentioned in the Engishiki, a book of regulations of the Engi era (901-922). Chinese shoyu was imported during the early days of the Ashikaga regime (1338-1574), and it was in large quantities manufactured at Kyoto during the Shogunate of Yoshiharu Ashikaga (1521-1545). But it is certain that shoyu in those early days was not in liquid form, and it was not until the early period of the Tokugawa regime (1603-1867) that liquid shoyu was first made in Japan.

"Tradition has it that in 1228 Gakushin, a Buddhist priest from China, taught the people of Wayakama the method of making shoyu, and the village of Yuasa in that province is known to be the oldest centre of shoyu manufacture. Shoyu was manufactured for the first time at Choshi, another centre, in Chiba prefecture, in 1616, and one shoyu maker, Hamaguchi by name, came to Choshi from Wakayama in 1645 to coach others in shoyu manufacture. Noda in the same prefecture of Chiba began the manufacture of shoyu during the era of Genroku (1685-1703), and it is now the largest centre of shoyu manufacture in Japan. Shoyu was much used during the Tokugawa period (1603-1867) and greatly improved during the Meiji era (1868-1912). In 1933 Japan produced 512 million litres of shoyu valued at 57 million yen, of which the share of Chiba prefecture where Choshi and Noda are situated, amounted to 111 million litres valued at 17 million yen. These figures are not inclusive, as the farmer makes shoyu for his own use.

"Professor L. Lunge and A. Langgardt [sic, Langgaard], who taught at the Tokyo Imperial University, in the early years (about 1877) took such a great interest in the manufacture of shoyu that they often visited the shoyu centres to study it in the making. Professor A. Langgardt on his return home to Germany, made an imitation of Japanese soy and got it patented in Germany and 'Moggi' [Maggi] now manufactured in Europe is a corruption of the name Mogi, who was a shoyu- maker of Noda...

"There are several brands of Japanese soy, of which the following are the chief: Yama-sa [Yamasa], Kikko-man [Kikkoman], Higeta, Kagi-yamasa, Maru-kin [Marukin]." An illustration of each brand and its meaning is given.

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There are illustrations of Kikkoman, Higeta, and Yamasa brand shoyu in wooden kegs. Photos shows a shoyu bottling factory and a yard filled with wood for shoyu barrels. Address: Manager, Fujiya Hotel, Miyanoshita, Japan.

3392. Yamaguchi, H.S.K.; Sakai, Atsuharu. 1937. Miso or bean-paste (Document part). In: H.S.K. Yamaguchi. 1937. We Japanese. Yokohama, Japan: Yamagata Press. 592 p. See p. 269-70. Book II.

• ***Summary:*** "It is generally believed in Japan that miso or bean-paste is responsible in a great measure for the generally sound physical health of the Japanese. It is indispensable to Japanese cuisine... What bread and butter is to a foreigner, boiled rice and bean-paste soup [miso soup] are to the Japanese...

"The word 'miso' is of obscure derivation, but it is usually taken to mean 'immature bean-soy.' People often attribute it to the invention of Priest Kanshin, a Chinese Buddhist, who was naturalised in Japan during the Nara days (710-784). Priest Ingen (1591-1673), who introduced the Wobaku [Obaku] sect of Buddhism to Japan [and erected the Manpuku-ji temple at Obaku in 1661], and after whom the haricot beans are named 'ingen,' was such a great admirer of bean-paste that, it is said, he took its soup every day instead of a certain Chinese medicine that he had used many years...

"The longer the paste is kept, it is believed, the better it tastes. In the rural districts, every farmer makes bean-paste for his own use, but in the urban districts it is supplied by the maker, and according to a report issued by the Government, Japan manufactured hundreds of million kilograms, valued at tens of million yen every year. A table gives the nutritional composition of Hatcho miso, Sendai miso, and Inaka miso. Other types of miso on the market are Aka (red) miso, Edo miso, and Shiro (white) miso.

"A few sayings about miso: Miso wo tsukeru = to put miso on (to make a mess of it). Temae miso = one's own miso [tastes best] (all geese are swans). Miso no Miso kusaki wa jo-miso ni arazu = Miso savouring of miso is no good miso."

Illustrations show: (1) Five men making miso in a traditional commercial shop. (2) A maid kneeling and preparing miso soup in a suribachi mortar with a long wooden pestle. Address: Manager, Fujiya Hotel, Miyanoshita, Japan.

3393. Yamaguchi, H.S.K.; Sakai, Atsuharu. 1937. Sukiyaki: How "sukiyaki" is served. Origin of "sukiyaki" (Document part). In: H.S.K. Yamaguchi. 1937. We Japanese. Yokohama, Japan: Yamagata Press. 592 p. See p. 264-66. Book II.

• ***Summary:*** To create the Japanese atmosphere at the Sukiyaki party, the guests must sit on cushions on the floor. For a party of four guests, a circular table is best, with the charcoal brazier (on which a *nabé* is set) or electric cooker in the middle. On plates surrounding the *nabé* are the ingredients required for the meal: Tender beef, thinly sliced. Cut leeks and often some onions mixed with the leeks. "Now comes the highly nutritious bean-curd known as *tofu* in Japan. This is very light and digestible, and of great value in Japanese soups and other dishes." *Konnyaku,* a gelatin-like vegetable, is cut into strings (*shirataki*) that look like silvery spaghetti. Japanese doctors say that *konnyaku* has considerable medicinal value.

"As seasoning the Japanese usually put a little of what is called *Ajinomoto,* along with a little soup stock. This *Ajinomoto* is one of the most marvelous seasonings in the world, recognized even by the French as superior to their *sel de celeri,* in which French chefs have so much faith. It ought to be better known to housewives throughout the world. Housewives travelling make inquiries about it and buy quantities in Japan to take home.

"Now come two important liquids. The first, *shoyu* or *soy,* is indispensable. It is the Oriental sauce which is the basis of almost all sauces in the world, with the difference, however that whereas so many Western sauces are strongly spiced and therefore too piquant, and consequently harmful to delicate stomachs, the Japanese *shoyu* is a natural soy bean-sauce, highly nutritious and an irresistible appetizer." Address: Manager, Fujiya Hotel, Miyanoshita, Japan.

3394. Ohtani, Yoshio. 1938. Nihon kôji-kin ni kansuru kenkyû. IV. Tanpakushitsu bunkai-ryoku no hikaku [Studies on Japanese koji molds. IV. Comparison of strength in hydrolyzing protein]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 16(1):43-44. [Jap]
Address: Osaka Teidai, Kôgaku-bu, Jôzôgaku Kyôshitsu, Osaka, Japan.

3395. Read, J.W.; Haas, L.W. 1938. Studies on the baking quality of flour as affected by certain enzyme actions. V. Further studies concerning potassium bromate and enzyme activity. *Cereal Chemistry* 15(1):59-68. Jan. [11 ref]

• ***Summary:*** This article gave the first indication of a protease inhibitor in plants, and the first indication that this inhibitor was or resembled a protein. In discussing the effects of an aqueous extract of soya bean flour on gelatin proteolysis, the authors state: "The soya bean contains a very potent fat peroxidizing enzyme which is water soluble. Some liquefaction tests were made with a 10% extract of soya bean flour to ascertain if such an extract contained any factor or factors which might affect the activity of several proteases... Trypsin appeared to be the most affected."

In the section title "Bromate and diastasis," Table 7 shows the "Saccharogenic activity as influenced by the bromate and persulfate of potassium." The dosage of potassium bromate ranged from 0.2 mg per 5 gm of wheat flour to 4.0 mg. Bromate was shown to increase diastasis.

"Summary:... Bromate and persulphate of potassium, when present in suitable amounts, promoted saccharogenic

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activity.

"An aqueous extract of soya bean contained some factor or factors which repressed the activity of trypsin, pepsin and the protease of Taka diastase, but did not inhibit the activity of papain and bromelin. Like trypsin and pepsin the proteinase of malt was also repressed."

Note 1. Haas did pioneering research in both trypsin inhibitors and lipoxygenases in soybeans. This is the earliest document seen (Jan. 2010) that discusses a protease inhibitor or a trypsin inhibitor in soya beans.

Note 2. This is the earliest document seen (Sept. 2007) that mentions potassium sorbate as a dough improver in connection with the addition of soya bean flour in baking. Address: The W.E. Long Company, Chicago, Illinois.

3396. Saitô, Tsutomu. 1938. Nattô-kin no "chifusu" kin ni taisuru kikkô sayô ni tsuite [Antagonistic action of natto bacteria toward typhus bacteria]. *Hokkaido Igaku–Acta Medica Hokkaidonensia* (*Hokkaido J. of Medical Science*) 16(1):82-92. Jan. [8 ref. Jap]
• ***Summary:*** Reported the inhibitory effect of *Bacillus natto* against the typhoid bacterium. Address: Hokkaido Teikoku Daigaku, Igaku-bu, Eisei-gaku Kyôshitsu (Shunin, Inoue Kyôju) (Hokkaido Imperial Univ.).

3397. Ohtani, Yoshio. 1938. Nihon kôji-kin ni kansuru kenkyû. V. Shikiso seisan-ryoku no hikaku [Studies on Japanese koji molds. V. Comparison of strength in producing pigments]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 16(2):128-29. [2 ref. Jap]
Address: Osaka Teidai, Kôgaku-bu, Jôzôgaku Kyôshitsu, Osaka, Japan.

3398. Okano, Koji; Beppu, Iwao. 1938. [Soybean oil. I. Soybean oil foots. 2. Isolation of free amino acids]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 14(3):248-50. March. (Chem. Abst. 32:6086). [8 ref. Jap]

3399. Tsuda, Kyosuke; Kitagawa, Seikichi. 1938. Ueber Sojabohnen-Saponin. III. [Soybean saponins. III.]. *Berichte der Deutschen Chemischen Gesellschaft* 71B(4):790-97. April 6. Abteilung B. [14 ref. Ger]
• ***Summary:*** Discusses the oxidation of a sapogenol obtained from soybeans, which they call Soya Sapogenol B (*Soja-Sapogenol*). Address: Aus d. Pharmazeut. Institut d. Kaiserl. Universitaet Tokio, Japan.

3400. *Industrial and Engineering Chemistry, News Edition.* 1938. Artificial fiber from soybean cake [Ryohei Inouye receives Fuji prize for 1937]. 16(8):232. April 20.
• ***Summary:*** On March 5, Ryohei Inouye received the Fuji prize award from the Physical and Chemical Study Council of Kyoto Imperial University for his discovery of a process by which it is economically possible to produce artificial fiber from the proteins of soybean cake. The council believes this is an outstanding contribution to the development of Japan's chemical industry in 1937. These researches were stimulated by the Italian process of producing fibers from casein and by researches in Germany which aim to produce textile fiber from fish protein. A company has been formed to undertake the production of the fiber from soybean cake and hopes to be producing 20 to 30 tons/day by autumn.

Note 1. On 8 Sept. 1937 Toshiji Kajita and Ryohei Inoue of Japan applied for a U.S. patent titled "Process for manufacturing artificial fiber from protein contained in soya bean." This patent (No. 2,192,194) was issued on 5 March 1940 and assigned to Showa Sangyo K.K. of Yokohama. On 5 March 1938 Ryohei Inouye of Japan received the Fuji prize for artificial fiber made from soybean proteins. At the same time, Robert Boyer of the Ford Motor Co. in Dearborn, Michigan, must have been researching and developing an identical product, which he first exhibited in May 1938. Yet it would seem that Inouye (and Kajita) of Japan should be given the credit for invention of the product. But was Inouye's product ever sold commercially?

Note 2. This is the earliest English-language document seen (Dec. 2004) that uses the term "artificial fiber" to refer to spun soy protein fiber used like a textile fiber.

Note 3. This is the earliest document seen (Jan. 2014) that concerns the work of Showa Sangyo K.K. with soybeans.

3401. Iwamoto, Kunitarô. 1938. Tôfu seizô kôtei-chû ni okeru bitamin B-1 no shôchô ni tsuite [On changes in vitamin B-1 during tofu manufacture]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 16(4):314-17. [7 ref. Jap]
Address: Naimushô Eisei Shikenjô, Japan.

3402. Yamazaki, Momoji; Kawamata, Tôzô. 1938. Nattô kin no baiyô [Cultivation of natto bacteria]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 16(4):291-313. [Jap]

3403. Nihon Kari Kogyo, K. K. 1938. Procédé de fabrication de fibres artificielles a partir de la proteine contenue dans le soja [Process for manufacturing artificial fibre from protein contained in soybean]. *French Patent* 827,992. May 6. (Chem. Abst. 32:7285). [Fre]*

3404. Nippon Kari Kogyo K.K. 1938. [Textile fibers made from soybean protein]. *French Patent* 827,992. May 6. [Fre]*
• ***Summary:*** The fibers are made by a process similar to that for making Lanital, a wool-like fiber made from casein. Note: This process for making soy protein fiber was patented (in two patents) by this Japanese company before it was "invented" by Robert Boyer at the Ford Motor Co.

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3405. *Science News Letter.* 1938. New fiber made from soybean protein to be used in autos: Ford factories already have half-a-dozen good jobs for Chinese legume's products; Good mixer with tung oil. 33:302. May 7.
• ***Summary:*** "A new synthetic fiber, made from the protein material of soybeans, was exhibited for the first time by Dr. R.A. Boyer of the research department of the Ford Motor Company before the meetings of the Fourth Annual Conference of the Farm Chemurgic Council, at Omaha [Nebraska in April 1938; Proceedings were never published]. The new fiber, destined for use in automobile upholstery, was developed as an outgrowth of work by Italian chemists in making a synthetic wool from milk casein." In 1937 some 400,000 pounds of soybean meal were used in the manufacture of parts for motor cars, probably largely as a filler. "The enamel on Ford cars contains 35 per cent soybean oil and 300,000 gallons of this oil were needed in 1937. The foundry uses some 250,000 gallons yearly in its operations. Soybean meal, from which the oil has been extracted, is widely used in the plastic molding compounds from which are made steering wheels and other parts of motor cars. Last year 400,000 pounds of soybean meal were used in this way. Soybean meal is also being used in the foundry of the steel mill, where large-sized cores in the molds are made of this material. A million pounds of this core binder, containing a large proportion of soybean meal, was used by the Ford plants last year. Soybean meal finds additional use as an impregnating agent for gaskets. A water-soluble paint, using soybean oil as the carrying agent for paint pigment, has been developed and is being employed in the Ford factories."

Note 1. This is the earliest document seen (June 2011) concerning the Ford Motor Company's work with soy protein fiber. Notice however that on 8 Sept. 1937 Toshiji Kajita and Ryohei Inoue of Japan applied for a U.S. patent titled "Process for manufacturing artificial fiber from protein contained in soya bean." This patent (No. 2,192,194) was issued on 5 March 1940 and assigned to Showa Sangyo K.K. of Yokohama. On 5 March 1938 Ryohei Inouye of Japan received the Fuji prize for his earlier discovery of soy protein fiber. His research was stimulated by the Italian process of producing fibers from casein and by researches in Germany which aim to produce textile fiber from fish protein.

Note 2. This is the earliest English-language document seen (Dec. 2004) that uses the term "synthetic fiber" to refer to spun soy protein fiber used like a textile fiber.

3406. Nihon Kari Kogyo, K. K. 1938. Procédé de fabrication de fibres artificielles a partir de la proteine contenue dans le soja [Process for manufacturing artificial fibre from protein contained in soybean]. *French Patent* 828,075. May 10. (Chem. Abst. 32:7286). [Fre]*

3407. Nippon Kari Kogyo K.K. 1938. [Textile fibers made from soybean protein]. *French Patent* 828,075. May 10. [Fre]*
• ***Summary:*** The fibers are made by a process similar to that for making Lanital, a wool-like fiber made from casein.

3408. *Science.* 1938. Yarn from soybean. 87(2264):Supplement p. 10. May 20.
• ***Summary:*** "Development of the process for converting soybean protein into fiber is credited to Ryojei [Ryohei] Inouye, awarded recently the Fujii [Fuji] prize of the Physical and Chemical Study Council of Kyoto Imperial University, one of Japan's 'big six' universities, for his accomplishment." A Japanese company is preparing to start production of this new synthetic fiber on a small commercial scale this fall.

Note: This is the earliest English-language document seen (Dec. 2004) that uses the term "yarn" (or "yarns") to refer to spun soy protein fiber used like a textile fiber.

3409. Illington: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1938.
• ***Summary:*** Sources: Woodruff, Sybil; Klaas, Helen. 1938. "A study of soybean varieties with reference to their use as food." *Illinois Agric. Exp. Station, Bulletin* No. 443. p. 421-67. May. See p. 466. Illington–In the green stage, it was rated Fair in 1935 and Good in 1936. In the dry stage, it was rated Good in 1935 and Very Good in 1936. Its flavor was not very good.

Lloyd, J.W.; Burlison, W.L. 1939. "Eighteen varieties of edible soybeans: Their adaptability, acceptability, culture and characteristics." *Illinois Agric. Exp. Station, Bulletin* No. 453. p. 385-439. March. See p. 394-97, 413, 425.
Morse, W.J. 1941. "Shanghaied... a super food." *Soybean Digest.* July. p. 4-5, 10. See p. 5. Illington is an early variety, maturing in 101-110 days.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 12-13. Illington is in the USDA Germplasm Collection. Maturity group: III. Year named or released: 1938. Developer or sponsor: Illinois AES (Agric. Exp. Station). Literature: 09, 10. Source and other information: From Japan to the Illinois AES (Agric. Exp. Station) by 1938. Prior designation: None. Address: USA.

3410. Imperial: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1938. Seed color: Yellow (straw), hilum pale.
• ***Summary:*** Sources: Woodruff, Sybil; Klaas, Helen. 1938. "A study of soybean varieties with reference to their use as food." *Illinois Agric. Exp. Station, Bulletin* No. 443. p. 421-67. May. Concerning Imperial (formerly No. 81780)–See p. 430, 432, 440, 445-46, 458. It is a late-maturing variety. In 1935 the date for best use was Sept. 16, and in 1936 it was Sept. 21. A color photo shows the pods and beans (both green and dry) (p. 432). Its overall rating for food use was

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very good. Its field score was 90 in 1935 and 80 in 1937. Its crop yield was medium in 1935 and high in 1936.–In the green stage (p. 459), it was rated Very Good in 1935 and 1936.

Morse, W.J. 1938. "Edible varieties of soybeans." *Proceedings of the American Soybean Assoc.* p. 30-33. A table (p. 32) shows: F.P.I. No.: 81780. Days to ripen: 125. Seed color: Straw yellow. Hilum: Pale. Seeds per lb: 1,920. Oil and protein content (moisture-free basis): 19.88% and 41.19%. Use: Dry edible or green vegetable.

Lloyd, J.W.; Burlison, W.L. 1939. "Eighteen varieties of edible soybeans: Their adaptability, acceptability, culture and characteristics." *Illinois Agric. Exp. Station, Bulletin* No. 453. p. 385-439. March. See p. 394-97, 413, 425.

Morse, W.J.; Cartter, J.L. 1939. "Soybeans: Culture and varieties." *USDA Farmers' Bulletin* No. 1520 (Revised ed.) 39 p. Nov. See p. 11. "Imperial–Introduced under F.P.I. No. 81780, native name, 'Tsurunoko,' from Kotoni, Hokkaido, Japan, in 1929. Maturity, about 125 days; pubescence, gray; flowers, purple, appearing in 50 to 55 days; pods, two-seeded; seeds, straw yellow with pale hilum, about 1,920 to the pound; germ, yellow; oil, 19.88 percent; protein, 41.19 percent. This variety makes an excellent green shelled bean and may be used as a dry edible bean."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 12-13. Imperial is in the USDA Germplasm Collection. Maturity group: IV. Year named or released: 1939. Developer or sponsor: USDA. Literature: 11. Source and other information: 'Tsurunoko' from the Hokushu ES (Experiment Station), Kotoni, Hokkaido, Japan, in 1929. Prior designation: PI 81780. Address: USA.

3411. Tortoise Egg: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1938.
• ***Summary:*** Sources: Woodruff, Sybil; Klaas, Helen. 1938. "A study of soybean varieties with reference to their use as food." *Illinois Agric. Exp. Station, Bulletin* No. 443. p. 421-67. May. See p. 466. In the green stage, it was rated Fair in 1936. Its color, texture, and flavor were not very good.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 18-19. Tortoise Egg is in the USDA Germplasm Collection. Maturity group: I. Year named or released: 1938. Developer or sponsor: Illinois AES (Agric. Exp. Station). Literature: 09. Source and other information: From Japan to the Illinois AES by 1938. Prior designation: None. Address: USA.

3412. Willomi: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1938. Seed color: Yellow (straw), hilum pale-brown.
• ***Summary:*** Sources: Woodruff, Sybil; Klaas, Helen. 1938. "A study of soybean varieties with reference to their use as food." *Illinois Agric. Exp. Station, Bulletin* No. 443. p. 421-67. May. See p. 430, 440, 445-46, 458. Willomi (Formerly #81044-1) was studied in 1934, 1935, and 1936. Its overall rating for food use was very good. Its field score was 98 in 1935 and 80 in 1937. Its crop yield was high in 1935 and medium in 1936.–In the green stage (p. 458), it was rated Good in 1934, Good in 1935, and Very Good in 1936.

Morse, W.J. 1938. "Edible varieties of soybeans." *Proceedings of the American Soybean Assoc.* p. 30-33. A table (p. 32) shows: F.P.I. No.: 81044-1. Days to ripen: 115. Seed color: Straw yellow. Hilum: Brown. Seeds per lb: 1,312. Oil and protein content (moisture-free basis): 18.31% and 44.63%. Use: Dry edible or green vegetable.

Lloyd, J.W.; Burlison, W.L. 1939. "Eighteen varieties of edible soybeans: Their adaptability, acceptability, culture and characteristics." *Illinois Agric. Exp. Station, Bulletin* No. 453. p. 385-439. March. See p. 394-97, 413, 423-24.

Morse, W.J.; Cartter, J.L. 1939. "Soybeans: Culture and varieties." *USDA Farmers' Bulletin* No. 1520 (Revised ed.) 39 p. Nov. See p. 16. "Willomi–Selection (81044-1) made in 1931 at Arlington Farm [Virginia] from F.P.I. No. 81044, native name, 'Akita Daizu,' introduced from Hakodate, Hokkaido, Japan, in 1929. Maturity, about 115 days; pubescence, gray; flowers, purple, appearing in 50 to 55 days; pods, two- to three-seeds; seeds, straw yellow with pale-brown hilum, about 1,312 to the pound; germ, yellow; oil, 18.31 percent; protein, 44.63 percent."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 18-19. Willomi is in the USDA Germplasm Collection. Maturity group: III. Year named or released: 1939. Developer or sponsor: USDA. Literature: 11. Source and other information: 'Akita Daizu' from Hakodate, Hokkaido, Japan, in 1929 [subline B was separated in 1967 at Urbana]. Prior designation: PI 81044-1. Address: USA.

3413. Yamazaki, Momoji; Kawamata, Tôzô. 1938. Nattô kin no baiyô–Zoku [Cultivation of natto bacteria–Continued]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 16(5):446-59. [Jap]

3414. *Christian Science Monitor.* 1938. Rice Japanese food mainstay. June 8. p. 6.
• ***Summary:*** "The regular accompaniment to rice at the morning meal consists of beancurd soup and a very bitter pickled plum [*umeboshi*] as an appetizer, with perhaps some seaweed. Fish, vegetables, pickles, and beancurd are supplementary dishes at other meals. But rice is the central item in the Japanese menu." A photo shows two peasants treading a crude waterwheel that irrigates a rice field near Osaka.

3415. Shojun, Matsuyama Oji (Danshaku). 1938. Tôfu raisan [In praise of tofu]. *Gekkan Ryukyu* (*Ryukyu Monthly*). June. [Jap]

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• ***Summary:*** About *tofuyo,* Okinawan fermented tofu. Note: This is the earliest document seen (June 2004) that mentions *tofuyo* or Okinawan wine-fermented tofu. Address: Okinawa.

3416. Tsuda, Kyosuke; Kazuno, Taro. 1938. Shôyu abura no shin suterin to Soja-Sapogenol B to no hikaku ni tsuite [Comparison of a new sterin in shoyu oil and soja-sapogenol B]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) 58(6):522. [4 ref. Jap]
• ***Summary:*** This article all appears in German, by the same authors (vol. 58, p. 142), under the title "Ueber die Identitat des Soja-Sapogenols B mit einem neuen Sterin aus 'Shoyu-öl.'" Address: 1. Tokyo Teikoku Daigaku Yakugaku Kyoshitsu; 2. Okayama Idai Seikagaku Kyoshitsu.

3417. Tsuda, Kyosuke; Kitagawa, Seikichi. 1938. Ueber Sojabohnen-Saponin. IV. [Soybean saponins. IV.]. *Berichte der Deutschen Chemischen Gesellschaft* 71B(8):1604-09. June. [9 ref. Ger]
• ***Summary:*** Discusses the structures of sapogenols obtained from soybeans (incl. Soya Sapogenol B [*Soja-Sapogenol* B] and C) and proves the triterpenoid hydropicenic nature of these compounds. Address: Aus d. Pharmazeut. Institut d. Kaiserl. Universitaet Tokyo, Japan.

3418. United Press (UP). 1938. Chinese dump Japan soy beans in water. *Los Angeles Times.* July 5. p. 3.
• ***Summary:*** "Penang (Straits Settlements) July 4." The Chinese are having a soy bean party, their equivalent of the Boston Tea Party in the British colonies of North America.

"While a crowd of cheering Chinese lined a wharf here today, demonstrators seized a cargo of Japanese soy beans and dumped it into the harbor as a protest against the Japanese invasion of China."

Note: Penang, an island near Singapore, was the first British settlement in Malaya, acquired in 1786 by the East India Company from the sultan of Kedah. In 1826 the British combined Penang, Melaka and Singapore to form Straits Settlements.

3419. *Times* (*London*). 1938. Rioting at Penang: Bonfires of Japanese goods. July 7. p. 15, col. 1.
• ***Summary:*** From a correspondent in Singapore. Two days of anti-Japanese rioting at Penang have left a British policeman wounded. "The trouble began in a shop which was suspected of dealing in Japanese soya beans." A Chinese mob ransacked many shops and burned the Japanese goods.

Note: Penang is in today's (2005) Malaysia. It was later occupied by Japanese during World War II. The Chinese were angry because Japanese troops had already invaded Manchuria and China. The Japanese rape of Nanking, China, was in Dec. 1937. Address: [London].

3420. *Science News Letter.* 1938. Fiber and cloth made from soybean protein [in Japan]. 34:105. Aug. 13.
• ***Summary:*** A Japanese company is preparing to start production in the fall of 1938 on a small commercial scale of another new synthetic fiber, produced this time by chemical means from the soybean. The company plans to manufacture fibers and cloth at the rate of 20 to 30 tons a day. The process for converting soybean protein into fiber was developed by Ryojei Inouye, who was recently awarded the Fujii prize of the Physical and Chemical Study Council of Kyoto Imperial University, one of Japan's "big six" universities.

The drive to produce the new material as soon as possible was inspired by German success in making a fiber that contains 50% fish albumin and 50% cellulose, and by an Italian process which makes yarn out of casein.

3421. Mogi, Masatoshi. 1938. Miso jôzô ni kansuru kôbo no kenkyû [Studies on the yeasts of miso fermentation]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 14(8):951-88. Aug.; 14(9):1175-1207. Sept. [34 ref. Jap]
• ***Summary:*** Contents: I. Materials for experiments. II. Morphological characteristics. III. Physiological characteristics. Address: Brewing Laboratory, Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

3422. Aoda: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1938. Seed color: Green, hilum light brown.
• ***Summary:*** Sources: Morse, W.J. 1938. "Edible varieties of soybeans." *Proceedings of the American Soybean Assoc.* p. 30-33. See p. 32. Variety: Aoda. F.P.I. No.: 81043. Days to ripen: 140. Seed color: Green. Hilum: Brown. Seed per pound: 1424. Oil and protein content (moisture-free basis): 18.53% and 41.04%. Use: Green vegetable.

Morse, W.J.; Cartter, J.L. 1939. "Soybeans: Culture and varieties." *USDA Farmers' Bulletin* No. 1520 (Revised ed.) 39 p. Nov. See p. 8. "Aoda–Introduced under F.P.I. No. 81043, 'Ao Daizu,' from Hakodate, Japan, in 1929. A green seeded variety said to be used as a green vegetable bean because of its excellent flavor. Maturity, about 140 days; pubescence, gray; flowers, purple, appearing in 65 to 70 days; pods, two-seeded; seeds, green with light-brown hilum, about 1,424 to the pound; germ, green; oil 18.53 percent; protein 41.04 percent (on a moisture free basis)."

Soybean Digest. 1941. "Seed directory. Feb. p. 12. Sources of soybean seeds are listed by type–"Field varieties" and "edible varieties." Aoda, one of the six "edible varieties," is now being sold in the USA by "Soybean" Johnson, 1151 Claytonia Terrace, Richmond Heights, Missouri.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 8-9. Aoda is in the USDA Germplasm Collection. Maturity group: IV. Year named or released: 1939. Developer or sponsor: USDA. Literature: 11.

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Source and other information: 'Ao Daizu' from Hakodate, Hokkaido, Japan, in 1929. Prior designation: PI 81043.

3423. Esselen, Gustavus J.; Scott, Walter M. 1938. Modified plastics 1918-1938. *Chemical Industries* 43(3):258-59, 261-63, 265-67. Sept. [29 ref]
• ***Summary:*** "The public has become plastic conscious within the last few years and many writers have made the statement that we are now entering upon an Age of Plastics."

"Bitumen or pitch holds the undoubted distinction of being the oldest known plastic. Students of our early civilizations have discovered that bitumen was used as a plastic many years before Christ in ancient Babylon."

"Casein as a plastic material dates to 1897, when 2 Germans, W. Krische and A. Spitteler, working at first independently and then together upon the problem of waterproofing casein coatings, discovered the casein-formaldehyde reaction. A patent was granted in Oct. 1897 and attention was then given to the production of plastic casein in the form of masses, rather than as protective coatings. The process was soon acquired by the Galolith [Galalith] Company, and commercial development [of Galalith] was started in Germany."

"Estimates of the output of casein plastics in various countries of the world for selected years from 1913-1935, inclusive are given in Table V." The leading producers of casein plastics in 1935 (in million lb) were thought to be France (7.7), Germany (4.5), England (3.7-4.5), Japan (1.5), and Italy (1.3). World production in 1930 was about 22 million lb.

"The protein material from soybeans is analogous in its properties to casein and to zein. Soybean meal, from which the oil has been extracted, can be used as the basis for plastic molding material. If plasticized with 5% or more of water it behaves in a similar manner to casein, but it is necessary to modify the casein procedure somewhat and the product is not as good... It appears that the best plastic material is obtained by removing all moisture and plasticizing the soybean protein with some anhydrous organic agent.

"Plastics from soybean meal or protein have not yet been marketed on any large scale in this country. However, it has been stated (*Science News Letter* 33, 302, 1938) that in 1937, 400,000 lb of soybean meal were used in the manufacture of parts for motor cars, probably largely as filler." Address: Consultants, Boston, Massachusetts.

3424. Kibi, Masajiro. 1938. Shôyu jôzô-yô kôji-kin ni tsuite. II. Seiiku no jôken [On the varieties of koji molds employed in the brewing of shoyu. II. Conditions for growth]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 14(9):1094-1102. [8 ref. Jap]
• ***Summary:*** Discusses the effects of temperature and pH on growth. Address: Yamasa Shoyu K.K. Kenkyusho. Biseibutsu Jikken-shitsu: Nôgaku-shi.

3425. Lyman, J.F. 1938. The soybean as food for man. *Proceedings of the American Soybean Association* p. 25-30. 18th annual meeting. Held 12-14 Sept. at Wooster and Columbus, Ohio.
• ***Summary:*** "The Chinese and other Eastern peoples have solved the problem of food seasoning without the use of meat. They have found that a meaty flavor can be obtained from the soybean through a fermentation process. Soy sauce is to the Chinese what gravy is to the American. Even more important is soy sauce in China because the use of food flavors and condiments in that country is much more restricted than with us. The Chinese have simple tastes. Soy sauce, salt and pepper are the only food flavors commonly used by them.

"While the chemist has made but little study of food flavors and the physiologist has done but little also, enough is known of the problem so that soy sauce can be made by chemical methods as well as by the ancient fermentation process. The chief meaty-like taste of soy sauce is known to be the salt of an amino acid, mono-sodium-glutamate. This salt is now manufactured for use as a condiment. The process involves the disintegration of the soybean of other protein, preferably wheat gluten, with hydrochloric acid. A mixture of about 20 amino acids is obtained among which mono-sodium-glutamate makes up about one-fifth in the case of soybean protein and two-fifths in the case of wheat gluten.

"The mono-sodium-glutamate can be crystallized from the mixture by adjusting the acidity to pH 3.2, or the mixture can be neutralized to a desired acidity and used without refining just as soy sauce is used" (p. 25).

"In Japan mono-sodium-glutamate of good purity is sold at a wholesale price of about two dollars a pound under the name Ajinomoto" (p. 26).

A diagram (p. 28) shows "Some possible food products from the soybean," including sprouts, soybean milk, soybean curd, soybean cheese, soy sauce, meat sauce, meal, flour (for use in breakfast cereal, bread, sausage, meat loaves, or ice cream), refined oil (for use in lard substitutes), crude oil (for us in margarine or dressing), and lecithin (an anti oxidant or emulsifier). Address: Dep. of Agricultural Chemistry, Ohio State Univ.

3426. Mogi, Masatoshi. 1938. Miso jôzô ni kansuru kôbo no kenkyû. III. Seirigaku-teki seishitsu [Studies on the yeasts of miso fermentation. III. Physiological characteristics]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 14(9):1175-1207. Sept. [Jap]
Address: Nôgaku-shi, Brewing Laboratory, Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

3427. Morse, W.J. 1938. Edible varieties of soybeans. *Proceedings of the American Soybean Association* p. 30-33. 18th annual meeting. Held 12-14 Sept. at Wooster and

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Columbus, Ohio.

• ***Summary:*** "Although the soybean had attracted attention at various times as an article of food in the United States, it was not until the World War [World War I], when a cheap source of protein was being sought, that the soybean was really considered seriously as an article of diet for Americans. The dried beans were prepared in many ways but owing to the time required for cooking, the peculiar taste, and improper methods of processing, soybean products were not generally accepted. During this period cooking tests were conducted with all of the varieties and introductions then available in an attempt to find varieties lacking the unpleasant bean taste and which would cook quickly. Only two such varieties were found–the Easycook and Hahto. Some progress was made in getting people to eat these varieties..."

"Oriental varieties of soybeans are distinguished not only according to seed and plant characters but also according to use, such as for curd [tofu], sprouts, green vegetables, roasted beans, and numerous other food products. Attempts to obtain suitable edible varieties from oriental countries through correspondence met with but little success. During agricultural exploration work in the Orient from 1929 to 1931, many varieties of soybeans were found in Japan and Chosen [Korea] which were used solely as green shelled or dry edible beans. These edible types, ranging in maturity from 75 to 145 days, have been under test for the past six years at various experiment stations throughout the United States." In addition, "extensive investigations of the cooking qualities and composition of the green shelled and dry edible beans have been made by various Departments of Home Economics. Many of these varieties were judged much superior to the commercial varieties in flavor, texture, and ease of cooking. Moreover, tests indicate that the flour from most of the edible varieties has a better flavor than the available commercial soybean flours... Thirty-one of the varieties introduced as edible beans have been found sufficiently promising to be assigned varietal names, shown in table 1, and have been distributed into those regions to which they seem especially adapted. Although the supply of seed of these varieties at present is quite limited, seed stocks are being increased rapidly at several experiment stations and by various growers to meet the growing demand for edible soybeans... Both the green (immature) and dry beans contain much more fat and protein and less carbohydrates than other leguminous seeds. Few naturally occurring foods are as rich in protein as soybeans... The soybean is also a good source of some of the mineral elements, containing more calcium and phosphorus than any of the cereals and excelling most foods as a source of available iron. Because of the alkaline elements in soybeans, they belong to the class of alkali-forming foods.

Table 1, titled "Characteristics of edible varieties of soybeans" (p. 32) lists the following 31 varieties: Agate, Aoda, Bansei, Chame, Chusei, Easycook, Fuji, Funk Delicious, Goku (the smallest bean in this table; 3,216 seeds/lb), Haberlandt, Hahto (the second largest bean; 1,250 seeds/lb), Hakote, Higan, Hiro, Hokkaido (the largest bean; 1,232 seeds/lb), Imperial, Jogun, Kanro, Kura, Nanda, Osaya, Rokusun, Sato, Shiro, Sioux (the next to smallest bean in this table; 3,000 seeds/lb), Sousei, Suru, Toku, Tokyo, Waseda, Willomi. For each variety the table shows: F.P.I. number, number of days to ripen, seed color (green, straw yellow, olive yellow, brown, black), hilum color (brown, black, pale), seeds per pound, oil content and protein content (% on moisture-free basis), and use (green vegetable, or dry edible).

"Some commercial concerns are now canning the green beans and at the Illinois Agricultural Experiment Station attempts to preserve green soybeans with freezing storage methods have been very successful.

"Extensive nutritional studies revealing the unique dietary value of the soybean and its products during recent years have had much to do with the rapid and growing popularity of the soybean as a food."

Note: This is the earliest document seen (July 2013) that mentions the soybean varieties Aoda or Sioux. Address: Bureau of Plant Industry, USDA, Washington, DC.

3428. Sioux: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1938. Seed color: Yellow (olive), hilum black.

• ***Summary:*** Sources: Morse, W.J. 1938. "Edible varieties of soybeans." *Proceedings of the American Soybean Assoc.* p. 30-33. See p. 32. Variety: Sioux. F.P.I. No.: 81021. Days to ripen: 85. Seed color: Olive yellow. Hilum: Black. Seeds per pound: 3,000. Oil and protein content (moisture-free basis): 15.69% and 50.22%. Use: Dry edible or green vegetable.

Morse, W.J.; Cartter, J.L. 1939. "Soybeans: Culture and varieties." *USDA Farmers' Bulletin* No. 1520 (Revised ed.) 39 p. Nov. See p. 15. "Sioux–Introduced under F.P.I. No. 81021, native name, 'Aoshiro Eda Mame,' from Sapporo, Hokkaido, Japan, in 1929. An early greenish-yellow variety said to be used as a green vegetable bean. Maturity, about 85 days; pubescence, tawny; flowers, purple, appearing in 30 to 35 days; pods, two-seeded; seeds, olive yellow with black hilum, about 3,000 to the pound; germ, yellow; oil, 15.69 percent; protein, 50.22 percent."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 16-17. Sioux is in the USDA Germplasm Collection. Maturity group: 000. Year named or released: 1939. Developer or sponsor: USDA. Literature: 11. Source and other information: 'Aoshiro Eda Mame' from Sapporo, Hokkaido, Japan, in 1929. Prior designation: PI 81021. Address: USA.

3429. *Chemical Age* (*London*). 1938. "Lanital" manufacture. Use of soya bean casein in Japan and Manchukuo. 39:320. Oct. 22.

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• ***Summary:*** The German Press reported that an agreement has been concluded between the Snia Viscosa of Italy and a Japanese industrial group under which the latter acquires the right to manufacture "Lanital" in Japan and Manchukuo. It has been proved that casein from the soya bean is a good substitute for milk casein in Lanital manufacture. Ferretti, the discoverer of Lanital, and part owners of the patent rights, has been experimenting with soya bean casein with successful results. The Lanital industry in Italy is also widening the Lanital patent basis to include soya casein.

3430. Akabori, Shiro; Kaneko, T.; Mochizuki, S. 1938. [On the aroma of soy sauce. V. The synthesis of methionol and related compounds]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 59(10):1135-38. Oct. [7 ref. Jap]

3431. Akabori, Shiro. 1938. Shôyu no kôki seibun ni tsuite. IV. [On the aroma of soy sauce. IV. β, gamma-butylenglycol and its pinacolin rearrangement]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 59(10):1132-34. Oct. [5 ref. Jap]

3432. Katagiri, Hideo; Mugibayashi, Narataro. 1938. [Relationship between nitrogen compounds of various seeds of crops and the diastatic power of their malts. I. Kaoliang. II. Beans, especially mung beans]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 14(10):1237-42; 14(1):1243-47. (Chem. Abst. 33:6456). English-language summary in Bulletin of the Agricultural Chemical Society of Japan 12(5):54-55, bound at the front of Nippon Nogei Kagaku Kaishi. [13 ref. Jap]
• ***Summary:*** Part II: Beans. The maltase, saccharifying and liquefying power of both germinated and ungerminated seeds of various kinds of beans were investigated, including mature and immature (green) soy-beans, azuki- and mung beans.

Maltase and the liquefying enzyme were never found in ungerminated seeds. Only germinated mung beans had the powerful capability to liquefy starch. During germination, the globulin nitrogen of all seeds was decreased and nonprotein nitrogen was always increased. It was concluded that the saccharifying power of mung beans could be estimated from the amount of total nitrogen, or more exactly the amount of albumin nitrogen, of the ungerminated seeds–as was already found with the seeds of kaoliang (see 14:1237). Address: Agricultural Chemical Lab., Kyoto Imperial Univ., Kyoto, Japan.

3433. Kawamori, Toshio. 1938. Tanpaku sanbun kaibutsu to shôyu no eiyô shiken [Nutritional experiment on shoyu and the decomposition of protein with acid]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 16(10):829-35. [5 ref. Jap]
Address: Osaka Teikoku Daigaku, Kôgaku-bu, Jôzôgaku Kyôshitsu, Takada Kenkyûshitsu, Osaka, Japan.

3434. Kawamori, Toshio. 1938. Shokuryô mondai toshite shôyu jôzô-hô no kentô. I. Shôyu jôzô ni okeru genryô seibun no royô-ritsu [Examination of soy sauce fermentation as a food resources problem. I. Utilization of raw materials in soy sauce fermentation]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 16(10):860-73. [13 ref. Jap]
Address: Osaka Teikoku Daigaku, Kôgaku-bu, Jôzôgaku Kyôshitsu, Takada Kenkyûshitsu, Osaka, Japan.

3435. Mogi, Masatoshi. 1938. Miso jôzô ni kansuru kôbo no kenkyû (kan). IV. Bunri seru kôbo no bunrui narabini ruien oyobi hyôchô [Studies on the yeasts of miso fermentation (conclusion). IV. Classification, relation, and diagnosis of isolated yeasts]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 14(10):1297-1324. Oct. [34 ref. Jap]
Address: Noda Shoyu K.K. Shikenjo, Nôgaku-shi (Brewing Laboratory, Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan).

3436. Schroeder, Franz. 1938. Die Sojabohne, ihre wirtschaftliche Bedeutung und ihre Verwertung fuer die menschliche Ernaehrung [The soybean, its economic significance and its use as human food]. *Ernaehrung* (*Die*) 3(9):245-57. Sept.; 3(10):281-93. Oct. [61 ref. Ger]
• ***Summary:*** Adaptations of soybeans to Western food habits are discussed in detail. Page 89 mentions efforts to commercialize and popularize the use of soy flour (*Sojamehl*), for example the little Edelsoja Cookbook from the New Edelsoja Co. in Berlin (*das kleine Edelsoja-Kochbuch der Neuen Edelsoja-Gesellschaft in Berlin*) and the Edelsoja Cookbook from the Edel Soja Workshop in Lübeck (*das Edelsoja-Kochbuch des Edel-Soja-Praktikums in Lübeck*). Address: Oberregierungsrat und Mitglied des Reichsgesundheitsamts i. R., Wilhelmshoeher Strasse 3, Berlin-Friedenau, Germany.

3437. Keely, T. Southwell. 1938. At sea in a Japanese pearling lugger: A white man describes the ceaseless hunt for shell on the Arafura seabed. *Argus* (*The*) (*Melbourne, Victoria, Australia*). Nov. 19. p. 8. The Argus Week-end magazine.
• ***Summary:*** "Give him a few sticks of wood, some scraps of meat, and a trifle of soya bean sauce and Kenzo could produce an appetizing meal." For the white guests, sliced raw fish was seasoned with the "inevitable soya sauce."

Note: This is the earliest of 4 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "soya sauce." Address: Darwin [Australia].

3438. Hastings, Milo. 1938. A college that feeds itself. *Physical Culture.* Nov.
• ***Summary:*** About Madison College near Nashville, Tennessee. About 500 people now live on the campus, of

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which 300-350 are students. About 90% of the vegetables (including soybeans) consumed by all these people are grown by student labor. The college has its own mills for whole-grain products and its own bakery, "which also serves whole-wheat and soy-bean bread to over one hundred retail stores in the nearby city of Nashville."

"The address Madison College, Tennessee, has become familiar to patrons of health food stores as the place of origin of a distinctive line of products made from soy-beans." The reason for that grew out of an interesting combination of circumstances. First, the college was founded upon the idea that the "students should by their own labor produce as nearly as possible all their own food supply for a completely nourishing diet. Second: Madison College and Sanitarium are strictly vegetarian, and, as at the Battle Creek Sanitarium, the vegetarianism has been worked out as part of the school dietary as well as the sanitarium dietary. To students and patients alike the importance of proper food for the body is emphasized.

"Third: one phase of the work at Madison College has to do with the training of medical missionaries. That has not only brought to the teaching staff people who have had experience in the Orient, but has also brought students from those countries. (At present there are six Japanese and ten Chinese students.)

"Out of these circumstances came the development of a new line of foods which we may call the Americanization of the second most important food material in the Eastern world and the greatest of all vegetarian sources of protein–the soy-bean."

To Madison College, with its interest in perfecting a vegetarian diet, came Perry A. Webber, as professor of chemistry. He had taken his doctor's degree at Michigan State College after a fourteen years' residence in Japan. It was a happy combination of circumstances, and the American chemist, with his Japanese experience, set to work to Americanize the soy-bean as a source of human food.

"It also happened that one of Dr. Webber's Chinese friends, Philip S. Chen, was a fellow student of chemistry at Michigan State College, having come to America to study science. When he had completed his chemical work for a doctor's degree at Michigan, he entered Madison College as a special student to take up practice teaching in the Department of Chemistry under Dr. Webber. The two men, each with a knowledge of soy-beans as used in the Orient, now worked together as chemists in the American college.

"After two years of this cooperation Dr. Webber was called back to Japan to become the head of a school there. Dr. Chen then became the professor of Chemistry at Madison College and continued to work on soy-bean products."

Though Dr. Chen says soy-bean milk has been used in China for 3,000 years, the type made at Madison "is new because it is different and superior to the older forms of the Oriental product." It has been made "more acceptable to American tastes and to the more exacting demands of present-day nutritional science. This also applies to the substitutes for meat and the cheese products made from soy-beans, and to the use of soy-bean flour as an ingredient in bakery and cereal products. Today all this is of special interest to vegetarians and to those who follow the latest forms of health foods. These advances in food science will later become of far greater significance."

Dr. Frances L. Dittes, head of the Department of Nutrition, specializes in soybeans, "both in nutritional research and menu applications. Thus, the new food products developed from soy-beans, along of course with other vegetarian dishes, were worked out and tried out in the students' dining hall and also in the Madison Sanitarium. Patients cured at the sanitarium naturally wished to continue the use of the food products after returning home. This gave the nucleus of a health food manufacturing business.

"This, in turn, provided another campus industry for the work-your-way college, giving occupation for the students in which they could take an especial interest and pride, since the business grew out of the research work of the college and was closely tied in with both their agricultural and their health work."

Note: This article is reprinted near the back of the 1989 edition of *Madison–God's Beautiful Farm.*

3439. Kihara, Kiyoshi. 1938. Shôyu oyobi aminosan-eki no yûki-san hikaku kenkyû [Comparative studies of organic acids in shoyu and so-called "amino acid solution" or liquid HVP]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 16(11):919-36. [25 ref. Jap]
Address: Kagawa-ken Shôyu Shiken-jô.

3440. Miyaji, Kenji; Oguri, Motozo. 1938. Tamari abura fukenka butsu-chû no bôkabi seibun ni kansuru kenkyû. II. [Studies on an antimold substance in the unsaponifiable substance in tamari oil]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 14(12):1523-25. Dec. [5 ref. Jap]
Address: Gifu Koto Norin Gakko, Nôgaku Hakase.

3441. Fukai, Tôshi; Inamori, S. 1938. Shôyu oyobi miso no chakushoku ni tsuite. I. Shôyu saikin to shikiso seisei [On coloring of shoyu and miso. I. Bacteria in shoyu and pigment formation]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 127. p. 91-114. [14 ref. Jap]
• ***Summary:*** Includes a discussion of Bacillus melanicus soya.

3442. Fukai, Tôshi; Yabu-uchi, Y.; Nonomura, S. 1938. Usukuchi shôyu jôzô shiken [A new special method for manufacturing light-colored shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 127. p. 195-204. [14 ref. Jap]

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3443. Fukai, Tôshi; Inamori, S. 1938. Miso onjô shiken [Brewing trial of miso by a system of warming]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 127. p. 215-223. [Jap]

3444. Fukai, Tôshi. 1938. Kaon sokujô miso no moromi keika (Toku ni enryô oyobi suiryo o henka shita baai) [The progress of miso moromi with heated, accelerated fermentation (Especially with changes in the salt and moisture contents)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 33(11):1214-17. [Jap]

3445. Imperial Economic Committee. 1938. Vegetable oils and oilseeds. London: H.M. Stationery Office. *
• ***Summary:*** The world's leading soybean exporters in 1937 (in million lb) were: Manchuria 3,350, Korea 343, Other countries 179. The world's leading soybean importers in 1937 (in million lb) were: Japan 1,670, Germany 1,324, Denmark 542, Sweden 258, and Netherlands 220.

3446. Kinoshita, Asakichi. 1938. Shôyu genryô to shite dasshi daizu no gôriteki sei kôji hô [A rational method for making koji using defatted soybean meal]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 33(4):406-08. [Jap]
• ***Summary:*** Kinoshita was head of his own research laboratory. Address: Kinoshita Jozo Kenkyu Shocho.

3447. Matsumoto, K.; Toki, R. 1938. Dasshi kasu kôji no kôso o shiyô shitaru gantô "amino" san eki no chôjuku jikken (Dasshi kasu to shôyu jôzô sono 8) [Taming of HVP (amino acid liquid) containing sugar using the enzymes from defatted bran-koji]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 33(2):168-73. [Jap]
• ***Summary:*** Part 8 in the series on using defatted meals in shoyu brewing.

3448. Matsumoto, K. 1938. Jôzô butsu ni taisuru kôshuha denryû ôyô to sono ichi, ni no jikken [Application of high frequency electric waves to fermentation products. I.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 33(12):1326-30. [11 ref. Jap]

3449. Matsumoto, K.; Takahashi, T. 1938. Shôyu jôzô-yô sui hikaku shiken [The comparison of waters for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 127. p. 125-30. [Jap]

3450. Matsumoto, K.; Yabu-uchi, Y.; Nonomura, S. 1938. Kenki-teki baiyô moromi tenka shôyu jôzô shiken [On the application of special shoyu moromi (mash) by anaerobic culture for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 127. p. 131-39. [Jap]

3451. Matsumoto, K.; Nagahashi, K. 1938. Kôji kinshu hikaku shôyu jôzô shiken. II. [Comparison of several kinds of *Aspergillus oryzae* for shoyu brewing. II.]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 127. p. 141-48. [Jap]

3452. Matsumoto, K.; Takahashi, T.; Nonomura, S. 1938. Kakushu dasshi daizu shiyo shôyu jôzô hikaku shiken [Comparison of various kinds of fat-free soybeans as a raw material for shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 127. p. 149-57, 159-71. [Jap]

3453. Matsumoto, K. 1938. Genryô o kotonishitaru kakushu shôyu moromi narabini beni-funyû-chû no saikin ni tsuite [Bacteria in shoyu moromi made from various raw materials and in chian-tao-fu (red fermented tofu)]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 127. p. 123-298. [8 ref. Jap]

3454. Matsumoto, K.; Yabu-uchi, Y.; Nonomura, S. 1938. Shiro nuka shiyô shôyu jôzô shiken [Application of white rice bran for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 127. p. 173-79, 181-94. [3 ref. Jap]

3455. Matsumoto, K. 1938. Bareisho kin ôyô no miso seizô ni tsuite (Miso to bisei-butsu IV.). Furoku bunkenshu [Application of potato bacteria to miso manufacture (Miso and microorganisms IV.)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 33(8):916-21. [Jap]

3456. Matsumoto, K. 1938. Miso to bisei-butsu [Miso and microorganisms. II]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 33:692-96. [Jap]
• ***Summary:*** Discusses the uses of yeasts, lactic acid bacteria, and heat-resistant lactic acid bacteria. Address: Japan.

3457. Matsumoto, K. 1938. Miso to bisei-butsu [Miso and microorganisms. III]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 33:830-33. [Jap]
Address: Japan.

3458. Mogi, Masatoshi. 1938. Miso jôzô ni kansuru kôbo no kenkyû [Studies on the yeasts in miso fermentation (Abstract)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 33(10):1186. [Jap]
Address: Brewing Laboratory, Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

3459. Rokusho, B. 1938. Sanbunkai-hô o ôyôseru sokujô shôyu no hinshitsu ni tsuite [On the quality of rapid shoyu made using the acid decomposing method]. *Nippon*

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Jozo Kyokai Zasshi (*J. of the Society of Brewing, Japan*) 33(2):162-63. [Jap]
Address: Mantetsu Chuo Shikensho (Manchurian Railway Central Research Lab).

3460. Sumi, M.; Tsuzuki, J. 1938. Ni, san shokuhin-chû no furabin (vitamin B-2) ryô (1) [The flavin (vitamin B-2) content of several foodstuffs (1)]. *Rikagaku Kenkyujo Hokoku* (*Report of the Institute of Physical and Chemical Research*) 17(12):1296-99. (Chem. Abst. 34:2939). [12 ref. Jap]
• ***Summary:*** The following foods contain the following percentage of moisture and number of units per 100 gm. The unit of measure is not known: Miso: Shinshu miso 50.5% moisture/28-35 units, sweet red miso 52.5%/12-63, Sendai red miso 54.0%/15-78, Farmhouse (Inaka) miso 53.0%/18-83, Sanshu Hatcho miso 48.5%/20-51, sweet white miso 53.0%/16-50. Shoyu 21-27 units. Shoyu presscake (kasu) 16%/710-753. Amazake 23-68 units.

3461. Suzuki, T. 1938. Shôyu genryô daizu ichibu daiyô to shite no amino-san shikomi ni tsuite [Utilization of amino acids as a substitute for part of the soybeans in shoyu brewing]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 33(15):576-78. [Jap]
Address: Tatsuno Shoyu Dogyo Kumiai Shikensho.

3462. Wang, Ping Hsun. 1938. Agricultural resources of China and Japan–with a comparative survey. *Hautes Etudes* (*Tientsin*)*, Economic Studies* No. 12. See p. 177-78.
• ***Summary:*** A table (p. 177) shows Soya bean yield in quintals per hectare, from 1931-32 to 1936-37, in China and Japan. 1 quintal = 100 kg. In China the yield increased from 10.9 in 1931-32 to 12.9 in 1936-37. In Japan the yield increased from 9.1 in 1931-32 to a local peak of 11.2 in 1933-34, then decreased to 8.8 in 1935-36.

A pie chart (p. 177) shows the position of leading soybean producing countries in total world soybean production in 1936-37. China proper: 50.0%. Manchuria: 35.5%. U.S.A.: 6.5%. Japan: 2%. Others: 7%.

A table (p. 178) gives the same statistics as the pie chart, but adds the actual production in 1,000 quintals.

3463. *World Trade Notes on Chemicals and Allied Products* (*U.S. Dept. Commerce*)**.** 1938. Soy bean casein for plastics manufacture–Japan. 12(47):814. *

3464. Yamada, M.; Ishimaru, Yoshio. 1938. Shôyu-chû no tôbun no teiryô ni tsuite [On the estimation of sugars in shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 127. p. 115-21. [Jap]

3465. Bush, Lewis William; Kagami, Yoshiyuki. 1938. Japanalia: reference book to things Japanese. London: John Gifford, Ltd. xx + 193 p. Illust. Maps. Index. 20 cm.
• ***Summary:*** This little encyclopedia begins with an outline of Japanese history (p. xi-xx). Under Agriculture–rice (p. 3-4): Other cereals grown in Japan include barley, wheat, rye, oats, the soy-bean (*Daizu*) used chiefly for making [soy] sauce, and the small red bean (*Azuki*)**.**

Under Festivals and holidays–February (48): "About the 3rd of 4th *Setsubun* (Bean-Throwing Rite) the last day of winter according to old lunar calendar. On this night a religious rite called *Tsuina,* or driving away the evil spirits and calling in fortune is held at many temples and shrines, and people scatter [soy] beans, one for each year of their age over the rooms of their houses shouting *'Fukuwa uchi, oni wa soto'* (Welcome good luck, out with demons!)."

September 1st. *Ni-hyaku-tô-ka,* 210th day from *Setsubun.* Rice harvesting begins.

Under Food–rice (p. 59) soy sauce is mentioned.

In the front of the book is a map of "Old Japan" and in the rear a map of "Modern Japan."

3466. Dominion Bureau of Statistics, Ottawa, Canada. 1938. Imports into Canada for consumption, years ended March 31, 1933 to 1937: Agricultural and vegetable products. *Trade of Canada.* Fiscal year ended March 31, 1937.
• ***Summary:*** Table No. 37, titled "Imports into Canada for consumption, Years ended March 31, 1933 to 1937, shows: Imports of soy sauce–from United Kingdom, Hong Kong, China, Japan, Syria, United States (p. 287). It shows that 133 gallons of soy sauce with a value of $15 were imported from Syria in 1933, but none in 1934, 1935, or 1936.

Imports of soya beans (*Fèves de soja,* p. 288). Imports of peanut oil (*Huile d'arachide,* p. 303). Imports of soya bean oil (*Huile de soja,* p. 300).

Imports of soya bean cake and soya bean meal, for use exclusively in the manufacture of cattle food and of fertilizers (Included "Soya Beans" prior to April 1, 1934; to April 1936, p. 339.7).

Imports of soya bean oil meal, for use exclusively in the manufacture of cattle food and of fertilizers (From May 1, 1936, p. 339.8).

Imports of soya bean oil meal (*Tourteaux d'huile de fèves de soja*) and soya bean flour (*Farine de fèves de soja*), when imported by manufacturers of glues or adhesives for use exclusively in the manufacture of such glues or adhesives (From May 1, 1936, p. 339.9; Note: 5,600 cwt was imported from the USA only) [1 cwt = hundredweight = 112 pounds].

Imports of peanut oil and soya bean oil for the manufacture of soap, and peanut oil for canning fish (p. 344.1). Imports of soya bean oil for the manufacturing of soap (p. 344.5). Address: Ottawa, Canada.

3467. Fairchild, David. 1938. The world was my garden: Travels of a plant explorer. New York, NY: Charles Scribner's Sons. xiv + 494 p. Assisted by Elizabeth and

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Alfred Kay. Illust. Index. 25 cm.

• ***Summary:*** This wonderful book, an autobiography of David Fairchild, also tells the story of the early days of the USDA and its Section of Foreign Seed and Plant Introduction, and of the pioneering work with plant introduction to the United States. It contains about 207 black-and-white photos, mostly taken by the author. One of these (p. 472A) shows Howard P. Dorsett (standing) and David Fairchild (seated), who "spent twenty happy years in close association, trying to increase the number and improve through introductions the quality of the fruits and vegetables of the United States."

Contents: 1. Background. 2. Kansas. 3. I enter government service. 4. I meet Barbour Lathrop and reach Naples [Italy]. 5. Breslau, Berlin, and Bonn [Germany]. 6. Java ho! 7. The Lathrop-Fairchild odyssey begins. 8. The Cannibal Isles (Incl. Hawaiian islands). 9. American interlude (in 1897 his father resigned as president of Kansas State College of Agriculture after the wave of Populism engulfed the college). 10. The West Indies and South America. 11. Cotton in Egypt. 12. Across the Java Sea. 13. From Finland to Dalmatia. 14. Land of the Pharaohs. 15. Malta, Tunis, Algiers, and Spain. 16. England, America, and west to the Orient once more. 17. The Persian Gulf and Bagdad [Baghdad. Note: Iraq was established in 1921 out of former Turkish territory]. 18. A glimpse of Saïgon [Saigon] and a long stay in Japan. 19. I visit Luther Burbank and circumnavigate Africa. 20. I meet Alexander Graham Bell. 21. A grand tour of these United States. 22. Mostly personal. 23. Washington, Madeira, and "In the Woods." 24. Baddeck, Nova Scotia. 25. Mostly aviation. 26. Lacquer and wild wheat. 27. Aaron Aaronsohn and Joseph Rock. 28. More plants, introduction gardens, and Mr. Bell. 29. Florida in 1912. 30. Monsters of the backyard. 31. The flowering cherry trees are planted in Washington. 32. Quarantine increases and war [World War I] begins. 33. Seeds from Afghanistan. 34. The plains of Canada. 35. The war and dried vegetables. 36. The Allison Armour expeditions. 37. Aloha.

In 1889 Beverly T. Galloway, head of USDA's Division of Plant Pathology, brought David Fairchild, age 19, to Washington, DC, to join five plant pathologists who were working in attic rooms of the old red brick department building. P. Howard Dorsett, Galloway's Wisconsin classmate, soon joined the group. Soon shy and scholarly Walter T. Swingle, Fairchild's Kansas State classmate and close friend since their student days in Germany, arrived with his growing library of agricultural references in 5 or 6 languages. Seeking an opportunity to learn about the flora of foreign countries, Fairchild accepted a Smithsonian fellowship to study entomology in Naples, Italy, and resigned from the USDA. Fairchild's pioneering work with plant introduction traces its roots back to late 1893. On board a ship, the young plant pathologist met Barbour Lathrop, a wealthy San Francisco gentleman who later took him on an extended tour of the Pacific and showed him fruits, grains, and ornamental plants that could be valuable in America. In 1895 Lathrop gave Fairchild the money to begin his study of the plant treasures of the tropics. Returning to the USA in 1897 (with Mr. Lathrop), after an absence of 4 years, David Fairchild knew exactly what he wanted to do with his life. He visited his parents in Manhattan, Kansas, and learned that a wave of "Populism" (resembling Bolshevism) had caused his father to resign as president of the college (p. 105). In August 1897 he reached Washington, DC–without a job. James Wilson, the Secretary of Agriculture, firmly believed that "what agriculture needed most was more knowledge." "The idea of plant introduction as a government activity was germinating in other minds besides Lathrop's and mine" (p. 106). Secretary Wilson's first act after taking office had been to send N.E. Hansen to Russia in search of cold-resistant cereal grains and fruits for America's great plains. Swingle has recently presented a paper on introducing subtropical plants to Florida.

Fairchild and Swingle conceived a plan to divert $20,000 dollars of the funds appropriated for the wasteful Congressional Seed Distribution Service (which was already spending several hundred thousand dollars a year) in order to finance a section for the specific purpose of introducing new, useful, and carefully selected crops into the United States. He enthusiastically presented the idea to Secretary Wilson, who approved the plan and asked him to organize the new Foreign Seed and Plant Introduction Section (p. 107). Housed on the fifth floor under the eaves of the old Department of Agriculture building and staffed by one teenage secretary, it became a reality when Congress passed the revised appropriation bill in July, 1898.

"In 1899, all that existed of the Department of Agriculture was housed in an ugly old building with a mansard roof topping its red-brick walls. It was situated in a park south of Pennsylvania Avenue, just beyond one of the most disreputable quarters of the city" (p. 18).

In 1916 David and Marian Fairchild purchased a piece of property located in Coconut Grove on Biscayne Bay, Florida; they named it The Kampong. On the property was a very old stone barn, a huge stone entrance gate, and many fine old tropical trees (p. 452-53, 456A, 472C). A Kampong is a Malay word (first used in English in 1844) meaning "a native hamlet or village in a Malay-speaking country."

Good photos show: (1-4) Members of the USDA Section of Plant Pathology taken in the early 1890s: Walter T. Swingle, Joseph James, David Fairchild, Theodore Holm, Beverly T. Galloway, Merton B. Waite, and P. Howard Dorsett (p. 26A-B). (5) Barbour Lathrop and David Fairchild in the cabin of a boat, off Sumatra, Christmas, 1895. (6) The uniform of a worker at Mr. Suzuki's nursery in Tokyo, Japan. The back is decorated with large Chinese characters. (5) Fermentation vats with conical bamboo covers in a soy sauce factory at Ichang (I-ch'ang or Yichang), a city in west Hupeh

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/ Hubei province in Central China (p. 256F, probably taken by Frank N. Meyer in 1917). (6) page shows "A prolific Soy Bean plant ripe for harvest" and loaded with pods (p. 256F). (7) David Fairchild (seated) and Howard Dorsett (standing), each in two-piece suits, by at a desk, examining various fruits (p. 472A). Address: USDA.

3468. Fairchild, David. 1938. A long stay in Japan: Encounters with soy beans, tofu, soy sauce, and green soy beans in the pods (Document part). In: D. Fairchild. 1938. The World Was My Garden: Travels of a Plant Explorer. New York, NY: Charles Scribner's Sons. xiv + 494 p. See p. 258-59, 327-28. Assisted by Elizabeth and Alfred Kay.
• ***Summary:*** In 1902 at Kusafuka, Japan, Fairchild visited the home of Mr. Tsuboi. He had "considerable difficulty digesting the raw fish and seaweed, but became very fond of the egg dishes, the bean cheese or 'tofu,' and the universal soy sauce... But the dish which I afterward served in Washington [DC] was a delicate variety of the soy bean. The young, flat, rather hairy pods–much smaller than the lima bean–are boiled in salted water and served in the pod in a little lacquer bowls. I enjoyed opening the pods and taking out the delicate green beans, which have a pleasant, nutty flavor. Some Americans complain that it takes too long to empty the pods, and of course there is no reply to such an objection" (p. 258).

Japanese "cuisine is conspicuous for the absence of gravies, for which they substitute a sauce made from the soy bean by a complicated process of fermentation. Almost every meal includes boiled rice, often served with delicate, soy bean curds [tofu]... and pretty bits of colored soy bean candy" (p. 259).

Note: This is the earliest English-language document seen (April 2013) that uses the terms "soy bean curds" to refer to tofu.

"From Mr. Tsuboi's delightful home, we journeyed to a branch experiment station at Anjo where there were fields of the chief agricultural crops of the country. The soy beans particularly interested me, as in 1898 I had imported both beans and some soil from a Tokyo soy bean field. Waite [Merton B. Waite, of the USDA Section of Plant Pathology] and I discovered that root nodules could be induced on soy bean plants by growing them in Japanese soil, but, when they are grown on new soil, they will not develop the nodules unless the soil is inoculated. In Virginia, Maine, Michigan, and Kansas, a general interest in the soy bean and its possibilities had developed among the experiment station workers, although it was only used as cattle food.

"I hope that a book will be written describing the vast soy bean industry which has developed in America since those early beginnings, and the important part played by the varieties introduced by Frank Meyer and later by W.J. Morse and P.H. Dorsett. Morse has devoted the best years of his life to a careful and penetrating study of the soy bean, and he should receive the full measure of credit for his contributions to an industry now measured by millions of acres under culture in America each year" (p. 259).

After Fairchild was married, he and his wife, Marian, started a garden by their home in Maryland, about 10 miles outside of Washington, DC. A delightful Japanese peasant boy names Mori served as their gardener. In the garden: "We grew soy-beans as a vegetable and had to endure the criticism that they took too long to shell (p. 327-28).

A photos show: Mr. Tsuboi, an authority on bamboo, enjoying his dwarf plants in charming porcelain bowls and trays (p. 256D). A prolific soy bean plant with many hairy pods (p. 256F). Address: USDA.

3469. Fiene, F.; Blumenthal, Saul. 1938. Handbook of food manufacture: A handbook of practical food information... New York, NY: Chemical Publishing Co. vi + 603 p. See p. 89. Index. 24 cm.
• ***Summary:*** This book contains many commercial scale formulas / recipes. Chapter 2, "Description of raw materials," includes brief descriptions of "corn oil (maize oil), cottonseed oil, arachis oil (also called peanut, ground nut, and earth nut oil), sesame oil (gingli oil, teel oil), soy bean oil, and rape oil" (p. 70-71).

Chapter 3, "Milk and milk products," includes subsections titled "Infants' milk, synthetic" (a recipe for a dry mix in which "Soya bean powder, 125 g." is the main ingredient), "Soya bean vegetable milk" and "Soya bean curd" (p. 89). Concerning the milk: "Soya bean meal after the oil is extracted or whole soya bean meal may be utilized quite as well as the whole bean. The milk can be used successfully in numerous preparations, such as breads and cakes, in creaming vegetables, in milk chocolate, and in custards. After separating the liquid from the solid material, the residue is still very rich in nutritive substances and can be dried and used for cattle feed or made into flour for human food."

Note 1. This is the earliest English-language document seen (Aug. 2013) that uses the term "Soya bean vegetable milk" to refer to soymilk.

Note 2. This is the earliest English-language document seen (Nov. 2013) that uses the term "soya bean meal" or the term "whole soya bean meal" to refer to whole soy flour.

Concerning the curd: "This curd, after being drained or pressed, represents bean curd of [sic, or] tofu, which is extensively eaten and forms the basis of numerous fermented, smoked, and dried cheeses in China and Japan... In many cities of the United States having a large oriental population fresh bean curd may be found in Chinese and Japanese markets."

Chapter 5, on canned foods, notes in the section titled "Dried beans" (p. 126) that "Soya" beans sold in cans.

Chapter 17, on "Bread" contains two formulas (p. 378-79) for "Soya bean flour bread," the first containing 260

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lb. wheat flour, 65 lb. "Soya flour," etc., and the second containing 25 lb. "Whole soya flour," 25 lb "Whole wheat flour," etc. The straight dough method is used.

Chapter 23, titled "Health foods" begins (p. 445): "Natural and vitamin-laden health-building foods and drinks are essential for healthy muscles, nerves, glands, and for the growth and maintenance of a healthy, vigorous, and sound mind." The best diets are those containing plenty of fresh foods and juices. "Nuts and soya beans are good substitutes for meats, fish, eggs, and sea foods." A section in this chapter on the "Soy bean" begins (p. 447): "The soy bean is justly entitled to be called the king of the legumes. Not only because it is lowest in starch but also because, firstly, it is the most complete and best protein for both growing children and adults and, secondly, because of its unusually high mineral content being quite high in alkaline potassium, calcium, and magnesium... it is an alkaline food."

Formulas for health foods include (p. 454-55): "Health dry cereals" (six formulas, two if which contain "Soy bean middlings" [medium size soy grits, probably made by cracking whole soybeans]). Coffee substitutes and health drinks (three formulas, the 3rd containing only 75 oz. roasted whole wheat and 25 oz. roasted soy bean middlings). The next health-food subsection, titled "Flour, meals, etc." states (p. 455): "Soy bean flour, with or without a high percentage of fat, is used to make bread, biscuits, noodles, mayonnaise, candy, etc."

Chapter 24, "Acid-forming and alkali-forming foods," states: "When foods yielding an acid ash predominate in the diet, a condition of acidosis may result unless the resulting constituents are neutralized with alkaline ash foods."

Next come two lists: (1) "Acid-forming foods, starting with those foods having the least amount of acid-forming ash." The foods with the *most* acid-forming ash are: 1. White bread. 2. Cheese. 3. Meat, chicken. 4. Fish, haddock. 5. Meat, venison. 6. Meat, beef, lean. 7. Meat, veal.

(2) "Alkali-forming foods, starting with those foods having the least amount of alkali-forming ash." The foods with the *most* alkali-forming ash are: 1. Soy bean. 2. Olives. 3. Beans, lima, dried. 4. Linseed oil meal. 5. Spinach. 6. Raisins. 7. Beans, dried. 8. Almonds. Address: 1. PhD, Food Research Chemist; 2. B.S., Consulting Food Chemist and Director of Shirley Labs., New York City.

3470. Hayashi, Yasushige. 1938. Zuihitsu: Tôfu no kara [Essays: Okara, the "shell" of tofu]. Tokyo: Modaan Nihon-sha. 310 p. 19 cm. [Jap]
• ***Summary:*** Essays and thoughts on various subjects, including okara and tofu. The title is taken from the title of the first essay.

3471. Japan-Manchoukuo Year Book. 1938. Tokyo, Japan: Japan-Manchoukuo Year Book Co. Index. 26 cm. Fifth annual issue. [Eng]
• ***Summary:*** Each year book is divided into two main parts: Japan, and Manchoukuo. This book was published in late 1937.

In the Japan and Manchoukuo parts of the book, soya beans are most widely discussed in the respective chapters on Agriculture. In each case, information given the previous year is updated one year.

Page xxii. A pie chart shows principal exports from Manchoukuo in 1936. In descending order of importance they are: Soya beans 41,0%. [Soya] bean cake 10.1%. Coal 6.7%. [Soya] bean oil 4.0%. Millet 3.5%. Groundnuts 3.0%. Other beans 2.8%, etc.

Page 341. Table 28 shows production of "Beans, potatoes and sweet potatoes" in hectolitres from 1931 to 1935. 1.80391 hectolitres = 1 koku = 5.11902 dry bushels (USA). For soya beans:

4.079 million hectoliters in 1935

Page 793. Two large tables show "Area under various crops (in hectares)" and "Amount of crops (metric tons)" in Manchoukuo yearly from 1924 to 1936. For soya beans: 4.175 million metric tons in 1936

The other principal crops shown in the tables are other beans, kaoliang, millet, maize, wheat, rice, upland rice, and other cereals.

Page 794. A large table gives the forecast (as of 1 July 1937) of major crops for crop year 1937-30 in all of Manchuria, South Manchuria, and North Manchuria. The text about soya beans is repeated.

Page 795. A table shows soya bean (exports in metric tons) from 1930 to 1936. Exports in 1936 were 1.963 million metric tons.

3472. Juyo Tokusanbutsu Kensajo. 1938. Jûyô tokusanbutsu kensa kankei hôki [Laws and regulations related to the inspection of important special products]. Manchuria. 124 p. [Jap]*
Address: Manchuria.

3473. Kihara, Kiyoshi. 1938. Shôyu oyobi aminosan-eki no yûki-san hikaku kenkyû [Comparative studies of organic acids in shoyu and so-called "amino acid solution" or liquid HVP (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15(2):A23. [1 ref. Jap]
• ***Summary:*** Abstracted from Jozogaku Zasshi 16:919 (1938).

3474. Merrill, Elmer D.; Walker, Egbert H. 1938. A bibliography of eastern Asiatic botany. Jamaica Plain, Massachusetts: The Arnold Arboretum of Harvard University. 719 p. See p. 608, 679. References through 1936. See also Supplement by Walker (1960), with references through 1958. [9 soy ref]
• ***Summary:*** A superb bibliography. The title page states:

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"Sponsored by the Smithsonian Institution, Arnold Arboretum of Harvard University, New York Botanical Garden, and Harvard-Yenching Institute." All serial abbreviations are written out in full on the first 20 pages. This book won the Oberly Award for Bibliography in Agricultural Sciences in 1941. A long and interesting appendix titled "Older Oriental Works" (p. 551-51), includes Chinese works (p. 551-59) and Japanese works (p. 559-61). Address: 1. Arnold Arboretum of Harvard Univ.; 2. Smithsonian Institution, Washington DC.

3475. Rafu Shinposha. comp. 1938. Rafu nenkan [The yearbook and directory 1938-1939]. Los Angeles, California: Rafu Shinpôsha. [Jap]*
Address: Los Angeles.

3476. Ueno, Seiichi. 1938. Daizu-yu to gyoyu [Soy oil and fish oil]. Tokyo: Kyoritsu-sha. 177 p. (Series: Shinko kagaku kogyo taikei). [Jap]

3477. Oriental Show-You Company. 1938? Oriental Show-You recipes. Columbia City, Indiana: Oriental Show-You Co. 24 p. Undated. Illust. Recipe index. 18 cm.
• ***Summary:*** Contents: Chop-Suey. Eggs. Entrees. Fish. Fritters. Meats. Miscellaneous. Noodles. Rice. Salads and dressings, Sandwiches. Soups.

"In addition to shoyu we are marketing canned Chop-Suey, [Mung] Bean Sprouts, Chow-Mein Noodles (fried), and Mixed Vegetables" (p. 1).

"Chop-suey sauce: No matter how skillful you deft fingers may be, you cannot make good chop-suey and other Oriental dishes with inferior sauce. It is absolutely necessary to use the best chop-suey sauce (soy) to get the tang of the orient.

'There are two or three qualities of soy, but the Japanese soy is reckoned the best'–*The Century Dictionary and Cyclopedia.* Oriental Show-You Sauce, being the purest soy brewed according to the secret Japanese formula, is considered the best by the thousands of people who have used it" (p. 2).

Sukiyaki is referred to as "Japanese chop-suey" (p. 4). "The Red Sun and the 'Show-You' on the labels are absolute guarantee of superior quality" (p. 22). Address: Columbia City, Indiana.

3478. Kuroda, Yoneko; Metzelthin, Pearl Violette Newfield. 1939. Information on Japanese food in reference to questionnaire submitted by Madame Pearl V. Metzelthin of New York City. Tokyo: Kokusai Bunka Shinkokai (The Society for International Cultural Relations). vii + 40 leaves. Jan. *
• ***Summary:*** Pearl Metzelthin was born in 1894.

3479. Iwasa, Kyozaburo; Uchino, Shigeru. 1939. Daizu-chu no sainyu busshitsu ni kansuru kenkyu. I. Daizu abura kasu oyobi sosei sutakiôsu no sayo ni tsuite [Investigation of the substances in soybean that induce milk production. I. On the ability of soybean presscake and raw stachyose to induce milk production]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 17(2):109-14. Feb. 15. [7 ref. Jap]

3480. Matsumoto, Tsuyoshi. 1939. Shihan shoyu no eiyo-ka ni tsuite [Nutritional value of commercial shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 17(2):97-102. Feb. 15. [Jap]
• ***Summary:*** This is part of a larger 3-part article, about the nutritional value of commercial food products, that starts on p. 97.

3481. Uchino, Shigeru; Iwasa, Kyozaburo. 1939. Daizu-chu no sainyu busshitsu ni kansuru kenkyu. II. Daizu abura kasu yori sainyu sayo busshitsu no bunri oyobi sono rinsho jikken ni tsuite [Investigation of the substances in soybean that induce milk production. II. On the separation of the milk-inducing substance in soybean presscake and clinical experiments using it]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 17(2):115-22. Feb. 15. [9 ref. Jap]

3482. Bloch, Kurt. 1939. Netherlands India takes advantage of soybean situation. *Far Eastern Survey* 8(3):34-35.
• ***Summary:*** Japanese expansion in East Asia and the worldwide economic depression have combined to encourage the cultivation of soybeans outside of Manchuria, especially in the Netherlands Indies [today's Indonesia] were soybeans have long been a basic foodstuff and where new land has become available because of the decrease in area planted to sugar cane. "The area devoted to soybean cultivation in Netherlands India has increased its relative position from less than 5% to more than 10% of the Manchurian area."

During the past eight years [since 1931], two main factors have influenced the international soybean market: (1) Japan's occupation of Manchuria has led to a sharp reduction of soybean acreage and production there; (2) Germany's *Fettwirtschaft* (edible fats' consumption regulation), initiated in 1933, resulted in a sharp reduction in the international demand for soybeans since Germany used to consume more than half of all European supplies. In addition, the fact that soybeans were dependent on a silver exchange standard has made them comparatively high priced, and soybean oil has been unable to compete with rival products.

"As a result soybeans have developed into a profitable crop in other areas, especially since in recent years the German-Manchurian barter trade has served to support the international level of prices in this commodity." There has also been a great expansion of soybean area in southeastern Europe–especially in Roumania and Bulgaria.

3483. *Revue Internationale des Produits Coloniaux et du Material Colonial.* 1939. L'extraction des dérivés du Soja

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[The extraction of soy derivatives]. 14(158):76-77. Feb. [Fre]
• ***Summary:*** This communication from the French commercial attaché in Tokyo describes the activities of several large, modern Japanese soybean processing companies in Manchuria. The modern soybean crushing mills use solvents, such as benzol or ethyl alcohol. The latter process, studied since 1926 by Dr. Masayasu Sato of the Central Laboratory, South Manchuria Railway Company (SMRC), is patented in England, Japan, France, Italy, and Denmark. The Sato is used commercially by the Manchuria Soya Bean Engineering Co., a private company with capitalization of 1.5 million yen subscribed by the SMRC and by the Nippon Food Stuff Engineering Co., an affiliate of Nippon Sangyo K.K. The factory / mill, which processes 80 metric tons (tonnes) per day of soybeans, and has the capacity to be within 300 tonnes, is located on the outskirts of Dairen, Manchuria. The company has also studied the processes for extracting from the oil a number of special products such as lecithin, vitamin B, a food condiment, saponins, and sugars. The residual cake, which is in the form of flakes named Soya Rex Flakes, would be of great food value. These products are to be produced by an affiliate, with capitalization of £200,000, the Manchurian Society for Soya Products, which is presently constructing a factory at Kawasaki, near Yokohama.

The sodium glutamate which is extracted from the cake could rival a condiment widely used in Japan under the name Aji-no-moto. The Society for nitrogen based fertilizers created this last April an affiliated firm with a capital of £10,000,000, a fourth of which is paid out, called "the Soya Bean Chemical Engineering Co." that will produce, exclusively a dozen products all derived from the soy oil or soya cakes in a factory currently being built at Konan (in Korea), where the master company already owns a very important group of chemical industries. Among these new products, we quote: amino-acid, oil based paints, boiled oil and lecithin used in tanning hides.

Several factories, among them Honen, Nisshin, and Nikka, that up until now were just producing soja oil, will now start outputting derivatives. Mentioned are substitutes for butter, wheat flour, soap, oil for human consumption, boiled oil for the printing industry.

The Japanese chemical industry, as is being done in Germany, is thus throwing itself systematically into the exploitation of this very complex raw material, the soybean, that it will find at its door step, on the Manchukouo [Manchurian] territory.

3484. Kihara, Kiyoshi. 1939. Shôyu to aminosan-eki no 2, 3 muki seibun [Some inorganic constituents of shoyu and "amino acid" solution]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 17(3):162-73. March 15. [Jap]
Address: Kagawa-ken Shôyu Shikenjô, Japan.

3485. Nakae, Tadashi. 1939. Aminosan chomiryo seizo ni kansuru kenkyu. Dai 14 ho. Tanpakushitsu genryo toshite no koridofu kezurikuzu [Research on making amino acid seasoning. XIV. The crumbs from trimming dried frozen tofu as a protein source]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 17(3):182-84. March 15. [Jap]*
Address: Japan.

3486. Nihon Kari Kogyo, K. K. 1939. Process for manufacturing artificial fibre from protein contained in soybean. *British Patent* 502,047. March 10. *

3487. Nihon Kari Kogyo, K. K. 1939. Process for manufacturing artificial fibre from protein contained in soybean. *British Patent* 502,048. March 10. *

3488. Kawano, Yoshio. 1939. Koji-kin koso ni yoru daizu tanpakushitsu no bunkai. I. Koji-kin zoku koso ni yoru bunkai [The hydrolysis of soy protein by enzymes of koji mold. I. Hydrolysis by the enzymes from a family of koji molds]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 17(4):223-30. April 15. [7 ref. Jap]
Address: Japan.

3489. Kawano, Yoshio. 1939. Koji-kin koso ni yoru daizu tanpakushitsu no bunkai. II. Koji-kin koso oyobi pepushin, papain konyo ni yoru bunkai [The hydrolysis of soy protein by enzymes of koji mold. II. Hydrolysis by the enzymes of koji molds as well as papain and pepsin]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 17(4):231-33. April 15. [4 ref. Jap]
Address: Japan.

3490. Fuzikawa, Fukuziro [Fujikawa, Fukujiro]. 1939. Über die antiseptische Wirkung der Orsellinsäureester auf Shoyu (Sojasauce). II. Uber die antiseptische Wirkung der Phenole, Phenolcarbonsäuren, aus denen die Flechtenstoffe zusammengesetzt sind, sowie deren Ester [The antiseptic effect of Orsellin acid esters on shoyu (soy sauce)]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) 59(4):240-42. [1 ref. Ger; Jap]
• ***Summary:*** This article all appears in German, by the same authors (vol. 59, No. 4, p. 93-94), under the title shown above. Address: 1. Aus der Pharmaceutischen Fachschule zu Kyoto.

3491. Primmer, George H. 1939. United States soybean industry. *Economic Geography* 15(2):205-11. April.
• ***Summary:*** Contents: Introduction. Recent phenomenal acreage increase. Soil relationships. Effect of slope. Climatic influences. Relation to pests and diseases. Use of soybeans for food and feed (coffee substitute, "cooked as a green vegetable," "soy sprouts of about two inches receive praise as a winter vegetable," "Duluth confectionary counters display 'Salted Soys' alongside other exotic nuts," "Recipes

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for preparing soybean 'milk' circulate widely").

Note. This is the 3rd earliest English-language document seen (Jan. 2013) that contains the modern term "soy sprouts."

Industrial uses of soybean oil and residue: the regional industrial products in Urbana, Illinois

Figures show: (1) Bar chart of the world's principal soybean producing countries in 1924-25, and in 1935-36. In 1936, Manchuria was by far the leader, followed by the USA, Chosen [Korea], Japan (whose production has decreased since 1925), and Netherland India [today's Indonesia].

(2) A map of the eastern half of the United States, with carefully located 50,000-acre dots showing areas of heaviest soybean production. Between 1934 and 1939, the area increased 5-fold in Mississippi and 21-fold in Minnesota. The area in Oklahoma decreased.

(3) A graph shows that the number of combines used to harvest soybeans in Illinois skyrocketed from 0 in 1924, to about 20 in 1925, to about 75 in 1926, to about 300 in 1927; by 1935 the number had increased to an estimated 3,000. (4) A photo shows a combine harvesting soybeans.

(5) A photo of a "Superior field of Indiana soybeans probably cultivated for the last time as plants shade most of the field's surface. Two-row corn cultivators or "beet cultivators may till four such soybean rows simultaneously.

(6) A graph shows soybean oil imports into the United states; these imports increased dramatically during World War I, peaking in 1918 [at 335.98 million lb].

(7) A map shows the location of soybean oil mills in the United States. There are large numbers in Illinois, Indiana, Ohio, Iowa, and North Carolina.

(8) A bar chart shows "Utilization of soybean oil processed in the United States" in 1934, 1935, and 1936. In 1934 the 30 million lb was used mostly by the drying oil industry. In 1935 the 140 million lb was used mostly for [lard] compounds and vegetable shortenings. In 1936 the 280 million lb was still used mostly for compounds and vegetable shortenings, but a significant amount was used for oleo, other edible, the drying oil industry, and soap.

(9) A photo shows a mill for removal of oil from Corn Belt soybeans; the processing plant serves an area tributary to Champaign, Illinois, and ships the oil to Chicago factory area.

"Soybeans provided some of the none-too-kindly remembered 'coffee' rations to Union Civil War soldiers. Sausage makers, at times, put up to 50 per cent soybean flour in part of their product."

Note: This is the earliest English-language document seen (Dec. 2012) that uses the term "Salted Soys" to refer to soynuts.

3492. Tsuda, Kyosuke; Ichikawa, Zentaro. 1939. Ueber Sojabohnen-Saponin. V. [Soybean saponins. V.]. *Berichte der Deutschen Chemischen Gesellschaft* 72B(4):716-23. April. [8 ref. Ger]

• ***Summary:*** Discusses the structures of sapogenols obtained from soybeans and proves the triterpenoid hydropicenic nature of these compounds. Address: Aus d. Pharmazeut. Institut d. Kaiserl. Universitaet Tokyo, Japan.

3493. Iwasa, Kyozaburo. 1939. Daizu-chu no sainyu busshitsu ni kansuru kenkyu. II. Abura kasu oyobi kasseiten, sansei hakudo shori ni yoru shusei, chushutsu-butsu no bitamin B-1 ganryo ni tsuite [Investigation of the substances in soybean that induce milk production. II. On the vitamin B-1 content of soybean presscake and the sake extract after treatment with activated carbon and acidic hakudo (?)]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 17(5):341-44. May 15. [4 ref. Jap]

3494. Kawano, Yoshio. 1939. Koji-kin koso ni yoru daizu tanpakushitsu no bunkai. III. Bunkai ni taisuru shoyu joken no sokutei [The hydrolysis of soy protein by enzymes of koji mold. III. Gathering data on the conditions of hydrolysis when making shoyu]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 17(5):303-12. May 15. [6 ref. Jap]
Address: Japan.

3495. Kawano, Yoshio. 1939. Koji-kin koso ni yoru daizu tanpakushitsu no bunkai. IV. Kaika-mame, aruso, metanôru shori daizu tanpakushitsu no hikaku bunkai [The hydrolysis of soy protein by enzymes of koji mold. IV. Comparisons of the hydrolysis of soy protein of blossomed (?) soybeans, and those treated by aruso (?) and methanol]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 17(5):313-14. May 15. [2 ref. Jap]
Address: Japan.

3496. Hutchinson, C.M. 1939. Home-grown food in war time: A direct method of production (Letter to the editor). *Times* (*London*). May 16. p. 10, col. 1.

• ***Summary:*** In Japan, the peasant has long "been largely dependent on the soy bean as his principal source of protein food, and his relative physical energy and powers of endurance as compared with the natives of other Oriental countries, such as India, who are also largely vegetarians, are well known. This difference is not due to the absence of legumes in India nor because the soy bean is not cultivated in the latter country, but to the fact that the Japanese are acquainted with a method of preparing this vegetable for human consumption in a manner which not only renders its palatable but highly digestible and nutritious.

"In place of cooking in the ordinary manner of the bean it is boiled and crushed and the resultant mash inoculated with a ferment which in the course of a few days converts it into a vegetable cheese, known as natto; this process of fermentation is actually one of predigestion which peptonizes and thus renders assimilable the whole of the vegetable protein in the bean so that no strain is thrown upon

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the digestive processes of the consumer."

There is no reason why this fermentation process should not be applied to beans grown in England.

Note 1. This is the earliest document seen (Jan. 2009) that mentions soy beans during World War II. This war would have a huge impact on production and utilization of soybeans worldwide.

Note 2. Aldeburgh is on the east coast of England, northeast of London, about midway between Lowestoft and Harwich. Address: Alde End, Aldeburgh.

3497. Yanagi, Kaneko. 1939. Ryûkyû chinmi no ichiya [One night enjoying specialty products from the Ryukyu Islands]. *Gekkan Mingei* (*Monthly Folkcraft*) 1(240):41-43. May. [Jap]

• ***Summary:*** The author mentions briefly (p. 41) that she tasted "tofu-yuu" [fermented tofu] from the banquet table at Shojun Danshaku's home.

3498. Kaneko, Takeo. 1939. Shôyu yori hisutamin oyobi mechionin no bunri ni tsuite [On the isolation of histamine and methionine from shoyu]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 60(6):539-41. June. [6 ref. Jap]

3499. Okano, Koji; Beppu, Iwao. 1939. Daizu shikiso no kenkyû. I. Shin isoflavon oyobi isoflavonglucoside no yon-shu ni tsuite [Coloring matter in soybeans. I. Isolation of four kinds of isoflavones from soya bean]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15(7):645-52. July. (Chem. Abst. 34:429). English-language summary in Bulletin of the Agricultural Chemical Society of Japan 15:110, bound at the back of Nippon Nogei Kagaku Kaishi. [3 ref. Jap; eng]

• ***Summary:*** The authors isolated four different isoflavones from the ethanol extract of soybeans. Lecithin was salted out from the solution and a crude saponin was precipitated from the alcoholic filtrate by the addition of acid. The saponin-pigment complex was dissolved in alcohol and the saponin precipitated by the addition of lead acetate. The lead-saponin complex was removed from the filtrate after which the pigments were fractionally separated. The mixture of ethanol and ethyl ether was added to the solution which resulted in the separation of yellow insoluble needles melting at 265ºC. The product corresponded to the formula $C_{21}H_{20}O_{10}$ and was named isogenistein. On hydrolysis, glucose and an aglycone, isogenistein, melting at 302ºC were obtained. The aglycone corresponded to $C_{15}H_{10}O_5$ and gave a triacetyl derivative melting at 189ºC and a di-methyl ether melting at 120-125ºC. On the basis of these results, isogenistein was presumed to be 5,7,2'-trihydroxy isoflavone, isomeric with genistein.

The soluble portion yielded three other crystalline products. One of these, which was designated as tatoin, consisted of colorless needles melting at 318ºC and having the formula $C_{16}H_{12}O_4$. It gave a diacetyl derivative melting at 185ºC, a monomethyl-ether melting at 160-163ºC and a dimethyl-ether melting at 165ºC. These and many other reactions indicated the probable identity of tatoin with 8-methyl- 5,7,4'-trihydroxy isoflavone.

The second product, which was designated as methylgenistein, consisted of faintly yellow needles melting at 298ºC. The product was characterized by the preparation and analysis of a large number of derivatives on the basis of which it was concluded that methylgenistein was probably 8-methyl- 5,7,4'-trihydroxy isoflavone.

The third product consisted of faintly yellow lustrous needles melting at 255ºC and corresponding to the formula $C_{22}H_{22}O_{10}$ was designated as methylisogenistein. On hydrolysis it yielded glucose and an aglucone melting at 301-302ºC, corresponding to the formula $C_{16}H_{12}O_5$. The aglucone was converted into a series of derivatives, the analysis of which indicated it to be 8-methyl- 5,7,2'-trihydroxy isoflavone, isomeric with methylgenistein. Address: Central Laboratory, South Manchuria Railway Co.

3500. Inoue, Y. 1939. [Artificial wool]. *Japanese Patent* 131,864. Aug. 28. (Chem. Abst. 35:3106). [Jap]*

• ***Summary:*** Using soybean meal and carbon disulphide.

3501. Kondo, K.; Hayashi, S.; Morishige, S. 1939. Daizu tanpaku no bunri [Fractionation of soybean protein]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15(8):727-36. Aug. (Chem. Abst. 34:137). [9 ref. Jap]

3502. Kono, Michitoshi; Nagata, Norio. 1939. Seishu, shôyu, su, gurutamin-san sooda, amino-san oyobi mizu ni yoru kinzoku zairyô no fushoku shiken [Corrosion test of metals with sake, shoyu, vinegar (*su*), monosodium glutamate, amino acids and water]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 17(9):618-26. Sept. 15. [4 ref. Jap]
Address: Hiroshima Kôtô Kôgyô Gakkô, Jôzô Gakka Kyôshitsu, Hiroshima, Japan.

3503. Morse, W.J. 1939. Soybeans–The world around. *Proceedings of the American Soybean Association* p. 39-44. 19th annual meeting. Held 11-12 Sept. at Madison, Wisconsin.

• ***Summary:*** Contents: Introduction. Asia: China, Manchoukuo [Manchuria], Chosen (Korea), Japan, Netherlands Indies [Indonesia], Philippine Islands. Europe. Rumania. North and South America. Africa. Australia.

In Europe, production is presently "confined largely to European Russia, Bulgaria, Yugoslavia, Czechoslovakia, and Rumania. In Europe as a whole, slightly more than 3 million bushels of seed were produced in 1938, 80 per cent of which was produced in Bulgaria, Rumania, and Yugoslavia. The largest increase has been in Rumania, due chiefly to the fact

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that Germany, by guaranteeing purchases, has given a certain stability to cultivation... Russian scientists have for the past several years carried on extensive experiments with the soybean. At the present time the principal areas of cultivation are the Ukraine and certain regions in northern Caucasus.

"Previous to the World War, Europe absorbed about 50 per cent of the exports of soybeans from Asiatic countries, the largest of the imports being taken by the United Kingdom, with Denmark and the Netherlands taking the remainder. In the post-war period [after World War I] important changes took place, Germany taking first place as an importer and other nations entering into the international trade in the bean and its products. At present Germany still holds first place as an importer of soybeans, followed by Denmark, England, Sweden, and the Netherlands. Among other countries that have increased their imports are France, Norway, Latvia, and Italy...

In South America, soybeans are at the experimental stage. "Successful results have been obtained in Cuba, Argentina, Brazil, Chile, and in some parts of Mexico."

"Africa: Extensive experiments have been conducted with the soybean in various parts of Africa for many years but as yet it is an unfamiliar crop to the majority of African farmers. It has been successfully cultivated in the upland, midland, and coast districts of Natal and throughout Gambia, Sierra Leone, Nigeria, and the Gold Coast Colony. In the cotton and corn growing districts of Belgian Congo the soybean has been grown successfully for forage and food purposes. Results in all cases, however, indicate that more and better varieties, and improved methods of culture and harvesting are essential before the soybean becomes a factor of much economic importance in African agriculture. The crop is advised more as a crop for domestic use than the European market. It is of interest to note that in 1938 nearly 4 million pounds of soybean meal were used in native rations in the mine compounds of South Africa.

"Australia: Successful results have been obtained with a few American varieties in Victoria and Queensland, but thus far efforts to establish the soybean as a commercial crop have been disappointing. At the present time, however, more extensive tests are being conducted to obtain adapted varieties in order to produce beans on a commercial scale."

A table (p. 43) gives "Acreage, production, and imports of soybeans by countries (Compiled from official sources)," based largely on 1938 statistics. The countries are: Austria, Belgo-Luxembourg [Belgium], British Malaya, Bulgaria, Canada, China, Chosen (Korea), Czechoslovakia, Denmark, Estonia, France, Germany, Hongkong, Italy, Japan, Kwantung, Latvia, Manchoukuo, Netherlands, Netherlands Indies, Norway, Poland-Danzig, Rumania, Sweden, Taiwan (Formosa), United Kingdom, United States, U.S.S.R. (Russia), Yugoslavia.

Leading soybean producers are: China 217,192,000 bushels (1936), Manchoukuo 170,269,000 bushels, United States 57,665,000 bushels, Chosen 18,480,000 bushels, Japan 13,473,000 bushels (1937), Netherlands Indies 9,873,000 bushels (production minus seed for planting), U.S.S.R. 2,502,000 bushels, Rumania 1,804,000 bushels.

Leading soybean importers include: Germany 28,766,356 bushels (the world's largest soybean importer), Japan 27,796,787 bushels (#2 worldwide), Estonia 195,475 bushels, Latvia 86,347 bushels, and Poland-Danzig 19,106 bushels.

Note: This is the earliest document seen (Feb. 2005) concerning soybeans in Estonia. This document contains the earliest date seen for soybeans in Estonia (1938). Address: USDA Bureau of Plant Industry, Washington, DC.

3504. Tomiyasu, Yukio. 1939. Shôyu-chû beta-hydroglutaminic acid no sonzai ni tsuite [On the existence of β-hydroglutaminic acid in shoyu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15(9):871-75. Sept. (Chem. Abst. 34:583). [5 ref. Jap] Address: Kyushu Taikoku Daigaku, Nôgaku-bu, Nosan Seizo-gaku Kyoshitsu.

3505. Mogi, Masatoshi. 1939. Miso jôzô ni kansuru kôbo no kenkyû (zokuhô). I. Keitaigaku-teki seishitsu [Studies on the yeasts found in miso. (Supplementary contributions). I. Morphological properties]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15(10):921-32. Oct. English reference in Bulletin of the Agricultural Chemical Society of Japan 15(10), bound at the back of Nippon Nogei Kagaku Kaishi (p. 137). [Jap] Address: Brewing Laboratory, Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

3506. Otani, Yoshio. 1939. Microbiological studies on the "nukamiso-pickles." *Zentralblatt fuer Bakteriologie. Series 2.* 101(4/8):139-51. [8 ref. Eng]
• ***Summary:*** To make nukamiso pickles, vegetables are put in a mixture of rice bran, salt, and water, then fermented and ripened. Miso is not typically used, but the bed has a consistency similar to that of miso. Inoue (1895) first analyzed nukamiso pickles and described their chemical components. Sawamura (1904) isolated a species of scum yeast and 4 species of bacteria from both fresh and old nukamiso. Address: Inst. of Zymomycology, Imperial College of Agriculture, Tottori, Japan.

3507. Udaka, H. 1939. [Artificial fibers from casein or soybean protein]. *Japanese Patent* 133,062. Nov. 7. (Chem. Abst. 35:3456). [Jap]*
• ***Summary:*** Using soybean protein and lanolin.

3508. Saito, Kendo. 1939. Tôyô-san kinrui chikin. VII. Kôbo-rui (1). Torulopsis Soya nov. spec. [Understanding East Asian microorganisms. VII. Yeasts (1). Torulopsis

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Soya, new species]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 17(11):772-73. Nov. 15. [Jap]
Address: Japan.

3509. Hennefrund, Helen E. comp. 1939. The peanut industry: A selected list of references on the economic aspects of the industry, 1920-1939. *USDA Bureau of Agricultural Economics, Agricultural Economics Bibliography* No. 80. viii + 238 p. Nov. 28 cm. [641 ref]
• ***Summary:*** This bibliography was compiled under the direction of Mary G. Lacy, librarian at the Bureau of Agricultural Economics. Contents: Foreword, by Mary Lacy. Sources consulted. General. United States: General, Agricultural Adjustment Program, cost of production and labor requirements, grading and standardization, legislation, markets and marketing, mechanization, periodicals, Philippine Islands, statistics, storage, utilization (general, feed and its nutritive value, peanut butter, peanut oil).

Foreign countries: General, Algeria, Argentina, Australia, Belgium and Belgian Congo, Brazil, British Empire, British East Africa, British West Africa, Bulgaria, Canada, Ceylon, China, Colombia, Cuba, Denmark, Egypt, France, French West Africa (incl. Senegal, French Guinea), Germany, India, Indo-China, Italy, Japan and Manchuria, Malaya, Mexico, Morocco, Netherlands and Dutch East Indies, Palestine, Poland, Portugal and Colonies, Rhodesia, South Africa, Spain, Sudan, Sweden, Thailand (Siam), Tunis [Tunisia], Turkey, Union of Soviet Socialist Republics, Uruguay, West Indies (British), Yugoslavia.

Pages 1-145 contain 641 bibliographic references (partially annotated), arranged by subject as shown above. Pages 146-238 are indexes.

The Foreword notes: "This bibliography supersedes and brings up to date a typewritten list by Vajen E. Hitz issued in 1931 entitled 'The peanut industry: Selected references on the economic aspects of the industry... 1920 to date.' It contains references to books, pamphlets, and periodical articles relating to the economic aspects of the peanut industry in the United States and in foreign countries from 1920 through the first five months of 1939... Call numbers following the citations are those of the U.S. Department of Agriculture Library, unless otherwise noted. 'Libr. Congr.' preceding a call number indicates that the publication is in the Library of Congress." Address: USDA Bureau of Agricultural Economics.

3510. Mogi, Masatoshi. 1939. Miso jôzô ni kansuru kôbo no kenkyû (zokuhô). II. Seirigaku-teki seishitsu. (3). Seirigaku-teki seishitsu. VII. Himaku no seisan [Studies on the yeasts found in miso. (Supplementary contributions). II. Physiological properties. (3). Physiological properties. VII. Film production]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15(11):1023-36. Nov. English-language summary in Bulletin of the Agricultural Chemical Society of Japan 13:24-25, bound at the back of Nippon Nogei Kagaku Kaishi (p. 143). [Jap]
Address: Brewing Laboratory, Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

3511. Morse, W.J.; Cartter, J.L. 1939. Soybeans: Culture and varieties. *Farmers' Bulletin* (*USDA*) No. 1520 (Revised ed.). 39 p. Nov. Revision of April 1927 edition, further revised in 1949.
• ***Summary:*** Contents: History. Description. Distribution and production. Climatic adaptations. Soil preferences, Varieties (classified by length of growing season into 7 groups, and divided within each group into "Seed, forage, green vegetable, and dry edible" types). Description of varieties (describes 125 varieties). Preparation of the seedbed. Fertilizers and lime. Inoculation. Time of seeding. Methods of seeding. Rate of seeding. Depth of seeding. Cultivation. Soybeans in rotations. Soybeans in mixtures. Soybeans drilled in small grains. Cost of production. Insect enemies of soybeans. Soybean diseases. Other enemies of soybeans.

"History: Ancient Chinese literature reveals that the soybean was extensively cultivated and highly valued as a food centuries before written records were kept. The first record of the plant is contained in a materia medica describing the plants of China, written by Emperor Sheng Nung in 2838 B.C. Methods of culture, varieties for different purposes, and numerous uses are repeatedly mentioned in later records, indicating the soybean to be of very ancient cultivation and perhaps one of the oldest crops grown by man. It was considered the most important cultivated legume and one of the five sacred grains essential to the existence of Chinese civilization. Soybean seed was sown yearly with great ceremony by the emperors of China, and poets through the ages have extolled the virtues of the plant in its services to humanity.

"The soybean was first made known to Europeans by Engelbert Kaempfer, a German botanist, who spent 2 years, 1691-92, in Japan. Seed sent by Chinese missionaries was planted as early as 1740 in botanic gardens in France..."

"Distribution and production: The soybean is grown to a greater extent in Manchuria than in any other country in the world. It occupies about 25 percent of the total cultivated area and is relied upon by the Manchurian farmer as a cash crop. China, Japan, and Chosen [Korea] are large producers and the soybean is cultivated more or less also in the Philippines, Siam, Cochin China, Netherland India [later Indonesia], and India. In other parts of the world, particularly Germany, England, Soviet Union, France, Italy, Czechoslovakia, Rumania, Mexico, Argentina, Cuba, Canada, New South Wales, New Zealand, Algeria, Egypt, British East Africa, South Africa, and Spain, various degrees of success have been obtained."

The section on diseases discusses the following: Purple spot of seeds, bacterial blight, bacterial pustule, mosaic, wilt,

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brown spot, sunburn or aphid injury, downy mildew, pod and stem blight, anthracnose, sclerotial stem rot, frog-eye spots, and *Pythium* root rot.

A table (p. 6-7) shows different varieties of soybeans recommended for four different uses (seed, forage, green vegetable, or dry edible), classified by the length of the growing season. Green vegetable–Very early (100 days or less): Agate, Sioux. Early (101 to 110 days): Bansei, Chusei, Goku, Kanro, Waseda. Medium early (111 to 120 days): Fuji, Hakote, Hiro, Hokkaido, Jogun, Kura, Osaya, Sato, Shiro, Sousei, Suru, Toku, Willomi. Medium (121 to 130 days): Chame, Funk Delicious, Imperial. Medium late (131 to 140 days): Aoda, Hahto, Higan, Rokusun. Late (141 to 160 days): Nanda.

Dry edible–Early (101 to 110 days): Bansei, Chusei, Goku, Kanro, Waseda. Medium early (111 to 120 days): Hokkaido, Jogun, Osaya, Sousei, Suru, Toku, Willomi. Medium (121 to 130 days): Funk Delicious, Imperial. Medium late (131 to 140 days): Easycook*, Haberlandt*, Higan, Rokusun, Tokyo*. Late (141 to 160 days): Nanda. Note: All dry edible varieties except three (Easycook, Haberlandt, and Tokyo–which are followed by an asterisk (*)) are also included in the green vegetable group. But many in the green vegetable group are not included in the dry edible group.

Detailed descriptions of the following 125 varieties are given (p. 7-17): Agate, A.K., Aksarben, Aoda, Arksoy, Avoyelles, Bansei, Barchet, Biloxi, Black Beauty (same as Ebony), Black Eyebrow, Cayuga, Chame, Charlee, Chernie, Chestnut, Chiquita, Chusei, Clemson, Columbia, Creole, Delnoshat, Delsta, Dixie, Dunfield, Early Green (same as Medium Green), Early Virginia Brown (same as Virginia), Early Wilson (same as Wilson), Early Wisconsin Black (same as Wisconsin Black), Early Yellow (same as Ito San), Easycook, Ebony, Elton, Fuji, Funk Delicious, George Washington, Georgian, Goku, Guelph (same as Medium Green), Habaro, Haberlandt, Hahto, Hakote, Harbinsoy, Hayseed, Herman, Higan, Hiro, Hokkaido, Hollybrook, Hongkong, Hoosier, Hurrelbrink, Illini, Ilsoy, Imperial, Indiana Hollybrook (same as Midwest), Ito San, Jogun, Kanro, Kingwa, Kura, Laredo, Large Brown (same as Mammoth Brown), Large Yellow (same as Mammoth Yellow), Late Yellow (same as Mammoth Yellow), Lexington, Macoupin, Mamloxi, Mammoth Brown, Mammoth Yellow, Mamredo, Manchu, Mandarin, Mandell, Mansoy, Medium Early Green (same as Medium Green), Medium Early Yellow (same as Ito San), Medium Green, Medium Yellow (same as Midwest), Midwest, Minsoy, Missoy, Monetta, Morse, Mukden, Nanda, Nanking, Norredo, Northern Hollybrook (same as Midwest), Ogemaw, Old Dominion, Oloxi (formerly Coker's Black Beauty), Osaya, Otootan, Ozark, Palmetto, Pee Dee (Coker's 31-15), Peking, Pine Dell Perfection, Pinpu, Richland, Rokusun, Sato, Scioto, Shiro, Sioux, Sooty, Sousei, Southern Green, Southern Prolific, Soysota, Suru, Tarheel Black, Toku, Tokyo, Virginia (selection {19186-D} from the Morse variety at Arlington Experiment Farm in 1907), Waseda, Wea, White Biloxi, Willomi, Wilson, Wilson-Five, Wisconsin Black, Woods' Yellow, Yelredo (a nonshattering selection, Coker's 319), Yokoten. Address: 1. Senior Agronomist; 2. Assoc. Agronomist, Div. of Forage Crops and Diseases; Both: USDA Bureau of Plant Industry, Washington, DC.

3512. Terui, Gyôzô. 1939. Yûki-san hakkô ni kansuru seirigaku-teki kenkyû. I. Kyôshi-kin (*A. niger*) no keitai-teki oyobi seiri-teki seishitsu ni tsuite [Biological investigation of organic acid fermentation. I. Morphological and physiological characteristics of *Aspergillus niger*]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 17(12):829-38. Dec. 15. [31 ref. Jap]
Address: Osaka Teidai, Kôgaku-bu, Jôzôgaku Kyôshitsu, Osaka, Japan.

3513. Terui, Gyôzô. 1939. Yûki-san hakkô ni kansuru seirigaku-teki kenkyû. II. Kuen-san hakkô no shojô-ken (1) [Biological investigation of organic acid fermentation. II. Various conditions of citric acid fermentation (1)]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 17(12):839-45. Dec. 15. [11 ref. Jap]
Address: Osaka Teidai, Kôgaku-bu, Jôzôgaku Kyôshitsu, Osaka, Japan.

3514. Mogi, Masatoshi. 1939. Miso jôzô ni kansuru kôbo no kenkyû (zokuhô). III. Bunri seru kôbo no bunrui narabini ruien oyobi hyôchô. (4). Bunri seru kôbo no bunrui narabini ruien oyobi hyôchô [Studies on the yeasts of miso fermentation (continued). III. Classification, relation, and diagnosis of isolated yeasts]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15(12):1221-32. Dec. [Jap]
Address: Noda Shoyu K.K. Shikenjo (Brewing Laboratory, Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan).

3515. Fujii, T. 1939. Kome kasu riyô no shôyu jôzôhô [Brewing shoyu using rice bran]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 34(9):920-25. [Jap]

3516. Fukai, Tôshi; Nonomura, Seiichi. 1939. Sosei aminosan-eki no shûki seibun ni tsuite. II. Asetoin kei busshitsu no sonzai [On the component of odor in liquid hydrolysed vegetable protein (HVP). II. Presence of acetoin derivatives]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 99-. [Jap]

3517. Fukai, Tôshi. 1939. Shôyu ni konnyû-seru sosei amino-san eki to karameru no kenshutsu [Detection of the liquid hydrolyzed vegetable protein (HVP) and caramel mixed into soy sauce]. *Jozo Shikensho Hokoku* (*Report of the*

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Brewing Experiment Station) No. 128. p. 105-08. [Jap]

3518. Fukai, Tôshi; Nonomura, Seiichi. 1939. Komugi daiyô genryô to shite dasshi daizu, shiro muka, tapioka ruuto shôyu jôzô shiken [The utilization of soybean cake, white rice bran and tapioca root in place of wheat for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 365-73. [Jap]

3519. Fukai, Toshio; Nonomura, Seiichi. 1939. Seihaku kôryan shôyu jôzô shiken [Use of polished kaoliang for brewing shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 357-63. [Jap]

3520. Fukai, Tôshi. 1939. Shôyu no chisso to sono hokyû ni tsuite (Junkai kôen ichibu no hoi) [Shoyu nitrogen and its supply]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 34(11):1073-81. [Jap]

3521. Fukai, Tôshi; Furukawa, T. 1939. Daizu kasu o chisso gen to suru shusei hakkô no fuzeru yu ni tsuite [On the fusel oil produced in the alcoholic fermentation using soybean cake as the nitrogen source]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 123-31. [12 ref. Jap]
• ***Summary:*** Fusel oil yields higher alcohols, such as isoamyl alcohol, amylalcohol, propylalcohol, isobutylalcohol, etc.

Note: *Webster's Dictionary* defines fusel oil (derived from the German *fusel* = bad liquor, and first used in 1868) as "an acrid oily liquid occurring in insufficiently distilled alcoholic liquors, consisting chiefly of amyl alcohol, and used especially as a source of alcohols and as a solvent."

3522. Hamabe, G.; Nagao, H. 1939. [Performance of diesel engines using soybean oil as fuel]. *Nippon Kikai Gakkai Ronbunshu* (*Transactions of the Society of Mechanical Engineers, Tokyo*) 5(No. 20(II)):5-9. (Chem. Abst. 35:4178). [Jap]*
• ***Summary:*** Ignition lag was reportedly reduced with engines using soybean oil.

3523. Kono, M.; Nagata, N. 1939. Seishu, shôyu, su, gurutamin san sooda, amino-san, kyûsui ni yoru kinzoku zairyô no fushoku shiken [Corrosion test of metals using sake, shoyu, vinegar, monosodium glutamate, and amino acids (Abstract)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 34(11):1141-42. [Jap]

3524. Kurano, K.; Itai, J.; Nonomura, S. 1939. Rizopusu kin ôyô shôyu jôzô shiken (Die Anwendung des Rhizopus anstatt des Aspergillus fuer das Syoyu brauen) [Application of *Rhizopus* instead of *Aspergillus* for brewing shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 289-95. [Jap]

3525. Matsumoto, K. 1939. Shinko shôyu moromi no kôso sayô no hikaku [Comparison of enzyme action and the age of shoyu moromi]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 34(3):239-42; 34(4):373-77. [9 ref. Jap]

3526. Matsumoto, K.; Narimiya, K. 1939. Shôyu bareisho kin no koso-ryoku to baiyô no kankei [The relationship between the enzymatic strength of potato bacteria for shoyu and their cultivation]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 34(7):675-79; 34(8):774-77. [Jap]

3527. Matsumoto, Kenji; Nonomura, Seiichi. 1939. Gyo fun shiyô shôyu jôzô shiken [The use of fish meal for brewing shoyu]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 297-308. [Jap]

3528. Matsumoto, K.; Nonomura, S. 1939. Dasshi nuka riyô shôyu jôzô shiken [On the use of defatted rice bran for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 317-22. [Jap]

3529. Matsumoto, K.; Nonomura, S. 1939. Aka nuka oyobi dasshi nuka hikaku shôyu jôzô shiken [Comparison of rice bran and fat-free bran for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 323-33. [Jap]

3530. Matsumoto, K.; Nonomura, S. 1939. Kôso eki ôyô shôyu jôzô shiken [Application of enzyme solutions for shoyu manufacture]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 335-42. [Jap]

3531. Matsumoto, K.; Nonomura, S. 1939. Awa oyobi hakumai senjôsui shiyô shôyu jôzô shiken [Use of millet and waste water gained in washing of polished rice for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 343-47. [Jap]

3532. Matsumoto, K.; Nonomura, S. 1939. Tokushu baiyô shôbo ôyô shiken [Application of yeast and bacteria cultured specially for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 349-55. [Jap]

3533. Matsumoto, Kenji; Nonomura, Seiichi. 1939. Kenki-teki baiyô shôbo ôyô shôyu jôzô shiken [On the application of shoyu yeast and lactic acid bacteria cultured in an anaerobic state for shoyu brewing]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 309-16. [Jap]

3534. Matsumoto, K.; Komatsu, S. 1939. Miso-chû no saikin-rui ni tsuite. III. Miso-chû no kenki-sei seisan kin ni

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tsuite [On the bacteria in miso. III. On the anaerobic acid-producing bacteria in miso]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 109-22. [Jap]

3535. Matsumoto, K.; Takahashi, T. 1939. Miso-chû no saikin ni tsuite. V. Nyûsan-kin kôbo tenka miso jôzô shiken [On bacteria in miso. V. On the utilization of lactic acid bacteria and yeast for miso manufacture]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 389-96. [Jap]

3536. Matsumoto, K.; Takahashi, T.; Tsujita, D. 1939. Miso-chû no saikin-rui ni tsuite. VI. Tainetsu nyûsan-kin oyobi kôon kôbo ôyô miso seizô shiken [On bacteria in miso. VI. The application of thermophilic lactic acid bacteria and yeast to miso manufacture]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 397-401. [Jap]

3537. Matsumoto, K.; Tsujita, D. 1939. Miso-chû no saikin-rui ni tsuite. IV. Miso seizô ni bareisho-kin no ôyô ni tsuite [On the bacteria in miso. IV. The application of mesentericus potato bacteria to miso manufacture]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 381-88. [4 ref. Jap]

3538. Matsumoto, K. 1939. Miso to bisei-butsu. V. Bunri saikin-rui no tokusei to sayô no ryakujutsu [Miso and microorganisms. V. Properties and action of microorganisms isolated from miso]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 34(11):1117-20. [Jap]

3539. Matsumoto, K.; Tsujita, D. 1939. Kôso ôyô miso seizô no shiken [The application of enzymes for miso manufacture]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 128. p. 375-80. [13 ref. Jap]

3540. Mogi, Masatoshi. 1939. Miso jôzô ni kansuru kôbo no kenkyû (Zokuhô) [Research on yeast in miso manufacture. Morphological and physiological properties of the yeast (Abstract)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 34(12):1251. [Jap]
Address: Brewing Laboratory, Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

3541. Sumi, M. 1939. [Flavin (vitamin B-2) content in some foods. I.]. *Rikagaku Kenkyujo Hokoku* (*Report of the Institute of Physical and Chemical Research*) 17:1296-. [Ger]*
Address: Japan.

3542. Wada, N.; Takaki, Y. 1939. Formation of plastics from soya bean protein. *J. of the Society of Chemical Industry, Japan* 42:317-18B. Supplemental binding to Kogyo Kagaku Zasshi. [Eng]*
• ***Summary:*** Also in Soc. Chem. Indus. Jour., 59B, p. 150 (1940).

3543. Abend, Hallett. 1939. Chaos in Asia. New York, NY: I. Washburn, Inc. 313 p. See p. 29. Illust. (map). 22 cm.
• ***Summary:*** Chapter 2, "How Japan carries on" (p. 26+) is about conditions inside Japan, since the Manchurian "incident" of 7 July 1937, as it fights a war in China. Gasoline is rationed to 12 gallons/month. Gaiety is strictly banned and dance halls are closed. Taxes are high and the country's gold reserves have been exhausted. Wages are sky-high and the "pinch of the unofficial American and British boycotts of Japanese-made goods is making itself felt." In short, the island nation is in dire straits.

"The Army is so much better fed, these days, than the civilians that Japanese informants say a marked change is noticeable in all the conscripts before they have been three months in uniform. They fill out, they broaden, their color improves, their eyes have new luster. For the conscripts get meat once each day, they are fed eggs, they are given raw fish in plenty, and they get all the nourishing soya bean curd that they can eat." Address: Author of books on East Asia.

3544. Embree, John Fee. 1939. Suye Mura, a Japanese village. Chicago, Illinois: University of Chicago Press. xxxi + 354 p. Index. 21 cm. Reprinted in 1964 with new Foreword.
• ***Summary:*** This is the earliest known detailed anthropological study of Japanese village life. John Embree is a pioneer anthropologist who lived (with his wife) in the remote mountain Japanese farming village of Suye Mura in Kumamoto prefecture (on Japan's southern island of Kyushu) from Aug. 1935 to Dec. 1936. Mr. Toshio Sano, a graduate of Tokyo Language School, lived with Embree and acted as his interpreter and translator.

Soybeans and soyfoods (particularly tofu) are discussed throughout the book.

Page 41: "Tôfu (soy-bean curd) is prepared in the *mura* by several *tôfu*-makers and sold to the rest of the villagers. It is made by grinding soybeans in a stone quern. It is eaten a great deal in soup and is used as a cheap substitute for fish at some social gatherings.

"The diet is largely vegetarian, though fish and occasionally chicken accompany a banquet. Plenty of proteins are available in the many foods made of soy beans, especially the soy-bean soup (*miso-shiru*), soy-bean sauce (*shôyu*), and soy-bean curd cake (*tôfu*) (see Table 1).

Pages 42-43: Table 1, titled "Agricultural products by season," has four columns for each of the four seasons. Azuki beans and sasage are harvested in summer and autumn; soy beans and sesame seed in autumn. Note: Edamame is not mentioned.

"Page 45: "Pigs are raised for outside sale by most of the *tôfu* makers. A piglet is bought for 5 yen from some city

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broker, fed on *tôfu* waste [tôfu waste, okara] and general garbage (very scanty in a farmer's house) for about a year, after which time the broker comes back and buys the grown pig for from 15 to 20 yen." The "villagers never think of eating pig meat themselves." "Some people make flour at home on revolving grind-stones (*hikiusu*), similar to those used in making the bean-curd *tôfu.*

A photo (facing p. 52) shows the front of a local *tôfu* shop (Kakui), with two ladies seated on the low wooden platform. The caption reads: "This woman makes *tôfu* daily. Her shop carries a few tinned goods, some candy, beer, geta, thongs, etc. It is a favorite gathering-place for people to sit about and talk."

Page 53: "Some widows and farmers' wives, usually of the poorer families, make *tôfu* as a means of increasing the family income. Such a family has only a little farmland, otherwise the wife would not have the time to devote every morning to making and selling *tôfu.*" "Each *buraku* [village, community] has a *tôfu* maker." Sometimes the wives of fishermen make *tôfu.*

Pages 60-61. In the *yakuba* (village office) there are frequent parties. Two man, paid as messengers, go to buy *tôfu* for these parties.

Page 115: On Kwannon Day, a party is held and a square of *tôfu* is served with *shôchû* to each person present. Tofu is also served at other types of parties and sometimes taken as a gift (p. 118, 122, 124, 128, 147).

Page 160: The author identifies six social classes in this village. Small shopkeepers and *tôfu* makers belong to the 4th class, the "lower middle."

Page 241: Of the Seven Gods, Daikoku and Ebisu are the patron saints of shopkeepers and *tôfu* makers.

Page 254: Inari is the god of crops, especially of rice. "People always refer to Inari as *Oinarisan* (Honorable Inari)."

Pages 292-93. "The eleventh month" of the lunar calendar. On the 15th day is the old Ichifusa Shrine Day. On the evening of the 14th day, *tôfu* is roasted on special bamboo sticks in the fire pit. This preparation, called *dengaku* is made in honor of Otakesan (Ichifusa Shrine).

Page 315: Most *tôfu* makers specialize in doing just that, but some shopkeepers also make *tôfu.*

Page 318: Household expenses. Most miso is made at home. Tofu and other goods purchased at local stores may be paid for with rice instead of money.

3545. Fukai, Tôshi; Nonomura, Seiichi. 1939. Sosei aminosan-eki no shûki seibun ni tsuite. II. Asetoin-kei busshitsu no sonzai [On the bad-smelling constituents of crude amino acid solution (liquid HVP). II. The presence of acetoin derivatives (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15:A150. [1 ref. Jap]
• ***Summary:*** Abstracted from Jozo Shikensho Hokoku 128:99 (1939).

3546. Fukai, Tôshi. 1939. Shôyu ni konnyu seru sosei aminosan-eki to karameru no kenshutsu [Detection of liquid hydrolyzed vegetable protein (HVP) and caramel mixed into to soy sauce (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15:A152. [Jap]
• ***Summary:*** Abstracted from Jozo Shikensho Hokoku. No. 128. p. 105. (1939).

3547. Fukai, Toshio; Nonomura, Seiichi. 1939. Seihaku kôryan shôyu jôzô shiken [Use of polished kaoliang for brewing shoyu (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15:A152. [1 ref. Jap]
• ***Summary:*** Abstracted from Jozo Shikensho Hokoku. No. 128. p. 357-63 (1939).

3548. Fukai, Tôshi; Nonomura, Seiichi. 1939. Komugi daiyo genryô toshite dasshi daizu, shironuka, tapioka ruuto shôyu jôzô shiken [Use of soybean cake, white rice bran and tapioca root in place of wheat for brewing shoyu (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15:A153. [1 ref. Jap]
• ***Summary:*** Abstracted from Jozo Shikensho Hokoku. No. 128. p. 365-73. (1939).

3549. Fukai, Toshi. 1939. Shôyu oyobi miso [Soy sauce and miso]. Tokyo: Taiyokaku. 7 + 398 p. Index. 23 cm. [Jap]*
• ***Summary:*** The author was born in 1888. Address: Japan.

3550. Hanzawa, Jun. 1939. Nattô [Natto]. In: Kôso Kagaku Kôgyô Zenshu (Complete Enzymological Industry). Tokyo: Koseikaku. [Jap]*

3551. International Institute of Agriculture. 1939. Oils and fats: Production and international trade. *Studies of Principal Agricultural Products on the World Market* No. 4. Part I. 345 p. See p. 59-76. [Eng]
• ***Summary:*** Nine major oilseed crops and their respective oils are discussed: cottonseed, groundnut, linseed, soya beans (p. 59-76), sunflower seed, colza seed–rapeseed–mustard seed, sesame seed, castor seed, perilla seed, others (hemp seed, poppy seed, maize/corn). I. Grinenco wrote section IV titled "Soya beans and soya bean oil." Contents: I. Production (p. 59-68). Areas of production: Table 18 shows "Areas cultivated for soya." Average 1924-1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, in China, Manchukuo, Chosen [Korea], Japan, Netherlands Indies [Indonesia], United States, USSR, Europe.

Table 19 shows "Areas cultivated for soya" during the same time periods shown above. In 1936 the world's leading soybean producing countries (in 1,000 metric tons) were: China 5,911.0, Manchukuo [Manchuria] 4,175.5,

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United States 816.0, Chosen [Korea] 487.1, Japan 339.8, Netherlands Indies (Java and Madura) 247.4, USSR 44.3, Kwantung 17.7, Taiwan 4.4.

Table 20 shows "Area and production of soya in China by provinces (average 1931-1935)." The leaders in total production are (in 1,000 metric tons): Shantung 1,980.7, Kiangsu 1087.4, Honan 765.0, Szechuan 517.0.

Table 21 shows "Production of soya in Manchukuo by provinces in 1936 (in 1,000 metric tons):" Northern provinces: Pinkiang 1,083.9, Kirin 980.8, Lungkiang 464.9, Sankiang 260.6, Chientao 91.4, Heiho 2.7. Total north: 2,884.3. Southern provinces: Fengtien 985.4, Antung 154.7, Chinchow 151.1. Total south: 1,291.2.

Table 22 shows "Area cultivated for the production of soya bean in the United States (in 1,000 ha):" Figures are given for Illinois, Indiana, Iowa, Ohio, North Carolina, Mississippi, Missouri, Other states. Total.

II. Trade (p. 68-76). Principal countries exporting soya beans: Manchukuo, Chosen [Korea], The United States. Principal countries importing soya beans: Germany, Denmark, Sweden, Netherlands, France, Norway, Latvia, Italy, Japan, Chosen, Netherlands Indies. Principal countries exporting and importing soya oil: Manchukuo, Japan, United Kingdom, Austria, Czechoslovakia, Finland, French Morocco, Hong Kong. III. Conclusion (p. 76).

Concerning Norway: Table 24 (p. 71) shows "Net world imports of soya beans (in 1,000 metric tons)," yearly from 1929 to 1936, plus average 1909-1913, and average 1924-1928. A footnote shows that in 1910-11 Norway imported 700 tonnes of soybean oil, followed by an average of 100 tonnes in 1924-28. Norwegian imports of soybean oil were zero from 1929 to 1932, then 2,200 tonnes in 1933, rising to 15,300 tonnes in 1934, then 15,700 tonnes in 1935, and 22,900 tonnes in 1936.

Concerning Finland: Pages 74-75 state that Finland imports soya oil. Finland's first recorded imports were in 1931, when 684 metric tons (tonnes) were imported. By 1936 Finland was importing 2,565 tonnes of soya oil a year. Note: This is the earliest document seen (May 2002) concerning soybean products (soy oil) in Finland; soybeans as such have not yet been reported. This document contains the earliest date seen for soybean products (soy oil) in Finland (1931).

Concerning Latvia: Page 72 states: "Among the countries that have increased their imports of soya beans are France, Norway, and Latvia, although the quantities imported up to the present are relatively small." They are so small that no statistics are given. Address: Villa Umberto I, Rome, Italy.

3552. International Institute of Agriculture. 1939. Oils and fats: Production and international trade. *Studies of Principal Agricultural Products on the World Market* No. 5. Part II. 423 p. [Eng]

• ***Summary:*** Contents: Section II. Land animal fats. Butter. Pig fats. Beef and mutton fats. Trends in world production of and world trade in fats of land animals. III. Marine animal oils and fats. IV. Production and consumption of fats and oils in certain countries. V. Utilisation of fats and oils. VI. Prices of fats and oils (with graphs). Address: Villa Umberto I, Rome, Italy.

3553. Japan Year Book 1939-40. 1939. Tokyo: The Foreign Affairs Association of Japan. 26 + 1220 + 26 p. With fold-out map of Japanese empire. See p. 412-13.

• ***Summary:*** The Preface indicates that this book was published in about Sept. 1939. The editor's name is not given.

Pages 412-13. "Leguminous plants:... Area of leguminous plants in 1937 was 606,184 cho and the production was valued at ¥96,048,470. During the past decade the area planted has been pursuing a slow downward movement, while a sharp reduction experienced by production was more than made good by the increase of 1933. Soy-beans and azuki (red) beans are predominant both in area and production. In 1937

Soy-beans were planted on 331,572 cho which produced 2.842 million koku worth 50,848,576 yen.

Azuki beans were planted on 104,288 cho which produced 0.833 million koku worth 17,272,620 yen.

Note: Production of azuki beans in 1937 in Japan was 29.3% that of soy-beans.

3554. Japan-Manchoukuo Year Book. 1939. Tokyo, Japan: Japan-Manchoukuo Year Book Co. xxiv + 1202 p. Index. 26 cm. Sixth annual issue. [Eng]

• ***Summary:*** Each year book is divided into two main parts: Japan, and Manchoukuo. This book was published in late 1938.

In the Japan and Manchoukuo parts of the book, soya beans are most widely discussed in the respective chapters on Agriculture. In each case, information given the previous year is updated one year. The Foreword states: "A special feature of this issue is the supplement entitled Japan's Economic Position in China."

Page 332. Table 23 shows production of "Beans, potatoes and sweet potatoes" in hectolitres from 1927 to 1936. 1.80391 hectolitres = 1 koku = 5.11902 dry bushels (USA). For soya beans:

4.751 million hectoliters in 1936

Page 760. In the chapter on Railways. Table 5 shows "Staple commodities hauled" from 1931-1938.

1931–4.927 million metric tons (mmt) soya beans & other beans, 0.739 mmt bean cake, and 0.103 mmt bean oil.

1932–7.435 million metric tons (mmt) soya beans & other beans, 0.851 mmt bean cake, and 0.091 mmt bean oil.

1933–7.643 million metric tons (mmt) soya beans & other beans, 0.566 mmt bean cake, and 0.030 mmt bean oil.

1934–5.102 million metric tons (mmt) soya beans & other beans, 0.601 mmt bean cake, and 0.029 mmt bean oil.

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1935–5.427 million metric tons (mmt) soya beans, 0.502 mmt bean cake, and 0.026 mmt bean oil.

1936–4.407 million metric tons (mmt) soya beans, 0.428 mmt bean cake, and 0.025 mmt bean oil.

1937*–2.676 million metric tons (mmt) soya beans, 0.233 mmt bean cake, and 0.022 mmt bean oil. * = Excluding North Chosen Line.

1938*–2.640 million metric tons (mmt) soya beans, 0.321 mmt bean cake, and 0.024 mmt bean oil. * = Excluding North Chosen Line.

Below this table is a section about the new freight rates.

Page 761. Table 6 shows "Soya-bean freight rates in yen per metric ton. Table 6A shows rates F.O.B. Rashin [Rason, Rajin, a port city on the east coast of Korea, 20 miles from the Russian frontier] from 12 localities Table 6B shows F.O.B. Dairen. from the same 12 localities.

Below that and on page 762 is a history of the South Manchuria Railway Company.

Page 759. A large table shows "Area under various crops (in hectares)" yearly from 1924 to 1938. In 1938 soya beans were planted on 3.784 million hectares.

Page 760. A large table shows "Output of principal of crops (metric tons)" in Manchoukuo yearly from 1924 to 1938. The latter year is an estimate. For soya beans: 4.381 million metric tons in 1938.

The other principal crops shown in the tables are other beans, kaoliang, millet, maize, wheat, rice, upland rice, and other cereals. The text about "Soya beans" is repeated on this page and the next.

Page 761. A table shows soya bean exports (in metric tons) from 1930 to 1937. Exports in 1937 were 1.974 million metric tons.

3555. Kihara, Kiyoshi. 1939. Shôyu to aminosan-eki no 2, 3 muki seibun [Some inorganic constituents of shoyu and "amino acid" solution (liquid HVP) (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15:A63. [1 ref. Jap]

• ***Summary:*** Abstracted from Jozogaku Zasshi 17:162 (1939).

3556. Manshu Dengyo Kabushiki Kaisha. 1939. Daizu jinzô yômô [Artificial wool from soybeans]. Shinkyo (Ch'ang Ch'un), Manchuria. 22 p. [Jap]

• ***Summary:*** This technical booklet describes how soy protein is spun into fibers that resemble those of wool. Manshû Dengyo Kabushiki Kaisha means Manchurian Electrical Industry Inc. Address: Shinkyo (Ch'ang Ch'un), Manchuria.

3557. Matagrin, Am. 1939. Le soja et les industries du soja: Produits alimentaires, huile de soja, lécithine végétale, caséine végétale [Soya and soya industries: Food products, soy oil, vegetable lecithin, and vegetable casein]. Paris: Gauthier-Villars. x + 390 p. Illust. 18 cm. [300 ref. Fre]

• ***Summary:*** Contents: Introduction. 1. The agricultural, industrial, and commercial history of soya: Asiatic origins and propagation in Europe, soya in America (its cultivation and industries), soya in Europe, Asia, Africa, and Oceania (1936) (1. Admission of soya in the agriculture and industry of European nations (p. 35): Soya in France, soy industry and commerce in central and northern Europe {England, Germany, Holland, Denmark, Sweden, Poland, Austria and Hungary, Switzerland}, penetration of soya into southern Europe {Iberian peninsula, Italy, Balkan countries of Dalmatia, Istria, Yugoslavia, Greece (p. 47), Bulgaria, Romania, Ukraine}, the grandeur and decadence of soya in Russia. 2. Soya in modern Asia (p. 51): China and Manchuria, Japan, Korea, Formosa, French Indochina {Tonkin, Cambodia, Cochin China}, the British and Dutch Indies {Siam, Assam, Bengal, Burma, Ceylon, India, Straits Settlements [later Singapore] / Malacca}, western Asia {Turkestan, Persia (p. 57)}. 3. Soya in Africa and Australia (p. 57-58): South Africa, Rhodesia, Nigeria, Gold Coast [later Ghana], Cote d'Ivoire, Dahomey, Togo, Algeria, Tunisia, Morocco, Egypt, Australia {Queensland, New South Wales, Victoria}, Tasmania, New Zealand, not yet in British New Guinea [later Papua New Guinea], Philippines, Java).

2. The botany and agronomy of soya: The plant, its names, its botanical characteristics, its varieties (original and created by selection), the cultivation of soya.

3. The general chemistry of soya: Chemical composition of the plant, structure and chemical composition of the beans.

4. Using soya in soyfoods and soyfood products: Whole soybeans (whole green, dry, sprouted, roasted and salted {*soja á l'état vert, fève de soja sèche, fève grillée, fève salée de soja, fèves de soja salées,* p. 166-67}, soynut butter {*un mélange rappelant les beurres végétaux*}, soy coffee, soy confections {*confiture de soja*}, soy chocolate, soy sprouts {*fèves de soja germées, germes de fèves de soja*}), soymilk and tofu (*le lait et le fromage de soja;* soymilk cream, concentrated soymilk, soymilk powder / powdered soymilk, fermented soymilk {*lait fermenté, yoghurt, kéfir, koumys,* p. 189}, fermented tofu {*fromages de soja*}), okara (*pulpe résiduaire de la préparation du lait de soja*), fermented soy products (solid, paste, and liquid condiments; natto, miso, and shoyu [soy sauce]; kiu-tsee and lactic ferments), soy flour and bread.

5. The soy oil industry and products derived from it: Extraction and refining of soy oil, properties and use of soy oil.

6. The vegetable lecithin industry: Extraction of vegetable lecithin, properties and use of vegetable lecithin.

7. The vegetable casein industries and plastic materials based on soya: Soybean cakes and flours from which the oil has been removed, use of such cakes and flours, in the crude state, as a raw material for plastics, manufacture and use of

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vegetable protein, soybean cellulose for artificial silk, soya furfural and furfuraldehyde (phenolic resins). Conclusion: How to launch soya industries in France. Important terms. A bibliography appears at the end of each chapter.

Note 1. This is the earliest French-language document seen that uses the terms *Fève grillée, fève salée de soja,* or *fèves de soja salées,* "roasted soy beans" to refer to soynuts.

Note 2. This is the earliest French-language document seen (April 2005) that mentions soynut butter, which it calls *un mélange rappelant les beurres végétaux.*

Summary: Matagrin wrote two previous books: *Manuel du Savonnier* (Paris, no date given) and *L'Industrie des Produits chimiques et ses Travailleurs* (Paris, 1925).

Francis G. Beltzer, a practical chemist, became a major force in visualizing new industrial uses for the soybean in the West. By contrast, Li and Grandvoinnet (1912) paid little attention to soy oil in their book, devoting only 3 pages out of 150 to the subject, and only ½ page to industrial uses, while largely ignoring lecithin. These two books had a great influence on soy in France and they nicely complement each other (p. vi).

The Soybean, by Piper & Morse (1923), was published in both New York and London. Horvath was a Russo-American chemist. Italians who made important contributions to the soybean were professors Bottari, Mattei, Panatelli, and Tito Poggi (p. vii).

Leon Rouest, French the agronomist, wrote an important book titled *Le soja français et ses applications agricoles et industrielles* (Chateauroux 1936). Since 1920 he has devoted himself to the culture of soybeans and to the selection of acclimatized varieties. He was director of the Laboratory of Soja in the north Caucasus from 1930 to 1935, and in 1921 he had already published a book, *Le soja et son lait végétal.* His new (1936) book benefitted from the collaboration of Henry de Guerpel, an agricultural engineer and mayor of Percy-en-Auge, who was also an indefatigable prophet of soybeans in France, until his untimely death in Jan. 1937.

Anyone in the world can order (from the U.S. Government Printing Office in Washington, DC) the many U.S. publications about soybeans from the USDA or state agricultural experiment stations. These substantial works are based on careful research and enriched with numerous tables and photos–a fine example of the key role that governments can play in introducing and popularizing soya. Recently J.A. LeClerc (of USDA's Bureau of Chemistry and Soils) said the soybean has become a naturalized American (p. viii).

More than a century ago lord Byron wrote *Beppo,* the first Western poem on soy. It was an account of a carnival at Venice, Italy, in 1818. He advised the tourists to bring "Ketchup, Soy [sauce], Chili-vinegar."

Maurice Druel was one of the young engineers who worked with competence to launch a soy industry in France (p. x).

For an early chronology of soybeans and soyfoods in France (1856+, see pages 8-12). 1857-58: Lechaume planted soybeans at Vitry-sur-Seine and got encouraging results. A report by the National Society for Acclimatization declared: "The acclimatization of the soybean is complete."

1859–Setback for the first tests by Vilmorin with Chinese beans that were too late, but success by Dr. Turrel in le Var.

1862-69–Success of Mme. Delisse, in Gironde.

Then the Franco-Prussian war arrested these tests, so the center of interest moved to central Europe. The world exposition of Vienna in 1873 and Haberlandt. In his book one finds the first analyses of the seed by Steuf, of the cake by Woelker / Voelker, the results of texts by Berndt on oil extraction (p. 9).

Podolie is in the Ukraine.

Of Haberlandt's 148 trials in 1877, only 12 failed for lack of warmth. Much new agronomic information was accumulated.

Back in France: 1874-80–Society of Horticulture d'Etampes (Seine-et-Oise) grew a yellow Chinese variety which succeeded. This "soja d'Etampes" was studied intensively from the chemical and agronomic points of view by Lechartier and various authors. A doctor from the region prepared, for his personal use, a vegetable cheese (tofu). But the grain did not find buyers so its cultivation did not spread. There now remain only 2 or 3 innovators to cultivate soybeans and on 5-10 acres maximum. But Chinese soybeans mature in the region of Paris, as in 1879 at Marseille.

1880–While the tests of Boursier in l'Oise have succeeded. and while Olivier-Lecq, ardent propagator of soybeans, distributed 100 kg to farmers in the north, the national Society of Acclimatization organized cultural trials all over France. Results were obtained in each of the regions, some with record yields. The general objection of the farmers was the difficulty found in using the soybean as a legume (it was too hard) or to find buyers.

As Paillieux said so well: "Our point of departure has not been happy one; the soybean has been presented simply as a new legume" (p. 10).

The German successes in soybean cultivation were studied by Wein in 1881 (p. 10).

In the 1880s there was a big growth of interest in vegetarian diets in Europe. Compare this with the USA (p. 11).

Li Yu-ying: After his 1905 speech, in 1908 he created a laboratory for studies, which soon founded the factory La Caseo-Sojaine at Vallees, near Colombes (Seine), administered by a French-Chinese company. This establishment made soyfoods using imported soybeans, especially tofu (p. 12).

Dr. Bloch of France recommended thin sheets of pressed tofu as a reserve ration for troops.

Lever Bros. soap works used lots of soy oil in Britain (p. 12).

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The British did some cultural trials in India, Burma, Siam (Thailand), and South Africa.

Japan, in effect, annexed Korea in 1895.

It was only after 1905 that soybean tests took place, first in Guyana, where the soybean matured easily.

Soybeans were grown for forage more in the South of USA than in the north. Continued. Address: France.

3558. Matagrin, Am. 1939. Le soja et les industries du soja: Le soja en Afrique et en Australie [Soya and soya industries: Soya in Africa and Australia (Document part)]. Paris: Gauthier-Villars. x + 390 p. See p. 57-58. 18 cm. [Fre]

• ***Summary:*** There are no indigenous soybean varieties in Africa, but soybeans were introduced by the English to the Cape [South Africa]; then to the Orange Free Province, Rhodesia, and Transvaal, and also to Nigeria, the Gold Coast [later Ghana], and Côte d'Ivoire. Likewise, they were introduced by the French to Dahomey [later Benin] and Togo. Today soybeans seem to offer good promise everywhere, but production has been developed only in southern Africa. In northern Africa, earlier trials, which were rather indecisive due to the lack of selection and lack of human experience (except for those of Asian peoples), have been undertaken more seriously since 1918 in Algeria, then in Tunisia and then in Morocco; the coastal regions, where irrigation is unnecessary, seem more favorable.

Elsewhere, it is important to get early maturing varieties in order to avoid dehiscence of the pods under the influence of the summer heat. Note: Seedpods of some soybean varieties dehisce at maturity. That is, they split lengthwise along the natural line of the pod and discharge the contents of the pod–the soybean seeds.

The sandy and rocky soils, which are sometimes well tolerated by soybeans grown in the USA (North Carolina, etc.), are poorly suited in Algeria.

Following the advice of Mr. Rouest, we could try planting the seeds in two rows (20 to 25 cm apart), leaving between the two rows a space of about 1 meter of fallow (unplanted) land. In Tunisia, the climate and the vast territory offer advantages to many soybean varieties, and the trials which began in the 19th century, have now reached a certain amplitude / developed prosperously.

Note: Haberlandt (1878, p. 6) states that he obtained one green-seeded soybean from Tunis [later renamed Tunisia] in 1873 at the Vienna World Exposition (*Wiener Weltausstellung*).

In Morocco, where 35,000 to 50,000 tonnes per year of other beans (*d'autres fèves*) are produced, at least one-third of which is exported (including the bean of Safi, which reminds one of the horse bean or dry kidney bean {*féverole*} of Egypt), this crop succeeds in the regions that are rather cool zones or that allow irrigation. This crop could enrich the soils with nitrogen in the valley of Sebou and the area around Fez, the small market-garden valleys of Mogador, perhaps even on the plains or plateaus of the Chaouïa and of the Doukala [Doukkala; the latter two places are now both in Morocco].

As for Egypt, it has already been worked over by the English propaganda, and soy has spread in the valley of the Nile, beside the horse-beans (*féveroles*) which have an ancient reputation.

In Australia this Asian legume is finally being cultivated successfully. It began at the start of the 20th century in the southeast, and today it grows all along the eastern coast (Queensland, New South Wales, Victoria). From there it somehow spread a bit to Tasmania and toward Adelaide, and above all to New Zealand, where it was welcomed. It does not seem that British New Guinea [later renamed Papua New Guinea] contributed its transmission, although the Dutch region of this large insular territory [Dutch New Guinea, later named Irian Jaya = Irian Barat or West New Guinea] did adopt the soybean, either from Mindanao (Philippines) or from Java [Indonesia].

Tables show: (1) Production and utilization of soybeans in the USA in 1934 and 1935, by states (in 100 metric tons) (p. 18-19). (2) Quantity and value of soybeans, soybean cake, and soybean oil imported into the USA from 1909 to 1928 (p. 26). (3) Importation of soybeans and soy oil into Great Britain (from 1913), Germany (from 1922), Netherlands (from 1913), Denmark (from 1913), and Sweden (from 1930) (all in Europe) in 1913, 1922, 1925, 1930, 1933, 1934, and 1935 (p. 41). (7A) Production of soybeans in China, Manchuria, Korea, and Japan (all in East Asia) in 1928 and 1935 (p. 51). (7B) Soybean trade among countries in Asia in 1909-13, 1922-23, 1924-25 incl. China and Manchuria, Japan, Korea, Dutch Indies, Java and Madura, Formosa, British and French possessions (p. 51).

Note 1. This is the earliest document seen (Aug. 2009) concerning soybeans in Dahomey (later Benin), Côte d'Ivoire (Ivory Coast), or Togo, or the cultivation of soybeans in Dahomey, Côte d'Ivoire, or Togo. This document contains the earliest date seen for soybeans in Dahomey, Côte d'Ivoire, or Togo, or the cultivation of soybeans in Dahomey, Côte d'Ivoire, or Togo (1939; one of two documents for Côte d'Ivoire). The source of these soybeans is unknown. Unfortunately, the author gives no documentation for this early cultivation of soybeans in Dahomey, Côte d'Ivoire, and Togo.

Note 2. Matagrin says (without citing any source) that soybean trials were conducted in Tunisia (a protectorate of France from May 1881 to 1956) in the 19th century. If that were true, this document would contain the earliest date seen for the cultivation of soybeans in Tunisia. In 1869, Tunisia declared itself bankrupt. An international commission, with representatives from France, the United Kingdom, and Italy took over its economy. In 1878 Friedrich Haberlandt wrote that he had obtained 20 varieties of soybeans at the Vienna World Exposition in 1873; at least one of these, he said,

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came from Tunis (Tunisia). How did soybeans get to Tunisia in order to be tested there? One possibility is that they were sent there from France by the Society for Acclimatization, which reported that it was conducting soybean trials in neighboring Algeria a few years before 1880. Address: France.

3559. Matagrin, Am. 1939. Le soja et les industries du soja: Produits alimentaires, huile de soja, lécithine végétale, caséine végétale [Soya and soya industries: Food products, soy oil, vegetable lecithin, and vegetable casein (Continued–Document part II]. Paris: Gauthier-Villars. x + 390 p. 18 cm. [300 ref. Fre]

• ***Summary:*** Continued. The agricultural experiment stations and the scientific labs have played an important role in the U.S., also the farm equipment manufacturers.

The experiment stations in many states have helped the farmers to clarify cultural questions which greatly influence yields, preparation of the soil, type and proportion of fertilizer use, dates and methods of planting, how many seeds per acre, choice of varieties according to the climate and soil, role of the soybean in mixed cultures and in crop rotation, etc.

In this book, Matagrin always says "fèves de soja."

1936 listing of soyfoods firms (p. 27): Fearn Soya Foods Co., Chicago, Illinois. Soybean Health Prods Co. Oakland, California (tofu). Soyex Co. Nutley, New Jersey. La Sierra Industries, Ontario, California (soymilk). American Lecithin Co., Atlanta, Georgia. Ten soy flour companies (p. 29).

American Lecithin Co. in 1936 was in Atlanta, Georgia. From when to when was it in Illinois?

Soy in France (p. 36): Prof. Beille of Bordeaux published a good work on soy but it is no longer available. Also the books of Prof. Jumelle of Marseille on colonial crops and vegetable oils. Prof. R. Lepine of Lyon in 1919 in *Revue Scientifique,* wrote about soy culture in Algeria and the preparation of soymilk.

Mr. Rouest perfected again the selections of yellow or green varieties that he had undertaken from 1907, with success. Using American seeds, others who experimented were Messrs. Brioux at Rouen, Carle of Carbonniere in le Tarn, and Semichon at Carcassonne; he likewise cultivated it at l'Aude from 1918. A list of 42 of Rouest's varieties (chosen from 2,000 others) were given in Rouest's book *Le Soja Francaise* showing that he was more qualified than anyone to write a book of this tile. He pursued his cultures and selections in France from 1921-30, in the Caucasus from 1930 to 1935, and thus fulfilled the efforts started by the Society for Acclimatization and its successors. He worked with another apostle, Henry de Guerpel, and agronomist and mayor of Percy-en-Auge (Calvados), who developed and perfected during 5 years the culture of the best varieties of soybeans in the regions surrounding his country house at Plainville, near Mézidon. He did not only collaborate on the book with Rouest, but also published interesting articles in several reviews in France and the colonies. Also Mr. Denaiffe of Carignan (Ardennes), author of the esteemed book *Les Haricots,* did important culture work and provided information.

Today production of soybeans in France is no more than several thousand hectoliters of beans = several 100,000 liters. For forage, the crop / culture has developed only in North Africa. It was encouraged by Rouest and de Guerpel.

Caseo Sojaine's products were excellent but expensive.

The products of Heudebert (probably diabetic products made with soyflour?), were well known in England as in France (p. 39).

Since 1913 the oil mills of Marseille, France, have started to use soy oil (mainly for hydrogenation) and those of the north (mainly for manufacture of soft soaps).

Recently the foundation (at Chateauroux) of a Society of Friends, Producers and Technicians of Soja has been announced by M. Druel.

In England the fine botanist J.L. North tested with success 13 Manchurian soybean seeds in 1913 and in the third harvest expanded these to 12,000 seeds, which he sent in 1917 to a farm at Uxbridge in Middlesex and to the Ogilvie Farm in Essex. There was a remarkable harvest in 1921, followed by good development of the enterprise. It advanced thanks to Piper and Morse's 1923 book *The Soybean* which to told of American successes. North succeeded in 1928 in getting 20-80 pods per stalk. In 1921 North's work drew the attention of the Ford establishment in Boreham which was not able to obtain good yields with American soybeans but succeeded with North's. Today England cultivates soybeans on about 15 hectares and yields are 1,400 to 2,500 liters per ha.

In England. Lever Bros. are big users of soy oil in soap. The main oil mills using soybeans are J. Bibby and Sons in Liverpool, three others in Hull, one in Erith and one refinery on the outskirts of London. Huge amounts of soy oil and meal are imported by a subsidiary of Lever Bros.

Germany: The recent agreement between Germany and Japan foreseeing an exchange of arms, explosives, etc. in exchange for soybeans which can furnish explosives (for nitroglycerine, naturally) is a barter / swap (of cannons for soybeans) analogous to that with Manchuria in 1934. What is certain is that the agents of I.G. Farbenindustrie A.G. under the patronage of the Economic Federation of Central Europe has been enforcing for 3 years soybeans culture in the Balkans which trade voluntarily with Germany.

Spain was rich in other oil sources (mainly olive oil). so not pay much attention to soy.

Italy: In 1918 a trial by Prof. Borzi, on a parcel of 2.5 acres at the Colonial Garden in Palerme / Palermo gave a yield of 20 liters/ha. In 1918-20 at the Institute Bonafous in Turin, a scientific research center, did research on yellow soybeans. Then trials were done in Liguria, Lombardia

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and Capo d'Istria, and Palerme about 1920s–a total of a dozen localities. Retaking in 1922 these tests of 1884 in Piedmont, Prof. Tito Poggi seeded 8 parcels in Monferrat, then helped to popularize soybeans in Italy. By the mid-1920s soy flour was widely used in baking. In March 1926 a "Bread for ammunition = pagnotto di munizione" containing 10% soy flour was heartily welcomed by the garrison in Rome. Already an official tasting by Mussolini (of the bread by him?) has been commented upon by the Italian press. The success of the campaign to promote use of wheat limited, after that, the outlets for soy in human foods, but the oil remained widely used by industry and the cake for production of milk.

Bulgaria and Rumania were influenced by the example of the Ukraine = Podolie?

The grandeur and decadence of soja in Russia: The book by L. Rouest, who was director of the Soy Laboratory in the North Caucasus from 1930 to 1935, brings together, but in a somewhat dispersed way, a very instructive documentation on soya in Russia. He described the grandeur and decadence. Soya was cultivated, it seems, since the victory of the Tcherkesses? (p. 48) and the incursions in east Turkestan, about 1860, then introduced into the Ukraine and Bessarabia, either from the Caucasus or from Hungary in the following years. Finally better known when the construction of the Transsiberian railroad connected (*conduisit*) Russia and Manchuria (1896-1900) But the soybean could not fail to interest the higher government officials. Before the universal success of the soybean after World War I, it was seen not only as an interior resource but also as an export crop. However in 1931, of the 5,970,000 ha in Russia used to grow oilseeds, less than 1,100 were used to grow soybeans versus 5.2 million used for sunflowers, 300,000 for castor oil, 140,000 for sesame, 30,000 for peanuts, and 350,000 for others such as rapeseed. But the industry began to demand soybeans. A large furniture factory in Oklanskaia made glues of vegetable proteins. The oil was studied for use in soaps and paints. The famine which menaced the working population because the moujiks [muzhiks, mujiks], resisted the exploitation of the lands into collectives, was able to be prevented or delayed by the progress in the culture of soybeans. Also the 5-year plan foresaw the extension of this crop onto 3-5 million ha with harvests of at least 1,500 kg per ha. To guide the farmers and perfect management techniques, specialists were recruited and concessions were granted to Germany in diverse regions. For how would the USSR itself have harvested the 1935 crop of about one million quintals = 100,000 MT. The number is enormous by comparison with the rest of Europe. (Did the Soviets see themselves as pioneers of a revolutionary new crop?)

Here, according to the agronomist Rouest, are the causes of the Russian setback. 1. Negligence and ignorance of the Russian peasant. 2. Disadvantages of the communist regime, 3. The general ideological method, always little reconcilable with the needs of the changes and hazards of agriculture (e.g., research to find varieties permitting the use of large harvesters). 4. Poorly chosen cultural methods. 5. Use of most of the harvest for food. The best literature concerns the moujik [muzhik, mujik] peasants, and one long study of 1911, of which we have a copy, written by a Russian doctor,... Sowed in the black earth of the Caucasus and the Ukraine, these soybeans, said Rouest, evidently saved the lives of thousands of people... We have been told that the Russians are disgusted at the compulsory use of soybeans, result of unskilled cooks...? Address: France.

3560. Matagrin, Am. 1939. Le soja et les industries du soja: Produits alimentaires, huile de soja, lécithine végétale, caséine végétale [Soya and soya industries: Food products, soy oil, vegetable lecithin, and vegetable casein (Continued–Document part III]. Paris: Gauthier-Villars. x + 390 p. 18 cm. [300 ref. Fre]

• ***Summary:*** Continued. Japan: The great oil mills of Kobe. In Japan, for cooking, sesame oil is preferred and for illumination rapeseed oil.

French Indochina: From 1931. It is estimated Tonkin cultivated about 12,000 ha of soybeans and harvested an average of 7,500 metric tons per year. The low yield of only 625 kg/ha, compared with a world average of 1,000, is explained by the fact that soybeans are generally cultivated with corn in a 1:1 mixture. Some soybeans are exported to Hong Kong. Since 1933 Paul Braemer, chief of agricultural services in Hong Kong, is exerting himself to propagate more this nutritious plant. Up till now the strong flavor of the soy protein deters colonials from using soy for food and soymilk. Made experimentally at the Maurice Museum, these have not attained but a relative success in the European colony. However the natives use many products. The village of Cu-da / Cuda 10 km from Hadong [in today's Vietnam] specializes in a type of soy sauce which cannot be made except from April to July, and which must be kept in sealed containers.

English and Dutch Indies: Today Prof. D. Kanga of Gujerat College of Ahmedabad, recommends warmly this economical and fortifying food. Soy is now used increasingly in industrial dining rooms and universities (he lists names). It is likely that India will acclimatize varieties rich in oil, develop extraction mills in its centers of industry, and deliver a large tonnage to the English soap makers.

Soybeans, propagated by the Russians, have long been grown on the plains of Turkestan [today's Afghanistan] and tests have been done in Persia [today's Iran] and the Soviet and Chinese republics of Central Asia northeast of there.

Soy in Africa: The French tried growing soybeans successfully in Dahomey and Togo. In North Africa trials have been taken more seriously since 1918 in Algeria, then in Tunisia and Morocco. In Tunisia, the tests which began in the late 19th century, are now growing. In Morocco lots of

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other beans are grown.

Australia is finally cultivating soybeans since the start of the century in the southeast, and today on all the east coast (Queensland, New South Wales and Victoria).

Soybean etymology: Low Countries = Sojaboon. Russia = Soia. Italy = Soia or (better) soja.

At the start of this century, when the German industry launched "Nitragine," a liquid culture of nitrogen fixing bacteria, there was much interest. The American practice, founded on the research of Norman Shaw (1910) and on the experience at the agricultural experiment stations at Michigan (1905), Wisconsin (1907, 1922). etc. consists of inoculating new soil with soil from former soybean fields.

Matagrin has a lengthy and excellent review of soybean agronomy. Also one of the best bibliographies; the most extensive of any European book to date on all aspects of soybeans and soyfoods.

The USA and the USSR were the first two countries to mechanize soybean planting and harvesting.

On the diseases and enemies of the soybean (p. 108): Earliest citation is 1919 from J. of Agricultural Research, and from the Nebraska Agricultural Experiment Station. Third is Wolf and Lehman 1920.

Most of the early studies on soybean diseases and enemies are analyzed in Morse (1927) "Soy Beans: Culture and Varieties." In the same publication is found a summary of U.S. work on insect enemies of soybeans established by H.R. Walton, Bureau of Etymology, Washington, DC.

The early research on the chemical composition of the soybean plant was to determine its value as forage. The key work in France was done by Lechartier and Joulie. The latter also studied the composition of the soybeans from Etampes, as did Giljaranski. and H.L. North.

The structure of the soybean cells was studied in France by Colin and Blondel (1888).

Matagrin has a strong historical dimension running through every chapter.

The median oil content from Asian soybeans is not more than 17%, while that of American soybeans attains 19%.

In about 1920, West and Levene developed the chemical formula and structure for animal lecithin.

The importance of soybeans as a protein source was not pointed out by researchers for 69 years, i.e., until the 1880s, and was not considered from an economic point of view until the World War I put into relief the problems of feeding populations and armies. Then interest and patents multiplied. For example, in 1910 the processes of S. Satow of Sendai, Japan for the precipitation of soymilk by a ferment or by sulfuric acid.

Most legumes contain only 1.6 to 2.9% oil, with the exception of peanuts which contain 45%. Soy contains 20%.

Concerning soy lecithin, From 1870 to 1910 W. Koch (1902), Fraenkel, (p. 152) not only verified the initial conclusions of Thudichum about this agent of nutritional assimilation. Koch showed in 1902 that this phosphatide was important.

At the start of the 20th century, soy pap was prescribed with success for diabetics in the hospitals of Algeria, as in Japan and Austria.

Page 158: Number of calories costing 15 centimes in 1938. Li Yu-ying had a similar chart but he omitted potatoes.

Potatoes: 80 grams give 224 calories

Soybeans: 40 grams give 188 calories

Rice: 50 grams give 180 calories

Bread: 45 grams give 145

Followed by 16 other foods.

Etymology: Matagrin (p. 160-61) says "fève de soja" and "soja à l'etat vert" (for green vegetable soybeans).

Miss Ellen Kingsley (p. 161) of the U.S. Bureau of Home Economics published many recipes using whole dry soybeans.

Durand (no citation) discussed cooking whole soybeans in water with sodium bicarbonate. This well-known process for all legumes leaves an unpleasant taste. So he recommended pressure cooking. Then he gives recipes for whole dry soybeans.

At whole dry soybeans, there is considerable discussion of their use in vegetarian diets. Was Matagrin a vegetarian?

Etymology: Matagrin (p. 166) says "la farine des fèves grilles" for roasted soy flour.

At the Iowa College of Agriculture, Nelson made a soynut butter as follows: Deep-fry soybeans in oil at 100-110ºC for about 5 minutes. Grind the soybeans finely. Then grill at 160ºF for about 20 minutes. Finally mixing these with some of the deep-frying oil.

Soy coffee is cafe without caffeine. Matagrin uses lots of information from Li Yu-ying; likewise information from Li appeared in countless later articles. Li was one of the two original sources; Paillieux was the second.

Is soymilk presently consumed more widely that animal milks in China? Not in Japan.

Carles (note spelling) was not a Frenchman who did work on soymilk.

Soymilk (p. 172): According to an article by Prof. R. Lepine of Lyon (1919), concerning a communication of Mlle. Castet of the Society of Horticulture of Alger (Algiers).

Rouest was director *du Laboratoire du Soja* in Russia's North Caucasus.

Castagnol (soymilk) in Bulletin of Indochina, uses a centrifuge.

Soymilk patents from France. G.D. Thevenot (1920-25), A. Serault (1931), M. Adler (1933).

Arao Itano (1918). Made soymilk from soy flour with *Bacillus* inoculum. So it was fermented soymilk developed by a Japanese.

Etymology: *Fèves de soja entieres* = whole soybeans.

Li Yu-ying used cold extraction of soymilk, Chinese style.

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Matagrin has an excellent review of all the various ways of making soymilk.

Muggia and Gasca (1921) made soymilk with a bland flavor in Italy.

1933 process for making soymilk in Russia by Bogatskij, Storozhuk and Morumtzev.

In raising animals, soymilk renders a great service. It is very wildly used now in USA and in Asia. but its use is limited by that fact that it is more economical to feed the animals the bean itself or the cake.

Adding lecithin to soymilk gives it a light flavor of butter.

Etymology: Matagrin unfortunately calls yuba *Crème de lait de soja* (Phu-chuc of Indochina) [dried yuba sticks]. According to an analysis by a pharmacist, Monnier, of the Pasteur Institute of Hanoi, it contains 64.62% oils, 8.98% Nitrogen. It is often prepared with fish bladders or minced meat.

Just. Hatmaker (p. 190) made powdered soymilk, as did three other processes, including a spray process of Bevenot and Neveu. This process was also widely used in English soap factories. Matagrin gives 3 analyses of powdered soymilk, the earliest from Li Yu-ying.

Pages 192-93: Discusses soy yogurt (*Yoghourt au lait de soja*), soy kefir (*Kéfir au lait de soja*), and soy koumis / koumiss (*koumys*).

Matagrin gives detailed descriptions of many methods of making tofu and 9 pages of information (p. 194-202)

Bloch said the best coagulant is magnesium chloride. Beltzer preferred acids to calcium salts.

Ellen J. Kingsley (1935) of the USDA gives a method for making tofu.

Drs. Labbé (Labbe) and Marchoisne have shown that vegetable albumines, despite current opinion, are very assimilable.

Matagrin gives a number of nice tofu recipes including French-style tofu in Petits-fours (fancy biscuits; p. 201) and Tofu meringue. Address: France.

3561. Matagrin, Am. 1939. Le soja et les industries du soja: Produits alimentaires, huile de soja, lécithine végétale, caséine végétale [Soya and soya industries: Food products, soy oil, vegetable lecithin, and vegetable casein (Continued–Document part IV]. Paris: Gauthier-Villars. x + 390 p. 18 cm. [300 ref. Fre]

• ***Summary:*** Continued. Etymology: For "okara" Matagrin says *Pulpe residuaire de la preparation du lait de soja.*

Dr. Bloch showed okara contained 88.75% water. Beltzer gave a microscopic analysis. Mlle. Castet, in tests with okara in 1918 in Algiers, added sugar and cooked for at least one hour to get something like an almond paste, which she used in patisserie. Also in 1918 Holmes of the USA used dried okara in biscuits. Since then many recipes have appeared in America. Souffle, Salad with apples, Sandwich filling, etc.

Koenig did two analyses of miso, not stated when.

Matagrin gave many detailed descriptions of process for making various soyfoods by various authors in many countries.

Chinese Yeast, Kiu-tsee. This product, described by Daby de Thiersant, according to the practice in Kwantung.

Lots on soy flour; processes and recipes.

Berczeller carried on the work of Haberlandt in Central Europe. But did Berczeller know of Haberlandt?

Lecerf made bread entirely from soy flour and Bourdin, of Reims, made "soy gluten" bread rich in carbohydrates. Heudebert made dietetic products from soy flour. Breads for diabetics were made by Menudier (1890), Bloch, Labbe, Dujardin-Beaumetz, Martinet, Cazalis, Le Goff, etc.

By 1930 solvent extractors were processing 1,000 tonnes/day. The great oil mills of Hamburg-Harburg were processing up to 1,200 tons per 24 hours. A system consumes 5.5 tonnes of steam and 30 kwh of power per ton of soybeans.

At the Ford Motor Co., the Flumerfelt continuous extractor, inspired clearly by that of Ford (the former = U.S. Patent 1,920,499 of 1 Aug. 1933.) with a screw in a tube. For the Ford system it required only 1 man to process 1,800 kg in 8 hours. Remarkable! The Ford extractor is very economical and all manual. Ford hopes it can be sold for about $3,000.

Soy oil as food: In Haberlandt, C. Berndt submitted to pressure Chinese soybeans, which he had obtained from Japan and which also served as the first European analysis of soybean samples, due to Steuf. Without ignoring the eventual industrial interest, in this oil, Berndt was interested in food uses. He said: "And I have also found a large proportion of oil in the cake, the pressing having been insufficient. I had a fried food / fritter (*friture*) prepared with the oil and found not the least after taste." Better to translate directly from German. The experiment was not decisive. Nutritive properties of soy oil: Some (Dr. Petit among others) say soy oil is purgative. Kaempfer noted well in 1690 the medicinal use of black, dwarf? soybeans as an antiasthmatic powder. At Nutrition: Dr. Bloch showed that consumption of 100 gm of this oil causes no laxative effect. but rather a mechanical effect that lubricates the intestines.

The abundance of olive oil in France has led to limited adoption of soy oil.

As cottonseed declined, soy oil gradually replaced it. Is the decline of cotton related to synthetic fabrics or only to the boll weevil?

Soy oil is most widely used in soaps in the USA and USSR where cotton oil use is dropping and imports of palm oil and coconut oil are large; they do not use soy oil alone. Is it usually or often hydrogenated?

Tests on destructive distillation of soy oil started in Japan. In 1920-21 S. Satow formed a calcium soap with soy oil and submitted it to the usual procedure for cracking,

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obtained below 150ºC various fractions' 20% light oil; 150-300ºC 60% kerosene type oil; 300-330ºC heavy petrole fraction.

Artificial rubber: In about 1915 Grosse and Sauer in Germany developed a process for making artificial rubber from soy oil. In 1921 a Canadian process was developed (W.G. Wright, British patent 142,416).

Various processes for making plastics with soy flour. In 1920 Hager in Portland, Oregon, developed and patented (British patent No. 140,781) a process for making a charge, for bandages, and rubber from soy flour.

The Ford Motor Co. uses annually in making its cars 2,500 kiloliters of soy oil (of which about 1,625 kl for paint and enamel and the rest for foundry cores) and will also absorb 2,180 metric tons of soybean meal (defatted), 3/4 of which for window pane frames–as of Jan 1937. Only at the River Rouge plant in Dearborn, Michigan.

In Japan in 1938 many of the big companies such as Nippon Denko Kaisha, Allied Showa Industry, Japan Oil and Fats, Hohnen Oil, and Bean Chemical Industry, are starting to make soy casein (*caseine de soja;* p. 336.8).

Li Yu-ying who, at least, would point out "Sojalithe," soy glue, the fabrication of isolates (*isolants*) as applications of vegetable protein (p. 337). Preparation of vegetable casein (etymology). Beltzer wrote voluminously on this subject. So he may have preceded Li Yu-ying.

Page 342: Process of H. Beaufour, 1929 French patent for ultrafiltration for separation in colloidal solution, but no mention of soy.

Lots being done by 1939 with isolates for industrial use. Long chapter on it and many patents. Much of the information is from Beltzer's book *Les Industries de la caseine et du lactose.* Then we go on (p. 349). Utilization of *la caseine vegetale du soja.*

A. Food and Pharmaceutical uses. Curded products like tofu, long used in East Asia, are well suited for boulangerie and patisserie = for baking and making pastry. Their addition to flour creates no difficulties and gives a less special flavor than whole soy flour (*la farine entiere de soja*). Etymology. Who first used this. Li Yu-ying? `

It can be added to powdered foods such as milk, cocoa, or to food tablets. In the pharmaceutical industry, it serves also as an excipient (an inert substance that forms a vehicle, as for a drug). Presently several hundred tons a year are used in these two ways in Central Europe and the USSR.

B. Technical uses of vegetable casein (p. 350). In the US in 1936 consumption of vegetable casein approached 30,000 tonnes, nearly 2/3 going to paper making and to plywood glues. The rest going to paints or plastics. The future looks to be in plastics.

Manufacture and utilization of sojalithe: This as well as Galalith was invented by Spitteler (German Patent 127,942) when Trillat recognized in 1892 that formol hardened albumenoids. International Galalith of Harburg and Gennevilliers only perfected the demineralization of casein. From 1901 to the present, via many processes, mostly German and French, have perfected the initial method. Beltzer designed an entire factory, with floor plans and machinery for treating / processing 10 tonnes a day of soybean vegetable casein. It requires defatted soybean meal. Washed in cold water, coagulated with gypsum. Break curd into pieces and wash over cloth with cold water. The casein is then dissolved in, then reprecipitated with acetic acid. and run through a filter press. The vegetable protein, after swelling for 10-12 hr in hot water, can be pressed into tablets and made insoluble by formol gas, or mixed with an aqueous solution of 24-42% formaldehyde, then add phenol as in the Ford process.

Glues of vegetable protein: Add alkali to make it soluble. Paper glues. Glidden has a 1936 French patent.

Paints and coatings of casein. Water-based, or whitewash.

Soy cellulose for artificial silk.

Lots of research on plastics from soybean oil and meal done at Iowa State College. Dailey 1933. Enemark 1935. Forster 1935, Campbell 1926 (p. 365-66). Zenor and Tillson 1931; protein adhesives from soybean meal.

Serious explosions in the USA with soy oil extraction. In Chicago on 7 Oct. 1935, 11 workers were killed and 55 injured at the Glidden plant, while material damage was estimated at $600,000. Two months later an explosion of the same type in an extraction plant at Momence, Illinois, took four victims, killing 2!

Li Yu-ying was right in his vision for starting a soy processing industry in France at Caseo Sojaine. He threatened many commercial industries, arousing the hostility of the dairies.

This is a remarkable, fine, complete detailed book, covering on all aspects of soy. Address: France.

3562. Matsumoto, Kenji; Nonomura, Seiichi. 1939. Gyofun shiyô shôyu shiken [The use of fish meal for brewing shoyu (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15:A152. [1 ref. Jap]

• ***Summary:*** Abstracted from Jozo Shikensho Hokoku. No. 128. p. 297-308 (1939).

3563. Matsumoto, Kenji; Nonomura, Seiichi. 1939. Kenki-teki shôbô ôyô shôyu jôzô shiken [Application of anaerobic "shobo" to shoyu brewing (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15:A152. [1 ref. Jap]

• ***Summary:*** Abstracted from Jozo Shikensho Hokoku 128:309 (1939). Shobo is a mixture of lactic acid number G6 and a new shoyu yeast from Higeta.

3564. Matsumoto, Kenji; Nonomura, Seiichi. 1939. Awa

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oyobi hakumai senjôsui shiyô shôyu jôzô shiken [Use of millet and waste water gained in washing polished rice for brewing shoyu (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15:A152. [1 ref. Jap]
• ***Summary:*** Abstracted from Jozo Shikensho Hokoku. No. 128. p. 343-47 (1939).

3565. Nakae, Tadashi. 1939. Amino-san chômiryô seizô ni kansuru kenkyû. XIII. Tanpakushitsu genryô toshite no keshi abura kasu [Studies of preparation of amino acid seasoning. XIII. Poppy oil cake as raw material (Abstract)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 15:A21. [1 ref. Jap]
• ***Summary:*** Abstracted from *Jozogaku Zasshi* 17(9):14. Soybeans are mentioned briefly.

3566. Woodhead, Henry George Wandesforde. 1939. China year book. China: North China Daily News & Herald. xxiv + 663 p. Index. 22 cm.
• ***Summary:*** Li Yu-ying is mentioned on page 187 (left column): "Courtesy name: Shih-tseng. Born 1882; native of Kaoyang, Hopei. One of the Kuomintang's 'elder statesmen.' Studied in France and established first bean-curd [tofu] factory at Paris. 1928, chairman, Peiping branch, Kuomintang Central Political Council. Member, Kuomintang Central Supervisory Committee, since 1924. Director, Peiping Research Academy, since 1929."

Note: On pages xiii to xxiv is an interesting "Calendar for the year–January to December–of major events in Chinese and world history," arranged by day of the month rather than chronologically. For example: January (first month; 11th + 12th moon). 27th day. "Great opium burning at Shanghai 1919. Japan repudiated Central Government 1938." Address: C.B.E.

3567. Hennefrund, Helen E. comp. 1939? Bibliography on Japanese in American agriculture. Washington, DC. 122 p. Unpublished manuscript. Undated. 28 cm. [641 ref]*
• ***Summary:*** This document was written for the Japanese American Evacuation and Resettlement program. Address: USDA Bureau of Agricultural Economics.

3568. Mogi, Masatoshi. 1940. Miso jôzô ni kansuru kôbo no kenkyû (Zoku-hô). IV. Kôsatsu oyobi sôkatsu. (5). Kosatsu [Studies on the yeasts in miso fermentation. IV. Considerations and summary. (5). Considerations]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 16(1):7-17. Jan. [27 ref. Jap]
Address: Noda Shoyu K.K. Shikenjo: Brewing Laboratory, Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

3569. Takata, Ryôhei; Nakae, Tadashi; Shimano, Asao. 1940. Amino-san chômiryô seizô ni kansuru kenkyû. XVII. Tanpakushitsu genryô toshite no tô-rui, dasshi daizu oyobi 2-3 kasu-rui [Preparation of amino acid seasoning. XVII. Beans, defatted soybean cake, and 2-3 other cakes as nitrogenous raw materials]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 18(1):24-28. [1 ref. Jap]
Address: Osaka Teikoku Daigaku, Kôgaku-bu, Jôzôgaku Kyôshitsu, Takada Kenkyûshitsu, Osaka, Japan.

3570. Webber, P.A. 1940. Are soy beans a good food? *Madison Health Messenger* (*Madison, Tennessee*) 2(3A):1, 4. Undated.
• ***Summary:*** "There is probably no legume which has been more universally used, and justly so, than the soy bean. In the earliest Oriental records that go back to the beginning of the Historical Period its use is frequently mentioned. Today after thousands of years, in hundreds of recipes, it is finding its way into the daily dietary of upwards of half the population of The world.

"Only within the last few years has this interesting food received any emphasis in the Occident, but now it is at last receiving at least a part of the attention that it so much deserves. Methods for its use are daily being perfected and presented to the people of Europe and America. United States government agencies and State Experiment stations are spending much time and money to bring this unique legume and its use to the attention of the people of the United States.

"Considerable research with experimental animals and humans has shown beyond a doubt its high value as a food. Its impressive chemical analysis 20% fat, 40% protein, 5% minerals, with its cheapness makes it one of the most economical and best sources of fat, protein, and mineral elements that can be found in any food. Combined daily in its various forms in the diet with plentiful supplies of vegetables, fruits, and grains, it contributes to a well-balanced ration providing adequate protein, fat, carbohydrate, minerals, and vitamins.

"Despite the above mentioned facts proven by many thousands of years of human experience and corroborated by the experimental evidence of scores of research laboratories, recently most adverse but unfortunate criticism has been published concerning the soy bean, attempting to lead the public to an unfavorable attitude toward this most useful food by cleverly covering the facts.

"Even the warmest enthusiast for this food would hardly think of it in terms of supplying all the needs of the human dietary. An All-Wise Providence has provided a great variety of foods, and nature indicates a generous and liberal intake from this bountiful supply. Far be it from those who know the nutritional values of the soy bean best, and are most vocal in its praise to divert attention in any way from any other worth-while food.

"We have been cited to the use of soy beans when fed to test animals, producing high blood pressure, indigestible

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wastes in the intestines, and albumin and casts appearing in the urine, showing kidney degeneration. It is unfortunate that along with this statement covering soy beans, it was not told the reader that excessive protein of whatever source in the diet, animal or vegetable in origin, will produce like results. This has been proven conclusively by Dr. Newburg of the University of Michigan Hospital and others. It would seem fair, to say the least, that the quantity of protein fed to these test animals would have been reported also, that the reader may know that the experiment was conducted to show what an 'excess' of soy bean protein would produce. In apprehension of this unscientific attempt calculated to mislead the reader, your attention is called to the word 'excess' which is the key to the whole situation. When too many soy beans are used over a long period of time these conditions may develop. This is true also of any of the rich protein foods such as meat, eggs, cheese, etc. Here as in other things the rule of moderation can be well taken. As yet soy beans are not being used extensively enough in the United States to be considered a cause for the alarming growth of high blood pressure, kidney degeneration, etc., so it is hardly fair to lay the blame of these prevalent conditions in Americans today on the humble soy bean. It is plain to even the unscientific mind that these conditions are being brought on, at least to some extent, by the excessive use of other high protein foods and habits that bring about general health degeneration.

"A clear statement of truth on this subject instead of a half truth would have given the reader the proper impression; but half truths seem to be in vogue today; nevertheless such methods of deception are most reprehensible, and call forth a statement of the whole truth as recognized scientists report it. In spite of what has been written to the contrary, briefly the following facts still remain:

"1. The soy bean has been used successfully for thousands of years in the dietary of hundreds of millions of human beings.

"2. It is a high protein food and along with other high protein foods should be eaten in moderation.

"3. It is one of the cheapest and best sources of complete protein, fat, minerals, and vitamin B-1.

"4. Its proper use is being encouraged by Federal and State Agencies.

"5. Scientific, experimental and clinical evidence show that when eaten in proper combination with other foods it provides a most valuable adjunct to the diet.

"6. Scientifically trained dietitians and other medical experts are increasing their use of the soy bean in diet therapy. For twenty-five years the famous Battle Creek Sanitarium has been serving soy bean foods in many ways.

"7. Many manufacturers of soy bean foods are properly representing their foods to the public and are producing fine tasty foods.

"8. The public need not 'beware' of soy beans any more than they would beware of an excess of any other kind of protein food provided for our nourishment.

"In conclusion I wish to assure the reader that my acquaintance with soy beans covers many years, sixteen of which were spent in the Orient where I had a first-hand opportunity to observe soy beans as they were used in the diets of hundreds of millions of people and certainly if soy beans were such a dangerous food there would be little of the population of China and Japan left, considering that they have been using soy beans for thousands of years; however, instead today they are growing in numbers faster than Americans. I have been using soy bean foods for nearly twenty-five years and none of the symptoms which were so misleadingly presented to the reader are present in my body.

"The reader's attention is cited [called] to thousands of pages of scientific literature found in any large public or other library, in corroboration of the above stated facts."

Note: two different issues of this periodical are shown to be Volume 2, No. 3. the earlier of these two, which we have decided to call 2(3A) was published after Sept. 1939 (see last page) and before 15 Feb. 1940. We have estimated the publication date to be Jan. 1940. the second of these two, which we have decided to call 2(3B) was published after March 1940 (see 1st page). We have estimated the publication date to be April. 1940–3 months later. Address: PhD, Head of Chemistry Dep., Madison College.

3571. Ozouf, René. 1940. Le soja [The soybean]. *Journal des Instituteurs et des Institutrices* (*France*) 86(12):47. March 2. [2 ref. Fre]*

• ***Summary:*** This article appears in the section of this issue titled "Partie Scolaire," in the subsection titled "Pour les Grandes et les Adultes." Contents: Introduction. Its cultivation (one of the oldest cultivated plants in the world, widely cultivated for ages in East Asia (especially Manchuria)), it is an annual, which prefers temperate climates, there are more than 1,200 varieties, cultivated in the Corn Belt of the USA, and in Korea, Japan, Java, the USSR, Romania, Hungary, Bulgaria, Yugoslavia, and France (but yields here are low).

Its utilization: The bacteria in the nodules on its roots are a source of nitrogen fertilizer. It can be used as a green forage crop, like lucern / alfalfa. If this is dried, it can be made into hay or silage. Pigs can be raised on soybean pasture in the open air. It is much appreciated as a green manure. Because the seeds are rich in nitrogen, protein and oil, it is utilized in the form of beans or of oilseed presscake for the feeding of all farm animals. It also has many uses as an industrial product. Above al, it is used as a source of oil and cake / meal.

The modern soybean utilization industry is most highly developed in Manchuria, where the principal centers are (in order of importance) Dairen, Harbin, Antung and Yingkou (W.-G. Ying-k'ou; formerly Newchwang or Niuchwang);

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in China, above all in Nanking and Shanghai; in Korea at Konan (in today's North Korea) and in the ports of Seishin (Ch'ongjin, Chongjin, in today's North Korea), and Rashin; in Japan at Kobe-Osaka and Tokyo-Yokohama; in Siberia, in the Russian Far East at Khabarovsk and Vladivostok.

In Europe, Germany is in first place in the various soy industries, and especially of oil, lecithin, and cakes. Hamburg and its surroundings are the leading center, followed by Bremen, Stettin [Szczecin, in Poland as of Jan. 2011], Berlin, etc. In the years immediately preceding the war of 1939, the Reich imported 40-50% of the soybeans produced in Manchuria. Hull is the principal soybean crushing center in England. Throughout Scandinavia the soybean is transformed into cake and margarine, as well as in the Netherlands and in Belgium. In France, two factories that make oil and lecithin are in operation near Arras and Lille.

In the United States soybean processing industries are developed everywhere, particularly in Chicago [Illinois] and Milwaukee [Wisconsin] and in the towns of Illinois and New York. Ford automobile factories use soybeans to make plastic accessories.

Soybean trade and commerce.

3572. Kajita, Toshiji; Inoue, Ryohei. Assignors to Showa Sangyo K.K., Yokohama, Japan. 1940. Process for manufacturing artificial fiber from protein contained in soya bean. *U.S. Patent* 2,192,194. March 5. 2 p. Application filed 8 Sept. 1937.
• ***Summary:*** "The invention relates to a process of manufacturing artificial fiber form protein contained in soya bean and consists in extracting the protein, with dilute alkaline solution, from the residue of the soya bean after the oil content has been extracted. The protein is then precipitated by adding acids or metallic salts thereof to said solution. The precipitate is washed with water, allowing a suitable amount of water to remain with the precipitate. Lecithin is added thereto and then the mixture is dissolved in alkaline solution. The resulting solution is then allowed to mature after which the solution thus obtained is spun into an acid bath which may contain suitable organic coagulation agents. The object of this invention is to obtain a fiber of remarkably increased tensile strength and to employ the lecithin as stabilizer."

Note 1. This process is very similar to that patented later by Robert Boyer, William Atkinson, and Charles Robinette, and assigned to the Ford Motor Company. The Boyer patent (U.S. Patent 2,377,854) was applied for on 7 June 1941, and issued on 12 June 1945. Address: Tokyo, Japan.

3573. Kress, Otto; Johnson, Charles E. Assignors to The Institute of Paper Chemistry (Appleton, Wisconsin). 1940. Proteinized hosiery. *U.S. Patent* 2,192,919. March 12. 4 p. Application filed 23 Dec. 1937.
• ***Summary:*** Uses soybean protein and wax. Includes silk stockings. Address: Appleton, Wisconsin.

3574. Potter, R.D. 1940. A synthetic fiber from soya beans. *Science* (*Supplement*) 91(2359):13. March 15. [1 ref]
• ***Summary:*** The process is described in a new patent, No. 2,192,194, granted by the U.S. Patent Office, to Toshiji Kajita and Ryohei Inoue, of Tokyo. The claims of a silk fiber are novel.

3575. Kajita, Toshiji; Inoue, Ryohei; Yamanouchi, Akira. Assignors to Showa Sangyo Kabushiki Kaisha (Tsurumi-ku, Yokohama, Japan). 1940. Process for producing proteic coating or film upon fiber, textile, or the like. *U.S. Patent* 2,193,818. March 19. 1 p. Application filed 8 Sept. 1937.
• ***Summary:*** Uses soybean protein and tartaric acid. Address: Tokyo, Japan.

3576. *Science News Letter.* 1940. Japanese make synthetic fiber from soya bean. Yarns finished to resemble either silk or wool; Lecithin used to prevent premature hardening. 37:191. March 23.
• ***Summary:*** Article by R.D. Potter in Science (supp.) March 15. p. 13.

3577. Kajita, Toshiji; Inoue, Ryohei. Assignors to Showa Sangyo K.K. (Yokohama, Japan). 1940. Process for manufacturing artificial fiber from protein contained in soybean. *U.S. Patent* 2,198,538. April 23. 2 p. Application filed 8 Sept. 1937. In Japan, 25 May 1937.
• ***Summary:*** Extract soybean casein from soybean material with dilute alkali, precipitate with acid, add sugar while the precipitate is wet, then dissolve in alkali to produce a spinning solution. Address: Tokyo, Japan.

3578. Okano, Koji; Beppu, Iwao. 1940. Daizu shikiso no kenkyû. II. San shu no furabon-kei shikiso ni tsuite. (Fu) Resen ni tsuite [Coloring matter of soybeans. II. Three kinds of flavones and resene]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 16(5):369-72. May. English reference in Bulletin of the Agricultural Chemical Society of Japan 16(5):83, bound at the front of Nippon Nogei Kagaku Kaishi. [1 ref. Jap; eng]
• ***Summary:*** Describes solvent extraction using ethyl alcohol. Address: Central Laboratory, South Manchuria Railway Co.

3579. Mogi, Masatoshi. 1940. Miso jôzô ni kansuru kôbo no kenkyû (hoi). I. Keitaigaku-teki seishitsu [Studies on the yeasts in miso fermentation (addenda). I. Morphological characteristics]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 18(6):543-54. June. [Jap]
Address: Noda Shoyu K.K. Shikenjo (Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan).

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3580. *Modern Plastics.* 1940. U.S. plastics patents: Protein fiber. 17(11):63-64. July.
• ***Summary:*** See U.S. Patent No. 2,198,538, issued to T. Kajita and R. Inoue on 23 April 1940. Address: Tokyo, Japan.

3581. Burlison, W.L. 1940. Importance of soybeans to American agriculture (With some notes on soybean research). *Proceedings of the American Soybean Association* p. 27-35. 20th annual meeting. Held 18-20 Aug. at Dearborn, Michigan.
• ***Summary:*** Contents: List of 11 things that the future of the soybean as an important Illinois crop is dependent upon–according to G.L. Jordan, Dep. of Agricultural Economics, Univ. of Illinois. Where do we go from here in soybean production? Table 1–Annual production of soybeans in five leading countries from 1925-1939: USA, Manchuria, Chosen [Korea], Japan, Netherland India. Table 2–World production of soybeans in 1,000 bushels (excluding China) from 1925-1939, including percentage increase each year over 1925. These figures include, in addition to the countries shown in Table 1, Kwantung, Taiwan, USSR, Rumania, Bulgaria, Yugoslavia, and certain other small countries in Europe. U.S. soybean production as a percentage of world production. Why this rapid increase in U.S. soybean production? Rapid increase in U.S. soybean production during the past 6 years. Research leads the way: List of typical research projects at larger corn belt agricultural experiment stations.

Extracts from letters on the future of soybeans in Illinois from thoughtful observers: H.G. Atwood, Allied Mills, Inc., 26 Dec. 1939. G.G. McIlroy, President, American Soybean Association, 7 Dec. 1939. W.J. O'Brien, The Glidden Co., 8 Dec. 1939. N.P. Noble, Swift and Company Soybean Mill, 8 Dec. 1939 (Swift has now built soybean mills at Cairo, Illinois; Des Moines, Iowa; and Fostoria, Ohio. Swift is using larger quantities of soybean oil in their various products). Edward J. Dies, National Soybean Processors Assn., 14 Dec. 1939. D.F. Christy, Acting Director, USDA Office of Foreign Agricultural Relations, 17 Feb. 1940. E.F. Johnson, Ralston-Purina Company, 21 Dec. 1939. H.P. Rusk, Dean and Director, Illinois Experiment Station, 22 May 1940. J.W. Hayward, Archer-Daniels-Midland Company, 24 May 1940.

Growth in the number of soybean crushing mills in the USA from about 10 in 1925 to approximately 75 in 1939. Increase in soybean yields in Illinois from 13.5 bushels/acre in 1925 to 24.5 bushels/acre in 1939. Growing industrial utilization of soybeans. Conclusion: "The importance of soybeans to American agriculture is bound to be of greater significance as the years go by."

Concerning research: "Our research program on soybeans in this country is nothing less than remarkable. In 1937 a list of soybean projects was published by H.M. Steece, Specialist in Agronomy, Office of Experiment Stations, U.S. Department of Agriculture." In 1937 some 53 agricultural experiment stations were conducting 258 separate investigations on soybeans. "By far the largest number of these have to do with the varieties and methods of production." A photo (p. 29) shows a tractor pulling a combine harvesting soybeans in Indiana.

Note: This is the earliest English-language document seen (March 2003) that uses the term "soybean research" (see subtitle) to refer to research on soybean production. Address: Head, Dep. of Agronomy, Univ. of Illinois.

3582. D.P. 1940. Le soja. Note complémentaire sur son utilisation dans l'industrie des fibres artificielles [The soybean: A note on its use in the artificial fiber industry]. *Revue Internationale des Produits Coloniaux et du Materiel Colonial* 15(173-76):105-06. May/Aug. [1 ref. Fre]
• ***Summary:*** Soybeans can be used to make cellulose and rayon. R. Inouye in Japan has patented a process.

3583. Morse, W.J. 1940. Soybeans around the world. *Proceedings of the American Soybean Association* p. 72-74. 20th annual meeting. Held 18-20 Aug. at Dearborn, Michigan.
• ***Summary:*** The areas where soybean production has recently increased are the East Indies, Rumania, Austria, Bulgaria, Czechoslovakia, and Yugoslavia. "Soybean production in the Danube Basin in 1939 amounted to approximately 5 million bushels. The acreage in Bulgaria, Hungary, Rumania, and Yugoslavia increased more than 60% in 1940, this being attributed to the activities of two German companies which distributed selected seed and inoculation culture, and contracted in advance for taking the entire production at increased prices. The Greek government planned extensive cultivation of soybeans in 1940, providing for importation of seed, requiring compulsory cultivation of the crop, and the purchase of the entire crop from farmers at remunerative prices."

The increase in production has been largely due to the development of adapted soybean types through introduction, selection, and hybridization. "Soybean breeding programs have been carried on extensively in Germany, Russia, Netherland Indies, Rumania, Japan, Manchuria, South Africa, Canada, and some of the Balkan countries, and to a lesser extent in Sweden, England, Holland, France, Italy, Poland, Australia, India, and the Philippines."

"The outbreak of hostilities in Europe and the resulting interference with the flow of Manchurian soybeans into European markets brought about a rather critical situation to the producers in that part of the Orient. Moreover, Manchurian authorities on November 1, 1939, set up a soybean monopoly whereby the government purchases all soybeans for sale, fixes the price, and makes all export sales... Soybean exports from Manchuria for the first 8 months of the 1939-40 marketing year amounted to

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approximately 24 million bushels as compared with 59 million bushels for the corresponding period last season. Exports to Europe during the 8 months of this season were estimated at about 4 million bushels as compared with actual exports of 32 million bushels for the same months in 1938-39. About one million bushels were exported this year to Germany via Trans-Siberian Railway, and over 2.5 million bushels to Europe by sea, a major portion of which went to Italy.

"With practical cessation of direct shipments to European countries, Japanese and Manchurian officials began concentrating on the development of new industrial outlets for soybeans. The process of making usable protein from soybean material as a substitute for imported milk casein has been widely studied by government and industrial agencies in Manchuria and Japan. At present the principal ways in which soybean protein is substituting for milk casein are as glue for wooden articles, furniture, veneer, plywood, etc., paper sizing, as the adhesive element in insecticides and water paints, and as material for artificial wool and plastics. In 1938 more than 22 million pounds of soybean glue were used. A few Japanese companies have industrialized the manufacture of protein on rather an extensive scale. In Japan only one firm is reported to be producing soybean plastics, and these are not entirely satisfactory. Soybean fiber, or casein fiber as it is known in Japanese trade circles, is manufactured exclusively by one concern which sells its products to a spinning firm for making into yarn and cloth. The present capacity of the factory is about 22,000 pounds per day although actual daily production is said to be only about 13,000 pounds. The fiber known as 'Silkool' has not yet been exported. The domestic prices range from 33 to 35 cents per pound.

"A sample of 'Soyalex' recently received from Japan was said to contain not less than 60% pure lecithin. This new soybean product may be used in making butter, chocolate, for dressing of leather, making of shoe polishes and toilet foods such as face creams and soaps, for cooking, making noodles and macaroni, and in the preparation of valuable chemicals."

A portrait photo shows W.J. Morse.

Note 1. This is the earliest document seen (Jan. 2000) concerning the cultivation of soybeans in Sweden.

Note 2. This is the earliest English-language document seen (Dec. 2004) that uses the term "soybean fiber" to refer to spun soy protein fiber used like a textile fiber. Address: USDA Bureau of Plant Industry, Washington, DC.

3584. A.C. 1940. La culture de la fève soja [Cultivation of the soybean]. *Croix* (*La*) (*Paris*). Sept. 7. p. 2, col. 2. [Fre]
• ***Summary:*** Would this not be the moment to introduce into France the cultivation of this Oriental legume?

For 5,000 years the soybean has constituted a substantial prepared dish for the Chinese, and for the last 30 years its renown has become international. It has been exported in bulk and in sacks from all the ports of Manchuria and mainly from Dairen, the terminus of the "South Manchuria Railway." Among the farm products sent from Manchuria, whose value is about $500 million a year, the soybean occupies by far the first place.

The Japanese are also interested in this crop. Millions of immigrants from the provinces of Shantung and Zhili (Chili, Chihli; dissolved in 1928) come to harvest it.

In their laboratories at Dairen, Japanese chemists have discovered numerous ways of utilizing the soybean: not only for feeding man and beast, but it can also be used for making soap, cheese [tofu], varnish and paints, ink for printing, enamel, linoleum, explosives and motor fuels, and lubricants. It is made into bread; the flour is used in Italy for macaroni as well as for biscuits. An exquisite table oil is extracted from the soybean. Some flavors in a bowl of soup give the aroma and the taste if true bouillon. Japan must nourish a constantly increasing population with the products of its old, exhausted fields. The waste products from the soybeans [i.e., from pressing out the oil], pressed into large cakes, make an excellent fertilizer and contribute largely to the solution of the problem. The Japanese continue their research into obtaining a more abundant harvest and improving the soybean oil.

I believe that the soybean is cultivated in Ireland. Why is the cultivation of this modern manna not introduced into France?

Note: Amazing that by Sept. 1940 the writer is unaware of all the work since 1855 to introduce the soybean to France!

3585. Noda Shoyu K.K. 1940. Noda Shôyu K.K. Nijûnen-shi [Twenty-year history of Noda Shoyu, Inc.]. Noda, Japan: Noda Shoyu K.K. 733 p. Illust. No index. 22 cm. [Jap]
• ***Summary:*** This is the earliest known major history of Kikkoman, written largely by Mr. Morio Ichiyama. Contents: Preface. 1. History: Before the establishment of Noda Shoyu K.K. (The origin and its changes {Thoughts on its origin, Tokugawa period, Meiji period, beginning of the Taisho period}, development of shoyu industry and the town of Noda, Noda Shoyu Jozo Kumiai, family trees and family traditions of the Mogi, Takanashi, Horikiri, and Ishikawa families, virtues of the family), foundation of Noda Shoyu K.K. {the opportunity to unite, the establishment of a joint undertaking}, 20 years after the establishment. 2. Organization and management. 3. Plants (17): Korea, Jinsen?, Keijo plants. 4. Fermentation process: Special products (mirin, miso, sauce), testing center. 5. Business. 6. Cultural welfare facilities. 7. Connected enterprises: K.K. Noda Shoyu Ginko, Sobu Tetsudo K.K., Noda Transportation K.K., Gomei Company Senshukai, Foundational Juridical Perdon Kofukai, Manchuria Noda Shoyu K.K., Choshi Shoyu K.K.

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Appendixes. Timeline / time table / chronology: Ranking of capital investments of shoyu producing companies in Japan, graph of yearly shoyu production in Japan, sales of shoyu, mirin, and miso by the company, sales of the company's shoyu comparing by area and also container, the company's shoyu exporting map, average sales of the company's shoyu, prices of raw materials of shoyu production, prices of shoyu in different type containers.

Pages 461-65 give an introduction to and description of each of the major brands produced by companies presently in the Noda Shoyu group. Under the Kikkoman brand, we learn that the producer of this brand of shoyu is the Saheiji MOGI family. It is said that the logo was designed by Manpei SARANUMA. It is said that the meaning and origin of the brand is as follows. The first "big army of God" in Japan was honored at a place named *Shimousa no Kuni, Kikkô mountain* (*Kikkô-zan*), *Katori Shrine* (*Jingu*). The name of the mountain, Kikkô, was used in the brand. The tortoise (*kamé*) symbolizes long life and is thus a symbol of happiness. It is said that a tortoise lives for 10,000 [*ichi-man*] years. The grace with the tortoise is born shows high-class dignity with supernatural power.

Pages 466-480 show all of the shoyu brands (including minor ones) produced by companies in the Noda Shoyu group. For each brand, the name, year of introduction, quality rank, and area where sold are given. Early brands, those introduced before the start of the Meiji period (1868), are read from top to bottom, right to left.

The Saheiji MOGI line produced a total of 15 shoyu brands. The earliest was introduced in 1784. Early brands were: Kikkôman (Tenmei 2 = 1784), Kikkôdai (Tenmei 2 = 1784), Azumaichi (Tenmei 2 = 1784), Yamataika (Tenmei 2 = 1784).

The Shichirouemon MOGI line produced a total of 58 shoyu brands. The earliest was introduced in 1772. Early brands were: Kihaku (Anei 1 = 1772), Kagikashiwa (Anei 1 = 1772), Fujikashiwa (Anei 1 = 1772), Shôchikuba (Anei 1 = 1772), Kikkôkashiwa (Tenmei period = 1781-89), Hôzan (Kaei 2 = 1849).

The Shichizaemon MOGI line produced a total of 30 shoyu brands. The earliest was introduced in 1830. Early brands were: Kushigata (Tenpo 1 = 1830).

The Hyôzaemon TAKANASHI line produced a total of 39 shoyu brands. The earliest was introduced in 1772. Early brands were: Jôjû (Anei 1 = 1772), Betatakara (Anei 1 = 1772), Tachitakara (Anei 1 = 1772), Jigamisakari (Anei 1 = 1772), Fundonokina (Genji 1 = 1864), Fujitakara (Kaei 2 = 1849).

The Fusagoro MOGI line produced a total of 48 shoyu brands. The earliest was introduced in 1753. Early brands were: Minakami (Ansei 2 = 1855), Fujimasa (Hôreki 3 = 1753).

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The Noda Shoyu Goshi Gaisha produced a total of 13 shoyu brands, the Keizaburo MOGI line produced a total of 7 shoyu brands, the Monjiro HORIKIRI line and the Kanzaemon YOSHIDA line each produced one brand, and the Nihon Shoyu K.K. produced 2 brands, but all were introduced after the start of the Meiji period (1868).

A section on exports (p. 650-) notes that it is not clear when direct exports of shoyu from Japan to the western world began, but at some time during the Bunsei (1818-1830) or Tempô (1830-1844) periods it was shipped to Holland along with other goods. In 1854 (at the start of the Ansei period, 1854-1860) an American ship came to Japan and during the stay they bought some Japanese shoyu. Also during this same Ansei period it is said that special shoyu was made for export. Made by Sairinko SHIMAZU, it was bottled and shipped via Holland House (Oranda Yashiki) in Nagasaki.

Contains many photos and illustrations. Two of these, on unnumbered pages near the front of the book, are of special interest: (1) MOGI Shichirouemon (lived 1860-1929) was the first president and CEO (*shodai torishimaru shacho*) of Noda Shoyu Inc., which began operations on 1 Jan. 1918 and was the forerunner of today's Kikkoman. An inspiring tribute and eulogy to him appears in: Fruin, W. Mark. 1983. *Kikkoman: Company, Clan, and Community* (Harvard University Press, see p. 129-54). In 1889 he assumed headship of the Kashiwa family branch, then became the most influential director of the Noda cartel. After 1900 he was probably the most widely known and respected shoyu maker in Japan.

(2) MOGI Saheji was the first senior executive manager (*jomu torishimaruyaku*) of Noda Shoyu Inc. Saheji succeeded Shichirouemon as president of Noda Shoyu Inc. Saheiji is the name of a *bunke* or branch family. Anyone born or adopted into the family takes the name. So at one time this Saheiji was the head of a branch family of the Mogi clan that had among its brands, the Kikkoman brand.

Note 1. Fruin (1983, p. 302-03) further clarifies the relationships: Since the establishment of Noda Shoyu, Inc. "in 1918, kinship has been employed not for interfamily cooperation but for interfamily rivalry. Household membership has become all-important in determining access to the upper reaches of corporate power. Consider the following statistics... Of the twenty-eight main and branch households in the three Mogi, Takanashi, and Horikiri *dôzoku* (see figure A-1),... the percentage of households" by lineage that engage in shoyu manufacture is as follows: "Horikiri, 13; Takanashi, 50; Mogi, 53." But "within the overall Mogi clan one main and two branch households contend. The importance of the subdivisions within the Mogi clan is revealed by the fact that, although eight of the company presidents to date have been Mogis, within the greater Mogi lineage 63 percent of the company presidents can be traced to the Kashiwa branch household of Mogi Shichirouemon, 25 percent from the Mogi-sa group of Mogi Saheiji, and only 12 percent from the main house of Mogi Shichizaemon. Household hegemony was reflected as well on the first board of directors, with 67, 22, and 11 percent representation for the households of Mogi Shichiroeumon, Saheiji, and Shichizaemon respectively."

Note 2. A *dôzoku* is a lineage or clan composed of several stem families or descent groups, called *ie* (Fruin, p. 343, Glossary). Address: Noda, Japan.

3586. *Ohio Farmer.* 1940. Now its soybean milk! This and other foods produced by new Ohio plant. 186(11):10. Nov. 30. Whole No. 4606.

• ***Summary:*** About the work of Dr. Harry W. Miller (of Ohio and China) with soymilk. Today, because of the Japanese invasion of Shanghai, there now stands in Mt. Vernon, Ohio, a plant producing soybean milk, powder, and a number of products from the edible soybean. The head of this company, International Nutrition Laboratory, is Dr. H.W. Miller, who was born in Miami County, Ohio, and educated as a surgeon. For many years he was head surgeon in an American mission hospital in China. During this time he saw the need for milk and other dairy products in China; they were unavailable to most people due to the high cost and short supply. So he and his associates started a plant in Shanghai for the production of soybean milk. In 1937, at the time of the Japanese invasion, they had 15 delivery boys going out each day on bicycles to deliver the soybean milk to thousands of customers.

When Japanese bombs destroyed the plant in 1937, Dr. Miller decided to relocate near Mt. Vernon, in Knox County, Ohio. He and his sons built the plant, and also designed and built much of the equipment in it. According to Dr. Miller, soybean milk "is more quickly assimilated by the body than animal milk, it gives a quick recovery from exhaustion and fatigue, and is especially desirable as a food for infants and invalids. The liquid and powdered soybean milk produced in this plant is sold to doctors and hospitals all over the United States..." The steps in the process are described. They also make Mien Jing, based on wheat gluten, to which are added fresh vegetables and soya sauce to make a nutritious food with a meat-like flavor.

"During the past summer this plant also packed a quantity of edible soybeans. These were canned, both as green beans, and dried beans with tomato sauce added. Another product is a soybean flour..."

Some of the edible soybeans used in this plant were grown on the farm run by Dr. Miller near Mt. Vernon and by farmers in the neighborhood. However it has been necessary to import a large portion of the soybeans from other states.

Dr. Miller's organization is presently establishing another plant for the production of soybean milk in the Philippines. Moreover, 2,000 pounds of powdered soybean milk were recently shipped to China from Mt. Vernon.

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Photos show: (1) Dr. Harry Miller, seated at a desk in a coat and tie, examining samples of edible varieties of soybeans. (2) The plant of the International Nutrition Laboratory near Mt. Vernon, Ohio. (3) A worker inspecting a can of edible soybeans, which are packed in cans and labeled, ready to ship to all parts of the USA.

3587. Kihara, Kiyoshi. 1940. Untersuchungen ueber den Geruch von Syôyû, I-III. [Investigations on the aroma of soy sauce. I-III]. *J. of the Society of Chemical Industry, Japan* 43(11):403B. Nov. Supplemental binding to Kogyo Kagaku Zasshi. [Ger]
• ***Summary:*** Contents: I. The volatile constituents. II. The less volatile constituents. III. On the similarity between shoyu and the products resulting when soybeans are hydrolyzed with hydrochloric acid. Address: Kagawa prefecture Shoyu Laboratory, Japan.

3588. Kihara, Kiyoshi. 1940. [Investigations on the aroma of soy sauce. I-III.]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 43(11):876-83. Nov. German summary p. 403-B, Supplemental Binding. [Jap; ger]
• ***Summary:*** 1. Volatile constituents. II. The nonvolatile constituents. III. Comparison between soy sauce and chemical hydrolyzate of soybeans. Address: Kagawa prefecture Shoyu Laboratory, Japan.

3589. Rabbit, James A. 1940. Rice in the cultural life of the Japanese people. *Transactions of the Asiatic Society of Japan* 19:187-257. Dec. Series 2. Plus 6 pages of unnumbered plates at end. A lecture delivered before the Asiatic Society of Japan, Nov. 1939. [33 ref]
• ***Summary:*** This is an in-depth article by an expert on the subject. Contents: Foreword. The sacredness of rice. The honorable rice throughout the year. Rice in Japanese literature. Rice and religion. Socio-economic influences.

Page 243: "Intercourse with foreign countries, limited as it was from the 16th to the middle of the 19th centuries, has not been without its influence on the national cookery, as is evidenced by the introduction of such exotic foods as *sukiyaki* or *gyûnabe* (beef and vegetables fried in a flat pan with *shôyu* sauce), *torinabe* (fowl and vegetables fried in a flat pan with *shôyu* sauce), tempura (fried in batter) and many other dishes which are still considered to be almost a part of the Japanese menu, particularly in the thousands of eating houses of the metropolitan cities."

Page 244: "The trinity which constitutes the bulk of Japanese daily fare consists of rice, *miso* (bean paste) [sic, soup], and *tsukemono* (pickled vegetables cured with salt or a mixture of rice bran and salt)."

On p. 245 is an interesting discussion of *genmai* (uncleaned rice [brown rice]). "This *genmai* with a generous mixture of wheat was for a long time the staple food among farmers... Although the superior nourishment of *genmai* is well known at the present time and has received much publicity, those who favor its universal adoption are looked upon as faddists, similar to the attitude toward vegetarians in western lands."

Page 255: In Japan there a huge variety of places to eat, "which range from a street stall selling soba (hot buckwheat noodles covered with soy [sauce] with a sprinkling of green onions) to the semi-private club-like *machiai* (waiting house)...

Pages 256-57 discuss the origins, history, and present status of sushi. Today there are an estimated 1,500 to 1,600 sushi shops in Tokyo alone; in addition to these about 500 small stalls appear each night. Describes the arts of making and eating sushi. "After dipping it into a dish of *shôyu* (soya bean sauce), place the dripping sushi into your *kuchi* (mouth) without the loss of one drop of sauce and in such a manner that the fish side comes in contact with the tongue before the rice." Address: Japan.

3590. Fujii, T. 1940. Shôyu jôzô narabini sonota 2, 3 no genryô to shite shiken seru "kiyatsusabaruto" (mata wa katsusaba) [Shoyu brewing using cassava root and several other raw materials]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 35(5):456-60. [Jap]

3591. Fujii, T. 1940. Shôyu tanpakushitsu genryô daizu aruiwa daizu kasu daiyô toshite sufu zansa no riyô [Brewing shoyu using "sufu" residue as a protein source substitute for soybeans or soybean cake]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 35(6):532-33. [Jap]
• ***Summary:*** Sufu means "staple fiber," not "fermented tofu." It is a by-product of artificial wool made from soybeans or defatted soybean cake.

3592. Fukai, Tôshi; Inamori, S. 1940. Miso shikiso sosei saikin no kensaku [On bacteria producing the color of miso]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 129. p. 139-58. [Jap]

3593. Hemmi, T. 1940. Studies on septorioses of plants. VI. *Septoria glycines* Hemmi causing the brown spot disease of soybean. *Memoirs of the College of Agriculture, Kyoto University* 47:1-14. *

3594. *Hiroshima Joshi* (*Hiroshima-ken Jozo Shikenjo Hokoku*). 1940. [Studies on miso]. 18:76-. [Jap]*

3595. Liu, K. 1940. Studies on a fusarium disease of soybean pods. *Memoirs of the College of Agriculture, Kyoto University* 47:15-29. *

3596. Nakamura, Mitsuo; Tomita, Sakan. 1940. Antioxygens of fatty oils. *J. of the Society of Chemical Industry, Japan* 43:271B. Supplemental binding to Kogyo Kagaku Zasshi.

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[Eng]*
Address: Dep. of Applied Chemistry, Faculty of Engineering, Tokyo Imperial Univ.

3597. Okamura, K. 1940. [Substitute fuels for high-speed diesel engines]. *Nenryo Kyokaishi* (*J. of the Fuel Society of Japan*) 19:691-705. (Chem. Abst. 35:1964). [Jap]*

3598. Senbon, S. 1940. Anwendung des *Bazillus natto* zur Therapie gegen Tricophytia [Utilization of *Bacillus natto* as therapy against tricophytia]. *Medical J. of Taiwan* 39:14-17. [Ger]*
• ***Summary:*** *Bacillus natto* were found to have a beneficial effect in treating human infections caused by two species of trichophytia.

3599. Suzuki, T. 1940. Shôyu kasu sei tane kôji ni tsuite [Koji starter made from shoyu cake]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 35(6):539-40. [Jap]

3600. Bunrui Hawai Nihonjin jigyoka nenkan: Showa 15-16-nen [Dr. K.C. Kondo's classified Japanese business directory of territory of Hawaii: 1940-1941]. 1940. Honolulu, Hawaii: Jigyoka Nenkan-sha. 4 + 6 + 381 p. Illust. (Ports.). 23 cm. [Jap; Eng]*
• ***Summary:*** Compiled and published by Kakujiro Clifferd Kondo. Address: Hawaii.

3601. Fukai, Tôshi. 1940. Kagaku shôyu to daiyô genryô shikomihô [How to make HVP / chemical shoyu and shoyu using substitute ingredients]. Tokyo: Konno Shoten Shuppanbu. 151 p. 23 cm. 2nd ed. 1941 (164 p.). [Jap]*
• ***Summary:*** The author was born in 1888. Address: Japan.

3602. Japan Year Book 1940-41. 1940. Tokyo: The Foreign Affairs Association of Japan. 1164 + 60 p. See p. 424, 955-56.
• ***Summary:*** The Preface indicates that this book was published in about Oct. 1940. The editor's name is not given.

Page 424. "Leguminous plants: Area of leguminous plants in 1938 was 589,167 cho and the production was valued at ¥96,820,990. During the past decade the area planted has been pursuing a slow downward movement. Soya-beans and azuki (red) beans are predominant both in area and production." In 1938

Soy-beans were planted on 329,674 cho which produced 2.700 million koku worth 51,119,383 yen.

Azuki beans were planted on 102,997 cho which produced 0.677 million koku worth 16,800,777 yen.

Pages 955-56. Two large tables show "Cultivated area and production of cereals" (in hectares and metric tons), 1934-1938. For soya beans:

3.889 million metric tons in 1935
4.175 million metric tons in 1936
4.173 million metric tons in 1937
4.185 million metric tons in 1938
4.050 million metric tons in 1939

Other crops in the table are other legumes, kaoliang, millet, maize, wheat paddy-field rice, upland rice, and other cereals.

3603. Japan-Manchoukuo Year Book. 1940. Tokyo, Japan: Japan-Manchoukuo Year Book Co. Index. 26 cm. Seventh annual issue. [Eng]
• ***Summary:*** Each year book is divided into two main parts: Japan, and Manchoukuo. This book was published in late 1939.

In the Japan and Manchoukuo parts of the book, soya beans are most widely discussed in the respective chapters on Agriculture. In each case, information given the previous year is updated one year.

Page 290-91. In the chapter on "Agriculture and stockbreeding" in Japan, Table 19 shows "Production of various grains, potatoes, etc." in koku from 1927 to 1938. 1.80391 hectolitres = 1 koku = 5.11902 dry bushels (USA). For soya bean:

2.700 million koku in 1938

Table 19B gives the value of each crops (in yen) from 1927 to 1938. Other crops in this table are oats, millet, barnyard millet, proso millet, maize, buckwheat, red bean, sweet potato, and Irish potato.

Page 391. In the chapter on "Chemical industry" Table 3 shows the "Production of chemical fertilizers" (in metric tons) from 1926 to 1937. The quantity (in metric tons) and value (in yen) of each is given. These fertilizers are: Sulphate of ammonia [ammonium sulfate], calcium cyanamide, superphosphate of lime, and muriate of potash [potassium chloride].

Table 5, "Imports of commercial fertilizers" from 1931 to 1938 include "Bean-oil cake," the imports of which steadily decreased from 1.032 million metric tons in 1931 to 0.623 million metric tons in 1938.

Page 403. In the same chapter Table 38 shows "Vegetable oil production" with quantity in metric tons and value in yen, from 1930 to 1937. Soya bean oil production increased from 36,977 metric tons (mt) in 1930 to 65,455 metric tons in 1937–making it the leading vegetable oil produced in Japan. The other leading vegetable oils made in Japan in 1937 were:

Rapeseed 28,893 metric tons
Perilla 23,206 metric tons
Cottonseed 23,154 metric tons
Coconut 16,112 metric tons
Peanut 7,648 metric tons
Sesamum [Sesame] 6,653 metric tons
Linseed 4,254 metric tons
Hempseed 329 metric tons

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Table 23. Output of Bean Cake at the Principal Cities

(Unit: Volume in 1,000 pieces; 1 piece weighs 27.6 kgs.)

	Dairen	Yingkow	Antung	Harbin	Total	Total incl. Others	(M¥1,000)
1932	30,812	5,228	4,568	3,441	44,050	47,744	80,687
1933	19,587	4,093	3,444	3,270	30,394	38,436	59,576
1934	20,227	2,772	3,935	2,911	29,845	42,835	50,117
1935	14,198	2,921	2,349	3,870	23,339	39,633	53,901
1936	12,734	1,877	1,267	3,392	19,269	31,552	63,135
1937	13,029	1,973	1,040	3,614	19,656	....	....
1938	14,329	491	1,139	4,626	20,585	....	....

Table 24. Number of Bean-cake Mills and Productive Capacity

		South Manchuria Districts				North Manchuria Districts		
		Dairen	Antung	Yingkow	Other places	Harbin	Other places	Total
No. of mills	1923	87	25	29	416	42	7	606
	1929	59	26	22	297	40	28	472
	1933	50	23	20	238	43	28	402
	1936	45	22	14	289	24	28	422
	1937	42	21	20	235	28	20	365
Productive capacity in 1,000 pieces of bean-cake per day	1923	308	45	42	128	87	5	615
	1929	218	54	39	130	83	46	570
	1933	149	37	33	88	94	38	439
	1936	173	36	29	90	57	38	423
	1937	140	31	31	70	60	24	356

Table 25. Export of Bean Oil and Bean-cake By Destinations

(a) Bean Oil

Volume (m. tons):

	Japan & Chosen	China	Hongkong	Germany	Great Britain	Nether-lands	U.S.A.	Total incl. Others
1932	387	91,200	....	20,350	4,220	6,300	998	128,000
1933	278	47,675	....	24,400	4,910	2,520	1,960	81,120
1934	1,322	31,800	1,610	43,750	2,520	10,210	426	97,200
1935	755	9,730	9,180	26,200	15,900	11,410	6,000	89,000
1936	1,230	9,720	10,900	26,000	11,390	3,840	2,550	66,000
1937	615	2,306	6,527	19,407	3,443	24,666	5,907	69,654
1938	298	21,166	180	15,907	225	14,441	712	57,248
Value (M¥1,000):								
1932	79	17,932	....	3,768	777	1,086	198	24,512
1933	63	10,519	....	5,497	1,127	570	449	18,473
1934	302	4,792	316	7,703	454	1,754	82	16,262
1935	178	2,208	2,052	5,935	3,584	2,580	1,370	20,132
1936	429	3,111	3,291	8,183	3,551	1,236	860	21,383
1937	219	847	2,411	6,731	1,303	9,253	2,197	25,343
1938	93	5,317	46	3,804	51	3,625	157	14,099

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(b) Bean-cake

Volume (1,000 m. tons):

	Japan & Chosen	China	Germany	Nether-lands	U.S.A.	Great Britain	Total incl. Others
1932	719	479	43.9	11.5	12.2	3.4	1,420
1933	765	234	8.4	5.2	25.4	1.6	1,040
1934	972	182	9.3	4.5	30.5	1.0	1,205
1935	765	192	6.3	0.6	39.2	1.9	980
1936	701	110	4.5	0.2	4.1	0	849
1937	646	99	4.2	0.8	37.5	..	802
1938	807	40	0.3	3.1	8.4	..	869
Value (M¥1,000):							
1932	34,437	24,700	1,781	424	543	166	66,301
1933	40,948	12,976	471	257	1,265	81	57,614
1934	41,376	7,475	386	184	1,256	39	51,509
1935	38,076	9,946	333	30	1,945	98	51,370
1936	43,220	7,341	320	13	1,610	5	53,127
1937	50,292	7,713	301	59	2,896	..	62,336
1938	65,365	3,134	30	284	774	..	70,575

Table 29. Production, Etc. of Soy and Miso (Bean paste) in Kwantung

	No. of plants	Production: Miso Volume (Kwan)	Production: Miso Value (Yen)	Production: Soy Volume (Koku)	Production: Soy Value (Yen)
1931	16	646,691	230,725	20,950	520,633
1932	17	837,850	312,540	58,069	553,388
1933	22	953,129	338,751	39,714	923,542
1934	22	1,090,711	453,757	49,259	1,168,904
1935	24	1,357,560	495,464	52,102	1,136,847
1936	31	1,485,739	712,848	116,734	1,373,284
1937	22	982,398	345,658	44,253	961,475

Factories operating less than 5 workers excluded.

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Paulownia 76 metric tons

On the same page, Table 39 shows exports and imports of vegetable oils from 1933 to 1938. Exports of soya bean oil decreased from 2.242 million kin in 1933 (1 kin = 0.6 kg) to 1.795 million kin in 1938. Imports of soya bean oil increased from 128,000 kin in 1933 to 321,000 kin in 1938. The three main vegetable oils imported into Japan in 1937 were cottonseed oil (10.324 million kin), coconut oil (2.400 million kin), and paulownia oil (1.439 million kin).

Page 444, in the chapter on "Commerce," Table 13 shows the "Average wholesale price of staple commodities in Tokyo" in yen per koku, average December each year from 1934 to 1938. The brand of soya beans was "Manchu White." The price dropped from a high of 19.37 yen in 1936 to a low of 7.70 yen in 1937.

Page 454, in the chapter on "Foreign Trade," a table shows trade of "Oil cake" from 1927 to 1938.

Pages 470-71 in the same chapter contain a very large table titled "Imports by countries of origin" in yen from 1937 to 1938. Categories include "Beans & Peas," "Oil yielding materials" and "Oil cake." For each of the three categories, Manchoukuo is the main country of origin, followed by Kwantung Province, then China, then British India, then D.E.I. [Dutch East Indies].

Page 714, in the chapter on "Agriculture" in Manchoukuo, a large table shows "Output of principal of crops (metric tons)" from 1924 to 1938. For soya beans: 4.612 million metric tons in 1938.

The other principal crops shown in the tables are other beans, kaoliang, millet, maize, wheat, rice, upland rice, and other cereals.

Page 715. The text about "Soya beans" is repeated on this page.

Page 739, in the chapter on "Commerce," Table 12 shows "Wholesale prices of principal staple commodities in Hsinking [Changchun, in Jilin province] from 1934 to July 1939 in M¥ [million? yen]. The price of 1st grade soya beans went from 3.36 per 100 kin in 1934 to 7.76 per 100 kin in July 1939. That of bean cake rose from 0.90 per piece in 1934 to 2.68 in July 1938. The wholesale price of bean oil increased from 10.50 per kin in 1934 to 20.88 per kin in July 1939.

Page 779-80, in the chapter on "Manufacturing industries," has a long section "IV. Bean oil & cake." The four principal cities of manufacturing in Manchoukuo are Dairen, Yingkow, Antung, and Harbin. Table 22 shows "Output of bean oil at the principal cities" in 1,000 kin [1 kin = 0.6 kg] from 1932 to 1938. The leading city by far was Dairen. The total bean oil produced decreased at the four centers decreased from 221.061 million kin in 1932 to 97.255 million kin in 1938.

The text below this table states (p. 779-80): "At first the main business of the industry was the extracting of linseed oil. The primitive linseed oil extraction method was applied to soya beans in Tiehling and Changchun (present Hsinking) districts, important market of beans, some sixty years ago. As the result obtained was satisfactory, the bean oil industry commenced. At that time, the bean oil was directed for local consumption alone, and was used for cooking, lighting, and other domestic purposes.

"The original method of pressing oil out of beans was very simple and primitive, only hand or mule operated wedge or screw system being used. But with the rapid progress made in the utilization of bean oil and the increased demands abroad, the method of oil extraction was improved. Hydraulic power came to be used in place of human labour or mule power, in operating the presses. Then a more scientific method of extraction by means of chemical solvents was discovered by the Central Laboratory of the South Manchuria Railway Company. Under this new extraction method, benzine, benzol or alcohol is used to extract and dissolve oil contained in beans.

"Uses of Bean Oil.–The uses of soya bean oil have increased markedly in the last three decades. At present they are used for such diversified purposes as the manufacture of soap, as a lard and butter substitute, as a constituent of paint, varnish and shellac, glycerine, water proofing, and as substitutes for rubber and petroleum.

"Bean Cake.–Soya bean cake is used for various purposes, the principal uses being fertilizer and animal feed, while with further processing it is manufactured into a celluloid substitute, medicine, sizing for paper-making and for Ajinomoto. It is also used extensively for the manufacturing of sauce material, bean flour and shoyu and miso.

Below this (p. 780) is a large Table 23 "Output of bean cake in the principal cities" from 1932 to 1937 in 1,000 pieces (1 piece weighs 27.6 kg). Again, Dairen is by far the leading city. The total decreased from 44.744 million pieces in 1932 to 20.585 million pieces in 1938.

Below this (p. 780) is a large Table 24 "Number of bean-cake mills and productive capacity" in major South and North Manchuria [customs] districts from 1923 to 1937.

Page 782. In the same chapter, Table 29. "Production, etc. of soy and miso (bean paste) in Kwantung" gives values from 1931 to 1937. The number of plants increased from 16 in 1931 to 22 in 1937. The volume of miso increased from 646,691 kwan in 1931 to 1,485,739 kwan in 1936. The volume of soy sauce increased from 20,950 koku in 1931 to 116,734 koku in 1936.

Above this table is a brief section on "Soy" sauce: "In sympathy with the rapidly increasing number of Japanese residents since the foundation of the country, the soy industry has made marked developments. The output of soy was 44,253 koku in 1937. Imports of soy were valued at ¥1,564,000 in 1938."

Page 798. In the chapter on "Foreign trade" we read: "Soya beans constituted in 1938 the most important export

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article, representing 32% of the total export value, and 44% if other varieties of bens and derivatives are included. The most important customer for beans was Japan, followed by Egypt and Germany. In bean cakes and oil, Japanese imports concentrated on cake whilst European countries such as Germany, the Netherlands, and Great Britain mostly bought oil."

On the same page (p. 798) Table 4, "Volume of principal articles imported and exported" from 1934 to 1938 gives values for soya beans (decreased), bean cakes (decreased), and bean oil (decreased).

Page 800. In the same chapter, Table 6, "Exports of principal commodities" 1934-1938 by country of destination shows that the total increased from 160,349 million yen in 1934 to 234,363 million yen in 1938.

Page 801. A similar table for bean oil appears.

Page 803. A similar table for bean-cake appears.

3604. Japanese cooking and etiquette. 1940. Tokyo: Keisen Girls School. xii + 219 p. Illust. 18 cm. *
• ***Summary:*** By the 1940 graduating class of Keisen Girls' School.

3605. Japanese Wholesale Grocers' Association. 1940. Japanese food recipes. San Francisco, California: Japanese Wholesale Grocers' Association. viii + 113 p. Illust. Index. 19 cm. *
• ***Summary:*** Includes a glossary. "These recipes have been compiled by the Japanese Wholesale Grocers' Association under the auspices of the Nippon Trade Agency at San Francisco" (p. vi). Pearl Metzelthin was born in 1894.

3606. Kishimoto, Mitsuo. 1940. Hokushi daizu ni kansuru chôsa hôkoku [Report of a survey on the soybeans of northern China]. Peking, China: Minami Manshû Tetsudô K.K. Hokushi Keizai Chôsajo [South Manchuria Railway Co.]. 32 p. [Jap]*
Address: Peking, China.

3607. Makino, Tomitarô. 1940. Nippon shokubutsu sôran [A illustrated flora of Nippon with cultivated and naturalized plants]. Tokyo: Hokuryûkan. 13 + 1070 + 29 + 72 + 11 p. Illust. (some color). Index. 24 cm. [Jap]
• ***Summary:*** The frontispiece is a portrait photo of Dr. Makino. Two entries related to the soybean appear on p. 407, each with its Japanese (*hiragana*) and Chinese (*kanji*) characters a large and detailed illustration of the plant showing stems, leaves, pods, seeds, and flowers.

(1) Jap: *Tsurumame. Glycine soja* Sieb. et Zucc. (=*G. ussuriensis Reg. et Maack*).

(2) Jap: *Daizu. Glycine max* Merril. (=*G. hispida Maxim.*). Address: Dr. Sc. [Japan].

3608. Murai, Kô. 1940. Zaibei Nihonjin sangyô sôran [A compendium of Japanese agriculture in America]. Los Angeles, California: Beikoku Sangyô Nippô Sha. [Jap]*

3609. Nippon Gakujutsu Shinkokai. 1940. Manyôshû [Man'yoshu]. Tokyo: Iwanami Shoten. 502 p. [Jap]*

3610. Oriental Show-You Company. 1940. Oriental recipes. Columbia City, Indiana: Oriental Show-You Co. 24 p. Illust. 19 cm. *
• ***Summary:*** These recipes describe how to use the company's shoyu (naturally fermented, Japanese-style soy sauce).

3611. Prescott, Samuel Cate; Dunn, Cecil Gordon. eds. 1940. Industrial microbiology. New York, NY: McGraw Hill Book Co. x + 541 p. Illust. Index. 23 cm. [53* ref]
• ***Summary:*** In Chapter 8, titled "Yeast: Its manufacture, vitamins, and uses," p. 155 states that soybeans, freed of bitter principles, sugar-beet juice, and various other substances have been proposed either to increase the yield of yeast or to act as the source of nutrient material (See Chrzaszcz and Janicki 1936).

Chapter 24 titled "The molds" (p. 339-57) discusses: Some important Aspergilli (members of the *Aspergillus flavus-oryzae,* especially strains of the *A. oryzae* series are of major industrial importance in the Orient [East Asia]). They are used to make sake, shoyu, miso, and *mizuame,* a sugar syrup made from rice (p. 350). Divisions of Penicillia (the genus Penicillium). The genus Rhizopus (used in the amylo process for converting starch to sugar by the use of selected molds–see p. 48-50). Mold enzymes. Apparatus for cultivating molds. References on molds (42).

Chapter 32 titled "Mold enzyme preparations: Uses and products" (p. 419-24), has the following contents: Introduction. Commercial amylase and its preparation. Koji and its preparation. Some mold products (in Japan): Soy sauce or shoyu, tamari, miso. The uses of mold enzymes (industrially): Amylases, invertase, proteases, and pectinase. The authors cite the industrial applications of members of the *Aspergillus flavus-oryzæ* group especially strains of *Aspergillus oryzæ.* Commercial amylase or diastase is marketed under a variety of trade names such as Taka-diastase, Kashiwagidiastase, Digestin, Polyzyme, Protozyme, and Oryzyme. These are generally mixtures of enzymes, however purified enzyme preparations (such as Taka-amylase) may be obtained.

Koji may also be used to make sake (rice wine) and shocho (distilled alcoholic liquor). "The use of *koji* in the United States was introduced by Takamine" (p. 420).
Address: Cambridge, Massachusetts.

3612. Sampaio, Sebastiao C. 1940. Soja [Soybeans]. Sao Paulo, Brazil: Tipografia Brasil, Rothschild Loureiro & Cia, Ltda. 43 p. Secretaria da Agricultura, Industria e Comercio

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do Estado de Sao Paulo. [20 ref. Por]
• ***Summary:*** Contents: Introduction: Soya. Botanical description. Varieties. Composition of the plant. Culture/ cultivation. Enemies and pests. Improvement of the seeds: Improving the oil (*óleo dos graos de soja*), improving the cake and flour, other improvements. Commerce and trade.

This general book draws heavily on U.S. publications, including Piper and Morse, 1923. The section titled "other improvements" (p. 38-39) briefly mentions many food uses of soybeans, including vegetable-type soybeans (Easycook and Hahto), green vegetable soybeans (*Quando verdes... elas constituem ótimo legume verde = when green... they constitute an excellent green vegetable*), sprouted seeds (*sementes germinadas*), soy flour, soymilk (*leite de soja*), soy casein, soy cheese (*queijos e requeijoes*) [tofu], shoyu, and miso. The Japanese colony in Sao Paulo makes shoyu in commercial quantities.

Note 1. This is the earliest Portuguese-language document seen (June 2009) that mentions green vegetable soybeans, which it describes as shown above.

Note 2. This is the earliest Portuguese-language document seen (Sept. 2006) that uses the term *óleo dos graos de soja* to refer to soybean oil.

Note 3. This is the earliest Portuguese-language document seen (Jan. 2013) that mentions sprouted soybeans, which it calls *sementes germinadas.*

Note 4. This is the earliest Portuguese-language document seen (April 2013) that uses the term *queijos e requeijoes* to refer to tofu. Address: 3a Seccao Tecnica do Departamento do Fomento da Producao Vegetal, Sao Paulo, Brazil.

3613. Saris, John. 1940. The first voiage of the English to the islands of Iapan... Tokyo: Toyo Bunko. [123 p.] 31 cm. Facsimile of the original ms. in the Toyo Bunko, Tokyo.
• ***Summary:*** This is a facsimile reprint of Saris' handwritten log. On 29 Aug. 1613, while in Japan (near Shizuoka), Saris wrote (Toyo Bunko transcription): "Of Henns they haue greate store, as likewise of Deere, both redd and fallowe wilde bores, hares Goates Kyne etc. Of theese they haue plentie, butter they make none, Neither will they eate any Milke, because theie hould it to be as bloode, nor tame beasts."

Note 1. The word transcribed from the original manuscript as "Cheese" by Satow in 1900 is transcribed here by the Japanese as "theese." To us the word looks more like "theese," but we are not sure.

Note 2. John Saris died in 1646.

3614. Soybean collection at the N.I. Vavilov All-Russian Research Institute of Plant Industry (VIR) based on the log book of 1940. 1940.
• ***Summary:*** This list of soybean accessions at the VIR (St. Petersburg, Russia) in 1940 was sent by Irina Seferova, Soybean Collection Curator at the VIR. Based on that year's log book, it shows that the VIR had 4,014 accessions of various types (landrace, breeder resource, primitive line, advanced Cultivar, and a few wild forms) which are not individually designated. These come from 35 different countries, regions, etc. as follows: Africa 1. Africa, Congo 2. Africa, South Africa 6. Austria 1. Canada 14. Caucasus, Abkhazia (USSR) 21. Caucasus, Georgia (USSR) 31. Caucasus, North Caucasus (USSR) 9. Central Asia (USSR) 5. Ceylon (Sri Lanka) 2.

China 2,347.

China, Manchuria, Experimental Station Echo 547. Cuba 1. France 9. Germany 11. Guatemala 2. Hungary 4. India 37. Iran 1. Ireland 1. Italy 7.

Japan 171. Korea 49. Latvia 2. Lithuania 6. Mexico 1. Netherlands 1. Poland 4. Russia, European part (USSR) 29.

Russia, Far Eastern Region (USSR) 421. Russia, Siberia (USSR) 13. Ukraine (USSR) 14.

USA 233. Uzbekistan (USSR) 9. West Asia 3.

Total 4,014.

A separate table sent by Irena on 30 Nov. 2010 shows 13 major collections of soybeans, They are ranked on the table by number of soybean accessions. All of the entries are dated and some have multiple dates. Moreover, it is not clear whether that soybeans were collected during an expedition or whether they were sent to VIR for some reason. We will assume an expedition only when its leader is named.

(1) 1,859 accessions from Experimental Station Echo, Manchuria (China), Donor: A.D. Woeikoff [Aleksandr Dmitrievich Voeikov (1879-1944)- LC transliteration]. Years: 1923, 1929, 1931.

Note: According to a USDA periodical in March 1926, Woeikoff was director, Experimental Station, Echo" at "Tiehlingho, Kirin Province, Manchuria." This "Experimental Station. Echo" in Manchuria was operated by the old Chinese Eastern Railway.

(2) 529 accessions from Echo Experimental Station, Manchuria (China). Years: 1923, 1924, 1927, 1928, 1929, 1932.

(3) 232 accessions. VIR Expedition to Far East Region (USSR), led by Trofim Jakolevich Zarubajlo [Trofim IAkolevich Zarubailo] (born 1906). Year: 1932. Note: A post-graduate student of the VIR in 1932, he then became an employee of the VIR and was the leading expert in the genetics of cereal crops.

(4) 194 accessions. VIR Expedition to USA, led by D.N. Borodin, Head of the Division, Dep. of Applied Botany and Plant Breeding. Accessions from USA, Japan, China, Korea, and Russia. Years: 1921, 1922, 1923, 1924, 1925, 1926, 1928.

(5) 171 accessions. from Manchuria, Agronomical Department of the Chinese Eastern Railway, Vrachinskij [Vrachinskii]. Year: 1929. Vrachinskij is the family name of a person. Nothing more about him is known.

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(6) 79 accessions. VIR Expedition to Japan led by Evgenija Nikolaevna Sinskaja [Eveniia Nikolaevna Sinskaia–LC transliteration] (Sinskaya). Year: 1928. Note: An employee of the VIR, Sinskaya (a woman) was one of the most talented botanists and plant breeders in Russia. She created her own scientific schools. An exceptional field researcher, experimenter and theorist, botanist, geographer, ethnobotanist, and environmentalist, Evgenia Nikolaevna was not only a good friend and active adherent of N.I. Vavilov, who selflessly helped him in carrying out his scientific and institutional programs, but she was also an outstanding follower, playing a significant role in the development of his ideas and concepts.

(7) 74 accessions from Manchuria Agricultural Society, China. Year: 1925, 1926.

(8) 66 accessions. VIR Expedition to Far East Region (USSR), led by M. Tchenkova. Year: 1929.

(9) 62 accessions from the Moscow Agricultural Exhibition, Russia. These accessions came from Russia, Ukraine, Caucasus, Central Asia. Year: 1923.

(10) 87 accessions. Expeditions to Italy (1927), China, Japan, and Korea (1929) led by N.I. Vavilov (See separate record for 1929).

(11) Other, 661 accessions (1921-1940).

Photos show: (1) E.N. Sinskaja / Sinskaia (1889-1965).

(2) Trofim Jakelovich Zarubajlo / Zarubailo (born 1906).

Note: "Today, the N.I. Vavilov Institute of Plant Industry in St. Petersburg still maintains one of the world's largest collections of plant genetic material. The Institute began as the Bureau of Applied Botany in 1894, and was reorganized in 1924 into the All-Union Research Institute of Applied Botany and New Crops, and in 1930 into the Research Institute of Plant Industry. Vavilov was the head of the institute from 1921 to 1940. In 1968 the institute was renamed after him in time for its 75th anniversary" (Source: Wikipedia, at Nikolai Vavilov, Dec. 2010). The VIR celebrated its 100th anniversary in 1994–www.vir.nw.ru. Address: St. Petersburg, USSR.

3615. Zaibei Nihonjin Kai. 1940. Zaibei Nihonjin shi [History of Japanese in America]. 1619 Laguna St., San Francisco, California. [Jap; eng+]

• ***Summary:*** The section titled *"MUTO Yamaji no Shôyu-gyo"* (Yamaji Mutô's shoyu business) (p. 59) states that in 1887 Yamaji MUTO tried to sell Kikkoman shoyu in San Jose, California in beautiful pottery containers. Initially the venture was a success, but the product was purchased more for the container than for the shoyu. The container was used for a flower vase. Sales dropped rapidly after 1 month, and the venture soon failed. Address: San Francisco, California.

3616. **Product Name:** [Best Canned Maruta Misozuke Daikon (Giant White Japanese Radishes Pickled in Miso)].
Foreign Name: Maruta Misozuke Daikon.
Manufacturer's Name: Kawamura Yoheibei.
Manufacturer's Address: Honzaimoku-cho 3 chôme, Kyôbashi-ku, Tokyo-shi, Japan. Phone: Kyôbashi 1705..
Date of Introduction: 1940?
Ingredients: Daikon, miso.
New Product–Documentation: Photocopy of label (from canned product) sent to Soyfoods Center (in late 1981) by Esta Keirn, formerly of Oriental Show-You Company (Columbia City, Indiana). Undated. Characters are read from right to left. Maruta is a registered trademark. Supplier to the Imperial Army and Navy (*Kunaishô Riku Kaigun Goyôtatsu*). Makers of "Homare zuke" products that help you to live for 10,000 years (*Homare zuke seizô moto*).

3617. Deasy, George F. 1941. Geography of the United States soybean-oil industry. *J. of Geography* 40(1):1-7. Jan. [2 ref]

• ***Summary:*** Contents: Development of the United States soybean industry. Distribution of American soybean mills. Uses of soybean oil. Future of the United States bean soil industry,

Tables show: (1) "United States production of vegetable oils from domestic oil-yielding seeds." Cottonseed oil 1,678 million lb. Soybean oil 323 million lb. Linseed oil 157 million lb. Corn oil 137 million lb. Peanut oil 78 million lb. Olive oil 5 million lb. Tung oil 2 million lb. Thus, soybean oil ranks second only to cottonseed oil–but a distant second. The amount of soybean oil produced is only 19% as much as the amount of cottonseed oil.

(2) United States acreage and production of soybeans, 1924 to 1938. For even-numbered years gives: Total soybean acreage (increased from 1.78 million in 1924 to 7.79 million in 1938). Acreage harvested for soybeans (increased from 0.448 million to 2.898 million). Total production of soybeans (increased from 4.947 million bushels to 57.665 million). Soybeans crushed (increased from 0.307 million bushels to 48.886 million). Percent of total production crushed (increased from 6.2% in 1924 to 84.8% in 1938).

(3) Comparative conditions of the soybean industry in selected regions and states of the U.S., 1937. Defines and gives figures for 2 regions and 2 states: North-central states, southern states, Illinois, Mississippi. Gives for each: Percentage cut for hay, hogged off, and cut for beans. Yield of beans in bushels/acre. Total soybean production.

(4) U.S. factory consumption of soybean oil, 1938 (million pounds): Edible products: Shortening 137.133. Oleomargarine 39.885. Others 11.280. Inedible products: Paint and varnish 15.183. Soap 10.897. Linoleum and oilcloth 3.605. Miscellaneous products: Unclassified 5.399. Loss: (incl. foots) 14.046.

Bar charts show: (1) Estimated soybean production in leading countries, 1938: China, Manchukuo, United States, Chosen [Korea], Japan. (2) Estimated soybean production in leading U.S. states: Illinois, Indiana, Iowa, Ohio, North

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Carolina, Missouri, Others.

Maps show: (1) Total U.S. soybean acreage, 1934. Each dot represents 1,000 acres (2) Total U.S. soybean production, 1934. Each dot represents 5,000 bushels. (3) Location of soybean mills in the USA, Nov. 1939. Each dot represents a mill which processes soybeans, or is reported to be equipped or will be equipped for soybean crushing. Most of the mills are in the Midwest, or the central Atlantic seaboard. Address: Formerly Univ. of Cincinnati, Ohio.

3618. French Commercial Attache in Tokyo. 1941. L'extraction des derivés du soja [The extraction of soybean derivatives]. *Revue Internationale du Soja* 1(1):33-34. Feb. [Fre]
• ***Summary:*** Discusses the work of the South Manchuria Railway Co. with soybeans, including solvent extraction (especially that done by M. Sato using ethyl alcohol; The resulting meal is sold under the name Soya Rex [Soyalex?] Flakes), The Manchurian Soya Products Society (which is building a plant at Kawasaki, near Tokyo), The Society of Nitrogen Fertilizers, Ajinomoto, the Soya Bean Chemical Engineering Co., Hohnen, Nisshin, and Nikka. Address: Tokyo, Japan.

3619. Prat, D. de. 1941. Le soja: Matière adhésive et matière textile [Soy: Its use in adhesive and textile materials]. *Revue Internationale du Soja* 1(2):49-54. March. [Fre]
• ***Summary:*** Soy flour can be used to make adhesives by mixing it with gelatin, glue, or casein. Details are given on making textile materials, including treatment of soybean stalks to isolate the fibers, treatment of the pods, treatment of the residue of oil extraction (isolation of protein from soybean cake or meal, then spinning it into fibers). In America, the Ford Motor Company makes protein fibers from soy flour; they are condensed with formaldehyde. A process used in Japan by Nihan [sic, Nihon] Kary Kogyo Kabushiki Kaisha is described. The cakes are first washed with a warm dilute (5-10%) alkaline solution at 20-30ºC for 2-5 hours. The proteins extracted (10-20%) are then precipitated by the addition of acids or of metallic salts (acetic, sulphuric, or phosphoric acid) to this alkaline solution. The precipitated material is dissolved in a dilute alkaline solution, with the addition of lecithin. The precipitant is washed in water in order to give it an appropriate water content. The solution is allowed to "ripen" (mûrissement), and is then spun in a in a coagulating bath, to which a coagulant is added. In Japan, Showa-Sangyo makes and sells a product named "Silkool," which is an artificial fiber made from soy protein and which would have characteristics similar to that of Lanital. "Soja Bean Silk" is also made in Japan from soy protein.

3620. Takahashi, R. 1941. Some injurious insects of agricultural plants and forest trees in Siam and Indo-China. I. Aphididae. *Taiwan Government Agricultural Research Institute Report* No. 78. 27 p. March. *
• ***Summary:*** Discusses *Aphis glycines, A. laburni.*

3621. Wolman, Minka. 1941. There is no indigestion in Japan. *Argus* (*The*) (*Melbourne, Victoria, Australia*). April 5. p. 15S.
• ***Summary:*** "Polished rice is the principal food,... Shoyu (soy) sauce and the many preparations of the soya bean are used in almost every dish."

"Shoyu sauce" is used to season sukiyaki, tempura, sashimi, and kabayaki (grilled eels; "A thick tasty sauce made from shoyu is poured over them").

3622. Kajita, Toshiji; Inoue, Ryohei. Assignors to Showa Sangyo K.K., Yokohama, Japan. 1941. Process for manufacturing artificial fiber from protein contained in soybean. *U.S. Patent* 2,237,832. April 8. 2 p. Original application filed 8 Sept. 1937, Serial No. 162,954. Divided and this application filed 7 June 1939. Filed in Japan 25 May 1937.
• ***Summary:*** Uses soybean protein and tartaric acid. Address: Tokyo, Japan.

3623. Comin, Donald. 1941. Notes on green vegetable varieties of edible soybeans. *Ohio Agricultural Experiment Station, Department of Horticulture, Publication* No. 58. 6 p. June 17. Mimeographed.
• ***Summary:*** "The Department of Horticulture, Ohio Agricultural Experiment Station, planted green vegetable varieties of edible soybeans for the first time in 1940." However in 1937 and 1938 such edible soybeans were grown by the Ohio State University Department of Agronomy in cooperation with the USDA at Columbus, Ohio. Data concerning these trials is show in table 2. The beans were planted on 9 June 1937 and 1 June 1938.

Table 1 shows "Notes on green vegetable varieties of edible soybeans" that were tested and have names. For each variety is given the F.P.I. number, variety name, seed color, hilum color, and number of days to maturity in Washington, DC. They are listed in ascending order of number of days to maturity as follows: Agate, (90 days to maturity), Bansei, Waseda, Chusei, Goku, Kanro, Fugi [sic, Fuji] (115 days), Willomi, Hokkaido, Sousie [sic, Sousei], Osaya, Shiro, Hakote, Sato, Hiro, Toku, Suru, Kura, Jogun, Chame (125 days), Higan, Rokusun, Aoda, Nanda (145 days).

Table 2 shows data on "green vegetable varieties of edible soybeans" grown by Dep. of Agronomy, Ohio State University, 1937 and 1938. Named varieties: Bansei, Waseda, Hakote, Fugi, Willomi, Hokkaido, Jogun, Imperial, Kura. Tables 3 and 4 show data or the same varieties in 1940. Address: Wooster, Ohio.

3624. Concepcion, Isabelo. 1941. Significance of soy bean in

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the dietary of Filipinos. *Acta Medica Philippina* 2(4):479-95. April/June. Read before the Sixth Pacific Science Congress, San Francisco, California, July 24 to Aug. 12, 1939. [28 ref]
• ***Summary:*** Contents: Introduction. Composition and nutritive value. Supplementary value of soy bean (to a rice-based diet). Forms of soy bean used in Philippines: Soy bean curd or "tokua," fermented bean curd or "tahuri," soy bean curd brain or "tojo" (served with a little thick brown sugar syrup), soybean with shaved ice or "mongo con hielo," soy bean flour, soy bean milk. Deficiencies of Filipino diet. Effects of improper food. The need for a campaign to popularize soy bean products. Conclusions.

"Soy bean is grown in many parts of the Philippines where it is known as 'utao' and also as Chinese 'Balatong.' It is grown in large quantities in Batangas Province. The green pods are harvested in October and November and the dried seeds may be had in bulk in December and January. Just when soy bean was first cultivated in the Philippines is not known. For years casual plantings have been made but it is only in comparatively recent years that the cultivation has been seriously considered as an agricultural industry. Statistics indicate that consumption of soy bean in the Philippines has grown faster than production. They also show a growing appreciation of soy bean in the Philippines."

Soy bean with shaved ice "is a very popular soy bean mixture introduced by the Japanese but now sold in nearly all refreshment parlors all over the Philippines. The preparation consists of a mixture of boiled red mongo and soy bean mixed with cream, brown sugar and ice shavings. This form of soy bean mixture is more nourishing than any other preparation just described on account of its cream and sugar content."

The consumption of soy bean products in the Philippines "does not amount to very much. The reason for this apparent neglect is the general lack of sufficient information. It is desirable that the government should initiate the necessary campaign to inform the people regarding the valuable nutritive properties of soy bean. Although the Bureau of Science since 1931 has been carrying a demonstration campaign to teach the public the different methods of cooking soy bean with the aim of popularizing its use among the masses, its efforts so far have not yielded the expected results. Another reason is the lack of a central body in the Philippines that can coordinate all the nutrition work to be carried out in that country. Furthermore, there is lacking a definite long range policy for the betterment of nutrition...

"The popularization among the masses of soy bean and soy bean products like soy bean curd, soy bean flour, and soy bean milk should be undertaken along with a more intensive campaign about its nutritive value carried on in the different schools all over the Philippines."

Note 1. In section titled "Fermented bean curd or 'Tahuri'" (4 paragraphs and 1 table), the text is a combination of that first presented by Gibbs and Agcaoili (1912) and Orosa (1932). Although the word "fermented" is used here to describe *tahuri* for the first time, no information about a fermentation microorganism or process is given.

Note 2. This is one of the earliest English-language documents seen (Sept. 2006) that uses the term "Soy bean" in a new way–as a singular noun, like corn or wheat, not preceded by "the." Examples: "Soy bean is grown in many parts of the Philippines..." "... campaign to teach the public the different methods of cooking soy bean with the aim of popularizing its use among the masses,..." Address: Dep. of Physiology and Biochemistry, College of Medicine, Univ. of the Philippines.

3625. Prat, D. de. 1941. Le soja: Matière adhésive et matière textile [Soy: Its use in adhesive and textile materials]. *Revue Internationale des Produits Coloniaux et du Material Colonial* 16(182):71-76. June. [Fre]
• ***Summary:*** A reprint of the author's article in the March 1941 edition of *Revue Internationale du Soja.*

3626. Etum or Eatum: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. Synonym: Soy Good (Morse 1948). 1941. Seed color: Yellow (straw), hilum light brown.
• ***Summary:*** Sources: Morse, W.J. 1941. "Shanghaied... a super food." *Soybean Digest.* July. p. 4-5, 10. See p. 5. Etum is an early variety, maturing in 101-110 days.

Weiss, Martin G.; Wilsie, C.P.; Lowe, B.; Nelson, P.M. 1942. "Vegetable soybeans." *Iowa Agric. Exp. Station, Bulletin* No. P39. p. 381-95. Jan. New Series. See p. 394. Table 1, titled "Summary of agronomic data and palatability scores of soybean varieties tested for suitability as human food at Ames, Iowa, 1935-1939" gives the following for Eatum [Etum]: Date green beans picked: Aug. 23. Date mature: Sept. 18. Height in inches: 22.0. Lodging: 1.6 (0 = perfect, 5 = badly lodged). Seed quality: 4.0 (0 = poor, 5 = excellent). Seed mottling: 2.4 (0 = none, 5 = much mottling). No. of beans per pound: 1,699. Mature seed yield: 19.18 bu/acre. Palatability score: 7.0 (0 = very poor, 10 = excellent).

Morse, W.J. 1948. "Soybean varietal names used to date." Washington, DC: Appendix to the mimeographed report of the Fourth Work Planning Conference of the North Central States Collaborators of the U.S. Regional Soybean Laboratory, Urbana, Illinois. RSLM 148. 9 p. May 26. See p. 3. "Etum–P.I. 86100."

USDA Production and Marketing Administration [Grain Branch]. 1948. "Soybean varieties: Descriptions, synonyms and names of obsolete or old and seldom grown varieties." Washington, DC. 25 p. Aug. See p. 6. "Etum–Introduced under P.I. No. 86100, native name 'Oyachi,' from Obihiro, Hokkaido, Japan, in 1930. Maturity, early; pubescence, gray; flowers, purple; pods, two- to three-seeded; shattering, medium; seeds, straw yellow with light brown hilum, about 1,600 to the pound; germ, yellow; oil, 19.0 percent; protein,

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44.8 percent; iodine number, 117."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 10-11. Etum is in the USDA Germplasm Collection. Maturity group: II. Year named or released: by 1941. Developer or sponsor: USDA. Literature: 13, 14. Source and other information: 'Oyachi' from the Tokachi Branch ES (Experiment Station), Obihiro, Hokkaido, Japan, in 1930. Prior designation: PI 86100. Address: USA.

3627. Jackson: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1941. Seed color: Green, with black hilum and green cotyledons.
• ***Summary:*** Sources: Morse, W.J. 1941. "Shanghaied... a super food." *Soybean Digest.* July. p. 4-5, 10. See p. 5. Jackson is a late variety, maturing in 141 or more days.

Morse, W.J. 1948. "Soybean varietal names used to date." Washington, DC: Appendix to the mimeographed report of the Fourth Work Planning Conference of the North Central States Collaborators of the U.S. Regional Soybean Laboratory, Urbana, Illinois. RSLM 148. 9 p. May 26. See p. 4. "Jackson–P.I. 82581."

Talk with Dr. Richard Bernard of Illinois. 1999. Aug. 31. There were two varieties named Jackson. The second, introduced in 1953, was named after Stonewall Jackson. It was one of many varieties named after Southern Confederate generals by southern soybean breeders. After it was released, the former name Jackson was retired and the PI number 82581 was used instead. Address: USA.

3628. Morse, W.J. 1941. Shanghaied... a super food. *Soybean Digest.* July. p. 4-5, 10. [10 ref]
• ***Summary:*** The super food is green vegetable soybeans from edible soybeans. "Attempts to secure seed of these food varieties from oriental countries through correspondence met with little success, due to the fact that the edible types were classified under another name than the soybean. During agricultural exploration work in the Orient from 1929 to 1931, many varieties of soybeans were found in Japan and Chosen [Korea] which were used solely as green vegetables or dry edible beans." These varieties have been under test for the past 8-9 years at various agricultural experiment stations throughout the United States.

A table shows 42 "edible varieties of soybeans classified according to maturity." Very early (100 days or less): Agate, Sioux. Early (101-110 days): Bansei, Chusei, Etum, Giant Green, Goku, Kanro, Kanum, Sac, Tastee, Waseda, Yellow Marvel. Medium Early (111-120 days): Fuji, Hakote, Hiro, Hokkaido, Jogun, Kura, Osaya, Sato, Shiro, Sousei, Suru, Toku, Willomi, Wolverine. Medium (121-130 days): Chame, Emperor, Funk Delicious, Illington, Imperial. Medium late (131-140 days): Aoda, Easycook, Hahto, Higan, Rokusun. Late (141 or more days): Green, and Black, Jackson, Jefferson, Nanda, Seminole.

DR. W. J. MORSE

"Most of these edible types have been found to be much superior to the commercial varieties in flavor, texture, and ease of cooking. Moreover, tests have indicated that the flour made from edible types has a better flavor than that made from commercial varieties. Some of the edible types have also been judged to be superior to commercial types in the manufacture of bean milk, roasted beans and other food products...

"One of the most promising uses of edible varieties of soybeans is as a green shelled bean and for this purpose the pods should be picked when the beans have reached the full size but are still green and succulent. The green beans resemble young, tender Lima beans and have a rich, distinctive and delicious flavor... The usual oriental way of cooking green soybeans is to boil the pods in water flavored with soy sauce or salt and serve them to be eaten from the pod."

In America, "Several commercial concerns have canned large packs of green soybeans, which have become quite popular."

Photos show: 1. Soybeans sprouts pushing up out of spherical earthenware pots at a market in East Asia. 2. A woman selling "soybean curd" ("the 'boneless meat' of millions of Oriental people") in a Korean market. 3. "In place of candy between meals, Japanese children often carry about a small bag of cooked [green] vegetable soybeans, break open the pods and lick the salty beans out with their tongues." 4. Roasted soybeans, which are used extensively in candies in Japan. 5. Portrait of Dr. [sic] William J. Morse. 6. Green vegetable soybeans (in the pods on plants, or shelled) being sold in a Korean farmers market. 7. "This Japanese farm girl has just pulled an armful of green vegetable soybean plants to prepare for market." 8. A Korean peddler with a large pack of green vegetable soybeans on his back.

Note: This is the earliest document seen (Aug. 2013) that mentions the soybean varieties Etum, Green and Black, Jackson, Jefferson, Kanum, Sac, Seminole, Tastee, Wolverine, or Yellow Marvel. Address: USDA Bureau of Plant Industry, Washington, DC.

3629. Sac: New U.S. domestic soybean variety. Large-seeded

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and/or vegetable-type soybean. 1941. Seed color: Yellow (olive), hilum black.
• ***Summary:*** Sources: Morse, W.J. 1941. "Shanghaied... a super food." *Soybean Digest.* July. p. 4-5, 10. See p. 5. Sac is an early variety, maturing in 101-110 days.

Weiss, Martin G.; Wilsie, C.P.; Lowe, B.; Nelson, P.M. 1942. "Vegetable soybeans." *Iowa Agric. Exp. Station, Bulletin* No. P39. p. 381-95. Jan. New Series. See p. 394. Table 1, titled "Summary of agronomic data and palatability scores of soybean varieties tested for suitability as human food at Ames, Iowa, 1935-1939" gives the following for Sac (80462): Date green beans picked: Aug. 21. Date mature: Sept. 7. Height in inches: 13.4. Lodging: 1.1 (0 = perfect, 5 = badly lodged). Seed quality: 3.2 (0 = poor, 5 = excellent). Seed mottling: 1.1 (0 = none, 5 = much mottling). No. of beans per pound: 1,486. Mature seed yield: 11.59 bu/acre. Palatability score: 8.0 (0 = very poor, 10 = excellent).

Morse, W.J. 1948. "Soybean varietal names used to date." Washington, DC: Appendix to the mimeographed report of the Fourth Work Planning Conference of the North Central States Collaborators of the U.S. Regional Soybean Laboratory, Urbana, Illinois. RSLM 148. 9 p. May 26. See p. 7. "Sac–P.I. 80462."

USDA Production and Marketing Administration [Grain Branch]. 1948. "Soybean varieties: Descriptions, synonyms and names of obsolete or old and seldom grown varieties." Washington, DC. 25 p. Aug. See p. 15. "Sac–Introduced under P.I. No. 80462, native name 'Furisode,' from Tokyo, Japan, in 1929. Maturity, very early; pubescence, tawny; flowers, purple; pods, two- to three-seeded; shattering, much; seeds, olive-yellow with black hilum, about 1,600 to the pound; germ, yellow; oil, 20.2 percent; protein, 44.6 percent; iodine number, 119."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 16-17. Sac is in the USDA Germplasm Collection. Maturity group: I. Year named or released: 1941. Developer or sponsor: Iowa AES (Agric. Exp. Station). Literature: 13, 14. Source and other information: 'Furisode' from Tokyo, Japan, in 1929. Prior designation: PI 80462. Address: USA.

3630. *Soybean Digest.* 1941. Hawaiians make many soybean foods. July. p. 8-9.
• ***Summary:*** Carey D. Miller, nutrition specialist at the Hawaii Agricultural Experiment Station, has described a large number of the soybean foods that Hawaiians make in Bulletin No. 68 of the Hawaii Station, "Japanese Foods Commonly Used in Hawaii" (1933). These foods include: Edamame (Green Soybeans; "The whole pod of the fresh green beans is placed in boiling salted water and cooked for about 25 minutes"), Tofu (Soybean Curd, incl. the residue known as "kirazu"), Aburage (Fried Soybean Curd), Miso, and Shoyu. A brief description is given of how each is made. Photos show: Three triangles of aburage on a dish. A dish of tôfu kasu (okara or kirazu).

Note: This is the earliest English-language document seen (Sept. 2011) with the term "soybean foods" in the title.

3631. Tastee: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1941. Seed color: Yellow (olive), hilum black.
• ***Summary:*** Sources: Morse, W.J. 1941. "Shanghaied... a super food." *Soybean Digest.* July. p. 4-5, 10. See p. 5. Tastee is an early variety, maturing in 101-110 days.

Weiss, Martin G.; Wilsie, C.P.; Lowe, B.; Nelson, P.M. 1942. "Vegetable soybeans." *Iowa Agric. Exp. Station, Bulletin* No. P39. p. 381-95. Jan. New Series. See p. 394. Table 1, titled "Summary of agronomic data and palatability scores of soybean varieties tested for suitability as human food at Ames, Iowa, 1935-1939" gives the following for Tastee (86019): Date green beans picked: Sept. 5. Date mature: Sept. 19. Height in inches: 21.0. Lodging: -. Seed quality: 3.5 (0 = poor, 5 = excellent). Seed mottling: 0.3 (0 = none, 5 = much mottling). No. of beans per pound: 1,555. Mature seed yield: 12.28 bu/acre. Palatability score: 5.6 (0 = very poor, 10 = excellent).

Morse, W.J. 1948. "Soybean varietal names used to date." Washington, DC: Appendix to the mimeographed report of the Fourth Work Planning Conference of the North Central States Collaborators of the U.S. Regional Soybean Laboratory, Urbana, Illinois. RSLM 148. 9 p. May 26. See p. 8. "Tastee–P.I. 86109."

USDA Production and Marketing Administration [Grain Branch]. 1948. "Soybean varieties: Descriptions, synonyms and names of obsolete or old and seldom grown varieties." Washington, DC. 25 p. Aug. See p. 16. "Tastee–Introduced under P.I. No. 86019, native name 'Kuro Kake Be,' from Obihiro, Hokkaido, Japan, in 1930. Maturity, early; pubescence, tawny; flowers, purple; pods, two- to three-seeded; shattering, medium; seeds, olive-yellow with black hilum, about 1,500 to the pound; germ, yellow; oil, 20.2 percent; protein, 40.4 percent; iodine number, 130."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 18-19. Tastee is in the USDA Germplasm Collection. Maturity group: II. Year named or released: by 1941. Developer or sponsor: USDA. Literature: 13, 14. Source and other information: 'Kurakake B' from the Tokachi Branch ES (Experiment Station), Obihiro, Hokkaido, Japan, in 1930. Prior designation: PI 86019. Address: USA.

3632. Wolverine: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1941. Seed color: Yellow (straw), hilum pale to light brown.
• ***Summary:*** Sources: Morse, W.J. 1941. "Shanghaied... a super food." *Soybean Digest.* July. p. 4-5, 10. See p. 5.

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Wolverine is a medium early variety, maturing in 111-120 days.

Weiss, Martin G.; Wilsie, C.P.; Lowe, B.; Nelson, P.M. 1942. "Vegetable soybeans." *Iowa Agric. Exp. Station, Bulletin* No. P39. p. 381-95. Jan. New Series. See p. 394. Table 1, titled "Summary of agronomic data and palatability scores of soybean varieties tested for suitability as human food at Ames, Iowa, 1935-1939" gives the following for Wolverine (80490-1): Date green beans picked: Sept. 3. Date mature: Oct. 9. Height in inches: 23.0. Lodging: 1.2 (0 = perfectly erect, 5 = badly lodged). Seed quality: -. Seed mottling: -. No. of beans per pound: -. Mature seed yield: -. Palatability score: 6.9 (0 = very poor, 10 = excellent).

Morse, W.J.; Cartter, J.L.; Williams, L.F. 1949. "Soybeans: Culture and varieties." *USDA Farmers' Bulletin* No. 1520 (Revised ed.). 38 p. Aug. See p. 20. "Wolverine–Selection, P.I. No. 80490-1, made in 1930 at Arlington Farm, Virginia, from P.I. No. 80490, native name 'Tamba Otsubu Daizu,' introduced from Yokohama, Japan, in 1929, used as a green shelled bean and in the manufacture of bean curd. Maturity classification, group III; pubescence, gray; flowers, purple; pods, two- to three-seeded; shattering, much; seeds, straw yellow with pale to light-brown hilum, about 1,800 to the pound; germ, yellow; oil, 21.2 percent; protein, 39.4 percent; iodine number, 131."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 18-19. Wolverine is in the USDA Germplasm Collection. Maturity group: III. Year named or released: 1941. Developer or sponsor: USDA. Literature: 14. Source and other information: 'Tamba Otsubu Daizu' from Tamba, Kyoto, Japan, in 1929. Prior designation: PI 80490-1. Address: USA.

3633. *New Canadian* (*The*). 1941. Shoyu supplies cut off–Local firm prepared to meet demand. Community consumes fifty thousand gallons annually. Aug. 22. p. 8.

• ***Summary:*** Mr. Teiichi Amano, head of Amano Bros. Ltd. makes Maruten brand shoyu bean-sauce, miso, and vinegar in his plant at 2141, 2135, 2131 Dundas Street, Vancouver, BC, Canada. In January 1941 he started to brew shoyu, which used to be imported from Japan before budget import restrictions took effect. It must age for 7-12 months. His soybeans are imported from California. For 12 years he has made miso and vinegar, and in Japan his father and grandfather made shoyu. Mr. Amano estimates that shoyu consumption in British Columbia exceeds 48,000 gallons/year. A photo shows the inside of the shoyu plant.

A large ad (5 x 4 inches) at lower left of page is titled "Amano Bros. Ltd.: Manufacturers of shoyu bean-sauce, miso, vinegar."

Note: This is the earliest English-language document seen that uses the term "shoyu bean-sauce" to refer to soy sauce or shoyu. Address: British Columbia, Canada.

3634. Ladejinsky, W.I. 1941. Manchurian agriculture under Japanese control. *Foreign Agriculture* 5(8):309-40. Aug. [37 ref]

• ***Summary:*** Japanese control of Manchurian agriculture has assumed two forms. The first, initiated shortly after the "incident" of 1931–the occupation of the country by Japan–is Japanese colonization of Manchuria on a large scale. The second and more recent phase is the establishment of a stringent control over all aspects of Manchurian agricultural economy in order to enable Japan to get a large supply of foodstuffs as soon as possible and at the lowest possible price. So far neither program has achieved the expected results.

Until about the end of the nineteenth century, the country was a primitive, sparsely settled agricultural and cattle-grazing region. Since then, however, the fertile soil, suitable climate, the laying of a network of railways, and the removal of all barriers against Chinese immigration have been responsible for the development of Manchuria into one of Asia's most important agricultural regions. The industrialization of the country during the 1930s, so energetically fostered by Japan, has produced almost no change in its rural character. The recent program of expansion of agricultural production, as compared with the downward revision of the ambitious industrialization plans, serves to emphasize the importance of agriculture.

Agricultural control in Manchuria did not come into

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its own until the Government monopolized the soybean trade, both domestic and foreign, in the fall of 1939. In order to raise exports to non-yen countries, the reduction of Manchurian prices of soybeans and bean products became a necessity. Accordingly, Manchuria instituted a comprehensive system of control over its most important industry by enacting on October 17, 1939, the Law for Control of Staple Produce. This law aims to control and regulate the price and distribution of staple products (soybeans, seeds, bean cake, and bean oil), and to expand production and exports, as well as to develop industries using such produce as raw material. The Manchuria Staple Products Company was created by a special act of October 17, 1939, to carry out these provisions.

The two acts transformed the country's leading industry into a state monopoly. The farmers must now sell their chief cash crop to the monopoly at officially fixed prices; the monopoly in turn sells to the exporters in accordance with its own regulations. The main reason for the establishment of the monopoly was to supply Japanese farmers and consumers with beans and bean products at the lowest possible price and to get possession of the remainder of the crop for the purpose of securing the much-needed foreign exchange. Address: Agricultural Economist, Office of Foreign Agricultural Relations.

3635. *Washington Post.* 1941. Japan hems in Vladivostok, Soviet 'Doorway to Pacific.' Sept. 5. p. 11.
• ***Summary:*** A bulletin from the National Geographic Society explains that Vladivostok, which 75 years ago [i.e., about 1866] was a boisterous outpost of muddy streets, wooden shacks, saloons and gambling houses, is not a modern, busy city of about 206,000 inhabitants, and a Soviet air and naval base. The picturesque harbor, known as the "Golden Horn," is normally filled with ships. It has always been a link between the vast reaches of Siberia and the outside world, yet only a few miles from the border of Japanese dominated Manchukuo. A bit further south is Chosen [Korea], also dominated by Japan. And Japanese ships dominate the waters around the port.

"Vladivostock's harbor freezes over later in December and the ice lasts until mid-April." Ice-breakers keep the way open for steamers to enter and leave the port during that time.

"Warehouses along the waterfront [in Vladivostok] ordinarily are filled with soy beans and by-products, such as soy bean oil and soy bean cakes." These are the port's main export items, along with Siberian timber and dried fish.

3636. Balzli, Jean. 1941. Le soja à travers le monde [The soybean around the world]. *Revue Internationale du Soja* 1(5):187-93. Sept. [Fre]
• ***Summary:*** Bulgaria. Hungary. Japan. Netherlands and Netherlands Indies [Indonesia]. USR. Sweden. Switzerland. Germany. Romania. United States.

In Germany, two firms have launched commercial soyfoods: 1. Hensel-Werke, of Stuttgart-Cannstatt and of Magstadt (Wurtemberg); 2. The Neue Edelsoja Gesellschaft, of Berlin. But it is in Switzerland that we find the record number of companies making soyfoods. Each of these is named and described. (1) The house of Morga S.A., of Ebnat-Kappel (near Saint-Gall), headed by M.E. Lieberherr, who was Swiss consul in East Asia. (2) The large firm of Conservenfabrik Lenzburg, of Lenzburg (between Zurich and Berne), client of the house of Morga S.A., sells a delicious spread named "Hero-Soto" composed of tomato puree thickened with soybean puree. (3) M.A. Niklaus de Bienne...

Note. This is the earliest document seen (Feb. 2013) that mentions Helsel-Werke in connection with soyfoods. Address: Dr.

3637. Iwasa, Yosaburô; Iwamoto, Kunitarô. 1941. Kôri-dofu ni kansuru kenkyû. I. Kakushu bônanzai ni tsuite [Research on dried-frozen tofu. I. Concerning the varieties of expanding and softening agents]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 19(10):748-56. Oct. [2 ref. Jap]
Address: Osaka.

3638. Mogi, Masatoshi; Nakajima, Shigeji. 1941. Miso jôzô shiken: "Homare shiro-miso" no kenkyû. XIV. [Studies on miso fermentation: Research on "homare" white miso. XIV]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 19(10):757-72. Oct. [8 ref. Jap]
Address: Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan (Noda Shoyu Kabushiki-gaisha, Shikenjo).

3639. Mogi, Masatoshi; Nakajima, Shigeji. 1941. Miso jôzô shiken: "Homare shiro-miso" no kenkyû. XV. [Studies on miso fermentation: Research on "homare" white miso. XV]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 19(10):772-79. Oct. [20 ref. Jap]
Address: Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan (Noda Shoyu Kabushiki-gaisha, Shikenjo).

3640. Mogi, Masatoshi; Nakajima, Shigeji. 1941. Miso jôzô shiken: "Homare shiro-miso" no kenkyû. XVI. [Studies on miso fermentation: Research on "homare" white miso. XVI]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 19(11):835-50. Nov. [16 ref. Jap]
Address: Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan (Noda Shoyu Kabushiki-gaisha, Shikenjo).

3641. *Soybean Digest.* 1941. Derivation [of the term "soybean"]. Nov. p. 12.
• ***Summary:*** "Julean Arnold of Berkeley, California, who spent more than 35 years in China as Commercial Attache, believes that the name 'soybean' came from the Chinese

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through the Japanese. He describes its probable origination as follows: The name is really taken from the Chinese 'chiang-yiu' which means soy-sauce, and which in Japanese is pronounced 'shou-yu,' contracted also by the Japanese into 'so-ya' but with the fundamental Chinese character for 'chiang-yiu' pronounced 'gee-ang yu.' The 'yiu' or 'yu' is the Chinese character for oil or sauce. In any event, 'chiang-yiu' means soy-sauce. The Chinese character for 'ya' means sprouts, thus the word 'tou' combined with 'ya' means bean sprouts. The Chinese equivalent for soybean is 'hwang' or 'huang-tou,' the 'huang' meaning yellow. Thus the word 'soy' carries us back to 'chiang-yiu' pronounced by the Japanese 'shou-yiu' and corrupted into 'so-ya' and further corrupted into 'soy-a' or 'soya' but really meaning soy sauce, while in English used for the whole category of legumes known as soybeans." Address: Commercial Attache, China.

3642. Japan, the new official guide. 1941. Tokyo: Tetsudôshô, Tsûrisuto Byûrô, Kokusai Kankô Shinkôkai. See p. 91. *

• ***Summary:*** Foods in the daily diet of all Japanese include "miso (bean paste used for bean soup and kinds of dressing), tohu (bean curd),..."

Note the spelling "Tohu."

3643. Matsumoto, K.; Naruse, K. 1941. Miso oyobi miso-dama-chû no saikin-rui ni tsuite. Miso oyobi miso-dama ni okeru saikin-rui no gakujutsu-teki shiken [On the bacteria in miso and miso-dama]. *Jozo Shikensho Hokoku* (*Report of the Brewing Experiment Station*) No. 129. p. 93-138. [9 ref. Jap]

3644. Matsumoto, K.; Murakami, H. 1941. [On the sediment during the pasteurization of shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 36:63-71. [Jap]* Address: Japan.

3645. Becker, Joseph A.; Froulich, Paul; Jackson, D.; et al. 1941. Agricultural statistics, 1941. Washington, DC: U.S. Government Printing Office. 731 p. For soybeans and soy products see p. 7, 299-305, 490, 494, 496, 519, 523.

• ***Summary:*** "This volume presents information formerly published (until 1935) in the statistical section of the Yearbook of Agriculture" (p. 1). "Export and import statistics of the United States include trade with the Philippine Islands. They also include any trade between foreign countries and Alaska, Hawaii, and Puerto Rico, but do not include shipments between continental United States and these possessions. Prior to January 1, 1935, the Virgin Islands of the United States were treated in the same manner as the Philippine Islands, but since that date the Virgin Islands are treated in the same manner as Alaska, Hawaii, and Puerto Rico." (p. 5). A bushel of soybeans weighs 60 lb and a gallon of soybean oil weighs 7.5 lb (p. 7). Note: No separate statistics are given for soybeans or soybean products grown in or exported to or from Alaska, Hawaii, Puerto Rico, or the Virgin Islands.

Table 392 (p. 299) gives U.S. soybean acreage statistics for the years 1924-1940, including: Acreage grown alone for all purposes, total acreage (incl. half the interplanted acres), acreage harvested for beans, yield per acre, production, price (dollars/bushel), farm value (in 1,000 dollars), foreign trade (imports and exports, year beginning in July). In 1924 for soybeans: Acreage grown alone for all purposes: 1,567,000. Total acreage: 1,782,000. Acreage harvested for beans: 448,000. Yield per acre: 11.0 bushels. Production: 4,947,000 bushels. Average price per bushel received by farmers: $2.46.

The corresponding figures in 1928 were: Acreage grown alone for all purposes: 2,154,000. Total acreage: 2,439,000. Acreage harvested for beans: 579,000. Yield per acre: 13.6 bushels. Production: 7,880,000 bushels. Average price per bushel received by farmers: $1.88.

Table 393 (p. 299) gives U.S. soybean production and farm disposition statistics for the years 1924-1940, including: Total production, used for seed (total, or home grown), fed to livestock, sold.

Table 394 (p. 300) gives U.S. soybean statistics for acreage, yield, production, and season average price received by farmers, by States, average 1929-38, annual 1939 and 1940. The states are: New York, New Jersey, Pennsylvania, Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, Nebraska, Kansas, Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Kentucky, Tennessee, Alabama, Mississippi, Arkansas, Louisiana, Oklahoma, Texas, and USA total.

Table 395 (p. 301) gives soybean statistics for acreage and production in specified countries, average 1930-34, and annual 1935 to 1940. The countries are China, Manchuria, United States, Chosen [Korea], Japan, Taiwan, Netherlands Indies, Rumania, Bulgaria, Yugoslavia, Hungary, and estimated world total.

Table 396 (p. 302) gives the average price per bushel of soybeans received by U.S. farmers each month and season average from 1930 to 1940.

Table 397 (p. 302) titled "Soybeans for seed" gives the average wholesale price per bushel at Baltimore and St. Louis, 1931-1941, each month from Jan. to May and average.

Table 398 (p. 302) titled "Soybeans for crushing" gives the average price per bushel, U.S. No. 2 Yellow, bulk, carlots, net track Chicago, 1933-40, each month from Oct. to Sept.

Table 399 (p. 303) gives statistics on amount of soybeans crushed, and production, imports, and exports of soybean oil (crude basis), and soybean cake and meal, USA, 1930-1940.

Table 400 (p. 303) gives the average price per pound of soybean oil (domestic crude) in tank cars, midwestern mills, 1929-1940, each month and yearly average.

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Table 401 (p. 303) gives the average price per pound of soybean oil (domestic crude) in drums, New York, 1931-1940, each month and yearly average.

Table 402 (p. 304) gives the average price per ton of soybean meal (41% protein), at Chicago, 1930-1940, each month and yearly average.

Table 403 (p. 305) for soybeans and soybean oil, gives international trade (exports and imports), averages 1925-1934, annual 1938, 1939. For soybeans: Principal exporting countries–China, Manchuria, United States, total. Principal importing countries–Germany, Japan, Denmark, United Kingdom, Sweden, Italy, Netherlands, Canada, total. For soybean oil: Principal exporting countries–China, Manchuria, Denmark, Japan, Sweden, total. Principal importing countries–Netherlands, United Kingdom, Italy, Germany, United States, Belgium, Chile, France, Morocco, Norway, Algeria, Austria, Czechoslovakia, Canada, USSR, total.

Table 659 (p. 490) gives U.S. exports (in pounds) of vegetable oils (incl. corn, cottonseed, linseed, cocoa butter, coconut, peanut, and soybean oil) from 1914 to 1939.

Table 617 (p. 455) gives statistics on oleomargarine–materials used in manufacture, USA, 1924-1940. Concerning soybean oil: Less than 500 lb were used in 1924 and 1925, but 33,000 lb were used in 1926. The first significant amount was used in 1930: 2.25 million lb. Note: Additional statistics on oleomargarine production and consumption in the USA are given on p. 454-57.

Table 660 (p. 494) gives U.S. imports (in pounds) of oilseeds (incl. soybeans {but no data given for 1918-1926}, sesame seeds, rapeseed) and vegetable oils (incl. olive oil, palm oil, palm kernel oil, peanut oil, perilla oil, rapeseed oil, soybean oil, and tung oil) from 1914 to 1939.

Table 662 gives imports of principal agricultural products (incl. soybean and soybean oil) into the United States, by countries, each year 1932-1940. The source countries for soybean (p. 519) are: Kwantung, Japan, China, Germany, other countries, total. The source countries for soybean oil (p. 523) are: Kwantung, Japan, China, Netherlands, other countries, total. Address: U.S. Dep. of Agriculture, Yearbook Statistical Committee, Washington, DC.

3646. Blanchard, Marcel. 1941. Le soja en France: Ses possibilités culturales. Ses débouchés industriels. Son intérêt économique [The soybean in France: Its cultural possibilities. Its industrial outlets. Its economic interest]. Paris. Societe d'Editions Geographique, Maritimes et Coloniales, 17 rue Jacob, 6eme. ii + 200 p. Illust. 22 cm. [158 ref. Fre]

• ***Summary:*** Contents: Introduction. Part 1: Cultivation of soya. 1. The soybean. 2. Soybean cultivation worldwide. 3. The varieties of soybeans. 4. The requirements of the soybean crop. 5. Sowing soybeans. 6. The soybean during its vegetative stage. 7. Harvesting soybeans. 8. Mixed cropping and intercropping of soybeans. 9. The enemies and diseases of the soybean.

10. History of soybean cultivation in France (introduction in 1739 at Jardin des Plantes under direction of Buffon, 1850–National Society for Acclimatization, around 1880 MM Vilmorin-Andrieux, M. Pailleux, M.P. Olivier-Lecq, Messrs. Lechartier, Denaiffe, Dr. Le Goff, Boulanger & Dausse, Brioux, Semichon, Carle de Carbonnières, Rouest, de Guerpel).

11. The vegetative cycle of the soybean in France. 12. The soybean at the various French agricultural research centers (*les Centres de Recherches agronomiques français*) including Centre de Versailles, Station de Dijon, de Colmar, de Clermont-Ferrand, d'Antibes. 13. The possibilities of soya in France in terms of its cultivation.

Part 2: The nutritional value of the soybean. 1. The nutritional value of the soybean.

Part 3: Utilization of soya. 1. Soybeans in the farm economy. 3. The soybean in human nutrition and in industry.

Part 4: The soybean from an economic viewpoint. 1. Commerce and trade in soybeans and soybean products up to Sept. 1939. 2. The present economic possibilities of the soybean in France. Conclusion. Bibliography. 16 illustrations. 8 maps.

The introduction begins: "In a letter written on 15 Jan. 1935, on board the *Chenonceaux* which was sailing toward Shanghai, Li Lu-Ying [sic, Li Yu-ying], president of the National Academy of Peiping (l'Académie Nationale de Péping) offered to furnish us with the translation of important documents in the Chinese, Japanese, and Russian languages concerning all aspects of soya. Let him find here the expression of our gratitude, because he introduced us to a plant, in which there is more interest abroad than in the country of its origin."

The publisher was formerly named Maison Challamel, founded in 1839.

Illustrations show: (1) The branch of a soybean plant, with the flowers and young pods, enlarged 3x. (2) The flower of a soybean plant as it is about to open, enlarged 5x. (3) A soybean branch with mature pods and leaves, enlarged 2x. (4) Two views of a soybean seed with parts labeled. C = chalza (*chalze*). H = hilum (*hile*). M = micropyle (*micropyle*). R = radicle (*radicule*). A-H = hypocotyl axis (germ) (*axe hypocotylé*). G = raphe, bud, leaf-bud (*gemmule*). Enlarged 3x. Note: The raphe is a small grove extending to the chalza, where the integuments were attached to the ovule proper.

(5) Microscopic view of a transverse section of the seedcoat: C.P. = palisade layer of cells (*cellules en palisade*). C.S. = hourglass cells (*cellules en sablier*). P.E. = spongy parenchyma (*parenchyme externe*). C.A. = aleurone layer (*cellules à aleurone*). P.I. = remains of parenchyma cells of endosperm or internal parenchyma (*parenchyme*

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interne). Enlarged 247x. (6) Cells of the epidermis facing the microscope. Enlarged 460x. (7) Microscopic view of a transverse section of a cotyledon, two views, showing starch grains (*grain d'amidon*), oil droplets (*oléolaste*), and aleurone grains (*grain d'aleurone;* high in protein). (7a) Six large maps of soy in Asia and in Oceania, in North America and in South America, in Europe and in Africa in 1939 (p. 12-36). (8) Nodules containing nitrogen-fixing bacteria on the roots of a soybean plant (p. 66). (9) Planting soybeans; a man walks behind a planter pulled by two horses (p. 84). (10) Cultivating soybeans; a man sits on a cultivator pulled by two horses (p. 89). (11) A field of long, straight, weed-free rows of soybeans in the United States. (12) Drying of soybean hay in shocks. (13) Harvesting soybeans; a man sits on a harvester pulled by two horses. (14) Threshing soybeans using a machine (p. 99). (15) Intercropping of soya and maize. (16) The soybean variety Lisbonne growing at the Central Station for Seed Trials (*Station Central d'Essais d Semences*) (p. 122). (17) Map of France with isotherm lines of July and a line showing the northern limit of maize cultivation (p. 134).

Tables: (1) Asiatic varieties: Chinese and Manchurian varieties (6 varieties), varieties from the British Indies (7), from the Dutch Indies (11), Japanese varieties (17).

(2). American varieties: Canadian varieties (7), U.S. varieties (40 varieties) (for each is given: Days to maturity, flower color, seed color, color of the oil, oil content, protein content, weight of 1,000 seeds in grams, seed yield (in kg/ha), yield of hay containing 15% moisture (in kg/ha)). (3) European varieties: German (7), Austrian (3), English (4), Italian (1), Polish (7), Czech (9), Soviet Russian (9).

Mineral needs of the soybean. Yield of two soybean varieties, with and without inoculation. Yield of three soybean varieties with and without inoculation. Germination percentages of 8 French soybean varieties at the Station Centrale d-Essais de Semences in 1938-39 (ranges from 91% to 100%). Variation in the composition of soybean hay at 4 stages of maturity. Weight of seeds vs. straw for 10 U.S. soybean varieties (the straw weighs 1.5 to 2.7 times as much as the seeds). Average yield of soybeans in four countries in 1933 (in kg/ha): Manchuria 1,200. Japan 1,000. Korea 650. China 950. Length of the vegetative cycle at four stations with 10 varieties in France (ranges from 98 to 157 days). Length of the vegetative cycle at four more stations with 16 varieties in France (ranges from 95 to 172 days). 18 varieties that completely matured their seeds at 2 stations in 1921 and in 1922. Oil and protein content of 7 French soybean varieties at Station de Clermont-Ferrand. The seed yield of 10 soybean varieties at the same station. The seed yield of 6 soybean varieties at Station d'Antibes. Six tables (p. 138-42) on the nutritional value of soybeans. Six tables (p. 148-61) on the utilization of soybeans in the farm economy and for feeding animals 2 tables (p. 162-42) on the soybean in the human diet and in industry. 5 tables (p. 175-42) in trade in soybeans and its by-products. 7 tables (p. 181-86) on the present economic possibilities of the soybean in France.

Chinese and Manchurian varieties soybean varieties (p. 48): Chu Yen Tou Erh, Kung-Chu-ling pai Mei, Pai Hoa Tso Tse, Su Li Huang, Ta Li Huang, Tieh Chia, Tou Tse.

Soybean varieties from the British Indies (*des Indes britanniques*) (p. 48): Behrum, Hto-nao, Hto-nang, Mirjanhat, Pekyat-pyin, Pe-Ngypi [pè-ngapi], and Santonauk. Note: According Thompstone & Sawyer (1914), some of the above names are the names of the yellow soybean in different parts of Burma.

Soybean varieties from the Dutch Indies (*des Indes néerlandaises*) (p. 48): Djepoen, Idjo, Ireng, Krawe, Mentik, Poetik, No. 16 sélectionné, No. 17 sélectionné, No. 27 sélectionné, No. 28 sélectionné, No. 29 sélectionné.

One variety from Indochina (p. 48) is Langson.

Soybean varieties from Japan (p. 50): Akasaya, Banseihikarikuro [Bansei hikari kuro], Chinseihikarikuro [Chinsei hikari kuro], Gindaizu [Gin daizu], Ishikarishiro [Ishi kari shiro], Kanro, Kurosaya, Mitsuishidaizu [Mitsuishi daizu], Naktchadaka, Oyachi no. 2, Rankoshi no. 1, Shimoshirazu no. 1 [Shimo shirazu no. 1], Shirokotsubu, Shirotsurunoko, Tsurunoko, Wasehodaka / Waschodaka, Yoshiokatairin [Yoshio katairin].

Soybean varieties from Canada (p. 50): A.K. (Harrow), Brun du Manitoba, Soja jaune de Montréal / Montreal, Soja jaune de Québec / Quebec 92, Manchu (Hudson), Mandarin (Ottawa), O.A.C. No. 211. Address: Directeur interimaire, Station d'Essais de Semences (Ministere de l'Agriculture), France; In 1946 Chef de Travaux at this station.

3647. Fallon, F. (Baron). 1941. Le soja [The soybean]. *Belgique. Ministere des Colonies. Direction Generale de l'Agriculture et de l'Elevage. Propagande et Vulgarisation Agricoles* No. 21. 39 p. Bruxelles: Impr. Industrielle et Financiere. [17 ref. Fre]

• ***Summary:*** Contents: Botanical description: Introduction, the plant's needs, varieties. Soybean cultivation in Europe: Introduction (for some countries preferred early, medium, and late varieties are listed), France, Great Britain, Hungary, Poland (selection has been done at the Wilna experiment station using varieties imported from Hungary and Czechoslovakia), Romania (About 30,000 ha are devoted to soybeans, primarily in Bessarabia [Besarabia], Dobrouja [Dobrudja, Dobrogea], Bukovina [Bucovina], Walachia or Wallachia or Valachia [now called Muntenia, a fertile belt across southern Romania], and Moldavia. Most of these varieties came from Austria), Switzerland, USSR (the main soybean regions are all warm ones–the Caucasus, Ukraine, and Transcaucasia). Soybean cultivation in America. Soybean cultivation in Africa (especially in South Africa, mainly for forage in the Natal and Transvaal). Soybean cultivation in Asia: China and Manchuria, Malaysia, British Indies, Dutch Indies, Indochina, Japan. Soybean cultivation

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in Oceania (mainly Philippines).

Cultivation: Crop rotation, inoculation, planting and propagation, maintenance and manuring the land, harvest, seed storage, yield, selection of varieties. Soybean utilization: As human food (dry soybeans, soy sauce, soy flour, soymilk, tofu, soy oil), industrial uses (soy oil, refining and use, soymilk casein). Soya as a fertilizer: Green manure, or soybean cakes. Soya as a feed for domestic animals: Green forage, hay, silage, pasture, seeds, cakes. Soybean cultivation in the Belgian Congo. Soybean trade.

In the Congo various soybean trials have been undertaken since 1936 at the stations of the National Institute for Agronomic Study of the Belgian Congo (l'Institut National pour l'Etude agronomique du Congo Belge). Numerous varieties from the USA and Manchuria have been tested. Address: Directeur au Ministere des Colonies, Professeur a l'Institut Agronomique de Gembloux [Belgium].

3648. Japan-Manchoukuo Year Book. 1941. Tokyo, Japan: Japan-Manchoukuo Year Book Co. Index. 26 cm. Eighth annual issue. [Eng]

• ***Summary:*** This is the last issue. Each year book is divided into two main parts: Japan, and Manchoukuo. This book was published in mid-March 1941.

In the Japan and Manchoukuo parts of the book, soya beans are most widely discussed in the respective chapters on Agriculture. In each case, information given the previous year is updated one year.

Page 289-90. In the chapter on "Agriculture and stockbreeding" in Japan, Table 19 shows "Production of various grains, potatoes, etc." in koku from 1927 to 1939. 1 koku = 1.803 litre = 5.11902 dry bushels (USA). For soya bean:

2,606 million koku in 1938

1.948 million koku in 1939

Table 19B gives the value of each crops (in yen) from 1927 to 1939. Other crops in this table are oats, millet, barnyard millet, proso millet, maize, buckwheat, red bean, sweet potato, and Irish potato.

Page 391. In the chapter on "Chemical industry" "Imports of commercial fertilizers" from 1931 to 1938 include "Bean-oil cake," the imports of which decreased from 1.032 million metric tons in 1931 to a low of 0.376 million metric tons in 1936, then began to increase to 0.849 million metric tons in 1939.

Page 403. In the same chapter Table 38 shows "Vegetable oil production" with quantity in metric tons and value in yen, from 1930 to 1938. Soya bean oil production increased from 36,977 metric tons (mt) in 1930 to 65,711 metric tons in 1938–making it the leading vegetable oil produced in Japan.

Page 446, in the chapter on "Commerce," Table 13 shows the "Average wholesale price of staple commodities in Tokyo" in yen per koku, average December each year from 1934 to 1939. The brand of soya beans was "Manchu White." The price dropped from a high of 19.37 yen in 1936 to a low of 7.70 yen in 1937, then rose to 13.90 in June 1940.

Page 455, in the chapter on "Foreign Trade," a table shows trade of "Oil cake" from 1927 to 1st half of 1940. The amount decreased from 1927 to 1936 then increased thereafter.

Page 460 in the same chapter contains a very large table titled "Imports by countries of origin" in yen from 1933 to 1938. Categories include "Oil cake," which has increased from 41,181 in 1933 to 104,639 in 1939. Manchoukuo is the main country of origin, followed by Kwantung Province, then China, then British India, then D.E.I. [Dutch East Indies].

Page 684, in the chapter on "Agriculture" in Manchoukuo, a large table shows "Output of principal of crops (metric tons)" from 1924 to 1939. For soya beans: 4.091 million metric tons in 1938. 3.956 million metric tons in 1939.

The other principal crops shown in the tables are other beans, kaoliang, millet, maize, wheat, rice, upland rice, and other cereals.

Page 778, in the chapter on "Commerce," Table 12 shows "Wholesale prices of principal staple commodities in Hsinking [Changchun, in Jilin province] from 1934 to 1940 in M¥ [million? yen]. The price of 1st grade soya beans went from 3.36 per 100 kin in 1934 to 7.69 per 100 kin in Dec. 1940. Wholesale prices for bean cake and bean oil also underwent dramatic inflation.

Page 812-13, in the chapter on "Manufacturing industries," has a long section "IV. Bean oil & cake." The four principal cities of manufacturing in Manchoukuo are Dairen, Yingkow, Antung, and Harbin. Table 20 shows "Output of bean oil at the principal cities" in 1,000 kin [1 kin = 0.6 kg] from 1932 to 1938. The leading city by far was Dairen. The total bean oil produced decreased at the four centers decreased from 221.061 million kin in 1932 to 97.255 million kin in 1938, then rose sharply to 127.850 million kin in 1939.

Pages 813-14, and their tables, are very similar to their counterparts in the 1940 year book.

3649. Photo of John Takeo Tadano, owner of Marusho Shoyu. 1941.

• ***Summary:*** The inscription on the photo reads: "To Nakatsu family. Always, John Tadano. '41." Sent to SoyInfo Center by Barbara Y. Peters, his daughter (Nov. 2008). Barbara writes: "My father was a food broker, I believe, for Japan Foods. He had attended Phoenix College, but when World War II started he was not able to continue. I gather he was also on the football team as quarterback when the war broke out. He was stripped of the title Homecoming King too."

3650. Sakanishi, Shiho. 1941. Beikoku Gikai Toshokan

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Sakanishi shiryo. Food culture of Japan (drafts). Washington, DC: Library of Congress. 84 sheets. 27 cm. *
• ***Summary:*** Shiho Sakanishi was born in 1896.

3651. Saris, John. 1941. The first voyage of the English to Japan. Transcribed and collated by Takanobu Otsuka. Tokyo: Toyo Bunko. xxxii + 266 p. 26 cm. Supplementary volume. [3 ref]
• ***Summary:*** A transcription of the original manuscript, which was published in a facsimile edition in 1940. The original manuscript has the title: *The first voyage of the English to the islands of Japan.*

On 29 Aug. 1613, while in Japan (near Shizuoka), Saris wrote: "Of Henns they haue greate store, as likewise of Deere, both redd and fallowe wilde bores, hares Goates Kyne etc. Of theese they haue plentie, butter they make none, Neither will they eate any Milke, because theie hould it to be as bloode, nor tame beasts."

Note 1. The word transcribed from the original manuscript as "Cheese" by Satow in 1900 is transcribed here by the Japanese as "theese."

Note 2. John Saris died in 1646.

3652. Thunberg, Karl Peter. 1941. Tsunberugu no nihon kikô [Thunberg's voyages in Japan]. Tokyo: Okugawa Shobo. Translated by Yamada Tamaki from original edition of 1796. [Jap]*

3653. *Miso Shoyu Kogyo* (*The Miso and Shoyu Industries*). 1941--. Serial/periodical. Tokyo: The Soy Society. Monthly. [Jap]*
• ***Summary:*** The book *Japanese Serial Publications in the National Agricultural Library* gives the English title as "The Soy and Miso Sauce Industry." Address: Tokyo, Japan.

3654. Daizu ni kansuru sankô bunken [Bibliography on soybeans]. 1941? Tokyo: Kikakuin Daiyonbu Dainika. 22 p. [Jap]*

3655. **Product Name:** [Silkool (Artificial Silk-like Filament from Soy Protein Fiber)].
Foreign Name: Silkool.
Manufacturer's Name: Showa-Sangyo.
Manufacturer's Address: Japan.
Date of Introduction: 1941?
Ingredients: Soy protein.
New Product–Documentation: Prat. 1941. Revue Internationale du Soja. March. p. 49-54. In Japan, Showa-Sangyo makes and sells a product named "Silkool," which is an artificial fiber made from soy protein and which would have characteristics similar to that of Lanital.

3656. Dei, Kooiti. 1942. Ueber die Inaktivierung der Sojaurease durch Borsaeure [The inactivation of soy urease using boric acid]. *Tohoku J. of Experimental Medicine* 42(1):93-100. Jan. 31. [9 ref. Ger]
Address: Medical-Chemical Institute, Faculty of Medicine, Imperial Tohoku Univ., Sendai [Japan].

3657. Miller, Harry W. 1942. Answering America's protein problem! *Soybean Digest.* Jan. p. 6.
• ***Summary:*** "Editor's Note: Dr. Miller, whom we here introduce to the readers of The Soybean Digest, is a leader of the soybean food industry. President of the International Nutrition Laboratory, Mt. Vernon, Ohio, manufacturers of Miller's Soya Foods, he has had a most interesting career.

"Graduating in medicine in Chicago in 1902, he went to China the next year as a medical missionary under the Seventh-day Adventist board. He spent 8 years in the interior of China, and then was transferred to the superintendency of the Washington Sanitarium and Hospital, Tacoma Park, D.C., where he remained from 1913 to 1925.

"Returning to China in 1925, he established several medical centers in that country and in Japan, Korea, the Philippines and the Malay Peninsula.

"Becoming interested in dietary problems, because his specialty, goiter surgery, was directly concerned with a dietary deficiency condition, and because of the high Oriental mortality rate due to malnutrition, he began studying the food products which might ease the situation.

"This led him to the soybean, because, he observed, malnutrition was not nearly so acute in those sections in which the soybean was an article of diet.

"In 1936 Dr. Miller established a food plant in Shanghai from which he manufactured milk from the soybean. As he puts it: 'This work was nicely underway when the Japanese invasion of Shanghai resulted in the complete destruction of the plant, and after a year of waiting I again returned to America and established in Mt. Vernon the International Nutrition Laboratory where we have specialized on the processing of the soybean, not only studying varieties best suited for human food, but methods of preparing the bean and also developing processing equipment, that will give us a more satisfactory product."

"Dr. Miller has an interesting statement regarding the use of Soya Milk in infant feeding: 'In this country nearly a score of babies that we are in touch with have either been started on Soya Milk or have been transferred to it very shortly after birth, and the number of users of Soya Milk for infants are increasing very rapidly. Our results of feeding large numbers of babies and children are to be found in the National Medical Journal of China.'"

"Soybean foods for human consumption have to date been scarcely available in America, and the question arises: Why bother to supplement a dietary which is already so abundant?

"Still, it would seem strange it the raw material which has been a mainstay in the Oriental diet for so many

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centuries could not be utilized in the American diet. It can be!

"That part of the American diet most often lacking is protein. Most animal proteins are cumbered with toxins, and most vegetable proteins are inadequate for nutrition.

"Soybeans the Answer: The soybean provides the answer to the protein problem. With a protein content of more than 40 per cent, it is the best source of protein which we have. Its protein is biologically equal to that of meats and animal foods, and it has the advantage of being free from toxins.

"The effectiveness of the soybean is strikingly demonstrated in China. Where vegetable protein is abundantly supplied in the diet as in Manchuria, and in North China, we have a stalwart race of people. However, in South China where the major products are oil and sugar we see dwarfed bodies and it is a rare exception to find in the warm climate among oil and carbohydrate feeders a single well-developed individual." A photo shows "The International Nutrition Laboratories, Mt. Vernon, Ohio, home of 'Miller's Soya Foods.'" The building is large, and appears to be constructed from bricks. Address: M.D., International Nutrition Lab., Mt. Vernon, Ohio.

3658. *Chicago Daily Tribune.* 1942. Java–Its a crowded corner of the rich Indies' storehouse. Feb. 4. p. 6.
• ***Summary:*** Yesterday, Java was subjected to its first Japanese air raid. "It is the heart of the Netherlands East Indies, the most densely populated area in the world, and one of the richest in natural resources." Its population, together with that of Madoera [Madura island, administered as part of East Java], is approximately 42 million.

Roughly 40-50% of the land on Java is cultivated–the remainder being mostly forests or mountains. The main crops are rice, rubber, sugar cane, cassava, millets, sweet potatoes, soy beans, kapok...

Includes a good historical overview of the European powers in Java; the Portuguese were the first to arrive.

3659. Chevalier, Aug. 1942. Production mondiale de graines de Soja [World soybean production]. *Revue de Botanique Appliquee & d'Agriculture Tropicale* 22(245-246):98-99. Jan/Feb. [Fre]
• ***Summary:*** The world's leading soybean producers in the mid- to late 1930s, in terms of million tonnes produced, were: China 5.01, Manchuria 4.32, USA 1.57, Korea 0.507, Japan 0.367, and the Netherlands Indies [Indonesia] 0.288. Address: France.

3660. Mogi, Masatoshi; Nakajima, Shigeji. 1942. Miso jôzô shiken: "Homare shiro-miso" no kenkyû. XVIII. "Waki," sokushin shiken [Studies on miso fermentation: Research on "homare" white miso. XVIII Test to promote *waki*]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 20(2):107-13. Feb. [6 ref. Jap]
• ***Summary:*** In this article, the Japanese noun *waki* is difficult to translate into English. Related verbs are *wakikaeru* = to seethe, ferment, or boil up; *wakideru* = to bubble up; *wakiagaru* = to boil up, arise. Two possible translations are "overfermentation" or "bubbling from fermentation." Address: Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan (Noda Shoyu Kabushiki-gaisha, Shikenjo).

3661. Mogi, Masatoshi; Nakajima, Shigeji. 1942. Miso jôzô shiken: "Homare shiro-miso" no kenkyû. XIX. "Waki," bôshi shiken [Studies on miso fermentation: Research on "homare" white miso. XIX. Test to stop *waki*]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 20(3):155-68. March. [6 ref. Jap]
• ***Summary:*** In this article, the Japanese noun *waki* is difficult to translate into English. Related verbs are *wakikaeru* = to seethe, ferment, or boil up; *wakideru* = to bubble up; *wakiagaru* = to boil up, arise. Two possible translations are "overfermentation" or "bubbling from fermentation." Address: Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan (Noda Shoyu Kabushiki-gaisha, Shikenjo).

3662. Dies, Edward J. 1942. Tables (Document part). In: E.J. Dies. 1942. Soybeans: Gold from the Soil. New York, NY: The Macmillan Co. 122 p. April. 21 cm.
• ***Summary:*** Tables show: (1) U.S. soybean acreage, yield, and production, 1924-1941 (p. 5). During this time acreage has increased more than 12-fold from 448,000 to 5,855,000 acres. Yield as increased 88% from 11.0 to 20.7 bushels/acre. Production has increased more than 21-fold from 4.947 million to 106.712 million bushels.

(2) Soybean production in specified countries and estimated world total (p. 10-11). The countries are: China, Manchuria, United States, Chosen [Korea], Japan, Netherlands India [later Indonesia], Kwantung [Leased Territory], Taiwan, U.S.S.R., Rumania, Bulgaria, Yugoslavia, other Europe (incl. Poland, Czechoslovakia, and what was formerly Austria).

(3) Illinois soybean acreage, yield, and production, 1919-1941 (p. 25). Production (in bushels) increased from 30,000 in 1919, to 46,000 in 1920, to 167,000 in 1921, to 812,000 in 1922, to 1,431,000 in 1925, to 6,970,000 in 1930, to 24,012,000 in 1935, to 34,912,000 in 1940, to a peak of 49,128,000 in 1941.

(4) "Soybean varieties–Origin and varietal characteristics" (p. 38-47). For each variety is given: Place of origin, year introduced to USA, days to mature, flower color, pubescence color, seed characters (seed coat color, germ color, hilum color, seeds per pod, seeds per pound, oil percentage, protein percentage), use (de = dry edible beans, f = forage, gra = grain, gv = green vegetable).

Soybean varieties described in the table on p. 38-47 are:

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Agate, A.K., Aksarben, Aoda, Arisoy, Arksoy, Avoyelles, Bansei, Barchet, Biloxi, Black Eyebrow, Cayuga, Chame, Charlee, Chief, Chernie, Chestnut, Chiquita, Chusei, Clemson, Columbia, Creole, Delnoshat, Delsta, Dixie, Dunfield, Easycook, Ebony, Elton, Emperor, Etum, Fuji, Funk Delicious, George Washington, Georgian, Green Giant, Goku, Habaro, Haberlandt, Hahto, Hakote, Harbinsoy, Hayseed, Herman, Higan, Hiro, Hokkaido, Hollybrook, Hongkong, Hoosier, Hurrelbrink, Illini, Ilsoy, Imperial, Ito San, Jogun, Kanro, Kanum, Kingwa, Kura, Laredo, Lexington, Macoupin, Magnolia, Mamloxi, Mammoth Brown, Mammoth Yellow, Mamredo, Manchu, Mandarin, Mandell, Mansoy, Medium Green, Midwest, Mingo, Minsoy, Missoy, Monetta, Morse, Mount Carmel, Mukden, Nanda, Nanking, Norredo, Ogemaw, Old Dominion, Oloxi, Ontario, Osaya, Otootan, Ozark, Palmetto, Patoka, Pee Dee, Peking, Pine Dell Perfection, Pinpu, Richland, Rokusun, Sato, Scioto, Seminole, Seneca, Shiro, Sioux, Sooty, Sousei, Southern Green, Southern Prolific, Soysota, Suru, Tarheel Black, Tastee, Toku, Tokyo, Virginia, Waseda, Wea, White Biloxi, Willomi, Wilson, Wilson Five, Wisconsin Black, Wood's Yellow, Yelredo, Yokoten.

(5) U.S. production and crushing of soybeans, and production of soybean oil and meal from 1924 to 1941 (p. 53, based on government reports). Domestic production of soybean oil, only 2.2 million lb in 1924, had increased almost 6-fold by 1929 to 13.424 million lb. Then in June 1930 the protective Smoot-Hawley tariff went into effect. By levying a tariff on imported soybeans and soybean oil, it stimulated domestic soybean crushing and production. Oil production (in million lb) jumped immediately, from 13.424 in 1929 to 34.688 in 1930 (even though the Great Depression had begun), to 208.9 in 1935, to 565.2 in 1940. Note: A semi-log graph of U.S. soy oil production vs. time shows that it increased at the most rapid rate from 1924 to 1935. This rate decreased slightly between 1935 and 1942, then decreased again from 1942 to about 1980.

(6) Soybean oil imported and exported (pounds to and from USA, from 1912 to 1940) (p. 58). The first soybean oil was exported from the USA in the latter half of 1919. At least 1 million pounds/year was exported from that time until 1940. The peak year was 1920, when 46.7 million lb were exported. Source: Department of Commerce, Bureau of the Census.

(7) Factory consumption of soybean oil by classes of products, 1931-1940 (p. 61). The classes are: Compounds and cooking fats [shortening], oleomargarine, other edible products, soap, paint and varnish, linoleum and oilcloth, printing ink, miscellaneous, foots and loss, total. In 1931 and 1932, and in most subsequent years, the leading class was shortening. In 1939 the top four classes were (in million lb): shortening 212.3, oleomargarine 87.1, other edible products 39.9, and paint and varnish 29.8. Source: Bureau of Census reports.

(8) Supplies of feed in 1939 (p. 78). Feed supplies are composed of feed grains (91.73% of the total), cereal by-products (5.16%, including wheat meal products, gluten feed, distillers and brewers dried), and oil and cake meals (3.10%, including cottonseed {1.55%}, soybean {1.04%}, linseed {0.32%}, and other 0.17%). Address: USA.

3663. Ladejinsky, W.; Rossiter, Fred J. 1942. Food situation in far eastern and southeastern Asia. *Foreign Agriculture* 6(4):147-64. April.

• ***Summary:*** Rice is the most important food product in all of the countries except North China and Manchuria. Following the Japanese invasion of 1931, soybean production dropped, declining 38% by 1934. Between 1935 and 1939 agricultural output increased once again, though it did not attain previous levels. Then beginning in 1939, a new decline in agricultural production set in. This coincided with the establishment of a stringent control over all aspects of Manchurian agricultural economy in order to enable Japan to get a large supply of foodstuffs as soon as possible and for as little as possible. Because of the opposition of the Manchurian farmers to this scheme, the shortage of both human and animal labor, and not altogether favorable climatic conditions–the soybean crop was reduced from 157 million bushels in 1938 to 145 million bushels in 1939 and in 1940 and 1941 to an estimated 125 and 115 million bushels, respectively. The net effect of reduced production has been a sharp decline in agricultural exports.

Since soybeans and soybean products constitute Manchuria's leading export crop, the exported volume of these products is especially revealing. In 1939-40 (October-September) Manchuria exported 25 million bushels of soybeans, 775,000 short tons of beans cake, and 150 million pounds of bean oil, as compared with 77 million bushels, 1.1 million short tons, and 220 million pounds of soybeans, cake, and oil, respectively, the previous year.

This decline in Manchurian soybean exports affected Japan's food supplies adversely. Aside from the direct use of soybeans for food, probably the most important soybean product from the viewpoint of diet is bean curd [tofu], one of the main sources of protein for the great majority of the Japanese urban population. In 1939-40 Japan was able to get 41 million bushels of soybeans (including cake and meal), against 58 million the previous year. In 1940-41 Japan increased its soybean takings to 48 million bushels, but it was much below the planned record import volume of 84 million bushels. Address: Office of Foreign Agricultural Relations [USDA].

3664. Mogi, Masatoshi; Nakajima, Shigeji. 1942. Miso jôzô shiken: "Homare shiro-miso" no kenkyû. XX. "Waki" kôbo ni tsuite [Studies on miso fermentation: Research on "homare" white miso. XX. The yeasts involved in *waki*]. *Jozogaku Zasshi* (*J. of Brewing, Osaka*) 20(4):258-63. April.

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[6 ref. Jap]
• ***Summary:*** In this article, the Japanese noun *waki* is difficult to translate into English. Related verbs are *wakikaeru* = to seethe, ferment, or boil up; *wakideru* = to bubble up; *wakiagaru* = to boil up, arise. Two possible translations are "overfermentation" or "bubbling from fermentation." Address: Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan (Noda Shoyu Kabushiki-gaisha, Shikenjo).

3665. Iwasa, Yosaburo. 1942. Daizu-chû no sainyû busshitsu ni kansuru kenkyû. VI. Kesshô busshitsu no sainyû kôka [Study of a substance in soybeans which stimulates production of milk. VI. Effect of crystalized materials in inducing milk production]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 18(6):577-80. June. (Chem. Abst. 45:4315). [4 ref. Jap]
• ***Summary:*** Soy saponin A stimulated lactation in albino rats, rabbits, and women.

3666. Mogi, Masatoshi. 1942. Miso jôzô ni kansuru kôbo no kenkyû (hoi). II. Seirigaku-teki seishitsu [Studies on the yeasts in miso fermentation (addenda). II. Physiological characteristics]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 18(7):629-41. July. [Jap]
Address: Noda Shoyu K.K. Shikenjo (Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan).

3667. Burlison, W.L. 1942. Soybeans. Paper presented on Aug. 21. 7 p. 28 cm.
• ***Summary:*** It is not known to what group or where Prof. Burlison presented this paper, which begins: "Almost overnight the midwest has boomed as an 'arsenal' of food and oil for the United Nations, and it has done it with one of Japan's own crops–the soybean.

"Today, less than a year after Pearl Harbor, precious war material is being rolled out in a record crop of more than 14 million acres of soybeans, most of which is concentrated in five or six midwestern states. Out of those beans will come four and a half million tons of oil–oil for explosives, for food, for paint and varnish for U.S. fleets and oil medicines."

"If agriculture has any miracles, this is one of them, and only the midwest could have done it. Science, fertile fields, big farms and power machinery, coupled with the cooperation and pioneering spirit of industry and of organized agriculture, have made a major industrial and wartime crop out of what was once little more than a curiosity and a luxury. Even until just recently it was just 'cattle and hog feed,'"

In 1804 soybeans were first grown in the United States in Pennsylvania. In 1829 Thomas Nuttall tried growing the soybean in a botanical garden in the eastern United States.

"Midwest 'pioneers' mentioned along with Morse as champions and sponsors of this 'wonder' crop are Profs. W.L. Burlison, J.C. Hackleman and C.M. Woodworth, of the University of Illinois; Illinois farmers such as the late Charles L. MeHarry [sic, Meharry], John T. Smith and W.E. Riegel; Profs. W.A. Ostrander and Keller Beeson, of Purdue University; Fouts Brothers, on whose Indiana farm the American Soybean Association was organized; Johnson Brothers, Ohio farmers [Edward Franklin "Soybean" Johnson (1889-1961), and Elmer Solomon Johnson (1879-1920) of Stryker, Ohio], and I.C. Bradley, pioneer processor of soybeans.

"As a result of their pioneering efforts single farmers in Illinois are now growing more soybeans than were grown in the entire United States 40 or 50 years ago. Alfred and Eugene Knight, for instance, have 1,040 acres in soybeans on the 1,800-acre tract they are farming near Fithian, Illinois. They have 700 acres planted in rows for cultivation and weed control, and 480 acres in a single field. At one place on their land there are beans for a solid mile."

J.E. Johnson, manager of the Knight farms, is vice-president of the American Soybean Association, chairman of the Illinois Farm Chemurgic Council, and a member of the board of directors of the Illinois Crop Improvement Association.

"As recently as 1909 only 2,000 acres of soybean were reported in the census figures for the whole of the United States, and most of these were grown for hay and feed." "All this has meant a sweeping diversification of midwest agriculture."

Location: Univ. of Illinois at Urbana Archives, Department of Agronomy Subject File, Record Series 8/6/2, Box 18. Folder: Soybeans. Address: Urbana, Illinois.

3668. Mogi, Masatoshi. 1942. Miso jôzô ni kansuru kôbo no kenkyû. III. Bunri seru kôbo no bunrui narabini ruien oyobi hyôchô (4) [Studies on the yeasts in miso fermentation. III. Classification of isolated yeasts (4)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 18(8):733-41. Aug. [Jap]
• ***Summary:*** Genera discussed include Zygopichia, Hansenula, Pseudohansenula, Torulopsis, Pseudomycoderma, and Pseudomonilia. A number of new species are claimed. Address: Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

3669. Bunnell, D.J. 1942. Soybean oil in the war time economy. *Soybean Digest.* Oct. p. 4.
• ***Summary:*** Germany has long needed to import large amounts of edible oils. Anticipating war, Germany prepared for the time when she would be cut off from world trade. A program was instituted to build stock-piles and plans were made to increase production within her zone of influence. In 1937 Germany imported 21½ million bushels of soybeans from Manchuria, up from 16 million bushels in 1936.

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Indications of stock-piling were first apparent in 1937, and increased progressively up until the war started in 1939.

After extensive experiments, Germany found that she was not well suited to large production of oil-bearing seeds. Her best potential source of new supply was from corn-growing countries within her zone of influence in southeastern Europe. Germany's Ministry of Agriculture worked out a plan in which Bulgaria and Romania were guaranteed 10% better return per acre, independent of yield, if they would convert corn acres to growing soybeans. The results were not large, yet several million bushels of soybeans were grown to add to Germany's oil supply. "During the present growing season, soybeans have been planted in the conquered territory of the Ukraine."

In the spring of 1940 when Germany invaded Norway, the 60-70 million pounds/year of mostly fish oil that the USA imported from Norway were cut off. When Germany moved into Spain, southern France, Italy, and Greece, American imports of about 100 million pounds/year of olive oil were cut off. Yet as long as the war was confined to Europe, the USA was not seriously handicapped. Our total imports of edible oil had amounted to 1½ to 2 billion pounds/year before the war; so we had lost only about 10% of our imports.

The picture changed abruptly in Dec. 1941 when Japan invaded the Philippines and the South Pacific. That area had been supplying us with well over one billion pounds/year of edible oils–mainly coconut oil from the Philippines, palm and palm-kernel oil from the Netherlands East Indies and Malaya, tung oil from China, and perilla oil from Japan. The USA now faced severe oil shortage within months.

To aggravate this situation, our domestic consumption had increased in 1941 to almost 11 billion pounds, from 9.7 billion in 1940. In addition, our allies needed oil from us; Russia had lost her main source (the Ukraine) and we were already supplying England and the other United Nations under the Lend-Lease Act. In early 1942, U.S. government officials awoke to the fact that she would have to be the world's largest exporter of edible oils for the duration of the war.

Our domestic production had to be sharply increased if shortages were to be avoided. American farmers were asked to sharply increase their acreages of soybeans, peanuts, and flax. The soybean current soybean harvest is estimated at 211 million bushels, up from 106 million one year ago. Also, peanut acreage doubled. A portrait photo shows D.J. Bunnell. Address: Vice-President, Central Soya Co., Chicago, Illinois.

3670. Mogi, Masatoshi. 1942. Miso jôzô ni kansuru kôbo no kenkyû. IV. Kôsatsu oyobi sôkatsu. (5). Kôsatsu [Studies on the yeasts in miso fermentation. IV. Considerations and summary. (5). Considerations]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 18(10):940-44. Oct. [23 ref. Jap]

• ***Summary:*** The main genera discussed include Saccharomyces, Zygosaccharomyces, Zygopichia, Hansenula, Pseudohansenula, Torulopsis, Pseudomycoderma, and Pseudomonilia. A number of new species are claimed. Address: Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

3671. *Minami Manshu Tetsudo K.K., Mantetsu Chosa Kenkyu Shiryo* (*South Manchuria Railway Co., Survey Research Documents*). 1942-1943. Daizu ryûtsû kikô no hensen [Changes in the structure of soybean transportation and distribution (in Manchuria)]. No. 68. 186 p. [Jap]* Address: Manchuria.

3672. Iguchi, K. 1942. [Extraction of soybeans by alcoholysis]. *Nihon Gakujutsu Kyokai Hokoku* (*Report of the Japanese Society for the Advancement of Science*) 16:391-96. [Jap]*

• ***Summary:*** Describes solvent extraction using ethyl alcohol.

3673. Kosaka, K.; Fukuoka, M. 1942. Taka-aze daizubatake ni okeru riipaa (gaikaki) shiyô seiseki [Results of using a reaper to harvest high-diked soybean fields]. *Minami Manshu Tetsudo K.K., Hokuman Keizai Chosajo. Hokkei Chosa Toku* (*South Manchuria Railway Co., North Manchuria Economic Survey Office, Special*) No. 38. 8 p. [Jap]* Address: Manchuria.

3674. Matsumoto, T. 1942. [On the regional distribution of soybean varieties]. *Ikushu Kenkyu* (*Breeding Research*) 1:144-49. [Jap]*

• ***Summary:*** The author conducted the first scientific research on the distribution of summer vs. autumn type soybeans in Japan. He grouped the many varieties of soybean in Japan into three types (summer, autumn, and intermediate) based on planting these types at several times throughout the season. But he did not establish a clear criterion for distinguishing these three types.

3675. Japan Year Book 1942-43. 1942. Tokyo: The Foreign Affairs Association of Japan. 1020 + 2 p. See p. 398, 895.

• ***Summary:*** The Preface indicates that this book was published in about Oct. 1942. The editor's name is not given.

Page 398. "Leguminous plants: Area of leguminous plants in 1939 was 583,123 cho and the production was valued at ¥167,950,279. During the past decade the area planted has been pursuing a slow downward movement. Soya-beans and azuki (red) beans are predominant both in area and production." In 1939

Soya-beans were planted on 329,674 cho which produced 2.700 million koku worth 51,119,383 yen.

Azuki beans were planted on 97,392 cho which produced 0.701 million koku worth 29,770,625 yen.

Pages 895-96. Two large tables show "Cultivated area

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and production of cereals" (in hectares and metric tons), 1936-1940–in Manchoukuo. For soya beans:

4.147 million metric tons in 1936
4.352 million metric tons in 1937
4.624 million metric tons in 1938
3.995 million metric tons in 1939
3.799 million metric tons in 1940

Other crops in the table are other legumes, kaoliang, millet, maize, wheat paddy-field rice, upland rice, and other cereals.

3676. Masuno, Minoru. 1942. Sekai no daizu to kôgyô [Soybeans and their industries worldwide]. Tokyo: Kawade Shobo. 208 p. [Jap]
Address: Tokyo.

3677. Onuki, Motoi. 1942. Chômi shokuhin [Foods that are seasonings]. Tokyo: Yuzankaku. 233 + 6 p. 22 cm. [Jap]*
Address: Japan.

3678. Satow, Ernest Mason; Masakata, Ishibashi. comps. 1942. An English-Japanese dictionary of the spoken language. Revised by E.M. Hobart-Hampden, G.M.C. and Harold G. Parlett. South Pasadena, California: P.D. and Ione Perkins. ix + 1530 + 20 p. See p. 1232. 20 cm.
• ***Summary:*** The entry for "Bean" (*mame*) includes (p. 125-26): "broad bean(s) (*vicia faba*)" = sora mame; ketsu-mame (vulgar). "French bean(s)" = ingen-mame. "Indian bean(s)" = adzusa. "parched bean(s)" = iri-mame. "small red bean(s) (*phaseolus subtrilobatus*)" = adzuki; shôdzu (with 2 Chinese characters = 2 Cc). "soya bean(s)," soy = daidzu (2 Cc). "sugared bean(s) = ama-nattô.

The entry for "Beancurd" (*tôfu*) (2 Cc) states (p. 126): "served in hot water" = yudôfu. "baked" = yaki-dôfu. baked and "smeared with sweetened miso" = dengaku (2 Cc); dengaku-dôfu. (Note: Hachihai-dôfu is–cut small and stewed in a sauce of 4 parts water, 2 parts sake, and 2 parts soy [sauce]). "fried" = abura-age, aburaage.

Beanpaste, n. an.

The entry for "Rice" states (p. 1142-43): (the riceplant) = ine; (raw grain rice) = kome; (cooked rice) = meshi, gohan (2 Cc); gozen (2 Cc); o mamma (child's word)... "glutinous rice" = mochi-gome. "glutinous rice and red beans" = o-sekihan (2 cc); kowa-meshi (given in Japan as a return for wedding); "new rice" = shimmai [shinmai]. "rice and red beans (eaten in Japan on the 1st, 15th and 28th day of each month and on birthdays, and supposed to be productive of good luck)" = aka no meshi; aka no gohan. "rice and tea"... = kigara-cha, or kigara-meshi, is rice boiled with a little soy and now generally given instead if cha-meshi. "uncleaned rice (husked but not polished) = gemmai [genmai]. "Rice-cake" = mochi; o kachin; ammo (child's word).

The entry for "Sauce" states (p. 1176): kake-shiru; (of wheat, beans, salt) miso; shôyu (2 Cc).

The entry for "Sieve" (*furui*) states (p. 1232): "a memory like a sieve" = *misokoshi-mimi.* "a hair sieve" = kinugoshi.

Note: The word "kinugoshi," in this sense, appears to have nothing to do with kinugoshi tofu.

The entry for "Soup" states (p. 1264): soppu; (o) tsuyu; shiru; (flavored with soy) sui-mono;... (made with miso) o tsuke; miso-shiru; o-mi-o-tsuke (used only by women).

The entry for "Soy" (shôyu) (2 Cc) states (p. 1265): "o shitaji" (used by women). "soy pourer" = shôyu-tsugi; shôyu-sashi.

Soy-bean, n. daidzu (2 Cc). black soybean, kuro-mame; kuro-daidzu.

Words *not* listed: kinako, kinugoshi tofu, yuba. Address: 1. Japanese Secretary to H.M. Legation at Yedo; 2. Imperial Japanese Foreign Office.

3679. Takenobu, Yoshitaro. ed. 1942. Kenkyusha's new Japanese-English dictionary. Cambridge, Massachusetts: Harvard University Press. iv + 2280 p. 24 cm. American edition. Reproduced by a photolithographic process from the 82nd printing of 1939." Title also in Japanese: *Shin Wa-Ei Daijiten.* [Eng; jap]
• ***Summary:*** "The present war has necessitated the publication in the United States of a new edition of Kenkyusha's Japanese-English Dictionary because this country is cut off from the former source of supply of the dictionary and because the demand and need for all Japanese dictionaries has greatly increased. To meet this need, the Department of Far Eastern Languages of Harvard University has undertaken the project of publishing in the United States this dictionary as well as other essential Chinese and Japanese dictionaries, and the Rockefeller Foundation has supplied the necessary funds for the enterprise.

"This American edition of the dictionary has been reproduced by a photolithographic process from the eighty-second printing of 1939. No changes have been made in this edition except to increase slightly the size of the print and the book."

The very first page, titled *Kaisetsu* ("explanation"), shows the Japanese syllabary and the romanization of each.

Near the end are two appendixes: (1) Pages 2264-74: *Saishin-go oyobi gairai-go ichiran* [List of most recent words and foreign words]. (2) Pages 2275-80: *Chugai hikaku nenpyo* [List of Japanese emperors and era names, with Japanese years and Western calendar years–starting with the first legendary emperor Jimmu (660-585 BC)].

The content of this pirated American edition is basically the same as that of Kenkyusha's 1931 second edition of this dictionary. Address: General editor, Japan.

3680. Tennessee Non Pop: New U.S. domestic soybean variety. 1942. Seed color: Yellow (straw), hilum light brown.
• ***Summary:*** Sources: Morse, W.J. 1948. "Soybean

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varietal names used to date." Washington, DC: Appendix to the mimeographed report of the Fourth Work Planning Conference of the North Central States Collaborators of the U.S. Regional Soybean Laboratory, Urbana, Illinois. RSLM 148. 9 p. May 26. See p. 8. "Tennessee Non Pop–Tennessee Experiment Station selection."

USDA Production and Marketing Administration [Grain Branch]. 1948. "Soybean varieties: Descriptions, synonyms and names of obsolete or old and seldom grown varieties." Washington, DC. 25 p. Aug. See p. 16-17. "Tennessee Non Pop–Selection from a cross between the Tokyo variety and P.I. No. 54610 by the Tennessee Agricultural Experiment Station. Maturity, late; pubescence, gray; flowers, both purple and white; pods, two- to three-seeded; shattering, little; seeds, straw yellow with pale to light brown hilum, about 2,900 to the pound; germ, yellow; oil, 19.4 percent; protein, 43.4 percent; iodine number, 135."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 18-19. Tennessee Non Pop is in the USDA Germplasm Collection. Maturity group: VII. Year named or released: 1942. Developer or sponsor: Tennessee AES (Agric. Exp. Station). Literature: 13, 14. Source and other information: Selected from 'Tokyo' x PI 54.610 (from Chanchung, Jilin China, in 1921). Prior designation: None. Address: USA.

3681. Borth, Christy L. 1943. Modern chemists and their work: Pioneers of plenty. New enlarged edition. New York, NY: The New Home Library. [12] + 13-410. See p. 200-12, 359-74. Index. 21 cm.

• ***Summary:*** This book was originally published in Sept. 1939 as *Pioneers of Plenty: The Story of Chemurgy.* This is an enlarged version of that book.

Partial contents: Foreword, by the publishers. Introduction: 1. Chemurgy. Book one: Chemurgy's cradle rockers. 2. Chemurgy's crowded stage. 3. Hale–Father of chemurgy [Dr. William J. "Billy" Hale, a great organic chemist]. 4. Hale and Herty hunt. 5. Herty–Pioneer of the pines. 6. The Herty heritage. 7. Garvan–A career of contrasts [Francis Patrick Garvan, a Manhattan {New York} lawyer, who transformed undisciplined ideas into the potent reality of chemurgic action]. 8. Garvan–The chemurgic crusader.

Book two: Pioneers and problems. 9. Baekeland–Plastic pioneer. 10. Ford links farm and factory [mostly about the work of Henry Ford and his researchers with "the soy" / soy bean]. 11. Chemurgic oil fields [about soy oil and other vegetable oils, incl. coconut, palm, flax, cotton, corn, tung, perilla, chia, sesame, pine, peanut]. 11. The first and greatest chemurgist [George Washington Carver]. 12. Too much food! [for the first time in history]...

Book three: Americans discover America... 19. Research pays off [Henry Ford, soy beans, A.E. Staley, Dr. W.L. Burlison of the University of Illinois, Adolf Hitler, American Soybean Association, the four regional laboratories]. 20 The farm grown automobile arrives [Henry Ford's and Bob Boyer's plastic car].

Since Ford began his soy research in 1930, he has spent more than $3 million on this project, upon which more than 20 scientists have been constantly employed (p. 206). Since as early as 1919, Henry Ford's "mind was moving toward chemurgic conclusions." Many of his statements in interviews during the 1920s, although "they must have sounded far-fetched at the time, dovetail nicely into the currently unfolding pattern of chemurgic thinking" (p. 207). For every million Ford automobiles, about 2 million lb of soy-bean oil are used (p. 207-08). Even today about two thirds of the world's annual crop of soybeans (6 million tons) are raised in Japan's "puppet state" of Manchukuo (p. 209).

3682. Monsi, Masami. 1943. Untersuchungen ueber den Mechanismus den Schleuderbewegung der Sojabohne–Huelse [Research on the mechanism of dehiscence of the soybean pod]. *Japanese J. of Botany* 12(3/4):437-74. March 31. [28 ref. Ger]
Address: Botanisches Institut, Naturwissenschaftliche Fakultaet, Kaiserl. Universitaet zu Tokyo [Japan].

3683. Nakajima, K. 1943. Nattôkin no ôyô ni kansuru kenkyû (Jogen oyobi dai 1 pô) [Application of *Bacillus natto* I]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 19(3):155-62. March (Chem. Abst. 46:7703). [6 ref. Jap]

3684. Gamio, Manuel. 1943. Soybeans in the Indian diet. *Soybean Digest.* April. p. 4. Translated from the Spanish by Edna O. Miller.

• ***Summary:*** As early as 1929, when Dr. Gamio or his organization (Inter-American Indian Institute) attended the third conference of the "Institute of Pacific Relations" held in Kyoto, Japan, he became aware of "the high nutritive value of the soybean and we realized that its cultivation and use in Mexico would solve both biologically and economically the difficult problem of food for the people.

"Upon recommendations of the First Inter-American Indian Congress of 1940 and of the Board of Directors of that Institute, there was presented to the Office of the Coordinator of Inter-American Affairs and the Department of State a project that has for its objective bettering the nourishment of the Indians of America by the use of the soy bean and its derivatives. This project is to begin in Mexico," in the Valley of Mezquital, state of Hidalgo. "The project of the Institute is confined to only one section of the valley, where soy beans will be planted and kitchens set up in which the Indians will be taught to season and use the foods which can be derived from soybeans...

"In parts of Mexico, principally in the northern plateau, this legume is already being cultivated on a considerable

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scale, but we understand that its production will be devoted chiefly to industrial uses and perhaps to exportation." A photo shows Dr. Gamio. Address: Dr., Director of the Inter-American Indian Inst., Editor of the Boletin Indigenista, Mexico City, Mexico.

3685. Hartz, Jacob. 1943. Soybeans in the south. *Chemurgy Digest.* June 30. p. 99-100.
• ***Summary:*** "The history of soybeans in the South has been very brief. Soybeans were first grown for hay and forage purposes approximately twenty years ago in a very small way in the Mississippi Valley...

"When the small harvester-threshers, commonly called combines, were introduced for the harvesting of soybeans, the acreage increased by leaps and bounds. At that time, (1933) the cotton reduction program was staged by the Triple A. This took out of production 13½ million acres of cotton land in the South and Southwest. Therefore, soybeans really made the first big increase in acreage a decade ago.

"However, the big impetus to soybean growing in the South was given when all supplies of vegetable oils and high protein meals were shut off from the Orient and Southwest Pacific. Japanese aggression resulted in freighters being put to uses other than bringing these products to the Pacific coast.

"The writer has been growing and selecting adapted varieties and distributing soybeans as a seedsman in the South for the past eighteen years" [i.e. since 1926].

"Had Southern farmers and seedsmen insisted on their colleges of agriculture and experiment stations doing half as much work in the propagation of new varieties as has been done in Illinois, Indiana and Ohio, our soybean program for the South would be much further advanced than it is today."

"World War II has stopped the flow of vegetable oils and meal from the Orient and South America to our West Coast. The War Production Board, acting last year through the A.A.A., encouraged Southern farmers to triple their soybean acreage by pegging the price at $1.60 per bushel. This resulted in the South's largest production."

"For several years past the United States Regional Soybean Research Laboratory has directed a program in the twelve northcentral soybean growing states. Unfortunately, their funds were not sufficient to permit work in the South. However, funds have been made available since January 1 through the Bankhead-Jones Act to enable this laboratory, working under the direction of the United States Department of Agriculture Bureau of Plant Industry to carry on the same type program in twelve southern states including Oklahoma and Texas. This work is being done with the cooperation of the colleges of agriculture and experiment stations in those states."

"Mr. Jacob Hartz is a member of the Chemurgic Council, and is recognized as one of the leading authorities on soybean growing, being Southern Director of the American Soybean Association. He is owner of the Jacob Hartz Seed Company at Stuttgart, Arkansas, and is a member of the Arkansas State Plant Board, representing the Arkansas Seed Growers' Association. He has been active in various seedsmen's groups including the Southern Seedsmen's Association." Note: This article was adapted from one in *Southern Seedsmen.* Address: Owner, Jacob Hartz Seed Co., Stuttgart, Arkansas.

3686. Brown, Wenzell. 1943. Hong Kong aftermath. New York, NY: Smith & Durrell, Inc. 283 p. See p. 80. June. No index. 21 cm.
• ***Summary:*** The story of the fall of Hong Kong in 1941, and the experiences of the author in the Stanley Prison Camp, established by the Japanese conquerors.

Page 80: "We drew up the package and examined it and found that it contained some bean curd cheese and two pomeloes... Bean curd cheese has much the flavor of a very strong Gorgonzola. We each had a square of about a quarter of an inch which flavored an entire bowl of rice."

3687. Ohwi, Jisaburo. 1943. Symbolae ad Floram Asia Orientalis XIX. [Contribution to the flora of East Asia XIX]. *Acta Phytotaxonomica et Geobotanica* (*Shokubutsu Bunrui Chiri*) 12(2):107-13. June. [14 ref. Lat; Jap]
• ***Summary:*** On p. 110 the author first named *Glycine koidzumii.* In Okinawa it is known as *Miyako-jima tsuru-mame* (Miyako Island vine bean).

3688. *Soybean Digest.* 1943. Japs eat rice and bean curd. June. p. 5.
• ***Summary:*** "The Japanese soldier in the field eats a highly nutritious, scientifically balanced diet particularly well adapted to his special needs and considerably better than the customary diet of the Japanese civilian, according to studies of captured Japanese army rations made at the Board of Economic Warfare. Food items tested include the standard ration biscuit, a health drink called "Mirin" containing lactic acid, a yeast preparation called "Florylin," wheat germ tablets, and a tinned ration labeled 'rice and soybean curd.'

"Rice and bean curd is a mixture of cooked rice and soybean protein flavored with shoyu sauce. Soybeans ground in water yield soluble proteins which form a solution known as 'soybean milk.' When boiled this forms a surface skin [yuba] due to the coagulation of proteins, and the skin when totally or partially dried is highly nutritious, containing valuable proteins which are considered a satisfactory substitute for fish or meat.

Note: The writer is confused about the difference between tofu and yuba. This food has nothing to do with yuba. It is probably vinegared rice in deep-fried tofu pouches (*Inari-zushi*).

"The rice and bean curd ration used by the Japanese thus offers an excellent combination of carbohydrate and protein.

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It is, in fact, a sort of cooked sandwich, in which boiled rice takes the place of bread and the soybean protein takes the place of meat."

3689. *New Yorker.* 1943. Meat without bones. 19(24):14-15. July 31.
• ***Summary:*** A humorous article. "Governor Dewey's announcement that only the soy bean stands between New Yorkers and starvation made the soy as timely as Badoglio" [Pietro Badoglio, and Italian soldier and politician. As Prime Minister of Italy, replacing fascist dictator Mussolini, he signed an Armistice with the Allies].

"We immediately sent out our man with instructions to get the soy story and spare no expense doing it, and he has submitted the following facts. In the first place, it is true that a diet of soy beans and water will sustain life indefinitely; Governor Dewey could live on soy beans and water until he becomes president." This year the acreage will probably double or triple as "the result of the soy's publicized ability to take the place of meat and other protein foods that are now hard to get. In this country the soy is considered chiefly an article of civilian diet, but it is also included in military rations as an ingredient of such things as soups, gravies, and pie crusts."

"In China as well as Japan, soy bean curds are called 'meat without bones.'"

Soy bean oil can be used for pretty much any purpose, including a butter substitute and artificial rubber (which won't stretch but works fine as a doormat). The beans may be served as a "green vegetable. Put in a warm, steamy place, they shoot out sprouts, which make a nice salad. Soy-bean flour makes good muffins. Mixed with ten parts water, it turns into a palatable milky drink. From this milk several kinds of cheese and something like buttermilk may be produced. The dried bean can be used as a breakfast cereal, or, roasted and ground, as a coffee substitute.

"Soy meal with the oil removed has dozens of uses in industry... Soy-bean glue is now the preferred adhesive for pine and fir plywood, from which the Mosquito bomber is made. Soy beans can also, of course, be put in beanbags."

Note 1. This is the earliest document seen (June 2012) with the phrase "Meat without bones" (or a similar phrase) in the title; it is used to refer to tofu.

Note 2. This is the earliest document seen (Aug. 2013) that uses the term "milky drink" to refer to soymilk.

Note 3. Notice the interesting use of the terms "the soy's publicized ability..." and "the soy is considered..."

3690. Iguchi, Morihiro; Sato, Masanori. 1943. Daizu abura no shusei chushutsu ni kankei suru 2, 3 no hosokuteki kenkyu. I. Shusei jôki no kyûshûzai ni tsuite [2-3 supplemental experiments regarding the extraction of soybean oil using ethyl alcohol. I. On absorbing agents of the vapor of distilled alcoholic beverages]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 46(8):781-84. Aug. [12 ref. Jap]
Address: South Manchuria Railway Co. (Mantetsu Chûô Shikenjo, Yûkikagaku-ka, Ippan Yûki Kenkyu-shitsu).

3691. *Let's Live.* 1943. Japs eat rice and bean curd. Aug. p. 5.
• ***Summary:*** "The Japanese soldier is well fed according to the Board of Economic Welfare which has analyzed rations captured. Items tested were a standard ration biscuit... and a ration labeled 'rice and soybean curd.' This latter offers an excellent combination of carbohydrates and protein."

3692. Miyoshi, Shigeo; Takai, Kohei. 1943. Daizu tanpakushitsu kôchakuzai no kenkyu. I. Daizu tanpakushitsu no metanooru ni yoru hensei [Study of glue made from soy protein. I. Changes in soy protein caused by methanol]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 46(8):794-96. Aug. [6 ref. Jap]
Address: Tôyô Reeyon KK Kenkyû-ba, Japan.

3693. Miller, Harry W. 1943. Soybeans and the Orient. *Soybean Digest.* Sept. p. 18, 44.
• ***Summary:*** "It was my privilege during 23 years of residence in the Orient to travel very extensively through the provinces of China, and to acquaint myself with all eastern Asia relative to soybean production. I found that while the central and northern provinces of China including Manchuria are the principal soybean producing areas of the Orient, that soybeans are widely used by all the groups of Orientals, save the Filipinos, and the Malays, and are universally used by the Chinese, and that wherever they emigrate in any part of the world, the one universal food of the Chinese is soybeans, and not rice, as so often claimed.

"There are millions of the Chinese who do not live in the rice producing territories. The Chinese and many of the Oriental people have come to understand by common experience rather than scientific deduction that soy protein is an essential to livelihood and cannot with safety he dispensed with from their diet. Wherever in Chinese occupied territories soil and climatic conditions are at all favorable to the production of soybeans, they will be found as one of the stable crops. However the yield in the tropical portions of China is rather small. They have depended on importing beans from Manchuria and northern China. The same is true of the South Sea Islands.

"Foundation: Much that we have learned concerning handling soybeans and preparing them into food materials we must credit to the knowledge gained through studies made and travels in the Orient, chiefly in China, Korea, and Japan. Like their handling of many other things, they have developed the soybean culture and processing up to a certain point and there they stand. We have built upon their foundation, and have carried research in the agricultural field, as also processing methods several steps farther, and

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have made soya food products not only better but far more digestible, and therefore nutritionally more available, and found out that the bean can be made tasty as well.

"You may ask how are the Oriental people using the soybean. There are many ways. If you were to visit the Chinese markets during the late summer and early autumn months you would be able to purchase shelled green soybeans. You would also be able to purchase the unshelled beans, that is in the pods just like you buy peas in the pod. Some people prefer to purchase them in the pods, cook them in the pods in salt water, and then squeeze out the beans and eat them from the pod. There have been no canning facilities available to the Chinese for any of their products in years past, and so the use of the green soybean is only seasonable. You might expect that since the Chinese have stone mills everywhere to grind their wheat and their corn into flour and meal that they would be grinding their soybeans into a flour. But soy flour is largely an Occidental product. It would be very difficult for you to pick up in any of the markets of China a pound of soy flour.

"Curd: The Chinese have learned through long experience that the greatest value nutritionally from the soybean is obtained through a water extraction of its protein. This milky liquid after it is strained is coagulated into a cheese [tofu]. Ninety percent and possibly even higher of the nutrition the Oriental obtains from the soybean is taken in the form of this cheese. Of course they have many ways of dealing with this soft gelatinous curd, which has a very high water content. They press it into cakes, about the thickness of a large slice of bread. This then is placed in a brine solution or other flavored liquid, and later sliced up like we at times dice cheese. Again it is pressed into thin sheets that are about a sixteenth of an inch in thickness. These are also diced up and eaten like a relish or a salad.

"Another common product is a thin semi-transparent sheet of protein [yuba] made by a slow heating vat filled with this soya milk. A heavy scum will come to the surface, which they lift off at intervals and suspend to dry. These sheets are later on used as food wrappers. They can use these sheets which are pure protein, like we can use cellophane sheets, but instead of wrapping parcels with them they stuff them with certain vegetables, imitating the body and legs of a fowl, or the form of a fish, or they can represent almost anything in the way of an animal, and by submitting them to a little baking, give the same nice brownish hue by the use of a little oil, so you could hardly tell whether you were eating actual turkey or an artificial one.

"When you go to the market where the soybean producer delivers his finished products, you will see a great variety of foods made from soybeans. As I say, you can buy the bean curd in squares, or you can buy the patties, or you can buy the thin sheets of soya cheese, or you can buy these large semi-transparent sheets of soya protein. These in turn can be incorporated into many tasty and highly nutritious dishes, by the skill and ingenuity of the cook, and has also the likeness of meat in flavor and appearance. Naturally nutritionally we know of the high value of these proteins for a proper substitute for meat, fish, fowl, eggs, and the protein of animal milk.

"Of course the Chinese have as one of their big industries the making of oil from the soybean, and that is true of the Koreans and the Japanese. They heat the bean, grind it, and put it into wooden presses and extract the oil by driving wedges into their oil presses, bringing a tremendous pressure to bear upon the roasted beans. This oil is all used for edible purposes.

"The residue of the bean cake contains about 6 percent of oil, and has been exported in recent years to great extent. But the Chinese have in certain localities ground it up and used the bean cake meal for food, although much has been used in China and exported for fertilizer.

"The soybean is also extensively sprouted, and these sprouts are used in their vegetable food mixtures and eaten as bean sprouts.

"I shall not attempt at all to discuss the varieties of soybeans found in the Orient. I have seen almost every color, every shape and size, running from a small shot sized bean to the large jumbo sizes, such as we have in our edible list. All the beans that I have seen that come from India have been of a very small size. When we buy beans in China we go to the market and ask for soya beans. If we are not satisfied with what they have we go to another shop, and see if we can find a bean of superior size and quality. We never purchase soybeans in China by name of any variety.

"As is well known, China and most parts of the Orient grow from two to three crops per annum on the same ground. In some areas when they harvest a rice crop they plant a soybean crop on the same soil. In other areas when they harvest a wheat crop they put in a crop of soybeans. We believe in many of our central states, and certainly this would be true of the southern portions of our central states, that it would be quite practical to harvest a crop of peas, and disk the land, and plant and harvest a crop of soybeans" (Continued).

3694. Iguchi, M.; Sato, M. 1943. [Soybean alcohol extraction. II. Depression of ethanol vapor absorption in wash liquids]. *J. of the Society of Chemical Industry, Japan* 46:199C-200C. Supplemental binding to Kogyo Kagaku Zasshi. [Jap; eng]
• ***Summary:*** Describes solvent extraction using ethyl alcohol.

3695. Platt, B.S.; Culwick, G.M. 1943. Far Eastern Food Relief (Non European). British Colonial Office. [Ger]*

3696. Bazore, Katherine. 1943. Hawaiian and Pacific foods, a cook book of culinary customs and recipes adapted for the American hostess. New York, NY: M. Barrows and

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Company. 286 p. Illust. 24 cm. *
• ***Summary:*** Concerning the word *kirazu:* Page 62: "After tofu has been made there is a residue which the Japanese use, calling it kirazu (55). It is inexpensive, may be eaten by animals as well as humans. Sometimes the shops give it away with purchases of tofu."

The recipe for Kirazu with vegetables (O kara) (with "5 cups kirazu {bean curd residue}," p. 199-200. "This is a very inexpensive dish as the kirazu may frequently be obtained free at the tofu factory").

The term "dried bean curd skin" appears on pages 51 and 58. It refers to dried yuba or "chook." The term "bean curd skin" appears on page 266.

The term "Nam yue (a red bean curd)" appears on page 51.

Katherine Bazore was born in 1895. Address: Chairman Home Economics Dept., University of Hawaii.

3697. Nagai, Isaburo. 1943. [Soybeans]. In: Crops. Vol. 2. Tokyo: K.K. Yokendo. 403 p. [Jap]*

3698. Nishino, Shoji. 1943. Shôyu miso shokusu kikaku bunsekihô [Methods of analyzing the standards of shoyu, miso and vinegar]. Osaka: Konno Shoten Shupan-bu. 109 p. 22 cm. [Jap]*
Address: Japan.

3699. Noda Shoyu. 1943. Noda Shôyu enkaku-shi [History of Noda Shoyu]. Noda: Noda Shoyu K.K., Shain Jitsumu Koshukai. 38 p. 2 vols. 20 cm. [Jap]
Address: Noda, Japan.

3700. Rebelo Hespanha, Jaime. 1943. A soja: Cultura e utilizacao dos seus produtos [The soybean: Cultivation and use of its products]. Lisboa, Portugal: Livraria Rodrigues. 42 p. No index. [Por]
• ***Summary:*** Contents: Part I: Soybean culture. 1. Introduction: History and origin, botanical description, advantages of its cultivation for farmers. 2. Soybean culture: Climate, terrain, types of culture, seed and sowing, varieties and sub-varieties, seed characteristics, time of planting, manuring and fertilizing, precautions during cultivation, harvest. 3. Yields.

Part II: The products of soya and its utilization. 1. As human food: As a green vegetable (*como legume*), flour (*farinha*), milk (*leite*), cheese (*queijo-caseina* [tofu]), oil (*oleo*), the hulls (*bagaço*). 2. Feed for cattle. 3. Industrial products.

In Spanish the soybean is called "Soja, Soya, Haba, or Guisante de Japan."

In the section on soybean culture, pages 10-11 state: "For 20 years [i.e. since 1923], the soybean has been cultivated in Ribatejo, with the only goal of providing feed for cattle. The soybean is now being cultivated technically in Alentejo, in Baixo-Minho, and in parts of Estremadura. [Note 1. Ribatejo, Alentejo, Estremadura, Baixa, and Minho are all provinces of Portugal, according to the U.S. Board of Geographic Names for Portugal, 1961.] The land in these areas is well suited for growing soybeans. The most admirable initiative for the cultivation of soybeans in Portugal was undertaken by the Malange [Malanje] Agricultural Station (in Angola), which obtained a yellow variety that had been given an excellent classification in Germany.

"Soybean cultivation in Angola could be extensively spread, even among European farmers. The growing period does not exceed 145 days, and the yield averages 700 kg of seeds [per hectare], bringing a price of $25 (0.25 angolares) per kilogram. It would be good if the example given by the Malange Agricultural Station would spread to the [area around the] cities."

Note 2 This is the second earliest document seen concerning soybeans in Portugal, or the cultivation of soybeans in Portugal. This document contains the second earliest date seen for soybeans in Portugal, or the cultivation of soybeans in Portugal (1923 in Ribatejo). The source of these soybeans is unknown. The author was born in 1891.

Note 3. This is the earliest Portuguese-language document seen (April 2013) that uses the term *queijo caseina* to refer to tofu. Address: Major do S.A.M., Portugal.

3701. Arisoy: New U.S. domestic soybean variety. 1943? Seed color: Yellow (straw), hilum brown.
• ***Summary:*** Sources: Morse, W.J. 1948. "Soybean varietal names used to date." Washington, DC: Appendix to the mimeographed report of the Fourth Work Planning Conference of the North Central States Collaborators of the U.S. Regional Soybean Laboratory, Urbana, Illinois. RSLM 148. 9 p. May 26. See p. 1. "Arisoy–P.I. 86736."

USDA Production and Marketing Administration [Grain Branch]. 1948. "Soybean varieties: Descriptions, synonyms and names of obsolete or old and seldom grown varieties." Washington, DC. 25 p. Aug. See p. 2. "Arisoy–Introduced under P.I. No. 86736, native name "Izari Mame Kinai, #1," from Konosu, Japan, in 1930. Maturity, very late; pubescence, tawny; flowers, purple; pods, two-seeded; shattering, medium; seeds, straw yellow with brown hilum, about 4,200 to the pound; germ, yellow; oil, 17.46 percent, protein, 44.9 percent; iodine number, 132."

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 8-9. Arisoy is in the USDA Germplasm Collection. Maturity group: VIII. Year named or released: by 1943. Developer or sponsor: USDA. Literature: 13, 14. Source and other information: 'Izari Mame Kinai No. 1' from Konosu, Saitama, Japan, in 1930. Prior designation: PI 86736. Address: USA.

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3702. Miyoshi, Shigeo; Takai, Yasuhira. 1944. Daizu tanpakushitsu kôchaku-zai no kenkyû. II-III. [Soybean protein glue. II-III.]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 47(1):65-68. Jan. [Jap]
• ***Summary:*** Part II: Treatment of defatted soybean flakes by ethanol containing organic acid (*Dasshi daizu no yûki-san on ganyu suru etanooru shori ni tsuite*). The soybean flakes underwent solvent extraction using ethyl alcohol. III: A study on agglutination of the protein in defatted soybeans extracted with various solvents (*Yôzai no sôi suru dasshi daizu-chu no tanpaku shitsu no kôchaku-ryoku ni tsuite*). Address: Tôyô Reion [Rayon] K.K., Kenkyû-bu.

3703. Sakaguchi, Kinichiro; Yamada, K. 1944. Kôji-kin no keitai to sono bunrui ni tsuite. I. [On the morphology of the koji molds (Aspergilli) and their classification. I.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 20(1):65-73. Jan. [8 ref. Jap]
Address: Tokyo Teikoku Daigaku, Nôgaku-bu, Nogei Kagaku Kyoshitsu.

3704. Inokuchi, Kinjiro; Kitagawa, Kazuo. 1944. Daizu no arukoorishu chûshutsu. I-II. [Extraction of soybeans by alcoholysis: I-II.]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 47(2):156-57. Feb. [Jap]
• ***Summary:*** Part I: Explanation of the extraction method and preliminary experiment (*Hon chûshutsu-hô no gaisetsu narabini chûshutsu yobi jikken*). Describes solvent extraction using ethyl alcohol. II. Soy oil ethanolysis (*Daizu-yu no etanoorishisu*).

Note: *Webster's Third New International Dictionary* (1963) defines alcoholysis as "any chemical reaction analogous to hydrolysis in which an alcohol plays a role similar to that of water (e.g. alcoholysis of an ester to a different ester)." Address: Mantetsu Chuo Shiken-jo Yuki-ka Gakka [Manchurian Railway Central Research Lab., Organic Chemistry Div.].

3705. Oberhelman, Lois; Beeson, K.E.; Straszheim, M. 1944. Growing and using soybeans for food. *Purdue University* (*Indiana*), *Department of Agricultural Extension, Extension Bulletin* No. 305. 8 p. Feb. [1 ref]
• ***Summary:*** Contents: Introduction (mentions "fresh green soybeans"). Description of the plant. Suitable yellow varieties. Varieties available from producers or dealers in the Corn Belt ("Leading vegetable varieties adapted to Indiana are listed in order of maturity... Numbers accompanying variety names are U.S.D.A. introduction numbers"): Very early (Giant Green). Early (Bansei, Fuji, Chusei, Kanro). Midseason (Hokkaido, Jogun, Willomi, Kura, Sousie [Sousei], Toku, Emperor, Tastee). Medium late (Rokusun, Funks Delicious [Funk Delicious], Higan, Easy Cook [Easycook]). Late (Aoda). Very late (Nanda). Seed sources ("For names of growers or distributors of vegetable soybean seeds, write to the Agronomy Extension Division, Purdue University"). Culture ("Rabbits like vegetable soys"). Commercial uses ("In Wisconsin, Ohio, and other states companies are canning green vegetable varieties on a commercial scale in much the same manner as garden peas"). Home uses: Green soybeans, canning green soybeans ("vegetable soybeans"), dry soybeans (with 8 recipes, including those for "soybean pulp–made by mashing, grinding, or pressing the cooked dried soybeans through a coarse sieve"). Soybean sprouts (with 4 recipes). Soybean flour, grits and puffs (with 8 recipes). Address: 1&3. Home Economics Extension; 2. Agronomy Extension. All: Lafayette, Indiana.

3706. Sakaguchi, Kinichiro; Yamada, K. 1944. Kôji-kin no keitai to sono bunrui ni tsuite. II. [On the morphology of the koji molds (Aspergilli) and their classification. II.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 20(2):141-54. Feb. [Jap]
Address: Tokyo Teikoku Daigaku, Nôgaku-bu, Nogei Kagaku Kyoshitsu.

3707. Inokuchi, Kinjiro; Kitagawa, Kazuo; Yachiro, Shingo. 1944. Daizu no arukoorishu chûshutsu. III-IV. Daizu-yu no metanoorishisu [Extraction of soybeans by alcoholysis. III-IV. Extraction experiment]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 47(3):235-39. March. [Jap]
• ***Summary:*** Describes solvent extraction using ethyl alcohol. Address: Mantetsu Chuo Shiken-jo Yuki-ka Gakka [Manchurian Railway Central Research Lab., Organic Chemistry Div.].

3708. Nakajima, K.; Ikeda, M. 1944. Nattôkin no ôyô ni kansuru kenkyû. II. Nattô no seizôjôken ni kansuru kenkyû (2). Nattô seizô-ji no ondo oyobi jikan to tanpaku bunkai to no kankei [Manufacture of natto. II. The relation of temperature and time to the decomposition of protein]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 20(6):336-37. June. [1 ref. Jap]

3709. *Soybean Digest.* 1944. Lack of soy sauce worries Nisei workers. July. p. 11.
• ***Summary:*** In Urbana, Illinois, a shortage of soy sauce at "the chow shack in the work camp manned by Nisei evacuees threatened the morale of these workers in their pea vining operations..." These are "American citizens of Nipponese parentage, who had been evacuated from Pacific Coast areas to avoid trouble there... Barrels or 10 and 15 gallon tins were what they needed. Soy sauce seems as essential to these evacuees as coffee to the average American worker."

3710. Naval Medical Research Institute, Bureau of Medicine

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and Surgery 1944. Far Eastern nutritional relief (Japanese culture). OPNAV 13-18. Civil affairs guide. Restricted. Washington, DC: Office of the Chief of Naval Operations. vi + 19 p. See p. 4-13, 15-16. Aug. 15. 18 cm.

• ***Summary:*** From the title page: "Prepared by the Naval Medical Research Institute, Bureau of Medicine and Surgery, for Military Government Section, Central Division, Chief of Naval Operations." At the top of every page is written the word "RESTRICTED," which is also underlined for added emphasis.

Note: On 6 Aug. 1945 the U.S. dropped the first atomic bomb on Hiroshima, Japan. This manual was prepared about one year before that event. Therefore it appears that the U.S. believed, a year before the war was over, that it would win the war.

Page 4: Table 3. Proposed basic rations (daily intake per person). In the left column are the basic foodstuffs needed. Across the top are: Weight, calories, calcium, iron, vitamin A, thiamin, riboflavin, niacin. Soy sauce can be used as a source of salt. "Provisional emergency nutritional plan"–when the optimal diet is unavailable but a bare subsistence diet is all that is possible–for 2-3 months.

Page 5: Table 4, "Recommended emergency nutritional plan" includes soybeans and groundnuts as types of "Pulses"–of which 100,000 people will need 9.0 long tons per day.

Page 6: The basic Japanese food habits may be summarized as follows:

"(a) All Japanese, rich and poor, eat fair quantities of three types of food: rice, which provides bulk and carbohydrates; beans, especially the soybean, which provide protein and some fats; and pickled vegetables and fruits, which provide vitamins.

"(b) Fish is eaten by all, but only the more well-to-do eat it in quantity. It never replaces rice.

"(c) Fresh vegetables are common in the diet of all Japanese, although (as in other countries) the farmer probably eats more than the poor city dweller does.

"(d) Meat is not a major article of diet, although its popularity has increased greatly in recent years."

Azuki bean paste is also used as a covering on some rice cakes. As for salads: "A Japanese dressing of vinegar, soy sauce, and sugar on thinly sliced cucumber or cold, boiled spinach would be more in keeping with Japanese food habits."

Page 7: "Fried bean-curd (*age*) is sometimes served with boiled rice (*gohan*)." Discusses various types of sushi.

Page 8: Including inarizushi (with fried bean curds).

Note 1. This is the earliest English-language document seen (April 2013) that contains the word *inarizushi* (one word without hyphenation). "3. Beans (*Mame*). Beans are almost as important as rice in the Japanese diet. The two most important beans are the soybean (*daizu*), and a small red bean (*azuki*)."

Page 9: "The soybean forms the basis of the salty miso paste which in turn is the basis of bean soup or misoshiru. This bean soup, together with rice and pickles, is the standard breakfast throughout the country, and is eaten as part of dinner by millions of Japanese. Added to the thick salty soup are various bits of vegetable and fish which the housewife may have available.

"In cities miso is made by specialists and sold in small food shops, but each summer in the country every housewife makes her own annual supply.

"Soy sauce or shoyu is of vital importance in the Japanese diet. This is used as a sauce for fish, for rice dishes, and for meat dishes. It is to the Japanese what salt is to us, an indispensable adjunct to any meal. Any strange food might be made palatable if there were soy sauce to go with it.

"Tofu is a third important soybean product. This is a bean-curd cake. As a rule it is prepared in square blocks by special tofu makers who peddle it to the neighborhood. It forms a substitute for fish at a modest meal. The flavor and consistency of tofu vary with the region and maker. Tofu makers often raise pigs on the waste products of tofu making.

"The small red azuki beans are made into paste and used as stuffing for rice cakes, and the beans are sometimes mixed with rice on festival occasions. Azuki beans are in the nature of a minor special treat."

"Most farmers grow at least part of the beans they need.

"4. Pickles (Tsukemono or okoko. 'fragrant thing'). Almost nothing is served in Japan without some pickled product to go with it as an appetizer. Thus, pickle is served with all ordinary meals, with boxed lunches (bento), or often together with tea or wine at meals.

"The commonest form of processed pickle purchased in shops is pickled radish or daikon. (The pickle itself is called *takuan*). Another common form is pickled plum or umeboshi."

Page 10: "Fish and shellfish often form a part of sushi, which is plain rice flavored with vinegar, with slices of fish, shellfish, or omelet laid on top or rolled in seaweed or fried bean-curd. Fish are also eaten in soup, especially a clear soup with chunks of the fish in it."

Page 11: Fruits and vegetables include "(f) Konnyaku (paste made from the starch of the plant 'devil's tongue')." "Konnyaku is boiled and processed into squares and sold–then cooked in soy sauce or soup. It is also used in shredded form."

Other vegetables include "(d) Bean sprouts (*moyashi*)."

Page 12: "Most vegetables are boiled and eaten with soy sauce and a little sugar. They are frequently put into soup, cooked into a stew, chopped up and mixed with rice, or pickled."

Page 13: "Salt (brine production) is used generously in making miso and green vegetable pickles. Salt is a government monopoly and is sold at little or no profit."

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"8. Meat. Such meat dishes as sukiyaki, using either beef or chicken, are common in middle and upper-class urban families. Soy sauce is an important element in cooking sukiyaki. In general, before the war beef and pork were coming to be eaten more and more among the poorer classes, especially in cities."

Page 14: "Major Japanese dislikes" include:

"(a) Entrails and internal organs of cattle or pigs, e.g., livers, tongue, or brain. (b) Lamb (said to smell). (c) Mutton. (d) Cheese (strongly disliked by most Japanese). (e) Milk and butter would be hard to make acceptable. This applies to foods fried in butter..."

Page 15: "11. Field recommendations:

"(a) Basic food habits are ingrained early in childhood. Food is a center of anxiety and fear. In times of war and calamity. Thus, food will be subject to wild rumor and constant criticism.

"(b) The cultivation of gardens should be encouraged.

"(c) So far as Japan is concerned, a general supply of fresh pickled vegetables and shoyu will go a long way toward making even the handouts of a conqueror palatable.

"(d) Because food habits are often difficult to change, it would probably be helpful to enlist local assistance in the preparation and distribution of food supplies. Cooks make excellent anthropologists. Given any food, a Japanese cook would manage to Japanize it. For instance, in cooking vegetables Japanese use soy sauce and sugar, not salt and butter. Similarly, spaghetti in tomato sauce or macaroni in cheese would not be acceptable. Cooked in soy sauce, sugar and dried bonito shavings, however, it would probably be eaten, as in this form it would be similar to Japanese soba or udon."

Table 5, "Composition of Japanese foods per 100 grams (Ready to be eaten)" includes: "Bean-curd omelet. Pea curd. Bean curd (*Tofu*). Bean residue [okara]. Sprouted beans (5% protein)."

Page 16: Table 6 (8 columns), "Production and consumption of foodstuffs in Japan proper–1936" includes rice, wheat, barley, other cereals, soybeans, other beans,... For each food is given: Name of food. Area (1,000 acres). Value of production (million yen). Production (million pounds). Exports (million pounds). Imports (million pounds). Total (million pounds). Consumption per capita (pounds; Rice: 350.9. Wheat 42.2. Barley 36.3. Soybeans 27.2. Fish 67.3. Meat 4.8. Eggs 5.9. Dairy products 0.8, but fresh milk, of which consumption amounted to 1.04 gallons per capita, has not been included). Extensive notes accompany Table 6.

3711. Moyer, Raymond T. 1944. The agricultural potentialities of Manchuria. *Foreign Agriculture* 8(8):171-91. Aug. [12 ref]

• ***Summary:*** The name Manchuria has been used for some centuries by Western peoples as a designation for the territory located outside the Great Wall, northeast of China proper. The Chinese during more recent times have called it the Three Eastern Provinces, meaning Liaoning (Fengtien), Kirin [Jilin], and Heilungkiang Provinces. Under the Japanese after 1931 this territory, together with that of a fourth Province, Jehol, was organized into a political entity to which the name "Manchoukuo" was given. As used in this discussion, Manchuria refers to the territory included in the four Provinces. Together they cover an area estimated at 496,531 square miles, which is greater than the combined areas of Germany, France, Belgium, and the Netherlands. The population in 1940 was stated to be about 43 million, at least 90% of which was Chinese. A distinction is often made between North Manchuria and South Manchuria. No sharp line of demarcation divides these regions. The 44th parallel is sometimes used as a line divided the two.

Slightly more land is devoted to the production of soybeans than to any other crop. The important pre-war crop regions and their principal crops are as follows: Kaoliang-millet-soybean region–grows a tall, grain sorghum called kaoliang, Maize-soybean-kaoliang region, Soybean-millet-kaoliang region, and the soybean-wheat-millet region. The soybean acreage of Manchuria was 8,700,000 acres, Kaoliang covered 7,300,000 acres, millet had 6,300,000, and maize and wheat had 3,300,000 and 2,700,000 acres respectively. The calculated yield of soybeans, over the 5-year period 1934-38, averaged 16.8 bushels per acre as compared with 17.2 for China and 16.1 for the U.S. (1931-39).

Of the total value of all products exported, average 1933-37, approximately 70% was contributed from agricultural and animal products. Soybeans and soybean products alone accounted for 49% of the total. The annual export of soybeans averaged about 2,300,000 short tons. Soybean oil averaged about 88,000 tons which, if converted into its equivalent in soybeans, brings the total, in terms of soybeans, to about 3,200,000 tons. Further amounts of other beans exported raises the total average quantity to about 3,400,000 tons. In addition, about a million tons of soybean cake were exported (see table 6). Of the soybeans exported, about 60% went to Europe and most of the remainder to Japan and to China proper. Of the oil, Japan took a major part, but China also took a large quantity. Of the cake, about 80% went to Japan and most of the remainder to China.

From 1934-38 the average amount of soybeans produced was 4,362,000 short tons. There were 3,157,000 short tons available for export, and they imported none. Thus there were 1,205,000 short tons available for utilization, and 1,024,000 tons available after providing for feed and seed. The number of pounds available, per capita, for human consumption in Manchuria was 57.8 pounds. In China proper, it was only 29.8 pounds. Address: Office of Foreign Agricultural Relations.

3712. Nakajima, K.; Ikeda, M. 1944. Nattô-kin no ôyô

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ni kansuru kenkyû. III. Nattô no seizô jôken ni kansuru kenkyû (3). Hakkô-chû no ondo henka ni tsuite [Research on the application of natto bacteria. III. Studies on the conditions of natto production (3). Temperature changes during fermentation]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 20(8):425-33. Aug. (Chem. Abst. 46:7703). [3 ref. Jap]

3713. Lang, A.L. 1944. Facts on soybean fertilization. *Soybean Digest.* Sept. p. 52, 54, 58.
• ***Summary:*** Piper and Morse state that in China and Manchuria the only fertilizer applied is a compost of stable manure and earth. In some districts in Japan, straw ashes and phosphate of lime are used, while in others wood ashes and phosphate of lime are used. "These treatments would indicate response to organic matter, calcium, phosphorus and potassium."

The first fertilizer studies on soybeans in the USA were by Flagg at Rhode Island and Phelps at Connecticut. Flagg found that applications of 150 to 450 pounds of nitrate of soda were not profitable. Phelps found in studies from 1895 to 1901 that nitrogen fertilization failed to increase the yield or protein content of the beans produced.

In recent years, research on soybean fertilization has been concentrated in the Midwest Cornbelt areas. Researchers include Albrecht and Klemme of Missouri, H.R. Meldrum of Iowa, and R.E. Yoder of Ohio [in the Agronomy Dept., Ohio Agric. Exp. Station]. "At the Illinois Station, soybeans have been grown on the soil fertility plots of the local farm and outlying experiment fields since 1903." Soybeans seem to do better on poor run-down acid soils than almost any other Cornbelt crop. They respond well to phosphate and potash fertilizers. A photo shows A.L. Lang. Address: Assoc. chief of the soil experiment fields, Univ. of Illinois.

3714. Umeda, Isao; Tateno, M.; Matsumoto, M. Assignors to Noda Shoyu K.K. 1944. Chômiryô seizô-hô (shinshiki 1 gô) [Method of preparing a seasoning (semi-fermented soy sauce #1)]. *Japanese Patent* 167,668. Oct. 18. Application filed 12 April 1943. [Jap]*
• ***Summary:*** This Shinshiki #1 patent for making chemical soy sauce was opened by Kikkoman to other shoyu brewers in Japan free of charge (Yokotsuka 1980). In 1948 the same offer was made with the Shinshiki #2 patent for a soy sauce made by a combination of fermentation and chemical processes. Address: Noda Shoyu Co., Noda, Japan; 1. Head of research lab.; 2. Actual discoverer; 3. Asst. researcher.

3715. Asai, Toichi. 1944. Ueber die Mycorrhizenbildung der Leguminosen-Pflanzen [On the building of mycorrhizae in leguminous plants]. *Japanese J. of Botany* 13(3):463-85. Nov. 28. [12 ref. Ger]
• ***Summary:*** Among the important crops plants that have vesicular-arbuscular (VA) mycorrhizae are soybeans. Table 1 (p. 465-66) shows the various leguminous plants (including soybeans) in which the existence of active endotrophic mycorrizae have been confirmed. A table (p. 472) gives details on cultivated soybeans. A detailed summary of the article is given (p. 484-85). Address: Botanical Lab., Fifth Higher School of Kumamoto.

3716. Lee, Hsiang Kai. 1944. Miracle bean for starving millions. *Soybean Digest.* Nov. p. 10.
• ***Summary:*** "Because of the importance of the soybean as human food" the history of China has been "marked with bloody clashes. The invasion of China in 1931 by greedy Japs was caused primarily by the lush prize of the immense soybean crops of China, which in the past decade have averaged more than 250 million bushels a year. China's rich soybean land was seized with two objectives: The first one is the insidious scheme to subjugate China's 450 million people through starvation, the second one is to utilize the immense crops of soybeans to build up Japan's industrial strength for world conquest."

The author "was born and raised on soybeans in Honan, China." Address: Engineer, Ford Motor Co.

3717. Markham (James E.). 1944. Display ad: Notice of sale. Invitation for bids for the purchase of shares of stock of Oriental Show-You Company. *Chicago Daily Tribune.* Dec. 3. p. A6.
• ***Summary:*** World War I is now raging. This company in Indiana was founded and owned by a Japanese man, Mr. Shinzo Ohki. Japanese were not allowed to become American citizens if they had been born outside the USA.

This fairly large, prominent ad begins: "James E. Markham, Alien Property Custodian, invites bids for the purchase as a whole of 132 shares of common stock, of par value $100 each, (constituting approximately 39% of the outstanding common stock) and 20 shares of preferred stock, of the par value of $100 each (constituting approximately 17% of the outstanding preferred stock) of *Oriental Show-You Company,* an Indiana corporation, engaged in the manufacture and sale of Oriental Show-You sauce and food products, with its office and place of business at Columbia City, Indiana..."

"All bids must be presented at the office of the Alien Property Custodian, 123 South LaSalle Street, Chicago, Illinois, on or before 12:00 o'clock noon, Central War Time, on December 20, 1944, at which time and place all Bids will be opened publicly. The stock will be sold only to American citizens." Address: Alien Property Custodian, Chicago.

3718. Bayles, D.P. 1944. Soy oil is pinch hitting. *Soybean Digest.* Dec. p. 8-9.
• ***Summary:*** "Use of soybean oil in protective coatings remained about 2 to 2.5% of total oils employed by that

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industry from 1930 until the outbreak of the Sino-Japanese war in 1937. Then with the curtailment of tung oil supplies, it rose in importance until in 1941 it represented 4.7% of total oils used for drying purposes." Address: Bureau of Foreign & Domestic Commerce.

3719. Finding aid for the Abiko family papers, ca. 1890-1944 (Archival collection). 1944. University of California, Los Angeles (UCLA), Library, Department of Special Collections. 44 boxes (22 linear feet). 2 oversize boxes, *
• ***Summary:*** Collection No. 1690. "Kyutaro Abiko (1865-1936) was the longtime publisher of the *Nichibei Shinbun* of San Francisco, the leading Japanese daily newspaper published from 1899-1942. He also organized the Central California Land Company. In 1909, he married Yonako Abiko (1880-1944). After the death of Kyutaro in 1936, Yonako Abiko became publisher of the *Nichibei Shinbun.* During World War II, she was briefly interned at the Tanforan Assembly Center in San Bruno, California. The couple had a son, Yasuo Abiko (1910-88). The collection consists of correspondence, diaries, photographs, and memorabilia related to the Abiko family. Most of the material in the collection is in Japanese, but some is in English as well."

Physical location: "Physical location: Stored off-site at SRLF. Advance notice is required for access to the collection. Please contact the UCLA Library, Department of Special Collections Reference Desk for paging information." Address: Los Angeles, California 90095-1575.

3720. International Institute of Agriculture. 1944. Agricultural commodities and raw materials produced and consumed in the different parts of the world 1934-1938. Villa Umberto, Rome, Italy: IIA. 229 p. Index. 24 cm.
• ***Summary:*** Concerning world soya production (worth $184 million gold), Asia [mainly China, Manchuokuo [Manchuria], Chosen [Korea], Netherlands Indies (Java and Madura), Japan, Kwantung, and Taiwan; based on 1939 IIA studies of world market #4] produces 89.6% (393.5 million bu of 60 lb each, worth $165 million), North America 9.4% (41.2 million bu, worth 17 million), USSR 0.6% (2.6 million bu, worth $1 million), and Europe 0.4% (1.8 million bu, worth $1 million).

Concerning world soya consumption (worth $184 million gold), Asia consumes 78.4% (worth $145 million), Europe 11.6% (worth $21 million), North America 9.3% (worth 17 million), USSR 0.7% (worth $1 million).

Between 1934 and 1938 soya production has increased greatly, rising 90% in Asia, 9% in North America, and 1% in the USSR and Europe. The biggest soya exporting continent is Asia, and the biggest importer is Europe. In Europe, Germany (at 24.3 million bushels, each 60 lb) imports more than all other European countries combined, followed by Denmark (8.8 million), the UK (4.8), Sweden (4.4), and Netherlands (3.7). Address: Rome, Italy.

3721. Miller, Harry W. 1944. The story of milk from the soya bean. Mount Vernon, Ohio: International Nutrition Laboratory. 37 p. See p. 1-6.
• ***Summary:*** This rare and very interesting booklet was sent to Soyfoods Center by Charles D. Howes of Mt. Vernon, Ohio, in Feb. 1979.

Contents: Full page photo of the "International Nutrition Laboratory established for processing soya bean foods, located at Mt. Vernon, Ohio. Foreword, by J.A. LeClerc, PhD, Formerly Senior Chemist of the USDA (Retired). March 5, 1944. The story of vegetable milk (Soyalac), by Harry W. Miller, M.D. Early trend, observations in China, back in America, the milk question, encouraged to produce a vegetable milk, further studies in China, the role of the International Nutrition Laboratory in America. Other products of the International Nutrition Laboratory.

"Foreword: The preparation of a palatable and appetite-appealing soya milk is proving a great boon to people allergic to cow's milk. It has been estimated that 20 to 25 per cent of our population are allergic to ordinary milk and many thousands of babies suffer from infantile eczema and other violent symptoms, whose condition clears up when transferred to soya milk feeding.

"Soya milk as prepared has approximately the same composition as cow's milk, except when soya milk is especially prepared for infants its formula simulates mother's milk. Soya milk contains more Vitamin B than cow's milk, and an equal quantity of Vitamin B-2. The valuable proteins found in soya milk contain all the Amino-acids known to be essential for growth. Preparations made from the soya bean are relatively rich in iron and copper, so that soya milk compares very favorably with animal milk as to its nutritional and biologic values.

"Soya milk has this further advantage that it does not endanger the user to disease producing germs.

"In view of the fact that there is not enough animal milk available in this country for the optimum nutrition of our population, also that it takes three years of care and feeding before a cow gives milk, that only a small percentage of the food consumed by the cow is returned in the form of milk, and further that the use of only ten million bushels or one twenty-fifth of our annual soy bean crop for conversion into soy bean milk, would supply a pint of milk every day to 8,000,000 people, at a cost less than that for cow's milk, and that soya milk is palatable, and especially acceptable by children, it would seem the sensible thing to encourage the preparation and consumption of soya milk on a large scale.

"The 'Story of Vegetable Milk' is most interesting to read. The successful preparation of an appetite-appealing soya milk, after years of experimentation by Dr. Harry W. Miller, now bids fair to become one of the most practical of modern food discoveries. Its use will not only be the means of saving thousands of children from unnecessary suffering

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and sickness but soya milk should prove a good substitute for cow's milk for those who are allergic to animal milk.

"It is my sincere wish that all who are fortunate enough to obtain a copy of Dr. Miller's "Story of Vegetable Milk," will study its contents and then pass it on to others, in order that in due time, millions of our people will have recognized the full nutritive value of this most excellent food product."– Signed, Joseph A. LeClerc, PhD.

"Early trend: Being the oldest of a family of five children, it fell to my lot to help Mother about the kitchen. She was well known for her sumptuous meals, and we always had many visitors at our house. Later as a part of the curriculum of the college which I attended was a course in cookery, and this stimulated my interest in knowing how good things were made as well as their food values. Then when I became a student of medicine we were introduced into a study of food preparation which in those days (1898) was rather unusual in the program of a medical school. This course only seemed to further whet up my interest in the study of foods and their preparation.

"Having to earn the resources for pursuing my medical education. I secured the position of guiding visiting groups through a food factory. As I explained the processes of manufacture, many questions were directed to me on all phases of nutrition as it relates to health and disease, and I took great interest as a guide to inform myself in every way available. I hungrily devoured literature on the subject and was fortunate in being under the tutorage [sic, tutelage] of the father of nutrition work in America, namely the late Dr. John Harvey Kellogg, to whom more credit belongs for furthering the selection, processing and sanitary packaging of breakfast foods than any other man. He was forty years ahead of the times in advocating the value of proper diet in relation to the cure of the sick, and so I have been able to grow up with the advance of nutrition work from its beginning and see the birth of the science of dietetics.

"Observations in China: In the autumn of 1903 my wife and I sailed as medical missionaries for interior China. After a stormy voyage, in which seasickness had deprived us of rations that were included in the price of our ticket, as well as several pounds of flesh, we arrived at the port of Kobe, Japan, where our colleagues, Dr. and Mrs. Lockwood, who preceded us one year, had a small sanitarium and had prepared a sumptuous meal for us. Half starved, we ate with great relish. One dish that was new to us especially attracted attention. It was a protein loaf made from the soy bean curd which was marketed under the name 'To Fu.'

"Arriving at the port of Shanghai, China, we went inland and took up our abode in the central part of the province of Honan, where we not only wore the Chinese costumes, including the queue, but our diet was from foods bought from the local markets, and consisted of only those edibles indigenous to China. Here again we were introduced to the soy bean, whose home is China, and which has been the great source of protein of the Chinese people for millenniums.

"The bean was grown abundantly in Honan, and in fact in all parts of North and Central China. Wherever the Chinese emigrate, they utilize this bean in many marvelous and tasty ways, mostly, however, in the form of cheese made by coagulating the milk with calcium sulphate. This curd is eaten in its soft state, or else pressed into little square cakes. The curd may be formed in sheets by pressing cloths. They also gather sheets of almost pure albumen [yuba] from a scum arising to the top of the soy milk on heating same. Accustomed to people chiefly drinking cow's milk, rather than making products from it, I questioned the Chinese why they did not use the soy milk. They said some of the aged with weak digestions do, but that the cheese was more popular, as they could combine it with other cooked foods. Still more did I wonder why, for the much undernourished infants of the Orient, they did not give them soy milk, containing as it does such important food entities as salts, vitamins, protein and oil in richer amounts than the bean curd and without the undesirable gypsum.

"Being engaged in language study and other mission responsibilities for several years I could do but little more than ponder over what I felt were great possibilities in soy milk for the people of China as well as other lands, were it scientifically studied.

"Another observation I made was that the people of North and Central China who were vegetable-protein eaters, getting especially soy bean rations, were a large and muscular people in comparison with those of the South, where rice was the food, and who used more meat in their diet. These results were later confirmed by experiments to show that the protein of the soy bean is one of the greatest body building foods known.

"Back in America: After eight years' service in China, I was compelled to return to America on account of illness contracted in interior China. When sufficiently recuperated, I was called to the position of medical superintendent and surgeon of the Washington Sanitarium and Hospital at the nation's capital. This again brought me in touch with important nutrition studies carried on at the government bureaus in Washington and also the work at Johns Hopkins University. We also had our own laboratory where we prepared several soy products and introduced many original dishes into our hospital dietary. The Washington Sanitarium was an institution whose dietary was of the lacto-vegetarian type" (Continued). Address: M.D., Mt. Vernon, Ohio.

3722. Miller, Harry W. 1944. The story of milk from the soya bean (Continued–Document part V). Mount Vernon, Ohio: International Nutrition Laboratory. 37 p. See p. 23-30.
• ***Summary:*** Continued. "Unfortunately, the war that broke out in Shanghai on August 13, 1937, put an end to this illustrious beginning of making a soya milk with the

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vegetable cow. The sales returns were just beginning to equal the cost of operation. As a consequence of the war, the fire and bombing destroyed more than a hundred thousand dollars, national currency, worth of property and equipment. However much valuable experience had been gained during this time through the feeding of infants and children and the dieting of special disease conditions. The results of this experience were published in the *China Medical Journal,* 1937. These results showed that soy bean milk was second only to mothers milk in the feeding of infants and children and has no equal in dieting cases of stomach acidity and other intestinal complaints. The high biologic value of its protein, the ease of its digestion and ready absorption, when combined with dextrose and maltose, yielded a food of tremendous value to the people of the Orient where the soy bean is indigenous. This brief experiment in conducting a soy bean dairy left a contribution far exceeding the losses sustained by fire and the bombs. For two years we had to turn largely aside from food manufacture. We were busy establishing and organizing a sanitarium at Hankow, China, known as the Wuhan Sanitarium and Hospital. This large institution was extensively used for the care of sick refugees and disabled and wounded soldiers up till October 25, 1938, when the Japanese army forces entered the Wuhan area. Three months later I, with a group of four other Americans, being among the first to evacuate from Central China, were granted transportation on a Japanese transport to Shanghai.

"The Role of the International Nutrition Laboratory in America: Back in America, my first thoughts were how most advantageously to follow up our food research work and lay hold upon the wealth of nutritional advance and the knowledge of food processing in the U.S.A. in perfecting processes developed in China. The need of the peoples of the Orient was uppermost in our mind and protein direct from vegetation seemed their only way out for adequate nutrition, the soy bean naturally being that source. We, therefore, secured land and erected a suitable building on a farm at the suburbs of Mt. Vernon, Ohio, as this was in the soy bean growing belt.

"No sooner did we start the foundation of the building than we began also to fabricate the equipment for carrying forward the processes already worked out for the manufacture of soya milk and subsidiary food products from the soy bean according to our more recent research. The farm gave me opportunity to grow several types of the edible soy beans. The edible soy beans differ widely from the field type beans grown so extensively in the United States. The field varieties are raised for hay or for ripened beans to be used by the oil refiners, the residual bean cake is sold for stock feed. A small part of the bean crop is used for flour. The edible beans are those varieties that are better flavored, easier to cook, make better flour and are such as can be shelled in the immature state for green pack tinned beans. There is as much difference in foods made from the edible beans and those made from the field soy beans as in the taste and quality of sweet corn and that of field corn. There are two belts in America for producing soy beans. Some varieties of soy beans mature in from 90 to 120 days and are suitable for planting in the northern belt which includes the states of Ohio, Indiana, Illinois, Michigan, Wisconsin and Iowa, and the beans requiring over 120 days to mature are grown in the southern belt including the states of North and South Carolina, Georgia, Arkansas, Texas and Missouri.

"Out of fourteen varieties of the edible beans planted on our farm, four outstanding varieties were selected, namely, Bansei, Aoda, Funk's Delicious and Hokkaido. These four mentioned in the order of their value were found best for green pack canning, also made the best quality flour and milk, and were found best for processing for other foods. From our southern soy bean station located in North Carolina, there were three varieties, namely, Rokusun, Tokyo and Woods Yellow, named in the order of their value for food processing, A very unique feature of our farm experiment work was the shelling of green soy beans, with the use of a Viner obtained from the Scott Viner Company of Columbus [Ohio]. Some 40,000 cases of these delicious beans were put up this season (1943). A single unit of these Viners is capable of shelling five tons of green beans in one day.

"Because of the limited production in America of these fine vegetable types of soy beans, we readily saw that we would have to run, as an important adjunct of the laboratory, a seed department, and an extensive agricultural program in raising this type of beans, and our methods in these lines have been perfected to overcome shattering, uneven ripening and other heretofore drawbacks to the raising of these splendid beans. We now have under cultivation annually several hundred acres of these large delicious edible soyas for green bean canning and for milk processing.

"Our factory, a newly built brick structure, lined with enameled tile, was completed in the autumn of 1939 and contains laboratory space, test kitchen space where soy milk and soy products are under continual tests for their combining properties in tasty recipes. This modern food factory has three large boilers for supplying steam pressure for processing, and contains specially constructed stainless steel cookers, vacuum pans, spray dryer, iron cow (homogenizer), grinder, centrifuges, sterilizers and other processing machinery. This is our first model plant where we have arranged the machinery in series so that the hydrated beans start at one end of the factory and come out a dehydrated complete milk powder at the other end, all ready for tinning in sanitary cans, and shipping.

"Nothing is perhaps more spectacular than to watch this milky bean juice being converted into a palatable, readily digestible milk, containing all the food essentials, with minerals and vitamins added and flowing from the iron cow in quantities as much as is often secured from the aggregate milkings of several hundreds of cows. It is truly a wonder,

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a colloid milk, bacteria free, being made in a sanitary laboratory.

"The splendid tasting and readily soluble powdered milk as it is now produced at the International Nutrition Laboratory came about only as a result of much effort and time in making many improvements and alterations of equipment from week to week. Dr. Weisner, of Ohio State University, did much valuable research work on the bacteriology of soy milk, and we are indebted to Dr. W.J. Morse for supplying seeds and much valuable information, and to Dr. LeClerc, senior chemist of the Government Department of Agriculture, for check-ups that assisted us in the standardization of our products.

"We were fortunate in being able to develop this milk in the Orient with a background of the Chinese experience with soy bean foods for ages and also have the benefit of scientific and technical expert help in the United States through the frequent visits I made to this country, and I feel profoundly grateful for the services of many of the leading nutrition experts as also the laboratory and engineer help to be found in Government Bureaus at Washington and at the Ohio State University. For vitamin assays, I am indebted to Dr. Howard J. Cannon, Director of the Laboratory of Vitamin Technology at Chicago. In the Orient we also had able laboratory help, and the feeding work was under our own supervision in Shanghai Sanitarium Clinic, a 200-bed hospital conducting a very large maternity and children's department.

"Soy beans can be grown in almost any country of the world and are capable of many methods of preparation. In Oriental countries we need to improve the preparation of soy bean foods to make them more digestible. In the Occident we have readily at hand the processing vats to thoroughly cook the beans, but to go over big, they must be made readily available and also palatable. The International Nutrition Laboratory, as its name indicates has been established to thoroughly process the bean and at the same time make it palatable so that its use can be universal. In warm climates or frigid areas nothing is more easy of digestion than the colloid liquid, soya milk.

"On several occasions we have gone out to lecture and give demonstration to clubs and to the annual meetings of the American Soy Bean Association. We have observed the textiles, fabrics and plastics made from soy bean protein with great admiration. At one meeting, wool was shown made from the soy bean and at another a cap, necktie, and many other articles we use" (Continued). Address: Mt. Vernon, Ohio.

3723. **Product Name:** Agé.
Manufacturer's Name: Slocan Soya Co.
Manufacturer's Address: Slocan, BC, Canada.
Date of Introduction: 1944?
New Product–Documentation: Note: Slocan is in the southeast part of British Columbia. Letter from Edward and Danette Westlind. 1989. Aug. 14. "My wife and I are purchasing a small tofu and agé business on September 1, 1989. Slocan Soya Co. was started during the second World War when there was a large population of Japanese Canadians interned in the Slocan Valley. For roughly 30 years, agé was the only product made by Slocan Soya. Twelve years ago Slocan Soya Co. was sold to a local Caucasian woman who started producing tofu to supplement her income. From the 1940s until now there has been very little in equipment upgrading and the business has been gradually declining due to lack of interest on the part of its owner. We are confidant that with new energy and enthusiasm on our part the business can be revived."

3724. Greenway, P.J. 1945. Origins of some East African food plants. Part III. *East African Agricultural Journal* 10(3):177-80. Jan.
• ***Summary:*** "The first effort to establish this crop in East Africa appears to have been made at Amani [German East Africa; in today's Tanzania] in 1907 and further introductions were made from the U.S.A. in 1909. These do not appear to have been successful and further trials were made in 1911 with seeds from China, Japan and South Africa. Since about 1920 further trials have been, and are being, made by departments of agriculture in East Africa... It is recorded that occasional plots of soy beans are to be seen cultivated by the natives in Uganda and Kenya, they apparently trade their seeds with Indian traders."

Note: This document contains the earliest date seen for soybeans in Tanzania, or the cultivation of soybeans in Tanzania (1907). The source of these soybeans is unknown. Address: Systematic Botanist, East African Agricultural Research Inst., Amani [German East Africa, later in Tanzania].

3725. Morse, W.J. 1945. Soybeans in the land of our enemies. *Soybean Digest.* Jan. p. 6-7.
• ***Summary:*** Text of a letter to the American Soybean Assoc., Guelph, Canada, written from Tokyo, Japan on 20 July 1929. This is the first ASA meeting Morse has missed. He and Dorsett, comprising the Oriental Agricultural Exploration Expedition, arrived in Japan on March 18 and set up headquarters in Tokyo. "It is amazing, the extent to which the soybean is used for food in Japan." For details, see Morse 1929 ("Letter from Dr. Morse"). Address: USDA Bureau of Plant Industry, Washington, DC.

3726. Schofield, Maurice. 1945. The amazing soya bean. *Contemporary Review* (*London*) 167:48-51. Jan. [4 ref]
• ***Summary:*** Contains a good but brief history of the soybean, including the history of its cultivation in Britain. Samuel Dale, the British botanist, probably thought of soybean cultivation long ago. The "Royal Botanical Gardens at Kew saw some specimens in 1790. But it was

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the awakening in the West which stirred up the ground at Woburn, where prior to 1914 the Royal Agricultural Society had several years' experimenting with it before concluding that soya needed a warmer climate than ours. In 1916 the Board of Agriculture, though maintaining that the Japanese and Manchurian varieties hitherto tested would not produce seed in economic amounts in Britain, suggested the possibility that varieties more suitable might be bred...

"After Mr. Henry Ford's success with thousands of acres of soya near Detroit [Michigan], it was not surprising in 1933 to hear of part of the Fordson Estate at Boreham, Essex, being turned over to soya cultivation. A six-acre field was prepared, 47 varieties of soya from North America, Manchuria and Japan being sown. Despite very good weather in that year, the initial fast-growing period (experienced in the hot season of Manchuria) was not good enough: our merry month of May was not so merry for soya. By September many plants had very small pods; others had not got beyond the flowering stage; others yet again had not bloomed at all. A year later a twenty-acre field was prepared to utilise what was hoped to be acclimatised seed from the previous year. There was a good race to maturity between 'green Jap,' 'brown C,' and 'black O,' with the 'Jap' variety winning...

"That there is still a case for soya in England is the belief of enthusiasts like J.L. North, of the Royal Botanic Society, Miss Elisabeth Bowbridge, who was connected with the Essex experiments, and Dr. H. Hunter, director of the National Institute of Agricultural Botany at Cambridge. Dr. Hunter, after twelve years' experience, holds that only varieties like 'Jap' and 'brown C' have a tolerable chance of full maturity in this country, yet soya cultivation is still worthy of a place in British agriculture because of its superior qualities." Address: England.

3727. McCay, Jeanette B.; Loosli, J.K.; Adolph, W.H.; Brewer, Lucille; Munn, M.T.; Neidert, Marion; et al. 1945. Soybeans: An old food in a new world. *Cornell University, Extension Bulletin* No. 668. 65 p. Feb. Illust. Index. 28 cm. Produced by the Soybean Committee of the New York State Emergency Food Commission. [38 ref]

• ***Summary:*** Contents: A potential food resource: Introduced into the United States, new American industries. Composition and food value of soybeans: Proteins, fats, carbohydrates, minerals, vitamins, the enzymes of the soybean. How to use soybeans and soy products (contains many recipes): Fresh green soybeans (how to cook, how to can, how to freeze), dry soybeans (how to cook, how to can, how to freeze, 3 recipes, salted soybeans [oil-roasted soynuts], how to prepare bean pulp {by running drained cooked soybeans through a meat chopper}, 4 recipes), sprouted soybeans (vitamin C forms during sprouting, exposure to light does not affect vitamin C, riboflavin and niacin are also increased, how to sprout soybeans at home {9-step process}, store sprouts in refrigerator, how to freeze sprouted soybeans, how to cook sprouted soybeans, illustration of apparatus [equipment] for sprouting soybeans in quantity, 6 sprouted soybean recipes), grits, flakes and flour (protein equivalents {one pound of low fat soy flour is equal in protein value to two pounds of cheese, 2 pounds of navy beans, 2½ pounds of beefsteak or chicken, 3 dozen eggs, 5 pounds of bread, or 12 pints of milk}, a little soy flour with wheat flour improves protein quality, amount of protein, iron, and calcium also increased, 23 soy-grits and flour recipes {divided into 3 main dishes, 3 quick breads, 17 desserts}), a stronger staff of life–bread (rats fed bread containing only 5% soy flour grow much better than those eating white bread, does soy bread taste good?, little change required in baking with soy flour, 6 yeast bread recipes), soybeans in large-quantity cooking (6 recipes), other soybean products (soybean curd, soybean milk, soy sauce). Production, varieties, and culture of soybeans. Soybeans in animal feeding: For cattle, for sheep, horses, swine, and poultry, soybean hay a substitute for alfalfa, for dogs and fur-bearing animals. References. Index.

Contains nine bar charts in the form of illustrations / pictorial drawings / symbolic graphics (which may be by Kenneth Washburn).

How to sprout soybeans at home (p. 26-27):

"1. Select a stock of clean, bright, new-crop soybeans of one of the field varieties. The yellow seeds have less conspicuous skins than do the black beans, although the black beans may be preferred. The garden varieties are not satisfactory because the sprouts break off easily, but the exact variety is unimportant so long as the seed is good.

"2. Handpick the seed thoroughly, and discard everything except clean, whole beans.

"3. Wash the beans and place them in a suitable container for sprouting, such as a one- or a two-quart glass fruit jar. The bean sprouts increase to about six times their original volume.

"4. Cover the seeds with at least four times their volume of lukewarm water and let them stand for a few hours, or at most overnight, until they are swollen.

"5. Pour off this water, and wash or rinse the swollen beans thoroughly, then pour off the last wash water.

"6. Cover the top of the jar with a piece of cheesecloth or other thin cloth, and tie it on securely. Quarter-inch mesh screening also makes a good cover.

"7. Invert the jar and place it in a cupboard or dark place, in a slightly tilted position, so that the excess water can drain away.

"8. At least three times a day, or better every four hours, place the jar under the water tap or pour on plenty of cool water, thus thoroughly and carefully washing the swelling and sprouting seeds, so that bacteria or molds which may have developed are carried away. The better the washing, the better the sprouts. After washing, place the jar back in its

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slanting position.

"Chlorinated lime water to kill fungus growth is not needed if the seed is well selected. If such a solution is used (1 tablespoon of chlorinated lime in 1 gallon of water), it should not remain on the seeds longer than for ½ hour; the soybeans are injured by a longer exposure.

"9. In from three to four days at room temperature, the sprouts will be from 1 to 2 inches long and ready for use. Then pour the sprouts into clean cold water and shuck off the skins if this is desired. With the yellow-seeded varieties, however, the skins are not conspicuous and need not be removed. If a flower pot or similar receptacle is used for sprouting with a piece of cloth over the bottom hole for drainage, be sure that the surface of the beans is also covered with a piece of moist cloth to prevent drying; otherwise the sprouts will be tough and will not be uniform.

"It is not wise to attempt sprout production in the summer, because good sprouts will not be produced in warm weather unless the place where they are sprouted can be kept at about 70ºF. The sprouting of old, badly cracked, discolored or shriveled soybeans should not be attempted, for this only causes trouble. Soybeans packaged for cooking and baking are not likely to sprout too well. When in doubt, one should make a preliminary trial. If, after the first day, or after soaking, the beans become soft or soggy, they are probably unfit for sprouting.

"The commercial production of soybean sprouts in large quantities proceeds along the same lines as outlined, except that larger sprouting devices or tanks are used and the process is more carefully controlled. An apparatus with an automatic watering device developed at Cornell University to sprout a large quantity of beans is shown in figure 6.

"Store sprouts in refrigerator: Sprouts not used immediately must be stored in a covered container in the refrigerator, as is any fresh, crisp vegetable, for as long as a week. They must be kept moist; otherwise they will wilt or discolor. If kept longer, they must be blanched for 2 minutes, then canned as a green beans, dried, or frozen."

Tables show: 1. Proximate and mineral composition of soybeans and soy flours. Essential amino acids in servings of certain protein-rich foods (lean meat, eggs, cooked soybeans). 3. Calcium, iron, and B vitamins (thiamine, riboflavin, niacin) supplied by common serving portions of certain foods. 4. Vitamin composition of 7 soy products. 5. Food values of sprouted soybeans and of some common vegetables per 100-gram edible portions. 6. Thiamine, riboflavin, and niacin content of soybeans during sprouting, storage, and dehydration. 7. Soybean milk, cow's milk, and human milk (typical nutritional analyses). 8. Composition of some [seven] soybean products used for food in the Far East. 9. Varieties of soybeans most suitable in New York State for animal feed and human food (For green vegetables: "Garden varieties such as Green Giant, Hokkaido, Jogun, Bansei, Fuji, Tortoise Egg, and Willomi").

Concerning "Fresh Green Soybeans: When gathered from the garden while the pods are still greenish and the seeds are still soft but fully developed, the soybean is a new green vegetable that some persons say is more attractive and delicious than the fresh lima bean. Many Victory gardeners have grown them for the first time, and they may be purchased commercially canned as are green peas."

Note: This is the earliest English-language document seen (Aug. 2003) that contains the term "protein quality." Address: New York.

3728. Pohjakallio, Onni. 1945. Soijapavusta (Glycine hispida Max.) [About the soybean]. *Luonnon Ystava* (*Friend of Nature*) 49(1):24-28. Feb. [Fin]

• ***Summary:*** In 1936, from May to September, soybean field plot trials were conducted at the Agricultural Research Centre, Dep. of Plant Breeding, Jokioinen [pronounced yo-ki-OI-nen] in southern Finland [just southwest of Forssa, at about 60.8º north latitude].

Soybean varieties were not able to produce any mature seeds in most of the trial years, except 1937, when the summer was very long and warm. Also in 1938 some varieties produced seed yields with a high germination percentage. Trials were conducted for seed production, but it is not stated which variety gave the best seed yield.

The text states that the earliest varieties in the trials were Manitoba (probably from Canada), Hokkaido (probably from Japan), Soya Vilnensis (from Lithuania), and Aro (from Sweden). A number of other varieties, whose names are not given, were also used in the trials. Table 1 shows varieties used in a 1943 trial: Manitoba, Manchuria, Virginia, and Ön (from Japan). Table 2 shows that the variety Peking was used in another 1943 trial.

Page 24 states: "Soybean is not adapted to growing in Sweden, but because it possesses many promising characteristics it is of interest. So the Swedish government has given money (10,000 SEK) for the breeding of soybean varieties. Also in Finland, in the Department of Plant Breeding, Jokioinen, some preliminary soybean trials were conducted."

Page 25 states: "It has been reported that soybean yield in Germany has been 10,000 to 30,000 kg/ha of fresh seed, 5,000 to 8,000 kg/ha of hay, or 800 to 3,000 kg/ha of dry soybean seeds. Also in Sweden, in trials conducted in 1938, yields of 1,800 kg/ha of seeds were attained, but in 1941 the mean yield was 529 kg/ha and in 1942 only 240 kg/ha. In Finland, the soybean has been cultivated on such small areas that one cannot speak of yields per hectare. In most of the years, the field trials in Finland produced no yield of mature seed. In the trials at Jokioinen in the years 1936-1944, where the earliest varieties (except in 1936) were tested, the pods were able to reach the yellow color only in 1937, when the summer was very warm." A photo (p. 25) shows the soybean variety Hokkaido growing in Jokioinen in 1937.

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Page 28 notes that it is said that the soybean is a crop for short daylength, but great differences have been found in that character between varieties. "Our plant breeders should try to breed soybean varieties that are adapted to conditions in Finland. Therefore soybean varieties which possess the lowest sensitivity to photoperiodism have been crossed together in Finland." The variety which was least sensitive to photoperiod was Manitoba.

Note 1. This is the earliest document seen (Feb. 2001) concerning soybeans in Finland, or the cultivation of soybeans in Finland. This document contains the earliest date seen for soybeans in Finland, or the cultivation of soybeans in Finland (1936). The source of these soybeans is unknown.

Note 2. This document was discovered and partially translated for Soyfoods Center in Jan. 1995 by Dr. Simo Hovinen a plant breeder at Boreal Plant Breeding in Jokioinen, Finland. He tried unsuccessfully to find the original field reports of the soybean field trials conducted at Jokioinen during the years 1936-1944. He also searched through many research series from Finland but was unable to find any article about the trials mentioned in Onni Pohjakallio's text. Address: Jokioinen, Finland.

3729. Yamazaki, Momiji. 1945. Tôa hakkô kagaku ronkô [East Asian studies/theses on fermentation chemistry]. Tokyo: Daiichi Shuppan K.K. han. 436 p. Published 20 March 1945. [160* ref. Jap]

• ***Summary:*** This remarkable work, published in a limited edition of 1,000 copies, was written by Dr. Yamazaki, a microbiologist, who graduated from the Department of Agricultural Chemistry, Tokyo University, in 1914. The book is a review of existing Asian literature on fermented foods, with a good bibliography. Dr. Yamazaki may have been employed by the laboratories of the Manchurian Railway.

Contents: Introduction: Preface, origin of alcoholic beverages, various alcoholic beverages of the world, summary. Chinese fermentation chemistry documents: Preface, Chinese ancient grains, Chinese ancient grain foods, Various types of Chinese-made koji, Various Chinese-made alcoholic beverages, summary. Japanese fermentation chemistry documents: Preface, Japanese land, inhabitants on Japanese land, Japanese New Stone Age culture, conclusions. Real papers: Japanese ancient foods, Various types of Japanese-made koji, Japanese-made various alcoholic beverages, summary. Korean fermentation chemistry documents: Preface, Korean produced grains, Various types of Korean-made koji, Various Korean-made alcoholic beverages, summary. Tables.

3730. Dorsett, P.H.; Morse, W.J. 1945. Soys in the Orient. *Soybean Digest.* April. p. 10-12. Text of a letter written July 1930.

• ***Summary:*** Reprinted from: *Proceedings of the American Soybean Assoc.* 1930, p. 96-100. The article was originally titled "Soybeans in the Orient." One large photo shows Morse with several richly illustrated boxes of black miso [Hatcho miso]; smaller photos show abura-age [deep-fried tofu pouches], and tofu kasu [okara]. Address: Dairen, Manchuria.

3731. Shelledy, F.H. 1945. Japanese trade studies: Soybeans. *U.S. Tariff Commission, Special Industry Analysis* No. 13. 6 p. May. [3 ref]

• ***Summary:*** Contents: Foreword. Introduction and summary. Description and uses. Production. Imports. Post-war problems.

This "report is one of a number which were prepared during 1944 and 1945 for the Foreign Economic Administration..." Most of the data "were taken from official and semi-official Japanese sources." Errors and inconsistencies in these data have frequently been detected.

"Japan is not important as a world producer of soybeans. It is, however, normally the world's principal soybean importer. Its annual production during 1928-39 was only 10 to 14 million bushels. By comparison, the production in the United States was 90 million bushels in 1939 and more than 190 million bushels in 1943 and 1944; the average annual production of soybean in Manchuria during the thirties was more than 150 million bushels annually.

"Prior to the present war Japan took most of the exportable surplus of Manchuria, the principal world exporter of soybeans, as well as substantial quantities from Korea, a country which produces almost twice as many soybeans as does Japan. During the 10 years 1928-1938, Japanese imports averaged 26 million bushels annually, approximately double its own production."

"If an annual per capita consumption of 0.5 bushels [30 lb] of soybeans were to be maintained in Japan in the post-war period," Japan would require a total supply of about 37 million bushels/year, based on a 1940 population of 73.1 million. An estimated 10-14 million bushels could be produced in Japan in the short term period after the war. The rest must be imported.

Uses of soybeans include miso, soy sauce or shoyu, and tofu. The main center of soybean production in Japan is the island of Hokkaido. The soybean is the principal oilseed imported into Japan.

Tables show: (1) Soybeans: Production, imports, exports, and apparent consumption, Japan Proper and Karafuto, 1928-39. Columns show: Production. Imports from Empire. Other imports. Total imports. Exports. Apparent consumption: Total and per capita. (2) Soybeans: Imports into Japan from principal sources, average 1928-32, annually 1933-39. The graph has two main parts: Quantity (1,000 bushels), and value (1,000 yen). Empire areas: Manchuria (incl. Kwantung), Korea, Formosa, total. Non-Empire areas. Grand total. Source: Monthly and annual returns of foreign trade of Japan, Korea, and Formosa. Address: U.S. Tariff

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Commission, Washington, DC.

3732. Thom, Charles; Raper, Kenneth B. 1945. Manual of the Aspergilli. Baltimore, Maryland: The Williams & Wilkins Co. v-ix + 373 p. May. Illust. 7 color plates. Index. 24 cm. [260* ref]

• ***Summary:*** Contents: Preface. Part I: General discussion. 1. Historical introduction. 2. Classification, generic diagnosis, and synonymy. 3. Morphology and description. 4. Cultivation and examination. 5. Preservation of cultures. 6. Variation.

Part II: The manual proper. 7. The use of the manual. 5-21 contain descriptions of 14 Aspergillus groups incl. 18. The *Aspergillus wentii* group. 19. The *Aspergillus tamarii* group. and 20. The *Aspergillus flavus-oryzae* group.

Part III: Reference material. 22. Topical bibliography. 23. General bibliography. 24. Check list of species and genera. 25. Accepted species, varieties, and mutations.

"After the development of the microscope, men began to see structure in molds. In 1729, Micheli distinguished conidiophores and heads. "He noted that the heads were rough, the spore chains or columns producing an uneven surface, hence he gave the name Aspergillus (rough head). He then marked with Latin phrases his sketches of differently colored moldy substances... *Aspergillus capitulo pulla* for a black form, etc."

"After DeBary's group began to study organisms in comparative culture, the number of publications began to increase rapidly... Titles appeared in the 125 years before DeBary's 1854 paper; 73 appeared in the next 18 years preceding Brefeld's 1872 papers; 236 in the next 19 years just preceding Wehmer's oxalic acid reports in 1891. All of this may be called the period of physiological morphology. The remaining two thousand, published between 1891 and 1928, represent the pure culture period. This may equally well be called the biochemical period" (p. 4-5).

"Aspergillus wentii is a cosmopolitan species that is fairly common in soils, upon moist grains and other vegetable matter undergoing slow decomposition... In the Orient, it is often included with *Aspergillus tamarii, A. flavus,* and *A. oryzae,* all under the latter name as a rule, in the 'Koji' preparations used in the manufacture of various soy products."

Aspergillus tamarii is "a cosmopolitan mold upon vegetable material undergoing slow decomposition and can be isolated from almost all soils examined. Like *A. niger* and *A. flavus,* it is more frequently recovered from warm and semi-tropical soils than from cool, temperate soils, although it occurs in the latter. The species commonly appears with *A. flavus* and *A. oryzae* as a constituent part of the 'koji' used in the fermentation industries of the Orient. Certain strains apparently produce appreciable amounts of diastatic and proteolytic enzyme, while other strains are known to produce kojic acid...

"Kita's culture was isolated from a soybean sauce termed 'Tamari', hence the species name. Tamari is made by a shorter fermentation process than soy sauce or shoyu, and differs from it in flavor. Kita believed that where it was made empirically, it owed its individuality to the particular aspergillus which he isolated and described."

"Two species names are widely used for members of this cosmopolitan group. *Aspergillus oryzae* is applied quite generally, without regard to morphology, to the strains used by the Japanese and Chinese in the fermentation of rice and soy products. Although purified cultures are used in many places, the nomenclature is based more upon utilization than upon morphology. There appears, however, in these industries, a series of strains with long conidiophores, radiate heads, mostly greenish-yellow, with the green often fading completely in old cultures. These strains appear to be most commonly used in the production of the diastatic type of ferments and to be distributed in the great culture collections as *Aspergillus oryzae* (Ahlb.) Cohn. Such strains seem to be mostly oriental or tropical in origin." The other species is *Aspergillus flavus.* This chapter (p. 262-65) contains many excellent high-magnification illustrations of *A. oryzae.*

3733. Portères, Roland. 1945. Introduction du Soja dans l'alimentation des populations indigènes de la région forestière de la Guinée française [Introduction of the soybean to the diet of the native people in the forested region of French Guinea]. *Agriculture* (*France*) No. 57. p. 62-63. July. [Fre]

• ***Summary:*** Contents: The need to introduce soya into the indigenous diet. The difficulties of cooking soya. Varieties of soya that are easier to cook: Size and form of the seed, characteristics of the seed coat. Soaking, washing, and cooking. Cooking by the indigenous people. Difficulties of improving the indigenous diet by using soya. Favorable seasons for the entry of soya into the diet.

In the forested region of French Guinea (*Guinée*) (as well as in the western part of the Ivory Coast) the diet is rich in cellulose (from various greens and roots), starch (rice, starchy roots and tubers), and oils (such as palm oil), but is deeply deficient in protein. Protein could be furnished by meat, fish, or the seeds of legumes. As for meat from domesticated animals, we can calculate that in the area in and around Macenta (*Cercle de Macenta*) [a forested area in southeast Guinea] no more than 10 kg are available per person per year. The *Tomas* and the *N'Guerzés* people are not active hunters. They do only a little trapping and from that get only a little game (squirrels, rats, birds). They also fish very little.

In a village of 1,000 inhabitants like that of Seredou [in French Guinea, where there is a French agricultural experiment station], possessed of few flocks or herds, the supply of protein foods is represented annually by 2 kg of domestic meat, 2 kg of meat from wild game, and 1 kg of

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fish–or only 5 kg per person per year. The production of leguminous seeds (*niébés* [*niebes, Niebe, niebes, cowpeas, Vigna unguiculata*], peanuts {*arachides*}, voandzou [voandzeia, Bambara groundnut], and haricot beans) is estimated at 5-6 tonnes.

Among vegetable proteins, there are great differences. Research on the utilization of plant proteins by human beings shows that the protein of the soybean (*la graine de soja*) is most efficiently used. Moreover, the richness of soya in protein (40%) and oils (18-20%), its good digestibility, and its easy and rapid production, make the popularization of its cultivation a pressing necessity.

However, the indigenous people do not know how to cook soya, and it can be difficult to cook. The author has examined the difficulties encountered and has developed a process of easy cooking applicable to the indigenous people and a classification of the varieties according to the ease with which they can be cooked. Varieties of whole soybeans which are easier to cook have the following characteristics: Form: Round, not ovoid or ellipsoid. Size: Large. Brilliance of the seed coat: Dull, not shiny. Hilum color (*Tégument au polê embryonnaire*)*:* Dark. Volume after soaking in water for 24 hours: Swells to 2-3 times its previous size. Separation of seed coat during cooking: Good and easy. Separation of seed coat after 24 hours of soaking: Good and easy.

The soybean varieties recognized as easy or rather easy to cook at Seredou are: Mammoth Yellow, Manchurian Yellow, Haberlandt, Tokyo black dwarf, Virginia black, Wood's, Manchu, Ile-de-France, Hei-Tan-Black, Mandchourie green, Seredou 265, Seredou 266, Kamianetz I, II, and III, Mandarin, Kurome Osaya, Early Japan (*Hâtif du Japon*), Messine, O Yachi, Washington 36.903, Ota San, Jaune de Cracovie.

After practical trials at Seredou in 1940, the following process was adopted using local water of pH 5.5. 1. Soaking–Wash the soybean seeds quickly then let them soak in water at ambient temperature for 12-24 hours. Pour off the soak water and do a second rapid washing. 2. Cooking–Toss the soybeans into boiling water. Return to a boil, then cook at a light boil. Keep the pot covered during cooking. If you must add water during cooking, add only boiling water. Cooking time should be 2½ hours for large seeds, 3 hours for medium-sized seeds, and 3½ hours for small seeds.

The indigenous people do not cook their beans in this way at all; in fact they believe that the longer you cook beans, the harder they become. But at Seredou several indigenous people have learned the correct method of cooking and they like soya. In other areas (Macenta, Kissidougou, Yombiro), those who have tasted cooked soybeans like them very much, better than haricot beans.

The best time to introduce soya in the local diet is in the months before the rice is harvested especially June and July. Add salt only at the end of cooking and then the beans cook for a few more minutes.

Note: This is the earliest document seen (Aug. 2009) concerning soybeans in French Guinea (renamed Guinea in 1958), or the cultivation of soybeans in French Guinea. Address: Ingénieur Agricole et d'Agronomie coloniale. Licencié ès-sciences.

3734. Miller, Carey D. 1945. Thiamin content of Japanese soybean products. *J. of the American Dietetic Association* 21(7):430-32. Aug. [10 ref]

• ***Summary:*** The approximate amount of thiamin retained in various soybean products is as follows: Raw soybeans, 100%. Soybeans pressure cooked for 60 minutes at 121ºC, 26% (i.e., 74% of the thiamin is lost). Soybean "milk" (*tonyu*), 74%. Soybean curd residue (*kirazu*), 19%. Soybean curd (*tofu*), 18%. Tofu contains 54 mcg. thiamin per 100 gm. About 7% of the thiamin in tofu appears to be destroyed by the cooking process, about 20% remains in the residue (*kirazu*), and the remainder of the thiamin (almost 60%) is lost in the discarded liquid which drains off when the protein in precipitated and pressed.

The author acknowledges the help of the Yokoyama Tofu Factory. *Kirazu* may be used as a human food in combination with vegetables, etc. "However, in Hawaii most of the *kirazu* is fed to pigs. To make tofu, hot soybean milk "was mixed with a liquid containing magnesium and calcium sulfates, a by-product obtained in the manufacture of salt from sea water, which precipitated the tofu as a flocculent curd."

Note: This is the earliest English-language document seen (June 2013) that uses the term "Soybean curd residue" to refer to okara.

Aburage (a fried soybean curd) loses additional thiamin as a result of the cooking process. "Miso, made from cooked soybeans and fermented rice, which is allowed to age in huge wooden vats for 2 months or longer, is a relatively good source of thiamin," containing about 130 mcg. per 100 gm. But since relatively small amounts are used, even by people who favor this food, its contribution to the daily thiamin need is not great. Address: Nutrition Dep., Hawaii Agric. Exp. Station, Univ. of Hawaii, Honolulu.

3735. Surrender of Japan after World War II (Important event). 1945.

• ***Summary:*** The surrender of the Empire of Japan on September 2, 1945, brought the hostilities of World War II to a close. The documents and terms of unconditional surrender were signed on board the battleship USS Missouri in Tokyo Harbor. The United States now stood astride the world as the only remaining Great Power.

The background to the surrender was:

By 1945, the Japanese had suffered an unbroken string of defeats for nearly two years in the South West Pacific, the Marianas campaign, and the Philippines campaign. The Allies captured the nearby islands of Iwo Jima and Okinawa

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in the first half of 1945. Okinawa was to be a staging area for Operation Downfall, the American invasion of the Japanese Home Islands. Such an invasion was dreaded by both sides; it was widely believed that Japan would fight to the bitter end and never surrender. Thus, the United States would have to fight, in enemy territory, for every inch, from Okinawa, on to Kyûshû, all the way to Tokyo. But the Japanese Imperial High Command was determined not to allow the allies to establish a beachhead on Kyûshû–Japan's southernmost main island. The strategy of making a last stand at Kyûshû was based on the assumption of continued Soviet neutrality.

1945 Aug. 6–The United States dropped an atomic bomb on the city of Hiroshima, hoping that the resulting destruction and devastation would cause Japan to surrender; it did not.

1945 Aug. 8–The United States dropped a second atomic bomb on the city of Nagasaki. Late in the evening of the same day, in accordance with the Yalta agreements, but in violation of the Soviet-Japanese Neutrality Pact, the Soviet Union declared war on Japan, and soon after midnight on August 9, 1945, the Soviet Union invaded the Imperial Japanese puppet state of Manchoukuo.

The combined shock of these events caused Emperor Hirohito to intervene.

1945 Aug. 15–In a recorded address broadcast across the Empire, Emperor Hirohito announced the surrender of Japan to the allies.

3736. Arnold, Julean. 1945. Soy–China's Cinderella. *Soybean Digest.* Sept. p. 36-37, 69.

• ***Summary:*** In the summer of 1937 masses of Chinese refugees poured into Shanghai in frantic efforts to escape Japanese armed forces. The immediate problems were food and shelter. One relief agency, China Child Welfare, Inc., with which the author worked, helped to establish 220 refugee camps to accommodate 250,000 people. Since tofu is too concentrated for infants, the group turned to soybean milk. "Fortunately the Peking Union Medical College of the Rockefeller had several decades earlier carried on extensive research with the soybean under the direction of a Russian scientist Dr. A. A. Horvath. He became a great enthusiast on the nutritive properties of the soybean. He found that by adding a certain amount of calcium lactate, sodium chloride [table salt] and sugar to the soybean milk, it would be possible to produce a substitute for cow's milk, and at a fraction of the cost of cow's milk. Chinese trained under him carried on research experiments.

"Thus when we were interested in preparing a scientific, sanitary, and standardized soybean milk we looked for assistance to Doctors Ho and Tso who were trained at the P.U.M.C. but later came to Shanghai to join the Lester Institute where they continued their work on soybean nutritive products. So we impressed them into service. We also secured much aid from Dr. W.S. Fu, who supervised a Chinese children's hospital in Shanghai. He gave us accommodations for setting up a small plant for the manufacture of soybean milk in one of the court-yards of his hospital." A description of the equipment and process used is given. After boiling the soymilk for 20 minutes, calcium lactate, sodium chloride, and sugar were added. The soybean milk was served hot to the children in the camps. The plant was managed by Miss Nellie Lee, a Chinese who graduated from Mt. Holyoke College and had studied dietetics and social science.

After taking the milk from the soybean, there is a residue [okara] very rich in protein. We found by adding 40 percent coarsely ground wheat flour which is also plentiful in China, plus the other ingredients above mentioned, we could make a biscuit which when baked in an oven proved to be very palatable. It represented probably the greatest food value for the cost obtainable. A Chinese department store baked them for us. We distributed millions of them to the refugee camps.

"In order that our committee might take the fullest possible advantage of the very able assistance we received from Chinese scientists, doctors and others we organized the China Nutritional Aid Council with Chinese and American members for the express purpose of popularizing a properly prepared soybean milk and other soybean nutritional products." This council, backed by China Child Welfare, Inc. of New York, launched a campaign to share with people in other parts of China "the advantages of our experiences in providing soybean milk for from 25,000 to 37,000 children daily in the refugee camps in addition to several millions of soybean biscuits furnished the refugees."

"Another American medical missionary, Dr. H.W. Miller, went much further in his experiences with soybean milk products. He became so enthusiastic about their possibilities that he set up a modern plant in Shanghai for their manufacture, with facilities for producing qualities acceptable to those whose palates rebelled against the ordinary types of soybean milk."

After the Japanese bombing of Pearl Harbor, the China Nutritional Aid Council and its soymilk plant moved to Chung-king [or Ch'ung-ch'ing, a city in southern Szechuan province; the Kuomintang made it the political capital of China from Oct. 1938 until the end of World War II]. Nellie Lee has worked for 5 years "spreading the gospel of soybean milk for the great masses in that country."

"When John D. Rockefeller Jr. came to Peking about 25 years ago to dedicate the Peking Union Medical College of the Rockefeller Foundation, he told me that he found it harder to spend money than to make it." A large photo (p. 36) shows a Chinese mother feeding her children "soy milk and soy cakes at a food shop where highly nutritious foods are made and sold at cost prices."

Note 1. This is the earliest document seen (July 2012, one of two) that uses the word "Cinderella" in connection

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with the soybean. The author, however, does not elaborate on this idea. This is the earliest document seen (July 2012) with "Cinderella" in the title.

Note 2. In the winter of 1937 K.S. Lo of Hong Kong, age 27, happened to be in Shanghai on other business. There he attended a talk by Julean Arnold titled "Soya Bean: The Cow of China." This talk inspired Lo to establish the Hong Kong Soya Bean Products Co., Ltd. in March 1940. This company later made the world-famous Vitasoy soymilk. If the date and title of this talk are correct, this would be the earliest date seen (Aug. 2002) for the use of the term "Cow of China." Address: Berkeley, California.

3737. Ladejinsky, W.I. 1945. Agriculture in Japan: Prewar. *Foreign Agriculture* 9(9):130-42. Sept. [7 ref]
• ***Summary:*** The soybean is a staple food of the Japanese. Soybeans are also in demand for a number of industrial products, chief of which is soybean oil. The 1939 soybeans are estimated to have occupied 795,000 acres. Because of the competition from imported Manchurian soybeans, extension of mulberry-tree plantations prior to the 1930s, and increased acreage under orchards and vegetables, the soybean area declined from an annual average of 1,091,000 acres during the 5-year period 1920-24 to 808,000 acres in 1935-39, or by 26%. Production decreased from 18 to 13.5 million bushels. Despite the declining output, consumption of soybeans during the same period increased from an annual average of 32 million to about 44 million bushels. Production of soybeans in recent years has averaged about 30% of the country's consumption. The shortage of about 30 million bushels was made up by imports from Manchuria (80%) and Korea (20%). Address: Office of Foreign Agricultural Relations.

3738. Weigle, Edith. 1945. Japanese close-ups. *Chicago Daily Tribune.* Oct. 10. p. R6.
• ***Summary:*** Tokyo–In the early morning, at about 5:30 or 6:00 (it's still dark in winter), "there comes the song of the boy selling nato [natto]." He calls out the word three times, with two notes to each word. In the key of C, the notes would be E-G, G-A, E-G. "Nato [sic, Natto], pronounced nah-toe, is a bean [fermented soybeans] used in the morning one-dish meal. When it is mashed, seasoned with raw egg and finely chopped onions, and heated, the Japanese eat it in quantity, washing it down with green tea." They are now ready for the day.

In the early after, the "tofu (bean curd) seller, also rides a bicycle and makes a querulous wailing sound that apparently has the appeal of the Pied Piper, for small children inevitably follow his slow progress down the lanes."

3739. Anzai, Isamu. 1945. Ueber die Proteasenwirkung der ruhenden und keimenden Sojabohne [The protease activity of the resting and germinating soybean]. *Tohoku J. of Experimental Medicine* 48(1-2):31-39. Dec. 25. [9 ref. Ger]
• ***Summary:*** Contains 9 tables and a summary in German. When soybeans are pulverised, proteinase and peptonase activity can be determined; their optima are at 7.0 to 7.5 pH and 37ºC. Address: Medical-Chemical Institute, Faculty of Medicine, Imperial Tohoku Univ., Sendai [Japan].

3740. Holman, Ross L. 1945. A chemurgic fantasy. *Yale Review* 35(2):282-91. Dec. Condensed as "New riches from farm synthetics" in Science Digest. 1945. 17:53-55. March.
• ***Summary:*** The farm chemurgic movement, started in 1934 to find industrial markets for surplus farm crops, has begun to grow. W.J. Hale is the founder of the present chemurgic movement. "There is no farm crop that the test tube has turned into more industrial products than soy beans. It is surprising to see what the soy bean can become in the hands of a chemical juggler. To offset war scarcities it can be processed into many things, from gunstocks for guns to a good substitute for butter; from vitamin K for our blood to a handkerchief for our tears.

"America's industrial pioneer number one with soy beans is Henry Ford. With a staff of chemists, a laboratory, and several thousand acres of soys he is turning these beans not only into a large variety of things to eat but into something to wear and ride, to keep the rain off and to doctor our liver troubles. We may recall how extravagant Ford sounded to us in the Twenties when he said that some day we would be able to dispense with the farm cow and drink synthetic milk [See *New York Tribune,* 9 Feb. 1921]. This fantastic prophecy made rich material for newspaper reporters and cartoonists. There were comic caricatures of a robot cow pouring out synthetic milk to be churned into a synthetic butter. Today reporters and cartoonists know that the joke has backfired. Ford's chemists have been getting milk from soy beans for years. The milk has been shown to have important food values. The list of Ford's soy foods includes meats, cheese, breakfast foods, macaroni, bread, crackers, sweet milk, buttermilk, and coffee."

Reichhold Chemical Corporation and one or two other companies are producing soy-bean rubber at the rate of 25,000 tons a year.

The author also discusses how Henry Ford uses soy beans to make synthetic wool. "Ford himself frequently wears a soy-bean suit, and experiments seem to prove that it can be manufactured at less cost than any other textile fiber. Two Japanese scientists processed a wool from soys before the war and insisted that wool for a whole suit of clothes could be manufactured for less than a dollar."

"The climax of Ford's pre-war chemurgic achievements was the manufacture of a car with a all-plastic body. The body, made largely of soys, was 1,000 pounds lighter than a similar car with a steel body... Just about the time it was ready to go into production Pearl Harbor stalled the manufacture of cars for the duration.

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"Madison College near Nashville, Tennessee, is an educational institution that has turned farm chemurgy into a bonanza... The chief crop handled here is the soy bean, which is manufactured into 30 foods ranging from meat to coffee." The students, working their way through college, make the foods and student nurses and boys taking pre-medical courses play a major role at the school's sanitarium, where "patients are nursed back to health on soy foods."

At Taftville, Connecticut, the National Dairy Products Corporation is now manufacturing 10 million pounds a year of Aralac, a wool-like fiber made from the casein in skim milk.

"America's pioneer chemurgist, who performed scientific miracles before chemurgy ever got its name, was the late Dr. George W. Carver, of Tuskegee Institute in Alabama. Dr. Carver's record of processing over 300 industrial products from the peanut and 120 from the sweet potato is too well known to need discussion here."

Note: This is the earliest document seen (April 2002) that mentions vitamin K in connection with soy.

3741. Otto, R.B. 1945. [Gasoline derived from vegetable oils]. *Boletim de Divulgacao do Instituto de Oleos, Rio de Janeiro* No. 3. p. 91-99. (Chem. Abst. 41:6690). [Por]*

3742. Leighton, Alexander H. 1945. The governing of men: general principles and recommendations based on experience at a Japanese relocation camp. Princeton, New Jersey: Princeton University Press. xvi + 404 p. Illust. (maps, plans). 23 cm.
• ***Summary:*** Part 1: The story of Poston. Part 2: Principles and recommendations.

Note: Alexander H. Leighton lived 1908-2007.

3743. Swingle, Walter T. 1945. Our agricultural debt to Asia. In: Arthur E. Christy, ed. 1945. The Asian Legacy and American Life. New York: The John Day Co. x + 276 p. See p. 84-114. Index. 21 cm. Also published by The Asia Press, 1942. [2 ref]
• ***Summary:*** "The beginning and foundation of the Library of Congress Orientalia Collection was the great Chinese encyclopedia, the *Ssu k'u ch'uan shu,* a gift of the Empress Dowager of China.

"About 1914, Dr. Swingle, then head of the Office of Crop physiology and Breeding, Bureau of Plant Industry, U.S. Dept. of Agriculture, was able to secure the services of a Cornell graduate, Dr. Hing Kwai Fung, to make abstracts and/or translations of information in the *Ssu k'u ch'uan shu* regarding economic plants. Dr. Swingle interested Dr. Herbert Putnam, Librarian of Congress in increasing the holdings of Chinese books, especially gazeteers [sic, gazetteers] which contain local information. When Dr. Fung returned to China, he was given a modest sum for purchasing books. Dr. Fung was able to persuade the Commercial Press (the largest publishing firm in China, located in Shanghai) to act as receiving agent for books for the Library of Congress, and to ship them to Washington [DC]. Soon after, Dr. Swingle was sent to the Orient–in March 1918–by the Dept. of Agriculture." There he made arrangements for collecting books in Tokyo and Shanghai.

"As American merchants and missionaries gradually penetrated into China, they sent home more and more plants and trees. The Arnold Arboretum, organized and directed by the great tree expert, C.S. Sargent, financed extensive trips to the Orient to obtain botanical specimens and seeds of ornamental trees and shrubs as well as photographs of them as they grew in their native habitat. These trees and shrubs revolutionized the garden and park plantings of the northern parts of the United States. The illustrated popular books of E.H. Wilson, who made many trips to the Orient for the Arnold Arboretum, helped to arouse interest in the very rich arboreal flora of China...

"The Plant Introduction Service of the U.S. Department of Agriculture was organized by David Fairchild in 1897; he did very extensive exploring for foreign economic and ornamental plants from 1898 on, and directed the Plant Introduction Service from 1909 to 1928. I was fortunate enough to be one of the first 'agricultural explorers.'" Of these men Frank N. Meyer and P.H. Dorsett were outstanding, not only for the number and value of the plants they secured, but also for the detailed and accurate descriptions of every plant they sent to Washington.

"P.H. Dorsett some years later, during the twenties, traveled widely in North China taking many fine photographs of Chinese crop plants and writing descriptions of the culture, harvesting and curing of each. On these trips he collected many varieties of soy beans largely through the utilization of a new and potent method of securing the willing cooperation of all educated Chinese people. A complete translation, prepared by Michael J. Hagerty under my direction in 1917 of the chapter on soy beans contained in a standard Chinese work on economic plants (the *Chih Wu Ming T'u K'ao* by Wu Ch'i-chun) had been furnished the plant explorers looking for soy bean varieties. This translation, covering eighty-two pages, discussed several hundred varieties, telling where they were largely grown. In all cases the name of the variety and the name of the locality where it was grown were not only spelled out in English but also written carefully in Chinese characters. An index made it easy to turn to any variety under discussion and see what was said about its culture.

"This was a turning point in field explorations in China. Such indexed translations in the hands of foreign plant explorers insured the attention of all educated Chinese, who gladly directed the explorer to the nearest source of the various named varieties. I had learned this at first hand in 1915 when studying varieties of Citrus in southern China. Surprise and skepticism about the foreigners knowledge

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of Chinese books gave way to astonishment and warm approbation."

"The soy bean is a striking example of the introduction of a new crop... Soy beans were sent from China to France as early as 1740 and from 1779 were grown in the famous Botanic Garden of Paris. Benjamin Franklin, who had been a member of the French Academy of Sciences since 1772, sent seeds back to the United States and urged that they be given a trial. But in spite of his plea, the soy bean remained merely a curiosity in this country for more than a century.

"In the late eighties [sic, 1890] Prof. C.C. Georgeson brought soy bean seeds from Japan, where he had been teaching at the Agricultural College at Komaba, and planted them in a field on the campus of the Kansas State Agricultural College. I could see the stunted soy bean plants from the windows of the botanical laboratory where I was a teen-age research assistant. This variety, adapted to the perpetual spring climate of Komaba near Tokyo, did not do well on the bare Kansas hills, often swept by hot dry winds. And nothing happened. Soy beans did not arouse interest among Kansas farmers until many years after this failure.

"In the third decade of the twentieth century Dorsett sent to Washington more than 800 named soy bean varieties from China, Manchuria and Japan. These together with shipments secured by Dr. David Fairchild from his numerous correspondents in the Old World, especially in Asia, amounted by 1928 to a total of more than 2800 packages of soy beans, almost all named varieties but many of them duplicated, some of them many times. Meantime tests made by W.J. Morse, in charge of soy bean culture for the Bureau of Plant Industry, showed that many varieties had a narrow range of adaptability. Accordingly, from 1929 to 1931, Morse joined Dorsett in the Orient and these two experts, with trained Chinese helpers, brought to this country the largest single collection of soy bean varieties ever assembled. As soon as Morse returned from studying soy beans in Asia and attacked the problem of finding which Asiatic varieties adapted to the different regions and selecting and breeding to make them fit various American soils and climates, a remarkable change occurred in soy bean culture. Yields went up and plantings increased year by year...

"One of the best-known industrial uses for soy bean proteins is for making water-resistant glue. No less than 30,000 tons of soy bean glue were made in 1942 by a single firm and its licenses annually, most of it being used in the rapidly growing plywood industry. Soy bean proteins have been enthusiastically used by Henry Ford in his automobiles, being mixed with the more expensive phenolic resins, thereby reducing costs and also yielding a more plastic, freer-flowing mixture which takes dyes better...

"As long ago as 1917-1918 Dr. Yamei Kin set up under my general supervision for the U.S. Department of Agriculture a soy bean mill in New York City in the hope of supplying tofu to increase the bulk and food value of meat dishes served to soldiers in training at near-by camps. Dr. Kin succeeded in making excellent tofu. She even served to a group of army officers a meal composed entirely of soy bean dishes! However, it proved impossible to test tofu on a large scale at that time, since we could not get priority for transportation of soy beans from North Carolina, then the nearest region where they were grown on any considerable scale.

"A splendid example of a double fermentation is the soy bean cheese called *nam yüe* by the Cantonese and *sufu* in North China. It is preferred even to the best Roquefort as a salad dressing constituent by those who have had the opportunity to try it. It is made by Chinese masters of the cheesemaker's art who believe that its fermentation is an insoluble mystery.

"Shih Chi-yien, then working in the American University of Soochow, published in 1918 the first English account of the most important fermented bean foods. He traced the making of *tofu* from soy beans back to the Han dynasty (A.D. 22). Ten years later Wai Ngan-shou [Nganshou], one of the first scientifically-trained Chinese microbiologists and fermentation experts, was able to isolate and identify as a new species of Mucor the mold that makes possible the *nam yüe* fermentation. It is a curious fungus, *Mucor sufu,* distantly related to the miraculous *Penicillium notatum* whose marvelous curative action has only recently been discovered. A third fermentation expert, Shih You-kuang, studied another soy bean fermentation product, *meitauza,* made by another species of Mucor, and published an illustrated account of it in German in 1937. In his review of the literature of Mucor fermentations, Shih You-kuang cites no fewer than thirty articles by eighteen authors all based on Chinese fermentations...

"Miss Elizabeth Groff, under my direction in 1918, made a thorough study of the fermentation of soy sauce in the famous factories of Canton, China, and published the first detailed account of the process in the *Philippine Journal of Science* for 1919."

"It has been my privilege to assist in building up a great Chinese library in the Library of Congress, under the enlightened policy of Dr. Herbert Putnam, beginning in 1912. The Orientalia Division, headed by Dr. Arthur Hummel, is now the largest Chinese library outside of Asia and is probably larger than all the European libraries of Chinese books combined. It now contains, Dr. Hummel estimates, about 230,000 Chinese volumes (*Chüan*) and some 20,000 more will soon be added in the form of bibliofilm [a type of microfilm] copies of very rare works from the Chinese National Library, sent to Washington for safekeeping."

Note 1. This is the earliest secondary document seen that mentions the early introduction of soybeans to America by Benjamin Franklin.

Note 2. This is the earliest English-language document seen (Oct. 2011) that uses the term *nam yüe* to refer to

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Chinese-style fermented tofu. It is 2nd earliest English-language document seen (Oct. 2011) uses the word "sufu" to refer to Chinese-style fermented tofu, and the first such document written by a Westerner. Photos show Dr. Walter Tennyson Swingle, and his wife Maude K. Address: Collaborator, Bureau of Plant Industry, USDA; Consultant on Tropical Botany, Univ. of Miami, Florida.

3744. Fumiko. 1945? Sukiyaki: The art of Japanese cooking and hospitality. Honolulu, Hawaii: Hawaiiana Books. Distributed by South Sea Sales. 68 p. Undated. Illust. 22 cm. *

• ***Summary:*** Edited and copyrighted by Scotty Guletz.

3745. Soroa, José Maria de. 1945? La soja. Su cultivo y aplicaciones. Segunda edicion, corregida y aumentada [The soybean. Its cultivation and utilization. 2nd ed.]. Madrid, Spain: Ministerio de Agricultura. Seccion de Publicaciones, Prensa y Propaganda. 87 p. Undated. No index. 16 cm. First ed. was by Abadal and Soroa, 1932. [Spa]

• ***Summary:*** Contents: The soybean. Recent history. Some antecedents to the present trials conducted in Spain. Agronomic notes (incl. soybean varieties). Preparation of the soil. Utilization of soybeans. Food uses. Other applications of the seed. Industrial uses. Soybean oil. Use of the soybean plant as feed. Forage. Use of soybean in clinical analysis (urease). Appendix: Soybean production worldwide in 1925-1929 and 1933 (from IIA, Rome).

For some years the author has been dedicated to the economic propagation of this legume (*la soja*) in Spain. He has succeeded in calling attention to its merits, both with the first edition of this book (1932) and with subsequent work and demonstrations; a number of farmers have experimented with the crop. He was asked to do a new edition of this booklet by the Ministry of Agriculture's Department of Publications, Press, and Propaganda / Advertising, in order to synthesize some observations of recent years and to give an opinion on the possibilities and economic advantages of 'la soja' in Spain. The author reflects that the days of hunger in the 'red zone' are not far away (p. 5).

The Station of Cereal Culture (*Estación de Cerealicultura*) and the Institute of Agronomic Investigations (*Instituto de Investigaciones Agronómicas*) are already working on soybean cultivation. The author offers to the Superior Council of Scientific Investigations the subject of the use of soy in the diet, and how to perfect the soybean, lower its price, and employ its derivatives in as many technical fields as other countries already do. In effect, not alone did Russia start giving maximum attention to the soybean (p. 7).

In southeast Spain, soybeans have been cultivated on the farms of Jerez de la Frontera by the author's esteemed teacher and the director of the Center D. Eduardo Noriega Abascal (p. 8). A graph on page 10 shows soybean imports and exports for 1934 for various countries.

Some antecedents to the present trials conducted in Spain: In 1917 the Spanish council in Shanghai, don Julio Palencia, sent to the Spanish Department of State a study on the cultivation of soybeans, proposing that trials be made to acclimatize the valuable legume to their country.

In Motril (a city in south central Spain on the Mediterranean) and then in the Southern Agricultural Station at Malaga (a town just to the west of Motril, also on the Mediterranean), soybeans started to be cultivated about 10 years ago (c. 1931). by the agronomic engineer D. Arsenio Rueda, in parcels of 5 ares = 0.5 ha, from which he obtained yields each of 60 litres (.78kg/liter), so 46.8 kg per 5 ares.

Both white and black varieties have given good results, but the white was better, and the seeds obtained have been divided among agriculturists...

In Spain, besides the trials cited above, for more than 25 years (since ca. 1916) the soybean has been cultivated with excitement thanks to the zeal and the interest, realized in patriotic labor on the farm in Jerez (southeast Spain), of the agronomical engineer Eduardo Noriega, and also of Mr. Oritz, comrade of the former. They shared yellow and black varieties with Valencian farmers; Valencia is on the Mediterranean. Cultivation has since been accomplished in the central Spanish region. There is also a record of the cultivation of soybeans in Lerida in the years 1925-26 by the doctor don Jose Abdal, an illustrious pharmacist.

The sowing was done with seeds procured from Japan of the variety soja hispida, yellow seeded, with the object of seeing if it would grow in this province. The seeds were soaked for 10 hours in water, then planted in a garden without more security or care than they would take with any other plant. They were sown at the end of April and most of the seeds germinated, reaching a height of 65 cm. They developed and flowered perfectly, and were completely developed by the end of August. This small trial can only demonstrate that the soybean will grow in irrigated terrain, on a warm site, and without much care (p. 12-14).

The agronomic engineer Jesus Andreu, 20 years ago, did tests on the culture of soy as a forage plant in the province of Pontevedra with good results. There is also news, if incomplete, of other successful tests in the provinces of Madrid and Toledo.

As a consequence of this news–and perhaps of the spreading of these and of the foreign trials, and of the experiences of the National Agronomic Institute–soybeans have been divided among individuals and farms for the last 10 years by the General Direction of Agriculture. And the Institute of Cereal Culture has resumed trials with seeds of Japanese origin. The author's companions, don Felix Sancho Penasco and don Fernando Gaspar are studying a hundred varieties, and will determine the requirements of each variety in order to select the ones appropriate for each region (p. 15). Address: Ingeniero Agronomo, Madrid, Spain.

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3745a. United States, Office of Foreign Agricultural Relations. 1945. Civil affairs handbook, Japan. Section 7, Agriculture. Washington, DC: Headquarters, Army Service Forces. xii + 195 p. Maps. 25 cm. Supplement (xiv + 236 p.) issued in 1945. [1 soy ref]

• ***Summary:*** A digital version of this book is available on HathiTrust. This Section 7 is one in a series of 17 sections about Japan, including: 1. Geographical and Social Background. 2. Government and Administration. 3. Legal Affairs. 4. Government Finance. 5. Money and Banking. 6. Natural Resources, etc.

This book offers many deep insights into Japan's agriculture in 1945 and before. For example, we read on page xi that shortly before the war: "Practically all of the sugar had to be imported from Formosa; two-thirds of the soy beans from Manchuria and Korea; and 20% of the rice from Korea and Formosa." Japan's hard-working farmers supplied the rest.

The book contains 57 tables, 14 figures, and one map (4 maps on one page, xiv).

Printed across the top of the title page: "Army Service Forces Manual M 354-7." On the same page below the title: "Headquarters, Army Service Forces, 1 April 1944."

Page 59 states: "The principal soybean foods used daily in Japanese life are soysauce, miso (red, white, black), tofu or bean curd, soybean milk, green vegetable beans, roasted beans, soy flour, natto, yuba (film from soybean milk when heated), and beverages (coffee substitute and tea mixture with roasted beans). Soysauce is extensively manufactured by large concerns throughout the Japanese Empire. It is used at every meal by the Japanese family, taking the place of salt and other condiments. Miso is a fermented product from rice or barley, salt, and soybeans, usually requiring from 6 to 12 months for curing. It is a daily breakfast dish in the form of soup with vegetables and it is also used to preserve vegetables, fish, and meat. Tofu, made in small factories throughout cities and villages, is used extensively in place of meat. It is used in the fresh or dried state in soups with vegetables, mixed with vegetables and fried as squares in deep fat, and also toasted. Soy flour is used with wheat flour in the making of various breads, rolls, buns, crackers, and pastries. The roasted flour mixed with sugar is used in making various forms of confections. The roasted beans are used in much the same manner as salted peanuts, and in the making of numerous candies and cakes. Soybean milk is made in the tofu factories and sold as fresh milk [Interesting!]. Natto is a fermented bean, occurring in the various forms though not used as extensively as miso and tofu.

"Japan imports large quantities of soybeans, bean oil, and bean cake from Manchuria. The beans are used largely in the manufacture of soysauce and miso. Only a small percent of the Manchurian beans is processed for oil and meal as there are but three or four bean oil mills in Japan. The beans imported from Chosen [Korea] are of much higher quality than the Manchurian beans and, therefore, are used entirely in the manufacture of miso, tofu, and other food products. Bean oil is used in the manufacture of shortening, salad oil, cooking oil, and various industrial products such as paints, enamels, varnish, soap, and waterproof goods. Bean cake is used largely (90 percent) as fertilizer though considerable quantities are used as cattle feed and in the manufacture of a cheap soysauce. In recent years bean cake has also been used in the manufacture of a wool-like fiber."

Pages 101 and 104, in the section on "Leguminous crops," state: "The principal legume crops produced are soy beans, other beans, peas and peanuts. The most important is soy beans. Soy beans are a staple food of the Japanese, and are used for soy sauce, bean paste and bean soup. They are also in demand for a number of industrial purposes, chief of which is soy bean oil.

"The total area of all leguminous crops in 1936 was 1,516,000 acres (includes 19,000 acres under peanuts) or 7.6 percent of the total cultivated area. The soy bean crop alone covered 807,000 acres. The 1939 area under all these crops amounted to 1,449,000 acres of which soy beans are estimated at 795,000 acres (Table 41). Because of competition from imported Manchurian soy beans, extension of mulberry tree plantations prior to the 1930's, and increased acreage under orchards and vegetables, the soy bean area declined from an annual average of 1,091,000 acres during the 5-year period 1920-24 to 803,000 acres in the period 1935-39, or by 26 percent. Production followed suit, with a decrease from 18 to 13.5 million bushels. Despite the declining output, consumption of soy beans during the same period has increased from an annual average of 32 million bushels to about 44 million bushels. Production of soy beans in recent years has averaged about 30 percent of the country's consumption.

"The shortage of about 30 million bushels was made up by imports from Manchuria (supplying 80 percent) and Korea (20 percent). Next to rice, soy beans form the largest single imported foodstuff. From the Japanese point of view, the mitigating factor of this situation is that the colonies are the sole source of supply. This fact has led a Japanese to remark that from a practical point of view Japan is self-sufficient in soy beans. With respect to other beans, such as 'azuki' and 'broad' beans [*sora mame*] the ratio of domestic production to total consumption has been estimated at 55 and 85 percent, respectively. The condition that applies to imported soy beans applies to these beans as well, since they, too, originate in Manchuria."

The word "soybeans" appears on 35 pages in this book, "soybean" on 28 pages, "soy" on 15 pages (p. 104, 101, 59, 68, 92, 105, 137, 140, 147, xii, 55, 58, 223, 228, 233), "soysauce" on 6 pages, "bean paste" [miso] on 5 pages, "miso" on 5 pages, "tofu" on 4 pages (p. 59, 100, 58, 233), "soy flour" on 3 pages, "soybean milk" on 3 pages, "green

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vegetable beans" on 2 pages (p. 56, 59), "shoyu" on 2 pages (p. 97, 100), "natto" on 2 pages (p. 59, 100), "yuba" (film from soybean milk when heated) on 2 pages (p. 59, 100), "roasted beans" on 1 page (p. 59). Address: Washington, DC.

Table 41. - Leguminous crops: acreage and production in Japan 1930 to 1939

Year	Soy beans		Other beans		Peas		Peanuts	
	Acres: 1,000 acres	Production: 1,000 bushels	Acres: 1,000 acres	Production: 1,000 bushels	Acres: 1,000 acres	Production: 1,000 bushels	Acres: 1,000 acres	Production: 1,000 pounds
1930	857	15,532	617	11,856	95	1,967	14	23,372
1931	866	12,719	595	7,971	114	2,003	15	24,784
1932	844	12,350	599	6,766	112	1,672	16	25,608
1933	800	14,372	611	11,397	136	2,182	17	31,571
1934	831	11,075	596	8,185	140	2,824	19	25,055
1935	822	11,576	570	6,932	153	2,142	19	26,964
1936	807	13,484	554	7,611	135	1,922	19	30,237
1937	813	14,554	-	-	-	-	-	-
1938	808	13,822	-	-	-	-	-	-
1939	795	14,063	546	9,145	88	1,475	20	34,392

Office of Foreign Agricultural Relations. Compiled from official sources.

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3746. Iguchi, K.; Kichiga, S.; Serizawa, R. 1946. [Extraction of organic substances]. *Japanese Patent* 172,096. Jan. 9, 1946. [Jap]*
• ***Summary:*** Describes solvent extraction using ethyl alcohol.

3747. Bourne, Geoffrey H. 1946. Nutrition in Japan. *Nature* (*London*) 157(3981):177-78. Feb.
• ***Summary:*** "The Japanese diet is "deficient in fat. In 1928 the daily intake of this nutrient was only about 15-20 gm. a day, which is only about one quarter of the desirable intake. 85 per cent of the fat which was consumed was vegetable fat and therefore contained no fat-soluble vitamins."

Protein was derived principally from fish and soya beans, and a very small quantity from beef and other meats in certain classes. Fish and other marine products are not entirely satisfactory as the sole sources of animal protein because of the variation in the seasons... Soya bean, which contains a high-quality protein, forms the most stable source of protein."

3748. Strayer, George M. 1946. Editor's desk: Back Rivers Bill if amended. *Soybean Digest.* March. p. 5.
• ***Summary:*** "H.R. 579, known as the Rivers Bill, has been in the hands of the committee on agriculture of the House of Representatives for over a year. As written it would repeal the federal taxes on margarine, and the federal taxes on the manufacturers, wholesalers and retailers of margarine.

"Repeatedly the American Soybean Association has adopted resolutions at its annual conventions endorsing the repeal of such taxes on margarine *produced from domestic fats and oils.* The war years, together with the Japanese annexation of Far Eastern supplies of tropical oils, have made it impossible for margarine manufacturers to use anything other than domestic fats in their product. Over 40 percent of the oil used in margarine in 1945 was soybean oil."

The Rivers Bill does not yet limit the repeal of the taxes to margarine produced from oils and fats produced within the continental United States.

The other section, titled "It's full [soybean] production once more in 1946," states: "The uncertainty concerning the 1946 soybean price has at last been ended with Secretary of Agriculture Anderson's announcement February 25 that the present support of $2.04 will be continued.

"The need for continued high production of soybeans is part of the general picture of world food shortages,..."

Note: This is earliest appearance of "Editor's Desk" in *Soybean Digest.* Address: Secretary, American Soybean Assoc., Hudson, Iowa.

3749. Emory, Mayo L. 1946. Soybean milk-substitute as used on Okinawa. *U.S. Naval Medical Bulletin* 46:616-18. April.
• ***Summary:*** Near the end of World War II, after the campaign for Okinawa, "the nutrition of the native children presented a serious problem. Both malnutrition and undernutrition were universal and starvation was common." "Breast-fed children suffered most," followed by orphans under the age of 6.

"Soybean was one of the foods available. It was found that a substance closely resembling milk (table 1) was produced as a intermediate step in the preparation of a native soybean dish *tofu.*

"On 18 July 1945 the formula was made up experimentally in a native kitchen and tried out in General Hospital G6-59 on the pediatric ward. The following day the formula was used in the orphanage of 142 children of Dispensary G10-20. The food was readily accepted by the children... One cupful, approximately 200 cc, was given to each child before the noon meal. Those who wished more were given more." It was found that dehydrated egg powder could be added easily to the soybean formula to make a more valuable food. After only a month, on Aug. 19, the experiments were concluded.

The method of preparation was simple; the formula is given (for 1 lb dry soybeans, 1 lb of dehydrated egg powder and 3/4 lb sugar could be added). "Four natives (one cook and three helpers) could prepare enough milk-substitute to feed a thousand children." The "bean residue" [okara], a by-product of the process, was generally eaten "in soups by both adults and children, but it was not suitable for infants." Address: Surgeon U.S.P.H.S [U.S. Public Health Service].

3750. *Sun* (*Baltimore, Maryland*). 1946. Palace kitchen invaded by Japs: Demonstrators eye menu and demand leftist cabinet. May 14. p. 1.
• ***Summary:*** The end of World War II has left many hungry in Japan. On Sunday, about 100 men and women, some with children strapped to their backs, invaded Emperor Hirohito's Imperial Palace in Tokyo demanding to see the emperor and to ask why rations were two weeks late.

When they were told that the emperor was "out of town," they demanded to see his kitchens, where they found preparations underway for a banquet. The menu included: "Blue cod cooked in soysauce... Vegetables cooked in bean paste" [miso].

The spokesmen for these demonstrations are often said to be members or leaders of the Communist party, and economic complaints are often viewed as tied to political goals. The marchers waived red flags.

3751. Hall, Lloyd A. 1946. Protein hydrolysates–Flavor ingredients for foods. *Food Industries* 18(5):681-84, 808, 810, 812, 814, 816. May.
• ***Summary:*** The subtitle reads: "Acid digestion of casein, corn or wheat gluten yields an amino acid mixture with a meaty or other flavorful taste. The digest is clarified,

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neutralized and dried for addition to soups, sauces, meat products and spice mixtures."

"To the best of our knowledge, the first commercial use of hydrolysates was in China and Japan about 1908. Several patents pertaining to them were granted to the Japanese scientist, Ikeda, in 1912. The Japanese were the first to make commercial use of mono-sodium glutamate, one of the salts of glutamic acid. It was used to impart or intensify a meat flavor, especially in soups, broths, gravies, and like foods.

"Production of glutamate: Until 1935, most of the mono-sodium glutamate used in this country was purchased from Japan. About 1935, domestic commercial production of mono-sodium glutamate from wheat gluten began. Shortly afterwards commercial production of it from Steffen's waste water, a by-product from beet sugar factories, was started by an Ohio plant.

"The proportion of the various amino acids in the hydrolysates varies with the protein material used. Wheat and corn glutens, yeast, soybean meal and casein are the most commonly used proteins."

"Three basic methods: The three types of hydrolytic methods which may be used are: (1) enzymic hydrolysis; (2) alkaline hydrolysis; and (3) acid hydrolysis.

"Enzymic hydrolysis is usually carried out with pancreatic trypsin and papain." Acid hydrolysis of proteins is often preferred over the other methods because it does not destroy the tryptophane content of the proteins. Alkaline hydrolysis has the advantage that very little humin is formed, but the hydrolysate does not contain all of the amino acids nor does it have the good flavor of the acid hydrolysate.

In its commercial process, Griffith Laboratories uses the acid hydrolysis process with hydrochloric and sulphuric acids. The ten steps in the process are described, as follows: 1. Run water acidified with hydrochloric acid into a steam-jacketed, glass-lined kettle. "2. Heat to 113ºC. 3. Stir in the protein material. 4. Heat at atmospheric pressure for about 9 hours to obtain complete hydrolysis. 5. Filter to remove the humin. 6. Pump filtrate into a glass-lined vacuum kettle. 7. Distil under vacuum to remove about 50% of hydrochloric acid content. 8. Dilute with water to the desired specific gravity and add activated carbon to decolorize. 9. Boil for a few minutes and filter. 10. Pump to another kettle and neutralize with sodium carbonate to pH 5.2-5.4 to obtain best flavor value." The higher the amino nitrogen content of the hydrolysate, the better the taste. The authors believe that higher quality standards should be established for protein hydrolysates to be used in food products; the amino acid content is now rarely shown. "Mono-sodium glutamate and other 'non-essential' amino acids, such as glycine," impart a good taste to food products. There is a prejudice against protein hydrolysate powders because they are hygroscopic; this problem can be overcome by using liquid hydrolysates.

Three photos show the equipment used in the process. Address: Director of Research, Griffith Laboratories, Inc., Chicago, Illinois.

3752. Igarashi, Seiji. 1946. Renzoku-shiki daizu-yu teion chûshutsu-hô no kenkyû. I-V. [Continuous low-temperature extraction of soybean oil. I-V.]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 49(4-5):67-72. April/May. [Jap]
• ***Summary:*** Part I: Comparison of extraction effects of soybean oil with various solvents. Describes solvent extraction using ethyl alcohol. Address: Mantetsu Chuo Shiken-jo Yuki-ka Gakka [Manchurian Railway Central Research Lab., Organic Chemistry Div.].

3753. *Soybean Digest.* 1946. Grits and flakes... from the world of soy: The Japanese super-battleship Yamato was powered by a soybean oil fuel during its suicidal sortie off Kyushu... May. p. 32.
• ***Summary:*** "... during the closing days of the war [World War II], the U.S. naval technical mission to Japan has disclosed, according to the United Press."

3754. Morse, W.J. 1946. The Pacific story. Radio broadcast. NBC. Hollywood, California. June 2. John Baker OI, Radio Service. 4 p. transcript
• ***Summary:*** The broadcast [written by Morse, apparently to East Asia] begins: "This Pacific program means a great deal to me. It is an impressive justification of the late Dr. Charles V. Piper of the Department of Agriculture who was my boss nearly 40 years ago when I started working on soybeans." It was his vision of the possibilities in the United States of this great crop of the East that started the development that has made it a team mate for our native Indian earn. It was in 1907 that Dr. Piper said to me, "this plant has great possibilities for our agriculture and industry," He soon backed up his faith with action. Not only did we work on collecting new varieties from every possible source but he sent me out to look over cottonseed-oil mills as possible outlets for the flood of soybeans he felt sure would come.

"It has been my wish many times that Dr. Piper could have lived to see these later days, especially the present ones when the United States as a soybean producer has occupied second place, headed only by China. It is pleasing to us now that products of American-grown soybeans are a part of the bread that is returning across the Pacific to those people [in China] who gave us generously of breeding material.

"We began collecting new varieties and strains from the Orient about 1908. A few varieties had been brought over a hundred years before but during that century it was merely a garden oddity. In those years we were living beside an undiscovered gold mine, you might say. But now we know we have something–the most valuable of the many p1ant gifts out China and perhaps the most versatile plant known.

"When I recite what we consider the virtues of the soybean, it may sound to the people on the other side of the

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Pacific like a school boy at the supper table announcing his discoveries of the day. Nevertheless, this is a good place to say that on both sides of this ocean and in Europe, too, it really deserves its name of "Wonder Bean"–a valuable aid to good farming, a protein feed for livestock, a big-tonnage raw material for industry, and a nutritious human food that is winning a high place in the diet. The war greatly emphasized its usefulness.

"In the United States the acreage of this crop had reached sizeable proportions before the war and it had a place on the grain exchange–along with such mainstays of our life as wheat and corn. But in 1907, when Dr. Piper visioned its future, the total acreage in the United States was only 50,000, Three years ago it reached a peak of nearly 16,000,000 acres. The production of soybeans in 1917 was about 70,000 tons. By 1945 it had increased almost 100 fold.

"We needed the soybean–farmers, manufacturers, and consumers–and, with great merit to start with, it was made to fit more exactly into various uses.

"Testing and selection are going on now at perhaps a greater rate than ever before, using types and strains brought in by thousands from China, Japan, Korea, and Manchuria. More than 15 years ago I spent 2 years in those countries. I have pleasant recollections of the people who proudly brought in their favorite beans from farms and village garden plots. We now have under test more than 2,500 varieties, types, and strains, with about 100 varieties commercially available. Some of them, bred or selected for the north country, mature in 75 days and some, suitable for southern states, take 175 days.

"Until recent years the farmer has looked on the soybean mostly as a forage crop, Of late years it has gained in food and industrial uses. Today more than 100 oil mills are crushing soybeans; 200 concerns are manufacturing soybean food products; and more than 100 manufacturers are turning out various industrial products, including plastics and oils for paint and other uses. Now it is a $500,000,000 industry.

"Not only has Federal and State research widened the fields of usefulness of the soybean, but recently there has been much research by commercial interests.

"The soybean food list includes scores of products but those now getting most attention are soy flour, grits, flakes, and meat substitutes. Soy flour's greatest usefulness is in adding value to other foods.

"In industry the soybean is on a good and broad foundation, with about 70 percent or our production processed by oil mills. Industry uses the oil for the manufacture of cooking fat and many industrial products. The remaining high-protein meal is used for stock feed, flour, plastics and other industrial products.

"Altogether we have learned a lot about the soybean–from its home countries of the Orient and through our own efforts–and it has become so important as to be almost indispensable. Our plant pot is really a melting pot."

Address: USDA.

3755. Marquis, Arnold. 1946. The Pacific story. Radio broadcast. National Broadcasting Company (NBC). Hollywood, California. June 2. 30 minutes. 23 p. transcript.
• ***Summary:*** This radio broadcast is a fascinating story–told by many voices–of how the Japanese scientifically developed soybean production, utilization, and export in their puppet state of Manchukuo, and, how the USA intends to capture the soybean export markets lost by the Japanese when they lost World War II.

The Chinese speak of the soybean this way: "It is the poor man's meat. It is the cow of China. It is meat without bones. The Japanese speak of it this way: If we could have held Manchuria, it would have guaranteed that Japan could never be starved out. American nutritionists speak of it this way: It is high in protein. It is rich in vitamins–in A, B-1, C, G, and E–and also in the bloodclotting vitamin K. Weight for weight it contains several times as much B-1 as beefsteak. And as for minerals: One-half cup of soy flour contains as much calcium as a whole cup of milk... [and] as much phosphorus as two cups of milk. And weight for weight, it contains as much iron as liver, twice as much iron as molasses, and three times as much iron as whole wheat flour. The soybean is a wonder food. One pound of soy beans is almost a complete one-day ration for an adult."

The USA is now developing two famine-relief foods based on soybeans. The first contains 50% soybean, plus split peas, wheat flour, and a little peanut-meal, onion, salt, and fish-oil. Four million pounds of this mixture and twelve million pounds of another soy-based mixture are being sent "to the famine areas of China." In other words, soybean are being sent from the USA to the land of their origin, "where they have been a mainstay for five thousand years."

Discusses: The growing of soybeans in Manchuria. The Japanese takeover and extension of their control via the South Manchuria Railroad, whose terminus is Dairen. The importance of Manchurian soybeans to Japan. The Japanese Central Laboratory at Dairen and its research on soybeans. The two Japanese agricultural experiment stations in Manchukuo. Development of the benzine [benzene] solvent extraction process for soybean oil, "until there were 200 large bean plants in southern Manchuria." Soybeans as a livestock feed in Manchuria. Use of soybeans as food in China: "Tofu is bean-curd... This is fermented tofu. It is very good. Tofu is eaten in several forms. Fresh, fermented, dried or frozen. Just about any way it is prepared, its food value is preserved... We also use the oil of the soy bean. And with the soy bean we make soy sauce." Many Asiatic peoples also use soybeans to "make bean milk and bean flour." "They roast them for confections [kinako]. They eat them green [green vegetable soybeans]. They sprout them [soybean sprouts] and they even make drinks of them.

Note 1. This is the earliest English-language document

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seen (Oct. 2011) that contains the term "fermented tofu.

Industrial uses of soybeans in America. How Dairen became Japan's great center of the soy bean industry in Manchuria, and the Mixed Storage System. "About 55% of the soybeans grown in Manchuria are used for human food."

"You see, its all tied together. The growing of the bean, the processing, the transportation, and the export. Since 1937, the economy of Manchuria has been developed for the benefit of Japan." The Japanese and the Bank of Manchukuo (which is an instrument of the powerful Mitsui and Mitsubishi financial combines) are "buying up all the soybean business" and trying to eliminate the major European companies that were exporting soybeans before the Japanese moved in, such as Dreyfus Co. (France), and Wassard Co. (Denmark). Although the Japanese claim that Manchukuo is an independent nation, other nations realize it is a puppet state. The Chinese Eastern Railway, which was built by the Russians and has its terminus at Vladivostok, is in competition with the Japanese-controlled South Manchuria Railroad for the soy bean business of Manchuria. The latter uses rebates (kickbacks) to try to eliminate competition.

In 1937, after 6 years of dominating Manchuria, Japan invaded China proper–using Manchuria to supply their troops. "By 1941, Manchuria was yielding some four million tons of soybeans. The Japanese controlled every pound of it. And by 1941 they had fostered the growing of soybeans in Korea, and also in Japan itself. Also, by this time, the Japanese had seized a good part of the soybean country of China proper. But by Pearl Harbor [7 Dec. 1941], the United States was also growing soybeans: Over 3 million tons in 1941. By 1945 it was nearly 6 million tons."

Now that the war is over, the Japanese have lost the entire soybean industry in Manchuria–including the laboratories, bean oil mills, Dairen, the South Manchuria Railroad, and the Bank of Manchukuo which controlled it. China, which now controls Manchuria, "will consume much of the soybeans which, before the war, were exported to European countries, and to Japan." The United States has begun to supply this soybean export demand, and in fact "is already shipping soybean products back to the Far East–to the famine stricken areas of China."

America Doctor: "So far most of our soybeans have gone for feeding livestock. But now we known what they can mean to man. Narrator: Now, in this great crisis, we are learning what the Chinese have known for thousands of years. Chinese: It is the poor man's meat. It is the cow of China. It is meat without bones... Announcer: This is the story of the wonder food and the part it has played in our time."

Next comes a 5-minute segment in which W.J. Morse of the USDA Bureau of Plant Industry (Beltsville, Maryland) talks about the significance of the soybean and its development, and the new Pacific Program. Then the conclusion: "For a reprint of this program, send ten cents in stamps or coin to University of California Press, Berkeley, California. The Pacific Story is written and directed by Arnold Marquis. The original musical score was composed and conducted by Thomas Peluse. Your narrator–Gayne Whitman... This program came to you from Hollywood. This is N.B.C.–The National Broadcasting System." Note 2. A cover letter accompanies this manuscript. It is from Arnold Marquis, Writer-Producer, The Pacific Story, to Mr. John Baker, Department of Radio, USDA, Washington, DC. The letterhead reads: National Broadcasting Company, Inc., A service of Radio Corporation of America, Sunset and Vine, Hollywood 28, California. [Phone]: 6161. Dated May 13, 1946. Address: USDA.

3756. McWethy, John A. 1946. Soybean success: War boom continues as many plants expand, bring out new products. Examples: Meat flavor, wool-like fibre, bottle cap adhesive, soymilk cheese. St. Louis meeting draws 400. *Wall Street Journal.* Aug. 31. p. 1.

• ***Summary:*** This article is about the 3-day meeting of the American Soybean Association in St. Louis, Missouri. The soybean industry thrived during the depression, more than doubled in size during World War II, and is now continuing to grow. The A.E. Staley Manufacturing Co., America's largest soybean processor, has just started construction of a new $1 million plant that will turn soybeans into monosodium glutamate (MSG), making one million pounds a year. MSG has been previously made on a small scale in the USA from wheat, but Staley's plant will be the first to make it on a large scale from soybeans.

The Drackett Co. in Cincinnati is putting the finishing touches on a commercial plant that will make a wool-like fibre from soybeans. Robert A. Boyer, the firm's research director, said the new fibre will be used mostly for blending with rayon. He thinks it may sell for less than wool.

ADM, one of America's four largest soybean processors, earlier this year completed a plant to make a "whipping agent" from the versatile soybean; it can replace egg albumin, which is much more expensive.

Dr. Harry W. Miller, president of the International Nutrition Laboratory (Mt. Vernon, Ohio), "started making soybean products in Shanghai, China, in 1935. Bombed out in 1937 by the Nips [Nipponese = Japanese], he came to this country and began making similar products here in 1939. Now his firm does a $500,000 a year business and could do a lot more if sugar and other ingredients used with soybeans were available." His most popular items are [soy] milk, cutlets, and canned green soybeans. He says the milk tastes "rather like malted milk and is especially good for infants and others allergic to animal milk. His company has also developed a cheese made from soymilk, a prepared mix for ice cream from the soymilk, and "albumen sheets" [yuba], which are very popular in China.

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These sheets aren't much thicker than a piece of paper and are used in China to make the layers of a loaf filled with mushrooms. The Chinese also use soybeans [yuba] to make products that taste like both fish and chicken. In American kitchens, an excellent substitute for butter can be made "by combining soya oil, soya milk," carotene oil for color, and salt.

One big American breakfast cereal maker is said to be planning to introduce a "soya flake cereal soon, similar in appearance to cornflakes. Another may soon market a puffed soyabean cereal, a third may introduce a cooked cereal made from soybeans, oats and wheat."

General Mills is building a factory for producing a synthetic resin from soybeans–a product developed at the Northern Regional Research Laboratory in Peoria, Illinois. Dr. G.E. Hilbert, NRRL's director, says this new resin shows "considerable promise as a protective coating and as a heat-sealing and moisture-proofing agent.

During the past few years, soybean processors have been switching to the solvent extraction systems, from the expeller system, for obtaining oil from soybeans. Most newer plants use hexane solvent. The advantage of the solvent system is that it removes all but about half of one percent of the oil, compared with 3½% to 5% left in the meal when expellers are used. The meal currently sells for 3 cents/lb compared with 11.75 cents/lb for the oil.

NRRL has recently developed a process that uses alcohol instead of hexane. This yields superior "soyflour." Before the war, production of soyflour was 25 million lb/year; this year it is expected to top 400 million lb. Roth Products Corp. of Chicago has already used 6 million pounds of soyflour this year in its dehydrated soups, baked goods, pancake flour mixes, and sausage filler.

The soybean industry (especially the NRRL) is also working to make soybean oil more stable. It "has a tendency to develop a grassy or painty flavor on standing." A process obtained from Germany "goes a long way toward preventing the development of these objectionable flavors."

The Lincoln soybean variety, developed at the U.S. [Regional] Soybean Laboratory at Urbana, Illinois, and first made available to farmers during the war, is playing a major role in increasing yields. Today farmers in the corn belt are getting 25-30 bushels/acre with Lincoln, compared with only 15-16 bushels/acre in the early 1920s with varieties then available. Moreover, today's soybeans contain 20-21% oil compared with only 15-17% about 20-25 years ago.

3757. Ashikaga, Chiye. 1946. Chôri ni yoru shokuhin-chu bitamin B-1 no henka. II. Edamame ni tsuite [Changes in vitamin B-1 during cooking. II. Green vegetable soybeans]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 24:85-88. July/Sept. (Chem. Abst. 47:5039). [Jap]
• ***Summary:*** Green vegetable soybeans (*edamamé*) contained 280.1 to 403.2 mcg per 100 gm of vitamin B-1 and the pod contained 88.4 to 99.1 mcg/100 gm. When the fresh soybeans were boiled for 1 hour in water, 35% of the vitamin B-1 was lost, but the beans in the pods were somewhat protected from the loss; after boiling for 30 minutes, 10.5% of the vitamin B-1 was protected from loss when in the hulls. Address: Osaka Municipal Inst. of Domestic Science, Japan.

3758. Igarashi, S. 1946. Daizu-yu shinseki assaku-hô no kenkyû. I-II. [Continuous low-temperature extraction of soybean oil: I-II. Outline of extraction apparatus and influence of drying of material upon the extracting effect]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 49(8-9):135-38. Aug/Sept. [Jap; eng]

3759. Igarashi, S. 1946. [Continuous low-temperature extraction of soybean oil. II. Influence of miscella concentration, extracting temperature, extracting time, amount of raw material treated, agitation, degree of rolling and freshness of the material upon the extracting effect]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 49(8-9):135-38. Aug/Sept. [Jap]

3760. Yokoyama, Shûzô. 1946. Taizu tanpaku yôeki ni kansuru kenkyû. II. Tanpaku ryûshi no keijo ni oyobosu arukari hensei no eikyô ni tsuite [Research in soy protein solutions. II. The effect of alkaline denaturation on the shape of protein particles]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 49:135. Sept. [Jap; eng]

3761. Portères, Roland. 1946. Observations sur les possibilités de culture du soja en Guinée forestière [Observations on the possibilities of growing soybeans in the forested parts of French Guinea]. *Bulletin Agronomique* (*Ministere de la France d'Outre Mer, Direction de l'Agriculture, de Elevage et des Forets*) No. 1. 80 p. Nov. [Nogent-sur-Marne (Seine), France]. [3 ref. Fre]
• ***Summary:*** Contents: Introduction. Table showing the climate of the Sérédou [Seredou] station. 1. Varieties tried at the Sérédou Station: Introduction of soybean varieties (in 1935 [from Manchuria, and Japan], in 1938 [from Annam, Cochinchine, and Cambodia], in 1939 [from Tonkin, Java, USA, and France], and in 1940 [from French Cameroon, Poland, Argentina, Netherlands, Italy], new acquisitions in 1939 and 1940, multiplicity of varieties), classification of the soybeans at Sérédou, agro-botanical observations on the varieties, attempt at classification (general, botanical classification, classification of seed varieties), principal characters (incl. name and place of origin) of the soybean varieties cultivated at Sérédou in 1940.

2. Ecology: The ecological behavior of some (39) varieties, general ecological behavior (the phases of vegetation and critical periods), soya for forage, soybean seeds and their selection, facilities needed for cultivation and production during the year, inoculation of the seeds, quality

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of the soil, enemies of the soybean including parasites and diseases.

3. Plan for production of soybeans in a forested tropical zone: Organization of cultivation, map of precipitation in West Africa (Sérédou receives about 2,000 mm/year), exports (3-4 crops a year can be grown), cropping patterns, growing soybeans for use as food.

4. Modifications of indigenous methods: The need to introduce soya as an indigenous food and badly needed source of protein, difficulty of cooking soybeans, selecting varieties best suited to cooking, soaking, washing and cooking, cooking by the local people, times of year favorable for introducing soya into the diet, place of soya in the crop rotation.

5. The nutritional composition of soybeans grown in West Africa (analyses of varieties cultivated at Sérédou were made by M. Nguyen Van Cuc, a chemist at Nogent-sur-Marne), graph showing that oil content and protein content are inversely related. 6. General conclusions based on the first trials: Based on the 1939 and 1940 trials one can conclude that in the forested areas of [southeast] Guinea (Gueckedou, Macenta, N'Zerekore [Nzerekore]), and the sub-forested areas (Kissidougou, Beyla), soybeans can be grown with good results, and every effort must be made in this direction in the years to come. Soybeans can help meet the food shortages that exist in June, July, and part of August.

The preface (p. 3) states: "Sporadic attempts at the introduction of soybean cultivation have been in French West Africa since 1900. They have been conducted on a small scale in the various stations of Dahomey [later Benin], Ivory Coast, Upper Volta, French Guinea, French Sudan (*Soudan français* [Mali]), Upper Senegal-Niger (*Haute-Sénégal-Niger* [Mali]), and at the Office of Niger (Soninkoura [probably Soninnkoura in the Segou region of Mali on the Niger River], using irrigated cultivation). Practical results have been obtained in forested Guinea (at the Sérédou Station) and in the upper Ivory Coast. This study focuses on the results of trials conducted at Sérédou in 1939 and 1940.

The section on "Introduction of soybean varieties at the Sérédou Station" (p. 5) states that in 1935 five varieties were tested at Macenta by M. Barthes. They were Nogent 2856–Black *Wou T'ecu,* from Manchuria. None germinated (*ne germèrent pas*). Nogent 2855–Black *Hoi T'ecu,* from Manchuria. None germinated. Nogent 2852–Yellow *Huen T'ecu,* from Manchuria. 102 plants matured. Nogent 2817–Yellow of Japan. 17 plants matured. Nogent 2853–Green *Tsing T'ecu,* from Manchuria. 1,000 plants matured. Of these five, only No. 2853, the green-seeded soybean from Manchuria did well, and was kept and appreciated, but its cultivation was continued until 1939.

The best The best period for vegetation is from October to March in low irrigated lands, and until June in high lands. The vegetation period varied from 80 to 160 days for the different varieties (in the short cycle varieties branching is very reduced). Soybeans can be cultivated for export or for local consumption, both as forage and as food for the natives. Soybeans for export must be harvested during March-April and exported during the dry season. As a food for the natives it can be a supplement during the food-short months of June and July. Since soybean seeds lose their germination power quickly during the rainy season, it is necessary to have a little cultivation during June, August, and September in order to produce the necessary seeds for export. This cultivation cannot be integrated into the cultivation for food as it produces in a season when rice, which is preferred by the natives, is available.

Note 1. This is the earliest document seen (Aug. 2009) concerning soybeans in Upper Volta (renamed Burkina Faso in 1984), or the cultivation of soybeans in Upper Volta.

Note 2. This is the earliest reliable document seen (Aug. 2009) concerning soybeans in Dahomey (renamed Benin in 1975), or the cultivation of soybeans in Dahomey.

Note 3. This document contains the earliest date seen for soybeans in French Guinea, or the cultivation of soybeans in French Guinea (1935). The source of these soybeans was Manchuria and Japan. Address: Ingénieur d'Agronomie Coloniale, Licencié ès Sciences.

3762. van Veen, A.G. 1946. De voeding in de Japansche interneerings-kampen in Nederlandsch Indie [The food in Japanese internment camps in the Netherlands Indies]. *Voeding* 7(5):173-86. Dec. 15. [Dut; eng; fre]

• ***Summary:*** Among the foods consumed in these camps were soybeans (*soojaboonen*), tempeh (*tempe,* see p. 175, 183-84), and ontjom, starting in November 1944. "The food was very insufficient, calorically as well as regards further composition and taste. So numerous cases of nutritional oedema and other deficiency phenomena occurred. The construction of kitchens, bakeries and such was done by the inhabitants of the camps themselves with the most primitive materials. Food yeast, baker's yeast, maize malt, vitamin B extracts and other useful products were also made by the inhabitants themselves mostly out of waste products. For the patients very simple diets were composed." Address: Geneeskundig Laboratorium, Hoogschool, Batavia (Jakarta, Indonesia).

3763. Inokuchi, Kinjiro; Kitagawa, Jiro; Shimada, Yoshihide. 1946. Daizu no arukoorishu chûshutsu. V-VI. [Extraction of soybeans by alcoholysis. V-VI.]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 49(1-2):31-35. Dec. [Jap]

• ***Summary:*** Part V is Properties of extracted soybeans (*Hon chûshitsu-hô de erareta dasshi daizu no seiijô*). Describes solvent extraction using ethyl alcohol.

Part VI is Characteristics of ethyl ester, a fatty acid of soybean oil (*Daizu-yu shibô-san echiruesuteru no seiijô*). Address: Mantetsu Chuo Shiken-jo Yuki-ka Gakka

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[Manchurian Railway Central Research Lab., Organic Chemistry Div.].

3764. *J. of the American Society of Agronomy.* 1946. Fellows elect: William Morse. 38(12):1116-18. Dec.
• ***Summary:*** "William Joseph Morse was born in New York in 1884. He was granted the B.S. degree by Cornell University [Ithaca, New York] in 1907 and the same year began his studies with the U.S. Dept. of Agriculture where he is, at present, principle agronomist in charge of soybean investigations for the Division of Forage Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering. The U.S. Regional Soybean Laboratory, conducting research in twenty-four states is also under his direction.

"Although Mr. Morse has published many papers on his investigations on cowpeas, velvet beans and other miscellaneous legumes, his chief interest and work has been with soybeans. It may be appropriately stated that he is the father of soybean production in American agriculture. His many authoritative publications on varieties, culture and uses of the soybean attest to his outstanding work. From 1929 to 1931, he traveled through China, Japan, Korea and Manchuria collecting new varieties of soybeans and compiling data on cultural methods and uses for them.

"Mr. Morse was three-times president of the American Soybean Association, and has served the American Society of Agronomy for many years on the important committee of Varietal Standardization and Registration." A photo shows William Morse.

Note: This is the earliest document seen (June 2003) that uses the word "father" in connection with William Morse and soybean production in the USA.

3765. Senryôki shuppanbutsu: Ryôri to eiyô. 15 vols. [Publications of the occupation period; Food and nutrition. 15 vols.]. 1946-1951. Japan: 13-26 cm. [Jap]
• ***Summary:*** Chapter (or volume) 8 of this book is *Nattô no gôriteki seizôhô* (Rational natto production), by Yamazaki Momoji and Miura Jirô.

This is a collection of publications mostly from the censorship collection of Allied Forces for occupation (1945-1952); this group contains works on cooking and nutrition.

3766. Meals for Millions Foundation. 1946-1967. Meals for Millions Foundation Records, 1946-1967 (Finding aid for archival collection). Los Angeles, California: University of California at Los Angeles (UCLA). 48 boxes (24 linear feet). 1 oversize box.
• ***Summary:*** Collection No. 1107. Repository: UCLA Library, Dep. of Special Collections, Los Angeles. Physical location: Stored off-site at SRLF (Southern Regional Library Facility). Please contact UCLA for paging information.

"The Meals for Millions Foundation of Los Angeles was a non-profit organization dedicated to the eradication of hunger in the world through 'three-cent meals.' The plan for such a program was formulated by Clifford Clinton (of Clifton cafeterias in Los Angeles, California), who, with the assistance of Dr. Henry Borsook of Caltech organized the foundation in 1946. The basic product of the foundation, known as Multi-purpose Food, was a tasteless additive that could be mixed with virtually anything. Developed by Dr. Borsook, MPF was said to provide one-third of the daily vitamins, minerals, and protein needed by the average adult.

"Shortly after setting up the Foundation, Clinton brought in Florence Rose and Ernest Chamberlain to be co-directors and take over the day-to-day management. This collection or archive consists primarily of the office and personal files of Miss Rose, most of which she rescued from destruction when Meals for Millions began to change course in 1965. Florence Rose left the Foundation at that time and was then associated with Investors Overseas Services until her death in 1969.

"The collection came to UCLA indirectly (via Smith College [although Florence Rose's personal papers are still at Smith College]) from Ernest Chamberlain, close friend and confident of Miss Rose. The files have been alphabetically listed and their arrangement retained as originally filed. Consequently, a great deal of duplication exists throughout and the interrelationships of materials are often cloudy at best" (Quoted from the Biographical narrative on the website, July 2007). Organization: Arranged in the following series: 1. Alphabetical files of the Meals for Millions (MFM) Foundation (boxes 1-21); 2. Miscellaneous unsorted correspondence and ephemera (boxes 22-26); 3. Miscellaneous printed material (boxes 27-30); 4. MFM notebook files of printed material (boxes 31-37); 5. MFM projects in foreign countries (boxes 38-47); 6. Miscellaneous files re soybeans, MFM staff and financial information, newspapers (box 48); 7. Two records by Peggy Lee produced for MFM, photographs, People to people film (oversize box).

Boxes 38 to 47 are MFM projects in foreign countries or regions, listed alphabetically: Africa, Alaska, Argentina, Bolivia, Brazil, Ceylon, Chile, Finland, Germany, Haiti, Honduras, Hong Kong, Hungary, Iceland, India (5), Indonesia, Israel, Japan, Korea, Lebanon, Mexico, Pakistan, Paraguay, Peru, Philippines, South Vietnam, Taiwan, Tanzania, Thailand, Uruguay, Vietnam. Box 48 is oversize materials.

URL: http:// www.library.ucla.edu/ libraries/special/ scweb/. Address: Los Angeles, California.

3767. Inoue, N. 1946. [On the substance of so-called *Bacillus natto* and utilization of the natto]. *Eiyogaku Zasshi* (*Japanese J. of Nutrition*) 6:88-89. [Jap; eng]*

3768. Taira, T. 1946. [Proteinase of *Bacillus natto* (preliminary report)]. *Oyo Kingaku* (*J. of Applied Mycology*) 1:84-87. [Jap]*

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3769. Bascom, William R. 1946. Economic Survey of Micronesia for the U.S. Navy. Vol. 7. Human and economic resources–Ponape, Eastern Carolines. Honolulu, Hawaii: U.S. Commercial Company. 287 p. See p. 126-27. [231* ref]
• ***Summary:*** In Chapter 2, "The people," Section B is titled "Cultural data." From the Introduction (p. 18) we can extract a brief chronology. Before 1826–Native period. 1826. O'Connell is shipwrecked. 1826-1886–Pre-Spanish period. 1899–Germany purchases Ponape, together with the rest of the Carolines and most of the Marianas, after Spain had been defeated in the Spanish-American War. 1914 Oct.–The Japanese Navy takes control of Ponape and rules it with a military government; a civilian administration is added in 1918. 1920–The Carolines become a Japanese mandate under the League of Nations. 1922–A Japanese civilian administration called the South Seas Government (*Nanyo Cho*) is added. The Japanese Period ends in Sept. 1945 near the end of World War II, with a surrender to U.S. forces; the American Period begins.

In Chapter 6, "Resources and production," Section A is titled "Agriculture." The introduction states (p. 171-72): The Japanese established the Tropical Industries Research Station at the site of the Pohnpei Agricultural Station [in 1926]. Agricultural investigations were under the direction of Mr. Moritaro Hoshino; a manuscript written by him, reporting the results of his investigations, was made available to this Survey and translated in part; it is the source of some of the following information: "The Japanese on Ponape grew a variety of foods for their own use. In 1934 small government-subsidized truck gardens were started in Palikir, and during the war this activity expanded until the island was almost entirely self-supporting. Sweet potatoes and cassava seem to have been the most important staples, but many other plants were also grown... the Japanese grew tomatoes, green peppers, okra, *mitsuba,* spinach, kohlrabi, cabbage, lettuce, a kind of parsley, water cress (*mizu napa*), turnips, radishes, carrots, peanuts, soya beans, and rice. Of those in the latter group, at least lettuce, peanuts, and rice had been planted in small quantities by the Germans."

Note 1. This study was republished in 1965 in *Anthropological Records* (University of California Press). 22:1-156. April. 15. See p. 87.

Note 2. This is the earliest document seen (March 2010) concerning soybeans in Micronesia, or the cultivation of soybeans in Micronesia. This document contains the earliest date seen for soybeans in Micronesia, or the cultivation of soybeans in Micronesia (1945 or before). The source of these soybeans was probably Japan.

Note 3. Thanks to Diane Ragone (July 2002) of the National Tropical Botanical Garden (Kauai, Hawaii) for providing the 1965 source. Address: [Univ. of California].

3770. Holmberg, Sven A. 1946. Från sojaväxtförädlingen vid Fiskeby [Soybean breeding at Fiskeby]. *Kunglinga Lantbruksakademiens Tidskrift* (*J. of the Royal Swedish Academy of Agriculture*) 85(4):373-84. [Swe; eng]
• ***Summary:*** "The first aim of soya bean breeding at Fiskeby, Sweden, has been to achieve earlier maturity. Varieties which in America and elsewhere are described as 'extra-early,' do not behave as such when grown in the cool, long-day climate of Sweden. The Canadian variety, Manitoba brown, which ripens in 100 days at Ottawa, Ontario, on the 45th latitude, requires 143 days on the 58th latitude at Fiskeby, Sweden. The Sioux variety ripens in 185 days in Virginia, USA (39º), 114-121 days on southern Sachalin [Sakhalin] (47º), and in 136 days at Fiskeby (58º)."

Note: Sakhalin, belongs to the USSR; belonged to Japan from 1905-1945 as Karafuto, but belonged to Russia before that.

"Out of 6,426 attempted hybridizations, only 872 gave progeny. By crossing the short, extra-early varieties found on the islands of Hokkaido [Japan] and Sachalin with the taller, medium-early varieties from Manchuria and Germany, new hybrids were raised. Some of these are decidedly earlier in maturity than either of their parents and are also medium in height. Many of these new hybrids ripen on our latitudes the first days of September showing an advance in earliness of 2-3 weeks as compared with the 'extra-early' varieties cultivated before. New crosses have been made to increase the yield and improve the quality of these hybrids."

Note: This is the earliest document seen (Jan. 2010) that is by or about Sven A. Holmberg, or his work breeding soybeans for northern latitudes and/or cold climates. Address: Sweden.

3771. Katsumata, Senkichiro [pseudonym: Eisaku Waseda]. 1946. Notes on Japanese cuisine. Tokyo: Japan Travel Bureau. 24 p. Illust. 18 cm. *

3772. Kobayashi, M. 1946. Daizu [Soybeans]. Tokyo: Zakkoku-Sôsho. [Jap]*
• ***Summary:*** The author discussed summer vs. autumn soybeans.

3773. Mogi, Masatoshi. 1946. Taigai miso [Making miso with nongrain koji]. Tokyo: Seikatsu-sha. 408 p. [Jap]*
• ***Summary:*** Discusses substitutes for miso raw materials. Descriptions of making miso koji using potatoes, chestnuts, buckwheat, millet, etc. No history. Note: Mogi was born in 1907. Address: Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

3774. Mogi, Masatoshi. 1946. Daitai miso [Miso substitutes (approximately miso)]. Tokyo: Seikatsu-sha. 407 p. [Jap]* Address: Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

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3775. Morimoto, Rokuji. 1946. Nihon nôkô bunka no kigen: Kôkogaku-jo yori mitaru Nihon genshi nôgyô no kenkyû [The origins of Japan's farming culture: Research on primitive Japanese agriculture based on archaeology]. Tokyo: ?? Shobô. 303 p. Illust. 19 cm. [Jap]*
Address: Japan.

3776. Oriental Show-You Company. 1946. Oriental recipes. Columbia City, Indiana: Oriental Show-You Co. 15 p. *
• ***Summary:*** These recipes describe how to use the company's shoyu (naturally fermented, Japanese-style soy sauce). A 24-page edition was published in 1940.

3777. Rombauer, Irma S. 1946. The joy of cooking: A compilation of reliable recipes with an occasional culinary chat. Indianapolis, Indiana, and New York, NY: The Bobbs-Merrill Co. 884 p. Illust. by Marion Rombauer Becker. Index. 22 cm.
• ***Summary:*** This is the earliest known edition of *The Joy of Cooking* since the end of World War II. It was actually printed from the 1943 plates with very few changes. It has the same number of pages as the 1943 edition, but less emphasis on soy. Soy-related recipes: Chicken chop suey (with soy sauce, p. 143-44). Sukiyaki (with soy sauce, but no tofu, p. 163). Chow mein with fried noodles (with soy sauce, p. 164). Dried bean loaf (with dried soybeans, p. 176). Soybeans, green (p. 280). Soybeans (dried; "Boil them in fresh salted water until tender {about 3 hours}," p. 280). Seasonings and ingredients for sauces (incl. soy sauce, p. 379).

Includes a delightful Foreword and "Preface to the 1943 edition." Also well-known recipes for Peanut butter cookies and Peanut brittle. Worcestershire sauce is used to season many sauce or gravy recipes (p. 379-92). Words notably missing from this edition: Blender, milk shake. Address: St. Louis, Missouri.

3778. Walworth, Arthur. 1946. Black ships off Japan: The story of Commodore Perry's expedition. New York, NY: Alfred A. Knopf. xviii + 277 p. + viii. See p. 191, 263-64. Introduction by Sir George Sansom. 22 cm. [83* ref]
• ***Summary:*** On about 13 March 1854, the Japanese permitted the U.S. officers to walk about the towns of Yokohama and Kanagawa. Dr. James Morrow, the expedition's agriculturist, went on land also. The Treaty of Kanagawa was signed by Japanese and American representatives on 13 March 1854 and proclaimed on 22 June 1855. The Japanese celebrated the occasion with a big meal that included fish, shrimp, sea weed jelly, side dishes of confections, soy sauce, condiment, rice, saké, etc.

Appendix L, titled "Presents received by Americans from the Japanese government, March 24, 1854," notes that "1 box, 10 jars of soy" were received from Udono, 4th commissioner. The term "soy" here refers to shoyu (Japanese-style soy sauce); no mention is made of soybeans as such. Arthur Clarence Walworth was born in 1903.

3779. *Soybean Blue Book.* 1947-1966. Serial/periodical. Hudson, Iowa: American Soybean Assoc. Annual. Titled Soybean Blue Book from 1947-1966; Soybean Digest Blue Book from 1967-1979; Soya Bluebook from 1980 to present.
• ***Summary:*** A directory and information book for the soybean production and processing industries–but with much greater emphasis on processing and utilization. One of the most valuable sources of worldwide information on soybeans. During the period from 1947 to the 1960s, the Blue Book was usually published in March or April of each year.

In the 1966 Blue Book (p. 28-29) are two full-page tables titled "World Soybean Production." The first gives acreage in 1,000 acres, yield in bushels per acre, and production in 1,000 bushels. The second gives hectarage, yield in kilograms per hectare, and production in 1,000 metric tons. Figures are given for: 1950-54 (average), 1955-59 (average), 1963, 1964, and 1965. Statistics are given for the following countries: North America: Canada, United States. South America: Argentina, Brazil, Colombia, Paraguay. Europe: Italy, Rumania, Yugoslavia, Other Europe (excluding USSR). USSR (in Europe and Asia). Africa: Nigeria, Rhodesia, Tanzania. Asia: Turkey, China (Mainland), Cambodia, China (Taiwan), Indonesia, Japan, Korea (South), Thailand. Estimated world total. Address: Hudson, Iowa.

3780. *Soybean Digest.* 1947. Sweden hunts for varieties. March. p. 18.
• ***Summary:*** "The first problem of soybean production is Sweden is finding varieties that will mature in that northern latitude.

"Breeding work at Fiskeby in Sweden is covered in the preliminary report of Sven A. Holmberg of Norrkoping in the *Journal of the Royal Swedish Academy of Agriculture.* Middle Sweden is in the same latitude as northern Canada and southern Alaska. Successful soybean growing requires varieties that can be harvested in early September... The Canadian variety, Manitoba Brown, which ripens in 100 days at Ottawa, Ontario on the 45th latitude requires 143 days on the 58th latitude at Fiskeby, Sweden. The Sioux variety ripens in 85 days in Virginia, in 114-121 days on southern Sachalin [Sakhalin] and in 136 days at Fiskeby...

"Mr. Holmberg will be glad to send a copy of his report on the work at Fiskeby, which contains an English summary, to interested readers. Address Sven A. Holmberg, Norrkoping, Sweden."

3781. Brillmayer, Franz A. 1947. Geschichte der Einfuehrung der Soja in Oesterreich [History of the introduction of the soybean to Austria. I. (Document part)].

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In: F.A. Brillmayer. 1947. Die Kultur der Soja in Oesterreich. Vienna: Scholle-Verlag. 97 p. See p. 11-14. [Ger]

• ***Summary:*** Starting in 1920 again, for the second time, Austria promoted the production and utilization of soybeans, and with this the impulse for a new "soya wave," which now went all over Europe, was unleashed. Here in Vienna a soya industry also began with the production of Edelsoja. Assistant Professor Kupelwieser used it to demonstrate the outstanding significance of soya as a protein source, going against the then current opinion that soya was primarily an oilseed. From my soybean breeding location at Platt in Lower Austria, Austrian cultivars spread all over Europe and even overseas.

Why should it not be widely known that valuable pioneering work was performed in Austria? The line of soybeans bred in Platt went to Poland, the Balkans, to Hungary, Belgium, Holland, and Greece, to Turkey, to Persia, Canada, England, Germany, Dutch Guiana [later renamed Suriname], the Indian Peninsula [Vorderindien, incl. India, Sri Lanka, and parts of Pakistan and Burma], China, Java, Tanganyika, to French Morocco, and Bessarabia [now part of the Moldavian S.S.R. in the USSR]. It was not only new breeds of soybeans that spread out from Austria but a rekindling of the "soya idea" that had its origin here. This led to a change of opinion and the soybean came to be seen as a world power factor (*Weltmachtfaktor*), as is already well known today.

According to Dr. [E.C.] Winkler's patented process for debittering soya, a very modern factory was erected in Vienna XX. In it, a part of the oil was expressed, leaving a meal with only half its original fat content. Dr. Winkler achieved, through prior debittering of the soybeans, an excellent food and salad oil that did not need to be further refined. Also, the production of unrefined salad oil from Edelsoja originated in Austria.

History of the introduction of soya to Austria (p. 11): On the occasion of the Vienna World Exhibition of 1873, Japan exhibited soybeans and awakened a great interest for this Asian plant throughout Central Europe. This was mainly because of the fact that in the Exhibition attention was called to the value of the soybean. The Viennese university professor Friedrich Haberlandt took the matter into his own hands. Through the agency of the imperial embassy / legation he had the Ministry of Agriculture acquire 20 soybean samples from Japan and China. The tests were done in the warmer provinces of the Monarchy. There were 148 agronomic trials introduced in Hungary, Dalmatia [a former region on the Adriatic coast of what is now Croatia; formerly an Austrian crownland], Kärnten [Carinthia, today a state in southern Austria bordering on Italy and Yugoslavia], Steiermark [Styria, a state in the mountainous part of central and southeast Austria], Istrien [Istria, in Slovenia since June 1991], and Mähren [Moravia, a region in central Czechoslovakia]. In 1877 Haberlandt had already gathered so much experience that exact guidance for cultivating soybeans could be given. At this time the first composition analyses were undertaken, so exact knowledge of the value of soybean seeds was obtained. Likewise, through Steuf and Wolker, experience was gained in pressing oil from the seeds, and selections were undertaken in the Botanical Garden at Vienna. The highest yielding types were called "Haberlandt" and these first appeared in the seed catalog of the great seed company Vilmorin Andrieux & Co. in 1880.

Haberlandt pointed out the value of the soybean as food and recommended a diet of soybeans and potatoes, which contained all nutrients necessary for human life. It was also recommended that the soybean be incorporated into the commissary provisions of the army, and in this process that peas in the popular pea sausage 'Erbswurst' be partially replaced by soybeans.

At that time, the soybean could not stand on its own. It remained strong for a long time in the peasant agriculture of Krain [Carniola; now in Slovenia] and Istrien, and served as a 'coffee bean' (*Kaffeebohne*) in the preparation of a breakfast drink. There were two conditions which stood in the way of the spread of soybeans. First, the soybean is a foreign food to us. When cooked, it remains hard and has an after-taste, an off flavor that is bitter. The very thin layer under the seed coat of the bean is the source of this after-taste. In addition, it was said that Asian soyfoods have no taste. What is more, there was plenty of food in the Monarchy, so there was no need for a new, foreign food.

The soybean completely disappeared from memory in Austria. It was only kept in a few botanical gardens as a curiosity.

In 1920 I began breeding soybean lines with the goal of getting ones that would ripen in our climate and give reasonable yields. Conditions for soybean culture became ripe after World War I due to the general lack of food. My starting material was a matchbox full of soybeans that a prisoner of war had brought with him from Siberia. After a long delay, the solution to the soybean problem was begun in Platt in lower Austria, near Zellerndorf in the district of Hollabrun. Some of the seeds ripened and in the next year those that ripened earliest were selected. In 1924 I was able to announce to Dr. Markus Brandl (the top agricultural official in the area) that I had a field of soybeans that matured in mid-September. Immediately Dr. Fritz Drahorad was sent to Platt to inspect and report on the soybean plant. Drahorad was the current top ranking agronomic official in Vienna in charge of plant cultivation and seed testing (*Oberkommissär der Bundesanstalt für Pflanzenbau und Samenprüfung*) and the assistant to Privy Councillor (*Hofrat*) Professor Dr. Tschermak von Seysenegg, who had been involved with soya at Royal College of Agriculture (*Hochschule für Bodenkultur*) in Vienna. He wrote a confirming report, that a good yielding, early maturing variety was now at hand. This first domestic variety was small seeded and black. It was

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called Platter SS (Black Seeded) 14.

Using newspaper articles and a small price list, I propagated soybean culture. I pointed out its significance as human and animal food, established connections with central authorities in China, and exchanged experiences and breeding material with research stations in Manchuria. The Chinese Eastern Railway soybean station in Harbin, which then employed a staff of 20 scientists, published annually a hefty volume with research results dealing with all questions of culture, breeding and utilization. In this way, Austria received new breeding material from Manchuria–over 80 soybean varieties. But in Platt they failed to perform up to our expectations because of the longer vegetation period.

Meanwhile, from the small-seeded SS 14 a very large seeded strain was selected. In the price list of 1929, eight lines appeared, with maturity times ranging from 114 to 128 days. One thousand seeds weighed 158 to 170 gm. Yields steadily improved throughout 1929. In the same year, the new varieties of Platt Yellow and Platt Yellow Giant were made available in small quantities for research. A table (p. 14) shows that 100-gm packets of mixed types were sold, including many black types and Professor Früwirth's Black Eyebrow, all prefaced by the word 'Platter.'

Note: This is the 2nd earliest document seen (Oct. 2007) concerning the cultivation of soybeans in Persia [renamed Iran in 1935]. Address: Braunsdorf–Vienna, Austria.

3782. *Soybean Digest.* 1947. To live: Japan must import more soybeans. May. p. 36.
• ***Summary:*** "The Manchurian soybean crop in large part holds the key to the economic health of the Japanese people. This situation is revealed in a special analysis prepared for the Foreign Economic Administration by F.H. Shelledy of the U.S. Tariff Commission... In the past the heavily peopled islands have grown only one-third of their needed soybeans. The rest have come from Manchuria, chief supplier to the world soybean trade, and to a smaller extent, from Korea. The soybean was one reason why the Japs over-ran Manchuria... Now, however, the Manchurians are growing a third fewer soybeans than they were before the war... Before the war Japanese farmers grew from 10 to 14 million bushels of soybeans annually. Most of their crop found its way to the island markets, being superior for food to the beans imported from Manchuria and Korea... But Japanese farmers used a large part of the crop as green manure, since they lacked animal manures. They also depended on the Manchurian soybeans as a source of fertilizer... Before the war the Japanese were importing 26 million bushels of soybeans annually...

"'Actually there appears to be little chance of any substantial increase in soybean production in Japan. If Japan is to have sufficient soybeans to supply its needs, it will have to import most of them,' Shelledy says."

3783. Walsh, Robert M. 1947. Soybean production–Here and abroad: And possible competition from other oilseeds. *Soybean Digest.* May. p. 18-21.
• ***Summary:*** Contents: Introduction: Soybean production concentrated in China, Manchuria, and USA, uses of soybeans oil. War-time role. Short during the war. Early postwar situation. Possible future developments. Long time [term] outlook.

"Before the war, Asia produced 400 million bushels of soybeans a year; the United States 56 million." China was the leading producer, with slightly over 200 million bushels/year–all of which was used domestically. Manchuria produced about 150 million bushels/year and was the world's chief exporter. "The United States, Korea, Japan, and the Netherlands Indies were the only remaining producers of any consequence. Contrary to popular, output in southeastern Europe was extremely small."

In the USA, production grew from 5 million bushels in 1924 (mostly for seed use) to 23 million bushels in 1934, with an increasing percentage "going to oil mills for crushing. The severe drought of 1934 was a notable factor leading to the present day importance of soybeans as a cash crop in the United States. Soybeans proved to be more drought-resistant than corn. In 1935 farmers more than doubled their 1934 production." By 1939 production had reached 90 million bushels.

"Drought related shortages of lard in 1935-37 resulted in a rapid gain in the use of soybean oil in shortening." Between 1935 and 1939, soybean oil went from being used mostly in nonfood industrial products (paint and related products was the biggest use in 1935) to being used mostly in food products (such as shortening and margarine). Cottonseed oil was still the main liquid oil used in processed foods and linseed oil was still the main oil used in "drying-oil products."

"To sum up, soybean oil made notable gains in production and use during the late 1930's. This upward movement was sharply accelerated by the war which followed.

"War-time role: Throughout most of 1940 the United States had large supplies of domestic and imported oils, and prices were low. And our consumption of fats in 1941 was the largest in peace-time history. Real trouble began in 1942. Imports fell abruptly after the Japanese attack on Pearl Harbor. The United States had been dependent on Pacific sources for about half its imports of fats and oils. In the five years 1937-41, imports had averaged 2 billion pounds annually. From 1942 through 1946, yearly imports were less than half that amount. The major loss was in coconut oil," followed by palm oil from the Netherlands Indies, and tung oil from China. In addition, the U.S. had previously lost nearly 100 million pounds of olive oil from the Mediterranean region, and fairly large amounts of fish- and fish-liver oils from the European North Atlantic area.

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During World War II, the U.S. government acted to increase domestic oil production and to ration supplies. Soybean production increased. "To induce larger output, AAA [Agricultural Adjustment Administration] restrictions on soybean acreage were partially relaxed in June 1941. The government offered to support prices of 1941-crop soybeans at approximately $1 per bushel. These actions, together with rising market prices, brought forth an increase of over 1 million acres in soybeans harvested for beans.

"An all-out war production program for oilseeds was launched in 1942. High production goals were set for soybeans, flaxseed, and peanuts... Large-scale increases in livestock production were fostered."

Production of soybean oil showed steady gains throughout the war, rising from some 500 million pounds in the 1940 season, to 1,200 million pounds in the 1942 season, and reaching a peak of 1,400 million pounds in 1945-46.

A graph shows "Soybeans harvested for beans: Production, crushings, and price, United States, 1924-46." The upper graph shows U.S. soybean production and crushings in millions of bushels. The lower graph shows the price received by farmers in dollars/bushel and the "comparable price (September 15)."

Photos show: (1) A storage yard of a Manchurian grain and soybean merchant. (2) The new flax and soybean plant of Cargill, Inc. at Port Cargill, Savage, Minnesota. Address: Special Asst. to the Chief, Bureau of Agricultural Economics [USDA].

3784. Hedge, Porter M. 1947. Washington Digest: Army buys more [soy] flour. *Soybean Digest.* June. p. 39.

• ***Summary:*** "The Army has ordered 75,000 long tons of soy flour for June, July, and August delivery for civilian feeding in Japan, the Ryukyu Islands [which stretch southward from Kyushu, Japan's southernmost main island], and Korea.

"Of the total 62,600 long tons are for Japan proper and the Ryukyu Islands; the remainder for Korea. The Korean shipment, and 12,500 long tons of the Japan quota are a substitute for pulses."

3785. Caldwell, Joseph S.; Culpepper, C.W.; Hutchins, M.C.; Ezell, B.D.; Wilcox, M.S. 1947. Dehydration of green vegetable soybeans: A comparison of quality in nineteen varieties and strains with that of canned green and mature dry beans. *Canner* (*The*) 105(10):13-16, 24. Aug. 30; 105(11):13-14, 16, 26. Sept. 6; 105(12):15-16, 18. Sept. 13; 105(13):35-36. Sept. 20. Summarized in Soybean Digest. March 1948, p. 20-30. [25 ref]

• ***Summary:*** "Japanese horticulturalists classify vegetable soybeans as garden vegetables and have developed and selected about 125 distinct varieties which they grow especially for food purposes... out of a total of about 125 varieties introduced from Japan [to the USA], approximately 25 are fairly well adapted to conditions in some or most of the important soybean-producing districts and combine satisfactory yields and good to excellent quality as fresh green beans."

"The canning of vegetable soybeans on a commercial scale is assuming some importance. Twenty-three canning companies in 12 states included soybeans in the list of products packed in 1944. The number was reduced to 16 in 10 states in 1946" [according to the National Canners Association, Canners Directory, for 1944 and 1946]... Commercial freezing of soybeans, either alone or in combination with sweet corn as succotash, has very recently begun by a few commercial operators.

For the first varieties to reach usable maturity, the green pods were picked from the plants by hand, spread in the laboratory on wire trays to a depth of about an inch, steamed for a few minutes to soften the pods, then shelled in a power-driven pea huller equipped with special screens having openings of suitable size. "This method proved slow and unsatisfactory, as the pods clung together in masses so that many remained unopened even after two or three passages through the machine, while the empty hulls broke up and tended to clog the screens." A much more satisfactory and efficient method is described, still using the pea huller.

Table 1 shows the 17 varieties of green vegetable soybeans used, date harvested, days from planting screen size, length of blanch, total solids content, ascorbic acid content (hand shelled, or steamed then machine shelled), carotene content, and yield of dry product as a percentage of fresh product. The varieties, listed alphabetically, are: Aoda, Bansei, Emperor, Etum, Giant Green, Hahto, Imperial, Jogun 2, Kanum, Kanro, Rokusun, Sousei, Tastee, Willomi, and Wolverine. The varieties with the best scores after dehydration were Willomi (strain A), and Etum. Address: USDA.

3786. Leonard, Warren H. 1947. Barley culture in Japan. *J. of the American Society of Agronomy* 39(8):643-58. Aug. [2 ref]

• ***Summary:*** Contents: Introduction. Geographical distribution. Regional types and varieties. General cultural practices. Cultural methods on upland fields. Culture on paddy fields. Diseases and insect pests. Utilization. General summary.

Barley, one of the most important crops grown in Japan, is used for both food and forage. Almost all barley grown in Japan is the common six-row barley, *Hordeum vulgare,* as in the United States. In Japan, most of the crop is spring barley, seeded in the fall. The two basic types are covered barley and naked barley; about 60% of the crop is naked barley (which threshes free from the glumes, as does common wheat) and 40% covered. During the period 1936-1940, the cultivated area devoted to barley was about 14% of Japan's arable land area. When the covered and naked types are included together, barley ranks second in acreage among

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all Japan's cultivated crops, being exceeded only by rice, which occupies 53% of the cultivated area. Barley is grown throughout Japan.

Table 6, titled "Uses of barley in Japan, 1942" gives the number of bushels and percentage for covered barley / naked barley for the following uses: Meal (eating use) 64.42% / 75.88%. Fodder or feed 22.83% / 14.36%. Seed 2.96% / 3.39%. Bean paste [miso] and soysauce 2.99% (1.032 million bu) / 6.03% (1.826 million bu). Beer 5.00% / -. Other uses (candy, medicine, yeast, etc.) 1.80% / 0.34%.

Note that both covered barley and naked barley are used to make miso and soysauce, but about 77% more naked barley is used in terms of bushels per year.

Barley is generally preferred to wheat for cooking with rice; it is pearled when used in this manner. Barley straw is used for straw braids, roof-thatching, litter, and mulches for vegetables.

Covered barley is grown almost exclusively in the United States, primarily for use as livestock feed and for malting. Address: Prof. of Agronomy, Colorado A. and M. College, Ft. Collins, Colorado.

3787. Seiler, Hans G. 1947. Soja in der japanischen Kueche [Soya in Japanese cookery]. In: Dr. Wolfgang von Schuh, ed. 1947. Bericht Ueber die Erste Deutsche Soja-Tagung in Weissenburg, Bayern, 28-31 Aug. 1947. Heilsbronn bei Ansbach, Mittelfranken: Arbeitskreis fuer Landwirtschaft, Deutsche Arbeitsgemeinschaft Soja. 24 p. See p. 10-11. [Ger] Address: Studienrat and Dr., Erlangen.

3788. Rodrigo, P.A. 1947. Soybean culture in the Philippines. *Philippine J. of Agriculture* 13(1):1-22 + 5 plates. Third quarter. Summarized in Soybean Digest, May 1948, p. 41. [14 ref. Eng]

• ***Summary:*** Contents: Introduction. Description and history. Climatic and soil requirements. Varieties. Propagation. Preparation of the soil. Fertilizers and lime. Inoculation. Planting. Care of the crop. Harvesting and production: For day, for seed. Cost of production. Uses of soybeans. Diseases. "In the big cities in the Islands, many of the soybean products like soy sauce or toyo, tokua, tajuri [fermented tofu], tojo [soymilk curds], miso, etc. are becoming more popularly used by the Filipinos, and will be more so as their nutritive values become more fully realized. Already, in some sections of the country where soybean is being grown, the seed is used either as a green or as a dry vegetable. The dried bean is roasted and is eaten offhand or is used in adulterating coffee, and the bean in the dough stage is boiled and eaten like peanut" (p. 2).

Note 1. This is the earliest English-language document seen (Oct. 2011) that uses the word *tajuri* to refer to fermented tofu.

Table 1 shows annual imports (in kg) of soybeans and soybean products into the Philippines from 1929 to 1940, including dried beans, soy sauces, soybean meal, tausi (fermented black soybeans, salted), paste (miso), and total. By far the leading import (by weight) from 1929 to 1937 was dried soybeans. In 1929 some 4,574,497 kg were imported. This figure rose gradually (with ups and downs) to a peak of 5,660,575 kg in 1937, then fell sharply to only 237,666 kg in 1940. Soybean sauces were the No. 2 import, starting with 606,231 kg in 1929, rising to a peak of 1,441,563 kg in 1932, then remaining above 1,000,000 for most years thereafter. Imports of soybean meal started in 1935 with 660,699 kg; they reached a peak 1,023,303 in 1936 (the next year), then remained near 1,000,000 thereafter. Tausi was first imported in 1940, the amount being 151,571 kg.

Table 2 shows the value of these items (in pesos). In 1940 the imports of greatest value were soy sauces (120,346 pesos), soybean meal (50,682), and tausi (20,280).

"In the Philippines, while the plant has been under cultivation since the Spanish regime [1571-1898], it has not gained much headway due mainly to the lack of a variety suitable for commercial planting, and perhaps due to want of interest among farmers" (p. 4-5). The Philippine Bureau of Plant Industry has, to date, introduced more than 200 soybean varieties to the Philippines from the USA, China, Japan, Hawaii, Java, and India, but it presently recommends only a few varieties for commercial planting. These include Ami, which has long been cultivated there and is well adapted to the varied soil and climatic conditions.

Based on the results of a number of years' trials in different regions of the Islands, the following varieties have been found to be productive: Yellow Biloxi Hybrid (introduced from Hawaii in 1936), Mis 28 E.B. Str. 3910 (introduced from India in 1937), Mis 33 Dixi (introduced from India in 1937), Head Green (introduced from the USA in 1935), and American Black. All of these varieties are good for May and June planting, and all but Yellow Biloxi Hybrid are good for September to December planting (dry season).

"In the Philippines, the green but fully developed pods are harvested, and the seed is cooked and eaten in practically the same way as lima bean or patani... In Lipa, Batangas, soybean in the dough stage is boiled in the pod and sold and eaten offhand" like peanuts. The more common soy products made in the Philippines are soy sauce or *toyo,* tokua [tofu], tausi [fermented black soybeans], and miso. "Soybean milk is being manufactured by the Bureau of Plant Industry in a limited scale and a big modern firm has started putting soybean milk and other products in the local markets" (p. 15-16).

Note 2. This is the earliest English-language document seen (Nov. 2011) that uses the word *tausi* to refer to fermented black soybeans. Address: Chief, Horticulture Research Section, Bureau of Plant Industry.

3789. *Soybean Digest.* 1947. Export to Japan? Nov. p. 36.

• ***Summary:*** "There is some prospect that a limited volume

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of whole soybeans may be exported to Japan this year for use in preparation of soya base foods for human consumption. This has been discussed by Army and State Department officials with the Department of Agriculture. Army and State Department are reported to be strongly in favor of some whole soybean exports. Fats and oils officials haven't been too keen on the idea since there is plenty of crushing capacity in this country."

3790. Osaki, J. 1947. [Antagonism of *Bacillus natto* to pathogens]. *Oyo Kingaku* (*J. of Applied Mycology*) 2:47-52. [Jap]*

3791. Ozawa, J.; Takeda, A. 1947. [Fermentation of pectin. II. Relation between pectin and processing of food]. *Nogaku Kenkyu* (*Agricultural Research*) 37:52-53. (Chem. Abst. 44:7460). [Jap]*

3792. Taira, T.; Itami, F. 1947. [Some properties of the proteinase of natto]. *Oyo Kingaku* (*J. of Applied Mycology*) 2:77-83. [Jap]*

3793. Burt, Elinor. 1947. Far Eastern cookery. Boston, Massachusetts: Little, Brown & Co. xi + 349 p. Illust. by Samuel Bryant. 22 cm. *
• ***Summary:*** Elinor Burt was born in 1899.

3794. Cole, A.B. ed. 1947. A scientist with Perry in Japan: The Journal of Dr. James Morrow. Chapel Hill, NC: University of North Carolina Press. 307 p.
• ***Summary:*** For background on Commodore Perry and the opening of Japan, see Fairbank, Reischauer, and Craig. 1973. *East Asia: Tradition and Transformation,* p. 327; a summary is given in this bibliography.

In 1854, Dr. James Morrow of South Carolina, agriculturist with the U.S. Perry expedition to Japan, East Asia, spent 18 weeks in Japan. He took seeds, plants, and scientific information from the USA to distribute as gifts for the shogun Tokugawa Iesada, and was instructed to collect the same and make observations, which he recorded in this journal. He explored the Great Liu Ch'iu (Okinawa), and sampled fried bean sprouts (we are not told what type [probably mung bean]) and soy sauce in "a little sauce of bean soy" in Canton (p. 48).

In April 1854 in Kanagawa, Japan, he "put in small papers more than two hundred papers of seed, and sent one of each kind to Mr. Allen, gardener of New York,–to Mr. Landreth, gardener in Philadelphia,*" (p. 155) (Endnote 89, p. 286: *"Probably Richard L. Allen, formerly of A.B. Allen & Co, dealers in agricultural implements in New York, and probably David Landreth of David Landreth & Son {David & Oliver Landreth & Thomas F. O'Neil} in Philadelphia."), "also to Mr. Buist, gardener in Philadelphia,–to Henry Gourdin, Esq., of Charleston,–and to Gen. Wade Hampton, of Columbia, South Carolina [a planter and congressman]. I sent the large Japanese papers to the Department of the Interior at Washington [DC].

Appendix G (p. 228) shows a list of seed bought in Simoda [Shimoda] Bay in large quantities in April 1853 (1854?) [sic, probably 1854]. Included are "Small red Beans (soya) [azuki?]," and "Black beans (another variety)."

Appendix H (p. 228-30) contains a "List of seed presented to me [Morrow] by the Japanese gentleman who was the principal in making the treaty & collected by himself as he said with great pains. These were principally from Yeddo [Edo, today's Tokyo] and Conagowa" [Kanagawa; an important port in 1854, a town north of Yokohama and a prefecture whose capital is Yokohama]. Included in the list of 56 plants are "Dolichos pease (green), Red Beans, Black pease, Red pea–Dolichos, and Small red Bean (soya) [azuki?]."

A photo (frontispiece) facing the title page shows Dr. James Morrow. Note: Morrow's soybean seeds were sent to the Commissioner of Patents, whence they were distributed to farmers, and planted from 1855 on.

3795. Food and Agricultural Organization of the United Nations. 1947. Soybeans: Area, yield, and production. *Yearbook of Food and Agricultural Statistics.* See p. 101-02.
• ***Summary:*** Under soybeans, gives region/continent and country, then statistics for soybean area, yield, and production for each soybean producing country. Statistics show that the following countries produced the following amounts of soybeans (measured in 1,000 metric tons) during the 1934-38 period (the earliest period given).

Europe: Austria 0.2. Bulgaria 11.6. Czechoslovakia 0.9. Hungary 0 (but 6.2 in 1940 and 1.3 in 1945). Italy less than 0.5 (but 0.01 in 1940 and 0.9 in 1945). Poland 0.5. Rumania [Romania] 11.7, Yugoslavia 1.5. Europe total: Former boundaries 550, present boundaries 260. USSR: Former boundaries 68.1, present boundaries 97.1.

America: Canada 5.5. United States 1,164.0. Total 1,170.0

Asia: China: China Proper 6,092.7, Formosa (Taiwan) 4.2, Kwantung 20.2, Manchuria 3,851.0. Indochina: Cambodia 0.4 (in 1937). Japan 325.1. Korea 518.6. Netherlands Indies [Indonesia]: Bali and Lombok 9.0, Java and Madura 236.4. Asia total: 10.60. Africa: Southern Rhodesia less than 0.5 (but 0.3 in 1942 and 0.2 in 1945).

World totals: Excluding USSR–Former boundaries 11.829. Excluding USSR–Present boundaries 11.800. Including USSR: 11.9000.

3796. *U.S. General Imports. Schedule A. Commodity by Country.* 1947--. Serial/periodical. Washington, DC: U.S. Dept. of Commerce, Bureau of Census. Monthly and Annual.
• ***Summary:*** Gives statistics for imports of soy sauce to the USA. In the book titled *Soyfoods Industry and Market,* by

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Shurtleff & Aoyagi (1982), statistics for the years 1947 to 1981 are given for soy sauce imports to the USA (in both a full-page graph and a full-page table) from: Japan, China (PRC), Hong Kong, total (1,000 lb), and total ($1,000). The major source of U.S. imports has always been Japan; this figure peaked at 18,672,000 lb in 1972, then fell after Kikkoman's plant opened in the USA. Total imports increased from 220,000 lb in 1947, to a peak of 23,098,000 in 1972 (worth $3,116,000), falling to 8,093,000 in 1974, then rising to 19,613,000 in 1981 (worth $7,044,000).

3797. Berrehsem, Marion. 1948. Cookery from the Orient has many a recipe helpful to Americans learning to save meat. *Christian Science Monitor.* Jan. 8. p. 10.
• ***Summary:*** "Centuries ago the Asiatics learned the value of the soybean, which is not inferior to meat in nutritional value." The widespread acclaim for Asiatic cookery "can be attributed in no small measure to the fact that cooks in these countries have devised many delicious menus which use meat in small quantities, or not at all.

Recipes include: Egg foo yung, with soy sauce as optional but recommended ingredient. Cream soy sauce, with 1 cup rich cream or milk, "1 to 3 tablespoons soy sauce," plus butter and flour.

3798. Okano, K. 1948. Nama daizu no yûdokusei tanpakushitsu ni tsuite. Daizu saponin no yôketsu hanno ni tsuite [The toxic protein in raw soybeans. The hemolytic reaction of soybean saponin]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 22(1):23-24. Jan. (Chem. Abst. 46:5197). [8 ref. Jap]
• ***Summary:*** Heating soybean saponins in the presence of the meal destroys their hemolytic activity, but heating the purified saponins does not.

3799. Caldwell, J.S.; Culpepper, C.W.; Hutchins, M.C.; Ezell, B.D.; Wilcox, M.S. 1948. Dehydrated green vegetable soybeans. *Soybean Digest.* March. p. 20-21, 24-28, 30.
• ***Summary:*** "The authors compared most of the leading vegetable varieties of soys in three forms: canned green, dehydrated green and mature dry beans. Tests were made for flavor and desirability... Approximately 125 varieties of soybeans are classified by Japanese horticulturists as garden vegetables and are grown specifically for use as human food. Thorough tests of these in the United States have shown that some 25 are fairly well adapted to conditions in some or most of the important soybean-producing districts and that they combine satisfactory yields and good to excellent quality as fresh green beans.

"Canning of vegetable soybeans on a commercial scale is assuming some importance. The number of canners reporting soybeans in the list of products packed increased from 7 in 5 states in 1940 to 23 in 12 states in 1944, but was reduced to 16 in 10 states in 1946 (according to the National Canners' Association Canners' Directory), and to 16 in 8 states in 1947. Commercial freezing of soybeans, either alone or in combination with sweet corn as succotash, has very recently been begun by a few operators. The wide adaptation of vegetable soybeans to cultivation, and their acceptability and especially their high nutritive value as fresh vegetables, which exceeds that of any other fresh legume (Chatfield and Adams 1931) seemed to warrant a study of the possibilities of dehydration as a means of preserving them."

Seventeen varieties of "vegetable or 'edible' soybeans were selected for the study by William J. Morse of the Division of Forage Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering. All of the varieties were grown together on the Plant Industry Farm at Beltsville, Maryland. The varieties were ready for harvest from 84 days (Sousei) to 111 days (Rokusun 17) after planting. The beans were shelled, blanched in flowing steam for 8 minutes, then dried "in a rapid current of air at 170ºF for the first 4 hours, with reduction to 150º for the remaining 4-5 hours of the drying period. Material was removed from the drier with a moisture content of 5 to 5.5 percent." The two varieties judged best overall were Willomi (strain A) and Etum (authentic strain).

Comparison of dehydrated with canned green soybeans was difficult since the canned and dried products of the same variety were so dissimilar. "The dried product retained much of the characteristic flavor of the fresh beans; in the canned, this was lost and replaced by an altered 'canned' flavor which was much less appealing to all the judges.

Part of the planting of each variety was allowed to mature, then the beans were harvested, dried, and the mature dry soybeans pressure cooked. "Mature dry beans, as a class had a characteristic, mild, nut-like flavor and the rather strong 'beany' taste of some varieties, fresh or dehydrated, was never present. The mature nut-like flavor was somewhat more attractive and pleasing, in the opinion of the judges, than the flavor of the dehydrated green beans, and they considered that most consumers tasting both products for the first time would prefer the mature beans. On the contrary, those who are familiar with the fresh vegetable would prefer the dehydrated product rather than the mature dry bean.

"No comparison between dehydrated and frozen beans were possible in the present study." Address: Div. of Fruit & Vegetable Crops and Diseases, Bureau of Plant Industry, USDA.

3800. Gehrke, Charles W.; Weiser, Harry H. 1948. A comparative study of the biochemical activity of *Streptococcus lactis, S. citrovorus*, and *S. paracitrovorus* when grown in cow's milk and soybean milk. *J. of Dairy Science* 31(4):213-22. April. [17 ref]
• ***Summary:*** These three microorganisms are widely used to culture butter. "Soybean or vegetable milk is used extensively throughout Japan and China for infant feeding as

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well as for adults." The introduction of soybean milk to the American people has occurred only recently. Soybean milk has been manufactured in the form of a powder. It has been used with good results... especially in those countries that find it cheaper to use a vegetable milk... The development by butter organisms of diacetyl [which is partially responsible for the aroma of butter] and related compounds in vegetable milk and products made from it may be desirable from a commercial standpoint."

The butter cultures were obtained from the Department of Dairy Industry, Iowa State College, Ames. The soybean milk was obtained from Harry Miller, Director of the International Nutrition Laboratory, Mt. Vernon, Ohio. Cow's milk and soybean milk were inoculated and incubated, then measurements of the following were taken at regular intervals up to 216 hours: pH, titratable acidity, volatile acidity, and Mg Ni salt. The production of acetylmethylcarbinol (AMC) and diacetyl in soybean milk by butter culture organisms was not evident until after an incubation period of 48 hours; however, upon incubation of cultured soybean milk for 168 to 216 hours, larger amounts of the flavor and aroma compounds were produced in soybean milk than in cow's milk. "The values obtained for the titratable acidity in cow's milk and cow's milk to which 0.15 per cent citric acid had been added were nearly twice as great as those secured for the soybean milk. Address: Dep. of Bacteriology, The Ohio State Univ., Columbus, Ohio.

3801. Hidatsa: New U.S. domestic soybean variety. 1948.
• ***Summary:*** Sources: Morse, W.J. 1948. "Soybean varietal names used to date." Washington, DC: Appendix to the mimeographed report of the Fourth Work Planning Conference of the North Central States Collaborators of the U.S. Regional Soybean Laboratory, Urbana, Illinois. RSLM 148. 9 p. May 26. See p. 4. "Hidatsa–P.I. 81038."

USDA Production and Marketing Administration [Grain Branch]. 1948. "Soybean varieties: Descriptions, synonyms and names of obsolete or old and seldom grown varieties." Washington, DC. 25 p. Aug. See p. 8. "Hidatsa–Introduced under P.I. No. 81038, native name 'Chusei Eda Mame,' from Sapporo, Hokkaido, Japan, in 1929. Maturity, very early; pubescence, tawny; flowers, purple; pods, two- to three seeded; shattering, much; seeds, olive yellow with black hilum, about 2,400 to the pound; germ, yellow; oil, 18.9 percent; protein, 39.9 percent."

Note: This variety was received from Japan as "Chusei Eda Mame," indicating that the Japanese considered it a 'vegetable type' soybean. Yet unlike most such soybeans, it is small seeded (2,400 seeds per pound)–an unusual combination.

Bernard, R.L.; Juvik, G.A.; Nelson, R.L. 1987. "USDA soybean germplasm collection inventory." Vol. 1. INTSOY Series No. 30. p. 10-11. Hidatsa is in the USDA Germplasm Collection. Maturity group: 000. Year named or released: 1941. Developer or sponsor: O.H. Will and Company, Bismark, North Dakota. Literature: 13, 14. Source and other information: 'Sousei Eda Mame' from Sapporo, Hokkaido, Japan, in 1929. Prior designation: PI 81038. Address: USA.

3802. Morse, W.J. 1948. Soybeans yesterday and today. *Foreign Agriculture* 12(5):91-95. May. Summarized in Soybean Digest, June 1948, p. 32.
• ***Summary:*** A good overview of soybeans and their history in China, Manchuria, Korea, and Japan (the principal regions of world soybean production), plus thoughts on their relatively recent introduction to the Western world.

"In China, the soybean is one of the leading and most ancient of crops, ranking fifth in extent of culture and occupying about 9% of the total cultivated area. Although grown everywhere in China, about 60% of the soybean acreage and production is confined largely to 3 northern Provinces, Shantung, Kiangsu, and Honan. China consumes practically all its production, estimates indicating 55% for food, 27% for oil extraction and other purposes, 10% for stock feed, and 8% of the total cultivated area of Manchuria and is a dominating factor in the life of that country. As a cash crop, it provides fully half the total volume of freight handled by Manchurian railroads. Estimates have indicated that from one-third to two-thirds of the production of soybeans was exported; 15 to 20% utilized for food, feed, and planting; and the remainder processed for oil and oil meal.

"Korea occupies third place among the soybean-producing countries of Asia. Acreage and production are confined largely to the central and northern areas, because southern Korea, growing chiefly cotton and rice, seems less well adapted to soybean-seed production. The entire seed production is used for food, stock feed, export, and planting, none being used for oil extraction.

"Japan, although a large producer of soybeans, has consumed all its own production and imported large quantities of seed from Manchuria and Korea. Since World War I, production of soybeans in Japan has decreased to some extent, more emphasis being placed on the greater production of rice. The proportion of soybeans used by Japan for various purposes was: Miso (soybean-rice fermented paste), 22%; soy sauce, 22%; oil and oil cake, 21.5%; bean curd, 15.5%; confections, 7.2%; forage, 6.2%; green manure, 2.5%; seed, 1.8%; green vegetable beans, 0.8%; and miscellaneous 0.5%.

"In the Soviet Far East the soybean is said to be one of the chief industrial crops and in some districts to constitute 20% of the cultivated area. Acreage and production have increased markedly since 1926, especially in the Khabarovsk territory.

"Previous to 1935 soybean oil in the United States was utilized chiefly in soap, paint, and varnish. Since that time, however, 70 to 85% of the soybean-oil supply has been used

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in the food industries... The soybean has become one of the most valuable, if not the most valuable, of China's gifts to the Western World."

Photos show: (1) Manchurian soybean in bags being loaded on a freighter at the Dairen wharves for shipment to European oil mills. (2) Two horses pulling a plow, and a 2nd man planting soybeans on ridged rows in Manchuria. (3) Soybean plants growing along the edges of rice paddies, as is common in oriental countries; the green beans will be used for home consumption. (4) Two Korean men threshing soybean plants in a courtyard with bamboo flails. "In Korea, as well as in many other oriental countries, bamboo flails are used in threshing soybeans." (5) A man with a sickle in a field of dried soybean plants. "Soybeans are harvested by hand in all the soybean-producing countries of the Orient." (6) A combine harvesting soybeans in the USA. It has "been one of the important factors in the economic production of soybeans in the United States." (7) "General view of a Chinese oil-mill yard in Manchuria, showing mill, storage of soybeans in osier bins, and steel tanks." Address: Principal Agronomist, USDA Div. of Forage Crops and Diseases, BPI [Bureau of Plant Industry], SAE [Soils and Agricultural Engineering], ARA, Beltsville, Maryland.

3803. Miller, H.W. 1948. Survey of soy foods in East Asia. *Soybean Digest.* June. p. 22-23.

• ***Summary:*** The primary objective of Miller's company "was to develop a milk built up to formula for babies, children, and adults that could be utilized by Oriental populations where animal milk is not available, and which for economic reasons can never be a dependable source of food supplies for the masses.

"Before the war the Laboratory had branches both in Manila, Philippine Islands, and Shanghai, China. The war saw the plant in Shanghai completely demolished and the equipment destroyed. In Manila, the building was left, but all the equipment was removed. Therefore we have been busy since the end of hostilities in restoring these plants.

"In 1946 and 1947 and during this last January and February the writer made trips and spent time in connection with these institutions. I am glad to report that on my last visit to the Philippine Islands I was able to see the plant there start its operations. The machinery and equipment are practically restored.

"At the present time there are no soybeans under cultivation in the Philippine Islands... though certain parts are very well adapted to the growth of the southern type of soybeans.

"The Manila plant is interested in marketing bottled 'Soyalac' (soy milk) both in natural and chocolate flavors, and also in entering the production of soy ice cream–we are permitted to call it that in the Philippines.

"From Manila I went to Hongkong where 8 years ago a small company known as the Hongkong Milk Factory made a beginning in homogenizing a constituted soy milk. On this last trip to Hongkong, K.S. Lo, the manager, took me through their plant. He informed me that they are now serving to each of the school children a half-pint bottle of the soy milk, both in the natural and the chocolate flavors, at their noon lunch.

"The Hongkong Milk Factory is in reality a soybean dairy. As you view the equipment including the bottle filling machine and the refrigerating unit, you would not know you were not in an American dairy. Mr. Lo informed me that if they had refrigeration they could be putting this soy milk out in many of the other cities of China on a very large scale.

"The firm obtains it beans from China, mostly from the province of Chang Tung, though some come from Manchuria. The beans are not of a very fine quality."

At Shanghai there were two soybean enterprises that particularly attracted my attention. The one for which we helped secure the machinery and equipment is being run under the name of the International Nutrition Products Co., Ltd. It is to be run very much like the Manila plant in the manufacture of liquid soy milk. The company will develop along with it a soy margarine and soy spread in the form of a mayonnaise dressing.

"The other enterprise is being undertaken by the government. The Chinese Army Quartermaster Department has purchased a property where ice cream, dried eggs and butter, and also candy were made. This large property has a splendid group of buildings with refrigeration." Here the Chinese Army intends to run a "soybean factory and a vegetable dehydration plant.

"The Chinese Army has secured the help of my son, Harry Willis Miller, Jr. He is there at the present time erecting this plant. It is perhaps the largest soy protein processing plant we know of at present. The firm has bought equipment for large-scale production of a spray-dried soy milk powder. This is to be included in other rations of a dehydrated character for use of the Chinese Army."

In Japan, the author found the people to be "greatly undernourished, especially in regard to protein. Soybeans are scarcely to be had... Bean curd plants are all closed down... I know of nothing that the Japanese nation needs worse than soybeans... I found the Japanese people, even to the advisor to the Emperor, whom I met, pleading with us to establish a plant similar to that which we have in China and the Philippines. However we have no financial interest in those plants. They are carried on wholly by local capital. Our part is simply the 'know-how' in setting them up and transmitting the processes to them."

Note: This is the second earliest document seen that uses the term "soy foods" in the title. Address: International Nutrition Lab., Mt. Vernon, Ohio.

3804. *Soybean Digest.* 1948. On tour of Orient [Dr. A.K. Smith]. June. p. 13.

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• ***Summary:*** "To add to this country's knowledge of processing and preparing soybeans for food, Dr. Allan K. Smith of the oil and protein division, Northern Regional Research Laboratory, Peoria, Illinois, has left the United States for a 3-month investigation that will have covered Japan, Korea, and China before he returns next August. This extension of the Northern Laboratory's soybean research program has been made possible through provisions of the Research and Marketing Act. The information obtained will be the basis for studies on making soy food products more acceptable as a high-protein source in the American diet." A portrait photo shows Dr. A.K. Smith.

3805. Smith, Allan K. 1948. Re: Discovery of a new process for making soy sauce in Peiping, China. Letter to Drs. K.B. Raper and L.B. Lockwood, Northern Regional Research Laboratory, Peoria, Illinois, July 5. 2 p. Typed, without signature (carbon copy). [Eng]
• ***Summary:*** "The so called new process uses a high frequency current to shorten the aging process. The process was developed in Japan and the operators in Peiping are Japanese who have stayed in China after the evacuation of the Japanese... What I know now is rather sketchy. The effect of the high frequency current is not in the immediate acceleration of the action of the organisms in the system, but rather it is supposed to decompose or breakdown the substrate so that it is more readily acted upon by the organisms or enzymes so that the work of the organisms becomes easier. The process is still in the experimental stage in Peiping." A description of the process, which takes two months, is then given. A hand drawn illustration (sketch) shows a wooden tank, an external generator, and two electrodes in the soy mash in the tank–one on the bottom and one floating on top. Address: Shanghai, China.

3806. Smith, A.K. 1948. Re: Using high-frequency current to shorten soy sauce aging process in China and Japan. Letter to Drs. Kenneth Raper and Louis Lockwood, Northern Regional Laboratory, Peoria, Illinois, July 5. 2 p. Typed, without signature (carbon copy).
• ***Summary:*** "In Peiping, I ran into something new and different in making soy sauce. I don't know what it is worth but the operators claim it has value.

"The so called new process uses a high frequency current to shorten the aging; process. This process was developed in Japan and the operators in Peiping are Japanese who have stayed in China after the evacuation of the Japanese. I shall probably find out more about the process when I get into Japan. What I know now is rather sketchy. The effect of the high frequency current is not in the immediate acceleration of the action of the organisms in the system, but rather it is supposed to decompose or break down the substrate so that it is more readily acted upon by the organisms or enzymes so that the work of the organism becomes easier. The process is still in the experimental stage in Peiping, the operator had built his own generator and he did not think that he had reached the best operating conditions. He was using 2 months total time for his process.

"The parched wheat and steamed beans are seeded with the mold in shallow boxes, stacked in a fermentation room at 37º to 42º C. for about 72 hours. The molded material is mixed with a 9% salt solution (10º Bé) ratio of salt solution to material is 110. The material is then placed in the electrolytic treating tank–which is a wooden tank with an electrode in the bottom and one floating on top. The electrolytic treatment lasts for one week's time but the material receives only two treatments a day of about 15 minutes duration, morning and evening. Too much electrolytic treatment kills the organisms, also the frequency and voltage must be regulated for best results. The current in the plant visited was supposed to operate at 30,000 cycles but the operator thought that 50,000 cycles would be better. The wave length was supposed to be 7.5 meters, the generator was a sparking type. The amperage was 200 mm (?) I think.

"After a week of electrolytic treatment, the material was stored in a cement tank at about 40º C and the sauce removed in about 45 days. The factors which the operator thought important and which required definite control for maximum results are: (1) amperage, (2) frequency, (3) length of wave, (4) salt contents, (5) salt solution temperature, and time of applying the electric current.

"Sample #51 and 52 are the molds taken from this plant."

An simple illustration by the writer shows the wooden tank (filled with steamed soy cake and parched wheat) with generator. Address: Traveling in Shanghai, China; Normally at NRRL, Peoria, Illinois.

3807. Murata, Hideko. Assignor to King Shoyu Company (Honolulu, Hawaii). 1948. Sauce preparation. *U.S. Patent* 2,444,577. July 6. 3 p. Application filed 20 Jan. 1947. [3 ref]
• ***Summary:*** "This invention relates to sauce preparation and more particularly to a process for the production of shoyu, a

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Japanese type soy sauce."

"It is [the] object of this invention to provide a process for the production of a soy sauce which may be carried out in a few days,... [is] inexpensive,... [and] comparable in taste and in composition to that produced by the older methods requiring a considerably longer period to complete."

"I have now discovered that an excellent soy sauce may be prepared from vegetable proteins without utilizing the slow process of enzymatic degradation," by hydrolysis with a strong mineral acid such as hydrochloric acid at elevated temperatures. "This new method requires only 4 to 5 days for completion in contrast to the older fermentation methods which require weeks, months or even years to complete." Address: Honolulu, Hawaii.

3808. Onuki, Motoi. 1948. Shôyu [Shoyu]. Tokyo: Takeuchi Shobo. 414 p. Illust. Index. July. 21 cm. [Jap]
• ***Summary:*** The author, now president of Yamasa Shoyu in Chôshi, Japan, graduated from Tokyo Teikoku Daigaku, Nogeikaku-ka (Tokyo Imperial University, Dept. of Agricultural Chemistry). He lived 1895-1960. Chôshi is a seaport town at the mouth of the Tone River, 60 miles east of Tokyo, on the tip of Cape Inubo (Jap. *Inubô-saki*). Address: Presently: Yamasa Shôyu K.K., Torishimariyaku (President), Nôgaku Hakase. Chôshi-shi, Kitaogawa-machi 2504, Chiba prefecture, Japan.

3809. Lagos U., José Angel. 1948. Cultivo de la soya [Cultivation of the soybean]. *Revista de Agricultura* (*Costa Rica*) 20(9):365-67. Sept. [Spa]
• ***Summary:*** Contents: Introduction. Botanical characteristics. Climate. Soil. Planting. Cultivation. Rotation. Fertilizers (including importance of root nodules with nitrogen fixing bacteria, and use as green manure {*abono verde*}). Harvest. Utilization. Hay (and silage).

The soybean is known by various names: Soya or soja, *frijol chino* (Chinese bean), *frijol japonés* (Japanese bean), and *haba de Manchuria* (Manchurian bean).

Utilization: It has many uses. Its oil has practical application in manufacturing industries. The seeds or beans are used for human food. It can be used to make delicious dishes, salads, etc.

Note 1. No mention is made of soybean cultivation in Costa Rica.

Note 2. This is the earliest Spanish-language document seen (March 2012) that gives the name of the soybean as *frijol chino* or *frijol japonés* or *haba de Manchuria*. Address: Nicoya [Costa Rica].

3810. Douglas, Marjory Stoneman. 1948. The most unforgettable character I've met [Barbour Lathrop]. *Reader's Digest.* Nov. p. 67-71.
• ***Summary:*** Describes the work of Barbour Lathrop and David Fairchild in setting up the Section of Foreign Seed and Plant Introduction within the U.S. Department of Agriculture. Fairchild was one of the earliest importers of soybean varieties into the U.S. Lathrop, born in 1846 in Alexandria, Virginia, was an American traveler extraordinaire. He wanted nothing for himself except to be free and to travel light. He never owned any property and never married. The room he kept at the Bohemian Club in San Francisco was the most permanent home he knew. The income he inherited from after his father's death in 1885 was enough for his constant travels and a few good clothes. He gave away much of his money in research grants to young scientists and students. In 1885 he visited Japan and visited the Hairy Ainus. "To have foreign plants introduced into the United States became the most important purpose of his life. There was at that time no provision for such a project in the Department of Agriculture. Lathrop's first thought was to find a young scientist who could travel with him and look for plant material. On shipboard, during his 18th trip around the world, he met David Fairchild, a young plant pathologist who had resigned from the Department of Agriculture to study entomology at Naples. Two years later Lathrop gave Fairchild the money with which to begin in Java his great studies of the plant treasures of the tropics. Lathrop then took him around the world to study plant life.

"In 1897 Fairchild presented a plan for a bureau of plant introduction to the Secretary of Agriculture, who approved it and appointed Dr. Fairchild to set it up. There was still no appropriation for it, but funds from the Forestry division were used to establish a place where foreign plants and seeds could be received.

"Lathrop descended on Washington and insisted that Dr. Fairchild needed to know much more about exotic plants before the bureau could function effectively. Accordingly, Fairchild was designated a Special Agent of the Department of Agriculture, but Lathrop paid his salary and all expenses of new years of exploring together. After nine years of travel, Dr. Fairchild returned to Washington to become Chief Plant Explorer of the Bureau of Foreign Seed and Plant Introduction.

"Later in Florida, where Dr. Fairchild founded a Tropical Plant Introduction Garden, the first award of the Meyer Medal for Plant Introduction was made to Lathrop." Note: This medal was created memorial for plant explorer Frank N. Meyer, who died in 1918.

An illustration (line drawing) shows a portrait of Lathrop.

3811. Fairchild, David. 1948. Early experiences with the soybean. *Soybean Digest.* Nov. p. 14-15. [2 ref]
• ***Summary:*** "It was not until 1897 that I first saw soybeans growing... I found my friend Merton B. Waite had been trying to grow soybeans on his farm outside Washington [DC, in Maryland; see Fairchild, Oct. 1948], but with little success. They had been sent in by some American consul

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or missionary, I believe. At about the same time Dr. George T. Moore [who by 1903 was Physiologist in Charge of the Lab. of Plant Physiology, Bureau of Plant Industry, USDA, working on soybean root bacteria] in working on the root nodules of leguminous plants had discovered that the nodules contained bacteria. Waite and I talked over the matter of the failure of his soybeans and wondered if they might require special bacteria, so I wrote out to Japan and imported several pounds of soil from a soybean field.

"We made a little experiment, planting alternate rows of soybeans with and without the addition of this Tokyo soil. The effect of the imported soil was immediately apparent as the plants grown in it made a far better growth and had their roots covered with bacterial nodules, whereas the control were practically without any.

"Photographs had yet to come into any general use as records of agricultural experiments, but Waite had taken up photography as a hobby and made excellent photographs with his stand camera. So at harvest time he pulled up an equal number of soybean plants from the soil-treated rows and from the controls, and the only photographic record in existence of this little experiment (the first of its kind, I suppose, in the world) is this negative taken by Waite in the autumn of 1897.

"Although these experiments did not at the time lead to more extensive trials, they indicate the awakening of our interest in soybeans.

"In that fall of 1897 it was my privilege to organize the office of plant introduction in the Department of Agriculture. We began introducing a great number of different kinds of plants, among them, as I see from our inventories printed at the time, occasional small collections of soybeans from China and Japan. They were obtained mostly through correspondence with missionaries and consuls stationed there.

"At that time the Department had no testing ground near Washington where we could grow miscellaneous vegetables, including these soybean collections. It was not until several years had passed that facilities were provided on the so-called 'Potomac Flats' [in Washington, DC] and James H. Beattie, an enthusiastic young horticulturist, took over the planting of our introduced seeds.

"The soybeans did well and Beattie soon had on his hands a quantity of seeds. But we didn't know just what to do with these strange beans. When cooked in the way other beans were prepared they had a strange flavor that nobody seemed to like...

"It was not, I think, until the office of forage crop investigations was organized and C.V. Piper took charge that the soybean as a forage crop attracted attention and Beattie's experiments came to be looked upon as important. We planted larger patches of soybeans on a tract of land near Bethesda, MD...

"And then we ran into the difficulty of harvesting the soybeans. P.H. Dorsett of the office, one of the most ingenious and most indefatigable workers I have ever known, and his friend Rankin, who was running the little experimental farm, put their heads together and adapted a bean picker then in use–in California I think–and discovered that it was perfectly possible to harvest soybeans mechanically...

"I went out exploring again and my travels with Mr. Lathrop this time took me into the soybean fields of Japan. The tremendous importance of the crop as I saw it there made a great impression on me. Also the almost universal use of soy sauce, which Americans were just beginning to appreciate, fixed my interest...

"Dr. Yamei Kin, an extraordinary Chinese woman whose acquaintance I had made on the boat returning from Japan, made a visit to Washington and captivated us all by her enthusiasm over soybeans. She introduced us to 'tofu,' a delicate cheese which has not even yet attracted the attention it deserves from the American public.

"In 1903 A.J. Pieters came to me one day and told me of an amazing young Hollander who had been a gardener of the great geneticist, Hugo de Vries. He was then on his way back from a trip on foot to Mexico, and I wired him to come to Washington. For 13 years, as agricultural explorer of our office, Frank N. Meyer tramped from village to village over much of China. He gathered soybeans whenever he saw them, for he felt it was important to secure all the local varieties he could for our plant breeders before they should have disappeared as the result of the spread of standard varieties he thought was bound to come.

"The importance of getting as many as possible of these local varieties and these, or selections from them, form, I believe, the basis of the very extensive soybean breeding that has been done by the various plant breeders of America."

Note: According to Vivian Wiser of the USDA and to the Washington D.C. Historical Society (13 Feb. 1991; phone 301-785-2068, Mrs. Offut), in 1897 Merton Waite lived in downtown Washington, D.C. in a built-up area. There is no record of his owning a farm outside Washington D.C., but he may have owned the farm as a sort of summer home or he may possibly have worked with the group at the USDA farm at Somerset, Montgomery County, Maryland. He was a plant pathologist and physiologist, in charge of diseases of orchard fruit trees, especially pears and peaches. There is a collection of David Fairchild's materials at Coconut Grove. His personal residence, The Kampong near Coconut Grove, is still (as of 1998) well preserved and open to the public. Address: "The Kampong," Coconut Grove, Florida.

3812. Ariga, T. 1948. Daizu hinshu no seitai gata [Ecotypes of soybean varieties]. *Nogyo Oyobi Engei* (*Agriculture and Horticulture*) 23(11):617-20. Dec. [Jap]

• ***Summary:*** The author conducted the second scientific study on the distribution of summer vs. autumn type

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soybeans in Japan. Address: Fukushima-ken, Anseki Noji Kairyo Jikkensho Gikan.

3813. Karasawa, Kotaro. 1948. Daizu (*Glycine soja*) to yasei chûkanshu (*G. gracilis*) to no kôzatsu jikken [Crossing experiments with *Glycine soja* and *G. gracilis*]. *Idengaku Zasshi* (*Japanese J. of Genetics*) 23(5-6):105-08. Dec. [2 ref. Jap; Eng]
Address: Japan.

3814. Kurakake, T. 1948. Japan Association [Japan Soybean Association] (Letter to the editor). *Soybean Digest.* Dec. p. 10.
• ***Summary:*** "The Japan Soybean Association was founded on March 4, 1946 for the purpose of increasing production of soybeans, improving varieties and increasing the rational utilization of soybeans.

"As is well known, soybeans are an Asiatic crop which have been utilized as food for centuries. Before the war, Japan relied on importation from Manchuria and Korea for a major part of its supplies, but since the termination of hostilities, these sources have been cut off. Consequently, Japan has to rely on its own production and also on importation from other sources. This other source is the United States, whose soybean history is relatively new but which has expanded so rapidly that it has become the largest producer in the world. Since the end of the war, Japan has imported 42,569 tons as of October 10, 1948, by which she has been able to fill the minimum requirement.

"The Japan Soybean Association is planning to have a Soybean Exhibition on January 20, 1949 at one of the leading department stores in Tokyo and we would like to have if possible, some exhibits or literature from your Association. Expansion of soybeans in the industrial field in the United States is tremendous and we would like to know as much as possible about the production and use of soybeans in the United States.

"We shall appreciate it if you can help us with this exhibition and also keep in close touch with you." Address: Secretary, The Japan Soybean Assoc., Chuo-ku, Tokyo.

3815. Niida, T.; Yasuda, H. 1948. Estimation of streptomycin with *Bacillus natto*. *J. of Antibiotics* 2(12):827-29. *

3816. Food and Agricultural Organization of the United Nations. 1948. Soybeans: Area, yield, and production. *Yearbook of Food and Agricultural Statistics–Production.* See p. 101-02.
• ***Summary:*** Under soybeans, gives region / continent and country, then statistics for soybean area, yield, and production for each soybean producing country. Statistics show that the following countries produced the following amounts of soybeans (measured in 1,000 metric tons) during the 1934-38 period.

Europe: Austria 0.2. Bulgaria 11.6. Czechoslovakia 0.9. Hungary 0 (but 1.3 in 1945). Italy less than 50 metric tons (but 0.9 in 1945). Poland 0.5. Rumania [Romania] 11.7, Yugoslavia 1.5. Europe total: 27.0.

USSR: (97.1).

North America: Canada 5.5. United States 1,164.0. Total 1,170.0

Asia: China: China Proper 6,092.7, 3,851.0, Taiwan (Formosa) 4.2. Indonesia: Bali and Lombok 9.0, Java and Madura 236.4. Japan 325.1. Korea 518.6. South Korea 0 (but 122.2 in 1945 and 130.6 in 1946). Philippines 0 (but 0.2 in 1946). Siam [later Thailand] 3.6. Turkey (but 0.4 in 1945). Asia total: 11,070.0.

Africa: Nyasaland 0 (but 0.4 in 1946). Ruanda-Urundi 0 (but 0.9 in 1947). Southern Rhodesia less than 50 metric tons (but 0.2 in 1945). Uganda 0 (but 2.6 in 1946). Union of South Africa 0 (but 1.5 in 1945).

World totals (Excluding USSR): 12,300.0.

Note: This is the earliest document seen (Nov. 2007) that gives soybean production or area statistics for Turkey or for the Middle East. This document contains the earliest date seen for soybean production or area statistics for Turkey or for the Middle East (1945).

3817. Fukai, Tôshi. 1948. Shôyu jôzô-hô [Method of brewing shoyu]. Tokyo: Sangyo Tosho. 426 p. 22 cm. 2nd ed. 1952 (2 + 24 + 426 p.). [Jap]*
• ***Summary:*** The author was born in 1888.

3818. Fukai, Tôshi. 1948. Daiyô genryô shôyu seizôhô [Substitute ingredients for making shoyu]. Tokyo: Sangyo Tosho Kabushiki Kaisha. 10 + 418 p. Illust. 22 cm. [Jap]*
• ***Summary:*** The author was born in 1888. Address: Japan.

3819. Japan Year Book 1946-48. 1948. Tokyo: The Foreign Affairs Association of Japan. 614 + 314 p. See p. 291, 367, 376. 22 cm.
• ***Summary:*** The Preface indicates that this book was published in about Dec. 1948. The editor's name is not given.

Page 291. A full-page table shows "Annual yields of cereals and vegetables" (area in *chobu,* yield in *kan,* production in *koku*). For soy beans (dried):

2.299 million koku in 1943
2.072 million koku in 1944
1.321 million koku in 1945
1.565 million koku in 1946.

In 1946 production of azuki beans was 16.7% that of soy beans.

Page 367. "Soy-bean Cake: This is another item of fertilizer which was imported into this country before the war, principally from Manchuria. Of the demand for some 1,000,000 tons, 60 percent was imported in the form of soy-bean cake and 40 percent in the form of soy-bean."

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Page 376. "Flavors: Oriental flavors are produced in considerable quantities as indispensable for Japanese cooking, of which soy, or Japanese sauce and miso, or soybean paste are important items.

"The domestic production of soybeans being insufficient, Japan imported before the war or in 1941-45 twice as much soybeans as domestic production from Manchuria and Korea to meet the home consumption of soy and miso."

Three tables (p. 376) show (1) Soybean imports [to Japan] during 1940-1944. These imports are from Manchuria,, Korea, Central China, and total. (2) Production of soybeans in Japan 1943-1946, area planted, yield and production of dried soybeans. (3) Soybean allocations by kind [end use] in 1941 and 1944. The end uses are miso, soy sauce, staple food [beans eaten as beans], other food, chemical [industrial], fodder, and others.

3820. Smith, A.K. 1948. Microorganisms collected in China, Japan, and Korea. 7 p. Unpublished typescript.
• ***Summary:*** Dr. Smith collected 100 samples in Shanghai (58 samples), Nanking (13), Hangchow, Canton, Tokyo, Noda (near Tokyo, Japan), Korea (7).

3821. Kihara, Y. 1949. Daizu no riyo ni kansuru kenkyu [Utilization of the soybean]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 1. p. 85-98. Jan. (Chem. Abst. 45:6762). [Jap]
• ***Summary:*** Note: This is the earliest document seen (Jan. 2014) concerning the National Food Research Institute (*Shokuryo Kenkyujo*) in Tokyo, Japan.

Concerning milestones related to access by English-language speakers of this periodical:

First issue with title and author of each article given in English: No. 2 (Aug. 1949).

First issue with summary / abstract of each article given with article in English: No. 5 (March 1951).

First issue with summaries / abstracts of articles given at back of issue in English: No. 6 (March 1952).

First issue with summaries / abstracts only of articles by NFRI researchers published: No. 12 (Aug. 1957).

First issue with reprints of articles by NFRI researchers published: No. 17 (March 1963).

First issue with summary / abstract of each article given at front of article under title and author article in English: No. 21 (Jan. 1966).

Periodical changes title: No. 27 (March 1970).

Periodical moves (with NFRI) from Koto-ku, Tokyo, to Yatabe-machi, Ibaraki-ken, Japan: No. 35 (Oct. 1979). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

3822. Nakajima, Minoru; Imaki, Takashi; Takei, Sankichi. 1949. Shôyu kôki seibun no kenkyû. I. Shôyu kôki-chû no tei futten busshitsu oyobi sansei busshitsu ni tsuite [Studies on the flavorous components of soy sauce. I. On the lower boiling compounds and acidic compounds in soy sauce aroma and flavor]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 70(1-2):40-42. Jan/Feb. [10 ref. Jap] Address: Kyôdai [Kyoto Daigaku] Nôgaku-bu, Nôsan Seizôgaku Kenkyû-shitsu, Kyoto, Japan.

3823. Smith, Allan K. 1949. Oriental use of soybeans as food: With special attention to farming practices. Notes on Oriental farming practices. I. China. *Soybean Digest.* Feb. p. 15-17.
• ***Summary:*** Contents: Introduction. Farming conditions. Oilseed production. "On a visit to China, Japan, and Korea during the summer of 1948, the author as a representative of the Northern Regional Research Laboratory, was given the opportunity of studying the methods of Oriental people in using soybeans as food and to collect microorganisms used in fermenting soybeans and other fermentable products."

"In Japan, the natural resources and the food processing sections of the Supreme Command of the Allied Powers furnished guidance and transportation in seeking information."

In China, nearly 90% of the people are farmers. "Agriculture is their most important industry." In north China, the crops (including soybeans) are similar to those in the USA. In "south China there is less diversification and the principal crop is rice."

"The high density of population in China dictates a vegetarian diet for most of the people, especially her peasants. I was informed by the best authorities that customarily the peasants of China eat meat only three times a year, on their three great holidays, the Dragon Festival, the Autumn Festival, and their New Year's celebration." The Chinese diet is very well balanced. Address: Northern Regional Research Lab., Peoria, Illinois.

3824. Nakajima, Minoru; Takei, Sankichi. 1949. [Studies on the flavorous ingredients of soy sauce. II. On the isolation of shoyu-aldehyde and its chemical structure]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 70(3):47-49. March. [13 ref. Jap]

3825. Nakajima, Minoru; Takei, Sankichi. 1949. [Studies on the flavorous ingredients of soy sauce. III. Synthesis of y-acetylbutyaldehyde (soyanal) and acetovanillon]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 70(3):47, 49-52. March. [13 ref. Jap]

3826. Smith, Allan K. 1949. Oriental use of soybeans as food: Notes on Oriental farming practices. II. China. *Soybean Digest.* March. p. 26-28, 30, 32, 34.
• ***Summary:*** Contents: Soy sauce in China. Sweet flour paste–Tien Mien Chang [Chiang]. Soy or vegetable milk

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(incl. Willis Miller, yuba). Soybean curd or tofu (incl. use in Buddhist restaurants to look like meat, poultry, or fish dishes).

Soybean cheese [fermented tofu]. Fen-t'iao from mung beans (vermicelli). Fermented soybeans [fermented black soybeans] (made from small black soybeans). Vinegar fermentation process.

Concerning soy milk: "The Chinese National government has taken an active interest in soy milk for use by its army, Willis Miller, with offices and business connections in the Henningsen Produce Co. in the Dollar Building at 51 Canton Road, Shanghai, has just completed building a soy milk plant for the Chinese government. The process is patterned after that of the International Nutritional Laboratories [Dr. Harry W. Miller] at Mt. Vernon, Ohio, for making a powdered or spray-dried milk. Mr. Miller is also supervising the installation of a vegetable canning plant for the same purpose." Address: Northern Regional Research Lab., Peoria, Illinois.

3827. Tamiya, H.; Hirano, J.; Fukuda, S. 1949. On the use of natto extract as an effective stimulant for penicillin production. I. *J. of Antibiotics* 2(6):358-63. *

3828. Graff, Henry F. 1949. The early impact of Japan upon American agriculture. *Agricultural History* 23(2):110-15. April. [32 ref]
• ***Summary:*** This pioneering and extremely important article on the early history of the soybean in America contains many pre-1860 citations, cited here for the first time, concerning farmers testing soybeans in Mississippi, Indiana, Ohio, New York, Connecticut, Missouri, New Hampshire, North Carolina, Kentucky, Virginia, Maryland, Delaware, and Pennsylvania. Many of these early citations are from "Letters and Reports of the Agricultural Division of the Patent Office, 1839-60." Address: Dep. of History, Columbia Univ., New York.

3829. Mee, Sanae. 1949. A study of carboxylase in soybean sprouts. *Archives of Biochemistry* 22(1):139-48. May. [8 ref]
• ***Summary:*** The thiamine content of soybean sprouts has been investigated in several forms. The activity of the enzyme carboxylase, which was shown to be present, rises to a maximum shortly after sprouting begins, then falls off. Manganese was shown to be an effective activator of carboxylase. Variations in the carboxylase activity are paralleled by variations in the amount of thiamine in combined form. Address: Lab. of Biochemistry, Osaka Imperial Univ., Osaka, Japan.

3830. Smith, Allan K. 1949. Oriental uses of soybeans as food: With attention to fermented products. Notes on Oriental farming practices. IV. Japan. *Soybean Digest.* May. p. 24-26, 28, 30.
• ***Summary:*** Contents: Introduction. Production of miso. Soy sauce in Japan. Monosodium glutamate. Trends in soy sauce production.

"The Kikkoman Shoyu Co. Ltd. was founded in 1764. This is the largest soy sauce plant in Japan and probably the largest in the world for making a fermented type sauce. The annual shoyu production at Noda has been as much as 23 million gallons, consuming 30,000 tonnes (11 million bushels) of soybeans, 27,000 tonnes of wheat, and 29,000 tonnes of salt. The Noda city factory includes 8 brewing plants, 1 barreling plant, 6 auxiliary plants for the construction of barrels and other materials used in their process, and a research laboratory with a staff of more than 30 workers. The factories of Noda city are spread over 2,333 acres of land... The koji is made in wooden trays about 14 by 24 by 4 inches deep. There are 1,500 cement fermenting tanks in one plant. For a good grade of soy sauce, the mash is fermented for 8-12 months. But owing to the current pressing need for the sauce, the fermenting period is now often shortened to 3 months." Address: Northern Regional Research Lab., Peoria, Illinois.

3831. Smith, Allan K. 1949. Oriental methods of using soybeans as food: With special attention to fermented products. Notes on Oriental farming practices. *USDA Bureau of Agricultural and Industrial Chemistry.* AIC-234. June. 40 p.
• ***Summary:*** Page 1 states: "The text of this bulletin, with slight revisions, is as it appeared serially in *The Soybean Digest,* issues of February through June, 1949, although many additional photos appear herein. It is processed with the publisher's permission." Note: An enlarged 65 page edition was issued in July 1961.

Photos show: (1) Nine people in a field cultivating soybean with hoes near Nanking, China. All of these workers but one are women. July 1948. (2) "The three-man shovel, Korean version of the turning plow. The motive power is supplied by the mean holding the ropes." (3) A man and donkey threshing wheat with a stone roller. (4) A water buffalo and man pumping water from the rice fields. All parts of the pump and elevator are made of wood. Near Nanking, China, July 1948. (5) Windmill used for pumping water. The sails or vanes are mats woven from grass. (6) Children with baskets of soybean sprouts and inflated Chinese national currency in the market place at Canton, China. Aug. 1948. (7) Soybean milk for sale on the streets of Canton, China. Aug. 1948. It is in bottles, carried using a shoulder pole. (8) A wedge press for oilseed operations at Canton, China. Preformed disks of the flaked or ground meal are inserted in the slot and turned clockwise in the hollow log; pressure is applied with wooden wedges. July 1948. (9) Equipment for steaming soybeans preparatory to making soy sauce. Steam is passed upward through the wooden tanks from a boiler beneath. Peiping, China. 1948. (10) Soy sauce preparation.

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Steamed soybeans are placed in woven baskets or trays for 3 to 7 days to permit the growth of the mold *Aspergillus oryzae*. Nanking, China. July 1948. (11) Many earthenware jars for soy sauce production in a courtyard surrounded by houses. "Following the growth of a thick mold on the soybeans, they are mixed with parched and cracked wheat and placed with salt solution in earthenware jars for fermentation, which lasts 3 months to 2 years. Soy paste [chiang] is fermented in a similar manner but it contains less water and the fermentation period is about 3 months. Shanghai, China. Aug. 1948." (12) "Soybean curd and vegetables displayed for sale in market place, Seoul, Korea. Aug. 1948." (13) Squares of soybean curd covered with white mold on round, woven bamboo trays. "This is the first step in making soybean cheese. Canton, China, Aug. 1948." (14) Two rows of large hydraulic presses in the mill of the China Vegetable Oil Company, Shanghai. June 1948. (15) Men loading round, hydraulic-pressed soybean cakes onto a truck, on the Bund. Shanghai, July 1948. (16) Men and an ox preparing a seed bed at a Japanese agricultural experiment station near Tokyo. 1948. (17) "A miso plant in Tokyo. The large tubs [vats] in foreground are used for the fermentation of miso. A part of this plant was destroyed by bombs during the war. Aug. 1948." (18) Three men standing by presses destroyed during bombing raids over Tokyo. These presses formerly were used for filtering monosodium glutamate. July 1948. (19) Many stacked wooden tubs of ajinomoto (monosodium glutamate) ready for shipment at a plant located between Tokyo and Yokohama, Japan. Aug. 1948. This plant had a maximum production of 7.5 million pounds of ajinomoto in 1937. (20) Agricultural Experiment Station near Seoul, Korea. This station was built by the Japanese during their occupation of Korea. Later it was taken over and administered by the newly formed Korean Government. Aug. 1948. (21) A Korean boy standing in a field of sorghum interplanted with soybeans; this is a common practice in Korea. 1948. (22) A boy using a shoulder pole to carry two wooden buckets of night soil to the land. Korea. 1948. (23) A wooden shopper looking over the different varieties of soybeans in the market place at Seoul, Korea. Aug. 1948. (24) Outline map of Korea showing where principal varieties of soybeans are grown, the section in which each variety is found, the acreage, and production. Address: Head of Meal Products Investigations, Oilseed Crops Lab., Northern Utilization Research and Development Div., Peoeia, Illinois.

3832. Akiya, T.; Miyazaki, M. 1949. Kokunai-san daizu no sanchi hinshu betsu kagaku sosei [Chemical composition of indigenous soy-beans, by producing centers and species]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 2. p. 83-88. Aug. [Jap; eng] Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan (Shokuhin Eiyo-bu, Sogo Shokuryo Kenkyujo).

3833. Boswell, Victor R. 1949. Our vegetable travelers. *National Geographic Magazine* 96(2):145-217. Aug. See p. 145, 216-17. With 32 paintings by Else Bostelmann.
• ***Summary:*** The author tells the story of the origin, nature, behavior, and travels of some of America's most commonly grown vegetables that originated in other countries. We call our vegetables "truck crops." This word "truck" is derived from the French word *troquer* meaning "to barter or exchange." It is applied because of the general practice of bartering or dealing small lots of vegetables in traditional outdoor markets.

The section titled "Vegetable soybeans are new in America" (p. 216-17) notes that "Soybeans (*Soja max*) have been grown in the Orient for more than 5,000 years, but, strangely enough, they appear to have been known in the Western World a scant 250 years [i.e. since 1699]. It is puzzling, indeed, that this plant of Chinese origin should have become established so late in the West (including western Asia, Europe, and the Americas), while many other species from China have been known and valued in the West for thousands of years."

"The first written record about soybean goes back to an old Chinese *Materia Medica* written between 2900 and 2800 B.C. There is, however, no known record of it in a European language older than A.D. 1712, when a German traveler [Englebert Kaempfer] reported finding it in Japan in 1691 and 1692."

"Ship captain brought soybeans to America:... Actually, the first record of it in this country was in an old encyclopedia published in Philadelphia in 1804. That article said it was a plant adapted to Pennsylvania and well worthy of cultivation there. It had been introduced about 1800 by the captain of a clipper ship who bought some of the beans to supplement his ship's stores." A more reliable history follows.

"The vegetable varieties of soybeans are gradually gaining favor in the United States... It was only about a dozen years ago [i.e. 1937] that many Americans began to learn about vegetable varieties of soybean; yet their use as a vegetable is at least 1,500 years old and probably much older." Address: Principal Horticulturist, United States Dep. of Agriculture.

3834. Iguchi, Nobuyoshi. 1949. Kôji-kin ni kansuru kenkyû. I. Shigai-sen shôsha ni yoru shôyu-yô kôji-kin no heni ni tsuite [Studies on *Aspergilli*. I. Mutation of *Aspergillus sojae* Sakaguchi et Yamada by irradiation of ultraviolet rays]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 23(1):16-18. Aug. [4 ref. Jap; eng] Address: Noda Industrial Science Lab., Noda, Japan (Noda Sangyo Kagaku Kenkyusho).

3835. Iguchi, Nobuyoshi. 1949. Kôji-kin ni kansuru kenkyû.

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II. [Studies on *Aspergilli.* II. The production of ultraviolet-induced mutations in *Aspergillus sojae* (continued)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 23(8):357-60. Aug. Colored plate on unumbered page after p. 360. [15 ref. Jap; eng]
Address: Noda Industrial Science Lab., Noda, Japan (Noda Sangyo Kagaku Kenkyusho).

3836. Sakurai, Yoshito; Watanabe, T.; Yokozawa, I.; Koizumi, U. 1949. Daizu no chûyu kôtei ga daizu tanpaku no henshu ni oyobosu eikyô ni tsuite [Effect of soy-bean defatting process on the protein denaturation of soybean]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 2. p. 73-76. Aug. [9 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan (Shokuhin Eiyo-bu, Sogo Shokuryo Kenkyujo).

3837. Watanabe, Tokuji; Yokozawa, I.; Koizumi, U. 1949. Daizu-fun chozô-chû ni okeru tanpaku no hensei ni tsuite (yohô) [On the denaturation of soybean flour during preservation (Preliminary report)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 2. p. 77-81. Aug. English-language summary p. 81. [4 ref. Jap; eng]
• ***Summary:*** Note: This is the 2nd earliest document seen (March 2002) concerning the National Food Research Institute (*Sogo Shokuryo Kenkyujo*) in Tokyo, Japan.
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan (Shokuhin Eiyo-bu, Sogo Shokuryo Kenkyujo).

3838. Shimada, I. 1949. Letters: Exchange troubles. *Soybean Digest.* Sept. p. 130.
• ***Summary:*** The author, superintendent of the Tsurumi plant of the Showa Sangyo Co. Ltd. in Yokohama, Japan, writes the editor of *Soybean Digest:* "Since our defeat [the defeat of Japan in World War II] 100,000 to 200,000 tons of U.S. soybeans have been imported here yearly. They give much nutrition to our people for which we cannot express too many thanks. Our Tsurumi plant has a daily capacity of 325 tons of soybeans by solvent extraction. We hope to know more about your crop. Your American Soybean Association is well known also to us as having given great contributions to the industry in your country. The Soybean Digest published monthly would be highly esteemed by us also."

A note by the Editor at the end of this letter states: "Many people in foreign countries are unable to subscribe for the Soybean Digest or Soybean Blue Book due to lack of currency exchange. The Digest is unable to comply with the many requests for free subscriptions that arise due to this condition." Address: Yokohama, Japan.

3839. Ishidate, Morizo; Shibata, S.; Hagiwara, H. 1949. Nattô-kin no sansei suru kôkin-sei busshitsu ni tsuite (yohô) [Antibacterial substance produced by *B. natto.* (Preliminary report)]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) 69(6-10):373-75. Oct. [9 ref. Jap; eng]
• ***Summary:*** *Bacillus natto* was cultured in a medium (pH 7.0) which contained glucose, sodium glutamate, and aqueous extract of soy beans. A substance was obtained from the filtrate of this medium which inhibits the growth, in vitro, of *Staphylococcus aureus*–the most common cause of staph infections. "Bacterial, physical and chemical properties of the substance are explained." Address: Pharmaceutical Lab., the Physiographical Research Inst., and Pharmaceutical Inst., Medical Faculty, Univ. of Tokyo, Tokyo, Japan.

3840. Kawamura, Sin'itiro [Shinichiro]. 1949. [Utilization of the by-products of soybean protein manufacture. I. Alcoholic fermentation of the waste liquor from protein manufacture]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 23(3):129-34. Oct. [1 ref. Jap; esp]
Address: Agricultural Faculty, Nihon Univ.

3841. Kurakake, T. 1949. Soybeans in Japan. *Soybean Digest.* Oct. p. 18, 20.
• ***Summary:*** "Though soybeans have been grown for centuries in Japan the tendency has been to neglect them due to a lack of ingenuity among farmers in improving varieties, to the fact that government laboratories did not take measures to improve them, and to the fact that growth was rather satisfactory even when they were allowed to grow naturally.

"It is very difficult to find out the number of varieties in Japan, but the Japanese Soybean Association estimates the number at more than 1,000. The reason for this large number is assumed to be that they appeared naturally during the long span of time over which they were grown in the various localities.

"Experiment Stations: In Japan, each prefecture has its own agricultural experiment station, and each experiment station selects varieties that are most suitable for the prefecture and encourages the farmers to grow them. There are about 170 of these recommended varieties. Of the above, about 10 are the result of cross breeding carried out at the experiment stations; about 50 to 60 are by selection and the remainder are produced naturally.

"The characteristics of good varieties in Japan have been: resistance to disease, high yield and a good taste when roasted. However, recently soybeans have been looked on as a source of oil because of the shortage of fats and oils, and soybeans with high oil content are in great demand.

"Japanese soybeans are classed as summer, autumn and intermediate types according to the planting and maturing periods. Summer type varieties are planted in April and May. The flowers bloom with the high temperatures of the early summer, and the beans can be harvested in late July or early

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August. The period from planting to harvest is from 90 to 100 days.

"It seems that the summer varieties are generally heat-sensitive and have relatively low photo-sensitivity. They are widely grown in the plains of western and eastern Japan and in Hokkaido. Most of the varieties grown in Japan are of this type. Usually they are small-seeded.

"The autumn type soybean in contrast to the summer type is highly photo-sensitive and has almost no heat sensitivity. It is planted from the middle to the latter part of June. Flower bloom is accelerated as day length is shortened after mid-summer. The beans are harvested in November. The time from planting to harvest is more than 130 days. Varieties of this type are usually grown in the western part of Japan where it is relatively warm. But the acreage is comparatively small.

"Varieties of the intermediate type are in between the summer and autumn types. Planting is from May to June. They have photo- and heat-sensitivity to about the same extent, and require from 100 to 130 days to mature. This type is grown widely in northern Japan with the exception of the mountainous districts of eastern Japan and Hokkaido, and the number of varieties is next to the summer type.

"The total soybean acreage and production in Japan has been declining since about 1910, which was the peak. The acreage during the latter part of the 1880's was more than 400,000 chobu [1 chobu = 1 chô = 2.45 acres] with a production of over 300,000 tons. Acreage and production gradually increased to about 460,000 chobu and 500,000 tons. However, with this as the peak, acreage and production have gradually decreased so that since the Pacific War acreage has been 220,000 chobu and production 200,000 tons. With the decrease in acreage and production there was also a decrease in yield per area planted.

"During the same period, from the 1880's to just before the Pacific War, the yield of rice, wheat and barley increased from 180 to 200 percent, but that of soybeans fell from 20 to 30 percent from the peak period. The reduction in yield shows to what extent the farmers neglected improvement of varieties, while the government was inactive and without progressive policies.

"Were unprofitable: Another reason for the decline is that soybeans were an unprofitable crop for farmers. Japan began to import large quantities of cheap Manchurian and Korean soybeans during the 1890's. As a result the farmers in Japan were compelled to sell their soybeans at a cheap price. At about the same time the capitalistic economy began to develop in Japan with the gradual evolution of exchange economics. Japanese farmers quit planting unprofitable crops and changed over to more profitable ones. Soybeans were replaced with mulberries for silk raising, orchards, vegetables and sweet potatoes.

"Soybeans were always sold at about 60 percent of the price of rice and at about the same price as fertilizer. Actually much of the soybean crop in Japan was formerly used as fertilizer.

"However, in spite of the fact that soybeans were an unprofitable crop, they did not disappear entirely from the farms in Japan. Farmers continued to plant them not as a commercial crop but for their own consumption. Only the excess above their own needs was sold on the market.

"The districts where soybeans are grown most widely are areas where agrarian economics is most backward–in the mountainous areas of Tohoku, Hokuriku or Kanto and in the Kyushu area. In the advanced agricultural areas they are limited to the banks of rice paddies, roadsides or plots around the houses. In other words, the existence of soybeans indicates feudalism in Japan. Under such conditions there is no opportunity to improve varieties to fit specific farms. Here lies the answer to the question of why the soybean declined in importance year after year but still continued to exist.

"The rise and fall of soybeans in Japan has a very close relation with the importation of foreign soybeans, which has increased six-fold since 1897.

"The principal exporters of soybeans to Japan were Manchuria and Korea. Quantities imported by Japan gradually increased from about 200,000 tons during the 1910's to 800,000 tons following 1928. As a result of this large quantity of cheap soybeans, domestic soybeans were almost neglected.

"However, defeat in war caused a great change in the soybean picture in Japan. Japan lost Manchuria and Korea and the importation of soybeans from these territories was completely cut off. As a result, Japan faced a grave fats and oils and protein shortage.

"Total imports of soybeans since the war have been less than 10 percent what they were before the war.

"Formerly, the greater part of the soybean meal obtained after the extraction of the oil was used as fertilizer or livestock feeds; but soy bean oil meal and soy flour imported from the United States are now used for making miso and shoyu. This indicates the critical shortage of soybeans."

Note: This is one of the most interesting articles we have ever seen on the history of soybeans in Japan from the late 1800s until 1949. Address: Secretary, The Japanese Soybean Assoc., Tokyo, Japan.

3842. *Vegetarian News Digest* (*Los Angeles*). 1949. Health in the news: The soy bean–wonder food of many uses. 1(9):21. Sept/Oct.

• ***Summary:*** "Allan K. Smith of the Northern Regional Research Laboratory, Peoria, Illinois, recently returned to the United States from the Orient where he learned of countless uses for soy beans. In China, Japan and Korea he found soy beans being fermented, ground, and processed in various ways. In its motherland, Smith discovered, the soybean is a source of flour and cake, oil, bean sprouts, vegetable milk, various sauces and pastes, curd, cheese, and several other

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foods." Describes how soy milk is made in China. One restaurant that Smith visited prepared more than 25 different dishes from soybeans.

3843. Brant, Burl. 1949. CARE packages use soy products. *Soybean Digest.* Nov. p. 39.
• ***Summary:*** "Since April 1948, when the Japanese Food Package for CARE was developed, two soybean products have been continuously included in those packages. They are soy sauce, known as 'shoyu' and a bean curd [sic] preparation, known as 'miso.'" Both the miso and shoyu shipped to Japan were made in the USA. The annual production of shoyu in America is estimated at about 500,000 gallons. The shoyu sent to Japan is made by blending traditional fermented shoyu with HVP soy sauce. Address: Asst. Executive Director, Cooperative for American Remittances to Europe, Inc. (CARE).

3844. Kagawa, Aya. 1949. Japanese cookbook (100 favorite Japanese recipes for Western cooks). Tokyo: Japan Travel Bureau. 162 p. Illust. (line drawings, and color-, and black and white photos). 19 cm. Series: Tourist Library No. 11.
• ***Summary:*** Contents: Preface. General remarks (The why of Japanese food, its nutritive value, table utensils, an ordinary meal, meals for guests, table etiquette, kitchen utensils, how to cut up fish and vegetables, glossary {incl. aburaage, miso, shoyu, tofu}). Japanese cookery: Table of measures, soups, boiled foods, broiled foods, fried foods, saucepan foods, steamed foods, *hitashimono* (boiled greens in soy [sauce]), aemono (dressed vegetables), vinegared foods, sliced raw fish (sashimi), rice foods, sushi (vinegared rice foods), pickles, seasonal menus, New Year's foods, Girls' Festival foods. How to make Japanese cakes (incl. bean paste from red beans).

Many recipes call for "shoyu" [soy sauce]. Soy related recipes: Scrambled egg soup (with shoyu or Worcester sauce, p. 42). Tofu and Japanese leek soup (p. 49). Miso soups (p. 50-51). Broiled egg-plants (with miso, p. 70). Beef sukiyaki (with tofu, p. 79-80). Fish stew (with tofu, p. 81). Odamaki mushi (with yuba, p. 85). Boiled greens in soy (p. 91-92). Dressed food with white sesame [seeds] and vinegar (and aburaage {fried beancurd}, p. 96). Dressed carrot and kidney beans in pod (with tofu, p. 97).

On p. 14 we read: "Soy beans are used very much in Japanese food; especially in hilly regions where fish is scarce, or in vegetarian menus (in connection with Buddhism). Beans are not only simply boiled but eaten in various ways. They are made into *tôfu* (beancurds), *aburaage* (fried tôfu), *nattô* (steamed and fermented beans), *shôyu, miso,* [azuki] bean-paste used in cakes, etc." Key flavorings are miso, shoyu, sugar, and vinegar. Sake, mirin, dashi and ajinomoto (seasoning powder) are also important. "Seaweeds are usually eaten dry. Nori (seasoned laver), kombu (tangle), wakame (lobe leafed undaria), hijiki (spindle-shaped bladder-leaf), and so on, are rich in iodine,..."

Note: This is the earliest English-language document seen (April 2013) that contains the term "fried tôfu" (with diacritics).

"Of flavorings, *miso, shôyu,* sugar and vinegar are the most important. *Sake* (Japanese wine), *mirin* (a sweet kind of *sake*) and *dashi* are used in this way to give flavor. Properly speaking, *dashi* is formed by boiling shaving [sic, shavings] of *katsuobushi* (dried bonito) or *kombu* (tangle, a kind of kelp), but *ajinomoto* (seasoning powder) may take its place. Usually, however, *dashi* is not made, and instead *niboshi* (a small dried fish) is boiled together with the food to give it flavor. Besides, ground walnuts sesame, peanuts etc., are used to dress vegetables. In addition to these, mustard, red pepper, horse radish [wasabi], the leaves and berries of *shiso* (a kind of highly flavored leaf), the leaves and berries of *sansho* (Japanese pepper), Japanese leeks [negi], *myôga* (myôga ginger [*Zingiber mioga* Roscoe]), ginger [shôga, the root of *Zingiber officinale*], are used as flavorings, being found growing in most kitchen gardens."

"Our special thanks are due to Dr. R.H. [Reginald Horace] Blyth, professor of Gakushin University, who translated the original Japanese manuscript into English." Aya Kagawa was born in 1899. The book was first published in December 1949 but not copyrighted until 1952. The almost identical 9th printing appeared in April 1955. Only the color photos were changed (upgraded) by 1955. The first true revision and 2nd edition was the so-called "Fourteenth & revised edition" of 1962. Address: M.D. and president of Joshi Eiyô Tanki Daigaku (Women's Nutrition College), Tokyo, Japan.

3845. Yokotsuka, Tamotsu. 1949. Shôyu kôki seibun ni kansuru kenkyû. I. Shôyu kasu ni yoru kôki seibun no bunri, shu toshite teifutten kôki seibun ni tsuite [Studies on flavorous substances in soy [sauce]. I. Isolation of flavorous substances from soy-cake, chiefly the flavors substances of lower boiling point]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 23(5):200-05. Dec. [13 ref. Jap; eng]
Address: Noda Industrial Science Laboratory, Noda, Japan (Kikkoman).

3846. Vavilov, Nikolai Ivanovich. 1949-50. The origin, variation, immunity and breeding of cultivated plants (Translated from the Russian by K. Starr Chester). *Chronica Botanica* 13(1/6):1-366. Original Russian ed. 1935. [4 ref]
• ***Summary:*** N.I. Vavilov was a major contributor to scientific thought in the fields of genetics, plant breeding, and the study of plant variation, systematics, and evolution.

Page 2 notes: "the higher the technical level of a civilization the more highly bred are its crop plants. Thus, Chinese vegetables including different varieties of cabbage, soybeans, rice... are noteworthy for the quality and size

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of fruit and seed, and altogether bear witness of careful selection during many centuries."

Page 20 introduces a section titled "World centers of origin of the most important cultivated plants. Page 21 lists the major cultivated plants from the Chinese Center of Origin, including the soybean (*Glycine hispida* Maxim.), adzuki bean (*Phaseolus angularis* Wight.), broomcorn millet (*Panicum miliaceum* L.), Italian millet (*Panicum italicum* L.), Japanese barnyard millet (*Panicum frumentaceum* Fr. and Sav.), kaoliang (*Andropogon sorghum* Brot.), buckwheat (*Fagopyrum esculentum* Moench.), and Tartar buckwheat (*Fagopyrum tataricum* Gaertn.).

Page 26 notes: "The most important endemic plants of the temperate zone are three species of millet, buckwheat, soya bean, and a number of legumes... Moreover, the species are usually represented by enormous numbers of botanical varieties and hereditary forms. The varieties of soy bean, adzuki bean, persimmon, and citrus fruits include thousands of easily distinguished hereditary forms.

Page 43 lists the major cultivated plants from the Brazilian-Paraguayan Center of Origin, including manioc, peanut (*Arachis hypogaea,* on light soils), cocoa, and the rubber tree.

Page 46 discusses "Primary and Secondary Crops: Our research has suggested a division of all cultivated herbaceous plants into two groups. The first group consists of plants cultivated from ancient times and known only in cultivation or in wild state. These are called the primary group. To this group belong such plants as wheat, barley, corn, soy bean, flax, and cotton. The second group consists of all plants which have been derived from weeds which grew among the basic primary plants." Cultivated rye arose from the second group.

Four related tables on pages 75-78 show variability in 15 species of the Papilionaceae, including the soybean. The heritable variable characters include: Color of blossom (8 characters), size of blossom (2), structure of pod wall (2), form of pod (7), color of ripe pod (6), size of pod (2), surface of pod (4), seed form (6), seed surface (2), seed color (8), variegation of seed coat (3), color of cotyledons (3), seed size (2; large and small), color of scar (3), leaf structure (2), leaf form (3), size of leaf (4), leaf margin (2, entire or toothed), hairiness of leaves (2), color of stipules (2, green or with anthocyanin; stipules are the pair of appendages borne at the base of the leaf), color of leaves (2), and waxy layer on plant (2 characters), stem structure (2), plant height (3), hairiness of stem (2), form of stem (3), color of shoots (2), color of stem (2), habit (2, erect or decumbent), vegetative period (2, early or late), formations of albinos (2, present or not present). On the basis of the Law of Homologous Series, though soybeans usually consist of forms with hairy pods, we might expect to find forms with smooth pods. Such forms originally came from Japan and Manchuria.

Page 84 discusses parallel variations in distant families. Fasciations–In almost all families there appears to be a tendency to the formation of fasciated or hypertrophied organs of different kinds–including in soybeans.

3847. **Product Name:** [Higashimaru Shoyu].
Manufacturer's Name: Higashimaru Shoyu Co. Ltd.
Manufacturer's Address: 100-3 Tominaga, Tatsuno city 679-41, Japan.
Date of Introduction: 1949.
New Product–Documentation: Fruin. 1984. History of Five Japanese Shoyu Companies. Soya Bluebook. 1986. p. 105.

3848. Ito, Y. 1949. [On the amidase action of *Bacillus natto*]. *Acta Scholae Medicinalis Universitatis Imperialis in Kioto* 27:224-30. *

3849. Ito, Y. 1949. [On the protease action of *Bacillus natto*]. *Acta Scholae Medicinalis Universitatis Imperialis in Kioto* 27:247-61. *

3850. Kanie, M.; Morihara, K. 1949. [On the gelatinase of *Bacillus natto* I]. *Kagoshima Koto Norin Gakko Gakujutsu Hokoku* (*Bulletin of the Kagoshima Imperial College of Agriculture and Forestry*) 15:101-10. [Jap]*

3851. Mori, M.; Okamoto, K. 1949. [On the antibiotic action of metabolites of *Bacillus natto*]. *Kagaku to Kogyo* (*Chemistry and Chemical Industry*) 2:228-29. [Jap]*

3852. Nagata, Tadao. 1949. Daizu no natsuaki daizu sei ni kansuru kenkyû. I. Natsuaki daizu sei ni yoru daizu hinshu no bunrui [Studies on the growth habit of so-called summer versus autumn soybeans. I. Classification of varieties with respect to said habit]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 18:131-34. [Jap; eng]
Address: Laboratory of Crop Science, Faculty of Agriculture, Kyoto Univ., Japan.

3853. Blyth, R.H. (Reginald Horace). 1949. Senryu: Japanese satirical verses. Tokyo: The Hokuseido Press. iv + 230 p. Illust. No index. 21 cm. [1 ref]
• ***Summary:*** These verses were chosen, translated and explained by R.H. Byth. Contents: Preface. Introduction. Haiku and senryu (17 chapters, each on a different subject; e.g., Nature and man. All and one. Simple and complex. Sex. Zen. Religion. Is senryu poetry?). The origins and technique of senryu (vocabulary and syntax, poetic brevity, personification, colloquialisms, the composition of senryu, customs and manners, postscripts, anonymity, principle of selection, conclusion). Senryu (14 chapters, each on a different subject; e.g., Women. Children. Mothers. Fathers. Wives. Husbands. Mothers-in-Law. Other relations.

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Professions. Animals. Things. Historical. Psychology. Pictures of life).

The Preface begins: "Rightly or wrongly, I feel that the appropriate way to appreciate senryu is through the understanding of haiku... haiku preceded senryu by about a hundred years." Haiku and senryu together give "a fairly complete idea of the nature of the Japanese people, their spirituality and idealism on the one hand, and their thorough-going realism on the other... the 'world of calm delight' and the 'strife divine.'" "The average Japanese and especially the so-called intelligentsia, has a low opinion of senryu. This is quite unjustified."

The Introduction begins: "Senryu are expressions of moments of vision into, not the nature of things, but the nature of man."

In the 14 chapters of the section on "Senryu," each entry has four parts: (1) The senryu itself, written in Japanese characters. (2) Romanization of (1). (3) Translation of (1) in the form of 3 lines with 17 or fewer syllables. (4) Blyth's commentary on this senryu. In addition, many senryu are accompanied by an illustration. The great majority of these illustrations are by Mr. Sobun Taniwaki, who died in 1947.

Page 90 (chapter on "Wives"):

"'To the cook she says
"A hundred times,
"Don't forget the bean-curd water.'"

Comment: "The water bean curd is boiled in is supposed to be good for washing clothes in. The mistress keeps telling the maid-servant, ad nauseum, not to throw away the water after the bean curd is cooked. In this repetition, this persistence about a small thing, is seen a whole world of the human mind."

Page 117 (on "Professions"):

"Holding the *dengaku* in his hand
"The pack-horse driver
"Comes out to scold the horse."

Comment: "*Dengaku* is baked bean-curd covered with *miso,* a kind of sauce. The horse gets tired of waiting for his master in the pub, and begins pawing the ground... This is a road-side scene of Old Japan." Address: Author, Tokyo, Japan.

3854. Mogi, Masatoshi. 1949. Shôyu miso [Shoyu and miso]. Tokyo: Daiamondo-sha. viii + 283 p. [4] p. of plates. Illust. 19 cm. [Jap]

• ***Summary:*** The first four pages of this book contain 10 small photos relating to shoyu production and 10 relating to miso production. Contents: I. Shoyu. Commercial products: 1. History of shoyu (p. 3). 2. Varieties of shoyu (p. 8). 3. Supply and demand of shoyu (p. 25). 4. Quality of shoyu (p. 28). 5. Containers used for shoyu (p. 36). Production: 6. Fermented shoyu (*Jôzô shoyu*) production method (p. 40). 7. Amino-san shoyu production method (p. 90). 8. Semi-chemical shoyu production method (p. 108). 9. Methods of preventing formation of undesirable mold on and gas in bottled shoyu (kabi, p. 110). 10. About steaming equipment (jôki kikan) in the shoyu plant (p. 115). Industry: 11. Structure of the shoyu industry (p. 123). 12. The structure of selling and buying of shoyu (p. 141). 13. Supply and demand for shoyu, and the future of the industry (p. 149).

II. Miso. Commercial products: 1. History of miso (p. 173). 2. Supply and demand for miso (p. 175). 3. Varieties of miso (p. 179). 4. Standards for miso (p. 188). 5. Nutritional composition of various types of miso (p. 189). 6. Storing miso (p. 191). Production: 7. Regular miso production methods (p. 193). 8. Methods of making miso using substitute raw materials (p. 223). Industry: Structure of the miso industry (p. 245). 10. Financial condition of the miso industry (p. 254).

The author was born in 1907. Address: Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

3855. Saito, Akio. 1949. [Chronology of soybeans in Japan, 1927 to 1949] (Document part). In: Akio Saito. 1985. Daizu Geppo (Soybean Monthly News). Feb. p. 14-15. [Jap]

• ***Summary:*** 1927 Sept. 15–Noda Shoyu [Kikkoman] has the longest strike in pre World War II Japan. The labor system becomes more modern and employer-employee problems start to be handled in new ways.

1928–The production of soy oil reaches 38,000 tons, passing rapeseed oil which is 30,000 tons. Soy oil is now Japan's leading vegetable oil.

1931 Sept.–Japan invades Manchuria, using the Mukden incident as a pretext. 1932–Japan attacks China. By early 1932 Japan had conquered all of Manchuria.

1932 Feb.–The Rikagaku Kenkyujo in Tokyo makes salt-free shoyu for the first time.

1935–At about this time, systematic cultivation of soybean seeds begins.

1938–The average retail price of good quality shoyu is 62 *sen* for 18 liters (10 *sho*).

1938 Sept.–The *Kokusaku Daiyohin Fukyu Kyokai* is founded. This organization encourages the substitution of less expensive or more abundant ingredients in shoyu, such as barley for rice, millet or barn yard millet grass (*hie*) for barley, or the chrysalis of a silkworm for soybeans and wheat in making HVP shoyu (*amino-san shoyu*).

1939–The first soybean is registered in Japan; it is named "Ministry of Agriculture and Forestry, Number 1" (*Norin ichi-go*).

1939 Dec.–The Japanese government puts its energy into controlling the rising prices of rice, miso, shoyu, salt, matches, fresh produce, etc. (i.e. essential foods for daily life).

1940 March–The "Central Price-Fixing Organization" (*Chuo Bukka Iinkai*) sets ceiling prices for the following to control inflation: soy oil, soybean cake, Japanese soybeans mixed with Manchurian soybeans, salted salmon, salted

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trout, dried nori, and eggs.

1940 April–The "Price Setting Central Committee" (*Kakaku Keisei Chuo Iinkai*) decides to use a ticket (rationing) system for ten items including rice, miso, shoyu, salt, matches, charcoal, and sugar.

1940 June–The Ministry of Agriculture and Forestry (*Norinsho*) and the Ministry of Commerce and Industry (*Shokosho*) proclaim the new revision of the regulation for controlling excessive profits (*Borikoi Nado Torishimari Kisoku Kaisei*), and on responsibility relating to prices.

1940 Sept.–Even though people are under control, summer resorts become crowded and people take home rice and miso and souvenirs. The government asks them not to do this.

1940 Oct.–The Japan Soybean Control Corporation (*Nihon Daizu Tosei K.K.*) and the Cooperative Soybean Products Marketing Corporation (*Daizu Seihin Kyohan K.K.*) are founded.

1941 June–The home use food oil ticket (rationing) system starts.

1941 Dec. 7–Japan attacks Pearl Harbor. War with the USA begins. 1942 Feb.–The ticket rationing system starts for miso and shoyu.

1943 June–The regulations for emergency food production are decided. They start to use unused lands for production of various small grains and legumes (*zakkoku*).

1943 Nov.–A record book rationing system is established for tofu, to ensure fair distribution.

1945 Aug. 14–Japan surrenders to the USA in World War II after atomic bombs are dropped on Hiroshima and Nagasaki (Aug. 6 and 9).

1945–Because of unusually cold weather, Japan's soybean production drops dramatically, resulting in one of the smallest crops since 1878. It is only 170,400 tonnes, 36.3% lower than the previous year.

1947–The production of shoyu this year is only 1,868,500 *koku.* Since there is not enough shoyu, a lot of substitute shoyu and powdered shoyu (*kona shoyu*) appear; neither of these two products are regulated.

1947 May 3–A new constitution is adopted in Japan in which the country renounces the right to wage war, the emperor gives up claims to divinity, and the Diet becomes the sole law-making authority.

1948 Oct.–At about this time, the food situation in Japan starts to improve. Address: Norin Suisansho, Tokei Johobu, Norin Tokeika Kacho Hosa.

3856. Sasaki, Kyota. 1949. Amino-san shôyu seizô-hô. Fu gurutamin san sooda [Method of manufacturing HVP or amino-acid soy sauce. With a supplement on monosodium glutamate]. Tokyo: Fuminsha. 181 p. [Jap]
• ***Summary:*** Amino acid. Address: Kôgaku-shi, Japan.

3857. Shimizu, Ken'ichi. 1949. Kindai shôyu jôzô no shinzui [The essentials of modern shoyu brewing]. Tokyo: Sanpo Shobo. 327 p. [Jap]

3858. *SoyaScan Notes.* 1949. Chronology of the macrobiotic movement in North America, 1949-1966. 25 Jan. 1995. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1949–Michio Kushi, a student of George Ohsawa, arrives in New York City from Japan, in connection with the World Federalist Movement. He writes letters back to Japan, and Ohsawa reads them to his students at his center (*Maison Ignoramus*) in Yokohama, near Tokyo, Japan.

1951–Aveline Tomoko Yokoyama falls in love with Michio's letters, wins a trip to America by being the best seller of Ohsawa's newspapers, and meets Michio in New York.

1952, early–Herman Aihara, age 31 (born Nobuo Nishiyama on 28 Sept. 1920), arrives in America, and settles in New York City. As early as March 1952 he was selling macrobiotic foods in New York; he imported them from Ohsawa in Japan.

1953–Michio Kushi and Aveline Tomoko Yokoyama are married in New York. They had exchanged letters before she arrived.

1955 Dec.–Herman Aihara and Chiiko (Cornellia) Yokota are married in New York. Cornellia arrived in the United States from Japan in Oct. 1955. They had exchanged many letters before she arrived.

1959 or 1960–Zen Teahouse, the first macrobiotic restaurant in the USA, is started in New York City by Alcan Yamaguchi. It was located at 317 Second Ave. and consisted of a small (4-table) main room containing a kitchen. Miso and shoyu were served regularly. This restaurant was later renamed Paradox.

1959 Nov. or Dec.–George Ohsawa arrives in America for the first time, staying in New York City with Herman Aihara, his closest associate. After a week he flies to California to find a source of short-grain brown rice; he locates Koda Brothers (in Dos Palos), but also gives lectures in San Francisco and Los Angeles. After one week in California, he returns to New York City.

1960 Jan.–Ohsawa presents the first of three series of lectures designed to introduce macrobiotics, and the philosophy and medicine of the Orient, to America; each for ten nights during January, February, and March of 1960 at the Buddhist Academy in New York City. During these lectures his first work in English is published, a mimeographed edition of *Zen Macrobiotics.* He and the Aiharas duplicated and bound these in the Aiharas' apartment, then sold them at the lectures for $0.50. He also lectured at the Universalist Church, The New School for Social Research, Columbia University, and New York City College (See: *Macrobiotics: The Art of Longevity and Rejuvenation,* p. 188-89).

1960 May 10–Herman Aihara starts publishing

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Macrobiotic News, a magazine consisting mainly of Ohsawa's lectures, plus some current news.

1960 July–Ohsawa returns to America (after a trip to Europe) and lectures daily for two months at the first American macrobiotic summer camp at Southampton, Long Island, New York. Mrs. Lima Ohsawa, aided by Cornellia Aihara, gives macrobiotic cooking classes. Many people attend, especially writers, actors, artists, musicians, and intellectuals.

1960–To serve this growing interest, a tiny restaurant named Musubi is started in Greenwich Village and run by Alcan Yamaguchi, Romain Noboru Sato, Herman Aihara, and Michio Kushi. In late 1961 Musubi was moved to 55th Street.

1960–The first macrobiotic food store (combined with a gift shop), named Ginza, is started by Herman Aihara.

1961 Feb.–At a meeting of the Ohsawa Foundation, Inc. (New York City) Herman Aihara is elected president while he was traveling in Europe. He accepted the position when he returned later that month.

1961 summer–George and Lima Ohsawa come to America again for the second macrobiotic summer camp, this time in the Catskill Mountains at Wurtsboro, New York. Lima and Cornellia Aihara give cooking classes. After the camp, at the time of the Berlin Wall crisis (August 1961, before the Cuban missile crisis of Oct. 1962), Ohsawa feared that a nuclear war might be near. He urged his followers to leave New York and find a place that was safer from radioactive fallout and good for growing rice. After extensive research, they choose Chico, California.

1961 Oct. 1–Thirty four people (11 families) arrive in Chico from New York City in a caravan of vans, buses, and station wagons. Among the active people in the group are Bob Kennedy, Herman Aihara, Teal Ames, Lou Oles, and Dick Smith.

1961 Nov.–The first printed edition of *Zen Macrobiotics,* by G. Ohsawa is printed in Japan (218 pages). It has been edited and the parts rearranged.

1962 March 6–The group in Chico establishes a new food company named Chico-San as a retail store and an import and wholesale business. It was capitalized with $10,000. In addition to a line of whole-grain products, they soon began to import a variety of macrobiotic foods from Ohsawa in Japan. The first store and food plant (they made sesame salt or *gomashio* and repackaged foods) was in the basement of a small hearing aid shop in Chico. It became the first macrobiotic food production company in the USA.

1962 July 7–Third summer camp opens in Wurtsboro, New York, under the direction of Irma Paule and Sam Chapman; it continued until Labor Day.

1962 Christmas–George Ohsawa visits Chico and lectures on macrobiotics.

1963–Ohsawa lectures in Boston, New York City, and at the fourth macrobiotic summer camp (the first on the West Coast) at Chico. Lima Ohsawa and Cornellia Aihara give cooking classes. In Chico, Ohsawa suggests that the group try making rice cakes. He sends them a rice cake machine from Japan and production began in the fall of 1963. Rice cakes soon became Chico-San's first really popular and successful product.

1963 May–Junsei Yamazaki arrives in the USA (in San Francisco) from Japan. He first goes (by bus) to Chico, California, to help with the installation of small rice cake machines. After the July 1963 summer camp in Chico, California, he goes to New York, arriving in August.

1964 summer–Ohsawa lectures in California at the fifth macrobiotic summer camp (2nd on the West Coast) at Big Sur. Lima Ohsawa and Cornellia Aihara give cooking classes.

1964 Sept.–After the macrobiotic summer camp on Martha's Vineyard, the Kushi family moves from the island to Cambridge, Massachusetts (101 Walden St., on the outskirts of Boston to the northwest). Michio stops all his outside business activities and directs his full attention to teaching macrobiotics.

1964 Nov.–The first edition of *Zen Cookery,* edited by Teal Nichols, a book of macrobiotic recipes (83 p.), is published by The Ohsawa Foundation in Chico, California.

1965–The macrobiotic movement in America, though small, is growing rapidly. Ohsawa lectures again in California at Mayoro Lodge, near Pulga.

1965–Michio Kushi organizes the first East West Institute out of his home in Cambridge and begins teaching macrobiotics, cosmology, and cooking to mostly young people.

1965–The second edition of Ohsawa's *Zen Macrobiotics* is prepared and published by Lou Oles of the Ohsawa Foundation in Los Angeles. It contains much more information (including much more about soyfoods) than the original 1960 mimeographed edition.

1965–*You are All Sanpaku* by William Dufty is published.

1965 Nov. 9–Beth Ann Simon, a young heroin addict from New Jersey, dies while following a strict macrobiotic diet. This is the movement's first major setback. Ohsawa and the macrobiotic diet receive much adverse publicity, and the incident brands macrobiotics among many in the medical and health professions as a dangerous and extreme form of food faddism. The image was hard to get rid of. The U.S. Food and Drug Administration closes the New York branch of the Ohsawa Foundation, run by Irma Paule.

1966 April 24–George Ohsawa dies unexpectedly in Tokyo, Japan, at age 72–just as his teaching is beginning to spread rapidly in the West. The cause of his death: a heart attack, perhaps caused by filarial parasites he had picked up at Lambarene, Gabon.

1966 April–Erewhon opens as a tiny (10 by 20 foot) retail store downstairs at 303-B Newbury Street in Boston.

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1966, summer–Michio Kushi begins to lecture each Monday and Wednesday evening in a back room of the Arlington Street Church in Boston. These talks were supplemented by cooking classes with Aveline Kushi in Brookline.

3859. Suzuki, Miyoshichi. 1949. Daizu zôshu saibai-hô [Method of growing soybeans to increase yields]. Tokyo: Fuminsha. 215 p. [24 ref. Jap]
Address: Fukushima-ken, Nogyo Kairyo Kacho, Ken Noji Shikensho-cho, Japan.

3860. Umeda, Isao. 1949. Shôyu [Shoyu (Japanese soy sauce)]. Tokyo: Sankyo Shuppan Co. 312 p. Revised eds. 1954-55. 326 p.; 1963. 232 p. [117 ref. Jap]
Address: Noda Shoyu Shiken-shi cho. Head, Noda Shoyu Research Lab.

3861. Yamaguchi, H.S.K.; Sakai, Atsuharu. 1949. Setsubun or Bean-Throwing Ceremony (Document part). In: H.S.K. Yamaguchi. 1949. We Japanese. Yokohama, Japan: Yamagata Press. 592 p. See p. 554-55. Book III.
• ***Summary:*** "'Fuku wa uchi! (Fortune in) Fuku wa uchi (Fortune in) Oni wa soto (Devil out)'

"This is a cry heard from almost every orthodox Japanese home on the evening of the Setsubun (literally season change), which comes on at the end of Kan or coldest season. The Kan season, which lasts for thirty days, inclusive of Daikan (major-cold) and Shokan (minor-cold), ends usually on the 2nd or 3rd of February, when the ceremony of Mame-maki (bean-throwing) or Tsunan (devil-driving) is held in most Japanese houses.

"On the day of Setsubun, a small branch of *Hiiragi-tree* (*Osmanthus aquifolium*), which resembles the holly, and the head of a dried sardine are put at the entrance of each house... In the evening, the ceremony of Mame-maki, or bean-throwing, is held to 'bring fortune in and drive evil out.' The bean-thrower, who is the master or scion of a family (never a woman in olden days), is dressed in Kamishimo-dress and he throws a handful of parched beans from a dry measure, which he carries on a Sambon-tray [sic, sanbo-tray], crying as quoted above. He throws a handful twice in the lucky direction of the year where resides the Year-virtue God, and once in the direction opposite to him. He repeats the same cries in every room and closet that there may be in the house, one of its doors being open while he throws the beans, possibly, as an exit for the Devil. Thus is the fortune invited and evil driven out for the year.

"Some of the beans that are thrown in the room are kept on account of a common belief that, if you eat three of these beans at the time when the first thunder peals in the year, you will escape a thunder bolt during the year. A man or woman in his or her 'unlucky years of age,' i.e. 25 and 42 years for men and 19 and 33 years for women, will wrap in a piece of white paper as many of beans used at Setsubun as his or her years of age, together with some coins, which are thrown away at crossroads so that evil may be done away with for the year.

"Recently the ceremony of bean-throwing is held at every large Shinto shrine and Buddhist temple, when some champion wrestlers or noted actors act as what are called 'Toshi-otoko' (literally year-man) as the bean-thrower is commonly called. Happy are those indeed who succeed in catching a few beans that are thrown by these year-men, for great are crowds who assemble to catch a few of the beans. These beans, which the luckier people of the crowds catch, are kept at home as a luck-bringer for the year.

"Tradition has it that during the reign of the Emperor Uda (59th) a devil of some kind lived in a cave near Lake Misoro in Kumano. It came out in the night to make havoc in the neighbourhood, till, by following the oracle of Vaiscavana, seven wise men were ordered by the Emperor to kill the evil spirit. They threw parched beans into the cave by closing its entrance with the leaves of the Hiiragi-tree and heads of sardines. This is said to be the origin of the practice of throwing parched beans in the evil direction with a few Hiiragi-leaves and the head of a dried sardine outside a door which is open at the time when the beans are thrown out."

An illustration (line drawing) shows a man in traditional Japanese dress (a hakama and kamishimo), standing on the wooden walkway that surrounds a temple, throwing beans at Setsubun out of a small wooden measuring box (*masu*).

Note: In short, Setsubun, the bean-throwing festival, both rids evil from the previous year, and brings prospects of good fortune for the current year. Address: Manager, Fujiya Hotel, Miyanoshita, Japan.

3862. Yamazaki, Momiji; Miura, Jiro. 1949. Gôriteki nattô no seizô-hô [Rational method of making natto]. In: Gôriteki Nattô no Seizô-hô. Tokyo: Sangyo Hyoronsha Co., Ltd. See p. 89-198. [Jap]*
• ***Summary:*** In 1949, Yamazaki and Miura developed a modern fermentation room for natto and created the basis for Japan's modern natto industry.

3863. Meade, Mary. 1950. Expert teaches class to prepare Hawaiian specialties. *Chicago Daily Tribune.* Jan. 23. p. B3.
• ***Summary:*** Chicago home economist Dorothy Roost Bates, just back from four years in the Hawaiian paradise, was the teacher in the last of these foreign fare classes.

"The teriyaki is expensive since it requires a tender cut of beef, preferably the rib eye. Mrs. Bates used sirloin...

Teriyaki (A Japanese appetizer): 1 pound tender beef steak, ¼ cup soy sauce, 1 tablespoon sugar, 1 clove garlic, 1 teaspoon ginger (fresh), chopped fine.

"Slice meat in thin strips across grain. Place on bamboo sticks [skewers] (100 for 25 cents in Chinatown)." Mix soy sauce with other sauce ingredients. Soak meat in sauce 30

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minutes or more, turning to marinate evenly. Broil 5 minutes on each side before serving hot.

"These are usually done over charcoal, but broiling [in an oven under an overhead gas flame] works very well. The skewered beef may be arranged on a cooky [cookie] sheet for broiling." Also contains recipes for Hawaiian curry. Chicken luau.

Note 1. This is the earliest teriyaki recipe seen (Nov. 2006) that uses beef (or any other kind of red meat) and the main ingredient.

Note 2. It is also the earliest teriyaki recipe seen that has a complex sauce, similar to modern teriyaki sauces.

3864. Umeda, Isao; Tateno, M.; Naoi, T.; Uchida, H. Assignors to Noda Shoyu K.K. 1950. Shôyu jôzôhô (shinshiki 2 gô) [Method of brewing shoyu (semi-fermented soy sauce #2)]. *Japanese Patent* 181,616. Jan. 27. Application filed 18 Aug. 1948. [Jap]*
Address: Noda Shoyu Co., Noda, Japan; 1. Head of research lab.; 2. Actual discoverer; 3-4. Asst. researchers.

3865. Kikkoman Shoyu K.K. 1950. [Annual report–1949]. Noda, Japan. Jan. [Jap]*
Address: Noda, Japan.

3866. Nagata, Tadao. 1950. Daizu hinshu no tokusei ni kansuru kenkyû [Studies on the characteristics of soybean varieties]. Nihon Daizu Kyokai (Japanese Soybean Assoc.), Kyoto Daigaku Nogakubu, Sakumotsu Kenkyushitsu. 115 p. [64 ref. Jap]
Address: Nara Gakugei Daigaku, Japan; Formerly Kyoto Daigaku Nogakubu Sakumotsugaku Kenkyushitsu.

3867. Kawamura, Sin'itiro [Shinichiro]. 1950. [Utilization of the by-products of soybean protein manufacture. II. Concentration of soluble carbohydrates]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 23(7):310-15. Feb. [5 ref. Jap; esp]
Address: Agricultural Faculty, Nihon Univ.

3868. Kubo, Takahashi. 1950. Shôyu abura ni kansuru kenkyû. I. Shôyu abura seisei kiko ni tsuite (1) [Studies on shoyu oil. I. The mechanism of formation of shoyu oil (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 23(8):335-42. March. [17 ref. Jap]
Address: Noda Shoyu Co. Ltd., Noda-shi, Chiba-ken, Japan.

3869. *Sun* (*Baltimore, Maryland*). 1950. On making things taste more like themselves. April 17. p. 10.
• ***Summary:*** Monosodium glutamate has been garnering a lot of publicity lately. In fact, the name is now so well known that it is popularly known in commercial circles as MSG.

"The virtue of monosodium glutamate is that it intensified flavor. This has been known to the Chinese for generations. The knowledge was passed on to the Japanese," who started manufacturing it and sold it in the United States prior to the start of World War II.

"However, what with the running out of Japanese patents and the disruption of the war, manufacture of MSG was commenced in this country," where annual production is now some 9 million pounds. It is used chiefly in canned soup and soup powders.

MSG is a type of amino acid. It may be extracted [sic, hydrolyzed] from corn gluten, wheat gluten, or soybean gluten [sic]. "Another important source is the molasses from beet sugar which yields a product [substance] known as Steffens waste."

"The Chinese extracted their MSG from soybean gluten [sic] and called it ve-tsin." When the Japanese began to manufacture it commercially, they named it ajinomoto, which means 'element [basis] of taste.'"

You can add a dash of MSG to any dish, just as you would Worcestershire sauce or paprika.

It is claimed that, under certain circumstances, "glutamic acids increase the mental ability of persons with low I.Q.'s."

3870. Nakajima, Iwao; Kato, Junichi. 1950. Kôji-kin ni yoru nama denpun no shôka ni tsuite [On the digestion of raw starch by the koji mold *Aspergillus oryzae*]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 28(6):220-21. June. [Jap]
Address: Nihon Daigaku, Nôgaku-bu, Japan.

3871. Nakano, Masahiro; Ebine, H.; Shijo, N. 1950. Budomari o kotoniseru shobaku ni tsuite [On "shobaku" (wheat bran used for shoyu making) produced from wheat at various milling rates]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 3. p. 107-20. June. [14 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan (Hakko Shokuhin-bu, Sogo Shokuryo Kenkyujo).

3872. Nickerson, Jane. 1950. News of food: Higeta shoyu shipped here. *New York Times.* Aug. 29. p. 30.
• ***Summary:*** The first shipment of Higeta soy sauce (shoyu) ever made to the United States has just arrived from Choshi, Japan, imported by George Saiki. It is made by that venerable company, Choshi Shoyu, which has been brewing soy sauce in Japan since 1616. Long located in the village of Choshi, in Chiba prefecture, its factory is now equipped with modern equipment. A 22-oz. bottle of Higeta shoyu retails for $0.74 at Macys.

Saiki says that Higeta shoyu has long been used in Japan's imperial household. It is now fermented for 6-18 months. Mr. Saiki, like most Orientals, recommends its use in a wide range of dishes, from soup and fish, to fowl, meat and vegetables.

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3873. Miso Manufacturing Experiment Administration Committee. 1950. Miso jôzô shiken hôkoku [Report of the experiments on miso manufacturing, May 1950]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 4. p. [iii] + 1-84 + 1-90 + 1-32. Sept. English translation (32 p.) is bound at the end of Issue No. 4. [Jap; Eng]

• ***Summary:*** The first three parts of this article (177 p.) are in Japanese and the last part (32 p.) is a detailed English summary.

Contents (English summary): 1. The circumstances which led to make the miso manufacturing experiments: The general aspects of raw materials for miso, the circumstances which led to set about the experiment work.

2. Experiment methods and experimental results: The experiment methods, marking by means of functional testing (frequency curve, analysis of variance and minimum differences required for significance among average marks, discussion), chemical analysis (raw materials, chemical analysis of defatted soy-beans, non-defatted soy-beans, and corn-meal, denaturation of protein in defatted soy-beans, enzymic digestion of defatted soy-beans), finished goods (miso) (general analysis, correlation between the analytical results and the functional testing results, nitrogenous compounds, judgment for finished goods by dividing into 3 grades, analysis made by excluding the disparity among manufacturing plants, judgment for the results of finished goods, by manufacturing plants (minimum significant difference–2.39)).

3. Conclusions: Premises, 50% koji products, 100% koji products, 150% koji products.

4. Discussion. 5. Appendix–Experiments on a laboratory scale: Object of experiments and outline thereof, koji-making experiment, conclusions.

In the years before World War II, annual consumption of soybeans in Japan was not less than 1,000,000 tonnes (metric tons), of which 300,000 tonnes were grown in Japan and the remainder was imported from Manchuria and Korea. Out of this 1,000,000 tonnes, about 700,000 tons are estimated to have been consumed as foods or seasonings; approximately 250,000 tonnes were used as raw materials for miso, which is one of Japan's most important seasonings.

Concerning miso consumption in the years just before World War II, exact figures are not available, but it can be roughly estimated at about 150 million *kan* (1 kan = 8.27 pounds), or a little more than 2 *kan* (ca. 16.5 lb) per person per year.

In those days, miso was made to suit public tastes in the various regions of Japan, and there were various kinds of miso according to the region. Miso can be grouped into three basic types: soy-bean miso (*Mame miso*) salty miso, and sweetish miso. Describes briefly how each of the three types was made. One table (p. 2) shows the ingredients used to make each of these three types: (1) Soy-bean miso: Soy-beans 10 *koku* = 1,800 liters. Salt 110 *kan* = 909.7 lb = 413.5 kg. Ripened miso 1,000 *kan* = 8,270 lb = 3,759.1 kg.

(2) Salty miso: Soy-beans 14.0 *koku* = 2,250 liters. Milled rice or milled barley 7.0 *koku* = 1,260 liters (made into koji). Salt 185 *kan* = 1,530 lb = 695.4 kg. Ripened miso 1,650 *kan* = 8,270 lb = 3,759.1 kg.

(3) Sweetish miso: Soy-beans 12.8.0 *koku* = 2,304 liters. Milled rice or milled barley 15.7 *koku* = 2,826 liters (made into koji). Salt 94 *kan* = 777.4 lb = 353.4 kg. Ripened miso 1,700 *kan* = 14,059 lb = 6,390.5 kg.

As late as 1941, due to food shortages, miso was brought under Japanese government control; from that time until the end of the war, miso production gradually decreased. Starting in about 1944 only one type of miso was made for all the regions of Japan–a type of salty miso. 100 *kan* of miso was made using 34 *kan* of soy-beans, 16 *kan* of milled rice or barley, and 15 *kan* of salt. Efforts were made to shorten the fermentation time by using a quick ripening method [a heated or warm environment].

At the end of World War II, Japan was unable to import soy-beans from Manchuria [and, to a lesser extent, Korea]. This dire soybean shortage led to a sharp decrease in miso production; Japan started to use defatted soybean meal and defatted soy flour (imported from the USA) in place of whole soybeans, and sweet potatoes or imported corn instead of some rice or barley, to make miso. The quality of miso dropped. The experiments described in this report represent an attempt to improve miso quality scientifically, mainly by investigating how to use defatted soybean meal to make better quality miso. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

3874. Obata, Y.; Nukata, K.; Zama, K. 1950. [Studies on the phosphatides. I. Isolation of lecithin]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 24(1):29-32. Nov. [10 ref. Jap; eng]
Address: Dep. of Fisheries, Faculty of Agriculture, Hokkaido Univ.

3875. Obata, Y.; Sasa, S.; Nukata, K. 1950. [Studies on the phosphatides. II. A new method for the isolation of cephalin]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 24(1):33-35. Nov. [4 ref. Jap; eng]

• ***Summary:*** The existing method for the isolation of cephalin from animal material is not readily applicable to the isolation of the same substance from plant material. Soybean cephalin was isolated from "soybean lecithin." Address: Dep. of Fisheries, Faculty of Agriculture, Hokkaido Univ., Sapporo.

3876. *Soybean Digest.* 1950. Japan shifts from whole beans to meal. Nov. p. 24.

• ***Summary:*** Two pie charts show Japanese usage of

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soybeans in 1940 and 1948. In 1940 the Japanese were consuming about half of their 562,000 tonnes of soybeans as whole soybeans used to make various foods such as shoyu, miso, and tofu. But by 1948 nearly all their soybeans were being used in the form of soybean oil meal, especially to make miso, shoyu, and amino acids. Consumption of miso and shoyu have greatly increased, while other uses (especially tofu) have shrunk.

"During the 10 years preceding the end of World War II, Japan imported an average of about 700,000 tons of soybeans, chiefly from Manchuria. This inflow of soybeans was stopped almost entirely immediately after the war, which resulted in critical protein and oil supplies. But imports since then have increased, overcoming the extreme shortage. About 80 percent of total soybean imports during 1946-48 were from the U.S."

3877. Holmberg, Sven A. 1950. Soybean trials in Sweden. *Soybean Digest.* Dec. p. 13.
• ***Summary:*** Varieties: "Even the earliest of the foreign varieties are too late when grown in Sweden.

"By crossing varieties of northern island origin (Hokkaido [Japan] and Sachalin [Sakhalin]) with northern continental varieties (north Manchuria, North America and central Europe) we have produced some 1,900 hybrids.

"One of these hybrid progenies, 'Fiskeby III' is now being grown commercially on a small scale for human food."

"Growing district: Although we do most of our breeding work at Fiskeby, we have for safety placed some replica plots and most of our contract culture of soybeans somewhat further south near the city of Kalmar between latitude 56º and 57º. We have to reckon with some risk of summer frost until late in June and then again from September on."

Yield: "We have no figures of average crop results. But at this time we consider a yield of 15 bushels an acre as normal and fairly satisfactory.

"Under favorable growing conditions we have not infrequently recorded about 25 bushels an acre in field culture. In yield tests at Fiskeby the 4-year average (1946-1949) was slightly above 26 bushels/acre.

"Usage: The small quantities of soybeans harvested in Sweden beyond those required for seed are consumed as human food. For culture in Sweden we select only strains which in flavor, seed coat color, seed size and cookability answer the requirements for an edible soybean."

A simple map shows the location of Fiskeby [southwest of Stockholm]. Photos show: (1) Soybeans at Fiskeby being harvested with a combine, pulled by a tractor. (2) Jordan Finergaard standing and holding in each hand some harvested soybean hybrid progenies. He has made a large number of such crosses at Fiskeby. (3) A field of ripe soybeans at Fiskeby.

Note: Fiskeby is located next to Norrköping (Norrkoping) in southern Sweden, southwest of Stockholm. Address: Algot Holmberg & Soner A-B, Norrkoping, Sweden.

3878. Tammes, P.M.L. 1950. Bereiding van ketjap [Preparation of soy sauce]. *Landbouw* (*Bogor, Java*) 22(10-12):568-69. Dec. [Dut]
• ***Summary:*** Contains a brief description of how to make Japanese-style soy sauce, and an analysis of its composition in both volume per 100 cubic centimeters, and grams per 100 grams. Address: Makassar (Algemeen Proefstation, Landbouw).

3879. Yuasa shôyu enkaku-shi [Record of Yuasa shoyu]. 1950-1960? Kubo-san no ie, Yuasa-cho, Arita-gun, Wakayama-ken, Japan. 46 p. Unpublished manuscript. Handwritten. 19 x 25 cm. [Jap]
• ***Summary:*** According to Heiji Tamura (*Shoyu no Hon,* 1971, p. 31), there is a lovely poem in this work titled "The Song of Shoyu" (*Shoyu no uta*) that reads as follows:

Smell the aroma from the depths of the brewing keg!
Waves of fragrance, deep purple, tamari;
Flowers of wisteria.
Its origins reaching back to the Antei period,
Its brewing lineage inherited from the great teacher.
Tamari from Yuasa is the first in the Emperor's kingdom.
Its aroma is of the finest quality,
Its flavor most excellent,
Its fame, noblest and purest flower of Arita.

Note: Arita is the early name of the Yuasa region. This poem was translated by Shurtleff and Aoyagi and published in *The Book of Miso* (1976, p. 220). The original Japanese reads like this: *"Nachi no ura. Soko made niou murasaki no namiuchi tsuzuku fuji no hana. Nezashi wa furuku Antei ni. Hoto Kokushi no nagare o kumite kamosu Yuasa no shoyu wa Kokoku ni okeru hajime nari. Kaori wa takaku, aji yoshi to, homare Arita no seika."*

Note: This book is not in the Wakayama Prefectural Library nor in the Yuasa Choritsu Library (8/89).

Talk with Seiichi Ando. 1989. Sept. 12. He saw this book, which he believes was never published, 20-30 years ago at the home of a shoyu maker named Mr. Kubo located at Yuasa-cho in Yuasa, Wakayama prefecture, Japan. The manuscript is a basically a history of this company and household. It was definitely written after the start of the Meiji period in 1868. The first word of the Japanese title is the logo or symbol of this house's brand of shoyu.

Letter from Wakayama Univ. Keizaigaku-bu, Sakaedani 930, Wakayama city 640, Japan. The unnamed writer of this letter was not able to locate this book in his Keizaigaku-bu, the university library, the city library, the prefectural Kyoiku Iinkai, the Yuasa Kyoiku Iinkai, and the prefectural history Hensan-shitsu. Finally he located a shoyu maker in Yuasa who had a copy of the original work but would not lend it to be photocopied for fear it might be damaged. The shoyu

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maker's name was Chobei KANO, Yuasa 7, Yuasa-cho, Arita-gun, Wakayama-ken. Phone: 0737-62-2035. His brand is Kakucho (*Tsuno + nagai*). He can also be reached (in Yuasa-cho) at Kokudo-ten (Country + road + shop) Yuasa 147. Phone: 0737-63-5243. Address: Arita-gun, Wakayama-ken, Japan.

3880. Nakazawa, Ryoji. ed. 1950-1964. Hakkô oyobi seibutsu kagaku bunken-shû [Bibliography of fermentation and biological chemistry]. Tokyo: Nihon Gakujitsu Shinkokai/Hirokawa Publishing Co. 11 volumes. In European languages and Romanized Japanese. [500 soy ref. Eng; Jap]

• ***Summary:*** Contains extensive, excellent bibliographies on the following soy-related subjects (listed here alphabetically): Amazake (p. 139, only 2 references). Kôzi (Koji) (p. 398-410). Mirin (p. 464-65). Miso (p. 465-68). Natto (p. 8-9). Natto bacteria (p. 9-10). Penicillium (p. 210-63; see p. 240 for tempeh and ontjom). Rhizopus (p. 81-97). Soybean and soybean cake (p. 271-77). Syôyu [Shoyu] (p. 436-49). Tôhu (p. 498, only 3 references, all for nonfermented tofu).

Each bibliography lists the documents in approximately chronological sequence. An unnumbered page near the beginning titled (in Japanese characters only) *Shuyô Inyo Bunken* [Main Periodicals Cited] lists 51 such periodicals, of which 12 are in Japanese. Of these twelve, all have the title written in Chinese characters, with an English translation, and a Chinese plus a romanized abbreviation of the Japanese title.

Two examples: No. 2. *Nippon Nogei Kagaku Kaishi.* J. Agr. Chem. Soc. Japan [J. of the Agricultural Chemical Society of Japan]. *Nô-ka.* No. 4. *Nihon Jozo Kyokai Zasshi.* J. Fermentation Association Soc. Japan. *Zyô-Kyô.* Note that much of the romanization throughout these 11 volumes is based on a system that is no longer used. Nakazawa was born in 1878. Address: Japan.

3881. **Product Name:** [Mieki Soy Sauce (HVP)].
Manufacturer's Name: Ajinomoto Co. Inc.
Manufacturer's Address: Kyobashi 1-5-8, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1950.
New Product–Documentation: Yokotsuka (1980) notes that in 1950 Ajinomoto began to sell Mieki or Ajieki (HVP), a major event in Japanese soy sauce history. Soya Bluebook. 1986. p. 105.

3882. Arimitsu, T. 1950. [Antibacterial effect of *Bacillus natto* and its metabolite for pathogens]. *Hokkaido Igaku Zasshi* (*Hokkaido J. of Medical Science*) 25:1-6. *

3883. Photograph of the T. Amano Co. in Vancouver, British Columbia, Canada. 1950. Vancouver, British Columbia, Canada.

• ***Summary:*** This black-and-white photo, sent to Soyfoods Center in 1981 by T. Amano Co. of British Columbia, shows the front of a small, modern building. A floor-to-ceiling panel of glass bricks are to the left of the main door near the center. Over the door, in large letters is written: "T. Amano Co." On the right front window, partly covering venetian blinds, in smaller letters, we read on five lines: "T. Amano Co. Manufacturers–Soya sauce & rice paste [miso]. Oriental food products. Importers & exporters." Address: Vancouver, British Columbia, Canada.

3884. Yamada, M.; Muto, H. 1950. [The occurrence of biacetyl as an impurity in fermented alcohol]. *Nippon Jozo Kyokai Zasshi* (*Journal of the Japanese Brewers' Association*) 45:70-71. (Chem. Abst. 46:1705). [Jap]*

3885. Adachi, Isamu; Sakurai, Shigeru. 1950. Nihon shokumotsu-shi [History of Japanese foods]. Tokyo: Yuzankaku. 480 p. [Jap]

• ***Summary:*** Best book seen on the history of Japanese foods. The following appears in chapter 8. Edo Period:

"Amazake and Shirozake (p. 375-76). In ancient times there was Kozake and hitoyo-zake (one-night sake). They became known as amazake at a later date. But kozake was different from subsequent amazake; sometimes it was made using sake instead of water in the fermentation. The term 'amazake' first appeared in the literature of the Keicho period, which started in A.D. 1596. Later, during the Kan-ei period (1624-1630) there was Shirakawa Amazake.

"In Rokujo, in Kyoto, the Yamashiro-zake was very old and famous. Within the city of Edo (today's Tokyo), in the Yokayama-cho section, during the Temmei period (1781-89), Sangoku Ichi Amazake was sold. After taking it home, the consumer would add an equal amount of boiling water to the amazake and stir while simmering. The names Sangoku Ichi (three countries are one) and Shirayuki (white snow) came from the fact that it was sold in a container with a plum flower crest drawn on it (*umebachi*) and also Mt. Fuji was drawn in the shop. This was because the goddess of the Mt. Fuji shrine is named *Konohana Sakuya Hime* ("Tree Flower Blooming Princess"); she got pregnant overnight. Since amazake was known as "one-night sake" in ancient times it was connected with this goddess.

"Amazake used to be sold only in winter. Around the Bunka period (1804-1817) it was sold year-round. There were 5-6 amazake shops in Edo (Tokyo). Among them, the one in front of the Asakusa Honganji temple was famous. Although at that time amazake was sold during the summer, it later returned to being a winter drink."

3886. Brown, Helen Evans. 1950. Chafing dish book. Los Angeles, California: The Ward Ritchie Press. [21] + 141 + 8 p. Index. 16 x 16 cm.

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• ***Summary:*** This stylish little cookbook reflects the growing influence of Asian (especially Chinese) culture and cuisine in California–and the author's enthusiasm for it. The recipe for sukiyaki (#93) calls for "a soy bean cake" [a cake of tofu]. A footnote to the recipe for Chinese spinach (#117) states: "The Chinese would add a piece of fermented bean cake to this; a piece of bleu cheese gives much the same effect."

Helen Brown uses "soy sauce" to season all of her Chinese- and Japanese-style recipes: Nos. 32, 60, 64, 73, 77, 87, 89, 91, 93, 117. Address: Pasadena, California.

3887. Burtis, E.L. 1950. World soybean production and trade. In: K.S. Markley, ed. 1950. Soybeans and Soybean Products. Vol. I. New York: Interscience Publishers or John Wiley & Sons. xvi + 1145 p. See p. 61-108. [17 ref]

• ***Summary:*** Contents: 1. Historical summary. 2. The Far East: China, Manchuria, Korea, Japan, Netherland Indies, other countries of Asia, net foreign trade of Asia. 3. Europe: Production, foreign trade. 4. United States: Varietal development, trends in planted acreage, soybeans for seed, acreage and production of soybeans for hay, vegetable-type soybeans, growth of the soybean-processing industry, soybean oil production, trade, and utilization, production and utilization of soybean oil foots (the residue from refining), soybean meal and other soybean protein products (incl. soybean flour, soybean glue, and other industrial soybean products). 5. Minor world areas.

Tables: (2) Soybean production in leading countries and estimated world total, 1922-1948. Statistics are given for China (excluding Manchuria), Manchuria, Korea, Japan, Formosa [Taiwan], Netherlands Indies [Dutch East Indies, later Indonesia], United States, Canada (1936 on), USSR (1928-1938), 5 Danubian countries (Austria, Yugoslavia, Hungary, Rumania, and Bulgaria, 1934 on, partly estimated by author).

(3) Net exports or imports of soybeans (million bushels) by major exporting and importing countries, 1909-1913 and 1922-1948. China and Manchuria (combined) dominate world soybean exports from 1910 to 1940, with the peak year being 1929 (100 million bushels) and with more than 50 million bushels being exported every year from 1926 to 1939. But by 1941 exports as fallen to almost zero. The only other exporter was the USA, which had its first net soybean exports in 1932 (4.2 million bu); this rose to a peak of 10.5 million bu in 1939 then dropped to almost zero during World War II. Europe was the largest a net importer of soybeans from 1910 to 1948; the peak years were 1929 and 1933, when 62.6 million bushels were imported. Japan was the second largest net importer of soybeans from 1910 to 1948; the peak year was 1938, when 29.8 million bushels were imported. The Netherland Indies (today's Indonesia) is the only country from Southeast Asia in this table. The country imported 2.0 million bushels in 1913. Imports steadily decreased from 4.2 million bushels in 1922 to less that 50,000 bushels in 1936. Then the country switched to being an exporter, with 400,000 bushels in 1937, and averaging about 300,000 bushels per year from 1937 to 1941. Trade stopped during World War II (1942-1947) then resumed again in 1948 with 200,000 bushels of exports.

(4) Net exports or imports of soybean oil (million pounds) by major exporting and importing countries, 1909-1913 and 1922-1948. (5) Net exports or imports of soybean cake and meal (thousands of metric tons) by major exporting and importing countries, 1929-1948. (6) Net exports or imports of soybean oil and soybean in terms of oil (million pounds) by major exporting and importing countries, 1909-1913, 1922-1948.

(7) Net exports or imports of soybean cake and meal and soybeans in terms of meal (thousands of metric tons) by major exporting and importing countries, 1929-1948. (8) Apparent consumption of soybean oil and soybean cake and meal by principal European countries, 1929-1938 (based on tables 3-7). (9) Soybean acreage grown in the United States for all purposes (equivalent solid acreage), by states and groups of states, 1924-1948 (1,000 acres).

(10) Soybean acreage harvested for beans in the United States, 1924-1948 (1,000 acres). (11) Soybean production in the United States, by states and groups of states, 1924-1948 (1,000 bushels). (12) Soybean supply and disposition in the United States, 1924-1948 (1,000 bushels).

(13) Acreage and production of soybeans, soybeans processed for oil and meal, and soybean oil produced in the United States, 1924-1948. (14) Soybean oil production, trade, (imports and exports), stocks (crude basis), and domestic disappearance in the United States, 1910-1948 (1,000 pounds; compiled from reports of the Bureau of the Census). (15) Soybean oil utilization by classes of products in the United States, 1931-1948. Food products: Margarine, shortening, other, total. Nonfood products: Soap, paint and varnish, other drying oil products, miscellaneous non-food products, loss, incl. oil in foots, total. Total domestic disappearance. One table is in 1,000 lb.; a 2nd is in per cent of total.

(16) Supply and utilization of soybean protein products (meal basis) in the United States, 1921-1947 (1,000 metric tons). For each year is given: Estimated production, imports or soybean cake and meal, total supply, exports of soybean cake and meal. Domestic utilization in: Full-fat soybean flour, low- and medium-fat soybean flour, soybean glue for softwood plywood, soybean glue for hardwood plywood, other uses (largely feed for livestock).

A map (p. 90) shows soybeans harvested for beans in the USA, 1944. Each dot represents 2,000 acres.

A graph (p. 105) shows tonnage of high-protein feeds fed to livestock, 1926-1947. Within this are four graphs for: Soybean cake and meal, other oilseed cake and meal (mostly cottonseed), tankage and meat scraps, fish meal, dried milk products, gluten feed and meal, and (beginning 1935)

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brewers' and distillers' dried grains, and total.

A graph (p. 66) shows world soybean production from 1922 to 1949. The data is from Table 2. Within this are graphs for USA and for East Asia (incl. China, Manchuria, Korea, and Japan).

One bar chart (p. 73) shows domestic consumption and net exports of soybeans and soybean oil, in terms of oil (million lb.), by principal consuming countries, annual average, 1929-1938 (Based on tables 2-4. Oil equivalent of soybeans calculated at 8.4 pounds per bushel). By far the biggest consumer is China. By far the biggest exporter is Manchuria. Others: Japan, Germany, United States, Korea, Netherlands Indies, United Kingdom, Netherlands, Denmark, Other Europe (except U.S.S.R.).

Another bar chart (p. 74) shows domestic consumption and net exports of soybeans and soybean meal, in terms of meal (1,000 metric tons), by principal consuming countries, annual average, 1929-1938 (Based on tables 2, 3, 5, and 7. Meal equivalent of soybeans calculated at the rate of 0.02117 metric tons per bushel). The biggest consumer is China, followed by Japan. By far the biggest exporter is Manchuria. Other small exporters: Germany, United States, Korea, Formosa, Netherlands Indies, Denmark, United Kingdom, Other Europe (except U.S.S.R.). Address: Bureau of Agricultural Economics, USDA, Washington, DC.

3888. Burtis, E.L. 1950. World soybean production and trade: Historical summary (Document part). In: K.S. Markley, ed. 1950. Soybeans and Soybean Products. Vol. I. New York: Interscience Publishers or John Wiley & Sons. xvi + 1145 p. See p. 61-63. [17 ref]

• ***Summary:*** "World soybean production and trade have passed through three major stages of development. In the first phase, extending from prehistoric times to 1908, soybean production and trade were confined almost exclusively to eastern Asia. Uncultivated species of soybeans still grow wild in North China, Manchuria, and Korea. Apparently culture of soybeans as an agricultural crop originated in that area, and spread first to Japan, Formosa, southern China, Indo-China, Siam, the northern border districts of India, and the Netherland Indies.

"In North China, Manchuria, Korea, and Japan, soybeans have long been a major crop. They are mentioned in ancient Chinese writings as one of the five sacred grains. Farther south, soybeans are less important both in agriculture and in the diet.

"A lively coastwise trade in soybeans, soybean cake, and soybean oil was carried on between Manchurian and southern Chinese ports for centuries before Chinese ports were opened to foreign ships in the mid-1800's. Exports of soybeans and soybean products from Manchurian ports to Japan increased rapidly in the late 1800's, especially after China made special trade concessions at the end of the Sino-Japanese war in 1895. Japanese import demand for soybeans and soybean cake was strong, and the population of Manchuria was growing rapidly. Opportunities in Manchuria attracted a steady stream of agricultural workers from northern China after restrictions on immigration to Manchuria were relaxed by the Chinese government in the third quarter of the 19th century.

"The second stage of development in soybean production and trade, extending from 1908 to 1939, was marked by large exports of soybeans and soybean oil from Manchuria to Europe. The beginning of this trade was an indirect result of the Russo-Japanese War in 1904-1905. Food requirements for Japanese troops stationed in Manchuria had led to an increase in production of soybeans. When these troops were withdrawn, a surplus of soybeans developed. At the same time, the Japanese acquired a substantial interest in the Manchurian export trade through their lease of the South Manchurian Railway and development of the port of Dairen at the southern end of the railway.

"Japanese firms in 1908 made several shipments of Manchurian soybeans to England, where the soybeans were found to be a suitable source of oil for soap manufacture and meal for use in mixed feeds for livestock. Nearly all previous shipments of soybeans from the Orient to Europe had arrived in an unsatisfactory condition largely because of poor shipping practices. Exports of Manchurian soybeans to Europe increased rapidly after 1908. At first these shipments went to England, but by 1910 to other European countries also, especially Germany, Denmark, and the Netherlands. After an interruption during World War I, trade with Europe continued to grow, reaching a peak in the late 1920's and early 1930's. Soybeans were one of the leading materials processed by the expanding oilseed-processing industry in Europe.

"Large exports of soybean oil from Manchuria to Europe also developed, beginning about 1910 and reaching a peak in 1926. Soybean-processing capacity in Dairen grew along with this trade; the oil mills in Dairen produced largely for export and by 1924 accounted for about half the total soybean-processing capacity located along Manchurian railroads. Exports of Manchurian soybean cake also were large in the 1920's and 1930's, but the cake was too high in oil and water content to stand the tropical sea voyage to Europe and therefore went mainly to Japan, Formosa, and Korea.

"The growth of imports of Manchurian soybeans and soybean oil into Europe was the natural consequence of an active European import demand for fats and oils and protein concentrates, and a vast immigration from China into the relatively empty but fertile Manchurian farmlands during the 1920's.

"The third and present stage in the world history of soybeans is marked by the pre-eminence of the United States in production and processing of soybeans for oil and meal.

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This phase began in 1940 when war disrupted the trade between Manchuria and Europe. Exports of soybeans from Manchuria to Europe had not been resumed by 1948, except for small quantities moving through northern China ports.

"Soybeans were very little grown before 1910 as an agricultural crop in the United States. Production first began to assume commercial importance during World War I; it showed a steady upward trend in the 1920's and early 1930's, expanded rapidly after 1936, and in 1942 rose sharply to a new high level in response to strong wartime demand for domestic sources of fats and oils and oilseed meal. Soybean acreage and production were well maintained through 1948. Soybeans are well adapted to the climate and soils of the Corn Belt and to the crop rotations and mechanized farming practiced in the Corn Belt.

"Since the early 1920's the soybean-processing industry in the United States has actively carried on research to improve methods of processing soybeans and soybean products and to develop new uses and markets. Mill capacity has always been ample for the increasingly large output available for processing, except early in World War II, when steel and other materials needed for new additions were reserved for more urgent war uses. The United States soybean-processing industry now stands first in the world in size and in technical knowledge and ability." Address: Bureau of Agricultural Economics, USDA, Washington, DC.

3889. Hartsuch, Bruce Edwin. 1950. Introduction to textile chemistry. New York, NY: John Wiley and Sons, Inc. ix + 413 p. 22 cm. [3 soy ref]
• ***Summary:*** Preface: "During recent years there has been an increasing awareness that something revolutionary has occurred in the field of textiles. New fibers and filaments have made their appearance; the wizardry of the textile chemist and engineer has produced fibers from such raw materials as soybeans, corn, skim milk, chicken feathers and benzene; old fibers have been improved; wool has been torn down and rebuilt so that many of its undesirable properties have been lost; rayons of exceptionally high strength are being manufactured; we now have shrink-resistant wool, mothproof wool, fire-resistant cotton, and cotton cloths that will not shrink."

"This book has been designed and written as a textbook for college students and teachers who have a knowledge of the theoretical and applied chemistry..."

Table 12, "Strength of fibers" (p. 109) gives (for 20 fibers) the tenacity (tensile strength) and wet strength as a percentage of dry strength. Nylon (of the high tenacity type) has the highest tenacity: 6.0 to 7.5 gm per denier; soybean fiber has the lowest 0.6 to 0.8. Of natural fibers, cotton is 4.2 to 6.3, silk (degummed) is 2.8 to 4.9, and wool is 1.0 to 1.7. Concerning wet strength as a percentage of dry strength, cotton is highest (best) at 110-130%, wool is 76-97%, and silk is 75-95%. But soybean fiber is only 30-35%, which means that it has relatively little tensile strength when dry, and only about one-third as much when wet.

Table 13 gives the "Elongation of fibers (percentage of increase in length at the break)." Soybean fiber has a dry elongation of 40, making it more elastic than most other fibers; no wet elongation is given for soybean fiber.

On pages 369-72 is a long section about "Soybean fiber," with emphasis on the way it is made. "The Japanese were among the first to investigate the use of soybean protein in the manufacture of protein fibers, and patents were granted in this country in 1940 and 1941 (U.S. Patents 2,192,194, 2,198,538, and 2,237,832)." Near the end of the book (p. 373-86) is a Glossary, which includes definitions of "spinneret" and "spinning." Address: Assoc. Prof. of Chemistry, Michigan State College.

3890. Holmberg, Sven A. 1950. Sojabönodlingens möjligheter och berättigande i vårt land: Några erfarenheter från förädlingsarbeten och försök vid Fiskeby [The possibilities of soybeans in our land (Sweden): Some experiences of research and breeding at Fiskeby]. *Kungliga Skogs- och Lantbruksakademiens Tidskrift* (*J. of the Royal Swedish Academy of Agriculture and Forestry*) 89(5-6):460-68. English-language summary in Soybean Digest (May 1951, p. 36) as "Native soys in Sweden." [6 ref. Swe; eng]
• ***Summary:*** "Attempts to grow foreign soy bean varieties in Sweden have not been successful. Hybridization and selection for adaptation to Swedish climate have resulted in a large number of strains which ripen as far north as Norrköping," north latitude 58º30'. Day length is no longer an obstacle to soy bean growing in Sweden. "Three soy bean strains of the variety 201-14 (Fiskeby III) show a mean yield during 4 years (1946-1949) at 2 stations in the districts of Östergötland and South Kalmar of about 1,800 kg/ha (27 bushels per acre). A comparison between soy bean test results in Sweden (for group 201-14) and in the U.S.A. (for group 0 and group I) will show little or no difference in bean yield and protein content, but American tests give about 4 per cent more oil. Only edible types of soy beans are of interest for growing in Sweden. The Swedish edible soy bean variety 201-14 (Fiskeby III) has found usage for food principally in the Swedish Army. A suitable growing district for Swedish soy beans and some experience in soy bean culture is to be found in the district of South Kalmar. The chief aim of our soy bean breeding is further increase in bean yield, while retaining present standard of edible quality and early maturity."

Although most attempts to grow foreign soy bean varieties in Sweden have been unsuccessful, a selection of a cross between a north Japanese and a German variety will ripen seed as far north as 50º30' in Sweden. Address: Fiskeby, Sweden.

3891. Japan Rodosho Shokugyo Antei-kyoku. 1950. Washi

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seizôgyô [Japanese-style paper manufacturers]. Tokyo: Rodosho Shokugyo Antei-kyoku. 105 p. 21 cm. Shokumu Kaisetsu, No. 61. [Jap]*
• ***Summary:*** This is a Japanese government publication. Address: Japan.

3892. Japan Rodosho Shokugyo Antei-kyoku. 1950. Miso seizôgyô [Miso manufacturers]. Tokyo: Rodosho Shokugyo Antei-kyoku. 105 p. 21 cm. Shokumu Kaisetsu, No. 61. [Jap]*
• ***Summary:*** This Japanese government publication must be very similar to another published the same year titled *Washi seizogyoku.* Both are No. 61 in the same series and both have the same author, publisher, and number of pages. Address: Japan.

3893. Klose, Nelson. 1950. America's crop heritage: The history of foreign plant introduction by the federal government. Ames, Iowa: Iowa State College Press. x + 156 p. See p. 11-15, 119, 134-36. Illust. Portraits. Maps. 24 cm. [34* ref]
• ***Summary:*** Contents: Foreword, by David G. Fairchild (The Kampong, Sept. 1949). Preface. 1. Early American agriculture: Methods and terminology, colonial introductions, introductions of the eighteenth century, contributions of individuals, public experimentation and exploration (Trustee's Garden of Georgia in Savannah laid out in 1733 by General James Oglethorpe to grow silk, rice, and indigo, contribution of Royal Botanic Gardens at Kew–founded in 1760, Sir Joseph Banks director for 48 years, sends first professional plant hunter, Francis Masson, to Africa in 1772 for 3 successive years, plant explorer David Nelson, Captain William Bligh and the mutiny on the *Bounty* intended to introduce the seedless breadfruit tree into the West Indies as a food for slaves, the work of John Ellis). 2. Search for new crops 1770-1840: Introductions by statesmen (Benjamin Franklin, George Washington, Thomas Jefferson), work of agricultural societies, Dr. Henry Perrine. 3. Federal promotion of crops: The Treasury Circular of 1819, the Treasury Circular of 1827, assistance of the Navy (The Perry Expedition to Japan and James Morrow), Diplomatic assistance. 4. Leadership of the Patent Office 1836-62: First agricultural appropriation (Oliver Ellsworth, head of the Patent Office during this period, was instrumental in securing the appropriation of $1,000 in 1839), work of the Patent Office (and Commissioner Ellsworth), agriculture under the Department of the Interior (Ellsworth, Charles Mason, D.P. Holloway, D.J. Browne, distribution of seeds incl. supply of foreign seeds from the seed firms of Vilmorin-Andrieux in Paris [France], Charlwood and Cummings in London [England], Ernst Von Spreckelsen and Co. in Hamburg [Germany], and William Skirving in Liverpool [England], seed distribution curtailed), separate crop histories (tea and Robert Fortune, sorghums for sugar), miscellaneous introductions. 5. The commissionership 1862-69: Aims and methods of the commissioners (Isaac Newton, Horace Capron, Frederick Watts, William Le Duc, Norman Colman), international exchange of plants. 6. Main importations: Wheat and small grains, oats, fiber crops, grapes, citrus fruits, tea. 7. Lesser importations: Sugar crops, fruits, vegetables, tropical plants, pasture and forage crops, trees. 8. Plant introduction under Rusk and Morton: Distribution of seeds and plants, promotion of special crops, the division of pomology, fiber and forage crops. 9. Bonanza years: Problems facing agriculture, work of plant explorers (Fairchild and Lathrop, Niels Hansen, Mark Carleton, Seaman Knapp). 10. Plant introduction of the twentieth century: Search for new crops, introductions by Meyer, significant introductions 1901-13, the war years [World War II], looking to the future.

Benjamin "Franklin's name is linked with the history of three field crops which achieved economic importance: upland rice, broom corn [broomcorn], and soybeans... He became enthusiastic over the soybean as a result of his membership in the French Academy of Sciences. Soybeans sent from China to France as early as 1740 were grown after 1779 in the famous Botanic Garden of Paris. From France, Franklin sent some of the seeds to the United States, but the soybean did not find a favorable reception until the technology of the twentieth century demanded it" (p. 14).

"O.F. Cook, in 1898, began the 'Inventory of Plants Introduced" in which numbers were assigned to each new item and information given on its origin, nature, value, and cultivation" (p. 110).

Chapter 10–"Introductions of the twentieth century. David G. Fairchild took charge of the Office of Foreign Seed and Plant Introduction in 1897, and held that post, except for tours of exploration, for twenty-seven years. Under his leadership the Office set up an efficient system for disseminating plants, and experts in different parts of the country were employed to locate new plant materials. In 1902 Fairchild's division came under the jurisdiction of the new Bureau of Plant Industry. Three other divisions–the Arlington Experimental Farm, Congressional seed distributions, and tea investigations–were established at the same time. When the Bureau of Plant Industry was organized in 1900, it was the first official agricultural organization of its kind devoted exclusively to plant introduction. In addition to the four branches listed above, there were divisions concerned with physiology and pathology, botany, grass and forage plants, pomology, and the experimental gardens and grounds. Under Beverly T. Galloway, the Department's leading plant pathologist, more than two hundred employees were engaged in plant work... The Arlington Farms and Potomac Flats were located in Washington, DC, and an eighty-acre garden at Chico, California" (p. 120).

One of America's outstanding plant explorers, Frank N. Meyer, made four trips to Asia over a period of 12 years

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(1905-1918) and sent back more than 2,500 introductions. His four trips and important plant discoveries on each are summarized. "On his last trip to China in 1918, Meyer disappeared from the deck of a steamer plying the Yangtze River. There is some indication that he may have committed suicide, for his letters reveal that the mental and physical hardships of his lonely existence may have broken his will to live" (p. 122-23). An excellent photo (facing p. 124) shows Frank Meyer.

There was a shift in emphasis from introduction to breeding, hybridization, and selection after William A. Taylor succeeded Galloway in 1913 and during the 1920s.

"Soybeans from Asia are probably the most outstanding plant introductions since the Kharkov and durum wheats. Economic products of the soybean plant, now a major field crop, include hay, forage, food and feed products, and oil for many industrial uses. Recent introductions of the soybean have been merged by breeding, into new, superior plants with little resemblance of the original.

"Interest in the soybean as a commercial crop began with the introduction of three varieties from Japan in 1900. Nearly three hundred varieties were obtained in China, Japan, and India in 1909. The Department recommended soybeans as a crop that could be substituted for cotton in the South.

"In 1910, twenty soybeans from a group of 350 under test were selected for wide distribution. Three hundred varieties received from Korea and northern Manchuria in 1914 were expected to extend soybean cultivation northward in America...

"The distribution of soybeans was a prominent feature of crop seed distribution after 1914, Estimated value of the crop of 2,500,000 acres was $23,917,500. Because of its contributions to the new industry, the Bureau of Plant Industry claimed credit for half its value. Ryerson, in 1933, stated that all but three of the twenty varieties of soybeans then in cultivation were found by the Office of Plant Introduction.

"When it became clear that the soybean would be a major crop, the Department decided to send two explorers to search the soybean areas of Japan, Sakhalin, Manchuria, Korea, and China to make sure our farmers would have the best varieties. After two years of work, P.H. Dorsett, of the Division of Plant Exploration and Introduction, and W.J. Morse, of the Division of Forage Crops and Diseases, returned with almost three thousand varieties" (p. 135).

Table 1 (p. 57) shows seed distributed by the federal government 1862-89. The number of packets grew from 306,304 packets in 1862, to 1.2 million in 1863, to 2.22 million in 1975, to 3.62 million in 1884, to a peak of 4.667 million in 1885. The annual appropriation to fund this distribution work, which began with $25,000 in 1870, grew steadily to $100,000 in 1885. Address: Assoc. Prof. of Social Sciences, Central State College, Iowa.

3894. Masuno, Minoru. 1950. Daizu to sono riyô [The soybean and its utilization]. Tokyo: Sangyo Hyoron-sha. 197 p. [Jap]

• ***Summary:*** A very nicely done predecessor to Watanabe et al.'s book *Daizu Shokuhin.* Address: Tokyo Daigaku Kyoju, Kôgaku Hakase, Japan.

3895. Moncrieff, R.W. 1950. Artificial fibres. New York, NY: John Wiley & Sons, Inc. x + 313 p. Illust. Index. 22 cm. [4 soy ref]

• ***Summary:*** Part III of this book, titled "Regenerated Protein Fibres," contains 4 chapters (13-16), one each on fibers made from casein (Lanital, Aralac, Fibrolane), peanuts (Ardil), soybeans, and corn protein (zein, Vicara). Chapter 13, titled "Casein Fibres–Lanital, Aralac, Fibrolane" notes that the early attempts to make fibres from casein were unsuccessful, and it was not until 1935 that the problem was really solved. An Italian, by name [Antonio] Ferretti, carried out a series of researches in 1924-1935 and succeeded in making pliable fibres with certain wool-like characteristics. The Italian rayon producers, Snia Viscosa, purchased Ferretti's patents and undertook large-scale production of casein fibre from milk. This fiber they called 'Lanital' (*lana* is Latin for wool), and in 1937 some 1,200 tons of this fiber was made. In the U.S.A. the Atlantic Research Associates, Inc., carried out research independently, and in 1939 undertook production of a casein fibre, to which they gave the name 'Aralac'. The company which manufactured this material is named Aralac Inc., and in 1943 the production was about 5,000 tons. However, in 1948, Aralac Inc. sold their entire plant and property [in Taftville, Connecticut] to the Virginia-Carolina Chemical Corporation [of Richmond, Virginia], who are using it to make 'Vicara' fibre from corn protein. 'Aralac' is not at present (1949) being manufactured." Fibrolane is the name of a fibre made from casein in the UK by Courtaulds Ltd.

Chapter 14, titled "Ardil," notes that "'Ardil" is a vegetable protein fibre made from the proteins in ground-nuts or 'monkey nuts'. It is a product of research carried out by I.C.I. Ltd., and was developed at their Ardeer factory in Scotland, from which its name is derived." Research on the product was begun in 1935 by Professors Astbury and Chibnall, and in 1938 the first filaments were spun at Ardeer. Plans were made to construct a pilot plant, but due to the intervention of World War II, the plant was not established until 1946. Its output in 1948 was half a ton per week. Also discusses the development, chemical structure, manufacture, properties, dyeing, and uss of Ardil–with a photo and 3 references.

The contents of chapter 15, titled "Soybean Fibres" is as follows: Introduction. Manufacture. Properties. Dyeing. Uses. The chapter begins: "The Ford Motor Co. carried out research on the separation of proteins from the soy bean and

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their solution and regeneration as fibres. The fibres, which came into production in 1939, were spun and woven to make upholstery for motor-cars. In 1942 about half a ton a day of fibre was being produced. The process was taken over by the Drackett Products Co. of Cincinnati [Ohio] in 1943. Considerable earlier work had been done in England and Japan, and it is possible that in the latter country production anticipated that of the Ford Motor Co... A new plant for the commercial production of Azlon is now (1949) being built [by Drackett].

Chapter 15, titled "Zein Fibres–'Vicara,'" begins: "The production of a fibre from zein or maizin, the protein of corn, has been developed by the Corn Products Refining Co. of Illinois and by du Pont de Nemours and Co. The former company patented in 1939 a process for the production of zein from corn protein, but afterwards little more was heard of fibre production until 1948. Probably the hiatus was due to the world shortage of corn; but despite the shortage, research was carried on by the Virginia-Carolina Chemical Corporation of Richmond, Virginia, so that production could be started when the supply of corn permitted. In 1948 this organization purchased the fibre plant in Taftville [Connecticut] which had formerly been used [by Aralac Inc. and Atlantic Research Associates] for the production of 'Aralac,' the casein fibre. The factory was re-tooled and re-designed, and the production of 'Vicara,' which is an attractive fibre, is now a commercial undertaking.

Chapter 8 (p. 86-126), titled "Viscose, is about viscose rayon, a regenerated cellulose. "Development of Viscose: The greatest single factor in the development of the viscose process has undoubtedly been the support given to it by Courtaulds, Ltd., although there have naturally there have naturally appeared other viscose producers. The pioneer work was undoubtedly carried out by Courtaulds, who not only founded and developed an important new industry, but also introduced it to America under the name 'The American Viscose Co.' During the 1939-45 War this American company was sold to American interests in order to provide dollars for Britain... The present happy position of the viscose industry not only in this country [England], but throughout the world is undoubtedly due to the industrial genius of the late Mr. Samuel Courtauld." World production increased from 1,000 tons in 1900 to 8,000 tons in 1910, to 15,000 tons in 1920, to 200,000 tons in 1930, to 1,100,000 tons in 1940.

Note: The book is dedicated "To my father, William Moncrieff (1875-1954), a pioneer in the weaving of artificial fibres." A second edition was published in 1954, and a third edition in 1957.

Note: This is the earliest document seen that refers to "regenerated protein fibers." Address: B.Sc., F.R.I.C., F.T.I.

3896. Morse, W.J. 1950. History of soybean production. In: K.S. Markley, ed. 1950. Soybeans and Soybean Products. Vol. I. New York: Interscience Publishers or John Wiley & Sons. xvi + 1145 p. See p. 3-59. [59 ref]

• ***Summary:*** Contents: 1. Origin. 2. Ancient history. 3. Modern history. 4. Description of soybean plant. 5. World distribution. 6. Climatic adaptations. 7. Soil preferences. 8. Soil erosion and practices. 9. Varieties and variety improvement. 10. Fertilizer and lime requirements. 11. Inoculation. 12. Cultural methods: Preparation of seedbed, methods of seeding, time of seeding, rate of seeding, depth of seeding, cultivation. 13. Rotations. 14. Mixture with other crops. 15. Hay production. 16. Seed production. 17. Soil improvement. 18. Diseases. 19. Insect enemies. 20. Other enemies (rabbits, pigeons, pheasants).

This chapter contains many original, interesting photos and a map. Figures (photos unless otherwise indicated) show: (1) Wild soybeans, cultivated soybeans, and *Glycine gracilis.* (2) Unloading soybeans from farm carts and storing the seed in osier bins in a Chinese merchant's storage yard–Manchuria. (3) Map of the principal soybean seed producing areas and countries of the world. (4) A soybean grain market in Korea. (5) "Fertilizer used for soybeans by Manchurian farmers is compost placed in piles in the field and scattered between rows of previous year's crop just before planting soybeans." (6) Roots of soybean plant (2 photos) showing abundant development of nodules. (7) Ordinary grain drill (pulled by a tractor) may be used in sowing soybeans in rows or close drills. (8) Soybeans sown by hand on ridges in rows about 21 inches apart in Manchuria. Two horses pull a wooden plow. (9) Korean woman planting soybeans along ridged rows. (10) Soybeans planted along edges of rice paddies in Japan, China, and Korea are used for home consumption. (11) Cultivating soybeans in rows, using a tractor-pulled rotary hoe, weeder, or harrow, in the Corn Belt. (12) Hand-cultivation of soybeans in Manchuria. (13) A field of plants: "The Korean farmer grows many other crops with soybeans: millet, mung beans, buckwheat, sesame, susu, or castor beans." (14) A field of soybeans and Kaoliang in China planted in alternate hills. (15) The combine has been one of the most important factors in the economic production of soybeans in the United States. (16) Harvesting soybeans by hand methods in Manchuria. (17) Threshing soybeans in Manchuria using a stone roller pulled over the plants by horse or donkey. (18) Primitive wind method of separating soybean seed from threshed plant material in Manchuria. (19) Korean farmers threshing soybeans with bamboo flails on the home threshing ground. (20) Japanese farmers turning under soybeans in a rice paddy for soil improvement. Address: 6809 Fifth St. N.W., Washington, DC; formerly Principal Agronomist, Div. of Forage Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA, Beltsville, Maryland.

3897. Morse, W.J. 1950. History of soybean production: 5. World distribution (Document part). In: K.S. Markley, ed.

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1950. Soybeans and Soybean Products. Vol. I. New York: Interscience Publishers or John Wiley & Sons. xvi + 1145 p. See p. 10-14.

• ***Summary:*** "The production of soybeans, which for many centuries was confined to the countries of Asia, spread rapidly after World War I to the western world, and since World War II practically all leading nations have become more and more interested in the culture and production of the crop. Agricultural experiment stations throughout the world have become engaged in the development of varieties suited to their soil and climatic conditions through introduction, selection, and hybridization. Successful results have been obtained in many countries and, in a few, acreage and production have increased to the extent that the crop has become an important factor in that nation's agriculture. This is especially true of the United States, Netherland Indies, Rumania, U.S.S.R., Austria, Bulgaria, and Poland.

"The principal zones of soybean production in the Orient are China, Manchuria, Korea, and Japan. In Manchuria, the soybean occupies about 25% of the total cultivated area and is a dominating factor in the economic life of the country. As a cash crop it provides fully half the farm income in the north and more than half the total volume of freight handled by the railroads. It is estimated that from one- to two-thirds of the production of soy beans is exported; 15 to 20% is utilized for food, feed, and planting, and the remainder is used for oil extraction.

"In China, the soybean is one of the principal and most ancient of crops, ranking fifth in extent of culture and occupying about 9% of the total cultivated area. Although grown everywhere in China, about 60% of the soybean acreage is confined to three northern provinces, Shantung, Kiangsu, and Honan. China consumes practically all of her production, estimates indicating more than 50% for food, 27% for oil extraction and other purposes, 10% for stock feed, and 8% for planting.

"Korea occupies third place among the soybean-producing countries of Asia. Acreage and production are confined largely to central and northern Korea, as southern Korea, which grows principally cotton and rice, seems to be less suited to the successful production of soybeans. The entire Korean production is used for food, stock feed, planting and export, and none is used for oil extraction.

"Japan, although a large producer of soybeans, has consumed all her production and has imported large quantities from Manchuria and Korea. Acreage and production of soybeans in Japan have decreased since World War I and greater emphasis has been placed on increased production of rice. The proportions of soybeans used by Japan for various purposes are: 'miso' (soybean-rice fermented paste), 22%; soy sauce, 22%; oil and oil cake, 21.5%; soybean curd [tofu], 15.5%; confections, 7.2%; forage, 6.2%; green manure, 2.5%; seed, 1.8%; green vegetable beans, 0.8%; and miscellaneous, 0.5%.

"In the Soviet Far East, the soybean is said to be one of the chief industrial crops and in some districts constitutes 20% of the cultivated area. Acreage and production have increased markedly since 1926, especially in Khabarovsk territory, the largest seed-producing area.

"South of China, the soybean is cultivated to some extent in the Netherland Indies, India, Siam, Cochin China, Philippines, and Australia. Until 1932, the production of soybeans in the Netherland Indies was not sufficient to meet the domestic demand. Since then, acreage and production have gradually increased until soybeans began to be exported to Holland about 1936. The soybean has been widely cultivated for a long time by the natives of the hilly regions from the borders of Afghanistan eastward to Burma, to northern Siam, and French Indo-China. The crop in India has been grown for its forage and food value rather than for commerce. Although successful results have been obtained in some of the provinces with varieties of good oil content, the growing of the crop as an oil seed does not appear to have been popular with the native farmers. In Australia successful results with American varieties have greatly increased acreage and production, especially in the states of Queensland, New South Wales, and Victoria.

"Although attempts to grow soybeans in European countries have extended over many years, it is only within the past few years that there has been any appreciable production. At present, production is confined largely to European U.S.S.R., Bulgaria, Yugoslavia, Austria, Rumania, and Czechoslovakia, production being largest in Rumania, Bulgaria, and Yugoslavia. In the development of adapted varieties, some progress has been made in Sweden, Poland, Netherlands, and Hungary. Because of the economic importance of the soybean, scientists of the U.S.S.R. have carried on extensive experiments with it, especially in the development of adapted varieties and utilization. At present, the principal areas of production are Ukraine, Moldavia, and certain regions in the North Caucasus.

"Experiments have been conducted with the soybean in nearly all regions of Africa but as yet it is an unfamiliar crop to the majority of African farmer. It has been grown successfully in the upland, midlands, and coastal districts of Natal [South Africa] and throughout Gambia, Nigeria, Egypt, the Gold Coast Colony, and also in the corn- and cotton-growing districts of the Belgian Congo.

"Although the soybean has been the subject of considerable experimental work in practically all countries of the Americas, little progress has been made in commercial culture except in the United States and Canada."

Note: This is the earliest document seen (Oct. 2010) that clearly refers to soybeans in Afghanistan, or the cultivation of soybeans in Afghanistan. This document contains the earliest clear date seen for soybeans in Afghanistan, or the cultivation of soybeans in Afghanistan (long before 1950). The source of these soybeans is unknown. Address:

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6809 Fifth St. N.W., Washington, DC; formerly Principal Agronomist, Div. of Forage Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA, Beltsville, Maryland.

3898. Morse, W.J. 1950. History of soybean production: 3A. Modern history in Asia and Europe (Document part). In: K.S. Markley, ed. 1950. Soybeans and Soybean Products. Vol. I. New York: Interscience Publishers or John Wiley & Sons. xvi + 1145 p. See p. 6-9.

• ***Summary:*** "The origin of soybean culture in Manchuria is not definitely known, but it is supposed to have been brought from central China many centuries ago. At first soybeans were grown only for food but when they became a source of oil, production gradually increased. No mention has been found of soybean oil in ancient Chinese literature, so it is concluded that the crushing of soybeans for oil occurred in comparatively recent times. The production of soybeans, however, was more or less localized until after the Chinese-Japanese War (1894-1895), when Japan began to import the soybean oil cake for fertilizing purposes, resulting in a sudden expansion of demand for this product. Soybean cake became the chief end product of the oil mill industry. The Russo-Japanese War brought about a wider interest in the soybean and its products; shipments were made to Europe about 1908 and the soybean assumed worldwide attention. Acreage and production increased rapidly and the soybean became one of the most staple crops and exports of Manchuria.

"The soybean was first brought to the attention of Europeans in 1712 by Engelbert Kaempfer, a German botanist, who spent two years, 1691-1692, in Japan. Although Kaempfer discussed in detail the various food products prepared from the soybean by the Japanese, little interest was taken in the crop. According to Dale's *Pharmacologiae,* it is evident that European pharmacologists were familiar with the Japanese soybean and its medicinal uses in 1751. Soybean seed sent from China by missionaries was planted as early as 1740 in the Jardin des Plantes, Paris. The plant was experimented with at various times after this date and in 1855 the *Société d'Acclimatation* distributed seed but did not succeed in establishing a permanent culture of the plant. The soybean was grown in 1790 in the Royal Botanical Gardens, Kew, England, but apparently no effort was made toward its culture as a crop. The greatest impetus given soybean cultivation in Europe was the work in 1875 and subsequent years of Friedrich Haberlandt of Vienna, who published the results of his work in much detail. Haberlandt obtained seed of nineteen varieties–Chinese and Japanese–at the Vienna Exposition in 1873. Only four of these varieties matured and in 1877 seed was distributed to various co-operators throughout Europe. Although most of the tests gave fairly promising results, and Haberlandt strongly urged the use of the soybean as a food plant for both man and beast, the soybean failed to obtain any great importance until about 1909. Previous to this time efforts had been made to introduce the soybean and its products–oil and oil meal–from the Far East into European markets in competition with similar products manufactured from other oleaginous seeds, but they were generally unsuccessful, chiefly because of the inferior quality of the meal and oil, and unfavorable shipping conditions for the seed. Although attempts to grow soybeans in European countries have extended over many years, in general, the climatic conditions are not well suited to the successful culture of the crop. At present, production is largely confined to parts of European U.S.S.R., Austria, Bulgaria, Yugoslavia, Czechoslovakia, and Rumania." Address: 6809 Fifth St. N.W., Washington, DC; formerly Principal Agronomist, Div. of Forage Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA, Beltsville, Maryland.

3899. Morse, W.J. 1950. History of soybean production: 3B. Modern history in the United States (Document part). In: K.S. Markley, ed. 1950. Soybeans and Soybean Products. Vol. I. New York: Interscience Publishers or John Wiley & Sons. xvi + 1145 p. See p. 6-9.

• ***Summary:*** "The first mention of the soybean in the United States is by Mease in 1804, who stated that 'the soybean bears the climate of Pennsylvania very well and should be cultivated.' In 1829, Thomas Nuttall grew a variety in the botanic gardens at Cambridge, Massachusetts. From observations he wrote, 'Its principal recommendation at present is only a luxury, affording the well-known sauce, soy, which at this time is only prepared in China and Japan.' The Perry expedition to Japan in 1854 brought back two varieties of soybeans which were distributed by the United States Commissioner of Patents. Frequent references to the soybean occurred thereafter in agricultural literature under such names as Japan pea, Japan bean, and Japanese fodder plant. [Note: The last two names do not appear in the SoyaScan database as of Nov. 1991.]

"The Mammoth Yellow variety, cultivated extensively in the southern states for many years, is said to have originated from seed sent from China by missionaries in 1873. In 1878, G.H. Cook of New Brunswick, New Jersey, obtained seed of the soybean from the Bavarian station and James Neilson obtained several varieties from Vienna. Crops of these varieties were harvested in 1879. Undoubtedly these varieties were some of those grown and distributed throughout Europe by Haberlandt. In 1890, C.C. Georgeson of the Kansas Agricultural Experiment Station brought in three varieties from Japan and in 1889 W.P. Brooks of the Massachusetts Agricultural Experiment Station brought back several varieties from the same country.

"Previous to the numerous introductions by the United States Department of Agriculture beginning in 1898, there were not more than eight varieties of soybeans grown in

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the United States and these with quite limited adaptation to soil and climatic conditions. With the introduction and development of new and improved varieties adapted to a greater range of soil and climatic conditions and uses, acreage and production gradually increased. Until about 20 years ago, most of the soybeans in this country were grown in the southern and eastern states. In 1919, the five leading states in soybean acreage were North Carolina, Virginia, Mississippi, Kentucky, and Alabama. By 1924, the relatively more rapid expansion of the crop in the north central region of the country brought Illinois into the leading position, followed by Indiana, Tennessee, North Carolina, and Missouri. Illinois has held the lead in acreage and production ever since, and the north central region has grown in importance as a region of soybean production and processing.

"Soybeans at first, and for several years, were grown primarily as a forage and pasture crop. Previous to 1930 the acreage harvested for seed was less than one-fourth the total acreage grown for all purposes. With the adaption [adoption] of improved methods of culture, improvement of machinery for planting, cultivating, and harvesting, adapted improved varieties for processing for oil, and with the development of markets for soybeans for crushing purposes, a gradual increase in the proportion of acreage harvested for soybeans took place. In 1939, 40% of the total soybean acreage was harvested for seed. The proportion for this purpose increased rapidly during the war years. In 1944, 72% of the total planted acreage was harvested for seed and in 1947, 84.5%. An important factor in the marked increase in acreage of soybeans in 1934 was the severe drought, which ruined large acreages of corn, small grains, and tame hay in the early season of the year–as a result of which soybeans were planted as an emergency crop. The program of the Agricultural Adjustment Administration, United States Department of Agriculture was a stimulus to the expansion in acreage of soybeans in the last half of the 1930's. Corn acreage limitations and allotments restricted the acreage of corn and so increased the acreage of cropland available to other crops. Soybeans for seed, although classified as a soil-depleting crop in the principal producing regions, competed effectively for part of this acreage. The greatest annual increase in acreage of soybeans harvested for seed occurred in 1942, in response to the urgent appeal by the Government early that year for a large increase in soybean production to meet wartime demands for oil and fats. Programs of production goals and guaranteed support prices have contributed to maintaining production at a high level since 1942. The Government program for soybean processors, which greatly reduced their risks, was also of importance.

"Standards for use in grading and marketing soybeans were set up by the United States Department of Agriculture as early as 1925 and in 1936 a future [futures] market for soybeans was established in Chicago. In 1929, a soybean laboratory was established in Ohio by the United States Department of Agriculture to conduct research toward the development of high-oil and high-protein varieties. In 1936, the United States Regional Soybean Industrial Products Laboratory was located at Urbana, Illinois, and in co-operation with the experiment stations of the 12 north central states began agronomic investigations in the development of new improved varieties for industrial purposes and chemical research on the development of new industrial uses for soybeans. In 1942, the laboratory work devoted to industrial uses was transferred from Urbana to the Northern Regional Research Laboratory at Peoria, Illinois. At this time the agronomic research remaining at Urbana was designated the United States Regional Soybean Laboratory and was expanded to include 12 southern states in addition to the 12 north central states originally served. The Regional Research Laboratory at Peoria conducts research on soybean processing and on processing and utilization of the oil and oil meal for food and industrial purposes.

"Numerous commercial concerns as well as many public research institutions, are conducting research designed to develop more efficient techniques in processing soybeans for food and industrial uses. Much research is also being conducted on methods for improving the quality of oil and flour, and for adapting these products to specific uses." Address: 6809 Fifth St. N.W., Washington, DC; formerly Principal Agronomist, Div. of Forage Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA, Beltsville, Maryland.

3900. Morse, W.J. 1950. History of soybean production: 9. Varieties and variety improvement (Document part). In: K.S. Markley, ed. 1950. Soybeans and Soybean Products. Vol. I. New York: Interscience Publishers or John Wiley & Sons. xvi + 1145 p. See p. 17-23.

• ***Summary:*** "Varieties of soybeans are very numerous [especially in East Asia], no doubt because of the fact that the soybean seems to be peculiarly sensitive to changes of soil and climatic conditions." Differences in behavior of the same pure-line variety in different locations are often so striking that it is difficult to believe that the variety is the same.

In China, soybean varieties are quite numerous and "are classified according to color, size, shape, time of planting, method of planting and use. The local names of varieties differ in different localities so that it is very difficult to obtain a variety which is widely known." There has not been much organized research on soybean varietal improvement in China. "The University of Nanking has done more work of this kind than any other organization."

Although many soybean varieties are grown in Manchuria, only three types are distinguished: yellow, green and black. This has apparently been found adequate for commercial purposes. In detail, these three groups are:

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(1) Hwang Tou–yellow beans. (a) Pei Mei (white eyebrow, pale hilum). (b) Chin Huang (golden yellow or golden round). (c) Hei Chi (black belly), dark hilum. These three varieties are highly prized for the quality of their oil, but Pei Mei and Chin Huang are also valued for the soybean curd [tofu] made from them.

(2) Ching Tou–green beans. (a) Green with yellow germ or cotyledon. (b) Green with green germ or cotyledon. The green bean with the yellow germ yields more soybean curd but of an inferior quality compared to that of the yellow varieties. The green bean with the green germ is preferred for making sprouts.

Hei Tou or Wo Tou–black beans. (a) Ta Un Tou (large, black), green germ. (b) Hsia Un Tou (small, black), yellow germ. (c) Puen Un Tou (flat, black), yellow germ. The Ta Un Tou is used for oil, the Hsia Un Tou for oil and Horse feeds, and the Puen Un Tou for salted fermented soybeans [fermented black soybeans].

"Most of the varieties grown by Manchurian farmers consist of a mixture of varieties of which more than 90% are yellow-seeded types." The distribution throughout Manchuria of the various types is discussed. Native Korean soybean are classified into eight different groups.

Since 1898 the USDA had brought into the United States more than 10,000 introductions from China, Manchuria, Korea, Japan, India, Netherland Indies [Indonesia], South Africa, and several European countries.

Table 1 (two pages) shows the "Characteristics of soybean varieties most generally grown in the United States," arranged into seven groups from very early to very late maturity. For each variety in every group is given: Seed color (black, brown, green, olive or greenish yellow, straw yellow), hilum color (black, brown, dark brown, light brown, pale), seeds per lb., oil %, protein %, iodine value (range: 119 to 140), pubescence color (gray, or tawny), flower color (purple, white, or purple & white), shattering (little, medium, or much), and use (commercial {grain or oil and meal}, forage, or vegetable). The groups are: (1) Very early: Agate, Capital, Cayuga, Flambeau, Goldsoy, Habaro, Kabott, Mandarin, Mandarin 507, Mandarin (Ottawa), Minsoy, Ontario [developed in USA], Pridesoy, Sac.

(2) Early: Adams, Bansei, Earlyana, Hawkeye, Illini, Kanro, Lincoln, Manchu, Manchu 3, Manchu 606, Manchukota, Mendota, Montoe, Richland, Seneca.

(3) Medium Early: Chief, Dunfield, Hokkaido, Hongkong, Jogun, Mandell, Mingo, Mukden, Scioto, Viking.

(4) Medium: Aoda, Boone, Funk Delicious, Gibson, Kingwa, Macoupin, Mount Caramel, Patoka, S100, Virginia, Wabash, Wilson.

(5) Medium late: Arksoy, Arksoy 2913, Haberlandt, Laredo, Ogden, Ralsoy.

(6) Late: CNS, Mamloxi, Mammoth Yellow, Palmetto, Roanoke, Tanner, Tokyo, Volstate, Woods Yellow.

(7) Very late: Acadian, Avoyelles, Gatan, Otootan, Pelican, Seminole, Yelnando.

"Varieties now grown in the United States may be divided into three general groups, namely commercial (grain), vegetable, and forage. Varieties for commercial seed production are preferably yellow-seeded and are used largely for processing for oil, meal, and soybean flour, but these varieties may also be used for forage purposes if heavier rates of seeding are used. The varieties used principally for forage and green manure are the black- and brown-seeded varieties, which for the most part are low in oil but yield a finer and heavier forage than the commercial and vegetable varieties.

"The term 'vegetable varieties' has been applied to varieties introduced from oriental countries where they are used solely as green vegetable or dry, edible soybeans. In extensive tests of the quality of the green and dry beans made by the Bureau of Human Nutrition and Home Economics, Department of Agriculture, and by departments of home economics of various agricultural colleges, the vegetable varieties have proved much superior to the field or commercial varieties in flavor, texture, and ease of cooking. Many of these vegetable types have been found through experiments to be superior to commercial types for soybean milk, soybean flour, soybean curd, salted roasted soybeans, and other food products. (See Chapter XXV). The varieties used for processing and forage purposes usually do not cook easily and have a raw 'beany' flavor. Nearly all vegetable varieties cook easily and have a sweet or bland nutty flavor. The most suitable vegetable varieties are those with straw-yellow, greenish-yellow, or green seed, although a few black, brown, and bicolored varieties do have superior qualities as green shelled beans. Vegetable varieties, ranging in maturity from 75 to 175 days, have been developed for all soybean-producing areas in the United States.

"Several commercial companies have canned large packs of the green shelled beans of the vegetable varieties. Quick-frozen green shelled beans alone and in succotash have been placed on the market by several companies, the frozen product being highly satisfactory in color, texture, and flavor. For canning or quick freezing in the green stage, the yellow- and green-seeded varieties make a more attractive product than the black-, brown-, or bicolor-seeded varieties. Vegetable varieties have also become quite popular with the home gardeners and many seedsmen in various sections handle two or more varieties" (p. 22).

Listed from very early to very late, vegetable varieties include: Agate, Sac, Bansei, Kanro, Mendota, Hokkaido, Jogun, Aoda, Funk Delicious, and Seminole. Address: 6809 Fifth St. N.W., Washington, DC; formerly Principal Agronomist, Div. of Forage Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA, Beltsville, Maryland.

3901. Noda Shoyu Co. 1950. [Labor agreement]. Tokyo:

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Yoshida Shuppansha. 50 p. [Jap]*
Address: Noda, Japan.

3902. Zakkoku Shorei-kai. 1950. Daizu no kenkyû [Soybean research]. Tokyo: Sangyo Tosho. 268 p. [Jap]
• ***Summary:*** Pages 174-85 discuss: 1. Roasted soybeans (*irimamé*). 2. Cooked whole soybeans and ground soybeans (*nimamé, udemamé, mamé-zuri*). Soaked soybeans (*hitashi-mamé*). 4. Uncooked ground soaked soybeans (*goto* and *go*). 5. Ground soybean paste molded into shapes (*uchigo, gotsu-dotsu,* and *jinda tofu*). 6. A mixture of soybean paste and rice molded into a stick shape (*mamé-shitogi*). 7. Goto miso and Goto miso soup (*Goto misoshiru*). 8. Various kinds of natto. 9. Miso. 10. Miso soup. 11. Roasted soy flour, and soybean flour (*kinako* and *tofun*). 12. [Soy] bean sprouts (*moyashi*). 13. Soybeans soaked in their pods (*mamé-tsuke*).

Note: This is the earliest document seen (Nov. 2008) that mentions *jinda* or *jinda tofu.*

3903. Yuasa Shoyu Jozo Dogyo Kumiai [Yuasa Shoyu Brewers' Assoc.]. ed. 1950? Yuasa shôyu enkaku taiyô: Nihon shôyu jôzô no biso. Wakayama-ken jûyô bussan [Summary of the history of Yuasa shoyu: The originator of Japanese shoyu brewing. An important product of Wakayama prefecture]. Yuasa-cho, Arita-gun, Wakayama prefecture, Japan. 200 p. [Jap]
• ***Summary:*** Company name with diacritics is: Yuasa Shôyu Jôzô Dogyo Kumiai. The head of the Brewers' Assoc. is Seshichi Kubo. Included in this history of Yuasa shoyu are logos of at least 6 major Yuasa shoyu manufacturers, together with the company name. Histories of individual companies are not included. One of the companies is Kadocho Shoyu; the founder of its parent company (honke) was Kodaya Umataro.

Yuasa shoyu originated in 1230 A.D., the 4th year of the Antei period. It started to be produced and sold during the Bunreki period by Bo Iwasa. It started to be shipped to Osaka in 1535 (the 4th year of the Temmon period) by Akagiri Zenuemon (or Yoshiuemon). The Yuasa shoyu dealer in Osaka (Yuasa Zogyojo) was Ihei Komatsuya. The Osaka shoyu distributor was established in 1782 (the 2nd year of Temmei) by Matsutaro Kochiya. The Yuasa Shoyu Brewers' Assoc. was founded on 21 June 1899 (the 32nd year of Meiji). Production is 52,700 koku (1 koku = 180 liters, so 9,486,000 liters), worth 850,000 yen. Address: Yuasa, Wakayama prefecture, Japan.

3904. Hokubei Mainichi Shinbunsha. comp. 1951. Hokubei Mainichi nenkan [Hokubei Mainichi year book]. San Francisco, California: Hokubei Mainichi Shinbunsha. 772 p. Index (at front). Illust. (in ads). 22 cm. [Eng; Jap]
• ***Summary:*** This 1951 yearbook was printed on 30 Nov. 1950 and published on 5 Dec. 1950. At the beginning of every city with a large number of Japanese residents is an index and a list of phone number abbreviations. A typical entry starts with the company name in Japanese, then the company name, address and phone number in English. Address: 1737 Sutter St., San Francisco, California 94115. Phone: Jordan 7-7323.

3905. Morse, W.J. 1951. What's in a name? *Soybean Digest.* Jan. p. 22-24.
• ***Summary:*** "Ancient Chinese literature recording the advice of agriculturists on the best varieties of soybeans to plant under different soil and climatic conditions and the utilization of certain varieties for specific purposes, indicates that the soybean was perhaps one of the oldest crops grown by man [sic]. Varieties of soybeans are very numerous in oriental countries, especially Korea. There during agricultural explorations by the United States Department of Agriculture in 1929 to 1931 more varieties showing a wider range of color, size, and shape of seed and plant characters were found than in China, Manchuria, and Japan.

"The soybean is peculiarly sensitive to changes of soil and climatic conditions and this explains undoubtedly to a very great extent why practically every locality in the soybean regions of eastern Asia has its own varieties. Explorations in small villages in China and Korea revealed that nearly every family had its own favorite varieties for different uses.

"It is noteworthy that of the large number of varieties introduced into the United States from the Orient the same variety has rarely been secured a second time unless from the same locality. Obviously, centuries of experience aided by natural crossing and selection have brought about the development of the vast number of varieties for special purposes under local conditions in China, Korea, and Japan.

"Prior to the introduction of numerous varieties of soybeans by the Department in 1898, not more than eight varieties had been grown in the United States. The culture of these was limited to a few well-defined areas. During the past 50 years the Department has made several thousand introductions of soybeans from China, Korea, Manchuria, Indonesia (Java), and India, representing many hundreds of distinct types.

"This large collection, ranging in maturity from 75 to 200 or more days, has shown wide differences in color, size, shape, composition and quality of seed, plant characters, utilization, and in adaptation to the various soil and climatic conditions in the United States.

"In a recent review of all introductions received from eastern Asia, it was noted that a large number of those from China, Korea, and Japan were sent in under their native varietal names, the translation of which revealed some very interesting and perplexing names. It was interesting to note among the oriental names three–Chief, Chestnut, and Hawkeye–that breeders in the United States have assigned to varieties developed for their own local conditions.

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"The many peculiar oriental varietal names of soybeans suggested the title of this article. It was thought that American soybean breeders and growers would be interested in knowing the sort of varietal names soybeans have in other parts of the world.

"It is obvious that the oriental breeder or grower, in naming some of the varieties, must have been in a poetic frame of mind in assigning such names as 'Heaven's Bird,' 'White Spirit of the Wind,' 'Flower Garden,' and 'Clasped Hands.'

"The large number of varietal names is quite understandable as they indicate various seed and plant characters, temples, villages, prefectures, animals, birds, uses, and occasionally a breeder's name. This will be noted in the following lists and selected classification of varieties.

"It is not to be assumed that these lists of names represent all of the varieties grown in these countries. In fact, they are only a selected number from the varieties introduced into the United States during the past 50 years. It was interesting to note that some of the Chinese varietal names were the same as those in Chinese literature dating back 100 years ago."

"Selected classification of Chinese soybean varieties:

"Seed Color: Black Belly, Chicken's Foot Yellow, Crow's Eye Yellow, Crow's Skin Green, Flesh Yellow, Musk Deer's Skin Yellow, Parrot Green, Raven's Eye Yellow, Tiger Skin.

"Seed Size: Great White, Large Black, Large Green, Large White Eyebrow, Small Golden.

"Seed Shape: Flat Black Golden Round, Large Round Black, Pearl Shape, Round Pearl, Small Round Green.

"Hilum (Seed scar): Flowery Eyebrow, Large White Eyebrow.

"Maturity: August Green, Autumn Azure, Burst Pods in Six Months, Eighth Month White, Fifth Month Yellow, Melon Ripe, Midsummer Yellow.

"Pods: Five Month Broad Pod, Four Grain Green, Four Grain Yellow, Iron Pod Green, Three Bean Pod, White Podded Green.

"Leaf: Long Large Green Leaf.

"Pubescence: Hairy Green, Red Hair Green, Sixth Month White Hairy, Yellow Hair Green.

"Utilization: Black Curd, Follow Rice, Round Cattle Feed, Vegetable.

"Odd Names: Entwined Silk, Moon Tooth, Sparrow's Cackling, Unknown Water."

"Selected classification of Korean varieties:

"Seed Color: Barbarian Blue, Black Chestnut, Castor Bean Skin, Golden, Indigo, Lacquer Black, Red Striped, Rich Black, Widower (Black and White), Yellow Dragon's Eye.

"Seed Size: Big Green, Large Black, Small Blackeye, Small Blue.

"Flower: Early White Flower, Large White Flower, White Flower Pure Yellow.

"Hilum: Chotan White Eye, Green Eye, Purple Mouth, Rensen Brown Eye, Small Blackeye, White Eye.

"Maturity: Aid For New Land, Black Sprout, Black Vegetable, Edible, Millet Friend, Plant In Millet, Plant in Wheat, Plant Between Crops, Rainy Season, Roasting, Sprout.

"Habit: Climbing.

"Leaf: Bamboo Leaf.

"Birds: Crow's Early, Domestic Geese, Pigeon, Skylark, Swallow, Water Rail.

"Animals: Deer, Horse, Mouse, Red Rat, White Horse.

"Village: Anpen, Chotan, Tansen.

"Superior Varieties: Great Happiness, Plentiful, Prolific, Rich, Rich and Virtuous.

"Odd Names: Beheaded, Clasped Hands, Cow's Knee, Flying Fish, Flower Garden, Peaceful, South Sea, Spirit of the Wind, Turtle Nest, White Priest's Foot, Wild Boar's Hip."

"Selected classification of Japanese varieties:

"Seed Color: Black Autumn, Black Saddle, Brown Spotted, Green Fool, India Ink, Mink Skin, Pretty Flesh Color, Silver White, Yellow Jewel, Yellowish White Blackeye.

"Seed Size: Large Green, Large Jewel, Large White, Large White Ring, Small Blackeye, Small Bullet, Small White.

"Seed Shape: Gingko Seed Shape, White Ball, Water Caltrop Shape.

"Hilum (seed scar): Blackeye, Green Eye, No Eye, White Eye, White Mouse Eye.

"Pods: Black Eye Long Pod, Black Pod Gold, Four Seeded Yellow, Fox Pod, One Seed, Red Pod, Three Seeded Pod, Two Seeded Pod, Yellow Pod, White Pod.

"Pubescence: Early Smooth, Green Non Hairy, Half Smooth, Middle Season Smooth, Naked Devil, Non Hairy, Smooth White, Smooth Devil, White Hair.

"Stems: Fan Shape Stem, Red Stalk, Single Stalk, White Stem.

"Leaf: Five Leaf Saddle, Monbetsu Long Leaf.

"Habit of Growth: Akita Bunch, Bunching Maiden, Doesn't Touch The Earth, Dwarf, Very Bunched Pods.

"Maturity: August, Black Autumn, Early Gold, Middle Season, October, Very Early Abundant, Yellow Fall, Midseason Fox, Through Frost, White Autumn.

"Utilization: Devil Chaser [for roasted soybeans–irimame], Forage, Miso, Natto, Paddy Field Boundary, Produces in Shady Places, Soy Sauce, White Sprout.

Superior Varieties: Abundance, Abundant Pods, Brings Treasure, Early Increase, Excessive Yield, Fortune, Heavy Yield, One Hundred Percent Good, Small, Fortune, One Thousand Pod.

"Animals: Early Fox, Mink, Mouse, Small Donkey, Tiger.

"Birds: Crane's Friend, Dove, Dove Killer, Sparrow,

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Wild Duck, Wild Goose, Young Crane.

"Persons: Bingo's White, Chichanari, Hachiya.

"Prefectures (states): Aizu, Chiba, Echigo.

"Shrines: Goshanari, Miyashiro, Zankonji.

"Villages: Chizuka, Hachirihan, Iwakiri.

"Odd. Names: Covered with Frost, Bright Country, Elder Brother, Enter Priesthood, Heaven's Bird, Old Woman's Cane, Pretty Girl, Through the Water, Under The Snow, White Dog's Foot."

Photos show: (1) Bean curd [tofu] cakes being sold by vendors on streets in Peking, China. In the Orient special varieties of soybeans are used in the manufacture of bean curd and many other soy products. (2) Korean farmers' market day held weekly in the small villages. This offers a rich source of soybean varieties. (3) Japanese farm girls planting seed of the Azemame (Paddy Field Boundary Soybean) variety on the land bounding a rice paddy. The beans are used in making miso (salty soy paste), soy sauce, and other foods for human consumption.

Note: This is the earliest English-language document seen (Aug. 2011) that uses the term "salty soy paste" to refer to miso. Address: Retired Principal Agronomist, Div. of Forage Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U.S. Dep. of Agriculture, USDA.

3906. Nakamura, Michinori; Yamazaki, Kyoji; Maruo, Bunji. 1951. [Studies on the enzymic formation and degradation of starch. IV. Distribution of phosphorylase, phosphatase, and β-amylase in plants (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 24(5):197-201. March 1. [23 ref. Jap; eng]
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Tokyo Univ., Tokyo, Japan.

3907. Bening, W. 1951. First published report on soybeans: It was written in Germany in 1712. *Soybean Digest.* March. p. 20-22.
• ***Summary:*** This book was the *Amoenitatum Exoticarum* ("Exotic Novelties") by Engelbert Kaempfer. The book, itself, is located in a locked glass case at the Engelbert Kaempfer Museum, in the dreamy medieval town of Lemgo, Germany, where Kaempfer was born on 16 Sept. 1651. When he died, he left behind his extensive diaries, drawings, and manuscripts, some of which are still among the rare materials of the British Museum in London. Kaempfer had a lifelong desire to travel abroad and an "unbelievable capacity for learning foreign languages... An amateur in almost all fields of science, with profound knowledge in medicine, botany, and pharmaceuticals, at the age of 32 Engelbert managed in 1713 to be engaged as secretary to the Royal Swedish Ambassador Extraordinary on a special mission to Persia. And some years later, after many story book adventures, he was assigned as surgeon in the colony of the Dutch East India Company in Japan."

The author then gives an English-language translation of what Kaempfer wrote about the soybean. "This [Dutch East India] company operated at that time the only European colony in Japan. It was licensed by the emperor of the country. The colony was hermetically sealed from the country and its inhabitants. Laws were extremely severe on foreigners as well as the natives.

"Kaempfer, whose only wish was to study the country and its population, despaired. Yet under these hard circumstances, he wrought the masterpiece of his life. His open character and untroubled friendliness to all, and his extraordinary gift of learning languages overnight, opened to him the minds and hearts of the Japanese people...

"Engelbert Kaempfer in those prison years on the little island of Deshima, laid the foundation of western science in Japan.

"When Engelbert returned to Lemgo 10 years after he had left home, he wrote his *Amoenitates Exoticae* in the difficult Latin language of those times."

Photos show: (1) Kaempfer's book, opened to the illustration of a soybean plant. (2) Dr. W. Bening, "a German nutritionist and soya expert, who has been connected with the program for improvement of the German diet with soy foods." (3) The outside front of the Engelbert Kaempfer Museum near Lemgo. (4) Page 840 of Kaempfer's book, which contains a brief discussion of Siuku, or Kuro Mame [black soybeans]. Address: PhD, German nutritionist and soya expert.

3908. Iguchi, Nobuyoshi. 1951. Kôji-kin ni kansuru kenkyû. III. Shôyu kôji-kin heni kabu no koso ryoku to kosan seisan ni tsuite [Studies on *Aspergilli.* III. The effects of ultraviolet radiation on the power of enzyme activities and production of koji acid in *Aspergillus sojae*]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 24(6):283-87. March. [13 ref. Jap; eng]
Address: Noda Industrial Science Lab., Noda, Japan (Noda Sangyo Kagaku Kenkyusho).

3909. Kibi, Masajiro. 1951. Shôyu jôzô-yô kôji-kin ni tsuite. III. [On the varieties of *Aspergillus oryzae* employed in shoyu manufacture. III. The amylase and the protease]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 24(6):278-81. March. [10 ref. Jap; eng]
Address: Microbiological Lab., Yamasa Shoyu Co., Ltd. (Yamasa Shoyu K.K. Kenkyusho. Biseibutsu Jikken-shitsu: Nôgaku-shi).

3910. Nagata, Tadao. 1951. Daizu ni okeru hashu-ki ni yoru keichô no henka no hinshu kansai ni tsuite [On the varietal difference of the mode of change of stem length due to seeding periods in soy beans]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*)

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19(3-4):279-82. March. [5 ref. Jap; eng]
Address: Nara Gakugei Daigaku, Nara, Japan.

3911. Obata, Yataro; Yamanishi, Tadashi. 1951. Shôyu no kôki. I. Tanpakushitsu bunkai-butsu oyobi amino-san yori shôjiru kôki ni tsuite [Studies on the flavors of soy (sauce). I. On the flavors developed from hydrolyzed protein and amino acids]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 24(5):226-29. March. [13 ref. Jap; eng]
Address: Lab. of Agricultural Chemistry, Hokkaido Univ., Japan.

3912. Watanabe, Tokuji; Hayakawa, A.; Kamata, H.; Sakurai, Y. 1951. Daizu tanpakushitsu ni kansuru kenkyû. I. Daizu no kanetsu, yôzai shori, chozô ga daizu tanpaku ni oyobosu eikyô. II. Daizu tokuni keiatsu-saku dasshi daizu no tanpakushitsu no chozô-chû ni okeru henka ni tsuite. III. Daizu no kasui kanetsu ni yoru tanpakushitsu no suiyô-sei no henka [A study of soybean protein. I. On the effect of heating, solvent treatment and storage of soybean on its proteins. II. On the denaturation of soybean protein and mildly pressed soybean cake during storage. III. On the effect of heating of soybeans with water on the protein solubility in water]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 5. p. 51-57. March. [Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

3913. Obata, Yataro; Yamanishi, Tadashi. 1951. Shôyu no kôki. II. Merukaputan to arudehido yori shôzuru kôki [Studies on soy sauce flavors. II. The flavors of the compounds obtained by the reaction of mercaptan with aldehydes]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 24(7):334-38. April. [15 ref. Jap; eng]
Address: Lab. of Agricultural Chemistry, Hokkaido Univ., Japan.

3914. Yokotsuka, Tamotsu. 1951. Shôyu kôki seibun ni kansuru kenkyû. II. Shôyu no hikaori (1). $C_{10}H_{22}O_3$ naru acetyl no bunri [Studies on flavorous substances in soy [sauce]. II. Flavors resulting from heating. (1) Isolation of an acetal $C_{10}H_{22}O_3$]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 24(8):355-58. May. [3 ref. Jap; eng]
Address: Noda Industrial Science Laboratory.

3915. Yokotsuka, Tamotsu. 1951. Shôyu kôki seibun ni kansuru kenkyû. III. Shôyu no hikaori (2). $C_{10}H_{22}O_3$ oyobi $C_9H_{20}O_2$ no kôzô-shiki [Studies on flavorous substances in soy [sauce]. III. Flavors resulting from heating (2) The constitutional formula of $C_{10}H_{22}O_3$ and $C_9H_{20O}Â_2$]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 24(8):358-62. May. [3 ref. Jap; eng]
Address: Noda Industrial Science Laboratory.

3916. Yokotsuka, Tamotsu. 1951. Shôyu kôki seibun ni kansuru kenkyû. III. Shôyu no hikaori (3) [Studies on flavorous substances in soy [sauce]. IV. Flavors resulting from heating (3) Color reaction of acetals]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 24(9):402-06. June. [2 ref. Jap; eng]
Address: Noda Industrial Science Laboratory.

3917. Yokotsuka, Tamotsu. 1951. Shôyu kôki seibun ni kansuru kenkyû. III. Shôyu no hikaori (4) [Studies on flavorous substances in soy [sauce]. V. Flavors resulting from heating (4) Decomposition of flavors by alkali or light]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 24(9):407-09. June. [4 ref. Jap; eng]
Address: Noda Industrial Science Laboratory.

3918. Obata, Yataro; Yamanishi, Tadashi. 1951. Shôyu kôki no kenkyû. III. Fuhôwa arudehido oyobi fuhôwa keton no gôsei [Studies on soy sauce flavors. III. Synthesis of unsaturated aldehydes and ketones]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 24(10):479-81. July. [10 ref. Jap; eng]
Address: Inst. of Agricultural Chemistry, Hokkaido Univ., Sapporo, Japan.

3919. *Soybean Digest.* 1951. Accept "Soyalac" as infant food. July. p. 22.
• ***Summary:*** "'Soyalac,' a vegetable milk produced by the International Nutritional Laboratory, Mt. Vernon, Ohio, has been accepted as an infant food by the Council on Foods of the American Medical Association, Dr. H.W. Miller, the president announces.

"Miller began development of 'Soyalac' in China over 15 years ago. It is prepared from the valuable protein and oil of the soybean. Its carbohydrates are a combination of sugars and it is reinforced with minerals to build it up into infant food to care for nutrition problems from birth to weaning time.

"'In order to meet the requirements of the American Medical Association, a vast amount of experimental work was necessary, not only to produce feeding results with 'Soyalac' by leading child specialists, but to obtain records of the feeding of large groups of babies over a long period of time,' said Dr. Miller. 'These results were obtained in America, Japan, the Philippine Islands and China. 'Soyalac' was granted acceptance on the basis of its splendid record as a hypoallergic food.'

"International Nutrition Laboratory was recently purchased by Loma Linda food Co., Arlington, Calif., and is now being conducted as the latter firm's eastern division.

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Products manufactured by the Mt. Vernon plant will be almost exclusively derived from the soybean.

"The firm has set up the International Research Foundation in charge of Dr. Miller. The plan is to continue research into and investigation of soy products."

3920. Mogi, Masatoshi; Nakajima, Shigeji; Iguchi, Nobuyushi; Yoshida, Fumihiko. 1951. Kyôka miso no kenkyû. I. Furabin seisan ôki kôji-kin ni yoru miso shijô shiken [Studies on fortified miso (Fermented soybean paste). I. Trial brewing of miso with a riboflavin-producing strain of *Aspergillus oryzae*]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 29(8):302-310. English-language summary on p. 44 of this issue. [11 ref. Jap; eng]

• ***Summary:*** (1) Out of 121 strains of *Aspergillus oryzae* taken from many kinds of miso and koji starter (*Tané-koji*), eleven strains which produced riboflavin comparatively well were selected by means of culturing in Pfeffer's solution. (2) A strain that produces the most riboflavin was selected from these 11 strains by manufacturing soy-bean and rice malts.

(3) A sort of fortified miso was made on trial by using this strain, and it produced 3 times the ordinary amount of riboflavin in "rice Miso" and 2.4 times the amount of riboflavin in wheat Miso. Note: This is the earliest English-language document seen (Feb. 2009) that uses the term "rice miso" to refer to miso having rice and soybeans as its main ingredients. Address: Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan (Noda Sangyo Kagaku Kenkyujo).

3921. Obata, Yataro; Sakamura, S.; Yamanishi, T. 1951. Shôyu kôki no kenkyû. IV. Shôyu kôki no hassei jôken [Studies on the flavor of soy sauce. IV. On the conditions of the soy flavor development]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 25(1):8-12. Aug. [13 ref. Jap; eng]
Address: Dep. of Agricultural Chemistry, Hokkaido Univ., Japan.

3922. *Soybean Digest.* 1951. Japanese visitor. Aug. p. 31.

• ***Summary:*** "A study of U.S. soy products has been made by Shuichiro Kimoto, director of research and development of the laboratories of Yoshihara Oil Mill, Ltd., Kobe, Japan. Kimoto, who is now in New York City, is interested in taking back information about the technical aspects of the manufacture of U.S. soy products to the Japanese people... The Yoshihara firm processes a large number of oilseeds, including soybeans. The solvent, screw press and hydraulic processes are all used. Kimoto is a lecturer on agricultural chemistry in Japanese universities."

Note: This is the earliest document seen (Jan. 2014) that mentions the Yoshihara Oil Mill in connection with soybeans.

3923. Sakaguchi, Kinichiro; Amaha, Mikio. 1951. Saikin hôshi no tainetsu-sei ni kansuru kenkyû. I. Tainetsu-sei sokute-hô narabini sûshu no inshi no eikyô ni tsuite [Studies on the heat resistance of bacterial spores. I. On the method of determining the heat resistance and the effects of several factors]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 25(2):104-08. Sept. 1. [12 ref. Jap; eng]

• ***Summary:*** The "basic heat resistance" of spores of the aerobes (i.e., the survival time at 100ºC. with spore concentration of 50 million per ml.) are as follows:

Bacillus natto 16 minutes. *Bacillus subtilis* 10 minutes. *Sac. mesentericus* 10 minutes. *Bacillus megatherium* 8 minutes. *Bacillus mycoides* 10 minutes. Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo, Japan.

3924. Amaha, Mikio; Sakaguchi, Kinichiro. 1951. Saikin hôshi no tainetsu-sei ni kansuru kenkyû. II. Hôshi nôdo to tainetsu jikan no kankei ni tsuite [Studies on the heat resistance of bacterial spores. II. On the relation between spore concentration and survival time]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 25(3):140-44. Oct. 1. [8 ref. Jap; eng]
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo, Japan.

3925. Paddleford, Clementine. 1951. Flowers and food: Fae Huttenlocher's tables are beautiful, her meals delicious. And they all have a Japanese flavor. *Los Angeles Times.* Oct. 7. p. G24.

• ***Summary:*** Mrs. Tomoko Yamamoto lived in San Francisco until World War II, when she was sent to a relocation camp, then to Des Moines, Iowa, where she worked as a housekeeper for Fae Huttenlocher.

Jumbo shrimp tempura was served for dinner, to be dipped into a small bowl of soy sauce. "A touch of sugar was added to the sauce to lighten its salty taste." Address: *This Week* food editor.

3926. *New York Times.* 1951. News of food: Dried minnows among the exotic foods, mostly Japanese, sold at grocery here. Oct. 23. p. 32.

• ***Summary:*** About Joe Oyama's Oriental Food Shop at 2791 Broadway (at 107th St.) in New York City. The many Japanese foods he sells include: (1) Pickles of "cucumber in bean paste" [miso]. (2) Burdock root, which is "sometimes fried in bean oil seasoned with red pepper and soy sauce." (3) "Gomoku-no-moto–a combination of [diced] carrots, bamboo shoots, lotus roots, fried bean curds [agé], and Japanese mushrooms."

During World War II he shipped parcels of such foods as rice, soy bean paste [miso], and pickled radishes [daikon] "to the Japanese-Americans, who comprised the famed 442d

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Regimental Combat Team."

3927. Shinozaki, Yoshiji; Sato, Sadakichi; Kurebayashi, Sumiko. 1951. Nattô-kin ni yoru daizu tanpakushitsu no [The decomposition of soya-bean protein by *Bacillus natto*]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 21(4):151-54. Nov. 20. [9 ref. Jap]
Address: Kawasaki Chuô Health Centre, Kawasaki.

3928. Hirano, Mitsuo. 1951. Complaint from Japan [Crushers dissatisfied with quality of U.S. soybeans] (Letter to the editor). *Soybean Digest.* Nov. p. 38.
• ***Summary:*** Notes that in 1951, Japan purchased about 270,000 tons of soybeans from the USA on a commercial basis–in part because it was difficult to import soybeans from China and Manchuria after World War II and because of the "Korean incident." Japanese processors have expressed their dissatisfaction with the quality of these U.S. soybeans. The beans were purchased on the basis of Yellow No. 2, but it is the common opinion in Japan that they are of lower quality, and in fact are "much inferior to Manchurian soybeans." The U.S. soybeans contained a much higher percentage of foreign material (such as corn, cottonseed, broken stems, sand, and splits) and damaged kernels than Manchurian soybeans. American exporters should pay more attention to the quality of the soybeans they export from Japan.

A table shows Japanese imports of soybeans by country of origin from 1946 to 1951. The USA was the main source every year except 1950, when China was. In 1948 Japan imported 6,158 tons from Java, and in 1951 about 100 tons from Siam [Thailand]. Address: President, Assoc. of Fat and Oil Manufacturers, Tokyo, Japan.

3929. *Soybean Digest.* 1951. Grits and flakes... from the world of soy: Leaflet on soybeans in Japan. Nov. p. 42.
• ***Summary:*** "A leaflet with pictographs showing the production of soybeans and their usage in Japan has been issued by the Soya Bean Extraction Oil Mill Association of Japan. The leaflet is printed in both Japanese and English."

3930. Yokotsuka, Tamotsu. 1951. Shôyu kôki seibun ni kansuru kenkyû. VI. [Studies on flavorous substances in soy [sauce]. VI. Flavors with high boiling points. (1) Palmitic acid ethyl ester and Linolic acid ethyl ester]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 25(4):206-10. Nov. [8 ref. Jap; eng]
Address: Noda Industrial Science Laboratory.

3931. Fukai, Tôshi; Irie, S.; Ishiguro, K. 1951. [The preservation test for harmful yeasts of soy sauce by synthesized vitamin K3]. *Mag. Shiyukai* 2:23. *
Address: Japan.

3932. Fukui, Juro; Arai, Masao. 1951. Nihon ni okeru daizu hinshu no seitaigakuteki kenkyû. I. Kaika nissû no ketsujitsu nissû ni yoru hinshu no bunrui to sono chiriteki bunpu ni tsuite [Ecological studies on Japanese soy-bean varieties. I. Classification of soy-bean varieties on the basis of the days from germination to blooming and from blooming to ripening with special reference to their geographical differentiation]. *Ikushugaku Zasshi* (*Japanese J. of Breeding*) 1:27-39. [24 ref. Jap; eng]
• ***Summary:*** This classification of Japanese soybeans by two criteria into 9 maturity groups is now the standard. Maturity group Ia (60 days to flowering, less than 60 days from flowering to maturity) corresponds to USA maturity groups I–II; these beans grow in northern Japan (Hokkaido). Maturity group Vc (greater than 100 days to flowering, greater than 80 days from flowering to maturity) corresponds to USA maturity group VII; these beans grow in southern Japan (Kyushu). Address: Norinsho.

3933. Fukui, Juro; Yarimizu, H. 1951. [On the varietal difference of the effect of short day-length after blooming time of the seed ripening period of soy-beans]. *Ikushugaku Zasshi* (*Japanese J. of Breeding*) 1:86-90. [Jap; eng]*

3934. Harada, Y. 1951. Effect of temperature change on material in koji culture. *Tatsuno Inst. Soy Sauce, Report* 2:51-5. *

3935. Irie, T.; Yamazaki, K. 1951. [On the color of soy sauce]. *Chomi Kagaku* (*Seasoning Science*) 1(3):1-14. [Jap]*
Address: Japan.

3936. Kawamura, S. 1951. The manufacture of soybean protein. I. General introduction and preliminary experiments. *Bulletin of the College of Agriculture, Nihon University* 2:2-16. *
• ***Summary:*** Describes solvent extraction using ethyl alcohol.

3937. Kawamura, S. 1951. The manufacture of soybean protein. II. Extraction of soybean oil. Defatted soybean meal as the raw material for manufacturing soybean protein. *Bulletin of the College of Agriculture, Nihon University* 2:17-36. *

3938. Mogi, Masatoshi. 1951. [Research on the bottom yeasts of soy sauce. I.]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 29:317-21. [Jap]*
Address: Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

3939. Murakami, H. 1951. [Comparison between higher and lower temperatures for the culture of mold on corn meal. On the duration hours of highest temperature after second cooling, for the mold culture of soy sauce]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 46:52,

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90-93. [Jap]*

3940. Nagata, Tadao. 1951. [On the ecological variation in the summer- and autumn-type soybeans, with special reference to the varietal differences in the responsibility to atmospheric temperature and day-length]. *Nara Gakugei Daigaku Kiyo* (*Nara Gakugei University Bulletin*) 1(1):74-84. [Jap]*

3941. Ohara, H.; Orishi, R. 1951. [On the sedimentation caused by soy sauce]. *Tatsuno Inst. Soy Sauce, Report* 2:1-2. [Jap]*
Address: Japan.

3942. Shinoda, Osamu. 1951. Gokoku no kigen [Origin of the Five Cereal Crops (wu-ku) in East Asia]. *Shizen to Bunka* (*Nature and Culture*) 3:37-. [Jap]*
• ***Summary:*** Shinoda, born 1899, is widely considered to be Japan's greatest modern food historian and world's foremost authority on the history of Chinese and Japanese foods and eating. Among his many works that do not concern soybeans are *Kome to Nihonjin* (Rice and the Japanese, Tokyo, 1961, 222 p.). and *Kome no bunka-shi* (Cultural history of rice, Tokyo, 1970, 326 p.).

3943. Ueno, T. 1951. [Private opinion on the foam of soy sauce and the black viscous material accompanying it]. *Tatsuno Inst. Soy Sauce, Report* 2:51-55. [Jap]*

3944. Yoshino, H. 1951. Paper partition chromatography ni yoru shôyu no kenkyû. II. Shôyu-chû no tôbun ni tsuite [Studies on shoyu manufacture using paper partition chromatography. II. Sugars in shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 46:105-98. [4 ref. Jap; eng]

3945. Yoshino, H. 1951. Paper partition chromatography ni yoru shôyu no kenkyû. I. Koeki-chû no tô-rui oyobi yûri amino-san ni tsuite [Studies on shoyu manufacture by paper partition chromatography. I. Sugars and amino acids in the cooking liquid of soybeans]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 46:34-28. [20 ref. Jap; eng]

3946. Yoshino, H. 1951. Paper partition chromatography ni yoru shôyu no kenkyû. III. Shôyu-chû no yûri amino-san ni tsuite [Studies on shoyu using paper partition chromatography. III. Free amino acids in shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 46:149-47. [10 ref. Jap]

3947. Burnett, R.S. 1951. Soybean protein industrial products. In: K.S. Markley, ed. 1951. Soybeans and Soybean Products. Vol. II. New York: Interscience Publishers or John Wiley & Sons. xvi + 1145 p. See p. 1003-54. [139 ref]

• ***Summary:*** One of the best early summaries of industrial uses of soybeans. Contents: 1. Manufacture of soybean protein: Introduction, nature and evaluation of protein modification, choice of raw materials, industrial isolation and modification processes, improvement of color, plant operation and equipment. 2. Industrial utilization of soybean flour and isolated protein: Introduction, control of bacterial and mold growth, plywood glues, soybean flour paper-coating adhesives, Soybean protein [isolate] paper coating adhesives, paper and textile sizes (paper sizes, textile sizes), water-thinned paints, plastics, textile fibers, fire foam stabilizers, tacky and remoistening adhesives, printing inks, miscellaneous uses.

"The first large-scale industrial use of soy flour was the development of plywood glue in the Pacific Northwest about 20 years ago by I.F. Laucks and Glenn Davidson, who imported specially prepared hydraulic pressed soybean meal from Manchuria. The Douglas fir plywood industry needed a cheap, water-resistant adhesive. While casein was suitable for the purpose, it was more costly and subject to wide fluctuations in price and availability. Soybean flour adhesives produced a strong bond which, although not waterproof, is highly water resistant. Because the adhesive mixtures are not tacky, the glued veneer is easy to handle, and therefore the manufacturing process can be speeded up considerably... In 1942, 60 million pounds of soybean glue (dry basis) were used for gluing plywood. This amount, together with a small amount of casein glue, represented 85% of the total plywood glue production. By 1945, the amount had fallen to 70%. In 1947, consumption of soybean glue was 25 million lb. Dike (pers. comm. 1947) estimates that two-thirds of the 1947 production of Douglas fir plywood was glued with soybean adhesive and hence intended for interior use, while one-third (wet basis) was glued with phenolics and intended for exterior use. In the plywood industry as a whole, soybean glues represent, on a dry basis, by far the largest tonnage of any type of adhesive."

"It is noteworthy that the single largest use of casein and [isolated] soybean protein is in paper coatings. The average 1940-46 consumption of casein in the U.S. was about 65 million lb and of soybean protein about 15 million lb, approximately one half of each amount being consumed in paper coatings.

"Production of soybean fiber had reached 900,000–1,200,000 pounds by 1939 in Japan. No production of soybean fiber in Japan during and after the war has been reported. Pilot plant production of soybean fiber by the Ford Motor Company reached 5,000 pounds per day in 1940, but production was subsequently discontinued and the plant and equipment disposed of to The Drackett Company.

"The Federal Trade Commission, recognizing the potential and increasing importance of man-made protein fibers, has adopted for them the general name 'Azlon,' following the same pattern of using 'Rayon' for synthetic

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cellulose fibers... All protein fibers made on a commercial or pilot plant scale possess low dry and especially low wet strength."

Synthetic protein fibers can be classified and discussed in terms of the "wool model" or the "silk model." The mechanical properties of each of these two fibers is related to its structure. Wool has long-range elasticity but moderately low strength, whereas silk has much greater strength, but a significantly lower range of elasticity. The "full realization of the fact that that textile fibers are, for the most part, made of fibrous molecules has undoubtedly been one of the major factors contributing to the present activity in the field of synthetic fibers."

"During World War II, the greater part of the isolated soybean protein produced was hydrolyzed and used by the U.S. Navy to prepare a foam for fighting oil and gasoline fires on war ships. A soybean protein solution was fed into a water stream and the mixture converted into a foam by means of an aerating nozzle."

Tables show: (165) Effect of water-flake ratio on recovery of soybean protein. (166) Performance of gyrating screen with petroleum-naphtha extracted flakes extracted at pH 9.5. (167) Properties of phenolic plastics, containing treated soybean meal, prepared by wet and dry compounding. (168) Properties of high-impact, cord-filled, soybean protein-modified phenol-formaldehyde molding compounds. (169) Properties of Soybean Azlon Fiber (R.A. Boyer, The Drackett Co., private communication, 1 Nov. 1948).

Figures show: (203) Graph of viscosity-pH curves for 14% solutions of unmodified soybean protein, 18% solutions of modified soybean protein, and 18% solutions of casein. (204-210) Graphs concerning paper coating with isolated soybean protein: Parts of adhesive per 100 parts of pigment in Denison wax test; amounts of casein, soybean protein, oxidized corn starch, and thin boiling starch that must be used with clay and calcium carbonate to produce a coated paper with Denison wax test of 4-5; brightness of papers coated with clay and calcium carbonate, sized with soy protein and other sizings; opacity of papers coated with clay and calcium carbonate, sized with soy protein and other sizings; receptivity of ink on papers coated with clay and calcium carbonate, sized with soy protein and other sizings; smoothness of papers coated with clay and calcium carbonate, sized with soy protein and other sizings; gloss of papers coated with clay and calcium carbonate, sized with soy protein and other sizings, to produce a coated paper with Denison wax test of 4-5. Address: Protein By-Products Research, Research and Technical Div., Wilson & Co., Chicago, Illinois.

3948. Ciancio, Pedro N. 1951. La soja y el problema alimentario del Paraguay [The soybean and Paraguay's nutritional problem]. Asunción, Paraguay: Edit. "El Grafico." 505 p. No index. 25 cm. Contains a 17-page English-language summary. Ciencia de la Nutrition (Metabolismo). [50 ref. Spa; eng]

• ***Summary:*** On cover: *Ciencia de la nutrición* (*metabolismo*)**.** Contents (from English-language summary, p. 477-94): 1. Report on the soybean, presented at the First Interamerican Congress of Medicine (*Primer Congreso Interamericano de Medicina*), sponsored by the National Academy of Rio de Janeiro [Brazil], September 7-16, 1948 (the soybean was the 6th subject on the program; the report by Dr. Pedro Ciancio, which emphasized the nutritional benefits of soya as a protective and basic food, was unanimously approved by the scientific assembly). 2. The "Paraguayan Soybean," a new variety (developed after 20 years of cultivation in Paraguayan soil). 3. The nutritional value of soy in the light of modern science. 4. Deficiencies in the dietetic regimen in Paraguay and how to correct them; particular importance of the soy bean to correct these deficiencies. 5. Peculiarities of the biochemical structure of the soybean and the medical applications deriving therefrom. 6. Soy cultivation ("Paraguayan soil is excellent for the cultivation of soy... The average output ranges from 1,500 to 2,000 kilos per hectare but in some regions of Caazapá (Rosario, Charará, Buena Vista, etc.)... I obtained the enormous output of 4,000 kilos per hectare, and this without any inoculation whatever!"). 7. The place of soy in the diet. 8. World production of soy. 9. Conclusion. More about soy milk (p. 493).

The author emphasizes the many nutritional benefits of using soy flour (he used the term "whole soy flour," p. 493), toasted soy meal, and soy milk in the Paraguayan diet. He believes that soya can be used to improve the diet without increasing its cost. In 1950 the author conducted experiments, in collaboration with the distinguished biochemist Prof. Dr. Ramón Codas of the Faculty of Chemistry and Pharmacy (Asunción), feeding soy milk to undernourished families living in the Department of Caazapá. When 1 liter/day of soymilk was added to the usual diet for 2 months, "most of the groups had increased their weights, and better coloring and greater activity could be noted in all the members of the groups under observation. He recommended using the resulting okara in soups or tortillas.

Chapter 8, "World production of soy," states (p. 490): "Cultivation of soy began in 1921, the year in which I introduced the plant to our country. Although its cultivation is only slowly increasing, at the present time there are already many villages where soy is cultivated, though on a small scale."

In 1950 a group of renowned scientists (Bergmann, Weizmann, and Willstater) at Weizmann's Institute of Science at Rehovoth, Israel, confirmed the importance of soy in banishing world hunger. They developed a soy powder and Bergmann wrote a report about it.

Note 1. This document contains the earliest date seen

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for soybeans in Paraguay, or the cultivation of soybeans in Paraguay (1921). In 1989 E.R. Alvarez-Britos wrote: "In 1921, Dr. Pedro N. Ciancio, considered the apostle of soybean cultivation in Paraguay, introduced the varieties Hollybrook, Manouth [Mammoth?], Pekin [Peking], and Shanghai, from Argentina, the USA, and Japan."

Note 2. Much of this book was written between 1940 and 1942. Address: Prof., Dr., Asunción, Paraguay.

3949. Hui Manaolana Foundation (formerly Niji-no-Kai). 1951. Japanese foods (Tested recipes). Honolulu, Oahu, Hawaii: International Institute, Y.W.C.A. 122 p. Illust. (some colored). Index. 24 cm.

• ***Summary:*** The Hui Manaolana was formerly named Niji-no-Kai and is affiliated with the International Institute of the Y.W.C.A. The book was inspired by Mrs. Isaac M. Cox (Catherine E.B. Cox), an educator and volunteer advisor to the Y.M.C.A. Almost all the recipes in this book have been submitted by members of the group, and that woman's name appears next to the recipe title. Shoyu is called for in many recipes.

Following a preface and an introduction, the recipes are organized by type. The many interesting ads related to soyfoods, scattered throughout the book, are cited elsewhere. Helpful hints (p. 12): "To prevent tofu from crumbling, soak in salted water for a while before using." On p. 15 are 4 menus each for breakfast, lunch or supper, and dinner. Soups: Chiri (Fish & tofu soup). Kenchin (Vegetable soup with tofu). Basic miso soup. Satsuma jiru (Miso soup with chicken & vegetables). Oio fish dumplings in miso soup. Miso soup with long rice. Rice: Azuki meshi (Rice with red beans). Sekihan (Steamed azuki rice). Inari zushi (Sushi rice in aburage).

Fish and seafoods: Ebi no teriyaki (Barbecued shrimp. The sauce consists of: 3/4 cup shoyu, 1 teaspoon gourmet powder [Ajinomoto], ½ cup sugar, 1 teaspoon grated ginger, 1 clove garlic [crushed]. Mix well). Katsuo no miso yaki (Tuna broiled with miso sauce). Katsuo teriyaki (Broiled fresh tuna). Meat and chicken: Sukiyaki (with tofu). Pork and tofu. Tofu: Gan modoki [Ganmodoki]. Ankake tofu (Boiled tofu with thick sauce). Tofu with crab meat egg roll. Tofu tempura. Okara (Bean curd residue dish). Iri dofu. Okara nira (with aburage). Yudofu with goma [sesame] miso sauce. Fried tofu cooked in miso. Koya dofu (Frozen soybean curd cooked in shoyu).

Note 1. This is the earliest English-language document seen (April 2013) that uses the term "Koya dofu" (regardless of capitalization) to refer to dried-frozen tofu.

Note 2. This is the earliest English-language document seen (April 2013) that contains the term "Gan modoki" (regardless of hyphenation); it refers to deep-fried tofu burgers.

Vegetables: Kiriboshi and aburage. Nikomi oden with yakidofu. Cabbage with mustard & miso sauce. Shira ae–Watercress (With tofu dressing). Shira ae (Vegetable with tofu sauce). Daikon sumiso ae (Turnips in miso). Nikomi oden (Vegetables with miso). Nishime (with tofu). Nasu no shigiyaki (Fried eggplant with miso sauce). Negi–nuta (Green onions with miso sauce). Green pepper–miso yaki. Kuromame (black soybeans). Noodles: Kitsune udon (With aburage). Relishes: Konbu no tsukudani (Seasoned seaweed). Tekka miso (Fried miso with gobo). Kaibashira no tsukudani (Scallops cooked in shoyu). Shoyu turnips. Desserts: Ohagi (rice cake with bean paste and kinako). Many with kanten, azuki beans, and azuki koshi an (Sweetened bean paste).

Glossary (p. 97-98) includes: Aburage (fried bean curd). An (red bean paste). Azuki (red beans). Edamame (soybeans). Fu (gluten cake). Gourmet powder (mono-sodium glutamate). Kanten (gelatin made from agar-agar). Karashimiso (mustard miso). Kinako (yellow soy bean powder). Kirazu (bean curd residue). Konbu (seaweed). Kuromame (black soy beans). Miso (fermented rice and soy beans). Nori (sea weed). Okara (bean curd residue). Shira-ae (vegetables with mashed tofu). Shoyu (soy sauce). Sumiso (vinegar and miso sauce). Sushi. Tare (thick shoyu sauce). Tempura (fritters). Teriyaki (barbecue). Tofu (bean curd). Ume (pickled plum). Wakame (sea weed). Yakitofu [yakidofu, broiled or grilled tofu].

Note 3. This is the earliest English-language document seen (April 2013) that uses the term "Yakitofu" to refer to grilled tofu.

Note 4. This is the earliest English-language document seen (June 2013) that uses the term "bean curd residue" to refer to okara.

Note 5. This is the earliest English-language document seen (Nov. 2012) that uses the term "yellow soy bean powder" to refer to kinako [roasted whole soy flour]. Address: International Institute Y.W.C.A., Honolulu, Hawaii.

3950. Imai, K. 1951. [Practice and theory in soybean cultivation]. Osaka, Japan: Fuminsha Co. [Jap]*

3951. Murakami, H.; Okuyama, K.; Sugita, S. 1951. Kôji no kenkyû. II. Jôzô kôjikin no sentaku (1) Shôyu jôzô kôjikin [Studies on koji. II. Selection of Aspergilli for the Japanese brewing industry (1) Aspergilli for shoyu brewing]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 46(12):483-77. [13 ref. Jap; eng]

• ***Summary:*** Aspergilli were selected from shoyu brewing (14 strains), miso (14), amasake (9), sake (6), submerged culture for amylase production (5), and submerged culture for protease production (5). This report describes how to select Aspergilli for shoyu brewing and their classification by availability for shoyu brewing.

3952. Prime Minister's Office, Resource Council, Committee on Food Composition. 1951. [Standard tables of food composition in Japan]. Tokyo: Food and Nutrition Council.

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104 p. 2nd ed., 1954. 125 p. [Jap]*

3953. Smith, Dean A.; Woodruff, M.F.A. 1951. Deficiency diseases in Japanese prison camps. *Medical Research Council* (*London*), *Special Report Series* No. 274. p. 192. (HMSO Privy Council, G.B.).
• ***Summary:*** This comprehensive report discusses the effects of an inadequate, unbalanced, and unaccustomed diet, maintained over a period of years, on thousands of men, women and children, prisoners in the hands of the Japanese in Hong Kong and Singapore.

One section is titled "Preparation of Tempe." British and Dutch prisoners of war in Changi, a Japanese prisoner of war camp in Singapore, survived on tempeh. "Soya beans first appeared in Changi in May, 1943, as a purchase by the Camp Messing Fund; from December of that year onwards, they were occasionally issued to the camp by the Japanese in place of a certain amount of rice... The beans were first simply boiled, but in this form they were rather unpalatable and exceedingly indigestible, and many men passed unaltered beans in their stools. Some Dutch prisoners of war suggested that this difficulty could be overcome by converting the beans into a substance known in the Netherlands East Indies as *tempe,* a product which... occupies a very important place in the diets of those who live in central and east Java." A description of the tempeh-making process is given. "The original culture of fungus was obtained from the withered petals of the *Hibiscus* plant... At Changi, *tempe* was made part of the general issue when available and was used to treat protein and vitamin deficiencies, and was given to diabetics for whom the ordinary rice diet was unsuitable."

Note: According to *The Defining Years of the Dutch East Indies, 1942-1949,* by Jan A. Krancher (McFarland & Co. 1995), upon their invasion of Java in 1942, the Japanese began a process of Japanization of the archipelago. Over the next 3 years, more than 100,000 Dutch citizens were shipped to Japanese internment [prisoner of war] camps, and more than 4 million *romoeshas,* forced Indonesian laborers, were enlisted in the Japanese war effort. The Japanese occupation stimulated the development of Indonesian independence movements. Headed by Sukarno, nationalist forces declared their independence on August 17, 1945. For Dutch citizens, Dutch-Indonesians or "Indos," and pro-Dutch Indonesians, Sukarno's declaration marked the beginning of a new wave of terror.

3954. Stanley, Joseph. 1951. Production and utilization of lecithin. In: K.S. Markley, ed. 1951. Soybeans and Soybean Products. Vol. II. New York: Interscience Publishers or John Wiley & Sons. xvi + 1145 p. See p. 593-647. [162 ref]
• ***Summary:*** Contents: 1. Occurrence and composition: Occurrence, structure and composition, nomenclature. 2. Manufacture. 3. Commercial lecithins. 4. Physical properties. 5. Chemical properties. 6. Utilization of lecithin: Margarine, chocolate (measurement of viscosity of chocolate), confectionery and ice cream, baked products (bread, cakes, biscuits, cookies, and crackers), macaroni, edible oils and fats, antioxidants, pharmaceuticals, paints and printing inks, rubber and petroleum, leather and textiles, cosmetics, soaps, and miscellaneous applications. 7. Synthetic substitutes and other lecithins. 8. Analysis of lecithin: Rapid volumetric determination of phosphorus (standardization of 0.1 N uranyl nitrate, determination), determination of small amounts of lecithin. 9. Statistical and market analysis.

Originally soybean lecithin was considered to be an undesirable sludge, because the hydrated form tends to ferment producing bad-smelling substances. Thus, the main problem was to dispose of it without creating a nuisance. In Manchuria and Germany, where expeller and solvent extraction plants were installed, it was decided to dry under vacuum the hydrated substance which had been removed from the oil using a centrifuge. This dried residue was named "soybean lecithin," and initially no uses for it could be found. Researchers began to look for new applications, and initially they thought it could be used in nerve tonics like sodium phosphates and phytin, but such applications would consume very little lecithin. Over the last 20 years, thousands of commercial applications have been discovered, yet these use less than 20% of the lecithin that is potentially available.

The total production of soybean lecithin in the USA was estimated at 8 million lb in 1948, while about 40 million lb which could be produced is not recovered. About 94% of the lecithin recovered in the USA comes from soybeans. Soybean oil yields an average of 2.65% commercial lecithin; other vegetable oils yield on average only about 0.5% lecithin. The large present and potential production of lecithin has caused the price per pound to drop from about 75 cents 20 years ago to about 15 cents in 1950 (p. 593-94).

Historically, the manufacture of soybean lecithin began in the late 1920s in Germany with its recovery from expeller soybean foots, which were composed of phosphatides, phytins, sterols, glycerides, carbohydrates, gums, water and some soybean meal. After dehydrating the sludge at low temperature under vacuum, it was extracted with various solvents such as methanol, ethanol, benzene, etc. The extract was purified by re-extraction with acetone to remove the nonphosphatides. Then the residue was redissolved in an appropriate glyceride carrier to make commercial soybean lecithin. This process made a good, stable lecithin, but the various steps made it expensive.

The installation in Germany of solvent extraction plants for processing soybeans offered a convenient method of separating and purifying the lecithin without the use of solvents. The first good process was developed by Bollmann of the Hanseatische Muehlenwerke, A.G., in Hamburg, and patented in Germany on 8 Oct. 1923 (No. 382,912) and later

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in the USA on 12 June 1928 (No. 1,673,615). A detailed description of process is given (p. 601).

World soybean lecithin production in 1948 is estimated at 10 million lb. Another 2 million lb of vegetable lecithin was recovered worldwide, including corn lecithin in the USA, peanut lecithin in England, and rapeseed lecithin in Germany and elsewhere in Europe. During the period 1934-1938 soybean lecithin was produced in the USA, Germany, Japan, Denmark, and Norway. "It can safely be said that during 1934-1938 the world utilized only about 4% of its potential production of soybean lecithin, and it is doubtful whether more than 10% was utilized even in 1948."

"The lecithin that is not recovered is left in emulsion form or in the foots, and is either thrown away or at best is mixed with the press cake or sold for soap stock. At least 96% of the potential production of vegetable lecithin of the world suffers this fate." Address: Joseph Stanley Co., Chicago, Illinois.

3955. Tawada, Shinjun. 1951. Okinawa yakuyo shokubutsu yakukôzan [Medicinal uses of Okinawa pharmaceutical plants. 2nd ed.]. Naha, Okinawa: Kyûyôdô. 178 p. See p. 90. Illust. 1st ed. 1931. [Jap]
• ***Summary:*** Page 90 discusses: "Daizu (mame, miso mame). *Glycine max* Merrill. Toofu maami, ufuchijaa ufuchizaa." This book is handwritten in Japanese, with the names of the plants given in Latin. It discusses the uses of many species, which are systematically arranged. Mimeographed in Okinawa. Address: Japan.

3956. Grant, M.W. 1952. Deficiency diseases in Japanese prison camps. *Nature* (*London*) 169(4290):91-92. Jan. 19. [1 ref]
• ***Summary:*** "... many attempts were made to make soya beans palatable and digestible, the only satisfactory method proving to be one common in Indonesia, involving inoculation with a fungus [to make tempeh]. Otherwise, these beans were liable to give rise to much digestive disturbance when used in any quantity, even if first reduced to a fine meal."

3957. Cooking with a foreign accent: A collection of international recipes for everyday kitchen use–each one tested in the *Sunset* magazine kitchen. 1952. Menlo Park, California: Lane Publishing Co. (A Sunset Book). 64 p. Feb. Illust. Index. 28 cm.
• ***Summary:*** Contents: About this book. Soup. Fish. Breads and pancakes. Cereal products. Meats and poultry. Vegetables. Pastries and desserts.

Soy related recipes: Stuffed clams (with soy sauce, China, p. 12). Chinese lobster (with [mung] bean sprouts and soy sauce, p. 12). Fried fish (China, with soy sauce, p. 12).

Note 1. Soy sauce is called for in many other East Asian recipes in this book (p. 13, 25, 27 {incl. Worcestershire sauce}, 39, 41, 45, 47, 48). Sukiyaki (with soy sauce but without the usual tofu, p. 47).

Note 2. Most of these recipes are from European countries. Of the Asian recipes, there are 17 from China, 4 from India, 1 from Japan (Sukiyaki), and none from Indonesia, Korea, or the Philippines. Neither tofu nor miso is mentioned. Address: Menlo Park.

3958. Ichikawa, Morio. 1952. [Studies on the hydrolysis processes of soy bean protein. III. Quantitative estimation of amino acids by paper chromatography]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 30(2):77-80. Feb. English-language summary at start of issue, p. 7. [16 ref. Jap; eng]
Address: Dep. of Industrial Chemistry, Faculty of Engineering, Kyoto Univ., Japan.

3959. Ichikawa, Morio. 1952. [Studies on the hydrolysis of soy bean protein. II. Hydrolysis of soy bean protein with acid, enzyme and alkali]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 30(1):34-41. Jan. English-language summary at start of issue, p. 4. [16 ref. Jap; eng]
Address: Dep. of Industrial Chemistry, Faculty of Engineering, Kyoto Univ., Japan.

3960. Mogi, Masatoshi; Nakajima, S.; Ando, T. 1952. [Studies on harmful yeasts which ferment sterilized soy [sauce]. II. Morphological characters of isolated yeasts]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 30(2):49-59. Feb. English-language summary at start of issue, p. 5. [1 ref. Jap; eng]
Address: Noda Industrial Science Lab., Japan.

3961. Morse, W.J.; Cartter, J.L. 1952. Soybeans for feed, food, and industrial products. *Farmers' Bulletin* (*USDA*) No. 2038. 41 p. Feb. Supersedes Farmers' Bulletin No. 1617 (Morse 1930, 1932).
• ***Summary:*** Contents: Importance of the soybean and its byproducts. Direct use of soybeans on the farm: Soybean hay (for dairy cattle, beef cattle, horses and mules, sheep, swine, poultry), soybeans for pasturage (hogging down soybeans, sheep, beef and dairy cattle, poultry on soybean pasturage), soybean for soilage, for silage, for soil improvement, for livestock feed (feed for swine, dairy cattle, beef cattle, horses, sheep, poultry, wild game {quail, pigeons}), soybean straw (feeding value, fertilizing value).

Soybeans processed for meal and oil: Processing methods, meal for livestock (for dairy cattle, beef cattle, poultry, swine, sheep, dogs {in dog-food industry}, rabbits, fur-bearing animals, quail and pheasants), meal as fertilizer, for industrial purposes, in food products, use of oil (in food products, industrial uses such as paints and varnishes). Soybeans and products for human consumption: Vegetable soybeans, dry soybeans ("Other uses of the dry soybean

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{principally of oriental origin} are in the preparation of soybean milk, soybean curd, soybean sprouts, beverages, salted, roasted soybeans), soy flour, grits, and flakes, Oriental soybean foods, soy milk, soy curd, soy sauce, soy sprouts, soy beverages. Miscellaneous uses of the soybean: Honey production (the soybean as a honey plant, soy flour for honey bees), soy flour and grits in dog food, soy flakes in brewing beer, soy flour for insecticides.

Under "Soybean utilization," page 3 notes: (1) The roots and coarse stems are used as fuel in China, Manchuria, and Korea. (2) In many parts of China the plants, when 3 to 4 inches high, are used as greens. (3) In Manchuria and Korea, the leaves are cured and smoked as tobacco.

Under "Soy milk," page 38 states: "The ground soybean pulp or mash [okara] left after separating the liquid from the solid material is still of good nutritive quality, but it has very little flavor. It can be dried and made into flour for human food, combined with foods of more pronounced taste, or used for animal feed."

Under "Soy curd" [tofu], page 38 states: "Chinese and Japanese markets and restaurants in many cities in the United States sell fresh soy curd. Several firms in the United States can soy curd."

Under "Soy sprouts," page 40 states: "Soybeans and several other species of beans, especially the mung bean, are sprouted and used as a green vegetable in the Far East. Soy sprouts (fig. 18, D) can be produced successfully in the home, and a year-round fresh vegetable that may be used raw or cooked can be obtained by sprouting soybeans in a flower pot, a glass fruit jar, or a strainer.

"In producing sprouts, select a stock of clean, bright beans of the latest crop. Any of the field varieties may be used, but the yellow-seeded varieties have less conspicuous skins, though black-seeded varieties, such as the Cayuga, Peking, Wilson, and Otootan, seem to germinate more quickly and uniformly. Carefully hand-pick the seed, discarding everything except the clean, whole beans. Wash the beans thoroughly, cover with lukewarm water, and allow them to soak for a few hours (or at most overnight) until they are swollen. Place the beans in a container and cover them with dampened cheesecloth. Rustproof wire-mesh screening or cheesecloth can be used to cover the bottom of the container to allow for drainage. In using a glass fruit jar, cover the top with a piece of cheesecloth and tie it on securely. Invert the jar and place it in a dark spot at room temperature.

"Tilt it slightly so that excess water can drain away promptly. Pour plenty of water on the beans 3 to 4 times a day, thereby insuring thorough washing. The beans may be sprinkled each evening with chlorinated lime solution (1 teaspoon of calcium hypochlorite dissolved in 3 gallons of water) to keep down mold growth and spoilage. Chlorinated limewater is not needed to kill fungus growth if the seed is of good quality. In 3 to 4 days the sprouts will be 1 to 2 inches long and ready to use. Bean sprouts increase about six times their original volume. The commercial production of soy sprouts proceeds along the same, lines, except that larger sprouting tanks or trays are used and the process is more carefully controlled.

"Soybean sprouts can be used in many ways and are cooked and served with the bean attached. They are a fair source of thiamine, riboflavin, and ascorbic acid. The sprouts may be served raw in salads, cooked in various ways, and used in such dishes as omelets, stews, fricassees, and chop suey. They are very tender and lose their crispness if put into hot dishes more than a few minutes before serving.

"A few companies have successfully canned soy sprouts [in the USA]. The New York (Cornell) Agricultural Experiment Station found that sprouts lend themselves admirably to quick-freezing." Address: USDA.

3962. Nakano, Masahiro; Matsuura, Shinji. 1952. [Research on koji starter (*tane-kôji*). III. On the rate of germination of the mold spores]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 6. p. 157-60. March. English-language summary bound at the end of No. 6, p. 30. [Jap; eng]

• ***Summary:*** The hourly rate of germination for koji starter mold spores was examined by the direct counting method, as reported in part I, and the so-called "active spore numbers" were calculated. Nine samples of koji starter were examined: For miso (4), shoyu (3), and shochu (3), and each was given a code letter, M, S, and T respectively in the figures 1-9.

Conclusions: (1) Germination starts at about 3 hours and arrives at a stationary phase at about 6 hours in practical koji making; at this stage no control of mycelium growth is required. (2) There are products with rapid or with slow germination according to the blends of the makers. (3) Distinct differences in "active spore numbers" were found. In practice, the greater the "active spore numbers," the smaller the amount of koji starter required for making koji. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

3963. Yokotsuka, Tamotsu. 1952. Shôyu kôki seibun ni kansuru kenkyû. VII. [Studies on flavorous substances in soy [sauce]. VII. Flavors with high boiling points. (2) Amyl alcohol and amyl acetate]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 25(8):401-05. March. [13 ref. Jap; eng]
Address: Noda Industrial Science Laboratory.

3964. Yokotsuka, Tamotsu. 1952. Shôyu kôki seibun ni kansuru kenkyû. VIII. [Studies on flavorous substances in soy [sauce]. VIII. Flavors with high boiling points. (3) Benzaldehyde and benzoic acid ethyl ester]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 25(8):446-50. March. [4 ref. Jap; eng]

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Address: Noda Industrial Science Laboratory.

3965. *Shoyu to Gijutsu* (*Soy Sauce and Technology*). 1952-1969? Serial/periodical. Tokyo: Nippon Shoyu Gijutsukai. Biweekly (28 issues a year). No. 1. April 1952. [Jap]
Address: Japan.

3966. *Christian Science Monitor.* 1952. Open letter from Korea: A navy man writes home. April 23. p. 19.
• ***Summary:*** Previously, while in Japan, Bob (the writer) and a friend (Brooks) visited the Usami family in the suburban town of Atumi, near Kobe. "They had a big Sukiyaki dinner waiting for us." They sat on the floor, with their legs under the table, in the center of which and sunken was a charcoal hibachi. "Thin slices of beef, spinach, onions, Hakusai (Chinese lettuce), Tofu (bean curd), mushrooms, and other ingredients are put into the pan over the hibachi and flavored with soy sauce, sugar, and so on. The bubbling food is picked out of the pan by the individuals, with chopsticks.

"You have a little bowl with a raw egg in it, and you dip the hot slices of beef into that before eating. Everything was very good... and it was all most enjoyable."

3967. Fukuba, Hiroyasu. 1952. Lipoxidase ni tsuite [Studies on lipoxidase. I. A method for the determination of lipoxidase]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 25(9):483-87. April. [11 ref. Jap; eng]
• ***Summary:*** Describes two methods for determining lipoxidase. One is based on the decolorization of crocis. Neither uses soybeans. Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo.

3968. Iguchi, Nobuyoshi. 1952. Kôji-kin ni kansuru kenkyû. V. X-sen ni yoru shôyu-yo kôji-kin no heni ni tsuite [Studies on *Aspergilli.* V. The production of X-ray induced mutations in *Aspergillus sojae*]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 25(9):459-65. April. [26 ref. Jap; eng]
• ***Summary:*** The author's name is incorrectly written as "Iguhi" on the document. Address: Noda Industrial Science Lab., Noda, Japan (Noda Sangyo Kagaku Kenkyusho).

3969. Mogi, Masatoshi; Nakajima, S.; Ando, T. 1952. [Studies on harmful yeasts which ferment sterilized soy [sauce]. III. Physiological characters of isolated yeasts]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 30(4):152-59. April. English-language summary at start of issue, p. 16-17. [2 ref. Jap; eng]
Address: Noda Industrial Science Lab., Japan.

3970. Yasuda, Shuntaro; Kinoshita, Katzushi; Enomoto, Hideo. 1952. *Penicillium chrysogenum* Q176 [Effect of soybean oil on shaking cultures of *P. chrysogenum* Q176. V. Effect of the constituents of soybean oil on penicillin yield]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 25(9):465-68. April. [4 ref. Jap; eng]
Address: Meiji Confectionery Co. Ltd., Kawasaki plant.

3971. Yasuda, Shuntaro; Yamazaki, Keizo; Kinoshita, Katzushi; Mizoguchi, Sachiko; Enomoto, Hideo. 1952. *Penicillium chrysogenum* Q176 [Effect of soybean oil on shaking cultures of *P. chrysogenum* Q176. VI. Comparison of soybean oil and various oils on penicillin yield]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 25(9):469-72. April. [Jap; eng]
Address: Meiji Confectionery Co. Ltd., Kawasaki plant.

3972. Sakaguchi, Kinichiro; Ishitani, Chiyoko. 1952. Kôji-kin no shizen heni ni kansuru kenkyû. I. [Studies on the natural variation of koji molds (*Aspergillus oryzae* and *Aspergillus sojae*). I. On the relation between the morphological characteristics of various strains and the occurrence of variation, and the morphology of the variants obtained and their related strains]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 26(1):18-24. May 20. [13 ref. Jap; eng]
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo, Japan.

3973. Breirem, Knut. 1952. Oscar Kellner (May 13, 1851–September 22, 1911). *J. of Nutrition* 47(1):3-10. May.
• ***Summary:*** "It is generally accepted that German science in the period 1850 to 1914 was of very high standing... During this period Germany was a Mecca for students seeking advanced training in the physiological and chemical sciences." F. Honcamp has stated that in German agricultural chemistry, there were three great pioneers or pathfinders: Liebig, Hellriegel, and Kellner.

Oscar Keller was born in Tillowitz, Silesia, on 13 May 1851. Note: Today [2001] this small town, called Tulowice, lies in southwestern Poland. He fought in the Franco-German war [Franco-Prussian War] in 1870-71, then finished high school and went to the universities in Breslau and Leipzig to study the basic sciences, especially chemistry. An extremely diligent young man, he got his Ph.D. in the short space of three years from the University of Leipzig. His first scientific paper was published in 1874. As a young doctor Kellner became an assistant in animal chemistry at the Agricultural Academy of Proskau (Silesia).

In 1876 Kellner went to Hohenheim at Stuttgart (Württemberg). Here he became an assistant to Prof. Emil Wolff, who was of Danish origin. Before coming to Hohenheim Wolff had been the first director of the experiment station Möckern (Moeckern), at Leipzig, the first agricultural experiment station in Germany–erected in 1851, the year Kellner was born. Kellner began to study feed evaluation, a field in which he later became the master.

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In 1880, at age 29, he was invited to the Imperial University of Tokyo as a professor of agricultural chemistry. He stayed in Japan for 12 years and left a strong mark on the foundations of agricultural chemistry in Japan. In Japan, he married a Japanese woman. In 1892 he was called back home to Germany to become director of the agricultural experiment station at Möckern [Moeckern]. In 1905 the first edition of his book, *Ernaehrung der landwirtschaftlichen Nutztiere* (*The Feeding of Livestock*) was published. Many subsequent editions were published, the 10th in 1924. An English translation was published in 1910. He was also the editor of *Biedermann's Centralblatt für Agrikulturchemie* and *Die Landwirtschaftlichen Versuchsstationen.* Endowed with a strong personality and a love of work, he accomplished a great deal. He died in the autumn of 1911 of a heart attack at age 60.

An excellent full-page portrait photo shows Oscar Kellner. Note: While in Japan, he wrote three original and important articles each on miso and koji from 1889 to 1895. Address: Royal Agricultural College of Norway, Div. of Animal Nutrition, Vollebekk, Norway.

3974. Mogi, Masatoshi; Nakajima, S.; Ando, T. 1952. [Studies on harmful yeasts which ferment sterilized soy [sauce]. IV. Test for fermentation of soy by isolated yeasts]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 30(5):194-204. May. English-language summary at start of issue, p. 22. [19 ref. Jap; eng]
Address: Noda Industrial Science Lab., Japan.

3975. Ohara, Yuwao; Tsumura, Yukio. 1952. [Studies on some bacteria found in tamari-shoyu. I. On *Bacillus tamaridiastaticus* n. sp.]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 30(5):179-85. May. English-language summary at start of issue, p. 21. [7 ref. Jap; eng]
Address: College of Agriculture, Gifu Univ., Japan.

3976. Sakaguchi, Kinichiro; Ishitani, Chiyoko. 1952. Kôji-kin no shizen heni ni kansuru kenkyû. II. Kôji-kin no heni no saibôgaku-teki kenkyû [Studies on the natural variation of koji molds (*Aspergillus oryzae* and *Aspergillus sojae*). II. Cytological studies on the natural variation of koji-molds]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 26(2):85-90. June. [11 ref. Jap; eng]
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo.

3977. Strayer, George M. 1952. Editor's desk: Protests come from Japan now. *Soybean Digest.* June. p. 4.
• ***Summary:*** "It has hit from another quarter this time. Japanese buyers have filed with the American Soybean Association a protest on the quality of soybeans received by them in several cargoes during recent months." Address: Hudson, Iowa.

3978. Yamanishi, Tadashi; Obata, Y.; Sano, M. 1952. Shôyu no kôki. V. Ganryû kagô-butsu no gôsei [Studies on soy sauce flavors. V. Synthesis of sulfur-containing compounds]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 26(3):125-28. July. [13 ref. Jap; eng]
Address: Lab. of Agricultural Chemistry, Hokkaido Univ., Japan.

3979. Ueda, Iwao; Maekawa, K.; Shimada, H.; Fuji, H. 1952. Daizu hatsuga-ji no kakushu seibun no hendô ni kansuru kenkyû. III. Daizu hatsuga-ji no bitamin B-2 no shôchô ni tsuite [Studies on the changes in various components of germinating soybeans. III. The changes of vitamin B-2 in germinating soybeans]. *Osaka Ika Daigaku Zasshi* (*J. of Osaka Medical College*) 13(2):61-64. Aug. 31. [5 ref. Jap]
Address: Dep. of Biochemistry, Osaka Medical College, Osaka, Japan.

3980. Japan Year Book 1949-52. 1952. Tokyo: The Foreign Affairs Association of Japan. 778 + 552 p. See p. 414-15. 22 cm.
• ***Summary:*** The Preface indicates that this book was published in about Aug. 1952. The editor's name is not given.

Page 414. A large table shows "Production of cereals and vegetables" (area in chobu, yield in koku). For "Dried soy-beans

1.822 million koku in 1941
2.331 million koku in 1942
2.400 million koku in 1943
2.072 million koku in 1944
1.321 million koku in 1945
1.566 million koku in 1946
1.345 million koku in 1947
1.659 million koku in 1948
1.672 million koku in 1949
2.503 million koku in 1950

In 1950 production of red [azuki] beans was 16.5% that of soy beans.

Other crops mentioned in the table are dried maize, foxtail millet, sawa-millet, proso-millet, Indian-millet, buckwheat, and dried peas.

Page 415. This table continues on p. 415 with area in chobu and yield [production] in kan [1 kan = 3.75000 kilograms]. For Green soy-beans [Edamamé]:

11.275 million kan in 1941 on 9,671 million chobu
8.442 million kan in 1942
7.609 million kan in 1943
8.073 million kan in 1944
11.099 million kan in 1945
8.026 million kan in 1946
10.602 million kan in 1947
8.578 million kan in 1948

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10.362 million kan in 1949
9.890 million kan in 1950 on 6.000 million chobu.

3981. Hirano, Mitsuo. 1952. Using American soybeans in the Japanese economy. *Soybean Digest.* Sept. p. 28-29.
• ***Summary:*** Contents: Introduction. The soybean situation and its supply and demand in Japan. The soybean oil milling industry in Japan. The Japanese soybean industry and American soybeans. Conclusion.

The main purpose of the writer's present trip to the USA is to make a careful study of the American soybean market.

Soybean production in Japan gradually increased from 210,000 metric tons in 1880 to a peak of 540,000 tons in 1921. Thereafter production declined as imports from Manchuria rapidly rose. In 1945, the year that World War II ended, production in Japan was only 180,000 tons, but as a result of government policy aimed at increasing food production, it had risen to 440,000 tons by 1951. However most of this production is transformed into foods, so Japanese oil mills have had to depend almost entirely on exports for their raw material. In 1952 exports are expected to be about 350,000 tons.

The earliest Japanese government records of soybean imports show that in 1897, 131,000 tons were imported from Manchuria. That amount increased each year, reaching a peak in 1944 when approximately 930,000 tons were imported. However since the end of World War II, the pattern of Japanese soybean imports has changed dramatically. The United States and the West replaced Manchuria as the main source of Japanese soybean imports. At first, imports were made by the Japanese government from China and by the Occupation Forces from the USA under the GARIOA program. But imports from China was made increasingly difficult by the expansion of the Communist sphere of influence. Finally, in 1950, with the outbreak of the Korean War, soybean imports from China came to a complete stop. Since then, American soybeans have dominated the Japanese market.

From the late 1800s, the Japanese oil milling industry used mostly Manchurian soybeans. From the end of World War I (in 1918) until about 1925, many large soybean crushing mills were constructed in Japan. Just before World War II, in about 1940, the nine large solvent plants in Japan had a crushing capacity of 970,000 tons/year. World War II reduce this to six mills with a capacity of 490,000 tons. Since 1948, many smaller mills have been constructed; in 1951 there were 38 soybean oil extraction mills with a total capacity of about 1.2 million tons.

"I believe that the phenomenal increase in the production of soybeans in the United States is an accomplishment unequalled by anything in the agricultural history of the world... I firmly believe that it could not have been attained without the untiring efforts of the American farmers, agriculturists, government agents, and the American Soybean Association." With Communist forces entrenched in China, Manchurian soybeans are unavailable to Japan at the present time. So Japan is very grateful for this in U.S. production. However there is one problem–quality. Although Japanese oil millers buy Yellow No. 2 grade, the soybeans that arrive in Japan are of much inferior quality. The main problem is that they contain much more foreign material than is allowed–4 to 6% rather than 3% of pebbles, weeds, pebbles, sand, and dirt.

"American soybeans will continue to play as important role as a source of supply for the Japanese oil industry." However there will soon be growing competition from China. A portrait photo shows Mitsuo Hirano. Address: Managing Director of Hohnen Oil Co., Ltd. and President, Assoc. of Oil and Fat Manufacturers, Japan.

3982. Inamori, Shôjiro; Inamori, Michisaburo. 1952. Karushiumu kyôka miso no kenkyû. I. [Studies on calcium fortified bean-paste (miso). I. Experiment of brewing the bean-paste fortified by adding calcium carbonate]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 30(9):370-74. Sept. English-language summary on p. 39. [9 ref. Jap; eng]
• ***Summary:*** For fortification with a calcium salt, calcium carbonate is the most suited. When added at a level of less than 1%, it exerts no influence on the quality of the finished product. Address: Inamori Laboratory, Inamori & Co., Japan.

3983. Mogi, Masatoshi; Nakajima, S.; Iguchi, N. 1952. Kyôka miso no kenkyû. II. Shigaisen shôsha ni yoru miso kôji-kin no furabin seisan ni tsuite [Studies on fortified bean-paste (miso). II. On the riboflavin production by ultraviolet-induced mutants of *Aspergillus oryzae*]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 30(9):363-69. Sept. English-language summary on p. 39. [10 ref. Jap; eng]
• ***Summary:*** By treating the most excellent strain of *Aspergillus oryzae* (described in a previous report) with ultraviolet rays, 743 mutants were obtained. The authors classified them into 13 types. Of these mutants, 19 strains which produced exceedingly large amounts of riboflavin were selected culturing in Pfeffer's solution. Four strains produced 3 times as much riboflavin as the parent strain in soybean koji and 3 strains twice that of the latter in rice koji. A fortified miso, made by using the most abundant riboflavin producing strain, contained twice as much riboflavin as that made with the parent strain. Address: Noda Industrial Science Lab. Japan (Noda Sangyo Kagaku Kenkyujo).

3984. Nakano, M.; Ebine, H. 1952. Eiyô kyôka miso no kenkyû. I. Karushiumu kyôka miso [On the manufacture of enriched miso. I. Enrichment with calcium]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 7. p. 155-62. Sept. English-language summary p. 22-23. [5 ref. Jap; eng]

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• ***Summary:*** Precipitated light calcium carbonate is suitable both technically and economically as a calcium source. Up to 1% can be added to the miso without a noticeable change in the smell or taste. Details of the procedure for adding the calcium carbonate during the miso-making process are given. It is added after the koji starter to the steamed rice. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

3985. Nakano, Masahiro; Ebine, Hideo. 1952. Eiyô kyôka miso no kenkyû. II. Bitamin kyôka miso [On the manufacture of enriched miso. II. Enrichment with vitamins A, B-1 and B-2]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 7. p. 163-66. Sept. English-language summary p. 23. [6 ref. Jap; eng]
• ***Summary:*** Concentrated cod liver oil was used as the source of vitamin A; it was used as a homogenisate with the gelatin solution. Vitamins B-1 and B-2 were added in crystalline form. These vitamins were dissolved in the "pitching water" and added to the initial stage of ripening. Changes in the content of each vitamin were then examined.

Vitamin A content decreased rapidly. The initial 5,000 I.U. [International Units] had decreased to 1,700 I.U. after 10 days and to only a trace after 30 days. Vitamin B-1 content decreased somewhat, whereas vitamin B-2 content increased, and this showed in vitamin B-2 production in the koji mold. The fates of these vitamins were the same whether they were added alone or in combination. Their addition did not decrease the quality of the miso. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

3986. Watanabe, Tokuji; Hayakawa, A.; Kamata, H. 1952. Studies on soybean protein. V. The redispersion of protein from steamed soybean meal by autoclaving with water. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 7. p. 69-73. Sept. English-language summary p. 12-13. [Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

3987. Watanabe, Tokuji; Hayakawa, A.; Kamata, H. 1952. Studies on soybean protein. IV. The influence of heating of raw soybean protein on the dispersibility of its protein. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 7. p. 65-68. Sept. English-language summary p. 11-12. [Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

3988. Watanabe, Tokuji; Kamata, H. 1952. Studies on soybean protein. VI. The discoloration of autoclaved soybeans (Preliminary report). *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 7. p. 75-80. Sept. English-language summary p. 13-14. [Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

3989. Amaha, Mikio. 1952. Saikin hôshi no tainetsu-sei ni kansuru kenkyû. III. Kanetsu-go no baiyô kiso-sei no eikyô. (1) Tokuni tôrui no kôka ni tsuite [Studies on the heat resistance of bacterial spores. III. Effects of sugars in the subculture media on the survival times of *Bacillus natto* spores]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 26(6):306-13. Oct. 1. [15 ref. Jap]
Address: Dept. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo, Japan.

3990. Sakaguchi, Kinichiro; Ishitani, Chiyoko. 1952. Kôji-kin no shizen heni ni kansuru kenkyû. III. Shizen heni no genin ni kansuru kenkyû (heterokarioshitsu) [Studies on the natural variation of koji-molds (*Aspergillus oryzae* and *Aspergillus sojae*). III. Studies on the mechanism of natural variation based on heterocaryosis]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 26(6):279-85. Oct. [9 ref. Jap; eng]
• ***Summary:*** Anastomosis occurs between various strains of koji molds. Natural variation in koji molds (*Aspergillus oryzae* and *A. sojae*) is largely caused by heterocaryosis, which generally produces conidia of increased diameter.
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo.

3991. Amaha, Mikio. 1952. Saikin hôshi no tainetsu-sei ni kansuru kenkyû. IV. Kanetsu ni yoru hôshi no shimetsu genshô ni tsuite [Studies on the heat resistance of bacterial spores. IV. Kinetics of the death reaction of spores by heat]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 26(7):339-45. Nov. 1. [12 ref. Jap]
Address: Dept. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo, Japan.

3992. Amaha, Mikio; Sakaguchi, Kinichiro. 1952. Bacillus zoku saikin no hanshoku saibo narabini hôshi no eiyô yôkyû ni tsuite [Nutritional requirements of vegetative cells and spores of aerobic spore-forming bacilli]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 26(7):353-59. Nov. 1. [16 ref. Jap]
• ***Summary:*** The writers studied the nutritional requirements for formation of vegetative cells and spores of six species of *Bacillus* including *Bacillus natto.* On a completely synthetic medium this species required only biotin for growth, as did *B. mycoides.* Omission of DL isoleucine completely inhibited development of spores. When single amino acids were used for growth (e.g., L-glutamic acid, L-arginine, L-asparagine) they supported fair growth of the vegetative cells and spores.

Note: This is the earliest document seen (Jan. 2012) which states that *Bacillus natto* is different from *Bacillus*

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subtilis in that the former requires the vitamin biotin for growth, whereas the latter does not. Address: Dept. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo, Japan.

3993. Morse, W.J. 1952. Some export history (Letter to the editor). *Soybean Digest.* Nov. p. 30, 32.
• ***Summary:*** "I have read with interest your editorials on the export beans." During the 1930s, American soybeans were the cleaner, better color, and better quality than Manchurian soybeans. This was one reason that European mills preferred to buy soybeans from the USA rather than from Manchuria, and "would pay 5 cents more per bushel for American soys."

During the early 1930s: "In Japanese-held Manchurian territory and Korea, the Japanese soybean inspectors did a pretty thorough job of inspection. All of the beans I saw from those places–and I saw plenty–were clean and seemed to be of good quality. Of course these beans were taken largely by the Japanese mills and the Chinese mills in Manchuria. The Korean beans all went to Japan and were mostly used for food products. The Japanese soy sauce factories used the Manchurian beans."

Now Mr. Morse laments: "I just cannot see why with all our good modern machinery we send such trashy beans abroad. Must be a colored gentleman in the woodpile somewhere!" "It is quite obvious that if America wants to hold the European market they must ship something beside trashy beans."

3994. Yoshida, Shizuo. 1952. Yakan hosoku shômei no tsuyosa o kotoni shita chôbi no shita ni okeru daizu no kôshû hannô (yohô) [Photoperiodic responses in soybean plants under long-day conditions with supplemental illumination of different intensities at night (Preliminary report)]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 21(1&2):127-28. Nov. [1 ref. Jap; eng] Address: Faculty of Agriculture, Naniwa Univ.

3995. Amaha, Mikio. 1952. Saikin hôshi no tainetsu-sei ni kansuru kenkyû. V. Kanetsu-go no baiyô kiso-sei no eikyô. (2) Bitamin oyobi N gen ni tsuite [Studies on the heat resistance of bacterial spores. V. Effect of vitamins and amino acids in the synthetic subculture media on the survival time of *Bacillus natto* spores]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 26(8):420-27. Dec. 1. [17 ref. Jap]
• ***Summary:*** The composition of the cultural media was found to influence the survival time of the spores of *Bacillus natto.* The presence of thiamine, pyridoxin [pyridoxine], and biotin were found to be essential vitamins, and their presence prolonged survival time. Amino acids that were converted directly to glutamic acid gave longer survival times.

Note: This is the 2nd earliest document seen (Jan. 2012) which states that *Bacillus natto* is different from *Bacillus subtilis* in that the former requires the vitamin biotin for growth, whereas the latter does not. Address: Dept. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo, Japan.

3996. Sakaguchi, Kinichiro; Ishitani, Chiyoko. 1952. Kôji-kin no shizen heni ni kansuru kenkyû. IV. Shizen heni no genin ni kansuru kenkyû [Studies on the natural variation of koji-molds (*Aspergillus oryzae* and *Aspergillus sojae*). IV. Studies on heterocaryotic strains induced by irradiation of ultraviolet rays]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 26(8):435-39. Dec. 1. [15 ref. Jap; eng]
• ***Summary:*** Interestingly the real translation of the Japanese subtitle is "Studies on the causes of natural change." The S- (sporogenous) and F-type (floccose) strains of *Aspergillus oryzae,* which are the constant natural variants of the basic X-type, were irradiated with ultraviolet rays and the resultant mutants were studied cytologically. Address: Inst. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo.

3997. Tamura, Gakuzo; Kirimura, J.; Hara, H.; Sugimura, K. 1952. Bisei-butsu teiryô-hô ni yoru miso no amino-san sosei ni tsuite [The microbiological determination of formation of amino acids in "miso"]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 26(9):483-85. Dec. 10. [3 ref. Jap; eng]
• ***Summary:*** The amino acid composition of Hatcho miso (ratio of soybeans:rice is 10:0; fermentation time 2-3 years), Sendai miso (10:2; 1 year), and Edo miso (10:12; 6 days) were determined using a microbiological method, and are listed in detail. Little decomposition of essential amino acids during fermentation was found. Address: 1-2. Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo; 3-4. Shokuryo-cho, Shokuryo Kenkyu-jo.

3998. Maekawa, K.; Okada, K.; Kiuchi, Y. 1952. Daizu hatsuga-ji no kakushu seibun no hendô ni kansuru kenkyû. IV. Daizu hatsuga-ji no Vitamin C oyobi 2,3-diketogulon san no shôchô ni tsuite [Studies on the changes of various constituents in germinating soybeans. IV. The fate of vitamin C and 2,3-diketglulonic acid in germinating soybeans]. *Osaka Ika Daigaku Zasshi* (*J. of Osaka Medical College*) 13(3):110-15. Dec. 15. [Jap]
Address: Osaka Ika Daigaku, Ikagaku Kyoshitsu. Shunin: Sugimoto, Koichi, kyoju. (Dep. of Biochemistry, Osaka Medical College, Osaka, Japan).

3999. Ohara, Yuwao. 1952. [Classification of *Aspergillus tamarii-oryzae* group. II. Production of kojic acid from various compounds as an aid for identification (Supplement to Part I)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 26(10):547-51. Dec.

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[5 ref. Jap; eng]
Address: College of Agriculture, Gifu Univ.

4000. Shimoda, Chûjiro; Shimada, Shirô; Sugita, Osama. 1952. [Studies on an antibiotic substance *Oryzacidin* produced by *Aspergillus oryzae.* II. The mutation of *Aspergillus oryzae* sp. A-33 by irradiation with ultra-violet rays]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 26(12):645-47. Dec. Color photo on unnumbered page after p. 646. [4 ref. Jap; eng]
Address: The Yamamura Sake-Brewing Lab.

4001. Shimoda, Chûjiro; Nishiwaki, Yoshinobu. 1952. [Studies on an antibiotic substance *Oryzacidin* produced by *Aspergillus oryzae.* III. Chemical changes of media in tank fermentation]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 26(12):648-50. Dec. [1 ref. Jap; eng]
Address: The Yamamura Sake-Brewing Lab.

4002. Tsunoda, Toshinao; Ishizuka, Z.; Miyazawa, S.; Tamura, G. 1952. Bisei-butsu teiryô-hô ni yoru jôzô shôyu no amino-san sosei ni tsuite [The microbiological determination of formation of amino acids in "shoyu"]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 26(9):477-80. Dec. [15 ref. Jap; eng]
• ***Summary:*** Includes an analysis of Kikkoman special shoyu. Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo.

4003. Kawamura, S. 1952-1953. The manufacture of soybean protein. III. Extraction and precipitation of protein. Small-scale manufacture of soybean protein. *Bulletin of the College of Agriculture, Nihon University* 4:206-25. *

4004. Fukui, J.; Yarimizu, H. 1952. [Influence of the daylength and temperature upon the ripening period of soybeans]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 21:123-24. [Jap; eng]*
Address: Kanto-Tosan Agric. Exp. Station.

4005. Ichinohe, Minoru. 1952. [On the soy bean nematode, *Heterodera glycines* n. sp., from Japan]. *Oyo Dobutsugaku Zasshi* (*J. of Applied Zoology*) 17:1-8. [Jap]*
• ***Summary:*** This is the earliest known mention of this species; the author named the species. SCN was classified as a race of *Heterodera schachtii* Schmidt until, in this publication, Ichinohe first described it as *Heterodera glycines.* Address: Japan.

4006. Kanie, M.; Morihara, K. 1952. [On the gelatinase of *Bacillus natto* II. Characters of gelatinase]. *Kagoshima Daigaku Nogakubu Gakajutsu Hokoku* (*Bulletin of the Faculty of Agriculture, Kagoshima University*) 1:80-84. [Jap]*

4007. Kanie, M.; Morihara, K.; Kisanuki, M. 1952. [On the gelatinase of *Bacillus natto* III. Dissimilarity of production of the gelatinase components]. *Kagoshima Daigaku Nogakubu Gakajutsu Hokoku* (*Bulletin of the Faculty of Agriculture, Kagoshima University*) 1:85-89. [Jap]*

4008. Masao, H. 1952. [Studies on natto and natto bacilli. I. Bacteriological studies]. *J. of the Nihon Medical University* 19:240-43. *

4009. Nitta, K. 1952. [Studies on the oil and protein content of soybean seed]. *Hokkaido National Agricultural Experiment Station, Research Bull.* (*Japan*) No. 63. p. 64-69. [6 ref. Jap; eng]*
• ***Summary:*** A high correlation was found between the maturity of the soybean plant and the oil and protein content of its seeds; the earlier the maturity of the variety, the higher the oil content; the later the maturity, the higher the protein content.

4010. Oinuma, T. 1952. [An artificially induced tetraploid soybean as green manure]. *Ikushugaku Zasshi* (*Japanese J. of Breeding*) 2:7-13. [Jap]*
• ***Summary:*** Gives the chromosome number of *Glycine soja* Sieb et. Zucc. as 2n = 20.

4011. Suzuki, Y. 1952. [Physiological function of urease]. *Kagaku* (*Tokyo–Science*) 22:264. [Jap]*

4012. Tohanawa, T.; Sonoda, M.; Tamura, S. 1952. [Cattle deaths from trichloroethylene extracted soybean meal]. *J. Japan Vet. Med. Association* 5:282. [Jap]*

4013. Engler, George E. 1952. Japanese-American cookbook: Hibachi cookery in the American manner. Rutland, Vermont; Tokyo: Charles E. Tuttle. ix + 306 p. Index). 21 cm. [Eng; Jap]
• ***Summary:*** All text, recipes, and indexes are given in both English and Japanese on facing pages. These are mostly American-style recipes using mostly American-style ingredients–but cooked over a hibachi–a Japanese charcoal broiler. Engler was a chef at the "American Club (the first club in Tokyo for civilian employees of the United States Army...).

A few recipes call for "soy sauce" as a seasoning: Steak Polynesian (p. 92). Chicken chop suey American style (p. 132). Roast chicken, Chinese style (p. 144). Chicken stew, Chinese style (p. 144). Chicken and cauliflower, Chinese style (p. 145). Lobster Malayan style (p. 150; Lobsters should be alive when cooked; plunge head first into rapidly boiling water). French fried clams (p. 174). No other soy ingredients are used. Address: Tokyo, Japan.

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4014. Hayashi, Uichi. 1952. Nattô seizô-ji ni okeru N busshitu no henka ni tsuite [The change of N-compounds during natto manufacturing]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 4(5):188-91. (Chem. Abst. 5395. 1954). [Jap]

4015. Inagaki, Choten; Iechika, Keiko. 1952. Gyûnyû oyobi nyû-seihin no bitamin C kyôkqa ni kansuru kenkyû. I. Gyûnyû hikaku shita tônyû no bitamin C no antei-do [Studies on the vitamin C enrichment of milk and milk-products. I. Stability of vitamin C in soybean milk as compared to cow-milk]. *Nippon Eiyo Shokuryo Gakkaishi* (*J. of the Japanese Society of Nutrition and Food Science*) [*Nihon*] 4(5):183-86. [4 ref. Jap]
Address: Lab. of Nutrition Chemistry, Ochanomizu Univ., Bunkyo-ku, Otsuka, Tokyo.

4016. Karasawa, Kôtarô. 1952. Crossing experiments with *Glycine soja* and *G. gracilis. Genetica* 26:357-58. [2 ref]
• ***Summary:*** "In my brief paper (Karasawa 1936), I reported that the cultivated soy bean might have been derived from the wild bean through the accumulation of qualitative and quantitative changes due to gene mutation, unaccompanied by any chromosomal change. Since then, I have made two crossing experiments of the soy bean x *G. gracilis* and *G. gracilis* x *G. ussuriensis* in order to ascertain their genom affinities. The latter case, however, was not successful, probably being due to technical failure."

A photo shows the results (pods and seeds) of the first cross. Address: Nasu Cyto-genetic Lab., Tochigi prefecture, Japan.

4017. Manas y Cruz, M.; Rozul, Juan B. 1952. Plant production and exploration. In: 1952. A Half Century of Philippine Agriculture. Manila, Philippines: Liwayway Publishing. xix + 463 p. See p. 154-69, especially p. 157-58. Published for the Bureau of Agriculture Golden Jubilee Committee by Graphic House. [18* ref. Eng]
• ***Summary:*** "Only a few species of our cultivated plants are indigenous to this country... Plant introduction work in the Philippines was started as far back as the Spanish regime... Between 1521 and 1815 approximately 200 species of economic plants of American origin were introduced into the Philippines." Plant introduction became a major project of the Bureau of Agriculture after it was established in 1902. Its first chief, F. Lamson-Scribner, laid the basic foundation for the introduction and exploration work.

Direct introduction of hybrid strains, such as soybeans, has saved much time compared to "the development of native varieties by the processes of selection and hybridization. For instance, it must have taken its American breeders from 7 to 12 crop seasons to produce the hybrid strain of soybean, Mis 28 EB strain 3910. When tested here for 2 or 3 crop seasons, it proved to be a very suitable variety of soybean for commercial growing in the Philippines."

The section titled "Vegetable Crops" notes: "In general, the introduction of vegetable crops has been very successful. Practically all the vegetable crops grown commercially here [including soybeans]... are the products of plant introduction work... Of the soybean, *Glycine max,* we are now commercially growing introduced varieties and strains both suitable for the rainy and dry season culture. Of over a hundred varieties and strains introduced from China, Japan, U.S., Hawaii and India, only few have been selected as the most adapted to certain regions of the islands. The most successful introductions recommended for commercial planting are: Mis 33 Dixi, Head Green and Mis 28 EB Strain 3910, all adapted to rainy and dry season cultures, and Yellow Biloxi hybrid, only adapted to rainy season culture. They gave yields of from 15 to 25 cavans of seeds per hectare" Note: 1 cavan, a unit of weight in the Philippines = 44 kg or 50 kg. Thus, 15 to 25 cavans/ha = 0.66 to 1.25 tonnes/ha.

"Unfortunately, our detailed Plant Introduction records of the past years were practically all destroyed or lost during the last World War operations, so it has been quite difficult to reconstruct them from memory or from whatever literature the authors were able to ransack within the short time available."

On page 398 is an ad for Cenvoco Vegetable Lard, made by the Central Vegetable Oil Manufacturing Co. of Manila. This shortening was probably made from coconut oil rather than soy oil.

Note 1. This is the earliest English-language document seen (Feb. 2008) that uses the term "Vegetable Lard" to refer to vegetable shortening.

Note 2. This book was written by men of the Philippine Bureau of Agriculture and its successors, the Bureau of Plant Industry, the Bureau of Animal Industry, and the Fiber Inspection Service. Address: Bureau of Plant Industry.

4018. Merino, Gonzalo. 1952. Introduction. In: 1952. A Half Century of Philippine Agriculture. Manila, Philippines: Liwayway Publishing. xix + 463 p. See p. ix-xix + 8 unnumbered pages of photos of directors of the Bureau of Agriculture, the Bureau of Plant Industry, and the Bureau of Animal Industry.
• ***Summary:*** Gives a good history and overview of agriculture in the Philippines, and of the Bureau of Agriculture, the Bureau of Plant Industry, and the Bureau of Animal Industry. Contents: Introduction. Exit the Spaniard, enter the American (The archipelago was visited by Portuguese navigator Magellan in 1521. The Spanish founded Manila in 1571. Spain ceded the islands to America for $20 million in 1898 after the Spanish-American War. The Bureau of Agriculture was founded by Americans in 1902). The Commonwealth years (from 1935). Agriculture

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under the Japanese (who occupied the country during World War II). Postwar agriculture. Our agriculture in terms of pesos (soybeans are listed as one of 20 major field crops [not including fruits] worth a total of more than 200 million pesos in 1938). Farmers have changed for the better. Youth and agricultural education. Other government agricultural services. The farmer and today's world. Address: Director of Plant Industry.

4019. St. Peter's Sunday School and St. Mary's Guild. 1952. Oriental flavors: Recipes. Seattle, Washington: St. Peter's Mission. 33 p. Illust. 22 cm. *
• ***Summary:*** Aya Kagawa was born in 1899.

4020. Takenobu, Yoshitaro. ed. 1952. Kenkyusha's new Japanese-English dictionary. Tokyo: Kenkyusha. iv + 68 + 2266 + [2] p. 19 cm.
• ***Summary:*** This interim edition, between the 1931 second edition and the 1954 third edition has two dates written in Japanese in the front matter: March 1931 and April 1949. On the last page, the publication date is given in Japanese as 1 Feb. 1951.

This edition has two main parts: (1) "New Words (1949) consisting mostly of mostly English language words that entered the language due to the social and cultural influence of the American occupation of Japan. The words, a mini-dictionary on 68 pages, include words such as aakeedo = arcade (written in both rômaji and katakana). There are also some new Japanese words.

(2) The entire content of the 1931 second edition– exactly the same, page for page.

New words related to soy: daizu [abura]: [soy] bean oil. Address: General editor, Japan.

4021. Burlison, W.L. 1952? Looking ahead with soybeans. Urbana, Illinois. 14 p. Undated. Unpublished manuscript.
• ***Summary:*** Dr. Burlison, who had retired in June 1951, prepared this undated, handwritten manuscript for a talk on soybeans he gave or intended to give in about 1954. Contents: Introduction. 1. The challenge of the past: Publications, research, extension work, early soybean farmers (Stoddard of Carlinville), American Soybean Association, soybean processors in the USA and Illinois, Illinois Farm Advisers Assoc., H.G. Atwood and the Peoria Plan, establishment of Regional Soybean Laboratory 1936 is most significant recent event in soybean history (part is located in Peoria, headquarters in Urbana, Illinois), the challenge, Illinois still leads in soybean production.

2. The facts of the present: Strong interest by the university, researchers, farmers, and processors, average yield has more than doubled.

3. The promise of the future: Industrialists predicted needs for the future (See *Soybean Digest,* Sept. 1952. R.M. Bethke of Ralston Purina Co., H.C. Black of Swift & Co., J.C. Konen of Archer Daniels Midland Co., Ward Calland of National Crop Improvement Council, Mitsuo Hirano, president of Association of Oil and Fats Manufacturers of Japan, J.C.A. Faure of International Association of Seed Crushers, E.M. Learmonth of British Soya Products Ltd. (London), USDA Office of Agricultural Experiment Stations, George Strayer of American Soybean Association).

As early as 1897 in Illinois, "the soybean showed great future promise. To date our College of Agriculture has published 32 bulletins and 42 circulars and many hundreds of journal articles and pamphlets of various kinds. This is truly a fine record."

Today in the United States there are 260 plants which process soybeans; 37 of these are in Illinois.

"It should be noted that the first recorded effort to find an outlet for surplus [soybeans] was in 1921 when the president of the Illinois Farm Advisers Association contacted the industry for the purpose of finding a possible outlet in Illinois to handle our soybeans. Our soybean production was just getting under way which meant some uncertainty in soybean supplies.

"This uncertainty continued until 1928 when, because of heavy abandonment of winter wheat in Illinois, it seemed necessary to turn to soybeans for a part of the acreage if some assurance could be given that a sudden increase in production would not result in ruinous prices. After some negotiations with the late H.G. Atwood a price was set for soybeans as far as his company was concerned. So far as we know, this is the first instance of a case where the price was fixed before that crop was produced. This was a very important move in giving soybeans considerable stability.

"The most significant recent event in soybean history was the establishment in 1936 of the Regional Soybean Laboratory a part of which is now located in Peoria, Illinois, and a section devoted to soybean breeding with headquarters at this university."

"Illinois is still by long odds the leading soybean-producing state. Of the state's 102 counties, 41 produced from 1- to almost 4 million bushels in 1951. Outside of Illinois there are only 21 counties in the nation that produced 1 million bushels of soybeans last year. Four Illinois counties grew between 3 and 4 million bushels in 1951." Champaign County leads the nation with almost 4 million bushels. Address: Univ. of Illinois.

4022. Ozaki, Kaoru. 1953. Studies on the intensity of response to temperature and day-length during the growth period of soybeans. I. Response of varieties and their relation to the geographical distribution of soybean in Hokkaido. *Hokkaido Nogyo Shikenjo Iho* (*Hokkaido National Agricultural Experiment Station, Research Bulletin*) No. 64. p. 7-11. Feb. [5 ref. Jap; eng]
• ***Summary:*** In Hokkaido, summer type, intermediate type, and autumn type soybean varieties are grown. In the districts

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northward from the middle of Hokkaido and in the eastern districts, summer type varieties are mainly grown. In the warmer districts, summer type varieties are also mainly grown.

In the warmer districts southward from the middle of Hokkaido, varieties of all three types are grown.

4023. Bening, W. 1953. Soy flour and milk powder in Europe. II. *Soybean Digest.* March. p. 20-21. See also: Part III. April, p. 20.
• ***Summary:*** Japan exported the first Manchurian soybeans to Europe in 1905. "Two oil mills in Hamburg-Harburg, Hansa-Muhle and Brinckmann & Mergell, had independently–and almost simultaneously–invented the continuous solvent extraction process for oil seeds. After World War I Hansa-Muhle entered into close cooperation with *Geheimrat Rubener,* an outstanding German nutritionist.

"Rubener was among the first to recognize that protein is essential in the diet. He pointed out that different proteins have different values, that grain protein needs fortification with other high-value proteins, that soy flour is one of the cheapest and richest sources of those amino acids in which grain proteins are deficient.

"Hansa-Muhle was the first in Germany to actually promote protein enrichment of bread with soy flour in the meat-and-milk-deficient years following World War I. But the emergency was over sooner than anticipated. The new enriched *Rubener bread* did not have sufficient time to win over consumers."

"In Germany, the industry was just starting to step from promotion and education into actual commercial production when the import and currency policy of the Reich reduced soybean imports so drastically that almost no beans were available for the soy food industry. The production capacity of the country was reserved for war purposes. Allocations of beans could not be obtained except for army orders."

"After World War II... there was a lack of bread grain as well as fat. The food administrations fell back on Rubener's and Hansa-Muhle's procedure of the protein enrichment of bread with defatted soy flour. So defatted soy flour was shipped to Germany from America."

Soy flour was introduced into Greece when it was struggling to prevent extinction by bolshevism. The Italian-German occupation during World War II had reduced the country's food reserves. At first 5% soy flour was added to bread; this amount, combined with the relatively poor gluten content and baking quality of the available wheat, was too much; it "brought about a visible shrinkage in the bread volume. Reduction of the soy flour content to 3% resulted in satisfactory bread.

Photos show: (1) A large Rumanian soybean field in north Bessarabia, 1938, with 4 men standing in the field. (2) A portrait photo of W. Bening.

4024. *Soybean Digest.* 1953. 23 million meals of Multi-purpose food. March. p. 19.
• ***Summary:*** "Nearly 23 million 3-cent meals of the 'Multi-Purpose' food have been distributed on the hunger fronts of the world, according to a report issued by the non-profit Meals for Millions Foundation, Los Angeles...

"More than 1¼ million meals, the report states, have gone to feed Korean refugees (813,000 meals since last June). Shipments to India total 3,880,000 meals of which nearly a million have been shipped since June. Popularity of the food has been enhanced by development of special native recipes printed in the Korean and Tamil languages.

"Significant shipments have gone to the Middle East, Hong Kong, Formosa, Burma, Africa, Arabia, Japan, Philippines, Latin America, Europe, and Caribbean and South Pacific Islands.

"World-wide distribution has been through 133 American relief and religious agencies and health departments of foreign governments...

"For further information or to make contributions contact Meals for Millions Foundation, 648 South Broadway, Los Angeles 14, California."

Note: This is the earliest document seen (Dec. 2007) concerning soybean products (soy flour) in Arabia [this term usually refers to the Arabian Peninsula, but in this case it may well refer to Saudi Arabia]; soybeans as such have not yet been reported. This document contains the earliest date seen for soybean products in Arabia (March 1953); soybeans as such had not yet been reported by that date.

4025. Yada, N. 1953. [Lowering of the dry-point of light petroleum oil]. *Japanese Patent* 1882. April 30. [Jap]*
• ***Summary:*** Describes solvent extraction using ethyl alcohol.

4026. Inoue, Norimasa; Kitagawa, Shiro. 1953. Tôfu no eiseigaku-teki kenkyû [Sanitary studies on tofu (soybean curds)]. *Eiyogaku Zasshi* (*Japanese J. of Nutrition*) 10(6):182-83. April. [Jap; eng]
• ***Summary:*** The number of coli bacillus was 10-100 per gm in early March and 1,000 to 10,000 in early July. Address: Kokuritsu Eiyo Kenkyusho (National Inst. of Nutrition, Japan).

4027. Inoue, Norimasa. 1953. Nattô no kyôka ni kansuru kenkyû. I. Nattô no kyôka hôhô ni tsuite [Studies on the enrichment of natto (fermented soybeans). I. On the method of enrichment of natto]. *Eiyogaku Zasshi* (*Japanese J. of Nutrition*) 10(6):179-81. April. [1 ref. Jap; eng]
• ***Summary:*** The main nutrient added is vitamin B-2. Address: Kokuritsu Eiyo Kenkyusho (National Inst. of Nutrition, Japan).

4028. Niwa, Soichi; Katayama, N.; Suzuki, E. 1953. Tônyû no kakô ni kansuru kenkyû. I. Nyûsankin o mochiiru tônyû

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kakô no yobi jikken [Studies on the preparation of bean milk. I. Preliminary experiments on the preparation of bean milk by cultivating Lactobacillus]. *Eiyogaku Zasshi* (*Japanese J. of Nutrition*) 10(6):187-89. April. [3 ref. Jap; eng]
Address: 1-2. Aichi-ken Eisei Kenkyusho (Sanitary Inst. of Achi prefecture); 3. Lab. of Food & Nutrition, Kinjo College.

4029. Watanabe, Tokuji. 1953. Re: Questions about isolated soy protein. Photographs of the process for making Kori-Tofu. Letter to Allan K. Smith, Northern Regional Research Laboratory, Peoria, Illinois, about May 1. 2 p. Handwritten, with signature. [Eng]
• ***Summary:*** Dr. Watanabe received, with many thanks, the sample of isolated soybean protein prepared in the pilot plant at Peoria, Illinois, and sent by Dr. Smith. It will be very useful for his research. He asks Dr. Smith to please tell him the procedure used in preparing the sample and the method for determining the degree of denaturation of the protein.

He sends Dr. Smith seven small black-and-white photos plus two small illustrations (drawn by him) showing the process for preparing "Kori-Tofu, which is consumed in western Japan." Below each is an explanation. "Although the procedure is very primitive as you see," it is an interesting way to make soybeans more digestible and nutritious. If Dr. Smith is interested, Dr. Watanabe will send him more information about foods prepared from soybeans in Japan.

Note 1. This is the earliest English-language document seen (April 2013) that uses the term *Kori-Tofu* (regardless of capitalization) to refer to dried-frozen tofu.

The photos show the interior of a fairly small commercial tofu shop. The captions read: (1) Boiling of aqueous extract of ground soybeans. (2) Precipitation of protein by adding calcium chloride to the boiled extract. (3) Precipitate is poured into the frame [curds into forming box] and pressed. The result is tofu. (4) Tofu is preserved [kept fresh] by dipping in water. (5) The tofu is cut into slabs, and placed on wooden benches or tables outdoors in the winter; here it is exposed to the cold, dry air all night long. The slabs are then kept (aged) in a frozen state for 2 weeks. A freezer can also be used. (6) The pieces of frozen tofu are thawed by immersion in running water in a large sink. (7) The sponge-like tofu is pressed using a screw press to dehydrate it. (8) The dehydrated tofu is dried on racks by heating and ventilation. (9) The final products spread on tables where they are selected and graded.

Note 2. This is the earliest English-language document seen (April 2013) that uses the word "sponge" or the term "sponge-like" to describe the texture of dried-frozen tofu.

Note 3. Allan K. Smith earned his PhD degree in physical chemistry from Columbia University in New York City. Address: National Food Research Inst., Food Agency, Ministry of Agriculture and Forestry, Fukagawa-Hamazonocho 2, Koto-ku, Tokyo, Japan.

4030. Iguchi, Nobuyoshi. 1953. Kôji-kin ni kansuru kenkyû. VII. Nitrogen mustard ni yoru shôyu kôji-kin no heni ni tuite (1) [Studies on *Aspergilli.* VII. Induction of induced mutations in *Aspergillus sojae* by nitrogen mustard (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(5):229-33. May. [22 ref. Jap; eng]
Address: Noda Sangyo Kagaku Kenkyusho (Noda Industrial and Scientific Research Lab., Noda, Japan).

4031. Yokotsuka, Tamotsu. 1953. Shôyu kôki seibun ni kansuru kenkyû. IX. Kô futten-bu no kôki seibun (4) Phenol-sei kôki seibun no bunri [Studies on flavorous substances in soy [sauce]. IX. On a high boiling point fraction (4) Isolation of phenolic flavorous substances]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(5):276-81. May. [8 ref. Jap; eng]
• ***Summary:*** Hydroxy-2- methoxy-4- ethyl-benzene was isolated as phenylurethane (melting point: 104º) from the steam distillate of soy sauce presscake. It has proved to be an important component of soy sauce flavors. Address: Noda Industrial Science Laboratory [Noda, Japan].

4032. Beck, Mrs. Fred. 1953. Farmers market today (Ad). *Los Angeles Times.* June 17. p. 4.
• ***Summary:*** "The *hibachi* is the little charcoal-fired stove of Japan." It "is the very best charcoal broiler we've seen." It looks something like an old-fashioned iron pot, but its main advantage over "most charcoal broilers and braziers is an ingenious but simple draft control. It has a damper that works."

"With the *hibachi* comes a book of special recipes including one for Sukiyaki–and for Teriyaki Sauce. The price–$19.95."

Note: This is the earliest English-language document seen (April 2012) that contains the term "Teriyaki Sauce."

4033. Kobayashi, Setsuko; Shiseki, Kiyoshi. 1953. [The rise and fall of the various phosphorus compounds and dehydrogenase activity in the germination process]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 27(6):229-32. June 20. [7 ref. Jap]
Address: 1. Agricultural Chemistry Div., Dep. of Agriculture, Tokyo Univ. of Agriculture.

4034. Kondo, Kinsuke; Mori, Shigeki; Kajima, Morikazu. 1953. Tanpaku ni kansuru kenkyû (56). Daizu no kisei-bun tanpaku (sono 1) [Studies on proteins (56). On the components of soybean protein, Part I.]. *Kyoto Daigaku Shokuryo Kagaku Kenkyujo Hokoku* (*Bulletin of the Research Institute for Food Science, Kyoto University*) No. 11. p. 1-23. June. [12 ref. Jap; eng]
Address: Research Inst. for Food Science, Kyoto Univ., Kyoto, Japan.

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4035. Nakano, Masahiro; Matsuura, S.; Okada, Tsuneko. 1953. Tane kôji ni kansuru kenkyû. V. Kakuchi yori saishu seru kôji kinrui no kôso-ryoku ni yoru bunrui [Research on koji starter (tane-koji). V. On the grouping based on the enzymic activity of koji molds collected from various districts]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 8. p. 127-54. June. English-language summary p. 13. [7 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4036. Nakano, Masahiro; Matsuura, Shinji. 1953. Tane kôji ni kansuru kenkyû. VI. Dani no sentaku-teki kinkabu shokugai-sei ni tsuite [Research on koji starter (tane-koji). VI. On the selective infestation of the koji molds by mites]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 8. p. 155-59. June. English-language summary p. 14. [7 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4037. Nakano, Masahiro; Ebine, Hideo. 1953. Baichi no CN hiritsu to kôji-kin no kôso. Seisan no kankei ni tsuite [A study on the effect of the C/N ratio in the media on the formation of enzymes by the mold *Aspergillus oryzae*]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 8. p. 163-68. June. English-language summary p. 15. [7 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4038. Nakano, Masahiro; Ebine, Hideo. 1953. Shôyu jôzô-yo kôji-kin to kôso ryoku ni tsuite [On the enzymatic activity of the *Aspergilli* for shoyu manufacture]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 8. p. 169-72. June. English-language summary p. 16. [3 ref. Jap; eng]
• ***Summary:*** Molds of the genus *Aspergillus* which produce highly active protease were selected by a simple, suitable method as suitable for making shoyu. The optimal ratio of soy bean cake to wheat bran for the formation of amylase by the Aspergilli appears to be 1-3 to 7, and for the formation of protease it appears to be less.

The optimal ratio of soybean cake to wheat bran differs according to the strains of Aspergilli. Asp. 0-3-6 (*Aspergillus oryzae*) produces more active amylase and protease on the wheat bran. *Aspergillus Okazakii* produces more active protease on the media containing more soy bean cake.
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4039. Nakano, Masahiro; Yoshikawa, S.; Ebine, H. 1953. Kome miso no genryô haigô ni tsuite [On the proportion of raw materials used in manufacturing kome-miso (rice-miso)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 8. p. 173-77. June. English-language summary p. 16-17. [Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4040. Nakano, Masahiro; Ebine, Hideo. 1953. Miso no iro no kenkyû. Manseru hyô shokukei no ôyô [The color of miso: Use of Munsell's color notations]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 8. p. 179-85. June. English-language summary p. 17. [9 ref. Jap; eng]
• ***Summary:*** The color of miso can be well expressed using Munsell's color notations by the measurement of tristimulus values at the miso surface. Values are given for: Shiro miso, Shinshu miso, Edo or ama-miso, mugi or inaka miso, Sendai miso, and Hatcho miso. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4041. Nakano, M.; Ohta, H. 1953. Nattô ni kansuru kenkyû. I. Nattô-kin no hatsu netsu ni tsuite [Research on natto. I. On the production of heat by the natto bacillus]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 8. p. 187-92. June. English-language summary p. 18. [1 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4042. Nakano, M.; Ohta, H. 1953. Nattô ni kansuru kenkyû. II. Eiyô kyôka nattô ni tsuite [Research on the natto bacillus. II. The manufacture of enriched natto]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 8. p. 193-95. June. English-language summary p. 19. [1 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4043. Sakai, Heiichi; Miyazawa, S.; Terada, O. 1953. Bitamin B-12 no biseibutsu teiryô ni tsuite–Kakushu teiryô kin kabu no hikaku [On the microbiological assay of vitamin B-12–Comparative study of various assay organisms]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(6):377-81. June. [15 ref. Jap; eng]
• ***Summary:*** Four test organisms were compared from the standpoint of vitamin B-12 assay: *Lactobacillus lactis* Dorner, *L. leichmannii, Euglena gracilis* var. *bacillaris,* and *Escherichia coli* mutant. The standard error range for all is about the same (10-15%), but Euglena can grow normally in the presence of antibiotics. Address: Fermentation Lab., Agricultural Faculty, Tokyo Univ., Japan.

4044. Sasaki, R.; Tsugo, T. 1953. The manufacture of synthetic milk powder from whey and soy-bean. I. The preparation of synthetic milk from whey and soy-bean.

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International Dairy Congress, Proceedings 13(4):602-05. June. Proceedings of the 13th International Dairy Congress, held 22-26 June 1953 at The Hague, Netherlands. [2 ref. Eng; fre; ger]
• ***Summary:*** Although there are many ways of using whey, in Japan only a small percentage of it is used as raw material for the manufacture of lactose; most of it is mixed with skim milk [nonfat milk] for the feeding of calves, or is discarded.

The preferred process was: Soak soybeans in water overnight, then grind finely. Add whey to the ground soybeans. Heat the mixture. Remove the insoluble residue [okara] by press filtering. A powder can be prepared from the resulting liquid soy & whey milk.

When lactic acid whey was used the resulting product had a much better flavor than soy-bean milk itself. Address: Faculty of Agriculture, Univ. of Tokyo, Japan.

4045. Sasaki, R.; Tsugo, T. 1953. The manufacture of synthetic milk powder from whey and soy-bean. II. The manufacture and nutritive value of synthetic milk powder. *International Dairy Congress, Proceedings* 13(4):606-10. June. [5 ref. Eng; fre; ger]
• ***Summary:*** Using the process developed in the previous report, a manufacturing experiment was conducted semi-industrially at a milk powder factory. Various chemical properties of the product were determined and its nutritive value compared with that of regular whole milk powder. Address: Faculty of Agriculture, Univ. of Tokyo, Japan.

4046. Yamada, Noboru; Murata, Yoshio. 1953. [Study on the respiration of crop plants. IV. Effect of 2,4-D on the respiration of plants]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 21(3-4):199-200. June. [Jap; eng]
• ***Summary:*** An abnormal rate of respiration was observed in soybean seedlings soon after they were sprayed with 2,4-D.

Note: This is the earliest document seen (Aug. 2001) that mentions pesticides in connection with soybeans. Address: National Inst. of Agricultural Science, Japan.

4047. Yokotsuka, Tamotsu. 1953. Shôyu kôki seibun ni kansuru kenkyû. XI. Tei futten kôki seibun (2) [Studies on flavorous substances in soy [sauce]. XI. Flavors of lower boiling fractions (2)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(6):359-63. June. [6 ref. Jap; eng]
Address: Noda Industrial Science Laboratory, Noda, Japan (Kikkoman).

4048. Yokotsuka, Tamotsu. 1953. Shôyu kôki seibun ni kansuru kenkyû. X. [Studies on flavorous substances in soy [sauce]. X. Flavors with high boiling points. (5) Precursors of phenolic flavorous substances]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(6):334-39. June. [4 ref. Jap; eng]
• ***Summary:*** The flavorous substances in the steam distillate of soy-cake [soy sauce presscake; *shoyu kasu*] (boiling point 185-325º) were investigated by means of hydrolysis and oxidation. Address: Noda Industrial Science Laboratory.

4049. Costello, Michael. 1953. Meals for Millions: This crusading Californian is showing how the problem of world hunger can be licked. *Reader's Digest* 63:126-28. July. Condensed from *The Christian Century,* 70:602-04, May 20,1953.
• ***Summary:*** The colorful story of Clifford Clinton (an illustration shows his portrait), Henry Borsook, Multi-Purpose Food (based on soybean grits), and Meals for Millions Foundation, Inc. To aid the Foundation and its humanitarian work, "Clinton donates office space in one of his Los Angeles cafeteria buildings (located at 648 S. Broadway, Los Angeles 14, California). To reach it one passes through a dim 'landscaped' dining room with pools, grottos, singing birds and organ music, then up innumerable stairs, through a bakery and a carpentershop, and arrives finally in a bustling, crowded office. Here orders come from individuals, churches, social and governmental agencies. The Multi-Purpose Food business is handled by a small staff headed by a bouncy, enthusiastic woman named Florence Rose."

"Four million Multi-Purpose meals have gone to India, three million each to China and Japan, two million each to Germany and Korea, one million to France." Some 333,000 people in Lebanon, 250,000 people in the Philippines, and several hundred thousand in Austria and Greece have been saved from hunger by Multi-Purpose meals. Shipments have gone to the Vatican for distribution to Italian poor, to migrant labor camps in California and Arizona, to the Navajo and Hopi Indian reservations. The largest buyer and distributor is the Roman Catholic Church, followed by the Friends Service Committee.

Note: This is the earliest document seen (Feb. 2001) concerning soybean products (Multi-Purpose Food containing soy grits) in the Vatican; soybeans as such have not yet been reported.

4050. Hukinbara, Takashi; Muramatsu, Keiichiro. 1953. [The action of mold amylase on alcohol fermentations. I. The saccharogenic effect of Takadiastase and alcohol fermentation by the saccharifying agents of the differential enzymic ratios]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(7):398-402. July. [Jap; eng]
Address: The Scientific Research Inst. Ltd.

4051. *Miso Gijutsu* (*Miso Technology*). 1953--. Serial/ periodical. Central Miso Research Inst., Shinkawa 1-26-19, Chuo-ku, Tokyo 104, Japan. Vol. 1, No. 1. July 30, 1953.

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[Jap]
• ***Summary:*** Name changed to *Miso no Kagaku to Gijutsu* with issue No. 167, in Jan. 1968. Address: Tokyo, Japan.

4052. *Miso Kagaku* (*Miso Science*). 1953--. Serial/periodical. Zenkoku Miso Gijutsu Kurabu, Tokyo, Japan. [Jap]
Address: Tokyo, Japan.

4053. Sakai, Heiichi. 1953. Bisei-butsu ni yoru bitamin B-12 no seisan ni tsuite. II. Kaku shu bisei-butsu no B-12 seisan shiken [On vitamin B-12 production by fermentation. II. Production test of B-12 by various microorganisms]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(7):405-07. July. [7 ref. Jap; eng]
• ***Summary:*** Two strains of *Bacillus natto* produced 33.0 and 50.0 nanograms respectively of vitamin B-12 (LLD active substance) per cc in shaking culture. This was the highest value of 15 yeasts, 25 fungi (molds), and 25 bacteria tested. Four species of actinomycetes yielded higher values (80-100 nanograms per cc). Address: Tokyo Daigaku Nôgaku-bu, Hakkogaku Kyoshitsu (Fermentation Lab., Agricultural Faculty, Tokyo Univ., Japan).

4054. Sakai, Heiichi. 1953. Bisei-butsu ni yoru bitamin B-12 no seisan ni tsuite. III. Kôtani seisan kin no bunrui narabini sono kingaku-teki seijô [On vitamin B-12 production by fermentation. III. Isolation of high potential strains and their microbiological characteristics]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(7):407-12. July. [13 ref. Jap; eng]
Address: Fermentation Lab., Agricultural Faculty, Tokyo Univ., Japan.

4055. Iguchi, Nobuyoshi. 1953. Kôji-kin ni kansuru kenkyû. VIII. Nitrogen mustard ni yoru shôyu kôji-kin no heni ni tuite. (2). Biochemical mutant ni tsuite [Studies on *Aspergilli*. VIII. Induction of induced mutations in *Aspergillus sojae* by nitrogen mustard. (2). Biochemical mutants]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(8):541-44. Aug. [8 ref. Jap; eng]
Address: Noda Sangyo Kagaku Kenkyusho (Noda Industrial and Scientific Research Lab., Noda, Japan).

4056. Yokotsuka, Tamotsu. 1953. Shôyu kôki seibun ni kansuru kenkyû. XII. [Studies on flavorous substances in soy [sauce]. XII. Flavorous substances in raw soy [sauce] (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(8):549-53. Aug. [4 ref. Jap; eng]
Address: Noda Industrial Science Lab.

4057. Omata, Shojiro; Ueno, Teruo. 1953. Shôyu no iro ni kansuru kenkyû. I. Shôyu no shikichô narabini kasseitan ni taisuru tokusei [On the color of shoyu. I. Color of shoyu and its characteristics for the active charcoal]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(9):570-75. Sept. [5 ref. Jap; eng]
Address: Naniwa Daigaku Nôgaku-bu, Nogei Kagaku Kyoshitsu (Faculty of Agriculture, Naniwa Univ.).

4058. Omata, Shojiro; Ueno, Teruo. 1953. Shôyu no iro ni kansuru kenkyû. II. Chozô-chû no iro no henka ni kanshite [On the color of shoyu. II. Factors causing the color change during storage]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(9):575-80. Sept. [6 ref. Jap; eng]
• ***Summary:*** The main cause of color change in shoyu is air oxidation. The effects of enzymatic reaction, temperature and light are not important. Aeration causes darkening of color.
Address: Faculty of Agriculture, Naniwa Univ.

4059. Sakaguchi, Kinichiro; Ishitani, Chiyoko; Takamori, Shosaku. 1953. Kôji-kin no shizen heni ni kansuru kenkyû. V. Anastomosis no jôken no kentô [Studies on the natural variation of koji molds (*Aspergillus oryzae* and *Aspergillus sojae*). V. Studies on the environmental effects upon anastomosis]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(9):638-42. Sept. [8 ref. Jap; eng]
• ***Summary:*** "The environmental effects upon anastomosis of Koji-molds have been studied by means of hanging drop culture and mixed point-inoculum plate culture, using the color mutants of *Asp. sojae.*" Address: Tokyo Daigaku Nôgaku-bu, Nogei Kagaku Kyoshitsu (Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo).

4060. Yamanishi, Tadashi; Obata, Yataro. 1953. Shôyu kôki no kenkyû. VI. Merukaputaaru oyobi merukaputooru rui no gôsei [Studies on soy sauce flavors. VI. Synthesis of mercaptals and mercaptols]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(9):652-54. Sept. [11 ref. Jap; eng]
• ***Summary:*** "We have synthesized 16 kinds of mercaptans and 2 kinds of mercaptols. Eight of them are unknown substances. The odors of them are illustrated." Address: Hokkaido Daigaku Nôgaku-bu, Nogei Kagaku Kyoshitsu (Inst. of Agricultural Chemistry, Hokkaido Univ., Sapporo, Japan).

4061. Sneider, Vern. 1953. Below the teahouse. *New York Times.* Oct. 11. p. X1, X3.
• ***Summary:*** People are basically the same in their wants and desires, but that underlying similarity is often confused by externals. For example: "The Japanese might want his miso soup for breakfast; the Korean might want his pickles, called kimchi, and the American might want his ham and eggs. Yet basically they all want the same thing–namely, breakfast."

4062. Lo, K.S. 1953. The story of soybean milk. *Far Eastern*

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Economic Review. Oct. 29. p. 568-69.
• ***Summary:*** In 1936 the author, a resident of Hong Kong, happened to be in Shanghai, where he read a newspaper article about a talk given by a Dr. Webb [actually by Julean Arnold; see letter from K.S. Lo, 3 Nov. 1989] on the nutritional value of the soybean. He was very impressed. A year later, the invasion of China by Japan brought a steady flow of refugees into Hong Kong, and with them problems of food supply and malnutrition. Lo recalled the article he had read about soybeans and began to think about the idea of making soybean milk to be sold to the working classes at the lowest possible price. He took his idea to Hong Kong's new director of Medical Services, Dr. P.S. Selwyn-Clarke, who was known for his progressive ideas, his untiring energy for work, and his concern for the poor. "He at once offered me his moral support were I to embark on this scheme. It was through his personal encouragement and moral support that eventually I was able to bring it to fruition. He was also later to become my strongest supporter and advocate of soybean milk. A modest factory was built at Causeway Bay and it was opened for business in March, 1949 [actually 7 March 1940]. The equipment used was simple and crude and the method adopted for the making of this milk was modeled after the dairy industry. On the day of its opening, I can still remember that the total business done was 9 bottles sold."

"After two years of hard struggle, we were beginning to make some headway in our sales. At this point the Pacific War intervened and brought our activities to a stop. The factory was occupied by the Japanese, and what little equipment we had in it was lost. After the war was over we tried to restart it, and once again Dr. Selwyn-Clarke came to our rescue."

"Much to our surprise, the post-war public took to soybean milk without being coaxed. All of a sudden it became very popular, especially among the working classes." A larger and more modern factory was built at Aberdeen, and completed in 1950. After this a product that did not require refrigeration was developed; sales increased ten-fold. "Today we are able to produce from 3000-5000 cases (24 bottles each) of soybean milk a day; distributed over the territories of Hongkong, Kowloon, New Territories and Macao with a fleet of 18 trucks."

The company has "succeeded in producing a nutritious and wholesome food and putting it within the reach of the masses." The price has been kept down to 20 cents (H.K.) per bottle. The soybean milk is also extremely high in vitamin B, and because of the large amount consumed by the public daily, this has a beneficial nutritional effect. The company is now also working actively with UNICEF [United Nations International Children's Emergency Fund] in promoting similar projects in Asia. "Already we know for certain that a factory similar to ours has been put up in Djakarta by the Indonesian Government in conjunction with UNICEF."

"We are, however, not resting on our laurels. Our technicians have been busy experimenting on condensed soybean milk, which we hope to put on the market sometime next year. Then we will move onto soybean milk powder, and other forms of soya food products."

Note 1. This is the earliest document seen (April 2004) that describes UNICEF's awareness of the attractions of Vitasoy as a high protein soy beverage for use in developing countries, and joint efforts by UNICEF and Vitasoy to promote similar products in Asia. Note 2. When Vitasoy was launched in March 1940, it was fortified with vitamins, calcium, and cod liver oil. Now, in 1953, it appears not to be fortified at all.

4063. Funahashi, Saburo; Uritani, Izuko; Akazawa, T. 1953. [The metabolism of germinating plants. I. Evidence for the occurrence of coenzyme A in soybean seedlings]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(10):684-88. Oct. [23 ref. Jap; eng]
• ***Summary:*** A coenzyme A (CoA) preparation of 2.2 units per mg was isolated from soybean seedlings. Its occurrence in soybean seedlings may be taken as one piece of evidence that the TCA cycle was a major metabolic pathway in this plant tissue.

Note: The TCA (tricarboxylic acid) cycle, is presently (Dec. 2008) best know as the "citric acid cycle," and also as the "Krebs cycle." It is a series of enzyme-catalysed chemical reactions of central importance in all living cells that use oxygen as part of cellular respiration–first established by the seminal work of Albert Szent-Györgyi and Hans Krebs. Address: Dep. of Biological Chemistry, Faculty of Agriculture, Nagoya Univ., Nagoya, Japan.

4064. Tomoyeda, Mikio; Obata, Yataro. 1953. [Mechanism of microbiological synthesis by the butyl-acetone organism. III. Precursor of riboflavin including in soybean flake]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(10):869-72. Oct. [15 ref. Jap; eng]
• ***Summary:*** Note: After the table of contents in the Dec. 1953 issue is a full page portrait photo of the late Aso Keijiro, PhD (Asô Keijirô, hakase). Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Hokkaido Univ.

4065. Tsugo, Tomokichi. 1953. Gyûnyû narabini hoee ni taisuru daizu nyû no kongo nôshuku shiken [Experiments on the condensing of whole milk and whey mixed with soybean milk]. *Nippon Chikusan Gakkaiho* (*Japanese J. of Zootechnical Science*) 24(2):73-78. Oct. English-language summary in Dairy Science Abstracts 16:237. [6 ref. Jap; eng]
• ***Summary:*** "When soybean milk was mixed with cow's milk and the mixture was condensed, the viscosity of the concentrate became higher due to the protein of the soybean milk." Address: Faculty of Agriculture, Univ. of Tokyo,

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Tokyo, Japan.

4066. Yamanishi, Tadashi; Obata, Yataro. 1953. Shôyu kôki no kenkyû. VII. Acetals oyobi aldol shukugôbutsu no gôsei [Studies on soy sauce flavors. VII. Synthesis of acetals and aldol-condensation products]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(10):657-59. Oct. [10 ref. Jap; eng]
Address: Hokkaido Daigaku Nôgaku-bu, Nogei Kagaku Kyoshitsu (Inst. of Agricultural Chemistry, Hokkaido Univ., Sapporo, Japan).

4067. Yamanishi, Tadashi; Obata, Yataro. 1953. Shôyu kôki no kenkyû. VIII. Methylsulphides no gôsei [Studies on soy sauce flavors. VIII. Synthesis of methylsulphides]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(10):660-61. Oct. [7 ref. Jap; eng]
Address: Hokkaido Daigaku Nôgaku-bu, Nogei Kagaku Kyoshitsu (Inst. of Agricultural Chemistry, Hokkaido Univ., Sapporo, Japan).

4068. Loring, Patricia. 1953. Hawaii has varied food for visitors. *Chicago Daily Tribune.* Nov. 29. p. F7.
• ***Summary:*** "Japanese food, for me, was the most difficult to manage. Miso soup (made from soybeans), kidney beans, and cabbage for appetizers were edible. Beef tofu, kamaboko (fish cake), miso yaki [fish coated with miso, then broiled] were all questionable."

4069. Akasawa, Takashi; Funahashi, Saburo; Uritani, Ikuzo. 1953. [The metabolism of germinating plants. III. Coupling of transamination with tricarboxylic acid cycle in soybean seedlings]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(12):849-53. Dec. [18 ref. Jap; eng]
• ***Summary:*** Cytoplasmic particles isolated from soybean seedlings were previously shown to be active as an enzyme system in catalyzing the oxidation of acids in TCA cycle.

In this paper we present evidence that respiratory oxidation of an acid of TCA cycle members by the cell fraction in the presence of an alternative amino acid–alanine, aspartate or glutamate–are followed by the formation of remaining amino acids, when supplemented with coenzyme concentrates. Therefore, it seems that the particles are active in catalyzing action for the transamination which is coupled with TCA cycle (from journal@rchive). Address: Lab. of Biochemistry, Faculty of Agriculture, Nagoya Univ., Nagoya, Japan.

4070. Funahashi, Sabura; Akasawa, Takashi; Uritani, Ikuzo. 1953. [The metabolism of germinating plants. II. Pyruvate oxidation by the mitochondrial fraction]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 27(12):842-88. Dec. [29 ref. Jap; eng]
• ***Summary:*** Pyruvate oxidation by the mitochondrial fraction of soybean seedlings, including hypocotyl and cotyledon, was investigated in the light of recent understanding of the role of acyl-transferring coenzyme A. Address: Lab. of Biochemistry, Faculty of Agriculture, Nagoya Univ., Nagoya, Japan.

4071. Gamio, Manuel. 1953. Campaign to introduce soybean in Mexican diets. *Soybean Digest.* Dec. p. 16.
• ***Summary:*** "In 1929 when we attended a Conference of the Institute of Pacific Affairs held in Japan, we had the opportunity of becoming acquainted for the first time with the soybean and some foods that are made from it. Later several states and private organizations succeeded in introducing its cultivation in different regions of the country."

The author found, after complex experiments, that the best way to fortify corn tortas or tortillas is to cook the soybeans together with the corn in lime water. "For some time the Department of Public Education has been trying to increase the consumption of this legume through its rural schools, while the Department of Agriculture is attempting the same thing among the farmers and the farm schools. Finally, the National Corn Commission, which is the agency that has introduced the cultivation of hybrid corn in many regions of Mexico, has begun intensive propaganda for the soybean.

"For its part, the Inter-American Institute is making use of its publications, America Indigena (Indian America) and Boletin Indigenista (Indian Bulletin) has begun a prolonged campaign in Central and South America suggesting the introduction and general use of this grain. Also, it has sent samples of the seed to encourage its planting." Address: Director of the Inter-American Indian Inst., Mexico City, Mexico.

4072. Miyake, Suguru; Shimizu, Junichi. 1953. Nattô-kin tanpakushitsu bunkai kôso ni kansuru kenkyû. I. Tanpakushitsu bunkai kôso no kesshô ni tsuite [The studies on *Bacillus natto* protease. I. On crystallization of protease]. *Hyogo Noka Daigaku Kenkyu Hokoku, Nogaku-hen* (*Science Reports of the Hyogo University of Agriculture*) 1(1):11-14. (Chem. Abst. 49:12601). [6 ref. Jap; eng]
Address: Lab. of Biological Chemistry, Hyogo Univ. of Agriculture.

4073. Miyake, Suguru; Nonoguchi, Yoshitaka. 1953. Nattô-kin tanpakushitsu bunkai kôso ni kansuru kenkyû. II. Tanpakushitsu bunkai kôso no kesshô-kei no henka ni tsuite [The studies on *Bacillus natto* protease. II. On the change of crystal form of *Bacillus natto* protease]. *Hyogo Noka Daigaku Kenkyu Hokoku, Nogaku-hen* (*Science Reports of the Hyogo University of Agriculture*) 1(2):45-46. Dec. (Chem. Abst. 49:12601). [Jap; eng]

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Address: Lab. of Biological Chemistry.

4074. Niwa, Soichi; Katayama, Nobu. 1953. Tônyû no kakô ni kansuru kenkyû. II. Tônyû o genryô to shita nyûyô shokuhin no kakôhin [Studies on the preparation of bean milk. II. Manufacturing methods of milky foodstuffs by using bean milk]. *Eiyogaku Zasshi* (*Japanese J. of Nutrition*) 11(3):68-69. Dec. [1 ref. Jap; eng]
• ***Summary:*** As Japan has little available land for dairy farming, sufficient milk production cannot be expected. Bean milk, which is one of Japan's own soybean products, is rich in nutrients and is sold very cheaply as a by-product of the manufacture of Japanese tofu. For this reason, attempts have been made to use bean milk as a substitute for dairy products.

However, bean milk tastes of what is called "aokusai" (green and unripened). It is also impossible to sterilize it enough without coagulating it with the heat, so it can easily spoil, especially in the summer. Because of these weaknesses, it is hard to supply this bean milk to consumers, especially in summer. If these shortcomings could be eliminated, bean milk would become a very valuable high-protein nutritious food which could serve as a substitute for dairy products. Address: Aichi-ken Eisei Kenkyusho (Sanitary Inst. of Achi prefecture).

4075. Takeda, Yûkichi. ed. 1953-1957. [Kôtei] Nihon Shoki [Nihon Shoki: Chronicles of Japan from the earliest times to A.D. 697]. In: Nihon Koten Zenshu. 6 vols. Tokyo: Asahi Shinbun-sha. See vol. 1, p. 86-87. [Jap]*

4076. Fujii, M. 1953. [Studies on Japanese foods. Report II. On the digestibility and absorption rate of legumes]. *Fukuoka Igaku Zasshi* (*Fukuoka Acta Medica*) 44:374-81. [Jap]*

4077. Fukuba, H. 1953. [Higher-fatty acid dehydrogenase in plant seeds]. *Koso Kagaku Shimpojiumu* (*Symposia on Enzyme Chemistry*) 8:85. [Jap]*
Address: Japan.

4078. Ichinohe, M. 1953. [On the parasitism of the soybean nematode *Heterodera glycines*]. *Hokkaido National Agricultural Experiment Station, Research Bull.* (*Japan*) No. 64. p. 113-24. [9 ref. Jap; eng]*
• ***Summary:*** The degree of susceptibility of soybean, azuki bean (*Phaseolus angularis*), kidney bean (*Phaseolus vulgaris*), and Spanish runner bean (*Phaseolus coccineus*) to infection from *Heterodera glycines* was assessed in experiments in which the numbers of adult female nematodes attached to the tap roots of plants grown for 6 weeks in infested soil were counted. The degree of infection (the average number of adult females per tap root) was 28.3 for soybean, 26.7 for azuki bean, 3.2 for kidney bean, and 0 for Spanish runner bean.

4079. Ishizuka, Z.; Saito, N.; Umeda, Isao. 1953. Shôyu no gurutamin-san oyobi yûki-san ni tsuite [On the determination of glutamic acid and organic acids of soy sauce]. *Chomi Kagaku* (*Seasoning Science*) 1:29-40. [14 ref. Jap]
Address: Noda Shoyu Kabushiki Kaisha Gijutsu-bu.

4080. Kakimoto, D.; Kanazawa, A. 1953. Study on the transamination in *Bacillus natto.* No. 8. (I), (II). *Memoirs of the Faculty Fisheries, Kagoshima University* 3:121-31. *

4081. Masao, H. 1953. [Studies on natto and nattobacillus. II. Immunological studies]. *J. of the Nihon Medical University* 20:449-52. *

4082. Nakashima, Kyozo; Tamura, Tsuruo. 1953. Kôri-dôfu seizô kôtei ni kansuru kenkyû. I. Tôfu no tôketsu ni tsuite [Studies on the production of dried-frozen tofu. I. The tofu freezing process]. *Osaka Furitsu Kogyo Shoreikan Hokoku* (*Reports of the Industrial Research Institute, Osaka Prefecture*) No. 5-3:10-15. [5 ref. Jap; eng]
• ***Summary:*** Kôri-dôfu (also called Kôya-dôfu) is made by freezing, ageing, thawing, and drying firmly pressed tofu. The resulting product has a dry, sponge-like texture. The freezing process, which plays a very important part in determining the quality (and thus the price) of the final product, was investigated thermometrically and micrographically.

Commercial dried frozen tofu is frozen quickly. This imparts a fine-grained texture to the surface of the tofu, but requires prolonged aging (20-30 days) to restore the lost elasticity. Home-made frozen tofu, freezes more slowly outdoors in cold, snowy weather, which gives it a coarse-grained texture; it requires less aging (5-7 days).

Note: Accompanying this article is a 7-page, double-spaced, typed English-language translation by Henry Sasame, a Japanese-American who worked at NRRL in Peoria, Illinois, for about 5 years. Address: Osaka, Japan.

4083. Ohara, H.; Morita, S.; Nishiyama, T. 1953. [The color of soy sauce]. *Chomi Kagaku* (*Seasoning Science*) 1(4):23-32. [Jap]*
Address: Japan.

4084. Onuki, M.; Chiba, H. 1953. [On the color of soy sauce]. *Chomi Kagaku* (*Seasoning Science*) 1(3):1-14. [Jap]*
Address: Japan.

4085. Tai, K. 1953. [Distribution of urease in plant seeds]. *Shiga-kenritsu Nogyo Tanki Daigaku Gakujutsu Hokoku* (*Scientific Reports of the Shiga Agricultural College*) No. 4. p. 57. First Series. [Jap]*

4086. Ackerman, Edward A. 1953. Japan's natural resources

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and their relation to Japan's economic future. Chicago, Illinois: University of Chicago Press. xxv + 655 p. Illust. Maps. Index. 26 cm. [3 soy ref]
• ***Summary:*** A revision and expansion of the author's 1948 SCAP report.

Tables 13 and 18 (pages 80 and 90) list production (in both U.S. tons and metric tons) and crop area (in both acres and hectares) of major crops in Japan for 4 time periods. Soybean production during the period 1931-1940 averaged 325,300 tonnes (metric tons) on 326,600 ha; it was 181,000 tonnes on 233,100 ha in 1947, then 224,300 tonnes in 1949, increasing to 330,000 tonnes on 303,400 ha in 1950. Production figures for red beans (azuki beans) are also given for the same periods.

Table 17 (p. 86-88) gives the caloric and protein food value for each of these crops in table 13. For soybeans 6.5% of the crop is used for next year's seed, and in 1947 some 15% was fed to livestock and 47% went to non-food industrial uses.

Commercial fertilizers (p. 404):... "For many years Japan has used organic commercial fertilizers, including soybean meal, other oil cake meals, fertilizer manufactured from fish, bone meal, and many other materials used in small quantities. Before its commerce was disrupted by World War II, Japan imported substantial tonnages of organic materials from other oriental sources."

Page 420: "The most calories per unit area of land generally are produced by sweet potatoes, rice, and white potatoes in that order... The winter grains cannot be replaced by these crops, and certain minor crops such as soybeans, are of such importance for oil or protein, or both, that they are not likely to be replaced." Moreover, increased emphasis on sweet potato production would bring up serious storage problems."

Page 431: The yields of soybeans can be increased "by tip pruning" (see p. 626, no. 63). In Japan the six staples are "rice, barley, naked barley, wheat, sweet potatoes, white potatoes."

Page 524: A plastic board has been made in Britain from sawdust and other wastes, "A similar materials. "Another similar material, 'Excelite,' made from excelsior, silicate of soda, soy protein, and quicklime, is reported from the United States. It is less well adapted to Japan because soy protein is needed for food."

For many years. Japanese farmers used organic commercial fertilizers, including soybean meal. Large amounts were imported from other oriental countries (p. 404). Address: Univ. of Chicago, Illinois.

4087. Fisher, A.W.; Burlew, John S. 1953. Nutritional value of microscopic algae. In: John S. Burlew, ed. 1953. Algal Culture: From Laboratory to Pilot Plant. Washington, DC: Carnegie Institution of Washington. ix + 357 p. See p. 303-10. Chap. 20.
• ***Summary:*** The last section,"Algae as human food" (p. 309-10) states that there has not yet been an opportunity for feeding microscopic algae to human subjects. However: "In recent studies in Japan reported by Dr. Hiroshi Tamiya (private communication, May 1952), dry powdered *Chlorella ellipsoiidea* has been described as tasting like a dried seaweed or powdered green tea, both popular in Japan... Hydrolysates of powdered algae showed promise as a substitute for soy sauce."

Table 1 titled "Protein content of Chlorella compared with that of typical animal feeds" (p. 304) shows: Fish meal 60%, Chlorella 50%, brewer's yeast (USP) 48%, soybean meal (typical) 44%, dried skim milk 36%, brewers' dried grains 25%, wheat 12%. Chlorella has a low methionine content. Address: 1. Arthur D. Little, Inc., Cambridge, Massachusetts; 2. Carnegie Institution of Washington, Washington, DC.

4088. Kawayama, S. 1953. [Survey of the fauna of soybean insect-pests in Japan]. Tokyo: K.K. Yokendo. 129 p. [Jap]*
• ***Summary:*** Lists a large number of insect pests.

4089. Pritchard, Florence; Pritchard, Edgar W. 1953. A scientific meatless diet: Being the principles and practice of lacto-vegetarianism based on the latest scientific discoveries, with original recipes. 4th ed. Marryatville, South Australia: Published by the authors. 19 p. 22 cm.
• ***Summary:*** Discusses the advantages of a lacto-vegetarian diet, with recipes.

Concerning soya beans, page 7 contains a paragraph which states: "These beans deserve much more attention than they have hitherto received... In China and Japan they are a staple food, being made into innumerable dishes including soya bean milk and cheese [tofu]." There are also recipes for Boiled soya beans (p. 9), and Soya bean rissoles (p. 11). Address: 31 Yeronga Ave., North Kensington Park, Marryatville P.O., South Australia.

4090. Ramsbottom, John. 1953. Mushrooms & toadstools: A study of the activities of fungi. London: Collins. 306 p. See p. xxiii, 275. 84 color photos by Paul L. de Laszlo and others. 23 cm. *
• ***Summary:*** "The Koji for the enormous fermentation industries of Japan is *Aspergillus Oryzae,* or closely allied species."

4091. Fukuba, Hiroyasu; Komaru, Haruo. 1954. [Higher fatty acids dehydrogenase in plant seeds. I. Higher fatty acid dehydrogenase in green soybeans (edamamé)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(1):74-78. Jan. 15. [9 ref. Jap; eng]
• ***Summary:*** An extract of green vegetable soybeans had the same action as the higher fatty acid dehydrogenase. "This dehydrogenase took only the following fatty acids

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as the substrate: myristic, palmitic, stearic, oleic, linoleic, and alpha-hydroxy, 12-hydroxy, 9,10-dihydroxy, and 9,10,12-trihydroxystearic acids. The optimum pH of this enzyme was 6.8 and the optimum temperature was between 35 and 40ºC." Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo [Japan].

4092. Ohara, Yuwao; Nonomura, Hideo. 1954. Tamari moromi oyobi kôji kara bunri shita kôbo. I. *Pichia mogii* nov. sp. [Yeasts occurring in a moromi (mash) and koji of tamari soy sauce. I. *Pichia mogii* nov. sp.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(2):122-25. Feb. 15. [3 ref. Jap; eng]
• ***Summary:*** Six strains of *Pichia* were identified and isolated from the mash (moromi) and koji of tamari shoyu. All were identified as new species of *Pichia mogii* nov. sp. Address: Research Inst. of Fermentation, Faculty of Agriculture, Yamanashi Univ., Japan.

4093. Nickerson, Jane. 1954. News of food: New portable grill is introduced–Use is not limited to outdoors. *New York Times.* Feb. 20. p. 14.
• ***Summary:*** Hamilton Metal Products, which makes the new grill held a party at Peter's Back Yard (64 West Tenth Street) in New York City. Hamilton asked James Beard, the food authority, to host the party. Mr. Beard said the grill worked well for making teriyaki and sukiyaki, two cooked-on-the-spot Japanese dishes which have become very popular with Americans.

"Teriyaki consists of thin slices of beef which, after having been marinated in a savory liquid, are skewered and then broiled briefly." Sukiyaki is a combination of beef and vegetables that the Japanese cook at the table on a small charcoal brazier.

4094. Onishi, Hiroshi. 1954. [Studies on soy [sauce] yeasts. I. Methods of determining viable counts of yeasts separated from mixed culture with molds (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(2):134-40. Feb. [21 ref. Jap; eng]
Address: Noda Industrial and Scientific Research Laboratory.

4095. Yokotsuka, Tamotsu. 1954. Shôyu kôki seibun ni kansuru kenkyû. XIII. Jôzô shôyu no bôbi seibun narabini shôyu hiire ni yoru bôbai-sei no zôka ni tsuite [Studies on flavorous substances in soy [sauce]. XIII. On the yeast-static substances in brewed shoyu and their increase in heated shoyu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(2):114-18. Feb. [4 ref. Jap; eng]
• ***Summary:*** Phenolic substances increased in heated soy and "showed more resistance to the harmful yeasts of Soy than raw-Soy.

"Two phenolic substances were newly isolated from Soy;" one was obtained as crude crystals and the other was believed to be vanillin based on its *Rf* value from paper chromatography. Address: Noda Industrial Science Laboratory (Kikkoman), Japan.

4096. Ando, Seiichi; Ishi, Shojiro; Shoda, H. 1954. Yuasa shôyu-gyô no kenkyû [Research on the Yuasa shoyu industry]. *Wakayama-ken Juyo Kogyo Chosa* (*Surveys of Important Industries in Wakayama Prefecture*) No. 6. 31 p. (Wakayama-ken Keizai-bu). [Jap]
• ***Summary:*** Chapter 1 gives an in-depth discussion of the origins and history of shoyu in Yuasa. Note: This is the earliest publication seen on Yuasa shoyu written by Ando. Address: Wakayama Daigaku, Keizai Kenkyujo (Wakayama Univ., Economics Research Dep.).

4097. Katsui, Goichiro; Takata, Ryohei. 1954. Bitamin A kyôka miso no seizô ni kansuru kenkyû. I. Jukusei miso ni kuwaerareta bitamin A no anteido [Studies on the preparation of miso, fortified with vitamin A. I. Stability of vitamin A added to the ripened miso]. *Bitamin* (*Vitamins, Kyoto*) 7(3):229-232. March. [5 ref. Jap]
Address: Dep. of Industrial Chemistry, School of Engineering, Univ. of Kyoto.

4098. Tajiri, T.; Kudo, N. 1954. [On growing soybeans as green manure in paddy fields in Kumamoto Prefecture]. *Kyushu Nogyo Kenkyu* (*Kyushu Agricultural Research*) 13:109-11. March. [Jap]*
Address: Japan.

4099. Hayakawa, Akira; Watanabe, Tokuji. 1954. Kôri-dôfu no chakushoku bôshi ni kansuru kenkyû [Research on the prevention of discoloration of dried-frozen tofu (kori-tohu)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 9. p. 107-13. April. [1 ref. Jap]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4100. Kamada, Hidemoto; Sakurai, Yoshito. 1954. Shôyu (usukuchi) no chozô-chû no iro no henka ni tsuite [On the discoloration of (usukuchi) shoyu under storage conditions]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 9. p. 115-19. April. [2 ref. Jap]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4101. Kamada, Hidemoto; Watanabe, Tokuji. 1954. Tanpakushitsu bunkaibutsu o mochiiru happô shôka eki no seihô ni tsuite [On the study of soybean protein: The method of making hydrolyzed soy protein for fire extinguisher liquid]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 9. p. 121-26. April. [8 ref. Jap]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku,

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Tokyo, Japan.

4102. Morimura, Yuji; Tamiya, Nobuko. 1954. Preliminary experiments on the use of Chlorella as human food. *Food Technology* 8(4):179-82. April. [2 ref]
• ***Summary:*** Discusses the uses of unicellular algae, such as chlorella (*Chlorella ellipsoidea*), as a food supplement. Its taste is very similar to that of the powdered green tea (*matcha*) used in the traditional Japanese tea ceremony, and to powdered aonori (*Enteromorpha compressa*), which is used as a seasoning in Japanese cookery. An acceptable alternative to soy sauce can be made from chlorella. Address: The Tokugawa Inst. for Biological Research, Tokyo, Japan.

4103. Sugimoto, Koichi. 1954. Bio-chemical and nutritional studies of germinating soybeans. *Bulletin of the Osaka Medical School* 1(1):1-16. April. [16 ref. Eng]
• ***Summary:*** Soybeans, which are rich in nutrients, have been called "The meat of the farm" [*Hatake no niku*]. Soybeans grown in the dark are larger and heavier than those grown in the light. Details are given separately for the whole bean, stem and cotyledon. Address: Prof., Dep. of Biochemistry, Osaka Medical Univ., Osaka, Japan.

4104. Watanabe, Tokuji; Hayakawa, Akira; Kamada, H.; Sakurai, Y. 1954. Daizu tanpakushitsu ni kansuru kenkyû. VII. Tôfu seizô jôken no kentô [The study of soybean protein. VII. On the conditions of tofu manufacturing]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 9. p. 99-105. April. [Jap]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4105. Inoue, Yoshiyuki. 1954. [A stable, vitamin containing dried tofu (soybean cheese)]. *Japanese Patent* 2482. May 6. (Chem. Abst. 49:1990c). [Jap; eng+]*
• ***Summary:*** During the manufacture of kori-dofu, the water-soluble vitamins originally contained in the soybeans are mostly destroyed, and the remaining small amount of vitamins are damaged by the deterioration of fats during preservation of the dried tofu.

Soybean curd is dehydrated by freezing and thawing, immersed for 10 minutes in an aqueous solution containing 200 mg per 100 gm vitamin B-1 hydrochloride and a small amount of amino acid or thiourea, dehydrated by centrifuging, sprayed with 0.5% aqueous solution of tannin, kept at 0-5ºC for a while, dried *in vacuo,* and treated with ammonia gas to pH 8. Address: Biochem. Lab., College of Agriculture, Kyoto Univ., Japan.

4106. Kobayashi, Setsuko; Shiseki, Kiyoshi. 1954. [Histochemical studies on glycerophosphatase, RNA- (ribonucleic acid-) and DNA- (deoxyribonucleic acid-) phosphatase in germinating soybeans]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 31(4):215-18. May 20. [8 ref. Jap]
Address: 1. Dep. of Agricultural Chemistry, Faculty of Agriculture, Tokyo Univ. of Agriculture.

4107. Kirby, Riley H. 1954. The Japanese market for U.S. agricultural products. *Foreign Agriculture* 18(5):79-84. May.
• ***Summary:*** The population of Japan proper, 87,000,000 persons, is confined to an area of about 147,000 square miles. Only 16% of the country is farmed. Large-scale machinery is little used because the nearly 6 million farms are small–they average 2.5 acres–and labor is abundant–43% of Japan's population is employed on farms. The average amount of soybeans produced in Japan from the years 1931-40 was 358,000 short tons. Then, in 1949, Japan produced 247,000 tons; in 1950, 364,000 tons; in 1951, 523,000 tons; in 1952, 575,000 tons; and in 1953, 460,000. Rice alone occupies 40% of the planted areas of Japan.

Japan's imports of soybeans in recent years have approached 300,000 tons. There is some feeling that if Japan could produce margarine from soybean oil at sufficiently low cost, the Japanese people might further increase their consumption of bread, thus expanding the markets for both wheat and soybeans. Address: Regional Economist, Asia and the Middle East branch, Foreign Agricultural Services.

4108. Masuyama, Shinroku. 1954. [Studies on the higher fatty alcohols. VII. Sodium reduction and alkali isomerization of linseed and soybean oils]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(5):383-86. May. [16 ref. Jap; eng]
• ***Summary:*** Note: The Bouveault-Blanc reduction is a chemical reaction in which an ester is reduced to primary alcohols using absolute ethanol and sodium metal. Address: The Osaka Municipal Technical Research Institute.

4109. Hino, T.; Iwashita, S. Assignors to Ajinomoto Company. 1954. [Semichemical fermentation of soybean sauce]. *Japanese Patent* 3249. June 5. [Jap]*

4110. Kandatsu, Makoto; Yasui, Tadahiko. 1954. [Studies on the nutritive value of grass proteins. V. The effect of drying upon the nitrogen distribution in the green leaf of soybean]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(6):494-499. June. [5 ref. Jap; eng]
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo.

4111. Sakaguchi, Kinichiro; Ishitani, C.; Takamori, S. 1954. Kôji-kin no shizen heni ni kansuru kenkyû. VII. *Asp. oryzae* var. *magnasporus* no segregation ni tsuite (1) [Studies on the natural variation of koji molds (*Aspergillus oryzae* and *Aspergillus sojae*). VII. Studies on the segregation of *Asp. oryzae* var. *magnasporus* (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(6):441-

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44. June. [7 ref. Jap; eng]
Address: Dep. of Agriculture, Faculty of Agriculture, Univ. of Tokyo.

4112. Sakaguchi, Kinichiro; Ishitani, Chiyoko. 1954. Kôji-kin no shizen heni ni kansuru kenkyû. VIII. *Asp. oryzae* var. *magnasporus* no segregation ni tsuite (2) [Studies on the natural variation of koji molds (*Aspergillus oryzae* and *Aspergillus sojae*). VIII. Studies on the segregation of *Aspergillus oryzae* var. *magnasporus* (2)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(6):445-49. June. [10 ref. Jap; eng]
Address: Inst. of Applied Mycology, Univ. of Tokyo.

4113. Sakaguchi, Kinichiro; Ishitani, Chiyoko. 1954. Kôji-kin no shizen heni ni kansuru kenkyû. VI. Kinrui no zoku oyobi tane kan no anastomosis ni tsuite [Studies on the natural variation of koji molds (*Aspergillus oryzae* and *Aspergillus sojae*). VI. On the occurrence of anastomosis between species and genera of molds]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(6):435-41. June. [12 ref. Jap; eng]
• ***Summary:*** Numerous photomicrographs show anastomosis–self-fusion, and interspecific or intergeneric fusion. Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo.

4114. Funahashi, Saburo; Akazawa, Takashi. 1954. [Metabolism of germinating plants. IV. Enzymic synthesis of citric acid]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(7):574-77. [14 ref. Jap; eng]
• ***Summary:*** Results indicate that citrate synthesis in mung bean or soy bean from pyruvate and oxalacetate should proceed through reaction (I) and (III). The reaction sequence was verified and is given. Address: Lab. of Biochemistry, Faculty of Agriculture, Nagoya Univ., Nagoya, Japan.

4115. Irie, Toshio. 1954. Eki kôji ni yoru shôyu jôzô ni kansuru kenkyû. I. Shijô-kin no ekinai baiyô ni yoru Protease seisan ni tsuite [Studies on brewing soy sauce by enzymes obtained by submerged culture of molds. I. On the protease production under shaking culture of molds (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(7):550-56. July. (Chem. Abst. 50:15020). [18 ref. Jap; eng]
Address: Lab. of Zymology and Industrial Fermentation, Faculty of Agriculture, Kyushu Univ.; Nihon Chomiryo Brewing Co., Ltd., Koga Factory.

4116. Onishi, Hiroshi. 1954. [Studies on soy yeasts. II. Methods for determining viable counts of yeasts in soy mash (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(7):546-50. July. [10 ref. Jap; eng]
• ***Summary:*** This is an early study on osmophilic yeasts in soy sauce. The following species were tested: *Zygosaccharomyces major, Z. soya, Z. salsus.* Soy sauce mash is different from sake mash because of its high content of sodium chloride (about 18%) and its high nitrogen concentration (total N of 1.0 to 1.5%). It was found that the viable count of yeast cells grown in soy sauce mash experienced a remarkable fall when ordinary media without sodium chloride were used for the plating. Address: Noda Industrial and Scientific Research Laboratory.

4117. Arimune, Katayuki. Assignor to Bureau of Industrial Technics. 1954. [Improvement of drying or semidrying oils]. *Japanese Patent* 5390. Aug. 26. (Chem. Abst. 49:14342g). [Jap]*
• ***Summary:*** Soybean oil used; its water repellency was better than the product which used linseed oil.

4118. Kondo, Kinsuke; Mori, Shigeki; Kajima, Morikazu. 1954. Tanpaku ni kansuru kenkyû (61-62), Daizu no seijuku ki ni okeru ki seibun tanpaku no seisei [Studies on proteins (61-62). On the components of soybean protein (Parts 2-3)]. *Kyoto Daigaku Shokuryo Kagaku Kenkyujo Hokoku* (*Bulletin of the Research Institute for Food Science, Kyoto University*) No. 15. p. 37-55. Aug. [3 ref. Jap; eng]
Address: Research Inst. for Food Science, Kyoto Univ., Kyoto, Japan.

4119. Hiraki, Itaru. Assignor to Three S Gypsum Company. 1954. [Plaster containing soybean-hydrolysis]. *Japanese Patent* 5637. Sept. 6. (Chem. Abst. 49:14292f). [Jap]*
• ***Summary:*** 10 kg soybeans are hydrolyzed in 30 kg 20% hydrochloric acid by heating for 6 hours. The product is neutralized, mixed with 30 kg kieselguhr (loose or porous diatomite), and dried. 50 kg calcium sulfate hydrate ($CaSO_4.0.5H_2O$) and 30 kg calcium hydroxide are added.
Note: *Webster's Dictionary* defines diatomite as "a light friable siliceous material derived chiefly from diatom remains and used especially as a filter."

4120. Ohara, Yuwao; Nonomura, Hideo. 1954. Tamari moromi oyobi kôji kara bunri shita kôbo. II. [Yeasts occurring in a moromi (mash) and koji of tamari soy sauce. II. A taxonomic study on the four strains of *Cryptococaceae*]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(9):717-21. Sept. 15. [6 ref. Eng; jap]
• ***Summary:*** Four authentic strains of rather unusual yeasts were identified: *Candida polymorpha* nov. sp. strain S-3. *Cryptococcus diffluens* (Zach) Lodder var. non-membranaefaciens nov. var strain K-10. *Trichosporon behrendii* Lodder et Van Rij strain K 3-3. *Candida rugosa* (Anderson) Diddens et Lodder strain K 7. An illustration shows each of these yeasts. Address: Research Inst. of

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Fermentation, Faculty of Agriculture, Yamanashi Univ., Japan.

4121. Ohara, Yuwao; Nonomura, Hideo. 1954. Tamari moromi oyobi kôji kara bunri shita kôbo. III. *Saccharomyces rouxii* Boutroux [Yeasts occurring in a moromi (mash) and koji of tamari soy sauce. III. *Saccharomyces rouxii* Boutroux]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(9):721-24. Sept. 15. [18 ref. Jap; eng]
• ***Summary:*** Four strains of osmophilic yeasts most frequently isolated from tamari-shoyu mash were identified. "Two of them were recognized as *Saccharomyces rouxii* Boutroux, and two other strains were considered as identical with it."

Tables show: (1) Origins of the strains studied: A mash (1 year old) of tamari from Asano Co. in Gifu prefecture. A mash (3 months old) of tamari from Asano Co. in Gifu prefecture. A mash of tamari from Gifu Shoyu K.K. in Gifu prefecture. Tamari miso [Hatcho miso] from Hayakawa Co. at Okazaki, Aichi prefecture. (2) Morphological properties. (3) Sporulation and physiological properties. Two illustrations show spores and cells of *Saccharomyces rouxii* Boutroux. Address: Research Inst. of Fermentation, Faculty of Agriculture, Yamanashi Univ., Japan.

4122. Sakaguchi, Kenji. 1954. [The activities of bacteria in the soya-sauce fermentation. I. A method of viable counts of bacteria from the culture of mixed molds and yeasts]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(9):758-64. Sept. 15. [30 ref. Jap; eng] Address: Noda Industrial and Scientific Research Lab.

4123. *Washington Star Pictorial Magazine.* 1954. Bank of plant treasures. Sept. 26.
• ***Summary:*** Photos show: (1) "Headquarters for plant explorers and site of the bank of plant treasures in the Beltsville Plant Industry Station, located just north of Washington" [DC, in Maryland]. (2) "In Japan, 25 years ago, William J. Morse of Washington was inspecting soybeans. He is known as the father of the American soybean, now the basis of a multi-billion dollar industry."

4124. Shibuya, Yoshikazu. 1954. [Soy sauce from the mother liquor of glutamic acid]. *Japanese Patent* 6198. Sept. 27. (Chem. Abst. 50:2118e). [Jap]*
• ***Summary:*** Soybean cake is heated with 3-10% hydrochloric acid for 60 hours at 85ºC until the production of furfural reaches a maximum. The product is mixed with an equal weight of mother liquor from glutamic acid, heated for 3 hours at 60ºC, neutralized, fermented at 25-30ºC with a mold culture, and filtered. Address: Japan.

4125. *Soybean News.* 1954. 100.9 bushels per acre [in Japan]. 6(1):3-4. Sept.
• ***Summary:*** "That's right, soybeans that produced over 100 bushels per acre, according to a report we have received from F. Uryu, Agricultural Chemist for the Japan Soybean Association.

"Uryu reports that the winner of the 1951 soybean growing contest of Japan won the prize yield using the Akasaya variety with 100.9 bushels per acre.

"Now it is unlikely that the winner of any of our state soybean growing contests will equal this record in the near future. The methods used by this Japanese winner are quite different from our usual cultural practices. Here is how he did it.

"The inoculated seed was planted in a well fertilized seed bed on May 24. The soybean plants were lifted from this bed on June 15, topped back to just below the first compound leaf and planted 20 inches apart in well fertilized, irrigated rows 36 inches wide. They were cultivated and hand, weeded three times in July, sprayed with BHC [benzene hexachloride, an insecticide] chemical dust the 25th of Aug., hand harvested the 2Oth of Oct.

"Topping the plants is practiced in order to increase the number of pods per stalk. The accompanying picture indicates that the method works."

A photo (p. 3, by F. Uryu) shows a harvested Akasaya soybean variety plant densely covered with a huge number of pods.

4126. *Hartford Courant* (*Connecticut*). 1954. Street hawker remains familiar figure in Tokyo. Oct. 24. p. D14.
• ***Summary:*** No longer seen in the USA, street hawkers do a brisk business in Tokyo. The sellers of each product have their unique call. "The juvenile vendor is likely to be repeating 'Natto,' 'Natto' in young and earnest tones. He is selling fermented beans, which are served with soya sauce over warm cooked rice."

"'To-fu ya-san' appears with bean curds'" [tofu].

The 'chin-don-ya-san' is a one man band and children's theater. The ragman, and the peddlers of shell-fish and bamboo poles can also be heard.

4127. Ichikawa, Kunisuke. 1954. Kôso shôka ni yoru shôyu seizô ni kansuru kenkyû. I. Kôji-kin no junbai-yô hôhô no sentei [Studies on soy manufacture by enzymatic digestion. I. Selection of a submerged culture method suitable for soy bean digestion by *Aspergillus*]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 32(10):379-84. English-language summary on p. 37 of this issue. [8 ref. Jap; eng] Address: Dep. of Industrial Chemistry, Faculty of Engineering, Kyoto Univ., Kyoto, Japan (Kyoto Daigaku, Kôgaku-bu, Kôgyô Kagaku Kyôshitsu, Takada Kenkyûshitsu, Kyoto, Japan).

4128. Ohara, Yuwao; Nonomura, Hideo. 1954. Tamari

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moromi oyobi kôji kara bunri shita kôbo. IV. [Yeasts occurring in a moromi (mash) and koji of tamari soy sauce. IV. On the four strains including *Debaromyces tamarii* nov. sp.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(10):837-40. Oct. [11 ref. Jap; eng]
Address: Research Inst. of Fermentation, Faculty of Agriculture, Yamanashi Univ., Japan.

4129. Meade, Mary. 1954. Japanese dish, sukiyaki, should be prepared at table: Chafing dish or hot plate can be used. *Chicago Daily Tribune.* Nov. 16. p. A5.
• ***Summary:*** The recipe for Beef sukiyaki calls for "12 pieces tofu (soybean curd) in 1 inch cubes... Sauce: 1 cup shoyu (soy sauce), ¼ cup sake (rice wine), 1/3 cup sugar." Eat sukiyaki with bowls of rice.

4130. Yamaguchi, S.; Ebihara, K. Assignors to Noda Shoyu K.K. 1954. [Treatment for soybeans or fat-free soybeans]. *Japanese Patent* 7646. Nov. 19. [Jap]*
Address: Noda, Japan.

4131. Ishitani, Chiyoko; Sakaguchi, Kinichiro. 1954. Kôji-kin no shizen heni ni kansuru kenkyû. IX. Ryokushoku no coronii seisei no jitai ni tsuite [Studies on the natural variation of koji molds (*Aspergillus oryzae* and *Aspergillus sojae*). IX. Studies on the production of green colonies from the yellow mutant strains]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(11):898-903. Nov. [Jap; eng]
Address: Tokyo Daigaku Nôgaku-bu, Nogei Kagaku Kyoshitsu (Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo).

4132. Ishitani, Chiyoko; Sakaguchi, Kinichiro. 1954. Kôji-kin no shizen heni ni kansuru kenkyû. X. Ryokushoku no conidia seisei no saibôgaku-teki kenkyû [Studies on the natural variation of koji molds (*Aspergillus oryzae* and *Aspergillus sojae*). X. Cytological studies on the green conidium formation from the yellow mutant strains]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(11):903-09. Nov. [19 ref. Jap; eng]
Address: Inst. of Applied Mycology, Univ. of Tokyo.

4133. Ohara, Yuwao; Nonomura, Hideo. 1954. Tamari moromi oyobi kôji kara bunri shita kôbo. V. [Yeasts occurring in a moromi (mash) and koji of tamari soy sauce. V. On the *Trichosporon cutaneum* and its new variety]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(11):886-89. Nov. [7 ref. Jap; eng]
• ***Summary:*** A taxonomic study was made of 13 authentic yeast strains (Table 1) that produced arthrospores regularly and blastospores rarely. All of them were identified with *Trichosporon cutaneum* (7068) and one of them (K 32) was found to be a new variety, *Trichosporon cutaneum* var. *curvatum* nov. var. Address: Research Inst. of Fermentation, Faculty of Agriculture, Yamanashi Univ., Japan.

4134. Nickerson, Jane. 1954. Japanese culinary art for the New Year. *New York Times.* Dec. 26. p. SM30.
• ***Summary:*** Describes the food that Japanese-Americans prepare in New York City to celebrate the New Year. The first seven days of the New Year, called Matsu-no-Uchi, are a time for fun and feasting. They enjoy traditional foods, such as "rice-cake [mochi] soup (*zoni*), black beans (*kuromame*), sake (warm rice wine),... and *toso,* a sweet sake flavored with spices."

The rice cakes are "formed from a glutinous rice that is pounded into a starchy mass after being boiled..." "Black [soy] beans, sweetened, boiled, and eaten cold, carry with them the idea of a new year devoted to enterprising hard work. That is because the Japanese word for beans" [*mamé*] sounds the same as the word meaning 'industrious.'

4135. Ichikawa, Kunisuke. 1954. Kôso shôka ni yoru shôyu seizô ni kansuru kenkyû. II. Hyômen baiyô to shintô baiyô ni okeru protease no seisan [Studies on soy manufacture by enzymatic digestion. II. Surface culture and production of protease by submerged culture]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 32(12):501-06. English-language summary on p. 48 of this issue. [4 ref. Jap; eng]
Address: Dep. of Industrial Chemistry, Faculty of Engineering, Kyoto Univ., Kyoto, Japan (Kyoto Daigaku, Kôgaku-bu, Kôgyô Kagaku Kyôshitsu, Takada Kenkyûshitsu, Kyoto, Japan).

4136. Ishitani, Chiyoko; Sakaguchi, Kinichiro. 1954. Kôji-kin no shizen heni ni kansuru kenkyû. XI. Biochemical mutant [Studies on the natural variation of koji molds (*Aspergillus oryzae* and *Aspergillus soyae*). XI. Genetic examination of heterokaryosis using biochemical mutants (single-less strains)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 28(12):939-45. Dec. [20 ref. Jap; eng]
Address: Inst. of Applied Microbiology, Univ. of Tokyo, Tokyo, Japan.

4137. Smith, Allan K. 1954. Isolation and utilization of vegetable proteins. *Economic Botany* 8(4):291-315. Dec. [161 ref]
• ***Summary:*** Contents: Introduction. Vegetable protein sources. Raw materials for protein isolation. General procedures for protein isolation. Flax seed (*Linum usitatissimum* L.). Sunflower seed (*Helianthus annuus* L.). Soybean seed (*Glycine max* (L.) Merrill). Castor-beans (*Ricinus communis* L.). Seed of peanuts (*Arachis hypogaea L.*). Seed of cotton (*Gossypium sp.* L.). Corn (*Zea Mays* L.). Literature cited.

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The lengthy subtitle reads: "Among these proteins, those of soybean are isolated in the United States to the extent of about 30 million pounds annually, more than half of which are used in pigment coating of paper. Others, also discussed in this article, are derived from the seed of flax, sunflower, castor, peanut, cottonseed, and corn."

"Introduction: Vegetable protein isolation on a large scale for use in industrial processing operations is comparatively new, having its beginnings in 1935 in a small plant in Chicago [run by the Glidden Co.]. The development of a process for vegetable protein isolation was preceded by the use of vegetable protein concentrates for plywood glue [by I.F. Laucks Co.], in the form of soybean meal containing 40 to 50 percent protein, by the Douglas fir plywood industry of the Northwest in the early 1920s... Looking backward it is easy to see that the slow development of protein utilization, even in recent history, is attributable to the highly complex structure of the protein molecule... The chemistry of protein lags far behind the chemistry of the other two classes of major agricultural chemicals produced in such abundance by nature, namely, the carbohydrates and fats." The "process of building one pound of animal protein requires six to ten pounds of vegetable protein..." (p. 291).

Worldwide, the soybean is by far the largest oilseed crop, followed by peanuts, then cottonseed. Before the soybean became a major crop in the USA, peanuts led all other oilseeds in world production. (p. 292).

"Soybean protein is the only industrial protein isolated from oilseeds in the U.S." Soy protein has a higher yield and better color.

"The largest potential use of soybean protein is for textile fibers, but this use has not yet been developed. Fibers comparable to the casein fiber, Aralac, which was produced during World War II, have been made experimentally by the Ford Motor Co. (1937), The Drackett Company (1940), and the U.S. Department of Agriculture (1942). The great weakness of Aralac was its wet strength, and commercial production did not prove feasible. The Japanese, who were experimenting with soybean fibers before the war, have resumed their research. The British development of a commercial fiber from peanut protein and the American development of a protein from zein support the belief that a successful fiber can be made from soybean protein. Such a development might very well double the present rate of soybean protein production."

Soybean meal, when dehulled, contains about 50% protein and has several industrial uses including plywood glue, wallpaper coating, and adhesive formulations for the manufacture of paper products. A 1951 survey stated that 51.5 million lb of soybean meal were used in such industrial products. The largest single use, 35 million lb, was for plywood glue in Douglas fir plywood. Recent reports indicate this application has increased to 60 million lb.

Large amounts of wheat gluten and some corn gluten are used to make monosodium glutamate (MSG), which originated in Japan under the name "ajinomoto." The MSG shaker is rapidly finding a place in American homes next to the salt and pepper shakers. Smaller amounts of wheat gluten are used to make a taste product somewhat resembling pork chops.

Table I (p. 293) shows U.S. production of 7 oilseeds (soybeans, cottonseed, flax, peanut, castor bean, safflower, and sunflower) and protein concentrates made from them in 1951-52. Apparently soybean meal is considered a protein concentrate, since 5,704,000 tons were made in 1951-52. By far the largest amount of "protein concentrate" is made from soybeans, followed by cottonseed (2.5 million tons), flax (495,000 tons), peanut (150,000 tons), and safflower (6 tons). Address: Northern Utilization Research Branch, Peoria, Illinois.

4138. Ebihara, K. Assignors to Noda Shoyu K.K. 1954. [Synthetic aroma for soy sauce]. *Japanese Patent* 5250'54. [Jap]*
Address: Noda, Japan.

4139. Furuta, T.; Ohara, K. 1954. [The influence of iron on the color of soy sauce]. *Chomi Kagaku* (*Seasoning Science*) 2(2):6-12. [Jap]*
Address: Japan.

4140. **Product Name:** [Handmade Shoyu: Yuasa Tamari].
Foreign Name: Tezukuri Shôyu: Yuasa Tamari.
Manufacturer's Name: Kadocho K.K.
Manufacturer's Address: Yuasa 7, Yuasa-cho, Arita-gun, Wakayama-ken, Japan. Phone: 0737-62-2035.
Date of Introduction: 1954.
Ingredients: Whole soybeans grown in Japan, wheat, unrefined salt, and water.
Wt/Vol., Packaging, Price: 0.72 liters or 1.8 liters.
How Stored: Shelf stable.
New Product–Documentation: Labels. 1989, Oct. received from manufacturer. For the 0.72 liter container, the label is 5.25 by 4.25 inches. Brown on blue. Illustration (with caption) shows Yuasa Tamari shoyu being made by hand in the traditional way during the Tokugawa period (1600-1868), with men emptying wooden buckets into a large vat.

For the 1.8 liter container, the label is 4.25 inches square. Red, yellow, and green on white. The trademark is a thick-walled "O" with a roof over the top. "Yuasa: The homeland of shoyu. Founded 1831 (the 2nd year of Tempo)."

4141. Mogi, Masatoshi. 1954. Shôyu-zukuri no hensen: Kenkyûshitsu no mado kara mita 50 nen mae, 25 nen mae oyobi genzai [Changes in shoyu production: 50 years ago, 25 years, and today see from the laboratory window]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 49:290-94, 327-30, 377-81. [Jap]

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Address: Brewing Lab., Noda Shoyu Co. Ltd., Noda-machi, Chiba-ken, Japan.

4142. Nakashima, Kyozo; Tamura, Tsuruo. 1954. Kôri-dôfu seizô kôtei ni kansuru kenkyû. II. [Studies on the production of dried-frozen tofu. II. Coloring]. *Osaka Furitsu Kogyo Shoreikan Hokoku* (*Reports of the Industrial Research Institute, Osaka Prefecture*) No. 5-3:10-15. [5 ref. Jap; eng]
• ***Summary:*** Recently, manufacturers of dried-frozen tofu have been working to improve its color. The color of typical samples, collected at Osaka City central market in the summer of 1953, was measured with a Beckman photometer. It was found that the color of the finished product is influenced by the soy bean oil in the tofu. The higher the percentage of reflectance (and thus the whiter the color of the product), the higher the market price.

Note: Accompanying this article is a 5-page, double-spaced, typed English-language translation by Henry Sasame. Address: Osaka, Japan.

4143. Takeda, R. 1954. [Studies on the culture for the yeasts for soy sauce fermentation]. *Chomi Kagaku* (*Seasoning Science*) 2:23-28. [Jap]*

4144. Teramoto, S.; Hashida, W. 1954. [Control of harmful yeasts of soy sauce by sorbic acid]. *Chomi Kagaku* (*Seasoning Science*) 2(2):1-6. [Jap]*

4145. Yoshida, O.; Nakajima, Y.; Fujii, H.; Takahashi, S. 1954. [On the production of vitamin B-2 by *Bacillus natto*]. *Osaka Ika Daigaku Zasshi* (*J. of Osaka Medical College*) 15:3-6. [Jap]*

4146. Chinese borrowings in prehistoric Japanese. 1954. Tokyo: Yoshikawa Kobunkan. 61 p. 26 cm. [Eng]*
• ***Summary:*** About words and terms that have been borrowed from Chinese. Kinako is mentioned on p. 9.

4147. Fujimoto & Company: Soya bean products. 1954.
• ***Summary:*** This photo was taken by Ted Nagata in 1954 in Salt Lake City, Utah. Courtesy of Ted Nagata Collection and Densho Digital Archive. Address: Salt Lake City, Utah.

4148. Iwanami Shoten Henshu-bu. comp. 1954. Shôyu [Shoyu (Japanese soy sauce)]. Tokyo: Iwanami Shoten, Iwanami Bunko. 52 volumes. [Jap]*
Address: Tokyo, Japan.

4149. Katsumata, Senkichiro. ed. 1954. Kenkyusha's new Japanese-English dictionary. Entirely new ed. [3rd ed.]. Tokyo and Kyoto: Kenkyusha. xvi + 2136 p. 24 cm.
• ***Summary:*** Soy related words:

aburaage: see aburage.

aburage: fried beancurd.

age: a piece of fried bean-curd.

ama-miso: slightly salted bean paste.

atsuage: not listed.

Daitokuji natto: not listed.

daizu: a soya (= soy) bean. daizu kasu: a [soy] bean cake [a co-product of soy bean oil]. daizu abura: [soy] bean oil.

dengaku: bean curd baked and daubed with miso. dengaku-zashi ni sareru: to be transfixed; to be pierced through (as with a spear).

edamame: green soybeans.

ganmo: not listed.

ganmodoki: not listed. Hamananatto: not mentioned. Hamanatto: not mentioned.

inarizushi: fried bean-curd stuffed with boiled rice.

kogoridôfu = kôyadôfu.

Note 2. This is the earliest English-language document seen (April 2013) that contains the term *kogoridôfu* (written as one word, with diacritics) which it says is the same as kôyadôfu [dried-frozen tofu].

Note 3. This is also the earliest English-language document seen (April 2013) that uses the term *kôyadôfu* to refer to dried-frozen tofu.

koikuchi: not listed.

koikoku: a carp cooked in bean (= miso) soup.

kôji: malt (mugi); yeast; leaven (kôbo); kôji-ya: a maltster [a maker of kôji]. kôji ni suru: to malt something.

kôridôfu: a frozen bean curd.

kuromame: a black soy bean.

miso (chomiryô = seasoning): bean paste; miso. miso o suru: to mash the miso [as in a suribachi]. miso kakeru: to put miso on something (as food). (2) (tokui to ten) sore ga kare no miso da: that is what he takes pride in [that is what he is good at]. (3) (hikakuteki-ni) miso o kakeru (shuppai suru): to make a mess (=sad work) of something; to make a miserable (=poor) showing. miso o suru (hetsurau): to flatter [someone, as one's superiors]. [Modern is goma suru; kare, shatcho ni goma shitte-iru: he is flattering his boss. A grinding gesture goes with it. goma-suri: a person who flatters]. kuso miso ni iu: to speak meanly of a person; to speak of a person in the most disparaging terms. miso mo kuso mo isshoni suru: to mix up good and bad things. miso no miso kusaki wa, jô miso ni arazu: The secret of art lies in concealing art [Akiko never heard this saying]. soko ga miso darô: perhaps that's the point he takes pride in [=the key point].

misokoshi: a *miso* strainer. [misokoshi de mizu o sukuu]: weave a rope of sand; attempt impossibilities [literally, to try to scoop up water with a miso strainer].

miso-mame: soy (= soya) beans.

misuzu-dofu: not listed.

momen: no meaning related to tofu is listed.

nama-age: fried bean curd.

Note 4. This is the earliest English-language document seen (April 2013) that contains the term *nama-age* which

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refers "fried bean curd."

nattô: fermented soybeans. nattô uri: a vendor of fermented soybeans. nattô-jiru: miso soup with ground fermented soybeans.

nigari, nigashio: bittern; brine.

nimame: boiled beans [typically boiled soybeans served as part of *osechi* at New Year's].

nori [no tsukudani]: laver boiled down in soy [sauce].

oboro: not listed.

okabe: = tofu.

okara: bean curd refuse.

shimidôfu = kôridôfu [frozen tofu].

Note 5. This is the earliest English-language document seen (April 2013) that contains the term *shimidôfu* (written as one word, with diacritics) which it says is the same as kôridôfu.

shitaji (7): soy [sauce].

shôyu: soy [sauce].

tamari: [a kind of] soy; soy sauce; sauce from refined soy.

tôfu: beans curds (=cheese); tôfu. [tôfu itcho; in characters]: a piece (=cake) of bean-curds. [tôfu-ya]: a bean-curds dealer (=seller). [yaki-dôfu]: roasted bean-curd. kare ni iken shita totte, tôfu ni kasugai da: advice to him is like water sliding off a duck's back = It's a mere waste of words (=It is like pouring water into a sieve) to advise him. [tofu-ya e ni ri, saka-ya e san ri to iu tokoro da]: there is no human habitation within five miles of the place. [It's out in the boondocks].

tônyû: bean soup; soya-bean juice [sic, soymilk].

u-no-hana: (1) flowers of the *Deutzia scabra.* (2) [tôfu no kara] bean-curd refuse.

tsukudani: preserved food boiled down in soy.

yuba: dried bean curds [sic, the film that forms atop soymilk when it is dried]. Address: General editor, Japan.

4150. Ministry of Agriculture and Forestry, Agriculture and Forestry Economics Bureau, Statistical Section. 1954. Nôrinshô ruinen tôkeihyô, 1868-1953 [Historical statistics of the Ministry of Agriculture and Forestry, Japan, 1868-1953]. Tokyo, Japan. [Jap]*

4151. Nagahara, Taroh; Sugimura, Kei-ichiroh. 1954. Bisei-butsu hô ni yoru daizu aminosan no teiryô [Microbiological assay of soybean amino acids]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 6(6):275. [2 ref. Jap]

4152. Shinoda, Osamu. 1954. Mindai no shoku seikatsu [Gastronomic life in the Ming dynasty]. In: Kiyoshi Yabuuchi, ed., 1954. Tenkô Kaibutsu no Kenkyû (Studies on the T'ien Kung K'ai Wu). Tokyo. 483 + 15 p. See p. 74-92. [Jap]*

4153. Umeda, Shigeo. 1954. Nattô no tsukurikata [How to make natto]. Osaka City, Japan: Fuminsha. 4 + 3 + 114 p. Illust. 19 cm. Series: Fumin Nogyo Sensho, no. 29. [Jap]*
• ***Summary:*** Shigeo Umeda lived 1903-1965. Address: Japan.

4154. Valignano, Alessandro. 1954. Sumario de las cosas de Japón (1583). Adiciones del Sumario de Japón (1592). Editados por José Luis Alvarez-Taladriz [Summary of the things of Japan (1583). Additions to the Summary of Japan (1592), edited by José Luis Alvarez-Taladriz]. Tokyo, Japan: Sophia University. xix + 205 p. + 346 p. 26 cm. Series: Monumenta Nipponica Monograph No. 9. [230 ref. Spa]
• ***Summary:*** This book consists of two separate books by Valignano bound as one; each is paginated separately. In the 1st book, on page 93, the author mentions that he bought the necessary provisions, rice, miso, dried fish, etc. Footnote 240 gives a long definition of *misso* (sic, miso) in Italian from *Saverio Orientale,* by Bernardino Ginnaro (1641, Naples).

An appendix near the end of the 2nd book (published in 1592; see p. 317-330) begins with a Treatise on how they own land and calculate rents in Japan. It starts (p. 318) with a reference to "Principio [1601-1603], c. 6." In a long footnote on p. 320, he states: "To measure rice, wheat, barley, *Goma* [sesame seeds, used to make oil], *Mame* (see below), *Abura* (vegetable oil), *Saque* [saké], etc. they use certain measures such as the shaku, go, sho, to, koku, etc." Looking in more detail at the entry for *"Mame,"* after the word, we read (in square brackets), the Chinese character for "bean" followed by the Portuguese words 'Feijoes, ou graos de Iapao' ib. [VJP 150],..." This means that the word "Mame" means beans or Japanese beans. They are described in the VJP which, according to the abbreviations section at the front of this book (p. xix) means "Vocabulario de la Lingoa de Iapam. [Nagasaki, 1603-1604]. This is the famous first dictionary of Japanese in a European language, Portuguese, compiled by the Jesuit mission in Japan, and published by the Jesuits in Nagasaki in 1603-04. If we look on page 150 of that dictionary, we do indeed see: "Mame. Feijoes, ou graos de Iapao."

Note 1. Today, the word Japanese "mame" has two meanings: (1) Beans [generically, all types]. (2) A soybean. When the word *mame* is the first part of a compound word, it usually refers specifically to the soybean: *mameabura* is soybean oil–more commonly called *daizu abura; mamekasu* is soybean meal–more widely called *daizu kasu; mamemaki* is the ceremonial scattering of roasted soybeans at Setsubun. Therefore: It cannot be stated clearly that the soybean is mentioned in this book, or that the concept of a soybean, apart from beans in general, was clear to the author. However given this context of how foods are measured, we think it is more likely that he was referring to beans in general than to one particular type of beans. If he wanted to refer specifically to soybeans, they are clearly mentioned as *Daizzu* in the VJP

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dictionary which he cites! *Daizzu* [Daizu, the Japanese word for soybeans] are defined as: "Mame. Graos, ou feijoes de Iapao."

Note 2. *Principio* is an abbreviation (see p. xvii) that refers to a book titled *Libro Primero del principio y progresso de la Religion christiana en Jappon...* by Padre Alexandro Valignano of the Company of Jesus, 1601. Manuscript in the British Museum.

About the author: On p. 2-3 we read: The padre Alessandro Valignano (ca. 1539-1606) of the Society of Jesus [Jesuit] visited Japan three times, 1579-1582 (during the rule of Oda Nobunaga, who died in 1582), 1590-1592 (during the rule of Toyotomi Hideyoshi, who died in 1598), and 1598-1603 (during the rule of Tokugawa Ieyasu, who died in 1616). The fruit of his first trip was the *Sumario,* published in 1583, of his second trip was the *Adiciones del Sumario,* published in 1592, and of his third trip was the *Apologia de la Compañia de Jesûs de Japón y de la China* (1598) and the *Principio y progreso de la religión cristiana en Japón.*

His three visits correspond to three very important periods in Japanese history, in the transition from decentralized feudalism to centralized feudalism or from feudal anarchy to feudal order: the period of Azuchi (Nobunaga), of Momoyama (Hideyoshi), and of Tokugawa (Ieyasu). His writings capture magnificently the history of these 3 periods.

Because he is a Christian and a Jesuit father (Roman Catholic), his main interest is in religious affairs in Japan.

Brief biography: Valignano was an Italian missionary. 1566–He entered the Society of Jesus. 1574–Traveled to Portuguese India. In Asia, he helped to develop missionary work in Goa, Macau, and especially Japan, where he supported the mission with a share of the silk trade, developed a native clergy, and saw Christianity grow to some 300,000 adherents.

4155. *Zenkoku Miso Shoyu Nenkan* (*Miso and Shoyu Yearbook*). 1954--. Serial/periodical. Taito-ku, Tokyo: Shokuhin Sangyo Shinbunsha. [Jap]*
• ***Summary:*** Includes 2 parts: A directory and industry statistics. Address: Tokyo, Japan.

4156. **Product Name:** [Yuasa Shoyu].
Foreign Name: Yuasa Shôyu.
Manufacturer's Name: Yuasa Shoyu Co. Ltd.
Manufacturer's Address: Yuasa, Wakayama prefecture, Japan.
Date of Introduction: 1954?
New Product–Documentation: Ando and Ishi. 1954. Yuasa shoyu-gyo no kenkyu. 31 p. Fruin. 1984. History of five Japanese shoyu companies.

4157. Iguchi, Nobuyoshi. 1955. Kôji-kin ni kansuru kenkyû. X. Jinkô heni ni yoru kôso-ryoku no henka narabini kyoryoku tanpaku bunkai-kin no zôsei [Studies on *Aspergilli.* X. Changes of enzyme activities and induction of a mutant having higher proteolytic activity in *Aspergillus sojae* by induced mutations]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 29(1):73-78. Jan. [8 ref. Jap; eng]
Address: Noda Industrial and Scientific Research Lab., Noda, Japan.

4158. Kuninaka, A. 1955. [Studies on the decomposition of nucleic acid by microorganisms. II. On the ribonucleolytic enzyme system of *Aspergillus oryzae* employed in shoyu manufacture]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 29(1):52-57. Jan. [13 ref. Jap; eng]
Address: Microbiologiocal Lab., Yamasa Shoyu Co. Ltd., Choshi, Japan.

4159. Murata, Hisahito; Goto, Fujihiko. Assignors to Asahi Electrochemical Industries Company. 1955. [Epoxy resins]. *Japanese Patent* 1070. Feb. 19. (Chem. Abst. 50:17529i). [Jap]*
• ***Summary:*** A mixture of 400 gm soybean oil, 280 gm 30% hydrogen peroxide, 56 gm acetic acid, and 1.4 gm concentrated sulfuric acid was made to react for 7 hours at 50ºC to obtain a product with 72.7% epoxylation and an iodine number of 44.3.

4160. Omata, S.; Ueno, T.; Nakagawa, Y. 1955. [On the color of soy sauce. III. On the substances increasing color intensity of soy sauce]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 29(2):165-68. Feb. [12 ref. Jap; eng]
Address: Faculty of Agriculture, Naniwa Univ., Japan.

4161. Takahashi, Jusaku. 1955. 2, 3 no bitamin B-12 no shigen ni tsuite. I. [Studies on several sources of vitamin B-12. I.]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 8(2):25-27. March 11. [Jap]
• ***Summary:*** A significant amount of vitamin B-12 is found in natto and miso, although little is found in the whole soybeans from which these products are made. The amount of B-12 in soybeans and various soyfoods is as follows (measured in nanograms per 100 gm): Fresh whole dry soybeans 8, Tengu natto (sold commercially) 83, Shinshu miso 170, Shinshu miso (boiled for 15 minutes) 170, Shinshu miso (boiled for 30 minutes) 162.

When natto is stored at 30ºC, vitamin B-12 is slowly lost. It drops from 83 nanograms per 100 gm when fresh to 49 nanograms per 100 gm after 3 days.

4162. Kawamura, Sin'itirô. 1955. Studies on the utilization of the by-products of soybean-protein manufacture. VII.

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Summarizing discussion. *Kagawa-Kenritsu Noka Daigaku Gakujutsu Hokoku* (*Technical Bulletin of the Kagawa Agricultural College*) 6(3):227-40. March. [81 ref. Eng; jap]
• ***Summary:*** Deals with utilizing soluble carbohydrates. Soluble carbohydrates should be concentrated and utilized before the alkaline extraction of protein. Address: Lab. of Biological Chemistry.

4163. Masamune, Genkei. 1955. Enumeratio Tracheophytarum Ryukyu Insularum (V) [Listing of the plants of the Ryukyu Islands. V.]. *Science Reports of the Kanazawa University* 3(1):101-82. March. See p. 136. [Jap]
• ***Summary:*** Reports two Glycine species: (1) *Glycine koidzumii* Ohwi is named *Miyakojima tsurumame* in Japanese. It appears to be endemic on Miyako Island, Ryukyu Islands. (2) *Glycine tomentella* Hayata is named *Hiro-ha yabu mame* (broad-leaved bush bean) in Japanese. It may be cultivated in Okinawa, and it grows in Taiwan, the Philippines, and China. Address: Lab. of Systematic Botany, Faculty of Science, Kanazawa Univ., Japan.

4164. Omata, S.; Ueno, T.; Nakagawa, Y. 1955. [On the color of soy sauce. IV. On the effect of furfural on the color of soy sauce]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 29(3):215-19. March. [28 ref. Jap; eng]
Address: Faculty of Agriculture, Naniwa Univ.

4165. Sawada, T.; et al. 1955. Biseibutsu no kobaruto taisha ni kansuru kenkyu. II. *Aspergillus oryzae* oyobi *Bacillus natto* no kobaruto kyûshû ni tsuite [Studies on cobalt metabolism of microorganisms. II. On absorption of *Aspergillus oryzae* and *Bacillus natto*]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) 76(3):274-77. March. [7 ref. Jap]

4166. Nickerson, Jane. 1955. Sukiyaki and tempura. *New York Times.* April 24. p. SM50.
• ***Summary:*** Describes how to prepare each of these famous Japanese recipes. The recipe for sukiyaki is adapted from one used at the Miyako, the oldest Japanese restaurant in New York. Like most such recipes it calls for "soybean curd (tofu)..." "The soy sauce (shoyu) used in the dish should be Japanese; it has a marvelous intensity which makes it different from other such sauces." *Suki* means "plow" and *yaki* means "roasted." The legendary history of the dish is given.

For tempura, the traditional Japanese sauce is composed of soy sauce heated with dashi and other ingredients– including "monosodium glutamate, the vegetable protein seasoning sold here under such trade names as Accent and known in Japan as *aji-no-moto.*" Japanese make tempura from shrimp, seaweeds, string beans, eggplant, mushrooms, and many other kinds of vegetables. Four photos show views of these two dishes.

4167. Ebine, Hideo; Ito, Hiroshi; Nakano, Masahiro. 1955. Eiyô kyôka miso no kenkyû. III. Miso no karushiumu keitai ni tsuite [On the manufacture of enriched miso. III. Calcium salts in enriched miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 10. p. 149-53. April. [5 ref. Jap]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4168. Ebine, Hideo; Ito, Hiroshi; Koiso, Kenji; Nakano, Masahiro. 1955. Dasshi daizu miso ni tsuite [On soybean cake miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 10. p. 133-41. April. [4 ref. Jap]
• ***Summary:*** Describes how to make miso out of defatted soybean meal. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4169. Ebine, Hideo; Koiso, Kenji; Nakano, Masahiro. 1955. Miso no danshô sayô ni kansuru kenkyû. I. Kaku shu miso no danshô nô [Studies on the buffer action of miso. I. On the buffer action of every type of miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 10. p. 143-47. April. [4 ref. Jap]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4170. Ebine, Hideo; Nakajima, Michie; Nakano, Masahiro. 1955. Eiyô kyôka miso no kenkyû. IV. Bitamin, karushiumu kyôka miso ni tsuite [On the manufacture of enriched miso. IV. Enrichment with vitamins B-1, B-2 and calcium]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 10. p. 155-60. April. [8 ref. Jap]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4171. Omata, Shojiro; Ueno, Teruo; Nakagawa, Yasushi. 1955. Shôyu no iro ni kansuru kenkyû. V. Reductone no shôyu chakushoku ni oyobosu eikyô ni tsuite [On the color of soy-sauce. V. The effect of reductone on the color of soy-sauce]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 29(4):251-56. April. [22 ref. Jap; eng]
Address: Naniwa Daigaku, Nôgaku-bu, Nogei Kagaku Kyoshitsu.

4172. Omata, Shojiro; Ueno, Teruo; Nakagawa, Yasushi. 1955. Shôyu no iro ni kansuru kenkyû. VI. Shôyu shikiso ni tsuite (1) [On the color of soy-sauce. VI. On the soy-sauce pigment (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 29(4):256-60. April. [14 ref. Jap; eng]

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Address: Naniwa Daigaku, Nôgaku-bu, Nogei Kagaku Kyoshitsu.

4173. *Soybean Digest.* 1955. 1954 world [soybean] crop hit new record. April. p. 20. [1 ref]
• ***Summary:*** According to the USDA Foreign Agricultural Service, world soybean production established a new record in 1954; 742.8 million bushels were harvested, up 14% over 1953. Over 80% of the increase was accounted for by the United States. Most of the remaining increase occurred in China-Manchuria. In 1953 China produced 198 million bushels and Manchuria produced 134 million. In 1954 Manchuria's production statistics were included with those of China, the total being 350 million bu. Canada also set a new record with 5.065 million bu harvested. Also mentioned (with production statistics for 1953 in bushels) are Italy (35,000), Yugoslavia (155,000 avg. 1945-49), Other Europe (565,000) USSR (NA), Turkey (125,000), Indonesia (10,839,000), Japan (15,777,000), South Korea (4,995,000), Taiwan (Formosa) (640,000), Thailand (743,000), Brazil (3,242,000), Tanganyika (25,000), Nigeria (the biggest producer in Africa with 140,000 to 150,000 bu for export), and the Union of South Africa (68,000).

In Brazil, soybeans are produced in the states of Rio Grande do Sul and Sao Paulo. Average soybean acreage (harvested acres) in Brazil: 1945-1949: 23,000 acres. 1953: 148,000 acres. 1954 (preliminary): 162,000 acres. Average soybean yield in Brazil: 1945-1949: 19.0 bu/acre. 1953: 21.9 bu/acre. 1954 (preliminary): 22.7 bu/acre. Average soybean production in Brazil: 1945-1949: 446,000 bushels. 1953: 3,242,000 bushels. 1954 (preliminary): 3,674,000 bushels. "Brazil's harvest at 3.5 million bushels was up 13% from the year before. Some 2.6 million bushels were expected to be available for either crushing or export. The much-publicized program to increase soybean planting in Sao Paulo has so far met with discouraging results. This reportedly is due to the farmers' dissatisfaction with the earnings derived from soybeans compared with cotton and some other crops and to a shortage in Sao Paulo of combine harvesters."

Note 1. This is the earliest document seen (Jan. 2005) that gives soybean production or area statistics for Brazil.

Note 2. This is the earliest document seen (Jan. 2005) concerning the USDA's Foreign Agricultural Service and soybeans.

4174. Nakajima, Katsuichi. Assignor to Nichiman Food Industries Company. 1955. [Deodorization of soybeans]. *Japanese Patent* 3026. May 4. (Chem. Abst. 51:13264). [Jap]*
• ***Summary:*** Raw soybeans put in a closed vessel were steamed with vapor previously passed through a chamber packed with stems or leaves of the camphor tree and then dried *in vacuo* and pulverized. Address: Japan.

4175. Ikeda, Tetsutaro; Yamamoto, Ryuichi. Assignors to Shionogi Drug Manufacturing Company. 1955. [Water insoluble vitamin B-1 powder]. *Japanese Patent* 3400. May 20. (Chem. Abst. 51:13324c). [Jap]*
• ***Summary:*** A decoction from soybeans can be used instead of gelatin.

4176. Fujisawa, Shinkichi. 1955. Shokuhin moshiku wa shôyu, miso shikomi genryô to shite tekisuru butsuryô no seizô hôhô [Food product for brewing of soy sauce or fermented soybean paste]. *Japanese Patent* 30-4442. June 28. 3 p. (Chem. Abst. 51:13311b). [Jap]
• ***Summary:*** A protein-rich food product is prepared from sweet or white potatoes by addition of organic and inorganic nitrogen sources followed by cultivation with microorganisms. The product contains large amounts of vitamins and proteinaceous components and can be used as a food or as an ingredient in the production of soy sauce (at 60%) or miso (at 30%). Address: Gifu-ken, Inaba-gun, Numa-machi?, Okan 698, Japan.

4177. Fujisawa, Shinkichi. 1955. Shokuhin moshiku wa shôyu, miso shikomi genryô to shite tekisuru butsuryô no seizô hôhô [Food product for brewing of soy sauce or fermented soybean paste]. *Japanese Patent* 30-4443. June 28. 2 p. (Chem. Abst. 51:13311c). [Jap]
• ***Summary:*** Soybeans or defatted soybeans are hydrolyzed with acid or alkali, neutralized, mixed with fish meal or pressed cake of chrysalis and inorganic nitrogen sauces, cultured with slime bacteria, and fermented with yeast. Address: Gifu-ken, Inaba-gun, Numa-machi? Okan 698.

4178. Kawakami, Yasota. Assignor to Keikichi Endo. 1955. [Improvement of the flavor of soy sauce]. *Japanese Patent* 4444. June 28. (Chem. Abst. 51:13311e). [Jap]*
• ***Summary:*** Ethyl esters (100 parts) of fatty acids consisting mainly of linoleic and oleic acids are dissolved in 50-100 parts of ethanol by employing 50-150 parts of poly(oxyethylene sorbitan monooleate or -palmitate) as an emulsifier. Then 0.1-3 parts of the solution is added to 100 parts of a soy sauce of inferior flavor. The ethyl ester of cottonseed oil is also effective.

4179. Mino, Shoichiro; Mino, Yosuke. 1955. [Koji for the brewing of Mieki]. *Japanese Patent* 4445. June 28. (Chem. Abst. 51:13312c). [Jap]*
• ***Summary:*** *Mieki,* an amino acid solution produced as a by-product of sodium glutamate manufacture, has an off-flavor and a disagreeable fluorescence. These disadvantages are not removed by brewing with the usual koji. Vanillin can change the off-flavor to an agreeable soy-sauce flavor, and a red food color can remove the fluorescence and form a good soy-sauce color. These substances and alanine, glycine, and sodium glutamate are added to the usual koji.

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For example, a mixture of 5 gm alanine, 5 gm glycine, 5 gm sodium glutamate, 0.1 gm vanillin, 0.5 gm red food color, 700 ml Mieki, and 1.3 liter water was sterilized by boiling, and cooled. Cultures of 90 ml each *Zygosaccharomyces major* and *Z. soya* were added and the mixture was mixed with 5 kg roasted and crushed wheat and cultured with *Aspergillus candidus* at 28ºC for about 3 days to give 6.7 kg of a new koji. The koji (3 kg) was used with 10 liters of Mieki containing 2% total nitrogen to produce a soy sauce of superior flavor and color. Address: Japan.

4180. Morizui, Mareyuki. Assignor to Scientific Research Institute, Ltd. 1955. [Synthetic wine (ingredients include defatted soybeans)]. *Japanese Patent* 4438. June 28. (Chem. Abst. 51:17091b). [Jap]*
• ***Summary:*** Defatted soybeans are treated with methanol, rice-malt and saccharifying agent, and fermentation is caused by addition of yeast to make the ethanol content 5-20%. The product is mixed with perfumes or pure wine. Address: Japan.

4181. Takeda, Yojuro; Kagami, Motoo. Assignors to Takeda Foods Company. 1955. [Concentration of soy sauce by use of ion-exchange resins]. *Japanese Patent* 4441. June 28. (Chem. Abst. 51:13311d). [Jap]*
• ***Summary:*** Soy sauce is passed through a column of cation-exchange resin regenerated with hydrochloric acid, sulfuric acid, or sodium chloride, and the filtrate concentrated to ¼ volume. The flavor of the soy sauce, which is adsorbed on the column, is eluted with hydrochloric acid, adjusted to pH 4.4-4.6 with sodium hydroxide, and added to the concentrated filtrate to give a concentrated soy sauce of a superior fresh flavor.

4182. Iguchi, Nobuyoshi; Yamamoto, Kishiro. 1955. Kôji-kin ni kansuru kenkyû. XII. Jinkô heni kabu X-816 to oya kabu no tanpaku bunkai kôso-kei ni tsuite no hikaku (2) [Studies on Aspergilli. XII. The comparison of the proteolytic enzyme system between the induced mutant X-816 and the parent strain (2)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 29(6):394-99. June. [18 ref. Jap; eng]
Address: Noda Industrial and Scientific Research Lab., Noda, Japan (Noda Sangyo Kagaku Kenkyusho).

4183. Hamada, Hideo. 1955. Shôsô-in yakujin-chû no inamomi oyobi daizu no keishitsu ni tsuite [On the characters of paddy and soybeans in drug wastes preserved in the Shosoin Treasury]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 23(4):276. July. [1 ref. Jap; eng]
• ***Summary:*** The paddy and soybeans in the drug wastes preserved in the Shosoin Treasury were investigated morphologically and microchemically.

"The soybeans of the treasury exhibit the medium size and shape between those of the wild form and the summer varieties. The Shosoin soybeans weigh about 21% lighter than the contrasting soybeans of nearly the same size, and retain the minimum water contents of soybean, viz. 8.9%, while those of the summer varieties hold about 12% in general. Besides it is noteworthy that the cotyledon parenchymatous cells of the Shosoin soybeans are about 37% narrower than those of the contrasts. Despite being under such circumstances, no significant sign of chemical deterioration in soybean protein and fat in the plasm, exclusive of pectin in the middle lamella of the cell wall, is observed under a microscope." Address: Hyogo Agricultural College.

4184. Rao, Rama Kanth; Krishna, M.G.; Zaheer, S.H.; Arnold, L.K. 1955. Alcoholic extraction of vegetable oils. I. Solubilities of cottonseed, peanut, sesame, and soybean oils in aqueous ethanol. *J. of the American Oil Chemists' Society* 32(7):420-23. July. [7 ref]
• ***Summary:*** Describes solvent extraction using ethyl alcohol. Notes that as early as 1937 the Japanese reported the use of ethanol as a solvent for the batch extraction of soybeans in a plant at Dairen, Manchuria. In the USA, the most commonly used solvents for solvent extraction of vegetable oils are low boiling petroleum fractions, such as normal hexane. In European countries benzene, trichloroethylene, and cyclohexane have been used. In America, considerable work has been done on the use of ethanol and isopropyl alcohol as solvents. Address: Iowa Engineering Exp. Station, Iowa State College, Ames, Iowa.

4185. Thomas' wholesale grocery and kindred trades register: The official buyers' and sellers' guide... 57th annual ed. 1955. New York, New York: Thomas Publishing Co. See p. 789, 1470-74.
• ***Summary:*** Page 1123: "Oriental Show You Co., 20 Woodbridge E. (Imported Japanese)..." Address: New York 1, New York.

4186. McLaughlin, Kathleen. 1955. Soy milk plant to aid Indonesia: Factory in Jogjakarta may build up nutritional values for all Southeast Asia. *New York Times.* Sept. 18. p. 21.
• ***Summary:*** Harry Miller, Jr., an American technician for the United Nations Food and Agriculture Organization, is supervising construction of a plant to produce soybean milk–in both liquid and powdered form, in Jogjakarta, Indonesia. The plant is expected to be in production by Feb. 1956, and by mid-year the dehydrated form should be available for domestic shipment.

More than 20 years ago, Mr. Miller's father, an American medical missionary in China, developed a good-tasting soybean milk there. By hard work, persistence, and

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ingenuity, he developed the equipment that is now being instaled in the Jogjakarta plant.

"By 1936, Dr. Miller had returned to Shanghai with his family, erected and equipped a factory, and was turning out 3,000 quarts of bottled soybean milk a day, at 7 cents (U.S.) a quart. Cow's milk cost 30 cents.

"Then the war with Japan erupted. In 1937, Japanese forces completely destroyed his plant and in 1938 the Millers left China for their home in the United States." In 1947 they returned briefly to China, then in 1948 they left again before the Communist advance.

Dr. Miller's patents have long since been relinquished to the public domain, with the exception of an interest retained in one soybean milk plant in California. As an F.A.O. expert, Harry Miller Jr. hopes to make his father's soymilk processing system as widely available as possible, especially in places like Indonesia, where it can offer the greatest benefits.

The United Nations Children's Fund [UNICEF], which has provided $350,000 worth of the Miller type equipment for the Jogjakarta plant, has agreed that half of the annual output of 600 tons of soybean milk, powdered or liquid, from this plant, will be distributed free of charge to Indonesians for the first 3 years.

4187. Hirano, Mitsuo. 1955. Market situation on U.S. soybeans in Japan. *Soybean Digest.* Sept. p. 44-45.
• ***Summary:*** A portrait photo shows Mr. Hirano smiling. Address: President, Assoc. of Oil and Fat Manufacturers of Japan.

4188. Ishitani, Chiyoko. 1955. Kôji-kin no shizen heni ni kansuru kenkyû. XIII. Hakushoku kabu to ôshoku kabu no heterocaryon kara shinkabu (eizoku-teki ryokushoku kabu) no ikusei ni tsuite [Studies on the natural variation of koji molds (*Aspergillus oryzae* and *Aspergillus sojae*). XIII. The formation of new recombinants (stable green strains) from the heterocaryons between albino- and yellow-type mutant strains in *Aspergillus sojae*]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 29(9):682-89. Sept. [23 ref. Jap; eng]
Address: Inst. of Applied Mycology, Univ. of Tokyo (Tokyo Daigaku Oyô Biseibutsu Kenkyû-jo).

4189. Strayer, George M. 1955. Need industry council for vast selling job! Sees 100 million bushels annual exports in the not-far-distant future. *Soybean Digest.* Sept. p. 12, 14-15.
• ***Summary:*** At each year's annual convention, the problems are different. "Cottonoil stocks: Last year when we met at Memphis [Tennessee] the federal government owned vast quantities of cottonseed oil. Today those stocks are gone. Large tonnages were placed in the export markets of the world." At the same time, "we have sold about 55 million bushels of 1954-crop soybeans into export markets–about 15 million bushels about the highest previous figure."

"Our association has a vast educational and public relations job to do with foreign buyers"–as in Europe and Japan. It is now a buyer's market and ASA must do everything possible "to assure proper administration of the grades under the new standards."

"For several years I have pointed out at this meeting the desirability of forming an industrywide organization to carry on the promotional and educational work which our industry needs. The soybean industry has now reached a point where we are faced with a vast sales and promotional job... We must begin to do as many other industries have done–we must be prepared to sell and sell and sell. For some months a joint committee from this Association and from the National Soybean Processors Association has been meeting on this subject... Full report will be made today, together with suggested action by this group. It is my personal feeling that we have finally reached agreement on an industrywide Council or Institute, and that we must now move ahead just as rapidly as possible." ASA does not have the income to do this work alone.

Photos show: (1) George Strayer. (2) Chester B. Biddle and family of Remington, Indiana; he was president of the American Soybean Association from 1951 to 1953. (3) Charles P. Taft behind a podium, speaking about world trade. Address: American Soybean Assoc.

4190. Fujita, Akiji; Fujita, D.; Fujino, K. 1955. Fluorometric determination of vitamin B-6. III. Fractional determination of pyridoxal and 4-pyridoxic acid. *J. of Vitaminology* (*Osaka, Japan*) 1(4):279-89. Oct. 10. [13 ref]
• ***Summary:*** The percentage of vitamin B-6 in the form of pyridoxol, pyridoxal, and pyridoxamine in soybeans is 44, 44, and 12 respectively. Address: Biochemical Lab., Kitasato Inst., Minato-ku, Tokyo and Biochemical Inst., Kyoto Prefectural Univ. School of Medicine, Kawara-machi, Nishijin, Kyoto, Japan.

4191. Meade, Mary. 1955. Consul general's wife gives us Japanese recipes. *Chicago Daily Tribune.* Oct. 21. p. B1.
• ***Summary:*** Here is Mrs. Okuma's recipe. "Teriyaki (Six servings): 1 2½ pound frying chicken. ½ cup soy sauce. ½ cup sake. ½ teaspoon sugar. 1 teaspoon ginger juice (or 1 minced clove garlic). ¼ teaspoon aji-no-moto (monosodium glutamate).

Soak pieces of chicken for 1½ hours in a mixture of the other ingredients. Place in a baking pan and bake at 350 degrees [F.] for 45 minutes, Turn pieces several times and baste with sauce in which chicken was soaked. Serve with relishes: pickled horseradish, white onions, and cucumbers.

Note: This is the earliest English-language document seen (Nov. 2006) that uses chicken or poultry as the main ingredient in a teriyaki recipe. It is also the earliest that calls for baking (rather than broiling) the ingredients.

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4192. *Soybean Digest.* 1955. Strayer on special mission to Japan. Oct. p. 7.
• ***Summary:*** The USDA has announced "the appointment of Geo. M. Strayer, executive vice president of the American Soybean Association, as a marketing specialist in the fats and oils division on a temporary basis for a special agricultural mission in Asia,..."

"Strayer will leave in mid-October, will spend a minimum of a month in Japan, Hongkong and the Philippines surveying the market potential for American soybeans and soybean products.

"Japan has been the largest single buyer of U.S. soybeans the past two years. Strayer will contact buyers of soybeans and soybean oil meal, since the Japanese are also large buyers of the latter commodity, and will discuss the handling with them of soybean exports and the problems involved.

"He will be accompanied by Mrs. Strayer. They expect to return to the U.S. at the end of November."

4193. Tanabe, Keizo. Assignor to Agency of Industrial Science and Technology. 1955. [Catalysts for isomerization of oils]. *Japanese Patent* 8056. Nov. 7. (Chem. Abst. 51:18645f). [Jap]*
• ***Summary:*** The catalysts are suitable for transferring or conjugating the double bonds in the acid radicals of soybean oil, etc., to make drying oils. 50 parts soybean oil in the presence of 5 parts catalyst gave a 29% yield after 3-6 hours reaction in an inert atmosphere at 180-200ºC.

4194. Holmberg, Sven A. 1955. Problems of soybean adaptation in Sweden: Breeding work is based on Japanese material. *Soybean Digest.* Nov. p. 18, 20.
• ***Summary:*** "In the various European countries more or less serious efforts have been made to introduce the soybean as a crop. The northern extremes where soybeans are grown as a major crop in Asia are the plains of the Amur, the Nonni and the Sungari rivers on the mainland and the Japanese island of Hokkaido...

"Hokkaido is the only country in the world where soybeans are grown as a major crop in a relatively cool and partly marine climate. There is no doubt that soybean breeding material from Hokkaido holds more promise for Sweden, and generally for northern Europe, than material from Manchuria and other regions with a continental climate.

"In accordance with this surmise the author brought home to Sweden in 1940 a collection of soybean strains from Hokkaido and southern Sachalin (Sakhalin, Karafuto).

"This Japanese material was used in some 2,700 hybridizations followed by selection for adaptation. The choice of this breeding material has reduced the adaptation problem for Sweden to practical dimensions...

"Although the Kalmar-Oland region of Sweden, latitude 56º-57º, where the Fiskeby varieties of soybeans are grown commercially, enjoys a longer frost-free season than many soybean growing districts in Hokkaido, northern Manchuria and the northern United States, this relatively long growing season is required to ripen extra early varieties in a cool autumn. Only the breeding of Swedish soybean varieties combining earliness with adaptation to the day length of the latitude has made it possible to grow soybeans regularly in Sweden.

"In 1941 seed of three early foreign soybean varieties was distributed by the Swedish government Food Commission to farmers for practical growing trials. These failed and the experiment of growing foreign soybean varieties was soon abandoned.

"But the breeding of soybeans with a view to adaptation was pursued with the support of the government both by the Swedish Seed Association at Svalof and Algot Holmberg Seeds Ltd. at Fiskeby.

"In 1950 a brown-seeded soybean, Sv. Ugra, was announced at Svalof. It was from a cross of Wisconsin Black with a Polish variety. The yellow-seeded Fiskeby III originating from a cross between a German strain and a Sachalin variety was released by Holmberg in 1949.

"Since Fiskeby III was of the edible type it has been approved for use in army rations, school lunches, etc. It is grown commercially on a small scale in the Kalmar-Oland region. Its mean yield over a 10-year period has been 23.2 bushels per acre...

"In Holland a private breeder, Dr. Louis Koch, has also used northern Japanese material with good results. His successful work has been discontinued but his strains are kept alive."

A photo taken at Fiskeby in 1949 shows (left to right): Pierre Holmberg, George M. Strayer, M.E. Paddock (agricultural representative on an ECA mission), J.L. Cartter (U.S. Regional Soybean Laboratory), and Sven A. Holmberg.

ECA stands for European Cooperation Administration, which was a United States government agency set up in 1948 to administer the Marshall Plan. It reported to both the State Department and the Department of Commerce. Address: Fiskeby, Norrkoping, Sweden.

4195. Holmberg, Sven A. 1955. Sweden no daizu no tekiôsei [Problems of soybean adaptation in Sweden with special regards to the breeding works based on Japanese materials]. *Nogyo Oyobi Engei* (*Agriculture and Horticulture*) 30(11):1427-30. Nov. Translation into Japanese by T. Nagata. [12 ref. Jap]
Address: Fiskeby, Sweden.

4196. Komiya, Akira. 1955. Japanese soy sauce offers market for U.S. soybeans. *Soybean Digest.* Dec. p. 14-15.
• ***Summary:*** The best quality Japanese soy sauce, which is a dark brown color, turns red-yellow when water is added. It

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stimulates the appetite. The mixed ingredients are fermented at natural temperatures for about a year, then pressed with a hydraulic press. Japan is expected to produce 271,440,000 gallons of soy sauce during the year ending in March 1956. Since Japan's population is about 88 million, per capita consumption is about 3.1 gallons/year. The raw materials needed to produce this say sauce for one year are: Soybeans 30,000 tons. Soybean cake 200,000 tons (made from 250,000 tons of soybeans). Wheat 200,000 tons. Salt 250,000 tons. "This means that Japanese soy sauce makers are annually using 280,000 tons of American soybeans. Japanese soy sauce makers imported all their soybeans from Manchuria before World War II. The situation has since changed entirely."

Photos show: (1) A tank truck used for transporting soy sauce in Japan. (2) A hydraulic press for compressing the mash. Address: Managing Director, Japan Soy Sauce Brewer's Assoc.

4197. Strayer, George M. 1955. Why Japan wants clean soybeans. Blow to U.S. exports to Japan. *Soybean Digest.* Dec. p. 4-5.

• ***Summary:*** "Japan is a country of over 80 million people. Total area is about the same as California. Only a very small part is tillable."

"Last year Japan imported a total of about 750,000 metric tons of soybeans (27.5 million bushels). About 250,000 tons were crushed in oilseed mills. The remainder went directly into foods usage, producing soy sauce, soybean paste [miso], and soybean curd [tofu]. Over 90% of the flakes from the soybean crushing at the oil mills went to these same food plants.

"Soybeans are the life blood of Japan. They are an absolute necessity, for they are the food of the people. They are used directly, not indirectly, as is our soybean meal in the form of livestock products.

"There are over 3,000 vegetable oil mills in Japan, all except about 30 of them small community plants. Only 33 are on the list to receive imported soybeans. There are over 6,000 manufacturers of soy sauce in Japan. There are over 50,000 manufacturers of tofu or soybean curd, and there are several thousand small manufacturers of soybean paste or miso.

"These small plants do not and cannot have cleaning facilities. They must use the soybeans as they come. They prefer domestic beans, second choice is Chinese beans, and next come our beans. Why? Only one answer–foreign material. Their reaction is exactly as would be yours under similar conditions. They merely ask–why can you not sell us clean soybeans?"

The Japanese are importing more and more soybean from Red China. The Ministry of International Trade and Industry (MITI) favors increased trade with China. "Authorized imports of soybeans [to Japan] to 335,000 metric tons. Of these, 203,000 metric tons were allocated directly to oil mills and food manufacturers. They may be purchased on a global basis–wherever the buyer can buy at the lowest price and find acceptable supplies. Oil millers will favor U.S. beans because of higher oil content, while food manufacturers will probably buy Chinese beans when available.

"The remaining 132,000 tons were allocated to import firms. If a firm had a record of U.S. imports during the previous year the quota for that firm is based on 50% of the tonnage handled. But if a firm imported Chinese soybeans during that same period, the firm's quota is based on 100% of that tonnage.

"As soon as I discovered the content of the allocation I called it to the attention of embassy officials here in Tokyo, and a protest was filed with the Japanese government. However, at this writing much more work remains to be done.

"As closely as can be figured about 9 million bushels of soybean business was lost by the U.S. in this one allocation.

A large photo shows George Strayer standing behind a podium, addressing a room full of men seated in chairs. A movie projector is visible in the center aisle. The caption reads: "Strayer addressing meeting of 110 representatives of the soybean industry in Japan at the University Club in Tokyo Nov. 14. Invitations were issued by W.D. Termohlen, Agricultural Attache in the American Embassy, to the leadership of oilseed crushers, miso, soy sauce and soybean curd associations of Japan. At his side is Hiroshi Nakamura of Honen Oil Co., who served as interpreter. Mr. Nakamura was a Fulbright scholar in the United States during the 1954-55 university year."

Note 1. This article was written by Strayer in Tokyo, where he is conducting a marketing study for the U.S. Department of Agriculture.

Note 2. This is the earliest document seen (March 2001) concerning the activities of the American Soybean Association in Asia, in East Asia, or in Japan. This is also George Strayer's first trip to Japan.

4198. Morohashi, Tetsuji. 1955-1960. Daikanwa jiten [Chinese-Japanese historical dictionary]. Tokyo: Taishukan Shoten. 12 vols. + index (alphabetic by phonetic Japanese pronunciation). Cites earliest references (usually in Chinese documents) for Japanese words. [25+ ref. Jap]

• ***Summary:*** This is widely regarded as one of the greatest Chinese dictionaries. Volume 11, pages 394-95. The following pronunciations of Chinese words may not be correct. (33) Sho. Hishiomiso. Incubate rice or barley or beans, etc. Let them ferment and add salt to make these. (35) Chiang Yuan. Miso and shoyu shop. The shop where miso, shoyu, and pickles are sold. (36). Shoko. A big earthenware pot in which hishio is kept. (37). Shokyu. Shishibishio in a hot soup. (39). Chiang tsai. Miso pickled vegetables. (40).

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Shosho. Miso and shoyu craftsmen. (41). Shosui. Soup or porridge (Zosui) cooked with miso. Ruiju Meibutsuko, Shakuso orai. (42). Shosei. Hishio with flavor. (43). Shotsui. Hishio pot. (45). Chiang fang. Miso and/or shoyu shop. See (35). (46). Shobutsu Hishio. (47). Hishio no kame. Hishio vat. (48). Chiang-yu. Chinese soy sauce. Cooked soybeans, roasted barley and salt are fermented. The liquid is extracted; a salty seasoning, also called shitaji or murasaki.

4199. Miyake, S.; Watanabe, K. 1955. [The studies on *Bacillus natto* protease. III. Relation between deamination and protease production]. *Seikagaku* (*Biochemistry*) 27:209-11. [Jap]*

4200. Nakashima, Kyozo; Tamura, Tsuruo. 1955. Kôri-dôfu seizô kôtei ni kansuru kenkyû. III. [Studies on the production of dried-frozen tofu. III. Color of Koya-dofu (continued)]. *Osaka Furitsu Kogyo Shoreikan Hokoku* (*Reports of the Industrial Research Institute, Osaka Prefecture*) No. 7-1:31-37. [9 ref. Jap; eng]
• ***Summary:*** The color of Koya-dofu (dried-frozen tofu) turns from white to yellow during the manufacturing process. This change in color is caused mainly by the structural change in the tofu during processing. The faster the product is frozen, the whiter the color of the final product. The yellowish tint comes from the soybean oil which oozes out of the tofu due to internal stress. Auto-oxidation of oil or protein has little to do with the product's color.

The small amounts of genistein were found in the tofu deepen the color while the tofu is being treated with ammonia.

Commercial frozen tofu is frozen quickly which imparts a fine-grained texture to the surface of the tofu, but requires prolonged aging (20-30 days) to restore the lost elasticity. Home-made frozen tofu, freezes more slowly outdoors in cold, snowy weather, which gives it a coarse-grained texture; it requires less aging (5-7 days).

Note: Accompanying this article is a 6-page, double-spaced, typed English-language translation by Henry Sasame. Address: Osaka, Japan.

4201. Ohara, H.; Moriguchi, S. 1955. [Soy sauce fermentation under various conditions in the preparation of the saline. II. On the ratio of C and N]. *Chomi Kagaku* (*Seasoning Science*) 3(3):12-26. [Jap]*
Address: Japan.

4202. Sato, K. 1955. [Studies on the determination of sodium chloride in soy sauce. I. Direct titration method by silver solution]. *Chomi Kagaku* (*Seasoning Science*) 3(3):6-12. [Jap]*
Address: Japan.

4203. Takeshita, Toshio. 1955. [Modification of drying oils. 1. Synthesis of ethyleneglycol-d-glucoside and glycerol-d-glucoside and properties of the drying oils synthesized from these glucosides and drying oil fatty acids]. *Yushi Kagaku Kyokaishi* (*J. of the Japanese Oil Chemists' Society*) 4(5):245-50. (Chem. Abst. 50:4527d). [Jap]*
• ***Summary:*** Various glucosides were esterified by heating for up to 230º for 15 hours with fatty acids of linseed or soybean oil. The synthesized drying oils were superior to the original oil in drying properties. Address: Kagoshima Univ.

4204. Tanaka, R. ed. 1955. Yuba no bunken [Documents about yuba]. Kyoto, Japan: Senmaru-ya. 8 p. Unpublished manuscript. [6 ref. Jap]
• ***Summary:*** The passages on yuba are transcribed from various works, including the *Wakansansai Zukai, Kottoshu, Kyonan Rubetsushi,* and *Kaikai Shokukyo.* Address: Japan.

4205. Yokoyama, Yoshikuni; Takahashi, J.; Miura, K.; Kawarai, H. 1955. Miso oyobi shôyu no bitamin B-12 ganryô ni tsuite [Studies on vitamin B-12 in miso (fermented bean paste) and soy (sauce)]. *Utsunomiya Daigaku Nogakubu Gakujutsu Hokoku* (*Bulletin of the College of Agriculture, Utsunomiya University*) 2(3):411-12. [5 ref. Jap; eng]
• ***Summary:*** The vitamin B-12 content of miso and soy sauce was biologically tested using the microorganism *Euglena cracilis* var. *bacillaris.* The content differs by product type. Miso ranged from 83-316 m gamma% (probably 0.083-0.316 micrograms/100 gm) and shoyu averaged 450 m gamma% (probably 0.450 micrograms per 100 gm). In miso, the highest level was found in salty Edomiso (316) and the lowest level (83) in Sendai miso made at Utsunomiya University. Address: Utsunomiya Univ.

4206. Adachi, Isamu. 1955. Kinsei Nihon shokumotsu-shi [Recent history of Japanese foods]. Tokyo: Takahashi Shoten. 483 p. [Jap]
• ***Summary:*** Soyfoods are discussed on the following pages: Tofu (p. 52-53, 68-69, 150, 178-79, 188, 190-91, 194, 196-97), fried tofu–hiryozu and ganmodoki (p. 88–deep-fried tofu burgers), fried tofu–aburage or deep-fried tofu pouches (p. 96-97, 150), black soybeans (p. 140).

Note: This is the earliest (and only) English-language document seen (April 2013) that contains the word *hiryozu;* it refers to Kyoto-style deep-fried tofu balls.

4207. Glacken, Clarence J. 1955. The Great Loochoo: a study of Okinawan village life. Berkeley and Los Angeles, California: University of California Press. xvi + 324 p. See p. 280. Illust. Maps. 23 cm. [134 endnotes]
• ***Summary:*** A very interesting study in human geography and culture, and of the details of life in three villages (incl. Hanashiro and Matsuda) on the island of Okinawa starting in 1951. This book is doubly interesting because by the year

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2000 Okinawans were widely considered to be the longest-lived and healthiest people in the world (Willcox 2001).

The author decided to select a village whose economy was based on agriculture–this meant primarily the cultivation of rice, sugar cane, sweet potatoes, and soybeans (p. vii).

Okinawan villages have a striking "dependence on plants, not only for food but for other uses" (p. 3). Chapter 1 is about the geography and cultural history of Okinawa, which has long been pulled between and paid tribute to China and Japan. Okinawa is the largest and most populous of the Ryukyu islands. These islands are generally divided into four island groups (*gunto*)*;* the Okinawa, Amami, Yaeyama, and Mikado groups. Three maps and a table (p. 8-16) shows these relationships. Naha, the capital of Okinawa island, is in the southwest.

Bean paste [miso] or bean curd [tofu] are used in the cooperative ceremonies of housebuilding (p. 70-71).

The most typical shops in rural Okinawa include import stores, which carry rice, flour, soybean sauce, and wheat (p. 74). Small retail shops sell foods, including soybean oil and Ajinomoto (p. 76).

"In the farming areas, sugar and rice are the only significant sources of cash income. Sweet potatoes, rice, eggs, and soybeans may be sold," but they do not provide much cash. The farmer "can produce much of his food and need spend little money if he is willing to subsist on sweet potatoes, bean curd, and bean-paste soup" (p. 86).

Chapter 7, titled "Agriculture" states: "Soybeans, grown for home consumption, are used for making bean curd (*tôfu*) and bean paste (*miso*)*"* (p. 131, 151). For soybean cultivation and crop rotation, see pages 136, 138, 151. Soybean plants are harvested with a small sickle and threshed by a flail; the residues are used for either fertilizer of fuel. Whereas soybeans are always used to make tofu or miso, soy sauce is always purchased.

Another type of bean is the "red dwarf bean (*adzuki*)*"* (p. 151).

Table 16 (p. 153) shows that soybeans are grown as a dry-land (rainfed) crop; in Hanashiro in 1952 they occupied 19.2% of the total land area; sweet potatoes occupied 50.8% and rice 15.5%.

The term "waste bean curd" (*tofu no kasshu* [*kasu*]) is used to refer to okara (p. 158-59); it is fed to horses and oxen.

When a person dies, if his descendants are devoted, his life will be remembered and celebrated periodically until 33 years after his death (p. 204).

Page 280: "One of the most significant links between family, village, and school is the annual athletic meet (*undôkai*)... There is much bustle, laundering, hair washing and cooking in a village the day before the meet. Special lunches including rice dyed red, bean curd, slices of fish paste, beef or pork are prepared." The infant is with the mother "when she is turning the quern to make bean curd" (p. 204).

The main difference is the basic diet is that the poor eat more sweet potatoes and less rice. For most people, breakfast includes a "soup made of hot water and bean paste, perhaps with bits of other foods. For dinner: "Bean-paste soup, rice or sweet potatoes, bean curd and tea" (p. 223).

"Home-made bean curd (*tôfu*)*"* and bean paste (*miso*) are an important foods, but miso is the more important of the two. in the daily diet. The present diet is better than before the war, when it consisted of mostly of the sweet potato and bean-paste soup. The latter usually has a few shred of shreds of fish or meat in it. "In times of scarcity, or if the family is poor, only the paste is used; when it is dissolved in hot water, it makes a kind of clear bouillon which is jokingly referred to as 'mirror soup' (*kagami miso*) because one can see his face in it; it is also called 'nothing in it soup' (*nnshiru*)*"* (p. 224)

The method of making bean curd is described (in part incorrectly). The remaining whey is used for pig food. "Bean curd, fried, boiled in a soup, in a mixture with vegetables, or as an ingredient in *sukiyaki* is always served at a party."

"Most families serve bean-paste soup (*misoshiru*) every meal every day. It [miso] has four basic ingredients: soybeans, rice or barley–occasionally the cycad, salt, and water. Recipes differ considerably among families... It is put in a large jar (*tsubo*) which is placed in the kitchen or in a storeroom and allowed to stand for at least a year, sometimes for three. With age, the paste becomes sweeter and is considered to be better; when ready for use, it is very soluble in water" (p. 225).

An excellent photo (p. 239) shows a woman making bean curd using a hand mill.

In observances in memory of the dead, when the "tomb is revisited on the seventh day, rice cakes [mochi], bean curd, favorite foods of the deceased, and a little sake may be taken as offerings" (p. 248).

After New Year, the next public holiday is *Jûrokunichi* (literally, sixteenth day), the 16th day of the first lunar month (Feb. 21, 1951); it "is a day of devotion and prayer at the family tomb." In Hanashiru, food is taken in two lacquer boxes (*jûbako*), the second of which includes bean curd (p. 253).

In historical times, Okinawan culture was for centuries exposed to Chinese culture, especially from the 14th to the early 17th centuries, "The most significant borrowings, either directly from China or via Japan," have included "articles of diet, such as bean curd" (p. 298).

Soybean or soybeans are mentioned on pages vii, 74 (soybean sauce), 76-77 (soybean oil), 86, 138 ("The second month (March 8 to April 5, 1951) is devoted to soybean planting which continues until about the middle of the month..." The soybean plots are weeded), 131 ("Four crops are the mainstays of Okinawan agriculture: rice, sweet potatoes, soybeans, and sugar cane"), 135-36 (soybeans in crop rotation), 138-39 (Soybeans are harvested in the fifth

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month, June 5 to July 3, 1951), 151 (After the soybean, the daikon is the most important of the minor crops grown for home use. Soybeans are planted once a year), 297 (sweet potatoes, soybeans, and sugar cane can be grown freely on land unsuited for rice). Address: Geographer, Berkeley, California.

4208. Griffin, Stuart. 1955. Japanese food and cooking. Rutland, Vermont, and Tokyo, Japan: Charles E. Tuttle Co. 167 p. Illust. No index. 19 cm.
• ***Summary:*** This basic introduction by an American contains about 70 Japanese recipes. The best known of these in the USA is Sukiyaki. The chapter titled "Ingredients" states (p. 3-4) that ingredients available in the USA include *"fu,* or wheat gluten; *tofu,* or bean curd; *yuba* or dried bean curd [sic]; and *udon,* or macaroni... sugared red beans [azuki],... bean paste squares and jellies, seaweed rice-cakes [probably mochi], painted with *shoyu* sauce." Sauces and flavorings are very important to Japanese cookery. "Foremost among these is *shoyu,* or soy sauce, made from wheat or barley, soybeans, salt, and water A dark, inky, thirst-provoking liquid, it is similar to that found in Chinese restaurants. The wheat is grilled in a big iron pan until burnt-brown in hue. It is then crushed. [Soy] Beans are boiled in an adjacent cauldron, with a heavy weight on the lid. Boiling lasts three to five hours, then the fire is put out, and the beans are kept in the kettle overnight. Steaming may be used as a method of bean preparation. This process lasts for five or six hours. The grilled wheat and boiled beans are mixed and placed in a malt-room [sic, koji room] where malt seed [sic, koji starter] are added The mixture turns to malt [koji] in a few days. Salt water is put over the malt and left for a few more days, being stirred occasionally until fermentation takes place. This overall mixture is pressed, and the [soy] sauce obtained is bottled.

"*Miso* is another necessity. This is a mixture of malt [koji], salt, and mashed soybeans, the liquor of which is drained off in tubs and allowed to ferment. *Miso* will be discussed later in the soup chapter" (see p. 64). Soy sauce and Aji-no-Moto are frequently mentioned. Soy-related recipes: Chirashi-zushi (with beancurd, p. 31-34). Sashimi (with shoyu, p. 36-41). Miso soups (p. 49, 64-69). Bean curd soup (p. 52-53). Roasted on a plough (sukiyaki with bean curd, p. 70-81). Vegetables, white sesame & vinegar (salad, with "1 *aburaage,* a kind of fried Japanese bean curd," p. 1124-25). Shoyu spinach (salad, p. 134). Turnips in shoyu (p. 134-35). Sweet soy beans (a festival dish at New Year's, p. 154-55).

Also mentions: Red rice (with azuki beans and glutinous rice, p. 17-18). Norimaki-zushi (sushi wrapped with nori, p. 27-30). Red bean cake (*yokan,* with bean paste, made from red kidney beans, and agar-agar, p. 145-46). Red kidney bean soup cake (*shiruko* [with azuki beans and mochi], p. 148-49). Bean & jam cake (*kuzumanju,* [with azuki bean paste and kuzu], p. 150-51). Address: [Japan].

4209. Hamada, H. 1955. [The Shoso-in medicinals (ed. by Y. Asahina)]. Osaka: Mosshoku-shi no Zoku. See p. 364-67. [Jap]*

4210. Heco, Joseph. 1955. Horyu ki: Floating on the Pacific Ocean. Translated from the 1863 ed by Tosh Motofuji. Los Angeles, Calif.: Glen Dawson. xii + 89 p. Illust. 23 cm. Series: Early California Travels. *

4211. Ichiyama, Morio. ed. 1955. Noda Shôyu keizai shiryô shûsei [Economic and statistical data about the Noda Shoyu Co.]. Noda, Japan: Noda Shoyu Research Dept. 126 p. No index. 21 cm. [Jap; dut; eng+]
• ***Summary:*** Much of this information describes the development of Kikkoman and its predecessors during the Edo period. Pages 61-63 give information on early Dutch exports of shoyu from Japan. Bibliographic references are given for shoyu export documents, all written in old Indonesian Dutch (which is quite different from old Dutch of the same period), from 1668 to 1776 (Kanbun 8 to Anei 5) located at the Waran Bunsho-kan (Japanese-Dutch Document House at The Hague, Netherlands).

1. Copy of a letter dated 17 Dec. 1668, written by the governor, Balthasar Bort, and the Council of the Moluccas [Malacca? Malaccas?] near Ceylon to Ryklof van Goens. To: India, Southeast Coromandel area. To Coromandel: Sake 30 kegs (*taru*) and shoyu 12 kegs.

2. Copy of a letter dated 13 Feb. 1670 (Kanbun 10), written by the governor Antehong Pavilioen and the Council of Negapatonam. This is an order form for goods needed by the company, plus some other things. India, East Coast Ceylon island, northwest of opposite shore. Order from Japan: Sake 30 kegs, shoyu 12 kegs, miso 6 kegs.

3. Original general letter dated 13 Feb. 1677 by the Governor General and the Council of the Dutch East Indies from Batavia [today's Jakarta] (Northern part of India, east Coast Madras). To Coromandel: Palliacatta, Various types of Japanese shoyu 17 kegs.

4. Original general letter dated 13 Feb. 1679 (Enhô 7) by the Governor General and the Council of the Dutch East Indies. (India west north corner Surat). To Surat: Shoyu 4 kegs.

5. Original general letter dated 11 Dec. 1679 by the Governor General and the Council of the Dutch East Indies, from Batavia. To Coromandel: Miso 1 keg, shoyu 10 kegs, oil 8 kegs. To Ceylon: Shoyu 20 kegs, sake 2 layered kegs–6 kegs, miso 2 layered kegs = 20 kegs.

6. Original general letter dated 29 April 1681 (Tenwa 1) by the Governor General and the Council of the Dutch East Indies, from Batavia. Coromandel: Shoyu large keg(s) (ôdaru)–half kegs (handaru). Ceylon: Shoyu large keg(s) (ôdaru)–three-quarter kegs.

7. Memorandum, dated 8 Jan. 1681, concerning a list of

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merchandise imported by ship [from Japan] on Chinese junks and ships from other foreign countries in Tonkin. Offerings to the former king: Sake 5 kegs, shoyu 10 kegs. Offerings to the assistant king (fuku-ô): sake 5 kegs, shoyu 10 kegs.

8. Copy of a letter dated 14 March 1683 (Tenwa 3) from the Governor and Commissioner, Jacob Joris Pitch, and the Council of Palliacatta near Batavia. Sake: large keg(s), half keg(s). Shoyu: large keg(s), half keg(s). Miso: 6 kegs.

9. Copy of a letter dated 20 Jan. 1699 from governor Govert van Hoorn and the Council of Malacca. Ceylon: Sake 2-layer kegs–6 kegs. Shoyu 2-layer kegs–8 kegs. Miso 2-layer kegs–2 kegs. Bengal: Shoyu 5 kegs, miso 5 kegs. Nagapatnam [probably Nagapatinam, a seaport town in southeast Tamil Nadu, in south India, on the Coromandel Coast 160 miles south of Madras]: Sake 2-layer kegs–3 kegs. Shoyu 3 kegs.

10. Thunberg's *Travels in Japan* (*Nihon Kiko*) published in 1796 noted in 1776 (Anei 5) that the Japanese do not export much tea to the surrounding countries since Japanese tea is quite inferior in quality to tea from China. However the Japanese make shoyu that is far better than Chinese shoyu, and many kegs of shoyu have been shipped to Batavia [Jakarta], India, and Europe. The Dutch in Japan discovered how to use heat to prevent over-fermentation of shoyu. They boiled the shoyu in an iron cauldron, then bottled it and sealed the mouth with painting pitch (*rekisei*). Shoyu heat-treated in this way will retain its strength and can then be used in making various sauces.

Note: In various of the above reports, shoyu was written as Zoya or Soya; sake was written as Saky with an umlaut (2 dots) over the "y," and miso was written as Miso. These products were listed along with other Japanese goods. It is clear that these things were exported from Japan ports in India.

Also includes: Regulations of the Tokyo Shoyu Company (1881), p. 89-91. Address: Noda Shoyu, Noda, Japan.

4212. Kaikoku Hyakunen Kinen Bunka Jigyo-kai (Cultural Enterprise Assoc. for the 100th Anniversary of the Opening of Japan in the Meiji Era). 1955. Nihon bunka kôshô-shi [History of Japanese Cultural Negotiations]. Japan: Yoyo-sha. See vol. 5. Iju-hen (Immigration section), p. 409. [Jap]*
• ***Summary:*** Repeats the information from Morita 1915 about Haruhachi Shimada being the first to brew shoyu in Hawaii.

4213. Lundqvist, Eric. 1955. In eastern forests. Translation of Vildarna finns i väst. London: Hale. 264 p. Illust. 27 cm. *
• ***Summary:*** "Only white crayfish with ketjap sauce and paprika. We went ashore to look for turtles' eggs. The island is high and hilly, and covered with dense jungle."

Note 1. The "eastern forests" refer to those of Indonesia.

Note 2. This is the earliest English-language document seen (April 2012) that uses the term "ketjap sauce" to refer to (probably) ketjap (Indonesian soy sauce).

4214. Noda Shoyu K.K. 1955. Noda Shôyu Kabushiki Kaisha Sanjugonen-shi [Thirty-five-year history of Noda Shoyu, Inc.]. Noda, Japan: Noda Shoyu K.K. 865 p. Illust. No index. 28 cm. [Jap]
• ***Summary:*** This is the second major history of Kikkoman, written largely by Mr. Morio Ichiyama. Concerning the Mogi Saheiji family line (p. 107): The third generation Mogi in this line started a shoyu brewing business in 1782. The trademark, first used in 1784, is identical to the Kikkoman trademark used today; it was designed by Manbei SARANUMA, who was a grain merchant. Earlier in 1784 another trade mark named Kikko-dai was used briefly.

In the section on exports (p. 560), subsection "Development of exports," it is written that shoyu was allowed to be exported during the period of Japanese isolation (*sakoku*) that started in the early 1600s (early Tokugawa period). According to Dr. Iwao, whose source of information was the Hague Library in the Netherlands (*Waran Haagu Bunshokan;* probably Nederlandse Vereiniging van Bibliothecarissen, Documentalisten en Literatuuronderzoekers (NVB)), in 1668 the Japanese sent 12 kegs of shoyu to Coromandel, India (a coast region of southeast India on the Bay of Bengal), in 1670 to the island of Ceylon, in 1677 to Coromandel again, in 1679 and 1681 to Surat in northwest India and to Coromandel, in 1681 to Tonkin (part of French Indochina from 1887, today in North Vietnam) where 10 kegs of shoyu were offered to both the ex-king and the vice-king, and in 1699 shoyu was shipped [by Dutch merchants] (together with sake and miso) to Ceylon, Bengal, and Nagapattinam (a seaport town in southeast Tamil Nadu, south India, on the Coromandel coast, 160 miles south of Madras). Shoyu was written as "Zoya" or "Soya." Sake was written as "Saky" with two dots over the "y." And miso was written as "miso." These exported products were sold at various places in India.

Pages 453-56 discusses the *Mankin Sangyotai* or *Bankin Sugiwai Fukuro* (1731 or 1732), noting that koji starter (*moyashi*) was now being made specifically for shoyu. Sake is made mostly during the cold season (*kanzukuri*). Shoyu should be fermented during the summer (*dôyo shikomu*) and pressed at the end of fall.

Pages 529-30 discuss the size of the wooden kegs *taru* in which shoyu was shipped and retailed. During the Tokugawa or Edo period (1600-1868) the kegs typically had a capacity 8 *sho;* since 1 *sho* = 1.80 liters or 0.476 gallons, a typical shoyu keg had a capacity of 14.40 liters or 8.568 gallons. And they typically contained 7.5 *sho* of high-class shoyu or 7 *sho* or regular/low-class shoyu. Starting in the year Meiji 1 (1868), a keg with 9 *sho* capacity was introduced. Then in Meiji 33 (1900) a larger size keg (called the *ô-dara-zumé*) was introduced; its capacity is not given. A keg of half this

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capacity (called the *ô-dara no handaru*) was also introduced. Contains many photos and illustrations.

Note 1. *Webster's New Geographical Dictionary* (1988) defines Coromandel Coast as a coast of southeast India from Point Calimere north to the mouths of the Krishna River. It has a low shoreline with no good harbors. The chief ports are Nellore, Madras, Pondicherry, Cuddalore, Tranquebar, and Nagapattinam.

Note 2. This document contains the earliest clear date seen for soybean products (Japanese shoyu) in Ceylon (today's Sri Lanka; 1670), or Tonkin (today's North Vietnam; 1681); soybeans as such had not yet been reported. Address: Noda, Japan.

4215. Rodrigo, P.A. 1955. Brief directions for growing soybeans (Leaflet). Manila: Philippine Dep. of Agriculture and Natural Resources, Office of Agricultural Information. 2 p. Revised ed. July 21. [Eng]
• ***Summary:*** The author concludes: "The soybean crop is ready to be harvested in 120 to 150 days after planting, depending upon the variety and the season when grown. For general purposes, the crop can be harvested when about 90% matured, especially when there is danger of bad weather. If intended for seeds, however, the crop should be thoroughly matured. In the absence of a binder the plants may be pulled off and tied into small bundles. These bundles may be set into stacks and threshed as soon as dry. The Japanese portable rice thresher is also an efficient soybean thresher. When there is danger of continuous rain the crop should be harvested and placed in the shade before it gets wet. At this stage, the soybean is easily spoiled; the beans rot with great rapidity. Soybean for seed purposes should be threshed as soon as practicable and the grains immediately and thoroughly dried. The seeds which should be completely air-dried are then stored in sealed containers. The straw and other by-products of threshing should be spread in the field for manurial purposes." Address: Chief, Horticulture Research Section, Bureau of Plant Industry, Philippines.

4216. Takahashi, Jusaku. 1955. 2, 3 no bitamin B-12 shigen ni tsuite. I. [Studies on some sources of vitamin B-12. I.]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 8(2):49-51. (Chem. Abst. 54:18813. 1960). [Jap]
• ***Summary:*** Table 4 shows the vitamin B-12 content for the following soyfoods: Raw whole soybeans 8. Tengu natto 83. Shinshu miso 170. Misozuke ayu (ayu {sweetfish; *Plecoglossus altivelis*} fish pickled in miso) 2538.

Note: The units of B-12 per 100 gm are unclear.

4217. Umeda, Isao. 1955. Shôyu [Shoyu (Japanese soy sauce) 2nd ed.]. Tokyo: Sankyo Shuppan Co. 326 p. [100+ ref. Jap]*
Address: Noda Shoyu Shiken-shi cho. Head, Noda Shoyu Research Lab.

4218. Yamada, A.; Matshushita, A. 1955. [Studies on the free amino acids in soya beans and the variation of their contents during germination by paper chromatography]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 7(6):262-66. [13 ref. Jap]

4219. Yauchi, J.; Takita, K.; Amemiya, K. 1955. [On the adding of cultured yeasts into soy sauce moromi (mash)]. *Chomi Kagaku* (*Seasoning Science*) 3(4):18-22. Based on an MSc thesis, Cornell University, Ithaca, NY. [Jap]*

4220. Goodsell, Alice Forn. 1956. Tokyo restaurants cater to global appetites. *Christian Science Monitor.* Jan. 17. p. 12.
• ***Summary:*** Sukiyaki is a delicious sort of stew, cooked before your eyes at the table. Ingredients include "lotus root, bamboo sprouts, or tofu (custardy bean curd)–all cooked in a sauce of soy and other ingredients."

4221. Hedge, Porter M. 1956. Washington Digest: Brazil. *Soybean Digest.* Jan. p. 32-33.
• ***Summary:*** "A soybean expansion program is taking place in Brazil, Foreign Agriculture officials report.

"A new large crushing plant capable of producing around 20,000 metric tons of soybean oil a year is being built by an international concern.

"Technicians have been imported to help develop satisfactory varieties and demonstrate best methods of production.

"The expansion is taking place in the southern part of Brazil where most of present production is. The new processing plant is being located in this area.

"The Brazilian government in recent years has encouraged producers in this area to increase production of wheat so wheat imports could be reduced. Soybeans are a good crop to rotate with wheat. The area is one with large operators having ample capital to carry though an expansion program.

"Brazil's annual output of soybeans now is around 3 ½ to 4 million bushels. The new processing plant would be capable of handling an increase in volume equal to the size of the present crop.

"An increase in Brazilian supply would not necessarily mean a new supply for world trade. Most of the present output is grown by Japanese and Chinese immigrant farmers, and is marketed in Japan as soybeans.

"However, Brazil is short of fats. Population is increasing rapidly there, as in other parts of the world. The standard of living is rising. It's felt here that soybean expansion would be almost entirely for home use rather than export."

A portrait photo shows Porter M. Hedge. Address: Washington Correspondent for Soybean Digest.

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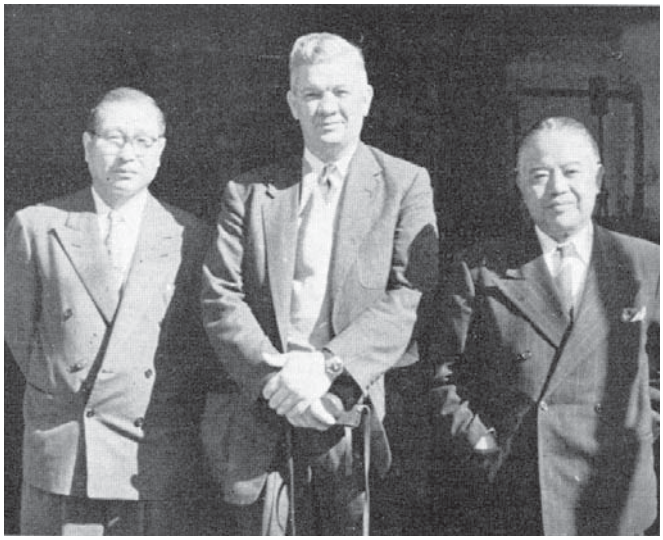
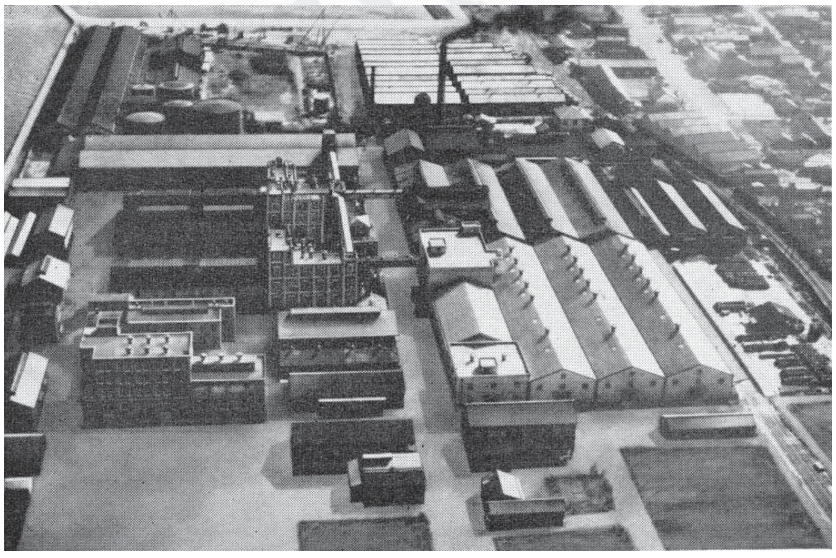
4222. Strayer, George M. 1956. We must remember: U.S. soybeans are food for the Japanese. *Soybean Digest.* Jan. p. 8-10.



• ***Summary:*** This is the first in a series of reports by the editor covering his recent marketing study for the USDA in East Asia. Above all, Japan wants clean soybeans from the U.S., with less foreign material. New U.S. standards allow No. 2 soybeans to contain up to 2% foreign material. U.S. standards classify all particles of soybeans which go through a 8/64-inch round hole screen as foreign material. Manchurian standards classify such broken particles of soybeans as unsound soybeans but not as foreign material. An estimated half of U.S. foreign material is these broken particles–which still end up making adequate soy products. "Because Manchurian [soy] beans have for years arrived with a foreign material content of ½% or less, the approximately 3,000 oil mills, 6,000 soy sauce plants, 5,000 soy paste [miso] plants and the 50,000 tofu or soybean curd plants in most cases do not have cleaning facilities... The role played by milk, meat, and eggs in the diets of America is taken by soybeans in the diets of Japan." The industries that uses soybeans are well organized, and each has its own trade association.

Photos show: (1) Strayer with the heads of the Yokkaichi oil mill and the Japan Oil and Fats Manufacturers Assoc. (2) The plant of the Hohnen Oil Co. at Shimizu which processes only soybeans into edible oil, glue, flour, and flakes for miso and tofu production (capacity 300,000 tons/year). (3) K. Sugiyama, chairman of the board of Hohnen Oil Co. receiving a medal. (4) Three men examining soybeans at the Takeya miso plant. (5) A cover photo shows a shipload of U.S. soybeans under new standards docks at the Ajinomoto plant in Yokohama, Japan.

4223. *New York Times.* 1956. Bean fetes mark 'spring' in Japan: Weather uncooperative as showerings of soy signal 'turning of the season.' Feb. 5. p. 11.



• ***Summary:*** "Tokyo, Feb. 4–Spring came to Japan ceremonially today with a chorus of staccato shouts and a shower of roasted soybeans in almost every household and all the temples of the land."

This ceremony, Setsubun (the "turning of the season"), celebrated on the first day of spring, is said to have originated in Japan's Imperial Court about 500 years ago. It "is supposed to frighten away demons and welcome beneficent spirits." The rite brings large sums of money into Buddhist temples and Shinto shrines throughout Japan.

One good place to see or participate in the Setsubun ceremony is at Tokyo's great temple of Kannon, the Buddhist goddess of mercy, located in the gay Asakusa amusement

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and shopping district. The ceremony, starting with a solemn procession of priests and about 40 lay notables, is described. "Many of the notables were business men in their forty-second year, a year supposed to be unlucky." They had paid large sums of money to the temple to be chosen to scatter the beans today, thus presumably nullifying the bad influences that are said to follow between one's 42nd and 43rd birthdays. Worshippers tossed 10-yen coins into slotted wooden receptacles. To catch a roasted soybean that has been tossed is supposed to bring exceptional good luck for the rest of the year.

4224. Elson, Katharine. 1956. Two Japanese shops cater to capital: For soya sauce or seaweed. *Washington Post, Times Herald.* Feb. 19. p. F13.
• ***Summary:*** The House of Hanna (1468 T st. nw.) was started in 1948 by Clara Hanaumi, wife of an American ex-GI, Harold Hanaumi, who was born in Hawaii and is of Japanese descent. A photo shows Harold Hanaumi in his shop discussing the "merits of a can of Japanese soy sauce with Mrs. Robert Overhuel."

The 2nd shop, Friends Market (1633 11th st. nw) is run by Harry Asaka. At first, Mr. Asaka featured just three items that are basic to "Japanese cooking–miso, a soybean paste; shoyu, the soya sauce, and rice."

4225. Strayer, George M. 1956. Japan's processors could use far more U.S. soybeans: Second of a series of reports by the editor covering his recent trip to the Far East. *Soybean Digest.* Feb. p. 6-9.
• ***Summary:*** Mr. Sugiyama, age 80, is chairman of the board of the Hohnen Oil Co., Tokyo, and is generally recognized as the dean of the Japanese oil industry. The soybean is today the major oilseed in Japan, but after crushing most of the oil and meal go into food products, rather than into feeds. "The Japanese oilseed crushing industry is an old one as compared with ours. According to information given me by Mr. Akaguchi, vice president of the Oil and Fat Manufacturers Association, the crushing of oilseeds in Japan on a commercial basis was started about 1630. Rapeseed was the first commodity crushed. The oil was the commodity desired. As soybeans came into the crushing picture they, too, were crushed for the oil, and the meal at the outset was of little consequence. Through the years the meal has become of increasing importance in the economy.

"Today there are two types of oilseed mills or plants in Japan. The first, and most numerous, is the small village plant, usually located in the interior villages, and operated by two or three persons. This is many times a strictly family enterprise. There are about 3,000 of these plants in Japan today, and in the trade they are known as 'mountain plants.' These plants operate on indigenous soybeans, garnered from the farms surrounding the village, and the oil and meal are utilized in the same village. Their production never enters normal trade channels...

"The other group of oilseed mills, known as 'sea plants,' are located on or near deep water, are comparatively large in size, and usually operate on imported raw materials, using solvent process equipment."

Before World War II, Japan's oilseed crushers imported about 800,000 tons/year of soybeans and up to 1 million tons/year of soybean oil meal and cake from the Chinese mainland. "Following the Japanese march into Manchuria in the early 1930s, the Japanese assumed ownership of many of the mills at Dairen and other Manchurian ports."

"During the 1955 calendar year total imports of soybeans into Japan were approximately 750,000 metric tons. Roughly half of this tonnage went to the oil mills, the other half to foods plants."

Photos show: (1) Mr. and Mrs. K. Sugiyama in formal Japanese dress. (2) Bags of soybeans being loaded onto trucks to be a warehouse of the Yoshihara Oil Co. near Osaka, Japan. (3) An Allis-Chalmers continuous solvent extraction unit at Yoshihara Oil Co. near Osaka.

4226. Strayer, George M. 1956. Japanese tofu makers don't like green beans or foreign material: Third of a series of reports by the editor covering his trip to the Far East. *Soybean Digest.* March. p. 20, 22.
• ***Summary:*** Contrary to general opinion, the Japanese are relatively well fed. "Theirs is a vegetable diet [largely meatless, near vegetarian, except for fish] out of necessity, for the concentration of nearly 90 million people on a small area of land less than the size of California and only about one-tenth of which is tillable makes a vegetable diet a necessity. They cannot afford the luxuries of an animal diet.

"Soybean protein fills the place in the Japanese diet that milk, meat and eggs occupy in our economy." Describes how tofu is made (8 photos show key steps in the process), and gives information based on an interview with Mr. Yamamoto of the Japan Tofu Association. Tofu originated in China where it has been made for at least 1,300 years. "In Japan the records show the production of tofu for something over 400 years... Today the tofu industry in Japan is using about 300,000 metric tons of soybeans per year, of which about 200,000 are produced in Japan and the remaining 100,000 tons are imported.

"A portion of the imports has been coming from the United States, some of them from Manchuria, and some from Brazil." "There are nearly 50,000 small tofu plants scattered throughout Japan. They buy their soybeans in small lots, and it is utterly impossible for them to provide adequate cleaning facilities in each of those plants. They must use the beans as they come to the plant, although I did see in my visits some efforts to screen the beans by hand and blow the light materials out of some lots. As can be easily imagined, morning glory seeds, foxtail, seed, cockleburs, corn and sticks and stems do not make good tofu. It is easy to

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understand why the plant operators want clean soybeans, and why over a period of time they are going to insist on having them.

"Managers of the tofu plants quickly point out that they consider the high foreign-material content of No. 2 beans a disadvantage from the standpoint of the quality of their product, and also from the standpoint of transportation on those materials. They would like, they continually point out, to buy clean soybeans, recognizing that they will cost more money.

"The tofu association buys some of the bean supplies coming from imported sources for its members. They want as light a yellow color as possible–in fact a nearly colorless or white bean is their preference. They want light-colored hilums, and greatly disapprove of the black hilum varieties because of the effect upon the color of the tofu. They want yellow interior color and yellow seedcoat, and dislike the green seedcoated beans which they sometimes get from the U.S. as U.S. No. 2 yellow beans."

4227. Strayer, George M. 1956. Communist China courts Japanese soybean market. *Foreign Agriculture* 20(3):6-7. March.
• ***Summary:*** American soybeans are selling for less at Japanese ports than soybeans from other sources. Address: American Soybean Assoc.

4228. Ishihara, Aiya. 1956. [The effect of 2,3,5-triiodobenzoic acid on the flower initiation of soybeans]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 24(3):211. April. [2 ref. Jap; eng]
• ***Summary:*** Soybeans, grown under short-day conditions, were sprayed with TIBA solutions at different growth stages from floral initiation to flowering. Treatments at about 10 days before flowering resulted in marked increases in the number of flower buds. Treatment at earlier stages resulted in greater increases in leaf numbers than bud numbers. Address: Faculty of Agriculture, Tokyo Univ.

4229. McKinney, L.L.; Cowan, J.C. 1956. Need for research on soybean oil meal. *Soybean Digest.* Part I. April. p. 14-16; Part II. May. p. 14-16, 18. [60 ref]
• ***Summary:*** Contents: Part I: Introduction. Vitamins: Known, unknown. Estrogenic activity. Saponins. Part II: Amino acids. Isolated soybean protein in nutrition. Summary.

"Estrogenic Activity: In 1946, reports began to appear in the Australian veterinary journals concerning the decrease in lambs from ewes grazing in subterranean clover [*Trifolium subterraneum*]. In some cases lambing fell below 10% of normal with 30% loss in ewes. During the period since 1950 the Australians have isolated isoflavones from the clover and have shown that these natural yellow dyes, found in most plant materials, are the causative agents. Genistein, an isoflavone also found in soybean oil meal (SOM), was found to be the principal one involved.

"The isoflavones have biological properties identical with those of stilbesterol (diethylstilbesterol) [stilbestrol, diethylstilbestrol]. Both of these compounds are proestrogens and are converted into the true hormones by the body. Stilbesterol is efficiently converted into the true hormone and has about equal activity. The isoflavones are not efficiently converted into the true hormone and have low activity. Genistein and diadzein [sic, daidzein], both of which are present in SOM, have about 1/50,000 of the activity of stilbesterol and the estrogenic activity varies considerably with the different isoflavones...

"According to Markley [1950] the presence of six isoflavones, usually in the form of glucosides, has been reported. These are genistin, diadzin [sic, daidzin], isogenistin, tatoin, methylgenistein, and methylisogenistein. The 'in' suffix denotes glucosides and 'ein' denotes the free isoflavone..."

Saponins: "Japanese workers pioneered the investigations on soy saponins and by 1940 they had shown that on hydrolysis four sapogenins along with glucose, galactose, rhamnose, arabinose, and glucuronic acid were obtained. They designated the sapogenins as soysapogenol A, B, C, and D. In 1950, Meyer, Jeger, and Ruzicka published their work leading to the structure of these four soysapogenols."

A graph shows (p. 14) U.S. high protein feed supply, 1925-1955, soybean oil meal equivalent, or 44% protein basis. In about 1941 soybean meal passed cottonseed meal to become the leading U.S. source of high-protein feed. Address: NRRL, Peoria, Illinois.

4230. *Soybean Digest.* 1956. Proceed on Japan project [Japanese-American Soybean Institute]. April. p. 7.
• ***Summary:*** In early April, 1956, the signing of a market development project for soybeans in Japan was announced jointly by the Foreign Agricultural Service, U.S. Department of Agriculture, and the American Soybean Association [ASA]. Designated as soybean project No. 2, it supplements the general market development agreement (signed previously by the two organizations), which designated the ASA as the official cooperator with USDA in projects involving P.L. 480 funds.

Up to $75,000 in Japanese yen may be used by the project to conduct an extended survey of deliveries of American soybeans, under the new grading standards which went into effect on 1 Sept. 1955. Preliminary details were worked out during October and November 1954 by George M. Strayer, while he was in Japan, with Japanese soybean trade groups.

"Establishment of an office in Tokyo, Japan, by a joint committee of the Japanese interests and the American

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Soybean Association is contemplated. First step will be the formation and activation of this Japanese-American Soybean Institute, and the employment of a managing director to be in charge of Tokyo operations."

Ersel Walley of the American Soybean Association is now in Japan as an official representative of ASA. The funds for the cooperative project will come from three sources: P.L. 480 sources, Japanese Trade Association sources, and ASA. The basic purpose of the project is to collect the necessary information on the "requirements of the Japanese market for soybeans so that exports of American soybeans may more nearly fill those needs, and thus expand the Japanese market for American soybeans."

Before World War II, Japan, which had a population of about 60 million people, imported as much as 800,000 metric tons of whole soybeans and 1 million tons of soybean cake and meal per year. Today Japan has a population of nearly 90 million people yet imports only 700,000 metric tons of whole soybeans and no soybean meal. Thus, there is demand which needs to be filled.

Japanese buyers have repeatedly objected to the "foreign material content and green-seedcoat color of many shipments of soybeans received" from the USA. This study will try to determine just how American soybean deliveries compare with those from Manchuria and Brazil, and how Japanese buyers who require a special quality or type of soybeans will be able to secure their needs–as through a special contract.

The current project is written to cover a period of one year starting 1 April 1956.

Note 1. This is the earliest document seen (Jan. 2014) concerning the Japanese-American Soybean Institute (JASI).

Note 2. This is the earliest document seen (March 2003) concerning a joint venture between USDA's Foreign Agricultural Service and the American Soybean Association. This soon became a large, thriving project.

4231. *Soybean Digest.* 1956. ASA [American Soybean Assoc.] men on Japan mission. April. p. 27.
• ***Summary:*** Ersel Walley and Marion Hartz will prepare an exhibit of soybeans and soybean products at the Osaka Trade Fair in April. Walley, former president of the American Soybean Association, is presently a member of its board of directors, and is also president of Walley Agricultural Service, Fort Wayne, Indiana.

Walley left the USA for Japan by plane on March 19. "He was in charge of the erection and staffing of the exhibit and is now meeting with Japanese trade groups of the soybean industry pertaining to a program of market development on soybeans under Public Law 480."

"The exhibit, sponsored jointly by the American Soybean Association and Foreign Agricultural Service of the U.S. Department of Agriculture, features the availability of American soybeans, the higher oil content as compared with shipments from other parts of the world, and demonstrates the place of soybean food products in supplementing the high rice diet of the Japanese people.

"'Japan is already our No. 1 customer for American soybeans,' Walley pointed out as he left for Seattle and Tokyo, 'but the potential market in Japan is only partially supplied. There is need for several times the present imports of soybeans as a source of fats and oil and protein.'

"As a purchaser of surplus agricultural commodities under Public Law 480 Japan has brought in wheat, rice, cotton and tobacco. A portion of the Japanese yen is issued in payment for those commodities to be used in further promotion and expansion of markets for agricultural commodities,..."

A photo shows Ersel Walley in 1956 holding two suitcases, standing in front of the ASA office in Hudson, Iowa. The caption states: "Ersel Walley as he left American Soybean Association headquarters to catch the plane for Japan."

4232. *Soybean Digest.* 1956. Mississippi County Farm Bureau made out a check for $300 to help finance the cost of the soybean market development study in Japan (Photo caption). April. p. 7.
• ***Summary:*** This photo shows: "Left to right, Hays Sullivan, Bill Wyatt, Tom Callis and Earl Wildy. Wildy is president, Callis is secretary and Sullivan and Wyatt have been active in the country's soybean program." Wyatt and Callis are holding and looking at the check.

4233. Nakamura, Mitsuo. 1956. [Drying oil from semidrying oil]. *Japanese Patent* 3931. May 28. (Chem. Abst. 51:13419b). [Jap]*
• ***Summary:*** Soybean oil is one of the ingredients. The product is filtered to obtain an isomerized soybean oil containing a conjugated double bond.

4234. Utsumi, Isamu; et al. Assignor to Tanabe Drug Manufacturing Company. 1956. [Amino acids mixture]. *Japanese Patent* 4395. June 11. (Chem. Abst. 51:15074g). [Jap]*
• ***Summary:*** A hydrochloric acid hydrolyzate of fat-extended soybean cake is concentrated *in vacuo,* and the residue is neutralized with sodium hydroxide to pH 7 and dried *in vacuo.* This residue (60 gm) and 7 gm ultrafine silicon dioxide are mixed, the mass is passed through a 20-mesh sieve, and the granules are mixed with 3% talc and molded into tablets. Address: Japan.

4235. Baens-Arcega, Luz; Marañon, Joaquin; Palo, Macario A. 1956. Proteolytic enzyme from a Philippine strain of *Aspergillus oryzae* (Ahlburg) Cohn. *Philippine J. of Science* 85(2):189-201. June. [7 ref. Eng]
• ***Summary:*** Strains of the mold *Aspergillus oryzæ* are used in Japan to make shoyu, miso, mizuame [rice syrup], and

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sake, and used in the manufacture of commercial enzymes such as Takadiastase, Polyzyme, Digestin, Oryzyme, and Kasiwagidiastase.

The authors isolated several protease-forming yellow-green molds. By repeatedly culturing the isolates in copra meal and rice bran media, one was found to produce protease of excellent digestive potency as evaluated by the Oshima and Church method. Optimum temperatures for protease production was 27ºC in copra meal and 22 to 27ºC in rice bran.

"The potency produced by the Philippine strain of *A. oryzæ* in copra meal is 3 times that of the most efficient *A. oryzæ* and 2 times that of the *Aspergillus effusus* type cultured in wheat bran by Oshima and Church." Address: Inst. of Science & Technol, Manila, Philippines.

4236. Walley, Ersel. 1956. Osaka soybean exhibit a success: Soybean marketing development program project No. 1. *Soybean Digest.* June. p. 6-8.
• ***Summary:*** "Japan was indeed a most logical location for our first truly International Exhibit of soybeans and soybean products." "Our exhibit at the Japan International Trade Fair in Osaka, April 8-22, 1956, was complete in every detail to tell the story of American soybeans from planting to ultimate utilization in the U.S. and Japan. A panorama of large photographs lined the wall of the exhibit telling the entire story through captions printed in Japanese." Two American films telling the entire story of American soybeans, in Japanese, were shown regularly in the small theater in the American pavilion, and proved of great interest. At least 500,000 people streamed through the American pavilion and viewed the exhibit.

Special thanks must be given to Shizuka Hayashi, managing director of the newly formed Japanese-American Soybean Institute, and to Marion Hartz of Stuttgart, Arkansas. Photos show: (1) Marion Hartz, Shizuka Hayashi, and Ersel Walley standing in the U.S. exhibit. (2) Long lines of people waiting to get into the American pavilion at the Osaka Trade Fair. (3) Ersel Walley demonstrating soybean cleaning equipment for many Japanese onlookers. (4) A Japanese trade group inspecting the soybean exhibit. (5) Mr. Hayashi with a group of Japanese tofu makers visiting the Trade Fair.

4237. *Washington Post and Times Herald.* 1956. Anne's trading post: Travelers bring recipes from afar. July 29. p. F14.
• ***Summary:*** Sukiyaki is the most popular of saucepan dishes. This recipe is taken from the *Japanese Cookbook* published by the Japan Travel Bureau. The ingredients include Soy sauce, 3 tablespoons and Tofu, 4 ounces. "Tofu is a bean curd which can be purchased here [in Washington, DC] however I omit it because it doesn't appeal to American palates."

4238. Owen, June. 1956. Food news: Other lands offer menu. *New York Times.* July 31. p. 26.
• ***Summary:*** "Oriental: Oriental Food Shop, 2791 Broadway, offers all the ingredients necessary for Japan's most noted dish, sukiyaki. These include tinned bean curd, bamboo shoots, and Japanese soya sauce."

Katagiri, 223 East 59th Street, is another good source for imported Japanese foods, especially canned, ready-to-eat products, including "scallions in soya sauce."

4239. Sato, Takao; Kamiyama, Keiji. 1956. Daizu no saishu ni kansuru kenkyû: Kotonaru hyôkô de saishu shita daizu sushi no jidai shokubutsu no seiiku shûryô ni oyobosu eikyô ni tsuite [Studies on seed production of soybean: Experimental researches of the effects of differences in the altitudes of producing localities upon the seeds and their progeny plants]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 24(4):317-18. July. [2 ref. Jap; eng]
• ***Summary:*** The seeds were produced at altitudes from 80 to 1,350 meters. Within a given variety, differences in seed size were due to edaphic (relating to the soil) rather than climatic conditions. The higher the altitude, the earlier was the flowering and seed maturity, and the lower was the fat content.

To produce superior soybean seeds, one should choose localities as free as possible from plant diseases or noxious insects. Of the seeds produced, larger sized ones from within each variety should be selected for planting to give more abundant yields. Address: Kanto-Tosan Agric. Exp. Station.

4240. Walley, Ersel. 1956. The Japanese-American Soybean Institute: Soybean marketing development program project No. 2. *Soybean Digest.* July. p. 12-13.
• ***Summary:*** Under agreement with the USDA's Foreign Agricultural Service, the American Soybean Association is charged with carrying out a year-round soybean marketing development program in Japan. This is the first such project to be conducted by an American commodity group in foreign sales promotion–so there were few guidelines or examples of how to proceed.

Walley went to Japan and initiated the first project, the soybean exhibit at the Osaka Trade Fair. The next project was the formation of this institute [JASI]. Mr. Shizuka Hayashi was hired as managing director. He "enjoys unusual respect and prestige throughout the entire Japanese soybean industry. He speaks and writes English excellently." He has devoted most of his life to oils and fats, and has visited the United States.

The Japanese members are the manufacturers of oil and fat, miso, tofu, and shoyu, plus the fat and oil importers-exporter associations.

Photos show: (1) Walley and Hayashi. (2) Signs above the American soybean exhibit at the Osaka Trade Fair.

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A large round sign shows two pods filled with soybeans plus soybean leaves at the top. Two rectangular signs read "Soybeans" in Japanese and English.

Note: According to a report titled "The Evolution of the Market Development Programs and the Public / Private Partnerships," by the U.S. Agricultural Export Development Council (USAEDC) concerning the cooperator program: "The first cooperative agreement was signed with the National Cotton Council in 1955, followed quickly by one with the Oregon Wheat Council. Soon the agreements expanded to include tobacco, soybeans, dairy, millers, poultry and rice in 1956, followed by prunes, raisins, Florida citrus, Sunkist (California / Arizona), canned peaches, red meat, tallow and grease, hides and skins in 1957 and Northwest apples and pears and a small feed grains project in 1958." Address: Special Representative and Past President of the American Soybean Assoc.

4241. Murata, Hisato; Bingo, Fujihiko. Assignors to Asahi Electrochemical Company. 1956. [Plasticizer from soy sauce oil]. *Japanese Patent* 7522. Aug. 30. (Chem. Abst. 52:10639i). [Jap]*
• ***Summary:*** A cold weatherproof plasticizer is made from soy sauce oil by its esterification with lower alcohols, followed by epoxidation. The resulting epoxidiated ester is shown to be superior to diocotyl phthalate, especially with respect to resistance against cold weather.

4242. Yano, Mototeru; Fujita, Akiji. 1956. The synthesis of vitamins by intestinal bacteria and the effect of cellulose. IV. Synthesis of vitamin B-6. *J. of Vitaminology* (*Osaka, Japan*) 2(3):209-15. Sept. 10. [7 ref]
• ***Summary:*** The percentage of vitamin B-6 in the form of pyridoxol, pyridoxal, and pyridoxamine in soybeans is 18, 77, and 5 respectively. Address: Biochemical Lab., Kitasato Inst., Minato-ku, Tokyo, Japan.

4243. Fukuhara, Yasuo. 1956. Nihon shokuniku-shi [A history of meat-eating in Japan]. Japan: Shokuniku Bunka-sha. 288 p. Sept. 15. [Jap]

4244. Hamada, Shigeo; Gamô, Kiyoshi; Kadosawa, Taichi; Aso, Kiyoshi. 1956. Shôyu-chû no to-rui ni tsuite [Studies on the sugars in soy sauce]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 34(9):407-410. English-language summary on p. 29 of this issue. [12 ref. Jap; eng]
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai, Japan.

4245. Hori, Shinichi; Ogawa, T.; Aoki, R.; Kondo, Y.; Ota, Y. 1956. Shôyu-chû no L-gurutamin san no shôchô ni tsuite. I. Shôyu-chû no L-gurutamin san no keitai oyobi seisei kiko ni tsuite [Studies on the behavior of L-glutamic acid in shoyu. I. Studies on the various types of L-glutamic acid and their formation mechanism in shoyu]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 30(9):519-23. Sept. [7 ref. Jap]
Address: Kawasaki Factory, Ajinomoto Co., Inc.

4246. Kurtz, Howard D. 1956. Marketing problems of U.S. soybeans in Japan: Change in U.S. grading standards was a big step in the right direction. *Soybean Digest.* Sept. p. 41.
• ***Summary:*** "The purpose of my visit to Japan was to study the Japanese soybean requirements in relation to our U.S. grades and standards; to learn more about the uses they make of our soybeans, and the marketing problems involved.

"The Department had from time to time, as this group knows, received quality complaints on certain deliveries. It was therefore thought a firsthand knowledge stood to aid us in developing standards that might better reflect character and quality from the export standpoint, for we in the Department are just as much interested as you folks in industry, to see that the grades enable buyers, both domestic and foreign, to get the kind and quality of commodities they want and need.

"To sum up briefly, from observations and discussions with Japanese industry people, the major marketing problems insofar as quality is concerned can, I believe, be broadly stated under two primary headings: foreign material and color.

"Foreign material: Comments by the Japanese indicated that we made a big step in the right direction last year when we reduced our foreign material by 1%. It is believed the Japanese interests are now reasonably well satisfied with the overall allowance of total foreign material. The kinds of foreign material contained in some of our deliveries, however, still remain a problem. The food manufacturers in particular object to such material as stems and certain weed seeds as they affect both the palatability and appearance of their products. For food purposes this is readily understandable.

"Due to the nature of my assignment, considerable time was spent observing the unloading of cargoes. The average results between the U.S. inspection and the Japanese inspection checked remarkably close, especially when one considers the handlings that occur between inspections. The Japanese use our standards and apply them in a manner similar to the way they are applied in this country.

"I did find, however, unevenness in foreign material in occasional holds of our ships, even though I am satisfied uniformity existed at the time they were sampled at our ports. As you know, soybeans containing foreign material are difficult to load uniformly in any type of container, because foreign material does not flow freely as do the soybeans. When this condition exists and our cargoes are broken up into many small lots, such as they are in Japan, the party receiving his delivery from an area of high foreign material is not satisfied. In fact, it appeared that many of our past

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complaints on the foreign material factor have probably stemmed from this distribution problem.

"Color: It was apparent the Japanese do not like any form of green coloring in soybeans. The oil people object to the color the green soybeans give oil, and to the reduced price they take when they market the flakes to the food people. The food manufacturer objects to the color the green soybeans give their product. To illustrate the importance the Japanese place on color, in addition to their inspectors showing the usual quality factors, the trade requires them also to show the percentage of light and dark green kernels. Color is a quality guide in that country. From observations both in Japan and since my return, it does not appear that the present Illinois-Minnesota origin buying arrangement is the solution to this problem. By this I do not wish to imply that it has not accomplished anything, rather it appears to have served its usefulness.

"It would seem the color problem could best be solved by separately classifying the green and yellow seed-coated soybeans under the framework of the standards. Our quality certificate itself could then better relate an accurate picture of the type of soybeans inspected.

"Color again enters into the picture in the form of purple mottling. Due to this not being pronounced in our Midwest and Midsouth crops the past two seasons, emphasis in Japan was not placed on this factor. Should We encounter years again though where they are prevalent, comments indicated there would be serious objections.

"Another indirect color problem in Japan deals with our splits. High percentages of splits are objected to, especially by the miso and tofu industries. They contend that soybeans that have been split for long periods of time fade and lose their natural yellowish color, resulting in a food product that has a dull appearance.

"It is believed if we can iron out most of these quality problems, through the combined efforts of all concerned, it will help put our trade with Japan on a much more solid foundation." Address: Board of Grain Supervisors, Agricultural Marketing Service, USDA, Chicago, Illinois.

4247. Sakaguchi, Yukio. 1956. American soybeans in Japan: Japan will have to import greater quantities of soybeans in the future, and will rely on U.S. soybeans if problems can be solved. *Soybean Digest.* Sept. p. 33.

• ***Summary:*** "On behalf of the Japanese soybean delegation consisting of five representatives, Goro Kawamura, president of Japan Miso Association; Saihei Toriumi, vice president of Japan Shoyu Association; Kumazo Abe, president of the Japan Tofu Association; Keiichi Matsuoka, president of Oil and Fat Importers and Exporters Association, and I, Yukio Sakaguchi, vice president of Oils and Fats Manufacturers' Association, I wish to express our sincere gratitude to the American Soybean Association for having invited us not only to attend this convention but to visit various places of interests and study conditions for the eventual benefits of both you and ourselves.

"In Japan, as you probably know, soy beans are consumed not only for oil extraction but also for various food products such as Shoyu sauce, Miso, Tofu and Natto, etc., also for making Monosodium Glutamate. We need 900,000 to 1 million tons of soybeans for these purposes. Although about 500,000 tons of domestic soybeans are produced a year, most of them are consumed by producers themselves and only about 200,000 tons are sold in the market. The balance, 700,000 to 800,000 tons, therefore, depends on imports.

"Approximately 500,000 tons of soybeans in 1954 and 800,000 tons in 1955 were imported to Japan, out of which 440,000 tons in 1954 and 570,000 tons in 1955 were imported from the U.S.A. I am sure Japan is one of the best customers for your country so far as soybeans are concerned.

"Before World War II, Japan depended solely on Manchurian soybeans but since the end of the war, owing to various difficulties involved in importing from Communist China, U.S. soybeans have taken the place of Chinese beans. However, it is noteworthy that lately due to the difference in freight distance in favour of Chinese beans and the fact that quality of Chinese beans is more suitable for food products than are American beans, import of Chinese beans is gradually increasing. That is to say, imported Chinese beans have been increased to 200,000 tons in 1955 from only 50,000 tons in 1954. Whereas the total imports of U.S. beans have decreased to 71% in 1955 and 95% in 1951, Chinese beans have come up to 25% from 3% in the same years.

"U.S. soybeans are better in oil content but contain more foreign material, damaged beans, broken beans, other seeds and other colored beans than Chinese beans. If improvement can be made in these points I am sure Japan will come to buy more U.S. beans in the future.

"Since Japan's consuming level of oils and fats at present is still very low as compared with other world nations and further in view of the demands for soybeans for various food manufacturers are increasing. I believe considerably greater quantity of soybeans will have to be imported in the future.

"It is therefore desirable that an overall study involving not only in respect to quality but also to other trade conditions and loading be made. Fortunately through the efforts of your Association, your government and your people, the Japanese-American Institute [JASI] has been established having as its members the American Soybean Association and the five Japanese organizations and is carrying out activities since early this spring. The various pending problems mentioned will surely be solved satisfactorily through the efforts of this Institute.

"Taking this opportunity, we wish to assure you that we will cooperate with the Japanese-American Soybean Institute in its activities.

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"In conclusion I again wish to thank you for having offered us a chance to attend your convention and to see and talk with all those concerned in the soybean industry in the U.S.A. At the same time, we sincerely hope that the friendly relations between the U.S.A. and Japan will be ever strengthened through the trading of soybeans."

A photo shows Y. Sakaguchi standing by a microphone at a podium. Address: Vice President, Oils and Fats Manufacturers' Assoc., Tokyo.

4248. *Soybean Digest.* 1956. European export program the first undertaking of Soybean Council! Sept. p. 26-27.
• ***Summary:*** At the top of the first page are two letters under the heading: "Endorsements for Soybean Council from USDA." These are: "Copies of actual letters [with signature on letterhead] received [in mid-August 1956] from True D. Morse, Acting Secretary of Agriculture, and Marvin L. McLain, Assistant Secretary, by Howard L. Roach, president of the Council."

The article begins: "A huge export market development program in European countries to be implemented with over one-half million dollars in P.L. 480 and soybean industry funds will be the first undertaking of the new Soybean Council of America.

"The Council is an industrywide organization formed this past summer for the purpose of research, education and promotion of the nation's soybean crop.

"An agreement between the U.S. Department of Agriculture's Foreign Agricultural Service and the Council to implement the program was approved by the Council's board of directors and signed by the officers. It was submitted to and signed by FAS Aug. 22. The program will be similar to the soybean market development program already in effect in Japan under the sponsorship of the American Soybean Association and Japanese trade groups.

"The European export program will include Italy, Spain, Germany, Austria, France, Finland and possibly other countries. It will in general follow the recommendations of Geo. M. Strayer, executive director of the Council, to USDA on his recent return from Europe. Strayer, who saw possible unwieldy surpluses developing from the 1956 and 1957 soybean crops, believes there is a potential increase of 60 to 70% in European markets for soybeans and soybean products over a period of years.

"A European office will be set up, and the Soybean Council will carry out projects in research, market analysis, sales promotion and related trading activities for soybeans, soybean oil and other soybean products in the above named European countries.

"The program will be financed by:

"$500,000 in foreign countries made available by FAS.

"$25,000 advanced by the Soybean Council.

"Funds advanced by European trade groups.

"The program is thus a massive attack by the Council on the threat of soybean surpluses during the next 2 crop years.

"The overall program of the Council, of which the European export project is a first step, will be financed by voluntary contributions from soybean producers at the point of sale. The operation will be simple. The collection of 10¢ per 100 bushels ($1.50 per carlot of 1,500 bushels) will be made by the buyer at the time of purchase. And soybean processing plants will deduct $1.50 per carlot on soybeans coming into their plants. The proceeds will be turned over to the Soybean Council of America. That is all there is to it.

"The checkoff will begin with the 1956-crop movement as originally planned.

"First report on the Council was made by its officers during the American Soybean Association convention at Urbana.

"Said President Howard L. Roach: 'The question has been asked, "Why aren't the grain men represented on the Council?"

"'We had to make a start somewhere. For the producer and processor associations to set up the Council seemed to be the most practical method of getting it started. That was what was done. 'Grain handlers will be brought into the Council as soon as they wish, and as soon as they have representation able to speak for them as a group.'"

"On the cover: In the lower left-hand picture on the front cover Treasurer Albert Dimond, Secretary R.G. Houghtlin and President Howard L. Roach give their first report on the Soybean Council of America at the ASA convention."

A photo shows: "Board of Directors of the Soybean Council of America. Left to right, R.G. Houghtlin, secretary, Chicago, Illinois; Geo. M. Strayer, executive director, Hudson, Iowa; Scott Cramer, Chicago; Dwight Dannen, St. Joseph, Missouri; Albert Dimond, treasurer, Lovington, Illinois; Dave Wing, vice president, Mechanicsburg, Ohio; Chester B. Biddle, Remington, Indiana; Howard L. Roach, president, Plainfield, Iowa; Jake Hartz, Jr., Stuttgart, Arkansas; John W. Evans, Montevideo, Minnesota; Wayne Lichty, assistant executive director, Hudson, Iowa; Ralph G. Golseth, Danville, Illinois; and John Sawyer, London, Ohio."

4249. Walley, Ersel. 1956. Japan: Soybean gateway to the Orient. Twin problems of foreign material and green color are still the chief ones facing us in the Japanese markets. Walley says we can develop markets at home and abroad for a billion bushels of soybeans. *Soybean Digest.* Sept. p. 31-32.
• ***Summary:*** This article begins: "Our reference here to Japan as the 'Gateway to the Orient' is not based primarily upon her geological location. It is based on the outstanding intelligence, aggressiveness, and willingness of the Japanese people to work.

"Soybeans were centuries old in Japan before they were even known in the United States. It is well established that tofu and perhaps other soya products have been used for food

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in Japan for over 400 years. We have before us the record of one soya sauce factory which is over 100 years old, and commercial oil extraction was established in Japan near the beginning of this century.

"The fact that Japan has for centuries supplemented their rice diet, rich in starch, with the essential proteins, fats, and minerals of soybeans may bear causal relation to the unusual energy of the Japanese people."

A photo shows the "Official visitation team of the Japanese-American Soybean Institute and Ersel Walley, who helped set up the Institute. Left to right, Matsuoka, Sakaguchi, Walley, Abe, Kawamura, Toriumi." Address: Past President and Director, American Soybean Association Fort Wayne, Indiana.

4250. Nickerson, Jane. 1956. Japan big contributor to American table: Products sent here to go on exhibition.–Recipes offered. *New York Times.* Oct. 25. p. 38.
• ***Summary:*** Japan exports more than 80 food products to the United States–more than the writer had expected. The variety of Japan's food contributions to America will be the subject of the Japanese Food Show, which opens to the public next Tuesday at the Japan Trade Center, 393 Fifth Ave., Manhattan. About 50 imported foods will be on display, some will be for sale, and the preparation of popular recipes (such as sukiyaki) will be demonstrated.

Imports to be displayed include "shoyu (soy sauce)."

Three Japanese specialty foods shops plan booths at the show: the Oriental Food Shop (2791 Broadway), Katagiri (224 East 59th St.), and Tanaka (144 West 65th St.).

A recipe for "Beef teriyaki" calls for: "½ cup shoyu (Japanese soy sauce)... 1 cake tofu (soy bean curd), cut into cubes..."

4251. Takahashi, Jûsaku. 1956. Bitamin B-12 kyôka shokuhin ni kansuru kenkyû. I. Shokuhin-chû bitamin B-12 no anteido ni tsuite [Studies on the fortification of some foods [incl. miso and soy sauce] with vitamin B-12. I. On the stability of vitamin B-12 in foods]. *Bitamin* (*Vitamins, Kyoto*) 11(4):385-88. Oct. 25. (Chem. Abst. 51:15816i). [11 ref. Jap; eng]
• ***Summary:*** The change of vitamin B-12 content in enriched miso, soy sauce, jam, and cream during storage and heating was tested by a microbiological method using *Euglena gracilis* var. *bacillaris.*

Vitamin B-12 added to miso was relative stable during storage for 30 days; 89% remained at 3-5ºC and 35-59% remained at 30ºC. However vitamin B-12 added to soy sauce was relatively unstable during storage; only 75% remained at 30ºC.

Vitamin B-12 added to miso was relative stable during heating; only 6% was degraded after 30 minutes at 100ºC. However vitamin B-12 added to soy sauce was so unstable on heating that 28-54% was degraded after heating for 12-30 minutes at 100ºC. In short, the enrichment of soy sauce with vitamin B-12 seems unsuitable. Address: Faculty of Agriculture, Utsunomiya Univ., Utsunomiya, Japan.

4252. Ebine, Hideo; Nakajima, Michie; Nakano, Masahiro. 1956. Eiyô kyôka miso no kenkyû. V. Misoshiru kanetsu ni saishite bitamin-rui no sonshitsu ni tsuite [On the manufacture of enriched miso. V. Loss of vitamins during preparation of miso soup]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 11. p. 111-12. Oct. [5 ref. Jap]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4253. *Soybean Digest.* 1956. Japanese saw our industry firsthand. Oct. p. 8.
• ***Summary:*** "Glimpses of the U.S. soybean tour by Japanese industry representatives are shown on this page.

"They came to see the U.S. soybean industry from farm to final usage and returned home to report on what they had seen to their respective industries. The tour started with attendance at the American Soybean Association convention at Urbana, Illinois, in mid-August, and ended with a visit to the U.S. Department of Agriculture in Washington in early September.

"The tour was part of the program of the Japanese-American Soybean Institute. Its purpose was to better relations between Japanese and American soybean trade groups. The Japanese hope to get out of it better soybeans for their food industries–fewer damaged and colored beans, and less foreign material. The Americans hope to get a bigger market for U.S. soybeans from the country that is already our best foreign customer."

Six photos show the Japanese members of the group at various stops along the tour.

4254. *Los Angeles Times.* 1956. Diet clue to cause of heart disease. Nov. 11. p. C2.
• ***Summary:*** In the last 25 years in Hawaii, there has been a large increase in the incidence of fatal heart attacks. After studying the hearts of persons who have come to autopsy, Dr. Nils P. Larsen of Honolulu suspects that this is because Hawaiians, whose income has risen significantly during this time, have been consuming much more "butter, cream, eggs, and milk" than before.

In Japan, the village of Narusawa, at the foot of Mt. Fuji, had the lowest rate of rejection of military conscripts during World War II; the villagers there lived largely on "soybean soup." Note: Probably miso soup.

In Mukojima, another village, the people have the greatest longevity of any village in Japan. About 8.4% of the population are over 70 years of age. The diet of Mukojima, which is described, includes noodles made from sweet potatoes, azuki beans, small fish, seaweed, carrots, and

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pumpkins.

4255. Kenney, Harry C. 1956. Exquisite Japanese display woos trade on New York's Fifth Avenue: Tokyo bids for global markets. *Christian Science Monitor.* Nov. 17. p. 17.
• ***Summary:*** At the Japanese Trade Center on Fifth Avenue you find an exquisite display of the products of postwar Japan. Japan, whose economy is now making real growth, is working to develop long-term overseas markets. The man the New York office is Masato Yamamoto, an executive in the Japan External Trade Recovery Organization (JETRO). A quiet man, he told the writer the remarkable story of Japan's 10-year recovery since the end of World War II.

Japan is, in many ways, like Britain in that both are islands which must import raw materials and export finished products. The key to survival is trade and exports.

Japan has a population of 90 million on an area about the size of Montana, only about 17% of which is arable.

"As I took leave of Mr. Yamamoto he handed me a bottle of shoyu, or Japanese soy sauce, from a display of about 50 other Japanese food products."

He explained that the Japanese have been making this sauce for about 1,000 years. Address: Staff correspondent.

4256. Hayashi, Shizuka. 1956. The work of the Japanese-American Soybean Institute. *Soybean Digest.* Nov. p. 20.
• ***Summary:*** This Institute was established in May 1956. The initial work has concentrated on a study of the condition of soybean from the USA and other countries when they arrive in Japan. Additional studies have been made of the shoyu and miso industries in Japan.

The Japanese soybean crop this season has been a poor one, estimated now at about 170,000 tons, far below the earlier estimate of 220,000 tons. These domestic soybeans are preferred by makers of miso, shoyu, tofu, glue, and feeds.

To make up the total requirements of 954,130 tons, some 784,130 tons must be imported. This includes 10,000 tons of Brazilian soybeans and at least 86,000 tons of Chinese soybeans–both depending on the price.

New-crop U.S. soybeans purchased by Japan are estimated as follows: 60,000 tons for October shipment, 110,000 tons for November shipment, and 30,000 tons for December shipment. Total: 200,000 tons. The average price is about $112 to $113/ton, C&F Japanese ports. A small photo shows Shizuka Hayashi.

Note: This is the first article seen by Shizuka Hayashi in Soybean Digest. Address: Managing Director, JASI, Tokyo.

4257. Kida, Setsuko; Hashida, Wataru; Teramoto, Shiro. 1956. Nattô oyobi nattô-kin ni kansuru gakuteki kenkyu. I. [Nutritional studies on natto and *Bacillus natto.* I. On the nutritional requirements of natto-bacillus]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 34(11):542-46. Nov. [16 ref. Jap; eng]
• ***Summary:*** Six strains of natto bacillus used in this study were isolated from several samples of natto in the market. These strains very much resembled the typical natto bacteria (*Bacillus natto* Sawamura etc.) and were also related to *Bacillus subtilis* NRRL 558 and to *Bacillus mesentericus.* According to the classification in *Bergey's Manual of Determinative Bacteriology* (6th ed.) the strains studied here may be included in the group *Bacillus subtilis.*

The nutritional requirements of the natto bacillus and *Bacillus subtilis* were compared when growing on a synthetic medium. The strains isolated from natto differed from *B. subtilis* NRRL 558 in that they required biotin in the vitamin-omission test and could not utilize certain amino acids (DL-serine, DL threonine, DL methionine) as a sole nitrogen source.

Note: This is the 3rd earliest (but the clearest) document seen (Jan. 2012) which states that *Bacillus natto* is different from *Bacillus subtilis* in that the former requires the vitamin biotin for growth, whereas the latter does not. Address: Dep. of Fermentation Technology, Faculty of Engineering, Osaka Univ., Japan.

4258. *Chicago Daily Tribune.* 1956. Musical sounds abound when you're in Japan. Dec. 9. p. F18.
• ***Summary:*** In the early morning "the natto seller peddles his fermented beans with a musical call of 'Natto, Natto.'"

Another food vendor "sells tofu (soybean curd). He does his advertising with a horn and his call of 'tofu!'"

4259. Hayashi, Shizuka. 1956. China to grow more soybeans. *Soybean Digest.* Dec. p. 19-20.
• ***Summary:*** The quality of U.S. soybeans arriving in Japan has improved over the past year. This is due to the new U.S. standards (which went into effect on 1 Sept. 1955), the work of the Japanese-American Soybean Inst. in monitoring the quality of soybean shipments, and the work of Mitsuo Hirano, president of the Oil and Fat Manufacturers Association, who visited the U.S. several years ago [in 1952] and strenuously negotiated with the government and trade groups to try to improve the quality of U.S. soybeans shipped to Japan.

Production of soybeans in Communist China in recent years is as follows (in tons): 1949–5,086,000. 1952–9,519,000. 1953–9,931,000. 1954–9,080,000. 1955–9,121,000. 1956–9,550,000 (estimate).

This year China will be a soybean exporter, with more than 50% of total exports going to Soviet Russia and the Eastern satellite countries. The next largest export buyer is Japan, for which approximately 200,000 tons will be available. Address: Japanese-American Soybean Inst., Tokyo.

4260. Iguchi, Nobuyoshi. 1956. Kôji-kin ni yoru shomondai. Jinkô heni ni yoru shôyu-yô kôji-kin no kairyô

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[Various problems concerning koji spores. Improvement in *Aspergillus sojae* used in making shoyu by induced mutation]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 34(12):553-59. [26 ref. Jap]
• ***Summary:*** Mutagens used to induce mutation in koji spores were ultraviolet radiation, x-rays, and N-mustard. The longer the dosing time, the lower the survival rate. Address: Noda Sangyô Kagaku Kenkyûsho.

4261. Kuninaka, Akira. 1956. Shôyu-chû no purin, pirimijin enki ni tsuite [Purine and pyridimine bases in soy (sauce)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 30(12):787-91. Dec. [19 ref. Jap]
Address: Microbiologiocal Lab., Yamasa Shoyu Co. Ltd., Choshi, Japan.

4262. Sugita, Noboru. 1956. Shôyu kôji no kantei to shôyu no hinshitsu ni tsuite [Evaluation of soy sauce koji and its relation to the quality of soy sauce]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 34(12):607-12. Dec. [Jap]
Address: Tatsuno Shoyu Kyodo Kumiai Shikensho, Japan.

4263. *Fair Trade.* 1956. [In re Noda Shoyu Kabushiki Kaisha, 7 FTC 108]. 1:18-27. [Jap]*
• ***Summary:*** The Federal Trade Commission decision on Noda Shoyu was handed down on 27 Dec. 1955.

4264. Furutani, Y. 1956. Kyûshû chihô no daizu saku to sono kaizen [Soybean cultivation and its improvement in the Kyushu area]. *Nogyo Gijutsu* (*Agricultural Technology*) 11:352-56. [Jap]

4265. Kohono, C. 1956. [Studies on the protein digestion of natto (I)]. *Mukogawa Gakuin Joshi Daigaku Kiyo. Seikatsu Kagaku-hen* (*Scientific Reports of Mukogawa Women's Univ.–Domestic Science Series*) 4:131-36. [Jap]*
• ***Summary:*** 2008 Aug. 12. WRS e-mailed www.nodai.ac.jp/english/... = Tokyo University of Agriculture.

The one I've been to is University Library for Agricultural and Life Sciences at 1-1-1 Yayoi, Bunkyo-ku, Tokyo 113-8657.

4266. Lu, Y.C.; Tsai, K.H.A. 1956. [A report of the experiments on the different times of planting of the prospective soybean varieties]. *J. of Agriculture and Forestry, Taiwan* (*Nung Lin Hsueh Pao*) 5:16-38. [10 ref. Chi; eng]*
• ***Summary:*** Sixty soybean varieties of Chinese, Japanese, and U.S. origin were planted on 10 different dates in 1954-55. The yields of most varieties were directly proportional to the length of the growing periods. Most of the varieties fell into distinct groups related to the planting date. Address: Formosa, (Taiwan).

4267. Lu, Y.C. 1956. [Inter-cropping of soybean by the "muddy-in" method with second crop of paddy rice]. *J. of Agriculture and Forestry, Taiwan* (*Nung Lin Hsueh Pao*) 5:39-55. [9 ref. Chi; eng]*
• ***Summary:*** Six varieties of soybeans from Taiwan, Japan, and the USA were planted. Those planted in hills gave a higher average plant-yield, whereas those drilled gave a higher yield per unit area. The varieties Wu-tou and Avoyelles gave high yields but their beans are small and have dark seed coats, which makes them unsuited for processing. The variety Shih-shih gave a good yield, had large beans with a yellow seed-coat, and seemed very promising for cultivation in Taiwan. Ao-biku, Taiwan-ching pe tou, and Fukien-ta-tou [Fujian dadou] are also yellow coated but have small beans and a thick seed coat. Address: Formosa, (Taiwan).

4268. Miyake, S.; Watanabe, K.; Yoshikawa, M.; Nonoguchi, Y. 1956. [The studies on *Bacillus natto* protease. IV. The effect of urea on the enzyme activities of *Bacillus natto* protease]. *Seikagaku* (*Biochemistry*) 28:527-29. [Jap]*

4269. Nagai, I. 1956. Production of rice and oil bearing crops: Report to the government of Yugoslavia. *FAO Expanded Technical Assistance Program, Report* No. 464. 20 p. 5 tables. [Eng]*
Address: Japan.

4270. Toya, N. 1956. [Chemical studies on the process of natto manufacturing]. *Kumamoto Joshi Daigaku Gakujutsu Kiyo* (*J. of Kumamoto Women's University*) 8:114-23. [Jap]*

4271. Umeda, I.; Saito, N. 1956. [On the standard color of soy sauce]. *Chomi Kagaku* (*Seasoning Science*) 4(2):1-20. [Jap]*

4272. Yoshii, H. 1956. [Symposia on miso manufacture]. All Japan Miso Industrial Assoc. 14-9. [Jap]*

4273. Chen, Philip S.; Chen, Helen D. 1956. The work of Dr. Harry Miller with soy milk (Document part). In: P.S. Chen and H.D. Chen. 1956. Soybeans for Health, Longevity, and Economy. South Lancaster, Massachusetts: The Chemical Elements. 241 p. See p. 14-15. [24 ref]
• ***Summary:*** Chapter 1, "Protein," begins: "The soybean is best known for its high protein content (p. 7). It then discusses the work of Dr. Harry Miller (p. 14-15): "The one who has done more with soy milk than any one else is Dr. Harry W. Miller, Director of Research, International Nutrition Research Foundation. He began his work with soy milk shortly after 1925 when he was in China as a medical missionary and saw the need of making a preparation for the feeding of babies and children. Referring to his work with soy milk, he said,'I regarded that work as of far greater

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importance than the building up of the sanitarium because it had to do with the preservation of thousands of lives that otherwise would be lost if they did not have a proper substitute for mother's breast milk, because cow's milk is beyond the economic level of the Chinese people and almost all the Oriental races. We used this milk extensively and a long period of experimental work was carried on. Studies were made of the development of babies and children as to their weight gains, their height gains, their disposition, their skin texture, their hair development, their dentition and bone development. We finally published the article in the Chinese Medical Journal in 1937.'

"Dr. Miller was the first to put out a true soy milk, one that is homogenized and built to any formula. Finally he made it into a powdered milk by spray drying. Both 'Soyagen' and 'Soyalac,' which he perfected according to his patented process, are now widely used by infants and children who are allergic to cow's milk, as well as by grown-ups who prefer a vegetarian diet.

"Besides his factory in this country, Dr. Miller has established soy milk plants in Japan and Formosa [Taiwan], and has helped the United Nations build a plant in Indonesia. His formula is used by three large soy milk companies in Hong Kong, one of which puts out 75,000 bottles a day." Address: 1. Prof. of Chemistry, Atlantic Union College, South Lancaster, Massachusetts; 2. National Science Foundation Fellow, Cornell Univ.

4274. Hori, Shinichi. 1956. Kagaku-shôyu (Gosei shôyu) [HVP soy sauce: Its development and significance]. In: N. Tomoda and K. Sakaguchi, eds. 1956. Fermented Foods. Tokyo: Kyoritsu Shuppan. 370 p. See p. 225-50. [Jap; eng+]

4275. Hui Manaolana. 1956. Japanese foods: (Tested recipes). Honolulu, Oahu, Hawaii: Hui Manaolana. 118 p. Illust. (some colored). Index. 24 cm.
• ***Summary:*** This 1956 edition is quite similar to the original 1951 edition: The text, recipes, and glossary are exactly the same and on the same pages. The ads on the following pages are the same: 23 (American-Hawaiian Soy Company), 39 (Fuji Masamune and Kinpyo Masamune), 40 (Kikkoman, but a different ad for Kikkoman Soy Sauce), 44 (Honolulu Sake Brewery & Ice Co., Ltd., same ad for Diamond Shoyu), 62 (Kanai Nissei Shokwai). The differences are few and superficial: (1) The title page and copyright page both mention "International Institute Y.W.C.A." The Hui Manaolana was formerly named Niji-no-Kai and was formerly affiliated with the International Institute of the Y.W.C.A. (2) The color photos are different and of better quality reproduction. (3) Many of the ads are different (e.g., p. 6, 8, 10, 16, etc.); the 1956 edition has more soy-related ads. (4) The back matter (from p. 98 to the end) is quite different. The 1956 edition has fewer ads after p. 98. In the 1956 edition, the ads end on p. 100 and the index starts on p. 101. But in the 1951 edition, the ads end on p. 110 and the index starts on p. 113. Address: Honolulu, Hawaii.

4276. Kimura, Shigeru. 1956. [Studies on Japanese foods. XXIV. The amino acid compositions of cereal and soybean proteins by column chromatographic analysis]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 9(2):75-80. [45 ref. Jap]

4277. Matsushita, Ayako; Yamada, Akira. 1956. Miso no jukusei ni ni tomonau yûri amino-san no henka ni kansuru kenkyû. II. Bitamin B-2 oyobi karushiumu tenka no eikyô ni tsuite [Studies on the free amino acids in the "miso" and the variation of their contents in the ripening periods. II. On the effects of vitamin B-2 and calcium]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 9(3):123-30. [11 ref. Jap]

4278. Miyake, Suguru; Watanabe, Ken; Yoshikawa, Mitsuyoshi; Nonoguchi, Yoshitaka. 1956. Nattô-kin tanpakushitsu benkai kôso ni kansuru kenkyû. V. Kesshô protease no kôsei aminosan ni tsuite [The studies on *Bacillus natto* protease. V. The constituting amino acids of the crystalline protease of *Bacillus natto* Sawamura]. *Hyogo Noka Daigaku Kenkyu Hokoku, Nogaku-hen* (*Science Reports of the Hyogo University of Agriculture*) 2(2):116-17. (Chem. Abst. 51:10609). [3 ref. Jap; eng]
Address: Biochemical Lab.

4279. Nagata, Tadao. 1956. Daizu-hen [Soybean agronomy]. Tokyo: K.K. Yokendo. Or Tokyo: Sôgô Nôgaku Taikei. 311 p. [863 ref. Jap]
Address: Hyogo Agricultural College, Japan.

4280. Ohsawa, G. 1956. Guide pratique de la médecine macrobiotique d'Extrême-Orient: Pour ceux qui ont bien étudié la philosophie dialectique pratique [Practical guide to the macrobiotic medicine of the Far East: For those who have studied well the philosophy of practical dialectics]. Centre Ignoramus, 26 rue Lamartine, Paris 9 eme, France. 82 leaves. 28 cm. [Fre]
• ***Summary:*** After Ohsawa arrived in France (Feb. 1956) he published this work in a stenciled edition. It was only sold or given as a present to students who had obtained "the fifth level (dan) of practicing the U.P. (Universal Principle)." On page 17, under the heading "Macrobiotic Pharmaceutical Preparations," we find No. 9: Miso and fried miso. And on page 80 is a 1-page explanation about miso. This book was translated into English and first published in August 1973 as a part of "Practical Guide to Far Eastern Macrobiotic Medicine."

Note: This is the earliest document seen (March 2011) in which George Ohsawa mentions miso–or any other soyfood product. Address: Paris.

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4281. Sato, Chieko. 1956. Japanese cooking of all kinds. Tokyo: Japanese Cooking Research. [8] + 191 + 224 + 4 + [4] p. of color plates Illust. (some color). 19 cm. [Eng; Jap]*

4282. Schwitzer, M.K. 1956. Margarine and cooking fats: Their history and world trade. I (Document part). In: M.K. Schwitzer. 1956. Margarine and Other Food Fats: Their History, Production and Use. New York, NY: Interscience Publishers, Inc. 385 p. See p. 59-78. Chap. 2. [52 ref]
• ***Summary:*** Contents: The invention of margarine in France. Other countries follow. The coining of a new word. The history of cooking fat [shortening]. Impact of fat hydrogenation. Recent expansion in margarine consumption. Consumption levels of margarine (per capita). Present world trade in margarine. The production of cooking fats (shortenings).

Margarine was invented in France in 1869 by the French chemist-turned-business man, Hippolyte Mège-Mouriés. Production started at Poissy in about 1872-73. In other European countries, margarine production started as follows: Netherlands in 1871, by the Jurgens and Van den Berghs in the little village of Oss; Denmark 1870-71, by Otto Monsted, Denmark soon had the highest per capita margarine consumption; Austria-Hungary 1873-74, in Liesing near Vienna; Germany 1875; United Kingdom 1889–Otto Monsted established England's first margarine plant in an old hat factory in Godley, Manchester. Demand was so great that he had to erect a new factory in Southall near London. Production began in March 1895 at the rate of more than 1,500 tons/week. The word 'margarine' was first used by Mège's teacher, Michel Eugène Chevreul, around 1813. At a meeting of the French Academy on 13 July 1813 Chevreul reported on a fat-like substance that he had prepared and which he named margarine or margaric acid

Page 59 states: "When Napoleon III had offered a prize in 1869 for a butter substitute that would be cheaper and would keep better than cows' butter, Mège was an easy winner, as by then he had produced a satisfactory product. A factory was installed in Poissy, but manufacture did not get under way until after the Franco-Prussian war of 1870-71 [in which France under Napoleon III was defeated by Prussia under Bismark]. The way was not clear, however, until Félix Boudet, a distinguished chemist retained by the French health authorities for the purpose, had reported favourably on the new product. On 12th April, 1872, a regulation was passed permitting the sale of margarine, but it was not to be called butter. Mège promptly formed the 'Société Anonyme d'Alimentation' with a capital of 800,000 francs. Large scale production started in 1873."

The Mège patent in the USA, issued in May 1874, was purchased by the United States Dairy Co., which hired Henry A. Mott to improve on Mège's method. A number of U.S. margarine patents were issued in the following years. Many of these suggested the use of lard or vegetable fats instead of oleo oil. One of the improved methods was used by the Commercial Manufacturing Co. in New York, which soon became America's largest margarine manufacturer.

Margarine was introduced to the USA after the Civil War, when the country was undergoing profound economic changes. Farmers strongly resisted the introduction of margarine, believing that it would compete with the butter made on their farms.

The word "margarine" was coined by Mège's teacher, Michel Eugène Chevreul, in about 1813. At a meeting of the French academy on 13 July 1813 Chevreul reported on a fat-like substance that he had prepared and which he named margarine or margaric acid. The name was derived from the Greek word for pearl (*margarites*) He gave its chemical formula as $C_{17}H_{34}O_2$. What Chevreul thought to be a new substance was, in fact, a mixture of palmitic and stearic acids.

Since Mège's crystalline substance had a pearly luster, he gave the soft portion of the tallow, expressed after digestion, the name oleo-margarine, since he believed it to be a mixture of oleine and margarine.

As in the Greek root the *g* is pronounced hard like the *g* in garlic; it is incorrect to pronounce margarine as marjarine, as if the g were replaced by j.

In England, margarine (imported from Holland) was first sold under the name of Butterine. This name was dropped in 1887 after Parliament passed the first Margarine Act (p. 63).

The histories of margarine and cooking fat [shortening] are closely connected. "Whereas all the important developments in the early history of margarine took place in Europe, the first significant pages in the history of cooking fat were written in America. It is ironical that one of the largest lard-consuming and exporting countries [USA] should have been the first to turn to an alternative. There is here a parallel with Denmark, which as the biggest exporter of butter had the highest *par caput* consumption of margarine. The new lard substitute was called 'compound' lard or 'shortening' in the United States; both were misnomers. There was often very little or no lard present, nor was the new product used only for baking purposes where 'shortness' was required. Compound fat or cooking fat are more correct designations" (p. 63).

"The introduction of hydrogenation into fat technology can be regarded as the re-birth of the margarine and cooking fat industries... No more was it necessary to rely on animal fats which were available only as by-products of the meat-packing and dairy industries." In 1902 Normann announced that he had hardened a liquid fat by hydrogenating it with a catalyst. Early commercial success was expected. Patents were applied for in Germany by a plant engineering firm (Leprince and Sivke; German Patent No. 141,029, of 1902) and by Normann himself in the United Kingdom (No. 1,515, or 1903). Normann's work was based on earlier experiments

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by Varentrapp (1840), Sabatier, Senderens, and others. The first large-scale hydrogenation plant began operations in 1906 in England, at Crosfield's factory in Warrington. In Germany the Oelwerke Germania, at Emmerich on the Rhine, started a plant for hydrogenating whale and linseed oils. Several years later, Procter & Gamble Co., Cincinnati, Ohio, began commercial hydrogenation in the USA.

Canada: Recent developments with margarine in Canada have followed those in the USA. In 1948 the Supreme Court rules that the provisions of 1935 Dairy Industry Act relating to margarine were invalid; in 1949 margarine was first produced in Canada. By 1952 margarine production had reached 47,000 tons, making Canada the second largest margarine producer in the British Commonwealth, after Great Britain. Address: Highgate, UK.

4283. Schwitzer, M.K. 1956. Margarine and cooking fats: Their history and world trade. II (Document part). In: M.K. Schwitzer. 1956. Margarine and Other Food Fats: Their History, Production and Use. New York, NY: Interscience Publishers, Inc. 385 p. See p. 59-78. Chap. 2. [52 ref]
• ***Summary:*** Tables: Table 8 (p. 67) shows margarine production in major countries worldwide in 1938, and 1946 to 1953. The countries are: United Kingdom, Australia, Canada, South Africa, British Caribbean, Austria, Belgium, Denmark, Finland, France, Germany, Israel, Japan, Netherlands, Norway, Poland, Soviet Union, Sweden United States. Production in these countries totaled 1,350,000 tons in 1938, dropping to 949,000 tons in 1946, then rising steadily to 2,618,000 tons in 1953. In 1938 Germany was by far the leading producer (439,000 tons), followed by United Kingdom (208,000), and USA (172,000). In 1953 the three largest producers were USA (577,000 tons), Germany (573,000), and United Kingdom (406,000). Holland was the world's largest margarine exporter.

Page 69: Graph of per capita consumption of margarine and butter in the UK and USA, 1938-1953. During this time, butter consumption decreased and margarine consumption increased in both countries. In the UK, per capita consumption of both margarine and butter are higher than in the USA, and margarine consumption passed that of butter in the mid-1940s.

Page 70: Estimated per caput consumption margarine in major countries worldwide in 1938, and 1946 to 1953. The countries are: United Kingdom, Australia, New Zealand, Canada, Norway, Netherlands, Sweden, USA, Finland, Denmark, Western Germany, and Belgium. Clearly Europeans, and especially those in Scandinavian or northern European countries, are the leading margarine consumers. In 1938 the leading countries were Denmark (47.4 lb/capita), Norway (141.2), and Sweden (10.5); USA was 2.9. In 1953 the leaders were Norway (51.1), Netherlands (40.8), and Denmark (40.1); USA was 7.9.

Page 71. Fats used in the production of margarine in the United Kingdom (1937-1953; soy oil started in 1951 and is insignificant). In 1938 UK margarines were made from 53% vegetable oils (groundnut was the leader, followed by coconut), 41% marine oils, and 6% animal fats. In 1953 UK margarines were made from 91% vegetable oils (groundnut was still the leader, followed by coconut), 8.8% marine oils, and 0.2% animal fats.

Page 72: Fats used in the production of margarine in the USA (1938-1953; soybean oil passed cottonseed oil in 1951). In 1938 U.S. margarines were made from 93.6% vegetable oils (cottonseed was the leader, followed by coconut then soybean oil), and 6.3% animal fats. In 1953 U.S. margarines were made from 98.9% vegetable oils (soybean oil was now the leader, followed by cottonseed), and 1.1% animal fats.

Page 73: Fats used in the production of margarine in certain countries (1937-1952) In 1951-53 soybean oil comprised the following percentage of all oils used to make margarine is these countries: Australia 0%, Canada 50%, Denmark 5%, Netherlands 5%, Norway 3%, Sweden 0%.

Page 75: Production of cooking fat (shortening), 1938, and 1946-53, in the UK, Canada, Germany, and USA. World production of "lard substitutes" is considerably smaller than that of margarine, and the USA and the UK are the only major manufacturers. Total production in these countries grew from 868,000 tons in 1938 to 1,075,000 tons in 1953. In 1953 the leading producers were USA (748,000 tons), United Kingdom (209,000 tons), and Canada (61,000 tons). In Germany shortening is called *Plattenfett* and *Kunstspeisefett.*

Page 76. Fats used in the production of cooking fat in the UK (1937-1953; soy is not mentioned).

Page 76: Fats used in the production of cooking fat in the United Kingdom (1937-1953; soybean oil is not mentioned).

Page 77: Fats used in the production of cooking fat in the USA (1938 and 1946-1953; soybean oil had passed cottonseed oil by 1946). In 1938 U.S. shortenings were made from 91.7% vegetable oils (cottonseed was by far the leader, followed by soybean then palm oil), 8.2% animal fats, and 0.1% marine oils. In 1953 U.S. shortenings were made from 18.6% vegetable oils (soybean oil was now by far the leader, followed by cottonseed), and 16.2% animal fats (mostly lard). Address: Highgate, UK.

4284. Tomoda, Yoshinori; Sakaguchi, Kinichiro. eds. 1956. Hakkô shokuhin [Fermented foods]. Tokyo: Kyoritsu Shuppan K.K. 359 p. Series: Bisei-butsu kôgaku koza (Microbial technology course), no. 8). [Jap]
• ***Summary:*** Contains long sections on miso (p. 1-92), shoyu (p. 93-248), HVP shoyu (p. 225-50), pickles (p. 251-74), vinegar (p. 275-304), Japanese-type "sauce" and Worcester sauce (p. 307-329), and fermented dairy milk products (p. 331-59; incl. acidophilus milk, kefir, and koumis).

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4285. Fukuba, Hiroyasu. 1957. [Higher fatty acids dehydrogenase in plant seeds. II. Higher fatty acids dehydrogenase in germinating soy beans]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(1):67-69. Jan. [2 ref. Jap]
Address: Lab. of Nutrition Chemistry, Ochanomizu Univ.

4286. Hori, Shinichi; Kato, Jiro; Wakamatsu, H.; Hayashi, K. 1957. Tanpakushitsu no kasui bunkai ni yoru chômiryô no seizô. III. Dasshi daizu ensan kasui bunkaieki-chû no yûki-san [Preparation of seasonings by the hydrolysis of protein. III. Organic acids in the hydrochloric acid hydrolysate of soybean meal]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(1):22-25. Jan. [6 ref. Jap]
Address: Research Laboratory of Ajinomoto Co., Inc.

4287. Hori, Shinichi; Kato, Jiro; Hino, Tetsuo; Mizokuchi, Naomasa. 1957. [Preparation of seasonings by the hydrolysis of proteins. I. On the hydrolysis of soybean meal with hydrochloric acid (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(1):17-19. Jan. [5 ref. Jap]
Address: Research Lab., Ajinomoto Co., Inc.

4288. Hori, Shinichi; Kato, Jiro; Hino, Tetsuo; Mizokuchi, Naomasa. 1957. [Preparation of seasonings by the hydrolysis of proteins. II. On the hydrolysis of soybean meal with hydrochloric acid (2)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(1):19-22. Jan. [25 ref. Jap]
Address: Research Lab. of Ajinomoto Co., Inc.

4289. Hori, Shinichi; Kato, Jiro; Wakamatsu, Hachiro; Hayashi, K. 1957. [Preparation of seasonings by the hydrolysis of proteins. III. Organic acids in the hydrochloric acid hydrolysate of soybean meal]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(1):22-25. Jan. [6 ref. Jap]
Address: Research Lab. of Ajinomoto Co., Inc.

4290. Hayashi, Shizuka. 1957. Soybean "schools" in larger cities. *Soybean Digest.* Feb. p. 25.
• ***Summary:*** "The Japanese-American Soybean Inst. is the operating agency for the market development project in Japan that is being conducted by the American Soybean Association and utilizing P.L. 480 funds."

The Institute has arranged for the production of a movie film about 18,000 to 20,000 feet in length showing the production and consumption of soybeans, with emphasis on the fact that they are the least expensive source of nutrition. Note: This film, titled "The Green Bud," was released by Dec. 1957.

Arrangements have been made with the Food Life Improvement Association (a government agency under the Ministry of Agriculture) and the Japan Nutrition Organization (a government agency under the Ministry of Welfare) for the opening of classes in various cities throughout Japan. More than 800 public health centers are engaged in activities first to educate prefectural leaders as to the value of soybeans and how to use more effectively the various soybean products in daily life, and then gradually to expand such activities throughout the whole population.

Researchers at Kyoto University will investigate why U.S. soybeans are not suitable for making natto and kinako. A study will also be made to find a method to preserve natto in a dried condition.

"Japan purchased approximately 300,000 metric tons of new crop [soy] beans during October-December 1956 and the first half of January 1957. This included 34,040 metric tons from China. The total budget for October 1956 to March 1957 calls for a total of 435,000 tons including 10,000 tons from Brazil." A photo shows Mr. Shizuka Hayashi. Address: Managing Director, Japanese-American Soybean Inst., Tokyo.

4291. Kohzu, Tokuichiro. 1957. Daizu kasu no ensan kasui bunkai ni yoru gurutamin-san seizô no kiso-teki kenkyû. I. Gurutamin-san no shûryô tsuite [Fundamental studies on manufacturing glutamic acid from soybean meal by the hydrolysis with hydrochloric acid. I. On the yield of glutamic acid]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(2):80-87. Feb. [1 ref. Jap]
Address: Nagano Junior College, Japan.

4292. Onaga, D.M.; Luh, B.S.; Leonard, S.J. 1957. Quality evaluation and chemical composition of soy sauce. *Food Research* 22(1):83-88. Feb. [18 ref. Eng]
• ***Summary:*** The quality of soy sauce varies greatly with the raw materials used and with the method of manufacture–by fermentation or by acid-hydrolysis. In the fermentation process, cooked soya beans and roasted wheat flour are fermented by the mold *Aspergillus oryzae* and then by yeasts; this is followed by a long digestion in brine.

Soy sauce samples obtained from markets in California showed significant differences in flavor and aroma. The importance of various chemical constituents to flavor is discussed. Address: Dep. of Food Technology, Univ. of California, Davis. 1. Moved to Herschel California Fruit Prods., Woodland, CA.

4293. *Soybean Digest.* 1957. [Soybean] Council leaders to Japan, Europe. Feb. p. 5.
• ***Summary:*** George M. Strayer, the Council's executive director, left Hudson, Iowa, for Japan on Feb. 1 to "review the progress of the soybean market project that has been carried on by the Japanese-American Soybean Institute... over the past year. And he will negotiate with Japanese trade

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groups and governmental agencies for continuation of the project for another 2 years."

"Howard L. Roach, Council president, will probably leave for Spain and Italy in February to set up central agencies for soybean market development projects in those countries. Roach will complete negotiations with three Spanish oilseed trade groups for their cooperation in the project." He will work with similar groups in Italy. The three purposes of the Spanish market development project are given. "The Soybean Council will supply a trained oil technician to work with Spanish and Italian government officials, trade people and consumer groups in solving problems connected with the use of U.S. soybean oil in Italian and Spanish foods."

4294. Takahashi, Teizo. 1957. [Glutamic acid hydrochloride by fermentation]. *Japanese Patent* 1088. Feb. 15. (Chem. Abst. 52:7614e). [Jap]*
• ***Summary:*** In the preparation of glutamic acid hydrochloride, raw seed proteins are hydrolyzed with a proteolytic enzyme, then treated with hydrochloric acid. An aqueous suspension of soybeans or defatted soybeans is cultured with a microorganism such as *Bacillus pumilus* until the proteins become water soluble. The solution is hydrolyzed with 10% hydrochloric acid, then filtered, etc.

4295. Sokolsky, George. 1957. These days: The China trade. *Washington Post, Times Herald.* March 20. p. A19.
• ***Summary:*** "There use to be a commercial attache in China, Julean Arnold, who tried hard to push American products. He tried to get the Chinese to like raisins."

Today the Chinese market has grown to 600 million people, who have a low standard of living. The Japanese, British and Germans would like to do more business with China. "The Japanese, particularly, are bound to find a way to barter manufactured goods for foodstuffs, especially the soybean, which is a staple of the Japanese cuisine and which grows plentifully in Manchuria and areas of North China."

4296. Fukuba, Hiroyasu; Mitsuzawa, Tokuko. 1957. [Higher fatty acid dehydrogenase in plant seeds. VI. On lecithin dehydrogenase]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(3):151-53. March. [6 ref. Jap]
Address: Lab. of Nutrition Chemistry, Ochanomizu Univ., Tokyo, Japan.

4297. Hayashi, Shizuka. 1957. Manufacture of natto is described. *Soybean Digest.* March. p. 30-31.
• ***Summary:*** Contents: Introduction. Screening selection (cleaning by removing foreign substances). Washing. Water soaking. Steam cooking. Implanting natto bacillus (*Bacillus natto*). Packing (into *kyogi*–thin, slice-cut veneers of wood; 0.331 lb of inoculated beans becomes 0.273 lb of natto). Placing in curing room (9 feet wide, 7 feet tall, and 9 feet from front to back. Heated by charcoal and kept at 42-43ºC). Removal from curing room. Value of natto. A flow diagram shows the main steps in the process. The chemical composition of natto is given. "It is reported that natto bacillus suppresses the multiplication of various disease-causing bacteria within the digestive organs." Natto keeps (without refrigeration) for 2-3 days in summer, 7-10 days in winter. Address: Managing Director, Japanese-American Soybean Inst., Tokyo, Japan.

4298. *Lettre Ignoramus* (*Paris*). 1957. "Miso" fabrication française [French miso making]. No. 1. p. 6. March. [Fre]
• ***Summary:*** *Lettre Ignoramus* was George Ohsawa's first French macrobiotic magazine. Note: This is the earliest periodical article seen related to macrobiotics and soyfoods. Address: Paris.

4299. Nakashima, Kyozo; Tamura, Tsuruo. 1957. Kôri-dôfu seizô kôtei ni kansuru kenkyû. IV. Tônyû no gyôseki ni tsuite [Studies on the production of dried-frozen tofu. IV. Coagulation of the soybean milk]. *Osaka Furitsu Kogyo Shoreikan Hokoku* (*Reports of the Industrial Research Institute, Osaka Prefecture*) 17:78-84. March. [3 ref. Jap; eng]
• ***Summary:*** The effect of temperature, time, and stirring speed on the coagulation of soymilk were studied, and the quantity of calcium chloride required to coagulate the milk was determined. Each of these variables is critical. If the temperature is too high when the coagulant is added, there is danger of having a "crust" due to the rapid coagulation. If too little coagulant is added, some of the soymilk will remain uncoagulated and the whey will be milky in appearance. When just the right amount of coagulant is added, the whey or supernatant will become transparent–but this correct amount may differ from one soybean variety to the next. The required amount of calcium chloride can be determined from the specific gravity of the soymilk. The rate at which the coagulant is added and the rate of stirring while it is added affect the final quality and yield of the tofu–as well as the size of the curds. Thus, for a given soybean variety, both the rate of adding and the speed of stirring should, ideally, be mechanized.

Note: Accompanying this article is a 12-page, double-spaced, typed English-language translation by Henry Sasame. Address: Osaka, Japan.

4300. Nakashima, Kyozo; Tamura, Tsuruo. 1957. Kôri-dôfu no seihô [The process for making dried-frozen tofu]. Osaka, Japan: Osaka Furitsu Kogyo Shoreikan (Industrial Research Institute, Osaka Prefecture). 58 p. March. Illust. 25 cm. [Jap]
• ***Summary:*** This report is based on four articles on the same subject by the same authors published from 1953 to 1957 in the *Osaka Furitsu Kogyo Shoreikan Hokoku* (*Reports of the*

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Industrial Research Institute, Osaka Prefecture). Contents: Introduction: What is dried-frozen tofu?, composition of soybeans, composition of soymilk. 1. Soaking and grinding: The process of soaking, the process of grinding, the process of extraction. 2. Curding: Optic curve of curding, elements that determine curding, required amount of coagulant, concentration of coagulant. 3. Freezing: Curve of freezing and time required, speed of freezing and the resulting composition of the tofu. 4. Effect of storage temperature. 5. Drying. 6. Process for softening. 7. Color of frozen tofu: Determination of color and factors affecting it, color of frozen tofu, nature of color, abnormal coloring of frozen tofu. 8. Tofu and microorganisms: Types of microorganisms. Closing remarks. Address: Osaka, Japan.

4301. Kawakami, Y. Assignor to Kawakami Research Institute. 1957. [Liquid soap]. *Japanese Patent* 2379. April 18. (Chem. Abst. 52:4218b). [Jap]*
• ***Summary:*** Soybean oil fatty acids are used to make a transparent soap product.

4302. Shurtleff, William. 1957. Journal of trip the Hawaiian Islands. 2 vols. Lafayette, California. Unpublished manuscript.
• ***Summary:*** April 22. Fly to Maui (Hana) where we enjoy a delicious shish kebab dinner (thin slices of marinated and grilled, skewered beef) outdoors. I learn a teriyaki sauce recipe (the first recipe I've ever learned for anything) from the chef: 1 cup soy sauce, 4 tablespoons oil, 1½ tablespoons sugar, 1 tablespoon vinegar, 1 pinch each ginger and garlic.

Note 1. For many years afterward, Shurtleff prepared this recipe for teriyaki sauce and used it at barbecues for family and friends.

Note 2. This is the earliest document seen (Nov. 2010) that mentions William Shurtleff in connection with any soy product. Address: Lafayette, California 94549.

4303. Umeda, Isao. 1957. Saikin ni okeru shôyu seizô gijutsu-jô no shomondai [Some problems on the recent brewing technology of soy-sauce]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(4):A48-A52. April. [29 ref. Jap]
• ***Summary:*** Contents: 1. On the processing of protein raw materials. 2. Various problems related to making koji. 3. On the glutamic acid in shoyu. Address: Noda Shoyu Co. Ltd.

4304. Nelson, Nancy S. 1957. Tokyo timepiece. *Christian Science Monitor.* May 22. p. 18.
• ***Summary:*** Tokyo–The writer has discovered a delightful way to tell time in Japan, by the sounds and sights of her street. "From one street to the next, as the tofu peddlers pass, the 'shush' sound of the amado (wooden shutters) follow, as they are slid back into the walls to let in the warm light of the [morning] sun." There "is an occasional screech of brakes when a housewife stops a tofu peddler to buy for breakfast.

"When echoes of the [small brass] tofu horns have faded, other merchants, as if this is their cue, make their appearances." There are the sellers of bamboo, goldfish, soba, and fish, the trash / rag man, and the kamishibai (children's theater).

"And with evening the tofu sellers return. Their plaintive horns seem to sound dusk across the city sky. Amado are dragged back across windows, electric lights go on, and a Tokyo day disappears.

"I feel that instead of selling bean curd, the tofu peddlers are really town criers heralding the night with their call meaning 'all's well.'"

4305. Fukumoto, J.; Yamamoto, T.; Ichikawa, K. 1957. [Studies on bacterial proteinase. VII. Some enzymatic properties of proteinase secreted by several strains of *Bacillus subtilis*]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(5):331-338. May. [24 ref. Jap]
Address: Inst. of Polytechnics, Osaka City Univ.

4306. Hayashi, Shizuka. 1957. Soybean market project now in second year. *Soybean Digest.* May. p. 36.
• ***Summary:*** "Continuation of the work of the Japanese-American Soybean Inst. (JASI) for another two years has been formally approved" by USDA's Foreign Agricultural Service.

During the first year, which ended on March 31, the institute concentrated mostly on research. The most important achievement is the improvement in the average quality of the soybeans arriving in Japan, especially in the decreasing percentage of foreign material, which now averages well below 2%. Great efforts must be made to continually reduce this percentage, and a long time will be required to eradicate the deeply rooted impression that U.S. soybeans contain excessive foreign material.

The plans for work in Japan during the next year are described. As of April 15, Japanese importers have purchased 90,000 tons of soybeans from China. By April 20 JASI will move into larger quarters in the Nikkatsu International Building (Room No. 410, No. 1, 1-chome, Yurakucho, Chiyoka-ku, Tokyo) in the center of the city. Address: Japanese-American Soybean Inst., Tokyo.

4307. Judd, J.E. 1957. Century-old dietary taboos in 20th century Japan. *J. of the American Dietetic Association* 33(5):489-91. May.
Address: New York City.

4308. Kohzu, Tokuichiro. 1957. Daizu kasu no ensan kasui bunkai ni yoru gurutamin-san seizô no kiso-teki kenkyû. II. Bunkai seisei-butsu ni tsuite (1) [Fundamental studies on manufacturing glutamic acid from soy-bean meal by

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hydrolysis with hydrochloric acid. II. On the products produced by hydrolysis (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(5):323-28. May. [1 ref. Jap]
Address: Nagano Junior College, Japan.

4309. Kohzu, Tokuichiro. 1957. [Fundamental studies on manufacturing glutamic acid from soy-bean meal by the hydrolysis with hydrochloric acid. II. On the products by hydrolysis (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(5):323-328. May. [1 ref. Jap]
Address: Nagano Junior College.

4310. Onishi, Hiroshi. 1957. Studies on osmophilic yeasts. I. Salt-tolerance and sugar-tolerance of osmophilic soy-yeasts. *Bulletin of the Agricultural Chemical Society of Japan* 21(3):137-42. May. [6 ref. Eng]
• ***Summary:*** The first experiment involved the reversibility of salt-tolerance in osmophilic soy yeasts. Three strains of *Zygosaccharomyces major* were cultured successively in NaCl-free and NaCl 18% koji extract media. The growth of osmophilic yeasts in a medium of high sodium chloride concentration involved a process of physiological adaptation.

For growth of the yeast *Zygosaccharomyces major,* the order of the toxicity of salts was as follows: K+ < Na+ < Mg++ < Ca++ < Li+. Address: Noda Inst. for Scientific Research [Noda City, Chiba-ken, Japan].

4311. Onishi, Hiroshi. 1957. Studies on osmophilic yeasts. II. Factors affecting the growth of soy yeasts and others in the environment of a high concentration of sodium chloride (1). *Bulletin of the Agricultural Chemical Society of Japan* 21(3):143-50. May. [14 ref. Eng]
• ***Summary:*** The following named yeasts were grown: *Zygosaccharomyces major, Z. soya, Z. salsus, Z. miso* α*, Saccharomyces miso* α*,* and *Pichia miso.* The following unnamed yeasts were also grown: N 5, N 8, N 24, A 31, A 34.

The pH range for the growth of soy yeasts (such as *Zygosaccharomyces major*) was found to be very wide (pH 3.0–7.0) in a NaCl-free medium, but quite narrow (ph 4-5) in a medium that contained 18% NaCl–as is typical of soy sauce. Address: Noda Inst. for Scientific Research [Noda City, Chiba-ken, Japan].

4312. Onishi, Hiroshi. 1957. Studies on osmophilic yeasts. III. Classification of osmophilic soy and miso yeasts. *Bulletin of the Agricultural Chemical Society of Japan* 21(3):151-56. May. [13 ref. Eng]
• ***Summary:*** Most of the salt-tolerant yeasts isolated from soy sauce and miso belonged to *Saccharomyces rouxii.* Some of them produced luxuriant pellicles (surface films) on culture media containing sodium chloride, but pellicles were not formed on salt-free media. A new variety was isolated from these yeast species: *Saccharomyces rouxii* Boutroux var. halomembranis nov. var. A few strains were identified as *Saccharomyces acidifaciens* (Nickerson) Lodder et Kreger-van Rij. Two new species were also described: *Torulopsis halophilus* nov. sp. and *Torulopsis nodaensis* nov. sp. These two species showed high salt tolerance, especially the former, which was a facultative halophile.

In a 1952 monograph titled *The Yeasts: A Taxonomic Study,* by J. Lodder and N.J.W. Kreger-van Rij, the subgenera *Zygosaccharomyces* is no longer recognized. In this classification almost all of the *Zygosaccharomyces* known as the osmophilic yeasts were included in only two species and one variety, *Saccharomyces rouxii* Boutroux, *Saccharomyces rouxii* Boutroux var. *polymorphus* Lodder and Kreger-van Rij, and *Saccharomyces mellis* (Fabian et Quinet) Lodder and Kreger-van Rij. For example, *Zygosaccharomyces major, Z. soya. Z. salus,* and *Z. japonicus,* known as soy yeasts, were all included in one species, *Saccharomyces rouxii.*
Address: Noda Inst. for Scientific Research [Noda City, Chiba-ken, Japan].

4313. Satomura, Yukio; Okada, Shigetaka; Fukumoto, Juitiro [Juichiro]. 1957. [Studies on bacteriolytic substances produced by microorganisms. I. Lysozyme-like enzyme accumulated in a culture filtrate of a *Bacillus subtilis* sp.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(5):281-284. May. [22 ref. Jap]
Address: Inst. of Polytechnics, Osaka City Univ.

4314. Satomura, Yukio; Okada, Shigetaka; Fukumoto, Juitiro. 1957. [Studies on bacteriolytic substances produced by microorganisms. II. Cultural conditions for accumulation of lysozome-like enzyme produced by a *B. subtilis* sp.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(5):285-288. May. [4 ref. Jap]
Address: Inst. of Polytechnics, Osaka City Univ.

4315. Satomura, Yukio; Okada, Shigetaka; Fukumoto, Juitiro. 1957. [Studies on bacteriolytic substances produced by microorganisms. III. Relation between formation of lysozome-like enzyme and lysogenicity, bacteriocinogenicity and anaerobic-lysis of a *B. subtilis* sp.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(5):289-293. May. [6 ref. Jap]
Address: Inst. of Polytechnics, Osaka City Univ.

4316. *Soybean Digest.* 1957. Duty on soybean meal [in Japan]. May. p. 35.
• ***Summary:*** A 5% import duty on soybean oil meal will become effective on 1 April 1957. A 10% tariff on imported soybeans, which had been suspended for some years, again became effective on 1 Oct. 1956. In 1956, the value of soybean imports to Japan was exceeded only by that of

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cotton and wheat.

4317. Hayashi, Shizuka. 1957. 50,000 visitors daily at Tokyo fair soybean exhibits. *Soybean Digest.* June. p. 18-19.
• ***Summary:*** A report of the U.S. soybean exhibit at the International Trade Fair in Tokyo, May 5-19. The Japanese-American Soybean Institute and Japanese trade groups cooperated with the U.S. Department of Agriculture (USDA) in sponsoring the exhibit. Twenty-seven nations participated in the fair. Describes the huge U.S. exhibits. Their Majesties the Emperor and Empress visited the fair, as did Mr. Ide, Japan's minister of agriculture.

Photos show: (1) Registration booth at the U.S. "soyabean" exhibit. (2) Cross section of a large model ship filled with U.S. soybeans. (3) American Soybean Assoc. President Albert Dimond and Mr. Hayashi standing beside the popular "Clipper" cleaner (which can clean unwanted foreign material from U.S. soybeans). On the wall is a huge photo showing the Port of New Orleans (Louisiana) public elevator. (4) Booth of the Association of Oil and Fat Manufacturers of Japan. Address: Japanese-American Soybean Inst., Tokyo.

4318. Mogi, Masatoshi. 1957. [Problems of the "miso" making]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(6):A72-A74. June. [29 ref. Jap]
Address: Noda Inst. of Scientific Research, Noda, Japan.

4319. Kagaya, Akira; Inaba, Yakumo; Abe, Takashi; Takata, Ryohei. 1957. Bitamin kyôka shôyu jisshi seiseki (Hiromae chihô shôni eiyô ni kansuru kenkyû, No. 66) [Effect of enriched soy [sauce] upon riboflavin deficiency of children in a farm village]. *Bitamin* (*Vitamins, Kyoto*) 13(1):52-57. July 25. [5 ref. Jap; eng]
• ***Summary:*** Soy sauce was fortified with 75 mg of thiamine, 75 mg of riboflavin, and 750 mg of niacinamide per 2 liters of sauce, and was introduced to a Japanese farm village where ariboflavinosis was found endemically among the inhabitants. Observations on its effects were made from Feb. to Oct. 1956. Vitamin fortification improved the diet and reduced symptoms. Address: 1-3. Dep. of Pediatrics, Faculty of Medicine, Hirosaki Univ., Hirosaki, Japan; 4. Kyoto Univ.

4320. Kurosawa, Yuichiro. 1957. [Steroids and microbes. I. Studies on estrogens of mare pregnancy urine]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(7):470-474. July. [8 ref. Jap]
Address: Tsurumi Chemical Research Inst., Tsurumi, Japan.

4321. Kurosawa, Y. 1957. [Steroids and microbes. II. Influence of steroides on the amylase and protease formation by *Aspergillus* sp.]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(7):474-478. July. [5 ref. Jap]
Address: Tsurumi Chemical Research Inst., Tsurumi, Japan.

4322. Kurosawa, Yuichiro. 1957. [Steroids and microbes. III. Metabolic products of testosteron by *Aspergillus oryzae*]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(7):478-481. July. [29 ref. Jap]
Address: Tsurumi Chemical Research Inst., Tsurumi, Japan.

4323. Sasaki, Tatsuji. 1957. daizu kon no soshiki baiyô ni kansuru kenkyû. I. Baiyô jôken ni tsuite [Studies on the tissue culture of soybean roots. I. The culture conditions (Abstract)]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 25(4):238. July. [Jap]
Address: Tohoku Univ., Dep. of Agriculture.

4324. Toriyama, Kunio; Toyokawa, Ryoichi. 1957. [A study of the low-temperature injury in soybean]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 25(4):197-98. July. [Jap; eng]
• ***Summary:*** Low-temperature treatment (at 17ºC and 20ºC) when soybeans were flowering resulted in very few flowers, the presence of cleistogamous flowers, an increase in the number of sterile seeds and one-seeded pods, and a reduction in seed weight. Address: Aomori Agric. Exp. Station, Fujisaka Farm.

4325. Nickerson, Jane. 1957. Japan sets the table. *New York Times.* Aug. 18. p. SM25.
• ***Summary:*** "Japan is helping Americans set their tables in unusual, appetizing fashion, exporting to the United States an increasing variety of delicacies."

Before World War II, U.S. food imports totaled $25 million. By last year this figure had increased to $60 million–more than double.

A recipe for Yosenabe (a meal-in-one-dish), whose name in Japanese means "gathered in one pan." The basic recipe calls for "3 pieces bean curd, sliced one-quarter inch thick." The Broth for cooking calls for "½ cup Japanese soy sauce" and "3 three-inch squares seaweed (kombu)."

4326. Kotwal, Lalita Kumarappa. 1957. Prodigious achievements of the Japanese people: Industries and handicrafts. *Times of India* (*The*) (*Bombay*). Aug. 20. p. 6.
• ***Summary:*** "Part of the dwelling serves as the factory and members of the family are generally the employees." Power machinery is not commonly used, as only simple tools are needed. "Typical products of such small enterprises are *tofu* (bean curd), noodles, *sushi* (rice and fish), *mochi* (rice cakes), *tatami* (floor mats), *shoji* (screens), and *gets* (wooden shoes)." These cottage industries are found throughout Japan.

4327. *Times of India* (*The*) (*Bombay*). 1957. Confectionery & foodstuffs. Aug. 20. p. 18.

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• ***Summary:*** The foods of Japan have changed noticeably since World War II. The islands of Japan, whose combined area is 15% smaller than that of California, are much much too small to grow enough staple food crops (such as rice) to feed the 80 million inhabitants. So Japan, which has been shorn of its overseas empire (Korea, Taiwan, Manchuria, etc.) has now become a major importer of wheat flour, and the number of bread eaters has been rapidly increasing.

Great efforts have also been made to incorporate more protein into the daily diet. "Scientists today have begun to view time-honored seasonings like miso and soy sauce, made largely from soybeans, from a new angle."

The most popular confections are *namagashi* which are traditional Japanese. They include *yokan* (hard red bean paste) [made from azuki beans].

4328. Ebine, Hideo; Ito, H.; Koiso, Kenji; Nakano, M. 1957. Miso no hyômen chakushoku ni kansuru kenkyû [Studies on browning of the miso surface]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 12. p. 37-42. Aug. [8 ref. Jap]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan (Hakko Shokuhin-bu, Sogo Shokuryo Kenkyujo).

4329. Ebine, Hideo; Ito, H.; Koiso, K.; Nakano, M. 1957. Enka aruminiumu no miso chakushoku bôshi kôka ni tsuite [The effect of aluminum chloride in preventing browning of miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 12. p. 43-47. Aug. [6 ref. Jap]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4330. Hayashi, Shizuka. 1957. Tofu takes large volume of soybeans. *Soybean Digest.* Aug. p. 26-27.
• ***Summary:*** "There are approximately 45,000 tofu manufacturers in Japan, of which about 23,000 are members of the Tofu Association. There is one large factory in Osaka, the largest in Japan, which consumes 2 tons of soybeans a day." In 1957 Japan will use 1,070,000 tons of soybeans, including approximately 350,000 tons for shoyu, 230,000 tons for miso, 160,000 tons for tofu, and 120,000 tons for other foods. But the Tofu Association says 308,000 tons will be used for tofu.

Note: This is the earliest English-language document seen that gives the number of tofu manufacturers in Japan, and statistics on the amount of soybeans used for making tofu in Japan. Address: Japanese-American Soybean Inst., Tokyo, Japan.

4331. Komiya, Masashi. 1957. The seven wonders of soy sauce. *Foreign Agriculture* 21(8):4. Aug.
• ***Summary:*** In spite of its salt content of 18%, shoyu does not taste excessively salty. By contrast, when sea water, which contains a mere 3% of salt is swallowed, the salty taste is almost unbearable. It is estimated that the average Japanese obtains one-third of the salt he needs from shoyu. Japan expects to produce 1,527,000 tons of soy sauce in 1957. Address: Managing Director, Japan Shoyu Assoc.

4332. *Report of the Noda Institute for Scientific Research, Japan.* 1957--. Serial/periodical. Published by Noda Institute for Scientific Research, Noda-shi, Chiba-ken, Japan. Director: Masatoshi, Mogi. No. 1 is Aug. 1957. [Eng]
• ***Summary:*** This institute is owned and run by Kikkoman Shoyu Co., Ltd. Address: Noda-shi, Chiba-ken, Japan.

4333. *Soybean Digest.* 1957. Brazilian soybean production up 10%. Aug. p. 27.
• ***Summary:*** "Soybean production in Brazil is expected to increase about 10% from last year, reports USDA's Foreign Agricultural Service. Soybeans have been an important export crop in Brazil in recent years, with Japan the principal market... A crushing plant in Porto Alegre with an annual capacity of 45,000 tons was recently brought into operation...

"A soybean extension service was recently added to the Sao Paulo Secretariat of Agriculture for the purpose of increasing soybean production."

4334. *Chicago Daily Tribune.* 1957. On our cover. Sept. 6. p. B4.
• ***Summary:*** On the cover of *Today's Food Guide,* is a photo of Kay Westfall in her kitchen, preparing her American version of Japanese sukiyaki. The recipe, which is given, includes: "1/3 cup soy sauce. 1 cake soy bean curd, sliced thin." The main ingredient is steak.

4335. United States Department of Agriculture. 1957. USDA announces study to promote wider use of U.S. soybeans in Japan (News release). Washington, DC. 1 p. Sept. 12. USDA 2775-57.
• ***Summary:*** "The U.S. Department of Agriculture announced today that it will send a a specialist to Japan to work with private trade groups and Government officials there to promote wider and more direct use of United States soybeans in Japanese diets.

"Although this country has been exporting about 20 million bushels of soybeans annually to Japan in recent years, only a relatively small quantity of the beans have been used in making such food products as 'tofu' and 'miso,'which utilize the whole soybean and not just the oil or the meal.

"Tofu and miso are a primary source of protein in the Japanese diet. The former is a custard-like curd eaten in soups, and the latter is a paste eaten in many food preparations.

"Dr. A.K. Smith of USDA's Northern Utilization and Development Division Peoria, Illinois, will go to Japan to

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study the reasons for the Japanese preference for their own and Chinese soybeans in the manufacture of products such as tofu and miso. His purpose will be to determine what differences exist between Japanese and Chinese soybeans and American soybeans, and why they occur. He also will seek to determine how foods can be made from United States soybeans which will be more acceptable to the Japanese.

"Success in his investigation can mean a broader market for United States soybeans in Japan.

"'USDA's Foreign Agricultural Service and the American Soybean Association of Hudson, Iowa, for some time have been conducting an overall program to promote the market for United States soybeans in Japan. That program has been expanded to include USDA's Agricultural Research Service, which has made Dr. Smith's services available." Address: Washington, DC.

4336. *Cotton Gin and Oil Mill Press.* 1957. Study will promote U.S. soybeans. Sept. 21.
• ***Summary:*** About A.K. Smith's upcoming trip to Japan.

4337. *Southwestern Miller.* 1957. U.S. seeks soy food uses: Dr. A.K. Smith of Department of Agriculture goes to Japan to discover reasons for preference for other beans. 36(30):56. Sept. 24.
• ***Summary:*** About Dr. A.K. Smith's upcoming trip to Japan.

4338. Hayashi, Shizuka. 1957. The Japanese-American Soybean Institute. *Soybean Digest.* Sept. p. 33-34, 36.
• ***Summary:*** Subtitle: "The Japanese know the quality of U.S. soybeans is improving. Mr. Hayashi expects every Japanese family to include soybeans in the daily diet as a result of the Institute campaign."

"Membership in the Japanese-American Soybean Institute [JASI] is made up of the Japanese Oil Processors Association, the Japan Soy Sauce Association. the Japan Miso Industry Association, the Japan Tofu Association, and the Oil and Fat Importers and Exporters Association–in other words all groups connected with the soybean industry in Japan. The American Soybean Association is also a member of the Institute.

The Institute carries out a variety of research and educational programs. Under the initial agreement, JASI was established in April 1956 for a period of 1 year with a total budget of $75,000; it began functioning on 1 May 1956. Each of the Institute's main projects and contracts signed during the first year is described. The production of a movie film, approved by USDA's Foreign Agricultural Service (FAS), is now in progress. "This will be a documentary colored film in three rolls of about 24,000 feet long. The theme of this film involves grammar school children working on a special subject of soybeans in their practical science room."

Before JASI was established, most Japanese did not realize that soybeans were grown in the U.S.–except on a small scale. "Before the war [World War II] we knew that Manchuria, China, was the only major soybean growing country. I was in Manchuria for more than 10 years before the war as an exporter of soybeans to Europe and Japan. We [Japan] imported about 1.5 millions tons of soybeans annually from China. Production in China was then around 6 million tons. In 1948 I visited this country [USA] and was surprised to learn for the first time of America's huge production of soybeans. After the war when Japan was still under the SCAP's [Supreme Commander Allied Powers = General Douglas MacArthur] control, soybeans were not available from China. It was then that Japan received soybeans from America for the first time in history. It is since then that Japan has gradually become familiar with American [U.S.] soybeans.

"However, soybeans coming into Japan right after the war were very bad. They contained enormous amounts of foreign material, worm-eaten damaged beans, broken beans; besides sizes were irregular and color was bad. The quality of American beans was so bad that it gave Japanese users the impression that U.S. soybeans were not comparable with Chinese soybeans. Everywhere we went we received complaints of foreign material." No makers of miso or tofu wanted to buy them.

Now, a year after JASI was established, the situation has improved. Everybody in the soybean industry now knows about U.S. soybeans, and knows their quality is improving. JASI sends these people a newsletter, the *Soybean Digest Late News,* translated into Japanese. A photo shows Shizuka Hayashi. Address: Managing Director, JASI, Tokyo.

4339. Hirano, Mitsuo. 1957. Greetings from the oil and fat manufacturers of Japan: Sees the possibility of greatly increased barter trade by Japan with China with fewer soybeans being bought from the United States. *Soybean Digest.* Sept. p. 37.
• ***Summary:*** "In recent years the American government and trade people concerned have been doing much to increase exports of soybeans from America by improving the quality of American beans and also by meeting other wishes of importing countries, the result of which has been favorable and certainly commands our respect and cooperation. In this connection, I may mention the achievements of the Japanese-American Soybean Institute which was organized in April of last year under the mutual cooperation between the American Soybean Association and our five Japanese soybean trade groups. The activities of the Institute are being carried out smoothly and its programs are being gradually accomplished.

"Now I should like to spend a few moments on the recent soybean situation in Japan. According to the demand-and-supply plan for the 1957 fiscal year of the Ministry of Agriculture and Forestry, the total demand of soybeans in Japan for the year starting on April 1 is estimated at

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1,070,000 tons, of which 220,000 tons are to be supplied by the domestic soybean production and the rest is to be imported from abroad. In the plan of the Ministry the total production of the 1957 soybean crop in Japan is estimated at 490,000 tons, of which 270,000 tons are considered to be consumed by the growers themselves and the remaining 220,000 tons are expected to be sold on the market.

"Of the 850,000 tons to be supplied from foreign sources, the preponderant portion of 610,000 tons are the raw material for the crushing industry and the rest is for other soybean food industries in the country.

"As you know, Japan's soybean imports are still under the foreign exchange allocation system, and for the first half of the 1957 fiscal year 315,000 tons out of the above-mentioned total of 850,000 tons were allocated to consumers, who are expected to have already imported the respective amounts allocated to them. For the second half of the fiscal year, according to the original plan of the government, about 500,000 tons of soybeans are to be imported from abroad. But in view of the shortage of foreign exchange that Japan has been experiencing in the past few months nobody can deny that the government may be forced to change its original plan and cut the amount of soybean imports for the second half.

"In order to cope with the problem of the dollar shortage, our government, as you may know, is now negotiating with your government to use the loans from the Export-Import Bank of Washington for the importation of about 150,000 tons of soybeans out of the amount to be allocated for the second half of the fiscal year. The negotiations may soon be concluded, I think.

"The amount of Chinese soybeans that were purchased under the allocation for the first half of the fiscal year was estimated at about 70,000 tons. Up to last April the payment was made in cash sterling, but since then the trade has been placed on a barter basis. Importers of Chinese soybeans must export to China within a certain period the equivalent value of the beans in other commodities. This obligation on the part of the importers appears to work as a brake on imports of Chinese beans. However, in view of the fact that the Japanese government has quite recently eased restrictions on a number of commodities to be exported to communist China, the barter trade between the two countries, according to general expectations, will be greatly improved. Furthermore, the Chinese trade being controlled by the state, prices and quantity of exports can be decided from political viewpoints and there is no knowing what policy may be taken by them to increase their exports of soybeans.

"Of course the quality of Chinese soybeans is not perfect in every respect, but still the very small percentage of foreign material and the shorter period of transportation give a favorable impression on the Japanese importers. This is particularly so when Japan is suffering from the shortage of foreign exchange.

"Rapeseed is the most important of all the oilseeds produced in Japan. The preliminary production estimate for 1957 is 270,000 tons, which is about 50,000 tons less than the production of last year. This decrease in production would mean a decrease of 17,000 tons in rapeseed oil, and if this decrease is to be compensated for by soybean oil, 100,000 tons of soybeans would have to be imported in addition to the original amount of 850,000 tons imports.

"But as mentioned before, because of the present foreign exchange situation it is feared that the whole of the original amount will not be allowed to be imported within the present fiscal year. On the other hand it must be remembered that the increase of soybean imports can be attained by increasing our exports of soybean oil to overseas markets, for in case of soybean oil exports we can get an exchange allocation for the equivalent quantity in beans in addition to the normal import allocation.

"I understand that an American soybean delegation will visit Japan this fall as a part of the activities of the Japanese-American Soybean Institute, and I believe that this kind of inspection tour is most appropriate and will certainly contribute much to deepening the mutual understanding."

Photos show: (1) A portrait photo of Mitsuo Hirano, smiling and looking dapper. (2) "Hirano's talk was presented by Ichiro Kashiwagi of New York," who is shown speaking at a podium with microphone. Address: President, Assoc. of Oil and Fat Manufacturers of Japan.

4340. Hougen, Volorous H. 1957. The Argentine soybean venture. *Foreign Agriculture* 21(9):13-14. Sept. Reprinted in Soybean Digest, Nov. 1957. p. 15.

• ***Summary:*** There is new evidence that the soybean may one day join sunflower, cottonseed, and flaxseed as an important oilseed crop in Argentina.

"This is not the first effort Argentina has made to grow soybeans. But it is the first scientifically planned introduction of the crop.

"Past history: Soybeans have a long history of misfortune in Argentina, dating from around 1882. The end of [the 19th] century saw good results from plantings in La Rioja Province; and in the early 1900's the Córdoba [Cordoba] Agricultural College reported successful trials. About this time experiments in using soybeans for fattening steers brought favorable results. In 1915, very large yields were reported in Córdoba Province. Seed was increased, and in 1924 the Ministry of Agriculture distributed it to farmers, on the theory that drought resistance and value as an animal feed would make soybeans a useful crop. This program did not, however, succeed in establishing the crop on a sound footing in any area.

"In the early 1930s a commercial organization imported about 300 tons of soybean seed, and about 14,800 acres were planted. However, unsatisfactory yields led to low returns, which gave little incentive for continued production. In

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1941 the *Instituto Argentino del Suelo* [*Suelo* = land, soil, or ground] encouraged a commercial firm to make further seed imports. This firm sold the seed and took an option to buy the crops. But again production failed to come up to expectations, apparently because growers did not know how to plant and how to grow the crop. In the crop year 1942-43, about 12,300 acres yielded only about 117,600 bushels of soybeans–10.4 bushels per acre, compared with average U.S. yields of about 20 bushels in 1951-55."

In recent years, Japanese colonists in subtropical Misiones Province (in the far northeast, bordering Paraguay) have brought their own seed and "grown a few thousand tons for their own food." But this area does not have the best kind of climate and soil for soybeans.

"Now, however, Argentine commercial interests have undertaken the introduction of soybeans on a large scale. They believe the crop may be more profitable than cotton, wheat, corn, and sunflower in certain marginal districts.

"The area selected for immediate development–about the size of Kansas–includes all of Santa Fe Province and parts of the adjacent Provinces."

"Production efforts for the 1956-57 crop centered in northwestern Santa Fe and western Chaco Provinces. Last November, although 19,000 acres had been prepared for planting, the season was so dry that only about 3,600 acres were actually planted, and much of the 1,000 tons of seed specially imported from the United States remain unused. But the expected yields of 20 to 21 bushels per acre will provide pure seed for planting this fall, plus some beans for the market.

"It was clear to me that careful planning has gone into this program. Argentine agronomists and soil scientists, trained in the United States, are analyzing soils and climatic conditions in cooperation with the Ministerio de Agricultura y Ganadería. Economic analyses are establishing the level of performance soybeans must reach if they are to displace other crops. At the government research centers and experiment stations, soybean varieties are receiving careful tests. In 1956-57, 74 varieties were on trial in different parts of the country. Those performing satisfactorily will receive a further test in field plantings."

"Like the varieties, the farmers themselves are carefully selected. Each gets not only a contract for the purchase of his crop, but seeds, inoculants, fertilizers, and technical guidance. Five times during the 1956-57 crop year, each grower received instruction and practical demonstration, covering everything from preparing the seedbed, planting, cultivating, and controlling diseases and insects, to harvesting the crop. Successful farmers are expected to help train others in future years."

A map shows Argentine soybean areas, centered on Santa Fe Province. Dark asterisks show permanent research centers. Small circles show experimental fields. The name of each is given.

Note: This document contains the earliest date seen for the cultivation of soybeans in Argentina (1882). Unfortunately, no citation for this date is given, and we are not told the source of these soybeans or where they were grown. Address: Fats and Oils Div., FAS [USDA].

4341. Ito, Kiyoe; Kinase, Michiko. 1957. Misoshiru no chôri ni tsuite. I. [On the preparation of miso soup]. *Kaseigaku Zasshi* (*J. of Home Economics of Japan*) 8(4):209-12. (Chem. Abst. 52:18934a). [5 ref. Jap]
• ***Summary:*** Discusses the relationship between the properties of miso soup and the brand of miso from which it is prepared. Address: Tokyo Univ. of Education (Tokyo Gakugei Daigaku).

4342. Kandatsu, Makoto; Yasui, Tadahiko. 1957. [Studies on the nutritive value of grass proteins. VIII. The effect of drying methods upon the digestibility of soy-bean leaf proteins]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(9):690-693. Sept. [4 ref. Jap]
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo.

4343. Kohzu, Tokuichiro. 1957. Daizu kasu no ensan kasui bunkai ni yoru gurutamin-san seizô no kiso-teki kenkyû. III. Bunkai seisei-butsu ni tsuite (2) [Fundamental studies on manufacturing glutamic acid from soy-bean meal by hydrolysis with hydrochloric acid. III. On the products produced by hydrolysis (2)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(9):658-64. Sept. [3 ref. Jap]
Address: Nagano Junior College, Japan.

4344. Kohzu, Tokuichiro. 1957. Daizu kasu no ensan kasui bunkai ni yoru gurutamin-san seizô no kiso-teki kenkyû. IV. Gurutamin-san ensan-en no shôshutsu ni tsuite [Fundamental studies on manufacturing glutamic acid from soy-bean meal by hydrolysis with hydrochloric acid. IV. On the crystallizing of glutamic acid hydrochloride]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(9):664-69. Sept. [4 ref. Jap]
Address: Nagano Junior College, Japan.

4345. Sato, Masahiro; Saito, Kyoko; Ozawa, Hiroko; Kojima, H.; Uemura, T. 1957. Korin yôkyû-sei shôyu kôbo ni kansuru kenkyu. I. Korin yôkyû-sei kôbo no tanri [Studies on the choline requiring shoyu-yeast. I. Isolation of choline requiring yeast]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(9):675-679. Sept. [5 ref. Jap; eng]
Address: Faculty of Agriculture, Univ. of Tohoku [Japan].

4346. Sato, Masahiro; Saito, Kyoko; Uemura, Teijiro. 1957. Korin yôkyû-sei shôyu kôbo ni kansuru kenkyu. II. Korin

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yôkyû-sei kôbo no bunri ni tsuite [Studies on the choline requiring shoyu-yeast. II. Taxonomic investigation of choline requiring shoyu-yeast]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(9):680-685. Sept. [10 ref. Jap; eng]
Address: Faculty of Agriculture, Univ. of Tohoku [Japan].

4347. *Soybean Digest.* 1957. Honorary life members [American Soybean Assoc.]: Howard L. Roach, Ersel Walley. Sept. p. 10.
• ***Summary:*** Howard Roach, from Plainfield, Iowa, was vice president of the American Soybean Assoc. in 1943 and 1944, and president in 1945 and 1946. Mr. Roach was active in the formation of the Soybean Council of America, Inc., and was elected its first president in 1956, which position he now holds.

Ersel Walley now lives in Fort Wayne, Indiana. He has had a very large impact on the growth of the soybean crop an on the American Soybean Association. "As a tenant farmer he began growing soybeans in 1922, and as a farm operator and manager [in Ohio], he has grown soybeans continuously since that year."

"For many years he has served as a director of the American Soybean Association, and was president in 1948 and 1949. In 1948, Walley spent 3 months in Europe at his own expense, investigating the possibility of a postwar market for American soybeans.

"In 1956 and 1957, he accepted assignments to arrange soybean exhibits at International Trade Fairs in Osaka and Tokyo. While in Japan in 1956 he was instrumental in establishing the Japanese-American Soybean Institute."

A portrait photo shows each man.

4348. *Soybean Digest.* 1957. [Multi-Purpose Food helps flood victims in Japan]. Sept. p. 31.
• ***Summary:*** A large photo shows the Freedoms Foundation medal and three American children presenting cans of MPF to Fumiko Miyagi. The caption reads: "Fumiko Miyagi of Japan, guest of the American Soybean Association at its Minneapolis [Minnesota] convention, expresses gratitude to Minneapolis children whose penny-wisdom and penny-power sent 3¢ meals of Multi-Purpose Food (MPF) to flood victims in Japan. Also expressing interest in this new role of American soybeans as a liberator of malnourished people is Albert Dimond, president of the American Soybean Association. Displayed at the convention exhibit of the non-profit Meals for Millions Foundation is the Freedoms Foundation medal it was awarded for 'outstanding achievement in bringing about a better understanding of the American way of life' by distribution of MPF free in distressed areas of the world. Miss Miyagi, a Tokyo art teacher and women's club leader, is president of the Japanese Meals for Millions affiliate."

Note: This is the earliest English-language document seen (Nov. 2002) that uses the word "malnourished."

4349. Strayer, George M. 1957. We are on the threshold of big things. *Soybean Digest.* Sept. p. 19, 20, 22, 24.
• ***Summary:*** Contents: Introduction. Went to Japan. Work of the Soybean Council of America. Legislative front. Finances better (American Soybean Assoc. {ASA} is in the black, in part because the Soybean Council of America has assumed some of the financial burden of the development work in Japan that had previously been borne by ASA). Thanks to many who have contributed time, effort, and talent to ASA during the past year (Ersel Walley, Albert Dimond, Kent Pellet, George McCulley, Del Cobie).

USDA statistics project a very large soybean crop in 1957. And U.S. soybean exports, the largest in history, are expected to reach 80 million bushels. Huge quantities of soybean oil have also been exported in 1957. "We have begun to capitalize on the tremendous potential markets for [U.S.] soybeans and soybean products which exist around the world."

The Japanese-American Soybean Institute (JASI) completed its first full year of operation on 31 March 1957. About $69,000 in Japanese yen were contributed under Public Law 480. Japanese trade groups contributed approximately $15,000 in Japanese yen in services, personnel time, and cash. ASA contributed approximately $25,000 in personnel time. In total, about $109,000 were spent during the first year to "conduct a rather thorough study of the needs of the Japanese markets." JASI has only one objective–to increase the markets for U.S. soybeans in Japan. Strayer spent the month of February in Japan reviewing the work of JASI and meeting with governmental agencies and the five Japanese trade groups which are participating in JASI and wish to continue. Upon returning to the USA Strayer immediately filed a request with USDA's Foreign Agricultural Service for a project which would use $150,000 in FAS funds. This project was approved on April 3 and is now in operation. So the JASI program has doubled in size over the past year. There "is a potential market in Japan for several times the quantity of soybeans now being purchased. The greatest single limiting factor is the allocation of dollars by the Japanese government. Another deterring factor is the 10% import duty which is levied on all soybeans imported into Japan today."

Photos show: (1) George Strayer. (2) Four processors from Halstead Elevator Co (Halstead, Minnesota) and Farmers Cooperative Association (Ralston, Iowa). (3) Four men visiting in the Crown Iron Works. (4) David G. Wing, Mechanicsburg, Ohio, giving the report of the nominating committee. (5) Agronomists G.P. Webster (Univ. of Kentucky, Lexington) and J.B. Peterson (Purdue Univ., Indiana). (6) Three Iowans from Iowa Cooperative Processing Association, Farmers Grain Dealers Assoc., and Farmers Cooperative Co. Address: Executive Vice President

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and Secretary-Treasurer, American Soybean Assoc. [Hudson, Iowa].

4350. Walley, Ersel. 1957. Soybeans around the world. It would take 400 million bushels of soybeans to meet minimum needs of babies and growing children alone in the Orient. *Soybean Digest.* Sept. p. 30-32.
• ***Summary:*** The author made a world tour studying soybeans, including visits to Hawaii, Japan and other parts of Asia, and Italy. He studied production of soy milk in Taiwan, Hong Kong, and Bangkok (Thailand). In Taiwan he visited a soya milk plant which was established "by our good friend and American Soybean Association pioneer, Dr. H.W. Miller. In Hong Kong, the 'peek hole' and gap in the Bamboo Curtain, we found many small soya food producers and no doubt the largest and most successful soya milk plant to be found anywhere [Hong Kong Soya Bean Products Co. Ltd., makers of Vitasoy]." Hong Kong is the place where competition between soybeans from Red China and the USA is said to meet head-on. "May I voice my conclusion that Red China needs in its domestic economy more soybeans than it can possibly produce.

"A trip to southeastern and south Asia included good and sufficient visits to Thailand (Siam), Burma, India, and Pakistan. Of these countries, Pakistan is the only one that has soybean production of mention and here the total production is less than 1 million bushels per year."

A photo shows Walley. Address: Part president and chairman of Market Development Committee, American Soybean Assoc.

4351. Yamamoto, Kisirô. 1957. Studies on koji. II. Effects of some conditions of medium on the production of mold protease. *Bulletin of the Agricultural Chemical Society of Japan* 21(5):313-18. Sept. [22 ref. Eng]
• ***Summary:*** "The medium of initial pH of 7-8, initial moisture content of 50 per cent, high C/N [carbon to nitrogen] ratio," and of rice bran or copra meal, each had a favorable influence on protease production. Address: Noda Inst. for Scientific Research, Noda, Japan.

4352. Yamamoto, Kisirô. 1957. Studies on koji. I. A new analytical method of koji. *Bulletin of the Agricultural Chemical Society of Japan* 21(5):308-12. Sept. [5 ref. Eng]
• ***Summary:*** Describes the "paste medium" technique. Address: Noda Inst. for Scientific Research, Noda, Japan.

4353. Yamamoto, Kisirô. 1957. Studies on koji. III. Effects of cultural temperature on the production of mold protease. *Bulletin of the Agricultural Chemical Society of Japan* 21(5):319-24. Sept. [9 ref. Eng]
• ***Summary:*** In the preparation of koji from various raw materials, it was recognized that the lower the incubation temperature, the more the three kinds of protease are produced by *Aspergillus soyae* KS. The practical lower limit of temperature was about 12ºC. Address: Noda Inst. for Scientific Research.

4354. Ozawa, Hiroko; Kojima, H.; Uemura, T. 1957. [Studies on the choline requiring shoyu-yeast. III. Changeability of choline response]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(10):738-743. Oct. [6 ref. Jap]
Address: Faculty of Agriculture, Univ. of Tohoku.

4355. *Soybean Digest.* 1957. USDA sending soy specialist to Japan. Oct. p. 16-17.
• ***Summary:*** About Dr. Allan K. Smith's upcoming trip to Japan. A portrait photo shows Dr. Smith.

4356. *Soybean Digest.* 1957. Japanese-American Soybean Institute: Good attendance at soy food courses. Oct. p. 16.
• ***Summary:*** "Short courses in food uses of soybeans were sponsored by the Institute for Japanese health center nutritionists in four cities during June, July and August.

"Attendance by the nutritionists ran from 54 to an even 100. The short courses were held in Amori [Aomori] City, Gifu City, Nikko City and Kochi. The nutritionists in turn will discuss the high nutritive value of soybeans and their utilization in the Japanese diet in future courses for consumers to be held by the local health centers and also in talks before local organizations and women's meetings.

"Speakers at the short courses were from the National Nutrition Research Institute, the Welfare Ministry, the Japan Nutrition Association and other organizations. They discussed the usage of soybeans in the diet as a low-cost means of correcting 'low-protein disease' which is prevalent in parts of Southeast Asia and Africa, and demonstrated the cooking of soybean dishes and some uses of soybean oil.

"The health center nutritionists correspond somewhat to the home demonstration agents in the United States.

"By first taking the information to the nutritionists and through them to the Japanese consumers, the Institute hopes to make the great majority of the Japanese people conscious of the part soybeans can play in raising the nutritional level of the diet in Japan.

"Japan exported a total of 12,429 metric tons of soybean oil in the January-July 1957 period, according to a dispatch from Shizuka Hayashi, managing director of the Institute. This compares with 7,951 tons for the full year of 1956.

"Japan exported no soybean oil in August, however. This is due to the great difficulty of obtaining soybeans during the latter half of the year because of Japan's foreign currency situation and the manufacturers' concern that any export of oil would hamper the flow of soybean oil into the domestic market during the period when plants have shut down for periodic repair.

"The Association of Oil and Fat Manufacturers of Japan

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reports that the target for edible oil and fat consumption in Japan in 1957 is 294,000 metric tons, of which 140,000 tons are to be imported.

"Soybean oil forms about 60% of the oils and fats processed from imported materials, and this percentage is expected to increase.

"Oil and fat consumption per capita is 8.5 grams per day in Japan, about the lowest level in the world. This may be expected to rise with the help of appropriate public relations activities.

"Other oils might be replaced by soybean oil if soybeans were placed on the free import list, and through a public relations program for soybean oil. A 10% customs duty was placed on soybeans last October.

"The Association of Oil and Fat Manufacturers plans to protest the import duty on soybeans during the coming session of the Diet.

"Some Japanese agricultural organizations want to restrict imports of soybeans to protect domestic soybeans and rapeseed. But organizations that use imported soybeans as raw materials and also the consumers of soybean products are opposed to the import duty.

"The Japan Soybean Association plans to send a soybean mission to China to discuss problems affecting Japanese-Chinese trade in soybeans and to study the Chinese crop and industry.

"Total Chinese soybeans contracted for delivery in the August-September-October 1957 period are 22,500 metric tons."

4357. *Soybean Digest.* 1957. First agreement with ARS (Photo caption). Oct. p. 16.

• ***Summary:*** The photo shows four men seated around a table and one man standing. The caption below the photo reads: "First foreign marketing project to be participated in by Agricultural Research Service, USDA, is activated by signing of agreement between ARS, Foreign Agricultural Service, and the American Soybean Association. Left to right: Theodore C. Byerly, deputy administrator, production research, ARS; Gordon Fraser, assistant administrator, FAS, signing the agreement; Geo. M. Strayer, executive vice president, American Soybean Association; Geo. A. Parks, Jr., director fats and oils division, FAS (standing); and Walter M. Scott, assistant to administrator, ARS. Dr. A.K. Smith will go to Japan under this agreement."

4358. Hayashi, Shizuka. 1957. Miso maker switches to U.S. beans. *Soybean Digest.* Nov. p. 24-25.

• ***Summary:*** A week-long soybean promotional program was held in the city of Sendai in September. The Institute participated in the name of the "Food Life Improvement Association." The speaker was J. Sasaki [probably of Sendai Miso Shoyu], vice president of the All Japan Miso Assoc. The biggest miso maker in the district and one of the largest in Japan, he also manufactures shoyu, and he has been using U.S. soybeans only since the early part of this season. Why? More uniform and consistent quality, less purple colored beans, lower price, larger quantities of the same variety available. Address: Managing Director, Japanese-American Soybean Inst., Tokyo, Japan.

4359. Omata, S.; Ueno, T.; Nakagawa, Y. 1957. Shôyu no kappen genshô ni kansuru kenkyû. VIII. Shôyu kôji no kappen genshô (1) [On the browning reaction of soy-sauce. VIII. On the browning reaction of soy-sauce koji (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 31(11):822-26. Nov. [12 ref. Jap]

• ***Summary:*** Substances which effect browning are amino acids, reducing sugars, reductones and carbonyl compounds. Address: College of Agriculture, University of Osaka prefecture, Japan.

4360. *Revue Internationale des Produits Tropicaux et du Materiel Tropical.* 1957. L'industrie du soja en Asie [The soybean industry in Asia]. 32(337):202. Nov. [Fre]

• ***Summary:*** Discusses soybean production in Japan, soybean production in China, and soybean production in Formosa.

In Japan, soybean production in 1956 did not pass 438,000 metric tons (tm), which is 70,000 metric tons less than in 1955.

China, which in 1956 disposed of about 200,000 metric tons of soybeans, exported 7.35 million bushels to Japan and has sold more than half of that to Russia and its satellites.

Formosa: Soybean production in Formosa is developing. Address: France.

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4361. *Soybean Digest.* 1957. Japan: Soybean imports by source. Nov. p. 24.
• ***Summary:*** This graph, compiled from USDA statistics, shows imports of soybeans to Japan during the period 1925–1956, from the United States, China, and other countries. Prior to 1934, most of the soybeans were imported from China. Imports from the U.S. began in 1934 and have risen steadily, especially since 1952, until in 1956 they account for 75% of the total. In the period since World War II, imports from China have been small but have grown steadily, accounting for about 20% of total imports in 1956. Total imports were about 22,500,000 bushels in 1925-29, falling to a low of about 5,000,000 bu in 1952, then reaching a peak of about 30,000,000 bu in 1955.

4362. USDA Agricultural Marketing Service. 1957. Soybean variety names. Washington, DC. 31 p. Nov. Supplement 1 to Service and Regulatory Announcements No. 156 "Rules and Regulations Under the Federal Seed Act."
• ***Summary:*** The title page states: "Included in Sec. 201.34(e) of the Regulations Under the Federal Seed Act and Descriptions." At the bottom of the "Contents" page is written: Supersedes mimeographed publication "Soybean Varieties" issued by the former Publication and Marketing Administration, U.S. Department of Agriculture, revised July 1953."

Contents: Introduction. Map showing maturity group areas. Description of varieties. Synonyms of variety names. List of obsolete or seldom grown varieties.

Description of varieties: Acadian, *Acme (Canada. * = Also the name of an old variety which is believed to be no longer in existence), Adams, Agate, Aoda, Arisoy, Arkan, Arksoy, Arksoy 2913, Armredo, Avoyelles, Bansei, Barchet, Bavender Special, Biloxi, Blackhawk, Boone, Capital (Canada), Cayuga, Chame, Charlee, Cherokee, Chief, Chippewa, Chusei, Clark, Clemson, CNS, CNS-4, CNS-24, Comet (Canada), Creole, Cypress #1, Delsoy, Delsta, Dorman, Dortchsoy #31, Dortchsoy #67, Dunfield, Earlyana, Easycook, Ebony, Emperor, Etum, Flambeau, Funk Delicious, Gatan, Georgian, Giant Green, Gibson, Goldsoy (Canada), Granger, Grant, Habaro, Haberlandt, Hahto, Hakote, Hardome (Canada), Harly (Canada), Harman (Canada), Harosoy (Canada), Hawkeye, Hayseed, Herman, Hidatsa, Higan, Hokkaido, Hongkong, Illini, Imperial, Improved Pelican, *Jackson, JEW 45, Jogun, Kabott (Canada), Kanrich, Kanro, Kanum, Kim, Kingwa, Korean (Canada), Kura, Laredo, Lee, Lincoln, L.Z., Macoupin, Magnolia, Mamloxi, Mammoth Brown, Mammoth Yellow, Mamotan, Mamredo, Manchu, Manchu No. 3, Manchu No. 606, Manchukota, Mandarin, Mandarin No. 507, Mandarin (Ottawa) (Canada), Mandell, Mendota, Mingo, Minsoy, Missoy, Monetta, Monroe, Montreal Manchu (Canada), Morse, Mount Carmel, Mukden, Nanda, Nanking, Norchief, Norsoy, Ogden, Ontario, Otootan, Pagoda (Canada), Palmetto, Patoka, Peking, Pelican, Pennsoy, Perry, Pridesoy No. 57, Ralsoy, Renville, Richland, Roanoke, Rokusun, Rose Non Pop, S-100, Sac, Sato, Scioto, Seminole, Seneca, Sioux, Smith Super, Sousei, Tanner, Tastee, Tennessee Non Pop, Tokyo, Viking, Virginia, Volstate, Wabash, Willomi, Wilson, Wisconsin Black, Wolverine, Woods Yellow, Yellow Gatan, Yelnando, Yelredo.

Synonyms of variety names (p. 24; Synonym -> Official variety name): Austrian Green -> Tokyo. Bakaziro -> Amherst. Banner -> Midwest. Bell -> Midwest. Best Green -> Hope. Best White -> Amherst. Black -> Buckshot. Black Beauty -> Ebony. Black Champion -> Peking. Black Sable -> Peking. Bopp -> Chernie. Brown -> Mammoth Brown. Brown Biloxi -> Biloxi. Brown Eda Mame -> Eda. Brown Otootan -> Tanner. Buster Brown -> Trenton. Cha Daidzu -> Eda. Clay -> Midwest. Claybank -> Midwest. Clemson Non-shattering -> CNS. Cluster Bean -> Midwest. Coker's 31-15 -> Pee Dee. Columbian -> Columbia. Dortchsoy-2 -> Ogden. Dwarf Brown -> Ogemaw.

Dwarf Early Yellow -> Ito San. Dwarf Green -> Medium Green. Early Black -> Wisconsin Black. Early Green -> Medium Green. Early Indiana Laredo -> Norredo. Early Japan -> Butterball. Early Korean -> Korean. Early Laredo -> Norredo. Early Mammoth Black -> Buckshot. Early Mandarin -> Mandarin. Early Virginia Brown -> Virginia. Early White -> Ito San. Early Wilson -> Wilson. Early Wilson Black -> Wilson. Early Wisconsin Black -> Wisconsin Black. Early Wood's Yellow -> Arksoy. Early Yellow -> Ito San. Eda Mame -> Ito San, Eda. Edsoy -> Delsoy. Essex -> Peking. Etampes -> Ito San. Evan's Crossbred No. 9 -> Ogemaw. Extra Early Black -> Wisconsin Black. Extra Early Black Eyebrow -> Black Eyebrow. Extra Select Sable -> Peking.

Feeser's Prolific -> Midwest. Flat Black -> Flat King. Foster's Prolific -> Midwest. Galloway -> Midwest. German Coffee Berry -> Ito San. Giant Brown -> Mammoth Brown. Giant Yellow -> Butterball. Gosha -> Manhattan. Green -> Medium Green. Green Field -> Illini. Green Samarow -> Samarow. Guelph -> Medium Green. Hale-Ogden 2 -> Ogden. Hollybrook Early -> Midwest. Ignotum -> Ogemaw. Illinois 13-19 -> Ilsoy. Illinois Champion -> Midwest. Indiana Hollybrook -> Midwest. Ita Mame -> Tokyo. Japan No. 15 -> Kingston. Japan Pea -> Ito San. Kiyusuke Daidzu -> Ito San. Kysuki -> Ito San. Large Black -> Buckshot. Large Brown -> Mammoth Brown. Large Yellow -> Mammoth Yellow.

Late -> Mammoth Yellow. Late Ita Mame -> Tokyo. Late Yellow -> Mammoth Yellow. Lima Soy -> Hahto. Mammoth -> Mammoth Yellow. Mammoth Black -> Tarheel Black. Mamotoc -> Tokyo. Manchuria -> Pinpu. Medium Black -> Buckshot. Medium Early Black -> Buckshot. Medium Early Brown -> Early Brown. Medium Early Green -> Medium Green. Medium Early Yellow ->

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Ito San. Medium Ita Mame -> Tokyo. Medium Yellow -> Midwest. Michigan Green -> Medium Green. Midwest Free -> Midwest. Minnsoya -> Monsoy [Minsoy?]. Mongol -> Midwest. New Bush Bean -> Midwest. New London -> Midwest. Northern Hollybrook -> Midwest. Ogema -> Ogemaw. Ohio Champion -> Midwest. Ohio Medium Green -> Medium Green.

Ohio 9035 -> Hamilton. Oloxi -> Coker's Black Beauty. Pedigreed Sable -> Peking. Pekwa -> Kingwa. Perley's Mongol -> Midwest. Premier -> Midwest. Prolific -> Midwest. Purredo -> Norredo. Rattlesnake -> Taha. Red Otootan -> Tanner. Red Sable -> Peking. Red Tanner -> Tanner. Roosevelt -> Midwest. Roosevelt Medium Early Yellow -> Midwest. Round Black -> Buckshot. Royal -> Wilson-Five. Sable -> Peking. Shanghai -> Tarheel Black. Siegenthaler -> Morse. Southern -> Mammoth Yellow. Southern Medium Green -> Tokyo. Soy Good -> Etum. Super Quick -> Sousei. Tarheel -> Tarheel Black. Tarheel Brown -> Mammoth Brown. Vanderburg Black -> Norredo.

Virginia Brown -> Virginia. Virginia Early Brown -> Virginia. Wilson Black -> Wilson. Wilson Early -> Wilson. Wilson Early Black -> Wilson. Wings Royal -> Peking. Wisconsin Early Black -> Wisconsin Black. Wisconsin Early Brown -> Early Brown. Wisconsin Early Green -> Medium Green. Wonder -> Midwest. Wyokatenn -> Yokoten. Yamagata Cha-daidzu -> Eda. Yellow -> Mammoth Yellow. Yellow Eda -> Ito San. Yellow Etampes -> Ito San. Yoko -> Yokoten. Yokotenn -> Yokoten. Yoshioko -> Yosho.

Obsolete or seldom grown varieties (p. 30): Acme* (* = Also the name of a Canadian variety released in 1953), A.K., A.K. Harrow, Aksarben, Aksawa, Allison Black, Amherst, Arlington, Auburn, Austin, Baird, Black Eyebrow, Brindle, Brooks, Brown Eda Mame, Brownie, Buckshot, Butterball, Chernie, Chestnut, Chiquita, Cloud, CNS-3, Columbia, Delaware No. 1838, Delaware No. 1846, Delnoshat, Delredo, Dixie, Doxie, Duggar, Early Brown, Early White Eyebrow, Eda, Edgecombe, Edward, Elton, Etampes, Extra Early Black, Extra Early Wood's Yellow, Fabulin, Fairchild, Farnham, Flat King, Flava, Fuji, Funman, Gala, George Washington, Giant Yellow, Goku, Goshen Prolific, Green and Black, Hamilton, Hankow, Hansen, Harbinsoy, Hiro, Hollybrook, Hoosier, Hope, Hudson Manchu, Hurrelbrink, Illington, Illinois 178, Ilsoy, Imported Yellow, Ito San, Ito San Cross, Jackson** (** = Also the name of a United States variety released in 1953), Jet, Jefferson, Kagon, Kentucky, Kenua, Kingston, Lexington, Looney No. 2, Lowrie, Loxitan, Luthy, Manhattan, Manitoba Brown, Mansoy, Medium Green, Merko, Meyer, Midunk, Midwest, Mikado, Misstuck, Morgan, Nanksoy, Nansemond, Natsu, Nemo Sonoma, New Deal, Nielson [Nielsen], Nigra, Norredo, Nuttall, O.A.C. No. 211, Ogemaw, Ohio 9001, Okute, Old Dominion, Osaya, Ozark, Pee Dee, Pinedell, Pine Dell Perfection, Pingsu, Pinpu, Pluto, Pocahontas, Preston, Riceland, Samarow, Sangra, Sedo, Sherwood, Shingto, Shiro, Sonoma, Sooty, Southern Green, South Prolific, Soysota, Stuart, Suru, Swan, Taha, Tanloxi, Tarheel Black, Tashing, Thurnoko [Tsuronoko?], Toku, Toyonago, Trenton, U.S. 2, U.S. 5, Verea, Vireo, Waseda, Watson Black, Wea, White Biloxi, White Eyebrow, Wilson-Five, Wing Jet, Yellow Marvel, Yellow Reisen [Yellow Riesen], Yokoten, Yosho.

Note: This is the earliest document seen (Aug. 2013) that mentions the soybean variety Fabulin. Address: Washington, DC.

4363. Japanese American Soybean Institute. 1957. Green bud (Color motion picture). Tokyo, Japan. 35 mm. Produced by Shin Riken Motion Picture Co. Summarized in Soybean Digest, Feb. 1958, p. 7. *

• ***Summary:*** This is a documentary colored film in three rolls of about 24,000 feet long. The theme involves grammar school children working on a special project on soybeans in their practical science room. It was first screened in Dec. 1957 in Japan.

4364. Kohono, C. 1957. [Studies on the protein digestion of natto (III)]. *Mukogawa Gakuin Joshi Daigaku Kiyo. Seikatsu Kagaku-hen* (*Scientific Reports of Mukogawa Women's Univ.–Domestic Science Series*) 5:281-87. [Jap]*

• ***Summary:*** 2008 Aug. 12. WRS e-mailed www.nodai.ac.jp/english/... = Tokyo University of Agriculture.

The one I've been to is University Library for Agricultural and Life Sciences at 1-1-1 Yayoi, Bunkyo-ku, Tokyo 113-8657.

4365. Kohono, C. 1957. [Studies on the protein digestion of natto (II)]. *Mukogawa Gakuin Joshi Daigaku Kiyo. Seikatsu Kagaku-hen* (*Scientific Reports of Mukogawa Women's Univ.–Domestic Science Series*) 5:133-39. [Jap]*

• ***Summary:*** 2008 Aug. 12. WRS e-mailed www.nodai.ac.jp/english/... = Tokyo University of Agriculture.

The one I've been to is University Library for Agricultural and Life Sciences at 1-1-1 Yayoi, Bunkyo-ku, Tokyo 113-8657.

4366. Machida, Yoshiro. 1957. Tôfu seizô-hô [Tofu manufacturing process]. *Japanese Patent* 228,062. [Jap]*

4367. Machida, Yoshiro. 1957. Aburage genryô to shite tekitô na dasshi daizu-ko no seizô-hô [Method of producing defatted soybean meal as an ingredient for deep-fried tofu pouches]. *Japanese Patent* 255,333. [Jap]*

4368. Machida, Yoshiro. 1957. Tôfu kôri-dôfu aburage genryô to shite tekitô na dasshi daizu-ko no seizô-hô [Method of producing defatted soybean meal as an ingredient for tofu, dried-frozen tofu, or deep-fried tofu pouches]. *Japanese Patent* 255,334. [Jap]*

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4369. Mitsui, M.; Kusaba, E. 1957. Shôyu no iro ni kansuru kenkyû. II. [Studies on the color of soy sauce. II.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 52(10):822-816. [12 ref. Jap]

4370. Mogi, M.; Iguchi, N. 1957. [Soy sauce and miso in 1956]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 52:109-16. (Chem. Abst. 51:17080g). [87 ref. Jap]
Address: Noda Inst. of Scientific Research Lab., Chiba.

4371. Nippon Mamerui Kikin Kyokai (Japanese Bean Foundation). 1957. Tohoku Chiho ni okeru mame-rui zakkoku-rui to no kyodo-shoku kanko hokoku [Report on local ways of eating beans and other minor crops in the Tohoku Region]. Tokyo: Nippon Mamerui Kikin Kyokai. [Jap]*

4372. Noda Shoyu K.K. 1957. [Company statistical tables]. Noda, Japan. 100 p. Unpublished manuscript. [Jap]*
• ***Summary:*** This handwritten document contains internal company statistics, such as production and sales figures from different *kura* (warehouses), prices of raw materials. In about 1956 the record keeping system was reorganized. Address: Noda, Japan.

4373. Norinsho (Ministry of Agriculture and Forestry). 1957. Nippon ni okeru daizu hinshu to sono funpu no igi [Varieties of soybeans in Japan and the significance of their distribution]. Tokyo: Norinsho. [Jap]*
• ***Summary:*** In the section on the northeastern provinces (*Tohoku Chiho*), green vegetable soybeans (*edamame*) are discussed.

4374. Segi, M.; Fukushima, I.; Fujisaku, S.; Kurihara, M.; Saito, S.; et al. 1957. An epidemiological study on cancer in Japan. *GANN* 48(Supplement):1-63. *
• ***Summary:*** Concerning stomach cancer: Consumption of miso soup or miso was associated with a decreased risk of stomach cancer.

Note: This is the earliest document seen that suggests there may be cancer-preventing substances in soybeans.

4375. Shuzui, K.; Sakamoto, M.; Tajima, O.; Kojima, Y. 1957. Gôsei seishu no kômi zôkyô ni kansuru kenkyû. IV. Seisei dasshi daizu to kôso-zai or riyô shita gôsei seishu ni tsuite [Studies for increasing the flavor and aroma artificial sake. IV. Artificial sake brewed by utilizing refined defatted soybean meal and taka-diastase]. *Kagaku Kenkyujo Hokoku* (*Reports of the Scientific Research Institute, Tokyo*) 33(6):353-58. [2 ref. Jap]

4376. **Product Name:** [Soymilk].
Foreign Name: Tônyû.
Manufacturer's Name: Ueda Tofu Shop.
Manufacturer's Address: Hachioji, Tokyo, Japan.
Date of Introduction: 1957.
Wt/Vol., Packaging, Price: 180 ml bottles.
How Stored: Refrigerated.
New Product–Documentation: William Shurtleff. 1981. Soyfoods. p. 35. "Dr. Harry Miller: Taking soymilk around the world." "Starting in about 1955 Dr. Miller started to recommend that the Adventist-run Japan San-iku School serve soymilk instead of cow's milk to the students; however the staff hesitated because of its nutritional value and flavor. In 1957 two Japanese Adventists, Mr. Hidekazu Watanabe and Mr. Hanzo Ueda (who ran Ueda Tofu Shop at the time), started making Japan's first soymilk on a small scale in Hachioji, Tokyo, bottling it is 180-ml milk bottles, and selling it locally. Mr. Watanabe later described the great value to them of Dr. Miller's ongoing technical, nutritional, and spiritual guidance. After some time, directors of the San-iku School visited the small soymilk plant, liked the soymilk flavor, and understood its nutritional value. In 1959 they bought similar equipment, set up a small plant in the school, and started to produce soymilk, which was bottled in 180-ml bottles and served to the students at every meal. In 1969 the San-iku School set up an independent food production company called College Health Foods (which later became today's San-iku Foods) and through it, with the help of Loma Linda Foods in America, began to produce Soyalac soymilk infant formula."

Letter (in Japanese) from Hidekazu Watanabe. 1981. July 19. Discusses the early history of this product. "The Ueda Tofu Shop in Hachioji helped with the product development; I was there at the time. In those days our name was *San-iku Gakuin Shokuhin-bu*, not San-iku Foods. The purpose was to provide a place of labor for the students and opportunities to learn food processing. It was not a business. Dr. Perry Webber was the principal of our school at the time. I think that our company did not make commercial soymilk before 1957. The food company is said to have been founded in 1928 in connection with the school, but legally it did not become an independent company until December 1970."

Note 1. This is the earliest known commercial soymilk product made in Japan.

Note 2. This product was the predecessor of Soyalac made by San-iku Foods.

Letter from Mr. Ichiro Tabuchi of San-Iku Foods. 1990. July 4. In 1948 Mr. Tabuchi visited Dr. Harry W. Miller and studied at his soymilk plant in Mt. Vernon, Ohio. During this period, Dr. Miller visited Nihon San-iku Gakuin (located at Chiba prefecture, Sodegaura-cho) almost every year and earnestly advised the people there to make soymilk. In about 1957-58 they started to make soymilk at a tofu plant that was owned by Mr. Ueda. They bottled it in 180 ml dairy milk bottles, which they sold with their tofu. It was a small scale operation and it didn't last long.

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Note 3. This is the earliest document seen (Aug. 2013) concerning major soymilk manufacturing companies in Japan.

4377. Yatazawa, M.; Yamazaki, Y. 1957. Absorption of fission products by plants. 5. Absorption of gross fission products. *Soil and Plant Food* (*Tokyo*) 2(3):158-63. [16 ref]*
• ***Summary:*** Discusses the absorption of radioactive waste from an atomic pile by eight crop plants, including soybeans; there was considerable variation in the uptake. The concentration of radioactive substances was highest in the tops of the family Leguminosae. Address: Nagoya Univ., Japan.

4378. Furushima, Toshio. 1957. Nihon nôgyô-shi [A history of Japanese agriculture]. Tokyo: Iwanami Zensho. 381 p. Illust. 18 cm. Iwanami Zensho 225. 16th ed. 1973. [Jap]*

4379. Griffin, Stuart. 1957. Japanese food and cooking. London: Arco Publishing. xv + 165 p. Illust. 19 cm. *
• ***Summary:*** Contains about 70 Japanese recipes.

4380. Hayashi, Yutaka; Ariyama, Hisashi. 1957. Daizu tanpakushitsu no shôka-do ni oyobosu kanetsu no eikyo [Effect of heat on the digestibility of soybean proteins]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 10(3):134-37. [18 ref. Jap; eng]
• ***Summary:*** Shows the influence of heat on the liberation of methionine, cystine, and lysine.

4381. Hosono, Shigeo. 1957. Kokusai shôhin to shiteno daizu: Kakaku kôzô to kaigai jijo [Soybeans as an international commodity]. Tokyo: Zakkoku Shôreikai. 120 p. 21 cm. [Jap]*
• ***Summary:*** Summarized in *Soybean Digest,* Feb. 1958, p. 22. Address: Staff member, General Agricultural Research Institute of Japan.

4382. Miyamoto, Kazuo. 1957. A nisei discovers Japan. Tokyo: Japan Times. [x] + 282 + [4] p. See p. 181. Illust. Port. No index. 20 cm.
• ***Summary:*** The author, a physician and American citizen, lived with his wife and two children for two years in Japan between 1937 and 1939 "just after the beginning of the China Incident." He spoke and wrote Japanese fluently.

Page 7: On 29 Sept. 1937, after just arriving in Japan, they enter Tokyo. He notes that prices are high, protein consumption is therefore insufficient, and the general population seems undernourished. Beans, including soya beans, ought to be used more extensively. Except for misoshiru [miso soup] and natto, they are apparently not widely used. He suggests that the government welfare department develop and publish soy recipes for the health of the people.

Page 48: On 8 Feb. 1938 on a trip into Yusawa, Niigata, in northeastern Japan, he went skiing. For lunch at a inn he had "natto with lots of onions to erase the odor."

On a train from Ueno station, Tokyo, he has breakfast in the diner of miso-shiru [miso soup], tsukemono [pickled vegetables], and rice for 25 *sen.*

Page 129: In Aomori at the hotel for breakfast they enjoy delicious eggplant fried in butter with shoyu, pepper, and pieces of chiso [beefsteak leaves].

Page 171: At Aoyama hot springs in Hokkaido, caught in a blizzard, he has a bento [Japanese box lunch] from the hotel that includes miso-shiru.

Page 181: On 21 March 1938 they are at the port of Shimonoseki, Japan (in southwestern Honshu, just north of Kyushu, in Yamaguchi prefecture, facing the Tsushima Strait). He notes that many people pass through this port on their way to Chosen [Korea] and Manchukuo [Manchuria].

Shimonoseki is known for its *fugu* or balloonfish (also called globefish or swellfish) for it is here that the largest catch in Japan is taken each year.

They found an eating place, Fujitomo, that served the delicacy. The raw sliced meat was arranged on a huge platter in three rows of semi-circles, so thinly sliced that it was transparent. "The above were dipped in a sauce prepared with murasaki, lime and onions. Tai, considered the king of fishes, must be allotted second place to this delicacy..."

Note 1. The word "murasaki" means purple in Japanese, and is still used in sushi shops and other specialty eating places to refer to soy sauce.

Note 2: This is the earliest English-language document seen (April 2012) that uses the word "murasaki" to refer to soy sauce.

The balloonfish is so poisonous it can kill a person; the toxin is contained in the ovaries. "At Shimonoseki, the season comes to an end at the end of March for then the spawning season begins and the danger of poisoning becomes greater."

Page 201: On a trip to Korea he enjoys *manul zany,* garlic pickled in shoyu.

In April 1955, the family returned to Japan to visit new relatives. Near Furukawa, in northeastern Japan, they inspected a "miso and shoyu factory."

Also discusses: Nori (p. 128). Wakame (seaweed, near Idzu / Izu) (p. 276). Address: Honolulu, Hawaii.

4383. Onishi, Hiroshi. 1957. Studies on osmophilic yeasts. III. Classification of osmophilic shoyu and miso yeasts. *Noda Sangyo Kagaku Kenkyusho* (*Report of the Noda Institute for Scientific Research, Japan*) 1:30-35. [13 ref. Eng]
• ***Summary:*** Reprinted from *Bulletin of the Agricultural Chemical Society of Japan* 21(3):151-56. May. Address: Japan.

4384. Onishi, Hiroshi. 1957. Studies on osmophilic yeasts.

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I. Salt-tolerance and sugar-tolerance of osmophilic soy-yeasts. *Noda Sangyo Kagaku Kenkyusho* (*Report of the Noda Institute for Scientific Research, Japan*) 1:16-21. [6 ref. Eng]
• ***Summary:*** Reprinted from *Bulletin of the Agricultural Chemical Society of Japan* 21(3):137-42. May. Address: Japan.

4385. Onishi, Hiroshi. 1957. Studies on osmophilic yeasts. II. Factors affecting growth of soy yeasts and others in the environment of a high concentration of sodium chloride (1). *Noda Sangyo Kagaku Kenkyusho* (*Report of the Noda Institute for Scientific Research, Japan*) 1:24-29. [14 ref. Eng]
• ***Summary:*** Reprinted from *Bulletin of the Agricultural Chemical Society of Japan* 21(3):143-50. May. Address: Japan.

4386. Photograph of a Japanese contingent visiting the Meals for Millions' test kitchen at Clifton's in Los Angeles. 1957.
• ***Summary:*** Ernest Chamberlain is on the far left. Lucille Brown (Food Supervisor) is 3rd from left, in the background. Jean Clinton Davis (daughter of Clifford Clinton) is 6th from left, in the background. They are reviewing Multi-Purpose Food.

This photo was taken in the test kitchen of Clifton's at 648 South Broadway, Los Angeles. The MFM offices were on the top floor of this 5-story building and the test kitchen was on the 4th floor. MFM used this space free of charge for about 10 years (1946-1956), then they moved to Seventh Street for a few years, and then to Santa Monica. The source of the photo is from an internal MFM newsletter.

This photo and date were sent to Soyinfo Center by Donald Clinton, son of Clifford Clinton (Jan. 2011).

4387. Tanizaki, Junichiro. 1957. The Makioka sisters. Translated from the Japanese by Edward G. Seidensticker. New York, NY: Alfred A. Knopf, Inc. 530 p. See p. 293. [1 ref]
• ***Summary:*** Page 293: "He always used white Kobe vinegar, never yellow Tokyo vinegar, and always a thick soy sauce not seen in Tokyo. He offered only fish taken before his very eyes, so to speak, here along the shores of the Inland Sea."

Note: What is the word for "thick soy sauce" in Japanese?

The title of the novel in Japanese is *Sasameyuki,* which means lightly falling snow. The translator, Edward Seidensticker, struggled over the title. Translations like "Fine Snow" and "Snow Flurries" do not convey the elegance or layers of meaning in the Japanese title. The novel follows the lives of the Makiokas, a wealthy Osaka family, from the autumn of 1936 to April, 1941. In Japan, the book has been called by Nakamura "the greatest cosmopolitan novel since the Meiji Restoration."

"In Osaka in the years immediately before World War II, four aristocratic women try to preserve a way of life that is vanishing. As told by Junichiro Tanizaki, the story of the Makioka sisters forms what is arguably the greatest Japanese novel of the twentieth century, a poignant yet unsparing portrait of a family-and an entire society-sliding into the abyss of modernity" (Publisher's description).

4388. Yamada, S. 1957. [Manual of the fermented food industries of Japan]. Tokyo. [Jap]*

4389. Yamamoto, M. 1957. The decreased germination of dry-seeds soaked in water (Abstract). *Biological Abstracts* 31(2):(Abst. #5834).
• ***Summary:*** A summary of a Japanese-language article published in the *Japanese J. of Ecology* 5(2):74-77. 1955. Address: Yamagata Univ., Japan.

4390. Tsukada, Toyoaki; Yamada, Yasuo. 1957? Frozen tofu (dehydrated tofu). Japan. 4 p. Undated. 28 cm. [Eng]
• ***Summary:*** This is a report on the Misuzu plant in Nagano City and the Daiya plant in Suwa City, Nagano prefecture, Japan. "The name 'frozen tofu' is somewhat misleading as the final product is a dried cake with the approximate dimensions of 2½ x 2 x 3/4 inches. The freezing of the tofu is a step in the process which develops certain desirable elastic property to the wet cake. It becomes like a sponge.

"The frozen tofu plants at Nagano and Suwa had essentially the same process but the Suwa plant was the more modern of the two in respect to engineering equipment. The Suwa plant had two completely separate units for making tofu, each one approximately the size of the Nagano plant.

"The Nagano plant reported they had used quite a few American soybeans until two years go when they changed to Chinese soybeans. In his opinion the best frozen tofu is made from Nagano beans but Nagano raises insufficient soybeans to supply the demand. The qualities desired in this product are good color and smoothness (including gloss) and bland flavor. In his process the American soybeans give equal color and smoothness but not flavor to the Chinese beans. American soybeans process as well as other beans. Some soybeans have a soft smooth taste whereas others leave a taste on the tongue. They described Brazilian soybeans as good for making tofu but not for miso. American soybeans give a high yield.

"The owner of the Suwa Plant said they could use up to 20% American soybeans in their process without loss of quality in their product.

"These frozen tofu plants operate on a large scale, of the order of 5-10 tons of beans per day. The frozen tofu process is much more readily adaptable to large scale operation than fresh tofu. All fresh tofu plants are small and usually process in the range of 100 to 200 pounds of beans per day. Because of the wide difference in scale of operation the retail price of frozen tofu is the same or even a little less than

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fresh tofu. While the frozen tofu plants have adopted more modern equipment than any of the other food processing plants, there is still much room for further modernization and improvement in efficiency of operation.

"The owner of the Suwa Plant recognizes the need for further research and development and made the following suggestions in the order indicated.

"1. Improve the freezing process–to produce an elastic type material in less time.

"2. Use of centrifuges for classification of original extract and also perhaps to concentrate the curd. Dorr thickener should be considered at the stage.

"3. Mechanization of trimming the tofu cakes to size and shape. Common problem to all frozen tofu makers.

"He did not make any suggestions on where research should be done, but mentioned of a certain person in Osaka Prefectural Institute of Industrial Promotion, Dr. K. Nakajima, who specializes in frozen tofu chemistry. Also mentioned Irie Co. of Osaka, which he suggested as a place for developing trimming and packing equipment. Following is a flow diagram of the process for making frozen tofu."
Address: 1. Director, Misuzu Co., Nagano City; 2. Director, Daiya Co., Suwa City. Both: Nagano prefecture, Japan.

4391. Ajinomoto Co. of New York, Inc. 1958. Foreign trade connections: Importers of original and finest monosodium glutamate (Ad). *New York Times.* Jan. 7. p. 76, col. 3.
• ***Summary:*** "99% pure. Mfrd [Manufactured] in Japan."
Address: 30 Broad St. [New York City]. Phone: BOwling Green 9-0089.

4392. *Times* (*London*). 1958. A truly festive season: New Year exchanges of hospitality in Japan. Jan. 25. p. 8, cols. 6-7.
• ***Summary:*** "From a correspondent." The writer gives a detailed, accurate description of New Year in Japan. Once the caller has entered a house, he must be offered food and drink, which includes: "[black soy] beans in sugar; lotus root in soya sauce; and bean curd [tofu]. The great New Year delicacy is mochi, or rice cake, made from boiled, pounded rice..." Also sake.

4393. Yokotsuka, Tamotsu. 1958. Shôyu kômi seibun ni kansuru kenkyû. XV. Hiire shôyu no kôki seibun (2) [Studies on flavorous substances in shôyu. XV. Flavorous substances in heated shôyu (2)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 32(1):23-26. Jan. [4 ref. Jap]
Address: Noda Inst. for Science Research.

4394. Okuhara, Akira; Yokotsuka, Tamotsu. 1958. Shôyu bunseki-hô ni kansuru kenkyû. I. Shôyu-chû no guriserin to sono teiryô-hô [Studies on the analytical methods of soy sauce. I. Glycerine in soy sauce and its estimation]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 32(2):138-43. Feb. [10 ref. Jap]
Address: Noda Soy Sauce Co. Ltd.

4395. Sakasai, Toshio; Yokotsuka, Tamotsu. 1958. Shôyu bunseki-hô ni kansuru kenkyû. II. Shôyu-chû no yuki-san oyobi forumôru chisso no denki-teki teihô [Studies on the analytical methods of soy sauce. II. Potentiometric titration of acidic ingredients and of formol nitrogen in soy sauce]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 32(2):144-51. Feb. [33 ref. Jap]
Address: Noda Soy Sauce Co. Ltd.

4396. *Soybean Digest.* 1958. Sees clash of U.S. and China in Japan market. Feb. p. 22.
• ***Summary:*** "Interests of the United States and communist China are certain to clash over the Japanese market for soybeans, which is important to both countries, according to a Japanese view.

"Dr. Shigeo Hosono, staff member of the General Agricultural Research Institute of Japan, points out that the United States depends on Japan for about 40% of her export market for soybeans. At the same time China–the world's second largest producer of soybeans–expects to export a substantial part of her surplus beans to Japan.

"Also, China has begun to export rice to Japan and is coming into conflict with U.S. rice exporters.

"The relationship of Chinese soybeans to international trade is discussed by Dr. Hosono in his book, the *Soybean as an International Commodity,* which was published in Japan in 1957.

"China's postwar production of soybeans has fallen well below the average prewar output of 10 to 11 million metric tons annually (in the neighborhood of 400 million bushels). The U.S. Department of Agriculture estimates 1957 soybean production in China-Manchuria at 335 million bushels.

"The sharp postwar decline in soybean production in China may be ascribable to the fact that some provinces, particularly Manchuria, did not recover entirely from war damage. And sudden changes in agriculture caused by land reform measures brought about a general decrease in crop production.

"In Dr. Hosono's view, production may be expected to recover entirely sooner or later since efforts are being made to increase yields of soybeans as well as other food crops in order to boost the supply of edible oils.

"Dr. Hosono sees communist China's potential exports at the present time as about 1 million metric tons (36.6 million bushels) annually, with about 300,000 tons going to Japan.

"Exports of soybean oil meal are restricted since meal is in heavy demand as a fertilizer to boost the output of cotton, according to the author. This is one reason why a larger part of the Chinese soybean crop is not available for export.

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"Dr. Hosono points out that exports are controlled by the Chinese government's foreign trade policy and are a monopoly of state-operated export-import companies.

"China's trade with countries in the Soviet orbit has rapidly increased since 1951 and reached 81% of total exports in 1954. Under the Soviet-Communist China trade agreement China imports machinery and equipment and exports raw materials including soybeans and vegetable oils.

"The changes in China's trade policy brought about by the communist government has naturally transformed Japan's trade with China. And Japan's peculiar relationship with the United States has brought Japan's trade with China under even more rigorous restriction.

"The U.S. embargo policy toward China hampers the development of Asiatic continental trade not only for Japan but also for West European countries. But Hosono believes there will be no difficulty for Japan to import Chinese soybeans if Japan can export goods demanded by China.

"Japanese tradesmen consider Chinese soybeans of excellent quality. Export standards call for less than 15% moisture, less than 3% foreign material and over 16% oil. And Japan can save considerable on freight charges by buying Chinese soybeans due to her geographical proximity."

4397. *Washington Post, Times Herald.* 1958. Spicy Japanese sauce gives character to meats: Discovered in Hawaii. March 14. p. C9.

• ***Summary:*** The "spicy Japanese sauce" is teriyaki sauce, which is featured in this article. Contains recipes for Teriyaki sauce (with "3 tablespoons brown sugar, ¼ teaspoon ginger, 2 cloves garlic cut, 3/4 cup soy sauce, 1 tablespoon whisky or brandy, optional, and 1¼ cups of water"), Beef teriyaki (with 1 cup soy sauce, 1 clove garlic, 1/3 cup saki [sake] or sherry, 1 inch piece fresh ginger or 1 teaspoon powdered ginger, 4 tablespoons dark brown sugar, 3 tablespoons grated onion; the beef is always cut into very thin strips, and each strip then skewered), and a variation on the latter–Liver or beef teriyaki (with "2 tablespoons shoyu {Japanese soy sauce}").

4398. Dimond, Albert. 1958. Former ASA secretary in Japan mission [American Soybean Assoc. secretary Dr. P.A. Webber]. *Soybean Digest.* March. p. 7.

• ***Summary:*** Albert Dimond, past president of the American Soybean Association (ASA). wrote this account of Dr. P.A. Webber, a former ASA secretary, after visiting him and Mrs. Webber while in Japan recently. The Webbers live and work 10 miles north of Maebashi City, and a third the way up towering Mount Takagi.

"Dr. Webber, who did his graduate work at the University of Michigan, and his wife, also a graduate of the same school, are well on their way toward building and establishing the Mount Akagi Rest Home and Rural School. This is a non-profit Christian, medical and educational center, dedicated to furnishing self-help education and a rehabilitation center for handicapped children. The center is on a mountainside farm of 125 acres.

"Dr. Webber has spent much of his life alternating between Japan and the United States, and has been in Japan since 1948.

"During the early part of his career in Japan he became thoroughly acquainted with the valuable properties of soybeans. On one of his sojourns in the United States he served as secretary of the American Soybean Association, in 1931-32.

"Among his other activities in the United States were serving on the faculties of Berea College in Kentucky and Madison College in Tennessee. He headed the latter for a time. These are both well-known self-help educational institutions. Madison College manufactures and sells soybean foods.

"Dr. Weber also did much of the research and development work on soy milk done in this country [Japan].

During World War II the U.S. government drafted him for "liaison work in Japanese concentration [internment] camps in the western" USA. He "speaks of this interval in his life with sadness. There is no mistaking his love of the Japanese people.

"Asked what was the most pressing need of the Japanese people, Dr. Webber replied, 'Nutrition.' What food? "Soybeans.' Of course it is not as simple as that, but he pointed out that Japan now consumes ½ bushel of soybeans per capita per year. The people need 3 bushels and could use 5 bushels for each person every year. Other forms of protein are beyond their pocketbooks. It is either soybeans or no protein.

"In Japan the government provides 6 years of school. The thirst for knowledge beyond that by these industrious and intense people is impossible to comprehend unless you have seen and talked with them.

"Dr. and Mrs. Webber in offering self-help educational advantages to this agricultural community are doing a wonderful service. It is an example of what can be done by a combination of science and devotion."

4399. Mogi, Kôya. 1958. Ekitai kôji-hô ni yoru shôyu no seizô ni kansuru kenkyû. II. Koji-kin puroteaze seisan-yo ekitai baiyochi no sentaku [Studies on soy-sauce production by submerged culture. II. Selection of suitable media for the production of protease in submerged culture]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 36(3):91-95. March. English summary on p. 9 of this issue. [7 ref. Jap; eng] Address: Tokyo Daigaku Nôgaku-bu, Nogei Kagaku-ka, Japan (Dep. of Agricultural Chemistry, Faculty of Agriculture, Tokyo Univ).

4400. Mogi, Kôya. 1958. Ekitai kôji-hô ni yoru shôyu

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no seizô ni kansuru kenkyû. I. Teki-sei koji-kin kabu no sentaku [Studies on soy-sauce production by submerged culture. I. Selection of suitable strains for the production of protease in submerged culture]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 36(3):87-90. March. English summary on p. 9 of this issue. [12 ref. Jap; eng]
Address: Tokyo Daigaku Nôgaku-bu, Nogei Kagaku-ka, Japan (Dep. of Agricultural Chemistry, Faculty of Agriculture, Tokyo Univ).

4401. Sakurada, Seiichi; Yamaguchi, Mitsuo. Assignors to Hohnen Oil Manufacturing Company. 1958. [Molded raw material for brewing]. *Japanese Patent* 1598. March 7. (Chem. Abst. 53:2534a). [Jap]*
• ***Summary:*** Defatted soybean flour (20 mesh, and containing 10-12% water) is mixed with 15% of its weight of water, pressed between iron plates at 100ºC to form a sheet 3 mm in thickness, cut into 3 mm cubes, heated with steam for 5-30 minutes, and dried. The product is suitable for use as a raw material (in place of whole soybeans) in fermented soy sauce.

4402. Manners, Marian. 1958. Japanese have diversified menus typical of place, season, occasion. *Los Angeles Times.* April 17. p. A7.
• ***Summary:*** A recipe for Beef sukiyaki calls for: "1 block tofu (bean curd), cut into cubes... 2 cups shoyu (soy sauce)." One dish eaten by Japanese families every day is "bean-curd soup."
Note: "Bean-curd soup" probably refers to miso soup with many small cubes of fresh tofu in it.

4403. Wood, Morrison. 1958. Hamburgers with that magic touch! These recipes here are sure to intrigue you. *Chicago Daily Tribune.* April 18. p. B10.
• ***Summary:*** Contains a recipe for oriental-style hamburgers that calls for "1½ teaspoons Japanese soy sauce," which is mixed with 1 teaspoon each of ground ginger and hot Chinese mustard, then spread thinly on both sides of two patties.

4404. Mogi, Kôya. 1958. Ekitai kôji-hô ni yoru shôyu no seizô ni kansuru kenkyû. III. Ekitai kôji ni yoru mushi-ni daizu no kosoku-teki bunkai (1) [Studies on soy-sauce production by submerged culture. III. Enzymic decomposition of steamed soybeans by submerged koji (1)]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 36(4):125-28. April. English-language summary on p. 13 of this issue. [2 ref. Jap; eng]
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Tokyo Univ., Japan (Tokyo Daigaku Nôgaku-bu, Nogei Kagaku-ka, Japan).

4405. Mogi, Kôya. 1958. Ekitai kôji-hô ni yoru shôyu no seizô ni kansuru kenkyû. III. Ekitai kôji ni yoru mushi-ni daizu no kosoku-teki bunkai (2) [Studies on soy-sauce production by submerged culture. IV. Enzymic decomposition of steamed soybeans by submerged koji (2)]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 36(4):128-31. April. English-language summary on p. 13 of this issue. [5 ref. Jap; eng]
Address: Tokyo Daigaku Nôgaku-bu, Nogei Kagaku-ka, Japan (Dep. of Agricultural Chemistry, Faculty of Agriculture, Tokyo Univ).

4406. Smith, Allan K. 1958. Use of United States soybeans in Japan. *USDA Agricultural Research Service.* ARS-71-12. iii + 36 p. April. April. Illust. 28 cm. Typewritten.
• ***Summary:*** An extremely well researched, interesting document based on a survey conducted in 1957 in Japan. Contents: Definitions of Japanese food products. Introduction. 1. Problems of Japanese food processors in using U.S. soybeans: Food production problems, foreign material, broken and dark-colored soybeans in exports. 2. Analysis of the problems. 3. Research proposals. 4. Miso: Processing, uses, production, composition. 5. Tofu and its modifications: Processing fresh tofu and frozen tofu, aburage. 6. Natto. 7. Hamanatto. 8. Kinako. 9. New products research: Soybean "milk," fermented cheese, soybean flour and isolated protein for foods, isolated soybean protein. Acknowledgments.

A graph on the front cover (and on p. 6) shows soybean production in the USA from 1938 to 1957 (in millions of acres harvested). Photos show: (1) Drying soybeans before threshing in Japan. (2) Manually operated threshing machine. (3) Power operated threshing machine. (4) Modern small-scale equipment for cleaning soybeans and grading for size. (5) Straw weaving equipment. Straw bags are used for soybeans, rice, and other farm products. (6) Cooling roasted soybeans and hand cleaning for making kinako. (7) Soybean varieties: Lincoln, White Hilum Iwate, and Acadian (six photos, showing each variety wet and dry). (8) Wooden vats used for fermenting miso; each stands a little taller than a man, and is bound with 4 bamboo hoops. (9) Miso in wooden tubs [kegs] ready for market. (10) Hand assembly of wooden tubs for shipping miso and shoyu. (11) Stone mill for wet grinding of soybeans to make tofu. (12) A modern tofu shop, with boiler, pressure cooker, filter, and precipitation vat. Photos 11 and 12 courtesy of Sugiyama Chemical Research Inst., Tokyo. (13) Deep fat frying of tofu for making aburage. (14) Wooden kegs used for fermenting hamanatto. Stone weights are used to compact the beans during fermentation.

Other figures: (1) Flow diagram of the miso manufacturing process (incl. koji). (2) Table showing total production of miso in Japan (about 1957) as reported by All Japan Miso Industrial Association. Factory made miso consists of: Rice miso 379,000 tonnes (metric tons), barley miso 146,000 tonnes, soybean miso 58,000 tonnes, total

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factory made 583,000 tonnes. Homemade miso of all types is 391,000 tonnes (67% of factory made). Total factory and home made: 974,000 tonnes. Ingredients used in this grand total: Soybeans 361,000 tonnes, rice 115,000 tonnes, barley 58,000 tonnes, salt 159,000 tonnes. (3) Table showing nutritional composition of rice miso, barley miso, and soybean miso. (4) Table showing composition of sweet miso, salty miso, and enriched miso. (5) Diagrammatic sketch of equipment used in making fresh tofu. (6) Flow diagram of a frozen tofu factory.

Note: The author was in Japan from Oct. 24 to Dec. 24, 1957. The principal localities visited were: Tokyo, Yokohama, Tochigi City, Nagano, Matsumoto, Suwa, Hamamatsu, Nagoya, Kyoto, Osaka, Fukuoka, Kumamoto, Nagasaki, and Sendai. His trip was sponsored by the Agricultural Research Service and the Foreign Agricultural Service of the USDA, and the American Soybean Association (Hudson, Iowa).

Note: This is the earliest document seen (July 2000) that mentions "barley miso"–a type of miso made with barley koji, soybeans, and salt. Address: Head of Meal Products Investigations, Oilseed Crops Lab., NRRL, Peoria, Illinois.

4407. Smith, Allan K. 1958. Use of United States soybeans in Japan: Hamanatto (Document part). *USDA Agricultural Research Service.* ARS-71-12. iii + 36 p. April. See p. 29-31. April. Illust. 28 cm.

• ***Summary:*** "Hamanatto: Hamanatto, sometimes spelled hamananatto, is made by fermenting whole soybeans. Hamanatto is produced in a limited area in Japan in the vicinity of Hamanatsu [sic, Hamamatsu in Shizuoka Prefecture, central Japan]. Hamanatto should not be confused in any way with natto. The only resemblance between the two products is that both are made by fermenting whole soybeans. Hamanatto has a pleasant flavor resembling miso or shoyu but is sweeter. Factors unfavorable to the popularity of hamanatto seem to be its very dark color (black) and its rather high cost. Hamanatto is said to cost four times as much as miso.

"Hamanatto is reported to have come to Japan by way of Korea about 350 years ago at the time of the Japanese invasion of that country. Natto means 'contributed beans' and hamanatto was contributed to the Japanese warriors. The process is reported to have originated in Buddhist temples where it was developed as a source of protein. The ancestors of the people owning the Yamaya Brewery and the Saito Mido Plant of Hamanatsu [sic] are said to have inherited the process from the Buddhist monks.

"In making hamanatto the beans are soaked in water for 4 hours and steamed without pressure for 10 hours. The cooked beans are spread on the floor for cooling to 30ºC. Koji prepared from roasted wheat or barley is sprinkled over the beans to cover their surface. The Japanese are very particular to cover the entire bean surface. The inoculated beans are placed in trays in a fermenting room for about 20 hours; during the fermentation the beans acquire a good coating of green mold. When taken from the fermenting room they are covered with a sticky material and must be separated and dried in the sun to about 12 percent moisture. This can be accomplished in one day if the weather is warm and sunny. At one factory the beans are carried to the roof for drying.

"The dry beans are placed in wooden buckets [kegs, bound with bamboo hoops] that have a capacity of about 15 gallons. Strips of ginger are placed in the bottom of the buckets before adding the beans and the salt water to cover them. A [wooden] cover that fits inside the bucket is placed over the beans and a very heavy weight placed on the cover. Rough stones estimated to weigh about 100 pounds are used for weights. Figure 18 [a photo] shows the buckets with the stone weights used during fermentation, which requires 6 to 12 months and must include one full summer. During fermentation the beans acquire a dark reddish color that is not unpleasing. After fermentation is completed and the beans are dried in the sun, they turn black. Hamanatto contains about 11 percent salt, said to be the cause of their turning black. Hamanatto will keep at room temperature for 1 year or longer.

"The makers of hamanatto, now using only Japanese soybeans, prefer a very select grade grown only in Hokkaido because they are large, are uniform in size, and are free of foreign matter. They claim to pay ¥4,500 for 60 kg. of specially selected beans; an equal quantity of U.S. [soy] beans would cost them ¥3,000. On this basis the relative cost per 60-pound bushel of Hokkaido and U.S. soybeans is $5.65 and $3.80, respectively.

"An analysis [of Hamanatto] supplied by the Yamaha Brewery is as follows: Water 39 percent, total nitrogen 3.8 percent, water-soluble nitrogen 2.6 percent, reducing sugars 7.0 percent, total sugars 10 percent, crude fiber 12.5 percent, ash (including 11 percent sodium chloride) 12 percent, volatile acids 0.015 percent, total acids 1.2 percent, and pH of water suspension 5.1. The composition of hamanatto probably varies considerably.

"If hamanatto could be produced in dark red rather than black color and the process modernized to bring the cost more in line with other fermented soybean products, it should have much wider acceptance and use."

Note 1. This is the earliest document seen (Nov. 2011) stating that Hamanatto [fermented black soybeans] were made at Yamaya temple in Hamamatsu.

Note 2. This is the earliest document seen (Jan. 2012) that uses the word "sticky" (or "stickiness," etc.) to describe Hamanatto. Address: Head of Meal Products Investigations, Oilseed Crops Lab., NRRL, Peoria, Illinois.

4408. Smith, Allan K. 1958. Use of United States soybeans in Japan: Kinako (Document part). *USDA Agricultural*

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Research Service. ARS-71-12. iii + 36 p. April. See p. 31-32. April. Illust. 28 cm.
• ***Summary:*** "Kinako is a Japanese product that corresponds more nearly to full-fat soy flour of the United States than any other product. Making kinako is a very simple process. Soybeans are roasted for one-half hour or longer in a gas-fired rotating drum to remove the bean flavor; roasting is continued until the characteristic toasted flavor so well known to soybean processors is acquired. The beans are then cooled by spreading on a straw mat in the open as shown in Figure 7 [p. 9]. Foreign matter is removed by hand, the beans are ground to a moderately fine flour, and the kinako is packaged by hand in plastic bags.

"The Kinako Association has l6 members in Tokyo and about 50 in all of Japan. Maximum production capacity of any of these plants is probably not more than 5 tons per day. Production of kinako is seasonal; December is the month of highest production. Production originated in farm homes as a small family industry; later, mechanization of the process was improved, and it became established as a commercial process.

"One of the principal ways of using kinako is to sprinkle it on rice or rice cake [mochi]. Rice cake is made by pounding cooked rice, and the kinako is sprinkled on the macerated product. The poor people of Japan are the principal users of kinako; it should be an excellent protein supplement for their rice. However, it is not known whether the nutritional value of kinako has ever been determined. It could be greatly improved by dehulling the soybeans. Dehulling would increase the protein content about 6 percent and remove undesirable fiber.

"There is not much known about the relative improvement in nutritional value obtained by roasting whole soybeans and steaming the grits. It is possible that if the beans selected for roasting happen to have a low moisture content, they would fail in gaining their best nutritional value. Comparative nutritional values should be made on roasted and properly heated soybeans. If the roasting treatment is inadequate, a conditioning or steam treatment should be installed in the process. The new procedure suggested would be to clean soybeans mechanically, crack the beans into grits, remove the hulls, condition the grits with steam, then roast and grind. Modernizing kinako factories would reduce labor cost, improve quality, nutritional value and color, and further extend its usefulness to other foods as in the fortification of bread, noodles, and other cereals."
Address: Head of Meal Products Investigations, Oilseed Crops Lab., NRRL, Peoria, Illinois.

4409. Watanabe, Ken; Yoshikawa, Mitsuyoshi; Nonoguchi, Yoshitaka; Kondo, Seigo. 1958. [Studies on *Bacillus natto* protease. VI. Crystallization of an inhibitor of *Bacillus natto* protease present in potato]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 32(4):260-62. April. [15 ref. Jap]
Address: Biochemical Lab., Hyogo Univ. of Agriculture, Hyogo-ken, Japan.

4410. Matsushita, Korechika. 1958. [Coating material for baking pans]. *Japanese Patent* 3535. May 9. (Chem. Abst. 53:8663a). [Jap]*
• ***Summary:*** Soybean-oil fatty acid used.

4411. *Washington Post.* 1958. Menu boasts Far East flavor: Anne's reader exchange. May 9. p. C6.
• ***Summary:*** A reader sends in a recipe for Sukiyaki, which calls for "1 cake bean curd (tofu), cut in small squares." It should be cooked in "cooking soy sauce," which includes "½ pint Japanese soy sauce."

4412. Hori, Shinichi; Motosaki, S.; Yoshida, T.; Hino, T.; Ito, K. Assignors to Ajinomoto Company. 1958. [Decolorization of amino acid soy sauce and simultaneous separation of aromatic amino acids]. *Japanese Patent* 3789. May 16. (Chem. Abst. 53:5586g). [Jap]*
• ***Summary:*** A hydrochloric acid hydrolyzate of protein is treated for separation of glutamic acid. The mother liquor (1000 ml) is treated by passing it through 300 gm of a non-ion-exchanging decolorizing resin at a rate of 10 ml/minute to obtain 85% decolorized soy sauce. The resin is washed with 300 gm water and the effluent concentrated to 30 ml to separate 0.7 gm tyrosine. Further concentration of the mother liquor gave 2.7 gm phenylalanine-hydrochloride.

4413. Kohzu, Tokuichiro; Mori, H.; Tadokoro, Y. 1958. Daizu kasu no ensan kasui bunkai ni yoru gurutamin-san seizô no kiso-teki kenkyû. V. Mi shori daizu kasu no kasui bunkai [Fundamental studies on manufacturing glutamic acid from soy-bean meal by hydrolysis with hydrochloric acid. V. Hydrolysis of raw soy-bean meal]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 32(5):333-37. May. [1 ref. Jap]
Address: 1. Nagano Junior College; 2. Tohoku Univ., Sendai; 3. Quartermaster Section, General Staff Office, Japanese Self-Defense Force.

4414. *Soybean Digest.* 1958. The news in brief: The crop, markets and other items of note. May. p. 9-10.
• ***Summary:*** Contents: New market programs for Spain, Italy. Outlook for Japan trade muddled ("A total of 265,000 metric tons of Chinese beans has been contracted [by Japanese buyers] as of April 15"). Soybean planting just started. Railroads ask for lower rates. Margarine bill passes House (H.R. 912 would "permit the serving of margarine to U.S. Navy personnel, but with the amendment that it can be served only when surplus stocks of butter from Commodity Credit Corp. are not available").

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4415. Yamashita, Taizo; Kawai, Sadao. Assignors to Nagao Research Institute. 1958. [High-protein foods from soybeans]. *Japanese Patent* 4542. June 7. (Chem. Abst. 53:9515g). [Jap]*
• ***Summary:*** Skin-free and fat-extracted soybeans are treated with acetic acid, alum, and sodium carbonate to obtain protein-rich food material containing 70% water which may be used as an ingredient for biscuits or macaroni.

4416. Hori, Shinichi; Matsumi, M.; Yoshida, T. Assignors to Ajinomoto Company. 1958. [Removal of iron from amino-acid soy sauce]. *Japanese Patent* 4546. June 9. (Chem. Abst. 53:9567c). [Jap]*
• ***Summary:*** A solution of 84 gm pyrogallol, 36.7 gm resorcinol in 363 ml water, and 50 ml 1 normal sodium hydroxide at 60ºC is treated with 25.4 ml of 35.5% formalin and let stand for 15 minutes to obtain a precipitate. This precipitate is mixed with water, heated for 2 hours at 180ºC in an autoclave, and the product ground to 20-30 mesh. Then 250 ml amino-acid soybean sauce (containing 9.51 mg iron/100 ml and 2.85 mg nitrogen/100 ml) of pH 7 is treated by passing through a glass tube containing 50 ml of the ground product to obtain an effluent containing 1.23 mg iron/100 ml. The resin can be regenerated by washing with 0.1 normal hydrochloric acid and water.

4417. Inoue, Norimasa; Oshima, Takeichi. 1958. Futatabi nattô no eiseigaku-teki shiken [Further sanitary test of natto]. *Eiyogaku Zasshi* (*Japanese J. of Nutrition*) 16(3):91-92. June. [2 ref. Jap; eng]
• ***Summary:*** Fourteen samples of natto were obtained from the market, made by different makers in Tokyo. These included 7 samples in rice-straw packages and the same number on wood shavings. All were examined by isolation of Aerobacter type bacteria, with the following results.

(1) Ten samples were found to contain Aerobacter type bacteria (5 each straw and wood shaving packages). (2) Among those ten, seven were identified to contain *Aerobacter aerogenes,* two to contain *Aerobacter cloacae,* and one to contain *Aerobacter mannanolyticus.* Address: National Nutritional Research Lab. (Kokuritsu Eiyô Kenkyûsho).

4418. Kirby, Riley H. 1958. Communist China and the Japanese farm market. *Foreign Agriculture* 22(6):5-7. June.
• ***Summary:*** The article starts: "After this article went to press, Communist China notified Japan that it was suspending all trade between the two countries."

For many years before World War II, China was one of Japan's major trading partners. "During the early and middle 1930's China accounted for one-eighth of Japan's total imports and one-fourth of its exports." Today about 75% of Japans imports from Mainland China consist of agricultural products. "Rice and soybeans make up about 70% of this amount," with soybeans being Japan's main import from China since 1955. Five graphs (p. 7) show these various import and export relationships between Japan and China. Address: Regional Economist, Asia and the Middle East branch, Foreign Agricultural Services.

4419. Masuyama, Shinroku. 1958. Shibô-zoku kôkyû arukôru ni kansuru kenkyû. XI. Fuhôwa kôkyû arukôru no poriechirin gurikôru eeteru ni tsuite [Studies on the higher fatty alcohols. XI. Preparation and properties of some ethenoxylated unsaturated higher fatty alcohols]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 32(6):440-43. June. [9 ref. Jap]
• ***Summary:*** Glycol ethers of fatty alcohols were produced from soybeans and corn. Address: The Osaka Municipal Technical Research Inst., Osaka, Japan.

4420. Masuyama, Shinroku; Yasuhara, Satoshi. 1958. Shibô-zoku kôkyû arukôru ni kansuru kenkyû. XII. Shibô-zoku kôkyû arukôru kuensan esuteru-rui no kôsanka-sei ni tsuite [Studies on the higher fatty alcohols. XII. Some citric acid monoesters of higher fatty alcohols as antioxidants]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 32(6):443-45. June. [8 ref. Jap]
• ***Summary:*** Glycol ethers of fatty alcohols were produced from soybeans and corn. Address: The Osaka Municipal Technical Research Inst., Osaka, Japan.

4421. *Soybean Digest.* 1958. The news in brief: The crop, markets and other items of note. June. p. 11-12.
• ***Summary:*** Contents: Soybean planting going well (percentage of planting completed in major states). Sees continued expansion of U.S. oilseeds. The outlook for soybean oil meal. Japan market uncertain. Prices for oilseeds and fats and oils, cif Rotterdam and Hamburg, week of May 24 (dollars per metric ton) reported by Albrecht H. Zetsche (U.S. soybeans, May $96.50. U.S. soybeans, Sept. $93.00. Chinese black soybeans, June-July $81.62. Chinese green soybeans, June-July $87.08. Chinese yellow soybeans, June-July $92.40).

4422. Tanaka, S.; Ueda, R. 1958. [Studies on the inorganic components in shoyu. I. On calcium and magnesium contents]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 36(6):251-57. June. English summary on p. 24 of this issue. [2 ref. Jap; eng]
Address: Dep. of Fermentation Technology, Faculty of Engineering, Osaka University, Japan.

4423. Ide, Fumio; Naraba, Tsunezo. Assignors to Nippon Telegraph & Telephone Corp. 1958. [Denatured oil paint containing titanium]. *Japanese Patent* 5549. July 26. (Chem. Abst. 53:1775a). [Jap]*
• ***Summary:*** Fatty acids from soybean oil are one of the

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ingredients.

4424. *Foreign Agriculture.* 1958. Foreign competition in oils and oilseeds. 22(7):19-21. July.
• ***Summary:*** "The United States is the world's largest producer of oils and oilseeds, and our competitive position in the international market is enhanced by our large exportable supplies of these commodities. We ship about 45 percent of the edible oils and oilseeds that move in world trade and about 50 percent of the flaxseed and linseed oil. Without substantial supplies of our edible oils the importing countries of the world would find it hard to meet their requirements, since the amounts available for export from other countries fall short of what is needed.

"For U.S. growers this trade is essential. Currently, our edible oil exports–mainly soybean and cottonseed oil–total about one third of our production, flaxseed and linseed oil about one-fifth. We have the potential to produce even more, so the question is–can we move it into world trade?"

"Dual market for soybeans: The United States and Communist China produce and export nearly all of the world's soybeans. There is a dual market for them. In the Western world the beans are crushed, the oil is used for both edible and non-edible products, and the meal is fed to animals. In the Orient a large portion is consumed as food.

"Japan is one of the major markets for soybeans and it is a dual market. Here large quantities of beans go directly into food products, and the remainder are crushed. Yet even after the crushing, most of the meal is used for human food and very little for animals. While Japan imports many more soybeans from us than it takes from Communist China, there are signs that we may lose part of this market to China because Japan is short of dollar exchange. Some groups in Japan, mainly the steel industry, would like to expand trade with China as an alternative market for their products, which cannot be absorbed domestically. Two trade agreements between groups in Japan and China were signed earlier this year for just this purpose. Apparently they have fallen through, at least temporarily.

"Where the United States gains most in world markets is through its large exportable supplies of soybeans. Europe has a sizable modern crushing industry which must be kept busy. Since the trend in many of the other oilseed-exporting countries is to crush the seed locally and only export products, Europe has increasingly turned to the United States for raw materials. India and Argentina, for instance, are exporting oilseed products and not the seeds."

A photo shows soybeans being loaded onto a ship in Tientsin Harbor, China.

4425. Hayashi, Shizuka. 1958. Hold 1-day meeting for Tokyo teachers. *Soybean Digest.* July. p. 24.
• ***Summary:*** The Japan Shoyu Association and the Japanese American Soybean Institute jointly sponsored a 1-day meeting to promote shoyu consumption. Attended by approximately 250 high school teachers who specialize in cooking courses, it was held in the Shoyu Association's hall. Mr. Shoda, president of the Shoyu Association, gave the opening speech. He was followed by Mr. Komiya, managing director of the Association, who explained that the Association is always working to improve shoyu quality and to produce shoyu that will be welcomed by housewives. "Mr. Komiya said a poor quality shoyu, which is produced in a few days time by a simple method, is by no means comparable to naturally produced shoyu in quality and flavor. The Association is discouraging the production of such low quality shoyu. He suggested that housewives learn to distinguish good quality from inferior shoyu. Low quality shoyu spoils the appetite while high quality shoyu which has a pleasant flavor and a bright scarlet color, enhances the appetite and gives better taste to food prepared from shoyu." Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building, No. 1, 1-Chome, Yuraku-cho, Chiyoda-ku, Tokyo, Japan.

4426. Hayashi, Shizuka. 1958. Soybean oil cooking contests [in Tokyo, Japan]. *Soybean Digest.* July. p. 24.
• ***Summary:*** In April, the first of a series of three soybean oil cooking contests was held in Tokyo, sponsored by the Oil and Fat Manufacturers Association and the Japanese American Soybean Institute. The second contest was held in Osaka at the Mitsukoshi Department Store Hall where approximately 800 housewives and others gathered to see the demonstrations. The third contest was held in Nagoya. Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building, No. 1, 1-Chome, Yuraku-cho, Chiyoda-ku, Tokyo, Japan.

4427. Fukushima, D.; Mogi, M. 1958. [Treatment of soybeans]. *Japanese Patent* 6817. Aug. 19. [Jap]*
• ***Summary:*** Describes solvent extraction using ethyl alcohol.

4428. Asao, Yasuo; Yokotsuka, Tamotsu. 1958. Shôyu kômi seibun ni kansuru kenkyû. XVI. Nama shôyu no kômi seibun (2) [Studies on flavorous substances in soy sauce. XVI. Flavorous substances in raw soy sauce. (2)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 32(8):617-22. Aug. [14 ref. Jap]
• ***Summary:*** Discusses acidic compounds. Address: Noda Soy Sauce Co., Ltd., Noda, Japan.

4429. Asao, Yasuo; Yokotsuka, Tamotsu. 1958. Shôyu kômi seibun ni kansuru kenkyû. XVII. Shôyu-chû no guayashiru seibun (1) [Studies on flavorous substances in soy sauce. XVII. Guaiacyl compounds in soy sauce (1).]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 32(8):622-28. Aug. [16 ref. Jap]
Address: Noda Soy Sauce Co., Ltd., Noda, Japan.

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4430. Hayashi, Shizuka. 1958. Activities of the Japanese American Soybean Institute. *Soybean Digest.* Sept. p. 30, 32.
• ***Summary:*** Contents: Introduction. Chronology of activities carried out by JASI. October, November 1957. December (JASI's new film about soybeans titled "Green Bud" was shown for the first time). January 1958. January. February. March. April. May. June. July. Kitchen car. Results. Chinese soybeans (the most important problem of all).

Japan has a long history of importing soybeans from China. The quality is good and the freight is less than soybeans shipped from the U.S. "Until the trade between Japan and China came to a break," many Japanese food manufacturers preferred Chinese soybeans. In March 1958 a barter contract was signed between Japanese importers and "Red China" involving about 300,000 tons of Chinese soybeans. Most of these were to be bartered for Japanese steel goods to be exported to China. Japan-China trade groups made strenuous efforts to persuade the Japanese government to approve the purchases. JASI, George Strayer (who happened to be in Japan at the time), and top level officials at the U.S. embassy in Japan struggled to stop these soybean imports from China–for they would have replaced U.S. soybean imports to Japan. This strong protest, followed by suspension of trade talks between Japan and Formosa [Taiwan] led to a "final disruption of the overall trade between Japan and Red China. The soybean contracts have been scrapped." JASI won–this time. Address: Managing Director, JASI.

4431. Miller, Harry W. 1958. Soybeans meeting nutritional needs in undeveloped countries. *Soybean Digest.* Sept. p. 68-73.
• ***Summary:*** "It was at the Dearborn, Michigan, meeting of the American Soybean Association held Aug. 18-20, 1940, that I presented a paper on 'Soybeans in Human Nutrition." In this paper I ventured the statement that while soybeans and the interest in them were chiefly valued for their oil content, I foresaw the day would come when soybeans in some form or other would become a regular item in the American diet for humans. The bean flakes and cake were discarded as fertilizer, except to a slight extent they were beginning to be used as stock feed, with a certain amount of credulity.

"At that time we were buying soybeans for a penny a pound, largely as a result of the fact that the value of their high biologic protein was not fully appreciated in animal feeds. Today it is being strongly emphasized and well authenticated that the soybean is one of the world's greatest protein yielders, and protein, as its name indicates, is of prime importance in maintaining the life and nutrition of mankind."

In countries where meat and dairy products as suppliers or protein are unavailable, or form a very small amount of the dietary, there is noted a predominantly high incidence of infections, as also a low life expectancy averaging from 25-30 years. This is directly related to a low intake of high quality protein. In these countries the most noticeable and severely injured classes are those of the newly weaned infant, the growing child, and expectant and nursing mothers. During these ages and conditions the demand for the ratio of protein in the diet is double that of the average adult man and woman. The impact of protein deficiency is more than any other factor the cause of deterioration healthwise in nations where this lack exists."

In the United States: "One-half of the products of cultivated land is fed to animals..."

"E.J. DeCastro, in his book *The Geography of Hunger* comparing animal and vegetable sources of protein states, 'The conversion of vegetable calories into animal tissue has long been known to be inefficient. Only 15% of vegetable calories is recovered in producing milk, 7% in eggs, and only 4% in beef.'"

Three tables (p. 70) show "that the value of food obtained from an acre of soybeans is three times that of wheat and twice that of corn. The reason we do not appreciate these values in this country is that we overproduce corn and wheat for edible purposes, but scarcely use any soybeans for human consumption."

"Up to this time the only agricultural product that has given any promise of being a replacement for animal milk is found in the soybean."

"The Japanese are perhaps the best per capita nourished people of the Asiatic races. Imagine them as maintaining a population that is more than half that of the United States on tillable soil no more than that found in the state of California. Through intensive farming and heavy use of fertilizers to the soil they have raised the yield per acre of land to a production of 13,000 calories per day. And on their land they are able to supply the nutritional requirements for a person on 0.2 acre, as contrasted to 1.8 acres in America. One-half of the calories of farm products in the United States go to animal feed. But in Japan only 5% of their calories come from meat, milk and eggs. Their annual consumption of the soybean as their main protein supplier is 50 pounds per capita,..."

"Milk Plant in Shanghai: After 1945 it looked as though we had a little open time for the development. The Chinese government put in a million-dollar soybean plant in Shanghai. It was completed and ready for operation just prior to the takeover of Shanghai by the Communists in 1949 which ended this.

"But the soy milk business has been spreading to other parts of Asia, first to the Philippines then Hong Kong, and now it has been taken up by the United Nations who are pushing the use of soy milk in Indonesia. The Indonesian people have used Tempe [tempeh], which is a form of boiled soybeans that have been inoculated with the aspergillus [sic,

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Rhizopus]. In that way they have consumed a considerable amount of soybeans. But here the bean was not in a form Where babies or young children could make use of it."

"Now with the ability to install practical soy milk and soy cheese [tofu] plants in countries, especially the tropics, where soybeans do not grow well and the need of protein is so great, there is opened to the soybean industry a tremendous field of opportunity. This field should also receive a liberal apportionment of funds for research. Some research has been given to this subject, but it's infinitesimal with what is required."

Photos show: (1) Portrait of Dr. Miller. (2) A "factory at Jogjakarta in central Java that produces a ton of soy milk [Saridele] every 7 hours. It is a cooperative venture between FAO, UNICEF, and the Indonesian government. Construction was supervised by H.W. (Bill) [Willis] Miller, son of the author." Water buffaloes are pulling a cart on a street in the foreground. Address: M.D., Director, International Nutrition Research Foundation, Arlington, California.

4432. Nagata, Tadao. 1958. Studies on the flowering and fruiting of summer vs. autumn soybean types. V. Effects of the day length after flower primordia initiation upon the flowering process with reference to the adaptation to planting time in autumn soybean type. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 27(1):87-90. Sept. [11 ref. Eng; jap]

• ***Summary:*** Adaptation of soybean to planting time has been of great interest to human beings since ancient times, when it was discussed in the *Lu-shi chun tsiu* (ca. 250 B.C.).

"In the temperate zone of Asia such as Central and South China and South Japan, the differentiation between summer vs. autumn soybeans–the former is a short season crop planted in April, and the latter a full season crop planted from June to July–is a well known fact as recorded in many old documents in China, such as *Ch'i-min yao-shu,* and *Tien-kung kai-wu,* and in Japan, such as *Nogyo zensho, Seikei zusetsu* and *Honzo zufu."*

The author has already reported the following: (1) For autumn soybean types, the variation of seed yield corresponding to a given planting time depends on the flowering process rather than on the ratio of pods to flowers. (2) Autumn soybean types had more flowers of moderate duration when they were planted in June, but fewer flowers that were too long in duration when they were planted in April.

In this experiment a typical autumn soybean type (also called a "late flowering soybean"), Akazaya-shirodaizu, belonging to class VII, was planted on May 5 in 1954 and April 25 in 1955. Some plants were given short day treatment before and after flowering primordia initiation. The author found an important new relationship between the planting time and the day length after flower primordia initiation. He found that the day length after flowering primordia initiation controls the flowering duration and the number of flowers per day. If the autumn soybean in planted at the proper time, it will bear abundant flowers in a comparatively short duration and have a high seed yield. Thus planting time is the key to high yield and this is primarily a phenological response to the variation in day length. Address: Hyogo Agricultural College, Japan.

4433. Rose, Florence. 1958. Plan international nutrition conference: Propose a working conference of officials from interested countries to tackle world nutrition problems. Soybeans can play a big part. *Soybean Digest.* Sept. p. 74-76.

• ***Summary:*** This is the text of a speech made by Florence Rose of MFM at the American Soybean Association's 38th annual meeting (On Aug. 20). Her actual mimeographed speech was titled "Soybeans Lead Bread–Through the World's Hunger Fronts."

During the past 12 years, the Meals for Millions Foundation, Inc. has sent over 54 million of these "3¢ meals based on soy grits to over 100 countries around the world.

ASA's 38th annual convention in Memphis, Tennessee, was the site of the second stage of the Multi-Purpose Food (MPF) idea "which is to assist other countries to produce their own counterpart Multi-Purpose Food, from their own resources." Today, in India, there is a MPF that utilizes peanuts as the protein source. "The Minister of Agriculture of India became president of our Indian Meals for Millions Association formed in 1955 to make the Indian people aware of this new approach to their age-old problem. Prime Minister Nehru authorized funds for the initial pilot plant now operating at the Central Food Technological Research Institute at Mysore." MFM has aided the take-off of the pilot plant by purchasing over 100,000 pounds of the Indian product–in addition to the 10 million meals of soy-based MPF shipped to India prior to 1956.

"The great United Nations agency, UNICEF, is prepared to assist the government of India in setting up large-scale production, after certain preliminaries are completed." A "grant of $25,000 has been made to our nongovernmental Indian affiliate to help it popularize and publicize the existence of this new food."

There is also a soy-based Multi-Purpose Food in Brazil now. In the Philippines and Japan Meals for Millions is working to develop local production of MPF. In Japan, in "cooperation with Mr. Shizuka Hayashi and your Japanese-American Soybean Institute, we hope there will soon be a Japanese MPF utilizing American soybeans as the protein base."

With its small budget and staff, MFM began looking for a short-cut that might cut the time between a good idea and concrete action.

"Trial balloon: This is the background that led us to send up a trial balloon in the May issue [article, p. 20-22] of

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the Soybean Digest proposing the idea of an International Conference to which would be invited principally officials on the ministerial levels from interested countries..."

Recently Florence Rose and Ernest Chamberlain (MFM secretary) presented the idea at the recent World Health Organization (WHO) assembly that met in Minneapolis, Minnesota, from May 22 to June 24. They personally discussed the conference with the ministers of health or their deputies from 27 of the 85 countries represented. "All expressed enthusiasm in participating in such a conference if the means could be developed to bring them to the conference location." Such a conference might be sponsored by the California Institute of Technology or one of the United Nations agencies such as WHO, FAO, and/or UNICEF. Best of all would be the American Soybean Association. Specific commitments to initiate MFM programs were given by ministers from Ceylon, Indonesia, and Liberia.

"Yesterday, Dwayne Andreas of Honeymead Products Co. gave us an inspiring example of what interest can mean, by offering Meals for Millions a [rail] carload of soy grits, a gift that will help provide an additional half-million meals of soybased MPF that can tremendously accelerate our programs in Japan and Spain and Italy." Address: Executive Secretary, MFM Foundation, Inc. [Los Angeles, California].

4434. *Soybean Digest.* 1958. Harry Willis Miller honorary life member [of American Soybean Association] 1958. Sept. p. 10-11.

• ***Summary:*** "Dr. Harry Willis Miller, director of the international Nutrition Research Foundation [INRF], Arlington, California, was born 79 years ago in Ludlow Falls, Ohio. Although renowned as one of the world's leading thyroid surgeons, he also has spent many years in soybean research and has done much to perfect and promote soybean food products on the American market.

"As a medical missionary sent to pioneer the work of Seventh-Day Adventists in China from 1903 to 1911, he wondered how he could aid the millions of undernourished Chinese children–hundreds of infants dying daily from malnutrition.

"After years of investigation and practical experimentation with one of the most staple foods in China, he discovered a method of 'milking' soybeans and perfected a palatable formula suitable for both infants and adults.

"The response to the product was spectacular. To meet the immediate demand machinery was shipped to China, and under Dr. Miller's management the first modern vegetable milk plant in the world was put into operation. Until the outbreak of war in Shanghai in 1937, fresh soybean milk was delivered daily to hundreds of homes in Shanghai.

"For the service he rendered to the people of Free China in saving the lives of countless thousands of infants with the use of soybean milk and for his untiring efforts in establishing a dozen or so sanitariums-hospital clinics in the Orient, he has received National China's highest honor. In 1956 Dr. Miller was decorated with the Brilliant Blue Star by Generalissimo Chiang Kai-shek himself.

"Although Dr. Miller has certificates to practice medicine in nine of the 49 states and 11 foreign countries, and even at his age retains a steady hand for surgery cases, he continues to devote much time to the development and perfection of soybean foods.

"Despite his full life as a general medical practitioner, and many years spent superintending numerous Chinese sanitarium-hospitals, serving as president of the Seventh-Day Adventist mission in prewar China, managing and editing the Chinese Signs of the Times, authoring many medical books and articles and lecturing around the world, he has managed to continue his soybean research and experimentation whatever his location.

"From 1939 to 1950, while medical director of the Mount Vernon, Ohio, sanitarium and hospital, he opened a research laboratory where he developed a new improved soy milk, soy-olive sandwich spread, and numerous other nutritious foods made from soybeans and grains, and initiated the International Nutrition Laboratory of America which later became the INRF which he has heavily endowed.

"In 1951 he sold his growing soybean food industry to the Loma Linda Food Co. and came to Arlington, California, where he now makes his home and spends as much time as possible in the new laboratory placed at his disposal by Loma Linda. Two years ago, the World Health Organization became interested in Dr. Miller's progress in developing a superior soy milk and modeled a million-dollar factory in Indonesia after the Loma Linda food factory which he had pioneered in Mount Vernon, Ohio. At the present time WHO is also providing $30,000 for an intensive 2-year infant nutrition research program at a leading U.S. hospital using his soy milk formula.

"Since his appointment as director of the INRF, has laboratory and experimental work have been frequently interrupted to answer please for help from his medical colleagues in foreign lands. From 1954-1956 he went to Penang [Malaysia] and Formosa to serve as medical director and surgeon for the hospitals there, took a similar post for 2 months in Trinidad in 1956, another in Libya in 1957, and he is now filling the post of medical director and surgeon at the Tokyo Sanitarium-Hospital in Japan during a 6-month leave of absence by an SDA medical-missionary.

"Despite his present busy daily routine at the sanitarium he is continuing his work with soybeans and has a nearby tofu shop deliver soy milk daily to the sanitarium in 5-gallon containers. Since his arrival he has introduced soy whipping cream for daily use at the sanitarium and routinely prescribes soy milk to allergic Chinese infants. He writes that he was surprised to find that the soy milk he helped perfect for the Loma Linda Food Co. is now obtainable by military personnel at the U.S. army post exchanges in Japan."

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Note 1. This is the earliest published English-language document seen (Oct. 2013) that contains the term "Soy whipping cream."

"While other men have rightly taken up golf, fishing, or other hobbies, Dr. Miller has devoted most of his spare time to research and development of vegetable foods. 'Soybeans have been my lifetime hobby,' he declares. Small wonder he is known from East to West as the man who gets 'milk from an iron cow.'

"Over the years Dr. Miller has been among the most active supporters of the American Soybean Association. He was chosen an honorary life member of the Association at the Des Moines convention. The award was made in his absence in Tokyo during the annual banquet."

Photos show: (1) Dr. and Mrs. Miller with Madam and Generalissimo Chiang Kai-shek. (2) Dr. Miller in Libya in 1957–standing outdoors and dressed in his plain white doctor's outfit. (3) "C.G. Simcox presents honorary life membership award to C.P. Miles, manager Loma Linda Food Co., Mt. Vernon, Ohio, in behalf of Dr. H.W. Miller. Award will be formally presented to Dr. Miller in Tokyo by Shizuko Hayashi, managing director of the Japanese American Soybean Institute."

4435. Sugiyama, Mototaro. 1958. The soybean situation in Japan. *Soybean Digest.* Sept. p. 34.

• ***Summary:*** Mr. Sugiyama is also president of Hohnen Oil Co., which consumes the largest quantity of soybeans imported into Japan.

"As you know, our country is today the No. 1 buyer of American soybeans in the world, and approximately 80% of the total imports are used by our crushing industry.

"First of all, I wish to report to you about the problem of Chinese soybeans in Japan in which, I think, all of you are most interested at the moment.

"The modern Japanese crushing industry started from the processing of Manchurian soybeans about a half century ago, and because of the long experience and familiarity with Manchurian soybeans many processors even today have a feeling of nostalgia for soybeans from the Chinese Mainland. But nostalgia and actual commercial trade are two entirely different things.

"At the beginning of this year, there arose the problem of importing Chinese soybeans on a barter basis in exchange for Japan's exports of steel products to Communist China, and we as buyers of soybeans felt it necessary at that time to state our position clearly as follows:

"1. We will be prepared to buy Chinese soybeans if they are competitive both in quality and in price with American soybeans.

"2. We strongly desire that the trade method employed by the Chinese be improved to one of more reasonable basis, because we are not satisfied with the way in which the Communist government authorities one-sidedly decide quantity, price, and time of shipment, and even designate Japanese importers to handle the transactions.

"3. We ask the Japanese government to maintain in a strict sense the system of Global Budget Allocation under which we can import soybeans from any source of the world according to our own choice.

"In spite of the announcement of our basic attitude as above, the pressure in favor of soybean imports from China was increasing from the so-called 'China trade expanionists' in the government–diet and trade circles as well–and finally toward the end of April we were forced to contract for a certain amount of Chinese soybeans.

"While the situation was such, both the Chinese and Japanese governments were discussing the problem of treatment of the Chinese national flag in Japan and in the midst of the negotiation an unfortunate flag incident occurred in Nagasaki. Following those political developments, the Communist government suddenly announced on May 10, for political reasons still not exactly known to us, to break off all trade relations with Japan, including of course soybean exports to our country. Thus, what we feared most now became a reality.

"As mentioned before, we had a sense of insecurity for our trade with Communist China, and consequently, we were not willing to rely on China for the supply of the important raw material for our industry and the source of fat and protein to our population.

"Then, what will be the future development of this problem? Nobody can answer this question with certainty as it now involves basic differences in the political and economic systems of Communist China and Japan.

"Next, I would like to have a few words on American soybeans in Japan.

"The percentage of American soy- beans in the total amount of our soybean imports was 91% in 1953, 87% in 1954, 71% in 1955, and 75% in 1956 and in 1957, while that of Chinese soybeans was 4%, 6%, 3%, 23%, and 24% respectively. We can tell from these figures that about three-quarters of the total soybean oil and other soybean products consumed by the Japanese people are today made from soybeans grown by the American farmers. It is now 10 years since products from American soybeans were introduced to our Japanese households, and during those years the feeling of nostalgia among the Japanese people for Manchurian soybeans has [sic] been gradually replaced by a new sense of attachment and friendship for American soybeans.

"In recent years competent officials of the U.S. Department of Agriculture and many leaders of your soybean industry have visited our country and established personal contacts, which I am sure have greatly contributed to deepening our sense of attachment for and understanding of your soybeans.

"I think there is a bright future for American soybeans in the Japanese market, but we should not be mere optimists

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simply watching the situation take its natural course. It is quite possible at any moment that the Chinese will abruptly decide to return to our market to compete with American soybeans, for which we must be well prepared.

"Also, the restrictive measures and boycott of Japanese commodities in America may strengthen the position of the 'China trade expansionists' in various sections of our economy. I am convinced that these and other problems confronting our processing industry will be fully understood by the people who have today assembled here from all segments of the American soybean industry." Address: President, Assoc. of Oil and Fat Manufacturers of Japan, Tokyo.

4436. *Journal Star* (*Peoria, Illinois*). 1958. Two Japanese scientists here to study soybean processing. Oct. 30. p. A-5.
• ***Summary:*** A large photo shows C.W. Hesseltine and A.K. Smith of the USDA Northern Utilization Research and Development Division [NRRL], and visiting Japanese scientists Tokuji Watanabe and Kazuo Shibasaki. The two Japanese scientists have arrived in Peoria to start a year's search for ways to increase the use of U.S. soybeans in Japanese foods–especially tofu and miso. The studies will conducted under an agreement between the Agricultural Research Service (ARS), the USDA's Foreign Agricultural Service, and the American Soybean Association. The research is part of USDA's research and development program to find new outlets for U.S. farm crops.

Dr. A.K. Smith of the Northern Division spent several months in Japan last year studying soybean utilization. He found that Japanese prefer U.S. soybeans for oil-mill processing, which accounts for about half of all Japanese soybeans. The other half is used to make traditional foods, and only a limited quantity of U.S. soybeans are used in this way.

"Dr. Shibasaki is an associate professor in the department of agriculture chemistry at Tohoku University, Sendai, Japan, and an adviser of Miyagi Prefecture Miso and Shoyu Industry Association.

"Mr. Watanabe is chief of the grain processing section of the Food Research Institute, Ministry of Agriculture and Forestry."

Note: Soyfoods Center owns a copy of this black-and-white photo (8½ by 11 inches); it was a gift of the USDA National Center for Agricultural Utilization Research (Peoria, Illinois), which owns the photo.

4437. *Foreign Agriculture.* 1958. Japanese housewives' contest highlights use of soybean oil. 22(10):18. Oct.
• ***Summary:*** Over 200 contestants submitted original recipes. Sponsors and supporters included the Japan Oil and Fat Manufacturers Association, Japanese American Soybean Institute, and Osaka Food-Life Improvement Society. Japan is the world's top importer of soybeans, and the U.S. is its top source, with Communist China second and Brazil third. Japan crushes most U.S. beans for oil, using Chinese beans for food.

4438. Kamada, Hidemoto; Sakurai, Yoshito. 1958. [Curd-producing capacity of two varieties of soybean]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 13. p. 119. Oct. [1 ref. Jap]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4439. Masui, Masamiki; Hara, Masami; Hiramatsu, Takashi. 1958. Depolymerization of deoxyribonucleic acid by the juice of soy-bean sprouts. *Biochimica et Biophysica Acta* 30(1):215-17. Oct. [6 ref]
• ***Summary:*** The enzyme deoxyribonuclease, with remarkable activity, was found in the juice of soy-bean sprouts and in the juice of the sprouts of *Phaseolus radiatus* var. typicus. Address: Dep. of Bacteriology, Osaka City Univ. Medical School, Osaka, Japan.

4440. Smith, A.K. 1958. Progress in research on soybeans. *Soybean Digest.* Oct. p. 14-17. [9 ref]
• ***Summary:*** Contents: Introduction. Soybean oil stability. Alleged antithiamin factor. U.S. soybeans in Japan. Foreign matter and broken beans. Food problems. Varietal differences. New products research. Soy flour and isolated protein for foods. Isolated soybean protein. Address: NRRL, Peoria, Illinois.

4441. Mogi, Masatoshi. 1958. [Shoyu, a Japanese sauce]. *Japanese Patent* 10,199. Nov. 25. (Chem. Abst. 53:4650a). [Jap]*
• ***Summary:*** Koji is prepared from 550 gm soybeans, 129 gm wheat, and 66 gm soy wheat. Then 660 cc of 7.5% sodium chloride solution is added, and the mixture is inoculated with the enzyme glutaminase obtained from the natto bacterium, *Bacillus subtilis.* After 7 days, sodium chloride is added to 18% concentration. The mixture is kept at 30ºC for 3 months to give shoyu containing 23.5 mg/cc glutamic acid. Address: Noda, Japan.

4442. Hayashi, Shizuka. 1958. U.S. study by Japanese scientists [Kazuo Shibasaki and Tokuji Watanabe]. *Soybean Digest.* Nov. p. 23.
• ***Summary:*** Two Japanese scientists are now at USDA's Northern Utilization Research and Development Division at Peoria, Illinois, where they are investigating the use of soybeans from the USA and other countries in making tofu and miso in Japan.

The two men are: (1) Kazuo Shibasaki, age 41, associate professor at the department of agricultural chemistry, Tohoku University. (2) Tokuji Watanabe, age 41, chief of section of grain processing, Food Research Institute, Japanese Ministry

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of Agriculture and Forestry. They arrive in Peoria Oct. 18.

"They are working under the joint soybean market development project of USDA's Foreign Agricultural Service and Agricultural Research Service, and the American Soybean Association" [ASA]. Their living expenses during their 9 months stay in the USA will be paid by ASA. "And their traveling expenses to the United States and back will be paid by the Japanese American Soybean Institute from funds allocated under the market development project." Address: Japanese-American Soybean Inst., Tokyo.

4443. Inoue, Takashi. 1958. Tamari jôzô-yô kokei kôji ni kansuru kenkyû. II. Miso-dama ni tsuite [Studies on the use of solid koji for making tamari. II. On "Miso-dama" (1)]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 36(11):458-62. Nov. English-language summary at start of issue, p. 42. [4 ref. Jap; eng]
• ***Summary:*** Miso-dama are balls made of cooked soybeans. The size of each ball has a great influence on the fermentation. Address: Nagoya Miso and Tamari Co., Ltd. (Nagoya Miso Tamari K.K.), Japan.

4444. Sakaguchi, Kenji. 1958. Studies on the activities of bacteria in soy sauce brewing. III. Taxonomic studies on *Pediococcus soyae nov. sp.* the soy sauce lactic acid bacteria. *Bulletin of the Agricultural Chemical Society of Japan* 22(6):353-62. Nov. Bound in the back of Nippon Nogei Kagaku Kaishi (J. of the Agricultural Chemical Society of Japan). [21 ref. Eng]
• ***Summary:*** "Thirteen strains of salt-tolerant specific lactic acid bacteria were isolated from soy sauce brewing mashes, and their taxonomical characteristics investigated." Details are given.

"From these facts the author proposed the name *Pediococcus soyae* nov. sp. for this sort of organism."

This bacterium requires two specific nutrients–a peptide-like substance (P-factor) and a dialyzable unknown substance (S-factor). Address: Noda Inst. for Scientific Research, Noda City, Chiba prefecture, Japan.

4445. Sakaguchi, Kenji. 1958. Studies on the activities of bacteria in soy sauce brewing. II. The proteinases and the existence of *Bacilli* spores in the soy mash (moromi). *Bulletin of the Agricultural Chemical Society of Japan* 22(6):345-52. Nov. Bound in the back of Nippon Nogei Kagaku Kaishi (J. of the Agricultural Chemical Society of Japan). [22 ref. Eng]
• ***Summary:*** The activity of proteinases [enzymes that break down / hydrolyze protein] in soy mash [*moromi*] juice was measured. "Compared to proteinases of purely cultured soy koji digest which consisted of only *Aspergillus* proteinases, no difference was observed with the proteinases of usual soy mash through the studies of pH-proteinase activity curves, the inhibition test, and inactivation by acid and alkali treatment. It is supposed, therefore, that the proteinases in soy mash are mostly of *Aspergillus* origin."

Very few *Bacilli* vegetative cells were found in the soy mash. Therefore the researcher "assumed that *Bacilli* mainly grow in the koji and survive in the soy mash mostly in the form of spores. This work also suggested that the so-called '*Aspergillus* alkaline proteinase' consists of two distinct proteinases, and further the existence of an inhibitor which only acts at pH 8." Address: Noda Inst. for Scientific Research, Noda City, Chiba prefecture, Japan.

4446. *Soybean Digest.* 1958. Dr. Miller receives honorary [life] membership [in American Soybean Association] (Photo caption). Nov. p. 23.
• ***Summary:*** This photo shows Dr. Harry W. Miller seated next to Mrs. Miller with 10-15 other people at a long table during a formal luncheon in Tokyo; there he received a gold medallion signifying his election as honorary life member of the American Soybean Association. "The luncheon was arranged by the Japanese American Soybean Institute and Shizuka Hayashi, managing director (standing), presented the award. Dr. Miller, who is on duty in a Tokyo hospital, was elected honorary life member at ASA's convention in Des Moines [Iowa] last August."

4447. Goodhue, Norma H. 1958. Epicure series features Japan chef: Feast for eyes, palate. *Los Angeles Times.* Dec. 25. p. A1.
• ***Summary:*** A recipe for Beef sukiyaki (Tokyo style) includes "1 tofu (soy-bean cake)," and "8 ounces (1 cup) soy sauce."

Monosodium glutamate is mentioned in the recipes for Suimono (Clear soup) and Tempura sauce. Address: Staff writer.

4448. Hayashi, Shizuka. 1958. Japanese-American Soybean Institute: Housewifes want more demonstrations. *Soybean Digest.* Dec. p. 20.
• ***Summary:*** Kitchen car demonstrations are teaching Japanese that "the oil and protein deficiency of housewives can be easily supplemented by soybeans."

A photo above the article shows C.W. Hesseltine and A.K. Smith of the USDA Northern Utilization Research and Development Division [NRRL], and visiting Japanese scientists Tokuji Watanabe and Kazuo Shibasaki.

4449. Nagata, Tadao. 1958. Daizu no mugen shinikusei no ikushugakuteki igi. V. Tônan Ajia o shu to suru sekai ni okeru mugen shinikusei hinshu no bunpu [Studies on the significance of indeterminate growing habit for breeding soybeans. V. Distribution of the indeterminate soybeans in the world with special regards to that in East-South Asia (Abstract)]. *Ikushugaku Zasshi* (*Japanese J. of Breeding*) 8(3):196. Dec. [Jap]

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4450. *Soybean Digest.* 1958. Japanese scientists start work at Peoria. Dec. p. 21.
• ***Summary:*** "Two Japanese scientists, Kazuo Shibasaki and Tokuji Watanabe, have arrived at the Northern Utilization Research and Development Division, Peoria, Illinois, to start a year's search for ways to increase the use of U.S. soybeans in Japanese foods...

"Dr. Shibasaki and Mr. Watanabe will study the use of U.S. whole soybeans in making tofu and miso, traditional Japanese foods... Dr. Shibasaki is an associate professor in the department of agricultural chemistry at Tohoku University, Sendai, Japan, and an adviser of Miyagi Prefecture Miso and Shoyu Industry Association. Mr. Watanabe is chief of the grain processing section of the Food Research Institute, Ministry of Agriculture and Forestry."

4451. Kishi, K. 1958. [Naringinase. III. The soybean constituent effective for the formation of naringinase]. *Kagaku to Kogyo* (*Chemistry and Chemical Industry*) 32:389-92. [Jap]*
• ***Summary:*** Describes solvent extraction using ethyl alcohol.

4452. Matsuo, T.; Sakurai, Y.; Kurata, H. 1958. [On wilt of soybean found in Japan and the causal *Fusaria*]. *Shinshu Daigaku Sen'igakubu Kenkyu Hokoku* (*Research Reports of the Faculty of Textile and Sericulture, Shinshu University*) 8:6-13. [Jap; eng]*
• ***Summary:*** Fusarium blight or wilt was found for the first time in the various districts of Japan. The causal fungi are *Fusarium oxysporum f. tracheiphilum* and *F. moniliforme.*

4453. Shigeno, Y.; Sotome, S. 1958. Nyûfu no seikagakuteki kenkyû. I. Nyûfu seizô ni kansuru Mukoru rui kinkabu to nyûfu no seibun ni tsuite [The biochemical study of fermented tofu (*chian toufu*). I. The biochemical study of mucor chian, and the chemical contents of chian tofu]. *Utsunomiya Daigaku Nogakubu Gakujutsu Hokoku* (*Bulletin of the College of Agriculture, Utsunomiya University*) 4(1):125-28. [4 ref. Jap; eng]
Address: Utsunomiya Univ., Japan.

4454. Shuzui, K.; Tajima, O. 1958. Gosei seishu no kômi zôkyô ni kansuru kenkyû. VII. Dasshi daizu ko riyô shu no umami seibun no kento (2). Ion kokan jushi bunbetsu ni yoru bunri kubun ni tsuite [Studies for increasing the flavor and aroma of artificial sake. VII. On delectable components in artificial sake made using defatted soybean powder (2)]. *Kagaku Kenkyujo Hokoku* (*Reports of the Scientific Research Institute, Tokyo*) 34(2):152-61. [4 ref. Jap]

4455. Tanegashima, C.; Kirita, Y. 1958. [Investigation of pyridine carbonic acids. I.]. *Mukogawa Joshi Daigaku Kiyo. Seikatsu Kagaku-hen* (*Scientific Reports of Mukogawa Women's Univ.–Domestic Science Series*) 6:105-09. [Jap]*

4456. Toyama, N.; Kamata, M. 1958. Shinshiki ni-gô shôyu jôzô-hô no shin henhô ni tsuite [An improvement in brewing Japanese semi-fermented shoyu]. *Miyazaki Daigaku Nogakubu, Kenkyu Hokoku* (*Bulletin of the Faculty of Agriculture, University of Miyazaki*) 3(1/2):18-22. [6 ref. Jap; eng]
• ***Summary:*** Edible soy products manufactured by the Noda Shoyu Company of Japan.

4457. Asai, Toshinobu; Arima, Kei. 1958. Summaries of papers presented by Prof. Teizo Takahashi and Prof. Kin-ichiro Sakaguchi. Tokyo: Kasai Publishing. 206 p. The lengthy front matter is unnumbered. [584 ref. Eng; jap]
• ***Summary:*** This work was compiled and published by "The Committee of Commemorative Meeting of 35 Year's Anniversary of Professor Kin-Ichiro Sakaguchi." Contents: Foreword, by T. Asai. Chronology of the professional career of Teizo Takahashi (1875-1952; he was Prof. Sakaguchi's teacher). Chronology of the professional career of Kin-ichiro Sakaguchi (1897-1958). A brief review of the researches of Prof. Teizo Takahashi (mainly with saké). A brief review of the researches of Prof. Kin-ichiro Sakaguchi. Prof. Takahashi has 190 references, and Sakaguchi has 394 references. Address: Tokyo, Japan.

4458. Cravens, W.W.; Sipos, Endre. 1958. Soybean oil meal. In: A.M. Altschul, ed. 1958. Processed Plant Protein Foodstuffs. New York: Academic Press. xv + 955 p. See p. 353-97. Chap. 14. [198 ref]
• ***Summary:*** Contents: Introduction. Production and trade: General world situation, United States (production, movement in trade, economic importance of soybean products). Structure and composition of the soybean seed: Gross and microscopic structure, influence of variety, soil, and climate on soybean yield and composition. Methods of processing. Composition of soybean oil meal: Standard specifications in the United States, soybean protein, amino acids, suppressive, toxic, and other factors, enzymes, carbohydrates, vitamins, minerals. Soybean oil meal for feed: General considerations, soybean oil meal for poultry, soybean oil meal for swine, soybean oil meal for ruminants (beef cattle, sheep, dairy cattle, soybean oil meal for dogs). Future trends in soybean oil meal utilization. This chapter is a review of the literature.

"No mention has been found of soybean oil in ancient Chinese literature, so it may be concluded that the crushing of soybeans for oil has occurred in comparatively recent times. The processing of soybeans, however, was more or less localized until after the Chinese-Japanese War (1894-1895), when Japan began to import soybean oil cake for fertilizing purposes, resulting in a sudden expansion of demand for this product. Soybean cake then became the chief

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end-product of the oil-meal industry. The Russo-Japanese War increased the production of soybeans in Manchuria, and, when this war ended, a surplus of soybeans developed. Japanese firms realized very soon the export potential of this crop, and in 1908 several shipments were made to Europe. After this time the soybean was one of the chief export items of this area...

"After many decades of experience and unsuccessful attempts, the first large-scale continuous solvent-extraction plants in the United States were introduced from Germany in 1934. Both the Hildebrandt 'U'-type and the Hansa-Muehle or Bollman [Bollmann] basket-type extractor were used exclusively until 1937 when the vertical gravity extraction columns built by the Allis-Chalmers Manufacturing Co. and the V.D. Anderson Co. were made available. Modifications of the Hansa-Muehle or Bollman extractor have been built in the United States by the French Oil Mill Machinery Co. and the Blaw-Knox Co. (Langhurst 1951, p. 541-90).

"Considerable research was devoted to find the most efficient and practical solvent for the extraction. Because of its nonflammability, trichloroethylene appeared to be promising at one time. After toxic symptoms were observed in cattle fed trichloroethylene extracted meal, however, it lost its popularity in the soybean processing industry (Picken et al. 1955, p. 420-24; see also the Duren disease in Chapter 6 by Kuiken). Hot alcohol extraction was tried in Manchuria but it is impractical in the United States because of its high cost, the necessity of drying the flakes to 3% moisture in the recovery process, the difficulty in maintaining high purity, and the poor selectivity of alcohol as solvent.

"Prior to 1930 no petroleum company specialized in solvent-extraction naphthas... Finally, commercial hexane filled the requirements better than any other solvent tried, because of its low cost, easy recovery, and selectivity for vegetable oils. Extreme precautions are necessary with flammable hydrocarbon solvents...

"In the United States the bulk of soybeans processed by solvent extraction is handled by the basket and vertical gravity types. Most of the plants operate at or near a solvent-to-soybean ratio or 1:1." Address: McMillen Feed Mills, Decatur, Indiana.

4459. Dean, R.F.A. 1958. Use of processed plant proteins as human food. In: A.M. Altschul, ed. 1958. Processed Plant Protein Foodstuffs. New York: Academic Press. xv + 955 p. See p. 205-47. Chap. 9. [99* ref]

• ***Summary:*** Contents: General considerations: Early sources of protein for human food, competition for food between man and his domestic animals, vegetarianism and vitamin B-12, protein requirements (of children, of adults). Plant proteins now in use: Foods that can be prepared in the home (cereals, legumes {incl. groundnuts, soybean}, sunflower seed, sesame), plant foods used after factory processing (cereals, legumes, sunflower seed meal, cottonseed meal). Other forms of plant food: Plankton, algae, food yeast, leaf proteins (p. 237-38). Future extensions of the use of plant proteins: The theoretical basis of selection, assessment of the value of foods intended for human consumption, practical measures for the future.

In 1957 some 160,000 tons of soybeans were used to make tofu in Japan. "Magnesium or calcium salts are the precipitants of the curd from the soybean milk; the product is eaten by nearly every family in Japan with its breakfast miso-soup."

During World War II, the attempt was made to introduce soya as a food crop to Uganda. But "no instruction was given in the necessary details of preparation, with the result that the crop was very reasonably declared inedible by the Africans. They retain a violent prejudice against it and are suspicious that it has been added to any food, such as yellow corn meal, that they find distasteful.

"One of the most interesting methods for making soya edible has evolved in Indonesia and was described in full by Van Veen and Schaeffer (1950). It takes advantage of the ability of the mold *Rhizopus oryzae* to grow on the bean and alter its constituents... The product made from soya is called *tempeh kedelee* (kedelee = soybean)." Details of the production process are given. A description of natto and its composition is also given (p. 218).

The section on algae gives detailed information on chlorella, a type photosynthetic single-cell protein. As early as 1954, Morimura and Tamiya in Japan were experimenting with the use of powdered *Chlorella ellipsoidea* in foods. Note: This is the earliest document seen (Aug. 1997–one of two documents) that mentions the use of algae or other photosynthetic single-cell protein as food.

The section on leaf proteins (p. 237-39) begins: "Protein synthesis is one of the chief activities of the leaf, and proteins are comparable to animal proteins in their amino acid composition (Lugg 1949). The young leaf is especially rich in protein..." Pirie (1953) has suggested a process for recovering the leaf protein from the fibrous residue left after mechanical separation; the protein is usually very difficult to free. Pirie (1953) has also described the likely structure of an efficient plant. "There are also obvious possibilities in such abundant and little-used material as the leaves of sugarcane, cassava, and bananas" (p. 238-39).

The section titled "Sesame" (p. 219-20) states that the Zande people of southwestern Sudan steep the seeds in water for a few minutes, then pound them lightly to loosen the outer coat. They then dry the seeds and the outer coat is sieved or winnowed away. The seeds are then roasted and ground to a paste, which is sometimes used to make a sauce (Culwick 1950). "The use of sesame as a sweetmeat or condiment is fairly widespread in the Near East. A sweetmeat called *tahinya* or *tahina* is made in the Gezira [Sudan] by cooking the roasted seeds in sugar; sometimes the seeds are crushed before the cooking, and sometimes not" (Culwick

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1951). Describes how to make the condiment. Address: Medical Research Council, Mulago Hospital, Kampala, Uganda.

4460. Ford, Herbert P. 1958. The life story of Dr. Harry W. Miller. Unpublished manuscript. 169 p. Unpublished manuscript. 28 cm.

• ***Summary:*** This manuscript is the slightly edited second draft of the transcript of a single 7-8 hour interview that Mr. Ford did with Dr. Miller in 1958 in Chicago. According to Mr. Ford, Dr. Miller later gave a copy of the manuscript to Raymond S. Moore PhD, a Seventh-day Adventist educator, with the understanding that Moore would use it as the basis for a book. The book, titled *China Doctor,* was published in 1961. Dr. Miller was not very happy with the way the book turned out.

Pages 122-35 give a much more detailed account and history of Dr. Miller's work with soy milk, tofu, yuba, other soyfoods, meatlike products, and wheat gluten than is found in the finished book, *China Doctor.*

Concerning wheat gluten: Dr. Miller's company in Mt. Vernon, Ohio, International Nutrition Laboratory, "had protein foods in which they used wheat gluten and made meat patties and various kinds of stews, sprouted the green soybeans and made a chili with them and wheat gluten." They also developed a vegetarian wiener [Veja Links] containing raw vital wheat gluten, soy flour, seasonings, and flavors. They stuffed these into wiener casings, submitted them to a smoke house and to cooking, then peeled off the casings/skins and canned the wieners. He developed these at the Mt. Vernon slaughterhouse.

"Soy milk manufacture in the U.S.A. (p. 131). In 1939 Dr. Miller returned to the United States having been so thoroughly convinced that soy milk was destined to have world-wide acceptance... His son, Harry Willis Miller, Jr. had returned preceding his father and had started a small soy milk plant in Utica, New York, where he made and bottled soy milk and also made and canned some of the protein foods out of wheat gluten for which they had developed recipes. This plant was later moved to Mt. Vernon, Ohio, after they started the soybean plant at Mt. Vernon. The plant was rather small at first as their capital was very limited. They had to build up the food plant out of his surgery earnings. As these products were mostly for export, the firm was called the International Nutrition Laboratory. It was called International because they didn't think of having any particular market for soy milk in the United States but anticipated making and packing soy powder which they could ship over to China, Japan, Korea, and other fields. Since the United States is a dairy country, they just thought they would have all kinds of difficulty getting it introduced over in America. They gave their attention largely in the early part of the work to making some products that went over quite well, which could be sold locally such as meat patties–vegaburgers. They would take the wheat flour, wash the starch from it, and make gluten patties. They actually built up a very fine product that was netting them earnings. The earnings of that, together with Dr. Miller's medical and surgery fees, to finally get together a spray dryer which they built with the aid of the know-how assistance of the Rogers Company, who sold these spray dryers... and through this home-made outfit they daily spray dried considerable powdered soy milk and placed it on the market. They made some ice cream mixes and they shipped out in barrels to the Philippines soy milk powder and also shipped consignments of the powder to Shanghai where they had formerly introduced a soy milk to the Shanghai Settlement. Thus they kept soy milk going up until the time of the world war in 1941 which cut them off from shipping to the Orient."

Note: This is the earliest document seen (Jan. 2014) concerning soy milk in international trade (for imported or export).

In the United States they found "an interest on the part of doctors in feeding babies that were covered with various kinds of rashes which they called atopic dermatitis. Many of these babies had asthma, diarrhea, projectal vomiting, nervous irritability and were unhappy babies, all because of the allergy to cow's milk formula." Doctors began to realize that babies with allergies and other sicknesses responded well to soybean milk; the market soon increased. Eggs and milk are the chief causes of allergy, but some vegetable proteins like wheat, corn, and some legumes also cause allergic reactions in some cases. Then doctors began to ask for evidence that the milk was safe. They suggested that it be submitted to the American Medical Association [AMA]. So at once Dr. Miller contacted Dr. Earl Baxter, Professor of Pediatrics at the Ohio State University Medical School, and he agreed to conduct some feeding experiments with soy milk. These studies showed that "babies could be nourished as well on soy milk." In Tokyo, Dr. Choei Ishibashi (later president of the Japan Medical Society) also did meticulous feeding tests with infants, using the powdered soy milk Dr. Miller had sent after World War II. Over a period of many months, he compared the blood, measurement, and growth records of babies fed soy milk with those fed animal milk [cow's milk]. Then Dr. Miller took the results of the studies in Japan and at Ohio State and submitted them to the Council on Food and Nutrition of the American Medical Association. The Council has 15 members, the very best scientists on food and nutrition. "They examined the [soy] milk, examined the claims for it, looked over the research, and then gave the seal of approval which was placed on every can of soymilk thereafter."

"Now that they had this seal of approval, they went to medical conventions and canvassed the doctors; the sale of soy milk grew very rapidly." The plant began to get larger; it made great demands and there were many details to look after. These facts and his lack of capital to carry on this work

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adequately made Dr. Miller realize that he must do one of two things. He must either organize a corporation, issue stock, and enlarge the company greatly, or he must dispose of the plant and give his time and attention to research.

During this time, Dr. Miller received valuable help from the U.S. Department of Agriculture [USDA]. Dr. J.A. LeClerc (Senior Chemist, Agricultural Chemical Research Division) and Mr. L.H. Bailey, who investigated the use of "soybean milk in making breads" and made the results and analyses available to Dr. Miller. "Thus they got themselves very well established in this country as having a milk for people who did get along with cow's milk."

However the secretary of the AMA told Dr. Miller that he should not claim or advertise that his soy milk was a good alternative to cow's milk for all babies, but only "for those babies who do not do well on cow's milk." However he added: "If you can take care of babies that cow's milk does not take care of, there is no reason why you could not take care of the other babies that cow's milk does agree with too." This was his diplomatic way of counseling them not to make unfriendly comparisons with cow's in a dairy country–even if those claims are valid. By following his advice, Dr. Miller was able to work well with the dairy industry without any conflicts.

The Loma Linda Food Company in California showed an interest in acquiring Dr. Miller's company in Ohio. "They had been making some soy milk in the liquid form, but they were interested in getting an Eastern branch." So in 1950 they purchased the [soy] milk plant in Mt. Vernon and have been operating since that time. This took a great burden off Dr. Miller's shoulders and left him free to do medical and nutritional research work. "It was then decided to start the International Nutrition Research Foundation and Dr. Miller was asked to be the Director of this Foundation. He placed a larger part of the purchase price of the factory into this Foundation, which would be devoted to food research only. From the day this research institution was started it has attracted a great deal of attention from all parts of the world; among those interested parties has been the World Health Organization of the United Nations. They came to the conclusion that soy milk had great possibilities in countries of low economic conditions where they could not afford to buy imported [cow's] milk," and in protein-deficient countries. They came to Mt. Vernon to investigate both the soy milk plant and the experimental research. Dr. Miller educated them on the many benefits of using protein from soybeans instead of from animals. As a result, the United Nations constructed a large soy milk plant in Djojakarta [Jogjakarta / Yogyakarta] Indonesia. It was built with the advice of Dr. S.S. De (who has headquarters in Bangkok, Thailand) and the support of the Government of Indonesia, FAO, UNICEF, and WHO.

4461. Itami, Kenkichi; Kato, Sumio. 1958. Nattô oyobi nattô-kin no bitamin B-2 ryô ni tsuite [Riboflavin (vitamin B-2) content of natto and Bacillus natto]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 10(4):206-08. [6 ref. Jap; eng]

4462. Kawamura, Wataru. 1958. Miso enkaku-shi [History of miso]. Tokyo: Zenkoku Miso Kogyo Kumiai. 817 p. Illust. 22 cm. [96 ref. Jap]

• ***Summary:*** The definitive work on the subject. Pages 187-213 list all early Japanese books mentioning miso, with a summary of what each says about it. Contents: Preface. Part 1. Tradition of miso (p. 1-228). Chronological table of miso history. Introduction (p. 1). Outline (p. 9). 1. Transportation in China and Japan in ancient times (p. 19). 2. Jiang in China (p. 29). 3. Jiang in the *Ch'i-min yao-shu* (p. 37). 4. Ancient Japan (p. 50). 5. The *Kojiki,* the *Nihonshoki* and miso (p. 55). 6. The Asuka and Hakuho periods (p. 66). 7. The Nara period (710-784 A.D., p. 72). 8. The Heian period (794-1160, p. 85). 9. The Kamakura period (1185-1333, p. 106). 10. The Muromachi period (1338-1573, p. 125). 11. The Momoyama period (1568-1600, p. 148). 12. The Edo period (1600-1868, p. 158). Appendix 1. Collections of old miso information (p. 187-213). Appendix 2. Old miso cookery (p. 215-228; recipes names and general descriptions of how to prepare them but with no amounts given).

Part 2. Local folk records of miso (miso in various prefectures from Hokkaido to Kagoshima-ken, p. 229-461).

Part 3. History of miso regulation (p. 463-815). 1. Early history of regulation (p. 463). 2. Intensification of regulation during World War II (p. 468). 3. National Miso Industry Association (p. 477). 4. Economic regulations and the new economic systems (p.494). 5. Regulatory activities of the Federation (p. 520). 6. Enforcing the *ichigen-teki* regulation (p. 543). 7. Organizing the system of production and supply (p. 555). 8. Methods of doing business (p. 567). 9. Regulation guidelines for processing miso (p. 582). 10. Consolidation of businesses (p. 622). 11. The Emperor's visit (p. 638). 12. Regulation of the controlled companies (p. 641). 13. Management after the war (p. 665). 14. Pressing conditions of miso and food (p. 694). 15. Discontinuance of *kokka sodo in ho* (national order of total mobilization, p. 723). 16. Start of the public organization for food rationing (p. 729). 17. Effect of food rationing on miso (p. 747). 18. Discontinuance of the public organization ("Kodan," p. 765). 19. National Miso Industry Association (p. 728). 20. Today's miso fermenting technology (p. 798). 21. Conclusion.

Note: A translation of this book into English would yield many heretofore hidden treasures for English speakers. Address: Miso teacher, 2-4-7 Kugenuma, Tachibana, Fujisawa-shi, Kanagawa-ken 251, Japan.

4463. Koyanagi, Tatsuo; Sato, Mitsuko. 1958. Miso no eiyô zôkyô ni kansuru kenkyû. I. Soruburu tenka miso-chû no B-12 oyobi mechionin ganryô [Studies on the enrichment of

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"miso". I. Vitamin B-12 and methionine contents of "miso" fortified with viscera solubles]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 10(6):269-71. [4 ref. Jap; eng]
• ***Summary:*** The fish viscera solubles were added before fermentation. If less than 2% by weight, no fishy smell appeared in the final product.

4464. Kuiken, K.A. 1958. Effect of other processing factors on vegetable protein meals. In: A.M. Altschul, ed. 1958. Processed Plant Protein Foodstuffs. New York: Academic Press. xv + 955 p. See p. 131-52. Chap. 6. [141 ref]
• ***Summary:*** Contents: Introduction. Solvent extraction of oilseeds: Introduction, physical properties of solvent-extracted oilseed meals, protein quality and content, solvents for oilseed extraction (hydrocarbons, alcohols, trichloroethylene). Chemical contamination of feed products: Bovine hyperkeratosis (X-disease) (occurrence, causative agent, toxic level, toxicity symptoms), pellets containing stilbesterol [stilbestrol], chemical seed protectants and pesticides. Selection of varieties and strains of seeds: Amino acids in soybean varieties, amino acids in cereal grain varieties, gossypol content of cotton varieties. Storage of raw materials and finished products: Fundamental considerations (feed moisture level and mold growth, airtight storage of wet grain), biological value of stored cereal grains and soybeans, behavior of gossypol in storage of cottonseed, meal, and feed mixtures, use of chemicals for protection of stored grains.

"Conversion of the soybean industry in the United States to solvent processing is far advanced; the volume of solvent-extracted cottonseed and linseed oil meals is increasing rapidly." Three main types of solvents are used for oilseed extraction: Hydrocarbons (typically hexane), alcohols (ethanol or isopropyl alcohol), and trichloroethylene. In 1937 Japanese workers first "reported the use of ethanol for extraction of soybeans in a mill at Dairen, Manchuria. Industrial development of alcohol-extraction systems have not occurred in the United States. The early Japanese interest in alcohol extraction was a result of local availability of solvents; at the present time Japanese processors generally use hexane for extraction of soybean oil." Details are given on the history of trichloroethylene and the undesirable biological effects of feedings trichloroethylene- extracted soybean meal ("trichlor meal") such as the Duren disease of cattle.

"Stilbesterol is of interest as a cattle feed ingredient; it is reported to stimulate rate of weight gain and reduce feed cost (Burroughs, Culbertson, and Kastelic 1955). On the other hand, low-level contamination of feeds with stilbesterol can cause serious reproductive disturbances in some animals."

Note: This is the earliest English-language document seen (June 2006) that uses the word "trichlor" to refer to "trichloroethylene." Address: The Buckeye Cellulose Corp., Memphis, Tennessee.

4465. Miyake, Suguru; Watanabe, Ken; Nonoguchi, Yoshitaka; Saeki, Takamichi. 1958. Nattô-kin tanpakushitsu benkai kôso ni kansuru kenkyû. VII. Kesshô protease no seishitsu ni tsuite [The studies on *Bacillus natto* protease. VII. Several properties of crystalline protease]. *Hyogo Noka Daigaku Kenkyu Hokoku, Nogaku-hen* (*Science Reports of the Hyogo University of Agriculture*) 3(2):97-100. [15 ref. Jap; eng]
• ***Summary:*** "The properties of a crystalline preparation of protease obtained from cultures of *Bacillus natto* were studied. The optimum pH of the enzyme for digestion of casein and gelatin was found to be 8.2 and the optimum temperature was approximately 55ºC." The enzyme was found to be stable after heat treatment for 10 minutes at 45ºC, but it was inactivated above this temperature. Address: Biochemical Lab.

4466. Motoyama, Tekishu. 1958. Inshoku jiten [Encyclopedia of food and drink]. Tokyo: Heibonsha. 604 p. Illust. 27 cm. [Jap]
• ***Summary:*** Includes listings for the following soy-related terms: Aburage (deep-fried tofu pouches), aemono (Japanese-style salads), agedashi-dofu, daizu (soybeans), dengaku, fu (wheat gluten; but the term "seitan" is not listed in this book), ganmodoki (tofu burgers), gisei-dofu, goma-dofu (sesame tofu), goma-miso (sesame miso), inari-zushi, iri-dofu (scrambled tofu), kenchin-jiru, miso, namemiso, natto, oboro-dofu (soymilk curds), oden (stew), okara, shira-ae (tofu salad), shoyu, sukiyaki, tekka, teriyaki, tofu, tonyu (soymilk), tsuto-dofu, unohana (okara), yakimiso (broiled miso), yuba.

Separate entries, with detailed information, are given for some of the above words or terms.

4467. Motoyama, Tekishu. 1958. Inshoku jiten: Shôyu [Encyclopedia of food and drink: Shoyu (Document part)]. Tokyo: Heibonsha. 604 p. See p. 278-80. [Jap]
• ***Summary:*** Contents: Ways of using soy sauce. Brewing soy sauce. Chemical soy sauce.

"Ways of using soy sauce (*shoyu*)*:* It goes without saying that the spread and development of soy sauce is due to its ability to enhance the flavors of foods and create new combinations of flavors. The fact that *namasu,* a dish of raw fish and vegetables seasoned with rice vinegar and soy sauce, is a favorite and representative way of serving sashimi is due largely to the flavor contributed by the soy sauce. On the whole, it cannot be denied that soy sauce tantalizes the palate. The basic significance of soy sauce lies in its ability to supplement the rather simple flavor given food when only salt is used as a seasoning. It is generally thought that the true flavor of soy sauce can best be enjoyed in *kijoyu* or plain, fresh unpasteurized soy sauce. Shoyu surpasses other seasonings in its ability to make each dish unique by evoking

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complex and delicate flavors inherent in the food itself.

"It is important that its users recognize this point from the beginning. Simply speaking, to experience the quintessence of the flavor of soy sauce, try serving it plain as *kijoyu* over fresh sashimi. In some cases the flavor of fish broiled lightly with salt (*shio-yaki*) or salted pickles can be improved by the addition of a very small amount of soy sauce, however basically these are esteemed for the flavor imparted by the salt. And if high-quality *koikuchi* is heated above a certain temperature–as is the case in broiling–a strong and unpleasant flavor will result. In order to compensate for this, *usukuchi* was created. Although pale in color, it contains a relatively large amount of salt. Able to harmonize well with other seasonings, it has a simple flavor and dissolves easily in water. It is used for soups and *nimono* (dishes simmered in liquids) since there are considered best when their flavors are light and simple. Used by itself it is too salty, and its flavor is inferior to that of regular shoyu. Unless used with liquids in broths, it does not harmonize well with other flavors.

"In broiled eels (*kabayaki*), in the mirin soy sauce (*mirin-joyu*) used with teriyaki, in tsukudani (preserved foods simmered in soy sauce), even in foods simmered in liquids (*nimono*) and especially in cooking where water is not used, *koikuchi* is preferred to *usukuchi* since it was originally developed for its rich, distinct flavor, slightly heavier consistency and darker color. The reason it is heated in *mirin-joyu* is to help unite both ingredients. It is also said that the longer-lasting the seasoning soy sauce (*tare*) used for broiled eels, the better; after several years of use, the oil from the eels and fish becomes mixed with the soy seasoning sauce. Each time the sauce is used afresh in broiling, the heat helps the soy, mirin, and oils to "marry." If the sauce is reheated in a pot, the fire should be turned off just before the liquid comes to a boil. Most fish are first broiled without seasoning sauce, and the sauce then applied later. In the case of tsukudani, it is more important that it last well than that it have a fine flavor so the problem is slightly different.

"Usukuchi is used largely in the Kyoto area and koikuchi in the Tokyo area. However Kyoto cooks use both types of soy sauce in restaurants and at home whereas Tokyo cooks use koikuchi almost exclusively, especially at home. When seasoning foods, if they are too bland or weak, we usually add shoyu, and if they are too salty we usually add sugar. Flavors in which sugar and soy sauce are combined have never been considered high class. Throughout most of Japan's culinary history, seasonings, herbs and spices have been used to a very limited extent. Shoyu and salt have been used to evoke the flavors inherent in foods, and the people have come to a deep appreciation for salt from the point of view of both economy and flavor. If you are well versed in the way of using salt in foods, there is no need to use *usukuchi,* and the efficiency of regular shoyu will rise.

"In recent years, for the sake of portability and preservation, soy sauce has been spray dried to make soy sauce powder and crystals. These of course, have a flavor and fragrance which is inferior to that of regular soy sauce. Since a small amount of mold often forms on the surface of shoyu during the warm summer months, this is often removed by heating the shoyu to 50-60ºC or straining it through cotton cloth. It can also be prevented by adding a small amount of mustard oil to the shoyu.

Note: This is the earliest document seen (April 2012) that mentions spray-dried or dehydrated soy sauce. After instant noodles were first marketed in Japan in Aug. 1958, sales of spray-dried increased as a seasoning for the noodles.

"Brewing soy sauce: Soy sauce is made from a fermented mixture of soybeans and wheat to which water and salt are added. The three basic varieties are *koikuchi* (literally: dark mouth) or regular dark soy sauce, *usukuchi* (literally: light mouth) or the lighter, milder, less common soy sauce used in the Kyoto area and *tamari.* Each of these is made by a somewhat different process. However in the case of the most common soy sauce, it is said that the finest flavor is attained if the koji is prepared from equal quantities of soy and wheat. The amount of salt ranges from 90-110% of the combined amounts of the soybeans and wheat. Thus the amount of water is generally twice the amount of salt. The finest soy sauce contains a relatively small percentage of both salt and water. Inferior grades contain 110% salt or water, as measured above.

"It is not absolutely necessary that soybeans contain all of their natural oils in order to use them in soy sauce. Although a certain percentage of the beans may be defatted soybeans, this percentage is very delicate. When a large percentage of defatted soybean meal is used, it is necessary to use a chemical process for adding amino acids to the soy sauce in order to obtain satisfactory fragrance in the soy sauce.

"Ordinarily, the wheat is roasted until golden brown and cracked into small pieces. The soybeans are rinsed, soaked overnight in water and then either boiled or steamed. After they have cooled somewhat, they are mixed with the cracked roasted wheat, koji spores (*tane koji*) are added and the mixture placed in a warm incubation room (*muro*). By the fourth day the mixture will have turned into *koji* and be covered with a bloom of fragrant white mold. At this time the salt and water solution are added in order to make *moromi,* the mash of soy sauce, wheat and soybeans. This mixture is stirred from time to time and allowed to ferment and age for at least one year.

"It is commonly said that one-year-old moromi has only fragrance, two-year moromi also has flavor and three-year-old moromi has fine color as well. In order to attain the perfect blend of fine qualities, these three different types of moromi are often mixed in the following proportions: 5 parts 1-year moromi, 2 parts 2-year and 1 part 3-year moromi. When the mixture is placed in a cotton sack and pressed,

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about 70-80% of the weight can be extracted as soy sauce liquid. This is allowed to settle and become clear for 2-3 days. After removing the oil which floats to the surface and the dregs on the bottom, the remainder–called *nama-tamari* (fresh-tamari)–is heated to 60-70ºC to sterilize or pasteurize it. It is then known as *Hi-ire* (put into fire), and is ordinary soy sauce made in Japan" (Continued).

4468. Motoyama, Tekishu. 1958. Inshoku jiten: Shôyu [Encyclopedia of food and drink: Shoyu (Document part II)]. Tokyo: Heibonsha. 604 p. See p. 278-80. [Jap]
• ***Summary:*** Continued: "In recent times, in order to maximize profits and employ capital most efficiently, various methods of high-speed brewing and processing have begun to be used. And due to the relationship between supply and demand, substitute varieties of each of the main types of soy sauce have been developed and are now being produced.

"*Usukuchi* soy sauce is made to have a light color due to the way it is used in cooking. The basic method of manufacture is the same as for regular soy sauce, however to give it a lighter color, the water in which the soybeans are cooked is changed during cooking and then drained off as soon as the beans come to a boil. The wheat is also roasted for a shorter time than for regular soy sauce to give it a lighter color and prevent scorching. The koji is prepared in more or less the same way as for regular soy sauce however the koji is removed from incubation when the mold is in the state called shimofuri or 'salt and pepper' so that there is less (?) mold than for regular soy sauce koji. A larger amount of brine is mixed with the koji and the mixture is allowed to age for 6-12 months. Before pressing, sweet sake (amazake) is added as a natural sweetener. The liquid is heated to a lower temperature (60ºC) for a shorter time (20-30 minutes) during sterilization. Therefore usukuchi cannot be kept as long as regular soy sauce without spoiling.

"In regular soy sauce–which is generally seen as a slightly lower quality product than tamari–salt water is also added to the pressed moromi and the mixture re-pressed to yield a liquid called *bansui.* This is used as one of the raw materials in the even lower quality chemical soy sauce. The main areas which have produced *koikuchi shoyu* since ancient times are Choshi and Noda in Chiba prefecture and Shozushima in Kanagawa prefecture. The main area producing *usukuchi shoyu* is Tatsuno in Hyogo prefecture, however it is also brewed in large quantities in farmhouses for home use. *Kanro shoyu* is a product originally developed in Yanaitsu in Yamaguchi prefecture. Made by reprocessing koikuchi shoyu into a thick, sweet liquid, it is prized in the Kyoto area where it is served with *sashimi* from white fish meat.

"Chemical *shoyu* (*daiyô* {substitute} *shoyu*)*:* Ordinarily, at least one year is required to brew regular soy sauce so that at the large breweries, huge aging cellars or warehouses are necessary. Since this ties up a large amount of capital and reduces profits, studies were first made of ways to speed up the traditional process and then of ways to make soy sauce using chemicals and new raw materials. Soon a large number of varieties of 'amino acid shoyu' appeared on the market. Inexpensive defatted soybean meal began to be used in place of whole, natural soybeans. The meal is first broken down by hydrochloric acid and then neutralized by soda ash to produce crude amino acid. If this product is mixed with brine, the resulting liquid has much the same color and flavor as natural soy sauce. However since the fragrance is poor, ready-made moromi is then added and the mixture reheated. The amino acids in the protein break down in to starches which are also added to produce sugars.

"By the discovery of sugar-containing amino acids, it became possible to devise soy sauce which had both sweetness and viscosity. After experiencing some difficulty with using low-priced defatted soybean meal, research began in the use of fish whose level of freshness had fallen, fish meal, viscera, chrysalis dregs, sesame seed dregs [defatted sesame meal left the oil was removed], and cotton seed dregs. Products were also developed by placing the pressed dregs of regular soy sauce in a liquid made by simmering fish, shell fish and seaweeds in order to impart their flavor to the soy sauce. Another variety of chemical soy sauce was developed for kidney disease patients who are unable to use salt in their food. Malic acid soda made from apples was used to simulate a salty flavor."

4469. Motoyama, Tekishu. 1958. Inshoku jiten: Teriyaki [Encyclopedia of food and drink: Teriyaki (Document part)]. Tokyo: Heibonsha. 604 p. See p. 397. [Jap]
• ***Summary:*** This is a Japanese cooking method used to make grilled dishes (*yakimono ryori*)*.* Fish meat is brushed or dipped in Mirin-shoyu then grilled.

Use the following types of fish: *Tai* (a sea bream, a red snapper, a porgy), *sawara* (a Spanish / spotted mackerel), *buri* (a yellowtail), or fresh salmon (*nama sake*)*.*

Mirin is used as the final touch to give a glossy or shinier appearance. In Japanese, the term *teri o dasu* is used to mean "bring out the gloss / luster" or "to make it shine." Therefore it is called teriyaki (glossy / shiny grill).

Note: The meaning of "Mirin-shoyu" is unclear. Are the only two ingredients mirin (sweetened sake for cooking / seasoning) and shoyu (regular Japanese-style soy sauce)? If yes, in what proportions are they used? If no, what are the other ingredients and the proportions of each?

4470. Motoyama, Tekishu. 1958. Inshoku jiten: Tekka miso [Encyclopedia of food and drink: Tekka miso (Document part)]. Tokyo: Heibonsha. 604 p. See p. 396. [Jap]
• ***Summary:*** Tekka miso is a type of finger-licking-miso (*name miso*)*.* Ingredients (like roasted soybeans, chopped burdock root, etc.) are mixed into a regular red miso, then add to your own taste, gingerroot, sugar, and/or barely malt

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syrup (*ame*). Finally everything is sautéed / cooked [often for quite a while] in sesame oil.

Some gourmets love to have this special miso made with added minced red chili peppers to make it a little spicy.

4471. Nippon Shokuhin Kyokai. 1958. Tôfu no eisei [Tofu sanitation]. Tokyo: NSK. 97 p. 19 cm. Series: Shokuhin eisei sosho; Tofu no maki. [Jap]*
• ***Summary:*** This is the first book on this subject, indicating that the microbiological safety of tofu was probably a matter of fairly widespread concern at the time.

4472. Richards, Janet; Richards, Charles. 1958. Basic Chinese and Japanese recipes. 3rd ed. rev. and expanded. San Francisco, California: City Lights Books. 75 p. Index of recipes. 17 cm.
• ***Summary:*** Contents: Introduction (General. For epicures, vegetarians, and dieters). Chinese recipes. Japanese recipes. General information: Buffet, party foods & hors d'oeuvres. To brew tea. Special imported ingredients. Where to get ingredients & equipment.

Introduction: "Most of the recipes in this book appear constantly on the menus of the Chinese and Japanese restaurants of San Francisco, New York, and a few other cities that have a population segment with Chinese or Japanese ancestry." Many recipes call for "soy sauce" and up to 1 teaspoon "MSG powder."

The section "For epicures, vegetarians, and dieters" states: "Of the special foods of the Orient, the most versatile is the soy bean. The number of widely differing foods made from soy beans is very large, including bean thread, noodles, soy sauce, soy milk with its derivatives such as dofu, the fermented nam yu and fu yu of China and miso of Japan. Western food technology has also added to the list."

Soy-related recipes–Chinese: Lo han chai (with dofu and seaweed, p. 19-21). Dofu with oyster sauce ("1 block of Japanese tofu, or 2 cakes of Chinese tofu," p. 22). Steamed fish with dofu (p. 29-30). Chicken in soy (with 1 cup soy sauce, p. 31-32). Chinese sauce [commercial]: Foo yü (sharp thick sauce [fermented tofu]). Jeung yow (soy sauce).

Note: This is the earliest English-language document seen (Oct. 2011) that uses the terms "nam yu" or "fermented nam yu" or "Foo yü" to refer to fermented tofu.

Japanese recipes: Miso soup (with tofu. Miso is "fermented soy beans," p. 48). Konbu salad (with soy sauce, p. 49). Egg plant with miso (p. 50). Turnips in soy (soy sauce, p. 50). Misoyaki (p. 54-55). Joints of chicken teriyaki (with Teriyaki sauce, p. 56). Beef sukiyaki (with tofu, p. 59-60). Beef teriyaki (cook on a hibachi, p. 60). Teriyaki sauce (p. 61; Ingredients: ½ cup table syrup {light cane molasses}, 1 quart shoyu {high quality Japanese soy sauce}, 3/4 lb. sugar, 2 pieces dashi konbu {dried kelp} 6 inches long, ½ teaspoon MSG powder, 2 tablespoons sake). Quick teriyaki sauce (p. 61; Ingredients: 3/4 cup soy sauce, 3 tablespoons sake {or sherry}, ¼ cup sugar, 1 teaspoon grated ginger, ½ tsp. MSG powder). Buta dofu (with "soy bean curd," p. 63).

Special imported ingredients (p. 68-71): Japanese–Canned foods: Bean curd, prepared black soy beans. Packaged foods: Miso (the light variety, fermented soy bean paste). Bottled foods: Fuyü (Chinese bean cake; Order top quality such as Quong Hop brand). Shoyu (soy sauce; Order top quality such as Kikkoman, Higeta, or Marukin). Chinese–Bottled foods: Soy sauce. Black beans (Dow Shee; for black bean sauce).

4473. Sekiguchi, R. 1958. [Manufacture of natto]. In: How to Manufacture and Cook Natto. Tokyo: Taibunkan Co., Ltd. See p. 110-63. [Jap]*

4474. Smith, Allan K. 1958. Vegetable protein isolates. In: A.M. Altschul, ed. 1958. Processed Plant Protein Foodstuffs. New York: Academic Press. xv + 955 p. See p. 249-76. Chap. 10. [143 ref]
• ***Summary:*** Contents: Introduction. Source materials for protein isolates: Oilseeds, cereal grains. Processing meal for protein isolation. Preparation and properties of isolated protein: Native proteins, commercial protein isolates, isolated proteins for food uses. The hull problem. Uses of protein isolates: Industrial applications, food uses. Selected oilseed protein isolates: Soybean (properties, soybean whey, commercial isolation, industrial and food uses), peanut (properties, utilization), cottonseed (properties, utilization), flaxseed, sunflower seed (source materials, isolation and properties). Cereal grain proteins: Corn protein (corn fractions, zein isolation, utilization), wheat proteins (gluten isolation, utilization).

The most important uses for wheat gluten "are for manufacture of monosodium glutamate and fortification of weak flours to produce high-protein bread... The monosodium salt of the L-form of glutamic acid has the unique power... of enhancing the flavor of many foods. Also, it is this salt which is largely responsible for the flavoring quality of soy sauce. Monosodium glutamate was developed to a commercial stage in Japan during the 1920's under the name Ajinomoto and was first produced in the United States in 1934." Five companies in the United States are now producing glutamate with an estimated annual capacity of 18 million pounds.

"The raw materials for glutamate in order of their importance are Steffen's waste (Manning 1948), a by-product of beet sugar refining, wheat gluten, and corn gluten; soybean meal has been used extensively in the Orient. The so-called Steffen's waste... is now the cheapest raw-material source for glutamic acid and accounts for an estimated 50% of production." Address: USDA NRRL, Peoria, Illinois.

4475. Taguchi, Keisaku. 1958. Daizu [Soybeans]. Tokyo: Norinsho Shinko Kenkyu-bu. 54 p. [Jap]*

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4476. Tamiya, Hiroshi. 1958. The koji, an important source of enzymes in Japan. In: Proceedings of the International Symposium on Enzyme Chemistry; Tokyo and Kyoto. Tokyo: Maruzen Co. Ltd. 541 p. Held 15-23 Oct. 1957 in Tokyo and Kyoto, Japan. See p. 21-24. [17 ref]
• ***Summary:*** "Etymologically the word Koji is an abbreviation of Kabi-tachi meaning something like 'Bloom of Mold,' and, as a matter of fact, the essential part of Koji is the mold *Aspergillus oryzae,* which is grown on steamed rice or other cereals and sometimes on steamed pulses. In the brewing of the Japanese rice-wine saké, Koji has long been used as the 'malting' agent to convert rice starch into fermentable sugar."

It is "no exaggeration to say that the dietary life of Japan cannot exist without Koji or the mold *A. oryzae.* At present the foods and drinks processed with this agent are being consumed at the rate of about 1,000 million U.S. dollars each year, and the taxes taken from it run up to more than 500 million U.S. dollars each year, which is as much as 20 per cent of the total national budget of our country [Japan; Sakaguchi 1957].

"Historical documents show that Japan learned the use of Koji from China more than 1700 years ago... But the real understanding of the nature and the mode of action of Koji became possible only in the latter half of the 19th century when our country opened her door to Western civilization. It was with the initiation of scientific studies of Koji at this dawn of a new age that enzymology in Japan made its start.

"Soon after the Meiji Restoration in 1868, some governmental colleges were established for conducting higher education of western science and technology. As the teaching staff of these colleges a number of scientists were invited from Western countries. The mold *A. oryzae* was first isolated from Koji in 1878 by a teacher of natural history from Germany, Dr. Ahlburg*, and the fact that the mold has a strong diastatic activity was first made clear in 1881 by a teacher of applied chemistry from England, Dr. Atkinson **. (Footnote: *Ahlburg, H., and Matsubara, S., *Tokyo Iji-Shinshi* 24, 12 [1878].) (Footnote: **Atkinson, R. W., *Tokyo Imp. Univ., Sci. Dept.* 6,1 [1881]; *Proc. Roy. Soc.* (London) 32,299 [1881].)"

The first Japanese scientist to become deeply interested in Koji was Jokichi Takamine. He "eventually succeeded in increasing considerably the diastatic activity of the mold. Having heard that the malting process using mold activity had never been practiced in occidental countries, an ambitious idea occurred to him, the idea of introducing the method into those countries, and with this idea he went to America in 1890. The demonstration he made there was a successful one, but unfortunately his project could not be realized due to the strong opposition of the manufacturers of malt. Undeterred by this failure he soon started an entirely new project, again using Koji-mold, but this time preparing from it a drug having a strong digestive activity*. The procedure he adopted was to grow Koji-mold on [wheat] bran, and to extract the mixture with water, from which the enzymes were precipitated with alcohol. The drug was named Takadiastase after his name Jokichi Takamine, the name which gained world-wide fame not only from this brilliant invention, but also through his later discovery of the adrenal hormone, adrenaline. (Footnote: *Takamine, J., U.S. Patent, 525823, 525825 [1894].)

"As Takadiastase gradually found a larger market, this commercial preparation or its origin *A. oryzae* also became a popular material for the study of enzymes in biochemical laboratories. The more it was investigated, the more varieties of enzymes were found in it. Since the early twentieth century it thus became one of the most popular research objects used in the study of enzymology*. (Footnote: *Tamiya, H., and Morita, S., Bibliographie von *Aspergillus, Botan. Mag.* (Tokyo) 43, No. 506 [1929] to 44, No. 524 [1930].)" Address: The Inst. of Applied Microbiology, Univ. of Tokyo and Tokugawa Inst. for Biological Research, Tokyo, Japan.

4477. Toyosawa, Isao. 1958. Shokuhin oyobi shiryô no korin ni kansuru kenkyû. II. Tôfu oyobi seizo haieki no korin ni tsuite [Studies on the choline of foods and fodders. II. Choline content in commercially prepared soybean curd and its waste liquor]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 10(6):272-74. [13 ref. Jap; eng]
• ***Summary:*** Retention of total choline was: Okara 10%, soymilk 83%, tofu 45%, and whey (waste liquor) 30%.

4478. Yushi Seizo Gyokai [Japan Oils and Fats Production Assoc.]. 1958. Seiyu yôran [Handbook of oil processing]. Tokyo. [Jap]
• ***Summary:*** Pages 1-4 contain a detailed chronology of the fats and oils industry in Japan from A.D. 97 to 1958. Address: Japan.

4479. Zakkoku Shorei-kai. 1958. Hokkaido daizu no gijutsu-teki, keizai-teki chôsa kenkyû [Investigation on Hokkaido soybeans: Technical and economical research]. Tokyo: Zakkoku Shorei-kai. 182 p. [Jap]
• ***Summary:*** Pages 126-33 discuss the history of soybeans in Hokkaido.

4480. *FAO Monthly Bulletin of Statistics.* 1958--. Serial/periodical. Rome, Italy: Food and Agricultural Organization of the United Nations. Yearly. ca. 350 p. *

4481. *FAO Production Yearbook.* 1958--. Serial/periodical. Rome, Italy: Food and Agricultural Organization of the United Nations. Yearly. ca. 350 p. Supersedes the Yearbook of Food and Agricultural Statistics, Part I (1947-1957), which was superseded by Production Yearbook (1958-1975).

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• ***Summary:*** Under soybeans, gives region/continent and nation, then statistics for soybean area, production, and yield for each soybean producing nation during the following time periods: 1948-1952, 1955, 1956, 1957. Regions and nations listed in the 1958 edition are: Europe: Czechoslovakia, Hungary, Italy, Romania, Yugoslavia.

U.S.S.R.

North and Central America: Canada, United States.

South America: Argentina (in 1948-52 1,000 hectares produced on average 1,000 metric tons of soybeans per year. This remained unchanged in 1955-1957), Brazil (in 1948-52 53,000 hectares produced on average 57,000 metric tons of soybeans per year. Production rose to 115,000 metric tons in 1955, 122,000 in 1956, and 132,000 in 1957).

Asia: Cambodia, China-Mainland, China-Taiwan, Indonesia-total (Java and Madura, Other islands), Japan, Korea-South, Philippines, Ryukyu Islands, Thailand, Turkey.

In 1948-52, Turkey produced 2,000 metric tons of soybeans on 2,000 ha; yield: 860 kg/ha. Production in Turkey increased to 4,000 metric tons in 1955, then 5,000 metric tons in 1956. Note: This is the earliest document seen (Dec. 2007) that gives soybean production or area statistics for Turkey or for the Middle East. This document contains the earliest production or area statistics seen for Turkey or the Middle East.

Africa: Belgian Congo (production in villages), Ethiopia and Eritrea (Fed. of Ethiopia) (starting with 5,000 tonnes {metric tons} in 1948-1952), Nigeria (Fed. of), Rhodesia and Nyasaland (Fed. of Nyasaland), Ruanda-Urundi (production in villages), Tanganyika, Uganda (recorded sales), Union of South Africa (farms and estates).

World total (excluding U.S.S.R.). Regional totals: Europe, North America, Latin America, Near East, Far East, Africa.

Note that statistics for given years (e.g. 1948-52) may change as time passes; apparently this yearbook is periodically updating its statistics.

4482. *Kurashino Techo* (*Notebook for Living*)**.** 1958? Tofuya no rappa. Aru nihonjin no kurashi [The tofu maker's horn. The life of one Japanese]. p. 157-65. Undated. Illust. [Jap]
• ***Summary:*** A poignant photographic essay showing the many activities in the life of a traditional tofu maker. Depicts an era that is rapidly vanishing from Japan.

4483. Fukushima, Danji. 1959. Studies on soybean proteins. I. Water dispersibility of protein of defatted soybean flour as a criterion for degree of denaturation. *Bulletin of the Agricultural Chemical Society of Japan* 23(1):7-14. Jan. [19 ref. Eng]
• ***Summary:*** Denaturation was measured by a change in the susceptibility of the protein (in a water extract of the flour) to the action of protease from *Aspergillus oryzae* before and after heat treatment. "It was found that the decrease of water dispersibility did not always run parallel with denaturation." Address: Noda Inst. for Scientific Research, Noda-Shi, Chiba-Ken, Japan.

4484. Fukushima, Danji. 1959. Studies on soybean proteins. II. A new method for quantitative determination of the degree of denaturation of protein in soybean flour. *Bulletin of the Agricultural Chemical Society of Japan* 23(1):15-21. Jan. [2 ref. Eng]
• ***Summary:*** "Owing to the inadequacy of the water dispersibility method as a criterion for denaturation of the protein in soybean flours, a new method was devised which was quantitative and applicable to soybean flours denatured under various conditions. In this method the native protein in flour is determined by the quantity of protein which is solubilized but remains unhydrolyzed by the protease action of *Aspergillus sojae***.** Conditions for the determination were decided as the result of various experiments.

"It was found that the decrease in the amount of water-extractable protein in heated flour with low water contents was attributable to the prevention of extraction of native protein by partly denatured protein." Address: Noda Inst. for Scientific Research, Noda-Shi, Chiba-Ken, Japan.

4485. Hayashi, Shizuka. 1959. Seek suitable U.S. food varieties [of soybeans]. *Soybean Digest***.** Jan. p. 25-26.
• ***Summary:*** "Nagano prefecture with about 320 miso manufacturers is the largest miso producing area in Japan. Its annual output is approximately 140,000 tons, more than one-fourth of the total Japanese production. Nagano miso is popularly known as 'Shinshu miso.' It is lighter in color than the miso produced in other areas."

Miso made from U.S. soybeans sells for a lower price than that made from Japanese or Chinese soybeans. "The biggest objections to U.S. soybeans were that they contained morning glory seeds, corn and other foreign material not found in beans of other origin. U.S. soybeans take much longer time in cooking to obtain the required softness. Due to the extra time required in steaming the color of the miso produced becomes darker. Further, the irregularity in size of the U.S. soybeans causes unevenness in softness when they are cooked. Broken beans are objectionable for this reason. Above all, the 'taste' of the soybeans after they are cooked is claimed to be unsatisfactory as compared with other beans, and this affects the sweetness or flavor of the miso produced."

Japanese miso makers used to import significant amounts of soybeans from China, but since the breakoff in trade between Japan and China last April, Chinese beans are no longer imported to Japan. So manufacturers of miso and tofu will have to rely more on U.S. soybeans. "Even the largest frozen (dried) tofu makers in the Nagano area are using U.S. soybeans." They met recently in Nagano city to discuss ways of getting better quality soybeans

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from America. A photo shows Mr. Hayashi speaking at this meeting. Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building, No. 1, 1-Chome, Yuraku-cho, Chiyoda-ku, Tokyo, Japan.

4486. Sakaguchi, Kenji. 1959. Studies on the activities of bacteria in soy sauce brewing. IV. Proteases, transaminases of *Pediococcus soyae nov. sp.* and its numerical transition in soy mash [shoyu moromi]. *Bulletin of the Agricultural Chemical Society of Japan* 23(1):22-28. Jan. [20 ref. Eng]
• ***Summary:*** Figure 2, a graph titled "Change of viable counts of lactic acid bacteria in soy mash," shows the numbers of two bacteria (in counts per ml) during a 12-month fermentation period. The number of salt-sensitive lactic acid bacteria plummets from 150 million on day 1 to zero shortly before 2 months. The number of *Pediococcus soyae* rises rapidly for zero on day 1 to a peak of 150 million after 4 months, then decreases to about 10,000 after 9 months.

The pH decreases steadily from about 6.0 on day 1 to about 5.0 (more acidic) after 6 months. Address: Noda Inst. for Scientific Research [Noda City, Chiba-ken, Japan].

4487. Watanabe, Ken; Kitayama, Norio; Matsushita, Isao. 1959. Nattô-kin tanpaku bunkai kôso ni kansuru kenkyû. VIII. Ion kôkan jushi ni yoru seisei kesshô-ka ni tsuite [Studies on *Bacillus natto* proteinase. VIII. The purification and crystallization of *Bacillus natto* proteinase using the ion exchange resin]. *Hyogo Noka Daigaku Kenkyu Hokoku, Nogaku-hen* (*Science Reports of the Hyogo University of Agriculture*) 4(1):69-72. [4 ref. Jap; eng]
Address: Biochemical lab.

4488. Mogi, Masatoshi. 1959. Shôyu jôzô ni okeru saikin no kenkyû [Recent studies on soy-sauce brewing]. *Hakko Kyokaishi* (*J. of the Fermentation Association*) 17(2):78-86. Feb. [58 ref. Jap]
• ***Summary:*** A review with 58 references. Address: Noda Sangyo Kagaku Kenkyu-jo, Noshi.

4489. Nakano, Masahiro. 1959. Miso to shôyu [Miso and shoyu]. *Shokuhin Kogyo* (*Food Industry*). Feb. p. 45-57. [19 ref. Jap]
• ***Summary:*** One graph shows miso production in Japanese factories from 1930 to 1955, and total and total supply in Japan from 1950-55. The difference between factory production and total supply would be accounted for by home production or imports. Factory production was about 590,000 tonnes (metric tons) from 1930 to 1940. It dropped during World War II, reaching a low of 200,000 tonnes in 1947. By 1955 it had recovered to about 500,000, but total supply was about 900,000 tonnes.

A second graph shows shoyu production in Japanese factories from 1930 to 1955 and total supply in Japan from 1950 to 1955. Factory production was about 1,040,000 tonnes from 1930 to 1940. It dropped during World War II, hitting a low of about 400,000 tons in 1947. By 1955 it had risen to about 1,180,000, surpassing the pre-war high of about 1,080,000. Total supply in 1955 was about 1,350,000. Thus in 1955 total miso supply was about 180% of factory production, whereas total shoyu supply was about 14% more than factory production. Miso factory production never surpassed its pre-war high. After the war, 35% of the miso and 15% of the shoyu was homemade, but thereafter it has decreased steadily. The rest of this article is mostly about the nutritional benefits of miso and shoyu.

Miso and shoyu were developed because of our need for salt. In the West, salt was also important. The Latin word for salt is salsa [actually, sal], and this word is the origin of the word salary, the payment for workers. The word sauce also stemmed from sal. Address: Shokuryo Kenkyujo Hakko Shokuhin Bucho.

4490. Nakano, Masahiro. 1959. Miso [Miso]. *Shokuhin Kogyo* (*Food Industry*). Feb. p. 5-7. [Jap]
Address: Shokuryo Kenkyujo Hakko Shokuhin Bucho.

4491. Ohsawa, George. 1959. La philosophie de la médecine de l'Extrême-Orient: Le livre de jugement suprême [The philosophy of East Asian medicine: The book of supreme judgment]. Paris: Librairie Philosophique J. Vrin. 207 p. Feb. 16. No index. 20 cm. [Fre]
• ***Summary:*** The author's name on the title page is given as "Nyoiti Sakurazawa (Ohsawa)." Contents: Foreword. Dedication: To my dear Dr. A. Schweitzer. Preface (written by G. Ohsawa on 18 Jan. 1956 at the station of the Protestant Mission at Andéndé, French Equatorial Africa (A.E.F.)). 1. Introduction: Medicine or faith? 2. A practical and dialectical classification. 3. The unique principal of science and the philosophy of East Asia. 4. The origin of man. 5. The medicine of East Asia. 6. The order of the universe and the constitution of man. 7. The supreme faculty of judgment. Appendixes: I and II. Practical guide to East Asian medicine: Gives addresses in France, Germany, Switzerland, Belgium, USA (Michio Kushi, 420 W. 119th St., New York 27, New York), Brazil (Tomio Kikuchi, rua Fugandes, 154, Liberdade Centro, Sao-Paulo), Japan (Nippon C.I., 8 Kasumi-cho, Minato-ku, Tokyo).

On p. 46 Ohsawa mentions miso (*la pâte de soya, de blé ou de riz, pâte tout-à-fait végétale,...*).

Note 1. This is the earliest document seen (May 2009) concerning the soyfoods movement in South America; Tomio Kikuchi was a pioneer in Brazil.

Note 2. This is the 2nd earliest document seen (March 2011) that mentions Michio Kushi.

4492. Walley, Ersel. 1959. India a logical protein market: Soybean Council of America, Inc. *Soybean Digest.* Feb. p.

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20.
• ***Summary:*** "From an address before the Delhi Rotary Club, New Delhi, India, Jan. 8. Mr. Walley of Fort Wayne, Indiana, chairman of the market development committee of the American Soybean Association, and Howard L. Roach, president of the Soybean Council of America, Inc., were in charge of the soybean exhibit at the U.S. Trade Fair in New Delhi, Dec. 10 to Jan. 10.

"The soybean crop, introduced into the United States from the Orient at the turn of the century, did not assume commercial importance until after World War I. The estimated production for 1958 was 574 million bushels, and increase of 70-fold in 30 years.

"As a pioneer grower it was my privilege to be identified with this very important and significant development in American agriculture."

"In 1935 your own Mr. Gandhi said, 'The soybean stands at the top of all known articles of diet..."

"My personal enthusiasm for the extended use of soybean products for direct human consumption began in Germany in 1948 when I saw the remarkable results secured from adding full fat soy flakes to the diet of emaciated men being returned as released war prisoners from the slave labor camps of Siberia. This interest in promoting the use of soybeans as an economic and valuable source of protein and fat for those whose diets are deficient in these essential elements has continued since that time.

"In the past 3 years it has been our privilege to cooperate with the Japanese soybean industries in promote the use of soybeans as food in Japan through increased use of such foods as tofu, miso, soya sauce and many other soya products more generally known. Hundreds of nutritionists have been trained to carry the story of soy proteins and fats to Japanese households."

In Europe, the Soybean Council of America, Inc. is teaching processors how to blend "soybean oil with olive oil to produce an acceptable and cheaper cooking oil which will be available in larger quantities to more people."

"Another important achievement in Europe is the increased use of soy flour in bread. Adding 5% soy flour greatly increases bread's protein content and value.

"You may ask why we came to India. India is important. Here you have one-seventh of the world's population and one-fifth of the free people of the world. Your future holds great promise. As you industrialize we feel you can and will need to import additional proteins and fats for food." Address: American Soybean Assoc.

4493. Fukui, J.; Ojima, M.; Yarimizu, H. 1959. [The influence of soil heaping at the lower part of stem upon bud-, flower-, and pod-shedding in soybean]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 27(3):377-78. March. [7 ref. Jap; eng]
• ***Summary:*** The number of pods per plant at ripening time and the seed yield was increased by heaping soil three times. Address: Kanto-Tosan Agric. Exp. Station.

4494. Sakaguchi, Kenji. 1959. Studies on the activities of bacteria in soy sauce brewing. V. The effects of *Aspergillus sojae, Pediococcus soyae, Bacillus subtilis,* and *Saccharomyces rouxii* in purely cultured soy sauce brewing. *Bulletin of the Agricultural Chemical Society of Japan* 23(2):100-106. March. Bound in the back of Nippon Nogei Kagaku Kaishi (J. of the Agricultural Chemical Society of Japan). [20 ref. Eng]
• ***Summary:*** This research found that the "The soy koji mold *Aspergillus oryzae* was undoubtedly the most important organism for soy sauce brewing. By its biochemical actions during the koji making stage, and by its enzymatic actions in soy mash, the mother body of soy sauce was produced." Most of the proteinases in soy mash come from *A. oryzae* (p. 103).

The salt tolerant yeast *Saccharomyces rouxii,* the former name of which was *Zygosaccharomyces major,* grows well in soy mash if it sufficiently aerated. This yeast consumes reducing sugars and produces ethanol (ethyl alcohol). The mixed inoculation of *Pediococcus soyae* (a bacterium) with *Saccharomyces rouxii* (a yeast) gave the best aroma and flavor, most closely approximating those of normal soy sauce.

Note: This is the earliest document seen (June 1999) that mentions the yeast *Saccharomyces rouxii* in connection with soy sauce fermentation. Address: Noda Inst. for Scientific Research, Noda city, Chiba-ken, Japan.

4495. Ueda, Ryuzo; Nagai, Shiro; Moriguchi, Shigehiro. 1959. Shôyu yuki-san ni kansuru kenkyû. I. Shôyu yûki-san no teiryô-hô ni tsuite [Studies on the organic acids in shoyu. I. Determination of the organic acids in shoyu]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(3):94-99. English-language summary on p. 10 of this issue. [9 ref. Jap; eng]
• ***Summary:*** The authors determined the organic acid content of *kiage shoyu* and *aminosan-eki* (HVP) separately by partition chromatography. Address: 1-2. Dep. of Fermentation Technology, Faculty of Engineering, Osaka Univ.; 3. Research Lab., Tatsuno Shoyu Co., Ltd., Japan.

4496. Ueda, Ryuzo; Nagai, Shiro; Moriguchi, Shigehiro. 1959. Shôyu yuki-san ni kansuru kenkyû. II. Shôyu oyobi aminosan-eki chû no yûki-san sosei ni tsuite [Studies on the organic acids in shoyu. II. Composition of the organic acid in shoyu and aminosan-eki]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(3):99-104. English-language summary on p. 10 of this issue. [7 ref. Jap; eng]
• ***Summary:*** Using 23 samples, the authors determined the composition of *kiage shoyu, tamari shoyu, sokujo shoyu, aminosan-eki* (*HVP*) *shoyu* and commercial retail shoyu. The

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HVP shoyu had the greatest content of levulinic acid (65-80%), followed by formic acid and acetic acid. Address: 1-2. Dep. of Fermentation Technology, Faculty of Engineering, Osaka Univ.; 3. Research Lab., Tatsuno Shoyu Co., Ltd., Japan (Tatsuno Shôyu K.K. Kenkyu-jô).

4497. Yamamoto, Kishirô. 1959. Studies on koji. IV. Mold protease production by replacement culture and inactive form protease in cell free extract. *Bulletin of the Agricultural Chemical Society of Japan* 23(2):110-15. March. [17 ref. Eng]
• ***Summary:*** "The effects of growth temperature on protease producing abilities of washed mycelial cells of *Aspergillus soyae* KS were investigated." The maximum ability of the cells grown at 35ºC to produce protease was almost the same as that of the cells grown at 20ºC. Address: Noda Inst. for Scientific Research [Noda City, Chiba-ken, Japan].

4498. Yoshii, Hisao; Ishihara, Akiyoshi. 1959. [Studies on soybean koji. I. On the protease activities of miso-dama koji]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(3):110-13. English-language summary on p. 12 of this issue. [9 ref. Jap; eng]
Address: Inst. of Food Technology, Aichi prefecture, Japan.

4499. Yamanouchi, Matsudaira. 1959. [Extraction of phytosterol from soybean cake]. *Japanese Patent* 2673. April 20. (Chem. Abst. 54:12503h). [Jap]*
• ***Summary:*** A large amount of soybean cake is mixed with sulphuric acid, and is then processed. The resulting phytosterol consists of campestrol, stigmasterol, Beta-sitosterol, gamma-sitosterol, stigmastanol, and gamma-sitostanol.

4500. Haldeman, Robert C. 1959. Potential effects of St. Lawrence Seaway on costs of transporting grain. *Marketing Research Report* (*USDA Agricultural Marketing Service*) No. 319. 149 p. April. [80 ref]
• ***Summary:*** Contents: Summary. Introduction. Grain production–Great Lakes–St. Lawrence waterway tributary area: Wheat, corn, barley, soybeans (p. 5), other grains. Characteristics of inland grain movements to interior and port destinations. Export grain movements: Wheat, corn, barley, soybeans and soybean oil, other grains. Potential export volume via the St. Lawrence Seaway. The Great Lakes- St. Lawrence waterway. Physical limitations of the waterway: Season of navigation, capacity of the Welland Canal, relationship of estimated traffic volume to capacity, capacity of the St. Lawrence Seaway locks, other physical limitations. Enabling legislation and seaway tolls: The Wiley-Dondero Act of May 13, 1954, The St. Lawrence Seaway Authority Act (of Canada), December 21, 1951. Grain handling expenses. Transportation costs and charges: motortrucks, railroads, inland waterways, Great Lakes, ocean transportation, liberty-type vessel, lake-ocean bulk carrier, comparative costs and charges. Summary of computed costs and charges on grain from interior points to foreign ports. Summary of computed costs and charges on grain to Atlantic Coast ports and tributary areas. Appendix.

Maps show: The Great Lakes and the St. Lawrence River and the Seaway (p. 2). An outline map of the United States with the areas where white wheat, hard red spring wheat, hard red winter wheat, and soft red winter wheat are grown (p. 4).

Illustrations show: A grain elevator truck dump, raised, with a truck in dumping position (p. 27).

Photos show: Grain flowing from the rear of a truck into a hopper-conveyor for movement into a grain elevator (p. 28). Automatic boxcar unloader with a boxcar being unloaded as it is gently oscillated; it can empty 5 cars per hour (p. 29). A Tennessee River tow, which is over 1,300 feet long and includes 21 bargeloads of grain. Pushed by a tugboat, the cargo totals 33,429 tons, or the equivalent of over 500 loaded railroad cars (p. 30). Unloading grain using floating pneumatic grain elevators, widely used at Antwerp and Rotterdam (p. 38).

Tables show: (1) Grain production (incl. soybeans) in selected states, average 1945-1954, 1955 and 1956 (p. 61). (14) Soybeans and soybean oil: U.S. exports by country of destination, averages 1945-49, 1945-54, 1950-54; annual 1955 and 1956. Figures are given for: North America–Canada, Cuba, Other, Total. South America–Chile, Other, Total. Europe–Austria, Belgium-Luxembourg, Denmark, Finland, France, West Germany, Greece, Iceland, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, Yugoslavia, Other, Total. Asia–Japan, Taiwan (Formosa), Other, Total. Africa. Australia and Oceania. Other. Grand Total. Soybean oil is converted to bushels of soybeans. The exports are on a calendar year basis. The units are 1,000 bushels.

In 1945-49 U.S. exports of soybeans and soybean oil were largest to: West Germany (and Austria) 3,345. France 2,100. Italy 1,745. Japan 1,548. Grand total: 21,219.

In 1956 (preliminary) U.S. exports of soybeans and soybean oil were largest to: Spain 36,630. Japan 19,148. West Germany (and Austria) 12,524. Netherlands 11,311. Grand total: 131,226–a remarkable 6.2-fold increase over 1945-49. Address: Transportation Economist, Marketing Research Div., Agricultural Marketing Service, USDA, Washington, DC.

4501. Inoue, Takashi; Tsuge, Yoshimi. 1959. [Studies on tamari. IV. On the precipitate separated from tamari by heating]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(4):152-55. [10 ref. Jap]
Address: Nagoya Miso and Tamari Co., Ltd., Japan.

4502. Miller, Harry W. 1959. Why Japan needs soy milk.

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Soybean Digest. April. p. 16-17.
• ***Summary:*** "It was an opportunity greatly appreciated to study the needs of the Japanese people nutritionally during my 7 months' responsibilities as surgeon and physician at the Tokyo Sanitarium and Hospital... The idea of a soybean beverage and milk from the soybean for soups and cooking was something altogether new... We set us a small pilot plant where we made soy milk, soy cream, soy ice cream, and soy spread... After seeing the ready acceptance by the nursing staff and patients of the Tokyo Sanitarium and Hospital of soy milk and soy cream made daily from a small fabricated plant of equipment procurable in Japan, we conceived the idea of such additions to be made to the tofu plants... We fitted up a small tofu plant out in a rural district with a homogenizer and a few utensils for milk handling. The milk is being bottled and capped there, and the local community is most appreciative. Since it sells at half the cost of fresh dairy milk it leaves a modest profit for the local shop."

4503. Nishimura, Toshihizô; Morinaga, Takamasa; Domoto, Yasuhiko. 1959. Saisei shôyu ni tsuite [Studies on double-brewed shoyu]. *Shoyu to Gijutsu* No. 249. p. 13-15. [Jap]* Address: Hiroshima-ken Shokuhin Kogyo Kenkyujo.

4504. Motosaki, Shinichi; Ogasahara, T.; Ito, K.; Adachi, S. Assignors to Ajinomoto Company. 1959. [Iron-free amino acid solution for flavoring purposes]. *Japanese Patent* 4387. May 9. (Chem. Abst. 53:20618b). [Jap]*
• ***Summary:*** Soybean cake is hydrolyzed with hydrochloric acid. Then to 100 liters of the resulting amino acid solution, 3 kg magnesium chloride is added, brought to pH 12 with sodium hydroxide solution, kept overnight at room temperature, and filtered to give an iron-free product.

4505. Hayashi, Shizuka. 1959. Japanese-American Soybean Institute: Reviews 3-year work of Institute. *Soybean Digest.* May. p. 29-30.
• ***Summary:*** Imports of soybeans to Japan from the USA increased to 777,436 tonnes (metric tons) in 1958, from 536,055 tonnes in 1956, and increase of 45% in just 2 years. This is partly a result of the Institute's 3 years of promotional activities. A list of 12 of the promotional activities is given.

4506. Kalnay, Francis. 1959. Soybean has all the answers (or nearly all). *House Beautiful* 101:174-75, 207-12. May.
• ***Summary:*** The opening 2-page spread contains photos of many commercial soyfood products available in America at the time: Dr. Fearn's Soy-O pancake flour (one with whole wheat and soya, and the other with just wheat and soya), Pure soya bean powder, and Soya bean granules, Wuest's soya-protein bread, Wuest's cookies, Wel-Pac kinako [roasted soy flour], Yamasa shoyu, Kikkoman shoyu, Oliver Tonkatsu Sauce (Tonkatsu are breaded pork cutlets), Hain soy oil (cold pressed), Amoy soy sauce, Prosperity soy sauce, Golden Sang Chan soy sauce, Madison Zoy-Koff, Hime aka-miso (Pacific Trading Co.), Hime yakidofu, Hime frozen bean curds, Delicious Edamame (Packed by Tokai Kanzume Co. Ltd., Nagoya, Japan), Quong Hop & Co. bean cake [tofu], Schiff soy lecithin, Oriental food shop black soybeans, Climax wheat and soy pure egg noodles (The Pfaffman Co., Cleveland, Ohio), and Prince Veta-Roni (Mezzani or Spaghetti; Prince Macaroni Co.).

The subtitle reads: It's a choice gourmet food. It's as nutritious as vitamin pills. It comes in a dozen forms and makes a hundred dishes.

The author uses soy-related words in a very modern way: "Have you ever noticed the way people who know food pronounce the simple word 'soy'? Their facial expression changes instantly, and their tone of voice turns positively lyric. There are two serious reasons for their extraordinary respect for a bean so little and so innocent. The soybean is enormously rich in protein. This wealth of protein is apparent in both quality and quantity... And because soy oil is high in unsaturated fatty acids, it fits well into today's popular low-cholesterol diets.

"In our country soy is relatively new... Soy is the most versatile legume imaginable... The glittering star in soy's troupe of players is soy sauce (also called soya and shoyu)... The soy food industry is still in its infancy in the U.S. Yet the variety of soy products available is impressive."

Note 1. This is the earliest publication seen (April 2001) that mentions Quong Hop & Co. in connection with tofu.

Note 2. This is the earliest English-language document seen (Aug. 2003) that contains the term "soya-protein" (or "soya-proteins").

4507. **Product Name:** [Oliver Breaded Pork Cutlet Sauce].
Foreign Name: Oribaa Tonkatsu Soosu.
Manufacturer's Name: Oliver. Made in Japan.
Manufacturer's Address: Japan.
Date of Introduction: 1959 May.
Wt/Vol., Packaging, Price: Bottle.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Francis Kalnay. 1959. House Beautiful. May. p. 174-75. "Soybean has all the answers." Photo of the bottle and label. The bottle is wrapped in paper.

4508. Tanaka, Shigetaka; Ueda, Ryuzo. 1959. [Studies on the inorganic components in shoyu. III. On the phosphorus and potassium contents]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(5):203-07. May. English-language summary on p. 20 of this issue. [15 ref. Jap; eng] Address: Osaka Univ., Japan.

4509. Callan, Mary Ann. 1959. Meals–Aid to millions. *Los Angeles Times.* June 7. Part IV. The Family. p. 1, D. Sunday.
• ***Summary:*** A dynamic little woman, Miss Florence Rose,

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operating with a small work force out of an unpretentious office on 7th street in Los Angeles, is busy making friends overseas for the United States. Miss Rose is the executive secretary of the Meals for Millions Foundation, and she works at their national headquarters. In 12 years the Foundation has shipped more than 56 million 3-cent meals to 100 countries abroad.

Multipurpose Food, developed by Caltech is now produced in the USA in Oxnard, California, primarily from soybean meal. The funds for sending the food abroad now comes from donations. India has produced MPF from peanut meal.

"Overseas women's groups in Brazil, Ethiopia, Greece, India, Japan, Korea, the Philippines, Taiwan, and Viet-Nam have received the friendship food for distribution–in quantities from 500 to 100,000 tons."

Note: This is the earliest article on soy seen (Aug. 2002) in the *Los Angeles Times.* Address: Times staff writer.

4510. Manners, Marian. 1959. What shall I cook? Menu ideas. *Los Angeles Times.* June 11. p. A5.
• ***Summary:*** Wednesday's dinner has a recipe for Mandarin meat balls, that calls for "¼ cup Japanese soy sauce."

Note: Suddenly, starting at about this time, the term "Japanese soy sauce" starts to be used in place of the term "soy sauce"–especially in the *Los Angeles Times.* Is this a coincidence or a commercial "pay for coverage" deal? We suspect the latter–a deal between Kikkoman and the Times. Consider the following chronology:

1957 June–Kikkoman International Inc. (KII) is established in San Francisco, California–Kikkoman's first overseas office in the United States or the Western World.

1958–The first KII branch is established in Los Angeles.

1960–The second KII branch is established in New York.

4511. Manners, Marian. 1959. Guests cook their own fare at Japanese table. *Los Angeles Times.* June 18. p. A8.
• ***Summary:*** A dinner party was given by Mr. and Mrs. George Nakatsuka of Pasadena, California; he is vice-president of the Japan Food Corp. Co-hosts included three West Coast executives with the firm and Kikkoman International, Inc.

"An honored guest was Gunzo Sugihara [age 76], board chairman with the Pacific Trading Co., which he founded in San Francisco in 1906, and a director of the Kikkoman firm." In 1899 he made his first journey to the USA. Each guest cooked his own food using an *okariba yaki.* Imported Japanese soy sauce, made from an ancient formula, requires 18 months to process, age and filter, so as to attain its "smooth flavor, deep, rich color, and freedom from sedimentation." The Kikkoman firm imports soybeans and wheat from the USA for the sauce it makes in Japan, and "only 1% of the 45 million gallons made annually is exported; the major portion is used by the Japanese." A recipe for Barbecue sauce, featuring "1 cup imported Japanese soy sauce" is given. A photo shows Marian Manners and Gunzo Sugihara–both having fun. Address: Times home economics director.

4512. Manners, Marian. 1959. What shall I cook? Menu ideas. *Los Angeles Times.* June 18. p. A9.
• ***Summary:*** Tomorrow's dinner includes "cucumbers in vinegar soy sauce (use Japanese soy sauce)."

4513. Manners, Marian. 1959. What shall I cook? Menu ideas. *Los Angeles Times.* June 25. p. A8.
• ***Summary:*** Tuesday's dinner includes "mixed Chinese vegetables with imported Japanese soy sauce,..."

4514. Hayashi, Shizuka. 1959. Institute makes oil survey in Tokyo: Japanese-American Soybean Institute *Soybean Digest.* June. p. 26.
• ***Summary:*** "A survey on the consumption of soybean oil covering the whole area of the city of Tokyo has been carried out by the staff of the Japanese American Soybean Institute. The metropolis has a population now exceeding 9 million or a total of 1,944,644 households,

"The so-called multistage or cluster sampling method was used in the survey. The whole Tokyo area was first divided into nine blocks. These nine blocks were divided equally into 3,400 parts, out of which 167 were chosen for the survey. The chosen areas included 1,111 households which constituted the secondary sampling unit.

"About 30 school girls of one of the nutrition colleges were employed to visit every family of the 1,111 selected. A number of questions were included in the questionnaires.

"The survey produced the following results:

"1. To a question inquiring whether the family used any edible oil, 93.3% gave an affirmative reply, and 6.7% replied that they do not use edible oil.

"It is amazing in modern civilized life there are still people who do not use edible oil at all. Out of approximately 2 million households there are more than 120,000 families who do not use edible oil, and of the whole Tokyo area approximately 700,000 do not eat oil. This fact alone indicates that more education is needed.

"2. The average daily per capita consumption of oil in Tokyo was shown by our survey to be 6.84 grams. The target set forth by the Japanese government for 1959 was 9.5 grams, which indicates that the quantity of oil consumed by the whole population should be increased.

"3. To a question of whether the oil is purchased by housewives who bring their own bottles or containers to be filled, about 70% replied 'yes.' The remaining 30% purchased in tins or bottles which were the original packages of the manufacturers.

"The survey clearly indicates that there is opportunity

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for manufacturers to push sales in their own containers under their brand names and thus increase consumption. The purchase of oil in bulk indicates that the housewives are more or less indifferent to specific brands of oil or to the manufacturers.

"4. To a question of where housewives do their buying of oil, approximately 60% indicated that they shop at grocery stores. It is surprising that only about 18% buy at the professional oil stores. This again indicates the possibility of increasing sales through the medium of proper shops.

"5. To a question of how often housewives use soybean oil in their cooking, those who use it less than five times a week constituted approximately 58%, and from six to ten times a week, 33%. This indicates that utilization of oil is still comparatively small.

"6. To a question of whether housewives are satisfied with prices they pay for edible oils, quite a large percentage said that the prices are high and the quality not altogether satisfactory. Increased consumption can be expected if the quality is improved and the price lowered.

"Nearly all the replies to various other questions indicate the importance of further public relations activities.

"The survey proved that the future prospect of soybean oil consumption in Japan definitely is promising if proper promotional activities are undertaken." Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building, No. 1, 1-Chome Yurakucho, Chiyoda-Ku, Tokyo, Japan.

4515. Hayashi, Shizuka. 1959. Miso makers protest F.M. in U.S. beans. *Soybean Digest.* June. p. 26.
• ***Summary:*** On May 9, all 49 directors of the All Japan Miso Industry Association signed a petition protesting the unacceptably high levels of foreign material [F.M.] is U.S. soybeans exported to Japan. The greatest problems are with corn, morning glory seeds, and split beans. Morning glory seeds must be picked out (usually by hand) and burned in accordance with Japanese food and hygiene laws.

The entire contents of the petition is given. Address: Japanese American Soybean Inst., Nikkatsu International Building, No. 1, 1-Chome Yurakucho, Chiyoda-Ku, Tokyo, Japan.

4516. Hayashi, Uichi. 1959. Nattô ni kansuru kenkyû. I. [Studies on natto. I. Search for a strain of *Bacillus natto* suited to use at a lower temperature]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(6):233-42. [30 ref. Jap; eng]
Address: Osaka Municipal Hygienic Laboratory, Japan (Osaka Shiritsu Eisei Kenkyujo).

4517. Manners, Marian. 1959. What shall I cook? Menu ideas. *Los Angeles Times.* July 9. p. A5.
• ***Summary:*** Monday's dinner includes "Pepper steak (use round steak, green pepper strips and Japanese soy sauce)."

4518. Manners, Marian. 1959. What shall I cook? Menu ideas. *Los Angeles Times.* July 16. p. A9.
• ***Summary:*** Sunday's dinner includes "barbecued turkey breast teriyaki style (use Japanese soy sauce, white wine, ginger, garlic)."

4519. Hayashi, Uichi. 1959. Nattô ni kansuru kenkyû. II. [Studies on natto. II. Enzymatic protein-decomposing capacity of *Bacillus natto* Sawamura strain No. 11 Hayashi]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(7):272-75. July. [12 ref. Jap; eng]
Address: Osaka Municipal Hygienic Laboratory, Japan.

4520. Hayashi, Uichi. 1959. Nattô ni kansuru kenkyû. III. [Studies on natto. III. The quality of natto in its relation to the time of soaking soybeans in water and to the pH value of it]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(7):276-80. July. [5 ref. Jap; eng]
• ***Summary:*** One of the most comprehensive studies of natto to date. The addition of H_3PO_4 (phosphoric acid, 0.05 to 0.1%) to the soaking water of dry soybeans to be used in making natto seemed to increase the storage life of the natto yet did not affect its taste or overall quality.

Hayashi's data indicated that there was no change in the fat and fiber contents of soybeans during a 24 hour period of fermentation, but that the carbohydrates [which cause flatulence] almost totally disappeared. A great increase in water-soluble and ammonia nitrogen was reported during fermentation as well as during storage. The amino acid composition was unchanged. Boiling significantly decreased the thiamine content of soybeans; but fermentation by *Bacillus natto* increased the thiamine content of natto to approximately the same level as that of the soybeans before boiling. The riboflavin content of natto was much greater than that in soybeans. Address: Osaka Municipal Hygienic Laboratory, Japan.

4521. Iwashita, Seishichi. 1959. [Studies on the spoilage by acid increase (sampai) of miso. III. Composition of the volatile acids of sampai miso and normal miso]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(7):264-67. July. English-language summary on p. 25 of this issue. [3 ref. Jap; eng]
Address: Asahi Chemical Indust. Co., Japan.

4522. Obata, Yataro; Matano, Kagenori. 1959. Nattô kôki ni kansuru kenkyû. I. Kihatsu-sei sansei busshitsu no kensaku [Studies on the flavor of natto. I. Identification of volatile acidic compounds by paper chromatography]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 33(7):567-69. July (Chem. Abst. 57:15569. 1962). [7 ref. Jap]

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Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Hokkaido Univ., Sapporo, Japan.

4523. Obata, Yataro; Matano, Kagenori. 1959. [Studies on the flavor of natto. II. On the change of diacetyl contents during the course of natto manufacture]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 33(7):569-71. July. [7 ref. Jap]
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Hokkaido Univ., Sapporo, Japan.

4524. Onishi, Hiroshi. 1959. Studies on osmophilic yeasts. IV. Changes in permeability of cell membranes of the osmophilic yeasts and the maintenance of their viability in the saline medium. *Bulletin of the Agricultural Chemical Society of Japan* 23(4):332-39. July. [10 ref. Eng]
• ***Summary:*** "A striking increase in the permeability of cell membranes of *Saccharomyces rouxii,* a typical salt-tolerant yeast, occurred when they were cultivated in the saline medium." Address: Noda Inst. for Scientific Research, Noda City, Chiba-ken, Japan.

4525. Davies, Lawrence E. 1959. Women's world: Hawaii. Mainlander shopping in Honolulu market likely to think she is on the mainland. *New York Times.* Aug. 13. p. 31.
• ***Summary:*** Hawaii's population of 645,000 is composed racially of 32% Japanese (persons of Japanese ancestry), 30% Caucasian, 17% Hawaiian or part Hawaiian, 11% Filipino, 6% Chinese, and 4% other races.

The shelves of Honolulu food markets are stocked with a mixture of mainland, East Asian, and local Hawaiian foods, including (from Japan) seaweed, jars of pickled gingerroot, "prepared seaweed seasoned with soy sauce and sugar," and "broiled eels canned with sugar, soy sauce, and sweet sake."

Note: The term "sweet sake" probably refers to *mirin,* but it might possibly refer to *amazake.*

4526. Hayashi, Shizuka. 1959. Japanese users react to U.S. beans. *Soybean Digest.* Aug. p. 34.
• ***Summary:*** "The fact that soybean in Japan are used 100% as food should by now be well realized by those in the soybean industry as well as by the growers. It has been repeatedly emphasized that soybean trade between the United States and Japan is to be based on the complete understanding of this fact."

One of the first projects of JASI "was to find out the causes of the unpopularity of U.S. soybeans among the Japanese users, especially the manufacturers of soybean products." The major complaints concern excessive "foreign material, broken beans, irregularity of sizes, and mixture of different varieties received. All these problems have been time and again called to the attention of interested parties in the United States." Considerable improvement has been made but there is still work to do. "The writer believes in the very near future specific varieties can be chosen for different food manufacturers and business will be done on the basis of [those] specific varieties."

A list gives the specifications for soybeans desired by Japanese oil processors (6 specs), miso manufacturers (3 specs), shoyu makers (3), tofu makers (2), frozen tofu makers (1), kinako makers (3), and natto makers (3). For example, for miso: (1) Soybeans with white hilum with rich protein content and of big size are preferred. (2) Soybeans should be stored separately by varieties [identity preserved]. (3) Foreign material, especially seeds of other plants, sand and stones should be eliminated.

And for tofu: (1) Soybeans should be rich in protein content with thin seedcoat. (2) Soybeans should be free from foreign material, especially that of poisonous seeds of other plants.

A photo shows Shizuka Hayashi tasting miso made from the U.S. soybean varieties Dorman, Mamloxi, and Jackson at the Inamari miso factory in Shizuoka city. Arthur Rollefson, U.S. assistant agricultural attache, is also shown.

Note: This is the earliest document seen (Feb. 2010) that introduces the concept of "identity preserved" ("Soybeans should be stored separately by varieties"). Address: Japanese-American Soybean Inst., Tokyo.

4527. Hayashi, Uichi. 1959. Nattô ni kansuru kenkyû. IV. [Studies on natto. IV. The production of natto at the room temperature of 20ºC]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(8):327-29. [Jap; eng]
Address: Osaka Municipal Hygienic Laboratory, Japan.

4528. Hayashi, Uichi. 1959. Nattô ni kansuru kenkyû. V. [Studies on natto. V. Relation between the humidity in the fermentation room and the quality of natto]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(8):329-32. [5 ref. Jap; eng]
Address: Osaka Municipal Hygienic Laboratory, Japan.

4529. Nakano, Masahiro. 1959. Traditional methods of food processing. Paper presented at Regional Seminar on Food Technology for Asia and the Far East. 15 p. Held 1-8 Aug. 1959 at Mysore, India. [Eng]
• ***Summary:*** Contents: General. Soybean foods: Miso, syoyu (soy sauce), aspects on the miso and syoyu, natto, tofu, kori-dofu. Technological methods of food processing: Koji, miso, syoyu [shoyu] (soy sauce), natto, tofu. Conclusion.

Note: This paper was sent as a gift, with note and autograph, to Dr. A.K. Smith of the Northern Regional Research Lab., Peoria, Illinois. Address: Food Research Inst., Ministry of Agriculture and Forestry, Tokyo, Japan.

4530. Ichinohe, Minoru. 1959. Studies on the soybean cyst nematode *Heterodera glycines* and its injury to soybean plants in Japan. *Plant Disease Reporter, Supplement*

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260:237-48. Sept. 15. Summarized in Soybean Digest, May 1961, p. 28. [14 ref]
• ***Summary:*** 1. Historical review: "The occurrence of the soybean-cyst nematode in Japan was first recorded by S. Hori in 1915. According to his report, Hori discovered the nematode on the roots of a soybean plant which was sent from Shirakawa, Fukushima Prefecture, where the same disease had been observed for many years. He noticed that this nematode was different from the root-knot nematode which had been well known in Japan at that time, and asked S. Uchida to identify it. In accordance with S. Uchida's identification, Hori referred the nematode to 21 species closely related to *Heterodera schachtii* which had been known as the causal nematode of 'Sugar-beet sickness' in Europe. Hori added in his paper that it is necessary to compare this nematode with *Heterodera göttingiana* which attacks pea in Germany."

"Ichinohe (1952) compared the soybean-cyst nematode with specimens of other species of Heterodera, and described it under the name *Heterodera glycines..."* Address: Nematologist, National Inst. of Agricultural Sciences, Tokyo, Japan.

4531. Tokunaga, T.; Tsuji, O.; Yasuda, K. Assignors to Nisshin Oil Manufacturing Company. 1959. [Extraction of phytosterols from soybean cake]. *Japanese Patent* 8528. Sept. 22. [Jap]*

4532. Hayashi, Uichi. 1959. Nattô ni kansuru kenkyû. VI. [Studies on natto. VI. Effect of substances added to the steep water on the quality of natto]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(9):360-68. [2 ref. Jap; eng]
Address: Osaka Municipal Hygienic Laboratory, Japan.

4533. Hayashi, Uichi. 1959. Nattô no eiyô-ka ni kansuru jikken-teki kenkyû. I. [Experimental studies of the nutritive value of "natto" (a fermented soybean). I. On the quantitative changes of dry matter, fats, carbohydrates and nitrogen compounds in the manufacturing process of natto]. *Kokumin Eisei* (*Japanese J. of the Nation's Health*) 28(3):568-73. Sept. [15 ref. Jap; eng]
Address: Osaka Municipal Hygienic Laboratory, Japan (Osaka Shiritsu Eisei Kenkyusho).

4534. Hayashi, Uichi. 1959. Nattô no eiyô-ka ni kansuru jikken-teki kenkyû. II. [Experimental studies of the nutritive value of "natto" (a fermented soybean). II. On the changes of vitamin B-2 and B-2 amounts for natto in its manufacturing process]. *Kokumin Eisei* (*Japanese J. of the Nation's Health*) 28(3):574-79. Sept. [11 ref. Jap; eng]
Address: Osaka Municipal Hygienic Laboratory, Japan (Osaka Shiritsu Eisei Kenkyusho).

4535. Hayashi, Uichi. 1959. Nattô no eiyô-ka ni kansuru jikken-teki kenkyû. III. [Experimental studies of the nutritive value of "natto" (a fermented soybean). III. On the digestibility and the biological value of protein in natto and other soybean foods]. *Kokumin Eisei* (*Japanese J. of the Nation's Health*) 28(3):580-87. Sept. [9 ref. Jap; eng]
• ***Summary:*** The protein quality of natto (70) was the highest, followed by boiled soybeans, then roasted soy flour (kinako). Address: Osaka Municipal Hygienic Laboratory, Japan (Osaka Shiritsu Eisei Kenkyusho).

4536. Hayashi, Uichi. 1959. Nattô no eiyô-ka ni kansuru jikken-teki kenkyû. IV. [Experimental studies of the nutritive value of "natto" (a fermented soybean). IV. On the feeding experiment by natto and other soybean products]. *Kokumin Eisei* (*Japanese J. of the Nation's Health*) 28(3):588-96. Sept. [4 ref. Jap; eng]
Address: Osaka Municipal Hygienic Laboratory, Japan (Osaka Shiritsu Eisei Kenkyusho).

4537. Hayashi, Uichi. 1959. Nattô-kin no shôkakan-nai ni okeru taido ni tsuite [On the attitude of natto bacilli in the digestive canal]. *Kokumin Eisei* (*Japanese J. of the Nation's Health*) 28(3):597-500. Sept. [5 ref. Jap; eng]
Address: Osaka Municipal Hygienic Laboratory, Japan (Osaka Shiritsu Eisei Kenkyusho).

4538. Kimura, Chikai; Kashiwaya, Kageaki; Asahara, Teruzo. 1959. Nitoroetan ni yoru daizu-yu no yôzai bunri [Solvent separation of soybean oil by nitroethane]. *Kogyo Kagaku Zasshi* (*J. of the Chemical Society of Japan, Industrial Chemistry Section*) 62(9):1381-83. Sept. [6 ref. Jap]

4539. Nagata, Tadao. 1959. Studies on the differentiation of soybeans in the world with special regard to that in Southeast Asia. II. Origin of culture and paths of dissemination of soybeans as considered by the distribution of their summer vs. autumn soybean habit and plant habit. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 28(1):79-82. Sept. Summarized in Soybean Digest, Feb. 1962, p. 26. [24 ref. Eng]
• ***Summary:*** Contents: Introduction. Clines established on combination of the summer vs. autumn soybean habit and plant habit. Ecotypes identified by the habits and their distributions in the world. A consideration on the origin of soybean culture. Some considerations on the paths of dissemination.

To illustrate the soybean's paths of dissemination, the author first establishes a system of four clines, based on the assumption that origin of soybean culture was in north and central China and moved into Manchuria, Japan and Southeast Asia (fig. 1). Each cline is identified by including summer vs. autumn soybean habit and plant habit (vining vs. nonvining). (1) The Manchurian cline (soybeans moved

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northward from China into Manchuria) is characterized by an increasing occurrence of special nonvining types which have a long relative flowering period and long relative growing period. (2) The Japanese full-season crop cline (soybeans moved from north China into Korea, and from there they were subsequently disseminated to central and northern Japan) is characterized by soybeans of the normal type having a short relative flowering period and a long relative growing period. Called *Aki-daizu* (autumn type), these soybeans are cultivated as a full-season crop in these regions and belong, more or less, to the short-day type. Historically we note that Korea had direct contact with China Proper, and especially with North China, during the Han dynasty (200 B.C. to the 3rd century A.D.). (3) The Japanese short-season crop cline (soybeans moved from central and south China, through Formosa [Taiwan] and Loochoo [Ryukyu Islands, incl. Okinawa]) is characterized by soybeans of the normal type having a short relative flowering period and short relative growing period. These short-season soybeans are designated as *Natsu-daizu* (summer type), since they are sown in the spring, mature early, and occasionally show very high protein content. However another (and more likely) path of introduction of short season crop soybean to Japan would have been directly from central China to south Japan, especially to Kyushu. Historically, we note that Japan had frequent contact with China before and during the Nara period (6th to 8th century A.D.). Recently soybean seeds were found in the *Shôsô-in,* which was established during the Nara period to store important materials (including medicinal herbs introduced from China). Moreover, these soybeans were identified as the short-season summer type akin to those grown in Kyushu and the Ryukyu Islands. (4) The Indo-Chinese cline (soybeans moved from central and south China, down through Southeast Asia [Vietnam, Laos, Thailand, Cambodia, Malaysia] to Indonesia) is characterized by an increasing occurrence of consistent vining types. Address: Hyogo Agricultural College, Japan.

4540. Onishi, Hiroshi. 1959. Studies on osmophilic yeasts. V. Factors affecting growth of soy yeasts and others in the environment of a high concentration of sodium chloride. (II). *Bulletin of the Agricultural Chemical Society of Japan* 23(5):351-58. Sept. [14 ref. Eng]
• ***Summary:*** It was found that many osmophilic yeasts were able to grow in a saline medium at a high temperature such as 40ºC, whereas in a "NaCl-free medium no growth occurred at the same temperature." Address: Noda Inst. for Scientific Research, Noda City, Chiba-ken, Japan.

4541. Onishi, Hiroshi. 1959. Studies on osmophilic yeasts. VI. Glycerol production by the salt-tolerant yeast in the medium with high concentrations of sodium chloride. *Bulletin of the Agricultural Chemical Society of Japan* 23(5):359-63. Sept. [15 ref. Eng]
• ***Summary:*** "*Saccharomyces rouxii,* which is a typical salt-tolerant yeast and plays an important sole in 'soy-brewing' [soy sauce fermentation], was found to ferment glucose giving high yields of glycerol in a high saline medium under aerobic conditions. However, only a small amount of glycerol was produced in the ordinary medium." Address: Noda Inst. for Scientific Research, Noda City, Chiba-ken, Japan.

4542. Smith, Allan K. 1959. Research on the increasing use of U.S. soybeans in Japan. *Soybean Digest.* Sept. p. 62-65.
• ***Summary:*** "In 1956 the American Soybean Association in collaboration with the Foreign Agricultural Service of the U.S. Department of Agriculture started a market development program on soybeans in Japan."

Late in 1957 Dr. Smith "spent 2 months in Japan studying the products and processes where U.S. soybeans are competing with Japanese and communist Chinese beans." He found that the traditional foods of Japan are processed from whole soybeans, whereas in the USA the use of whole soybeans has, until recently, "received no commercial recognition for food, feed, or industrial application. Also the traditional food processors of Japan value the protein more highly than the oil which is the reverse of the emphasis in this country."

The results of Dr. Smith's investigations were published in April 1958 under the title "Use of United States soybeans in Japan." "The problems raised by the Japanese are briefly summarized as follows: 1–Composition: It was generally stated that Japanese soybeans are higher in protein than our soybeans. 2–U.S. soybeans are slower to absorb water than Japanese beans and absorb water unevenly. 3–Our soybeans cook unevenly and consequently they may not support uniform fermentation. 4–Products from U.S. soybeans are darker in color than those made from Japanese soybeans. 5–Food products from U.S. beans do not have as good a flavor as from Japanese soybeans. 6–The Japanese do not like the amount of foreign matter, split and broken beans, and other crop material in U.S. soybeans.

Following Dr. Smith's investigation in Japan, a research project was initiated at the Northern Regional Research Laboratory in Peoria, Illinois. The immediate objectives of the project are: 1–To investigate the reported differences between U.S. and Japanese soybeans and to evaluate their significance. 2–To compare approximately 30 U.S. and 6 Japanese soybean varieties in miso and tofu, two most important Japanese foods, and to determine which U.S. varieties are suitable for making these foods. 3–To study the processing methods used by the Japanese and to modify their processes for better adaption [adaptation] of our soybeans to their use...

"Two Japanese scientists, Tokuji Watanabe and Kazuo Shibasaki, accepted invitations to come to the Northern Laboratory to work on these projects."

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In the 9 months that Dr. Shibasaki and Mr. Watanabe spent at the NRRL they made progress on all the 6 problems listed, though the project is still underway. They found two U.S. soybean varieties, Jackson and Lee, that make tofu very similar to that made from Japanese soybeans. Other promising varieties are Blackhawk, Comet, Dorman, Ottawa, Mandarin, and Acme.

"Composition: It was reported, and generally assumed to be true, that Japanese soybeans were higher in protein and lower in oil than U.S. soybeans. We have accumulated data (all on a moisture-free basis) to determine whether this report is true. Table 1 shows the protein and oil content of eight Japanese soybean varieties grown in various parts of Japan during 1957 or 1958. The name often indicates the area grown: Aomori, Hokkaido Akita, Kumamoto, Miyagi, Nagano, Hagi-Dani, Hokuho, and White Hilum Iwate. These 8 Japanese varieties contained an average of 40.5% protein and 17.2% oil in 1957 and 42.3% protein and 16.8% oil in 1959.

Table 2 shows the protein and oil content of 15 U.S. [and Canadian] soybean varieties grown in various parts of the USA during 1956, 1957 or 1958: Acme, Adams, Blackhawk, Chippewa, Clark, Comet-1, Comet-2, Dorman, Dortchsoy, Harosoy, Hawkeye, Jackson, Lee, Lincoln, and Norchief. These 15 U.S. varieties contained, on average, 41.8% protein in 1956, 40.1% in 1957, and 40.7% protein and 20.2% oil in 1958. Comparing these two tables, Dr. Smith concludes that U.S. and Japanese soybeans contain about the same amount of protein, but that U.S. field-type soybeans contain about 3.7% more oil than Japanese soybeans.

Table 3 shows the maturity group, protein and oil content, and weight in grams of 100 seeds for 33 recommended U.S. and Canadian varieties. This data is based on Cooperative Uniform Soybean Tests. These 33 varieties are grown in all the major soybean growing areas of the USA; Groups 00 to IV inclusive are grown in the North Central States, approximately north of Cairo, Illinois, to northern Minnesota; groups V to VIII inclusive are grown south of Cairo. The 33 varieties, sorted by ascending maturity group, and within each group alphabetically by varietal name are: Acme (00, Canadian), Crest, Flambeau, Capital (0), Comet, Grant, Mandarin, Norchief, Blackhawk (I), Chippewa, Adams (II), Harosoy, Hawkeye, Lindarin, Ford (III), Lincoln, Shelby, Clark (IV), Perry, Scott, Wabash, Dorman (V), Dortchsoy, S-100, Hood (VI), Ogden, CNS-4 (VII), Jackson, Lee, Bienville (VIII), Improved Pelican, J.E.W. 45 [Wannamaker], and Yelanda. This table shows that the oil content increases slightly as one moves from north to south

Smith then discusses garden- or vegetable-type soybeans. "U.S. vegetable soybeans: There is no clear definition for distinguishing the field-type from the garden-type beans. The distinctive features of the garden beans are in their superiority in flavor, texture, and ease of cooking–properties that make them preferred for food use... Most of our so-called vegetable-type soybeans we are growing in this country are Japanese garden varieties that came directly from that country; the Kim and Kanrich were developed in this country. Serious disadvantages of garden-type beans which restrict production are the tendency to shatter from the pods when ripe and the consequent large loss with mechanical harvesting... the yields of some varieties are also lower than for field beans. It has been stated frequently that the garden-type bean is higher in protein and lower in oil than the field type.

Table 4 shows the protein, oil, weight of 100 seeds in grams and hilum color for 14 "garden-type soybeans" on a dry basis. The source of the data for all the varieties except Kanrich, Kim, and Easycook is the University of Illinois Bulletin 453 by J.W. Lloyd and W.L. Burlison 1939 ["Eighteen varieties of edible soybeans: Their adaptability, acceptability, culture and characteristics"]. "For these data the protein values are no higher than for present-day field types and the oil values are only 0.77% lower" than typical field types soybeans shown in table 3. The weight in grams of 100 seeds, in descending order of seed weight and size, is as follows: Hokkaido 31.9, Funk Delicious 31.7, Willomi 31.1, Jogun 29.9, Emperor 29.7, Giant Green 29.4, Kim 28.7, Imperial 28.4, Kanrich 27.3, Fuji 25.9, Illington 25.9, Higan 23.4, Bansei 21.2, and Easycook 16.2.

Conclusion: It "appears that claims for high protein values for garden type soybeans may be exaggerated." A portrait photo shows A.K. Smith.

Note 1. This is the earliest document seen (Dec. 1998) concerning the breeding or selection of soybean varieties for food use–in this case tofu for Japan.

Note 2. This is the earliest English-language document seen (June 2009) that contains the term "garden-type soybeans" or "vegetable-type soybeans." The two terms as synonyms. Address: NRRL, Peoria, Illinois.

4543. *Soybean Digest.* 1959. Father of U.S. soy crop passes. W.J. Morse. Sept. p. 75.

• ***Summary:*** "William J. Morse, age 75, who had better claim than any other man to the title of founder of the soybean crop industry, died of a cerebral hemorrhage early in the morning of July 30 [1959] at his home in Eastchester, N.Y.

"Mr. Morse was known throughout the world an particularly in the United States and the Far East for his work in soybean development in the U.S. Department of Agriculture.

"He was one of the founders of the American Soybean Association and three times president. He was one of the first men to be elected an honorary life member of the Association.

"He was born in Lowville, N.Y., and attended Lowville Academy, then received his BSA from Cornell University [Ithaca, New York].

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"Mr. Morse went to USDA in 1907 just at the time the Bureau of Plant Industry was making plans to carry on research in the growing of soybeans.

"The plant, introduced from time to time from China, Manchuria, Korea, Japan, and other parts of Asia, had been known here for a century, but had increased to only a few thousand bushels a year. Now, after the long period of search and research, it is one of the nation's leading crops, totaling over half a billion bushels a year.

"Thirty years ago, after having put in 22 years of research in the Department, Mr. Morse spent 2 years exploring for soybeans and other crop plants in China, Japan, Korea, and Manchuria. He returned with hundreds of varieties, many of which contributed to the improvement of strains already here.

"By his development work he supplied the country with varieties suitable for various localities, increased the oil content of some–a big factor in the industrial use of this crop–and made other varieties better for food use. He stimulated the development of the vegetable soybean in this country. The soybean had been little more than a curiosity until research in USDA, largely by Mr. Morse, led the way to making it the important food, feed, and industrial crop of today.

"In 1947 USDA gave him a Superior Service Award.

"He published more than 75 bulletins and articles on soybeans and was co-author of The Soybean, published in 1923 and in print until very recently.

"Burial was at Mt. Hope Cemetery, Hastings-on-Hudson, N.Y. He is survived by a sister, Gladys H. Morse, Lowville, N.Y.; a daughter, Mrs. Walter A. Thalman, Eastchester, N.Y., and three grandchildren.

"Mrs. Morse died last Dec. 23."

A large, excellent portrait photo (taken in the 1940s) shows William Morse in his later years.

4544. Strayer, George M. 1959. Marketing opportunities lie before us. *Soybean Digest.* Sept. p. 18-21.
• ***Summary:*** Last year U.S. soybean production topped the 500 million bushel mark for the first time in history. "For the first time in history we will export over 100 million bushels of soybeans as beans during the present crop year ending Sept. 30. That means that 1 bushel out of every 5 produced on the farms of American finds its way to plants in Japan, Germany, England, Israel and the other countries of the world. This year again we will export about one-fifth of our [soybean] oil production... The soybeans have all been sold for dollars, while some portions of the oil have been sold for dollars and the remainder for foreign currencies under Public Law 480.

"The U.S. soybean crop has truly become an international commodity"–thanks in large part to ASA [American Soybean Assoc.] market development programs in Japan, Spain, Italy, Israel, and Germany. The Japanese program is the biggest and most successful; a long description of its activities is given. In India, the Soybean Council exhibited at a trade fair in Madras. Also discusses problems with grading standards (broken soybean particles are now classified as foreign material) and ASA's need for more members (it now has only 7,000).

The entire soybean industry has been saddened by the death of W.J. Morse on July 30. "More than any other man in the United States he was responsible for soybeans as we know them today. He made the plant exploration trips that uncovered the thousands of varieties and strains of soybeans that were brought to the United States for trial purposes, and which supplied the germ plasm for all [sic, many] of today's varieties of soybeans. One of the first two honorary life members chosen by this Association, Bill Morse retired from his work in the U.S. Department of Agriculture just 10 years ago. His contributions to the present billion-dollar soybean industry can never be adequately appraised."

Thanks to the nine men (serving without pay) who have represented ASA on the board of directors of the Soybean Council of America.

"Thanks to Kent Pellet for his continued faithful allegiance to the editorship of the *Soybean Digest,* the *Blue Book* and *Late News*,..." Address: Executive Vice President and Secretary-Treasurer, American Soybean Assoc. [Hudson, Iowa].

4545. Watanabe, Tokuji; Shibasaki, K. 1959. Japanese scientists look at U.S. soybeans. *Soybean Digest.* Sept. p. 66-68.
Address: Dep. of Agriculture and Forestry, Tokyo.

4546. Yamamoto, Ryozo; Ishikawa, Masashi. 1959. [Comparison between the soybean seeds ripened on a highland and those ripened on a lowland]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 28(1):77-78. Sept. [4 ref. Jap; eng]
Address: Faculty of Agriculture, Nagoya Univ.

4547. Manners, Marian. 1959. Teahouse perfect setting for serving Japanese meals. *Los Angeles Times.* Oct. 22. p. A1.
• ***Summary:*** A stylish, real Japanese Teahouse is one of the main attractions at the 10th annual Southern California Decorators Show.

The section titled "Soy sauce tops" notes that Japan exports to the United States nearly 100 different kinds of canned foods. The most popular among these is "Japanese soy sauce."

Recipes are given for: Shrimp and vegetables (with soy sauce). Kyuri aka-nasu sarada goma-shi (Cucumber tomato salad with sesame seeds; with "¼ cake fried bean curd"). Tamago-yaki (Japanese egg roll, with soy sauce). Chawan mushi (Steamed chicken and egg custard; with soy sauce).

A photo shows the approach to and exterior of the

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Teahouse. Address: Times Home Economics Director.

4548. National Food Research Institute (Shokuryo Kenkyujo). 1959. Tôfu seizô no gijutsu [The art and technique of tofu production]. *Shokuryo: Sono Kagaku to Gijutsu* (*Food: Its Science and Technology*) No. 3. p. 1-13. Oct. [Jap]
Address: Tokyo.

4549. Toyoshima, Haruo; Ueda, Ryûzô. 1959. Miso no yûki-san ni kansuru kenkyû. I. Shihan miso no yûki-san sosei [Studies on the organic acids in miso. I. On the composition of organic acids in commercial miso]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(10):431-35. English-language summary on p. 41 of this issue. [10 ref. Jap; eng]
Address: 1. Mori Women's Junior College, Kobe (Kobe Mori Joshi Tanki Daigaku); 2. Osaka Univ. (Handai Kôgaku-bu Hakko Kôgaku Kyoshitsu), Japan.

4550. Toyoshima, Haruo; Ueda, Ryûzô. 1959. Miso no yûki-san ni kansuru kenkyû. II. Miso no shurui-betsu yûki-san sosei [Studies on the organic acids in miso. II. On the composition of organic acids in various types of commercial miso]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(10):436-39. English-language summary on p. 41 of this issue. [7 ref. Jap; eng]
Address: 1. Mori Women's Junior College, Kobe (Kobe Mori Joshi Tanki Daigaku); 2. Osaka Univ. (Handai Kôgaku-bu Hakko Kôgaku Kyoshitsu), Japan.

4551. *FAO Nutrition Meetings Report Series.* 1959. Report of the FAO/UNICEF Regional School Feeding Seminar for Asia and the Far East. No. 22. 53 p. Held 10-19 Nov. 1958 at Tokyo, Japan. [5 soy ref]
• ***Summary:*** UNICEF stands for the United Nations International Children's Emergency Fund. Appendix 3 (p. 48-51) titled "Data on some nutritious food products that have been developed in Asia and the Far East," discusses Saridele, groundnut extract curd [tofu made from peanut milk], Indian Multipurpose Food (MPF, developed by CFTRI), miso, natto, and tempeh.

"'Saridele' is the name that has been given to a spray-dried soybean extract combined with an extract of sesame, or peanut, with or without the addition of malt. Vitamins and calcium are added to saridele in order to make its nutritive value similar to that of cow's milk or to enhance its nutritive value. Flavorings such as vanilla or chocolate are also used, which make the product highly acceptable.

"A plant having a capacity of about 800 kg./day has been erected in Indonesia with the financial assistance of UNICEF and the technical assistance of FAO. Saridele is manufactured from a mixture of soybeans and decorticated sesame in the proportion of 4:1. Malt extract from maize may be used to replace 50% of the cane sugar used. Soybean and sesame are soaked for about six hours and then disintegrated finely, together with 7 volumes of hot water. The slurry is stirred vigorously and then filtered. The filtered liquid is heated under pressure for 10 minutes at 120ºC., then flashcooled and formulated with Vitamin A, in oil solution, and malt, if desired. The formulated liquid is homogenized, concentrated in a vacuum evaporator to about 22% solids, then spray-dried. The powder finally is sifted and blended with finely ground cane sugar, and calcium carbonate, riboflavin, ascorbic acid and Vitamin B_{12} added; the mixture may be flavored with vanilla or chocolate." A table compares the nutritional composition of whole dried cow's milk and Saridele (based on a leaflet from Saridele Ltd., Indonesia).
Address: FAO, Rome.

4552. Onishi, Hiroshi; Saito, Narimasa. 1959. [Studies on the polyalcohols in soy sauce]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(11):457-61. English-language summary on p. 43 of this issue. [30 ref. Jap; eng]
Address: Noda Inst. for Scientific Research, Japan.

4553. Takeda, Hiroshi. 1959. Nyûji tanpaku taisha ni kansuru kenkyû. I. Bonyû eiyôji narabini jinkô eiyôji no chisso taisha ni kansuru kenkyû [Studies on the protein metabolism in infants. I. A study on the nitrogen metabolism in infants brought up on mother's milk and in those on an artificial diet]. *Nippon Shonika Gakkai Zasshi* (*Acta Paediatrica Japonica*) 63(9-12):3105-12. Dec. 1. [43 ref. Jap; eng]
Address: Okayama Daigaku Igaku-bu, Shoni-ka, Kyo-shitsu (Dep. of Pediatrics, Okayama Univ. Medical School).

4554. Kamada, Hidemoto; Sakurai, Yoshito. 1959. Daizu seihin no chakushoku ni kansuru kenkyû. I. [Browning reaction of soybean products. I. Effects of steaming on the color of soybean meal (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14. p. 123. Dec. [1 ref. Jap]
• ***Summary:*** Reprinted from *Nosan Kako Gijutsu Kenkyu Kaishi* (*J. for the Utilization of Agricultural Products*) 5(2):50+ (1958). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4555. Kamada, Hidemoto; Sakurai, Yoshito. 1959. Daizu seihin no chakushoku ni kansuru kenkyû. III. [Browning reaction of soybean products. III. Significance of soybean water-insoluble carbohydrates in the color formation of miso (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14. p. 125. Dec. [1 ref. Jap]
• ***Summary:*** Reprinted from *Nosan Kako Gijutsu Kenkyu Kaishi* (*J. for the Utilization of Agricultural Products*) 5(3):99+ (1958). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4556. Kamada, Hidemoto; Sakurai, Yoshito. 1959. Daizu

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seihin no chakushoku ni kansuru kenkyû. IV. [Browning reaction of soybean products. IV. Relationship between amino-carbonyl reaction and the color formation of miso or shoyu (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14. p. 126. Dec. [1 ref. Jap]
• ***Summary:*** Reprinted from *Nosan Kako Gijutsu Kenkyu Kaishi* (*J. for the Utilization of Agricultural Products*) 6(3):104+ (1958). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4557. Kamada, Hidemoto; Sakurai, Yoshito. 1959. Daizu seihin no chakushoku ni kansuru kenkyû. II. [Browning reaction of soybean products. II. Relationship between the color of steamed soybean meal and the color of miso (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14. p. 124. Dec. [1 ref. Jap]
• ***Summary:*** Reprinted from *Nosan Kako Gijutsu Kenkyu Kaishi* (*J. for the Utilization of Agricultural Products*) 5(2):52+ (1958). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4558. Nakano, Masahiro. 1959. FAO Ajia chiiki shokuhin kakô kaigi ni shusseki shite [Attending the FAO Asian food processing conference]. *Nosan Kakko Gijutsu Kenkyu Kaishi* (*J. for the Utilization of Agricultural Products*) 6(6):292-302. Dec. [Jap]
• ***Summary:*** Discusses Korean meju and soy sauce, Indonesian tempeh (tenpe), ontyom (onchom) and pongrek [sic, bongkrek], and Vietnamese nuoc-mam. Address: National Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4559. *Soybean Digest.* 1959. Soybean recipe book issued by Institute. Dec. p. 25.
• ***Summary:*** The Japanese-American Soybean Institute (JASI) recently issued a "Book of Recipes Using Soybeans." Edited by the Japan Nutrition Association (JNA), this booklet includes 108 recipes which have been introduced by the JNA at 2,200 "short courses in dietary improvement" held last year at the 800 Japanese health centers. Attendance at these courses (which were partly sponsored by JASI) was 220,000 people! The booklet, which is available at the health centers, contains articles on frozen and bagged tofu, shoyu, miso, natto, and "golden ajinomoto" (a seasoning made by the Ajinomoto Company).

4560. Taira, Harue; Ebisawa, H.; Sugimura, K.; Sakurai, Y. 1959. Daizu kakôhin no amino-san ni kansuru kenkyû. I. [Studies on amino acid contents of processed soybean. I. Total amino acids of soybean products (Abstract)]. *Shokuryo Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 14. p. 95. Dec. [1 ref. Jap]
• ***Summary:*** Amino acid content of the following are given: Two soybean varieties, tofu, deep-fried tofu pouches (abura-age), okara, dried frozen tofu, yuba, kinako, natto, and soymilk. Reprinted from *Eiyo to Shokuryo* 11(6):351 (1959). Address: 1-2. Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4561. Taira, Harue; Ebisawa, Harue; Sugimura, Keiichiro; Sakurai, Yoshito. 1959. Daizu kakôhin no amino-san ni kansuru kenkyû. II. [Studies on amino acid contents of processed soybean. II. Transfer of amino acids during "tofu" processing (Abstract)]. *Shokuryo Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 14. p. 96. Dec. [1 ref. Jap]
• ***Summary:*** A table shows the percentage of the basic amino acids that are transferred from dry soybeans to boiled soybeans, then to fresh soy puree (gô), okara #1, okara #2 wash, soymilk, tofu, soybean boiling water, and yuba. Address: 1-2. Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4562. Takeda, Hiroshi. 1959. Nyûji tanpaku taisha ni kansuru kenkyû. II. Rin yûki eiyô shitcho nyûji no chisso taisha ni oyobosu rijin tôyo no eikyô [Studies on the protein metabolism in infants. II. Influences of lysine administration on the nitrogen metabolism in infants with malnutrition at weaning time]. *Nippon Shonika Gakkai Zasshi* (*Acta Paediatrica Japonica*) 63(9-12):3113-19. [30 ref. Jap; eng] Address: Okayama Daigaku Igaku-bu, Shoni-ka, Kyo-shitsu (Dep. of Pediatrics, Okayama Univ. Medical School).

4563. Urano, Keishi; Nagase, Yoshimichi; Hiraoka, Koichi. 1959. [Studies on the irrigation and the deep plowing. I. On the growth and yields of upland rice and soybean plants]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 28(2):236-38. Dec. [8 ref. Jap; eng]
Address: Kikyogahara Branch, Nagano Agric. Exp. Station.

4564. Ebata, N.; Uno, R. 1959. [On the protein digestive power of *Bac. natto*]. *Scientific Report of the Faculty of Liberal Arts Education, Gifu University* 2:284-88. [Jap]*

4565. Ebine, Hideo; Oguri, Y. 1959. Shinku kansô-hô ni yoru kansô miso no shisaku [Preparation of dehydrated miso by vacuum drying]. *Miso Gijutsu* (*Miso Technology*) No. 64. p. 1-4. [7 ref. Jap]
Address: Shokuryo Kenkyujo.

4566. Masao, H. 1959. [Studies on natto and natto bacilli. III. Hygienic studies]. *J. of the Nihon Medical University* 26:540-47. *

4567. Miura, T. 1959. [Influence of natto and miso on growth and nitrogen metabolism in normal rats. (I) (II)].

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Nippon Shonika Gakkai Zasshi (*Acta Paediatrica Japonica*) 63:2241-54. [Jap; eng]*

4568. Yokoyama, Yoshikuni; Shigeno, Y.; Sotome, S.; Shimada, W.; Fukuda, K. 1959. Kôri-dôfu no kahhenka ni kansuru kenkyû. I. Kahhenka no kôri-dôfu-chû no shibô no seishitsu [Browning phenomenon of "Koridofu" (frozen soya-bean milk curd). I. The fat in the browned products]. *Utsunomiya Daigaku Nogakubu Gakujutsu Hokoku* (*Bulletin of the College of Agriculture, Utsunomiya University*) 4(2):231-33. [5 ref. Jap; eng]
Address: Utsunomiya Univ., Japan.

4569. Bush, Lewis William. 1959. Land of the dragonfly. London: Robert Hale. 224 p. Illust. Index. 23 cm.
• ***Summary:*** Chapter 20, titled "Mainly About Food," notes (p. 162-63) that sukiyaki is "cooked with soy, water, sugar, vegetables, bean curd..." And sashimi is "dipped in soy..."

"Miso is indispensable in Japanese cookery and is a paste made from beans and fermented rice, used for soups–particularly at breakfast, for preserving, and also as a condiment."

Buddhism was well established in China and Korea by the fourth century and was introduced into Japan between A.D. 500 and 600. Note: It may very well be that the cultivation of soybeans and their use in food, including fermented foods, were then introduced into Japan.

4570. Egami, Tomi. 1959. Typical Japanese cooking. 1st ed. Translated by V.A. McKenzie Skillman. Tokyo: Shibata Publishing Co. Ltd. Exclusive distributors: Japan Publications Trading Co., Ltd (Tokyo). [viii] + 146 p. Illust. (incl. color photos by Yoshikatsu Saeki). Index. 27 cm.
• ***Summary:*** Foods marked with an asterisk (*) are exported from Japan to the USA. Many recipes include "soy sauce" and monosodium glutamate (Ajinomoto). Soy related recipes include: Aburage * ("fried soy bean curd"–4 recipes). Broiled soy bean curd [*yakidofu*] (3 recipes. Sukiyaki, Yasainabe, Osechi). Chu-miso paste * ("made from soy beans, salt and rice malt [koji], seasoning for miso soup"–2 recipes). Ganmodoki * ("fried soy bean curd and vegetables"–Nikomi oden). Nama-age ("half fried soy bean curd"–Boiled vegetables).

Note: This is the earliest English-language document seen (April 2013) that contains the term "fried soy bean curd" or the term "half fried soy bean curd."

Okara ("soy bean curd leftovers"–Yoshino sushi). Red miso paste * ("made from soy beans, salt and rice malt [koji], seasoning for miso soup"–2 recipes). Soy bean (3 recipes). Soy bean curd * (14 recipes, incl. Gizeidofu / Gisei-dofu, p. 39). Soy bean powder * [kinako] (2 recipes; Kinakomochi, Kushi dango). Soy sauce ("Kikkoman"). White miso paste ("made from soy bean, salt and rice malt [koji], seasoning for miso soup"–2 recipes). Worcestershire sauce (Skewer nibblers).

Other interesting recipes include: Amazake. Azuki-sarashian ("red bean powder"–7 recipes). Black sesame seed (in Sekihan). Mochi rice. Red bean [azuki] (Sekihan). Rice cake ("made of mochi rice"). Seaweeds (kanten / agar-agar, kombu / konbu, nori / green laver & purple laver, wakame). White sesame seed. Yamaimo ("Japanese yam"). Tomi Egami was born in 1899. Address: [Japan].

4571. Fernandes Teixeira, Edgar. 1959. Enormes possibilidades para o cultivo da soja [The enormous possibilities for soybean cultivation]. In: 1959. Soja no Rio Grande do Sul. Secretaria da Agricultura (Companha da Produtividade Agricola): Porto Alegre. See p. 3-16. Chap. 1. [Por]
• ***Summary:*** Discusses: Soybean cultivation in Japan. Soya in India (and the work of Mahatma Gandhi starting in 1932). Soya in the USA. Soya in Soviet Russia (from 1926 to 1943 the area planted to soybeans grew four-fold). Soya in Brazil. Soya in Sao Paulo. Nematodes: An obstacle. Address: Secretaria da Agricultura, Diretoria Geral, Brazil.

4572. Figueiredo Paz, Ataliba de. 1959. Uma planta cuja cultura deve ser estimulada [A plant whose cultivation should be encouraged]. In: 1959. Soja no Rio Grande do Sul. Secretaria da Agricultura (Companha da Produtividade Agricola): Porto Alegre. See p. 63-76. Chap. 7. [Por]
• ***Summary:*** Thirty years ago Professor Ataliba de Figuerido Paz conducted many soybean experiments at the Escola de Agronomia e Veterinaria da Universidade do Rio Grande do Sul, Brazil. A table shows imports of soybeans in 1919, 1920, and 1921 from China (the main supplier), Japan, the USA, and other countries. Discusses the main varieties grown in Brazil, medium- and late varieties, soybean pests, soya in human nutrition, how soymilk is made from soybeans, soya–an excellent forage. Address: Escola de Agronomia e Veterinaria da Universidade do Rio Grande do Sul, Brazil.

4573. Inoue, Takashi; Tsuge, Yoshimi. 1959. [Studies on tamari. IV. On the precipitate separated from tamari by heating]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 37(4):152-55. English-language summary on p. 15 of this issue. [10 ref. Jap; eng]
Address: Nagoya Miso and Tamari Co., Ltd., Japan.

4574. Japanese American Soybean Institute. 1959. Book of recipes using soybeans. Japan Nutrition Assoc. *

4575. Kirkbride, Ronald. 1959. Tamiko. London: Cassell & Co. Ltd. 197 p. See Chap. 7, p. 54. 21 cm.
• ***Summary:*** A novel about war-torn Japan shortly after World War II by an author who knows the country well. Ivan takes his friends to Donzoko's, a high-class, expensive

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Geisha house in Tokyo. "They had hors d'oeuvres of raw wild vegetables, sashimi, thin slices of raw tuna and sea bream with soy sauce, fried honey-bees and salted thrush hearts served with turtle-dove soup... The food was endless."

4576. Nippon Shoyu Kyokai. 1959. Nippon shôyu gyôkai-shi [History of the Japanese shoyu industry]. Tokyo: Nippon Shoyu Kyokai. 613 p. [Jap]
• ***Summary:*** Contains good histories of Kikkoman, Yamasa, Choshi/Choshu, Marukin. Address: Tokyo.

4577. Obata, Yataro. 1959. Mieki [Mieki (Leaflet)]. Tokyo: Aji-no-moto Co. Ltd. 1 p. [Jap; eng+]
• ***Summary:*** "It was no other than shoyu which was shipped exclusively by Dutch merchants from Japan to Europe, where it was called the essence or flower of the cuisine at the palace of Louis XIV [in France]. These Dutchmen exported the shoyu in bottles or earthen jars, sealed with pine resin and sterilized [pasteurized] by boiling in hot water. From Japan, they sailed southwards into the Indian Ocean, then northwards into the Atlantic Ocean, finally arriving in Europe with the shoyu. It as very expensive but the quality was good. At parties held by the Bourbon kings of France [incl. Louis XIV and Louis XV], shoyu was loved. Shoyu was praised by Thunberg, who came to Japan in 1774 and later became head of Uppsala University in Sweden. The reason that this well-like shoyu was not served in the first-class dining rooms of European boats later in the Meiji period (1868-1912) was that the flavor was no longer as good, primarily because the moromi mash was no longer fermented for three years, but also because the second pressing (*niban shibori*) with water.

Note 1. This is the earliest document seen (April 2012) that mentions the use of shoyu by Louis XIV [who reigned from 1643 to 1715]. But the author is wrong! In a June 1983 discussion with William Shurtleff in Japan, Obata admitted that this is his speculation with no documentary evidence whatsoever to support it.

Note 2. Mieki is a type of HVP made by the Ajinomoto Co. Address: Ajinomoto Co., Ltd.

4578. Ogata, Sohaku. 1959. Zen for the West. London: Ryder, for the Buddhist Society. 182 p. Illust. Index. 22 cm. [2 ref]
• ***Summary:*** In the chapter titled "Life in a Zen monastery, the section on "Food" states that the meals are very simple. Breakfast consists of gruel and pickles. Lunch is rice mixed with barley, miso soup, and pickles. The evening meal is the same as breakfast. On special occasions, an extra dish will be added. Note: The monastery diet is free of animal products (vegan).

Sôhaku Ogata lived 1901-1973. In Japan, he was professor of Zen Buddhism at Hanazono University. During 1956-57 (during President Dwight Eisenhower's second term) he was invited by the U.S. government to be a Fulbright exchange professor and to deliver lectures on Zen Buddhism at Washington University (St. Louis, Missouri) and at the University of Michigan (Ann Arbor). Before returning to Japan, he visited England, The Netherlands, Belgium, Switzerland, France, Germany, Italy, and Monaco; he gave lectures on Zen and Japanese culture in many cities and towns. Address: Shokokuji Zen Monastery, Kyoto, Japan.

4579. Prescott, Samuel Cate; Dunn, Cecil Gordon. ed. 1959. Industrial microbiology. 3rd ed. Revised by Cecil Gordon Dunn. New York, NY: McGraw-Hill Book Co., Inc. 942 p. Illust. Index. 23 cm.
• ***Summary:*** Chap. 41, titled "Mold enzyme preparations: Uses and products" (p. 666-83) discusses: Mold enzymes: Submerged culture method, continuous tray method for producing mold enzymes, rotating drum method for producing mold enzymes (described by Underkofler et al. 1947), glucose oxidase, uses of mold enzymes (proteases, fungal enzymes). Some mold products: Use in Japan and China, soy sauce (koji from *Aspergillus flavus-oryzae,* Chinese soy sauce, preparation of the "kojies," chemical soy sauce), soy sauce yeasts, tamari, miso, koji. The section on patents (p. 682) cites 15 patents by J. Takamine yet (amazingly) Takamine's name does not appear in the extensive index at the end of the book–though he is considered by some to be the father of industrial microbiology.

The amylo process and a modified amylo process are discussed on pages 864-66. The amylo process is used primarily for converting starch to sugar by the use of selected molds (*Mucor, Rhizopus*), some of which have the ability to produce small quantities of alcohol from sugar.

Soy is also discussed on the following pages: Soybean oil and meal are used in the production of vitamin B-12 by *Streptomyces olivaceus* (p. 485-86). In the production of pentonic acids, several drops of soybean oil were used as an antifoam agent (p. 508). In the production of sodium gluconate, small amounts of soybean oil could be used as an antifoam agent, though they decreased the sugar utilization to an impractical value. (p. 594). L-Glutamic acid can be produced in a number of ways. One is by the hydrolysis of wheat gluten, soybean cake, or other protein-rich food material (p. 713-16). The commercial process now being used in Japan employs sweet potatoes as the chief raw material in a one-stage fermentation process with a strain of *Micrococcus* (p. 712-13).

In the chapter on Saccharifying Agents, Takamine is discussed in the section on "Mold bran" (p. 844). "Takamine, in 1914, advocated the use of mold enzymes (from *A. oryzae*) in the distilling industry. Studies were carried out in distilleries in Canada using his mold-bran preparation (*Taka-koji*) in place of malt to saccharify grains. Although the

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yields of alcohol obtained through the use of mold bran were reported to be higher than those obtained through the use of malt, the process was not adopted."

A table (p. 857) lists 19 sources of microbial amylase, including Taka-Diastase, made by Parke, Davis & Co., and Alase, made by Takamine Lab. Also in this chapter, in the section on submerged culture of mold amylases, a table (p. 859) shows that soybean meal is used as a protein source in the production of dextrinizing enzyme by *Aspergillus niger* NRRL 337. Address: 1. Sc.D., Prof. of Industrial Biology (Emeritus), Former Head of the Dep. of Biology and Public Health and Dean of the School of Science, MIT; 2. Assoc. Prof. of Industrial Microbiology in the Dep. of Food Technology, MIT (Massachusetts).

4580. Rio Grande do Sol, Brazil, Secretaria da Agricultura, Industria e Comercio. 1959. Soja no Rio Grande do Sul [Soya in Rio Grande do Sul]. Porto Alegre. 83 p. (Campanha da Produtividade Agricola). [Por]
• ***Summary:*** Contains 8 chapters by different Brazilian authors; each is cited separately. Address: Brazil.

4581. Smith, Thomas C. 1959. The agrarian origins of modern Japan. Stanford, California: Stanford University Press. *

4582. Taira, Hirokadzu; Ebisawa, H.; Sugimura, K.; Sakurai, Y. 1959. Daizu kakô-hin no amino-san in kansuru kenkyû. I. Shoshu shihan daizu seihin no zen amino-san ganryô [Studies on amino acid content of processed soybeans. I. Total amino acids of soybean products]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 11(6):351-54. [12 ref. Jap; eng]
• ***Summary:*** The total amino acid content of 16 kinds of soybean products were determined by microbiological assay method. These included two species of soybean, tofu, abura-age [deep-fried tofu pouches], okara, Kori-dofu [dried-frozen tofu], yuba, kina-ko [kinako, roasted full-fat soy flour], natto, and nyu-fu [fermented tofu]. Address: National Food Research Inst., Tokyo.

4583. Taira, Hirokadzu; Ebisawa, H.; Sugimura, K.; Sakurai, Y. 1959. Daizu kakô-hin no amino-san in kansuru kenkyû. II. Tôfu seizô kôtei ni okeru amino-san no suii [Studies on amino acid contents of processed soybeans. II. Transfer of amino acids during "tofu" processing]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 11(6):355-57. [1 ref. Jap; eng]
• ***Summary:*** The amino acid pattern of tofu was quite similar to that of the soybeans from which it was made, except that a significant amount of tyrosine ends up in the okara, as do smaller amounts of methionine and tryptophan. Address: National Food Research Inst., Tokyo.

4584. Tamura, Zenta. 1959. Tatsuno shôyu kenkyû shiryô [Tatsuno shoyu research materials]. Tatsuno city: Tatsuno Shoyu Kyodo Kumiai. 254 p. [Jap]
Address: Tatsuno city, Japan.

4585. Tokyo Union Church, Women's Society. 1959. Buy it and try it: Hints on cooking and living in Japan. Tokyo: The Women's Society. 275 p. Illust. 22 cm. *

4586. Tsuji, Kaichi. 1959. Misoshiru sanbyaku rokujû-go nichi [Miso soup 365 days a year]. Tokyo: Fujin Gaho-sha. 157 p. Illust. 26 cm. [Jap]*
• ***Summary:*** The author was born in 1907. Address: Japan.

4587. Umemoto, Seiichi. 1959. Japan: here and there. Tokyo: The Hokuseido Press. 229 p. Illust. 19 cm.
• ***Summary:*** *Mamemaki* is mentioned on page 191 in connection with the Dazaifu Tenmangu Shrine [Dazaifu Tenman-gû] a famous Shinto shrine at Dazaifu in Fukuoka prefecture. *Onisube* "is an ancient, unique event, held only at this shrine to scare off *Oni* (god of plague in this case) with much ado... In spirit it resembles more or less the quaint ceremony of *Mamemaki* (bean-scattering) held more popularly at temples and shrines all over the country on the eve of the springtide [first day of spring], February 4, shouting 'In with luck! Out with devils!'" Address: Japan.

4588. Hino, Tetsuo; Ito, K.; Hayashi, K.; Abe, N. 1960. Shôyu oyobi chômi eki-chû no enki-sei amino-san ni tsuite no kenkyû. I. Dattan-san kôso ni yoru L-rijin no teiryô ni tsuite [Studies on the basic amino acids of the soy sauces and the seasoning liquids. I. L-lysine determination by L-lysine decarboxylase]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 34(1):22-27. Jan. [16 ref. Jap]
Address: Ajinomoto Co. Ltd.

4589. Kropotkin, Alexandra. 1960. Lose 5 lbs. in 6 days with "No hunger" rice diet. *Coronet* 47(3):74-78. Jan.
• ***Summary:*** Cites the health and reducing values of rice and soy sauce. Dr. Walter Kempner, of Duke Univ. [Durham, North Carolina], believes in the health value of rice, since it "contains no cholesterol–which many doctors believe dangerous to the heart, kidneys and blood circulation." Note: All plant foods are free of cholesterol.

The writer prefers long grain brown rice, with long grain polished as a 2nd choice. She enjoys "a bowl of room-temperature rice with nothing but soy sauce, cold spinach and a small helping of 'pickled' vegetables"–in short a Japanese peasant diet. She seasons 3/4 cup cooked rice with 1 teaspoonful soy sauce: total 100 calories. She also uses 1 teaspoon soy sauce in her "geisha girl" salad dressing. Address: Princess.

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4590. May Co. (The). 1960. Our gourmet shop brings you fine foods from the exotic Far East (Ad). *Los Angeles Times.* Feb. 18. p. 29.
• ***Summary:*** "Kikkoman Soy Sauce. The most versatile sauce to come from the Orient. 25-oz. bottle 79¢." Address: Downtown, Valley, Wilshire, South Bay, Lakewood [Los Angeles area].

4591. *Soybean Digest.* 1960. USDA research may put more U.S. soybeans in Japanese foods. Feb. p. 20-21.
• ***Summary:*** Photos show: (1) A.K. Smith, NRRL chemist, and Tokuji Watanabe, visiting Japanese scientist, examining a cake of tofu. (2) Watanabe wet-grinding soybeans to be used in making tofu.

In 1959 Japan imported an estimated 35 million bushels of U.S. soybeans, almost 10 times the quantity imported in 1950. "About half the soybeans used in Japan are eaten as traditional foods, most of which are made in processes that begin with whole soybeans... Recognizing that Japanese whole-bean processors use limited amounts of our soybeans, Dr. Smith recommended studies of U.S. beans in Japanese food processes. The work began at the Northern Utilization Research and Development Division [NRRL] in Peoria, Illinois Research on miso was performed by Dr. Hesseltine, NRRL microbiologist, working with Kazuo Shibasaki, on leave from Tohoku University, Sendai, Japan. Research on tofu was conducted by Dr. Smith and A.M. Nash of Peoria, working with Tokuji Watanabe, on leave from the Japanese Ministry of Agriculture and Forestry.

"Japanese processors say our beans absorb water, cook, and ferment more unevenly than their own. They also object to foreign matter, split and broken beans, and other crop material in our beans and to the color and 'beany' flavor of products made from them... U.S. soybeans, introduced from the Orient, have for 25 years been bred for yield, oil content, pest resistance, and similar characteristics but not for food processes that begin with whole beans–about half the total use in Japan."

4592. Ueno, Takahiro; Kuramochi, Taira. 1960. Shinshiki shôyu ni kansuru kenkyû. I. Shinshiki shôyu seizô kôtei ni okeru ippan seibun henka [Studies on shinshiki shoyu (semi-chemical soy sauce). I. On the change of general components in the course of manufacture]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 34(2):187-93. Feb. [20 ref. Jap]
Address: Noda Soy Sauce Co. Ltd.

4593. Holland, Madeline. 1960. Japanese dishes with American airs! Chicagoans share culinary delights. *Chicago Daily Tribune.* March 4. p. B1.
• ***Summary:*** A recipe for Mizudaki [Mizutaki] beef calls for: "½ cup light colored soy sauce. 1½ tablespoons dark soy sauce."

Note: This is the earliest document seen (Sept. 2008) in all major U.S. newspapers digitized by ProQuest that uses the term "dark soy sauce" to refer to dark colored soy sauce. The new term appears in 444 documents between 1960 and the present, including three in the 1960s, etc.

4594. Inagaki, Choten; Fukuba, H.; Miyakawa, T.; Iwata, S. 1960. On the combination of protein and thiamine [in frozen tofu]. *J. of Vitaminology* (*Kyoto, Japan*) 6(1):43-51. March 10. [1 ref. Eng]
• ***Summary:*** On the disappearance of thiamine when soybean curd is frozen and thawed. Address: Lab. of Nutrition Chemistry, Ochanomizu Univ., Bunkyo-ku, Otsuka, Tokyo.

4595. *Cotton Gin and Oil Mill Press.* 1960. USDA research with Japanese foods shows promise for U.S. soybeans: May mean greater exports. 61(6):65. March 19.
• ***Summary:*** U.S. soybeans are not widely used in Japanese food processes that start with whole beans–even though total Japanese imports of U.S. soybeans in 1959 were estimated at 35 million bushels–almost ten times as many as imported in 1950. Recognizing this, Dr. A.K. Smith of the Agricultural Research Service, recommended studies of U.S. soybeans in Japanese food processes at the Northern Utilization Research and Development Division, Peoria, Illinois. About half of the soybean used in Japan are eaten as traditional foods, and the other half are crushed to make oil and meal. Most U.S. soybeans are crushed. About 20% of the soybeans are used to make miso.

Dr. Clifford Hesseltine and Dr. Kazuo Shibasaki developed a new miso process in which the soybeans are cracked into grits. A photo shows Dr. Tokuji Watanabe (on leave from Japan's Ministry of Agriculture) and A.M. Nash of the Northern Division as they work with typical Japanese equipment and study the process of making tofu from U.S. soybeans.

4596. *Sun* (*Baltimore, Maryland*). 1960. Chopsticks, chicken help spur U.S.-Japan goodwill. March 29. p. 36, 24.
• ***Summary:*** Have you ever tried to eat Maryland fried chicken with chopsticks? Between courses of *misoshiru* (soy bean [miso] soup), *oshinko* (Japanese pickles), *sunomono* (fish salad), *asashimi* (fillet of raw fish), *nori* (toasted seaweed), *gohan* (steamed rice), *yokan* (jellied confection containing azuki bean paste), and *ocha* (tea), several dozen individuals, representing both Japan tourists and Baltimore hosts, did just that yesterday. It created good will and plenty of laughs.

Baltimore's only Japanese restaurant is a little place on Jefferson street.

4597. American Soybean Association. 1960. Soybean Blue Book. Hudson, Iowa: American Soybean Assoc. 144 p Advertisers' index. 22 cm.

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• ***Summary:*** Contents: American Soybean Association. Japanese American Soybean Institute. National Soybean Processors Association. Soybean Council of America. Midsouth Soybean and Grain Shippers Association. Ontario Soya-Bean Growers' Marketing Board. U.S. Department of Agriculture: Agronomic Research (ARS), Disease Research, Entomological Research, Utilization Research and Development (Northern Utilization Division [NRRL], Eastern, Southern, Western), Marketing Research.

Tables: (1) World soybean production. (2) Canadian soybean production. (3) Soybean production, utilization and value, 1936-1959 Canada. (4) Soybean crushings in Canada. (5) Soybean production–United States (with acreage and yield), 1924-1959. (6) U.S. Soybean production by states (1959). (7) U.S. soybean production, supply, and utilization (incl. exports, carryover), 1924-1959. (8) U.S. soybean production, acreage, and yield by state, 1924-1959. (9) U.S. soybeans: Inspected receipts. (10) U.S. soybeans–supply and distribution, 1952-1959 (1,000 bushels). (11) U.S. Soybean oil meal and cake production, supply and utilization, 1924-1959 (1,000 tons). (12) Soybean oil, meal and cake production and stocks by states, 1955-1958. (13) Oilseed cake a meals, supply and distribution, Oct. 1950-59. Incl. soybean, cottonseed, linseed, peanut, copra, total. (14) Production of protein concentrates (cake and meal), 1937-41 (avg.) to 1951-59. Incl. soybean, linseed, cottonseed, copra, gluten feed and meal, tankage and meat scraps, fish cake and meal, dried milk products (dried and concentrated skim milk, buttermilk, and whey used for animal feed), other milk products (fed on farms), total. Note: In 1953-54,395,000 tons of dried milk products were fed to animals. (15) U.S. soy flour production. (16) Production and exports of soy flour and grits (incl. full fat, low fat, and defatted products, exported commercially or to military). (17) Production of mellorine [frozen dessert where vegetable oil replaces butterfat], 1953-59, by month. (18) U.S. fats and oils production, 1937-41 (avg.) to 1959. Incl. Butter, lard, edible beef fats, total edible animal fats, corn oil, cottonseed, edible olive oil, peanut oil, soybean oil, total edible vegetable oils, inedible oils. (19) Soybean oil utilization, 1931-1959 (million lb). Incl. Foods: Margarine, shortening, other, total, Non-food products: Soap, paint & varnish, other drying oil products, miscellaneous, loss, total, total domestic disappearance. (20) Same as No. 19 but in percentages.

(21) Utilization of soybean products, 1955-56 to 1958-59. Incl. meal and oil: Livestock feed, industrial, fertilizer, export. (22) Prices of U.S. soybeans, by month and season average, 1923-1959. (23) Same as No. 22 but only for No. 1 yellow: Chicago, Illinois country shipping points, Minneapolis. (24) Same as No. 21 but soybeans for crushing, No. 2 yellow. (25) Value of U.S. soybean crop, 1925-59 (thousand dollars) in these states: Total USA, Illinois, Iowa, Indiana, Ohio, Missouri, Minnesota. (26) Soybean price support operations, 1932-33 to 1959-60. Started in 1941-42 and has continued to the present, with a peak of $2.56 per bushel in 1953-55. (27) Price spread, soybeans and end products, 1945-1958. Spread between price received by farmers and value of products. (28) Prices of U.S. soybean oil meal (44% protein), 1929-1959 by month. (29) Prices of U.S. crude soybean oil, by month, 1929-30 to 1959-60. (30) Imports, exports, soybeans, oil and meal.

(31) Soybeans: Inspections for export, 1957-59, with country of destination and port of departure. (32) U.S. trade in soybeans, fats and oils. (33) Oil and fat exports under P.L. 480. Total, cottonseed oil, soybean oil, Oct. 1954 to Sept. 1959. Incl. country of destination, the top four being Turkey, Pakistan, Israel, and Egypt. (34) Imports, exports cake and meal, 1929-1958, incl. cottonseed, soybean, linseed, peanut, copra. Exports incl. country of destination. (33) Soybeans: Crushings and yields of oil and meal. (35) Bar chart: Major markets for U.S. soybeans since 1953: West Germany, Netherlands, Other Europe, Japan, Canada, Other. (36) Composition of soybean seeds, by variety, incl. Maturity Group No., % protein, % oil, weight of 100 seeds in grams. (37) Amino acids of soy protein. (38) Composition of Lecithin. (39) Composition of soybean oil, by variety. Incl. linolenic acid, linoleic acid, oleic acid, saturated acids.

Official standards for soybeans, Revised effective Sept. 1, 1955. Soy flour standards, for full-fat, low-fat, and defatted. Densities of various soybean products. Map of the USA showing the best adapted soybean varieties for each major soybean producing state. Directories: Processors of soybeans, by state, with address and names of officers (p. 56-74). Canadian soybean processors (p. 74). Manufacturers of 50% protein soybean meal (by state, p. 76). Foreign soybean processors, by country (p. 78-81). Refiners of soybean oil, by state (p. 82-84). Manufacturers and handlers of soy foods (p. 86-93): Beverages, breakfast foods, canners of green vegetable soybeans, canners of mature soybeans, cookies, crackers, toasts and wafers, frozen desserts (companies that make vegetable oils used in frozen desserts), health food store & supply houses, lecithin, macaroni, spaghetti & noodles, margarine, meat substitutes, proteins (Griffith Labs, Gunther, Worthington Foods), pudding powders (Brockville, Ontario, Canada), Salad and cooking oils, shortening, sausage binders, seasonings, soups, soybean oil, soybeans for cooking and sprouting, soy butter (Town Food Co., Riverside, California, makes "Town: soy lecithin spread; Shedd-Bartush Foods, Detroit, Michigan, makes "Willow Run" soy spread), soy cheese [tofu], soy flour, grits and flakes, soy flour mixes, soy milk, soy sauce, sprouts, vitamins, whipping agents.

Manufacturers of industrial products employing soybeans (p. 94-95): Caulking compounds & floor tile, coated papers & leather dressing, fire-fighting foam, glues, plywood & adhesives, insecticides, laminating, lecithin, oilcloth and coated fabrics, paints and varnishes (13 companies), paper sizings, wallpaper and wallboard

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coatings, resins, soaps, soybean fatty acids (8 companies), soybean oil. Services for the industry (p. 96-109): Analysts, appraisals, brokers, commission merchants & jobbers, consultants, engineering services, export elevators, exporters & importers, export warehousing and handling, farm management, field warehousing, futures market, market analysis, mill construction contractors, milling service, miscellaneous services, oil transports, transportation.

Equipment and supplies for the soybean industry (p. 110-32): Aspirators, bagging equipment, belting, chains, conveyors, elevators, defoliants, drying and aeration equipment (farm driers, grain driers, meal driers), dust control systems & dust collectors, elevator buckets, fans, farm equipment, fertilizers, fumigants, fungicides, germinators, grain and seed cleaning and separation equipment, grain grading equipment & moisture testers, grain handling equipment, granulators, grinding & mixing equipment, herbicides, insecticides & pesticides, inoculants, laboratory equipment, man-lifts, material level indicators, materials handling equipment, miscellaneous equipment, packaging materials, pelleting machines, power transmission equipment, pumps, respirators, seed protectants, sifters, soil testing, soybean storage (elevator & processing units, farm units), spraying and irrigating equipment, temperature systems, transportation equipment, truck lifts, unloaders, waterproofing, weighing and packaging equipment.

Soybean processing [crushing] and oil refining equipment and supplies (p. 134-42): Bleaching and filtering equipment, catalysts, complete plants [for crushing], continuous counter-current solvent extractors, continuous screw presses, degumming, deodorization, fractionation, hydraulic pressing equipment, hydrogenation, margarine, miscellaneous equipment, neutralization, shortening, solvent recovery, solvents, soybean seed [suppliers and private breeders], vegetable soybean seed. Advertisers' index. Incl. Allied Mills, V.D. Anderson, ADM, Arkansas Grain Corp., Big 4 Cooperative Processing Assn., Blaw-Knox Co., Buhler Mill Engineering Co., Cargill Inc., Central Soya Co., Crown Iron Works Co., Dannen Mills Inc., Delphos Grain and Soya Products Co., Albert Dickinson Co., Louis Dreyfus Corp., Esso Standard Oil, Farmers Cooperative Assn., Farmers' Cooperative Co., Felco Soybean Oil Meal Dealers, French Oil Mill Machinery Co., Funk Bros. Seed Co., Galesburg Soy Products Co., General Mills Inc., Jacob Hartz Seed Co., Inc., Honeymead Products Co., Huntley Mfg. Co., Illinois Soy Products Co., Iowa Milling Co., Iowa Soya Co., Jensen Mills, Kansas Soya Products Co, Inc., Spencer Kellogg & Sons, Inc., Lauhoff Soya Co., Albert Lea Engineering Co., North Iowa Cooperative Processing Assn., Penola Oil Co., Phillips Petroleum Co., Pillsbury Co., Port of New Orleans, Quincy Soybean Products Co., Rice Grain Corp., Seedburo Equipment Co. (measures oil content of soybeans in 10 minutes), Skelly Oil Co., A.E. Staley Mfg. Co., T.W. Wood & Sons (Seedsmen since 1879; Richmond, Virginia). Address: Hudson, Iowa.

4598. Ando, Seiichi. 1960. Yuasa shôyu [Yuasa shoyu]. In: Chihô-shi Kenkyû Kyôgi-kai, ed. 1960. Nihon sangyo-shi taikei. Vol. 6: Kinki Chihô-hen. Tokyo: Tokyo Daigaku Shuppan-kai. [Jap]*

• ***Summary:*** In this book titled "Outline of Japanese Industry," there is one volume on the Osaka-Kyoto (Kinki) area. In that volume is a discussion of Yuasa shoyu from an economic history viewpoint. Address: Osaka Sangyo Daigaku, Osaka, Japan.

4599. Aoyanagi, Yasunari; Higasa, Y.; Kotera, H.; Kishida, K. Assignors to Dai-Nippon Drug Manufacturing Company. 1960. [Fat emulsions suitable for intravenous injection]. *Japanese Patent* 1848. March 8. (Chem. Abst. 54:20100c). [Jap]*

• ***Summary:*** Soybean oil and lecithin may be used as ingredients.

4600. Hayashi, Shizuka. 1960. Public relations seminar by JASI. *Soybean Digest.* March. p. 20.

• ***Summary:*** At this seminar JASI taught Japanese manufacturers of soybean [food] products how sales of these products can be much increased through the use of public relations, including marketing research. "This is particularly true of marketing new products." Previously, these very manufacturers have lacked interest in public relations because they "have been enjoying a reasonably profitable business under the funds allocation system, which has afforded them a sort of protection."

At JASI's first seminar on PR [public relations] and marketing, held recently in Tokyo, about 40 companies and organizations from various parts of Japan participated. "There were two lectures. The first was by Professor Naoyoshi Horikawa on public relations and top management. The other, by T. Shimizu, was on sales promotion. Never in the history of the soybean industry [in Japan] has there been a gathering like this where the so-called 'big shots' of leading organizations sat side by side at the table."

A table shows estimated consumption of soybeans (S) and soybean meal (SM) during 1961 as planned by the Japanese government (tonnes = metric tons). The totals are 1.467 million tonnes of soybeans and 707,000 tonnes of soybean meal. Details: Oil processing: 928,000 S. Livestock feed: 303,000 SM. Tofu and fried tofu: 280,000 S + 20,000 SM. Shoyu: 29,000 S + 200,000 SM. Miso: 130,000 S + 50,000 SM. MSG: 73,000 SM. Other miscellaneous foods: 20,000 S + 40,000 SM. Frozen tofu: 40,000 S. Natto: 30,000 S. Other uses: 21,000 SM. Kinako: 10,000 S.

Note 1. This is the earliest document seen (Nov. 2012) that contains industry or market statistics for kinako or roasted whole soy flour by geographical region.

Note 2. This is the 2nd earliest document seen (Jan.

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2012) that contains industry or market statistics for natto by geographical region.

A large photo shows about 13 Japanese men seated at a long table at JASI's recent public relations seminar. The name and position of each man is given. They represented the following organizations: Miso Association. Tatsuno Shoyu. Shoyu Association. Frozen Tofu Association. Masuko Miso. Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building, No. 1-Chome Yurakucho Chiyoda-Ku, Tokyo, Japan.

4601. Ito, Tatsuro. 1960. [Preparation of a hexokinase from soy bean]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 34(3):275-78. March. [3 ref. Jap] Address: Dep. of Agricultural Chemistry, College of Agriculture, Kyoto University.

4602. Nagata, Tadao. 1960. Studies on the differentiation of soybeans in Japan and the world. *Memoirs of the Hyogo University of Agriculture* (*Agronomy Series 4*) 3(2):63-102. March. Agronomy Series No. 4. [101 ref. Eng]

• ***Summary:*** In these pioneering, innovative, and fascinating studies, the author uses mainly physiological and morphological data to point out the paths of dissemination of the soybean from China to the rest of the world. He has been studying the subject since 1944 and this is his most definitive publication to date.

Nagata shows that two morphologically different ecological clines can be distinguished in the population of cultivated Japanese soybean varieties: a full-season crop cline and a short-season crop cline.

Note: Clines consist of ecotypes or forms of species that exhibit gradual phenotypic and/or genetic differences over a geographical area.

He also shows that these two clines were introduced separately into Japan from different geographical regions. The full-season cline from north-central China through Korea and the short-season cline from central-south China through Taiwan, the Ryukyu Islands, and into southern Japan.

Contents: Introduction. 1. Classification of soybeans by their degree of summer vs. autumn habit: Reduced rate of period of flowering by delay of time of planting, relative flowering and relative growing period in comparison to the period of flowering. 2. Classification of soybeans by their plant habit [e.g. vining and twining, transmitted from the wild form; determinate vs. indeterminate]: Vining habit affected by the time of planting, determinate vs. indeterminate growth habit and the relation to the vining habit. 3. Interrelation among the summer vs. autumn soybean habit, plant habit and other characters: Interrelation between the summer vs. autumn soybean habit and the plant habit, interrelation of the relative flowering period and relative growing period to the determinate vs. indeterminate growth habit and seed size. 4. Geographical distribution of soybeans in Japan: Distribution of summer vs. autumn soybean habit, distribution of relative growing period of summer soybean and intermediate types, distribution of plant habit.

5. Geographical distribution of soybeans in the world: Distribution of summer vs. autumn soybean habit, distribution of the relative flowering period and relative growing period of summer soybean and intermediate types, distribution of plant habit. 6. The clinal tendencies of soybean distributions and genecological differentiation occurring along with the spreading: Clines established with summer vs. autumn soybean habit, clines established with plant habit, clines established on combination of the habits and their ecotypic significance. 7. Some considerations on the origin and dissemination of cultivated soybeans: Origin of culture, paths of dissemination. General conclusions: Origin of soybean culture, dissemination of soybean, ecological differentiation of soybeans.

The distinction between summer and autumn soybeans is an old one in Japan, dating back to the Edo period (1600 to 1868); it seems to have originated from analogous terms used in old China. The summer soybean is planted early, in April, and harvested in July to August, as a short-season crop in southwestern Japan, including the islands of Kyushu and Shikoku, and in the Kinki district [around Kyoto, Osaka, Nara, and Wakayama]. By contrast, the autumn soybean type is planted later, in June or July, and harvested in November to December in southwestern Japan. However a reliable criterion for distinguishing summer and autumn types has not been established to date (p. 65). The author believes one criterion is the rate of reduction of the number of days to flowering by the delay of planting time. This is shown clearly by the graph in figure 1. When autumn, intermediate, and summer soybeans are planted on April 5, they take about 102, 68, and 43 days to flower respectively. However when they are planted on Aug. 13, they take about 32, 22, and 25 days to flowering. Thus the change in the number of days to flowering is largest in the autumn soybean and smallest in the summer soybean.

Although maturity is the most important character dividing soybeans into maturity groups in the USA, this system is not used much in Japan since it is difficult to distinguish there between the many varieties of soybeans differing from one another in earliness or lateness.

The author divides all Japanese soybeans into four main types and ten sub-types: Summer soybean type (with 3 sub-types), intermediate type (with 2 sub-types), autumn soybean type (with 3 sub-types), and tropical soybean type (vining).

"Relative flowering period" and "relative growing period" are two key concepts that are hard to understand. Each can be calculated by dividing (1) the number days from the beginning to the end of flowering, or (2) the number of days from emergence to maturity, by (3) the number of days from emergence to flowering. Summer soybeans have

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relatively long lengths of both periods and autumn soybeans have relatively short lengths.

Concerning vining habit, soybeans may be divided into 3 types: Consistent vining, variable vining, and nonvining. The earlier the first two types are planted, the greater the degree of vining they show. Plants with a consistent vining habit are always indeterminate, whereas those with a variable vining habit are always indeterminate. Those with a non-vining habit are usually determinate, but about 10% may be indeterminate. Summer soybean rarely show vining. Indeterminate growth habit is accompanied by stem elongation after the beginning of flowering.

Table 9 shows that summer soybeans have a longer relative flowering period and longer relative growing period than autumn soybeans. Yet (contrary to the text) table 10 seems to indicate that summer soybeans have smaller (lighter weight) seeds than intermediate or autumn soybeans. Thus large-seeded soybeans are most likely to be of the autumn type.

Table 11 shows that the soybeans grown in Hokkaido (Japan's northernmost main island) are mostly summer soybeans; they are planted in early May and harvested in October. No autumn type soybeans are grown in Hokkaido. In the nearby northeast prefectures (Tohoku) intermediate type soybeans predominate. Autumn type soybeans are most widely grown in the Kinki and Chûgoku regions of central and south Japan. In the far south of Japan, summer- and intermediate type soybeans predominate.

Table 13 shows regional distribution of soybeans with respect to their seed sizes. The largest soybean came from Kantô; 60 gm per 100 seeds. The next two largest came from Tohoku and Kinki; 35 gm per 100 seeds.

Figure 9 (p. 82) shows that worldwide (especially in the USA, Europe, and East Asia), the soybeans grown at far northern latitudes (above 40º north latitude) tend to be summer soybeans (short season crop) with a long relative flowering period, a long relative growing period, and a special non-vining habit or normal habit. Autumn soybeans tend to be grown at more southerly latitudes. Most soybeans grown between the equator and 20º north latitude are tropical or autumn type soybeans with a vining habit.

Note: The author makes no attempt to correlate edamame (green vegetable soybeans) with a certain type, habit, or seed size. Address: Sasayama, Hyogo-ken.

4603. Ohsawa, George S. 1960. Zen macrobiotics. New York, NY: Ohsawa Foundation. 103 p. Undated. 28 cm.
• ***Summary:*** This bound, hardcover book was owned by Herman Aihara, and is now (April 2011) in the library of the George Ohsawa Macrobiotic Foundation in Chico, California (President: Carl Ferre). The size is 8½ by 11 inches. The cloth cover is pea green and on it, near the top, is written (on two lines): "Zen macrobiotics" with the word "Zen" in large bold capital letters. In the middle: "George S. Ohsawa," the author. And near the bottom (on two lines): "Ohsawa Foundation: New York–Paris–Brussels–Tokyo."

The book consists of leaves and the text is typewritten. All of the leaves in this edition are edited, some heavily, in two colors of ink: red edits by George Ohsawa, and blue by Lou Oles (According to Herman Aihara). There is no table of contents or copyright page. On the first leaf, near the top, the title is typewritten again on two lines: "Zen Macrobiotics." Then the book begins: "Two ways to happiness through health. Happiness is the goal of everyone in the world. But what is happiness?... In the Orient happiness was defined by sages some thousands of years ago as consisting of five factors, as follows: 1. The first fundamental factor of happiness is joyfulness, an amusing, interesting, brilliant and healthy longevity. 2. The second, not to be worried about money. 3. The third, instinctive capacity to avoid accidents and difficulties that would cause premature death. 4. A loving realization of the order of the infinite universe at all levels. 5. Not to become the first as you will become the last. But try to become the last so that you will become the first forever.

"... School education is completely unnecessary, and even detested. All great men are autonomous and self-made..."

Note 1. This section (two leaves) becomes the Forward in the next edition, which was printed in Japan.

The third leaf is a title page: Like the cover, it has text on 3 levels, but is typewritten. Title: "Macrobiotics: The Biological and Physiological Foundation of Zen Buddhism." Author: George Ohsawa. Publisher: Ohsawa Foundation: New York–Paris–Brussels–Tokyo.

Note 2. The relationship between this title page, the title page of the mimeographed edition, and the cover is unknown.

The next two leaves, are titled "Health to Peace" and numbered "i" and "ii." Note 3. They become the Preface in the next edition, which was printed in Japan.

Next is "iii" which is the Foreword in this mimeograph edition but becomes Chapter 1 in the next edition, printed in Japan.

Next are leaves "iv" through "xxii" which are the Introduction in this edition, but become Chapter 1-3 in the next edition printed in Japan. After leave xxii, the leaves are numbered "8" through "86," and after that is the back cover. The last section of the book is titled "The Case of Mr. E" (leaves 77-86). Note 4. It becomes the first appendix in next edition printed in Japan, which also contains a second appendix titled "The Pro-Forma Death Certificate..."

The mimeograph edition is thus missing pages 3-7. Moreover, all the pages are renumbered by Ohsawa by hand in the upper right corner. In Ohsawa's numbering there are no pages numbered 1, 2, 5, 6, 7, 8, 10, 33 and 34 (a total of 9) and thus his page is numbered 112.

Because the mimeograph edition is bound, it appears that the pages were rearranged after typing but before

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publication and distribution.

Page 19: "With the conception of Principal Food and that of secondary food clearly distinguished, people of the Orient could live a happy, free and peaceful life from the beginning up to the importation of the brilliant Occidental civilization, more or less violent, with its industrial and scientific instruments... The Principal Food should occupy at least 60% of your eating."

This bound, mimeograph book contains many recipes, all of which are numbered. Soy-related recipes include the following: In the section titled "Beans": 117. Boiled soy beans with miso (the soy beans are first roasted until they pop). 118. Boiled beans ("Boil soy beans until tender. Seasoned with soy sauce and salt. Boil until liquid is gone. Prepare black [soy] beans in the same way)."

Note 5. Later writings by Ohsawa show that by "black beans" he meant black soy beans, *Kuro mame* in Japanese. This is the earliest macrobiotic document seen (April 2013) that gives a recipe for whole soybeans.

119. Gomoku beans (boiled soy beans with vegetables). 120. Goziru soup (Gôjiru; ground soaked soybeans with vegetables). 121 and 122. "Aduki" [azuki, adzuki] beans. 159. Hiziji [Hijiki] with age (seasoned with "soyu" [sic, shoyu]). 160. Hiziki and soyabean (seasoned with syoyu [shoyu]).

In the section titled "Miso and syoyu preparation": "Both miso and syoyu should be of traditional make." 201. Sauce miso (miso-tahini sauce). 202. Miso cream. 203. "Muso" (miso and tahini with minced orange peel). 204. "Miso" soup (5 persons). 205. Carrot and onion au "miso" (15 persons). 206. Vegetable au miso. 207. "Oden" au miso. 208. Buckwheat "dango" au "miso." 209. "Miso-ae." 210. "Tekka" no. 1 (miso with minced yang vegetables–lotus root, burdock root, ginger–fried in sesame oil until very dry. Good for all yin diseases).

In the section titled "Syoyu": Recipes 212-221 are seasoned with "syoyu" (shoyu, traditional fermented soy sauce). "Use the traditional syoyu in all cooking (vegetables and fish). Syoyu diluted with a little water is very good for 'Sasimi' [sashimi] and fried oyster, 'Tempura', fish 'Sukiyaki', 'Tohu' ([tofu] vegetable cheese of soya beans), etc."

803. "'Tohu' plaster. Squeeze 'tohu' (white soya bean cheese) add 10% of flour; stretch this directly on the front or any part painful with inflammation. All pain or inflammation will go away soon." Note 6. This book does not use tofu in any recipes, probably because Ohsawa considered it too yin. However Ohsawa was the one person most responsible for introducing the word "tofu" to popular American culture; his later writings and especially his students and admirers spread the word to the four corners of the United States.

Note 7. This is the earliest macrobiotic document seen (April 2013) that mentions tofu.

Note 8. This is the earliest English-language document seen (July 2000) that mentions "Tekka" (spelled that way, which is now the proper romanization) or that gives a recipe for making it.

Note 9. This is the earliest English-language document seen (March 2006) that uses the word "aduki" beans to refer to azuki beans. This spelling was subsequently widely used, but only in macrobiotic publications.

Note 10. This is the earliest macrobiotic cookbook seen (Jan. 2012).

Also discusses: In the section on "Egyptian beans" (p. 30): Pois "chiche" (chickpeas, basic preparation by boiling). "Beignet" pois chiche (deep-fried balls of mashed chickpeas mixed with flour). Pois chiche croquette (chickpea croquettes).

Publication: "Published by Ohsawa Foundation, 331 Riverside Drive, New York City, U.S.A. (Secretary Aihara, 44 W. 96th St., New York City, U.S.A.)." Underneath this is "Printed in Japan."

Note 11: Concerning the date of publication, we read: "My first two books in English will arrive beginning of November: *Zen Macrobiotics* and *The Philosophy of Oriental Medicine."* (Source: G.O. [George Ohsawa]. 1960/09. "Letter from the editor." *Macrobiotic News* (New York, NY). No. 6. Sept. p. [7]). Address: New York, USA.

4604. Ohsawa, George. 1960. Zen macrobiotics [Continued, Part II]. New York, NY: Ohsawa Foundation. 103 p. Undated. 28 cm.

• ***Summary:*** This mimeograph bound book with the pea green cover, the only known copy of which is owned by the George Ohsawa Macrobiotic Foundation in Chico, California, raises many interesting questions about the publication history of this and closely related titles.

Carl Ferré, an expert on this subject, believes: (1) That there were several "printings" of mimeographed edition and that "printings" may vary. (2) There is a strong possibility that the first editions were sold in Jan., Feb., and March of 1960, before there was any editing on them. (3) It is unlikely that any books were sold with only Ohsawa's red edits on them. (4) It is probable that no books were sold with both Lou Oles' blue editing and George Ohsawa's red editing on them.

Was there a printed edition prior to and different from this edition?

Does anyone own such a copy?

How many pages did it contain and how were the pages arranged? For example, did the original book start with the title page, followed by ages i, ii, iii, etc?

Were the original pages reshuffled to create this bound edition? In this edition, why are there xxi pages of front matter numbered in roman numerals followed by pages 8 through 86 in Arabic numerals.

Why do some pages seem to be missing from this edition. Carl Ferre believes that someone typed the entire

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book, then Ohsawa decided to move some of the pages around, which they did before they bound and sold the books (for $0.50 each) at Ohsawa's lectures.

How did they bind the books? Did they bind the books by themselves or send them out to a professional bookbinder? Or did a person (who attended the lectures) who was in the bookbinding business offer to bind the books free of charge so they could be sold for only $0.50 each. Was it originally hardcover or paperback? Is the pea green book in Chico simply an example of all the books sold in 1960 at Ohsawa's lectures? Or is it unique–one of a kind? When and where did Ohsawa make all this handwritten changes in red? Was someone suggesting the changes to him? If yes, who?

Why is the title on the cover different from the title on the title page.

Why was the original title page numbered "9" in Ohsawa's handwriting.

What do the Japanese characters under the handwritten "9" mean?

Why is there content before the title page?

We are told the original mimeograph edition was duplicated and bound in the Aihara's apartment in New York City; how was it bound?

Carl Ferre reminds us (e-mail of 2 May 2011): Lou Oles took the recipes out of *Zen Macrobiotics* to create a separate book, *Zen Cookery.* "The problem that has always existed is that *Zen Macrobiotics* has numbers in it that refer to numbers in *Zen Cookery* and they have never corresponded. For example *Zen Macrobiotics* says "See *Zen Cookery* No. 103" and you go to *Zen Cookery,* find that number, and its something totally different–or even nonexistent." Address: New York, USA.

4605. Onishi, Hiroshi. 1960. Studies on osmophilic yeasts. VII. Production of polyalcohols by *Saccharomyces rouxii* in the concentrated media of sodium chloride and sugars, and identification of the polyalcohols produced. *Bulletin of the Agricultural Chemical Society of Japan* 24(2):126-30 March. [11 ref. Eng]
• ***Summary:*** The author identified polyalcohols which were produced in large amounts by Saccharomyces rouxii under aerobic fermentation in the concentrated media of sodium chloride and sugar; he began by isolating these products in crystalline form from the fermented broth.

The products were determined to be glycerol and D-arabitol. Address: Noda Inst. for Scientific Research, Noda City, Chiba-ken, Japan.

4606. Onishi, Hiroshi. 1960. Studies on osmophilic yeasts. VIII. Polyalcohol production by various genera and species of yeasts. *Bulletin of the Agricultural Chemical Society of Japan* 24(2):131-40. March. [12 ref. Eng]
• ***Summary:*** *"Pichia miso,* an osmophilic yeast, was isolated from miso-paste. It could produce very high yields of glycerol, erythritol, and D-arabitol.

Table 1 shows production of polyalcohohols by various genera and species of yeasts: *Saccharomyces* (25 species), *Zygosaccharomyces* (21 species), *Hansenula* (10 species), *Debaryomyces* (16 species), *Pichia* (14 species), Other genera of yeasts (30 species). Address: Noda Inst. for Scientific Research, Noda City, Chiba-ken, Japan.

4607. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*). 1960--. Serial/periodical. Shinshu Miso Kenkyusho, 469-6 Nakagosho, Nagano-shi 380, Japan. Vol. 1. March 1960 Annual. [Jap; eng]
• ***Summary:*** Initially titled *Reports of the Shinshu-Miso Research Institute.* It is now titled *Report of the Shinshu-Miso Research Institute.* It is published in March every year. A 1-year subscription sent by surface mail in 1989 cost $8.00. Address: Nagano-shi, Japan. Phone: 0262-28-1221.

4608. *Soybean Blue Book.* 1960. Japanese American Soybean Institute. p. 10.
• ***Summary:*** Gives the address, name of the managing director, structure, sources of funding, purpose and goals, and major accomplishments in chronological order.

In 1957 the Institute, in cooperation with USDA's Agricultural Research Service, sent Dr. A.K. Smith, specialist with USDA's Northern Utilization and Development Branch (Peoria, Illinois) to Japan to learn more about wider usage of U.S. soybeans in Japanese foods.

"The Institute has a film, 'The Green Bud,' showing production and consumption of soybeans with emphasis on food uses."

4609. Ito, Tatsuro; Inouye, Yoshiyuki. 1960. Daizu hekinokinaaze [Soybean hexokinases and some reaction products]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 34(4):306-09. April. [10 ref. Jap] Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Kyoto Univ., Kyoto, Japan.

4610. *Macrobiotic News* (*New York, NY*). 1960-1961. Serial/periodical. Ohsawa Foundation, Inc. No. 1 (May 1960) to No. 13 (July 1961). Frequency: Irregular.
• ***Summary:*** This is the earliest U.S. macrobiotic periodical. Succeeding title: Yin Yang. Title varies: Macrobiotics News from No. 1 (May 1960) to No. 4 (July 1960). Each issue of both titles is dated.

Note: As of April 2011, all issues of this periodical, with six different titles, are owned by the George Ohsawa Macrobiotic Foundation, Chico, California.

4611. Hayashi, Shizuka. 1960. A visit to a leading tofu factory. *Soybean Digest.* May. p. 26.
• ***Summary:*** This factory, which makes frozen tofu, was just completed on the outskirts of Nagano City. It uses 12 tons of

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U.S. soybeans a day, approximately 4,000 tons a year. There are three other large manufacturers as well and about 3,400 smaller ones making frozen tofu. Many belong to the All-Japan Frozen Food Tofu Manufacturers Assoc.

Note: This is the earliest document seen (April 2001) that contains tofu industry or market statistics for tofu for individual larger companies. Address: Japanese-American Soybean Inst., Tokyo, Japan.

4612. Hayashi, Uichi. 1960. Nattô ni kansuru kenkyû. VII. Nattô-kin no baiyô hôhô [Studies on natto. VII. The culture method of the natto bacillus]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 38(5):210-13. [2 ref. Jap; eng] Address: Osaka Municipal Hygienic Lab., Osaka, Japan.

4613. Hayashi, Uichi. 1960. Nattô ni kansuru kenkyû. VIII. [Studies on natto. VIII. Influence of carbon dioxide gas in the fermentation room]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 38(5):213-16. [4 ref. Jap; eng] Address: Osaka Municipal Hygienic Laboratory, Japan.

4614. Hayashi, Uichi. 1960. Nattô ni kansuru kenkyû. IX. [Studies on natto. IX. Effects of formalin on the fermentation]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 38(5):216-18. [Jap; eng]
Address: Osaka Municipal Hygienic Laboratory, Japan.

4615. Onishi, Hiroshi. 1960. Studies on osmophilic yeasts. VIII. Isolation of a new obligate halophilic yeast and some considerations on halophilism. *Bulletin of the Agricultural Chemical Society of Japan* 24(3):226-30. May. [10 ref. Eng]
• ***Summary:*** The writer has isolated this yeast from year-old "soy mash and named it *Torulopsis halonitratophila nov. sp."* Although it is an obligate halophile at 30ºC, "it exhibits facultative halophilism when tested at a lower temperature such as 20ºC. This observation suggests that cultural temperature is one of the most important factors for halophilism." Address: Noda Inst. for Scientific Research, Noda City, Chiba-ken, Japan.

4616. Tiner, Hugh M. 1960. Meals for Millions: A 3-cent 'lunch' fights hunger and malnutrition. *Rotarian* (*The*) 96(5):51. May.
• ***Summary:*** Tells the story of Clifford Clinton, Meals for Millions, and MPF (Multi-Purpose Food). Describes how many different Rotary Clubs in the USA have sent MPF overseas for use in relief and rehabilitation projects in Costa Rica, Portugal, Greece, Korea, Mexico, Ceylon, Hong Kong, and India. "Last year $247,000 poured into the Foundation's headquarters on Seventh Street in Los Angeles and sent 'meals' on their way to the hungry.

"But the chief aim of the Foundation is to aid Governments in developing their own versions of MPF, using food products of their regions. An Indian version, based on peanuts, is already in production, and the building of nine plants has been authorized for this purpose. A soy-based MPF is being produced in Brazil. Research is going ahead in the Philippines to develop MPF-type food with fish and coconut meal, in Mexico with soy, in Iraq with sesame and dates, and in the South Pacific with coconuts. Independent, self-supporting Meals for Millions affiliates are active in Brazil, Burma, Ceylon, Formosa, Hawaii, India, Israel, Japan, Mexico, Pakistan, the Philippines, and Thailand, studying, interpreting, and expanding the program." Address: Former president, George Pepperdine College; Past Distirct Governor, Rotary International; Rotarian, San Diego, California.

4617. All American. 1960. Sunday is father's day and pop's the tops! (Ad). *Los Angeles Times.* June 16. p. D13.
• ***Summary:*** A full-page ad for many foods sold at this supermarket–including: "Kikkoman Soy Sauce. 6-oz. bottle 29¢. 12-oz. bottle 39¢." Address: Ten locations in the greater Los Angeles area].

4618. Hayashi, Uichi. 1960. Nattô ni kansuru kenkyû. X. [Studies on natto. X. Manufacture of calcium-enriched natto]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 38(6):255-58. [1 ref. Jap; eng]
Address: Osaka Municipal Hygienic Laboratory, Japan.

4619. Hayashi, Uichi. 1960. Nattô ni kansuru kenkyû. XI. [Studies on natto. XI. Manufacture of miso (soybean paste) utilizing natto]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 38:258-60. [7 ref. Jap; eng]
Address: Osaka Municipal Hygienic Laboratory, Japan.

4620. Onishi, Hiroshi. 1960. Studies on osmophilic yeasts. X. Influence of the environmental factors on the change of microflora during the ripening process of soy-mash. *Bulletin of the Agricultural Chemical Society of Japan* 24(4):386-96. June. Supplement. [10 ref. Eng]
• ***Summary:*** "Soy-mash" means "soy sauce mash" or moromi. Address: Noda Inst. for Scientific Research, Noda City, Chiba-ken, Japan.

4621. Hayashi, Shizuka. 1960. Discuss problems of soybean usage. *Soybean Digest.* July. p. 26.
• ***Summary:*** Japanese "soy food manufacturers" were addressed by Charles Elkinton, U.S. agricultural attache. During fiscal year 1959 the total quantity of soybeans used by Japanese crushers and food manufacturers amounted to 1.2 million metric tons or 46.7 million bushels, up 12% over the previous year. Japan's total imports during fiscal 1959 were 1,073,477 metric tons of which 1,010,444 metric tons came from the USA.

The total amount of soybeans used by Japanese food manufacturers is as follows, in metric tons. Makers of tofu

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and frozen tofu used 340,000 tons in 1959/60 rising to 370,000 tons in 1960/61. Shoyu makers used 218,400 tons in 1959/60 rising to 220,537 tons in 1960/61. Miso makers used 186,400 tons in 1959/60 rising to 177,180 tons in 1960/61.

Oil processors crushed 768,870 metric tons or 28,218,000 bushels in 1958/59. A photo shows "Japanese soy food manufacturers," seated on cushions on tatami mats at two long tables, as they are addressed by Charles Elkinton. Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building No. 1, 1-Chome Yurakucho, Chiyoda-ku, Tokyo, Japan.

4622. Smith, Allan K.; Watanabe, Tokuji; Nash, Arlo M. 1960. Tofu from Japanese and United States soybeans. *Food Technology* 14(7):332-36. July. [8 ref]
• ***Summary:*** Most of the U.S. soybeans exported to Japan are processed for oil and meal that are used for making food products. A survey conducted in 1957 in Japan by A.K. Smith ("Use of U.S. soybeans in Japan," published April 1958) indicated that at least 25 million bushels of whole soybeans were used in making traditional Japanese foods such as miso, tofu, and natto, and that the Japanese wished to use more.

This paper describes pilot plant investigations comparing U.S. and Japanese soybean varieties to determine which U.S. varieties make the best tofu. Lee and Jackson varieties appeared to make tofu equal in yield, flavor, texture, and color to Japanese soybeans. "When such varieties are known to U.S. exporters and Japanese importers, more soybeans may be exported to Japan 'identity preserved' at some increase in cost over the U.S. No. 2 yellow beans" (p. 332-33).

Note: This is the earliest document seen (Feb. 2010) that uses the term "identity preserved" to refer to soybeans. Address: 1. NRRL, Peoria, Illinois; 2. Food Research Inst., Ministry of Agriculture and Forestry, Tokyo, Japan.

4623. Tokunaga, T.; Yoshitomi, K.; Mitsumoto, H. Assignors to Nissin Oil Mills. 1960. [Pure soybean lecithin]. *Japanese Patent* 8324. July, 1. [Jap]*

4624. Mathews (Mr.). 1960. Imported fine foods (Ad). *Los Angeles Times.* Aug. 7. p. GB10.
• ***Summary:*** Among these foods are "Kikko-man Soy Sauce, 4/5 qt. [quart]–75¢. Whale meat, 7 oz.–45¢. Aji-no-moto super seasoning, 7 oz.–$1.75." An illustration shows a bottle of KikkoMan soy sauce. Address: 600 San Fernando Road, L.A.

4625. Komori, Saburo; Shigeno, Yoshihiro. 1960. [Plasticization of vinyl chloride resins]. *Japanese Patent* 11,683. Aug. 22. (Chem. Abst. 55:10976b). [Jap]*
• ***Summary:*** A fatty acid obtained by saponification of soybean oil was used as the main ingredient in making a sheet of poly(vinyl chloride) resin.

4626. Hayashi, Shizuka. 1960. Soy flour in Tokyo school test. *Soybean Digest.* Aug. p. 30.
• ***Summary:*** "Rice has been the main staple food in Japan for centuries, the number of which cannot be definitely counted. Production has been steadily increasing with an average annual crop of about 13 million metric tons in recent years–somewhere near the production of soybeans in the United States.

"Because of the traditional rice diet the protein intake of the Japanese has been small compared with western countries, not to mention the extremely poor intake of fat." Note: Rice contains less than half as much protein as wheat. So rice-eating populations tend to be smaller in stature than wheat eaters.

"The fact that protein is indispensable to the human body has been seriously considered in Japan only since the last World War, along with the question of shifting from rice eating to wheat flour foods. The small income of the Japanese population does not permit them to obtain their protein from animal foods which are mostly very costly in Japan [sic, major oversimplification].

"It is now realized that soybeans are the most economic and ideal source of protein. As a result, the consumption of soybeans and soybean products is increasing.

"The writer believes that the aim of increasing protein intake in the diet can be easily attained if soy flour can be included in wheat flour products such as bread and noodles as well as confectioneries. Various promotional activities with this as the goal will be included in the program of the Japanese American Soybean Institute in the coming fiscal year.

"The total consumption of wheat flour for the 1959-60 fiscal year has been set at 2.4 million metric tons by the Japanese government. This requires an import of 2.1 million metric tons of wheat.

"Wheat flour is low in lysine, one of the eight amino acids, but it can be fortified or enriched by blending with soy flour which contains an adequate amount of lysine. If 10% soy flour is blended with wheat flour this could mean an additional market for a little over 9 million bushels of soybeans.

"The nutritional value of soy flour is well known, and the value of the wheat-soy flour mixture can easily be taught to the public. But whether the flavor of the mixture will be acceptable is a question that needs study.

"To study the question an experiment has just been carried out with 1,600 pupils in one of the Tokyo grammar schools. These children are each given a 100-gram piece of bread with their school lunches every day. At the request of the Japanese American Soybean Institute, the principal of the school agreed to try serving the children with bread made with wheat with defatted soy flour added. The test

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was carried out continuously for 5 days, the first 2 days with 5% soy flour added, and the following 3 days with 10% soy flour.

"Bread with the 5% quantity of de- fatted soy flour added came out in a slightly larger sized loaf than the loaf containing 10% soy flour. The bread was given to the children without disclosing the fact that it contained soy flour.

"In general, the result has been very satisfactory. No difference was observed between the way the children ate wheat flour bread and bread made with wheat flour and soy flour blended.

"There are 900,000 school children in Tokyo now on the school lunch program, and 10 million children in Japan. On the basis of 10 grams of soy flour per child per day, it would require approximately 30,000 metric tons a year to supplement the school lunches." Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building, No. 1-Chome Yurakucho, Chiyoda-Ku, Tokyo, Japan.

4627. *House Beautiful.* 1960. Japan. Aug. Entire issue. *
• ***Summary:*** This entire issue of *House Beautiful* was devoted to Japan. The editors found Japanese cuisine to be the best of the 29 countries they had visited. Concerning miso they write: "Some ingredients basic to their cuisine we literally have no counterpart for: such a one is miso, a paste made from soy beans that may be sweet or salty or red or white, and can make a dressing for green vegetables, a marinade for meats, or the filling body of a soup. All delicious!"

4628. Kawashima, Robert. 1960. Here's the way to prepare sukiyaki, the hottest item in the trade. *Los Angeles Times.* Sept. 18. p. K18.
• ***Summary:*** "The trade" refers to Japanese restaurant food in the USA. "The three big dishes, both in Japan and in the United States, are sukiyaki, tempura, and beef or chicken teriyaki." Each requires the use of soy sauce.

A recipe for Sukiyaki cooking sauce calls for "½ cup Japanese soy sauce."

A recipe for Teriyaki sauce calls for "1 cup Japanese soy sauce."

4629. Farlow, David R. 1960. The Japanese American Soybean Institute. When Automatic Allocation goes into effect you will see the full impact of JASI's promotion work. *Soybean Digest.* Sept. p. 35-36.
• ***Summary:*** JASI is starting to get involved with soy milk in Japan. There are about 60,000 tofu makers in Japan and they can readily make both tofu and soy milk. Dr. Harry W. Miller "has long been a strong advocate of the utilization of soy milk to aid in the increased consumption of protein and fat by the Japanese people... K.S. Lo of the Hong Kong Soybean Co. showed me his plant last fall, and I saw huge amounts of soy milk being manufactured and bottled for the Hong Kong area alone. Pepsi Cola is bottled in the same plant and Mr. Lo informed me that soy milk was outselling Pepsi Cola by about two to one in the Hong Kong area. I drank a bottle and I have to admit that much to my surprise it was delicious."

The increase in exports of U.S. soybeans to Japan has been accomplished under a "controlled allocation system"–controlled by the Japanese government. "When the Automatic Allocation system goes into effect, and the consumer alone decides the amount of soybeans and soybean products that are consumed, you will see the full effect that the promotion work that we have done has had." A small portrait photo shows David Farlow. Address: Asst. to the Executive Vice President, American Soybean Assoc.

4630. Fukamachi, Chiharu; Nakayama, Osamu; Suruga, Sachiko; Abe, Kazuyoshi; Tamamori, Shigeo; Watanabe, Tokuji. 1960. Tôfu seizô ni kansuru kenkyû. III. Tôfu genryô daizu no tekisei ni kansuru kenkyû. 1. Daizu no tekihi o hantei suru hôhô [Research on tofu production. III. Studies on the suitability of soybeans for tofu. 1. Method of judging the suitability of soybeans]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14B. p. 31-39. Sept. [Jap; eng+]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4631. Fukamachi, Chiharu; Nakayama, Osamu; Suruga, Sachiko; Abe, Kazuyoshi; Tamamori, Shigeo; Watanabe, Tokuji. 1960. Tôfu seizô ni kansuru kenkyû. III. Tôfu genryô daizu no tekisei ni kansuru kenkyû. 2 [Research on tofu production. III. Studies on the suitability of soybeans for tofu. 2.]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14B. p. 40-51. Sept. [Jap; eng+]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4632. Fukamachi, Chiharu; Nakayama, Osamu; Abe, Kazuyoshi; Suruga, Sachiko; Miyanaga, Setsuko. 1960. Tôfu seizô ni kansuru kenkyû. V. Tôfu seizô ni kansuru sono ta no kenkyû. 2. Bitamin A kyôka tôfu no seizô to hyôka [Research on tofu production. V. Other research on tofu production. 2. Manufacturing and evaluation of tofu fortified with vitamin A]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14B. p. 65-67. Sept. [4 ref. Jap; eng+]
• ***Summary:*** Contents: 1 Testing in the laboratory. 1.1 Experimental method. 1.2 Results of tests. 2 Testing in the factory. 2.1 Production method of tofu and its vitamin A content. 2.2 Results of the test. 3. Testing of bagged (*fukuro-iri*) tofu fortified with vitamin A. 3.1 Production method of bagged tofu. 3.2 Properties of bagged tofu. 3.3. Taste test.

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Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4633. Fukamachi, Chiharu; Nakayama, Osamu; Abe, Kazuyoshi; Suruga, Sachiko; Miyanaga, Setsuko. 1960. Tôfu seizô ni kansuru kenkyû. V. Tôfu seizô ni kansuru sono ta no kenkyû. 3. Fukuro-dofu ni taisuru rinsanen no riyô [Research on tofu production. V. Other research on tofu production. 3. Utilization of phosphate in bagged lactone silken tofu]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14B. p. 68-77. Sept. [Jap; eng+]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4634. Fukamachi, Chiharu; Teramachi, Yayoi; Nakayama, Osamu; Abe, Kazuyoshi; Suruga, Sachiko; Miyanaga, Setsuko; Watanabe, Tokuji. 1960. Tôfu seizô ni kansuru kenkyû. V. Tôfu seizô ni kansuru sono ta no kenkyû. 4. Futsû tôfu ni taisuru rinsanen riyô [Research on tofu production. V. Other research on tofu production. 4. Utilization of phosphate in regular tofu]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14B. p. 78-81. Sept. [Jap; eng+]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4635. Fukamachi, Chiharu; Nakayama, Osamu; Suruga, Sachiko; Abe, Kazuyoshi. 1960. Tôfu seizô ni kansuru kenkyû. V. Tôfu seizô ni kansuru sono ta no kenkyû. 5. Gyôkozai oyobi awakeshizai ni tsuite [Research on tofu production. V. Other research on tofu production. 5. About the coagulant and defoamer]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14B. p. 82-84. Sept. [Jap; eng+]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4636. Hayashi, Shizuka. 1960. The Japanese American Soybean Institute: We can supply the Japanese market with another 26 million bushels of soybeans if we seriously desire it. *Soybean Digest.* Sept. p. 31-32, 34.
• ***Summary:*** Contents: Introduction. Severe criticism (of U.S. soybeans by soybean users in Japan, and work to overcome this bad impression). Next on the consumption and import of soybeans. Now about the future outlook. Possibility of cutting down cost of oil prices. Price of soybean oil can be reduced. Soybean meal as a mixed feed has a big potential market. Soy flour expected to increase.

Before World War II "the soybean requirements of Japan were taken care of mostly by soybeans from Manchuria and China. Soybean oil and low-quality soybean meal were imported into Japan from Manchuria for use mostly as fertilizer." Whole soybeans were used for make shoyu and miso, and for crushing.

"The Japanese soybean industry has stepped into a new era since the war. The crushing industry has been shifted from Manchuria to Japan and it has developed quickly to the present important and prosperous stage. With expanded crushing capacity, the need for soybeans has increased and the major part of the requirements has been supplied by soybeans from the United States, with only a limited quantity from China."

"The break in trade between China and Japan since 1957 has given a chance for U.S. soybeans" to overcome their bad image in Japan.

"Consumption of various soy foods has shown substantial increase" and so have total soybeans imposts into Japan, and the U.S. percentage share of total imports. Table show: (1) Consumption of soybeans and oils in Japan (metric tons), annually from 1955-56 to 1960-61, for tofu and frozen tofu (increased from 319,000 to 370,000), miscellaneous (increased from 167,000 to 214,000), shoyu (increased from 248,000 to 272,000), oil mills (increased from 505,000 to 760,000), and per capita daily (increased from 7.52 gm to 10.80 gm). (2) Imports of soybeans to Japan (metric tons) annually from 1955-56 to 1959-60. In 1955-56: Total 767,099. From USA 571,612. U.S. share of total 74.5%. In 1959-60: Total 1,073,477. From USA 1,010,444. U.S. share of total 94.1%.

"Soybeans have now become the largest item volumewise of all U.S. agricultural products imported into Japan." They now top cotton, which had been the largest. Of all U.S. imports to Japan, soybeans are the second largest after scrap iron. This shows that the market development for U.S. soybeans in Japan has been successful–even under the present controlled currency allocation system which limits imports.

Four years ago the expression "P.R." [public relations] was known by very few people and there was little investment in P.R. in Japan. Today almost everyone in Japan knows what P.R. means. As an example of this change among soybean groups, the Miso Association had no budget for P.R. activities 3 years ago. Today its budget for fiscal year 1960 contains approximately 32 million yen or $90,000 for this purpose. "The same can be said of shoyu, tofu, and other groups." The "Shoyu Association has decided to send a team of 7 top executives of the leading shoyu makes to the United States in October 1960 to study the soybean industry. They are doing this at their own expense but with the cooperation of American Soybean Association.

The total investment in the soybean market development program in Japan over the past 4 years by Foreign Agricultural Service has been $425,000 and the contribution by various Japanese groups has been about $257,000 in cash and services combined.

A 1958 survey showed that the 1,368 oil mills in Japan were operating at 36.8% of capacity. This low percentage is due to the fact that 1,210 oil mills (about 90% of the total)

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are small factories with a daily processing capacity averaging 10 metric tons; they produce oil mainly from domestic rapeseed at low efficiency.

"If the import of soybean becomes free under the "Automatic Allocation system it is obvious that soybean oil production will be concentrated in the larger oil mills (61 crushers) occupying 85% of the nation's total daily extraction capacity of 8,289 tons. This will bring down the price of edible oil for Japanese consumers. A table shows that 159,000 tons of oil are made in Japan from domestic materials as follows: Rapeseed oil 65%. Fish and whale oil 25%. Rice bran oil 6%. Hog grease 4%. Since Japan has little possibility of increasing oil production from domestic raw materials, it must rely on imports. The price of domestic rapeseed is supported by Japan's government.

Another table shows the rapid growth in production of "concentrated feed" in response to the government's policy to encourage livestock production and the dairy industry. In 1955 it was 509,279 metric tons, rising to 1,310,098 tons in 1958, with 2,000,000 projected for 1960. The percentage of soybean meal used in mixed feeds has been about 4.5% because of the priority given to miso, shoyu and other food industries. However the Livestock Bureau has been requesting an increase in the import of soybeans for feed. Hayashi ends by estimating potential import growth of 700,000 metric tons or 26 million bushels, and by urging U.S. soybean growers to seize the opportunity. "If more funds for market development become available, first preference should be given to soybeans to meet the need for more oil, for more soy flour in bread, and for soybean meal as animal feed."

Photos show Shizuka Hayashi and Hiroshi Nakamura (delivering Hayashi's speech). Address: Managing Director, Japanese American Soybean Inst., Tokyo.

4637. Hoshino, Masao; Matsumoto, Fumie; Ikeda, Jugo. 1960. [Some experiments on the storage of seeds of leguminous plants]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 29(1):177-78. Sept. [4 ref. Jap; eng]
Address: Div. of Forage Crops, National Inst. of Agricultural Sciences.

4638. Moriguchi, Shigehiro; Ishikawa, Hiroshi. 1960. Maru daizu to dasshi daizu no usukuchi shôyu e no iro ni tsuite. II. [Studies on the browning of the light-colored shoyu made from raw and defatted soy-beans. II. On the chemical antioxidation factors in soy-beans]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 38(9):413-18. Sept. English summary on p. 42 of this issue. [9 ref. Jap]
• ***Summary:*** The authors reported in a previous paper that shoyu made from raw whole soybeans was lighter in color than that made from defatted soybeans. Address: Tatsuno Shoyu Co., Ltd., Japan.

4639. Moriguchi, Shigehiro; Ishikawa, Hiroshi. 1960. Maru daizu to dasshi daizu no usukuchi shôyu e no iro ni tsuite: III. Maru daizu-chû no butsuri-teki sanka bôshi yôin ni tsuite [Studies on the browning of the light-colored shoyu made from raw and defatted soy-beans. III. On the physical antioxidation factor in soy-beans]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 38(9):418-22. Sept. English summary on p. 42 of this issue. [5 ref. Jap]
Address: Tatsuno Shoyu Co., Ltd., Japan.

4640. Nakayama, Osamu; Fukamachi, Chiharu; Kubo, Shoji/Akiharu; Suruga, Sachiko; Miyanaga, Setsuko; Horiyasu, Shizuko; Watanabe, Tokuji. 1960. Tôfu seizô ni kansuru kenkyû. IV. Tôfu seizô-chû no ikô ni kansuru kenkyû. 1. Tanpakushitsu, shibô, muki-seibun no iko ni kansuru kenkyû [Research on tofu production. IV. Studies on the transformation of ingredients during tofu production. 1. Studies on the transformation of protein, fats, and inorganic ingredients]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14B. p. 52-55. Sept. [Jap; eng+]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4641. Nakayama, Osamu; Fukamachi, Chiharu; Kubo, Shoji/Akiharu; Suruga, Sachiko; Miyanaga, Setsuko; Horiyasu, Shizuko; Watanabe, Tokuji. 1960. Tôfu seizô ni kansuru kenkyû. IV. Tôfu seizô-chû no ikô ni kansuru kenkyû. 2. Amino-san no [Research on tofu production. IV. Studies on the transformation of ingredients during tofu production. 2. Amino acids]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14B. p. 56-57. Sept. [Jap; eng+]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4642. Strayer, George M. 1960. Commodity organizations that sell can find dollar markets overseas. *Chemurgic Digest.* Sept. p. 7-11.
• ***Summary:*** Today in the USA we have large surpluses of wheat, corn, cotton, rice and grain sorghums. "They are, in part, a result of the three great revolutions that have taken place in American agriculture in the 1900s: 1. Mechanization. 2. Hybridization. 3. Feeding efficiency." "Our single greatest problem today is wheat."

In 1946, just after World War II, the USA produced 180 million bushels of soybeans. "Many people thought we would drop back to 100 million bushels annual production." But instead production has increased, until today it is now nearly 600 million bushels. "Almost 25 million acres have been removed from corn, oats, wheat, cotton and hay acreages and transferred to the soybean crop. Today the U.S. is the worlds largest net exporter of fats and oils and oilseeds.

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In 1940 we were the world's largest importers. Where have the soybeans gone? Last year we exported 110 million bushels of soybeans–1 bushel out of every 5 produced." The soybeans were "sold into markets which did not exist for use 12 years ago! Japan bought almost 50 million bushels. The European countries bought 45 million bushels. And every bushel was sold for *dollars and only dollars."*

"Part of our increase is due to the breaking off of political relations between Japan and Red China, the traditional source of soybeans for Japan."

Discusses how these large soybean exports were developed. Recently Spain imported 300,000 tons of U.S. soybean oil. Last year Italy purchased 80,000 tons of soybean oil meal.

"Last winter the Soybean Council of America signed a 'global development agreement' with the Foreign Agricultural Service [FAS]..." Representatives of the fats and oils division of the FAS work together with representatives of the Soybean Council to sell soybean oil overseas. But the real work, Strayer emphasizes, must be done by "the commodity organizations representing the individual commodities... My point is this. No one else is personally interested in your markets except you!"

4643. Watanabe, Toshiyuki; Aso, Kiyoshi. 1960. Shiro shôyu no tôsosei ni tsuite [On the sugar composition of Shiro Shoyu (clear soy sauce)]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 38(9):435-40. Sept. English-language summary on p. 43-44 of this issue. [11 ref. Jap] Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai, Japan.

4644. Watanabe, Tokuji; Fukamachi, Chiharu. 1960. Tôfu seizô ni kansuru kenkyû. I. Tôfu seizô gijutsu no genjô ni kansuru chôsa [Research on tofu production. I. Survey of present tofu production technology]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14B. p. 1-5. Sept. [Jap; eng+]

• ***Summary:*** One of the most important and influential documents ever published on tofu, this report analyzed all the key variables in the process and led to major changes in the way tofu was produced in Japan, making the process more rational and efficient. An extensive summary of the results with many graphs is given in English by Shurtleff & Aoyagi in *Tofu & Soymilk Production.* This report was published shortly after Dr. Watanabe spent two years in the United States studying the suitability of American soybean varieties for making tofu, at the Northern Regional Research Center, Peoria, Illinois. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4645. Watanabe, Tokuji; Fukamachi, Chiharu; Nakayama, Osamu; Teramachi, Yayoi; Abe, Kazuyoshi; Suruga, Sachiko; Miyanaga, Setsuko. 1960. Tôfu seizô ni kansuru kenkyû. II. Tôfu seizô kôtei no hyôjunka ni taisuru kenkyû. 1. Futsû-dofu [Research on tofu production. II. Research on the standardization of the tofu making process. 1. Regular momen tofu]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14B. p. 6-15. Sept. [6 ref. Jap; eng+]

• ***Summary:*** Contents: Part I. Regular Momen Tofu. 1. Soybeans used for research. 2. Method of experiments. 2.1. Making soymilk. 2.2. Soymilk coagulation. 2.3. Measuring soymilk solids (2.3.1. Density of soymilk solids. 2.3.2. Density of protein in soymilk. 2.3.3. Volume of tofu. 2.3.4. Firmness of tofu. 2.3.5. Transparency of whey. 2.3.6. Tofu solids. 2.3.7. Density of protein in whey). 2.4. Expressing experimental results (2.4.1. Rate of extraction (%) of solids and of protein in soymilk. 2.4.2. Rate of solidification / coagulation. 2.4.3. Rate of tofu yield = Rate of extraction x rate of solidification / coagulation).

3. Results of experiments. 3.1 Cooking temperature of the slurry and the nature of the coagulated material (3.1.1. Effect of heating temperature on the tofu. 3.1.2. Effect of amount of water added during cooking. 3.1.3. Effect of temperature on conditions of extraction and solidification. 3.1.4. Cooking time). 3.2 Conditions of coagulation (3.2.1. Amount of coagulant. 3.2.2. Coagulation temperature. 3.2.3. Coagulation time. 3.2.4. Amount of stirring during coagulation. 3.2.5. Types of coagulants and effect on tofu. 3.2.6. Concentration of soymilk. 3.2.7. Varieties of soybeans used {Jackson, Dorman, Ogden, Lincoln, Harosoy, Hawkeye, Lee}). 3.3. Soaking the soybeans.

4. Standardization of the process for making regular tofu. 4.1. Amount of time soybeans should be soaked in water. 4.2. Method of obtaining soymilk. 4.3. Method of coagulating soymilk. 4.4. The standard manufacturing process.

Parts II and III. Silken tofu and Bagged lactone silken tofu follow a parallel structure. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4646. Watanabe, Tokuji; Fukamachi, Chiharu; Nakayama, Osamu; Teramachi, Yayoi; Abe, Kazuyoshi; Suruga, Sachiko; Miyanaga, Setsuko. 1960. Tôfu seizô ni kansuru kenkyû. II. Tôfu seizô kôtei no hyôjunka ni taisuru kenkyû. 2. Kinugoshi-dofu [Research on tofu production. II. Research on the standardization of the tofu making process. 2. Silken tofu]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14B. p. 16-24. Sept. [Jap; eng+]

• ***Summary:*** The structure of this part (Silken tofu, 2.2) parallels that of part 2.1 (Regular momen tofu, pages 6-15). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4647. Watanabe, Tokuji; Fukamachi, Chiharu; Nakayama, Osamu; Teramachi, Yayoi; Abe, Kazuyoshi; Suruga,

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Sachiko; Miyanaga, Setsuko. 1960. Tôfu seizô ni kansuru kenkyû. II. Tôfu seizô kôtei no hyôjunka ni taisuru kenkyû. 3. Fukuroiri-dofu [Research on tofu production. II. Research on the standardization of the tofu making process. 3. Bagged lactone silken tofu {GDL}]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14B. p. 25-30. Sept. [Jap; eng+]
• ***Summary:*** The structure of this part (Bagged lactone silken tofu, 2.3) parallels that of part 2.1 (Regular momen tofu, pages 6-15). Bagged Lactone Silken Tofu is a packaging innovation. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4648. Watanabe, Tokuji; Nakayama, Osamu; Fukamachi, Chiharu; Miyanaga, Setsuko; Suruga, Sachiko; Abe, Kazuyoshi. 1960. Tôfu seizô ni kansuru kenkyû. V. Tôfu seizô ni kansuru sono ta no kenkyû. 1. Nihon daizu to Amerika daizu no seijô, tanpakushitsu ganryô [Research on tofu production. V. Other research on tofu production. 1. Investigation of the characteristics Japanese soybeans and American soybeans: Protein content and fat content]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 14B. p. 58-64. Sept. [3 ref. Jap; eng+]
• ***Summary:*** Contents: Part 1. 1 Comparison of Japanese and American soybean varieties. 1.1 Soybeans used in the experiments. 1.2 Observations and method of analysis. Table 5.1 Properties and composition of Japanese soybeans–49 recommended varieties. Table 5.2 Properties and composition of Japanese soybeans–70 varieties other than those recommended. Table 5.3 Properties and composition of American soybeans–15 varieties (Dorman, Harosoy, Hawkeye, Jackson, Lee, Lincoln, Ogden, Clark, Mamloxi, Ogden). 1.3 Results of experiments and analytical interpretation. 2. Comparison of Japanese and American properties according to variety. 2.1 Soybeans used in the experiments. 2.2 Observations and methods of analysis. 2.3 Results of experiments and analytical interpretation. Table 5.4 Properties and composition of soybean varieties. Table 5.5 Analysis of electrical movement in water according to soybean variety (comparison of ingredients).

Part 2 (p. 65-66). 1 Testing in the laboratory. 1.1 Experimental method. 1.2 Results of tests. 2 Testing in the factory. 2.1 Production method of tofu and its vitamin A content. 2.2 Results of the test. 3. Testing of bagged (*fukuro-iri*) tofu fortified with vitamin A. 3.1 Production method of bagged tofu. 3.2 Properties of bagged tofu. 3.3. Taste test. 5 parts. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4649. All American. 1960. It's All-American for family favorites (Ad). *Los Angeles Times.* Oct. 6. p. F14.
• ***Summary:*** A full-page ad for many foods sold at this supermarket–including: "Kikkoman Soy Sauce. 6-oz. 29¢. 12-oz. 45¢. (KTTV Feature)." Address: Ten locations in the greater Los Angeles area].

4650. Motosaki, Shinichi; Ogasawara, T.; Kawai, J.; Hino, T.; Ito, K. Assignors to Ajinomoto Company, Inc. 1960. [Seasoning solution]. *Japanese Patent* 15,835. Oct. 21. (Chem. Abst. 55:10742h). [Jap]*
• ***Summary:*** Hydrochloric acid was used to hydrolyze fat-free soybean cake, to make hydrolyzed vegetable protein.

4651. Alden, Robert. 1960. Advertising: 'Guarantee' due for extinction. *New York Times.* Oct. 24. p. 38.
• ***Summary:*** The U.S. Federal Trade Commission has just issued stringent regulations regarding use of the word "guarantee" in advertisements.

The section "Accounts" states: "Kikkoman International, Inc., to Gotham-Vladimir Advertising, Inc. for advertising of Kikkoman Soy Sauce in the New York area."

4652. Hayashi, Shizuka. 1960. Japanese soy sauce team in United States. *Soybean Digest.* Oct. p. 22.
• ***Summary:*** "A group of top executives of the Japan Soy Sauce Brewers Association is making a 36-day tour of the U.S. soybean industry as guests of the American Soybean Association. The trip was arranged by the Japanese American Soybean Institute. The soy sauce manufacturers are traveling at their own expense, however."

They arrived in Waterloo, Iowa, Sept. 25. They plan to "visit farms where soybeans are grown and harvested, U.S. elevators, and soybean processing [crushing] plants; the Northern Regional Research Laboratory at Peoria, Illinois; grain grading and export facilities; and the U.S. Department of Agriculture in Washington, D.C.

The team from Japan includes Keizaburo Mogi, managing director, Noda Shoyu Co., Ltd.; Yoshiro Hamaguchi, managing director, Yamasa Shoyu Co., Ltd.; Kichiemon Hamaguchi, president, Choshi Shoyu Co., Ltd., and Mrs. Michiko Hamaguchi; Motoyashi Kinoshita, president, Marukin Shoyu Co., Ltd.; Heibei Yamashita, president, Kinoeno Shoyu Co., Ltd.; Chujiro Yamanouchi, vice president, Japan Shoyu Association, and president, Kyushu Shoyu Association; and Akira Komiya, managing director, Japan Shoyu Association.

"The team will be accompanied on their tour by David R. Farlow, assistant to the executive vice president of the American Soybean Association." Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building, No. 1, 1-Chome Yurakucho, Chiyoda-Ku, Tokyo, Japan.

4653. Miller, Harry W. 1960. The package soy milk shop. *Soybean Digest.* Oct. p. 14-15.
• ***Summary:*** Soy milk is now widely marketed in the United States in both powdered and evaporated forms.

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"The demand for the product has been mostly from those allergic to animal milk and through prescription to those who cannot tolerate dairy products. Its manufacture, however, has been by large factory establishments. This is the case with Loma Linda's Soyalac, Borden's Mull-Soy, and Mead Johnson's Sobee. The latest soy milk is being put out by the Indonesian soy milk plant located at Djorgakarta [Yogyakarta, Jogjakarta] which began soy milk powder production in 1957. These plants have contributed much to the knowledge of soy milk, and emphasized its value as a dietary article."

A package soy milk plant can be installed for less than $2,000. It can start as a tofu shop to which is added a steam boiler or steam generator of 5 to 10 horsepower capacity, either a hand-operated stone mill, or better a small mill run by an electric motor with steel or carborundum buhr, and a 50-gallon pressure cooker. The soymilk is formulated by adding sugar, oil, salt, calcium, and vitamins. "These are placed in about one-fifth the desired quantity of extracted milk and run through a small homogenizer especially made for the package plant. When it is homogenized it is added to the other four-fifths of the milk, and we have it as a constituted milk of a nice color and good flavor.

"In most places this soy milk is used hot and marketed at once as hot milk. However, where it is bottled (as is customary with animal milk) it is run over a cooler and bottled which adds a little expense. The package soy milk plant has a capacity for 150 pounds of cheese curd, and 200 gallons of milk per day of operation, using three trained workers, also at a very minimum of cost.

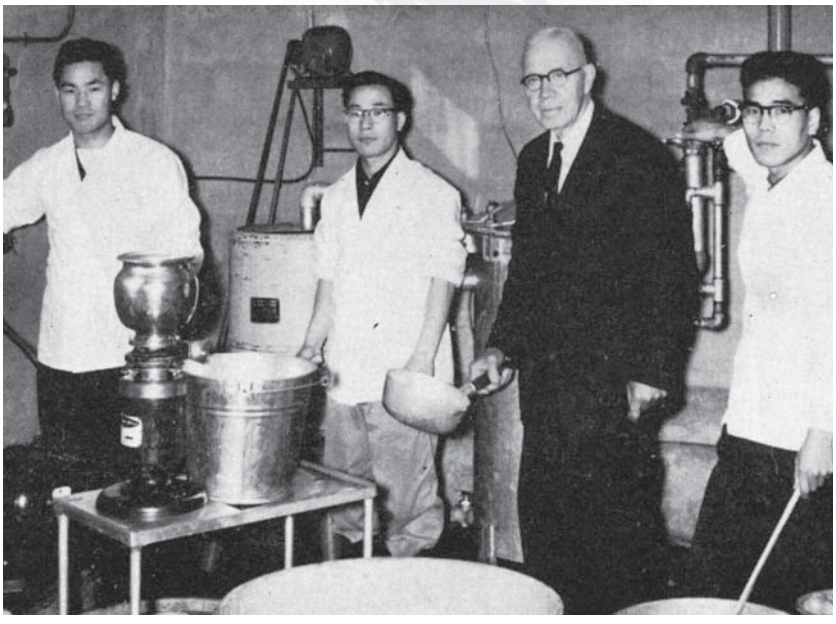
"Plant 30 Years Ago: The practicability of such package soy milk and cheese plants has been amply demonstrated. In fact, my first beginning with soy milk was made in a rather crude package plant at the Shanghai Sanitarium some 30 years ago. This grew into the large soy milk factory later in Shanghai. The next one, which was more streamlined, was put in a school at Taipei, Taiwan, supplying the school, the Taiwan Hospital and community with soy milk daily.

"One year ago the writer had the satisfaction of arranging a flow line of the above described equipment in a village in the northern suburbs of Tokyo, where soy milk is made in a soy cheese [tofu] factory so both bottled soy milk and tofu are supplied to the community and also to a state institution. There are an estimated 3,000 soy curd plants in Japan. At little additional cost each of these can be transformed into soy milk producing shops.

"A soy milk package unit has been assembled at Mountain View College, located in central Mindanao, Philippine Islands. Here the college farm raises a good type of edible soybean. There 700 students get soy milk for breakfast every morning and at noon have soy cheese. In these rice eating and corn producing areas the soybean thus prepared has made a great contribution to the health and welfare of the student body and faculty members.

"A similar package soy milk shop is now being installed at a school in Hong Kong, another at a college and hospital at Bandung, Indonesia, and another at a college in Japan.

"Thus a partial solution of the all-important protein in the nutrition of the Orientals, within their economic reach, is now a possibility. No greater benefit can be visualized than nutrition adequate for infants and the growing school child."



Photos show: (1) Three Japanese workers standing behind a table on which are glasses of soy milk. The caption reads: "Soy milk, ready for customers, is made fresh every day." (2) Dr. Harry Miller and three Japanese workers in a "soy milk package plant," or compact soy milk shop, with several pieces of equipment. Address: M.D., Director Emeritus International Nutrition Research Foundation.

4654. Strayer, George M. 1960. Editor's desk: Entertain Japanese trade teams. *Soybean Digest.* Oct. p. 4.

• ***Summary:*** "Japan is our No. 1 customer for

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U.S. soybeans. Out of total exports now estimated at nearly 140 million bushels during the 1959 crop year closed on Sept. 30, Japan took over 40 million bushels [i.e., more than 28%].

"Very significant is the tour of the soybean industry of the United States now being made by the team representing the Japan Soy Sauce Brewers Association." Shoyu manufacturers are the largest users of soybean meal; they also use some whole soybeans.

"This type of activity is obviously a means of creating more markets for U.S. soybeans." Address: American Soybean Assoc.

4655. Kikkoman International Inc. 1960. Kikkoman all-purpose soy sauce: Recipe of the week (Ad). *Los Angeles Times.* Nov. 10. p. A13.
• ***Summary:*** The recipe, Family-favorite teriyaki meatballs, features a sauce which calls for ½ cup Kikkoman soy sauce, 1½ tsp. brown sugar, ½ clove chopped garlic, ½ tsp. fresh or powdered ginger, and ½ cup water. The sauce is poured over meatballs, which are then baked.

4656. UPI Telephoto. 1960. A pointed reminder (Photo with caption). *Chicago Daily Defender.* Nov. 15. p. 16.
• ***Summary:*** This is an excellent, large photo of Shinzo Ohki, founder of Oriental Show-You Co. The caption reads: "Shinzo Ohki holds a Samurai sword estimated at more than 300 years old, from the collection of William Jones of Columbia City, Indiana. Tedious search has resulted in identifying the owners of two other swords which have been sent back to the families in Japan who prized them so highly."

The same photo, but smaller, appeared in the Nov. 26 issue (p. 8).

4657. Kikkoman International Inc. 1960. Kikkoman all-purpose soy sauce: Recipe of the week (Ad). *Los Angeles Times.* Nov. 17. p. 11.
• ***Summary:*** The recipe, Paradise island broiled chicken, calls for ½ cup Kikkoman soy sauce. "A super-surpriser–do it tonight!"

4658. Kikkoman International Inc. 1960. Kikkoman: Recipe of the week (Ad). *Los Angeles Times.* Nov. 21. p. A4.
• ***Summary:*** The recipe, Famous encore salad dressing, calls for 2 tbsp. Kikkoman soy sauce. "Shake well before using. Kikkoman soy sauce makes the lively difference!" The word "Kikkoman" is written in a bigger, bolder typeface. Across the bottom of the ad: "All-purpose Kikkoman Soy Sauce."

4659. Ishiguro, Takeo; Kato, Nobuyuki; Kato, Nobuo; Usuki, T.; Kishi, S. Assignors to Tanabe Seiyaku Company, Ltd. 1960. [Small particle pharmaceutical preparations]. *Japanese Patent* 17,600. Nov. 30. (Chem. Abst. 55:20340g). [Jap]*
• ***Summary:*** Lecithin or solidified soybean oil may be used instead of the typical beeswax.

4660. Hayashi, Shizuka. 1960. Soft tofu offers U.S. market. *Soybean Digest.* Nov. p. 24.
• ***Summary:*** Mr. Hayashi has recently learned that American soybeans are the best for making "soft tofu," which is rapidly becoming popular in Japan. The characteristic of soft tofu is that during coagulation there is very little loss of water soluble protein compared with ordinary tofu. Therefore the yield of soft tofu is much higher. After this discovery, the American Soybean Institute began to sponsor tofu making contests to encourage tofu makers to gradually shift to soft tofu. The first such contest was held in April 1959 in Osaka, jointly sponsored by the All Japan Tofu Press Co. The All Japan Tofu Association has over 40,000 manufacturers as members. Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building No. 1, 1-Chome Yurakucho, Chiyoda-ku, Tokyo, Japan.

4661. Hayashi, Shizuka. 1960. The tour of the soy sauce team. *Soybean Digest.* Nov. p. 24-25.
• ***Summary:*** "Shown on the opposite page are some of the pictures taken of the Japan Soy Sauce visiting team during their tour of the U.S. soybean industry in September and October." A list of many of the places visited is given.

Ten photos of the group and of individual members are shown; each has a detailed caption. Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building, No. 1, 1-Chome Yurakucho, Chiyoda-Ku, Tokyo, Japan.

4662. Ohsawa, George. 1960. The philosophy of Oriental medicine (The book of judgment). New York, NY: Ohsawa Foundation. 171 p. 19 cm. [7 ref]
• ***Summary:*** Ohsawa is trying to express a nondualistic worldview, its many forms of practice or application, and its manifestation in the field of time as pairs of opposites.

The Preface begins: "I wrote this book from the beginning of November until the end of November, 1955, in French Equatorial Africa in Dr. Schweitzer's hospital at Lambarene [Gabon], and from January 1 to January 13, 1956, at the Protestant Mission Station at Andende, in that old house where Dr. Schweitzer began his work in the year 1913,..."

"The aims of this book: 1. To point out the dialectical, universal, simple and useful Unique Principle of science and philosophy, of all the great religions and of all Far-Eastern civilization. 2. To show the biological, physiological, medical, educational, sociological and logical application of the Unique Principle. 3. To present especially Far-Eastern medicine in the light of the Unique Principle. 4. To reveal the Unique Principle in all its glory as the principle of infinite freedom and eternal peace.

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"The Unique Principle of the Far-East is exceedingly simple and extraordinarily practical... It is the 'conception-constitution' of Life and the Universe" (p. 3). It "is a manifestation of universal love, or the supreme judgment, embracing all the antagonisms and transforming them into oneness, and distributing the eternal joy of life to all, forever" (p. 4).

"Since the publication of my first book in French, *Le Principe Unique de la Science et de la Philosophie l'Extrême-Orient* (at Vrin's, Paris, 26 years ago [1931]), I have always worked in the same direction–for universal understanding. I left Japan forever about the end of my sixtieth year (October, 1953) to see my friends and the great man of the world, whom I believed would understand the Unique Principle, and the practical dialectics thereof. Note: The order of words in the title of Ohsawa's first book in French was actually *Principe Unique de la Philosophie et de la Science d'Extrême-Orient.*

"I hope the Unique Principle will become as well known as the art of flower arrangement, Chinese medicine, 'Acupuncture,' Bonsai, Bobkei, Zen Buddhism, and the theory of Judo-Aiki" [Aikido] (p. 4).

"Until the end of my life I shall always be traveling with my wife, showing how to master this practical dialectics, universal logic, and order of the universe; the very key to the Kingdom of Heaven that will establish infinite freedom, eternal happiness, and absolute justice everywhere." "I live in Europe, chiefly in France, six months of each year, and the rest of the time I shall visit other countries on this planet" (p. 5).

Contents: Preface. Introduction: The physics and metaphysics of yin and yang. 1. Medicine or faith? 2. The Unique Principle–a practical and dialectical classification: Yin (centrifugal) and Yang (centripetal) are always relative, the form, the weight, the color, about water, the chemical composition, the geographical point of view, the taste, conclusion, Dentie, Yin and Yang classification.

3. The Unique Principle of the science and philosophy of the Far East. 4. Man's origin. 5. Far Eastern medicine. 6. Order of the Universe and man's constitution. 7. Supreme judging ability. Appendixes.

"In the Far East, thousands of years ago, medicine evolved from perfect symptomatic medicine to prophylactic [preventive] medicine; then from prophylactic to the yogic (or religious) art of health,..." (p. 13). Western medicine is analytical, empirical medicine; it is a modern superstition (p. 19). "I am going to show you the identity of faith (realization of the order of the universe, or Oneness, the absolute–infinite–eternal) and the highest medicine" (p. 20).

Soy paste [miso] is a very Yang "vegetable paste, prepared with a 20 to 30% volume of salt, which will keep for at least three years" (p. 35).

"How can one, having two new-born twin dogs, make one become very vicious, restless, aggressive, and the other easy, friendly, quiet and patient? Answer: I will feed one with a diet including 20 to 30% of meat or fish, and the other a vegetarian diet with 60% or more cereals... If racing together, the non-vegetarian would lead for the first mile or so, but afterwards, the vegetarian would forge ahead" (p. 36).

"Vegetarian peoples are rather of philosophical and religious mind, inclined to meditation, aesthetics, literature and poetry. The non-vegetarian ones, on the contrary, are strongly inclined to so-called mechanical and industrial progress, and to colonization too. There have been no vegetarian people in world history who colonized other people by force (militarily or economically). From the beginning, the Japanese people were vegetarian until the introduction of Occidental civilization fifty years ago at the time of the Russian-Japanese war" [1904-05]. After that they "became utterly uprooted. The Japanese spirit was lost, as well as the whole of its tradition. To some degree they have allowed themselves to be colonized, spiritually and physiologically" (p. 37).

There are 7 stages of Yin-Yang classification of food. The 7th or highest is "all-embracing supreme judgment. All food products must be free of chemical fertilizer and insecticides (both very Yin), since they destroy not only the natural quality of the food, but also, sooner or later, those who eat it." The key complementary antagonism between Na [sodium] and K [potassium] was discovered by a Japanese doctor, Sagen Isiduka [Ishizuka], 70 years ago." He cured hundreds of thousands of incurable people. "When he died his funeral escort was over two miles long" (p. 38-39).

The greatest master of the Unique Principle was Lao-Tse [Laozi]. It is a polarizable monism (p. 41). "Everything is composed of two fundamental forces, Yin and Yang. They are seemingly antagonistic, but actually they are complementary" (p. 43).

"Every year about July or August, for almost twenty years, I have organized a 'New School' where the students learn the theory and practice of the method to establish good health following the tenets of the Unique Principle" (p. 44).

"But what is education? Present-day education, so-called, is nothing but phonographic remembrances of the mass production of professionals, technicians, engineers or teachers. In short it is a preparation for slavery" (p. 47). It is really indoctrination. There are two important types of education: pre-natal and post-natal. But a real teacher is able to make men free and happy forever (p. 48-50). Knowledge of the Unique Principle is called *Do* in Japan and *Tao* in China; it is the Great Way, and following it is called *gyo* [spiritual practice] (p. 50-52).

All food is of vegetal origin; it ultimately comes from plants (p 62). "Cow's milk is intended for the nourishment of calves... There is no reason for man to live upon the milk of the animal, which is biologically and intellectually inferior to him" (p. 67).

Illness is an alarm, sent by the Infinite to tell us that we

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are violating the Order of the Universe (p. 77). "The world is dialectical. Quality is influenced by quantity. The world of materiality and relativity is very complex in its expression and phenomena. It appears like an anarchic chaos, but a dialectical law rules it: the 'Unique Principle' or Yin-Yang law.'" Man is the masterpiece of creation. He is happy who has made up his mind to live in accordance with the Unique Principle (p. 82).

"About thirty years ago, I brought acupuncture to Europe and was the first practitioner of it there." "I was at the same time, the first importer of the art of flower arrangement and of the theory (or spirit) of Judo (Juzutsu [Jujutsu])." Both have become popular in today's Europe. "But few people are interested in the *Do* [*Tao*] of Judo and Kado, which is their philosophy" or "Unique Principle." The *Do* of Judo has also been forgotten in Japan (p. 88-89).

"The individual soul and the universal soul are one and the same thing, the infinite" (p. 156). On the last 2 pages of the book are important addresses in New York City (Ginza, Azuma) and Japan (Nippon C.I. in Tokyo), and Centers in Europe (France, Belgium).

Note 1. This is the 2nd earliest English-language document seen (May 2011) written by Ohsawa, who lived 1893-1966.

Note 2. Carl Ferré states (e-mail of 30 April 2011): It was first announced in the Nov. 1960 issue of *Macrobiotic News* and therefore may well have been first published in English in late 1960. The original French edition was published by Vrin in 1956. There were at least two printings of hardcover editions: (1) blue cover with gold lettering; it probably appeared first; (2) brown cover with thicker paper. Address: 1. Lambarene, French Equatorial Africa [Gabon]; 2. Ohsawa Foundation, 331 Riverside Dr., New York City, New York (Secretary Aihara, 44, W. 96th St., New York City, USA).

4663. Ohsawa, G. 1960 Zen macrobiotics: The art of longevity and rejuvenation. New York, NY: Ohsawa Foundation. Printed in Japan. 218 p. Undated. Index. 17 cm.
• ***Summary:*** This is the earliest known printed edition of Zen Macrobiotics. The cover is gray. The author is George Ohsawa. The content is basically the same as the original mimeograph edition, however it has been edited and several of the parts have been rearranged and renamed to create a Forward [sic] (p. 3-5), a Preface (p. 6-8), and Chapters 1-3 (p. 15-43). At the end are two appendixes: One, which was titled "The Case of Mr. E," appeared at the end of the mimeograph edition. The second, which has been added is titled "The Pro-Forma Death Certificate of the American World Empire and its Gold Dynasty."

Concerning the date of publication: Although the date is not given in or on the book, the periodical *Macrobiotic News* announced it as being available in November 1960.

Distinguishing marks of this printing: Page 3: "Forward" is misspelled. Page 7: "... hundreds of ways of cookin [sic] and eating. They are all aim [sic] to create..." Page 62: "The yellow part is most yound [sic, yang],..."

These four errors were corrected in the next printing.

Both printings have 218 pages. However, pages 217 and 218 are different in the two books.

At least two printings were done in Japan. As of April 2011, Carl Ferré, President, George Ohsawa Macrobiotic Foundation (Chico, California) has one original of each.

Carl adds (e-mail of 30 April 2011): "Page 218 of the book you have (*Macrobiotics: The Art of Longevity and Rejuvenation,* by G. Ohsawa) appears to be exactly the same as the second Japan printing. It seems to confirm my hypothesis of a first printing in Japan in 1960, a second printing in Japan around 1962, and a third printing of the same edition in the U.S. after the 1962 Japan printing (and might even be the 1964 book referred to in Yin Yang). I believe the first reference in Macrobiotic News to a printed book is November 1960. Because editions of *Zen Macrobiotics* may have been printed at the same time as *Philosophy of Oriental Medicine,* we may need to look into that title as well in order to determine the full story." Address: Ohsawa Foundation: 331 Riverside Dr., New York City. Secretary Aihara, 44 W. 96th St., New York City, U.S.A.

4664. *Soybean Digest.* 1960. The cover picture: Mrs. Michiko Hamaguchi. Nov. p. 23.
• ***Summary:*** Mrs. Hamaguchi was the guest of Mrs. George Strayer in Hudson, Iowa. She is a member of the Japan Soy Sauce Brewers Association visiting team which toured the USA in September and October.

"Mrs. Hamaguchi is not only the wife of K. Hamaguchi, a director of the Soy Sauce Association and president of the Choshi Soysauce Co., but she is also a well-known soprano singer in Japan."

4665. Kikkoman International Inc. 1960. Kikkoman all-purpose soy sauce: Recipe of the week (Ad). *Los Angeles Times.* Dec. 1. p. 21.
• ***Summary:*** The recipe, Easy does it steak superb, calls for ½ cup Kikkoman soy sauce.

4666. USDA ARS Northern Utilization Research and Development Division, Peoria, Illinois. 1960. Definitions of foreign foods of current interest (Brochure). Peoria, Illinois. 4 p. Dec. 13. 28 cm.
• ***Summary:*** The first section, titled "Japanese foods from soybeans" (p. 1-2) includes: Aburage, frozen tofu, Hamanatto (Hamananatto), kinako (A form of full-fat soy flour made by grinding roasted soybeans), koji (A culture prepared by growing *Aspergillus oryzae* on cooked rice, wheat or other cereal for a few days. Serves as a source of enzymes for making miso, soy sauce, saki [saké, sake]

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and other fermented foods), kori tofu, miso, monosodium glutamate (a seasoning compound first isolated from soy sauce), nama-age, natto, satsumage [satsuma age], soybean milk or tonyu, soy sauce or shoyu, tofu, yaki-dofu, yuba.

The second section, titled "Indonesian fermented foods" (p. 3-4) includes: Arak, ketjap (soy sauce made with black soybeans), ontjom, ragi, sajur asin, tapé ketan (fermented glutinous rice), tapé katella (fermented arrowroot), tempeh (or témpé or témpé kedelé), tuwak. Address: Peoria, Illinois.

4667. Jones, Stacy V. 1960. Variety of ideas in new patents: Japanese trade-mark. *New York Times.* Dec. 24. p. 19, 25.
• ***Summary:*** Yamasa Shoyu Company of Japan wishes to register with the "Patent Office an arrangement of Japanese characters, as a trade mark for soy sauces." On top of the Yamasa logo is an inverted "v," meaning "high mountain." Underneath it is a "character designating Kihei Hiroya, the founder of the business."

4668. Arnould, Francis. 1960. La vie et l'oeuvre du Dr. Berczeller et le soja alimentaire [The life and works of Dr. Berczeller and soyfoods (Continued–Document part II)]. *Revue d'Histoire de la Medecine Hebraique* 13(4):153-68. Dec. [Fre]
• ***Summary:*** Continued from page 159. Soy flour has numerous practical advantages. Its adds stability and shelf life to breads. Containing very little water, it is lightweight and easy to transport. It is extremely versatile, for use in many foods and dishes. It also has special uses, in war provisions and relief foods for refugees. Because of its light weight and nutritional density, it was used as a foodstuff by German skydivers / parachutists.

III. The big questions and projects: Berczeller was interested in the problem of world protein shortages. Germany had long had a serious deficiency of protein and fat, which could be corrected by soy. Germany imported about 1 million tons of soybeans before the war, and these soybeans were largely treated by the Berczeller process–which was a triumph. Russia experienced grave famines in about 1926, as well as at other times. So Russia turned to the soybean and cultivated it on large expanses of land. Dr. Berczeller traveled to Russia in about 1927 to create a modern soya industry there. North Africa and black Africa suffer from undernutrition and protein malnutrition. Soybean cultivation and a soyfoods industry would offer a solution to the problems of the entire continent.

In 1936 the Maharaja of Baroda [Maharaja Sayajirao Gaekwad III] well understood India's protein problem and had a book published on soya by Indian physicians. But they ignored the decisive progress made by Berczeller, so they were not able to develop utilization of soya that was properly treated. Berczeller was thinking as early as 1932 that introducing the food use of soya to India would be the main human goal of his life.

Even before 1932 Dr. Berczeller saw–at an early date–the great question of world protein supply and undernutrition. He studied the problem of the balance of nutrition and food in Germany scientifically. In 1932, Dr. Berczeller met F. Arnould because he took interest in the general econometric studies done by F. Arnould; this became the basis of their relationship [thus F. Arnould seems to have been an economist]. Thus Dr. Berczeller was a pioneer or precursor of in the field of agricultural and food econometrics.

He was very interested in various international organizations. He foresaw the need for an organization or international laboratory for the study of nutrition and food. From 1932 he told us that he would like to donate his fortune–which was very large–to such an organization.

His ideas and goals were a perfect match with those of existing organizations, the International Institute of Agriculture (Rome) before 1939, and the Food and Agriculture Organization [FAO] after World War II. Particular circumstances–and perhaps even occult occurrences–impeded the development of his works under this normal framework. He was interested in new protein sources, such as yeasts, and in the synthesis of amino acids and even poly-peptides.

IV. The life of Dr. Berczeller. We knew only a part of Dr. Berczeller's life and work. We would like to gather documents, testimonies, opinions, even criticisms from the many people who knew him. Dr. Berczeller explained to us that the idea of studying soya came to him in 1912 after attending a soyfoods dinner at the Japanese embassy in Berlin. He had been indisposed with a headache. So the slight toxicity of seemed to him to be a question of great importance. Already specializing in food questions, he had been an expert in the Austro-Hungarian government in this field during World War I (1914-1918). In about 1918-1920 he worked in the laboratory of Dr. Wasserman studying the proteins in blood. In 1921-22 he invented his process for treating soya. He was aided by the laboratories of the Skoda Foundation in Czechoslovakia.

In about 1924 Winston Churchill wrote a favorable article about food uses of soya in the London *Times.* A soyfoods dinner was given by the British Empire League in London; Winston Churchill attended.

In 1926 Dr. Berczeller went to Russia to organize a soya industry. He was considered to be named "Honorary General of the Red Army." He returned in 1930. In Germany his patents were used or exploited by Hansa Muehle of Hamburg, a huge milling enterprise. His products based on soya flour were sold by the Edel Soja Society in Berlin.

In England his soy flour was produced by the company named Soyolk in Rickmansworth near London. But a lawsuit (*procès*) opposed Soyolk to Dr. Berczeller. He later lost this lawsuit in about 1930.

A factory for making soy flour was also started in the

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Netherlands.

As early as 1929 Dr. Berczeller presented to the French government a proposal to introduce soy flour into human feeding. When we went to Quai d'Orsay [headquarters of the French government] in the company of Dr. Berczeller in 1932, we reminded our audience of our earlier proposal.

To discuss the introduction of soy flour in the food of large organizations, and of armies / militaries in particular, he went to see many important persons–Joseph Stalin, B. Mussolini, Miss Dorothy Thompson, secretary to President Franklin D. Roosevelt, etc. From 1929 to 1939 Dr. Berczeller travelled extensively in Europe to study on location the food of various countries: Romania, Bulgaria, Yugoslavia, Italy, Portugal, etc. He often traveled to Great Britain, where he studied the countries of the British Empire.

Dr. Berczeller in France: In 1932, when Dr. Berczeller asked us to present his work on soy in France, the agricultural situation in France was not favorable to the use of this progressive item, agriculture being then in the mist of a crisis of overproduction, with too much wheat, too much meat, too much milk, etc.

Those in charge were told to keep his ideas on file and reopen them when the next war broke out. This actually happened. In Oct. 1939 we asked CNRS, the National Center for Scientific Research, to invite Dr. Berczeller to come to France. He arrived in Paris via Geneva with an introduction from the secretary general of the League of Nations. We worked at Toulouse in 1939-40 on a program of soybean cultivation in southern France. During that time he stayed in Paris, at CNRS, working on introduction of soya into the army's food. But in June 1940 the defeat of France by Germany interrupted our work. Dr. Berczeller retreated to Toulouse.

After the armistice, soy flour could have been able to render a great service to France for feeding children. Some of it could have been imported from the United States, but human and political considerations impeded the realization of this.

Dr. Berczeller departed for Marseilles. We lost track of him, but we re-established contact after the Liberation (spring 1945). We tried to import some soy flour from the USA to feed undernourished people returning from the German camps. But incredible blunders on the part of the State's relevant departments caused our efforts to run aground. Several 'Liberty Ships' loaded with soja beans arrived in France but the knowledge as to what to do with these products was not on hand. Finally, they were given to... hogs.

Dr. Berczeller encountered difficulties of all types in France after the Liberation. Ruined, unknown, poorly received, old and sick, he finally lost his equilibrium and was no longer able to conduct his complex affairs and delicate studies. He was hospitalized at the hospital Lariboisière, then sent to various psychiatric hospitals. In this unfortunate evolution, CNRS has taken a very heavy responsibility by its incomprehension and by the false information that it gave. One could write an entire book recounting these misadventures of Dr. Berczeller in the French scientific milieux.

In 1940 Dr. Berczeller, working with a Quaker group near Toulouse, studied the importation of a soy-based infant formula made in the USA. The Quakers later helped him greatly in trying to rectify injustices, but without success. In 1952 Prof. Veznar of Zurich, Switzerland, helped arrange for Dr. Berczeller to be placed in the *Maison de Santé Nationale de Saint-Maurice.* The chief medical officer of this establishment, Prof. H. Baruk, cared for him with the greatest devotion. But he was not able to stop the development of an old heart malady. Dr. Berczeller died at Saint-Maurice on 14 Nov. 1955.

4669. Hayashi, Shizuka. 1960. Promotional work started for soy flour. *Soybean Digest.* Dec. p. 15.

• ***Summary:*** "Parallel with the promotional activities which the Japanese American Soybean Institute has been concentrating on to increase consumption of various soybean products such as soybean oil, miso, shoyu, tofu, frozen tofu and other soy foods, the Institute has now started developing new markets for soy flour for various purposes, and soybean meal for animal feeds.

"As a first step, plans have been made to promote the blending of soy flour with wheat flour for baking bread and other baked goods.

"Experimental investigations have shown that up to 10% of a good quality of soy flour can be blended with wheat flour and that this can be done effectively on a commercial basis.

"This requires educational work as well as promotion. It is, however, encouraging to know that some of the large bakeries are already using a certain percentage of soy flour with wheat flour and selling their breads to the public without disclosing to the public the fact that the breads contain soy flour. Unless there were some advantage or profit to be gained they would not voluntarily use soy flour.

"A series of experiments are being carried out at the experimental institute of the Ministry of Agriculture, for the purpose of encouraging use of soy flour with wheat flour, particularly among the rural housewives through the network of home economic extension workers.

All kinds of breads, cookies, doughnuts, cakes, noodles, etc., have been made. Special attention should be called to the success in making noodles with the addition of 30% soy flour. Noodles with 10% to 20% soy flour have been demonstrated as being perfect in their appearance, color, taste and quality. In fact, noodles with soy flour blended with the wheat are more palatable and acceptable than the ordinary 100% wheat flour noodles.

"Under the joint sponsorship of some of the school

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lunch newspapers and JASI, a meeting was held in the latter part of October. Representatives of grammar schools in the different wards of the city of Tokyo were present, also officials in charge of school lunch programs from the Ministries of Education, Agriculture, Welfare, and the Tokyo metropolitan government. About 30 nutritionists from the different wards of the metropolis were on hand; also, representatives of manufacturers of soy flour. Altogether, about 130 were present.

"The aim of the meeting was to educate the school teachers and officials of the different government departments regarding the excellent nutritional value of soy flour and to persuade them to start on a program using soy flour blended with wheat flour in making bread for the school lunch.

"Most teachers have very little knowledge of the values of soy flour and its nutritious ingredients such as fats, proteins, and vitamins. Some of the teachers had the idea that the soy flour now being used for baking and confectionery purposes is like the soybean cake and meal that Japan used to import from Manchuria before the war for fertilizer.

"This suggests that extensive promotional activities will have to be undertaken before the public will become familiar with the value of soy flour.

"An hour lecture was given by the writer explaining the nutritional values of soybeans and soy flour. I emphasized the advantage of using soy flour blended with wheat flour both from economical and nutritional points of view.

"The Japanese school lunch gives 100 grams of bread every day to each child. I explained that by adding 12.5% soy flour, this could reduce the quantity from 100 grams to 40 grams and still give the same nutritional values. Cost for each child could be cut from 5.5 yen to 3.27 yen.

"Since there are a little over 10 million school children in the school lunch program, the savings through the use of soy flour could come to 8 billion yen a year on the basis of 250 school lunch days. If the school lunch were given to the approximately 20 million school children who need it, the amazing amount of 16 billion yen, over $44 million, could be saved!

"After the lecture we served samples of 40-gram loaf [loaves] of soy-wheat flour bread baked under the direction of Dr. M. Akutsu, also various foods made with a blend of soy flour with a pottage soup which also contained soy flour.

"All the people in attendance seemed surprised at the excellent quality of the foods produced with soy flour.

"This was the first attempt to promote soy flour. Of course repeated publicity of this nature is needed to develop this new market." Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building, No. 1-Chome Yurakucho, Chiyoda-Ku, Tokyo, Japan.

4670. **Product Name:** [Ajieki (HVP Soy Sauce)].
Foreign Name: Ajieki.
Manufacturer's Name: Ajinomoto K.K.
Manufacturer's Address: Tokyo, Japan.
Date of Introduction: 1960.
New Product–Documentation: Ogasawara. 1960. Jozo Kogyo Rinji Zokan (Brewing Industry, Special Edition). p. 207-16; Ajinomoto K.K. 1978. Ajieki (Leaflet). 8 p. Soya Bluebook. 1984. p. 76. Ajinomoto Co., Inc., Kyobashi 1-5-8, Chuo-ku, Tokyo, Japan.

4671. Aoyama, Torahiko. 1960. Amino-san eki [Liquid hydrolyzed vegetable protein (HVP)]. *Jozo Kogyo Rinji Zokan* (*Brewing Industry, Special Edition*) p. 225-30. [6 ref. Jap]
Address: Professor, Ibaraki Univ., Ibaraki-ken, Japan.

4672. FAO. 1960. Report of the FAO Regional Seminar on Food Technology for Asia and the Far East. Rome, Italy: FAO. 39 p. Held 1-8 Aug. 1959 at Mysore, India. First published in mimeographed form as Expanded Technical Assistance Report No. 1159.
• ***Summary:*** Chapter 5 is titled "Protein-Rich Foods."
Address: FAO, Rome.

4673. Hayashi, Y.; Ariyama, H. 1960. [Studies on pulses used as food in Japan]. *Tohoku Nogyo Kenkyu* (*Tohoku Agricultural Research*) 11:171-85. [Jap]*
Address: Japan.

4674. Hibino, H.; Mano, M.; Innishi, M. 1960. [Enzymatic decomposition of protein by *Bacillus natto*]. *Bulletin of Nagoya Women's City College* 9:37-38. [Jap]*

4675. Kanno, Masaaki? 1960. Shinshiki 2-gô shôyu [Shinshiki No. 2 soy sauce, semifermented]. *Jozo Kogyo Rinji Zokan* (*Brewing Industry, Special Edition*) p. 217-24. [4 ref. Jap]
Address: Noda Sangyo Kagaku Kenkyusho, Noda, Japan.

4676. Kitani, K.; Inoue, Y. 1960. [Studies on the soybean rust and its control measure. I. Studies on the soybean rust]. *Shikoku Agricultural Experiment Station, Bulletin* 5:319-42. [Jap; eng]*
• ***Summary:*** In 1902, Torama Yoshinaga collected the soybean rust fungus in Kôchi prefecture on the Island of Shikoku. Address: Japan.

4677. Kohono, C. 1960. [Investigation of organic acids of natto]. *Mukogawa Joshi Daigaku Kiyo. Seikatsu Kagaku-hen* (*Scientific Reports of Mukogawa Women's Univ.–Domestic Science Series*) 8:201-205. [Jap]*
• ***Summary:*** 2008 Aug. 12. WRS e-mailed www.nodai.ac.jp/english/... = Tokyo University of Agriculture.

The one I've been to is University Library for Agricultural and Life Sciences at 1-1-1 Yayoi, Bunkyo-ku,

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Tokyo 113-8657.

4678. Machida, Yoshiro. 1960. Daizu tanpaku no kagaku [The science of soy protein]. *Nyu Fudo Indasutori* (*New Food Industry, Tokyo*) 2(4):18-24. [Jap]

4679. Nagata, Tadao. 1960. Daizu no kaika nissu, kaika kikan, ketsujitsu nissu ni oyobosu niccho no eikyô no sogo kankei, tokuni kankei kaika kikan, kankei seiiku no hinshu hansai to no kanren ni tsuite [Interrelation of the effects of daylength on the period of flowering, flowering period, and seed forming period, with special regards to the relative flowering period and the relative growing period of soybeans]. *Ikushugaku Zasshi* (*Japanese J. of Breeding*) 10:188-94. [10 ref. Eng; jap]
• ***Summary:*** "As emphasized in the former report (Nagata 1950), soybeans vary in the relative flowering period and the relative growing period compared with the period from emergence to flowering, and the said properties have intimate relation to the distribution of soybeans in Japan and the world (Nagata 1959, 1960). Nevertheless, the factors giving rise to these varietal differences have not been clarified to date. Parker and Borthwick (1951) and Fukui and Yarimizu (1951, 1952) dealt with the problem of the effects of daylength and temperature on the growths of pod and seed, and maturity. They observed that the daylength was a more marked factor affecting those growing processes than the temperature. Other researchers have also observed the effect of temperature at night on the seed formation or fructification (Furutani 1950, Takeshima 1952, Tanda 1952). Above all, Fukui and Yarimizu (1951, 1952) suggested that the long seed forming period of soybeans belonging to the summer soybean type or the intermediate type was attributable to their high sensitivity to photoperiod during the seed forming period.

"The author carried out several experiments on the relative periods of soybeans mentioned above, and found some correspondence of the determinate vs. indeterminate growth habit, seed size, and photoperiodic perception to the relative periods. The results obtained from the experiments are reported in this paper."

"Summary: In order to make it clearer to understand the varietal difference of the relative flowering period and the relative growing period, and the interrelations to other characters, the effects of daylength on the flowering period and the seed forming period were studied in the experiments of 1953 to 1954.

"1. The daylengths from 10 to 18 hours appeared to have greater effect on both of the said periods than on the period to flowering at hours of threshold shorter than the critical daylength. Such an effect differed between the varieties in parallel with the lengths of the periods under short daylength, that is, great on the flowering and the seed forming periods of indeterminate soybeans and the seed forming periods of determinate large seeded soybeans, while less on both of the periods of determinate and small seeded soybeans.

"2. The difference in the effect of daylength mentioned above was clear between the soybeans of summer soybean type and intermediate type due to the sudden leap of the period at the threshold daylength.

"3. Such results seem to make it easy to consider the varietal difference in the relative periods and the interrelations to determinate vs. indeterminate growth habit and seed size under natural daylength in fields, as shown schematically in Fig. 3." Address: Hyogo Agricultural College, Sasayama, Hyogo-ken, Japan.

4680. Nichibei Daizu Chosa-kai. 1960. Tenpe no seizô-hô [Tempeh production methods (Brochure)]. Tokyo: NDC. No. 130. 4 p. [Jap]
Address: Japanese American Soybean Institute.

4681. Ogasawara, Takeshi. 1960. Ajieki ni tsuite [On Ajieki, HVP soy sauce]. *Jozo Kogyo Rinji Zokan* (*Brewing Industry, Special Edition*) p. 207-16. [7 ref. Jap; eng+]
Address: Prof., Ibaraki Univ., Japan.

4682. Sakurai, Yoshito. 1960. Report of the researches on the production of high-protein food from fermented soybean products. Food Research Institute, Ministry of Agriculture and Forestry, Tokyo, Japan. *
• ***Summary:*** Sakurai reconfirmed that *Bacillus natto* is an aerobic, Gram-positive rod, and classified as a related strain of *B. subtilis.*

Note: Hesseltine and Wang (1972, p. 402) reported that there are two types of *Bacillus natto* in the laboratory of the Food Research Institute, Ministry of Agriculture and Forestry, Tokyo, Japan. One has its optimum temperature from 30º to 45ºC and the other, from 35º to 45ºC.

Sakurai recommended that the culture known as *B. natto* SB-3010 and having its optimum temperature from 35º to 45ºC appeared to be the one most suitable for making natto.
Address: National Food Research Inst., Tokyo.

4683. Sasaki, Ruth Fuller. 1960. Rinzai study for foreigners in Japan. Kyoto, Japan: First Zen Institute of America in Japan. 104 p. *
Address: Kyoto, Japan.

4684. Sunakawa, K. 1960. [Studies on the physical growth of natives of Naha city, Okinawa]. *Kagoshima Daigaku Igaku Zasshi* (*Medical Journal of Kagoshima Univ.*) 33:1509-84. [Jap]*

4685. Doi, Tadao. ed. 1960. Nippo Jisho: Vocabulario da lingoa de Iapam [Vocabulary of the language of Japan]. Tokyo: Iwanami Shoten. 822 p. 22 cm. [Por; Jap]
• ***Summary:*** This is facsimile edition of the original 1603

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edition, the second earliest dictionary of the Japanese language compiled by Europeans.

Soy-related terms in this dictionary include: Abura ague [Abura-agé]. Aburidôfu. Amazaqe [Amazake]. Cabe [Tofu]. Côji [Koji]. Daizzu [Daizu]. Dengacu [Dengaku]. Fanben [Hanben]. Icchô. Mame. Graos, ou feijoes de Iapao [Soybeans]. Miso [made with rice]. Misocoxi [Misokoshi, a miso strainer]. Misoya [A shop which sells miso]. Misoyaqijiru [Miso-yaki-jiru, a soup made with grilled miso and diced tofu]. Misôzzu [probably a soup seasoned with miso resembling Zosui]. Nattô. Nattôjiru. Tofu. Tofuya [A shop which makes and sells tofu]. Tamari. Vdondôfu [Udon-dôfu]. Xôyu [Shoyu, or soy sauce]. Yudôfu. Address: Nagasaki College of Japan.

4686. Hayashi, Y.; Ariyama, H. 1960. Daizu oyobi sono kakôhin no eiyô-ka ni kansuru kenkyû [Studies on the nutritive value of the soybean and its products]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 13:297-99. [4 ref. Jap; eng]

4687. Japaridze, A. 1960. [Soya]. Tblisi, Georgia. 64 p. 20 cm. [Geo]

• ***Summary:*** Page 3 states: In Europe, the soybean was first cultivated in France in 1779; in the USA it was first cultivated in 1804.

Page 5 states that in 1882 many soybean varieties were introduced to Georgia from Japan. But the first soybeans were introduced to Georgia in the 1860s. Address: Georgia.

4688. Joya, Mock. 1960. Things Japanese. Tokyo: Tokyo News Service, Ltd. [vi] + 782 + xliv p. Index. 21 cm.

• ***Summary:*** In Chapter 7, titled "Food, 'Sake' and Tobacco" (p. 275-331) the following may be of interest: Asakusa-nori (includes shoyu), azuki (incl. soybeans, tofu, miso, shoyu, natto), bento and kashi, cattle, chameshi, chawan-mushi ("somewhat similar to Western custards." Make katsuobushi {shaved dried bonito} soup stock, cool, pour into individual *chawan-mushi* bowls {each has a cover}. Mix in an equal quantity of beaten eggs. Add additional flavoring ingredients, cover, and steam until set. "One of the few Japanese dishes that resemble Western dishes in taste").

Chazuke, cooking (incl. sukiyaki and tempura), daikon (incl. miso), drinking cups and customs, eel-eating day (eels are broiled, steamed, then put in a specially prepared shoyu and broiled again), ginnan (ginkgo nuts), gobo (burdock, incl. miso soup and shoyu), gohan (boiled rice), kabayaki (eel), kamaboko, kashi (confections and sugar), katsuo-bushi (incl. shoyu), kawara-senbei (incl. miso), konnyaku (its shredded form, called shirataki, is used in sukiyaki), manju, matsutake mushrooms (widely used in sukiyaki in the fall), menrui (noodles, incl. soba, udon, shoyu), mikan (mandarin oranges), misoshiru (miso soup, incl. tofu, shoyu, tekka-miso, tai-miso, yuzu-miso, wakame), mochi, mochi-tsuki (pounding), myoga (*Zingiber mioga*), oden (with tofu, miso, and shoyu), one-sided fish, red rice (*sekihan,* made with azuki = red beans), ringo (apples), sakana (fish, incl. shoyu and tofu), sake drinking, sake eating, sashimi (incl. shoyu and mirin), satsuma-imo, seaweeds (sea vegetables), shincha (new tea), shoyu (Japanese-style soy sauce; per capita consumption is nearly 4 gallons a year), snake eaters, soba (incl. shoyu), souvenir cakes, sugar, suimono (clear soup, incl. miso and shoyu), sukiyaki (incl. tofu and shoyu), sushi (incl. Inari-zushi made with fried tofu), sweets in season, tea varieties, tea water, tempura (incl. sesame oil and shoyu), tobacco tradition, tofu (incl. bittern/nigari, yaki-dofu, aburage, ganmodoki, Koya-dofu, fried tofu, hiyayakko, sukiyaki, dengaku, miso, miso-shiru, shoyu), tokoroten (kanten, tengusa), tsukemono (pickles, incl. miso), umeboshi, wasabi (incl. shoyu), yasai (vegetables), yokan, and yonaki-soba. Note: Different types of yokan (yôkan, a paste made of azuki beans and sugar) include: mizu-yokan (soft azuki-bean jelly) and mushi-yokan (steamed yokan). Yokan-iro is a liver or rusty color.

Other subjects related to soy: Home cures (p. 66-67, for burns, apply the white of an egg or shoyu). Setsubun (p. 119, incl. mame-maki or throwing roasted soybeans). Brother mountains (p. 192, the most loved one, Fudo-iwa, was fed azuki or red beans but the unloved Gongen-yama was fed soya beans). Fox messengers (p. 207-08, aburage or fried tofu). Kuyo (p. 373-74, incl. hari-kuyo or mass for broken needles–but tofu is not mentioned). Azuki (p. 276-77). Red rice (sekihan, p. 303). Lunar calendar (p. 400, setsubun and bean throwing). Bamboo (p. 410, incl. bamboo shoots served with shoyu). Hi-no-kami (p. 474, incl. amazake). Sacred rice (p. 504, incl. setsubun and throwing roasted soybeans). Shoulder-chipped Jizo (p. 517, concerns the stone statue of Jozo at the Kiunji Temple, Tozaki-machi, Bunkyo-ku, Tokyo, and foxes and a tofu shop). Inari-san (p. 616-17, Inari-sushi and aburage). Address: Japan.

4689. Joya, Mock. 1960. Sukiyaki (Document part). In: Mock Joya. 1960. Things Japanese. Tokyo: Tokyo News Service, Ltd. [vi] + 782 + xliv p. See p. 316-17.

• ***Summary:*** Sukiyaki is mentioned throughout this book, on pages 281 (Cooking, Japanese), p. 293-94 (Konnyaku, incl. shirataki), p. 295-96 (Matsutake, a mushroom used in sukiyaki in the fall), and p. 325-26 (Tofu, a typical ingredient in sukiyaki).

The main entry for sukiyaki (p. 316) states: "Sukiyaki is a modern addition to the Japanese menu, and although it is only about 80 years old, it has become one of the most popular dishes of the people. Furthermore, sukiyaki has now become famous all over the world. Sukiyaki and tempura are pointed out by foreign visitors as the two outstanding dishes of Japan.

"There are a few controversies over the origin of the name, and the most commonly accepted theory is that

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formerly it was cooked on blades of plows, and therefore this way of cooking was called sukiyaki or plows, roasting. However, there is no proof that this story is authentic.

"Sukiyaki is the cooking of sliced beef, pork, chicken or duck meats over thick iron pans. Beef is the most common meat used for sukiyaki, but chicken and pork are equally good.

"In making sukiyaki, the first requirement is the flat thick iron pan, as when the pan is thin, it is impossible to make good sukiyaki. In the Imperial duck hunting party, small individual thick iron pans are used in cooking the duck meat. This pan is oblong in shape and extremely thick, and its top is almost level with only a slight depression to hold the meat. This pan reminds one of the shape of the Japanese plow, and there might be some relation between sukiyaki and plow (*suki*) as generally believed.

"There are different ways of cooking sukiyaki. The method used in cooking duck meat at the Imperial hunting parties may be the original one. Slices of duck meat are put into a mixture of *shoyu* and *mirin* (sweet sake), and then put on the heavy iron pan placed over a charcoal fire, when the pan becomes hot. The meat is almost instantly cooked, and it is turned over swiftly and eaten. It is extremely delicious. This method is believed to be the original way of cooking sukiyaki. The same method can be used in cooking the ordinary sukiyaki at home in the common sukiyaki pan with beef or pork.

"Then, the next method is to melt the fat of meat or butter on the hot pan, and then cook the meat on the pan. The cooked slices of meat are eaten with *shoyu* or salt. This method is quite new, but yet it is liked by many persons. This method, however, enables the people to eat enormous quantities of meat, as the thin slices will just melt in their mouths.

"The third method is the most common one. In the sukiyaki pan is first put a specially prepared sauce made with *shoyu, mirin, kombu* or *katsuo-bushi.* Then sliced Japanese onions, *tofu, shirataki* (kneaded devil's tongue and root), other vegetables, and sliced beef are added to be cooked. When they are cooked, the people sitting around eat from the pan. In autumn, *matsutake* and other mushrooms are also cooked together with meats. Beef, pork, duck meat, and other kinds of meat are cooked in the same manner.

"The last-mentioned is the most popular way of cooking sukiyaki, but originally perhaps, slices of meat were merely cooked on heated iron pans.

"There is no other new dish that has become so popular throughout the country within such a short period. At present, sukiyaki is a national dish, and particularly preferred by foreigners to other dishes of the country." Address: Japan.

4690. Joya, Mock. 1960. Inari-san (Document part). In: Mock Joya. 1960. Things Japanese. Tokyo: Tokyo News Service, Ltd. [vi] + 782 + xliv p. See p. 616-17.

• ***Summary:*** "Japan is a land of shrines, which are not only extremely numerous, but also play a big role in the people's life. Inari shrines, are, however, the most popular and numerous." Throughout Japan, in rural villages and in big cities, you can find Inari shrines, noted for the bright vermilion color in which their *torii* (gates) and buildings are painted. Inari was originally the guardian shrine of farmers. "But city dwellers too are all worshipers of Inari. They entertain such respect for Inari that they never call it plainly Inari, but always say *O-inari-san,* with the double honorifics."

"A *kitsune* or fox sculpted in stone or wood is always placed in front of them."

"To Inari shrines the people still bring various foods as offerings. Particularly *aburage* or fried tofu is believed to be the most favorite food of foxes of Inari shrines... Because of the reputed fondness of foxes for *aburage,* a kind of sushi wrapped up in *aburage* is commonly called *O-Inarisan.*

Note: This is the earliest English-language document seen (April 2013) that contains the words *Inari-san* or *O-Inarisan* in connection with *Inari-zushi.* Address: Japan.

4691. Joya, Mock. 1960. Setsubun (Document part). In: Mock Joya. 1960. Things Japanese. Tokyo: Tokyo News Service, Ltd. [vi] + 782 + xliv p. See p. 119-20.

• ***Summary:*** *Fuku wa uchi, Oni wa soto* (In with good luck, out with the demon) is loudly heard in all households throughout the country in the evening of *setsubun* (change of season) which falls in the first part of February. In shouting those words, the heads of households scatter roasted [soy] beans, to drive out the demon and all evil fortune. Setsubun is a time-honored festivity that is popularly observed by the people for insuring good luck for the year,

"Setsubun, as its name indicates, marks the end of the winter season under the old [lunar] calendar, and the season of spring begins on the following day, which is called risshun (birth of spring). So ordinarily it has no relation with the calendar year, but due to the popular idea that a new year begins with spring, setsubun gradually came to possess the same significance to the people as New Year's Eve. It is from this conception that the occasion came to be observed for wishing a good and happy new year.

"With this observance of setsubun it may be said that the people of Japan have three New Year's Eves–one under the solar calendar, another under the lunar calendar, and setsubun. The New Year's Eve under the lunar calendar is not observed now, although in rural districts New Year is still widely observed according to the lunar calendar. The setsubun is more popular and more widely observed than the New Year's Eve under the solar calendar. It is also more picturesque and interesting with the *mame-maki* or [soy] bean-throwing custom.

"This *setsubun* is also called *mame-maki* (bean throwing), *oni-harai* (devil chasing) and *tsuina* (evil

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dispersing). It is said to have developed from the old custom held on New Year's Eve, in which men dressed as devils were chased out to bring in a happy New Year.

"The custom of *oniharai* is at least more than 1,000 years old, as it is mentioned in *Tosa Nikki.* At first it was a court function, and later adopted by the common people. In the old days, *daizu* or soya beans were put in a wooden cereal measure [*masu*] and offered to Toshitoku-jin, a deity who is believed to have taught the people rice cultivation. Then they loudly called out, *'Oniwa soto fukuwa uchi'* (out with the devils, in with good luck) as it is still done today.

"It was during the Tokugawa [1600-1867] regime that *setsubun* particularly developed into a very elaborate and picturesque custom. Since olden days each household has held quite a merry party on the occasion. Moreover big temples hold public *setsubun* festivities on a considerably extensive scale.

"To draw the public to such festivities, they select *toshi-otoko* (the year's man) for throwing roasted beans for expelling the demon and inviting good luck for all present. For this honored duty, generally persons of reputation or local popularity are selected. Noted actors, wrestlers and other such public figures are given the honor. It is thought that the appointment as *toshi-otoko* will insure the person's good fortune during the year. Of late, actresses and other women are sometimes selected for throwing beans at such temple affairs. Over the heads of the crowding people gathered at such temples, the *toshi-otoko* scatter roasted beans with the merry shout of *fuku-wa-uchi, oni-wa-soto.* It is considered lucky to catch those thrown beans.

"In all households, it is customary not only to throw beans at the demon, but also to eat them. Each person has to eat as many beans as his or her age totals, and then one more. The extra bean stands for the New Year. The eating of the beans insures their good health and brings good fortune.

"Then again, those beans, as many as one's age and one more, are wrapped up in paper, and placed at some crossroad at night. If other persons step on those beans, all evils that accompanied the person during the past year would be driven off, it is believed.

"On *setsubun* many rites are still observed to dispel evil spirits and prevent calamities. First, as the most common feature of the day, a dried sardine head and a small branch of *hiiragi* (holly tree) are placed at the house entrance. The evil smell of the dried fish head is believed to drive away devils, and the thorny leaves of the *hiiragi* will stop any evil insect from entering the house.

"In many districts, tree branches are burned in the yard, as the crackling noise of the fire will drive away snakes and insects. The important feature of throwing roasted beans to drive away evils and devils and inviting good luck is said to have originated in cities, and later followed in rural districts." Address: Japan.

4692. Kajitani, Toshihiko. 1960. With friends, sukiyaki. Berkeley, California: [s.n]. 25 leaves. 31 cm. *

4693. Kihara, Yoshijiro; Takeuchi, Etsuko. 1960. [Organic acids in food products. I. Estimation of organic acids in food products by column chromatography]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 13(4):253-57. (Chem. Abst. 59:12077). [3 ref. Jap]*

• ***Summary:*** The organic acids in the food products such as soy sauce, soybean paste (miso), natto, pickle, vinegar, tea, coffee, bread etc. were estimated by the silica gel column chromatography. The kinds of the raw materials and the processing methods gave remarkable effects on the distribution of organic acids in each food product.

Soy sauces which were suspected to contain the acid-hydrolysate of soybean showed the presence of levulinic acid.

The miso varieties, fermented for a longer time, contained valeric [pentanoic], butyric and propionic acid, while only acetic acid was detected in the other products as volatile acid. (From journal@rchive).

4694. Leach, Bernard. 1960. A potter in Japan, 1952-1954. London: Faber and Faber Ltd. 246 p. Portrait. Illust. Index. 22 cm.

• ***Summary:*** The author is as fine a writer as he is a potter and artist. June 15, 1953 (p. 98). Near the great extinct volcano of Daisen on the borders of Tottori Province, the author and friends climbed up the old rough stone-paved pilgrims' way to the Kongoin temple. "There we were served the best meal I have eaten in Japan, vegetarian priests' food, over which infinite pains had been taken... mountain potatoes, crisp fried bean curd and some soft curd mixed into a paste with crushed sesame seed."

July 1, 1953 (p. 105): "A great feed of Continental sausages and Chinese riceballs stuffed with mincemeat and 'Funiu.' The last is a strange and fascinating decoction of fermented bean curd something like a smoky Camembert in taste and texture."

August 19, 1953 (p. 132). In Nagano, Japan, the author and friends visited the very large and famous temple of Zenkoji. They noted "all the commercialized signs of Buddhist decadence, as far from Sakya Muni [Shakyamuni, the Buddha] as Rome from Christ... the vulgarized business of popular religion is equally sickening, East or West.

After that they made their way to a soba shop and the author ordered Soba Gaki which was not on the menu. "This was a kind of porridge no longer in fashion... We ate it first with shoyu sauce and then with sweet adzuki beans."

Oct. 22, 1953 (p. 166). In Toyama the author and his friends had "lunch at a Buddhist vegetarian restaurant [probably serving *shojin ryôri*] which made me wish once again that I could share the meal and its setting with artist and craftsman friends in the West. The manner of serving

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surpassed all, it was the service of the heart. There is a saying that the Chinese eat with their stomachs and the Japanese with their eyes. The sheer beauty of each tray or dish of food, the quiet discretion. This represents a peak of culture and its home is in Japan."

Facing the title page is a photo of Bernard Leach. Address: Japan.

4695. Meals for Millions Foundation. 1960. Friendship Food for a Hungry World: Distribution summary. Los Angeles, California. 29 p. Undated. 28 cm.

• ***Summary:*** "The world-wide travels of the '3 cent meal' of Multi-Purpose Food, September 1946 to June, 1960 [13 years and 9 months]: 62 million meals [distributed] including 3,429 relief shipments to 127 countries through 210 cooperating agencies."

This 29 page typewritten booklet contains a complete listing of all the shipments of MPF over 14 years, from September 1946 through June 1960. However no dates are given for shipments to individual countries.

Contents: What is the Meals for Millions Foundation? Multi-Purpose Food (MPF): What it is, what it does. Index of countries. Distribution totals (Sept. 1946–June 1960). Acknowledgment.

The index of countries lists the "Country," the "American Agencies or Denominations Cooperating and/or Served," the "Number of Lbs." and the "Distributing and Recipient Agencies." Under each country is the number of shipments and the number of pounds shipped.

In the Index, the countries are listed alphabetically by region and within each region alphabetically by country, as follows (however in the body of the booklet they are listed alphabetically by country name). Countries receiving more than 50,000 lbs. (25 tons) will be noted: Africa: Angola, Belgian Congo (52,657 lb), Camerouns [Cameroon], Egypt, Eritrea, French Equatorial Africa, Ghana, Kenya, Liberia, Libya, Mauritius Is., Morocco, Mozambique, Nigeria, Republique du Congo [Congo-Brazzaville], Rhodesia, Sierra Leone, South Africa, Tanganyika, Tunisia, Uganda.

Asia–Near East: Iran, Iraq, Israel, Jordan, Lebanon (56,910 lb), Oman, Persian Gulf, Turkey.

Asia–Far East: Afghanistan, Borneo, Burma, Cambodia, Ceylon, China (358,957 lb; 1946-1951), Goa, Hong Kong (238,760 lb), India (1,394,707 lb; 742 shipments. Note: Indian MPF became available in 1956, and shipments from the USA were discontinued; 558,072 lb of Indian MPF were made; 410 shipments), Indonesia, Japan (535,250 lb), Korea (1,254,225 lb; 489 shipments), Laos, Macao, Malaya, Nepal, Okinawa (20,616 lb), Pakistan (83,292 lb), Philippines (122,103 lb), Taiwan (46,089), Thailand, Vietnam.

Asia–Pacific Islands: American Samoa, Caroline Islands, Fiji Islands, Guadalcanal, Hawaii, Marshall Islands, New Hebrides.

Europe: Austria (82,159 lb), Belgium, Czechoslovakia, England, Finland, France (124,996 lb), Germany (206,185 lb), Greece, Hungary, Italy, Luxemburg [Luxembourg], Netherlands, Poland, Rumania, Spain, Switzerland, Trieste, Yugoslavia.

Europe–North Atlantic Islands: Cape Verde Islands, Madeira Island.

Latin and Central America: British Honduras, Canal Zone, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama.

South America: Bolivia, Brazil (198,581 lb), Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela.

Caribbean Area: Cuba, French West Indies, Haiti (110,231 lb), Jamaica, Puerto Rico, St. Lucia, Virgin Islands.

North America: Alaska and Aleutian Islands, Canada (51,836 lb), United States (146,635 lb; American Indian relief, Migrant relief, School lunch and institutional projects {Clifton's Golden Rule Cafeteria donated 12,500 lbs}, Miscellaneous).

Additional countries reached through overseas parcels only: Argentina, Cyprus, Denmark, Malta, New Zealand, Norway, Nyasaland, Pitcairn Island, Saudi Arabia, Scotland, Sudan, Sweden, Trinidad.

At the end of all the countries (p. 28) is a box titled "Total Relief Distribution": 3,249 shipments [or perhaps 3,429], 6,412,256 pounds [3,206 tons, or 229 tons a year average for 14 years], 51,298,048 "meals" of MPF. On the next page are the details of the "Distribution totals."

There is also a special acknowledgment at the back to the U.S. Navy and the U.S. Naval Air Reserves "for their cooperation in transporting approximately 200,000 lbs. of M.P.F. during 1959-1960. Operation Handclasp, a people-to-people project of the U.S. Navy, originating in San Diego, has carried shipments to the Far East and to South America. Planes of the U.S. Naval Air Reserves have carried emergency supplies of MPF to disaster areas, such as flood victims in Nagoya, Japan, and to earthquake victims in Agadir, Morocco."

Note: The countries receiving the most MPF by weight are (in descending order of amount) are: India, Korea, Japan, China, Germany, France, Philippines, and Haiti.

A photo shows the cover of the 29-page summary document. This photo and photocopy of the document were sent to Soyinfo Center by Chris Dodson of Freedom from Hunger Foundation, Davis, California (Nov. 2010). Address: Los Angeles, California.

4696. Nagata, Tadao. 1960. Morphological, physiological, and genetic aspects of the summer vs. autumn soybean habit, the plant habit, and the interrelation between them in soybeans: Further studies on the genecological differentiation of soybeans in Japan and the world. *Hyogo Noka Daigaku Kenkyu Hokoku, Nogaku-hen* (*Science Reports of the Hyogo University of Agriculture*) 4(2):71-95. [36 ref. Eng]

• ***Summary:*** Contents: Introduction. Effects of the daylength

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and the temperature on the flowering of the summer vs. autumn soybean types. Effects of the daylength on the flowering period and the seed forming period, with special regards to the relative flowering period and the relative growing period. Morphological and physiological attributes of the plant habit. Genetic associations among the summer vs. autumn soybean habit, the plant habit and the others. Summary and conclusion. Address: Lab. of Plant Breeding, Sasayama, Hyogo-ken, Japan.

4697. Nagata, Tadao. 1960. Agronomic studies on the genecological differentiation of soybeans in Japan and the world. *Hyogo Noka Daigaku Kenkyu Hokoku, Nogaku-hen* (*Science Reports of the Hyogo University of Agriculture*) 4(2):96-122. [22 ref. Eng]
• ***Summary:*** Contents: Introduction. I. Adaptation of the summer vs. autumn soybean types to the planting time in relation to the flowering and the fruiting: Flowering and fruiting of the summer vs. autumn soybean types planted in a spaced rate and at the times of successive intervals throughout the growing season, effect of the daylength after the flower primordia initiation on the flowering process of the autumn soybean type in an ecological aspect of the planting time.

II. Significance of the indeterminate growth habit in the cultivation and breeding of soybeans. (1) Agronomic characteristics of the soybeans having the said habit: Properties of American soybeans attributive to their indeterminate growth habit, a supposed reason for cultivating the indeterminate growing soybeans in the tropics, some genetic associations between the determinate vs. indeterminate growth habit and other agronomic characters.

III. Significance of the indeterminate growth habit in the cultivation and breeding of soybeans. (2) Regional adaptabilities of the principal varieties of the summer soybean type cultivated in different regions: Cooperative performances in Japan, cooperative performances in the United States of America. Summary and conclusion. Address: Lab. of Plant Breeding, Sasayama, Hyogo-ken.

4698. Nankashû Nihonjin Shichijûnen Shi Kankô Iin Kai. 1960. Nankashû Nihonjin shichijûnen shi [A seventy-year history of the Japanese in Southern California]. Los Angeles, California: Nanka Nikkeijin Shôgyô Kaigisho. [Jap]*

4699. Reischauer, Edwin O.; Fairbank, John K. 1960. East Asia: The great tradition. Boston, Massachusetts: Houghton Mifflin Co. xiii + 739 p. Illust. Index. 23 cm. First published 1958. [150+* ref]
• ***Summary:*** A masterful history of the subject, focusing on political history. Contents: 1. The setting of East Asian history. 2. Early China: The birth of a civilization. 3. Classic China: The golden age of Chinese thought. 4. The first Chinese empire: The Ch'in and Han dynasties. 5. The "barbarian" challenge and the regeneration of the empire. 6. The late T'ang and Sung: The golden age of Chinese culture. 7. China and the "barbarians": The Mongol empire. 8. State and society under the Ming. 9. Traditional China at its height under the Ch'ing (incl. Manchu Conquest, Tibet). 10. Traditional Korea: A variant of the Chinese cultural pattern. 11. Early Japan: The absorption of Chinese civilization. 12. Feudal Japan: A departure from the Chinese pattern. 13. Tokugawa Japan: A centralized feudal state. 14. East Asia on the eve of modernization.

Page 12 states that "many of the principal crops and animals of East Asia, notably rice, the soy bean, the chicken, the water buffalo and the pig, seem to have come from hot and humid Southeast Asia." Note: As of 1995 the soybean is thought to have originated in northeast China, not in Southeast Asia. Address: Harvard Univ.

4700. Shibasaki, K.; Hesseltine, C.W. 1960. Miso–I. Preparation of soybeans for fermentation. *Bacteriological Proceedings* 60:49-50.
• ***Summary:*** This is the earliest known of Dr. Hesseltine's many important scientific research articles on miso. Approximately 13 million bushels of soybeans are used each year to make miso in Japan, yet only two general accounts of miso have been published in the USA.

The key to the new process proved to be the soybeans; 28 different Oriental and U.S. soybeans were investigated by softening through soaking and cooking. Soybeans that are not uniformly soft fail to ferment properly. Address: NRRL, Peoria, Illinois.

4701. Shufu-no-tomo-sha. 1960. Miso: Seiyô, chûka-fu ryôri [Miso: Western and Chinese style recipes]. Tokyo: Zenkoku Miso Kogyo-kai. 52 p. 21 cm. [Jap]
• ***Summary:*** Contains many recipes plus black-and-white photos, plus 4 color photos.

4702. Tatsuno Shoyu Kyodo Kumiai. 1960. Tatsuno shôyu no ayumi [Progress / history of Tatsuno Shoyu]. Tatsuno city. 8 p. 11 x 18 cm. [Jap; eng+]
• ***Summary:*** Name of company with diacritics is: Tatsuno Shôyu Kyôdo Kumiai. It is written that in 1587 shoyu making started in Tatsuno. They made a little bit of sake and shoyu there and in 1590 the number of manufacturers increased. In 1595 among sake and shoyu makers, sake production became very strong and popular. Around 1666 one shoyu maker invented a unique light-color shoyu and began selling it. They received an unexpected positive response from the people who used it, so they were encouraged, improved the product, and established the base of today's Tatsuno Usukuchi Shoyu.

During the period 1714-1740, with the rising popularity of sake production, many new sake makers opened new shops. Some 100 shops made sake on a scale of 20 to 300

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koku (1 koku = 180 liters or 47.6 gallons) per year. But for some reason, later, sake gradually lost its popularity and the shoyu industry became more popular. The climate of this place was suited for making shoyu. They had the advantages of easy access to good quality wheat, soybeans, and salt. Also there was a river for transportation of their products to Kyoto and Osaka. These were the reasons that Tatsuno was started.

In 1672 Wakizaka Yasumasa-ko of Shinshu Iida became Lord of that place and grew interested in making shoyu. He thought it was a promising industry and encouraged it. It is told in 1741, that as a result of that, exports of shoyu to Kyoto and Osaka grew to over several thousand kegs (*taru*) per year.

In 1809 the idea of adding amazake to shoyu (*Tatsuno usukuchi shoyu*) was invented. The new product became popular among a wide range of people. At about this same time they invented the idea of using the liquid from cooking soybeans when they age (*shikomu*) shoyu.

In 1830 records show that there were 35 shoyu producers in Tatsuno; they made about 20,000 *koku* (1 koku = 47.6 gallons or 180 liters; so 952,000 gallons or 3,600,000 liters) a year. Of this they exported 49,400 *taru* (kegs) to the Kyoto and Osaka areas. Note: 1 taru = 3 *to* and 6 sho = 3.6 *to* = 17.1 gallons or 64.8 liters. So 49,400 kegs would be 844,740 gallons or 3,201,120 liters, i.e. they exported about 88.7% of their shoyu to Osaka and Kyoto.

In 1848 Lord Wakizaka became a very important position of the *Kyoto Shoshi Dai* and further encouraged shoyu production. He gave low-interest loans, helped expand the market, and gave the name *oshiire-dokoro* to shoyu manufacturers. Therefore the name of Tatsuno usukuchi shoyu became more widely known.

During 1869-70 the number of companies making Tatsuno shoyu grew very rapidly, and with the intensive competition, the quality of the product fell drastically as output increased. Many companies went bankrupt. In June 1871 (Meiji 4) the Tatsuno Han Seisankyoku (Tatsuno feudal domain production office) was established to try to sell Tatsuno shoyu nationwide and treat sale of this shoyu as the work of the Han. But the next year the Han system was changed, largely ended–unfortunately for Tatsuno. At this difficult time, one shoyu maker named Shôzo Yokoyama (he was the first head of the Tatsuno shoyu union) became worried about the future of their industry, and met with other local shoyu makers to discuss this problem. In May 1897 (Meiji 9) they established regulations and worked hard to improve their business. As a result they laid the groundwork for today's Tatsuno usukuchi shoyu, which has become the most famous type of usukuchi shoyu. By 1882-83 the Tatsuno Shoyu Association had 65 members who produced over 200,000 koku/year (9,520,000 gallons or 36 million liters/year). Tatsuno proudly became one of Japan's top 3 shoyu manufacturing places.

All went well until 1937, when a war unexpectedly broke out between Japan and China. Things got worse during World War II, and from 1945 the lack of raw materials and workers caused major declines in both quality and quantity. Production dropped to 50,000 koku/year of regular shoyu; a decade of government economic controls (from late 1941 until March 1950) prohibited the production of usukuchi shoyu.

In Dec. 1949 the Tatsuno Shoyu Association was re-established with about 40 members, and in July 1950 the regulations concerning production and distribution of miso and shoyu were cancelled. The members had a lot of ideas and energy to rebuild their industry making Tatsuno usukuchi (light-colored) shoyu. Production and quality increased steadily, soon reaching 250,000 koku/year. In April 1952 the trade Association established the Tatsuno Shoyu Technical Training Center, where people can learn how to make better shoyu. In 1953 they cooperatively built a place to burn amino acid presscake. They found a way to reuse the salt with good results, so the government supported the project with one million yen.

Since there are few documents available to study the history of Tatsuno shoyu, in 1959 the members worked to collect this information and published it in October 1959. Since then, more interesting materials have been found, and the union is planning to publish a second volume. Address: Tatsuno city, Japan.

4703. Umeda, Isao; Ebine, H.; et al. 1960. Hakkô shokuhin [Fermented foods]. Tokyo: Kyoritsu Shuppan Co., Ltd. Microbiological Industry Series. [Jap]*

4704. Yamashita, Akinori; Ogata, T.; Fukuda, T. 1960. Enden kansui-chû no yûki busshitsu. I. Enden kara no yûki busshitsu no konnyû [Organic materials in salt water in salt fields. I. Intermixing of organic materials from a salt field]. *Hofu Seien Shikenjo Hokoku* (*Scientific Papers of the Hofu Salt Experiment Station*) No. 13. p. 39-. [Jap]
• ***Summary:*** Discusses the composition of salt water, including nigari. This journal is published by the Japan Monopoly Corporation (Nihon Senbai Kôsha). Address: Hofu, Yamaguchi prefecture, Japan.

4705. Yokotsuka, Tamotsu. 1960. Aroma and flavor of Japanese soy sauce. *Advances in Food Research* 10:75-134. [236 ref]
• ***Summary:*** The best review of the literature on soy sauce up to this time, this is Dr. Yokotsuka's first major publication in English. He was born on 25 March 1917. Contents: Introduction. Composition: Analysis, nitrogen containing compounds, carbohydrates, sugar, alcohols, and extractive, acids, salts, and related compounds, color. Chemical components of flavor: Fraction I, fraction II (b.p. < 78º), fraction III (b.p. > 78º), fraction IV (the acetal fraction),

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fraction VI. Sources of aroma and flavor development: Raw materials, processing, koji, mash (moromi), pasteurization. Flavor ingredients as natural preservatives: Natural yeast-static and bactericidal compounds, artificial preservatives for soy sauce. Summary: Acknowledgements, references. Address: Noda Inst. for Scientific Research, and Research Inst. of Noda Soy Sauce Co., Ltd., Noda-shi, Chiba-ken, Japan.

4706. Tada, Tatsuji. 1960? Japanese recipes. Revised ed. New York, NY: Japan Society. 20 p. Undated. 22 cm. *

4707. Smith, Allan K.; Hesseltine, C.W.; Shibasaki, K. Assignors to the USA as represented by the Secretary of Agriculture. 1961. Preparation of miso. *U.S. Patent* 2,967,108. Jan. 3. 3 p. Application filed 24 July 1959. [1 ref]
• ***Summary:*** "A non-exclusive, irrevocable, royalty-free license in the invention herein described, for all governmental purposes, throughout the world, with the power to grant sublicenses for such purposes, is hereby granted to the Government of the United States of America."

The main innovations in this patent are: (1) the use of dehulled soybean grits (from the soybean variety Hawkeye) instead of whole soybeans. (2) The optional addition of pure-culture *Saccharomyces rouxii* (NRRL Y-2547 and Y-2548). Address: NRRL, Peoria, Illinois.

4708. Hayashi, Shizuka. 1961. A visit to two Choshi shoyu plants. *Soybean Digest.* Jan. p. 18.
• ***Summary:*** Each year Japan produces about 1,200,000 metric tons (tonnes) of shoyu (soy sauce), using approximately 150,000 tonnes of soybean meal and 23,900 tonnes of whole soybeans, or the equivalent of 195,000 tonnes of whole soybeans.

Before World War II, shoyu manufacturers in Japan used only whole soybeans, and no soybean meal. The use of meal has been encouraged by the Japanese government under the allocation system. Japan's shoyu industry is the largest consumer of soybean meal for edible purposes, taking about 35% of the meal produced by the processing mills.

There are seven large manufacturers among some 5,000 shoyu makers in Japan. The shoyu production of these larger factories constitutes about 30% of Japan's total shoyu production. The author recently visited the two largest plants in Choshi City: "the Yamasa Shoyu Co., and the Choshi Shoyu Factory." The Choshi factory is the only shoyu company in Japan with oil processing equipment. This equipment is used to crush approximately 15,000 tons of soybeans annually. The meal is used exclusively for making shoyu but is insufficient to take care of the company's needs.

"According to the report of the six-member Japanese shoyu team that recently visited the United States the amino acid soy sauce made in the United States is altogether different from the shoyu produced in Japan."

"With a little promotion it will not take long before a bottle of naturally brewed shoyu will be found on the table of every family on the globe."

A photo shows David Harlow of the American Soybean Assoc. in the factory of the Yamasa Shoyu Co. with the two Hamaguchi brothers who own the plant. Y. Hamaguchi was a member of the Japanese shoyu team that recently visited the USA. Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Bldg, No. 1-Chome, Yurakucho, Chiyoda-ku, Tokyo, Japan.

4709. Kihara, Yoshijiro; Matoba, Nariko; Nanba, Rimiko. 1961. Nattô no seibun ni tsuite. I. Nattô no tô oyobi nenshitsu-butsu ni tsuite [Chemical constituents of natto. I. Sugars and mucilage in natto]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 35(1):57-61. Jan. [7 ref. Jap]
Address: Lab. of Food Chemistry, Faculty of Home Economics, Ochanomizu Univ., Tokyo, Japan (Ochanomizu Joshi-Daigaku, Shokuhin Kagaku Kenkyûshitsu).

4710. Nagata, Tadao. 1961. Studies on the differentiation of soybeans in the world, with special regard to that in the Southeast Asia. III. Some photoperiodic aspects of the nature of the tropical soybeans. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 29(2):267-72. Jan. [14 ref. Eng; jap]
• ***Summary:*** In the tropics, soybeans are a crop of minor economic importance. Concerning growth habit: Indeterminate soybean plants are generally taller than determinate soybean plants. Soybean plants from temperate zones grow low in height when planted in the tropics and the yield is usually lower. Address: Hyogo Agricultural College, Japan.

4711. Okuda, Y.; Sakka, A.; Tominaga, S. 1961. Daizu tanpaku no shôka kyûshuritsu (Nihon shoku no kenkyû No. 38) [Digestibility and absorption coefficient of soybean protein (Studies on Japanese foods, Report 38)]. *Fukuoka Igaku Zasshi* (*Fukuoka Acta Medica*) 52(1):52-54. (Chem. Abst. 61:8683d). Jan. [12 ref. Jap]
• ***Summary:*** The digestibility and absorption of soybean protein was studied on albino rats with the following results for the absorption coefficient of protein: Boiled soybean 96.46 plus or minus 0.94%. Soybean flour 96.61 plus or minus 2.24%. Isolated soybean protein 97.31 plus or minus 1.97%. Address: Laboratory of Protein Chemistry, Yamaguchi Medical School. Students at Yamaguchi Kenritsu Ika Daigaku, Tanpaku Kagaku Kenkyusho.

4712. Chikubu, Shinjiro; Yanai, Shoji; Tani, Tatsuo. 1961. [Studies on thiamine of cereals and beans by the photographic method. VII. The distribution of thiamine in the seed of soybean (Abstract)]. *Shokuryo Kenkyujo Kenkyu*

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Hokoku (*Report of the Food Research Institute*) No. 15. p. 173. Feb. [1 ref. Jap]
• ***Summary:*** Reprinted from *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 34(9):786+ (1960). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4713. Ebine, Hideo. 1961. [Determination of crude fat in miso (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 15. p. 154. Feb. [1 ref. Jap]
• ***Summary:*** Reprinted from *Miso Gijutsu* (*Miso Technology*). No. 51. p. 1 (1958). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4714. Ebine, Hideo; Kakeya, Masae; Koiso, Kenji; Ito, Hiroshi. 1961. [Sedimentation rate of miso soup (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 15. p. 155. Feb. [1 ref. Jap]
• ***Summary:*** Reprinted from *Miso Gijutsu* (*Miso Technology*). No. 57. p. 1 (1958). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4715. Ebine, Hideo; Sugiura, Nobuko. 1961. [White granule in miso (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 15. p. 156. Feb. [1 ref. Jap]
• ***Summary:*** Reprinted from *Miso Gijutsu* (*Miso Technology*). No. 62. p. 1 (1959). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4716. Ebine, Hideo; Oguri, Yuichi. 1961. [Trial of manufacturing dehydrated miso by vacuum drying (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 15. p. 157. Feb. [1 ref. Jap]
• ***Summary:*** Reprinted from *Miso Gijutsu* (*Miso Technology*). No. 64. p. 1 (1959). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4717. Ebine, Hideo. 1961. [White scale-like substance in miso packed in plastic bags (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 15. p. 158. Feb. [1 ref. Jap]
• ***Summary:*** Reprinted from *Miso Gijutsu* (*Miso Technology*). No. 64. p. 4 (1959). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4718. *Field Crop Abstracts.* 1961. Current agricultural research in Africa on annual field crops and grasslands. 14(1):1-7. Feb.
• ***Summary:*** According to replies to a questionnaire sent by *Field Crop Abstracts* to agricultural research institutes and experiment stations in Africa, soyabeans are being tested in Angola (Chianga Plant Improvement Station, Humpata Agricultural Centre, Malange Agricultural Centre, Mariano Machado Central Station of Animal Husbandry), Gambia (Gambia Rice Farm), Ghana (Babile Agricultural Station), and Kenya (Eldoret Agricultural Experiment Station, Kakamega Experimental Station, Mmea Irrigation Research Station). Japanese kudzu and native kudzu is being tested in Liberia at the Central Agricultural Experiment Station (Suakoko).

Includes a valuable list of all major agricultural experiment stations in these African countries.

4719. Fukamachi, Chiharu; Nakayama, Osamu; Suruga, Sachiko; Abe, Kazuyoshi; Watanabe, Tokuji. 1961. [Studies on the manufacture of tofu. Supplement]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 15. p. 120-29. Feb. [7 ref. Jap]
• ***Summary:*** Contents: 1. Tests on the suitability of various soybean varieties. 2. How to judge suitability as the raw material of silk-strained [kinugoshi] tofu and bagged tofu. 3. Utilization of phosphate for production of bagged tofu. 4. Utilization of phosphate for production of silk-strained tofu.

Table 1 shows properties and results of soybean tested. Japanese varieties: Shirosaya #1, Seikai #3, Kogane Daizu, Shirosaya #1, Satsuiku #3, Tokachi Nagaba, Toiku #95 and #96, Tokachi Kotsubu #2. American soybean varieties: Jackson, Hawkeye, Harosoy, Lee. Note: The top four varieties were all Japanese.

Note: The English-language translation of this article was done in Japan in 1961 as part of a cooperative research project with the USA. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4720. Ito, Hiroshi; Ota, Teruo; Matsuura, Shinji; Ebine, Hideo; Hieda, Harukiyo; Nakano, Masahiro. 1961. [Soy sauce fermentation / brewing trial with special tane-koji (koji-starter) containing lactic acid bacteria and yeast in lyophile form. I. Change of microflora and enzymatic activity of koji during preparation]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 15. p. 135-39. Feb. [9 ref. Jap]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4721. Ito, Hiroshi; Ebine, Hideo; Ota, Teruo; Manabe, Masaru; Nakano, Masahiro. 1961. [Soy sauce fermentation / brewing trial with special tane-koji (koji-starter) containing lactic acid bacteria and yeast in lyophile form. I. Change of microflora and enzymatic activity of shoyu mash [moromi] during ripening / aging]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 15. p. 140-45. Feb. [6 ref. Jap]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

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4722. Kamada, Hidemoto; Sakurai, Yoshito. 1961. Daizu seihin no chakushoku ni kansuru kenkyû. V. [Browning reaction of soybean products. V. Relationship between color and 2,6-dichlorophenol indophenol reducing substances in miso and shoyu (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 15. p. 162. Feb. [1 ref. Jap]
• ***Summary:*** Reprinted from *Nosan Kako Gijutsu Kenkyu Kaishi* (*J. for the Utilization of Agricultural Products*) 7(3):105+ (1960). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4723. Kamada, Hidemoto; Sakurai, Yoshito. 1961. Daizu seihin no chakushoku ni kansuru kenkyû. VI. [Browning reaction of soybean products. VI. Hydrolysis of soybean water-insoluble carbohydrate by Taka-diastase (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 15. p. 163. Feb. [1 ref. Jap]
• ***Summary:*** Reprinted from *Nosan Kako Gijutsu Kenkyu Kaishi* (*J. for the Utilization of Agricultural Products*) 7(3):111+ (1960). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4724. Kamada, Hidemoto; Sakurai, Yoshito. 1961. Daizu seihin no chakushoku ni kansuru kenkyû. VII. [Browning reaction of soybean products. VII. Effects of aluminum on the color formation of miso (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 15. p. 164. Feb. [1 ref. Jap]
• ***Summary:*** Reprinted from *Nosan Kako Gijutsu Kenkyu Kaishi* (*J. for the Utilization of Agricultural Products*) 7(3):114+ (1960). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4725. Kamada, Hidemoto; Sakurai, Yoshito. 1961. Daizu seihin no chakushoku ni kansuru kenkyû. VIII. [Browning reaction of soybean products. VIII. Discoloration of shiro-shoyu in storage (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 15. p. 165. Feb. [1 ref. Jap]
• ***Summary:*** Reprinted from *Nosan Kako Gijutsu Kenkyu Kaishi* (*J. for the Utilization of Agricultural Products*) 7(3):118+ (1960). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4726. Onishi, Hiroshi; Saito, N.; Koshiyama, I. 1961. Studies on osmophilic yeasts. XI. Various factors affecting polyalcohol production by *Pichia miso*. *Agricultural and Biological Chemistry* 25(2):124-30. Feb. [13 ref. Eng]
• ***Summary:*** *Pichia miso* is a highly osmophilic yeast (one that thrives in high osmotic pressure); it is not a type of miso, although it was isolated from miso (soybean paste). A polyalcohol (also known as a polyol, sugar alcohol, or polyhydric alcohol) is a hydrogenated form of carbohydrate, whose carbonyl group (aldehyde or ketone, reducing sugar) has been reduced to a primary or secondary hydroxyl group (hence the alcohol). Address: Noda Inst. for Scientific Research, Noda City, Chiba-ken, Japan.

4727. *SoyaScan Notes.* 1961. Official figures for per capita annual consumption of shoyu in Japan (1952-1961) (Overview). Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1952–12.9 kg/year = 35.3 gm/day = 5.934 sho/year.
1953–13.1 kg/year = 35.8 gm/day = 6.026 sho/year.
1954–14.1 kg/year = 38.5 gm/day = 6.486 sho/year.
1955–14.3 kg/year = 39.1 gm/day = 6.578 sho/year.
1956–14.6 kg/year = 39.9 gm/day = 6.716 sho/year.
1957–13.7 kg/year = 37.5 gm/day = 6.302 sho/year.
1958–13.4 kg/year = 36.8 gm/day = 6.164 sho/year.
1959–13.7 kg/year = 37.4 gm/day = 6.302 sho/year.
1960–13.6 kg/year = 37.3 gm/day = 6.256 sho/year.
1961–13.0 kg/year = 35.6 gm/day = 5.980 sho/year.
Note: The peak year during this early postwar period was 1956. A *sho* is the traditional unit for measuring capacity / volume. 1 *sho* = 1.800 liters = 1.903 quarts = 0.476 gallons.

4728. Teramachi, Yayoi; Nakayama, Osamu; Abe, Kazuyoshi; Watanabe, Tokuji. 1961. [Studies on the manufacture of tofu. II. Research on the standardization of the process for making aburage (deep-fried tofu pouches)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 15. p. 130-34. Feb. [7 ref. Jap] Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4729. "The New York Times;" "The Times of India" New Service. 1961. "An exciting city closer to New York in zest": Life in Japan's capital. *Times of India* (*The*) (*Bombay*). March 13. p. 6.
• ***Summary:*** The latest thing in Tokyo is the "instant boom"–which includes "instant five-vegetable Chinese dishes, instant noodles and instant wonton soup, a novel on 'instant love' and instant bean curd."

4730. Takeuchi, Kintaro. 1961. [Insolubilized carrier for soluble vitamins]. *Japanese Patent* 2142. March 28. Application filed 17 July 1958. (Chem. Abst. 56:11726b). [Jap]*
• ***Summary:*** Fat-free crude soybean flour is used as a carrier for vitamin B-1.

4731. Andreas, Dwayne O. 1961. More jobs, more earnings, better buys and more revenue. *Chemurgic Digest.* Feb/March. p. 12.
• ***Summary:*** "Soybeans have become known as the 'miracle' crop of American agriculture. The record seems to support

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the title.

In the past 20 years the U.S. soybean crop has grown from 77 million bushels to over 500 million bushels today, and the farm value has increased from less than $70 million to around $1 billion today.

But anyone "who looks for a 'miracle' to explain the fantastic story of the soybean industry is in for a disappointment. Rather behind the success story in the 'work' story..."

For example, at USDA's Northern Regional Laboratory in Peoria, Illinois, "a new process has been developed for preparing two of Japan's most important foods–miso and tofu. Both use soybeans."

Congressmen "ought to support substantial increases in spending for utilization research." Address: President, Chemurgic Council.

4732. Saito, Masataka. 1961. Studies on the influence of low-temperature on soybean plants. I. Effects of day or night temperature on the growth and ripening of plants. *Hokkaido Nogyo Shikenjo Iho* (*Hokkaido National Agricultural Experiment Station, Research Bulletin*) No. 76. p. 9-14. March. [15 ref. Jap; eng]

• ***Summary:*** Two late and one early soybean varieties were used, grown in soil by pot culture. Two temperature treatments were made, viz. at day time (8:00 a.m. to 5:00 p.m.) and at night time (5:00 p.m. to 8:00 a.m.) respectively.

"High temperature treatment was administered in the green house and low temperature treatment was done under natural air conditions. No photoperiodical treatment was conducted.

"The results of this experiment were as follows: (1) The growth of soybean plants differed with varieties used in this experiment. Namely, in the early variety the growth was more accelerated by high day-temperature than by high night-temperature.

"But in the late varieties, plant growth was hastened by high night-temperature.

"The plants grown under these conditions seemed to show a poor growth, specifically, development of branches, number of flowers and total plant weight decreased.

"It seemed that the difference between early and late varieties were due to physiological mechanism of response to temperature.

"(2) High night-temperature increased mean ovule number of pods in 3-4 seeded pod varieties.

"(3) The oil content of seeds seemed to increase under high day-temperature. On the other hand protein content of seeds increased under high night-temperature conditions."

4733. Smith, Allan K.; Nash, A.; Wilson, L.I. 1961. Water absorption of soybeans. *J. of the American Oil Chemists' Society* 38(3):120-23. March. [7 ref]

• ***Summary:*** This study compares the rate of water absorption of U.S. and Japanese soybeans at 10º and 25ºC and at initial moisture levels ranging from 7.5 to 14%. The rate that soybeans absorb water is controlled by their seed coat; a pinhole or a crack in this coat greatly increases the absorption rate. A low initial moisture and the presence of hard beans reduces the rate of water absorption. U.S. soybeans usually have lower moisture and contain more hard beans than do Japanese soybeans.

Hard beans are defined as those that do not absorb enough water in 16 hours to soften normally when cooked in steam. They also observed that small beans are smaller and drier than soybeans that absorb water normally. The development of hardness is partly the result of hot dry weather during ripening. Address: NRRL, Peoria, Illinois.

4734. Hayashi, Shizuka. 1961. Favor U.S. soybeans for shoyu. *Soybean Digest.* April. p. 22.

• ***Summary:*** Gives the results of laboratory tests, conducted by the Soy Sauce Research Institute, comparing Japanese-grown soybeans (No. 2 grade Hokkaido Takachi small size variety) with U.S. soybeans (Illinois No. 2 yellow). The U.S. soybeans scored higher in the amount of soy sauce produced, and the taste and nitrogen content of that soy sauce.

An analysis of a sample of U.S. soybeans shows: Perfect beans 85.88%. Broken beans 11.81%. Damaged beans 0.84%. Foreign material 0.69%. Soybean hulls 0.61%. Morning glory seeds 0.15%.

The lab tests must be confirmed by large-scale experiments on a commercial basis before final conclusions can be made. Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building, No. 1, 1-Chome Yurakucho, Chiyoda-Ku, Tokyo, Japan.

4735. Kawakishi, Shunro; Hirano, Susumu; Yoshii, Hisao. 1961. Mamemiso, tamari jôzô ni okeru yûki-san. I. Miso-dama kôji-chû no yûki-san [Organic acids formed in the process of brewing soybean miso and tamari. I. Organic acids of soybean koji (miso-dama)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 35(4):347-50. April. [11 ref. Jap]
Address: Aichi-ken Shokuhin Kogyo Shikenjo.

4736. Moore, Raymond S. 1961. China Doctor: The life story of Harry Willis Miller. New York, NY: Harper & Brothers. xiv + 215 p. Illust. (8 pages of photos). Index. 21 cm. 2nd edition, 1969. Pacific Press, Mountain View, California.

• ***Summary:*** A key but sometimes inaccurate source of biographical information about this truly Great Man. Contains many excellent photos of Dr. Miller, including an especially good portrait facing page 80.

Contents: Foreword by Hollington K. Tong. Preface. Map: The Far East. The opium cure. Hallway to service. The medical buff. Young surgeon at work. Slow boat to China.

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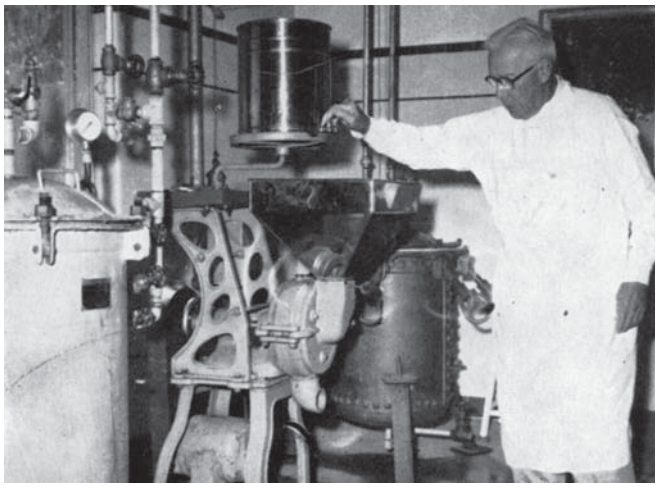

From mufti to mao tze and queue. The penniless VIP. Strange horizons. Pigtail honeymoon. Wife hunt. Picture section. Some close calls. A key decision. Operating on the Siamese elephant. Conquering new fields. Return to the Orient. No recipes in China. High finance. Facing the medical boards. A doctor's choice. Travel by presumption. To bow or not to bow. Kidnapping the generalissimo. "Mayor" Miller. An ounce of prevention. Shanghai again. China's greatest honor. Benghazi brink.

The rear cover of the book describes it as follows: "What happens when a man gives himself and his talents to the service of God? Here are a few of the things that Dr. Harry Willis Miller has done and is still doing! At 23 gave up a promising medical career and quarter-million dollar inheritance in America. Went to China as a medical missionary and lived among the poor and sick. Immediately began building the first of 15 hospitals throughout China. With inventive genius performed daring operations and made new discoveries in preventive medicine. Was responsible for many cures of the dread opium 'sickness,' including the cure of the famed 'Young Marshal' Chang. Became perhaps the most widely practiced surgeon in the world. Invented and developed soybean milk, which is responsible today for saving thousands of lives in undernourished areas of the world. Had many dramatic encounters with bandits, wars, famines. Was so well-known and respected that during World War II the Japanese invaders permitted Dr. Miller to give sanctuary to Chinese soldiers in the hospital compound. Returned to the U.S. for a time. Was consulting physician to 3 U.S. presidents and personal physician to national figures, senators, ambassadors, etc. Was awarded the coveted Blue Star of China by Generalissimo Chiang Kai-shek. At 81 is still healing and caring for the people of the Far East."

An ad for the book in *Soybean Digest* (Nov. 1935, p. 35) begins: "The incredible biography of the 'Schweitzer' of the Orient."

Pages 180-89 describe Dr. Miller's work with soy milk, Soyalac and Soyagen, and other soy foods. In the Shanghai Sanitarium kitchen he learned how to improve the flavor and digestibility of soy milk by running steam directly into the milk. From the Philippine Refining Co., which transformed bad-smelling copra into good-smelling coconut oil, he learned that steam distillation was the key to the transformation. From a Filipino company that refined stale and rancid butter into a product that tasted as fresh as new, he learned the secret of flash pasteurization–which effectively killed bacteria. Back in China, Dr. Miller, with his older son, Harry Willis Miller, Jr., worked to apply these new discoveries to soy milk. They worked! He expanded his experiments with infants and children, and in 1936 his results were published in the *Chinese Medical Journal.*

Photos (p. 81-89, unnumbered) show: (1) An excellent full-page portrait of Dr. Miller at age 81. (2) Harry and Maude Miller in China, wearing the Chinese dress they adopted after their arrival in 1903. Maude's tragic death two years later–caused by sprue, a vitamin deficiency disease–gave added personal meaning to Dr. Miller's nutritional research. (3) A group portrait showing a meeting of Adventist Missionaries at Shanghai, China, in 1907.

(4) Harry and Marie Iverson Miller at the time of their marriage in 1908. A trained nurse, she served with him through 42 years of missionary activity, and helped rear their 4 children. (5) Shanghai Sanitarium, opened 1 Jan. 1928, the first of 15 hospitals to be established in China under the leadership of Dr. Miller, who also founded numerous smaller clinics. (6) Members of the Shanghai Sanitarium staff in the mid-1930s, standing in front of a one-engine plane, as they see him off for a visit to outlying places.

(7) Dr. Miller and Marshall Chang Hsüeh-liang at Hankow airport in 1935, two years after Dr. Miller had cured the young Marshall's opium addiction. (8) Dr. Miller carried out more than 18,000 operations. Here he performs a thyroidectomy at one of his frequent visits to hospitals in Manila, Philippines. (9) Wuhan Sanitarium and Hospital at Wuchang, one of the medical units established through the generosity of the Young Marshal. Twenty thousand refugees moved into the Sanitarium compound when Hankow capitulated to the Japanese in 1938.

(10) The ruins of the Wuchang city dispensary, destroyed by Japanese bombs in 1938. (11) Dr. Miller examines a soybean plant grown on his farm at Mt. Vernon, Ohio. (12) Dr. Miller demonstrates his small-scale soymilk processing machine, which can be operated by one person. "The goal of Japan's Ministry of Health is to install one of these in each of the thirty thousand village tofu (soy cheese) factories in Japan."

(13) A baby and nurse with a large can of Soyalac in Japan. (14) A soymilk booth in Hong Kong, where more soymilk is sold than any kind of soft drink. The bottles in wooden cases are stacked four high. (15) A baby, little Mohammed Ali, a Bedouin child suffering from malnutrition bordering on starvation, at the Benghazi, Libya, hospital. In

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1956 Dr. Miller nursed him back to health. He soon grew strong and healthy and began to take a lively interest in the world around him.

(16) "Generalissimo Chiang Kai-shek greets Mrs. Mary Greer Miller while Madame Chiang congratulates Dr. Miller following the ceremonies held March 26, 1956, in which Miller received the Blue Star of China, that country's highest award, similar to the Congressional Medal of Honor in the United States." Address: Vice President, College of Medical Evangelists, Loma Linda, California.

4737. Park, Roy H. 1961. Food–Key to a travel kingdom. *Rotarian* (*The*) 97:31-33. April. *
• ***Summary:*** In Japan, teriyaki sauce contains soy sauce as the marinade's major ingredient. Sashimi, raw fillet of fish (such as tuna, sea bass), is dipped in hot mustard and soy sauce. The ingredients in the *bento* (Japanese box lunch) are also seasoned with soy sauce and sugar.

A photo shows people seated around a low table at a *ryokan* (traditional inn) in Japan as a "maid prepares tempting sukiyaki" right in their room. Address: Editor-in-Chief, Duncan Hines Inst., Inc. Rotarian, Ithaca, New York.

4738. Yoshii, Hisao; Kawakishi, Shunro; Hirano, Susumu. 1961. Mamemiso, tamari jôzô ni okeru yûki-san. II. Mamemiso jôzô-chû no yûki-san no ugoki [Organic acids formed in the process of brewing soybean miso and tamari. II. Changes in amounts of organic acids during miso brewing]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 35(4):351-54. April. [5 ref. Jap] Address: Aichi-ken Shokuhin Kogyo Shikenjo (Aichi Inst. of Food Technology).

4739. Onishi, Hiroshi. 1961. Studies on osmophilic yeasts. XII. Characteristic aspects on the assimilation and fermentation of sugars by osmophilic yeasts in the environment of a high concentration of sodium chloride. *Agricultural and Biological Chemistry* 25(5):341-49. May. [14 ref. Eng]
• ***Summary:*** "Sugar assimilability and fermentability are the most important criteria in the taxonomy of yeasts." The researchers found that "these properties of the salt-tolerant [halophilic] yeasts can be drastically altered by changing the concentration of NaCl [common salt] in the medium,..."

Assimilation of galactose and maltose by *Saccharomyces rouxii,* a typical salt tolerant yeast that plays an "important role in soy-brewing" [soy sauce fermentation], was negligible or extremely poor in a medium containing 18% NaCl, even though the assimilation was vigorous in the ordinary (NaCl-free) medium. Address: Noda Inst. for Scientific Research, Noda City, Chiba-ken, Japan.

4740. Report on the progress of studies on "the manufacture of tofu from U.S. soybeans." 1961. Food Research Institute, Japan. 3 p. May 17. Typed, without signature (carbon copy). [2 ref]
• ***Summary:*** Stamped at the top right corner: "Japanese American Soybean Institute." Typed on the line below that: "R-568. June 7, 1961. Under Contract (1960–4)." Contents: 1. Choice of U.S. soybean varieties which are suited for production of tofu (Hawkeye and Lee are suitable; Harosoy and Jackson are not). 2. Effects of the changes supposed to take place during transit and storage of soybeans on their quality as a raw material for tofu (considerable variation in the pH of the milk was noticed, depending on the soybean variety and whey the beans were old crop or new crop). 3. Suitability of high-protein, high-fat soybeans as a raw material for tofu (study is ongoing). 4. Improvement of tofu production method for U.S. soybeans (a special coagulant was used; dehulled beans gave whiter tofu). 5. Popularization of the method for making Soft Tofu. Address: Japan.

4741. Strayer, George M. 1961. Editor's desk: Japan will grow more livestock. *Soybean Digest.* May. p. 4. Written in Tokyo, Japan, April 24.
• ***Summary:*** "Written in Tokyo, Japan, April 24." Address: Tokyo, Japan.

4742. Hardin, Lowell S.; Hesser, Leon F. 1961. Soybean market development activities in Japan. *Soybean Digest.* June. p. 28, 30.
• ***Summary:*** Contents: Introduction. Program started in 1956. Favorable forces. U.S. producers in favorable position. Program is effective. Government policy important.

Note: "This is abstracted from a more complete evaluation of market development activities in Japan, a joint Purdue University-FAS study to be published in June as Purdue Experiment Station Bulletin 719. This was based on studies made in Japan in the summer of 1960 and reflects conditions which existed then."

On page 30 is this sidebar:

"Several developments have taken place which alter the outlook in Japan since Drs. Hardin and Hesser made their study there last summer. Among them are the impending end of automatic allocation in Japan, the higher U.S. market and support prices for soybeans, and the resumption of trading between China and Japan.–Editor."

Tables show: (1) Domestic production and imports of soybeans and soybean meal, Japan, 1934-36 average and 1953-59. In 1934-36, average domestic production of soybeans in Japan was 303,000 metric tons (tonnes) per year. Imports of soybeans was 700,000 metric tons. Imports of soybean meal is not listed. Domestic production of soybeans rose from 429,000 tonnes in 1953 to a peak of 507,000 metric tons in 1955, falling to 426,000 tonnes in 1959. Imports of soybeans rose steadily from 541,000 tonnes in 1953 to 1,073,000 tonnes in 1959. Imports of soybean meal fluctuated greatly from year to year from a high of 42,500

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TABLE 1. DOMESTIC PRODUCTION AND IMPORTS OF SOYBEANS AND SOYBEAN MEAL, JAPAN, 1934-36 AVERAGE AND 1953-59 (1,000 metric tons)

Fiscal year	Domestic production soybeans	Imports Soybeans	Imports Soybean meal
1934-36	303	700	—
1953	429	541	42.5
1954	376	576	6.8
1955	507	767	11.4
1956	456	667	7.1
1957	458	846	1.5
1958	391	956	25.7
1959	426	1,073	.5

Source: Food Agency statistics, Ministry of Agriculture and Forestry.

TABLE 2. SOYBEAN IMPORTS BY COUNTRY OF ORIGIN, JAPAN, 1953-1959 (1,000 metric tons)

Fiscal year	Total imports	Mainland U.S.A.	Mainland China	Brazil	Other countries
1953	541	494	22	24	1
1954	576	442	113	19	1
1955	767	572	167	27	1
1956	667	480	179	5	3
1957	846	640	205	0	1
1958	951	866	39	35	1
1959	1,100	1,000	0	33	30

Source: Finance Ministry's monthly Trade Report.

TABLE 3. SOYBEAN CONSUMPTION AND IMPORTS, JAPAN, 1953-59

Fiscal year	Consumption of soybeans in Japan: As whole soybeans 1,000 m/t	Crushed for extraction 1,000 m/t	Total 1,000 m/t	Total per capita pounds	Percent of imports from United States
1953	568	380	948	23.8	91
1954	509	417	926	23.2	75
1955	735	505	1,240	30.6	75
1956	625	547	1,172	28.6	72
1957	582	691	1,273	30.8	76
1958	571	769	1,340	32.1	91
1959	735	775	1,510	35.8	94

Source: Finance Ministry's monthly Trade Report.

tonnes in 1953 to a low of 500 tonnes in 1956. Source: Food Agency Statistics, Ministry of Agriculture and Forestry.

(2) Soybean imports by country of origin, Japan, 1953-59. Total soybean imports grew from 541,000 tonnes in 1953 to 1,100,000 tonnes in 1959. Imports from the USA grew from 494,000 tonnes in 1953 to 1,000 tonnes in 1959. Imports from the Mainland China grew from 22,000 tonnes in 1953 to a local peak of 205,000 tonnes in 1957, then fell to 0 tonnes in 1959. Imports from the Brazil grew from 24,000 tonnes in 1953 to 35,000 tonnes in 1959. Imports from other countries were negligible in all years except for 30,000 tonnes in 1959. Source: Finance Ministry's Monthly Trade Report.

(3) Soybean consumption and imports, Japan, 1953-59. consumption as whole soybeans increased from 568,000 tonnes to 735 tonnes. Crushed for extraction grew from 380,000 tonnes to 775,000 tonnes. Total consumption of soybeans grew from 948,000 tonnes in 1953 to 1,510,000 tonnes in 1959. Total per capita consumption of soybeans in Japan grew from 23.8 lb in 1953 to 35.8 lb in 1959. Imports from the USA fell from 91% in 1953 to a local low of 72% in 1956, then rose to 94% in 1959.

A photo shows Hardin and Hesser working on this study at desks in their office in Tokyo. Address: Agricultural Economists, Purdue Univ., Lafayette, Indiana.

4743. Hayashi, Shizuka. 1961. Soybeans in the nutrition of Japan. *Soybean Digest.* June. p. 31.

• ***Summary:*** "Japan, with a population of 95 million people on a land area smaller than that of the state of California, is confronted with the problem of how best to feed its population. With the population increasing at a rate of 1 million annually, the problem perhaps will become permanent. According to 1959 government statistics, the following amounts of soybeans (in tonnes or metric tons) were used to produce oil and soyfoods in Japan: Crushed for oil 840,583, tofu 318,150, shoyu (soysauce) 217,686, miso 173,933, frozen tofu 40,000, natto 35,000, kinako [roasted soy flour] 13,000.

Japan uses 420,000 tonnes of soybeans that are grown domestically and 1 million tonnes imported from the U.S. Of the 26.7 gm of fats and oils available to each Japanese daily, 7.6 gm (28%) is supplied by soybeans. Of the 67.7 gm of protein available to each Japanese daily, soybeans provide 10.6 gm (15.7%).

"Meat is not only scarce but the price is too high to meet the daily needs of average people. Annual per capita meat consumption in the United States is 237 pounds while in Japan it is only 2.3 pounds." "The Japanese intake of fats and oils is less than 10 pounds per capita in comparison with about 50 pounds in western countries."

"The Japanese live too much on carbohydrate foods. Rice eating must be minimized and more protein foods eaten. The obvious conclusion is the increased consumption of soybeans."

Note: This is the 2nd earliest document seen (Jan. 2012) that contains industry or market statistics for natto by geographical region. Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building., No. 1-chome Yurakucho, Chiyoda-ku, Tokyo, Japan.

4744. Lu, Ying-Chuan. 1961. [The correlations between the agronomic characters and the ecotypes of soybean varieties]. *Chung-hua Nung Hsueh Hui Pao* (*J. of the Agricultural Association of China, Taipei*) No. 34. p. 23-37. June. New Series. [20 ref. Chi; eng]

• ***Summary:*** "About 150 soybean varieties collected from China, USA, Japan, and Ryukyus (Okinawa) were tested in the planting season experiments, from July 1955 to December 1956 at one month interval.

"According to the average days from sowing to flowering and that from flowering to maturity, the tested varieties were classified into eight ecotypes." Address: Professor, Dep. of Agronomy, Taiwan Provincial College of Agriculture, Formosa.

4745. Meals for Millions. 1961. How you can help expand soybean markets: As protein food for people (Ad). *Soybean Digest.* June. p. 59.

• ***Summary:*** A half-page vertical ad. "1. Take out an annual membership in non-profit Meals for Millions Foundation ($10–$25–$100).

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"2. Make a personal or group contribution (in any amount) through your church, club, community group to provide '3¢ meals' of soy-based Multi-Purpose Food (MPF) to missions, hospitals, schools, orphanages.

"In the past 15 years Meals for Millions has introduced 63 million '3¢ meals' of MPF into 127 countries through more than 200 voluntary agencies for use under observation of medical, health and welfare authorities.

"Meals for Millions is unendowed, unsubsidized–maintained by voluntary contributions–by 'penny power and penny wisdom.'

"The Example of MPM has stimulated its Production in India, Japan, Brazil, Mexico in an international do-it-yourself program whereby developing countries are shown how to convert their own oilseed meals into domestic versions of MPF.

"Meals for Millions has received 5 Freedoms Foundation awards 'for outstanding achievement in bringing about a better understanding of the American way of life.'"

Note: Founded in 1949, the Freedoms Foundation is a national, non-profit, non-partisan, non-sectarian educational organization. The Foundation is located on an 85-acre campus adjacent to the Valley Forge National Historical Park in Pennsylvania and sits on ground that was once part of General Washington's encampment.

"An Eating-Is-Believing Program. A People-to-People Program. Malnutrition is preventable. Help prevent it with '20th Century Loaves and Fishes.' Soy-based MPF.

"MPF was developed at the California Institute of Technology. A 2-oz '3¢ meal' provides protein, vitamins, minerals in amounts approximately equal to those in ¼-pound beef; a glass of milk; a dish of peas and a potato."

"(Contributions deductible for income tax purposes)." Address: 215 West 7th St., Los Angeles 14, California.

4746. Namiki, Mitsuo; Okazawa, Y.; Matsuyama, A. 1961. Miso oyobi shôyu no gamma-sen shôsha. I. Miso no waki ni taisuru shôsha kôka [Gamma irradiation of miso and soy sauce. I. Radiation effects on "waki" (generation of gasses) of miso]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 35(6):528-33. June. [5 ref. Jap]
• ***Summary:*** Miso generates gasses during storage at high temperatures. This phenomenon called "Waki" is a disadvantage for commercial packaging. Irradiation reduces this gas generation. Address: 1-2. Inst. of Physical and Chemical Research; 3. Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo.

4747. Okazawa, Yoshishige; Namiki, M.; Matsuyama, A. 1961. Miso oyobi shôyu no gamma-sen shôsha. II. Bisei-butsu ni taisuru shôsha kôka [Gamma irradiation of miso and soy sauce. II. Radiation effects on microorganisms]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 35(6):533-40. June. [16 ref. Jap]
Address: 1-2. Inst. of Physical and Chemical Research; 3. Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo.

4748. Watanabe, Tokuji. 1961. Intermediate report [on the progress of studies on "the manufacture of tofu from U.S. soybeans"]. Food Research Institute, Japan. 56 p. June. Typed, without signature (carbon copy). [2 ref]
• ***Summary:*** Stamped at the top right corner: "Japanese American Soybean Institute." Typed on the line below that: "R-578. July 4, 1961." Written in ink to the right of that: "Under Contract (1960–4)." A cover letter dated 3 Aug. 1961 from George Strayer to A.K. Smith explains that this is a copy of Mr. Hayashi's R-578, which is an intermediate report on the work being done on tofu by Mr. Tokuji Watanabe of the Food Research Institute, Japan. Contents: On gelation and coagulation of soy milk (incl. 11 graphs and photos). Defatted soybeans as a raw material for tofu (incl. 3 tables and 3 graphs). Studies on the manufacture of soy milk (No. 1) (incl. 15 tables). Spray-drying of soy milk (incl. 8 tables). Address: Japan.

4749. Kawamura, Sin'itirô; Narasaki, Teiiti. 1961. Studies on the carbohydrates of soybeans. VI. Component sugars of fractionated polysaccharides, especially identification of fructose in some hemicelluloses. *Agricultural and Biological Chemistry* 25(7):527-31. July. [10 ref]
• ***Summary:*** Soybean polysaccharides were fractionated by using water, ammonium oxalate and sodium hydroxide solution as successive extracting agents. Fucose, rhamnose, xylose, arabinose, galactose, and galacturonic acid were identified in purified hemicelluloses. Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Kagawa Univ., Japan.

4750. Koyano, Kazuo; Nagao, Hideo. 1961. The change of birefringence sign, density, and opacity of an acrylic fiber. *Kolloid-Zeitschrift* 177(1):30-35. July. (Chem. Abst. 55:25262c). [17 ref. Eng; ger]
• ***Summary:*** Acrylic fiber was stretched in soybean oil. Address: Research Lab., Teikoku Rayon Co., Iwakuni, Japan.

4751. Nakamura, Hiroshi. 1961. The Japanese soybean market. *Illinois Agricultural Economics* 1(2):7-13. July.
• ***Summary:*** Contents: Introduction. Soybeans in the Japanese diet. Patterns of soybean consumption. Changes in tastes and preferences. Preferences for types of soybeans. Supply of soybeans to Japanese market. Soybean production in Japan. Future of soybean consumption in Japan. Japanese government import policy.

Table 1 shows "Soybean supply and consumption in Japan, 1934-1936 average and 1950-1959." Vertical columns show domestic production, imports, crushings, used as whole soybeans, and percent of imports from United States. By

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Table 1. — Soybean Supply and Consumption in Japan, 1934-1936 Average and 1950-1959

Fiscal year (April-March)	Domestic production	Imports	Crushings	Used as whole soybeans[a]	Percent of imports from United States
			(metric tons)		
1934-1936	303,000	700,000[b]	400,000[b]	600,000[b]	..
1950	447,000	218,000	258,000	497,000	47
1951	474,000	323,000	162,000	625,000	95
1952	521,000	296,000	284,000	535,000	97
1953	429,000	541,000	380,000	568,000	91
1954	376,000	576,000	417,000	509,000	75
1955	507,000	767,000	505,000	735,000	75
1956	456,000	667,000	547,000	625,000	72
1957	458,000	846,000	691,000	582,000	76
1958	391,000	951,000	769,000	571,000	91
1959	426,000	1,073,000	775,000	735,000	94

[a] Computed as residual from total supply minus crushings minus carryover.
[b] Estimates.
Source: Finance Ministry's Monthly Trade Report; Domestic Production, by Japanese Ministry of Agriculture Statistics.

1951, 95% of imports were coming from the USA.

Table 2 shows total and per capita consumption (in kg and lb) of miso, shoyu, and edible oils (all types) in Japan, 1934-1936 average and 1950-1959. In 1957, compared with the 1934-36 average, per capita consumption of miso is 19.62 lb (down 14.4%), shoyu is 30.20 lb (down 0.8%), and edible oils is 7.05 lb (up 350% from 1.98 lb).

"In Japan, soybeans are considered a food grain like rice and wheat and, in fact, serve as an important source of protein supply in the Japanese diet. Total annual consumption exceeds 1,500,000 metric tons; but as production in Japan is only 400,000 tons, more than a million tons of soybeans are imported each year, mostly from the United States. Of all the agricultural exports of the United States to Japan, soybeans today occupy the most important position, amounting to nearly 100 million dollars per year."

4752. Shibasaki, K.; Hesseltine, C.W. 1961. Miso–I. Preparation of soybeans for fermentation. *J. of Biochemical and Microbiological Technology and Engineering* 3(2):161-74. July. [3 ref]
Address: NRRL, Peoria, Illinois.

4753. Smith, Allan K. 1961. Oriental methods of using soybeans as food. With special attention to fermented products and notes on Oriental farming practices. *USDA Agricultural Research Service.* ARS-71-17. 65 p. July. Illust. 27 cm.
• ***Summary:*** Contents: Part I: China. Introduction. Farming conditions in China. Oilseed production. Soy sauce in China. Sweet flour paste–Tien mien chang [chiang]. Soybean or vegetable milk (incl. Willis Miller and the Henningsen Produce Co. in Shanghai). Yuba. Soybean curd or tofu. Soybean cheese [fermented tofu]: Chee-fan ("cheese" + "small cube"), tsüe-fan ("drunken cheese"), hon-fan ("red cheese"). Fen-T'iao from mung beans. Fermented soybeans [fermented black soybeans]. Vinegar fermentation process.
Note: This is the earliest document seen (Oct. 2011) that uses the term "tsüe-fan" ("drunken cheese") to refer to a type fermented tofu.
Part II. China–Chinese Institutions. Henry Lester Institute (in Shanghai; Dr. Bernard Read). Academia Sinica (headquarters in Nanking). China Vegetable Oil Corporation (CVOC, Shanghai). The China Oils and Fat Industries Ltd. (Shanghai). National Bureau of Industrial Research. Catholic University (Fu Jen, at Peiping). Yen Ching University (Peiping). Agriculture Experiment Station (Peiping).

Part III: Japan. Introduction. Production of miso in Japan. Soy sauce in Japan. Trends in soy sauce production. Part IV: With Raymond E. Culbertson. Korea. Introduction. Breeding work. Soybean varieties. Climatic relations. Soils of Korea. Topography. Land use. Cultural practices. Marketing. Soybeans as foodstuff. Soy sauce. Acknowledgment.

Page 19 states: "The China National Government has taken an active interest in soybean milk for use by its army. Mr. Willis Miller, with offices and business connections with the Henningsen Produce Company in the Dollar Building (7th Floor) at 51 Canton Road, Shanghai, had just completed, at the time of my visit, the building of a soybean milk plant for the Chinese Government. The process is patterned after that of the International Nutritional Laboratories at Mt. Vernon, Ohio, for making a powdered or spray-dried milk. Mr. Miller also was supervising the installation of a vegetable canning plant for the same purpose."

The text of this bulletin was previously published, serially, with slight revisions, in *Soybean Digest,* from Feb. to June 1949. Address: Northern Utilization Research and Development Div., Peoria, Illinois.

4754. *Soybean Digest.* 1961. Soybeans go on free list in Japan. July. p. 25.
• ***Summary:*** "Japan: Imported soybeans went on the free list (automatic allocation) in Japan July 1 as originally planned, The dropping of import restrictions on soybeans was confirmed by the Japanese cabinet in extraordinary session June 8.

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"Trading in U.S. soybeans on all Japanese grain exchanges will follow, with trading to be initiated Sept. 1. Detailed rules for trading in U.S. beans have been adopted by all Japanese grain exchanges, which up to now have traded only in domestic soybeans.

"The tariff on imported soybeans will remain at the current 10% rate until an extraordinary meeting of the Diet in early August, when a 13% tariff is expected to be approved.

"In the meantime, the Japanese Agriculture-Forestry Ministry is taking steps to protect Japanese soybean growers following the freeing of imports through increasing the subsidy and the price support program. Japan produced only 14.5 million bushels of soybeans in 1960 as compared to 41 million bushels imported. Observers have been predicting a rapid expansion in imports following automatic allocation. According to the Japanese economic planning board, Japan will need to import 75 million bushels by 1965 and 98 million bushels by 1970."

"Mainland China: In view of the export importance of soybeans and the unsatisfactory internal supply of cooking oils and protein foods, Communist China probably will strive to maintain soybean acreage at around the 4-million-acre level this year, according to Foreign Agricultural Service, USDA.

"Over the long run, and in the circumstances in which Mainland China finds itself, pressures for the expansion of grain acreage will impose relatively inflexible limits on the possibilities for expansion of oilseed acreage, including soybeans.

"Exports of soybeans from Communist China, which reached a postwar high of about 59 million bushels in 1959, declined sharply in 1960, reflecting reduced movement to the Soviet Bloc. In view of the serious food shortage in China the total level of foodstuff exports in 1961 undoubtedly will be cut back and soybeans likely will share in this downward trend."

4755. Yamamoto, Kishiro. 1961. Studies on the mechanism of mold protease production. III. Activating factors of inactive protease in cell-free extracts of *Aspergillus sojae* KS. *Agricultural and Biological Chemistry* 25(7):519-26. July. [16 ref. Eng]
• ***Summary:*** Several kinds of metals were found to be involved in activation. "The velocity of the activation was maximal around pH 10 as well as around pH 5. It was proved that a kinase (enzyme) capable of activating the inactive protease in alkaline solutions does exist in the cell-free extract." Address: Noda Inst. for Scientific Research, Noda, Japan.

4756. Strayer, George M. 1961. Re: Research on tofu being conducted in Japan by Mr. Tokuji Watanabe. Letter to Dr. A.K. Smith, Northern Utilization Research and Development Division, Agricultural Research Service, USDA, Peoria 5, Illinois, Aug. 3. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "Dear Allan: I am enclosing with this letter a copy of Mr. Hayashi's R-578, which is an intermediate report on the work being done by Mr. Tokuji Watanabe of the Food Research Institute [Japan]... you are at liberty to photocopy or otherwise reproduce any parts of it which you may want to retain. As soon as you have finished with this will you please return it to me so that we can dispatch it to FAS [Foreign Agricultural Service, Washington, DC].

Note: This American Soybean Assoc. letterhead is very interesting. Along the top is written: "An organization of those interested in the production and utilization of the soybean." In the center is the logo, consisting of the western hemisphere on the globe of a soybean. Around the bottom: "Founded 1920–Organized 1925." At the left top is the name and title (plus city and state) of each of 3 officers and 5 directors. At the right top are the names of ten more directors. Address: Executive Vice President and Secretary Treasurer, American Soybean Assoc., Hudson, Iowa.

4757. Ariga, Nagao; Ueki, K.; Kanai, T. Assignors to Japan Reichhold Chemicals, Inc. 1961. [Vehicle for paint]. *Japanese Patent* 16,040. Sept. 11. Application filed 5 Feb. 1960. (Chem. Abst. 56:10317g). [Jap]*
• ***Summary:*** Soybean oil fatty acid is a major ingredient in this product, which gives a film that dries and hardens rapidly and is resistant to soap and to boiling.

4758. Asao, Yasuo; Yokotsuka, Tamotsu. 1961. Shôyu kômi seibun ni kansuru kenkyû. XVIII. $C_7H_{12}O_5$ no tanri to sono kôzô (1) [Studies on flavorous substances in soy sauce. XVIII. Isolation of $C_7H_{12}O_5$ compound in soy sauce and its structure (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 35(9):831-37. Sept. [13 ref. Jap]
Address: Noda Soy Sauce Co., Ltd., Noda, Japan.

4759. Hayashi, Shizuka. 1961. Report on the Japanese American Soybean Institute. *Soybean Digest.* Sept. p. 37-38.
• ***Summary:*** This talk was presented at ASA's 41st annual meeting at Indianapolis, Indiana.

The goal of the American Soybean Institute, as provided by the contract between the American Soybean Association and the Foreign Agricultural Service, is to develop the Japanese market for U.S. soybeans. Therefore the institute directs its activities toward promotion of the various soybean products made and sold in Japan, and encouraging consumers to take more fat and protein in their daily diet by consuming more traditional soybean products such as miso, tofu, shoyu, and natto, as well as more of the relatively new foods such as soy flour and soybean oil.

1. Government agency: The Ministry of Agriculture and Forestry has under its control approximately 2,000 home advisors, 40 to 50 on the average stationed in each of the 46

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prefectures. Each home advisor covers an area that has about 4,000 families or approximately 20,000 population.

"The relation between the home advisors and the rural housewives is close and intimate. By virtue of training and education the home advisors have won the position where they are now regarded by the housewives as consultants to all rural families. Suggestions and opinions of the home advisors are unconditionally accepted by the housewives. We are using this network, under contract with the Ministry of Agriculture, to educate the housewives on the nutritional values of soybean products and the advantages of consuming more soybean products in their diets.

"This contract provides for 3-day exhibitions with cooking demonstrations, lectures and display of various panels to be held in three places in each prefecture. So far about 24 prefectures have been covered out of 46. Approximately 400,000 people have attended.

"2. Private Professional Organizations: We have a contract with one of the most influential and popular organizations which has groups of women all over Japan as its members. The leaders of these groups have had actual dietetic experience and education. This organization pushes its educational program under such slogans as, "Let Us Eat Oil Once a Day," or, "Use in Frying Pan Once a Day."

"3. Trade Press: Contracts are being entered into with the trade press to carry out jointly with them events to promote soybean products. By utilizing the press we get the advantage of wide dissemination of the news to the public at relatively low cost.

"4. Industrial Groups: We have contracts with the different soybean groups to promote products such as miso, shoyu, tofu, soybean oil, etc. Each of these groups has its own methods of promotion. For example, a contract with the Soy Sauce Association involves lectures, cooking demonstrations, and exchange of views with the high school home economics teachers. This aims at the large number of students each teacher has in her class.

"A contract with the Oil Processors Association involves soybean oil cooking contests arranged through the network of health centers where a great number of housewives are reached. Under contract with the Tofu Association, meetings are held with not only the manufacturers but also people in general. This is to demonstrate the advantage of producing the so-called 'soft tofu' which can be produced with very little loss of water soluble protein. Actually the aim is to encourage using U.S. soybeans because soft tofu can best be made with U.S. soybeans.

"A contract entered into with the miso groups calls for promotion largely through advertisements in magazines, daily newspapers, television, radios, and even by utilizing the theaters. This type of promotion is expensive but the major cost is borne by the miso groups themselves. JASI shares only a small portion."

Also discusses expired contracts with the Welfare Ministry, seminars with top executives in working with soybeans to explain the power of public relations, and future plans. Since July 1, U.S. soybeans can be freely imported into Japan–with no restrictions. Address: Managing Director, Japanese-American Soybean Inst., Tokyo.

4760. *Soybean Digest.* 1961. Honorary life members [American Soybean Assoc.]: Shizuka Hayashi and Albert Henry Probst. Sept. p. 12.

• ***Summary:*** "Shizuka Hayashi was born in Hawaii. He graduated from Japan Business College and Heald's Business College, San Francisco [California].

"Mr. Hayashi has devoted most of his life to the fats and oils business. From 1923 to 1940 he was manager of the import and export division of Nisshin Oil Mills, Limited, of Tokyo, Japan, and Dairen, Manchuria, one of the largest processors of soybeans and other oil-bearing seeds. When in 1940 the trade division of Nisshin was absorbed by Okura Trading Company, Mr. Hayashi was appointed manager of Okura's Dairen office.

"In 1942, Mr. Hayashi went to Singapore and Penang [Malaysia], representing both Okura and Dunlop Rubber Company. After the fall of Singapore he was adviser to the Manchurian government until the end of World War II. In 1948 he made a trip to the United States to study postwar conditions and renew business acquaintances. On his return home he started his own import and export business.

"When the Japanese American Soybean Institute was formed in 1956 as the operating agency for the soybean export program of the American Soybean Association and the U.S. Department of Agriculture, Mr. Hayashi became its managing director. Through the Institute the soybean industries of Japan and the United States and the

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governments of the two countries have learned to cooperate in using U.S. soybeans to provide a better diet for the Japanese people."

Albert H. Probst received his B.S., his M.S., and his Ph.D. degrees from Purdue University in 1936, 1938, and 1948. He was appointed agent on soybean investigations for the U.S. Department of Agriculture in May 1936. As research agronomist for the USDA and associate professor at Purdue University, he is in charge of soybean breeding in Indiana. He has assisted in the development of almost 20 new varieties of soybeans. He is author or co-author of over 70 technical and popular publications on soybean research and production.

Photos show Shizuka Hayashi and Albert Henry Probst.

4761. Yokotsuka, Tamotsu; Asao, Yasuo. 1961. Shôyu kômi seibun ni kansuru kenkyû. XIX. $C_7H_{12}O_5$ no kôzô (2) narabini shôyu-chû no α-jiketon kagô-butsu (1) [Studies on flavorous substances in soy sauce. XIX. The structure of $C_7H_{12}O_5$ compounds (2) and α-diketon compounds in soy sauce (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 35(9):837-45. Sept. [25 ref. Jap]
Address: Noda Soy Sauce Co., Ltd., Noda, Japan.

4762. Oba, Torao; Oizumi, Hisakazu; Kudo, Soroku; Ueda, Kunihiko. 1961. [Studies on blooming and fruiting in soybean plants, especially on the relationship between blooming and fruiting on each node in soybean plants, and weather conditions and production practices]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 30(1):68-71. Oct. [6 ref. Jap; eng]
Address: Tohoku National Agric. Exp. Station.

4763. Onishi, Hiroshi; Saito, Narimasa. 1961. Studies on osmophilic yeasts. XIII. Conversion of polyalcohol fermentation to ethanol fermentation. *Agricultural and Biological Chemistry* 25(10):768-72. Oct. [Eng]
• ***Summary:*** In a medium containing a high concentration of yeast extract, researchers observed aerobic formation of a large amount of ethanol by various yeasts of non-fermenting or extremely poor fermenting types such as *Torulopsis famata, Candida polymorpha* and *Pichia membranaefaciens* etc.

"Acetaldehyde formed as a metabolic intermediate leading to ethanol formation was trapped by the addition of sulfite and was identified as 2,4-dinitrophenylhydrazone."
Address: Noda Inst. for Scientific Research, Noda City, Chiba-ken, Japan.

4764. Spilsbury, Calvin A. 1961. Japan's oilseed and fats and oils industry. *USDA Foreign Agricultural Service.* FAS M-120. iv + 52 p. Oct. Illust. 28 cm. [9 ref]
• ***Summary:*** Contents: Introduction. Summary. The fats and oils industry: Total supply of fats and oils, edible fats and oils industries (oilseed crushing and refining industry, rice bran processing, margarine and shortening, oilseed food industries), industrial fats and oils (the soap industry, paint and protective coating industry). Domestic production of oilseeds and oil-bearing materials: Soybeans (farm income and management, research), rapeseed, other oilseeds, rice bran, marine oils, including whale, animal fats. Foreign trade: Soybeans, other oilseeds, marine oils, animal fats, oilcake and meal, trade controls. Demand and price: Price supports. Consumption. Marketing and market development: Marketing vegetable oils, marketing oilseeds (storage, inspection, soybeans, rapeseed), market development. Bibliography. No names of Asian crushers are given.

Japan's margarine and shortening production in 1960 was 88,600 metric tons, nearly 4½ times that of 1950... Margarine production in 1960 was 43,000 tons. Shortening production was only 41,600 tons in 1960. The margarine and shortening industry in Japan consists of 26 manufacturers, but a large percent of plant capacity is found in only a few plants: 4 plants have one-third of the industry capacity, which is around 400 metric tons per 8-hour day... 67% of the oils used to make margarine and shortening in Japan are animal and marine oils, with whale oil being the most widely used (26% of the total) followed by tallow and lard (21%), then fish oil (20.0%). Palm oils comprise 19.0% of the total and vegetable oils 14.0%.

Concerning oilseed food industries (p. 17-20), in 1960 some 532,218 tonnes (metric tons) of soybeans were used directly as foods or manufactured into foods in Japan. Substantial amounts of peanuts and sesame seeds were also so used. "The Japanese American Soybean Institute in Tokyo is actively promoting U.S. soybeans for food uses and has promoted soybeans as the meat of the field because of the excellence of their amino acids."

Note: This is the earliest document seen (Jan. 2005) containing the phrase "the meat of the field." Notice that it refers to soybeans and was apparently coined by an American organization in Japan.

"More soybeans are used directly for food than are grown in Japan, and the cake and meal from an additional 420,000 tons of soybeans are now used each year. The main soybean foods are: Miso, shoyu, tofu, aburaage (fried tofu), frozen tofu, natto, kinako, monosodium glutamate (extract of fermented soybeans and rice used as a seasoning compound; a low-grade shoyu is a by-product), tonyu (soybean milk, cooked water-extract of soybeans, not widely produced in Japan at the present time).

Miso: There are about 3,200 to 3,800 miso plants in Japan, and a large amount of home-made miso is also produced. "About 117,600 tons of soybeans and 52,300 tons of defatted soybean meal (expeller cake is thought to be the best) are required by this industry. Miso consumption is estimated at 28.9 grams per capita per day." Domestic

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Japanese soybeans, such as white hilum soybeans from Aomori are preferred to U.S. beans, which cook unevenly because of their hard seed coats.

Shoyu: There are about 5,000 producers; some have very large plants but many are small. Per capita consumption is about 3 gallons per year. This requires about 18,500 tonnes of soybeans and 155,000 tonnes of defatted soybean meal per year. A small amount of soybean oil (about 1,000 tonnes/year) is skimmed off the top of shoyu and used for a cutting oil. The cake that remains after pressing out the shoyu contains 4% salt, but it is an ideal hog feed as well as a fertilizer. Around 80,000 to 100,000 tonnes a year are produced. A taru (4½ gallons) of shoyu wholesales for about $3.60. A large volume of soy sauce is now being exported to the USA.

Tofu: There are around 50,000 small tofu plants in Japan. Their demand for soybeans is large and increasing. In 1960 production of tofu and aburaage required 254,800 tonnes of soybeans and 20,000 tonnes of defatted soybean meal. More soybeans and meal are used to make tofu than any other food in Japan, followed by shoyu, then miso. About three-fifths of the soybeans used are imported. In 1960 production of frozen tofu required 27,100 tonnes of soybeans.

In 1960 about 22,800 tonnes of soybeans were required to make natto, 6,200 tonnes to make kinako, 64,800 tones of defatted soybean meal were required to make monosodium glutamate, and 10,000 tonnes of soybeans plus 30,000 tonnes of defatted meal were required to make other soybean food products [such as whole soybeans, soybean milk, etc.].
Address: USDA Fats and Oils Div.

4765. Akiya, Shichiro; Sawamura, Ryoji. 1961. Nattô-kin no sansei suru nenseita tôshitsu ni kansuru kenkyû. I. Chûshutsu oyobi seisei [Studies on the viscous polysaccharide produced by *Bacillus natto.* I. Extraction and purification]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) 81(11):1583-87. Nov. [17 ref. Jap; eng]
• ***Summary:*** Natto is made by culturing *Bacillus natto,* a strain of *Bacillus subtilis,* on boiled soy-beans. Natto contains a viscous polysaccharide, which, when hydrolyzed gave three monosacchsarides: arabinose, xylose, and galactose. Address: 1. Tokyo Medico-Dental University, Yushima, Bunkyo-ku, Tokyo; 2. Pharmaceutical Inst., College of Science and Engineering, Nihon Univ., Kanda-surugadai, Chiyoda-ku, Tokyo. Both: Japan.

4766. Akiya, Shichiro; Sawamura, Ryoji. 1961. Nattô-kin no sansei suru nenseita tôshitsu ni kansuru kenkyû. II. Asechiru-ka oyobi mechiru-ka [Studies on the viscous polysaccharide produced by *Bacillus natto.* II. Acetylation and methylation]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) 81(11):1588-92. Nov. [2 ref. Jap; eng]
Address: 1. Tokyo Medico-Dental University, Yushima, Bunkyo-ku, Tokyo; 2. Pharmaceutical Inst., College of Science and Engineering, Nihon Univ., Kanda-surugadai, Chiyoda-ku, Tokyo. Both: Japan.

4767. Hesseltine, C.W.; Shibasaki, K. 1961. Miso. III. Pure culture fermentation with *Saccharomyces rouxii. Applied Microbiology* 9(6):515-18. Nov. [6 ref]
Address: 1. NRRL, Peoria, Illinois; 2. College of Agriculture, Tohoku Univ., Sendai, Japan.

4768. Kimura, Tadashi; Yoshida, Keinosuke. 1961. Enka biniru no jûgô ni kansuru kenkyû. XI. Enka biniru to fuhôwa kôkyû arukôru no metakuriru-san oyobi akuriru-san esuteru to no kyôjûgô [Polymerization of vinylchloride. XI. Copolymerization of vinylchloride with methacrylates and acrylate of long chain fatty alcohols]. *Kagaku to Kogyo* (*Osaka*) (*Science and Industry*) 35(11):465-69. Nov. (Chem. Abst. 56:14416b). [12 ref. Jap; eng]
• ***Summary:*** Copolymerization and acrylate of long chain fatty alcohols. These alcohols prepared by reduction of soybean oil and poppyseed oil. Address: Osaka Shiritsu Kôgyô Kenkyû-jo Shoin.

4769. Mogi, Koya; Ui, H.; Hayashi, T. 1961. Ekitai kôji-hô ni yoru shôyu no seizô ni kansuru kenkyû. VII. Ekitai kôji oyobi doro-jô kôji no heiyô ni yoru shôyu no shijô [Studies on the soy-sauce production by submerged culture. VII. Test brewing of soy-sauce by a compromised method between "liquid koji" and mushy koji methods]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 39(11):665-69. Nov. [12 ref. Jap; eng]
Address: Central Research Lab. of Noda Shoyu Co., Ltd., Japan.

4770. Sawamura, Ryoji. 1961. Nattô-kin no sansei suru nenseita tôshitsu ni kansuru kenkyû. III. Kayôso-san sanka [Studies on the viscous polysaccharide produced by *Bacillus natto.* III. Periodic oxidation]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) 81(11):1592-95. Nov. [5 ref. Jap; eng]
Address: Pharmaceutical Inst., College of Science and Engineering, Nihon Univ., Kanda-surugadai, Chiyoda-ku, Tokyo, Japan.

4771. *Soybean Digest.* 1961. A.K. Smith of Peoria Lab on trip to Asia. Nov. p. 7.
• ***Summary:*** Dr. A.K. Smith, head of meal products investigations, oilseed crops laboratory, Northern Regional Research Laboratory (Peoria, Illinois), left Oct. 15 on a 2½ month trip to India, Japan, and Indonesia. "Dr. Smith will survey research laboratories in the countries to determine those that are qualified to do food research and development on soybeans, soybean products, and related agricultural products under the P.L. 480 program." In Japan, he will visit

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trade associations to encourage the use of U.S. soybeans in Japanese foods.

Research is needed in six areas: Use of soy flour to supplement bread and cereal products. Manufacture of soybean protein. Use of tempeh. Production and nutritional value of soy milk. Production of low-salt miso for feeding babies. Comparison of U.S. soybean varieties in commercial production of tofu. A portrait photo shows Smith.

4772. *Soybean Digest.* 1961. Look for lower soy production in Japan. Nov. p. 23-24.

• ***Summary:*** It is very likely that Japanese soybean production will decrease rapidly following the freeing of soybean imports which took place on July 1, according to Hiroshi Nakamura, a former employee of the Hohnen Oil Co. who is now a graduate assistant working toward a Ph.D. degree at the University of Illinois.

The Japanese consume more than 1.5 million metric tons [tonnes] of soybeans per year, but only about 400,000 tons are grown in Japan. The rest is imported, mostly from the USA.

Also on July 1, the Japanese government raised the import duty on soybeans, an offsetting factor which may lower potential imports. Resumption of trade with Mainland China could also hurt U.S. soybean exports to Japan.

4773. Shumway, De Van L. 1961. 'Refugees' from N.Y. happy in N. California. *Deseret News* (*Salt Lake City, Utah*). Dec. 8. p. 8A.

• ***Summary:*** A group of New Yorkers, seeking refuge from nuclear war, have found a welcoming home in Chico, northern California. Alvin Baumann, a concert pianist-composer, led the group from Smithtown, New York, across the USA, arriving in Chico in October 2. The 13 families, totaling 34 men, women and children, quickly settled into this city of 16,000. And they say they feel more welcome every day. Painter Joan Andrews is impressed that service station attendants wash the windows of her small foreign car each time she stops for gasoline.

Many in the group are members of the Ohsawa Foundation; they "follow the teaching of a 68-year old Japanese philosopher, George Ohsawa, who teaches an orderly life based on natural foods."

Baumann said the group's own business is taking shape. Believers in eating "natural" foods, they have started the "Chico-San" Bakery and plan to share the profits. They will bake breads with no sugar and little yeast.

They also plan to start a restaurant where the menu will show the exact number of calories per serving, and where live music will be provided by group members. Once a week there will be a discussion on controversial or popular current events.

Note 1. This is the earliest document seen (May 2011) which states that Chico-San has started a bakery.

Note 3. There seems to be little chance of an atomic bomb being dropped on or near Chico. The nearest major city is San Francisco. Address: United Press International (UPI).

4774. Hayashi, Shizuka. 1961. Meal use expands in Japan. *Soybean Digest.* Dec. p. 23. [14 ref]

• ***Summary:*** "Paralleling the growth of the Japanese livestock industry the demand for livestock feed has increased sharply during recent years. As shown in table No. 1, production of livestock feeds during 1960 was more than 2.5 million tons or nearly 50% more than the previous year and three and one-half times that of 1956. Livestock production is shown in table No. 2.

"Approximately 80% of the annual feed production is used by the poultry industry. The other 20% goes for swine and cattle.

"The ingredients used in the production of mixed feeds vary somewhat from time to time depending on the supply situation and price fluctuation of the different ingredients. See table No. 3.

"The percentage of soybean meal used in livestock feeds is about 5%, as indicated by the table. The reason for this small percentage is due largely to the higher price of soybean meal as compared to prices of other ingredients.

"The many years of government control which restricted free imports of many commodities including soybeans created an abnormal state of the economy. The price level of soybean meal in Japan has been far above what it normally should be. This has become chronic and has robbed consumers of the desire for lower and more competitive prices. Table No. 4 shows the prices of various feed ingredients.

"The return of imports to unrestricted free trade on July 1 has changed the picture. Soybeans are now freely imported. The artificial high price of soybean meal will have to be corrected to be in line with the world market or be competitive with imported meal which is expected to be liberalized in the near future. The time will come, perhaps soon, when soybean meal will be used in a much larger quantity for poultry feed.

"Mixed poultry feeds in the United States now include nearly 30% soybean meal. The same formulas could be used by the Japanese poultry industry. Plans are now being worked out by the Japanese American Soybean Institute for promotion toward this end.

Tables show: (1) Production of mixed feeds 1956/1960 in Japan classified by use (metric tons). The uses are dairy cattle, draft cattle, poultry, others, and total. The greatest use (by far) is for poultry, which increased from 439,848 in 1956 to 2,061,564 in 1960. The total increased from 737,427 in 1956 to 2,521,489 in 1960.

(2) Number of poultry and livestock reared, 1957 to 1961. As of Feb. 1 each year. Numbers include chickens,

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dairy cattle, draft cattle, horses, and hogs. Chickens increased from 45.341 million in 1957 to 71.806 million in 1961. Hogs increased from 1.546 million in 1957 to 2.604 million in 1961.

(3) Consumption of ingredients for production of mixed feeds in 1960 (Jan. to Dec.). The top 4 ingredients were: Corn 1,212,826 metric tons (48.0% of total). Wheat bran 263,202 metric tons (10.4%). Soybean meal 133,805 metric tons (5.3%). Rice bran, rice oil meal 123,187 metric tons (4.9%).

(4) Tokyo wholesale prices of feeds (average Sept. 1961). Soybean meal is relatively expensive. Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building, No. 1, 1-Chome Yurakucho, Chiyoda-Ku, Tokyo, Japan.

4775. Ueno, Takahiro. 1961. Shinshiki shôyu ni kansuru kenkyû. XI. Bunkai genryô yori tansuikabutsu no jôkyô oyobi ni bunkai-eki no kassei tanshori to hakkô-sei [Studies on shinshiki shoyu (semi-chemical soy sauce). XI. Improving the effects of extracting the carbohydrate from defatted soybeans and the active charcoal treatment of acid hydrolysates for yeast fermentation]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 35(12):1193-98. Dec. [11 ref. Jap]
Address: Central Research Lab., Noda Soy Sauce Co. Ltd., Noda, Japan.

4776. Ueno, Takahiro. 1961. Shinshiki shôyu ni kansuru kenkyû. X. Kôbo ni yoru teikyû shibô-san no bunkai [Studies on shinshiki shoyu (semi-chemical soy sauce). X. Oxidation of short-chain fatty acids by yeast]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 35(12):1189-92. Dec. [11 ref. Jap]
Address: Central Research Lab., Noda Soy Sauce Co. Ltd., Noda, Japan.

4777. Ueno, Takahiro. 1961. Shinshiki shôyu ni kansuru kenkyû. IX. Dasshi daizu ensan bunkai-eki no hakkô sokaisei [Studies on shinshiki shoyu (semi-chemical soy sauce). IX. Inhibitory effects of acid hydrolysate of defatted soybean against yeast fermentation]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 35(12):1184-89. Dec. [27 ref. Jap]
Address: Central Research Lab., Noda Soy Sauce Co. Ltd., Noda, Japan.

4778. Directorate of National Agriculture, Vietnam. 1961. Field crops improvement. *Annual Progress Report, Directorate of National Agriculture, Vietnam.* p. 111-39. For the years 1960-61. *
• ***Summary:*** In soybean variety trials, Palmetto (from the USA) and Sankuo (from Japan) gave the highest yields. In the spacing trial the highest yields were obtained at 40 x 20 cm (1 plant per hill). Phosphate and calcium fertilizers significantly increased soybean yields. Eight varieties were planted monthly from Aug. to Dec. 1960. The growth period was shortened and plant height and yield were decreased by delayed planting. The largest seeds were produced from plants sown in September.

4779. Kitasato, T.; Inaba, A.(?); Kato, M. 1961. [Viscous substances of natto. I]. *Scientific Report of the Faculty of Liberal Arts Education, Gifu University* 2:484-85. (Chem. Abst. 68:2001. 1968). [Jap]*

4780. Kudo, Y.; Endo, Y.; Yasufuku, H.; Komatsu, H. 1961. [Changes of vitamin B-1 during natto manufacture]. *Kyoto Joshi Daigaku Shokumotsu Gakkaishi* (*J. of Food Science, Kyoto Women's University*) No. 10. p. 43-45. [Jap]*
Address: Japan.

4781. Matsumoto, M. 1961. [On the antibiotic activity of some bacilli. I. Observation on the antibiotic activity of isolated organisms and its bacteriological classification]. *Shimane Noka Daigaku Kenkyu Hokoku. A* (*Bulletin of the Shimane Agricultural College, A*) No. 9 A-1:145-51. [Jap]*

4782. Matsumoto, M. 1961. [On the antibiotic activity of some bacilli. II. The relation between antibacterial potency and cultural condition concerning to one strain previously isolated]. *Shimane Noka Daigaku Kenkyu Hokoku* (*Bulletin of the Faculty of Agriculture, Shimane University*) No. 9 A-1:152-59. [Jap]*

4783. Matsumoto, M. 1961. [On the antibiotic activity of some bacilli. III. Isolation and identification of the antibiotic of a strain of *B. prausnitzii* T]. *Shimane Noka Daigaku Kenkyu Hokoku* (*Bulletin of the Faculty of Agriculture, Shimane University*) No. 9 A-1:160-63. [Jap]*

4784. Matsumoto, M. 1961. [On the antibiotic activity of some bacilli. IV. Antibiotics of several strains of natto bacteria]. *Shimane Noka Daigaku Kenkyu Hokoku* (*Bulletin of the Faculty of Agriculture, Shimane University*) No. 9 A-1:164-67. [Jap]*

4785. Matsumoto, M. 1961. [On the antibiotic activity of some bacilli. V. Antibiotics of several strains not classified as natto bacteria]. *Shimane Noka Daigaku Kenkyu Hokoku* (*Bulletin of the Faculty of Agriculture, Shimane University*) No. 9 A-1:168-71. [Jap]*

4786. Matsumoto, M.; Iwahara, S. 1961. [On the production of slime substance by natto bacteria. I. Chemical composition of the slime substance]. *Shimane Noka Daigaku Kenkyu Hokoku* (*Bulletin of the Faculty of Agriculture, Shimane University*) No. 9 A-1:172-74. [Jap]*

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4787. Matsumoto, M.; Iwahara, S. 1961. [On the production of slime substance by natto bacteria. II. A method for the determination of the slime substance and the effects of cultural conditions on the production of the slime]. *Shimane Noka Daigaku Kenkyu Hokoku* (*Bulletin of the Faculty of Agriculture, Shimane University*) No. 9 A-1:175-78. [Jap]*

4788. Matsumoto, M.; Iwahara, S. 1961. [On the production of slime substance by natto bacteria. III. On the peculiar amino acid production by natto bacteria]. *Shimane Noka Daigaku Kenkyu Hokoku* (*Bulletin of the Faculty of Agriculture, Shimane University*) No. 9 A-1:179-82. [Jap]*

4789. Arimoto, K. 1961. Nutritional research on fermented soybean products. *National Academy of Sciences, National Research Council, Publication* No. 843. p. 269-73. Progress in Meeting Protein Needs of Infants and Preschool Children. [11 ref]
• ***Summary:*** Powdered natto (made by the method of Sakurai and Nakano 1961) can be added to biscuits, crackers, or soup. The addition of 15% powdered natto in biscuits, 20% in crackers, and 5% in curry soup was acceptable to school children. Address: Director, National Inst. of Nutrition, Toyama-cho, Shinjuku-ku, Tokyo.

4790. Department of Trade and Commerce, Canada. 1961. Oilseeds from Canada. Ottawa, Ontario, Canada. 24 p. 28 cm.
• ***Summary:*** "Oilseeds have been grown commercially in Canada since 1720 when the pioneers of New France grew flax for fibre and later for oil." Canada has gradually changed from a net importer of fats and oils to a net exporter. "Last year there were more than 4 million acres in Canada planted to various types of oilseeds, and the bulk of the oilseed production was exported to more than 25 countries of the world. Flaxseed, rapeseed, soybeans and mustardseed are the principal oil-bearing seeds exported from Canada."

A table (p. 3) shows acreage and production of Canada's 4 major oilseeds from 1948-52 to 1960. Throughout this period, flaxseed was the leading oilseed, with production growing from 230,000 tonnes to 638,000. Rapeseed grew from a minor crop to the second largest one, 9,000 tonnes in 1948-52 increasing to 250,000 tonnes in 1960. Soybeans are third, having grown from 86,000 tonnes to 154,000. In 1960 rapeseed first surpassed soybeans in production. Most of Canada's rapeseed is grown in the three prairie provinces of Alberta, Saskatchewan, and Manitoba. Virtually all soybeans are gown in southern Ontario. Canada is the world's leading exporter of rapeseed. The leading importers of this rapeseed are Japan (40,128 tonnes in 1960), followed by Italy (37,138 tonnes).

The section titled "Soybeans in Canada" (p. 16) gives statistics (tons exported and dollar value) on acreage and production, and on yearly exports from 1956 to 1960 of soybeans, soybean oil, soybean meal, and total. In 1960, Canada exported $20,939,000 worth of soybeans and soybean products, down from $26,988,000 in 1956. The main trend has been toward increased exports of soybeans and decreased exports of oil and meal [value-added products]. Address: Ottawa, Ontario, Canada.

4791. Egami, Tomi. 1961. Typical Japanese cooking. Tokyo: Shibata Publishing Co. (Exclusive distributors). Rutland, Vermont: Japan Publications Trading Co. 146 p. Illust. (part color). 27 cm. *
• ***Summary:*** Tomi Egami was born in 1899.

4792. György, Paul. 1961. The nutritive value of tempeh. *National Academy of Sciences, National Research Council, Publication* No. 843. p. 281-89. [3 ref]
• ***Summary:*** "The first tempeh preparations and control soybeans used in this study were obtained from Indonesia * (Footnote: *Through the courtesy of Dr. Poorwo Soedarmo, Institute of Nutrition, University of Djakarta, Indonesia) (1954, 1955) and Southern Rhodesia ** (Footnote: **Through the courtesy of the Executive Officer, Nutrition Council, Federal Ministry of Health, Salisbury, S. Rhodesia) (1955). In the following years attempts, largely futile, were made to produce tempeh in our own laboratory. In 1959 a cooperative arrangement has made it possible to produce tempeh and control soybeans on a larger scale in the Department of Food Science and Technology, New York State Agricultural Station, Cornell University, Geneva, N.Y. under the supervision of Drs. D.B. Hand and K.H. Steinkraus. Under this arrangement, animal studies are carried out independently in our laboratory and in the laboratory of the School of Nutrition (Dr. R.H. Barnes), Cornell University, Ithaca, N.Y."

Various rat feeding experiments are described. Hemolysis tests were carried out by Dr. Kiku Murata (Osaka, Japan) in György's laboratory. It was found that "tempeh is stabilized by virtue of an 'antioxidant' produced during the course of the fermentation process. Unfermented soy flour had a high peroxide content and was rancid.

Note: Dr. Paul György was born in Nagyvarad, Hungary, on 7 April 1893. He received his M.D. degree in Budapest in 1915 and later studied at Heidelberg, Germany, where he became a professor of pediatrics. He has made many contributions to the field of nutrition with his studies of vitamin B-6, pellagra, biotin and vitamin H. Since 1944 he has been associated with the Philadelphia General Hospital as a pediatrician and as Professor of Pediatrics at the University of Pennsylvania, a post from which he "retired" in 1960. Address: Chairman, Dep. of Pediatrics, Philadelphia General Hospital, Philadelphia 4, Pennsylvania.

4793. Ikeda, Yasaburo. 1961. Edamame wa namaiki da:

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zuihitsu [Green vegetable soybeans are conceited / impudent / impertinent: Essay]. Tokyo: Kawade Shobo Shinsha. 224 p. 20 cm. [Jap]*
• ***Summary:*** Yasaburo Ikeda lived 1914-1982. Address: Japan.

4794. Japanese Cooking Companions. 1961. Tempura and sukiyaki: Selected 60 recipes. Tokyo: Japan Publications. 56 p. Illust. Index. 21 cm. *
• ***Summary:*** Note: A similar edition (same publisher, same number of pages) may have been published in San Francisco, California, in 1961.

4795. Kobayashi, Kojin. 1961. Iida no miso shôyu shi [History of miso and shoyu in Iida City]. Iida: Shinano Kyodo Shuppansha. 120 p. [Jap]

4796. *National Academy of Sciences, National Research Council, Publication.* 1961. Progress in meeting protein needs of infants and preschool children: Proceedings of an international conference held in Washington, D.C., August 21-24, 1960 under the auspices of The Committee on Protein Malnutrition, Food and Nutrition Board, and The Nutrition Study Section, National Institutes of Health. No. 843. 570 p. Reviewed by Soybean Digest, Nov. 1961, p. 23.
• ***Summary:*** The National Academy of Sciences was established in 1863, the National Research Council in 1916, and the Food and Nutrition Board in 1940.

In Aug. 1960, 33 researchers from 18 foreign countries joined with 42 researchers from the USA in a 4-day conference to review the results of a worldwide research program for the development of protein products suitable for infants and children from indigenous resources such as soybeans, cottonseed, peanuts, and similar products in countries where protein deficiency is most prevalent. This research program has been conducted by the Committee on Protein Malnutrition with funds provided by the Rockefeller Foundation in cooperation with UNICEF, FAO, and WHO. The researchers also met to survey the areas of greatest need for further research, and to evaluate the status of knowledge in protein nutrition.

The 45 research reports in this volume constitute a comprehensive summary of the status of protein nutrition around the world and the technological problems involved in the development of economical protein foods. The papers are divided into the following groups: Central and South America (7 papers). Africa and the Middle East (10). India and the Far East (10). Relevant research in the United States (6). Experimental protein malnutrition in animals (4). Basic principles of protein and amino acid evaluation and potential protein resources (10). Protein problems around the world (3). Summary of the conference. Nomenclature guide to plant products cited.

Autret (p. 537) stated "the No. 1 problem for F.A.O. and for national agricultural departments is the production of protein foods of good quality." Address: Washington, DC.

4797. Ohwi, Jisaburo. 1961. Flora of Japan. English ed., revised and augmented. Edited by Frederick G. Meyer and Egbert H. Walker. Tokyo. May. See p. 1632-1633 [Eng]*
• ***Summary:*** This typewritten manuscript is an English translation of his book *Nihon shokubutsu-shi.* The author was born in 1905. Entries for *Glycine L., Glycine soja and Glycine max* are on pages 1632-1633 of the 2nd roll of microfilm, parts 6-10.

4798. Sakai, Sawako. 1961. Furusato no aji, haha no aji [The taste of my home village food, and of my mother's food]. Tokyo. 269 p. Illust. 19 cm. [Jap]*
• ***Summary:*** The Japanese vegetarian cookbook includes recipes for wild plants. The author was born in 1907.

4799. Sakurai, Yoshito; Nakano, Masahiro. 1961. Production of high-protein food from fermented soybean products. *National Academy of Sciences, National Research Council, Publication* No. 843. p. 251-55. Progress in Meeting Protein Needs of Infants and Preschool Children. [1 ref]
• ***Summary:*** A summary of a detailed report prepared for UNICEF. To improve the keeping properties of natto and broaden its potential uses, dry powdered natto was developed. The fermentation time was reduced to 6-8 hours so that the product would be more suitable for general consumption as a food. After fermentation the beans are spread out on metal trays for drying at low temperatures. either in vacuum or aeration, until the moisture content is less that 5%; then the beans are milled. Address: 1. Director, Food Research Inst., Ministry of Agriculture & Forestry, 2 Hamazono-cho, Kotoku, Tokyo, Japan; 2. Head, Fermentation Div., Food Research Inst., Fukagawa P.O., Tokyo.

4800. Sano, Tamotsu. 1961. Feeding studies with fermented soy products (natto and miso). *National Academy of Sciences, National Research Council, Publication* No. 843. p. 257-68. Progress in Meeting Protein Needs of Infants and Preschool Children. [31 ref]
• ***Summary:*** The author developed a natto powder, low-salt miso powder, and an autoclaved soybean powder for use in combating infant malnutrition in underdeveloped countries. Since 1957 Dr György has been studying these soybean foods in collaboration with the author in hopes of increasing their use in infant diets. The natto powder had a higher content of essential amino acids than the soybean powder. Natto powder gave the best results in growth studies on rats, but the increase in body weight was not as great as when the rats were fed skim milk at the same protein level. The miso powder decomposed into a rancid state and thus was unsuccessful.

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The vitamin B-12 content of natto was found to be higher than that of dry soybeans. Address: President, Tohoku Kosai Hospital, 10 Motoyagura-cho, Sendai, Japan.

4801. Shibasaki, K.; Hesseltine, C.W. 1961. Miso. II. Fermentation. *Developments in Industrial Microbiology* 2:205-14. [1 ref]
• ***Summary:*** "In a search for ways to increase the use of U.S. soybeans in traditional Japanese foods," uses soy grits from specific soybean varieties to make Shinshu Miso and Sendai Miso. The varieties are Chippewa, Adams, Lincoln, Clark, Harosoy, Hawkeye, Hokkaido-Akita, Iwate, Miyagi, Nagano, Chinese. Address: 1. College of Agriculture, Tohoku Univ., Sendai, Japan; 2. NRRL, Peoria, Illinois.

4802. Shin Nichibei Shinbun Sha. 1961. Beikoku Nikkeijin hyakunen shi [A hundred-year history of the Japanese in America]. Los Angeles, California: Shin Nichibei Shinbun Sha. [Jap]*

4803. Shufu-no-tomo-sha. 1961. Ryôri hyakka [Encyclopedia of Japanese cookery]. Tokyo: K.K. Shufu-no-tomo-sha. 768 + 20 p. Illust. Index. 21 cm. [Jap] Address: Tokyo.

4804. *SoyaScan Notes.* 1961. Overview of total miso production in Japan (1934-36, 1952-61). Source: *Shokuhin Kanri Tôkei Nenpo* (Food Industry Statistics Annual Report). [1 ref]
• ***Summary:*** These statistics are from a bundle of documents found in the Kikkoman *kura* in Noda, Japan. Mark Fruin donated a photocopy of all the documents to Soyfoods Center. Statistics are given each year for miso, vinegar, sauce, tomato ketchup, monosodium glutamate, and mayonnaise (from 1952 -1961).

Miso production grew from 596,996 tonnes (metric tons) in 1934 to a peak of 600,750 tons in both 1935 and 1936. No statistics are given from 1937 to 1951, years of disaster for Japan, ending with defeat in World War II.

Starting again, production grew from 381,713 tonnes in 1952, to a peak of 530,078 in 1956, then decreased slowly to 482,357 tonnes in 1961.

4805. *SoyaScan Notes.* 1961. Overview of factory production of miso in Japan (1930-1961). [1 ref]
• ***Summary:*** These statistics are from a bundle of documents found in the Kikkoman *kura* in Noda, Japan. Mark Fruin donated a photocopy of all the documents to Soyfoods Center. Statistics are given each year for miso in 1,000 *kan*, where 1,000 *kan* = 3,750 kg. Farmhouse and home production are not included. Miso production grew from 157,196 in 1930 to a peak of 160,200 in both 1935 and 1936, then fell gradually to 150,221 in 1940, 128,60 in 1942, 140,226 in 1943, and 129,679 in 1944. Then, as Japan was clearly losing the war, it plunged to 77,495 in 1945, 69,887 in 1946, and a low of 50,264 in 1947. In the postwar years, as Japan began to recover, it increased to 94,468 in 1948, dropped to 66,510 in 1950, then began steady growth–101,790 in 1952, rising to a peak of 198,779 in 1956. Then it began to decrease slowly to 180,884 in 1961.

4806. *SoyaScan Notes.* 1961. Chronology of Chico-San, Inc. (Chico, California). 24 March 2011. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1955 Dec.–Herman Aihara and Chiiko (Cornellia) Yokota are married in New York. Cornellia arrived in the United States from Japan in Oct. 1955.

1961 summer–George Ohsawa, fearing that a nuclear war might be near, urges his followers to leave New York and find a place that was safer from radioactive fallout and good for growing rice. After extensive research, they chose Chico, California.

1961 Oct. 1–Thirty two people (11 families) arrive in Chico (in the Sacramento Valley of northern California) from New York City in a caravan of vans, buses, and station wagons. It is an area of fertile farmland where rice is already being grown. Among the people in the group who remained active in work with macrobiotic foods were Bob Kennedy, Herman and Cornellia Aihara, Teal Ames, and Dick Smith.

1961 Dec. 8–The group in Chico has started a bakery named "Chico-San" (Shumway 1961).

1962 March 6–The group in Chico incorporates a new food company named Chico-San, Inc.; it consists of a retail store and an import and wholesale business. It is capitalized with $10,000. In addition to a line of whole-grain products, they soon began to import a variety of macrobiotic foods from Ohsawa in Japan. The first store and food plant (they made sesame salt or *gomashio* and repackaged foods) was in the basement of a small hearing aid shop in Chico. The address was apparently 64, 5th Ave., Chico, California. It became the first macrobiotic food manufacturing company in the USA. Note: Infinity Foods in New York City was apparently the first macrobiotic import and wholesale company.

1962 Christmas–George Ohsawa visits Chico and lectures on macrobiotics.

1963–Ohsawa lectures in Boston (Massachusetts), New York City, and at the fourth macrobiotic summer camp in Chico. Lima Ohsawa and Cornellia Aihara give cooking classes. In Chico, Ohsawa suggests that the group try making rice cakes. He sends them a rice cake machine from Japan and production began in the fall of 1963. Rice cakes soon became Chico-San's first really popular and successful product.

1963–Junsei Yamazaki emigrates to Chico, California, from Japan.

1964–Yamazaki starts to make miso and shoyu for Chico-San.

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1966 April 24–George Ohsawa dies. The Ohsawa Foundation now has offices in Los Angeles, New York, Paris and Tokyo.

1968 fall–Bob Kennedy of Chico-San signs a contract with the Lundberg brothers of Wehah Farm (Richvale, California) to grow short-grain brown rice organically, exclusively for Chico-San. Chico-San agrees to buy all brown rice planted in 1969.

1969–Lundberg brothers plant 78 acres of brown rice, which is harvested in the fall. Because of Chico-San's successful advertising campaign, one third of this crop as sold in advance and all was sold before the next year's crop was available. The rice

1969 fall–Wendell Lundberg visits Erewhon.

1970–Chico-San contracts for 200 acres of brown rice this year with Lundberg.

1970–Spiral Foods is organized by Chico-San and Peter Milbury to distribute Chico-San products directly to retail stores in the greater San Francisco Bay Area.

1970–Herman Aihara and Bob Kennedy establish the George Ohsawa Macrobiotic Foundation (GOMF). Junsei Yamazaki makes his first big batch of miso. First summer camp at French Meadows. Herman and Cornellia make their first nationwide teaching tour.

1971–Noboru [not Naboru] Muramoto sensei arrives.

1972–The book *Miso and Tamari,* by Herman Aihara published.

1972 Sept. 14.–Fire destroys the Chico-San plant. It started as a short in a rice-cake machine. Chico-San is out of business for several months. The company resumed business at another location across town. But Chico-San lost its exclusive right to distribute Lundberg organically grown brown rice as the company had been unable to package and ship rice and rice products for several key months during the peak sales season.

1973–Herman Aihara establishes the Vega Institute in San Francisco. Noboru Muramoto lectures and his first book, *Healing Ourselves,* is published.

1974–Herman Aihara moves GOMF to Oroville from San Francisco. *Soybean Diet,* by Herman published.

1976. Muramoto moves to Glen Ellen.

1984 Nov. 19–Heinz U.S.A. acquires Chico-San Inc. a manufacturer and marketer of rice cakes and related products. Privately held Chico-San (headquartered in Chico, California) operates rice-cake production facilities in California, Mississippi, and New Jersey. Founded in 1962, the company has about 340 employees.

1985 Jan.–The Quaker Oats Company acquires the Arden Rice Cakes business. The natural foods portion of the business is incorporated under the Mother's brand. Chico-San is based in Chico, California; Arden in North Carolina.

4807. Tokashiki, Tsûukan Peichin. 1961. Gyozen honzô [Food herbal]. Okinawa. [Jap]*

• ***Summary:*** E.H. Walker (1976) states that this edition mentions *Glycine max* (Vol. 5, p. 5): "Originally published in about 1860. Treats animal as well as plant foods, with Japanese names only... A new edition was published in 1961 in Okinawa. The author lived 1793-1845."

4808. Umeda, Isao. 1961. Shôyu [Shoyu (Japanese soy sauce). 3rd ed.]. Tokyo: Sankyo Shuppan Co. 238 p. See also 1963 ed. [100+ ref. Jap]
Address: Noda Shoyu Shiken-shi cho. Head, Noda Shoyu Research Lab.

4809. Yokoyama, Yohan. 1961. Shôyu no jôzô to gôseihô; fu sôsu seizô-hô [Shoyu: Fermentation and synthetic methods, with a supplement on the manufacture of Worcestershire style sauce]. Tokyo: Meibundo. 435 p. [Jap]

4810. Watanabe, Tokuji. 1961? Studies on tofu production from U.S. soybeans (2). Food Research Institute, Japan. 11 p. Undated. Typed, without signature. [2 ref. Eng]
• ***Summary:*** Contents: 1. Experiments in the laboratory: Weight per 1,000 seeds, color of seed coats and color of hilum of U.S. and Japanese soybeans, speed of water absorption in U.S. and Japanese soybeans, protein and fat contents of U.S. and Japanese soybeans, water-solubility of protein in U.S. and Japanese soybeans, natures of soy milk obtained from U.S. and Japanese soybeans. 2. Production test of tofu: Production method of tofu, comparison between the tofu made from U.S. soybeans and that from the Japanese, choice of U.S. soybean variety suitable for tofu production. 3. Improvement of production methods.

Tables show: (1) Properties of U.S. and Japanese soybeans (Japanese: Nagano, Hokkaido, Miyagi, Aomori, Kumamoto. U.S.: Harosoy, Hawkeye, Adams, Chippewa, Clark, Lincoln, Blackhawk, Acme, Ottawa Mandarin, Norchief, Comet, Lee, Jackson, Dorman, Dortchsoy, Ogden, Wabash, Monroe, S-100, Capital, Flambeau, Shelby, Ford, Hardome, Renville, Lindarin, Perry, Grant; For each variety is given: Weight per 1,000 seeds, color of seed coat, color of hilum, remarks). (2) Nitrogen content and nitrogen outflow of U.S. and Japanese soybeans. (3-1) Influence of the quantity of water added on the nitrogen solubility of soybeans. (3-2) Influences of the length and temperature of heating on the nitrogen solubility of soybeans. (4) Comparison between U.S. and Japanese soybeans in tofu production (for each variety is given: Percentage of protein and fat in the soybeans. Protein in laboratory soy milk {%}. Protein in factory soy milk {%}. Weight of tofu {kg from 1.8 kg of soybeans}. Yield rate of tofu {% of solids in soybeans appearing in tofu, dry basis}. Yield rate of protein {% of protein in soybeans appearing in tofu}. Protein in tofu {%}. Height of tofu {cm}. Moisture of tofu {%}. Hardness of tofu {using penetrometer; large value = soft tofu}. Properties of tofu–Coagulation, texture, color {3 = excellent, 2 = good,

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1 = fair}). (5) relationship of water-soluble protein + fat in soybeans to weight, protein, and fat contents of tofu. (6) Volume and composition of okara. (7-1) Properties of tofu at various doses of coagulant and various tempos [speeds] of coagulation.

Note: A Japanese version of all tables is given on unnumbered pages at the end. Address: Food Research Inst., Japan.

4811. Arimoto, K.; Tamura, E.; Matsuno, N.; Obata, Y. 1962. Daizu seihin no eiyô-ka ni kansuru kenkyû. III. Funmatsu nattô no jintai shôka kyûshû shiken [Research on the nutritional value of soyfoods. III. Experiments on the digestion and absorption of powdered natto in the human body]. *Kokuritsu Eiyo Kenkyusho, Kenkyu Hokoku* (*Research Report of the National Institute of Nutrition*). p. 46-48. Jan. 10. [Jap]
• ***Summary:*** Natto was ground into a flour for use as a food or food supplement.

4812. Japan Oilseed Processors Association (JOPA) is founded in Tokyo (Early event). 1962.
• ***Summary:*** The following are answers to questions about the origin of JOPA submitted by Soyinfo Center to Yoshinori Komura who was executive director of JOPA for 16 years from May 1997 until 2013.

JOPA was founded on 25 Jan. 1962 when members held the inaugural assembly. The government authorized its foundation on 25 Feb. the same year.

31 companies and 1 cooperative union of small oil millers initially participated in JOPA. The members included not only seed crushers but also refiners and oil processors.

In Japan the fiscal year begins in April and ends in March. The number of members were 34 at the end of March 1963. 2 companies joined JOPA after its foundation.

Mr. Yukio SAKAGUCHI, the president of Nisshin Oil Milling Co., was the first president of JOPA; he was also one of the core members who founded JOPA. JOPA also elected 2 vice presidents; they were Kyoji SUZUKI, the president of Ajinomoto Co., and Junnosuke HAYASHI, the president of Kumazawa Oil Milling Co.

The first address of JOPA's office was 2-9, Kayabacho, Nihonbashi, Chuo-ku, Tokyo. Later JOPA moved to its present address, Yushi-Kogyo kaikan, 3-13-11, Nihonbashi, Chuo-ku, Tokyo.

What were the main reasons for founding JOPA? Before the foundation of JOPA, there used be an association named "Japan Oil Manufacturing Association" (*Nihon Yushi Seizo Gyokai*). It was founded on October 1940 and dissolved in 1964. In its history, the biggest member company suddenly withdrew from JOMA in May 1961. I do not know why and the persons concerned with the company have gone to paradise without ever explaining their reason. It was actually a mystery. Therefore JOMA really lost its functions. The Minister of Agriculture & Forestry was anxious about this trouble and asked the other main crushers to re-organize the association. And main members at JOMA began to discuss the foundation of the new association and reached the conclusion to settle a new association by the end of 1961.

In Japan, the main role of the industrial association is lobbying to the government. On the other hand, the main function of industrial association used to be recognized as being the end unit of administration of the government. The important information of policy making was distributed just to the industrial association and therefore a company not joining to its association could never get any kind of information from the government.

The initial Japanese name of JOPA was *Nihon Yushi Kyokai.* In May 1991 the name was changed to *Nihon Shokubutsu-yu Kyokai*–which is still JOPA's name at present. "Nihon" means "Japan" or "Japanese." "Yushi" refers to any kind of oils and fats. *Kyokai* means "association." *Shokubutsu* means plants or vegetables, and *yu* means oil, so *Shokubutsu-yu* means vegetable oil. Members of JOPA have always processed only vegetable oils.

Note: JOPA's website (entirely in Japanese) is at www.oil.or.jp. On it is a history and a chronology of JOPA.

4813. Hino, Tetsuo; Tsunoda, T.; Tsuchiya, T.; Narui, K.; Tsuchiya, M.; Usui, A. 1962. Tanpakushitsu no kasui bunkai ni yoru chômiryô no seizô. IV. Dasshi daizu no ensan kasui bunkai ni okeru amino-san no shôchô [Preparation of seasonings by the hydrolysis of proteins. IV. Studies on the liberation and the degradation of amino acids during hydrochloric acid hydrolysis of soybean meal]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 36(1):82-85. Jan. [9 ref. Jap]
Address: Ajinomoto Co., Inc.

4814. Hino, Tetsuo; Kimizuka, A.; Ito, K.; Takenishi, T.; Ogasawara, T. 1962. Tanpakushitsu no kasui bunkai ni yoru chômiryô no seizô. V. Dasshi daizu ensan kasui bunkaieki-chû no chûsei karuboniiru kagô-butsu no kensaku ni tsuite [Preparation of seasonings by the hydrolysis of proteins. V. Research on neutral carbonyl compounds in the hydrochloric acid hydrolysate of soybean meal]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 36(1):85-91. Jan. [9 ref. Jap]
Address: Ajinomoto Co., Inc.

4815. Kosuge, Takuo; Kamiya, H.; Adachi, T. 1962. Nattô no nioi no seibun ni tsuite [A odorous component of natto, fermented soy-beans]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) 82(1):190. Jan. [3 ref. Jap]
• ***Summary:*** In this half-page "Communication to the editor," the authors claim that tetramethylpyrazine formed by the natto bacterium, *Bacillus natto,* is responsible for the unique odor (*nioi*) of natto. Address: 1. Shizuoka College of

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Pharmacy; 2. Shizuoka Factory of Yakult Co. Both: Shizuoka city, Shizuoka prefecture, Japan.

4816. Strayer, George M. 1962. The place of certification in the future soybean industry. *Soybean Digest.* Jan. p. 16-17. [14 ref]
• ***Summary:*** The author suggests that soybeans be certified as to variety for export commercially to meet the needs of a large and growing market for food abroad. This applies especially to Japan, for which examples are given.

4817. Paddleford, Clementine. 1962. Japanese dishes making hit in U.S. *Los Angeles Times.* Feb. 8. p. C12.
• ***Summary:*** New York–Japanese foods are everywhere in neighborhood and specialty shops throughout America." This week the writer sampled 50 Oriental delicacies. "The basic Japanese food exports remain with us as always the king crab meat, the Mandarin orange, the white tuna fish. Old friends are also the seasonings, Japanese Shoyu sauce, rice wine vinegar, the ajinomoto which is the monosodium glutamate to enhance the natural food flavors of meat, poultry, fish and vegetables." Also mirin, instant rice with seaweed, and *yuechizuke* which is "egg plant in soya bean paste" [miso].

Note: This is the earliest English-language document seen (March 2009) that uses the term "soya bean paste" to refer to miso.

"The Japanese soy sauce called shoyu is claimed more delicate than the Chinese version. Delicious for gravies and barbecue sauces." Address: Herald Tribune News Service.

4818. *New York Times.* 1962. A choice of new books for the younger reader's library. Feb. 25. p. BR19.
• ***Summary:*** Contains a book review of *Taro and the Tofu,* by Masako Matsuno [a woman]. Elizabeth Hodges wrote the review for children ages 6 to 8. It begins: "One cold night in Japan when the peddler from whom Taro's mother always bought the tofu (bean curd) for the family supper did not appear, Taro went to the old man's shop." A large illustration from the book shows Taro.

4819. Fukamachi, Chiharu; Suruga, Sachiko. 1962. [Qualification of coagulating reagent for tofu manufacture. I. Method of qualification of coagulating reagent (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 16. p. 112. Feb. [1 ref. Jap; eng]
• ***Summary:*** Calcium sulfate is the main coagulant used in making tofu from soybean milk, but calcium chloride and magnesium chloride are also used, alone or with calcium sulfate.

Besides these salts, some other chemicals are also available for this purpose, but there are technical difficulties in applying them to the coagulation of soybean milk.

This paper reports on the establishment of a standard method for evaluating the suitability of soybean milk coagulants on a laboratory scale. By this method, calcium gluconate, as an examined, and was found to be unsuitable as a coagulant.

Reprinted from *Nosan Kako Gijutsu Kenkyu Kaishi* (*J. for the Utilization of Agricultural Products*) 8(3):129+ (1961). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4820. Fukamachi, Chiharu; Suruga, Sachiko. 1962. [Qualification of coagulating reagent for tofu manufacture. II. Comparison of commercial coagulating reagents (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 16. p. 113. Feb. [1 ref. Jap; eng]
• ***Summary:*** In a previous paper, it was shown that coagulants with a fine crystalline structure were not suitable for making tofu, because they coagulated soymilk so quickly that control of the process was very difficult.

In this report, the pH of eleven tofu coagulants were observed in water. Coagulants with a low pH (such as 5.1) in suspension had limited latitude in the amount used and also gave low yields of tofu. It was concluded that such chemicals were not for making tofu.

Reprinted from *Nosan Kako Gijutsu Kenkyu Kaishi* (*J. for the Utilization of Agricultural Products*) 8(3):129+ (1961). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4821. Hino, Tetsuo; Kimizuka, A.; Ito, K.; Takenishi, T.; Ogasawara, T. 1962. Tanpakushitsu no kasui bunkai ni yoru chômiryô no seizô. VI. Dasshi daizu ensan kasui bunkai eki-chû no tansosû 5 no chûsei karuboniiru kagô-butsu ni tsuite [Preparation of seasonings by the hydrolysis of proteins. VI. Neutral C_5 carbonyl compounds in the hydrochloric acid hydrolysate of soybean meal]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 36(2):120-23. Feb. [6 ref. Jap]
Address: Ajinomoto Co., Inc.

4822. Kamada, Hidemoto; Nakano, Masahiro; Higurashi, Yasuo. 1962. Daizu seihin no chakushoku ni kansuru kenkyû. IX. [Browning reaction of soybean products. IX. Color formation of shoyu during brewing (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 16. p. 114. Feb. [1 ref. Jap; eng]
• ***Summary:*** Color formation of shôyu (soy sauce) and of an amino acid-sugar system during browning were investigated.

Color formation in shoyu was caused by the reaction between amino acids and sugar, especially pentose (a monosaccharide sugar with five carbon atoms). It was found to be unlikely that the reaction between amino acids and reductone or active carbonyl compound would be significant in color formation of shoyu during brewing (fermentation).

Color formation during fermentation of the mash

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(*moromi*) and pasteurization (at 82ºC for 30 minutes) of shoyu obtained from the mash were accompanied by a decrease in the pentose content.

Concentration of pentose had a significant effect on the rate and extent of browning of an amino acid-sugar system.

The presence of oxygen had a marked effect on color formation in the mash, but no effect on color formation during pasteurization of shoyu.

Reprinted from *Nosan Kako Gijutsu Kenkyu Kaishi* (*J. for the Utilization of Agricultural Products*) 8(1):6+ (1961).
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4823. Kamada, Hidemoto; Nakano, Masahiro. 1962. Daizu seihin no chakushoku ni kansuru kenkyû. X. [Browning reaction of soybean products. X. Characteristics of color of mieki [HVP soy sauce] (Abstract)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 16. p. 115. Feb. [1 ref. Jap; eng]
• ***Summary:*** The majority of color constituents of Mieki (HVP soy sauce launched by Ajinomoto in 1950) was precipitated by mixing with an equal volume of ethanol (ethyl alcohol).

The color intensity of Mieki stored at 38ºC for 30 days developed slightly, but never developed in the absence of oxygen.

The addition of amino acids had no effect on the color intensity of Mieki stored at 38ºC for 30 days.

Addition of the sugars xylose, galactose, and glucose caused significant browning in Mieki stored at 38ºC, however sodium bisulfite, sodium sulfite, and sodium cyanide inhibited browning.

Sunlight caused browning of Mieki, but not in the absence of oxygen.

Reprinted from *Nosan Kako Gijutsu Kenkyu Kaishi* (*J. for the Utilization of Agricultural Products*) 8(1):12+ (1961).
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4824. Kato, Hiromichi; Sakurai, Yoshito. 1962. Daizu seihin no kappen kikô ni kansuru kenkyû. II. Hiire shôyu no chakushoku nôka genshô ni okeru 3-deokishioson-rui, hekisôsu oyobi pentôsu no yakuwari [Studies on browning mechanisms of soybean products. II. Roles of 3-deoxyosones, hexoses and pentoses for the darkening of pasteurized soy-sauce]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 36(2):131-37. Feb. [15 ref. Jap]
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo.

4825. Matsuno, Masako. 1962. Taro and the tôfu. Cleveland, Ohio, and New York, NY: The World Publishing Company. 32 p. Feb. Illust. by Kazue Mizumura. 26 cm.
• ***Summary:*** This story, set in Japan, is for children aged 6 to 8. Taro goes to market to buy tofu from a store. He discovers that he has been given too much change. A little voice inside his head tempts him not to return it, to buy some more candy; No one will ever know. But he resists temptation and does what is right, even though it is cold and windy outside, and promptly returns the extra money to the peddler. “He was so happy he wanted to run all the way home.”

The dedication page states: “For my first son.” Each right-hand page contains a large color illustration, including: (1) The old tofu peddler lifting a cake of tofu out of his box, about to put it into Taro’s pail. (2) The tofu seller blowing his trumpet / horn as he carries his tofu in boxes using a shoulder pole. (3) The tofu man deep-frying his tofu.

4826. *New York Times.* 1962. Japanese foods are available here. March 29. p. 26.
• ***Summary:*** Gives five Japanese recipes–most calling for monosodium glutamate. The recipe for “Bean soup” [miso soup] calls for “three tablespoons soy bean paste” [miso] and an unspecified number of “cubes of tofu (bean curd).”

4827. Allewelt, R.W. 1962. Japanese boom sparks U.S. soybean gains. *Foreign Agriculture* 26(3):11. March.
• ***Summary:*** Japanese-American Soybean Institute contributed to the growth of this market for U.S. soybeans. Address: Fats and Oils Div., Foreign Agricultural Service, USDA.

4828. Saito, Masataka; Takasawa, Hiroshi. 1962. [Studies on the influence of low-temperature on soybean plants. II. Influence of low-temperature at various growing periods on plant growth and seed yields]. *Hokkaido Nogyo Shikenjo Iho* (*Hokkaido National Agricultural Experiment Station, Research Bulletin*) No. 78. p. 26-31. March. [10 ref. Jap; eng]

4829. Komori, Saburo; Shigeno, Yoshihiro. Assignors to Riken Vitamin Oil Company, Ltd. 1962. [Epoxidation of soybean oil esters]. *Japanese Patent* 1114. April 30. Application filed 26 March 1959. 2 p. (Chem. Abst. 59:6581g). [Jap]*
• ***Summary:*** The main starting material is soybean oil with an acid value of 0.5, saponification value of 192.6, and iodine number of 135.1. The main end product is epoxidized soybean oil.

4830. Hayashi, Shizuka. 1962. More U.S. soybeans in tofu. *Soybean Digest.* April. p. 25.
• ***Summary:*** There are more than 54,000 tofu makers throughout Japan. They use approximately 300,000 tons of soybeans annually. Address: Japanese-American Soybean Inst.

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4830a. Product Name: [Seitan].
Foreign Name: Seitan.
Manufacturer's Name: Marushima Shoyu K.K.
Manufacturer's Address: Kamigata-dori Ko 881, Uchiumi-cho, Shodo-gun, Kagawa-ken, Japan.
Date of Introduction: 1962.
Wt/Vol., Packaging, Price: 3.5 oz jar.
How Stored: Shelf stable.
New Product–Documentation: Note: This is the world's earliest known commercial seitan product. It was first imported to the USA by Erewhon Trading Co. in 1969.

Talk with Aveline Kushi. 1992. April 9. The first seitan imported to America was made by Marushima Shoyu Co. on Shodoshima in Japan. George Ohsawa went to visit the company, talked with Mr. Mokutani (who is still the chairman, and a close friend of the Kushis, and a great admirer of Ohsawa), and showed him how to make it. Marushima began to make seitan commercially in the late 1960s. It was imported to America by Muso Shokuhin at about the same time the first miso and shoyu were imported. She thinks it came in small jars, and was so salty that she used it as a seasoning in place of soy sauce in stews (such as soybean stews) or cooked it with vegetables; this cooking made it softer. This seitan probably started to be imported to America in about 1969.

Letter (fax) from Yuko Okada of Muso Co. Ltd., Japan. 1992. July 2. "I remember the term 'seitan' since I was a kid; it was probably coined by George Ohsawa. Sei means 'is' and tan is the first character in the Japanese term tanpaku, which means 'protein.' So seitan means something like 'right protein substitute.' Marushima Shoyu Co. developed seitan commercially in Japan and Muso has carried their seitan since Feb. 1966 when we started. We shipped seitan to Erewhon on a regular basis from 1968. [Note: Kotzsch. 1984, Dec. East West Journal p. 14-21 states that Muso began to export foods in 1969.] We also exported it to Chico-San [in the USA]. In Europe, we exported seitan to Paris, France." This seitan went to Institut Tenryu, which had a little macrobiotic food shop in Paris run by Madame Francoise Riviere. The first seitan Muso exported to Australia went to Spiral Foods.

Muso Shokuhin. Pure Heart–Muso general catalogue. 1990 July. p. 41. A color photo shows a 180-gm jar of Seitan. The product name is written in English (i.e., in roman letters). Under that, it is written smaller in katakana. Above the company name and address is written: "Sakurazawa Nyoichi shido" which means, "Made under the guidance of George Ohsawa."

Talk with Mr. Kiyoshi Mokutani, president of Marushima Shoyu K.K. in Japan. 1992. July 12. "The invention and development of seitan in Japan." He invented seitan in 1961-62 and took a sample to George Ohsawa, who coined the term "seitan" upon seeing it. Commercial production began in 1962. For details, see interview.

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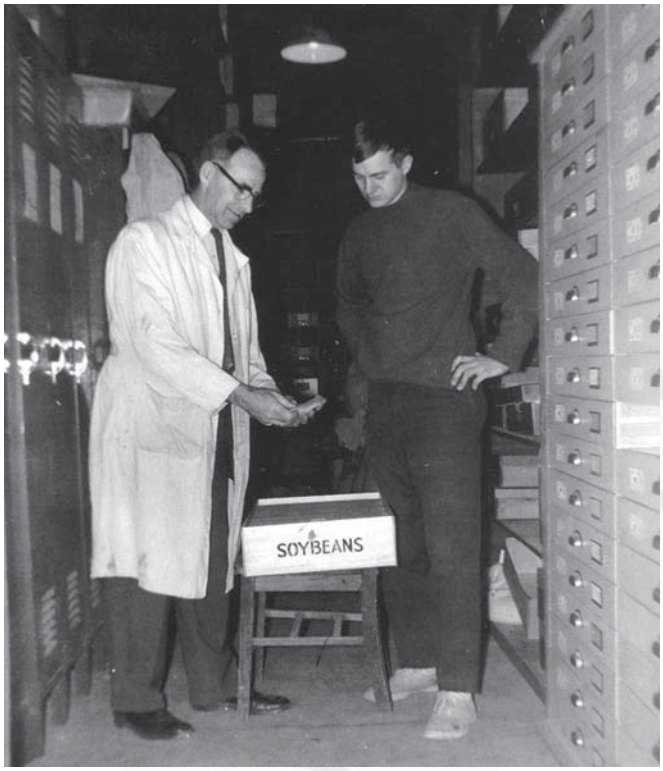
4831. Miyasaka, Shiro. 1962. Instruçoes prácticas: Cultura da soja [Soybean culture]. *O Agronomico* (*Campinas, SP, Brazil*) 14(3/4):10-22. March/April. [Por]
Address: Eng. Agr.

4832. Onishi, Hiroshi; Saito, Narimasa. 1962. Studies on osmophilic yeasts. XIV. Partial purification of polyol dehydrogenase from *Pichia miso* and the properties of this enzyme. *Agricultural and Biological Chemistry* 26(4):245-51. April. [37 ref. Eng]
Address: Noda Inst. for Scientific Research, Noda City, Chiba-ken, Japan.

4833. Photographs of William Brandemuhl studying soyfoods in the USA and Japan. 1962. Japan.



• ***Summary:*** William Brandemuhl was a pioneer in studying and writing about soyfoods in Japan after World War II. According to Tomoko Brandemuhl these black-and-white photographs (each 4½ by 6½ inches) were taken by a Japanese newspaper or magazine photographer. All but the first two were taken in Japan in 1963.

(a) The first time he saw soybeans, at the University of Wisconsin (April 1962). (b-d) Studying how tamari is made in Japan. (e) Checking and smelling koji made in small, traditional wooden koji trays. (f) Tasting shoyu or tamari. (g) Examining koji. (h) Cutting fresh tofu. (i) Unwrapping the cloth from freshly pressed tofu. (j) For transportation in Kyoto he used this scooter to visit various places that made or did research on soyfoods.

These photos were sent to Soyinfo Center in Aug. 2012 by Tomoko Brandemuhl (Stratford, Connecticut), his wife.

4834. *Christian Science Monitor.* 1962. The new and the old. May 10. p. B5.
• ***Summary:*** Contains a book review of *Taro and the Tôfu,* by Masako Matsuno. The review, by "M.S." begins: "The agonizing decision is, shall Taro return the extra change the old tôfu (bean curd) seller mistakenly gave him, or shall he keep it and buy some candy?"

4835. *Chicago Daily Tribune.* 1962. Gay fantasy for youngest readers. May 13. p. F4.
• ***Summary:*** Contains a book review of *Taro and the Tôfu,* by Masako Matsuno. The review, by "P.G." begins: "Taro is a little Japanese boy and tofu is a small white cake (bean curd) and an important Japanese food." "The child's first encounter with temptation is appealingly described." An illustration shows the cover of the book (Published by World, $3).

4836. Lee, Elinor. 1962. Japanese cooks are true artists. *New York Times.* May 20. p. L24.
• ***Summary:*** Describes how to make Sukiyaki over a hibachi (charcoal brazier). The recipe calls for "2 pounds of tenderloin beef cut into thin slices... and 12 pieces of tofu

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(soybean curd) cut into small cubes." Address: Staff reporter.

4837. Claiborne, Craig. 1962. Food news: Pizza vs. poi in Honolulu. *New York Times.* May 28. p. 32.
• ***Summary:*** East meets West on supermarket shelves in Hawaii. "More than half the population of the island of Oahu is of Japanese or Chinese origin..." The "endless kinds of exotic foods in plastic containers" include "tofu or bean curd, [mung] bean sprouts and poi, the poi made of arrow root..."

4838. Claiborne, Craig. 1962. Food news from Tokyo: Cuisines of virtually every country offered at all prices in restaurants. *New York Times.* May 30. p. 7.
• ***Summary:*** The article begins: "There is probably no city in the world today with a more fascinating and varied cuisine than Tokyo." The Imperial, perhaps the city's most famous hotel, offers a wide selection, including sukiyaki.

In Tokyo, the typical Japanese restaurant is small and does not offer a menu. It will often specialize on one or two full-course "dinners built around one particular food. That food may be game, for example, or raw fish, or tofu, which is soy bean curd, or beef."

Tofu is typically found in sukiyaki. For "batayaki, slices of matsuzaka beef, spectacularly marbled," are served with a dipping sauce, which includes "grated long radish [*daikon*] in shoyu (soy sauce), mustard and seven spices, including Japanese pepper, ground poppy seed, cayenne pepper, sesame seeds, seaweed, dried orange peel and hemp seed."

In recent years, "beer seems to have replaced sake as Japan's national drink." Address: Special to the New York Times.

4839. Hayashi, Shizuka. 1962. Opportunity grows for expanding outlook for [soybean] meal: Japanese American Soybean Institute. *Soybean Digest.* May. p. 50-51.
• ***Summary:*** "Meat and daily products are well known as good sources of protein and fat. But their cost is much too high in Japan, as compared with soybean foods, to be included in the daily diet. Also, production is limited, especially in the case of meat.

"If we were to take soybeans out of the food supply one can easily guess what might happen. The intake of oil and fat, although it has been steadily increasing in recent years, is still exceedingly poor. With an annual intake of less than 10 pounds per capita, Japan ranks among the nations of the lowest level in this regard. The import of soybeans and other oilseeds is shown in table 2.

"Based on the above analysis, the market development program for soybeans in Japan has largely emphasized promotion to increase the consumption of soybean oil. Of course, equal efforts are being exerted in encouraging more consumption of other soy products.

"Our promotional and educational activities extend to all the housewives in urban and rural areas, encouraging increased consumption and creating more interest, through the nationwide network of home economists and extension Workers of the Ministry of Agriculture and Forestry, of nutritionists of 800 health centers under the Welfare Ministry, numerous Women's associations and school teachers throughout Japan, as well as television and radio, newspapers and magazines.

"One hundred million people cannot be reached in a short time. To persuade them is even more difficult. Any public relations program is better than none, but to achieve results requires patience and repetition. Never before has the average Japanese person been as conscious of the soybean and its nutritional values, comparing favorably with meat and fish, as he is today.

"Soy flour is a relatively new product which is becoming popular. JASI has made an arrangement with the Japan School Lunch Association of the Ministry of Education to promote the use of 5% to 10% soy flour in school lunch bread, and also its utilization in school lunch dishes. Children registered in the school lunch program number about 10 million and the number is increasing. Beside utilization in school lunches, soy flour is now used in making ice cream, spaghetti and macaroni, hot cakes, biscuits and cookies, sausage curry, and many other items.

" Soybean meal could be used in a much larger percentage in livestock feeds in Japan than it is now. At present, only 5% of the total production of over 3.5 million tons of mixed feeds is soybean meal. JASI is on the job to raise this level to 20% or 30%.

"Because the import of soybeans for many years after the war was allocated with the quantity limited to take care of minimum requirements, the price of soybean meal remained too high, compared with the world market, to be liberally consumed in livestock feeds. This restriction was lifted on July 1, 1961, allowing soybeans to be freely imported into Japan. The price of soybean meal will naturally be lowered to compare favorably with other protein meals. At least it should become competitive with meal produced in other countries–especially when its import into Japan becomes free. This is expected next October.

"From now on soybean meal will have a chance in livestock feeds perhaps equal to that of other meals. However, to break into the field where fish and other meals have been strongly established for many years, soybean meal needs to be promoted vigorously. Mixed feed manufacturers as well as the end users of feeds need to be informed of the new situation. Many even need to be educated to the value and efficiency of using soybean meal in much larger quantities than at present.

"To encourage adoption of feed formulas used in the United States and other countries, which include soybean meal up to 30% or more, could be an effective means of achieving results. Livestock farmers as well as manufacturers seem generally to know the value of soybean meal. But

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before they will use a larger percentage of it they need to be persuaded by authentic experimental data. JASI recently arranged with one of the prefectural governments to carry out tests at the experiment stations, the data to be used for that purpose. Government reports are influential and help to guide the industry.

"Exports from Japan: There is no country in the world today where soybeans are utilized as food in such versatile ways as they are in Japan as miso in wet and instant powdered form, soy sauce, tofu, natto, kinako, aburaage (fried tofu), yuba and so forth. These could be just as good foods in all other countries as they are in Japan. For example, there is nothing better than the naturally brewed soy sauce for cooking, especially in sukiyaki or barbeque.

"Importers and dealers abroad should not overlook exploring possible markets for these foods. Some are already in world markets, but only a bit of the surface is being scratched."

Tables show: (1) Japan's food supply (1961) (including imports). The four columns are: (a) Name of food. (b) Value (in US$1,000). (c) Protein grams (per day). (d) Fat (grams per day). The four main sources of protein are rice (20.1 gm), fish (11.7 gm), soybeans and soybean products (10.4 gm), wheat (10.2 gm).

(2) Japan's imports of soybeans (1957-1961), all countries vs. USA alone, amount and value.

(3) Imports of other oil-bearing seeds (1957-1961). In 1961 the leaders, after soybeans, were linseed, cottonseed, copra, safflower seeds.

A small photo shows Shizuka Hayashi. Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building No. 1, 1-Chome Yurakucho Chiyoda-Ku, Tokyo, Japan.

4840. Kato, Yasumasa; Yanagisawa, Yukio. 1962. [Studies on nitrogen metabolism of soybean leaves. II. Protein metabolism of petiole-girdled leaves with special reference to the behavior of nitrogen liberated by protein breakdown]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 30(3):249-52. May. [6 ref. Jap; eng]
Address: Faculty of Textile Science and Technology, Shinshu Univ.

4841. Oizumi, Hisakazu; Nishiiri, Keiji; Katsura, Isami. 1962. [Function of leaves in soybean plants. I. Growth, dry matter, nitrogen, phosphorus, potassium and carbohydrate contents of each leaf]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 30(3):253-56. May. [4 ref. Jap; eng]
Address: Tohoku Univ. Agric. Exp. Station.

4842. Scott, Walter M. 1962. Current status of soybean research under P.L. 480. *Soybean Digest.* May. p. 44, 46-48.
• ***Summary:*** Gives a summary of progress on grants approved prior to Sept. 1971 in Finland, France, Israel, Italy, Japan, Poland, Spain, and the United Kingdom. There are now additional proposals under consideration in France, Indonesia, Israel, Italy, Japan, and Spain. For each project, the size of the grant in that country's currency is given.

In Finland, for example, a grant has been approved for an "Investigation of continuous multistage countercurrent crystallization of linseed and soybean fatty acids as a practical method of producing pure unsaturated fatty acids," by the University of Helsinki, Viik, Malmi. Amount: $70,500. Approved Feb. 1960. Address: Asst. Director, Foreign Research and Technical Programs Div., ARS, USDA.

4843. Claiborne, Craig. 1962. Food news from Noda: Soy sauces. *New York Times.* June 4. p. 24.
• ***Summary:*** The writer, on a trip to Japan, is now visiting Noda and Kikkoman, maker of one of Japan's finest soy sauces, "which, within recent months, has become widely distributed in the United States.

There are two Kikkoman soy sauce plants in Noda. One, which covers several acres, is equipped with the most modern processing and bottling equipment. The other is a picturesque, ancient building at the edge of a lake encircled by iris. Here, "soy sauce for the imperial household is made almost entirely by hand." The soy sauce is fermented in wooden vats, whose outside is painted vivid tangerine red and bamboo green.

Behind the soy sauce made in Noda stands a wealth of tradition, for here (as family records show) the Mogi family has supervised the production of soy sauce for three centuries. The current president of the company is Keizaburo Mogi, a tall gentleman, who takes pride in showing the writer around the premises. Yuzaburo Mogi, his son, age 27, also a company officer, earned his master's degree last June in business administration at Columbia University (New York City).

The company now makes 55 million gallons per year of soy sauce, of which about 3% is shipped to the USA, and much of that to Texas, where it is popular at barbecues.

The process for making soy sauce is described. The moromi mash is fermented for 12-18 months, until it has fully matured.

Soy sauce is believed to have originated in China and to have been introduced into Japan in 552 A.D. together with Buddhism. At that time, the seasoning was named *hishio,* "and like salt in ancient Rome, was supplied to civil and military officials of the Imperial Court as part of their salary."

It was not until about 1532 that the word shoyu, the present name for soy sauce in Japan, came to be used. The soy sauce plant at Noda was started about 100 years later.

Formerly, China was the chief supplier of soy beans to

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Japan. Today the great majority of soy beans used at Noda are imported from Illinois and Iowa. Address: Special to the Times.

4844. Fukushima, D. Assignor to Noda Industrial Science Research Institute. 1962. [Modification of alcohol treatment of soybeans for fermented products]. *Japanese Patent* 6313. June 28. [Jap]*
• ***Summary:*** Describes solvent extraction using ethyl alcohol. Address: Kikkoman.

4845. Tokunaga, T.; Yoshitomi, K.; Akioka, A.; Yamamoto, S. Assignors to Nisshin Oil Mills. 1962. [Deodorization and improvement of digestibility of defatted soybean flour]. *Japanese Patent* 6315. June 28. [Jap]*

4846. Schroeder, Peter B. comp. 1962. Japanese serial publications in the National Agricultural Library. *USDA Library List* No. 72. iii + 172 p. June. No index. 28 cm. [1100* ref]
• ***Summary:*** Names of Japanese serials and publishers are written in both Romaji (English transliteration) and Kanji (Chinese characters). Part I: Publications dealing with multiple agricultural subjects (p. 1-39). Part II: Publications dealing with specific subjects (p. 41-124). Part III: Alphabetic list of publications (p. 125-48). Part IV. List of publishers (p. 149-72).

"For nearly a century the National Agricultural Library has continuously received Japanese publications. It maintains a Japanese collection of more than 1,100 serials and 5,000 monographs in biological and agricultural fields, which is believed to be one of the largest collections of its kind in the world... The present bibliography contains serials that are currently received or have been received at the National Agricultural Library." Address: National Agricultural Library (NAL), Beltsville, Maryland.

4847. Shibasaki, K.; Hesseltine, C.W. 1962. Miso fermentation. *Economic Botany* 16(2):180-95. June. [32 ref]
• ***Summary:*** The role of miso in the Japanese diet is reported. The *Aspergillus oryzae* strain used for miso and sake has high amylolytic as well as proteolytic action. (That used for soy sauce has high proteolytic action). In miso fermentation, the koji starter is prepared by inoculating trays of cooked rice and vegetable ash. After good growth, the fungus is dried without killing its spores. Cooked soybeans are mixed with rice, salt and the koji starter. Chemical changes during fermentation are reported. Many microorganisms are present in miso. Address: 1. College of Agriculture, Tohoku Univ., Japan; 2. NRRL, Peoria, Illinois.

4848. Taylor, Clifford C.; Singh, Bhagwant. 1962. The competitive position of Maryland soybeans. *Maryland Agricultural Experiment Station, Bulletin* No. 473. 73 p. June. [14 ref]
• ***Summary:*** Contents: Summary. 1. Competition in price: Production expansion at lower prices, substitution and prices. 2. Competitive position in total consumption: Consumption of soybean meal. 3. Competitive position of oil in end products: Margarine, shortening, drying oil products, soap. 4. Competitive position of meal in feeding. 5. Competitive position in export markets: Potentialities of Africa as a competitor of United States soybean oil in Europe, competitive position of United States soybean oil in Asia, competitive position of United States soybean oil in Latin America, competitive position of United States soybean oil in Oceania, recapitulation. Appendix. Contains 39 tables and 6 figures.

"The soybean market has become of prime importance to growers on the Eastern Shore of Maryland. Here, as in nearby areas of Delaware and Virginia, soybean production has multiplied very rapidly within recent years." Address: Dep. of Agricultural Economics.

4849. *Foreign Crops and Markets* (*USDA Bureau of Agricultural Economics*). 1962. U.S. exports of soybeans, edible oils and meal rose in April. 85(2):20-21. July 9.
• ***Summary:*** Major markets for U.S. soybeans in April, with their percentages of total exports were: Japan 28, Canada 24, the Netherlands 17, and West Germany 14.

4850. Arai, Michio; Taga, Takashi. Assignors to Seiichi Ogura. 1962. [Coating leather exposed to solvent vapor]. *Japanese Patent* 8059. July 12. Application filed 18 April 1959. 2 p. (Chem. Abst. 59:7764d). [Jap]*
• ***Summary:*** Soybean oil is the main ingredient used to make a product for coating leather. This product is more insoluble in common solvents than ordinary mixed oils of animal and vegetable origin.

4851. Aruyama, K. 1962. [Yogurt from soybean]. *Japanese Patent* 9262. July 25. [Jap]*

4852. Fujiwara, Kozo; Tokuda, M.; Nanba, A. 1962. Shôyu chû no amino-san ni kansuru kenkyû. II. Tennen jôzô moromi ni okeru shuyô amino-san no shôchô [Studies on amino acids in Japanese soy sauce. II. Changes in the amounts of the main amino acids during the ordinary moromi (mash) process]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 40(7):327-32. July. [6 ref. Jap; eng]
• ***Summary:*** The term "ordinary moromi (mash) process" refers to the natural fermentation process. Changes in free amino acids were studied by microbioassay. Considerable amounts of free arginine disappeared during maturation of the mash. The amounts of free isoleucine, leucine, methionine and phenylalanine steadily increased in the course of maturation from the beginning of the mash process to the 396th day, while free glutamic acid, glycine, lysine and

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valine showed maxima. Address: 1. Dep. of Fermentation Technology, Faculty of Engineering, Osaka Univ.; 2-3. Osaka Joshigakuen Junior College, Japan.

4853. Fujiwara, Kozo; Tanaka, S.; Fujita, E. 1962. Shôyu-chû no amino-san ni kansuru kenkyû. I. Kakushu shôyu no amino-san genryô ni tsuite [Studies on amino acids in Japanese soy sauce. I. The contents of amino acids in soy sauces of various types]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 40(7):321-27. July. [13 ref. Jap; eng]
• ***Summary:*** "The contents of 10 amino acids (arginine, glutamic acid, glycine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, valine) in soy sauces of various types were determined by microbiological assay methods. Each amino acid content was expressed in mg/ml of soy sauce whose total nitrogen content was converted into 1%. Arginine contents in fermented soy sauces and 'aminosan-eki' (chemical hydrolyzate of protein-containing materials) were 0.7 mg/ml and 3 mg/ml, respectively. Glutamic acid contents in 'kiage' (fermented soy sauce), 'tamari' (ditto) and 'sokujo' (quickly fermented soy sauce) were about 8.5 mg/ml, 6.5 mg/ml and about 4.7 mg/ml, respectively. 'Aminosan-eki' contained 8.5 mg/ml or more of glutamic acid, while 'II go aminosan-eki' about 5 mg/ml." Address: 1-2. Osaka Univ., Japan; 3. Osaka Joshigakuen Junior College.

4854. Baker, Lois. 1962. 'Round the food stores: For a look at the latest ideas. *Chicago Daily Tribune.* Aug. 3. p. B2.
• ***Summary:*** "Of Japanese origin are Kikko-man Soy Sauce and Geisha White Peaches. All these items are stocked in every Jewel store."

4855. Fujiwara, Kozo; Ishikawa, H.; Nanba, A. 1962. Shôyu-chû no amino-san ni kansuru kenkyû. III. Kaon sokujô shomi ni okeru shuyo amino-san no shôchô [Studies on amino acids in Japanese soy sauce. III. Changes in the amounts of the main amino acids during the mash process accelerated with elevating temperature]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 40(8):384-89. Aug. [7 ref. Jap; eng]
Address: 1. Osaka Univ.; 2. Tatsuno Shoyu Co.; 3. Osaka Joshigakuen Junior College.

4856. Kumanotani, Jû; Chen, L.W.; Kuwata, T. 1962. Studies of the cross-linking and glass transition of fatty acid-modified alkyd resins. *Bulletin of the Chemical Society of Japan* 35(8):1341-49. Aug. (Chem. Abst. 57:13912f). [14 ref. Eng]
• ***Summary:*** Soybean oil fatty acids were used as reagents. Address: Dep. of Applied Chemistry, Faculty of Engineering, The Univ. of Tokyo, Hongo, Tokyo.

4857. Kosuge, Takuo; Adachi, Tahei; Kamiya, Hiroko. 1962. Isolation of tetramethylpyrazine from culture of *Bacillus natto,* and biosynthetic pathways of tetramethylpyrazine. *Nature* (*London*) 195(4846):1103. Sept. 15. [3 ref]
• ***Summary:*** Tetramethylpyrazine has the characteristic smell of natto, or fermented soybeans. Address: Shizuoka College of Pharmacy, Shizuoka, Japan.

4858. *Yin Yang: The Unifying Principle* (*Chico, California*). 1962-1965. Serial/periodical. Ohsawa Foundation, Inc. Vol. II, No. 1 (Sept. 1962) to Vol. V, No. 6 (June 1965). Frequency: Irregular.
• ***Summary:*** Preceding title: Macrobiotic News. Succeeding title: Macrobiotic Monthly. Each issue is dated. Note: One stray issue, titled U.P. ["Unique Principle"] was undated but published in about Dec. 1961 in Chico, California by the same publisher.

Subtitle varies: The Unique Principle. from Vol. II, No. 1 (Sept. 1962) to Vol. II, No. 2 (Dec. 1962).

4859. Grow, Howard E. 1962. Market development activities in Japan: Progress report. *Soybean Digest.* Sept. p. 36-37.
• ***Summary:*** Contents: Introduction. Low sales cost. New Oil Organization. Quality as improved.

Of the cost of selling soybeans to Japan, 78.2% is borne by the USDA Foreign Agricultural Service; the remaining 21.8% is borne by the American Soybean Association. The sales cost is less that 1 cent (0.898 cents) per bushel.

"The oil industry in Japan formed a new organization known as the Fats and Oils Association in January. All of the members of the former Fats and Oils Manufacturing Association and all other crushers are members of the new association. The consumption of edible oil in Japan is only about 12 pounds per capita in comparison with 64 pounds in the United States. This level of consumption is low, but has risen considerably since the initiation of the market development program."

"The quality of soybeans received in Japan from U.S. shippers has improved. This is particularly true in respect to lower content of foreign material. More improvement is needed. A considerable volume of the imports of U.S. soybeans now is on a varietal basis. There is room for more imports on the basis of variety.

"Two research projects on soybeans, in cooperation with industry groups in Japan and under contract with Agricultural Research Service, are now under way in Japan. These two projects are with shoyu and miso, and will continue for several years." Address: Asst. to Executive Vice President, American Soybean Assoc.

4860. Kasugai, Aiko. 1962. Mame-rui moyashi no amiraaze, toku-ni α-amiraaze ni tsuite [Studies on bean sprout amylase, especially on the α-amylase]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 36(9):784-

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88. Sept. [7 ref. Jap]
Address: Osaka Woman's Univ., Osaka, Japan.

4861. Kawashiro, Iwao; Kondo, Tatsuo. 1962. Shokuhin-chû no biryô yûgai-sei kinzoku no teiryô. II. Kome, komugi-ko oyobi daizu-chû no hiso, kadomiumu, do, mangan oyobi suigin ni tsuite [On the determination of trace amounts of toxic metals in foods. II. Contents of arsenic, cadmium, copper, manganese and mercury in rice, wheat flour, and soybean]. *Eisei Shikenjo Hokoku* (*Bulletin of National Institute of Hygienic Sciences*) 80:75. Sept. (Chem. Abst. 61:9951g). [7 ref. Jap]
• ***Summary:*** Soybeans contain less than 0.1 ppm (parts per million) of arsenic, no cadmium, 10.2 ppm of copper, 16.3 ppm of manganese, and no detectable mercury.

4862. Kiyosawa, Shigesa; Kiyosawa, Kazuko. 1962. A study on varietal difference in flowering habits of soybean plants as followed by grafting experiments. *Plant and Cell Physiology* (*Tokyo*) 3(3):263-73. Sept. [23 ref]
Address: Dep. of Physiology and Genetics, National Inst. of Agricultural Sciences, Japan.

4863. Spurlock, Hughes H. 1962. Trends and developments in Communist China's world trade in farm products 1955-60. *USDA Economic Research Service, Foreign Agricultural Economic Report* No. 6. 44 p. Sept. See p. 26-29.
Summarized as "Chinese soybeans static" in Soybean Digest, June 1963, p. 24. [11 ref]
• ***Summary:*** Since its founding on 1 Oct. 1949, the PRC has sought rapid industrialization and development of heavy industry. Most modern machinery and technology must be imported from advanced countries, using income from farm exports.

Table 12, titled "Export summary: Communist China's principal agricultural exports, 1955-1960" (p. 26), gives statistics (by weight only) for soybeans, peanuts, other oilseeds (sunflower seed, rapeseed, sesame seed, castor beans, cottonseed), tung oil, other vegetable oils (peanut oil, soybean oil, cottonseed oil, rapeseed oil, castor oil), rice, fresh fruit (apples, oranges, bananas, grapes), tea, and tobacco. The two largest exports by weight in 1960 were rice and soybeans. Soybean exports (in 1,000 metric tons) were: 1955–950.1. 1956–970.4. 1957–972.1. 1958–944.0. 1959–1,279.9. 1960–1,011.6.

The United States and Communist China do not trade with each other, but they compete in world export markets. "Sino-U.S. competition is sharper for soybeans than for any other product."

Table 13, "Soybeans: Communist China's exports, as recorded in available data of importing countries, 1955-60, in 1,000 metric tons." The importing countries are divided into two groups: "Free world" and "Soviet bloc." In 1955 the three leading importers were: Soviet Union (483.6), Japan (203.5), and West Germany (90.4). In 1960 the four leading importers were: Soviet Union (351.0), West Germany (212.0), Denmark (126.0), and Italy (110.0). Address: Regional Analysis Div., ERS, USDA.

4864. Wanamaker, George E. 1962. Marketing soybean oil, soybeans, and soybean meal in Cyprus, Lebanon, and Malta. *USDA Foreign Agricultural Service.* FAS-M-141. 43 p. Sept.
• ***Summary:*** Discusses U.S. foreign trade with these three countries. Contains an appendix on Jordan–but soy is not mentioned in it. Malta, an area within the British Commonwealth, has a general economy that is closely tied to military and naval expenditures of the United Kingdom. Malta's excellent deep seaport of Valletta has port-handling and bulk facilities for grains and vegetable oils. Malta imports each year with free currency over 3,000 tons of crude degummed soybean oil in bulk, and about 2,000 tons of margarine and shortening. From its excellent, relatively new refinery, Malta re-exports fully refined soybean oil to neighboring countries. "U.S. crude soybean oil was exported directly to Malta for the first time in 1960... Following a gradual introduction of 500 to 1,000 tons of soybean meal, import requirements for this high-amino-acid meal could average 5,000 tons a year by 1965, especially if the planned 30,000-unit poultry farms are set up. The United States, which is currently delivering bagged soybean meal to Greece, can export soybean meal to Malta at a per-protein-unit price that is competitive with other proteins now being imported.

"Imports of crude soybean oil, begun in 1958, have now all but replaced other seed oil imports. Refined soybean oil has been supplied primarily by Denmark, the United Kingdom, Japan, and the Netherlands. Crude degummed soybean oil is currently being imported from Denmark and the United States, but in earlier years it had originated from Israel and Japan.

Table 10 (p. 33) shows Malta's imports of selected animal fats and vegetable oils, 1957-1961. In 1957 Malta imported 1,228 tonnes (metric tons) of refined soybean oil and no crude soybean oil. In 1958 the country imported 1,440 tonnes of refined soybean oil and 1,446 tonnes of crude soybean oil. In 1961 (preliminary figures) Malta imported 43 tonnes of refined soybean oil and 3,186 tonnes of crude soybean oil.

Page 35 states: "The vegetable oil industry of Malta is represented by The Edible Oil Refining Company, Ltd., with its plant at [72 Merchants Street] Marsa, a suburb of Valletta. The refinery has always concentrated on the refining of crude degummed soybean oil, imported primarily in bulk from Western Europe." Photos show the refinery. Soybean cultivation in Malta is not mentioned.

Note: This is the earliest document seen (Feb. 2001) concerning soybean products (soy oil) in Malta. This document contains the earliest date seen for soybean

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products in Malta (refined soybean oil in 1957); soybeans as such had not yet been reported by that date. Address: Fats and Oils Div.

4865. Watanabe, Toshiyuki; Aso, Kiyoshi. 1962. On the sugar composition of Shiro Shoyu (clear soy sauce). *Tohoku J. of Agricultural Research* 13(3):265-71. Sept. Originally published in 1960 in Hakko Kogaku Zasshi (J. of Fermentation Technology) 38:435-40. [11 ref]
• ***Summary:*** The main sugar was glucose and it constituted about 70% of the total sugar. Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai, Japan.

4866. *Yin Yang: The Unifying Principle* (*Chico, California*). 1962. Useful addresses. p. 38. Sept.
• ***Summary:*** Chico-San's address is given as "1364 Mangrove Ave., Chico, California."

Other organizations whose addresses are given: Japan: Nippon (C.I.). Shinsei-Kai (C.I.). Anbara (C.I.). U.S.A.: Ohsawa Foundation (Chico, Calif.). Mr. Michio Kushi (562 Fifth Ave., New York 36, N.Y.). Azuma Inc. Mr. Tommy Nakayama (2486 Silverlake Blvd., Los Angeles, Calif.). Musubi Restaurant (61 W. 56th St., N.Y.). South America: Casa Longavida (Liberdada, Sao Paulo, Brazil). India: Mr. R.T. Saklath (9 Grant Lane, Calcutta 12, India). France: "Sesam" (Paris). "Longue Vie" (Paris).

Note: This is the earliest document seen (May 2011) that shows Chico-San as having an address on Mangrove Ave. in Chico, California.

4867. *Foreign Crops and Markets* (*USDA Bureau of Agricultural Economics*). 1962. Japan may postpone liberalization of soybean oil and meal. 85(14):22-23. Oct. 1.
• ***Summary:*** "The Japanese Government may postpone action on the liberalization of imports of soybean oil and soybean meal from the scheduled date of October 1 to at least April 1, 1963, (*Foreign Crops and Markets,* July 16, 1962.)

"Domestic oil manufacturers maintain that the 13 percent levy on soybeans, which were liberalized July 1, 1961, is too high. Domestic oil, manufactured from imported soybeans, will hardly compete with imported soybean oil at current prices, even though the import tariff on oil may be raised to a specific duty of 28 yen per kilogram (3.5 cents per pound) from the current temporary *ad valorem* of 20 percent.

"The soybean crushers have been appealing to the government for some time to reduce, or preferably eliminate, the 13 percent import duty on soybeans. The government is considering the recommendation of the Food Agency, which reportedly is in favor of a reduction. The tariff rate will be studied and a decision is expected to be made by April 1, 1963."

4868. Sakakibara, Shigeru; Yamanishi, Nobuo. Assignors to Japan Reichhold Chemicals, Inc. 1962. [Modified xylene-formaldehyde resin]. *Japanese Patent* 16,196. Oct. 10. Application filed 28 April 1961. 3 p. (Chem. Abst. 59:6589g). [Jap]*
• ***Summary:*** Soybean oil fatty acids are used to make the resin.

4869. Nakamura, Hiroshi. 1962. Problems of Japanese processors. *Soybean Digest.* Oct. p. 12-15.
• ***Summary:*** Per capita consumption of edible oils plus shortening and margarine has increased from 2.5 pounds in 1936-39 (average), to 13.2 lb in 1961. A photo shows the Hohnen Oil Mill plant at Shimizu, Japan.

4870. *Soybean Digest.* 1962. Japan is best U.S. market. Oct. p. 26.
• ***Summary:*** This is the summary of a report titled "Japan, the American Farmer's Best Export Market," published by the United States-Japan Trade Council, 1000 Connecticut Ave., Washington 6, DC. The report's date of publication is not given. "Japan is the best U.S. customer for soybeans, purchasing $100 million worth in 1961." Sales have doubled since 1956, the year the Japanese American Soybean Institute was established. Japan presently imports more than 75% of the soybeans it consumes.

A graph shows U.S. exports to Japan (in million bushels) from 1952 to 1961, with two lines projecting future growth. These imports have grown from 10 million in 1952, to 20 million in 1956, to 40 million in 1960, with a possibility of 65 to 80 million by 1968.

4871. *Foreign Crops and Markets* (*USDA Bureau of Agricultural Economics*). 1962. Japan buys soybeans from mainland China. 85(21):20. Nov. 19.
• ***Summary:*** "Japan's purchases of soybeans at the Canton trade fair this fall were unofficially reported as of November 1, 1962, at 60,000–70,000 metric tons. However, as of the date reported, the fair was only half over and further sales were expected.

"It is also reported that Hong Kong is now buying Chinese beans at the rate of 1,00–1,500 tons per month. Prices at which these transactions are being made are not readily verifiable."

4872. *Foreign Crops and Markets* (*USDA Bureau of Agricultural Economics*). 1962. Mainland China sells more soybeans. 85(22):14. Nov. 26.
• ***Summary:*** "On November 15, trade sources reported the sale by Mainland China of 32,000 tons (1.2 million bushels) of soybeans, of which 22,000 tons (0.8 million bushels) were sold to Europe. The destination of the remainder was undisclosed.

"This is in addition to the 60,000–70,000 metric tons

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(2.2–2.6 million bushels) which Mainland China reportedly sold to Japan at the Canton Fair."

"Current official trade reports indicate that Mainland China will have about 220,000 tons (8.1 million bushels) of soybeans available for export to Japan during the current year. This indicates a sharp decline from the 390,000 tons (14.3 million bushels) estimated earlier by unofficial sources. according to a trade publication China exported about 6 million bushels of soybeans to Japan from the 1961 crop."

4873. Morimoto, Saichi; Ishihara, M.; Yamamoto, A.; Hamada, K.; Imai, K.; Otsuka, M.; Murakami, H. Assignors to Toyo Spinning Company, Ltd. 1962. [Graft copolymerization of proteins with acrylonitrile]. *Japanese Patent* 18,387. Nov. 28. 2 p. Application filed 3 Feb. 1961. (Chem. Abst. 59:7721a). [Jap]*
• ***Summary:*** Soy protein is dissolved in dilute alkali, then processed to make a polymer, in the form of a light yellow powder with excellent dyeability.

4874. Grow, Howard E. 1962. Japanese American Soybean Institute: JASI expands scope of operations. *Soybean Digest.* Nov. p. 22.
• ***Summary:*** This fall, for the first time in 4 years, representatives of ASA, FAS, JASI and the agricultural attache have been able to sit down together and review the accomplishments of the JASI program.

"The program has expanded in its scope of operation with new organizations cooperating in the activities. The National Oil and Fat Dealers Federation has started an educational program to create use of more oil, through the wholesale and retail sellers of oil. The noodle industry has asked to cooperate in the program and are planning the use of soy flour in noodles. The Nutrition Improvement Popularization Institute has initiated a program to promote the use of soy flour in various institutions for children."

Also discusses: The operation of kitchen buses. The Tofu Association is using one bus to give 40 demonstrations per month. Some prefectural governments have purchased buses to operate on a full-time basis.

The School Lunch Association and the education department have tested the use of soy flour in rolls served to several thousand elementary and junior high school students. Questionnaires indicate that the rolls have been very well accepted.

Factory feeding: Nutritionists are promoting the use of soy oil and protein in the lunches of factory workers.

"The feeding tests using soybean meal as a supplement for fish meal in poultry rations are being continued."

Soybeans are now imported by importers without prior approval of the government. There is a 13% duty on all soybeans imported which protects domestic soybean farmers. Address: Assistant to the Executive Vice President, American Soybean Assoc.

4875. Watanabe, Tokuji; Nakayama, Osamu. 1962. Daizu no sui-chûshutsu tanpakushitsu ni kansuru kenkyû [Study of water-extracted protein of soybean]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 36(11):890-95. Nov. [19 ref. Jap]
Address: Food Research Inst., Ministry of Agriculture & Forestry, Japan.

4876. *Foreign Crops and Markets* (*USDA Bureau of Agricultural Economics*). 1962. Japan-Communist China conclude 5-year trade agreement. 85(25):15-16. Dec. 17.
• ***Summary:*** "A Japanese economic mission to Communist China has concluded a trade agreement whereby Japan will import 700,000 metric tons (25.7 million bushels) of soybeans from China over a 5-year period."

"The quantity covered in this agreement is said to be in addition to the 71,500 tons (2.6 million bushels) bought by Japanese firms at the Canton Trade Fair (*Foreign Crops and Markets,* November 26, 1962)."

4877. *Foreign Crops and Markets* (*USDA Bureau of Agricultural Economics*). 1962. Japan to implement soybean agreement. 85(26):18. Dec. 24.
• ***Summary:*** "Japanese importers are preparing to implement the agreement to buy 150,000 metric tons (5.5 million bushels) of soybeans from Communist China for 1963 delivery (*Foreign Crops and Markets,* December 17, 1962). Procurement of the first half of the quantity, or 75,000 tons, was to be committed by December 15, and the other half by January 15.

"The Japan-Communist China Trade Council had sent notices to all principal soybean users asking each to specify the quantity of beans each firm would guarantee to buy. If the total exceeded 75,000 tons for the first portion, there would be pro-rata sharing."

"It was expected that the miso (soybean paste) manufacturers would take as much as they could use, since Chinese beans have traditionally been favored for miso making. However, their annual capacity is only about 100,000 tons (3.7 million bushels). The oil crushers, on the other hand, are reluctant to buy the Chinese beans... As the oil content of the Chinese beans is lower than that of U.S. beans, the crushers do not want to pay an equal price. The Chinese had refused, at least until recently, to concede (about $7 per ton differential was requested) on this point. Whether the crushers will 'cooperate' despite this disadvantage is unknown."

4878. *Foreign Agriculture.* 1962. Japan expects to import more soybeans in 1962-63. 26(12):23. Dec.
• ***Summary:*** Japan, the single largest outlet for U.S. soybeans, buys 83% of its needs from the USA. A 13% duty on imported soybeans is now in effect, but Japanese soybean

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crushers have been appealing to the government to reduce or eliminate it.

"Soybean consumption in Japan has expanded sharply in recent years but soybean acreage has declined every year since 1954."

4879. Fujii, Hisao. 1962. Nattô-kin ni yoru nenshitsu-butsu no seisei ni kansuru kenkyû. I. Nenshutsu-butsu seisei jôken no kentô (1) [On the formation of mucilage by *Bacillus natto.* I. Factors affecting the formation of mucilage (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 36(12):1000-04. Dec. (Chem. Abst. 62:1114). [10 ref. Jap]
Address: Faculty of Home Life Science, Fukuoka Women's Univ., Fukuoka, Japan.

4880. Hanaoka, Yoshio. 1962. Shôyu hozon ni kansuru kenkyû. I. *Aspergillus sojae* no seisan suru esterase ni tsuite [Studies on preservation of soy sauce. I. On the esterase produced by *Aspergillus sojae*]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 40(12):610-614. Dec. [7 ref. Jap; eng]
• ***Summary:*** n-Butyl p-hydroxy benzoate is widely used as a preservative for soy sauce, but this material is enzymatically decomposed in raw soy sauce. This enzyme is produced by Asp. sojae and has the following characteristics: It is a kind of esterase and its optimal pH is 6.0. It is almost inactivated after heating at 50ºC for 10 minutes, but in the presence of sodium chloride this enzyme inactivation is altered. The longer the period of aging of soy sauce mash, the more the enzyme activity is depressed. Address: Central Research Inst. of Noda Shoyu Co., Ltd., Noda, Japan.

4881. Olson, Harvey Stuart. 1962. Olson's Orient guide [1st ed.]. Philadelphia, Pennsylvania and New York: J.B. Lippincott Co. 1008 p. Illust. (by Cy Ferring). Maps. Index. 20 cm. 1st ed., 1962 [1963].
• ***Summary:*** In Chapter 5, "On dining out in the Orient," we read (p. 229): In Japan, much loved and widely consumed items include "bean sprouts and pastes [miso] and sauces made from soy beans." The Japanese, like many "foreign visitors are fond of sukiyaki made of thin beef strips simmered in a tasty soy sauce garnished with fresh vegetables, served with a raw egg, and accompanied by rice. They enjoy tempura, too,..." The dip is made of finely grated radish [daikon] "and spicy soy sauce."

The section on "Chinese cuisine" states (p. 236): "Cantonese which is the blandest, most subtle, and least greasy of the varieties of Chinese cooking..." Features "bean curd and minced pork."

The section titled "Japanese specialties" (p. 245+) starts with Sukiyaki (One "bowl contains small pieces of lotus root, scallions, bamboo shoots, bean curds, mushrooms, and other greens," p. 246). Also (p. 249) "Batayaki is the first cousin to sukiyaki," but with the difference that "batayaki is prepared with a sauce less pungent than that used for sukiyaki." This sauce has "a soybean base, but mixed liberally with butter" [*bata*].

The entry for "Soy sauce" (p. 252) taken from the Random House *American College Dictionary* "defines soy sauce as 'a salty fermented sauce much used on fish and other dishes in the Orient, prepared from soy beans.' I cannot emphasize too strongly how important a part this sauce plays in the Japanese cuisine. It is not only used in connection with fish but as a sauce for sukiyaki. It is also used generously in preparing chicken and steak and is utilized as a garnish as well as an ingredient.

"As a matter of fact I can think of no place where this tasty bit is not likely to appear. I. for one, like soy sauce." However. if you wish, you can ask your waiter to omit it.

The section on Thailand (p. 278-79) notes: *"Haw Mok,* a flaming hot Thai specialty, is made by pounding dry chili peppers, shrimp paste, lemon grass, onions, garlic and salt, and blending them with steamed coconut milk and soy sauce decorated with egg and slices of raw fish. It is served in a large banana leaf."

The section on night clubs in Osaka, Japan says of Yen Kyo (p. 312). "Another quality Chinese restaurant... Taste the spring rolls, the chicken in papers, and the vegetable bean curd dishes."

In Chapter 12, "Japan," the section on Tokyo states (p. 692): "One can eat squid, lotus roots, roasted sparrows (head, claws and all), raw lobster, embryonic eggs on a stick, cuttlefish painted with soy sauce, blowfish, mud eel, mock turtle, fermented bean curd, bamboo shoots, and quail's eggs,..."

Note: The 1st, 2nd, and 3rd editions all contain 1008 p.

4882. Arimoto, K.; Tamura, -; Kawada, M.; et al. 1962. Daizu seihin no eiyô-ka ni kansuru kenkyû. IV. Funmatsu nattô o mochiita shokuhin no "acceptability test" ni tsuite [Research on the nutritional value of soyfoods. IV. Acceptability tests on 2 or 3 foods contained powdered natto]. *Kokuritsu Eiyo Kenkyusho, Kenkyu Hokoku* (*Research Report of the National Institute of Nutrition*). p. 48-49. [Jap]
• ***Summary:*** Used in a biscuit and a cracker.

4883. Arimoto, K.; Tamura, E.; Nishihara, A.; Tamura, A.; Kobatake, Y. 1962. [Nutritional value of soybean products. I. Nutritional value of natto-like products prepared by various processing conditions]. *Kokuritsu Eiyo Kenkyusho, Kenkyu Hokoku* (*Research Report of the National Institute of Nutrition*). p. 40-45. [Jap]*

4884. Arimoto, K.; Tamura, E.; Tamura, A.; Kobatake, Y. 1962. [Nutritional value of soybean products. II. Effect of hulling of soybeans and freeze-drying of fermented product on nutritional value of 'natto'-like product]. *Kokuritsu*

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Eiyo Kenkyusho, Kenkyu Hokoku (*Research Report of the National Institute of Nutrition*). p. 51-53. [Jap]*

4885. Arimoto, K.; Tamura, E.; Kobatake, Y. 1962. [Nutritional value of soybean products. III. Effect of drying methods on the nutritional value of 'natto'-like product]. *Kokuritsu Eiyo Kenkyusho, Kenkyu Hokoku* (*Research Report of the National Institute of Nutrition*). p. 53-54. [Jap]*

4886. **Product Name:** [Takaramame and Proplus (soy protein products)].
Foreign Name: Takaramame and Proplus.
Manufacturer's Name: Fuji Oil Co. Ltd.
Manufacturer's Address: Toyama Building 121, 2-chome Azuchi-cho, Higashi-ku, Osaka, Japan.
Date of Introduction: 1962.
Ingredients: Defatted soybean meal.
How Stored: Shelf stable.
New Product–Documentation: Fuji Seiyu K.K. (Fuji Oil Co.). 1977. Fuji Seiyu 25 Nen-shi: Showa 21 nen 11-gatsu–Showa 51 nen 3-gatsu [Fuji Oil Company Ltd.: 25-year history, Nov. 1946 to March 1976]. Tokyo: Fuji Oil Co. 622 p. See p. 418. These two soy protein products, made from Fuji's defatted soybean meal, were not commercially successful.

Note: These are the earliest known commercial soy products made by Fuji Oil Co.

4887. Genin, G. 1962. Le lait dans le monde [Milk in various countries of the world]. *Lait* (*Le*) 42(419-20):636-44. [Fre]
• ***Summary:*** The section titled "Japan: Manufacture of milk from soybeans" (p. 643) states: A former major in the Imperial army, Mr. Fujita, has found a way to furnish the Japanese population with an economical milk without increasing the importance of dairy animals. The milk which Fujita calls "Milkis" has a major advantage–its price is only one-third as much as that of cow's milk and the Department of Defense has created a pilot plant for the monthly production of 20,000 bottles (*flacons*) of this milk.

The milk is made from soybeans by a process which takes only 30 minutes. The national organizations which are working to develop the consumption of milk in this population are very interested in this new process. Address: Ingénieur E.P.C.I.

4888. Iwabuchi, T.; Suzuki, N. 1962. [Studies on the manufacture of dry provisions by the drying machine at the original temperature. II. Experiments on dehydration of natto]. *Miyagi-ken Nogyo Tanki Daigaku Gakujutsu Hokoku* (*Scientific Reports of Miyagi Agricultural College*) 10:45-50. *

4889. Izawa, G.; Okamoto, S. 1962. [Studies on transport of chemical constituents in germinating plant seeds. I. Transport of nitrogenous constituents in germinating soybean seeds]. *Hyogo Noka Daigaku Kenkyu Hokoku, Nogakuhen* (*Science Reports of the Hyogo University of Agriculture*) 5(2):101-08. [10 ref. Jap; eng]*

4890. Nagata, Tadao. 1962. [Studies on the significance of the indeterminate growth habit in breeding soybeans. II. A method of early and concise testing of the determinate vs. indeterminate growth habit by short-day treatment]. *Hyogo Noka Daigaku Kenkyu Hokoku, Nogaku-hen* (*Science Reports of the Hyogo University of Agriculture*) 5(2):66-68. [5 ref. Eng]
Address: Lab. of Plant Breeding, Hyogo Univ. of Agriculture, Sasayama, Hyogo, Japan.

4891. Nagata, Tadao. 1962. Report to the government of Yugoslavia on improvement of soybean cultivation. *FAO Expanded Technical Assistance Program, Report* No. 1465. 22 p. [Eng]
• ***Summary:*** The author served FAO in Yugoslavia for 4 months, from July to Nov. 1961. He travelled in most of the soybean growing areas of Yugoslavia, and visited many institutes and experiment farms, several faculties of agriculture and many farms.

Contents: 1. Introduction. 2. Historical review. 3. Climatic and soil conditions. 4. Present Aspect: Cropping systems, varieties and breeding, soil management, fertilizer and nitrogen bacteria, rate and time of sowing, cultivation and weed control, disease and insect damage, drought and hail damage, harvesting and yield, interplanting, cultivation for fodder, cultivation after wheat. 5. Future Prospects: Cultural practice (cropping system, varieties, soil management, nitrogen bacteria inoculation and fertilizer application, rate of sowing, cultivation and weed control, counter measures against drought, disease and pest control, practical suggestions), research (cropping system, varieties and breeding, growing for seed, nitrogen bacteria, fertilizers, rate of sowing, cultivation and weed control, control of insect damage, drought damage, machines for planting and cultivating, yield capacity of soybeans, organization of research). 6. Recommendations.

Note: This is earliest English-language document seen that uses the term "pest control" in connection with soybeans. Address: Hyogo Univ. of Agriculture, Sasayama, Hyogo-ken.

4892. **Product Name:** [Soymilk].
Manufacturer's Name: Nihon Tanpaku Kogyo.
Manufacturer's Address: Japan.
Date of Introduction: 1962.
New Product–Documentation: Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64. This was Japan's second commercial branded soymilk.

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4893. Shibasaki, Kazuo; Hesseltine, C.W. 1962. [Miso–I. Preparation of soybeans for fermentation]. *Soybean Res. Technol.* No. 15. p. 1-14. [Jap]*
Address: NRRL, Peoria, Illinois.

4894. Shibasaki, Kazuo; Hesseltine, C.W. 1962. [Miso. II. Fermentation]. *Soybean Res. Technol.* No. 16. p. 1-12. [Jap]*
Address: NRRL, Peoria, Illinois.

4895. Tsuchiya, Kanji. 1962. Dasshi daizu-ko no seisei hôhô [Method of refining defatted soybean powder]. *Japanese Patent* 16,658. Application filed 1961. [Jap]*

4896. Yamazoe, F. 1962. [Symptoms and mechanism of injury to crops exposed to hydrogen fluoride]. *Nogyo Gijutsu Kenkyusho Hokoku B* (*Bulletin of the National Institute of Agricultural Science, Series B: Soils and Fertilizers*) No. 12. p. 1-125. [111* ref. Jap; eng]*

4897. Amano, Motonosuke. 1962. Chûgoku nôgyô-shi kenkyû [Researches into Chinese agricultural history]. Tokyo: Ochanomizu Shobô. 950 p. 22 cm. 2nd. revised and expanded edition 1979. [Jap]*
• ***Summary:*** Includes crucial work on topics like the development of the plough, irrigated rice cultivation, cotton growing, etc. Very reliable on sources, but factual rather than interpretative.

4898. Anson, M.L. 1962. Oilseed proteins in foods. *Archives of Biochemistry and Biophysics.* Supplement 1. p. 68-77. [23 ref]
• ***Summary:*** "A major occupation of man is to feed plant materials to animals and to use the animals as a source of animal protein foods. It is now possible, by applications of modern biochemistry and technology, to feed oilseed materials into a factory and to come out with protein foods similar to animal protein foods in nutritional value, taste and texture.

"Protein technologies were developed in the Orient thousands of years ago to produce products such as soybean curd and fermentation foods which still play a big role in the protein economies of hundreds of millions of people. The modern oilseed meals now produced at very low price give promise of being very useful in the fight against protein malnutrition in poor countries."

"During World War II, Henry Ford, who had the soybean religion, made large amounts of good 'ice cream' entirely from soy protein and fat, until he was stopped. The Chinese have a variety of cheese made from soybeans."

In the section titled "Ancient foods based on oilseeds," the author discusses soy milk and bean curd (tofu) in detail. He notes that traditional fermented foods serve primarily as a source of flavor, and perhaps of vitamins. "In Japan today scores of thousands of factories, big and little, make the traditional soy foods. These factories use up not only local soybeans but almost 10% of the huge American crop. The Japanese eat much more soy protein than meat protein."
Address: 100 Eaton Square, London, S.W.1, England.

4899. Arimoto, K.; Tamura, E.; Nishihara, A.; Tamura, A.; Kojima, Y. 1962. Daizu seihin no eiyô-ka ni tsuite. II. Shuju no jôken ni oite seizô sareta funmatsu nattô ("Nattô"-like products) no eiyô-ka ni tsuite [Research on the nutritional value of soyfoods. II. Powdered natto produced under various conditions]. *Kokuritsu Eiyo Kenkyusho, Kenkyu Hokoku* (*Research Report of the National Institute of Nutrition*). p. 40-45. [Jap]

4900. Arimoto, K.; Tamura, E.; Baba, H.; Tamura, A.; Obata, Y. 1962. Daizu seihin no eiyô-ka ni kansuru kenkyû. I. Shihan nattô no eiyô-ka ni tsuite [Research on the nutritional value of soyfoods. I. On the nutritional value of commercial natto]. *Kokuritsu Eiyo Kenkyusho, Kenkyu Hokoku* (*Research Report of the National Institute of Nutrition*). p. 36-40. [Jap]

4901. Cartter, Jackson L.; Hartwig, Edgar E. 1962. The management of soybeans. *Advances in Agronomy* 14:359-412. [174 ref]
• ***Summary:*** Contents: I. Introduction: World production (958,275,000 bushels in 1960), United States production trends, utilization (processing to obtain oil and meal, hay and green manure). II. Soil and climatic adaptation: Areas of production in the United States, soil requirements, climatic adaptation (effect of temperature on plant growth, effect of temperature on composition of seed, effect of light on plant growth, effect of photoperiod on flowering and maturity, effect of soil moisture on growth). III. Time of planting and varietal adaptation: Effect on plant characters (maturity, plant height, lodging, seed quality, size of seed, seed yield), effect on composition of the seed. IV. Planting methods and equipment: Seedbed preparation (conventional, minimum tillage, deep tillage), row width and planting rate (row width, planting rate), double cropping (after fall-sown grain crops, after peas), special methods of planting, types of equipment. V. Rotation practices and erosion control: Effect on soybean yields, effect on the following crop, effect on weed population, soil residues from herbicides, erosion control. VI. Weed control: Effect of planting time on plant growth and weed competition, methods of cultivation, chemical weed control (pre-emergence herbicides, post-emergence herbicides). VII. Seed quality and seed treatment: Factors affecting seed quality and germination, seed treatment. VIII. Nutrient requirements: Nitrogen requirements and nodulation (effectiveness of nodulation as a source of nitrogen, methods of inoculation, survival of bacteria in the soil, effect of seed treatment on inoculation, effect of nitrogen applications), liming and pH levels (pH and plant development, calcium and magnesium requirements), phosphorus, potassium,

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trace elements, fertilizer practices and recommendations. IX. Water requirements and utilization: Water needs in relation to plant growth and development, irrigation and soil management. X. Growth-regulating chemicals. XI. Harvesting: When to harvest, harvesting methods. XII. Seed storage. XIII. Discussion. The USA now produces about 57% of the world's soybeans, followed by China (PRC; about 33%), Indonesia, Japan, Korea, USSR, Brazil, and Canada, in that order. By 1920, U.S. production was 3,000,000 bushels and the leading states were North Carolina, Virginia, Alabama, Missouri, and Kentucky–North Carolina producing 55% of the total. By 1931, the center of production had shifted to the North Central States, where it is at present. Address: 1. United States Regional Soybean Lab., Urbana, Illinois; 2. Stoneville, Mississippi.

4902. Doi, Masaru. 1962. The art of Japanese cookery. Tokyo, Japan: Shibata Publishing Co., Ltd. [x] + 110 p. Illust. (some color). No index. 22 cm. [Eng]

• ***Summary:*** Soy-related recipes include: Tempura sauce (*Tentsuyu,* with soy sauce, p. 5). Miso soup with soy bean curd (p. 5). *Kuya-mushi* (Egg custard with tofu, p. 13). *Kenchin-mushi of Kodai* (Sea bream steamed with tofu filling, p. 17). *Kayaku-gohan* (With aburaage, fried soy bean curd, p. 24). *Koya-dofu* (Dry frozen bean curd as an ingredient in sushi, p. 39). *Chirashi-sushi* (With Koya-dofu, p. 46). *Sukiyaki* (With tofu, and shoyu in warishita, p. 50-52). *Mizutaki* (With tofu, and shoyu in tsuke-jiru dipping sauce, p. 58-61). *Yudofu* (With tofu, and shoyu in tsuke-jiru, p. 62-63). *Dote-nabe* of oysters with white miso paste (p. 63-64). *Shigiyaki* of eggplants (With tsuke-miso, p. 66-69). *Teri-yaki* (Meat, fish, with *tare* of 2 parts soy sauce and 3 parts mirin, p. 73-73). Miso soup (with akamiso, shiro-miso, soy bean curd, wakame, etc., p. 94, 96-99). Ohagi (with kinako {soy bean powder} and sesame seeds, p. 106). *Shoyu-sashi*–A small soy sauce dispenser (p. 110).

Also discusses: *Sekihan* (Rice with azuki beans and gomashio, p. 24-25). *Sushi with nori* (p. 37). Toasted *fu*–Light wheat gluten cake (p. 77). "How to make red bean paste. Red beans, 1½ c[ups], Sugar, 9 oz."(p. 106).

Note 1. This is the 2nd earliest English-language document seen (May 2001) that contains the word "Teri-yaki" (or "Teriyaki"). The text reads: "In *Teri-yaki* rich sauce which gives a sheen to ingredients is used as seasoning. *Teri-yaki* is preferred for fatty ingredients."

Note 2. This is the earliest English-language document seen (July 2003) that uses the Japanese word "gomashio" to refer to "sesame salt."

Note 3. This is the earliest English-language document seen (March 2006) that uses the term "red bean paste" to refer to sweet azuki bean paste [*azuki-an*].

4903. Harris, Sara. 1962. House of 10,000 pleasures: a modern study of the geisha and of the streetwalker of Japan. New York, NY: E.P. Dutton & Co., Inc. 273 p. See p. 26. No index. 21 cm.

• ***Summary:*** This is a book about *geisha, pan-pans* or streetwalkers, maikos and *shikoni* (young geisha in training). It is equally a book about self-sacrifice–at times almost spiritual.

Page 26: "All these are either raw or cooked with bamboo sprouts, mushrooms, and persimmons in a heavy soy sauce. Sueko sits beside me all through the meal and feeds me with her chopsticks. Kazuko, dividing her time between them, does the same..."

Note: This is the earliest English-language document seen (April 2012) that uses the term "heavy soy sauce" to refer to a type of Japanese soy sauce.

Page 53: "Laying awake in the darkness, Kimiko heard the sounds of a winter night in Kyoto... The howling of the *oinarisans* peddling pickled rice wrapped in fried bean curd" [*inari-zushi*].

Kyoto's Gion, with its narrow streets, is a geisha section well known throughout Japan.

Pages 55-56: For Kimiko, on ordinary days like this, breakfast "consisted of two pickled plums, a bit of raw fish with soy sauce, and green tea. A small breakfast,..."

Page 60: "For Kimiko's first afternoon at Plum Tree House, lunch consisted of bean soup [miso soup] and hot tea."

Page 67: "Next to the days when she could prove her worth at games of skill, Kimiko loved the days when the peddlers came round to Gion. There was first the *tofu,* the bean-curd man. He walked with his bucket precariously balanced on bamboo poles on his back. How Kimiko enjoyed him whenever she was in possession of *sen* enough to buy some curd for herself and perhaps for Sumiko too! It was fun to eat the curd, and even better fun to treat your best friend. On the days when the *tofu* man stayed away from Gion, the *chindonya* couples were likely to come..." selling candy and lollipops.

Page 71: The long-awaited New Year's morning meal included "*mochi*-cake symbolizing 'happy congratulations,... the crisp seaweed, the fried bean curd,..."

4904. Hayashi, Shizuka. 1962. Problems involved in increasing world-wide use of soybean products as foods in Japan. In: USDA Northern Regional Research Laboratory, ed. 1962. Proceedings of Conference on Soybean Products for Protein in Human Foods. Peoria, IL: USDA NRRL. iii + 242 p. See p. 200-06.

• ***Summary:*** Contents: Price. Quality. Margarine and shortening. Mayonnaise. Miso, shoyu, tofu. Soybean meal. Soy flour. Soy milk. Frozen tofu. Food sources of Japan.

The 400,000 tons of soybeans produced in Japan are used for foods. From approximately 1 million tons of imported soybeans, Japan produces 150,000 tons of oil and 700,000 tons of meal. "Japanese oil consumption is the

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poorest [i.e. lowest = best] among the world nations. We need to consume oil at more than 5 times the present quantity to reach the level of the western countries." In 1952 Japanese consumption of edible oils was 7.52 gm per person per day, increasing to 11.52 gm in 1960. Soybean oil supplies about 30% of Japan's total oil supply. The main obstacles to greater consumption are price and quality (due to flavor reversion). The leading oil is rapeseed oil. The main oils used in margarine and shortening are fish oil (35.8% of total), beef tallow (25.4%), whale oil (10.0%), and coconut oil (8.0%).

New developments with traditional Japanese soy foods include: Dried, powdered miso in instant form is now available. Soybean meal is now the main ingredient in shoyu, rather than whole soybeans. A few soy milk plants have been erected and bottled soy milk is now sold in the market in limited areas. A certain culture is used to eliminate the beany flavor. Today, soybeans and soybean products provide the average Japanese with 10.6 gm/day of protein (16% of total protein consumption of 67.7 gm), and 7.6 gm/day of fat (28% of total fat consumption of 26.7 gm). During the period 1934-38, average Japanese protein consumption was 54.9 gm per person per day and fat consumption was 13.2 gm (less than half what it is today). Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building, Room 410, No. 1, 1-Chomo Yurakucho, Chiyoda-Ku, Tokyo, Japan.

4905. Hilbert, G.E. 1962. Foreign research program of U.S. Department of Agriculture on soybean protein products under Public Law 480. In: USDA Northern Regional Research Laboratory, ed. 1962. Proceedings of Conference on Soybean Products for Protein in Human Foods. Peoria, IL: USDA NRRL. iii + 242 p. See p. 93-98.

• ***Summary:*** "For many years, the Department was financing with dollars a farm research program abroad."

"A considerable expansion of our foreign research program was effected a few years ago under Public Law 480. This program of research is financed with foreign currency accruing to the United States from the sale of surplus agricultural commodities, and, in a sense, trades surpluses for research results. Research in the field of economics, forestry, farm, marketing and utilization is carried out under this program. Projects are selected for financing which are of direct interest to the United States and also of interest to the foreign country.

"At the present time, 195 grants or research agreements have been executed in 20 countries in Europe, Asia, and Latin America. Funds are available to initiate programs in an additional 6 countries. Proposals from most of these countries are being processed at the present time. The annual cost of the grants already executed amounts to about the equivalent of $2-2½ million in foreign currency annually. Substantial funds are available for the expansion of this program.

"The Public Law 480 foreign research program is being administered by the Foreign Research and Technical Programs Division, Agricultural Research Service, U.S. Department of Agriculture, in Washington. A regional office has been established in Rome, Italy, to negotiate the costs of grants and administratively supervise the program in Europe and the Near East. A regional office has been established in New Delhi, India, also, to carry out the same functions in the Far East.

"The technical phases of the program–that is, the approval of projects on which grants are executed and the review of progress reports–are handled by the various research divisions in the Department. For example, all projects on the utilization of soybeans fall under our Northern Utilization Research and Development Division. All those dealing with the nutritional aspects of soybeans as a food are under the jurisdiction of the Institute of Home Economics.

"Ideas for new research projects may come from within the Department, from research organizations abroad, from our Research and Marketing Advisory Committees, from national commodity organizations, or from the processing industry. We are indebted to The Soybean Council of America for the interest it has taken in developing our research program on soybeans abroad. The Council has stimulated many foreign research groups to submit projects on improving uses for soybeans. It has brought to our attention, also, important problems on soybeans that need attention.

"In developing a program on soybeans we have been faced with the problem that most countries in which we have funds have had practically no knowledge or experience on the uses of soybeans, and have conducted very little research on their utilization. The opportunity has been very limited for financing research on the utilization of soybeans in laboratories with background experience on its products.

"Fortunately, the activities of UNICEF and FAO, on increasing the protein level of the diet in the developing areas of the world, and the powerful market development program of The Soybean Council of America, have stimulated great interest in many countries on the usage of soy products in the diet. These efforts have facilitated the development of our research program on soy products.

"As the primary emphasis of this conference is on soybean products for protein in human foods, the research work we are financing on soybean oil and fatty acids will not be discussed here. My talk will cover only those projects dealing with soybean proteinaceous foods, and with minor components in soy flour or soybean products which may affect their food value. A dozen or more projects of this kind, in half a dozen countries, are underway or will be shortly.

"At the National Institute of Nutrition in Rome, Italy, we have executed a grant with Professor Visco to finance research on the use of soybean protein products as

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supplements to wheat flour production of pasta, such as spaghetti and macaroni. The southern part of Italy depends to a large extent upon cereal grains as the main staple of the diet. Raising the protein level and quality of the diet in Italy could be done readily by increasing the protein content of pasta with soy protein products. Professor Visco has set as his objective an increase of 10 percent in the soy protein content of pasta. He believes this amount of soy protein in pasta would provide all the essential amino acids necessary for good nutrition. The Institute has produced pasta containing 10 percent by weight of soy protein. Pasta containing the type of commercial soy protein used was unaltered in cooking quality, but had a slight gray cast and slight change in flavor. The effect of lowering the content of soy protein on color and flavor of pasta is now being investigated. The effect of other sources of commercial soy protein on color and flavor will be studied, also. Professor Visco is interested in following up these studies by conducting nutritional investigations on groups of school children, using pasta fortified with soy protein.

"In Japan, we are negotiating a grant with the Food Research Institute, in Tokyo, for research on dried tofu. Fresh tofu is the most important soybean food in Japan. On a dry basis, its protein content ranges from 50 to 60 percent, and fat content from 21 to 50 percent. It has a bland flavor. It is eaten as such usually with soy sauce. Slabs are deep-fat fried [tofu], also, forming an envelope which is stuffed with hot rice. Fresh tofu is made in thousands of small plants, many of them family-run operations. Fresh tofu has a relatively short storage life comparable to that of fresh milk. Dried tofu, which is a spongelike product, has come into production in recent years. It has a shelf life of 6 months or longer. However, the product is inferior to the fresh product in overall eating quality.

"Under the grant to be carried out at the Food Research Institute there will be studied the varietal effect of soybeans, and variation of processing conditions on the physical characteristics and flavor of dried tofu. Fresh and dried tofu have promise in supplementing the diet in the protein deficient areas of the world.

Miso is another important soybean food used in Japan. It is produced by the fermentation of soybeans with *Aspergillus oryzae*. The most popular use of miso in Japan is in soup. Miso soup plays an important part in the standard Japanese breakfast. Because of uneven uptake of water, not all varieties of soybeans can be used, or only with difficulty, in the traditional Japanese process for making miso. Most Japanese and Chinese varieties of soybeans are better than most American varieties. In preliminary experiments conducted at the Northern Utilization Research and Development Division, in cooperation with two Japanese miso experts, it was found that dehulled soybeans or soybean grits absorbed water uniformly and yielded excellent miso. Now we are interested in following up these studies on a pilot-plant scale using different varieties of soybeans, and carrying out the fermentation under various Japanese environmental conditions. A grant on this project is being negotiated with the Central Miso Institute.

"As it is produced at the present time, miso has a relatively high salt content. Salt is used in the process to control the microbiological population. Dr. Gyorgy informs me that miso with a greatly reduced salt content might make it more suitable for feeding infants and young children. The development of procedures for producing miso containing very little salt might broaden its usefulness." Continued. Address: Director, Foreign Research and Technical Programs Div., USDA, Agricultural Research Service, Washington 25, DC.

4906. Hilbert, G.E. 1962. Foreign research program of U.S. Department of Agriculture on soybean protein products under Public Law 480 (Continued–Document part II). In: USDA Northern Regional Research Laboratory, ed. 1962. Proceedings of Conference on Soybean Products for Protein in Human Foods. Peoria, IL: USDA NRRL. iii + 242 p. See p. 93-98.

• ***Summary:*** Continued: A related project on miso is under consideration in Israel. This is based upon producing a miso-type product from controlled amounts of oil ranging from none to that originally present in the bean. Japanese miso contains all the oil present in the bean.

"We are negotiating one other project with the Food Research Institute in Tokyo. This project deals with the development of procedures for producing a yogurt-type product from soy milk, and obtaining information on the changes that occur in the soybean components in the transformation. It is planned to have cooperative investigations on the nutritional value of the fermented soy milk conducted at the Institute of Nutrition Research under Dr. Arimoto. Although soy milk has been used for many years in the Orient as an infant food, the expansion of its use has been very slow, particularly in the underdeveloped areas of the world. At times, difficulties have been encountered in its large-scale production due either to lack of technical knowledge or to inadequate control methods. Soy milk may cause diarrhea or flatulence in some infants.

"It is possible that fermented soy milk may have advantages over soy milk. One potential advantage of fermented soy milk is that the acid may destroy undesirable microorganisms that too often occur under unsanitary conditions in underdeveloped areas of the world. The widespread use of yogurt in the original primitive areas of Northeastern Europe and Northern Asia may well have resulted from the comparatively greater safeness and stability of this product over milk. At the present time, 45 percent of all milk consumed in the USSR is in the form of yogurt, attesting its popularity and the fact that a taste for it can be acquired. Nutritional studies conducted in Europe have

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shown that yogurt is a highly nutritious product, and that digestibility is increased during the fermentation. Likewise, the fermentation of soy milk may lead to an improvement in its food value. At any rate, our hopes are high on this project.

"Fermented proteinaceous foods are produced and used in Indonesia. Three types are tempeh, ontjom, and ragi. Tempeh was just discussed by Dr. Steinkraus. Onjom is made by fermentation of peanut press cake with molds, probably the genus *Neurospora.* It is a popular food in West Java. Ragi is produced by a yeast-mold fermentation of rice flour and sugar. Little is known about the micro organisms effecting this fermentation. Ragi is not served as food. It is used in recipes for the preparation of other foods.

"More information on the microorganisms used in the fermentations to produce ontjom and ragi, and on the composition of these products, is needed. Similar types of products might be produced using other raw materials abundant in other underdeveloped countries. Knowledge on the quality of protein produced would be helpful in determining the usefulness of such products in upgrading the protein level of the diet.

"A grant is being negotiated with the Bandung Institute of Technology, Indonesia, on the isolation of pure cultures of microorganisms present in tempeh, ontjom, ragi, and other Indonesian fermented foods produced by different manufacturers in different parts of Java, as well as other islands of Indonesia. Variations of species used by different manufacturers and in different regions for the same type of food fermentation will be investigated under this grant also.

"Studies will be made of the chemical changes and physical transformations brought about by the pure cultures. This will involve an investigation of the products produced in the fermentations including the proteins elaborated in all except the tempeh fermentation which already is receiving a great deal of attention. Pure cultures of the isolated microorganisms will be studied further and characterized at the Northern Utilization Research and Development Division.

"A number of grants on soybean protein have been executed or are being negotiated with research institutes in Israel.

"One of these deals with the effect of processing conditions on the yield and quality of isolated protein. This grant is being negotiated with Professor Zimmerman, of the Israel Institute of Technology. A great deal of work has been done in the United States and Japan on the commercialization of soy products. Large quantities are being produced, and some are being used for food purposes. However, there is need for more information on processing and drying of soy proteins, and the effect of processing conditions on flavor and nutritive value. This is the kind of research to be carried out in Dr. Zimmerman's laboratory. Also, he will study the flavor and acceptability of isolated soy protein when used in various Israeli-type foods. The effect of processing on the nutritive value of isolated soy protein will be determined by animal feeding tests.

"Although much information has been obtained by Dr. Allan K. Smith and others in the United States on the physical and chemical properties of soy protein, little is known about the complexes of protein in the bean or in the meal. There has been neglected the problem of protein complexes in the native state or formed in soybean oil meal processing operations. Whether protein-phytate complexes exist in the bean or result from interaction during processing operations is unknown. No information is available as to whether nucleoproteins, lipoproteins, and mucoproteins exist in soybeans. we have no knowledge, either, as to the interaction with protein of pigments, metal ions, and carbohydrates during processing of the beans.

"However, these changes affect the color, flavor, and (in view of the sensitivity of lysine) the nutritive value of the protein. This problem on the chemical, physical, and biochemical properties of protein complexes in soybeans will be studied under a grant which is being negotiated with Dr. Katchalski at the Weizmann Institute of Science. Dr. Katchalski's team has a worldwide reputation for the fine work they have done on the structure and modification of proteins. It is an ideal group to investigate this difficult and very important problem, the solution of which may lead to the enhancement of the food value of soy flour and soy protein.

"A grant is being negotiated with Dr. Guggenheim, at Hebrew University, on the development and biological evaluation of protein-rich foods from vegetable sources. Various mixtures of cereals with combinations of soya, sesame, sunflower, and chick peas will be studied. The nutritive value of different combinations of proteins will be assessed on growing rats. In vitro methods of measuring the essential amino acids will be made, also, and compared with levels of amino acids present in the blood of the portal veins of rats following a protein meal. Nutritional evaluation of the protein mixtures on humans will be carried out at a later stage.

"There has been a real need for the development of a rapid chemical method for measuring the biological value of proteins. Such a test would be very helpful in measuring change in nutritive value of proteins, including soy protein or flour, during processing and on storage. we are financing two studies on the development of such a method. One line of work is being carried out at the Israel Institute of Technology under Dr. Zimmerman, and the other at the University of Cambridge, England, under Dr. K.J. Carpenter.

"We are financing three basic investigations on certain minor components of soybeans which may affect the nutritive value of soy products. One of these is a comprehensive study of the simple sugar and oligosaccharides in soybeans. This work is being done at the University of Caen, France. Another investigation deals

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with a detailed study of the polysaccharides of soybeans, and is being carried out at the University of Edinburgh, Scotland, under Professor Hirst. The third deals with the isolation and characterization of saponins in soybeans and various processed soy products. This study also will include the exploration of methods for inactivating saponins in the processing of soybeans. This work is being done by Professor Bondi, Hebrew University, Israel.

"In this discussion I have summarized, briefly, the various lines of activity we are sponsoring abroad under Public Law 480 on soy protein and proteinaceous soy foods, and related investigations affecting the food value of soy products. It is hoped these investigations in countries where no work on soybeans has been done previously will stimulate additional research on soybeans, and lead to an increased recognition of the importance of soy products in the diet. It is believed these investigations will provide information that should be helpful in guiding efforts to upgrade the diet in protein deficient areas of the world." Address: Director, Foreign Research and Technical Programs Div., USDA, Agricultural Research Service, Washington 25, DC.

4907. Kitamura, S. 1962. [Applied botany]. Tokyo: Asakura Book Co. See p. 261. [Jap]*
• ***Summary:*** Soybeans were introduced to and grown in Korea sometime between 30 B.C. and A.D. 70.

4908. Miller, Harry W. 1962. Traditional methods of processing and use of soy liquid and powdered milk. In: USDA Northern Regional Research Laboratory, ed. 1962. Proceedings of Conference on Soybean Products for Protein in Human Foods. Peoria, IL: USDA NRRL. iii + 242 p. See p. 149-56.
• ***Summary:*** "It is a new day when so many important sponsoring organizations join in evaluating the suitability of the protein of the humble soybean to meet the nutritional needs of the human subject, and to study practical ways of extending its benefits in protein deficient diets.

"In August l940, I presented a paper entitled 'The Role of the Soybean in Human Nutrition' before the American Soybean Association at Dearborn, Michigan, and predicted that the day would come when we would find an awakened interest in this country in utilizing soy products as a part of the American menu. I believe we are rapidly approaching that goal, There is now an awakening in many lands to the needs of better nutrition, and it is timely that study and research be given to how we can utilize the values of the soy protein for universal race betterment.

"Soybeans have for centuries been the chief protein supplier in the heavily populated areas of Southeast Asia. It is well to examine methods of processing and utilization as practiced in the Orient. However, the per capita utilization of soybeans has been far below their needs, ranging from 15 to 50 pounds per annum in countries like China, Japan, and Korea, largely due to the inability of agriculture to keep pace with population.

"It was in these soy-producing and-utilizing countries that I had the opportunity over more than half a century to observe their methods of preparation, and to check the results in the feeding of soy products. Considerable leafy vegetables, stems and 'roots' have to a certain extent supplemented the diet with protein, so that adults of mature age probably get adequate protein. However, the appalling infant mortality and adolescent protein deficiency diseases have stressed the need for increased rations such as may be supplied by the soybean.

"Protein has its greatest contribution during the growing years of life. Three times the amount of protein per unit of body weight is needed the first year of life compared with the adult. During adolescence and the teenage years twice the amount of protein is required till they attain their normal body weight as in after life. If individuals are well grown with ample biologic protein their chances for long life expectancy are enhanced.

"With the infant's short intestinal tract and its immature digestive juices, foods have to be reduced to liquids to be usable. Consequently, a liquid food beverage, if supplied in sufficient quantity and quality, enables normal growth to proceed rapidly. Without it, growth is stunted; anemia, infection follows and many do not survive these years of inadequate food intake. Those that survive childhood often die early in life of degenerative diseases.

"The need of liquid nourishment following birth is evident from the fact that all mammals, including the human, have no provision for taking solid food, so as a starter food a lacteal secretion is by nature supplied, and to meet the need of the growing years of the human, various animal milks have been used. However, the supply is meager in the Afro-Asiatic countries.

"My attention was called to soybeans as a dietary food upon reaching China and living on Chinese cuisine. It was some 20 years later, in 1925, that I embarked on the development of a liquid beverage from the soybean. Considerable progress has since been made in improvement of such a food beverage and its use. However, it is only a few areas where nutritional use is made of soy milk, and much remains to be done in its improvement and distribution to combat malnutrition.

"The Oriental approach to processing the soybean is entirely opposite to that of the west. Western countries process the soybean by grinding it into fine flour after dehulling, and screening through very fine 200- or 500-mesh screens, or shall we call it, the milling operation. While in lands where soybeans have been used for centuries, they first hydrate the beans, or as we call it, use the wet-milling operation.

"In Eastern countries interest in soybeans has been primarily in its protein content, while the West has vied for

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its oil. It was my good fortune that I began my study of the soybean in the Orient where soybeans were used for human food, rather than for animal rations. Soaking the hard, dry bean was the first procedure, and it then is ground into a milklike slurry. The whole soybean is given a water soak for 8 hours, or after dehulling a water bath for 2 hours. In either case the bean doubles its original weight by water intake. It is then ready for the milling operations. This is accomplished with stone buhr mills, or disintegrators, that break up the continuity of the fiber, and expose its nutrient particles of protein, oil, carbohydrate, vitamins, and minerals to a water wash. The water-soluble nutrients are separated from the fiber portion by filtration. The amount of water used in the slurry mix, its temperature, whether hot or cold, and also the quality of beans, determines the ratio of soluble nutrients to those still clinging to the fiber.

"In fact, there are numerous techniques to be observed to get the dispersible protein and other nutrients in the highest soluble amounts. Beans differ, as also the aging of beans. The nutrient yield is greatest immediately after harvest time. Long heat exposure in warm climates, makes for less solubility. A proper soak is of great importance; then next the grinding of the beans. A small stream of water to give a tearing, rubbing action so as to thoroughly expose all soluble ingredients is preferred to a mill with a cutting action to mince into fine particles. Before filtration this slurry should be agitated and heated, which will yield an additional 10 percent to the soluble ingredients. Several methods of filtration, such as a shaking screen, a plate and frame pres, vacuum drum filters, or centrifuges of various types can be used. A re-grind of the fiber cake and a second extraction makes possible an extra 5 to 8 percent recovery of the solubles. A possible 92 percent of protein with other nutrients in proportion has been attained by grinding and filtration methods. In practical plant operations we expect 60 to 80 percent protein recovery of the original bean. This leaves considerable nutrients in the fiber or pulp, which is then used for stock feed.

"The milky solution thus extracted is used either for cheese curds of various types, or is formulated and processed into a beverage milk–liquid or powdered. Soybeans are used in different countries in making a savory sauce, called Soy Sauce; a soup base as in Miso, or as a fermented bean as Japanese Natto. They are eaten as immature green beans in pod or shelled and are very delicious.

"Soy Milk: Trials have been made in the past to utilize soy milk by the Asiatics but for lack of proper processing methods such milk, as filtered and not formulated, was neither tasty nor nutritionally acceptable, giving rise to very unpleasant digestive responses. I have repeatedly asked in parts of China, Japan, and Korea why it was not used as a beverage, always with the same answer, that it gave rise to intestinal disturbances. So a cheese curd is used instead of milk. Curdling it into a cheese, through the use of calcium salts, vinegar or other coagulative agencies, has resulted in many savory food products. Heating this milk extract causes a scum film [yuba] to form, also very tasty, and the remaining portion is curdled and made into cheese [tofu] cakes of varying dimensions and density. All such sheets and blocks of curd receive a second cook, or are fermented, which seems to render them more digestible.

"Soy cheese or curd is easy to market and very popular, being tastily flavored and combined in the Chinese cuisine as a meat, fowl, and fish replacer. The Japanese report 70 different forms or dishes utilizing soybeans, and the Chinese even more. Out of 1 pound of soybeans they make 4 pounds of curd called Tofu.

"While we have spent some time in Indonesia we have had little experience with Tempe–a fermented soybean food product.

"My contributions had to do with developing an easily digested and highly nutritious soy milk, and processing it sufficiently to render it acceptable to both infants and adults. The extract from the bean which is rich in protein can be formulated as desired with added fat, carbohydrate, minerals, and vitamins. These properties can be varied or formulated to that of human milk, or any other type of animal milk. The final product can be made in a single strength, or condensed to double strength and canned, or spray-dried as a powder.

"Our first work in developing a formulated soy milk dates back 56 years ago when we secured a Disper mill [Dispermill], or homogenizer, to constitute a formulated liquid. This soy milk was first used in the Shanghai Sanitarium and Hospital as a table beverage for nurses, helpers, staff, and patients of the institution, and later to the baby and children's ward of the Shanghai Clinic and Hospital. Here we had baby boarders, infants kept under observation on soy milk feeding for up to 2 years. The results of this feeding was reported in the China Medical Journal of 1957. Many other farmed out research studies were made, such as at the indigent hospital in the Philippines; at the Tokyo University, and the Ohio State University in America.

"Results on the Ohio State study are shown in Figure 1.

"The first commercial development was a soy milk dairy established in Shanghai in 1935, the process used was in-bottle sterilized milk, formulated to the standard of cow's milk; also a chocolate milk; and a soy-acidophilus milk, which was extensively marketed all over the city of Shanghai up until the plant was destroyed in 1937 by the bombing of Shanghai.

"A soy milk powder plant was also fabricated there, using a local made Grey Jensen spray dryer, which also came to an end in the same way at the same time.

"There are many technical problems involved in producing a satisfactory nutritional beverage from the soybean to simulate milk, which in the few moments we have would be impossible to enter into. These are gradually being solved, such as improved color, taste,

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stability, condensing as a double strength canned milk, and as an instant soluble powdered soy milk. On vacuum pan evaporation, due to the viscosity of soy milk, concentrating to more than 30 percent solids is the limit, as compared with animal milk at 45 percent solids. However, generally speaking, once a water extraction soy milk is obtained the same methods and equipment used by the dairy industry are applicable to produce it in various forms for marketing" (Continued). Address: M.D., Director Emeritus, International Nutrition Research Foundation, 11503 Pierce Blvd., Arlington, California.

4909. Miyashita, Akira. 1962. Kôri-dôfu no rekishi [History of dried-frozen tofu]. Tokyo: Japanese National Frozen Tofu Association (Zenkoku Kori-dofu Kogyo Kyodo Kumiai Rengokai). 591 p. Illust. No index. 28 cm. [Jap]
• ***Summary:*** This is the most comprehensive work ever published on the subject. Unfortunately there are few references to sources. However on page 48 is a list of early documents (mostly scrolls and books) in which Kori-dofu is mentioned, as follows: 1624-1643 *Ryôri Monogatari,* and *Kebukiso.* 1648-1651 *Teitoku Bunshu.* 1688-1703 *Wakan Shojin Ryôri-sho,* and *Honcho Shokukan.* 1711-1715 *Toryu Setsuryo Ryôri Taizen.* 1716-1735 *Ryôri Komoku Chomi-sho.* 1748-1750 *Ryôri Sankai-kyo.* 1772-1780 *Shinsen Ryôri Kondate Burui-shu.* 1781-1788 *Tofu Hyakuchi,* and *Tofu Hyakuchin Zokuhen.* 1801 *Ryôri Shinan Taizen,* and *Honso Komoku Keimo.* 1804-1817 *Nihon Ryôri-ho Taizen.* 1818-1829 *Shojin Ryôri-tsu, Ryôri-tsu,* and *Shojin Ryôri Kondate-shu.* 1830-1843 *Toyo Kondate Ryôri Hayashikumi,* and *Ryôri Dokukeiko.* 1848-1853 Morisada Manko (essays).

Concerning the origin of Shimi-dofu (p. 38-39), there is a legend that Takeda Shingen taught how to make Shimi-dofu as well as miso. The areas where Takeda Shingen lived and where Shimi-dofu is sold are about the same, so it seems likely that there is some connection. In the early Edo period (p. 41), when a money economy became more common among the people, Shimi-dofu became a side business for many farm households in the area. In 1638 in Kefukiso? (Haikai-shu), there was a mention of *Matsumaekoku Kan-dofu,* which is Shimi-dofu.

Contents: 1. Origin of kori-dofu. 2. Production of kori-dofu in the Edo period. 3. The group of kori-dofu makers in Kuzushiro of Kishu and the monopoly of selling kori-dofu in Hasa Yama-han and Ishikawa-han. 4. The leaping progress of production of kori-dofu during the Meiji period. 5. The great European war [World War I] and the natural koya-dofu industry. 6. Shinshu Koya style kori-dofu marching out to Kansai. 7. The invention of kori-dofu which expands and softens. 8. The height of prosperity of the artificial freezing method and the downfall of natural kori-dofu. 9. Kori-dofu after the Pacific Ocean war [World War II]. 10. The group of kori-dofu production workers from Tajima who work away from home. 11. Present-day kori-dofu production business. Appendix. Postscript.

Note: The history of kori-dofu as told in this book is summarized in *The Book of Tofu,* by Shurtleff and Aoyagi (see p. 226-29). Kori-dofu was highly valued as a way of preserving tofu, and as a source of work in cold, mountainous regions during the lean winter months.

4910. Nakayama, Osamu; Watanabe, Tokuji. 1962. Tônyû ni kansuru kenkyû [Studies on soybean milk]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 15(3):191-95. [2 ref. Jap; eng]
• ***Summary:*** "Soybean milk is prepared in the laboratory under various conditions to discuss the effects of the amount of water added, heating temperature and heating time on its chemical composition and physical properties. When the amount of water is less than 5 times [the amount] of soybean, a part of its protein becomes insoluble and the viscosity of the milk is unusually high. The viscosity of the milk after dilution is higher than that of the milk which is diluted before heating. The chemical composition and physical properties of the milks prepared by heating before and after filtration are compared. Although the chemical composition of both milks are not so different, the viscosity of the latter milk is lower than that of the former.

"When 1.0% NaCl or 10% glucose or sucrose are added to the milk, they increase somewhat the viscosity. By adding 0.15% NaCl before heating, the viscosity of the milk becomes fairly higher than by adding after heating.

"The characteristic odor of soybean milk can be removed by soaking soybeans in 0.01-0.1% hydrogen peroxide solution and putting hot steam into the milk for 10 minutes." Address: National Food Research Inst., Tokyo.

4911. Obata, Yataro. 1962. Shôyu no shôrai [The future of shoyu]. In: 1962. Nihonjin no Tabemono [Foods of the Japanese People]. Tokyo: Kawade Shobo. See p. 316-22. [Jap; eng+]

4912. Ono, Fumie. 1962. Try a Japanese dish. Tokyo: Bokusui Publishing Co. 110 p. Index. 21 cm. *
• ***Summary:*** Contains about 70 Japanese recipes.

4913. Smith, Allan K. 1962. Problems involved in increasing world-wide use of soybean products as foods: Technical assistance in developing soybean markets. In: USDA Northern Regional Research Laboratory, ed. 1962. Proceedings of Conference on Soybean Products for Protein in Human Foods. Peoria, IL: USDA NRRL. iii + 242 p. See p. 214-16.
• ***Summary:*** "In Colombia the law requires the addition of a small amount of soy flour to wheat flour. However, I have been informed by a reliable correspondent that although the wheat millers buy the soy flour as required by law, they do not add it to the wheat flour because baking problems

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have not been solved." Address: Head, Meal Products Investigations, Oilseed Crops Lab., Northern Utilization R&D Div., Peoria, Illinois.

4914. Steenis-Kruseman, M.J. van. 1962. Contributions to the history of botany and exploration in Malaysia: 8. Heinrich Bürger (? 1806–1858), explorer in Japan and Sumatra. *Blumea* 11(2):495-508. [35 ref]
• ***Summary:*** A good biography of Heinrich Bürger. Of Jewish ancestry, he was probably born on 20 Jan. 1806 at Hameln (near Hannover, Germany), the seventh of ten children of Samuel Bürger and Eva Meyer. his father died when he was young. In 1823 he secretly left his parental home to go to Holland. In Sept. 1823 he sailed from Amsterdam to Java. A major reason that he entered the Dutch East India Co. was to help his mother and sisters financially. He was officially appointed apprentice pharmacist in the hospital at Weltevreden (=Batavia, Jakarta) and in 1825 was promoted to 3rd class pharmacist. Later in 1825 he was, at his own request, put at the disposal of the surgeon-general Ph. F. von Siebold at Deshima, a small islet in Nagasaki Bay–the place of Dutch settlement in Japan.

In 1826 Von Siebold made a journey to Edo and, under the guise of being his secretary, Bürger was allowed to accompany him.

In 1828 he was commissioned to take over the position of von Siebold, but due to problems with Siebold's illegal maps of Japan, the latter was not allowed to leave before Dec. 1829. For the preceding 13 months he was kept in the smallest house at Deshima, not by the Japanese but by the Dutch officials who feared that their commercial relations with Japan might be jeopardized. Yet even during this unpleasant period of isolation, Siebold managed to add to his nature specimens.

Between 1830 and 1835 Bürger sent large Japanese botanical and zoological collections to Leyden. Address: Oegstgeest.

4915. Strayer, George M. 1962. Market development on U.S. soybeans and soybean products. In: USDA Northern Regional Research Laboratory, ed. 1962. Proceedings of Conference on Soybean Products for Protein in Human Foods. Peoria, IL: USDA NRRL. iii + 242 p. See p. 29-37.
• ***Summary:*** "Among producers of major agricultural products in the U.S. producers of soybeans are in a unique position. Despite increases in production which are out of all proportion to normal expectations the markets for the crop have grown in approximate proportion to the production and there have never yet been surpluses of a proportion to justify classing the crop in the same surplus category with wheat, corn, cotton, tobacco, and other major U.S. crops."

As the production of soybeans in the United States continued to grow during the postwar years it became evident that we could produce in this country more soybeans than we could consume advantageously. At the same time it began to appear that other countries in the world might adopt U.S. soybeans into their economies, and that we had something which might offer potential export markets, either in the form of bean or as oil, meal, flour, or other end products.

"In 1949, I made my first trip overseas to explore market possibilities. J.L. Cartter of the U.S. Regional Laboratory at Urbana and I went into several of the northern European countries to determine what the soybean production potentials might be–and what our market possibilities looked like. In 1952, I went back again and at that time made a careful study of potentials in 10 European countries. In 1954, I went back as a member of a Foreign Trade Team sent by USDA to determine why we were losing our foreign markets for U.S. farm products.

"During 1954, Public Law 480 was passed by Congress, providing for the sale of U.S. surplus farm commodities for foreign currencies, with a portion of the proceeds to be made available to trade groups to enlarge and expand the markets for U.S. agricultural commodities. Soybeans were not in surplus, and were not made available for sale for foreign currencies. However, this did not preclude use of money accumulated from the sale of wheat, cotton, tobacco, butter, lard, and other commodities from being used to sell soybeans and/or soybean products.

"By the time P.L. 480 became operative a sizable group of people in the soybean industry had become aware of overseas market potentials for our products. We knew that potential markets existed, and that it was our responsibility to go after them. We decided to do just that.

"By 1955 Japan had become our largest single customer for U.S. soybeans. We were hearing complaints on quality, especially on foreign material content. Our varieties were strange to them, our methods of mechanical handling not understood and our grades and grading standards were confusing. Japan appeared to be an even bigger potential customer if we could help them solve some of the problems of using our product.

"Recognizing the situation, the Agricultural Attaché in Tokyo requested that the American Soybean Association, representing the soybean producers, send someone to Japan to work with the trade in that country. The Fats and Oils Division of Foreign Agricultural Service concurred, and it was my personal pleasure to spend 6½ weeks in Japan in late 1955. Out of that visit came the organization of a joint operational agency, called the Japanese-American Soybean Institute. Mr. Shizuka Hayashi was employed as managing director in early 1956, and since he will appear on this program later I will not describe in detail that organization or its operations.

"Since early 1956 the American Soybean Association, in conjunction with Foreign Agricultural Service and five Japanese trade groups has been operating this market

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development project on soybeans in Japan. The major activities have been in the field of education of the housewife on the place of protein and edible oil in the diet of the members of her family. Soybeans have been grown and used in that country for centuries, but the intake of both protein and oil were far below minimum standards, especially in the rural areas. Animal products were not available, and would not become available in quantity in the foreseeable future. Increased intake of protein and oil had to come from vegetable sources. The Japanese consumer was familiar with miso, tofu, shoyu, natto, kinako, and a long list of soybean protein products, and also with soybean oil for a cooking and salad oil. The services of trade organizations, governmental and quasi-governmental agencies, prefectural governments, and many other groups were enlisted. Throughout Japan the story of soy products and their value to health were repeated in a myriad of ways. Demonstrations, movies, training schools, extension workers, nutritionists, mobile demonstration buses, and a host of other avenues of approach have been used. Millions of housewives have been told the story in many ways and in many places.

"Results are the only true measurement of success or failure in an endeavor of this type. In the 1955 crop year U.S. exports of soybeans to Japan were 20,402,000 bushels. In the 1959 crop year, the last on which export figures are available, Japan's imports of U.S. soybeans had increased to 40.8 million bushels–every bushel sold for dollars. And this increase came under very strict governmental currency controls which greatly limited soybean imports into Japan. At least partially as a result of the buildup of demand for U.S. soybeans by foods manufacturers in Japan, created by demand for soybean oil and soy protein products, the Japanese government on July 1, 1961, for the first time since World War II, placed soybeans on the Automatic Allocation basis. It is our expectation that imports of U.S. soybeans into Japan will increase materially above present levels as a result of this action. In fact, at our recent American Soybean Association convention Mr. Hayashi predicted a virtual doubling of Japanese imports of U.S. soybeans in the next decade.

"Our experiences in Japan demonstrated to us early in the game that soybean markets could be expanded by expanding consumption of products. Our Japanese experience suggested that in many areas of the world the job was an industry-wide job, rather than a job for producers alone. We visualized that soybean handlers, soybean processors, exporters of soybeans, exporters of soybean oil and exporters of soybean meal all had a stake in expanding our overseas markets. In 1956, I made an intensive study of the potential markets for U. S. soybean products in 10 European countries. As a result of this study a series of committee sessions and industry conferences were held, resulting in the formation of an industry-wide nonprofit promotional organization, the Soybean Council of America. Financed by a voluntary check-off on the basis of bushelage or tonnage of soybeans crushed, handled or exported, the Soybean Council of America, Inc. now has active promotional programs launched in over 20 countries, and has 15 overseas offices scattered from India to Denmark to Peru, where staff members are stationed to do educational and promotional work designed to increase the markets for U.S. soybean products and soybeans. We recognize that in those countries where processing facilities are located they will buy soybeans and produce their own end products. We also know that many countries have need for oil and not for protein, and that other countries have adequate supplies of oil but are badly in need of protein supplies. As representatives of the U.S. soybean industry we consider it our function to sell the products the buyer wants in the form in which he desires them. Cooperation among producers and processors of soybeans in the financing of the Soybean Council program has been gratifying. The dollar expenses of the promotional programs are borne by the U.S. soybean industry, and through the cooperative program with Foreign Agricultural Service of the U.S. Department of Agriculture, as will be explained by Mr. Hougen, your next speaker, foreign currency funds are made available in certain countries for payment of market promotional and development expenses within those countries..."

This talk continues for 2 more pages and contains 3 tables: (1) U.S. soybean production and usage by crop years (Oct. 1 through Sept. 20) from 1924-25 to 1961-62. (2) U.S. soybean oil exports 1951-52 to 1959-60. (3) U.S. soybean meal exports 1950-51 to 1959-60. Address: Executive Vice President and Secretary-Treasurer, American Soybean Assoc., Hudson, Iowa.

4916. Sugimura, Keiichiro; Taira, H.; Ebisawa, H.; Sakurai, Y. 1962. Daizu kakô-hin no amino-san in kansuru kenkyû. IV. Mame miso seizô kôtei ni okeru amino-san riyô no henka [Studies on amino acid contents of processed soybean. IV. Variation of total and free amino acid contents in soybean "miso" processing]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 14(5):414-19. [6 ref. Jap; eng] Address: Shokuhin Sogo Kenkyujo, Tokyo, Japan.

4917. Sugimura, Keiichiro; Taira, H.; Ebisawa, H.; Sakurai, Y. 1962. Daizu kakô-hin no amino-san in kansuru kenkyû. III. Mame miso no amino san [Studies on amino acid contents of processed soybean. III. Total and free amino acids of soybean "miso"]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 14(5):411-13. [13 ref. Jap; eng]
• ***Summary:*** Eighteen kinds of amino acids were observed in three types of miso. Address: Shokuhin Sogo Kenkyujo, Tokyo, Japan.

4918. Takai Seisakusho. 1962. Atarashii tôfu no tsukurikata

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[New methods for making tofu]. Takai Manufacturing Co., 1-1 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan: Takai Seisakusho. 35 p. [Jap]
Address: Ishikawa-ken, Japan.

4919. Tsuji, Kaichi. 1962. Tôfu ryôri [Tofu cookery]. Tokyo: Fujin Gaho-sha. [Jap]
• ***Summary:*** Written by one of Japan's great masters of the art of Tea Ceremony Cuisine. The author was born in 1907.

4920. Tsuji, Kaichi. 1962. Gendai tôfu hyakuchin [One hundred rare and favorite tofu recipes for today's world]. Tokyo: Fujin Gaho-sha. 210 p. Illust. 19 cm. [Jap]*
• ***Summary:*** This is a modern version of the famous *Tofu Hyakuchin,* published in 1782. The author was born in 1907.

4921. Wang, Chi; Woo, Jay H. 1962. [Japanese scientific and technical publications in the Library of Congress]. Washington, DC: Science and Technology Div., Reference Dep., Library of Congress. 247 p. [Jap; Eng]*

4922. Ohsawa, G. 1962? Zen macrobiotics: The art of longevity and rejuvenation. New York, NY: Ohsawa Foundation. Printed in Japan. 218 p. Undated. Index. 17 cm.
• ***Summary:*** This is the second printed edition of Zen Macrobiotics. The cover is gray. The author is George Ohsawa. The content is basically the same as the first printed edition, except that (1) Typographical errors on pages 3, 7, and 62 have been corrected; (2) A folded, undated insert, titled "Dictionary of Macrobiotic Terms" was found in this printing between pages 216 and 217 (for details, see below). The insert is 17.0 cm / 6.69 inches high by 30.0 cm / 11.81 inches wide. Folded crosswise into thirds, it fits perfectly into these books; (3) The information on pages 217 and 218 is different and updated. The following appears on page 218: Brazil (Casa Longavida, Sao Paulo), Sweden (Miss Ilse Clausnitzer, Stockholm), U.S.A. (Ohsawa Foundation, 61, W. 56th St., New York; Ohsawa Foundation, P.O. Box 238, Chico, California; Chico-San, Inc., 64, 5th Ave., Chico, California; Musubi, 61, W. 56th St., New York–Macrobiotic Restaurant).

Concerning the date of publication: Although the date is not given in or on the book, Carl Ferré (who owns an original of this 2nd Japan printing) notes (8 May 2011): "Chico-San is listed. This means it was after Nov. 1961 at the earliest and most likely very early in 1962. I say this because the address given is not the Mangrove Ave. one." "There is no 'Printed in Japan' in this book either but it is so similar to the earlier one that it has to be printed in Japan. It is also undated. It is not 'revised'..."

In the 3-column "Dictionary of Macrobiotic Terms" (insert), for each entry there is the word or term, its definition, and one page number on which that word appears. Because the page numbers refer to pages in this edition, the dictionary was probably published at about the same time as this book–or at the time of the previous edition in 1960. The following is a selection from the Dictionary, with pages given for soy-related words: Aduki: Japanese red bean. Ae: Dressing (vegetables) with soy bean paste [miso], orange juice, etc. (p. 96). Aemono: Japanese salad (p. 88). Age: Fried bean curd. An: Red [aduki] bean jam. Ankake: Pouring [aduki] jam. Bancha: Coarse green roasted a few minutes. Bansho: Bancha with soy sauce (p. 152). Daikon: Long, white Japanese radish. Dango: A dumpling. Dentie: Head of eggplant salted, kept, dried and then burned into a powder. Egoma: A type of sesame seed–most yang. Gobo: Burdock. Gomashio: Sesame salt. Goma Tofu: Sesame curds (p. 87). Goziru [gôjiru, gojiru]: Soup made of grated soy beans and vegetables ("Ziru" means soup in Japanese) (p. 84). Gyoza: A Chinese food–vegetable mixture wrapped in pieces of thin dough. Hako: A mold or box in Japanese. Haru Tea: A very yang herb beverage. Hiziki [Hijiki]: Spindle-shaped, small, black seaweed. Jinenjo: A wild potato or a Japanese yam. Karinto: A kind of deep-fried cookie. Kasha: Russian buckwheat grain preparation. Kayu: Thin rice preparation [porridge]. Kinpira: Burdock and carrots preparation. Kitune [Kitsune]: Boiled rice or noodles cooked with thin fried bean curds [*agé*] (p. 68). Kobu (or Konbu): A (sea) tangle coming from deep ocean waters. Kobu Maki: Kobu stuffed with vegetables. Koi-Koku: A special carp and miso soup (p. 109). Kokkoh: A creamed blended cereal. Konnyaku: A paste made from flour of this Japanese tuberose [tuber]. Kuzu: Powdered plant-gelatine obtained from kuzu plant. M.U. tea: A tea made of 15 blended herb's roots. Matuba [Matsuba]: Pine leaves. Miso: Soy bean paste (p. 65). Miso Ae: Boiled vegetables served with miso cream (p. 96). Misoni: Carrots and onions cooked with miso (p. 129). Mochigome: Glutinous rice. Moti [Mochi]: Rice cake. Musubi: A knot. Nisime [Nishime]: Same as Nituke. Nituke [Nitsuke]: Vegetables sauteed. Nori: Laver or sloke–a kind of seaweed. Ogura: Aduki (red bean) preparation. Omedato: Dessert made of roasted rice and red beans. Originally Japanese word for congratulation. Oshitashi: Boiled vegetables, served with Tamari (p. 97). Ransho: Egg–Tamari preparation. Renkon: Lotus root. Sashimi: Sliced raw fish. Sarashina: A kind of buckwheat dish. Originally it means the name of a place famous for producing good buckwheat. Siitake [Shiitake]: A kind of Japanese mushroom. Sio [Shio]: Salt. Sio Kobu [Shio Kombu]: A kobu (seaweed) preparation. Soba: Buckwheat. Sukiyaki: Fish (or beef) and vegetables cooked a la japonaise. Sushi: A rice preparation. Syo-ban [Sho-ban]: Coarse green tea with soy sauce (p. 101). Tahini: Sesame butter. Tai: A red snapper [fish]. Tamari: Traditional soy sauce (p. 62). Tekka: A preparation of minced lotus root, burdock root, carrot, ginger, and miso (p. 96). Tempura: Japanese process of deep-frying in oil. Tofu: White soya bean cheese (p. 134). Tororo: Wild potato [wild yam]. Udon: Wheat vermicelli or noodle or macaroni.

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Umeboshi: Japanese plum salted and conserved for years. Ume-sho-ban: Medicinal beverage [containing umeboshi and shoyu] (p. 156). Yannoh (Ohsawa coffee): A cereal coffee made of roasted rice, wheat, aduki, chick peas and chicory. Yomogi: Mugwort (or wormwood). Yuba: Soybean protein prepared into transparent paper-like sheets (p. 77). Zosui: A rice preparation. Zaru: A bamboo basket. Address: Ohsawa Foundation: 331 Riverside Dr., New York City. Secretary Aihara, 44 W. 96th St., New York City, U.S.A.

4923. Ishiguro, Kôzô. 1963. Studies on pantothenic acid intake. I. Pantothenic acid content in Japanese foods. *Tohoku J. of Experimental Medicine* 78:375-80. Jan. 25 (Chem. Abst. 59:2095). [8 ref]

• ***Summary:*** Tables show: (1) Pantothenic and 4'-phosphopantothenic acid content in foods (Pantothenic acid {Pa A}) is highest in slimy agaric 0.80 mg/100 gm, moderate in stone leek {white part}, stone leek {green part}, and Japanese radish ("Daikon"). 4'-phosphopantothenic acid is very low in the 10 foods listed.

Note: The "slimy agaric" is probably *Stropharia aeruginosa,* commonly known as the verdigris agaric, a medium-sized green, slimy woodland mushroom.

(2) Free pantothenic acid and total panthetine [pantethine] content in foods. The section of the table titled "Pulses" includes the following two values:

Soybeans, dried 0.86 / 0.08.
Azuki beans, dried 1.35 / 0.03.
Black soy beans, dried 0.76 / 0.24.
Soy bean curd ("Tohu") 0.10 / 0.02.
"Abura-age" 0.12 / 0.04
"Miso" 0.37 / 0.17.
Fermented soy beans ("Natto") 1.60 / 0.60.
Peanut 1.80 / 0.20.
Congealed "Tohu" [perhaps dried frozen tofu] 0.12 / 0.02.

The foods with the highest content of free pantothenic acid in this table are: (1) Rice bran 6.50. (2) Pine agaric, fresh 2.00. (3) Peanut 1.80. (4) Natto 1.60.

The foods with the highest content of total panthetine in this table are: (1) Rice bran 2.20. (2) Fresh kantake mushroom 1.20. (3) Natto 0.60.

Note: Pulses generally contain a substantial amount of free Pa A, but are rather poor in total panthetine; however natto is rich in the latter. Address: Dep. of Hygiene, Tohoku Univ. School of Medicine, Sendai [Japan].

4924. Brandemuhl, William. 1963. Soybean history: Aspects of Buddhist influence. Anthropology Dept., University of Wisconsin, Madison. 15 p. Jan. Unpublished manuscript. 28 cm. Summarized as "Early Soybeans Were Spread by Buddhists" in Soybean Digest, July 1963, p. 21. [52 ref]

• ***Summary:*** This research paper (which is not a thesis) was prepared for Anthropology 150a, taught by Dr. R.J. (Robert) Miller. Contents: Purpose of study. Method of study. Botanical history: Naming the soybean, the *Glycine ussuriensis* case, other genetic evidence, claim on the origin of the soybean. Initial utilization. Botanical dissemination. Soybean history–non-botanical: Legend, recorded Chinese soybean history, concluding notes on soybean origin and cultivation history. Buddhist influence on the development of the soybean: Soysauce or shôyu, miso, tofu, natto, ancient soybean food products, the soybean grows.

"Another principal concern of this paper is the Buddhist connection to soybean development. The introduction of soybeans, although an approximation at the very best, coincides quite closely with the spread of Buddhism in Japan. As shown later, Buddhism has a very close connection with soybean history and in many product sectors of soybean development, may have created or at least popularized them" (p. 1).

"Contrary to the above statement I submit the following data which I believe can easily be documented: 1. Emperor Sheng-nung is a mythical character (letter from Herbert W. Johnson, Research Agronomist, USDA / ARS Crops Research Div., Beltsville, Maryland, 30 Aug. 1962). 2. Emperor Shen-nung was a legendary character who cannot be pinpointed to a date of 2838 B.C. (letter from Jung-pang Lo, Research Asst. Prof., Far Eastern and Russian Inst., Univ. of Washington, 6 Sept. 1962). 3. Shen-nung is a mythical ruler, never living at the date attributed to him or at any other date (letter from Edward H. Schaefer, Professor of Oriental Languages, Univ. of California, Berkeley, 6 Sept. 1962). 4. A work attributed to Shen-nung is called *Shen nung pen Ts'ao Ching* but since it contains many Han Period facts (around the beginning of the Christian era) it is believed to be a Post-Han work. This work is first mentioned by T'ao Hung-ching (who edited it) early in the 6th century A.D. (Jung-pang Lo). 5-6. The *Pen Ts'ao Kang Mu* was written by L. Shih-chen (1518-1593) in A.D. 1596 or 1597 (Jung-pang Lo, Schaefer)... 9. The word 'Shiyu' cannot be found in Chinese dictionaries. The name for the soybean in China being 'Ta-tou,' meaning big bean (Jung-pang Lo)."

"Concluding notes on soybean origin and cultivation history: *The Book of Poetry* (Shih-ching) mentions boiling shu (pulse) and the *Erh-ya* (a Chou period lexicon, authorship attributed to Confucius or his disciples) mentions Jung-shu. Kao yu, the commentator, remarked that the Jung-shu (pulse of the Hu people) which was also known as Ta-tou (the soybean). Jung was a term used by the Chinese in the Chou period for the non-Chinese people of the North and Ju was a term used by the Chinese people of the North and West. This would seem to indicate that the soybean was introduced to China from the non-Chinese people of the North. Also supporting this is the *Chou-shu* by Hsi meng, in which there is a reference to Shan-jung shu (pulse of the Jung people of the mountains). A commentator explains that the Shan-jung were tribes in the Northeast (Manchuria).

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"The Kuang-Tzu contains a passage saying that after Duke Huan of Chi (7 B.C.) defeated the Shan-jung the Jung-shu came to be known throughout China. Chia su-hsieh (5 A.D.) in his book *Ch'i-min Yao-shu* (Ts'tung-shu Chi-ch'eng, editor) quoted the *Shen-nung pen Ts'ao* as saying that Ta-tou (the big bean) was the Hu-Tou (Hu peoples' bean) which Chang Ch'ien brought back from his exploration of central Asia in the first century B.C., there being two varieties. In the Han period both Ts'ui shih and Fansheng in their books on farming techniques mention cultivation of the Ta-tou and its use in famine relief. The *Pen Ts'ao Kang Mu* (1596), mentioned earlier, has a long discourse on the medical properties of the Ta-tou (Jung-pang Lo)."

"Buddhist influence on the development of the soybean: Although references to the Buddhist influence on soybean development are particularly sparse I believe Buddhism deserves credit for initiating the spectacular expansion of soybean utilization in Japan which triggered utilization in the rest of the world. The Buddhist connection is certainly true if oil utilization is excluded. Below lie the reasons for my belief.

"Buddhism was introduced into Japan around 500-600 A.D. (Bush 1959, p. 28-29). Among the priests the traditional hate of flesh was present and agriculture of the field type was encouraged by the government (Tezuka 1936, p. 13). The introduction of soybeans fits well into this historical development. The recent finding of soybean seed in *Shôso In* (Japan) which was established in the Nara era for the storing of legumes of that era that were introduced from China (Nagata 1960, p. 97) proves as does the record of ceremony and taxation system of the Nara era (Nagata, p. 75) that soybeans did exist in Japan at that time.

"Soysauce or more properly shôyu, the now renowned Japanese flavoring, is said to have originated during the Chou dynasty (1134-246 B.C.) (Komiya 1955, p. 14) and was introduced into Japan when Buddhism was being established although not becoming popular until 1300 (Joya 1951, p. 31-33).

"Miso, soybean paste, is a much used breakfast and soup dish in Japan that was introduced to Japan from China or Korea (Horvath 1927, p. 83). It was definitely used by the priests when they first entered Japan, in fact they popularized it among their new vegetarian converts (Joya, p. 21-23).

"An ancient Chinese book states that the Philosopher Hamintze, a prince of the Han dynasty, was the inventor of Tofu or soybean curd (Horvath, p. 6) while another source attributes the tofu innovation to the Chinese Philosopher Whai Nain Tze (Piper & Morse 1923, p. 234). The manufacture of soybean curd (tofu) was started in China in 164 B.C. during Emperor Hwai Wen's reign by Liu An, duke of Hwai Nan. Liu An was a great friend of the Buddhist monks and it seems quite likely that he made this bean curd to provide a change or delicacy to break the monotony of the monastic ration." Note: Whai Nain = Huainan. Liu An was the duke (*tze*) of Huainan. So all of these people are one and the same person.

"Tofu was introduced into Japan from Korea for the first time during the Toyotomi government (Horvath, p. 73) and was undoubtedly introduced into Japan from China by the Buddhists (Piper & Morse, p. 234) being used for their daily food before it was generally used (Horvath, p. 73).

"The true Buddhist monk was carried through the period of childhood growth on a rather heavy diet of bean curd (Horvath, p. 17). Even the naming of soybean curd has its esoteric connotations as the Classical Chinese name for tofu is Li chi which probably means morning prayer (Horvath, p. 72).

"Natto, a sort of vegetable cheese prepared from soybeans has long been used by the Buddhists and is now used extensively by the Japanese (Piper & Morse, p. 224).

"Buddhism seems to have been a major reason for the development of Japan for main soybean products. With the existence of these products Japan opened the world to soybeans." Address: Univ. of Wisconsin, Madison, Wisconsin.

4925. Grow, Howard E. 1963. Feed industry is growing [in Japan]. *Soybean Digest.* Jan. p. 26.

• ***Summary:*** "Livestock production in Japan is developing at a rapid rate. This applies mainly to poultry, but also to swine and dairy at a slower rate. Over 170 million chicks were hatched in Japan this last year. Statistics do not show the percentages for broilers or layers, but many broilers are produced and laying flocks range from a few birds to over 50,000.

"A mixed feed industry is developing in Japan. More farmers are increasingly depending on mixed feed for their herds and flocks. This is a relatively new industry and as a result it has many problems. It appears that feed ingredients used are the ones that are traditionally available. During the past year or two Japan has been importing large amounts of feed grains from the United States and other countries. Protein supplements used are mostly fish meal, wheat and rice bran as well as other minor items. Generally the protein content of their rations is lower than commonly used in the United States. A very limited amount of soybean meal is used. It appears that considerably more fiber is used in the rations for broilers and baby chicks than we have found most desirable in this country.

"We believe that much more soybean meal could and should be used in the mixed feeds in Japan. Soybean meal available is not toasted as we know it in the United States. Projects to acquaint the feed industry with the nutritional value and economies that can be gained by using more soybean meal are now receiving our attention. In cooperation with the U.S. Feed Grains Council tentative employment of a trained nutritionist will permit active work with the feed industry, encouraging them to use more soybean meal. Some

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progress was made to employ a soybean meal promotion supervisor as an addition to the staff of JASI.

"Some previous tests indicate that research and testing of Japanese produced soybean meal is needed. Plans were completed for starting a feeding test comparing U.S. and Japanese produced meal as soon as some U.S. meal is available for that purpose. Tests will be conducted at three experiment stations under the direct supervision of Dr. Morimoto, chief of the Japan Animal Nutritional Institute. These tests will use 600 broilers and will run for approximately 70 days.

"The U.S. government has established a permanent trade center in Tokyo. Agriculture will be featured during the period from May 20 to June 15, 1963. The theme of this show will be feed and will be sponsored jointly by ASA, JASI and the U.S. Feed Grains Council. There will be exhibits of various sorts emphasizing U.S. feed ingredients and how they are used in efficient livestock and poultry production in the U.S. Seminars are planned for various segments of the livestock and feeding industries. Specialists from the United States will be used to report how research, production and management have combined to develop the livestock and feed industries in this country.

"All of the planning and supervision of the agricultural show in Tokyo is directed by Russell Strobel, assistant Agricultural Attache in Tokyo. The show and symposiums will follow much the same pattern that was used in the successful feed show in London during March and April of 1962. Some adjustments will be necessary because of local situations. Shizuka Hayashi and William Hattori, representing the U.S. Feed Grains Council in Japan, will work closely with Mr. Strobel." Address: Asst. to the Executive Vice President, American Soybean Assoc.

4926. Nagai, S.; Igarashi, M.; Taguchi, H.; Teramoto, S. 1963. [Studies on the filtration and compression of fermentation mashes. I. On the constant pressure filtration of shoyu and sake mashes]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 41(1):1-6. Jan. [6 ref. Jap; eng]
Address: Dep. of Fermentation Technology, Faculty of Engineering, Osaka Univ., Japan.

4927. Reuter. 1963. New uses of cottonseed oil: Contract for research. *Times of India* (*The*) (*Bombay*). Feb. 7. p. 1.
• ***Summary:*** Washington, DC, Feb. 26. The USDA yesterday announced the award of two contracts to Indian and Japanese scientists.

A 2-year contract worth $9,972 was awarded to the Japan Tofu Association of Tokyo. It would enable Japanese scientists to evaluate the suitability of U.S. Soyabean varieties for making fresh tofu, a major source of food protein in the Japanese diet.

Note: This is the earliest article or ad seen (Sept. 2010) in *The Times of India* that contains the word "tofu" in connection with soybeans.

4928. Nakamura, Sadaichi. 1963. Asukorubinsan no shokuhin kakô e no riyô ni kansuru kenkyû. II. Tôfu-chû no asukorubin san no anteisei ni tsuite [Research on the use of ascorbic acid (vitamin C) in food processing. II. Stability of ascorbic acid in soybean curd (tofu)]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 10(2):67-69. [20 ref. Jap]
Address: Osaka Furitsu Daigaku, Nogyo Tanki Daigaku-bu. Osaka-fu, Minami Kochi-gun, Mihara-cho.

4929. *Soybean Digest.* 1963. Two-year Japan food study. Feb. p. 20.
• ***Summary:*** William Brandemuhl, who earned a B.S. degree in economics at the University of Wisconsin in January, will begin a 2-year study of Japanese food at Kyoto University, starting Feb. 1. He plans to study "soybean products that are little known outside the Orient as well the more conventional soybean products" in hopes that they can be adapted for use elsewhere, especially in nutritionally deficient countries. He notes that Japan uses soybeans for food more than perhaps any other country.

A photo shows William Brandemuhl and Prof. J.H. Torrie of the University of Wisconsin, both looking at a bag of soybeans.

4930. O'Neal, Mary Lee S. 1963. Living in Japan an adventure: Youth section. *Christian Science Monitor.* March 8. p. 17.
• ***Summary:*** The writer's husband and family were sent to Japan by the U.S. Air Force. After several months they found themselves oriented to their new way of living–along with the inconveniences involved. They have become adept at eating sukiyaki with chopsticks at Japanese restaurants. "We have learned to recognize the tofu man piping a little horn as he goes to Japanese doors selling bean curd."

4931. *Foreign Agriculture.* 1963. Japan soybean imports may equal 1962. 1(10):14. March 11.
• ***Summary:*** Japan's imports of soybean meal in 1963 are expected to equal the approximately 16,000 tons believed to have been imported from the USA in 1962.

However in 1961, Japan imported 56,355 metric tons of soybean meal–the largest amount since 1951. Soybean imports were liberalized on 1 July 1961.

4932. Ebine, Hideo; Furusho, S.; Nakano, M. 1963. Miso no bôyu ni kansuru kenkyû. II. Kobukuro zume mugi miso no kanetsu shori [Study on the prevention of swelling in miso. II. Heat treatment of miso in plastic bags]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 42-48. March. [11 ref. Jap; eng]
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Tokyo, Japan.

4933. Ebine, H.; Matsushita, Z.; Sasaki, H.; Hasunuma, T.; Matsumoto, K. 1963. Rikuto o mochiita miso jôzô shiken [Evaluation of upland rice for making miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 162-69. March. [4 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4934. Ebine, Hideo; Ito, Hiroshi; Hieda, Harukiyo; Kosaka, Shokichi. 1963. Kansô nyûsan-kin oyobi kôbo o fukumu tane kôji ni yoru miso jôzô shiken [Miso manufacturing employing "tane-koji" (koji starter) including freeze-dried lactic acid bacteria and yeast]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 170-78. March. [17 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4935. Ebine, Hideo; Matsushita, Z.; Sasaki, H.; Hasunuma, T.; Otake, T.; Mouri, M. 1963. Dai 3 kai Miso Zenkoku Hinpyo-kai sogo seiseki. I. Sogo seiseki to butsuri kagaku bunseki kekka no kentô [Results of the third annual inspection of miso (1960). I. Relation of organoleptic test and chemical or physical analysis]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 179-201. March. [4 ref. Jap; eng]
• ***Summary:*** Samples of 226 miso varieties, collected from throughout Japan, were subjected to organoleptic tests, and both physical and chemical analysis. Organoleptic tests revealed that miso made from whole soybeans was superior to that made from soybean flakes or from a mixture of whole soybeans and flakes. Miso made from Japanese soybeans was superior to that made from soybeans imported from the USA or China.

Most miso graded as excellent or good conformed to the following formula: N = 0.1 (5S-R) where N is the weight of ordinary salt (NaCl), R is the weight of rice or barley, and S is the weight of soybeans. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4936. Ebine, Hideo; Ito, Hiroshi; Kosaka, Shokichi; Furusho, Shinji; Matsushita, Zenichi; Sasaki, Hirokuni; Hasunuma, Toshiko; Kumai, Keiji. 1963. Dai 4 kai Miso Zenkoku Hinpyo-kai sogo seiseki [Results of the 4th annual inspection of miso (1961)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 201-37. March. [6 ref. Jap; eng]
• ***Summary:*** 257 miso samples, collected from throughout Japan, were subjected to organoleptic tests, chemical analysis (including moisture, sodium chloride, acidity I, acidity II, and glutamic acid), physical analysis (pH and color), and microbiological counts. Seven conclusions are given.

(1) As observed in the 3rd annual inspection, Japanese soybeans showed general superiority to imported soybeans as a raw material for making miso. Note, however, that samples of miso made from U.S. soybeans and graded as excellent or good, increased in number during the past year. Imported soybeans can even be used successfully to make bright colored miso. However, soybean flakes are not yet considered a suitable raw material for making miso of good quality.

(3) Miso of high moisture content was graded as poor in consistency.

Reprinted from *Miso Kagaku* (*Miso Science*), No. 9, p. 30. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4937. Fukamachi, Chiharu; Abe, Kazuyoshi; Watanabe, Tokuji. 1963. Fukuro-iri tôfu genryô toshite no funmu kansô tônyû ni tsuite [Qualification of spray-dried soybean milk as the material of bagged tofu]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 129-31. March. Reprinted from Nippon Shokuhin Kogyo Gakkaishi 9:13 (1962). [4 ref. Jap; eng]
• ***Summary:*** Spray-dried whole soybean milk has recently appeared on the market in Japan. Tofu made with this milk was found to be excellent in firmness and its ability to hold water, compared to tofu made from fresh soymilk. For making bagged tofu, it is recommended that a mixture of dried and fresh soymilk be used, with 40% of the solids coming from the dried soymilk. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4938. Fukamachi, Chiharu; Abe, Kazuyoshi; Watanabe, Tokuji. 1963. Tôfu genryô to shite no dasshi daizu ni tsuite [Qualification of defatted soybean meal as a material for making tofu]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 132-34. March. Reprinted from Nippon Shokuhin Kogyo Gakkaishi 9:16 (1962). [3 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4939. Fukamachi, Chiharu; Abe, Kazuyoshi; Watanabe, Tokuji. 1963. Tônyû no gyôko ni oyobosu tenkabutsu no eikyô ni tsuite [Effects of additives on the coagulation of soybean milk by calcium salt]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 135-39. March. Reprinted from Nippon Shokuhin Kogyo Gakkaishi 9:19 (1962). [9 ref. Jap; eng]
• ***Summary:*** Tofu was coagulated with calcium sulfate calcium chloride, and sulfuric acid to compare their hardness and volume. The quality of the curd made with the acid was similar to that made with calcium chloride. Although the curd made with calcium sulfate was very soft and voluminous, it became smaller and harder and smaller in volume when

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a small amount of acid was added. Various kinds of agents were added to the soymilk before precipitation by calcium chloride to try to get a soft curd. Among these agents, sodium citrate and sodium polyphosphate seemed to be effective in making tofu softer and more voluminous, probably because of their high pH and their ability to increase the water-holding capacity of soy protein. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4940. Ito, Hiroshi; Ebine, H.; Kosaka, S.; Nakano, M. 1963. Miso no bôyu ni kansuru kenkyû. I. Masai kongo ni yoru fukurozume miso no fukure [Study on the prevention of swelling in miso. I. Swelling of blended miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 38-41. March. [3 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4941. Kamada, Hidemoto; Ebine, H.; Nakano, M. 1963. Daizu seihin no chakushoku ni kansuru kenkyû. XI. Daizu no mushi to chakushoku (1) [Browning reaction of soybean products. XI. Browning of soaked soybean by autoclaving (1)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 148-52. March. [8 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4942. Kamada, Hidemoto; Ebine, H.; Nakano, M. 1963. Daizu seihin no chakushoku ni kansuru kenkyû. XII. Daizu no mushi to chakushoku (2) [Browning reaction of soybean products. XII. Browning of soaked soybeans by autoclaving (2)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 153-57. March. [8 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4943. Kamada, Hideomoto; Ebine, Hideo; Nakano, Masahiro. 1963. Daizu seihin no chakushoku ni kansuru kenkyû. XIII. Miso jôzô-chû no chakushoku seibun no shôchô to iro no seisei [Browning reaction of soybean products. XIII. Color formation of miso during brewing]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 158-61. March. [8 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4944. Koshimizu, Yukio; Iizuka, Norio. 1963. Daizu no uiresu-byo ni kansuru kenkyû [Studies on soybean virus diseases in Japan]. *Tohoku Nogyo Shikenjo Kenkyu Hokoku* (*Bulletin of the Tohoku National Agricultural Experiment Station*) No. 27. 103 p. March. English-language summary p. 78-84. [81 ref. Jap; eng]
• ***Summary:*** This paper focuses on the soybean mosaic virus, the soybean stunt virus, and other legume viruses. The soybean stunt virus (SSV) was first isolated in 1955 from soybeans in Japan. Address: Morioka, Japan.

4945. Nakayama, Osamu; Watanabe, Tokuji. 1963. Tônyû ni kansuru kenkyû. I. [Studies on soybean milk. I.]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 144-47. March. [2 ref. Jap; eng]
• ***Summary:*** See summary at *Eiyo to Shokuryo* 15:191-95 (1962). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4946. Nishimura, Sachio; Hata, Naoaki. Assignors to Asahi Electro-Chemical Company. 1963. [Synthetic resin from epoxy soybean oil]. *Japanese Patent* 2746. March 29. 3 p. Application filed 31 March 1960. (Chem. Abst. 59:6583b). [Jap]*
• ***Summary:*** Epoxy soybean oil is used to make a transparent, yellow, insoluble resin.

4947. Sugimura, Keiichiro; Taira, Hirokadzu; Ebisawa, Harue; Sakurai, Yoshito. 1963. Daizu kakôhin no amino-san ni kansuru kenkyû. III. [Studies on amino acid contents of processed soybean. III. Total and free amino acids of soybean "miso"]. *Shokuryo Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 17. p. 312-14. March. [13 ref. Jap; eng]
• ***Summary:*** Reprinted from *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 14:411 (1962). Address: 1-2. Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4948. Sugimura, Keiichiro; Taira, Hirokadzu; Ebisawa, Harue; Sakurai, Yoshito. 1963. Daizu kakôhin no amino-san ni kansuru kenkyû. IV. [Studies on amino acid contents of processed soybean. IV. Variation of total and free amino acid contents in soybean "miso" processing]. *Shokuryo Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 17. p. 315-19. March. [6 ref. Jap; eng]
• ***Summary:*** Reprinted from *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 14:44 (1962). Address: 1-2. Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4949. Tsutsumi, Chuichi; Nagahara, T.; Muroi, K.; Ogawa, K. 1963. Kansôhô ni yoru mamerui no suibun teiryô. II. Daizuko, daizu oyobi rakkasei no suibun teiryô [Determination of moisture in legumes by oven-drying methods. II. Determination of moisture in whole soybean and peanut, soybean flour and defatted soybean meal]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research*

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Institute) No. 17. p. 18-23. March. [9 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4950. Watanabe, Tokuji; Abe, Kazuyoshi. 1963. Kakushu san-rui oyobi en-rui ni yoru tônyû no gyôko ni tsuite [Studies on the coagulation of soybean milk by various kinds of acid and salt]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 140-43. March. [5 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4951. Watanabe, Tokuji; Nakayama, Osamu; Abe, Kazuyoshi. 1963. Tônyû no funmu kansô ni kansuru kenkyû [Study of spray-dried soya milk]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 17. p. 124-28. March. Reprinted from Nosankaku Gijutsu Kenkyo Kaishi 8:288 (1961). [5 ref. Jap; eng]
• ***Summary:*** The nitrogen content is much higher with spray drying than with lyophilization. Spray-dried soymilk powder, which gelatinizes into tofu through dispersing in water and heating, is obtained from samples which contain calcium sulfate and sodium phosphate. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4952. *Foreign Agriculture.* 1963. Japan's soybean meal may be liberalized. 1(13):15. April 1.
• ***Summary:*** Shortage of the meal is hindering the development of the livestock feeding industry.

4953. Honma, Osamu; Ono, H.; Nishihara, K. 1963. Daizu o tanpakushitsu gen toshita nyûji shoku no riyô ni tsuite [On the use of soybeans as a source of protein in infant diets]. *Chiryo* (*J. of Therapy, Tokyo*) 45(4):705-10. April. [28 ref. Jap]
• ***Summary:*** In Germany, soybeans are valued as a food with medicinal uses. There are some products on the market sold as Vollsojamehl (whole soy flour, made by Henselwerk in Magstadt) that are used in regular foods and medicinally by adults, but also by elderly people and young children. Soy-based infant formulas made in the USA include: Mull-Soy Liquid (made by Borden); Sobee Powder and Sobee Liquid (made by Mead Johnson); Soyalac Infant Powder, Soyalac Infant Concentrated, and Soyagen Infant Powder (made by International Nutrition Lab. [Mt. Vernon, Ohio]). Those made in Germany include Soyakraft and Sojabasan (Henselwerk); Lactopriv; and Solactin. Address: Tokyo Keisatsu Byoin Shonika, Icho (Tokyo Police Hospital, Pediatric Div., Head).

4954. Umeda, Isao. 1963. Shôyu genryô no renzoku mushini [Continuous steaming of the raw materials in soy sauce brewing]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 41(4):205-07. April. [3 ref. Jap; eng]
• ***Summary:*** Continuous steaming of soybeans and wheat in a screw conveyer was tested using rotary valves. Address: Nihon Shoyu Kenkyujo (Japan Soy Sauce Laboratory, Tokyo).

4955. *Times* (*London*). 1963. Japan seeks expansion of trade with China: Five-year programme in full-swing. May 17. p. 20, cols. 4-5.
• ***Summary:*** From a correspondent in Tokyo. "With extreme caution, the Japanese Government has begun to tiptoe through the door that leads to expansion of trade with Communist China... with many anxious backward glances toward Washington" [DC]. Last year Japan concluded a £36 million trade agreement with China, and the programme is now in full swing.

But there is not much that the Japanese want to buy. "American soya beans are of better quality than China's, and the demand for Chinese soya beans is not likely to go beyond what is needed for purely culinary purposes."

4956. Akabori, Shiro; Kawakami, Y.; Izumi, Y.; Komatsu, S. Assignors to Ajimomoto Company, Inc. 1963. [Surfactant agents from soybean or wheat protein]. *Japanese Patent* 6455. May 20. 2 p. Application filed 13 March 1961. (Chem. Abst. 59:7758f). [Jap]*
• ***Summary:*** Soybean protein (containing 65% pure protein) is used to make a surfactant (a surface-active substance, such as a detergent).

4957. McEachern, Margaret. 1963. Symphony of sounds tells time in Tokyo: Centuries-old street calls. *Christian Science Monitor.* May 25. p. 15.
• ***Summary:*** Tokyo–The Japanese housewife doesn't need a clock to tell the time of day. She only needs to listen to the distinctive calls from her street.

"The day begins with the call, 'Natto... natto...' in a high youthful voice." That is the sound of a teen-age boy making his rounds as he sells his fermented [soy] beans–a little delicacy that is tasty and nourishing. Japanese housewives use natto in soup, seasoned with soy sauce, served over rice.

The Japanese may be the only people who enjoy soup in the morning. This soup, called *misoshiru,* "consists of 'miso,' or fermented bean soup [sic, fermented soybean paste] with vegetables and fish."

In the late afternoon one hears the eerie sound of the [soy] bean-curd seller. He carries his produce in wooden buckets attached to both ends of a long bamboo pole.

Note: The writer is apparently unaware that natto, miso, and tofu are each made of soybeans–for that word does not appear in the article. A photo shows a housewife shopping in Tokyo.

4958. Clagg, Elizabeth. 1963. Soy products in foods around

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the world. *Soybean Digest.* May. p. 42.
• ***Summary:*** Miss Clagg undertook a special tour for the Soybean Council last October. This article begins: "Soya from America is blending in foods all over the world to open a whole new world of eating enjoyment."

She found soy flour used by cooks in England, Brussels, and the Netherlands. Soy oil was also widely used. "Americans have adopted so many international recipes in recent years–but as yet we haven't tasted Japanese miso, tofu, natto, kinako, aburaage, German doughnuts, Spanish noodles. The many soybean recipes we tasted in 10,000 miles of tasting are unknown here at home."

A small portrait photo shows Elizabeth Clagg. Address: Member, American Home Economics Assoc. and the American Dietetics Assoc.

4959. Hayashi, Shizuka. 1963. The future of the crushing industry in Japan. *Soybean Digest.* May. p. 26-27.
• ***Summary:*** "The soybean crushing industry in Japan was for many years after the war a profitable enterprise with a margin of profit always assured under the government controlled trade policy. However, since the restrictions on imports of soybeans under the funds allocation system were withdrawn in July 1961 and the duty increased to 13% the picture has changed. The crushing industry has lost this assurance of easy profit making.

"What will be the future? It is government policy to liberalize the import of both soybean oil and meal in the near future. Let us analyze the problem under the assumption that this will take place.

"Of the annual production of 200,000 metric tons of vegetable oils made from imported materials in Japan; 65% is soybean oil. Soybean oil constitutes 40% of the total national production of 330,000 tons of vegetable oils. This shows how important a role soybeans play in the crushing industry. The change of picture could therefore be very serious.

"I will now proceed with analysis of the following points:

"1. Costs of oil and meal produced from imported soybeans compared with costs of imported oil and meal. Cost figures over the past 6 years reveal that without exception, the total cost of imported oil and meal is lower than the processors' cost from imported soybeans. Every month or year shows a loss for the crushers.

"2. Prices of imported soybean oil and meal compared with domestic prices.

"Here again domestic prices, based on Bank of Japan figures, compare unfavorably with prices of imports. A comparison of the actual prices of both domestic and imported meals points up the unfavorable position of domestic meal.

"3. Comparison of prices of soybean oil with prices of other oils produced from various imported materials. Soybean oil has always been priced higher than other oils. Other oils are being supported by the higher prices of soybean oil. Some oils are sold to be blended with soybean oil. If lower priced soybean oil is imported sales of these miscellaneous oils will be adversely affected, thus jeopardizing crushing of other oilseeds.

"4. Effect on domestic rapeseed. Lower import prices of soybean oil will render sales of rapeseed oil difficult. This will create problems in the production and government support of domestic rapeseed. The price of domestic rapeseed oil has always been lower than soybean oil.

"From the above analyses it can be concluded that the crushing business, in the event that oil and meal are liberalized, will not maintain its status as a profitable enterprise. However, this conclusion is based on statistical data and on an 'as is' situation with no consideration of the possibilities of creating additional business. Such items as cutting crushing costs through obtaining better yields, buying materials advantageously, selling products at higher prices or other successfully planned operations are not taken into consideration. There is a positive side which could contribute to profitable business.

"Since the unfavorable elements are primarily caused by the high rate of import duty on soybeans the elimination of the 13% duty is definitely the first remedy at hand. Processors are now petitioning for removal of the duty on beans which they import for crushing. But I think it would be more effective if they would combine their efforts with other soybean food processors to eliminate completely the duty on all beans imported for all purposes.

"Curtailed production: Processors have voluntarily agreed to cut their production as a means of overcoming the depressed market. Business enterprises are free to resort to this means when supply exceeds demand. Whether the present situation justifies this is a question. To force prices up at the expense of consumers is in a sense an industrial strike which will disrupt the economy. Perhaps industry people generally have the tendency to view the situation one-sidedly.

"Where should Japan market her oil and meal?

"The diet-deficient countries are mostly in the Far East. Countries like India, Pakistan, and Communist China are in need of oil and meal. However, the possibilities for Japan to sell her products to these countries are small primarily because of the insufficient dollar funds which these countries have. Unless Japan is willing to provide credit accommodations similar to that given by the United States under P.L. 480 or to agree to barter trade such markets are not within the reach of Japanese sellers even if prices are competitive.

"The only country where Japan can sell her soybean products is in Japan itself. With a population of 94 million and a growing economy (per capita income was $372 in 1961) Japan surpasses all other diet-deficient countries as

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being the best-qualified country to pay for her products and is perhaps the only one that can do so.

"The potential yearly demand in addition to present requirements for oils and fats and soybean meal in Japan can be estimated as:

"1. 340,000 metric tons of vegetable oil. In terms of soybeans this is 1,900,000 metric tons. Average daily per capita deficiency of fat in the Japanese diet is 10 grams. Based on 94 million people this amounts to 340,000 tons yearly.

"2. 300,000 tons of soy flour for edible purposes. This would be used for blending with wheat flour in such foods as bread, cakes, spaghetti, noodles and macaroni, and also directly in the diet.

"3. 500,000 tons in livestock feeds. Total production of feeds in Japan in 1961 was 3,900,000 tons. At least 15% soybean meal can be used in this volume of feeds.

"Processors are too worried about their present output to think of the potential demands. Rather than to curtail production, efforts should be made to create new demand.

"Promotional programs of JASI: Here are the various media through which the Japanese American Soybean Institute is conducting promotional activities:

"1. Through the network of the home economics extension workers of the Ministry of Agriculture and Forestry.

"2. Through the network of health centers throughout Japan.

"3. Through the high school economics teachers.

"4. Through the school lunch program, jointly with the Ministry of Education.

"5. Through local women's groups.

"The government agency networks are not available to private commercial firms. Processors have no access to such facilities if they want to promote their own brands. They concentrate mainly on advertisements by television, radio, magazines, etc., but because they are doing this individually it is limited in area and is less effective than a combined overall public relations program in which all would pool their funds.

"I strongly suggest that the Japanese processors participate jointly with JASI in the promotion of programs through the above agencies by shifting, say, one-half of their present advertising expenditures to the joint program. They will surely get much greater results."

Tables show: (1) 1962 prices of imported meal. (2) Prices of vegetable oils (1952-1961). The five oils (with their April 1962 prices in yen per 16.6 kg can) are: Soybean oil (2,500), rapeseed oil (2,413), cottonseed oil (2,150), kapok oil (2,241), safflower oil (2,423), and rice bran oil (2,150). Address: Managing Director, Japanese-American Soybean Inst., Tokyo.

4960. Machida, Yoshiro. 1963. Seisei daizu tanpaku no yotô [Utilization of refined soy protein]. *Shokuhin to Kagaku* (*Food and Science*) No. 38. May. p. 42-47. [Jap]

4961. Meals for Millions. 1963. Friendship food for a hungry world. Distribution of relief shipments, September 1946–May 15, 1963. 215 West 7th Street, Los Angeles 14, California. 4 p. Undated. [2 ref]

• ***Summary:*** Total distribution of MPF (Multi-Purpose Food) up to 15 May 1963 was 12,830,416 pounds, comprising 102.6 million meals. Countries receiving over 20,000 pounds, in descending order of amount received, were: India (1,979,748 lb), Korea (1,356,110), Japan (541,102), Hong Kong (394,259), China (358,957, stopped in 1951), Brazil (312,244), Germany (206,185), United States (183,366), Philippines (146,943), Haiti (139,823), France (126,022), Pakistan (101,041), Congo (86,101), Austria (82,159), Tanganyika (77,997) Mexico (65,722) Burma (63,554), Taiwan (58,639), Lebanon (56,910), Canada (51,836), Ceylon (38,428), Israel (38,280), Jamaica (38,171), Greece (38,133), Vietnam (37,524), Italy (36,768), Indonesia (35,873), Jordan (33,375), Hungary (33,165), New Guinea (31,535), Gabon (27,704), Liberia (27,187), Okinawa (23,640), Malaya (23,454), Morocco (22,736), Chile (22,721), Iran (21,482), Peru (21,374), Honduras (21,168), Bolivia (20,860), Nepal (20,626), Borneo (20,053).

The following countries (listed alphabetically) were early recipients of soy-based Multi-Purpose Food from Meals for Millions, and were late in introducing soybeans to the country: Bahamas (received 6 shipments totaling 2,079 lb between 1 July 1960 and 31 Dec. 1962). Basutoland [Lesotho] (received 2 shipments totaling 1,539 lb between 1 July 1960 and 31 Dec. 1962). Bolivia (received 2 shipments totaling 1,634 lb between Sept. 1946 and 30 June 1960). British Honduras (received 5 shipments totaling 11,319 lb between Sept. 1946 and 30 June 1960; renamed Belize in about 1975). Cape Verde Islands (received 1 shipment of 2,007 lb between Sept. 1946 and 30 June 1960; independent since 1975). Caroline Islands (received 2 shipments totaling 2,008 lb between Sept. 1946 and 30 June 1960; renamed Federated States of Micronesia in 1986). Central African Republic (received 1 shipment of 2,025 lb between 1 July 1960 and 31 Dec. 1962). Eritrea (received 1 shipment totaling 2,025 lb between Sept. 1946 and 30 June 1969). Fiji Islands (received 2 shipments totaling 2,052 lb between Sept. 1946 and 30 June 1969). Finland (received 1 shipment of 2,040 lb between Sept. 1946 and 30 June 1960). Gabon (received 3 shipments totaling 17,660 lb between Sept. 1946 and 30 June 1960). Guam (received 3 shipments totaling 4,995 lb between 1 July 1960 and 31 Dec. 1962). Guadalcanal ([later part of the Solomon Islands] received 1 shipment of 513 lb between Sept. 1946 and 30 June 1960). Iraq (received 3 shipments totaling 8,122 lb between Sept. 1946 and 30 June 1960). Jordan (received 9 shipments totaling 28,839 lb between Sept. 1946 and 30 June 1960).

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Liberia (received 10 shipments totaling 21,949 lb between Sept. 1946 and 30 June 1960). Luxemburg [Luxembourg] (received 1 shipment of 5,130 lb between Sept. 1946 and 30 June 1960). Marshall Islands (received 1 shipment of 739 lb between Sept. 1946 and 30 June 1960). Mozambique (received 3 shipments totaling 7,641 lb between Sept. 1946 and 30 June 1960). New Hebrides [later Vanuatu] (received 1 shipment of 513 lb between Sept. 1946 and 30 June 1960). Oman (received 4 shipments totaling 10,659 lb between Sept. 1946 and 30 June 1960). Panama (received 1 shipment of 96 lb between Sept. 1946 and 30 June 1960). Samoa (American) (received 6 shipments totaling 6,480 lb between Sept. 1946 and 30 June 1960). Somali (received 1 shipment of 270 lb between 1 July 1960 and 31 Dec. 1962). Swaziland (received 1 shipment of 621 lb between 1 July 1960 and 31 Dec. 1962). Tonga Islands [Kingdom of Tonga, independent since 1970] (received 5 shipments totaling 6,723 lb between 1 July 1960 and 31 Dec. 1962). Virgin Islands [USA] (received 2 shipments totaling 2,113 lb between Sept. 1946 and 30 June 1960). Western Samoa [independent since 1962] (received 1 shipment of 1,026 lb between 1 Jan. 1963 and 15 May 1963).

Other countries which received MFM shipments by 15 May 1963 are: Afghanistan, Algeria, Angola, Argentina, Basseterre [Probably refers to the island, Basse-Terre (or Guadeloupe proper) which is the western half of Guadeloupe, separated from the other half, Grand-Terre, by a narrow channel. As of 1994 Guadeloupe is a French Overseas Department. Probably not the seaport on St. Christopher Island, capital of St. Christopher-Nevis–since that is not a country], Belgium, Cambodia, Republic of Cameroun [Cameroon], Canal Zone, Colombia, Costa Rica, Cuba, Czechoslovakia, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, England, Eritrea, Ethiopia, French West Indies, Gambia, Ghana, Goa [former Portuguese possession; annexed by India in 1962; became a state of India in 1987], Grenada, Guatemala, Haute Volta [Upper Volta, later Burkina Faso], Iraq, Kenya, Laos, Libya, Macao, Madeira Islands [autonomous region of Portugal in east Atlantic Ocean, 600 miles due west of Casablanca, off the coast of Morocco], Mauritius Islands, Montserrat [island in the West Indies], Netherlands, Nicaragua, Nigeria, Northern Rhodesia [later Zambia], Nyasaland [later Malawi], Oman, Paraguay, Persian Gulf, Poland, Puerto Rico, Ruanda Urundi, Rumania [Romania], Ryukyu Islands, American Samoa, Santa Lucia [probably Saint Lucia island in the Caribbean], Sicily, Sierra Leone, South Africa, Southern Rhodesia [later Zimbabwe], Spain, Surinam [Suriname], Switzerland, Thailand, Trieste [Italy], Tunisia, Turkey, Uganda, Uruguay, Venezuela, Yugoslavia.

Note: This is the earliest document seen (March 2010) concerning soybean products (soy flour in MPF) in British Honduras [Belize], Cape Verde, Caroline Islands, Eritrea, Iraq, Lesotho, Liberia, Luxembourg, Marshall Islands, New Hebrides [Vanuatu], Oman, Samoa (American), Tonga, or Western Samoa. Soybeans as such have not yet been reported in these countries.

This document contains the earliest date seen for soybean products (soy flour in MPF) in Bolivia (June 1960), British Honduras (June 1960), Cape Verde (June 1960), Central African Republic (Dec. 1962), Eritrea (June 1960), Iraq (June 1960), Lesotho (Dec. 1962), Liberia (June 1960), Luxembourg (June 1960), Marshall Islands (June 1960), New Hebrides (June 1960; Vanuatu), Oman (June 1960), Samoa (American) (June 1960), Tonga (Dec. 1962), or Western Samoa (May 1963). Soybeans as such had not yet been reported by that date in these various countries. Address: Los Angeles, California.

4962. Senti, Frederic R. 1963. Current status of soybean utilization research under P.L. 480. *Soybean Digest.* May. p. 28, 30-34.

• ***Summary:*** This is the third in a series of USDA research reports under the P.L. 480 program. Discusses progress on active projects: Soybean oil in Seville, Spain; Chemical changes in sterols during refining of soy oil by Prof. H. Niewiadomski in Gdansk, Poland; Flavor stability of soy oil in by Prof. Y. Toyama at Toyo Univ. in Japan; Improving the frying quality of soybean oil by Prof. G. Varela at Univ. of Granada, Spain; Meal constituents.

Oriental foods: Production of shoyu (soy sauce) using U.S. vs. Japanese soybeans, use of dehulled soybean grits for making miso, miso-type food in Israel, use of U.S. soybeans in making tofu, or soybean curd, by the Japan Tofu Association, Tokyo.

Industrial applications: Polymerization studied in Milan, Italy. Soybean constituents. Oriental foods #2: Dried tofu in Japan, *Saccharomyces rouxii* yeast in shoyu and miso, development of fermented products from soybean milk in Japan, fermented soybean cheese in Taiwan, fermented soyfoods (tempeh, ontjom, ragi) in Indonesia.

Domestic research for increasing imports: Work with soy oil, UNICEF trainees from Brazil studying tempeh, projects saponins, protein complexes, and isolated protein quality in Israel.

A small portrait photo shows F.R. Senti. Address: Director, Northern Utilization Research and Development Div. (also known as the Northern Regional Research Lab.), Agricultural Research Service, USDA, Peoria, Illinois.

4963. Strayer, George M. 1963. Development of the Japanese market for soybeans: The first and largest U.S. market development project for soybeans and soybean products. *Soybean Digest.* May. p. 13, 16.

• ***Summary:*** A good historical overview of the American Soybean Assoc. soybean program in Japan, from Strayer's speech presented at the Agricultural Trade with Japan conference in Chicago.

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"For a long period of years Japan has produced a sizable tonnage of soybeans, a part of them in the northern island of Hokkaido, and a part of them grown on the other islands largely on the dikes or dividers around the rice paddies. But these supplies were not adequate to fill their needs, so considerable tonnage was imported from China and Manchuria each year.

Note: By 1886 Japan was producing 11.5 million bushels of soybeans a year; most were consumed as food (Tamari 1886).

The conquest of the Red Force [Red Army] in China, followed by the Korean episode [Korean war], cut off these Chinese supplies. The American military government shipped supplies of U.S. soybeans to Japan in the years immediately following World War II, as a source of protein for the Japanese people. The Japanese were also importing soybeans from Manchuria during these years, and at the same time Japanese interests owned processing facilities in Korea and in Dairen and Port Arthur of Manchuria. The Korean episode ended all that, and Japan found herself badly in need of a source of supply for her protein.

"During this same period things had been happening on American farms. At the start of World War II we were the world's largest net importer of fats and oils. The sea lanes were cut off, and we doubled and redoubled our soybean production as a means of supplying our requirements of fats and oils. We increased soybean production from 60 million bushels to over 180 million bushels during the war years. We learned what soybean oil could do in human foods and in industry, and what soy protein could do in contributing to economic livestock production. So, in the years since the war ended we have continued to increase soybean production from 180 million bushels per year to a predicted 725 million bushels in 1963. Today we are the world's largest net exporter of fats and oils and oil bearing materials.

"Early export troubles: As this process was going on Japan was restoring her economy, putting her people to work, increasing their incomes and their demand for food. Soybeans were being purchased from the United States but they were produced and handled mechanically, delivered in bulk, and the Japanese buyers were not accustomed to this type of handling and production nor happy with our beans. When I first went to Japan in 1955 we had a market for about 250,000 metric tons of soybeans but we were in trouble. I spent 6 weeks contacting the trades people, seeing for myself just what problems confronted us. A gentleman from the grain grading branch of the U.S. Department of Agriculture joined me, so that agency might understand our soybean sales problems. When we came home we agreed to try to do something about the situation.

"Exporters were appraised of the situation in meetings at export ports. Growers were told what the Japanese market demanded. Sampling and grading was tightened up. Japanese buyers were taught how to buy on our federal grade basis to get the desired quality. A Japanese firm was employed to make impartial samplings and grade determinations on the basis of our U.S. federal grades on cargoes as they arrived in Japan. By focusing much attention on our problems and their solutions we solved them–today U.S. soybeans are not only accepted but preferred in the Japanese market by most buyers, especially the oilseed crushers. Our quality is better, the oil content higher, our supply more dependable.

"In 1955 Japan was buying about 250,000 tons of soybeans per year from us. This seemed to be only a small portion of the potential, for per capita consumption of both oil and protein was far below levels necessary for proper nutrition. In early 1956 the American Soybean Association signed a contract with Foreign Agricultural Service to use some Japanese yen accrued under Public Law 480. A contractual working arrangement was worked out with the five trade groups in Japan representing the major users of soybeans plus the importers, and an office was established in Tokyo in April 1956. A campaign to increase per capita consumption of soybean food products was launched, using a variety of approaches.

"Working closely with the Ministry of Health, the Ministry of Agriculture, with private promotional organizations and with the miso, tofu, shoyu and oil trade groups a concerted campaign was carried on the educate the Japanese housewife on the functions of protein and oil in the human diet, and with the necessity of providing proper

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amounts of both in the meals prepared for her family. Very naturally, the Japanese, who had used soybeans for centuries, turned to soybean food products because of availability, price, and knowledge of how to use them."

Today Japan buys 1.2 million tons–42 million bushels–of U.S. soybeans a year, "and we visualize further increases to nearly double those figures by 1970."

"Last year Japan paid U.S. farmers about $100 million for soybeans."

Photos show: (1) A tofu maker in Japan selling tofu from a wooden box on the back of his bicycle to a group of laughing Japanese housewives. (2) Participants in the Agricultural Trade with Japan conference. Left to right: Ferenc Molnar, operations assistant, Soybean Council of America. V.H. Hougen, chief foreign marketing branch, fats and oils division, Foreign Agricultural Service, USDA; David G. Wing, vice president of the Soybean Council. Geo. M. Strayer, American Soybean Assoc. executive vice president. Howard E. Grow, assistant to ASA executive vice president. Address: Executive Vice President, American Soybean Assoc.

4964. Talese, Gay. 1963. One year later, still no bomb. *Esquire.* May. p. 76-77.
• ***Summary:*** The story of the Exodus from Long Island to Chico, California in the fall of 1961–prompted by the teachings of "Zen Buddhist philosopher" [sic] George Ohsawa. Full of interesting details. The Berlin Crisis has worsened and many believed that New York City was the world's leading target for an atomic bomb.

They chose Chico based on their interpretation of Atomic Energy Commission reports and data.

It was Mr. Alvin Baumann who gathered friends at his home one evening when they decided to leave the New York City area. These were not aging beatniks (as the press has implied) but a group of largely successful, professional people. Their names and professions are given. But they had had enough of the big city "rat race"–they were fed up and ready for a simpler life. A study of AEC reports showed Chico as a possible place to go. A few days after the meeting at his home, Bauman and two others flew to California to look at small towns north of San Francisco. The found Chico and liked it. It had a population of less than 37,000, an average temperature of 63 degrees, its own university (Chico State College) to give an intellectual flavor, and it was only 3 hours by car from San Francisco.

"The possibility of great doses of nuclear fallout being carried by rain into Chico is slight because the area has a light rainy season, and the surrounding mountain formation keeps away east-to-west winds that might be transporting atomic dust from other contaminated cities."

They were given a big welcome, but some people in Chico were suspicious–and rumors began to fly when it was learned that the first baby born to Mr. and Mrs. Aihara in Chico had died. An inquest–rare in Chico–stated that the death was attributed to "abdominal abscesses." But then the rumors stopped.

Note: Herman and Cornellia Aihara had two children born in New York–Mari / Marie and Jiro–who were part of the caravan trip to Chico.

The newcomers soon got jobs and also opened a "large health-food shop" named Chico-San. The business averaged sales of $2,000 a month. Irv Hirsh [also spelled Hirsch] worked as a baker–of unleavened bread. Lou Oles, a former trumpeter with Benny Goodman, enrolled as a student of mathematics and physics at Chico State College. At a tavern frequented by college students, Teal Ames was introduced one evening by a friend to a California bachelor named Bill Nichols, who now also lived in Chico. Six weeks after he met Teal he converted to a macrobiotic diet; then they were married.

4965. Watanabe, Tokuji; Nakayama, Osamu; Iwasaki, Noriko. 1963. Daizu tanpakushitsu no teion shori ni yoru seijô henka. I. Daizu no suichushûtsu eki no toketsu ni yoru tanpakushitsu no fuyo seika [Studies on the changes of the properties of soybean protein by freezing. I. Changes in the water extract of soybeans]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 10(5):163-66. [8 ref. Jap]
Address: National Food Research Inst., Tokyo.

4966. Watanabe, Tokuji; Fukamachi, Chiharu; Abe, Kazuyoshi. 1963. Daizu tanpakushitsu no teionshori ni yoru seijô henka. II. Daizu tanpaku gyokobutsu no tôketsu ni yoru seijo henka [Studies on the changes of the properties of soybean protein by freezing. II. Changes in soybean protein curd]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 10(5):167-69. [2 ref. Jap]
Address: National Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

4967. *Foreign Agriculture.* 1963. Japan's soybean, meal imports down. 1(23):15. June 10.
• ***Summary:*** A table show's Japan's imports of soybeans and soybean meal from the USA in 1961, 1962, and the first quarter of 1963.

4968. *Foreign Agriculture.* 1963. Japan reports new strains of Chinese soybeans. 1(24):15. June 17.
• ***Summary:*** New strains of Chinese soybeans with a high oil content may in several years' time replace U.S. soybeans in Japan. Communist Chinese scientists have developed six new strains of soybeans with a high oil content. Kirin Number 1 is reported to contain 23.2% oil, the highest in China. Chinese soybeans in Japan have had a much lower oil content, averaging about 16%.

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4969. Morimoto, Saichi; Ishihara, M.; Yamamoto, A.; Hamada, K.; Imai, K.; Otsuka, M. Assignors to Toyo Spinning Company. 1963. [Graft copolymers]. *Japanese Patent* 9431. June 17. 2 p. Application filed 9 Feb. 1961. (Chem. Abst. 59:8928c). [Jap]*
• ***Summary:*** Soybean protein is used and the resulting polymer solution is spun.

4970. Bowser, Hallowell. 1963. The rusty bells of hope. *Saturday Review* 46:24. June 22.
• ***Summary:*** "With the single exception of death, mankind's classic enemy is hunger. All through the historical period, right up to the present moment, our best thinkers have stood paralyzed before the problem of how to grow enough food to keep expanding populations well fed."

However in recent years a unique new approach to the problem has emerged from a modest Los Angeles organization known as Meals for Millions. Caltech biochemist Dr. Henry Borsook, who is research director of Meals for Millions, says "It is easier, cheaper, and often more convenient to get vitamins and minerals from sources other than food." He is proposing an agricultural revolution "that involves no added agricultural production. Instead, it makes use of foodstuffs not previously utilized as human fare."

"Though it is plagued by a chronic shortage of funds, more than 73,000,000 meals have been sent to starving people in 143 counties, territories, and island dependencies, and the files in MFM headquarters at 215 West 7th Street, in Los Angeles, overflow with letters of thanks for 'The Friendship Food.'

"The head nurse of the Schweitzer clinic at Lambaréné [Lambarene] wrote, 'It is wonderful food. The patients like it and it does them great good... They love the flavour of MPF in crocodile soup... We have used MPF sparingly because we do not know when we might be so fortunate as to receive more.'"

"The MFM self-help program has been especially successful in India, Japan, Mexico, and Brazil, which have taken over production of MPF themselves, adapting the formula to local conditions. India, for instance, uses a base of peanut meal and Bengal gram [chickpea, garbanzo bean] instead of soy meal. Many other nations are preparing to produce MPF independently."

4971. *Foreign Agriculture.* 1963. Japan revises U.S. soybean standards. 1(24):14. June.
• ***Summary:*** The Osaka Grain Exchange has announced revised standards for the sales of U.S. soybeans. There must now be over 87.0% perfect beans, below 8.0% split beans, and less than 0.5% foreign material in shipments. The old specifications only required that there be over 76.9% perfect beans, less than 15.0% split, and less than 2.4% foreign material in a shipment. The primary purpose of these new standards is to increase the transactions and deliveries on the Osaka Grain Exchange.

4972. Fujii, Hisao. 1963. Nattô-kin ni yoru nenshitsu-butsu no seisei ni kansuru kenkyû. II. Nenshutsu-butsu seisei jôken no kentô (2) [On the formation of mucilage by *Bacillus natto.* II. Factors affecting the formation of mucilage (2)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 37(6):346-50. June (Chem. Abst. 63:3338). [9 ref. Jap]
Address: Faculty of Home Life Science, Fukuoka Women's Univ., Fukuoka, Japan.

4973. Morimoto, Shigemi; Kagoshima, Yayoko. 1963. Sokujô shôyu ni kansuru kenkyû. II. Arukooru hakkô ôyô shinsoku-jô shôyu seizô-hô ni tsuite. Arukooru no nôdo henka ga shôyu kôji no yôshutsu-sei ni oyobosu eikyô [Studies on a quick ripening process for soy sauce. II. A new quick ripening process based on alcohol fermentation. Relationship between the change of alcohol concentration and hydrolyzing power of soy sauce koji]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 41(6):331-36. [2 ref. Jap; eng]
• ***Summary:*** Process based on alcohol fermentation. Address: Shoin Junior College, Kobe, Japan.

4974. Ariyama, H. 1963. Process for the manufacture of a synthetic yoghurt from soybean. *U.S. Patent* 3,096,177. July 2. 2 p. Application filed 31 Aug. 1960. [5 ref]
• ***Summary:*** This synthetic yoghurt [soy yogurt], cultured with *Lactobacillus bulgaricus,* is 3 times higher in protein content (9.8% vs. 3.4%), much lower in fat (0.4% vs. 1.1%), 6 times higher in minerals content, and 4 times higher in lecithin than ordinary yoghurt made from cow's milk. The incubation takes place at 37-43ºC for 4-6 hours. Address: Higashi Ariyama, 301 Nippon Jutakukodan, Apt.-House 5th Bldg., No. 75-1, Biwakubi-cho, Sendai-shi, Japan.

4975. Nishimura, Sachio; Hata, Naoaki. Assignors to Asahi Electro-Chemical Company, Ltd. 1963. [Inner epoxides]. *Japanese Patent* 11,289. July 5. Application filed 30 Nov. 1960. 5 p. (Chem. Abst. 59:12984e). [Jap]*
• ***Summary:*** Soybean oil is epoxidized to give a resin of tensile strength 410 kg per square centimeter.

4976. Fukushima, D. 1963. [Soybean meal recovery]. *Japanese Patent* 11,937. July 12. [Jap]*
• ***Summary:*** Describes solvent extraction using ethyl alcohol.

4977. Sakata, Hajime; Enomoto, M.; Higuchi, Y. 1963. [Deodorization of soybean milk products]. *Japanese Patent* 11,939. July 12. 2 p. Application filed 30 Dec. 1961. (Chem. Abst. 60:6144a). [Jap]*
• ***Summary:*** Sodium sulfite was used to reduce the odor of soymilk, and the residual sodium sulfite was removed with

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an ion-exchange resin. Some hydrazine derivatives could also be used.

4978. Sakata, Hajime; Enomoto, M.; Higuchi, Y. 1963. [Deodorization of soybean milk products]. *Japanese Patent* 11,940. July 12. 2 p. Application filed 30 Dec. 1961. (Chem. Abst. 60:6144a). [Jap]*
• ***Summary:*** Deodorization was conducted by introducing hydrogen into the raw soymilk or mashed soybeans in the presence of Raney-Ni.

4979. Sklarewitz, Norman. 1963. Japanese open door to more U.S. makers of consumer goods. *Wall Street Journal.* July 26. p. 1.
• ***Summary:*** Besides Heinz, the Kellogg Co. is another leading U.S. food producer that has entered into a partnership with a Japanese firm. Its breakfast cereal has been made and marketed in Japan since April through Japan's Ajinomoto Co. "Kellogg and Ajinomoto hope to persuade enough Japanese to substitute corn flakes for their traditional breakfast fare of rice, soybean soup [miso soup] and pickles to take in about $2.7 million in sales within two years." Address: Staff reporter for the Journal.

4980. Fujii, Hisao. 1963. Nattô-kin ni yoru nenshitsu-butsu no seisei ni kansuru kenkyû. III. Itohiki nattô no nenshitsu-butsu ni tsuite (1) [On the formation of mucilage by *Bacillus natto.* III. Chemical constituents of mucilage in natto (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 37(7):407-11. July (Chem. Abst. 63:3338). [22 ref. Jap]
Address: Faculty of Home Life Science, Fukuoka Women's Univ., Fukuoka, Japan.

4981. Kato, H.; Sakurai, Yoshito. 1963. Daizu seihin no kappen kikô ni kansuru kenkyû. III. Hiire shôyu no kappen ni okeru 3-deokishioson-rui narabini furufuraaru-rui no igi [Studies on browning mechanisms of soybean products. III. Roles of 3-deoxyosones and furfurals for the darkening of pasteurized soy-sauce]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 37(7):423-25. July. [8 ref. Jap]
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Univ. of Tokyo, Japan.

4982. Onishi, Hiroshi. 1963. Studies on osmophilic yeasts. XV. Effect of high concentrations of sodium chloride on polyalcohol production. *Agricultural and Biological Chemistry* 27(7):543-47. July. [13 ref. Eng]
• ***Summary:*** *"Pichia miso,* an excellent polyalcohol producing yeast, produced only one kind of polyalcohol, namely glycerol, in the medium containing sodium chloride at high concentration,..." Address: Noda Inst. for Scientific Research, Noda City, Chiba-ken, Japan.

4983. Smith, Allan K. 1963. Foreign uses of soybean protein foods. *Cereal Science Today* 8(6):196, 198, 200, 210. July. [28 ref]
• ***Summary:*** Contents: Introduction (world food shortages). Technological assistance (by NRRL). Oriental traditional foods: Tofu, shoyu or soy sauce, miso or soy paste, monosodium glutamate, natto and kinako, soy beverage, tempeh (tempe). Recent food developments. Address: NRRL, Peoria, Illinois.

4984. *Hartford Courant* (*Connecticut*). 1963. Today we look for new ideas from the Japanese. Aug. 11. p. 1D.
• ***Summary:*** A glimpse of home life in postwar Japan, with six photos and an illustration of a mother with a baby on her back and a child standing beside her. A typical day's menu for a middle class family is: "Breakfast: bean paste [miso] soup, rice, pickled vegetables and seaweed, Tofu, which is a bean curd, like custard, and green tea."

The evening meal, usually served Japanese style, includes "cooked or pickled vegetables, tofu bean curd custard, a clear soup and some fresh fruit... washed down with many tiny cups of green tea."

4985. Nishimura, Sachio. Assignor to Asahi Electro-Chemical Company. 1963. [Hardening of epoxides]. *Japanese Patent* 14,839. Aug. 14. Application filed 9 Feb. 1961. 4 p. (Chem. Abst. 59:14174h). [Jap]*
• ***Summary:*** Purified soybean oil is used to make a hardened resin with a tensile strength of 470 gm per square centimeter.

4986. Mitani, Kazuma. 1963. Edo shôbai zu-e [Illustrations of merchants, artisans and peddlers during the Edo period in Japan]. Tokyo: Seiabo. 271 p. Illust. No index. 20 x 27 cm. [Jap]
• ***Summary:*** A stunning book, filled with large, lovely illustrations (mostly wood-block prints or line drawings) from the Edo period (1600-1867) in Japan. Soy-related illustrations:

(1) A tofu shop (p. 18), showing a man sitting on a wooden lever-press pressing the soymilk out of cloth straining bag while his wife, with a baby on her back, turns a hand-turned stone mill that grinds soaked soybeans into a smooth puree, which falls into a wooden tub. Large blocks of tofu are shown immersed in cold water in a sort of wooden sink, with a tofu knife on top. In the background, up a step inside the house, an elderly person is deep-frying tofu.

(2) A tofu seller (p. 19), walking in the street with two wooden tubs of tofu at both ends of a shoulder pole. He is wearing getas on his feet and a large round straw hat.

(3) A shoyu seller (p. 23), walking in the street from door to door with several layers of wooden tubs at both ends of a shoulder pole and a kerchief over the head.

(4) A man in a shop with Kinzanji hishio in wooden vats

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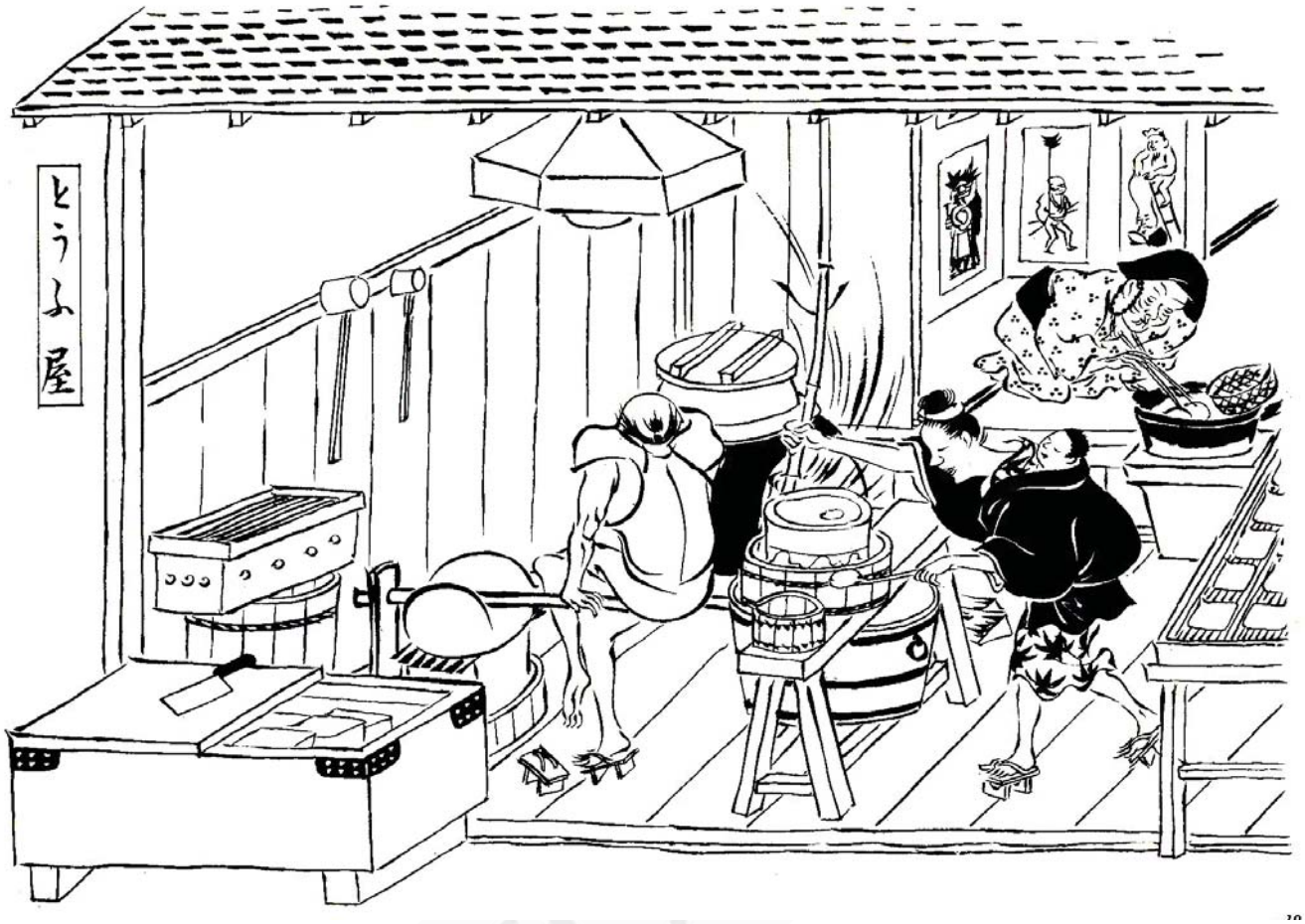

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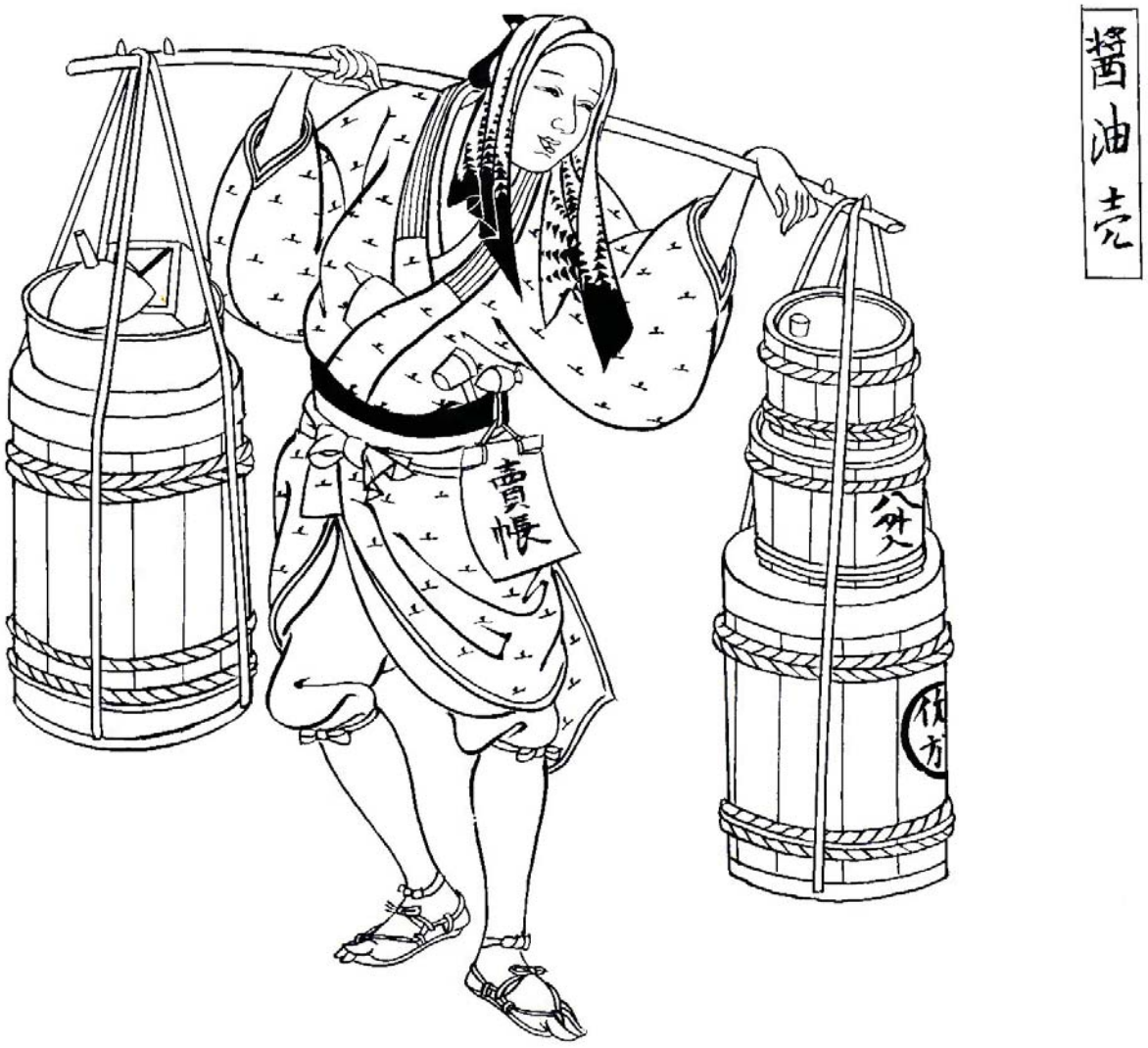

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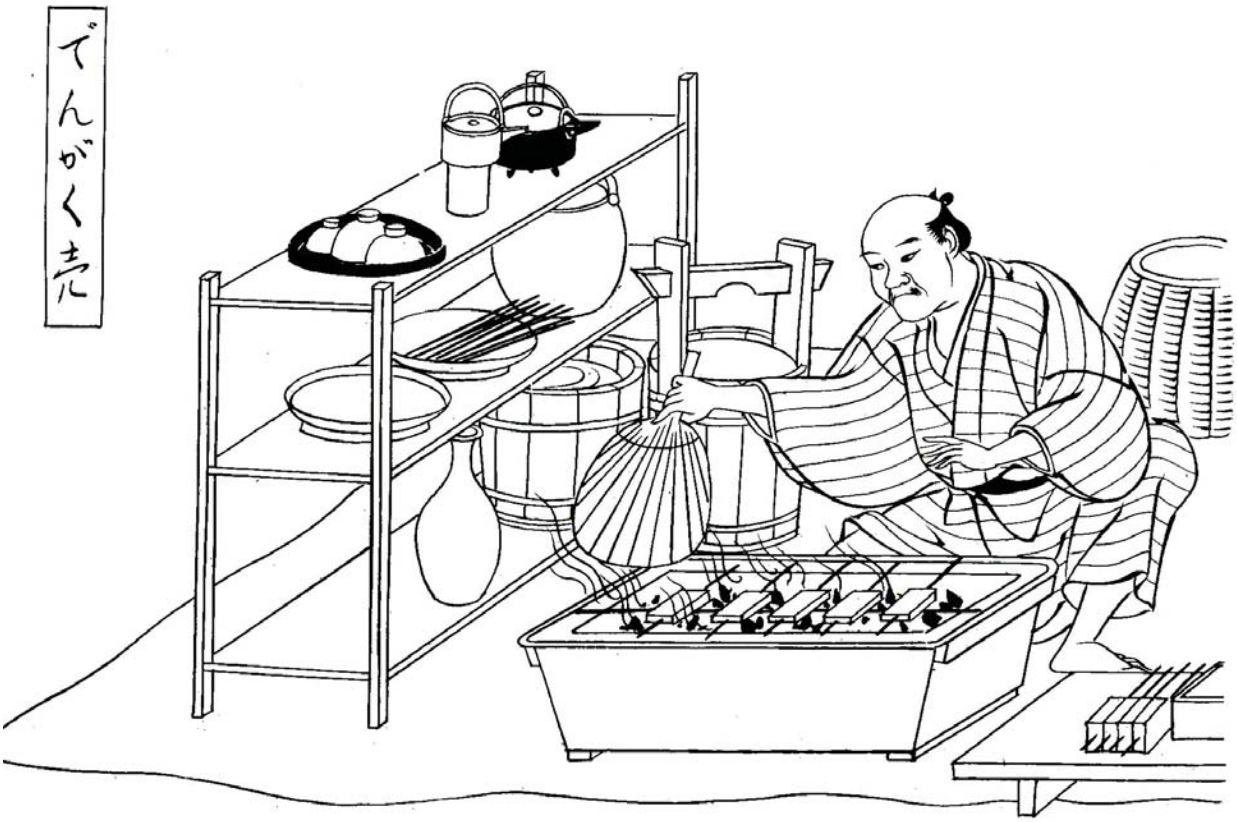

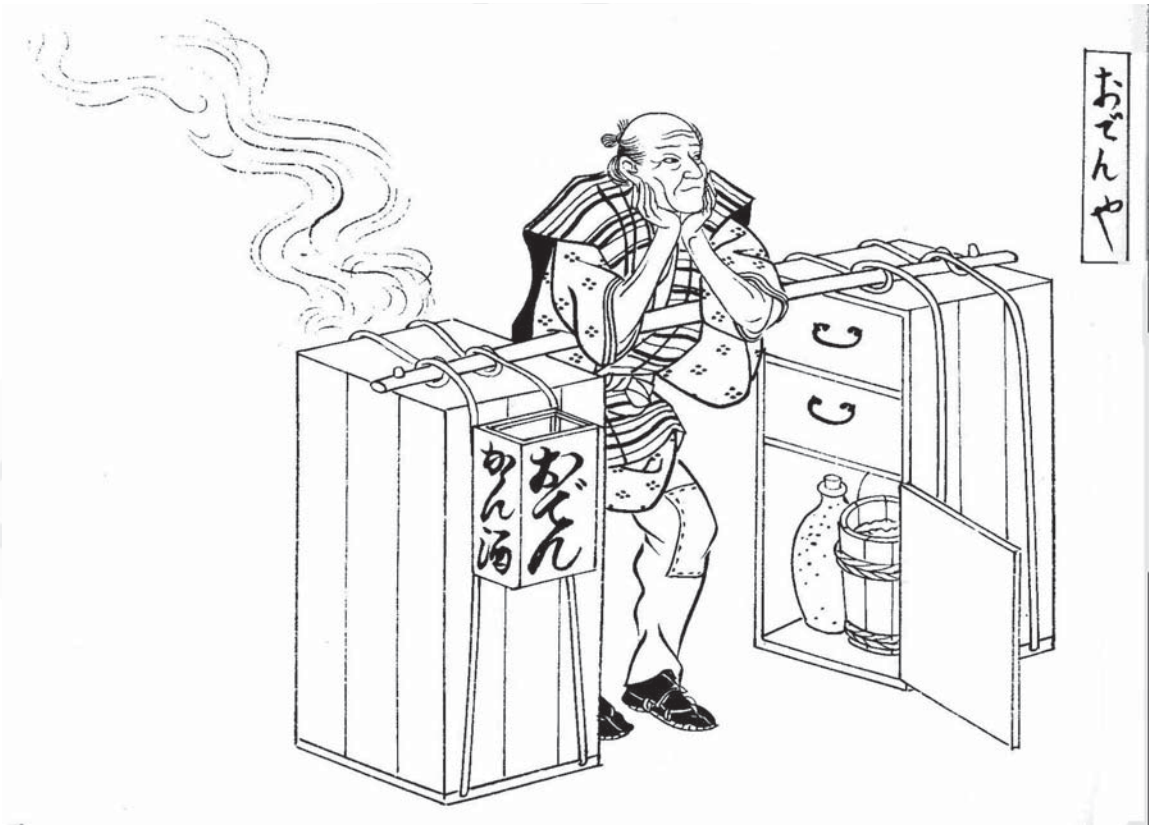

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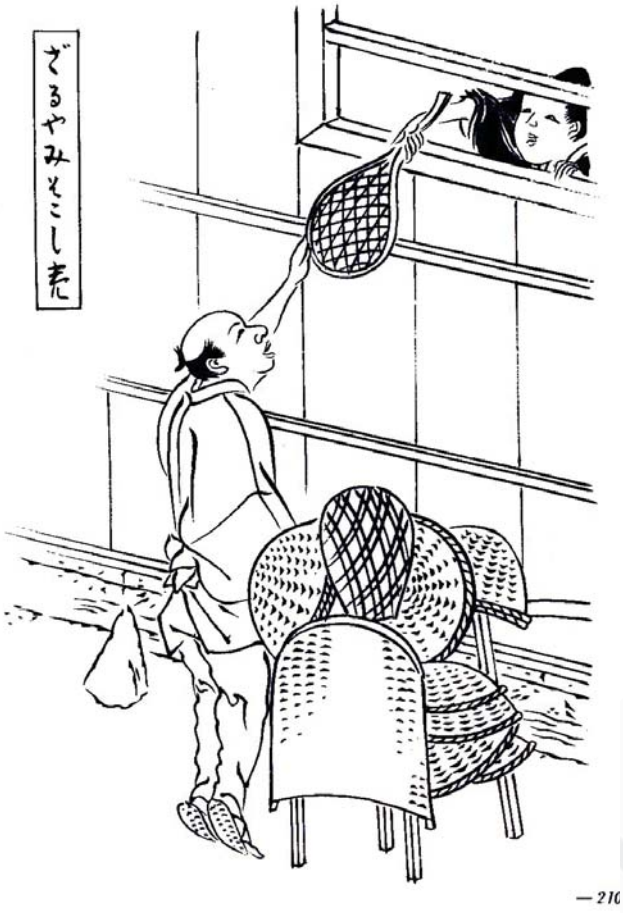

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of various sizes, each bound by braided bamboo hoops (p. 26).

(5) A woman in a kimono (p. 26), serving two cups of amazake.

(6) A man selling dengaku (p. 28), skewered tofu above hot coals in a brazier. He is fanning the coals and hunkering behind the brazier.

(7) A seller of oden (p. 29). He is standing, resting on the shoulder pole, which rests atop two tall boxes.

(8) A man making Inari-zushi (p. 49) at a street stall. An illustration below the roof shows a fox running.

(9) A man selling woven bamboo baskets and miso strainers (*zaru* ya *miso-koshi*) (p. 210).

(10) A woman (*edamamé uri*) with a child on her back as she walks (p. 239), selling edamamé (green vegetable soybeans) in a basket under her right arm.

The author collected these illustrations from many sources; the source of each is given in an "accompanying source book"–which we have been unable to locate. He re-drew each of the old originals, but tried to be true to the original. He eliminated a few things that he felt were not needed in some illustrations and added a few more things to others to make them clearer for today's readers. There are no illustrations that he created. Most of the originals are from the mid-Edo period, especially the Kansei, Bunka, and Bunsei eras (1789-1830), with 2-3 things from the Kyoho period (1716-1735).

To make this book he went to many libraries, archives, and other places where historical documents are kept; he was helped by many other people. He was born on 15 March 1912 (Meiji 45). He graduated from Tokyo Bijutsu Daigaku. Nihon ga-ka (Tokyo Fine-Arts Univ., Japanese Art Dept.). He is a member of the Bijutsu Shuppan Renmei (Art Related Publishing Bureau). He presently lives at Setagaya-ku, Tokyo. The book has a detailed table of contents, but no index. Address: Japan.

4987. Fujii, Hisao. 1963. Nattô-kin ni yoru nenshitsu-butsu no seisei ni kansuru kenkyû. IV. Itohiki nattô no nenshitsu-butsu ni tsuite (2) [On the formation of mucilage by *Bacillus natto.* IV. Chemical constituents of mucilage in natto (2)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 37(8):474-77. Aug. (Chem. Abst. 63:3339). [11 ref. Jap]
Address: Faculty of Home Life Science, Fukuoka Women's Univ., Fukuoka, Japan.

4988. Machida, Yoshiro. 1963. Shokuyô daizu tanpakushitsu to sono atarashii yôto [New uses of edible soy protein]. *Nippon Yukagaku Kyokaishi* (*J. of the Japanese Oil Science Society*) 11(8):461-67. Aug. Bessatsu. [10 ref. Jap]
Address: Sugiyama Industrial Chemical Research, Tokyo, Japan.

4989. Tamura, T. 1963. Tônyû no gyôseki to denkaishitsu no gyôseki-ka [Coagulation numbers for soymilk and its electrolytes or salts]. *Kogyo Kagaku Zasshi* (*J. of the Society of Chemical Industry, Japan*) 66(8):1224-27. Aug. (Chem. Abst. 61:7615g). [7 ref. Jap]
Address: Osaka Furitsu Kogyo Shoreikan, Osaka-shi, Nishi-ku, ?-shima, kami-machi.

4990. Yoshino, K. 1963. Daizu san nyû no tsukurikata: Atarashii nôsan kakô [How to make soybean milk: A new agricultural product]. *Nogyo Oyobi Engei* (*Agriculture and Horticulture*) 38(8):1263-66. Aug. [Jap]
Address: Nogyo Koto Gakko, Chiba-ken, Japan.

4991. *Foreign Agriculture.* 1963. Japanese to negotiate for Chinese soybeans. 1(35):13. Sept. 16. [1 ref]
• ***Summary:*** "Some groups forecast that Japan will take about 250,000 metric tons (9.2 million bu.), either under the agreement alone or with outside purchases included.

"Japanese and Chinese groups agreed in November 1962 on a 5-year program for the exportation of 700,000 tons (25.7 million bu.) of soybeans from Communist China to Japan. For 1963, the first year of the agreement, 150,000 tons (5.5 million bu.) were programmed. However, actual imports probably will exceed 200,000 tons (7.3 million bu.), for some soybeans have been bought outside of the agreed quantity. Communist China is pricing its soybeans below those of the United States, as an inducement to Japanese buyers."

4992. Morimoto, Saichi; Ishihara, M.; Yamamoto, A.; Hamada, K.; Imai, K.; Otsuka, M. Assignors to Toyo Spinning Company, Ltd. (Kita-ku, Osaka, Japan). 1963. Graft copolymer containing spinnable solution and method for preparing and spinning thereof. *U.S. Patent* 3,104,154. Sept. 17. 6 p. Application filed 5 Feb. 1962. 1 drawing. [3 ref. Eng]
Address: 1. Otsu; 2. Sakyo-ku, Kyoto; 3-6. Shiga-gun, Shiga-ken. All: Japan.

4993. Aoki, Hatsuo; Saito, Huiga; Ikeda, Yonosuke. 1963. Transduction and transformation between *Bacillus subtilis* and *Bacillus natto. J. of General and Applied Microbiology* (*Tokyo*) 9(3):305-11. Sept. [9 ref]
• ***Summary:*** Seven strains of *Bacillus natto* were all found to be vulnerable to phage S-1, while five among them were able to transfer their genetic traits to *Bacillus subtilis* by the phage. Address: Inst. of Applied Microbiology, Univ. of Tokyo, Bunkyo-ku, Tokyo, Japan.

4994. *Foreign Agriculture.* 1963. Japan's soybean imports and consumption up. 1(39):14. Sept.
• ***Summary:*** Japan's imports of soybeans in the Japanese fiscal year, beginning April 1963, are estimated at about

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1,360,000 tonnes (50 million bushels). The U.S. supplied 86% of the January-July imports, and Communist China supplied 14%. Area planted to soybeans in 1963 declined by 10% to 593,000 acres. Liberalization of imported soybean oil and soybean meal is expected to be postponed until sometime in 1964.

4995. Grow, H.E. 1963. Selling U.S. soybeans in Japan. *Soybean Digest.* Sept. p. 57-60, 62.
• ***Summary:*** "This country [Japan] continues to develop at an unbelievable rate. More good highways are being constructed every year and in spite of the mountainous terrain in many areas, superhighways are being built and used. Tokyo is preparing for the 1964 Olympics with the construction of more subways and superhighways leading to the Olympic area. A new superrailroad will be completed next year which runs from Tokyo to Osaka, a distance of about 300 miles, and with only one intermediate stop will have a running time of approximately 3 hours.

"Another area of expansion, in which we are particularly interested, is in animal agriculture. As you have heard many times, there has been very little livestock and poultry in Japan. That situation is changing rapidly, particularly in the field of poultry and swine. A preliminary report of a projection study indicates that by 1975 poultry numbers will nearly double from about 80 million to 140 million birds, of which a large percentage will be broilers. Swine will increase from 3½ million to 10 million head and dairy cows will increase from a little over 1 million to over 3 million animals. This projection in the field of animal agriculture should be considered as quite reliable, since the information comes from several separate sources which more or less agree.

"This rapid increase in livestock and poultry numbers will increase the feed requirements far beyond the present usage and will require large amounts of feedstuffs. As Japan is limited in ability to produce feeds, a large amount of these requirements will need to be imported. I know that you are particularly interested in What the future market for U.S. soybeans in Japan will be and I can tell you that it is very encouraging.

"As you know, up to this time our American Soybean Association activities have been mostly in the field of human foods and nutrition. Considerable progress has been made in this area and perhaps as a nation Japan is more nutrition conscious than any other country. There are several reasons for this. The per capita income in Japan in 1956, at the time that our program started, was equivalent of $228 per person. In 1961 per capita income was $403 and has continued to rise in 1962 to an estimated $468. As incomes have increased, some of the increased per capita income has been spent for food.

"Japanese Branch: The American Soybean Association, as many of you know, maintains in Japan a market development branch that is known as the Japanese American Soybean Institute, or JASI, as it is commonly called. JASI is directed by Shizuka Hayashi and maintains a staff of 10 people. JASI is directly responsible for the detailed planning and supervising of the programs and activities that are carried out to stimulate greater use of U.S. soybeans and soybean products in Japan. JASI is financed cooperatively by ASA, Foreign Agricultural Service of USDA and the various industry groups in Japan.

Note: This paper continues for 4 more pages. A small portrait photo shows Howard Grow. Address: Assistant to Executive Vice President, American Soybean Assoc.

4996. *Foreign Agriculture.* 1963. Chinese soybeans reportedly of better quality. 1(40):11. Oct. 7.
• ***Summary:*** Importers and crushers indicate that on the basis of present quality Chinese soybeans can be used for crushing on a $3/tonne differential below U.S. soybeans. Formerly $5 to $7 was considered necessary. In 1962 China supplied 13% of Japan's total soybean imports and the U.S. supplied virtually all of the remainder.

4997. *Foreign Agriculture.* 1963. U.S. soybean exports, biggest cash earner. 1(41):11. Oct. 14.
• ***Summary:*** Soybeans and soybean products were the leading "cash on the barrelhead" dollar earner of all U.S. agricultural exports during the 1962-63 marketing year, according to preliminary comparisons of leading U.S. farm products exported for dollars. Major customers have been fast-growing commercial feed industries–first in Western Europe and later in Japan–particularly feed for poultry and hogs and to some extent for beef cattle.

4998. Nelson, Kay Shaw. 1963. Humble vegetable with a glorious past: In praise of the lowly pumpkin. *Christian Science Monitor.* Oct. 25. p. 17.
• ***Summary:*** In the USA we think of pumpkins in connection with Halloween jack-o'-lanterns, pumpkin pie, and Cinderella. "In Japan the whole pumpkin, scooped out and filled with a mixture of minced chicken, sliced carrot, mushrooms, soy sauce, sugar, tofu, green peas, and eggs, is steamed." Address: Washington, DC.

4999. Fujii, Hisao. 1963. Nattôkin ni yoru nenshitsu-butsu no seisei ni kansuru kenkyû. V. Nenshitsu-butsu sosei ni oyobosu baiyô jôken no eikyô [On the formation of mucilage by *Bacillus natto.* V. Effects of some cultural conditions on the chemical constituents of mucilage]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 37(10):615-18. Oct. (Chem. Abst. 63:12021). [10 ref. Jap] Address: Faculty of Home Life Science, Fukuoka Women's Univ., Fukuoka, Japan.

5000. Fujii, Hisao. 1963. Nattô-kin ni yoru nenshitsu-butsu

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no seisei ni kansuru kenkyû. VI. Nenshitsu-butsu seisei no kisa ni tsuite (1) [On the formation of mucilage by *Bacillus natto.* VI. The mechanism of mucilage formation (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 37(10):619-22. Oct. (Chem. Abst. 63:12021). [14 ref. Jap]
Address: Faculty of Home Life Science, Fukuoka Women's Univ., Fukuoka, Japan.

5001. *Foreign Agriculture.* 1963. Japan to import more Chinese soybeans. 1(44):13-14. Nov. 4.
• ***Summary:*** This is part of the 5-year agreement negotiated in Peking in November 1962 to import 700,000 tonnes (25.7 million bushels) of soybeans from Mainland China. (See Foreign Crops and Markets, Dec. 17, 1962).

5002. *Foreign Agriculture.* 1963. Japanese marketing toasted soybean meal. 1(47):13. Nov. 25.
• ***Summary:*** A large oilseed processor in Japan is scheduled to start marketing toasted soybean meal this month. This will be the first time that roasted soybean meal has been placed on the domestic market. It is expected that toasting will be widely adopted, because of the additional nutritive value of meal so treated. Each of the plants will continue to produce some untoasted meal for soy-sauce production.

5003. Hayashi, Shizuka. 1963. Meal market grows in Japan. *Soybean Digest.* Nov. p. 20.
• ***Summary:*** "Japan produced 14,500 million eggs during 1962. This pushes up Japan to the second largest producing country in the world, the first being the United States, with 64,000 million. The third is England With 11,500 million. The livestock industry in Japan, especially the poultry industry, is rapidly expanding in these last few years as indicated below (a table shows the number of chickens and livestock produced in Japan each year from 1958 to 1962).

"In parallel with the expansion of the livestock industry, the demand for feeds is increasing. As statistics indicate, total mixed feed production came up to nearly 5 million metric tons in 1962..."

A photo shows the inside of the JASI office in Chiyoda-ku, Tokyo. Address: Managing Director, Japanese American Soybean Inst., 410 Nikkatsu International Bldg., No. 1, 1-chome Yurakucho, Chiyoda-ku, Tokyo, Japan.

5004. Muto, Shizuko; Takahashi, E.; Hara, M.; Konuma, Y. 1963. Soybean products as protein sources for weanling infants. *J. of the American Dietetic Association* 43(5):451-56. Nov. [12 ref]
• ***Summary:*** In Japan, the main protein sources for the weanling infant, in the form of solid food, "are *tofu* (soybean curd), *natto* (fermented soybean), and *kinako* (toasted soybean flour)."

Describes briefly how each is made commercially. For example, for kinako, the soybeans are dry heated in an oven for about 25 minutes. The temperature inside the beans at the time they are removed from the oven is about 105ºC. They are then milled into flour [probably after being allowed to cool to room temperature] and sieved through a 70-mesh screen. "The product has a pleasant odor, similar to fresh-toasted bread, and is brownish yellow in color. It is mixed with sugar and is used as a coating for rice cakes."

Nitrogen balance studies on infants fed these foods showed that they "can be substituted at least in part for animal foods in the solid diet of weanling infants with no appreciable drawbacks on growth, digestibility, and nitrogen retention."

Note: The researchers seem to assume that animal-based protein sources are nutritionally superior to plant-based sources. Address: Aiiku Research Inst. of the Mother and Child, Tokyo.

5005. *Soybean Digest.* 1963. Japan miso team visits U.S. Nov. p. 22.
• ***Summary:*** "A team of nine representatives of the Japanese miso industry and their interpreter from Japan were guests recently of the American Soybean Association at Hudson, Iowa. They were under the leadership of Tabukei Tanaka, president of the Japan Miso Industrial Cooperative Association.

"The group visited several farms in the area, and the farmers' elevator and processing plant of the Farmers Cooperative Co. at Dike, Iowa, in addition to the American Soybean Association headquarters.

"The miso manufacturers traveled widely visiting the U.S. soybean industry, with stops in New Orleans [Louisiana], Chicago [Illinois], Minneapolis [Minnesota], Peoria [Illinois], and Washington [DC], before making a tour of Europe on their way home.

Miso is a fermented product made from soybeans and is used mainly as a soup, but also for preserving fish, meat and vegetables, and for various kinds of Japanese cooking. Japanese miso manufacturers have become much interested in purchase of U.S. soybeans for the making of miso in recent years.

"Talk by Mr. Tanaka: Said Mr. Tanaka, in a talk at the Waterloo, Iowa, Elks Club, where he and other members of the team were guests of ASA: 'Ninety percent of miso is cooked into miso soup and is served at the tables of all Japanese families every morning without missing a single day. Over a period of a year you will be surprised to learn of the wide variety of the items served in miso, and how fresh they are. There is no country in the world that has so many common vegetables, fish and shellfish in the rivers and ocean, and seaweed. The U.S. adults would not know the names of the fish and shellfish though even the children of Japan know them well. "'Miso makes rare delicacies of all kinds easily available as regular food every morning. I

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believe that to know the taste of miso soup is to know the people of Japan, as it expresses the arts and culture of Japan. Mt. Fujiyama is well known as a symbol of the landscape of Japan. Please recognize miso as a symbol of the common food and delicacies of Japan.

"'Soybeans are not only judged by their elements but as an ingredient of miso, of which Japan is proud. Special care should be exercised in selecting soybeans for miso. So please understand the reason why we are as careful to obtain a white germ, lustrous hull, and even the same sized bean as the pearls we select for a necklace. The members of this tour are the representatives of miso industrial and manufacturing enterprises, so they may tell you of their various requirements for soybeans.

"'Please obtain a good understanding of this unique food of the Japanese people. We beg you to supply us with good soybeans.'"

Photos show: (1) "Japan miso team at home of Mr. and Mrs. Geo. M. Strayer in Hudson, Iowa. Front row, left to right: Zensuke Aoki, vice president, Aoki Miso Shoyu Co.; Mr. Strayer; Ukitsu Matsubayashi, president, Shoman Sangyo Co.; Saburo Watanabe, president, Otomo Food Industry Co.; and Howard E. Grow, assistant to the ASA executive vice president. Back row, l to r: Sadao Nakagaki, president, Yamajirushi Miso Co.; Goro Komatsu, president, Yamaman Kashimaya Shoten; Tokubei Tanaka, president, Japan Miso Industrial Cooperative Association, the tour leader; Matauemon Iida, president, Abumata Shoten; Ken Sasaki, managing director, Sendai Miso Shoyu Co.; Sakubei Takekuchi, president, Chikuma-Miso Co.; and Hiroshi Ushiyama, Yusen Air & Sea Service Co., the interpreter.

(2) Miso team in field of Kim soybeans on the Strayer Seed Farms near Hudson. ASA's executive vice president, Geo. M. Strayer; is second from right, and Howard E. Grow, assistant, is at right. Second from left is Tokubei Tanaka, president of the Miso Association.

5006. U.S. Department of Agriculture. 1963. U.S. soybean exports biggest cash earner. *Soybean Digest.* Nov. Front cover.
• ***Summary:*** "Soybeans and soybean products were the leading 'cash on the barrelhead' dollar earner of all U.S. agricultural exports during the 1962-63 marketing year, according to preliminary comparisons of leading U.S. farm products exported for dollars.

"U.S. soybeans and soybean meal, exported at competitive U.S. market prices, are in active demand on the world market. This export dollar demand takes up all the soybeans not being purchased by the U.S. crushing industry. It also takes up all the soybean meal that is not consumed domestically.

"Major customers have been fast-growing commercial feed industries–first in Western Europe and later in Japan–particularly feed for poultry and hogs and to some extent for beef cattle, all of which have been finding ready markets as meat consumption has risen along with per capita incomes."

5007. *Foreign Agriculture.* 1963. Japan, Communist China agree on soybean prices. 1(48):15. Dec. 2.
• ***Summary:*** "The price agreed on by the Japan-Communist China Trade Mission for the 30,000 metric tons (1.1 million bushels) of soybeans scheduled for shipment to Japan in November and December was $103.74 per [metric] ton ($2.82 per bushel), f.o.b. Addition of the freight rate expected to be $5.60 per ton, makes the c.i.f. price $109.34 per ton, or $2.98 per bushel. This price was reported at the end of October to be about $6 per ton lower than that of U.S. soybeans."

Japan is to take 150,000 tons of soybeans from Communist China in 1963, the first year of its 5-year agreement to import 700,000 tons (25.7 million bu) of Chinese soybeans. An additional 70,000 tons (2.6 million bu) was purchased outside the agreed contract, bringing Japan's total 1963 purchases to 220,000 (8.1 million bu). Increased purchases from China this year have been brought about mainly by increased U.S. domestic prices. The quality of Chinese soybeans that Japan has imported this year is reported to be better than that of previous imports, and the oil content has been higher.

5008. *Foreign Agriculture.* 1963. Japanese raise support price for soybean crop. 1(49):10. Dec. 9.
• ***Summary:*** Japan's 1963 soybean crop will be supported at 3,310 yen per 60 kilograms ($4.17 per bu). This increased price is designed to boost production in Japan, where acreage in soybeans has declined every year since 1954. The Japanese farmer may sell his soybeans either to the National Marketing Federation of Agricultural Cooperatives (ZENKOREN) or on the local market.

5009. Loring, Kay. 1963. Front views and profiles: Japanese dinner. *Chicago Tribune.* Dec. 13. p. B14.
• ***Summary:*** Naka-no-Ya Tea House (2100 Lincoln Park West) will prepare a Japanese dinner at your table. First they brink a large copper cauldron, called a mizu taki, to the table, together with a large platter of artistically arranged vegetables, beef, and chicken.

"Chicken brother was kept simmering in the mizu taki. Dexterously using chopsticks, one young woman placed small portions of pea pods, giant black mushrooms, bamboo shoots, spinach, soy bean cakes [tofu]. Japanese cabbage, and the meats into the liquid." After simmering for only a few minutes, they were served steaming hot.

5010. *Foreign Agriculture.* 1963. Japan probably to import U.S. soybean meal. 1(50):10. Dec. 16.
• ***Summary:*** An apparent soybean meal shortage in Japan has prompted the Livestock Bureau of the Ministry of

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Agriculture and Forestry (MAF) to request permission to import 50,000 tonnes of soybean meal. In all of 1962, Japan imported 15,821 tons of soybean meal (5,945 from the United States and 9,627 from the USSR). Japan's production of mixed formula feed continues to grow at a rapid rate and soybean crushings have not increased rapidly enough to meet the growing demand for soybean meal by the mixed feed industry.

5011. Nishimura, Sachio; Hata, Naoaki. Assignors to Asahi Electric Industry Company. 1963. [Thermosetting epoxy resin]. *Japanese Patent* 26,572. Dec. 20. 3 p. Application filed 13 June 1961. (Chem. Abst. 60:8200g). [Jap]*
• ***Summary:*** Epoxidized linseed oil or soybean oil may be used.

5012. *Foreign Agriculture.* 1963. Japanese buy soybeans at Canton trade fair. 1(51):13. Dec. 23.
• ***Summary:*** Japanese purchases from China in 1964 are expected to total 300,000 tonnes (11.0 million bu). The Japanese trading firms have become very active in purchasing Chinese beans recently owing mainly to an increased oil content this year, less cleanout, and lower prices than U.S. beans.

5013. Keaton, Clyde. 1963. Japan: An expanding market for soybeans. *Foreign Agriculture* 1(51):9. Dec. 23.
• ***Summary:*** A good overview. "Of total commercial utilization of soybeans in Japan, about 19 percent goes into the manufacture of tofu (bean curd) and 8 percent into miso (soy paste). Largest user, however, is the soybean crushing industry, which takes about 67 percent of the total–and most of the American beans–for the production of oil and meal."

"Price is a major factor in soybean sales to Japan. The Communist Chinese Government has been pricing Chinese beans below those of the United States as an inducement to Japanese buyers; it can set prices at any level to move the desired quantity of beans into the Japanese market. This puts U.S. exporters at a disadvantage." Address: Asst. Agricultural Attaché, Tokyo, Japan.

5014. Hasegawa, Kiyozo; Kusano, T.; Mitsuda, H. 1963. Fractionation of soybean proteins by gel filtration. *Agricultural and Biological Chemistry* 27(12):878-80. Dec. [9 ref]
• ***Summary:*** Ultracentrifugal studies (Naismith 1955; Wolf and Briggs 1956) have shown that soybean proteins consist of four major components having sedimentation constants of approximately 2, 7, 11 and 15 S at ph 7.6 to 7.8 and 0.5 ionic strength. The 11S and 7S globulins account for about 70% of total soybean protein. This communication deals with fractionation of soybean proteins by gel filtration with Sephadex G-200. Address: Dep. of Agricultural Chemistry, Kyoto Univ., Kyoto, Japan.

5015. Hayashi, Shizuka. 1963. Japan's food supply: What is wrong with it? *Soybean Digest.* Dec. p. 26. [4 ref]
• ***Summary:*** This article begins with a long table showing the "Total food supply of Japan." It is divided into carbohydrate foods, protein foods, oils and fats, and others.

The average Japanese presently gets 80% of total daily calories from carbohydrates (mainly rice), and 12% from fat (31 gm). Of this, soybean products supply 13.1 gm of protein per day and 5.0 gm of fat per day.

"From all studies we seem to come to the conclusion that diets should contain enough fat to supply 40% to 50% of the calories. As for Japan this level is definitely too high at present. Let us take the figure of 30% of the calories as the minimum fat requirement for the Japanese people. This requires 76 grams per capita per day intake of fat. The Japanese people, therefore, need now to increase their intake of fats by 45 grams a day. This is a must from the nutritional standpoint. If balancing of diets is to be emphasized the food policy of Japan must be revised on this basis. An increase of 45 grams of fat a day means an increase in supply of 1,600,000 metric tons a year in terms of soybean oil or 335 million bushels of soybeans.

"Fat intake in the United States was 149 grams per person per day in 1958. Nearly all countries in Western Europe consumed 109 to 131 grams per capita per day in 1958.

"JASI is continuing its activities in behalf of greater fat consumption. Every opportunity is being grasped and efforts are being made to create the opportunity to promote more and more consumption of soybean oil. In subsequent issues of the *Soybean Digest* I will include reports on some of the oil promotional activities carried out by JASI." Address: Managing Director, Japanese-American Soybean Inst., Tokyo.

5016. Uesugi, Yoshio. 1963. Hônen Seiyu K.K. 40 nen-shi [40 year history of Hohnen Oil Co.]. Tokyo: Hohnen Seiyu K.K. 307 p. Dec. Illust. 27 cm. [Jap]
• ***Summary:*** Contents: Preface. Photos of products and top managers. 1. History of the period before the company was founded (p. 1): Origin of the oil industry, brief history of the soy bean oil industry. 2. Founding of the company and company and establishment of its foundations (p. 7). 3. The company finally starts to grow (p. 33): Promotional activities for products, completion of soybean glue. 4. The Sino-Japanese war starts [July 1937] (p. 45): Honen Seiyu K.K. in Manchuria. 5. Confusion after the war (p. 71). 6. The change to an independent economy (*Jishu Keizai e Tenkan*) (p. 87). 7. Honen products (p. 147): Related oil products, defatted soybean meal, Yutaka Mamé, plywood glue and its changes, Honen Mera sheet siding or veneer (*keshôban*), lecithin, soymilk A, defoamer (*awakeshi-zai*), HOC powder for making mochi, HOC curd. 8. Present status (p. 171): 13

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sub-chapters on company divisions. 9. Related companies and organizations (p. 217): Appendix. Pages 255-72 contain a detailed chronology of this major Japanese company, which crushes soybeans, and makes soy oil and soy protein products. My personal history, by Kintaro Sugiyama (p. 273). Closing remarks. Address: Japan.

5017. Uesugi, Yoshio. 1963. Brief history of the solvent extraction plant at Dairen, Manchuria, owned by Suzuki Shoten, then Hohnen Oil Co. Ltd. (Document part). In: Y. Uesugi. 1963. Hohnen Seiyu K.K. 40 nen-shi [40 year history of Hohnen Oil Co.]. Tokyo: Hohnen Seiyu K.K. 307 p. See p. 60-63.
• ***Summary:*** In July 1913 the South Manchuria Railway Co. (Manshu Tetsudo) started to build this plant. In March 1914 they started to operate the plant. In the spring of 1915 Suzuki Shoten of Kobe, Japan, bought the plant from the Manchuria Railway Co. for the amount of money the railway company had spent on the plant, and with some conditions. The name was changed to Suzuki Yubô, and they started to use the benzene method of solvent extraction. In Sept. 1915 Fusanobu Isobe became the first plant manager, and in July 1916 Nobuaki Oda became the second.

During World War I, Suzuki Shoten was the largest producer of vegetable oil in Japan. But in Nov. 1917 the company was forced by the postwar economic crisis to give up their plant at Dairen as well as their plants in Japan at Shimizu (Shizuoka prefecture), Naruo, and Yokohama. In 1922 Hohnen Oil Co. Ltd. (Hohnen Seiyu K.K.) was formed to take over these plants. On 20 April 1922 Hohnen obtained all rights to these four plants formerly owned by Suzuki. At this time the total area of the Dairen plant and company housing was about 20,000 tsubo (16.4 acres). Roughly 100,000 tonnes of soybeans were crushed each year, and a maximum of 12,000 tonnes of soybeans were crushed per month. Address: Japan.

5018. Uesugi, Yoshio. 1963. Brief history of the solvent extraction plants at Shimizu, Yokohama, and Nishinomiya (later Naruo) Japan, built by Suzuki Shoten, then obtained by Hohnen Oil Co. Ltd. (Document part). In: Y. Uesugi. 1963. Hohnen Seiyu K.K. 40 nen-shi [40 year history of Hohnen Oil Co.]. Tokyo: Hohnen Seiyu K.K. 307 p. See p. 4, 202-03.
• ***Summary:*** On 19 June 1916 Suzuki Shoten started to build a benzene solvent extraction plant at Shimizu, Shizuoka prefecture, Japan. That June Fusanobu Isobe became the first plant manager and in May 1917 Shinsuke (or Kiyosuke) Imô became the second plant manager. On 30 Jan. 1917 they finished building this plant.

In Aug. 1917 Suzuki Shoten started to build a benzene solvent extraction plant at Nishinomiya (Hyogo prefecture). The first plant manager from Aug. 1917 was Yahachiro Obata. On 30 March 1918 they finished building this plant. The second plant manager was Doyozo Kikuchi from Oct. 1921 to Sept. 1925. The soybean processing capacity was 250 tonnes/day. During World War I, Suzuki Shoten was the largest producer of vegetable oil in Japan. But in Nov. 1917 the company was forced by the postwar economic crisis to give up these plants. In 1922 Hohnen Oil Co. Ltd. (Hohnen Seiyu K.K.) was formed to take over the Suzuki plants. On 20 April 1922 Hohnen obtained all rights to these plants. The types of products produced at the Shimizu plant were: unrefined soybean oil (daizu genyu), Shirasame oil, special grade oil (tokusei-yu), salad oil, defatted soybean meal, Sakuramame, Chitose-mame, Yutaka-mame, Top Run, Hohnen Glue, Merashet Keshôban, Pearl Beans for fermentation (Jôzôyô), and S.M. Soyalet. At the Nishinomiya / Naruo plant the company produced soybean oils, rapeseed oil, Kinshô oil (Gold medal), Ginshô oil (Silver medal), cottonseed oil, defatted soybean meal, lecithin, etc.

In Aug. 1923 Suzuki Shoten built an oil mill in Yokohama (Kanagawa prefecture) to expand their oil production. The capacity of the benzene plant at Shimizu was 500 tonnes of soybeans per day, and that of the benzene plant at Yokohama was 250 tonnes of soybeans per day. Address: Japan.

5019. Uesugi, Yoshio. 1963. Brief history of Japanese solvent extraction plants in Manchuria, Suzuki Shoten, and Hohnen Oil Co. (Document part). In: Y. Uesugi. 1963. Hohnen Seiyu K.K. 40 nen-shi [40 year history of Hohnen Oil Co.]. Tokyo: Hohnen Seiyu K.K. 307 p. See p. 7-10.
• ***Summary:*** In 1905, after the Japanese victory in the Russo-Japanese War (*Nichiro Senso*), Japan obtained special rights in Manchuria. The treaty of Portsmouth, signed on 5 Sept. 1905, gave Japan the Russian lease on the Kwantung Peninsula in southern Manchuria and the Russian-built South Manchurian Railway as far north as Changchun. The Japanese called this railway company the *Minami Manshu Tetsudo K.K.* In 1898 Russia had obtained the lease of the Kwantung Peninsula and the right to connect its Chinese Eastern Railway by a southward extension, the South Manchurian Railway, to the ports of the peninsula, Port Arthur and Dairen (Ta-lien in Chinese).

In 1905 Manchuria was basically an agricultural country and one of its main crops was soybeans. The country's best known industry was the soybean crushing industry, but the methods, equipment, management, and sales were very primitive and the mills very small and scattered. So at that time the South Manchuria Railway Co. (SMRC) recognized the value of soybeans and decided to greatly improve the oil industry in Manchuria. The began by sending some engineers to Europe to study European processing methods. At that time, all major companies in Germany foresaw a great future in the benzene solvent extraction method, so SMRC bought a patent for the process from Germany. Shortly thereafter, in July 1913, they began to build a benzene solvent extraction plant at Dairen, Manchuria. By 1915, after conducting

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extensive research using this plant, they were convinced that this process had great potential worldwide. So in 1916 they sold the rights to the plant to a private company, Suzuki Shoten of Kobe, with some conditions. This came to be the beginning of Hohnen Oil. Co. in Japan.

At that time the cost of fertilizer to Japan was 115 million yen/year, of which 32.3 million yen was spent on imported soybean cake. Japan wanted to cut import expenses and improve the quality of the product to help Japanese agriculture. The main food oil in Japan was rapeseed oil (*natane abura*). Some vegetable oil was burned in lamps and a little found non-food industrial applications. Europe was much more advanced in oilseed crushing than Japan. The soy oil industry in Japan was very small and it lacked experience with large-scale extraction methods. But Suzuki Shoten of Kobe decided to take a large risk to enter an area that seemed to have a bright future. This took great courage.

In 1914, as World War I began in Europe, the world economy was greatly changed. The Japanese oil industry received a large shock. At that time many of the world's countries experienced a shortage of oils, so the Manchurian oil industry became very active. The oil department of Suzuki Shoten, with what appeared to be the luck of good timing, expanded the capacity of their plant at Dairen, and in 1917 and 1918 built plants at Shimizu (500 tonnes/day capacity), Naruo (250 tonnes/day), and Yokohama (250 tonnes/day), thereby becoming the largest oil company in Japan, with the three largest oil mills in Japan. But unfortunately after World War I, in 1917, many Japanese companies went bankrupt when the good economic times ended. Suzuki's huge program of building oil mills in Japan in 1917 and 1918 left the company short of funds. [As did its unsuccessful attempt to corner the soybean cake/meal market in 1917.] In 1918 Suzuki, too, had to reorganize, so they made each of their divisions into independent companies. On 20 April 1922 the former oil division of Suzuki officially became Hohnen Seiyu K.K. They took over the 4 large oil mills at Dairen, Shimizu, Naruo, and Yokohama. Thus they took a step toward competition of large national companies. Address: Japan.

5020. Uesugi, Yoshio. 1963. Japan's largest soybean crushing mills in about 1918 (Document part). In: Y. Uesugi. 1963. Hohnen Seiyu K.K. 40 nen-shi [40 year history of Hohnen Oil Co.]. Tokyo: Hohnen Seiyu K.K. 307 p. See p. 4-6.
• ***Summary:*** Soybean processing capacity in tonnes/day–Plant name–Location–Year founded–Method.

500. Gomei-gaisha Suzuki Shoten Oil Dept. Shimizu. 1917. Solvent.

250. Gomei-gaisha Suzuki Shoten Oil Dept. Naruo. 1917. Solvent.

250. Gomei-gaisha Suzuki Shoten Oil Dept. Yokohama. 1918. Solvent.

120. Matsushita Mamekasu Seizo-sho. Yokohama. 1910. Pressure.

100. Nikka Seiyu K.K. Wakamatsu. 1873. Solvent.

100. Yokohama Mamekasu Seizo K.K. 1913. Pressure.

100. Yano Seiyu-sho. Atsuta (Atta?). 1914. Solvent.

90. Gomei-gaisha Iguchi Seiyu-jo. Kamezaki-cho. 1915. Pressure.

90. Nihon Kagaku Hiryo K.K. Osaka. 1918. Solvent.

80. Abe Toyu Seizo-sho. Nagoya. 1917. Solvent.

Note: Only 3 of these 10 companies use pressure. Most of the solvent plants were built after the start of World War I, in 1914. Address: Japan.

5021. Yanagihara, Toshiko; Komoda, Hayashi; Yoneyama, Hitoshi.; Yamada, Masakazu. 1963. [So-called oriental flavour of various foods]. *Shokuhin Eiseigaku Zasshi* (*J. of the Food Hygienic Society of Japan*) 4(6):348-53. Dec. (Chem. Abst. 60:13787). [3 ref. Jap; eng]
• ***Summary:*** The various foods include fish-soy, "kusaya-no-himono" (some dried fish), and natto (viscid steamed soybeans fermented with *Bacillus natto*). The so-called oriental flavor was shown to consist mainly of the mixture of acetic acid and *iso*-valeric acid. The latter acid may perhaps be derived from leucine formed as a oxidatively decomposed product of protein. Address: Dep. of Fermentation, Tokyo Univ. of Agriculture, Setagaya-4, Setagaya-ku, Tokyo.

5022. Kokusho Sô-mokuroku [Catalog of bibliographic Information on Japanese books, old and new]. 1963-1976. Tokyo: Iwanami Shoten. 9 volumes. [Jap]*
Address: Tokyo, Japan.

5023. Machida, Yoshiro. 1963. Daizu tanpaku sooseeji seizô-hô [Production of a soy protein sausage]. *Japanese Patent* 319,141. [Jap]*

5024. Matsubara, A.; Sugiyama, H. 1963. Ryusui shiki kansui ni yoru tôfu no osen bôshi ni tsuite [Prevention of contamination of tofu, or soybean curd, by a constant flow of water]. *Nippon Jui Shikai Zasshi* (*J. of the Japan Veterinary Medical Association*) 16(11):22-23. [18 ref. Jap]
Address: Sosei Hokenjo, Hyogo-ken, Japan.

5025. Matsubara, A. 1963. Hi-Zex fukurozume tôfu no kanetsu shori ni tsuite [Sanitary effect of heating bean curd packed in Hi-Zex bags]. *Nippon Jui Shikai Zasshi* (*J. of the Japan Veterinary Medical Association*) 16(5):178-80. [8 ref. Jap; eng]
Address: Health Center, Aioi City, Hyogo prefecture, Sosei Hokenjo, Hyogo-ken, Japan.

5026. Matsubara, A.; Sugiyama, H. 1963. Shigaisen sakkintô ni yoru tôfu osen bôshi no kenkyû [Studies on the prevention of contamination of tofu, or bean curd, by germicidal

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ultraviolet lamp]. *Nippon Jui Shikai Zasshi* (*J. of the Japan Veterinary Medical Association*) 16(7):256-57. [10 ref. Jap] Address: Sosei Hokenjo, Hyogo-ken, Japan.

5027. Matsumoto, M.; Iwahara, S.; Abe, S. 1963. [On the polynucleotides in the cell of natto-bacteria]. *Shimane Noka Daigaku Kenkyu Hokoku* (*Bulletin of the Faculty of Agriculture, Shimane University*) 11:50-53. [Jap]*

5028. Tada, M.; Kawamura, S. 1963. [Changes of soybean carbohydrates during growth and germination. I]. *Kagawa Daigaku Nogakuba Gakujutsu Hokoku* (*Technical Bulletin of the Faculty of Agriculture, Kagawa Univ.*) 14:148-55. [Jap]*
• ***Summary:*** Immature soybean seeds contained 4-5% starch and starch decreased to almost zero on maturity. They also observed that the reducing sugar content of soybeans decreased and nonreducing sugar content increased during development.

5029. Cartter, Jackson L.; Hartwig, Edgar E. 1963. The management of soybeans. In: A.G. Norman, ed. 1963. The Soybean. New York: Academic Press. x + 239 p. See p. 161-226. [209 ref]
• ***Summary:*** Contents: 1. Introduction: World production, United States production trends, utilization (processing to obtain oil and meal, hay and green manure). 2. Soil and climatic adaptation: Areas of production in the United States, soil requirements, climatic adaptation (effect of temperature on plant growth, effect of temperature on composition of seed, effect of light on plant growth, effect of photoperiod on flowering and maturity, effect of soil moisture on growth). 3. Time of planting and varietal adaptation: Effect on plant characters (maturity, plant height, lodging, seed quality, size of seed, seed yield), effect on composition of the seed. 4. Planting methods and equipment: Seedbed preparation (conventional, minimum tillage, deep tillage), row width and planting rate (row width, planting rate), double cropping (after fall-sown grain crops, after peas), special methods of planting, types of equipment. 5. Rotation practices and erosion control: Effect on soybean yields, effect on the following crop, effect on weed population, soil residues from herbicides, erosion control. 6. Weed control: Effect of planting time on plant growth and weed competition, methods of cultivation, chemical weed control (pre-emergence herbicides, post-emergence herbicides). 7. Seed quality and seed treatment: Factors affecting seed quality and germination, seed treatment. 8. Nutrient requirements: Nitrogen requirements and nodulation (effectiveness of nodulation as a source of nitrogen, methods of inoculation, survival of bacteria in the soil, effect of seed treatment on inoculation, effect of nitrogen applications), liming and pH levels (pH and plant development, calcium and magnesium requirements), phosphorus, potassium, trace elements, fertilizer practices and recommendations. 9. Water requirements and utilization: Water needs in relation to plant growth and development, irrigation and soil management. 10. Growth-regulating chemicals. 11. Diseases: Foliar, root and stem, seed. 12. Insects and spider mites: Leaf feeders, above-ground stem feeders, pod feeders, root feeders. 13. Nematodes: Root knot, cyst, others. 14. Harvesting: When to harvest (moisture content of seed, chemical defoliation, losses from respiration after maturity), harvesting methods (historical, combine harvesting). 15. Seed storage. 16. Discussion. The USA now produces about 57% of the world's soybeans, followed by China (PRC; about 33%), Indonesia, Japan, Korea, USSR, Brazil, and Canada, in that order. By 1920, U.S. production was 3,000,000 bushels and the leading states were North Carolina, Virginia, Alabama, Missouri, and Kentucky–North Carolina producing 55% of the total. By 1931, the center of production had shifted to the North Central States, where it is at present.

The subsection titled "Seed treatment" (p. 193) states: "Seed treatment with a fungicide is not recommended as a general practice when seed with high germination is planted. Stands may be increased by seed treatment when seed having a germination of 85 per cent is planted. Although seed treatment seldom results in increased seed yields,... the improved stands resulting from seed treatment aid in giving soybeans a competitive advantage with weeds. Studies by Howard W. Johnson *et al.* (1954) show that seed may be treated at any time between harvest and planting with equal effectiveness. The most satisfactory time for treating seed would be as it is cleaned. The materials Arasan, Captan, and Spergon have proved to be most satisfactory for treatment of soybean seed. Before any lot of seed is treated, it may be a good practice to check the germination with and without the fungicide to determine the beneficial effect of seed treatment on each seed lot."

The section titled "Harvesting methods: Historical" (p. 219) states: "The earliest harvester designed specifically for soybeans was a two-wheeled, horse-drawn machine which straddled the bean row (Piper & Morse, 1923, p. 94). This special harvester was common in Virginia and North Carolina, but was never commonly used in the North Central States. Harvesting losses ranged from 20 per cent under favorable conditions to as high as 60 per cent under unfavorable (Sjogren, 1939). In small-grain growing areas, the binder and thresher were adapted for soybean harvest. Harvest losses for using the binder or mower for cutting and then threshing ranged from 16 to 35 per cent of the total yield, with an average loss of 24 per cent (Sjogren, 1939).

"The combine harvester was first used for soybeans in the mid-twenties. The combine harvester has been a major factor in the expansion of soybean production. This machine required less labor than earlier methods and was more efficient." Address: 1. Agronomist-in-charge, U.S. Regional Soybean Lab., Crops Research Div., ARS USDA, Urbana, Illinois; 2. Research Agronomist, U.S. Regional Soybean

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Lab., ARS USDA, Stoneville, Mississippi.

5030. Kagawa, Aya. 1963. Japanese cookbook: 100 favorite Japanese recipes for Western cooks. [14th & rev. ed.]. Tokyo: Japan Travel Bureau. 198 p. Illust. (some color). Index. 19 cm. Series: Tourist Library No. 11.

• ***Summary:*** The first edition was published in 1949. This is actually the 2nd ed., which is 36 pages longer. Most of the information about soyfoods in the 1st edition is also in this 2nd edition, but often on different pages: Several examples: Long passage about soybeans and soyfoods (p. 16). Glossary (soy entries, p. 40-42). Nameko miso soup (p. 81). Miso-shiru (introduction, p. 82). Tofu and Japanese leek soup (p. 89). Four kinds of miso soup (p. 90-92).

The last two pages in the 1963 printing are devoted to full-page ads: (1) "Zest that's best with Kikkoman." "Brewed by Noda Shoyu Co., Ltd., Tokyo, Japan. Sole agent in U.S.A.: Kikkoman International Inc., 900 Marin St., San Francisco 24, California. 930 San Mateo St., Los Angeles, Calif. 11-31 31st. Ave., Long Island City 2, New York." Photos show a can and a bottle of Kikkoman All-Purpose Soy Sauce.

(2) "Try Aji-no-Moto: The super seasoning." "Just add a pinch of Aji-no-Moto before, during, or after cooking and see how it unlocks those hidden flavors in all foods–raw, cooked, dried, canned, or frozen." An illustration show an Italian chef with a white chef's hat (*toque blanche*), moustache, kerchief, and upward pointing right index finger. Illustrations show a small glass shaker and a metal can of Aji-no-Moto.

Aya Kagawa was born in 1899. Address: M.D. and president of Joshi Eiyô Tanki Daigaku (Women's Nutrition College), Tokyo, Japan.

5031. Kan, Johnny; Leong, Charles L. 1963. Eight immortal flavors. Berkeley, California: Howell-North Books. 246 p. Illust. (by Jake Lee). Index. 24 cm. 2nd edition 1980.

• ***Summary:*** An interesting book, by a master cook and an excellent researcher and writer. Full of new and useful information.

From the publisher's description: "This is the first cookbook–written by a Chinese-American to emanate from San Francisco's Chinatown–the mecca for both Oriental and Occidental gourmets. It is the only cookbook dealing strictly with Cantonese cookery." The Foreword, written by the famous food writer James Beard (of New York City) in Oct. 1963. notes that he grew up in Portland, Oregon, and was a close childhood friend of the Kan family and of their cousin Johnny Kan, who came to visit from San Francisco's Chinatown [in California]–a "city within a city." Kan's mother was an excellent and ingenious cook. Beard considers Kan's Restaurant "the outstanding Chinese restaurant today."

The "Eight Immortal Flavors" of Chinese cookery are *Hom*–salty. *Tom*–bland (like rice). *Teem*–sweet. *Seen*–sour. *Foo*–bitter. *Lot*–hot (as in chili peppers). *Heong*–fragrant (smell more than taste). *Gum*–golden (as in citrus peel or kumquat). They are always referred to in this order. Note 1. In Western cookery there are only four traditional flavors–sweet, sour, salty, and bitter. The Japanese add a 5th, "umami."

The chefs and cuisine of Kwangchow (the ancient name for Canton, now spelled Guangzhou) are considered the finest in all of China (p. 28).

The chapter titled "Native condiments, sauces, and ingredients" (p. 43-55) includes: Bean curd (*Dow Fu*)*:* "One of the most useful of Chinese ingredients," it is usually pressed into ½-inch by 3-inch squares. Bland in flavor, it is a great mixer for highly flavored foods. "It is even delicious in its fresh state with spicy condiments and is known as 'the meat without bones."

Note 2. This is the earliest English-language document seen (April 2013) that uses the term *Dow Fu* (regardless of capitalization or hyphenation) to refer to Chinese-style tofu.

Black [soy] bean, Dried (*Woo Dow*)*.*

"Soybean skin (*Foo Jook*)*:* Dried skin of soybean milk. Sold in packages, it is flat and thin, with a creamy-glaze appearance. Soak it before using in soups, or in smother-cooking recipes." It has an enjoyable chewy texture and slightly nut-like flavor.

"Soybean skin, sweet (*Teem Jook*)*:* Similar but thicker than *Foo Jook,* its taste is slightly sweeter."

Illustrations (p. 46-47) show: Soy bean skin (foo jook). Bean curd (dow foo).

Condiments (p. 51-54)–"Black beans, salted (*Dow see*)*:* Cured, fermented small black beans... Should be soaked briefly and washed before use. A common use is to mash beans with garlic, creating a seasoning popular for both seafood and meats."

Monosodium glutamate (*Mei Jing*)*:* This flavor accent powder had its origin centuries ago in old China. "A charming story, which we like to believe, involved a contest in which several monks with gourmet tastes competed with each other to produce the most delicious batch of *Loh Han Jai,* the standard monks' food consisting of a variety of various vegetarian ingredients... The winner had added one precious secret ingredient the others did not have–a powdered dried seaweed [*konbu, Laminaria japonica*] which was later discovered to be the first crude source of monosodium glutamate. It was not until 1908 that Dr. Kikunae Ikeda, the great Japanese scientist successfully extracted Glutamic Acid from edible seaweed and from it crystallized monosodium glutamate and marketed it under the name of *Aji-no-Moto.* Then in 1921 Chinese scientist Poo-Nien Wu of Shanghai developed a process for extracting monosodium glutamate from wheat protein and was marketing his discovery, Ve-Tsin, in China, Singapore, Malaya, and the Philippines to the amount of 350,000 pounds a year. Other raw material sources are corn, soybean protein, and desugared beet molasses.

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Sauces (p. 54-55)–Bean sauce (*Min See Jeung*)*:* A brown salty bean paste. Oyster sauce (*Ho Yow*)*.* Red seasoning sauce (*Hoy Sin Jeung* [*Hoisin Sauce*])*:* A thick red sauce that contains soybeans as an ingredient. "A table condiment for Peking duck."

Spiced red bean curd (*Nom Yee*)*:* "A variation of bean cake fermented." It has a slightly harder consistency, a brick-red color, and a pungent, aromatic flavor.

Soy sauce (*See Yow*)*:* "For Chinese cooking, soy sauce is the great all-purpose and most indispensable of all sauce." There are many grades and types. "For the 'red cooking' method, ingredients are incarnadined by the dark sauce. It may be used as a table dip, by itself, or mixed with mustard." Unlike salt, it has "the taste of a beef essence." It is made by the fermentation of cooked soybeans, roasted wheat, a yeast mold and salt. The best grades of Chinese soy sauce are still made by the old-fashioned, aged, natural fermentation process, rather than by the quickly made chemical hydrolysis method [HVP soy sauce]. The type know as *Sang Chau,* light and color and density, is the premier kind for flavoring and dipping." But unless you ask for it by name, "you will get the darker soy sauce or *See Yow.* There is no definitive record of the origin of soy sauce. "Reference to the sauce has been made as early as the Chou Dynasty [1045-256 BC], some 200 years before Christ!... Undoubtedly since its very origin soy sauce has been made in the home or as a village industry. As a manufactured product it started in 1688. With its long condimentary life, no wonder that, to the Chinese, soy sauce is the Sauce of Life."

Note 3. This is the earliest English-language document seen (April 2012) that uses the term "Sang Chau" to refer to light Cantonese soy sauce."

Vegetables (p. 81-87): Bean sprouts (*Ngah Choy*)*:* This common and inexpensive little vegetable is overused in some Chinese restaurants as a "filler." The name "literally means 'vegetable for the teeth,' implying a crunchy sensation. Bean sprouts are tiny shoots which grow from the soy bean. They are one of the trio of basic Chinese foodstuffs–bean sprouts, bean curd and soy sauce–derived from the wonder bean. The sprouts average two inches long, are opaque white and the bean head is yellow... Another variety of bean sprouts, germinated from a larger type of bean, is the Dow Ngah, or Big Bean Sprout. This variety grows a little longer, with a larger golden head, and the sprout is crunchier, but has a more raw 'beany' flavor. This variety is not used in Chinese restaurants."

Soy-related recipes: Spinach with foo yee sauce (Baw choy foo yee, with "2 preserved bean cakes (*Foo Yee*) mashed with 2 teaspoons juice from jar," p. 89). Shows how "any commonplace vegetable can be turned into an epicurean dish by simply adding preserved bean cake" [fermented tofu] and a touch of garlic. Try it "and you will discover why Foo Yee is often referred to as the miracle ingredient among Chinese condiments."

Bean cake sauteed with meat (Dow foo yuke, with "8 bean cakes (*Dow foo*)*.* Slice each bean cake into 6 pieces," p. 99). Fresh asparagus chicken with black bean sauce (Lei soon gai kow, with "1 full tablespoon mashed fermented black beans (*Dow see*)*,* combined with 1 clove mashed garlic and 1 tablespoon soy sauce, with a dash of monosodium glutamate," p. 100).

Note 4. This is the earliest document seen (Nov. 2011) that uses the term "black bean sauce" and clearly shows how to make it in the kitchen as part of preparing the dish.

Chinese cabbage with foo yee sauce (Siew choy foo yee, with "2 fermented bean cakes (*Foo Yee*) with 2 teaspoons juice from the jar," p. 107). Mustard greens with foo yee sauce (Gai choy chow foo yee, with "2 fermented bean cakes (*Foo Yee*) mashed with 2 teaspoons juice from the jar," and 1 teaspoon soy sauce, p. 109).

Steamed salmon with black bean sauce (Dow see jing sah-mon yee, with "2 tablespoons fermented Black Beans (*Dow See*)*,* crushed to paste," p. 131). Prawns with black bean sauce (See jup hah kow, with "2 tablespoons Black Bean Paste (*Dow see*)*,* p. 133). Steamed fish with black bean sauce (Dow see seen gee jing yee, with "2 tablespoons fermented Black Beans (*Dow see*)*,* crushed to a paste," p. 141).

Dried oysters with bean curd skim (Ho see munn foo jook, with "6 sheets Bean Curd Skim (*Foo jook*) pre-soaked in cold water for 2 hours. Drain thoroughly. Cut in 2 to 3-inch pieces." p. 143).

Note 5. This is the earliest document seen (Dec. 2010) that uses the term "Bean Curd Skim" to refer to dried yuba sticks. Continued. Address: 1. Chef, Chinatown; 2. Historian of Chinese life in America.

5032. Moncrieff, R.W. 1963. Man-made fibres. 4th ed. London: Heywood & Co. Ltd. x + 742 p. See p. 287-95.
• ***Summary:*** Part II of this book is titled "Fibres made from natural polymers." Within Part II, chapter 18, titled "Ardil, Vicara, Soybean," notes that Ardil fiber, made from peanut (groundnut) protein, was first spun at Ardeer [Scotland] in 1938 and after World War II was manufactured at Dumfries [Scotland] until 1957, when it was discontinued. Vicara was made from corn (maize) protein, named zein, by the Virginia Carolina Chemical Corporation from 1948 until 1957.

The contents of the section titled "Soybean" is as follows: Introduction. Manufacture. Properties. Protein fibres and body comfort: Low stiffness for small stretches or bends, compliance, frictional coefficient of the fibre, resilience, loftiness, moisture absorption, heat of wetting (protein fibres generally give out heat when they are wetted), thermal conductivity, static, filament cross section.

"For short periods several manufacturers have made fibre from soybean protein. At one time the Ford Motor Co. made it and used it for car upholstery; it was once made in Japan under the name Silkool. The attraction of soybean as

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raw material for a fibre lies in its high protein content (35 per cent) compared with groundnuts (25 per cent) and maize (10 per cent). Furthermore the beans which look like light brown peas grow prolifically in the East and in America." The manufacturing process and properties are then discussed briefly. The main disadvantage of soy protein fiber is that it loses strength when it gets wet. Its main attraction lies in the abundance and low cost of soybeans.

Note: The first edition of this book, published in 1950, was titled *Artificial Fibres.* Address: BSc, F.R.I.C., United Kingdom.

5033. Nakamura, Hiroshi. 1963. Structure of the soybean processing industry in the United States: Economic, institutional, and technical factors in its development. PhD thesis, University of Illinois at Urbana-Champaign. 290 p. Page 2720 in volume 24/07 of Dissertation Abstracts International. *

• ***Summary:*** Includes review of growth of industry, cost analysis of soybean processing, locational analysis of soybean processing, and use of the Chicago futures market by soybean processors. Address: Univ. of Illinois at Urbana-Champaign.

5034. Ogura, T. ed. 1963. Agricultural development in modern Japan. Tokyo: Japan FAO Association. 704 p. Maps. 21 x 15 cm. [72* ref]*

5035. Onishi, Hiroshi. 1963. Osmophilic yeasts. *Advances in Food Research* 12:53-94. [150+* ref]

• ***Summary:*** Since the word "osmophilic" was first used by von Richter (1912) for the group of yeasts that can grow well in an environment of high osmotic pressures, a large number of yeasts showing sugar- and salt-tolerant properties have been described.

Soy sauce mashes differ significantly from other brew mashes in their high content of sodium chloride (about 18%) and nitrogen (1.0 to 1.5% as total nitrogen). Thus, in Japan, osmophilic yeasts have been investigated mainly for "effective utilization in the soy sauce and miso paste industry."

Soy [sauce] yeasts and miso yeasts: The first report on soy [sauce] yeasts appeared in 1906, when Saito isolated 5 strains of salt-tolerant yeasts from soy sauce mashes in the Choshi district and classified them into *Saccharomyces soya, Zygosaccharomyces japonicus, Pichia farinosa, Mycoderma* sp., and *Torula* sp. Subsequently, many taxonomic studies were carried out on soy yeasts (Mitsuda, 1910; Nishimura, 1910; Kita, 1911; Ishimaru, 1935). However, none of these observations explained which yeast played an important role in the ripening of soy mashes. Takahashi and Yukawa (1911) showed that *Zygosaccharomyces major* and *Zygosaccharomyces soja* were useful in ripening soy mashes, giving the characteristic taste and flavor through their fermentation. *Zygosaccharomyces japonicus* and *Zygosaccharomyces salsus* were shown to be harmful because they were the main cause of the formation of pellicles leading to deterioration of the commercial quality. This work has been believed to give the most reliable information on both microbiological and applied aspects of soy yeasts.

"As for miso yeasts, extensive and detailed studies were conducted by Mogi (1938-1942). Unlike soy sauce, miso pastes were commercially produced in great variety with different raw materials and various contents of NaCl. Mogi described many new species of miso yeasts belonging to *Saccharomyces, Zygosaccharomyces, Debaryomyces, Hanseluna, Pseudohanseluna, Pseudohanseluna, Pichia, Zygopichia, Torulopsis, Pseudomycoderma,* and *Pseudomonilia.* Among them, the dominants were *Saccharomyces, Torulopsis, Zygosaccharomyces,* and *Zygopichia,* and the last two were found chiefly in miso paste of relatively high salt content."

Salt tolerant yeasts, especially *Saccharomyces rouxii,* play an important role in soy sauce and miso fermentation in Japan. They play a key role in creating the characteristic flavor and taste, and when added, can shorten the ripening period of the mash while improving its quality. Especially with semichemical soy sauce, involving acid hydrolysis of the soybeans, it is very important to add yeasts that cause vigorous fermentation of the mash, which improves the flavor and taste.

But osmophilic yeasts can also cause food spoilage– especially the dry white pellicles or films that form on the surface of (usually raw) soy sauce, and may cause gaseous fermentation. These pellicles are caused by the growth of film-forming yeasts such as *Saccharomyces rouxii* var. *halomembranis* and *Pichia;* the result is deterioration of soy sauce quality. "This spoilage cannot be seen in well-matured soy sauce of good quality, because it contains yeast-static compounds."

Note: This is the earliest document seen (June 1999) that mentions the yeast *Zygosaccharomyces rouxii* in connection with soy sauce or miso. Address: Noda Inst. for Scientific Research, Noda-shi, Chiba-ken, Japan.

5036. Sato, Makoto. ed. 1963. Kuki, hishio, misho, miso, shôyu nado ni kansuru shiryô [Historical documents about kuki (fermented black soybeans), hishio or chiang, misho, miso and shoyu]. Noda: Noda Kofukai Toshokan. 230 p. Illust. No index. 28 cm. [189 ref. Jap]

• ***Summary:*** Reprints of 189 old documents on shoyu and miso, and their progenitors, in chronological sequence. The alternate title is "Shoyu miso shiryo shusei." Makoto Sato was born in 1907. Address: Head, Kofukai Library (Kofukai Toshokan Cho).

5037. Sato, Makoto. ed. 1963. Shôyu miso shiryô shûsei

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[Collected historical documents about shoyu and miso]. Noda: Okikazekai Toshokan. 230 p. 22 cm. [Jap]*
• ***Summary:*** See the other entry for Sato 1963. Address: Japan.

5038. Tanaka, Heihachi; Nicholas, Betty. 1963. The pleasures of Japanese cooking. Englewood Cliffs, New Jersey: Prentice Hall, Inc. viii + 247 p. Illust. Index. 22 cm.
• ***Summary:*** Contents: Introduction. 1. A chat about Japanese food: Seasonings and flavorings, table settings and utensils, kitchen utensils, etiquette, cooking and serving a Japanese meal. 2. Appetizers. 3. Soups. 4. Broiled dishes. 5. Steamed dishes. 6. Saucepan foods. 7. Fried foods. 8. Salads. 9. Vegetables. 10. Rice and noodle dishes. 11. Thirst-quenchers. 12. Desserts. 13, Festival foods. Glossary [of Japanese foods and utensils]. List of retail outlets for Japanese food products (national chains and alphabetically by state in the USA).

The book begins (p. 1): "To many Westerners, the cuisine of Japan consists almost entirely of *sukiyaki, tempura,* rice and soy sauce. Nothing could be further from the truth."

Vegetables "are harvested at the height of their season," when tender and full of flavor, then cooked lightly and used (for example) "as an ingredient in *misoshiru* (thick soup [miso soup]) or pickled" (p. 3).

"If one were to single out the most important vegetable cultivated in Japan it would be the soybean. For this legume,... is such a versatile food that it is served in some manner at practically every Japanese meal.

"In the hilly interior of the country where fish is scarce, or in the vegetarian menus of the Buddhists, soybeans are called the 'fish of the field' and relied upon as a valuable source of protein. A favored way of preparing the green soybean is simply to boil and hull it. Dried soybeans are ground [sic, soaked before grinding], soaked in water, cooked and mashed, sieved through silk, and finally cooked again to produce bean curd or *tofu.*

"Steamed and fermented beans become *natto. Miso,* a bean paste made by boiling soybeans, mashing them, adding wheat ferment [sic] and salt and allowing this mixture to ferment for several months, lends itself to use in countless dishes. *Moyashi,* the tender young sprouts of the soybean, are cultivated on indoor racks to conserve precious space in the fields." In a few days, a single cup of soybeans will produce 3-4 pounds of succulent sprouts (p. 3-4).

"Queen of Japanese seasonings is *shoyu* or soy sauce, a dark, red-brown. thirst-provoking liquid made from wheat or barley, soybeans, salt and water. *Shoyu* is loved by the Japanese for its piquant flavor and its use is so extensive that almost no dish is conceivable without it." A brief history of shoyu and its forerunner, *hishio,* and the process for making shoyu are given. Shoyu "mash is allowed to ferment and mature naturally for a full eighteen months when it is pressed and the sauce obtained pasteurized to become refined *shoyu.*

"Another multi-purpose seasoning and foodstuff is *miso,* a paste made from fermented rice and soybeans." Most miso "lasts for years without spoiling or deteriorating. There are two types of *miso*–red and white. Both are widely used in Japan but western palates seem to prefer the white type. Both are highly nutritious and are used in literally hundreds of ways: as a seasoning, a main dish and the basis of many hearty, potage-type soups" (p. 5-6).

"For centuries [sic] Japanese cooks have used a dashi of *aji-no-moto,* a seaweed or vegetable protein derivative, to intensify the natural flavors of the foods they cooked. Translated, *aji-no-moto* means 'essence of taste' (it is often referred to as taste powder) because the minute white crystals heighten the inherent flavors of foods,... but lending no flavor of their own" (p. 6).

Yakimono are broiled foods. "Flavor broiling includes *yakitori* (broiled chicken), *teriyaki* (fish marinated in a sauce containing shoyu and then broiled),... Miso-broiling is used for such vegetables as eggplant as well as for fish or meat" (p. 13).

"Inasmuch as *shoyu,* or soy sauce, is such an all-important seasoning and is called for in almost every Japanese recipe, it should be noted that the use of genuine *shoyu* is quite essential. Most other soy sauces, while excellent for other types of cuisine, really don't do justice to Japanese cooking" (p. 19). Also discusses wasabi, sesame seeds, sesame oil, katsuobushi, konbu, sake, and various mushrooms (p. 20-22).

"*Tofu,* or soybean curd, is such a versatile foodstuff–it may be boiled, fried, steamed, sautéed or marinated–that it is included as an ingredient in many recipes in this cookbook. Fresh *tofu* is sold in cakes; refrigerated, it will keep about one week. It is also available in cans and, while the processed product is not quite as tender as the fresh, it does make a satisfactory substitute. The consistence of *tofu* resembles thick custard and it should be handled carefully to avoid breaking and crumbling. Western taste buds seem to find *tofu* bland and a bit flavorless, but when deftly sauced it is very delicious–and also nutritious. Note: *tofu* must not be overcooked or it will toughen and develop a rubbery texture" (p. 24).

Recipes include: Norimaki-Sushi (with nori, shoyu, and sashimi). Tiny teriyaki (ingredients: 2 pounds beef tenderloin, 1 cup shoyu, 3/4 cup water, ½ cup mirin, 3/4 cup honey, 1 clove garlic, crushed, and 1 one-inch piece fresh gingerroot, grated; p. 46). Liver tsukudani (with shoyu; p. 55). Fish and tofu stew (p. 69). Oyster miso (p. 71). Vegetable and noodle miso (p. 72). Shrimp or prawn miso (p. 73).

Chapter 4 is titled "Broiled foods." "... almost all cooking in Japan is done over a charcoal fire,..." "Without a doubt, the most popular of all broiled dishes with the Japanese people is *yakitori,* or broiled chicken... Almost as popular as *yakitori* is *teriyaki,* usually fish marinated in

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a *shoyu* sauce, arranged on long skewers, and then broiled over charcoal. *Teriyaki* means 'glaze broiled'–*teri* meaning 'shiny' and *yaki* 'broiled' or 'roasted.' Actually any meat may be *teriyaki,"* but all have in common "the marinade of shoyu, sake, and sugar" (p. 75-76). Recipes include: Salmon teriyaki. Shrimp teriyaki. Stuffed beef teriyaki (p. 88-90). Shoyu marinade basting sauce (p. 93). Sukiyaki (with tofu and shoyu; p. 110). Tempura sauce (with shoyu, p. 121). Fried tofu with sauce (p. 127). Pickled seaweed (with konbu and shoyu, p. 140). Sesame-shoyu dressing (p. 151). Vegetables with tofu sauce (p. 154). Cabbage with mustard-miso sauce (p. 157). Eggplant with miso sauce (p. 164). Azuki meshi (red beans and rice; p. 181). Domburi soboro (with tofu; p. 182-83). "Red bean paste (sweetened)." Ingredients: "2 cups red beans (azuki). 2 cups sugar. 2 teaspoons salt." (p. 203.) Also called "sweetened red bean paste" (p. 200; Jap. *azuki an;* p. 200-203). Yokan (with "1½ cups strained red bean paste"–*koshi-an;* p. 204). Hikishamanju (Bean jam buns with strained red bean paste; p. 207). Shiruko (Red bean soup [azuki] with rice cakes {mochi}; p. 209). Zoni (Rice cake soup, with mochi; p. 215-16). Sweetened soybeans (for New Year's, p. 217-18).

The glossary includes abura-age, azuki ("red beans"), azuki-an ("red bean paste"), daizu (soybean), ganmodoki, kanten, konbu, konnyaku, miso (aka miso, shiro miso), misoshiru, mochi, mochigome, mochiko, nori, shiru-miso, shoyu, teriyaki, tofu, wakame, yakidofu.

Note: This is the earliest English-language document seen (March 2006) that uses the term "sweetened red bean paste" to refer to sweet azuki bean paste [*azuki-an*] or that uses the term "strained red bean paste" to refer to strained azuki bean paste [*koshi-an*]. Address: 1. Head Chef, Japanese Cuisine, Japan Airlines.

5039. Tedoradze, S. 1963. [Soya]. Tblisi, Georgia: State Press. 76 p. 20 cm. [Geo]

• ***Summary:*** Page 1 states: Soybeans were cultivated in Armenia in 1930, and in Azerbaidjan in 1931.

Page 6 states: In 1882 G. Sturua (a Georgian statesman) gave some soybean varieties to the Caucasus Agricultural Society; he obtained these from his brother in Japan.

Page 7 states: In 1898, Georgia has many landraces and varieties of soybeans. Professor L. Dekabrelevich wrote that the soybean was introduced to Georgia during the 1860s or 1870s.

Note 1. This document contains the earliest date seen for soybeans in Armenia, or the cultivation of soybeans in Armenia (1930). The source of these soybeans is unknown.

Note 2. This document contains the earliest date seen for soybeans in Azerbaijan, or the cultivation of soybeans in Azerbaijan (1931). The source of these soybeans is unknown. Address: Georgia.

5040. Teriyaki and sushi: Selected 72 recipes. 1963. Elmsford, New York: Japan Publications Trading Co. 58 p. Illust. Index. 21 cm.

• ***Summary:*** On title page: "Compiled by the Japanese cooking companions." The 12th printing was Jan. 1976. Contents: Rice dishes (incl. How to cook delicious sushi rice, oshi zushi, norimaki). Vermicelli dishes (incl. tsukejiru, kakejiru, somen, soba, udon). Soups. Broiled dishes (inc. teriyaki). Marinated dishes. Boiled dishes. Steamed dishes. Fried dishes. Casseroles. Tart dishes. Pickles. Confectionery. Glossary. Note: Brands promoted in the recipes throughout this book, by appearing in large boldface type, are: Kikkoman soy sauce. Aji-no-Moto, Manjo mirin (sweet rice wine).

Soy-related recipes include: Kenchin-jiru (with "½ tofu (bean curd) (1/3 lb)," p. 17). Miso soup (with 4 tbsp. bean paste (miso)" and "2 aburage," p. 19). Konnyaku (devil's tongue) and carrots with white bean curd paste dressing (with tofu, p. 29-30). Bean curd with liquid starch (with tofu, p. 32). Meat and vegetables in aburage-bags (with "2 large aburage, p. 34). Bonito cooked with bean paste (with miso, p. 35). Steamed squid ("stuffed with tofu and vegetables," with "1 tofu (bean curd)," p. 38-39). Sukiyaki (with "2/3 lb. broiled bean curd," p. 46). Yudofu (with "1 lb. bean curd," p. 47). Yosenabe (with "1/3 lb bean curd," p. 47).

Note 1: This is the earliest document seen (April 2013) that calls for the use of grilled tofu ("broiled bean curd") in sukiyaki. That is the standard way of making sukiyaki in Japan.

The recipe titled simply "Teriyaki" (p. 22) states: "Teriyaki is fish or meat marinated in a mixture of mirin and saké, sugar and soy sauce and roasted directly over fire. This method of roasting is most suited for oily fish, fish with thick meat, chicken and beef." The sauce contains: "2 tbsp. Kikkoman soy sauce, 2 tbsp. Manjo mirin, 1 oz. ginger, and sweetened vinegar (mixture of 1 tsp. vinegar, 1 tsp. sugar, and a few shakes of salt)" (p. 22-23).

The Glossary (p. 47) includes: "Aburage–fried soy bean curd. An–[azuki] bean jam [also called 'red bean jam' in index]. Miso–bean paste. Misozuke–pickles in bean paste. Tofu–bean curd. Yudofu–boiled soy bean curd."

5041. Umeda, Isao. 1963. Shôyu [Soy-bean sauce]. Tokyo: Sankyo Shuppan K.K. 232 p. Index. 28 cm. Final technical report. USDA P.L. 480. Project UR-A11-(40)-C. [95 ref. Jap]

• ***Summary:*** Contents: Part I. 1. Raw materials. 2. Treatment of raw materials. 3. Making koji. 4. Moromi: Fermentation (*shikomi*), methods of fermentation, mixing, ripening (*jukusei*), research on ripening, microorganisms in moromi. 5. Pressing out the shoyu. 6. Refining (*seisei*)*:* Method of heat treatment (or pasteurization; *hiire*), changes during heat treatment, flavor, composition (*seibun*) of regular shoyu and of special shoyu [*tokushu*], methods of analyzing shoyu.

Part II: Special subjects. 1. Substitute raw materials: Substitutes for soybeans, for wheat, for both soybeans and

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wheat (copra meal, wheat bran [*fusuma*]). 2. Tamari shoyu and usukuchi shoyu: Tamari and soybean miso, usukuchi shoyu. 3. Secondary products (*fukuseihin*)*:* Shoyu presscake (*shoyu kasu*), shoyu oil, soybean soak water, ? eki, use of koji spores. 4. Kegs (*taru*). 5. Semi-fermented shoyu #2 (*Shinshiki nigo*)*:* Research on its production. Address: Nôgaku Hakase, Tokyo Daigaku Nôgaku-bu, Tokyo, Japan.

5042. Katakura, Benkichi. 1963? Moyashi no yurai [The history of sprouts]. Japan. [Jap]*
• ***Summary:*** The Bible of the soy sprouts industry in Japan. Address: 80 year old, Tachikawa, 0425-22-3101.

5043. Nagata, Aikichi; Yamamoto, H.; Terashima, S.; Matsumoto, T.; Onishi, S.; Konishi, S. Assignors to Ajinomoto Company, Inc. 1964. [Beverages from oil-free soybean flakes]. *German Patent* 1,160,717. Jan. 2. 4 p. Japanese application filed 12 Sept. 1959. (Chem. Abst. 61:6287h). [Ger]*
• ***Summary:*** The final beverage is an orange juice substitute.

5044. Morimoto, Saichi; Yamamoto, A.; Hamada, K. Assignors to Toyo Spinning Company, Ltd. 1964. [Vinyl compound grafting on cyanoethylated or carbamoylethylated protein]. *Japanese Patent* 90. Jan. 11. 4 p. Application filed 30 Aug. 1961. (Chem. Abst. 60:13380g). [Jap]*
• ***Summary:*** Defatted soybeans were used to make a white, transparent fiber with a tenacity of 4.31 gm per denier. It can be easily and fastly dyed with acidic, basic, or disperse dyes.

5045. Sklarewitz, Norman. 1964. Japan may seek freer trade with U.S. in annual joint review that opens today. *Wall Street Journal.* Jan. 27. p. 5.
• ***Summary:*** "Tokyo–Japan is worried about its economic prospects and may start pressing the U.S. for some special concessions." Inflation is a major concern, with the government's consumer price index up 20% from 1960. "Some illustrations: A cake of tofu bean curd, a staple of the Japanese diet, went up 20% in the past year alone." Imports exceeded exports and Japan ran up the 3rd largest trade deficit in its history. Address: Staff reporter.

5046. Hayashi, Shizuka. 1964. Contests stress importance of fats in diet. *Soybean Digest.* Jan. p. 29-30.
• ***Summary:*** Wicked! The American Soybean Association now has a major campaign to to try to persuade Japanese, especially children, to eat more fat "for the growth and health of our bodies." "The younger generation especially, because of the ignorance or perhaps indifference of their parents, has not been taught the importance of oil in the diet. This is perhaps the greatest reason why Japan is among the poorest of fat-eating nations. The correction of this situation must start with educating the youngsters. There are over 10 million children in grammar school, 11 million in high school in Japan."

A photo shows two girls, members of a home economics club, pinning up a slogan they have selected on the wall. Written in Japanese characters, it reads: "Take more oil." Address: Managing Director, Japanese-American Soybean Inst., Tokyo.

5047. Hayashi, Shizuka. 1964. Japan team would like to see annual U.S. tour. *Soybean Digest.* Jan. p. 30.
• ***Summary:*** A nine-man Japanese miso team toured the USA early in the fall of 1963 at the invitation of the American Soybean Association. They hope such U.S. tours can take place each year. This first overseas mission of the Japan Miso Industrial Cooperative left Tokyo on Sept. 7 and returned Oct. 17 after a round-the-world trip. Tokubei Tanaka, president of the Association, headed the mission. Address: Managing Director, Japanese American Soybean Inst.

5048. Lambert, J.W. 1964. A plant breeder's look at Japan's soybean needs. *Soybean Digest.* Jan. p. 9-10.
• ***Summary:*** "During a 5-week tour of Japan the writer had opportunity to meet with several representatives of each of the major soybean food industries and with soybean research scientists at several agricultural and industrial research stations."

"The Japanese market is not only large–it is complex. Whereas many of the market countries process soybeans in much the same manner as is done in the United States, Japan uses an important part of her available supply of soybeans directly in the manufacture of traditional food items such as tofu, miso, natto and kinako. Of the 1,443,500 metric tons of soybeans consumed in Japan between April 1, 1962, and March 31, 1963, 65% to be sure was processed in the conventional manner, i.e. for oil and meal; but 20% was used for tofu; 9% for miso; about 2% each for frozen tofu," natto, shoyu, kinako, and other miscellaneous soybean foods.

"In general Japanese soybean industries like the availability of American soybeans in large relatively uniform lots. They acknowledge the marked improvement of American beans in recent years with respect to splits and to dirt and other foreign material." Some like specific varieties such as Hawkeye, Illinois, Ohio, Indiana, and Harosoy. "In most cases the No. 2 Ordinary was indeed 'ordinary,' being a wide mixture of varieties and having a rather high percentage of splits, foreign material and damage. The No. 2 Select had much of the objectionable material removed. 'Hawkeye' was often true to label and was favored by makers of conventional tofu. 'Harosoy,' usually rather pure varietywise and low in foreign material, was favored by frozen tofu and miso makers.

"The additional price on these pure varieties was a deterrent, however..."

"Many of the makers of the conventional tofu and aburaage are using a high proportion of U.S. soybeans,

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especially in the Tokyo area. On Kyushu, on the other hand, there is a preference for Japanese beans. But even here the lower price of American or Chinese beans was attractive to the tofu makers.

"Miso makers expressed a definite preference for Japanese soybeans but more often because of price were using Chinese beans. Only occasionally were they using U.S. soybeans. The Japanese varieties are preferred because they soften and absorb water more rapidly and uniformly in cooking and reputedly have the most desirable flavor and taste. They are usually large-seeded, and the most highly regarded varieties have colorless hila, which is important in making the popular pale yellow miso. They are relatively free of foreign material and split beans.

"The Chinese soybeans are usually relatively free of foreign material and splits, have a high proportion of colorless hila and are lowest in price. They are relatively small and are no better in taste than U.S. beans. American soybeans, unless identity preserved Harosoys, tend to have a high proportion of dark-colored hila and are high in splits and foreign material.

"Want Less Hull: Natto making requires a very high percentage of whole, unsplit beans and freedom from foreign matter. For this reason a very high proportion of the requirements of this industry are drawn from the domestic supply.

"The representatives of the principal industries were asked what they would like most in soybeans for their respective operations; their replies can be summarized as follows: (1) The crushing industry would like beans with a high oil content and a somewhat higher protein than they are presently getting; they would also like a lower hull percentage. (2) The tofu makers would like beans having a high percentage of soluble protein and protein that coagulates over a fairly wide range of coagulant concentrations. (3) Miso makers would like large seeded beans which have colorless hila and which absorb water rapidly and uniformly during the cooking process; they also often mentioned 'good taste after cooking.' All of these manufacturers would like to have beans low in foreign material and in split beans. The reasons for the former are obvious. The preference for low split bean content is based primarily on the fact that split and whole beans absorb water at different rates.

"Inasmuch as the soybean food manufacturers often expressed a preference for Japanese soybeans providing they could be obtained in large enough quantities and at reasonable prices, it seemed desirable to observe production of soybeans on Japanese farms and to discuss varieties and variety improvement with Japanese experiment station workers. Soybean fields in Japan are exceedingly small by U.S. standards and are located mainly in the hilly or mountainous sections where rice is not grown. A very large portion of the best land in Japan is devoted to rice. Some beans are, to be sure, produced on the banks of the rice paddies, but these beans seldom find their way into the market place. Most of them are used by the farm families who produce them."

"The Japanese varieties are of considerable interest. Virtually all of them have what physiologists call a 'determinate' type of growth. That is, they grow vegetatively until they reach about maximum height before they start to flower, and then the seeds set at all of the nodes within a short period of time. This is in contrast to most of the varieties grown in the Cornbelt [Corn Belt] which are of the 'indeterminate type' that begins to flower when it has three to five true leaves, and continues to flower and set seed for 2 or 3 weeks or until it reaches maximum height.

"The Japanese varieties are relatively short and branch rather profusely under the conventional way of planting, that is in rows about 20 to 24 inches apart and in two plant hills about 6 or 7 inches apart in the rows. The seeds are usually very large, often averaging 35 or more grams per 100 seeds, in contrast to American varieties with 16 to 20 grams per 100. Hilum colors vary, colorless ones are most popular with processors. Oil content is usually much lower than in U.S. beans and protein content higher. As marketed the moisture content is usually higher than that of U.S. beans."

"Japanese varieties of several maturities are being accumulated by the Japanese American Soybean Institute and will be sent to the United States for study and comparison with U.S. varieties under our conditions. The Japanese varieties will be made available to U.S. soybean workers in the regions where they are best adapted. It is hoped that as a result of the present study American soybean breeders may have a better understanding of the needs of the Japanese soybean food industries. It seems likely that the scientists who provide the varieties for American farm production may find it worthwhile to devote a part of their energies and resources to developing sorts that will find an enthusiastic reception by these industries." Address: Prof., Univ. of Minnesota.

5049. *Oleagineux.* 1964. Industrie du soja [The soybean industry]. 19(1):41-42. Jan. [2 ref. Fre]
• ***Summary:*** Contents: Worldwide production of soybeans. Predictions for soybean exports. The need for research and the American Soybean Association. The effect of molybdium on soya. Soybean crushers and oil refiners in Canada. Market development in Germany by the Soybean Council of America. Denmark's purchase of soya. Soybean Council fair on Cyprus. Sales in Colombia. Sales in Japan. New uses. Address: Paris.

5050. Hayashi, Shizuka. 1964. Active JASI oil program. *Soybean Digest.* Feb. p. 22.
• ***Summary:*** JASI continues to use every tool at its disposal try to get the Japanese to consume more edible oils and fats–especially from soybeans. Address: Managing Director,

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Japanese American Soybean Inst., Nikkatsu International Building, No. 1, 1-Chome, Yuraku-cho, Chiyoda-ku, Tokyo, Japan.

5051. *Soybean Digest.* 1964. Nisshin builds soybean plant on deep harbor. Feb. p. 16.
• ***Summary:*** Nisshin Oil Mills, Ltd., of Tokyo, a major soybean processor, is building a soybean processing plant at Isoko in the coastal industrial zone of Yokohama. It is the first soybean processing plant to be built on a deep water harbor in Japan.

"The first stage of the plant, which has a processing capacity of 180,000 tons yearly and a storage capacity of 33,000 tons, was completed in November. Cost of the plant to date has been close to $1 million.

"The firm states that the Isoko plant is very convenient for the landing of cargo, since a 25,000-ton ocean going freighter can be unloaded from its berth. The plant is also advantageous for land transportation, being connected with the National Railways.

"Both extracting and refining equipment of the latest type is being installed including a Rotocel extractor and De Laval deoxidation equipment."

5052. *Guardian* (*England*). 1964. Company affairs: Hohnen-Lever. March 5. p. 14.
• ***Summary:*** "Negotiations for Unilever's joint project with the Hohnen Oil Co. of Japan, to manufacture and sell margarine and other edible fats, have been completed, and the inaugural meeting of Hohnen-Lever, in which the United Kingdom concern will have a 45 per cent stake, is expected to take place on March 26."

A factory with a capacity of 26,000 tons per year will be built at Shimizu, southwest of Tokyo; it is expected to start operating in Aug. 1965.

5053. Kawai, Kazuyuki; Nakamura, H.; Shigano, Y. Assignors to Dainippon Ink & Chemicals Inc. 1964. [Plasticizers]. *Japanese Patent* 2605. March 13. 4 p. Application filed 18 Dec. 1961. (Chem. Abst. 61:3265h). [Jap]*

5054. Akiya, Toshimi. 1964. [Studies on the characteristic and nutritive changes in oils during heating. IV. Decay of linoleic acid contents of soybean oils during heating]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 18. p. 84-87. March. [18 ref. Jap; eng]
• ***Summary:*** It was found that the linoleic acid content of soybean oil had fallen to only 40% of its original value after the oil had been heated at 30ºC for 6 hours, whereas the content was essentially the same as in the original soybean oil when the oil was heated at 200ºC for 6 hours. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5055. André, Émile; Hou, Kia-Wo. 1964. La lipoxydase. Sa découverte dans le résidu de la préparation du lait de soja [Lipoxidase. Its discovery in the residue by-product of soybean milk production]. *Oleagineux* 19(3):187-93. March. English-language summary, p. XXVII. [Fre; eng]
• ***Summary:*** "The cheese called *Teou-fou* in China is somewhat consumed in Paris and the region surrounding it, where the number of Chinese restaurants is greater than one could believe." Of the total restaurants in this area, about 35 are Chinese restaurants, 10 at Vietnamese, and only 5 are Japanese. They are visited both by people of those countries and by western consumers who are curious to taste exotic foods. "There were, and still are, two or three shops in and around Paris, where tofu (fromage de soja) is prepared daily and delivered to the restaurateurs who have ordered it. Mr. Kia-Wo Hou had friendly relations with one of the two established at Colombes and was able to easily procure the materials he needed."

Note: In about 1910 Li Yu-ying, a Chinese soyfoods pioneer, established a soyfoods manufacturing company named Usine de la Caséo-Sojaïne, at Vallées, near Colombes, outside of Paris. It is not clear how the current companies at Colombes are related to the earlier company. Address: 1. Conseil scientifique a l'R.H.O.; 2. Docteur es-Sciences de l'Universite de Paris.

5056. *Foreign Agriculture.* 1964. Big year for U.S. soybean promotion in Japan ends in record sales of U.S. soybeans in 1963. 2(12):9. March.
• ***Summary:*** The Japanese-American Soybean Institute (JASI), in 1963, pushed closer to its 20-pound goal for per capita consumption of edible oils in Japan. Consumption–now at 13 pounds per capita (of which about a third is soybeans oil)–has nearly doubled since 1956.

5057. Hutchison, George S. 1964. The soybean industry fifty years ago. *Soybean Digest.* March. p. 24-25.
• ***Summary:*** In 1915, while on a business trip to the Orient for his employer (Albert Dickinson Co., seed merchants), the author had an opportunity to observe the soybean crushing industry in Manchuria. "By the courtesy of Mr. Hatsumi Okura, Okura & Co., Tokyo, whom I met on the train traveling from Japan and up through Korea to Manchuria, I was permitted to go through the modern experimental extraction mill built by the South Manchurian Railroad at a cost of about $200,000, which had been put into operation about one year earlier. This mill used a Benzine extraction process developed in Germany and had a daily capacity of about 17 tons of oil and 100 tons of soybean meal. It was rated the fourth largest oil extraction plant in the world at that time. This was the first attempt to use the extraction method of processing soybeans in the Orient. Prior to that,

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practically all the processing was done by screw press.

"There were perhaps a dozen or more smaller soybean mills at Dairen. The Nisshin mill, operated by Okura & Co., used hydraulic presses but most of the others, operated by native Chinese, were of small capacity and used screw presses operated by manpower with capstan bars to rotate the screw."

He closes with a prediction of a bright future for "the Golden Bean." Photos show: (1) Mr. Hutchison riding in a rickshaw during his trip to Manchuria in 1915. (2) A portrait photo of George S. Hutchison. Address: Former director and treasurer, Albert Dickinson Co.

5058. Ito, Hiroshi; Ebine, Hideo; Kosaka, Shokichi. 1964. Shihan jôzô-yô nyûsan-kin no seijô [On the properties of lactic acid bacteria in commercially available starter for making miso and soy sauce]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 18. p. 28-35. March. [14 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5059. Ito, Hiroshi; Ebine, Hideo. 1964. Miso no nyûsan-kin no kenkyû. I. Miso no nyûsan-kin no bunri [Studies on lactic acid bacteria in miso. I. Isolation of lactic acid bacteria from miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 18. p. 1-8. March. [35 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5060. Ito, Hiroshi; Ebine, Hideo; Furusho, Shinji; Kosaka, Shokichi. 1964. Miso no nyûsan-kin no kenkyû. II. Miso no nyûsan-kin no bunpu [Studies on lactic acid bacteria in miso. II. Investigation of their distribution on various types of miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 18. p. 9-13. March. [10 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5061. Ito, Hiroshi; Ebine, Hideo. 1964. Miso no nyûsan-kin no kenkyû. III. Enterococcus Group no kin ni tsuite [Studies on lactic acid bacteria in miso. III. On the enterococcus group]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 18. p. 14-22. March. [39 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5062. Ito, Hiroshi; Ebine, Hideo. 1964. [On the hardness of miso as estimated by a jelly tester]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 18. p. 43-45. March. [7 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5063. Kamada, Hideomoto; Ebine, Hideo; Nakano, Masahiro. 1964. Daizu seihin no chakushoku ni kansuru kenkyû. XIV. [Browning reaction of soybean products. XIV. Browning of soaked soybeans by autoclaving (3)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 18. p. 142-48. March. [9 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* 10(2):48-52 (1963). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5064. Kamada, Hideomoto; Ebine, Hideo; Nakano, Masahiro. 1964. Daizu seihin no chakushoku ni kansuru kenkyû. XV. [Browning reaction of soybean products. XV. Browning of soaked soybeans by autoclaving (4)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 18. p. 149-53. March. [3 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* 10(2):53-56 (1963). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5065. Kamada, Hideomoto; Ebine, Hideo; Nakano, Masahiro. 1964. Daizu seihin no chakushoku ni kansuru kenkyû. XVI. [Browning reaction of soybean products. XVI. Browning of bottled soy sauce during storage]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 18. p. 154-57. March. [8 ref. Jap; eng]
• ***Summary:*** The color of pasteurized soy sauce was relatively stable compared with that of raw (unpasteurized) soy sauce, and it was protected from browning at 38ºC for 1 month by bottling and storing in an oxygen-free environment.

Bottled soy sauce can be prevented from browning by storing it at a temperature below 20ºC [68ºF, or by refrigerating it].

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* 10(3):99-101 (1963). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5066. Matsuura, Shinji; Ito, H.; Ohta, T.; Nakano, M. 1964. Tane kôji yô mokuhai no muki seibun ni tsuite [Inorganic components of tree ashes used in the manufacture of "tane-koji" (koji starter)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 18. p. 64-66. March. [6 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5067. Nakano, Masahiro; Ohta, Teruo. 1964. Shihan miso yô tane kôji no kinkabu ni kansuru kenkyû [On the strains of commercially available "tane-koji" (koji starter) for making miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the*

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Food Research Institute) No. 18. p. 60-63. March. [Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5068. National Food Research Institute (Shokuryo Kenkyujo). 1964. Daizu tanpakushitsu shokuhin no bussei [Physical characteristics of soy protein foods]. *Shokuryo: Sono Kagaku to Gijutsu* (*Food: Its Science and Technology*) No. 7. p. 55-65. March. [Jap]
• ***Summary:*** Discusses soymilk, tofu, aburage, soy protein gel and curd, Gelsoy, isolated soy protein (bunri tanpaku). Address: Tokyo.

5069. Ohta, Teruo; Ebine, H.; Nakano, M. 1964. Tenpe (tempeh) ni kansuru kenkyû. I. Indonesia-san tenpe funmatsu no hinshitsu to seijô ni tsuite [Study on tempeh. I. On the property of tempeh powder made in Indonesia]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 18. p. 67-69. March. [4 ref. Jap; eng]
• ***Summary:*** Soybeans were fermented with *Rhizopus oryzae* for 60 hours at 30ºC, then vacuum dried and ground to a powder. The solubility of protein and the rate of amino-nitrogen to total-nitrogen were 20% and 2% respectively, indicating that protein hydrolysis slightly exceeded that of koji-beans, but was far less than that of natto.

Peroxide value of fat and oil in tempeh stored for 3 months at room temperature was only 1.3 M.E./kg, whereas that of cooked and dried soybean powder and that of natto powder stored under the same conditions were 71 M.E./kg and 38 M.E./kg respectively. This fact shows that tempeh has antioxidative property comparable to that of miso. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5070. Ohta, Teruo; Ebine, Hideo; Nakano, Masahiro; Hieda, Harukyo; Sasaki, Hirokuni. 1964. Nattô-kin o riyô suru daizu hakkô shokuhin ni kansuru kenkyû. I. Seizô jôken ni kansuru kisoteki kenkyû [Manufacturing new-type fermented soybean food product employing *Bacillus natto.* I. Investigation of the production on a laboratory scale]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 18. p. 46-52. March. [9 ref. Jap; eng]
• ***Summary:*** A description of the process and an indication of its acceptability. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5071. Ohta, Teruo; Ebine, H.; Nakano, M.; Hieda, H.; Sasaki, H. 1964. Nattô-kin o riyô suru daizu hakkô shokuhin ni kansuru kenkyû. II. Chûkan seizô shiken to niji kakôhin no shikô chôsa [Manufacturing new-type fermented soybean food product employing *Bacillus natto.* II. Manufacturing at a pilot plant and investigation of the acceptability of second generation products]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 18. p. 53-59. March. [2 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5072. *Foreign Agriculture.* 1964. U.S. soybean industry is invited to participate in Tokyo trade center soybean show in August. 2(14):10. April 6.
• ***Summary:*** "The U.S. Department of Agriculture has invited industry participation in a soybean exhibit to be held at the U.S. Trade Center in Tokyo, Japan, Aug. 24 to Sept. 11 under the foreign market development program.

"The American Soybean Association will cooperate with USDA's Foreign Agricultural Service in sponsoring the exhibit, which will include a seminar covering all aspects of soybean usage in Japan, with papers to be presented by U.S. soybean industry representatives. The Association with FAS carries on market development work in Japan through the Japanese-American Soybean Institute.

"Exhibit space at the Center during the show will be available without charge to U.S. firms interested in the Japanese market for soybeans and soybean products. The exhibitor will provide all materials and personnel for its booth and will make customs arrangements for shipping samples of its product and other exhibit materials into Japan."

5073. Suehiro, Kensuke; Ishizaki, I. Assignors to Noguchi Research Foundation. 1964. [Refining sulfur]. *Japanese Patent* 4719. April 16. Application filed 12 Feb. 1957. 2 p. (Chem. Abst. 61:6656b). [Jap]*

5074. Hayashi, Shizuka. 1964. Tests favor U.S. soy meal. *Soybean Digest.* April. p. 30.
• ***Summary:*** "Production of mixed feeds in Japan has shown a rapid increase during recent years. In 1959 production was 1,853,000 metric tons, which increased to 5,700,000 metric tons in 1963. The growth of the livestock industry, especially that of poultry, has of course contributed to this increased consumption of feeds.

A wide table shows growth in livestock numbers in Japan from 1958 to 1963. Chickens grew from 50.2 million to 92 million. Dairy cattle increased 654,000 to 1.14 million. Draft cattle decreased from 2.46 million to 2.33 million (as they were replaced by machines). Horses likewise decreased 762,000 to 471,000. Hogs increased 1.65 million to 3.27 million.

Tests in Japan showed that soybean meal was the best protein source to use in mixed feed raise livestock profitably. Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building, No. 1, 1-Chome, Yuraku-cho, Chiyoda-ku, Tokyo, Japan.

5075. *Foreign Agriculture.* 1964. Speakers announced for upcoming U.S. soybean seminar in Tokyo. 2(21):10. May 25.

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• ***Summary:*** "Five leading U.S. specialists in livestock and human nutrition will be the keynote speakers at the U.S. soybean seminar to be held at the Tokyo Trade Center, August 24 to September 4. The seminar will run concurrently with a 19-day soybean exhibit to open August 24, both of which will be sponsored by the American Soybean Association in cooperation with the Foreign Agricultural Service."

The five U.S. speakers, their affiliations, and their topics to be presented at the seminar are listed. "A special attraction will be demonstrations on the uses of soy products in human foods, to be presented September 7-11 by Mrs. Dorothea Van Gundy Jones, nutritionist of Loma Linda Foods, Riverside, California."

5076. Abe, Kumazo. 1964. Outlook for fewer tofu producers, more production. *Soybean Digest.* May. p. 48.
• ***Summary:*** "It is commonly believed that about 300,000 tons of soybeans are consumed yearly by the tofu industry in Japan. This consumption may be analyzed as follows according to the statistics announced by the Food Agency: In 1961 actual consumption of soybeans and soybean meal for production of tofu was recorded respectively at 271,100 tons and 30,000 tons, and consumption during 1962 was recorded respectively at 269,700 tons and 30,000 tons, or a slight decrease. But consumption in 1963 was estimated to total 285,100 tons of soybeans and 65,000 tons of soybean meal, indicating a considerable increase. Consumption in 1964 is expected to increase to 287,700 tons of soybeans and 70,000 tons of soybean meal.

"In terms of purely soybeans, the share of tofu in the consumption for food uses, which includes miso and shoyu, is about 60%. Of this consumption, about 10% is said to be Japanese soybeans and the remainder consists of imported soybeans, chiefly from the United States.

"Soybeans are mostly purchased by tofu producers from local grain dealers, but there are many cases of joint purchase by the Japan Tofu Association through trading firms on port of landing basis. There are also cases where the Prefectural Tofu Association makes purchase of about one-third of its yearly requirement on a long-term contract with the importing firm.

"It is commonly believed that there are about 50,000 tofu producers in the country, but their number changes from year to year according to the annual license statistics announced by the Welfare Ministry. They totaled 51,600 in 1960, but they were below 50,000 as of the end of June 1963.

"In Tokyo, tofu producers have increased by more than 200 as compared with 1959 due to population growth. But in Kagoshima there are 450 producers less than in 1959.

"Tofu producers are of such small scale that they have been considered as representative of small enterprises since olden times. A producer having four or five employees may be in the best class. But the scale of business has a tendency to become larger gradually as is shown from the decrease in the number of producers and the increase in consumption of tofu. Amalgamation has been taking place in various areas. Equipment is being mechanized and factories are adopting automation.

"On the other hand, production of bagged tofu increases year by year. Influential tofu producers in many areas have started its production, and enterprises in the other fields have also fixed eyes on its production and started." Address: President, Japan Tofu and Arburaage Assoc.

5077. Adachi, Tahei; Kamiya, H.; Kosuge, Takuo. 1964. Kosôkin no taishasan-butsu ni tsuite. II. Bacillus nattô ni yoru tetramethylpyrazine no seisei [Studies on the metabolic products of *Bacillus subtilis.* II. The production of tetramethylpyrazine by natto]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) 84(5):451-52. May. [2 ref. Jap; eng]
• ***Summary:*** Tetramethylpyrazine was isolated and identified. "This compound was assumed to be responsible for the odor of natto." Address: 1. Shizuoka Factory of Yakult Co.; 2. Shizuoka College of Pharmacy. Both: Shizuoka city, Shizuoka prefecture, Japan.

5078. Circle, S.J.; Meyer, E.W. 1964. Soy isolated protein and partially isolated protein: Production and properties. Presented at International Symposium on Oilseed Proteins. Held May 10-15 at Fuji National Park, Japan. *

5079. Hayashi, Shizuka. 1964. Japan will require more [soy] oil, meal and soy flour. *Soybean Digest.* May. p. 42-43.
• ***Summary:*** "Increase of soybeans into Japan have increased steadily since the U.S. market development program was started with the opening of the Japanese American Soybean Institute's office in Tokyo in 1956."

A table shows imports of soybeans into Japan from 1956 (Jan. to Dec) to 1963. Imports of U.S. soybeans in 1956 were 536,055 metric tons (tonnes), worth $61,955,000. By 1963 they had increased to 1,314,303 tonnes worth $143,748,369.

During this same time period imports of soybeans from China had decreased from 165,859 tonnes in 1956 to zero tonnes in 1959, then increasing to 226,644 tonnes in 1963.

"Of all commodities Japan imported from the USA, the soybean ranked No. 1 in 1963. It topped scrap iron and cotton. The total net increase since 1956 up to 1963 amounts to $286 million.

"Let us first study how soybeans are utilized in Japan. By now it has become well known, I am sure, that there is no country in the world where the soybean is utilized in as many diferent styles of foods as it is in Japan. The most popularly known and manufactured in commercial quantity are tofu, miso, soy sauce, frozen tofu, natto, kinako, and soybean oil. The production and the quantity of soybeans used in each of

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these foods are as shown at top page 43.

"These soybean foods supply the two major nutrients protein and oil in the amount of 9.2 grams and 7.5 grams respectively per capita a day, which constituted 11% and 24% respectively of the total daily intake in 1962.

"What would happen to the Japanese diets if there were no supply of soybeans? The present per capita consumption of fats and oils and protein of 31 grams and 70 grams respectively would be considerably reduced to a level that would seriously cripple the food structure (*Soybean Digest* January 1963).

"The largest percentage of imported soybeans is consumed for oil crushing which takes approximately 65%. There are about 1,030 crushers in Japan but those which crush soybeans are limited to only about 25 including eight larger companies which process about 80% of the total crushed.

"The oil is used almost 100% for edible purposes. The meal is used for production of soy sauce, which takes the largest percentage; and for miso and tofu which use a smaller quantity. About 60% of the meal produced goes to the feed industry.

"In addition to the above traditional soybean foods, a more recent product is soy flour which is fast gaining popularity for various uses such as in bread, noodles, confections, ice cream, sausage, curry sauce and even in preparation of daily meals. It is well worth emphasizing that the noodle manufacturers association, comprising more than 8,000 members throughout Japan, has started a nationwide program with JASI's support to recommend that all its members use 5% to 10% soy flour to enrich wheat noodles which consume approximately 1 million tons of wheat flour annually. From both the nutritional and money-making standpoints many manufacturers have determined to use soy flour because they have discovered it offers definite advantages. The long traditional habit of a 100%-white-wheat-flour noodle has thus been broken under the pressure of the necessity to catch up with the changing world. All soybean products so far cited are for human foods."
Address: Japanese-American Soybean Inst., 410 Nikkatsu International Building, Yurakucho 1-1, Chiyoda-ku, Tokyo.

5080. Kamiya, Hiroko; Adachi, T.; Kosuge, T. 1964. Kosô-kin no taishasan-butsu ni tsuite. I. Tetramethylpyrazine no buri oyobi kakunin [Studies on the metabolic products of *Bacillus subtilis.* I. Isolation and identification of tetramethylpyrazine]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) 84(5):448-51. May. [4 ref. Jap; eng]
Address: 1, 3. Shizuoka College of Pharmacy; 2. Shizuoka Factory of Yakult Co. Both: Shizuoka city, Shizuoka prefecture, Japan.

5081. Kihara, Yoshijiro; Nanba, Rimiko. 1964. Nattô no seibun ni tsuite. II. Nattô no origosakkaraido ni tsuite [Chemical constituents of natto. II. Oligosaccharides in natto]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 38(5):257-61. May. (Chem. Abst. 62:14983). [16 ref. Jap]
Address: Lab. of Food Chemistry, Faculty of Home Economics, Ochanomizu Univ., Tokyo, Japan.

5082. Komiya, Akira. 1964. The shoyu industry in Japan. *Soybean Digest.* May. p. 43-44.
• ***Summary:*** Table 1 (which does not include data from farm villages) shows the average yearly expenses for seasonings per household in Japan: 1. Refined sugar 19.7% of total expenses. 2. Shoyu 18.3%. 3. Miso 14.3%. 4. Luxury items 13.1%. 5. Edible oils 9.4%. 10. Margarine 2.3%. 11. Salt 2.0%.

Table 2 shows the quantity and value of shoyu produced in Japan from 1958 to 1962 (according to 3 different sets of data). According to the Japan Shoyu Association, the amount has increased from 1,117,800 kl in 1958 to 1,160,750 kl in 1962, an increase of 4%.

Shoyu has been used daily as a seasoning in Japanese for 800 years [i.e. since about 1164]. Five reasons are given to explain why it is "now becoming a daily necessity." Foreigners like to use shoyu for barbecue and Sukiyaki.
Address: Managing Director, Japan Shoyu Assoc.

5083. Lo, K.S. 1964. Pioneering soy milk in Southeast Asia. *Soybean Digest.* May. p. 18, 20.
• ***Summary:*** "In 1962 we sold 2,500,000 cases of Vitasoy... Vitasoy has become the largest single seller in the local soft drink market. And this is no small achievement, when we are competing with such internationally known brands as Coca Cola, Pepsi Cola and Seven Up. We have certainly come a long way since we first got started in 1940 with a small setup to make 'milk' out of the soybean. How I came about it was quite an accident. I happened to be in Shanghai in 1937 and attended a talk given by the late Julian Arnold who was then commercial attache to the American Embassy in Nanking. He called soybean the 'Cow of China' and practically attributed to it the preservation of the Chinese race... I was very impressed by his talk and came away with soybean stuck in my mind. I soon returned to Hong Kong and decided to do some experiments in making a formulated soybean milk which could serve as a milk substitute. A few friends took an interest in my work, and a private limited company with a paidup capital of HK$15,000 was formed to put the product on the market. The small factory with its crude equipment was formally opened in March 1940 by the then director of medical services, Dr. Selwyn-Clarke. In my opening speech, I said that the aim and object of this new venture was to bring better nutrition to the masses of people at the price they could afford to pay. This has ever since remained the policy of our company. To this day the retail

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price of our Vitasoy is less than one-third the price of cow's milk.

"The first couple of years were extremely difficult. We soon found that, even among us Chinese to whom the soybean was by no means new, there was a strong prejudice against soy milk. They not only did not believe its nutritional values, but thought it could cause diarrhea, indigestion and stomach ache. At that stage the taste of our product, too, left much to be desired. Many consumers found it hard to take, because of the strong beany flavor and the slightly bitter taste. Another problem we had to face was the keeping quality of the soy milk. We followed the dairy industry by packing it in standard half-pint milk bottles and sealed them with paper cap and hood. They spoiled even quicker than milk unless they were kept under refrigeration all the time."

"Hurt by public prejudice and lack of marketing know-how, the business soon became a failure. When the Pacific War broke out in December 1942, the company had not only lost all its money, but also owed a large sum to me personally because I had to put up the money in order to keep it going. After the Japanese took over Hong Kong, they also took over our small factory and everything inside it. I left the Colony for Free China and remained there until the war was over.

"I returned to Hong Kong after the war was over, and my first task was to get Vitasoy back on the market. I was happy to find most of the equipment was left intact in the factory and by November 1945 Vitasoy [which was named Sunspot Soya Milk at the time] was on sale again. This time I decided to push my product to the small people in the street and to market it as a beverage rather than a milk substitute."

In 1953 the original milk bottle with a paper cap and hood was changed to a soft drink bottle with a metal crown cap. After sterilization by heat, it could be kept for months without refrigeration. "This technical breakthrough gave the biggest impetus to the increase in sales volume."

"Soft drink sales in Hong Kong are very seasonal, with 80% of the volume during the 6 summer months and the remaining 20% spread out from November to April. So we set to work on a heater which will keep Vitasoy hot during the cold weather. Its function will be just the opposite of an electric beverage cooler. After some initial failures we finally came out with a heater which has a capacity of heating up to 4 cases of Vitasoy at a time and always maintains a temperature of 145ºF. So at any time during the winter a customer can walk up to a store and ask for a bottle of hot Vitasoy which will take away the chill, and yet not hot enough to burn his lips... With the help of the heaters, we are able to maintain 50% of our peak summer sales through the winter months. Hot Vitasoy stands out uniquely among the soft drinks, because there is no other soft drink which one can drink hot!"

In 1963 the company built a new plant in Kowloon with twice the production capacity of the old original plant in Hong Kong. Today, Vitasoy is consumed by 250,000 people daily.

"The influence of our work does not stop within the bounds of this little island. We helped UNICEF train technicians to operate a soybean milk powder plant in Indonesia. In Singapore, Malaya and Thailand, private enterprise started soybean milk plants after having seen our success in Hong Kong."

Photos show: (1) K.S. Lo. (2) Part of the crowd standing in line at the Vitasoy plant in Kowloon. Address: Hong Kong Soya Bean Products Co., Ltd.

5084. *Soybean Digest.* 1964. Nisshin plant is one of world's most modern. May. p. 10.

• ***Summary:*** "With the completion of its soybean processing and oil refining plant at Isoko in November, Nisshin Oil Mills now claims the largest processing capacity in Japan, and one of the most modern plants.

"The Isoko plant is also the first in Japan equipped to produce toasted soybean meal, and 80% of its production is now toasted.

"Nisshin's total processing capacity is about 320,000 metric tons a year. In addition to the Isoko plant with a capacity of about 11,000 tons monthly, Nisshin has a plant at Kanagawa with a similar capacity, one at Kobe with 5,000 tons capacity, and one at Osaka with 2,500 tons capacity.

"Construction was begun on the Isoko plant in April 1962 and completed last November. Nisshin is now processing about 6,000 tons of soybeans and 5,000 tons of cottonseed monthly.

"The extraction plant is a Blaw-Knox Rotocel continuous extraction unit with desolventizing toaster. Refining equipment is De Laval with continuous decoloring and deodorizing equipment. Nisshin has storage capacity for 33,000 metric tons of soybeans at Isoko. The firm also has its own wharf which will accommodate 25,000-ton ocean-going freighters.

"Nisshin produces untoasted meal for miso and soy sauce in addition to the toasted meal.

"The firm also produces quality salad oil at Isoko. Its automatic filling and packing equipment has a capacity of 1,800 400-gram bottles and 7,200 cans an hour.

Photos show: (1) At Isoko plant of Nisshin Oil Mills (left to right): Howard E. Grow, assistant to the executive vice president, American Soybean Association, Hudson, Iowa; Joseph C. Dodson, U.S. agricultural attache, Tokyo; and Yukio Sakaguchi, president, Nisshin. (2) Nisshin plant at Isoko, showing big storage elevators. In foreground are (left to right) Hayashi, managing director of the Japanese American Soybean Institute; Mr. Dodson; and Mr. Sakaguchi. (3) Interior of Nisshin plant. Left to right: Mr. Hayashi, Mr. Dodson. (4) English ship SS Hopepeak unloads at Nisshin's Isoko plant.

5085. Suzuki, Kyoji. 1964. Japanese oil manufacturing

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industry. *Soybean Digest.* May. p. 45.

• ***Summary:*** "1. Past Development. In Japan the processing of oilseeds has been going on since very olden times. In about the 10th century extraction of oil chiefly from perilla and sesame was started and in the 17th century extraction from rapeseed and cottonseed was started full scale. It was, however, in the beginning of the 20th century that the Japanese oil industry was firmly established as a modern industry.

"When Japan founded the South Manchurian Railway Co. in Dairen, Manchuria, in 1907, a laboratory devoted to the study of utilization of Manchurian soybeans, an internationally known specialty crop, was established within the Central Research Institute attached to the company. The laboratory adopted the benzine extraction method developed in Germany, and a pilot plant was set up for the first time in Dairen in 1910.

"In the 1920's oil mills, each with an annual processing capacity at the 100,000-ton level, were established in rapid succession for production of soybean oil. These mills exported vegetable oils in considerable quantities in the first third of the 20th century. Their exports totaled 82,883 tons in 1935, 83,407 tons in 1936, and 58,953 tons in 1937. It is especially noteworthy that in those days the United States purchased vegetable oils from Japan. About 59,000 tons were exported to that country in 1935, as many as about 70,000 tons exported in 1936 and about 40,000 tons shipped in 1937, though the United States is at present the world's largest exporting country of vegetable oils and oil-bearing materials.

2. Present Condition. As Japan has a land which is climatically unsuitable for growth of some kinds of oil-bearing crops, sufficient yields cannot be obtained except for rapeseed. Most of the required oil-bearing materials must be imported from abroad. Moreover, Japanese oil mills which were mostly ruined in World War II had to pass about 10 years of difficulties due to the work of restoration and an insufficient supply of raw materials. However, in proportion to the steady increase in the supply of raw materials, improvement of equipment and production techniques has progressed rapidly in such a way that crushing of oilseeds totaled 2,280,604 metric tons in 1963. This shows an increase of 18% over 1962 which recorded 1,930,617 metric tons and reached about double prewar crushing. Of the oilseeds crushed during 1963, domestic crops totaled 355,665 tons and the remaining 1,924,939 tons were imports, which included 1,185,410 tons of soybeans.

"Japan's imports of soybeans totaling 1,185,410 tons during 1963 included Chinese soybeans for food uses (chiefly for production of miso and tofu). At present soybeans for oil extraction are almost entirely imported from the United States. About 200,000 tons of domestic soybeans are in the market, but they cannot be used for oil extraction because of their low oil content.

"3. Problems in the Japanese Crushing Industry. One of the biggest problems confronting the developing Japanese oil industry is the complete liberalization of manufactured oils and fats imports. In preparation for Japan's transition on April 1, 1964, as an Article 8 nation in IMF [International Monetary Fund], the Japanese government has so far gradually expanded the list of liberalized goods, also liberalizing a few manufactured oils and fats several times. The government is now studying liberalization of soybean oil and about 10 other commodities which are still remaining. As stated before, Japanese oil mills cover about 80% of their raw materials by imports.

"For protection of domestic soybeans an import duty of 13% or 4,800 yen per ton is imposed on imported soybeans which are large in quantity and occupy the biggest share in the raw materials of oil mills. It is very unreasonable to liberalize manufactured oils and fats when a high duty is imposed on raw oilstuffs in addition to the disadvantageous situation of Japan as an importing country. So Japanese processors have given detailed explanations to the government clarifying their situation, and the government understanding this point is now taking a policy to liberalize soybean oil and other soybean products after abolishing the duty on soybeans.

"4. Outlook for the Future. We desire that the crushing industries in all countries of the world will develop by refining their techniques and rationalizing their management. We should try to develop our industry on a fair-play basis by repealing the government's unreasonable tariff policy, by overcoming any disadvantage which may be imposed on Japan as an importing country by countries producing the raw material.

"Oil intake by the Japanese people has been very low since olden times because of their diets based on rice. In spite of its remarkable increase in recent years, oil intake is still at a lower level than the American and European diets, but it is expected to increase hereafter little by little as diets improve. Future demands for oils and fats in Japan are expected to maintain a fairly high rate of expansion in parallel with the increased demand for protein meals resulting from development of the livestock industry.

"In order to meet such increased demands, equipment of Japanese post-war oil mills has been all modernized attaining a processing potential to more than satisfy domestic requirements. Therefore, imports of raw materials will increase year by year. There is absolutely no need for Japan to import end products such as oils and meals. We would like to make clear that the half-century-old Japanese oil industry will more and more need increased imports of various oil-bearing materials but no imports of processed goods."

Note. This is the earliest English-language document seen (Jan. 2014) that mentions the Japan Oilseed Processors Association. Address: President, Japan Oilseed Processors Assoc.

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5086. Yokotsuka, Tamotsu. 1964. Shoyu. Paper presented at International Symposium on Oilseed Protein Foods, Institute of Food Technologists, USA. See p. 31-48. Held 11-15 May 1964 at Lake Yamanaka, Japan.

• ***Summary:*** Contents: General situation of shoyu in the Orient with emphasis on Japan: The 3 types of shoyu now available in Japan (*koikuchi, usukuchi, and tamari;* about 90% of Japanese shoyu is of the koikuchi type, whose color is between that usukuchi [light] and tamari [dark]).

Note: This is the earliest English-language document seen (April 2012) that contains the word *koikuchi* (it refers to the type of shoyu / soy sauce most widely used in Japan) or the word *usukuchi* (it refers to light-colored shoyu made and used mostly in the Kyoto-Osaka area).

Government regulation of the quality of shoyu in Japan. History of shoyu in the Orient. Development of technology and research in recent years, and problems for the future: Utilization ratio of the total nitrogen, use of defatted soybeans instead of whole ones, reduction of fermentation period, technical aspects (growing koji 50 cm deep without the use of small wooden trays, reducing the two major production costs of growing koji and pressing the mash, pressing once with great pressure for a long time to avoid water washing which causes oxidation), three keys to shoyu production (culturing the mold, stirring the mash, and pasteurization), academic research on microbes in and flavorous compounds of shoyu problems for the future.

The total production of shoyu in Japan is about one million kiloliters, and per capita consumption is about 10 liters/year; this has been decreasing. Japanese get about 50% of their daily salt intake from shoyu, plus about 2 grams of protein. There are more than 5,000 commercial shoyu manufacturers in Japan. They produce about 95% of all Japanese shoyu; the remaining 5% is produced by farmers in the countryside. The biggest manufacturer's market share [Kikkoman's] is about 20%. About 50% of the total output is produced by 35 factories. As is the case with many industries, there has been a growing concentration of shoyu production among the larger companies.

It takes one year or more to finish shoyu fermentation at the natural (ambient) temperature. One-year mash [moromi] has the best flavor, two-year mash has the best taste, and three-year mash has the best color. Up until World War II, these three kinds of mash were blended to produce the highest grade shoyu.

The by-products of the shoyu industry are soy cake and soy oil [shoyu cake and shoyu oil]. Soy cake usually contains about 3.5% of total nitrogen and about 10% of carbohydrate; it is used chiefly for animal feeds. The oil layer, which rises to the top of shoyu, is ethylesters of higher fatty acids, including 30 to 40 free fatty acids. It is removed before pasteurization and utilized for cutting oil, as a raw material in lower grades of soap, as a source of linoleic acid, etc.

The glycerol content of shoyu produced from whole soybeans and wheat is about 1.0 to 1.2%, while that of shoyu produced from defatted soybeans and wheat is about 0.3 to 0.5%.

In Japan, shoyu is sold in two types and sizes of containers: wooden kegs (72 liters and 18 liters), and glass bottles (2 liters, 1.8 liters, and 1 liter). The most popular of these in Japan is the 2 liter glass bottle, which presently costs 100 to 250 yen.

All shoyu exported from Japan has been regulated by government law since 1950. The inspection consists of both organoleptic and analytical tests involving baumé, sodium chloride content, extract, and total nitrogen. Wartime circumstances gave rise to very diluted shoyu which still contained 18% salt, but got its dark brown color from caramel and had a nitrogen content of only 0.1 to 0.2%. These circumstances also led to the chemical hydrolysis of oilseed protein such as defatted soybean meal, copra meal, peanut meal, and sometimes cottonseed meal in order to get shoyu-like substances. MSG manufacturers were chemically hydrolyzing soybean and wheat protein. They succeeded in refining and processing the mother liquor of glutamic acid [HVP] to be used as a very inexpensive way of increasing the quantity of shoyu. Even today this accounts for about 30% of Japanese shoyu.

All of these circumstances delayed the restoration of the quality of Japanese shoyu for a long time after World War II. In 1963 new quality standards were implemented by the Japanese government, supported by the Japanese Shoyu Association and many technicians. The law of the Netherlands forbids the use of the name "soy sauce" for all products except those made from soybeans by fermentation, and with a nitrogen content more than a certain amount. This law excludes most Japanese soy sauce, and Japanese shoyu makers would like to see the law changed.

History: The word shoyu first appeared in Japan in 1596, and in China in 1618, as far as is known in Japan. "Years ago several kinds of beans and corn were used as raw materials; nowadays, however, only soybeans and wheat are used in Japan." Soybeans were first introduced into Europe in 1723 by Thunberg, later president of Upsalla University. In 1723, the population of Tokyo was one million and there were nine associations of shoyu makers in Japan, including the Noda association, which consisted of 19 manufacturers.

Export history: "Japanese shoyu was exported to European countries by the Dutch about 300 years ago. According to old records shoyu was presented to Louis XIV, and it was kept as a secret ingredient by the cooks of the court; the same period when coffee from Ethiopia was first brought to him." For 200 years after that time, export of shoyu was not widely permitted by the Japanese government. Meanwhile Chinese soy sauce became popular all over the world. Though the export of Japanese shoyu was reopened in the Meiji period (1868-1912), the market share of Japanese

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shoyu worldwide is still very small. Only about 0.2% of the shoyu made in Japan is presently exported, but the amount is increasing year after year. Note: This is the second earliest document seen stating that Louis XIV used shoyu; the first was by Obata (1959). However Obata admitted in 1983 that his statement was pure speculation, with no document to support it.

Defatted soybeans: "The advantages of the use of defatted soybeans are lower cost per unit weight of nitrogen and the reduction of fermentation period. The period to get the highest content of glutamic acid in mash is 10 to 12 months for defatted soybean mash, while it is 18 months for whole-soybean mash at one natural temperature. The disadvantages of defatted soybeans are inferior stability of the final product with respect to oxidation and heating, lower glycerol content and higher acidity, and a little difficulty in alcoholic fermentation. This higher acidity is caused by higher lactic acid content.

To reduce the fermentation period: Use defatted soybeans, treat the soybeans adequately, make koji with high enzymatic activity, and warm the mash. Several years ago a warming temperature of 40ºC (104ºF) was used, but nowadays there is a trend toward the use of lower warming temperatures (30-35ºC maximum) in order to avoid inferior odor and a decrease in the amino acid content. A lower temperature during the beginning stage of fermentation is widely believed to be preferable to promote high nitrogen yield, especially higher content of glutamic acid, and to promote alcoholic fermentation.

Since ancient times the 3 most difficult processes have been culturing the mold, stirring the mash, and pasteurization. The various functions of pasteurization are examined. During and after World War II, when the quality of shoyu declined sharply, and it was easily damaged by filmforming surface yeasts, the pasteurization temperature was raised to more than 80ºC and butyl-para-hydroxybenzoate, an artificial preservative approved by the government, was added. Nowadays, however, since the quality has been restored, this pasteurization temperature cannot be lowered, because consumers are accustomed to the flavor from the higher temperature.

Future problems: Concentration and dehydration of shoyu, more economical containers, new methods of pressing the mash for higher efficiency, further reduction of the fermentation period, export of shoyu, development of highly processed secondary products, etc. Address: Noda Shoyu Co., Ltd.

5087. Hayashi, Shizuka. 1964. Some renewal of Japan-China soybean trade. *Soybean Digest.* June. p. 26.
• ***Summary:*** In 1963 Japan's imports of soybeans from China reached a record high, as shown in a table. The rest of the article explains the reasons for these fluctuations. Address: Japanese-American Soybean Inst., Tokyo.

	Chinese soybeans		U. S. soybeans
	Imported quantity M/T	Unit price (CIF M/T) $	Unit price (CIF M/T) $
Jan.-Dec.			
1956	165,859	124	116
1957	199,664	119	115
1958	89,197	100	99
1959	0		95
1960	147	133	94
1961	42,490	118	111
1962	165,020	100	103
1963	226,644	105	109

5088. Kawashima, Masao. 1964. Kôri-dôfu no seizô to gijutsu [Production and technology of dried-frozen tofu]. *Shokuhin Kogyo* (*Food Industry*) 7(16):52-57. [Jap]
• ***Summary:*** This article is part of a special series titled "Production of new food and its equipment." Address: Habutae Tofu K.K., Kikaku, Kagaku Kenkyu-shitsu, Kanazawa-shi, Ishikawa-ken 921, Japan.

5089. Norin Suisan-sho, Nosan Engei Kyoku, Hatasaku Shinko-ka. 1964. Daizu ni kansuru shiryo [Statistics concerning soybeans]. Tokyo, Japan. 26 cm. [Jap]
• ***Summary:*** This yearly report, published by Japan's Ministry of Agriculture, Forestry, and Fisheries (MAFF), is packed with detailed statistics on soybean production, trade, and utilization in Japan. Address: Tokyo, Japan.

5090. *Soybean Digest.* 1964. China promotes soybean trade in Japan. July. p. 29.
• ***Summary:*** "For the first time since 1955, Mainland China is holding trade fairs in Japan to promote soybeans and other farm products." Chinese soybeans have a lower oil content than American soybeans, and sell for about $10/ton less. Through this year in Japan, they have been used mostly in the production of miso.

5091. *Soybean Digest.* 1964. Dr. [Hiroshi] Nakamura joins Hohnen Oil Co., Ltd, in Tokyo. July. p. 26.
• ***Summary:*** Hiroshi Nakamura, who received his Ph.D. in the department of agricultural economics at the University of Illinois, Urbana, Illinois, in 1963, was made manager of the Hohnen Oil Co., Ltd., Tokyo, effective April 1. Dr. Nakamura is a former Hohnen employee.

"His thesis at the University of Illinois was entitled, 'Structure of the Soybean Processing Industry in the United States.' It is expected that a bulletin reporting the results of his thesis Work will be published by the Illinois Agricultural Experiment Station.

After receipt of his doctorate, Dr. Nakamura completed a research study at the University of Illinois in the department of agricultural economics with Professors T.A. Hieronymus

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and C.G. Judge, and published the results of the research in AERR-67, 'Inter- regional Analyses of the Soybean Sector.'

"During the early months of this year Dr. Nakamura was engaged in University of Illinois research in Japan studying the economic development of that country with Professors T.A. Hieronymus and G.K. Brinegar.

"Dr. Nakamura's responsibilities with Hohnen will include handling foreign aspects of the company's business, and organizing research pertaining to marketing activities of the company.

"Hohnen has soybean processing plants at Shimizu, Nishinomiya, and Sakaide, and an edible fats and oils plant jointly with Unilever in Shimizu."

A small photo shows Dr. Nakamura (left) standing with M. Sugiyama Hohnen managing director.

5092. Asahi Kasei Kogyo Company. 1964. [Soybean protein beverage]. *Japanese Patent* 16,324. Aug. 11. English-language summary in Soybean Digest, Feb. 1966, p. 52. [Jap]*

• ***Summary:*** Uses defatted soybean meal. Address: Osaka, Japan.

5093. György, Paul; Murata, K.; Ikehata, H. 1964. Antioxidants isolated from fermented soybeans (tempeh). *Nature* (*London*) 203(4947):870-72. Aug. 22. [10 ref]

• ***Summary:*** The isoflavone 6,7,4'-trihydroxyisoflavone was found in tempeh and the authors believe this highly active substance is probably a normal constituent of soybeans. [Note: This isoflavone was later shown to be a product of the fermentation process]. This may be an example of isoflavone modification that may occur during the fermentation or processing of soybeans. "Daidzein and genistein are the aglucones of the known glucosides, daidzin and genistin. Enzymatic hydrolysis of the glucosides through the action of *Rhizopus oryzae* has been proved... The antioxidants liberated in tempeh act probably through their protection and preservation of the biologically eminently effective vitamin E in soybeans and not by direct biological action. When larger amounts of 6,7,4'-trihydroxyisoflavone become available, its antioxidant effect in vitamin E-deficient animals should be investigated." Address: 1. Univ. of Pennsylvania; 2-3. Osaka City Univ., Osaka, Japan.

5094. Polansky, Marilyn M.; Murphy, E.W.; Toepfer, E.W. 1964. Components of vitamin B-6 in grains and cereal products. *J. of the Association of Official Agricultural Chemists* 47(4):750-53. Aug. [6 ref]

• ***Summary:*** The percentage of vitamin B-6 in the form of pyridoxol, pyridoxal, and pyridoxamine in soy flour is 63, 25, and 12 respectively. Address: Human Nutrition Research Div., ARS, USDA, Beltsville, Maryland.

5095. Smith, A.K. 1964. The Mount Fuji meeting. An international symposium on oilseed protein foods. *Soybean Digest.* Aug. p. 18-20.

• ***Summary:*** The symposium, sponsored by the International Institute of Food Technology, was held on May 11-15 at the Mt. Fuji Hotel, Lake Yamanaka, Japan. "The 85 technologists participating in the program represented 20 countries and included 30 from Japan and 20 from the United States. An additional 26 technical observers represented the Japanese food industry." "The Mount Fuji symposium was a historic occasion for the advancement of oilseed protein foods, being the first time an international conference was devoted solely to this subject."

"Dr. Y. Sakurai of Tokyo University and George F. Stewart of the University of California, Davis, were co-chairman for the meeting. Dr. T.M. Anson, assisted by others, developed the program. Dr. Masahiro Nakano was chairman of a committee to collect and display oilseed protein foods."

"Soybeans, peanuts, cottonseed, sesame, and coconut were the five oilseeds included in the program as sources of food proteins. Because of their long history and extensive use for food, soybeans were the topics of a major part of the papers and discussion."

"Among the newer developments in the Orient, K.S. Lo of Hong Kong reported on his successful commercial operation in the daily production of 24,000 cases of soybean milk in his two plants. His milk is made from well-washed and dehulled soybeans. It contains about 3% protein, 2-3% fat, and 5-7% carbohydrates, with added vitamins and calcium. Mr. Lo's methods for marketing soymilk are unique; he is also a large dealer in bottled soft drinks, and he markets soy milk as a soft drink. His milk competes with soft drinks rather than with other forms of milk or other health foods. Regardless of his method of marketing, he feels that the product is serving an important nutritional function in the Hong Kong area." Note: Vitasoy is once again being fortified with vitamins and calcium.

Dr. Tokuji Watanabe of the Food Research Institute reported on new ways of making tofu, such as "packed or bagged tofu" which is increasing in popularity. The soymilk is coagulated with calcium sulfate inside a polyethylene or vinylidene chloride plastic bag followed by heating in a water bath. This new process saves time and labor. Several plants are now producing 20,000 bags per day. Tofu is now also being freshly prepared in the home from spray-dried soy milk, coagulated with calcium. "More than 285,000 metric tons of soybeans and 65,000 metric tons of soybean meal are consumed annually for making fresh tofu in Japan, and because of low cost and high food quality, its consumption is said to be increasing.

Concerning miso, koji is now being made by a continuous method in 20-inch deep metal trays. Miso soup is now sold in a dried form. Shoyu production consumes 250,000 metric tons of soybeans of the equivalent as meal.

"The use of soy flour and grits in the United States for

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edible purposes was estimated at 200 million pounds and in England at 40 million pounds. The largest use of soy flour in the United States was estimated at 50 million pounds for bread and other baked products. In England, most soy flour is the full fat, enzymatic active type and is used at about 0.75% for improving color and flavor of baked goods."

"While isolated soybean protein for industrial uses has been produced since 1937, the production for food protein dates only from 1959. The production of industrial protein is carried on by two U.S. producers and annual production was estimated to be in the range of 40-50 million pounds. Four U.S. companies were reported to be producing or engaged in extensive research on isolated protein for food uses. The newest to be manufactured is referred to as a protein concentrate. It is prepared by washing soy flakes either with 80% alcohol or with water at the isoelectric point of the protein (pH 4.5). The concentrates must contain 70% protein whereas the isolate is 95% or more. The largest use of the isolate and concentrate is in comminuted or ground meat products, also referred to as sausage-type meats. Soy protein concentrate can be legally used in sausage-type meats up to 3.5% of the finished product." Address: NRRL, Peoria, Illinois.

5096. Chapin, W.P.G. 1964. Small sounds of Shimouma. *Christian Science Monitor.* Sept. 15. p. 8.
• ***Summary:*** The writer lives with his wife and children in Tokyo, in a part called Shimouma, in Setagaya-ku. "There are many peddlers. Some pull two-wheeled carts filled with their wares and all announce their presence by blowing a horn or by wailing."

"The men who sell *tofu* (bean curd) use horns with a reedy tone like that of a snake charmer. *Tofu* is popular, so the *tofu* man's progress is slow, and the thin, penetrating whine of his horn can be heard for hours through the day."

5097. Jayasena, H. 1964. Ceylon Meals for Millions Program. Report of proceedings of the inaugural meeting of the Meals for Millions Council of Ceylon, held 22 Sept. 1964 (Leaflet). Ceylon: Mimeograph leaflet published by the author. 2 p. 36 cm.
• ***Summary:*** "The Junior Chamber of Colombo, on the suggestion of Miss Florence Rose, Executive Director of the Meals for Millions Foundation, U.S.A. who while on a brief visit to Ceylon since 1955 when she last came and founded the original Meals for Millions Committee, organised the re-activation of this programme by convening a meeting of voluntary social service and welfare organisations and interested persons to form the Meals for Millions Council of Ceylon. This meeting was held at the Jubilee Room of the Galle Face Hotel at 6.30 P.M. on 22.9.1964.

"The proceedings of the meeting commenced by a discussion in which Miss Florence Rose expressed her deep debt to Mr. K. Somasundaram, former Director of the Ceylon Red Cross Society and to Dr. J.H.F. Jayasuriya who organised the meeting of the original Ceylon Meals for Millions Committee at his residence and to all those who helped to get the programme moving and thereby making the present developments possible.

"In the course of her talk Miss Florence Rose reviewed the programme of the Meals for Millions Foundation all over the world and drew special attention to the developments that have taken place in India, Brazil, Philippines and Japan where the example of the American MPF had stimulated the development of local variations using indigenous raw materials hitherto unused as human food. She explained that in the course of the years since 1955 when she came to this beautiful Island, the Meals for Millions Foundation, U.S.A. had gifted to Ceylon approximately 40,000 lbs. of American MPF which utilises soyabean meal as its protein base to the Government of Ceylon, the Ceylon Red Cross Meals for Millions Committee and other voluntary agencies here. She also explained that in the course of the 18 years in which she has been directing this 'People to People' programme, 13 million pounds of this 'Friendship Food' (MPF) had been introduced to 129 countries." "She pointed out that the Indian version of this food–'Indian multi-purpose Food' is now used in the State of Madras to provide essential protein, vitamins and minerals for over one million children in the Madras State school feeding programme. She also emphasised the developments now taking place in the Philippines, which have been stimulated greatly by the work of the Philippines Meals for Millions Affiliate and the scientific collaboration of Universities, Research Foundations and their leaders.

"After this introductory address, the colour film 'People to People' was screened which showed examples of the work of the Meals for Millions programme in various countries, with special emphasis on the Indian programme and the great interest displayed in this connection by the late Mr. Nehru, former Prime Minister of India who states in this film: 'This India needs, this is what India wants; but we must do it in our own way.'"

"The name of Prof. C.C. de Silva was unanimously adopted as the Chairman of the Ceylon Meals for Millions Council. This was proposed by Mr. Upatissa Hulugalla and seconded by Mr. H. Jayasena.

"Mr. Upatissa Hulugalla proposed that Mr. H. Jayasena be elected the Convenor and Secretary of the Ceylon Meals for Millions Council. The notion was seconded by Mr. N.D. Wijayanayaka and was unanimously adopted by the House."

A list of the 14 people present at the inaugural meeting includes Mr. H. Stanley Fernando (Chamber of Commerce), Dr. (Mrs.) B.V. De Mel, Mr. I. Paiva, Dr. M.J. Carrol, Director U.S. Information Services and Mr. H. Jayasena.

Miss Florence Rose expressed her appreciation to various people including to "Mr. H. Jayasena, whose personal interest and educational efforts on behalf of the programme began five years ago when as Secretary of the

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National Development Inquiry of the All Ceylon Buddhist Congress he first wrote to her Headquarters for information regarding the programme." Address: Ceylon Meals for Millions Council.

5098. Friendly, Bob. 1964. Japanese lady pushes soy in man's world [Yoshiko Kojima]. *Soybean Digest.* Sept. p. 77. From the New Orleans Times-Picayune.
• ***Summary:*** Pretty brunette Yoshiko Kojima, who is 5 feet tall when standing on her briefcase, is food promotion director for the Japanese American Soybean Institute in Tokyo. This institute is a venture of the USDA with the American Soybean Association. On a business tour of the USA, she says that Japan imports 1.2 million tons of soybeans a year, 70% through the Port of New Orleans, Louisiana. A photo shows Miss Kojima.

5099. Grow, Howard E. 1964. Japanese American Soybean Institute market development activities. *Soybean Digest.* Sept. p. 45-47.
• ***Summary:*** Contents: Introduction. Increased soybean exports to Japan. China has been supplying an increasing amount of Japan's soybean imports during the past 2 years. New approach to promotion of soy oil. Modern processing plant now making properly "toasted" soybean meal in Japan. Study Japan soybean varieties for making foods. Nine U.S. firms will exhibit on the first floor of the Trade Center.

"As you perhaps know, soybeans took over first place as the largest dollar earner of all agricultural commodities in the export market during last year. Soybeans were also in first place in dollar sales of all exports to Japan this year. Cotton and scrap iron have been in first place in exports to Japan for many years, but are falling behind soybeans this year. Japan imported nearly 49 million bushels of soybeans from the United States during the 1962-63 marketing year. This 49 million bushels is 27% of the total soybean exports as beans for 1962-63. Our exports of soybeans to Japan during the previous year were approximately 40 million bushels."

"Soybean meal has been a minor source of protein for livestock feed in Japan. The percentage of soybean meal was only 4.4% of total feed ingredients in 1960 and amounted to only 133,000 metric tons. There has been a steady increase in the percentage of soybean meal used in feed, along with increased tonnage. During 1963 soybean meal supplied 6.6% of the total feed ingredients. This amounted to nearly 400,000 metric tons. The estimated volume for 1964 is 470,000 tons of soybean meal in feed, while the projected requirement for 1965 is 560,000 tons." Address: Assistant to Executive Vice President, American Soybean Assoc.

5100. Kobatake, Yoshiki; Matsuno, N.; Tamura, E. 1964. Daizu kakô shokuhin no tanpakushitsu no eiyô-ka [Nutritional value of protein in Japanese soybean products]. *Eiyogaku Zasshi* (*Japanese J. of Nutrition*) 22(5):173-77. Sept. [7 ref. Jap]
• ***Summary:*** The Biological Value of tofu was 68.5, and dried-frozen tofu (kori-dofu) was 69.1. Both values indicate high nutritional quality. Even higher protein quality was observed in okara, a by-product of tofu. Its Biological Value was 84.9, though its absorption rate was 78.4%. The value for casein was 80.1, for salt-free miso 73.2, for low-salt miso 70.7, and for freeze-dried low-salt miso 60.5. Address: Division of Biochemistry of Nutrition, National Institute of Nutrition.

5101. Mizukami, Masanao. 1964. The Oil and Fat Importers and Exporters Association [of Japan]. *Soybean Digest.* Sept. p. 43-44.
• ***Summary:*** Provides statistics about soybeans in Japan but relatively little new information. Address: President, OFIEA, Tokyo, Japan.

5102. Sugiyama, Mototaro. 1964. Potential of the Japanese soybean market. *Soybean Digest.* Sept. p. 40, 42.
• ***Summary:*** Examines the current situation of and prospects for the Japanese soybean market in future years, in a speech at ASA's 44th annual convention. The United States is the leading supplier of soybeans to Japan.

"The demand for soybeans in Japan, as in other countries processing soybeans, is a derived demand from uses of soybean oil and soybean meal. In addition, we have demand for soybeans to be used in making the traditional soybean foods. In order to discuss the potential of the Japanese soybean market, therefore, we must look into the demand structure for soybean products in Japan.

Demand for Soybean Oil: Let us first examine the consumption of soybean oil. In Japan practically all the soybean oil produced is used for edible purposes, mostly as cooking oil for frying and salad dressing. In terms of the Japanese fiscal year starting April 1, the per capita consumption of vegetable oils in liquid form and pure lard for cooking uses, excluding consumption figures for margarine and shortening, increased from 3.3 pounds in 1952 to 8.4 pounds in 1962, the average annual rate of increase being 10.6%."

"Thus, on the average the increase of the per capita consumption of vegetable oils and pure lard for cooking was 1.4 times greater than the rate of increase of the per capita real income in 1952-62. This is a fortunate situation for processors of oilseeds because of the implication that so long as the real income keeps rising at the rate of 7% per annum we can expect a 10% increase in the annual consumption of vegetable oils for cooking, provided of course that the relationship between income and consumption of edible oils does not change materially at a higher level of income for some years to come.

"The per capita consumption of soybean oil for edible uses increased from 1.1 pounds in 1952 to 3.8 pounds in

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1962 or at an average rate of 13% per year, as compared with 10.6% annual increase of the per capita aggregate consumption of vegetable oils and pure lard for cooking. As a result, the proportion of soybean oil in the aggregate consumption of vegetable oils and pure lard increased from 32% in 1952 to 45% in 1962.

Demand for Soybean Flakes and Meal: "There have been two major uses of soybean meal in Japan. The so-called food utilization includes uses of extracted soybean flakes or meal in manufacturing soy sauce, monosodium glutamate, miso, tofu and other miscellaneous food items [listed above] in the order of consumption. The quantity used in these food products has remained at about the same level of 300,000 metric tons per annum in the past several years. While use for soy sauce and tofu tends to increase slightly, monosodium glutamate is no longer made from soybean flakes due to the development of a new and better manufacturing technology."

"In sharp contrast to the increasing consumption of edible oils, the per capita consumption of the traditional soybean foods in Japan has continued to decrease in recent years. For instance, the per capita consumption of miso was 21.4 pounds per year in 1952 but it declined to 17 pounds in 1962 or nearly 21% decrease in the 10-year period. During the same period the per capita consumption of soy sauce declined by 14% from 28.4 pounds to 24.5 pounds. The consumption of tofu remained at about the same level in the 1952-62 period [from 20.0 to 20.5 pieces per capita per year] but has tended to decline in the last few years. The per capita consumption of fried tofu or aburaage declined by 16% between 1952 and 1962."

"The other major use of soybean meal is for manufacturing mixed feeds for livestock and poultry. Use of soybean meal in feed has been increasing very rapidly in line with the growing livestock industry in Japan. Starting from a low level in the early 1950's the quantity of soybean meal used in mixed feeds amounted to about 400,000 metric tons in 1962 and 600,000 tons in 1963, thus occupying approximately 60% of the total disappearance of soybean flakes and meal in Japan." "The average annual rate of increase of soybean meal consumption in mixed feeds in the 1958-1963 period is 22%."

A large and very interesting table (p. 42) shows annual per capita "Consumption trends of cooking oils and protein foods in Japan" from 1952 to 1962. Meat and meat products increased from 5.1 pounds in 1952 to 16.3 pounds in 1962 for an average annual increase of 14.4%.

"The per capita consumption of eggs reached a level of 14.8 pounds in 1962 and continues to increase rapidly."

Import of soybeans from all countries increased from 167,032 metric tons in 1952 to 1,293,111 metric tons in 1962 for an average annual increase of 11.7%.

"Use of Whole Soybeans for Foods: On the other hand, the per capita consumption of whole soybeans in the form of the traditional soybean products such as tofu, miso, natto, etc. has declined by about 10% in the past few years from the peak of 12.1 pounds in 1959 to 11.0 pounds in 1962 in line with the declining per capita consumption of these soybean products. In view of the strong consumer preference for livestock products, particularly among the younger generation, it is expected that the per capita consumption of traditional soybean foods will continue to decline in the future."

The rest of the paper deals with predictions / projections for future Japanese demand for soybeans. Address: President, Japan Oilseed Processors Assoc., Tokyo, Japan.

5103. Dorothea Van Gundy Jones (far right) in Japan at a meeting with staff of the *Yomiuri Shinbun* newspaper (Photograph). 1964.
• ***Summary:*** A 4½ by 7 inch black-and-white photo. Left to right: (1) Photographer for the paper. (2) Yoshie Kanamori reporter in charge of women's affairs for the newspaper. (3) Reporter for the newspaper who acted as interpreter. (4) Mr. K. Yamamoto, interpreter, with public relations company. (5) Dorothea Van Gundy Jones, sponsored by the American Soybean Association.

5104. Dorothea Van Gundy Jones seated at a table at the Loma Linda Foods booth at an exhibition in Japan the fall of 1964 (Photograph). 1964.
• ***Summary:*** This 4½ by 7 inch black-and-white photo was taken in Tokyo by E. Bradley Davis of the Foreign Correspondents Club of Japan. The exhibition was organized by the American Soybean Association. A sign on the table at which Dorothea is seated is written in Japanese. A sign for "Loma Linda Foods Company" is on a large, round panel, and many canned Loma Linda products are on shelves.

Dorothea described the trip in 1965 in an article titled "Nutritionist Jones praises low-fat foods of Japan: To Tokyo for tofu," published in *Today's Food* (Loma Linda Foods, Riverside, California) 10(1):4-6. Spring.

5105. Kikkoman Shoyu Co., Ltd. 1964. Kikkoman Shoyu Co., Ltd. (Leaflet). Noda City, Chiba prefecture, Japan. 2 p. Oct. Front and back. 17 x 18 cm.
• ***Summary:*** On one side of this leaflet are many facts about the company, including capital (¥2,700 million), yearly output (66 million gallons of shoyu), products, plants in Japan, offices in Japan, top management team, international offices in USA (San Francisco, Los Angeles, New York), Japan Calpak Co. Ltd (Del Monte), other divisions.

On the other side is a map of Japan showing the locations of Kikkoman plants and offices, and a map showing how to get from Tokyo to Noda by train or road. Address: Noda City, Chiba prefecture, Japan.

5106. Watanabe, Tokuji; Teramachi, Yayoi; Fukamachi, T.; Nakayama, Osamu. 1964. [Process for production of instant

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soybean curd powder]. *Japanese Patent* 431884. Nov. 2. [Jap]*
Address: National Food Research Inst., Tokyo.

5107. *Foreign Agriculture.* 1964. Japan now using U.S. soybeans in food. 2(46):7. Nov. 16.
• ***Summary:*** More than 10% of the nearly 49 million bushels of U.S. soybeans exported to Japan during the 1963 marketing year went into the production of three staple foods–shoyu, tofu, and miso. Until 6 years ago, Japan imported no soybeans from the U.S. for food manufacture–all U.S. imports were processed into oil and meal.

5108. New Ginza. 1964. The finest in Japanese cuisine: Japanese theatre restaurant (Ad). *Los Angeles Times.* Nov. 20. p. D11.
• ***Summary:*** "Traditional turkey dinner... Roast turkey with rice and chestnut soysauce. Dressing and cranberry sauce.

Or: Baked ham $3.25, including "Japanese style soybean cake [tofu] turkey roll, Chestnut soysauce rice."

Or. Japanese teriyaki ham. Address: 254 E. 1st St., Los Angeles. Phone: MA. 5-2444.

5109. Jones, Dorothea Van Gundy. 1964. Soybean magic. *Today's Food* (*Loma Linda Foods, Riverside, California*) 9(3):4-6. Autumn.

• ***Summary:*** The author is on her way to Tokyo, Japan, where the American Soybean Association has asked her to participate in a soybean seminar and fair; she will lecture and demonstrate the use of soybeans in human nutrition.

"My interest in soybeans goes back many years when our family came in contact with them at the world's fair in San Francisco. They were featured in one of the Oriental displays. My father became so enthusiastic, he promptly bought a hundred pound sack of soybeans and we began experimenting. We discovered they were hard to cook and had a peculiar flavor. It was some time before we found a way to mask their beany taste and prepare them properly... My father [T.A. Van Gundy] became a real pioneer in introducing this king of the legume family and often was referred to as 'Soybean Van Gundy.'

"Many years ago, Loma Linda Foods became aware of the nutritional value of soybeans and began manufacturing a few products. Today there are twenty-five soybean foods under the famous Loma Linda label–some made entirely from soybeans and others incorporating them in some form. One of the latest additions to the Loma Linda line is Boston Style Baked Soybeans.

A photo shows Dorothea Van Gundy Jones with Miss Kojima, assistant manager of the Japanese Soybean Association [sic, Japanese American Soybean Institute], who is visiting the USA as part of her world tour to study uses of the soy bean.

Page 5 shows that the following Loma Linda brand soy products are now available: Soy Flour, Soyagen (All Purpose or Malt), Sandwich Spread, VegeChee, Smokene, Boston Baked Soybeans, and Soy Sauce. A photo on the cover of this issue of Loma Linda's quarterly magazine shows a can of Loma Linda VegeBits. Address: Nutritionist, Loma Linda Foods, 11503 Pierce Place, Riverside, California.

5110. Nichols, Teal. ed. 1964. Zen cookery. Chico, California: The Ohsawa Foundation. 83 p. Index. 22 cm. A second edition appeared in 1965.
• ***Summary:*** This is the earliest known macrobiotic cookbook written by an American, and its influence was profound.

Note 1. The Nov. 1964 edition of *Yin Yang* magazine, published in Chico, California, announced that the book had been published that month (Nov.).

"Acknowledgements: Our heartfelt gratitude goes to Lima Ohsawa, the foremost authority on Macrobiotic Cookery, without whose patient assistance and teaching this book would not have been possible. Many of the recipes appearing in Zen Cookery are from her collection in an earlier edition of Zen Macrobiotics. The Editor wishes further to thank the following people for recipes, suggestions, and invaluable comments: Joanne Hirsh, Dorothy Salant, Nina Bauman, Cornellia Aihara, Penny Smith, Shayne Oles, Betty Kennedy, and Jane Andrews."

"Zen Cookery is a collection of recipes gleaned from the files of many people, all of whom have adjusted their salt intake to suit their own needs. Their recipes reflect this."

Contents: 1. Grains. 2. Noodles. 3. Vegetables. 4. Soups. 5. Sauces. 6. Salads. 7. Inspirations from around the world. 8. Special dishes. 9. Miso soy bean paste. 10. Tamari soy sauce. 11. Breads. 12. Pancakes and crepes. 13. Pie doughs. 14. Desserts. 15. Beverages.

Note 2. This is the earliest English-language document seen (March 2012) that contains the term "tamari soy sauce." It is also the earliest English-language cook book seen that contains the word "tamari" or the term "tamari soy sauce."

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Each recipe is numbered. Recipes mentioning soy in recipe name (and a few other recipes introducing foods new to the USA): 2. Rice with tamari soy sauce. 3. Rice with aduki beans. 4. Rice & aduki pudding. 7. Sesame rice. 9. Rice with chick peas (garbanzo). 21-28. Buckwheat recipes. 34. Bulghur. 48. Buckwheat noodles in soup (Soba with kombu). 50. Buckwheat noodles with fried bean curds [tofu]. 54. Buckwheat noodles with miso sauce. 55-56. Buckwheat noodles in kuzu sauce. 61. Udon with aduki. 62. Carrot sesame nituke [nitsuke]. 75. Scallion nituke with miso (soybean paste). 76. Carrot and onion nituke with miso. 77. Onion nituke with miso. 78. Vegetable miso stew. 79. Boiled pumpkin with miso. 80. Vegetable sauces with kuzu arrowroot (and tamari soy sauce).

81. Vegetables with tamari soy sauce and tahini. 98. Jinenjo (5 recipes). 101. Miso-vegetable relish. 102. Aduki beans, black [soy] beans, chick peas. 105. Baked chick peas. 106. Buckwheat-aduki pancakes. 107. Udon with aduki beans. 108. Chestnut-aduki gelatine. 109. Chick pea party dip (with tahini and tamari). 110-118. Sea vegetables (kombu, nori, hiziki, wakame, most with tamari). 119. Clear broth (with tamari). 122. Tamari-vegetable broth. or stock. 123. Miso soup (2 types). 124. Creamed miso soup. 125. Root vegetable soup with miso. 131. Soybean soup. 134. Wakame soup (with miso). 149. Sesame sauce. 150. Miso sauce. 151. Miso salad dressing. 152. Thick tamari soy sauce. 153. Tahini tamari soy sauce. 154. Onion tahini sauce (with tamari). 172. Wakame salad.

189. Clam miso. 190. Scallop miso-lemon. 203 Miso spread [with tahini]. 204. Miso sauce [with tahini and orange rind]. 205. Sauce for vegetables [with black sesame and miso]. 206. Scallion miso. 207. Miso salad dressing. 208. Miso-vegetable relish. 209. Miso soup. 210. Udon with miso sauce. 211. Rice porridge with miso. 212. Deep fried miso balls. 213. Carrots and onions miso. 214. Vegetables miso. 215. Tekka (2 types). 216. Tea with tamari soy sauce. 217. Tamari broth. 218. Stringbeans. 219. Dried radish (daikon). 220. Shredded sea vegetables (hiziki). 221. Thick tamari soy sauce. 222. Tahini-tamari sauce. 223. Vegetables with tahini-tamari soy sauce. 234. Aduki muffins. 238. Miso spread (for sandwiches). 239. Tahini-tamari spread. 246. Buckwheat aduki pancakes. 272. Aduki pudding. 273. Chestnut-aduki gelatine. 274. Kanten jello (with agar).

291. Grain Milk (Kokkoh [Kokoh]; a finely ground combination of roasted rice, glutinous rice, oatmeal, soybeans, and sesame seeds). 294. Tea with tamari soy sauce (syo-ban).

Note 3. This is the earliest document seen (Feb. 2005) that mentions Kokkoh (or Kokoh), a grain milk introduced by macrobiotics.

Note 4. Tofu, amazake, and seitan are not mentioned in this book. 287 is Ohsawa Coffee (Yannoh) and 288 is Dandelion Coffee.

Note 5. This is the earliest document seen (June 2000) that mentions the use of miso in a salad dressing (Nos. 151 and 207).

Note 6. In 1985, when writing a revised edition of this book titled *The First Macrobiotic Cookbook,* Herman Aihara wrote (p. v) that this 1964 edition, published by the Ohsawa Foundation of Chico, California, was first the edition of the various subsequent and very influential books with this title.

Note 7. This is the earliest document seen (March 2011) concerning Herman or Cornellia Aihara and macrobiotics (or soyfoods).

Note 8. Along with soyfoods, this cookbook (and its many successors) also introduced numerous other basic Japanese foods such as aduki [azuki] beans (3-4, 102, 106-08, 234, 272-73), sea vegetables of all types, and soba. Address: Chico, California.

5111. Kitasato, T.; Ojio, S.; Tanaka, T. 1964-1965. [Viscous substances of natto. II. Purification of viscous substances]. *Scientific Report of the Faculty of Liberal Arts Education, Gifu University* (*Natural Science*) 3:263-65. (Chem. Abst. 68:2002. 1968). [Jap]*

5112. Ikehata, Hideo; et al. 1964. Hakkô daizu tempeh ni kansuru kenkyû. II. Koyoketsu busshitsu no seishitsu [Research on tempeh. II. The nature of hemolytic substances]. *Eiyo* (*Nutrition and Nutrology*) 17(1):35. [Jap]*

5113. Kato, I. 1964. [Histological and embryological studies on fallen flowers, pods and abortive seeds in soybean, *Glycine max* (L.)]. *Tokai-Kinki National Agricultural Experiment Station, Bulletin* No. 11. p. 1-52. [86 ref. Jap; eng]*
Address: Tokai-Kinki National Agric. Exp. Station, Tsu, Mie prefecture, Japan.

5114. Ozawa, K. 1964. [Studies on *Bacillus natto.* Comparative research of newly isolated or preserved *B. natto* or *B. subtilis*]. *Meguro Kenkyusho Hokoku* 7:1-8. [Jap]*

5115. **Product Name:** Affair (Non-Dairy Soy Ice Cream).
Manufacturer's Name: Presto Food Products.
Manufacturer's Address: Kansas City, Missouri.
Date of Introduction: 1964.
New Product–Documentation: Shurtleff & Aoyagi. 1985. Tofutti & Other Soy Ice Creams. p. 29-30. "The world's second soy-based commercial non-dairy frozen dessert having a registered trademark." In 1964, after 9 years of R&D by RGB Laboratories, Presto Foods launched America's second commercial soy ice cream. Called Affair, it was a delicious product made for Presto by Swift & Co. at their kosher supervised ice cream plant, using soy protein from Central Soya and coconut fat. Targeted primarily to the kosher Jewish market in New York, it was kosher pareve and came in chocolate, vanilla, and strawberry

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flavors. The demand for the product was there but Presto had great difficulty getting it distributed. The ice cream distributors wouldn't touch it and Presto did not have their own distribution. So it failed and was withdrawn after about a year. In l965 Presto licensed Nissei Co. in Osaka, Japan to make their soy ice cream, which Nissei was still doing in 1985, although at some point they changed the protein source from isolated soy proteins to casein. It was not until 1981 that Presto Foods tried to introduce a frozen dessert again, this time with Mocha Mix Non-Dairy Frozen Dessert (Borne l985, personal communication).

5116. Sakurai, K. 1964. The role and significance of soy bean foods in Japan. University of Tokyo. Unpublished manuscript. *
Address: Tokyo, Japan.

5117. Shibamoto, G. 1964. [Experimental studies on the nutritive effect of natto. I]. *Tokyo Ika Daigaku Zasshi* (*J. of Tokyo Medical College*) 22:337-38. [Jap]*

5118. Shibamoto, G. 1964. [Experimental studies on the nutritive effect of natto. II]. *Tokyo Ika Daigaku Zasshi* (*J. of Tokyo Medical College*) 22:449. [Jap]*

5119. Tsuno, S.; Matsumoto, M. 1964. [Studies on the nutritional value of Natto Prorich I]. *Kobe Daigaku Kyoikugaku-bu Kenkyu Shuroku* (*Bulletin of the Faculty of Education, Kobe University*) 31:129. [Jap]*

5120. Akizuki, Tatsuichiro. 1964. Taishitsu to shokumotsu: Kenkô e no michi [Physical constitution and food: The path to health]. Nagasaki: Published by the author. 40 p. 22 cm. [Jap]
• ***Summary:*** Contents: Introduction. The medical science of one's physical constitution. One's physical constitution. Foods. Nutrition. Food products. Miso. Components of miso. Protein. Fat. Minerals. Bacteria. Medical considerations. Conclusion.

Dr. Akizuki, director of the Saint Francis Hospital in Nagasaki, was born with a congenitally weak constitution, and has devoted his career to researching the use of food as preventive medicine. He has placed special emphasis on a holistic (rather than symptomatic) approach to healing, and on traditional natural foods native to Japan. "I feel that miso soup is the most essential part of a person's diet... I have found that, with very few exceptions, families which make a practice of serving miso soup daily are almost never sick... By enjoying miso soup each day, your constitution will gradually improve and you will develop resistance to disease. I believe that miso belongs to the highest class of medicines, those which help prevent disease and strengthen the body through continued usage... Some people speak of miso as a condiment, but miso brings out the flavor and nutritional value in all foods and helps the body to digest and assimilate whatever we eat... I use and have deep respect for modern medicines such as antibiotics and modern surgical techniques, yet they must only be employed when absolutely necessary. Of prime importance is the development of a strong constitution through proper eating. The basic condition of a person's constitution determines whether or not he will be only mildly and temporarily affected by diseases, or be seriously and chronically affected."

In 1945, when the atomic bomb fell on Nagasaki, Dr. Akizuki's hospital–located only one mile from the epicenter of the blast–was left in ruins. Fortunately, he and his nurses and co-workers were not in the building and were uninjured. Throughout the following 2 years, though, Dr. Akizuki and his staff worked daily in prolonged close contact with fallout victims in areas of Nagasaki which were heavily damaged and highly radioactive. Nevertheless, neither he nor his associates suffered from the usual and expected effects of radiation. Dr. Akizuki was extremely interested in this phenomenon, which he hypothesized may well have been due to the fact that he and his staff had been drinking miso soup regularly. But he felt that only a thorough scientific study of the phenomenon could provide the full answer.

One might ask, "Why did Dr. Akizuki wait 17 years to write this book?" Dr. Hideo Ebine (10/89) says, "I think he was very busy even after the war, taking care of many atomic bomb survivors and ordinary patients as a clinician, reconstructing the destroyed hospital, and writing the book *Nagasaki Genbakuki* (Diary of the Nagasaki Atomic Explosion), and so on. Dr. Akizuki is not a typical western type physician. His philosophy somewhat resembles that of macrobiotics, based on the use of food and diet to overcome disease. He examined the results of his treatment for 30 working staff of his hospital affected by radiation, and many patients who suffered directly from the atomic explosion before his confidence in the results of his treatment was obtained." Note: An abridged, undated edition, edited by Kawamura Wataru and titled *Taishitsu wa Shokumotsu de* [Your physical constitution depends on what you eat] was published by the Japanese National Miso Association.
Address: Saint Francis Hospital, Nagasaki.

5121. Arima, K. 1964. Microbial enzyme production. In: M.P. Starr, ed. 1964. Global Impacts of Applied Microbiology. New York: Wiley. 572 p. See p. 277-94. Held 29 July to 3 Aug. 1963 at Stockholm, Sweden.
• ***Summary:*** Table 1 (p. 278-79) shows industrially produced enzymes and their applications. Among the 34 enzymes are diastase (from malt), Takadiastase (from *Aspergillus oryzae*), amylase (from *B. subtilis,* [the natto bacterium]), rennet (from calf stomach), papain (from papaya), Takamine Pectinase Clarase (made by Takamine Lab.), penicillinase (from *B. subtilis,* made by Takamine Lab.), glucose oxidase (from *Aspergillus niger,* made by Takamine Lab.), adenylic

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acid (in Takadiastase).

Page 280 discusses "Takadiastase–This enzyme is produced by *Aspergillus oryzae* and is sold as a digestive aid. It is the oldest enzymatic product in use, but is still sold throughout the world. It is manufactured by the conventional tray culture method."

Page 282 discusses microbial rennet: "Rennet is the enzyme which develops in the fourth stomach of young calves while they are milk-fed. Later, when they are switched to other feed, the enzyme disappears." In recent years a shortage of animal rennet for cheesemaking has developed, so many investigators have searched for substitutes among vegetable and microbial enzymes. Arima and Iwasaki began this line of research several years ago and succeeded in isolating soil microorganisms that produced rennet. Their microbial rennet enzyme has been tested for making cheese, both in the USA and in Japan, and has proven satisfactory with respect to coagulation activity, flavor, and texture of the cheese.

Pages 283-89 discuss commercial enzyme production. The two basic methods are liquid culture (surface, or submerged) and solid culture (five types of Koji methods: Conventional koji tray culture, mechanized koji tray culture, rotary drum culture (not very successful), koji tray culture with aeration of controlled temperature and humidity, and thick layer koji culture). Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Bunkyo-Ku, Japan.

5122. Carletti, Francesco. 1964. My voyage around the world. Translation from the Italian [of Ragionamenti, 1594-1606] by Herbert Weinstock. New York, NY: Pantheon Books. Div. of Random House. xv + 270 p. See p. 110. [1 ref]

• ***Summary:*** This is the English-language translation of the 16th century Florentine merchant Carletti (lived 1573?-1636). In the section titled "Second Account: The East Indies" (p. 93+), in the chapter titled "First chronicle of the East Indies" he states (p. 99) that he arrived in Japan in June 1597 at Nagasaki. On page 110 he discusses rice miso, which he calls *"misol."* For details see the 1606 entry for Francesco Carletti. Address: Florence, Italy.

5123. Chamberlain, Basil Hall. 1964. Kojiki, or records of ancient matters. *Transactions of the Asiatic Society of Japan* No. 12. Supplement. 428 p. See p. xl. *

• ***Summary:*** Note: The Kojiki first appeared in Japan in 712 A.D.

5124. Choy, Jung Suck (Mrs.). 1964. The art of Oriental cooking. Los Angeles, California: The Ward Ritchie Press. xi + 156 p. Introduction by Dr. Lee Wok Chang. Illust. Index. 18 x 18 cm.

• ***Summary:*** Contents: Introduction. Korean food. Chinese food. Japanese food. Shopping guide for Oriental ingredients (1 p., with emphasis on the names and address of stores selling Oriental foods). For each category of food (such as Soup) and for each recipe, the name in English is given first, followed by the Asian name in parentheses. ½ to 1 teaspoon "monosodium glutamate" is called for in many recipes. Likewise "soy sauce" is used in many recipes.

Note 1. The index to this book is not a typical index. For example, although "bean curd" is called for in many recipes, it does not appear in the index. So one must read the entire book and all the ingredients in each recipe to find which recipes call for bean curd.

Note 2. The book has an unusually heavy emphasis on animal foods–meat, chicken, fish, shellfish, and eggs. Did people in Korea, China, and Japan really eat like this in 1964?

In Korean, bean curd is called dubu or do-bu (p. 13); bean curd is also called for on pages 45, 50, 54, 125, 136, 137, 138 Other ingredients used: Miso, p. 125. Red beans [azuki], p. 63.

Recipes include: Fish teriyaki, p. 134. Sukiyaki, p. 136. Mizu-taki, p. 137-38. Beef teriyaki, p. 140-41. Pork teriyaki, p. 141.

The shopping guide mentions: Bean curds. Chinese black beans [fermented black soybeans]. Miso. Monosodium glutamate. Sesame seeds. Sesame oil. Soy sauce.

Note: The author was born and raised in Korea. She and her husband joined the faculty of Seoul National University in 1947; she taught home economics. Since 1950 in the United States, she has been giving courses on Oriental cooking to various social and church groups. Address: Berkeley, California.

5125. Japan Dietetic Assoc. Corp. (JDAC). 1964. [Standard composition of Japanese foods]. Tokyo: Daiichi Shuppan K.K. 124 p. [Jap; Eng]

• ***Summary:*** The basic source of information on the nutritional composition of all Japanese foods.

5126. Jayasena, H. 1964. Meals for Millions and multi-purpose food (Leaflet). Ceylon: All Ceylon Buddhist Congress. 2 p. 36 cm.

• ***Summary:*** Contents of this mimeographed leaflet: Introduction. World-wide programme against hunger. India's example. An old dictum challenged. Food tradition and coconuts. W.H.O. [World Health Organization of the United Nations] recommends. A step forward.

"Multi-purpose food consists of a scientific blend of vegetable proteins, vitamins and minerals to provide maximum nutrition in palatable protein form at minimum cost. Besides, it has been designed to provide an adequate supplement to inadequate diets without affecting the taste and texture of the food usually consumed.

"This food was first developed by Professor Dr. Henry Borsook at the California Institute of Technology, U.S.A.

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in 1945 from a moderate research grant provided by Mr. Clifford Clinton, a civic leader and restaurant operator of Los Angeles.

"Multi-purpose Food called MPF for short was first produced out of soyabean press-cake and enriched with vitamins and minerals to provide in a two ounce quantity one-third of the minimum daily requirements of the essential protein, vitamins and minerals for an adult man established by regulation by the U.S. Food and Drug Administration."

"In 1946, the non-profit-making Meals for Millions Foundation was established in the USA to introduce this new concept for the prevention of malnutrition. By this programme, the Meals for Millions Foundation proposed:

"(1) To introduce to under-developed countries, the soy-based multi-purpose food (MPF) as an example of the type of low-cost food concentrate that could convert poor deficient diets into good nutritious diets.

"(2) To stimulate self-help programmes in the developing countries for them to produce from their own resources MPF type foods to prevent malnutrition among the vulnerable groups in their countries.

"India's example: Although till 1956, the American Meals for Millions Foundation was the only source of multi-purpose food, the stimulus provided by the popularisation of the MPF idea in India led to research being carried out at the Central Food Technological Research Institute, Mysore which resulted in an indigenous MPF being produced in India in 1954. It was made out of local raw material consisting principally of peanut and Bengal gram. This programme received the enthusiastic support of the Indian Prime Minister and the members of his cabinet.

"The Government of Madras after appropriate feeding trials decided to use Indian MPF for its school feeding programme involving about one million children. The MPF required for this feeding programme is produced by a private manufacturer. This idea is catching up in other States of the Indian Union. Indian MPF, a minimum of 1 to 2 ounces costing 3 to 6 N.P. per day is considered sufficient to meet a substantial part of the protein and vitamin deficiencies in the Indian diet. Besides India, Brazil, Mexico, and Japan are also producing MPFs, making use of indigenous raw material.

"An old dictum challenged: MPF whether of the soy-based or other varieties have been formulated on the principle which Dr. Henry Borsook once explained in the following words:

"'We recognized in 1946 that the outstanding world nutrition problem was protein deficiency. The means for coping with vitamin and mineral deficiencies was worked out. The obstacle to coping with the problem of protein deficiency was the wrong teaching which prevailed... that without animal protein there would always be protein malnutrition. There is no scientific justification for this dictum.'

"'It was motivated' he said 'by antiquated ideas, by wrong economics...'

"Dr. Henry Borsook, stressing this point further explained:

"'We know from proved scientific evidence that certain mixtures of vegetable proteins can do just as well nutritionally as animal proteins and we know the reason why. Animal protein is too expensive. A cow or a hog converts only about three percent of its feed into human food...'"

"'Vegetable proteins' Dr. Borsook emphasised 'are the cheapest in land, human labour and materials. There are vast unused reserves of human food in vegetable proteins, especially those in industrial by-products.'"

Incidentally, Dr. Henry Borsook is not alone in this view. This same view is shared by Dr. Moises Behar, Director of the Institute of Nutrition, Central America and Panama, among others. The thesis that animal protein is not essential for human nutrition because by the scientific mixing of various foods it is possible to produce a kind of vegetable "meat" is indeed heartening news for Buddhists especially who by reasons of religious persuasion are enjoined to abstain from killing animals for food or other purposes."

"It is noteworthy that while soyabean meal has been in use as a human food for quite some time, in regard to peanut press-cake, the W.H.O. Protein Advisory Group has recently concluded that solvent extracted groundnut flour can be safely used in feeding children, provided that solvents of known characteristics are utilized and controlled. We would like to make the observation that we should not stop with growing peanut and *gingelly* [sesame] alone. It will be well to consider growing soybean in Ceylon which has experimentally proved feasible in certain parts of the country. In terms of vegetable protein it gives the highest yield. It is also worth reflecting that it is a crop that has retained its place in the food economy of China for nearly 6,000 years.

"A step forward:

"In conclusion it may be pointed out that multi-purpose food is a product that has been universally used. From 1946 till to-date, approximately 13 million pounds of this "wonder food" have been introduced through voluntary agencies to medical, health, and welfare authorities in 129 countries and territories.

"All the conditions requiring the production of MPF in Ceylon are now present. We have malnutrition and under-nutrition of a considerable scale. We have a fair supply of one product, namely, coconut, that can form the base of such a product. The know-how and the technology also can be had, if needed. NPF has experimentally proved as a mean of reducing rice-intake, not only without ill-effects, but with nutritional benefits. The sooner MPF is popularised in Ceylon, the better it will be for the people's welfare." Address: Honorary Secretary, National Development Enquiry, All Ceylon Buddhist Congress.

5127. Mabuchi, Toichi. 1964. Tales concerning the origin of

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grains in the insular areas of Eastern and Southeastern Asia. *Asian Folklore Studies* (*Nagoya, Japan*) 23(1):1-92. See p. 3. [80+* ref. Eng]*
• ***Summary:*** Page 3 tells a story from the *Kojiki*, which first appeared in Japan in 712 A.D.: "A heavenly god asked an earthly goddess for a meal. Having seen her cooking various kinds of food taken out of her mouth, nose and anus, the heavenly god killed her in anger. Shortly afterward there appeared seeds of various crops from her corpse; from her eyes rice, from her ears the 'millet', from her nose the red bean [probably azuki], from her anus the soya bean, from her vagina barley, while the silk worm came out of her head."

Harlan (1975, p. 45) notes: "The source of the soybean suggests flatulence,..."

Note: This paper was first presented on 20 June 1962 at Indiana University.

5128. Murata, Kiku; Ikehata, H.; György, P. 1964. Detection and isolation of the antioxidants from fermented soya beans, tempeh. In: Proceedings of the Sixth International Congress of Nutrition. Edinburgh and London: E. & S. Livingstone Ltd. xv + 683 p. See p. 601. Held 9-15 Aug. 1963 at Edinburgh, Scotland.
• ***Summary:*** The authors detected an antioxidant in the alcohol extract of tempeh which is similar to that of vitamin E; it prevents haemolysis of red blood cells to dialuric acid. They attempted to isolate the active antioxidants from tempeh and succeeded in obtaining two isoflavons and one unknown "Factor 2" in crystalline forms. Two of the crystals were identified as daidzein and geninstein. Compared with vitamin E, they have only 1% and 5% respectively of the activity to prevent the haemolysis of red blood cells. However "Factor 2" has twice the activity of vitamin E.

Also summarized in *Nutrition Abstracts and Reviews* (1964, p. 1792). Address: 1-2. Osaka City Univ., Osaka, Japan; 3. Philadelphia General Hospital, Philadelphia, Pennsylvania.

5129. Nagasawa, T.; Tamura, T.; Fujiyama, R.; Kawakami, K. 1964. Miso ni tenka shita bitamin A ryokuka no shôchô to sono misoshiru-chû no anteisei ni tsuite [Potency of vitamin A palmitate added to home-made miso (soybean paste) and cooked miso soup]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 17(3):185-87. [Jap]

5130. Ohsawa, George. 1964. Le Zen macrobiotique; ou, L'art du rajeunissement et de la longévité [Zen macrobiotics, or the art of rejuvenation and longevity]. Paris: Librairie Philosophique J. Vrin. 212 p. [Fre]*
• ***Summary:*** The author (lived 1893-1966) lists his name on the title page as "Georges Ohsawa (Nyoiti Sakurazawa)."

5131. Taira, Harue; Taira, Hirokadzu; Sakurai, Y. 1964. Daizu kakôhin no amino-san ni kansuru kenkyû. V. Nattô seizô kôtei-chû no aminosan [Studies on amino acid contents of processed soybean. V. Variation of total and free amino acid contents in "natto" processing]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 17(4):248-50. [12 ref. Jap; eng]
Address: Nôrinsho, Shokuhin Sogo Kenkyujo, Tokyo, Japan; Tokyo Daigaku Nogaku-bu.

5132. Takagi, Heiji; Fujiyama, R.; Nagasawa, T. 1964. Nôka jika jôzô miso no hinshitsu ni kansuru kenkyû. III. Hissu amino-san kôsei ni tsuite [Studies on the qualities of home-made miso (soybean paste) used by farm families. III. On the essential amino acid composition]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 17(3):181-84. [8 ref. Jap; eng]

5133. Takagi, Heiji; Fujiyama, R.; Nagasawa, T. 1964. Nôka jika jôzô miso no hinshitsu ni kansuru kenkyû. II. Chiramin no ganryô ni tsuite [Studies on the qualities of homemade miso (soybean paste) used by farm families. II. On the tyramine content]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 17(2):123-25. [3 ref. Jap; eng]

5134. Watanabe, Minoru. 1964. Nihon shokuseikatsu-shi [History of Japanese food culture]. Tokyo: Kichikawa Kobunkan. 330 p. Illust. Index. 21 cm. [Jap]
• ***Summary:*** Amazake (p. 43), tofu (p. 3, 129), natto (p. 147), miso (p. 3, 88, 102, 130, 149, 203-05, 241, 288, 301, 314), shoyu (3, 149, 202, 241, 301).

Amazake: There were two types of fermented foods in Japan prior to the 8th century A.D.: The sake line and the hishio (*chiang*) line. The sake line used mainly rice as an ingredient but barley (*mugi*), broomcorn millet (*kibi*), glutinous mountain yam (*yama imo*), and fruits were also used. The hishio line led to miso and soy sauce. Both the early Japanese classics Kojiki (A.D. 712) and the Nihon Shoki (A.D. 720) mention sake. From burial mound tombs created during the period A.D. 300 to 600 have been excavated groups of stone burial objects which are thought to be sake making implements. The earliest sake was made from glutinous rice (*mochi-gome*); it was quite sweet, thick, and glutinous/sticky, and was called "one night sake" (*hitoyo-zake*). It was thick like today's amazake base before it has been diluted, and was probably served on tree leaves and eaten, rather than being drunk as a beverage. After the arrival of foreigners in Japan bringing brewing methods, regular rice started to be used to make drinks with a high alcohol content. Salty and/or pungent condiments (*karami*) were also added. Japanese cedar or cryptomeria (*sugi*) or bamboo leaves may have been used as preservatives. All of these beverages were thick grogs, not clarified sake. Moreover, unlike in later eras, they were not used to add color/pleasure to people's daily life. Rather they were used mainly at religious festivals and ceremonies.

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5135. Yoritaka, Toyoji; Matsuda, G.; Oka, K.; Muta, I. 1964. The effect of soybean protein for albino rats. In: Proceedings of the Sixth International Congress of Nutrition. Edinburgh and London: E. & S. Livingstone Ltd. xv + 683 p. See p. 477. Held 9-15 Aug. 1963 at Edinburgh, Scotland. Address: Dep. of Biochemistry, School of Medicine, Nagasaki Univ., Japan.

5136. *Daizu ni Kansuru Shiryo* (*Statistics on Soybeans and Soyfoods in Japan*). 1964--. Serial/periodical. Tokyo: Norin-sho, Engei Kyoku, Tokusan-ka (Japan Dep. of Agriculture, Forestry, and Fisheries). Annual. 26 cm. [30 ref. Jap]
• ***Summary:*** This annual publication of the Ministry of Agriculture, all in Japanese, is the single best unified source of statistical information on soybeans and soyfoods in Japan. By the 1970s the name of the publishing organization had changed to Norin Suisan-sho, Nosan Engei Kyoku, Hatasaku Shinkoka. The average length of a volume was 146 pages in the 1960s, increasing to 170 pages in the 1980s.

Table of Contents for the 1984 Edition reads: I. Finding where soybeans fit (in Japanese agriculture) (p. 1). 1. Changes in the size of area of the cultivated fields (p. 1). 2. Changes in usage of land (p. 2). 3. Changes in the rate of usage of cultivated fields (p. 6). 4. Converting rice fields to other crops (p. 7).

II. Production trends (p. 14). 1. Results of production (p. 14). 2. Present status of management (p. 28).

III. Grant money system (p. 56). 1. Outline of grant money system for soybeans and rapeseeds (p. 56). 2. Changes in the standard price of soybeans and the amount of soybeans subject to the grant money (p. 58). 3. Results of the regulated sales of soybeans (p. 59). 4. Monthly changes in the price of soybeans (p. 60). 5. Standards of inspection of soybeans (p. 62). 6. The present status of inspecting and ranking soybeans (p. 66).

IV. Outlines of the budget of the countermeasure of promoting the production of soybeans (p. 70). 1. Changes in the budget (p. 70). 2. Outline of budget of soy-related items in 1984 (p. 72). 3. The present status of enforcement of the enterprises (p. 82).

V. Varieties of soybeans (p. 86). 1. Table of the soybean varieties which were registered as Norin Bango (agriculture & forestry number) (p. 86). 2. Table listing the main existing varieties (p. 96). 3. Table of the varieties which each prefecture recommends (p. 102). 4. The status of planting different varieties of soybeans (p. 104).

VI. The present status of management techniques of cultivation (p. 109). 1. The season of soybeans in the main producing prefectures (p. 109). 2. Outline of the national association of promoting the improvement of management of beans in 1983 (p. 112).

VII. Trend of demand for soybeans (p. 132). 1. Changes in the demand for and the rate of self supply of soybeans (p. 132). 2. The status of demand for soybeans by year (p. 133). 3. Changes in the amount of soybeans imported for food use and the amount of soybeans used in various items (p. 133). 4. The results of production, shipping, and the usage of raw materials of miso and shoyu (p. 136). 5. The status of consumption of processed soybean products (p. 140). 6. Nutrients of soybeans and soybean products (= soyfoods) (p. 144). 7. Long term view (p. 150). 8. Changes in the rate of making soybeans as merchandise (p. 150). 9. The status of the production of soybeans in main producing countries (p. 151). 10. Changes in the amount of soybean production in the USA (p. 152). 11. The amount and the price of exported soybeans of main exporting countries, by countries (p. 153). 12. The amount and the price of imported soybeans of the main importing countries, by countries (p. 154). 13. The Japanese import situation for soybeans, by years and countries (p. 156). 14. The imported amounts, exported amounts, and the domestic prices by years (p. 162). 15. Changes in the soybean tax (p. 164).

5137. Ohsawa, G. 1964? Macrobiotics: The art of longevity and rejuvenation. New York, Paris, Brussel [sic], Tokyo: Ohsawa Foundation. Printed in the U.S.A. by Eastern Technical Publications (Boston & New York). 218 p. Undated. Index. 17 cm.
• ***Summary:*** This is the earliest known American printing of "Zen Macrobiotics." The word "Zen" was removed from the title at Michio Kushi's suggestion. The cover is yellowish tan. The author is George Ohsawa.

Contents: Foreword: Two ways to happiness through health. Preface: Health to peace. Books by the same author (7 in French, 9 in Japanese, one in English, plus 4 periodicals). Table of contents. 1. Macrobiotics and Oriental medicine. Why I have written this book. What is the philosophy of the Far East? 2. What is my therapy? Unhappiness, illness, crime. Incurable disease. Three categories of cure. What we must not cure. Satori. Courage, honesty justice. Tolerance. 3. The six main conditions of health and happiness. 4. Nothing shall be impossible to you. You should have infinite freedom. You must be your own doctor. 5. Ohsawa's macrobiotic cuisine. 6. Principal foods: Rice, buckwheat, udon etc., millet, raw rice etc. (p. 62-71, with recipes). 7. Secondary foods (p. 72-103, with recipes): Nituke, soup (lotus root ankake, kuzu gruel, cracknel yuba), pie, gyoza (piroshiki), chapati, jinenjo (wild potato, tororo). Egyptian beans (chick peas, *pois chiche*), beans (boiled soy beans with miso, gomoku beans, goziru [gojiru] soup, aduki beans), corn, aduki (ogura vermicelli), goma-tohu [sesame tofu], aemono (salads), varieties (chou farci, buckwheat crepe), wild vegetables, seaweeds (shi kobu [shio kombu], kobu maki, fried kobu, musubi kobu, kobu soup, matsuba kobu, salmon head kobu-maki, hiziki with lotus root, hiziki nitsuke, hiziki with "age," hiziki and soyabean, gomoku hiziki, hiziki rice), wild plants (dandelion leaves or root, aozu {wild

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spinach}, fuki), miso and tamari preparation (sauce miso, miso cream, muso [miso with tahini and orange peel], miso soup, carrot and onion au miso, vegetable au miso, oden au miso, buckwheat dango au miso, miso ae, tekka no. 1 and 2), syoyu [shoyu] (sakura rice, sauce au shoyu, sauce au sesame, bouillon au shoyu, ositasi [ohitashi], oatmeal cream, potage oatmeal, sauce bechamel a la sauce shoyu, mayonnaise a la sauce shoyu, sauce Lyonnaise; "Shoyu diluted with a little water is very good for Sasimi [Sashimi = raw fish] and fried oyster, tempura, fish Sukiyaki, tofu {vegetable cheese of soya beans}, etc."), beverages (rice tea, wheat tea, dandelion coffee, Ohsawa Coffee {Yannoh; incl. roasted and ground rice, wheat, aduki, chick peas, and chicory}, Kokkoh {incl. roasted rice, glutinous rice, oatmeal, soya beans, and sesame seeds}, Mu tea, syo-ban {coarse green tea with soy sauce}, kuzu [cream, with shoyu] {"A good drink for everyone"}, aduki juice, radish [daikon] drink no. 1 and 2, ransyo {one beaten egg + 50% of traditional Ohsawa shoyu}, soba tea, umeboshi juice, ume-syo-kuzu, special rice cream).

8. Special dishes. Desserts. 9. Yin and Yang. 10. Macrobiotic suggestions for various symptoms of disease (p. 131-36, with recipes): General suggestions (by disease), macrobiotic external treatment (tofu plaster, soya bean plaster, Dentie). 11. Specific curative dietary suggestions: Examples of diseases and their macrobiotic treatments. 12. Kokkoh: Macrobiotic food for baby. 13. On cooking. Salt. Folk medicine. Your history. Appendix: The case of Mr. E. (Cure in 10 hours). "Pro-forma death certificate of the American World Empire and its Gold Dynasty."

Ohsawa centers and friends (p. 217-18): England (Trustin Foods, London; Mrs. R. Takagi, London), France (Centre Ignoramus, Longue Vie, Guenmai [Genmai = brown rice], Yamato, Ohsawa-France; all in Paris). Germany (Miss M. Arnoldi, Heidelberg; Dr. P. Martin, Munich; Dr. Henning, Hamburg), Italy (Miss H. Onoda, Rome; Mrs. Baccolis, Rome), Japan (Nippon Centre Ignoramus, 8 Kasumi-cho, Minato-ku, Tokyo; Shinsekai, Osaka), Brazil (Casa Longavida, Sao Paulo), Sweden (Miss Ilse Clausnitzer, Stockholm), U.S.A. (Ohsawa Foundation, 61, W. 56th St., New York; Ohsawa Foundation, P.O. Box 238, Chico, California; Chico-San, Inc., 64, 5th Ave., Chico, California; Musubi, 61, W. 56th St., New York–Macrobiotic Restaurant).

This book is undated, but it contains clues as to when it was published. On page 190 is reference to an article in *Time* magazine dated 7 March 1960 about the sad state of health in the United States. Then on page 189, Ohsawa states: "Upon my arrival in the United States last November, I began my lectures on the philosophy and medicine of the Orient. I gave some in Los Angeles and San Francisco [California], but mostly in New York institutes and schools such as the Universalist Church, The New School for Social Research, Columbia University, New York City College, and the American Buddhist Academy. I have postponed my departure twice. But I am very happy as I have confirmed my assumption: marriage between paradoxical philosophy of the Orient and the materialistic techniques of precision of American science, which must be realized for the infinite freedom of Man and for world peace" (p. 189).

Concerning the date of publication, which is not given in or on the book. One guess is about 1964, because when you do a printing of a book, you want to print enough to last for at least two years. This 1962 + 2 = 1964. A pretty weak reason! Carl Ferré (6 and 8 May 2011) states: I've done enough printing to know that the book printed in the USA uses the same plates as the second printing in Japan except for two changes. They added "Printed in the USA by..." (in a different type face) to the back side of the first page, which is blank; and, they whited out "Zen" and the smaller "Macrobiotics" on the cover and title page and replaced both with one word: "Macrobiotics" (again, in a different type face). The rest of the book appears to be exactly the same as the second printing from Japan."

"My thinking is that 1964 is a pretty good guess because I believe it may have been arranged by the East Coast Group–thus, the word 'Zen' was off the title and it was printed by a printer in Boston and New York. This would be about the time Michio Kushi was getting settled in Massachusetts."

Note 1. These lines almost certainly describe Ohsawa's first visit to the United States. He arrived in November 1959 and stayed well into 1960.

Note 2. All recipes in this book are numbered, from No. 1 (Unpolished rice, p. 162) to No. 816 (Rice plaster, p. 136). The recipe numbers are identical to those published in the mimeograph edition of *Zen Macrobiotics* (also titled *Macrobiotics–The Biological and Physiological Foundation of Zen Buddhism*), published in early 1960.

Note 3. The contents of this book is very similar to that of the earliest published edition of *Zen Macrobiotics*, which was printed in Japan and was 218 pages long.

5138. Matsumoto, Kenji. 1965. Miso shôyu no aji [The flavor of miso and shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 60(1):30-33. Jan. [Jap] Address: Nihon Jozo Kyokai.

5139. Mitsuda, Hisateru; Kusano, T.; Hasegawa, K. 1965. Purification of the 11S component of soybean proteins. *Agricultural and Biological Chemistry* 29(1):7-12. Jan. [21 ref. Eng]

• ***Summary:*** Among the ultracentrifugal components, the initial effort towards isolation was done for the 11S component. The partial purification and characterization of the 11S component were first studied by Wolf and coworkers, and the first ultracentrifugal pure isolation was accomplished in 1965, and described in this paper. Address: Lab. of Nutritional Chemistry, Faculty of Agriculture, Kyoto Univ., Kyoto, Japan.

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5140. Yoshikawa, Seiji. 1965. Miso no aji [The flavor of miso]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 60(1):34-37. Jan. [Jap]
Address: Norinsho Shokuryo Kenkyujo.

5141. Fukushima, Danji. Assignor to Zaidan Hojin Noda Sangyo Kagaku Kenkyusho (Chiba-ken, Japan). 1965. Method for treatment of soybean proteins. *U.S. Patent* 3,170,802. Feb. 23. 10 p. Application filed 14 Dec. 1960. [6 ref]
• ***Summary:*** Describes solvent extraction of soybean meal using ethyl alcohol. Note: As of 1969 most of the soybean meal used in Japan for making fermented soy sauce has been extracted with alcohol, and this has made a great contribution to increasing soy sauce yields. Address: Yono-shi, Saitama-ken, Japan.

5142. Banno Tsusho Company. 1965. [Deodorizing soybean milk]. *Japanese Patent* 3461. Feb. 23. English-language summary in Soybean Digest, Feb. 1966, p. 53. [Jap]*
• ***Summary:*** The soymilk is adjusted to pH 6.8 then subjected to dialysis with a suitable colloid impervious film and activated charcoal.

5143. Ilany-Feigenbaum, Jacob. 1965. The proteolytic enzymes of Japanese koji and Taka-diastase. *J. of Food Science* 30(1):148-50. Jan/Feb. [10 ref]
• ***Summary:*** Israeli research on reduction of time for fermentation of Japanese miso or Israeli miso-type products. The proteolytic activity of enzymes extracted from koji made by Japanese or Israeli methods and of commercial samples of taka-diastase (from Parke, Davis & Co.) was found to be slower at pH 5.0 than at either neutral or alkaline pH. At pH 5.0 it takes longer to obtain comparable digestion of the substrate compared with pH 7.8. Miso is a mixture of cooked soybeans and rice koji. Address: Dep. of Biochemistry, Bar-Ilan Univ., Ramat-Gan, Israel.

5144. Koshiyama, Ikunori; Iguchi, Nobuyoshi. 1965. Studies on soybean protein. I. A ribonucleoprotein and ribonucleic acids in soybean casein fraction. *Agricultural and Biological Chemistry* 29(2):144-50. Feb. [24 ref. Eng]
Address: Noda Inst. for Scientific Research, Noda City, Chiba-ken, Japan.

5145. Morinaga Milk Products Company. 1965. [Deodorizing soybean milk]. *Japanese Patent* 3462. Feb. 23. 2 p. English-language summary in Soybean Digest, Feb. 1966, p. 53. [Jap]*
• ***Summary:*** "In a method for thoroughly deodorizing soybean milk, the raw aqueous soybean extract is inoculated with one or more of the following species of bacteria: Leuconostoc diacetylactease; Leuconostoc dextranicum; and Leuconostoc citrovorum. The inoculated milk is fermented at 20º-25ºC for a period of from 12 to 30 hours at a pH of about 6.5."

Note: This is the earliest document seen (March 2013) concerning Morinaga and soy.

5146. Nagai, K. 1965. [Deodorizing soybean milk]. *Japanese Patent* 3,459. Feb. 23. English-language summary in Soybean Digest, Feb. 1966, p. 52-53. [Jap]*

5147. Watanabe, Tokuji; Teramachi, Yayoi; Fukamachi, T.; Nakayama, Osamu. 1965. [Process for production of soybean protein food]. *Japanese Patent* 439230. Feb. 8. [Jap]*
Address: National Food Research Inst., Tokyo.

5148. Ebine, Hideo; Shimokawa, Katsuyoshi; Katayanagi, Teruko. 1965. Sodium aluminum chloride no miso henshoku bôshi kôka [Application of sodium-aluminum chloride as anti-browning reagent of miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 19. p. 154-55. March. [2 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5149. Ebine, Hideo; Shimokawa, Katsuyoshi; Katayanagi, Teruko. 1965. Tokoferôru no miso henshoku bôshi kôka [Application of tocopherols as anti-browning reagent of miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 19. p. 151-53. March. [7 ref. Jap; eng]
• ***Summary:*** Tocopherols (prepared from soybean oil foots as a by-product of soybean oil production) are very effective anti-browning agents. Moreover, their addition does not lower the overall quality of the miso. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5150. Ebine, Hideo; Hamazaki, Sakio. 1965. 5'-ribonukureochido no miso e no tenka [Improvement of the flavor of miso by 5'-ribonucleotides]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 19. p. 147-50. March. [12 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5151. Ito, Hiroshi; Ebine, Hideo; Nakano, Masahiro. 1965. Kôtanpaku teien miso. I. Seizô shori hôhô [High-protein, low-salt miso. I. Investigation of the manufacturing process]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 19. p. 127-36. March. [8 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5152. Ito, Hiroshi; Ebine, Hideo. 1965. Miso no nyûsan-kin

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no kenkyû. IV. Pediococcus group [Studies on lactic acid bacteria in miso. IV. On the Pediococcus group]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 19. p. 89-102. March. [20 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5153. Ito, Hiroshi; Ebine, Hideo. 1965. Miso no nyûsan-kin no kenkyû. V. Sanhai miso ni tsuite [Studies on lactic acid bacteria in miso. V. On the acidification by lactic acid bacteria]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 19. p. 103-09. March. [14 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5154. Ito, Hiroshi; Ebine, H.; Esuka, Katsuki; Togano, Yasunori. 1965. Miso no nyûsan-kin no kenkyû. VI. Kansô nyûsan-kin oyobi kôbo o fukumu tane kôji ni yoru miso no jôzô shiken [Studies on lactic acid bacteria in miso. VI. Miso manufacturing employing "tane koji" (koji starter) including freeze-dried *Pediococcus soyae* and *Streptococcus faecalis*]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 19. p. 110-20. March. [10 ref. Jap; eng]
• ***Summary:*** Note: This is the earliest document seen (Jan. 2009) which mentions that *Streptococcus* bacteria are involved in the miso fermentation. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5155. Ito, Hiroshi; Ebine, Hideo. 1965. Miso no nyûsan-kin no kenkyû. VII. Aruginin no bunkai [Studies on lactic acid bacteria in miso. VII. Hydrolysis of argenine]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 19. p. 121-26. March. [13 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5156. Ito, Hiroshi; Ebine, Hideo; Ramachandra Rao, T.N. 1965. [Manufacturing miso that is high in protein or low in salt. I. Investigation of the manufacturing process]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 19. p. 137-40. March. [1 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan; 2. Central Food Technological Institute (CFTRI), Mysore, India.

5157. Mogi, Masatoshi; Iguchi, N. 1965. Showa 39 nendo no shôyu, miso no kenkyû gyôseki [Accomplishments of shoyu and miso research during 1964 (Including HVP semi-fermented soy sauce and other related substances)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 60(3):218-39. March. [440 ref. Jap]
Address: Noda Sangyo Kagaku Kenkyusho.

5158. Nakayama, Osamu; Teramachi, Yayoi; Watanabe, Tokuji. 1965. Fukuro-dôfu yo gyôkozai toshite no gurukono deruta rakuton ni tsuite [Glucono delta-lactone as a coagulant of packaged lactone silken tofu]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 12(3):81-84. [3 ref. Jap]
Address: 1. Fujisawa Yakuhin Kogyo K.K., Chuo-Kenkyusho; 3. Norinsho Shokuryo Kenkyusho, Tokyo-to, Koto-ku, Edogawa Hamazono-cho 2, Japan.

5159. Ohsawa, George. 1965. Zen macrobiotics: The art of rejuvenation and longevity. Revised, edited and annotated by Lou Oles. Los Angeles, California: Ohsawa Foundation, Inc., The Ignoramus Press iii + 120 p. No index. 22 cm. Series: The Philosophy of Oriental Medicine, Vol. 1. [20 ref]
• ***Summary:*** This is probably the 3rd English-language edition of *Zen Macrobiotics.* The 1st edition was published in Nov. 1960 in New York. Address: Los Angeles, California.

5160. Ohta, Teruo; Kamada, Hidemoto; Ebine, Hideo; Ramachandra Rao, T.N. 1965. Indo-san mame rui o genryô to suru hakkô shokuhin no seizô. II. Teishokuen miso no seizô [Manufacturing fermented foods from Indian pulses. II. Manufacturing low-salt miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 19. p. 141-46. March. [5 ref. Jap; eng]
• ***Summary:*** Seven varieties of Indian pulses were tested; Bengal gram gave the best low-salt miso. All pulses must be dehulled. The ratio of dehulled pulses to rice (which was made into koji) was 2 to 1. Address: 1-3. Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan; 4. Central Food Technological Research Inst., Mysore-2, India.

5161. *Soybean Blue Book.* 1965. Japanese American Soybean Institute. p. 10.
• ***Summary:*** Gives the address, name of the managing director, structure, sources of funding, purpose and goals, and major accomplishments in chronological order. The institute was formed in early 1956.

1963–"The Institute arranged for the testing of 27 U.S. soybean varieties for their suitability for production of tofu and miso by the respective associations."

5162. Watanabe, Tokuji; Nakayama, O.; Iwasaki, M. 1965. Daizu tanpakushitsu no chûshutsu ni taisuru pH no eikyô ni tsuite [Effect of pH on the extraction of soybean protein]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 19. p. 279-83. March. Reprinted from Nippon Shokuhin Kogyo Gakkaishi 10(1):504-07 (1964). [4 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

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5163. Abbott, J.C. 1965. Protein rich foods from oilseeds: Economic aspects. *P.A.G. News Bulletin* (*Protein Advisory Group, WHO / FAO / UNICEF*) No. 5. p. 19-38. April. [15 ref]

• ***Summary:*** Table 1 lists annual consumption (in metric tons) of oilseed protein foods in some main consuming areas. Column 1: Miso, tofu, tempeh and other fermented or cooked soybean products: Mainland China 3,736,000. Japan 2,536,000. Indonesia 200,000. South Korea 160,000. Taiwan 153,000. Hong Kong 15,000. Malaya 15,000. Singapore 15,000.

Column 2: Soy milks: Singapore and Malaya 1,300 metric tons, Hong Kong 1,000.

Note: This is the earliest document seen (Aug. 2013) that contains industry or market statistics for soymilk by geographical region. Address: Chief, Marketing Branch, FAO Headquarters, Rome, Italy.

5164. Hayashi, Shizuka. 1965. How JASI promotes soybeans. *Soybean Digest.* May. p. 64.

• ***Summary:*** "As our various promotional activities have progressed since 1956 we have become aware of the fact that Japan urgently needs oils and fats–more than double the quantity we now consume–and that this need can be ideally met by soybean oil. In the present-day dietetics where balanced nutrition is called for, what is required in Japan is balancing the diet by increasing the level of fats and oils.

"The development of the soybean market in Japan can be most efficiently achieved by increasing the intake of oil by the Japanese people. I believe that JASI has not made a mistake in concentrating its activities largely in programs promoting soybean oil. I have repeatedly pointed out that if the Japanese people consume 1 gram of oil more per capita per day this means 35,000 tons of soybean oil or 200,000 tons of soybeans yearly. Based on 76 grams, which from the nutritional standpoint is the minimum amount of fats Japanese people should take per day, they are now short at least 40 grams of oil a day. In terms of soybean oil, this means 1,400,000 tons or the oil from 290 million bushels of soybeans yearly. This quantity must be imported if not produced in Japan." Address: Managing Director, Japanese American Soybean Inst., Nikkatsu International Building, No. 1, 1-Chome, Yuraku-cho, Chiyoda-ku, Tokyo, Japan.

5165. Jones, Dorothea Van Gundy. 1965. Nutritionist Jones praises low-fat foods of Japan: To Tokyo for tofu. *Today's Food* (*Loma Linda Foods, Riverside, California*) 10(1):4-6. Spring.

• ***Summary:*** In the fall of 1964 Dorothea was invited by the American Soybean Association to travel to Tokyo, Japan, to participate in a soybean seminar and fair. It was held in August and sponsored jointly by the U.S. Government and the American Soybean Association. She also lectured and demonstrated the use of soybeans in human nutrition. This article describes the trip. Part of her time was taken up with television, radio, and newspaper interviews. Miss Kojima went along to interpret. On a side trip to rural Japan, they had the privilege to stay in a Japanese Inn. Photos show: (1) Nutritionist Dorothea Van Gundy Jones demonstrates Western cookery at a stove while Soybean Institute Vice-President Miss Kojima translates for the audience. (2) Ingredients for making sukiyaki (incl. Loma Linda Tender-Bits and Loma Linda Soy Sauce). (3) Dorothea Jones and her husband standing behind ace carvings at a banquet.

5166. Kitamura, Osamu. 1965. Soybean meal as feed in Japan. *Soybean Digest.* May. p. 46-47.

• ***Summary:*** As the use of soybean meal in feeding livestock and poultry is aimed at the utilization of its protein, there is naturally no need to use oilseed meals when protein sources of animal origin such as fish meal and meat scraps are low priced.

"However, in-shore fishing in Japan has decreased its catches gradually year by year, and many of the fish caught are now marketed as higher priced chilled and frozen fish without being processed into fish meal. This is a result of the rapid development of the cold storage and refrigerating industries at the fishing bases. Consequently, production of fish meal has declined year by year, and Japan now has to import fish meal, contrary to the former situation when it was exported.

"It was in about 1925 that the use of soybean meal began as a protein source in addition to fish meal. At that time Manchurian soybean meal was being imported and it was publicized that soybean meal was equally valuable as fish meal as a protein source. Use of soybean meal began gradually with the establishment of a special livestock experiment station to use it and the announcement of experimental data in newspapers and magazines.

"However, there were some commercial formula feeds which did not use soybean meal due to the defective amino acid composition of its protein or its lack of [sic] unidentifiable growth factors.

"Present soybean meal use: The feed industry in Japan has advanced rapidly along with the steady progress of dietetics. Studies in the physiological effects of amino acids and in the application of the energy theory have been conducted, accompanied by announcement of the experimental data. Thus notions about feeds have changed remarkably during the past 14 to 15 years. Exchange of scientific information with the countries of the world has also been carried out, bringing the Japanese nutritional studies with livestock and poultry up to the international level.

"Consequently, in the Japanese feed industry 20-odd major manufacturers are engaged in studies to develop efficient and economical feeds by establishing their own experiment stations, perfecting their laboratories, and increasing the number of first-rate scientists on their staff.

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These efforts are now bringing about significant results.

"The merits and demerits of soybean meal have been completely recognized due to various types of experiments conducted so far. Supplementation of methionine and lysine has already reached the practical stage, increasing the utility of soybean meal year after year. But it is a fact that there has been a recent tendency for its use to decrease sharply because of the price factor.

"The comparison of recent prices between soybean meal and fish meal on the basis of their protein content is as follows:" A small table shows that fish meal (from Peru) contains 65% protein and costs ¥57,000 per ton, or ¥877 per 1% protein. Soybean meal (Japanese 45% protein and costs ¥45,000 per ton, or ¥1000 per 1% protein).

"Thus, we must consider that soybean meal is higher priced on the basis of the unit of protein, and its amino acid composition is inferior. And in addition to the price factor, use of fish meal is more advantageous with respect to vitamin B-12, which the latter is said to contain. These factors seem to be responsible for the declining use of soybean meal by livestock feeders as well as feed manufacturers. When soybean meal was priced at the level of 30,000 yen a ton, there was a trend toward mixing a high level (around 15%) of soybean meal by sharply reducing the use of fish meal in formula feed. At present the level of soybean meal mixed is probably below 5% to 6%.

"When soybean meal was used in large quantities, the market price of methionine was brought into question. Accelerating domestic production of methionine and importation of low-priced methionine have been discussed, but these possibilities seem to have been forgotten since the price hike in soybean meal.

"Possibilities of soybean meal: Most domestically produced soybean meal is still untoasted. This is the major cause hampering the use of soybean meal. Therefore, if the Japanese crushers really want to expand the outlets for their soybean meal, they should install perfect toasting equipment and make an effort to lower its protein-unit price below the level of fish meal. Japanese feed manufacturers are now in a critical condition because of the sharp price hike of grains, bran, oilseed meals, animal protein sources and many other items. And Japanese poultry farmers, who are major consumers of feed, are also desperate because of the low price of eggs and the high feed price. It is the view of many people that if this situation continues for a half-year, it will ruin Japanese poultry farming–which has a total production of 166 billion yen, next largest to rice production–with the possibility of halving the consumption of feed. It should be recognized that the future of both feed uses of soybean meal and imports of feedstuffs looks quite dark. If the egg price this spring, when production increases, can maintain its present level without going down below 165 yen per Kg (net received by farmers), the poultry business is expected to be stabilized again.

"Japanese poultry industry: Until 2 or 3 years ago poultry raising was stabilized next to rice production in Japan and was entered into by farmers without hesitation. Japanese poultry farming has rapidly expanded into a large enterprise, turning from small flock feeding to large flock feeding. The nation's poultry production, which totaled 70 million birds until 6 or 7 years ago, sharply increased to 120 million birds in 1964. The egg price per Kg averaged 196 yen in 1958, 189 yen in 1961, and 204 yen in 1963, which was a paying basis. But the price entered a nationwide slump beginning with the sharp drop to the level of 130 yen per Kg registered in Kita-Kyushu City, July 1964. After a moderate pickup in early fall, the price again dropped to around 150 yen in October and November. It was feared that the price would go down below production costs this spring, but it suddenly took an upturn in early March to the delight of poultry farmers.

"Analysis indicates that the cost of feed is more than 66% of the production cost of eggs. Thus, if an egg is sold at 10 yen (180 yen per Kg), feed cost would be 6 yen to 7 yen per egg. Since last fall, manufacturers of formula feeds have been compelled to refrain from raising their sales prices despite the sharp rise of feedstuff prices due to the depression of poultry enterprises. The feed manufacturers continued this attitude for about a half year at the risk of red ink, but in January they were finally compelled to announce a price hike of 800 yen to 1,000 yen per ton because there was no prospect of price reduction either in grains or soybean meal and other oilseed meals.

"During 1964 poultry farmers were distressed by the low price of eggs on one hand, and on the other by the high price of feed, inevitably going into the red. Many poultry farmers went bankrupt, and closed their businesses. This reduced flocks drastically. Under present circumstances, many observers say that the number of chickens fed in 1965 will be reduced to 70 to 80 million birds, the scale of 2 or 3 years ago.

"When the number of chickens has been sharply reduced, sacrificing small growers as at present, it can be anticipated that the relation between egg production and its demand will again be unbalanced, incurring a marked rise in egg prices. Japanese farmers who have once experienced such a confused state will naturally deepen their impression that poultry farming is an extremely unstable enterprise. So it is considered hopeless for the time being that there will be another poultry boom.

"Though poultry farmers who have survived will have a time of prosperity, big blows will hit the new feed manufacturers who have started operations stimulated by the recent poultry boom and also old feed manufacturers who have expanded their facilities. It is feared that selling competition will become even more severe, eventually causing marketing of inferior products, and this will result in the loss of credit.

"This is a serious problem concerning not only soybean

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meal but also the entire feed industry in Japan." Address: PhD, Adviser to the Japanese American Soybean Institute.

5167. Miller, Harry W. 1965. Meeting the world's nutritional needs with soy milk. *Soybean Digest.* May. p. 19-21.
• ***Summary:*** In East Asia, milk is in short supply and expensive. A replacement made from soybeans has proved acceptable both tastewise and nutritionally. Moreover, animals are not an efficient means of producing protein. In East Asia, soybeans for food use have traditionally been soaked and then milled. Thus a "wet milling operation" is used instead of dry milling, as to make flour. "For adult use, they have built up a number of soy protein dishes, called 'meat without bones'. However they have not taken into consideration the nutritional needs of infants and growing children, and malnutrition is seen everywhere in these developing countries."

"In Japan, 30 pounds per capita of soybean are consumed as food but to provide soy milk for infants and children another 15 pounds per capita need to be added." For soy milk processing two systems are in use: the small community soy milk plant (the fresh milk may be dispensed from the conventional milk can without bottling, thus lowering the cost) and the large commercial bottling plant. "In Hong Kong, soy milk is made, bottled, and distributed everywhere in the colony for 3½ cents for a 7-ounce bottle. It has the largest sale of any bottled beverage in the colony... In Hong Kong are two factories of the most modern type, with upwards of 40 large delivery beverage trucks, under the genius and leadership of K.S. Lo, general manager. These plants daily manufacture some 25,000 cases each containing 24 bottles of soy milk [i.e. 600,000 bottles/day]. These are delivered to hospitals and schools, and this milk is on sale at all beverage places..." In Singapore, in Bangkok, Thailand, and in Manila, Philippines, soy milk is also made and well accepted. In Formosa, where 2-3 years ago there was only one soy milk plant in Taipei, today more than a dozen rural pilot plants have sprung up all over the country.

Photos show: (1) A bottling machine at a soy milk plant in Hong Kong. (2) Boy scouts in Hong Kong drinking bottled soy milk. Address: M.D., Director Emeritus, International Nutrition Research Foundation, Arlington, California.

5168. Nakamura, Hiroshi. 1965. Market for soybean oil and other edible fats and oils in Japan. *Soybean Digest.* May. p. 44-45.
• ***Summary:*** "In Japan practically all of the refined soybean oil produced is consumed in the liquid form either as cooking oil or salad oil. Very little soybean oil is used in the manufacture of shortening, margarine, or other edible oil products. This basic pattern of consumption has not changed much in the past few years in spite of the rapid increase in the production and utilization of soybean oil in the Japanese market.

"The major liquid edible oils consumed in Japan are shown in table 1. It must be pointed out that all these oils are produced from imported oilseeds, the only exceptions being rice bran oil and about half of rapeseed oil production. The table indicates that total consumption has been rising rapidly but that the consumption of safflowerseed [safflower seed] oil has increased most relative to other oils. This is due partly to the higher prices of U.S. soybeans in 1963 and 1964, and also to the lower import duty of 5% ad valorem on safflowerseed as compared with the import duty on soybeans. The duty on soybeans is the lower of either 13% ad valorem or a specific duty of 4,800 yen ($13.33) per metric ton. The table also shows that the consumption of rapeseed oil has tended to decline in the past few years. This tendency results from the decreasing domestic production of rapeseed.

"Roughly 75% of cottonseed oil consumed in Japan is used for the manufacture of mayonnaise and the rest is used in the liquid form for fish canning and other edible purposes. Rice bran oil and sesame oil are both consumed as cooking oil or salad oil.

"Per capita consumption: The per capita annual consumption of soybean oil has increased at a rate of 15% per annum in the recent 5-year period from 1959 to 1963, while that of rapeseed oil has declined considerably during the same period (table 2). The per capita consumption of other edible fats and oils has increased faster than soybean oil. Along with the westernization of modes of living the dietary habits of the Japanese people have been changing in recent years resulting in increasing consumption of livestock products and fats and oils. The rising income of consumers and the relatively stable consumer price level in the past have certainly promoted and permitted consumer preference for better quality foods.

"The consumption data of edible vegetable oils in the past decade indicate an income elasticity of demand of +1.4. This means that in the past 10 years the consumption of edible oils in Japan has increased on the average of a rate 1.4 times faster than the rate of increase of consumer income. The question now is the prospect for future consumption. The real income of Japanese consumers is expected to rise steadily in the next few years at an annual rate of 6% to 7%. But will the consumption of edible oils keep on rising at a still faster rate as in the past?

"The annual per capita consumption of edible fats and oils in Japan is still only one-third the level of U.S. consumption. Of course, the dietary habits of the two countries differ greatly and the Japanese types of food do not provide as much fats and oils as the American types of food contain. We do not expect, therefore, that the level of per capita consumption of fats and oils in Japan will rise to the high level of U.S. consumers even in the long run. However, we can reasonably anticipate that as the consumer income continues to rise in Japan the consumption of edible fats and

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oils will also continue to increase at a rate about equal to that of the rise in income for a few years to come.

"Future potential and problems: The aggregate consumption of soybean oil and other edible fats and oils in Japan depends on the size of the population and the annual per capita consumption. The population of Japan, as shown in table 1, increases by about 1% per annum, but annual per capita consumption tends to increase by 10% or a little more. In the next 10 years these two factors will remain basically unchanged, except that the rate of increase of per capita consumption will decline as the absolute level of consumption gets higher. Nevertheless, it may be expected that the aggregate consumption of edible fats and oils in Japan will be doubled in the next 10 years. As the generations change from the old prewar people to the postwar children, the patterns of food consumption will tend to be further westernized with increased use of edible fats and oils.

"To meet such an increasing demand for edible fats and oils soybeans will be preferred as a suitable oilseed because of the very rapidly expanding market for soybean meal as an important ingredient in mixed feeds (table 3). As a matter of fact, the demand for high-protein oilseed meals has been increasing at a much greater rate than fats and oils consumption. Consumer preference for livestock products continues to be very strong and this will be reflected in ever-increasing demand for mixed feeds by livestock farmers. Under these circumstances, of the two products of the oilseed crushing industry, oil tends to be in surplus in relation to oilseed meal. Therefore, an oilseed with a lower level of oil content but higher in protein is preferable and soybeans can best meet such requirements as compared with other oilseeds.

Thus, the Japanese oilseed processing industry will increasingly depend on soybeans as its main raw material, although the current high level of import duty on soybeans certainly has an adverse effect on such a trend and permits other less favored oilseeds to be processed in Japan. The same is true of the prospect for the future potential of soybean oil consumption in the Japanese market, since the high import duty on soybeans is reflected in the prices of soybean oil relative to those of competing fats and oils.

Photos show: (1) An aerial view of the Shimizu crushing plant of Hohnen Oil Co. with a tanker berthed at the dock. (2) A small portrait photo of Hiroshi Nakamura.

Tables show: (1) Domestic consumption of major edible vegetable oils, 1960-1964 (crude oil basis). In 1964, soybean oil accounted for 45.8% of edible oil consumption in Japan, followed by rapeseed oil (17.2%), safflower oil (15.8%). rice bran oil (10.1%), cottonseed oil (9.4%), and sesame oil (1.7%).

(2) Per capita annual consumption of edible fats and oils in Japan, 1959-63 (crude oil basis; fiscal year starting April 1).

Per capita consumption of soybean oil increased from 2.43 lb in 1959 to 4.78 lb in 1966.

Per capita consumption of rapeseed oil decreased from 2.67 lb in 1959 to 1.60 lb in 1966.

Total per capita consumption of all oils and fats in Japan increased from 9.15 lb in 1959 to 14.19 lb in 1966 (a 55% increase).

Japan's population increased from 92,640,000 1959 to 96,160,000 in 1966. Source: Compiled from official statistics.

(3) Annual consumption of soybean meal for mixed feeds in Japan, 1959-1963 (metric tons). Soybean meal increased from 84,234 metric tons in 1959 to 402,220 metric tons in 1963. All other raw materials in mixed feed increased from 1,661,488 metric tons in 1959 to 5,654,537 metric tons in 1963. Source: Feedstuffs Section, Ministry of Agriculture and Forestry. Address: Asst. Manager, Business Dep., Hohnen Oil Co., Ltd., Tokyo.

5169. Sano, S. 1965. [Production of a dry fermented soybean paste]. *Japanese Patent* 11,358. June 7. 2 p. [Jap]*

5170. Fukushima, D. 1965. Internal structure of soybean protein molecule (11S protein) in aqueous solution. *J. of Biochemistry* (*Tokyo*) 57(6):822. June. [6 ref]
• ***Summary:*** Although many investigations of soybean proteins have been conducted, our knowledge of the internal structure (i.e., conformation) of soy protein molecules is rudimentary. The writer measured the optical rotary dispersion of the cold insoluble fraction (CIF), which is one of the major components of soybean proteins. He found that this fraction was electrophoretically homogeneous and that more than 90% was composed of 11S protein and its -S.S- polymer. Address: Central Research Lab., Kikkoman Shoyu Co. Ltd., Noda-shi, Chiba-ken.

5171. Namba, Haruyuki. 1965. [Studies on heat-denatured soybean protein. I. Digestion of protein in autoclaved soybean flour by Taka-diastase]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 12(6):226-29. [7 ref. Jap]
Address: Shimane Prefectural Industrial Research Lab. (Shimane-ken Kôgyô Shikenjô), Koshihara-chô, Matsue-shi.

5172. Namba, Haruyuki. 1965. [Studies on heat-denatured soybean protein. II. On the autoclaving conditions that influence the heat-denatured protein of defatted soybean flour]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 12(6):230-34. [7 ref. Jap]
Address: Shimane Prefectural Industrial Research Lab. (Shimane-ken Kôgyô Shikenjô), Koshihara-chô, Matsue-shi.

5173. *Soybean Digest.* 1965. Research leads to a new food market for soybeans. June. p. 16.

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• ***Summary:*** "Acceptance of U.S. soybeans in traditional foods of Japan is growing as U.S. exporters and Japanese processors apply results of research, the U.S. Department of Agriculture reports.

"More than 10% of the nearly 49 million bushels exported to Japan during the 1963 market year went into production of three staple foods in the Japanese diet. These are shoyu, or soy sauce; tofu, a soft, white gelatin-like food used in soup or for frying; and miso, a food paste used in soup.

"Until about 6 years ago, Japan imported no soybeans from the United States for use in making these foods–all U.S. imports were processed into oil and meal.

"Reinforcing this new Japanese food market is a new export industry in the United States–selecting soybean varieties for Oriental food processing and maintaining the identity of the selections during shipment.

"These developments are the direct result of research by USDA's Agricultural Research Service and Japanese institutions working under grants from ARS. The work was begun in 1957 at the Northern Utilization Research Laboratory, Peoria, Illinois, when ARS scientists, with the cooperation of two Japanese scientists on leave from their institutions, set out to find differences between U.S. and Japanese soybeans that might explain why Japanese food processors preferred domestically grown beans. Later, companion studies were initiated in Japan–by the Japan Shoyu Research Institute, the Japan Tofu Association, the Food Research Institute, and the Central Miso Institute. The American Soybean Association, through its operating arm in Tokyo, the Japanese American Soybean Institute, was active in initiating the project.

"These studies show that:

"1–U.S.-grown soybeans can be used to make traditional Japanese foods equal in quality to food made from Japanese beans.

"2–U.S. No. 2 beans–the most commonly available commercial grade–yield more shoyu than Japanese beans selected for shoyu production.

"3–Hawkeye variety is the best of 12 varieties tested for making tofu.

"4–Comet, Yelnanda, and Harosoy varieties are best for making miso.

"5–Characteristics required in soybeans for Oriental foods can be used as a basis for selecting and breeding U.S. varieties for this purpose.

"The Peoria scientists demonstrated for the first time that high-quality miso and tofu can be made from U.S. soybeans. The miso processing time was shortened by cracking the beans and removing the seedcoats. This dehulling reduces soaking and cooking time and increases protein content and uniformity of the finished miso.

"The Japanese scientists have found (1) that lower production costs and higher yields of shoyu make U.S. soybeans more profitable in Japan than domestically grown beans; (2) that Chippewa and CNS-4 varieties rank next to Hawkeye in tofu yields and quality and that a high protein content is essential to high tofu quality; and (3) that miso color is affected by cooking time before fermentation is started–better color is produced by shorter cooking.

"A laboratory test of soybeans for tofu production, now being developed, will be made available to U.S. plant breeders for screening and improving varieties for the export market.

"The grants to Japan, awarded under Public Law 480, were financed with foreign currency obtained by the United States from the sale of farm products abroad. This money cannot be converted into dollars for use in the United States, but a portion of it can be used to pay for foreign research that will benefit U.S. agriculture."

A photo shows: USDA scientists Dr. C.W. Hesseltine and Dr. A.K. Smith, and Japanese scientists Dr. Tokuji Watanabe and Dr. Kazuo Shibasaki (left to right). They started research in 1957 at the Northern Utilization Research Laboratory, Peoria, Illinois, on using U.S. soybeans in traditional Oriental Foods.

5174. *Yin Yang–The Unique Principle* (*Chico, California*). 1965. Miso. 5(6):8. June. [1 ref]

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• ***Summary:*** This magazine is the same as *The Macrobiotic Monthly* and *The Macrobiotic.* It started as *Macrobiotic News* in 1960 in New York. After being moved to Chico, California, it was renamed *Yin Yang.*

"Miso, a traditional... Contains a nutritional analysis of barley miso from S. Yamada's *Manual of the Fermented Food Industries of Japan* (1957, Tokyo. p. 44).

Miso has long been recommended as one of the basic elements of the Macrobiotic way of eating. Individuals who use it every day have found it remarkable in health-promoting qualities–a valuable aid in instances of general weakness, anemia and iron deficiency. "Miso is a mixture of soyabeans, barley, salt and water–cooked and then aged for at least eighteen months." Address: Ohsawa Foundation, P.O. Box 238, Chico, California.

5175. *Macrobiotic Monthly* (*The*) (*Chico, California*). 1965-1968. Serial/periodical. Ohsawa Foundation, Inc. Vol. V, No. 7 (June 1965) to Vol. VIII, No. 11 (Nov. 1968). Frequency: Irregular.
• ***Summary:*** Preceding title: Yin Yang: The Unifying Principle. Succeeding title: The Macrobiotic. Most issues are dated.

Place of publication varies: Vol. VI, No. 1 (June 1966) to Vol. VII, No. 4 (Oct. 1967) were published in Los Angeles, California–By Shane Oles.

5176. *Times* (*London*). 1965. Eating Japanese. July 26. p. 13, cols. 6-7.
• ***Summary:*** From a correspondent. Interest in things Japanese is waxing strong in Britain, "stimulated, perhaps, by last year's Tokyo Olympics. Several small shops selling solely Japanese goods have opened in London... On the subject of Japanese food, however, most people would confess their complete ignorance. In the whole of Britain there is not one restaurant specializing in Japanese meals, compared with thousands of Indian and Chinese establishments that have shot up since the war."

Contains 3 recipes. For sushi: "Brush each one lightly with *shoyu* (soy bean sauce), using a pastry brush." Mizutaki calls for 1 teaspoon of *shoyu* as an ingredient.

5177. Ebine, Hideo; Nakano, Masahiro; Kosaka, Shokichi. 1965. Daizu chiizu no seizô-hô [Process for manufacturing a soy cheese]. *Japanese Patent* 16,737. July 30. 2 p. [Jap]
• ***Summary:*** This pioneering Japanese-language patent (the world's third earliest patent related to a soy cheese) is widely miscited as Kenkyusho, C.M. 1965. The key steps in making this soy cheese are: Prepare soymilk, then add enough water soluble acid casein (milk protein) so that there are 25 to 35 parts by weight of casein per 100 parts of soymilk solids. To this "improved soymilk" add calcium chloride and lactic acid to reduce the pH to 5.4. Then add rennet and lactic acid starter which is extracted from miso. The soy protein will coagulate with the milk protein to form curds. Also add glucose at the level of 0.2% by weight of the soymilk to improve the curd formation.

Note: This is the earliest document seen (Oct. 2003) concerning a Western-style, nonfermented soy cheese. Address: National Food Research Inst., Tokyo.

5178. Thrapp, Dan L. 1965. Thousands owe lives to doctor's soybean "milk." Noted surgeon nutritionist, now 86, devised formula as missionary in 1925 [Dr. Harry Miller]. *Los Angeles Times.* July 31. p. 19. Saturday.
• ***Summary:*** "Starving babies, often cast out to die because the parents have no way to feed them, inspired Dr. Miller to undertake his research [on milk from soybeans 40 years ago]... Today in Hong Kong about 25,000 cases of 24 bottles in a case are delivered daily... In America, the use of soybean formula for infants is growing rapidly–at a rate of 15-20% a year. Dr Miller has seen plants to create his product rise in China, Japan, Formosa, the Philippines, Singapore, Thailand, and, of course, Hong Kong. 'The nutritional qualities of the soybean are a gift to the world,' he said, 'and I have not copyright.' He said that U.S. studies showed that 14% of the people here are allergic to some degree to cow's milk and 7% of new-born infants get severely ill from cow's milk formula. There is no allergy rate from soybean milk, he said... Since 1960 he has been in Hong Kong raising money for two hospitals." One served refuges from Red China. As a surgeon, he has performed more than 3,000 goiter operations during his lifetime. Address: Times religion editor.

5179. Aoki, Hiroshi. 1965. Daizu tanpakushitsu no geru keisei ni kansuru kenkyû. II. Geru keisei ni eikyô oyobosu 2, 3 no kihon-teki inshi ni tsuite [Studies on the gelation of soybean protein. II. On the fundamental factors affecting the gelation]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 39(7):270-76. July. [8 ref. Jap] Address: Yokohama Factory, Ajinomoto Co., Inc.

5180. Aoki, H. 1965. Daizu tanpakushitsu no geru keisei ni kansuru kenkyû. III. Arukari-en no eikyô ni tsuite [Studies on the gelation of soybean protein. III. On the effect of alkaline salts]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 39(7):277-85. July. [15 ref. Jap] Address: Yokohama Factory, Ajinomoto Co., Inc.

5181. Aso, Kazue. 1965. Dasshi daizu no eiyô-ka ni kansuru kenkyû: Toripushin inhibitaa no bunri to hatsuiku sogai sayô [Nutritional studies of soybean meals processed in different conditions. IV. Study of the trypsin inhibiting fractions]. *Nippon Chikusan Gakkaiho* (*Japanese J. of Zootechnical Science*) 36(7):252-59. July. [9 ref. Jap]
Address: Nihon Nosan Kogyo Co., Ltd., Research Center.

5182. De, Sasanka S. 1965. The present state of protein-rich

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food development in Asia and the Far East. *J. of Nutrition and Dietetics* (*India*) 2(3):166-76. July. [23 ref]
• ***Summary:*** Gives an excellent account of soymilk production in Asia during the mid-1960s and a brief history of the FAO/WHO/UNICEF/Protein-rich food program. "The First International Conference sponsored by FAO, WHO and Josiah Macy Jr. Foundation (New York) held in Jamaica in 1953, discussed the biological, technical and pathological aspects of protein malnutrition. The next Conference on 'Human protein requirements and their fulfillments in practice' held in Princeton in 1955 under the same sponsorship, gave detailed consideration to the testing of new protein rich foods before their use in child feeding was recommended.

"The Protein Advisory Group (PAG) was established by the Director-General of WHO in 1955 to 'act on behalf of WHO in rendering advice to FAO and UNICEF on the safety and suitability for human consumption of proposed new protein-rich foods.' The PAG... became a tripartite FAO/WHO/UNICEF Protein Advisory Group in 1961."

Soybean milk: "In 1939, K.S. Lo established a firm known as 'Hong Kong Soyabean Products' to produce sterilized bottled soya milk. The two plants of the firm in Hong Kong produce 12,000 cases (24 x 7-oz. bottles per case) a day."

Also discusses miso, natto, tempeh, full-fat soya flour, soya presscake and meal, groundnut protein isolate. Address: Regional Office for Asia and Far East, FAO, Bangkok, Thailand.

5183. Kamada, H.; Ebine, H.; Nakano, M. 1965. Nattô to miso genryo toshite no daizu hinshitsu no hantei-hô [Evaluation method of the quality of soybean employed for natto and miso manufacturing]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 60(7):620-23. July. [8 ref. Jap]
Address: 1. Karepisu [Calpis] Shokuhin Kenkyujo.

5184. Kawashima, Masao. 1965. Kôri-dôfu seizô ni okeru daizu seibun no riyô ritsu [Utilization of soybean constituents in the manufacture of dried-frozen tofu]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 12(7):291-94. [10 ref. Jap]
Address: Habutae Tofu K.K. Kikaku, Kagaku Kenkyu Shitsu, Ishikawa-ken, Kanazawa-shi, Nishi Kanazawa-cho 1-145, Japan.

5185. Kushi, Michio; Fulton, Robert E.; Blum, Cecil. eds. 1965. Macrobiotics study report: The way of life according to the order of the universe. Vol. 1. Cambridge, Massachusetts. East-West Institute. 41 p. 27 cm. [4 ref]
• ***Summary:*** Contents: Seven principles of the order of the universe. Twelve theorems of the unifying principle (both-inside front cover). Editorial, by the 3 editors. Cigarettes and cancer, by George Ohsawa (age 73), founder, world macrobiotic movement [Conclusion: smoking cures cancer]. The new discovery of the transmutation of the atom, by Michio Kushi, Director, East West Institute [he has given numerous lectures for the past 8 years in New York, Boston, Philadelphia [Pennsylvania], and Washington, DC; discusses Louis Kervran and Sanehide Komaki]. My conclusions in biological research, by Kikuo Chishima, M.D., Prof., Gifu Univ., Japan. Thoughts of man, by Michio Kushi. Love, by George Ohsawa.

What is macrobiotics?, by Roger E. Fulton, Cambridge, Massachusetts. Order of the macrobiotic diet (from No. 7 to No. -3). One week's menu (No. 7) for health and happiness, by Aveline Kushi (p. 29-30); includes miso soup, azuki beans, bulgur with tahini sauce, and sesame rice. Sakura meshi (rice with tamari). "1. Grain: Brown rice, whole wheat, buckwheat,... azuki beans. "2. Seasoning: Sea salt, tamari (soy sauce), miso (soy bean paste), gomashio (roasted sea salt and sesame seeds mixed), kuzu, umeboshi (salted plums), sesame oil, corn oil. 3. Beverage: Grain coffee, bancha tea, mu tea, dandelion tea, etc." Note 1. This is a vegan menu. Note 2. This is the earliest English-language document seen (Dec. 2006) that uses the term "salted plums" to refer umeboshi salt plums.

EWI news (a chronology of events from Sept. 1964 to the present). Miraculous events [and cures]. Leprosy cured in Argentina. Testimonials. Open letter to Dr. Frederick Stare, Harvard School of Public Health, by Simone Billaudeau. George Ohsawa's schedule (May to Aug. 1965). Literary contributions. Financial contribution and subscription. Announcement: 1965 Macrobiotic summer camp. Useful addresses: USA, Brazil, Argentina, Sweden, Belgium, France, Germany, England, Spain, Italy, India, Japan. Key CI = Centre Ignoramus. E = Editor. R = Restaurant. MC = Macrobiotic Camp. MF = Macrobiotic Foods. MFF = Macrobiotic Foods Factory. OC = Ohsawa Center. OF = Ohsawa Foundation. Classification of yin and yang (inside rear cover). Poem titled "Wind chimes" by Cecil Blum on rear cover (11 June 1965).

EWI News: 1964 Sept.–After the Macrobiotic Summer Camp on Martha's Vineyard, Michio Kushi and his family moved from the Island to Cambridge, Mass. For the previous year, Mr. Kushi's lectures were conducted almost every month in Boston at the Mattson Academy of Karate. George Ohsawa was also in Boston and Martha's Vineyard in 1964. In Sept. 1964, East-West Institute was incorporated as a non-profit educational establishment. Mr. David Levin and Mr. Ramsay Wood initiated it with several others. Address: East-West Institute, 101 Walden St., Cambridge, Massachusetts.

5186. Ohta, Teruo. 1965. Nyûfu [Fermented tofu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 60(7):588-91. July; 60(8):695-99. Aug. [3 ref. Jap]
• ***Summary:*** This is the earliest document seen that mentions

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Yamazaki, who found the earliest reference to fermented tofu in China. Address: Norinsho Shokuhin Sogo Kenkyujo.

5187. *Foreign Agriculture.* 1965. Who grows, sells, and buys the world's soybean crop. 3(31):6-7, 16. Aug. 2.
• ***Summary:*** World soybean production and trade were at an all-time high last year. U.S. remains principal supplier, Japan and West Germany big buyers.

5188. *Christian Science Monitor.* 1965. Just cook it all at table. Aug. 19. p. 6.
• ***Summary:*** Gives recipes for Sukiyaki and for rice. Sukiyaki calls for: "1 tofu (optional) (This is a bean curd made fresh daily of soya). 1 cup shoyu sauce."

5189. Mizunoe, Seiryo. Nihon Koyu Kogyo Company. 1965. Daizu-ko o genryô to suru chiizu-ruiji shokuhin seizô-hô [Production of cheese analog using soy flour]. *Japanese Patent* 21,230. Sept. 20. Application filed 17 Sept. 1964. [Jap]

5190. Dodson, J.C. 1965. U.S. soybeans in the economy of Japan. *Soybean Digest.* Sept. p. 27-28.
• ***Summary:*** Three broad elements have an important bearing on how well we do in maximizing our sales of soybeans to Japan: (1) the state of the Japanese economy, (2) the present market situation for soybeans, and (3) the ASA-USDA market development program. He discusses each of these in detail.

There is presently a recession in Japan, a normal part of the business cycle. Yet the "Japanese economy has great underlying strength and is basically sound. The foreign trade balance is good, foreign exchange reserves remain at a high level, consumer expenditures are holding up well, and there is virtually no unemployment. The current problems are temporary."

"Japan's domestic production of soybeans is on a steady downtrend, as the planted area declines each year. On the other hand, requirements for soybeans for food and feed are going up. This obviously means an increasing reliance on imports.

"The competition for the Japanese soybean market is between the United States and Communist China. If quality is maintained and if the price relationships are satisfactory, the Japanese processors prefer to buy from the United States because of the reliability of supplies and their preference for the free market mechanism. Purchases from Communist China tend to be hampered by political considerations and arbitrary pricing.

"At the same time, there are strong pressures in Japan for expansion of trade with Communist China to provide an outlet for more of Japan's products. Not too many products which Japan can use are available from China. Soybeans are one commodity in ready demand."

"Consumption of the traditional Japanese soybean foods–miso, tofu, and shoyu–has leveled off, and may begin to decline as the shift in diet [toward a Western diet] continues." Address: Former Agricultural Attache, U.S. Embassy, Tokyo.

5191. Fujimaki, Masao; Arai, S.; Kirigaya, N.; Sakurai, Y. 1965. Studies on flavor components in soybean. I. Aliphatic carbonyl compounds. *Agricultural and Biological Chemistry* 29(9):855-63. Sept. [13 ref]
• ***Summary:*** n-Hexanal is likely to be one of the main components of green bean flavor in soybeans. Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Tokyo, Japan.

5192. Grow, Howard E. 1965. The ASA program in Japan. *Soybean Digest.* Sept. p. 29-30.
• ***Summary:*** "The market development program in Japan has been in operation for over 9 years. We have learned many things in those 9 years. In the beginning, major emphasis was on improved human nutrition. Now we are at a stage where we need to concentrate our efforts in the areas which today offer the greatest potential for increased use of U.S. soybeans. The two areas most likely to expand are soybean meal in livestock and poultry feeds and increased consumption of soybean oil in the human diet."

An edible oil survey will be conducted: An analysis of the results should point out special opportunities that could lead to increased edible oil consumption and to main factors that seem likely to influence significant future trends in markets. The report will make suggestions and recommendations for marketing strategy in the promotion and expansion of soybean oil in the Japanese diet."

"Oil consumption in Japan was 4.61 pounds per person annually when our American Soybean Association market development program started in 1956. It has increased to over 13 pounds now, but is far below the World Food Organization's recommendation of 30 pounds, or the 46 pounds consumed per person in the United States."

Also discusses: Visitors from Japan at ASA's 45th annual convention. Animal agriculture developing rapidly in Japan: 446,000 metric tons of soybean meal were used in feed during 1964.

"Feeding trials: Some feeding trials have been and are being carried out to demonstrate the economy and efficiency of soybean meal in comparison with other protein feeds. Recommendations for poultry and swine include more soybean meal as an increased source of protein. The results of these demonstrations are being reported to feed company representatives and poultry producers at meetings throughout Japan. The feed companies are interested and cooperative support is developing." Address: Asst. to the Executive Vice President, American Soybean Assoc., Hudson, Iowa.

5193. Hirano, Kiyoshi. 1965. Market for soybeans in the

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Japan oil industry. *Soybean Digest.* Sept. p. 31.
• ***Summary:*** "Quality is wanted: I now sincerely wish to all of my friends in the American soybean industry the betterment of quality which you export to us, and secondly a stable supply in all respects.

"First, the shipments we have been receiving from you still show considerable admixture and cause many problems. I would like to take this opportunity to ask you to consider supplying us on pure basis as has been customary for other oilseeds. I also draw your kind attention to shipping us good soybeans with higher oil and protein content.

"Second, erratic price swings and shipment irregularities also force us to try to be less dependent on American soybeans due to the risks involved during the rather long ocean voyage. I am concerned with the possible danger of the traditional share of American soybeans in our growing crushing industry being affected adversely due to these problems.

"However, I would like very much to see that you could continue to improve and stabilize the supply for us and remain as the largest supplier of soybeans in the World. I also wish your Association prosperous progress in its capacity to help us all in the soybean processing business."

A small portrait photo shows Kiyoshi Hirano. Address: President, Japan Oilseed Processors Assoc., Tokyo, Japan.

5194. Imaki, R.; Kashima, Y. 1965. Tôfu no mukisei-bun ni tsuite [Mineral constituents of tofu]. *Eiyogaku Zasshi* (*Japanese J. of Nutrition*) 23(4):83-88. Sept. [4 ref. Jap; eng]
• ***Summary:*** Tofu is rich in calcium. Address: Kanagawa Nutrition College.

5195. Koshiyama, Ikunori. 1965. Purification of the 7S component of soybean proteins. *Agricultural and Biological Chemistry* 29(9):885-87. Sept. [12 ref]
• ***Summary:*** Describes the earliest isolation, in 1965, of the 7S protein of soybean in its ultracentrifugally pure state. Address: Noda Inst. for Scientific Research, Noda City, Chiba-ken, Japan.

5196. Ohta, Teruo. 1965. Tenpe [Tempeh]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 60(9):778-83. Sept. [Jap]
Address: Norinsho Shokugo Kenkyujo, Tokyo.

5197. Pogeler, Glenn H. 1965. What the Soybean Council is doing for you. *Soybean Digest.* Sept. p. 38-40.
• ***Summary:*** "Just a few short years ago, Howard Roach had a dream and it was about Spain. His research showed that the per capita consumption of edible oils was pitifully low in that country. Because Spain was almost entirely dependent on the olive crop as a source of edible fat, she was finding her supply of fats for the population always at a low level. Because olives are a tree crop, the production is based on a cycle of on one year, and off the next. This makes a tremendous fluctuation in supply from year to year.

"Howard Roach convinced the Spanish government that a program of supplementing their olive oil supply with soybean oil would make it possible to increase the per capita consumption of oil for the benefit of all. This would also allow Spain to continue her normal exports of olive oil which were needed to produce foreign exchange to enable them to continue the industrial expansion of the nation.

"Spain negotiated a P.L. 480 agreement, and for several years bought soybean oil under P.L. 480 [using local currency, pesetas]. As her financial situation improved, she was able to switch to dollar purchases and today, Spain is the largest buyer of soybean oil from the United States."

"Iran is another example of a country which originally began by buying U.S. soybean oil under P.L. 480 and has now switched to dollar purchases. Iran, in the fiscal year ending 1960, took from the United States 11,000 metric tons of soybean oil and, just 5 years later, is expected to import 45,000 metric tons."

"India is our newest large buyer of soybean oil and last fall signed an agreement with the U.S. government to take in approximately 75,000 tons..." Other users of U.S. soybean oil this past season include Pakistan, Greece, Guinea, Iceland, Tunisia, Egypt, Sierra Leone, Yugoslavia, Chile, Taiwan and several others.

"Europe and Canada are the major dollar buyers of U.S.-produced soybean oil." Major buyers of U.S. soybeans are Japan, Netherlands, Canada, West Germany, Denmark and many other countries.

"Spain is building up a crushing industry and, by the end of 1965, is expected to be able to crush very close to 700,000 metric tons of oilseeds per year..."

Soybean exports will top 200 million bushels this year and are expected to continue to rise. "Latest government estimates indicate that approximately 2 million tons of soybean meal will find their way overseas from the 1964 crop of soybeans. This is another record breaker with France, Germany, Netherlands, Canada, Belgium, Yugoslavia, Italy, Denmark, and Spain being the major users.

There has been a tremendous expansion in the exports of U.S. soybeans and soybean products. The Soybean Council of America deserves part of the credit. "In my travels overseas, it seems as though everyone is talking about soybeans and soybean products."

Also discusses how the Soybean Council operates and is financed, its relationship to USDA's Foreign Agricultural Service, its overseas offices, some of its problems, and reasons for expanding the program. A portrait photo shows Glenn Pogeler. Address: President, Soybean Council of America, Inc.

5198. Dodson, Joseph C. 1965. U.S. official notes new trends in utilization of soybean in Japan, predicts rising demand.

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Foreign Agriculture 3(40):11. Oct. 4.
• ***Summary:*** Excerpts from a speech given at the annual convention of the American Soybean Association in Memphis. The soft spot in the potential magnitude of Japanese soybean consumption may well be the level of oil consumption. The level needs to be raised substantially. Address: Former U.S. Agricultural Attaché in Tokyo.

5199. *Foreign Agriculture.* 1965. Japanese soybean study. 3(42):12. Oct. 11.
• ***Summary:*** The Japan Shoyu Research Institute, Tokyo, will compare Japanese and U.S. soybean meals for making shoyu (soy sauce), under a grant awarded by the U.S. Dep. of Agriculture. Previous research at the Institute showed that whole soybeans from the United States yielded slightly higher quantities of shoyu than Japanese beans, and that the quality of shoyu was about equal. In recent years, defatted soybean meal has replaced whole beans as the foremost raw material for making soy sauce.

5200. Ohsawa, George. 1965. Zen macrobiotics: The art of rejuvenation and longevity. Revised, edited and annotated by Lou Oles and Shayne Oles Suehle. Los Angeles, California: Ohsawa Foundation, Inc. xiv + 128 p. No index. 17 cm. Series: The Philosophy of Oriental Medicine, Vol. 1. [20 ref]

• ***Summary:*** Note: This book was probably published after July 1970, even though the copyright date is 1965. This is probably the 4th English-language edition of *Zen Macrobiotics.* The 1st edition was published in Nov. 1960 in New York and the 2nd edition in 1965 in Los Angeles, revised by Lou Oles.

Note 1. Shayne's maiden name was apparently Shirley S. Federbush. The California marriage records state that she married Ferdinand E. Suehle on 24 July 1970. So this book was almost certainly published after their marriage date.

Note 2. The date on this book is too early, as explained by Carl Ferre (e-mail of 15 April 2011), president of the George Ohsawa Macrobiotic Foundation. "The libraries are going by copyright dates and do not correspond to when they were printed and made available to people. The second one was printed after Lou Oles had died, which was in 1967 if I recall correctly, and she had remarried! It should have had a new copyright date, but didn't.

"From the early magazines, it appears Lou and Shayne Oles moved to Los Angeles in December, 1965. He announced the move in the January 1966 issue of the magazine and there is nothing about an intended move in the November 1964 issue... Note also that they used 'Ignoramus Press' for some of their books." Address: Los Angeles, California.

5201. *Foreign Agriculture.* 1965. The export and promotion of U.S. oilseeds and oilseed products. 3(48):10-12. Nov. 29.
• ***Summary:*** "U.S. oilseeds and oilseed products have continued as the nation's top dollar export earner of all agricultural commodities in the past year–a firm member of the 'billion dollar club.' FY [fiscal year] 1965 was a record export year with $1.1 billion total trade up 30 percent over 1963-64 and over 90 percent represented dollar business... Most of the 'nondollar' exports were soybean and cottonseed oils that moved under Public Law 480."

The year 1964-65 was a record year for exports of soybeans and soybean products. Leading importers of U.S. soybeans (in million bushels) were Japan (48.4), Canada (33.9), Netherlands (26.9), and West Germany (22.4). Leading importers of U.S. soybean meal (in 1,000 tons) were France (358.4), West Germany (300.7), Canada (249.4), and Netherlands (245.2). Leading importers of U.S. soybean oil (in million lb; 2,204.6 lb = 1 metric ton) were Spain (239.5), Pakistan (195.2), India (137.0), Morocco (79.5), Iran (70.7), Greece (54.7), Israel (42.9), and Yugoslavia (41.7).

"In Japan, one of the largest U.S. markets, continued check sampling at the rate of 5-10% is being made on imports to insure that the same quality of beans purchased is actually shipped and that U.S. exporters are informed of low-quality shipments. The American Soybean Association, through the Japan Oilstuff Inspectors Corporation, points out specific shipments of low quality thus allowing ASA to back up requests for exporters to maintain grade standards.

"ASA sponsored trips of two teams of Japanese Soybean Crushing Association officials to the United States in 1965 (the larger team came at its own expense) to view U.S. soybean production, marketing, and shipping methods. Since then, Japanese crushers have had a better understanding of the dependable supply and quality of U.S. soybeans."

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5202. Grow, Howard E. 1965. Need 6 million bu. more soybeans: Japanese American Soybean Institute. *Soybean Digest.* Nov. p. 17.
• ***Summary:*** Japan has the fastest growing economy in the world. "The increased income is being used to purchase more food, such as animal products and fats and oils. Increased animal production requires more feed. The outlook for increased use of soybean meal is favorable and for 1965-66 the estimate is for 736,000 metric tons. This is up from 565,800 metric tons for the present year. After allowance for imports of soybean meal, there will be a need for Japan to import approximately 6 million bushels more soybeans than during 1964-65.

"Edible oil intake during the past few years has increased by more than 10% each year. The Japanese Food Agency forecasts an increase of only 2.7% during 1965-66. On this basis there will be more soybean oil produced in Japan than is expected to be used. An effective program must be developed that will stimulate increased oil intake, which is still at only about one-half the level recommended for proper nutrition.

"Imports from China: Japan will import about 300,000 metric tons or about 11 million bushels of soybeans from China this year. Expectations are that the volume will be about the same in 1966. Chinese soybeans contain less foreign material, are about 2% lower in oil content than U.S. soybeans. Chinese beans can be purchased for about $7 per ton less than U.S. beans, because of the lower oil content. Chinese beans also have the advantage of a shorter time in delivery and fewer split beans. The Chinese government determines the volume of soybeans to be exported and there isn't much we can do about it. Some food manufacturers in Japan use Chinese soybeans..."

"There will be a further shrinkage of soybeans in native foods as more western-type foods are consumed. There will continue to be activity in the promotion of the native foods, but major emphasis for market development activities will be in soybean meal and soybean oil." Address: Asst. to the Executive Vice President, American Soybean Assoc.

5203. Matsumura, T.; et al. 1965. Allergy to soybean in childhood in Japan. Presented at the First International Symposium on Pediatric Allergy. Held 5-6 Nov. 1965 at Tokyo, Japan. *

5204. *Soybean Digest.* 1965. Japanese soybean processors make tour of U.S. industry. Nov. p. 18.
• ***Summary:*** "A group of executives representing Japan's major producers of soybean oil and the editor of a Tokyo newspaper made a 15-day U.S. tour in October–the first for top-level Japanese oil manufacturers. Representing processors who spend about $125 million for 50 million bushels of U.S. soybeans annually, the team visited major soybean-producing areas, processing plants, and oil refineries." The tour was arranged by the American Soybean Association. Many organizations had representatives, including Showa Sangyo Co. Ltd., Nisshin Oil Mills, Ltd., Japanese Oil Processors Association, Tokyo Fats and Oils Co., Ltd., Asahi Yushi Co., Ltd., Hohnen Oil Co., Ltd. (M. Sugiyama), Yoshiwara Oil Mill, Ltd., Yokkaichi Oil & Fat Co., Ltd., and Oils and Fats Press Co., Tokyo.

5205. Murata, Kiku. 1965. Annual report of research conducted under grants authorized by PL-480. Project title: Nutritional value of tempeh. Osaka, Japan. 15 p. Grant Number: FG-Ja-110; A11-HN-1.
• ***Summary:*** Dates of research period covered by report: 14 Oct. 1964 to 31 Oct. 1965. Includes 3 tables and 4 graphs. Introduction: "It is significant to study the nutritional value of tempeh in detail from various points of view, not only to study the biologically active substances but also to find changes in content of nutrients of tempeh during the fermentation of soybeans."

Summary: Hemolysis-preventing and antioxidant activities were detected in tempeh but not in boiled unfermented soybeans. Among the biologically active substances isolated from tempeh, it was found that the isoflavone 6,7,4'-trihydroxyisoflavone, which was originally isolated from tempeh but never isolated previously from natural foods, was most active in preventing in vitro dialuric acid-induced hemolysis of red blood cells. The content of riboflavin and nicotinic acid increase significantly during tempeh fermentation.

Note: This is the earliest document seen that contains the term "biologically active substances." By the early 1990s these substances were renamed "phytochemicals." Address: Food and Nutrition Lab., Faculty of Science of Living, Osaka City Univ., Nishi-ku, Osaka, Japan.

5206. Fukushima, D.; Arai, A. Assignors to Kikkoman Shoyu K.K. 1965. Daizu o genryô to shita kabi-chiizu no seizô-hô [Process for making a mold-fermented cheese from soybeans]. *Japanese Patent* 21,228. 2 p. Application filed 19 June 1964. [Jap]
Address: Kikkoman.

5207. Murata, Kiku. 1965. Nutritional value of tempeh. Annual Report of Research Conducted Under Grants Authorized by PL-480. Grant No. FG-Ja-110; All-NH-1. 15 p. *

5208. Shibamoto, G. 1965. [Experimental studies on the nutritive effect of natto. III]. *Tokyo Ika Daigaku Zasshi* (*J. of Tokyo Medical College*) 23:367-70. [Jap]*

5209. [Report on the present status of the miso industry]. 1965. Norinsho (Japanese Ministry of Agriculture and

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Forestry). [Jap]*

5210. [Report on the present status of the shoyu industry]. 1965. Norinsho (Japanese Ministry of Agriculture and Forestry). [Jap]*

5211. Arimoto, Kinitaro; Sakurai, Yoshito. 1965. Food and nutrition in Japan. In: Martin S. Peterson and Donald K. Tressler, eds. 1965. Food Technology the World Over. Vol. II. South America, Africa and the Middle East, Asia. Westport, Connecticut: AVI Publishing Co., Inc. ix + 414 p. See p. 359-94. Illust. Index. 24 cm. [13 ref]

• ***Summary:*** This chapter, after the Introduction, is divided into two parts: 1, titled "Nutrition (p. 360-74)" by Arimoto, and 2, titled "Food technology" (p. 374-94)" by Yosito [Yoshito] Sakurai. In Part 1, table 110, "Food supply in Japan" includes average statistics on soybeans, miso, and shoyu in kg/year and gm/day for 1944-1948, 1961, and 1961. in kg/year for the three periods: Soybeans: 3.5, 5.4, and 5.0. Miso: 10.6, 8.1, and 7.7. Shoyu: 15.9, 13.0, and 11.1. Source: Ministry of Agriculture and Forestry, Balance Sheets. Surprisingly, supplies were greater for each during and immediately after World War II than in the early 1960s.

Table 116, "Intake of foods classified into food groups and type of work (gm per capita per day), 1963" gives statistics for the entire nation, agricultural households, and non-agricultural households, as follows: Soybeans: 1.3, 1.7, 1.0. Miso: 25.1, 30.1, 22.5. Soybean products: 37.3, 29.9, 41.5. Seaweeds: 4.6, 4.2, 4.7. Shoyu: 26.2, 30.0, 23.6. Soybean products as a source of high quality protein are discussed (p. 366).

Part 2 begins with a section on "Rice" (p. 374-77) which notes that rice supplies half the calories in the Japanese diet. Japan produces all of the rice it needs–about 13 million tons. Imported rice (about 150,000 tons) is used only as a raw material in confections and miso. Japan imports most of its soybean from the USA and China, and these soybeans are processed by characteristically Japanese methods to make tofu, miso, and shoyu (p. 377).

Animal husbandry is not widely practiced in Japan, largely because the land is hilly with few grazing lands. Thus most beef, pork, and chicken are imported. The production of cow's milk is gradually increasing; it is now 27 million hectoliters.

Packaging of foods has changed greatly during the past decade. Packaged foods are now common. Shoyu and miso, once sold by the measure, are now sold in bottles and plastic bags, respectively. Table 128 (p. 378), titled "Supply of raw materials and food consumption of their products in 1959 (Japan)" shows the following for soybeans (in metric tons = tonnes). Soybeans–Domestic supply: 410,000 tonnes. Imports: 1,000,000 tonnes. Miso consumption: 850,000 tonnes. Shoyu: 1,280,000 tonnes. Tofu: 640,000 tonnes. Aburaage 170,000 tonnes. Natto 60,000 tonnes. Meat 330,000 tonnes. Fishery products: 6,170,000 tonnes.

The section titled "Soybeans" (p. 380-86) has the following contents: Introduction. Miso, shoyu, natto, tofu, koritofu (dried tofu) [dried-frozen tofu], yuba. Photos show: (1) Shoyu brewing in tanks in a large factory. (2) Pressing and washing of tofu in koritofu manufacture in a large, modern factory. (3) Aerial view of a large, modern plant for koritofu production. (4) The thawing operation in making koritofu. (5) The drying operation in making koritofu. Address: 1. PhD, Director, National Inst. of Nutrition, Tokyo, Japan; 2. PhD, Prof., Dep. of Agricultural Chemistry, Faculty of Agriculture, Tokyo Univ., Tokyo, Japan.

5212. Brandemuhl, William. 1965. Soybean utilization in Japan. San Francisco, California. xxii + 478 p. Unpublished manuscript. Illust. No index. 28 cm. [189 ref]

• ***Summary:*** A superb, in-depth, pioneering study, based on extensive original field research in Japan. It is carefully documented with hundreds of original interviews and published sources properly cited in two different lists of sources (numerical and alphabetical) Contains 30 tables and 190 excellent photos–including 7 of the author.

Table of contents: Preface. Notes. List of tables. List of figures. Map. Part I: Background. 1. The soybean: Birth and spread (legend, botanical inception, Nagata's theory of origin, spread to Japan and beyond, the American story).

Part II: Japan's production and supply of soybeans. 1. Japan the country and supply of domestic soybeans (Japan the country, domestic soybean production, planting and harvesting, marketing domestic soybean). 2. Importation of Red Chinese soybeans (background, mechanics, advantages, and prospects). 3. Importation of U.S. soybeans (history, method and mechanics of importation, the American shippers, concluding comments on importation). 4. Distribution (use in brief, super-wholesaler, wholesaler, retailer wholesaler, Japan's grain exchange).

Part III: Soybean utilization in Japan. 1. Utilization of soybeans for oil and meal (oil crushing history, soybean source, delivery of soybeans, the crushing industry, liberalization of soybean oil and meal, oil utilization in Japan, meal utilization in Japan). 2. Tofu (history, use of soybeans, manufacture, the tofu factory, marketing tofu products, recently developed tofu products, tofu as food, concluding comments). 3. Miso (importation, home production of miso, quantity of miso produced, soybean used for producing miso, kinds of miso, fermentation time, comparison of miso firms, manufacturing, packing and marketing, price, instant miso, use of miso, miso consumption outlook). 4. Shoyu (introduction, production and manufacturers, manufacture, raw materials, preparation of raw materials for natural shoyu, preparation of materials for chemical method shoyu, preparation of materials for mixed method shoyu, fermentation, filtering and pressing, sterilization, bottling, price, use of shoyu, miscellaneous

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shoyu products, concluding comments). 5. Natto (description, history, Daitokuji natto, the natto industry, consumption, natto soybeans, processing, making cost and price, marketing, use of natto, problems, new ideas and natto products). 6. Frozen tofu (history, development, frozen tofu soybeans, processing, freezing, defrosting, drying, treatment with ammonia and packing, marketing, preservation, use). 7. Kinako. 8. Yuba (history and development, the plight of the yuba industry, soybeans for yuba, manufacture, classification of yuba, use). 9. Tsukudani and nimame (description, soybean tsukudani, nimame). 10. Hamanatto (history, manufacture, use). 11. Edamame. 12. Moyashi [bean sprouts] (manufacture, use). 11. Miscellaneous products (fermented soybean curd, MSG–monosodium glutamate, confectionary products {roasted soybeans for Setsubun, soybean candy, isonori, mameheto, shinseimame, suhama}, other products). Conclusion. Sources (numerically arranged). Sources (alphabetically arranged).

Tables: 1. U.S. soybean production, 1924-1963. 2. United States, Red China, and world production of soybeans (bushels), 1950-1963. 3. U.S. soybean importation, exportation and amount processed for oil and meal, 1924-1963. 4. U.S. exportation of soybeans (1,000 bushels) total, by continent, and to six largest importing countries, 1958-1962. 5. Japan's soybean acreage, production, and merchandising rate. 6. Japan's importation of soybeans, total, and Red China's portion, 1945-1963. 7. Japan's total importation of soybeans and U.S. portion, 1945-1963. 8. Soybean usage in Japan, 1963. 9. Japan's processing of oilseeds, 1963. 10. Crushing capacity of selected Japanese oilseed crushers. 11. Eight largest crushers of soybeans and amount of soybeans crushed per month in 1963. 12. Total quantity of soybeans crushed in Japan, 1950-1963. 13. Japan's daily per capita intake of edible fats and oils. 14. Japan's consumption of edible fats and oils, 1945-1961. 15. Use of soybean meal. 16. Chemical composition of tofu and aburaage. 17. Quantity of soybeans and soybean meal used for tofu-aburaage productions (all Japan), 1950-1963. 18. Miso production and quantity of soybeans and soybean meal used, 1950-1963. 19. Composition of miso. 20. Daily per capita consumption of miso in Japan, 1950-1963. 21. All Japan production of shoyu and use of soybeans and soybean meal, 1950-1963. 22. Composition of shoyu. 23. Yearly per capita consumption of shoyu, 1950-1963. 24. Composition of natto. 25. Production of frozen tofu and use of soybeans. 26. Composition of frozen tofu. 27. Yearly per capita consumption of frozen tofu. 28. Composition of kinako. 29. Composition of yuba. 30. Monosodium glutamate production and use of soybeans and soybean meal. Continued.

This typed manuscript was sent to Soyfoods Center in July 2004 by Tomoko Brandemuhl, the wife of the author. About the author (based on several interviews with Tomoko, July 2004): William Victor Brandemuhl was born on 30 Nov. 1940 at Iron Mountain, Michigan. He grew up in Florence, Wisconsin, then attended the University of Wisconsin at Madison. He roomed for 3-4 years with various Japanese cancer researchers at the university. He also became close to Tomoko Arai (born 12 Dec. 1937 in Tokyo), a Japanese woman, who was doing graduate studies in social work there as a Rotary International Fellowship student. William initially intended to graduate in June 1962, but stayed an extra year in order to pursue independent studies in Japanese language and soybeans. He became interested in the soybean and its history in an anthropology class taught by Dr. R.J. Miller; William finished his excellent research paper on soybeans in Jan. 1963. He also took one year of Japanese language instruction (night classes). William graduated in Jan. 1963 with a BSc degree in economics.

William obtained a grant (no strings attached) from Honeymead Products Co. of Mankato, Minnesota, to study soybean utilization in Japan. Only one American had studied this subject in Japan after World War II–Allan K. Smith of the USDA, who visited Japan and wrote short but detailed reports in 1948-49 and 1958. In Jan. 1963 Brandemuhl arrived in Japan and became a research fellow at the Department of Agricultural Economics, Kyoto University, Kyoto, Japan. Between Feb. 1963 and May 1964 (15 months) he conducted field research on soybean utilization in Japan. In June 1963 (after William had been in Japan for 4 months), Tomoko completed her graduate studies, graduated from the University of Wisconsin, and (since her scholarship was finished), returned to Japan–to be with William and to help him with his research in Japanese, which he spoke only moderately well. She traveled with him throughout Japan and translated for him during the many interviews he conducted. At each destination, she spoke about America to the local Rotary club–which paid her transportation, room, and board. William's monthly check from Honeymead paid for his room and board–but not for his travel and research, so he had to work part time doing English translation for a Japanese company. On trips, he took many photos using his expensive Nikon camera. Tomoko's family lived near Kobe, where she and William were married on 8 Aug. 1964–three months after he finished his field research. Several days after the marriage, they returned to the USA to visit his parents in Florence, Wisconsin, and enjoy a wedding party there.

William now knew he wanted to pursue a career in international business. He was soon offered a job at Crocker Citizen National Bank (International Division) in San Francisco, California. They drove to San Francisco and got an apartment at 1701 21st Avenue; he began work that fall, and was soon learning the basics of international business. Every evening after work at the bank he returned home to work on transforming his field notes into a manuscript. As he wrote the rough draft, Tomoko (a skilled pianist but not a skilled typist) typed it on a manual typewriter. The next day he would correct any mistakes and she would retype each page into final form. In 1965 he had the best carbon copy

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bound and sent it to Honeymead; he kept the original. It was never published and he received no academic credit for it.

On 26 May 1966 their first son and only child, Konrad Victor Brandemuhl, was born in San Francisco. They bought a house in Pacifica. In 1967 he was offered a job with Caterpillar Tractor Co. (International Div.) in Peoria, Illinois. In 1968 he moved with his boss to work at Allis-Chalmers Manufacturing Co., West Allis, Wisconsin. In 1969 he was transferred to Tokyo, Japan, as Far East Representative of the company. In 1970 he was transferred to Singapore as Far East Manager of the company.

William and Tomoko later lived for about 10 years near Tokyo, Japan (mostly in Mitaka), and for a while in Singapore. Over the years he showed his typescript on "Soybean Utilization in Japan" to many people, but nobody was interested. In 1986 he started his own trading company, specializing in textiles, natural rubber, latex thread, and various machine mechanisms. Tragically, William died on 2 April 1998 in Bangkok, Thailand, of pneumonia, during a business trip. He loved the excitement of international business and interaction with people of different cultural backgrounds. Address: San Francisco, California.

5213. Brandemuhl, William. 1965. Soybean utilization in Japan: Figures (Document part). San Francisco, California. xxii + 478 p. Unpublished manuscript. 28 cm. [189 ref]
• ***Summary:*** 1. Black soybeans from Japan's Tanba region and American Harosoy soybeans. 2. Soybeans growing on a dike. 3. Soybean plants drying on rack. 4. Soybean plants drying just prior to harvesting. 5. Soybean plants drying just prior to harvesting. 6. Soybean harvester. 7. Depodding rack and pod filled stalk. 8. Depodding soybeans. 9. Entrance to the Red Chinese Trade Fair held in Tokyo, during April, 1964. 10. One of the agricultural exhibits at the Chinese Trade Fair (corn and soybeans). 11. Soybeans and soybean plants exhibited at the Chinese Trade Fair. 12. Soybeans and other bean products that Red China is capable of exporting (exhibition at the Red Chinese Trade Fair). 13. Soybeans on display at retail store. 14. Soybeans on display at retail store. 15. Barge unloading of soybeans at oil mill. 16. Barge unloading of soybeans at oil mill. 17 Soybean tank receiver at oil mill. 18. Multi-spout soybean feeder at barge side. 19. An oil gift assortment.

20. Selling oil at a small oil retail shop. 21. Dispensing oil. 22. Selection of oil at oil retail shop (notice birds in cage at right). 23. Vegetable oil displayed with petroleum products. 24. Vegetable oil displayed with petroleum products. 25. Bottling facilities at oil wholesaler's. 26. Bottling facilities at oil wholesaler's. 27. Prepackaged oil products displayed at wholesaler's. 28. Seafood fried in soybean oil. 29. Selling soybean oil fried products. 30. Temperature controlled fryer. 31. At a chicken farm. 32. Handling 20 kilograms bags of chicken feed. 33. Soybean meal on top of other components of mixed feed prior to hand mixing. 34. Bag fastener for mixed feeds packed at wholesaler. 35. Fermenting agent for bakery (contains equal quantities of soybean flour, yeast, and water). 36. Silk worms eating mulberry leaves. 37. Silk worms eating soybean protein mixed with mulberry leaves. 38. Tofu. 39. Soybean grinder.

40. Soybean grinder. 41. Soybean grinder. 42. Open pit live steam cooker. 43. Open pit wood-stoked cooker. 44. Okara tank and press. 45. Outdated okara press. 46. Tonyu [soymilk] receiving tanks (precipitation tanks). 47. Removing water from precipitating curd. 48. Pressing tofu with stone weights. 49. Yakidofu. 50. Yakidofu being dippered into a shaping box. 51. Mechanical press for pressing yakidofu. 52. Cutting yakidofu. 53. Roasting yakidofu. 54. Kinugoshi tofu. 55. Aburaage. 56. Aburaage prior to being deep fried. 57. Frying sushiage, a product similar to aburaage. 58. Frying aburaage. 59. Hirosu: left front; atsuage: right front; sushiage: left rear; aburaage: center rear.

Note 1. This is the earliest English-language document seen (April 2013) that uses the word "Hirosu" to refer to Kyoto-style deep-fried tofu treasure balls.

Note 2. This is the earliest English-language document seen (April 2013) contains the word *atsuage* or the word *sushiage;* they refers to types of deep-fried tofu.

60. Okara for use as cattle feed. 61. Okara for food use. 62. Overall view of production portion of tofu plant. 63. Tofu peddler. 64. Tofu on display. 65. Bagged tofu. 66. Miso-shiru soup. 67. Dengaku (yakidofu covered with miso and placed over low heat). 68. Aburaage formed as a bag with rice inside. 69. Yudofu, Japan's most famous but not often eaten tofu dish. 70. Yudofu. 71. Miso. 72. Fermentation starting material (rice inoculated with bacteria). 73. The first step in making home miso. 74. Mashing soybeans for home miso. 75. Rice koji being used for home produced miso. 76. Salt being added to soybean and koji for the making of home miso. 77. Mixing home miso components. 78. Mixing home miso components. 79. Freshly made home miso.

80. Home miso after one year natural fermentation. 81. Koji maker. 82. Koji filled boxes. 83. Autoclave for steaming soybeans. 84. Koji mixed with salt. 85. Wooden vat for miso fermentation. 86. Weights for pressing miso. 87. Removing miso from fermentation vat. 88. Mixing and grinding miso. 89. Degraining [grinding] miso. 90. Miso on display. 91. Miso packing and sealing instrument. 92. Packing miso in a plastic bag. 93. Beef and rice miso preserver. 94. Seafood and rice miso preserver. 95. Receiving soybean meal at shoyu factory. 96. Saline solution for shoyu production. 97. Fermenting moromi. 98. Equipment used for bubbling moromi. 99. Temperature control of moromi.

100. New moromi. 101. Moromi which has fermented nearly one year. 102. Hydraulic press for pressing moromi. 103. Running moromi into filter cloth. 104. Filter cloth containing moromi. 105. Raw shoyu storage tank. 106.

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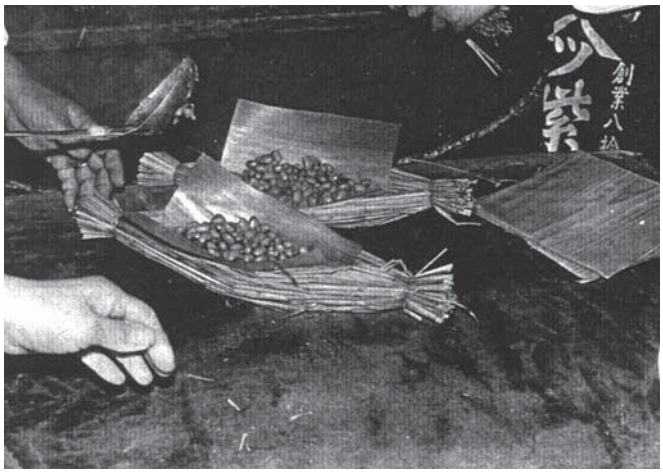
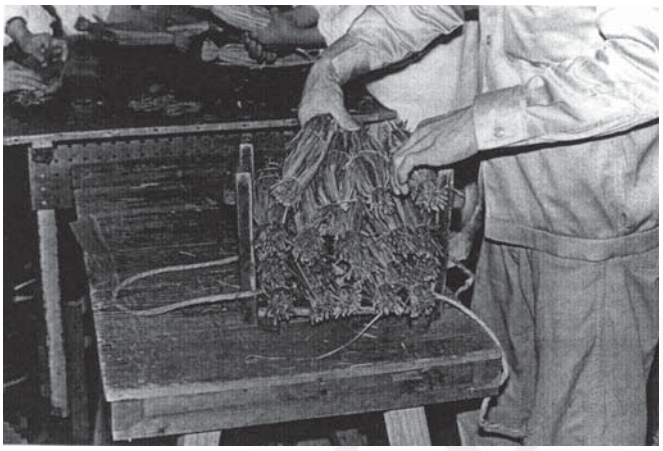


Open press for previously pressed moromi. 107. Opening moromi filter cloth. 108. Removing shoyu kasu (shoyu presscake) from filter cloth. 109. Bagging shoyu kasu for sale as cattle food. 110. Quick method shoyu kasu. 111. Shoyu sterilization instrument. 113. Shoyu bottler. 114. Bottling shoyu by hand. 115. High speed labeling. 116. Hand labeling. 117. Preparing sauce for shipment. 118. Shoyu cold sauce. 119. Filling plastic bottles with shoyu for use in box lunches.

120. Broiled chicken coated with shoyu. 121. Fish marinated in shoyu. 122. Fish baked with shoyu. 123. Grilled eels basted with shoyu. 124. Daitokuji natto (look like raisins spread on a sheet of paper).

125. Cooker for steaming soybeans for natto. 126. Pressurized container for inoculating soybeans. 127. Inoculating soybeans for natto. 128. Traditional method of packing natto. 129. Traditional method of packing natto. 130. Incubation rack and traditional packages of natto. 131. Packaging inoculated soybeans prior to incubation. 132. Packaging inoculated soybeans prior to incubation. 133. Inoculated soybeans in recently introduced containers. 134. Natto incubation room. 135. Natto on display at egg shop.

136. Overall view of frozen tofu factory. 137. Precipitation containers for frozen tofu tonyu. 138. Smoothing frozen tofu curd. 139. Frozen tofu curd flowing



into shaping box.

140. Shaping box for frozen tofu curd equipped with sheet metal guide. 141. Removing formed frozen tofu curd from sink. 142. Cutting formed curd into freezing size. 143. Sized curd in -20ºC freezer. 144. Sized curd in -5ºC degree freezer. 145. Defrosting frozen tofu. 146. Removing frozen tofu curd from centrifuge. 147. Inspecting frozen tofu curd for dryness. 148. Drying frozen tofu. 149. Grinding frozen tofu into marketable size. 150. Packing frozen tofu. 151. Frozen tofu on display. 152. Cooked frozen tofu displayed in food shop. 153. Cooked frozen tofu mixed with vegetables. 154. Packing kinako. 155. Kinako on display. 156. Covering pounded rice cake [mochi] with kinako. 157. Yuba. 158. Yuba hanging on rack above tonyu tank. 159. Lifting yuba from tonyu tank.

160. Fresh yuba. 161. Rolling fresh yuba into marketable form. 162. Combining fresh yuba with vegetables. 163. Rolling dry yuba. 164. Yuba on display. 165. Shoyu vats at tsukudani factory. 166. Tsukudani cooker. 167. Cooling tsukudani. 168. Nimame being marketed. 169. Nimame with shoyu and shrimp. 170. Nimame with shrimp. 171. Selling nimame. 172. Nimame as served. 173. Hamanatto. 174. Sun drying Hamanatto. 175. Close-up of sun-dried Hamanatto. 176. Pressing Hamanatto. 177. Grading Hamanatto. 178. Hamanatto on display. 179. Edamame.

180. Sprouting soybeans. 181. Sprouting soybean covered with straw. 182. Close-up of sprouting soybeans. 183. Sprouting soybeans. 184. Wetting down sprouting soybeans. 185. Soybean sprouts. 186. Mappe sprouts [Note 2. “Mappe” is not a Japanese word; mappe beans are imported from Burma]. 187. Soybean roasting oven. 188. Roasting soybeans. 189. Soybeans and seaweed. 190. Black soybeans in pounded rice cake [mochi].

Map of Japan. Address: San Francisco, California.

5214. Brandemuhl, William. 1965. Soybean utilization in Japan: List of interviews (Document part). San Francisco, California. xxii + 478 p. Unpublished manuscript. 28 cm. [189 ref]

• ***Summary:*** Between Feb. 1963 and May 1964 the author

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interviewed people from the following organizations (listed alphabetically) related to soybean utilization in Japan. In many cases he interviewed the owner, president, or managing director.

1. Agricultural Experimental Farm, Kamigori, Hyogo-ken. 2. Akutagawa Candle Co., Kyoto. 3. Aoki Miso Co., Nagano-ken. 4. Aoki Umbrella Co., Kyoto. 5. Aoyama Candy Co., Kyoto. 6. Bunge Far East Agent, Osaka. 7. Choko Shoyu Miso Co., Nagasaki. 8. Continental Overseas Corp., Tokyo. 9. Daiichi Trade Co., Kobe. 10. Dainihon Ink and Chemical Co., Osaka. 11. Dainihon Pharmaceutical Co., Osaka. 12. Daiya Frozen Tofu Co., Suwako-gun, Nagano-ken. 13. Daizu Yuryo Wholesale and Broker, Kobe. 14. Franceya Chocolate Co., Kyoto. 15. Fuji Oil Co., Osaka. Note: This is the earliest document seen (June 2009) concerning the work of Fuji Oil Co. (Osaka, Japan) with soy.

16. Genroku Brewing Co., Kyoto. 17. Gion Mameheto Candy Co., Kyoto. 18. Hamamoto Tofu Co., Kyoto. 19. Hamano Tofu Co., Kyoto. 20. Hanamura Bread Co., Kobe. 21. Harada Miso Co., Kyoto. 22. Hasegawa Oil Co., Kyoto. 23. Hashizume Tsukudani Co., Kyoto. 24. Hirota Sauce Co., Kyoto. 25. Hohnen Oil Co., Osaka. 26. Honda Miso Co., Kyoto. 27. Ishino Miso Co., Kyoto. 28. Itoh Trade Co., Osaka. 29. Itoh Trade Co., Tokyo.

30. Iwai Trade Co., Osaka. 31. Kaihara Natto Co., Kyoto. 32. Kamejirushi Shinshu Miso Co., Nagano-ken. 33. Kanegabuchi Chemical Co., Takasago-shi, Hyogo-ken. 34. Kanemasu Grain Wholesaling Co., Osaka. 35. Kanematsu Trade Co., Osaka. 36. Kansai Paint Co., Osaka. 37. Kansai Shoji Wholesale Co., Kyoto. 38. Kanto Miso Co., Kyoto. 39. Kasakura Natto Co., Tokyo. 40. Kato Kinako Co., Tokyo. 41. Kido Tofu Co., Tokyo. 42. Kobata Farm, Kyoto. 43. Kobayashi, Michiharu, Kyoto University, Kyoto. 44. Koya-san Frozen Tofu Co., Ito-gun, Wakayam-ken.

45. Kurosawa Miso Co., Nagano-ken. 46. Kyoto Prefectural Agricultural Cooperative, Kyoto. 47. Louis Dreyfus and Co., Tokyo. 48. Mame Masa Candy Co., Kyoto. 49. Marubeni Iida Trade Co., Osaka. 50. Meiji Chocolate Co., Osaka. 51. Midori Natto Co., Tokyo. 52. Mitsui Trade Co., Osaka. 53. Mitsui Trade Co., Tokyo. 54. Moriguchi Natto Co., Kyoto. 55. Morita Frozen Tofu Co., Sasayama, Hyogo-ken. 56. Moriwaki frozen Tofu Co., Taka-gun, Hyogo-ken. 57. Nagata, T., Dept. of Plant Breeding, Hyogo University of Agriculture, Sasayama, Hyogo-ken. 58. Nagoya Miso Co., Nagoya. 59. Nakai Wholesale Co., Osaka.

60. Nakamura Yuba Co., Kyoto. 61. Nakayama Farm, Kamigori-cho, Hyogo-ken. 62. Nakazawa Soap Co., Kyoto. 63. Namikawa Tofu Co., Kyoto. 64. Naruse Natto Bacteria Co., Tokyo. 65. National Agricultural Cooperative Assoc., Osaka. 66. Nihon Paint Co., Osaka. 67. Nikka Oil Co., Tokyo. 68. Nisshin Meal Co., Kobe. 69. Nisshin Oil Co., Yokohama. 70. Noda Shoyu Co., Takasago-shi, Hyogo-ken. 71. Nomura Meal Co., Kyoto. 72. Nomura Tsukudani Co, Kyoto. 73. Nunoura, Hiroshi, Kyoto Women's University, Kyoto. 74. Oguchi, K., Nagano-ken Shinshu Miso Assoc., Nagano-ken.

75. Ohashi, Taiji, Japan Soap Assoc., Tokyo. 76. Okazaki Natto, Tokyo. 77. O-mame Candy Co., Kyoto. 78. Osaka Grain Exchange, Osaka. 79. Osaka Prefectural Miso Assoc., Osaka. 80. Otsuya Agricultural Brokers, Kyoto. 81. Ryo Tofu Co., Kyoto. 82. Sawai Wholesale Co., Kyoto. 83. Senmaru Yuba, Kyoto. 84. Shimamoto Tofu Co., Kyoto. 85. Shinseimame Candy Co., Kyoto. 86. Sugimori, T., Marukin Shoyu Brewing Co., Kyoto. 87. Tada, H., Kyoto Prefectural College, Kyoto. 88. Taiyozakoku Wholesale Co., Kyoto. 89. Takeya Miso Co., Suwako-shi, Nagano-ken.

90. Tanaka Narazuke, Kyoto. 91. Tatsuno Higashimaru Shoyu Co., Tatsuno-shi, Hyogo-ken. 92. Tawa Chicken Farm, Kyoto. 93. Tofu Aburaage Assoc., Kyoto. 94. Toyo Menka Trade Co., Osaka. 95. Uchida Tsukemono, Kyoto. 96. Ueda Miso Assoc., Ueda-shi, Nagano-ken. 97. Uemura Suhama Candy Co., Kyoto. 98. Uno Tofu Co., Kyoto. 99. Yamajirushi Miso Co., Nagano-ken. 100. Yamamoto Farm, Taki-gun, Hyogo-ken. 101. Yamanaka Oil Wholesale Co., Kyoto. 102. Yamato Bean Sprout Co., Kyoto. 103. Yamaya Hamanatto Co., Shizuoka-ken. 104. Yazura Yahata, Kyoto Textile University, Kyoto.

105. Yoshihara Oil Co., Osaka. 106. Yoshimura, Hyogo University of Agriculture, Sasayama-shi, Hyogo-ken. 107. Yoshizabaru Retail Co., Kyoto. 108. Yubahan Co., Kyoto. 109. Yubakichi Co., Kyoto. Address: San Francisco, California.

5215. Brandemuhl, William. 1965. Daitokuji natto (Document part). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 304-06, Unpublished manuscript. 28 cm. [189 ref]

• ***Summary:*** "Daitokuji Natto: Sources: (1) Dr. Hiroshi Nonoura, asst. prof., Kyoto Women's Univ., interview on 6 May 1963. (2) Nomura Tsukudani Co., Kyoto, visit on 20 May 1963. (3) H. Tada, Kyoto Prefectural College, visits on May 19, June 17, 1963.

"Daitokuji Natto (see Figure 124) was developed by the Zen sect of Buddhism as a source of food value [and seasoning] because the Zen Sect observes strict vegetarian habits [incl. vegan diet]. Its name indicates its origin, Daitokuji temple in Kyoto, where it is still produced and used in the everyday diet of the priests as well as used in many of that temple's ceremonies. Although a few other temples may produce a similar product in extremely small quantity, Daitokuji temple is recognized as the only place of production. Production is accomplished in the early summer during the rainy season supposedly because that time promotes desired bacterial [sic, mold] growth.

"The exact method of processing is known only to the priests that manufacture it but it is made entirely by hand and makes use of a great amount of salt as evidenced by its extremely salty taste. Because of its saltiness, Daitokuji

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Natto cannot be eaten by itself but should be consumed [as a seasoning] with rice. Daitokuji Natto's black paste-like appearance does not in any way resemble regular [sticky] natto or the whole soybeans that are used to make it. Since Daitokuji Natto is not a commercial product, most Japanese although having a vague knowledge of what it is, have never seen or tasted it. Its use even among the priests of Daitokuji temple will decrease as even their diets have become increasingly modernized."

Note 1. This is the earliest English-language document seen (Nov. 2011) that contains the term "Daitokuji natto."

Note 2. The Daitokuji Natto in Fig. 124 look like individual whole and broken black raisins, rather than like a black paste.

Note 3. The author says that Daitokuji natto is not a commercial product; however by Oct. 2011 it was being sold. Address: San Francisco, California.

5216. Brandemuhl, William. 1965. Yuba: History and development, plight of the yuba industry, soybeans for yuba (Document part). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 367-86, Unpublished manuscript. 28 cm. [18 ref]

• ***Summary:*** "Yuba (see Figure 157) a film removed from the surface of heated Tonyu and sold as either a fresh or dried high protein food enjoys, as many other traditional foods, only limited use;

"History and Development: Yuba is believed to have originated in China and was first carried to Japan by Buddhist priests supposedly in part by the same priest who discovered frozen Tofu, around 1400 A.D. That priest (Kobodaishi) not only established the Koya-san temples in Wakayama but as he was quite famous; he traveled extensively establishing temples in many parts of Japan. In Kyoto the center of Yuba consumption today, he established a large number of temples and resided the longest. As Kyoto was the capital of Japan and the home of many noble families Yuba quickly developed into a favorite although not exclusive food of the military, governmental, and noble families.

"In that way Yuba grew very popular and expensive but when the capital was moved to Tokyo most of the noble families also moved so Yuba began its long and gradual decline extending even to the present. In trying to maintain their sales the Yuba makers sent Yuba to Tokyo but with transportation what it was the venture was unsuccessful. After that a few Yuba makers moved and established themselves in Tokyo of which two still remain today. Demand for Yuba is indicated by the fact that there are only two Yuba shops, not much larger than the average Tofu shop for Tokyo's 10 million people.

"Most of the Yuba producers at present can trace their production back to the time of selling to noble families indicating that the Yuba industry is vested in tradition with very few new plants developing. The number of Yuba plants has in fact been decreasing, because when a maker of the older generation dies there is no one to take his place as in the words of one maker, 'If I don't have a stupid son my business will die with me.' In the past at least the oldest son was bound to conduct the affairs of his father's business even if he did not want to. Today however this same lad can attend college by virtue of his father's hard earned wealth and later begin a life of his own choice. With such situation existing the present number of Yuba makers stands at about 50 throughout Japan with the majority of them in the Kyoto and Osaka areas of Japan. Kyoto has between 20 and 30 plants, Osaka less than 10 and Kobe less than seven. Nara has a few plants with the rest being mainly located separately throughout the Kansai area.

"With a few exceptions Yuba makers produce at plants operated with more pronounced traditional procedures than do Tofu plants. At one time Tofu and Yuba were produced in the same plant but with specialization, developed independently with Tofu taking the lead as far as innovation is concerned. The usual plant will utilize an average of 150 kilogram of soybeans per day with the Osaka shops consuming slightly more.

"The largest Yuba maker in Japan does not use more than 200 kilograms [of soybeans per day]. Although soybean usage is not calculated for Yuba, with only 50 plants it is apparent that yearly usage is not large. A National Association of Yuba makers existed at one time but not at present because such a small number of makers could not afford promotional activities of the kind that would be effective in addition to the fact that the National Association would not receive much of an advantage if they purchased soybean for the maker because distribution cost would counteract any savings. In Kyoto a Yuba Association exists but not for any expressed purpose except, possibly, brotherhood. Even that is not achieved as the traditional makers are constantly reprimanding the more progressive elements for attempting to put them out of business. Although competition is not greatly suppressed at present before World War II the Yuba industry was highly competitive. Price wars were a common occurrence. Observing the Yuba industry and operation at present one finds such nearly unbelievable.

"The Plight of the Yuba Industry: Although unlike the Tofu industry in that Yuba is only made during the day, labor is one of the most important problems facing the industry. Larger Yuba plants cannot be constructed because at crucial points in the manufacturing process a large amount of manual work is required. By virtue of its raw material Yuba is already a high priced product so if high wages were paid the price of Yuba would have to be increase further. Even if demand would not decrease as a consequence it is very likely that at such price some of the large efficient food firms would begin producing and marketing Yuba. Instead of encouraging

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or allowing this to happen Yuba continues to be produced in small inefficient factories utilizing of as much family labor as possible. Automation to displace this zero-cost labor would seemingly be unwise as would automating to increase capacity even if the difficult to produce Yuba could, from a technical viewpoint, be produced under automated principles. Assuming that Yuba will continue to be produced without the benefits of modernization and possibly rightly so a number of conditions such as sanitation require long-needed attention."

Note: This is the earliest document seen (Oct. 2012) that gives yuba industry and market statistics, trends, and analyses for a geographical region (Japan).

"Soybeans for Yuba: The makers of Yuba prefer and use domestic soybeans for virtually all production. This is further defined as Shiga prefecture soybeans, an area not far from the majority of Yuba production but not an area of large soybean production so price is extremely high. The Yuba makers do not like to use U.S., Red Chinese, or even Hokkaido soybeans. Red Chinese soybeans are least preferred with both Hokkaido and U.S. soybeans occasionally used. The Yuba makers desire a fresh large white hilum, high protein soybean with very few splits. Many soybean food product makers prefer soybeans with such quality but cannot afford to use them. Yuba makers are willing to pay the price and count on selling Yuba to a certain type of consumer regardless of price.

"After the war whole soybeans were in short supply so Yuba makers attempted to use soybean meal. They found such procedure impossible so have not attempted use of meal since. The future of using domestic soybeans seems rather questionable with decreasing production especially outside of Hokkaido. This may mean that for the small quantity of soybeans required, U.S. soybeans, especially the selected types, may come to be used" (Continued). Address: San Francisco, California.

5217. Brandemuhl, William. 1965. Yuba: Manufacture, classification and use (Document part). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 367-86, Unpublished manuscript. 28 cm. [18 ref]

• ***Summary:*** The section titled "Manufacture–Initial steps" begins with "Soaking and grinding: Soybeans are first soaked in well water for 6-8 hours in summer and 12-24 hours in winter. Checking the state of soaking is accomplished in the same way as with Tofu, that is, to examine the inside color of the soybeans, as well as the appearance of bubbles rising in the container used for soaking. If soybeans for Yuba happen to soak too much they become too sticky after cooking and too much Okara results. After soaking 5-10 kilograms (dry weight) of soybeans they are ground in the same way and with the same type of equipment that is used to grind Tofu soybeans except that more often the grinder will be smaller. When grinding, an equal quantity of water is added.

"Cooking: The ground soybeans and water are transferred to a live steam, oil, or sawdust heated cooker either by negative pressure in the case steam is used or by hand. Water in the quantity equal to the quantity of ground material may be added portion by portion before, during, and after cooking depending on the makers method for obtaining the most protein from the Okara.

"Use of an open pit steam cooker is rather limitedly used because of its cost. It is said by makers who cook in other ways that a steam cooker does not give the desired quality Tonyu [soymilk] but this seems to be a rationale for their financial inability to purchase same. Yuba makers that use open steam cookers believe that cooking under pressure would even be better but then a more skilled operator is required and considering the production economics of the Yuba industry such a operator would be difficult to find. Traditionally charcoal then wood was used to cook but now the common source of heat is pine sawdust. Its pitch content and intermediate hardness makes it an ideal inexpensive fuel. Commercial companies selling such sawdust receive $.28 (100 yen) for a bushel burlap bag. With a steam cooker cooking time is very similar to Tofu while heating with saw dust necessitates boiling the ground material for 30-40 minutes. Stirring is done a number of times to insure even cooking.

"Pressing: After the ground material is cooked, pressing is accomplished in much the same way as with Tofu. The cooked material is pressured, pumped, or hand dippered from the cooker to a course nylon filter which is placed in the press box. The press used to separate the Tonyu and Okara is seldom power driven but tends to be of an older kind than most Tofu presses. The pressing operation is an important part of manufacturing Yuba because as much Tonyu as possible is desired, while with frozen Tofu much more use of the Okara is the rule. After pressing the Tonyu flows through a very fine cotton filter into a 100 liter container (quantity of Tonyu is usually around 90 liters per batch). Bubbles that form on the top of the cooking liquid are removed because if allowed to remain they would make it difficult for film to form. At this point the similarity between Tofu and Yuba end as Yuba is not precipitated with magnesium sulfate.

"Film formation: After all the possible Tonyu is obtained for a batch it is transferred by hand to a large shallow wood partitioned tank as can be seen in Figure 158. Usually the tanks are made of brass but the more progressive firms use stainless steel because brass tarnishes and is easily damaged. The 2½ inch deep tank is usually partitioned into 20, 24, or 30 squares 18 inch square (or sometimes that large and slightly narrower) forming a double row 10, 12, or l5 squares long. The 24 square tank seems to be the most favored because one person can most efficiently manage lifting protein film from 24 squares. In former times Yuba was made in separate containers rather than the one tank

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with removable wood partitions as are how used. This caused very individual but ununiform production. At present Yuba is not made in separate containers. Underneath the 2-10 Tonyu tanks that the Yuba maker may have is another tank which acts as a double boiler when hot water is circulated through it. Before Tonyu for Yuba was heated directly but it was found that greater control could be exercised if the double boiler system was used. This type of heating tank is now used at all Yuba plants with the source of heat for the water usually being sawdust. Even the makers which use steam cookers used the slow burning sawdust to maintain the temperature of the circulating water at 90-95ºC for maintaining the Tonyu at 80-85ºC. Yuba Tonyu should not be heated to the boiling point as it would produce a final product that is hard, however if temperature were too far below boiling film would not form. After Tonyu is poured into such a tank it flows under the partitions to an even level. After the level is even bubbles if any are removed and the Tonyu in the tank is allowed to stand untouched for about 15 minutes at which time a thin yellow film can be seen on the surface of the Tonyu in each square.

Film removal: After the entire surface area of a square is covered with the film it is lifted off (see Figure 159) with a small wood shaft 12-18 inches in length. The shaft is first inserted into the Tonyu at the right near side of a square and slide underneath the surface to the rear along the right side partition. Then the shaft is gently lifted which also lifts the film. As the film is being lifted it is turned broadside to the maker and lifted entirely out of the squares The shaft with a piece of Yuba hanging from it is then attached to a rack above the tank as shown in both Figure 158 and 159. The method of removal varies with plant but all follow the above description in principle. After raising one piece of Yuba from the square the maker moves to the subsequent squares of the tank. When the last square is finished a film has again formed on the first one so that a maker can work almost continuously until the last of the Tonyu is gone. More likely he will add his available Tonyu when the level becomes low so that Yuba is never removed from the bottom until a days work is nearly finished.

"After the Yuba sheets have dried slightly they may or may not be rehung with two or more hung together, depending upon the way the sheet is to be folded as a final product. For certain forms of Yuba the lifting shaft may be inserted so that the sheet is doubled upon lifting. Lifting Yuba from the surface of Tonyu requires a great amount of manual work and it is believed that the lifting process can not be automated even if the remainder of operations were.

Note. This is the earliest document seen (Oct. 2012) that contains a detailed description of how to make yuba on commercial scale.

"Classification of Yuba: Although there are many sub-types there are only two different kinds of Yuba, that is fresh Yuba and dry Yuba. Fresh Yuba, only produced in Kyoto, is only allowed to remain on the rack above the Tonyu tanks until the unsolidified portion drains. Then it is removed and racked together as shown in Figure 160. The fresh Yuba remains in the rack until sale is expected or order for same is received. At that time from two to five sheets of fresh Yuba are hand rolled as shown in Figure 161 and wrapped in paper. Fresh Yuba may also be cut in particular size pieces and folded with cooked vegetables as shown in Figure 162. Fresh Yuba may also be fried with burdock wrapped inside" (Continued). Address: San Francisco, California.

5218. Brandemuhl, William. 1965. Yuba: Manufacture, classification and use (Continued–Document part II). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 367-86, Unpublished manuscript. 28 cm. [18 ref]

• ***Summary:*** Continued. "Originally all Yuba was made as fresh Yuba but as it only lasts a short time, drying began. At present only about 20 percent of total Yuba production is sold fresh. Fresh Yuba is very perishable lasting only two to four days in winter and for four to eight hours in summer. In summer it is only marketed at the Yuba shop. Yuba meant to be marketed as dry needs to dry on the rack only one to three hours in summer while 12-24 hours in winter. Rain in any season will lengthen the drying time required. For dry Yuba the process of making, drying, folding, and packaging usually requires one day so a certain day's production is usually marketed the following day.

"Part of the quality difference of dry Yuba stems from the fact that a Yuba sheet is lifted from the top of a Tonyu batch is lighter and of much better quality than subsequent sheets with the sheets lifted with Tonyu that has remained on the bottom very dark, relatively poor quality, sweeter tasting, and thicker. Of whatever quality, Yuba usually darkens as it dries although bottom lifted pieces become the darkest.

"If a sheet of Yuba is of such a size and consistency that it can be easily folded (see Figure 163) it is graded higher than a sheet which does not have these characteristics. Broken and cracked pieces are very often not even folded but just bagged. When folding, a sheet of Yuba that is slightly wet is used for shaping the dry Yuba with greater ease. The natural color of yuba is tan but often it is colored yellow for the purpose of food arrangement. It is for that purpose that some Yuba is colored blue but the people who appreciate Yuba the most prefer it in its natural color.

"Dry Yuba can be stored with no adverse effects for two to three years if humidity is not extremely high. This ability is one of its most important advantages but since it is such an expensive product, (290 grams for $.97 or 350 yen) Yuba cannot realize its inherent advantages. Fresh Yuba while being $.0.56 (20 yen) for one sheet is only available in the neighborhood of the Yuba shop.

"Use: Most Yuba sales are conducted at the Yuba retail shop usually located at the front of a factory or through

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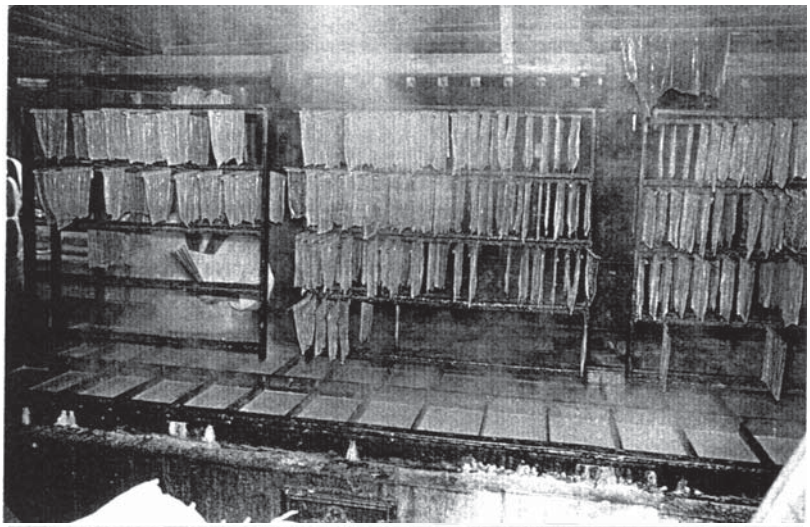
telephone orders from steady customers. In Yuba production areas, department stores may stock Yuba (see Figure 164) even though it is a slow moving item. Outside the immediate area of production Yuba cannot be found except possibly at New Years. The above fact is somewhat the reason why at least 90 percent of the Japanese people do not know what Yuba is. The Shiga prefecture farmers who supply soybeans for Yuba have no idea of what the product is. Because of expense nation-wide promotion cannot be done and because of the present nature of the Yuba industry Yuba makers do not particularly desire to promote Yuba on a national basis because each Yuba shop has a large number of steady customers with rather set Yuba consumption patterns so he can easily predict expected sales and lead a relaxed life producing only that amount. This type of feeling is amazingly professed by the makers themselves.



"Yuba unlike Tofu, Natto, and Miso is not eaten every day by even a connoisseur of Yuba. Most Yuba consumers do not eat Yuba for its excellent food value (see Table XXIX) but rather for its taste and adaptability for traditional Japanese food. Traditional Japanese food is so closely connected with Yuba that Yuba is along with frozen Tofu an important component of the completely vegetable dish mentioned in respect to frozen Tofu usage. For traditional food purposes Yuba is often requested by telegram or mail order from parts of Japan where Yuba is not produced. With the gradual disappearance of such traditional foods it is hard to believe, as Yuba makers state, that Yuba consumption is increasing. This is amplified by the fact that most young people neither know how to prepare Yuba or like its taste. For the small group of people that appreciate the taste of Yuba or value it history Yuba may be prepared and used in the following way:

"Fresh uncooked Yuba is very often eaten with Shoyu and other seasonings. Dry Yuba must be precooked and, then for example, placed in the following foods as fresh Yuba might be directly placed: (1) Sukiyaki. (2) Yudofu. (3) Many types of soup. (4) Substitute for or complement to raw fish and rice. (5) Fried in Tempura.

"A specialty product that Yuba makers have capitalized upon is in respect to the beer drinking habits of Japan. Most often when beer is ordered at places serving same, a small dish of food will accompany each order. The customer is usually charged for this even though he may not want it although sometimes it is served without charge. Of the hundreds of possible foods for this dish Yuba makers produce a fried Yuba with the basic material the dark waste Yuba that gathers on the shaft for lifting Yuba from the Tonyu tank. It is unfortunate however that the people who eat such food do not know it is Yuba.

"Yuba should not be precooked or cooked too much as with overcooking Yuba's taste becomes very bad. This fact makes it a food requiring delicate attention and therefore not considered suitable for use in the average meal.

"The fact that Yuba is light makes it an ideal traditional food for use by Japanese residing in other countries. A limited quantity of Yuba is exported for this purpose but an export market among the natives of any country is questionable as even most Japanese prefer other foods to Yuba."

Photos show: 157 (page 368). Yuba. 158. Yuba hanging on rack above tonyu tank. 159. Lifting yuba from tonyu tank. 160. Fresh yuba. 161. Rolling fresh yuba into marketable form. 162. Combining fresh yuba with vegetables. 163. Rolling dry yuba. 164. Yuba on display.

Sources (p. 467-68, #160-68): Visits to and interviews with: (1) Nakamura Yuba, Jan. 9 and March 6, 1964. (2) Senmaru Yuba, March 16 and Feb. 20, 1964. (3) Yubahan Co., Kyoto, Japan, June 6, 1964. (4) Yubakichi, June 6 and

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18, 1963. Address: San Francisco, California.

5219. Brandemuhl, William. 1965. Kinako (Document part). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 360-66, Unpublished manuscript. 28 cm. [2 ref]

• ***Summary:*** "Kinako is the Japanese traditional equivalent of U.S. full-fat soybean flour although it is made from whole soybeans. The origin of the commercial product as it exists today is from one of the uses that farmers put to soybeans since ancient times. Farmers would roast soybeans and then grind with a stone pestle in a container that most likely would be generations old. With the availability of commercial Kinako the practice of making Kinako at home has all but disappeared. Although home making has disappeared, rural people continue to consume substantially more Kinako than urban residents.

"Most of Japan's 80 Kinako makers do not make Kinako on a full time basis but make it along with other roasted products for themselves or on custom order from a soybean wholesaler or retail store. Distribution is therefore handled by at least three different kinds of firms, each usually not handling Kinako as a sole product. There are Kinako makers that produce Kinako as their chief product, although even such makers, producing around three to five tons of Kinako per day, usually makes other products that can be manufactured utilizing the same facilities.

Note: This is the earliest document seen (Oct. 2012) that gives kinako or roasted whole soy flour industry and market statistics, trends, and analyses for a geographical region (Japan).

The manufacturing process begins with the cleaning of whole soybeans. In the past domestic soybeans were used but at present because of price nearly all Kinako is made from Chinese soybeans. The soybeans are then conveyed to an oven that is usually fired with oil and roasted with sand for 40 seconds. Since the roasting is accomplished by experienced personnel the temperature of roasting is unknown, however the oven operator can easily tell if the temperature is too low or too high by the state of the removed soybeans.

"After removal from the oven (sometimes removal is effected by a combination of shaker and conveyor) the roasted soybeans are cooled to natural temperature. Then 10 percent of the fiber of the toasted soybeans [the hull / seed coat] is removed by an instrument designed especially for Kinako making, then finely ground, and packed by hand (see Figure 154).

"Kinako is available in 80 grams, two and three kilogram packages plus in bulk as shown in Figure 155. Since bulk Kinako is very often displayed in open or inadequately covered containers it is, to say the least, an unsanitary method of marketing. Fortunately it is becoming less popular with the 80 gram package now accounting for an important portion of purchased Kinako. The 80 gram package is priced at $.056 (20 yen) while $.056 (20 yen) also purchases 100 grams of bulk Kinako. The price is markedly different, however Kinako in a package can be stored for one year if the seal is not broken whereas bulk Kinako is not storable even if placed in a tightly sealed container.

"One of the greatest disadvantages of Kinako is that it is an excellent spawning place for bugs so it has to be stored very carefully. The two and three kilogram packages market at $.356 (l10 yen) per kilogram, however the average non-rural family does not have general use for such quantity. The larger packages are purchased for particular occasions such as New Years. The traditional dishes prepared for New Years utilize a large amount of Kinako causing the seasonal production of Kinako to be mainly concentrated in December. While the large maker may produce Kinako the entire year, most of the small makers only produce then. An interesting fact regarding New Years consumption is that many people who do not use Kinako throughout the year consume large quantities at this time even though it is readily available at all times.

"Research on the per capita consumption of Kinako has never been seriously undertaken, however considering Japan as whole it would be extremely low although certain areas consume much greater quantities then others and people in the lower economic ranks eat more Kinako using it as an inexpensive source of food value as indicated by Table XXVIII. The method of processing suggests that the optimum amount of food value is not utilized, however tradition governs the consumption of this product so changing the manufacturing process and consequently causing a change in final product would not be well accepted.

"The amount of Kinako produced per year as well as the quantity of soybeans used for producing that amount is not known, however it is not more than a few thousand tons. With increasing population (see Table XX) Kinako production is only remaining stable if not decreasing and the number of makers is remaining stable. The principal use of Kinako is for covering pounded rice cake [mochi] as shown in Figure 156. For this purpose sugar is usually although not necessarily mixed with the Kinako. The Kinako industry has not made an attempt to market their product for the fortification and enrichment of other foods although Kinako in its present state most likely would not be the optimum product suitable for such, especially with the increasing availability of soy flour as the U.S. knows it. Although soy flour produced in the oil mills will never replace Kinako it is a likely possibility that the consumption of Kinako will gradually decline in absolute quantity produced with such decrease caused by the increase in consumption of western type foods, very few of which are suitable for use with Kinako."

Photos show: 154. Packing kinako. 155. Kinako on display. 156. Covering pounded rice cake [mochi] with

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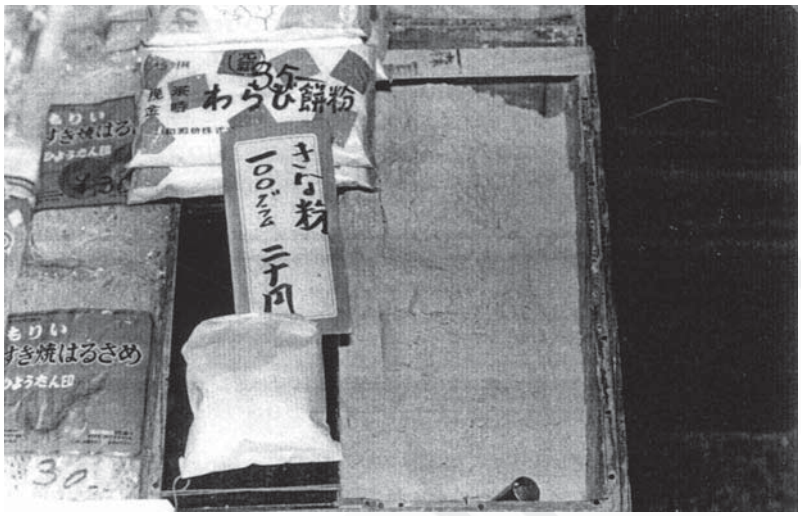

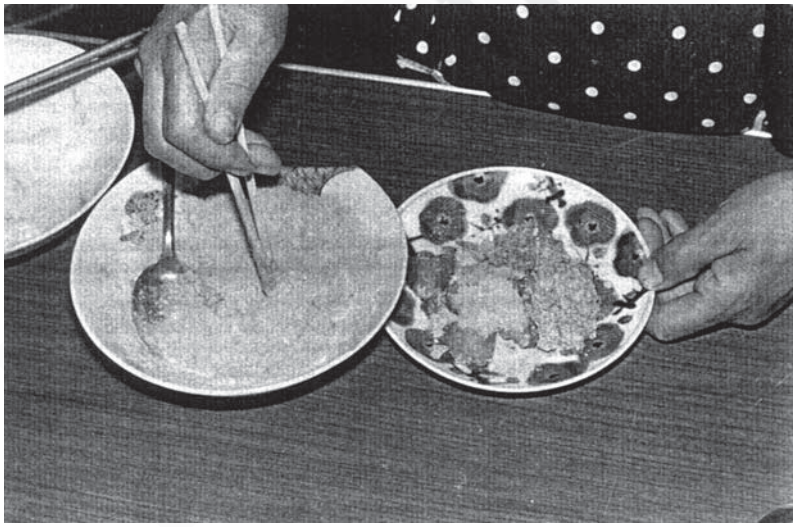

kinako.

Sources (p. 467, #159): (1) Gion Mameheto Candy Co., information obtained interviewing officers of same, Kyoto, Japan, Sept. 20, 1963. (2) Kanemasu Grain Wholesale. (3) Kato Kinako Co., information obtained interviewing owner of same, Tokyo, Japan, April 23, l964. (4) Kobata Farm, information obtained interviewing owner of Same, Kyoto, Japan, Oct. 11, 1963. (5) Sawai Wholesale. Address: San Francisco, California.

5220. Brandemuhl, William. 1965. Miscellaneous products–Confectionary products (Document part). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 426-33. Unpublished manuscript. 28 cm. [2 ref]

• ***Summary:*** "Introduction (source 183): Although the traditional candies of Japan are becoming less and less consumed with chocolates and other types of western confectionary capturing a larger share of the market there are still thousands of small candy manufacturers producing in addition to the other traditional candies, many types of soybean contained products. These makers, in using from a few kilograms of soybeans per year to over 10 tons, prefer and only use domestic soybeans. The candy makers buy cleaned select soybean at $18.06 to $20.83 (6,500-7,500 yen) per 60 kilograms. The largest portion of the soybeans used for candies are roasted over a low flame in ovens such as pictured in Figure 187 and 188 and may be soaked in water and dried before being roasted. Relative to manufacture of western type candies the traditional candy makers produce under very inefficient and labor intensive conditions so that very often the traditional candy is higher priced. Even though it is usually quite attractive and appreciated by certain groups of people, children, the largest group of candy consumers, do not seem to like the traditional, particularly ones with hard roasted soybeans inside.

"Although by no means limited to the following, a number of the candies containing soybeans are briefly described below.

Roasted soybeans (184): The most common type of soybean candy is plain roasted soybeans. It is especially popular around the third of February as at that time it takes on a ceremonial function. In many households that day is the day to chase away bad fortune being called the Setsubun Festival. This is done by throwing soybeans in the number of one for every year of age. This ceremony although serious in the past is now mainly for children. Buddhism still honors the ceremony with some temples selling smalls bags of soybeans containing about 18 pieces at $0.056 (2O yen). Other temples may have a short drama for public viewing in which a devil is chased away by a priest throwing soybeans

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after which both dance for a period of time.

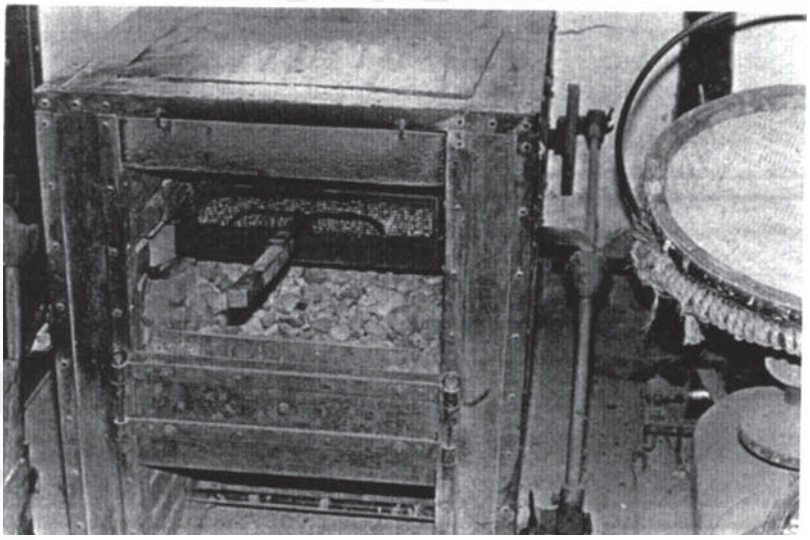
"It was common for high priests or celebrators to throw soybeans to the crowd from a platform but supposedly the custom was too expensive so it is seldom done at present. During that season the price of such roasted soybeans is for example $0.14 (5O yen) for a 15O gram package. Packaging is somewhat costly at that time because of the decoration involved. For other times of the year roasted soybeans are most often sold over the counter although various size bags are also available, both at lower prices than during the Setsubun Festival season.

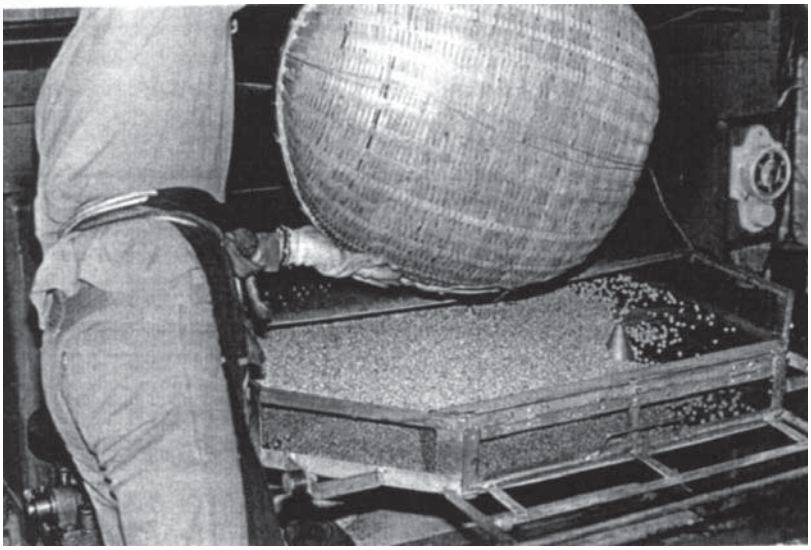
"Isonori (185): Isonori is closely related to plain roasted soybean as Isonori is composed of roasted soybean that have small pieces of dried seaweed adhered to and covering part of the soybean. The seaweed is moistened and added to a batch of soybeans immediately after roasting. Isonori is usually eaten as a complement to beer or liquor and is sold at $0.084 (3O yen) for a 60 gram package and $0.84 (3OO yen) for one kilogram.

"Mameheto (186): Mameheto is a two to six inch transparent shaft of golden brown sugar with roasted soybeans completely enclosed within the 1/3-inch diameter shaft. The manufacture of Mameheto is invariably a family business with the process technique passed from generation to generation, The soybeans used for this candy can only be from a certain place within Japan so the price of this candy is very high. The roasting of the soybeans is accomplished very easily but uniform shaping of the sugar as well as encasing the soybean are very difficult. The skilled maker begins with a hot shaft of sugar 2½ inches thick and six inches long. He then selects a portion of this material and soybeans in the quantity of one, two, or three for every 1½ inch of shaft. As a result of careful rolling of the hot sugar the desired characteristics are effected. The makers of this delicate but unpopular type of candy consider themselves to be artists. Although the future is questionable the present makers seems to have an adequate profit margin although volume is not great, the plight of so many of the traditional industries.

Shinseimame (187): Shinseimame is a roasted black soybean covered with sugar, Kinako, and powdered green seaweed. Its history is long and closely connected with Japanese traditional tea. At present the number of places making it are few and the total consumption of soybeans for Shinseimame probably does not exceed one metric ton per year. The amount of labor required to produce such candy is tremendous. First sugar and water are simmered over a charcoal stove. When a suitable temperature is reached the syrup is poured over the roasted soybean. When the soybeans are completely covered they are placed in a wire screen, hand shaken, and powdered sugar is placed on top. Then the shaker is shaken for 30 seconds so that the soybeans roll and gather sugar. This is done 10 times after which the same thing is done 10 more times with a mixture of sugar and a mixture of Kinako. Then the same thing is done five times with green seaweed so the final appearance is a green sphere about 3/4 inch in diameter containing besides the black soybeans, six parts soybean, one part sugar, two parts Kinako and one part seaweed.

"Suhama (188): Suhama is a tan or green colored candy that does not contain whole soybeans but is principally made of soybean flour nearly like Kinako but less roasted. A quantity of the flour is placed in a container of simmering sugar syrup and stirred for 15 minutes. After a paste-like substance has formed it is formed into rectangular bars and allowed to cool. Then it is coated with sugar and more of the Kinako-like flour and packaged. Suhama is a well known but little used product that is usually made in a portion of the





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maker's home or even the kitchen of same.

"Miscellaneous candies (189): The above mentioned candies only begin to enumerate the large number of soybean based products that are produced in Japan. Depending upon section of Japan it is also possible to find soybeans wrapped in a small piece of seaweed (see Figure 189), soybeans individually covered with green powdered sea-weed, a roasted green seed coat soybeans, sweet Miso-covered soybeans, soybean flour (Kinako-like) twists, cookies with flakes of whole roasted soybean frosting it, and many others. Most of these uses sprang from the long history of domestic soybean production and cannot be easily adapted to imported soybean whether they are from Red China or the U.S. It is likely therefore that use of domestic soybeans will continue even at higher prices and with higher price soybeans, the final product will corresponding increase in price. This trend will cause the candies to be purchased by even a more select, smaller sector of people, resulting in the gradual disappearance of these products."

Photos show: 187 (page 428). Soybean roasting oven. 188. Roasting soybeans. 189. Soybeans and seaweed.

Sources (p. 426-33, #183-89): Visits to and interviews with: 183. (1) Gion Mameheto. (2) Mamemasa Candy Co., information obtained interviewing owner of same, Kyoto, Japan, June 4, 1963. (3) Meiji Chocolate. (4) O-mame Candy Co., information obtained interviewing owner, Kyoto, Japan, Feb. 20, 1964.

184. (1) Mibu Temple, information obtained visiting same, Kyoto, Japan, Feb. 3, 1964. (2) Nunoura. (3) O-mame Candy. (4) Taiyozakoku Wholesale.

185. (2) Aoyama Candy Co., information obtained interviewing owner, Kyoto, Japan, March 13, 1963. (2) Mamemasa Candy. (3) O-mame Candy.

186. (1) Gion Mameheto. (2) Tada, June 17, 1964.

187. Shinseimame Candy Co., information obtained interviewing owners, Kyoto, Japan, June 25, 1963.

188. Uemura Suhama Candy Co., information obtained interviewing owner, Kyoto, Japan, June 4, 1963.

189. (1) Mamemasa Candy Co. (2) Namikawa Tofu, April 13, 1963. (3) O-mame Candy. (4) Uno Tofu, April 4, 1963. Address: San Francisco, California.

5221. Brandemuhl, William. 1965. Moyashi [bean sprouts] (Document part). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 413-23, Unpublished manuscript. 28 cm. [1 ref]

• ***Summary:*** "Manufacture: Japan has two basic types of Moyashi (bean sprouts), one made from Burmese mappe beans and the other from soybeans. The mappe bean is imported duty free by trade companies and contracted for by the National and Local Moyashi Associations. Soybean Moyashi [soybean sprouts] can be made only from Hokkaido soybeans which cost $194.45 (70,000 yen) per ton as other soybeans are too hard or contain too many splits. The type of soybean that is suitable for soybean Moyashi is also suitable for Natto."

Note: Black mappe (*Vigna mungo*) also known as black gram, black lentil [not to be confused with the much smaller true black lentil (*Lens culinaris*)], white lentil, black matpe bean, is a bean that originated in India and is now grown in southern Asia (Thailand, Burma. India). The mung bean (*Vigna radiata*), a close relative of the black mappe, is also widely used for sprouting in many countries–but apparently not at this time in Japan.

"The Moyashi maker in Japan, unlike the small scale operators of other Asian countries, can be very large, at least with respect to his mappe facilities. Temperature and humidity control are common as well as automatic soaking machines. As will be apparent soybean Moyashi is not produced on this scale in Japan because demand is not high.

"The process of making soybeans Moyashi is accomplished under the same condition as for mappe Moyashi, that is, the sprouting room at 22-23ºC and water used to soak the growing sprout at 18ºC although since soybean sprouts are less sensitive, these conditions are not required but exist because they are required for mappe Moyashi.

"First 15-20 pounds of soybeans are placed in a container (see Figure 180) and washed with water. The container has outlets at the bottom so at no time is there water standing in the container but rather the soybeans are washed down. From that time the soybeans must be washed with water every four hours night and day the entire seven days it takes to finish the sprouting process. While the environmental conditions of sprouting soybean Moyashi do not need to be delicate, the inherent nature of the soybean cause it to be difficult to sprout so it is important that new soybeans be used. The first day the container need not be covered but is just allowed to stand in the dark room. The next day the soybeans in the container mentioned above are put in four containers and covered with a straw mat (see Figure 181).

"In addition to protecting the sprouting soybeans from light so they do not turn green, the container is covered so the heads of sprouts grow straight up. The head of the mappe bean is removed after sprouting but the head of the soybean is eaten. After one or two days in the second container the soybeans have sprouted as shown in Figure 182. While near the end of the seven day sprouting period they look as shown in Figure 183. After the container is covered with straw, washing is accomplished by running water into the container (see Figure l84) until it fills. As the water flows out the outlet at the bottom of the container, the straw mat as well as the sprouting soybean absorbs an adequate quantity of water. After seven days the sprout becomes about five inches long. The growth of the sprout can be regulated by raising and lowering temperature which quickens or slows growth respectively. With average facilities the Moyashi maker

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claims that soybean Moyashi is extremely simple to make. After the seven days sprouting period the sprout is ready to be marketed at $.014 (5 yen) per 100 grams, the same price as mappe Moyashi.

"Use: The consumption of mappe Moyashi is greatly dependent upon the supply of fresh vegetables. At certain times fresh vegetables because extremely high priced even during a particular vegetable's season. At this time mappe Moyashi's demand greatly increases. The production of mappe Moyashi is therefore considered highly profitable but economically dangerous for the maker while the production of soybean Moyashi has an element of scarcity but profit is low. The scarcity stems from the fact that the demand of soybean Moyashi is constant over a short term because the only people that eat it are the Korean residents of Japan (except in case of extreme food shortage).

"The concept of Moyashi originated in China, became popular in Korea then passed to Japan's southernmost island, Kyushu, where inhabitants eat more mappe Moyashi than other areas of Japan even today. Soybean Moyashi is a popular Korean food so it might be expected that the 500,000 Koreans that reside in Japan might demand same instead of consuming the mappe Moyashi which they consider tasteless. As the Korean people do not substitute soybean Moyashi for vegetables but eat it regularly, demand is constant. Demand level is indicated by the fact that for the 50,000 Koreans who live in Kyoto four of seven Moyashi makers produce 240 kilograms of soybean Moyashi in addition to mappe Moyashi. Although soybean Moyashi are required for Korean ceremonial occasions, the Korean population in Japan is decreasing and becoming more Japanized so consumption of soybean Moyashi is decreasing. Even though decreasing the present number of Koreans is rather conspicuous as they tend to group together. The prejudice that the Japanese have toward the Koreans is well illustrated by the following: when a Japanese family desires to rent or construct a home, their visits to the area prior to moving there may well include an examination of the market place. If a pan of soybean Moyashi (see Figure 185) is displayed with mappe Moyashi (see Figure 186) the family seriously considers whether or not to move into the neighborhood because they then know that Koreans live nearby. Whatever the social implication might be, soybean Moyashi is sold wherever Korean people live, with such food usually consumed by the Korean people in large quantities either boiled or fried by itself or with vegetables and meat."

Photos show: 180 (p. 414). Soybeans for sprouting in metal pails. 181. Sprouting soybeans in wooden kegs covered with straw. 182. Close-up of sprouting soybeans held in two hands. 183. Sprouting soybeans as they overflow a wooden keg. 184. Wetting down sprouting soybeans. 185. Soybean sprouts in retail tub. 186. Mappe sprouts. Sources (p. 469, #178): Yamato Bean Sprout Company, information obtained interviewing owner of same, Kyoto, Japan, March 19, 1964. Address: San Francisco, California.

5222. Brandemuhl, William. 1965. Tofu (including Aburaage and related products): History, use of soybeans, manufacture (Document part). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 137-201, Unpublished manuscript. 28 cm. [18 ref]

• ***Summary:*** "History: Tofu, the coagulated protein and fat of ground cooked soybeans (see Figure 38) according to an ancient Chinese book was invented by a philosopher, prince *Hamintze* of the Han dynasty, while another source attributes the invention of Tofu to another Chinese philosopher *Whai Nain Tze.* Manufacture was supposedly begun in China in 164 B.C. during Emperor *Hwai Wen's* reign by *Liu an,* duke of *Hwai an. Liu an* was a good friend of the Buddhists monks so it is believed he started manufacturing Tofu, so as to give them a somewhat more varying diet. Tofu come to Japan (probably through Korea) for the first time during the Toyotomi period (880 years ago). Although not completely documented, Buddhist priests probably were the transmitting agents as the priests used Tofu long before it was in general use.

"Use of soybeans: Throughout Japanese history domestic soybeans were used to make Tofu, however Chinese soybeans began to be used after trade began between Japan and China. During and at the end of World War II all soybeans were in short supply, however in the early fifties U.S. soybeans began to be used for Tofu. This use developed so that now Tofu accounts for the largest Japanese food use of U.S. soybeans. The Tofu makers would use domestic soybeans if they were not too expensive however. Some makers still use a certain percentage of domestic beans although such practice is becoming less popular. More often used are U.S. specialty beans such as Illinois, Indiana, Ohio, Hawkeye, or select No. 2 ordinary even though such soybeans are higher priced then regular soybeans. Chinese soybeans are again starting to be used for Aburaage although because of custom U.S. soybeans are not likely be replaced in the foreseeable future. The existence of over 60,000 Tofu makers consuming over 200,000 MT of soybean per year with each maker consuming between 15-300 kilograms per day presents somewhat of a problem regarding soybean purchasing. Each particular maker is too small to purchase directly from anyone but the smallest wholesaler where the price of soybeans is too high for efficient operation. The Japanese people are association minded with the Tofu makers being no exception. The Tofu makers authorize their local association to purchase soybeans in large lots for future distribution to individual makers. The Tofu makers do not especially like to purchase through the association as the association charges for handling, however the makers have a desire to support the association so accept purchasing through it. The association deals with the importer, crusher, and large wholesaler, selecting whichever seller will give the

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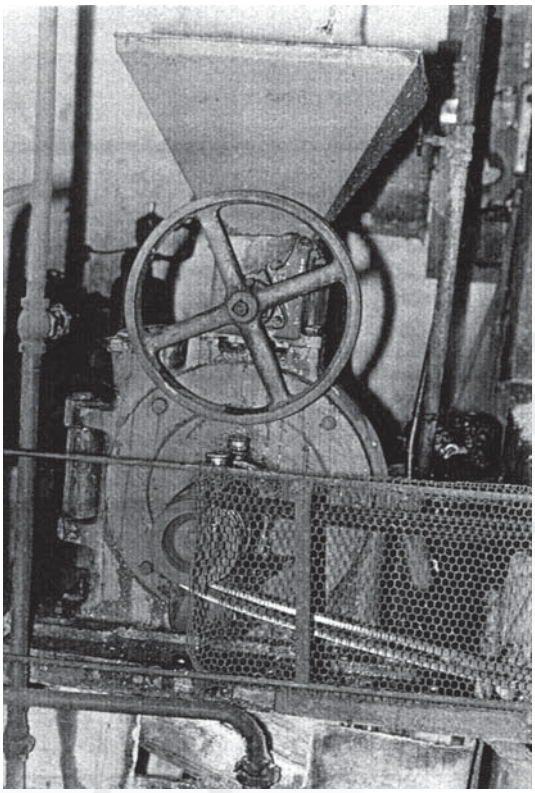

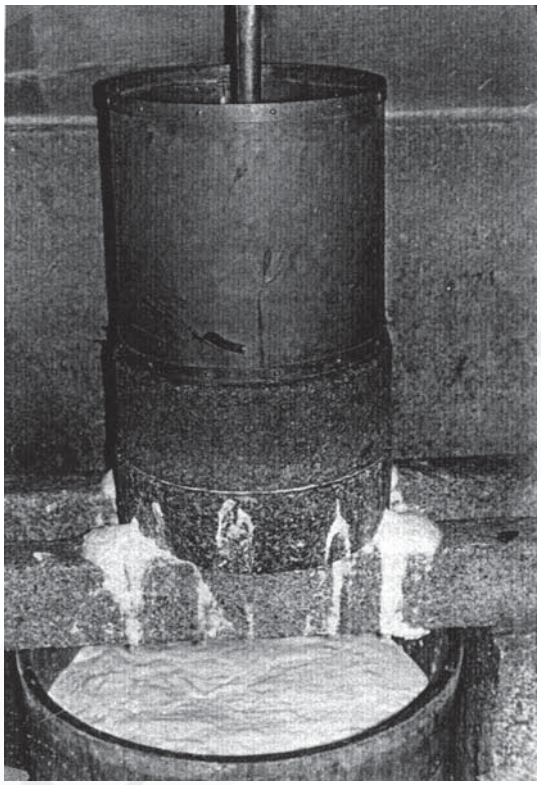

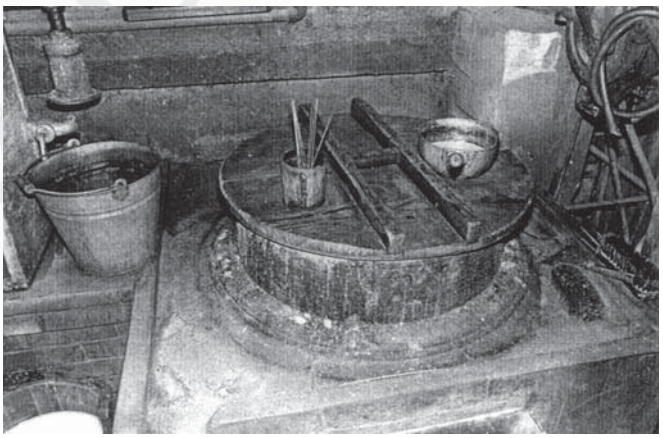

best terms.

"The numerous Tofu makers that do not belong to the association (about 1/6) as well as members whose association does not purchase usually work out an arrangement with the smaller wholesalers. Soybeans are delivered to the maker by truck with the maker receiving material for a number of weeks each time he receives. The shipment is kept in bag form until the day before use.

"Manufacture–Regular Tofu (white Tofu): The manufacturing procedure described below is for the most used type of Tofu, 'Shirodofu' (white Tofu) as is seen in Figure 38. Other related products such as Yakidofu, Kinugoshi dofu, Aburaage, Hirosu, and others are processed in much the same way. Additional or different methods of processing these latter products are described in respective sections.

"The process of making Tofu consists of ten steps, that is, soaking, cooking, filtering, coagulating or precipitating, shaping, pressing, submerging [in water], cutting, and again submerging.

"Soaking: Depending upon season of year, 5-15 hours before processing, clean whole soybeans are put in containers of any size but most used are metal drums, wooden barrels or 20 liter tins. Water is added to the container until the soybeans in the container are completely submerged. Although length of soaking is not such a strict factor, generally soybeans are soaked 10-l4 hours in winter and 5-10 hours in summer. Soybeans soaking in any one

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container should be of uniform size as soaking would not be even. Because of their small size, U.S. soybean are soaked for less time than Hokkaido soybeans. In winter Hokkaido soybeans may require as much as five additional hours of soaking. There seems to be to guides besides experience that indicate when soaking is sufficient, that is, the appearance of bubbles rising to the surface of the water and the whiteness of they inside of the soybeans.

"Grinding: Tofu processing usually begins at 3:00-5:00 in the morning so that the final product may be ready for use during that day. Processing is initiated by the removing of unabsorbed water from the containers. After that between five and eight kilograms of the soaked soybeans are put into an electric powered grinder of the types shown in Figures 39, 40, and 4l. The type of grinder pictured in Figure 39 is the most popular. Water is run into the grinder's intake container and the grinder is started. After ground as small as possible the soybeans in the form of thick white cream (see bottom of Figure 41) enter a container positioned at the outlet of the grinder. The cream could be called more paste-like than a liquid although it flows If it cannot water is added. If the cream is too thin, the residue after filtering will contain too much of the protein. For a batch of approximately seven kilograms of soaked soybeans the volume of creamy substance should be around 54 liters.

"Cooking: The type of cooker used depends upon the economic situation of the maker. Two of three types of cookers commonly used are shown in Figure 42 and 43. Although, wood (Figure 43) or oil stoked cookers are used, use of a steam boiler is slowly replacing all other methods. Either a small steam pressure cooker or a live steam open pit steam cooker (Figure 42) might be used if the factory has a steam boiler. To indicate that making Tofu is a cottage type industry very often makers with steam boilers will use same for heating their bath. The ground soybeans and water are usually drawn into the cookers by negative pressure but this procedure may also be done manually. Such is necessary if the maker does not have a steam boiler. After the cream is pulled into the cooker, water is added to the container to collect the residue remaining on the container's surface. This thin solution is also drawn into the cooker, Cooking lasts about four or five minutes or until pressure reaches approximately 10-12 pounds per square inch or the equivalent of it if another type of cooker is used. Cooking is very important for removing distasteful flavor, protein, causing good or bad cohesiveness and water holding capacity, although it is done without gauges, meters, or time control by the experienced Tofu maker. As an indication of the time of operation the cooking of 35-40 different batches may be completed by 6:00 a.m.

"Filtering: After cooking, a valve is opened. This valve is connected to a 1½ inch diameter pipe which bends upward so that it is positioned over a container usually around 24 inches square and made of metal although wood and tile are also used. A tile tank is shown in Figure 44. At the end of the pipe a course nylon bag is attached. The opening of the outlet value with pressure still fed to the cooker causes the cooked material to be forced through the looped pipe and into the nylon bag filter. Steam flow is then terminated then started again to force out what remains in the cooker.

"At some factories gravity may be used to remove the material from the cooker and such also might be accomplished by hand. The tank which the bag rests in also has an outlet at its bottom so the liquid (called Tonyu [soymilk]) which can readily pass through the coarse filter makes it way by pipe to a container. The temperature of this material is 100ºC when it leaves the cooker, however it drops to 80ºC by the time it reaches the container. The material that does not flow through the nylon filter is called Okara. As soon as all the material is forced out of the cooker and what liquid there is flows to the precipitating container a quantity of cold water (15-20 liters) stored in a tank above the container is dumped upon the nylon filter dropping the temperature of the Okara to 60ºC so that as much protein as possible can be removed. At some places this water may run directly into the cooker after the initial liquid was forced out.

Note 1. The author and his wife, Tomoko, did most of their tofu research in Kyoto. Companies they visited and observed in the spring of 1963 (listed alphabetically) were: Hamano Tofu Co., Hamamoto Tofu Co., Namikawa Tofu Co., Ryo Tofu Co., Shimamoto Tofu, and Uno Tofu. They also learned much from the Tofu-Aburaage Association (Kyoto). And they visited and observed Sasanoyuki Tofu Restaurant (Tokyo, 11 June 1963).

Note 2. The word *Shirodofu* is occasionally (but rarely) used to distinguish "white tofu" from non-white tofu (such deep-fried tofu, grilled tofu, dried-frozen tofu, etc.). This is the earliest English-language document seen (April 2013) that contains the word *Shirodofu.* (Continued). Address: San Francisco, California.

5223. Brandemuhl, William. 1965. Tofu (including Aburaage and related products): Manufacture (Continued–Document part II). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 137-201, Unpublished manuscript. 28 cm. [18 ref]

• ***Summary:*** (Continued). "As the water flows upon the filter it is worked over with a wooden club and then pressed. The press usually is like the one pictured in Figure 44 although an old fashion stone weight with lever may be used (see Figure 45) or as is becoming popular an electric driven press. It is important to get as much of the Tonyu out of the Okara as possible (because Okara is nearly a complete waste) so when pressing is finished the nylon filter may be stripped with the club before mentioned to remove the remaining Tonyu. Some makers are now using centrifuges but as a result too many bubbles appear so that a bubble suppressing agent has to be used although this agent affects the taste of final product.

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Some makers used this agent even though they do not centrifuge. After as much Tonyu is removed from the Okura as thought possible the nylon bag is unhooked from the pipe holding it and carried to a drum at which time the Okara is dumped (see Okara section for more information on its use). The nylon bag is then dipped into water and beat with a club while it is lying on the floor. After most Okara particles have been removed the bag is returned to its position at the end of the pipe and used again. All of the Tonyu which flowed from the cooker to the container to the next container is again filtered just before it runs into the latter as a fine cotton bag is attached to the pipe outlet. For this purpose a round wire screen bottom box may also be used.

"The bag or screen box collects the Okara that passed through the course nylon filter. Only a small quantity of Okara is collected at this time with what is collected being discarded. The container that the Tonyu flows into is pictured in Figure 46. One or two more cotton filter bags line such container. These filters are removed from the container with the one minute amount of Okara in it, and used again without removing the Okara from the bag. When the amount collected nears one pound it is discarded or re-pressed for further extraction. At this point the Tonyu looks somewhat yellow. The number of containers and number of outlets for inflowing Tonyu very often determines the scale of operation of a particular Tofu maker. A maker nearing retirement may have only one wood plugged outlet and two containers which have to be moved for every batch while other more progressive makers may have over 6 brass valve stoppered outlets. Most Tofu makers fall between that above two cases with the efficiency of operation seemingly directly related to the efficiency of this procedure. The material of these containers are either wood on metal (stainless) depending upon the final product. White Tofu makes use of wood more often but wood is not absolutely necessary. Wood is used because it maintains temperature better than metal for the adding of the calcium sulfate, the subject of the next section.

"Precipitation: When the Tonyu enters the precipitation at containers it is around 68ºC. If hotter, the temperature is reduced by adding cold water. Because of work with other portions of manufacture the Tonyu may be allowed to remain in the container to cool naturally to 68ºC or even lower. However if temperature became lower than 60ºC precipitation would begin to get difficult so generally the adding of calcium sulfate takes place while the Tonyu is between 60-70ºC with the most desired temperature being 66-68ºC. The amount of calcium sulfate added varies slightly with each maker and varies slightly with each batch as seldom is a scale used for accurate measurement, however the most usual quantity for the size batch mentioned above is around 200-300 grams. A guide seems to be to add about 30 grams for each kilogram of soybeans used. Methods of adding the precipitating agent also vary by place so that the below descriptions are only examples of many used. First 100 grams of the agent is mixed with cold water in a two liter pan. A wooden paddle is inserted into the Tonyu and using the near edge of the container as a pivot point the maker stirs the Tonyu in an up and down fashion five times while slowly adding the agent with water on the fifth stir. Then the solution is stirred three more times, when 100 more grams of agent is mixed with water in the same manner as before and the solution is once again stirred five times with the agent being added on the fifth stir. At the end of the fifth stir the wooden paddle is brought up breaking the surface of the solution. In each case the four first stirs are rapid while the fifth is rather slow.

"Another method of adding the agent may be to stir the solution is circular fashion for three complete rounds then dump the whole 200 grams of agent mixed in water into the solution in the opposite direction of the current. After this the solution is stirred each way two times at the end of which the paddle is used to quiet the current. At this time certain makers will add small quantities of certain chemicals to enrich their Tofu in order to have advertising advantage. Immediately after adding the agent, a change in the nature of the solution can be observed. At this time the experienced Tofu maker can tell if the batch under watch will be of good quality. After stirring, a cover is put on the tank and left to stand for precipitation about 25 minutes during which time supernatant solution forming at the top of the precipitating solution is removed by placing a light bamboo basket on the surface. The cracks between the bamboo straps allow water but not precipitating curd to enter the basket. The water that collects in the basket is dippered out. About 50 percent of the quantity of water contained in the curd is removed. A small stone is placed in the basket to increase the speed of collecting water.

"During the 25 minute precipitation period the solution may also be stirred although gently. The amount of agent added, the amount of water removed, and the amount of above stirring determines the softness of Tofu. Generally soft Tofu is desired although certain restaurants, schools, and other institutions, may request hard Tofu. The maker accommodates them by stirring more and removing more water so that the hard Tofu contains only 80 percent water instead of 90 percent as soft Tofu does. Stirring the Tofu divides the mass into more pieces allowing more water to be taken off whereas hard Tofu because of the adding of too much agent probably would be a mistake on the part of maker rather than a calculated effort however more of less calcium sulfate may be added in making related products.

"Although the method of removing water mentioned above is probably the most used, Figure 47 indicates the same process being accomplished with a cloth covered rack. After completion of the above process the curd is ready to be shaped.

"Shaping and pressing: After precipitation is completed one or two boxes (see Figure 48) made of wood or metal

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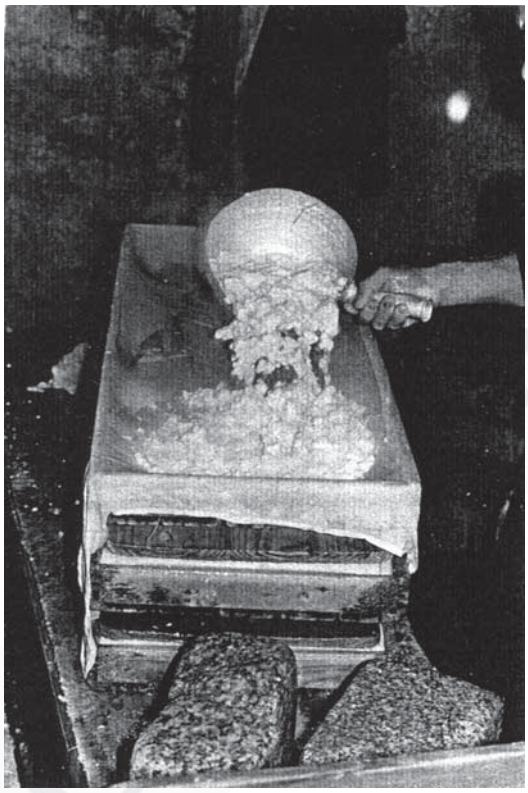
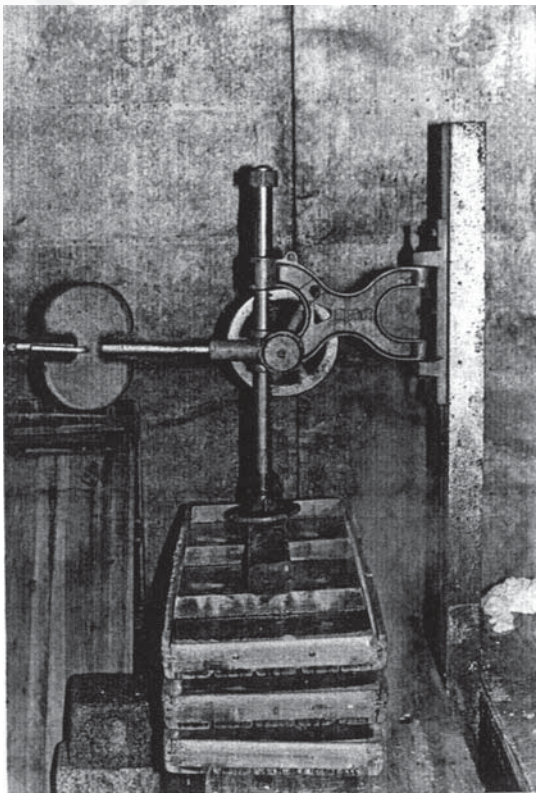
and having many 3/8 inch holes on all sides and bottom with side holes slanting downward for efficient water draining are prepared with a cross-shaped cotton filter cloth. This cloth is moistened for easy forming and positioning inside the box. More waster (usually the supernatant solution) is poured into the box to make the cotton filter cling to the sides. Precipitated curd is then dippered into the box with the maker first removing small pieces from the precipitation tank and gently pouring to the middle of the Tofu shaping box letting the curd run to the edges. If large pieces are dippered they are broken into small pieces by pouring from a greater distance away from the level of curd. About 18 liters of curd are poured into two boxes for each batch although some makers will only make one box from each batch. A block of formed Tofu weighs therefore between four and eight kilograms.

"If too much curd exists for the available box, an extension is added to one of the boxes. Because the curd is semi-solid at this time it can be added to the box higher than the height of the box, especially in the middle. The middle is always more densely packed then the edges as when pressed the middle receives more pressure. After the filled the box is allowed to stand for 10 minutes at which time the curd at the edges of the box is pushed to the center and then the portion of the cross shaped cotton filter remaining outside of the box is made to cover the top of the curd in a carefully folded fashion and a wooden cover that fits completely inside the box is positioned as are stone weights totaling about 20 pounds (see Figure 48). The boxes are then allowed to set for 40-90 minutes" (Continued). Address: San Francisco, California.

5224. Brandemuhl, William. 1965. Tofu (including Aburaage and related products): Manufacture of Yakidofu and Aburaage (Continued–Document part III). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 137-201, Unpublished manuscript. 28 cm. [18 ref]

• ***Summary:*** (Continued). "Submergence, cutting and resubmergence: After pressing for the desired length of time the stone weights and cover are removed and the box is taken to a sink (stainless steel or tile) and submerged in a large quantity of water and then inverted so that the formed block of Tofu can slide out of the box into the water. Depending upon how busy the shop is the block may or may not be cut immediately upon being put into the water. When it is cut the block is brought near the surface and a wood frame with three to six nylon wires strung across it is put over the top of the Tofu block. The block is then inverted and the frame is quickly pulled upward cutting the Tofu into a number of pieces. These pieces may then be cut even smaller to the standard marketing size or may remain large for cutting to standard size at time of sale. At all times Tofu must be stored in water to maintain its form and also to improve taste.





Optimum taste is achieved after three hours soaking although taste difference is not very great. One block when cut to marketable size (440 grams) makes about 80 pieces With dimensions equaling 2½ x 6 inches x 1 inch. Occasionally

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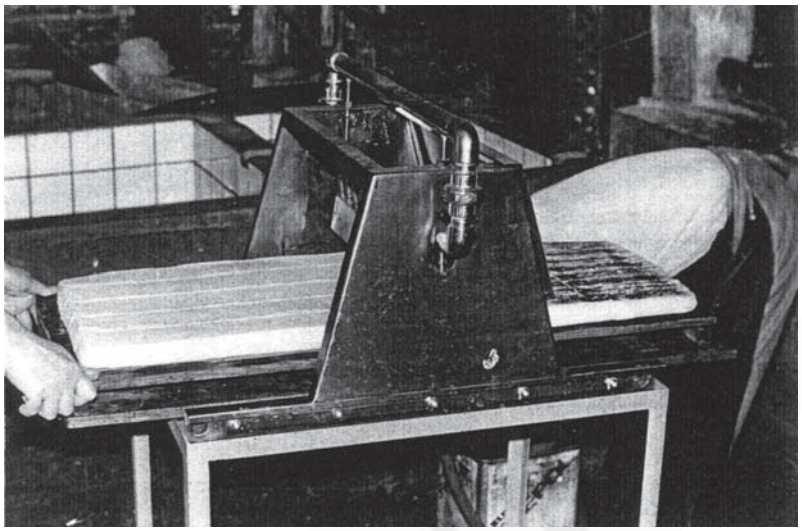
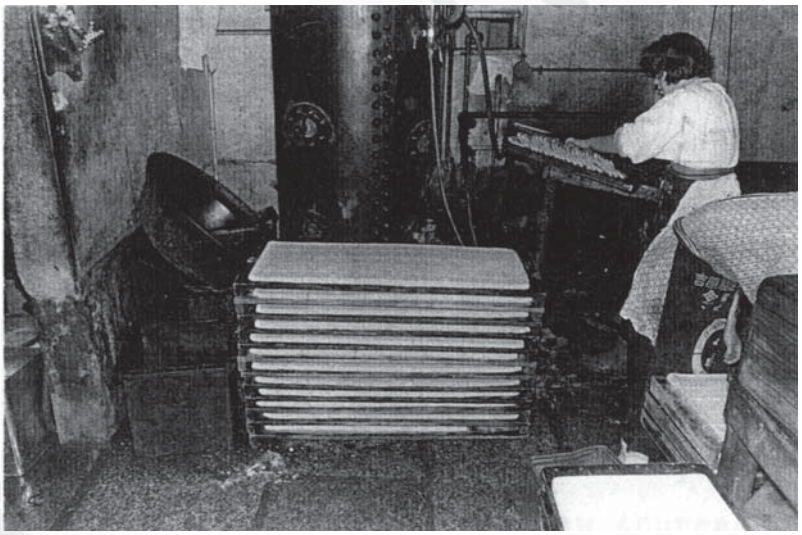
this type of Tofu is also sold without regard to shape as for a special order a certain quantity would be put into a cotton bag and delivered.

"After cutting Tofu into suitable shape for the ways it is marketed the manufacturing process is completed. Marketing and use treated after treatment of additional and different manufacturing processes of related products.

"Yakidofu (see Figure 49) is Tofu that is slightly surface roasted It is processed in the same way as regular Tofu except that it is cooked at a somewhat higher pressure and contains less water. While the wicker basket is resting upon the surface of a Yakidofu batch more water is removed and pressing is with greater pressure. Instead of being put into a box like regular Tofu (see Figure 48) one batch of Yakidofu is dippered into three filter covered wooden trays as shown in Figure 50, covered, and then pressed with a mechanical press as shown in Figure 51. The tray that holds Yakidofu is about 39 inches long, 14 inches wide, and 2½ inches high. There are many 3/8 inch holes in the bottom of this box and well as in the cover to drain excess water. The bottom is grooved so as to provide guide lines for cutting Yakidofu into pieces. The cover fits inside the tray with two ribs projecting 1½ inches from the upper side. These ribs make it possible to stack one tray upon the other and still be able to press effectively. Pressing is done for 15-20 minutes during which time the trays under press may be changed in order (as many as ten trays may be under the press at one time).





"After pressing is completed the cover is removed and the cloth filter is unwrapped from the top of the Yakidofu. A cover which completely covers the tray and has ribs on its end is placed on the tray and quickly turned over allowing the sheet of Yakidofu to position itself on the cover. The sheet is then cut into 25 pieces (see Figure 52) using the guide lines provided by the grooves in the tray. Cutting may be accomplished by such a knife as used in Figure 52 or with a gang knife. The kind of knife used is likely to be made of brass as supposedly its cutting properties are better than stainless steel. After cutting Yakidofu is put on a slanting rack to dry. Then when the majority of the morning's operations are finished the Yakidofu sheet is roasted by the instrument pictured in Figure 53. Many other methods of roasting are used such as gas torches moved over the surface of the sheet or a charcoal stove fanned by a blower. The later case necessitates the skewering of each individual piece, positioning and repositioning near the hottest area of the charcoal stove. This method is not very sanitary as coke dust circulates and settles everywhere including on other products. After roasting, Yakidofu is slid into water and stored until time of sale, delivery, or pick up. Yakidofu is stored in water only after it has been cut into the standard consumer size, unlike regular Tofu. Because it remains out of water for so long and because of its method of cooking, Yakidofu is much harder than regular Tofu;

"Kinugoshi (see Figure 54) is slightly different than regular Tofu in that it is softer and smoother. The smoothness is the reason why the first few letters of Kinugoshi means silk filtered. In ancient times this may have been a possibility but at present silk filtered Tofu does not exist. The Tofu makers believing that the silk filtered rumor is worth the advertisement value so do not discourage the belief.

Note. This is the earliest English-language document seen (April 2013) that mentions silken tofu or uses the term "silk filtered tofu" or the string "Kinu" or the word "Kinugoshi" to refer to silken tofu.

"Kinugoshi is only produced in summer because it is eaten cold with green onions and Shoyu with a little ginger for flavoring. Yakidofu Tonyu may be used for Kinugoshi although filtering is more carefully done, The Tonyu for Kinugoshi is not precipitated in the large containers however

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as each maker has a number of small metal boxes about 16 x 8 x 4 inches for such purpose. The boxes have a stopper outlet on their bottom for assistance in the removing of the Kinugoshi pieces at the appropriate time. When Kinugoshi is about to be made the inside walls of the box are coated with a minute quantity of rapeseed oil. After coating with oil enough of the precipitation agent needed for precipitating the amount of Tonyu put into the box of above dimension is added. Then Tonyu is poured into the box with the pouring active enough to cause slow precipitation of the Tonyu. The Tonyu filled container is allowed to set for 20-30 minutes and then is submerged in water (container included) for two hours. After two hours the box is brought to the surface of the water and the precipitated curd is divided into 24 pieces. The stopper at the bottom of box is then removed. This in combination with the oil coating allows the 24 pieces of Kinugoshi to slide out of the container into water;

"Aburaage–Initial processing: Although Aburaage treated as an end product is much-different than Tofu, until a certain point in the manufacturing process the procedure is nearly the same. Aburaage (see Figure 55) is Tofu deep fried in vegetable oil, being of various sizes but usually eight inches long, three or four inches wide and 3/4 inch thick. It is a soybean product that did not originate in China but was developed in Japan. Aburaage uses whole clean soaked soybeans as raw material but in addition soybean meal specifically manufactured for Tofu products may be added.

"Uses of soybean meal: A number of years ago oil crushers saw a possible market for soybean meal if it could be successfully used in the manufacture of Tofu. As mentioned before, meal promotion was conducted to convince Tofu makers to use soybean meal. Through experimentation it was found that soybean meal would not seriously effect the taste of Aburaage since oil is absorbed by Aburaage during the frying process. Since oil is an important taste factor, only small quantities of meal could be used with none used during prosperous times. As also mentioned before, the crusher now believes his meal market is better for cattle than for Tofu so he is trying to discourage an increase in demand for Tofu meal. And also since the crushers now sells select whole soybeans in great quantity to the Tofu maker he does not want to not be able to sell whole soybeans although this is somewhat unusual reasoning on the part of the crushers. After the advertising program conducted by the crushers, most Tofu makers because of economic reasons began to use soybean meal for Aburaage although not in the quantity advertised as acceptable. Usually for one batch of Aburaage 1 to 2.5 kilograms of meal might be added with places that produce poor quality Tofu products using a greater quantity although very few use 100 percent soybean meal. Soybean meal is mixed with the ground soybeans or is mixed with water and drawn into the cooker after the ground soybean substance. As long as taste of good Tofu remains a factor soybean meal will not likely become the main component of regular Tofu although if promotion continued, soybean meal would become more and more used for Aburaage, as meal has an advantage over whole soybeans in that it need not be soaked. If therefore an emergency order appeared the Tofu maker could comply.

"Cooking Aburaage material is the same as for regular Tofu but since Aburaage needs more cohesiveness (because it not stored in water) a harder material is produced by increasing the amount of precipitating agent (about 1/5 more), removing a greater quantity of water than for either regular Tofu or Yakidofu, and stirring more while precipitating to break the curd into small pieces so that more water can be removed. It is dippered, trayed, and pressed in the same way as Yakidofu. About four trays of Aburaage can be made from one batch giving 100 pieces of Aburaage. In contrast to other types of Tofu products if a portion of a batch remains it can be added to the next batch attesting to the fact that of all types Aburaage is the least delicate. After pressing it is cut in the same way as Yakidofu and stored for further drying, cover upon cover as shown in Figure 56.

"Although the process and appearance of Yakidofu and Aburaage are similar until this point the water content of Aburaage is much lower so they are not interchangeable" (Continued). Address: San Francisco, California.

5225. Brandemuhl, William. 1965. Tofu (including Aburaage and related products): Frying Aburaage, Atsuage, Hirosu / Ganmodoki, Okara, Soybean Milk (Continued–Document part IV). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 137-201, Unpublished manuscript. 28 cm. [18 ref]

• ***Summary:*** (Continued). "Frying Aburaage: Aburaage is usually fried in rapeseed oil with soybean oil being occasionally used. Frying is accomplished in two stages as Figure 56 indicates. The containers used to fry are usually housed with bricks and heated by oil and blower although wood is sometimes used. A wood stoked fryer has the disadvantage of uncontrollable temperature. The oil containers are provided with hoods but as seen in Figure 57 cleanliness is difficult to maintain.

"The number of double oil containers varies with the size of the maker with a slightly larger than average maker processing about 1,000 Aburaage at a frying rate of about 120-150 per hour so at least two vats are needed. Each of the double containers are about 28 inches square and 2½ inches deep. Although it seems that the containers are completely separated by a partition actually a three millimeter space exists between the bottom of the oil vat and the partition so that a certain amount of oil circulates between the two vats.

"Although most vats are as pictured in Figure 57 some have slanting sides for easier insertion of the raw Aburaage and conservation of oil. To insure even frying on both sides of the Aburaage as well as to increase speed of frying one of the two vats used for frying the same Aburaage has a wire

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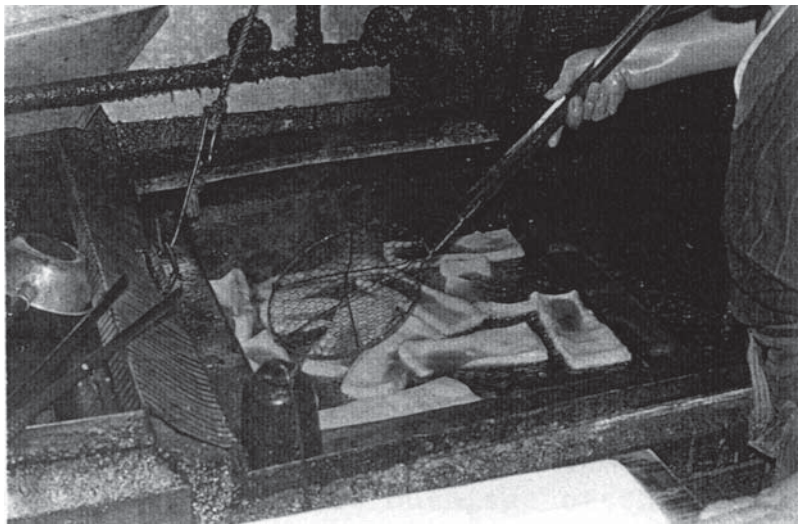

mesh rack that is constructed to fit inside the vat. Such mesh is hinged to the container at the rear so by suitable attached wire or rope, the mesh can be easily controlled. A weight is put on the mesh so that the buoyancy of the frying Aburaage will not raise the mesh and defeat its purpose. In addition to the above equipment three hand utensils are used for frying Aburaage, one is a dipper (seen in foreground of Figure 57), for pouring oil over the Aburaage, another is a wire mesh spatula about 10 inches in diameter (see Figure 58) used to turn and individually press certain Aburaage, and the third is a long metal forceps for removing the Aburaage from the oil. Although equipment is supposedly cleaned everyday the oil in use is unusually dark although clean oil usually stored in a tank above the working area delivers large quantities of oil quite often.

"Given the above equipment Aburaage are fried in the following fashion. About 12 Aburaage are taken by hand four at a time from the trays shown in Figure 56 and inserted into the number one vat of oil. The oil in this vat has a temperature of around lOOºC. Immediately upon insertion the Aburaage sink to the bottom of the oil. Two and one half minutes later they rise to the surface and at that time another batch of Aburaage are inserted in the same vat but the latter do not interfere with the frying of the first batch because they sink. As soon as the first batch rises they are turned and selectively pressed with the wire mesh spatula and the dipper mentioned above is used to pour oil from vat number two at 180-21OºC onto the uncooked side of the Aburaage. About five minutes after insertion the Aburaage are transferred to vat number two and pressed under the surface of the oil with the hinged wire mesh and weight. About three to four minutes later the golden brown Aburaage are removed with the metal forceps and placed on a slanting wire rack adjacent to the number two vat. The length of frying time varies with the temperature of oil that each maker might use so that generalizations cannot be made, however each maker attempts to produce the largest Aburaage possible given the size of raw Aburaage used. If frying is successful the Aburaage will first become very puffed and then collapse having then a skin-like surface. The void space may then be used after suitable cutting for holding rice, one of the most popular ways to prepare Aburaage. The 1.8 liters of oil that are absorbed into 100 Aburaage make the protein rich Aburaage very rich in oil also. One reason why the use of meal has been successful for Aburaage is that oil absent from raw Aburaage is replaced in great part by frying.

"After excess oil has dripped from the Aburaage on the wire tray, they are removed and placed on another wire tray and stored in a wooden rack until marketed. The form the 240 gram Aburaage takes is as shown in the center rear of Figure 59.

"Sushiage is made using exactly the same materials and procedures as Aburaage except that Sushiage is less than one half the size of Aburaage as can be seen when comparing both in Figure 59 and Figure 57 (Sushiage) with Figure 58 (Aburaage). Length of frying Sushiage has to be compensated so that total frying time is usually less than eight minutes.

"The Japanese people delight in consuming a slice of raw fish set upon a small ball of rice but since fish is expensive a quantity of rice packed inside a split Sushiage often acts as an inexpensive substitute.

"Atsuage (see right front, Figure 59) may best be described as being two different products although marketed as the same. Standard Tofu which cannot be sold on the day it is processed is on the next day cut into triangular pieces one inch thick with legs about two and one half or three inches long. This product when fried only in the hot oil vat for a short time is called Atsuage. Since it is small

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it can easily be used when a piece of Aburaage is too large for the required use. Demand for Atsuage is usually higher than what can be made from the varying quantity material remaining each day so Atsuage also has to be made from regular batches of Aburaage resulting in products of two different qualities but not distinguished as such. A little known fact is that Tofu makers make nearly as much profit on cutting old regular Tofu into four pieces, frying, and selling as Atsuage as they do on selling regular Tofu.

"Hirosu (also called Ganmodoki) is pictured in Figure 59 on the left front. It is composed of old regular Tofu, old Yakidofu (after the roasted surface is removed), the trimmings obtained when cutting Aburaage products, a shredded vegetable (usually carrots), ground yam, and sesame seeds. The first three materials are put into a cotton bag and pressed with a stone or the mechanical press if it is free so that a great portion of the water is removed.

"After removing the material from the press, the shredded carrots, ground yam, and sesame seeds (the sesame seeds may also be placed in the top of the material after formed) are mixed together by hand. Then the paste-like material is shaped into balls the size of one scoop of ice cream. In fact an ice cream scoop is sometimes used for shaping; otherwise it is done by hand. The balls are then put in the low temperature oil vat and allowed to remain submerged for a short while, then transferred to the high temperature oil (180-200ºC) and fried until golden brown. Hirosu is more often used by poor people than other Aburaage products but not limited to same.

"Okara, as mentioned before, is the residue of the various filterings [sic] of the raw Tonyu. It is usually sold to dairy farms for feed at $.01 (four yen) a kilogram. Figure 60 shows a farm owned truck with Okara from a number of Tofu shops located in the farm's milk market. Not all Okara is fed to cows however, as it is also a popular food for rabbits, and Tofu delivery people also carry it for selling as dog food. Although for cleaning purpose other commercial products have replaced Okara, it can be used as a floor and hand cleaner. A small amount is also sold for human food (see Figure 61) with very poor people accounting for most of the food use.

"Soybean milk: Although other places in Asia use soybean milk with large and small scale factories producing same for a milk deficient population, in Japan soybean milk is not significantly consumed, although one modern factory is producing a similar product, however initiation of production is too recent to tell if this product will be successful. The Tonyu of Tofu production would seemingly be marketed but it is not because of the availability of fresh milk. Such was not the case up to about 25 years ago when nearly every Tofu shop sold Tonyu for direct human consumption and even for enriching other food products such as bakery goods.

"The Tofu factory: Figure 62 shows the production area of a Tofu factory employing six persons and producing the following amount of Tofu per day:

"Products. Pieces
"Regular Tofu 560
"Yakidofu 150
"Aburaage 1,200
"Sushiage 2,700
"Atsuage 400

"This factory is much larger than average yet for the above Production only 140-200 kilograms of soybeans are used. It might be imagined that to employ six people, hand work is the rule rather than the exception" (Continued). Address: San Francisco, California.

5226. Brandemuhl, William. 1965. Tofu (including Aburaage and related products): The Tofu factory, marketing Tofu, preservation (Continued–Document part V). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 137-201, Unpublished manuscript. 28 cm. [18 ref]

• ***Summary:*** (Continued). Although all members of the family help the business in some way, labor cost is not yet so high (Tofu worker receive $60-75 per month live in salary) and the Tofu industry makes use of much inexpensive equipment. With the development and rapid expansion of food and other industries, Tofu production is becoming far behind with respect to modern methods so cost of production is increasing, forcing many Tofu makers into bankruptcy. The number of Tofu makers is decreasing in still another way and that is at present the sons of Tofu makers observe that making Tofu is not a desirable job, either prestige or condition wise, so are refusing to assume ownership of the shop at the suitable time.

"This creates somewhat of an advantage for the young people who do enter the business as the older men running their own business can neither maintain quantity of production as they increase in age or handle young employees to maintain same so the young producer can slowly increase his sales by capturing the local market from an old maker. Also young aggressive makers are in a much better profit position as the profit margin seems to be high but more volume than a few bushels a day is needed to insure a comfortable financial position.

"Although Tofu makers as a whole believe that modernization and automation cannot be accomplished with Tofu in the form it is because of its distribution, a few individual makers are making real progress, such as frying Aburaage while it continuously moves through an oil container on a stainless steel conveyor.

"Unfortunately as with many traditional industries in Japan, old methods are adhered to as if they were part of the maker. This is fact is partly true but such makers are going to suffer the most when innovation is finally realized. A traditional industry in Japan is bound by a great number

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of customs and rules that are not written but not bound as yet to scientific measuring, weighing, testing, and providing adequate sanitation, even though there is one government inspection per year. The latter seems to be especially important as Japan's large modern industries are showcases of sanitation but yet people do not have concern when they are handed a piece of Aburaage with the same hand that a moment before connected a fuel oil pipe to the boiler.

"Marketing tofu products: For Tofu products these are five chief sales places or ways of selling:

"(1) Directly at the shop

"(2) By Tofu peddlers (carrying particular sounding horns to announce their presence and pulling carts by hand or bicycle as seen in Figure 63)

"(3) Maker owned sales outlets in market places

"(4) At shops in and outside of markets where other foods are also sold (see Figure 64)

"(5) To institutions, school, and factories

"Because of the nature of Tofu, its manufacture is not conducted in the manufacturing section of a city or village but rather in an area of dense population. This indicates the lack of zoning laws that Japanese citizens live with but such is necessary for the Tofu maker. So located, the housewives of the immediate area stop at the Tofu shop on their way home from shopping for other foods, or as is the case in the morning, go directly from their home and buy Tofu, to put in the every day soup, *Miso-shiru.* Most often the housewife carries a pan to carry the wet Tofu, but at present a machine which seals plastic around an order for about $.006 (0.5 yen) is becoming popular. This machine is becoming used for a great number of foods although $.006 is still a high cost for packing Tofu.

"If a particular shop is small the owner himself may take care of peddling Tofu door to door. If somewhat larger his employees will do same and if in the wholesale class, independent peddlers will buy and sell for themselves. The independent peddler can buy Tofu from the wholesaler for $.041 (l5 yen) and sell it for $.056 (20 yen) so can make more money counting other related products than he could working in a factory. There is no equivalent of the Tofu peddler in the U.S. except possibly the milk deliverer but the Tofu man may pass each area three times a day and deals personally with his consumers although always maintaining the status of a peddler. More progressive Tofu makers may own one or more shops in a market place and have one or two employees handle his entire line. This type of venture probably earns the greatest amount of money for the maker as more people can be contacted with less effort and time. Unfortunately there are so few market places in relation to the number of Tofu makers in any particular area.

"The Tofu wholesaler and even retailer sells Tofu at wholesale prices to many shops such as the one pictured in Figure 64. This type of sale is not so profitable for the maker or for the end seller as volume is so small and delivery must be every day. As the number of markets increase this type of seller will decrease in number.

"Sales to hospitals, schools, and factories offer volume outlets but since such sales are so competitive, custom necessitates discounting, so profit is not large although demand is somewhat predictable. Many of the firms that only wholesale Tofu aim for this market. Food sales to factories assume an unusual proportion compared with counterpart industries in the U.S. because as job fringe benefits, dormitories, breakfast, lunch, and dinner are often provided. The quality of such benefits is somewhat debatable but it is sure that Tofu products are used so that less meat need be.

"Preservation: One of the greatest disadvantages of Tofu is that it cannot be stored for a great length of time. By test if regular Tofu is kept in water that is under 5ºC it lasts for one week, if stored in 10ºC water it will last two days. If stored in water above 15ºC it will only last for one day and except for certain winter days the latter is the most real case so every day delivery is necessary. Aburaage is easier to market especially in winter as it lasts about one week however in summer it lasts the same as regular Tofu. Besides taste, preservation is the only other major problem confronting the automation of the Tofu industry. Quantitative production could most likely be achieved but distribution would have to be conducted in the same way so increased delivery cost would most likely outweigh the costs of local production that is now prevalent. The only solution seems to be what numerous places have tried without success and that is for many small makers in one area to combine, incorporate, and construct an automated factory with each of the combined members assuming a directorship. Delivery is still within the area covered by the makers acting separately while economies of scale are achieved because of size and such a method is probably the only way that capital could be raised. Outside investors including most banks do not consider the prospects of the Tofu industry favorably so will not invest. An individual maker even if successful does not have but a small part of the money necessary for constructing and operating an automated factory. One problem that constantly exists wherever these combines are formed is that the individual maker after having decided all business matters himself for many years cannot adjust to group decision making by the corporate board. This problem has until the present caused the combines to fail

"Price: The price of Tofu has been increasing but it is still a low cost item on the food budget. Regular Tofu sells for $.06 (20 yen), production costs approximately $.03 (11 yen) with the wholesale price at $.042 (15 yen). This would seem to indicate that the makers who own outlets have quite wide profit margin while those that only wholesale have to operate on a much narrower margin. Such wholesalers producing around 560 regular Tofu per day would only earn $6.23 (2,240 yen) with quite a large amount of capital investment given the Tofu industry. Yakidofu although

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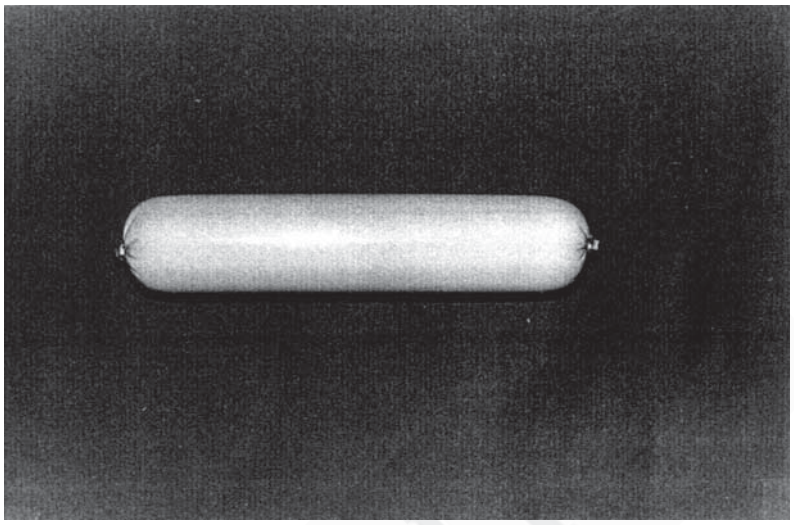
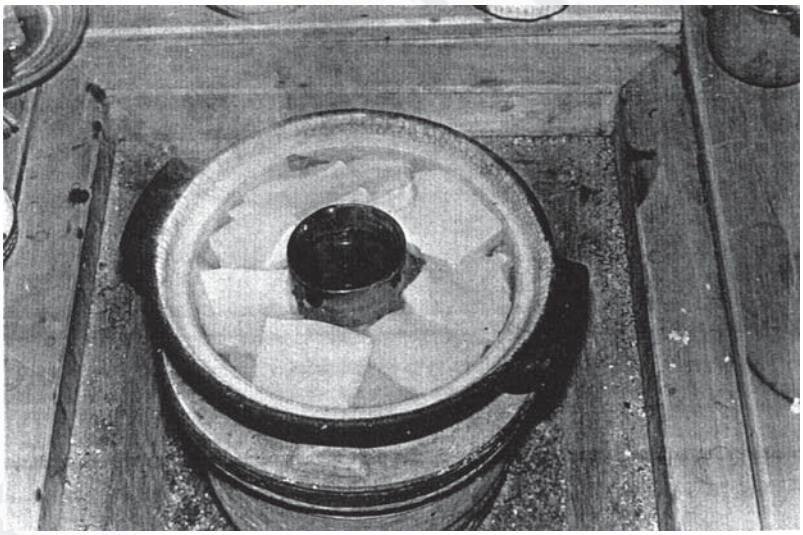
taking less time to produce has to be handled more (roasting) sells at the wholesale and retail level at the same price as regular Tofu. Yakidofu also contains less water. It is unsure why the makers make such sacrifice but probably demand for Tofu would decrease if that type was not available at the same price as Shiradofu [Shirodofu?]. Housewives could not substitute regular Tofu in the place of Yakidofu so they might very well substitute a completely different product. One of the 24 pieces of Kinugoshi contained in the Kinugoshi tank sells for $0.44 (16 yen). Aburaage retails at $.056 (20 yen) but because of the oil used in frying, cost of production is $.033 (12 yen) in contrast to $.03 (11 yen) for regular Tofu. This is compensated for by the fact that Aburaage lasts longer than regular Tofu so there is less waste. Both Hirosu and Atsuage wholesale for $.014 (5 yen) and retail for $.019 (7 yen).

"As mentioned previously profit margin appears to be adequate (considering all products over 35 percent) however volume is a real problem" (Continued).

Table 16 (p. 189) gives the chemical composition of tofu and aburaage (per 100 grams). Table 17 (p. 190) gives the quantity of soybeans and soybean meal used in Japan for making tofu and aburaage products (1956-1963, year starting April 1). The amount of whole soybeans used increased from 143,800 metric tons (tonnes) in 1956 to 285,100 tonnes in 1963. The amount of [defatted] soybean meal used increased from 3,200 tonnes in 1956 to 65,000 tonnes in 1963. Address: San Francisco, California.





5227. Brandemuhl, William. 1965. Tofu (including Aburaage and related products): Recently developed Tofu products, Tofu as a food, concluding remarks (Continued–Document part VI). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 137-201, Unpublished manuscript. 28 cm. [18 ref]

• ***Summary:*** (Continued). Recently two revolutionary Tofu products were developed improving some of the defects of Tofu in its present form. The first product (bagged Tofu; see Figure 65) is more akin to regular Tofu in that it can easily be made in the ordinary Tofu shop if a few additional pieces of equipment are procured. This equipment is now available commercially so most makers that are interested purchase it. Tonyu is prepared in the same way as for regular Tofu and then stored in drums without being precipitated. It is then put into a machine that delivers a certain quantity of Tonyu at 20-25ºC into a plastic bag along with a small quantity of precipitating agent. The bag is then bound by wire with a manually operated machine or bound by hand with a multi-looped rubber band. With this process the Tonyu plus calcium sulfate is compressed into a tight round cylinder so that only a few air bubbles remain. Then a large number of the bags are put in a barrel of water heated with live steam and cooked for 30 minutes at a temperature slightly under boiling which precipitates the Tonyu into curd. The finished product is a very smooth round shaped piece of Tofu 250 grams in weight which need not be stored in water and lasts one week without deterioration. Such a product might retail for $.069 (25 yen), wholesale for $.05 (18 yen) and costs about $.044 (16 yen) to make. If too much calcium sulfate is added the curd separates from the water and if too little the Tonyu does not solidify, however an element of standardization can be effected in making this product even in the small shop.

"Another product called "Proton" is very similar as an end product although a soybean meal processed specifically for Tofu is used to make the Tonyu and factories producing Proton operate on a automated mass production scale. Proton has most of the advantages of bag Tofu and many additional ones.

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"Both of these products are experiencing only a small degree of success however as the tradition based Tofu industry is not supporting such products to any great extent, especially Proton which potentially could put many small Tofu makers out of business. In addition the taste of both bagged Tofu and Proton is supposedly inferior to regular Tofu and consumers greatly hesitate accepting a round shaped piece of Tofu in place of the usual rectangular one. In recent years Japan has increasingly accepted completely new products, however when such product is a substitute for a traditional one such new product only slowly gains acceptance. All of the above factors inhibit the growth of the enterprising firms that are developing new Tofu products, ones that with slight modification will become the future Tofu of Japan.

Tofu as a food: One might say that Tofu products can be used in nearly all Japanese food dishes although a few uses account for most of Tofu consumption. Both regular Tofu and Aburaage are used more than any other way in the every day breakfast soup Miso-shiru (see Figure 66) a dish that has Miso as a base with Tofu, Aburaage, and vegetables also contained.

"Nearly all Yakidofu is used in that famous Japanese dish Sukiyaki. Although it may occasionally be used as shown in Figure 67, that is, covered with Miso and placed over low heat for an item called Dengaku. Besides Miso-shiru, Aburaage in its various forms is eaten with rice shaped as shown in Figure 68 or in the same way that raw fish is eaten with rice. Another important way in which Aburaage products are used is as a protein source for the many types of noodle soups that exist in Japan. Aburaage is particularly suited for a 100 percent wheat noodle called Udon.

"A very famous regular Tofu dish (Yudofu) originated in a Buddhist temple and is now also often eaten at home. A large casserole dish is filled with water, heated (very often over charcoal in temples) while a sheet of dried sea tangle [konbu] clings to the bottom inside surface and a jar of Shoyu-based sauce standing upright in the center of the container (see Figure 69). A few minutes is all that required to cook Tofu (Tofu should not be overcooked as it becomes porous) after which it is put into a small bowl of the sauce which contains Shoyu, green onions, and ginger (see Figure 70). A small number of restaurants specialize in preparing only Tofu but although all quite famous by preparing 60 dishes made from Tofu. Such places are not common dining places as when served as an only food Tofu becomes boring even for the Japanese. Such traditional restaurants may be reserved two to three weeks in advance because of their uniqueness. Japanese housewives sometimes use the near tasteless Tofu as an extender putting it into meatballs, hamburgers, or scrambled eggs, while the fish sausage companies use Tofu as a fish extender for cheaper fish sausages.

"Kinugoshi is the only kind of Tofu which is usually eaten without cooking as it is served from ice water into a dish which contains Shoyu, ginger, and possibly green onions.

"The above indicated a great variety of uses for the easily digested Tofu products. In addition, Tofu or Aburaage may be used as the main ingredient of many other dishes as in the examples below,

"Tofu:

"Tofu pudding

"Whale meat rolled in Tofu

"Tofu and vegetables boiled with tomato sauce

"Tofu dumplings and meat,

"Tofu hamburgers

"Tofu vegetable soup

"Tofu salad

"Aburaage:

"Okara stuffed Aburaage

"Fried Hirosu with vegetables

"Concluding comments: Tofu the product that has survived hundreds of years of Japanese history is now experiencing somewhat of a crisis as Japan's economy and most industries are expanding at a rate that is without equal. Per capita demand for Tofu is decreasing so if population increase was not causing absolute quantity consumed to increase soybeans would slowly decline in importance as the chief soybean food. Japan's population growth has been quite high but efforts have been undertaken to stabilize growth so even Tofu may feel the effects.

"Tofu being such a well known food never had to be advertised, but recently to compete with the heavily advertised western type foods Tofu producers have had to. For a small Tofu maker, advertising is impossible so the local association is used but its economic situation is not the best either so advertisement assumes a completely different form than the advertisement of the large food companies. The latter most often uses expensive television spots while it is doubtful whether Tofu has ever been advertised on television. Instead the Tofu association may solicit funds from their raw material suppliers (large companies) to publish a small pamphlet for distribution by the maker in proportion to his share of production relative to total production of all members. This is generally true however the large makers will support such advertisement even if the smaller maker is favored.

"Another method of advertising is to engage a temple to create a festival honoring an aspect of Tofu. This results in free newspaper space as most always such festivals are covered by a feature writer (a number are sure to be invited). How effective each advertisement is a debatable question but it is sure that such efforts will not eliminate the increasing need for modernization and rational business decisions. If such is not achieved economic factors will cause much suffering among thousands of Tofu makers. Tofu making can no longer remain the family business it is when a large

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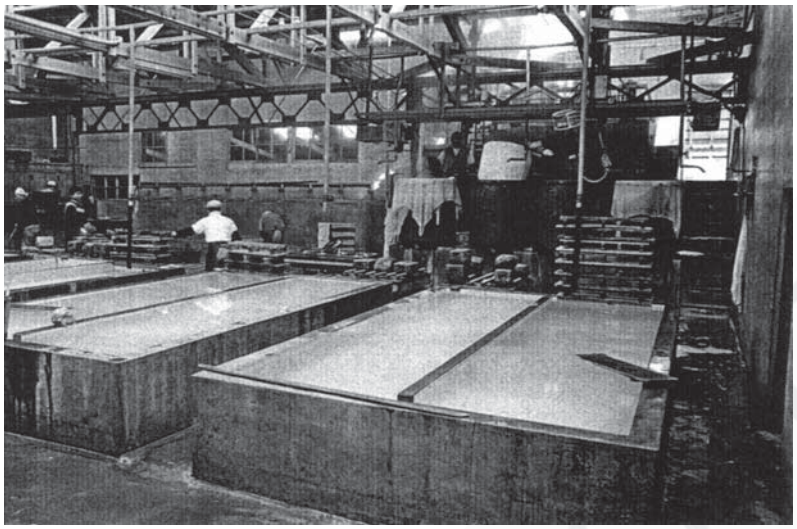
productive unit such as a few that do exist successfully and efficiently produce if originally founded in a correct way. Progress may have been long in coming for the Tofu industry but the climb has started. The question that remain however is whether most Tofu makers will join." Address: San Francisco, California.

5228. Brandemuhl, William. 1965. Frozen tofu: History, development, frozen tofu soybeans, processing (Document part). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 328-359, Unpublished manuscript. 28 cm. [18 ref]



• ***Summary:*** This excellent chapter contains the most detailed information on frozen tofu to date. "Frozen Tofu (Koyadofu or Koridofu) is processed in the same way as regular Tofu until curd (although harder curd than regular Tofu) is formed at which time the curd, cut into small pieces, is frozen for a few hours at -20ºC, and then stored for two weeks at -5ºC. After it is removed from cold storage the pieces are placed in water for defrosting, centrifuged, dried in ovens and open air, trimmed, treated with ammonia, packed, and sold as a dry, highly preservable, high protein product for use in traditional Japanese dishes.

Note: This is the earliest English-language document seen (April 2013) that uses the word "Koyadofu" or the word "Koridofu" to refer to dried-frozen tofu.

"History: China supposedly has or had a product somewhat similar to frozen Tofu, although frozen Tofu as Japan knows it is completely of Japanese origin. Although a number of theories have been put forth regarding the method of origin it is agreed that the place of origin is the Koyasan Mountain in Wakayama prefecture. Connection between Koyadofu (frozen Tofu) and Koyasan is not coincidental as the name of frozen Tofu also originated in Koyasan Mountain. The most acceptable theory of method of origin seems to involve a priest, Kobodaishi, the originator of the Koyasan temples. Kobodaishi, journeyed to China as did scores of other priests, for the study of Buddhism. It was there that he learned about Tofu. When he returned he grew soybeans so that his priests and converts might eat the new product. Soon Tofu began to be used regularly and with that a piece of Tofu accidently remained outside during a very cold Koyasan winter about 800 years ago. Legend has modified this to state that a priest wearing wooden shoes was returning from the Tofu shop a dark slippery night, fell in the snow, lost a piece of the Tofu, and proceeded home. Whether the latter is true is highly questionable although whatever the reason for remaining outside overnight, the next morning the piece of Tofu, by that time frozen, was found and the priests then experimented with the possibility of freezing Tofu and in the process developed frozen Tofu into a dry cake after it has been frozen. After the priest developed foods that could utilize frozen Tofu they popularized such foods in the Koyasan area so that soon commercial production began, with consumption and then production spreading to other places in Japan.

"Although because of the availability of regular Tofu, frozen Tofu did not become as popular as regular Tofu except among the priests of certain temples particularly those at Koyasan. The Koyasan temples still use a large quantity of frozen Tofu for making a multi-course dinner (for themselves and visitors) in which Koyadofu is carefully prepared to appear as a large number of items such as fish, meat, or vegetables. The Koyasan temples are not the only place one might find this type of dinner but the type at Koyasan is the most famous.

"Development: The production of frozen Tofu is now partially automated with all freezing done by machine but such was not the case in the near past. Before the Meiji period only natural frozen Tofu was produced. Production was limited to areas with very cold weather and even in such places only in winter and high in the mountains; A few people produced Koyadofu at home (those living high enough), however the usual way in which commercial frozen Tofu was produced was for six or seven people to go to a suitable place on the mountain for about 90 days each winter producing approximately 700,000 pieces of Koyadofu. At present, frozen Tofu factories can produce that same quantity in three days. Since the Koyasan area was not the only area suited for making frozen Tofu other areas began production, notably the Nagano area, the same area famous for Miso. Production of natural Koyadofu although surviving until recently was too dependent upon environmental factors so a Mr. Nakahama, one time a Columbia University student, imported American freezing equipment and produced machine made Koyadofu for the first time in Yonago city in Totori prefecture in Meiji 43 (1910). This man some 18 years before had imported an ice-making machine and

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attempted to commercially produce and sell ice and frozen fish but failed. After receiving a patent for the machine frozen Tofu process Mr. Nakahama began production in the city of Osaka but found water in short supply and the cost of production too expensive for efficient operation so he moved to the Wakayama area. His success slowly prompted other producers to begin machine production. Although ten years ago natural production could be found, shortly after the end of World War II machine produced frozen Tofu accounted for the majority of production. Utilizing freezing equipment, frozen Tofu production is not limited to three months per year or only certain geographical locations and can be produced in much greater quantity for a given time period. Even though the machine process can provide a cheaper more uniform product, the consumers of frozen Tofu have just begun to accept that the machine process produces a better product. As in the Miso industry the number of factories is decreasing, although production of frozen Tofu is remaining constant or increasing. Until ten years ago there were many small producers operating only a short time each year. These have all but disappeared with approximately 45 plants now operating, all processing with moderately large and semi-automated facilities. Figure 136 indicates the scale of an average frozen Tofu factory. Although only the portion of the factory which operates similarly to tofu is shown it can be seen that Tofu and frozen Tofu processing are not similar in production scale.

"As Miso is developing in the Nagano area so is frozen Tofu. The scale of operations, outside of Nagano is not as large or as automated as one half of the frozen Tofu makers are located in Nagano and they produce over 80 percent of Japan's production of frozen Tofu. Nagano has the only frozen Tofu factory that is completely automated.

"Many of the frozen Tofu factories outside of Nagano are finding it difficult to compete with the large scale maker so are forced to curtail production because of lack of demand. Since the frozen Tofu factories represent a substantial capital investment it would be very inefficient to allow the factory to be nonoperative for part of the year so even the most successful October-June producer of frozen Tofu may now produce a summer demand product such as ice cream. The smaller producers may also rent freezer space to companies during the summer months. It remains to be seen if such companies will continue to operate profitably.

"Frozen Tofu soybeans: The National and Prefectural Frozen Tofu Associations, while not as active as the Miso Association, do purchase and distribute soybeans for most of their members. As domestic soybeans are priced much too high for frozen Tofu use, U.S. soybeans (No. 2 ordinary) began to be used in recent years. However with soybean trade with China restored, U.S. soybeans may well be replaced. At present the typical maker uses varying proportions of both U.S. and Chinese soybeans. Although considering the stable supply of U.S. soybeans, the makers prefer Red Chinese soybeans mainly because of price although the foreign matter present in U.S. soybeans also plays a part. Frozen Tofu producers can usually purchase sixty kilograms of Red Chinese soybeans $.84 (300 yen) cheaper. The selected types of U.S. soybeans would be ideally suited for frozen Tofu but price is prohibitive.

"The 45 frozen Tofu makers produce the quantity of frozen Tofu indicated in Table XXV and annually consume the amount of soybeans also denoted in Table XXV. Even in peak years use of soybeans total less than 30,000 tons so even if Red Chinese soybeans did come to be used it would not mean a great decrease in use of U.S. soybeans.

"Processing: For the production of frozen Tofu, soybeans are soaked, ground, and steamed in much the same way as regular Tofu except all procedures are conducted on a larger scale. Soybeans are soaked 8-20 hours depending on season, water ground as fine as possible, and steamed for 10 minutes at 6 kg per square cm or the equivalent of that in an open cooker. Okara is usually removed from the ground cooked substance in the same way as regular Tofu however use of a centrifuge for this purpose is much more popular. The Okara obtained is sold for cattle feed at $12.50 to $13.89 (4,500 to 5,000 yen) per ton. The Tonyu [soymilk] flows through nylon and cotton filters to precipitation containers that are similar to but larger than precipitation containers for Tofu (compare Figure 46 and Figure 137). At this point the efficiency of the frozen Tofu maker would greatly decrease if he used regular Tofu methods of adding magnesium sulfate, of removing water and putting curd into shaping boxes so generally the precipitation agent is added at 60ºC with an electric mixer and water is removed by mechanical means (pump) and shaping boxes may be filled simultaneously using a custom built apparatus as shown in Figures 138 and 139."

Note: Table 25 shows that production of frozen tofu in Japan increased dramatically from 150 million pieces in 1950 to 630 million pieces in 1963. The amount of soybeans used to make frozen tofu in Japan increased from 6,000 metric tons (tonnes) in 1950 to 25,300 metric tons in 1963 (Continued). Address: San Francisco, California.

5229. Brandemuhl, William. 1965. Frozen tofu: Processing, freezing, defrosting, drying, treatment with ammonia, packing, marketing, and use (Document part). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 328-359, Unpublished manuscript. 28 cm. [18 ref]

• ***Summary:*** Continued: "A great amount of labor is still required for this process but relative to Tofu the quantity placed in shaping box per man hour is significantly greater. Frozen Tofu Tonyu and curd are much less sensitive to handling than Tofu so they can be mechanically handled without adverse effects. Frozen Tofu curd is formed in a box that is 13 x 30 x 6 inches. It contains a cotton filter

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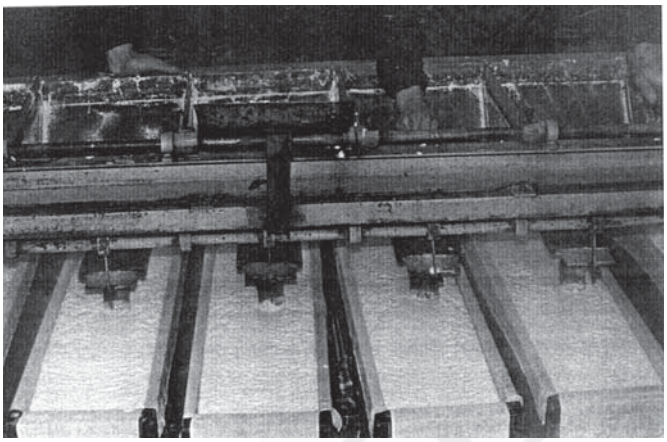

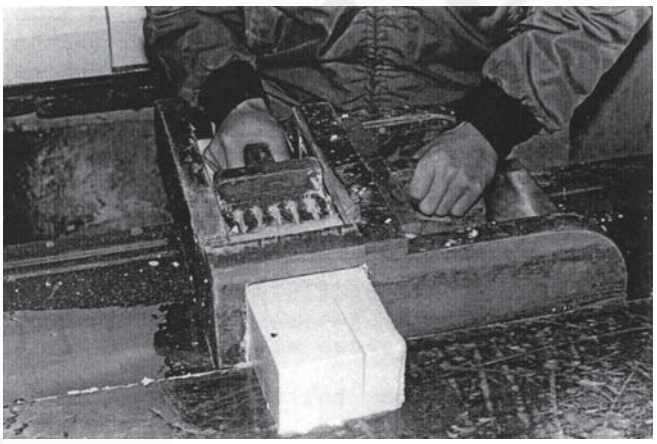

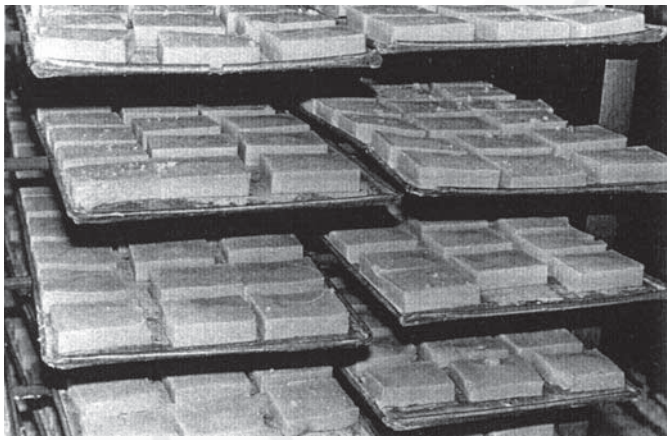

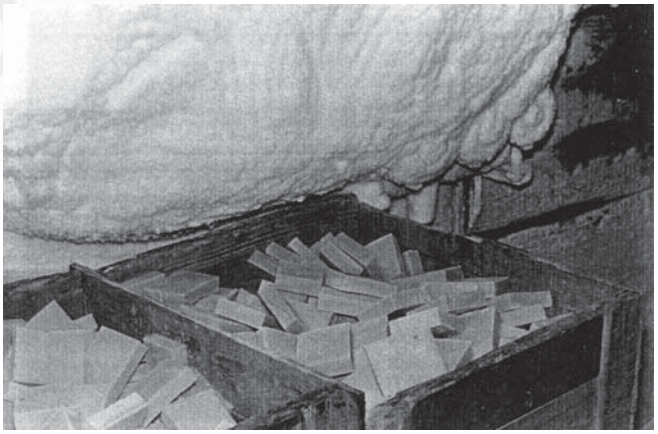

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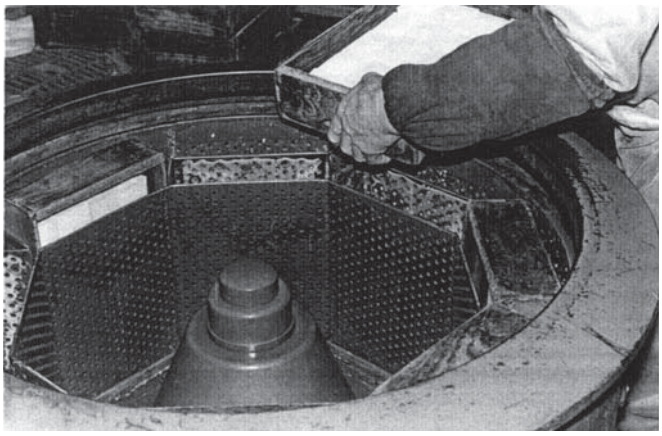

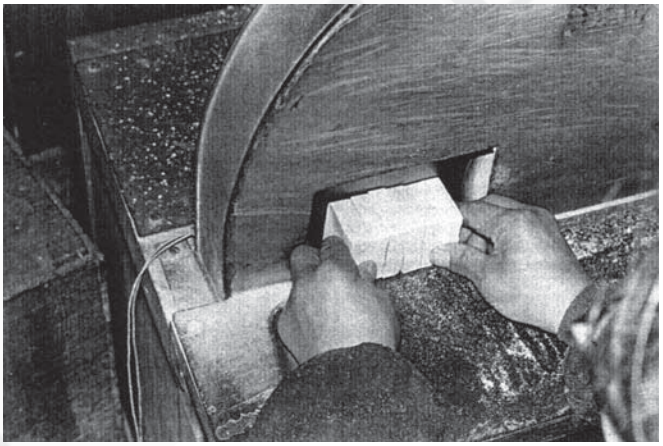

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cloth and is pressed with a 10-20 kilogram weight (stone) for one to two hours in much the same way as regular Tofu although as the frozen Tofu industry is very interested in improving their methods of production, time saving devices such as shown in Figure 140 (curd foaming guide) are utilized throughout the production process. More water is removed from precipitating curd and the curd is pressed with greater pressure than regular Tofu as a hard curd is desirable because frozen Tofu curd is handled while out of water and is to be frozen. After the curd is formed it is submerged in water. Usually the Tofu maker has one small sink in which to submerge Tofu, while frozen Tofu makers usually have a number of large sinks for this purpose (see Figure 136).

"From this point the procedure for Frozen Tofu differs from regular Tofu in that the submerged curd is removed (see Figure 141) only after soaking 24 hours while Tofu is removed and marketed only a few hours after. Since the final frozen Tofu product is storable manufacture is carried on only during the day, not in the early morning as Tofu. After the curd is removed from the water it is cut crosswise mechanically or manually in four to six pieces and then each piece is cut in small pieces 1 x 3 x 3 inches with a mechanical cutter as shown in Figure 142. A few factories have automated the entire cutting process but the method mentioned above is the most popular at the present. The cut pieces are then ready for freezing.

"Freezing, defrosting, drying, treatment with ammonia, and packing: After the formed curd has been cut into small pieces it is placed on trays (see Figure 143) in a freezer at approximately -20ºC for four hours. After quick frozen in such a way the pieces are removed from the trays and put in boxes as shown in Figure 144 and stored at approximately -5ºC for two weeks. Freezing at -20ºC is supposedly for insuring that the piece becomes completely frozen while the two weeks cold storage is for cohesiveness, porosity, maintaining size, and softness. The duration of both types of freezing vary with manufacturer although the above temperatures and time seem to be used the most frequently. After freezing for a desired period the pieces are removed from the freezer and placed in a tank of water for defrosting (see Figure 145). The soaking lasts for about five hours after which defrosting is completed and the now soft piece of curd are then centrifuged to partially remove the large percentage of water that is contained (see Figure 146). Centrifugation achieves this but for reducing same to 10-12 percent a hot air oven is used. For 13 hours the oven temperature is maintained at 110ºC then reduced to 45ºC for another three hours. After the oven treatment the frozen Tofu pieces are inspected by hand for relative dryness (see Figure 147) with pieces of like dryness shelved together and completely dry pieces stored as in Figure 148. Pieces with greater moisture are shelved so that adequate circulation may dry them properly. Until a few years ago natural drying was done in the open air on the roof of the factory or other suitable place however improved centrifugation and oven drying techniques have removed the need for such along with reducing the time required for natural drying from 27 to 20 days. Drying frozen Tofu outside is still practiced by a few makers although such will disappear completely within a few years just as natural freezing disappeared. In 1931 it was found that treating frozen Tofu with ammonia was advantageous in respect to softening after cooking, water absorption, and size increase.

"From its advent in 1931 ammonia's use with frozen Tofu increased in popularity so that at present virtually all frozen Tofu produced in so treated. After frozen Tofu is completely dry it is placed on racks in a small room that is saturated with ammonia gas and allowed to absorb ammonia for approximately one hour. Then frozen Tofu is allowed to aerate so that volatile ammonia can escape. After a certain time the pieces are trimmed as shown in Figure 149 and then graded into four to six grades. Packing frozen Tofu is very important with respect to storability so much care is taken to insure a tightly closed package for all except bulk orders as such are usually displayed in the open air at the market (see Figure 151). Besides in bulk, a box with 10 pieces of frozen Tofu packed in a plastic bag is available as are Cellophane packages (see Figure 150) containing six and 10 pieces. Broken pieces are very often packed in plastic bags. Because of price the broken sell quite readily. A little known fact is that the broken pieces also have the best cooking characteristics. Each type of package may be divided by quality into as many as three grades. Each grade usually can be distinguished by the consumer according to color, although while size is standard for all companies, colors with respect to grades are not.

"Marketing: After being packaged, except for what is marketed in the immediate proximity of the factory, frozen Tofu is trucked to the central markets of the larger cities which handles distribution to retail outlets as well as act as middlemen for the village and country wholesalers and retailers. For high quality frozen Tofu the manufacturer's price is approximately $.0139 (5 yen) with wholesale price about $.018 (6.5 yen) and retail price about $.022 (8 yen). The manufacturer considers it unfortunate that high quality frozen Tofu is the least demanded because poorer grades realize relatively less profit.

"Since production of frozen Tofu is no longer seasonal the quality purchased at one time is decreasing so that the 100 piece box is no longer in great demand except for Buddhist ceremonies, hotel cooking, and other special purposes. Households that do not lack money purchase the ten piece package while poor households purchase piece by piece from shops which very often display unpackaged frozen Tofu without covering as shown in Figure 151.

"The Frozen Tofu Associations at the prefectural level attempt to fix the price of frozen Tofu however with the many grades that exist, such is unsuccessful as it is too

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difficult to compare price of one company's frozen Tofu with another. With the existence of a competitive market, frozen Tofu is, coupled with its food value, a very inexpensive product. Its virtues are not well known however, as given the scale of even the largest company, national advertising cannot be conducted because of costs. This causes the item to remain a specialized product among older people and to be unknown among the younger people. It is thought by the various makers that greater emphasis should be put upon advertising, however they are not exactly sure how they can do this.

"If properly manufactured and packaged frozen Tofu is an extremely long lasting product. If stored in ideal condition, i.e. low humidity, stable temperature, et cetera, frozen Tofu would last many years. Ideal conditions very seldom exist especially in Japan so the frozen Tofu makers recommend that frozen Tofu should be consumed within three months in summer and within six months in winter. These recommendations may be for sales purposes, however in about three months the ammonia smell will disappear and supposedly that is a sign of decreasing taste. If the surface of frozen Tofu changes to dark yellow the piece has decreased further in taste but remains edible. If the piece becomes dark yellow throughout it should not be eaten. The preservation potential of frozen Tofu could most likely be increased through research and development of new methods of making and packing. At that time and even at present frozen Tofu seemingly would be ideally suited for use in parts of the world where environmental conditions are not suitable for fresh foods. Japanese frozen Tofu makers are too small to explore the possibilities of the export market but it is the hope of the makers that such a market will develop even on a small scale.

"Use: Frozen Tofu, a food product with composition as stated in Table XXVI is, as indicated, high in food value particularly protein, Unfortunately it is not a popular food nor well liked so its actual value to the Japanese diet is limited as per capita consumption for Japan is a whole is extremely low (see Table XXVII). Somewhat the reverse is true in rural areas especially those which do not have regular Tofu delivered. Rural consumption of frozen Tofu is double that of urban consumption" (Continued). Address: San Francisco, California.

5230. Brandemuhl, William. 1965. Frozen tofu: Use, closing comments (Document part). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 328-359, Unpublished manuscript. 28 cm. [18 ref]

• ***Summary:*** Continued: "Frozen Tofu is so identified with Buddhism such as Buddhist conducted funerals and other ceremonies that although the food is not considered sacred, it is considered to have a special role in religion. Liberalization from this role may be what is needed to develop the consumer market. The initial steps of preparing frozen Tofu is rather easy but subsequent steps to blend frozen Tofu with other foods are difficult. Consequently most young housewives do not prepare frozen Tofu. At first the desired number of pieces are placed in a pan of boiling water for 30 seconds and upon removal squeezed if possible. At this time the pieces are cooked with a number of foods. When cooking is completed the piece will have expanded 2½ times its original size, significantly increasing the water content from the 5-10 percent content before cooking. Because of the work involved, certain foods shops do sell cooked frozen Tofu (see Figure 152) but the price more than doubles. The most difficult part of cooking frozen Tofu however is making it taste like the food it is cooked with as frozen Tofu has very little inherent taste. If taste is not successfully added, partaking of frozen Tofu is similar to consuming a sponge. Cooked frozen Tofu mixed with certain foods is available in certain shops (see Figure 153) but it is not a popular carry home food item because of the price.

"For the experienced cook, especially a farmer's wife, frozen Tofu can be prepared in the following ways:

"(1) In Sukiyaki (some frozen Tofu makers market Sukiyaki size pieces).

"(2) As a breading for meat.

"(3) Simmered with boiled vegetables.

"(4) After a dry piece is crushed and soaked, fried with carrots.

"(5) After a dry piece is crushed, soaked, and sauteed, mixed with eggs for making omelets.

"(6) Lightly cooked with Shoyu and sugar (a dish liked by poor people).

"(7) After being cooked with Shoyu and sugar, fried with onions.

"For the most of the above uses, frozen Tofu does not add much or could easily be replaced with an easy to prepare substitute so the rushing urban housewife in fact uses the substitute. The progressive segment of the frozen Tofu industry believes that for expansion of use, modernization of the product is necessary.

"For this group modernization means an instant frozen Tofu most likely in powder form. Recently patents were procured on an initial type of instant frozen Tofu although such products are not ready to be marketed. As with Miso and Tofu, modernization involves a great change in the shape, appearance and other characteristics that are time honored and a part of the way of using. Instant frozen Tofu may have an advantage over Tofu and Miso though as instant frozen Tofu would definitely be easier to prepare than the traditional product. If instant frozen Tofu is technically impossible (which seems unlikely given the initial success) or if it is unaccepted it is quite possible that frozen Tofu consumption will gradually decline with the expiration of the aging segment of the population that now use frozen Tofu."

Note: Table 26 gives the composition of frozen tofu (100

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gm) on a dry weight basis; it contains 53.5% protein, 26.4% fat, 480 calories, and 590 mg of calcium.

Table 27 gives the yearly per capita consumption of frozen tofu in Japan from 1950 to 1963. It grew dramatically from 1.8 pieces weighing 35 grams in 1950 to 6.6 pieces weighing 132 grams in 1963. Yet the absolute amount is still very small. Address: San Francisco, California.

5231. Brandemuhl, William. 1965. Tsukudani and nimame (Document part). In: William Brandemuhl. 1965. Soybean Utilization in Japan. San Francisco, California. xxii + 478 p. See p. 387-99, Unpublished manuscript. 28 cm. [2 ref]

• ***Summary:*** "Description (Endnote 170): With the hope that certain types of food–mainly fish–could be preserved, an emperor of Japan at one time gave an island to certain parties for the development of a long lasting food made of common perishable food items. The result was Tsukudani, (mentioned in the Shoyu section), one or more of a variety of foods that are soaked if necessary, steamed, cooked with Shoyu, sugar, and other seasonings, cooled, and packed. The first to develop was Tsukudani made of whole small fish. After that came shrimp, other types of fish, and sea foods, many kinds of kelp, many kinds of seaweed, vegetables, beef, red beans and soybeans. All such types of Tsukudani have found acceptance among certain groups, attested to by the fact that such items were made in great quantity at home throughout Japan. With the thought of capturing a portion of the market, companies began to promote commercial Tsukudani and did same with a great degree of success. At present Tsukudani is very often produced in large modern factories. The greatest advancement that the companies brought forth was in the field of packing as sealing a quantity of Tsukudani in plastic after exhausting the air results in a product that lasts six months to one year. The most used Tsukudani is made from kelp, although whatever kind is produced, quick-method Shoyu is an important component. Figure 165 somewhat indicates Shoyu's use for Tsukudani as pictured are five large vats that are used exclusively for quick-method Shoyu for Tsukudani. In certain kelp Tsukudani as much as 30-50 percent of total volume is accounted for by Shoyu. Soybean Tsukudani has only 10 percent Shoyu because of the inherent qualities of the whole soybean.

"Manufacture (Endnote 171): Soybean Tsukudani as mentioned before contains about 10 percent Shoyu. In addition to soybeans it usually contains water, carrots, lotus root, kelp, and sugar in possible proportions as follows:

"Soybeans 56 kilograms
"Kelp 2 kilograms
"Carrots 3 kilograms
"Lotus root 4 kilograms
"Sugar 13 kilograms
"Light Shoyu 20 liters
"Water 20 liters

Note. This is the earliest English-language document seen (June 2013) that contains the term "Soybean Tsukudani." "A very large maker might use 300-350 kilograms of soybeans per day however statistics on total soybean usage for Tsukudani are unknown as data are not kept for soybean Tsukudani alone. U.S. soybeans are too small for making Tsukudani so only Hokkaido soybeans are used at present. If domestic soybeans continue to decrease in production it is believed that Tsukudani producers will shift to using imported soybeans, possibly Red Chinese. At first the Hokkaido soybeans are soaked for 8-16 hours depending on the season then steamed in an autoclave with a small quantity of kelp for 30 minutes at one kg per square cm pressure.

"While the soybeans and kelp are steaming the water, Shoyu, carrots, lotus root, and sugar are boiled for 30 minutes in a steam cooker as shown in Figure 166. Some Tsukudani makers believe that high grade Tsukudani can only be made if the proportion of material and size of cooking facilities are reduced from the quantity and capacity mentioned above. Such makers therefore may have as many as 40 small size cookers and many small autoclaves. The boiling material is stirred a number of times during the 30 minutes. When both steaming and cooking are completed the steamed soybeans and kelp are added to the boiled material and boiled for an additional 15 minutes. After such cooking the entire batch is placed in a container and allowed to cool naturally and soak for 12 hours in the liquid that it was boiled in (see Figure 167). After soaking, the liquid is drained but by this time the volume has increased two-fold. The drained material is then vacuum packed and sterilized making it ready for marketing.

"Use of soybeans Tsukudani (Endnote 172): Soybean Tsukudani is usually packed in 140, 200, or 300 gram packages. The making cost of the 140 gram package is supposedly $0.061 (22.5 yen) while the wholesale price is $0.065 (25 yen) and retail price might be $0.083 (30 yen). The 200 and 300 gram packages may retail for $0.097 and $.16 (35 and 58 yen) respectively. Soybean Tsukudani is available at all department stores (for the purpose of advertisement), all market places, Shoyu shops, and variety food shops. Tsukudani of all types increased in demand more than six times since World War II however since 1955 growth has been rather stable. Soybean Tsukudani, as with most other types, is mainly consumed by the lower classes. If combined with rice Tsukudani makes an adequate if not complete meal. Since it is a cooked product it can just be unpacked and eaten. Because of this, Tsukudani is very often used every day in the laborer's as well as the lower ranked office worker's lunch box. Besides of the product similar to Tsukudani mentioned below, people eat soybean Tsukudani very infrequently, if ever, preferring instead a high quality kelp Tsukudani.

"Nimame (Endnote 173): Nimame is a product very similar to soybean Tsukudani except that Nimame is most

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often sold from open containers (see Figure 168) and it does not have as many ingredients in one type but it may be combined with a greater number of other foods depending upon the season, festival, financial status, and other factors.

"Nimame was originally a farm household dish that provided a use for domestically grown soybeans. Such soybeans were first put in an iron pot with water, salt, and sugar and cooked for as long as 24 hours. Experimentation proved that a small quantity of sea weed or kelp improved the flavor. After that the practice of eating Nimame spread to the cities where other foods were found suitable for complementing the taste of the soybeans. At present shrimp (see Figure 169 and 170), other seafood, and vegetables all can be found in small shops that prepare cooked foods. It is made by Tsukudani companies as well so its usually sold in Tsukudani shops. Nimame is made from domestic soybeans and is commercially prepared in the same way as Tsukudani minus a number of components. Nimame is prepared at home by boiling the components between 12-24 hours. Nimame eaten as an ordinary dish is, like Tsukudani, a lower class food except around the New Year's season when the original form of Nimame, that is, just soybeans cooked with Shoyu and sugar are consumed by virtually all Japanese regardless of class. At that time Nimame may be prepared in the home or purchased (see Figure 171). For an unknown reason black soybeans (Figure 171) rather than yellow ones are preferred for New Year's consumption although it is thought that since black soybeans have the tendency to become very shiny when boiled with sugar so when served as shown in Figure 172 a more decorative setting can be achieved. Black Tanba paddy field soybeans (mentioned previously) are the most demanded for New Year's purposes, with black Tanba dike soybeans following and Hokkaido black soybeans a close third. Japan's total consumption of Nimame is completely unknown as there are unknown thousands of unspecialized shops selling an unrecorded amount of Nimame. Nimame is considered an important way in which farmers use their unmarketed domestic production, although again statistics are lacking."

Figures (black and white photos) show: (165) Shoyu vats, outdoors but under a roof, at a Tsukudani factory. (166) A Tsukudani cooker. (167) Cooling Tsukudani. (168) Nimame being sold retail in a market. (169) Nimame with shoyu and shrimp. (170) Nimame with shrimp. (171) A Japanese woman with a scale selling Nimame. (172) Nimame as served.

Endnote 170: Genroku Shoyu, April 26, May 2, 4, 1963. Nomura Tsukudani, May 20, 25, 1963.

Endnote 171: Genroku Shoyu, May 2, 1963. Hashizume Tsukudani. Nakamura Yuba, March 6, 1964. Nomura Tsukudani, May 20, 25, 1963.

Endnote 172: Hashi Tsukudani. Nomura Tsukudani, May 20, 25, 1963. Shimamoto Tofu. Tada. June 5, 1963. Endnote 173: Kurosawa Miso. Tada, May 29, 1963. Yamamoto Farm, information obtained interviewing owner of same, Taki-gun, Hyogo-ken, Japan, Dec. 7, 1983. Address: San Francisco, California.

5232. Cooper, Michael. ed. 1965. They came to Japan: An anthology of European reports on Japan, 1543-1640. Berkeley and Los Angeles, California: University of California Press. xviii + 439 p. Index. 24 cm. [30+* ref]
• ***Summary:*** This book is about the "Christian century" in Japan, which includes these key events (chronology): 1542–Portuguese arrive in Japan. 1549–Arrival of St. Francis Xavier. 1568–Nobunaga becomes ruler of central Japan. 1582–Hideyoshi succeeds Nobunaga. 1587–Edict issued expelling missionaries. 1598–Ieyasu succeeds Hideyoshi.

1614–General persecution of Christians begins. 1624–Expulsion of Spaniards. 1639–Expulsion of Portuguese. 1640–Unsuccessful embassy from Macao [to Japan].

This anthology is composed of selections / excerpts from the writings (original texts) of more than 30 Europeans who visited Japan during the period from 1542 to 1640. The material is organized into 23 chapters, by subject, including: The country. History. The people. Social relations. The language. Food and drink. Shinto. Buddhism. Temples and idols. Persecution.

In the chapter on "Food and drink" is a section (p. 190) titled "Their diet," by John Saris, in which he states: "... of Cheese [probably tofu] they have plentie, Butter they make none, neither will they eate any Milke, because they hold it to bee as bloud [blood], nor tame beasts."

Sources: "Saris, John. (1) The Voyage of Captain John Saris to Japan, 1613. E.M. Satow, ed. London, 1900. (2) The First Voyage of the English to Japan. Takanobu Otsuka, ed. Tokyo, 1941."

Another section (p. 191) titled "Three meals a day," by Jorge Alvares states: "Their food consists of rice, chick-peas [probably soybeans], mangoes, maize, Indian corn, yams and wheat, and I think all of it is served dressed with some paste [probably miso].

Source: "Alvarez, Jorge. 1547. Report in *Missoes dos Jesuitas no Oriente,* by Jeronimo P.A. Camara Manoel, p. 112-25."

The author, who was born in 1930, is a Jesuit who has written much on the early history of Japan. Address: S.J. [Jesuit], Campion Hall, Oxford [and Sophia Univ. (Jesuit), Tokyo, Japan].

5233. Ikehata, Hideo; Ohtsuki, K.; Murata, Kiku. 1965. Hakkô daizu tempeh ni kansuru kenkyû. IV. Kôyô ketsu-sei busshitsu bunrihô no kentô [Research on tempeh. IV. Investigations on separating hemolytic substances (Abstract)]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 18(1):13-14. [Jap]
• ***Summary:*** Discusses 6, 7, 4'-Trihydroxyisoflavone and Factor 2. Address: Osaka Univ.

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5234. Kawamura, Wataru; Matsumoto, E. 1965. Misoshiru fudoki [Miso soups throughout the provinces]. Tokyo: Zenkoku Miso Rengokai. 57 p. [Jap]
Address: 2-4-7 Kugenuma, Tachibana, Fujisawa-shi, Kanagawa-ken 251, Japan.

5235. Koyanagi, Tatsuo; Oikawa, Keiko. 1965. Daizu seihin oyobi shoku-en ga nezumi no hatsuiku oyobi kôjo-sen ni oyobosu eikyô [The effect of soybean products or sodium chloride in diets on the thyroid and growth of rats]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 18(3):190-93. [17 ref. Jap; eng]
• ***Summary:*** Tests with rats showed that the feeding of heated soybeans, natto (fermented soybeans containing no sodium chloride), miso (fermented soybeans containing sodium chloride) or tofu (soybean curd) produced a high incidence of thyroid enlargement in the rats, but the enlargement was prevented by increasing the iodine content of the diets by a small amount.

The inclusion of sodium chloride in iodine-deficient diets at the 3% level caused a pronounced hypertrophy of the thyroid and weight loss in rats. In this case, the supplementation of iodine alone did not prevent the weight loss, but adding methionine plus iodine did.

Axelrod et al. have reported that thyroxine production in rats was increased with increasing sodium chloride intake. Thus, the effects of a large intake of sodium chloride resemble in some respects those of administration of thyroxine.

"It is well established that thyroxine increases the metabolic rate and oxygen consumption of animals and beyond small and very critical levels the thyroid hormone decreases growth and feed efficiency. Charkey found that all of these effects of thyroxine can be reversed by methionine. The present findings that methionine prevented the weight decrease of rats fed a diet of high sodium chloride content may be explained by the antithyrotoxic effect of methionine." Address: Tohoku Daigaku Nôgaku-bu, Eiyo Kagaku Kyôshitsu [Lab. of Nutrition, Faculty of Agriculture, Tohoku Univ., Sendai, Japan].

5236. Kurokawa, Kazuo. 1965. Daizu oyobi sono kakkô shokuhin no suiyôsei chisso ni tsuite [Study of water soluble nitrogen of soybean and its products]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 17(5):333-36. (Chem. Abst. 64:11768. 1966). [5 ref. Jap; eng]
• ***Summary:*** The water soluble fraction of the nitrogen in soybean products varied depending on the way that each product was processed. In the case of miso, approximately 60% of the nitrogen was extractable, mostly as formol nitrogen. Address: Tokyo-toritsu Hakuô [Shiro Kamome] Kôtôgakko.

5237. May, Jacques M. 1965. Food technology and nutrition in Communist China. In: Martin S. Peterson and Donald K. Tressler, eds. 1965. Food Technology the World Over. Vol. II. South America, Africa and the Middle East, Asia. Westport, Connecticut: AVI Publishing Co., Inc. ix + 414 p. See p. 245-74. Illust. Index. 24 cm. [7 ref]
• ***Summary:*** This chapter is reprinted with permission from "The Ecology of Malnutrition in the Far and Near East," by Dr. Jacques M. May, with the collaboration of Irma S. Jarcho, M.P.H., New York, 1961.

Despite its vast territory, China lacks good arable land. Only 11% of the total surface area is presently cultivated. In 1958 China was one of the poorest fed nations in the world, with 1,830 calories per capita per day; 75% of these came from grain foods, 9.2% from vegetable fats, and only 4.5% from animal proteins.

Forced industrialization competes with agricultural growth for financial and labor resources. Table 79 shows production of various food crops (in millions of tons) in five recent years (see below). For soybeans these figures were 9.5 in 1952, 10.2 in 1956, 10.0 in 1957, 12.5 in 1958, and 15 in 1959 (target).

China's Second Five-Year plan (1958-1962) divided China into zones and sought to increase agricultural production.

China's main trading partner is Japan. Table 85 (p. 258) shows exports to Japan in metric tons. For soybeans: 204,000 in 1954, 66,000 in 1955, and 200,000 in 1956.

Relaxation of the Western economic embargo against communist bloc nations may cause China to purchase more products from the West. Address: Director, Medical Geography Dep., American Geographical Society, New York City, NY.

5238. Ohwi, Jisaburo. 1965. Flora of Japan (in English): A combined, much revised, and extended translation by the author of his *Flora of Japan* (1953) and *Flora of Japan, Pteridophyta* (1957). Edited by Frederick G. Meyer and Egbert H. Walker. Washington, DC: Smithsonian Institution. ix + 1067 p. See p. 570-71. Illust. Map. Index. 28 cm. [Eng]
• ***Summary:*** Gives a botanical description of *Glycine soja* Sieb. & Zucc. (the wild soybean, called *tsuru-mame* or *no-mame* in Japanese) and *Glycine max* (L.) Merr. (the cultivated soybean, called *daizu* in Japanese). The author was born in 1905. Address: Ohwi: National Science Museum, Tokyo, Japan; Meyer: Research Botanist, U.S. National Arboretum; Walker: Research Associate, Smithsonian Institution.

5239. Portrait photo of William Brandemuhl, American soyfoods pioneer in Japan. 1965. Japan.
• ***Summary:*** William Brandemuhl was a pioneer in studying and writing about soyfoods in Japan after World War II. His magnum opus, "Soybean Utilization in Japan" was

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completed in 1965. According to Tomoko Brandemuhl this black-and-white photograph (4½ by 6½ inches) was taken in late 1965, shortly after the book was completed

This photo was sent to Soyinfo Center in Oct. 2012 by Tomoko Brandemuhl (Stratford, Connecticut), his wife.

5240. Raper, Kenneth B.; Fennell, Dorothy I. 1965. The genus *Aspergillus.* Baltimore, Maryland: The Williams & Wilkins Co. 686 p. Illust. Index. 24 cm. [400+* ref]
• ***Summary:*** The authors discuss the koji molds in Chapter 18 titled "Aspergillus flavus group." Contents: Outstanding characters. General considerations (incl. *A. oryzae, A. oryzae* var. *effusus, A. flavus, A. tamarii,* and *A. flavo-furcatis*). Occurrence and significance: Introduction, enzymes (amylolytic, proteolytic, lipolytic). "Members of this group are widely distributed in nature. They are regularly isolated from soils, particularly those from tropical and subtropical areas, from forage and decaying vegetation, from stored seeds and grains, and from various types of food products. They contribute to decomposition processes... Except for *A. Niger* and allied species, they have been used more widely in industry than any other group of molds, particularly for the production of enzymes.

"Members of the *Aspergillus flavus* group produce diastatic and proteolytic enzymes abundantly. In large measure the alcoholic and soy food industries of the Far East are based upon these molds and their enzymes. In the soy industries, closely related molds, or even the same strains, are used as a source of proteolytic enzymes. In 1894 Takamine secured a series of U.S. patents covering the production of diastatic enzymes and the making of alcoholic liquors. Subsequent to this, other investigators, mostly Japanese, published a number of papers in this field. Oshima, in 1922 and 1928, reported on the production of protease by members of the *A. flavus-oryzae* group. Today, considerable quantities of diastatic enzymes, proteolytic enzymes, and mixed diastatic and proteolytic preparations are being manufactured from these molds for use in the food, textile, and tanning industries." Address: Dep. of Bateriology, Univ. of Wisconsin, Madison, Wisconsin.

5241. Richmond, Sonya. 1965. International vegetarian cookery. London and Glasgow: Collins. 192 p. Index. 22 cm. Published in the USA by Arco in 1967.
• ***Summary:*** This book, dedicated to the author's yoga pupils, arranges recipes (mostly entrees and soups) by country. The only Asian countries included are China and India; Japan is not. The author, who appears to be British, has collected these recipes from other vegetarians during her travels. The only soy-related recipe in the book is "Soya Bean Noodles," listed under China (p. 49). The introduction to the recipe reads: "This is a most useful recipe for the vegetarian because it requires soya bean flour. As I have said before [where?] soya bean is one of the most valuable sources of protein known to man. It is easy to buy soya beans, both whole and cracked, in health-food shops and delicatessens. It is equally easy to obtain soya bean flour which is yellow in colour. Do not attempt to use it like ordinary flour for it contains no starch and therefore is not a thickening agent. It has to be cooked according to its own nature. This Chinese recipe makes excellent use of it, and this recipe is also extensively used in Japan." The only ingredients are: 1 lb. soya bean flour, 2 egg yolks, 1 tsp. salt, and cold water as required. No wheat flour is used.

5242. Sakurazawa, Nyoiti [Ohsawa, George]. 1965. You are all sanpaku. English version by William Dufty. Secaucus, New Jersey: University Books. 224 p. Index. 22 cm. First paperback edition published in 1980 by Citadel Press, Secaucus, NJ.
• ***Summary:*** Contents: Introduction. The divine ritual. A land of sanpaku. Faith and medicine. The cause. The cure. The daily check-up. Food and sex. Prayer and fasting. The sacred act. About salt. About sugar. About milk. About liquids. About chewing. About principal foods. Soulfood: Brown rice, rice cream, buckwheat, buckwheat cream, wheat, cous cous, chapati, millet, raw rice, bread, gomasio [gomashio] (sesame salt), umeboshi plums, miso and shoyu, tahini, miso cream, about tea, coarse green tea (bancha), soya ban (coarse green bancha tea with soy sauce), mu tea, lotus tea, lotus tea, mint tea, thyme tea, Ohsawa coffee (Yannoh; made of rice, wheat, aduki beans, chick peas, chicory, and a little oil), Dandelio (dandelion coffee substitute), kokoh,

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kuzu, umeboshi juice, ume syo kuzu (umeboshi + shoyu + kuzu), aduki juice, radish drink (daikon #1 and #2), special rice cream, brown rice tea, wheat tea. The oneness of the universe [Ohsawa's profound and beautiful credo]. Tables: 1. Macrobiotic table of daily food in order of yin to yang. Note: The most yin foods are indicated by 3 downward-pointing triangles; the most yang foods by 3 upward-pointing triangles. Beans (except aduki) are quite yin, being symbolized by 2 downward-pointing triangles. Eggplant, tomato, and potato are the most yin vegetables. The most yang cereal is buckwheat, followed by rice. 2. Physical phenomena–Yin/yang table. Biographical note on Ohsawa (p. 213-18).

This was the first popular book in English to explain the principles of macrobiotics. "*Sanpaku* describes a condition in which they white of the eye can be seen between the pupil and the lower lid as the subject gazes directly forward. This, we quickly learn, connotes a grave state of physical and spiritual imbalance." It is the Oriental sign of impending disaster.

Soy-related recipes and information include: Soya bean plaster (p. 140). Tofu plaster (p. 141; tofu is called "white soya bean cheese"). Tekka [miso] for anemia and general weakness (p. 143). Miso and shoyu (p. 190). Miso cream (with tahini, p. 190-91). Soya ban: Coarse green bancha tea with soy sauce (p. 194). Ume syo kuzu (p. 199; a proven medicinal beverage [made from umeboshi, shoyu, and kuzu]).

About sugar (p. 165): "I am confident that Western medicine will one day admit what has been known in the Orient for years: sugar is without question the number one murderer in the history of humanity–much more lethal than opium or radioactive atomic fallout–especially for those people who eat rice as their principal food."

About milk (p. 169): "There is no reason for man to live on the milk of an animal–especially an animal inferior to him biologically and intellectually." People of the Orient avoid milk "because they respect the biological natural laws of the Order of the Universe... Once the young offspring of animals have their teeth and are weaned from nursing, they no longer drink milk... No animal ever does." "The quality and quantity of a mother's milk controls her child's destiny. In cases where the mother's milk is not available, babies can be fed with *Kokoh*–a macrobiotic cereal milk made with roasted rice, glutinous rice, oatmeal, soya beans and sesame seeds reduced to powered form" (see recipe p. 198).

Miscellanea: The Ohsawa Foundation at 317 Second Avenue in New York City, located on the first floor of an old tenement, had a 4-table restaurant in the front and a kitchen in the rear. There were several macrobiotic restaurants in Paris, plus a tiny macrobiotic food store named Les Trois Epis and the Librarie Ohsawa, both on Rue Lamartine Guy Massat was editor of the French monthly journal *Yin/Yang*. The author: "I could not remember a single doctor, out of dozens who treated me, who had ever shown the slightest curiosity about what I ate and drank."

"The stark facts presented to the President of the U.S. by his Special Commission on the Nation's Health in December of 1964 are staggering: In 1963 heart-artery disease caused 55% of all U.S. deaths, and cancer 16%. Strokes 210,000; diseases of arteries outside the brain combined with diseases of the heart to kill 793,000. Cancer killed 285,000" (p. 66). Occidental medicine is symptomatic medicine; it does not seek to cure the basic causes. And it is microscopic/analytical. It seeks the truth in a maze of details; but the "truth is whole." The "ultimate cause of every illness is violation of the order of the universe through ignorance or through arrogance,..." (p. 80-81). "Disease is a divine warning, a message from nature seeking to guide us to the correct path" (p. 98). The essential factor in the proper nutrition of the human body is the proper proportion of Yin and Yang. The best proportion of Yin/Yang or Potassium/Sodium is 5 to 1. All those foods whose K/Na ratio is greater than 5 to 1 are Yin. The books ends with a "Biographical Note: Sakurazawa-Ohsawa" who is said to have "published some 300 works in Japanese and more than 20 books in Western languages, principally French." His wife, Lima, is a professor of traditional Japanese music. There is a selected bibliography of Ohsawa's books, especially those published in French. Address: New York.

5243. Shibaki, Yoshiko. 1965. Yuba. Sumidagawa [Yuba and the Sumidagawa river]. Tokyo: Shinchôsha. 221 p. 16 cm. [Jap]*
• ***Summary:*** This is a work of fiction. The Sumida River (*Sumida-gawa*) flows through Tokyo, Japan, into Tokyo Bay. The author, Yoshiko Shibaki, was born in 1914.

5244. Shimoda, Yoshihito. 1965. Nihon-jin no shoku seikatsu shi [History of Japanese food culture]. Tokyo: Koseikan. 138 p. Japanese summary by Kawakami 1978. [Jap]
Address: Japan.

5245. *SoyaScan Notes.* 1965. Chronology of The Infinity Company (Originally named Perseverance Foods). 16 Jan. 1992. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1965?–This company was founded in New York City under the name Perseverance Foods by Howard Rower. 1964 or 1965–The company name was changed to The Infinity Co., but it was popularly known as Infinity Foods. In 196? it was incorporated as The Infinity Food Co. Inc.

After Herman Aihara and the Chico group left New York in 1961 and the Kushis left in 1963, something of a void was left–which Infinity filled. It was a macrobiotic and natural foods warehouse, importer, and wholesale distribution company that was a prime source of food for many of the early macrobiotic and natural foods groups and students, including the Kushi Study Houses in Boston, Massachusetts.

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Infinity imported foods (including Mugi Miso by 1965) from Tokyo CI (Centre Ignoramus), which "guaranteed" the foods' quasi-medicinal effects. The food was of top quality. The owners (including Howard Rower and Jason Hammond) were involved with the Church of Scientology.

1971–Greenberg's Natural Foods in New York City and Mother Nature & Sons in New York City both advertise that they carry foods supplied by Infinity Food Co. which was located at 171 Duane Ave., New York City, New York 10013 [later 10005]. Phone: 212-925-2062. Infinity was located in the old produce district of New York, an area of town called Tribecca.

Bruce Macdonald (1992) remembers that for a while, in the late 1960s, Erewhon was Infinity's largest customer, even though Infinity was always a relatively small company. As Howard Rower moved up in the Scientology hierarchy, he gradually lost interest in Infinity. He married someone who was very wealthy, soon got in the "fast lane," was traveling to Europe, etc. Bruce doubts that the decline of Infinity was attributable to Erewhon in any way. Bruce thinks Infinity went out of business in about 1970 or 1971.

Sources: Ad in East West Journal. 1971. 1(16):10. says the company was started in 1964 in New York; E. Farmilant. 1972. Macrobiotic Cooking. p. 208; Paul Hawken. 1973. East West Journal 3(8):11-16. Aug. "Erewhon: A biography. The view within." Shurtleff & Aoyagi. 1983. George Ohsawa and the macrobiotic movement: History of work with soyfoods. Interview with Jimmy Silver. 1992. Dec. 9 and 15. "History of work with natural foods." Interview with Bruce Macdonald of Erewhon. 1992. April 5. Address: New York. Phone: 212-925-2062.

5246. Takahashi, Jûsaku; Jinno, Kan. 1965. Nôka no hozon-shoku no kyôka ni kansuru kenkyû. II. Jika-yô "kakô name-miso" no hinshitsu ni tsuite [Studies on the enrichment of preserved foods for farm families. II. On the qualities of home-made "namemiso" (processed miso)]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 17(6):429-33. [17 ref. Jap; eng]

5247. Takahashi, Jûsaku; Jinno, Kan. 1965. Nôka no hozon-shoku no kyôka ni kansuru kenkyû. I. Jika-yô "jozo name-miso" no hinshitsu ni tsuite [Studies on the enrichment of preserved foods for farm families. I. On the qualities of home-made "fermented namemiso"]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 17(6):381-86. [20 ref. Jap; eng]

5248. Union Serial Card Catalog of East Asian Publications. 1965? [Chi; Jap]*
• ***Summary:*** In the middle 1960s the major 12-15 East Asian libraries in America created this catalog by exchanging copies of the cards showing their holdings for East Asian serials. It fills two cabinets of file drawers. Each of the participating libraries has a copy. However the University of California at Berkeley has discarded their catalog for lack of library space.

5249. Akiya, Tomiya; Shimizu, Taeko; Ohashi, Fusako. 1966. [Studies on oil enriched feed. IV. Effect of defatted soy bean powder on deterioration of oil enriched feed]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 21. p. 72-75. Jan. [1 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5250. Ebine, Hideo; Sasaki, Hirokuni. 1966. Miso ni tenka shita sorubinsan no bôyu ni kansuru kenkyû. I. Sorubinsan no teiryô-hô [Study on the effect of sorbic acid as a preservative in miso. I. Determination of sorbic acid in miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 21. p. 35-37. Jan. [5 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5251. Ebine, Hideo; Sakano, Keiichi. 1966. Kobukurozume miso ni hassei suru kabi [Mold which developed on the inner surface of miso packaged in small plastic bags]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 21. p. 38-40. Jan. [2 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5252. Ebine, Hideo; Ito, H.; Suh, Kee Bong. 1966. Shiokiri kôji no chozô-chû ni okeru kôso ryokuka no shôchô [Changes of enzymatic activity of salted koji and non-salted koji during storage]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 21. p. 41-43. Jan. [7 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5253. Hoshino, Naoji; Tamura, Shinpachiro; Kawabata, Akiko; Taima, Ayako; Hara, Haruki. 1966. [Enzymic digestion of cereal proteins. II. Liberation of amino acids from raw and heated wheat gluten and soybean glycinin with an enzymic preparation]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 21. p. 125-28. Jan. [9 ref. Jap; eng]
• ***Summary:*** Reprinted from *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 18(2):111-14 (1965). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5254. Ito, Hiroshi; Ebine, H.; Nakano, M. 1966. Kôtanpaku teishokuen miso. II. Seihin no chozô-sei no kôzô ni tsuite [Making high-protein, low-salt miso. II. On the structure

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of the preservation of miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 21. p. 55-59. Jan. [13 ref. Jap; eng]
• ***Summary:*** High-protein, low salt miso could be stored well for 10 days at or below 10ºC. The miso acidified when stored for 4 days at over 20ºC. The preservatives dehydroacetic acid and sorbic acid, which are allowed for use with miso, could protect swelling at the level of one part in 500 but not at 1 part in 1,000. Freeze drying was found to be better than vacuum drying for miso. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5255. Ito, H.; Ebine, H. 1966. Miso no nyûsan-kin no kenkyû. VIII. Taien-sei no hikui Streptococcus group [Studies on lactic acid bacteria in miso. VIII. On the *Streptococcus* group having low salt tolerance]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 21. p. 44-54. Jan. [16 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5256. Kamada, Hidemoto; Ebine, Hideo; Nakano, Masahiro. 1966. Nattô to miso genryô toshite no daizu hinshitsu no hantei-hô [Evaluation method of the quality of soybean employed for natto and miso manufacturing]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 21. p. 136-40. Jan. [8 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 60(7):620-23 (1965). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5257. Kamada, Hidemoto; Ebine, Hideo; Nakano, Masahiro; Chiba, Akira. 1966. [Effect of manufacturing method on the properties of shoyu koji]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 21. p. 141-44. Jan. [3 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* 12(6):242-45 (1965). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5258. Nakao, Sasuke. 1966. Saibai shokubutsu to nôkô no kigen [The origin of cultivation and agriculture]. Tokyo: Iwanami Shoten. vii + 192 p. See p. 59-75. Series: Iwanami Shinsho. [Jap]*
• ***Summary:*** Natto-like fermented soybean foods are manufactured in various Asian countries besides Japan, including eastern Nepal, northern West Bengal and Sikkim provinces in India, Bhutan, northern Myanmar, northern Thailand, and Yunnan province in China; these places overlapped the "laurel forest zone in South Asia and Southeast Asia" Address: Ethnologist, Japan.

5259. Taira, Harue; Taira, Hirokadzu; Sakurai, Y. 1966. Daizu kakôhin no amino-san ni kansuru kenkyû. V. Nattô seizô kôtei-chû no aminosan [Studies on amino acid contents of processed soybean. V. Variation of total and free amino acid contents in "natto" processing]. *Shokuryo Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 21. p. 219-21. Jan. [12 ref. Jap; eng]
• ***Summary:*** Reprinted from *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 17(4):248-50 (1964). Address: 1-2. Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5260. Tamura, Shinhachiro; Kenmochi, Kuniko; Watanabe, Tokuji. 1966. Tanpaku bunkai kôso-zai o kongô, konnetsu shita baai no daizu tanpaku no kasui bunkai ni tsuite [Hydrolysis of soybean protein by mixing with protease preparation]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 21. p. 129-35. Jan. [4 ref. Jap; eng]
• ***Summary:*** The action of several protease preparations on soybean protein was studied to elucidate the possibility of making cheese-like products from soybean. Dried frozen tofu (kori-dofu) was powdered then mixed with the protease solution, kneaded for 30 minutes, then allowed to stand for 24 hours at 45ºC while digestion / hydrolysis took place.

Under the proper conditions, products with about the same level of total free amino acids as processed cheese can be produced. "Although some were good, most of them had a rather queer taste and dark color." The pattern of free amino acids in those products was somewhat different from that of cheese.

The possibility that these products could be "used as a cheese-like food or a raw material for some processed foods is discussed."

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 11(10):438-43 (1964).
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5261. Watanabe, Tokuji; Hashizume, K.; Kawakita, A.; Kitamura, T. 1966. Kôri-dôfu seizô kôtei ni kansuru kenkyû [Studies on the process for making kori-tofu (dried-frozen tofu)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 21. p. 26-34. Jan. [5 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5262. Sutton, Horace. 1966. Japanese chefs dish it out. *Los Angeles Times.* Feb. 20. p. H11.
• ***Summary:*** In Tokyo there are many ways of getting a meal. For example, at most coffee shops (if you insist) you can order "a tray that includes miso soup with fried tofu, Japanese tamago yaki [omelet, fried eggs] with white radish [daikon], oshinko," etc.

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Note: This article also appeared in the *Chicago Tribune* (Feb. 27, p. J11 and K11), and in the *Baltimore Sun* (March 6, H6).

5263. *Sunset* (*Menlo Park, California*). 1966. Cooking with *dow foo.* 136:190, 192-93. Feb.
• ***Summary:*** "The Chinese call it *dow foo;* the Japanese, *tofu.* Both terms refer to a soft, cheese-like food made of soybean curd. The picture below shows the three forms of fresh dow foo available in Chinese markets. The water bean cake (*suey dow foo*) has a high water content and is used in Chinese soups. The smaller, compressed cakes (*dow foo yuen*), with medium water content, are diced and sautéed with meat or vegetables. The little fried bean cakes (*dow foo bok*) can be sautéed whole or sliced, or stuffed with a meat mixture.

Note 1. This is the earliest English-language document seen (April 2013) that contains the term "fried bean cakes" or the term *dow foo bok.* Both refer to fried tofu.

Note 2. This is the earliest English-language document seen (April 2013) that contains the term "water bean cake" or the *suey dow foo* [*shui doufu*]. Both refer to Chinese-style soft tofu. tofu.

"Japanese tofu is similar in texture and flavor to the Chinese dow foo yuen, and can be substituted for dow foo bok, although the tofu pieces are twice as large.

"Soybean cake has little flavor of its own, but it quickly takes on the flavors of foods with which it cooks, while its soft texture provides an interesting contrast."

Gives recipes for: Chinese soup with suey dow foo. Dow foo yuen with leeks. Dow foo yuen with oyster beef (uses oyster sauce). Dow foo yuen with chicken or pork (uses brown bean sauce). Sliced dow foo bok with steamed fish. Dow foo bok stuffed with pork.

Note 1. This is the earliest of many tofu recipes seen in *Sunset* magazine. This is also the earliest English-language document seen (Feb. 2004) that uses the term "soybean cake" or "dow foo yuen" to refer to tofu.

5264. Claiborne, Craig. 1966. New Yorkers take to tempura and chopsticks with gusto. *New York Times.* March 10. p. 22.
• ***Summary:*** "But gastronomically there has been no phenomenon in recent years to equal the proliferation of Japanese restaurants [in Manhattan], East Side, West Side and up and down the town."

There have been Japanese restaurants in New York for many years but in the early days, unless one spoke Japanese, the choice was between tempura and sukiyaki. Today the choice of dishes is almost unlimited.

The first of the "grand luxe Japanese restaurants" in Manhattan was the Saito; it offered tatami mat rooms (*ozashiki*). Next came the Kabuki, then the Nippon.

Mizutaki is "boiled chicken and vegetables served with soy and lemon sauce." Appetizers include "bits of tuna with soy [sauce] and ginger, and stashi, the traditional dish with soy and ginger." Kabayaki is [eels] "glazed with a light soy sand sugar sauce." Three recipes are given: Shabu-shabu calls for "2 pieces tofu (bean curd), each cut into four pieces." Ponzu sauce (Soy and lemon sauce) calls for ½ cup each lemon juice and "Japanese soy sauce, ¼ teaspoon ajinomoto (monosodium glutamate)..." Gomazu sauce (sesame sauce) calls for "4 ounces sesame seeds or one-half cup tahini (sesame paste...), ½ cup Japanese soy sauce. ¼ teaspoon ajinomoto (monosodium glutamate)..."

5265. *Foreign Agriculture.* 1966. Japan's city people, bakeries, institutions responsible for increased use of soybean oil. 4(12):11-16. March 21.
• ***Summary:*** ... according to a market research study on edible oils recently completed for the American Soybean Association. The key to continuing gains in U.S. exports to Japan is promotion of soybean oil consumption. Japan's consumption of all fats and oils–at around 14 pounds per person–still lags behind that of most other highly developed nations. It is one-fourth that of the Netherlands at 60 pounds and one-third the U.S. level of 46 pounds. Approximately half of the 313-grams of vegetable oil consumer per person each month is soybean oil.

5266. Namba, Haruyuki. 1966. [Studies on heat-denatured soybean protein. III. Autoclaving of soybean grain / seeds]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 13(3):91-95. [10 ref. Jap]
Address: Shimane Prefectural Industrial Research Lab. (Shimane-ken Kôgyô Shikenjô), Koshihara-chô, Matsue-shi.

5267. Shibasaki, Kazuo; Okubo, Kazuyoshi. 1966. Starch gel electrophoresis of soybean proteins in high concentration of urea. *Tohoku J. of Agricultural Research* 16(4):317-29. March. [18 ref. Eng]
Address: Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai.

5268. Watanabe, Tokuji; Ebine, H.; Ohta, T. 1966. Daizu shokuhin no kakô gijutsu [Technology of soybean processing]. *Shokuryo Kenkyujo, Shokuryo Gijutsu Fukyu Shiriizu* (*National Food Research Institute, Extension Series of Food Technology*) No. 4. 61 p. March. [Jap]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan (Norinsho Shokuryo Kenkyujo).

5269. Meade, Mary. 1966. Raw chicken best in many oriental dishes. *Chicago Tribune.* April 4. p. C13.
• ***Summary:*** Japan Air Lines says there is much interest in authentic Japanese sukiyaki, but adds that it would be almost impossible to duplicate the dish as it is served in Japan.

"Tofu is bean curd." If not available, it may be omitted. "Shoyu is Japanese soy sauce. It is important to use this instead of American or Chinese soy sauce because it is less

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salty.

The recipe for Sukiyaki includes "12 1-inch cubes of tofu" and "½ cup shoyu."

5270. McCormick, Sally. 1966. Azuma Sukiyaki House: For leisurely dining in the Japanese manner–5120 N. Broadway, Chicago (Advertorial). *Chicago Tribune.* April 7. p. H12.
• ***Summary:*** Next came the Sukiyaki. "Chieko glided in once more with an hibachi stove, large frying pan, and an attractive tray full of appetizing, fresh vegetables, thinly sliced prime rib, and soy cakes... She removed the suet and added generous slices of beef, fresh mushrooms, bamboo shoots, Tofu (soy bean cakes), Shiratake [Shirataki] (yam noodles) and assorted fresh vegetables." The restaurant also serves Beef Teriyaki, Chicken Teriyaki, and Salmon Teriyaki. Three photos show Azuma.

Note 1. This might be called an "advertorial."

This ad also appeared in the 29 Sept. 1966 issue of this newspaper (p. J9).

Note 2. Shirataki are thin noodles of konnyaku, a gelatinous paste made from the root of the devil's tongue plant, *Amorphophallus konjac.* Konnyaku has no flavor, and no nutritional value, because its starch is not digestible by the human body. However it is an excellent source of dietary fiber and is appreciated for its chewy texture.

5271. *SoyaScan Notes.* 1966. Chronology of Erewhon. Renamed Erewhon Trading Co. in 1967. 12 Dec. 1991. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1966 April 9–Erewhon opens as a small (10- by 20-foot) macrobiotic and natural foods retail store at 303-B Newbury Street (below street level) in Boston. Aveline and Michio Kushi are the founders, but Aveline is the sole owner. Evan Root is the first retail store manager. The origin of the natural foods industry and movement in America can be traced to this date. Erewhon is the first store of its kind in America and it soon serves as a model for many other similar natural food stores across the nation. Erewhon sells several soyfoods, mainly miso and shoyu purchased from Howard Rower's Infinity Foods or Japan Foods Corp., both in New York.

1967 Aug.–Paul Hawken takes over the management of Erewhon (one small retail store) from Evan Root. He changes the name to Erewhon Trading Co. (from simply "Erewhon") and starts to expand the business.

1968 May–Paul Hawken incorporates Erewhon Trading Company. Paul later states that he and Aveline Kushi each own 50% of the stock. However Aveline Kushi and her attorney, Morris Kirsner, agree that they offered him 50% of the Erewhon stock shortly before he left for Japan (in March 1969) but he did not accept it. To this day (Feb. 1999) Aveline has no idea why Paul did not accept such a generous offer.

1968 June–Hawken establishes his first supplier of organically grown grains, Ted Whitmer, a wheat farmer in Montana. By 1973 Erewhon had established and contracted with 57 farms in 35 states to provide the company directly with organically-grown foods.

1968 Aug.–Erewhon starts to import foods from Japan, initially from Muso Shokuhin, later by correspondence with Mr. Akiyoshi Kazama, who worked for an import/export company named Mitoku, which sold no food at the time. The initial orders contained red miso (made by Sendai Miso Shoyu Co.) and natural shoyu (made by Marushima).

1968 Nov.–On Thanksgiving day, Erewhon moves up and across the street to a much bigger and nicer location at 342 Newbury St. Paul had hired Bruce Macdonald, a carpenter, to remodel this store. The company now has 6 employees: Paul Hawken, Roger Hillyard, Bruce Macdonald, Bill Tara, Jim Docker, and Jean Allison. One day later, Bill Tara leaves to start a macrobiotic East West Center in Chicago. The original downstairs room is taken over by Tao Books, then Redwing Books. Tofu, curded with calcium sulfate and made by a Chinese company in Boston, starts to be sold.

1969 March–Paul Hawken and Evan Root leave for Japan. Bruce Macdonald takes over as general manager of Erewhon. Paul stays in Japan for 9 months, arranging for individual packaging of products that were formerly imported in bulk, and finding new items for Erewhon to import. He visits suppliers, works with Mitoku and Muso, and studies Japanese language and culture.

1969 spring–Erewhon starts wholesaling foods, under the direction of Bruce Macdonald. Their first wholesale product is natural sesame oil.

1969 Aug.–Aveline Kushi moves to Los Angeles where her youngest son, Hisao, undergoes traditional Japanese bone massage therapy. In Los Angeles, she establishes the first macrobiotic study house at 7511 Franklin Ave. Bill Tara arrives about a month later to set up a retail store, Erewhon West, which opens on 8001 Beverly Blvd. in about September.

1969 Oct. (early)–Bruce Macdonald leaves for Los Angeles with his new bride, Maureen Traill, to run the new Erewhon West retail store there. Roger Hillyard takes over as general manager of Erewhon in Boston.

1970 Jan. 1–Erewhon's earliest existing catalogue seen (wholesale and retail) lists 7 pages of natural food products–most of them imported from Japan. By March 1970 Erewhon lists 96 products in its catalog.

1970 July–Erewhon's rapidly expanding distribution business moves into a large (20,000 square feet) fifth-floor leased brick warehouse at 33 Farnsworth St., on the docks in South Boston. *East West Journal* and Tao Books soon move to the same area.

1970 fall–Erewhon receives its first shipment of brown rice from the Lundberg brothers in Richvale, California; it is "unsprayed" but not organic. Chico-San has exclusive rights

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to all Lundberg's organic brown rice.

1971 Jan.–*East West Journal* begins publication in Boston, Massachusetts.

1971–Erewhon Trading Company of Los Angeles has expanded and is now at 8001 and 8003 Beverly Blvd., Los Angeles, CA 90048.

1971 March–Roger Hillyard is replaced as general manager of Erewhon–Boston.

1971 March–Paul Hawken finalizes a contract with Carl Garrich of Lone Pine, Arkansas, to grow short-grain brown rice organically and exclusively for Erewhon. 330 acres are planted in April. That fall, Erewhon starts to retail and wholesale its first organic brown rice.

1971 May–Bruce Macdonald leaves Erewhon in a dispute over ownership of the company.

1972–John W. Deming Jr. plans to invest $150,000 in Erewhon in exchange for stock, and Advest Co. plans to conduct Erewhon's first public stock offering–but neither happens after Michio Kushi nixes the plans.

1972 fall–Erewhon first buys organic brown rice from Lundberg brothers of California; a fire that destroyed Chico-San's plant in early Aug. 1972 rendered their exclusive contract with the Lundbergs null and void.

1973 Aug.–Paul Hawken writes a critical history of Erewhon and its problems. Published in *East West Journal* it is titled "Erewhon: A Biography. The View Within." Shortly thereafter Paul Hawken resigns, saying that running Erewhon was a nightmare. Some say he sells his 25% ownership back to the company, which was subsequently managed by Bill Garrison, Tyler Smith, Jeff Flasher, and Tom Williams, in that sequence.

1974 July to 1977–Erewhon becomes the exclusive representative and agent for both the Muso and Mitoku companies in North America. The labels of all products imported from these companies must bear the Erewhon label.

Starting in late 1969 a number of macrobiotic and/or natural foods companies grew into distributors following the models established by and with help from Erewhon: Eden Organic Foods in Ann Arbor (started by Bill Bolduc on 4 Nov. 1969), Food for Life (started in 1970 by Bill Tara as a retail store on the 10th floor of a Chicago office building), Janus in Seattle, Washington (Jan. 1972, by George Gearhart and Blake Rankin, formerly of Spiral Foods), Essene in Philadelphia, Pennsylvania (by Feb. 1971), Laurelbrook in Maryland (Aug. 1971), Ceres in Colorado Springs (1973), and The Well in San Jose, California (1973, by Phil Parenti). These macrobiotic distributors had a strong influence on the numerous other non-macrobiotic natural food distributors, such as Lifestream (started in 1969 as a retail store), Westbrae in Berkeley, California (wholesale distribution: July 1970, by Bob Gerner; retail: Feb. 1971, Gerner). Shadowfax (New York, 1971), and Tree of Life in St. Augustine, Florida (retail: May 1971; wholesale distribution: Feb. 1972, by Irwin Carasso).

1975 Aug. 1–Erewhon sells all of its West Coast Division in California (Los Angeles and Culver City) to John Fountain and John Deming for cash and notes, realizing a net gain of $86,872.

1977 March 23–Erewhon sues natural foods retail stores in several states for boycotting Erewhon for selling to co-ops. Erewhon eventually wins the case, but its legal bills are something like $250,000. There was not enough money to pay these fees and Erewhon never recovered.

1978 (early)–Erewhon moves into a huge warehouse and office complex at 3 East St., Cambridge, Massachusetts 02141.

1979 April 27–The workers in Erewhon's production, trucking, shipping, and kitchen departments vote 42-19 to form a union affiliated with Local 925, the Service Employees International Union.

1979–John Deming steps in to liquidate all the assets of financially failing Erewhon–Los Angeles. Tom DeSilva, Tyler Smith, and Jeff Flasher buy the retail store at 8001 Beverly Blvd.

1981 Feb.–Erewhon currently lists 4,000 products in its catalog–in its bid to become a full-line distributor. It services 2,000 customers and provides jobs for 175 people in its warehouse and retail stores.

1981 Nov. 10–Erewhon files for bankruptcy protection under Chapter 11 of the Federal Bankruptcy Act because of debts totaling $4.3 million. At this time, Aveline Kushi is the sole owner of Erewhon. Stow Mills picked up the lion's share of the Erewhon business, with Westbrae also getting a significant part of it.

1982 May–A $1.3 million offer by Ronald Rossetti, president of Nature Food Centres, is accepted as the reorganization plan in the Erewhon, Inc. bankruptcy. Rossetti purchased Erewhon as an individual; it was never part of Nature Food Centres.

1986–Erewhon acquires U.S. Mills, which had been founded in 1908. In effect U.S. Mills and Erewhon were merged, and U.S. Mills was chosen as the corporate name, largely since it had been around longer.

1988 May–Chuck Verde (who was the president of Erewhon) and Cynthia Davis acquired the U.S. Mills / Erewhon business. They became the main joint shareholders. Address: 303-B Newbury St., Boston, Massachusetts.

5272. Arai, Soichi; Suzuki, H.; Fujimaki, M.; Sakurai, Y. 1966. Studies on flavor components in soybean. II. Phenolic acids in defatted soybean flour. *Agricultural and Biological Chemistry* 30(4):364-69. April. [12 ref]

• ***Summary:*** The ethanol (ethyl alcohol, 1:1) extract of defatted soybean flour was systematically fractionated and the resulting phenolic acid fraction was studied. The authors identified a series of at least 7 phenolic acids (syringic, vanillic, ferulic, gentisic, salicylic, *p*-coumaric, and *p*-hydroxybenzoic acids) and two isomers of chlorogenic

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acids found in the flour. The main component among the phenolic acids was syringic acid, which was isolated as 3,5-dinitrobenzoate. These phenolic acids may have some influence on soybean flavor since they possess sour, bitter, and astringent tastes. Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Japan.

5273. Gomyô, Toshiharu; Nakamura, Michinori. 1966. Biosynthesis of raffinose from uridine diphosphate galactose and sucrose by an enzyme preparation of immature soybeans. *Agricultural and Biological Chemistry* 30(4):425-27. April. [15 ref]
• ***Summary:*** "Immature soybeans" refers to "Edamame," which were obtained from a local market. Address: Dep. of Agricultural Chemistry, The Univ. of Tokyo, Japan.

5274. Altschul, Aaron M. 1966. A look at the world protein situation: We can solve the world food problem but not easily and not without new ideas. *Soybean Digest.* May. p. 15-16, 19-22.
• ***Summary:*** Begins with an autobiography of Aaron Altschul. His first interest was in proteins, particularly seed proteins. Then he moved to New Orleans and was given broad opportunities in the Seed Protein Laboratory, organized almost 8 years ago. His second interest was in cottonseed, traditionally a southern crop, and on ways to realize to the maximum the potential of its proteins. "The success of this effort led the to opening of new markets to cottonseed protein in foodstuffs for monogastric animals. "Another important event was my meeting Don Sabin of UNICEF who invited me to become a consultant to his group to help this UN agency to develop new sources of protein for humans to replace skim milk powder. At one of the UNICEF meetings I met Professor Nevin Scrimshaw, then head of INCAP in Guatemala, and this led to my involvement in his development of Incaparina. a corn-cottonseed food for infants."

In 1958 his first book, *Processed Plant Protein Foodstuffs,* was published. It was followed by *Proteins–Their Chemistry and Politics.*

Contents: Protein malnutrition. Situation is urgent. Cottonseed as food (Incaparina, soybean foods in Japan–tofu, miso, shoyu–provide about 10% of Japan's protein, soymilk in Hong Kong, ProNutro in South Africa). Limiting amino acids. Tailormade foods (aleurone grains as seen by electron microscopes, the majority of the proteins are the so-called globulins). Purified proteins (three major proteins appear pure by ultracentrifugation, ion exchange chromatography, gel electrophoresis on polyacrylamide gel, the major seed proteins of aleurins, ergastic proteins in seeds, ultimate structure of seed proteins is unknown). New foods required (until world population can be stabilized and controlled).

A small portrait photo shows Altschul. Address: Seed Protein Pioneering Research Lab., New Orleans, Louisiana.

5275. Hayashi, Shizuka. 1966. There's an increasing trend to soybean oil in Japan. *Soybean Digest.* May. p. 68-69.
• ***Summary:*** In 1965-66 some 1,852,000 tonnes of soybeans were used in Japan. Of this, 1,341,000 tons (74.5%) were crushed, 297,000 tons (16.0%) were made into tofu and frozen tofu, 150,000 tons (8.1%) were made into miso, 32,000 tons (1.7%) were made into natto, and 32,000 tons were made into soy sauce and other soy products.

Crushing the soybeans yielded 1,073,000 tons of soybean meal. Of this, 736,000 tons (68.6%) was used for animal feeds (largely as a component of mixed feeds), 174,000 tons (16.2%) to make shoyu, 65,000 tons to make tofu, 63,000 tons for other food uses, and 35,000 tons for other non-food uses. Thus, a little over 50% of all soybeans used in Japan in 1965 were used to make foods–not including soy oil.

Per capita consumption of edible oil in Japan has increased dramatically, from 7.52 grams per day in 1956 to 18.44 grams in 1965. During the same period, total soybean oil consumption has risen from 74,010 tonnes to 219,967 tonnes. In recent years a number of the large soybean crushing companies, such as Hohnen, Nikkoh, Nisshin, Showa, and Yoshiwara have expanded their extraction plants. "The various soybean food processors including soy sauce, miso, and tofu are consolidating into fewer large-scale plants with financial support from the government for improvement and better efficiency." Address: Japanese American Soybean Inst.

5276. Hirano, Kiyoshi. 1966. Situation of soy industry in Japan. *Soybean Digest.* May. p. 38-39.
• ***Summary:*** "In addition to importing soybeans, Japan produces domestically about 200,000 tons of soybeans, one-half of which are consumed locally, the remaining 100,000 tons being brought to the commercial market.

"Since the domestically produced soybeans contain less oil than imported soybeans, they are all used for traditional Japanese foods such as miso (soy paste) and tofu (soy curd). Practically all of the soybeans used by the oilseed processing industry in Japan have been imported from the United States."

Tables show: (1) Supply and demand for soybeans in Japan–1954-1965. (2) Consumption of oilseeds in Japan–1954-1964. Address: President, The Japan Oilseed Processors Assoc.

5277. Hoshino, Masao. 1966. Japanese margarine situation. *Soybean Digest.* May. p. 39-40.
• ***Summary:*** In 1909 margarine production started in Japan. The two main oils used (since olden times) in Japanese margarine are soybean oil and rapeseed oil.

Since 1946 the diet of Japan has improved greatly, especially as the younger generation is coming "to prefer

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a bread diet to a rice diet. Thus, meals are being balanced with the utilization of protein and fat. This popularization of the bread diet is attributable to the great influence of its adoption in the school lunch program of primary and junior high schools The liking of the young people for a bread diet stimulated by school feeding is now firmly rooted and ineradicable. The effect of this tendency is statistically demonstrated by the spectacular growth in physique of children and youths.

At present, Japanese margarine, shortening and lard are produced by 25 companied operating 27 factories..."

A table shows production of three products in 1966. Margarine 59,700 tons. Shortening 64,400 tons. Refined lard 59,700 tons.

In recent years margarine production has increased around 10% annually.

Because Japan is an island, "the oils used in margarine production are chiefly marine oils," such as fish oil and finback whale oil. Address: Vice President, Japan Margarine Industrial Assoc.

5278. *Today's Food* (*Loma Linda Foods, Riverside, California*). 1966. Celebrating our 60th anniversary [Loma Linda Foods]. 11(1):5 (back cover). Spring.
• ***Summary:*** Loma Linda Foods has been guided by the wise counsel of Ellen G. White, who began discussing healthful nutrition in 1863. "Actually, the nutrition work of Seventh-day Adventists, who own and operate Loma Linda Foods, began 100 years ago at Battle Creek Michigan... But the denominational affiliation with the old Battle Creek San breakfast foods ended in 1903 and it was not until 1906 that it was reactivated at the Loma Linda Sanitarium in California. Here stoneground wheat bread and healthful cookies and fruit crackers were made in the sanitarium bakery, and in 1907 demand for the products from residents of the growing community forced the construction of a separate building. Here in a combination bakery and store, the business thrived for 30 years.

"Now known as Loma Linda Foods, the new factory continued making fine bread and cookies but added high protein products perfected to take the place of meat in vegetarian menus; whole grain breakfast foods; Breakfast Cup cereal drink [coffee substitute]; and about 1930, began making the first soy milk.

"Demand for Loma Linda Foods quickly outgrew the small delivery truck service developed within a 125 mile area, and when land for a new plant was offered by what was then La Sierra Junior College, ten miles west of Riverside, the move was made.

"Our present plant and Western Division general offices opened in 1938, and in 1951 the Eastern Division headquarters opened in Mount Vernon, Ohio. Developed for 25 years under the leadership of George T. Chapman from Australia, and now managed by Charles P. Miles, Loma Linda Foods is one of 30 food factories owned and operated by Seventh-day Adventists in Australia, New Zealand, South America, England, France, Denmark, Germany, Switzerland, Africa and Japan.

"Some 300 workers, plus nearly 100 salesmen, are dedicated to the production and distribution of more than three dozen tasty products bearing the Loma Linda Foods label..."

Color photos show: The general offices and main Loma Linda Foods plant at Riverside. Sales representatives and management personnel of the Western Division of Loma Linda Foods.

5279. Purcelli, Marion. 1966. Japanese fare surprises Westerner. *Chicago Tribune.* June 3. p. B4.
• ***Summary:*** "Mention Japanese food and most people [Americans] think of tempura, sukiyaki, and steamed rice." But at homes in Japan, these dishes [except for the rice] are rarely served. A traditional, elaborate appetizer includes a platter of raw fish, "sauces for the fish, water lotus, noodles, egg and fish cakes, and baked soy bean curd."

5280. Abiko, Nobuo. 1966. Japanese teachers point to void. *Christian Science Monitor.* June 10. p. 5.
• ***Summary:*** One rural schoolteacher says that what Japanese need most and now lack in Japan is "deep religious feeling" to restrain and channel individualism. Before World War II "militaristic nationalism" bound Japan together, but now Japanese have nothing to unify them.

For Akira Miyashita, a teacher in a rural high school, the issue is acutely personal. He is also a cultural historian who is deeply interested in the history of tofu. In olden times, the religion of Japan was Buddhism. Today, he says, few people "realize that such uniquely Japanese foods as 'nori' (seaweed) and 'tofu' (strained bean curd) are bequests from the nation's Buddhist past, handed down from the ascetic diet of ancient Buddhist monks."

He believes "the humble diet tells the inner story of the Japanese people."

A photo shows Mr. Miyashita with his wife and two children.

Note: Miyashita's book, *Kôri-dôfu no rekishi* [History of dried-frozen tofu], published in 1962 in Tokyo by the Japanese National Frozen Tofu Association (Zenkoku Kori-dofu Kogyo Kyodo Kumiai Rengokai) (591 p.) is a unique and outstanding piece of historical scholarship.

5281. Kawamura, Sin'itirô. 1966. A chromatographic study of the sugars and oligosaccharides in soybeans to provide information needed to improve processing of fat-free soybean meal for foods and feeds, thereby contributing to its expanded utilization. Takamatsu, Japan: Kagawa University. ii + 51 p. Final report. USDA P.L. 480. Grant no. FG-Ja-105. Period covered 9 Feb. 1963 to 8 June 1966. [30 ref]

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Address: Kagawa Univ., Takamatsu, Kagawa-ken, Japan.

5282. Norton-Taylor, Duncan. 1966. World hunger. *Fortune* 73(6):111-14, 170, 174, 177, 180, 184. June.
• ***Summary:*** The subtitle reads: "No problem presses more remorselessly on this generation. Giving food away only postpones crises and may compound them. What the U.S. should be exporting is a practical version of the capitalist revolution that made its own agriculture one of the wonders of the world."

How can we feed whose population is now doubling every 30 years or so, and is expected to reach 7.4 billion by the year 2000? And population growth is most rapid in those regions least able to support more people. Most burdensome is India, with its 500 million. The challenge is to raise the Third World to a state where it can feed itself. Note: This is the earliest English-language document seen (July 2003) that uses the term "Third World" for what French call the *tiers monde,* to refer to "underdeveloped countries not in the Communist bloc."

During the 1940s population worldwide began to accelerate as DDT and antibiotics reduced the death rate in the Third World from about 30 per 1,000 right after World War II to about 20 per 1,000 at present. Meanwhile the birth rate in the Third World continues to exceed 40 per 1,000. Before World War II, the Third World had net exports of about 11 million metric tons (tonnes) of grain to industrial nations. From 1948 to 1952 the flow reversed: the Third World imported an average of 4 million tonnes a year, increasing to 13 million tonnes/year from 1957 to 1959 and 25 million in 1964.

Economist Theodore W. Schultz of the University of Chicago, Illinois, in his book *Transforming Traditional Agriculture,* has shown how Western European farmers have successfully substituted capital for land. With a population density much greater than that of Asia and a generally poor endowment of farm land, farmers in Italy, Austria, Greece (and Israel) have been increasing agricultural production at a remarkable rate.

The U.S. Public Law 480 (once called "Food for Peace" and first developed during the Eisenhower administration) has failed; it may have helped feed hungry people but it has not helped the needy countries to be able to feed themselves. During the past 11 years the U.S. has shipped, mainly to Third World countries, food that cost it some $25 billion. When food was shipped in emergencies, the recipient countries were not billed at all. Taiwan and Japan have used this food successfully so that now they no longer need it. But the three countries which have received the most PL 480 aid, India, Pakistan, and the United Arab Republic [Egypt and Syria] have not. Turkey, for example, received soybean oil in exchange for an agreement not to export its olive oil.

Can U.S. private enterprise help Third World agriculture and food? Corn Products sells Maizena–a mixture of edible corn oil and soybean oil. And in order to make this new food more profitable, Corn Products is teaching Brazilian farmers how to grow soybeans, which now have to be imported to Brazil from the U.S. In Brazil, Mexico, and Peru, Anderson, Clayton provides agricultural service for local farmers who grow soybeans, peanuts, and cotton seeds for a line of cooking and salad oils, shortening, and margarine that the company processes and markets. "It finances seed, fertilizers, and insecticides, and gives advice on planting and harvesting." Anderson, Clayton plants provide 6,000 jobs in Brazil, 4,500 in Mexico, and 800 in Peru.

The Ford and Rockefeller foundations are also doing important work in the Third World. The Ford Foundation has already spent $300,000 in an experiment to crossbreed West Pakistan's wheat with high-yielding Mexican dwarf strains.

Americans must realize that the world will be unsafe unless there is economic and political stability–and adequate food–throughout the Third World.

5283. *Soybean Digest.* 1966. Says Japanese feed men will double meal usage by 1970 [E.D. Griffin]. June. p. 20.
• ***Summary:*** "The Japanese feed industry will use 1.2 million tons of soybean meal in 1970 compared with a 1965 usage of 581,000 tons. This is the prediction of E.D. Griffin, director of member relations for the American Feed Manufacturers Association. That would mean a demand for 56.4 million bushels of soybeans for the feed industry alone. Total U.S. exports of soybeans to Japan in 1965 amounted to 52.5 million bushels.

"Mr. Griffin spent a month in Japan as a speaker at the U.S. feed trade seminar in Tokyo, and later at meetings for feed manufacturers in a number of Japanese cities. He toured Japan studying the poultry and livestock industry.

"Mr. Griffin's trip was under the sponsorship of the American Soybean Association.

"Dr. Vaughn Speer, Iowa State University animal nutritionist, who also spoke at the feed trade seminar and accompanied Mr. Griffin on his tour, said he agreed with Mr. Griffin in his estimate.

"He reports Japan produces a very small percentage of the ingredients needed to compound feed. The United States is the chief source of feed grains and soybeans. Currently the manufactured feed tonnage in Japan is about 8 million tons, with some 70% of the total poultry feed.

"The per capita consumption of all meat and poultry in Japan is about 17 pounds, compared to over 200 pounds in the United States. A very small portion of that is poultry.

"The economy of Japan has shown a faster expansion than in any free country in the world over the past 10 years–and it continues to expand. History shows that with improved living standards comes an increased demand for meat, milk, and eggs. That change is taking place in Japan today.

"Mr. Griffin predicts that the greatest rise in Japanese living standards will come from expansion of its own

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agriculture rather than from buying poultry or meat from the United States. This will be primarily an expansion of poultry for eggs, broilers for meat, and pork. Broilers offer the best feed conversion ratio.

"There is evidence of much interest in the development of an integrated broiler industry in Japan. Egg and pork production are moving ahead along scientific lines. That means an increased demand for feed grains and soybean meal.

"Mr. Griffin estimates a total volume of 10 million tons of livestock feed mixed in Japan by 1970 and calls this figure conservative. 'That's a 25% increase over 1965. At the present time soybean meal represents 8% of the feed manufactured. This percentage could double and still be far below U.S. usage. Figuring soybean meal usage at 12% of the ration, and a 25% increase in the feed tonnage in Japan by 1970, that would mean 1,200,000 tons of soybean meal being used in mixed feeds in Japan by 1970.

"The Japanese are beginning to realize that feed is a major cost item, says Mr. Griffin. Fish meal continues to increase in price. In due course they will come to depend on soybean meal as a source of protein.

"In America we have learned to depend on soybean meal as our main source of protein for hog and poultry rations. This will likely happen eventually in Japan. 'Some of the American Soybean Association's market development work of past years is showing tangible results,' says Mr. Griffin."

A small portrait photo shows E.D. Griffin.

5284. Takahashi, Hideo; Saito, Hiuga; Ikeda, Yonosuke. 1966. Genetic relatedness of spore bearing *Bacilli* studied by the DNA agar method. *J. of General and Applied Microbiology* (*Tokyo*) 12(2):113-18. June. [11 ref]
• ***Summary:*** "Two methods by which one can compare the structural homology of two DNA's are known: the density method... and the DNA agar method." Address: Inst. of Applied Microbiology, The Univ. of Tokyo, Bunkyo-ku, Tokyo, Japan.

5285. *Los Angeles Times.* 1966. Patio show stopper in a Japanese mood. July 31. p. 16.
• ***Summary:*** Nipponese cuisine is known for its eye appeal, and sukiyaki is a shining example of this. It is cooked at the table and the ingredients are arranged like flowers. Ingredients include "sliced mushrooms, cubed soy bean curd (tofu) and yam noodles (shirataki)" [thin konnyaku noodles]. Large photos show Sukiyaki.

5286. *Los Angeles Times.* 1966. Patio show-stopper in a Japanese mood. July 31. p. 16.
• ***Summary:*** Sukiyaki is a shining example of the eye appeal for which Japanese food–Nipponese cuisine–in famous. Although it is cooked at the table, the most impressive feature is the flower-like arrangement of the uncooked ingredients.

One of the ingredients is "cubed soy bean curd (tofu)." A key ingredient in the pungent sauce is "½ cup soy sauce." Suet is normally used, but vegetable oil can be substituted.

Note: Suet is raw beef or mutton fat, especially the hard fat found around the loins and kidneys. Suet is usually made into tallow in a process called rendering, which involves melting and extended simmering, followed by straining, cooling and usually a repetition of the entire process.

Several large photos show the arrangement of the uncooked ingredients like petals on flowers.

5287. Nagata, Tadao. 1966. Mugenshin ikusei daizu no tokuchô: Wagakuni de ikusei sareta [Characteristics of the soybeans of indeterminate growth habit bred in Japan]. *Nogyo Oyobi Engei* (*Agriculture and Horticulture*) 41(7):1083-84. July. [8 ref. Jap]
Address: Hyogo Noka Daigaku, Sasayama, Hyogo-ken.

5288. Bowen, William; Shook, Edgar. 1966. Why they call those soybeans "golden." *Fortune* 74:126-29, 186, 191. Aug.
• ***Summary:*** Soybeans have become a $2.5-billion crop in the U.S., a major U.S. export, and the basis of a hefty domestic processing industry. In the futures market, soybeans have outdistanced all other commodities in dollar volume of transactions. At Chicago's Board of Trade soybean futures are bought and sold in the largest of the seven commodity pits–*the* pit, the famous arena formerly occupied by the old-time champion, wheat...

"The U.S. produces about 70 percent of the world's soybeans, and is the only nation with a substantial surplus for export. The only other big producer of soybeans, Red China, consumes most of its crop at home...

"Last fall's crop was four times as big as 1945's, and about 170 times as big as that first officially recorded crop in 1924...

"Since the early 1950's, demand for meat, and hence for soybean meal, has grown faster in Western Europe and Japan than in the U.S., and as a result U.S. soybean exports have expanded at an average annual rate of 16 percent since 1953... In dollar earnings, soybeans and soybean products now rank as the U.S.'s No. 1 agricultural export...

"In recent years margins have tended to be uncomfortably narrow...For a big, efficient crusher, the breakeven crushing margin comes to about 17 cents a bushel. During the past several years average industry-wide crushing margins... have tended to run considerably below that breakeven level...

"Intense competition and meager margins have driven many companies out of soybean processing. The number of companies in the business has shrunk from about ninety in 1946 to sixty-five or so today. Some big companies have dropped out, including Spencer Kellogg and General Mills. The companies still in soybean processing include six giants,

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all headquartered in the Midwest. Among them they have something like 60 percent of the industry's total crushing capacity. The biggest are Central Soya Co. of Fort Wayne, Indiana, with a capacity of 84 million bushels a year, and Cargill, Inc., of Minneapolis [Minnesota]. Cargill claims to have about the same capacity as Central Soya. The other four members of the Big Six all have capacities on the order of 50 million to 60 million bushels a year: Archer Daniels Midland Co. (Minneapolis), Ralston Purina Co. (St. Louis), Swift & Co. (Chicago), A.E. Staley Manufacturing Co. (Decatur, Illinois).

"These companies all have large interests apart from soybeans, Archer Daniels, Cargill, Ralston, and Staley in grains, and Swift in meats. Even Central Soya, despite its name, gets less than half its revenues from soybean processing; the company has spread out on a grand scale into other fields, including feed manufacturing and grain merchandising...

"Soybean futures work like other commodity futures. The future bought or sold constitutes an enforceable contract to take delivery of, or deliver, a specified quantity at a specified price in a specified month at a specified place. But at any time prior to the delivery month the buyer or seller can cancel out the contract at will (though not always, of course, without loss), simply by taking an equal action in the opposite direction. The trader who bought sells, or the trader who sold buys, and, lo, everything washes out. The earlier and later transactions offset each other. Most futures contracts are offset in this way, prior to maturity; at the Board of Trade only 1 percent or so are settled by actual delivery of the commodities.

"Basically, the commodity-futures market enables holders of large inventories to hedge against inventory losses resulting from price declines."

Contains a detailed discussion of hedging and its complexities and uncertainties. "Hedging is more sophisticated than crushing."

5289. Ishii, Kenji; Kawamura, A.; Iwata, T. 1966. Hatcho miso no nigami ni kansuru kenkyû. III. Butanooru chûshutsu kubun no teimi [Studies on the bitter taste of Hatcho-miso. III. Taste of the butanol extract of Hatcho-miso]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 44(8):459-62. Aug. [3 ref. Jap; eng]

• ***Summary:*** "Hatcho-miso was extracted with ether and the residue was then extracted with butanol. The butanol extract had a bitter taste." Address: Dep. of Agricultural Chemistry, College of Agriculture and Veterinary Medicine, Nihon University, Setagaya-ku, Tokyo, Japan.

5290. Kirchner-Dean, Otto. comp. 1966. Soybean processing and utilization: A selected list of references, 1955-1965. *USDA Library List* No. 83. iv + 183 p. Aug. Author index. Subject index. 28 cm. [2218 ref]

• ***Summary:*** Contents: Part I: Processing. Meal. Oil. Beans. Part II: Utilization. Meal in feed. Oil in feed. Beans in feed. Meal in food. Oil in food (General, margarine). Beans in food (general, flour, milk, soy sauce). Meal for industrial uses (general, coatings). Oil for industrial uses (general, coatings, drying oils, paints, resins, soaps). Beans for industrial uses. Part III: Chemistry and research. Amino acids, bibliography, biochemistry, chromatography, composition, enzymes, fatty acids, lecithin, lipides, lipoxidase, organic chemistry, pesticide residues, phosphatides, proteins, research, sterols. Part IV: Miscellaneous. Argentina, Australia, Brazil, California, Canada, China, Congo, cook books, Far East, government loans, India, industry, international trade, Japan, laws and legislation, markets and marketing, nutrition, pesticide residues, varieties.

"All citations except those to patents have been examined and verified by the compiler. Patents cited were obtained from Chemical Abstracts. All foreign language titles have been translated into English with the original language indicated. [Warning: Many patent titles listed in this are different from those appearing on the actual patent.]

"Sources consulted: Agricultural Index, Bibliographic Index, Bibliography of Agriculture, Biological and Agricultural Index, Card Catalog of the National Agricultural Library, Chemical Abstracts, Dissertation Abstracts, Engineering Index, Food Science Abstracts, Journal of the Science of Food and Agriculture, Nutrition Reviews, and Pesticides Documentation Bulletin." Address: National Agricultural Library, Div. of Reference, Special Bibliographies Section.

5291. Kiribuchi, Toshiko; Mizunaga, T.; Funahashi, C. 1966. Separation of soybean sterols by florisil chromatography and characterization of acylated steryl glucoside. *Agricultural and Biological Chemistry* 30(8):770-78. Aug. [15 ref]

• ***Summary:*** Sterols are known to exist in plants in 3 different forms: free state, acyl ester and glycoside (phytosteroline). But sterols of ground soybeans, as analyzed from acetone extracts, are found in four forms: free, ester, and free and acylated glucosides. Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, The Univ. of Tokyo, Tokyo, Japan.

5292. Morimoto, Shigemi; Murakami, Michiyo. 1966. Sokujô shôyu ni kansuru kenkyû. VII. Arukooru hakkô ôyô shinsoku-jô shôyu seizô-hô ni tsuite. Gasu kuromatogurafii ni yoru kôki seibun no teiryô [Studies on a quick ripening process of soy sauce. VI. A new quick ripening process based on alcohol fermentation. A quantitative analysis of the flavor components using gas-liquid chromatography]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 44(8):476-82. Aug. [2 ref. Jap; eng]

Address: Shoin Junior College, Kobe, Japan.

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5293. Morimoto, Shigemi; Murakami, Michiyo. 1966. Sokujô shôyu ni kansuru kenkyû. VII. Arukooru hakkô ôyô shinsoku-jô shôyu seizô-hô ni tsuite. Gasu kuromatogurafii ni yoru kôki seibun no teisei [Studies on a quick ripening process of soy sauce. V. A new quick ripening process based on alcohol fermentation. A qualitative analysis of soy sauce flavor components using gas-liquid chromatography]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 44(8):467-75. Aug. [9 ref. Jap; eng]

• ***Summary:*** "The flavor components such as isoamyl alcohol, n-butyl acetate, ethyl maleate, ethyl levulinate and ethyl caprate, which have not been reported until now, were detected in at least 2 or more columns" of the 4 used.

"The other components, i.e., ethyl alcohol, ethyl acetate, n-propyl alcohol, isobutyl alcohol, n-butyl alcohol, acetic acid, butyric acid, ethyl lactate, furfurol, 2,3-butyleneglycol, benzaldehyde, methionol, ethyl succinate, ethyl benzoate, Beta-phenylethyl alcohol, ethyl isovalerate, isobutylaldehyde, isopropyl alcohol and diacetyl were detected in at least 2 or more columns." Address: Shoin Junior College, Kobe, Japan.

5294. *USDA Economic Research Service, Statistical Bulletin.* 1966. U.S. fats and oils statistics 1909-1965. No. 376. 222 p. Aug.

• ***Summary:*** Table 74 (p. 67) gives "Soybeans: Acreage, supply, disposition, and price, 1924-65." The 21 column heads include: Production (increased from 4.9 million bushels in 1924 to 701.9 million in 1964). Exports (began in Oct. 1931, with 2.2 million bu reported for 1931, increasing to 205.9 million bu in 1964; based on inspections by Federal licensed inspectors). Crushings (increased from 0.3 million bu in 1924 to 473.1 million bu in 1964). Average price per bushel received for the season by farmers ($2.46 in 1924, falling to a low of $0.50 in 1931, staying below $1.00 until 1941 except for $1.27 in 1936, first topping $2.00 again at $2.05 in 1944, reaching an all-time peak of $3.33 in 1947, then staying between $2.00 and $2.75 until 1964).

Production of oil (increased from 2 million lb and 7.4 lb per bushel crushed in 1924 to 5,146 million lb and 10.9 lb per bushel crushed in 1964). Production of meal (increased from 8,000 tons and 49.5 lb per bushel crushed in 1924 to 11,286,000 tons and 47.7 lb per bushel crushed in 1964).

Table 86 (p. 76) shows "Soybean oil: Supply and disposition and oil equivalent of exports of soybeans, 1916-64." Soybean oil production increased from 2 million lb in 1922 (the earliest year for which figures are reported) to 5,146,000 lb in 1964. Soybean oil imports started at 27 million lb in 1911, dropped slightly for several years, then skyrocketed to 118 million lb in 1915 after the start of World War I, and peaked at 332 million lb in 1917. They were negligible after 1922, when a tariff effectively shut off imports and promoted domestic U.S. soy oil production. The earliest figures for soy oil exports show that 58 million lb were exported in 1919, but in the following years soy oil exports were negligible, and did not top the 1919 figure until 1943. The big increases came starting in 1955 and by 1964 had reached 1,353,000 lb/year. Consumption/disappearance of soy oil in the U.S. was very large during World War I (when the amount consumed equaled the amount imported), then it was very small until the mid-1930s. It grew from then on, first in industrial uses, and after World War II in food uses. It rose from 1,076,000 lb in 1941 to 4,072,000 lb in 1964.

Table 87 (p. 77) shows "Soybean oil: Supply, disposition, and utilization, and oil equivalent of export of soybeans, 1912-1965. Utilization is divided into food uses and nonfood uses. Food uses included (in order or importance in 1917): Cooking and salad oils, shortening, and margarine. Nonfood uses included (with the earliest year reported after each): Soap (1912), paint and varnish (1931), linoleum and oilcloth (1931), resins (1949), other (1931). In 1965 the main food uses (in million lb) were: Shortening (1,471), cooking and salad oils (1,135), and margarine (1,112). In 1965 the main nonfood uses (in million lb) were: Paint and varnish (96), resins (96).

Table 173 (p. 155) lists "Soybeans: United States exports by country of destination, 1947-64." In 1964 the leading importers of American soybeans (in 1,000 bushels) were: Japan (49,298), Canada (34,951), Netherlands (28,066), West Germany (23,325), Denmark (13,444), Italy (10,401). In South America, the leading importer was Venezuela (1,228). In Eastern Europe it was Poland (1,785) and the USSR (1,320). In Africa it was Morocco (418).

5295. *Foreign Agriculture.* 1966. U.S. soybean producers and Japanese crushers promote consumer use of soybean oil in Japan. 4(38):9. Sept. 19.

5296. Grow, Howard E. 1966. The Japanese market development project. *Soybean Digest.* Sept. p. 63-65.

• ***Summary:*** Contents: Introduction. Increase in exports. Use of vegetable oil. Expansion in crushing. The activities of Mr. E.D. Griffin, director of member relations for the American Feed Manufacturers Association and former vice president and sales manager of Allied mills. Team of U.S. producers visits Japan for 3 weeks (Laurel Meade and Harris Barnes).

"Many of you will remember that at last year's convention in Memphis we had three men from Japan representing the oil industry. Mr. Kiyoshi Hirano, president of the Japan Oilseed Processors Association, presented a report at the convention. Mr. Masao Hoshino, president of the Margarine Manufacturers, was present, as well as Mr. Ichiro Omori, an oil press reporter.

"In October a team of 15 representatives of the processing firms in Japan visited the United States for 15 days under the leadership of Mr. Y. Sakaguchi, who is

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president of the Japan Oilseed Processors Association. This team of 15 men represented processing firms that crush over 50% of the 62 million bushels of soybeans sold to Japan this year.

"These two groups saw how soybeans are produced and harvested under our production methods and practices and they were much impressed. They viewed the marketing system in operation and were intrigued by what they saw. Because of these visits the Japanese are now more inclined to purchase their requirements from the United States when prices are competitive." Address: Assistant to the Executive Vice President, American Soybean Assoc.

5297. Komoda, M.; Onuki, N.; Harada, I. 1966. Studies on cause of color reversion of edible soybean oil and its prevention. I. Relation between the moisture of soybeans and the quantity of tocopherol in them. *Agricultural and Biological Chemistry* 30(9):906-12. Sept.
Address: 1-2. Sugiyama Chemica Research Inst., Mitaka-shi; 3. Hohnen Oil Co. Ltd., Shimizu Plant, Shimizu-shi, Japan.

5298. Okubo, Kazuyoshi; Shibasaki, Kazuo. 1966. Fractionation of soybean proteins by column chromatography on DEAE- cellulose. *Agricultural and Biological Chemistry* 30(9):939-40. Sept. [7 ref. Eng]
Address: Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai, Japan.

5299. Randolph, Chet. 1966. Agree on oil promotion for Japan. *Soybean Digest.* Sept. p. 66.
• ***Summary:*** The American Soybean Association reached final agreement recently with the Japan Oilseed Processors Association on a jointly financed and jointly administered consumer promotion program to increase the sale of vegetable oil in Japan.

"The eight major buyers of U.S. soybeans in Japan, under the leadership of Y. Sakaguchi, Association president, agreed to match U.S. funds with cash and institutional tie-in advertising.

"After reaching final agreement on financing, administration and broad program goals with the executive committee made up of leaders from each of the participating processors, a technical management committee was named, composed of the key advertising men from the companies and ASA representatives."

A portrait photo shows Chet Randolph. Address: Field Director, American Soybean Assoc., Hudson, Iowa, IA.

5300. Taira, Harue. 1966. Studies on amino acid contents of processed soybean. X. The influence of added sugars on the heat destruction of the basic and sulfur containing amino acids in soybean products. *Agricultural and Biological Chemistry* 30(9):847-55. Sept. [17 ref]
Address: Food Research Inst., Ministry of Agriculture & Forestry, Fukugawa, Koto-ku, Tokyo, Japan.

5301. Kasai, Tadasi; Kawamura, Shin'itiro. 1966. Soybean oligosaccharides: Isolation by gel filtration and identification by acetylation. *Kagawa Daigaku Nogakubu Gakujutsu Hokoku* (*Technical Bulletin of Faculty of Agriculture, Kagawa University*) 18(1):9-15. Oct. [9 ref. Eng; jap]
• ***Summary:*** The authors used dextran gel filtration for the isolation and purification of sucrose, raffinose, stachyose, and verbascose from soybeans. They found that Sephadex G-15, which may be applied to compounds with molecular weights below 1500, was superior to carbon column chromatography, especially for isolating and purifying stachyose. The Sephadex G-15 elutes first the highest molecular weights whereas the carbon column elutes the lowest molecular weight.

The sugars were extracted from both the defatted raw and autoclaved flakes. The melting points and specific rotations were determined on the sugars and their acetate derivatives, and are reported for sucrose, raffinose, and stachyose in tabular form.

Note: This is the earliest document seen (June 2006) that mentions "verbascose," a soybean oligosaccharide. Address: Japan.

5302. Narasaki, Teiichi. 1966. Enzymatic hydrolysis of soybean polysaccharides. I. Hydrolysis of the hemicellulose B-1 of soybean cotyledons by Taka-diastase. *Kagawa Daigaku Nogakubu Gakujutsu Hokoku* (*Technical Bulletin of Faculty of Agriculture, Kagawa University*) 18(1):16-22. Oct. [5 ref. Eng; jap]
• ***Summary:*** Taka-diastase liberated xylose, arabinose, galactose, galacturonic acid in the hydrolyzate and gave an unhydrolyzable polysaccharide residue rich in rhamnose, fucose, xylose, glucose, and galacturonic acid. Moreover, five intermediate hydrolysis products were formed in an early stage of the incubation and two of them remained unchanged in the hydrolyzate after 48 hours of incubation. Address: Lab. of Agricultural Products Technology, Kagawa Univ., Japan.

5303. Saio, Kyoko; Watanabe, Tokuji. 1966. Preliminary investigation on protein bodies of soybean seeds. *Agricultural and Biological Chemistry* 30(11):1133-38. Nov. [11 ref]
• ***Summary:*** Note: This is the second earliest document seen (Feb. 2004) that describes the use of an electron microscope to examine soybeans or soyfoods. Address: Food Research Inst., Ministry of Agriculture and Forestry, Japan.

5304. *Soybean Digest.* 1966. ASA initiates oil program in Japan. Nov. p. 16-17.
• ***Summary:*** The goal of the American Soybean Association program is to double Japanese per capita consumption of fat

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and oil (especially soybean oil) from its present level of 15 pounds up to 30 pounds, and increase use of soybean meal in Japanese livestock feeds. The American Soybean Assoc. recently reached an agreement with the Japanese Oilseed Processors Association on a joint mass media advertising campaign including radio, television, and women's magazines.

5305. Yasumatsu, Kkatsuhara; Ohno, M.; Tobari, M.; Shimazono, H. 1966. Studies on the enzymes produced by *Trametes sanguinea.* III. Solubilization of yeast and soybean meal by the enzymes from *Trametes sanguinea. Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 44(11):847-53. Nov. [18 ref. Eng]
• ***Summary:*** "In the light of food ingredients, the hydrolyzate by the enzymatic hydrolysis was better than that by acid hydrolysis, because the former was richer in vitamin content, poorer in amount of sodium chloride, higher in the yield of nitrogen and better in flavor." Address: Technological Research Laboratories, R&D Div., Takeda Chemical Ind., Ltd., Higashiyodogawa-ku, Osaka, Japan.

5306. Takeuchi, Tokuo; Yoshii, Hisao. 1966. Miso, shôyu no peptides ni kansuru kenkyû. III. Miso jukusei-chû no henka [Studies on the peptides in miso and soy sauce. III. Changes in the amounts of peptides during miso ripening]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 44(12):934-39. Dec. [12 ref. Jap; eng]
Address: Food Research Inst. of Aichi prefecture, Nishi-ku, Nagoya, Japan.

5307. [Commodity classification: Yearly amount of expenditures, quantities by commodities per household by cities, groups, districts, cities within prefectural government (all households)]. 1966-1981. Serial/periodical. Tokyo: Norinsho, Government of Japan. Serial/periodical. Tokyo: Norinsho, Government of Japan. [Jap]
• ***Summary:*** Gives statistics for the quantities consumed per household and the amount expended (in yen) for the following foods: Soybean products, tofu, fried tofu, natto, other soybean products, sea vegetables (nori, wakame, kombu), and umeboshi. Statistics are for the following groupings: (1) City groups (All Japan, all cities, cities with population of 50,000 or more, major cities, middle-sized cities, small cities, towns and villages); (2) Districts (Hokkaido, Tohoku, Kanto, Hokuriku, Tokai, Kinki, Chugoku, Shikoku, Kyushu, Okinawa); 49 major cities.

For example, for tofu in 1981: The average Japanese household consumed 86.91 cakes (cho). Consumption per household was highest in small cities (92.04 cakes) and lowest in major cities (84.19 cakes). In the districts, consumption per household was highest in Tohoku (northeast Japan, 101.91 cakes) followed by Chugoku (98.15), and lowest by far in Hokkaido (the soybean production center of Japan, 58.28 cakes). The major cities with the highest per household consumption are Toyama (capital of Toyama prefecture in northeast Japan, 118.96 cakes) and Morioka (capital of Iwate prefecture in northeast Japan, 118.42 cakes). The major city with the lowest per household consumption is Sapporo (capital of Hokkaido prefecture, Japan's northernmost island, 59.83 cakes).

For natto, the major consuming district was Tohoku, followed by Hokkaido, then Kanto. The city with the largest per household consumption was Mito, followed by Aomori, then Morioka and Utsunomiya. Address: Tokyo, Japan.

5308. Kitasato, T.; Omae, K.; Okayama, T. 1966. [Viscous substances of natto. III. Purification of viscous substances]. *Scientific Report of the Faculty of Liberal Arts Education, Gifu University* (*Natural Science*) 3:539-40. (Chem. Abst. 68:2003. 1968). [Jap]*

5309. Nakano, Masahiro. 1966. On the Japanese food, miso, in respect to the processing and dietetical view. In: VIIth International Congress of Nutrition. Abstracts of paper. Hamburg 3-10 VIII. See p. 241. *
Address: National Food Research Inst., Tokyo.

5310. Nihon Daizu. 1966. Fire or explosion in solvent extraction plant. Kobe, Japan.
• ***Summary:*** Kingsbaker, C. Louis. 2005. "List of fires and explosions in extraction plants." Atlanta, Georgia. 3 p. Aug. 4. Unpublished manuscript. Address: Kobe, Japan.

5311. Tanegashima, C.; Kirita, Y. 1966. [Investigation of pyridine carbonic acids. II.]. *Mukogawa Joshi Daigaku Kiyo. Seikatsu Kagaku-hen* (*Scientific Reports of Mukogawa Women's Univ.–Domestic Science Series*) 14:81-83. [Jap]*

5312. Urakami, C.; Sakamoto, R.; Takada, A.; Tanaka, H.; Furuhashi, N.; Uemura, T. 1966. Effects of ^{60}Co on natto 1966. *Radioisotopes* (*Japan*) 15:228-33. *

5313. Buck, Pearl S. 1966. The people of Japan. New York, NY: Simon and Schuster. 255 p. See xiv, p. 167. Illust. 24 cm. *
• ***Summary:*** "Chicken with miso paste and raw vegetables."

5314. Ebine, Hideo. 1966. Fermented soybean foods in Japan. Tokyo: Tropical Agricultural Research Center, Ministry of Agriculture and Forestry. 20 p. *
Address: National Food Research Inst., Tokyo, Japan.

5315. Ebine, Hideo. 1966. Manufacturing digestible proteinous foods from oilseeds and pulses by enzymatic treatment. *JARQ* (*Japan Agricultural Research Quarterly*) 1(1):21-25. [3 ref. Eng]
Address: Chief, Fermentation Chemistry Lab., Fermentation

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Div., Food Research Inst.

5316. Murata, Kiku; Ikehata, H. 1966. Hemolysis preventing antioxidant activity of synthesized 6.7.4' -trihydroxyisoflavone and that isolated from tempeh. In: 1966. Proceedings of the Seventh International Congress of Nutrition, Hamburg. Braunschweig, West Germany: Verlag Friedr. Vieweg & Sohn GmbH. See vol. 5, p. 656-59. [3 ref]
• ***Summary:*** Contents: Introduction. Synthesis of 6.7.4' -trihydroxyisoflavone and its derivatives and their biological activities. Antihemolytic activities of tempeh with different fermentation times. Production of Beta-glucosidase activity in *Rhizopus oligosporus.* Summary. Address: Osaka City Univ., Osaka, Japan.

5317. Nagano Miso Kogyo Kyodo Kumiai Rengokai. 1966. Shinshû Miso no rekishi [History of Shinshu miso]. Nagano, Japan. 578 p. [Jap]*

5318. Nakamura, James I. 1966. Agricultural production and the economic development of Japan, 1873-1922. Princeton, New Jersey: Princeton University Press. xxiii + 257 p. Illust. Index. 24 cm. Series: Studies of the East Asian Institute, Columbia University. [149* ref]
• ***Summary:*** Japan's economic growth is usually described in superlatives and agriculture is widely viewed as playing an unusually important role in this growth. In reexamining government statistics about Japan's historical agricultural growth, the author finds that the median growth rate was not 2.4% as previously believed, but probably no more than 1.0%. This remarkable finding dispels much of the mystery surrounding Japan's miraculous "take-off" in the Meiji period.

Japan was a net food exporter until about 1895. By 1920 Japan had become heavily dependent on food imports, including wheat, soy beans, sugar, and animal products (p. 126).

During the Meiji period and until relatively recently, most rural households in Japan were nearly self-sufficient, producing almost all of their own cloth, clothes, footgear, housing, many farm implements, and most processed foods and beverages including "soy sauce, bean paste sauce (*miso*), pickles, rice wine (*sake*), etc. (p. 127, 139-40).

Table 5 (p. 228-30) gives the yield of ten Japanese crops from 1879 to 1925. The yield of soy beans increased from 0.516 *koku/tan* [10.45 bushels/acre] in 1879 (1 koku = 4.96 bushels; 1 tan = 0.245 acres) to 0.778 *koku/tan* in 1900 to 0.915 *koku/tan* [18.52 bu/acre] in 1919.

Soybeans are also mentioned on pages 97, 231, and 233. Address: New York.

5319. Nelson, Andrew Nathaniel. 1966. The modern reader's Japanese-English character dictionary. Revised ed. Rutland, Vermont, and Tokyo, Japan: Charles E. Tuttle Co. 1109 p. Index. 24 cm. [15 ref. Jap; Eng]
• ***Summary:*** Radical 37 = dai or oh = big + 3 strokes = #1171 = *daizu* or *ômame* = soy bean (p. 290).

Radical 75 = tree; at left = ki hen. #2211 = eda of edamame. Radical 82 = Hair of animals, ke. Radical 85 = Water + 11 strokes = soymilk. Radical 151 = Bean + 7 strokes = mame (bean) or tou = toufu. Radical 164 = Liquid (Sake sukuri) + 11 strokes = shoyu no sho. Radical 201 = Yellow (variant is 11 strokes).

Soy related words: (1) Miso: *miso* (fermented [soy] bean paste; flattery, p. 247). *miso o tsukeru* (to make a mess of, p. 247). *miso shiru, misojiru* (bean-paste soup, p. 247). *miso mame* (soybeans, p. 247). *misoni* (boiling with bean paste, p. 247). *misozuke* (pickled in bean paste, p. 247). *misokoshi* (bean-paste strainer, p. 247). *misosuri* (grinding bean paste; flattery, p. 247). *temai miso* (self praise; bean paste of one's own making, p. 420). *miso dengaku* (tofu baked [grilled] with miso, p. 621). *konamiso* (powdered miso, p. 691). *nuka miso* (salted rice-bran paste, for pickling, p. 694). *karamiso* (salty miso, p. 869).

(2) Tôfu [tofu]: *yakkodôfu* [yakkodofu] (tofu cut in cubes, p. 47). *kôridôfu* [kori-dofu] (frozen tofu, p. 75). *unohana* (refuse from tofu, p. 119). *shimidôfu, kogoridôfu, kogodôfu* [shimi-dofu, kogo-dofu, kogori-dofu] (frozen tofu, p. 192).

Note 1. This is the earliest English-language document seen (April 2013) that contains the word *kogodôfu* (written as one word, with diacritics) which it says is the same as *shimidôfu,* all of which it defines as frozen tofu.

age (fried tofu, p. 447). *kara, okara* (tofu refuse, p. 525). *aburage* (fried tofu, p. 543). *yuba* (dried tofu [sic], p. 561). *yakidôfu* [yaki-dofu] (broiled bean curd, p. 578).

Note 2. This is the earliest English-language document seen (April 2013) that contains the word *yakidôfu* (written as one word, with diacritics).

nama-age (fried tofu, p. 618). *dengaku* (tofu baked with miso, p. 621). *inarizushi* (fried tofu stuffed with seasoned rice, p. 668). *tofu* (bean curd, tofu, p. 843). *kirazu* (tofu refuse [okara], p. 941). *kôyadôfu* (frozen tofu, p. 978).

toshi no mame ([soy] beans of the bean scattering ceremony, p. 88).

mitsumame (boiled [soy] beans with treacle / molasses, p. 328).

edamamé (green soybeans, p. 494). *irimame* (parched [soy] beans, p. 576).

nimame (boiled [soy] beans, p. 578).

nattô (fermented soy beans, p. 697).

tamari (soy sauce, p. 564).

azemame (soy beans grown on rice-field ridges, p. 624). *moyashi* (artificially sprouted beans, p. 780). *moyashi mame* (beans for sprouting, p. 781). *hôrai mame* (sugar-coated beans, p. 786).

kuromame (black soy bean, p. 992).

mame abura (soybean oil, p. 843). *tônyû* (soybean milk,

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p. 843). *kinako* (soybean flour, p. 991). Address: PhD, Tokyo, Japan.

5320. Nihon Ginko Tokeiyoku. 1966. Hundred-year statistics of the Japanese economy. Tokyo, Japan. *
• ***Summary:*** Pages 110-11, "Principal Products of Agriculture, Forestry and Fishing," give Japanese soybean production statistics from 1878 to 1964.

Pages 286-89, "Exports and Imports of Principal Commodities," give soybean import statistics from 1897 to 1965 by tonnage and value.

5321. Nippon Shoyu Gijutsukai. 1966. [Analytical methods of soy sauce. 2nd ed.]. Tokyo: Sanyusha Publishing Co. * Address: Tokyo.

5322. Photograph of Evan Root at the first Erewhon retail store at 303B Newbury St. in Boston, Massachusetts. 1966.
• ***Summary:*** Evan Root wrote in Nov. 2010: This "one is me, circa 1966, at 303-B Newbury St., Boston, below street level, at the corner of Hereford Street, wearing a Japanese clerk's coat, something like what is called a Happi Coat, hand made by Aveline [Kushi]. This picture was in Lilly Kushi's marvelous photo album, which you may well have had a chance to see. She took it out and gave it to me near the end of her life.

"There are, to my knowledge, very few photo archives of that first little Erewhon store. You can't see anything of the store or the shelves in the picture. I am sitting at the check-out desk, upon which there is a decorative bouquet of wheat grain in a vase.

"This store defied all business reason as so few people came through the doors to shop. It was principally a place where people came to talk and wonder about our place in the universe, and how macrobiotic practice could align us with that order. It took about one year before we had our first $100 day, and that was worth a celebration."

Question: In those early days, which important macrobiotic addresses were in Boston and which were in Brookline (which was enclosed on three sides by Boston)?

Evan: "Before I left for Japan (spring 1969), in Brookline there was the Kushi's house at 216 Gardner Road. This is the first house the Kushis rented when they moved from Wellesley in March of 1966 and was their home along with as many other people as could fit in, myself included. There were several apartments where groups of mb (macrobiotic) students lived, as well. Sometime later (I can't recall the timing here) 29 University Road opened up as the first 'study house' outside of the Kushi's home. I think another one opened on Washington Street before I left, though my memory is hazy on just when. These first ones were rented by Aveline and were all under the Kushi umbrella with 'house leaders' usually a couple whose studies of Macrobiotics qualified them as 'senior students.' There may have been one or two others.

"By the time I returned, there were numerous 'study houses,' more in Brookline and in various other locations such as Brighton, Cambridge, Boston, Jamaica Plain, and Wakefield as well. At this time, maybe 6 or 7 of them were in the Kushi study house system, and many were independent.

"Before I left for Japan, the important Boston addresses were: 303B Newbury Street (first as Erewhon retail store, then as Tao Books), 342 Newbury Street (Erewhon retail), 272A Newbury Street, and The Arlington Street Church, a Unitarian Universalist church at 351 Boylston Street where Michio's lectures and large community events were held. I could say (only somewhat facetiously) that the Half Shell, a seafood restaurant on Boylston Street was important as well, as it was very near Erewhon, and served as a place for many a meeting with Michio and fish dinner for the working crew.

"When I returned from Japan, arriving in Boston in late October of 1972, added to the list above, the Seventh Inn restaurant, an outgrowth of Sanae was operating near the corner of Boylston and Arlington Street. Aveline had rented space in the building next to the Arlington Street Church on Boylston St. and had installed a Noh Stage there. This was referred to as the Noh Center, and most of the downtown classes were held there at this time. Erewhon's warehouse at 33 Farnsworth Street in Boston had, of course, been up and running for some time.

"In an eight-block stretch, running from Erewhon on Newbury Street to Seventh Inn on Boylston, there were 5 (6 counting the Church) active Macrobiotic "hot spots." During any given walk down Newbury or Boylston Street, a macrobiotic person of those days would encounter many friends just by virtue of walking down the street."

Note: Evan helped the Kushis open the pioneering natural / macrobiotic food store, Erewhon, and was it's first manager. This first Erewhon retail store was located at 303B Newbury Street in Boston and opened for business on 9 April 1966. The business was registered in Aveline's name.

Evan continues: "Interesting side note: During a certain period of time, not too long after we opened the retail store, when the U.S. government was attempting to have the Kushis deported, the registration of the business was transferred to my name. For almost a year, I was the straw owner. After some time, the Kushis prevailed, and the ownership went back to Aveline.

"You may ask, why do I prefer the wording 'registered' rather than 'owned'? This is because questions, and even thoughts about ownership did not arise until later. The store was opened to serve a need, and the Kushis acted more like the custodians of a communal trust or mission. In essence, I believe they tried to act in this manner throughout Erewhon's existence, although many factors came into play to muddy that water."

This photo was sent by Evan Root to Patricia Smith (of Mill Valley, California) and by Patricia to Soyinfo Center

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(Nov. 2010).

5323. Schenk, E.G.; Naundorf, G. 1966. Lexikon der tropischen, subtropischen und mediterranen Nahrungs- und Genussmittel [Dictionary of tropical, subtropical, and Mediterranean foods and food adjuncts (stimulants / enjoyables)]. Herford, Germany: Nicolaische Verlagsbuchhandlung Herford. xiv + 199 p. Index. 21 cm. Series: Manualia Nicolai 1. [200* ref. Ger]
• ***Summary:*** Pages 70-71 give a list of Japanese foods (after Mayerhofer and Pirquet 1926) in no apparent order, with the Japanese name followed by a translation of that name into German. Included in the long list are: Akamiso, miso, shiromiso, tofukasu [okara], daizu, fu [dried wheat gluten], kingyo-fu, kiri-fu, kiri-mochi [frozen and dried rice cake], ame [malt extract], mirin, aburage [tofu fried in vegetable oil], natto–Bohnenkäse, Tofu–Sojatopfen, Tonyu–Sojamilch, azuki [small red beans], kwansen-fu, kinako–Sojabohnenmehl, geröstet, amasake–unvergorener Sake, umeboshi, koritofu [frozen and dried tofu], midzuame [soft ame = rice syrup], shoyu–Sojasauce, yuba–eine Bohnenspeise. Plus many types of sea vegetables.

On pages 140-42 the following terms are defined in German: Soja [soya], Sojabohne [soybeans], Sojabohnenkäse [soy cheese or tofu], Sojabohnenmehl [soybean meal], Sojabohnenöl [soybean oil], Sojakäse [fermented soy cheese], Sojamilch [soymilk], Soja-Nahrungsmittel [soyfoods]: Koji, Miso, Tofu, Nato [sic, natto], kondensierte Soja-Milch [condensed soymilk], Japanische Verarbeitungen [Japanese processed foods: Japanische Soja-Sauce Shoju (Shoyu), Miso, Tofu], Soja-Nahrungsmittel, javanische [Javanese] soyfoods: Tao-Hoe, Tempeh, Ketjap, Tao-Tjiong [a term, and perhaps a product, between *doujiang* and *tao-tjo,* Indonesian-style miso], Sojatunken, Soja-Verarbeitungen: Sojamilch, Bohnenkäse, Teoufou (China), Tofu (Japan), Dan Phu (Vietnam), Natto (Japan), Tao-tehe (China).–Bohnenbrei Miso (Japan), Tao-tjiung (doujiang, China).–Sojasauce: Shogu [sic, Shoyu] (Japan), Tsiang-Yeou, Tao-yu (China), Ketjap (Java), Tuong (Vietnam).–Gärmittel: Kiut see (Japan). Then a table shows the nutritional composition of 8 of these foods.

Note 1. This is the earliest German-language document seen (April 2013) that uses the term *Sojabohnenkäse* ("soybean cheese") to refer to tofu.

Note 2. This book contains more than its fair share of errors and could be better organized. Address: 1. Prof. Dr. med. habil., Dr. phil. nat, Laurensberg ueber Aachen, Germany.

5324. Young, John. 1966. The research activities of the South Manchuria Railway Company, 1907-1945: A history and bibliography. New York, NY: East Asian Institute, Columbia University. xii + 682 p. *
• ***Summary:*** Based mostly on Library of Congress holdings.

5325. Zen cookery: The philosophy of Oriental culture. Vol. I. Practical macrobiotics. 1966. Los Angeles, California: Ohsawa Foundation, Inc., The Ignoramus Press. 84 p. Index. 22cm.
• ***Summary:*** The revolutionary little reddish-orange or yellow book, with a black plastic comb binding, that introduced many to macrobiotic cooking. No author or editor is listed. The Ohsawa Foundation has branches in Los Angeles, New York, Wellesley, Paris, and Tokyo. Contents and format are identical to the 1964 edition edited by Teal Nichols, published by the Ohsawa Foundation of Chico– which see. Address: Ohsawa Foundation, Inc., 1434 N. Curson Ave., Los Angeles, California.

5326. Misuzu-Tofu K.K. 1966? Misuzu-dôfu no jôzu na tsukaikata [How to use Misuzu Tofu skillfully]. Nagano City, Japan. 8 p. Undated. Illust. 12 x 18 cm. [Jap]
• ***Summary:*** Contains 7 recipes for dried-frozen tofu, each accompanied by a black-and-white photo. On page 4 are five photos showing how the tofu is made inside the factory. On page 6 is an illustrated flow chart of the process. The steps are: Cleaning the soybeans, soaking, wet grinding, heating the slurry, filtering off the soymilk, pricipitation with the coagulant, filtering the curds, washing the curds, cutting the tofu into small cakes, freezing, cold storage, thawing in water, pressing out the water, drying, trimming, ammonia treatment, packaging. A photo shows the package. Steps translated into English by Eiji Yonemura of Misuzu Co.

On p. 7, a colored pie chart shows the nutritional composition of dried-frozen tofu. A second chart shows that Misuzu Tofu is much less expensive per calorie than other common foods such as eggs, meat, or fish. Cartoons by Hiro. Address: Nagano City, Japan.

5327. Fujii, Hisao; Oki, Kuniko; Makihara, Miyoko; Keshino, Junko; Keshino, R.; Takeya, Ryuko. 1967. Nattô-kin ni yoru nenshitsu-butsu no seisei ni kansuru kenkyû. VII. Nattô-kin faaji no bunrui to sono ippan teki seishitsu [On the formation of mucilage by *Bacillus natto.* VII. Isolation and characterization of a bacteriophage active against "natto"-producing bacteria]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 41(1):39-43. Jan. (Chem. Abst. 67:8826). [15 ref. Jap]
• ***Summary:*** "A new bacteriophage was isolated from an abnormally fermented 'natto' and named phage PN-1... The phage had a hexagonal head about 75mμ in diameter and a tail with a swollen end." The tail was about 240 mμ long, 10 mμ wide in the middle, and 25mμ at the swollen end. This phage was found to attack 9 strains of the 23 tested, all belonging to the *Bacillus subtilis* group.

The 9 susceptible strains were all characterized by their ability to produce natto and had been named *Bacillus natto* (Table 2).

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Note 1. This is the earliest English-language document seen (Jan. 2012) that contains the word "phage" or the word "bacteriophage" in connection with natto.

Note 2. The word "phage" derives from the Greek, "to devour." A bacteriophage is any one of a number of viruses that infect bacteria. They do this by injecting genetic material (in either a circular or linear arrangement), which they carry enclosed in an outer protein capsid. Bacteriophages are among the most common and diverse entities in the biosphere. The term is commonly used in its shortened form, "phage." (Source: Wikipedia, at Bacteriophage). An illustration at this Wikipedia entry is titled "The structure of a typical myovirus bacteriophage." Myovirus bacteriophages use a hypodermic syringe-like motion to inject their genetic material into the cell.

Bacteriophages (and their ability to kill harmful bacteria) were discovered independently in 1915 by British bacteriologist Frederick Twort (in London) and in 1917 by French-Canadian microbiologist Félix d'Hérelle (working at the Pasteur Institute in Paris). Address: Faculty of Home Life Science, Fukuoka Women's Univ., Fukuoka, Japan.

5328. Hanaoka, Yoshio. 1967. Shôyu hozon ni kansuru kenkyû. V. B.H.B., B.A. no kakushu shôyu-chû no kôbo nyûsan-kin ni taisuru sayô ni tsuite [Studies on preservation of soy sauce. V. The effects of B.H.B. and B.A. in several soy sauces on yeast and lactic acid bacteria]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(1):22-28. Jan. [25 ref. Jap; eng]
• ***Summary:*** B.H.B. is n-butyl-p-hydroxybenzoate and B.A. is benzoic acid. Both have germicidal effects on yeasts and lactic acid bacteria. B.H.B. is more effective in killing yeast than bacteria. Address: Central Research Inst., Kikkoman Shoyu Co. Ltd., Noda, Chiba, Japan.

5329. Kasai, Takanori; Obata, Yataro. 1967. Changes in amino acid composition during germination of soybean. III. Changes in gamma-glutamyltranspeptidase activity. *Agricultural and Biological Chemistry* 31(1):127-29. Jan. [8 ref]
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Hokkaido Univ., Sapporo.

5330. Kuroshima, Eizaburo; Oyama, Y.; Matsuo, T. 1967. Shôyu jôzô ni kanyo suru bisei-butsu no gurutamin san shôchô ni oyobosu eikyô ni tsuite. II. Shôyu baichi ni ni okeru gurutamin-san bunkai to seigôsei [Biosynthesis and degradation of glutamic acid in microorganisms relating to soy sauce brewing. II. Biosynthesis and degradation of glutamic acid in soy sauce medium]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(1):9-16. Jan. [15 ref. Jap; eng]
• ***Summary:*** "The degradation of glutamic acid in soy sauce medium was less than that in the synthetic medium. The degradation of glutamic acid by organisms relating to soy sauce brewing was observed using *Saccharomyces rouxii* variety *halomembranis* and *H. anomala,* but not when using *S. rouxii* and genus *Bacillus.*

"Biosynthesis of glutamic acid in soy sauce medium was decreased remarkably in comparison with that in synthetic medium. Biosynthesis of glutamic acid by test organisms was detectable using *S. rouxii* variety *halomembranis* and *H. anomala,* but very hard to observe in other organisms." Address: Research Inst. of Marukin Soy Sauce Co., Kagawa prefecture, Japan.

5331. Kuroshima, Eizaburo; Oyama, Y.; Matsuo, T. 1967. Shôyu jozô ni kanyo suru bisei-butsu no gurutamin-san shôchô ni oyobosu eikyô ni tsuite. I. Gôsei baichi ni okeru gurutamin-san bunkai to seigôsei [Biosynthesis and degradation of glutamic acid in microorganisms relating to soy sauce brewing. I. Biosynthesis and degradation of glutamic acid in synthetic medium]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(1):1-8. Jan. [18 ref. Jap; eng]
Address: Research Inst. of Marukin Soy Sauce Co., Kagawa prefecture, Japan.

5332. Lu, Ying-Chuan; Tsai, K.-H.; Oka, H.-I. 1967. Studies on soybean breeding in Taiwan. I. Growing seasons and adaptabilities of introduced varieties. *Botanical Bulletin of Academia Sinica* 8(1):37-53. Jan. [24 ref. Eng; chi]
• ***Summary:*** "Before 1948, soybean culture in Taiwan was quite limited except for growing them for green manure. Later, a few varieties introduced from the U.S.A. and Japan were extended to certain areas of the island. At present, soybean production is growing year after year, arriving at 55,563 hectares and 61,897 tons in 1965. In retrospect, at the beginning of this study, the writers wanted to know why no soybeans had been grown in Taiwan, though this valuable legume of Asian origin was cultivated in all countries or areas surrounding the island. We then learned that this was due to lack of adaptive varieties." Address: 1-2. College of Agriculture, Chung-Hsing Univ., Taichung, Taiwan, Rebublic of China; 3. National Inst. of Genetics, Mishima, Japan.

5333. Lu, Ying-Chuan; Tsai, K.-H.; Oka, H.-I. 1967. Studies on soybean breeding in Taiwan. II. Breeding experiments with successive hybrid generations grown in different seasons. *Botanical Bulletin of Academia Sinica* 8(1):80-90. Jan. [14 ref]
Address: 1-2. College of Agriculture, Chung-Hsing Univ., Taichung, Taiwan, Rebublic of China; 3. National Inst. of Genetics, Mishima, Japan.

5334. Mitsuda, Hisateru; Yasumoto, K.; Yamamoto, A.; Kusano, T. 1967. Study on soybean lipoxygenase. I.

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Preparation of crystalline enzyme and assay by polarographic method. *Agricultural and Biological Chemistry* 31(1):115-18. Jan. [17 ref]
• ***Summary:*** "Lipoxygenase (E.C. 1.99.1.1) specifically catalyzes the oxidation of methylene-interrupted unsaturated fatty acids and their esters to respective hydroperoxides." Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Kyoto Univ., Kyoto, Japan.

5335. Morimoto, Shigemi; Sakaguchi, Y.; Murakami, M. 1967. Sokujô shôyu ni kansuru kenkyû. VII. Arukooru hakkô ôyô shinsoku-jô shôyu seizô-hô ni tsuite [Studies on a quick ripening process of soy sauce. VII. A new quick ripening process based on alcohol fermentation. The composition of organic acid]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(1):17-21. Jan. [18 ref. Jap; eng]
• ***Summary:*** Organic acids studied include oxalic, malic, and lactic acids. Address: Shoin Junior College, Kobe, Japan.

5336. *Soybean Digest.* 1967. Research grants: To search for the best tofu varieties. Jan. p. 28-29.
• ***Summary:*** "The best varieties of U.S. soybeans for making dried tofu and the best processing methods for manufacturing this traditional Japanese food will be sought by Japanese food scientists under a grant awarded by the U.S. Department of Agriculture.

"The grant will be paid for with foreign currency obtained by the United States from sales of farm products abroad under P.L. 480. This money cannot be converted into dollars for use in the United States.

"There are two forms of tofu–fresh and dried. The dried form also has other names, such as Kori, Koya. It is sometimes called frozen tofu because freezing is part of the drying process.

"Under the 3-year research grant of $35,802, paid in Japanese yen, food chemists at the Japan Frozen Tofu Association in Tokyo will experiment with numerous American soybean varieties to try to determine which are best suited for manufacturing dried tofu. They will also try to determine the effect of various processing methods on the yield, cost, physical properties, and flavor of dried tofu.

"Fresh tofu resembles cottage cheese in appearance, taste, and composition. Dried tofu, made with present processing methods, is darker than the fresh and has less desirable flavor and texture. However, fresh tofu is very unstable, having a shelf life comparable to that of fresh milk, While the dried product has a shelf life of more than 6 months and can be transported long distances without loss in quality.

"The Japanese tofu makers have been mixing a small percentage of American beans with the native varieties; but recently they have started using higher percentages of the American Hawkeye variety in both fresh and dried tofu.

"If they can find additional U.S. varieties that make good quality dried tofu and can improve processing methods, they may import more U.S. soybeans, as U.S. beans are cheaper than native varieties.

"Foreign agricultural research done under P.L. 480 is administered by USDA's Agricultural Research Service."

5337. Takeuchi, Tokuo; Yoshii, Hisao. 1967. Miso, shôyu no peptides ni kansuru kenkyû. V. Genryô C/N hi o i ni shita miso no peptides keitai (2) [Studies on the peptides in miso and soy sauce. V. Relation between the amino acid composition of miso peptides and C/N ratio of the raw materials]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(1):34-39. Jan. [16 ref. Jap; eng]
Address: Inst. of Food Technology, Aichi prefecture, Nagoya, Japan.

5338. Takeuchi, Tokuo; Yoshii, Hisao. 1967. Miso, shôyu no peptides ni kansuru kenkyû. IV. Genryô C/N hi o i ni shita miso no peptides keitai (1) [Studies on the peptides in miso and soy sauce. IV. Relation between the C/N ratio of the raw materials and the distributive patterns of peptides in miso]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(1):29-33. Jan. [16 ref. Jap; eng]
• ***Summary:*** "Soybean koji (low carbon/nitrogen ratio) contained more amino acids and peptides than any other koji of higher C/N ratio. This tendency seemed to have originated from the proteolytic character of soybean koji, because the neutral and alkali protease of *Asp. oryzae* (principal protease in soybean koji) would be more active in soybean protein than in acid protease.

"In the ripened miso the same distributive pattern of peptides was observed regardless of C/N ratio of raw materials. Therefore, the peptide patterns may be virtually similar for all types of miso." Address: Inst. of Food Technology, Aichi prefecture, Nagoya, Japan.

5339. Umeda, Isao. 1967. Kore kara no shôyu seizô-hô. I. [Future shoyu production methods. I.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 62(1):39-42. Jan. [8 ref. Jap]
Address: Nihon Shoyu Kenkyujo.

5340. Yokotsuka, Tamotsu; Sasaki, M.; Kikuchi, T.; Asao, Y.; Nobuhara, A. 1967. Kôji-kin no seisan-butsu ni kansuru kenkyû. I. Hôsan tane kôji-kin no seisan suru shû toshite keikô seibun ni tsuite [Studies on the compounds produced by molds. I. Fluorescent compounds produced by Japanese industrial molds]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 41(1):32-38. Jan. [22 ref. Jap; eng]
• ***Summary:*** Shows the absence of aflatoxins in Japanese fermented foods such as shoyu and miso–based on extracts of 60 strains of molds. Address: Central Research Inst., Kikkoman Shoyu Co. Ltd., Noda Inst. for Scientific

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Research, Noda-shi, Chiba-ken, Japan.

5341. Lebumfacil-Davide, Clara S. 1967. Corn and sorghum as possible substitutes for wheat in soy sauce production. *Philippine Agriculturist* 50(9):843-60. Feb. [10 ref]
• ***Summary:*** Soy sauce was made from three different cereal-soy combinations: Wheat-soybean, corn-soybean, and sorghum soybean. Chemical analysis showed that the traditional wheat-soybean substrate had the highest pH, highest total titratable acidity, and highest percentage of total nitrogen, proteins, amino nitrogen in total nitrogen, non-chloride solids, amino nitrogen and reducing sugars.

In the soy sauce made from the sorghum-soybean substrate, the amino acids tryptophane, lysine, and histidine were relatively higher.

In the soy sauce made from the corn-soybean substrate, the aspartic and glutamic amino acids were relatively higher. In all the soy sauces, cystine was present in traces only.

"Results obtained showed that neither corn nor sorghum can suitably substitute for wheat in the combinations mentioned. Organoleptic tests for aroma and flavor of the soy sauce showed that wheat-soybean" was the best of the three substrates.

Introduction: For many years Japanese and Chinese food companies have had monopoly on the manufacture of soy sauce for the Philippine market. "However a number food companies in the Philippines are making headway towards soy sauce manufacturing." However one of the basic problems facing these local companies is the high cost of production, and especially the high cost of importing raw materials, such as soybean and wheat. Unless Filipino farmers can produce and provide these raw materials, a local soy sauce industry will never flourish.

Contains 7 tables. Address: Univ. of the Philippines.

5342. Machida, Yoshiro. 1967. Tôfu gyôkai no genjô to shôrai [The present and future of the tofu industry]. *Shokuhin Kaihatsu* (*Up-to-Date Food Processing*) 2(11):16-23. Feb. [17 ref. Jap]
Address: Tokyo, Japan.

5343. Roberts, Hibbert Rice. 1967. The Meals for Millions Foundation: a study of a non-governmental organization (Continued–Document Part V). PhD thesis in Political Science, University of Washington. 288 leaves. [53 + 100+ footnotes]
• ***Summary:*** Continued: Chapter 5, "MFM and the United States government." "Over a period of nearly twenty years, the executive and legislative branches of the federal government have been a source of both assistance and frustration to MFM's staff as it sought to promote the use and production of MPF and MFP-type foods throughout the world." Dr. Allan K. Smith of the USDA's Northern Regional Research Laboratory (Peoria, Illinois), "an expert on soybean protein and its uses gave great encouragement to the infant Foundation [starting with a letter dated 30 Dec. 1947] and undoubtedly brought to its attention a potential source of technical advice,..." (p. 115-18).

The Bureau of Educational Affairs of the State Department provided ongoing help. The Foreign Training Division of USDA's Foreign Agricultural Service also responded favorably and now furnishes MFM the names and itinerary of individuals brought to the United States by the USDA to study American food and nutrition programs. "As a result, many foreign nutritionists, politicians, officials, and businessmen on U.S. government sponsored tours have visited MFM headquarters and have listened to Miss Rose and staff explain the MPF answer to protein scarcity in developing nations of the world." This "represents another step in the slow process of educating the citizens of other countries about the potential of vegetable proteins as a source of human food and the wisdom of manufacturing MPF-type foods." Perhaps the U.S. "officials believed that the example of an American-supported voluntary agency motivatd by an unselfish desire to help improve the living conditions of people in other countries would create a favorable impression of the United States in the minds of its guests. In any case, the routing of visitors to MFM by two federal departments appears to be a satisfactory arrangement for everyone involved" (p. 118-20).

The U.S. government sometimes helped in transporting MPF to foreign countries for relief. In one case, in 1959-60, MFM sent (with transportation paid) "over 74,000 pounds of MPF to Hong Kong, Japan, the Philippines and Taiwan in less than a year" (p. 120). It might be seen as part of the fight against communism. Also discuses Public Law 480–the Agricultural Trade and Assistance Act of 1954, which was signed into law on 10 July 1954–which offered to pay for some shipping (p. 120). "The lack of an MFM representative in Washington, who could personally press appropriate officials, greatly hurt MFM."

In Feb. 1958, in a speech delivered at Caltech, President Richard Nixon mentioned "Multi-Purpose Food which has meant so much to undernourished peoples all over the world" and congratulated Dr. Borsook for his "imaginative work" (p. 132-33; See also *Pasadena Star News* 17 Feb. 1958).

Also discusses the Armed Forces, school lunch program, civil defense and bomb shelters, and the American Soybean Association. The "Foreign Agricultural Service of the USDA and the American Soybean Association had entered into an agreement, on 7 Feb. 1956, which committed 108 million yen or $300,000 of PL 480 counterpart funds for a project to 'expand the market for U.S. soybeans in Japan.'" This was part of Section 104 within Public Law 480. MFM unsuccessfully tried to attach itself to this agreement (p. 143).

Continues the discussion of PL 480, Senator Hubert Humphrey (encouraged MFM; cordial relationship), MFM's

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"ambitiously conceived but sporadically executed campaign to convince U.S. officials that high-protein vegetable supplements, i.e., MPF, should be incorporated into the relief and emergency feeding programs authorized by PL 480" (p. 144-51). George McGovern (Director of the Food for Peace program). Dec. 1961 Eddie Albert of MFM shows the film "People to People" to McGovern, who calls it "an inspiration" and requests a copy for his office (p. 154-55). But the benefits to MFM of all this effort were negligible.

At the national level, pressed by "a keen and understandable desire to augment the limited resources and modest capabilities of the Foundation, Miss Rose and Mr. Chamberlain seem to strike out in any direction that they feel might lead to an improvement in the fortunes of their organization. What started to be a relatively simple effort on the part of MFM to obtain a PL 480 grant of $18,000 to develop a Japanese version of MPF, soon spiraled into an increasingly complex campaign to alter the focus of the United States overseas surplus food disposal program. The question of whether MFM, or more specifically Miss Rose and Mr. Chamberlain, should embark on such a campaign was never raised" (p. 159).

Chapter 6, Meals for Millions and the United Nations Children's Fund (UNICEF). The apparent identity of interest between the Fund and the Foundation "helps to explain why Miss Rose and Mr. Chamberlain concentrated so heavily upon the establishment of a cooperative relationship with UNICEF" (p. 161). However from its beginning in 1947, when MFM first offered to donate MPF to UNICEF, until the present, this relationship was filled with disappointments and frustrations for MFM (p. 161-96).

Dr. James Hundley of UNICEF told a MFM delegation of three (on 26 Feb. 1958) that the Saridele (soybean milk powder) plant in Indonesia had cost UNICEF approximately $480,000. But villagers found the powder "difficult to blend with water and prone to absorb moisture and harden when left exposed to the air" (p. 179).

The unfortunate and unhappy relationship shattered unmistakably on 9 June 1959 when Dr. Henry Borsook delivered the opening address at the Second Annual Inter-American Food Congress in Miami Beach, Florida. The "answer he gave to the question posed in the title of his address, 'We can at this time provide fairly adequate nutrition for the world. Why isn't it being done?' included a bitter and poignant indictment of 'official agriculture' in general and United Nations nutritional scientists in particular" (p. 182-87). Thereafter, UNICEF officials showed no desire to cooperative with MFM. Yet both sides were at fault. "Thus, it is little wonder that MFM–UNICEF relations were filled with more discord than collaboration and understanding" (p. 196).

Chapter 7, "Meals for Millions overseas," concentrates on the development of the production of MPF-type foods in India and Brazil, where they are still (as of 1967) being produced, in order to describe and analyze MFM's approach to famine prevention (p. 197). "India: In 1957, Meals for Millions achieved its most significant advance in the field of hunger prevention when the Mysore Central Food Technological Research Institute [CFTRI] started to produce on a regular albeit limited basis an Indian version of American MPF for use in a school lunch program in the state of Mysore." The formulation was based on peanuts and bengal gram. But it was not until 1960 that a large-scale Indian MPF plant went into operation (p. 221-23). From 1946 to 1956 MFM gave India 1.39 million pounds of American MPF but there were ongoing problems with its distribution (p. 199-202).

Brazil: "In June 1956 a Brazilian company began processing its own soybean-based, fortified food supplement patterned after the American MPF." Here Maurice Abrahams had taken the initiative–not MFM. Pages 223-56 describe, step by step, the chain of events that led to the ill-fated attempt to start making an MPF-type food in Brazil. The idea for this project "started in the later summer of 1953 when Mr. Abrahams, a United States citizen residing in Sao Paulo, Brazil, happened to read a glowing account of MFM and MPF in the July, 1953 issue of *Readers' Digest.* He was stimulated to think of the commercial potential, as well as the humanitarian value of an inexpensive soybean food if sold on a large scale to lower-income and malnourished Brazilians. After an exchange of letters with Miss Rose, Mr. Abrahams concluded that a commercial venture was feasible and flew to Los Angeles to discuss the details of a contract to produce MPF in Brazil. Though later events were to show that Mr. Abrahams had made an error in judgment, when they signed an agreement on 19 April 1954 [with Mr. Abrahams doing business as the Capital Research and Management Company], he and MFM's officers were highly optimistic about the great market potential of a Brazilian MPF." Details of the contract are given (p. 223-24). Continued. Address: Seattle, Washington.

5344. McCormick, Sally. 1967. Azuma Sukiyaki House: A bit of the Orient in the heart of Chicago–5120 N. Broadway, Chicago (Advertorial). *Chicago Tribune.* March 23. p. E9.
• ***Summary:*** "We were then served Steak Teriyaki, a tenderloin steak, marinated in Teriyaki sauce and thinly sliced..." Next came Beef Teriyaki, with "soy bean cakes [tofu], soy sauce, dry onions and rice wine" stirred into the pan. Although its piece d'resistance is Sukiyaki, the restaurant also offers Chicken Teriyaki and Salmon Teriyaki. Three photos show Azuma Sukiyaki House.

5345. American Soybean Association. 1967. Soybean Digest Blue Book Issue. Hudson, Iowa: American Soybean Assoc. 170 p. Index. Advertisers' index. 22 cm.
• ***Summary:*** The title page of this year's *Blue Book* states: "Blue Book issue. Vol. 27. March, 1967. No. 6." A table

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(p. 26) gives world soybean production by continent and country, from 1955-59 to 1966 (preliminary) as follows: North America: Canada, United States, Mexico. South America: Argentina, Brazil, Colombia, Paraguay. Europe: Italy, Romania, Yugoslavia, Other Europe (excluding U.S.S.R.). USSR (Europe and Asia). Africa: Nigeria, Rhodesia, Tanzania. Asia: Turkey (Europe and Asia), China–Mainland, Cambodia, China–Taiwan, Indonesia, Japan, Korea–South, Thailand. Total #1. Total #2.

Soybean production in Mexico increased from about 39,000 bu in 1955-59, to 1,315 in 1964, to 2,205 in 1965 to 4,410 (preliminary) in 1966.

A table (p. 29) gives U.S. exports of soybeans, oil and meal from 1962 to 1965 (preliminary) to the following regions and countries (for marketing years beginning Sept. 1; in bushels): North America: Canada, Mexico, other, total. South America: total. Western Europe: Belgium & Luxembourg, Czechoslovakia, Denmark, Finland, France, Germany–West, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom, other, total. Eastern Europe: Czechoslovakia, Hungary, USSR (Europe and Asia), Poland, other, total. Africa, total. Asia and Oceania: Hong Kong, Israel, Japan, Korea–South, Philippines, Taiwan, other, total. Grand total.

Exports of U.S. soybeans to Mexico increased from 33,000 bu in 1962 to 177,00 in 1964. Note: This is the 2nd earliest document seen (Feb. 2009) that gives statistics for trade (imports or exports) of soybeans, soy oil, or soybean meal to Mexico or Central America. Address: Hudson, Iowa.

5346. Ebine, Hideo; Sakano, Keiichi. 1967. Miso no pH no sokutei [Determination of the pH value of miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 22. p. 43-45. March. [3 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5347. Hayashi, Shizuka. 1967. Serve Japanese soy noodles. *Soybean Digest.* March. p. 24.
• ***Summary:*** "A soybean exhibition was recently held for 3 consecutive days in Yokohama at the Takashimaya Department Store, one of the three largest department stores in Japan. The exhibit, devoted exclusively to soy foods, was under the sponsorship of the store, the prefectural government of Kanagawa, and various soybean groups.

"It was held to promote increased consumption of various soy products such as salad and cooking oils made from soybean oil, soy sauce, miso, frozen tofu, tofu products, and soy flour. Approximately 25 booths were used by manufacturers to display their products."

The Japanese American Soybean Institute set up a snackbar named "Protein House" (Tanpaku-an) and served Japanese udon noodles made with a mixture of 15% soy flour and 85% wheat flour. The noodles were very popular and crowds swarmed the booth. "It was emphasized that the soy noodle has over three times the nutritional value of an ordinary noodle." 7,000 people visited the 3-day exhibition and 381 entered the contents to name the noodle. The name selected by a committee was "Protein Noodle" (Tampaku-Udon). Address: Managing Director, Japanese American Soybean Inst.

5348. Ito, Hiroshi; Ebine, Hideo. 1967. Miso no bôyu ni kansuru kenkyû. III. *Clostridium* ni yoru fukure [Study on the prevention of swelling in miso. III. Swelling caused by *Clostridium*]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 22. p. 46-53. March. [9 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5349. Ito, Hiroshi; Ebine, H.; Ohta, T. 1967. Miso no bôyu ni kansuru kenkyû. IV. Clostridium no sakkin [Study on the prevention of swelling in miso. IV. Sterilization of *Clostridium*]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 22. p. 54-60. March. [21 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5350. Ito, Hiroshi; Ebine, Hideo. 1967. Miso no bôyu ni kansuru kenkyû. V. Clostridium no taien-sei [Study on the prevention of swelling in miso. V. Salt-tolerance of *Clostridium*]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 22. p. 61-67. March. [13 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5351. Kato, Hiroshi; Yoshii, Hisao. 1967. Shôyu-chû no taien-sei kôbo no zôshoku sokushin busshitsu ni kansuru kenkyû. I. Kôji-jiru ni taisuru shôyu no hosoku kôka [Studies on growth promoting substances in soy sauce for osmophilic yeasts. I. Effects of soy sauce as a koji extract supplement on yeast growth]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(3):191-96. March. [16 ref. Jap; eng]
Address: Inst. of Food Technology, Aichi prefecture, Nagoya, Japan.

5352. Kato, Hiroshi; Yoshii, Hisao. 1967. Shôyu-chû no taien-sei kôbo no zôshoku sokushin busshitsu ni kansuru kenkyû. II. Zôshoku sokushin busshitsu no bunkaku [Studies on growth promoting substances in soy sauce for osmophilic yeasts. II. Separation of growth promoting substances from soy sauce]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(3):197-203. March. [13 ref. Jap; eng]
Address: Inst. of Food Technology, Aichi prefecture, Nagoya, Japan.

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5353. Ohta, Teruo; Nakano, Masahiro; Kobayashi, Y.; Muto, H. 1967. Dai ikkai Zenkoku Nattô Kanhyôkai no sôgô seiseki [Report of the first All-Japan "Natto" Exhibition, April 1965]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 22. p. 68-91. March. (Chem. Abst. 66:104143. 1967). [1 ref. Jap; eng]
• ***Summary:*** In order to promote consumer acceptability and to rationalize the natto manufacturing process, 56 samples of natto products were collected from throughout Japan. They were submitted to sensory evaluation and chemical analysis, and the soybean varieties and manufacturing facilities of each natto maker were investigated. Results:

1. Soybeans: 59% were grown in China, 30% in Japan, and 2% in the USA. The remaining 9% were a mixture of these.

2. The distinctive factor of natto that received the highest sensory evaluation is the production of sufficient mucous substance which shows long-lasting viscosity with fine elastic threads that develop uniformly.

3. No correlation was found between the origin or type of soybeans and the natto quality.

4. Natto is still made in the traditional way, and the scale is mostly domestic or home based.

The outline of the natto-making process can be summarized as follows: Soak the soybeans in water at 15-20ºC for 15-20 hours or at 7-10ºC (winter) for 20-24 hours. Steam under pressure for 30-40 minutes at 1 to 1.2 kg per square cm, or for 15-30 minutes at 1.5 to 2.0 kg. Inoculate with a pure-culture natto starter after the temperature of the soybeans has decreased to: (a) 70ºC. (b) 40-60ºC. (c) Below 30ºC. These three traditional temperatures appear to make no difference in the final product. Pack 80-120 gm of weighed, inoculated soybeans into a container made of wood shavings or synthetic film. Ferment the soybeans in the containers (often with many containers on shelves in a rolling rack) for 15-20 hours in a small incubation room, keeping the temperature at 40-50ºC.

5. The shelf life of fresh natto has been prolonged by the installation of cold storage (refrigeration). 30-45% of natto makers sell their natto refrigerated, depending on their location in Japan.

Natto given the highest scores in sensory evaluation had the following characteristics: Moisture around 60%. Protein water-solubility 45-60%. Protein decomposition rate (amino-acid formation) 5-6%. Ammonia formation rate 4-5%. Ph value 7.2 to 7.4. Curdmeter hardness 30-40 gm. unit. Colorimetric Rd is 16-22. Address: 1-2. Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5354. Saito, Nobuo; Tanaka, Teruo. 1967. Shôyu no kanno kensa-hô ni kansuru kenkyû. I. Mikaku handan ni kansuru tôkei-teki kenkyû [Studies on sensory evaluation of soy sauce. I. Statistical research on the taste judgment]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(3):246-53. March. [3 ref. Jap; eng]
Address: Central Research Inst., Kikkoman Shoyu Co., Ltd., Noda, Chiba, Japan.

5355. Taira, Harue; Taira, Hirokadzu; Sugimura, Keiichiro; Sakurai, Yoshito. 1967. Daizu kakôhin no amino-san ni kansuru kenkyû. VI. [Studies on amino acid contents of processed soybean. VI. The heat destruction of amino acid in defatted soybean flour]. *Shokuryo Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 22. p. 324-30. March. [21 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 29(12):1074-79 (1965). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5356. Taira, Harue; Taira, Hirokadzu; Sugimura, Keiichiro; Sakurai, Yoshito. 1967. Daizu kakôhin no amino-san ni kansuru kenkyû. VII. [Studies on amino acid contents of processed soybean. VII. The influence of added water on the destruction of amino acid in defatted soybean flour]. *Shokuryo Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 22. p. 331-34. March. [4 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 29(12):1080-83 (1965). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5357. Taira, Hirokadzu; Taira, Harue; Sakurai, Yoshito. 1967. Daizu kakôhin no amino-san ni kansuru kenkyû. VIII. [Studies on amino acid contents of processed soybean. VIII. Effect of heating on total lysine and available lysine in defatted soybean flour]. *Shokuryo Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 22. p. 335-37. March. [12 ref. Eng; jap]
• ***Summary:*** Reprinted from *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 18(5):359-61 (1965). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5358. Taira, Hirokadzu; Taira, Harue; Sakurai, Yoshito. 1967. Daizu kakôhin no amino-san ni kansuru kenkyû. IX. [Studies on amino acid contents of processed soybean. IX. Effect of heating on amino acid liberation with enzymes in defatted soybean flour]. *Shokuryo Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 22. p. 338-44. March. [21 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 40(1):41-47 (1966). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5359. Loring, Kay. 1967. Tokyo Tea Garden, modest spot, but food's excellent. *Chicago Tribune.* April 2. p. E14.

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• ***Summary:*** Located in the English basement at 2 W. Huron St., Tokyo Tea Garden serves "the bland little hiya yakko (soy bean cakes [tofu])..." "Of course its the sukiyaki (thin sliced beef cooked with vegetables) that most Americans associate with Japan,..."

5360. Hanaoka, Yoshio. 1967. Shôyu hozon ni kansuru kenkyû. VI. Lactobacillus ni yoru shôyu-chû no gurutamin-san, asuparagin-san no bunkai ni tsuite [Studies on preservation of soy sauce. VI. Enzymic decomposition of L-glutamic acid and L-aspartic acid in soy sauce *Lactobacilli.* browning reaction products on antifungal activity]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(4):312-19. April. [12 ref. Jap; eng] Address: Central Research Inst., Kikkoman Shoyu Co. Ltd., Noda, Chiba, Japan.

5361. Sakurai, Yoshito. 1967. Request for review of PL 480 progress report. Japan. 2 p. April 25.
• ***Summary:*** To J.C. Cowan, sponsoring scientist, Oilseed Crops [NRRL, Peoria, Illinois]. Project title: "Evaluation of United States soybean and processing conditions for manufacture of dried tofu, to increase the use of United States soybean in Japan and other countries." Project No.: UR-All-(40)-32. Amount of current payment requested: ¥1,546,301. Grant or contract No.: FG-Ja-124. Name of institution: Japan Frozen Tofu Association. Report period: 1 Sept. 1966 to 28 Feb. 1967. Summary of progress: Experiments were carried out on three items: 1. On the preferred conditions in each step of preparing kori-tofu. 2. On the browning mechanism of kori-tofu during storage. 3. On the keeping quality of kori-tofu during storage. Director of research institution: Toyoaki Tsukada. Address: Principal researcher, Japan Frozen Tofu Assoc., Japan.

5362. Sasaki, Masaoki; Kikuchi, T.; Asao, Y.; Yokotsuka, T. 1967. Kôji-kin no seisan-butsu ni kansuru kenkyû. II. Hôsan tane kôji-kin no seisan suru shû toshite keikô seibun ni tsuite (2) [Studies on the compounds produced by molds. II. Fluorescent compounds produced by Japanese industrial molds (2)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 41(4):154-58. April. [8 ref. Jap; eng]
• ***Summary:*** Probably shows absence of aflatoxins in Japanese fermented foods. Three fluorescent compounds, all of which were presumed to be pyrazine derivatives, were newly isolated from the culture of *Aspergillus sojae* X-1. Each of these compounds gave the R_f value resembling that of Aflatoxin B-1 in some solvent system of thin-layer chromatography. Address: Central Research Inst., Kikkoman Shoyu Co. Ltd., Noda Inst. for Scientific Research, Noda-shi, Chiba-ken, Japan.

5363. Toyama, Yoshiyuki. 1967. Investigation of the partial hydrogenation of soybean oil to produce a stable liquid oil with improved properties. Saitama-ken: Toyo University. 87 p. 30 cm. Final technical report. Project no. UR-A11-(40)-5. Grant no. FG-Ja-103. Reporting period: 5 April 1962 to 4 April 1967. [60 ref]
• ***Summary:*** Soybean oil is the leading edible oil in Japan. In 1967 some 902,900 tons of edible oils and fats were consumed in Japan, of which 305,900 tons (33.9%) were soybean oil. Of this soybean oil, only 5,300 tons are used in a solid form, largely as hydrogenated fat, while the rest is used in a liquid form. However flavor reversion in soybean oil is a major problem compared with other popular oils. And soybean salad oil has special problems because of its poor flavor stability. Producers of this salad oil are hoping to improve its flavor stability, and this can be done through partial hydrogenation. Address: Dep. of Applied Chemistry, Faculty of Engineering, Toyo Univ., Kujirai, Kawagoe-shi, Saitama-ken, Japan.

5364. Bentley, Orville G. 1967. Soybean production in the world–Limitations and potentials. *USDA Agricultural Research Service.* ARS-71-35. p. 2-19. May. Proceedings of International Conference on Soybean Protein Foods. Held 17-19 Oct. 1966 at Peoria, Illinois. [18 ref]
• ***Summary:*** This is the first paper in Session I, titled "Potentials for soybean production and use as related to world protein needs," Nevin S. Scrimshaw presiding. Contents: Introduction: "It is generally agreed by students of world food problems that the shortage of protein is the most critical need now and in the foreseeable future." Historical overview: Piper and Morse, Mildred Lager. An overview of worldwide soybean production: USA, Europe. Production in Eastern Asia: China, Indonesia, Japan, Taiwan, Thailand, India, Soviet Union, Latin America (Brazil, Paraguay), Mexico, Colombia, Argentina, Australia (no statistics given), Europe (European Russia, Bulgaria, Yugoslavia, Rumania, and Czechoslovakia).

Prospects for further production: USA, southeastern Europe, Russia, Thailand, Japan, Brazil, Colombia, Argentina, Mexico. Summary.

"In southern European Russia, commercial soybean plantings were reported in the 1870s. In the Far East, soybean cultivation may be even older as a part of the culture of the local Chinese. Before the revolution, acreage was small, however."

"Latin America is a relative newcomer in soybean production. Brazil is the only country where large acreage has been planted for more than a decade. In recent years soybeans have been planted in Argentina, Colombia, Mexico, Paraguay, and Surinam. Brazil is the major exporter with smaller amounts coming from Paraguay and Surinam. Venezuela is a major importer and Mexico imports some.

"Estimates for 1965 show that Brazil produced 16,610,000 bushels (453,000 metric tons), Mexico produced

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2,482,000 bushels (67,690 metric tons), Colombia produced 1,835,000 bushels (50,000 metric tons), Paraguay 660,000 bushels (18,000 metric tons), and Argentina 360,000 bushels (9,800 metric tons). Total production of Central and South America would be only slightly more than 1 percent of world output. In Brazil about 90% of the production is concentrated in the state of Rio Grande do Sul, the southern-most part of the country. The balance is grown in nearby Santa Catarina and Parana. The climate is similar to some of our southern states... A major processing plant has been built near Porto Alegre."

"In Mexico, production began very recently. Almost all acreage is in the State of Sonora, bordering Arizona and Southern California. Here plantings started in 1959... In the Yaqui Valley, soybeans are always grown under irrigation where they fill in successfully as a second crop following wheat and cotton." In Colombia, acreage is concentrated in the Cauca Valley on the western slope of the Andes. In Argentina, acreage up to a few years ago amounted to about 1,000 hectares, most of which is grown in the state of Misiones, the far northeast area bordering upon Rio Grande do Sul in Brazil. In recent years there has been expansion in the pampas.

In the USA, "some expansion to the West is possible under irrigated conditions. Research trials in Oregon, Washington, and California show yields as high as 80 bushels an acre. But where water is limited, the highest value crops will be favored." Address: Dean, College of Agriculture, Univ. of Illinois.

5365. Grow, Howard E. 1967. "Hard-sell" oil campaign under way. *Soybean Digest.* May. p. 52-53.

• ***Summary:*** "The various programs and activities of the Japanese American Soybean Institute since 1957 have been successful in increasing U.S. exports of soybeans to Japan from approximately 20 million bushels in 1957 to over 65 million bushels in 1966. The activities have been carried out in cooperation with various quasi-governmental agencies and product organizations in the promotion of traditional Japanese foods and increased use of soybean oil in the human diet, and greater use of soybean meal in feeds for livestock and poultry. Mr. Hayashi's report shows the increased use of U.S. soybeans in the production and manufacturing of these traditional foods over the past 10-year period. He has also indicated the possibilities for future use of these products.

"Several programs and activities have been carried out during the past 10 years to promote greater use of edible oils in the human diet. The per-capita edible-oil intake has increased from 4½ pounds in 1956 to slightly over 16 pounds per person in 1966. This increase has come about through activities such as demonstrations, cooking schools, and group-feeding seminars, which have been on a soft-sell basis, carried out through educational and extension-type meetings. The Japan Welfare Ministry, through the Japan Nutrition Association, has established a goal of per-capita intake of oil of 30 pounds as a minimum for the Japanese population.

"An increased demand for manufactured feeds has resulted from the developing livestock and poultry industry in Japan. In 1958-59 slightly over 58,000 metric tons of soybean meal were used in the manufacture of feed for poultry and livestock. This amounted to 4.4% of the total tonnage of feed ingredients. The demand for manufactured feeds has grown so that in 1966 over 623,000 metric tons of soybean meal were used in the manufacture of feed, 7.6% of the total tonnage of feed ingredients. It is expected that the broiler industry will expand rather rapidly in the next few years and as a result the need for soybean meal will continue to increase. This will provide additional supplies of soybean oil from the processing of the required tonnage of soybeans to supply the meal.

"Eight of the major oilseed processors who are members of the Japan Oilseed Processors Association and who in the past relied on brand advertising for the promotion of oils have joined with the American Soybean Association in developing a consumer type of promotion for vegetable oil, with major emphasis on soybean oil, in a program covering a 15-month period ending Dec. 31, 1967.

"In 1965, the J. Walter Thompson Co. was employed by the American Soybean Association and Foreign Agricultural Service to conduct a study on edible oil consumption in Japan. Based on this study, negotiations were undertaken with the oilseed crushers in Japan toward an industrywide edible-vegetable-oil promotion campaign.

"In July 1966, agreement was reached between eight major oilseed crushing companies, the American Soybean Association, and FAS to institute such a program. A working agreement between ASA and JOPA was first drawn, and then these two organizations, with FAS approval, selected Dentsu Advertising Ltd. to conduct the campaign. Funds came from oilseed crushers and from the ASA Market Development Project.

"The mass media hard-sell vegetable oil promotion program, the first ever conducted in Japan on an industry-wide basis, includes a 25-minute video tape television program on Saturday morning over four tv stations in Tokyo, Osaka, Nagoya, and Fukuoka. Viewers over these four stations total 65 million people, which is two-thirds of the population of Japan. The entire program of promotion is channeled to the housewife. A symbol was designed and used along with slogans in all the promotion activities. In addition to the tv program, publicity is channeled to newspapers and women's magazines, with some newspaper advertising.

"Other promotion activities will be distributed throughout the period with major activity during May, June, September, and November. These are the periods preceding the gift-giving seasons in June and December when a large amount of brand advertising is done by the processors.

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"This new approach to promotion for increased use of oil in Japan will be evaluated by a research organization through surveys. Benchmarks from which the evaluation will be determined were established by a survey made in November 1966. A half-way evaluation will result from a survey made this May, and a second evaluation will be made on the basis of a survey in November. The results of these evaluation studies will be used in determining the type and extent of future programs.

"In addition to the mass media program, increased activity has been carried out in the past few months in the promotion of vegetable-oil margarines. Very little vegetable oil has been used in the manufacture of margarine in Japan until recently. Only 370 metric tons of soybean oil were used in the manufacture of margarine and shortening in 1964. This increased to 990 metric tons in 1965 and to approximately 4,000 metric tons in 1966. This increase came about as a result of a few margarine manufacturers in cooperation with the Japanese American Soybean Institute developing interest in a high-quality vegetable-oil margarine.

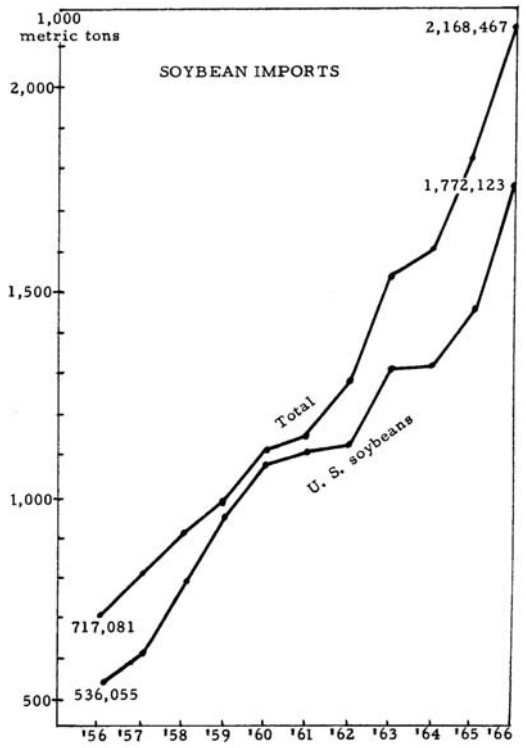
"During December 1965 and January 1966 a pilot program was carried out, demonstrating the use of vegetable-oil margarine with sampling in stores. As a result of these demonstrations and sampling activities, reports from 10 selected stores during the following 12 months indicated that margarine sales had increased by over 20%.

"A program for promotion of vegetable-oil margarine has just been completed with the sampling and demonstrations by trained demonstrators in 200 stores for a period totaling 600 days. Results from these activities in increased sales of margarine are not yet available. In addition to the in-store demonstrations, 50 outdoor signboards were used for the promotion of vegetable-oil margarine during February and March, and car cards were used in trains, subways, streetcars, and buses during the same period. These activities were all coordinated. An attempt was made to tie in the promotion through the use of the same symbol and slogan used in the oil promotion campaign carried out by Dentsu."

An illustration shows the smiley-face "Symbol used extensively in the vegetable oil promotion campaign." See also pages 25 and 27. A photo (p. 53) shows a large billboard / signboard with a woman's hand, using a butter knife to spread margarine on a piece of toast. Written, in Japanese, on the billboard is "Delicious. Vegetable-oil margarine." The caption states: "Signboards in Japan promote both use of margarine made from U.S. soybean oil and toast made from U.S. wheat. Even the use of toast is relatively new in Japan."

Note: Wheat contains almost twice as much protein as rice. Address: Asst. to the executive vice president, American Soybean Assoc., Hudson, Iowa.

5366. Hayashi, Shizuka. 1967. Soybean exports to Japan have tripled. *Soybean Digest.* May. p. 50, 52.



• ***Summary:*** A graph shows that total soybean imports to Japan have tripled from 1956 to 1966; about 82% of these imports come from the USA. Address: Managing Director, Japanese American Soybean Inst., Tokyo, Japan.

5367. Kawamura, Sin'itiro [Shinichiro]. 1967. Review of PL 480 work on soybean carbohydrates. *USDA Agricultural Research Service.* ARS-71-35. p. 249-54. May. Proceedings of International Conference on Soybean Protein Foods. Held 17-19 Oct. 1966 at Peoria, Illinois.

• ***Summary:*** The soybean consists of 90% cotyledons, 7% hull, and 2% hypocotyl by weight on a moisture-free basis. The soluble carbohydrates consist of sucrose 4.5% and the oligosaccharides stachyose (3.7%) and raffinose (1.1%).

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Address: Faculty of Agriculture, Kagawa Univ., Mikityo [Miki-cho], Kagawa-ken, Japan.

5368. Sakaguchi, Yukio. 1967. Japan's oilseed crushing industry and U.S. soybeans. *Soybean Digest.* May. p. 25, 27.

• ***Summary:*** "Oil, meal balance: The Japanese crushing industry is confronted with the important problem of balancing oil and meal. It needs to exert its utmost efforts to secure oil-bearing seeds other than soybeans. In this connection, Canadian rapeseed is attracting special attention recently. Rapeseed has a long history as an indigenous oil source familiar to the Japanese people. Because of the recent steady decline of their domestic production, imports from Canada have been increasing year by year, reaching 210,000 tons in 1966.

"In Japan, as rapeseed meal is in special demand as fertilizer, rapeseed processing is on a more profitable basis than that of soybeans. However, the foreign currency allocation system is applied to rapeseed imports with a view to protecting domestic production. And yet, considering the future supply-demand situation in all kinds of seed oils and meals and the potential demand for rapeseed meal for feedstuffs as well as fertilizer use, imports of rapeseed are expected to continue to increase as it grows more difficult to obtain other oilseeds.

Since U.S. soybeans predominate in the oilstuffs crushed at Japanese mills, we crushers want to express our desire to the United States for an improvement in quality and trading terms. The unusual low oil content of the arriving 1966-crop U.S. soybeans is being pointed out frequently. Formerly No. 2 yellow soybeans were thought to have an oil content over 19%, but recent arrivals have been barely 18%. Of course, some variation of quality of farm products by crop year is inevitable. But much more effort to ensure maximum higher oil content is desirable since such a variation of this level greatly affects the paying basis of crushers.

"Further, strong appeals have often been made to the United States for measures to reduce foreign materials to the lowest possible level for efficient transportation as well as for the efficiency of Japanese mill operations. We therefore hope that the terms of trade will be revised to pure basis with landed quality and weight final. It is our ideal to be able to purchase U.S. soybeans of stable quality and price, and we wish American cooperation toward this end.

"The joint U.S.-Japanese public relations campaign for vegetable oils, which started last November, is in progress through primarily newspapers and TV. A cooking contest has also been opened to make the campaign more impressive. This campaign often proposed in the past has finally come true through the cooperation of the American Soybean Association, USDA Foreign Agricultural Service, the American Embassy, and the Japanese American Soybean Institute. It is certainly gratifying that the present campaign is effective and contributing toward elevation of the people's physical standard through encouraging increased intake of edible fats and oils. It is evident that this success directly leads to increased crushing of soybeans and eventually to increased imports of U. S. soybeans. We firmly believe that continuation of this joint U.S.-Japanese campaign will benefit both the United States and Japan.

"The Japanese oilseed crushing industry, confronted with the two critical problems, liberalization of oil and meal imports and liberalization of capital, is making all-out efforts in the structural improvement of enterprise and strengthening of international competition. In conclusion, I eagerly desire for the sake of U.S.-Japan co-prosperity that the U.S. soybean industry, after understanding the situation of Japanese processors, will make more efforts to ensure a dependable supply of high-quality soybeans at stabilized prices. This will enable the Japanese industry to increase consumption of oil and meal processed from U.S. soybeans."

Photos show: (1) Portrait of Yukio Sakaguchi. (2) Nisshin Oil Mills soybean processing plant at Isogo. Nisshin also has plants at Kanagawa and Kobe. Address: President, Japan Oilseed Processors Assoc.; President, The Nisshin Oil Mills Ltd., Tokyo, Japan.

5369. Saio, Kyoko; Koyama, E.; Watanabe, T. 1967. Protein–calcium–phytic acid relationships in soybean. I. Effects of calcium and phosphorus on solubility characteristics of soybean meal protein. *Agricultural and Biological Chemistry* 31(10):1195-1200. June. [12 ref]

• ***Summary:*** Discusses the solubility characteristics of soybean meal protein as a function of pH. Phosphorus and calcium have a very significant effect on the solubility of that protein. It is difficult to increase the calcium content in soy milk, since soy protein is coagulated and precipitated by calcium-protein interaction. The coagulated soy protein is not suitable for beverages. Address: 1&3. Food Research Inst., Ministry of Agriculture and Forestry; 2. Japan Tofu Assoc.

5370. *Soybean Digest.* 1967. ASA management changes. June. p. 4.

• ***Summary:*** On 1 May 1967 ASA's "board of directors received and very regretfully accepted the resignation of George M. Strayer as executive vice president of the American Soybean Assoc. Mr. Strayer's 27 years with the

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Association saw the development and growth of one of the foremost commodity organizations of producers in the world... Chet Randolph now has the reins of management of the Association." Photos show Laurel Meade (President of the ASA), Chet Randolph, and Howard E Grow.

5371. *Soybean Digest.* 1967. ASA representative in Japan [Scott Sawyers]. June. p. 4.
• ***Summary:*** Scott Sawyers, age 38, of Bloomington, Illinois, has been appointed American Soybean Association's country director in Japan. A brief biography is given. A photo shows Sawyers.

5372. Strayer, George M. 1967. A review of 27 years. *Soybean Digest.* June. p. 5.
• ***Summary:*** "In 1940 soybeans to many people were still an oriental curiosity that had affected certain people like W.J. Morse, W.L. Burlison, Keller Beeson, Bill Riegel, John T. Smith, Glenn McIlroy, Dave Wing and others, but had never really caught on as a crop. Total soybean production in 1940 was only 78 million bushels, much of it used for forage purposes.

"Then came the war, with the intense drive to replace the fats and oils which had been imported up to that time–two-fifths of our entire consumption of fats and oils. The sea lanes were cut off, ocean shipping was scarce, we had to produce our own oil and some for our allies. We doubled soybean production, built processing plants, provided that oil. In so doing we also provided something which triggered the greatest explosion in livestock production the world had ever seen–high-quality protein at a relatively cheap price. Out of it came our broiler industry, our turkey industry, and all livestock feeding as we know it today.

"There were those who said soybeans were a 'War Baby'–that we never again would have use for a 100-million-bushel crop when the war ended. They were sincere in their beliefs, but they were looking backward and not forward. Instead of reducing production we have continued to move upward rapidly to the expected 1-billion-bushel mark in 1967...

"I was hired by the board of directors on a part-time basis in September 1940 at Dearborn, Michigan, to start a soybean news letter. The time had come, in the estimation of that board, that we needed some medium of exchanging information about the soybean crop. As the first and only part-time employee of the Association I sold the advertising, wrote the copy, read the proofs and did the mailing of the *Soybean Digest.*

"Back in 1949 I was asked by what was then ECA [European Co-operation Administration] to be a member of a two-man technical assistance team to go to Europe–particularly Germany–to make a study of possible use of and production of soybeans as human food supplies were still the major postwar problem. The huge potential markets for U.S. soybeans and products became apparent to me on that trip. Again in 1952 and 1954, trips through Northern Europe–not at Association expense–brought home to me the huge potential market which someone was going to supply.

"In 1955 I was asked by USDA to make a survey of potential markets for U.S. soybeans in Japan. This resulted in the formation of our market development project in Japan, the organization of the Japanese American Soybean Institute, and the execution of the contract with USDA to use foreign currency funds to promote markets for U.S. soybeans and soybean products. This is the largest market development project on any commodity in any country of the world today.

"In 1956 I was asked to do the same type of job in Europe, surveying market potentials for soybeans and soybean products in 10 countries. Out of this survey came the organization of the Soybean Council of America...

"As I leave my responsibilities in the American Soybean Association after these 27 years I do so with great regret." This is the last issue of Editor's Desk, which ceases with Strayer's departure from the magazine. A photo shows Strayer.

5373. Tada, Masakazu. 1967. Some features of Japanese vegetarianism. *British Vegetarian.* May/June. p. 225-28.
• ***Summary:*** For 1,850 years Japan kept no livestock farms as one sees in Europe. The main source of animal protein was only from fish and shellfish. But modern Japanese, especially those living in big cities, think animal protein is indispensable. One important feature of Japanese vegetarianism is the development and use of fermented foods, such as miso, shoyu, and natto. Address: Dr., 718 Daisen, P.O. Nirayama, Shizuoka, Japan.

5374. Tsai, Kuo-Hai; Lu, Y.-C.; Oka, H.-I. 1967. Studies on soybean breeding in Taiwan. III. Yield stability of strains obtained from disruptive seasonal selection of hybrid populations. *Botanical Bulletin of Academia Sinica* 8(7):209-20. July. [12 ref. Eng; chi]
Address: 1-2. College of Agriculture, Chung-Hsing Univ., Taichung, Taiwan, Rebublic of China; 3. National Inst. of Genetics, Mishima, Japan.

5375. Obara, T.; Kimura, M. 1967. Gel filtration fractionation of the whole water-extractable soybean proteins. *J. of Food Science* 32(4):531-34. July/Aug. [22 ref]
• ***Summary:*** Five fractions were obtained by gel filtration with a Sephadex-200 column-4 protein and 1 non-protein. Trypsin inhibitor activity was only present in the fourth fraction. Address: Dep. of Agricultural Chemistry, Tokyo Univ. of Education, Komaba, Meguro-ku, Tokyo, Japan.

5376. Asao, Yasuo; Sakasai, T.; Yokotsuka, T. 1967. Shôyu kômi seibun ni kansuru kenkyû. XXVI. Shôyu kôbo ni yoru kômi no seisei (2) [Studies on flavorous substances

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in shoyu. XXVI. Flavorous components produced by yeast fermentation (2)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 41(9):434-41. Sept. [12 ref. Jap; eng]
• ***Summary:*** *Torulopsis* species of yeast were found to produce alkylphenols during shoyu fermentation. Address: Central Research Inst., Kikkoman Shoyu Co. Ltd., Noda Inst. for Scientific Research.

5377. Grow, Howard E. 1967. New faces, new program in Japan. *Soybean Digest.* Sept. p. 61-64.
• ***Summary:*** Contents: Introduction. Oil promotion. Margarine (made from vegetable oil) promotion campaign. Soybean meal. Seminars and demonstrations.

"New faces" refers to the seven visitors who have come from Japan to be at ASA's annual convention. Bunzo Watanabe is president of the Japan Oilseed Processors Association, Scott Sawyers has been designated country director for the American Soybean Association in Japan.

Scott "is now stationed in Japan and working with Shizuka Hayashi and Yoshiko Kojima in directing the program there. Mr. Hayashi is continuing in his capacity as managing director of the Japanese American Soybean Institute. He continues directing many of the activities along with Miss Kojima, as he has been the past several years." Address: American Soybean Assoc., Hudson, Iowa.

5378. Hanaoka, Yoshio; Yokotsuka, Tamotsu. 1967. Shôyu hozon ni kansuru kenkyû. VII. Shôyu-chû no ansoku kôsan to sono seiin ni tsuite [Studies on preservation of soy sauce. VII. Benzoic acid in soy sauce and its mechanism of formation]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(9):826-31. Sept. [8 ref. Jap; eng]
• ***Summary:*** "Naturally fermented soy sauce contains many kinds of aliphatic and aromatic acids including trace amounts of benzoic acid (B.A.). It was found that the content of B.A. in soy sauce can be most accurately determined by gas chromatography with a hydrogen flame ionization detector."

"By this procedure the amount of B.A. in raw soy sauce was found to be about 3 parts per million (ppm), and after heating 0.3-1.0 ppm increase was observed. The occurrence of B.A. in soy sauce was found not to be derived from the metabolites of *Aspergillus sojae,* yeasts and bacteria of fermentation, but from the B.A. of raw materials, defatted soybean flour (B.A. about 18 ppm) and wheat (B.A. about 4.0 ppm)." Address: Central Research Inst., Kikkoman Shoyu Co. Ltd., Noda, Chiba, Japan.

5379. Watanabe, Bunzo. 1967. Report from Japan [on the Japanese soybean crushing industry]. *Soybean Digest.* Sept. p. 64-66.
• ***Summary:*** "Thirdly, I wish to mention the advanced usages of soy protein in Japan. You may already be aware of the large quantities of soybeans that are used in a broad range for the production of traditional Japanese foods, such as soy sauce, miso (a soup base in paste form), tofu (bean curd) and others. Studies on concentrated soy protein are conducted by scholars and soybean processing firms for various uses, chiefly as food products. Soy protein is already used in large quantities in bakery products, confectioneries, ice cream, fish sausages, processed meat products, alimentary pastes, etc., and further applications are under research. At present, approximately 110,229,000 pounds of soy protein are consumed for such purposes. Soy protein of special high content is marketed for specific uses, and concentrations of even over 90% [soy protein isolates] protein are being developed."

"Fourthly, I would like to make a request, which I believe should be for the benefit of all.

"At present, 2% is set as the maximum allowance of foreign matter for No. 2 yellow soybeans, but the actual imports to Japan show this allowance is taken for granted as a privilege. The 1966 crop proved to be better than the 1964 crop, but 30% of the arrivals were at the maximum allowance of 2% or more. Forty-seven percent of the 1965 crop arrivals fell in this poor category. It is a great loss to the Japanese processors, who are not receiving guaranteed quality products, on top of which they are paying extra freight and other charges for the extra foreign matter.

"Pure-soybean basis: As all crushers naturally prefer to take delivery of clean beans, some inducement, if necessary, should be given to transactions on a pure-soybean basis. This problem is so grave that I hope it will be given prompt consideration and cooperation by all the people concerned, from growers to shippers, exporters or any others involved in the distribution channel."

A small portrait photo shows Bunzo Watanabe. Address: President, Japan Oilseed Processors Assoc., Tokyo, Japan.

5380. Yokotsuka, Tamotsu; Sakasai, T.; Asao, Y. 1967. Shôyu kômi seibun ni kansuru kenkyû. XXVI. Shôyu kôbo ni yoru kômi no seisei (1) [Studies on flavorous substances in shoyu. XXV. Flavorous components produced by yeast fermentation (1)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 41(9):428-33. Sept. [11 ref. Jap; eng]
• ***Summary:*** Three hundred strains of yeast were isolated from several kinds of shoyu mash, which were found to have good flavor. This good flavor was shown to be caused by the formation of 4-ethylguaiacol and other phenolic components. This research was financed in part by the USDA Agricultural Research Service. Address: Central Research Inst., Kikkoman Shoyu Co., Ltd., Noda Inst. for Scientific Research.

5381. Yokotsuka, Tamotsu; Asao, Y.; Sakasai, T. 1967. Shôyu kômi seibun ni kansuru kenkyû. XXVII. Torura-zoku kôbo ni yoru 4EG fukô to hinshitsu hyôka [Studies

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on flavorous substances in shoyu. XXVII. The production of 4-ethylguaiacol during shoyu fermentation, and its role for shoyu flavor]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 41(9):442-47. Sept. [7 ref. Jap; eng]
• ***Summary:*** "4-Ethylguaiacol, one of the important flavorous components of shoyu, was microbiologically produced by *Torulopsis* species of halophilic yeast added during the process of shoyu fermentation." Address: Central Research Inst., Kikkoman Shoyu Co. Ltd., Noda Inst. for Scientific Research.

5382. McCormick, Sally. 1967. Azuma Sukiyaki House: Enjoy an evening of dining Japanese style–5120 N. Broadway, Chicago (Advertorial). *Chicago Tribune.* Oct. 26. p. J15.
• ***Summary:*** "Beef Sukiyaki cooked at the table over a Hibachi grill... made with thin slices of beef, fresh vegetables, soy bean cakes [tofu] and Japanese noodles." This deluxe dinner costs only $4.75 per person. They also serve Teriyaki and Tempura with soft Samisen [Shamisen] music in lovely, authentic Tatami rooms with sliding shoji screens.

5383. Murata, Kiku; Ikehata, Hideo; Miyamoto, Teijiro. 1967. Studies on the nutritional value of tempeh. *J. of Food Science* 32(5):580-86. Sept/Oct. [27 ref]
• ***Summary:*** The nutritional composition of tempeh and unfermented soybeans were compared. There were no large differences in protein and ash content between tempeh and unfermented soybeans. Fiber was slightly increased during fermentation. The fat content of tempeh was slightly lower than that of soybeans, but the acid value was noticeably higher. Free amino acids were increased during fermentation. The amount of different free amino acids in the palatable tempeh was from 1 to 85 times as much as that of unfermented soybeans. Riboflavin increased 8 to 47 times, vitamin B-6 (pyridoxine) increased 4 to 14 times, and nicotinic acid (niacin) increased 2 to 5 times in tempehs made and sun-dried in Indonesia. Pantothenic acid also increased during fermentation, although thiamine was little altered.

Tables: (1) Chemical composition of tempeh and unfermented soybeans. (2) Amino acid composition of tempeh and unfermented soybeans. (3) Changes in free amino acids of tempeh during fermentation. (4) Chemical characteristics of oils from tempeh and unfermented soybeans. (5) Vitamin content of Indonesian tempeh and unfermented soybeans (in dry matter).

Figures: (1) IR spectra of oil fractions from soybeans and tempeh. (2) Changes in thiamine and riboflavin content of tempeh during fermentation. (3) Changes in pantothenic acid and vitamin B content of tempeh during fermentation. (4) Changes in nicotinic acid content of tempeh during fermentation. Address: Food and Nutrition Lab., Faculty of Science of Living, Osaka City Univ., Osaka, Japan.

5384. Dubawsky, Rebecca. 1967. Cooking with grains and vegetables plus: Booklet one–A beginning. Boston, Massachusetts: Order of the Universe Publications. 29 p. Illust. No index. 28 cm.
• ***Summary:*** This was the first macrobiotic cookbook written entirely by a Westerner. Rebecca, an older woman who never married and who later moved to Florida, collected these recipes from Aveline Kushi's cooking classes in Boston. The dedication (p. 3) states: "The teaching of Aveline Kushi has made the information that follows possible." The preface (p. 7), written by Michio Kushi on 20 Oct. 1967, begins: "Life is a dream. The purpose of our life is to realize our dream. Those who see a happy, peaceful dream shall become happy and peaceful..." The book has no copyright page, date or place of publication. It was printed by Jacques de Langre [DeLangre], 7557 Sunset Blvd., Hollywood, California 90046. Address given by Farmilant (1972) as Box 203, Prudential Center Station, Boston.

The section titled "Condiments" (p. 11-12) states: "Soya sauce–(Tamari- Japanese word for thick soya sauce)–always used in cooking–never at table, except with noodles, tempura, or soup. Miso–is a dark brown vegetable protein–much more digestible than animal protein." Recipes are given for making Scallion miso, and Carrot top miso.

The section titled "Beans" (p. 17) mentions black beans: "Dried beans–*aduki, navy, pinto, kidney, black beans and chick peas*–double in bulk on cooking. 1 cup = 4 servings (side dish to main course)–wash 3 times and soak beans 1 to 3 hours before using." It then warns: "Cook *black beans* by pot–they clog pressure cooker." The section titled "Soups, Sauces, and Spreads" (p. 19) includes a recipe for "Vegetable, soya vegetable, and miso vegetable soup." There are simple recipes for: Miso sauce (p. 22). Cooking black beans (p. 25). Vegetable soya soup (p. 27). Vegetable miso soup. Vegetable sauces (with soya or miso, p. 27).

Description of book: The covers are dark green, with the title printed in black ink and all lowercase letters. In the lower left corner of the cover is written: The Order of the Universe Publications, Box 203 Prudential Center Station, Boston, Massachusetts–02199. At the bottom of page 29 (the last numbered page): "Booklet II, *More About Grains and Vegetables,* will come out as soon as possible." Near the bottom of the rear cover: "November 1967. Revised edition–July 1969. $1.00."

Note: Jacques de Langre, Ph.D., also spelled his name DeLangre and Delangre. Address: Boston, Massachusetts.

5385. Ebine, Hideo. 1967. Miso no seibun. I. Chisso kagô-butsu [The constituents of miso. I. Nitrogen compounds]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 62(11):1210-14. Nov. [49 ref. Jap]

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Address: Norinsho Shokuryo Kenkyujo.

5386. Ishigami, Yuzo; Ishikawa, H.; Tsujimura, T.; Ueda, R. 1967. Shôyu kôji no seizô katei ni okeru kakushu bisei-butsu no kyodô ni kansuru kenkyû. IV. Kakushu bisei-butsu no zôshoku, taisha ni oyobosu baiyô skikomi haigô wariai no eikyô [Studies on changes in microflora and its metabolism during the process of making koji in soy sauce brewing. IV. The effects of the ratio of defatted soybeans to roasted wheat on the growth and metabolism of some organisms]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(11):1015-22. Nov. [6 ref. Jap; eng]
Address: 1-2. Higashimaru Shoyu Co., Ltd., Tatsuno, Hyogo prefecture; 3. Dep. of Fermentation Technology, Faculty of Engineering, Osaka Univ., Higashinoda, Osaka, Japan.

5387. Ishigami, Yuzo; Ishikawa, H.; Tsujimura, T.; Ueda, R. 1967. Shôyu kôji no seizô katei ni okeru kakushu bisei-butsu no kyodô ni kansuru kenkyû. III. Kakushu bisei-butsu no zôshoku, taisha ni oyobosu baiyô ondo no eikyô [Studies on changes in microflora and its metabolism during the process of making koji in soy sauce brewing. III. Effects of cultural temperatures on the growth and metabolism of some organisms]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(11):1009-14. Nov. [9 ref. Jap; eng]
Address: 1-2. Higashimaru Shoyu Co., Ltd., Tatsuno, Hyogo prefecture; 3. Dep. of Fermentation Technology, Faculty of Engineering, Osaka Univ., Higashinoda, Osaka.

5388. Ishigami, Yuzo; Ishikawa, H.; Takezuru, H.; Ueda, R. 1967. Shôyu kôji no seizô katei ni okeru kakushu bisei-butsu no kyodô ni kansuru kenkyû. II. Kakushu bisei-butsu no zôshoku, taisha ni oyobosu baichi shoki suibun genryô no eikyô [Studies on changes in microflora and its metabolism during the process of making koji in soy sauce brewing. II. Effects of initial moisture content of media on the growth and metabolism of some organisms]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(11):1003-08. Nov. [10 ref. Jap; eng]
Address: 1-2. Higashimaru Shoyu Co., Ltd., Tatsuno, Hyogo prefecture; 3. Dep. of Fermentation Technology, Faculty of Engineering, Osaka Univ., Higashinoda, Osaka.

5389. Okubo, Kazuyoshi; Shibasaki, Kazuo. 1967. Fractionation of main components and their subunits of soybean proteins. *Agricultural and Biological Chemistry* 31(11):1276-82. Nov. [11 ref. Eng]
Address: Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai.

5390. Otsu, Masaki. 1967. Kôji no chozô ni kansuru kenkyû. I. Chozô jôken ni yoru kôji no hinshitsu henka [Studies on storage of koji. I. Changes in quality of koji under various conditions of storage]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(11):997-1002. Nov. [17 ref. Jap; eng]
• ***Summary:*** "It was found that titratable acidity of Koji containing about 30% moisture was much increased by its storage at 30ºC, though the enzymatic activity was very stable for about a month at 30ºC regardless of the moisture content in Koji. It is considered that, when the moisture content in Koji is adjusted below 16%, not only the enzymatic activity but also other qualities of Koji become very stable during its storage at room temperature." Address: Food Industrial Experiment Station, Japan.

5391. Saito, Nobuo; Tanaka, Teruo. 1967. Shôyu no kannô kensa-hô ni kansuru kenkyû. I. Kagaku seibun ni yoru hinshitsu pataan no kôsei [Studies on sensory evaluation of soy sauce. III. Construction of quality pattern on the chemical factors]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(11):1033-39. Nov. [3 ref. Jap; eng]
Address: Central Research Inst., Kikkoman Shoyu Co., Ltd., Noda, Chiba, Japan.

5392. Saito, Nobuo; Tanaka, Teruo. 1967. Shôyu no kannô kensa-hô ni kansuru kenkyû. II. Shûkaku handan ni kansuru tokei-teki kenkyû [Studies on sensory evaluation of soy sauce. II. Statistical research on odor judgment]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 45(11):1023-32. Nov. [2 ref. Jap; eng]
Address: Central Research Inst., Kikkoman Shoyu Co., Ltd., Noda, Chiba, Japan.

5393. *Soybean Digest.* 1967. Extensive broiler operation by Marubeni. Nov. p. 31.
• ***Summary:*** "Marubeni-Iida Co. of Osaka, Japan, has entered the broiler business with a tie-up with Sterling Poultry Products, Ltd., Norfolk, England, according to the Japan Economic Journal...

"Four other Japanese firms are already in the broiler business. Mitsui & Co. and C. Itoh & Co. are producing broilers in tie-ups with U.S. interests. Mitsubishi Shoji Kaisha is preparing to launch a similar venture in cooperation with Nippon Ham Co. of Osaka and Swift & Co. of the United States. Kanematsu-Gosho, long experienced in broiler trading, has agreed with Peterson Farms, Inc., to start a similar integrated chicken venture...

"The Japanese Ministry of Agriculture has approved establishment of a joint egg-processing venture–Shosan Seymour–by Showa Sangyo Co. of Tokyo in cooperation on a 50-50 basis with the Seymour foods division of Norris Grain Co. of the United States. Shosan Seymour will be the first joint venture with foreign capital in this field in Japan since World War II."

5394. *Soybean Digest.* 1967. U.S. visit of Japanese processors. Nov. p. 30.

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• ***Summary:*** A team, consisting of representatives of major Japanese soybean processing firms, is in the U.S. for 2 weeks visiting soybean farms and industry. They are discussing mutual problems of Japanese buyers and U.S. soybean growers. The team is headed by Shogo Kuroda, manager of the Tokyo branch, Yoshihara Oil Mill, Ltd. The following other firms are represented: Kumazawa Seiyu Sangyo Co. Ltd., Ajinomoto Co., Inc., Nisshin Oil Mills Ltd., Nihon Koyu Kogyo Co., Ltd., and Hohnen Oil Co. Ltd. Three photos show members of the team, who are apparently sponsored by the American Soybean Assoc.

5395. A.F.P. 1967. Artificial meat from soyabean. *Times of India* (*The*) (*Bombay*). Dec. 28. p. 9.
• ***Summary:*** Tokyo, Dec. 27. Artificial "meat" made from soyabeans has been developed by Nisshin Seiyu ("oils and fats") Company, of Yokohama–a food manufacturing company. The company plans, within the year, to test-produce the "meat" for mixing into processed meat such as sausages, meat balls, and meat paste. The company claims that its new plant in Yokohama is the largest of its kind in the world.

The company also claims that the new product, made from defatted soybean meal, will make the meat items less expensive and more nutritious, without affecting the taste of the meat.

"Its selling price will be one-eighth the price of beef and one-third the price of pork or chicken in Japan."

5396. Ebine, Hideo. 1967. Miso seibun ichiran. II. Tô-rui, yuki-san oyobi sono ta no seibun [A glance at miso's constituents. II. Sugars, organic acids, and other components]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 62(12):1368-73. Dec. [57 ref. Jap] Address: Norinsho Shokuryo Kenkyujo.

5397. Matsumura, Tatsuo; Kurome, T.; Watabe, I.; Tateno, K. 1967. Shokuesa arerugii no kenkyû. VI. Daizu arerugii [Studies on food allergies. VI. Soybean allergies]. *Arerugii* (*Japanese J. of Allergology*) 16:874. English-language summary in Annals of Allergy (1968), 26(11):576. [23 ref. Jap; eng]
• ***Summary:*** Forty-two clinical cases were reported due to allergy to soybeans. Address: Gunma Univ. School of Medicine.

5398. Murakami, Hideya; Takase, S.; Ishii, T. 1967. Non-productivity of aflatoxin by Japanese industrial strains of *Aspergillus.* I. Production of fluorescent substances in agar slant and shaking cultures. *J. of General and Applied Microbiology* (*Tokyo*) 13(4):323-34. Dec. [14 ref. Eng]
• ***Summary:*** "Two hundred and fourteen strains of the *Aspergillus* were cultured both in agar slants and in a liquid medium by shaking, and the productivity of aflatoxins was studied, respectively, by observation of the fluorescence of the medium and by fluorometry and thin-layer chromatography, using the aflatoxin-producing strain ATCC 15517 as a control." None of the resulting products were aflatoxins. "However, the fact does exist that certain strains belonging to the *Aspergillus flavus-oryzae* group or the *A. flavus* group produce aflatoxins..."

"Materials and methods–Microorganisms: We used 214 strains including 176 strains of the yellow-green-spored *Aspergillus* and 38 strains of the other *Aspergillus.* All of the formers were isolated or collected in our institute during 1904 to 1965, consisting of 100 strains for Sake brewing, 32 strains for Miso brewing and 44 strains for Shoyu brewing. Among the latter 38 strains, 16 strains were those used for manufacturing Shôchû (Japanese distilled liquor) and the remainings [sic, rest] were non-industrial strains received from the Institute of Applied Microbiology, University of Tokyo. Aflatoxin-producing ATCC 15517 was sent from the National Institute of Health, Tokyo, and used as a control." Address: Research Inst. of Brewing, Tokyo.

5399. Bailey, Ethel Zoe. 1967-1981. Glycine soja–Foreign sources. Part II. Ithaca, New York: L.H. Bailey Hortorium. 3 cards. Unpublished.
• ***Summary:*** Continued: (51) Oslo 67–Hortus Botanicus Universitatis Osloensis, Oslo, Norway, 1967 [LR 1983]. (52) Frank. 66–Botanischer Garten der Johann Wolfgang Goethe Universitaet, Siesmayerstrasse 72, 6 Frankfurt am Main, Germany, 1966 [LR 1980]. (53) Heid. 66–Botanischer Garten der Universitaet, D-6900 Heidelberg, Germany, 1966 [LR 1981]. (54) Angola 68–Instituto de Investigacao Agronomica de Angola, Caixa Postal 406, Nova Lisboa, Angola, 1968 [LR 1975]. (55) Nancy 64–Jardin Botanique de la Ville de Nancy, 100 Rue du Jardin Botanique, 54600 Villers-les-Nancy, Nancy, France, 1964 [LR 1981].

(56) Liege 63–Jardin & Institut de Botanique de l'Universite de Liege, 3 Rue Fusch, Liege, Belgium, 1963 [LR 1975]. (57) Oxf. 68–Botanic Garden, University of Oxford, Rose Lane, Oxford, England, UK, 1968 [LR 1981]. (58) Read. 71–Agricultural Botanic Garden, University of Reading, Reading, Berkshire, England, UK, 1971 [LR 1974]. (59) Kosice 70–See (40) Kosice 63 (Slovakia). (60) K.S.F. 72–Kerteszeti es Szoleszeti Foiskola (Inst. Bot. Acad. Horti- et Viticulture), Novenytami Tanszeke, Menesi-ut 44, Budapest xi, Hungary, 1972 [LR 1982].

(61) Ruhr 71–Ruhr–Universitaet Bochum, Botanische Garten, Postfach 2148, D-4630 Bochum, Germany, 1971 [LR 1980]. (62) Ant. 72–Hortus Botanicus Antveroiensis Plantentuin, Gerard le Grellelaan 5, Antwerp, Belgium, 1972 [LR 1973]. (63) Pecs 73–See (43) Pecs 63 (Hungary). (64) Toh. 74–Hortus Botanicus Tohoku Universitatis Sendaiensis, Sendai, Japan, 1974 [LR 1982]. (65) Bol. 73–Istituto Botanico dell'Universita di Bologna, Via Irnerio 42, Bologna 40126, Italy, 1973 [LR 1981].

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(66) Barc. 77–Institut Botanic de Barcelona, Av. Muntanyans, Parc de Montjuic, Barcelona 4, Spain, 1977 [LR 1981]. (67) Lugd. 78–Hortus Botanicus Academicus Lugduno-Batavus, Nonnensteeg 3, Leiden, Netherlands, 1978 [LR 1981]. (68) Purw. 79–Purwodadi Botanic Garden, Lawang, East Java, Indonesia, 1979 [LR 1979]. (69) Oxf. 79–See (57) Oxf. 68 (Oxford, England). (70) Hohen. 79–See (27) Hohen. 58 (Hohenheim, Germany).

(71) Delft 80–Technische Hogeschool Delft, Julianalaan, Delft, Netherlands, 1980 [LR 1980]. (72) Gand. 81–Plantentuin der Rijksuniversiteit (formerly named Hortus Botanicus Gandavensis), K.L. Ledeganckstraat 35, B-9000 Gent, Belgium, 1981 [LR 1981].

On a separate card is one entry for *Soja Glycine* (which should probably be *Glycine soja*)*:* St. A. 71–University Botanic Gardens, St. Andrews, Scotland, UK, 1971 [LR 1982]. Address: L.H. Bailey Hortorium, 462 Mann Library, Cornell Univ., Ithaca, New York 14853-4301. Phone: 607-255-7981. Fax: 607-255-7979.

5400. Aoki, Hiroshi. 1967. Tanpakushitsu kôgyô [Protein factories]. *Kindai Kogyo Kagaku* (*Modern Industrial Chemistry*) No. 22. p. 395-467. (Asakura Shoten, Tokyo). Revised 1972. [379 ref. Jap]
• ***Summary:*** Concerns the manufacture and processing of vegetable and animal proteins. This book is number 22 in a series of 23 monographs. Address: Ajinomoto Co. Ltd.

5401. Ebine, Hideo. 1967. Evaluation of dehulled soybean-grits from United States varieties for making miso. Tokyo: Central Miso Inst., Echizenbori 3-3. Chuo-ku. 168 p. Final technical report, USDA P.L. 480. Project UR-A11-(40)-2. Grant No. FG-Ja-101.
Address: Central Miso Inst., Echizenbori 3-3, Chuo-ku, Tokyo.

5402. **Product Name:** [Fuji Pro (isolated soy protein)].
Foreign Name: Fuji Pro.
Manufacturer's Name: Fuji Oil Co. Ltd.
Manufacturer's Address: Toyama Building 121, 2-chome Azuchi-cho, Higashi-ku, Osaka, Japan.
Date of Introduction: 1967.
Ingredients: Defatted soybean meal.
How Stored: Shelf stable.
New Product–Documentation: Fuji Seiyu K.K. (Fuji Oil Co.). 1977. Fuji Seiyu 25 Nen-shi: Showa 21 nen 11-gatsu–Showa 51 nen 3-gatsu [Fuji Oil Company Ltd.: 25-year history, Nov. 1946 to March 1976]. Tokyo: Fuji Oil Co. 622 p. See p. 418. This was the first soy protein isolate made in Japan.

5403. Ikehata, Hideo. 1967. Daizu no furabonoido [Soybean flavonoids]. *Shokuhin Kogyo* (*Food Industry*) 10(16):42-47. [16 ref. Jap]
• ***Summary:*** Discusses genistein, daidzein, daidzin, isoflavones, and estrogens. Address: Osaka Shiritsu Daigaku, Japan.

5404. Kasuya, Ritsu; Ikehata, H.; Miyamoto, T.; Murata, K. 1967. Nattô to tempeh no B-rui bitamin [B-vitamin content of natto and tempeh]. *Kaseigaku Zasshi* (*J. of Home Economics of Japan*) 18:362-64. [10 ref. Jap]
Address: Osaka, Japan.

5405. Kawamura, S. 1967. [Quantitative paper chromatography of sugars of the cotyledon, hull, and hypocotyl of soybeans of selected varieties]. *Kagawa Daigaku Nogakuba Gakujutsu Hokoku* (*Technical Bulletin of the Faculty of Agriculture, Kagawa Univ.*) 15:117-31. [Jap]*

5406. Kawamura, S.; Tada, M.; Irie, N. 1967. [Effect of autoclaving on sugars of defatted soybean flakes from selected varieties]. *Kagawa Daigaku Nogakuba Gakujutsu Hokoku* (*Technical Bulletin of the Faculty of Agriculture, Kagawa Univ.*) 15:147-53. [Jap]*
• ***Summary:*** The authors examined the sugars of the whole soybean and of the defatted seed parts for 6 U.S. and 9 Japanese varieties by quantitative paper chromatography. They estimated the maximum variation by this method as ± 10%; they reported finding verbascose, but they did not have a standard for it. They determined the total sugars by anthrone colorimetry.

Their results on a dry basis for U.S. whole soybeans are sucrose 4.5%, raffinose 1.1%, stachyose 3.7%, and traces of arabinose and glucose for a total of 9.3% sugars. For the Japanese soybeans the values are sucrose 5.7%, raffinose 1.1%, stachyose 4.1%, and traces of arabinose and glucose for a total of 10.9% sugars. Thus the Japanese soybeans appear to be somewhat higher in sugars, especially sucrose, than U.S. soybeans.

The authors state that the arabinose reported in the hull may not be free, but could have come from the water-soluble saccharides that were liberated in the course of isolation of the other components.

5407. Nagata, Tadao. 1967. [Studies on the significance of indeterminate growth habit in breeding soybeans]. *Ikushugaku Zasshi* (*Japanese J. of Breeding*) 17:25-32; 17:131-36. [Eng; jap]*
Address: Hyogo Agricultural College, Sasayama, Hyogo-ken.

5408. National Food Research Institute (Shokuryo Kenkyujo). 1967. Tôfu no seizô to tenkabutsu [Tofu production and additives]. *Shokuryo: Sono Kagaku to Gijutsu* (*Food: Its Science and Technology*) No. 10. p. 89-103. [Jap]
Address: Tokyo.

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5409. Tanegashima, C.; Kirita, Y. 1967. [Investigation of pyridine carbonic acids. III.]. *Mukogawa Joshi Daigaku Kiyo. Seikatsu Kagaku-hen* (*Scientific Reports of Mukogawa Women's Univ.–Domestic Science Series*) 15:75-79. [Jap]*

5410. Tsukasa, N.; Iso, N.; Suyama, Y. 1967. [Study on natto's mucilage. I. Physical and chemical properties of the mucilage]. *Meiji Daigaku Nogakubu Kenkyu Hokoku* (*Bulletin of the Department of Agriculture, Meiji University*) 22:45-50. (Chem. Abst. 69:92968. 1968). [Jap]*

5411. Yokotsuka, Tamotsu. 1967. [Toxic substances produced by molds and nonproductivity of aflatoxin by Japanese koji-molds]. *Chomi Kagaku* (*Seasoning Science*) 14:23-37. [Jap]*
Address: Kikkoman.

5412. Boxer, Charles R. 1967. The Christian century in Japan, 1549-1650. 2nd printing corrected. Berkeley and Los Angeles, California: University of California Press. xv + 535 p. + [9] leaves of plates. Illust. Index. 25 cm. [279 + 210 endnotes]
• ***Summary:*** Contents: Dedication. Preface. 1. From Marco Polo to Mendes Pinto. 2. Japan through Jesuit spectacles. 3. Christianity and the *kurofune* [black ships, Portuguese carracks]. 4. Jesuits and friars. 5. Christian culture ad missionary life. 6. Pirates and traders. 7. The palm of Christian fortitude. 8. Sakoku, or the closed country.

Appendixes [original documents]. I. Extracts from a letter written by Francis Xavier, S.J., to the Jesuits at Goa dated Kagoshima, Nov. 5, 1549 (p. 401). II. The Rutter of the Santa Cruz, July 5, 1585–March 30, 1586 (p. 406). III. Affidavits concerning Jesuit and Franciscan rivalry, 1593-1597 (p. 415). IV. Pedro de Baeza on the China-Japanese Trade, ca. 1609 (p. 425). V. Japanese state papers on the Macao-Nagasaki trade, 1611-1621 (p. 428). VI. The martyrdom of Omura, August 25, 1624 (p. 436). VII. Text of the Sakoku, or Closed Country Edict of June, 1636 (p. 439). VIII. Oath of Apostasy, 1645 (p. 441). IX. List of Japanese nengo or year periods, 1532-1652 (p. 443). X. List of Nagasaki Bugyo, 1587-1650 (p. 444). XI. Heads of the Jesuit mission in Japan, 1549-1643 (p. 445). XII. Visitors of the Jesuit Province of Japan and the Vice-Province of China, 1568-1643 (p. 446). XIII/ The apostate fathers, 1633-1643 (p. 447). XIV. Summary of martyrology, 1614-1650 (p. 448). Notes. Bibliography. Index and glossary.

Boxer provides an account [p. 348] of a Yedo (Tokyo) jail by Spanish Franciscan, Fray Diego de Francisco in 1615. "The official ration was a handful of rice daily, barely enough to sustain life for forty or fifty days,... On the other hand, the guards could sometimes be bribed to allow the prisoners' friends to smuggle in a little rice, *soy,* [sauce] or fish by way of supplementing the starvation diet." Note: This passage was first cited by Hymowitz 2007, in "History of the Soybean." Address: Camoens Prof. of Portuguese, King's College, Univ. of London, England.

5413. Dai Nihon hyakka jiten [Encyclopedia Japonica]. 23 vols. 1967. Tokyo: Shogakukan. [Jap]
• ***Summary:*** Amazake (Vol. 1, p. 380-81). When rice koji is mixed into cooked rice or rice porridge, the starch of the rice is converted to sweet substances such as glucose and maltose by the enzyme action to make a fragrant, sweet drink. During the Nara period (A.D. 710-784) and Heian period (795-1185) it was called Kosake or Hitoyo-zake. In the Nihon Shoki (A.D. 720) it was written that amazake was offered to the emperor Ojin Tenno (who reigned A.D. 270-310). Originally amazake was made for use in religious ceremonies, but by the Edo period (1600-1868) amazake sellers (amazake-uri) appeared and sold amazake in a earthenware pots (donabe) or brass pots placed in tall, red lacquerware boxes suspended from each end of a shoulder pole (see illustration). The amazake seller would carry these through the streets of the neighborhood calling out "sweet, sweet" (amai, amai). On a shrine or temple's festival day amazake was widely sold at wayside stalls, as it still is today. One old amazake shop that still exists is Amanoya at Kanda Myojin-mae [Soto Kanda 2-18-5, Chiyoda-ku, Tokyo. The koji is made in the ancient mounded way in long, earth-walled tunnels 20 feet below the streets of Tokyo]. Amazake became very popular during an era when there were very few sweet foods available to the common people. Initially it was served only in the winter as a hot drink, but later it came to be consumed throughout the four seasons. It was enjoyed at tea houses and oceanside swimming places to banish tiredness or to warm one's body. Also an instant amazake, which could be made at home easily, became popular.

Famous amazake products in Japan: There are many festivals throughout Japan that center around amazake, and transmit tradition to the next generation. 1. Yamakawa-zake of the Rokujo district of Kyoto has a long history. At the Ohara Shrine in Kyoto (at Sanwa-cho, Amada-gun, Kyoto-fu) each March 23 and September 23 they celebrate the spring and fall offerings respectively (haruzashi and akizashi). In this famous festival, they offer amazake to their god and to visitors. 2. At Horikana village in Nagano prefecture (Karasu-mura, Minami Azumi-gun) there is an amazake festival each January or February. In Saitama prefecture (Kita Katsushika-gun) there is an amazake festival each September 9. 4. At the Shimomaino Shrine in Miyazaki prefecture (Nanpo, Nobeoka-shi) there is the Ichiya-zukuri amazake festival.

To make amazake, either glutinous rice or regular short-grain rice can be used. One can make it soft (yawaraka-zukuri) or firm (kata-zukuri) by adding more or less water. Cook white rice or make rice porridge. Add rice koji and hot water (about 70ºC); use about the same amount of water as

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rice for the firm consistency or 3-4 times as much for the soft consistency. Keep the temperature at 55-60ºC for 8-10 hours. Good amazake, in which almost all the rice starch has been converted to glucose, will be very sweet. Thin it with water, bring to a boil, and drink. Adding a little freshly grated gingerroot lends a nice fragrance. Another type of amazake is made with sake lees (sake kasu) sweetened by adding sugar.

The word amazake is used in Japanese waka (31-syllable poems) as an indicator of summer, as are the words Hitoyozake, Kozake, and Amazake-uri.

Soybeans. (Vol. 11, p. 365-67). Address: Japan.

5414. Herbert, Jean. 1967. Shintô: At the fountain-head of Japan. New York: Stein and Day. 622 p. Preface by Yukitada Sasaki. Illust. Nap. 25 cm. [778* ref]
• ***Summary:*** Chapter 22, "Kami of the road, the house and the field..." states (p. 506): "Offerings to the Inari temples largely consist of food which is supposed to be agreeable to the fox: *aburage* (fried bean-curd or *tofu*), cooked rice, fish, meats, etc. Because of the reputed fondness of foxes for *abura-age,* a kind of *sushi* wrapped up in *aburage* is commonly called *o-inari-san."* Address: Japan.

5415. Joshi Eiyo Daigaku (Women's College of Nutrition). 1967. Tôfu, mame, miso ryôri: Jû-ni ka getsu [Tofu, soybean, and miso cookery throughout the 12 months]. Tokyo: Joshi Eiyo Daigaku Shuppan-bu. 226 p. Revised 1973. Illust. Index. 18 cm. [Jap]
Address: Tokyo, Japan.

5416. Kato, Hidetoshi. 1967. Meiji, Taisho, Shôwa sesô-shi [History of food life and social conditions in Japan during the Meiji, Taisho, and Showa periods]. Tokyo: Shakai Shiso-sha. 380 p. Japanese summary by Kawakami 1978. [Jap]
Address: Japan.

5417. Kawamura, Shinichiro. 1967. Kinako no seibun, toku-ni tôrui [Sugars and other components of kinako or parched full-fat soybean flour]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 20(3):174-76. [4 ref. Jap; eng]
• ***Summary:*** Raw soybean flour was processed to kinako (parched full-fat soy flour) by heating at 140º for 6 minutes, or about 160º for 4.5 minutes.

5418. *Malawi Department of Agriculture, Ministry of Natural Resources, Annual Report.* 1967. Legumes. For the year 1963/64. Part II. 142 p.
• ***Summary:*** In the section on "Legumes," the subsection titled "Soya" (p. 28) reports that two soybean variety trials were conducted at Bvumbwe [the Bvumbwe Tung and Agricultural Experiment Station, Box 748, Limbe]. The first trials were from 1961-63. During this period, Hernon 107 gave the best seed yields (1,153 lb/acre), followed by Pelican (1,090), and Hernon 147. The mean yield for 5 varieties was 946 lb. The second trial tested 3 varieties from Japan and 6 from Southern Rhodesia. They were planted on 3 Dec. 1963. Geduld gave the best yield (1,742 lb/acre), followed by Lee (1,307) and Hood (1,307).

The subsection titled "Soya Beans" (p. 29) states that the variety collection at Chitedze [Agricultural Research Station, Chitedze, Box 158, Lilongwe] was planted to renew seed. Ten varieties that yielded over 800 lb/acre are listed. "At Chitala [Chitala Experiment Station, Salima] the long term variety Malaya gave 640 lb/acre seed and the medium term Volstate 590 lb/acre. There was no response to single superphosphate at 200 lb/acre.

Note 1. Nyasaland achieved independence and was renamed Malawi in 1964. Note 2. The title page reads, from top to bottom: Ministry of Natural Resources. Annual Report of the Department of Agriculture for the Year 1963/64. Part II. 1967. Printed and Published by the Government Printer, Zomba, Malawi. Address: Malawi.

5419. Manyôshû [The Manyoshu: A new and complete translation, by H.H. Honda]. 1967. Tokyo: Hokuseido Press. xii + 345 p. 31 cm. [Jap]*
• ***Summary:*** The translator, Heihachirô Honda, was born in 1893.

5420. Mateles, Richard I.; Wogan, Gerald N. eds. 1967. Biochemistry of some foodborne microbial toxins. Cambridge, Massachusetts: MIT Press. ix + 171 p. Papers presented at the Symposium on Microbial Toxins held at the meeting of the American Chemical Society, New York, on 12 Sept. 1966. [100+* ref]
• ***Summary:*** Contents: Part I: Bacterial and algal toxins. Part II: Fungal toxins. One chapter in each part is about soy. They are cited separately. Address: MIT, Cambridge, Massachusetts.

5421. Nakano, Masahiro. ed. 1967. Hakkô shokuhin [Fermented foods]. Tokyo: Korin Shoin. 244 p. See esp. p. 81-101. [Jap]
• ***Summary:*** Includes sections on soymilk yogurt (cultured with *Lactobacillus bulgaricus*) and *nyu fu* [fermented tofu].

Chapter 6, *Nyu fu* notes that this is an ancient food that came from China and Taiwan, but has never become a part of Japanese cuisine. In the United States (and in English) it is known as "Soybean cheese" and "Vegetable cheese," while in China it is known as "Nyufu" as well as Chaw taufu, Sufu, Funyu, etc.

6.1.2–Places of production and varieties: Nyufu is made mainly in the middle to southern four coastal provinces of China. These include (pinyin / Wade-Giles): Jejiang / Chekiang (Jap: Sekkô), Jiangsu / Kiangsu (Jap: Kôso), Fujian / Fukien (Jap: Fukken), Guangdong / Kwangtung (Jap: Kanton). A lot of Nyufu is also made in Taiwan, which

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is located off the coast of Fujian province.

Since nyufu has been produced for a long time over a vast area, there are many varieties. A study conducted in the 1920s found the varieties shown in chart 6.1 in the Shanghai market (Shanghai is in Jiangsu province near the mouth of the Yangtze River).

(1) Pickled without mold on the tofu. (i) Jianning-dofu: Drain then dry the tofu, add salt, and pickle in jiang or the residue / dregs left after making soy sauce.

(ii) Doufuru: Drain then dry the tofu. Sprinkle it with salt then pickle it in koji.

(2) Culture mold on small cubes of tofu until a fragrant white mycelium surrounds each cube, then pickle.

(iii) Jiangrufu: Pickle in jiang or the residue / dregs left after making soy sauce.

(iv). Honjiang rufu [red jiang fermented tofu]: Pickle in a mixture of red rice / angkak (a red koji made by growing *Monascus* mold on rice) and the residue / dregs left after making soy sauce.

(v) Zaorufu: Pickle in sake lees.

(vi) Hongrufu: Pickle in red sake lees.

(vii) Jiujia rufu: Pickle in white sake / daku-shu, like unrefined sake (*doburoku*).

(viii) Xiangrufu (fragrant rufu): Pickle in jiang with olive leaves, fragrant mushrooms, etc.

Dr. Masahiro Nakano was born in 1907. Address: National Food Research Inst., Tokyo.

5422. Oo, Shu. 1967. Shi Ryûkyû zatsuroku [Miscellaneous reports of the messengers to Ryukyu]. In: Koza Tekisuto Sakuhoshi Roku-shu [Collected Reports to the Chinese Emperor Made by the Messengers to Ryukyu, Lecture Texts]. Compiled by Kadena Sotoku. Published by Kyodoshi Kenkyu-kai. No. 4, p. 23. [Jap]*

5423. Richmond, Sonya. 1967. International vegetarian cookery. New York, NY: Arco Publishing Co. 192 p. Index. 22 cm. First published in 1965 in the UK.
• ***Summary:*** For details, see the original 1965 edition.

5424. Riesman, David; Riesman, Evelyn Thompson. 1967. Conversations in Japan: Modernization, politics, and culture. New York, NY: Basic Books, Inc. xii + 371 p. See p. 58. Index. 25 cm.
• ***Summary:*** These are the authors' published diaries and tape recorded conversations with Japanese during a 2-month visit to Japan from Sept. 30 to Dec. 2, 1961. The visit was sponsored by the Japan Committee for Intellectual Exchange. The husband is a Harvard professor; his wife accompanied him. On 12 Oct. 1961 the authors visited Mr. Sekihara (an architect) and his wife at their home in Tokyo. "The whole effect of the room... was a blending of the cosmopolitan and the Japanese, like the meal, which began with cocktails and hors d'oeuvres, then went on to raw fish and delicacies such as fresh ginger root, soybean soup, meat and vegetables, rice and pickle, then on top of all this, apple pie and green tea. It was served buffet style." Note: "Soybean soup" probably refers to miso soup. The authors also enjoyed raw fish and seaweed (p. 319). Address: Brattleboro, Vermont; Cambridge, Massachusetts.

5425. Yokotsuka, Tamotsu; Sasaki, M.; Kikuchi, T.; Asao, Y.; Nobuhara, A. 1967. Production of fluorescent compounds other than aflatoxins by Japanese industrial molds. In: R.I. Mateles and G.N. Wogan, eds. 1967. Biochemistry of Some Foodborne Microbial Toxins. Cambridge, MA: MIT Press. ix + 171 p. See p. 131-52. [17 ref]
• ***Summary:*** Early study showing absence of aflatoxins in fermented soyfoods. "Conclusions: 1. None of the 73 seed cultures or starter strains of *Aspergilli* tested under our conditions produced aflatoxins. These findings confirm the reports of Hesseltine et al. (1965), Aibara and Miyake (1965), and Masuda et al. (1965)." Address: Noda Inst. for Scientific Research and Central Research Inst. of Kikkoman Shoyu Co. Ltd., Noda, Japan.

5426. Misoshiru [Miso soup]. 1967? Tokyo: NHK [Jap]*
• ***Summary:*** An early postwar Japanese-language book about the many types of miso soup by Japanese National Broadcasting (NHK). Address: Tokyo, Japan.

5427. Kameda, Yukio; Kanatomo, S.; Kameda, Y.; Saito, Y. 1968. A contact antitumor activity of *Bacillus natto* on solid type Ehrlich carcinoma cells. *Chemical and Pharmaceutical Bulletin* 16(1):186-87. Jan. [2 ref]
• ***Summary:*** The authors have been searching for familiar bacteria that have high selective toxicity on human tumor cells. "The first choice was the bacillus of 'Natto' (fermented Japanese beans) which is a popular and cheap daily food for Japanese."

They found a strain (tentatively called KMD 1126) of *Bacillus natto* (the natto bacterium) which had contact antitumor activity in male inbred mice. "A mouse was transplanted intraperitoneally with approximately 10^7 Ehrlich ascites carcinoma cells." A table shows in detail the antitumor effect. The tumors on the treated side of each mouse were either nonexistent or much smaller than those on the untreated side.

Note: In medicine, ascites (also known as peritoneal cavity fluid) is an accumulation of fluid in the peritoneal cavity. The peritoneum is the smooth, transparent membrane that lines the cavity of the abdomen of humans and other mammals, and is folded inward over the abdominal and pelvic viscera. Address: Faculty of Pharmaceutical Sciences, Kanazawa Univ., Kanazawa, Japan.

5428. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*). 1968--. Serial/periodical. Central Miso

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Research Inst., Shinkawa 1-26-19, Chuo-ku, Tokyo 104, Japan. Formerly Miso Gijutsu up to No. 166. This new name began in Jan. 1968. In 1983, issue No. 347 became Vol. 31, number 1. As of April 1989 the journal has never published English abstracts. [Jap]
Address: Tokyo, Japan.

5429. Saito, Nobuo; Tanaka, T.; Yokotsuka, T. 1968. Shôyu no kannô kensa-hô ni kansuru kenkyû. IV. Seibun chôwa ni kansuru tôkei-teki kenkyû [Studies on sensory evaluation of soy sauce. IV. Statistical research on the harmony of chemical factors]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 46(1):28-33. Jan. [3 ref. Jap; eng]
• ***Summary:*** Five factors contribute 88.9% to the quality of soy sauce: Preference, size of contents, glutamic acid, organic acid, and additives. Address: Central Research Inst., Kikkoman Shoyu Co., Ltd., Noda, Chiba, Japan.

5430. Shibasaki, Kazuo; Asano, Mitsuo. 1968. [Histochemical studies of soybean cotyledons]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 15(1):1-7. [6 ref. Jap; eng]*
Address: Dep. of Food Chemistry, Faculty of Agriculture, Tohoku University, Japan.

5431. Sugano, D. 1968. [Method of cheese production using *Neurospora molds*]. *Japanese Patent* 744/68. Jan. 11. [Jap]*

5432. Takeyama, Shinji. 1968. Edo amamiso ni tsuite [On sweet red miso]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 63(1):23-26. Jan. [11 ref. Jap]
Address: Abumata Miso K.K.

5433. Parsons, Cynthia. 1968. Americans report: Japanese school days. *Christian Science Monitor.* Feb. 3. p. 11.
• ***Summary:*** This article is about three American children who attend regular Japanese school in Kyoto. The instruction is in Japanese. Concerning lunch, one child said: "Today we had fried tofu, an apple, milk, and three pieces of bread with butter." Address: Education educator.

5434. Mattson, Marie. 1968. Visiting a Buddhist monastery at Koyasan. *Chicago Tribune.* Feb. 18. p. H15 or N15.
• ***Summary:*** Koyasan [Koya-san, "Mt. Koya"], "one of the most unusual communities anywhere on earth," is perched atop Mt. Kôya [Koya], in Wakayama prefecture south of Osaka, where it was founded over 1,000 years ago [in 819] by the Buddhist monk Kûkai (known posthumously as Kobo-Daishi), founder of the Shingon sect.

In the community today there are 120 buildings [many quite old] and a resident population of 9,000–making it one of the world's largest religious communities.

"The food at Koyasan is vegetarian, for strict Buddhists do not believe in killing any living thing. This even eliminates eggs... a vegetarian breakfast includes [miso] soup, rice, *tofu* (bean curd, which is a prime source of protein), fruits, vegetables, and tea."

Everyone goes to bed early in order to be up at 6 a.m. for Buddhist service. Photos show: (1) A pagoda [*Konpon Daitô,* the central point of Mt. Koya]. (2) A wandering Buddhist monk playing his flute. A small map of Japan shows the location of Koyasan.

5435. Ebine, Hideo; Yamamoto, Kôki. 1968. Dappi daizu ni yoru miso jôzô. II. Dappi daizu no miso genryô to shite no hyôka [Miso manufacturing from dehulled soybeans. II. Evaluation of dehulled soybeans for making miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 23. p. 1-4. Feb. [11 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5436. Ebine, Hideo; Sakano, Keichi; Kizaki, Michiyo; Kimura, Haruo. 1968. Eiyô kyôka miso no kenkyû. VII. Mechionin oyobi yûdôtai no miso e no tenka [On the manufacture of enriched miso. VII. Addition of L and DL form methionine and methionine sulfoxide]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 23. p. 9-13. Feb. [5 ref. Jap; eng]
• ***Summary:*** L-methionine, DL-methionine and methionine sulfoxide were added to two varieties of miso at the level of 0.2%. One was a light-yellow rice miso and the other a dark-colored rice miso. One group was pasteurized at 60ºC; the other was not. Both were allowed to stand at 30ºC for one month. There was no significant loss of methionine. In general, the non-pasteurized miso was organoleptically superior to the pasteurized miso. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5437. Ebine, Hideo; Nakano, M.; Kuroha, I. 1968. Eiyô kyôka miso no kenkyû. VI. Mechionin no tenka jiki to seihin ni oyobosu eikyô [On the manufacture of enriched miso. VI. Effects of added methionine on the quality of miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 23. p. 5-8. Feb. [10 ref. Jap; eng]
• ***Summary:*** The lysine content of rice or barley miso is comparatively high, whereas the content of sulfur-containing amino acids and tryptophan is low. DL-methionine was added to unripened miso at the level of 0.2–3% at the time the cooked soybeans were mixed with salted rice koji and ordinary salt. It was allowed to ferment at room temperature for a month and then at 30ºC for 3 weeks. During the fermentation, much of the added methionine was lost, accompanied by an off-flavor, probably due to the activity of microorganisms in the miso. This drawback was improved by pasteurization of miso to which DL-methionine had been added–after it had ripened adequately. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

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5438. Ito, Hiroshi. 1968. Shôyu seizô kôtei ni kanren suru bisei-butsu no dôtai [On the microflora in the process of soy-sauce manufacturing]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 23. p. 14-22. Feb. [17 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5439. Ito, H.; Ebine, H. 1968. Appen komugi shikomi no shôyu no bisei-butsu [Microflora in soy sauce moromi (mash) made from roll-pressed wheat]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 23. p. 23-25. Feb. [3 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5440. Saio, Kyoko; Wakabayashi, A.; Watanabe, T. 1968. Kanetsu ga daizu tanpakushitsu ni oyobosu eikyô [Effects of heating on soybean meal proteins]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 42(2):90-96. Feb. [9 ref. Jap; eng]
Address: 1-2. Niigata Food Research Inst., Niigata prefecture; 3. Food Research Inst., Ministry of Agriculture & Forestry.

5441. Saito, Nobuo; Tanaka, T.; Sogabe, A.; Yokotsuka, T. 1968. Shôyu no kannô kensa-hô ni kansuru kenkyû. V. Shikôsei, kagaku seibun kan no shimyureeshon [Studies on sensory evaluation of soy sauce. V. Simulation model between preference and chemical factors]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 46(2):107-12. Feb. [5 ref. Jap; eng]
Address: Central Research Inst., Kikkoman Shoyu Co., Ltd., Noda, Chiba, Japan.

5442. Loring, Kay. 1968. Front views & profiles: Japanese adventuring. *Chicago Tribune.* March 8. p. C3.
• ***Summary:*** Includes a description to Kamehachi Sushi, a Japanese sushi restaurant in Chicago. Sushi is the most popular of all snack foods in Japan. Every neighborhood of each city in Japan has its tiny sushi bar. Dinner at Kamehachi "began with the traditional soy bean soup [miso soup], delicate and delicious... Also appealing to my taste buds was inari-zushi (soy bean pockets filled with a slightly sweetened rice)." There was also a bowl of "yu-dofu,... delicate bean curd squares. These were served in a bowl of steaming liquid and each person helped himself, transferring the curd to his plate, then dipping each bite of it into a sauce with dried fish base."

5443. *Foreign Agriculture.* 1968. Asian trade in U.S. soybeans and feedgrains. March 11. p. 9.

5444. McCormick, Sally. 1968. Azuma Sukiyaki House: Now you can enjoy an evening in Japan–5120 N. Broadway, Chicago (Advertorial). *Chicago Tribune.* March 21. p. W10.
• ***Summary:*** "It was a pleasure watching her prepare Beef Sukiyaki... Then soy bean cakes [tofu], dry onions and rice wine were stirred into the pan." Azuma also serves Beef Teriyaki, Chicken Teriyaki, and Salmon Teriyaki. Three photos show Azuma Sukiyaki House.

5445. Adams, Ben. 1968. San Francisco: An informal guide. Revised by Nora Lapin, 3rd revised ed. New York, NY: Hill and Wang. xvi + 236 p. March. Foreword by Jessica Mitford. Illust. (by Charles Mattox). Index. 20 cm.
• ***Summary:*** Under Chinese restaurants–Page 89: "Sun Tai Sam Yuen [Cantonese], 622 Jackson St.,... YU 2-2844. An unpretentious Chinese eating house with regular dinners and all the tried-and-true Chinatown dishes. But you can also get here some delicious and unusual specialties–Chinese sausage, salted vegetable with pork, and Chinese red cheese and pork."

Note: The Japanese restaurant Yamato Sukiyaki House is at 717 California (near Grant). Sukiyaki is served at the table on a *hibachi,* seasoned with soy sauce.

5446. Matsuoka, Hiroatsu; Sasago, Kenji; Sekiguchi, Masakatsu. 1968. Daizunyû o riyô shita chiizu yô shokuhin no seizô ni kansuru kenkyû [Manufacturing of a cheese-like product from soybean milk. I.]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 15(3):103-08. [9 ref. Jap]
• ***Summary:*** Conditions for manufacturing cheese-like products from soybeans were investigated. Among three bacteria examined, *Streptococcus thermophilus* produced remarkably greater amounts of acids in soymilk than *S. lactis* and *Lactobacillus bulgaricus.* In conditions of 70-98ºC for 5 minutes, higher temperatures resulted in a higher level of solid content in final product. Difference in initial pH of soymilk only slightly affected the quality of the product. Based on these and other results, the following procedure was used for manufacturing: Soymilk containing 11% solid was heated at 98ºC for 5 minutes, cooled to 50ºC, the temperature at which *S. thermophilus* was inoculated, and calcium chloride (0.4%) was added for coagulating. The curd was kept for 10 minutes at 50ºC, cut, hooped, and pressed overnight. In addition, mold starter (*Penicillium caseicolum*) and sodium chloride were spread over the surface. During ripening of the curd at 15ºC and 85% RH for three weeks, water-soluble nitrogen increased to 50% of the total nitrogen. The product contained 70% moisture, and significant darkening developed with the process of ripening. Address: 1. Laboratory of Food Chemistry, Tachikawa College of Tokyo; 2-3. Dep. of Home Economics, Kawamura College, Toshima-ku, Tokyo.

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5447. Murakami, Hideya; Takase, S.; Kuwabara, K. 1968. Non-productivity of aflatoxin by Japanese industrial strains of *Aspergillus.* II. Production of fluorescent substances in rice koji and their identification by absorption spectrum. *J. of General and Applied Microbiology* (*Tokyo*) 14(1):97-110. March. [8 ref. Eng]
• ***Summary:*** Fluorescent spots produced by various strains of *Aspergillus* mold were classified into nine patterns, but none of these had the same ultraviolet absorption spectrum as that of aflatoxin. The preparation of rice koji is described. Address: Research Inst. of Brewing, 2-6 Takinogawa, Kita-ku, Tokyo.

5448. *Soybean Digest.* 1968. Meatlike product produced in Japan. March. p. 7.
• ***Summary:*** "Successful development of a meatlike product from soy protein on a commercial basis was recently announced by Nisshin Oil Mills Ltd., Tokyo, Japan. The new product, marketed as Soymee [it may have been later renamed Soymea], is the first of its kind to be commercialized in Japan...

"Soymee will be sold initially to meat processors for manufacture of hamlike and sausagelike products or for mixing with beef and pork for processing."

5449. Taira, Harue. 1968. Daizu kakôhin no amino-san ni kansuru kenkyû. X. [Studies on amino acid contents of processed soybean. X. The influence of added sugars on the heat destruction of the basic and sulphur containing amino acids in soybean products]. *Shokuryo Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 23. p. 175-83. March. [17 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 30(9):847-55 (1966). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5450. Yoshikawa, Seiji. 1968. [Food preference pattern and acceptance of miso soup]. *Shokuryo Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 23. p. 204-10. March. [Jap; eng]
• ***Summary:*** Reprinted from *Miso Gijutsu* (*Miso Technology*). No. 160. p. 4-9 (1967). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5451. Saikowski, Charlotte. 1968. America's foods expand Japan's menu. *Christian Science Monitor.* April 19. p. 6.
• ***Summary:*** Orville Freeman, U.S. Secretary of Agriculture, wants to export more American products to Japan. In Tokyo, he and his wife attended the recent "American Festival of Fun, Food, and Fashion." He noted that "The Japanese diet is still low in protein..." which means a great market for American brooder chicks.

"Such traditional Japanese foods as 'miso' (soybean paste), 'shoyu' (soy sauce) and 'tofu' (bean curd) are made for the most part from American-produced soybeans." Address: Staff correspondent.

5452. Saikowski, Charlotte. 1968. America's foods expand Japan's menu. *Christian Science Monitor.* April 19. p. 6.
• ***Summary:*** At the recent "American Festival of Fun, Food, and Fashion" in Tokyo, Japan, officials of the USDA and their wives were on a "buy-American campaign" and on a campaign to encourage Japanese officials to reduce Japan's trade restrictions [such as protective import duties and tariffs]. Mrs. Orville Freeman, wife of the U.S. Secretary of Agriculture, said that America was trying to sell "nutrition, variety, and convenience."

Japan, which does not have enough land to met its own food needs, already depends heavily on America for its food needs, importing nearly $1 billion worth last year. "Such traditional Japanese foods as 'miso' (soybean paste), 'shoyu' (soy sauce), and 'tofu' (bean curd) are made for the most part from" soybeans grown in the United States.

5453. Hongo, Motoyoshi; Yoshimoto, Akihiro. 1968. Formation of phage-induced gamma-polyglutamic acid depolymerase in lysogenic strain of *Bacillus natto:* Short communication. *Agricultural and Biological Chemistry* 32(4):525-27. April. [5 ref]
• ***Summary:*** Describes how the "lysogenic strain releases phage-induced PGA depolymerase in its culture fluid and the enzyme may be able to cleave PGA to small peptides, but not to glutamic acid." Address: Lab. of Applied Microbiology, Dep. of Agricultural Chemistry, Kyushu Univ., Fukuoka, Japan.

5454. Saio, Kyoko; Koyama, E.; Watanabe, T. 1968. Protein–calcium–phytic acid relationships in soybean. II. Effects of phytic acid on combination of calcium with soybean meal protein. *Agricultural and Biological Chemistry* 32(4):448-52. April. [10 ref]
• ***Summary:*** Many molecules of calcium and phosphorus may be bound by a single protein molecule. More calcium is bound as the amount of phytic acid in the system increases. Address: 1&3. Food Research Inst., Ministry of Agriculture and Forestry; 2. Japan Tofu Assoc.

5455. Umeda, Isao. 1968. Kore kara no shôyu seizô-hô. IX. [Future shoyu production methods. IX.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 63(4):417-21. April. [9 ref. Jap]
Address: Nihon Shoyu Kenkyujo.

5456. *Los Angeles Times.* 1968. Mizutaki says sayonara to lengthy meal preparation. May 30. p. G22.
• ***Summary:*** A general recipe for Mizutaki ("water cookery") includes "Bean curd squares (tofu)." The dipping sauce includes "½ cup soy sauce" and "½ teaspoon monosodium

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glutamate."

5457. Fukushima, Danji. 1968. Internal structure of 7S and 11S globulin molecules in soybean proteins. *Cereal Chemistry* 45(3):203-24. May. [36 ref]
• ***Summary:*** The internal structure of soybean protein molecules (7S and 11S, native soybean globulins) was investigated by optical rotary dispersion (ORD), ultraviolet difference spectra, infrared absorption spectra, and other techniques. The 11S globulin contained more sulfur-containing amino acids than the 7S globulin. The major soybean proteins have primary, secondary, tertiary, and quatenary structures.

Native soybean proteins were found to possess a fairly compact internal structure, in which most of the peptide bonds are buried and cannot be hydrolyzed by proteinase without disruption of the internal structure. Only when the closely packed peptide chains are unfolded upon denaturation do they become accessible to proteinase molecules. Thus the substrates are hydrolyzed in proportion to the degree of denaturation of the substrate protein molecules.

Hydrolysis by proteinase appears to occur step by step, especially in the native protein. This could be explained as follows. When a peptide bond located at the surface of a tightly folded molecule is hydrolyzed, the molecule would be partly unfolded in the form close to a random coil, then it would be refolded in a new conformation after a certain time.

The "author concluded that (1) the major internal structures of both 7S and 11S globulins of soybeans are not alpha-helix, but are both the antiparallel betastructures and the disordered structures; (2) the molecules are fairly compact as a whole and even in their disordered parts; (3) the molecules are folded tertiarily and the water-impenetrable hydrophobic region is formed; (4) the hydrophobic bonds play an important role for stabilization of the internal structure; and (5) the molecules are not hydrolyzed by proteinase before the internal structure is disrupted, and the initial velocity of the hydrolysis by proteinases is proportional to the degree of its disruption." Address: Central Research Inst., Kikkoman Shoyu Co., Noda, Japan.

5458. Hayashi, Shizuka. 1968. Japanese diets need still more oil and protein. *Soybean Digest.* May. p. 32, 35.
• ***Summary:*** For the first time in 12 years (since JASI started promoting U.S. soybeans in Japan in 1956), Japan's import of U.S. soybeans, figured on a calendar year basis, lost its momentum. In 1967 Japan imported 1.770 million metric tons of U.S. soybeans, down slightly from 1.772 million metric tons in 1966. Fortunately [for the American Soybean Assoc.] total Japanese consumption of oils and fats was 850,000 metric tons, up 11% over 1966–largely due to imports of sunflower seed from the USSR.

A table shows percentage consumption of various oils and fats in Japan in 1966 and 1967, with 1968 projected. For 1967: Soybean oil 32%. Other vegetable oils 42%. Animal fats and fish oils 26%.

The remedy: Three alternatives could turn the tide: (1) Lower the cost of U.S. soybeans to Japanese crushers. (2) Stop the import of competing oilseeds. (3) Increase Japanese consumption of oils.

Almost all of the U.S. soybeans imported to Japan are crushed to make oil and meal. "Of the total 1.77 million tons of U.S. soybeans imported last year about 1.6 million tons [90.4%] went for crushing." Other seeds widely crushed for oil and meal in Japan are rapeseed, sunflowerseed, safflowerseed [safflower seed], kapok, cottonseed, copra, sesameseed, corn, peanut, palm kernel, and rice bran.

JASI must persuade the Japanese government to share its promotional campaigns and programs. "The intake of oil and protein, especially oil, urgently needs to be increased. This is the guideline of the Japanese government," which is also encouraging the Japanese people to eat more green vegetables. "The future soybean program needs more emphasis on salad oil, vegetable margarine, and fried tofu (aburaage).

Fried tofu consumes 45% (152,000 tons or 5.5 million bushels) of the total soybeans used by tofu makers. In addition 30,000 tons of soybean oil (from 6.6 million bushels of soybeans) is required to fry aburaage. Fried tofu therefore presently uses a total of 12 million bushels of soybeans. "In fact it is one of the largest of U.S. soybeans. A nationwide campaign to double this consumption needs to be planned. A total of 18,000 sushi shops and 30,000 noodle shops are buyers if fried tofu." A photo shows Shizuka Hayashi.

Note: This is the last article seen by Shizuka Hayashi in Soybean Digest. Address: Japanese-American Soybean Inst., Tokyo.

5459. Randolph, Chet. 1968. Japan Soya operates on U.S. soybeans. *Soybean Digest.* May. p. 24.
• ***Summary:*** Located near Kobe is a soybean processing plant named Japan Soya Product Co. (Nihon Daizu Seiyu Co. Ltd.). A photo shows the plant. Built as a joint venture by Hohnen Oil Co. and Yoshihara Oil Mill, it "is the first company in Japan to tie its name to soybeans." It began operation in about Dec. 1967. The president is Yoshio Noguchi.

5460. Watanabe, Bunzo. 1968. The Japanese oilseed processing industry. *Soybean Digest.* May. p. 36, 38.
• ***Summary:*** Tables show: (1) Imports of soybeans to Japan during calendar year 1967 by country of origin: USA 81%, Red China 19%, Other countries 1%. Total imported: 2,169,000 metric tons (79,710,000 bushels). (2) Consumption of edible refined oils and fats in Japan (1963-1967). Per capita consumption rose from 13.58 lb in 1963 to 18.08 lb in 1967. (3) Total oils and fats production in

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Japan (1963-1967), imports and domestically grown, by oilseed type. Soybeans are by far the most important oilseed, followed by rapeseed. Rice bran is the main domestic source of oil. (4) Consumption of soybeans in Japan classified by utilization (1963-68, 1,000 metric tons). The following figures are for 1968 (1,000 metric tons): Crushed for oil 1,739. Foods: Tofu and aburage 294. Miso 170. Natto 50. Frozen tofu 40. Shoyu 15. Kinako 13. Other 70. The total used for food grew from 497 in 1963 to 652 in 1968.

Photos show: (1) American Soybean Association (ASA) executives seated around a table holding chopsticks at tempura luncheon with Mr. Watanabe, who is president of the Japanese Oilseed Processors Association, and other Japanese oilseed officials. From left, Shohei Takai, managing director Japan Oilseed Processors Association (JOPA); S. Yamada, manager oils and fats division, Ajinomoto Co., Inc; Scott Sawyers, ASA country director in Japan; Chet Randolph, ASA executive vice president; Mr. Bunzo Watanabe; and Hiroshi Higashimori, chief secretary JOPA. Tempura is a substantial outlet for soybean oil. (2) Portrait of Bunzo Watanabe. Address: Japanese Oilseed Processors Assoc., Japan.

5461. Ikehata, Hideo; Wakaizumi, M.; Murata, K. 1968. Antioxidant and antihemolytic activity of a new isoflavone, "Factor 2" isolated from tempeh. *Agricultural and Biological Chemistry* 32(6):740-46. June. [14 ref]
• ***Summary:*** "A new isoflavone assigned the trivial name 'Factor 2' which was first isolated from tempeh, a fermented soybean product, and identified as 6,7,4'-trihydroxyisoflavone was technically synthesized and tested for antioxidant activity by several methods. Factor 2 was proved to be a potent antioxidant in aqueous solution at pH 7.4. However it was not effective in preventing autoxidation of soybean oil and soybean powder. Factor 2 given orally to rats fed a vitamin-E deficient diet was also negative in hemolysis preventing activity. Biological activity of tempeh and the isolated Factor 2 to prevent hemolysis of red blood cells of rats fed a vitamin-E deficient diet was discussed." Address: Food and Nutrition Lab., Faculty of Science of Living, Osaka City Univ., Nishi-ku, Osaka, Japan.

5462. Shinoda, Osamu. 1968. O-tôfu no hanashi [The story of tofu]. *Rakumi* 6:4-8. June. [Jap]*
• ***Summary:*** An exhaustive search of the early Chinese food literature leads the author to believe that the world's earliest reference to the word *dofu* appears in the *Qing Yilu / Ch'ing I Lu* (Jap. *Seiiroku*), written by T'ao Ku in about A.D. 950, just before the Sung dynasty. This was more than 1,000 years after the supposed discovery of tofu by Liu An prior to 122 B.C. Address: Japan.

5463. Tajima, Yoshio; Kunioka, Etsuo. 1968. Homogeneous hydrogenation of soybean fatty esters by the Ziegler type of catalyst systems. *J. of the American Oil Chemists' Society* 45(6):478-79. June. [7 ref]
• ***Summary:*** Homogeneous hydrogenation of fatty esters (methyl linolenate, methyl linoleate) by binary catalyst systems of transitional methyl linoleate, by binary catalyst systems of transitional metal compounds (Ni (acac)3, $CoCl_2$, Co (acac), and $FeCl_3$) and organo-aluminum compounds (triethyl aluminum) is reported. Address: Central Research Lab., Toyo Rayon Company Ltd., Otsu, Shiga, Japan.

5464. *East* (*The–Higashi*). 1968. Charming flavor, traditional fragrance: The story of shoyu for the gourmet. 4(4):45-47. June/July. [Eng]
• ***Summary:*** Contents: Introduction (Nuoc mam, sashimi, shoyu). The history of shoyu (incl. shojin-ryori, kaiseki ryori). The chance discovery of shoyu (incl. Zen priest Kakushin, Keizanji miso, Yuasa in Wakayama prefecture, tamari, Yamasa Shoyu brewery at Choshi in Chiba prefecture). How is shoyu produced?

"It is said that toward the end of the Muromachi Period around 1560, the people of Yuasa began to sell this seasoning [*shôyu*] in the Osaka-Kyoto area. Later, during the Tokugawa Period, around 1635, with the establishment of the alternate-year residence of the daimyôs in Edo (*sankin-kôtai*), and the accelerated urbanization of Edo, *shôyu* breweries sprang up at Chôshi and Noda in Chiba Prefecture making it available in the Kantô Plains. Production methods were gradually improved, and wheat began to be used, thus producing the present-day *koi-kuchi* [*koikuchi*] (deep-colored) *shôyu* which took the place of the old *tamari* (settled) *shôyu.* This new deep-colored *shôyu* spread from Edo throughout the whole country. Thus the Yamasa Shôyu Brewery of Chôshi became the main big enterprise producing deep-colored *shôyu,* while *usukuchi* (light-colored) *shôyu* produced in the Kansai Area [Kyoto-Osaka] and *tamari shôyu* produced in Aichi Prefecture [especially around Nagoya] also developed, and continued to hold their places on the market."

The main reasons Yamasa traditionally maintained its facilities at Choshi are because of the temperate climate and the plentiful supply of under-ground water.

5465. *East* (*The–Higashi*). 1968. Yamasa Shoyu: Authentic Japanese quality soy sauce (Ad). 4(4):?? June/July. [Eng]
• ***Summary:*** At the center of this full-page color ad is a large, rectangular photo of sukiyaki ingredients on a plate above a Japanese table setting. The caption: "Heightens the full natural taste of foods with just the slightest touch, no matter whether cooking is Japanese or western style." Below that are small photos of a bottle and a yellow and purple can of Yamasa Shoyu. The logo reads: "Since 1645." Brewed by Yamasa Shoyu Co., Ltd., Choshi, Chiba-ken, Japan.

Note 3. This is the earliest document seen (Oct. 2009) that gives the date 1645 as the beginning of Yamasa Shoyu.

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YAMASA SHOYU

Authentic Japanese Quality Soy Sauce

SINCE 1645

Heightens the full natural taste of foods with just the lightest touch, no matter whether cooking is Japanese or western style.

BREWED BY
YAMASA SHOYU CO., LTD.
Choshi, Chiba-ken, Japan

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5466. Fujimaki, Masao; Kato, H.; Arai, S.; Tamaki, E. 1968. Applying proteolytic enzymes on soybean. I. Proteolytic enzyme treatment of soybean protein and its effect on the flavor. *Food Technology* 22(7):77-81. July. [9 ref]
• ***Summary:*** It is demonstrated that enzymatic proteolysis is useful for removing trypsin inhibitors and undesirable flavors from soy protein concentrate under mild conditions. Spray-dried soy sodium proteinate (Promine-D from Central Soya Co.) was as the substrate; it contain 97% protein on a dry basis. Three well-known enzymes (papain, bromelin, and pepsin), and nine commercial proteolytic enzyme preparations of microbial origin (Molsin, Rapidase, Prozyme, Takadiastase-SS, Coronase, Thermoase, Pronase, Bioprase, and alkaline proteinase of *Bacillus subtilis*) were tested. Molsin gave the best results; optimum conditions are given (incl. pH 2.8, temperature 60ºC).

Undesirable flavors were mostly removed by treating the soy protein preparation with an appropriate proteolytic enzyme. Beany flavor generally decreased in the early stage of digestion/fermentation, however bitter flavor often increased with increasing digestion time. In some cases astringent flavor and oily or maltol-like flavor appeared, the latter being prominent after long digestion.

Takadiastase-SS was produced from *Aspergillus oryzae* by Sankyo Co. in Japan. Address: Dep. of Agricultural Chemistry, The Univ. of Tokyo.

5467. Saio, Kyoko; Watanabe, Tokuji. 1968. Daizu shokuhin no bisai kôzô [Observations of the minute structure of soybean foods, as seen under an electron microscope]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 15(7):290-96. [8 ref. Jap]
• ***Summary:*** Of the electron microscopic pictures taken in the investigation on protein bodies and the protein in soybean seeds, some were presented to elucidate their fine structures and their changes in processing. No change in protein bodies and spherosomes in intact cells of soybean cotyledons occurred as a result of soaking in water overnight, while remarkable changes, such as bursting of protein bodies, curdling of their protein in mass without dissolving, and converting of spherosomes into rather large oil droplets, were observed after successive heat-steaming and fermentation with *Bacillus natto.* In tofu gel, a network is formed with protein microgranules, and oil droplets located in groups along it. The meshlike structure of the fresh tofu used to make dried frozen tofu (kori-dofu) is denser than that of ordinary tofu. During freezing, protein microgranules are localized and denatured by the growth of ice crystals (from the online abstract at http://www.journalarchive.jst.go.jp/english/).

This is the earliest document seen (Jan. 2012) that describes the use of an electron microscope to examine soyfoods. Address: Food Research Inst., Ministry of Agriculture & Forestry, Koto-ku, Tokyo.

5468. *Soybean Digest.* 1968. Hayashi steps down as JASI head in Tokyo. July. p. 3.
• ***Summary:*** After 12 years of service, Shizuka Hayashi retired as managing director of the Japanese American Soybean Institute in Tokyo, effective July 1. He has been in charge of the organization since it was founded. Under his leadership, millions of Japanese became "better acquainted with soybeans and the part they play in a more adequate diet. Mr. Hayashi's greatest achievement in the early days of JASI was to erase the bad image U.S. soybeans had in Japan right after World War II. His achievement was a major factor in leading Japan to become the world's No. 1 buyer of U.S. [soy] beans.

"During his tenure the Japanese margarine industry has begun to turn to soybean oil as an ingredient in its product; and soybean meal, as an ingredient in feeds for the growing swine and poultry industries in Japan, has become a major outlet for U.S. soybeans."

"Scott Sawyers will head the Japanese operations as country director in Japan for ASA-JASI." A portrait photo shows Mr. S. Hayashi.

5469. Manabe, Masaru; Matsuura, S.; Nakano, M. 1968. Hakkô shokuhin-chû no keiko seibun ni kansuru kenkyû. I. Kôji-kin no seisan suru kurorohorumu kayô-sei keiko busshitsu ni tsuite [Studies on the fluorescent compounds in fermented foods. I. Chloroform soluble fluorescent compounds produced by koji molds]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 15(8):341-46. [15 ref. Jap; eng]
• ***Summary:*** An early study showing the absence of aflatoxins in Japanese fermented foods. Address: Food Research Inst., Ministry of Agriculture & Forestry, Koto-ku, Tokyo.

5470. Okumura, George K.; Wilkinson, Jack E. 1968. Process of producing soy milk from sprouted soy beans. *U.S. Patent* 3,399,997. Sept. 3. 3 p. Application filed 5 April 1965. [5 ref]
• ***Summary:*** Soybeans are cleaned, moistened, and sprouted at 90-100ºF for about 3 days to produce sprouts approximately ½ to 1½ inches long. The sprouting step is found to (1) largely eliminate the disagreeable aspect of soybean flavor in the final "soy-base milk," (2) improve the vitamin content of the soybeans, and (3) cause the soybean hulls to be loosened, thereby facilitating their subsequent removal. The sprouted soybeans are then ground to a slurry, using a stone grinder. Add water to the slurry and mix. Cook in a pressure cooker or open vat, then strain to remove the hot suspension liquor [soy milk]. Now slowly add and stir in a mixture of calcium sulphate and magnesium chloride to form a curd. Wash the precipitated curd, then removed all excess water, and press the curd in a cloth-lined forming

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box to make bean curd [tofu]. Now grind the curd to a very fine state using an emulsifying machine or colloid mill. Formulate the milk to resemble, as nearly as possible, natural cow's milk, by adding oil, sugar, salt, calcium gluconate and ferrous sulphate. To produce a fortified milk, vitamins A, D, and C may also be added. Pasteurize, homogenize, cool, and pack. Address: 1. 3151 S. Elm Ave., 93706; 2. 2411 Divisadero St., 93721. Both: Fresno, California.

5471. Murata, Kiku; Miyamoto, T.; Taguchi, F. 1968. Biosynthesis of B vitamins with *Rhizopus oligosporus. J. of Vitaminology* (*Kyoto, Japan*) 14(3):191-97. Sept. 10. [4 ref]
• ***Summary:*** "The thiamine, riboflavin, and biotin content of the fungus increased during tempeh fermentation in proportion to weight or nitrogen content. Concentration of riboflavin and biotin in the medium also increased. The thiamine content of the medium decreased indicating that it was taken up from the medium by the fungus rather than synthesized." Address: Nutrition Lab., Faculty of Science of Living, Osaka City Univ., Nishi-ku, Osaka 550, Japan.

5472. Sawyers, Scott. 1968. Japan–Best U.S. Soybean market and still growing. *Foreign Agriculture.* Sept. 16. p. 12.
• ***Summary:*** From a speech given at the American Soybean Association's (ASA) 48th annual meeting in August.

5473. Associated Press (AP). 1968. Tofu is good for you. *Hartford Courant* (*Connecticut*). Sept. 29. p. 9E.
• ***Summary:*** Los Angeles (AP)–Tofu? Americans are familiar with many Japanese words such as sukiyaki, sayonara, jiujitsu [jujitsu], karate, etc. "But what or who is tofu?" Defined in the simplest terms "tofu is a soybean curd cake. It is of Japanese origin [sic; "tofu" is a Japanese word, but the food was invented in China] and is produced as a staple in Japan and many other Asian countries."

Although "tofu" is far from becoming a household word in America, "the number of Americans eating the product appears to be increasing, at least in Los Angeles.

"The sale of more than one million packages of tofu last year is an increase of 15 per cent over the previous year."

Although it is a good source of protein, it is low in cost, retailing for only 39 to 40 cents for a 20 3/4 inch package [= 30.5 cents a pound].

Two local hospitals serve it to heart patients as a substitute for meat.

Describes briefly how tofu is made. In America it is best known as white cubes in sukiyaki or as the "curd cake in clear soup."

5474. Aoki, H.; Sakurai, M. 1968. Daizu tanpakushitsu no geru keisei ni kansuru kenkyû. IV. Kangen-zai, sanka-zai oyobi hensei-zai no eikyô ni tsuite [Studies on the gelation of soybean protein. IV. On the effects of reducing agents, oxidizing agents and protein denaturants]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 42(9):544-52. Sept. [20 ref. Jap; eng]
Address: Central Research Laboratory, Ajinomoto Co., Inc., Japan.

5475. Koshiyama, I. 1968. Chemical and physical properties of a 7S protein in soybean globulins. *Cereal Chemistry* 45(5):394-404. Sept. [35 ref]
Address: Noda Inst. for Scientific Research, Noda-shi, Chiba-ken, Japan.

5476. Koshiyama, I. 1968. Chromatographic and sedimentation behavior of a purified 7S protein in soybean globulins. *Cereal Chemistry* 45(5):405-12. Sept. [16 ref]
Address: Noda Inst. for Scientific Research, Noda-shi, Chiba-ken, Japan.

5477. Murakami, Hideya; Sagawa, H.; Takase, S. 1968. Non-productivity of aflatoxin by Japanese industrial strains of *Aspergillus.* III. Common characteristics of the aflatoxin-producing strains. *J. of General and Applied Microbiology* (*Tokyo*) 14(3):251-62. Sept. [13 ref. Eng]
• ***Summary:*** The following mycological characteristics were found to be most common in aflatoxin-producing strains of *Aspergillus:* (1) Color of conidial heads is green even in old cultures; (2) The reverse side of the colony is wrinkled and colored; (3) The following are present–sclerotia, globose to subglobose vesicles, biserate stigmata, and conidiophores with roughened walls; (4) High productivity of pigment, total acid, and kojic acid; (5) Low ability to brown rice koji or to produce deferriferrichromes.

Sixteen mold strains were selected from 160 industrial strains as mycologically similar to the so-called aflatoxin strains. Their aflatoxin productivity together with the productivity of 13 aflatoxin strains was investigated using the same methods described in parts I and II. It was found that all of the industrial strains and four of the 13 aflatoxin strains did NOT produce aflatoxin.

Most of the aflatoxin strains used in these experiments were sent from the Northern Utilization Research and Development Division, Peoria, Illinois, USA; most had been proved to produce aflatoxin by the duckling assay. "Rice kojis were made using 10 g of polished rice in 100 ml flasks." On p. 255, two photos show the oval-shaped vesicles of aflatoxin strains, and an illustration shows chromatographic patterns of 29 aflatoxin-producing strains. Table 3 (p. 260) lists the morphological characteristics of 16 industrial aflatoxin strains, including details on the color of the old slant culture, vesicles, conidia, and colony. Table 4 (p. 261) lists physiological characteristics of 16 industrial aflatoxin strains, including details on the pigments, total acid, kojic acid, rice-koji (browning, and DF-value), relative intensity of fluorescence (blue, or green), and pattern of

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TLC (thin-layer chromatograms). Address: Research Inst. of Brewing, Tokyo.

5478. Ouchi, Ichiro; Mochizuki, Tsutomo. 1968. Miso jukusei-chû no chisso seibun no shôchô ni kansuru kenkyû. III. Miso jukusei-chû no yûri amino-san no shôchô ni tsuite [Studies on the degradation of soybean protein during miso making. III. Changes in amino acid content]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 15(9):418-21. [11 ref. Jap]
• ***Summary:*** "Changes in free amino acids during miso making were investigated. Total free amino acids showed a rapid increase in the first 10 days of fermentation and then a slow increase in the latter part. Except for glutamic acid, aspartic acid and proline, liberation of individual free amino acid indicated the same tendency. Free glutamic acid, aspartic acid and proline increased almost linearly with progress in fermentation up to 50 days. The rate of liberation was high for lysine, arginine, threonine, serine, proline and tyrosine, and low for valine, histidine, glycine and aspartic acid. Glutamic acid showed the lowest liberation among all other amino acids." Address: Shinshu Miso Research Inst., Nagano.

5479. Sawyers, Scott. 1968. The soybean market in Japan, Taiwan, and Korea. *Soybean Digest.* Sept. p. 68, 70-72.
• ***Summary:*** The American Soybean Assoc. office in Japan, known as the Japanese American Soybean Institute, has concentrated on mass media and consumer promotions to increase the utilization of soybean oil, meal, and traditional foods prepared from soybeans. In Japan, this means liquid cooking oil, tempura oil, salad oil, vegetable oil margarine, miso, tofu, and soy sauce. Also, the growing preference for more meat, milk, and eggs in the Japanese diet requires the use of more soybean meal to support an expanding livestock and poultry industry. Efforts were made to popularize two slogans: "Take Oil Once a Day for Foods Cooked with Vegetable oil." And: "Take Oil for Health, Stamina, and Vitality." The key focus is to encourage the Japanese to consume more soy oil in their diet. A portrait photo shows Scott Sawyers. Address: Country Director, Japanese American Soybean Inst.-American Soybean Assoc., Tokyo.

5480. Schnittker, John A. 1968. The supply-demand imbalance of soybeans. *Foreign Agriculture.* Oct. 14. p. 4-5.
• ***Summary:*** Discusses the world abundance of soybeans and the opportunities and responsibilities which fall on producing countries. Trade in oilseeds was freed somewhat in the Dillon Round of negotiations back in the early 1960's. The trade door was opened wider in the Kennedy Round of discussions which ended in 1967, when the United Kingdom agreed to completely eliminate the import duty on soybeans and Japan, our major market, agreed to a 50% cut in the import duty on soybeans. Address: Undersecretary of Agriculture.

5481. McCormick, Sally. 1968. Azuma Sukiyaki House: Dine graciously in the Oriental manner–5120 N. Broadway, Chicago (Advertorial). *Chicago Tribune.* Oct. 24. p. G17.
• ***Summary:*** "Other Japanese dinners worthy of trying are New York Steak Teri-Yaki, Filet Mignon Teriyaki, Chicken Teri-Yaki, Fresh King Salmon Teri-Yaki, marinated in soy sauce and Mirin Sake and charcoal broiled, Fresh Rainbow Trout, charcoal broiled Sansho-Miso-Yaki style, Maine Lobster tail Teri-Yaki or Curry Yaki, Tuna or Sea Bass Teri-Yaki or Shio Yaki."

The dinner menu prices range from $4.35 to $6.15.

"The menu also features many side dishes with such exotic names as Cold Tofu, Miso Shiru, Chawan Mushi and many more."

Contains three photos featuring women taken inside the restaurant.

5482. Hanaoka, Yoshio. 1968. Shôyu hozon ni kansuru kenkyû. VIII. Hikôso-teki kappen hannô busshitsu no bobai kôka ni tsuite [Studies on preservation of soy sauce. VIII. Effect of nonenzymatic browning reaction products on antifungal activity]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 46(11):909-14. Nov. [11 ref. Jap; eng]
• ***Summary:*** "A mixture of 0.2 molar D-xylose and 0.1 molar L-amino acid, when heated at 120ºC for 60 minutes, showed an inhibitory effect against the growth of *Saccharomyces rouxii* variety *halomembranic.*" Address: Central Research Inst., Kikkoman Shoyu Co. Ltd., Noda, Chiba, Japan.

5483. Imahara, Hirotsugu; Nakahama, Toshio. 1968. Shôyu no sanmaku-sei kôbo ni kansuru kenkyû. VIII. Kôki seibun ni tsuite [Studies on pellicle producing soy yeast. VIII. On the flavor substances]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 46(11):876-84. Nov. [13 ref. Jap; eng]
• ***Summary:*** Both film forming and non-film forming yeasts are strains of *Zygosaccharomyces* yeast. They form films on top of soy sauce. Address: Faculty of Agriculture, Kyoto Prefectural Univ., Sakyo-ku, Kyoto, Japan.

5484. Izumori, Ken; Omata, Shojiro. 1968. Taien-sei nyûsan-kin *Tetracoccus soyae* no amino-san taisha ni tsuite. I. Threonine no sanka-teki taisha [On the amino acid metabolism by *Tretracoccus soyae.* I. Oxidative metabolism of threonine]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 46(11):869-75. Nov. [27 ref. Jap; eng] Address: Dep. of Agricultural Chemistry, Osaka Prefectural Univ., Sakai, Osaka, Japan.

5485. Kitahara, Seiji; Ishizuka, Zentaro. 1968. Shôyu jôzô bisei-butsu ni kansuru kenkyû. I. Saikin ni yoru moromi

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eki-jiru no kondaku ni tsuite [Studies on microorganisms in soy-sauce brewing. I. On turbidity of soy-sauce caused by bacteria]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 46(11):853-57. Nov. [9 ref. Jap; eng]
• ***Summary:*** Turbidity appeared to be caused by dead microccal cells. Address: Central Research Inst., Kikkoman Shoyu Co. Ltd., Noda, Chiba, Japan.

5486. Shinoda, Osamu. 1968. Tôfu-kô [Thoughts / treatise on tofu]. *Fuzoku* (*Historical Review of Manners and Customs*) 8(11):30-37. Nov. [10 ref. Jap]
• ***Summary:*** An exhaustive search of the early Chinese food literature leads the author to believe that the world's earliest reference to the word *dofu* appears in the *Ch'ing I Lu* (Jap. Seiiroku), written by T'ao Ku in about A.D. 950, just before the Sung dynasty. This was more than 1,000 years after the supposed discovery of tofu by Liu An prior to 122 B.C.

Shinoda (born 1899, and considered by many to be Japan's greatest modern food historian) believes that after the middle of the T'ang dynasty (i.e., after about A.D. 750), the Chinese, who still had no dairy animals, began to make tofu instead of dairy cheese. By the start of the Sung dynasty in A.D. 960, tofu was popular all over China. After publication of the *Ch'ing I Lu,* reference to tofu began to appear in many other Chinese works.

On p. 35 of this article is a table showing the 12 earliest known Japanese documents that mention tofu. The table contains three columns: (1) The title of the document in Japanese. (2) The year it appeared. (3) The name given to tofu in the document (for example, Tofu-jiru, or shirakabe, or dengaku).

The following is our best effort to romanize and translate these. (1) *Kagenki.* [Record]. 1238. Taufu-jiru. (2) *Gion shigyô nikki* [Diary of the execution of Gion]. 1350. Mori. (3) *Inryôken nichiroku* [Daily records of Inryôken]. 1437. Dengaku. (4) *Jinson Daisôjô ki* [Record of Jinson Daisôjô]. 1457. Tôfu. (5) *Oyudono no Ue no nikki* [Diary of Oyudono no Ue]. 1477. Oden. (6) *Gohôkôin Konoe Masaie ki* [Record of Gohôkôin Konoe Masaie]. 1479. Shirakabe. (7) *Ninagawa Chikamoto ki* [Record of Ninagawa Chikamoto]. 1483. Shirakabe. (8) *Shoken nichiroku* [Journal of Shoken]. 1486. Dengaku. (9) *Inryôken nichiroku* [Journal of Inryôken]. 1487. Mura Dengaku. (10) *Rokuon nichiroku* [Journal of the Deer Garden]. 1489. Tofu. (11) *Tsuneatsu Hôin nikki* [Diary of Tsuneatsu Hôin]. 1532. Tofu. (12) *Shishinki* [Record of my heart]. 1534. Tengaku. Address: Japan.

5487. *SoyaScan Notes.* 1968. Chronology of soybeans, soyfoods and natural foods in the United States 1968 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1968, March. Saci, a liquid soymilk in chocolate and caramel flavors, launched by Coca-Cola Industrias Ltda. in Brazil. Indicates growing interest in commercial soy beverages in Third World countries.

1968, April. First Workshop on Soybean held in New Delhi by the Indian Council of Agricultural Research.

1968, April. *Aerobics* by Dr. Kenneth Cooper published. The book soon becomes a major force in America's new wave of interest in health, fitness, and jogging.

1968, May. Conference on Protein Rich Food Products from Oilseeds held by the USDA in New Orleans, Louisiana. Oilseed proteins are increasingly seen as the answer to the "protein crisis."

1968, May. *Ten Talents* self-published by Frank and Rosalie Hurd of Chisolm, Minnesota. An early vegan cookbook (using no meat, eggs, or dairy products) with many innovative soy recipes.

1968. *International Action to Avert the Impending Protein Crisis,* a United Nations publication, recommends soybeans as the single most promising protein source to close the "protein gap."

1968, Aug. Erewhon starts importing foods from Japan, initially from Muso Shokuhin, then later by correspondence with Mr. Akiyoshi Kazama, who worked for an import/export company named Mitoku, which sold no food at that time. The initial orders include red miso (made by one of George Ohsawa's cronies) and natural shoyu made by Marushima. These soon become high-volume items.

1968. *Plant Foods for Human Nutrition,* a scientific journal, starts publication from the Vegetarian Nutritional Research Centre, Watford, Herts, England. Runs many articles on soy nutrition and on vegan diets.

5488. Photographs of Erewhon retail at 342 Newbury Street. 1968. Boston, Massachusetts.
• ***Summary:*** (1) Front of the store. (2) Back of the store. To the left is the door to the office. On the pallets stacks of both multiwall paper sacks (left) and burlap bags (rear). They arrived at the store by the truckload and the workers (including Jean) had to unload them by hand–sometimes hoisting them onto one shoulder. (3) Jean Allison seated at a desk in the Erewhon office.

These photos were sent to Soyinfo Center by Jean Allison Young of Chatham, Massachusetts, in Feb. 2011.

Letter (e-mail) from Norio Kushi. 2011. Feb. 8. These photos were "both taken at 342 Newbury Street, Boston, in 1968 soon after the move from 303-B Newbury to 342 Newbury, in Boston. I am guessing that both photos were taken within minutes of each other.

"The person behind the cash register, facing towards the right in the photo is Eric Utne, who later worked at *East West Journal,* eventually becoming the editor. He later left *East West Journal* and he, along with his then wife, Peggy Taylor, started New Age Journal. When Eric and Peggy split up, Peggy retained *New Age Journal,* with Eric Utne soon thereafter starting *The Utne Reader.* Eric Utne currently lives in Minneapolis [Minnesota] with his wife, Nina...

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"The person facing Eric Utne, might be Jim Ledbetter,... or it could be a customer who I have never met. Jim Ledbetter and Jean Allison both lived at 216 Gardner Road. in Brookline with our family during this time. Eric Utne lived in one of the other study houses, 6 Ellery St, Cambridge, Massachusetts.

"The 2nd photo is of the stockroom in the rear half of the store. The size of the stockroom and how the bags of rice and other commodities are stacked would indicate the photos were taken soon after the move. Shelf space in the retail section kept growing along with business, and the rear storage room, once half the square footage of the store began shrinking as the need to expand the retail space increased, eventually necessitating the opening of the warehouse at 33 Farnsworth St. in Boston. Other than brown rice being in the burlap or paper 100 lb sacks, I don't know what any of the other products would be in the other sacks or boxes.

"As I recall, we didn't start getting the 50 lb organic rice in the paper sacks till after the opening of the Erewhon warehouse. Up till that point I recall the brown rice came in the 100 lb burlap sacks. Therefore, I feel that what is in the paper sacks would be beans and grains other than brown rice.

"I was noticing on the selves to the left there are smaller sacks. All the rice, grains, beans, etc were all packaged from bulk into these bags by hand. The item that was in these bags were rubber stamped onto the front of the bag just prior to filling them.

"We also received many Japanese items, such as shoyu (which we called tamari), miso, and umeboshi in those bulk wooden kegs. They were hand poured or scooped into bottles and jars. I don't see any of these items in this photo. The store photo was also rather Spartan, which is what lead me to feel that these photos were taken soon after moving from 303-B Newbury St. to 342 Newbury St. "I would stop by the store regularly but didn't actually 'work' there during this time. I used to come in and just help out after school or on Saturdays just for the fun of it.

"At the prior location at 303-B Newbury St, I spent many full Saturdays helping out. I was there one Saturday when we had the very first day we did over $100.00 in sales. The other person who was working on that day was Jean Mohan. At least during the 303-B Newbury Street days, people who lived in our house at 216 Gardner Rd, Brookline, MA, would take turns working at the store, although Evan Root was the manager."

Letter (e-mail) from Evan Root. 2011. Feb. 10. These two photos "are of the store at 342 Newbury St. This was the 'first edition.' It was, of course, remodeled from the shell that was rented. But it is before a bigger remodeling which yielded the whole first floor for the store, bins for grains and beans, and a walk-in refrigerator where the office was. The accounting office and storage moved to the basement and a winched lift to bring the goods up for stocking." Address: Boston, Massachusetts.

5489. Ebine, Hideo; Ito, Hiroshi. 1968. [Evaluation of artificial rice by extrusion cooker as raw materials for making miso]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 170. p. 1-. [Jap]*
Address: National Food Research Inst., Tokyo.

5490. Ebine, Hideo. 1968. [Detection of defatted soybeans in miso by a microscopical method]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 177. p. 23-. [Jap]*
Address: National Food Research Inst., Tokyo.

5491. Ebine, Hideo; Sakano, K. 1968. [Production of miso from natto]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 173. p. 23-. [Jap]*
Address: National Food Research Inst., Tokyo.

5492. Ebine, H.; Kimura, H.; Wadaka, H. 1968. [Application of *Rhizopus* for shoyu manufacturing]. *Chomi Kagaku* (*Seasoning Science*) No. 15. p. 1-. [Jap]*
Address: National Food Research Inst., Tokyo.

5493. Ebine, Hideo; Matsushita, Z.; Sasaki, H. 1968. [Evaluation of U.S. soybeans as raw materials for making miso: (Part 1) Miso manufacturing test on a laboratory scale (1)]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 181. p. 19-. [Jap]*
Address: National Food Research Inst., Tokyo.

5494. Fukushima, D. 1968. High-protein food products. In: Proceedings of the Western Hemisphere Nutritional Congress II. See p. 95. *

5495. Funahashi, S. 1968. Systematic determination of soybean sterols in four classes; method and its application to soybean varieties. Tokyo: Dep. of Agricultural Chemistry, University of Tokyo. 46 p. Final report, P.L. 480; project no. UR-A11-(40)-13 on USDA grant no. FG-Ja-107. [10+ ref]*
Address: Japan.

5496. Kawashima, Masao. 1968. Kôri-dôfu seizô ni okeru saikin no gijutsu-teki shomondai [Various recent technical problems in dried-frozen tofu production]. *Shokuhin to Kagaku* (*Food and Science*) 10(8):41-50. Illust. [Jap]
Address: Habutae Tofu K.K.

5497. Komatsu, Y. 1968. Shôyu seisan ni kanyo suru 2, 3 no kôso no dôtai. I. Reisui shikomi ni okeru keinichi-teki seibun henka to kôso kassei no shôchô ni tsuite [Changes of some enzymes in shoyu brewing. I. Changes of the constituents and enzyme activities in shoyu fermentation by low-temperature mashing]. *Chomi Kagaku* (*Seasoning Science*) 15(2):10-20. [13 ref. Jap]

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Address: Hiroshima-ken Shokuhin Kogyo Shikensho (Food Industrial Experiment Station, Hiroshima prefecture).

5498. Kurisu, H.; Iwasa, A.; Iizawa, K. 1968. [Effect of tablets of bacillus natto on the enteric bacterial flora in humans and animals]. *Eisei Shikenjo Hokoku* (*Report of the National Institute of Hygienic Sciences*) 86:99-103. [Jap]*
Address: Japan.

5499. Nagata, Tadao. 1968. [Studies on the significance of indeterminate growth habit in breeding soybeans]. *Ikushugaku Zasshi* (*Japanese J. of Breeding*) 18:235-40; 18:291-98. [Eng; jap]*
Address: Hyogo Agricultural College, Sasayama, Hyogo-ken.

5500. **Product Name:** [Soymee (Meatlike Soy Protein Product) {Renamed Soymea then back to Soymee in 1970s}].
Foreign Name: Soymea.
Manufacturer's Name: Nisshin Oil Mills Ltd. (Nisshin Seiyu).
Manufacturer's Address: Shinkawa 2-2, Chuo-ku, Tokyo, Japan.
Date of Introduction: 1968.
New Product–Documentation: *Soybean Digest.* 1968. March. p. 7. "Meatlike product produced in Japan." The product was named "Soymee" at this time. *Soybean Digest.* 1969. June. p. 44. "Nisshin Oil Co. markets Soymea, leads in manufacture of vegetable protein in Japan." Soybean Digest Blue Book. 1970. p. 108. "Soymea." Soya Bluebook. 1981. p. 63. It is now called "Soymee Soy Protein." Also 1982. p. 67; 1984. p. 60.

5501. Takeda, Ryôsaku; Nakayama, Shigenori. 1968. Kôji-kin no pepuchidaaze ni kansuru kenkyû. III. Kôji no pepuchidaaze kyôka to shôyu sokujô-hô no isshi-an ni tsuite [Studies on the peptidase of *Aspergilli.* III. Enrichment of koji with peptidase and a proposal for rapid fermentation of shoyu]. *Chomi Kagaku* (*Seasoning Science*) 15(3):19-25. [7 ref. Jap]
• ***Summary:*** Also discusses protease, proteinase, endopeptidase, exopeptidase, and peptides. Address: Kagawa-ken Hakko Shokuhin Shikensho (Kagawa-ken Fermented Foods Experiment Station).

5502. Tanegashima, C.; Kirita, Y. 1968. [Investigation of pyridine carbonic acids. IV.]. *Mukogawa Joshi Daigaku Kiyo. Seikatsu Kagaku-hen* (*Scientific Reports of Mukogawa Women's Univ.–Domestic Science Series*) 16:93-98. [Jap]*

5503. Tenbata, M.; Morinaga, T. 1968. [Fermenting ability and the refined degree of soy moromi by addition of chemical soy sauce]. *Hiroshima-ken Shokuhin Kogyo Shikenjo Hokoku* (*Research Report of the Hiroshima Prefecture Food Research Institute*) 10:37-44. [Jap]*

5504. Tsuno, S.; Matsumoto, M. 1968. [Studies on the nutritional value of Natto Prorich II. Part I Purification and some properties of the protease]. *Kobe Daigaku Kyoikugaku-bu Kenkyu Shuroku* (*Bulletin of the Faculty of Education, Kobe University*) 40:49-60. [Jap]*

5505. Abehsera, Michel. 1968. Zen macrobiotic cooking. New Hyde Park, New York: University Books/Avon. 224 p. Index. 18 cm. [15 ref]
• ***Summary:*** Abehsera's first macrobiotic cookbook contains a strict approach to macrobiotics. Includes many short stories by and about George Ohsawa.

In the Introduction, the author states (p. 13) that if he had been asked to write a cookbook 5 years ago, he would have been utterly amused, for he was in a precarious state of health and, for him, a cookbook was basically a collection of "recipes for stuffing one's belly.

"These five years have been an exhilarating adventure and happiness spent with my dear wife and children together with a 'thousand' friends. The anguished thoughts of a 28-year-old have been dissipated and he has been freed from the tortures and agony that previously pervaded his existence.

"This new and happy change has been due to the profound influence of George Ohsawa, who made it possible for me to recover my health so that I could leave France [Paris] and journey to New York, the city of my dreams. Now, I have decided to write a cookbook."

Contains the following soy-related recipes: Miso spread (with sesame butter, p. 105). Miso onion spread (p. 106). Miso in green (with green pepper and scallion, p. 106-07). Miso soup (p. 117). Chinese soup (with miso, p. 120). La belle jardiniere (with miso, p. 123). Koi-koku (with carp, burdock, and miso, p. 125-26). French onion soup (with tamari, p. 132). Soup stock made with miso paste (p. 137). There are no tofu or seitan recipes in this book. It is not a vegetarian cookbook, since many recipes call for fish and seafood.

Monthly publications (p. 208): (1) *Yin-Yang,* Centre International Ignoramus, 26 Rue Lamartine, Paris 9eme, France. (2) *The Macro-Biotic Monthly,* Ignoramus Press, Los Angeles, California. (3) *The Order of the Universe,* Order of the Universe Publications, Box 203, Prudential Center Station, Boston, Massachusetts.

Shopping guide (p. 209-10): Those marked with an asterisk (*) welcome mail orders. (1) Chinese products (incl. tofu, woks): Wo Fat Co., 16 Bowery, New York, N.Y. 10013. Mon Fong Wo Co., 36 Pell St., New York, N.Y. 10013. Yuit Hing Market Corp., 23 Pell St., New York, N.Y. 10013.

(2) Organic fruits, vegetables and whole grains. Also oil, sea salt and many other health foods. * Good Earth–Natural

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Foods, Inc., 1336 First Ave., New York, N.Y. * Nature's Cupboard, 80 E. Seventh St., New York, NY. Living Foods Coop, Inc., 165 Ninth St., New York, N.Y. * Greenberg's. 125 First Ave., New York, N.Y.

The next two stores are the same as above but no fruits and vegetables: * Brownie's Natural Food Stores, 21 E. 16th St., New York, N.Y. * Kalustyan Orient Export Trading Corp., 123 Lexington Ave., New York,

(3) Japanese food products: Bancha tea, seaweed, Japanese vegetables, Japanese knives, soba and udon noodles, dried lotus, burdock, tofu, sesame seeds, bonito and other dried fish, tawashi [vegetable scrubbing brush], daikon [giant white radish]: * Japan Mart Inc., 239 W. 105th St., New York, N.Y. Katagiri & Co., Inc., 224 E. 59th St., New York, N.Y. Tanaka (K.) Co., Inc., 326 Amsterdam Ave., New York, N.Y.

(4) Wholesale organic products and all macrobiotic products: Chico San, Inc., 1262 Humboldt, Chico, California. The Infinity Co., New York, N.Y., 10012. Balanced Foods, 2500 83 St., North Bergen, N.J. [New Jersey]. Specialty Food, 116 W. Houston St., New York, N.Y.

Glossary (p. 211-15): Aduki or azuki beans, bancha, bonito flakes, brown rice, bulgur, burdock, cellophane noodles, chapati, couscous, daikon, ginseng tea, gomasio [gomashio], hiziki [hijiki], Japanese knife, kasha, kokkoh [grain milk; weaning food for babies], kuzu, lotus tea or kohren tea, miso, mu tea, nituke [nitsuke], nori, sea salt, semolina, soba, soy or soya sauce (see tamari), suribachi, tahini, tamari, tempura, tofu, udon, umeboshi plums, vegetable brush or tawashi, wok.

A few glossary definitions: "Tamari: A pure soy sauce concentrate, a byproduct of miso. Commercial soy sauce is not recommended; macrobiotic stores have the right kind."

"Tofu: A curd made of the liquid in which crushed soybeans have been softened; it is solidified by boiling" [sic].

Note: This book was published in London in 1969 by Anchor Press, Ltd. (201 p.). Address: New York.

5506. Akizuki, Tatsuichiro (Akiduki). 1968. Miso. Translated by Herman Aihara. *Macrobiotic Monthly* 8(5):6-12. [1 ref]
• ***Summary:*** Discusses miso in the treatment of tuberculosis and atomic radiation exposure. On 9 Aug. 1945 the atomic bomb was dropped on Nagasaki. It killed many thousands of people. Dr. Akizuki was in charge of the St. Francis Hospital, located only 1 mile from the center of the blast in Nagasaki. The hospital was completely destroyed. He and his assistants helped may victims who suffered the effects of the bomb. He noticed that none of his co-workers suffered or died from radiation. He attributed this to the fact that they had developed a strong constitution by consuming miso soup and brown rice daily. He considers miso to be the highest form of medicine. It produces an alkaline condition in the body. Address: Chico, California.

5507. Borgstrom, Georg. 1968. Principles of food science: Food microbiology and biochemistry (Vol. 2). New York, NY: Macmillan. xiv + 473 p. Index. 26 cm. [9 ref]
• ***Summary:*** In Chapter 4, "Fermentation," is a section titled "soybeans" (p. 110-12) which discusses: Tofu or teou-fu, miso, sufu, natto, tempeh, taotjo and ketjap (shoyu / soy sauce).

"Frozen tofu (kori tofu, or koya dofu) is tofu that has been frozen for several weeks and dried. Aburage is fresh tofu dried in deep fat. Namaage is fresh tofu that has been surface-fried."

In Chapter 10, "Trends in food utilization," is a section titled "Soybean" (p. 297-301) which discusses: Soybean products and fermented products ("These foods are all rather unknown among Western peoples, although they are eaten by millions of people and constitute some of the most common foods on earth." Yet some "typical oriental soy foods," such as tofu and tempeh, are finding acceptance in the West. One soy product that is widely used in most parts of the world is soy sauce. Soy flour and soy grits were first made commercially in the USA in the early 1930s. Milk made from the soybean is important in China {see Vol. I, Chap. 15}. Fermented products include taotjo, soy sauce or ketjap). Soybean protein, including soybean oil and defatted soybean oil meal (In 1961, 9.5 million tons of soybean oil meal was used in the USA, mainly for animal foods, with special grades used for food and industrial products, such as isolated soybean protein. Purified proteins extracted from dehulled and defatted meal, when toasted, are used in "Civil Defense emergency rations" and by the "international organization Meals for Millions." Some 90% of the processed soybean oil in the USA now goes into food uses. Soybean oil is now the most important ingredient in oleomargarine {see Fig. 10.1}. About one-third of the soybeans moved off the farm are exported; Japan is our biggest customer {taking about 57%} followed by Western Europe {27%}, Canada {8%} and Israel {5%}). Soybean uses (Despite its nutritive value, "the soybean is not looked upon with favor in many areas" for two main reasons: it does not soften well during cooking and it is difficult to digest. Many other legumes share these problems, but they are generally require less cooking. When soy flour is used, alone or with cereal flours, the drawbacks almost vanish. "Soybean milk is not comparable to animal milk or human milk except in protein content." And it usually has an unpleasant, bitter taste, but this can be removed at least cost by bulk processing. When soybean curd is made in the typical way, "many nutritious components are lost," yet it is easy to digest. Soy sauce can be used only as a condiment because of its high salt content. Germinated soybeans make an excellent vegetable, which is rich in vitamin C).

Table 10-1 (p. 300) shows utilization of soybean oil (in millions of pounds) (1947-49 to 1967). The columns are: Shortening (the largest use and steadily increasing),

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margarine, cooking, salad and other edible oils (No. 2), total for food uses, total nonfood uses.

Toasted soy protein (Made by General Mills, starting in Belmont, Iowa, and named Hi-Pro and Protein Plus. "The Belmont plant has been running at capacity to supply for American Civil Defense stockpiling of toasted soy protein"). MPF (Multi-Purpose Food) made by a joint venture between General Mills and the Meals for Millions foundation. Gelsoy (the "first vegetable protein found to have gelling properties"). Promine (an edible soy protein). Fibrotein (soy protein spun into edible filaments). Soybean oil (The initial purpose of the U.S. soybean crushing industry was to obtain oil. The residual meal was considered virtually useless).

Chapter 13, titled "The world food issue," is about world hunger, which is "an ever-present specter for 2.3 billion people of the present world population of 3.4 billion." These people are concentrated largely in warm parts of the globe. Also discusses "protein malnutrition" (the main problem) and the need for more animal protein. North America has an animal protein "intake nine times that of the Far East." A section on "Plant milks" (p. 428-29), which are made from pulses and cereals, includes a subsection titled "Soybeans" which begins: "Soybeans form the basis of the most widely used and successful plant milks in China, Hong Kong, Indonesia, and the Philippines. Such milk has recently become available in Europe and the United States, primarily for clinical purposes"–for children allergic to the proteins in cows' milk.

Notes: Many references, divided into English and non-English, books and papers, are given at the end of each chapter. Address: Michigan State Univ.

5508. De Mente, Boye; Perry, Fred Thomas. 1968. The Japanese as consumers. New York and Tokyo: Weatherhill/ Walker. *

5509. Fukui, J. ed. 1968. [Soybean breeding]. Tokyo: Rateisu (Latice). 200+ p. [Jap]*

5510. Fukui, Juro. 1968. Soy-bean breeding in Japan. *JARQ* (*Japan Agricultural Research Quarterly*) 3(3):5-9. [Eng]
• ***Summary:*** The local soybean varieties local to the cold part of Kushiro, Hokkaido are "a survival after long and severe natural selection." Note: Kushiro is in the far eastern part of Hokkaido. In Japan, these local varieties are collected, investigated and widely used in modern soybean breeding. Address: Prof., Faculty of Agriculture, Iwate Univ.

5511. Hawkes, Alex D. 1968. A world of vegetable cookery: An encyclopedic treasury of recipes, botany and lore of the vegetable kingdom. New York, NY: Simon and Schuster. 274 p. See p. 213-14. Illust. by Bill Goldsmith. 29 cm.
• ***Summary:*** The section titled "Soybean" focuses on green vegetable soybeans, noting: "In the Orient and increasingly in such places as Hawaii and California in this country, green Soybeans are for sale as a fresh vegetable. The plants have pod-laden branches, each short, narrow, very hairy pod containing three or four edible seeds. The fresh Soybean pods are washed, then boiled in lightly salted water until they are soft. Drained, they are seasoned to taste with soy sauce and a bit of sugar, then served, the beans being shucked from the pods at table."

There is a casserole recipe named "Miss Diddley's Green Soybeans." Also discusses briefly dried soybeans, roasted soybeans "ground into a meal and into flours of various degrees of coarseness [roasted soy flour] and "even used as a substitute for coffee, sprouted soybeans (a recipe is given for "Soybean Sprouts Cantonese"), soy oil, soy sauce, tofu, and miso. The author notes: "I often prepare my own version of *miso,* using dried navy or other white beans (see p. 44), instead of utilizing the commercial imported variety."

"Tôfu is the curd of cooked, mashed white soybeans, which has been precipitated, then pressed into cakes. It is perishable, hence most conveniently bought in cans, water-packed. The rather soft but firm cakes–sometimes baked or even fried prior to canning, and respectively known as *yakidôfu* and *aburage*–have a bland flavor, vaguely reminiscent of a custard. It is just this suavity which makes *tôfu* so valuable, since it quickly absorbs the flavors around it in such things as soups, sukiyaki, and mizutaki, yet retains its exceptionally pleasant substance. *Tôfu* is to be found in many of our domestic markets, imported from Japan. With its high content of readily digestible protein, it should be better known by all Americans."

5512. Ito, K. 1968. Miso no chômi kinô ni tsuite. II. [Tasting effect of "miso" as a seasoning. II.]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 21(1):1-3. [8 ref. Jap; eng]
• ***Summary:*** By cooking miso and mackerel together, C-20 and C-22 fatty acids with 5 or 6 double bonds (which are sources of fish odor), were decreased.

5513. Iwadare, Shoji. 1968. Nihon-teki chôju-hô [Japanese methods for life extension]. Tokyo: Oobunsha. [Jap]*

5514. Kikkoman Shoyu K.K. 1968. Kikkôman Shôyu shi [History of Kikkoman Shoyu]. Noda, Japan: Kikkoman Shoyu K.K. 804 p. Illust. No index. 26 cm. [113 ref. Jap; eng+]
• ***Summary:*** This is the third (and best) major history of Kikkoman, written largely by Mr. Morio Ichiyama. Contents: Preface. I. Overview–1. Fermented foods. 2. Japanese shoyu. II. Present status: 1. Overview of Noda (p. 15): Location, overview photo of city area. 2. Main building and facilities (p. 18): Main office, Tokyo branch, Osaka branch, plant No. 7, Kansai plant, inside the fermentation plant, bottling plant, sake making plant, food manufacturing plant, Goyo Gura

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traditional shoyu facility, Central Research Center. 3. The distribution and view of the buildings (p. 36): Distribution chart of the main buildings in the Noda area, view of the plant, water providing facility. 4. Products (p. 41): Shoyu, products made by food manufacturing department and sake brewing department. 5. Sales and marketing (p. 44): Domestic, overseas. 6. Welfare facilities (p. 48): Health center house, attached hospital, cultural gymnasium, dormitory and company housing quarters. 7. Connected enterprises (p. 50): *K.K. Senshûya* (*Chiaki*), foundational juridicial person / (*kôfûkai*), foundational juridicial person / (*Noda Sangyo Kagaku Kenkyusho*), *Sôbu-Tsûun K.K.*, Kikkoman International, Inc., Tone Coca-Cola Bottling Co., Kikko Food Industry K.K., Seishin Seiyaku K.K. (pharmaceutical company), Mann's Wine K.K. 8. The staff members (p. 58).

III. History. 1. The history of shoyu (p. 61): History of shoyu, origin of character meaning shoyu, Daishokuzen and Shoin, Zashin of Shoin, the beginning of shoyu exports (p. 76), the first shoyu plant overseas, shoyu which was protected by the Lord of the Han (*Hanko*), references to Noda Shoyu in literature. 2. Trademarks (p. 86): The change of trademark, the origin of the Kikkoman trademark. 3. Management of the organization (p. 91): Changes in organization, changes in management, changes in bookkeeping. 4. Production (p. 118): History of the method, raw materials, processes, containers, sauce, new seasonings, various kinds of sake. 5. The plant (p. 231): Noda plant, Kansai (Osaka-Kyoto area) plant, sake making plant. 6. Research center (p. 265): History of the research center, achievements. 7. Businesses (p. 269): Sales, wholesale, business customs, export, transportation, prices, advertising, business offices, overseas activities. 8. Labor (p. 375): Changes in labor conditions, the labor union, labor relations board. 9. Welfare (p. 393): Health insurance union, medical facilities, dormitories for single workers and company housing quarters, day care center, travel club, fire department, committee for funerals, weddings, etc. (*Kyozaikai*), athletic association, cultural committee, Noda Shoyu co-op.

IV. Pre-history–Before the company's establishment. 1. Natural and environmental history of Noda (p. 415). 2. Development of the shoyu industry in Noda (p. 432). 3. Family tree (p. 440). 4. Brief description of the major contributions (p. 448, incl. Kotohira Shrine, Kameo Mogi's theory of business, founding of the Senshu-kai, the man who emphasized thrift and simplicity, the 1st president of the company, the 2nd president–Mogi-Honke, the 3rd president Chu-do Kikkoman Kuramoto).

V. Company history. 1. Developmental stage and established stage (p. 469): Outline, foundation of the company, beginning of the business, developments and labor problems, overproduction and the business world. 2. The new order and the controlled economy during World War II (p. 494): Outline, changes during the war, process under controlled economy during the war. 3. The U.S. occupation period (p. 519): Outline, development of democracy, danger of the business world, changes caused by international conditions. 4. Development period of new Japan (p. 547): Outline, quickening of economic growth, advancing technology, a step forward to modernization, diversification of the business.

Appendixes: 1. Company time table (20 p.). 2. Charts and graphs concerning the company's history (5 p.). 3. Food history and shoyu (193 p., including many old illustrations, photos, a 38-page chronology of Japanese food culture {p. 137-75}, and a bibliography {p. 191-93}). Closing remarks (2 p.). Contains many photos, illustrations, and copies of early documents.

Note: Ichiyama is not listed in this book as the author, even though he wrote it. On the copyright page the author is given as Kikkoman K.K. Continued. Address: Noda, Japan.

5515. Kikkoman Shoyu K.K. 1968. Kikkôman Shôyu shi [History of Kikkoman Shoyu (Continued–Document part II)]. Noda, Japan: Kikkoman Shoyu K.K. 804 p. Illust. [113 ref. Jap; eng+]

• ***Summary:*** The section on the beginning of shoyu exports (p. 76) states that the exporting of shoyu from Japan began when a group of merchants were allowed to do business after the closing of Japan during the Kan-ei era (1624-30) of the early Tokugawa period. In 1641 a group of Dutchmen moved to Nagasaki from Hirado. At that time, two merchants already in business were allowed to conduct trade: Their names were Koyanagi Heizaemon and Sameya Hisazaemon. They established a stock company with 16 shares. The shareholders were called *Dejima shoshiki urikomi shônin.* To the original two merchants, in 1653 four more were added and in 1666 ten more were added, making a total of 16. These were called the "Comprador Merchant Guild" (*Konpura Nakama*). They started exporting shoyu from Japan. According to documents in the Hague: 1668–It was exported to Coromandel on the southeast coast of India. 1670–To Ceylon. 1699–To Ceylon, Bengal, and Nakabatanam. 1716–To Coromandel. 1717–To Suratt, in northwest India. Furthermore, the Dutch took shoyu to Europe. So we can see that in the late 1600s and early 1700s the people of Europe started to use shoyu.

The section on exports (p. 294-99) states that it is difficult to tell when shoyu from Noda was first exported from Japan. In 1879 a person named Domoto (?) got one Kikkoman brand and its logo (in the shape of a hexagon, but not the current Kikkoman logo) registered in California, and then he started to sell the product there. In about 1899 the Saheiji MOGI family's Kikkoman brand shoyu began to be exported to Hawaii via Okada-shoten, a company with offices at Koamicho 3-5 in Tokyo. In 1907 the Verleysen-Nyssens company in Brussels, Belgium, began to import

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shoyu in large kegs. They repackaged it in grey ceramic bottles of their own design, then published a pamphlet in French (see p. 295) describing the product (which they called "Soya") and showing a photo of two sizes of bottles. A 1.2 liter bottled retailed for 1.75 francs. Page 296 shows a gift coupon from the year 1922 from America. When a person buys a bottle of shoyu, he or she gets this $0.50 coupon.

Excerpts from Appendix 3 (p. 152+): Chronology of food history. 1610–Tamari was made in Nagoya using only soybeans when the Nagoya Castle was built. 1615–Dried nori sheets invented in Edo.

1616–Shoyu started to be made in Choshi, Shimousa.

1661–Takanashi (1661) and Mogi (1662) families in Noda started to make shoyu and miso.

1666–Usukuchi shoyu started to be made in Tatsuno, Hanshu / Banshu by a certain man. And Bizen shoyu started to be made in Bizen.

1698–Shoyu wholesaler (*tonya*) first appeared in the literature in *Sonazaki Shinju,* by Chikamatsu Monzaemon.

1781–Kanro shoyu starts to be made. Mr. Takada offered shoyu to Yoshikawa-ko and received the admiration / appreciation of *kanro* ("sweet dew").

1810–Choshi Shoyu received the *gozengoyô* Tanaka-gen han bakufu.

1829–The Takanashi house of Noda received the Bakufu's order for shoyu (*goryomaru*)**.** Address: Noda, Japan.

5516. Kojiki: Record of ancient matters. Translated and with and introduction by Donald L. Philippi. 1968. Tokyo: University of Tokyo Press. vii + 655 p. See p. 87, 404-05. Index. 24 cm. [Eng]
• ***Summary:*** This is an English-language translation of Japan's oldest chronicle, the Kojiki, written in 712 A.D. The text concerning the origin of soy beans in Japan is given under the original document. In Appendix A (p. 404-05) is a translation of the portion of the *Nihon Shoki* that relates to soybeans. Philippi notes, in comparing the two: "The similarities of this myth [the Nihon Shoki] with the Chinese P'an-ku myth have often been pointed out, but there appear to be even more strikingly similar myths in Taiwan and the Philippines. Matsumura, arguing from the rather large divergences in detail between the *Kojiki* and *Nihon shoki* versions, concludes that this myth was originally a native Japanese folk tale which was incorporated into the official mythology in various current versions.

"Some of the explanations suggested for the slaying of the food-goddess are: the idea that all things of value in life originated in a criminal act; the practice of slaying a victim to ensure a good crop; the practice of performing rites to pacify the grain spirits slain when plants are cut down at harvest."

Concerning azuki, the *Kojiki* states that when the god *Susano no Mikoto* came to earth, he killed a man and azuki sprang from the man's nose. Address: Philippi: Tokyo.

5517. Kono, Tomomi. 1968. Shôyu no hyakka [Everything about shoyu]. Tokyo: Shinju Shoin. 175 p. [Jap]

5518. Kuriyama, Kiichi. 1968. Shizen shoku no kôryoku [The efficacy of natural foods]. Tokyo: Tokuma Shoten. 235 p. 18 cm. [Jap]*
• ***Summary:*** Discusses a natural foods, vegetarian diet. The author was born in 1889.

5519. Matsushita, Ryuichi. 1968. Tôfuya no shiki: Aru seishun no kiroku [The four seasons at a tofu shop: The record of a young man]. Tokyo: Kodansha. 313 p. 20 cm. [Jap]
• ***Summary:*** The author, a tofu maker and waka poet, gives a poetic description of his daily life, throughout the year, in a tofu shop. Address: Tokyo, Japan.

5520. Saga Prefectural Agric. Exp. Station. 1968. [Studies on the breeding of high protein soybean varieties]. In: J. Fukui, ed. 1968. [Soybean Breeding]. Tokyo: Latice. See p. 98-147. Chap. 5. [Jap]*

5521. Watanabe, Tokuji. 1968. Advanced technology in non-fermented soybean foods in Japan. *JARQ* (*Japan Agricultural Research Quarterly*) 3(4):9-13. [7 ref. Eng]
• ***Summary:*** A landmark article, filled with new and accurate information. Contents: Introduction. Tofu and derived foods: Fresh tofu (incl. "momen tofu," "kinugoshi," and "packed tofu." Glucono-delta-lactone has been known for the past several years as a coagulant for kinugoshi and packed tofu), aburage ("Thin sliced tofu"), kori-tofu (also called "dried tofu" it is made by freezing hard fresh tofu). Soybean protein concentrates: Dried soybean milk, 70% protein concentrates, soybean protein curd. Isolated soybean protein. Soybean protein fiber (a thick solution of alkaline isolated soybean protein is forced through spinnerettes into a batch consisting of an acid and salt mixture). Conclusion.

Note. This is the earliest English-language document seen (April 2013) that uses the term *momen* refer to a type of tofu.

Each year about 2,000,000 metric tons of soybeans are consumed in Japan. Most of these are imported from the United States or Communist China. Of this total, about 1,300,000 metric tons are crushed to make soybean oil and meal; about 75% of defatted soybean meal is fed to animals. Of this total, one million metric tons (included a portion of the defatted soybean meal) are used by the food industry to make human foods and condiments.

Although the demand for soybeans in Japan is increasing steadily, domestic production is decreasing, largely because imported soybeans are less expensive.

Traditional Japanese fermented soybean foods include

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miso, soysauce, and natto. Traditional non-fermented foods include tofu, aburage, koritofu, and kinako. Moreover a number of new foods or food materials are derived from defatted soybeans; they can be used in fish and meat products.

In fresh tofu, a nitrofuran derivative is permitted to be added as a preservative in amounts up to 5 parts per million.

Kinugoshi is made by mixing thick soybean milk at about 70ºC with calcium sulfate suspended in water in a box which has no holes. The milk coagulates into a homogeneous gel without separation of curds and whey.

Packed tofu is made by mixing cold thick soybean milk with a calcium salt in sausage-shaped plastic film bags. Each bag is then sealed closed and immersed in hot water at 90º C for 40 minutes. The soybean milk coagulates into a homogeneous gel like kinugoshi. "Packed tofu is more sanitary, transportable and preservable than momen or kinugoshi."

In some modern factories, aburage is made on a larger scale than momen tofu, using a continuous deep-fryer. There are more than 10-20 aburage factories in Japan which consume at least 600 kg of soybeans per day.

A detailed description of the process for making kori-tofu is given. Several kori-tofu factories consume at least 10 metric tons of soybeans a day.

Small photos show: (1) Fresh tofu soaked in cold water ready to be sold. (2) Continuous manufacture of packed tofu (made with GDL). (3) Equipment for making packed tofu from spray dried soybean milk. (4) Continuous deep-frying equipment for making aburage. (5) Bird's-eye view of a large-scale kori-tofu factory. (6) Soaking tofu cakes in cold water for pre-cooling and removing excess calcium chloride in making kori-tofu. (7) Continuous freezing of cut tofu cakes in making kori-tofu.

Flow sheets show: (1) Kori-tofu making. (2) Fresh tofu making. Address: Head, Food and Nutrition Div., Food Research Inst., Japan.

5522. Zenkoku Shoyu Kogyo Kyodo Kumiai Rengokai. ed. 1968. Nihon shôyu gyôkai shi. Dai 2 kan [History of the Japan Shoyu Association. Vol. 2]. Tokyo: Nihon Shoyu Gyokai. 473 p. [Jap]
Address: Tokyo, Japan.

5523. *Macrobiotic* (*The*) (*Carmichael, San Francisco, and Orville, California*). 1969-1978. Serial/periodical. George Ohsawa Macrobiotic Foundation. Vol. 9, No. 1 (Jan. 1969) to Issue No. 127 (Dec. 1978). Frequency: Irregular.
• ***Summary:*** Preceding title: The Macrobiotic Monthly. Succeeding title: GOMF News.

Most issues are dated. Place of publication varies: Vol. 9, No. 1 (Jan. 1969) to Vol. 9, No. 4 (April 1969) were published in Chico, California.

Vol. 9, No. 5 (May 1969) to Vol. 10, No. 4 (Nov. 1970) were published in Carmichael, California.

Vol. 11, No. 1 (Jan. 1969) to Issue No. 98 (May 1974) were published in Can Francisco, California.

Issue No. 99 (July 1974) to Issue No. 127 (Dec. 1978) were published in Oroville, California.

The name of the publisher changed starting with Vol. 11, No. 1 to George Ohsawa Macrobiotic Foundation from Ohsawa Foundation, Inc.

5524. Kawashima, Masao. 1969. Kôri-dôfu seizô gijutsu no kindaika to kogaku no ôyô [Modernization of and application of engineering to dried-frozen tofu production techniques]. *Shokuhin Kogyo* (*Food Industry*) 12(2):41-51. Jan. Illust. [Jap]
Address: Habutae Tofu K.K.

5525. Kitahara, Seiji; Ishizuka, Zentaro. 1969. Shôyu jôzô bisei-butsu ni kansuru kenkyû. II. Moromi eki-jiru kondaku saikin no dôtei [Studies on microorganisms in soy-sauce brewing. II. Identification of bacteria causing turbidity in soy-sauce]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(1):1-7. Jan. [5 ref. Jap; eng]
• ***Summary:*** Two strains were identified as *Micrococcus ureae* and *Micrococcus caseolyticus*. Address: Central Research Inst., Kikkoman Shoyu Co. Ltd., Noda, Chiba, Japan.

5526. Okuhara, Akira; Nakajima, T.; Tanaka, T.; Saito, N.; Yokotsuka, T. 1969. Shôyu no iro. II. Iro no antei-sei [Color of soy sauce. II. Stability of color]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(1):57-68. Jan. [24 ref. Jap; eng]
Address: Central Research Lab., Kikkoman Shoyu Co. Ltd., Noda, Noda-shi, Chiba prefecture, Japan.

5527. Okuhara, Akira; Harada, M.; Saito, N.; Yokotsuka, T. 1969. Shôyu no iro. I. Sansei hakudo ni yoru dasshoku [Color of soy sauce. I. Pigment adsorption on acid clay]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(1):50-68. Jan. [6 ref. Jap; eng]
• ***Summary:*** "Acid clay can be used to decolorize soy sauce; it adsorbs the pigment but hardly adsorbs the flavor."

Note: *Webster's Dictionary* defines adsorb (a term first used in 1882) as "to take up and hold by adsorption." Adsorption is "the adhesion in an extremely thin layer of molecules (as of gases, solutes, or liquids) to the surfaces of solid bodies or liquids with which they are in contact–compare absorption." Address: Central Research Lab., Kikkoman Shoyu Co. Ltd., Noda, Noda-shi, Chiba prefecture, Japan.

5528. Saio, Kyoko; Koyama, Emiko; Yamazaki, S.; Watanabe, T. 1969. Protein–calcium–phytic acid relationships in soybean. III. Effect of phytic acid on

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coagulative reaction in tofu-making. *Agricultural and Biological Chemistry* 33(1):36-42. Jan. Reprinted in English in Shokuryo Kenkyusho Kenkyu Hokoku 25:181-88 (1970). [9 ref]
• ***Summary:*** Phytic acid, which is naturally present in soybean seeds, or when added to soybean milk, had significant effects on the physical properties of prepared tofu-gel. The higher the content of phytic acid in soybean milk, the slower the coagulative reaction between soybean protein and calcium; a slow reaction is favorable for tofu gel formation. Address: 1&4. Food Research Inst., Ministry of Agriculture & Forestry, Fukugawa, Koto-ku, Tokyo, Japan; 2-3. Japan Tofu Assoc.

5529. Hesseltine, C.W.; Wang, H.L. 1969. Oriental fermented foods made from soybeans. *USDA Agricultural Research Service.* ARS-74-50. p. 45-52. Feb. Proceedings of the Ninth Dry Bean Research Conference.
• ***Summary:*** Contents: Introduction. Koji. Shoyu or soy sauce. Miso. Hamanatto. Sufu. Tempeh. Natto. Idli. Conclusion. Flow sheets (without quantities of ingredients) show the basic process used in making the following foods: shoyu, miso, hamanatto, sufu (fermented tofu), and tempeh.

A photo taken in Aug. 1948 shows a miso plant in Tokyo, Japan, with large wooden vats in the foreground. A part of this plant was destroyed during World War II.

Note: No mention is made if using soybeans in idli, nor is there a flow sheet showing the process for making idli. Address: Northern Utilization Research and Development Div., USDA, Peoria, Illinois.

5530. Koshiyama, Ikunori. 1969. Distribution of the 7S proteins in soybean globulins by gel filtration with Sephadex G-200. *Agricultural and Biological Chemistry* 33(2):281-84. Feb. [9 ref]
• ***Summary:*** Five photos show the ultracentrifugal patterns of each fraction of SPI separated by gel filtration with Sephadex G-20. Address: Noda Inst. for Scientific Research, Noda, Japan.

5531. Miyata, K.; Takada, R. 1969. Saikin no tamari shôyu no jôzôhô [Current method for making tamari shoyu]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 64(2):148-52. Feb. [10 ref. Jap]
Address: 1. Aichi-ken Miso Tamari Shoyu Kogyo Kyodo Kumiai; 2. K.K. Aichi Kenjosha Kenkyu Shitsu.

5532. *Soybean Digest.* 1969. Hybrid yeast for shoyu making. Feb. p. 28.
• ***Summary:*** The new hybrid yeasts were "bred from *Saccharomyces rouxii,* the chief fermentation yeast used in making shoyu, in P.L. 480 research sponsored by USDA's Agricultural Research Service. Development of the hybrid is one of the most significant applications to date of yeast breeding for the production of fermented soybean foods, says Dr. Clifford Hesseltine, ARS microbiologist. Groundwork for this breakthrough was laid at the ARS Northern Utilization Research Laboratory, Peoria, Illinois, by microbiologists Dr. Lynferd J. Wickerham and Kermit A. Burton...

"The Japanese work was directed by Dr. Masatoshi Mogi. These studies were conducted at the Noda Institute for Scientific Research, Noda City, Japan."

5533. Tanaka, Teruo; Saito, N.; Nakajima, T.; Yokotsuka, T. 1969. Shôyu no kannô kensa-hô ni kansuru kenkyû. VI. Aji no sôgo kankei to baransu [Studies on sensory evaluation of soy sauce. VI. Interrelation and harmony of flavor]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(2):137-45. Feb. [13 ref. Jap; eng]
Address: Central Research Inst., Kikkoman Shoyu Co. Ltd., Noda, Chiba, Japan.

5534. Umeda, I.; Nakamura, K.; Yamato, M.; Nakamura, Y. 1969. Investigations on comparative production of shoyu (soy-sauce) from defatted soybean meals obtained from United States and Japanese soybeans and processed by United States and Japanese methods. Japan Shoyu Research Inst., #9, 3-chome, Koami-cho, Nihonbashi, Chuo-ku, Tokyo. 103 p. Final technical report. USDA P.L. 480. Project no. UR-A11-(40)-21. Grant no. FG-Ja-117. 1 Aug. 1965 to 20 Feb. 1969. [Eng]
• ***Summary:*** In accordance with the Europeanization and instantization of Japanese cooking styles these days, soy sauce consumption per capita has been decreasing. In 1957, total Japanese production of soy sauce exceeded 1.1 million Kl [kiloliters = 1,000 liters]. Thereafter, however, production stagnated and is currently at 1.2 million Kl.

There are more than 4,000 soy sauce manufacturers in Japan, however most of them are smaller enterprises, and only five have large factories. The big five produce 35% of soy sauce made in Japan.

About 160,000 tons of defatted soybean meal and only 15,000 tons of whole soybeans are used to make soy sauce in Japan. Address: Japan Shoyu Research Inst., #9, 3-chome, Koami-cho, Nihonbashi, Chuo-ku, Tokyo, Japan.

5535. McCormick, Sally. 1969. Azuma Sukiyaki House: A bit of Japan in the heart of Chicago–5120 N. Broadway, Chicago (Advertorial). *Chicago Tribune.* March 20. p. W13.
• ***Summary:*** "It was a pleasure watching her prepare Beef Sukiyaki... Then soy bean cakes [tofu], soy sauce, dry onions and rice wine were stirred into the pan." Azuma also serves Beef Teriyaki, Chicken Teriyaki, and Salmon Teriyaki. Three photos show Azuma Sukiyaki House.

5536. Pepper, Thomas. 1969. Food kept seasonal: In Japan. *Sun* (*Baltimore, Maryland*). March 20. p. D1.
• ***Summary:*** The recipe for Mizutaki calls for "2 cans of

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'tofu,' Japanese soy bean curd." It should be cut into one-inch cubes. The dipping sauce includes "5 tablespoons of Kikkoman soy sauce."

5537. Ebine, Hideo; Sakano, Keichi. 1969. Nattô miso no shisaku [Production of miso from natto]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 24. p. 122-24. March. [7 ref. Jap; eng]
• ***Summary:*** Reprinted from *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*)**.** No. 173. p. 23-25 (1968). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5538. Ebine, Hideo. 1969. [Detection of defatted soybeans in miso using a microscope]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 24. p. 119-21. March. [2 ref. Jap; eng]
• ***Summary:*** Reprinted from *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*)**.** No. 170. p. 23-25 (1968). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5539. Ebine, Hideo; Kimura, Haruo; Wadaka, Hitoshi. 1969. [Application of *Rhizopus* [molds] for shoyu manufacture]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 24. p. 125-33. March. [7 ref. Jap; eng]
• ***Summary:*** Reprinted from *Chomi Kagaku* (*Seasoning Science*) 15(3):1-9 (1968). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5540. Fujimaki, Masao. 1969. Fundamental investigation of proteolytic enzyme application to soybean protein in relation to flavor. Tokyo: University of Tokyo. 112 p. Final technical report. P.L. 480 project no. UR-A11-(40)-8. Grant no. FG-Ja-111. For period Oct. 1964–March 1969. [176 ref]
• ***Summary:*** "The ultimate aim of this study is to obtain basic information for preparing enzymatic modified soybean protein having less odor and less taste." Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Bunkyo-ku, Tokyo, Japan.

5541. Fukushima, Danji. 1969. Denaturation of soybean proteins by organic solvents. *Cereal Chemistry* 46(2):156-63. March. [14 ref]
Address: Central Research Inst., Kikkoman Shoyu Co., Noda-shi, Chiba-ken, Japan.

5542. Ohta, Teruo. 1969. Nattô [Natto]. *Shokuryo: Sono Kagaku to Gijutsu* (*Food: Its Science and Technology*) No. 12. p. 20-36. March. [Jap]
Address: National Food Research Inst., Tokyo, Japan.

5543. Okubo, Kazuyoshi; Asano, M.; Kimura, Y.; Shibasaki, K. 1969. On basic subunits dissociated from C (11S) component of soybean proteins with urea. *Agricultural and Biological Chemistry* 33(3):463-65. March. [11 ref. Eng]
Address: Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai, Japan.

5544. Saio, Kyoko; Wakabayashi, Akira; Watanabe, Tokuji. 1969. [Effects of heating on soybean meal proteins]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 24. p. 92-98. March. [9 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 42(2):90-96 (1968). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5545. Saio, Kyoko; Koyama, Emiko; Watanabe, Tokuji. 1969. Protein–calcium–phytic acid relationships in soybean. I. Effects of calcium and phosphorus on solubility characteristics of soybean meal protein. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 24. p. 99-105. March. [12 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 31(10):1195-1200 (1967). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5546. Saio, Kyoko; Koyama, Emiko; Watanabe, Tokuji. 1969. Protein–calcium–phytic acid relationships in soybean. II. Effects of phytic acid on combination of calcium with soybean meal protein. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 24. p. 106-11. March. [10 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 32(4):448-52 (1967). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5547. Saio, Kyoko; Watanabe, Tokuji. 1969. Daizu shokuhin no bisai kôzô [Observation of soybean foods under electron microscope]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 24. p. 112-18. March. [8 ref. Jap; eng]
• ***Summary:*** Photos show 15 different electron microscope pictures including raw (dry) soybeans, soaked soybeans, steamed soybeans, natto, tofu, and frozen tofu. Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 15(7):290-96 (1968). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5548. Yamashita, Michiko; Arai, S.; Fujimaki, M. 1969. Applying proteolytic enzymes on soybean. IV. A ninhydrin-negative bitter peptide in peptic hydrolyzate of soybean protein. *Agricultural and Biological Chemistry* 33(3):321-30. March. [44 ref]
Address: Dep. of Agricultural Chemistry, Tokyo Univ.

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5549. Spilsbury, Calvin C. 1969. Three stages in Far East soybean markets. *Foreign Agriculture.* April 14. p. 6-8.
• ***Summary:*** Today soybean markets in the Far East, the original home of the soybean, have emerged from time-honored Eastern patterns and have differentiated into what may be called three types–traditional, transitional, and industrial. In traditional markets soybeans continue to be sold and used chiefly for human protein foods, and volumes traded are comparatively small. Also, volumes processed by modern methods are small. Transitional markets are characterized by larger volume, the modern processing of considerable quantities of soybeans for oil for human consumption, and the developing use of soybean meal for human food products and for high-protein animal feeds for emerging livestock and poultry industries. In industrial markets very large quantities of soybeans are efficiently imported, marketed, and processed for oils and fats for human use and for meal for vigorous livestock industries; at the same time soybeans are still used in traditional foods and soybean meal is used to make a variety of new food products.

Korea is a traditional soybean market. Nearly all soybeans are processed into human protein foods such as synthetic milk, flour, paste for soup [miso], curd for consumption in more solid form, mash, sprouted beans, soy sauce, and even fermented "cheese". About 60 to 70% of the domestic crop of about 200,000 tonnes annually is sold in the country's food markets directly to private and commercial consumers. Total imports in 1968 were 28,000 tonnes–all from the U.S.

Most processing of soybeans for human use is done in individual homes by housewives. For example, nearly every Korean family makes a product known as kochojang, or hot bean mash, which consists of powdered, fermented soybeans mixed with red pepper, salt, and water. Some foodmaking (soybean curd and soy sauce) is organized into cottage industry. Most of the soybeans imported from the U.S. are made into traditional soybean foods for rations for the Korean army by one large food factory. Crushing soybeans and other oilseeds for oil is done by about 100 small mills throughout the country. The estimated capacity of all the mills added together is about 200,000 tonnes per year of oilseeds of all types. The largest mills have capacities less than 25 tons per day.

In Taiwan, very little of the imported soybeans are used to make traditional Far East foods. The larger crushing and extraction facilities are clustered around large cities–Taipei, Taichung, Tainan, and Kaohsiung. Only the last is a port, and even there no mills are located on deep water. Imported soybeans are discharged by ships' equipment onto docks, where they are bagged and then stored. Bagged beans are sent by truck or rail to inland processing plants. Modern deep-water bulk discharge facilities are to be built at Kaohsiung along with storage for soybeans and grain.

Japan is the giant of Far Eastern markets for U.S. soybeans. One of the most important recent improvements in soybean logistics has been the development of modern deepwater grain and soybean terminals where soybeans can be rapidly discharged from ships' holds directly to storage, interim transportation, or crushing mills. The first fast-discharge elevator on deep water for soybeans or grain was built by an American-Japanese company. At present four terminals have been built in the Tokyo and Kobe areas, and two more are under construction. Unloading is accomplished by pneumatic suction tubes with capacities of 600 to 800 tons per hour (about 6,000 tonnes per 8-hour day). In Korea and Taiwan, facilities for the fast unloading of large tankers do not exist. Many large, new crushing mills have been built on harbor frontage rather than inland so that they can benefit from bulk transportation methods. The annual capacity of the 15 large, modern mills in Japan is estimated at 1.8 million tons of soybeans. The first mills in Japan were in the mountains because most oilseed crops were grown there. Address: Fats and Oils Div., Foreign Agricultural Service.

5550. Barnes, Harris H., Jr. 1969. President's report: Let's put our men where the action is. *Soybean Digest.* April. p. 4-5.
• ***Summary:*** "New marketing organization: Recently in Washington [DC], in company with Sheldon Houck, representing the National Soybean Processors Assn., final plans were made for closing the Soybean Council of America office as of June 30. The work of this office will be taken over and expanded by the newly named American Soybean Institute, a market development organization, conceived by the American Soybean Assn. in St. Louis [Missouri] last December.

"The sole purpose of the new organization will be to increase sales of whole soybeans and soybean meal and soybean oil all over the world, including the U.S.

"ASA members think this is the time for action. Never was there a time where unity in the soybean industry was needed as much as today. With this in mind we have asked the processors–who along with the growers will be the greatest financial contributors to this agency–to band together with the exporters and country elevators and the terminal elevators, the exporters and transporters of soybeans, the soybean trade such as farm machinery, chemicals and fertilizers, the national farm organizations, extension service, research and Foreign Agricultural Service.

"It is felt that this band of interested soybean people can pool knowledge and be able to come up with concrete recommendations where market development money should be spent and in what amounts.

"As I write this, Chet Randolph, our executive vice president, is winging his way to Japan to supervise our activities there, under the capable leadership of Scott Sawyers, our Far East director. From Japan, Chet will

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move on to Taiwan where we hope to do our next market development work in the Far East.

"Markets in Europe:

"Europe will be included in Chet's trip this time as we contemplate new markets and the enlarging of markets which we will take over from the Soybean Council as more funds from growers, processors, and agribusiness become available to ASI.

"Money is the only thing that keeps us from moving right now into countries like Taiwan, Iran, Egypt, Turkey, Yugoslavia, Australia, and North Africa... to mention several."

"If we are to sell soybeans, we have to have people where the action is... in purchases of soybeans and soybean products! It takes big money to open offices in spots where we need them. And the grower must be motivated in the direction of market development.

"In the fall we are going into our Phase 2 program, that of collection of the ½¢/bu at first point of sale... the elevator or the oil mill. Your help will be greatly appreciated as you visit with your neighbor and with your good friend, your elevator operator." Address: President, American Soybean Assoc.

5551. *Soybean Digest.* 1969. Randolph on market development visit. April. p. 26.
• ***Summary:*** Chet Randolph, executive vice president of the American Soybean Assn., is on a worldwide supervisory visit for soybean market development. Most of his time will be spent in Japan, reviewing details and progress of ASA's active program in the Far East. Then he will visit market development contacts in Hong Kong, Iran, Israel, Italy, Germany, and the Netherlands. The trip is entirely financed by soft currency generated by PL 480 programs. A photo shows ASA's men in Tokyo: Scott Sawyers (Far East Director) and Mitsugi "Jack" Yamashita (assistant country director).

5552. Tanaka, Teruo; Saito, N.; Sogabe, A.; Yokotsuka, T. 1969. Shôyu no kannô kensa-hô ni kansuru kenkyû. VIII. Shukaku handan ni yoru meigara hantei no datôsei [Studies on sensory evaluation of soy sauce. VIII. Accuracy of brand judgment by the sensorium]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(4):244-48. April. [5 ref. Jap; eng]
• ***Summary:*** A statistical method was developed to test the accuracy of brand judgment based on people's sense of smell. Address: Central Research Inst., Kikkoman Shoyu Co., Ltd., Noda, Chiba, Japan.

5553. Tanaka, Teruo; Saito, N.; Nakajima, T.; Yokotsuka, T. 1969. Shôyu no kannô kensa-hô ni kansuru kenkyû. VII. Shôyu no burendo kôka ni tsuite [Studies on sensory evaluation of soy sauce. VII. Statistical research on the effect of blending]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(4):237-43. April. [10 ref. Jap; eng]
• ***Summary:*** "This paper reports mathematical investigations into the effect of blending on the preference of soy sauce and the correlation among 3 components." Address: Central Research Inst., Kikkoman Shoyu Co., Ltd., Noda, Chiba, Japan.

5554. Dosti, Rose. 1969. Happy holiday for Japanese. *Los Angeles Times.* May 8. p. H20.
• ***Summary:*** On April 29th, the Emperor of Japan celebrated his birthday, and wherever Japanese live there were banzai cheers. The hurrahs were especially loud in Los Angeles, for more Japanese-Americans live here than in any other part of the United States.

A photo shows Japanese Consul General Kanji Takasugi, with his wife, Shinako. They hosted a party for 800 guests honoring the Emperor's birthday.

The meal is described and recipes are given for tempura and its dipping sauce (*tentsuyu*), based on soy sauce, mirin and grated daikon (white radish). "Plain rice is served with a thin soup called omiso [miso soup] to which soy bean cakes (tofu) and green onion pieces are added."

5555. Tabuchi, Ichiro. 1969. Tônyû inryo ni kansuru chôsa to kongo [A survey on soymilk and its future]. *Daizu Kaihatsu, Shokuhin Kaihatsu* (*Soybean Development, Food Development*). May 27. p. 10-15. [Jap]
• ***Summary:*** Contents: Why we started producing soymilk. First is the economic reason; getting soymilk directly from soybeans is less expensive than feeding cows and getting milk from them. Second is the health reason. Our school has 3 goals in our education; the help develop a sound mind in a sound body with high moral values. We also emphasize independence and self-sufficiency, in part be encouraging students to be active in one of the businesses that are part of the school. And we encourage students to produce, as much as possible, what we eat at school.

We used to run a self-sufficient dairy farm and produced milk, which we used at the school and sent any extra to the Tokyo Eisei Byôin (Tokyo Adventist Hospital), etc. But during World War II for about 2 years, Christianity in Japan received pressure from the Japanese government. After the war we lost the milk cows and couldn't run the dairy farm. We switched these plants to make other foods. At this time we were using the nonfat dry milk from the USA–which was not tasty, or a little milk which we got somewhere. But that was not enough for the growing children at school. We needed the least expensive and most nutritious milk we could find.

Right at this time, Dr. Harry W. Miller visited us. He was an honorary member of the Japan and American Soybean Association, and a developer and researcher of soymilk; he urged us to make soymilk.

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But actually we were not so sure about making soymilk, so we hesitated. It was a long time later that we decided to do so.

The main reason for our hesitation was that even if we made soymilk, we were not sure that the children would like it and drink it. But as we think about it now, it was an unnecessary worry.

Anyway, Dr. Miller stayed for two months at our school and taught us how to make soymilk. He also gave three lectures on soymilk. mostly from a nutritional point of view. He did this because some thought that soymilk was nutritionally inferior to cow's milk and therefore it would not be a good idea to feed soymilk to growing children. Therefore he had to correct this point of view.

So in 1959, from the earnest recommendation (*nesshin na susume*) of Dr. Miller and the wise decision of our school principal, we discontinued the use of dairy milk and switched to soymilk only.

There was the opinion that we should keep both and let individuals decide which they wanted to drink.

It has been just ten years since we made the decision to switch to 100% soymilk. As I look back, I realize that we were now free of the work of feeding, caring for, and milking dairy cows; that was a big plus.

At present we make 1,000 bottles of soymilk a day, and this work is done by 1 person in half a day; it is very efficient.

Also discusses: Physical condition improves with ongoing soymilk consumption. Boys (male students) tend to like soymilk more than girls. Try not to lose the characteristics of soymilk.

Note: This is the earliest publication seen written by Mr. Tabuchi about soymilk and Soyalac. Address: Nihon San-iku Gakuin.

5556. Asao, Yasuo; Sakasai, T.; Yokotsuka, T. 1969. Shôyu no fûmi kettei ni okeru kôbo no yakuwari [The role of yeasts in the production of shoyu flavor]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(5):318-26. May. [12 ref. Jap; eng]

• ***Summary:*** Several yeast strains isolated from various kinds of shoyu mash were studied for their ability to produce good flavor in shoyu. Besides *Saccharomyces rouxii* (which is the most indispensable yeast for shoyu fermentation), *Torulopsis* strains were studied and found to play a very important role in producing good shoyu flavor.

Alkyphenols such as 4-ethylguaiacol and 4-ethylphenol were produced by *Torulopsis* strains when they were added to the shoyu fermentation. These alkyphenols were not produced in mash fermented by *Saccharomyces rouxii.* Address: Central Research Inst., Kikkoman Shoyu Co., Ltd., Japan.

5557. Barnes, Harris H., Jr. 1969. The Japanese market for soybeans. *Soybean Digest.* May. p. 36-37.

• ***Summary:*** Contents: Introduction. Gyosai Tamura's cooking school demonstrations (1,000+ attendees at each of three classes in Tokyo). Japan Margarine Association. Oil and meal promotion campaigns (89% of the current market development budget is being spent on vegetable oil promotion). Livestock growers must be educated on the importance of high-protein, high-performance feed. New approach needed in promoting traditional foods–shoyu, miso and tofu. Shoyu makers want high-protein soybeans. Scott Sawyers, our Far East Director, doing a good job and living with his family in a Japanese neighborhood. Address: President, American Soybean Assoc.

5558. Photographs of Paul Hawken and Evan Root inside the Great Buddha at Kamakura, Japan, looking out the rear window. 1969.

• ***Summary:*** This Buddha is hollow and there are windows in the rear and a staircase up through the inside. This photo was taken shortly after Paul and Evan arrived in the spring of 1969.

Evan writes (Nov. 2010): "Paul and I went to Japan together, by boat from San Francisco to Yokohama. We took the *Brazil Maru* of the Mitsui OSK line. This was a combination passenger and freight vessel taking 15 days to cross with a one day stop in Honolulu, Hawaii."

Q: Why did you go and why did Paul go? Was it Michio or Aveline Kushi's idea? "In conversations with Michio, he often said, 'when you go to Japan...' such and such. He never said 'if you go to Japan.' I had been running Sanae Restaurant for about a year and a half (a long time in those youthful days). We had gone from a few loyal customers to lines down the block waiting to get in every night. I was starting to think about opening a second restaurant. Michio counseled me not to limit myself by getting tied down to business. At that time, the Boston Macrobiotic community was like a school, and people were coming from all over the country to study. Many of these people worked at Erewhon, Sanae or other macrobiotic enterprises. I wanted to take on a new adventure, and, at the same time make room for others to grow. I did not know exactly what to do, but Michio's words 'when you go to Japan' filled that gap. Of course, I thought, the next step was to go to the country of origin of this movement.

"As far as the case with Paul, I cannot speak for him. My sense is that it was for cultural education plus business.

"Paul and I had been close friends since he arrived in Boston in the summer of '68. He hung out at the little Erewhon (303B), and picked my brain about everything. I wanted to start a restaurant and convinced Aveline that Paul was the best man to take over the store. When this was settled, Martin Russell and others filled in at Erewhon while Paul and I took a drive away car out to California so he could arrange to make the move to Boston. On the way, we

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stopped in all sorts of places to give classes in macrobiotic philosophy and cooking. We also visited Jacques and Yvette DeLangre, Reme's ranch and Chico-San, places where food processing was going on (Reme's tekka [miso] and onion concentrate were excellent).

"It seemed like Paul and I were both on the same timetable in terms of needing some new horizons, so it was convenient and natural that we went at the same time. Though Erewhon paid for his trip, and Sanae paid for mine, we both went on business visas connected to Erewhon."

Q: Did you stay together or see each other often?

"Our arrival was celebrated by a big dinner party at Lima Ohsawa's. Because we were Michio's students, many people were there to welcome us. It was a testament to the esteem with which Michio was held in the Japanese *seishoku* [macrobiotic] community. Michio and Aveline themselves had not been back to Japan since leaving for the U.S.

"Note: *seishoku* is the word that was used for 'macrobiotic' in Japan when I was there. It is written with the characters for correct / proper + food. The word 'macrobiotic' was not commonly used in Japan at that time.

"Paul and I were taken here and there for some sight-seeing including the trip to Kamakura. We also met Mr. Kazama [of Mitoku]. After a short time together in Tokyo, Paul went to Osaka to stay with the Okada family and connect into the food scene and make connections for Erewhon. We saw each other from time to time, once to visit some food production sources like shoyu, rice vinegar and sesame oil. Another time we went on an outing to meet Kôji Ogasawara, the noted proponent of *Kototama* (the word soul); he was the author of a book titled *Kototama: The Principle of One Hundred deities of the Kojiki.* This was something Michio had told us about, related to a kind of esoteric history of Japan. Mrs. Okada took us to Ogasawara's and we listened to him tell us about the *Kototama* and the *Kojiki,* though due to the language difference and the esoteric nature of the subject, it went largely over my head."

Q: What of importance did each of you accomplish? How long did each of you stay?

"I recollect that Paul stayed somewhere around 9 months. During that time he did a lot of relationship building for Erewhon, as well as learning about foods and processing. Certainly, the relationship with Muso Shokuhin was deepened.

"As for me, after a month or two, I realized that I didn't really know what I was doing over there. I had begun to take lessons in Japanese at the Tokyo Nippongo Gakko in Shibuya, but this was no easy language that I could pick up without really applying myself. There quickly came the day that I had to decide to let it go or really dig in. I choose to dig in. That became the what that I was doing. To me that was probably the single most important decision because it affected everything else. After about two years of study, I serendipitously met a teacher who could actually teach the language to Westerners. This was a revelation, and I began to learn the language according to the Japanese way rather than the translated from English way. This deepened my ability to relate and opened many doors for me. My last year there, I worked for Muso Shokuhin as their translator / international correspondent.

"I stayed in Japan for 3 years and 7+ months. By agreement if I did not return within 18 months, I let go of my 50% ownership position in Sanae Restaurant at a prearranged figure (a modest sum) and used that money to support my living and education in Japan until I knew enough to utilize my Japanese in gainful ways."

Note: This photo was sent by Evan Root to Patricia Smith and by Patricia to Soyinfo Center (Nov. 2010).

5559. Sawyers, Scott. 1969. Japan could buy 80 million bushels this year. *Soybean Digest.* May. p. 34-35.

• ***Summary:*** "Additional shipments of soybeans to Japan will have plenty of company and there could even be increased competition. Canadian rapeseed is available in greater volume and at lower prices. Soviet sunflower plus Malaysian palm and other sources of oils will continue to compete for this important market.

"Soybeans are now priced rather competitively with other oilseeds. This is more evident when full value is attributed to the protein from soybean meal.

"Rapeseed is being aggressively promoted to Japanese buyers and feed manufacturers. Rapeseed meal is being pushed as a cheap replacement for some soybean meal in swine and poultry feed rations."

Last year Japan purchased 74 million bushels of soybeans valued at $228 million.

A small photo portrait shows Scott Sawyers. Address: American Soybean Assoc., Far East Director.

5560. *Soybean Digest.* 1969. The Soybean Council of America. May. p. 41.

• ***Summary:*** A brief summary of the activities of SCA during its 13-year history. "Some of the last reports to come from the Soybean Council of America are carried on following pages. The Council, which has had a distinguished 13-year history in market development work for soybeans and soybean products, is now being superseded by other organizations geared to project marketing efforts in-to new dimensions.

"The Council and the Japanese American Soybean Institute, both founded in 1956, have been pioneering efforts in this field. The Council was a joint effort of the American Soybean Assn. and the National Soybean Processors Assn.; JASI, of ASA alone.

"Both were created to match what was considered to be an abundant supply of soybeans back in 1956 with the need of the world's people for a better diet. Government and growers and industry were just beginning to perceive the

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immensity of this problem.

"ASA-JASI signed with the U.S. Department of Agriculture the first contract for market development work for a U.S. farm commodity. And SBC made the first contract on a global basis.

"At its zenith, the Council was actively engaged in 50 countries and had 15 country offices overseas in addition to supervisory offices in the U.S. and Europe. Both production and exports of soybeans have tripled in the 13 years since SBC and JASI were founded.

"Many people both in the U.S. and abroad have participated in the Council's work, including dedicated staff members and officials and directors of both NSPA and ASA.

"Worthy of special mention are the two men who have served as president–the late Howard Roach and Glenn Pogeler; also George Strayer, one of the founders and executive director until 2 years ago."

5561. Fujimaki, Masao; Yamashita, M.; Okazawa, Y.; Arai, S. 1969. Diffusable bitter peptides in peptic hydrolyzate of soybean protein. *Agricultural and Biological Chemistry* 32(6):794-95. June. [21 ref]
Address: Dep. of Agricultural Chemistry, Tokyo Univ., Bunkyo-ku, Tokyo.

5562. *Soybean Digest.* 1969. Nisshin Oil Co. markets Soymea, leads in manufacture of vegetable protein in Japan. June. p. 44.
• ***Summary:*** "Manufacture of high-grade vegetable protein is developing rapidly in Japan, according to Elmer W. Hallowell, U.S. agricultural attache at Tokyo.

"The effort is being led by Nisshin Oil Co., which has put its product, Soymea, on the market, says Hallowell.

"Thirteen of the larger companies organized a 'New-Protein-Food Conference' in late February. The conference plans to start market development programs for the new protein foods.

"In addition to the 13 companies of the conference, 19 others are reported to be currently dealing with high-grade vegetable protein. Some companies have contracted joint ventures with foreign firms.

"In addition to these Japanese firms, which use proteins of soybeans or wheat, some manufacture protein from petroleum through fermentation. This protein likely will be used in animal feed, at least in the early stages of the industry.

"The Japanese government is interested in the production of high-grade protein and plans to budget funds to the Food Research Institute, which is conducting intensified research in this area."

5563. *Soybean Digest.* 1969. Japan's soybean demand expected to increase 66%. June. p. 44.
• ***Summary:*** "Japan's demand for soybeans by 1977 will be about 4.5 million tons, or an increase of 66% over 1968 and more than three times the demand in 1961, Yasuyuki Suzuki, manager of the Chicago produce department of Mitsui & Co. (USA) Inc., says.

"Mitsui is one of the largest of Japan's international trading firms.

"Ninety-nine percent of Japan's imported soybeans, he said, is for human consumption–72% to extract oil and produce meal, and 27% to make such traditional Japanese staple foods as tofu (soybean curd), miso (soybean paste), and shoyu (soy sauce).

"Mr. Suzuki said that U.S. soybeans compete throughout the world with other source materials such as sunflowerseeds, peanuts, rapeseed, palm kernels, and copra as sources of oil; and urea, fish meal, and perhaps future petro-proteins as sources of protein. He said that, while Japan is in a position to choose from among these sources, Japan prefers to concentrate on its present good relation- ship with U.S. soybean growers, rather than change to alternate sources.

"As an example of this, he cited his own company's active promotion of Hawkeye soybeans in Japan for the last 13 years."

5564. *Guardian* (*England*). 1969. Japan: Sculptures from a hard-boiled egg. July 16. p. 16.
• ***Summary:*** A recipe for Sukiyaki calls for "½ lb tofu (bean curd) in 1-in. cakes." The dipping sauce includes "12 tablespoons shoyu." Three suppliers of Japanese food products in London are listed. Mikadoya has two locations and Cydilda has one.

5565. Hansen, Barbara. 1969. Sukiyaki with a Yankee accent: 'Better than Japan version.' *Los Angeles Times.* July 17. p. F1.
• ***Summary:*** Taro Yashima, of East Los Angeles, is an artist who likes to cook sukiyaki, which he likes better than the traditional Japanese dish. In it he uses three types of tofu: regular tofu (packed with water in 12 oz blocks), age tofu ("puffy, French fried soy bean cakes"), and koya tofu ("which is labeled as frozen tofu"). "The frozen tofu is actually a dried product and is found on market shelves, not in the freezer." He uses 4 slices of koya tofu, split lengthwise. A photo shows Mr. Yashima making his style of sukiyaki.

5566. Aoki, Hiroshi; Sakurai, Masako. 1969. Daizu tanpakushitsu no geru keisei ni kansuru kenkyû. V. Kanetsu hensei no kôka ni tsuite [Studies on the gelation of soybean protein. V. On the effects of heat denaturation]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 43(7):448-56. July. [10 ref. Jap; eng]
Address: Central Research Laboratories, Ajinomoto Co. Inc.

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5567. Fukushima, Danji. 1969. Enzymatic hydrolysis of alcohol-denatured soybean proteins. *Cereal Chemistry* 46(4):405-18. July. [24 ref]
• ***Summary:*** The author studied the effect of denaturation conditions on the enzymatic digestion of soybean proteins. The maximum amount of hydrolysis was 5-10% higher in alcohol-denatured proteins than in water-denatured ones, although the initial speed of hydrolysis was slower in the former. The enzyme trypsin possesses the strongest ability to hydrolyze water-denatured soy proteins. During both denaturation treatments, and especially with water, some of the oligosaccharides in the soy flour disappeared. The degree of hydrolysis increases rapidly at the beginning then quickly slows. The acid-precipitated fraction and the whey fraction increased in their degree of maximum proteolysis after alcohol denaturation, as compared with water denaturation.

For soy sauce manufacture, only the maximum hydrolysis values with mold proteinases are important. Today most of the soybean meal used in Japan for making fermented soy sauce has been extracted with alcohol, and this has made a great contribution to increasing soy sauce yields. Address: Central Research Inst., Kikkoman Shoyu Co., Noda-shi, Chiba-ken, Japan.

5568. Photograph of Paul Hawken and Evan Root before the Shinto temple gate at Ogasawara. 1969.
• ***Summary:*** Paul Hawken (left) and Evan Root (summer 1969) in front of the gate of a Shinto shrine. This particular shrine was said to house ancient historical documents regarding the esoteric meaning of the Japanese language, "word soul" or *Kototama.*

They had met Kôji Ogasawara, the author of *Kototama, The Principle of One Hundred Deities of the Kojiki.* He also founded Dai San Bunmei Kai (The Third Civilization Association).

Note: This photo was sent by Evan Root to Patricia Smith and by Patricia to Soyinfo Center (Nov. 2010).

5569. *Soybean Digest.* 1969. ASA [American Soybean Assoc.] expands market development worldwide. July. p. 10.
• ***Summary:*** "ASA, which pioneered commodity market development in Japan 13 years ago, is now undertaking such projects in 17 countries. ASA signed a long-range agreement with USDA's Foreign Agricultural Service in mid-June. The agreement guarantees financing of the projects totaling approximately $1.6 million for a 2-year period. Industry organizations in other countries are expected to match that amount, which will mean an action program of over $3 million in the next 2 years to expand soybean markets in many parts of the world."

"Offices in Germany and Iran are being opened... The German office will handle projects in Germany, Austria, and Switzerland. The Iranian office will be responsible for market development programs in Iran and the Middle East..." An American Soybean Institute is being developed.

5570. Fukuchi, Masakazu; Hishiki, N.; Mori, K.; Ueda, R.; Ishigami, Y.; Ishikawa, H. 1969. Shôyu-chû no kobunshi kagô-butsu ni kansuru kenkyû. I. Shôyu-chû no kôbunshi pepuchido, tôtanpaku oyobi tatôrui no bunri [Studies on high molecular constituents in soy sauce. I. Isolation of high peptides, glycoproteins and polysaccharides in soy sauce]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(8):510-17. Aug. [16 ref. Jap; eng]
Address: 1-4. Dep. of Fermentation Technology, Faculty of Engineering, Osaka Univ.; 5-6. Higashimaru Shoyu Co. Ltd., Tatsuno, Hyogo, Japan.

5571. Morimoto, Shigemi; Matsutani, Noriko. 1969. Shôyu no kôki seibun ni kansuru kenkyû. Furfuryl alcohol no bunri to kôbo-rui oyobi kabi-yûri ni yoru furfuryl alcohol keisei ni tsuite [Studies on the flavor components of soy sauce. Isolation of furfuryl alcohol and the formation of furfuryl alcohol from furfural by yeasts and molds]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(8):518-25. Aug. [6 ref. Jap; eng]
Address: Shoin Junior College, Fukiai-ku, Kobe, Japan.

5572. Sakurai, Yoshito. 1969. Fundamental investigation of evaluation of United States soybean and processing conditions for manufacture of dried tofu, to increase the use of United States soybean in Japan and other countries: Final report of research conducted under grant authorized by Public Law 480 for the U.S. Department of Agriculture Sept. 1966–Aug. 1969. Tokyo: Japan Frozen Tofu Association. 68 + [59] p. No index. 30 cm. Project no. UR-A11-(40)-32. Grant no. FG-Ja-124. Report period Sept. 1966–Aug. 1969. [Eng]
• ***Summary:*** Contents: Summary. Introduction. 1. Effect of processing conditions on the quality of final product in kori-tofu manufacturing. 2. Soybean protein denaturation by freezing. 3. Difference in physical properties of fresh-tofu and kori-tofu prepared from 7S and 11S soybean protein components. 4. Evaluation of soybean varieties as a material for kori-tofu making. 5. Studies on the browning of kori-tofu. 6. Texture changes of cooked kori-tofu: Influence of storage conditions of kori-tofu. 7. Studies on the development of swelling and elastic softening properties of rehydrated kori-tofu. Conclusion. Note Yoshito Sakurai was born in 1905. Address: Tokyo, Japan.

5573. Shojun, Matsuyama Oji (Danshaku). 1969. Tôfu raisan [In praise of tofu]. In: Matsuyama Oji Shojun Iko. Yamazato Eikichi henshu [Collected Writings of Matsuyama Oji Shojun. Edited by Eikichi Yamazato]. Published by Shojun Iko Kanko-kai. See p. 7-13. Aug. 10. Originally published June 1938 in Gekkan Ryukyu (Ryukyu Monthly). [Jap]

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5574. Takeuchi, Tokuo; Yoshida, M.; Yoshii, H. 1969. Miso, shôyu no peptides ni kansuru kenkyû. VII. Peptides no shôyu no hinshitsu ni ataeru kôka [Studies on peptides in miso and soy-sauce. VII. Effects of peptides on the quality of soy-sauce]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(8):502-09. Aug. [26 ref. Jap; eng] Address: Food Research Inst., Aichi prefecture, Nishi-ku, Nagoya, Japan.

5575. Takeuchi, Tokuo; Yoshida, M.; Yoshii, H. 1969. Miso, shôyu no peptides ni kansuru kenkyû. VII. Mame miso teibunshi peptides guruupu bunkaku to sono seijô [Studies on peptides in miso and soy-sauce. VI. Group separation of lower peptides in mame-miso (soybean miso) and their properties]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(8):496-501. Aug. [16 ref. Jap; eng] Address: Food Research Inst., Aichi prefecture, Nishi-ku, Nagoya, Japan.

5576. *Agricultural Research.* 1969. Hakko tofu: new food from soybeans. 18(3):14. Sept.
• ***Summary:*** *Hakko tofu* is a Japanese term meaning "fermented soybean curd." This food, to be made from American-grown soybeans, was developed through a Public Law 480 project in Japan sponsored by the U.S. Agricultural Research Service (ARS). The ARS sponsoring scientist, Dr. Clifford W. Hesseltine, says this food contains high quality protein, based on a 21-day rat growth study; the PER is 2.7, compared with 2.2 for regular tofu.

The principal Japanese investigator, Dr. Tetsujiro Obara (at the Dep. of Agricultural Chemistry, Tokyo Univ. of Education) found that a 1:420 ratio of calcium sulfate to soymilk added at 158ºF gave the best product.

Traditionally the enzymes from a mold were used to ripen the tofu, but the investigators experimented with commercial enzymes. Papain gave the best individual performance, but a mixture of papain, pronase, and bioprase gave optimum results for faster ripening and improved texture. For bacterial starters that lower the PH, the best results were obtained from a blend of half *Streptococcus cremoris* and half *S. lactis.*

Note: This is the earliest English-language document seen (Oct. 2011) that uses the term "Hakko tofu" to refer to fermented tofu.

5577. Barnes, Harris H., Jr.; Randolph, Chet. 1969. A massive program mounted: ASA report. *Soybean Digest.* Sept. p. 19-22.
• ***Summary:*** At the annual meeting of the American Soybean Assoc. in New Orleans last year, there was evidence of a new outlook and attitude. "An entire section of the growers' convention dealt with market development and more precisely the need to mount a massive program to move soybeans and soybean products." The ASA's 15-year-old program in Japan has provided experience and the nucleus for expansion into other countries, including Taiwan, Korea, Germany, and Iran. The ASA has signed a $1.6 million agreement with the Foreign Agricultural Service for market development in 17 countries during the next two years.

"It's particularly encouraging to note that three states have now held soybean checkoff referendums that passed by sound majorities. In Louisiana it was 77%, North Carolina 82%, South Carolina 80%... In addition, Minnesota, Missouri, Texas, and Ohio have all passed enabling acts... The above is evidence growers support the ASA effort to step up market development work." Yet ASA membership has failed to grow. Address: 1. President; 2. Executive vice president. Both: American Soybean Assoc.

5578. Hirano, Kiyoshi. 1969. The fats and oils situation in Japan. *Soybean Digest.* Sept. p. 62.
• ***Summary:*** "In 1968, 66 million bushels of soybeans were crushed resulting in the production of 1,520,000 s.t. [short tons; 1 short ton = 2,000 lb] of soybean meal. A total of 1,170,000 s.t. were used in formula feeds while the balance of the 350,000 s.t. were used for the production of soy sauce, tofu and other traditional foods.

"However, since 1967, a big change has been taking place in this area of soybean meal: that is (1) the development of vegetable protein products, and (2) the development of petroleum protein products.

Regarding vegetable protein products in Japan, there are two kinds. One is soy protein and the other wheat protein using wheat gluten as its basis. Since 1968, vegetable protein has been promoted by the mass media. In fact, in 1968 and 1969, a 2-year period, 37 companies have either announced their new products or will be announcing them shortly. These new products will be distributed mainly for institutional use. Two American companies have already tied up with some Japanese companies. In the future I am sure we can anticipate more.

"In a joint effort to bring about a wholesome development of this new protein product, 19 major manufacturers in Japan got together and organized the New Protein Food Council in March of 1969.

"Future of the meat analogue: The future of this new meat analogue is difficult to predict. However, if it is accepted that means it will become a big outlet for soybean meal.

"As to petroleum protein, several chemical industries have made plans to produce synthetic protein by fermentation. In fact, one or two companies have already started the construction of a factory having the production capacity of 60,000 to 120,000 tons. It is being forecast that petroleum protein will be used first in mixed feeds. Experimental work is being carried out on a rather large scale.

"In 1968, Japan imported 2,900,000 tons of oilseeds

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for crushing, which is equivalent to 85% of our total need. Soybeans totaled 1.8 million tons, rapeseed 250,000, cottonseed 246,000, sunflower 71,000, safflower 63,000, copra 126,000, linseed 100,000, and miscellaneous 230,000 tons.

"We trust that the members of ASA and the people related to the American soybean industry will continue their efforts to supply us with good-quality soybeans at a fair price." Address: President, Japan Oilseed Processors Assoc.

5579. Palmby, Clarence D. 1969. Production and world sales of U.S. soybeans. *Soybean Digest.* Sept. p. 48-51.
• ***Summary:*** Discusses: How soybeans more than make up for declines in cotton production. Sales of soybeans to western Europe, Asia, and Oceania. The mistake in 1966 which raised the price support level from $2.25 to $2.50 per bushel. The threat of the proposed EEC internal consumption tax of $60/tonne on vegetable and marine oils, and $30/tonne on oil cakes. The growing importance of substitutes–especially those made from soybeans.

"The soybean is a typical American. It came as a lonely immigrant. It struggled in obscurity. Slowly it began to thrive–to succeed in its new environment–to become a part of the American scene. Finally, a century and a half after its first introduction, the soybean began the sudden expansion that has made it the second ranking income producer among cash farm crops. This is a phenomenon of only the past 20 years."

A photo shows Palmby. Address: U.S. Asst. Secretary of Agriculture for International Affairs and Commodity Programs.

5580. Palmer, Lane. 1969. Can we save our export markets? *Farm Journal* 93(9):20-21, 42. Sept.
• ***Summary:*** The American Soybean Association, an aggressive commodity group, has been very successful in developing export markets for soybeans. 40% of all U.S. soybeans are now exported. ASA has increased soybean exports to Japan from 20 million bushels in 1954 to nearly 80 million in 1968. "ASA has made a remarkable record on a small budget." ASA is now launching a 3-stage program to expand exports. A key part of the program is a ½ cent per bushel [checkoff] from farmers. Address: Editor.

5581. Saio, Kyoko; Kamiya, Makoto; Watanabe, Tokuji. 1969. Food processing characteristics of soybean 11S and 7S proteins. I. Effect of difference of protein components among soybean varieties on formation of tofu-gel. *Agricultural and Biological Chemistry* 33(9):1301-08. Sept. Reprinted in English in Shokuryo Kenkyusho Kenkyu Hokoku 25:189-97 (1970). [10 ref]
• ***Summary:*** It was showed that the 11S and 7S protein fractions could contribute to the textural characteristics of tofu. Tofu made from crude 11S protein was much harder than tofu made from 7S protein. The crude 11S fraction contributed greatly to the springiness, chewiness, and gumminess of tofu. Address: 1&3. Food Research Inst., Ministry of Agriculture and Forestry; 2. Japan Protein Industry Co., Ltd.

5582. Amano, Takeo; Takeuchi, T.; Yoshii, H. 1969. Shôyu bôbai-zai ni kansuru kenkyû. X. *Aspergillus sojae* no sansei suru paraokishi ansoku kôsan buchiru bunkai kôso no shosei-shitsu ni tsuite [Studies on antiseptics [preservatives] for use in soy sauce. X. Properties of n-Butyl p-Hydroxybenzoate esterase produced by *Aspergillus oryzae*]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(10):610-16. Oct. [14 ref. Jap; eng]
Address: Food Research Inst., Aichi prefecture, Nishi-ku, Nagoya, Japan.

5583. *Macrobiotic* (*The*) (*Chico, California*). 1969. Miso and cancer. 9(7):2-8. Sept/Oct. [3 ref]
• ***Summary:*** Herman Aihara summarizes and comments on two articles about miso and cancer in *Time* magazine (9 May 1969) and *Medical World News* (16 May 1969), then gives a synopsis of what miso is from two articles in *Health Food Business Review* (Sept. 1967 and July 1968). Following a translation of Dr. Akizuki's writings about his experiences with miso following the atomic blast at Nagasaki, Aihara shares his own thoughts about miso's health promoting properties, and about the causes of stomach cancer (sugar, overeating, fish and eggs, tropical fruits). He believes that smoking tobacco does not cause cancer. Address: Ohsawa Foundation, Chico, California.

5584. Misuzu-Tofu Co., Ltd. 1969. Misuzu-dôfu no shiori [A guide to Misuzu-Tofu Co. Ltd.]. Nagano City, Japan. 6 p. Oct. [Jap]
• ***Summary:*** Contains 8 recipes for dried-frozen tofu. Address: Nagano City, Japan.

5585. Sekine, Hiroshi; Nasuno, Seeichi; Iguchi, Nobuyoshi. 1969. Isolation of highly proteolytic mutants from *Aspergillus sojae*. *Agricultural and Biological Chemistry* 33(10):1477-82. Oct. [17 ref]
• ***Summary:*** "Mutational experiments were performed to improve the protease productivity of the mutant strain X-816 previously induced by X-ray irradiation from *Aspergillus sojae* K.S. as a high protease producer."

A significant correlation was found between the protease production in wheat bran koji and the clear zone around a fungal colony formed on a special medium containing casein. Address: Noda Inst. for Scientific Research, Noda-shi, Chiba-ken, Japan.

5586. Taira, Harue; Koyanagi, Tatsuo; Takanohashi, Y.; Oikawa, K. 1969. Studies on amino acid contents of

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processed soybean. XI. Evaluation of nutritional losses of overheated defatted soybean flour. *Agricultural and Biological Chemistry* 33(10):1387-98. Oct. Reprinted in English in Shokuryo Kenkyusho Kenkyu Hokoku 26:181-92 (1971). [29 ref. Eng]
Address: 1. Food Research Inst., Shiohama, Kotoku, Tokyo; 2. Lab. of Nutrition, Faculty of Agriculture, Tohoku Univ., Sendai [Japan].

5587. VJG. 1969. Advanced technology in non-fermented soybean foods in Japan, by T. Watanabe. *Food Science and Technology Abstracts* 1(10):1236. Oct. [1 ref]
• ***Summary:*** This is a summary (by VJG) of an article that appeared in *Japan Agricultural Research Quarterly* 3(4):9-13 (1968) [7 refs., Eng.].

The article discusses: "Preparation of fresh tofu, aburage (dehydrated and deep-fried tofu slices) and kori-tofu (frozen fresh tofu). Composition and methods of preparation of soybean protein concentrates (dried soybean milk, 70% protein concentrates, soybean protein curd),..."

Note 1. This is the earliest English-language document seen (April 2013) that contains the term "fried tofu slices" or the term "deep-fried tofu slices."

Note 2. This is the earliest English-language document seen (April 2013) that uses the term "frozen fresh tofu" to refer to dried-frozen tofu.

5588. Claiborne, Craig. 1969. New restaurant that offers Japanese fare. *New York Times.* Nov. 7. p. 54.
• ***Summary:*** At Daruma (310 Third Ave., between 23rd and 24th streets), the broiled eel and the teriyaki are excellent. "Even the sukiyaki, which is not cooked at the table as it should be, is above average in its seasonings, and there is an interesting dish called buta tofu [Pork tofu] made with pork and bean curd." There is also a sushi bar.

5589. *Times of India* (*The*) (*Bombay*). 1969. City notes: 1:4 bonus by Hind. Lever [Hindustan Lever]. Nov. 21. p. 4.
• ***Summary:*** The section titled "Groundnut extractions" states: "Japan offers a good market for groundnut extractions." It imported about 60,000 tonnes from India in 1968-69. "Japan meets its requirements by importing soyabean extractions from the U.S." But in recent years Japan has shown more interest in Indian groundnut extractions.

Note: This is the earliest of 41 articles or ads seen (Sept. 2010) in *The Times of India* that contains the term "soyabean extractions," which in this context means "solvent extracted soyabean meal." Likewise, "groundnut extractions" refers to "solvent extracted groundnut meal."

5590. Nisshin Oil Mills Co., Ltd. 1969. Nisshin Seiyu 60 nen-shi [Nisshin Oil Mills 60-year history]. Tokyo, Japan. 374 p. Illust. Index. 26 cm. [Jap]
• ***Summary:*** This book states that in 1901 soybeans were first crushed in Japan for oil and meal by Owada Seisakusho.
Address: Japan.

5591. Kuroshima, Eizaburo; Oyama, Y.; Matsuo, T.; Shugimori, T. 1969. Shôyu jôzô ni kanyo suru eisei-butsu no gurutamin-san shôchô ni oyobosu eikyô ni tsuite. III. Shôyu-chû no gurutamin-san no keitai to sore ni 2, 3 no inshi ni tsuite [Biosynthesis and degradation of glutamic acid in microorganisms relating to the soy sauce brewing. III. Some factors affecting the glutamic acid and its related substances formation in soy sauce brewing]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(11):693-700. Nov. [10 ref. Jap; eng]
Address: Research Inst. of Marukin Soy Sauce Co., Kagawa prefecture, Japan.

5592. Sakaguchi, Yukio. 1969. Soy protein foods in Japan. *Soybean Digest.* Nov. p. 28.
• ***Summary:*** "In Japan the soybean has been called "the meat of the field" [*hatake no niku*] and has been an important protein source since olden times. With an outstandingly high nutritive value, soybeans have been providing traditional Japanese foods such as miso, soy sauce, tofu, natto and others, and have become indispensable in our eating habits.

"However, as the Westernization of the people's eating habits has progressed rapidly in recent times, food intake has shifted from the traditional products to protein of animal origin–livestock products. On the other hand. from an international viewpoint, the increase in supplies of animal protein (such as fish and meat) cannot catch up with the growth of world population. Especially in Japan it is difficult to hope for marked development of animal husbandry due to the restrictive climatical and geographical condition in this country. Thus, the shortage of animal protein presents a significant problem for the near future.

"Demonstrate merits of vegetable protein: If the familiar soy protein is introduced in the modernized style in the people's diets in order to cover the shortage of animal protein, meeting the rapidly increasing demand, this will serve to demonstrate more definitely the merits of vegetable protein. This is the background of our marketing of new food products based on vegetable protein.

"Nisshin Oil Mills Co. marketed Soymee, a fiber-form soy protein food [soy protein isolate fiber], in January last year, the first of its kind in Japan. Since then, similar new food products based on soy protein or wheat protein in fiber form, textured form, or powder form have been introduced to the market one after another. As a result, 18 manufacturers of such vegetable protein foods organized the New Protein Foods Council in March of this year. The objective of the organization is to popularize vegetable protein and development of this industry through the promotional activities for such new protein food products.

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"We are aiming to develop a new phase in people's diets by supplying entirely new protein foods, not substitutes for fish and meat. Such food products will demonstrate their merits perfectly as health foods in spite of their low cost.

"Is extender and improver: In Japan, also, soy protein has been used so far as an extender and improver of food products processed from fish and meat, of milk products, bread and confectionery. For such uses the soy protein has all been marketed in the powder form. However, since last year many such products have been marketed in the highly purified fiber form, textured form, and block form. Moreover, these products have gone beyond the boundary of ingredients of food products and are now cooked in their original forms. It appears processed products to be served directly at the table will increase rapidly in production, actually establishing themselves as new food products compatible with fish and meat.

"We want to develop more inexpensive and delicious new protein food products by enhancing the outstanding nutritive value of soy protein in order to contribute toward dietary improvement in Japan."

Note: An example of such new foods, soon to be developed, is surimi–a crab meat alternative. Address: President, New Protein Foods Council, Japan.

5593. *SoyaScan Notes.* 1969. Chronology of Eden Organic Foods, Inc. Renamed Eden Foods, Inc. in April 1971. Part I. 1969 to 1972. 31 Jan. 1992. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** 1969 Nov. 4–Eden Organic Foods is named and incorporated as a non-profit corporation by Bill Bolduc. Other names on the articles of incorporation are Judith Bolduc, Ronald Teeguarden, Gloria Dunn, and Linda Succop. It is a natural foods co-op retail store at 514 East William St. in Ann Arbor, Michigan. Bill is president of the company and his wife, Judy, is part-time secretary. The date of incorporation, Nov. 4, was selected by an astrologer, Michael Erlewine, because it was astrologically propitious. Michael also designed the Eden logo of four sprouts in a circle. Also in Nov. 1969 Eden begins selling soyfoods, tamari and miso purchased from Erewhon.

Prior to this, starting in about the summer of 1969, Ronnie Teeguarden and Gloria Dunn had started a loosely-knit food buying co-op–which had no name, no assets, no formal structure, and no bank account. Original or very early members included Tim and Pattie Redmond, Mark and Nancy Retzloff, Linda Succop, Iona Teeguarden, and Bob Thorson. On about 3-5 different occasions they collectively ordered macrobiotic staples (including tamari and miso) from Erewhon in Boston, Massachusetts, using the Erewhon catalog. When the foods arrived, the members got together and divided them up at the Teeguarden-Leabu General Store, at 209 South State St. in Ann Arbor. This general store, located in the basement below Marshall's Bookstore, carried mostly antique clothing and records, and the art of local artists. By September 1969, Bill and Judy Bolduc joined the food co-op. They also joined the Zen Macrobiotic Supper Club; all of its members were also members of the food co-op.

In the fall of 1969 the Teeguarden-Leabu second-hand store looked like it was about to close, which would leave the food co-op without a home. The group (especially Ronnie Teeguarden) convinced Bill Bolduc to take charge of the food co-op and find it a permanent home, which he did–in an upstairs apartment at 514 East William St. Members of the informal food-buying co-op who worked at Eden Organic Foods included Bill Bolduc, Gloria Dunn, and Tim Redmond. An environmental group named the Environmental Defense Education Network (EDEN) also operated out of the Teeguarden-Leabu General Store; it was from this group that Eden got its name. That fall, after the Eden Organic Foods co-op was up and running, Tim Redmond went to Boston to work and study at Sanae, a macrobiotic restaurant on 272A Newbury St.

1970 summer–Bill Bolduc establishes Eden's first contact with an organic food grower (Bill Vreeland of Ypsilanti, Michigan, who grows organic wheat and soybeans). He soon makes Eden's first direct purchase of organically grown wheat, which the company mills and sells.

1970 July 6–Eden Organic Foods, Inc is reorganized upon a stock basis. Bill Bolduc (who resides at 6210 Bethel Church Rd., Saline, Michigan) owns all the shares (1,000). Other people listed on this document are Judith Bolduc, Ronald Teeguarden, and Gloria Dunn.

1970 Sept.–The fledgling company has an offer from Cynthia Shevel to move into a newly decorated mini-mall at 211 South State St. on the main street of campus. They need money to finance the move. Tim Redmond's father says he will help finance the expansion only if the business is reorganized as a for-profit corporation. So Eden is changed into a for-profit corporation, and Redmond invests the $10,000 he borrowed from his father in Eden in exchange for 50% ownership. In Nov. 1970 Eden moves into the mini-mall (they register the new address on Nov. 17) and soon begins to mill flour and bake granola at the new store. Bolduc and Redmond are now equal partners.

1971 April 8–Bolduc registers a change in the company name to Eden Foods, Inc. from Eden Organic Foods, Inc. After the store was up and running, Redmond returns to Boston and Sanae restaurant, where he completed his studies.

1971 Jan.–Michael Potter is hired by Bill Bolduc. Mike had initially had a good-paying job at an art gallery in Royal Oak, Michigan. Then he began working for, and eventually became a partner in Joyous Revival, a macrobiotic and natural foods retail store in Birmingham, Michigan. At that time he and his wife, Carol Roller Potter (Ron Roller's sister), moved from Royal Oak to Walnut Lake, Michigan–to be nearer to Joyous Revival. In the fall of 1970 Michael

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Potter, while still working at Joyous Revival and at Bill Bolduc's request, had done volunteer work to try to help a failing new Eden retail store in downtown Detroit on the campus of Wayne State University. This store was owned jointly by Eden and two people named John and Darleen–two of the first people in the area interested in macrobiotics. By Jan. 1971 it had become evident that the store would not be able to survive financially, so Michael's first job after being hired was to make one last try to save it, then to help in shutting it down.

1971 May or June–Tim Redmond returns to Ann Arbor permanently, having finished his macrobiotic training in Boston. He planned to open a restaurant like Sanae in Ann Arbor but instead got increasingly involved with Eden Foods.

1971 June–Eden starts to wholesale natural foods out of the back of their retail store at 211 South State Street. They buy increasingly from original sources instead of other wholesalers. Buying clubs and co-ops come to the retail store to pick up their bulk foods.

1971 July–Eden's wholesale pricelist, dated July 26, shows that Eden is selling bulk (50 and 100 lb) soybeans, corn, soft wheat, and rye, which are being grown organically in Michigan (by Tom Vreeland). Eden stone-ground a portion of them into flour–on order. Eden is also selling numerous bulk and packaged grains, cereals, flours, and beans from Arrowhead Mills in Deaf Smith County, Texas; some are organically grown.

1971 early summer–Bill Bolduc asks Mike Potter to manage the Eden retail store at 211 South State St. Mike and his pregnant wife, Carol, move to Ann Arbor from Walnut Lake. By this time the company name was Eden Foods, Inc.

1971 Aug.–Eden Foods starts to distribute its wholesale bulk products, especially in the Detroit area. The company starts to bring in small trailer loads of staples from Arrowhead Mills in Texas. Bolduc and Redmond, realizing that Eden is the only natural foods store in the area, borrow some money and rent a 4,000 square foot Quonset hut warehouse on North Main Street north of Ann Arbor near the Huron River. They expand their wholesale and distribution operations.

1971 Oct.–Mike Potter is given 13.5% of the common stock of Eden Foods, Inc. largely to compensate him for his many hours of unpaid volunteer work. According to Michael Potter (Dec. 1986), at this point the common stock ownership of Eden Foods is: Between Bill and Judy Bolduc 43.5%, Tim Redmond 43.5%, and Michael Potter 13.5%. Potter later says (Feb. 1993) that Bill Bolduc and Tim Redmond now own the same number of shares, but Judy Bolduc owned a small number of shares so the Bolducs owned the largest block.

1972 fall–Ron Roller starts to work part time for Eden Foods. Continued. Address: 514 East William St. in Ann Arbor, Michigan. Phone: 313-769-8444.

5594. *SoyaScan Notes.* 1969. Chronology of Eden Foods, Inc. Part II. 1973 to Nov. 1981. 31 Jan. 1992. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued: 1973 March–Eden moves into a larger warehouse at 310 West Ann Street in Ann Arbor, sharing it with Midwest Natural Foods, which initially was not a competitor. At about this time, Ron Roller starts working full-time for Eden. While at this warehouse, in late 1973 or early 1974, Eden receives its first shipments of imported Japanese natural foods from Mr. Kazama of Mitoku in Tokyo. Tim Redmond had ordered these foods from Mr. Kazama at a meeting of the Natural Foods Distributors Association in Florida. Initially Eden was forced to import Erewhon-branded products. Redmond recalls that at this time he was working at and managing the warehouse and Potter was working at and managing the retail store. Redmond was managing the corporation because he controlled it.

1973 summer.–The Eden retail store moves to a much larger location at 330 Maynard St. in Ann Arbor, on the University of Michigan campus. It now includes three operations under one roof in 6,000 square feet of leased space: A large natural foods retail store, a natural fast-food deli, and a natural foods bakery named Sun Bakery that had relocated itself from Kalamazoo, Michigan. This operation proved to be very profitable; it paid off all Eden's debts and paid for the new warehouse, offices, trucks, and equipment.

1973 July–Bill and Judy Bolduc leave Eden Foods, selling their stock to Mike Potter for $2,500 cash. Tim Redmond becomes president. Redmond ends up owning 51% and Potter 49% of the shares in Eden Foods. Potter recalls that he bought the stock directly from the Bolducs, then gave a small amount to Redmond so that Redmond would have majority ownership. Redmond recalls that the Bolducs sold their stock back to the corporation, then Redmond sold enough shares to Potter so that he (Redmond) would keep control with 51% of the shares.

1973 late or 1974 early–Potter and Redmond become equal owners of Eden Foods after Potter loans the company $44,000 (entrusted to him by his father), then converts the loan into an investment in the company in exchange for equal ownership.

1973 Sept.–Mike Potter becomes president of Eden Foods at the unanimous recommendation of an employee steering committee. At about this time Midwest Natural Foods starts to compete with Eden Foods, carrying many of the same products that Eden carries plus dairy products and frozen foods. Eden has never sold dairy products or frozen foods and, in the face of new competition from Midwest, Michael Potter reaffirms this position. This decision makes it impossible for Eden to become a full-line distributor like Midwest, and lays the groundwork for Eden's eventual decision in 1986 or 1987 to discontinue distribution to retail stores and focus on manufacturing of natural foods.

1974 spring–Eden moves from 310 West Ann St. into a

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larger warehouse at 4601 Platt Road. This move extricates Eden from what had become a "pathetic relationship" with Midwest Natural Foods. Redmond is sure that he and Potter became equal partners before this move.

1974 March 7-8–Michael Potter represents Eden at the meeting of Natural Foods Distributors at the Janus conference room in Seattle, Washington.

1974 Oct.–Potter makes the first of his eleven trips to the People's Republic of China. On the way back he visits Yuko Okada at the Muso Company in Osaka, Japan. Potter decides to import exclusively from Muso.

1977 Aug.–Eden Foods opens Turtle Island restaurant at 315 South State St. in Ann Arbor.

1979 spring–Cliff Adler, a painter renovating apartments in Ann Arbor, is hired by Michael Potter to work for Eden in Chicago, Illinois, to try to expand their sales to natural food retail stores. During that summer Cliff lends Eden Foods $100,000, for which he is paid bank interest rates. Tim Redmond, however, believes Cliff was hired as a salesman in 1976, and that on 15 March 1979 Cliff became a shareholder in Eden Foods, buying 10% of the stock.

1979 Nov. 26–The Eden warehouse at 4601 Platt Road is destroyed by a large fire. According to the *Ann Arbor News* (Nov. 27-29) total damages are estimated at $650,000. Eden Foods, organized in 1970, employs some 100 persons in distribution and production, supplies about 500 natural food stores and restaurants, has annual sales of about $5 million, and is said by its owners to be "the largest natural foods distributorship in the Midwest." This fire burned many of Eden's key records, including records that would have helped in determining dates and facts for this chronology. Eden has never kept a written chronology of key events in the company's history.

1979 Dec.–Within 10 days after the fire, the board of directors (Potter, Adler, and Redmond) meets, authorizes a large number of additional shares of common stock, and decides to give away (free of charge) shares of Eden Foods' common stock to six key employees/managers to try to motivate them to stay with the company and help try to rebuild it. They also decide to lay off 35 other people. Shortly thereafter Cliff Adler decides to convert his $100,000 loan to stock (equity)

1980 Jan.–Tim Redmond decides to leave Eden Foods; he leaves in May, selling most of his stock (he kept 1,000 shares) in exchange for ownership of the Maynard Street Connection, Inc., which has a retail store and restaurant at 330 Maynard St., which are now separate companies.

1980 Feb.–Now Michael Potter and Cliff Adler each own 34% of Eden Foods shares, Frank Dietrich (of Natural Foods, Inc., Toledo, Ohio) owns 10% (which he bought for $100,000), Ron Roller owns 5%, Michael Gordon 4%, Mark Cook 4%, Kathy Knor 3%, Bill Swaney 3%, and Bob Duha 3%. Michael Potter notes that four things saved Eden Foods (which now had a negative net worth of more than $800,000) after the fire: (1) Cliff Adler's conversion of his $100,000; (2) The incredible cooperation, generosity, and kindness that Eden received from its suppliers in the natural foods industry, and their trust that Eden would do its best to pay back they money at a time when interest rates were over 20%; (3) Frank Dietrick's investment of $100,000 in the company; and (4) The great effort made by natural foods retail stores and consumers to go out of their way help Eden survive by purchasing more Eden products. Note that it was not until Feb. 1982 that Eden ended up receiving from its insurer (Hartford Insurance Company) $400,000 net, or $0.50 for each dollar Eden felt it was owed.

1980 Nov.–Eden Foods headquarters moves into a 20,000 square foot building at 701 Tecumseh Road in the tiny town of Clinton (population 2,000) about 60 miles southwest of Detroit.

1981 Nov.–Erewhon Trading Co. files for Chapter 11 bankruptcy protection. Trying to keep up with the super-distributors in their region (especially Balanced Foods) Erewhon had moved into an 80,000 square foot warehouse and added too many items to their product line too fast–which destroyed the company. Stow Mills picked up the bulk of their business, with Westbrae scooping up most of the business for their Japanese imports. Eden had not yet recovered enough financially to take advantage of this opportunity. Continued.

5595. *SoyaScan Notes.* 1969. Chronology of Eden Foods, Inc. Part III. 1983 to present. 31 Jan. 1992. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** 1983 July–Eden Foods surprises the U.S. natural foods industry by introducing Edensoy, a long-life soymilk in plain, carob, or cranberry flavors, imported from Marusan-Ai Co. in Japan, and packaged in a stand-up foil retort pouch.

1984 Jan.–The Muso Company of Osaka, Japan, appoints Eden Foods its General Agent for North America.

1984 March 2–A series of calamities hit Eden Foods in quick succession. The FDA (U.S. Food and Drug Administration) informs Eden Foods, in a strongly worded letter, that it considers eleven claims in a promotional pamphlet for Edensoy to be erroneous. The FDA advised that the "Good for Babies" section of the pamphlet be deleted.

1985 June 14–The FDA informs Michael Potter that a six-month-old child in Canada had become seriously ill after being fed the company's soymilk as an infant formula. The mother said her decision to forgo regular infant formula was inspired by Eden's own literature–the promotional pamphlet cited above which said that Edensoy was "Good for Babies." Eden took the position: "There's a problem and we're responsible for it." To date some 18 million packs of Edensoy have been sold.

1985 June 23–Eden Foods voluntarily mails 10,686 requests for a recall of the pamphlet to its distributors and to

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individual retail stores.

1985 July–Eden Foods forms a joint venture partnership with four Japanese companies, and incorporates in the state of Michigan as American Soy Products, Inc.

1985–Eden opens a west coast sales office and warehouse in San Francisco, California.

1986 May–The Lima Company of Belgium appoints Eden Foods its General Agent for North America.

1986 Nov.–American Soy Products, Inc. launches a new generation of Edensoy soymilk products, in original, vanilla, and carob flavors. Made at a large, new factory in Saline, Michigan, they are packaged in Tetra Brik Aseptic cartons. This is the earliest known aseptic soymilk plant in the USA.

1987 Jan. 1–Eden Foods stops distributing products directly to retail stores (which comprised only 10% of Eden's total sales), drops 150 products, and starts serving as a master distributor, selling only through other distributors. This decision had a very positive effect on Eden's growth; all the energy that was formerly required to attend to 10% of the business was now free to be focused on developing new products and the Eden brand.

1988 April 13–Cliff Adler and Michael Potter are in a serious car accident. Cliff is killed and Michael is seriously injured. Upon Cliff Adler's death, Michael immediately and automatically acquires Cliff's 34% share in the company–because Eden Foods Inc. and Michael and Cliff, jointly and severally, had a buy-sell contract that came into effect in the event that either Cliff or Michael should die. The value of Cliff's stock was $500,000. Michael pays this amount from his personal funds for the stock. Potter now owns a large majority of Eden Foods' stock.

1988 May–While Eden Foods is still reeling from the effects of the car accident, the FDA files charges against Eden for publishing inaccurate information in a pamphlet which stated that Edensoy was "Good for Babies." Eden's previous major effort to recall all of these pamphlets from retail stores apparently had little or no effect on the FDA charges.

1988–Eden Foods joins OCIA, the Organic Crop Improvement Association, for independent certification of organically-grown crops.

1989 Jan. 20–Nearly 6 years after Eden Foods published its ill-fated Edensoy pamphlet, the company is fined $110,000 by a federal judge in Detroit, and its president, Michael Potter, is fined $25,000 and sentenced to 30 days imprisonment. On Feb. 24 he begins to serve out his sentence in Bay City, Michigan.

1989 Oct. 12–Michael Potter is convicted of manslaughter and sentenced at the circuit court in Ann Arbor to 8-15 years in jail for his role in the April 1988 automobile accident that caused Cliff Adler's death. He begins to serve out his sentence in Oct. 1989 in Coldwater, Michigan. Ron Roller takes over as president of Eden Foods–the top position.

1989–Eden and OCIA establish standards for food processing as well as growing crops.

1991 mid-June–Ron Roller, president of Eden Foods, is asked to resign from his position. He chooses to leave and go to American Soy products to work full time. There he becomes CEO.

1992–Eden Foods now has 180 distributors, virtually all of whom distribute Edensoy. Owners of stock in Eden Foods include Mike Potter (who owns more than 50% of the shares), Tim Redmond, Mark Cook, Bill Swaney, and at least one other person.

1992 Aug.–Michael Potter returns to work at Eden Foods. He was re-sentenced and his sentence is changed to 60 months probation. 1993 Dec. 31–Potter purchases Tim Redmond's remaining 1,000 shares of Eden Foods stock, which Tim has kept since 1980.

5596. *Soybean Digest.* 1969. MPF provides protein for world's hungry. Nov. p. 3.

• ***Summary:*** Multi-purpose food, developed for the Meals for Millions Foundation nearly 25 years ago, "continues to provide vital protein-enrichment to the diets of the hungry both at home and abroad."

"Of equal significance, through the Foundation's pilot plant and training center in Santa Monica, California, students from all over the world learn how to process their own protein-rich food supplement from their own resources.

"Today, soy-based MPF is being manufactured in Japan, Brazil, Mexico, and Korea. These plants, operated by the inhabitants of the countries, with the technological assistance of Meals for Millions, personify the self-help philosophy of the Foundation which believes in a hand-up rather than a hand-out program."

A photo shows two young boys carrying a case of "Meals for Millions–Friendship Food."

5597. *Soybean Digest.* 1969. Scientists develop new soy food, hakko tofu. Nov. p. 33.

• ***Summary:*** This is a summary of the following article: *Agricultural Research.* 1969. "Hakko tofu: new food from soybeans." 18(3):14. Sept.

5598. *Soybean Digest.* 1969. Chen, Sera to posts in Far East for ASA [American Soybean Assoc.]. Nov. p. 58.

• ***Summary:*** "Dr. Steve Chen will be ASA country director for Taiwan in a new office to be opened soon in Taipei. Karl Sera will be feed and meal specialist in ASA's office in Tokyo, Japan, working with Scott Sawyers, Far East director. Dr. Chen has most recently been doing research on carbohydrate of soybeans and development of high-protein food items for Ralston Purina International at St. Louis. Previously, as director of marketing for Ralston Purina Eastern at Hong Kong, he was engaged in promotion of Purina mixed feeds, animal health products, and consumer

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products...

"Dr. Chen holds a B.S. degree at National Taiwan University and M.S. and Ph.D. degrees at West Virginia University... Mr. Sera attended St. Joseph's College at Yokohama, Japan; and received his B.S. in dairy science at Iowa State University... Both Dr. Chen and Mr. Sera will be working with Scott Sawyers, ASA Far East director. Both mean are married and have families." A photo shows Chen and Sera.

5599. *Soybean Digest.* 1969. Soy sauce leader of Japan is gone. Nov. p. 50-51.
• ***Summary:*** Saihei Toriumi of Chiba, Japan, was president of one of Japan's leading soy sauce manufacturing firms. He was also one of the organizers of the All Japan Soy Sauce Brewers Association and its first managing director. He had been permanent advisor to the Association since 1956. Mr. Toriumi was a strong supporter of the Japanese American Soybean Institute, and was a director of JASI representing his Association from JASI's organization until his death. A photo shows Toriumi.

5600. *Soybean Digest.* 1969. Phase II kicked off in several states. Nov. p. 13.
• ***Summary:*** Phase II is a voluntary ½ cent per bushel checkoff on soybeans at the first point of sale. This American Soybean Assoc. program has been kicked off in several states according to ASA field director Merv Syverson. Funds collected from this program will go for market development in Japan, Germany, and Iran. Some states have moved directly into Phase III, which uses state enabling legislation to gain the ½ cent per bushel deduction. "North Carolina, Louisiana, and recently south Carolina have circulated referendums and will automatically collect the funds at the first point of sale."

Progress from other Midwest states: The Ohio legislature has passed a checkoff bill and is anticipating a referendum. In Indiana a checkoff bill has not yet passed, but the Indiana Soybean Growers Assn. has voted to go to Phase II. In Illinois the Land of Lincoln Soybean Assn. has gone into Phase II both at the elevator and later on in direct grower contact. Minnesota has passed a checkoff bill but has not yet set the date for a second referendum. The Minnesota Soybean Growers Assn. is working on a membership drive and has instituted a voluntary checkoff. The Nebraska Soybean Assn. plans a drive in December for the minimum 400 members for affiliation with the ASA. The Missouri legislature has passed a checkoff bill and the Missouri Soybean Assn. is preparing for a referendum; the date is to be set.

5601. United Nations Industrial Development Organization (UNIDO). 1969. Expert group meeting on soybean processing and use. UNIDO Document ID/WG.45/3. Held 17-21 Nov. 1969 at Peoria, Illinois.
• ***Summary:*** Consists of ten papers by various authors, each cited and paginated separately. These proceedings were never published in bound form. Address: Vienna, Austria.

5602. Watanabe, Tokuji. 1969. Industrial production of soybean foods in Japan. Paper presented at United Nations Industrial Development Organization Expert Group Meeting on Soya Bean Processing and Use. 38 p. Document: ID/WG.45/3. Held 17-21 Nov. 1969 at Peoria, Illinois. [16 ref]
• ***Summary:*** Contents: Tofu and its industrial production: Process of tofu making, tofu production as an industry, equipment for tofu production, varieties of tofu, new materials of tofu, new types of tofu, aburage and other deep fried tofu.

Note 1. This is the 2nd earliest English-language document seen (April 2013) that contains the term "deep fried tofu" (regardless of hyphenation).

Kori-tofu and its industrial production: Process of kori-tofu making, kori-tofu production as an industry, equipment for kori-tofu production, distribution of kori-tofu, utilization of by-products.

Yuba and its industrial production.

Kinako [roasted whole soy flour] and its industrial production. The Japanese word can be written either in hiragana or using two Chinese characters which mean "yellow flour." Kinako is made from whole soybeans. Sometimes the soybean hulls are removed before roasting. Kinako is widely used as an ingredient in Japanese confections [such as kinako mochi or Abekawa mochi (toasted mochi in kinako); it was traditionally sold along the banks of the Abekawa River in Shizuoka, Japan]. About 12,000 metric tons of soybeans are used per year in making kinako.

New soybean food materials and their industrial production: New soybean food materials, usage of new soybean food materials, future of new soybean foods, other food uses of soybeans.

Natto and its industrial production: Process of natto making, equipment for natto production, natto production as an industry.

Miso and its industrial production: Varieties of miso, Process of miso making, miso production as an industry, industrialization of miso making, distribution of miso, future prospect of demand for miso, mycotoxins and fermented soybean foods.

Shoyu and its industrial production: Process of shoyu making, shoyu production as an industry, nitrogen utilization ratio in shoyu making, special shoyu.

Figures show: (1) Flow sheets of production of traditional soybean foods in Japan: Tofu, kori-tofu, yuba, kinako, natto, miso (with koji), shoyu. (2) NK-type soybean cooker (by courtesy of Kikkoman Shoyu Co. Ltd.). (capacity: 1 metric ton of defatted soybean meal). (3) (3) Continuous

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cooker of soybean meal (by courtesy of Yamasa Shoyu Co. Ltd.). (capacity: 1 metric ton of defatted soybean meal per hour).

Photos show: (1) Tofu soaked in water for sale. (2) Large-scale tofu factory (by courtesy of Tokyo Tofu Co., Ltd.). (3) Continuous cooker of ground soybeans (by courtesy of Masuko Sangyo Co., Ltd.). (4) Decanter, a kind of continuous centrifuge (by courtesy of Kokusan Seiko Co., Ltd). (capacity: 3,000 kg of ground soybeans per hour). (5) Factory of packed tofu from spray-dried soybean milk (by courtesy of Nippon Tanpaku Kogyo Co., Ltd.). (6) Continuous deep-fryer of aburage (by courtesy of Iwase Tekkosho Co., Ltd). (capacity: 1,000 to 1,500 pieces per hour). (7). Daiya Kori-tofu (Left one in the dish is swollen by hot water). (8) Bird's-eye view of large scale factory of kori-tofu (by courtesy of Misuzu Tofu Co., Ltd). (capacity: 10 to 15 metric tons of soybeans per day). (9) Soaking of large cake of tofu for precooling during making of kori-tofu (by courtesy of Misuzu Tofu Co., Ltd). (10) Continuous freezing equipment used in making of kori-tofu (by courtesy of Misuzu Tofu Co., Ltd). (11) Continuous thawing apparatus of frozen tofu (by courtesy of Misuzu Tofu Co., Ltd). (capacity: 10,000 to 15,000 pieces per hour). (12) Yuba plant (by courtesy of Ohara Co., Ltd). (13) Natto mixed up by chopsticks. (14) Inside of fermentation room for natto making (by courtesy of Suzuyo Kogyo Co., Ltd). (15) Two brands and varieties of miso, both in plastic bag and on dish. (16) Rotary cooker of soybean (by courtesy of Hinode Miso Co., Ltd). (capacity: 1 metric ton of soybeans). (17) Continuous rice cooker (by courtesy of Hinode Miso Co., Ltd). (capacity: 1.5 metric tons of rice per hour). (18) Rotary koji fermenter (by courtesy of Miyasaka Miso Co., Ltd). (capacity: 1.8 metric tons of rice in each fermenter). (19) Pasteurizer of miso (by courtesy of Nagata Machinery Co., Ltd). (capacity: 1 metric ton of miso per hour). (20) Fermentation tank of moromi [mash] (by courtesy of Kikkoman Shoyu Co., Ltd). (capacity: 1.5 metric tons of rice per hour). (21) Shoyu in large glass bottle and smaller plastic container. (22) (22) Large-scale koji fermenter (by courtesy of Yamasa Shoyu Co., Ltd).

Concerning natto: The surface of each natto "soybean is covered with a viscous sticky substance, which has the property of forming long stringy threads when mixed up (Photo 13). The longer the strings, the better the quality of natto." The texture of the cooked soybeans is softened by the enzymes of *Bacillus natto.* About 50,000 metric tons of soybeans are used each year to make natto. It is most popular in northeastern Japan (Tohoku region). Natto is fairly perishable, and excess ammonia will be produced by overfermentation. There are about 1,300 plants that make natto in Japan; the average plant consumes about 100 kg/day of soybeans. Recently, however, large, mechanized factories that consume 2-3 metric tons/day of soybeans have been constructed. From 10 kg of whole dry soybeans about 18 kg of natto can be made. One package of natto containing 100 gm costs 15-20 yen (about 4-6 cents U.S.).

Note 2. This is the earliest English-language document seen (Jan. 2012) that uses the word "sticky" to describe natto. Address: Food and Nutrition Div., Food Research Inst., Ministry of Agriculture & Forestry, Tokyo, Japan.

5603. *SoyaScan Notes.* 1969. Chronology of soybeans, soyfoods and natural foods in the United States 1969 plus overview of the 1960s (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** 1969 Jan. Volume 1, Number 1 of *Food Science and Technology Abstracts* published; the earliest records in it go back to Jan. 1968. It is created from the world's first computerized database specializing in food.

1969 Jan. Richard M. Nixon inaugurated as President of the United States. Clifford M. Hardin of Indiana is Secretary of Agriculture.

1969 March. Paul Hawken takes a 9-month trip to Japan and arranges for Mitoku and Muso Shokuhin to export natural foods to Erewhon.

1969 March. Soybean yields in tests top 100 bushels/acre for the first time.

1969 March. Essene Macrobiotic Supply starts business in Philadelphia, Pennsylvania. Denny Waxman and Charles Smith are founders.

1969 June. A.E. Staley Manufacturing Co. acquires Gunther Products, a pioneer in the field of modified (enzyme hydrolyzed) soy whipping proteins. Gunther had been founded in 1948, incorporated in 1949.

1969 Aug. Erewhon–Los Angeles opens as a small macrobiotic natural foods retail store at 8003 Beverly Blvd. Bill Tara is the first manager.

1969. USAID starts actively encouraging U.S. businesses to launch low-cost commercial protein products in Third World countries.

1969 fall. Erewhon Natural Foods in Boston starts to distribute macrobiotic and natural foods. They had begun to wholesale these foods out of the back of their retail store in the spring of 1969. They are America's first natural foods distributor, and remain the largest for many years.

1969 Oct. *Protein-Enriched Cereal Foods for World Needs,* edited by Max Milner, published by American Assoc. of Cereal Chemists.

1969 Nov. Bac-o-Bits, meatless bacon bits made from extruded soy flour, start to be sold nationwide by General Mills. Its forerunner, Bac*O's, made from spun soy protein fiber, had been introduced in May 1966. Frozen Bontrae meat analogs are sold to the foodservice trade. This pioneering work by one of America's largest food companies indicated to the U.S. food industry that the time for soy protein foods of the future had arrived.

1969 Nov. 4. Eden Organic Foods incorporated in Ann Arbor, Michigan by Bill Bolduc, and their macrobiotic retail

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store begins operation, selling soyfoods including tamari and miso purchased from Erewhon. The company grew out of a loosely-knit food buying co-op which had started in about July 1967 but which had no name, no formal structure, and no bank account. Bolduc was joined 9 months later by Tim Redmond.

1969 Nov. 17-21. United Nations Industrial Development Organization Expert Group Meeting on Soya Bean Processing and Use held at Peoria, Illinois.

1969. The first of the new wave of tempeh shops in the Western world, Handelsonderneming van Dappern (later renamed Tempeh production Inc.) started by Robert van Dappern in Kerkrade, The Netherlands. It soon becomes the world's largest tempeh manufacturer.

1969. The Program for International Research, Improvement, and Development of Soybeans (PIRIDS) established at the University of Illinois with funding from a Rockefeller Foundation grant. The forerunner of INTSOY, it is directed by Earl R. Leng.

1960s overview:

Oilseed Proteins and the Protein Gap. Worldwide, there is a growing consensus that Third World countries are facing a "protein crisis," that protein malnutrition is the world's most widespread deficiency disease, and that low-cost oilseed proteins (such as defatted soybean meal and flour) offer the most promising hope for remedying the problem. The leading architect and proponent of this view is Dr. Aaron Altschul of Georgetown University School of Medicine. The United Nations' FAO/WHO/UNICEF Protein Advisory Group, composed of the world's leading authorities in the field, is very active from the mid-1960s to the mid-1970s, supporting wider use of soy protein products and soyfoods.

Food for Peace Shipments of Soy Fortified Foods begin. The first shipment of such foods, CSM (corn-soy-milk), took place in 1966, when 28,000 metric tons (tonnes) were shipped. The next year 54,000 tonnes were shipped. Shipments increased dramatically during the 1970s.

Growing Interest in Modern Soy Protein Products. These new products, including soy protein isolates and concentrates, and textured soy protein products, now appear to have major potential in the food systems of all countries.

Leading Soyfoods Research Centers in America are the Northern Regional Research Laboratory at Peoria, Illinois (Hesseltine, Wang, Mustakas, Wolf), and the New York State Agricultural Experiment Station at Geneva, New York (Steinkraus and Bourne).

Vitasoy sales are booming in Southeast Asia. The introduction of Vitasoy by K.S. Lo in Hong Kong in the early 1940s brought soymilk into the modern era. Takeoff began in 1955 when Vitasoy began to be marketed like a soft drink. Sales grew from 8.4 million bottles that year to 42 million in 1960 and 100 million in 1970, a 2.4-fold increase during the 1960s. By 1962 Vitasoy had become Hong Kong's best-selling soft drink, ahead of such internationally known brands as Coca-Cola, Pepsi-Cola, and Seven-Up.

Shoyu (Soy Sauce) Becomes a World Class Seasoning, Thanks to Kikkoman. Shoyu has long been the world's most popular seasoning other than salt, and Kikkoman has been the world's largest manufacturer since about 1918. During the 1960s Kikkoman internationalized its operations, developing new markets for shoyu throughout the world by exporting from Japan and promoting the products for use in Western-style recipes, largely with meat, fish, and poultry. Production climbed from 183,000 kiloliters in 1960 to 340,000 kl in 1970. During the same period its share of the Japanese shoyu market rose from 18% in 1960 to 30% in 1970.

Steady Rise in Soybean Production in Latin America and Africa. In Latin America production rose from 231,000 tonnes in 1960 to 1,535,000 tonnes in 1969, a 6.6-fold increase during the decade. Brazil accounted for 87% of that production in 1969, followed by Mexico and Colombia.

African soybean production rose from 27,000 tonnes in 1960 to 74,000 tonnes in 1969, a 2.7-fold increase. Nigeria accounted for 84% of that production in 1969, followed by South Africa and Ethiopia.

American Soybean Association Funding Increases Dramatically from Checkoff Programs. This was a decade of great growth for ASA. In 1962 the Minnesota Soybean Growers Assoc., the first affiliated state association, was founded. The ASA's biggest breakthrough to date came in 1966, when soybean growers began to support their own market development and research activities (previously funded by USDA's Foreign Agricultural Service) using funds provided by state checkoff programs. Typically ½ to 1 cent of funding was generated from each bushel of soybeans sold in states where a checkoff referendum had passed. By the early 1970s the checkoff programs had begun to generate large sums of money, which allowed ASA to expand its activities. Expanded market development activities overseas led to a steady, long-term increase in soybean exports.

Soybean Changes from an Oilseed to a Protein Seed. Prior to the mid-1940s the soybean, worldwide, had been crushed primarily for its oil. The meal was considered a by-product. But in the post-war period, with growing affluence driving increased demand for meat, the demand for meal outstripped that for oil, and the oil became the by-product. This trend, which started in America, was in full swing by the 1960s and expanded to other countries thereafter.

Soybean Digest and ASA Interest in Soyfoods. During the past two decades *Soybean Digest* has published a steady stream of articles on soyfoods worldwide. Soyfoods were given big play at many ASA annual conventions. This interest in the USA had largely stopped by the mid-1970s, focusing on soybean production instead.

5604. Fujimaki, Masao; Igarashi, Ssusmu; Asano, Katsuhiko. 1969. Kôri-dofu no bônan-sei hatsugen ni kansuru kenkyû

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[Study on the manifestation of swelling and elasticity in dried-frozen tofu]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 16(12):549. [Jap]*

5605. Okubo, Kazuyoshi; Sagara, G.; Shibasaki, K. 1969. The relationship between the ultracentrifugal fraction and the gel electrophoretical bands of soybean proteins. *Tohoku J. of Agricultural Research* 20(4):222-30. Dec. [12 ref. Eng] Address: Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai.

5606. *Soybean Digest.* 1969. Growers continue to back soybeans nationally: Market development. Dec. p. 3.
• ***Summary:*** "Funds continue to flow in from farmers supporting the American Soybean Assn.'s campaign to promote soybean sales abroad. Many states are in Phase II of the development program which is a voluntary checkoff of ½ cent per bushel made at the [first] point of sale.

"Phase II is an interim program until states pass legislation which enables an automatic deduction of ½¢/bu from all soybean sales. (The ½ cent will be refunded to any farmers who prefer not to support the market development activities in states where growers have passed a checkoff referendum.)

"The legislative program and referendum, Phase III, have already been passed in North Carolina, South Carolina, and Louisiana.

"Funds raised under these programs will be used to develop and expand world markets for soybeans. Funds are matched by the Foreign Agricultural Service [FAS], and in some cases by local processors–so every dollar contributed by farmers is multiplied 5 to 10 times.

"Results of market development activities have been so successful in Japan and Spain that additional funds will be used to develop markets in France, Italy and other nations in Europe and the Far East. Japan and Spain are the biggest importers of U.S. soybeans..."

5607. *Soybean Digest.* 1969. News in brief: ASA-JOPA win prize in Japan. Dec. p. 11.
• ***Summary:*** "A salad dressing advertisement used in the joint advertising campaign of the American Soybean Association and the Japan Oilseed Processors Assn. in Japanese women's magazines has won the top award for a magazine advertisement in Japan."

5608. Tanaka, Teruo; Saito, Nobuo. 1969. Studies on sensory evaluation of soy sauce. X. Relation between odor patterns and chemical factors (1). *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(12):780-89. Dec. [19 ref. Eng]
• ***Summary:*** Tring to determine which odor components play an important role in or have an important effect on the odor of soy sauce is a momentous problem. The author discuss the linear relationship that exists between odor patterns and 19 chemical factors (on the one hand) and quality patterns (on the other). Address: Central Research Inst., Kikkoman Shoyu Co., Ltd., Noda, Chiba, Japan.

5609. Tanaka, Teruo; Saito, Nobuo. 1969. Studies on sensory evaluation of soy sauce. IX. Construction of odor pattern on the odor judgment. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 47(12):772-79. Dec. [27 ref. Eng]
• ***Summary:*** The major components of soy sauce odor are related to: (1) The ratio of brewed soy sauce to amino acid solution obtained by hydrolysing soy beans with hydrochloric acid and adjusting the resulting solution to pH 5.0 with sodium carbonate; (2) Microbial contamination; (3) Medicinal dependent strains of *Aspergillus oryzae;* (4) Degree of ripening; (5) Pasteurization. These 5 factors explain 75% of the total variance. The strongest is number (1). Address: Central Research Inst., Kikkoman Shoyu Co., Ltd., Noda, Chiba, Japan.

5610. **Product Name:** [Soyalac {Soymilk}].
Foreign Name: Soiyarakku Neo.
Manufacturer's Name: College Health Foods. Later renamed San-iku Foods.
Manufacturer's Address: 1-1 Nagaurataku, Sodegaura-machi, Kimizu-gun, Chiba-ken 299-02, Japan.
Date of Introduction: 1969.
Wt/Vol., Packaging, Price: 180 ml glass bottle. Caned by 1980.
New Product–Documentation: Letter from Charles D. Howes. 1978. Oct. List of Seventh-day Adventist soymilk plants. In Japan: San-iku Foods, Kanno 4162, Sodegaura-machi, Kimitsu-gun, Chiba-ken 299-02. M. Urumba, Manager. Hidekazu Watanabe, production manager for Soyalac.

Shurtleff & Aoyagi. 1979. Tofu & Soymilk Production. p. 227-28. Gives a detailed description of the method used to make Soyalac.

William Shurtleff. 1981. Soyfoods. p. 35. "Dr. Harry Miller: Taking soymilk around the world." "Starting in about 1955 Dr. Miller started to recommend that the Adventist-run Japan San-iku School serve soymilk instead of cow's milk to the students; however the staff hesitated because of its nutritional value and flavor. In 1957 two Japanese Adventists, Mr. Hidekazu Watanabe and Mr. Hanzo Ueda (who ran a tofu shop at the time), started making Japan's first soymilk on a small scale in Hachioji, Tokyo, bottling it in 180-ml bottles, and selling it locally. Mr. Watanabe later described the great value to them of Dr. Miller's ongoing technical, nutritional, and spiritual guidance. After some time, directors of the San-iku School visited the small soymilk plant, liked the soymilk flavor, and understood its nutritional value. In 1959 they bought similar equipment, set up a small plant in the school, and started to produce soymilk, which was bottled in 180-ml bottles and served to the students at every meal. In 1969

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the San-iku School set up an independent food production company called College Health Foods (which later became today's San-iku Foods) and through it, with the help of Loma Linda Foods in America, began to produce Soyalac soymilk infant formula." By 1980 this product was canned in plain and carob flavors.

Letter (in Japanese) from Hidekazu Watanabe. 1981. July 19. Discusses the early history of this product. "The Ueda Tofu Shop in Hachioji helped with the product development; I was there at the time. In those days our name was San-iku Gakuin Shokuhin-bu (the food department of the San-iku School). The purpose was to provide a place of labor for the students and opportunities to learn food processing. It was not a business. Dr. Perry Webber was the principal of our school at the time." K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Soiyarakku Neo was introduced in 1969. It is now sold by Saniku Fuuzu in a 425 gm can and distributed nationwide.

Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64. "In 1958 Dr. Miller set up a small soymilk plant in the kitchen of the Adventist-run Tokyo Sanitarium. It was used to make soymilk, soy whipping cream, soymilk ice cream, and soy spread, which were served to the staff and patients. In 1959 a small soymilk plant was established in the Seventh-day Adventist San-iku School. From this year, Japan's oldest existing soymilk company, San-iku Foods, traces its origin. By 1982 San-iku Foods was Japan's fourth largest soymilk manufacturer.

Letter from San-iku Foods. 1990. June. This product was introduced in 1969.

Letter from Ichiro Tabuchi. 1990. July 4. In 1970 San-iku Foods became independent from the San-iku Gakuin Food Department and started to make and sell infant formula.

5611. Ebine, Hideo; Matsushita, Z.; Sasaki, H. 1969. [Evaluation of U.S. soybeans as raw materials for making miso: (Part 1) Miso manufacturing test on a laboratory scale (2)]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 183. p. 18-. [Jap]*
Address: National Food Research Inst., Tokyo.

5612. Ebine, Hideo; Matsushita, Z.; Sasaki, H. 1969. [Evaluation of U.S. soybeans as raw materials for making miso: (Part 1) Miso manufacturing test on a laboratory scale (3)]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 185. p. 22-. [Jap]*
Address: National Food Research Inst., Tokyo.

5613. Ebine, Hideo; Matsushita, Z.; Sasaki, H.; Yanai, S.; Ariyoshi, M.; Machii, M. 1969. [Evaluation of U.S. soybeans as raw materials for making miso: (Part 1) Miso manufacturing test on a laboratory scale (4)]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 186. p. 21-. [Jap]*
Address: National Food Research Inst., Tokyo.

5614. Ebine, H.; Matsuura, M. 1969. [Application of *Rhizopus* for shoyu manufacturing: (Part II) Properties of *Rhizopus* enzymes]. *Chomi Kagaku* (*Seasoning Science*) No. 16. p. 15-. [Jap]*
Address: National Food Research Inst., Tokyo.

5615. **Product Name:** [Fuji Nikku (Textured soy protein)].
Foreign Name: Fuji Nikku.
Manufacturer's Name: Fuji Oil Co. Ltd.
Manufacturer's Address: Toyama Building 121, 2-chome Azuchi-cho, Higashi-ku, Osaka, Japan.
Date of Introduction: 1969.
Ingredients: Defatted soybean meal.
How Stored: Shelf stable.
New Product–Documentation: Fuji Seiyu K.K. (Fuji Oil Co.). 1977. Fuji Seiyu 25 Nen-shi: Showa 21 nen 11-gatsu–Showa 51 nen 3-gatsu [Fuji Oil Company Ltd.: 25-year history, Nov. 1946 to March 1976]. Tokyo: Fuji Oil Co. 622 p. See p. 418. This was the first textured soy protein product made in Japan.

5616. Fujita, Mitsuo; Yoshikawa, Yôzô. 1969. Nattô no bitamin B-2 seisei to ryûsan ion no shôchô [Vitamin B-2 production and the rise and fall of sulfate ions in natto]. *Mimasaka Joshi Daigaku Kiyo* No. 2. p. 64-72. [Jap]*

5617. Kawamura, S. 1969. Studies on enzymatic hydrolysis of soybean oligosaccharides, to provide information basic to increasing the utilization of soybean food and feed products. Final Report, PL 480 project no. UR-A11-(40)-31 on USDA grant no. FG-JA-123. 75 p. [60 ref]*
Address: Dep. of Agricultural Chemistry, Kagawa Univ., Hirai, Japan.

5618. Kawashima, Masao. 1969. Kôri-dôfu no tôketsu to jukusei no sokushin [Acceleration of freezing and maturation while frozen of dried-frozen tofu]. *Shokuhin to Kagaku* (*Food and Science*). p. 145-47. Special edition on Protein Foods of the Future. [Jap]
Address: Habutae Tofu K.K., Shokuryô Kagaku Kenkyû-shitsu, Kanazawa-shi, Ishikawa-ken 921, Japan.

5619. Kawashima, Masao. 1969. Kôri-dôfu no kindai-teki seizô no tame no kôjô reiauto [Factory layout for modern production of dried-frozen tofu]. *Shokuhin to Kagaku* (*Food and Science*). p. 163-69. Special edition on Protein Foods of the Future. Illust. [Jap]
Address: Habutae Tofu K.K., Shokuryô Kagaku Kenkyû-shitsu, Kanazawa-shi, Ishikawa-ken 921, Japan.

5620. Kon, Masayo. 1969. Hamanattô ni kansuru kenkyû. I.

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Biseibutsu teiryô-ho ni yoru hamanattô oyobi Daitokuji-nattô no yûri aminosan sosei [Study on hamanatto. I. The free amino acid composition of hamanatto and Daitokuji-natto determined by a quantitative microorganism assay]. *Shizuoka Joshi Daigaku Kenkyu Kiyo* No. 3. p. 185. [Jap]*

5621. **Product Name:** [Luppy {Soymilk}].
Foreign Name: Luppy.
Manufacturer's Name: Luppy Tanpaku (House Shokuhin).
Manufacturer's Address: Minami Gotani 360-2, Yashio-shi, Saitama-ken 340, Japan. Phone: 048-924-5011.
Date of Introduction: 1969.
New Product–Documentation: Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that House Shokuhin first made commercial soymilk in Japan in 1969.

Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64. This was Japan's third commercial branded soymilk. Shurtleff and Aoyagi visited the company during the mid-1970s, but were not allowed to see the plant.

5622. Machida, Yoshiro. 1969. Tôfu, Aburage no kagaku [Science of tofu and deep-fried tofu pouches]. *Shokuhin to Kagaku* (*Food and Science*) No. 10. p. 124-27. Special issue (zokan). [Jap]

5623. Norinsho (Japanese Ministry of Agriculture and Forestry). 1969. [Report on the present status of the dried-frozen tofu industry]. Tokyo. [Jap]*

5624. Norinsho (Japanese Ministry of Agriculture and Forestry). 1969. [Report on the present status of the tofu industry]. Tokyo. [Jap]*

5625. Omata, S.; Murao, S.; Imamori, C.; Urakami, C.; Tanaka, Y.; Jono, A.; Morito, H.; Ueno, T. 1969. Effects of "Co gamma-rays" on natto preparation and *Bacillus natto. Osaka Furitsu Daigaku Kiyo* (*Nogaku Seibutsugaku*) (*Bulletin of University of Osaka Prefecture, Series B, Agriculture and Biology*) 21:61-76. (Chem. Abst. 72:41954. 1970). *
• ***Summary:*** Most articles are in English.

5626. Sekiguchi, Katsumasa; Kurokura, Mineko; Matsuoka, Hiroatsu; Sasako, Kenji. 1969. Daizu-nyû o rishita yooguruto nyûsan inryô seizô ni kansuru kenkyû [Research on the production of a yogurt-style lactic acid drink containing soymilk]. *Kawamura Tandai Kobun* 6:49. [Jap]*

5627. Shochiku Goemon Doimachiten. 1969. New soyfoods restaurant or deli. Resien Koen Yoko, Kami Kawabata-cho, Hakata-ku, Fukuoka-shi, Japan. [Jap; eng+]
• ***Summary:*** Toyo Shinpo (Soyfoods News). 1987. Oct. 21. p. 10. [Review of a tofu specialty restaurant]. The restaurant, Shochiku Goemon Doimachiten, at Resien Koen Yoko, Kami Kawabata-cho, Hakata-ku, Fukuoka-shi, Japan, has been open for 18 years. They serve a variety of tofu recipes in both Japanese and Western styles, including non-vegetarian dishes. They make their own tofu with 100% nigari and Japanese soybeans. Address: Fukuoka city, Japan. Phone: 092-291-0593.

5628. Tanegashima, C.; Odera, N. 1969. [Nicotinic acid during natto processing. IV.]. *Mukogawa Joshi Daigaku Kiyo. Seikatsu Kagaku-hen* (*Scientific Reports of Mukogawa Women's Univ.–Domestic Science Series*) 17:75-78. [Jap]*

5629. Watanabe, Tokuji. 1969. Evaluation of United States soybean varieties as a material for producing fresh tofu, to increase soybean utilization in Japan. Tokyo: Japan Tofu Association. 75 p. Final report, P.L. 480, project no. UR-A11-(40)-11 for the USDA on grant no. FG-Ja-104. [10+ ref. Eng]*
Address: Japan.

5630. Yoshikawa, Yôzô; Fujita, Mitsuo. 1969. Nattô no nenshitsu-butsu ni kansuru kenkyû [A study of the viscous substances in natto]. *Mimasaka Joshi Daigaku Kiyo* No. 2. p. 73-78. [Jap]*

5631. Yoshikura, K.; Hamaguchi, Y. 1969. [Anthocyanins of black soybeans]. *Shokuhin Eiyo Zasshi* (*Japanese J. of Food Nutrition*) 22:15-18. [Jap]*
Address: Japan.

5632. Cooking good food. 1969. Order of the Universe Publications, Box 203, Prudential Center Station, Boston, MA 02199. 34 p. No index. 28 cm.
• ***Summary:*** A simple, concise source of the basic macrobiotic ideas adapted to the American way. Note 1. This booklet was written by Jim Ledbetter, a student of macrobiotic teacher Michio Kushi, although his name does not appear in it.

Contents: The traditional food of man. The way of eating. Salt and oil. Special foods. Useful kitchen items. Cooking brown rice. Cooking other grains. Cooking vegetables. Cooking sea vegetables. Cooking beans. Cooking soups. Cooking with flours (Cooking noodles, cooking creams, baking bread, variations with flour). Cooking animal food. Preparing salads. Preparing condiments. Preparing drinks. Cooking desserts. Plasters. Traveling and eating out. he manner of eating. The seven levels of cooking.

In Chapter 4, titled "Special Foods" is a section on "Soybean foods" (p. 6), which states: "The soybean has been called the 'Vegetable Cow' of the Orient. It is full of good vegetable quality protein (43%). It was not traditionally eaten without special preparation, because it is fairly yin, except by monks who wished to limit their sexual desires. When cured

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with salt, however, it was used as a daily food. You will find these traditional preparations very helpful in your kitchen.

"Tamari is the ancient form of soysauce, fermented for at least eighteen months from soybeans, salt, wheat or barley, and water, without chemicals or preservatives. It has a very distinctive, delicious taste. It is used mainly in cooking vegetables when it is added after salting and just before the end of cooking time, and in broths. It is rarely used directly on grains, but is often found on the table to use with deep-fried foods. Some women mix tamari with an equal amount of water to make it less strong.

"Miso is a paste made from the same ingredients as tamari. There are two varieties; one (Hacho) is a little harder and darker in texture than the other. It has many uses, especially in soups, in which case it is added towards the end of cooking time so that the wonderful digestion-aiding bacteria it contains will not be destroyed. (All of these soybean condiments produce their best flavor when cooked slightly.) Miso soup has a deep, satisfying bouillon flavor, and is often taken every day as a delicious source of energy. It is helpful to thin miso in a little water before adding it to soups and sauces.

"Morromi [sic, moromi] is the pulp from which tamari has been made. It has a very special tangy flavor, and is used like miso.

"Seitan or 'Protein X' is made from the same ingredients as the above condiments. A slightly different process produces a strong jerky which, when boiled or sauteed, resembles beef in appearance and taste. It is very good in soups" (p. 6). Note 2. This is the earliest document seen (March 2011) that mentions "seitan." It is also the earliest English-language document seen (March 2011) that contains the word "seitan." By placing seitan in the category of "Soybean Foods," the author is apparently emphasizing the importance of soy sauce as one of its two main ingredients. He seems to have tasted seitan, but it is not clear that he knows what its other main ingredients are (wheat gluten, ginger, sesame oil) or how it is prepared.

"Tofu is made from fresh soybeans. This curd or 'cheese' is a good quality, strong yin food which is very refreshing for occasional use in summer when it is cooked with tamari. It is helpful to store tofu in water. The more yang pulp, which is usually thrown away, can sometimes to obtained from the Oriental stores which make tofu, and used to make delicious casseroles or well-sauteed vegetable dishes."

The section on "Condiments" (p. 6-7) discusses Gomasio (Sesame salt), umeboshi (salted plums), and Tekka. The section on "Oriental vegetables" (p. 7) discusses lotus root, daikon, ginger root, Chinese cabbage, jinenjo (Japanese potato), and kuzu arrowroot.

In the chapter titled "Cooking Beans" the author considers "Aduki Beans" to be the "King of Beans."

"Black Beans: The imported Japanese black beans are higher nutritional quality and superior taste. They are very sweet, delicious beans. They should be soaked and boiled, because their skin can become loose and clog a pressure cooker spout."

"Miso Soup: This hearty bouillon is the staple everyday soup. Prepare vegetables and boil for at least one-half hour (if you want a really good soup); thin miso with a little of the stock in a bowl and add it to the soup towards the end. Do not boil the soup after adding miso or the beneficial digestion-aiding bacteria will be harmed. If it is simmered very slowly, it can be cooked from 5 minutes to one hour.

"Tamari Soup: Prepare as above using tamari instead of miso for flavoring. A simple tamari broth with onions or carrots and onions is often served over dishes such as noodles."

In the chapter titled "Preparing Condiments" (p. 27) we read: "Vegetable Miso. Slice vegetables finely and saute. Add diluted miso and water and cook. Scallions, chives, carrot tops and many other vegetables are good prepared in this manner. 'Tekka' is made from lotus root, burdock root and carrots. 'Sigure' [Shigure] ('November Rain') is prepared with lotus roots, carrots, and onions. A little freshly grated ginger is often added towards the end of the cooking. A small amount of these condiments is usually sufficient."

The chapter titled "Preparing drinks" (p. 28-29) discusses Mu tea, umeboshi tea, chicory, Yannoh [Ohsawa coffee], dandelion coffee, Bardan, Kokkoh, kuzu, ume-syo-kuzu, and daikon drink.

The chapter titled "Cooking Desserts" (p. 30) states: "Amasake (Homemade Rice Wine). For special occasions this drink is very smooth and sweet."

Tofu is also mentioned in the chapter titled "Plasters" (p. 31). "Tofu Plaster. Squeeze tofu (soy bean curd, see *Special Foods*) and mix with 10% flour to make it more manageable. Apply this to any painful, feverish, or inflamed area. Alternating tofu plasters with ginger compresses often helps stubborn cases."

Note 3 This is the earliest document seen (July 2000) that mentions "Hacho" miso (spelled that way). Subsequently, many macrobiotic publications used this word and spelled it that way.

The chapter titled "Cooking sea vegetables" briefly defines kombu, wakame, hiziki (the incorrect idea concerning "black rice" comes from a casual remark by Evan Root), arame, dulse, and nori (laver).

Note 4 One original edition of this booklet, sent to Soyfoods Center by Tim Redmond (a founder of Eden Foods), has one dark blue stalk of wheat against a light blue background. In the lower right corner of the cover the following has been stamped with a blue ink stamp: "Eden Organic Food Store, 514 E. William. Ann Arbor, Mich. [Michigan] 48104." Address: [Massachusetts].

5633. Fujisawa Pharmeceutical Co. 1969. Glucono delta-

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lactone. Osaka, Japan. [12 ref]
Address: Osaka, Japan.

5634. Hawaii Nihonjin Iminshi Kankokai. 1969. Hawaii Nihonjin iminshi [History of Japanese Immigration to Hawaii]. Japan: HNIK. See p. 211. [Jap]*
• ***Summary:*** Repeats the information from Morita 1915 about Haruhachi Shimada being the first to brew shoyu in Hawaii.

5635. Hosokawa, Bill. 1969. Nisei: The quiet Americans. New York, NY: William Morrow and Company, Inc. xvii + 522 p. Foreword by Edwin O. Reischauer. Illust. Index. 28 cm.
• ***Summary:*** In this book the term "Issei," which literally means "first generation," generally is applied to Japanese who immigrated to the USA prior to the Exclusion Act of 1924. Nisei are the American-born children of these Issei. This book is extremely thorough, well researched and written; the author is a seasoned journalist.

An illustration (p. 28) shows the "Principal members of Japan's first diplomatic mission to the United States in 1860, wearing formal *hakama* costumes and swords." Page 29 discusses the memorable voyage of the *Kanrin Maru.*
Address: Denver Post, Denver, Colorado.

5636. Hosokawa, Bill. 1969. Early Japanese immigrants to and farming communities in California. The Wakamatsu Tea and Silk Farm Colony (Document part). In: B. Hosokawa. 1969. Nisei: The Quiet Americans. New York: William Morrow and Company, Inc. xvii + 522 p. See p. 31-34, 37, 496.
• ***Summary:*** The earliest Japanese farming community in California, the Wakamatsu Tea and Silk Farm Colony, was established in 1869 near Coloma in El Dorado County (35 miles northeast of Sacramento and 5 miles northwest of Placerville). Chapter 4, "The Vanguard Arrives," notes (p. 31-33, and 37) that the founders of this colony arrived in San Francisco from Japan on 27 May 1869 on the sidewheeler *S.S. China* of the Pacific Mail Co. This was probably the first immigrant party from Japan to arrive in the United States. It consisted of venturesome Japanese from the vicinity of Aizu Wakamatsu located about 200 miles northeast of Tokyo. "While most Japanese immigrants came to the United States for economic reasons, this first group was in effect made up of political refugees. Matsudaira Katamori, feudal lord of Aizu Wakamatsu, had sided with the Tokugawa shogunate in opposing the restoration to power of the imperial family. When the Tokugawas finally lost the struggle, their allies were stripped of wealth and influence, their retinue of warriors cast adrift as *ronin* (masterless samurai)." One of Matsudaira's advisors, Henry Schnell (a Dutchman, or perhaps a German), suggested that they seek refuge in the United States. "Schnell was commissioned to lead an advance party which would pave the way for later groups. Apparently the project had special approval, for general emigration was still prohibited.

"The records of the time are incomplete, but Mrs. Fern Sayre and Soichi Nakatani of Sacramento through painstaking research have uncovered considerable information about this project, called the Wakamatsu Tea and Silk Farm Colony. Henry Taketa of Sacramento in an article based on this research, has written in *The Pacific Citizen:*

"'Much of the group was made up of farmers and those in the trades, but several were samurai followers of Lord Matsudaira. Four women, including teen-age nursemaid Ito Okei of the Schnell family, were with the pioneer party.

"'The settlers, arriving in San Francisco, proceeded to Sacramento by riverboat and wagontrained to Placerville and nearby Gold Hill, where Schnell had arranged to purchase 600 acres for the farm colony. With them came 50,000 three-year-old mulberry trees for silk farming, a large quantity of bamboo shoots for food and craft industry, tea seeds, grape seedlings and other varieties of plants and seeds of their native land.'

"The colony was short-lived. The plants from Japan, weakened from the long voyage, failed to thrive in the dry soil, and water for irrigation was scarce. Financial aid expected from Japan failed to materialize. Schnell left with his wife and two daughters, promising to return with money, but he did not come back. The colony lasted less than two years. Some of the Japanese are believed to have returned to the homeland. Others drifted away and left no trace of their passage.

"There is reliable record of only three. One was Okei, the second a samurai and carpenter named Sakurai Matsunosuke, the third Masumizu Kuninosuke. Within two years Okei died of a fever that periodically swept the West and was buried atop Gold Hill... The original stone over her grave bears this stark epitaph: 'In memory of Okei, died 1871, age 19 years, a Japanese girl.'...

"The state of California in 1966 recognized the arrival of the Wakamatsu colony as an 'historic event' and the Japanese American Citizens League designated 1969 as the centennial of Japanese immigration to the United States. On June 7, 1969, a State Historical Plaque, telling the story of the Wakamatsu Colony, was placed on the grounds of Gold Trail School in El Dorado County some one hundred yards from the Okei grave.

"There are, however, indications that Japanese settlers were in California prior to the Wakamatsu Colony. The San Francisco *Chronicle* under date of June 17, 1869, mentions the arrival of Japanese 'upwards to a year ago.' They were described as 'gentlemen of refinement and influence in their country, from which they were compelled to flee, almost destitute, because their travel in civilized countries had made them too liberal in their ideas to suit the Mikado.' The report goes on to say the Japanese spoke English and French,

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and on the advice of a Mr. Van Reed, 'father of the United States consul at Jedo [sic, Edo, today's Tokyo],' leased a farm in Alameda County. Nothing further is heard of these gentlemen."

A photo (p. 496) shows California registered historical landmark No. 815: "Wakamatsu Tea and Silk Farm Colony. Site of the only tea and silk farm established in California. First agricultural settlement of pioneer Japanese immigrants who arrived at Gold Hill on June 8, 1869. Despite the initial success, it failed to prosper. It marked the beginning of Japanese influence on the agricultural economy of California." Address: Denver Post, Denver, Colorado.

5637. Hosokawa, Nobuo; Nanba, T.; Takeuchi, T.; Yoshida, T.; Yoshida, M.; Amano, T.; Yoshii, H. 1969. Miso shôyu jôzô ni okeru kôso-zai no riyô ni kansuru kenkyû. III. Kôso-zai ni yoru tanshoku-kei kara miso no shijô [Studies on the use of enzyme preparations in miso and soy sauce brewing. III. Trials on the application of some kind of mold protease preparation for light-colored salty miso]. *Aichi-ken Shokuhin Kogyo Shikenjo Nenpo* (*Annual Reports of the Food Research Institute, Aichi Prefecture*) 9:83-88. For the year 1968. [10 ref. Jap]
• ***Summary:*** Enzymes used included Takadiastase and papain. Address: Food Research Inst., Aichi prefecture, 2-1 Shinpukuji-cho, Nishi-ku, Nagoya-shi 451, Japan.

5638. Hosokawa, Nobuo; Yoshii, H.; Takeuchi, T.; Yoshida, M.; Nanba, T.; Amano, T. 1969. Miso shôyu jôzô ni okeru kôso-zai no riyô ni kansuru kenkyû. II. Tamari shôyu ni taisurusansei puroteaze seizai no tenka kôka [Studies on the use of enzyme preparations in miso and soy sauce brewing. II. On the effect of acid protease preparation for tamari soy sauce brewing]. *Aichi-ken Shokuhin Kogyo Shikenjo Nenpo* (*Annual Reports of the Food Research Institute, Aichi Prefecture*) 9:80-82. For the year 1968. [7 ref. Jap]
Address: Food Research Inst., Aichi prefecture, 2-1 Shinpukuji-cho, Nishi-ku, Nagoya-shi 451, Japan.

5639. Kawaguchi, Yutaka; Tsugo, Tomokichi. 1969. Daizu-nyû tanpaku tanpakushitsu no rikagaku-teki seishitsu ni oyobosu daizu-nyu no chôsei-hô to pH no eikyô [Effect of preparation methods and pH values on the physicochemical properties of protein in soybean milk]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 22(1):5-11. [17 ref. Jap; eng]
Address: Tokyo Univ., Nôgaku-bu, Nogeikagaku-ka.

5640. Kawashima, Ryoichi. 1969. Trends of research of soybean cultivation in Japan. *JARQ* (*Japan Agricultural Research Quarterly*) 4(4):15-19. [4 ref. Eng]
• ***Summary:*** Contents: History of research. High productivity: Photosynthesis, growth analysis, soil and fertilizer, method of cultivation, high yield cultivation. Good quality seed. Pest control. Preventative measures against cold-weather damage.

History: The area of soybean cultivation in Japan remained at about 450,000 ha until about 1920, when it began to decrease gradually, falling to half (225,000 ha) by the start of World War II. This decrease was caused by increasing imports of soybeans from Manchuria. During this period of decrease, research on soybean cultivation was seldom conducted, except for breeding, and that continued with difficulty.

In the years immediately after World War II, soybean production in Japan showed no signs of increasing, being thrust aside by production of urgently needed starch foods [such as rice and barley].

Then in 1950 soybean production began to increase rapidly and an area of 400,000 ha was maintained over the next five years. Detailed studies of soybean cultivation were undertaken during those years.

In 1945 the first laboratory of soybean cultivation was established at the Imperial Agricultural Experiment Station. And with the rapid increase in cultivated area, studied on soybean cultivation began at the national and public agricultural experiment stations and universities.

But starting in 1955, as imports of soybeans from the United States increased rapidly, the area of soybean cultivation decreased year after year. But to strengthen the competitive position of Japanese soybeans, research on these soybeans was intensified, even after the free trade of soybeans was opened up in 1961.

However by 1968, due to increasing soybean imports, the area of soybean cultivation in Japan had decreased to 120,000 ha and soybean production in Japan decreased to 7% (170,000 tons) of all demand. Nevertheless, soybean research is still considered important as it is one of the major sources of plant proteins.

Today, research on soybean cultivation is being conducted at five breeding institutes and at some national agricultural experiment stations and universities. Here, in laboratories, advanced studies are being made. An outline of the research results is published by the Ministry of Agriculture and Forestry, and detailed results obtained during successive years were collected and published in 1953 (obtained in 1939-1951) and in 1967 (obtained in 1952-1963). Address: Chief, 2nd Lab., 2nd Div. of Plant Physiology, Dep. of Physiology and Genetics, National Inst. of Agricultural Sciences, Japan.

5641. Kusano, Aiko. 1969. Nattô seizô katei ni okeru daizu tanpaku no henka. I. Sô-chisso, suiyô-sei chisso, TCA kayô-sei chisso, amino-tai chisso, pepuchido-tai chisso ni tsuite [Changes in soybean protein during natto production. I. On the total nitrogen, water soluble nitrogen, TCA soluble nitrogen, amino nitrogen, and peptide nitrogen]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*)

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22(9):615-20. [9 ref. Jap]
• ***Summary:*** Three kinds of natto were prepared using 3 different strains of *Bacillus natto.* Likewise a liquid natto was made from steamed soybeans, fermented under aeration and crushing. In regular natto water soluble nitrogen decreased to 85% of that in raw soybeans. TCA soluble nitrogen, amino nitrogen, and peptide nitrogen increased significantly in natto and their proportions differed in the natto made from two strains of *Bacillus natto.* Note: TCA is probably trichloracetic acid. Address: Gifu Daigaku, Kyôiku-bu (Dep. of Education, Gifu Univ.).

5642. Meals for Millions Foundation. 1969. Annual report 1968. Santa Monica, California: MFM Foundation. 8 p. Typed with signature on letterhead.
• ***Summary:*** Submitted by I.F. Saunders, Executive Director. Contents: Summary. MFM board and staff. Technical training. Research & development. Multi-purpose food shipments (278,113 lb to 33 countries). Financial condition (Donations in 1968 were $408,000, the highest in MFM's history. Only 7% of income was used for administration and management, and only 13% for fund raising and public relations). U.S. Projects: California ("Governor Ronald Reagan has readily accepted the title of Honorary Chairman of the Meals for Millions California Chapter." He has participated in MFM "activities over the past years, and is acquainted with what we are doing and firmly believes in the way we are doing it"), Nevada, Arizona, Mississippi, South Carolina. Overseas Projects: Japan, Korea, Taiwan, Philippines, Hong Kong, Thailand, India, Ceylon, Pakistan, Iran, Ecuador, Chile, Brazil, Mexico. Remarks.

Note 1. This is the earliest document seen (Dec. 2010) which shows that Meals for Millions Foundation was now located at 1800 Olympic Blvd. in Santa Monica–15 miles west of Los Angeles. Actually, MFM moved to this location in 1967.

Note 2. This is the earliest annual report seen (Dec. 2010) for Meals for Millions.

Chris Dodson of Freedom from Hunger (FFH), who kindly sent this annual report (and almost all subsequent MFM / FFH annual reports) to Soyinfo Center (Dec. 2010), says she can find no evidence of annual reports for 1965, 1966, or 1967 in the FFH archives. Address: 1800 Olympic Boulevard (P.O. Box 1666), Santa Monica, California. Phone: 870-0451.

5643. Misumi, Kan. 1969. Miso daigaku [Miso university: The great teaching on miso]. Tokyo: Bungeisha. 230 p. Illust. 22 cm. Reprinted in 2001 by Gendai Shokan in Tokyo. [Jap]
• ***Summary:*** Contents: 1. The art and skill of making miso. 2. Thoughts about miso. 3. Barley miso. 4. Aged miso. 5. The limitless art of miso. 6. Wheat miso. 7. American miso. 8. Farmhouse miso. 9. Kumakusu miso. 10. Selective art. 11. Hangover treatment. 12. Kinzanji miso. The author's thoughts about miso. Additional discussion on pickles.

Kan Misumi, the author, lived 1903-1971. This book, which contains numerous excellent photos (many in color) and recipes, is a highly personal and literary approach to the subject of miso by a Kyushu-born novelist who, upon retirement, turned his spacious Tokyo home into a center for the study and preparation of miso and miso pickles. This volume and its companion, *Pickle University* (*Tsukemono Daigaku*) contain a wealth of information about the preparation of both these foods in the traditional, natural way.

Note: This is the earliest document seen (March 2009) that gives detailed, illustrated directions for making miso at home. Address: Dr. of Literature (Bungei Hakase), Tokyo.

5644. Misumi, Kan. 1969. Tsukemono daigaku [The great teaching on pickles]. Tokyo: Bungeisha. 266 p. Illust. No index. 22 cm. [Jap]
• ***Summary:*** This book contains many excellent photos and recipes. Contents: Pickles and health. Then 25 chapters on various types of pickles. Chapter 10 is umeboshi (salt plums). Chapter 15 is koji pickles. Chapter 16 is miso pickles and sand pickles (*suna-zuke*). Address: Bungei hakase, Tokyo.

5645. Moore, Raymond S. 1969. China Doctor: The life story of Harry Willis Miller. 2nd ed. Mountain View, California: Pacific Press. 215 p.
• ***Summary:*** The original edition of this book was published in 1961. This 1969 edition, although it has been completely re-set, contains only minor revisions: (1) A new color paperback cover shows a large illustration of Dr. Miller's face. (2) This second edition contains a 3-page Postscript (p. 150-52), which describes his work in Hong Kong (1960-65, 1969), Philippines (1966), expansion of his work with soymilk in Hong Kong ("The Hong Kong soft drink industry dispenses more milks derived from his soybean milk than all others combined"), other work with soy ("His grain-and-soybean-based foods are being adopted as alternates to meat in lands which cannot support animals as a principal diet source. They range from soy cheese, milk, ice cream, and butter-like spreads to simulated steaks, wieners, and sausages. These vegetable foods now are making headway even in the United States and other Western countries. In an era of population dilemmas, Harry Miller reminds the experts that meat, as compared with vegetable protein, takes several times the acreage to produce the same amount of food."), George McGovern and Food for Peace (1961) which resulted in sharply increased exports of soybeans from the USA. (3) The number of pages in the book has been reduced to 152, from the original 215. (4) The valuable index in the first edition has (unfortunately) been omitted. (5) The number of photos has been reduced to 11, from 16 in the first edition, and many photos from the first edition were omitted.

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New photos (located on unnumbered pages 142-47) show: (1) Harry and Maude Miller at the time of their wedding in 1902. (2) Dr. Miller with a woman victim of goiter in China. (3) Hong Kong Hospital for Chinese refugees at Tsuen Wan, completed in June, 1965. (4) Dr. Miller with little Mohammed Ali, a Bedouin child in Libya. (5) Harry and his wife Mary in 1957 waiting at the airport in Benghazi, Libya. (6) Mr. Chan Shun donates 1 million Hong Kong dollars for the construction of a Seventh-day Adventist hospital in Hong Kong. Dr. Miller looks on. (7) In 1968 at Albuquerque, New Mexico, Dr. and Mrs. Miller are given a red-carpet welcome by Governor David F. Cargo.

5646. Nishiyama, Buichi; Kumashiro, Yukio. trans. 1969. Seimin yôjutsu. 2nd ed. [Ch'i-min yao-shu (Qimin yaoshu)]. Tokyo: Asian Economic Press (Ajiya Keizai Press). [Jap]
• ***Summary:*** Translation into Japanese with explanatory notes and extensive general discussion.

5647. Obara, Tetsujiro; Kobayashi, M.K.; Kobayashi, T.; Watanabe, Y.; Ohata, M.; Tanaka, M. 1969. Basic investigations on the development of foods from enzymatically treated soybean protein concentrates to increase the use of United States soybeans in Japan. Tokyo: Dep. of Agricultural Chemistry, Faculty of Agriculture, Tokyo University of Education. 97 p. Undated. Final report, P.L. 480. Project no. UR-A11-(40)-26. Grant no. FG-Ja-122. Report period: 13 Oct. 1965–12 Oct. 1968. Summarized in Soybean Digest, May 1969, p. 77. [12 ref. Eng]
• ***Summary:*** The group prepared a cheese-like soy protein food by enzymatic treatment. They began by extracting soymilk. The enzymes papain, Bioprase, and Pronase were tested. Address: Dep. of Agricultural Chemistry, Tokyo Univ. of Education, Komaba 2-19-1, Meguro-ku, Tokyo, Japan.

5648. Ohsawa, Georges (Nyoiti Sakurazawa). 1969. Le Zen macrobiotique; ou, l'art du rajeunissement et de la longévité [Zen macrobiotics, or the art of rejuvenation and longevity]. Paris: Librairie Philosophique J. Vrin. 212 p. Index. 19 cm. Preface by Cauvet-Duhamel. [Fre]
• ***Summary:*** Contents: Preface, by Cauvet-Duhamel. Foreword, by G. Ohsawa. 1. Macrobiotics and the medicine of the Orient. My therapeutics. 3. The seven conditions of health and happiness. 4. With faith, nothing is impossible. 5. Yin and yang. 6. My macrobiotic cuisine and the ten ways of eating properly. 7 Principal foods (*Les aliments principaux*). 8. Secondary foods. 9. Special dishes. 10. Suggestions for some illnesses / maladies. 11. Healing regimens. 12. Food for infants. 13. Some ideas.

Appendixes: A cure in 10 hours. Pro-forma death certificate for the world empire of the American gold dynasty. My talks in the United States (starting in Nov. 1959, in New York, Los Angeles, and San Francisco). The despair of American doctors according to the *Times* of 7 March 1960 (listing of the number of people with 17 incurable diseases). How much does the death of a civilization cost? The real cause of sickness, unhappiness, and war. Professional education and religion. Medicine's last cry of despair. The medical revolution in the China of Mao Tse-tung. Medicine: God alone understands it. My prophecy.

The following foods are discussed: Rice, buckwheat, millet and other cereals (p. 67-77). Azuki beans (p. 98). Sesame tofu (p. 98). Sea vegetables (konbu, hijiki, p. 101-05). Miso and miso recipes (p. 105-08, incl. Tekka). Shoyu and shoyu recipes (p. 108-10). Ohsawa coffee (Yannoh, with azuki, p. 111-12). Syo-ban (Natural green tea with shoyu, p. 113-14). Kuzu (p. 114). Umeboshi juice (p. 116-17). Ume-syo-ban (umeboshi and tamari shoyu, p. 117). Ume syo-kuzu (with umeboshi, shoyu, and kuzu, p. 117). Miso fried in sesame oil (p. 118).

Note 2. The author, born in 1893, lists his name on the title page as "Georges Ohsawa (Nyoiti Sakurazawa)."

Note 3. This is the earliest French-language document seen (April 2012) that uses the term *tamari* to refer to soy sauce.

5649. Rodrigues, Joao. 1969. Rodorigesu Nihon daibunten [The art of the language of Japan. Edited by Shôzô Shima and Masakazu Shima]. Tokyo: Bunka Shobô Hakubunsha. 479 p. 27 cm. [Por; Jap]*
• ***Summary:*** This is a reprint of the second major dictionary published by Jesuit priests in Japan. The original edition was published in 1604 in Nagasaki by the Collegio de Iapao da Companhia. Rodrigues lived 1561-1634.

5650. Rudzinski, Russ. 1969. Japanese country cookbook. San Francisco, California: Nitty Gritty Productions. xvi + 198 p. Illust. by Mike Nelson. 14 x 22 cm.
• ***Summary:*** An innovative but hard-to-read book printed with red ink on dark tan paper. The many illustrations (black line drawings) are excellent.

A surprisingly large number of the recipes in this cookbook contain soyfoods. Soy-related recipes include: Sukiyaki (with "1 block of fresh bean cake (*tofu*) or 1 can *tofu,* cut into bite-size squares," and shoyu, p. 5-10). Teriyaki (normally done on a hibachi grill; *teri* = shiny or glazed and *yaki* = broiled, p. 16). Miso shiru (p. 20). Chicken teriyaki with sesame seeds (with shoyu, p. 24). Chicken liver teriyaki (with shoyu, p. 26). Shrimp teriyaki (with shoyu, p. 28). Spicy shrimp teriyaki (with shoyu, p. 28-29). Tofu dengaku (p. 29). Tofu yaki (fried) (with tofu, miso and shoyu, p. 29). Tofu soup (p. 48). Kaki no miso suimono (Oyster soup with soybean paste, p. 55). Vegetable and noodle miso soup (p. 56). Shrimp miso (p. 56). Takara yaki (omelette with tofu, p. 65). Tofu-egg cakes (p. 66). Tofu-egg omelette with white toasted sesame seeds (p. 66). Fried tofu with egg (p. 67). Cabbage with miso sauce (p. 85). Horenso (spinach) with miso (p. 89). Karai nasubi miso (Spicy eggplant with

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miso, p. 94). Goma nasubi miso (Eggplant with miso and sesame seed paste, p. 95). Tofu sauce (p. 102). Inari sushi (with aburage, p. 110-11). Miso dango (meatless rice-based patties / balls, p. 117). Soba (buckwheat noodles) with miso sauce (p. 122). Tofu to niku donburi (bowl with meat and tofu, p. 127). Sakana no nitsuke (fish cooked with miso, p. 135). Shiroi sakana no nitsuke (white fish with miso, p. 136). Tofu to ebi no kuzu-ni (tofu and prawns in kuzu sauce, p. 139). Simple kaki (oyster) miso (p. 140). Kaki nabe (pot of oysters with miso, p. 141). Kaki to tofu nabe (oyster pot with tofu and white miso, p. 141). Yaki hamaguri (broiled clams with white miso, p. 143). Kawari tofu nori zuke (prawn dumplings with tofu, p. 148). Tori dango miso (fried ground chicken with miso, p. 162). Tofu, pork and vegetables (p. 167). Mashed tofu and ground pork (p. 168). Buta nabe (pot-au-pork with "4 fried tofu, fresh or canned, cut in strips," p. 168). Pork mizutaki (with tofu, p. 169). Beef mizutaki (with tofu, p. 175-76). Shabu-shabu (with tofu, p. 181). Shoyu is used in many, if not most, of the recipes in this book.

At the back is a glossary, which includes definitions of aburage, miso, shoyu, and tofu. Address: California.

5651. Saito, Akio. 1969. [Chronology of soybeans in Japan, 1950 to 1969] (Document part). In: Akio Saito. 1985. Daizu Geppo (Soybean Monthly News). Feb. p. 15-16. [Jap]

• ***Summary:*** 1950–The production of soybeans increases greatly to 446,900 tonnes (2.1 times more than in recent years).

1950–In March, the food ration system organization is closed. In July the ration systems for miso and shoyu are removed.

1951 March–The restrictions for soybeans and rapeseed are removed. From this time on, the number of natto makers increases rapidly.

1952–Soybean production in Japan reaches 521,500 tonnes, the largest since World War II.

1953 Jan.–Restrictions are imposed on imports of foreign soybeans paid for in foreign currencies.

1955. Rice production in Japan this year is 12,390,000 tonnes (up 35.9% over last year). This is the first time it has topped 12,000,000 tonnes. Irrigated rice cultivation (*suiden*) is 20% more than last year. The days of rice shortages are over and the black-market price of rice falls. The per-capita direct consumption of soybeans for the year is 4.5 kg (This information comes from *Norin Suisan-sho, Shokuryo Jukyu-ho*).

1955 April–Soybeans from Brazil are graded using the AA system (*Yunyu jido shonin sei*).

1956–A new natto container is invented, made of shaved wood (*kyogi*) lined with a polyethylene sheet.

1956 June 13–New regulations for agricultural products and price stabilization. Domestic soybeans are added to them.

1956 Oct.–The tax on imported soybeans rises to 10% and the no-tax system for soybeans is removed.

1959–The first instant miso soup is introduced by Yamajirushi Miso in Nagano. It contains dried green onions, wakame, dried tofu [probably dried-frozen tofu], etc.

1959–At about this time research begins on meat analogs made from soy protein.

1960–Per capita consumption of shoyu drops to 13.7 kg. It has now fallen below 14 kg/person.

1960 Soybean imports rise to 1,128,000 metric tons topping 1,000,000 tons for the first time.

1961 July 1–The tax on imported soybeans is removed.

1962–A new natto container made of Styrofoam is invented (*PHP yoki, happo suchiroru*).

1963–In the USA General Mills starts to sell meat analogs made from soy protein.

1965–Per capita miso consumption drops to 7.8 kg, falling below 8 kg/person.

1965–Production of defatted soybean meal reaches 1,074,000 tonnes, passing the 1 million tonne mark for the first time. Production has risen 56% in during the past 5 years.

1966–At about this time meat analogs, based on modern soy protein products, start to be sold commercially in Japan–to institutions.

1966–Soybean imports rise to 2,168,467 tonnes, passing the 2 million tonne mark for the first time.

1966–Production of soybeans in Japan drops below 200,000 tonnes for the first time. Japan now produces only 9% of the soybeans it consumes.

1966 May–Kikkoman starts to sell low-salt shoyu.
1968–Meat analogs based on soy protein start to be sold to the general public in Japan.

1968 June–Research conducted by the *Mainichi Shinbun* shows that the size and price of tofu is now different in different areas. In Tokyo it sells for 25 yen per 300 gm or over. Cakes of tofu sold in downtown Tokyo (*shitamachi*) are smaller than those sold uptown (in the hilly sections) (*yamanote*). Some tofu shops that are not members of the tofu association sell it for 15 yen per 350 gm. In Nagoya it retails for 30 yen per 450 gm, and in Northern Kyushu 25 yen per 450 gm. Per capita consumption of tofu is 33 cakes (*cho*) a year.

1969–Annual per capita consumption of soy oil in Japan rises to 3.2 kg per person, passing the 3 kg mark for the first time. In 1960 it was 1.2 kg/person. Address: Norin Suisansho, Tokei Johobu, Norin Tokeika Kacho Hosa.

5652. Sanbuichi, Takashi; Gotoh, Kanji. 1969. Studies on adaptation in soybean varieties. *Hokkaido Prefectural Agricultural Experiment Station, Bulletin* No. 19. p. 36-46. [Jap; eng]*

• ***Summary:*** Discusses cool weather tolerance in soyabean breeding.

Note: This is the earliest document seen (July 2010)

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concerning cold tolerance in soybeans. Address: Tokachi Agric. Exp. Station, Memuro-cho, Kasai-gun, Hokkaido, Japan.

5653. Sekine, Shinryû. 1969. Nara-cho shokuseikatsu no kenkyû [Research on the eating habits of the Nara period (A.D. 710-784) in Japan]. Tokyo: Yoshikawa Kôbunkan. 9 + 542 + 35 p. See p. 30. 22 cm. [Jap]*
• ***Summary:*** The earliest known soybeans excavated in Japan, dated from the beginning of the first century A.D., were from the Iba ruins in Hamamatsu city, Shizuoka prefecture, Japan.

Another early soybean find, dated from the third century A.D., was excavated from the Yasuda Okayama ruins in Mioka Village, Kumage-gun, Yamaguchi prefecture, Japan. Address: Japan.

5654. Shibutani, Yoshikazu. 1969. Shôyu zukuri no jissai [The reality of manufacturing soy sauce]. Tokyo: Chijin Shokan. 290 p. 19 cm. [Jap]*
• ***Summary:*** Note: Yoshikazu Shibutani was born in 1893.

5655. Shibuya, Yoshiichi. 1969. Shôyuzukuri no jissai [Practical shoyu production]. Tokyo: Chijin Shokan. 290 p. (Modern Engineering Library). [35 ref. Jap]
• ***Summary:*** A technical book with a substantial bibliography.

5656. Shinojima, Chu; Ashihara, Tamako. 1969. Practical shoyu cooking: Delicious dishes with Japanese soy sauce. Tokyo: Japan Publications Inc. 61 p. Illust. No index. 26 cm. [Eng]
• ***Summary:*** Contents: Introduction. Helpful hints on how to use this book. Egg dishes. Beef and veal dishes. Okinawan dishes. Chicken dishes. Japanese soy sauce–Shoyu. Pork dishes. Modern Japanese cooking. Canned foods and salads. Desserts. Tofu dishes and soups. Fish dishes.

Contains many full-page color photos. The word "shoyu" is used throughout the book, and all recipes call for the use of "shoyu." The chapter titled "Japanese soy sauce–Shoyu" (p. 32-33) begins: "Shoyu is the single seasoning without which the art of Japanese cooking would be impossible. Its flavor and fragrance also blend beautifully with food of other countries, and shoyu is now in use throughout the world. Japan's largest shoyu producer, the Kikkoman Shoyu Company, exports its product to 51 countries around the world." It also notes that among the traditional influences on Japanese cooking, that "of Buddhism was especially strong in regard to developing a respect for the natural flavor of each food item. The best means of bringing out the flavor of each food was found to be through the use of shoyu."

5657. Stanton, W.R. 1969. Some domesticated lower plants in South-east Asian food technology. In: Peter J. Ucko and G.W. Dimbleby, eds. 1969. The Domestication and Exploitation of Plants and Animals. Chicago: Aldine Pub. Co. xxvi + 581 p. See p. 463-690. Proceedings of a meeting... held at the Institute of Archaeology, London University. Illust. 26 cm. [10 ref]
• ***Summary:*** In this paper, "lower plants" refers to microorganisms and algae. These cultivated microorganisms include marine and lacustrine algae (nori, kombu), fungi (Aspergillus, Rhizopus species), yeasts (Saccharomyces species) and bacteria (Lactobacillus, etc.). In Indonesia, tempeh (cakes made by fermenting soybeans) and fermented groundnuts "provide about one-third of the total crude protein requirement the population..." (p. 464). A complex fermentation is used to make miso, a fermented soybean paste, in Japan; a number of different microorganisms take part at different stages. Some 75% of the households in Japan use miso daily as the main soup seasoning–according to a recent survey.

"The Japanese products represent a northward and eastward migration of the 'sho' process (a general term in Japan for the high salt fermentations). Today these fermentations are carried out under highly industrialized conditions, the organisms being given the benefit of highly specialized environments, and the domestication in consequence has proceeded here further than it has elsewhere in the region" (p. 467). Address: Tropical Products Inst., London.

5658. Steinberg, Raphael. 1969. The cooking of Japan. New York, NY: Time-Life Books. 208 p. Illust. General index. Recipe index (English). Recipe index (Japanese). 28 cm.
• ***Summary:*** A superb, elegant book, that (with its spiral-bound companion volume of recipes) captures in both words and photos (by Eliot Elisfon) the true spirit of Japanese food and cookery. Contents: Introduction: Solving the mysteries of Japan's marvelous cuisine, by Faubion Bowers. 1. The heritage of a remarkable past. 2. Foods to suit the seasons. 3. The logic of Japanese cookery. 4. The world's greatest seafood. 5. Simple, satisfying foods of home. 6. A ceremony that sired a cuisine (*kaiseki* or tea ceremony cooking, with roots in 13th century Zen Buddhism). 7. Eating out as a way of life. 8. Magnificent meals in elegant settings.

Soy-related: The writer of the introduction snacked on odorous, fermented soy beans (*natto*) at night before retiring (p. 6). His son said to him recently, "Please, Dad. Not *tofu* again!" (p. 7). Importance of the soybean (p. 16-17; China has had a huge impact on Japanese culture. "Perhaps the most important food innovation contributed by China was the soybean, which is various disguises is still the foundation stone of Japanese cooking"). Shoyu is the Japanese word for soy sauce (p. 26). Tofu (soybean curd), which is cooked with other foods throughout most of the year, becomes a dish in its own right during the summer, served on ice and flavored

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with soy sauce (as *hiyayakko,* p. 32). Photos of tofu, shoyu, green soybeans [*edamamé*] and akadashi miso in prepared festival dishes (p. 34-35). *Matsutake* mushrooms with tofu or shoyu. "The most important lesson to be learned deals with the ubiquitous role of the soybean. Generally considered by Westerners to be the most humble of vegetables, the soybean is in fact the king of the Japanese kitchen. One might almost say that Japanese cuisine is built upon a tripod of soybean products: *miso,* a fermented soybean paste; *tofu,* a custardlike soybean cake; and soy sauce, used both to season foods as they are being cooked and to make dipping mixtures that enhance the flavors of the foods as they are being eaten." Details about these three products and their uses is then given (p. 41-42). Teriyaki or "shining broil" (p. 43). Two-page color photo shows (p. 44-45): Azuki beans and *kuromame* (black soybeans), sesame seeds, sesame oil, *fu* (wheat gluten croutons), *aonoriko* (powdered green seaweed), Kikkoman shoyu, *aka miso, shiro miso, tofu,* nori and wakame.

Ponzu, a dipping sauce which is half soy sauce and half lemon or lime juice (p. 46). Sukiyaki (p. 46). Tempura (p. 49). *Aemono* and *sunomono* with tofu, miso, or soy sauce (p. 48). Photo of a tofu-slicing knife with a serrated blade (p. 50). Recipes: Clear soup with tofu and shrimp (*Sumashi wan,* p. 55). Miso soup with red and white miso (p. 56-57, 59). Miso-flavored pork and vegetable stew (*Satsuma-jiru,* p. 61). Soy and sesame-seed dressing with string beans (*Goma joyu-ae,* with "½ cup white sesame seeds, toasted and ground to a paste," p. 62). Tofu and sesame-seed dressing with vegetables (*Shira-ae,* p. 63; "Add the sesame seeds..., warm them until lightly toasted. Grind them to a paste in a *suribachi* {serrated mixing bowl} or, more easily, pulverize them at high speed in an electric blender with 1/8 teaspoon of soy sauce. Transfer the sesame-seed paste to a mixing bowl...)."

Two color photos show: (1) Toasted sesame seeds in a *suribachi* with a wooden pestle. (2) When ground, they "quickly release their oil and turn into a paste." White miso dressing (*Neri shiro miso,* p. 67). Photo of *zensai,* incl. miso-marinated asparagus, and abalone cooked in soy sauce (p. 72). Sashimi dipped in soy sauce (p. 81-83, 90-91).

Undersea vegetables: nori, kombu, wakame, hijiki (p. 88-89). Recipes: Sushi (p. 95-101). Tempura (p. 103). Mirin and soy dipping sauce for tempura and noodles (*Soba tsuyu,* p. 104). Deep-fried tofu in soy-seasoned sauce (*Agedashi,* p. 105).

Tofu is the Japanese word for soybean curd (p. 108). Umeboshi (p. 109). Miso soup (p. 109-10). Natto and miso (p. 115). Tofu and shoyu in *yudofu* (p. 116). Sekihan and azuki (red beans, p. 120). *Mame* ("beans") are served at traditional wedding feasts; the word also means good health. Mochi (p. 121). Recipes: Sekihan (p. 126). Fox noodles with deep-fried tofu (*Kitsune udon,* p. 127). Bubbling tofu (*Yudofu,* p. 132-33). *Sukiyaki* (p. 134, with tofu and soy sauce). *Shabu shabu* (with tofu, p. 135).

Tofu and miso in *kaiseki* cuisine based on Zen Buddhism and the tea ceremony (p. 146-49). Teriyaki, mirin, ponzu, tofu (p. 152). Tofu and shoyu (p. 159). Sasanoyuki restaurant in Tokyo (uses tofu as a main ingredient in every dish, p. 160-61). Sukiyaki, with tofu and soy sauce (photo, p. 166-67). Broiled mackerel in miso marinade (*Miso zuke,* p. 169). Dengaku tofu (p. 172-73, with color photo). Beef teriyaki (with shoyu, p. 174-75). Yakitori (with teriyaki sauce, p. 174-75). Grilled chicken with sweet soy-seasoned glaze (*Tori teriyaki,* p. 176). Black soybeans and tofu (p. 188). At a geisha house, shoyu is called *murasaki* ("the purple").

A guide to Japanese ingredients (glossary): Incl. aji-no-moto, aonoriko, azuki, fu, goma, goma-abura, hichimi (shichimi) togarashi, kombu, konnyaku, mirin, miso, MSG, nori, shoyu, soba, tofu, umeboshi, wakame, wasabi.

Note: The spiral-bound recipe book accompanying this volume contains the recipes in the parent volume and no new information; the binding makes it easier to use in the kitchen. Address: USA.

5659. Takeuchi, T.; Joshida, M.; Hosokawa, N.; Nanba, T.; Amano, T.; Yoshii, H.; Yoshida, T.; Murai, K. 1969. [Studies on tamari brewing. I. On the factory coefficient]. *Aichi-ken Shokuhin Kogyo Shikenjo Nenpo* (*Annual Reports of the Food Research Institute, Aichi Prefecture*) 9:58-67. For the year 1968. [Jap]*
Address: Food Research Inst., Aichi prefecture, 2-1 Shinpukuji-cho, Nishi-ku, Nagoya-shi 451, Japan.

5660. Takeuchi, T.; Amano, Y.; Yoshii, H. 1969. [On the amounts of levulinic acid in commercial soy sauces]. *Aichi-ken Shokuhin Kogyo Shikenjo Nenpo* (*Annual Reports of the Food Research Institute, Aichi Prefecture*) 9:76-79. For the year 1968. [Jap]*
Address: Food Research Inst., Aichi prefecture, 2-1 Shinpukuji-cho, Nishi-ku, Nagoya-shi 451, Japan.

5661. Yamaguchi, Kozo. 1969. Jôzô kikai: Sake, miso, shôyu seizô no kindaika o hakaru [Brewing machines: Designing for the modernization of sake, miso, and shoyu production]. Tokyo: Chijin Shokan. 169 p. (Modern Engineering Library). [20+ ref. Jap]*

5662. Muso Shokuhin. 1969? Tennen jôzô shôyu [Naturally fermented shoyu (Leaflet)]. Osaka, Japan. 1 p. Undated. [Jap]
Address: Osaka, Japan. Phone: (06) 772-5340.

5663. Erewhon Trading Co., Inc. 1970. Traditional foods: Importers, processors, distributors. Wholesale-retail catalogue. Boston, Massachusetts. 12 p. Jan. 1. 22 cm. [2 ref]
• ***Summary:*** On the cover is the silhouette of three heads of grain on the plant, by a Japanese crest. Prices are given for each item. The company sells the following types of foods:

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1. Grains: Brown rice (short grain Kokuho Rose grown by Koda Brothers, in 2 lb, 5 lb., 10 lb., 25 lb., 50 lb., or 100 lb. quantities). Sweet brown rice (Koda Bros.; it is more glutinous than brown rice, in the same 6 quantities). Note: No claim is made, anywhere in the catalog, that this rice is organic, or unsprayed, or "natural" or anything other than regular brown rice.

2. Beans: Azuki beans (imported from Hokkaido), Black beans ("Kuromame, a black soy bean import"), Chickpeas (Garbanzo, imported from southern Europe).

3. Sea vegetables: Dulse (From Grand Manan Island, Canada), hiziki, kombu, nori (dried laver), wakame (the latter 4 imported from Japan).

4. Soy Bean Products: Soy sauce (Aged naturally in wooden kegs at least 18 months; 16 oz for $1.20, 32 oz for $2.25, ½ gallon for $4.25, 1 gallon for $8.00, 4.75 gallon keg {21.13 liters} for $30.00). Hacho miso ("Soybean puree made from soybeans, salt & water. No chemicals used in fermentation. Aged at least 18 months"; 1 lb for $1.20, 2 lb, 4 lb, 44 lb keg for $36.00). Mugi miso ("Soybean puree. A lighter miso made with barley"; 1 lb, 2 lb, 44 lb keg). Moromi ("A thick sauce removed from the bottom of the soy sauce kegs after fermentation. Its uses are unlimited in soups & sauces"; 7 oz for $1.20.). Seitan ("Wheat and soy sauce cooked together for a long time. When used in soups or sauteed in vegetables it has a taste much like beef"; 3½ oz for $1.20). Note 1. This is the earliest document seen (July 2005) that mentions seitan and clearly understands what it is.

5. Condiments: *Furikake* ("A tangy sesame condiment made from Miso, sesame seeds, soy flour, nori and bonita [sic, bonito] flakes"; 3½ oz.), Daikon pickle, Sesame miso ("A hearty condiment for use on rice and other grains. Made from miso and unhulled sesame seeds"; 3½ oz). Tekka ("A strong dark condiment; famous for its medicinal qualities. Made from carrots, burdock, lotus, ginger, sesame oil, and miso"; 3½ oz), Sesame seeds, Sesame tahini.

6. Sea salt: Grey unrefined (from the Mediterranean Sea, unwashed and unground), White unrefined. 7. Oils: Corn germ oil (unrefined, pressed. No solvents, chemicals, or preservatives), Sesame oil. 8. Noodles: Ito soba, Kame soba, Udon. 9. Beverages: Kukicha, Kohren (Lotus root powder), Mu beverage (made from 16 different herbs), Yannoh (coffee-like drink made from grains and beans).

10. Miscellaneous: Dentie toothpowder (made from eggplant and salt), Kuzu arrowroot, Umeboshi & chiso [shiso, shisonoha, or beefsteak leaves], Umeboshi ("Salt plums aged in wooden kegs for at least 3 years").

11. Cookbooks (written in America): *Cooking Good Food,* and *Cooking with Grains and Vegetables.*

The majority of the above products are imported, mostly from Japan.

The inside front cover states: "Due to the growth of our business and our belief that good quality food should be available at low cost, we have eliminated many items from our wholesale list. We have eliminated most grains because excellent quality grains are available from many sources at more reasonable prices than we are able to charge. Two excellent sources for grains are Arrowhead Mills, Box 866, Hereford, Texas, and Pioneer Specialty Foods, Box 427, Fargo, North Dakota. Also eliminated from our wholesale list is Chico-San products. For these please write directly to Chico-San, 1262 Humboldt Ave., Chico, California, or contact any health food distributor."

Note 2. The products in this catalog do not require refrigeration; they contain no refined sugar / white sugar, no meat, and no dairy products–just like the catalogs of almost all subsequent natural food distributors during the 1970s and 1980s.

Note 3. This is the earliest existing Erewhon catalog seen (March 2011), and the earliest document seen (March 2011) concerning Erewhon and soy.

Note 4. This is the earliest document seen (March 2006) that mentions Arrowhead Mills, of Hereford, Texas. Address: 342 Newbury Street, Boston, Massachusetts 02115. Phone: 617-262-3420.

5664. Claiborne, Craig. 1970. East meets West. *New York Times.* Jan. 4. p. 196.

• ***Summary:*** The Japanese dish named shabu-shabu "is sometimes called oriental fondue in this country." The Japanese word is "onomatopoeic; it imitates the sound of chopsticks as they swirl the broth." It is served as a communal dish at Saito (131 West 52nd St.) one of New York's best Japanese restaurants.

The recipe for Shabu-shabu calls for "2 pieces tofu (bean curd), cut into 4 pieces (eight pieces in all)." There are also recipes for Ponzu, Gomatare [Gomadare], and Dashi. In the first two of these, "soy sauce" is a key ingredient. In all three call for the use of "ajinomoto (monosodium glutamate), optional," up to 1 tablespoon in the Gomatare recipe!

5665. Okumura, George K.; Wilkinson, Jack E. 1970. Preparation of vegetable protein-containing food products. *U.S. Patent* 3,490,914. Jan. 20. 4 p. Application filed 15 May 1967. [6 ref]

• ***Summary:*** "Water soluble protein is extracted by precipitation from de-fatted slurry of soy bean or other protein-containing vegetable material, and is then converted by a freezing step in a fibrous, sponge-like protein mass lacking the taste of soy or other starting material, which mass can then be further processed into a meat-like solid food or into a milk, or derivative of milk such as cheese, ice-cream, yogurt, etc., additional steps of finely comminuting the fibrous mass and adding water and other additives being utilized in producing the milk.

"This application is a continuation-in-part of our application Ser. No. 445,695, filed April 5, 1965, for Process of Producing Soy Milk from Sprouted Soy Beans, now

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Patent No. 3,399,997 and of our abandoned application Ser. No. 638,573, filed May 15, 1967, for Processing of Soy Food Products with Freeze Treatment." Address: 1. 3151 S. Elm Ave., 93706; 2. 2411 Divisadero St., 93721. Both: Fresno, California.

5666. Arora, S.K.; Sandhu, R.S.; Mehrotra, N. 1970. Chemical composition and correlation studies in soybean (*Glycine max* (L.) Merr.). *Indian J. of Agricultural Sciences* 40(1):54-58. Jan. [7 ref]
• ***Summary:*** Soybean seeds of 50 genetically diverse varieties were grown at the Oilseeds Research Substation, Kangra, during the rainy (*kharif*) season of 1966. These soybeans came from both India and abroad: Australia, China, Japan, USA, Nepal, Sikkim, Bihar (Pusa), Solan, Matina, Simla Hills, Punjab. A table shows for each variety: Yield (gm/plant), oil (%), protein (%), minerals per 100 gm, phosphorus (%), and calcium (%).

Note: Hissar is a town Haryana state, northern India, 100 miles west-northwest of Delhi. Address: Punjab Agricultural Univ., Hissar [Haryana, India].

5667. Hashimoto, Hikotaka; Yoshida, H.; Yokotsuka, T. 1970. [Removal of iron from soy sauce]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 48(1):50-55. Jan. [16 ref. Jap; eng]
Address: Central Research Inst., Kikkoman Shoyu Co. Ltd., Noda, Chiba prefecture, Japan.

5668. Tanaka, Teruo; Saito, N.; Yokotsuka, T. 1970. [Studies on sensory evaluation of soy sauce. XI. Relations between odour patterns and chemical factors (2)]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 48(1):56-62. Jan. [13 ref. Jap; eng]
Address: Central Research Inst., Kikkoman Shoyu Co., Ltd., Noda, Chiba, Japan.

5669. *Times of India* (*The*) (*Bombay*). 1970. Foreign futures markets. Feb. 24. p. 7.
• ***Summary:*** The names of each futures market and the crops which are traded are listed for the USA (15 such markets), Japan (20), Brazil (1), Pakistan (1), and the United Kingdom (12). Seven other European countries also have futures markets but only the country names are given–no details.

In the USA, soyabean futures contracts are traded on: (1) Chicago Board of Trade (also oil and meal). (2) Chicago Open Board of Trade. (3) Memphis Board of Trade Clearing Association [Tennessee] (only soyabean meal). (4) Minneapolis Grain Exchange [Minnesota].

Japan: (1) The Hokkaido Grain Exchange (also trades red bean [azuki] futures). (2) The Osaka Grain Exchange (soyabean, red bean, American soyabean). (3) The Tokyo Grain Exchange (soyabean, red bean, American soyabean). (4) The Kobe Grain Exchange (soyabean, red bean, American soyabean). (5) The Nagoya Grain Exchange (soyabean, red bean, American soyabean). (6) The Kammon Commodity Exchange [Shimonoseki] (soyabean, red bean, American soyabean).

United Kingdom: (1) The London Vegetable Oil Terminal Market Association, London (soyabean oil only).

Source: *Forward Markets Bulletin,* Oct. 1969.

5670. Ebine, Hideo; Matsushita, Zenichi; Sasaki, Hirokuni. 1970. Beikoku-san daizu no miso genryô to shite no tekisei hyôka. I. Beisan daizu ni yoru shôkibo miso jôzô shiken (1) [Evaluation of U.S. soybeans as raw materials for making miso. I. Miso manufacturing on a laboratory scale (1)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 25. p. 97-105. Feb. Reprinted from Miso no Kagaku to Gijutsu No. 181, p. 19-27 (1969). [6 ref. Jap; eng]
• ***Summary:*** Among the U.S. varieties tested, Comet, Yelnanda, and Harosoy were promising. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5671. Ebine, H.; Matsuura, M. 1970. Rizoopusu-zoku no shôyu jôzô e no riyô. II. Rizoopusu-zoku kôbo to tokusei [Application of *Rhizopus* for shoyu manufacturing. II. Properties of Rhizopus enzymes]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 25. p. 140-45. Feb. Reprinted from Chomi Kagaku 16(4):15-19 (1969). [4 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan (Norinsho Shokuryo Kenkyujo).

5672. Ebine, Hideo; Matsushita, Z.; Sasaki, H. 1970. Beikoku-san daizu no miso genryô to shite no tekisei hyôka. I. Beisan daizu ni yoru shôkibo miso jôzô shiken (2) [Evaluation of U.S. soybeans as raw materials for making miso. I. Miso manufacturing on a laboratory scale (2)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 25. p. 106-16. Feb. Reprinted from Miso no Kagaku to Gijutsu No. 183, p. 18-27 (1969). [1 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan (Norinsho Shokuryo Kenkyujo).

5673. Ebine, Hideo; Matsushita, Z.; Sasaki, H. 1970. Beikoku-san daizu no miso genryô to shite no tekisei hyôka. I. Beisan daizu ni yoru shôkibo miso jôzô shiken (3) [Evaluation of U.S. soybeans as raw materials for making miso. I. Miso manufacturing on a laboratory scale (3)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 25. p. 117-25. Feb. Reprinted from Miso no Kagaku to Gijutsu No. 185, p. 22-29 (1969). [3 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan (Norinsho Shokuryo Kenkyujo).

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5674. Ebine, Hideo; Matsushita, Z.; Sasaki, H.; Yanai, S.; Ariyoshi, M.; Machi, M. 1970. Beikoku-san daizu no miso genryô to shite no tekisei hyôka. I. Beisan daizu ni yoru shôkibo miso jôzô shiken (4) [Evaluation of U.S. soybeans as raw materials for making miso. I. Miso manufacturing on a laboratory scale (4)]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 25. p. 126-35. Feb. Reprinted from Miso no Kagaku to Gijutsu No. 186, p. 21-29 (1969). [4 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan (Norinsho Shokuryo Kenkyujo).

5675. Ebine, Hideo; Ito, Hiroshi. 1970. Hijôsha jinzô mai no seikôji to miso genryô to shite no hyôka [Evaluation of artificial rice by extrusion cooker as a raw material for making miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 25. p. 136-39. Feb. Reprinted from Miso no Kagaku to Gijutsu No. 170, p. 1-3 (1969). [10 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan (Norinsho Shokuryo Kenkyujo).

5676. Hashizume, Kazumoto; Kita, Shinichiro; Watanabe, Tokuji. 1970. [Studies on the change of the properties of soybean protein by freezing. III. Changes in solubility of soybean protein in several solubilizing reagents by frozen storage]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 25. p. 176-80. Feb. [5 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 16(1):10-14 (1969).
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5677. Kaikoo: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1970.
• ***Summary:*** Sources: Gilbert, James C.; Chinn, J.T.; Tanaka, J.S. 1970. "Four new tropical vegetable-type soybeans with root-knot nematode resistance." *Hawaii Agric. Exp. Station, Research Report.* No. 178. 7 p. [Feb.]. See p. 7. "White flowered, year-round adaptability in Hawaii, 'Kaikoo' produces plants that are taller in the summer with medium maturity (65 days to fresh market harvest). It is root-knot resistant and vigorous with pods held off the ground to allow machine harvesting. 'Kaikoo' performs well in a variety of soil types." Note: No dry-seed color is given.

Barnes, W.C. ed. 1970. "New vegetable varieties list XVII: Soybeans, edible." *HortScience* 5(3):146-49. June. New varieties of edible soybeans are Kahala, Kaikoo, Kailua, and Mokapu Summer. All were released in 1969 by the University of Hawaii Agric. Exp. Station in Honolulu, and all have resistance to root-knot nematode. For details, see Hawaii Agric. Exp. Station, Research Report 178. Address: USA.

5678. Kailua: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1970.
• ***Summary:*** Sources: Gilbert, James C.; Chinn, J.T.; Tanaka, J.S. 1970. "Four new tropical vegetable-type soybeans with root-knot nematode resistance." *Hawaii Agric. Exp. Station, Research Report.* No. 178. 7 p. [Feb.]. See p. 7. "A good year-round performer in Hawaii, with white flowers and dark green foliage, 'Kailua' requires about 68 days for fresh market harvest. Resistant to root-knot, it is not recommended for machine harvest because seed pods start near the ground level. The pods are comparatively easy to strip from plants when green. Both 'Kailua' and 'Mokapu Summer' bear the pods closer together than 'Kaikoo' and 'Kahala' varieties." Note: No dry-seed color is given.

Barnes, W.C. ed. 1970. "New vegetable varieties list XVII: Soybeans, edible." *HortScience* 5(3):146-49. June. New varieties of edible soybeans are Kahala, Kaikoo, Kailua, and Mokapu Summer. All were released in 1969 by the University of Hawaii Agric. Exp. Station in Honolulu, and all have resistance to root-knot nematode. For details, see Hawaii Agric. Exp. Station, Research Report 178. Address: USA.

5679. Mokapu Summer: New U.S. domestic soybean variety. Large-seeded and/or vegetable-type soybean. 1970.
• ***Summary:*** Sources: Gilbert, James C.; Chinn, J.T.; Tanaka, J.S. 1970. "Four new tropical vegetable-type soybeans with root-knot nematode resistance." *Hawaii Agric. Exp. Station, Research Report.* No. 178. 7 p. [Feb.]. See p. 7. "Mokapu Summer (B-C-281-2-2): A fairly compact plant resembling 'Bansei' in most characters, including purple flowers, but with root-knot nematode resistance. In pod maturity it is about 8 days later. Like 'Bansei,' it will be short if planted in November or December, but should not be subject to the root rotting troubles which often cause complete failure of 'Bansei' plantings here. 'Mokapu Summer' is shorter than the others on this list but has large seed and pod size. It should be planted for March to August only (daylength 12-13 hours). 'Mokapu Summer' requires about 68 days to reach fresh market harvest at Waimanalo Farm in July."

Barnes, W.C. ed. 1970. "New vegetable varieties list XVII: Soybeans, edible." *HortScience* 5(3):146-49. June. New varieties of edible soybeans are Kahala, Kaikoo, Kailua, and Mokapu Summer. All were released in 1969 by the University of Hawaii Agric. Exp. Station in Honolulu, and all have resistance to root-knot nematode. For details, see Hawaii Agric. Exp. Station, Research Report 178. Address: USA.

5680. Saio, Kyoko; Koyama, Emiko; Yamazaki, Sadao; Watanabe, Tokuji. 1970. Protein–calcium–phytic acid relationships in soybean. III. Effect of phytic acid on

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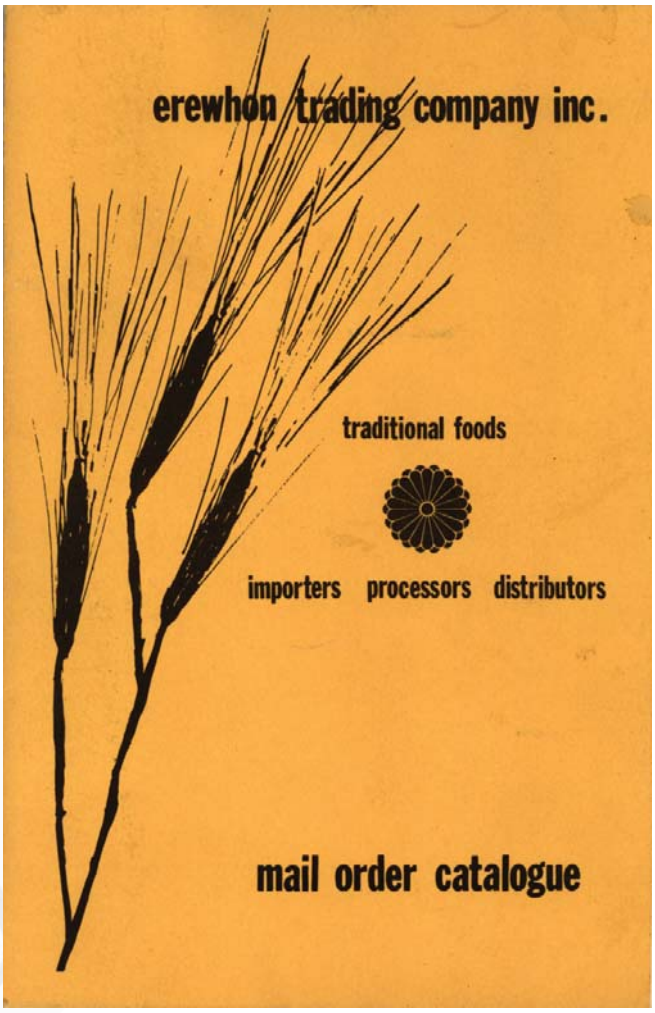
coagulative reaction in tofu-making. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 25. p. 181-88. Feb. [9 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 33(1):36-42 (1969). Address: 1, 4. Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan; 2-3. Japan Tofu Assoc.

5681. Saio, Kyoko; Kamiya, Makoto; Watanabe, Tokuji. 1970. Food processing characteristics of soybean 11S and 7S proteins. I. Effect of difference of protein component among soybean varieties on formation of tofu-gel. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 25. p. 189-97. Feb. [10 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 33(9):1301-08 (1969). Address: 1, 3. Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan; 2. Japan Protein Industry Co., Ltd.

5682. Tamura, Shinhachiro; Yamazaki, SadaO; Osawa, Fumie; Watanabe, Tokuji. 1970. Yuden kanetsuho ni yoru kappu tôfu seizô-hô no kaihatsu [Development of cup tofu making process using microwave heating]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 25. p. 58-61. Feb. [Jap; eng]
• ***Summary:*** Coagulated with GDL (Glucono delta lactone). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5683. Erewhon Trading Co., Inc. 1970. Traditional foods: Importers, processors, distributors. Mail order catalogue. Boston, Massachusetts. 16 p. March 1. [2 ref]
• ***Summary:*** On the orange cover is the silhouette of three heads of grain on the plant, by a Japanese crest. The company sells the following types of foods: 1. Whole grains: Brown rice (short grain grown by Koda Brothers, in 6 weights from 2 lb. to 100 lb). "Not strictly organic, but the finest available in the U.S. today."

Note: The previous sentence, starting with "Not strictly organic" is deceptive and misleading. According to "Erewhon, A Biography," by Paul Hawken (*East West Journal,* Aug. 1973, p. 13) the short-grain brown rice being sold by Erewhon at this time was grown by the Lundberg brothers (Wehah Farm, Richvale, California) and harvested in the fall of 1969. But this rice was the result of a secret deal, so Koda Brothers is listed in the Catalog as the grower. According to the Koda website, Koda first started to convert some fields to organic in 2004. Moreover, this rice was not "the finest available in the U.S. today." The only organically grown brown rice in the USA in March 1970 was grown by the Lundberg Brothers (Wehah Farms) in Richvale, California. 1969 was the first year they had grown rice organically, and they grew 78 acres under contract with Chico-San, who agreed to buy all the brown rice grown on



that acreage in exchange for the exclusive right to sell that rice. Chico-San sold half the rice in advance and had no trouble selling all of it. But they refused to sell any of the rice to Erewhon. In 1970 Lundberg expanded their exclusive organic brown rice acreage to 200 acres; that rice was harvested in the fall of 1971.

Sweet brown rice (also grown by Koda Bros.), buckwheat groats (Kasha, from Pocono Mts. in Pennsylvania), wheat berries (organically grown in the Golden Valley of North Dakota), millet (organically grown), barley, yellow and white corn (organically grown in Deaf Smith County, Texas), oats, rye (organically grown in Deaf Smith County, Texas). Table of prices for different weights. 2. Fresh stone ground flours. 3. Cereals, made from whole grains and milled in a manner to allow quick cooking, incl. Kokoh (which can be used as a milk substitute or prepared as a cereal for children). 3. Noodles (udon, soba, and shonai fu–wheat gluten cakes). 4. Beans: Azuki beans ("The King of Beans... Organically grown on the island of Hokkaido, Japan), black beans (a sweet black soybean imported from Japan. Organically grown), chickpeas, soybeans ("Organically grown in Pennsylvania. A food high in protein,

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vitamins and minerals. Should be soaked many hours before cooking. Particularly good if cooked with Kombu"), pinto beans, whole green lentils, red split lentils. Table of prices for different weights.

5. Sea vegetables: Nori (dried laver), kombu, wakame, hiziki, agar-agar. 6. Dried fish and vegetables: Bonita [sic, Bonito] flakes, chirimen iriko, daikon pickle, gourd strips (dried), daikon (dried radish). 6. Order form. 7. Beverages: Kukicha, mu herbal beverage, yannoh, lotus root powder, mugicha (barley tea), peppermint tea.

8. Soybean Products (imported from Japan): Soy sauce ("aged for at least 18 months"; 16 oz, 32 oz, ½ gallon, 1 gallon, 4.75 gallon keg). Mugi miso–Soybean puree ("Made by a special enzymatic process, this Miso is aged for 18 months. It is made from soybeans, barley, water and salt. It is ideal for making soups and sauces and blends well with tahini to make a spread for bread." 1 lb, 2 lb, 4 lb, 44 lb keg). Hacho miso–Soybean puree ("A darker, stronger miso than Mugi Miso..."). Moromi ("A thick sauce removed from the bottom of the Soy Sauce kegs after fermentation. Its uses are unlimited in soups & sauces"; 7 oz.). Seitan ("A concentrated protein source made from wheat and soy sauce. When used in soups or sauteed in vegetables, it has a taste much like beef"; 3½ oz.).

9. Condiments: *Furikake,* kuzu arrowroot, tekka, umeboshi, sesame butter, Erewhon sesame tahini, sesame salt, white sea salt, grey sea salt. 10. Oils: Refined corn oil, corn germ oil, sesame oil. 11. Sundries: Sesame seeds, sunflower seeds, pumpkin seeds, popcorn, raisins (Thompsons), dried apricots, wheat germ (raw), apple butter, whole dried chestnuts. 12. Toilet articles: Dentie (tooth powder made from eggplant and salt), Aditi sesame shampoo, Orgene [Orjene] herbal shampoo, Fu-nori (seaweed shampoo), sesame coconut soap, vege oat soap.

13. Kitchen and tableware: Cookbooks: *Zen Cookery, Cooking with Grains and Vegetables, Cooking Good Food, Zen Macrobiotic Cooking.* Tableware: Rice paddles (bamboo), soy sauce dispenser, oil skimmer, bamboo tea strainer, vegetable press, vegetable brush, bamboo chopsticks (Japanese), chopsticks (Chinese), MAC knife (vegetable), vegetable knife, fish knife, grater, suribachi (3 sizes), Corona hand grinding flour mill ($10.95).

On the inside rear cover is a United Parcel Service rate chart. Address: 342 Newbury Street, Boston, Massachusetts 02115. Phone: 617-262-3420.

5684. American Soybean Association. 1970. Soybean Digest Blue Book Issue. Hudson, Iowa: American Soybean Assoc. 176 p. March. Index. Index of advertisers. 22 cm.
• ***Summary:*** Starting on page 54 is a section titled "Charting the course of soybean trade," which states: "Steadily bigger harvests, strong foreign demand, and aggressive market development have combined to make soybeans the leading U.S. crop as a dollar earner in foreign markets. We exported over $1.1 billion worth of soybeans and soybean products in 1967-68, and our share of world exports has risen from 2% in 1934-38 to about 90%. Output from about 2 out of every 5 harvested soybean acres goes abroad as beans or products. See the following pages."

On the top half of p. 55 is a bar chart titled "U.S. soybean exports as a share (percentage) of total U.S. agricultural exports. The percentage increased from about 1½% in 1948 to about 17½% in 1968.

On the bottom half of page 55 is a graph titled "Trend of U.S. soybean exports, 1944-68. It starts at zero in 1944-48 and increases to just over 250 million bushels in 1968. Since 1964 it has been growing more rapidly that previously.

On the top half of p. 56 is a bar chart titled "State shares of U.S. soybean exports," which shows the dollar value of exports from 10 leading states in 1954 and 1968. The states, in descending order of 1968 exports are Illinois, Iowa, Arkansas, Missouri, Indiana, Minnesota, Mississippi, Ohio, Louisiana, and North Carolina.

On the bottom half of p. 55 is a bar chart titled "Ten leading U.S. soybean export markets, 1968," with the amount of soybeans exported to each market in million bushels. The countries in descending order are Japan, Netherlands, West Germany, Spain, Canada, Denmark, Italy, Taiwan, Israel, and Belgium-Luxembourg. Address: Hudson, Iowa.

5685. **Product Name:** [Fujinic Meatless Meat].
Foreign Name: Fujinic.
Manufacturer's Name: Fuji Oil Co. Ltd.
Manufacturer's Address: Toyama Building 121, 2-chome Azuchi-cho, Higashi-ku, Osaka, Japan.
Date of Introduction: 1970 March.
New Product–Documentation: *Soybean Digest Blue Book.* 1970. p. 108.

5686. **Product Name:** [Mac-Curd Soy Milk].
Manufacturer's Name: Hohnen Oil Co. Ltd.
Manufacturer's Address: Mitsui Seimei Building Ltd., 1-chome Ohtemachi, Chiyoda-ku, Tokyo, Japan.
Date of Introduction: 1970 March.
New Product–Documentation: *Soybean Digest Blue Book.* 1970. p. 108; 1981. p. 60.

5687. Holthuis, L.B.; Sakai, T. 1970. Ph. F. von Siebold and Fauna Japonica: A history of early Japanese zoology. Tokyo: Academic Press of Japan. xvi + 3223 p. March. Illust. (many color). No index. 30 cm. [Eng; Jap]
• ***Summary:*** Part I of this book (p. 1-206) is in English, many beautiful plates are in the middle, and Part II (p. 207-304) is a translation of the same material into Japanese.

Contents: Preface (#1), by H. Boschma, emeritus prof. of systematic zoology, Leiden University, Netherlands. Preface (#2), by Yaichiro Okada, President, Biogeographical

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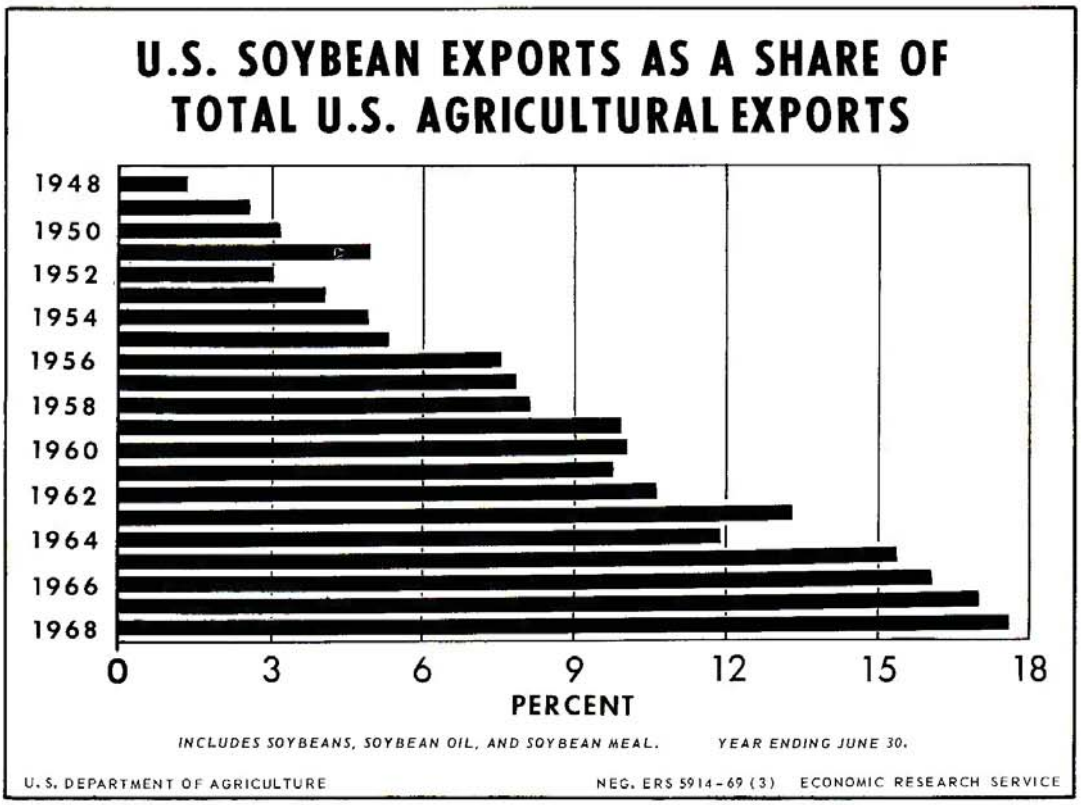

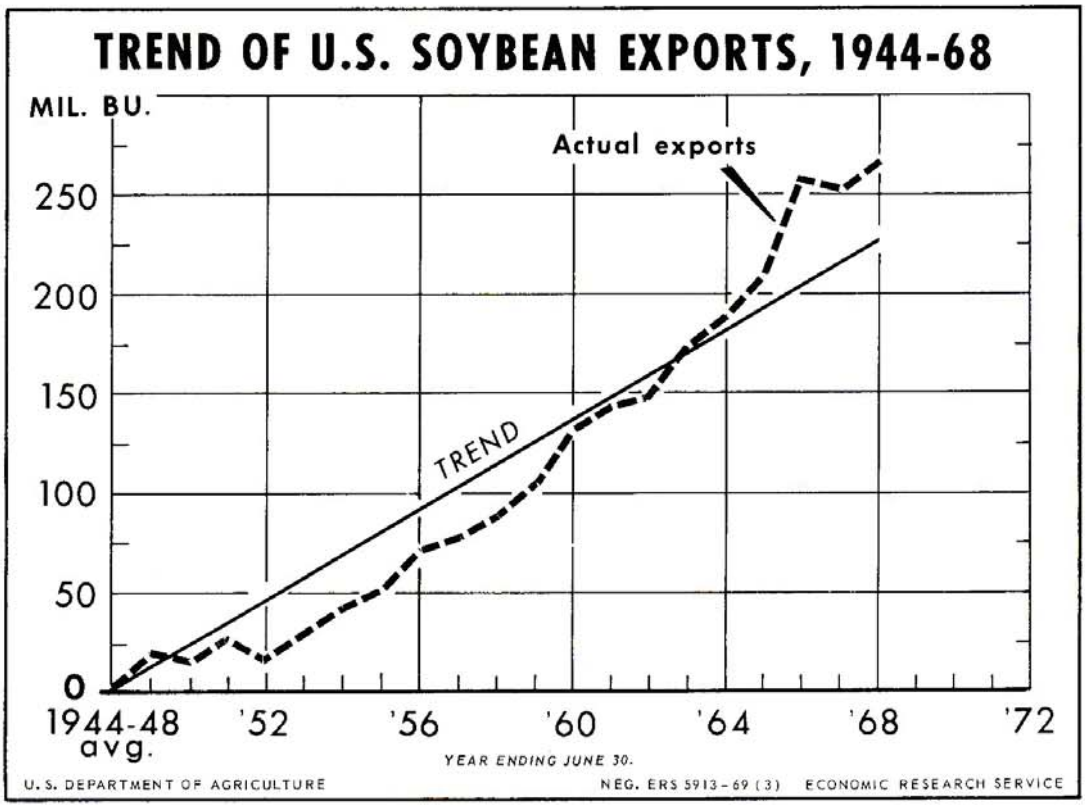

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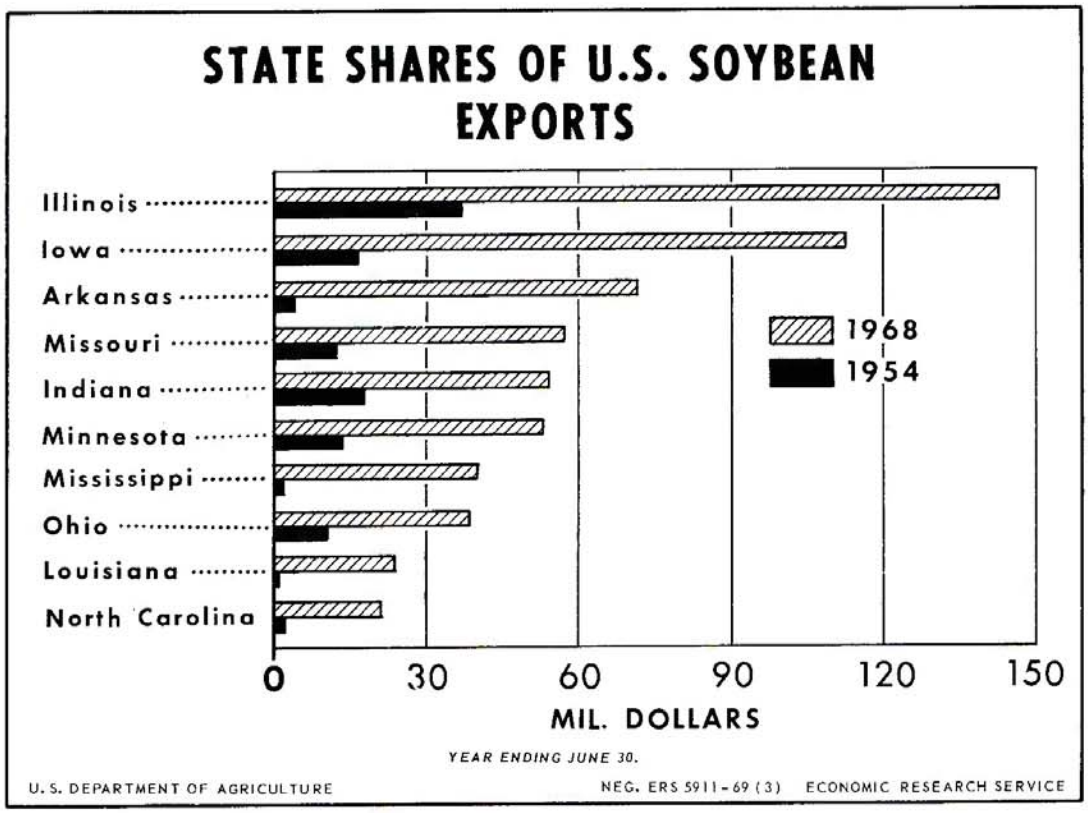

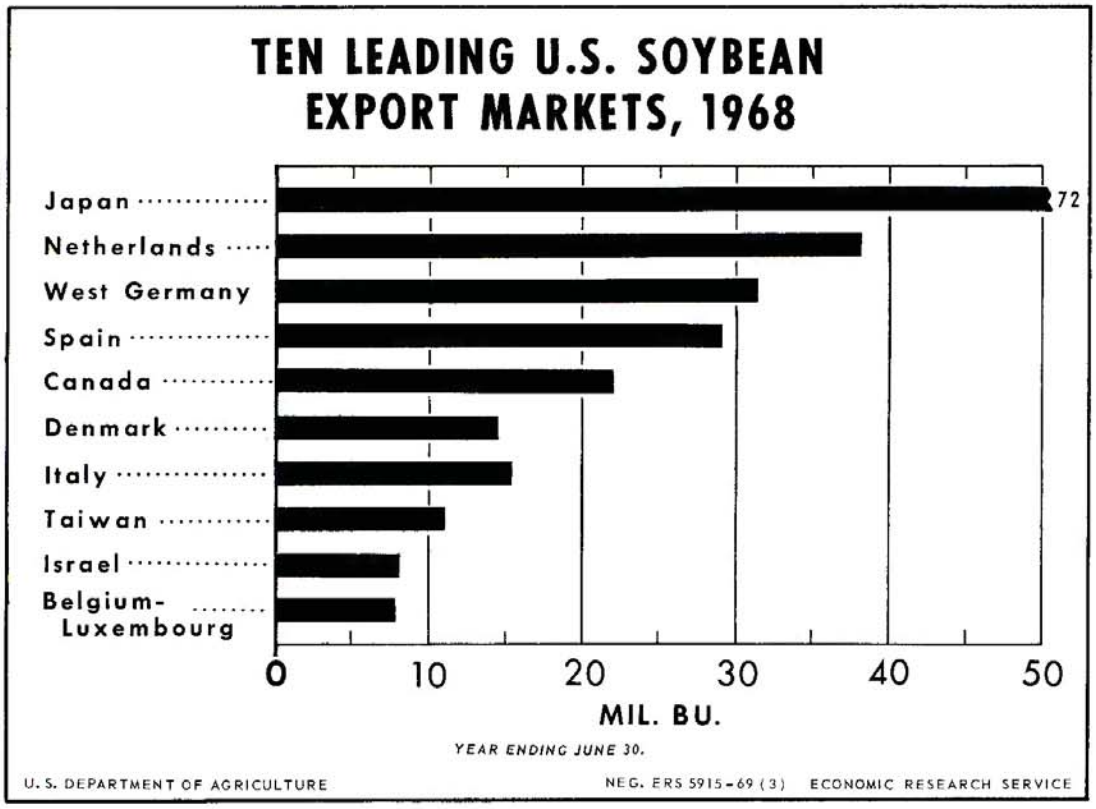

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Society of Japan. Part I. Introduction. 1. The knowledge of the Japanese fauna in western Europe before 1820: General remarks, Englebert Kaempfer (1651-1716, German), Carl Peter Thunberg (1743-1828, Swedish), the last period. 2. Philipp Franz von Siebold and Heinrich Bürger: Philipp Franz von Siebold (1796-1866, German; youth, voyage to and stay in Java {1822-23}, First visit to Japan {1823-29}, Europe and second visit to Japan {1930-1866}), Heinrich Bürger (ca. 1806-1858), Japanese biologists closely in contact with Von Siebold. 3. Von Siebold's and Bürger's contributions to Japanese zoology: Von Siebold's zoological publications, Von Siebold's and Bürger's collections, Siebold's journey to Edo and his zoological collections. 4. Von Siebold's *Fauna Japonica:* General, mammalia, aves, reptilia, pisces, crustacea, Temminck's "Discours préliminaire," the Tokyo reprint edition of the *Fauna Japonica,* 1934. 5. Revision of the systematic names of Crustacea in Siebold's *Fauna Japonica.* 6. The plates of marine animals made by Kawahara Keiga (1786-18?) for Von Siebold and Bürger. References. Plates (I-XXXII). Part II (in Japanese).

On unnumbered pages of front matter are: (1) Von Siebold's color portrait at age 28 by Kawahara Keiga. Color photo of spines of volumes 104 (1833-1850) first edition of *Fauna Japonica,* by Von Siebold. (2) Black-and white portrait of Von Siebold at age 39 by Joseph Schmeller. Portrait of Von Siebold standing with his servant by Kawara Keiga. Von Siebold's signature dating from 31 July 1830. (3) Map (2 page spread) of Japan showing route from Nagasaki to Edo of members of the Dutch Trading Post (15 Feb. 1826 to 7 July 1826).

Chapter 1, "The knowledge of the Japanese fauna in western Europe before 1820" is extremely interesting, and contains detailed biographies of Kaempfer (p. 9-16), Thunberg (p. 16-20), Von Siebold (p. 23-36), and Bürger (p. 37-42). Kaempfer was in Japan for two years, 1690 Sept. 25 to 1692 Oct. 31; he twice accompanied the journey to the court of the Shogun in Tokyo (13 Feb. to 7 May 1691 and 2 March to 21 May 1692). Thunberg went to the University of Uppsala and became a pupil of Linnaeus. In 1770 he obtained his doctor's degree and his teachers had great expectations of him. He was in Japan for only one year, 1775 Aug. 13 to 1776 Dec. 3; he joined the yearly visit to the Shogun's court in Tokyo (4 April to 25 June 1776). Von Siebold was in Japan for six years, 1823 Aug. 12 to 1829 Dec. 30; he once joined the delegation to the shogun's court, 15 Feb. 1826 to 7 July 1826. All three were primarily physicians and therefore very good botanists; each published extensive and detailed accounts of his experiences in Japan. Address: 1. Rijksmuseum van Natuurlijke Historie at Leiden, Netherlands; 2. Formerly of Yokohama National Univ., Japan.

5688. Li, Hui-lin. 1970. The origin of cultivated plants in Southeast Asia. *Economic Botany* 24(1):3-19. March. [40 ref]

• ***Summary:*** "Cultivated plants represent man's most important heritage, and we cannot afford to lose sight of this fact even in an age of great and rapid technological advancement... The beginning of scientific studies on origins of cultivated plants stems from the work of Alphonso de Candolle, specifically from his *Géographie botanique raisonée* (1855). The latest botanical methods were employed and correlated with evidence from archaeology, history, and linguistics. The cultivated plants were treated only as a chapter in a work on the distribution of plants as a whole... This chapter was later revised and greatly expanded into his *L'origines des plantes cultivées* (1882), a standard classical treatise on this subject even today...

"At about the same time, Mendel was using cultivated plants in his experimental studies of the nature of variation. His *Versuche über Pflanzen-Hybriden* (1865) lay unnoticed by the scientific world until 1900, when its rediscovery sparked the science of genetics... It was, however, not until Vavilov that genetics was consistently and systematically applied to the elucidation of problems on the origins of cultivated plants. Vavilov's *Studies on the Origin of Cultivated Plants* (1926) has exerted a great influence on later workers. He refined and brought up to date the botanical methods of de Candolle, while the newer approaches of genetics and cytogenetics were introduced and correlated with the older methods." Following continual revision, Vavilov's final scheme indicates 8 world centers of the origin of cultivated plants (including China) and 3 supplemental centers. But while Vavilov was most familiar with Europe, western Asia, and South America, "he seems to have been relatively unfamiliar with eastern Asia. His 'Chinese center' embodies the whole of China from northern cold-temperate regions all the way to the subtropical south."

The author proposes four horizontal belts of origin of cultivated plants in South-East Asia. The Northern China Belt, which includes the Yellow River Valley and the southern part of northeastern China (Manchuria) is the famous loess region, and the place of birth and early development of Chinese civilization. Though the loess soil is especially suitable for the development of agriculture, the climate of this belt is the most severe, the "precipitation is the least and the most unevenly distributed, and it has the fewest types of plants. However the cultural level of the people here is developed to a higher degree, and its system of agriculture is also the most complete. This situation seems to agree with Toynbee's theory that civilization develops as a result of a challenge." One of the cereal crops that originated in this belt is millet, *Panicum miliaceum,* the most important cereal in earliest times. Foxtail millet, *Setaria italica,* also appeared in this belt at an early date. Both were widely cultivated in Neolithic times.

"From ancient to present times, the chief legume crop

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of northern China has been the soybean, *Glycine max.* It was called in ancient times, *Shu,* and it is now generally called *Ta Tou* (Great Bean)... Today, it is the most wide spread and the most diversely utilized crop in all China...

"The cultivation and utilization of the soybean in ancient China also greatly affected the development of agriculture. The ancient peoples are known to have been at first ignorant of the use of fertilizers, but eventually discovered that the cultivation of soybeans increased the productivity of the soil. Thus the soybean is responsible for the development of crop rotation and the application of fertilizers. Among all the legume crops, the soybean has the most complete protein complex, approaching most nearly that of animal protein. Thus, in human nutrition it can completely replace animal food. The relatively small development of animal husbandry and fishery in northern China could be the effect of the use of soybean...

"The soybean is also the most important edible oil crop in China. The ancient people, because of their limited knowledge and technology, did not know how to extract oil from seeds...

"In ancient times the tender leaves of the soybean, called *Huo,* were also used as a leafy vegetable." Legumes and oil crops are more important in the north than in the south of China. When man domesticates plants and animals, he himself becomes domesticated and civilization begins.

Although the flora of the Japanese Archipelago is fairly rich, no important cultivated crops originated there; all were introduced from outside. Address: Morris Arboretum, Univ. of Pennsylvania, Philadelphia.

5689. Meals for Millions Foundation. 1970. Annual report 1969. Santa Monica, California: MFM Foundation. 9 p. Typed with signature on letterhead.
• ***Summary:*** Submitted by I.F. Saunders, Executive Director. MFM's logo (in the upper left on the title page) shows two hands gripping the handle of a horizontal spoon, with its mouth to the right facing upward–in white on a black background. Note: This is the earliest document seen (Dec. 2010) on which this logo appears.

Contents: In Memoriam: Three great friends of the Foundation passed away in 1969: "Our Founder, Clifford E, Clinton, a giant among men; Florence Rose, the first Executive Director, beloved around the world; and Don Belding, a much-revered and long-time member of the Board of Directors.

"Their loss is felt deeply by each of us."

Summary of annual report. MFM board and staff (In March of 1969, at the Semi-Annual Meeting of the Board of Directors, in accordance with the By-Laws of this Foundation," Dr. Morris Asimow was re-elected chairman of the board and Mr. Russell Eller, was re-elected president...)

"Key loss to the staff was: Mark Sterner, who now lives in Korea, but who continues to help us through his work with Korea High Protein Foods, Inc." Meals for Millions training school (administrated by Eva Kadiev). Research and development (enriched noodles, peanut meal concentrate, crystalline protein). United States projects: California, Texas, Connecticut, South Carolina, American Indians. Overseas Projects: Korea, Ecuador, Japan, Taiwan, Hong Kong, Thailand, India, Pakistan, Iran, Vietnam, Brazil, Mexico, Chile. Women's Clubs. Public relations. Remarks.

Note 1. No financial information is given, nor information on shipments of MPF for the year.

Note 2. A photo (on the Web, Dec. 2010) shows Clifford E. Clinton's signature on his grave marker at Forest Lawn Memorial Park (Glendale, California). Plot: Kindly Light section, Lot 311, Interment Space 6. The grave site is on a grassy hillside. Address: 1800 Olympic Boulevard (P.O. Box 1666), Santa Monica, California. Phone: 870-0451.

5690. **Product Name:** [Burgmate].
Manufacturer's Name: Morinaga Confectionery Co. Ltd.
Manufacturer's Address: Shiba 5-33-1, Minato-ku, Tokyo, Japan.
Date of Introduction: 1970 March.
New Product–Documentation: *Soybean Digest Blue Book.* 1970. p. 108.

5691. **Product Name:** [Nikopron-sss, Nikomeat, Nikophimea {Textured Soy Proteins}].
Foreign Name: Nikopron-sss, Nikomeat, Nikophimea.
Manufacturer's Name: Nihon Koyu Co. Ltd.
Manufacturer's Address: Kazama Building, Surugadai Kanda 4-4, Chiyoda-ku, Tokyo, Japan.
Date of Introduction: 1970 March.
New Product–Documentation: *Soybean Digest Blue Book.* 1970. p. 108.

5692. **Product Name:** [Texgran (Textured Soy Flour. Extruded)].
Manufacturer's Name: Nihon Soda. Affiliate of Swift & Co.
Manufacturer's Address: Shin-Otemachi Bdlg., Chiyoda-ku, Tokyo, Japan.
Date of Introduction: 1970 March.
New Product–Documentation: *Soybean Digest Blue Book.* 1970. p. 108.

5693. **Product Name:** [Isopron].
Foreign Name: Isopron.
Manufacturer's Name: Nikka Oil Co. Ltd.
Manufacturer's Address: 9, Kamakura-cho, Kanda, Chiyoda-ku, Tokyo, Japan.
Date of Introduction: 1970 March.
New Product–Documentation: *Soybean Digest Blue Book.* 1970. p. 108.

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5694. Okuhara, Akira; Saito, Nobuo. 1970. Color of soy sauce. IV. Decolorization and depression of browning by reduction. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 48(3):190-201. March. [8 ref. Eng]
• ***Summary:*** The browning of apples and apple sauce is well known in the west. This report describes the decolorization of the browning pigment and the depression of browning. The browning pigment of soy sauce and concentrated apple juice were found to be reduced using metals such as zinc, aluminum, iron, tin (Sn = stannum), sodium, and magnesium, and by electrolysis, to colorless substances.

"The browning pigments of some liquid foods were also reduced electrolytically to colorless substances." Address: Central Research Inst., Kikkoman Soy Sauce Co. Ltd., 399 Noda, Chiba prefecture, Japan.

5695. Okuhara, Akira; Saito, Nobuo. 1970. Color of soy sauce. III. Effect of reducing agents on browning of soy sauce. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 48(3):177-89. March. [11 ref. Eng]
• ***Summary:*** Non-oxidative browning (browning in the absence of oxygen) is depressed by reduction. That is, soy sauce which is kept under reductive conditions by favorable fermentation during the mash process turns brown only slowly. Address: Central Research Inst., Kikkoman Soy Sauce Co. Ltd., Noda, Chiba-ken, Japan.

5696. **Product Name:** [Vegetein {Soy Protein}].
Foreign Name: Vegetein.
Manufacturer's Name: Yoshiwara Oil Co. Ltd.
Manufacturer's Address: Osaka Building, Uchisaiwai-cho 2-1, Chiyoda-ku, Tokyo, Japan.
Date of Introduction: 1970 March.
New Product–Documentation: *Soybean Digest Blue Book.* 1970. p. 108.

5697. Okuhara, Akira; Tanaka, T.; Saito, N.; Yokotsuka, T. 1970. [Color of soy sauce. V. Application of multiple correlation analysis to analysis of browning mechanism]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 48(4):228-36. April. [6 ref. Jap; eng]
Address: Central Research Inst., Kikkoman Soy Sauce Co. Ltd., Noda, Chiba prefecture, Japan.

5698. Sugimori, Tsunetake; Jose, Hirokazu. 1970. [Studies on halotolerant lactic acid bacteria relating to soy sauce brewing. I. Isolation and taxonomic studies of *Tetracoccus* sp.]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 48(4):218-27. April. [18 ref. Jap; eng]
Address: Kyoto Research Labs., Marukin Shoyu Co. Ltd., Uji, Kyoto, Japan.

5699. Ives, Bill. 1970. Traveling gourmet finds sukiyaki. *Washington Post, Times Herald.* May 7. p. C14.
• ***Summary:*** The ingredients in the recipe for Sukiyaki include "1 block tofu (bean curd) cut into one-inch cubes, optional," "1 cup soya sauce," and "1 teaspoon monosodium glutamate."

5700. Ives, Bill. 1970. Japanese housewife's burden–leaping inflation. *Christian Science Monitor.* May 29. p. 1.
• ***Summary:*** A large graph of consumer price indices for various countries, from 1963 to 1969, shows that inflation in Japan is growing the fastest (up 35% from 1963), whereas in West Germany and the United States it is growing the slowest (up 10-12% since 1963).

When the writer went shopping with Mrs. Masako Mogi in Tokyo he saw firsthand how fast the price of everything from baths to soups was rising. "In the supermarket she picked up a square of spongy tofu (Japanese bean curd) for 18 yen. She'd prefer [traditional] handmade tofu, rather than the mass-produced kind, but its almost double the price. Then came two strips of dried and fried tofu called age (pronounced ah-gay),..." Address: Tokyo–Staff correspondent for the Monitor.

5701. Arai, S.; Yamashita, M.; Kato, H.; Fujimaki, M. 1970. Applying proteolytic enzymes on soybean. V. A nondialyzable bitter peptide in peptic hydrolyzate of soybean protein and its bitterness in relation to the chemical structure. *Agricultural and Biological Chemistry* 34(5):729-38. May. [27 ref]
• ***Summary:*** The cold-insoluble fraction of soy protein was hydrolyzed with pepsin under usual conditions and the hydrolyzate was dialyzed. Hydrolysis of the bitter peptide with pepsin lessened its bitterness. Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Tokyo, Japan.

5702. Ball, Charles E. 1970. How promotion is selling your soybeans. *Farm Journal* 94(5):38-39, 76. May.
• ***Summary:*** Discusses soybean promotion and sales in Japan. Each dollar an American farmer contributes for increasing soybean sales in Japan is matched with $15 from other sources–mainly the U.S. Foreign Agricultural Service and Japanese cooperators. Address: Southern Field Staff.

5703. Hirano, Kiyoshi. 1970. Japan's outlook for soybean crushing. *Soybean Digest.* May. p. 41-42.
• ***Summary:*** Contents: The general situation. Present situation: Demand for fats and oils products, processing of raw material and the supply of finished products, the present situation in oil. Future outlook: Demand, future prospects.

"Trade and capital liberation has been an important subject confronting the economic circles in Japan. As to the processing of oil (crushing), the Japanese government has tentatively decided that capital liberalization will take place beginning in the fall of 1970 and trade liberalization by the end of 1971.

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"In order to adjust to this situation, the oil crushers of Japan petitioned to the government to lift the tariff levied on soybeans, rapeseed, etc. and to discontinue the 'import allocation system' that is presently applied to rapeseeds. At the same time, earnest efforts to reorganize their company structure have been underway so that they may have the strength to live through the keen international competition. Further, crushers have exercised every effort to modernize their methods of manufacture as well as equipment and facilities.

In 1962, Nisshin Oil Mill constructed a large-size plant on the coast in Isogo, Yokohama. In 1966, Hohnen Oil and Yoshiwara inaugurated a joint venture–a company called Japan Soya and established their plant in Kobe. Showa Sangyo also constructed a large-size plant in Kobe adjacent to Japan Soya. Then, in the fall of 1969, through the investment of Ajinomoto, a new company named Toyo Seiyu was inaugurated on the reclaimed land of Chiba.

"All of these plants are handling soybeans as their main material and can process 1,000 to 1,500 metric tons per day. These plants are comparable to any in the world, both in scale and modern techniques. As to the older plants, steady progress is being made to modernize their operations.

"Taking all this into consideration, it is believed that Japan now ranks as the No. 2 oil-crushing country in the Free World, next to the U.S.

"As we all know, fats and oils are very scarce in Japan. To supplement the rice and a small amount of rapeseed produced at home, Japan needs to import soybeans from the U.S. and various other raw materials from other countries. Due to the present allocation system on imported rapeseed and with the liberalization of rapeseed near at hand, the approximately 150 small factories that have the capability of crushing 10 to 15 metric tons a day are being compelled either to go into some other business or quit entirely. It is, therefore, predicted that a tremendous change will take place within the oilseed crushing industry of Japan in a matter of 1 to 2 years."

A small portrait photo shows Kiyoshi Hirano. Address: President, Japanese Oilseed Processors Assoc., Vice President, Showa Sangyo Co. Ltd.

5704. Hori, Keinosuke; Otaki, Shinichiro; Nakamura, Tomie; Umashima, Yasumasa. 1970. Tôfu no shibô tenka ni tsuite [On the addition of fat to tofu]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 17(5):201-04. [Jap]*

5705. Saio, Kyoko; Kamiya, Makoto; Watanabe, Tokuji. 1970. Tôfu no bussei ni kansuru ikkôsatsu [Statistical observations on the physical properties of tofu]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 17(5):207-10. Reprinted in Shokuryo Kenkyujo Kenkyu Hokoku (Report of the Food Research Institute) 26:193-96 (1971). [4 ref. Jap; eng]
Address: 1&3. National Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan; 2. Japan Protein Industry Co., Ltd., Kodaira, Tokyo.

5706. Sera, Karl H.G. 1970. Role of soybean meal in the Japanese feed industry. *Soybean Digest.* May. p. 44-45, 47-48.
• ***Summary:*** Contents: Introduction. Imports. Domestic production and land reclamation. Most feeds are formula feeds. Trend to modern farms. Much educational work needed.

Tables: (1) Number of livestock and poultry in Japan (millions) in 1969 and 1980. Shows layers (225 million in 1980; #1), broilers, swine, dairy cattle, and beef cattle.

(2) Formula feed production in Japan in 1969 and 1980. And Levels of soybean meal in that feed.

(3) Annual per capital food consumption (lbs) in the USA and Japan. Shows carbohydrates (130 vs. 300), meat (225 vs. 18), eggs, fish (10 vs. 70), milk and dairy products (550 vs. 100), oil (50 vs. 20).

(4) Daily per capital food consumption the USA and Japan. Shows calories (3,000 vs. 2,300), protein (92 vs. 70 gm), animal protein (65 gm vs. 25 gm), Engel's number (total expenditure on food divided by total disposable income x 100) (18 vs. 34), percentage of carbohydrates (24% vs. 64%).

(5) Five commonly used protein sources for feed and their prices in Japan: The sources are: Soybean meal 44% protein. Soybean meal 50%. Fish meal 55-60%. Fish solubles 30%. Cottonseed meal 32%. Peanut meal with hull 30%.

(6) Protein sources in Japan and their prices per protein unit:

Soybean meal 50% 110 yen.
Soybean meal 40% 118 yen.
Peanut meal 30% 123 yen.
Fish meal 55% 124 yen.
Fish solubles 30% 133 yen.
Cottonseed meal 32% 125 yen.

A small portrait photo shows Karl Sera. Address: Specialist in Charge, Feed and Meal Dep., American Soybean Assoc., Tokyo, Japan.

5707. Pier 1 Imports. 1970. Yen for tempura? (Ad). *Los Angeles Times.* June 7. p. P39.
• ***Summary:*** "Next time you hunger for Japanese food, begin at Pier 1! Delicate tempura's a snap with our help. Tempura pan [wok], complete with chopsticks, lifter-strainer, draining rack–$1.59. Non-fail [Hime] tempura batter mix is the quick and easy, sure way to success–$0.69. Marukin soy sauce, a genuine shoyu, will also come in handy for barbecue marinades. Economy size 34 oz. bottle–$0.99."

An illustration shows a bottle of Marukin soy sauce, the

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other items described, and a bottle of sesame oil. Address: Los Angeles area (11 stores).

5708. Meade, Mary. 1970. Serendipity potato salad is full of surprises. *Chicago Tribune.* June 10. p. B3.
• ***Summary:*** "The Japanese American Service Committee asked us to tell them which Japanese recipes are most requested by readers." The answer, of course, was sukiyaki. The committee's favorite sukiyaki recipe, which is given, calls for "1 tofu (soy bean curd), cut into 1-inch cubes," and "3/4 cup Kikkoman (soy sauce)."

5709. Pitcher, Shackford. 1970. Brazil's soybean output reaches new records. *Foreign Agriculture.* June 22. p. 8-9.
• ***Summary:*** "Soybean production in Brazil saw an unprecedented growth in the 1960's with continued growth expected in the 1970's... In one decade soybean production increased from the 1960 level of 7.6 million bushels to 34.9 million bushels in 1969. The 1969 crop enabled Brazil to achieve record soybean exports totaling 11.4 million bushels, valued at $29 million... By 1967 Brazil had surpassed the outturn of the Soviet Union and become the world's third largest soybean producer...

"Presently almost all of Brazil's soybean production is limited to the four southern States, with Rio Grande do Sul, the southernmost State, accounting for 70 percent of the crop. The State's first experiments with soybeans were conducted in 1941... Today, the bulk of Rio Grande do Sul soybeans come from larger farms growing wheat as well. These two crops are grown in rotation, with the soybeans planted in November and December–often in the same field on which a crop of wheat was just harvested...

"The tremendous expansion of soybeans in Rio Grande do Sul can be attributed to the work of the State's department of agriculture and IPFS (*Instituto Privado para Fomento de Soya*), a private, trade-sponsored institute active in soybean development during the early 1960's... Paraná is Brazil's second largest soybean producer...

"Sao Paulo, where soybeans were first introduced into Brazil about 60 years ago by Japanese immigrant farmers, is third among Brazil's soybean-producing States. In 1925 soybean research was initiated at Sao Simao Experiment Station in Sao Paulo, based on a collection of about 50 U.S. varieties. Cultivation was on a small scale until the early 1950's, when the Sao Paulo Department of Agriculture (SPDA) initiated an expansion program, loaning farmers combines and purchasing most of the crop. Now almost 100-percent mechanized, Sao Paulo soybean farmers plant an average of 250 acres of soybeans each; although some plant as few as 60 acres and others as many as 2,200 acres...

"Much of the research work on soybeans in Brazil is being done by the Agronomic Institute at Campinas (IAC), an SPDA agency in eastern Sao Paulo... In late 1969, a factory for isolating soy protein was inaugurated in Rio Grande do Sul with a yearly capacity of 1,000 metric tons of product. Soybean flours of various kinds are already produced by a number of Brazilian companies." Address: U.S. Agricultural Officer, Sao Paulo, Brazil.

5710. Hansen, Barbara. 1970. Former Miss America finds new frontiers in cookery. *Los Angeles Times.* June 25. p. 128.
• ***Summary:*** When Rosemary La Planche won the Miss America title in 1941, it was reported that she liked to cook. She is now married, lives in Sherman Oaks, California, and likes to cook creatively. Her recipe for Sukiyaki Rosemary calls for "1 cake tofu (bean curd), cut into bite-size pieces" and for "½ cup soy sauce."

5711. Fujimaki, Masao; Yamashita, M.; Okazawa, Y.; Arai, S. 1970. Applying proteolytic enzymes on soybean. III. Diffusable bitter peptides and free amino acids in peptic hydrolyzate of soybean protein. *J. of Food Science* 35(3):215-18. May/June. [21 ref]
• ***Summary:*** Fujimaki and co-workers (1968) found that undesirable flavors were mostly removed from a soy protein preparation by treating it with an appropriate proteolytic enzyme. In many cases, however, the enzymic hydrolyzate was accompanied by an undesirable bitter flavor–probably due to some types of peptides.

In this paper, the authors isolated and characterized 7 types of diffusable bitter peptides made by digesting soybean cold-insoluble protein in a dilute hydrochloric acid solution with pepsin. Bitterness of the diffusable fraction was attributed to free amino acids that have a bitter flavor (such as isoleucine, leucine, phenylalanine, and valine) and to various peptides. Almost all diffusable bitter peptides investigated here had leucine at the termini. By treating these peptides with carboxypeptidase A, the bitterness decreased considerably. Moreover, applying carboxypeptidase A or Nagarse (a bacterial neutral proteinase) to the diffusable fraction of the peptic hydrolyzate was also effective in removing some of the bitterness. Address: Dep. of Agricultural Chemistry, Tokyo Univ., Tokyo, Japan.

5712. Noguchi, Masatoshi; Arai, S.; Kato, H.; Fujimaki, M. 1970. Applying proteolytic enzymes on soybean. II. Effect of Aspergillopeptidase A preparation on removal of flavor from soybean products. *J. of Food Science* 35(3):211-14. May/June. [23 ref]
• ***Summary:*** "Chemical and organoleptic tests showed that partial digestion of soybean curd and defatted soybean flour by aspergillopeptidase A preparation removed flavor compounds and fatty materials from these soybean products." Address: Dep. of Agricultural Chemistry, Tokyo Univ.

5713. U.S. Department of Agriculture. 1970. The annual report on activities carried out under the Public Law 480, 83d

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Congress, as amended, during the period January 1 through December 31, 1969. Washington, DC: U.S. Government Printing Office. See p. 122-27. Cover reads: Food for Peace: 1969 Annual Report on Public Law 480.
• ***Summary:*** Table 20 is titled "Title II, Public Law 480– Total commodities by program type, fiscal year 1969." The three main program sponsors and distributing agencies are (1) Volag (American voluntary agencies, UNICEF and UNRWA [United Nations Relief and Works Agency] unless otherwise noted), (2) Government to government, and (3) WFP (World Food Program). Each of these are Private Voluntary Organizations (PVO/PVOs), registered with USAID. Only two foods containing soy protein were distributed: CSM (Corn soya mix) and WSB (wheat soya blend). They were lumped together in the statistics and sent in the following amounts (in thousands of pounds) to the following continents and countries: Africa total 89,470 lb: Cameroon 600, Congo 162, Dahomey 80, The Gambia 385, Ghana 976, Kenya 478, Lesotho 775, Malawi 39, Mali 4,500, Morocco 300, Nigeria 78,232, Senegal 80, Sierra Leone 1,810, Tanzania 365, Togo 18, Upper Volta 670.

Near East-South Asia total 222,817: Gaza [occupied by Israel since 1967] 2,653, India 216,176, Jordan 1,527, Jordan-West Bank [occupied by Israel since 1967] 1,042, Lebanon 738, Nepal 18, Pakistan 1, Syria 662.

Far East total 57,861: Burma 360, Indonesia 3,669, Korea 9,698, Laos 53, Macao 113, Malaysia 2,474, Philippines 3,140, Ryukyu Islands [located south of Japan, incl. Okinawa, Sakishima, and Amami island groups. Self governing from 1966. Returned to Japan in 1972] 227, Vietnam 38,127.

Latin America total 45,291: Bolivia 72, Brazil 19,851, Chile 2,605, Colombia 1,696, Costa Rica 142, Dominica 4, Dominican Republic 6,680, Ecuador 608, El Salvador 1,178, Grenada 68, Guatemala 1,773, Guyana 58, Haiti 1,585, Honduras 435, Jamaica 124, Martinique [French] 75, Panama 734, Paraguay 2,477, Peru 4,847, Uruguay 279.

Grand total: 415,439,000 lb of CSM and WSB. The following amounts of CSM/WSB (in 1,000 lb) were distributed by the three groups: Volag 292,587, Government to government 122,851, and WFP 1. Countries receiving more than 1 million lb of CSM and WSB combined (in millions of pounds): India 216.2, Nigeria 78.2, Vietnam 38.1, Brazil 19.9, Korea 9.7, Dominican Republic 6.7, Peru 4.8, Mali 4.5, Indonesia 3.7, Philippines 3.1, Gaza 2.7, Chile 2.6, Malaysia 2.5, Paraguay 2.5, Sierra Leone 1.8, Guatemala 1.8 Colombia 1.7, Haiti 1.6, Jordan 1.5, El Salvador 1.2, Jordan West Bank 1.0.

Note: This is the earliest document seen (Feb. 2002) concerning soybean products (cereal soy blends) in Martinique, or Panama. This document contains the earliest date seen for soybean products in Martinique, or Panama (1969); soybeans as such had not yet been reported by that date. Address: Washington, DC. Phone: 703-875-4901 (1991).

5714. Hewitt, Jean. 1970. A shop that sells table accessories along with cooking demonstrations. *New York Times.* July 15. p. 26.
• ***Summary:*** The shop is Tablerie at 1033 Third Ave., near 61st, in New York City, owned by Mary Ann Zimmerman. Today Mrs. Kenneth Ziegel, a home economist from Wilmington, Delaware, is demonstrating how to prepare Japanese dishes. Her recipe for "Miso shiru (Bean paste soup)" includes "1 tofu (fresh bean curd, cubed)" and "2½ tablespoons miso paste (fermented bean curd paste)."

Note: Describing miso as "fermented bean curd paste" is incorrect; "fermented soybean paste" would be better.

5715. Lee, Elinor. 1970. The art of sukiyaki. *Washington Post, Times Herald.* July 30. p. E1.
• ***Summary:*** Expo '70 is now underway in Osaka, Japan. One of the tastiest Japanese dishes and probably the most familiar to most Americans, "sukiyaki is a popular choice for patio or porch suppers. In Japan, sukiyaki is prepared at the table in a heavy iron skillet over a hibachi (charcoal brazier)."

This recipe "doesn't call for tofu (bean curd), but you can add tofu if you wish."

A large photo shows beautifully sliced sukiyaki ingredients surrounding a modern table-top cooker. Japanese cooks strive to please both the eye and the palate.

5716. Amano, T.; Takeuchi, T.; Yoshii, H. 1970. Shôyu kasu no riyô ni kansuru kenkyû. I. Shôyu kasu-chû no to narabini amino-san sosei ni tsuite [Studies on utilization of soy sauce cake. I. Chemical composition of soy sauce cake and its amino acids]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 48(7):425-30. [17 ref. Jap; eng]
Address: Food Research Inst., Aichi Pref, Nishi-ku, Nagoya, Japan.

5717. Hongo, Motoyoshi; Yoshimoto, Akihiro. 1970. Bacteriophages of *Bacillus natto.* Part II. Induction of gamma-polyglutamic acid depolymerase following phage infection. *Agricultural and Biological Chemistry* 34(7):1047-54. July. [22 ref]
• ***Summary:*** "A depolymerase capable of decomposing gamma-polyglutamic acid was formed when *Bacillus natto* was infected with bacteriophages."

Note: A bacteriophage (from 'bacteria' and Greek verb *phagein* meaning "to eat") is any one of a number of viruses that infect bacteria. The term is commonly used in its shortened form, phage (Source: Wikipedia). Address: Lab. of Applied Microbiology, Dep. of Agricultural Chemistry, Kyushu Univ., Fukuoka, Japan.

5718. Hongo, Motoyoshi; Yoshimoto, Akihiro. 1970.

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Bacteriophages of *Bacillus natto.* Part III. Action of phage-induced gamma-polyglutamic acid and the enzymatic hydrolyzates. *Agricultural and Biological Chemistry* 34(7):1055-63. July. [9 ref. Eng]
• ***Summary:*** "Phage-induced gamma-polyglutamic acid depolymerase was purified about 1000 fold by Sephadex G-75 and DEAE-cellulose column chromatographies and Sephadex G-200 gel filtration." Address: Lab. of Applied Microbiology, Dep. of Agricultural Chemistry, Kyushu Univ., Fukuoka, Japan.

5719. Tsai, Kuo-Hai; Lu, Ying-Chuan; Oka, H.I. 1970. Studies on soybean breeding in Taiwan. IV. Adaptability to fall cropping explored by disruptive seasonal selection of hybrid populations. *SABRAO Newsletter* 2(2):91-102. [7 ref] Address: 1-2. Dep. of Agronomy, Chung-Hsing Univ., Taichung, Taiwan; 3. National Inst. of Genetics, Mishima City, Shizuoka prefecture, 411 Japan.

5720. Wenkam, Nao S.; Wolff, Robert J. 1970. A half century of changing food habits among Japanese in Hawaii. *J. of the American Dietetic Association* 57(6):29-32. July. [15 ref]
• ***Summary:*** In about 1885, a predominantly vegetarian diet was representative of the farming and laboring classes in Japan. "The three great staples were rice, barley, and soybeans." Those who could not afford rice consumed a less expensive grain such as millet, wheat, barley, buckwheat, or even sweet potatoes. Legumes, which were used universally, included soybean products, peas, mung beans and azuki. The main soybean products were tofu, miso, natto, aburage, and shoyu. Other foods in general use included daikon radish, several types of cabbage, marine algae such as nori, konbu, wakame. etc.

"According to statistics for 1880, total plant food consumption was proportioned as follows: rice, 53 per cent; barley and wheat, 27 per cent; tubers and vegetables, 6 per cent; fruits and algae, less than 1 per cent.

"The chief animal food was fish, much used near the sea, less in the interior. Poultry and eggs were used in small amounts. Beef, mutton, pork, milk, and butter formed a minor part of the diet. The amounts of animal food available per capita per year in 1900 were: meats, 1.3 lb.; fresh fish, 27 lb.; dried fish, 2.5 lb.; and imported meats and fish, 0.3 lb."

A bar chart shows that the daily intake of protein for Japanese adults in Japan and Hawaii has increased from 62 gm in the late 19th century to 101 gm today–an increase of 63%. During the same period, daily fat intake has increased from 10 gm to 87 gm–an 8.7-fold increase! Calories per day are about the same. Address: Dep. of Food and Nutritional Sciences, and School of Public Health, Univ. of Hawaii, Honolulu.

5721. Lee, Elinor. 1970. Sukiyaki, gift from Japan, pleases both eye and palate. *Washington Post, Times Herald.* Aug. 20. p. I26.
• ***Summary:*** The text of this article is very similar to that by the same writer first published in this newspaper on July 30, p. E1, however with several more recipes and without the photo.

5722. Arai, S.; Noguchi, M.; Kurosawa, S.; Kato, H.; Fujimaki, M. 1970. Applying proteolytic enzymes on soybean. 6. Deodorization effect of aspergillopeptidase A and debittering effect of aspergillus acid carboxipeptidase. *J. of Food Science* 35(4):392-95. July/Aug. [10 ref]
• ***Summary:*** The authors applied acid proteolytic enzymes and an exo-peptidase to soy protein in an attempt to remove bitter taste and beany flavor. Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Tokyo, JapanUniv.

5723. Hashimoto, Hikotaka; Yoshida, H.; Yokotsuka, T. 1970. [Studies on sediment of shoyu. II. Effect of chelating agents and surfactants on the prevention of secondary sediment of shoyu]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 48(8):501-05. Aug. [9 ref. Jap; eng]
Address: Central Research Laboratories, Kikkoman Shoyu Co., Ltd., Noda, Japan.

5724. Hashimoto, Hikotaka; Yoshida, H.; Yokotsuka, T. 1970. [Studies on sediment of shoyu. I. Factors influencing the formation of secondary sediment of shoyu]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 48(8):493-500. Aug. [14 ref. Jap; eng]
Address: Central Research Laboratories, Kikkoman Shoyu Co., Ltd., Noda, Japan.

5725. Probst, A.H. 1970. Fifty years of soybean variety improvement. *Soybean Digest.* Aug. p. 66-70.
• ***Summary:*** Contents: Introduction. The trend to yellow seed. Common objectives of soybean breeders: High yield, high oil content, high protein content, disease resistance, improved seed quality, maturity to fit rotations, shattering resistance, desirable plant height, lodging resistance, high podding from soil level. Threat of root rot. Reasons for yields of 100 bushels/acre.

Before 1920, the soybean was used mostly as a forage crop. It was "used extensively for hay, and to a lesser extent for soilage, silage, green manure, lambing- or hogging-off when grown as a companion crop with corn, and for direct feeding of the beans." In 1924 the first official U.S. production statistics showed that of the 1,782,000 acres produced, only 448,000, or 25%, were harvested for beans. "It was not until 1941 that 5,881,000 acres harvested for beans surpassed the 5,510,000 acres grown for all other purposes.

"The development of the soybean processing industry was nudged into being mainly by World War I when there

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was such a shortage of fats and oils in the U.S. that it was necessary to import Manchurian soybean oil."

"Well over 10,000 introductions have been brought into the U.S. since 1898. Approximately 4,775 introductions were brought in by W.J. Morse and P.H. Dorsett who spent 2½ years during 1929-1931 on an agricultural exploration trip in Japan, Korea, and Manchuria.

"The germplasm collection today numbers about 3,200 types plus nearly 300 named varieties."

"Through 1940 most varieties were released either as direct introductions, rogued introductions, or selections from introductions. Some selections from introductions may have been of hybrid origin. A few varieties developed from introductions which played an important role in the rapid expansion of acreage planted for processing 20-50 years ago included Dunfield, Illini, Manchu, Richland, Mukden, Mandarin, Habaro, Boone, Patoka, and Roanoke. All vegetable-type varieties up to 1956 were introductions.

"Only a few varieties released through 1940 are known to have come from artificial hybridization-breeding programs. These include Mamloxi, Mamotan, Mamredo, Ogden, Volstate, Tennessee Non-pop, Oloxi, Pee Dee, and Yelredo.

"Of this group, only Ogden, with numerous good qualities sought in varieties today, was grown extensively for a long period. The popularity of Ogden was such that nearly 30 years after its release in 1941 some of it was still being grown commercially.

"Following 1940, and especially after 1950 there have been few varieties released which have come directly from introductions."

"The establishment of the U.S. Regional Soybean Industrial Products Laboratory (now the U.S. Regional Soybean Laboratory) in 1936 at Urbana, Illinois, brought about a tremendous increase in soybean breeding. Variety development immediately lost its provincialism and went "big league" to have an immediate impact nationally and eventually internationally."

"A recent listing of the leading soybean varieties for the U.S. and Canada included 39, plus seven special-use varieties, five of which were vegetable types and two were high-protein types.

"Since 1943 over 80 varieties have been or are in the process of registration by the American Society of Agronomy or, more recently, the Crop Science Society of America.

"The major part of soybean-variety development in the past has been accomplished by public agencies, particularly the agricultural experiment stations and the U.S. Department of Agriculture. At least one private company has been breeding soybeans for many years; a few for shorter periods.

"During the past few years, a few number of private companies have entered the field of soybean breeding."

Two main factors have led to yields of 100 bushels/acre or more: Better soybean varieties combined with improved cultural practices.

Small portrait photos show: George Kimmons (Ozark, Missouri; the first person to get 100 bu/acre yields, in 1968 with 109.6 bu/acre). W.J. Morse. M.D. Weiss. H.W. Johnson. R.W. Howell. B.E. Caldwell. J.L. Cartter. R.L. Bernard. R.L. Cooper. E.E. Hartwig. The work of each man in soybean variety development is discussed briefly on p. 70. Address: USDA Research Economist, and Prof. of Agronomy, Purdue Univ. [Indiana].

5726. *Soybean Digest.* 1970. Whole beans: The past-future link. Aug. p. 72.

• ***Summary:*** Contains a detailed chronology of USDA's Northern Utilization Research Laboratory (Peoria, Illinois) work with soyfoods–starting in 1926, about 15 years before the Lab began operations.

A photo shows C.W. Hesseltine and A.K. Smith of the NRRL with visiting Japanese scientists Tokuji Watanabe and Kazuo Shibasaki.

5727. Strayer, George M. 1970. Basic problems haven't changed. *Soybean Digest.* Aug. p. 54-57.

• ***Summary:*** This is an interesting history of the American Soybean Association as seen through the eyes of its most important early member.

"Geo. M. Strayer served as executive officer of the American Soybean Assn. from 1940 until 1967, through the formative years when most of the present structure was established. His term of service on the board of directors started 3 years earlier and was probably longer than that of any other one man. Today he is secretary of Associated Hybrid Producers, as he has been for many years. He exports corn, soybeans, grain sorghum, popcorn, and other midwestern products through Agricultural Exports Inc. He is associated with his brother Gordon and other members of his family in Strayer Seed Farms. He recently was elected mayor of Hudson where he has resided for the past 30 years. The above sketch of Mr. Strayer as mayor is by Jack Bender of the Waterloo (Iowa) Daily Courier.

"Soybeans to me 52 years ago were just a lot of work–a novelty of which a small amount of seed had been secured by my father from W.J. Morse in the Department of Agriculture. Planted in the hills of a small patch of popcorn, they had to be pulled by hand, dried, and then threshed out by hand and with a flail. They were too late for complete maturity in our latitude–but we found out they would grow here!

"By the spring of 1924 there were enough varieties (all imports from the Orient) that my father, B.S. Strayer, in cooperation with USDA and the local Smith-Hughes agricultural instructor, planted a testplot of about 3 acres, and included some 15 or 20 strains of varying maturities. There were black, green, brown, yellow, and vari-colored varieties."

"First exposure to the American Soybean Assn. came

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in September of 1924 when my father attended the fifth meeting at Ames, Iowa. It was a 2-day meeting, in the days of dirt and gravel roads, and the 100 miles to Ames was a major journey taken the day prior to meetings. I heard the stories of the wonders of the soybean crop secondhanded–I was in high school, the meetings came after school started, and such meetings were no place for kids anyway!

"Wonders of the soybean world: It was not until 1930 that I had my first exposure to the American Soybean Assn., except for reading the proceedings of each of the annual meetings as mailed to all members. The sessions that year were held at the University of Illinois.

"Four of us drove over for the meetings. We stayed at a private home in Urbana. I was indoctrinated into the wonders of the world of such men as W.L. Burlison, J.C. Hackelman, Soybean Briggs, Bill Riegel, John T. Smith, W.K. Kellogg, Keller Beeson, W.J. Morse, Charlie Meharry, Taylor Fouts, Scott Wilkins, and others.

"Today, only Soybean Briggs is still living. But they were the men who had the vision and the foresight and the fortitude to preach and talk soybeans, to plant and harvest them, and to interest people in their possible uses.

"At these 1930 meetings, held while I was a college student, I found my real interest for future years. I believe it was in 1937 after graduating and starting to farm that I was first elected to the board of directors of ASA. My father had served several years ahead of me.

"In 1936 the ASA annual convention was held in Iowa, and I was a member of the committee given the responsibility for planning the program. The first day was held at Iowa State University at Ames, the second day at Cedar Rapids, where processing facilities could be visited, and the third day was held at Hudson on our farms.

"In preparation for the big event we had freshly painted our farm buildings with paint made with soybean oil."

Also discusses: The launching of *Soybean Digest* (Nov. 1940). First trips abroad (1949 with Jack Cartter as members of ECA Technical Assistance Mission No. 1 to Europe, especially Germany; in 1952 to visit potential customers in Western Europe at his own expense; in 1954 as a member of the official USDA-sponsored agricultural trade mission; in 1955 weeks with Paul Quintus, head of USDA's fats and oils division, to study the possibilities of selling soybeans to that country. "I spent 7 weeks in Japan meeting with processors, foods manufacturers, shoyu manufacturers, tofu makers, miso makers, and Japanese government officials").

"The Japanese American Soybean Institute was formed in early 1956, and became the first overseas market development project on soybeans or any oilseed.

"With soybean production zooming, and with the Japanese project well underway, it appeared logical to explore other possible markets. In May of 1956 Paul Quintus again asked me to serve as an emissary of USDA and the soybean industry, this time to survey market possibilities and potentials in 10 Western European countries. Given a free hand, I spent about 2 months on this assignment, came back convinced that we had both problems and opportunities in Europe.

"I recommended that an industry-wide organization be formed. The European market was not solely a soybean market. Some countries would use oil, others meal, still others soybeans. It was too big a job for the small American Soybean Assn. Processors as well as growers had a stake in that market. Out of the arguments, discussions and deliberations the Soybean Council of America was formed to do the market development work in Europe and eventually in South America and in parts of Asia, with both growers, through ASA, and processors, through the National Soybean Processors Assn., participating.

"The problems are the same: Today's problems are the same as those of 1945–creation of larger and larger markets for U.S. soybeans." Address: Former Executive Vice President, American Soybean Assoc. and former editor, Soybean Digest.

5728. Tanaka, Seiichi; Nakayama, Tokiko; Koda, Maki. 1970. Chûgoku shokuhin jiten [Encyclopedia of Chinese foods]. Tokyo: Shoseki Bunbutsu Ryutsukai. 438 p. [Jap]
• ***Summary:*** Gives nutritional analyses for the various types of Chinese tofu, yuba, and related products (p. 310-13).
Address: Japan.

5729. Yamagata, Kei; Fujita, Tokio. 1970. [Studies on yeasts isolated from saké-cake pickle and soya-mash. I. Identification and salt tolerance of yeasts]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 48(8):485-92. Aug. [7 ref. Jap; eng]
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Kinki Univ., Osaka, Japan.

5730. Hansen, Barbara. 1970. Language of cookery: Soy sauce hails from number of countries. *Los Angeles Times.* Sept. 10. p. K9.
• ***Summary:*** Compares Japanese, Chinese, Indonesian, Hawaiian, and U.S. soy sauces. These can be either brewed [fermented] or mixed from various ingredients to simulate the flavor, color, and texture of the brewed soy sauces. The mixed sauces "are based on hydrolized vegetable proteins and are colored with caramel coloring."

Among imported Chinese soy sauces, there is "the familiar dark soy sauce and also a light soy sauce, which can be used to salt and season food when a dark color is not desired."

Shoyu is the Japanese word for soy sauce.

"If you take up Indonesian cookery, don't assume that ketjap is the thick red sauce which Americans pour on hamburgers. Ketjap is the term for Indonesian-style soy sauce, which is slightly sweetened." Note: Could this latter

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be ketjap manis?

5731. Dosti, Rose. 1970. An Oriental flavor to table cookery. *Los Angeles Times.* Sept. 24. p. J18.
• ***Summary:*** Setsuko Ohkagawa, of Tokyo, who is now in Los Angeles, is intrigued by Kaiseki ryori, featuring the authentic of the Japanese tea ceremony. But she thinks that the Japanese art of table cooking (*Nabe mono*) might be most interesting to Americans, who already like fondue and the intimate quality Americans seem to enjoy. Recipes are given for: (1) Mizutaki, including "1 cake tofu (soy bean curd) cut into 1½-inch pieces." (2) Sukiyaki, incl. 1 cake tofu (soy bean curd). (3) Shabu-Shabu. incl. "1 cake tofu, sliced into 1-inch squares." A photo shows Setsuko serving.

5732. Kato, A.; Yamaura, Y. 1970. A rapid gas chromatographic method for the determination of fatty acid compositions of soybean oil and castor oil. *Chemistry and Industry* (*London*) No. 39. p. 1260. Sept. 26. [4 ref]
• ***Summary:*** Short research note. To determine fatty acids, oils and fats are transesterified and the methyl esters analyzed by GLC. A technique has been developed to speed up esterification using a precolum (NaOH [sodium hydroxide] and diethyleneglycol succinate on chromosorb in the presence of helium) for the preparation of methyl esters from glycerides. Address: Government Chemical Industrial Research Inst., Tokyo, Japan.

5733. Arai, Soichi; Noguchi, M.; Kaji, M.; Kato, H.; Fujimaki, M. 1970. *n*-Hexanal and some volatile alcohols: Their distribution in raw soybean tissues and formation in crude soy protein concentrate by lipoxygenase. *Agricultural and Biological Chemistry* 34(9):1420-23. Sept. [8 ref] Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Japan.

5734. Arai, S.; Noguchi, M.; Yamashita, M.; Kato, H.; Fujimaki, M. 1970. Applying proteolytic enzymes on soybean. VII. Properties of soy protein treated with microbial acid protease (Molsin). *Agricultural and Biological Chemistry* 34(9):1338-1345. Sept. [20 ref]
• ***Summary:*** Molsin, a microbial protease produced by the mold Aspergillus saitoi, has been evaluated as the most effective in removing undesirable flavors from soy protein concentrates. Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Tokyo, Japan.

5735. Fujimaki, M.; Yamashita, M.; Arai, S.; Kato, H. 1970. Enzymatic modification of proteins in foodstuffs. I. Enzymatic proteolysis and plastein synthesis application for preparing bland protein-like substances. *Agricultural and Biological Chemistry* 34(9):1325-32. Sept.
Address: Dep. of Agricultural Chemistry, Tokyo Univ.

5736. *Soybean Digest.* 1970. Honorary life members [American Soybean Assoc.]: Harris H. Barnes, Yukio Sakaguchi, Dr. Jean W. Lambert, John Reiser Jr., and Dr. Richard L. Bernard. Sept. p. 20-21.
• ***Summary:*** "Yukio Sakaguchi is president of Nisshin Oil Mills Co. and president of the Japan Oilseed Processors Association. He has been associated with this leading Japanese oilseed processing firm since 1924 and president since 1955. And he has been president or vice president of the Japan Processor Association continuously for 21 years.

"Mr. Sakaguchi was most instrumental in establishing the joint U.S. Department of Agriculture-American Soybean Association market development project for soybeans in Japan in 1956. The program has had the complete support of Mr. Sakaguchi and of JOPA. His help is undoubtedly a reason the Japan project for soybeans has become one of the most important market development projects for farm products."

Mr. Sakaguchi "helped to found the new Japan Protein Food Institute and is president of the Institute."

Dr. Jean W. Lambert has long been known as "Mr. Soybean" in Minnesota. He is currently a professor agronomy and plant genetics at the University of Minnesota. He made a trip to Japan in 1963 to obtain an agronomist's view of the Japanese food market for soybeans, for the American Soybean Association. He is a native of Nebraska.

John Reiser is a farmer who is the most consistent winner in the history of the Illinois 5-acre Soybean Yield Contest. Since the contest began in 1964, he set the all-time contest record of 82.7 bushels per acre and holds a 6-year average of 73.6 bushels. He is a native of Ashland, Illinois.

Dr. Richard L. Bernard is one of the world's leading soybean geneticists. Since 1954 he has released the varieties Shelby, Harosoy 63, Hawkeye 63, Clark 63, Chippewa 64, and Wayne, which was the leading U.S. soybean variety in 1968. Dr. Bernard obtained his Ph.D. from North Carolina State University. He has been associated with the U.S. Regional Soybean Laboratory at Urbana, Illinois since 1954. Photos show Harris H. Barnes, Yukio Sakaguchi, Dr. Jean W. Lambert, John Reiser Jr., and Dr. Richard L. Bernard.

5737. Tamada, Tetsuo. 1970. [Aphid transmission and host range of soybean dwarf virus]. *Nippon Shokubutsu Byori Gakkaiho* (*Annals of the Phytopathological Society of Japan*) 36(4):266-74. Sept. [25 ref. Eng; jap]
• ***Summary:*** A detailed, early description of the soybean dwarf virus (SDV), which has been found in Hokkaido, Japan, since about 1952, and which causes severe damage to soybean crops. Address: Hokkaido Central Agric. Exp. Station, Naganuma, Hokkaido, Japan.

5738. Yamashita, Michiko; Arai, S.; Gonda, M.; Kato, H.; Fujimaki, M. 1970. Enzymatic modification of proteins in foodstuffs. II. Nutritive properties of soy plastein and its

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bio-utility evaluation in rats. *Agricultural and Biological Chemistry* 34(9):1333-37. Sept. [8 ref]
• ***Summary:*** Soy protein was hydrolyzed with pepsin. The hydrolyzate was incubated with a commercial microbial protease (Bioprase) to obtain soy plastein. Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Japan.

5739. *Los Angeles Times.* 1970. Mastering the menu: Learn how to order your Kaffee mit Schlagobers. Oct. 2. p. I2.
• ***Summary:*** For each of 15 countries where Americans travel, gives a list of words that are useful when ordering in a restaurant. Under Japan: "Kabayaki: Broiled eels. Miso: Bean paste [soy]. Natto: Steamed and fermented [soy] bean. Sashimi: Raw fish dish... Shoyu: Soy sauce. Soba: Buckwheat noodles. Sukiyaki: A quick-cooked meat stew [with tofu and shoyu]. Sushi: Flavored rice and raw fish [sic, many kinds without raw fish]. Tempura: Deep-fried shrimp, fish and vegetables. Tofu: Bean curd. Unagi: Eel."

Note: This same article appeared under the title "Are menus a puzzle? Master a few of those foreign food phrases" in the Oct. 6 issue (p. F16) of this newspaper.

5740. Yamanaka, Yoshitada; Okumura, Shinji; Mitsugi, Koji; Hasegawa, Yoshisuke. Assignors to Ajinomoto Company, Inc. (Tokyo, Japan). 1970. Method of preparing a sour milk beverage. *U.S. Patent* 3,535,117. Oct. 20. 2 p. Application filed 2 April 1968. [4 ref]
• ***Summary:*** "A sour milk beverage having the consistency and taste of buttermilk (sour milk) or yoghurt is prepared by fermentation of an aqueous dispersion of skim milk solids and soybean protein containing certain amino acids by lactic acid bacteria. The amino acids modify the fermentation process in such a manner as to suppress the soybean flavor which otherwise mars the taste of the fermentation product." Address: 1-2. Tokyo; 3. Yokohama city; 4. Kawasaki city. All: Japan.

5741. Arai, Soichi; Noguchi, M.; Yamashita, M.; Kato, H.; Fujimaki, M. 1970. Studies on flavor components in soybean. VI. Some evidence for occurrence of protein-flavor binding. *Agricultural and Biological Chemistry* 34(10):1569-73. Oct. [12 ref]
• ***Summary:*** This is the earliest publication seen suggesting that binding of off-flavors by proteins is a major cause of the persistence of these off-flavors. The hydrophobic binding of these components by soy protein has been implicated in the occurrence of off-flavors. They also found that n-hexanal was one of the major contributors responsible for the beany odor of soybeans.

Note: This is the earliest document seen that uses the term "n-hexanal" or "hexanal" in connection with soybeans and their off-flavors. Address: Dep. of Agricultural Chemistry, Tokyo Univ.

5742. Clark, R.W.; Mies, D.W.; Hymowitz, T. 1970. Distribution of a trypsin inhibitor variant in seed proteins of soybean varieties. *Crop Science* 10(5):486-87. Sept/Oct. [11 ref]
• ***Summary:*** Soybean trypsin inhibitor is a protein that was discovered by Bowman (1944) and is regarded as an "antinutritional factor in soybeans."

Consumption of raw soybeans causes pancreatic hypertrophy in chickens (Bray 1964; Chernick et al. 1948) and "is believed to inhibit growth, by upsetting the balance between methionine and cystine in the pancreas" (Booth et al. 1960).

Two different forms of soybean trypsin inhibitor protein were studied using electrophoresis with 294 soybeans. 7% of the soybeans had Rf 0.92 electrophoretic bands and 93% had Rf 0.05 bands, where Rf is the relative mobility of the dye front. Soybean varieties of known origin that had the Rf 0.92 band were from Japan or Korea and were mostly in Maturity Groups 1 through IV; but not all soybeans from Japan or Korea had this band. None of the major commercial varieties of soybeans presently grown in the USA contained the Rf 0.92 band. The Rf 0.92 predominates in vegetable type soybeans. Examples of vegetable types are Agate, Aoda, Burwell, Giant Green, Goku, Jogun, Portugal, Rokusun, Sac, Sato-3, Soursei [sic, Sousei], Tortoise Egg, and Wolverine.

Approximately 90 to 95% of the total soybean acreage in the USA is seeded to varieties derived from six plant introductions that originated in Manchuria: P.I. [plant introduction] numbers 30593, 36653, 36846, 50523, 70502, and A.K.

Note: This is the earliest document seen (Oct. 2013) concerning trypsin inhibitors and seed electrophoresis. It is also the first study of the geographical distribution of various forms of the soybean trypsin inhibitor SBTI-A2. Address: Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801.

5743. Hashimoto, Hikotaka; Yoshida, H.; Yokotsuka, T. 1970. [Studies on sediment of shoyu. IV. Precursor of secondary sediment of shoyu]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 48(10):628-34. Oct. [19 ref. Jap; eng]
Address: Central Research Laboratories, Kikkoman Shoyu Co., Ltd., Noda, Chiba prefecture, Japan.

5744. Hashimoto, Hikotaka; Yoshida, H.; Yokotsuka, T. 1970. [Studies on sediment of shoyu. III. Effect of adsorbents and precipitants on prevention of secondary sediment of shoyu]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 48(10):622-27. Oct. [9 ref. Jap; eng]
Address: Central Research Laboratories, Kikkoman Shoyu Co., Ltd., Noda, Japan.

5745. Nakagaki, T.; Hirano, S. 1970. Growth-promoting activity of an aqueous extract of soybean seeds for some

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microorganisms. *Agricultural and Biological Chemistry* 34(10):1580-83. Oct. [12 ref. Eng]
• ***Summary:*** Soymilk that promoted growth of two strains of *L. acidophilus* and one strain of *L. bulgaricus* was found to contain free adenine, guanosine and L-tryptophane. Address: 1. Central Research Lab., Nippon Rakuno Kyodo Co., Ltd., Oda, Izumishi, Osaka; 2. Dep. of Agricultural Chemistry, Kyoto Univ.

5746. Sault, J.L.; Gale, J.B. 1970. A review of developments in simulated meats. *Quarterly Review of Agricultural Economics* (*Australia*) 23(4):209-221. Oct. [42 ref]
• ***Summary:*** Contents: Introduction. Nature of simulated meat products: Sources of raw material, processing methods. Production and marketing: The United States market (where virtually all production has been based on soya bean protein), the Japanese market, the Western European market, other countries (South Africa, Canada, Australia). Factors influencing competition with natural meats: Differences in properties, increases in incomes and changes in tastes, relative prices, promotion, government regulations. Summary and conclusions.

"The United States and Japan are the two main producers of simulated meats and account for most of world consumption... Virtually all of the United States' commercial production of simulated meats has been based on soya bean protein." At least 15 companies made simulated meat in 1969, but six of these produce most of the items marketed. A number of the manufacturers (such as General Mills) are very large and have invested large amounts of time and money in the process.

In Japan, production of western-style simulated meats is a very recent development. Consumption of such items is still very small, though it appears to be rising. "In 1968 domestic production plus imports of simulated meats totalled 37.7 million lb, and during the first six months of 1969 they amounted to 25.9 million lb." Most of these products are made in Japan by at least 19 firms. One feature of the Japanese industry has been the importance of wheat gluten as a protein source. In 1968 and the first half of 1969 some 36% of Japan's output was derived from wheat gluten; virtually all of the rest was based on soy protein.

Sales of simulated meat products in Western Europe have been considerably lower than those in the USA and Japan. The main developments have occurred in the Netherlands, West Germany, and Sweden. In the Netherlands, imports rose from 44,000 lb in 1967 to 1,166,000 lb in 1968, then fell the next year. In West Germany, simulated meats were first introduced to the trade and consumers in mid-1968.

"In South Africa one firm is manufacturing a simulated meat from soy protein by what appears to be a thermoplastic extrusion process. The product is being used as a meat extender rather than as a complete meat substitute. It is reported to be of a dry and wiry texture requiring a good deal of seasoning to make it palatable." Its price is higher than that of natural meat.

Note: This is the earliest document seen (Dec. 1997) that uses the term "thermoplastic extrusion" in connection with soy.

5747. Yamanaka, Yoshitada; Furukawa, Noboru. 1970. Daizu tanpakushitsu no shokuyôteki riyô ni kansuru kenkyû. II. Daizunyû no tenka ga nyûgyô yô nyûsan-kin no sanseisei to kaado ni oyobosu eikyô [Studies on utilization of soybean protein for food manufacturing. II. Influence of soy milk added to skim milk on the acidity and hardness of curd produced by lactic acid bacteria for dairy use]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 17(10):456-61. [12 ref. Jap; eng]
• ***Summary:*** Growing lactic streptococci in soymilk to which nonfat dry milk was added increased acid production. A harder curd was obtained by increasing the proportion of soymilk in a mixture of skim milk and soymilk fermented by various lactic organisms. Address: Dep. of Zootechnical Science, Tokyo Univ. of Agriculture. Setagaya-ku, Tokyo.

5748. Yamashita, Michiko; Arai, S.; Matsuyama, J.; Kato, H.; Fujimaki, M. 1970. Enzymatic modification of proteins in foodstuffs. IV. Bitter dipeptides as plastein-building blocks debittering of peptic proteolyzate with α-chymotrypsin. *Agricultural and Biological Chemistry* 34(10):1492-1500. Oct. [8 ref]
Address: Dep. of Agricultural Chemistry, Tokyo Univ.

5749. *Foreign Agriculture.* 1970. The soybean and ASA–Fifty years of growing up together. Nov. 16. p. 2-3.
• ***Summary:*** Soybeans had been known in America since 1804 when a few bags were brought from China as a reserve food supply in the hold of a Yankee Clipper. Civil War soldiers carried them as "coffee berries," using them to brew coffee when the real thing became scarce. The USDA recorded the first soybean statistics in 1919 with a report that there had been 99,000 acres of U.S. farmland planted in beans during that year. In 1956 the American Soybean Assoc. signed a contract with USDA's Foreign Agricultural Service to cooperate in soybean market development work in Europe and Japan. This was the first such contract for overseas promotion of any U.S. farm commodity. Out of the effort came the Japanese-American Soybean Institute and the Soybean Council of America (a joint effort of ASA and the National Soybean Processors Association). Last year soybeans ranked as the nation's #1 agricultural export with a total value of over $1,400 million. Photos show: The first plant [Elizabeth City Oil & Fertilizer Co.] to process U.S. soybeans, located in Elizabeth City, North Carolina. Farmers harvesting Laredo soybeans at Mississippi State University in about 1920.

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5750. Fukushima, Danji.; van Buren, Jerome P. 1970. Effect of physical and chemical processing factors on the redispersibility of dried soy milk proteins. *Cereal Chemistry* 47(6):571-78. Nov. [8 ref]
Address: Cornell Univ., Geneva, New York.

5751. Fukushima, Danji.; van Buren, J.P. 1970. Mechanisms of protein insolubilization during the drying of soy milk. Role of disulfide and hydrophonic bonds. *Cereal Chemistry* 47(6):687-96. Nov. [9 ref]
• ***Summary:*** Insolubilization during drying was the result of polymerization, which took place through disulfide bonds, as indicated by the effects of sulfhydryl-blocking agents, and through hydrophobic bonds, as indicated by the effect of sodium dodecyl sulfate. Address: Cornell Univ., Geneva, New York.

5752. Goldman, M.C. 1970. Southern California–Food-shopper's paradise! An exciting burst of organic-living enthusiasm–among young, old and in-between–has created a tidal wave of food shops and more products from Santa Barbara to San Diego. *Organic Gardening and Farming* 17(11):38-45. Nov.
• ***Summary:*** "Spearheading the surge to organic foods today is the West Coast's literal Garden of Eden–the southern half of Golden California." And this should be no surprise. A climate well suited for year-round gardening and farming join with people of all ages with people interested in natural foods plus "that rapidly-enlarging segment of the younger generation now so awake to wholesome eating.

"Actually, a sizable chunk of early interest in organic ideas belongs to this paradisiacal area. Pioneers like Phil Arena, Herbert Clarence White, Maria Wilkes, Clarence Tontz, Lee Anderson and dozens more have all lent the sunny Southwest locale an aura of organic history-in-the making."

In a late July trip from Santa Barbara south to San Diego the writer observed in shop after shop (there are at least 300 "health food stores") along the beautiful Pacific coastline, streams of young folks–many with surfboards and/or children in tow–were coming in to buy fresh fruits and vegetables, whole grains, "juices, kelp and dulse, sea salt and soy products, breads and eggs."

Veteran Betty Morales, prolific writer and lecturer, notes: "The influx of young people is like a blood transfusion to the health-food business, particularly to the retailers of organically-grown foods."

Sun Circle Ranches, based in California, supplied by some 200 organic farmers (large and small), are the leading nationwide distributor of organic produce.

In Los Angeles, Erewhon Trading Co., related to the original shop in downtown Boston, Massachusetts, is only a year old, yet serves 100 West Coast stores, natural food restaurants, co-ops and various institutions. Paul Hawken, president of Erewhon [a macrobiotic company], notes that even some of the big universities, including UCLA, have become customers for the popular organic brown rice and soy sauce.

Jimmy Silver, shop manager, says the store's retail clientele consist of about half each younger and older people. Fresh produce from Sun Circle attracts both. Silver sells about 1,200 hundred pound bags of brown rice each month–90% of it wholesale to established shops in L.A. and other parts of the Southwest. Grown for Erewhon by Wehah Farms in Richvale, California, it now retails for $16.50 per 100-lb sack.

"Grains from the well-known Arrowhead Mills in Deaf Smith County, Texas, also make up a sizable segment of business, says Hawken, a young man who typifies the keen, forceful drive of the new generation in health foods marketing. Along with these and rice, soy sauce made from Japanese organic-grown beans constitutes the biggest seller–nearly 4,000 gallons a month at $8 by the gallon, down to $1.20 per pint. Various soybean pastes, such as *mugi miso* prepared with the beans, well water and salt, are also favorite products. So is seaweed..."

Says veteran store owner Walter Lindberg: "No question about it, people are becoming more concerned about the quality of the food they buy." All store owners say that business has jumped during the past year–especially from young people. "Young people have an open communication system that far outstrips TV and radio."

At the Sun and Earth shop in Goleta, a suburb of Santa Barbara packed with students, one popular item (called the "natural foods answer to the TV dinner") is "a platter of our soyburgers, carrots and parsley," which retails for 57 cents.

Goldman concludes: "The thunderbolt of organic living has not only struck ground in the West–it's sent a strong, vital message crackling everywhere in the land."

Contains 6 photos taken inside the new breed of food shops. Address: Box 866, Hereford, Texas.

5753. Photographs of people at the Erewhon–Los Angeles macrobiotic retail store. 1970. Los Angeles, California.
• ***Summary:*** These five black-and-white photographs were taken in mid-November 1970 at the Erewhon–Los Angeles retail store on Beverly Boulevard (at the corner of Edinburgh) by Jimmy and Susan Silver. The photos were sent to Soyinfo Center by Jimmy Silver in Aug. 2010.

They show: (1-2) Bruce Macdonald (who was in charge of the store and Erewhon West Coast operations at the time) standing near the cash register. (3) Customers in the store. (4) Jimmy Silver hugging his daughter Rachael (who is in a wooden barrel) In the store. (5) The produce section at Erewhon–Los Angeles.

Note: In an e-mail dated 29 Aug. 2010, Jimmy Silver adds: "We had a warehouse catercorner across Beverly Blvd. The other store employees (and I use the term loosely, as we

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all lived at the Kushis' house on Franklin Ave. and basically received room and board and sort of an allowance at Bruce's discretion, not actual pay) were Bobby Orgo and John Curran. We all worked at both the store and the warehouse (which did some wholesale and institutional sales, to other stores and restaurants). For whatever reason, Bruce liked me working in the store and talking to the customers or talking to customers on the phone. So even though Bobby was the one with the most experience and know-how, I kind of became the de facto second in command after a little while, handling the money, etc.

"Also, Jim Docker and Leon Abehsera worked at the store, but doing construction and physical improvements, not the work of the business itself. They both had this incredible (to me, anyway) ability to lie down on a sack of rice, any time of day, and immediately go to sleep for five or ten minutes, and then get up looking and acting as if they'd just had 8 hours sleep.

"Bobby Orgo was really a character. He once got in a big argument with the health inspector (!) of all people, who had come to check out the warehouse. Everything was 'dry' at the warehouse (no refrigeration), so the inspector was saying this and that about the rules, but was basically going to let it all go. Bobby comes in smoking a cigarette and the inspector tells him he can't smoke in a food facility. Why not? Against the health code. So what–smoking isn't bad for you (macrobiotics tended to look at smoking as 'yangizing', which was 'good' for yin people, which everyone was assumed more or less to be). They get into a big yelling match, and the inspector ends up citing us for about fifty violations, and we ended up having to put in tile coving, a floor drain and stainless steel sinks–all to handle bags of grain, because of Bobby's argument."

In an e-mail dated 10 Jan. 2010 Jimmy Silver adds: Doug Rauch was both sales and purchasing manager. I more or less worked for him, or was trained by him, when I came to Erewhon, mostly because I was interested in what he was doing. He was the guy that knew all the product information.

"Nominally I was in charge of getting the catalogs out, 'envisioning' and 'theming' them, labels and label concepts and designs, new products, customer relations (but in a more technical sense, like product research questions–our customers were primarily stores and coops), vendor relations (making nice with our suppliers and producers beyond issues of payments and shipments and orders), and handling the import business from Japan and our relations with our two Japanese suppliers, Muso and Mitoku. Sort of like a jack of no trades.

"Doug got Trader Joe's (TJ) to take on natural food products from Erewhon. Eventually he left and then went to work for TJ. Their office at the time was only a few blocks from where he lived. I was sent over to his house for two or three days during the transition and made notes on a yellow legal pad of all the things I needed to do and pay attention to that he told me, and then I became the sales manager and purchasing manager. By then Erewhon was in Vernon, no longer in Culver City.

"Doug rapidly rose at TJ, and shortly became their youngest VP. He convinced them to expand to the East Coast and became president of the East Coast division. Now he has 'graduated' as he would put it, has some sort of fellowship at Harvard, and helps out at the local NPR station (I think he may be the chairman, which I believe means they rely on him to make sure that they raise enough money to keep operating)." Doug is tall–a very interesting guy with a very dry wit.

5754. Yoshimoto, Akihiro; Nomura, Sigeyuki; Hongo, Motoyoshi. 1970. [Bacteriophages of *Bacillus natto.* IV. Natto plant pollution by bacteriophages]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 48(11):660-68. Nov. [11 ref. Jap; eng]
Address: Lab. of Applied Microbiology, Dep. of Agricultural Chemistry, Kyushu Univ., Fukuoka, Japan.

5755. Murata, Kiku; Miyamoto, Teijiro; Kokufu, Etsuko; Sanke, Yukiko. 1970. Studies on the nutritional value of tempeh. III. Changes in biotin and folic acid contents during tempeh fermentation. *J. of Vitaminology* (*Kyoto, Japan*) 16(4):281-84. Dec. 10. [10 ref]
• ***Summary:*** Changes in biotin and total folic acid activities during fermentation with *Rhizopus oligosporus* were investigated. It was found that the contents of biotin and total folate compounds in tempeh were 2.3 and 4-5 times higher than those in unfermented soybeans, respectively. Address: Food and Nutrition Lab., Faculty of Science of Living, Osaka City Univ., Sumiyoshi-ku, Osaka, Japan (Post No. 558).

5756. Saio, Kyoko; Matsuo, T.; Watanabe, T. 1970. Preliminary electron microscopic investigation on soybean 11S protein. *Agricultural and Biological Chemistry* 34(12):1851-54. Dec. [5 ref]
Address: 1&3. Food Research Inst., Ministry of Agriculture & Forestry, Tokyo; 2. Japan Electron Optics Lab. Co. Ltd.

5757. Saito, Masataka; Yamamoto, Tadashi; Goto, Kazuo; Hashimoto, Koji. 1970. [The influence of cool temperature before and after anthesis, on podsetting and nutrients in soybean plants]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 39(4):511-19. Dec. [4 ref. Eng; jap]
• ***Summary:*** In Hokkaido, temperature requirements of different soybean varieties are investigated at agricultural facilities and experiment stations in both field tests and phytotrons.

Note 1. A phytotron is a completely closed greenhouse that can be used for study of environmental conditions on

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plant growth. Also, the production (or consumption) of gases can be monitored.

Cold hardy local strains are crossed with market varieties to improve the weather / cold resistance of the latter.

Note 2. Anthesis (derived from the Greek word *anthesis* = to bloom) is the period during which a flower is fully open and functional. It may also refer to the onset of that period. Address: 1-2. Hokkaido Prefectural Tokachi Agric. Exp. Station, Tokachi, Hokkaido.

5758. **Product Name:** [Ajipron Soy Protein].
Foreign Name: Ajipron.
Manufacturer's Name: Ajinomoto Co. Ltd.
Manufacturer's Address: Takara-cho 7-1, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1970.
New Product–Documentation: *Soybean Digest Blue Book.* 1970. p. 108.

5759. Araki, Satoshi; Kaneko, Kiyoko; Tominaga, Yoshie; Horibe, Fumiko. 1970. Jinkô niku-iri tôfu no chôsei [Preparation of tofu with artificial meat]. *Tokyo Kasei Gakuin Daigaku Kiyo* 10:67. [Jap]*

5760. **Product Name:** [Soy Flour].
Manufacturer's Name: Asahi Yushi Co. Ltd.
Manufacturer's Address: 16-chome 4-jo, Asahikawa, Japan.
Date of Introduction: 1970.
New Product–Documentation: *Soybean Digest Blue Book.* 1970. p. 107. Soya Bluebook. 1981. p. 63. Address is now Higashi Asahikawa, Asahikawa City 070, Japan.

5761. **Product Name:** [Soyalac {Soymilk} (For General Use)].
Foreign Name: Soiyarakku Ippanyô.
Manufacturer's Name: College Health Foods. Later renamed San-iku Foods.
Manufacturer's Address: 1-1 Nagaurataku, Sodegaura-machi, Kimizu-gun, Chiba-ken 299-02, Japan.
Date of Introduction: 1970.
Wt/Vol., Packaging, Price: 425 gm can.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Soiyarakku Ippanyô was introduced in 1970. It is now sold by Saniku Fuuzu in a 425 gm can and distributed nationwide.

5762. *East* (*The–Higashi*). 1970. Mentions "kinako mochi." Vol. 6. *
• ***Summary:*** "I asked subtly, my mouth pleasantly full of kinako mochi. Here's the story: Once some time ago in a certain temple just over this..."

5763. Ebata, Okiei. 1970. Nattô-kin ni kansuru kenkyû [A study on natto microorganisms]. *Tokai Joshi Tandai Kiyo* No. 2. [Jap]*

5764. Ebine, Hideo; Miyairi, M. 1970. [Studies on enriched miso: (Part 8) Trial to enrich miso with iron]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 196. p. 28-. [Jap]*
Address: National Food Research Inst., Tokyo.

5765. Holmberg, Sven A. 1970. [Notes on soybeans in eastern Siberia and northern Japan]. Fiskeby, Sweden. 12 p. Unpublished manuscript. [Swe]*
Address: Fiskeby, Sweden.

5766. Ito, Hideo; Ebine, H. 1970. Miso no kôki seibun no kenkyû. I. Heddo gasu ni yoru kenshitsu [Studies on the flavor components of miso. I. Detection of flavor in the head space]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 191. p. 22-. [12 ref. Jap; eng]*
Address: National Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5767. Ito, H.; Ebine, H. 1970. Miso no kôki seibun no kenkyû. II. Fukureta miso no kihatsusei seibun [Studies on the flavor components of miso. II. Volatile substances in swollen miso packages]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 191. p. 25-. [5 ref. Jap; eng]*
Address: National Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5768. Ito, H.; Ebine, H. 1970. Miso no kôki seibun no kenkyû. IV. Kaku shu miso no kihatsusei kôki seibun [Studies on the flavor components of miso. IV. Flavor substances in different varieties of commercial miso]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 198. p. 19-. [5 ref. Jap; eng]*
Address: National Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5769. Ito, H.; Ebine, H. 1970. Miso no kôki seibun no kenkyû. III. Arukoru rui to saikuramin san no dôtei hôhô [Studies on the flavor components of miso. III. Detection of alcohols and cyclamic acid as nitrite ester]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 194. p. 14-. [4 ref. Jap; eng]*
Address: National Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5770. Kanazawa, Akio; Shimaya, M.; Kawasaki, M.; Kashiwada, K. 1970. Artificial diet of prawn. *Nihon Suisan Gakkai shi* (*Bulletin of the Japanese Society of Scientific Fisheries*) 36:949-54. *
• ***Summary:*** 8% soybean oil was used as a lipid in the

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artificial diet of the prawn (*Penaeus japonicus*). Address: Faculty of Fisheries, Kagoshima Univ., 4-50-20 Shimoarata, Japan.

5771. Kikkoman. 1970. Shoyu. Film soundtrack transcript. Noda, Japan: Kikkoman Inc. 6 p. Unpublished manuscript. [Eng]
Address: Noda, Japan.

5772. Li, T. 1970. [The present condition and prospects for the future of the shoyu industry in Korea]. [Jap]*
• ***Summary:*** The fermented soy sauce industrially produced in Korea is of the Japanese koikuchi type, and in 1970 the annual industrial production was estimated to be about 220,000 kl. Assuming that the daily per capita consumption is about 20 ml, the amount cited above in equivalent to one-half the demand for soy sauce in Korea, and it is estimated the same amount is produced at home.

5773. **Product Name:** [Tanmea {Soy Protein}].
Foreign Name: Tanmea.
Manufacturer's Name: Meito Sangyo.
Manufacturer's Address: Kikuidori 1-1, Nishi-ku, Nagoya, Japan.
Date of Introduction: 1970.
New Product–Documentation: *Soybean Digest Blue Book.* 1970. p. 108.

5774. Murata, Kiku. 1970. Hakkô daizu, tenpei (Tempeh) no eiyô-ka ni kansuru kenkyû (Sosetsu) [Studies on the nutritional value of tempeh (general remarks and introduction)]. *Osaka Shiritsu Daigaku Kaseigakubu Kiyo* (*Bulletin of the Faculty of Home Economics, Osaka City University*) 18:19-33. [30 ref. Jap; eng]
• ***Summary:*** "After investigation of the nutritional value of tempeh, including antioxidative and antihemolytic activities of tempeh, for several years, the following results were obtained: 1. Lipid of the tempeh powder is stable, while that of the unfermented soybean powder is labile to oxidation during storage. 2. It was found that isoflavones, especially Factor 2 (6-7-4'-trihydroxyisoflavone), which was liberated with Beta-glucosidase during fermentation with *Rhizopus,* was one of the antioxidants in tempeh. 3. The isolated or chemically synthesized crystalline Factor 2 was active in preventing hemolysis of the red blood cells of the vitamin E deficient rats *in vitro* but not in *in vivo* tests. 4. Protein Efficiency Ratio (PER) of tempeh and of unfermented soybeans (fresh or stored) were not significantly different. However, hemolysis percentages of blood of rats fed stored tempeh were less than 20%, while those of rats fed stored unfermented soybeans were 100% throughout the experimental period after 2 weeks. The serum tocopherol of the tempeh group was higher than that of the unfermented soybean group. 5. Most of the B vitamins except thiamine in tempeh were increased to 4-8 times as much as those of unfermented soybeans during fermentation. 6. It was observed that supplementation of methionine (1.09%), lysine (0.34%), and threonine (0.24% in protein level) improved PER as well as that of tempeh 7: whole egg 3 in protein level." Address: Osaka.

5775. Ota, Shizuyuki. 1970. Reshichin [Lecithin]. *Yukagaku* (*Oil Chemistry*) 19(8):792-806. [175 ref. Jap]
• ***Summary:*** The best known review of the literature on lecithin by a Japanese, with numerous Japanese references, both early and current. A small portrait photo shows the author. Address: Central Research Laboratories, Aji-no-moto Co. Inc., Suzuki-cho, Kawasaki, Kanagawa-ken, Japan.

5776. Takasago Koryo Kogyo Company. 1970. [Manufacture of fermented soymilk with added nonfat dry milk]. *Japanese Patent* 12,256/70. [Jap]*

5777. Takashima, Mieko; Morimoto, Toshiko; Sekine, Takashi. 1970. Shihan tôfu no shokuhin eisei gakuteki kenkyû [A study of the hygienic properties of commercial tofu]. *Joshi Eiyo Daigaku Kiyo* No. 1. p. 86-91. [Jap]*

5778. Yokotsuka, Tamotsu; Asao, Y.; Sasaki, M.; Oshita, K. 1970. Pyrazine compounds produced by molds. In: Proceedings of the First U.S.-Japan Conference on Toxic Microorganisms. U.S. Dept. of Interior and UJNR Panel on Toxic Microorganisms. See p. 133. *
• ***Summary:*** Shoyu is a safe food. Address: Noda Inst. for Scientific Research and Central Research Inst. of Kikkoman Shoyu Co. Ltd., Noda, Japan.

5779. Abehsera, Michel. 1970. Cooking for life. Swan House, P.O. Box 638, Binghamton, NY 13902. xiv + 364 p. First Avon Flare Books printing, March 1972. Index. 21cm.
• ***Summary:*** Contains many imaginative and joyous macrobiotic recipes. Acknowledgments: "This book could never have been completed without the help of my wife, Claude. Most of the recipes are hers; she cooked, tested and wrote them down... Jack Garvy completed the editing of the book and made definite English corrections. My exceptional friend William Dufty gave valuable advice. Finally, my brother Charles was very helpful..."

The author uses the term "black beans" and from his definition on page 18 it seems that he is referring to black soybeans: "Black Beans, twin brothers of the red aduki in size, are sold in Chinese, Japanese and natural-food stores. They are the milk and honey of the bean family, and their flavor and texture impart a delightful sweetness and richness to any soup or vegetable dish." No definition is given of soybeans. In the section titled "Condiments" (p. 20-21), the author defines soya sauce, miso, seitan, salted plums, tofu, kuzu, etc. "Tofu is another name for soya-bean curd.

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In Chinatown, you'll see it in wooden barrels. It looks like Feta Greek Cheese and some people would swear it tastes like chicken. It is excellent served with sauteed vegetables, sauces, fried or cooked in Miso Soup.

"Seitan: Your guests will almost certainly mistake this for meat. Teeth find it pleasant to chew. A combination of wheat gluten, wheat soya beans [sic], water and salt, it comes in handy when mixed with vegetables, sauces and soups." Note 1. No recipe for making or using seitan appears in this book.

Soy-related recipes include: Cooking beans in a pressure-cooker (p. 66; "Do not pressure cook black beans. Their skins may come off and clog the pressure cooker spout. It is quite dangerous!"). Cooking beans in a pot (incl. soya beans, p. 67). Black-bean stew (with miso, p. 70). Soja jardiniere (with whole soya beans and miso).

In the chapter titled "Soups," the author tells the story of how the famous Japanese physician, Dr. Tatsuichiro Akizuki, used miso to strengthen his constitution and to survive the atomic bomb dropped on Nagasaki on 9 Aug. 1945. Under "Minerals" in that chapter he discusses other virtues possessed by miso, then gives a recipe for Miso soup (p. 86).

Radishes sauteed in miso (p. 114). Sandwich au gratin (with miso spread, p. 114). Macrobiotic marbles (with miso, p. 155). Claudia's pizza (with miso, p. 158). Salade au cresson (with miso, p. 169). Nato [sic, Natto] (Japanese salad with natto, p. 171; Note 2. The author describes "Nato" as "sour soy-beans, bought in a Japanese store"). Miso sauce (p. 178). Miso spread (with tahini, p. 187). Oat-miso spread (p. 188). Scallion spread (with miso, p. 188). Miso pâté (p. 189). Komoku (with tofu, deep-fried and cut into strips, p. 212). O'Sushi (with tofu, p. 217). Kasha à l'Orientale (with tofu, p. 220). Bi-Cuan (Vietnamese recipe with fried tofu, p. 226). Kagetsu ice cream (with fine soya powder [perhaps Jolly Joan from Ener-G foods in Seattle], p. 334; "Kagetsu is a beautiful restaurant in Seattle"). Yellow pompidou (with soya bean powder, p. 336).

The Foreword states (p. 1-2): "Ten years ago I was a sick man, struggling to stay alive and to finish a novel. I suspected I might fail in both matters and the doctors of Paris agreed. They abandoned me as a hopeless case. It was then that I discovered a way of life called Macrobiotics. After a year of eating grains and vegetables, my health restored, I ventured to New York to discover America and finish my novel."

Note 3. *Webster's Dictionary* (1985) defines feta, a word first used in English in 1940, as "a white semisoft Greek cheese made from sheep's or goat's milk and cured in brine."

Fax from Jimmy Silver. 1991. Dec. 17. This was the first best-selling macro / natural food cookbook. Michel is head of a (the?) Jewish community in Montreal, Canada. He has 7-9 brothers and 1 sister. "His brother, George, founded the Nature de France clay based body care company–originally called Cattier but changed after they were sued by Cartier. I thought they would have prevailed in the suit but George didn't want to spend $500,000 to fight it even if he won." Address: New York.

5780. Bock, Felicia Gressitt. trans. 1970. Engi-shiki: Procedures of the Engi era. Books I-V. Tokyo: Sophia University. xi + 216 p. Index. 27 cm. [196* ref. Eng]

• ***Summary:*** This is volume 1 of a two-volume series. The second volume (ix + 190 p.), published in 1972, contains Books V-IX. These "Procedures of the Engi era (A.D. 901-922) are a great body of regulations designed to supplement the administrative codes which were drawn up in the early eighth century. Because of their wide scope and the minute details included, they are an invaluable source of information about Japan in the Nara and early Heian periods–eighth, ninth, and early tenth centuries."

"At first glance the *Engi-shiki* appear to be huge aggregate lists, enumerations, specifications, registers, and statistics. Such they are, but in relation to the department of government under which they fall, they provide many essential regulations for carrying out day-to-day details of civil and religious administration" (Preface, p. v).

The contents of the five books translated here are as follows: Book one: Festivals of the four seasons (Part I). Festivals of the second month, festivals of the fourth month, festivals of the sixth month (repeated in the twelfth month). Book two: Festivals of the four seasons (Part II). Festivals of the ninth month, festivals of the eleventh month, festivals of the twelfth month. Book three: Extraordinary festivals. Book four: The Shrine of the Great Deity in Ise. Book five: Bureau of the Consecrated Imperial Princess. The back matter includes: A map (p. 186) showing the Provinces and Circuits at the time of the *Engi-shiki* (circuits–from east to west: Tokai-do, Tosan-do/Tozan-do, Hokuriku-do, Nankai-do, San'yo-do, San'in-do/Sanin-do, Saikai-do), a table of ancient Japanese measurements, eight appendixes, a bibliography, and a glossary and key.

In the many long list of ritual objects, two types of sea vegetables (wakame and arame) appear very frequently (see p. 61, footnote 161). Other common objects are hemp and bark cloth (primeval clothing materials), salt, sake, rice, abalone, sea-bream, bonito, and silk.

In Book Five, included in the list of "Monthly Requirements" (p. 163) are: 2 *kin* 13 *ryô* each of laver and codium, 11 *kin* 4 *ryô* each of wakame and gelidium,... 6 *sho* of fermented soybeans,... 2 *sho* of fermented bean paste, 1 *to* 5 *sho* of barley sugar, 3 *to* each of glutinous rice, soybeans, red beans [azuki], wheat, sorghum, sesame seeds..."

In Book Five, included in the list of things "Required for the Three Occasions in the First Month" after New Year (p. 163) are "1 *kin* each of laver [nori] and wakame, 3 *shô* of salt, 1 *shô* 5 *gô* each of pickles, bean paste [kuki, miso] and vinegar, 6 *to* of sake, 9 *shô* of glutinous rice, 3 *shô* each of soybeans, red beans [azuki], millet and sorghum, 6 *shô* each

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of wheat, sesame, and raw chestnuts..."

In Book Five, in the List of Pharmacopoeia required (p. 178+) is included "1 *gô* 1 *shaku* of fermented bean sauce (p. 179) [kuki, the ancestor of miso; see p. 194], and 6 *koku* each of soybeans and red beans [azuki], 1 *koku* of sesame seed... and 3 *koku* of sesame seed oil... and 1 *to* of dried sweet arrowroot [kudzu powder, see footnote 591] (p. 182).

Note: This is the earliest English-language document seen (Nov. 2011) that uses the word "kuki" to refer to early Japanese fermented black soybeans.

5781. Chang, Wonona W.; Chang, Irving B.; Kutscher, Helene W.; Kutscher, Austin H. 1970. An encyclopedia of Chinese food and cooking. New York, NY: Crown Publishers, Inc. x + 534 p. Edited by Lillian G. Kutscher. Charlotte Adams, Consulting Editor. Illust. Index. 26 cm. International Cookbook Series edition. [52 ref]

• ***Summary:*** This comprehensive work, the result of at least 25 years of collaboration, contains over 1,000 recipes. The 4th printing (March 1977) proclaims prominently: "The first Completely Safe Chinese cookbook compiled in accordance with latest food research without MSG (monosodium glutamate)." Following introductory chapters titled "Chinese Cuisine: Background," "Regional Chinese Cooking," "Utensils for Cooking, Serving, and Eating," "Cooking Preparations," and "Cooking Techniques," there is a detailed "Guide to Ingredients" (p. 22-57), which describes the following soy-related foods and gives Cantonese / Mandarin pronunciations / transliterations (see p. 22): beans, black (wu dow / wu do); beans–black salted fermented beans (dow si / do shih; used as a condiment or flavoring agent [seasoning]. Aroma: fragrant, appetizing); bean cake, fermented (fu yu / fu yu [fermented tofu]); bean curd (dow fu); bean curd, dried (dried bean curd [dried yuba], p. 25, 47–tiem jook or fu jook pei / t'ien ch'u or fu pi chi); bean curd cheese, red (nam yu / nan yu); bean filling, sweet (dow sa / do sa; made from red [azuki] beans or green / [mung] beans); bean sauce, brown or yellow (mien see jiong); bean sprouts (large, from soybeans) (wong dow gna / huang do ya); hoisin sauce (red seasoning sauce) (hoy sin jiong / hai hsien jiang); soy sauce (dark lo tsow / lao tsou; heavy–jiong yow / jiang yu [jiang you]; light–sang tsow / sheng tsou; table soy sauce–sin tsow / shien tsou) "Dark soy sauce has caramel added for coloring. Heavy soy sauce, which has a slightly sweet smell, is also known as black soy. Light soy sauce is the most delicately flavored and is light brown in color. Japanese soy sauce, somewhere between the Chinese light and heavy, is preferable to domestic brands but inferior to Chinese brands."

Vegetable steak (mien gon / mein jing) "Meat substitute made from wheat gluten. Shape: 3-inch square or round patty ½ inch thick." Brown, chewy, and firm. Sold in cans.

Photos (black and white, p. 47) show fermented black beans, fresh bean curd, pressed bean curd, bean curd sticks and bean curd sheets [both kinds of yuba, but "bean curd sheets" on p. 47 are called "bean curd, dried"], brown bean sauce, and large fresh bean sprouts.

Note 1. This is the earliest English-language document seen (Oct. 2012) that uses the term "bean curd sheets" or the term "fu jook" or the term "fu jook pei" or the term "fu pi chi" or the term "t'ien ch'u" to refer to yuba or to dried yuba sticks.

Pages 58-60 contain a "Shopping list for Chinese cupboard." Foods are listed alphabetically in English, with the Cantonese term romanized and Chinese character forms. Next come the 1,000 Chinese recipes divided into chapters. One chapter is titled "Bean Curd" (p. 422-34), which includes Ma Po Dow Fu (p. 433); there are so many recipes for regular tofu (dow fu) in this book that we do not have room to list them all. The many other soy-related recipes are listed in the excellent index.

Recipes for "bean cake, fermented" [fermented tofu] are: Scrambled eggs with fermented bean cake (Fu yu don, Canton, p. 134). Duck with fermented bean cake (Fu yu ta, Adapted, p. 276). Steamed pork with fermented bean cake (Fu yu tsing ju yoke, Canton, p. 292). Stir-fried green beans with fermented bean cake (Fu yu tsang dow, Canton, p. 391). Lettuce and fermented bean cake (Fu yu sang tsoi, Canton, p. 392). Spinach and fermented bean cake (Dow fu bo tsai, General, p. 399). Watercress and fermented bean cake (Fu yu sai yong tsoi, Canton, p. 40).

Recipes for "black beans, salted" [fermented black soybeans] are: Pork with bitter melon and salted black beans (Fu gwa yoke si, Canton, p. 305). Shrimp with bitter melon and salted black beans (Fu gwa dow si har, Canton, p. 306). Steamed spareribs with salted black beans (Dow si pai gwut, Canton, p. 320). Beef with bitter melon and salted black beans (Fu gwa ngo yoke do si jiong, Canton, p. 340). Black bean sauce (Huk dow tsup, Canton, p. 436; with garlic and ginger.

Note 2. This is the earliest separate recipe seen {Nov. 2008} for "Black bean sauce").

Recipes for "bean curd, dried" [dried yuba] are: Pig's feet with dried bean curd soup (Ju gyok tiem jook tong, Adapted, p. 113; with "10 sheets dried bean curd." Soak sheets in hot water for 30 minutes. Drain, cut crosswise into pieces 1 inch wide, then add to soup). Spare ribs with dried bean curd soup (Pai gwut shiu tiem jook, Adapted, p. 321). Dried bean curd strips with soy sauce (Hung shu tiem jook, General, p. 424). Vegetarian ham dried bean curd (Sue ho twei dow fu, Shanghai, p. 429; with "20 sheets dried bean curd").

Recipes for "bean curd skin" (or bean curd sheets) [yuba sheets, fresh or dried] are: Red-cooked carp with bean curd skin (Fu pi hung sao yu, Shanghai, p. 158; with "bean curd skin to cover" carp). Red-cooked carp with bean curd skin–Approved ulcer recipe (Hung sao li yu dow fu pi, General, p. 158; with "¼ lb. dried bean curd skin {about 20 pieces, 1½ by 5 inches}. Soak for 30 minutes in hot water. Drain. Cut

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into 2-inch squares).

Recipes for "frozen bean curd" [frozen tofu]: Frozen bean curd with soybean sprout soup (Dung dow fu dow ya tong, Adapted, p. 90; with "2 cakes frozen bean curd" and "½ lb. soy bean sprouts." "Defrost frozen bean curd by covering with cold water, letting stand 2 to 4 hours before cooking. Then cut each piece into 10 to 12 thin slices"). Spareribs with frozen bean curd (Pai gwut shiu dung dow fu, Adapted, p. 320; with "4 cakes frozen bean curd"). Stir-fried frozen bean curd (Tsao dung dow fu, Peking, p. 422; with "6 cakes frozen bean curd. * Wrap 2 to 3 pieces fresh bean curd together in waxed paper, freeze until hard").

Recipes for "pressed bean curd" [pressed tofu]: Pressed bean curd shrimp (Sha tze gahn si, Shanghai, p. 178, with "4 pieces pressed bean curd"). Golden strips with pressed bean curd (La jiao tsao san sih, Hupeh, p. 313). Pressed bean curd and celery with stir-fried beef (Dow fu gahn ching tsai ro si, Shanghai, p. 357). Stir-fried pressed bean curd with pork (Dow fu gahn tsao ro si, Shanghai, p. 427). Stir-fried pressed bean curd with chicken (Dow fu gahn tsao gee si, Shanghai, p. 427).

Recipes for "soybean sprouts": Spareribs soybean sprout soup (Pai gu dow ya tong, General, p. 112). Beef shank soybean sprout soup (Wu hwa niu ro hwang dow ya tong, General, p. 112). Braised soybean sprouts (Hung sao hwang do ya, Shanghai, p. 376).

Note 3. This is the earliest English-language document seen (Jan. 2013) that uses the term "wong dow gna" or the term "huang do ya" to refer to soybean sprouts. Address: USA.

5782. Hong Kong Soya Bean Products Co. Ltd. 1970. The Hong Kong Soya Bean Products Co. Ltd. 1940-1970. Kowloon, Hong Kong. Annual Report. 17 p. Summarized in Soybean Digest, July 1971, p. 30. [Eng; chi]

• ***Summary:*** Written in both English and Chinese, this important document contains an detailed history of the company, which celebrates its year of founding as 1940.

Photos show: (1) K.S. Lo, Chairman. (2) Directors and employees in 1940 outside original Causeway Bay factory. (3) Aberdeen factory, an early photo. (4) Employees in 1950. (5) Employees in 1960. (6) Illustration of Kwun Tong factory opened in 1962. (7) Pepsi Cola bottling line. (8) Vitasoy bottles being capped. (9) Quality control. (10) Loading of trucks by more than 20 fork lift vehicles. (11) A retail outlet and cooler; About 15,000 stores sell Vitasoy in the Colony. (12) More than 100 trucks distribute Vitasoy and Pepsi Cola in Hongkong. (13-14) Vitasoy and Pepsi signs are seen everywhere in Hongkong. (15) The board of directors in 1970. (16) The five "Lo's" instant rice dishes soon to be marketed. (17) Meat dicing machine. Packaged Foods Division capable of processing 8,000 lb of meat/hour. (18) Three "Lo's" cheese spreads soon to be marketed. (19) Part of production plant–Cheese division. (20) "Lo's" weaning food–first product developed by the Extrusion Foods Div. (21) Packaging machine–Extrusion Foods Div.

A bar chart shows that annual sales grew from $5.1 million in 1960 to $17.0 million in 1965, to $30.0 million in 1969. The number of employees grew from 352 in 1960 to about 630 in 1970.

In 1937 K.S. Lo, the founder, who happened to be on a business visit to Shanghai, attended a lecture by Julian Arnold, then Trade Attache to the United States Embassy in Nanking. The subject was "Soybean–The Cow of China." Lo left inspired to do something about the widespread nutritional diseases then found in Hongkong. "He applied to the government for a license to manufacture soymilk in 1938. He received such a discouraging and unfavorable reply from the Sanitary Board that he was forced to give up his plan. However, a year later, Dr. P.S. Selwyn Clarke took over the chair of the Sanitary Board, and day by chance he came across Lo's application. He telephoned Lo and assured him that he would issue him the necessary license.

"Lo was overjoyed and immediately went to raise a modest capital of $18,000. He put up a small factory at Causeway Bay and the plant was opened in March 1940 by Sir Man-Kam Lo... Sales remained poor for the first two years. By the end of 1941, when the Pacific War broke out, the Company was almost on the verge of bankruptcy. The factory was occupied by the Japanese soon after Hongkong fell and Lo left for Free China [Taiwan]. In Sept. 1945 he returned to Hongkong and production was restarted in Nov. of that year." Lo started to market his product as a soft drink through soft drink outlets, instead of like milk. Sales grew rapidly. By 1949 the company had accumulated enough capital to buy a piece of land and build a new factory in Aberdeen. In the meantime the company had also acquired the Greenspot franchise. So in 1950, the Aberdeen factory was opened and used for the bottling of Greenspot while Vitasoy remained at the Causeway Bay factory. In 1952 the bottle was changed to a soft drink bottle that was sterilized. Sales skyrocketed. In 1957 the company gave up the Greenspot franchise and acquired the Pepsi Cola bottling franchise. In 1962 a new 6-story, 300,000 square foot factory was opened in Kowloon. In 1964 the company invented a powdered soymilk. That year Lo was invited to present a paper at the "International Symposium on Oilseed Protein Foods" in Japan. His concepts caught the attention of UNICEF and FAO, which had been trying to find ways of increasing protein consumption in developing countries. A joint venture with Monsanto proved unsuccessful and was terminated last year. Monsanto was given a license to manufacture a powdered soymilk concentrate.

The company has created three new divisions. The Packaged Foods Division will be introducing in the spring a line of precooked foods which are ready for the table after simply heating. They include Chow Fan, Bar-B-Q Spare Rib, Dim Sum, etc. The Cheese Division will be launching

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this year 3 types of soymilk-based cheese spreads: Chinese Fu-Yu, European Blue Cheese, and English Cheddar. The Extrusion Foods Division is developing a high-protein weaning food, and hopes eventually to branch out into snack foods and meat substitutes.

5783. Hooker, Alan. 1970. Vegetarian gourmet cookery. San Francisco, California: 101 Productions. 192 p. Edited by Helen Morrow. Illust. by Sara Raffetto. 21 x 21 cm.
• ***Summary:*** The section on "Entrees" states (p. 101-02) that one of the easiest ways to get one's daily protein is by using soya flour, which can be added to many foods.

Soy-related recipes include: Baked soy beans (p. 56). Tofu with tempura vegetables (p. 132). Page 181 recommends various vegetarian food products, including Vegeburger and Choplets (made by Loma Linda Foods), Kikkoman brewed Soy Sauce, Bakon Yeast, and Gravy Quik (which contains soy and other vegetable proteins). Address: Founder, Ranch House vegetarian restaurant, Ojai, California.

5784. Iwanami Shoten. 1970. Tôshô sômokuroku. 8 vols. [Listing of all early Japanese books. 8 vols.]. Tokyo: Iwanami Shoten. [Jap]*

5785. Jameson, J.D. ed. 1970. Agriculture in Uganda. 2nd ed. London: Oxford University Press, Humphrey Milford. 395 p.
• ***Summary:*** Soya beans are discussed on various pages. "A significant response by soya beans to treatment with molybdate [to correct soils deficient in molybdenum] has been obtained at Namulonge" (p. 83).

As part of the banana and coffee system, practiced in most fertile parts of Uganda, a wide range of minor crops are grown, including "soya" (p. 131). The Montane systems are generally practiced by Bantu people and are based on production of bananas as the main food crop. Many minor crops are grown under this system, including "soya" (p. 135).

On pages 246-47 is a long section on "Soyabeans," by S.K. Mukasa (B.Sc., Dip. Agric. (E.A.), Senior Research Officer). "The earliest attempts to establish soyabean in East Africa are believed to have been made at Amani [German East Africa, later Tanganyika], in 1907 and 1909, using seed from the U.S.A., but these attempts were unsuccessful [See Greenway 1945]. In 1911 further introductions were made from China, Japan, and South Africa, and by 1920 the East African Departments of Agriculture were conducting trials. During the Second World War special efforts were made to encourage soybean cultivation.

"Seed distributions were organized in Buganda, Busoga, Mbale, Ankole, Toro, Bunyoro, and Lango; and demonstration plots were planted at some schools to popularize the crop. In most districts progress was very disappointing and only limited transitory success was achieved in Masaka, Mengo, and Ankole districts. The largest estimated acreage of about 40,000, for the country, was planted in 1944. During that year 4020 tons were marketed in Buganda but even here the crop was no longer popular and it had gone out of cultivation in Kyagwe County. After 1944 the acreage of soyabean rapidly declined; currently it is estimated to be less than 1000 acres for the whole country.

"Low yields and unprofitable market prices are probably the main causes of the decline. The low yields have been mainly due to bad germination and the use of poor varieties, or more often mixtures of varieties. Because of difficulties in cooking the soyabean has not been successfully incorporated into local diet; and so its cultivation is determined by market price changes. However, there are now prospects of establishing local processing industries to convert the bean into more acceptable forms which should assist in stimulating local use and stabilizing local market prices."

Concerning insect infestation and crop storage: "Soya bean is relatively free of pests if stored only for short periods" (p. 275). Address: Formerly Chief Research Officer, Dep. of Agriculture, Uganda.

5786. Kajiura, Itsugai. 1970. Shôjin ryôri no gokui [The secret principles of Buddhist vegetarian cookery]. Tokyo: Daihôrinkaku. 246 p. 19 cm. [Jap]*
• ***Summary:*** Shôjin ryôri is the Buddhist vegetarian cookery developed in Japan, largely in and around Zen temples. Address: Japan.

5787. Kawaguchi, Y.; Tsugo, T. 1970. Daizu nyû tanpakushitsu no rikagaku-teki seishitsu ni oyobosu kanetsu no eikyô [Effect of heating on the physicochemical properties of protein in soybean milk]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 23:98-107. [6 ref. Jap; eng]
Address: Tokyo Univ., Nôgaku-bu, Nogeikagaku-ka.

5788. Kirkup, James. 1970. Japan behind the fan. London: J.M. Dent & Sons Ltd. xii + 228 p. See p. 104. Illust. Index. 23 cm.
• ***Summary:*** The author traveled to Japan in the late 1960s to study the language and culture. While staying with the Sato family, he and Mrs. Sato are in the kitchen cooking. He describes the preparations including: "... a red lacquer bowl of rich *miso* soy (bean paste) soup."

5789. Konno, Shoshin. 1970. Soybean cultivation in Japan. *JARQ* (*Japan Agricultural Research Quarterly*) 5(2):21-27. [Eng]
• ***Summary:*** Contents: Soybean demand and production in Japan. Condition of location. Cropping system. Cultivation method: Varieties, fertilizer, planting time, planting rate, land preparation, intertillage and hilling, control of weed,

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insect and disease, harvesting and threshing, mechanized cultivation. Average yield. Green soybean [green vegetable soybeans]. Problems in soybean cultivation in Japan.

Table 1 shows "Production and consumption of soybeans in Japan" from 1915 to 1969. Statistics are given for planted area, production, imports, consumption, and self-supplying rate (% self sufficiency). Area and production decreased steadily from 1915 to 1945, skyrocketed in the early 1950s after World War II, then fell very rapidly after about 1954, as imports rose. Japan's rate of soybean self-sufficiency was 66% in 1915, dropping to 45% in 1925, 31% in 1935, and 18% in 1945. Then it jumped to 69% in 1950, fell to 27% in 1960, and 5% in 1969.

Soybeans are grown throughout Japan, but are most widely grown in northern Japan, particularly in Hokkaido, every prefecture of the Tohoku region and in Nagano, Niigata, and Kumamoto prefectures.

"Green soybean is harvested at the pod filling stage, boiled in the pod and used as a food." Because of the high profitability, green soybean production has gradually increased recently so that the area planted reached 7,490 ha in 1968 and 7,860 ha in 1969 accounting for 5.8% and 7.1% respectively of the total area planted to soybeans in Japan. Address: Dep. of Physiology and Genetics, National Inst. of Agricultural Sciences (Kitamoto).

5790. Kono, Tomomi. 1970. Encyclopedia: Tôfu, rekishi [Encyclopedia Japonica: Tofu history]. Tokyo: Shogakukan. See vol. 13, p. 227. [Jap]

5791. Matsuura, Shinji. 1970. Aflatoxins and fermented foods in Japan. *JARQ* (*Japan Agricultural Research Quarterly*) 5(1):46-51. [6 ref. Eng]
• ***Summary:*** No aflatoxins were detected in any samples of miso or shoyu examined. However, aflatoxin-like compounds were detected in about 30% of the koji molds examined, but these compounds differed from aflatoxins in their ultraviolet absorption spectra. Address: Chief, Lab. of Fermentation Technology, Fermentation Div., National Food Research Instute, Tokyo.

5792. Morishita, Keiichi. 1970. Kenkô jiei ron: Kagi was shizen seishoku [Essay on health self-sufficiency: The key is natural and correct eating]. Tokyo: Yomiuri Shinbun-sha. 266 p. 18 cm. (Kenko Series). [Jap]*
• ***Summary:*** About nutrition and vegetarianism. The author was born in 1928.

5793. Mukasa, S.K. 1970. Soyabeans. In: J.D. Jameson, ed. 1970. Agriculture in Uganda, 2nd ed. Published for the Uganda Government, Ministry of Agriculture and Forestry by the Oxford University Press. 395 p. See p. 83, 131, 135, 246-47, 275.
• ***Summary:*** "The earliest attempts to establish soyabean in East Africa are believed to have been made at Amani [German East Africa, later Tanganyika], in 1907 and 1909, using seed from U.S.A., but these attempts were unsuccessful. In 1911 further introductions were made from China, Japan, and South Africa, and by 1920 the East African Departments of Agriculture were conducting trials. During the Second World War special efforts were made to encourage soyabean cultivation in Uganda.

"Seed distributions were organized in Buganda, Busoga, Mbale, Ankole, Toro, Bunyoro, and Lango; and demonstration plots were planted at some schools to popularize the crop. In most districts progress was very disappointing and only limited transitory success was achieved in Masaka, Mengo, and Ankole districts. The largest estimated acreage of about 40,000, for the country, was planted in 1944. During that year 4,020 tons were marketed in Buganda but even here the crop was no longer popular and it had gone out of cultivation in Kyagwe country. After 1944 the acreage of soyabean rapidly declined; currently it is estimated to be less than 1,000 acres for the whole country." Address: Jameson was formerly Chief Research Officer, Dep. of Agriculture, Uganda.

5794. Oda, Miho; Takekawa, Masai. 1970. Kyôi no yasai-shoku kenko-hô [The wonderful way to health through a vegetarian diet]. Tokyo: Nihon Bungei-sha. 317 p. 19 cm. [Jap]*

5795. Shokuhin daijiten [Great Japanese encyclopedia of foods]. 1970. Tokyo. [Jap]
• ***Summary:*** Contains entries for amazake, miso, natto, shoyu, and tofu.

5796. Steinberg, Rafael. 1970. Pacific and Southeast Asian cooking. New York, NY: Time-Life Books. 208 p. Illust. (color photos). Index. 28 cm. Series: Foods of the World.
• ***Summary:*** A superb book filled with beautiful recipes, text, and color photos. Accompanied by a 128-page spiral-bound book of recipes. Bean curd [tofu] is mentioned on pages 74 (in Indonesian *gudeg*) and 172 (in Vietnamese soup).

Recipes that call for *ketjap manis* (Indonesian sweet soy sauce) are Broiled skewered marinated chicken (Saté ajam, with 2 tablespoons *ketjap manis,* p. 88) and Spiced peanut sauce (Katjang saos, with 1 tablespoon *ketjap manis,* p. 93). The actual recipe for "Ketjap manis (Indonesian sweet soy sauce)" on page 106, which makes about 1 quart, calls for: 2 cups dark brown sugar, 2 cups water, 1½ cups Japanese soy sauce, 3/4 cup dark molasses, ½ teaspoon ground *laos,* ½ teaspoon ground coriander, and ½ teaspoon freshly ground pepper.

Note: This is the earliest English-language document seen (April 2012) that uses the term "Indonesian sweet soy sauce" to refer to *ketjap manis.*

The very interesting headnote (p. 106) states: "The

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ubiquitous American tomato ketchup, or catsup, gets its name but not its ingredients from the Malayan 'kechop' (in Chinese 'ketsiap') which originally was a pickled fish brine."

Tjolo-Tjolo (Moluccas, Broiled fish and vegetables with 3 sauces). "To prepare the ketjap sauce, mix ½ cup *ketjap manis* and 1 tablespoon of fresh lime juice in a serving bowl" (p. 107).

5797. Stobart, Tom. 1970. The International Wine and Food Society's guide to herbs, spices and flavourings. New York, NY: McGraw-Hill. 261 p. Illust. (part color). Index. 26 cm.
• ***Summary:*** For a book published in 1970, this book contains a great deal of original and useful information. Note that the word "seasoning(s)" does not appear in the title or the index. For many entries, the equivalent word in various European languages is given. In addition, for plants, the botanical name and family are usually given. Contents: Black and white illustrations. Colour plates. Introduction: The history of flavourings, the importance of flavourings, the origin of this book ("I come to this subject as a traveller who has lived in a number of different countries"), the scientific basis of flavouring, scientific, popular and foreign names, synthetic and harmful flavourings, flavouring in practice, growing herbs. An alphabet of herbs, spices and flavourings (The entries are in alphabetic order). Appendix.

Soy related entries: Harvey's sauce: "One of the old English sauces... In 1870, the courts decided there was no exclusive commercial right to the name 'Harvey's Sauce', as there are recipes for it dating back to at least the 17th century.

"Though there are many formulae, it is, in general, based on walnut and mushroom ketchup–flavoured with anchovy, garlic, and often soy sauce and vinegar. It has the appearance of Worcestershire sauce, but is not hot although it does contain some chilli."

Soy [sauce]–Soya bean: "The soy bean is undoubtedly the world's most important legume." It can be eaten as a fresh bean [green vegetable soybeans], as a dried bean and as soybean flour. It is a leading source of cooking oil "much used as a substitute for olive oil in Spain." From it one can make a kind of milk [soymilk]. "In the East [East Asia], it is also fermented to make various kinds of curd and bean cheese. The soy product which concerns us is soy sauce."

It originated in China and "is thought to have been brought from China to Japan by a Buddhist priest about A.D. 500. In the West it became well known during the nineteenth century. It is one of the ingredients of Worcestershire sauce and Harvey's sauce."

Worcestershire sauce (p. 236-37): See also the original 1970 ed. published in England.

Also discusses: Ketchup, M.S.G., oil ("The word 'oil' is derived from 'olive'"), sesame (incl. tahina. "The pure oil is almost without taste or smell and does not easily go rancid in hot countries, which is one reason for its popularity").

Address: England.

5798. Tokyo-to Irimame Rakkasei Shokogyo Kyodo Kumiai. ed. 1970. Warera no ayumi [Progress / history of the Japanese Soynut and Peanut Association]. Tokyo: TIRSKK. 196 p. Illust. 22 cm. [3 ref. Jap]
• ***Summary:*** Contains a history of *Setsubun* (lunar Japanese New Year) and *mamé-maki* (scattering roasted soybeans), p. 40-41.

Contents: Photos of successive boards of directors. Photos of present board of directors, supervisors and secretaries. Greeting at this publishing. About this 100 year history book publishing. For this publishing. Origin of roasted beans and the sudden rise of the roasted bean industry. History of the roasted bean industry and looking back. Changes in the peanuts of Chiba prefecture. The dissemination of peanuts. Classifications and varieties of peanuts. The yearly conditions of supply and demand of peanuts. The amount of peanuts imported annually. The monthly consumption of peanuts, how much money is spent on peanuts per family and the average price. The yearly conditions of domestic peanut productions, 1905-1967. Our footsteps (chronology). Table of the changing prices of brown rice over time. Setsubun and Mame-maki: A History of Setsubun. Hinamatsuri (in March) and Hina-arare. List of union members. Address: Tokyo, Japan.

5799. *Census of manufacturers. Norinsho, Research and Statistics Dept.* 1970--. Serial/periodical. Norinsho, Kasumigaseki 1-2-1, Chiyoda-ku, Tokyo 100, Japan. Annual. *
Address: Ministry of International Trade and Industry.

5800. Kikkoman. 1970? Kikkoman: All purpose sauce. Delicious with meats, salad, fish & vegetables (Brochure). Tokyo: Kikkoman Shoyu Co. 12 p. Undated. 18 x 18 cm. [Eng]
• ***Summary:*** On the front cover is a color photo of a man in a green shirt barbecuing food on the grill of a raised barbecue. His son is facing him; his wife and daughter are in the background on a green lawn.

Contents (on unnumbered pages). History of shoyu– and of Kikkoman. Kikkoman (overview). Research and development. Chronological table. Chart of soy sauce brewing. Map of Japan, showing Kikkoman's plants and offices. Map showing location of Kikkoman's Noda and Nagareyama plants north of Tokyo, with railway lines and roads. Map showing location of Kikkoman's Kansai plant (Takasago plant at Kakogawa) west of Osaka and Kobe with railway lines and roads. Kikkoman Shoyu Co., Ltd. incl. Capital (¥3,600 million). Yearly output of soy sauce (100 million U.S. gallons). Commercial products: Soy sauce, Teriyaki Barbecue Marinade, Worcestershire Sauce, Memmi (soup base for noodles), Rice Wine (Sake & Mirin,

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etc.). Offices. Had office: Noda City, Chiba Prefecture. International Operations Department: 11, 3-chome, Koami-cho, Nihonbashi, Chuo-ku, Tokyo 103, Japan. Phone: 669-1111. Top management team: President: Keizaburo Mogi, etc. Kikkoman family of companies.

Illustrations show: Traditional soy sauce brewing (black and blue). Kikkoman plant No. 7. Kikkoman Kansai plant.

Photos show: (1) "Kikkoman's Central Research Institute, where all kinds of fermentation studies are conducted" (black and white). (2) "The Royal Brewing Plant [*Goyo Gura*] makes shoyu for the exclusive use of Japan's Imperial Household." (3) Three steps in the chart of soy sauce brewing.

Chronological table: "1560–Shoyu brewery started at Noda.

"1661–Takanashi and Mogi families constructed shoyu breweries and start brewing of shoyu.

"1782–Brand name of Kikkoman established.

"1838–Kikkoman Brand Shoyu designated as the shoyu to be supplied to the Tokugawa Shogunate.

"1885–Kikkoman Brand registered as a trade mark.

"1886–Kikkoman Brand trade mark registered in Germany.

"1906–Kikkoman Brand registered in the U.S.

"1908–Kikkoman designated as purveyors to the Imperial Household.

"1917–Eight Mogi and Takanashi families amalgamated and established the Noda Shoyu Co., Ltd. Capital increased to ¥7 million.

"1926–The modern brewing plant Kikkoman plant No. 7 built.

"1929–The largest plant, the Kansai [Kobe-Osaka area] plant, completed.

"1930 Kikkoman bottle plant built.

"1936–Kikkoman Worcestershire sauce plant completed.

"1939–Government controlled price of soy sauce when World War II starts.

"1945–Capital increased to ¥30 million.

"1946–Stocks opened to the public.

"1948–Capital increased to ¥80 million.

"1949–Export of soy sauce reopened [after it stopped during World War II].

"1950 Control over soy sauce released [discontinued] and free competition started.

"1950–Capital increased to ¥200 million.

"1952–Capital increased to ¥400 million.

"1957–Kikkoman International Inc., established in San Francisco.

"1958–Capital increased to ¥1,200 million.

"1961–Capital increased to ¥1,800 million.

"1964–Capital increased to ¥2,700 million." Address: Kikkoman, Tokyo, Japan.

5801. **Product Name:** Hama-Natto Savory Miso Beans.
Manufacturer's Name: Mitoku Co. Ltd. (Distributor). Made in Japan.
Manufacturer's Address: C.P.O. Box 780, Tokyo 100-91, Japan. Phone: 33-201-6701.
Date of Introduction: 1970?
Ingredients: Naturally fermented soybeans, ginger, sea salt.
Wt/Vol., Packaging, Price: 5.3 oz (150 gm) plastic bag.
How Stored: Shelf stable.
New Product–Documentation: Product with Label purchased from Health Flavors (distributor), Brewster, New York. 2000. Nov. 10. The self-adhesive Mitoku label (orange, brown, and beige) is affixed over the printed label of the manufacturer: Marunishi, Hoi-gun, Aichi-ken, Japan. The label states: "An authentic taste of traditional Japan. Mitoku Savory Miso Beans are a traditional Japanese fermented soyfood. First prepared by Zen priests in the 15th century as part of their vegetarian cuisine, they are still handmade in the same, completely natural way, and are even now prized for their delicious gourmet flavor and rich, heavy aroma.

"Savory Miso Beans can be eaten as they are, as tasty hors d'oeuvre with tea, beer or natural saké. They are also used as a condiment, like Tekka, on brown rice, vegetables or noodles. Mixed with grated radish (daikon) and seasoned to taste with Sanbai-Su Three Taste Dressing, they make a traditional side-dish that's both delicious and full of goodness."

Talk with Jan Belleme, Mitoku's representative in the USA. 2000. Nov. 21. This product has been available since about 1970.

5802. **Product Name:** Authentic Snow-Dried Tofu.
Manufacturer's Name: Mitoku Co. Ltd. (Distributor). Made in Japan.
Manufacturer's Address: C.P.O. Box 780, Tokyo 100-91, Japan. Phone: 33-201-6701.
Date of Introduction: 1970?
Ingredients: Tofu (soybeans, water and nigari–a natural coagulant extracted from sea water).
Wt/Vol., Packaging, Price: 2.45 oz (70 gm) plastic bag.
How Stored: Shelf stable.
New Product–Documentation: Product with Label purchased from Health Flavors (distributor), Brewster, New York. 2000. Nov. 10. 5½ by 9 inches plastic bag. Orange, gold, black, white, and red. "Mitoku macrobiotic Snow-Dried Tofu is hand-crafted in the snowy highlands of central Japan by one of the few hearty families who still use the traditional methods. The result is an all natural, delicious and concentrated convenience food that stores well and readily absorbs flavors."

Talk with Jan Belleme, Mitoku's representative in the USA. 2000. Nov. 21. This product has been available since about 1970.

5803. **Product Name:** [Tsuru Habutae Frozen Tofu].

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Foreign Name: Tsuru Habutae Kôri-dôfu.
Manufacturer's Name: Tokiwa Reito Shokuhin.
Manufacturer's Address: Ina 5057, Ina-shi 396, Nagano-ken, Japan.
Date of Introduction: 1970?

5804. Carberry, James F. 1971. Our daily bread: Food faddism spurts as young, old people shift to organic diets. Concern on pesticides cited, but some see deception by quacks claiming cures. Yin and yang ice cream. *Wall Street Journal.* Jan. 21. p. 1, 12.
• ***Summary:*** Written from Hollywood, California, this article reports that "food faddism has been particularly prevalent lately." Kahan & Lessin Co., one of the nation's biggest distributors of organic foods, reports that its sales have doubled to $12 million a year from $6 million in 1968. New Age Foods of San Francisco [owned by Fred Rohé] recently opened a branch store in suburban Palo Alto, where it expects to gross $1 million during its first year.

"Health and organic food advocates say the popularity of such items–as well as the more conventional products grown under 'natural' conditions–reflects the growing public concern over pesticide poisoning and the publicity over the dangers of food additives, preservatives, and substitutes like cyclamates."

Richard Hansen is a sociologist at the University of California at Davis; he is researching the organic food movement.

"New insights into universe: Bruce MacDonald [sic Macdonald], president of Erewhon Trading Co., a Boston and Los Angeles concern that specializes in such exotic foods as hacho miso (a soybean paste), says that organic foods appeal to many dropouts from the drug culture. 'It's not just that the body's malnourished from being on drugs a long time,' he says. 'It's also that organic foods can give a person new insights into the order of the universe."

Warren Stagg, the bearded proprietor of H.E.L.P., a popular vegetarian restaurant, believes in the mystical, spiritual value of certain foods. A vegetarian diet can help elevate a person to a higher level of consciousness and bring him into harmony with the order of the universe, he says. Since 75% of H.E.L.P.'s clientele are nonvegetarians, the "restaurant offers some meat substitutes such as 'beef' stroganoff made from vegetable protein, mushrooms, scallions, bell peppers and sour cream sauce, and a 'vegeburger' sandwich that's also made from vegetable protein. Other dishes on its menu include braised tofu (soybean cake) with brown rice and a salad of cottage cheese, alfalfa sprouts, sunflower seeds, grated carrots, scallions, figs and apricots."

Note 1. This is the earliest English-language document seen (April 2013) that uses the term "braised tofu" to refer to grilled tofu.

"A group of young people following a macrobiotic diet live in an old Victorian mansion above Hollywood's Sunset Strip. They are students of the late Georges Ohsawa, a Japanese philosopher who taught about the delicate balance between yin and yang; they eat ascetic meals that include pressure-cooked brown rice and seaweed soup. There have recently been well-publicized cases of the deaths or severe illnesses of a few young people subsisting on only brown rice, the extreme form of the macrobiotic diet.

"Another famous food-faddist helped found a huge business in breakfast cereals. He was John Harvey Kellogg..." according to Ronald Deutsch, author of a history of food fads called "The Nuts Among the Berries." Deutsch then tells his inaccurate version of how Mr. [sic, Dr.] Kellogg got into the cereal business.

"One man who spends a great deal of time pooh-pooing various nutritional eccentricities is Dr. Fred Stare, chairman of the department of nutrition at Harvard University's School of Public Health." Dr. Stare discusses his pet peeves.

Note 2. Bruce Macdonald recalls (April 1992): "In early 1971 *The Wall Street Journal* ran a front-page feature story on the emerging new natural foods industry. A person from Merrill-Lynch came in and said, 'We could package this business and raise millions for you.'"

Advest Co. 1972. Dec. "A recent *Wall Street Journal* article named this industry as one of the ten highest growth industries for the 1970s." Address: Staff Reporter.

5805. Imahara, Hirotsugu; Iwai, M.; Nakahama, T. 1971. Shôyu no sanmaku-sei kôbo ni kansuru kenkyû. IX. [Studies on the pellicle-producing soy yeast. IX. Relationship between the physico-chemical properties and pellicle formation of yeast]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 49(1):8-15. Jan. [24 ref. Jap; eng]
• ***Summary:*** A pellicle or film is formed on the surface of soy sauce by various strains of *Zygosaccharomyces* yeast. The pellicle-forming yeast generally caused less sedimentation and a smaller specific gravity that non-pellicle-forming yeast. A strong negative charge was found on the surface of the non-pellicle-forming yeast and it was found to be lyophilic.

Note: *Webster's Dictionary* defines lyopilic (an adjective first used in about 1911) as "marked by a strong affinity between a dispersed phase and the liquid in which it is dispersed." e.g. "A lyophilic colloid." Address: Faculty of Agriculture, Kyoto Prefectural Univ., Sakyo-ku, Kyoto, Japan.

5806. *Soybean Digest.* 1971. One woman and the bean [Mrs. Clarence Y. Shimamura of Honolulu]. Jan. p. 50.
• ***Summary:*** "Mrs. Clarence Y. Shimamura of Honolulu has contributed to the welfare of many people.

"During the war when there was a meat shortage, Mrs. Shimamura, home economist for the Honolulu Gas Co., began a search into her past for soybean food recipes. 'I was brought up on soybean products,' she says. There

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followed many demonstrations, cooking schools, and special luncheons for the purpose of introducing soybean food dishes as meat substitutes and for their nutritious value.

"A grandmother who is writing a book of her experiences and work with soybeans, she continues to present television programs on every-day dishes containing soybeans. She visits the homes for elderly orientals to find more old recipes. She uses soy flour as well as the traditional Japanese-Chinese soy foods such as soy sauce, tofu, bean paste, and natto. Mrs. Shimamura is particularly excited by the new soy protein analogs."

Mrs. Shimamura raises her own bean sprouts and uses them in many recipes besides chop suey. She likes them in "green tossed salad, sauteed, flavored with soy sauce and mixed with chopped green onions as a vegetable dish or parboiled (when fresh) and added to egg omelet as well as to soup and stews."

While her husband was earning his law degree at Cambridge University, Massachusetts, "she became acquainted with Boston Baked Beans. She found them delicious and after returning to Hawaii experimented with soybeans until she produced the soybean Boston style recipe for which she is now so well known. Recipes are given for: Steamed Hawaiian brown bread (with "1 c. soybean flour"). Soybeans Boston style (with "2½ c. soybeans").

A photo shows Mrs. Shimamura with her soybeans Boston-style.

5807. Loring, Kay. 1971. Japanese restaurants–Tea rooms to sushi bars. *Chicago Tribune.* Feb. 7. p. F5.
• ***Summary:*** "The traditional sushi bar was introduced to Chicago by Kamehachi Sushi, 1617 N. Wells St., in Old Town." Particularly tasty in the writer's opinion is "inari-zuchi [sic, inari-zushi], soy bean pockets filled with slightly sweetened [and mildly vinegared] rice."

5808. Conversation with Farmer City Grain (Interview). 1971. Conducted by Dr. Walter Wolf of NRRL, Peoria, Illinois 61604, Feb. 22. 1 p. handwritten transcript.
• ***Summary:*** Mr. Louis West was out of town for 2-3 weeks. The person Dr. Wolf talked to said that Hawkeye and Kanrich are the major varieties used. M-I sold by Mico is Kanrich. Hawkeye acreage is decreasing and Beeson usage is increasing to supply soybeans to take the place of Hawkeye variety.

Magma, Prize and Kanrich are being used for miso [in Japan] while Hawkeye and Beeson are converted into tofu.

5809. Ebine, Hideo; Miyairi, Masao. 1971. Eiyô kyôka miso no kenkyû. VIII. Tetsu no kyôka no kokoromi [Studies on enriched miso. VIII. Trial to enrich miso with iron]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 26. p. 141-44. Feb. Reprinted from Miso no Kagaku to Gijutsu. No. 193. p. 28-30 (1970). [2 ref. Jap; eng]
• ***Summary:*** Commercial miso was found to contain 2.94 ± 0.36 mg per 100 gm at the 5% level of error. This value is very low compared with the 5.95 ± 1.15 mg per 100 gm obtained in 1955. When ferric citrate was used to enrich the iron content of miso, the addition of 1 mg of iron to 100 gm of miso gave satisfactory results, but 2.5 mg of iron gave an unfavorable effect on both the color and flavor. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5810. Horan, F.E.; Odell, A.D.; Forman, M.J. 1971. Textured vegetable proteins. *PAG Bulletin* (*Protein Advisory Group, WHO / FAO / UNICEF*) 2(1):22-26. Winter. No. 13.
• ***Summary:*** This paper was compiled from background documents presented by the authors at the 18th PAG [Protein Advisory Group] meeting held on 9-12 Feb. 1971 at Rome, Italy. Contents: Introduction. Spun monofilament products. Extrusion-expansion products (currently marketed at about $0.45/lb). General considerations. Case studies: Thailand (ADM's TVP), Brazil (Swift & Co.'s textured meat analogs), India (Swift & Co., ditto). Textured vegetable protein products: Fibroprotein–Spun Protein Fibers (Worthington Foods Div., Ohio), Textured Edi-Pro (Ralston Purina Co., Missouri), Texgran (Swift & Co., Illinois), Bontrae (General Mills, Minnesota; spun vegetable protein products), Carne Vegetal (Industria e Comercio de Productos Alimenticios Vegetal Ltd., Brazil). LiveLong–VP (Nisshin Flour Milling Co. Ltd., Japan; a wheat gluten extract in the form of a dried or frozen mincemeat-like product. "It seems to be made by a filament extrusion process using isolated wheat gluten protein"). The Farmarco Co. (Far-Mar Co., Kansas), The Fuji Oil Co. (Japan; thermoplastic extrusion), and Shefa Protein Foods Ltd. (Israel) each manufactures texturized soy food products by thermoplastic extrusion.

Introduction: "The chief virtue of the individual members of this new class of foods rests in their ability to supply precisely reproducible balanced dietary inputs of essential amino acids with greatly enhanced agronomic efficiency and with high consumer acceptance... At the moment two broad classes of meat analogues are apparent. The extrusion–expansion products sell for US 10-15¢ per pound; the spun monofilament products sell at present in the USA for 20-25% less than meats, but are still too expensive to be of interest for developing countries."

"General considerations: Meat analogs do not appear to have a negative connotation to vegetarians; there are many examples of eager acceptance of meat analogs by such groups. The textured protein approach is also a stride forward in food efficiency, since conversion of soy to animal protein averages about 7% efficiency."

"Over the past few years US/AID has entered into contracts with twelve different U.S. commercial companies to investigate and evaluate low-cost proprietary protein

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products in some ten developing countries."

Note: This is the earliest English-language document seen (Dec. 2004) that uses the word "Fibroprotein" to refer to edible spun soy protein fiber. Address: 1. ADM, Decatur, Illinois; 2. General Mills, Minneapolis, Minnesota.

5811. Ito, Hiroshi; Ebine, Hideo. 1971. Miso no kôki seibun no kenkyû. III. Arukooru rui to saikuramin san no dôtei hôhô [Studies on the flavor components of miso. III. Detection of alcohols and cyclamic acid as nitrite ester]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 26. p. 128-34. Feb. Reprinted from Miso no Kagaku to Gijutsu. No. 194. p. 14-20 (1970). [4 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5812. Ito, Hiroshi; Ebine, Hideo. 1971. Miso no kôki seibun no kenkyû. II. Fukureta miso no kihatsusei seibun [Studies on the flavor components of miso. II. Volatile substances in swollen miso packages]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 26. p. 123-27. Feb. Reprinted from Miso no Kagaku to Gijutsu. No. 191. p. 25-29 (1970). [5 ref. Jap; eng]
• ***Summary:*** "The composition of gases in a polyethylene bag in which miso swelled by the action of microorganisms during storage was examined by gas chromatography. Carbon dioxide was the major component and nitrogen and oxygen were also detected. Acetaldehyde, ethyl formate, ethyl acetate, ethanol, butyl acetate, amyl acetate, *iso*-amyl acetates, *iso*-amyl alcohol and ethyl lactate were detected. The amounts of ethanol and acetaldehyde increased remarkably when the swelling proceeded in the polyethylene bag." Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5813. Ito, Hiroshi; Ebine, Hideo. 1971. Miso no kôki seibun no kenkyû. I. Heddo gasu ni yoru kenshitsu [Studies on the flavor components of miso. I. Detection of flavor in the head space]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 26. p. 119-22. Feb. Reprinted from Miso no Kagaku to Gijutsu. No. 191. p. 22-24 (1970). [12 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5814. Ito, Hiroshi; Ebine, Hideo. 1971. Miso no kôki seibun no kenkyû. IV. Kaku shu miso no kihatsusei kôki seibun [Studies on the flavor components of miso. IV. Flavor substances in different varieties of commercial miso]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 26. p. 135-40. Feb. Reprinted from Miso no Kagaku to Gijutsu. No. 198. p. 19-24 (1970). [5 ref. Jap; eng]
Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5815. Murata, Kiku; Ikehata, H.; Edani, Y.; Koyanagi, K. 1971. Studies on the nutritional value of tempeh. II. Rat feeding test with tempeh, unfermented soybeans, and tempeh supplemented with amino acids. *Agricultural and Biological Chemistry* 35(2):233-41. Feb. [13 ref]
• ***Summary:*** In a rat feeding experiment, it was observed that the PER value of tempeh (fresh or stored) was not significantly different from that of the unfermented soybeans (fresh or stored). However the peroxide value of the oil of stored tempeh was only 10% of that of stored soybean powder [soy flour].

"Substitution of whole egg for tempeh to supply 30% of protein in the diet improved the quality of the protein as measured by the protein efficiency ratio. An equal improvement was accomplished by supplementation of tempeh with lysine, methionine, and threonine in such amounts as the level of these amino acids equal to that in the tempeh-egg diet." Address: Food and Nutrition Lab., Faculty of Science of Living, Osaka City Univ., Sumiyoshi-ku, Osaka, Japan.

5816. Saio, Kyoko; Kamiya, M.; Watanabe, T. 1971. Tôfu no bussei ni kansuru ikkôsatsu [Statistical observations on the physical properties of tofu]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 26. p. 193-96. Feb. Reprinted from Nippon Shokuhin Kogyo Gakkaishi 17(5):207-10 (1970). [4 ref. Jap; eng]
Address: 1&3. Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan; 2. Japan Protein Industry Co., Ltd., Kodaira, Tokyo.

5817. Taira, Harue; Koyanagi, Tatsuo; Takanohashi, Teru; Oikawa, Keiko. 1971. Daizu kakôhin no amino-san ni kansuru kenkyû. XI. [Studies on amino acid contents of processed soybean. XI. Evaluation of nutritional loses of overheated defatted soybean flour]. *Shokuryo Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 26. p. 181-92. Feb. [29 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 33(10):1387-98 (1969). Address: 1. Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan; 2. Lab. of Nutrition, Faculty of Agriculture, Tohoku Univ., Sendai; 4. Dep. of Home Economics, Iwate Univ., Morioka.

5818. Claiborne, Craig. 1971. To cook Japanese style, it helps if you have obliging butcher. *New York Times.* March 4. p. 41.
• ***Summary:*** Ayako Wakita, a slender young woman, is the wife of Aijiro Wakita, a Japanese painter and sculptor. They live in a Manhattan apartment in New York City where, she remarks, "in season" foods are not as widely available as

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in Japan. She cooks Japanese style twice a week when they entertain friends. Her recipe for Yosenabe calls for "6 or 8 one-and-one-half-inch cubes bean curd (tofu)." A photo shows beautiful Ayako as she arranges dishes on the family table.

5819. Shinoda, Osamu. 1971. Doufu kao [Thoughts / treatise on tofu]. *Ta-lu Tsa-chih* (*The Continent Magazine, Taiwan*) 42:172-78. (Also numbered p. 8-14). March 31. [12 ref. Chi; eng]

• ***Summary:*** A Chinese-language publication apparently similar in content to his 1968 Japanese-language publication by the same title.

A summary, translated into English by Ernst Wolff for Theodore Hymowitz in Jan. 1972, states: The word "tofu" first appeared in the Chinese document *Ching Yi Loo* (Pinyin: Qing Yi Lü) by Tao Goo (Tao Gu) in the early Sung Dynasty (960-1126 A.D.), although the Japanese believed that tofu technology was invented by Prince Liu An of Huai-Nan around 200 B.C. in China. Shinoda believes that the technology for making tofu was adapted from that of cheese making introduced to China by nomadic people, the so-called "Hoo." They migrated from the north into China during the period from the Six Dynasties (222-589 A.D.) to the T'ang dynasty (618-907 A.D.), in the time just before the Sung dynasty. Tofu was first a popular food among the middle and lower classes during the Sung dynasty. Then it also became part of the diet of the upper class, and was even served to the emperor and royal family during the Ming dynasty (1368-1662). Tofu was introduced to Japan by vegetarian Buddhist monks around the 12th century. On page 12 is an extremely interesting list of the 12 earliest documents (1238-1534), which Shinoda has been able to find, that mention tofu under various names. For each is given the title, the date it appeared, and the name used for tofu or the food in which it appeared. For details, see Shinoda 1968 (in *Fuzoku*).

Terms which are romanized or appear in English in this document include: Cheese, butter, yoghurt, casein, khorot, Suridofu, Hikizuri-dofu, Tofu-zu, Mori, Dengaku, tofu, Oden, Shirakabe, Mura Dengaku, Sakai, Okabe, Antofu, Ganmodoki, bean curd. A romanized Japanese verse reads:

Harusato wa Kabe no Tatoe ni Naradofu, Shiroki wa Tsuki no somuke zari keri.

Koisureba kurushikarikeri Udzidofu, Mamehito no Na o ikadetoramashi.

Note: According to Abe (1974, p. 99) this is one of Japan's earliest references to tofu; it is a waka-style poem that comes from a work titled either *Shichijû-ichiban Shokunin-zukushi Uta Awase* or *Nanajû Ichiban Shokunin Jin Utaawase* and appears in the section of poems about sômen noodle sellers. Address: Japan.

5820. Anderson, Earl V. 1971. The new priorities. Food: Preventing hunger and malnutrition. *Chemical and Engineering News* 49(10):19-22. March.

• ***Summary:*** This special report looks at new opportunites for chemists and chemical engineers in three areas: food, shelter, and health. Technology can help in solving the problems of world hunger and malnutrition. FAO "estimates that 2 billion people are hungry or undernourished, including several million Americans." USDA's Aaron M. Altschul believes that food technology, properly directed, can help solve these problems. In addition to the Green Revolution, there has been "the other Silent Revolution of this century,"... the explosive growth in our knowledge of foods and nutrition, and in the ability to engineer foods.

The emphasis has been on protein foods "because protein deficiency is the most universal nutritional problem... Of the 82 million tons consumed in the world, only 25 tons [31%] come from animal sources." Most of the animal protein is consumed by the 1 billion people in developed countries.

Protein deficiencies can be overcome by fortifying grains or natural protein concentrates–as from soybeans–with amino acids such as lysine. Or we can use new techniques for converting "inexpensive vegetable proteins into textured foods that look and taste much like the more expensive animal foods. Products have been made from vegetable protein that closely resemble beef, chicken, seafood, ham, and bacon. They cost less than the real thing yet they are nutritious and attractive. Such products from textured soy already are being widely marketed in the U.S., western Europe, and Japan. In time they may become new protein sources in the less-developed countries.

"In fact, AID now is sponsoring studies of textured products in less developed countries. Archer-Daniels-Midland is conducting one in Thailand and General Mills in Pakistan."

But what should we call these new products? You can't call it meat because it isn't. "You can call it soybeans because nobody would buy it. These products have been called animal protein food analogs... But that's not a marketable name either. The name that industry and the Government seem to be settling on is textured protein products (TPP)." The FDA has proposed a standard for TPP.

"Vitasoy, a soybean soft drink that has been sold in Hong Kong for 25 years, has captured 25% of the soft drink market there." Based on that success, "Monsanto is marketing a soy protein beverage called Puma through a franchiser in Guyana. It is now the second most popular soft drink in the country (Coke is first). Coca Cola, meanwhile, is marketing a fruit-flavored beverage, Samson, in Dutch Guiana (Surinam).

"So far, soybeans are the major source of vegetable proteins used in food fortification and TPP products."

Also discusses: Cottonseed protein, proteins from peanuts, sunflower, and safflower seeds, fish protein concentrate (FPC), and single-cell protein from petroleum,

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computer controlled food processing lines, etc.

Photos show: (1) A line spinning soy protein fibers in a liquid bath, tended by a man in a white hard hat. (2) A black boy drinking Puma in Guyana. (3) "British Petroleum's protein-from-petroleum plant at Grangemouth, Scotland." It produces 4,000 tons/year of animal-grade protein by fermentation of Candida yeasts on a petroleum substrate. Address: Senior Editor, New York City.

5821. Fujimaki, Masao; Kato, H.; Arai, S.; Yamashita, M. 1971. Application of microbial proteases to soybean and other materials to improve acceptability, especially through the formation of plastein. *J. of Applied Bacteriology* 34(1):119-31. March. [26 ref]
• ***Summary:*** The authors attempted to remove the bitter taste and beany flavor of soybeans by liberation of bound odorants by proteolytic enzymes (especially microbial proteases, i.e. hydrolysis with endo-peptidase), and by using the plastein reaction. Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Tokyo, Japan.

5822. Koshiyama, I. 1971. Some aspects of subunit structure of a 7S protein in soybean globulins. *Agricultural and Biological Chemistry* 35(3):385-92. March. [15 ref] Address: Noda Inst. for Scientific Research, Noda-shi, Chiba-ken, Japan.

5823. Meals for Millions Foundation. 1971. Annual report 1970. Santa Monica, California: MFM Foundation. 15 p. 25 x 19 cm.
• ***Summary:*** Submitted by I.F. Saunders, Executive Director. The report is printed with dark brown ink on beige paper. Contents: Introduction. Board of Directors and committees (Chairman is Morris Asimow, PhD, Prof. of Engineering, UCLA; President is Russell Z. Eller). Club activities, by Mrs. Mary Flint–Director (Successful involvement with Walks for Development). Program report, by Donald Ebright, PhD, program director: 1. Programs with production facilities (Korea High Protein Food, Inc. at Chunchon [Chun Chon]) began making protein-rich MPF in June, 1970. Director is Yong Soo Pyun, "ably assisted by Mark Sterner, former production chief for Meals for Millions in Santa Monica, California." The plant has a capacity of making 40 tons per day of MPF. Ecuador will start producing MPF in 1971. 2. Independent production facilities, making MPF in India, Mexico, and Japan. Plans in South Vietnam and Pakistan. 3. Domestic feeding programs with MPF enriching and packaging. 4. Feeding programs with nutritional education (Brazil, Mexico). 5. Disasters aided in 1970 with relief shipments (Biafra / Nigeria, The Congo, Peru). U.S. programs, by Helene Carey, director. Regional headquarters (western region, mid-west area, south-west area). Research and development, by Lawrence Lipman, director. Training school, by Eva-Maria Kadiev. Public relations, by Adine Lough, Director.

MFM's logo shows two hands gripping the handle of a horizontal spoon, with its mouth to the right facing upward–in white on a dark background.

Photos show: (1) Aerial view of the large, impressive plant in Chunchon, Korea. (2) The R&D team.

Note: No financial information is given, nor information on shipments of MPF for the year. Address: 1800 Olympic Boulevard (P.O. Box 1666), Santa Monica, California 90406. Phone: 870-0451.

5824. Okuhara, Akira; Saito, N.; Yokotsuka, T. 1971. Color of soy sauce. VI. The effect of peptides on browning. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 49(3):272-87. March. [10 ref. Eng]
• ***Summary:*** The browning of soy sauce is much faster than that of solutions containing only sugars and amino acids. In soy sauce, a small amount of amino acids is consumed during browning.

Peptides are among the most important components promoting the browning of soy sauce, and some part of the browning of other fermented products is also caused by peptides. Address: Central Research Inst., Kikkoman Shoyu Co. Ltd., 399 Noda, Chiba prefecture, Japan.

5825. *Soybean Digest.* 1971. Y. Sakaguchi and Scott Sawyers in Tokyo (photo caption). March. p. 17.
• ***Summary:*** A small photo; the caption reads: "Y. Sakaguchi, president of Nisshin Oil Mills and the Japan Oilseed Processors Assn., and Scott Sawyers [ASA-Japan] shake hands after launching a 12-month vegetable oil promotion campaign in Japan. The occasion was the signing of the ASA-JOPA contract agreement for 1971. The year's joint activity of the two groups will include teaching new recipes using vegetable oil at cooking schools, advertisements in leading women's magazines, and events such as an International Salad Festival."

5826. Watanabe, Tokuji. 1971. [Process for production of packed tofu]. *Japanese Patent* 602654. April 12. [Jap]* Address: National Food Research Inst., Tokyo.

5827. Watanabe, Tokuji. 1971. [Process for production of kinugoshi tofu (soft, pudding type)]. *Japanese Patent* 602655. April 12. [Jap]*
Address: National Food Research Inst., Tokyo.

5828. Hashizume, Kazumoto; Kakiuchi, K.; Koyama, E.; Watanabe, T. 1971. Denaturation of soybean protein by freezing. Part I. *Agricultural and Biological Chemistry* 35(4):449-59. April. [14 ref]
• ***Summary:*** Role of S-S bond in denaturation. Address: 1&4. Food Research Inst., Ministry of Agriculture and Forestry; 2. Inst. for Protein Research, Osaka Univ.; 3. Japan

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Kori-tofu Assoc.

5829. Jose, Hirokazu; Sugimori, Tsunetake. 1971. [Studies on halotolerant lactic acid bacteria relating to soy sauce brewing. II. Effect of L-proline on halotolerance of *Tetracoccus* No. 100]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 49(4):302-12. April. [12 ref. Jap; eng]
• ***Summary:*** *Tetracoccus* No. 100 is a halotolerant lactic acid bacterium isolated from both soy koji and soy mash [moromi]. L-proline facilitates its halotolerance. Address: Kyoto Research Laboratories, Marukin Shoyu Co., Ltd., Uji, Kyoto, Japan.

5830. Mogi, Saheiji. 1971. International marketing of an oriental product: Overseas marketing of Japanese soy sauce. *Asian Productivity Organization. Translation Series* No. 23. 16 p. April. (Tokyo). First published in Japanese in the Japan Marketing Association's magazine Marketing News, No. 136. Nov. 1969. [Eng]
Address: Managing Director, International Operations, Kikkoman Shoyu Co., Ltd., Japan.

5831. Sugimoto, H.; Van Buren, J.P. 1971. Evaluations of monosaccharides, disaccharides and corn syrups as dispersants for heat-processed dried soy milk proteins. *J. of Food Science* 36(2):346-48. March/April. [11 ref]
• ***Summary:*** Addition of some of these substances to heat-treated soy milk before drying improved redispersibility of resultant dried products. Address: New York State Agric. Exp. Station, Cornell Univ., Geneva, New York 14456. Sugimoto is presently with Kikkoman, at Noda, Japan.

5832. Kosuge, Takuo; Zenda, Hiroshi; Tsuji, Kunio; Yamamoto, Takeshi; Narita, Hiroko. 1971. Studies on flavor components of foodstuffs. I. Distribution of tetramethylpyrazine in fermented foodstuffs. *Agricultural and Biological Chemistry* 35(5):693-96. May. [17 ref]
• ***Summary:*** Tetramethylpyrazine (T.M.P.) was detected in many Japanese fermented foodstuffs, especially miso (29 mcg/kg), natto (22), and soy sauce (4). Moreover, the amount of T.M.P. in miso increased almost tenfold (from 29 to 265 mcg/kg) after storage for 1 year. This fact indicates that T.M.P. may play an important part in the flavor of these fermented foods. Roasted foods, such as coffee, cocoa, and peanuts, are a rich source of alkylpyrazines. Address: Shizuoka College of Pharmacy, Shizuoka, Japan.

5833. Yamagata, Kei; Fujita, Tokio. 1971. [Studies on yeasts isolated from saké-cake pickles and soy-mash. II. Salt tolerance and cellular characteristics of Torulopsis yeasts]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 49(5):385-89. May. [4 ref. Jap; eng]
Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Kinki Univ., Osaka, Japan.

5834. *Foreign Agriculture.* 1971. Japanese imports of U.S. soybeans peak at 2.9 million tons in 1970. June 7. p. 5.
• ***Summary:*** Contents: Introduction. Soybean imports. Rapeseed imports. Peanut imports. Soybean production. Rapeseed production. Peanut production.

Soybean production in Japan has dropped steadily for several years, from 135,700 metric tons in 1969 to 126,000 tons in 1970 (down 7%).

"The [Japanese] Government–in order to encourage diversion of riceland to other crops and to promote the production of oilseeds–has proposed payment of approximately $393 per acre if soybeans, rapeseed, or other annual crops are planted on paddy fields in 1971. Certain farmers who plant soybeans cooperatively will receive approximately $450 per acre."

A photo shows 4 Americans watching a Japanese worker preparing to press moromi in a hydraulic press to make soy sauce.

5835. Sanke, Yukiko; Miyamoto, Teijiro; Murata, Kiku. 1971. Studies on the nutritional value of tempeh. IV. Biosynthesis of folate compounds with *Rhizopus oligosporus. J. of Vitaminology* (*Kyoto, Japan*) 17(2):96-100. June 10. [5 ref]
• ***Summary:*** A previous study (Murata et al. 1970) showed that active folate compounds were produced in tempeh during fermentation with *Rhizopus oligosporus.* This study was conducted to clarify whether folate activity in tempeh was formed *de novo* or released from a bound form during fermentation. The former (de novo formation) was found to be the case.

Folate compounds are related to folic acid. *Webster's Dictionary* defines folic acid (derived from the Latin folium = leaf, and first used in 1941) as "a crystalline pteroylglutamicacid ($C_{19}H_{19}N_7O_6$) that is a vitamin of the B complex and is used especially in the treatment of nutritional anemias." Address: Food and Nutrition Lab., Faculty of Science of Living, Osaka City Univ., Sumiyoshi-ku, Osaka, Japan (Post No. 558).

5836. Fujimaki, Masao; Kato, H.; Arai, S.; Yamashita, M. Assignors to the USA as represented by the Secretary of Agriculture. 1971. Enzymatic improvement of soybean flavor and stability. *U.S. Patent* 3,585,047. June 15. 3 p. Application filed 30 Oct. 1968. [1 ref]
• ***Summary:*** The bitter and beany (astringent) flavors of soybean curd [tofu] or defatted soybean flour can be greatly reduced by applying a proteolytic enzyme. For example, suspend 10 gm of soybean curd in 1,000 ml of dilute hydrochloric acid (HCl) (pH2.8) and allow it to be digested at 50ºC with 0.1 gm of commercially obtained aspergillopeptidase-A (Molsin, made by Seishin Seiyaku

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Co. of Japan), produced by *Aspergillus saitoi.* After 2 hours, stop the digestion by neutralization with sodium hydroxide (NaOH), obtain a precipitate by filtration or centrifugation, and treat it with 10 times its weight of 50% ethanol to remove the liberated beany and astringent flavors. Remove the wash liquid by filtration and lyophilize the treated curd. Address: Tokyo, Japan.

5837. Kushi, Aveline. 1971. Recipes from *The Book of Miso. East West Journal* 1(7):7.
• ***Summary:*** Contains a drawing by Aveline Kushi of a family making miso, plus five soup recipes and two miso relish recipes from her forthcoming cookbook.

Note 1. This is the earliest document seen by either Michio or Aveline Kushi.

Note 2. This is the earliest article on soy seen (Aug. 2002) in the *East West Journal.* Address: EWJ, P.O. Box 203, Prudential Center Station, Boston, Massachusetts 02199. $6.00 for 20 issues.

5838. Nasuno, Seiichi; Nakadai, Tadanobu. 1971. Formation of glutamic acid from defatted soybeans by *Aspergillus oryzae* 460. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 49(6):544-51. June. [25 ref. Eng]
• ***Summary:*** *Aspergillus oryzae* 460, a strain which was isolated from air, liberates twice as much glutamic acid from defatted soybeans as did ordinary shoyu molds. This strain never produced aflatoxins on two different special media for aflatoxin production. Amino peptidase activity was found to have a significant correlation with the formation of glutamic acid by the isolated strain and related strains of *Aspergillus* species. A mutant exhibiting about twice as much aminopeptidase activity as that of the parent strain was obtained by UV (ultraviolet) irradiation. Address: Noda Inst. for Scientific Research, Noda-shi, Japan.

5839. Ohsawa, George. 1971. Macrobiotics: An invitation to health and happiness. Edited and appended by Herman Aihara. Oroville, California: George Ohsawa Macrobiotic Foundation. 95 p. Illust. 21 cm.
• ***Summary:*** Contents: Introduction. What is happiness? Judgment and health. Seven conditions of health. Foods for health and happiness. How to eat. Macrobiotic external treatment.

Appendixes (by Herman Aihara). A. History of macrobiotics. B. Warning of Diet No. 7. C. How to start macrobiotics. D. Macrobiotic cooking. E. Recipes (Cornellia Aihara). F. Does the macrobiotic diet supply enough protein. G. Vitamins. H. Conclusion: Eight macrobiotic principles, the Unifying Principle, the Order of the Universe.

Soy-related recipes include: Creamed onion-miso soup (p. 41). A table showing the amount of protein in various foods includes soybeans, soy sauce, natto, and miso.

Note: In his book *Learning from Salmon,* Herman Aihara says that this was his first book, published in June 1971. The copyright page says "Copyright 1971," but the National Union Catalog seems to indicate that it was not copyrighted until 1976. The 6th printing was 1984.

5840. Saio, Kyoko; Kajikawa, Masahiro; Yamazaki, Sado; Watanabe, T. 1971. Food processing characteristics of soybean proteins. II. Effect of sulfhydryl groups on physical properties of tofu-gel. *Agricultural and Biological Chemistry* 35(6):890-98. June. [11 ref]
• ***Summary:*** "Changes in the amount of sulfhydryl groups by heating or treatment with urea were more rapid in 11S protein as compared with 7S protein." "Tofu-gel from 11S protein got harder and stronger as the amount of sulfhydryl groups increased.

"The results may suggest that tofu prepared from 11S protein has more disulfide bonds in its gel than that from 7S protein." Address: 1&3. Food Research Inst., Ministry of Agriculture and Forestry; 2. Food and Feed Research Lab., Takeda Chemical Industry, Ltd.

5841. Tabuchi, Ichiro. 1971. Saishoku-shugi no riron-teki haikei: Shokubutsu-sei tanpaku shokuhin kaihatsu ni okeru shûkyô-teki tachiba ni tsuite [Theoretical background on vegetarianism: The religious viewpoint in the development of vegetable protein foods]. *Shokuhin Kaihatsu* (*Up-to-Date Food Processing*) 6(6):31-35. June. [5 ref. Jap]
• ***Summary:*** Contents: Seventh-day Adventists. Ellen G. White's viewpoint. Seventh-day Adventist food enterprises and their purposes. Popularization of Soyalac made by San-iku Foods (Shokuhin) in Japan. The campaign for quitting tobacco in 5 days at the Adventist Tokyo Hospital (*Tokyo Eisei Byoin*).

The section on the popularization of Soyalac states: "Although in a recent issue of *Shokuhin Kaihatsu* magazine, soymilk was described as an illusory food (*maboroshi*), at least for us, it is a very real food, because San-iku Shokuhin has been making soymilk for the last 12 years and providing it for our school dormitory cafeteria meals. We have gotten good results in both taste and nutrition. With this experience and Loma Linda's formula and technique (they make formulated dairylike [chôsei] soymilk), Neo-Soyalac was born. It is a superior, nutritious infant formula.

"Soyalac was developed by Dr. Harry W. Miller, who was the world's leading authority in the field of soymilk. He spent half a century researching and developing Soyalac. It started to be produced and sold in the 1940s. Since that time it has contributed as an infant formula, and a milk substitute for children who are allergic to or dislike dairy milk. Its effectiveness and safeness have been proved by clinical experimentation. Also, Soyalac was used after World War II as an especially nutritious food for the protein-rich food program of the World Health Organization (WHO), FAO, and UNICEF and it saved many children from starvation and

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kwashiorkor.

"San-iku Shokuhin is now starting this work in Japan. We are trying to popularize our soymilk through very special methods such as via our religious network, health food stores, and doctors detailings. Babies who can't drink cow's milk or had allergies have been saved. Those with rashes and sweat rashes have been cured. We have received many expressions of thanks. One mother raised her 3 children on soymilk only, and one of the three was selected at a healthy baby contest in her county (*gun*). Formulated soymilk is not a medicine, therefore we are not allowed to promote its medicinal effects. Nevertheless, these various good effects have been proved clinically and in actual experience.

"A century ago, Ellen G. White predicted that 'the time will come when we will not even drink dairy milk.' Now we feel that this prediction is coming true as we see our dairy milk contaminated with penicillin, BHC, DDT, etc. I feel that in this day and age our work to popularize soymilk, which contains no antibiotics, no chemicals, and no cholesterol, and which is so nutritious and healthy, is very meaningful." Address: Product Development Dep. (Kaihatsu-bu), San-iku Foods, Japan.

5842. Sokolov, Raymond A. 1971. Macrobiotic cooking–Learning the secrets of yin and yang. *New York Times.* July 8. p. 41.

• ***Summary:*** Cornellia Aihara, from San Francisco, California, is teaching a macrobiotic cooking class to 30 local enthusiasts in downtown Brooklyn. Each "paid $6 to attend the class, a dinner, and a lecture" by Herman Aihara. In "the mystical world of macrobiotic diet the Aihara family are the equivalent of Pope, President, and Julia Child." Herman is the director of the George Ohsawa Macrobiotic Foundation. Ohsawa, now deceased, "brought the gospel of the grain-centered diet of Zen Buddhism to the United States and Europe.

Recipes are given for Brown rice, Wakame soup with miso, and Ohsawa coffee pudding.

5843. Kushi, Michio. 1971. Re: News of macrobiotics in Boston and beyond. Letter to macrobiotic friends, July 15. 2 p. Typed, without signature.

• ***Summary:*** "1. Our home address has been changed from 216 Gardner Road to 440 Boylston Street, Brookline, Massachusetts 02146 and the telephone number stays the same, 617-734-3853. Though this house is within a residential section, it faces Route 9 and two schools are at both sides of the house. We are having, therefore, our small studies at home including seminars for teachers, juniors, seniors and women. Two weekly church lectures are continuously held, and our enterprises such as Erewhon, Sanae, Tao, and the publications are being managed by our friends. Though all these establishments are respectively advancing, except Erewhon, they are still financially unsatisfactory.

"2. In Boston about 10 friends are with American friends who have come from Europe and South America. Since Eric [Utne] and Peggy [Taylor] have returned to America for their marriage, Ron Dobrin, the editor of EWJ, is going to be in London, and Rosemary [Traill] is also leaving for London in a few days. During this summer, besides Paul and Dora [Hawken], several marriages were made and several more babies were born among our friends. Duncan and Susan [Sims] with five other Boston friends are now in their land in British Columbia and NHK is planning to introduce their development of land and cultivation in sometime October or November for Japanese people. New Hampshire's Erewhon farm is under the leadership of Richard and Elain [Mensoff; her maiden name was Sutton] and about 10 Boston friends are cultivating organic vegetables. Allan and Dorna are also there.

"3. For July 4th weekend, Herman and Cornellia [Aihara] and their two children with Bob Johnson spent three days with our Boston friends. Michel's [Abehsera's] Binghamton camp [in upstate New York] was held for a week, and Awosting Retreat is having MB [macrobiotic] summer camp this week though our friends are attending as my substitute. Lynn Miller is now in Europe and Bill Anton will join her sometime in the future. Richard and Connie [Sandler; her maiden name was Frank] are in New York, planning to study Medical science more thoroughly. Bob Petrofsky and Hy Lerner are also planning to develop their lands in Vermont, though Hy may visit Japan early in the next year to study the oriental medicine. Los Angeles house and Erewhon are smoothly operated, and many Boston friends are there, including Roger and Susan [Hillyard], Carolyn [Heidenry], Maureen [Traill], Adele [Wood], John Demoulin. Bruce Macdonald is to return to LA [Los Angeles] after Roger and Susan set out for their domestic long travel. Aveline will spend this summer by the end of August. Ron Kotzsch and Jinx, with my children, are also in Los Angeles. Becky [Rebecca] Wood will be there also.

"EWJ [East West Journal] is managed by several friends with Jack Garvey who was in Tucson [Arizona], and Bruce Gardiner with a few friends is trying to publish regularly the Order of the Universe. The Book of Do-in was published by Jack DeLangre, Macrobiotics, the Invitation to Health and Happiness, was published by Herman's Foundation, and the Book of Miso by Aveline is now being prepared to publish."

Norio Kushi adds by e-mail (27 March 2011): Maureen referred to in the letter is definitely Maureen Traill, the younger sister of Rosemary Traill. Maureen's first husband was Bruce MacDonald and they had their first child (a daughter named "Lori," who now goes by "Lorelei"), while living in Hollywood (Los Angeles) at the first macrobiotic house, 7511 Franklin Ave. Address: 440 Boylston St., Brookline, Massachusetts 02146.

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5844. Kushi, Michio. 1971. Re: Japan, Boston, and Erewhon–Los Angeles. Letter to Evan Root, July 30. 1 p. Typed, without signature.
• ***Summary:*** "After you left for Japan, it has passed almost three years. During this period you have shown a steadiness of development. I have heard you are returning to Japan for a short period. By your eyes, please see the present Boston situation and what we are facing in America. You woud feel that America is changing rapidly toward MB [macrobiotics]. When you cme back to Boston, let us have a welcome party with many new friends.

"Aveline [Kushi] is now in Los Angeles until the 10th of September. On the way of coming over to the East Coast, I hope you can visit our Hollywood center and Erewhon in LA [Los Angeles], staying a few days there. Make your report and lecture there too. Let them notify [Notify them of] your arrival date before you leave Japan. They will pick you up at the airport. You may also visit San Francisco, Chico [California], Seattle [Washington], and several major places in this country, to see many friends.

"Hollywood address: 7357 Franklin Ave., Hollywood, California 90046. Phone: (213) 876-9153." Address: 440 Boylston St., Brookline, Massachusetts 02146.

5845. Hashimoto, Hikotaka; Yoshida, H.; Yokotsuka, T. 1971. [Studies on sediment of shoyu. V. Composition of sediments formed by heating of raw shoyu and isolation of precursors of sediments]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 49(7):642-49. July. [12 ref. Jap; eng]
Address: Central Research Laboratories, Kikkoman Shoyu Co., Ltd., Noda, Japan.

5846. Hymowitz, T.; Mies, D.W.; Klebek, C.J. 1971. Frequency of trypsin inhibitor variant in seed protein of four soybean populations. *East African Agricultural and Forestry Journal* 37(1):73-77. July. [8 ref]
• ***Summary:*** At least four different trypsin inhibitors have been found in soybeans. The authors used acrylamide disc electrophoresis to study 274 soybean genotypes from four diverse populations (East African, Himalayan, Japanese, and Genetic Type Collection). The Rf 0.92 electrophoretic band, which represents a trypsin inhibitor variant, was found in high frequency in Japanese plant introductions of Maturity Groups I and II.

"Perhaps, electrophoretic banding patterns of seed protein such as utilized in this study can be adapted to determine the movement of soybean germ plasm from North China to Africa, Europe, North and South America."

"In the United States, soybean cultivars may be divided into stem termination groups, namely determinate and indeterminate. Soybean cultivars grown in the north usually have the indeterminate character while those cultivated in the south possess the determinate character." All soybeans grown in northern Japan have determinate stems. Address: Dep. of Agronomy, Univ. of Illinois.

5847. Bell, Don. 1971. Ohsawa and the yin and yang of health. *Chicago Tribune.* Aug. 1. p. F23.
• ***Summary:*** The film "Joe" [1970] has a scene shot in an unusual restaurant in New York City's East Village. The dishes have unusual names like miso soup, hiziki [hijiki], and wakame salad. One man calls it "Jap food," but the waiter explains that it's "food in accordance with the order of the universe"–a definition of macrobiotics. We are what we eat. A respected scientist has stated that each year, 98% of the atoms in our bodies are replaced by new atoms that we take in from the food we eat, the water we drink, and the air we breathe.

Popular foods in the macrobiotic diet include seaweed, tahini (made from sesame seeds, a replacement for butter), Japanese azuki beans, and miso and tamari (protein-rich seasonings).

5848. Daniels, Mary. 1971. A loaf of whole-grain bread, a jug of bancha and thou: "Food for Life" is food that's "in accord with the Universe"–even on Halsted Street. *Chicago Tribune.* Aug. 1. p. F18-F25.
• ***Summary:*** "The mecca of macrobiotics in the United States today is Boston, and its Mohammed [Muhammad] is a Japanese professor of Oriental studies, Michio Kushi. Kushi is a disciple of Georges Ohsawa, who gave his first lectures in New York's Buddhist Temple in 1959." Ohsawa's followers went in two directions. In Oct. 1961, one group went to [Chico] California under the leadership of Herman Aihara. The other followed Kushi to Boston.

The first macrobiotic study house in the Boston area was established very informally about 7-8 years ago in the Kushi's home in Brookline. Soon thereafter his students founded Tao Books and Erewhon. By word of mouth and by his writings, Michio Kushi has attracted young people from all over the USA, many of them seeking something better than drugs. Soon the demands on his time were so great that Kushi had to give up his classes at Harvard to teach from his home and lecture twice a week on the true path to happiness.

Erewhon is now almost the size of a supermarket; it owns a large warehouse near the Boston docks. Eight large photos show foods sold at Erewhon retail stores. One caption mentions miso.

Part II of this article, titled "Macrobiotics: where it's at in Chicago," is about Tom Swan and his macrobiotic food store "Food for Life." This store, around which the local macrobiotic community revolves, was started in Feb. 1970 at 2356 Seminary by Ron Kotzsch, a Harvard student who had worked at the Erewhon store in Boston.

On the shelves are cans and bottles of corn germ oil and sesame oil (both auger pressed, and both with a rich, natural flavor), sesame butter, a variety of seaweeds imported from

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Japan, buckwheat noodles, "a fermented soy paste rich in energy called miso (dancers down it before a performance), and a natural soy sauce called tamari that makes you realize how much the supermarket stuff cheats you in taste. All of these things are proudly labeled 'no preservatives.'"

Also mentions: John Palumbo, Bill Tara, Loren McCune, The Caldron, Dr. Walter Kempner, Burl Ives, brown rice from Chico San, organic foods, Gloria Swanson, and William Dufty. Includes five macrobiotic recipes: Brown rice with gomasio [gomashio]; leftovers fried and served with tamari (soy) sauce. Seaweed and carrots. Bancha tea. Tempura batter. Raisin muffins.

5849. Dimler, R.J. 1971. Dried tofu made from U.S. soybeans. *Notes from the Director of the Northern Division* (*Peoria, Illinois*) No. 1040. p. 1. Aug. 6.

• ***Summary:*** "Working under a PL-480 project sponsored by Dr. Cowan (Oilseed Crops), Prof. Yosito [Yoshito] Sakurai, Japan Frozen Tofu Association, Tokyo, developed a standardized procedure for making kori-tofu (dried tofu). Salient features of the method include rapidly chilling fresh tofu to -10ºC. in 1 to 2 hours and holding at -1º to -3ºC. for 13 weeks. Basic studies suggest that the ratio of 7S / 11S proteins is important for kori-tofu, but the optimum ratio was not determined. Laboratory evaluation of four U.S., two Chinese, and three Japanese varieties of soybeans indicated that Hawkeye, a U.S. soybean, was the best variety for making kori-tofu. Browning sometimes occurs during storage because in high humidities a reaction takes place between the protein and the products from the oxidation of unsaturated fatty acids. Low storage temperature and humidities are desirable in protecting dried tofu from browning.

"Kori-tofu is a traditional Japanese soybean food. Its production requires a 3-week process that is fairly complicated. According to Professor Sakurai, the variety of soybeans used as raw material is the most important of the many process factors that affect quality and yield. Therefore, the favorable results obtained with U.S. beans are significant. In the past, kori-tofu was made primarily from Japanese and Chinese beans, about 40,000 tons annually, but now more and more U.S. soybeans are entering this market." Address: Director.

5850. *SoyaScan Notes.* 1971. Chronology of Laurelbrook in Maryland. 16 March 1992. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** 1971 Aug. 23–Laurelbrook Foods begins as a macrobiotic natural foods wholesale distributor in Forest Hill, Harford County, Maryland (about 25 miles northeast of Baltimore). The company started as a division of Cycle Parts & Accessories, Inc., a motorcycle parts company that Rod was planning to start in late 1970 shortly before the idea of starting a natural foods distribution company took form. Laurelbrook company never moved from its original location, but they kept a post office box (P.O. Box 47) in nearby Bel Air. Their original price list shows that they carried 11 products, mostly bulk organic grains and beans (including soybeans) purchased from Arrowhead Mills. Erewhon was their other major supplier from the outset. The company was founded by Rod and Margy Coates, the parents of five daughters (including Sally, Judy, Marion [Ronnie], and Dora Coates) and one son (Dan). Dora was Paul Hawken's first wife; they were married in June 1971 in Maryland. Judy was John Deming's first wife; they were married in Aug. 1972. Both Paul and John worked with Erewhon. Rod and Margy decided to call the company Laurelbrook since they lived on Laurelbrook Road in Fallston, Maryland. Rod and Margy first got interested in natural foods in 1967 when their next to oldest daughter, Judy, who had been studying macrobiotics with Michio and Aveline Kushi in Boston, Massachusetts, and had worked for Erewhon, offered to come home and cook for her parents for two weeks and let them try out the diet.

1971 Sept. 30–Laurelbrook is still considered by Rod Coates to be a division of his Cycle Parts & Accessories, Inc.

1973 Dec.–Laurelbrook opens a new, second warehouse in Raleigh, North Carolina (at 330 West Davie St.). Four people start and run the operation.

1974–Laurelbrook, which now employs 24 people, enlarges its warehouse.

1975–Feb.–Laurelbrook publishes a 6-page booklet showing that the company now distributes about 43 different food products–including soy flour, tamari, and miso.

1976 Nov.–One of Laurelbrook's employees is trying to start a labor union. Management vigorously opposes it. Laurelbrook now employees 32 people and has a fleet of 12 trucks that delivers to 350 stores. It is still a family operation, with Rod and Margy Coates, their 3 children, a son-in-law, a niece, and a nephew working at Laurelbrook.

1977–Laurelbrook outgrows its warehouse at 330 West Davie St. in Raleigh, North Carolina, so they move into a larger warehouse facility at 2319 Laurelbrook Street in Raleigh.

1977 Nov.–Laurelbrook has 44 employees. Sales last year were about $3 million.

1978 June–Laurelbrook is now importing foods from Mitoku in Japan.

1979 May–Rod Coates hires Richard Curry as accountant and general manager.

1980 March 17–At a special meeting of the board of directors, Rod informs the board that he will be retiring in one week, on 23 March 1980, his 65th birthday. He recommends that he be replaced as president by Richard Curry and that his (Rod's) official position be chairman of the board.

1981 March–Things are not going well at Laurelbrook. Rod and Marge feel that Richard is not doing a good job

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in running the company. Employee morale is down. But Richard blames the problems on Rod, and wants Rod to be less actively involved with Laurelbrook on a daily basis.

1981 March–Dora Hawken is fired from her position in the Laurelbrook office.

1981 July 21–Rod, Margy, and Dan Coates, constituting all the board of directors of Laurelbrook, resign, effective immediately. They are upset with the way Richard Curry is running the company.

1981 Aug.–Richard Curry offers to buy out the Coates' interest in Laurelbrook foods. They accept the offer. Rod and Margy keep ownership of the property and Richard was to pay them rent for using it.

1981 Nov. 21–Over the next 30 days Richard Curry places five large orders with Hain Pure Foods in the amount of $35,577.

1982 Feb. 15–Laurelbrook Foods files for Chapter 11 bankruptcy protection and does business under Chapter 11 for about 18 months. Richard Curry is president.

1982 Dec. 22–Rod Coates presents a list of items that he alleges Richard Curry sold illegally after the bankruptcy of Laurelbrook, and before the auction of the company's assets. Attached to this are letters between attorneys.

1983 Oct-Dec.–Rod and Margy Coates have to pay off the debt of $35,577 to Hain–even though they no longer own the company. In Dec. 1983 the last of the equipment in the warehouse was auctioned off.

1990 March 4–Rod Coates dies of Alzheimer's disease. As of early 1992, Judy Coates lives in Ross, California, and Dora lives in Marin, California. Address: 505 Granary Rd., Forest Hill, Maryland 21050.

5851. Perkins, Louise. 1971. Soybeans spearhead record U.S. farm sales to Japan. *Foreign Agriculture*. Aug. 30. p. 5-6.

• ***Summary:*** Since the mid-1960's Japan has been the top dollar market for U.S. agricultural exports. Australia has ranked first among U.S. competitors in agricultural trade, followed by Japan, since 1965. Canada, Mainland China, Mexico, and Thailand all contribute to Japan's soybean imports.

5852. Murakami, Hideya. 1971. Classification of the koji mold. *J. of General and Applied Microbiology* (*Tokyo*) 17(4):281-309. Aug. [40 ref. Eng]

• ***Summary:*** A taxonomical study of the genus *Aspergillus* was made centering on 403 strains of koji mold, with some other molds as reference. "Morphological, physiological, and cultural characteristics were compared, and 20 mycological characters of each strain were submitted to component analysis by a computer." The following characters were selected as the most significant keys for taxonomic differentiation: seriation of sterigmata, roughness of conidial walls, color of old cultures, diameter of conidia, and pink coloration of conidia in the anisaldehyde medium.

As a result, all the strains were shown to belong to two different clusters: (1) The *Aspergillus oryzae* group. (2) The *Aspergillus flavus* group.

The koji molds were placed in the *Aspergillus oryzae* group including *Aspergillus sojae* Sakaguchi et Yamada, *A. tamarii* Kita, *A. oryzae* (Ahlburg) Cohn, *A. oryzae* var. *viride*, var. nov., and *A. oryzae* var. *brunneus*, var. nov., and the strains other than koji mold were placed in the *A. flavus* group including *A. flavus* Link, *A. parasiticus* Speare, and *A. toxicarius*, sp. nov.

Historical review: Among the innumerable kinds of fungi found in nature, some *Aspergilli* used widely for the manufacture of Japanese foods, such as *Saké, Miso, Shoyu, Mirin, Amazake,* and so on, have long been called koji molds.

A brief definition / description of each of these foods is given.

"Ahlburg, in 1876, isolated for the first time a yellow-white mold from koji for *Saké* making." It was originally named *Eurotium oryzae* Ahlburg although it was renamed *Aspergillus oryzae* (Ahlburg) Cohn by Cohn in 1884, owing to its non-production of perithecia. Although *Aspergillus oryzae* was described in detail by Wehmer in 1895, it was not until the beginning of the 20th century that the koji mold was found to contain multiple kinds of microbes, when Takahashi in 1909 isolated many different molds from koji used in the manufacture of *Saké, Miso,* and *Shoyu* and found that all were varieties of *Aspergillus oryzae*. Address: Research Inst. of Brewing, Tax Administration Agency of Finance Ministry, Takinogawa 2-6, Kita-ku, Tokyo 114, Japan.

5853. Yamamoto, Kajiro. comp. 1971. Noren: Tokyo o shiru tame ni [Noren: In order to get to know Tokyo]. Tokyo: Shinto Manzo/Hato Basu (Bus) Kogyo K.K. 256 p. Illust. 18 cm. [Jap]

• ***Summary:*** *Noren* is the Japanese word for the decorative cloth, bearing the company crest or logo (*mon*), that hangs in the doorway of traditional Japanese shops, especially restaurants. This guidebook contains brief descriptions and sketches of famous, old, and interesting/colorful Japanese food companies and restaurants in Tokyo. Each description is by a different author, and is accompanied by a an illustration (line drawing) of the front of the restaurant. Those with a strong tie to soyfoods include Sasa-no-yuki (p. 76; founded 1703), and Shinoda-zushi Sôhonten (p. 87; founded 1872). At the back of the book is the address and phone number of each food company or restaurant, a chronology giving the year that each was founded, and several maps of Tokyo showing where each is located. Address: Tokyo, Japan.

5854. Visit to Pacific Grain Co. (Interview). 1971. Conducted by Dr. Walter Wolf of NRRL, Peoria, Illinois 61604, Feb. 22. 1 p. handwritten transcript.

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• ***Summary:*** Pacific Grain [Farmer City, Illinois] now has 20,000 acres under contract for growing Beeson variety soybeans. Beeson averages about 10 bushels per acre better than Hawkeye. Beeson, however, has a tendency for the hulls to crack which leads to splits on handling after the beans have been cleaned.

5855. Watanabe, Tokuji; Hashizume, K. 1971. [Process for production of food materials from soybean]. *Japanese Patent* 621622. Oct. 10. [Jap]*
Address: National Food Research Inst., Tokyo.

5856. *Christian Science Monitor.* 1971. Soy sauce perks up many American dishes, especially turkey and corn. Oct. 21. p. 11.
• ***Summary:*** Kikkoman began when two families in Japan started a soy sauce company at about the same time the first English families at Plymouth Rock enjoyed their first Thanksgiving. Kikkoman now has a test kitchen in San Francisco, where a home economist uses the company's soy sauce directly on meats as a table sauce.

Soy sauce originated in East Asia. "The Chinese and Japanese names for soy sauce are very similar–"see yow' and 'shoyu' respectively." The original soy sauce in China was made from soy beans, water and salt only. But in Japan, long ago, it was found that adding crushed, toasted wheat produced more natural sweetness, better color, and additional flavor notes. In China, soy sauce is still generally made without wheat–although some manufacturers now add it.

"The 'tamari' sauce sold by American health food stores is really a Chinese-type sauce made in Japan with a Japanese name." But it is no longer authentic tamari, made without wheat; it generally now contains some wheat.

Since 1898 Kikkoman has been the purveyor of soy sauce to the Emperor of Japan. They constructed a special factory for his sauce [the Goyô Gura at Noda].

5857. B.W. [Becky Wood]. 1971. Making miso in America. *East West Journal* 1(14):6.
• ***Summary:*** Contains a description with photos of how miso is made at Norio and Fujimoto, but without the details necessary to actually make miso on a commercial scale.

Chico-San is developing a domestic miso which it hopes to offer commercially in the near future. Miso expert, Junsei Yamazaki, has tested and developed miso in Chico, California for the last seven years. Mr. Yamazaki has one batch which has been aging for a year. He hopes to market this batch in six months. Chico-San will expand its plant for large-scale production as the miso is perfected.

"We called Erewhon to ask if they had plans for the production of miso and Bill Tara reported that there is a big and rapidly growing market for miso. But, he said, ideally miso should be made in a given area for consumption in that area." Erewhon will introduce to the domestic market a yeast grain called koji, essential to the production of miso.

There are currently two companies in the continental U.S. which produce miso on a commercial basis. One is located San Francisco and the other in Salt Lake City. Each produces rice miso made from white rice. The Norio Company has been located on the outskirts of San Francisco's Japan-town, at 1532 Post Street, since the company started in 1919. The company is owned and solely operated by Mr. and Mrs. Minoru Arikawa and son.

Fujimoto and Company, which originated in Oakland, California, moved to 302 South Fourth West, Salt Lake City, Utah, in 1945. Mr. Sekino heads the three-man plant. He speaks little English. Address: EWJ, P.O. Box 203, Prudential Center Station, Boston, Massachusetts 02199. $6.00 for 20 issues.

5858. Jose, Hirokazu; Sugimori, Tsunetake. 1971. [Studies on halotolerant lactic acid bacteria relating to soy sauce brewing. III. Halotolerant effect of L-proline on several enzymes of *Tetracoccus* No. 100]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 49(10):861-69. Oct. [18 ref. Jap; eng]
Address: Kyoto Research Laboratories, Marukin Shoyu Co., Ltd., Uji, Kyoto, Japan.

5859. Sugimoto, H.; Van Buren, J.P.; Robinson, W.B. 1971. An enzymatic process for a protein-containing beverage based on soybean protein and lemon juice. *J. of Food Science* 36(5):729-31. Sept/Oct. [25 ref]
• ***Summary:*** Cooked suspensions of isolated soy protein were mixed with a small amount of acid protease preparation from *Trametes sanguines.* Address: New York State Agric. Exp. Station, Cornell Univ., Geneva, New York 14456. Sugimoto is presently with Kikkoman, at Noda, Japan.

5860. Yoshimoto, Tadashi; Fukumoto, Juichiro; Tsuru, Daisuke. 1971. Studies on bacterial proteases: Some enzymatic and physicochemical properties of the alkaline protease from *Bacillus natto. International J. of Protein Research* 3(5):285-95. [28 ref. Eng]
• ***Summary:*** Various strains of *Bacillus natto* are known to produce proteolytic enzymes that have generally been classified into two groups: neutral and alkaline proteases.

An alkaline protease of the bacterium *Bacillus natto* strain Ns was purified and crystallized from aqueous solution. "The enzyme was most active at pH values between 10.3 and 10.8 toward casein substrate and completely inactivated by incubation with DFP... The fact that most strains of *Bacillus natto* so far investigated by us have also produced this type of protease suggests that *Bacillus natto* mainly secretes the alkaline protease belonging to the group of subtilisin type Carlsberg." Address: Faculty of Science, Osaka City Univ., Sumiyoshi-ku, Osaka, Japan.

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5861. United Press International (UPI). 1971. Japan offers delicacy: Raw viper in blood. *Hartford Courant* (*Connecticut*). Nov. 26. p. 95B.
• ***Summary:*** Of course, this delicacy is an exotic repast in Japan. A more usual meal might consist of "tofu (bean curd) soup, fish, either raw or cooked, and a bowl of rice." Seaweed, chrysanthemum flowers (*kiku*), and baby bees are also consumed in Japan.

Note: This soup is usually called "miso soup with tofu."

5862. Fischer, R.W. 1971. Plans for developing world markets for U.S. soybeans and soybean products. Cedar Falls, Iowa. 322 p. Nov. Prepared for the American Soybean Association, Hudson, Iowa.
• ***Summary:*** Contents: Summary: World Market Development Plan for Soybeans and Soybean Products. 1. The World Situation for Marketing Soybean Products 2. Objectives of the Long Range Market Development Program 3. Outline of Market Development Activities and Methods 4. Requirements for the Market Development Program

5. Market Development Plans by Area and by Country.

West Europe: Austria, Belgium/Luxemburg, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

East Europe: Bulgaria, Czechoslovakia, East Germany, Hungary, Poland, Rumania, Yugoslavia.

Far East: Australia, Hong Kong / Singapore, Japan, Korea, Philippines, Taiwan, Thailand.

Others: Iran, Israel, Mexico, North Africa, Southeast Asia.

6. Details of Certain Key Marketing Programs, Operations and Methods. 7. The Market Development Staff: Responsibilities and Qualifications. 8. Market Development Program Budgets. 9. Appendices.

Note: This table of contents was accompanied by a letter on Soypro International, Inc. letterhead signed by Linda Schipper, Secretary to R.W. Fischer. Address: President, Soypro International Inc., 314 Main St., Cedar Falls, Iowa 50613.

5863. Kubota, Hayato; Nakayama, S.; Tateishi, T. Assignors to Fuji Oil Company Ltd. 1971. Fat compositions and processes for making whipping topping. *British Patent* 1,256,053. Dec. 8. 3 p. Application filed 20 Jan. 1970. (Chem. Abst. 76:125630). [Eng]*
• ***Summary:*** Soybean oil, lecithin, and milk were used in the topping.

5864. *Chicago Daily Defender.* 1971. Illinois holds first food expo. Dec. 16. p. 28.
• ***Summary:*** The first Illinois "Food Expo" was held at the Continental Plaza Hotel in Chicago; Gordon L. Roop, director of the Illinois Department of Agriculture, paid the bill. "Among the many products exhibited were egg rolls, roasted soybean nuts, horseradish, frozen apples, natural cheese, honey,..."

5865. Abe, Koryu. comp. 1971. Tôfu hyakuchin to zokuhen [One hundred favorite tofu recipes, and supplement]. Tokyo: Shinshu Shorin. 280 p. Illust. No index. 22 cm. Facsimile of original 1782 edition, and modern translation. [1 ref. Jap]
• ***Summary:*** Contents: Introduction. Forward. Essay. About the author (autobiographical). Tofu Hyakuchin: Introduction, table of contents, recipes. Tofu Hyakuchin Zokuhen: Introduction, table of contents, recipes. Translations of Tofu Haykuchin and Tofu Haykuchin Zokuhen. Comments about cooking with tofu. Contains 100 recipes.

The illustrations in these two books are described at their original editions published in 1782 and 1783. Address: Tokyo, Japan.

5866. Kameda, Yukio; Sagai, H.; Yamada, T.; Kanatomo, S.; Matsui, K. 1971. Antitumor activity of *Bacillus natto.* II. Formation of cytolytic substances on Ehrlich ascites carcinoma in *Bacillus natto* KMD 1126. *Chemical and Pharmaceutical Bulletin* 19(12):2572-78. Dec. [10 ref]
• ***Summary:*** A culture medium suspension of *Bacillus natto* KMD 1126 had no significant cytolytic activity on Ehrlich ascites carcinoma cells. "But when the bacterial suspension was preincubated in the buffer at 37ºC for 2 hours, cytolytic substances were found outside the cells."

It was found that there are at least two kinds of substances in the preincubation mixture. One which had a high molecular weight, had cytolytic and hemolytic activities, whereas the other, which had low molecular weight, had only cytolytic activity. Address: Faculty of Pharmaceutical Sciences, Kanazawa Univ., 13-1 Takara-machi, Kanazawa, Japan.

5867. Yamashita, Michiko; Arai, Soichi; Tsai, Shun-Jen; Fujimaki, Masao. 1971. Plastein reaction as a method for enhancing the sulfur-containing amino acid level of soybean protein. *J. of Agricultural and Food Chemistry* 19(6):1151-54. Nov/Dec. [25 ref]
Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Bunkyo-ku, Tokyo, Japan.

5868. Fukui, Juro; Kaizuma, Norihiko. 1971. [Morphological and ecological differentiation of various characters of the Japanese wild soybean, *Glycine soja*]. *J. of the Faculty of Agriculture, Iwate University* 10(4):195-208. [14 ref. Jap; eng]*
Address: Morioka, Japan.

5869. Hayashi, Yoshio; Kawabata, Makoto; Taguchi, Kuniko. 1971. Nattô no nenshitsu-butsu ni kansuru kenkyû [A study of the viscous substances in natto]. *Kyoto Furitsu Daigaku*

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Gakujutsu Hokoku, Rigaku, Seikatsu Kagaku (*Kyoto Prefectural Univ., Scientific Reports: Natural Science and Life Science*) 22:13-17. (Chem. Abst. 76:110278y). [Jap]*
• ***Summary:*** Natto mucilage is composed mainly of an acidic glycopeptide. 600 mg mucilage was obtained from 220 gm natto (100 gm soybeans). The chemical composition of the mucilage is: sugar 61.5%, hexosamines 2.8%, total nitrogen 4.1%, amino-nitrogen 2.9%, and uronic acid 20.4%. The constituent sugars of the mucilage are arabinose, xylose, rhamnose, galactose, glucose, glucosamine, and galactosamine. The peptide portion comprises 16% of the mucilage and 17 amino acids were liberated from the mucilage on hydrolysis. Address: Kyoto Prefectural Univ., Kyoto, Japan.

5870. **Product Name:** [Jonnapu Soymilk].
Foreign Name: Jonnapu Tônyû.
Manufacturer's Name: Kenbi-sha K.K.
Manufacturer's Address: 4-22-40, Takadono, Asahi-ku, Osaka 535, Japan.
Date of Introduction: 1971.
Wt/Vol., Packaging, Price: 300 ml poly container.
New Product–Documentation: Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that Kenbi-sha first made commercial soymilk in Japan in 1974.

K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Jonnapu Tônyû was introduced in a 300 ml poly container in 1971 and distributed nationwide.

Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64.

5871. Ko (Yasu?), -. 1971. [History of Unzen frozen- and dried-frozen tofu (Leaflet)]. Unzen Kunimi Reito K.K., Tahira, Kunimi-cho, Korai-gen, Nagano-ken, Japan. 1 p. [Jap; eng]

5872. Murata, Kiku. 1971. [Studies on the nutritional value of tempeh]. *Osaka Shiritsu Daigaku, Kassei Gakubu Kiyo* (*Report of Osaka City University*) 18:19-33. [30 ref. Jap]*
• ***Summary:*** Daidzein and genistein found in fermented soybeans are reported to possess antioxidant activity. Address: Osaka City Univ., Japan.

5873. Shinoda, Osamu. 1971. Tôfu-kô [Thoughts / treatise on tofu]. *Sekai* (*The World*). p. 30-37. [Jap]

5874. Uchida, Kinji; Mogi, Koya. 1971. Shôyu no shibô-san oyobi sono genryô shishitsu to no kankei ni tsuite. II. Genryô shishitsu no shibôsan sosei oyobi sono shôyu shibôsan to no kankei [Fatty acid composition of shoyu oils and their relation to those of the raw materials. II. Fatty acids of the total lipids from soybeans, defatted soybeans and wheat, the raw materials of shoyu brewing]. *Chomi Kagaku* (*Seasoning Science*) 18(11):472-77. (Chem. Abst. 80:904355). [8 ref. Jap]
Address: Central Research Laboratories, Kikkoman Shoyu Co. Ltd. (Chuo Kenkyusho).

5875. Uchida, Kinji; Mogi, Koya. 1971. Shôyu no shibô-san oyobi sono genryô shishitsu to no kankei ni tsuite. I. Shôyu no shibôsan sosei [Fatty acid composition of shoyu oils and their relation to those of the raw materials. I. The composition of the fatty acids in shoyu. soybeans, and wheat, the raw materials of shoyu brewing]. *Chomi Kagaku* (*Seasoning Science*) 18(11):466-71. (Chem. Abst. 80:144504). [16 ref. Jap]
Address: Central Research Laboratories, Kikkoman Shoyu Co. Ltd. (Chuo Kenkyusho).

5876. Aihara, Cornellia. 1971. Macrobiotic child care. *Macroguide* No. 8. 41 p. (George Ohsawa Macrobiotic Foundation, 1544 Oak St., Oroville, CA 95965).
• ***Summary:*** Contents: What is macrobiotic? About the author (autobiographical). Two pages of photos of the Ohsawa and Aihara families. Macrobiotic child care. First solid foods for baby. Prenatal and postnatal care. How to be a beautiful and loved wife. Recipes for baby's solid food. What is the Foundation? [GOMF].

Pages 35-41 contain "Recipes for baby's solid foods." These include: Mochi made with rice flour. Miso zoni (mochi in miso soup). Amasake (describes how to make amasake at home using either (A) 2 cups sweet brown rice, ¼ cup koji, and 4 cups water, or (B) 7 cups sweet brown rice flour, 1 cup koji, and 8 cups boiling water).

But where did Cornellia expect people to get koji?

Letter (e-mail) from Peter Milbury who worked for Chico-San for many years. 2012. July 18. "I arrived in Chico around that time, and there were two sources. Junsei Yamazaki was making koji as part of the Yinnies Syrup process. Also, we imported it directly from our supplier in Japan. It was not a popular item at that time, so it was probably a special order from Japan."

Note: "Yinnies" was an organic grain-based chewy candy or sweet syrup, made for Chico-San Inc. Address: California.

5877. Ando, Seiichi. 1971. Yuasa shôyu [Yuasa shoyu]. In: S. Ando, ed. 1971. Wakayama-ken no Rekishi [History of Wakayama Prefecture]. Tokyo: Yamakawa Shuppansha. See p. 108-11. [Jap]
Address: Wakayama prefecture, Japan.

5878. Ashida, Jun. 1971. Eiyôgaku gairon [Nutritional chemistry]. Tokyo: Yokendo. [Jap]

5879. Bailey, Paul. 1971. City in the sun: the Japanese concentration camp at Poston, Arizona. Los Angeles, California: Westernlore Press. x + 222 p. Illust. 22 cm. [18

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ref]
• ***Summary:*** "At Shogatsu, or New Year's, Poston's tofu factory had worked overtime to manufacture a sufficiency of cakes" (p. 207).

Photos show: (1) "Tofu factory, Poston." One man is pouring soaked soybeans into the hopper of a grinder, where they are ground into a thick puree, which falls into a wooden tub on a table. Two other men are looking on. "Besides making the bean curd *tofu* cakes, these specialists manufactured Poston's *mochigoni.* In *mochigoni,* the heavy rice dough is kneaded and pounded into flaky lightness with beam and paddle, cut into cakes and deep fried in fat" (p. 162).

(2) "Tofu factory, Poston. The native bean curd *tofu* is an important and popular part of the Japanese diet." One Japanese man ladles cooked soybean purée out of an iron cauldron (mounted in a brick dais) and into a straining bag held open by a wooden frame and a second man. In this bag the soymilk is separated from the okara (p. 166).

Paul Dayton Bailey was born in 1906.

Note 1. There is no such Japanese word as *mochigoni.* The nearest word that makes any sense is *mochigome,* which means "glutinous rice." Cooked glutinous rice can be pounded to make cakes of mochi, which can be deep fried.

Note 2. Of all the government officials in California and Washington, DC, only Harold Ickes and the ACLU spoke out against the unfair treatment of Japanese-Americans in internment camps and afterwards (p. 204-05).

5880. Endo, Koichi. 1971. Nosanbutsu bôeki no kôzô bunseki [Structural analysis of the trade in agricultural products]. Tokyo: Toyo Keizai Shimposha. 215 p. [20+ ref. Jap]*
Address: Tokyo, Japan.

5881. Godin, V.J.; Spensley, P.V. 1971. Oils and oilseeds: Soyabean. *TPI Crop and Product Digests* No. 1. p. 148-51. [19 ref]
• ***Summary:*** World soybean production has been increasing at the rate of 2.3% per annum from 1959 to 1968. World production has grown from an average of 19,724 tonnes in 1959-63 to an average of 38,405 tonnes in 1964-68. The three leading producing countries are USA (24,789,000 tonnes average 1964-68), China (10,978,000), and Brazil (559,000). The major importing countries are Japan (347,000 tonnes average 1964-1968), West Germany (262,000), Spain (136,000), Netherlands (97,000), Italy (93,000), Canada (83,000). Fluctuating prices and major influences affecting the basic trends are discussed. Address: TPI (Tropical Products Inst.), 56/62 Gray's Inn Rd., London WC1X 8LU, England.

5882. Hirayama, Takeshi. 1971. Epidemiology of stomach cancer. In: Tadashige Murakami, ed. 1971. Early Gastric Cancer. Baltimore, Maryland: University Park Press. Gann Monograph on Cancer Research No. 11. viii + 301 p. See p. 3-19. (Tokyo: Tokyo Univ. Press). [18 ref]
• ***Summary:*** This paper outlines the results of an epidemiological case-control study of stomach cancer in Japan. Table 1 (p. 10) shows "Factors associated with the standardized death rate for stomach cancer in 46 prefectures in Japan." Many foods and nutritional elements are included. A negative association means: The more one consumes, the less one's risk of dying from stomach cancer in Japan. The author reported a significant negative association for tofu (-5.28), vitamin A (- 4.12), and calcium (-6.54), and a very significant negative association for milk (-9.19). Thus these foods and nutrients appear to protect against stomach cancer. There was a significant positive association for fermented soybeans (+4.90; probably natto) and with a large amount of highly salted foods, including highly salted miso, but not including soy sauce or regular miso.

"The number of deaths from cancer of the stomach is still on the increase in Japan. Most of the increase, however, was found to be due to the increase in population itself. When the change in age structure was taken into account, the disease was noted to be on the downward trend since 1958. The death rate for age 45-49 in 1970 was 29% less for males and 14% less for females than in 1955." The standardized death rate from stomach cancer for men in Japan (68.57) was the highest in the world, and over 7 times higher than for U.S. whites (9.42). By marital status, widowed men have the highest rate (376.3), followed by separated men (273.6), then married men (116.4), with single men (75.1) having the lowest rate.

"In an international survey of 24 countries, the decline in the death rate for stomach cancer in recent years was found to be closely correlated to milk consumption." Address: Epidemiology Div., National Cancer Center Research Inst., Tsukiji 5-1-1, Chuo-ku, Tokyo, Japan 104.

5883. Ikenaka, Tokuji; Koide, T.; Odani, S. 1971. Structure and chemical modification of the Kunitz soybean trypsin inhibitor. In: H. Fritz and H. Tschesche, eds. 1971. Proceedings of the 1st International Research Conference on Proteinase Inhibitors. Berlin: Walter de Gruyter. ix + 304 p. See p. 108-16. Conference held 4-6 Nov. 1970 in Munich. [18 ref]
• ***Summary:*** The first details of the primary structures of the plant proteinase inhibitors started to appear in 1971 with the sequences of the lima bean inhibitor and the soybean (Kunitz) inhibitor. Address: Dep. of Chemistry, Osaka Univ. College of Science, Toyonaka [Japan].

5884. Kitamura, S.; Murata, G. 1971. Coloured illustrations, woody plants, Japan. All volumes. Japan: Hoikusha Publishing Co. *

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5885. Kusano, Aiko. 1971. Nattô seizô katei ni okeru daizu tanpaku no henka. II. TCA kayôsei kubun ni okeru zen amino-san, yûri amino-san pepuchido-tai amino-san ni tsuite [Changes in soybean protein during natto production. II. On the TCA soluble total and free amino acids in the TCA soluble fraction]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 24(1):8-12. (Chem. Abst. 75:87257). [4 ref. Jap]
Address: Faculty of Pedagogy, Gifu Univ., Nagara Gifu City, Japan.

5886. Mogi, Keizaburo. 1971. Watakushi no rirekisho [My personal history (curriculum vitae)]. Tokyo: Nihon Keizai Shinbunsha. 120 p. [Jap]*
Address: Noda, Japan.

5887. Moriyasu, Tadashi. 1971. Nihon meika jiten [Encyclopedia of fine Japanese confections]. Tokyo: Tokyo-do Shuppan. 380 p. [Jap]
• ***Summary:*** The best source of information on the history of Japanese confections, with extensive information on kinako (roasted soy flour). Out of print.

5888. Ohsawa, Lima. 1971. Makurobiotiku ryôri: Shokuyô katei ryôri 700 shu [Macrobiotic cookery: Food-cure home cookery–700 recipes]. Tokyo: Nihon CI Kyokai. xix + 7 + 200 + 6 p. Illust. (many color plates). Index. 26 cm. [Jap]
• ***Summary:*** This macrobiotic classic contains many chapters and recipes related to soyfoods and other interesting Japanese foods: Azuki and bean cookery (p. 96-98). Tofu cookery (p. 99-104). Miso cookery (p. 104-08; tofu, miso, and shoyu recipes are also scattered throughout the book). The chapter titled "Other Vegetable Cookery" (p. 110-24) contains many recipes for *kôfû,* a term used to refer to fresh wheat gluten. There are recipes for Kofu cutlets and Kofu croquettes (#419, p. 112). Skewered kofu cutlets. Kofu fukume-ni. Kofu rolls (p. 113). Deep-fried kofu chunks (#423, p. 114; it states that kofu can be purchased at Chinese grocery stores). Interestingly, there is no mention of seitan. The same chapter contains 9 yuba recipes (p. 121-22). Recipes for sea vegetables are scattered throughout the book, especially in the chapter on wild vegetables (p. 135-37). Two recipes using amazake as a sweetener appear on p. 152, and homemade amazake beverage is found on p. 169

An extensively revised English-language translation of this book was published in 1974 under the title *The Art of Just Cooking* by Autumn Press. Address: Tokyo.

5889. Ohta, Teruo. 1971. Tenpe [Tempeh]. In: T. Watanabe, H. Ebine, and T. Ohta, eds. 1971. Daizu Shokuhin [Soyfoods]. Tokyo: Korin Shoin. 271 p. See p. 208-17. [4 ref. Jap]
Address: National Food Research Inst., Tokyo, Japan.

5890. Sakaguchi, K.; Uemura, T.; Kinoshita, S. eds. 1971. Biochemical and industrial aspects of fermentation. Tokyo: Kodansha Ltd. 356 p. [Eng]
Address: 1. Emeritus Prof. of the Univ. of Tokyo; 2. Former Prof. of Applied Microbiology, Univ. of Tokyo; 3. Director, Tokyo Research Lab., Kyowa Hakko Kogyo Co. Ltd., Machida-shi, Tokyo, Japan.

5891. Sawaji, N. 1971. Endo, soramame, ingen-mame, edamame, suito-kon [Peas, fava beans, green beans, green vegetable soybeans, and sweet corn]. In: Y. Inako, M. Serisawa, N. Sawaji. Tokyo: Ie no Hikari Kyokai. See p. 128-29. [Jap]*
Address: Japan.

5892. Takashima, Shizuye. 1971. A child in prison camp [1st ed]. Montreal, Canada; Plattsburg, New York: Tundra Books. [74] p. Illust. so x 25 cm.
• ***Summary:*** "The people in Japan, hearing how we have been treated by the Canadian Government, and that we are living in camps in the woods, send us barrels of soya sauce and miso paste."

Note 1. This book is written for elementary and junior high school students. A Japanese-Canadian girl recalls her experiences of the three years (1942-1945) that she and her family spent in a Canadian internment (evacuation and relocation) camp during World War II. It was the New Denver Relocation Center in eastern British Columbia. In late 1941 they had lived in Vancouver, BC.

"In December 1941, 22,000 men, women and children of Japanese origin were living on Canada's West Coast. Within a few months every one of them–whether Canadian-born, naturalized citizen or new immigrant–was stripped of all civil rights and submitted to three years of indignity on a scale that makes the episode the most disgraceful in the country's history" (inside front dust jacket). Address: Toronto, Canada.

5893. Tamura, Heiji; Hirano, Masaaki. 1971. Shôyu no hon [The book of shoyu]. Tokyo: Shibata Shoten. 286 + vi p. Illust. Index. 19 cm. [15 ref. Jap; eng+]
• ***Summary:*** Contents: Part I: Knowledge of shoyu. History of shoyu. How shoyu is made. Topography of shoyu: Shoyu in the provinces. Varieties of shoyu. Races of shoyu. How shoyu is used. Talk on various topics concerning shoyu. The science of shoyu. How to use shoyu and its near future. Part

II: Shoyu cookery. Japanese cookery. Chinese cookery. Western cookery. One drop of shoyu can enliven. Part III: Shoyu and me. Short essays by famous Japanese about their fond, often childhood, memories of shoyu and its significance in their lives and in Japanese culture.

Mr. Tamura is a cooking teacher; he is said to have gotten most of his information other than recipes and reminiscences from another book, *History of Kikkoman*

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Shoyu (*Kikkoman Shoyu shi,* by Ichiyama 1968). Address: Tokyo, Japan.

5894. Tsuji, Kaichi. 1971. Kaiseki: Zen tastes in Japanese cooking. Tokyo and Palo Alto: Kodansha International Ltd. 207 p. With 96 color plates. Original woodcuts by Masakazu Kuwata. 29 cm.

• ***Summary:*** Contents: Foreword by Yasunari Kawabata (winner of the Nobel Prize for literature in 1968). Foreword: The tea ceremony and kaiseki by Sôshitsu Sen (head of the Urasenke School of Tea and the 15th generation descendent of Sen no Rikyu, founder of the school). Utensils and Kaiseki by Seizô Hayashiya (chief curator of the Ceramics Department at the Tokyo National Museum). The twelve months of kaiseki. The kaiseki courses (defines and describes each course, such as Mukôzuke, Misoshiru [pages 168-71 give a fine description of miso and miso soup], Wanmori, Yakimono, Azukebachi, Hassun, etc.). Postscript. Notes on utensils. List of recipes. Glossary: Includes descriptions of miso, natto (incl. *Daitokuji-nattô,* p. 66), shoyu, tofu, and yuba, plus azuki and Dainagon-azuki, many types of wheat gluten (fu), kuzu, mochi, sea vegetables (konbu, nori, wakame), fresh-water algae (Kamogawa-nori, Suizenji-nori {= Kotobuki-nori}), and umeboshi.

This is a magnificent, beautiful book, the finest work available on Japan's highest form of haute cuisine, Tea Ceremony Cuisine, by a great Japanese Kaiseki chef. It was first published in Japanese by Tan-kôsha Inc. of Kyoto. Soyfoods are used throughout the book–especially miso, since one of the fixed courses in a kaiseki meal is miso soup (*misoshiru*). Many recipes use soy sauce, often the light colored type, usukuchi. Most recipes are shown in an accompanying full-color photo. The tea ceremony was developed at the court of the shogun in late Ashikaga times under such men as Soami, and his father and grandfather, Geiami (1431-1485) and Noami, who were painters, landscape gardeners, and poets in Kyoto. The greatest of the tea masters, under whom the tea ceremony (*chanoyu*) took final shape, was Sen no Rikyu (1521-1591). Zen preached the importance of the simple, uncluttered life. As a Zen priest and tea instructor, "Rikyu believed that amid the solitude of calm withdrawal from worldly cares sought by those who practice *chanoyu,* there should exist an element of creativity that leads to the serene enjoyment of beauty. The heart of this creativity, according to Rikyu's Zen aesthetics, lies in the careful avoidance of the trite, the obvious, and the emphatic. Beauty has its most powerful effects when it arises from suggestion and restraint...

"Centuries ago, it was a rule that Zen priests ate only two regular meals a day–morning and noon. But since the priests engaged in rather strenuous work, by evening they were often hungry, and to assuage this hunger they would eat a light meal, which was called *yakuseki* ('hot stones'). This term came from the practice of putting heated stones inside their clothing, by which the priests staved off hunger and cold during long sessions of meditation. When the tea masters developed the custom of serving a meal during the tea ceremony, they called it *kaiseki* ('breast stones'). By evoking the image used in the Zen term, they seasoned their specialty with religious connotations."

Soy-related recipes include: Miso soup (with aonorifu, azuki beans, and mustard, p. 29, plate 1, at Opening, the first of the 12 kaiseki months). Miso soup (with sesame custard, ginkgo nuts, and mustard), and Mukôzuke (with yuba and bonito flakes, p. 41, plate 9, at Evening). Miso soup (with wakanafu, kampyo [kanpyo], and mustard), and Azukebachi (hot dish, with sea cucumbers boiled in saké and mirin, boiled yuba, citron peel garnish, p. 53, plate 17 & 22, at New Year's). Miso soup (with Sanshu miso, roasted momen bean curd [grilled tofu], and black [soy] beans), and Hassun (with natto wrapped in sea bream fillets, and miso-pickled chisha stems, p. 65-66, plate 25 & 31, at Spring).

Note. This is the earliest English-language document seen (April 2013) that contain the term "roasted momen bean curd;" it refers grilled tofu.

Miso soup (with icicle radish, temarifu, and mustard), and Azukebachi (hot dish, with octopus boiled in saké, and yuba, garnished with Japanese pepper, p. 77, plate 33 & 36, at Doll Festival). Miso soup (with yuba, warabi fern shoots, and mustard, p. 89, plate 41, at Flower Viewing). Miso soup (with walnut custard, trefoil, and mustard, p. 101, plate 49, at Brazier). Miso soup (with eggplants, bamboo shoots, and mustard) and Wanmori (abalone and bean curd custard, chisa leaves [a variety of lettuce], and grated ginger, p. 113, plate 57 & 59, at Off Season). Miso soup (with Sanshu miso, shiratamako, junsai) and Wanmori (with yuba and egg custard, asauri, and wasabi, p. 125, plate 65 & 68, at Morning). Miso soup (with Sendai and Sanshu-miso, koimo, and hojiso), and Yakimono (with deep-fried eggplant slices coated with white miso and broiled), and Hassun (broiled burdock wrapped in yuba, and deep-fried green peppers, p. 137-38, plate 73 & 76, at All Soul's Day). Miso soup (with namafu, shirouri, and mustard), and Azukebachi (hot dish, with deep-fried dumplings of bean curd and hamo {sea/conger eel}, and broiled eggplants), and Hassun (with abalone cooked in saké and miso, soy beans in the pod [green vegetable soybeans] p. 149-50, plate 81, 85 & 86, at Moon Viewing). Miso soup (with koimo, zuiki, and sesame seeds), and Mukôzuke (with abalone, bean curd, and sesame seeds), and Wanmori (with boiled pine mushrooms and bean curd, nori, citron peel, p. 161, plate 89 & 92, at Closing).

Interesting Glossary entries: (1) *Daitokuji-nattô,* a "variety to which extra salt has been added, from the Daitokuji temple in Kyoto where it was first made as a preserve to be eaten in times of famine." (2) "*Fu* is the general name for a light cake make of wheat gluten. The two basic types of this cake are uncooked (*namafu*) and baked (*yakifu*). The names that precede the suffix refer to what has

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been added to the gluten, the shape of the cake, or the area famous for a certain kind of cake. *Aonorifu* is baked and contains *Aonokiro. Chôjifu* is made long (=*cho*-) and cut to fit the bowl. *Daitokujifu* is fried cake that originated from the Daitokuji temple in Kyoto. *Temarifu* is a cake in the shape of a child's ball (=*temari*). *Wakanafu* contains several kinds of young greens (=*wakana*) that give it a fresh springlike color."

Note: This is the earliest English-language document seen (Nov. 2011) that uses the term *Daitokuji-nattô* (with a diacritical mark above the o -> ô, and hyphenated) to refer to this Japanese type of "fermented black soybeans." Address: Kyoto, Japan.

5895. Uemura, Teijiro. 1971. Historical introduction [to the biochemical and industrial aspects of fermentation in Japan]. In: K. Sakaguchi, T. Uemura, and S. Kinoshita, eds. 1971. Biochemical and Industrial Aspects of Fermentation in Japan. Tokyo: Kodansha Ltd. See p. 1-8. [Eng]
Address: Former Prof. of Applied Microbiology, Univ. of Tokyo.

5896. U.S. Department of Agriculture. 1971. The annual report on activities carried out under the Public Law 480, 83d Congress, as amended, during the period January 1 through December 31, 1970. Washington, DC: U.S. Government Printing Office. 132 p. See p. 113-20. Cover reads: Food for Peace: 1970 Annual Report on Public Law 480.
• ***Summary:*** Table 19 is titled "Title II, Public Law 480–Total commodities by program sponsor, fiscal year 1970." The main program sponsors and distributing agencies, listed alphabetically, are AJJDC (American-Jewish Joint Distribution Committee), CARE, CRS (Catholic Relief Service), CWS (Church World Service), LWR (Lutheran World Relief), SAWS (Seventh-day Adventist World Service), UNICEF, UNRWA (United Nations Relief and Works Agency), WFP (World Food Program). Each of these are Private Voluntary Organizations (PVO/PVOs), registered with USAID. Only two foods containing soy protein were distributed: CSM (Corn soya mix) and WSB (wheat soya blend). They were sent in the following amounts (in thousands of pounds) to the following continents and countries: Africa (50,362 CSM and 6,087 WSB): Cameroon (82 CSM), Ghana (1,104 CSM and 201 WSB), Malagasy [Madagascar] (425 CSM), Malawi (61 CSM), Nigeria (41,343 CSM and 5,886 WSB), Rwanda (200 CSM), Senegal (5,301 CSM), Sierra Leone (699 CSM), Tanzania (887 CSM), Togo (260 CSM).

Near East-South Asia (192,116 CSM and 2,504 WSB): Ceylon (50 WSB), Gaza [occupied by Israel since 1967] (814 CSM and 1,892 WSB), India (189,044 CSM and 105 WSB), Jordan (680 CSM), Jordan-West Bank [occupied by Israel since 1967] (1,110 CSM), Lebanon (160 CSM), Pakistan (457 WSB), Syria (308 CSM).

East Asia (21,530 CSM and 451 WSB): Hong Kong (384 CSM and 100 WSB), Indonesia (9,245 CSM and 150 WSB), Korea (4,586 CSM), Laos (275 CSM), Malaysia (220 CSM), Philippines (1,545 CSM and 201 WSB), Ryukyu Islands [located south of Japan, incl. Okinawa, Sakishima, and Amami island groups. Self governing from 1966. Returned to Japan in 1972] (50 CSM), Vietnam (5,225 CSM).

Latin America (53,761 CSM and 2,305 WSB): Antigua (37 CSM), Bolivia (555 CSM and 173 WSB), Brazil (29,919 CSM and 506 WSB), British Honduras [Belize] (225 CSM and 20 WSB), Chile (1,726 CSM and 151 WSB), Costa Rica (679 CSM and 100 WSB), Dominica (23 CSM), Dominican Republic (7,429 CSM and 105 WSB), Ecuador (1,295 CSM), El Salvador (836 CSM and 200 WSB), Grenada (114 CSM), Guatemala (1,944 CSM), Guyana (72 CSM), Haiti (1,010 CSM), Honduras (674 CSM), Jamaica (208 CSM and 100 WSB), Montserrat (18 CSM), Panama (765 CSM and 450 WSB), Paraguay (491 CSM and 400 WSB), Peru (5,842 CSM and 100 WSB), St. Kitts (59 CSM), St. Lucia (69 CSM), St. Vincent (30 CSM), Uruguay (81 CSM).

Grand total by commodity: 317,769,000 lb of CSM and 11,347,000 lb of WSB. Agencies distributing the most CSM and WSB (in million lb): CARE 180, CRS 68, UNICEF 42.

Countries receiving more than 1 million lb of CSM and WSB combined (in millions of pounds): India 189.1, Brazil 30.4, Indonesia 9.3, Dominican Republic 7.5, Peru 5.6, Vietnam 5.2, Korea 4.6, Guatemala 1.9, Chile 1.8, Philippines 1.7, Ecuador 1.3, Jordan-West Bank 1.1, Haiti 1.0.

Concerning "veg oil" (soybean oil) shipped under P.L. 480 Title II in fiscal year 1970: India received 54.227 million lb [24,597 metric tons] (p. 116). Address: Washington, DC. Phone: 703-875-4901 (1991).

5897. Watanabe, Tokuji; Ebine, Hideo; Ohta, Teruo. eds. 1971. Daizu shokuhin [Soyfoods]. Tokyo: Korin Shoin. 271 p. Illust. Index. 22 cm. [134 ref. Jap; eng+]
• ***Summary:*** This is the best book published to date on soyfoods in Japan; however it is written in Japanese. Contents: 1. Classifications and varieties of soybeans (p. 1). 2. Physical characteristics of soybeans (p. 5). 3. Chemical characteristics of soybeans (p. 9). 4. Standards and methods of examining soybeans (p. 47). 5. Special characteristics and problems of using soybeans for food (p. 53).

6. Current status of the soybean industry in Japan (p. 63). 7. Soymilk and various types of tofu: Aburage (deep-fried tofu pouches), ganmodoki (deep-fried tofu burgers), kôri-dofu (dried frozen tofu), soymilk, and yuba (p. 75). 8. Fermented soyfoods: Natto (p. 123-40), shoyu (p. 141-67), miso (p. 168-95), fermented tofu (*rufu*) (p. 196-202). 9. Other soyfoods: Kinako (p. 203-04), soy sprouts or moyashi (p. 206-08), tempeh or tenpe (p. 209-17). 10. Quality and usage of defatted soybeans (*dasshi daizu*) (p. 219).

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11. New food uses of soybeans and especially defatted soybeans (incl. 70% soy protein powder, soy protein curds, soy protein isolate, surimi gel, spun soy protein fibers) (p. 229). 12. Advice regarding supplying protein from organizations such as the United Nations and FAO (p. 257).

A 47-page translation of portions of this book (parts of Chapter 6 and all of Chapter 7) by Akiko Aoyagi and Chapters 8.1 and 8.2 by Alfred Birnbaum are available at Soyfoods Center.

Tokuji Watanabe was born in 1917. Hideo Ebine was born in 1921. Teruo Ota was born in 1926. Address: National Food Research Inst., Tokyo.

5898. Watanabe, Tokuji; Ebine, Hideo; Ohta, Teruo. eds. 1971. Nattô [Natto]. In: Tokuji Watanabe, H. Ebine and T. Ohta, eds. 1971. Daizu Shokuhin [Soyfoods]. Tokyo: Korin Shoin. 271 p. See p. 123-38. [5 ref. Jap; eng+]

• ***Summary:*** An excellent scholarly work. This chapter was translated by Alfred Birnbaum. Chapter 8, titled "Fermented soyfoods," has four parts, beginning with "Natto."

Introduction: There are two types of natto: regular natto (*itohiki natto*), produced by the action of natto bacteria on cooked soybeans, and salty natto (*shio-natto*), produced by letting a koji mold [*Aspergillus oryzae*] grow on the cooked beans [to make soybean koji], then adding salt water. Although both are traditional fermented soyfoods that have been passed down in Japan from ancient times, the fermenting agent, production method, and nature of each product are different. The main fermenting agent for regular natto is bacteria and, as no salt is added to the basic ingredients as with salty natto, the ripening time is shorter, although the finished product does not keep well. Also regular natto has the characteristic of forming large amounts of sticky filaments. We will discuss salty natto separately.

At present, the production of regular natto is by far the larger of the two, being carried out in all regions of Japan; this product is better known and is usually referred to as simply "natto."

8.1.1 Regular natto (*itohiki nattô*)*:* (a) The history of natto: The origins of natto are not certain, but tradition has it that it was discovered some 1,000 years ago in the Tôhoku [northeast] region of Japan and has been passed down to the present. At first it was made by wrapping cooked soybeans in rice straw, but since 1920, when Dr. Hanzawa of Hokkaido's Agriculture Department first succeeded in producing pure-culture bacteria, industrialized production has been carried out as it is today using this pure culture. Whereas formerly, when natural fermentation dependent on the natto bacteria found in the rice straw meant instability of production levels and many questions of sanitation, this new method has become the basis for today's comparatively safe industrialized natto production.

(b) Regionality of natto consumption: Before World War II, consumption of natto was confined almost exclusively to the Tôhoku region (northeast prefectures) and further north, though recently it has spread throughout Japan. This tendency is most noted in the cities, which are now areas of large consumption. For example, looking at the cities listed by prefecture in the Tables of National Consumption, we find that in 1968 the average amount per capita spent that year on natto was highest in Sendai at 967 yen, followed by others such as Sapporo 719 yen, Fukushima 915 yen, Mito 871 yen, Tokyo 489 yen, Nagoya 177 yen, Kyoto 183 yen, Osaka 98 yen, Hiroshima 139 yen, Matsue 144 yen, Matsuyama 78 yen, and Fukuoka [the furthest south, in northern Kyushu] 217 yen, the national average being 343 yen. While there exist many large differences between the various in money spent, we can see clearly that the consumption of natto has spread nationwide.

8.1.2 Natto bacteria and their characteristics: Although natto has a history of some 1,000 years, the history of bacteriological research on the bacteria that produce natto amounts to less than 100 years. The oldest bacteriological study on natto-producing bacteria in Japan is thought to be Yabe's report in the 15th issue of the *Journal of the Japanese Chemists' Society* (1895) that he had succeeded in isolating several strains of bacteria from natto.

From that time on, much research was carried out on natto bacteria, but it was not until 1906 that Sawamura successfully isolated from those natto bacteria a bacterium which, when recultured on cooked soybeans, would consistently produce the characteristic sticky filaments and flavor of natto. Upon researching the morphological and propagative characteristics as well as the physiological makeup of this bacterium, he found it to be very similar to *Bacillus mesentericus* and named the new strain *Bacillus natto* Sawamura. This research ascertained that natto is produced solely by the fermenting action of the natto bacteria. The bacteriological characteristics of this strain are shown in Table 8.1.

However in the 6th edition (1948) of *Bergey's Manual of Determinative Bacteriology* recognized the world over as the authoritative classification of bacteria, *B. natto* Sawamura is listed under *B. sublitis,* whereas the 7th edition fails to list it at all. In other words, as far as Bergey's classification is concerned a sub-strain of *B. subtilis* is responsible for natto fermentation. Be that as it may, culturing any of the bacteria which closely resemble *B. natto,* such as *B. subtilis, B. cereus, B. megaterium,* or *B. mycoides,* on cooked beans fails to produce a product of natto's sticky filaments and flavor.

The choice of strains to be actually used in producing natto is carried out by testing which successfully produce a natto with characteristic filaments and fragrance. Moreover, common to all natto bacteria chosen in this way are found to be certain marked differences from other *B. subtilis* strains. For example, while natto bacteria can neither germinate nor grow without biotin, other strains of *B. subtilis* can. Further, while a bacteriophage that dissolves natto bacteria has been

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discovered, this bacteriophage has no effect on other strains. Judging from evidence such as this even if natto bacteria were to be classified under *B. subtilis,* for all practical purposes they are clearly a bacterial group having special characteristics distinct from other *B. subtilis* strains.

8.1.3 Natto bacteria growth and soybean composition: Natto bacteria grow well on cooked soybeans of course, but they also grow well on other beans, and other foodstuffs of plant origin such as grains. They can even grow on animal foodstuffs such as meat, fish, and dairy products. However, growth on plant protein is greater, as is the production of sticky filaments. As exhaustive research has been carried out on the composition of nutrients needed for the germination and growth of natto bacteria, and those nutritional requirements are now clear. The result was that natto bacteria use sugars, particularly dextrose, sucrose, glucose, etc. as sources of carbon, and that sucrose was necessary not only for bacterial growth, but also for the production of the sticky filaments. Soybeans are approximately 20% of carbohydrate in composition, some 30% of that being sucrose, enough for the growth of natto bacteria.

Protein, that is to say amino acids, are used as nitrogen sources. Of these amino acids, natto bacteria find glutamic acid, arginine, aspartic acid, proline, etc. easy to utilize whereas threonine, tryptophane, phenylalanine, methionine, etc. are comparatively difficult. However of the amino acids composing the soybean's protein, that former group of amino acids readily utilized by natto bacteria is in greater abundance than the latter less readily utilized ones such as methionine and tryptophan. Though not solely for this reason, it is nonetheless true that natto bacteria grow better on a culture medium of glycine, the soybean's major protein, as a nitrogen source than on a culture medium of milk casein.

In regard to vitamins, natto bacteria require biotin, any culture media lacking in biotin being incapable of causing spore germination or growth of the nutrient cell (*eiyo saibo*). Though certain bacteria classified as belonging to the same genus, such as *B. subtilis, B. megaterium,* and *B. cereus,* do not require biotin, besides *B. natto* such other members of the *Bacillus* family such as *B. mycoides, B. pumilus,* and *B. coagulans* do not require biotin, while the absolute minimum density of biotin necessary for natto bacteria growth is 0.18%, complete growth requires at least 18%. Other vitamins particularly the B group, are useful in creating a suitable growing medium for natto bacteria, and as shown in Table 8.2, soybeans contain biotin sufficient not only for the germination of natto bacteria spores, but also for the propagation of the nutrient cell, thus eliminating any need for adding biotin in the production of natto.

8.1.4 Natto bacteria growth and environment: Beyond a doubt the single most important thing in the production of natto is to allow the natto bacteria to grow fully on the cooked soybeans, however in order to achieve this, it is also important to know what environmental conditions are most conductive to the germination and propagation of natto bacteria. In the production of natto, the natto bacteria used are in the forms of spores, either in a liquid cells (*eiyo saibo*) and finally proceed into cell division.

The optimum temperature for natto bacteria spore germination is approximately 40ºC, most spores having germinated and begun propagation within 2 hours on a peptone-glucose culture medium, though at 50ºC the germination is rather slow, and at 55ºC and above no germination can be found within a 24 hour period.

Tables show: 8.1 Propagative and physiological characteristics of *Bacillus natto* Sawamura. 8.2 Vitamins in soybeans (per 100 gm). Continued. Address: National Food Research Inst., Tokyo.

5899. Watanabe, Tokuji; Ebine, Hideo; Ohta, Teruo. eds. 1971. Hamanattô [Hamanatto]. In: Tokuji Watanabe, H. Ebine and T. Ohta, eds. 1971. Daizu Shokuhin [Soyfoods]. Tokyo: Korin Shoin. 271 p. See p. 123, 139-40. [Jap; eng+]
• ***Summary:*** An excellent scholarly work. This subchapter was translated by Alfred Birnbaum. Chapter 8, titled "Fermented soyfoods," has four parts, beginning with "Natto."

Introduction: There are two types of natto: regular natto (*itohiki natto*), produced by the action of natto bacteria on cooked soybeans, and salty natto (*shio-natto*), produced by letting a koji mold [*Aspergillus oryzae*] grow on the cooked beans [to make soybean koji], then adding salt water. Although both are traditional fermented soyfoods that have been passed down in Japan from ancient times, the fermenting agent, production method, and nature of each product are different. The main fermenting agent for regular natto is bacteria and, as no salt is added to the basic ingredients as with salty natto, the ripening time is shorter, although the finished product does not keep well. Also regular natto has the characteristic of forming large amounts of sticky filaments. By comparison, salty natto requires that the koji-molded soybeans ripen in saltwater, the main fermenting agents being the koji mold in the beginning, and yeasts and lactic acid bacteria towards the latter end of the process. As the amount of salt present is high, the ripening time required is comparatively long, taking ordinarily from several months to about a year. Salty natto is usually sold as a blackish, semi-dried product, with absolutely no formation of sticky filaments, but rather with a distinctive flavor derived from the addition of the salt and other seasonings. The large amount of salt used also makes it keep well.

At present, the production of regular natto is by far the larger of the two, being carried out in all regions of Japan; this product is better known and is usually referred to as simply "natto." On the other hand, salty natto is produced as the specialty product of such specific places as Kyoto (*Daitokuji nattô*), Nara (*Jofukuji-nattô*), and Hamamatsu (*Hama-natto*) (p. 123).

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8.1.9 Hama-nattô: Hama-natto is a variety of salty natto made in and around Hamamatsu in Shizuoka prefecture. It is unrelated to regular (*itohiki*) natto except that both are fermented soy products. Rather, it is closer to miso. It is said that the first true production of Hama-natto dates from the time when Tokugawa Ieyasu became the lord of Hamamatsu Castle [1568] and wrote instructions to the monks of the nearby Daifukuji temple.

(a) Production method: The basic ingredients are 100 kg soybeans, 9.2 kg wheat or barley flour, 18 kg salt, 7.5 kg of ginger, and koji starter. Large-seeded soybeans, such as those from the Orani region of Hokkaido or Tsuru-no-ko are used. The wheat or barley is roasted then ground to a no. 85 mesh or finer flour. The ginger is thoroughly washed, thinly sliced, and pickled in shoyu [Japanese soy sauce].

Fig. 8.4 is a flow chart of Hama-natto production. First inspect the large soybeans for any extraneous matter or imperfect beans, then wash them thoroughly to rid them of any sand or dirt. Soak in water at 20ºC for 3-4 hours, then allow to drain for several hours. Steam for 5-6 hours at normal pressure, then leave overnight in the steaming vat. The next morning, spread out the beans and allow to cool to below 40ºC. Then mix in koji starter (*tané-koji*). Sprinkle the roasted flour on top of this and mix the entire mass well.

Spread the mixture evenly in wooden koji trays and place in a koji incubation room at 30-33ºC for approximately 50 hours to allow the growth of the koji mold. When the mold has grown sufficiently, remove the koji rays from the incubation room and allow to sun-dry outdoors until the moisture content of 30-35% at the time of removal from the room, falls to 20-25%, at which point place the mixture in wooden kegs or small vats. Add enough saltwater (or shoyu, which is occasionally used) to just cover the molded soybeans. Place a pressing lid and weight on top of the mixture, and allow to stand for 6-12 months as it ripens.

After the full fermentation is complete, spread the mixture out on a cloth to dry in the sun and mix in the pickled ginger, to make the final product.

Hama-natto is a simple food [or seasoning], dull blackish in color, but the flavor is deep and rich, and its nutritional value and storability are both excellent. Its percentage nutritional composition is shown in Table 8.10. Address: National Food Research Inst., Tokyo.

5900. Watanabe, Tokuji; Ebine, Hideo; Ohta, Teruo. eds. 1971. Nattô [Natto]. In: Tokuji Watanabe, H. Ebine and T. Ohta, eds. 1971. Daizu Shokuhin [Soyfoods]. Tokyo: Korin Shoin. 271 p. See p. 123-38. [Jap; eng+]

• ***Summary:*** Continued. The same is also true of 10ºC and below. Thus, the ideal temperature for the initial fermentation period of natto is approximately 40ºC, though in actual production practices the natto bacteria inoculation takes place at 80ºC and above. This is not only due to the fact that natto bacteria spores are highly resistant to heat and lose almost no germination strength at this temperature, but also because germination proceeds rather more effectively if the dormant spores are exposed for a short period of time to high temperature.

For example, if the spores are given a heat treatment of 100ºC for 10 minutes or 85ºC for 30 minutes, the germination rate goes up. Of course, once the heat treatment is completed it is necessary to reduce the temperature to the optimum germination temperature immediately. Loss of capacity for germination due to heat only at 100ºC for 30 minutes and above. Further, there is almost no lowering of the germination rate from low temperature, even at -20ºC for 1 year. Once germinated, however, the nutrient cell does not have the heat resistance of the spore = its optimum propagative temperature being 40-50ºC, it would die in 5 minutes at 100ºC. Further, while growth can be found at 50ºC and below on culture media with good nutritional conditions for natto bacteria, such as cooked soybeans, no growth can be found on media lacking those conditions. At 55ºC and above, growth almost stops, and at 20ºC and below, the growth rate drops to 1/10 or less of that at 40ºC.

Natto bacteria growth is also effected by hydrogen ion density. While natto bacteria propagate well in neutral to slightly alkaline pH, both germination and growth decrease with increased acidity, and severe harm occurs at pH 4.5 and below. Most cooked soybeans fall within the range of pH 6.4-6.8, and as ripening progresses they gradually become more alkaline, reaching pH 7.2-7.6 at the completion of their ripening process. Also, oxygen is needed for natto bacteria growth, yet though in actuality the density of carbon dioxide in the natto fermentation chamber sometimes goes over 15%, it has almost no effects on natto's ripening process.

8.1.5. Natto production: In the past, natto was made by wrapping cooked soybeans in rice straw and leaving them in a warm place, allowing the natto bacteria on the straw to transfer to the cooked beans and having them ferment until filaments formed, whereas today's natto uses pure cultured natto spores for inoculation and convenient sanitary containers, the temperature and moisture levels of the fermentation chamber being controlled by automatic regulatory equipment, typical of the many modernizations now applied. Natto production proceeds as shown in figure 8.1.

(a) Ingredient soybeans: up to 10 years ago, domestic medium-sized and small beans were used as ingredient soybeans for natto. Besides specifically small bean varieties, beans sorted out as small through a mesh called *"Banseki-shita"* were used; as shown in Tables 8.3 and 8.4, the compositional differences between different bean sizes of the same variety were small, whereas the differences in size distribution according to growing region were particularly notable. Both the Koganeshiro and Kitamishiro varieties shown in the tables produced a greater number of small bean soybeans when grown in the Kitami Region than in

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the Tokachi Region. Further, if one compares the relatively small weight per thousand beans Tokachi-nagaha and Koganeshiro varieties from the very same Tokachi Region, or even the Kitamishiro variety, there is no sharp difference in composition, nor even much difference in the complete sugars (zentô) (that portion of reduced sugars produced through hydrochloric acid hydrolysis) which greatly affect the qualitative value of soybeans used for natto.

Thus while the reason may not always seem clear why small beans are so highly regarded as ingredients for natto, upon thorough inquiry we find that small beans have a higher water absorbency, the cooked beans are easier to make natto from, that production proceeds more smoothly, and finally, the small beans are easier to eat.

Compositional differences between soybeans are clearly reflected in quality, much as in the last 10 years we have seen a move from using domestic Japanese soybeans to using those imported from China, to where now 80% of all soybeans used for natto production are Chinese soybeans. Although one might cite the nationwide rise in production technology levels as the reason, the main reason for this shift is that domestic soybean planting has decreased, making them a difficult to obtain ingredient priced far above imported soybeans.

Domestic soybeans contain more carbohydrates, especially the fermentable sugar, sucrose, than imported soybeans, the cooked beans having a better, more naturally sweet flavor. For this reason, natto bacteria propagate better, with excellent formation of sticky filaments, and the natto is generally easier to produce. Among imported soybeans, Chinese beans are preferred, American beans being said to be difficult to make natto with, though it not the case that American beans have been found unconditionally not suitable for natto, but rather that they have not been used because American soybeans have not yet been thoroughly studied. Among Chinese soybeans, Manchurian small bean varieties are preferred, such other varieties as Jingshanpu, Hulan, and Dengshou also enjoying some reputation. Certain small beans selected from those American soybeans imported for miso production are also used for natto.

(b) Selection and washing: The ingredient soybeans are first put into a sorting machine which removes extraneous materials, imperfect or damaged beans, and dirt and sand, and also performs the needed bean size sorting, though nowadays the soybean wholesaler has taken on the responsibility for this step. The selected soybeans are then washed at the natto factory to remove any sand and dirt on the beans' surface. This step utilizes the bean washing machine pictured in Figure 8.2 (photo).

(c) Soaking: After washing is completed, the soybeans are soaked in water to allow full absorption of moisture. The amount absorbed by soybeans is 1.2 to 1.5 fold, that is to say they become 2.2 to 2.5 times the weight of the soybean before soaking. In order to achieve this full absorption, a soaking of 24-30 hours at a water temperature of 0-5ºC, 16-20 hours at 10-15ºC, or 8-12 hours at 20-25º is necessary. A 200-400 L stainless steel or plastic-lined tub is used for the soaking container. Ordinary water may be used for soaking if it meets the standards for drinking water, though if the calcium hardness is 500 p.p.m. and above, softening the water with conditioning agents allows the beans to cook softer, and if the iron content is 5 p.p.m. and above, it is necessary to remove the iron to prevent a blackening of the cooked beans.

(d) Cooking: Almost all cooking is presently done in steam-trapping pressurized vats, 60 kg (4 *tô*) capacity, 70 kg (5 *tô*) capacity and 120 kg (6 *tô*) capacity vats being equipment in standard use. See Fig. 8.3 (photo of pressure cooker). Gradually, more and more stainless steel vats are coming into use. The newest vats are cylindrical with hand or electric-powered mechanisms for rotating the drum, thus not only eliminating any unevenness of cooking and facilitating removal of the cooked beans, but also occasionally allowing for the natto bacteria inoculation to occur in the vat with the following step of mixing accomplished by rotating the drum. In cooking, the pressure inside the vat is allowed to reach 1 to 1.5 kg/cm squared, and maintained at that level for 20-30 minutes, after which time the pressure cook is opened slightly to allow the pressure to fall.

(e) Natto bacteria inoculation and packing: The natto bacteria used is that sold directly from the specialist manufacturer of inoculant bacteria, available in either liquid or powdered form, though both contain approximately 1-10 x 10^7 natto bacteria spores per gram. Usually 5 gm of inoculant bacteria diluted in 3-5 liters of sterilized water is used per 60 kg of soybeans. The normal method of inoculation is to sprinkle the dilute bacterial solution or to pour it with a ladle over the cooked beans while they are still 80ºC or above.

Figures show: 8.1 Flowchart of natto production. Tables show: 8.3 Soybean characteristics by size and by growing region. The regions are: Koganeshiro: Tokachi, Kitami, Kitamishiro: Takachi, Kitami. Tokachi-nagaha: Tokachi. For each sub-region are given figures for large, medium, and small soybeans–15 in all. For each of the 15 soybean types, the following figures are given: Distribution by bean size (percentage; totals 100% for each region). Seed to coat ratio. Weight per 1,000 beans (gm) (ranges from 272 to 131). Water absorbency (%) after 8 hours, 15 hours, and 24 hours. Percentage of eluted solids (*yôshitsu kokei-bun*) after 24 hours. Note: Elution is a term used in analytical and organic chemistry to describe the process of extracting one material from another by washing with a solvent.

Table 8.4. Soybean composition by size and by growing region. The 3 regions and 5 sub-regions are the same as in table 8.2. For each of the 15 soybean types is given percentage of moisture, protein, fat, carbohydrate, ash, total sugars (zentô). Continued. Address: National Food Research Inst., Tokyo.

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5901. Watanabe, Tokuji; Ebine, Hideo; Ohta, Teruo. eds. 1971. Nattô [Natto]. In: Tokuji Watanabe, H. Ebine and T. Ohta, eds. 1971. Daizu Shokuhin [Soyfoods]. Tokyo: Korin Shoin. 271 p. See p. 123-38. [Jap; eng+]

• ***Summary:*** Continued. As soon as inoculation is completed, a standard measure of the cooked beans is immediately packed into containers. This packing step is the step lagging most behind mechanization in natto's production process. Although an automatic measuring and packaging machine to pack a standard measure of the cooked beans into containers without harm will no doubt be developed someday, at present this step is largely done by hand. One reason is that the containers used are specialized and of many types.

(f) Containers: The packaging containers for natto are made of straw, then wood sheets, man-made paper, polyethylene, high-density polyethylene (a kind of HDPE, *haizekkusu* = Hai-Zex, developed by Suzuki Chemical Co.), polystyrene, etc. alone or in combination. Although with straw and wood sheeting, there are problems of sanitation caused by the presence of many unwanted bacteria, the image of simplicity presented by such materials is well suited to a traditional food such as natto, and many consumers like such packaging. Thus, straw and wood sheeting are used, having been sterilized first.

(g) Fermentation chamber: Up until a few years ago, natto was made in insulated double-wall fermentation chambers, the temperature being controlled by charcoal fire or electric heat, and the moisture level being maintained by boiling water in the chamber, but since the development of automatic natto production equipment, natto can now be made without the constant care that was formerly required. The principle behind this change of improved insulation, thus accommodating and averaging of fermentation chamber interior temperature and moisture levels.

The natto bacteria on the cooked beans germinate around the optimum temperature of 40ºC. At this time, heat is not yet produced by fermentation, so a pilot light is used to prevent the chamber temperature from falling below 40ºC. Some 4-6 hours after placement in the chamber, a fermentative heat accompanying the natto bacteria preparation arises, and both the temperature of the product and of the chamber increase. The equipment is set so that cooling will come on during this time if the chamber temperature rises to 42-45ºC and above. Within approximately 6-8 hours, the product temperature climbs to 50-53ºC. After several hours at this temperature, the product temperature is cooled to external air temperature and fermentation is stopped approximately 14-18 hours after placement in the chamber. To prevent the moisture level in the fermentation chamber from reaching the dew point under the forced-air cooling, care is taken to prevent excessively moist air from being cycled into the chamber.

(h) Storage and transport: Once fermentation is completed, the natto is taken out of the fermentation chamber, cooled to 10ºC and below in a cooling chamber and then shipped. In case it is not to be shipped it is kept at 2-7ºC in a refrigeration room.

(i) Natto production results: The ingredient soybeans vary somewhat, but 100 parts soybeans will produce 220 parts cooked soybeans and 200 parts natto.

8.1.6 Compositional changes in the soybean during the natto production process: (a) Chemical change: As natto bacteria fermentation progresses the components of the soybean break down and its structure softens, thus making it easier to digest and absorb. Concerning the changes occurring throughout this period (as shown in Table 8.5), we find that among the carbohydrates, the complete sugars those reduced sugars released by 205% hydrochloric acid hydrolysis, decrease from the beginning to the middle of fermentation. From the start of heat production during the fourth hour of natto's fermentation when protein reduction begins to the completion of ripening at 16-18 hours, we find that nearly 60% of the protein has been changed into water soluble nitrogenous compounds, though only a relatively minor approximate 10% have been reduced to amino acids. The progressive stages of protein reduction are shown in Table 8.6. After the sixteenth hour at which natto's ripening is generally thought to be complete, there is an increase in ammonia production, bringing an increase in a distinct ammonia smell.

(b) Changes in soybean structure caused fermentation: Although the main changes in protein are as described above, the changes in soybean structures brought about by the action of natto bacteria are as in the summarized observations reported by Iguchi, et al. While both uncooked and cooked soybeans stained to a uniform brick color throughout by Millon's reagent (*miron shikiyaku*), it was clearly found that natto is broken down progressively from the outer surface, and on staining fat with Sudan III, both uncooked and cooked soybeans showed a distribution of fat globules of uniform size throughout the cell, but in natto's outer cells, the breakdown of the protein causes these fat globules to fuse together into large clusters. Further, in the outer surface of the soybean, it was shown that when the intercellular material breaks down the state of decomposition has begun.

Note: Sudan III is a lysochrome (fat-soluble dye) diazo dye used for staining of triglycerides in frozen sections, and some protein bound lipids and lipoproteins on paraffin sections.

Saio et al. have observed under the electron microscope the structural changes undergone by the embryonic leaf of the soybean during the natto production process, and according to their findings, the components of the soybean do not exist uniformly throughout the soybean; for example, the bean becomes natto the protein bodies themselves are broken up and fat droplets spill out into the intercellular areas, though upon staining with osmium tetroxide (*shisanka*

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osumiumu) stain it was found that the fat had already lost the ability to maintain a droplet state and had permeated the cellular structure itself.

8.1.7 Special components of natto: (a) Natto flavor: The flavor of natto being produced by natto bacteria fermentation, it is said that the main flavor comes from substances broken down from soybean proteins. As stated under the heading of Compositional Changes During Fermentation, the breaking down of soybean proteins under the action of natto bacteria turns 50-60% of those proteins into water soluble nitrogenous compounds, of which 10% are amino acids. Table 8.7 on the distribution and isolability (ability to be isolated) of the amino acids in natto shows that each amino acid is different and that glutamic acid, said to be directly related to flavor, has a isolability of 11%, with a rather strong 0.36 gm per 100 gm of natto. In addition, such other amino acids as threonine, tryptophan, leucine, valine, etc. have high isolability.

Organic acids are also related to flavor. As shown in Table 8.8, acetic and lactic acids are in abundance, although the same amounts are present in cooked beans. Those organic acids that increase in fermentation are butyric, propionic, and succinic (*kohaku-san*) acids, the production of butyric acid being greatest in rice straw-wrapped natto. Occasionally there will be a bitter taste or strong smell to natto, or a mold-like spotting on its surface, the bitter taste coming from a peptide having isoleucine at its nitrogen extremity, and the mold-like spotting often being a crystallization of tyrosine. Further, the main causal component of the unpleasant smell, commonly referred to as "lazy fragrance" (*fushoko*), is said to be isovaleric acid. That which known as the smell of natto is related to the presence of the above-mentioned ammonia, organic acids, fatty acids, etc., as well as to diacetyl (*jiasechiru;* IUPAC systematic name: butanedione or 2,3-butanedione). Diacetyl increases along with natto ripening, though it decreases with the storage of the final product. Note: Diacetyl is a natural by-product of fermentation.

Tables show: 8.5 Compositional changes in natto during fermentation (after 0, 4, 8, 12, 16, and 18 hours).

8.6 Morphological changes in nitrogenous compounds (percentage of dry material, percentage of total nitrogen) after 0, 4, 8, 12, 16, and 18 hours.

8.7 Amino acids in natto (per 100 gm) (total amino acid, gm), isolable amino acid (gm, isolability %).

8.8 Organic acids in natto (Kibara et al.) (After 0, 3, 6, 9, 12, 15, 16 hours of fermentation, and after 1 or 2 days of storage). For each time is given: Moisture (%), valeric acid (or pentanoic acid), butyric acid, propionic acid, acetic acid, levulinic acid (*reburin-san*), succinic acid (*kohaku-san*), lactic acid. Note: Formation of sticky filaments begins after 3-6 hours of natto fermentation. A strong smell is emitted after 2 days of storage. Address: National Food Research Inst., Tokyo.

5902. Watanabe, Tokuji; Ebine, Hideo; Ohta, Teruo. eds. 1971. Nattô [Natto]. In: Tokuji Watanabe, H. Ebine and T. Ohta, eds. 1971. Daizu Shokuhin [Soyfoods]. Tokyo: Korin Shoin. 271 p. See p. 123-38. [Jap; eng+]

• ***Summary:*** Continued. 8.1.8 Natto-related products: (a) Dried natto: Natto is either soaked in strong saltwater, or sprinkled with table salt and left for 15-20 hours, at which time it is spread out thinly in a container and sun-dried. If mechanical heat drying is to be used, a moisture-tight container through which dry air with less than 20% moisture and approximately 40ºC is circulated until the moisture in the natto reaches 8% or less. If the drying temperature exceeds 60ºC, flavor and coloration are affected unfavorably.

(b) Natto hishio: Rice koji and table salt are added to natto and weighted for 2-3 weeks until ripened. Kombu, ginger, dried daikon, and salt-pickled vegetables are sometimes also added. The usual ratio of natto to rice koji to salt is about 5:4:1.

(c) UNICEF Powder: The Japanese Ministry of Agriculture and Forestry's Food Research Center under request from UNICEF for 3 years starting from 1959 co-operated in research to develop a dried powder form of natto. It is a "predigested" high soy protein powder in which the soybean structure has been softened by a short fermentation by natto bacteria.

The product process is the same as for natto, except that its fermentation is cut short at 6-8 hours, it is then press-ground to noodle shape, the moisture level is reduced to 4% or less at a reduced atmosphere of 30mmHg or less, and finally ground finely in impact-type mills. The resultant product is a powder of light yellow color and comparatively low moisture sensitivity, it has no soybean smell but rather a light fragrance and delicate flavor, and has a relatively great storability. Table 8.9 compares the composition of UNICEF Powder and cooked soybeans. A biscuit containing UNICEF Powder was production- and taste-tested, with the result reportedly being that the failure rate was high for biscuits containing 30% or more of the powder, and that the taste was acceptable up to about 15%. A trial of these 15% UNICEF Powder biscuits was then run on school children to ascertain their taste acceptability over a 30 day period and it was found to be liked by all, regardless of grade level or sex.

Moreover, Kosuge (?), et al. succeeded in isolating a compound called tetramethylpyradine from natto, a compound with a strong ability for sublimation and whose smell at certain strengths greatly resembled that of natto; it is supposed that it is one component of the natto's fragrance. An illustration shows the chemical structure of tetramethylpyradine.

(b) Natto's sticky filaments: Natto's sticky filaments are living compounds made by the action of natto bacteria on the components of the soybean, mixtures of glutamic acid polypeptides and *furakuton* (?) of layered *furakutosu* (?).

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While the comparative amounts may fluctuate, the former is said to comprise 60-80% of the whole, strong filament formation being accounted for by the polypeptides and *furakutau* (?) contributing towards a normalized level of stickiness. In investigating these glutamic acid polypeptides, the surface of the natto was rinsed with approximately its volume of water, the resulting dilute fluid was then separated in a centrifuge, the lighter upper liquid of which was further passed into a cellophane membrane, and finally dropped into methanol, forming sticky particles whose molecular weight was approximately 15,000; Thus, it is estimated that these are clusters of some 100 molecules of glutamic acid.

It has been shown experimentally that these sticky filaments are made by natto bacteria working on L-glutamic acid. The glutamic acid that composes these sticky filaments includes D-shape glutamic acid, which comprises anywhere from 20-80% of it. The sticky filaments make up about 2% of the natto on a dry-weight basis, and at their most stable level have a pH of 7.2 to 7.4, though the stickiness becomes weaker at a greater alkalinity or acidity. For example, on flavoring natto for the eating, the addition of table salt, rather than of shoyu, will produce more filaments. The greatest reason for natto whose filament formation is weak is contamination by unwanted bacteria or by a natto bacteriophage, etc.

(c) Natto enzymes: Within each 1 gm of natto there are approximately 10 million natto bacteria which produce large amounts of enzymes. Of each type of enzyme, the strongest are those enzymes for breaking down proteins, and in particular, alkaline proteinase as has been crystallized by Mitake, et al. This crystalline proteinase shows the highest level of activity at pH 8.2 and at 55ºC, and though it is stable at pH 5-8, if the temperature rises to 55ºC and above it becomes unstable, and it is destroyed when heated for 10 minutes at 65ºC and above. Its digestive strength on casein is said to be stronger than that of commercial preparation *pankureachin* (?). Also, the action of such enzymes such as amylase, cellulase and lipase in natto are strong.

(d) Natto's nutritional and medicinal values: Natto enjoys the reputation of being high in nutritional value, perhaps the greatest reason given is that in a rice-centered diet like that of Japan, such soyfoods as natto are of great importance as protein sources. Though the main nutritional components are that of the soybean itself, as was previously stated in natto, the breakdown of the soybean structure and digestion of the protein are fairly accomplished, thus the digestibility is increased. According to the research of Hayashi et al., the digestion and absorption rate of white mice fed a diet of 68 parts white rice and 28 parts natto and 4 parts inorganic salt was 93.2% broken down compositionally to 86.8% protein, 89.8% fat, and 97.4% sugars, much higher than for cooked soybeans. In vitamins, a notable increase of vitamin B-2 to a level 5-10 times that before fermentation or approximately 1 mg per 100 gm of natto is found. Also, 30% of the vitamin B-1 inactivated during pressure cooking is reactivated during fermentation. Further, there is much discussion about the effects of the digestive enzymes stored in natto, however, we have not been able to locate any research as to whether these enzymes produce benevolent effects within the body. Although there is much tentative evidence and basic research to the effect that natto is helpful in the prevention and cure of such contagious diseases as dysentery and intestinal typhus, at present it is still uncertain among medical specialists whether natto can prevent food poisoning or intestinal ailments, or whether it is of value as a convalescent dietary food.

Table 8.9 shows: Comparative composition of cooked soybean powder and UNICEF's fermented soybean powder. Footnotes are given concerning: soluble nitrogen, total sugars, and total acids. Address: National Food Research Inst., Tokyo.

5903. *National Observer.* 1972. Guess who came to dinner and brought a soy-sauce factory? Japanese textiles loom nearer. Jan. 1.

• ***Summary:*** The Japanese are coming! With the dollar devaluation, many Japanese firms that used to export products to America are now building manufacturing plants here. Most intend to employ American labor. Recently the Walworth County [Wisconsin] board of supervisors voted 42 to 1 to allow construction of a $6 million Kikkoman soy sauce plant in the county. This will be "Kikkoman's only plant outside Japan, where the company has been making soy sauce for over 300 years." A photo shows two bottles of Kikkoman soy sauce next to a map of Wisconsin.

Note: This is the earliest document seen (Sept. 2008) that that announces Kikkoman's plans to build a soy sauce factory in the United States, or that mentions Walworth, Wisconsin, in connection with Kikkoman.

5904. Chico-San Inc. 1972. Chico-San Inc. products: A catalog of unique foods. P.O. Box 1004, Chico, CA 95926. 24 p. Revised Jan. 1972.

• ***Summary:*** The cover of this catalog is printed with dark brown ink on pea-green paper. A complex, circular orange-red spiral is above the title. Three sheaves of grain are across the bottom. Soyfoods imported from Japan include Lima Soy Sauce, Soybean Puree (Miso), and dehydrated miso. They also sell black [soy] beans.

Contents: Rice cakes is our bag. "How Chico-San guarantees Oriental-type, organically-grown brown rice." Wehah Farms is mentioned often in this article. Whole grains and flours. Cereals. Whole grain noodles. Beans. Specialties (incl. Yinnies / Ame). Seeds. Condiments. Sea vegetables. Dried foods. Beverages. Cosmetics. Dentifrice. Utensils. Recipes.

"Chico-San products have gained increasing acceptance throughout the country since their introduction in 1960." The

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booklet contains 11 pages of recipes (p. 13-23) including: Miso-sesame spread. Miso soup (p. 20). Address: P.O. Box 1004, Chico, California 95926.

5905. *SoyaScan Notes.* 1972. Chronology of Janus Natural Foods, macrobiotic and natural foods distributor in Seattle, Washington. And of Granum. 17 March. 1992. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1972 Jan.–Janus Foods Inc. is established at 712 Seventh Ave. South in Seattle, Washington, by George Gearhart and Blake Rankin, formerly of Spiral Foods. Some background: In 1969, while a student at UCLA, Rankin came in contact with Erewhon, Los Angeles. After graduation from UCLA he and several friends set up a small health food store in Victoria, BC, Canada. Then he spent 3 months in Boston, Massachusetts, living in a Kushi study house and working in an Erewhon warehouse. Back in Seattle, he worked at Spiral Foods, a wholesale operation that was an offshoot of Chico-San. Spiral Foods owned the O-Soba Noodle Nook in Seattle. Shortly after that he and George Gearhart, the proprietor, closed Spiral Foods and in Jan. 1972 opened Janus Foods as a macrobiotic and natural foods wholesale and distribution company. Tim Hartman was third of the original incorporators; all three men managed the company. It was successful. From opening day, Janus sold miso and shoyu, imported from Japan; they were among the company's best-selling products. Janus never owned a natural foods retail store or restaurant, and never sold foods retail from their warehouse.

1972 Sept.–Rankin leaves Seattle on a trip to Japan via Hawaii. He leaves Hawaii for Japan in March 1973. Erewhon had given Janus permission to buy natural foods (bearing the Erewhon label) directly from Japan, so in the spring of 1973 Rankin traveled and worked with Muso and Mitoku to set up the first shipments to Janus in Seattle. Janus probably never paid any royalties or fees directly to Erewhon. He leaves Japan in Sept. 1973. Then he goes to Nepal and India on a spiritual search. In late 1973 he returns to Seattle and works for Janus.

1973–Two directories show that "Janus Foods Inc." is still located at 712 7th Ave. South, Seattle, Washington 98104. They now sell tamari and miso and distribute products from Erewhon, Spiral Foods, Deaf Smith, Pure & Simple, Chico-San, and Arrowhead Mills.

1974 March 8–Janus (Gearhart, Rankin, and Hartman) hosts the meeting of the Natural Food Distributors in Seattle; 16 people representing 12 companies attended.

1974 July 19. By this date, Janus Natural Foods, Inc. is located at 1523 Airport Way South, Seattle, WA 98134. Tim Hartman is still a manager of the company and Rankin is present. The company now sells barley koji. The company now has a lovely sprout-like logo (designed by Frederick Walsh) and a new brand called "Verity," whose labels were also designed by Walsh. Soy sauce and misos were sold under the Verity label for a while starting before Sept. 1976.

1975–The three managers decide to rotate the presidency of Janus annually. Rankin became president and Hartman left the company before his turn came around. During 1974 and 1975 Rankin and Gearhart were working on miso production.

1976 Sept.–Rankin leaves Janus and returns to Japan where he works for Mitoku and studies calligraphy. A few days after his arrival in Japan he meets his future wife, Yoko. They later had two children, but separated in 1988 and eventually were divorced.

1977–Janus leaves its large warehouse on Airport Way.

1979 Month? (before summer) Janus goes out of business, under the management of George Gearhart.

1981–Rankin returns to Seattle and in January or February starts Granum (pronounced GRAH-num, not GRAY-num) as a distributor and importer for Mitoku macrobiotic food products from Japan. The Granum logo is designed by Frederick Walsh. As of 1985 Granum has a small retail store and a 10,000 square foot warehouse, both at 2901 N.E. Blakeley St., Seattle, Washington 98105. Expected 1985 gross is more than $500,000.

As of March 1992 Granum has more than doubled its business compared with 1985. Blake has remarried to Nancy and they have a 2-year-old son, Addison. George Gearhart now lives in the suburbs to the south of Seattle. He is a sales manager, but no longer works in the natural foods industry. Address: 712 7th Ave. South, Seattle, Washington 98104.

5906. Takeuchi, Tokuo; Hosokawa, N.; Yoshida, M. 1972. [Studies on the characteristics of proteolysate in soybean *miso* manufactured with enzyme preparation]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 50(1):21-29. Jan. [44 ref. Jap; eng]
Address: Food Research Inst., Aichi prefecture, Nishi-ku, Nagoya, Japan.

5907. Manabe, M.; Ohnuma, Shizuko; Matsuura, Shinji. 1972. Jôzô shokuhin-chû no keikô seibun ni kansuru kenkyû. II. Miso oyobi miso kôji no afuratokishin osen no yûmu ni tsuite [Studies on the fluorescent compounds in fermented foods. II. Tests on aflatoxin contamination of miso and miso-koji in Japan]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 19(2):76-80. (Chem. Abst. 81:167,973). [10 ref. Jap; eng]
• ***Summary:*** Studies were conducted to investigate whether or not miso and miso-koji in Japan contained aflatoxins. 108 samples of commercial miso, 33 of home-made miso, and 28 of miso-koji from almost all the prefectures of Japan were tested for their aflatoxin content. The results showed no aflatoxin on any of them. "But on the thin-layer chromatograms, 3 commercial misos, one home-made miso, and two miso-kojis showed aflatoxin-like fluorescent substances. The extracts of these aflatoxin-like substances

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were examined by the yolk sac test for their toxicity to the chicken embryo. The results however were all negative." Address: National Food Research Inst., Ministry of Agriculture & Forestry, Koto-ku, Tokyo.

5908. Yokotsuka, Tamotsu; Aonuma, T.; Mogi, K.; Fukushima, D.; Yasuda, A.; Watanabe, H.; Tsukada, N.; Arai, A. Assignors to Kikkoman Shoyu Company, Ltd. (Noda-shi, Japan). 1972. Method of preparing soy. *U.S. Patent* 3,647,484. March 7. 7 p. Application filed 27 Feb. 1969. 1 drawing. [1 ref]

• ***Summary:*** Soybeans in any form (incl. soybean meal), having a moisture content of 30-70% by weight, are steamed with saturated steam having a gauge pressure of not less than 1.8 kg per square cm for a short period of time, not to exceed 10 minutes, followed by rapid cooling to a temperature not to exceed 100ºC, are used as the starting material for the preparation of soy [sauce]. This method can provide soy of superior flavor and of high quality wherein the possibility of the formation of clouds [cloudiness] and precipitates when diluted and heated in its use does not occur, and can be carried out advantageously, on an industrial scale, with improved yield and good reproducibility. Address: 1. Higashikatsushikagun; 2. Kashiwa-shi; 3-8. Noda-shi. All: Japan.

5909. Aihara, Cornellia. ed. 1972. The *dô* of cooking (Ryorido). Vol. 1. Macroguide No. 13. San Francisco, California: George Ohsawa Macrobiotic Foundation. 109 p. Illust. No index. March. 25 cm.

• ***Summary:*** All recipes in this macrobiotic cookbook are numbered. Contains information on soy sauce and miso (p. 44-45). Soy-related recipes include: "Top of stove" casserole noodle soup (with "dry tofu" [dried-frozen tofu] and fried wheat gluten, p. 58). Fried whole wheat noodles (with seitan, p. 60). Homemade noodles with soup (and barley miso, p. 61). Onion miso (p. 62). Rolled cabbage with tofu (p. 63). Wheat gluten (p. 71, made from 10 cups whole wheat flour and 4 cups unbleached flour). Seitan (p. 72). Fresh wheat fu (2 versions). Serving recipes–boiled fu (p. 73). Fried fu–gluten cutlet. Shish kebab (with cooked fu, p. 73-74). Making tofu (at home using 3 cups soybeans and nigari, p. 75-76). Making nigari (p. 76). Quantity tofu preparation (using 10 lb soybeans). Okara or unohana (sauteed with soybeans and vegetables, p. 76). Tofu with kuzu sauce (p. 78). Fried tofu. Shinano-age (Fried tofu with buckwheat, p. 79). Kaminari Tofu (Thunder Tofu, p. 79). Nori-maki (Tofu rolled in nori, p. 80). Age-tofu (stuffed tofu, variation, p. 80-81). Miso salad dressing (p. 90). Bean sprout miso salad (p. 91; it is not clear what kinds of beans the bean sprouts are made from–probably mung beans). Gamodoki ([Ganmodoki] mock goose; p. 99-100).

Note 1. This is the earliest (and only) English-language document seen (April 2013) that contains the word *gamodoki* or the term "mock goose," both of which refer to deep-fried tofu burgers.

French bread made with gluten water (p. 104). Amazake is not mentioned. Some recipes call for chicken or fish as ingredients.

Note 2. This is the earliest cookbook seen (July 2005) that gives a recipe for making seitan, as follows: "1 T. [tablespoon] dark sesame oil. 1 T. minced gingerroot. 1-2 cups soy sauce. 5 cups cold cooked gluten. Heat oil in a sauce pan, add minced ginger (use only fresh ginger) and saute. The amount of soy sauce used depends upon how long you intend to store the Seitan. Use a larger amount of soy sauce for longer storing and refrigerating. Add soy sauce, bring to a boil, and drop in pieces of gluten. Cook on low heat for three hours, stirring frequently. Remove cover and continue cooking until excess liquid is absorbed and evaporated. Seitan is ideal as a seasoning in noodles au gratin, stews, cooked with vegetables, etc. It will keep for long periods of time in the refrigerator."

After Volume 2 of this series of four seasonal cookbooks was issued, Volume 1 was subtitled "Spring Cooking." Address: San Francisco, California.

5910. Ebine, Hideo; Matsushita, Zenichi; Sasaki, Hirokuni. 1972. Beikoku-san daizu no miso genryô toshite no tekisei hyôka (hoi) Sôgô hyôka [Evaluation of U.S. soybeans as raw materials for making miso (Supplement). Summary of evaluation tests]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 27. p. 132-36. March. Reprinted from Miso no Kagaku to Gijutsu No. 210. p. 21-24 (1971). [5 ref. Jap; eng]

• ***Summary:*** A test of 101 U.S. soybean varieties showed that those most suitable for making miso are Kanrich, Mandarin, and Comet. U.S. soybeans generally have much higher oil content and lower carbohydrate content than Japanese soybeans. Discusses the key points in evaluating the suitability of a soybean variety for making miso. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5911. Ebine, Hideo; Matsushita, Zenichi; Sasaki, Hirokuni. 1972. Beikoku-san daizu no miso genryô to shite no tekisei hyôka. III. Sentaku hinshu ni yoru chûkan kôgyô shiken [Evaluation of U.S. soybeans as raw materials for making miso. III. Miso manufacturing from screened soybean varieties in pilot plants]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 27. p. 118-31. March. Reprinted from Miso no Kagaku to Gijutsu No. 206. p. 16-28 (1971). [2 ref. Jap; eng]

• ***Summary:*** As a result of pre-screening, the soybean varieties Comet, Harosoy, M-1 (Kanrich), and Tsurunotamago (abbreviated as Tsuru were used for making miso in pilot plants). "White miso. light-colored salty miso, and red salty miso were made from whole soybeans and from

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soybean grits. The ability of the whole soybeans to absorb water was M-1 > Comet > Tsuru > Harosoy for light colored salty red miso and for red salty miso, and M-1 > Comet > Harosoy > Tsuru for white miso.

As for soybean grits, although the amount of solid matter lost during soaking and cooking is larger than for whole soybeans, the color of the cooked grits is brighter, resulting in miso of a beautiful color made from them, and the protein of cooked soybean grits is more susceptible to enzyme hydrolysis resulting in higher evaluation of their miso in a sensory / organoleptic test. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5912. Ebine, Hideo; Matsushita, Z.; Sasaki, H. 1972. Beikoku-san daizu no miso genryô to shite no tekisei hyôka. II. Daizu gurittsu ni yoru miso jôzô [Evaluation of U.S. soybeans as raw materials for making miso. II. Miso manufacturing from soybean-grits]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 27. p. 109-17. March. Reprinted from Miso no Kagaku to Gijutsu No. 203. p. 18-25 (1971). [7 ref. Jap; eng]
• ***Summary:*** Soybean grits were made from several dehulled U.S. soybean varieties (Dorman, Lee, Yelnanda, Harosoy, Hokkaido, and Clark) using two different dehulling machines. Large grits were preferred and the Weston Moisture Meter gave the best results. When using grits, 13% of the water soluble dry matter was lost in the water during soaking and steam cooking–twice as much as with whole soybeans. The main losses were from water-soluble sugars (6.1%) and protein (3.9%), both of which cause miso color formation.

When the grits were grits were soaked in water before cooking, the color of the cooked grits and of the miso made from them was "bright and beautiful." The loss of dry matter was the main problem. Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5913. Hashiba, H. 1972. Non-enzymic browning of soy sauce. Comparison of the browning of soy sauce with that of a sugar-amino acid model system. *Agricultural and Biological Chemistry* 36(3):390-97. March. [6 ref] Address: Noda Inst. for Scientific Research, Noda-shi, Chiba-ken, Japan.

5914. Hashizume, Kazumoto; Umeda, Keiji; Watanabe, Tokuji. 1972. [Effect of ionizing radiation on soybean protein. I. Effect of cathode ray radiation on frozen denaturation]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 27. p. 151-54. March. [9 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 18(2):80-83 (1971). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5915. Hashizume, Kazumoto; Kakiuchi, Kinji; Koyama, Emiko; Watanabe, Tokuji. 1972. Denaturation of soybean protein by freezing. I. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 27. p. 155-65. March. [14 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 35(4):449-59 (1971). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5916. Ito, Hiroshi; Ebine, Hideo; Takeuchi, Yasuko. 1972. Miso no kôki seibun no kenkyû. V. Kihatsusan no gasu kuromatogurafii [Studies on the flavor of miso. V. Rapid gas chromatographic analysis of volatile acids]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 27. p. 137-41. March. Reprinted from Miso no Kagaku to Gijutsu 208:20-23 (1971). [10 ref. Jap; eng] Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5917. Nakano, Masahiro. 1972. Miso–One of the Japanese traditional fermented foodstuffs. Paper presented at the Fourth International Fermentation Symposium. 4 p. Held 19-25 March 1972 at Kyoto, Japan.
• ***Summary:*** On the front page, the following organizations are listed in both English and Japanese: (1) Nagano Miso Industrial Co-operative Association, No. 1014, Minamiagata-machi, Nagano-shi, Japan. Phone: 0262 (28) 1221. (2) Japan Miso Industrial Co-operative Association, Shinkawa 1-26-19, Chuo-ku, Tokyo. Phone: 03-(551)-7161.

Contents: Traditional foodstuffs. Japanese fermented foods. Definitions of miso and koji. Miso: Its prototype was introduced to Japan about 1,200 years ago, development into miso, the varieties of miso. Koji, Aspergillus oryzae, and enzymes. Period of fermentation and salt-resistant lactic acid bacteria. Miso soup. Per capita consumption of miso throughout Japan is now about 27-30 gm/day. Flow diagram for commercial production of rice miso, with amounts of each ingredient given. Table showing nutritional composition of five basic types of miso.

Note: This is the earliest document seen (March 2009) that gives basic information about commercial miso production. Address: Meiji Univ., Japan.

5918. Saio, Kyoko; Kajikawa, Masahiro; Watanabe, Tokuji. 1972. Food processing characteristics of soybean proteins. II. Effect of sulfhydryl groups on physical properties of tofu-gel. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 27. p. 142-50. March. [11 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 35(6):890-97 (1971). Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

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5919. *Soybean Digest.* 1972. The role of soybeans in Japanese festival. March. p. 38.
• ***Summary:*** "Soybeans are traditionally used in "Setsubun," a Japanese festival to welcome the arrival of spring and bring fortune. The occasion is marked with a soybean tossing ceremony at all Buddhist temples and Shinto shrines in Japan. The ritual is performed in the homes by tossing beans into corners of rooms and out of windows. A photo shows Scott Sawyers, American Soybean Assoc. Far East director, dressed in a formal kimono and holding a special wooden box of soybeans at the Hiye shrine. Priests blessed a selection of U.S. soybeans to be used in the upcoming rites.

90% of the soybeans imported to Japan come from the USA–this is 3 million metric tons, valued at more than $350 million.

5920. Tamura, Shinpachiro; Ishima, T.; Saito, S.; Miyauchi, T.; Tomita, F.; Yoshikawa, S. 1972. [Studies in the patterns of six tastes of twenty drinks in Japan]. *Shokuryo Kenkyujo Kenkyu Hokoku* (*Report of the Food Research Institute*) No. 27. p. 77-83. March. [3 ref. Jap; eng]
• ***Summary:*** "Taste patterns of 20 drinks in Japan were studied." A total of 10 points were assigned to each of "six taste components, namely, sweet, salty, sour, bitter, tasty, and astringent."

These drinks included miso soup and soy sauce soup (*sumashi-jiru,* a clear soup seasoned with soy sauce). A very interesting diagram showing these relationships appears on p. 80.

"The highest pattern similarity (0.996) was found between two kinds of green tea, namely 'sen-cha' and 'ban-cha,' and the lowest one was found between soysauce soup and coffee or Coca-Cola." Address: Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

5921. Hashimoto, Hikotaka; Yokotsuka, Tamotsu. 1972. [Studies on sediment of *shoyu* (Soy sauce). VI. Sediment forming activity in fermented raw *shoyu*]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 50(4):257-63. April. [9 ref. Jap; eng]
Address: Central Research Laboratories, Kikkoman Shoyu Co., Ltd., Noda, Chiba prefecture, Japan.

5922. Okuhara, Akira; Tanaka, T.; Saito, N.; Yokotsuka, T. 1972. [Color of soy sauce. VII. Oxidative browning]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 50(4):264-72. April. [12 ref. Jap; eng]
Address: Central Research Inst., Kikkoman Soy Sauce Co. Ltd., Noda-shi, Chiba prefecture, Japan.

5923. *Soybean Digest.* 1972. New TVP firm in Japan. April. p. 36.
• ***Summary:*** "General Mills, Minneapolis, Minnesota, announced that it has licensed a Japanese firm to produce textured vegetable protein foods. Takeda Chemical Industries Ltd., Osaka, a leading Japanese pharmaceutical and food company, and Yoshihara Oil Mill Co. will produce the new foods at a plant to be built in Osaka by Japan Soy Protein Co. Ltd., a joint venture of the two Japanese firms." The new company will make Bontrae type products.

5924. **Product Name:** [Textured Vegetable Protein (Frozen Spun Soy Protein Isolates)].
Manufacturer's Name: Takeda Chemical Industries Ltd.
Manufacturer's Address: Osaka, Japan.
Date of Introduction: 1972 April.
New Product–Documentation: *Soybean Digest.* 1972. April. p. 36. "New TVP firm in Japan." General Mills licensed the Bontrae process to Takeda.

5925. Yasumatsu, Katsuhara; Toda, J.; Wada, T.; Misaki, M.; Ishii, K. 1972. Studies on the functional properties of food-grade soybean products. Part III: Properties of heat-coagulated gels from soybean products. *Agricultural and Biological Chemistry* 36(4):537-543. April. [9 ref]
• ***Summary:*** "Food-grade soybean products have various functional properties, such as emulsification properties, whipping properties, dough forming properties, gel forming abilities and so on."

It is already known that soybean protein has the ability for form a gel. For example, "tofu' (soybean curd) is a kind of Ca-coagulated gel of soy protein." There are also "heat-coagulated gels."

Note: This is the earliest English-language document seen (June 2009) that contains the term "food-grade soybean" (or "food grade soybean")–perhaps as a synonym for vegetable-type soybeans. Address: Food Research Labs., Food Products Div., Takeda Chemical Industries Ltd., Osaka, Japan.

5926. Yasumatsu, Katsuhara; Toda, J.; Kajikawa, M.; et al. 1972. Studies on the functional properties of food-grade soybean products. I. Classification of soybean products by their chemical constituents and protein properties. *Agricultural and Biological Chemistry* 36(4):523-31. April. [17 ref]
• ***Summary:*** Chemical analyses of 43 commercial soybean products were conducted. Figures show: (1) Chemical composition of these commercial products. The horizontal axis shows content of chemical constituent. The vertical axis shows the number of products. (2) Protein properties of commercial products, including: Water dispersible nitrogen. Amount of native protein. Dispersible nitrogen in 3% NaCl. Dispersible nitrogen in acetic acid. Dispersible nitrogen in pH 2.0 solution. Dispersible nitrogen in pH 11.08 solution. Dispersible nitrogen in phosphatase, pH5.

"The principal component analysis was applied to correlation matrix among chemical constituents." "The same

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procedure was applied to correlation matrix among protein properties."

"Discussion: Food-grade soybean products are generally classified according to their processing method or protein contents. They are usually designated as soy flour, soy protein extract, soy protein concentrate and soy protein isolate, in order of increasing protein contents." A brief description of how each is made and its typical protein content is given. "Soy protein extract consists of water extractable components of defatted soy flour. This is produced by drying the so-called soy-milk."

Note: This is the earliest English-language document seen (June 2009) that contains the term "food-grade soybean" (or "food grade soybean")–referring to edible soy products. It is also the earliest English-language document seen (July 2009) that contains the term "food-grade soybean products" (or "food grade soybean products"). Address: Food Research Labs., Food Products Div., Takeda Chemical Industries, Ltd., Osaka, Japan.

5927. Farmilant, Eunice. 1972. Macrobiotic cooking. New York, NY: New American Library. 224 p. Foreword by Herman Aihara. May. Index. 18 cm. [31 ref]
• ***Summary:*** This pocketbook has a color (beige) photo on the cover of ears of wheat, one wooden spoon filled with soybeans and one filled with unpolished rice. It is "A basic introductory guide to cooking and eating the macrobiotic way." The author's interest in macrobiotics began in April 1968. Basic information on soyfoods (especially miso, tamari, and tofu) is given on pages 29, 33-38, 213-14. Soy-related recipes include: Wheat berries and black beans (i.e. black soybeans, p. 78). Sprouts (incl. soy sprouts, p. 82-83). Miso pickles (p. 124-25). Miso soup (p. 128-29). Cream of miso soup (p. 135). Black beans and wheat berries (p. 139).

There is an entire chapter on miso and tofu (p. 142-46) including: What makes miso so beneficial? Barley miso (nutritional analysis). Miso-vegetable stew. Miso-rice. Miso stew with vegetables. Miso-vegetable spoon bread. Homemade tofu (curded with fresh lemon juice).

Pizza–Macrobiotic style (with miso, p. 149). Chop suey (with tofu and miso, p. 151-52). Miso bechamel sauce (p. 159). Miso gravy. Simple tahini and tamari sauces (p. 160). Tempura dip (with tamari). Simple miso spreads (p. 161). Miso-vegetable spread. Miso-watercress spread.

There is a directory of macrobiotic stores and restaurants in the U.S. (p. 191-203, subdivided alphabetically by state, and within each state alphabetically by city). The following states have the following number of stores and restaurants: Alaska 1, Arizona 4, Arkansas 1, California 32, Colorado 4, Connecticut 18, District of Columbia 3, Florida 14, Georgia 7, Hawaii 2, Illinois 7, Indiana 2, Iowa 5, Louisiana 4, Maine 14, Maryland 7, Massachusetts 51, Michigan 12, Minnesota 3, Mississippi 2, Missouri 3, Nevada 1, New Hampshire 20, New Jersey 9, New Mexico 3, New York 61, North Carolina 5, Ohio 14, Oklahoma 3, Oregon 2, Pennsylvania 8, Rhode Island 5, South Carolina 1, Texas 4, Utah 1, Vermont 26, Virginia 4, Washington 3, Wisconsin 2.

There is also a directory of stores, restaurants, and centers outside the U.S. (p. 204-07, subdivided by country). The following countries have the following number of stores, restaurants, or centers: Australia 1, Belgium 2, Brazil 2, Canada 15, Denmark 4, France 29, Germany 1, Holland (Netherlands) 2, India 1, Italy 1, Japan 3, Portugal 1, Puerto Rico 1, Spain 1, Sweden 1, Switzerland 2, United Kingdom: England 13, Scotland 1, Vietnam 2.

A list of wholesale distributors in the U.S. (p. 208-09) includes Shiloh Farms (Route 59, Sulfur Springs, Arkansas; [Warren Clough]), Erewhon Trading Co. (8003 W. Beverly Blvd., Los Angeles, California 90048), Chico San Foods (1262 Humboldt Ave., Chico, California 95926), Erewhon Trading Co. (33 Farnsworth St., Boston, Massachusetts 02210), Deer Valley Farms (Guilford, New York 13780), Infinity Food Co. (171 Duane, New York, NY 10013), Mottel Foods (451 Washington, New York, NY 10013), Juniper Farms (Box 100, Sugar Loaf, NY 10981), Pioneer Specialty Foods (Fargo, North Dakota 58100), Merit Food Co. (Pill Hill Lane, Box 177, Bally, Pennsylvania 19503), Essene (58th & Grays Ave., Philadelphia, PA 19143).

5928. Machida, Yoshiro. 1972. Tanpaku shokuhin toshite no tôfu [Tofu as a protein source]. *Daizu Kaihatsu, Shokuhin Kaihatsu* (*Soybean Development, Food Development*). May. p. 1-4. [Jap]
Address: Sugiyama Industrial Chemical Research, Tokyo, Japan.

5929. Nakano, Masahiro. 1972. Synopsis on the Japanese traditional fermented foodstuffs. In: W.R. Stanton, ed. 1972. Waste Recovery by Microorganisms: Selected Papers for the UNESCO/ICRO Work Study. Kuala Lumpur: Ministry of Education, Malaysia. See p. 27-48. Distributed in the USA by UNIPUB, New York.
• ***Summary:*** Contents: Introduction. Miso. Shoyu. Tane-koji. Koji. Natto. Sake. Concluding remarks. Appendix. Address: Tokyo, Japan.

5930. Sawyers, Scott. 1972. New products incorporating soy oil [in Japan]. *Soybean Digest.* May. p. 22-23.
• ***Summary:*** "Nisshin Kako Chemical Industry Co. put on sale in February Thousand Island dressing in a 12-gram package. It is designed for use in school lunch programs and other institutional menus. The dressing can also be used as a spread on sandwiches. During the ASI-School Lunch Institute taste sample survey with 4th and 6th grade students several months ago, Thousand Island-type flavoring proved to be the favorite.

"Kenko Mayonnaise Co. has begun marketing of curry-mayonnaise-flavored salad dressing in 15-gram packages

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suitable for use in school lunch menus. The new product was ready for mass production and packaging in March. The same ASI-School Lunch Institute study determined that a curry-flavored dressing ranked next to Thousand Island in preference. Curry-mayonnaise dressing is recommended as a delightful seasoning for other side dishes too.

"Maruwa Oil-Margarine Co., which recently celebrated its 50th year of successful business, announced plans to market a new-quality based principally on soy oil under the name 'Uni-Margarine,' in a new 1-kg package. It is a specially designed cooking-type margarine intended for school lunch and institutional uses.

"Fukuzo Takahashi, president of Maruwa Oil, has been a longtime supporter of ASA market development activities. He has served as vice president of the Japan Margarine Assn. for several years.

"Nisshin Oil Co. on March 15 held an announcement party for over 1,000 wholesalers, retailers, industry, governmental representatives, and business associates in Tokyo's newest skyscraper, the Keio Plaza, to announce Nisshin's entry into prepared salad dressings. Three kinds of dressings, labeled French, Thousand Island, and Russian, are in production and ready for distribution in attractive bottles–separately or in a kit containing all three varieties (see photo). The 200-cc bottles with new no-drip lid will sell nationwide for 150 yen. An attractive mass media program included TV spot commercials and posters at point-of-sale.

"Yukio Sakaguchi, president of Nisshin Co., reported on the successful work by his personnel in preparing products for new customers. Nisshin salad oil has established a fine reputation over the years.

"Mr. Sakaguchi is also past president of the Japan Oilseed Processors Assn. As vice president of the International Association of Seed Crushers, he will be in charge of Japan's plans as host country for the IASC Congress May 23-26 in Kyoto.

Successful promotion: Mitsukan Vinegar Co. has had a successful year through their promotion of a salad shaker bottle or salad dressing kit for home-style dressings. This convenience item is becoming more popular with Japanese housewives. ASA, jointly with Mitsukan, has helped popularize this idea through in-store sales promotions, classes, and exhibits.

"The prominent Kewpee Mayonnaise Co. also began sales of prepared salad dressing this last year, featuring five flavors. Kewpee for the first time used more soy oil than competing oils in mayonnaise-salad dressing manufacture.

"Yoshihara Oil Co. has been the first major processor to identify one of their products as pure soy oil. Yoshihara has had Golden Salad Oil and Golden Tempura Oil on the market for many years. A new white-labeled soybean salad oil has been developed as a premium item.

"Yoshihara has cooperated with ASA on several occasions in holding special sales promotions with selected supermarket chains over the last 2 years.

"Yoshihara is a growing customer for U.S. soybeans. A modern crushing plant is presently under construction near Kobe. When completed late this year, the capacity will be 800 metric tons of soybeans daily. We look forward to more joint activities in the future.

"Due credit should be given for the improvement in U. S.-Japan trade. There are tough problems; some remain to be negotiated by mutual understanding and exchange of viewpoints.

"The Japan government and the oil processing industry have made positive steps toward freer trade. Vegetable oils and oilseed meals were liberalized for import during the past year. Import duties have been adjusted or it is planned to reduce or eliminate them in the future.

"Currency revaluation should help processors obtain better buys on soybean raw materials than would have been the case otherwise. The U.S. dock strike disrupted the flow of supplies and in some cases increased costs of transportation and operation."

A photo shows new products in Japan utilizing soy oil: In foreground: small packets of Nisshin Kako salad dressing and Kenko mayonnaise salad dressing. At left, Alpha Uni-Margarine for institutional cooking by the Maruwa Oil Co. At right, Nisshin salad dressings in 3-bottle kit displaying French, Soft, and Russian dressings. Address: Director for the Far East, American Soybean Assoc.

5931. Suzuki, Shigeaki. 1972. From Japan: Comments on American soybeans. *Soybean Digest.* May. p. 24.
• ***Summary:*** "You may not be able to imagine how essential soybeans are for the daily life of the Japanese. They are literally indispensable for our foodstuffs. They are not only raw material for oil processors who extract the oil.

"The varied usages of soybeans are unique in Japan–such as miso (soybean paste), tofu (soy-bean cake), and natto (fermented soybeans). These products are the protein base of our food and as such are deep-rooted in our eating habits. They have been valued for hundreds of years.

"Knowing our food habits, the great quantity of soybean oil we consume annually is readily understandable. At the moment, including 700,000 metric tons for food processing, this totals approximately 3,200,000 metric tons of which the majority is imported from the U.S. Fifty-three percent of the total vegetable oil production is soybean oil used for cooking. This demonstrates the overwhelming importance of soybean oil among soy products in Japan.

"Outlook for soybean meal: Now the trend of consumption of oil and fats in our country has changed greatly from edible fats that include marine and animal fats, to a much higher percentage of vegetable oils. The emphasis is on 'vegetable' today. On the other hand, considering the growing demand for defatted soybean meal for cattle feed and food protein it is obvious that the overall consumption of

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soybean meal will be increasing tremendously. This tendency is not only limited to Japan; I venture to say it is world-wide today. It can be said that the responsibility on the shoulders of the American soybean producers for the supply will be greater than ever.

"Prices are unstable: In observing this great demand, I feel a slight anxiety. It appears that American soybean production is not increasing proportionately to the growing demand of the world. Consequently, this reacts immediately on the Chicago market. The supply shortage brings a prompt upsurge in prices, and naturally speculation plays its part in swinging prices up and down regardless of the effect it has on the costs of the users. Since the finished products of soybeans are important household food items, their prices should not be affected by such speculative manipulators. Also as users of this material, we cannot say that we are in a favorable position.

"Geographically, Japan is over on the other side of the Pacific Ocean. The time required to procure soybeans, ship, and eventually process them into a product is more than a full 3 months. This clearly implies that there is no safety-hedge for us to work in order to maintain a stabilized price. We are at the mercy of unstable prices. This, in fact, is one of the regrettable factors that hinders the stabilization of the oil and fats business.

"U.S. the prime source: Brazil and Argentina were once great soybean suppliers but unfortunately they are no more. There are almost no opportunities to purchase from them. Recently China and Australia have been considered possible suppliers but have not yet reached that stage. Therefore, only the American soybean suppliers are able to furnish the quantity we need.

"I still believe in the potential productivity and the constant growth in the supply of American soybeans. For the benefit of the healthy, expanding world consumers' market, including Japan, I hope and trust the American Soybean Assn. will do its utmost to maintain a constant flow of soybeans for the sake of all."

A small portrait photo shows Shigeaki Suzuki. Address: President, Japan Oilseed Processors Assoc.

5932. Takeuchi, Tokuo. 1972. Miso, shôyu no peptides ni kansuru kenkyu. IX. [Studies on peptides in miso and soy-sauce. IX. Some properties of peptides having high and low molecular weight in soybean miso]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 50(5):321-30. May. [20 ref. Jap; eng]
Address: Food Research Inst., Aichi prefecture, Nishi-ku, Nagoya, Japan.

5933. Wijnandt, J. 1972. La transformation des graines de soya en farine toastee [Processing soybeans to make roasted soy flour]. In: Comité de Coordination pour le Developpement en République du Zaïre (CODEZA). Séminaire National sur le Soja [National Seminar on Soya]. Kananga, Zaire. 191 p. See p. 135-44. Published in 1986. [Fre]
• ***Summary:*** Contents: Introduction. First trials with soybean utilization (1962-1965). Manufacture of roasted soy flour: Generalities, description of different processes. Commercialization: Purchase of the soybeans by ETSA (Ecole Technique Secondaire Supérieure d'Agriculture, de Tshibashi), transport, storage, resale price by commercial agents, sale and distribution, packaging, the soya cookie project. Conclusion. Appendix 1. Equipment used for a capacity of 15 kg/hour, with the CeCoCo 'Fuji' Coffee roaster (Torréfacteur CeCoCo, P.O. Box 8, Ibaraki, Osaka-Fu, Japan). Appendix 2. Equipment used for a capacity of 80 kg/hour, with Torréfacteur Probat." Appendix 3. Costs of actual daily production: 75% yield, 400 kg in 5 hours, 4 workers. Appendix 4. Recipe for cookies with soy flour used at the Inabanza Center from 1968-1973: wheat flour 600 gm, soya flour 300 gm, sugar 200 gm, lard or oil 120 gm, salt 5 gm, sodium bicarbonate 5 gm, ammonium bicarbonate 5 gm, water 200-250 cc. Recipe with corn, soya, and wheat to make 55 kg of cookies, containing 14% protein, 59% carbohydrates, 16% lipids, and 436 calories per 100 gm. Machines used at Bisoka for making soya cookies at the end of 1974 (type, brand, function, power use, capacity).

At the start of this project in 1961, the directors focused all of their attention on soybean cultivation, giving none to preparation of foods. But noting the lack of interest shown by the local people in consuming soybeans as such, they saw the necessity of giving more attention to utilization. The first utilization trials ran from 1962 to 1965; under the direction of Mrs. d'Heer, they tried unsuccessfully to use soybeans as whole soybeans, as soymilk, and as products made from soymilk. They tried to make a fermented soy yogurt using cultures sent from Wageningen. The product turned out well but the taste was foreign to the local people and it was too perishable. Investigation of powdered soymilk revealed that the equipment was too expensive and complicated. Then in 1969 they found that roasted soy flour worked very well in the local diet, to fortify cassava and corn products. A detailed description of the process and equipment is given. Key assistance was provided by ETSA (Ecole Technique Secondaire de Tshibashi). Address: ETSA–Tshibashi, B.P. 110, Kananga, Zaire.

5934. Yasumatsu, Katsuhara; Sawada, K.; Moritaka, S.; Misaki, M.; Toda, J.; Wada, T.; Ishii, K. 1972. Studies on the functional properties of food-grade soybean products. IV. Whipping and emulsifying properties of soybean products. *Agricultural and Biological Chemistry* 36(5):719-27. May. [10 ref]
• ***Summary:*** A series of investigations is being "undertaken to investigate the functional properties of food-grade soybean products in relation to both their chemical properties and

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their practical food applications." Native defatted soybean flour, which contained native and soluble protein, exhibited excellent whipping properties. Address: Food Research Labs., Food Products Div., Takeda Chemical Industries Ltd., Osaka, Japan.

5935. Randolph, Chet. 1972. U.S. soybean group adapts overseas promotion to individual markets. *Foreign Agriculture.* June 5. p. 6-7, 9.
• ***Summary:*** The American Soybean Association (ASA) uses the term "market development" to mean a total program from the farmer to the consumer. It is not just advertising, not just promotion, not even just marketing. Market development in Taiwan. The ASA went to Taiwan in 1969, and set about modernizing the domestic and industrial uses of soybeans in that country. In order to do this they established a monthly trade journal, invited teams of local executives to visit the U.S., and sent technicians to Taiwan to instate many different programs to improve the production, processing, and marketing of soybeans and soybean products. Market development in Germany. Here, the ASA set about trying to change the government's requirement that fishmeal was necessary in every pig and poultry ration. They first stimulated research in the German universities to convince the German government that the fishmeal requirement was harmful to the soybean trade. The ASA also campaigned to remove the stigma that soybean margarine could not contain more than 25% soybean oil as it would then require salt to mask the oil's flavor.

In Japan the ASA works on developing mass media advertisement for soy oil. They also work with the Japan Nutrition Association, which conducts small group cooking schools. They have worked for years to help start the Japanese vegetable margarine industry and then encouraged an effective, merchandising campaign. Address: Director of Market Development, American Soybean Assoc.

5936. Matsuoka, Hiroatsu; Sasako, Kenji. 1972. Daizu-nyû o riyô shita chiizu-yô shokuhin no seizô ni kansuru kenkyû. II. Daizu-nyû no kanetsu shori oyobi kaado seizô-ji ni okeru toripushin inhibitaa kassei no henka [Research on manufacturing a cheese-like food from soymilk. II. Changes in the trypsin inhibitor activity during heating of the soybeans and making the curds]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 19(6):262-67. [Jap]*

5937. The wedding of Kazuko Aoyagi and Travis Venters at International Christian University (ICU) in Tokyo and the wedding cake with tofu icing / frosting (Photograph). 1972.
• ***Summary:*** Two photographs of this wedding, which took place on 11 June 1972, are owned by Soyfoods Center. The first, 4½ by 3¼ inches, color, shows Travis and Kazuko standing in a room at ICU, dressed in wedding clothes. Standing behind them are 10-15 people. Standing to their left, dressed all in white, is Jeffrey Broadbent, who is reading from a book of scriptures. Standing to his left is Yoshiko Aoyagi. Bananas and pineapples are piled on two tables.

The second, 6 by 4 inches, black and white, taken 10-15 minutes after the first, shows Travis and Kazuko standing outside on the ICU lawn, with about 15 people standing close behind them, as rice is being thrown over them. Akiko Aoyagi is standing just to the left of Kazuko and William Shurtleff is standing just behind her. Everyone is smiling and having a good time.

A remarkable cake was served at this wedding–though no photograph of it can be found. It was made by Gretchen Broadbent. Gretchen, a very creative cook interested in natural foods and tofu, volunteered to make all the food for the wedding party. The centerpiece of her creations, which 5-6 people remembered clearly more than 25 years later (Jan. 1999), was the wedding cake. It was a sensation. The icing / frosting was made of tofu! No one had ever seen anything like it. It was a round layered cake, with each layer being a fruitcake that was slightly smaller than the one below it. Made entirely of natural foods, it contained whole-wheat flour instead of white flour and honey or fruits instead of sugar. Thus, it was rather heavy. Gretchen made the frosting–her own invention–by whipping firmly pressed tofu in a blender with honey. The cake even had a theme–evolution. Gretchen formed many small creatures out of dough, then deep-fried them. There were little crabs and starfish on the bottom layer, then little animals on the second layer, and finally on the top–guess what–human beings–our precious species. Because Gretchen did not have an oven in her apartment, she baked the cake on the ICU campus in an oven at the home of Steve and Marty Caldwell. She recalls: "I was really into that cake!"

5938. Tsai, Shun-Jen; Yamashita, M.; Arai, Soichi; Fujimaki, M. 1972. Effect of substrate concentration on plastein productivity and some rheological properties of the products. *Agricultural and Biological Chemistry* 36(6):1045-49. June. [8 ref]
• ***Summary:*** Discusses the tastes of a proteinase-modified soybean protein. A plastein is any of several substances that resemble proteins and are precipitated by the action of proteolytic enzymes (as pepsin or papain) on the digestion products of protein. Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Tokyo, Japan.

5939. Webber, Ella V. 1972. Perry A. Webber: Pioneer missionary in true education to Japan. Chattanooga, Tennessee: Southern Missionary College. 87 p. *
• ***Summary:*** Perry A. Webber was born on 15 June 1890 in Northville, Michigan. His parents became Seventh-day Adventists (SDAs) during his early childhood. In 1904 the family moved to Berrien Springs, Michigan, and Perry was

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educated there. In 1911 Perry graduated with a BA from Emmanuel Missionary College [in Berrien Springs] and in 1912 he was married to Ella Mae Verney.

In 1913 he was appointed by the SDA General Conference Foreign Mission Board to go, with his wife, as missionaries to Japan. In Tokyo they studied Japanese language for 2 years, then began pioneering educational work in Japan until 1927. For 4 years (1915-19) they worked in Fukuoka (in northern Kyushu), then returned to Tokyo. A son, Alfred B. Webber, was born in Dec. 1919; he later became a medical doctor. In Tokyo they worked at a school in Ogikubo. By 1921 Perry was teaching about the virtues of brown rice. In 1923 Perry found 25 acres of land in Sodegaura; in September of that year the Great Tokyo Earthquake (*Kanto Daishinsai*) took place. Later in 1923 the family returned to California because of the wife's respiratory problems. Harry Webber was born in Glendale. After a year in Honolulu, Hawaii, in 1934, they returned to Japan in the summer of 1925 and moved the college into the country. In the spring of 1926 the students and teachers started to build their own self-supporting school, with Perry as principal. This school later grew into the Japan Missionary College (*Saniku Gakuin*). The Japanese name means "three-sided school" since equal emphasis was placed on mental, moral, and manual development.

During these years Perry grew very fond of Japanese food and especially of Inari-zushi (made of deep-fried tofu pouches filled with vinegared rice). On his way to language school, he used to stop in regularly at the Shinoda Sushi Shop in Kanda (in Awaji-cho by the 1970s) to enjoy their Inari-zushi. The shop once developed a special Webber Sushi, named after him, and they used his name in some of their promotional materials. He was also very fond of regular tofu and of miso soup.

In 1927 the Webbers returned to America to educate themselves in good health. At this time Adventists believed that the true remedies are "pure air, sunlight, abstemiousness, rest, exercise, proper diet, the use of water, and trust in Divine power (*Ministry of Healing*, p. 127). In the fall of 1928 Perry entered Michigan State University to study biological chemistry while his wife, Ella Mae, studied nutrition; both were deeply interested in understanding the principles of good health. By May 1929 Perry was considered "one of our teachers" by Madison College in Madison, Tennessee.

During the early 1930s and the Great Depression, many students' only hope of getting an education was to rely on their own efforts. Madison, which offered a work-study program, became a very attractive alternative school.

In Sept. 1930 the family moved to Madison while Perry finished his thesis. In June 1931 Perry was awarded his PhD degree in biological chemistry, with special interest in chemistry and soyfoods development. At Madison he became a instructor of chemistry with a strong interest in food chemistry. In the following years he became the main person at Madison responsible for the school's growing involvement with soyfoods. In Nov. 1931 Perry wrote a long two-part article for *The Madison Survey* titled "Facts Concerning the Soybean." During the early 1930s he put a great deal of creative energy into expanding Madison's line of commercial soyfood products. Most of the products that were introduced between 1931 and 1934 were the result of his work. In August 1933 Perry Webber and Frances L. Dittes attended the annual convention of the American Soybean Association (ASA) in Baton Rouge, Louisiana. Webber presented a lecture with slides about the importance of soyfoods in Asia and their potential in America. He also prepared an exhibition of Madison soyfoods that was displayed at the convention. Webber was secretary-treasurer of the ASA for one year at this time. He visited Edsel A. Ruddiman at the Ford Motor Company and gave a talk to him and other leading research scientists about soyfoods. He was also a close friend of Dr. John Harvey Kellogg. He visited Kellogg, talked about soyfoods, and did some work developing a preservative for some of Kellogg's crackers.

Perry Webber worked at Madison until Sept. 1935 when, after a big farewell party, he returned to Japan to serve as principal of the Japan Missionary College (Saniku Gakuin). There he taught a lot about nutrition and the value of a vegetarian diet. In about 1936 Webber visited Dr. Harry Miller in Shanghai, China, and helped him set up a sanitation and research lab for analyzing the Vetose soymilk products at his new plant.

From 1939 to 1943, during World War II, Webber was back in the USA, teaching at Madison as head of the chemistry department. He was also at Madison from 1946 to 1953 and from 1959 to 1962, each stay punctuated by work in Japan. While serving as an administrator at Madison Foods (1959-1963) he and Sam Yoshimura pulled the factory out of debt and put it several thousand dollars into the black in one year's time.

During his trip to Japan that began in the spring of 1953, he taught one food plant how to make gluten, soymilk, and soy croquettes. Also in 1953 he started a self-supporting organization at Mt. Akagi, about 125 miles northwest of Tokyo; there he worked for more than 7 years. In the winter of 1956 he suddenly became ill with pneumonia. He returned to America in the summer of 1958 and was found to have Parkinsonism; no medicine was prescribed until 1962. In 1966 Perry was an outpatient at the Madison Sanitarium / Hospital for a time, then he became a inpatient from Oct. 1967 to Jan. 1968. In Sept. 1968 he went to a convalescent home in Lodi, California. His son, Dr. Alfred B. Webber, was living and practicing medicine in Lodi. In 1969 he returned to the Wildwood Sanitarium, a self-supporting Seventh-day Adventist convalescent home and health care facility in Wildwood, Georgia (northern Georgia). He passed away there in January 1973 at age 82 of Parkinsonism.

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5940. Arai, Soichi; Yamashita, M.; Fujimaki, M. 1972. Glutamyl oligopeptides as factors responsible for tastes of a proteinase-modified soybean protein. *Agricultural and Biological Chemistry* 36(7):1253-56. July. [11 ref] Address: Dep. of Agricultural Chemistry, Tokyo Univ., Tkoyo, Japan.

5941. Ebine, Hideo; Matsushita, Z.; Sasaki, H.; Yanai, S.; Ariyoshi, M.; Machi, M. 1972. Beikoku-san daizu no miso genryô to shite no tekisei hyôka [Evaluation of U.S. soybeans as raw materials for making miso]. *Report of Central Miso Institute* No. 7. 66 p. July. Collection of 7 articles, in Japanese, with 4-page English-language summary. [28 ref. Jap; eng]

• ***Summary:*** Part I: Miso manufacturing test on a laboratory scale. (1) Employing 13 varieties of U.S. soybeans and 11 varieties of Japanese soybeans of 1961 crops, U.S. soybeans were generally higher in oil content and lower in carbohydrate content than Japanese soybeans. Among the tested U.S. varieties, Comet, Yelnanda and Harosoy were promising.

(2) In 1962, 27 samples of U.S. soybean crops and 5 samples of Japanese soybeans were employed. Not all the Japanese varieties tested were evaluated superior to the U.S. varieties, but the evaluation of consistency or texture was higher than that of U.S. varieties.

(3) Fourteen samples of U.S. soybeans from the 1963 crop and 26 samples from the 1964 crop were evaluated for their suitability in making miso. From the 1963 crop, Comet, J.E.W.-45, and Mandarin were considered the best. From the 1964 crop, Mandarin and Kanrich were considered best.

(4) Of the soybean samples of 1965 and 1964 crops, the results showed that Kanrich variety of 1964 was the best. "In comparison with U.S. soybeans, the characteristics of Japanese soybeans can be significantly recognized in the consistency of miso, namely in its fine and smooth texture."

Part II: Miso manufacturing from soybean-grits. Twice as much dry matter was lost during cooking as when whole soybeans were used. The main constituents of the loss were water-soluble sugar (6.1%) and protein (3.9%) which cause color formation of miso. When the soybean grits were soaked in water before cooking, the color of the cooked soybean grits as well as miso made from them were bright and beautiful. The flavor of fermented miso was also improved by this method of using soybean grits.

Part III: Miso manufactured from screened soybean varieties in pilot plants. The variety M-1 gave the best results for light colored salty miso, red salty miso, and white miso.

(Supplement) Evaluation tests were conducted on 101 U.S. and 24 Japanese soybean samples. In comparison with Japanese soybeans, the U.S. soybeans showed a higher level of oil content and a lower level of carbohydrate content. The varieties of U.S. soybeans suitable for making miso are Kanrich, Mandarin, and Comet. Soft and bright soybeans are generally suitable, since they show a high absorbing capacity of water. Soybeans rich in carbohydrate show generally high capacity of water absorption. Large size of soybeans are generally acceptable. Address: 1. Shokuryo Kenkyujo, Tokyo.

5942. Kameda, Yukio; Matsui, K.; Kato, H.; Yamada, T.; Sagai, H. 1972. Antitumor activity of *Bacillus natto.* III. Isolation and characterization of a cytolytic substance on Ehrlich ascites carcinoma cells in the culture medium of *Bacillus natto* KMD 1126. *Chemical and Pharmaceutical Bulletin* 20(7):1551-57. July. [8 ref]

• ***Summary:*** At least two kinds of cytolytic substances that acted on Ehrlich carcinoma cells in the culture medium of *Bacillus natto* KMD 1126. One of these cytolytic substances was found "to be identical with surfactin which was a potent clotting inhibitor in the thrombin fibrinogen system obtained from the culture medium of *Bacillus subtilis* by Kakinuma et al.

Note: Natto, which is defined as "fermented beans," might be better defined as "fermented soybeans." Address: Faculty of Pharmaceutical Sciences, Kanazawa Univ., 13-1 Takara-machi, Kanazawa, Japan.

5943. Murata, Kiku; Fujita, K. 1972. Hakkô daizu tenpei no kôsansei kôyô ketsuin-shi no kensatsu [Studies on antioxidative and antihemolytic factor in tempeh]. *Seikagaku* (*Biochemistry*) 44(8):496. Aug. Presented at the 45th Annual Meeting of the Japanese Biochemical Society. [1 ref. Jap] Address: Osaka Shiritsu Daigaku, Kasei Shokumotsu, Japan.

5944. Baker, Bruce. 1972. U.S. soybean complex exports top $2 billion in fiscal year 1972. *Foreign Agriculture.* Sept. 18. p. 5, 12.

• ***Summary:*** For the first time, the U.S. soybean crop has become the Nation's leading cash crop. In fiscal year 1972, U.S. farmers reported higher cash receipts for soybeans than for corn, which has long been the leading cash earner. The soybean crop also reached another important milestone when it became the first agricultural commodity to have total annual exports valued at more than $2,000 million; the total export value of soybeans and soybean production hit an all-time high of $2,004 million. The devaluation of the U.S. dollar lowered the price of U.S. soybeans in terms of many foreign currencies. The price was reduced most for Japan and the European Economic Community–which together take 65% of total U.S. soybean exports. Within the EC, the Netherlands was the leading market for U.S. soybeans. Japan is the second largest market for U.S. soybeans, Spain the third. Address: Fats and Oil Div., Foreign Agricultural Service.

5945. Ebine, Hideo. 1972. Fermented soybean foods in

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Japan. *Tropical Agriculture Research Series* No. 6. p. 217-23. Sept. Symposium on Food Legumes.
• ***Summary:*** Production of fermented soybean foods in Japan in metric tons (tonnes) (1968): Miso: 553,000 tonnes; includes the use of 169,000 tonnes of whole soybeans, 6,600 tonnes of defatted soybeans, 84,400 tonnes of rice, 18,200 tonnes of barley, and 71,200 tonnes of salt. In addition, roughly 200,000 tonnes of miso are made at home in Japan.

Shoyu: 1,027,000 kiloliters; includes the use of 14,900 tonnes of whole soybeans and 147,320 tonnes of defatted soybeans, 126,600 tonnes of wheat, 7,700 tonnes of wheat bran, and 172,200 tonnes of salt.

Natto: 90,000 tonnes; includes the use of 47,000 tonnes of whole soybeans.

Note that miso uses more soybeans than shoyu. Annual per capita consumptions of these foods was: Miso 6.7 kg, shoyu 10.2 liters, and natto 760 gm. Address: Head, Fermentation Div., National Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo.

5946. Iida, Wataru. 1972. Major diseases of leguminous crops in Japan. *Tropical Agriculture Research Series* No. 6. p. 101-07. Sept. Symposium on Food Legumes.
• ***Summary:*** A large table (p. 101), which occupies 2/3 of the page, is titled "Diseases of soybean" and contains 2 columns: (1) English name. (2) Name of causal agent. There are 5 virus diseases, and 21 other named diseases. Address: Prof., Faculty of Horticulture, Chiba Univ., Matsudo-shi, Chiba-ken, Japan.

5947. Kaizuma, Norihiko; Fukui, Juro. 1972. Breeding for chemical quality of soybean in Japan. *Tropical Agriculture Research Series* No. 6. p. 55-68. Sept. Symposium on Food Legumes. [16 ref]
• ***Summary:*** As is now well known, in many parts of the world there are chronic nutritional deficiencies, especially protein deficiencies, which have become serious problems. The breeding and production of soybeans with high protein content could offer a promising solution to such problems.

However, methionine is the limiting amino acid in soybeans. If the methionine content of soybeans can be increased, the usable protein will automatically increase.

Since 1968, the authors have carried out fundamental research on the breeding of soybeans with high protein and high sulfur-containing amino acid (especially methionine) contents. This paper gives a summary of the what has been learned to date in this research–conducted under a 1969 mandate from Japan's Ministry of Agriculture and Forestry. Address: Faculty of Agriculture, Iwate Univ., Morioka-shi, Japan.

5948. Kobayashi, Takashi; Hasegawa, T.; Kegasawa, K. 1972. Major insect pests of leguminous crops in Japan. *Tropical Agriculture Research Series* No. 6. p. 109-26. Sept. Symposium on Food Legumes. [9 ref]
• ***Summary:*** The greatest number attack soybeans. Address: 1-2. Tohoku Agric. Exp. Station, Morioka-shi, Japan.

5949. Konno, Shoshin. 1972. Physiological studies of soybeans in Japan. *Tropical Agriculture Research Series* No. 6. p. 151-68. Sept. Symposium on Food Legumes. [66 ref]
• ***Summary:*** Contents: Preface. Germination. Development and shedding of floral organs. Soil moisture. Nutriophysiology. Dry mater production and photosynthesis. Ripening and chemical components of seed. Cool weather damage. Conclusion. Discussion.

Regular studies on soybean physiology started in or after 1946. Most of these studies were done to address problems which arose in the course of breeding or cultivation experiments.

In Japan, soybeans are produced mainly in Hokkaido and in the Tohoku region (Northeast provinces of Akita, Aomori, Fukushima, Iwate, Miyagi and Yamagata). Address: 2nd Div. of Plant Physiology, National Inst. of Agricultural Sciences, Arai, Kitamoto-shi, Saitama, Japan.

5950. Matsumoto, Shigeo; Ohba, Torao. 1972. Growing techniques of soybean in Japan. *Tropical Agriculture Research Series* No. 6. p. 75-86. Sept. Symposium on Food Legumes. [12 ref]
• ***Summary:*** Discusses: Ecotypes of soybean varieties and local distribution. Soybean cultivation in west Japan: Summer soybean cultivation, autumn soybean cultivation, inoculation of root nodule bacteria, fertilizer, application, rotation system. Soybean cultivation in east Japan: Characteristics of soybean cultivation in east Japan, cultivation methods. Discussion. Address: Second Agronomy Div., Tohoku National Agric. Exp. Station, Morioka-shi, Japan.

5951. Motomiya, Giichi; Ito, Ryuji. 1972. Domestic production, importation and utilization of food legumes and research organization in Japan. *Tropical Agriculture Research Series* No. 6. p. 23-32. Sept. Symposium on Food Legumes.
• ***Summary:*** "The history of soybean cultivation in Japan seems to be fairly old, because some descriptions on 'Daizu' (soybean) can be seen in the ancient chronicles of Japan (Kojiki and Nihonshoki, written at the beginning of 8th century) and the carbonized 'Daizu' was found in the vestige of ancient civilization of the strawrope pottery in the period of B.C. But the statistical data of soybean production was not yet established completely before 1878... But the production of soybean in Japan was gradually decreased by the cause of sudden increase of importation from China since 1930, and this decrease was accelerated furthermore by the cheap American soybean imported abundantly since 1961 under the free trade system, and consequently the cultivation areas of

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soybean decreased to 100,000 hectares in 1971...

Research and experiment on food legumes in Japan. Soybean: The agricultural experiment stations were established one after another in every prefecture in Japan since the establishment of the National Agricultural Experiment Station in 1893. And about 80 years have passed since the breedings of rice, wheat, barley and soybean were started in these experiment stations...

"Breeding objectives are as follows: High yielding (more than 4 tons per ha.), good qualities (yellow hilum, large seed, protein contents over 50% or oil contents over 25%), resistance against disease and insects,... resistance against cold weather and adaptability for mechanized cultivation...

"The whole country has been divided into five breeding regions according to the ecological types of cultivated soybean to accomplish the above described breeding objectives."

Soybean production / imports in Japan in tonnes (metric tons): 507,100 / 808,177 in 1955; 417,600 / 1,128,290 in 1960; 229,700 / 1,847,469 in 1965; 126,000 / 3,243,790 in 1970; 122,400 / 3,211,568 in 1971.

Page 32 discusses peanuts, kidney beans, and azuki beans. Address: Ministry of Agriculture & Forestry, Kasumigaseki, Chiyoda-ku, Tokyo, Japan.

5952. Nagata, Tadao. 1972. Agro-genecological approaches to the variety differentiation in soybeans. *Tropical Agriculture Research Series* No. 6. p. 137-50. Sept. Symposium on Food Legumes. [19 ref]
Address: Faculty of Agriculture, Kobe Univ., Rokkodai-cho 1, Kobe-shi, Japan.

5953. Saio, Kyoko; Watanabe, Tokuji. 1972. Advanced food technology of soybean and other legumes in Japan. *Tropical Agriculture Research Series* No. 6. p. 209-16. Sept. Symposium on Food Legumes.
• ***Summary:*** The following amounts of whole soybeans (in 1,000 metric tons) are used in Japan to make these products: Tofu and fried tofu 295, miso 169, natto 47, Kori-tofu (dried or frozen tofu) 34, shoyu 15, kinako 12, others 70. Total 642.

The following amounts of defatted soybeans (in 1,000 metric tons) are used in Japan to make these products: Shoyu 154, tofu and fried tofu 77, miso 8, others 45. Total 284. Grand total: 926. Address: 1. Senior Research Officer; 2. Director. Both: National Food Research Inst., Shiohama 1-4-12, Koto-ku, Tokyo.

5954. Saito, Masataka. 1972. Breeding of soybean in Japan. *Tropical Agriculture Research Series* No. 6. p. 43-54. Sept. Symposium on Food Legumes.
• ***Summary:*** Contents: Introduction. Soybean breeding organizations in Japan. Breeding objectives and their allotment: High yielding ability, seed components, cool-weather resistance, resistance to soybean cyst nematode, resistance to virus, resistance to other diseases and insect pests, ability to br harvested mechanically. Results of breeding. Problems to be solved in the future. Discussion. Address: Chief, Lab. of Soybean Breeding, Hokkaido Tokachi Agric. Exp. Station, Memuro-cho, Kasai-gun, Hokkaido, Japan.

5955. *Tropical Agriculture Research Series.* 1972. Symposium on food legumes. No. 6. 253 p. Sept. No index. Proceedings of a Symposium on Tropical Agriculture Researches, 12-14 Sept. 1972. (Tropical Agriculture Research Center, Ministry of Agric. and Forestry, Nishigahara 2-2-1, Kita-ku, Tokyo 114, Japan). [150+ ref]
• ***Summary:*** Soybeans, azuki (adzuki) beans, and peanuts are among the main legumes discussed. Chairman: N. Matsumi (Upland Farming Div., Central Agricultural Experiment Station, Kitamoto, Saitama, Japan). Address: Tropical Agriculture Research Center, Ministry of Agriculture and Forestry, Nishigahara 2-2-1, Kita-ku, Tokyo 114, Japan.

5956. *Los Angeles Times.* 1972. Are menus a puzzle? Master a few of those foreign food phrases. Oct. 6. p. F16.
• ***Summary:*** Foods listed under "Japan" include: "... Miso: Bean paste. Natto: Steamed and fermented bean... Shoyu: Soy sauce... Tofu: Bean curd."

5957. Rodale, Robert. 1972. Milking the soybean. *Washington Post, Times Herald.* Oct. 26. p. H10.
• ***Summary:*** "The versatile, high-nutrient soybean can be processed easily into a kind of milk with several nutritional advantages over cow's milk. That may come as a shock to dairymen, but it's true."

Soy milk, which comes from a plant, contains little saturated fat, and is an alternative for people who are allergic to dairy milk. Describes how to make soymilk at home. Although it is easy to make an inexpensive, it is not popular in the USA; most Americans don't like the slight "beany" flavor.

However a food made from soy milk, whose taste does please our palates, is slowly gaining popularity. "That food has the rather unattractive name 'bean curd.'" You may have seen it on the menu at a Chinese or Japanese restaurant. The Chinese themselves call it [in Cantonese] *dow foo yuen* and the Japanese call it *tofu,* a name that is gaining popularity in the United States. Surprisingly, bean curd made in Taiwan and shipped to the U.S. in cans is labeled *tofu.*

"The big value of bean curd is that it offers a high-protein, good-tasting alternative to meat. It's a true convenience food, with outstanding culinary and nutritional values." Describes the many ways it can be used. It is not an exotic oriental food, but one that "has the potential to become a basic food eaten and enjoyed regularly by millions of Americans."

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A recipe for Bean curd and Chinese cabbage soup calls for 4 cups homemade chicken stock and "¼ pound bean curd."

5958. Haenszel, William; Kurihara, M.; Segi, M.; Lee, Richard K.C. 1972. Stomach cancer among Japanese in Hawaii. *J. of the National Cancer Institute* 49(4):969-88. Oct. [53* ref]
• ***Summary:*** Consumption of tofu was associated with a significant decrease in risk from stomach cancer. Address: Biometry Branch, National Cancer Inst., Bethedsa, Maryland 20014.

5959. Haggerty, Donna. 1972. Fire reflects macrobiotics. *Macrobiotic* (*The*) (*Chico, California*) No. 81. Oct. *
• ***Summary:*** The article begins: "The burning of Chico-San / Spiral Foods on September 14 came as quite a shock to all of us."

Her article attempts to answer why the fire happened in terms of yin-yang and macrobiotic theory. At the end of the article is this interesting response: "Dear Donna, "In my opinion, Chico-San reached extreme yang [pressure, heat (Chico is very hot in summer), activity, etc.] and not enough yin (such as space, less activity, etc.). "Herman Aihara."

5960. Kushi, Michio. 1972. Macrobiotic seminars of Michio Kushi. Boston, Massachusetts. 152 p. Illust. No index. 28 cm. Transcribed by Joan Mansolilli.
• ***Summary:*** This is a transcript of talk given by Michio Kushi, macrobiotic teacher, in the fall of 1972, from Oct. 10 to Dec. 20. The main subjects are: Theory and practice of natural agriculture. Principles of the ancient world calendar. Disease–Origin, causes, and cures.

Soyfoods are mentioned briefly as the cure for various ailments, including diabetes mellitus (p. 92, 94; miso, tamari), venereal disease (p. 104; tekka, strong miso), stomach cancer (p. 128-29; miso soup, fried tofu, tekka, miso pickles), toxication from cigarette smoking (p. 131; miso soup), appendicitis with high fever (p. 132-33; tofu plaster on head). Address: Boston, Massachusetts.

5961. Photograph of Evan Root and Jim Gronemeyer standing by the Erewhon Los Angeles macrobiotic retail store. 1972.
• ***Summary:*** This photo was taken in about Oct. 1972. The black and white photo shows the two at the back of the store, and the color photo shows the outside front of the store. Jim was one of those who built the first Erewhon West at the behest of Aveline Kushi–who was living in Los Angeles at the time. Evan and Jim were old friends from pre-macrobiotic days; Jim showed Evan around.

Note: This photo was sent by Evan Root to Patricia Smith and by Patricia to Soyinfo Center (Nov. 2010).

5962. Advest Co. 1972. Private placement $500,400. 1112 shares. Erewhon Inc. (Continued–Document part II). Hartford, Connecticut. 34 p. 28 cm.
• ***Summary:*** Continued from p. 12. Management of Erewhon: Paul Hawken–President & chairman. Born on 8 Feb. 1946 in San Mateo, California. Attended Berkeley High School in Berkeley, California. Graduated from Nevada Union High School 1963 [located between Nevada City and Grass Valley, California, in the Sierra Nevada foothills]. Worked one year as a carpenter. Traveled in Europe 1964-65, studied at Alliance Française. Returned to the USA and enrolled at San Francisco State. School was closed by demonstrations, so he went into business for himself–Commercial photography, portraits, and advertising. Left business in 1966 to come to Boston to begin working at Erewhon in Aug. 1966. Married [to Dora Coates, June 1971], one child.

Tomoko Kushi–Stockholder. Michio Kushi–Director East West Foundation. Morris Kirsner–Attorney at law.

John Deming, Jr.–Retail manager. Born 27 June 1947 in Tacoma, Washington. Graduated from Bolton High School at Alexandria, Louisiana, in 1965. Attended Tulane University (New Orleans) until 1967, majoring in English. Began his own business, opening a natural food store in Jackson, Mississippi. Sold the business in Aug. 1971 and went to work with Erewhon in Los Angeles. Married [to Judy Coates in Aug. 1972].

Gordon William Garrison, Jr.–Vice-president. Born 19 Dec. 1946 in New York, NY. Graduated Bennington High School 1964. Attended Norwich University [Northfield, Vermont] 1964-65. Attended University of Vermont 1965-69, and graduated in 1969 with a B.A. in philosophy and art. Job Experience: Camp counselor, construction worker, ski instructor and patrolman, carpenter, farmer, tree surgeon, and lecturer. In 1970 started with Erewhon. Single.

Paul West–General Manager. In Feb. 1971 began employment with Erewhon. Married with two children.

Christopher J. Connolly–Production manager. Began work at Erewhon in 1970 in Los Angeles. Transferred to Boston in Oct. 1971. Single.

"Employees and facilities: The company maintains a retail store with 2,100 square feet at 342 Newbury Street, Boston, and a second retail store with 2,500 square feet at 8001 Beverly Blvd., Los Angeles. Supporting this store and the Western regional wholesale market is a 14,000 square foot warehouse at 8454 Steller Drive, Culver City, California.

"The company's headquarters and principal warehousing, packing, and processing facilities are located on 5 floors of two adjoining buildings at 33 Farnsworth Street, South Boston. This location comprises approximately 40,000 square feet. The company presently operates two packaging lines in Boston, 2 shifts daily, and one Packaging line in Los Angeles." The company employs approximately

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40 people.

"The Market" Because it has grown with the organic movement and has followed rigorous standards of food purchase and preparation, the company enjoys an impeccable reputation for integrity in the rapidly growing organic foods market. The company believes it is presently the largest supplier of organic foods in the East.

"The market for natural, organic and health foods is a dynamic and rapidly growing one. A recent *Wall Street Journal* article named this industry as one of the ten highest growth industries for the 1970s. The National Nutritional Foods Association [NNFA] estimates there are about 250 manufacturers and distributors in the industry whose total sales were estimated by Dr. Dennis Wood, of Arthur D. Little, to have grown from $140 million in 1970 to $200 million in 1971 and possibly $400 million in 1972. These products are sold in over 3000 independent stores and by many food chains. Their level of importance is indicated by the recent printing of a separate Sears & Roebuck catalogue for health and organic foods."

There is a diversity of motivations underlying consumer demand for organic foods. Three categories of demand appear to exist: Cultural, economic, and taste. Organic foods usually taste better than non-organic foods. "The growing public concern for ecology also lies behind the purchase of these foods. Presently many members of such organizations as the Audubon Society, Friends of the Earth, and the Sierra Club purchase organic foods to boycott the farmers and chemical industries whose use of pesticides and artificial fertilizers the groups consider harmful to the environment. The many life styles and philosophies that are loosely grouped as 'counter culture' also underlie the motivation to purchase organic foods. Youth predominates in this category, but some spokesmen are such notables as René Dubois and Buckminster Fuller. In its broadest terms, the 'counter culture' is a search for a better answer to man's modern pattern of life. Man's present life style has led to a dangerous disruption of his environment."

"In fiscal year 1972 the company attempted a vigorous program of distributor sales aimed principally at broadening its market geographically and increasing sales. This program was successful in increasing sales, but its implementation required a rapid and inefficient expansion of the work force and substantial price discounts on distributor products. By consequence, the company's overall gross margin contracted, while its operating expenses increased, resulting in a 10-month net loss of $50,000 on sales of $2.8 million." Since that time distributor sales were effectively discontinued and substantial numbers of personnel were laid off. Gross margins have returned to their previous levels.

"Since its founding, the company has never employed a salesman full-time or run a continuous advertising campaign. Sales growth has been largely in response to externally developed demand and limited by capital."

Photocopies show the following Erewhon-brand labels: Maple granola, Peanut butter, Apple juice, Olive oil, oil of sunflower, corn germ oil, oil of soybean, short grain brown rice (organically grown), whole wheat flour, hacho miso (soybean paste). Photos also show the front and interior of an Erewhon retail store. Address: 6 Central Row, Hartford, Connecticut 06103.

5963. Chico-San Inc. 1972. Products (Document part). In: Midwest Natural Foods Distributors, Inc. 1972. Catalog and price list. Nov. 1. Ann Arbor, Michigan. 58 p. See p. 7-8.
• ***Summary:*** Rice cakes, Buckwheat cakes, or Millet cakes (salted or nonsalted, 3½ oz). Yinnies rice candy (3½ oz). Rice chips or Corn chips (5 oz). Lima Tamari soy sauce (8 oz, pint, or quart). Miso soybean puree (8 or 16 oz). Sesame salt (2, 4 or 8 oz). Sesame salt (4, 8, or 16 oz). Sea salt, white unrefined (1 lb). Salt plums (4 or 8 oz). Kuzu (wild arrowroot) (2 oz or 4 oz). Wholewheat spaghetti (OG [=organically grown], 8½ oz). Buckwheat spaghetti (8½ oz). Wholewheat macaroni (OG, 12 oz). Buckwheat macaroni (12 oz). Azuki beans (8 oz, 1 lb). Wild ginseng root (½ oz). Wild ginseng powder (25/6-pkts). Ohsawa twig tea (4 or 8 oz). Mu tea–Lima, more ginseng (24/2 or 24/8 pkts). Mu tea–Osaka [Japan] (24/2 pkts [also called "16 Herb Tea." Label shows ingredients: Ginseng, Ligusticum, Paonia root, cypress, orange peel, ginger, Rehmannia, cinnamon, cloves, peach kernels, Coptis, liquorice root, Cnicus, Atractylis, Moutan, Hoelen]), Green tea, natural leaf (6 oz). Lotus root tea (1 3/4 oz). Rice cream (OG, 1 or 2 lb). Kombu, kelp size (3½ oz). Tooth powder jar (½ jar).

Appliances: Food grater (with or without well). Vegetable knife–square end. Fish knife–pointed end. Mortar (suribachi, small or large). Pestle–wooden. Vegetable press. Oil skimmer for tempura. Vegetable scrub brush (small or large). Soysauce tableserver–glass. Rice paddle–bamboo. Chopsticks–lacquered. Chopsticks–long cooking.

At the bottom is the Chico-San spiral logo.

Note: Many of these products are imported from Japan. Address: [Chico, California].

5964. Ishikawa, Hisao; Okubo, Katsumi; Oki, Tae. 1972. Nattô nenshitsu-butsu yôeki no eishisei (hiki ito sei?) ni tsuite [Characteristic spinability of a natto mucin solution]. *Nippon Kagaku Kaishi* (*J. of the Chemical Society of Japan*) No. 11. p. 2171-77. Nov. (Chem. Abst. 78:73434). [22 ref. Jap]
• ***Summary:*** A purified mucin solution, which was isolated from natto (fermented soybeans), was composed of fructan and poly-DL-glutamic acid in the ratio of 22.1% and 77.6%. Address: Faculty of Agriculture, Ehime Univ., Matsuyama-shi, Japan.

5965. *SoyaScan Notes.* 1972. Chronology of soybeans, soyfoods and natural foods in the United States 1972

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(Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1972 Jan. Janus begins operation as a macrobiotic natural foods distributor in Seattle, Washington. It is founded by George Gearhart and Blake Rankin.

1972 Feb. Tree of Life in St. Augustine, Florida, starts distributing natural foods. Founded by Irwin Carasso, this company would soon become the largest and most successful of its type.

1972 March. The Farm in Tennessee sets up a small plant and begins to make soymilk, which is rationed for use by babies and children.

1972 Sept. Frank Shorter wins the Olympic marathon, the first marathon victory by an American. A major boost to interest in running, exercise and fitness.

1972 Oct. William Shurtleff and Akiko Aoyagi start full time research on tofu in Japan, writing a book on the subject.

1972. *Soybeans: Chemistry and Technology,* by A.K. Smith and S.J. Circle, published.

1972. The Farm, a large spiritual and vegetarian community in Summertown, Tennessee, sets up a small "soy dairy" to make soymilk and tempeh for members, whose vegan diet contains no animal products, not even dairy products or eggs. This is the earliest known tempeh produced in a Caucasian-run tempeh shop in the U.S., although it is not sold commercially.

1972-74. World food crisis years. Photos of malnourished and starving children appear on the covers of leading magazines and in the TV news.

1972, July. Soviet wheat deal. The USSR suddenly purchases 18 million tons of wheat from the USA via Continental Grain, making it the largest food import deal in history. This starts an era of expanded U.S. agricultural trade with socialist countries. This massive Soviet purchase ends the long postwar period of food price stability.

1972. National Soybean Project established in Brazil.

1972. Soybean research starts at the International Institute of Tropical Agriculture (IITA), in Ibadan, Nigeria. The focus is on soybean production and varietal development. This gradually becomes the most important soybean research program in Africa, and plays a key role in helping national programs in Africa to get started.

5966. Kiuchi, Kan; Ohta, Teruo; Fujiie, Hiroko; Ebine, Hideo. 1972. [Studies on enzymatic hydrolysis of soybean polysaccharides. I. Purification and properties of hemicellulase from *Bacillus subtilis* No. 17]. *Nippon Shokhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 19(12):585-90. [Jap]*
Address: National Food Research Inst., Tokyo.

5967. Leung, W-T.W.; Butrum, R.R.; Chang, F.H. 1972. Food composition table for use in East Asia. Atlanta, Georgia: Center for Disease Control, U.S. Dept. of Health, Education, and Welfare. xiii + 334 p. Dec. No index. 30 cm.
• ***Summary:*** Part I. Proximate composition, mineral and vitamin contents of East Asian foods, by Woot-Tsuen Wu Leung, Ph.D. (Nutrition Program, Center for Disease Control, Dep. of Health, Education and Welfare), and Ritva Rauanheimo Butrum, M.S., and Flora Huang Chang, B.S. (Federation of American Societies for Experimental Biology).

Part II. Amino acid, fatty acid, certain B-vitamin and trace mineral content of some Asian foods, by M. Narayana Rao, Ph.D., and W. Polacchi (Food Policy and Nutrition Division, Food and Agriculture Organization of the United Nations).

In Part I, Food Group 3 titled "Grain legumes and legume products" (p. 16-22) gives the composition of the following (100 grams edible portion and as purchased): Adzuki beans (*Phaseolus angularis;* incl. "Azuki-an," and boiled sweetened). Asparagus bean: See Cowpea, yardlong. Asparagus pea: See Goabean. Bambara groundnut or jugo bean (*Voandzeia subterranea*). Bengal gram: See Chickpea. Blackeyed pea: See Cowpea, catjang. Blackgram: See Mung bean. Broad bean or horse bean (*Vicia faba;* incl. "Fuki-mame" and "Otafuku mame"). Burma bean: See Lima bean. Butter bean: See Lima bean. Catjang pea: See Pigeonpea. Chickpea or Bengal gram (*Cicer arietinum*). Cowpea, all varieties (*Vigna* species). Cowpea, yardlong: See Cowpea, all varieties. Dhal: See Lentil. Dolichos, Australia pea (*Dolichos lignosus*). French bean: See Kidney bean. Goabean [goa bean], asparagus pea, or winged bean (*Psophocarpus tetragonolobus*). Golden gram: See Mung bean. Green gram: See Mung bean. Haricot bean: See Kidney bean. Hindu cowpea: See Cowpeas, all varieties. Horse grain or horse gram or Madras gram (*Dolichos uniflorus; D. biflorus*). Horsebean: See Broadbean. Note 1. This is the earliest English-language document seen (Jan. 2005) that uses the word "horsebean" or the word "broadbean" to refer to *Vicia faba.*

Horsegram: See Horse grain. Hyacinth bean or Indian butterbean (*Lablab niger; Dolichos lablab*). Indian bean: See Mung bean. Indian butterbean: See Hyacinth bean. Jackbean, common (*Canavalia ensiformis*). Jugo bean: See Bambara groundnut. Kidney bean, French bean, navy bean, pinto bean, snap bean, or string bean (*Phaseolus vulgaris;* incl. "Usura-mame"). Lentil or dhal (*Lens culinaris; Lens esculenta; Ervum lens*). Lima bean, butter bean, or Burma bean (*Phaseolus lunatus; Phaseolus limensis*).

Note 2. This is the earliest English-language document seen (May 2003) that uses the scientific name *Lens culinaris* to refer to lentils.

Note 3. This is the earliest English-language document seen (Jan. 2009) that uses the name "Burma bean" to refer to the lima bean.

Madras gram: See Horse grain. Mung bean, Indian bean, red bean, green gram, golden gram, or blackgram / black

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gram (*Phaseolus aureus; Vigna radiata;* incl. vermicelli, dried starch, starch jelly, instant powdered green or red products with sugar and flour added). Mung bean, black gram or urd (*Phaseolus mungo; Vigna mungo*). Navy bean: See Kidney bean. Peanut or groundnut (*Arachis hypogaea;* incl. raw, roasted, with or without shell, salted, parched, seasoned, fried, peanut flour, peanut butter, peanut milk, peanut cake–defatted, peanut cake–defatted and fermented [onchom]). Peas, garden or field (*Pisum* species; incl. parched–salted, "Uguisu-mame"). Pigeonpea, or catjang pea (*Cajanus cajan; Cajanus indicus*). Pinto bean: See Kidney. Red bean: See Mung bean. Rice bean (*Phaseolus calcaratus; Vigna calcarata*). Soybean and soy products (Glycine max; G. hispida; G. soja; p. 19-21), incl: Whole mature seeds–dried (yellow, black), whole immature seeds dried, whole seeds–salted (black, green, green soaked, fried, fermented {natto}, pickled, roasted), flour made from roasted soybeans, defatted soybeans–whole seeds. Soybean products: Curd–unpressed, curd–tofu–raw (plain, kinugoshi, fukuroiri), curd–tofu–fried (moist type, dried type–regular size, dried type–small size, canned, abura age), curd–roasted [grilled], curd–tofu–fermented (home-prepared, jarred), curd–tofu (dried–spongy square, preserved, dried–rope-like, commercial {fermented with chili pepper}–jarred), curd cheese, curd sheet (milk clot sheet {yuba}) (moist type, dried type, pickled in soysauce), curd–pressed–raw (plain, fermented, spiced, strips–semi-dry), miso (Japan) (plain, sweet {5.3% salt added}, salty–light {10.4% salt added}, salty–dark {11.7% salt added}, mame-miso {9.7% salt added}, powdered {18.5% salt added}), paste [jiang] (plain, fermented, red pepper added, sweet, malt), soybean milk (unenriched–unsweetened, "Kaset" {Thailand; canned–concentrated, fluid}, Saridele {a mixture of soybeans, sesame seeds or peanuts, with vitamins and calcium added–Indonesia}), soybean sauce (dark–thick, light–thin, unspecified), tempeh (fermented soybean product, Indonesia), "Budo-mame" (cooked [whole soybeans]–Japan), Soybean residue [okara] (liquid, powder). Urd: See Mungo bean. Velvetbean (*Mucuna utilis; Stizolobium utilis;* incl. dried or mold-treated {tempeh}). Winged bean: See Goabean, Indes.

Food Group 4 titled "Nuts and seeds (p. 23-29) includes: Almonds, hemp seeds–whole, perilla–common (*Perilla frutescens*), safflower seeds, sesame seeds, sunflower seeds (*Helianthus annuus*), watermelon seeds.

Food Group 5, titled "Vegetables and vegetable products" (p. 30-75) includes: Amaranth, mungbean sprouts, seaweeds (many types), soybeans–immature seeds [green vegetable soybeans], soybean sprouts (raw, cooked).

Note 4. This is the earliest English-language document seen (April 2013) that mentions silken tofu, which it calls (in a table): "Curd, tofu, raw: 'Kinugoshi,' Japanese preparation."

Note 5. This is the earliest English-language document seen (Nov. 2012) that contains the term "flour of roasted soybeans."

Note 6. This is the earliest English-language document seen (Oct. 2006) that uses the term "Blackeyed pea" to refer to the cow pea. Address: Dep. Health Education and Welfare.

5968. Leung, Woot-Tsuen Wu; Butrum, R.R.; Chang, F.H. 1972. A selected bibliography on East-Asian foods and nutrition arranged according to subject matter and area. Atlanta, Georgia: Center for Disease Control, U.S. Dept. of Health, Education, and Welfare. vii + 296 p. Dec. 27 cm. [1500* ref]

• ***Summary:*** The references are arranged by country, and within each country by subject. Contents: Map of East Asia. Foreword. Whole region- East Asia. Burma. Cambodia. China, Mainland. China, Republic of (Taiwan). Hong Kong. Indonesia. Japan. Korea. Laos. Malaysia. Philippines. Singapore. Thailand. Vietnam.

Subject matter within each country: General. Food resources. Food composition. Food supplements. Food technology. Food habits. Nutrition and dietary surveys. Nutritional status. Nutrition education. Address: 1. Nutrition Program, Center for Disease Control, Dep. of Health, Education, and Welfare; 2-3. FASEB.

5969. Ajinomoto, Inc. 1972. [Dried miso preparation]. *Japanese Patent* 26,719/72. [Jap]*
Address: Ajinomoto, Japan.

5970. Akao, T.; Sasaki, T.; Sakai, M.; Takano, A.; Yokotsuka, T. 1972. A new plant for continuous production of "koji" in the "shoyu" industry. In: First Pacific Chemical Engineering Congress. See p. 127-28. Held 10-14 Oct. 1972 at Kyoto, Japan. *

5971. **Product Name:** [Tofu].
Manufacturer's Name: Alimentation Japonais Osaka.
Manufacturer's Address: 13 Rue du Helder, Paris 9eme, France. Phone: 770-049-1.
Date of Introduction: 1972.
New Product–Documentation: Shurtleff & Aoyagi. 1975. *The Book of Tofu.* p. 314.

Shurtleff & Aoyagi. 1978, Dec. *The Book of Tofu* (Ballantine pocketbook edition). "Appendix B: Tofu Shops and Soy Dairies in the West." p. 401. Owner: Mr. Mikiyo Yamanaka.

Soyfoods Center Computerized Mailing List. 1981. Jan. 22. Owner: Mr. Mikiyo Yamanaka. Note: This appears to be second earliest tofu manufacturer in France, after Li Yu-ying, and the first of the new generation.

Interview with Noboru Sakaguchi. 1990. June. He started this shop in 1971-72.

5972. Ebata, Junko; Fukuda, Y.; Hirai, K.; Murata, K.

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1972. Tenpei no kôsan kasei busshitsu no seisei ni kanyo suru beta-gurukoshidaaze [β-glucosidase involved in the antioxidant formation in tempeh, fermented soybeans]. *Noka* (*Agricultural Chemistry*) 46(7):323-29. [10 ref. Jap; eng]
• ***Summary:*** The Beta-glucosidase involved in formation of antioxidants (some isoflavones) from fermented soybeans with *Rhizopus oligosporus* was investigated. Genistin was hydrolysed. Address: Faculty of the Science of Living, Osaka City Univ., Osaka, Japan.

5973. Ebine, Hideo. 1972. Miso in conversion and manufacture of foodstuffs by microorganisms. In: Gyozo Terui, ed. 1972. Fermentation Technology Today: Proceedings of the Fourth International Fermentation Symposium. See p. 127-32. Held 5-9 Dec. 1971 at Kyoto, Japan. *
Address: Shokuhin Sogo Kenkyujo, Tokyo, Japan.

5974. Harada, Motô; Nakamura, Y.; Tanimura, A. 1972. Shokuhin-chû no nitorosamine ni kansuru kenkyû. IX. Shokuhin-chû no ashô sanen no bunpu [Studies on nitrosamines in food. IX. Distribution of nitrite in various foods]. *Shoku Eishi* (*J. of Food Hygiene*) 13(1):36-40. [Jap]*
• ***Summary:*** Nitrosamines [pronounced nai-TRO-suh-meens] are reaction products from nitrite and amines. Some salt-pickled foods contain considerable amounts of nitrite. But very small amounts of nitrite were found in rice, wheat, and soybeans used as raw materials for making shoyu and miso.

Interest in the safety of nitrites started in about 1970. The following nitrite levels (parts per million) were found in other Japanese foods: Shiouri shiozuki (salt pickled cucumbers) 96, red hot dogs 64-79, niboshi (small dried sardines) 31, ham 29, fish sausage 24. Very low levels were found in fresh bread crumbs 16, and roasted soy flour 15.

5975. Hayashi, Yoshio; Kawabata, Noboru; Taguchi, Kuniko. 1972. Nattô no nenshitsu-butsu ni kansuru kenkyû [A study of the viscous substances in natto. B.]. *Kyoto Furitsu Daigaku Gakujutsu Hokoku B* (*Scientific Reports of the Kyoto Prefectural University, B*) No. 22. p. 13-. [Jap]*

5976. **Product Name:** [Soymilk].
Foreign Name: Tônyû.
Manufacturer's Name: Ishihara Food Center K.K.
Manufacturer's Address: 2-8-11, Wakamiya, Ichikawa-shi, Chiba-ken 272. Japan.
Date of Introduction: 1972.
New Product–Documentation: Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that Ishihara Food Center first made commercial soymilk in Japan in 1972.

K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. Ishihara Fuudo Sentaa introduced soymilk in 370 ml puroo packs. No date of introduction is given.

Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64. This was Japan's fourth commercial branded soymilk.

5977. Kikkoman Shoyu Company Ltd. 1972. [Soy sauce condiment]. *Japanese Patent* 22 795/72. [Jap]*
• ***Summary:*** Heat denatured soybean or wheat gluten is treated with water and a proteolytic enzyme. Address: Noda, Japan.

5978. Kitaoka, K. 1972. [Soybean miso manufacturing with enzyme preparations]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 218. p. 19-24. (Chem. Abst. 80:81,090). [Jap]*

5979. Machida, Yoshiro. 1972. Tôfu seizô gijutsu no ôyô [Applications of tofu production technology]. *Shokuhin to Kagaku* (*Food and Science*) 14(6):111-14. [Jap]
Address: Sugiyama Industrial Chemical Research, Tokyo, Japan.

5980. Mochizuki, Tsutomu; Yasuhira, H.; Hondo, S.; Ouchi, I.; Rokugawa, K.; Itoga, K. 1972. Studies in the changes of several components during miso making. In: Gyozo Terui, ed. 1972. Fermentation Technology Today: Proceedings of the Fourth International Fermentation Symposium. See p. 663-68. (Chem. Abst. [1976] 84:29,405f). [1 ref]
Address: Sinshu Miso Research Inst., Nagano, Japan.

5981. Nasuno, Seiichi; Ohara, T.; Iguchi, N. 1972. Shôyu kôji-kin no jinkô heni ni yoru kairyô. I. Aspergillus sojae no proteaaze choryô seisan heni kabu no chikuji-teki bunri [Improvement of koji-mold for soy sauce production by induced mutation. I. Successive isolation of proteinase hyperproductive mutants of *Aspergillus sojae*]. *Chomi Kagaku* (*Seasoning Science*) 19(10):27-31. [11 ref. Jap]
Address: Noda Institute for Scientific Research, Noda-shi, Chiba-ken, Japan.

5982. Nasuno, Seiichi; Ohara, Tadahiko. 1972. Shôyu kôji-kin no jinkô heni ni yoru kairyô. II. Aspergillus sojae no oya kabu to heni kabu no seisan suru arukari proteaaze no hikaku [Improvement of koji-mold for soy sauce production by induced mutation. III. Comparison of alkaline proteinase from hyperproductive mutants and parent strain of *Aspergillus sojae*]. *Chomi Kagaku* (*Seasoning Science*) 19(10):41-47. [22 ref. Jap]
Address: Noda Institute for Scientific Research, Noda-shi, Chiba-ken, Japan.

5983. Nasuno, Seiichi; Ohara, Tadahiko. 1972. Shôyu kôji-kin no jinkô heni ni yoru kairyo. II. Aspergillus sojae no heni kabu ni yoru proteaaze oyobi jakkan no kasui bunkai kôso no choryô seisan [Improvement of koji-mold for soy

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sauce production by induced mutation. II. Hyperproduction of proteinase and some hydrolytic enzymes by mutants of *Aspergillus sojae*]. *Chomi Kagaku* (*Seasoning Science*) 19(10):32-40. [19 ref. Jap]
Address: Noda Institute for Scientific Research, Noda-shi, Chiba-ken, Japan.

5984. Sugimoto, Yoshimi; Murata, Kiku. 1972. Tenpei no kôsan kasei yûkô busshitsu no kensaku [Studies on the antioxidative factors in tempeh]. *Osaka Shiritsu Daigaku Kaseigakubu Kiyo* (*Bulletin of the Faculty of Home Economics, Osaka City University*) 20:13-19. [9 ref. Jap; eng]
Address: Osaka Shiritsu Daigaku, Katei Gakubu, Japan.

5985. Taira, Harue; Taira, Hirokadzu. 1972. [Influence of location on the chemical composition of soybean seeds]. *Nippon Sakumotsu Gakkai Kiji* (*Japanese J. of Crop Science*) 41:235-43. [Jap; eng]*
Address: 1. National Food Research Inst., Ministry of Agriculture, Forestry and Fisheries, Yatabe, Ibaraki 300-21.

5986. Terui, Gyozo. ed. 1972. Fermentation technology today: Proceedings of the Fourth International Fermentation Symposium, March 19-25, 1972, Kyoto, Japan. Osaka, Japan: Society of Fermentation Technology. xix + 890 p. Illust. 29 cm. *
• ***Summary:*** Sponsored by IUPAC, the Science Council of Japan, and the Society of Fermentation Technology, Japan.

5987. Yagi, K. 1972. [Packaged bean curd product]. *Japanese Patent* 13 690/72. [Jap]*
• ***Summary:*** Dried tofu is cooked, soaked in soy sauce, then put into a bag with a mixture of soy sauce, spices, binders, and preservatives. After the air is removed from the bag, it is sealed and steam heated. Address: Japan.

5988. Yokotsuka, Tamotsu. 1972. Some recent technological problems related to the quality of Japanese shoyu. In: Gyozo Terui, ed. 1972. Fermentation Technology Today: Proceedings of the Fourth International Fermentation Symposium. See p. 659-62. [40 ref]
• ***Summary:*** Contents: 1. Amino acid containing seasonings around the world and the general situation of the Japanese shoyu industry. 2. Chemical composition of Japanese shoyu, and the factors which influence the preference for shoyu. 3. Some important technical items in the production of Japanese fermented shoyu. 4. Mycotoxin problems with koji mold (research suggests that koji molds do not produce aflatoxins on TLC {thin layer chromatography}). Address: Kikkoman Shoyu Co., Ltd., Noda-shi, Chiba-ken, Japan.

5989. Aihara, Cornellia. 1972. The Chico-San cookbook. Chico, California: Chico-san, Inc. 126 p. Illust. 22cm. by Nan Schleiger. Reissued in revised form as Macrobiotic Kitchen by Japan Publications in 1982.
• ***Summary:*** All recipes are numbered and pages are unnumbered. Soy-related recipes include: 6. Brown rice in soy sauce. 16. Black [soy] beans and brown rice. 23. Inari-sushi (with agé). 24. Ohagi of 3 colors (with roasted soybean flour and miso). 32. Ojiya (with miso or soysauce). 37. Roasted rice (with black soybeans). 38. Musubi (with miso). 55. Kinako mochi. 76. Soy bean stock. 87. Oden (with agé and soy sauce). 90. Kenchin soup (with agé). 95. Cream of onion soup (with miso). 96. Hacho miso soup. 97. Mugi miso soup. 98. Kome miso. 99. Oil miso. 100. Sesame miso. 101. Walnut miso. 102. Miso salad dressing. 103. Shiguri [sic, shigure] miso (with scallops). 104. Tokiwa miso (with shiitake mushrooms, citron, and walnuts). 105. Oyster miso. 106. Tai miso. 108. Nuka miso zuke (vegetables pickled in rice bran and miso). 121. Miso pickles. 137. Daikon with agé. 138. Daikon with miso. 143. Turnip with sesame-miso. 159. Burdock-miso soup. 162. Burdock with miso. 180. Onion-miso sauce. 182. Scallion-miso. 191. Carrots with miso. 192. Carrots with soy sauce. 200. Dengaku (with miso). 220. Roasted soybeans. 221. Soybean soup. 222. Soybeans with vegetables. 223. Soybeans with miso. 224. Soybean tempura. 225. Mashed soybeans with tarako (cod fish roe). 226. Soybean croquettes. 227. Soybean potage. 228. Soybean muffins. 229. Kidney beans with miso. 237. Shigiyaki (small eggplants with miso). 241. Eggplant miso pickle. 267. Rolled shiso leaves with miso. 291. Tofu kuzu sauce. 292. Tofu chili-nabe. 293. Tofu with vegetables. 294. Tofu salad. 295. Okara rice. 296. Torimotsu okara (with chicken giblets). 297. Okara soup. 298. Okara croquettes. 299. Egg tofu. 308. Koi-koku (carp soup with miso). 311. Loach soup (with miso). 312. River fish with miso sauce. 320. Mackerel with miso. 335. Coltsfoot with miso. 341. Dandelion miso-ai [miso-ae]. 345. Horsetail with miso-ai. 359. Watercress miso-ai. 361. Nobiru goma miso (with wild onions). 369. Shiromiso shiru [sweet white miso soup]. 371. Nimame (black soybeans). 400. Shoyu bancha (twig tea). 408. Black bean tea. 409. Amasake (homemade from koji rice and sweet brown rice). 456. Amasake manju. 461. Soba with miso-ame. 515. Tekka (with Hacho and/or mugi miso). 516. Seitan (homemade). 517. Soy sauce (homemade). 518. Miso (homemade). 519. Tofu (homemade using nigari). 520. Nigari (homemade). 521. Amasake (homemade from koji rice and sweet brown rice flour).

Cornellia Aihara was born with a heart valve defect. She was told by doctors that she could never bear children and would probably not live past her nineteenth year. She proved them wrong on both counts. In 1955 she came to America from Japan at the invitation of Herman Aihara, a man she knew only through correspondence, and they were married. Within several years their two children were born.

Cornellia has applied herself to the teaching of macrobiotic cooking, childcare, home remedies, and

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philosophy since 1960. Address: Chico, California.

5990. Aihara, Cornellia. 1972. The *dô* of cooking (Ryorido). Vol. 2. Summer cooking. Macroguide No. 13. San Francisco, California: George Ohsawa Macrobiotic Foundation. 103 p. No index. 25 cm.
• ***Summary:*** All recipes in this macrobiotic cookbook are numbered. The section on "Tofu" contains recipes for: 35. Hiya yako [sic, yakko] (cold, uncooked tofu). 36. Kanten tofu (Tofu aspic). 37. Tofu kuzu aspic. 38. Harusame tofu kuzu sauce. 39. Unagi tofu [vegetarian].

The section on "Miso Soy Bean Paste" contains recipes for: 40. Soy bean miso [soybeans sauteed with miso]. 41. Vegetables with miso sauce. 42. Vegetable miso. 43. Green pepper with miso. 44. Deep fried miso balls.

Other soy recipes include: 60. Nori with soy sauce. 62. Kombu in soy sauce. 64. Hiziki tofu salad. 66. Fried koya tofu with carrot (with dried tofu). 71. Cold miso soup. 73. Split pea miso soup. 81. Tahini-tamari sauce. 89. Soy bean surprise [with miso-tahini sauce]. 92. Okara salad.

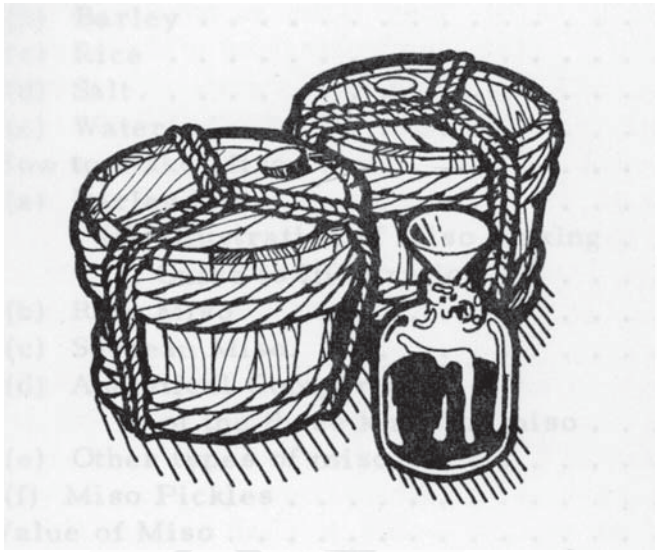
GOMF was founded in 1971. Address: 1471-10th Ave., San Francisco, California 94122.

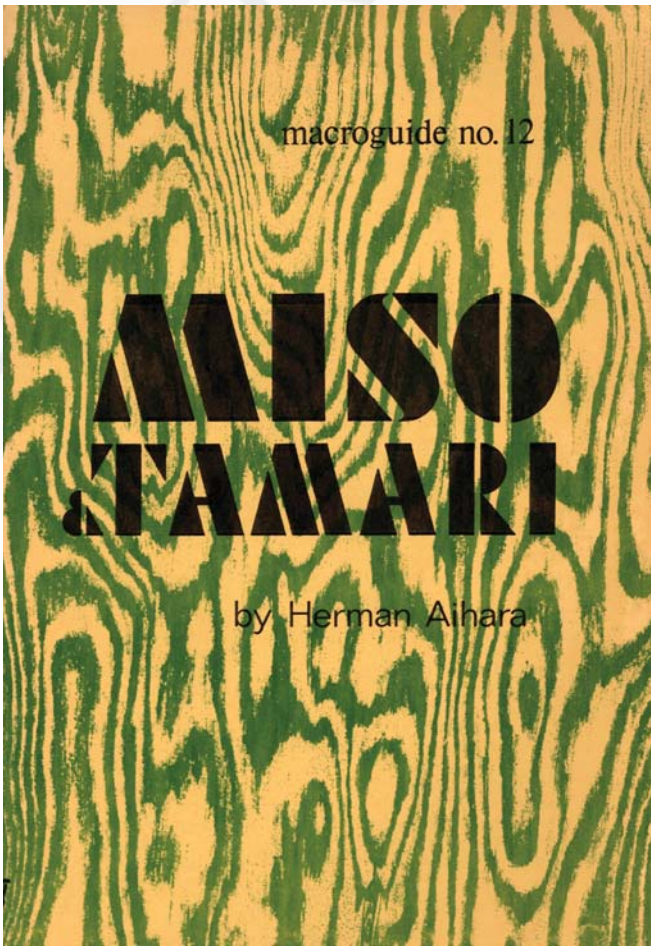
5991. Aihara, Cornellia. 1972. The *dô* of cooking (*Ryorido*). Spring. Oroville, California: George Ohsawa Macrobiotic Foundation. 125 p. Illust. by Carl Campbell. Index. 21 cm.
• ***Summary:*** This macrobiotic book is divided into two parts: Eleven chapters followed by 14 sections of recipes. In part one, miso is mentioned on pages 15, 35, and 51 (Condiments and spices). Recipe section IV, titled "Wheat gluten" (p. 79-82) contains recipes for: Wheat gluten. Seitan. Fresh wheat fu. Boiled fu. Fried fu–gluten cutlet. Shish kebab (using 3 strips of cooked fu). French bread (made with gluten water, p. 115).

Recipe section V, titled "Tofu" (p. 83-90) contains recipes for: Tofu making (using 3 cups green soybeans and nigari coagulant; with 11 excellent illustrations). Nigari (from gray sea salt). Quantity tofu preparation (using 10 lb soybeans). Okara or unohana (using "3 cups soybean puree leftover from tofu making"). Tofu with kuzu sauce. Fried tofu. Shinano-agé (Fried tofu with buckwheat). Kaminari tofu (Thunder tofu). Nori-maki (Tofu rolled in nori; with illustration). Age-tofu (Stuffed tofu; with illustration).

Soy-related recipes include: Onion miso (p. 70). Rolled cabbage with tofu (p. 71). Bean sprout miso salad (p. 100; miso is called "mixed soybean puree {half mugi and half kome}." The sprouts are probably from mung beans). Ganmodoki (Mock goose; p. 109). Gyoza filled with seitan, dipped in a mixture of soy sauce and lemon juice (p. 111-12). Address: George Ohsawa Macrobiotic Foundation, Oroville, California.

5992. Aihara, Herman. 1972. Miso & tamari. *Macroguide* (*San Francisco: George Ohsawa Macrobiotic Foundation*). No. 12. iii + 34 p. [3 ref]





• ***Summary:*** Contents: Preface. Part I: Miso. Introduction, the origin of miso, kinds of miso, ingredients (soybeans, barley, rice, salt, water) how to make miso [at home] (barley miso, rice miso, soybean miso, analytical comparison of the three kinds of miso, other types of miso, miso pickles)

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value of miso (protein, fat, minerals, poison prevention, heart disease, miso for beauty, stamina, miso for radiation and other diseases, miso soup), miso in the treatment of tuberculosis and atomic radiation exposure.

Part II: Tamari or traditional soy sauce. Introduction, history, chemical change of tamari, how to make tamari soy sauce at home, how to use soy sauce.

Part III: The other soybean foods. Tofu (preparation of soybean milk at home, coagulation of soybean protein, the formation of tofu in a mold [for homemade tofu], tofu for external treatment–tofu plaster, age–deep fried tofu [how to make at home]), natto (introduction, how to make natto at home).

Part IV: Appendix. Available publications, G.O.M.F. message.

Illustrations by Carl Campbell show: (1) Two traditional kegs of miso and a glass jar of tamari (title page). (2) Making mugi (barley) miso in Japan (9 steps; p. 10).

Note 1. This is the earliest English-language document seen (March 2009) that describes how to make miso at home. Recipes for three types of miso are given: Barley miso, rice miso, and soybean miso. The method is translated from *Miso University,* by K. Misumi (in Japanese). Fortunately, the exact amount of each of 5 ingredients is given, and nine excellent illustrations show the main steps in the traditional process. Unfortunately, the instructions are somewhat vague.

Note 2. This is the earliest English-language document seen (Jan. 2012) that describes how to make natto at home. Address: San Francisco, California.

5993. Bock, Felicia Gressitt. trans. 1972. Engi-shiki: Procedures of the Engi era. Books VI-X. Tokyo: Sophia University. ix + 190 p. Index. 27 cm. [506 footnotes. Eng]
• ***Summary:*** This is volume 2 of a two-volume series. The first volume, published in 1970, contains Books I-V.

5994. Ebine, Hideo. 1972. Miso. In: 1972. Proceedings of the [Sixth] International Symposium on Conversion and Manufacture of Foodstuffs by Microorganisms. Tokyo: Saikon Publishing Co. viii + 297 p. See p. 127-32.
• ***Summary:*** Contents: General description. Characteristics of miso as a food. Advances in miso manufacturing: Application of starters, application of new type cookers and koji fermenters, production of miso with enzyme preparation, production of new type miso (low salt, dehydrated). Problem of mycotoxin.

In 1969 some 552,000 [metric] tons of miso were produced industrially in Japan, employing 180,000 tons of soybeans, 92,000 tons of rice, 19,000 tons of barley, and 75,000 tons of salt. In addition, the amount of home-made miso is roughly estimated at 150,000 to 200,000 tons.

Japanese soybeans are the best for making miso of good quality, followed by Chinese soybeans, then U.S. soybeans. The best U.S. variety is "Kanrich and its related varieties, Mandarin and Comet, which are comparable to the best Japanese varieties."

Photos show: (1) Sterilization of miso using a long, horizontal machine. (3) Rotary drum fermenter for koji. Address: Fermentation Div., National Food Research Inst., Ministry of Agriculture and Forestry, Shiohama 1, Koto-ku, Tokyo, Japan.

5995. Fujimaki, Masao; Arai, Soichi; Yamashita, Michiko. 1972. Enzymatic protein hydrolysis and plastein synthesis: Their application to producing acceptable proteinaceous food materials. In: Proceedings of the [Sixth] International Symposium on Conversion and Manufacture of Foodstuffs by Microorganisms. Tokyo: Saikon Publishing Co. viii + 297 p. See p. 19-40. Held 5-9 Dec. 1971 at Kyoto, Japan. [55 ref] Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Tokyo, Japan.

5996. Furia, Thomas E. ed. 1972. CRC handbook of food additives. 2nd ed. 2 vols. Cleveland, Ohio: CRC Press (a Division of The Chemical Rubber Co.). Vol. 1: xi + 998 p. Vol. 2. 412 p. Index. 27 cm. [624* ref]
• ***Summary:*** The many chapters are published by various authors. Contents of Vol. 1: Introduction. 1. Enzymes. 2. Vitamins and amino acids. 3. Antimicrobial food additives. 4. Antioxidants as food stabilizers. 5. Acidulants in food processing. 6. Sequestrants in food. 7. Gums. 8. Starch in the food industry. 9. Surface active agents. 10. Polyhydric alcohols. 11. Natural and synthetic flavorings. 12. Flavor potentiators. 13. Nonnutritive sweeteners. 14. Color additives in food. 15. Phosphates in food processing.

Contents of Vol. 2: Legal considerations on food additives. Antioxidants as stabilizers for fats, oils, and lipid-containing foods. Enzymes. Nonnutritive sweeteners: Saccharin and cyclamate. New sweeteners. Natural and artificial flavors. Synthetic food colors.

Vol. 1: Chapter 12, titled "Flavor potentiators" (p. 513-21), by Loren B. Sjöström (Vice-President, Arthur D. Little, Inc., Cambridge, Massachusetts) notes (p. 513): "In the context of flavor, the term 'potentiator' is only a few years old. The identification of flavor potentiators is a twentieth century accomplishment, an area of research still in its infancy." Yet seasonings (such as salt), as well as herbs and spices, have been used since ancient times.

The section on "Flavor enhancers" begins (p. 515): "The best known and most widely used flavor enhancer is monosodium glutamate (MSG). In 1866, a German chemist, Ritthausen, isolated glutamic acid. Later another chemist converted the acid to a sodium salt, monosodium glutamate. In doing their work, neither had any interest in flavor.

"More than 40 years later, in 1908, a Japanese chemist at the University of Tokyo, Dr. Kikunae Ikeda, discovered the flavor enhancing properties of MSG. Dr. Ikeda had set out to find out why and how a certain seaweed, *Laminaria*

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japonica, affected flavor. Japanese cooks had used this seaweed for centuries to improve the flavor of soups and certain other foods. Dr. Ikeda discovered that the ingredient in the seaweed that made the difference was MSG, and that it had an unusual ability to enhance or intensify the flavor of many high protein foods.

"After isolating MSG, Dr. Ikeda developed a process for extracting it from wheat flour and other flours. Working with the Japanese chemical company, Suzuki and Co., he supervised the construction of a plant and, as a partner with the company, began commercial production of MSG in 1909.

"There were several attempts to produce MSG in the United States in the years following, but it was not until the 1940's that large-scale MSG production began in this country. By 1968, U.S. production had grown to 46 million pounds per year and world consumption had increased to more than 150 million pounds per year."

The section titled "Types of potentiators" discusses 5'-nucleotides, maltol, dioctyl sodium sulfosuccinate, and several others. The 5'-nucleotides are synergistic with salt, and especially with MSG; they can have something like a multiplier effect in increasing the effectiveness of salt or MSG.

Note: Soy does not appear in the index of this book. Nor can we find it mentioned in Chapter 12. Yet there are scattered mentions throughout the book: Soy protein concentrate (p. 5). Soy sauce, tamari sauce, and miso–made for centuries in the Orient using fungal protease (p. 59). Studies on breads supplemented with soy, nonfat dry milk, and lysine (p. 114).

Experimental use of esters of *p*-hydrobenzoic acid in soy sauce and other foods (p. 128). Gas sterilants: Ethylene and propylene oxides. The ethylene oxide process was used during World War II to reduce the bacterial counts in soy flour and cereal products used in processed meat products for the Armed Forces (p. 156). An excellent acidulant for hams and soy bean curds [tofu] has been obtained by coating citric acid with suitable animal or plant oils (p. 242-43).

"Synthetic aroma for soy sauce," by K. Ebihara. 1954 Japanese patent No. 5250'54 (p. 258). Soy flour as a widely used binder for processed meat (p. 425). Soy flakes (31.5% parts by weight) and soy hulls (3.0%) as ingredients in "Soft moist pet food" (p. 445).

Cake doughnut mixes sometimes contain soy flour (p. 656). Completely synthetic coffee whiteners usually contain a combination of vegetable fats, sodium caseinate or soy protein, gums as viscosity stabilizers, phosphate or citrate salts as stabilizers for the proteins and as buffering agents, corn syrup solids or sugar as sweeteners and bodying agents, liquid-type emulsifiers, and colors to duplicate the color of cream (p. 671-72). Whipped toppings are used to replace high-fat cream products just as coffee whiteners are used to replace low-fat cream products. Both use protein, which may be soy protein (p. 672).

Imitation sour cream, sour cream dressings, and chip dips. Replacements for fermented cream products represent a growing market These non-dairy products contain vegetable oil / fat, protein (either soy protein or sodium caseinate [derived from milk], gum stabilizers, etc., p. 673). When partially hydrolyzed soy protein and sodium hexametaphosphate (SHMP) are added to dried egg white, an angel food cake mix can be prepared in which all of the ingredients can be included in a single mixing stage (p. 679). Gelsoy, a patented soy protein made from specially processed, defatted and dehulled soybean flakes, is reported to have improved water- and fat-binding capabilities when treated with SHMP (p. 746, 778).

Improving protein whipping properties: Sevall and Schaeffer prepared protein whipping compositions from soy protein by combining the protein with SHMP etc. (p. 747). Gunther made an entirely new whipping protein composition by combining an enzyme-modified soy protein similar to Gelsoy, with gelatin and a polyphosphate (p. 747). A long table on the regulatory status of direct food additives mentions "Isolated soy protein" (p. 874-75); its use as a binder is regulated by the Meat Inspection Division (MID) of the USDA.

The word "soybean" is mentioned on 22 pages; all of these concern soybean oil except when noted (p. 65 {soybean protein}, 67 {soybean meal, soybean flour / flours}, 99, 114 {soybean products}, 192, 193, 197, 198, 207, 221, 222, 263, 264, 280, 289, 290, 319 {the soybean plant resembles the guar plant}, 350 {soybean protein, soybean methylcellulose}, 424, 746 {soybean flakes}, 747 {soybean protein}, 749 {soybean milk}). Address: Technical Development Manager, Industrial Chemicals Div., Geigy Chemical Corp., Ardsley, New York; President, Intechmark Corp., Palo Alto, California.

5997. Hesseltine, C.W.; Wang, H.L. 1972. Fermented soybean food products. In: A.K. Smith and S.J. Circle, eds. 1972. Soybeans: Chemistry and Technology. Westport, CT: AVI Publishing Co. xiii + 470 p. See p. 389-419. Chap. 11. [54 ref]

• ***Summary:*** Contents: Introduction. Koji. Miso: Preparation of koji, treatment of soybeans (mixing, fermentation). Shoyu: Incl. chemical shoyu. Natto. Hamanatto. Tempeh. Sufu [fermented tofu]. New soybean products made by fermentation: Cheese-type products, fermented soybean milk, an ontjom-type product. 10. Future of fermented soybean foods.

Tables: (1) Demand for whole soybeans in Japan (1964-1967) to make miso, shoyu, and natto. In 1967, only 4.5% of the soybeans used to make miso were used in the form of defatted soybeans, whereas the same year 91.1% of the soybeans used to make shoyu were defatted. The total demand in 1967 (in 1,000 metric tons) was miso 177, shoyu 169, and natto 47. (2) Chemical composition of soybean

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foods: Miso (salty light, salty light, soybean miso), natto, soybeans. (3) Annual production of miso in Japan (1956-1967). Production of 530,078 tons in 1956 decreased to a low of 453,956 tons in 1962, then rose to 520,510 tons in 1967. (4) Composition of miso in relation to time of fermentation and ratio of soybeans:rice:salt for three types of miso: White miso, light-yellow salty miso, and yellow-red salty miso. (5) Average composition of shoyu made from whole soybeans and defatted soybean meal.

Illustrations (flowsheets, without quantities of ingredients) show: (1) Process for making red miso. (2) Process for manufacture of shoyu. (3) Process for making hamanatto. (4) Tempeh fermentation on a laboratory scale. (5) Preparation of sufu. (6) Preparation of soybean cheese. Address: NRRL, Peoria, Illinois.

5998. Horton, Lucy. 1972. Country commune cooking. New York, NY: Coward, McCann & Geoghegan. 232 + [8] p. Illust. by Judith St. Soleil. Index. 24 cm.
• ***Summary:*** A nostalgic memoir (for those who came of age at this time) of the world of young Americans in communes in the early 1970s, with many fine illustrations (see p. 27). The author, raised in New York City and educated at Bryn Mawr (Pennsylvania, with a major in classical archaeology), earned her traveling money by working as a live-in maid and cook for a rich "Park Avenue Lady" before embarking on the project that became this book. She hitchhiked to San Francisco, arriving in June 1971, then spent most of the next year visiting 43 communes in 12 states and Canada, and collecting recipes from each. There she found "a New Age of Food Consciousness." The main topic of conversation and common interest at these intentional communities was not God or sex, but food. This book, with her 150+ favorite recipes, features natural and organic foods (with lapses). Most of the recipes from California and the West Coast are vegetarian, but in New Mexico and eastward (especially New England) she was "surprised to find that vegetarianism was more the exception than the rule" (p. 81). Thus, Chapter 3 is titled "Meat (and one fish)." There are recipes for chicken, fish, deer, goat, beef, etc.

The Introduction notes (p. 15): "The *sine qua non* of commune cooking is tamari soy sauce, an unspeakably delicious fermented Japanese product available in natural foods stores which bears no resemblance to commercial soy sauce" * (Footnote: *"Kikkoman soy sauce, available in supermarkets, tastes like tamari but contains a preservative").

"1. Soups: The commune soups I sampled were typically of mixed vegetables with a tomato or miso (p. 159) base" (p. 27).

Tamari chickbits (p. 94, with chicken). Note about soy grits (p. 114). Sprouts (p. 135-36, many kinds including alfalfa, mung beans, soybeans, from Terra Firma, Oregon). Miso Almond Sauce (p. 158-59). Tamari gravy (p. 159). Soy-related recipes include: From Chapter 2, "Vegetarian main dishes"–Donna's soyburgers (p. 60-61, with whole soybeans, from California). Soy cheeseburgers (p. 61-62, with whole soybeans, from Moon Garden, Oregon). Suzy's soybean casserole (p. 63-64, from Breadloaf, New Mexico). Baked soybeans (p. 64-65, from Woolman Hill School, Massachusetts). Larry's tofu (soy cheese) (p. 65-68, homemade tofu from whole soybeans, from Om Shanti, Mendocino County, California). Breakfast cereal with roasted, salted soybeans (p. 163). Soy spread (p. 227, with soy flour, from The Motherlode, Oregon). Soy nuts (p. 229-30, baked, soaked soybeans with oil and salt).

A photo on the rear cover shows the author, age 27, with long blonde hair, granny glasses, and blue denim overalls. Says Raymond A. Sokolov: "Lucy Horton has done more than collect exotic recipes... she has assembled the crucial artifacts of a movement within The Movement."

Also discusses (see index): Adelle Davis, gluten (wheat), granola, ground nuts, macrobiotic diet, peanuts. Address: Derby, Vermont.

5999. Hosking, Richard. 1972. A dictionary of Japanese food: Ingredients & culture. Boston: Tuttle Publishing. 239 p. Illust. by Richard C. Parker. Index. 19 cm. *
• ***Summary:*** An excellent, accurate book. The basic entry for each word is given under its Japanese name (thus *daizu* rather than soybeans). Each entry includes the Japanese term in kana (usually hiragana) and (usually) kanji (Chinese characters). One hundred small illustrations are very helpful. Address: Prof. of Sociology and English, Hiroshima Shudo Univ., Japan.

6000. Houck, James P.; Ryan, M.E.; Subotnik, A. 1972. Soybeans and their products: Markets, models, and policy. Minneapolis, MN: University of Minnesota Press. vi + 284 p. Illust. Index. 24 cm.
• ***Summary:*** This classic work developed the standard framework for soybean sector analysis based on the joint product characteristics of soybean oil and meal. Contents: 1. Introduction. 2. World markets for food oils and high-protein meals. 3. Soybean markets in the United States. 4. Prices in the soybean sector. 5. Dynamic supply and demand model of the market for U.S. soybeans and their products. 6. Policy analysis with the dynamic model. 7. The economic and statistical framework for regional demand analysis. 8. Analysis of regional export demand for U.S. soybean oil: Mediterranean region, developed countries, Eastern Europe, developing countries, Latin America, Asia and Africa. 9. Analysis of regional export demand for U.S. soybean meal. 10. Analysis of regional export demand for U.S. soybeans: European community, other Western Europe, Canada, Japan, Israel and Taiwan. 11. Summary of regional analyses. Appendixes: Description and sources of data. Effective support prices and acreage supply functions: A general approach. Address: Univ. of Minnesota.

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6001. Iha, Fuyu; Higaonna, Kanjun; Yokoyama, Shigena. comp. 1972. Ryûkyû shiryô sôsho [Ryukyu historical material series]. Tokyo: Tokyo Bijutsu. See vol. 1, p. 106. [Jap]*

6002. Inako, Yukimoto. 1972. Gendai nogyo gujutsu sosho: endou, soramame, ingenmame, edamame, suitokon [Modern agricultural techniques series: Green peas, broad beans / Fava beans, string beans, green vegetable soybeans, sweet corn]. Tokyo: Ieno-Hikari Kyokai. 205 p. Illust. Series: Sosai engei hen. Vegetable gardening series, No. 9. [Jap]*
• ***Summary:*** Includes how to grow edamame in a vegetable garden. Address: Japan.

6003. Japanese National Tofu Assoc. 1972. Tôfu shûsetsu [Tofu: Collected theories. (Tools and techniques for making tofu in the traditional way)]. Tokyo. 40 p. [Jap]
• ***Summary:*** This is a reprint of original 1872 edition.

6004. Kaneko, M. 1972. Hatchô miso [Hatcho miso]. Okazaki, Japan: Hayakawa Kyuemon Shoten. 8 p. [Jap] Address: Okazaki, Japan.

6005. Kawakoshi, Kenji. ed. 1972. Shashi–Chôshi Shôyu Kabushiki Kaisha [History of Choshi Shoyu, Inc.]. Choshi, Chiba-ken, Japan: Choshi Shoyu K.K. 512 p. Illust. No index. 28 cm. [Jap]
• ***Summary:*** Contents: Preface. Part I: History before the founding of Choshi Shoyu. 1. The origin of shoyu and its development (p. 1). 2. The shoyu industry in Choshi during the Tokugawa period (1600-1868) (p. 25). 3. The Meiji period (1868-1912) (p. 69). 4. The three families that founded the company (p. 87). Part II: The history of Choshi Shoyu (p. 115). 1. The period of the limited partnership (p. 119). 2. The period of expanding development (p. 137). 3. The period of production growth and heavy competition (p. 159). 4. The period of new development conditions before World War II (p. 203). 5. The days of controlled conditions during World War II (p. 203). 6. Difficulties under the Allied occupation of Japan (p. 223). 7. The period of modernization of the industry and of new technology (p. 247).

Part III: Documents (p. 299). 1. Organization and management (p. 301). 2. Production (p. 327): Raw materials for shoyu, changes in the production process, shoyu containers, the factory. 3. The research laboratory (p. 393): Its history, its work. 4. Business (p. 401): Brands, labels (Choshi Shoyu, Higeta Shoyu, "since 1616." Includes English-language labels from 1954 and 1961), and awards, advertisements, branches, shoyu prices, shoyu taxes. 5. Labor (p. 435). 6. Social benefits and activities (p. 453). Chronology of Choshi shoyu, 1616-1971 (p. 483-509). Conclusion. Address: Japan.

6006. Kawamura, Wataru; Tatsumi, Hamako. 1972. Miso no hon [The book of miso]. Tokyo: Shibata Shoten. 320 p. Illust. No index. 19 cm. [42 ref. Jap; eng+]
• ***Summary:*** Contents: Part I: Miso Culture. 1. Chinese jiang and Japanese miso. 2. Origin of miso in Japan. 3. Miso in Nara and Heian periods. 4. Miso in Kamakura period. 5. Miso in Muromachi-Momoyama periods. 6. Miso in Edo period. 7. Modern miso. 8. Value of miso. 9. Topography of miso. 10. About miso fermentation. 11. Miso slang and local words. 12. Haiku, senryu, kyoka and tanka of miso. 13. Classical miso cookery (contains many Japanese miso recipes). Appendix: Historical documents of miso.

Part II: Miso cooking. Preface. 1. Miso soup. 2. Aemono: Tossed with miso dressing. 3. Yakimono: Broiled food. 4. Nimono: Simmered with miso. 5. One pot cookery. 6. Nerimiso: Simmered with miso. 7. Agemono: Fried foods. 8. Miso pickles.

Wataru Kawamura was born in 1899. Hamako Tatsumi lived 1904-1977. Address: 1. 2-4-7 Kugenuma, Tachibana, Fujisawa-shi, Kanagawa-ken 251, Japan.

6007. Kawashima, Masao. 1972. Genjodakai was reizo tôfu de [Breakthroughs in production of dried-frozen tofu]. *Reishoku Sangyo* (*Refrigerated and Frozen Food Industry*) 1(3):65-69. [Jap]
Address: Habutae Tofu Co. Ltd., Shokuryo Kagaku Kenkyu Shitsu-cho, Nishi Kanazawa 2-162, Kanazawa-shi, Ishikawa-ken 921, Japan.

6008. Kikkoman Shoyu Co., Ltd. 1972. Guide to Kikkoman (Brochure). Noda City, Japan. 10 p. 15 x 10 cm booklet. [Eng]
• ***Summary:*** Contents: Introduction by Kenzaburo Mogi, president. Shoyu: Its past and present. History. Production method. People everywhere love Kikkoman (with a photo of 19 Kikkoman products). Kikkoman all over the world. Kikkoman in Japan. Note that the product is referred to throughout as "Kikkoman Shoyu" and not "Kikkoman Soy Sauce."

"History: In the 6th century Buddhism came to Japan from China, and with it came a strict ban on the eating of meat. Buddhism also brought a new vegetable-base sauce–a paste made by fermenting various grains–which replaced previous meat or fish-base seasonings. For a thousand years or so the Japanese used this paste as one of their major seasonings. It was not until the 17th century that this seasoning was developed into the shoyu that we know today.

Kikkoman worldwide: Kikkoman Foods Inc. (KFI) was established in 1972 to produce shoyu in America, our largest overseas market. Head office and plant: Walworth, Wisconsin 53184 USA.

Kikkoman International Inc. (KII) was established in 1957 to import and distribute our products in the USA. Head Office: 1581 Webster St., San Francisco, California 94115.

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Branches: Los Angeles, New York, Chicago.

Japan Food Corporation (JFC) is the largest importer and distributor of oriental foods in the United States. Head Office: 900 Marine St., San Francisco, CA 94124. Branches: Los Angeles, New York, Chicago, Sacramento, San Diego, Washington [DC].

Pacific Trading Co., Ltd. (PT) was established in 1928 in Tokyo to export oriental foods, mainly to the United States. Head Office: 767 Marunouchi Bldg., Chiyoda-ku, Tokyo.

Kikkoman Daitokai (Europe) GmbH is a restaurant chain, established in 1972 to serve mainly Japanese dishes. Head Office: 4 Dusseldorf, Kleverstrasse 46, West Germany.

Kikkoman in japan. Kikkoman is the leading brand of shoyu in Japan. The second best-selling brand sells only 23% as much shoyu as Kikkoman and the third best-seller only 13% as much. Kikkoman's capital: $18,500,000. Sales (1972): $218,000,000. Total production of shoyu (1972): 100,000,000 gallons. Number of employees 4,400. The names of members of the Kikkoman board of directors are given. Kikkoman subsidiaries are Kikko Foods Corp., Mann's Wine Co. Ltd., Seishin Pharmaceutical Co. Ltd., Tone Coca Cola Bottling Co. Ltd.

6009. Kikkoman Shoyu Co., Ltd. 1972. Kikkoman today & tomorrow (Brochure). Noda City, Japan. 14 p. [Eng]
• ***Summary:*** On the cover of this brochure is a man, standing in the lower right corner, looking up into a dark blue sky, in which there are seven colored heavenly bodies; the large central one is yellow, and the smaller ones, equidistant from the center, are (clockwise from the top) red, orange, yellow and green, blue, violet, and magenta. On the inside front cover is a huge red Kikkoman logo on a white background.

Contents (includes many color photos): History of shoyu and Kikkoman (with a chronology from 1661 to 1972). Present state of Kikkoman (graph of financial increase from 1917-1971; board of directors, company description and spirit). Kikkoman in Japan (products, plants, sales from 1950-1971). Kikkoman export products. Kikkoman soy sauce in America. International operations. Central research laboratories. Kikkoman soy sauce production method. Kikkoman group in Japan. People everywhere love Kikkoman. Kikkoman and advertising. The rear cover is dark blue.

The chronology (p. 1) begins: "Kikkoman Soy Sauce first went on the market in 1661 when the Takanashi and Mogi families constructed breweries and started the brewing of soy sauce." Address: 339, Noda, Noda-city, Chiba 278, Japan. Phone: (0471) 22-1111.

6010. Koaze, Yoshihisa; Nakajima, Yutaka; Eida, Toshiaki. 1972. Improvement of soybean products by microbial means. In: Proceedings of the [Sixth] International Symposium on Conversion and Manufacture of Foodstuffs by Microorganisms. Tokyo: Saikon Publishing Co. viii + 297 p. See p. 41-52. Held 5-9 Dec. 1971 at Kyoto, Japan. [19 ref]
• ***Summary:*** Starting with dehulled defatted soybean flour, and using a fermentation process followed by a purification process, the authors have developed a series of "Bland Soybean Protein Products." These products consistently received higher scores than isolated soy protein in organoleptic evaluation tests. Address: Food Research & Development Labs., Meiji Seika Kaisha Ltd., Kanagawa, Japan.

6011. Kondo, Akitani. 1972. Nihon no chôju mura, tanmei mura [Japanese long-life and short-life villages]. Tokyo: Sanrodo. [Jap]*

6012. Kondo, M. 1972. Chôju mura, Nippon kikô [Longevity villages: A diary of travels through Japan in search of the secrets of diet and life patterns]. Tokyo: Women's Nutrition University, Publications Dept. [Jap]*

6013. Koshiyama, Ikunori. 1972. Purification and physico-chemical properties of 11S globulin in soybean seeds. *International J. of Peptide and Protein Research* 4(3):167-76. [34 ref]
Address: Noda Inst. for Scientific Research, Noda-shi, Chiba-ken, Japan.

6014. Kusano, Aiko. 1972. Nattô seizô katei ni okeru daizu tanpaku no henka. III. Nattô seizo-ji ni okeru TCA kayô-sei kubun no ion kôkan kuromatogurafii oyobi geru roka ni yoru bunkaku [Changes in soybean protein during natto production. III. Fractionation of TCA soluble fraction during manufacture of natto by ion exchange chromatography and gel filtration]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 25(1):21-24. [9 ref. Jap]
Address: Faculty of Pedagogy, Gifu Univ., Nagara Gifu City, Japan.

6015. Maruhi. 1972. Tôfu ryôri, hyaku-sen [Tofu cookery, one hundred favorite recipes]. Tokyo: Sankosha Katei Buhen, Maruhi. 165 p. [Jap]

6016. Morishita, Keiichi. 1972. Shokuji kakumei: Genmai, saishoku no himitsu [Diet revolution: The secrets of brown rice and vegetarianism]. Tokyo: Bijinesu-sha. 252 p. 18 cm. Series: New Life Book No. 3. [Jap]*
• ***Summary:*** About nutrition and vegetarianism. The author was born in 1928.

6017. Nakahama, Toshio. 1972. Shôyu jôzô no saishin no gijutsu to kenkyû [Early technology and research related to shoyu brewing]. Tokyo: Nihon Jozo Kyokai. 344 p. [Jap]
Address: Kyoto Fu-ritsu Daigaku-cho, Japan.

6018. Nakao, Sasuke. 1972. Ryôri no kigen [The origin

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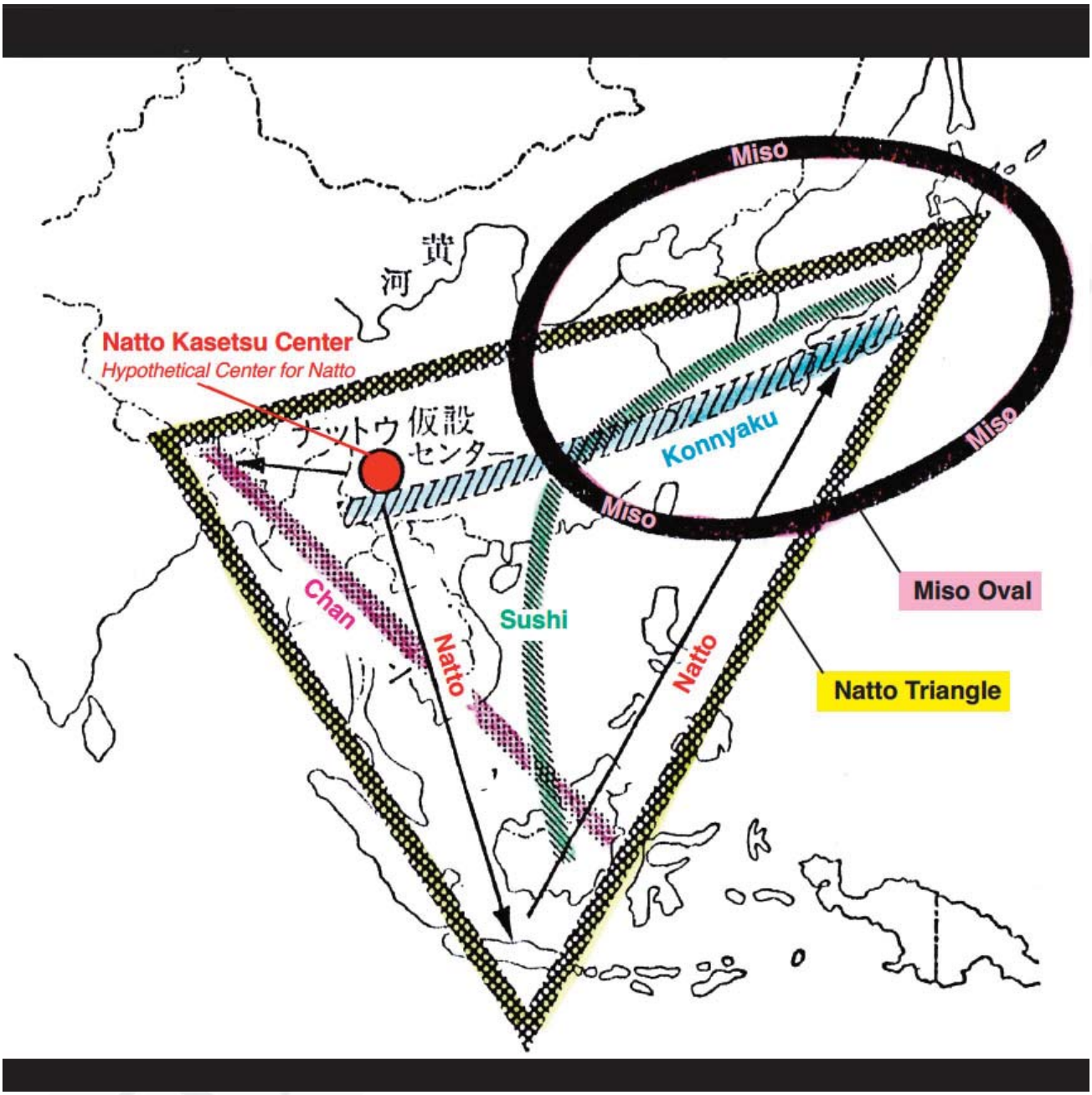

of foods]. Tokyo: Nihon Hoso Shuppan Kyokai (Japan Broadcast Publishing Association). 225 p. Illust. (some color). Maps. Index. 22 cm. Series: NHK Books No. 173. [Jap]

• ***Summary:*** The important chapter titled "The big natto triangle and miso," by Sasuke Nakao (p. 118-27) discusses natto, its relatives and ancestors in East Asia, and the "natto triangle" theory (with a map). Nakao hypothesized that natto (*itohiki natto,* made with one or more strains of bacteria) originated in the monsoon area of Southeast Asia, where there are East Asian evergreen forests. He considered Yunnan province in China to be the hypothetical center of natto's origin.

He states: We don't know much about natto in Japan. Konnyaku was clearly mentioned in the literature of the Heian period [794-1185]. But natto was first mentioned later, during the Muromachi period [1336-1573], therefore I guess it came from Java [sic] at about that time. Many new things from Europe (such as guns) also entered Japan during the Muromachi period.

What I call the "Miso Group" is salted mold-fermented soyfoods–such as miso, shoyu, tamari, and fermented black soybeans (*douchi*)–that originated in northern China outside the Big Natto Triangle, then spread to central China and to other countries such as Japan and Korea. I have shown the

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Miso Group on the map in an oval to the upper right. So the triangle and the oval shows the locations of these two groups of processed, fermented soyfoods.

In the Big Natto Triangle we find a number of foods that originated in northern China, including konnyaku and sushi. Sake is also fermented with a mold–the koji mold. Bean sprouts (a great Chinese invention, using beans that are hard to cook) also exist in the Miso Oval, but they spread into many areas within the Big Natto Triangle including Burma and Java.

Nyufu [dairy cheese or yogurt; literally "decayed / spoiled milk"] and tofu: Tofu was also a great invention of northern China–an easy way to eat soybeans. Seen from this point of view, European ways of cooking beans are very primitive.

Note: Traditional European beans generally contain too little protein and too much carbohydrates (especially starch) to enable them to be made into tofu.

Mr. Shinoda Osamu has developed the theory that tofu was invented in China but not in ancient times; probably in the middle of the Tang dynasty [618-906], and it became popular in the middle Song dynasty [960-1279], at which time it became an alternative to *nyufu* made from dairy milk. What I call *nyufu* here is different from *funyu* (fermented tofu), which is made by fermenting tofu, appeared after the invention of tofu, and is found today throughout East Asia. It is difficult to know exactly what *nyufu* was; in my opinion it was probably like *dahi* from India. In any case, it is certain that there was a product in called *nyufu* shortly before the Tang dynasty and during the early Tang.

During most of Chinese history, except when the nomadic milk-consuming Mongols ruled China during the Yuan dynasty (1279-1368), animal milks were not part of traditional Chinese culture.

Tofu was in Japan by 1183 AD (see *Diary of Hiroshige NAKAOMI,* entry for 1183). Maybe tofu was brought in by Buddhist monks and consumed in and around Nara. By the end of the Muromachi period [1336-1573] the center of tofu making and use had moved to Kyoto.

Another interesting thing is that in southern China and in Sichuan province, there is a tofu named *reiki* [*li qi,* pronounced "lichi;" "morning prayer]." The name originally referred to *nyufu* but later it came to refer to tofu. The origin of the word *reiki* was considered to be Sanskrit or some European language. It may have been connected with *nyufu* and/or dahi or India. Also, if we consider *reiki* to be the original name of tofu, then *nyufu* and tofu may have originated in Sichuan or southern China and migrated up to Northern China.

In summary: Nakano's theory is based on the observation that there are many varieties of non-salted fermented soyfoods and soy condiments inside the "natto triangle." Yunnan province in southwest China, Thailand, Myanmar (Burma), Bhutan, Nepal, Indonesia, and Japan all fall within this triangle.

Note 1. This is the earliest English-language document seen (Jan. 2012) that contains the term "natto triangle." Yet this term can be misleading, especially for non-Japanese. Natto is the only non-salted fermented soyfood or soy condiment indigenous to Japan. Natto is made by fermenting whole, cooked soybeans with bacteria (*Bacillus natto,* or *Bacillus subtilis*) in a warm place (ideally 104ºF or 40ºC) for about 24 hours. According to various Japanese legends, natto originated almost 1,000 years ago in northeast Japan when cooked soybeans were placed in a rice-straw sack strapped over the back of a horse. The natto bacteria are found abundantly on rice straw, and the warmth of the horse's body aided the fermentation. Under these conditions, the fermentation would take place naturally, without intentional inoculation.

The "natto triangle" refers to the geographical area within a large triangle in East-, South-, and Southeast Asia–the only place in the world where non-salted fermented soyfoods and soy condiments are indigenous. A number of these–such as tempeh in Indonesia and unsalted fermented black soybeans in China–are fermented primarily with molds (e.g., *Rhizopus, Aspergillus*) rather than bacteria. The triangle has its three corners in northeastern Japan (on the northeast, for natto), northeastern India and Nepal (on the west, for kinema), and in Java (Indonesia, on the south, for tempeh). It is incorrect to think of tempeh as a type of natto–by any definition! Applying this correction to the "natto triangle" causes it to fall apart! Extensive research after 1972 on the early history of tempeh and natto gave no support to the conjecture that natto came from Java.

However the incorrect theory actually turned out to have powerful predictive value, especially as close relatives of natto were discovered in northeast India by Tamang and co-workers starting in 1988, more than 15 years after the "natto triangle" hypothesis was proposed.

Sasake Nakao was born in 1916. The chapter titled *Mame no ryôri* [Bean cookery] is on pages 115-26.

6019. National Food Research Institute. 1972. National Food Research Institute [Japan]. NFRI, Ministry of Agriculture and Forestry, Shiohama-cho 1-4-12, Koto-ku, Tokyo. 27 p. [144 ref. Eng]

• ***Summary:*** Contents: Brief history. Budget and personnel. Organization. General survey of the Institute. Major research area. Facilities and pilot plants. Reports and patents. Publications. Scholarship. Location.

In 1934, the Rice Utilization Research Laboratory was established by the national government. The first building of about 330 square meters was completed in 1935 at the present site. In 1944 the title of the Laboratory was changed to the Research Institute of the Bureau of Staple Food Administration, and investigations were directed toward the processing and utilization of unconventional food resources.

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"Owing to the change in the food situation in Japan during World War II, the Institute carried out extensive research on the most efficient utilization of the nutrients in various foodstuffs, and on finding new food sources among various agricultural products, so as to meet the serious food shortage. This trend continued through the post-war period as the nation struggled with an even more acute food shortage problem. Fats and oils, fruits and vegetables, and fermented soybean products miso and soybean sauce were added as subjects of research.

"The Institute again changed its name to the Food Research Institute in 1947, and official analysis and standardization of food commodities were included in its activities... The Institute came to belong to the Food Agency in 1949 and later, in 1961, as a result of the reform in agricultural research administration, it was brought under the administration of the Agriculture, Forestry, and Fisheries Research Council together with other agricultural research establishments." The name was changed for a third time to the National Food Research Institute in 1970.

T. Watanabe is the Director of the organization. The fermentation research division is headed by H. Ebine, and consists of the following laboratories: Fermentation microbiology (M. Matsuno), fermentation chemistry (T. Ohta), industrial fermentation (H. Ito), mycotoxin (H. Ebine), resources utilization (N. Tsumura). The nutrition research division is headed by S. Kimura.

Note: This institute moved from Tokyo to Tsukuba in Feb. 1979. Address: Shokuhin Sogo Kenkyujo, Tokyo, Japan.

6020. National Research Council, Committee on Genetic Vulnerability of Major Crops. 1972. Genetic vulnerability of major crops. Washington, DC: National Academy of Sciences. vii + 307 p. For soybeans, see Chap. 13, p. 207-17. Illust. 23 cm.

• ***Summary:*** Chapter 13, titled "Soybeans and other edible legumes," discusses soybeans, peanuts, and dry beans. Contents for soybeans: Origin and history. Importance of crop. Genetic uniformity. Pests and diseases. Status of breeding for resistance.

Concern with genetic uniformity and vulnerability increased dramatically after 1970, when the U.S. corn crop was struck by Southern corn blight. Yields dropped 15% nationwide and more than 50% in certain major states. From 1924 to 1927 Dorsett collected 1,500 types of soybean in Manchuria, and in 1929-31 he and Morse collected 4,578 varieties and types in Manchuria, Korea, and Japan. This was the only expedition ever made into eastern Asia specifically to collect soybean germ plasm. By 1922-43 of the introductions received were found to be suited for seed production in the U.S., and they were named. Approximately 10,500 introductions have been brought to the U.S. since 1898–many of these have been duplicates, so many have been lost. Since 1943, 87 varieties have been registered by the Crop Science Society of America.

The vulnerability of any crop to epidemics depends upon the genetic uniformity of currently grown varieties. The practices that increase the vulnerability of varieties by restricting the germ plasm base are: 1. The parents used to develop new varieties are restricted to a few that tend to produce superior varieties under "normal" conditions. 2. A very few varieties dominate production. 3. Resistance to a given disease in currently grown varieties traces to a single source.

Most of the currently grown varieties can be related to 11 introductions, listed here in descending order of importance based on frequency of occurrence (percentage) in parentage of currently grown soybean varieties. Three percentages are given for each variety after the year of introduction–Northern frequency, Southern frequency, and total frequency. Northern refers to maturity groups 00-IV:

Mandarin (Pehtuanlintza, Northeastern China; 1911–84, 0, 58).

Richland (Changling, China; 1926–60, 0, 42).

AK [A.K.] (China; 1912–32, 63, 42).

Manchu (Niguta, China; 1911–56, 0, 39).

Tokyo (Yokohama, Japan; 1901–14, 58, 27).

Clemson (Nanking, China; 1927–9, 68, 27).

PI 54610 (Changchun, Liaoning Prov. China; 1921–14, 47, 24).

Mukden (Mukden, China; 1920–26, 0, 18).

Dunfield (Fancheatun Station, China; 1913–7, 26, 13).

Arksoy (Pingyang [Pyongyang / P'yongyang], Korea; 1914–0, 32, 10).

Roanoke (rogue from Pi 71597, Nanking, China; 1927–0, 26, 8).

The varieties Wayne, Amsoy, Corsoy, Clark or Clark 63, Lee, and Bragg accounted for 56% of the U.S. acreage. Statistics indicate that, for the soybean varieties currently grown, genetic uniformity is pronounced.

6021. Nihon kokugo daijiten [Great Japanese dictionary]. 1972. Tokyo. 20 volumes. [Jap]

• ***Summary:*** The most comprehensive Japanese-language dictionary available.

Amazake. (Vol. 1, p. 405): Also called *hitoyo-zake* or *kozake.* Cook rice to a soft porridge consistency. Cool a little and add koji. Stop the fermentation and drink. It is also made from sake lees (*sake kasu*) with added water and sugar. The word amazake is used in *waka* (31-syllable poems) as a season indicator. Amazake is mentioned in the following old documents: *Shinsenji kyo, Ryogekai, Wakan Sansai Zue,* and *Haikai Shoson Kushu* (quotes from each are given). The quote from the latter means "an idle and ignorant person makes amazake in Matsugaoka."

Amazake has various regional names. It is called Shirozake in Tokushima prefecture; Amadake in Nagasaki

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prefecture (Horie, Korai-gun); Doburoku in Yamanashi prefecture (Narada, Minami Kyoma-gun), Nara prefecture (Totsugawa, Yoshino-gun), and Wakayama prefecture (Kami Yamaji, Hidaka-gun); Amazaki in the Ryukyu Islands (incl. Okinawa, Amami-Oshima, Osumi, Sakishima, Tokara) which extend from Kyushu to Taiwan.

Amazake uri. A walking amazake seller, or the act of selling amazake while walking. There were some amazake sellers during the Muromachi period (1338-1573), but they became popular from the late 1500s on. The amazake sellers put cups (*chawan*) and trays (*obon*) in their front box along with a hanging lamp. In the back box they put an amazake kettle (*kama*), then carried it all on a shoulder pole. The term "amazake seller" was used in waka poems as a season indicator. Morisada Manko wrote an essay mentioning amazake sellers. In Kyoto and Osaka amazake is sold only on summer nights, in a special kettle with a bamboo basket (*kyo*); In Edo (Tokyo) it is sold at all times. In Edo they use a brass kettle or a special kettle and a bamboo basket as is used in Kyoto and Osaka.

6022. Nihongi: Chronicles of Japan from the earliest times to A.D. 697. Translated from the original Chinese and Japanese by W.G. Aston. 1972. Rutland, Vermont and Tokyo, Japan: Charles E. Tuttle Co. 443 p. Two volumes in one. See p. 32-33. With an introduction to the new edition by Terence Barrow.

• ***Summary:*** This book is also called the Nihon Shoki. The text and pagination are identical to those found in the 1924 edition of the Nihongi, by Aston. Address: England.

6023. Proceedings of the [Sixth] International Symposium on Conversion and Manufacture of Foodstuffs by Microorganisms. 1972. Tokyo: Saikon Publishing Co., Ltd. viii + 297 p. Held 5-9 Dec. 1971 at Kyoto, Japan.

• ***Summary:*** This is the Sixth International Symposium of the IUFoST [International Union of Food Science and Technology] hosted by the Japan Section, IFT. Contents: Foreword. Organization of the symposium. Open plenary session (3 papers). Microbial enzymes and their application to food processing (13 papers). Traditional foods (12 papers). Modern microbial foods (6 papers). Special lectures (3 lectures). Open discussions. Closing: Summary, closing lecture. List of foreign participants (directory of 16 people). List of Japanese participants (directory of 114 people). List of committee members. Address: Japan.

6024. Sakaguchi, Kinichiro. 1972. Development of industrial microbiology in Japan. In: Proceedings of the [Sixth] International Symposium on Conversion and Manufacture of Foodstuffs by Microorganisms. Tokyo: Saikon Publishing Co. viii + 297 p. See p. 7-10. Held 5-9 Dec. 1971 at Kyoto, Japan. [Eng]

• ***Summary:*** Japan has made many important contributions to the development of industrial microbiology, especially industrial mycology, because of the widespread use of koji molds (*Aspergillus oryzae*). Foods made from this one mold (including sake, miso, and soy sauce) accounted for about 1.5% of the Japanese gross national product, or ¥75,000 billion, in 1970.

Early documents show that molds were being used to make foods as early as 1,000 B.C. in China and as far back as the 6th century [A.D.] in Japan. In Japan, the use of lactic acid fermentation in the pure culture of yeast is already mentioned in "the diary of sake" [*Goshu no Nikki*] written in 1355, however the technology of adding koji starter [*tané koji* or "seed koji"] is even 400 years earlier [i.e., ca 955]. Moreover, an unmistakable description of low temperature pasteurization (*hiire*) appears in the *Tamon-in Diary* (1539-1596), "which was written about 300 years prior to Pasteur's famous invention."

When Japan began to introduce European scientific techniques during the Meiji period (Sept. 1868 to July 1912), the first subject of scientific research in Japan was the unique koji mold. One of the first major discoveries was the invention of Takadiastase [a diastatic enzyme] by Jokichi Takamine. This enzyme has a great influence on biological chemistry, enzyme chemistry, and various enzymes using microorganisms worldwide.

Soon the physiology of the koji mold and its fermentation products (especially organic acids) was studied by Japanese scientists. The determination of kojic acid by Yabuta was a major discovery. The *Rhyzopus* [*Rhizopus*] mold was also investigated; this led to the development of producing organic acids fumaric acid, citric acid, isocitric acid, itaconic acid, gluconic acid and others.

Two outstanding discoveries have recently been made in Japan: (1) The technology for making L-glutamic acid, lysine, and other amino acids; (2) The microbial technology for making flavor-enhancing nucleotides such as inosinic acid and guanylitic acid.

Japanese scientists and industries soon realized that instead of using microorganisms, the enzymes isolated from them could be used (in whole or in part) with no reduction in yield or quality. In the case of *Aspergillus oryzae,* which produces various enzymes (amylase, lipase, protease, etc.) this idea has been applied to the manufacture of alcohol, sake, mirin, miso, and soy sauce.

The classification and taxonomy by Jun Hanzawa of microorganisms used in the manufacture of *natto* (fermented soybean) and other popular Japanese fermented foods was of major importance.

Recently, Japanese scientists including Murakami and Yokotsuka [of Kikkoman] have found that the koji mold does not produce aflatoxins.

The industrial application of molds to establish a method of mass culture involves various difficult problems. Many Japanese manufacturers of sake, miso, and soy sauce "are

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practicing the conventional solid culture by using what are called Koji rooms" but large manufacturers are gradually switching over to aerobic apparatus.

To use the living action of microorganisms or their enzymatic action to make foods on a large scale will be increasingly seen "as a form of bioengineering or biotechnology," and the life sciences will increasing be spoken of as "a science for the future. 'Seek whatever is desired in microorganisms first. They will never betray you,' is my slogan." Although it may seem a little exaggerated, "I should like to ask you to take it as my firm conviction."

As I stated above, "microorganisms are the most intimate friends of the food industry," yet they are at the same time its powerful enemies. Their malignant side is as powerful as their benevolent side.

I am very glad, even proud, to see first-class microbial specialists and food specialists exchanging technological knowledge and cooperating with one another, "here in Japan where fermented foods have so long been a tradition." Address: Prof. Emeritus, Univ. of Tokyo, Tokyo, Japan.

6025. Sankosha Kateibu. comp. 1972. Maruhi tôfu ryôri hyaku-sen [One hundred top secret tofu recipes]. Tokyo: K.K. Sankosha. 165 p. Illust. No index. 18 cm. [Jap]
• ***Summary:*** Contents: Part I: 100 selected tofu recipes. How to cook tofu. Tofu cooking techniques/hints. How to drain tofu. How to treat/handle tofu. Tofu boiled/simmered/cooked in sauces. Broiled tofu. Steamed tofu. Pickled, raw, boiled, tossed tofu. Sauteed tofu. Deep fried tofu. Part II: Information about tofu. History of tofu. Tofu was born in China. Origin of the name "okabe." Other names for tofu. Various types of tofu. Names of tofu. Cruel tofu recipes. How to make tofu recipes tasty. Japanese cooking and the taste of tofu. The relationship between tofu and miso soup. How to make good tofu miso soup. How to cut tofu for miso soup. Good ingredients for tofu miso soup. Good ingredients for tofu soups. To what degree are you interested in tofu? Tofu is the best healing food. Tofu is valued overseas. If you don't eat tofu, you lose! How to make tofu. Changes in the prices of tofu products. Did you know...? Address: Tokyo, Japan.

6026. Shinoda, Osamu. 1972. Chôgoku shokkei sôsho [A collection of Chinese dietary classics. 2 vols.]. Tokyo. [Jap]*

6027. Smith, A.K.; Circle, S.J. 1972. Protein products as food ingredients. In: A.K. Smith and S.J. Circle, eds. 1972. Soybeans: Chemistry and Technology. Westport, CT: AVI Publishing Co. xiii + 470 p. See p. 339-88. Chap. 10. [180 ref]
• ***Summary:*** Contents: 1. Flavor: Taste panel results, flavor components, plastein formation and flavor, plastein formation and nutrition, some food uses tolerant of soy flavor. 2. Bread and pastries: Soy flour history, effect of soy flour on baking characteristics, soy protein isolate in bread, soy flour and flavor, enzyme active soy flour, soy flour in Britain, detecting of soy flour in wheat flour. 3. Other baked goods: General, doughnuts, snack products. 4. Breakfast cereals. 5. Macaroni products. 6. Dairy-type products: Imitation milk, soy milk, filled milk, soybean cheese, imitation cream cheese, coffee whiteners, whip toppings, and frozen desserts, yogurt type products. 7. Comminuted meat products and meat analogs: Comminuted meat products, meat analogs, spun fiber type meat analog, extrusion-cooked type meat analog, heat-gelled type meat analog, meat fibers in heat-gelled protein matrix, assay of soy protein products in meat-type foods. 8. Gelling and aerating agents: Gelsoy as gelling agent, soy protein isolate as gelling agent, soy protein isolate as aerating agent, soy whey protein as aerating agent, enzyme modified isolates as aerating agent, foam-mat drying adjunct, foaming agent for soda water. 9. Miscellaneous food applications: Brew flakes, soups, gravies and sauces, confections, imitation nut meats, and [soy] nut butters, spray drying adjunct. 10. Nonfermented Oriental soybean foods: Introduction, Chinese soy milk, dried soybean whole and defatted milks, tofu (fresh tofu, bagged tofu, dried tofu, fried tofu), yuba, kinako ("The Japanese have a product which is similar to full-fat soy flour except that it is made from whole roasted soybean and this contains the seed coat"), soybean sprouts (compositional changes).

Concerning Brew Flakes (p. 373): "Soy flakes, grits, and peptones have been used since about 1937 or earlier (Burnett 1951) as adjuncts in brewing beer. Grits and ground meal from screw press processing were the first products used in brewing but later they were replaced by solvent-extracted flakes. The best results are obtained with flakes or flour having a high NSI (nitrogen solubility index) with a minimum of heat treatment in processing. Up to 0.75 lb. of flakes per barrel of beer has been recommended by Hayward (1941).

"The flakes may be used in the normal mashing operation to provide amino acids, peptides, minerals, and vitamins as nutrients for the yeast. It was reported by Wahl (1944) and Wahl and Wahl (1937) that addition of hydrolyzed soybean protein directly to the beer improves foam stability, flavor, and body of the beer." Address: NRRL, Peoria, Illinois.

6028. Takeya Miso Hyakunenshi Henshu-bu. 1972. Takeya Miso hyakunen-shi [A hundred year history of Takeya Miso, Inc.]. Suwa, Japan. Takeya Miso. 506 p. 27 cm. [Jap]
• ***Summary:*** A very solid, well-researched book with a detailed chronology of the company's history. Takeya is the oldest of Japan's present large miso manufacturers. Address: Suwa, Japan.

6029. Tatsuno Shoyu Kyodo Kumiai. 1972. Tatsuno Shôyu Kyôdô Kumiai yôran [General survey and handbook of the

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Tatsuno Shoyu Association]. Tatsuno city. 406 p. [Jap; eng+]
• ***Summary:*** Contents: History of Tatsuno Shoyu (before the union). Part I: Ten years under the controlled economy (1939-1949). 1. Outline and overview: Changes in the system of controlling the shoyu economy. 2. The manufacturing union period. 3. The controlled company period. 4. The food rationing/distribution public corporation period. 5. Changes of prices and standards. 6. Report from the experimental station. 7. Other records.

Part II. 20-year history of Tatsuno Shoyu Cooperative Assoc. (1950-1972). 1. Outline of the 20-year history. 2. Establishment of the Tatsuno Shoyu Cooperative Assoc. 3. Progress after the establishment. 4. Enterprises. 5. Operation of the experimental station. 6. Tatsuno Shoyu technical training center–20-year history of vocational training. 7. Undertaking structural improvements in Tatsuno K.K. 8. Changes in the production rate of Tatsuno Shoyu. 9. The financial condition of the cooperative association. 10. Tatsuno-kai and other organizations. 11. Other records.

Part III. Data. It is said that Tatsuno Shoyu was started by Maruoya? Magouemon? in about 1532-1554. However no accurate historical information is available. It is thought that Tatsuno Shoyu started as a sake manufacturing business. Address: Tatsuno city, Japan.

6030. Tsuda, T.; Oshita, T.; Kobayashi, K.; Itoo, S. 1972. Shôjin ryôri; Daitoku-ji ryôri, Tansen-ji ryôri, Eihei-ji ryôri, Sôji-ji ryôri [Zen vegetarian cookery: From Daitokuji, Tansenji, Eiheiji, and Sôjiji]. Tokyo: Fujokai Shuppansha. 242 p. Illust. 22 cm. [Jap; eng]
• ***Summary:*** Written by the head cooks at four of Japan's best known Buddhist monasteries. A second edition was published in 1976.

On pages 78-79 is a description of Daitokuji-natto, a unique type of fermented black soybeans. They have what has been called "the flavor of tea." They are a type of "miso natto" made from soybeans, barley (*omugi*) and salt. The method of production, originally transmitted from China, was inherited from the famous Zen master Ikkyu [Ikkyû Sôjun, lived 1394-1481], who became head priest of Daitokuji temple in Kyoto in 1474. Future generations of monks and craftspeople at his personal sub-temple, Ikkyu, inherited the method from him and have passed it down to the present as a secret transmission.

At first the flavor of these savory chunks seems quite salty and a little sharp, but as you enjoy the flavor a little longer, overtones of subtle sweetness, tartness and spiciness emerge, creating a mysterious harmony.

Daitokuji fermented black soybeans are served in Japan in any of four ways: (1) Since long ago, tea masters and epicures have prized them for use in place of tea cakes (*chauke*) with thin whisked green tea or bancha tea. (2) In Ochazuke, they are sprinkled over hot rice in a small bowl, then doused with hot green tea. (3) Nowadays they are used

as an hors d'oeuvre with sake or beer. (4) Occasionally they are pureed with dashi soup stock and used as an ingredient in refreshing summertime miso soups or simmered vegetable preparations (*nimono*).

The Ikkyu subtemple within Daitokuji is Japan's most traditional maker. The entire year's supply is made only during July and early August, in the heat of summer, when exposure to sunlight enables proper drying. After the earlier steps in the preparation, the beans are mashed, reshaped into small balls 3/4 inch in diameter, arranged in wooden trays each about 12 by 24 by 2 inches deep, and sun-dried. A photo shows the mashed, reshaped soybeans in wooden trays at Daitokuji, a major Rinzai temple in Kyoto, Japan. Address: 1. Ikkyu, Daitokuji; 2. Head priest, Tanzenji, Kamakura (Rinzai sect); 3. Eiheiji (Soto sect, Asst. head cook); 4. Sojiji (Asst. head cook).

6031. Yokotsuka, Tamotsu. 1972. Shoyu. In: Proceedings of the [Sixth] International Symposium on Conversion and Manufacture of Foodstuffs by Microorganisms. Tokyo: Saikon Publishing Co. viii + 297 p. See p. 117-25. Held 5-9 Dec. 1971 at Kyoto, Japan. [68 ref]
• ***Summary:*** Tables show: (1) Basic characteristics of various types of soy sauce from different countries: Koikuchi (Japan), usukuchi (Japan), soy sauce (China, Malaya,

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Indonesia) and Fish soy (Malaya). For each is given: Baumè (density of liquids). NaCl in gm per 100 gm. Total nitrogen in gm per 100 gm. Reducing sugars in gm per 100 gm. Alcohol in ml per 100 ml. Color (dark to light).

(2) Japanese agricultural standard (JAS) for shoyu–koikuchi, tamari, and usukuchi. Grade depends most on total nitrogen content. (3) The relation between the preference for a shoyu and its chemical composition. The highest partial correlation coefficient is alcohol content = 0.35.

(4) The relation between the preference for a shoyu and its odorous components. (5) The relation between the preference for a shoyu and its taste components.

(6) Effect of cooking conditions of soybeans on the digestibility of protein in the mash. (7) Effect of cooking condition of soybeans on the enzymatic digestibility of protein (high pressure, short time has the highest digestibility).

(8) Fluorescent pyrazine compounds produced by moulds similar to aflatoxins regarding Rf values on TLC.

(9) Fluorescent isocoumarine compounds produced by moulds similar to aflatoxins regarding Rf values on TLC.

Graph: Yeast flora in shoyu fermentation. *Saccharomyces rouxii* has a count that peaks at about 2 months and has largely disappeared after 6 months. *Torulopsis* sp. has a count that peaks at about 15 days and again at 6 months and has disappeared after about 12 months. Address: Central Research Laboratories, Kikkoman Shoyu Co., Ltd., Chiba-ken, Japan.

6032. Yoshii, Hisao; Kaneko, Yasuyuki; Yamaguchi, Kazuo. 1972. Shokuhin bisei-butsu-gaku [Food microbiology]. Tokyo: Gisho-do. [Jap]*

6033. Chico-San Inc. 1972? Chico-San history and outline for future development. Chico, California: Chico-San Inc. 5 p. Undated. Unpublished typescript.

• ***Summary:*** A good early history of Chico-San, typewritten on the company's letterhead probably by Bob Kennedy. Atop the letterhead is printed: "Macrobiotic foods, rice cakes, cereals, sea vegetables." "By 1961 eleven macrobiotic families had packed their belongings, left their jobs behind in New York City, and headed for Chico, California, in the heart of the California rice growing country. In a short time Chico-San, Inc. was formed by some of these people for the purpose of importing foods of superior quality which were not available domestically, and locally producing foods of the highest quality for distribution throughout the United States."

One of the company's first popular products was the "Rice Cake, a light cracker made from puffed up whole grain brown rice. The first "machine," imported from Japan in 1963, made one cake at a time and was a crude, hand-operated device. Soon, three more machines were tied to the original one, still hand operated. Bob Kennedy, Dick Smith, and a few others found it necessary to work twelve hour shifts, and for six and seven days at a time to meet the steadily increasing demand for the unique new cracker. In 1965 pulled shoulder muscles ceased to be a problem when the first semi-automatic Rice Cake machine was put into operation...

"Central to the guiding philosophy behind Chico-San was the search for an organically grown brown rice–the prince of grains. This search ended in 1969 when the first organically grown short grain brown rice was harvested just south of Chico, in Richvale, California. This product, grown under exclusive contract for Chico-San, further enhanced their growing reputation...

"Back in the late fifties and sixties people who were interested in food and health were called 'food faddists', or 'health food nuts.' The food products found in most health food stores at this time consisted of a vast array of vitamin and mineral supplements, super protein concentrates, natural cosmetics, and a scattering of whole grains, few of which were organically grown.

"But little by little products with the Chico-San label found their way onto store shelves. First the Rice Cakes, then natural soy sauce, Miso Soybean paste, Sesame Butter and Sesame Salt, and organically grown Brown Rice became popular...

"In the back room too is Junsei Yamazaki, who emigrated to Chico from Japan in 1963 for the purpose of producing natural soy sauce and miso for Chico-San. These two products make up the greater percentage of the imports from Japan, and are subject to high duties and shipping costs. For 17 years Junsei was a rice farmer in Japan after graduating from Tokyo University with a degree in agriculture.

"Combined with the income from Stage I, Chico-San will be ready to begin Stage III. This stage includes the construction of a plant for the production of, at first, miso, and then soy sauce." Address: Chico-San Inc., 1262 Humboldt Ave. Chico, California 95926.

6034. Japan Shoyu Research Institute. 1972? Report on the comparative study of shoyu brewing from U.S. and Japanese soybeans (no. 6). Tokyo. 29 p. Project UR-A11-(40)-(C). * Address: Tokyo.

6035. Koyanagi, Tatsuo. 1972? Soybean elements and sodium chloride which affect the thyroid function. Sendai, Japan: Tohoku University. 18 p. Undated. Final technical report. USDA P.L. 480. Grant no. FG-Ja-125. [15 ref. Eng]

• ***Summary:*** This undated report, published between 1971 and July 1975, describes studies on rats of the goitrogenicity of various soybean preparations. The goitrogenic element in soybeans was extracted by methanol. It was soluble in acetone and butanol, but not in ethyl ether. Address: Faculty of Agriculture, Tohoku Univ., Sendai, Japan.

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6036. *Los Angeles Times.* 1973. Ease of shopping reduces efficiency. Jan. 11. p. K16.
• ***Summary:*** Any of the following will make a quick and interesting meal. "Use a fondue pot, a chafing dish or an electric skillet." The recipe for Sukiyaki Rosemary calls for "1 cake tofu (bean curd), cut into bite-size pieces."

6037. Erewhon, Inc. 1973. Erewhon visits a soy sauce factory (Ad). *East West Journal* 2(20):24. Jan. 15-30.
• ***Summary:*** "Soy sauce has been produced in Japan since it was introduced, along with Buddhism and the vegetarian diet, from mainland China over one thousand years ago. Today there are 5000 Japanese companies brewing a total of over 300 million gallons of soy sauce each year.

"One of these companies is Marushima Shoyu, located on Shodoshima Island, four hours by boat from Osaka through the Kii Strait. Marushima is a very old company, using traditional methods of manufacture, and it is here that Erewhon Tamari soy sauce is made. All soybeans used at Marushima are of unusually high quality, and come only from the island of Hokkaido."

A description of the process for making this soy sauce is then given. Whole soybeans are washed, soaked, then "steamed and boiled in a 14-foot-high cooker." Toasted whole wheat is "ground into flour, mixed with the cooked soybeans and placed in a large room, right on the wooden floor, which is kept very clean." The *koji* is placed in vats and spring water is added. The soy sauce changes color month by month until, after about one year, it begins to turn very dark and a rich aroma permeates the storage room. It is then poured into cypress-wood tanks and left to age for two more years. Unlike this pure, aged product sold under the Erewhon label, most other brands are aged only one to three months in concrete or metal containers.

"We at Erewhon would like to thank Marushima Shoyu for the wonderful product they make available to us."

Note: This was written by Paul Hawken. An illustration (line drawing) shows a traditional shoyu keg labeled "Marushima" and a gallon glass jar labeled "Tamari." Address: Boston, Massachusetts.

6038. Bernard, R.L. 1973. Soybean breeders need new germplasm. *Soybean News* 24(2):5, 3. Jan.
Address: Univ. of Illinois.

6039. Oka, H.I. 1973. Performance in Central Luzon of soybean varieties selected in Taiwan for wide adaptability. *SABRAO Newsletter* 5(1):29-38. [4 ref]
• ***Summary:*** "Ten soybean varieties from Thailand and two local varieties were tested in three different seasons at the Central Luzon State University, Muñoz, Philippines." Eight of the ten had been selected for yield stability following the breeding method of "disruptive seasonal selection." The results showed that, if cultivated with a package of recommended practices, these varieties have a high yield potential (about 2.5 tons/ha). Address: National Inst. of Genetics, Misima [Mishima] City, Japan 411.

6040. *Soybean Digest.* 1973. Zentoren [Japan Tofu Assoc.] opens new six-story center. Jan. p. 29.
• ***Summary:*** The Japan Tofu Association (*Zentoren*) "celebrated the opening of its new six- story center in Tokyo last Oct. 27. In attendance were Ministry of Agriculture and Forestry officials, staff of the agricultural attache's office, and industry leaders. Scott Sawyers, the American Soybean Assn.'s Far East director, represented ASA and presented the Tofu Assn. with a large wreath. The building had been in the planning stages since 1969 and the old building was torn down a year ago. Tofu is in wide use as a protein food in the Orient."

Photos show: (1) The six-story as seen from street level, outside. (2) A Japanese-style wreath (outside, at street level) presented by the ASA. Next to it is the wreath presented by Kakuei Tanaka, Prime Minister of Japan.

6041. Spiral Foods Inc. 1973. Mail order price list. Chico, California. 2 p. Jan. 35 cm.
• ***Summary:*** This single-sheet catalog and price list, photocopied front and back with black ink on tan paper, contains numerous background illustrations and the includes the following foods: Snacks: Rice cakes, corn chips, Yinnies–brown rice candy sugarless. Condiments: Lima tamari soy sauce–aged naturally over two years, Miso–soybean puree, entirely natural, rice malt vinegar, sesame butter, sesame oil–cold pressed, sesame salt, sea salt white unrefined, salt plums, kuzu–wild arrowroot starch. Grains, flours, seeds and beans: Brown rice / sweet brown rice–short grain, organically grown. Black [soy] beans–Japan import. Azuki beans–Japan import, dainagon. Whole grain noodles. Sea vegetables. Beverages. Hygienic goods. Utensils.

Talk with Robert J. Kennedy, founder of Chico-San. 1991. Oct. 3. By about 1966-1967 rice cakes and rice chips (senbei) were beginning to cut a wedge into the mass market nationwide, so Chico-San created the Spiral Foods brand for these mainstream products, keeping the Chico-San brand for the health food market. Address: 1144 West 1st Street, Chico, California 95926.

6042. Yoshimoto, Akihiro; Nomura, S.; Hongo, M. 1973. Gamma-polyglutamic acid depolymerase inducted by infections of *natto* and *subtilis* phages and its further properties. *Agricultural and Biological Chemistry* 37(1):83-90. Jan. [24 ref]
• ***Summary:*** Gamma-polyglutamic acid is known as PGA. Its depolymerase is an enzyme. Address: Lab. of Applied Microbiology, Dep. of Agricultural Chemistry, Kyushu Univ., Fukuoka, Japan.

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6043. *Mainichi Shinbun.* 1973. Zen no kokoro = ôtôfu [The heart of Zen = Tofu]. Feb. 20. [Jap]
• ***Summary:*** A large black-and-white photo shows William Shurtleff making tofu burgers at the tofu shop of Toshio Arai near Tokyo Japan. A processing / utilization chart drawn by Shurtleff shows how soybeans are transformed into thick soymilk (which is made into kinugoshi-dofu, or yuba), or thin soymilk (which is made into any of 7 types of tofu: oboro-dofu, aburage, o-tofu [*momengoshi*], atsuage, ganmodoki, yaki-dofu, or koya-dofu). Bill Shurtleff, age 31, comes from America, the world's main soybean producing country. He is living with the Aoyagi family at 278-28 Higashi Oizumi, Nerima-ku, Tokyo. His Book of Tofu is scheduled for publication in Sept. 1973. The article describes his appearance, then notes that he is a vegetarian doing Zen practice in Japan, which he feels is a very materialistic society. He is writing a book on tofu in large part to try to do something about the world food crisis. He is studying tofu at Sangen-ya under Mr. Toshio Arai. Mr. Arai notes that he has not yet finished his internship since he cannot yet make aburage by himself, but he should be "done" in about 3 months. Bill does translation work for his father's company and earns 30,500 yen/month which he lives off of. Akiko is his language teacher, so his Japanese has a feminine touch. There follows a brief description of Bill's favorite recipes: Ganmo burgers, Kori-dofu cutlets, Onion soup with tofu, and strawberry tofu whip.

Note: This is the earliest document seen (July 2012) concerning the work of William Shurtleff and Akiko Aoyagi with soyfoods, in Japan. Address: Tokyo, Japan.

6044. Koide, Takehiko; Ikenaka, Tokuji. 1973. Studies on soybean trypsin inhibitors. III. Amino-acid sequence of the carboxyl-terminal region and the complete amino-acid sequence of the soybean trypsin inhibitor (Kunitz). *European J. of Biochemistry* 32(3):417-31. Feb. [28 ref]
• ***Summary:*** Gives (for the first time) the complete amino acid sequence and primary structure of the Kunitz soybean trypsin inhibitor. Address: Dep. of Biochemistry, Niigata Univ. School of Medicine, Niigata, Japan.

6045. Zell, Fran. 1973. Food: Man who skates with grace cooks with beauty. *Chicago Tribune.* March 3. p. 14.
• ***Summary:*** Sashi Kuchiki, a Japanese star with the Ice Capades, likes to cook. His recipe for Sukiyaki includes "1 block tofu (bean curd) cut into 10 or 12 1-inch cubes" and "1 cup soy sauce." A photo shows him jumping while ice skating.

6046. Fukui, Juro; Taira, Hirokadzu; Kaizuma, Norihiko; Taira, Harue. 1973. [Subgeneric and specific differences in the content and amino acid composition of the seed protein in the genus Glycine]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 28. p. 176-81. March. [20 ref. Jap; eng]
• ***Summary:*** This experiment used 8 varieties of the cultivated soybean *Glycine max,* 4 strains of the semi-cultivated soybean *G. gracilis,* and 13 strains of wild species, including 7 strains of *G. soja,* 2 of *G. tabacina,* 2 of *G. tomentella,* and 1 of *G. clandestina.*

In 1969, the plants were grown in pots at the experimental field of the Plant Breeding Laboratory, Faculty of Agriculture, Iwate Univ.

The seeds of *Glycine soja* were found to have the highest protein content. "This fact shows the feasibility of breeding soybeans with higher protein content by the interspecific hybridization of *G. max x G. soja.*

Little difference in the sulfur-containing amino acids was found.

Reprinted from *Ikushugaku Zasshi* (*Japanese J. of Breeding*) 22(4):197-202 (1972). Address: 1&3. Faculty of Agriculture, Iwate Univ., Morioka; 2&4. National Food Research Inst., MAFF, Tokyo, Japan.

6047. Horii, Masaharu; Miyazaki, Motoyoshi. 1973. [Studies on trypsin inhibitor alteration in the processes of treatment of soybean. I. Trypsin inhibitor contents of soybeans, other beans, and soy products]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 28. p. 52-58. March. [26 ref. Jap; eng]
Address: National Food Research Inst., MAFF, Tokyo, Japan.

6048. Horii, Masaharu; Miyazaki, Motoyoshi. 1973. [Studies on trypsin inhibitor alteration in the processes of treatment of soybean. II. Trypsin inhibitor reduction during heating, defatting, and irradiation of soybean]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 28. p. 59-62. March. [6 ref. Jap; eng]
• ***Summary:*** Trypsin inhibitor in whole soybeans is most effectively destroyed by moist heat. At 100ºC, it was reduced to 46% by 2 minutes of steaming, 1% by 30 minutes, and 0.4% by 1 hour.

Note 1. Presumably, pressure cooking or autoclaving would reduce it even faster.

Note 2. Presumably the soybeans were soaked in water before steaming, but this is not stated in the English summary. Nor are we told for how long they were soaked or at what temperature. Address: National Food Research Inst., MAFF, Tokyo, Japan.

6049. Kameda, Yukio; Matsui, K.; Hosoya, K.; Nomura, A.; Sugano, N. 1973. Antitumor activity of *Bacillus natto.* IV. Purification and properties of an extracellular protease from *Bacillus natto* KMD 1126. *Chemical and Pharmaceutical Bulletin* 21(3):538-45. March. [21 ref]
• ***Summary:*** A protease is an enzyme that hydrolyzes

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proteins. This is an alkaline protease. "When a mixture of surfactin, the protease, and EDTA was incubated with carcinoma cells, a synergetic effect on the cytolysis of Ehrlich ascites carcinoma cells was observed." Address: Faculty of Pharmaceutical Sciences, Kanazawa Univ., 13-1 Takara-machi, Kanazawa, Japan.

6050. Manabe, Masaru; Ohnuma, Shizuko; Matsuura, Shinji. 1973. [Studies on the fluorescent compounds in fermented foods. II. Test on aflatoxin contamination of miso and miso-koji in Japan]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 28. p. 239-43. March. [10 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 19(2):76-80 (1968). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6051. Manabe, Masaru; Matsuura, Shinji. 1973. [Studies on the fluorescent compounds in fermented foods. III. Degradation of added aflatoxin during miso fermentation]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 28. p. 244-50. March. [14 ref. Jap; eng]
• ***Summary:*** "Although aflatoxin-like substances were detected in a few samples," no actual aflatoxin was detected in any of the rice samples.

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 19(6):268-74 (1972). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6052. Manabe, Masaru; Matsuura, Shinji. 1973. [Studies on the fluorescent compounds in fermented foods. IV. Degradation of added aflatoxin during miso fermentation]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 28. p. 251-55. March. [9 ref. Jap; eng]
• ***Summary:*** "A certain amount of aflatoxin was added to green miso before fermentation in order to investigate the degradation of the toxin during miso fermentation." There was some degradation of aflatoxin B1 and G1 in miso during the early stage of miso fermentation, but in the later stage the velocity was remarkably reduced. As a result, more than 50% of aflatoxin B1 and G1 remained in miso after 1 month fermentation. No degradation of aflatoxin B2 and G2 was detected during miso fermentation.

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 19(6):275-79 (1972). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6053. Simkowitz, Howard J. 1973. Vegetarian and macrobiotic guide: Europe, 1973; or, The great European health food trip. Craftsbury Publishers, Craftsbury, VT 05826. 111 p. March. 21 cm.
• ***Summary:*** The majority of this book is a directory and often detailed individual description (including address, nearest public transport station, hours) of European restaurants that serve vegetarian and/or macrobiotic food. Also includes food shops, spiritual centers, maps, vocabulary (in English, French, German, Spanish, and Italian), useful phrases (such as "I would like brown rice with carrots and soy sauce"), and exchange rates It is arranged by country, and within each country by major cities, and within larger cities by districts. For example, in the British Isles, under London, the author states: "I counted 44 vegetarian restaurants in London. Two of these [Wheat, and Chelsea House] are excellent, and seven others [incl. Cranks, and Cyranos] are quite good."

See ad in Useful Names and Addresses. 1973. p. 49 (Published by GOMF, Chico, California). Address: Craftsbury, Vermont.

6054. Taira, Harue; Taira, Hirokadzu. 1973. Influence of location on the chemical composition of soybean seeds. I. Protein, oil, carbohydrate and ash contents. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 28. p. 182-96. March. [19 ref. Eng; jap]
• ***Summary:*** Reprinted from *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 40(4):530-44 (1971). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6055. Taira, Harue; Taira, Hirokadzu. 1973. [Influence of location on the chemical composition of soybean seeds. II. Potassium, phosphorus, magnesium, and calcium contents]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 28. p. 197-209. March. [8 ref. Eng; jap]
• ***Summary:*** Reprinted from *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 41(2):213-25 (1972). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6056. Taira, Harue; Taira, Hirokadzu. 1973. [Influence of location on the chemical composition of soybean seeds. III. Protein component by disc electrophoresis]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 28. p. 210-18. March. [7 ref. Eng; jap]
• ***Summary:*** Reprinted from *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 41(2):235-43 (1972). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6057. Umeda, Keiji; Takano, H.; Sato, T.; et al. 1973.

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[Radiation treatment of feedstuffs: I. Digestibility of irradiated starch pulp, corn cob meal and soybean flour and disinfestation dose of tick (*Tyrophagus putrescentiae*)]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 28. p. 370-76. March. [24 ref. Jap; eng]

• ***Summary:*** Table 2 shows "Chemical composition of raw soybean flour," on 0, 6, 10, and 20 Mrads. A graph (Fig. 1) shows the in vitro digestibility of protein of irradiated raw soybean flour and torula yeast by pepsin. The digestibility of the soybean flour decreases very slightly with increasing dosages.

Reprinted from *Nippon Chikusan Gakkaiho* (*Japanese J. of Zootechnical Science*) 42(12):617-23 (1971). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6058. Yoshikawa, Seiji; Nishimaru, Shinya; Tamura, Shinpachiro; Ishima, Toshio. 1973. Shokuhin no juyô yosoku no tame no imêeji chôsa: Sôshû-kei deeta [A sampling survey of consumer's image of 104 foodstuffs in Japan]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 28. p. 355-69. March. [3 ref. Jap]

• ***Summary:*** Soyfoods analyzed in the survey are: 21. Tofu. 22. Natto. 71. Miso. 72, Shoyu.

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 19(4):165-79 (1972). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6059. Erewhon. 1973. Supplying natural food stores, co-ops, schools and communities (Catalog). Boston, Massachusetts. 12 p. Effective April 6, 1973.

• ***Summary:*** The number of products in Erewhon's catalog has increased dramatically during the past year. An illustration at the lower center of the cover is clip-art showing a man cutting barley. A message on the inside front cover is signed "Thank you all, Paul Hawken." Below his message is a smaller reproduction of the man cutting barley and below it: "Good morning."

Contents: Grains: Incl. brown rice (short grain, "Colusa," OG {organically grown}, California; medium grain, "Golden Rose," OG {organically grown}, California; medium grain, OG, Louisiana; long grain, OG, Texas; glutenous [sic, glutinous] sweet, OG, California). Wheat (Deaf Smith, hard red winter, or hard amber durum, OG, Texas; Ted Whitmer, hard red spring, OG, Montana; soft white pastry, OG, Washington [state]). Barley, pearl. Buckwheat groats. Corn. Millet. Oats. Popcorn. Rye. Cereals: Incl. Rice cream. Soybean flakes (Deaf Smith, OG). Stoneground flours: Incl. soybean flour, full fat, OG, Texas. Sweet brown rice flour, OG. Beans: Incl. Azuki beans (100, 50, or 25 lb). Soybeans (OG, Texas, 60 lb). Seeds and nuts: Incl. Almonds. Peanuts (spanish, split). Sesame seeds. Tamari & miso: Tamari soy sauce (8 oz, pints, quarts, half gallon, gallon, 4.7 gallon can). Hacho miso soy paste (1 lb or 44 lb keg). Mugi miso barley-soy paste (1 lb or 44 lb keg). Kome miso rice-soy paste (1 lb or 44 lb keg). Sea vegetables: Agar-agar, dulse, hiziki, kombu, nori, wakame, wakame root. Tea: Incl. Mu herbal beverage No. 9 and No. 16. Kukicha twig tea. Celestial Seasonings herb teas (39 flavors). Pasta: Wholewheat spaghetti, elbows, flat macaroni, and shells. Granola: Five flavors. Snacks: Incl. Corn munchies (organic corn chips with soy sauce). Chico-San corn chips and rice chips. Soybean oil (5 gallon tin). Olive oil. Peanut oil (organic, pint, quart, or 5 gallon tin). Butters: Almond Butter (Golden Farms, OG). Peanut Butter (Erewhon, old fashioned). Sesame butter. Sesame tahini. Honey (Paradise Valley, unheated, unfiltered, clover or orange). Condiments: Sea salt. Sesame salt. Tekka (vegetable-miso condiment). Unusual foods: Ame (rice and barley malt–glucose syrup). McHenry's sorghum molasses. Kuzu arrowroot. Sauerkraut. Umeboshi (plums pickled in brine). For cleanliness: Dr Bronner peppermint castille soap. Infinity herbal products (shampoo and soap). Natural Living Company (sesame cream shampoo, sesame lotion). Orjene (herbal shampoo). Tom's coco-orange all-purpose soap. For cooking: Knives (vegetable, utility, paring), chopsticks, rice paddle, tea strainer, "soy [sauce] dispenser" (4½ inch), oil skimmer, vegetable brush, suribachi, Chinese wok, Quaker City hand grinding mill. Austria Email iron-enamel pressure cookers. Save-a-Tree canvas shopping bags, shoulder bags, and bike bags. Flyers: Organic Merchants N.O.T. list. The Sugar Story. The Oil Story. The Macrobiotic Way. Macro-Ecology. Packaged in cellophane bags with recipes (1 lb, 1½ lb, and 2 lb): Incl. brown rice, wheat kernels, pearl barley, alfalfa seeds (OG), sesame seeds, pumpkin seeds, sunflower seeds, mung beans (sprouting), soybeans (sprouting or cooking, OG), pinto beans, chickpeas, green lentils, green split peas, split red lentils, morning cereal (6-grain cereal blend), infant cereal (koko), tsampa Tibetan barley cereal, rice cream, soybean flour (full fat, OG, 24 oz), soybeans (OG, 2 lb).

A long note at the top of this list states: "In our retail store we like to sell 'bulk' whenever possible. But we have found that to many new customers coming into our store everyday, pre-packaged foods such as we are presenting here offer a better introduction to the world of whole-grain cookery. Each package has an appealing 'kitchen-tested' recipe on the front so that new friends unfamiliar with these foods can give them a try. Furthermore, some people prefer to buy packaged foods because they feel for various reasons that food sold exposed is not as clean or pure. There is some truth to that, of course, depending on the store, but in any case we are happy to offer a complete line of Erewhon grains, cereals and flours in attractive, biodegradable cellophane packages. We will be expanding this line of cereals and grains and welcome your comments and suggestions. Please let us know how we can serve you

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better."

This catalog cover was reprinted with permission from the Michio and Aveline Kushi Macrobiotics Collection, Archives Center, National Museum of American History, Smithsonian Institution, Washington, DC. Address: 33 Farnsworth Street, Boston, Massachusetts 02210. Phone: (617) 542-1358.

6060. Oberdorfer, Don. 1973. Meat prices–Japanese pay more, eat less. *Washington Post, Times Herald.* April 7. p. A1, A13.
• ***Summary:*** Tokyo, April 6–The price of meat has been rising in both Japan and the United States. After several hours of research in Tokyo butcher shops, the writer's wife, Laura, found a bargain, frozen sliced beef for only $1.60/lb. "She used almost two-thirds of a pound, combined with tofu (soybean curd), Chinese cabbage, spring onions [negi] and mushrooms in seasoned broth, to feed our family of four a Japanese dish known as *shabu-shabu."* A bowl of rice–the staff of life in Japan–rounded out the dinner.

6061. Takai Seisakusho. 1973. Sarani susumu tôfu puranto no gôrika [Further progress in the efficiency of the tofu factory]. Aichi prefecture, Japan. 4 p. April 21. 30 cm. [Jap] Address: Aichi prefecture.

6062. Ready, Anne. 1973. Visitor echoes price complaints: High cost of sukiyaki. *Los Angeles Times.* April 26. p. J2.
• ***Summary:*** Sashi Kukichi, an ice skating champion, is preparing an authentic sukiyaki for his fiancee. "Another ingredient, tofu, is a soy bean cake that, when cooked, resembles a firm egg custard." The recipe calls for "1 8-oz. cake tofu, cut in 1-inch cubes, optional."

The recipe for *Tentsuyu* sauce with tempura calls for "1/3 cup soy sauce" and a dash of MSG.

6063. Altschul, Aaron M. 1973. The revered legume. *Nutrition Today* 8(2):22-29. March/April. Illust. [2 ref]
• ***Summary:*** Contains a nice but inauthentic illustration of Commodore Perry receiving a soybean plant in Japan. This illustration was created by slightly changing an almost identical illustration printed in Alan B. Cole's book "A Scientist with Perry in Japan: The Journal of Dr. James Morrow" (1947, p. 134). In the original, no soybean is shown. Address: Prof. of Community Medicine and International Health, School of Medicine, Georgetown Univ., Washington, DC.

6064. Dosti, Rose. 1973. USC students boast surplus: Cooperative beats the price squeeze. *Los Angeles Times.* May 17. p. K2.
• ***Summary:*** The women graduate students and undergraduates "who live and cook cooperatively at two Soroptimist residences at USC say they can" eat royally on little money. Each of 20 girls pays $25 a month into a common food fund and volunteers to cook the evening meal for 10 residents once every two weeks.

Their recipe for Sukiyaki includes "1 cake tofu (bean curd), cut into 1-inch cubes" and "1/3 cup soy sauce." A photo shows the girls, standing, gathered around a common dinner table, buffet style at USC, the University of Southern California, in Los Angeles.

Note: Soroptimist ("best for women"), founded in 1921, is an international volunteer organization for business and professional women who work to improve the lives of women and girls, in local communities and throughout the world. The organization seeks equality, peace, international goodwill, and to improve professional skills and to support human rights, specifically women's rights. Its headquarters is in Philadelphia, Pennsylvania. In 2009 it boasted about 95,000 members in more than 120 countries worldwide.

6065. Iacobucci, Guillermo Arturo; Myers, Dirck van Buren; Okubo, Kazuyoshi. Assignors to The Coca-Cola Company and Kikkoman Shoyu Company, Ltd. (Tokyo, Japan), fractional part interest to each. 1973. Process for preparing protein products. *U.S. Patent* 3,736,147. May 29. 10 p. Application filed 5 April 1971. 6 drawings. [5 ref]
• ***Summary:*** Process for preparing plant protein products having low phytic acid content by subjecting protein isolates to ultrafiltration in the presence of a suitable chemical reagent. Address: Coca-Cola Co., Atlanta, Georgia 30301.

6066. Mori, Tomohiko; Satouchi, K.; Matsushita, S. 1973. A protein inhibiting pancreatic lipase activity in soybean seeds. *Agricultural and Biological Chemistry* 37(5):1225-26. May. [5 ref]
• ***Summary:*** An inhibitor of pancreatic lipase was isolated from soybeans. Address: Research Inst. for Food Science, Kyoto Univ., Kyoto, Japan.

6067. *Soybean Digest.* 1973. End of 5-year oil promotion program. May. p. 37.
• ***Summary:*** Ceremonies held recently in Tokyo, Japan, formally ended a 5-year agreement under which the American Soybean Association (ASA) promoted vegetable oil in cooperation with the Japanese Oil Processors Association (JOPA). A program to promote identified soy oil brands is being planned to replace vegetable oil projects. A photo shows Ralph Jackson, ASA executive vice president, presenting a token of appreciation to Mr. Yoshii, president of JOPA.

6068. Dosti, Rose. 1973. Climax of a study project: 4th graders go Japanese for a meal. *Los Angeles Times.* June 14. p. K16.
• ***Summary:*** At Third Street School in Los Angeles, the 4th graders are finishing a social studies project on Japan; they

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are using chopsticks to lunch on a typical, authentic, home-cooked (by their parents) Japanese dinner. There was teriyaki on skewers (seasoned with soy sauce), sukiyaki, tempura, Inari Sushi ("made with aburage, a soybean curd skin, in which seasoned rice is stuffed"), and another kind of sushi made of vinegared rice and codfish wrapped in seaweed (nori). Recipes are given for Teriyaki and Inari Sushi. Two photos show the kids cooking.

6069. *Times* (*The*) (*Walworth, Fontana, and Williams Bay, Wisconsin*)**.** 1973. Famous symbol. June 21. p. 10. Special 12-page tabloid supplement on Kikkoman Foods Grand Opening.
• ***Summary:*** A large illustration shows the Kikkoman logo. "The Japanese symbol of a turtle–a hexagon–is the trademark of Kikkoman Shoyu Company, Ltd., Wisconsin's new food production firm. The turtle is considered a happy animal by the Japanese. It also means prosperity. Inside the bold Kikko (turtle) hexagon is the Japanese figure called man that means 10,000 or 10,000 years. Together they form the company name and trademark that represents a happy, long life. The mark was first used in 1782 and was registered in the United States in 1906. Kikkoman's company spirit is expressed by the trademark and by 'Sangyo Damashii,' an expression that says it always tries to enrich the daily lives of people by adding to the joys and benefits of good eating. Since 1630, Kikkoman has continuously produced the all-purpose seasoning, shoyu or soy sauce."

Note: This is the earliest English-language document seen (July 2011) which states clearly that Kikkoman has been making soy sauce since 1630. Quite a few previous ads state simply "Since 1630."

6070. Lee, Edward. 1973. Soybean embargo stirs uneasiness. *Chicago Tribune***.** June 29. p. C11.
• ***Summary:*** "Trading of soybean, soybean meal, and soybean oil futures was suspended yesterday on the Chicago Board of Trade after the government announced late Wednesday an immediate ban on exporting soybeans, cottonseed, and their products."

The director of the Chicago Board of Trade, who ordered the suspension, voted late yesterday to resume trading today. They gave no reason for the one-day suspension, although some believe it was to allow time to evaluate the impact of the ban on futures trading.

The embargo brought cheers from housewives who dislike the high cost of food, but it aroused indignation from U.S. trading partners, many of whom depend on American soybeans for animal feeds and/or human consumption. The Japanese were especially upset, because soybeans are a key ingredient in a host of Japanese foods, and 98% of Japan's soybean supplies come from the USA. The European Common Market was unhappy but had no comment.

6071. Oberdorfer, Don. 1973. Now even the soybean curd seems lost to Japanese. *Washington Post***.** June 29. p. D11.
• ***Summary:*** Tokyo–Last night the USA announced an embargo on soybean exports–a big surprise and shock in Japan. Now even tofu, the ubiquitous and much-enjoyed soybean curd, will become more expensive. Soybeans are very important in Japan as a source of both food (beancurd, miso soup, soy sauce, etc.) and feed. 60% of the cooking oil in Japan is soybean oil. The USA supplies more than 90% of Japan's soybeans, and they are a major item of trade.

6072. Pond, Elizabeth. 1973. The day the soybeans stop–Japanese concern. *Christian Science Monitor***.** June 29. p. 1-2.
• ***Summary:*** On June 27 the United States government started rationing soybean exports. This has become a new sore-spot in Japan-U.S. relations. On June 28, Japan's Foreign Minister, Masayoshi Ohira, expressed his government's concern to American Ambassador Mr. Robert Ingersoll. Mr. Ingersoll replied with a promise that the U.S. would try to meet Japan's demand for a stable supply of soybeans, cotton seeds, and cotton-seed products. He also mentioned that U.S. Secretary of Agriculture, Earl L. Butz, had stated at a press conference that "he would give special consideration to agricultural exports to Japan."

Japan could be hit hard by a shortage of soybeans. "No Japanese dinner is complete without miso soup (made of soybeans), and 92 percent of Japan's 3-million-ton annual imports of soybeans comes from the United States."

Now the Japanese are anxiously awaiting July 2, when the U.S. will issue its country-by-country export allocations [quotas]. "Japan fears that it might not even be allocated the full amount of soybean exports that have already been contracted." Once the U.S. export allocations are announced, the Japanese are hoping that the soybean export embargo will be lifted within a month–even though it is scheduled to last until the next soybean crop is harvested in September. Nevertheless, dealers will start contracting once the allocations are announced.

Japan is called a "surplus-trade" country by the U.S. meaning that the U.S. buys more from Japan than vice versa. So the U.S. has recently been browbeating Japan to buy more from the United States [conveniently forgetting that Japan has a much smaller population than the U.S.].

Last year Japan bought 3.12 million tons of soybeans worldwide," and it will buy an estimated 3.2 to 3.5 million this year if the supply is available.

"The price of tofu (bean curd) has already been shooting up in this inflationary year. Now Japan's many small and medium-size bean-curd and soy-sauce manufacturers and restaurant owners fear that the price will skyrocket 100 percent"–hitting every family budget that includes these daily necessities.

Japan no longer grows many soybeans. Production on

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the small farms is inefficient, and many Japanese farmers are leaving their farms for the cities. "Even a high price support has failed to halt the decrease in Japanese soybean acreage."

6073. Pond, Elizabeth. 1973. The day the soybeans stop–Japanese concern. *Christian Science Monitor.* June 30. p. 1, 3.
• ***Summary:*** On June 27 the U.S. government began rationing soybean exports–a move that could hit Japan hard. Japan imports 3.12 million tons of soybeans a year and 92% comes from the USA. The Japanese are now anxiously awaiting July 2, when the U.S. will announce country-by-country export allocations. In Japan, the "price of tofu (bean curd) has already been shooting up..." The Japanese are hoping the "soybean-export embargo" will be lifted within a month after the allocations are announced.

What is the need for rationing? Last year America harvested a bumper crop of soybeans, and this years' is expected to be 15-20% larger. So the supply is adequate. The problem is that world demand has suddenly outstripped American supply, in part because of a scarcity of Peruvian anchovies, which are used as feed, and in part because of the rising cost of soybeans as feed to produce meat, poultry, and dairy products within the USA causes domestic inflation. So Americans have decided to fill their own soybean demand before exporting.

In Japan, soybean production is inefficient, and many Japanese farmers are leaving their farms. Even a high Japanese price support program has failed to stop the decrease in Japanese soybean acreage. Address: Staff correspondent, Christian Science Monitor.

6074. *Food Processing* (*Chicago*). 1973. 21 outstanding new food plants: For making new and better products, increasing production, lowering costs [Kikkoman's plant in Walworth, Wisconsin]. June. p. 14-15.
• ***Summary:*** Kikkoman Foods Inc. (a div. of Kikkoman Shoyu, Ltd.) has built a $9 million, 144,000 square foot plant on a 2-acre site at Walworth, Wisconsin, to make soy sauce and teriyaki sauce. With a pre-cast concrete exterior, it features two packaging lines: 40 cans/minute and 300 bottles/minute. The waste treatment system is designed for 240,000 gallons/day. It was completed in June 1973.

6075. Ichiyama, Morio. 1973. Noda no shôyu [Noda's shoyu]. Noda-shi, Chiba-ken, Japan: Noda-shi Kyodo Hakubutsukan (Noda City Local History Museum). 22 p. Noda Series III. [Jap]
• ***Summary:*** Noda is the home city of Kikkoman, and Japan's largest center of shoyu production. Contains 65 old photos (all with captions, many with dates), several maps, a condensed history with many dates, and a chronology from 1558 to 1972. Address: Noda, Japan.

6076. *Washington Post, Times Herald.* 1973. The soybean embargo (Editorial). July 2. p. A22.
• ***Summary:*** Excellent analysis. "The administration's soybean embargo is a staggering confession of incompetence. To say that the embargo had become necessary does not render it desirable. It only demonstrates how far our government had let matters slide. This administration lurches from one economic crisis to the next, reacting in haste, with little evidence of thought or careful planning."

Last summer the USDA got an expensive lesson in the costs of carelessness in promoting farm exports, when the Russians unexpectedly bought a billion dollars worth of grain; it sat on its hands while grain traders sold off the nation's wheat stocks. This year they continued to do nothing while traders sold off our soybean stocks. If the USDA didn't know what was happening, the market surely did. The price of soybean meal and soybeans skyrocketed. Why? Because professional brokers realized that, between foreign and domestic sales, they had sold more soybeans than there were to sell.

Earlier this month, the administration was forced to freeze food prices.

"The soybean has become, over the past two decades, crucial to the nutrition of Americans and a large part of the world's population overseas. It is the cheapest and richest of all the sources of protein."

"Particularly in East Asia, soy products are an important part of the human diet. The embargo cuts off the flow of protein to people in Japan and Korea in order to control the prices of eggs and beef in the United States." The administration has made a "sudden and drastic decision to tear up our commitments to deliver the food supplies that we have already sold."

6077. Goodwin, June. ed. 1973. Inside the news briefly. *Christian Science Monitor.* July 3. p. 6.
• ***Summary:*** An excellent, large photo shows a Japanese woman (holding a young child) standing at the window of a traditional tofu shop while the tofu maker cuts her a cake of tofu from the large block of tofu floating in cold water in a large, rectangular, stainless-steel sink.

The caption reads: "Bean curd to the Japanese is like meat to Americans. To this Japanese mother, a meal just wouldn't be the same without the usual tofu (bean curd made from soybeans) which she is buying in a Tokyo shop. The latest U.S. ban on soybeans adds to her current woes of high food prices... Some Westerners may be switching from high-priced meat to lower-priced soybeans" (which contain 44% pure protein).

6078. Jameson, Sam. 1973. Japan shocked by U.S. decision to cut soybean export contracts. *Los Angeles Times.* July 4. p. C11.

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• ***Summary:*** "Tokyo–Japanese government and industry leaders expressed shock and disappointment Tuesday over the United States' decision to slash export contracts in soybeans to Japan and other countries by 50%."

Yukio Sakaguchi, the chairman of the Japan Cooking Oil & Fat Association called the decision "a form of economic war which must be considered a grave problem"–and "a violation of international justice." Sakaguchi is also president of Nissei [sic, Nisshin] Oils Corp.

Japan's Ministry of Agriculture, which had stated clearly its expectation that Japan–America's best soybean customer–would be given special treatment, was reported to be especially shocked by Washington's indiscriminate announcement. Japan is said to face the danger of running out of soybeans in late October. Feed manufacturers in particular said they would be unable to meet demands in the fall. Address: Times staff writer.

6079. Ungar, Peter. 1973. Soybean embargo (Letter to the editor). *Washington Post, Times Herald.* July 6. p. A23.
• ***Summary:*** "The administration's embargo on soybean and cottonseed exports is not only a very shortsighted and unworthy breach of contract with our customers but also an act of appalling callousness at a time of worldwide crop failures. To avoid price increases at home we are causing much steeper increases abroad. Yet for us food price rises mean a somewhat less tasty diet at worst while for populations which can barely survive on their incomes even now, further rises will constitute a desperate emergency. The awful truth is that for many a food price rise will be a virtual death sentence.

"To make matters worse the soybeans and cottonseed we withhold are earmarked to produce beef, a process in which most of the calories and proteins in the seed are lost in order to produce something more pleasing to our palate." Address: Scarsdale, New York.

6080. *New York Times.* 1973. Japanese upset by U.S. soybean curbs. July 7. p. 27, 32.
• ***Summary:*** Many Japanese are angry at President Nixon for his ban on exports of soybeans last week. Japan obtains 92% of her soybeans (nearly 3 millions tons a year) from the USA. These soybeans are needed, however, to meet shortage of cattle feed in the USA. Last Monday in Washington, DC, officials replaced the embargo on soybeans with a system of export licenses. Meanwhile, the price of soybeans has skyrocketed.

Japanese use soybeans in many foods, including "miso soup, a soybean broth." Tofu (soybean curd) and fish are the two most important sources of protein for Japanese, according to Kuniyoshi Takagi, managing director of the Federation of Tofu Makers' Associations. Makers of soy sauce say the USA has supplied all of the 240,000 tons of soybeans the industry consumes each year, according to Kaoru Ito, managing director of the Japan Soy Sauce Brewers Association. There was even concern at the restaurant Sasa-no-Yuki (snow on bamboo sprouts), which serves only tofu in 12 varied dishes; a full tofu dinner of 8 tofu dishes costs not more than $3.00.

The Japanese government, deeply upset, placed soybeans at the top of a list of controlled commodities under a new regulation (that went into effect today) against hoarding and price manipulation. Japan's "stocks of soybeans stood at 400,000 tons at the end of May, and are expected to drop to 200,000 tons by Sept. 30, and be exhausted by Oct. 31 if there are no further imports," according to a spokesman for the Ministry of International Trade and Industry.

While the Ministry of Agriculture and Forestry urges the U.S. government to insure that Japan has a steady supply of soybeans, Japanese officials are also "looking for other sources and accelerating programs to increase local production."

A bar chart shows: (1) U.S. soybean exports to the world: In 1971–420 million bushels worth $1.3 billion. In 1972–441 million bushels worth $1.5 billion. In 1973 (first 5 months)–248 million bushels worth $1.3 billion. (\ 2) U.S. soybean exports to Japan: In 1971–98 million bushels worth $311.1 million. In 1972–109.4 million bushels worth $375.4 million. In 1973 (first 5 months)–62.5 million bushels worth $347.7 million.

6081. *New York Times.* 1973. Japanese upset by U.S. soybean curbs. July 7. p. 27.
• ***Summary:*** Hiroshi Higashimori, Secretary-General of the Japan Oilseed Processors Association, expressed the feelings of many Japanese in all walks of life, when he said, "We're really angry at Nixon-san."

The anger is a result of the U.S. president's ban last week of soybean exports. "In Washington [DC] last Monday, officials replaced the embargo on soybean with a system of export licenses. Exporters will be allowed to ship 50 per cent of their soybean orders on hand as of June 15 and 40 per cent of their order for soybean meal.

Not long ago, when President Nixon established détente with Peking, without first informing Tokyo, the Japanese called it the "Nixon Shokku." Now the soybean export embargo is being called the "Shoyu Shokku" [soy sauce shock].

Soybeans are used in Japan to make foods and ingredients that appear in almost every meal. They are a key source of protein in the Japanese diet. The typical breakfast, for example, includes miso soup. Fish and tofu [soybean curd] are two of the most important sources of protein in the Japanese diet, said Kuniyoshi Takagi, managing director of the Federation of Tofu Makers' Association. Yet he fears that both will become remote from the daily diet, "fish because of contamination and tofu because of the U.S. embargo."

Makers of soy sauce are also concerned says Kaoru

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Ito, managing director of the Japan Soy Sauce Brewers Association. The U.S. has supplied all of the 240,000 tons of soybeans that the soy sauce industry imports and processes each year in Japan.

There was even concern at Sasa-no-Yuki ("Snow on bamboo sprouts" [leaves]), a restaurant that features tofu as the centerpiece of 12 varied dishes; a full dinner of 8 tofu dishes costs a maximum of $3–which is remarkably low for Tokyo. The Japanese government, deeply upset at Washington, "has placed soybeans at the top of a list of controlled commodities under a new regulation against hoarding and price manipulation that went into effect today."

Meanwhile, Japanese officials are looking for other sources of soybeans.

A two-part bar graph shows U.S. soybean exports in millions of bushels. (1) Exports to the world grew from 420 in 1971 to 441 in 1972 to 248 for the first 5 months of 1973. (2) Exports to the Japan grew from 98 in 1971 to 109.4 in 1972 to 62.5 for the first 5 months of 1973. Source: Department of Commerce.

6082. Illinois Agricultural Experiment Station. 1973. Soybean varieties developed at the Illinois A.E.S. Urbana, Illinois. 1 p. July 9. Unpublished typescript.
• ***Summary:*** For each variety is given: Variety name, prior designation, source (parentage), year named or released, developer or sponsor, and year selected. The first two varieties, both selections, were Illini and Ilsoy (1927). The first variety developed by crossing was Chief (1940; Illini x Manchu A, by C.M. Woodworth). The following varieties are listed (alphabetically): Chief (1940), Chippewa (1954), Chippewa 64 (1964), Clark (1953), Clark 63 (1963), Giant Green (by 1938; vegetable type from Takii Seed Co., Kyoto, Japan, 1935), Harosoy 63 (1963), Hawkeye 63 (1963), Illington (by 1938; vegetable type from Japan), Illini (1927, selection from A.K.), Ilsoy (by 1927, selection from Ebony), Lincoln (1943), Shelby (1958), Tortoise Egg (by 1938; vegetable type from Japan), Viking (1942), Wayne (1964), Williams (1971). Address: Urbana, Illinois.

6083. Jones, John A. 1973. Grain traders reeling under new export curbs: Depressed prices won't avert meat shortage, they say. *Los Angeles Times.* July 9. p. B8, B9.
• ***Summary:*** Shocked grain traders are wondering what the government will do next–"and some are predicting that whatever it is, it probably won't work." The government is clearly trying to use controls to depress grain prices.

All of the grain export commitments are in private contracts. The real purpose of the export licenses is to enable the government "to keep track of exactly how much grain is committed for export."

Yet in doing this the government has (1) Made our foreign trading partners angry at us, (2) caused many export houses to lose millions of dollars, (3) violated the sanctity of contracts, and (4) hampered the ability of futures markets to do their job.

There are price ceilings on processed commodities such as soybean oil and meal, but not on soybeans themselves. Price ceilings alone won't work, but combined with export controls, the combination should work.

The soybean crop was probably oversold. Traders made commitments to sell a certain amount of soybeans, but there simply may not be enough soybeans to fulfill all the contracts.

"The Japanese and West Germans are appalled at what we've done." Address: Times staff writer.

6084. Moorhead, John D. 1973. Little yellow bean pushing up prices: Whole world wants multipurpose soy meal. *Christian Science Monitor.* July 11. p. 1.
• ***Summary:*** Boston–"Soybeans: These unassuming yellow beans are the richest and cheapest source of protein known. And their meal makes the world's best animal feed." When president Nixon slapped an embargo and then strict controls on exports of soybeans, he was hoping to reduce soybean prices in the USA, and thereby eventually to reduce the price of meat.

Exports of soybean meal were 27% ahead of expected levels and a serious domestic shortage of soybeans was feared.

Nixon's soybean embargo has hurt the Japanese hardest–even though they were the best customer for U.S. soybeans. U.S. soybeans comprise 92% of all soybeans imported to Japan. Of those, 80% are "used for animal feed and the rest for such human staples as tofu (bean curd) and soy sauce."

A cartoon shows a personified soybean, wearing a big smile and a king's crown, holding in one hand a scepter with a dollar sign on it, sitting on a little mountain of dollar bills.

6085. Jameson, Sam. 1973. U.S. soybean curb is personal, national snub: Tokyo official. *Los Angeles Times.* July 13. p. B15, B21.
• ***Summary:*** Tokyo–Yoshio Sakurauchi, "Japan's agricultural minister said Thursday night the United States, in slashing export contracts of soybeans by 50%, had combined neglect of Japan with a personal snub to him."

He added his belief that the "four American Cabinet secretaries who will arrive here Saturday for two days of trade talks 'would not be in a position' to renew long-standing U.S. demands that Japan abolish its remaining 23 agricultural import quotas, 'having just restricted their own exports.'" Address: Times staff writer.

6086. *New York Times.* 1973. Japanese find U.S. unreliable on trade: 2 nations meet in Tokyo tomorrow amid anger over soybean curbs. July 15. p. 3.
• ***Summary:*** Tokyo, July 14. High Japanese officials feel that "the Nixon administration has taken this country's needs too

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lightly in recent steps to shore up the American economy."

6087. Oberdorfer, Don. 1973. Japanese attack U.S. trade policy. *Washington Post, Times Herald.* July 17. p. A1.
• ***Summary:*** Tokyo, July 16–Secretary of State William P. Rogers and other senior U.S. officials were subjected to a barrage of criticism today for alleged American deficiencies as a trading partner." At this joint cabinet-level conference on economic affairs, Rogers said that the curbs were "unavoidable and temporary."

Until just a few months ago, Washington [DC] was doing the complaining concerning the very large bilateral trade imbalance in favor of Japan; Washington made strong demands that the Japanese buy more from the U.S.

"At least four Japanese ministers, headed by Foreign Minister Masayoshi Ohira, expressed official dismay at the export restrictions during today's meeting here." Secretary of Agriculture Earl Butz was scheduled to be at the joint meeting, but he cancelled at the last minute, saying that he had urgent business to attend to in Washington. In his place he sent Undersecretary of Agriculture J. Phil Campbell.

"At a private hotel luncheon Sunday in the resort town of Hakone, Campbell and his wife heard little or nothing about Japan's special need for soybeans from the lips of their host, Agriculture Minister Yoshio Sakurauchi. However it did not escape their notice that the luncheon menu included boiled soybean snacks (edamame), Japanese soybean soup [miso soup], soybean curd squares (tofu), vegetables mixed with soybean curd [shira-ae], and cucumber with soy sauce."

6088. Chico-San Inc. 1973. Chico-San Inc. products: A catalog of unique foods. P.O. Box 1004, Chico, CA 95926. 26 p. Revised July 1973.
• ***Summary:*** Soyfoods imported from Japan include Lima Soy Sauce, Soybean Puree (Miso), and dehydrated miso. They also sell black [soy] beans.

Rice-based products include: Yinnies Grain Syrup ("a low cost natural sweetener made from whole grain barley and organically grown brown rice," in a 12 oz. jar; a photo shows the jar and label); a 3-page description tells how the product is made and gives its composition (maltose is the key natural sugar); recipes are included. Yinnies ("A traditional Oriental grain candy. The ingredients are organically grown brown rice and barley. No sugar or artificial sweeteners are used."). Rice chips with buckwheat. On the label of the Yinnies confection product the following statement appears: "The rice for the Yinnies is grown and harvested exclusively for and under the direct supervision of Chico-San by Wehah Farms of Richvale, California." A similar statement appears on the Rice Chips label.

Corn Chips. Rice Cakes (3 types, each with brown rice and sesame seeds: Plain, with Millet, or with Buckwheat). San-Wich Rice Cakes–Unsalted (Ingredients: Brown rice [organic], sesame seeds, Chico-San yinnies syrup (brown rice and barley), various sea vegetables, and kuzu).

One section (p. 9-10) is titled "How Chico-San guarantees Oriental-type, organically-grown brown rice." The words "Reprinted from *Health Foods Business* magazine" and "Wehah Farms" have been carefully deleted from the text of this article!

This is the revised edition of an earlier catalog. "Chico-San products have gained increasing acceptance throughout the country since their introduction in 1960." The booklet contains 8 pages of recipes, including: Sesame-miso spread for bread or dips. Black soy beans (p. 21). Wakame miso soup. Note: This is the earliest macrobiotic recipe seen which uses the term "Black soy beans" instead of "Black beans" to refer to black soybeans. Address: P.O. Box 1004, Chico, California 95926.

6089. Ikeda, Masanori. 1973. Food additives moving into wider applications. *Business Japan* 18(7):51, 56, 61-62, 64. July.
• ***Summary:*** The section on "Shoyu (Soy Sauce)" states: "Of the various condiments used by the average Japanese over a given year, shoyu or soy sauce constantly ranks first or second, accounting for 18.2 to 20 per cent of total condiments, according to figures by the Prime Minister's Office Statistics Bureau."

"There are about 4,000 shoyu producers in Japan, turning out approximately 1,200,000 kiloliters per year. About 40 per cent of the total is produced by five leading producers, and 60 per cent by the rest." The quality of shoyu make by all companies in Japan is excellent "because the government maintains a strict inspection system under the Japan Agricultural Standards (JAS).

"Before World War II, some shoyu was exported. But in the 10 years following the end of the war [1945-1955], Japan had little capacity to export due to the difficulty of securing sufficient raw material. Production barely met domestic demand. As the Japanese economy began to recover, exports were resumed.

"Full scale exports began in 1957. Since then Japan has shipped approximately 2,600 kiloliters annually overseas. In 1972 Japan exported approximately 8,000 kiloliters."

"Shoyu produced for export is graded into two categories–A and B–and the inspection standards are considerably higher than the JAS for domestic consumption. Only products that pass this strict examination are approved for export."

"Sauces: Sauce manufacturers in Japan (producers of fruit sauce and Worcestershire type sauce) total about 300 in number." The top ones are Kagome, Ikari, Bulldog, Kikkoman and Chicken. Address: Director General, Food and Marketing Bureau, Ministry of Agriculture and Forestry.

6090. Kato, Matsuo. 1973. Farmer co-ops leading to big business: Forceful agricultural co-op. *Business Japan*

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18(7):111-13. July.
• ***Summary:*** This article is mostly about the current ventures of Zenno and Nokyo in Japan. The economic activities of Nokyo (Agricultural Cooperative Association) comprise buying and selling. The supporting superstructure is Zenno (National Federation of Agricultural Cooperative Associations, whose chairman is Makoto Mihashi). While Zenchu (National Central Council of Agricultural Cooperative Associations, whose chairman is Tomoo Miyawaki) is a policymaking organ and also a strong political pressure group. Zenno is a purely economic organization supporting the economic activities of its member cooperatives, its annual business amounting to ¥2,340 billion. A powerful institution, its capability is second only to that of the four leading general trading houses [*zaibatsu*], such as Mitsui & Co. and Mitsubishi Corp.

"Zenno was created on March 32, 1972 through the merger of Zenhanren (National Marketing Federation of Agricultural Cooperatives) and Zenkoren (National Purchasing Federation of Agricultural Cooperatives). It is said that the merger took about ten years to materialize (i.e., before 1972). The argument for the merger was that the social situation surrounding farming and farmers has undergone a cataclysmic change, requiring the establishment of a new Nokyo movement."

6091. Kikkoman. 1973. Discover new taste–Kikkoman. *Business Japan* 18(7):57. July.
• ***Summary:*** This full-page ad shows a dispenser of Kikkoman shoyu, tilted downward, at the top, and below it (from top to bottom) a set of measuring spoons, a bowl, a ladle, a dish, a metal skillet and a wok.

The bottom quarter of the ad is devoted to text, which begins: "By the spring of 1973, Americans will be able to taste the delicate flavor of genuine Japanese soy sauce brewed and bottled in a plant now under construction in Wisconsin. It is just one facet in Kikkoman's worldwide operations... Kikkoman soy sauce is exported to more than 70 countries–proof that it goes well with any kind of food anyplace."

Across the bottom of the ad are the Kikkoman hexagonal logo (Since 1630) and, in large bold letters, "Kikkoman soy sauce."

6092. Roozen, J.P.; Pilnik, W. 1973. Ultrafiltration controlled enzymatic degradation of soy protein. *Process Biochemistry* 8(7):24-25. July. [17 ref]
• ***Summary:*** "Because of their taste, most hydrolysates formed by enzymatic degradation are not used in foodstuffs. Enzymatic depolymerisation in an ultrafiltration cell continuously separates peptides of desirable molecular weights from the reaction mixture. For application, the molecular weight has to be low enough to ensure solubility in acid fruit juice media, but not so low as to give a bitter taste."

Soy proteins of middle molecular weight are most suitable for introducing into fruit juices. These intermediate proteolytic products can be isolated by first digesting a soy protein solution with enzymes, then subjecting the mixture to ultrafiltration as the digestion proceeds.

Promine D, a commercial neutral isolated soybean protein in the sodium form, was purchased from Central Soya's plant in Chicago, Illinois. The following enzymes were studied: Pankreasproteinase A and Bakterienproteinase N (Röhm [Roehm] GmbH, Darmstadt, Germany), FAAN type A and Saure Protease SPR (Schweiz Ferment AG, Basel, Switzerland), HT Proteolytic 200 (Takamine, Miles Labs Inc.), and Rhozyme P-53 conc (Rohm & Haas, Philadelphia, Pennsylvania). The hydrolysis was carried out in a 142 mm Hi-Flux Ultrafiltration Cell (Millipore) placed in a thermostat. The ultrafiltration membrane was the DDS 800 membrane (De Dansk Sukkerfabrikker, Copenhagen, Denmark) with a nominal 100% rejection of molecules larger than 6,000 daltons. The pressure on the cell varied from 2 to 8 atmospheres.

The authors conclude that absence of beany flavor and bitterness is a very attractive property of these instant soluble hydrolysates. Therefore ultrafiltration appears to be a useful means of preparing high-grade food peptides. Address: Dep. of Food Science, Agricultural Univ., Wageningen, Netherlands.

6093. Greenwood, Leonard. 1973. Big bean boom in Brazil. *Detroit News.* Aug. 22. p. A-15, col. 4.
• ***Summary:*** Brazil's economy, in poor shape only 6 months ago, is now thriving. "The miracle was wrought by soybeans." A variety of factors have pushed world soybean prices from $200 a ton last year to near $600 a ton this year. A Brazil's farmers have just harvested a record crop. In the wheat and soybean state of Rio Grande do Sul, the combination of record production (expected to top 5 million tons this year) and unprecedented prices has created an atmosphere akin to gold fever. All over southern Brazil talk of soccer, Brazil's national game, has been replaced by talk of soybeans. Acreage is expanding. Some coffee growers are even tearing up their trees and converting the land to soybeans.

"Brazil has just signed an agreement with Japan to sell 2.5 million tons of soybeans next year for a staggering $1 billion. This will push soybeans ahead of coffee as Brazil's greatest money earner, the first time this century that any domestic product has ever topped coffee." Address: Los Angeles Times.

6094. Smith, Nancy. 1973. UI researcher seeks increased soybean yields: To satisfy world food demand. *News-Gazette* (*Champaign, Illinois*). Aug. 26.
• ***Summary:*** Discusses the work of soybean breeder Dr.

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Richard Bernard. He notes that soybean research has lagged behind that of other crops. "Many private companies employ corn researchers and hundreds of state and federally supported scientists are engaged in corn research and breeding while soybean research has been carried on by a handful of men." All the leading soybean varieties grown in the North Central states "have been produced by about four breeders."

Between 1952 and 1972, nationwide corn yields increased 132% compared with only 35% for soybeans. This is because, until quite recently, there has been almost no privately financed soybean research, and state experiment stations have shied away from soybean research. But Dr. Bernard reports that the soybean research is now intensifying and the future looks bright.

Dr. Bernard, who is in charge of the USDA germplasm collection for the northern half of the USA, is interested in wild soybeans. He recently visited Japan and Korea to collect samples of cultivated and wild soybeans. He collected almost 600 cultivated Korean soybean varieties and more than 150 wild varieties. His trip will net more than 1,000 new samples of soybean germplasm. "This is the first time in more than 40 years that the U.S. has obtained a large collection of new soybean stock from the Far East" [East Asia]. A photo shows Dr. Bernard checking the growth of a wild soybean plant in a UI greenhouse. Address: News-Gazette Farm Editor.

6095. *New York Times.* 1973. How families abroad are coping at the market: Some Japanese changing diets. Aug. 28. p. 37.

• ***Summary:*** In Tokyo, there is a widespread awareness that fish is too contaminated with mercury to eat safely. The other traditional source of protein, soybean products, have jumped in price because of the U.S. soybean embargo. In the last two months, the price of "tofu (bean curd or bean pudding)" has gone up 13 cents to 19 cents; a bottle of soy sauce 51 cents to 64 cents; cooking oil 55 cents to 70 cents,..."

Despite the rise in prices, tofu and miso soup are still regular parts of the diet for most Japanese.

A bar graph shows the percentage of income spent for food in 1971 in various countries: U.S. 17.6%. Germany 21.9%. Britain 22.3%. France 26.5%. Japan 30.7%. India 60.0%. Africa (various) 70.0. Source: Bureau of Labor Statistics. Grocery Manufacturers of America.

6096. Hawken, Paul. 1973. Erewhon: A biography. The view within. *East West Journal* 3(8):11-16. Aug.

• ***Summary:*** An early, critical history of Erewhon, written without any capital letters [all lowercase], expressing the viewpoint of one of its early, important, and very innovative presidents. "Arrogant" is a term often used to describe the attitude of the people running the company. A store by the name of "Erewhon" opened in May 1966 on Newbury St. in Boston, first manned by Evan Root, then Paul Hawken.

Paul "generally worked alone for first year [at Erewhon in Boston] with the exception of occasional help from members of the community–Elaine Sutton, Connie Frank, Peggy Taylor, and even Michio would help bag and clean.

"At that time I was much more interested in lectures, books, ideas, and more invisible things than food. I had no intention of doing Erewhon for very long, but that was before the remarkable and compelling visitations upon my brain that were precipitated by a five week fast augmented by only [brown] rice and water." Paul then describes the profound spiritual experience he had in 1966–one of great light and energy reaching down to the cellular level. "I could fully experience in that one moment the indivisibility of consciousness and body."

"Since nothing could really change until cells changed, it seemed the most logical thing was to provide the resource for that change to those who were ready for it. Soil and land would have to be found that was rich and uncontaminated... food should contain the life force inherent in natural growth. The problems posed were complex and many but all these questions gave me the answer as to the purpose of Erewhon... for those seeking the unveiling of the spirit, Erewhon would attempt to provide the renewing and cleansing power of the earth.

"This 'visceral mysticism' was a turning point for me and my relation to Erewhon. No revelation can arise unless ignorance precedes it, and the greatest lesson from this vision was the realization of how little I really knew or understood. My ignorance in the matters of spirit and consciousness were so great that I felt more at home with more plain and simple matters. Raising the quality of food seemed an area that was neglected, yet vital, in the path to higher consciousness."

In 1966 "On Thanksgiving day 1968 we opened a new store down the street [at 342 Newbury St.] which still exists today. At that time we were doing about $250 a day and the rent on the new store, with utilities, totalled over $1,000. It was a chance we took, a big chance, and seemed to set the pattern for many to come. The decision to place our economic life on the line was based on growth. By then Erewhon had grown to be six people, and all of us felt in our bones that we had a tiger by the tail. A sort of giddy optimism pervaded the new store, abetted by all of us working 12 to 20 hours a day–Bruce Macdonald, Jim Docker, Jean Allison, Bill Tara (later to leave for Chicago, Illinois), and Roger Hillyard. The intensity was so thick you could scoop it up and bag it. All of us felt like passengers on a very fast vehicle bound for unknown places. Business was increasing very rapidly and it seemed we could do no wrong. Time moved very quickly and I was soon to leave for Japan to establish a source of imported foods. My position as to coming back was ambivalent, so Roger Hillyard was appointed head in my absence. Bill Tara, who had set up Food for Life in Chicago on the tenth floor of a downtown office building, left for Los Angeles with Aveline [Kushi]

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and set up another Erewhon due to Aveline's prodding. It was later to prove to be our worst mistake and almost led us to bankruptcy.

"While I was away, roaming around Japan looking for pure foods and wise men, Roger [Hillyard] and others were busy establishing a wholesale business based primarily on the products that were being sent back from Japan. In retrospect, those times were chaotic, and I do not think the chaos let up until four years later, the spring of 1973. The chaos was (as I think back upon it) caused by thinly veiled ambition clothed in a stylishly cut suit of concern for our biosphere and guts. Perhaps this was a reflection of our urgent need to make up for years of bad living, bad ideas, and trash foods. In any case our actions were hasty, well-intentioned, very salty, and somewhat crude, but like a moldboard plow, we just kept coming.

"Chico-San saw us coming and promptly freaked out. They were very dismayed by their loss of New York business as our wholesale market developed. Chico-San had given us the impression in a number of personal conversations that they encouraged our self-reliance and particularly the importance of Japanese foods. Bob Kennedy, the head of Chico-San, candidly admitted that they lost money on imported items and they were able to stay in business only because they sold rice cakes. So it came as quite a surprise to us when they reversed their attitude. They began to express doubts about our motives and ability to procure good foods. Their attitude seemed to change into one where they were the 'official' food company, and that was that–appointed by the crown as it were. I can certainly see now how our brashness and youth did nothing to allay their doubts. In retrospect I have much sympathy, while realizing also that they did little to establish a real dialogue.

"Chico-San was formed by middle-aged people who split from New York City after Ohsawa walked into one of their meetings one night stoned on Scotch [whiskey] and announced the bomb was going to drop. This was during the Cuban [missile] crisis and there were many who shared that fear. They formed a well-organized caravan of families and trekked across the United States in a trip that got national coverage. Their purpose was to find the one place in America that was safest from radioactive fallout and also ideal for growing rice. Eureka! Chico, California. No one was more surprised than the local residents. The rift that opened between Erewhon and Chico-San has never closed. The rift could best be described as an ocean now. Peaceful coexistence. They mainly felt that their maturity and experience uniquely qualified them to be the best judge of what foods people should or should not eat. They thought that there should be only one 'label' and that we did not know enough about food to promote it... Herman Aihara who worked there then and Bob Kennedy felt that most young people had been 'ruined' by drugs and that their 'judgment' could never be completely restored,..." Continued. Address: [President, Erewhon].

6097. Hawken, Paul. 1973. Erewhon: A biography. The view within (Continued–Part II). *East West Journal* 3(8):11-16. Aug.

• ***Summary:*** Continued: "Perhaps the incident that best illustrates the conflict, and the one which simultaneously affected the most people, was the incident about the rice. To this day, I very much doubt there is agreement on the incidents leading up to the event, but here is one version anyway which may shed some light for others.

"In the fall of 1969, one Wendell Lundberg came striding into the retail store on Newbury Street and introduced himself as one of four brothers who were going to grow organic rice. He had heard of our company and wondered if we would be interested. We fell off our chairs. It seemed too easy at the time, and later events proved it to be so. A cordial conversation was entered into, addresses were exchanged, and he left. The following spring, I was in California, and a young man, who was on grant-in-aid to study organic farms dropped into our L.A. [Los Angeles] store and told us about these Lundberg brothers. Homer Lundberg and I began a relationship via the phone. I affirmed our desire to buy organic rice while he continued to express the desire to sell it. We set up an appointment in Richvale to discuss matters. Homer met me and told me that in the interim they had signed an exclusive five-year contract with Chico-San but that should be no problem because he had understood that Chico-San would sell the rice to us–wholesale. I explained how difficult it would be for us to buy rice wholesale from Chico-San and then try to redistribute to a hundred stores on the East Coast. He agreed and said that I should go to Bob. And he was sure it would be alright if I bought directly too or maybe paid Bob a small commission. I immediately went to see Bob Kennedy and posed the question to him, and he was simply appalled at the idea. High drama soon to come. I cannot accurately describe how hostile and upset the people at Chico-San were."

"Bob's attitude was formed partly because he had worked for years... trying to get a farmer to grow rice for him organically. When he finally found one, he had to just about sign his life away... in order to guarantee that the farmer would not lose money in case of a severely short crop. None of this of course was explained to us at the time. I suppose they just assumed we would know all the history behind it, but no one stopped to ask us or tell us or even show us the contract. We offered to share the risk, but that too was denied.

"The Lundbergs then made us an offer that they would grow a similar rice [in 1970] that was 'unsprayed' but which was still grown on ground with synthetic fertilizer. That was done and we were finally in the rice business, albeit second class.

The following year [1971] came quickly, and a new

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dance competition began to shape up. Bob [Kennedy of Chico-San] offered to sell us a certain number of acres if we would pay $1.50 for every bag we bought. One of the reasons he did this was because he heard rumors of other growers of organic rice [were there other growers?] selling to us. We accepted his offer initially, but I did not stop my search for an organic grower. With the help of Gloria Swanson, I located a group of farmers in Arkansas, and one in particular expressed interest.

"The farmer in Arkansas had fields which had been in soybeans with no fertilizers or pesticides. We tentatively lined up a source of Pfeiffer compost and manure, but as planting time came near it looked as though we were going to get the California rice offer and all the relations with the Arkansas grower were brought to a halt. At the last moment, however, Bob Kennedy reneged on his commitment and decided he would not sell us any rice. He said there just wasn't enough rice 'to go around' and that he was real sorry. (It was ironic because a year later [1972] the Lundbergs almost went out of business trying to get rid of all that organic rice that Chico-San had contracted for but could not buy.)

"We immediately contacted our Arkansas grower and drew up a contract... guaranteeing the farmer a fixed income per acre... [Note: The rice contract with Carl Garrich in Lone Pine, Arkansas, was finalized in March 1971. In April 1971 Garrich planted his organic rice crop on 330 acres]. The rice grew very well there and all was fine except for two things: First, our farmer could not clean the rice very well [seeds of various colors were mixed in with the rice], and second Chico-San had 300-400 acres too much rice, which they had contracted in expectation that they would sell the rice we had originally expected to sell. It did not work out that way so we had organic dirty rice and they had too much organic clean rice.

"Since then, because Chico-San could not meet their contractual obligations, the five-year exclusive had been null and void. Dozens of distributors now buy that rice, including Erewhon, which is now Lundberg's largest customer."

"That is the rice saga–the inevitable result of selfishness on everyone's part. I think one of the things I learned from this is that rice, which most consider inanimate, has a power of its own like water, and seeks its own level... The customer in this case was the victor and beneficiary.

"Bruce [Macdonald] and Roger [Hillyard] were soon to find that there was not enough space in the office for both to operate, so Bruce appointed himself West Coast manager much to Bill Tara's chagrin, relief, and disgust. Bruce began a very energetic effort to improve the West Coast store. Roger moved to a new fifth floor warehouse on Farnsworth Street overlooking the [Boston] harbor. He found new and dedicated people to help in the move. Richard Mensoff, Bill Johnson, Eric Utne, Chris Elbers, Rob Harrison, and Susan Sims. Richard, recently removed from set designing on Broadway [New York City], went to work immediately building the first Erewhon 'set.' It was beautiful, and unlike any food warehouse before it. Work had not even been completed when the first railroad car of rice backed into our siding. Aboard was 100,000 pounds of brown rice, and we had not the slightest idea of what to do with or how to unload it. Everyone just started carrying the [50 or 100-lb] bags of rice in on our shoulders as we had always done on Newbury Street. The looks of the warehousemen in the vicinity were incredulous. When they couldn't stand it any longer, they lent us their pallet jack and some old pallets, and we learned our first warehouse lesson.

"I returned from Japan in December 1969 and went to work with Bruce on the West Coast setting up a wholesale operation: it was Boston all over..." Address: [President, Erewhon].

6098. Hawken, Paul. 1973. Erewhon: A biography. The view within (Continued–Part III). *East West Journal* 3(8):11-16. Aug.

• ***Summary:*** Continued: Hawken returned to Boston in Dec. 1969, then was fired by Aveline Kushi. He left and worked in San Francisco with Fred Rohe at New Age Natural Foods. Hawken returned to Erewhon in Boston in the summer of 1970.

In 1970 the "natural foods boom" started and swept Erewhon along with it. "If there is one person who is 'most' responsible for Erewhon being here today and not bankrupt, it is John Deming, who brought a sense of joy and happiness wherever he went in the company. He assumed the manager's position at the retail store and made it the finest part of the company. His positive attitude was in contrast to the apprehension that all of us shared about the future. He gave Erewhon some money without which we would surely have failed. On his twenty-fifth birthday John came into a trust which sort of blew his mind. He had known nothing about it. He wanted to just give it to Erewhon, but it is on the books as a loan. It came just in time to pay back overdue creditors and panting bank officers."

A table (p. 16) shows Erewhon, Inc's. sales and sources of supply in 1966 and then in 1973. In 1966 Erewhon had about 200 retail customers. The company bought Koda rice from Sam Rabinowitz; imports from Chico-San, Infinity Co., Japan Foods Corp., and Wing-Wing; Lima (Belgium) products from Merit; grains and flours from Better Foods; and flour from Walnut Acres [founded by Paul Keene].

In 1973 in Boston the warehouse served about 200,000 customers (incl. 200 retail natural food stores, 43 Star Markets, 50 co-ops, 25 schools, 9 distributors, 10 restaurants, and 5 bakeries), and the store about 10,000 customers. In Los Angeles, the warehouse served about 75,000 customers (incl. 150 retail stores, 20 co-ops. 3 bakeries, and 10 distributors) and the store about 5,000 customers. A produce company in Los Angeles was supplied by about 40 organic farmers, and

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sold to 20 retail stores. Concerning soy products, Erewhon bought organically grown soybeans from Lone Pine in Arkansas [Carl Garrich of the Lone Pine Rice and Bean Farm], and soy oil from California. From Muso Syokuhin in Japan they imported tamari, and kome and hacho miso [plus azuki and black beans]. From Mitoku, Inc. they imported tamari and mugi miso.

Suppliers of organically grown grains included: Short, medium, and sweet rice (Wehah Farms, California). Medium rice (Willow Farms, Louisiana). Spring and durum wheat; flax (Ted Whitmer, Montana). Long rice (Jerry Ladds?, Texas). Winter wheat (Frank Ford, Arrowhead Mills, Texas). White wheat (Lewis Cox & Bill Ingram, Washington state). Buckwheat (Penn Argyl, Pennsylvania). Corn (Bill Stockett, Texas). Millet (Chuck Moses, North Dakota). Oats (Fruen, Minnesota). Rye (Mike Skinner, Colorado). Peanuts (Chas. Warnken, Texas).

Note 1. This is the earliest document seen (July 2011) that mentions Mitoku, or Muso Shokuhin.

Note 2. This is the earliest document seen (March 2006) that mentions Food for Life (started by Bill Tara in Chicago, Illinois). Address: [President, Erewhon].

6099. Hymowitz, T. 1973. Electrophoretic analysis of SBTI-A_2 in the USDA soybean germplasm collection. *Crop Science* 13(4):420-21. July/Aug. [6 ref]
• ***Summary:*** First work on geographic distribution of alleles determined by electrophoretic techniques. Hymowitz reports that the soybean's Ti-b (trypsin inhibitor) allele is present at a much higher frequency in Japanese and Korean soybean germ plasm

germplasm than in soybean populations from other areas of the world.

Note: This is the earliest document seen (Nov. 2003) with the term "soybean germplasm collection" or "USDA soybean germplasm collection" in the title. Address: Dep. of Agronomy, Univ. of Illinois.

6100. Kitamura, Keisuke; Okubo, K.; Shibasaki, K. 1973. The effect of cyanate in urea solutions on the gel electrophoresis of the subunits of soybean 11S globulin. *Agricultural and Biological Chemistry* 37(8):1983-1984. Aug. [9 ref. Eng]
Address: Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai, Japan.

6101. Ohsawa, George. 1973. Practical guide to Far-Eastern macrobiotic medicine. Herman Aihara, editor. The George Ohsawa Macrobiotic Foundation Inc., 1471–10th Ave., San Francisco, CA 94122. xi + 260 p. Aug. 21 cm.
• ***Summary:*** This book has a red, white, and black cover with a round yin-yang (*t'ai chi*) symbol on it. The Foreword begins: "This book, a compilation of several books and writings of George Ohsawa, attempts to give the whole scope of macrobiotic medicine to everyone." It includes the first English translation from French of Ohsawa's 1956 "Guide pratique de la medicine macrobiotique d'Extreme-Orient."

Contents: Forward [sic]. Preface. Introduction. Theory of macrobiotic medicine. Curing sickness. Cure the man. Letters from students of macrobiotic medicine. Appendix.

Information on soyfoods is found on the following pages: Tamari bancha (syoban, p. 85, 102). Miso (fermented soybean puree, p. 85). Tekka (miso, p. 87, 95). Tofu plaster (p. 88, 110-11, 125-30). Miso soup (p. 96). Koi-koku (Carp soup with miso, p. 99). Aburage (Age, p. 99). Deep-fried vegetable tofu (ganmo, with "1 tofu, ½ lotus root cut small, 2/3 inch jinenjo {nagaimo}, ½ inch carrot cut small, 2 inches burdock cut small, 1 quart oil, 1 cup whole wheat flour." Grind the tofu well in a suribachi, adding a pinch of salt, p. 99). Vegetable with ganmo (p. 100).

Note: This is the earliest English-language document seen (April 2013) that contains the word ganmo; it refers to deep-fried tofu burgers.

Dried radish with age ([aburage], see recipe 32, p. 100). Yin/yang soboro (with miso, p. 101). Scallion miso. Onion miso. Shigure miso (p. 103). Pheasant nituke [nitsuke] (with miso, p. 104).

The forward [sic] by Herman Aihara, editor, notes: "This book, a compilation of several books and writings of George Ohsawa, attempts to give the whole scope of macrobiotic medicine to everyone. The main part is treatment for sickness. However, treatment without understanding of principles and a good attitude is dangerous, therefore, the theory of macrobiotic and other articles were added. The book, like its predecessor, *The Unique Principle,* is unique not because of its name and contents, but rather in how it was translated, edited and published.

"The first part is a translation taken from Japanese books such as, *A New Dietetic Cure, How to Cure Sickness and a Sick Man,* and *Vegetarianism.* The second part is a translation from the French edition of *Practical Guide to Far-Eastern Medicine* which was done by Ann Harris. Noboru Muramoto was consulted to suit remedies to present-day American needs.

"Cornellia Aihara translated *Cooking for the Sick* which was written by Lima Ohsawa. *Massage and Palm Therapy* are based on notes taken by Cynthia McCluskey at Mirimichi Summer Camp, 1972. Photos of Cornellia demonstrating external treatments were taken by Fred Pulver. *The Manual of Macrobiotics* is a contribution of Nina Bond who took notes at George Ohsawa's lectures in New York at Summer Camp held about ten years ago.

"The third part is a translation from French and Japanese by Fred Pulver, Lou Oles and Herman Aihara.

"The last part is again taken from several articles appearing in past issues of *The Macrobiotic* magazine. The Appendix is taken from a translation of the French edition of Ohsawa's *Practical Guide to Far-Eastern Medicine.*"

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The preface, by George Ohsawa, states: "I am very happy to give you this short, simplified translation of my book, *Cure–Following the New Way of Eating.* It was originally written in Japanese, and is now in its 465th edition. I want to share with you the practical application of Macrobiotic healing that I have been teaching for almost 40 years–leaving aside the conceptual aspects covered in my other books and classes.

"Herein is the synthesis of my medical philosophy, which is nothing but the biological, physiological and dialectic interpretation of Far Eastern philosophy–the principles of the Order of the Universe and the Order of Man. For 30 years I have been writing on both the practical and theoretical sides of this question and have published more than 20 books and thousands of articles. But at this time I wish to limit myself to giving easily accessible information.

"My medical philosophy, the way of eating and the art of longevity and rejuvenation, is so simple and inexpensive that anyone can follow it any time, anywhere. If you decide to cure yourself before all else, you can forget about the bitter, painful and costly suffering that results from medical, physical, psychological and religious therapies.

"This system depends on you alone. No reliance on other people or on artificial means–everything depends on how you eat."

In the first chapter titled "How did I find macrobiotics? The principle of life," Ohsawa continues: "I was born at Sagano, Kyoto, Japan in 1893. My mother could not produce enough milk and I was a weak baby. I was told by mother that I almost died five times before I reached the first birthday. My family was poor. Father was a principal of an elementary school of a small village before I was born. Then my parents moved to Kyoto where he became a policeman. Mother worked at home to help finance–making strings for kimonos. Mother was an industrious woman. She studied Western science and culture through Yuzuru Niijima who was the founder of the Doshisha University. She died at the age of 30 from tuberculosis, leaving two sons. I was 10 and a younger brother was 6. Two sisters had died earlier due to the wrong diet which my mother introduced in our family through her study of Western science and culture.

"From that time we lived sad days as poor orphans. I was an apprentice in a Buddhist temple as a disciple. However, I soon started to vomit blood like my mother and sisters did. At 18, I had to give up my school, medicine, eggs and meat because I was too poor to continue such expensive living. I lived in the lowest living condition. In other words, I lived with brown rice, radish pickle and salt plum even though I was told that my sickness–tuberculosis–required eggs and meats by the doctors and my mother who gave us milk, eggs and bread every morning (which was violating natural order). We were punished for this violation. Such a diet destroyed our family's health. I, however, resented that I could not afford to continue such a diet because I didn't know the fact that such a diet was the cause of mother's and sisters' death and my sickness. If I could have afforded to continue that diet, I would have died at that time. I am so grateful that I was poor...

"Curing all my diseases and re-establishing my health at the age of 20, I realized that food is the source of life. After realization of this important fact, I decided to devote my life to preaching this doctrine...

"I traveled to France for the first time in 1914. Since then I have returned a dozen or more times."

6102. Hewitt, Jean. 1973. A Portuguese stew, an Oriental omelet. *New York Times.* Sept. 28. p. 26.
• ***Summary:*** The recipe for "Bean curd omelet" [*o-konomi-yaki*] includes "1 cake fresh bean curd (tofu) or one can, drained and cut into 3/4-inch cubes."

6103. Hashimoto, Hikotaka; Yokotsuka, Tamotsu. 1973. [Studies on sediment of shoyu. VII. The significant effect of thermostable acid protease on sediment formation of *shoyu* (soy sauce)]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 51(9):661-69. [15 ref. Jap; eng]
Address: Central Research Laboratories, Kikkoman Shoyu Co., Ltd., Noda, Japan.

6104. *Macrobiotic* (*The*) (*Chico, California*). 1973. Miso making with white rice koji. No. 92. p. 22.
• ***Summary:*** Koji is rice or wheat, barley, etc. which has been treated with a mold called succaromises [sic, *Saccharomyces* is a yeast genus]. Koji rice (only white rice unfortunately) is available in Japanese food stores. If you can't find it, one can ask their local natural food store to order some from the manufacturer–Fujimoto & Co., 500 West Street, Salt Lake City, Utah 84101.

One recipe for quick (yin) miso calls for 18 pounds soybeans and 18 pounds koji, 5 gallons water and 9 pounds salt. This amount will go in a ten gallon stone crock. In Japan, one twenty gallon barrel of miso feeds five persons for one year.

Letter (e-mail) from Carl Ferre of GOMF in Chico, California–in reply to inquiry. "Issue No. 92 was the 9th of 11 issues in 1973; so, my guess is [it was published in] September."

6105. *Soybean Digest.* 1973. ASA awards: Honorary life membership and certificates of meritorious service. Sept. p. 16-17.
• ***Summary:*** Honorary life memberships: (1) Dr. Charles A. Brim–Prof. at Agronomy at North Carolina State Univ. (2) Y.H. Chen, president of the Taiwan Vegetable Oil Manufacturers Assn. (TVOA) from 1969-1973, and a constant strong supporter of American Soybean Assoc. market development programs in Taiwan since ASA

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established its Taiwan branch office in 1969.

Certificates of meritorious service: (1) Education and research: Dr. James Torrie, Prof. of Agronomy, Univ. of Wisconsin. (2) Service within the organization: Miss Yoshiko Kojima, in Japan. (3) Farm communications: E.W. "Buddy" Sanders. (4) Agribusiness: Illinois Crop Improvement Assn. (5) State achievement award: Arkansas Soybean Assn. Photos show: Each of the five people.

6106. Tanner, J.W. 1973. Where we are and how we got there: An historical review of soybean production in Ontario. In: Ontario Soya-Bean Growers' Marketing Board, ed. 1973. Ontario Soybean Symposium 1973. Ottawa: Agriculture Canada. 110 p. See p. 11-22.

• ***Summary:*** The best summary of soybean history in Canada seen up to this time. The author believes that, "based on the chaotic events of the last 12 months... for historical purposes it would seem desirable to divide the history of soybeans into two eras: pre-September 1972 and post-September 1972. Certainly the events of the last year created an awareness in producers and the general public alike of a whole new vocabulary, including words such as anchovies, futures market, protein gap, embargo, superburger, and soaring prices. The latter produced another vocabulary most of which would be unprintable.

"The first report of soybeans grown in Canada was by C.A. Zavitz in 1893 at the Ontario Agricultural College. The seeds had been obtained from Dr. C. [Prof. C.C.] Georgeson, Kansas, who had received them from Japan three years earlier. [Note: Zavitz first published his research on soybeans in 1901, and first reported the results of his 1893 research in 1908]. For 30 years Zavitz, alone in Canada, meticulously conducted trials on variety tests, dates of planting, seed rates and row widths for soybeans grown for seed and hay.

"By 1927, Zavitz had evaluated over one hundred varieties, most of them for five years or over. The 31 year average of his best variety, Early Yellow was 16.78 bu/acre. The 22 year average green crop yield for the variety Ito San was 7.5 tons per acre per year. In 1924, Zavitz released OAC 211, the first variety of soybeans registered by the Canadian Seed Growers' Association. The variety continued as one of the recommended varieties until the mid 40's.

"The soybean program at Harrow was started in 1923 by Dr. F. Dimmock. [In 1923 he grew the first soybeans at Harrow. In 1925 the first soybeans were grown in Kent County. In 1930 the first soybean crosses were made at Harrow.] Dr. Dimmock was transferred to the Ottawa research station in 1927 where he continued his work on soybeans and produced a string of excellent early varieties of soybeans over 35-40 years including Acme, Comet, Crest, Mandarin, Capital, Merit, Kabott and Pagoda. The Harrow research was continued by Casper Owen who started breeding soybeans in 1931. This program was to prove to be one of the most outstanding in North America producing such varieties as AK (Harrow), Harman, Harly, Harosoy and Harome."

"In the late 1920s a few farmers were growing a small acreage of soybeans for grain, harvesting with a reaper and threshing the seed out. Two short-lived crushing plants were established in the south west part of Ontario in the mid-1930s, one of which was located at Shelbourne [sic, Colborne] Street in Chatham."

Note: Founded in 1934 (see p. 18), this was apparently the first crushing plant in Canada. In *Shepherd's City of Chatham* (*Ontario*) *Directory 1934-35* (p. B-166) we read: "Soyabean Oil & Meal Co-operative Co Ltd, G E Biles, mgr, Colborne n, w cor Adelaid." Spelled out, with punctuation, this becomes: northwest corner of the intersection of Colborne St. and Adelaide St. See also C.A. MacConkey (1935, p. 65) who gives the company name as: Soy Bean Oil and Meal Co-Operative Co. of Canada, Ltd.

"Subsequently, few beans were grown for hay. The late 1930s were critical years for the soybean in Ontario, and without the help of the Maple Leaf Mills plant (which was primarily processing flax) and Toronto Elevators [which later merged with Maple Leaf Mills in 1962], there would have been no place to market the new crop.

"The establishment of soybeans as a major crop in North America was assured by the occurrence of World War II. Demand for oil created a rapid expansion in acreage and processing facilities, and in the U.S.A. 1940 marked the first year in which the acreage harvested as seed exceeded the acreage harvested for hay. The latter continued to dwindle away and now, represents an insignificant portion of the U.S. acreage.

"The rapid expansion in acreage, once the demand for oil was established, occurred as a result of a major promotional effort by the consuming industries. With the construction of a new plant in Toronto in 1944, Victory Mills launched one of the greatest promotions of a crop ever witnessed in the Province of Ontario. Extension bulletins, newspaper advertisements, movies, newsletters and meetings inundated the farmers with information and enthusiasm. Ralph Chamberlain and later Ivan Roberts promoted the crop at every opportunity. Acreage grew and by the early 50's, the soybean had become a major cash crop in S. Ontario and had its own marketing board.

"As the market for oil increased and the acreage expanded in the 1920's and 30's, the problem of disposing of all of the meal economically became acute, to the point of slowing the expansion... Gradually the feed industry began to recognize the value of the meal in livestock and pet foods with the result that, with a major market established for the meal by-product, the expansion of the oil industry was assured."

"To me there have been three outstanding accomplishments in the development of soybeans in Ontario to date: the pioneering work of C.A. Zavitz at the Ontario

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Agricultural College... Next, the role of Victory Mills in promoting the crop once the market for oil was established.

"Finally, the development at the Harrow Research Station of the variety Harosoy by Mr. Casper Owen. Released in 1951, Harosoy eventually grew to 80% of the Canadian crop (1965). However, its total impact was even greater in the United States Midwest where, in 1966, 26% of the total U.S. crop of 25 million acres was Harosoy, including 42% of the crop in Illinois, 48% in Indiana, 46% in Ohio and 58% of Michigan's crop. To be that dominant, a variety can't just be good, it must be great and Harosoy (and later Harosoy 63) was certainly that."

A graph (p. 20) compares soybean yield in the USA and Canada from 1924 to 1971. The first statistics on Canadian soybean yields date from 1941, and from that year onward Canadian soybean yields were generally higher than U.S. yields–in some year 5-6 bushes/acre higher.

A second graph (p. 22) shows the surprisingly parallel growth of the number of soybean acres harvested from 1924 to 1972. Though the number of acres is smaller in Canada, the rate of growth is almost identical. Address: Crop Science Dep., Univ. of Guelph, Guelph, Ontario, Canada.

6107. Aonuma, Tatsuo; Yasuda, A.; Yuasa, T.; Arai, A.; Mogi, K.; Yokotsuka, T. Assignors to Kikkoman Shoyu Company, Ltd. (Noda-shi, Chiba-ken, Japan). 1973. Method of preparing soy and miso-paste. *U.S. Patent* 3,764,708. Oct. 9. 8 p. Application filed 11 Aug. 1971. [1 ref]

• ***Summary:*** "A method of preparing soy and miso-paste of superior flavor and taste and of high quality, which comprises treating the starting soy-beans and/or carbohydrates with a current of superheated steam at a gauge pressure of 4-8 kg/square cm and a temperature of 200ºC to 280ºC for a time not exceeding 15 seconds. The treated soybeans are quickly exhausted into the atmosphere at atmospheric pressure."

The examples use either defatted soybean flakes or granular soybeans. Both the present invention and the conventional method contain 17.55 gm of common salt per 100 ml of soy sauce. Products from the present invention and the conventional method contain (in gm/100 ml) respectively total nitrogen (1.808/1.680), amino nitrogen (0.890/0.828), glutamic acid (1.484/1.376), alcohol (2.08/2.01), and yield of nitrogen (89.42%/82.93%). Address: 1. Kashiwa; 2-5. Noda; 6. Nagareyama. All: Japan.

6108. Woodland, John. 1973. Heavy Russian buying now seen as a cause of soya bean shortage: Chinese imports behind soaring cost of vegetable oils. *Times* (*London*). Oct. 25. p. 26, cols. 5-7.

6109. Odani, S.; Ikenaka, T. 1973. Studies on soybean trypsin inhibitors. VIII. Disulfide bridges in soybean Bowman-Birk proteinase inhibitor. *J. of Biochemistry* (*Tokyo*) 74(4):697-715. Oct. [27 ref]

• ***Summary:*** Gives (for the first time) the complete amino acid sequence and covalent structure of the Bowman-Birk soybean trypsin inhibitor. Residues at the two reactive sites are shown as solid black circles. Probable sites of peptide bond cleavage are also shown. Address: Dep. of Biochemistry, Niigata Univ. School of Medicine, Niigata 951, Japan.

6110. Taira, Harue. 1973. Heat destruction of amino acids in soybean products. *JARQ* (*Japan Agricultural Research Quarterly*) 7(4):267-73. Oct. [11 ref]

• ***Summary:*** Traditional, processed soybean foods that are widely used in homes in Japan include "Shoyu (fermented soy sauce), Miso (fermented soybean paste), Natto (fermented soybeans), Tofu (bean curd), Aburaage (fried bean curd), Kori-tofu (dried Tofu) and Kinako (roasted soybean flour)."

One of the steps in making each of these foods is heating, which denatures the protein (making it more digestible), eliminates the peculiar soybean flavor, and develops colored substances (which "can prevent oxidation of the unsaturated fatty acid contained abundantly in soybeans during the fermentation process of Miso as an example"). Heating also eliminates antinutritional factors.

"But overheating causes excessive denaturation of soybean protein and destruction of amino acids."

Tables show: (1) Amino acid composition of 7 soybean products, including Mamemiso [soybean miso, such as Hatcho miso] and yuba. (2) Change of amino acid after three steps in the process of making Mame-miso: Soaking the soybeans, heating the soybeans, the final product. (3) Change of amino acid after two steps in the process of making natto: Heating the soybeans, final product. After heating at a rather high temperature for a short time (120ºC for 30 minutes), there was no decrease in any amino acids except arginine, which decreased by 17.8%, and decreased by 29.1% in the final product. Some essential amino acids increased during the natto process. Methionine increased from 0.9 gm per 17 gm of nitrogen to 1.1 gm, an increase of 22.2%. Cystine remained unchanged at 1.0. (4) Change of amino acid after three steps in the process of making Tofu: Soaking the soybeans, heating the soybeans, the final product. No amino acids are reduced by heating, and some (such as methionine) increase. Of the 18 amino acids measured, 5 are unchanged, 10 increase, and 3 decrease slightly: Glutamic acid 19.6 > 19.3. Tryptophan 1.5 > 1.4. Serine 6.6 > 6.4.

One of the products which is heated by dry heat only (without soaking in water) is kinako. It is heated at 160ºC for 10 minutes, then ground. This heating reduced lysine from 5.1 to 4.8.

Figures (graphs) show: (1) The heat destruction of lysine in defatted soybean flour at 4 different temperatures (from 100ºC to 126ºC) for 4 different times (from 30 minutes to 4 hours). The higher the temperature and the longer the time,

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the greater the destruction of lysine.

(2) The heat destruction of cystine in defatted soybean flour. Same 4 temperatures and times; roughly same results.

(3) The influence of water on the heat destruction of lysine in defatted soybean flour. Same 4 temperatures and times. Adding water reduces the destruction of lysine.

(4) The influence of water on the heat destruction of cystine in defatted soybean flour. Same 4 temperatures and times. Adding water reduces the destruction of cystine.

(5) Heat destruction of total and available lysine in defatted soybean flour. Same 4 temperatures and times.

(6) Enzyme treatment and total liberated amino acids. Address: Food Analysis and Nutrition Div., National Food Research Inst., Ministry of Agriculture & Forestry, Koto-ku, Tokyo.

6111. Leng, Earl R. 1973. Breeding soybeans for high productivity under conditions of developing areas. In: International Inst. of Tropical Agriculture. Proceedings of the First IITA Grain Legume Improvement Workshop. iii + 325 p. See p. 42-52. Held 29 Oct.–2 Nov. 1973 at Ibadan, Nigeria.

• ***Summary:*** Tables show results of variety trials in Costa Rica (1972), Nigeria (1971), Madhya Pradesh, India (1972), Thailand (1971), Jogjakarta, Indonesia (1971), Brazil (1970-71).

"While a few years ago there were grounds for believing that the USA could supply all the soybeans needed in world grain trade, at the present time it is very clear that this crop is in acutely short supply on a world-wide basis, and that many countries which previously have imported their soybean requirements will be considering means by which they may produce part or all of their needs.

"Development of the soybean from a forage crop into a major grain crop in the USA was made possible by a breeding breakthrough at the University of Illinois in the early 1920's. Dr. C.M. Woodworth developed types which had an upright, non-branching growth habit, rather than the prostrate, vining habit which previously had been most common. As a result, it became possible to harvest the crop with normal field machinery. Growth in acreage and productivity was explosive."

"In the USA there is at present a sharp distinction between 'northern' and 'southern' types. The 'northern' varieties are almost all of indeterminate growth habit and are based primarily on Manchurian and Hokkaido germ-plasm. The Manchurian types predominate, except in varieties adapted to extreme northern areas. While these 'northern' varieties are considered to be especially day-length sensitive, recent evidence indicates that their early maturity under warmer conditions is influenced more by high temperatures than by actual day-length."

"The 'southern' types may be traced generally to germ-plasm imported from Taiwan or southern China. All the modern U.S. varieties in this class are of determinate growth habit; that is, increase in height virtually ceases once flowering begins. Although these varieties are popularly regarded as less sensitive to day-length, they actually tend to be more day-length sensitive and less temperature-sensitive than the 'northern' types."

"In our experience with variety trials on a worldwide basis, we have found that some of the 'southern' types from the USA give superior performance when grown under favorable conditions, as compared with nearly all other germ-plasm tested."

"Soybean breeding is generally not well developed in countries other than the USA and Canada. Recently, however, Brazil and India have undertaken programs on a significant scale." Address: Univ. of Illinois, Urbana, IL.

6112. Garnier, Jean-François. 1973. Protéines: Construction, en France d'une usine de lysine franco-japonaise [Proteins: Construction in France of a French-Japanese lysine factory]. *Ouest-France.* Dec. 15. [Fre]
Address: France.

6113. Haenszel, William; Berg, J.W.; Segi, M.; Kurihara, M.; Locke, F.B. 1973. Large-bowel cancer in Hawaiian Japanese. *J. of the National Cancer Institute* 51(6):1765-79. Dec. [54* ref]

• ***Summary:*** The authors reported a significant increased risk of colon cancer among Japanese-born Issei (first generation immigrants) residing in Hawaii who consumed fermented soybeans (Relative Risk = 1.6), or red [azuki] beans (RR = 1.6). They did not find an increased risk among Nisei (second generation immigrants) or Hawaiian Japanese. Address: 1. Biometry Branch, National Cancer Inst., National Institutes of Health, Public Health Center, U.S. Dep. of Health, Education, and Welfare, Bethesda, Maryland 20014.

6114. Matsumoto, Shinichi. 1973. Executive marketing: Active promotion captures market share. *Business Japan* 18(12):112-13. Dec.

• ***Summary:*** Page 112 begins: "A number of foreign manufacturers have been making enthusiastic attempts..."

"The first was characterized by combined marketing efforts for Kikkoman Worcestershire sauce and Delmonte tomato ketchup. We came to the decision on this combined marketing effort first because they were distributed in similar marketing..." Address: Asst. Manager, Planning and Advertising, Kikkoman Shoyu K.K.

6115. Saio, Kyoko; Watanabe, Tokuji; Kaji, Matsumi. 1973. Food use of soybean 7S and 11S proteins. Extraction and functional properties of their fractions. *J. of Food Science* 38(7):1139-44. Nov/Dec. [12 ref]

• ***Summary:*** The physical properties of a gel (such a tofu), prepared by coagulation with a calcium salt, made from 7S

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or 11S protein respectively, were remarkably different. The gel from 11S protein was harder and more elastic than that from 7S protein. Yuba made from the two protein fractions was also very different.

"The present paper consists of an investigation and proposal of a conventional method to fractionate 7S and 11 proteins, based on their different precipitation behaviors with calcium salt." Address: 1-2. National Food Research Inst., Ministry of Agriculture and Forestry, Shiohama, Koto-ku, Tokyo, Japan; 3. Meiji Seika Kaisha Ltd., Kawasaki, Kanagawa-ken, Japan.

6116. Azumaya, Naoki. 1973. Nattô-kin ni yoru bitamin B-2 seisan ni kansuru kenkyû. I. Nika oyobi sankatetsu ion no eikyô [Study on vitamin B-2 production by natto bacteria. I. The effect of divalent and trivalent ions]. *Kumamoto Joshi Daigaku Gakujutsu Kiyo* (*J. of Kumamoto Women's University*) 25(1):45-52. [Jap]*

6117. **Product Name:** [Soymilk].
Manufacturer's Name: Haus Luppy.
Manufacturer's Address: Offices: Hakusan 4-30-12, Bunkyo-ku, Tokyo 112, Japan; Factory: Minami Gotani 360-2, Yashio-shi, Saitama-ken 340, Japan. Phone: 03-815-0159 (Offices). 0489024-5011 (Factory).
Date of Introduction: 1973.
New Product–Documentation: Shurtleff & Aoyagi. 1975. *The Book of Tofu.* p. 202. Shows an illustration of Luppy soymilk in a tetrahedronal aseptic Tetra-Pak carton.

Shurtleff & Aoyagi. 1979. Tofu & Soymilk Production. p. 199. Shows an illustration of Luppy soymilk in a tetrahedronal aseptic Tetra-Pak carton. Page 313 gives the company name and address. The founder and owner is Mr. Teisuke Yabuki who wrote *Tonyu no Shimpi* ("The Wonders of Soymilk"), Japan's first book on soymilk, a 160-page work published in 1974.

Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64. This was Japan's fifth commercial branded soymilk.

6118. **Product Name:** [House Hon Tofu Mix (Instant Soybean Curd Mix)].
Foreign Name: Hausu Hontôfu.
Manufacturer's Name: House Food Industrial Company Ltd. (Hausu Shokuhin Kogyo).
Manufacturer's Address: Plant: Sano city (100 km north of Tokyo), Japan. Head offices: Mikuriya-Sakaemachi 1-5-7, Higashi Osaka City, Osaka, Japan.
Date of Introduction: 1973.
Ingredients: Soy bean [powdered soymilk], glucono delta-lactone.
Wt/Vol., Packaging, Price: 2.3 oz In USA $0.99 in 1983.
How Stored: Shelf stable.
New Product–Documentation: Article in *Japan in*

Pictures. 1974. 16(1):12-15. "Bean curd, a subsidiary food as nutritious as meat. Instant bean curd developed in Japan." Two photos are given of the equipment in the plant and 6 of the package and how this instant silken tofu is prepared at home. At the modern plant, a mixture of ground soybeans and water "is applied to a centrifugal separator, which separates it into soymilk and refuse. The soymilk, which has been concentrated by being heated, is sprayed into a tank heated to 100ºC, a process which dehydrates the milk to produce a bean curd base in powdered form [powdered soymilk]. A unit quantity of this powder is packed in an aluminum-foil bag containing nitrogen gas, which is put on the market accompanied by a small amount of coagulant.

"Process to prepare bean curd on the spot. Put a bag of 'Hontofu' in 600 cc of water, which is to be agitated [with a whisk]. Boil about 3 minutes. Mix the accompanying coagulant [glucono delta-lactone] immediately after the flame is put out. Transfer the substance into the container [a plastic box shaped like a cake of tofu]. Leave it for about 20

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minutes and a block of bean curd is ready. Bean curd taken out of container [into a bowl of water]." Spot (½ page with photo of package) in *Food Product Development.* 1976. May. p. 88. Discusses: Ingredients and description. Product application. Product history. Product concept.

Label. 1985, undated. Photo on front panel of Chilled Tofu in clear glass bowl and Simmering Tofu in a *nabe* pot.

Sakai. 1988. Bestways. March. p. 21. The powdered tofu market is dominated by House Food, an Osaka based manufacturer, that launched powdered tofu in 1973. Note: Actually House launched a packet of powdered soymilk with a coagulant.

House Foods America Corporation. Annual report 1996. p. 13. This product, *Hontofu,* was launched in 1973.

6119. Saito, Y.; Ito, K.; Kawano, K.; Endo, H. 1973. Koso-zai riyô no miso jôzô ni tsuite [Miso manufacturing using enzymic preparations]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 236. p. 20-30. (Chem. Abst. 82:169,030p). [12 ref. Jap]*
Address: 1,3,4. Fukushima-ken, Aizu Wakamatsu Kogyo Shikensho Shokuhin-bu; 2. Nishimata Miso Shoyu Jozo K.K.

6120. Yamamoto, Yukiko. 1973. Hakkô daizu, tenpei no eiyô-ka ni tsuite [The nutritional value of fermented soybeans and tempeh]. *Hyogo Joshi Tandai* No. 6/7. p. 128. [Jap]*

6121. Yamashita, Akira. 1973. Tôfu no naka no shishitsu ni tsuite [The lipids in tofu]. *Obihiro Otani Tandai Kiyo* [Jap]*
Address: Obihiro, Hokkaido, Japan.

6122. Yasuda, A.; Mogi, K.; Yokotsuka, T. 1973. [Studies on the method of cooking protein-rich materials for soy sauce brewing. I. High temperature and short time cooking method]. *Chomi Kagaku* (*Seasoning Science*) 20(7):20-24. [Jap]*
Address: Noda, Japan.

6123. Yasuda, A.; Mogi, K.; Yokotsuka, T. 1973. [Studies on the method of cooking protein-rich materials for soy sauce brewing. II. Brewing test of soy sauce]. *Chomi Kagaku* (*Seasoning Science*) 20(7):25-27. [Jap]*
Address: Noda, Japan.

6124. **Product Name:** [Golden Soybean Salad Oil].
Foreign Name: Daizu.
Manufacturer's Name: Yoshihara Oil Mill, Ltd.
Manufacturer's Address: Naka Noshima 3-6-32, Kita-ku, Osaka, Japan.
Date of Introduction: 1973.
Wt/Vol., Packaging, Price: Can (2 sizes).
How Stored: Shelf stable.
New Product–Documentation: *Soybean Digest.* 1974. May. p. 12. "The Far East." ASA helped Yoshihara promote Japan's first identified soy oil. It was named "Daizu," which means "soybean(s) in Japanese.

American Soybean Association. 1974? Soybeans: From America's fertile soils the world's versatile protein resource. Photo of two cans. All in English. Note clear identification of soy as the oil type.

6125. Aihara, Cornellia. 1973. The *dô* of cooking (Ryorido). Vol. 4. Winter cooking. Macroguide No. 16. San Francisco, California: George Ohsawa Macrobiotic Foundation. 120 p. Illust. by Carl Campbell. 21 cm.
• ***Summary:*** All recipes in this macrobiotic cookbook are numbered.

Soy-related recipes include: 29. Nikomi Oden (with stuffed agé). 32. Boiled tofu (yutofu). 35. Furofuki daikon [with orange miso]. 36. Miso soup. 40. Kenchin soup [with tofu]. 47 Miso zoni, and white miso zoni. 87. Soy bean nishime. 89 & 90. Koji pickles. The section titled "Amasake" (p. 97-104) describes how to make it using sweet [glutinous] brown rice, then how to use it as a sweetener in various recipes: Amasake manju (steam cake). Amasake roll. Amasake karinto. Amasake cookies. Amasake cake. Amasake donuts (unyeasted or yeasted). Amasake crescents. Amasake wedding cake with frosting.

Also contains detailed, illustrated instructions for making and cooking with mochi (p. 23-30). A number of recipes contain fish and there is a picture of a cooked fish on the cover. Address: 1471–10th Ave., San Francisco, California 94122.

6126. Aihara, Cornellia. 1973. The *dô* of cooking (Ryorido). Vol. 3. Autumn cooking. San Francisco, California: George Ohsawa Macrobiotic Foundation. 100 p. Illust. by Carl Campbell. 21 cm. Revised ed. 1977.
• ***Summary:*** Interesting recipes include: Buckwheat noodle gratin (with tofu, p. 29). Udon with adzuki (p. 32). Endive rolled with agé (deep fried tofu, p. 33). Fu vegetable cream cooked (with wheat gluten cakes, p. 34). Carrots and onions miso (p. 37). Vegetable miso (p. 38). Sliced kombu nitsuke (with koya tofu [dried-frozen tofu], p. 38-39). Vegetable stew–Chinese style (with agé and frozen tofu, p. 41). Adzuki bean soup (p. 46). Creamed miso soup (p. 46). Kenchin soup (with vegetables and tofu, p. 47). Stuffed agé with sauce (p. 49). Thick tamari soy sauce (p. 50). Tahini-tamari sauce (p. 50). Mock meat sauce (with miso, p. 51). Chrysanthemum leaves with tofu (p. 63). Unagi-modoki (mock eel, with tofu, p. 64). Chick pea vegetable nitsuke (with koya tofu, p. 71). Wheat gluten and seitan (p. 71-74, incl. homemade wheat gluten, fresh wheat fu, boiled fu, fried fu–gluten cutlet, shish kebab with fu). Autumn dish (with adzuki beans and tamari, p. 72). Address: 1471–10th Ave., San Francisco, California 94122.

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6127. Azumaya Inc. 1973. Tofu recipes–Series one. Yudofu, Pork Tofu, Sukiyaki, Sweet 'n Sour Tofu (Tear-off recipe pad). San Francisco, California 94124. 6 recipes. Each recipe: 7.5 x 7.2 cm.
• ***Summary:*** Color photo on each recipe. Caption on each reads: "Tofu–from the bean that thinks it's meat!" These are the earliest tofu recipe pads or cards seen in the Western World. Each recipe is "Copyright 1973."

6128. Azumaya Inc.; Matsuda & Hinode. 1973. Tofu recipes (color): Tofu & Mushrooms, Tofu Meat Loaf, Tofu Tuna Patties, Eastern Omelet (Tear-off recipe pad). San Francisco, California 94124; Los Angeles, CA 90013. 4 recipes. Each 18 x 7.5 cm.
• ***Summary:*** Color photo on each recipe. Caption on each reads: "Tofu–from the bean that thinks it's meat!" Each recipe is "Copyright 1973." Note the cooperation between two California tofu manufacturers that are potential competitors, Address: Los Angeles, California.

6129. Borgstrom, Georg. 1973. World food resources. New York and London: Intext Educational Publishers. xi + 237 p. For soybeans, see p. 20-21, 136-37, 222. Index. 23 cm. Series: Intext Series in Ecology. [210* ref]
• ***Summary:*** Contents: Series preface. Preface. Introduction. Section I: Production. 1. Food commodities. 2. Prerequisites for crop production. 3. The tropics. 4. Crops and water. 5. Livestock and poultry. 6. What oceans and freshwaters provide. 7. Visions of the future. Section II: Utilization. 8. Food storage, processing, and marketing. 9. International trade in food and feed. Section III: Consumption. 10. Man's needs. 11. Food and population. 12. Nutrition and health. 13. Protein: the key issue. 14. Food and the ecology crisis. Supplementary tables.

The United States is presently the world's largest producer of soybeans, producing 67% of the total; China produces 24.5% and Others produce the remaining 8.5%. Three pie charts show global production of soybeans and peanuts (groundnuts) (p. 20-21). The section on "Oilseeds" (p. 136-37) also discusses soybeans and peanuts. Tables show (p. 222): (1) "Soybeans–world trade–annual average of 1967-1969 (millions of metric tons)." The USA has 90.1% of the 8.74 MMT of world exports. Europe has 58.3% and Asia has 36.3% of the 8.64 MMT of world imports. The leading countries for net soybean imports are: Japan 2.39, West Germany 1.48, Spain 0.92, Netherlands 0.66, Italy 0.61, Denmark 0.42, Taiwan 0.40, and Canada 0.38. (2) United States soybean exports (millions of bushels). Gives quantity and percentage of total for major regions and individual countries in 1967-68 and 1969-70. The protein in these exports is used mostly for livestock feed; no hungry countries are major importers of soybeans.

India is the world's leading producer of peanuts, producing 33% of the total, followed by China (13.5%), Nigeria (7.3%), the USA (7.2%), and Other (39%). Address: Michigan State Univ.

6130. Cowan, J.C. 1973. Processing and products [soybeans]. In: B.E. Caldwell, ed. 1973. Soybeans: Improvement, Production, and Uses. Madison, Wisconsin: American Society of Agronomy. xviii + 681 p. See p. 619-64. Chap. 20. [52 ref]
• ***Summary:*** Contents. 1. Introduction. 2. Processing for oil and meal: Preparation of flakes, solvents, extraction, desolventizer-toaster, degumming. 3. Conversion to edible oil products: Refining, bleaching, deodorization, hydrogenation. 4. Edible fat products: Salad and cooking oils, status of flavor stability, shortenings and margarine oils, lecithin. 5. Essential fatty acids and atherosclerosis. 6. Industrial uses of oil. 7. Meal for livestock and poultry: Nutritional aspects, factors affecting use of meals. 8. Edible protein products: Soy flour, concentrates and isolates, textured protein products (textured soy flour or textured soy protein fibers made into "meat analogues" resembling chicken, bacon, etc.). 9. Fermented and specialty foods: Tofu, soybean milk (an intermediate step in the manufacture of tofu), miso, shoyu (tamari, light-colored shoyu), sufu, tempeh, hamanatto, and natto.

Soybeans flow through a crushing plant as follows: First, they are cracked to release or loosen the hull and to break the cotyledon into about 4 parts. Shakers and aspirators separate the hull from the cracked cotyledons and rollers flake them. "Purified petroleum hydrocarbons known as hexane extract the oil from the flakes and the solvent is recovered. Moistened flakes are heated to inactivate the antinutritional factors and are converted to feeds for livestock and poultry. A small proportion of the flakes goes to a wide variety of soybean protein products including flour, isolates, and concentrates."

Tables show: (1) Utilization of soybean in U.S. in million pounds, every 5 years from Oct. 1933 to 1970 (Kromer 1970). (2) Use of soybean meal in the USA for feeding livestock and poultry (million tons). In 1969, the estimated amounts used were as follows: Cattle 3.43. Hogs 1.69. Other livestock 1.73. Total livestock: 6.85. Broilers 3.07. Hens and pullets 1.28. Other poultry 1.10. Total poultry 5.45. Total livestock + poultry 12.30. Note that cattle are the single biggest users. (3) Bleaching soybean oil (process, % clay and type, change in Lovibond color rating). (4) Effect of bleaching, citric acid, and light exposure on soybean salad oil. (5) Specifications for soybean oil. (6) Effect of linolenate content on flavor of soybean oil at elevated temperatures. (7) Composition of certain edible oil products from soybean oil and related products (salad oil, hydrogenated-winterized soybean salad oil, hydrogenated soybean oil liquid shortening, plastic shortening types I and II). (8) Changes in iron and copper content of soybean oil in commercial refining. (9) Properties of all-purpose and high-

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stability shortenings from all-hydrogenated vegetable oils and blends of animal fat and/or vegetable oil (iodine value, melting point, % linoleic acid, solid fat index {% solid at temperatures indicated}). (10) Typical analyses for mellorine and cookie and confectioner's fat. (11) Analytical data for typical margarine oils low and high in polyunsaturates (iodine value, melting point, % linoleic acid, solid fat index {% solid at temperatures indicated}). (12) NSPA–tentative lecithin specifications (NSPA, 1969-1970). (13) Composition of soybean lecithins. (14). Approximate composition of soybeans and meal products (whole bean, cotyledon, hull, hypocotyl, meal {cake–extruded, flakes–solvent extracted, dehulled flakes–extracted, mill feed–separated hulls, mill run–separated hulls}). (15) Amino acid analysis of soybean meal (44% protein and 49% protein {dehulled}) and corn. (16) Amino acid analysis of blends of soy flour with cereals and milk (Inglett 1968; Corn soy milk {CSM}, Millet soy milk, Wheat soy milk, etc.). (17) Partial formulas for young swine and boiler rations in percent total rations. (18) Partial formulas for dairy feeds (14% protein). A supplement to forage or roughage. (19) Soybean grits and flour–screensize. (20) Composition of soy flour. (21) Composition of 4 types of soy protein concentrates. (22) Uses for high-protein soy products (protein 70 [concentrates] and protein 90 [isolates]). Note: This is the earliest English-language document seen (Dec. 2004) that uses the term "protein 90" to refer to a soy protein isolate. (23) Amino acid analysis of fractions derived from dehulled extracted flakes (Rackis et. 1961, 1970). (24) Effect of cooking in salt solutions on texture of structured granules. (25) Composition and use (1,000 metric tons in 1964 and 1967) of soybeans for traditional foods in Japan (Use of whole soybeans in 1967 in 1,000 metric tons: Miso 169. Shoyu 15. Natto 47. Tofu 329. Total 642. Use of defatted flakes or grits in 1967 in 1,000 metric tons: Miso 8. Shoyu 154. Natto 0. Tofu 77. Total 284).

Figures show: (1) Flowchart: Processing of soybeans to oil and meal using hexane extraction. (2) Illustration: A modern soybean processing facility (aerial view, Central Soya, Inc.). (3) Schematic diagram / flowchart: Manufacture of edible soybean oil products (salad oil, salad and cooking oil, shortenings, margarines, liquid shortening). (4) Illustration: A continuous deodorizer for soybean oil. (5) Graph: Effect of prolonged storage at 100ºF on flavor score of hydrogenated-winterized soybean oil or soybean salad oil (nitrogen packed, air packed). (6) Illustration: Continuous chilling and working equipment for margarine production (Votator Div., Chemetron Corp.). (7) Flow diagram; Conversion of emulsions of margarine oils and ripened milk to conventional stick, whipped stick, and tub margarines (Votator Div.) (8) Chemical structure of prostaglandin-E_2, a fatty acid with hormone activity. (9) Diagram: Vapor-desolventizer- deodorizer for soybean flakes (Blaw-Knox Co.). (10) Flowchart and diagram: Operations with extruder-cooker. (11) Flow diagram: Manufacture of protein 70 [soy protein concentrate]. (12) Schematic diagram: Manufacture of soy protein isolate (Protein 90). (13) Photo: Chicken-simulated soy protein "meat" in three forms (Swift Edible Oil Co.). (14) Photo: Protein tow containing 16,000 monofilaments spread apart to show its fibrous nature; other tows in background (General Mills, Inc.). Address: NRRL, Peoria, Illinois.

6131. DeFrancis, John; Lincoln, V.R. 1973. Things Japanese in Hawaii. Honolulu, Hawaii: University Press of Hawaii. xiv + 210 p. Illust. Index. 19 x 23 cm. [Eng]

• ***Summary:*** The goal of this book is to preserve Japanese culture in Hawaii. In 1868, the first Japanese came to Hawaii. Between 1886 and 1924 the trickle became a flood, which resulted in a total immigration of some 180,000 persons. More than half of this number eventually returned to Japan.

Setsubun is mentioned on pages 11, 25, 26. Setsubun generally takes place on about Feb. 3. The word "Setsubun" means literally "division of the seasons. This festival is kept alive in Hawaii largely due to the efforts of students from Japan at the East-West Center, which is funded by the U.S. federal government and is affiliated with the University of Hawaii. Its formal name is "Center for Cultural and Technical Interchange between East and West." Setsubun, a thousand-year-old festival, marks the time of year when the old year and its accumulation of evils are left behind, and a new year full of god fortune and hope begins. In bygone years, men dressed as devils were chased out of houses so that a happy new year could be ushered in.

Today the symbolic casting out of evil spirits is found in the bean-throwing ceremony. "This consists of throwing roasted [soy] beans (one for each year of one's age) while shouting 'Good luck in, devils out!'" This ceremony brings throngs of revelers to Buddhist temples and Shinto shrines throughout Japan. In private homes, the master of the house walks from room to room, scattering beans at the entrance of each, while shouting the magic incantation. "Then, each member of the household eats as many beans as there are years in his age, plus one for the new year, so as to ensure himself a good year to come."

In Hawaii, Setsubun used to be more widely observed than it is today–when it is celebrated in only a few places, including the Shingon Mission [Buddhist] and at some Shinto shrines. Also, a special program is organized by students at the East-West Center. Other Setsubun celebrations are also discussed. A photo shows one such celebration.

Soy is mentioned throughout the chapter on "Food and dining places." In Sukiyaki, bean-curd and soy sauce are basic ingredients (p. 165). Soy sauce is also used to season tempura, sushi, sashimi, tsukemono (also miso), and sashimi (p. 166-67). One these two pages are nice sections on tôfu [tofu], kamaboko, shoyu, miso, sweets (with azuki), mochi, and saké.

Glossary (p. 201-06): "Azuki: A red bean frequently

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made into a sweetened paste used as a filling in various confections, especially for ceremonial occasions. Symbol of joy and happiness."

"Chimaki: A cake of rice, soybeans, flour, sugar and salt."

"Hibachi: Japanese charcoal grill."

"Miso: Bean paste made of soybeans, wheat [sic, barley] or rice, and salt."

"Sekihan: Rice cooked with azuki beans."

"Setsubun: Late winter festival marking the beginning of spring."

"Shôyu: Soy sauce."

Sukiyaki. Teriyaki. "Tôfu: Beancurd made from soybeans."

"Umeboshi: Very sour pickled plum." Address: Oahu, Hawaii.

6132. Dubawsky, Rebecca. 1973. Cooking with grains and vegetables. Los Angeles, California, and Boston, Massachusetts: Order of the Universe Publications. Distributed by Tao Books. 29 p. Undated. Illust. No index. 28 cm.

• ***Summary:*** This 1973 edition differs from the original 1967 edition as follows: (1) On the cover, in the upper left corner, is an illustration of a man bent over working in a rice field. The title is written in the lower right corner rather than in the upper left. The subtitle "Booklet one–A beginning" and the name and address of the publisher (in the lower left corner) have been omitted. (2) On the inside front cover, near the bottom, is written: "Distributed by Tao Books, 8454 Steller Dr., Los Angeles, Ca. [California] 90230. Tel.: (213) 837-2739 and 303B Newbury Street, Boston, Massachusetts 02115." (3) On the next page are two illustrations apparently taken from early sources (clip art): A full head of wheat with a long awn extending upward from the husk enclosing each grain. Two pumpkins on the vine with leaves above them. Below that: Library of Congress No. 73-127918. (4) Next comes a second title page, with silhouettes of rice plants at the left. (5) Next is a page stating: "The teaching of Aveline Kushi has made the information that follows possible." Below that: "Rebecca Dubawsky." To the left is another silhouette of grasses. (6) Next is a full-page of clip art showing a German chalet in the background, with three farmers working in a field in front of it, and a cart pulled by two oxen in the foreground. (7) Table of contents (p. 5). (8) Two stalks of grain. (9) The preface (p. 7) by Michio Kushi, October 20, 1967. (10) Three full heads of different types of grain. (11) Meals (p. 9).

(12) The last numbered page is 29, which has illustrations of a rice plant standing in water and a head of rice. (13) After that is "The Order of the Universe Publications" which contains descriptions of one periodical (*The Order of the Universe*) and five books and booklets (*Cooking Good Food; Cooking with Grains and Vegetables; Food for Spiritual Development,* by Michio Kushi; *Spirals;* and *Book of Do-In Guide Pratique,* by Jacques de Langre [DeLangre]). (14) At the bottom of the last page: "Printed in U.S.A. by Jacques de Langre, 7557 Sunset Blvd., Hollywood, Calif. 90046." Address: Boston, Massachusetts.

6133. Fairbank, John K.; Reischauer, Edwin O.; Craig, Albert M. 1973. East Asia: Tradition and transformation. Boston, Massachusetts: Houghton Mifflin Co. xvi + 969 p. Illust. Index. 24 cm.

• ***Summary:*** One of the best books ever written on the history of East Asia–a classic.

Note: Edwin Reischauer, born in Tokyo to missionary parents, was a professor of Far Eastern Languages at Harvard University and the author of a number of influential books on the relationships among the U.S., Japan, and China when he was called to the diplomatic corps by President John F. Kennedy. He served as U.S. ambassador to Japan from 1961 to 1966. He died in Sept. 1990 at La Jolla, California. Address: Harvard Univ.

6134. Fairbank, John K.; Reischauer, Edwin O.; Craig, Albert M. 1973. The Chinese Eastern Railway across Manchuria, 1896-1920s (Document part). In: J.K. Fairbank, et al. 1973. East Asia: Tradition and Transformation. Boston: Houghton Mifflin Co. xvi + 969 p. See p. 555, 625, 777.

• ***Summary:*** The Chinese Eastern Railway runs from Lupin (Manchouli) in the northwest, through Harbin, to Vladivostok in the southeast.

"Russia in 1896 had obtained from Peking the right to build the Chinese Eastern Railway across Manchuria to its port of Vladivostok on the Sea of Japan, thus shortening the Trans-Siberian Railway, the rail link it had started in 1891 to construct across Siberia to the Pacific. When Russia obtained the lease of the Kwantung Peninsula in 1898, it also got the right to connect this line by a southward extension, the South Manchurian Railway, to the ports of the peninsula, Port Arthur and Dairen (Ta-lien in Chinese). These railway concessions gave Russia considerable control over Manchuria...

"In 1896 Russia got Chinese permission to build the Chinese Eastern Railway 950 miles across Manchuria to Vladivostok, in order to avoid by this short-cut the costly tunnels and bridges which the trans-Siberian line would require on the 350-mile longer Amur route. Li Hung-chang in St. Petersburg negotiated in June 1896 a secret Russo-Chinese treaty of alliance. It committed China and Russia to fight together against any Japanese expansion on the continent. After much maneuvering and confusion, Russia followed up this treaty by sending a naval squadron into Port Arthur in December 1897 and getting from China in March 1898 a twenty-five year lease of the southern tip of Manchuria, the Liaotung (or Kwantung) Peninsula, with the right to connect it with the Chinese Eastern Railway by

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a north-south line 650 miles long, the South Manchurian Railway...

"The eventual Soviet treaty with Peking in May 1924 provided for joint administration of the Chinese Eastern Railway and a dominant Russian influence in Outer Mongolia." Address: Harvard Univ., Cambridge, Massachusetts.

6135. George Ohsawa Macrobiotic Foundation. 1973. Useful names and addresses. 1471–10th Ave., San Francisco, CA 94122. 55 p. 21 cm.

• ***Summary:*** This macrobiotic directory lists names and addresses of macrobiotic people, organizations, food stores and restaurants, and bookstores in the United States (each category broken down by state), Canada, and abroad. The leading states for individuals are California (7.3 pages), New York (1.5 p.), and Massachusetts (1 p.).

There are listings for the following foreign countries: Argentina, Australia, Austria, Belgium, Brazil, Costa Rica, Denmark, England, France, Germany, India, Ireland, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, South Vietnam.

There are ads for the following companies: Sunflower, The Queensberry Bakery (112 Queensberry St., Boston 02215), East West Foundation Center, Sanae Inc. at 2 locations (Sanae Restaurant at 272A Newbury St., Boston, and The Seventh Inn at 288 Boylston St. in Boston), Prasad (1956 University Ave., Berkeley, California) (p. 0). Eden whole earth grocery and delicatessen, and Sun Bakery (330 Maynard St., Ann Arbor, Michigan) (p. 18). Janus Natural Foods (712 7th Ave. South, Seattle, Washington 98104. Phone: 206-MA4-1084) shows that they distribute (import) tamari and miso, as well as sea vegetables. They carry the following brands: Erewhon, Spiral Foods, Deaf Smith, Pure & Simple, Chico-San, Arrowhead Mills (p. 27). Cliffrose (129 Coffman, Longmont, Colorado). Ceres Harvest Natural Foods (3632 W. Colorado Ave., Colorado Springs, CO 80904; wholesale and retail) (p. 39). The Good Karma Cafe (501 Dolores St., San Francisco), and The Good Earth (123 Bolinas Rd., Fairfax, CA 94930) (p. 50). Greenberg's Natural Foods, Inc. (125 1st Ave., New York, NY 10003).

Individuals and organizations interested in macrobiotics in the United States (arranged by state): Massachusetts: James Silver, Seventh Inn, 288 Boylston St., Boston, 02116. Erewhon Trading Co., 33 Farnsworth St., Boston, 02210. Michio Kushi, 440 Boylston St., Brookline, 02146. John Deming, c/o Kushi, 440 Boylston St., Brookline, 02146. Nik & Joanne Amartseff, Top of the Harbor, Gloucester, 01930. Ken & Ann Burns, 22 Knoll St., Roslindale, 02131.

Michigan: Mr. and Mrs. Michael Potter, #1169, 1407 Charlton Ave., Ann Arbor, 48103. Judith A. Bolduc, 822 Brookwood Rd., Ann Arbor, 48104.

The George Ohsawa Macrobiotic Foundation is a non-profit organization located at 1471–10th Ave., San Francisco, California 94122. It was founded in 1971. The aim of the Foundation is to spread the teaching of the unifying principle and its practical applications in daily life. Address: San Francisco, California.

6136. Hartwig, Edgar E. 1973. Varietal development (in soybeans). In: B.E. Caldwell, ed. 1973. Soybeans: Improvement, Production, and Uses. Madison, Wisconsin: American Society of Agronomy. xviii + 681 p. See p. 187-210. Chap. 6. [68 ref]

• ***Summary:*** Contents. 1. Introduction. 2. Maturity classification. 3. Photoperiod response: Latitude, light quality. 4. Early history. 5. Growth habit. 6. Germplasm collection: Range of maturity, seed size (seed weight), percent protein and oil, oil quality, protein quality, seed holding (pod dehiscence and shattering), seeds per pod, pubescent type (pubescence density and erectness, glabrous), response to minerals, source of genes for pest resistance (disease resistance).

7. Varietal development: Introduction and history, the northern states (Lincoln, Harosoy, Clark, Hark, Amsoy, Corsoy, Wayne), the southern states (Ogden, Roanoke, Jackson, Palmetto, Lee), mid-Atlantic states. 8. Genetic background for major U.S. varieties. 9. Breeding for special qualities: Phytophthora rot, brown stem rot, cyst nematodes, resistance to feeding by insects, differences in oil and protein content, vegetable types, height of lower pods, adaptation to short-day regions [i.e. southern latitudes]. 10. Comments.

"Varietal development" has been of great importance in establishing the soybean as a major crop in the USA. Understanding photoperiodism in relation to varietal development has also "been of extreme importance. For no other major crop is photoperiodism as important in determining area of adaptation" (p. 187).

Maturity classification: In the early 1900s, soybeans were often classified on a scale from early to late, and the number of days to maturity was given. But various studies, starting with Haberlandt (1877), including Mooers (1908), and especially those by Garner and Allard (1920-1930) on the significance of day length on flowering behavior (photoperiodism), indicated that "days to maturity was not an adequate means of describing these types. Also, it was not adequate to describe them as early or late"–unless the latitude and date of planting was given, since the average days maturity for any given variety depends strongly on both of these variables. As a method of describing this responsiveness to day length, ten maturity groups were developed. For example, groups OO, O, and I are adapted to the longer days in the northern areas of adaptability in the USA and Canada. Varieties classed in Group VIII are adapted to the southernmost portions of the continental United States.

Early history: Discusses–Perry expedition to Japan (1854), Ball (1907–recognized 23 varieties), Piper & Morse (1910–described 47 soybean types and listed 280 types that

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had been grown in the Washington, DC, area). By 1922 more than 800 introductions had been made by the USDA and tested in various parts of the United States (Piper & Morse 1923). Some 43 introductions, which were found to be suited for production in the USA, were given names. Suitability for forage production was emphasized. During the 20-year period from 1907 to 1927, more than 2,000 lots of seed received from China, Japan, Korea, Siberia, and India were introduced by the USDA for testing (Morse 1927). Dorsett (1927) collected nearly 1,500 seed lots from northeastern China (39-53º north latitude) during a 2½-year period prior to 1927.

Because of the growing interest in soybeans in the United States, the USDA organized the Dorsett-Morse expedition to the northeast prefectures of China, Korea, and Japan during the years 1929 to 1931. This was the only plant exploration program for which the primary objective was soybean collection. A total of 4,578 seed lots were collected. Of these, 3,379 (74%) were from Korea, 622 (14%) were from China, and 577 (13%) were from Japan. Many of the soybeans from Japan were "large-seeded, vegetable types. Several of these were named in anticipation of their acceptance by the U.S. public, but few were ever grown extensively. One of these, PI 80481 named Rokusun, has a 100-seed weight of 55 gm, the largest seed size known in soybeans."

Germplasm collection: "Prior to 1949, no organized effort was made to maintain soybean introductions. Many were discarded after their initial observation if an immediate use was not recognized. Since that time an effort has been made to catalog the characteristics of each introduction and maintain viable seed."

Seed size: The 100-seed weight for soybean varieties currently produced in the USA ranges from 12-18 gm. Varieties classified as vegetable types will usually have a 100-seed weight greater than 20 gm. The seeds of *Glycine max,* the cultivated soybean, range in weight from 4 to 55 gm per 100 seeds. The wild annual soybean, *Glycine ussuriensis,* has very small seeds (1.2 to 1.8 gm/100 seeds).

Concerning vegetable types: "No clear-cut distinction exists to define a vegetable-type soybean. In general, seed size is in excess of 20 gm per 100 seeds and the beans have a milder flavor. Several vegetable-type varieties with somewhat improved agronomic qualities have been released in recent years. Disoy is of Group I; Magna and Prize are of Group II; and Kim, Kanrich, and Verde are of Group III in maturity. Verde produces seed having green cotyledons on maturity, which is assumed to be an advantage when immature seeds are used for canning or freezing."

Tables: (1) Effect of latitude and day length on maturity date of the soybean variety Lincoln planted about May 20. The table shows location, latitude, date it is mature. (2) Approximate length of effective photoperiod at various latitudes for an assumed adapted variety that would be planted May 20 and would mature Sept. 20 at each latitude. (3) Soybean varieties recognized in the U.S. in 1907 and classified as to seed color. There were 6 black, 4 brown, 2 mottled, 2 green, 3 yellowish green, and 6 yellow.

(4) Soybean varieties registered by the Crop Science Society of America since 1942 according to maturity groups and approximate distribution of U.S. acreage by maturity groups. For example, maturity group 00, consisting of Acme, Portage, Flambeau, Altona, and Norman, accounts for only 0.1% of U.S. acreage. Maturity group II counts for 29.0%, III counts for 17.0%, IV counts of 12.0%, etc. (5) Parentage of the ten soybean varieties most widely grown in the U.S. in 1971. For example, Wayne, No. 1, of maturity group III, had as its parentage L49-4091 x Clark. Address: Agricultural Research Service–USDA, Stoneville, Mississippi.

6137. Holmberg, Sven A. 1973. Soybeans for cool temperate climates. *Agri Hortique Genetica* (*Sweden*) 31(1/2):1-20. [21 ref. Eng; swe]

• ***Summary:*** An extremely interesting, influential, and original article. Contents: Introduction. Climate and temperature requirements of soya. Breeding soybeans in Sweden. Experiences from 30 years of soybean trials at Fiskeby. Summary.

It begins: "Summer temperature and moisture are the main climatic factors regulating the distribution of the soybean as a crop. The limiting or inhibiting factor is moisture in the eastern and southern parts of Europe and temperature in the northwestern parts (Riede 1938). Within the framework outlined by temperature and water, latitude and photoperiodism guide the choice of varieties (Enken 1959)."

"Local soybean varieties developed and grown along the east coast of Hokkaido and adjacent islands of the Okhotsk Sea have proved of immense value for the breeding of soybeans for cool, temperate climates."

Enken (1959) defined minimum temperatures for different stages in the growth cycle of the soybean plant and showed that the flowering stage is the most sensitive to temperature, requiring a minimum of 17-18ºC for normal flowering. Most of Western Europe has a summer maximum temperature below or just about equal to V. Enken's "biological minimum" temperature needed for the formation of reproductive organs and flowering.

For soybean breeders looking for basic material [germplasm] for adaptation to the cool climate of north western Europe, two different agro-climatic regions are of special interest: (1) Near Kushiro, Abashiri, or Nemuro on the northeastern coast of Hokkaido, Japan, and adjacent islands of the Sea of Okhotsk. (2) The northern zone of the Amurskaja region [Amurskaya Oblast] of East Siberia, Russia. In this old and recently developed soybean growing district (just north of the Amur River and of northern Manchuria), cold hardiness is the object of both natural and

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artificial selection. This zone is about 1,200 miles northeast of northeastern Hokkaido.

"Summary: Cold tolerant soybean varieties are the result of a long period of natural selection and persistent effort of growers settled in the cool and foggy regions of the east coast of Hokkaido and adjacent islands of the Okhotsk Sea. These dwarf or semi-dwarf local varieties collected and investigated by Japanese research workers are of increasing importance to soybean breeding for cold tolerance in Hokkaido and elsewhere. The same varieties rank high in protein content and seed quality, but scarcely in seed yield. Their tolerance to cold weather has been the key which has opened to modern plant breeding large parts of north western Europe, including Sweden, to closer geneecological adaptation and further development of the soybean as a food crop. The variety Fiskeby V, in practical use as a garden variety, may be said to prove this. The existence in the Soviet Union of varieties with more moderate demands on germination temperature and high yielding varieties in the north of the United States are indicators of possibilities that further combination work will lead to further progress in producing varieties capable of competing with the cereals as modern agricultural crops."

Tables: (1) Temperature requirements of the soybean (after Enken and Koloskov). The four columns are: Stage of development, "Biological minimum," sufficient, and optimum. The six stages are: Germination, emergence, formation of reproductive organs, flowering, seed formation, and ripening. For flowering (as an example), the three temperatures are 17-18, 19-20, 22-25ºC.

(2) Some data regarding summer climates of certain stations situated in warm and cool temperate areas, respectively. The four columns are: Station (in two groups), period (years during which temperatures were measured), latitude, warmest summer month ºC, summation of day-degrees ºC 5 months. The stations are: Warm temperature: Columbus, Ohio, USA; Chicago, Illinois, USA; Shenyang (Mukden) China; Sapporo (Hokkaido) Japan; Pinkiang (Harbin) China; Chabarovsk [Kabarovsk], East Siberia, USSR [Russian Federation]; Winnipeg, Manitoba, Canada. Cool temperate: Abashiri, Hokkaido, Japan; Nemuro, Hokkaido, Japan; Brussels (Uccle), Belgium; London (Kew), England; Manchester, England; Copenhagen, Denmark; Norrköping (Fiskeby) Sweden–1931-1960 Norrköping (Fiskeby) Sweden–1960-71. Of all the stations listed, Fiskeby has the highest north latitude (58º36'), the coolest summer month (July, 16.2ºC), and the smallest summation of day-degrees over 5 months (2120–compared with 3192 in Columbus, Ohio).

(3) Mean temperatures, ºC, at Fiskeby / Nörkopping (latitude 58º36'), for the years 1970-1972. Temperatures are given each year for the months of April, May, June, July, August, September, October. August was the warmest the first year and July the 2nd and 3rd years.

(4) Local varieties of insular breed in yield tests at Fiskeby 1970-1972. Control: Fiskeby 5. The nine columns are: Variety, year (1970, 1971, 1972), date of seeding, date of bloom, date of ripeness, mean height of plants (cm), plants per square meter, seed weight (grams/plant), yield (kg/ha). The varieties include: Toshi-dai 7910, Karafuto 1 (from South Sakhalin), Fiskeby 5, Kamishunbetsu, Chishima (from the Kuril Islands).

(5) Market varieties of continental breed in yield test at Fiskeby 1970-1972. Control: Fiskeby 5. The nine columns are the same as those in Table 4. The varieties are: Amurskaja 310, Smena, Severnaja 4, Fiskeby 5, Altona. The highest yield (2,905 k/ha) was from Amurskaja 310 in 1972, planted on 25 April. The 2nd highest yield was from Smena in 1972, planted on 25 April. The 3rd highest was from Fiskeby 5 in 1972, planted on 25 April.

(6) Soybean varieties from three different agro-climatic regions–tested for germination in sand at a temperature of 9ºC in the day-time and 7ºC during the night. Almost all of each group would germinate at 20ºC. The table shows the per cent visible sprouts above sand surface after 14 to 21 days. The varieties in group 2 (Amurskaja 310, Severnaja 4, Smena) had the highest germination rates (range: 79-83% visible after 21 days).

(7) Soybean varieties from three different agro-climatic regions–tested for germination in sand at a temperature of 8ºC in the day-time and 6ºC during the night. Again, the varieties in group 2 (Amurskaja 310, Severnaja 4) had the highest germination rates (range: 55-66% visible after 26 days). They also had the longest mean length of seedlings after 26 days (47-48 mm).

(8) Protein and oil content of soybean varieties, grown at Fiskeby, during the years 1970-1972. In 1971 the mean protein content was 43.9% (range 39.1-48.4%) and the mean oil content was 14.9% (range 13.3-17.3%). In 1972 the mean protein content was 41.8% (range 38.3-47.0%) and the mean oil content was 15.8% (range 13.6-17.7%).

(9) Advances in earliness and lowering of temperature requirement, expressed in days from sowing and day-degrees ºC, respectively, in the breeding material at Fiskeby.

(10) Results regarding the variety Fiskeby V from Fiskeby near Norrköping during the years 1960-1972. The fifteen columns are: Year, seed yield (kg/ha), plants per square meter, planting date, start of flowering date, date of ripeness, days from planting to flowering, days from planting to ripeness, summation of daily mean temperatures ºC from planting to flowering, summation of daily mean temperatures ºC from planting to ripeness, mean temperatures ºC from planting to flowering, mean temperatures ºC from 1st flower and 30 days ahead, mean temperatures ºC from planting to ripeness, total rainfall from June to August (mm), total sunshine hours from July to August. The highest seed yield was in 1972 (2,290 kg/ha); the 2nd highest was in 1970 (2,030 kg/ha).

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(11) The variety Fiskeby V at Fiskeby during the periods 1960-1972 and 1968-1972.

Figures (graphs unless otherwise stated): (1) Yield in relation to average July temperature for the years 1970-1972 for the varieties Fiskeby 5, Chishima, Amurskaja 310, and Altona [developed at the University of Manitoba, Canada]. As the July temperature increases, so does the final seed yield.

(2) Yield in relation to general temperature requirements (Sum of day-degrees). For the varieties Fiskeby 5, Chishima, and Amurskaja 310. As the sum of day-degrees increases, so does the final seed yield–dramatically.

(3) Soybean varieties from 3 different agroclimatic zones tested for germination in sand at a day temperature of 9ºC and a night temperature of 7ºC (See table 6). The variety with the highest germination after 21 days is 1091-3-1-6-1 from zone 3.

(4) Soybean varieties from 3 different agroclimatic zones tested for germination in sand at a day temperature of 8ºC and a night temperature of 6ºC (See table 7).

(5) Chart showing the origin / pedigree of Fiskeby 5 and some other interesting lines from the breeding material–including 1110-5-5-5 and 990-13-2-5-3-1-1 and 1091-3-1-6-1.

(6) Photo (7.5 by 11 cm, black and white) showing fields of "A nice, evenly ripening crop of Fiskeby V in September 1971, with the buildings of the Fiskeby-Breeding Station near Norrköping in the background.

(7) Rayed diagram of recent crosses made including 1091-3-1-6-1 (which is at center of diagram).

(8) Photo of three dry soybean plants with a ruler measuring 0 to 70 cm at the right. Cross 1174, 1091 x Fiskeby V. From left to right: F-2 plant from cross 1174, Fiskeby 5, another F-2 plant from cross 1174.

6138. Ishinojima, Tadashi. 1973. Tôfu no ryôri: Shin tôfu hyakuchin [Tofu cookery: 100 new favorites]. *My Life Series* No. 15. 66 p. Illust. No index. 26 cm. (Tokyo: Gurafu-sha). [Jap]

• ***Summary:*** This beautiful book is filled with colorful photos of favorite and exotic Japanese tofu dishes, with recipes for each. These include: Dengaku. Shira-ae. Egg-tofu (Tamago-dofu). Tofu with hijiki. Chilled tofu (*hiya-yakko*). Contents: The taste of tofu. Two recipes for delicious tofu: Sukui-dofu, and Yu-dofu. Garnishes. Tofu Hyakuchin. Discussion about tofu. Homemade tofu. The nutritional value of tofu. Tofu cooking in the 4 seasons. Three soups. Traditional restaurant cooking: Sasa-no-yuki. Tofu cookery of Okinawa. Tofu cookery of China. An ad for *House Hon Tofu* (homemade silken tofu) appears at the back of the book. Address: Tokyo, Japan.

6139. Kawamura, Wataru. 1973. Misoshiru fudoki [Miso soups throughout the provinces]. Tokyo: Mainichi Shinbun. 213 p. Illust. No index. 20 cm. [Jap]

• ***Summary:*** A combination cookbook and discussion of miso in Japanese history and culture, in each of the provinces. Contents: Preface. Part I: The topography of miso soup. Story of the birth of a miso teacher. The homeland of miso. Jiang in the Chou Li (Shurei in Chinese; Rituals of the Chou Dynasty). The theory that Ganjin brought miso to Japan. About soybean miso. Sweet miso. Poems about miso soup. Genealogy of Satsuma-jiru soup. The original Miso Dengaku. Prayer to Bishamonten. Sendai miso. Shinshu miso. Kinzanji miso. Miso tenjin of Kumamoto. Miso dondo. The taste of michinoku. The arrival of sesame in Japan. The marriage of sesame and miso. Thoughts on salad with vinegar miso dressing. Pepper and wasabi. Bonito flakes. Mejika-bushi of Tosa. The virtues of sea vegetables. Suribachi grinding bowls, grinding pestle, and spatulas. Agar of Ashino and highland vegetables. Miso, konbu and wakame. Digging up mountain lilies and mountain yams. Miso soup shop. "Women and Miso soup" TV drama dialogue. Making a fire bath. The origin of Go-jiru soup. Foods that appear at the first of the season. A good daughter-in-law. Part II: Miso soup and miso cooking (recipes). Postscript. Address: Miso teacher, 2-4-7 Kugenuma, Tachibana, Fujisawa-shi, Kanagawa-ken 251, Japan.

6140. Nakayama, Tokiko. 1973. Chûgoku meisaifu [Chinese cuisine: Famous recipes]. Tokyo: Shibata Shoten. 4 Vols. [Jap]*

6141. Norinsho. 1973. Shôyu no Nihon Nôrin Kikaku [Shoyu: Japanese Ministry of Agriculture and Forestry Standards]. In: Nihon Norin Kikaku [Japanese Agricultural Standards]. Tokyo: Norinsho. See p. 1487-95. Revised 1980. [8 ref. Jap]

Address: Japanese Ministry of Agriculture and Forestry.

6142. Office of Rural Development. 1973. Introduction to soybean culture and directions of the research in Korea. Suweon, South Korea. *

• ***Summary:*** In 1923 local varieties were systematically collected in Korea and selections from them were attempted. In 1943 a variety from Japan, Yookoo 3, was released to Korean farmers as an improved variety with high yield.

6143. Photographs of William (Bill) Shurtleff, Akiko Aoyagi, and Soyfoods Center (1973-75). 1973.

• ***Summary:*** 1973–Two black and white photos: (a) Bill sitting cross-legged on tatami mats on the floor in upstairs room in Aoyagi home at 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: 03-925-4974. He is eating tofu from a small dish with chopsticks. His clothing indicates cold weather. (b) Bill and Akiko sitting meditation in upstairs room. In background: Altar, flowers, photo of Shunryu Suzuki roshi, low writing desk.

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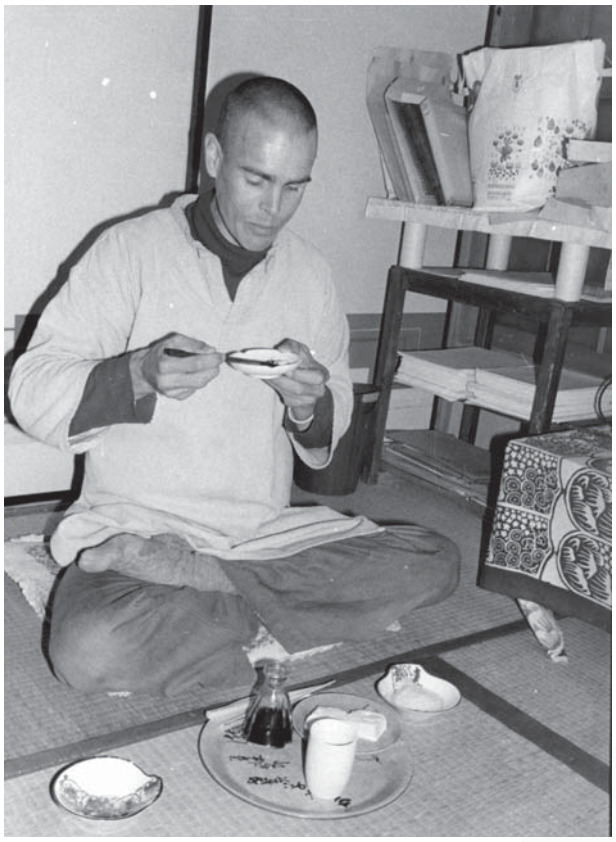

1974 Jan.–Bill Shurtleff at Arai-san's tofu shop, Sangen-ya, with their two daughters to left and right, Mrs. Arai standing in background.

1974 Jan.–Four black-and-white glossy photos published in the large-format magazine *Japan in Pictures* (Vol. 16, No. 1, p. 16-17), all taken at San-Gen Ya, the shop of tofu master Toshio Arai in Nerima-ku, Japan, where Shurtleff is an apprentice, learning how to make tofu in the traditional Japanese way. (a) Ladling cooked soybean puree (*gô*) out of the cauldron into the pressing sack. (b) Standing next to Mr. Arai. Much of the equipment in the shop can be seen as Mr. Arai talks about making tofu. (c) Sitting in full lotus position practicing meditation on tatami mats in the upstairs room at the home of Mr. and Mrs. Kinjiro Aoyagi in Nerima-ku. His head is shaved and a small altar is in the background. (4) With Mr. and Mrs. Arai, sitting on the step that leads from their tofu shop into their home.

1974 summer–Bill Shurtleff in Japanese-style summer dress at upstairs room at Aoyagi home. Altar and typewriter desk in background.

1975 Jan.–Bill (seated) and Akiko (standing) at photo studio near home in Nerima-ku, Tokyo. This photo (2 copies) would later appear near the back of *The Book of Tofu.*

1975 Nov.–Shurtleff and Aoyagi in the Shurtleff family kitchen at 790 Los Palos Dr., Lafayette, California: He is holding a plate on which rests a cake of tofu which they have just finished making from soybeans. In front of the two is a wooden tofu kit on the tile kitchen counter. Photo by Eric Rahkonen of the *Contra Costa Times.*

6144. Sakurai, Shigeru; Adachi, Isamu. 1973. Nihon Shokumotsu-shi [History of Japanese foods. Revised ed.]. Tokyo: Yuzankaku. 480 p. [Jap]

6145. Sasagawa, Rinpu; Adachi, Isamu. 1973. Nihon Shokumotsu-shi [History of Japanese foods]. Tokyo: Yusankaku Shuppan. 502 p. [Jap]*

6146. Shinoda, Osamu; Tanaka, Seiichi. 1973. Chûgoku shokkei sôsho [A collection of Chinese dietary classics]. Tokyo: Shoseki Bunbutsu Ryutsukai. [Jap]*

6147. Tanaka, Yonemi; Tomiyasu, Yukio. 1973. Nattô no hakushoku kenshoku-butsu no kagaku-teki sosei [Chemical components of the white deposits of natto (fermented soybeans)]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 26(8):473-78. [5 ref. Jap]
Address: Fukuoka Women's Junior College, Dazaifu-machi, Fukuoka.

6148. Tsuji, Tome. 1973. Tôfu ryôri [Tofu cookery]. Tokyo: 209 p. Illust. [Jap]*

6149. Research Libraries Group (RLG). 1973--. RLIN (Research Libraries Information Network) (Computerized bibliographic database). 1200 Villa St., Mountain View, CA 94041. [19000000* ref]
• ***Summary:*** This database is more academic than OCLC. According to the *Directory of Online Databases* (July 1990), this database comprises nearly 19 million cataloging records from LC MARC tapes, GPO (Government Printing Office) tapes, National Library of Medicine tapes, tapes of member libraries, etc.

Talk with Jennifer Heartsill of RLIN. 1990. Sept. 27. The database was developed at Stanford University and originally named BALLOTS (Bibliographic Automation of Large Library Operations using a Time Sharing system). Jennifer was there while it was being developed. RLIN originated at about the same time as OCLC; the two were developed independently and in parallel. OCLC took a very different approach to how they capitalized and began operations. RLIN first became available for use in 1973. Shortly thereafter they became the system of choice for RLG, which originated on the East Coast. BALLOTS preceded slightly RLG; they were separated by the continent. Then the system began to grow, with much of the funding from members. In 1989 the system became free of debt. Each user pays a fee for use; formerly this was on a transaction basis, now it is on a search basis. In RLG, there are now 34 governing members, 3 principal members, 60 special members, and a multitude of users–any library or individual

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can use RLIN. RLIN was originally located on the Stanford campus, but recently the organization moved to nearby Mountain View. RLIN, a non-profit group, still uses the Stanford computers. There is a flat annual fee for members.

OCLC has a large database and each record in it is for a unique title; appended to the record are holding symbols which show which libraries own that title. In RLIN, any library can have a complete record for its copy of a title, and include any special notes about the work (such as branch library location, autographed copy, etc.). Thus RLIN contains over 40 million bibliographic records, but only about 15 million unique titles, compared with 20-22 million for OCLC. RLIN has some unique databases, such as citations files, and the holdings of archival repositories. There are 9 bibliographic files in RLIN based on "material type": books, archival and manuscripts control (which have notes like abstracts), citations, maps, sound recordings, the 18th century Short Title Catalog (everything published in English or in an English-speaking country up to the year 1800), art, research in progress, etc. Both subscribe to the same records that the Library of Congress (LC) and the National Agricultural Library (NAL) put out on tape, but LC enters some records directly into the RLIN database for some things such as East Asiatic and Hebrew vernacular via Multiscript Workstations. They are now going out and looking for machine readable data. They have just added a new "citations file" from Engineering Information Inc. that gives article level information within serials and proceedings. RLIN and OCLC both use the MARC format, with numbered fields, and both now have a CJK (Chinese-Japanese-Korean) language service.

Update: Talk with reference librarians at Cal-Berkeley and Cal-Davis. 1991. March. RLIN is having serious financial troubles. It may either try to merge with OCLC (but OCLC may not want to buy it) or it may just die. The cost for cataloging has been too high. It started out being used only for cataloging, then backed into being a reference tool.

Article in Information Today. 1991. April. p. 24. "RLG board sets course for 1990s." They plan "major expansion of bibliographic access to archival holdings, computer files, and visual materials." RLG president is James Michalko.

Update from Western Archives Institute. 1993. June. RLIN is generally considered a better quality database design than OCLC and catalogers like it better; it allows more subject headings and longer record length. But OCLC is a stronger organization and it is easier to do interlibrary loan on OCLC.

Talk with research librarian at University of California at Berkeley. 1994. July 20. The records in RLIN are of better quality and done to a higher standard than those in OCLC; many of the OCLC records are entered by public libraries. RLIN also has a much better search engine. Address: Mountain View, California. Phone: 800-537-7546.

6150. **Product Name:** [Tofu (Firm, or Soft)].
Manufacturer's Name: Agro-Nippo Produtos Alimenticios Ltda.
Manufacturer's Address: Vila Clarice, Av. 15 de Novembro, 210-350 Pirituba, Sao Paulo, Brazil. Phone: 261-2348.
Date of Introduction: 1973?
New Product–Documentation: Shurtleff & Aoyagi. 1975. *The Book of Tofu.* p. 314. A large, modern Japanese-run tofu factory.

Shurtleff & Aoyagi. 1978, Dec. *The Book of Tofu* (Ballantine pocketbook edition). "Appendix B: Tofu Shops and Soy Dairies in the West." p. 400. Agro Nippo Produtos Alementicos Ltds., Av. 15 de Novembro, Vila Clarice, 210-350 Pirituba, Sao Paulo, Brazil. Tel: 261-348 (A large factory). Owner: Unknown.

Soyfoods Center. 1980. Sept. Tofu shops and soy dairies in the West (2 pages, typeset). Gives the company's name, address, and phone number.

Letter from Jane Cadwell Pautz. 1982. May 29. The company is now located at Av. José Alves de Mira 185, Pirituba, Sao Paulo, Brazil. They make both firm and soft tofu.

Talk with company by phone. 1989. May 18. The owner is Mikio Uchinaka. The company started about 16 years ago (i.e. in about 1973). The location has not changed but Av. 15 de Novembro has been renamed to Av. José Alves de Mira.

Letter (e-mail) from Jaime Nakamura of Brazil. 2012. Oct. 16. A record from the National Institute of Intellectual Property (http://www.inpi.gov.br/) in Brazil shows that Agro-Nippo Produtos Alimenticios Ltda. first registered the word "Tofu" as a mark (marca) on 12 July 1978. They re-registered it approximately one every 10 years thereafter.

6151. Hartz (Jacob) Seed Company, Inc. 1973? Hartz seed. Stuttgart, Arkansas. 8 p. Undated. 28 cm.
• ***Summary:*** Contents: Introduction. Arkansas' Grand Prairie: a major seed producing area for soybeans, rice and oats. Facilities. Research. Real estate and farm management. Export.

Jacob Hartz Sr. (1888-1963), pioneer in the development of soybean production in the South, founded Jacob Hartz Seed Company in 1926 [sic, 1942] and later that year built the first small seed cleaner in the State.

"More farmland in Arkansas is planted in soybeans than any other crop... Jacob Hartz Seed Company contracts upwards of one and one-half million bushels of Arkansas Certified "Blue Tag" Soybeans each year. This seed is produced by 150 Certified Seed Growers. The company's export operations have been directed into many areas of the Pacific, especially for natto, tofu, and miso in Japan.

Photos show: A portrait of Jacob Hartz, Sr. (p. 1)
An early binder, pulled by a tractor, cutting oats. Modern combines harvesting soybeans. An aerial view of the plants

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elevators and offices in Stuttgart. Company President Jake Hartz, Jr. with Dr. Curtis Williams in one of the company's three greenhouses. Address: P.O. Box 946, Stuttgart, Arkansas 72160. Phone: 501-673-8565.

6152. Kikkoman Foods, Inc. 1973? Standard policy manual. Walworth, Wisconsin. 65 p. Undated. 28 cm. [Eng]
• ***Summary:*** Section I. Organizational manual. Introduction. Company objectives. Organization principles. Organization chart. Committees. Position descriptions. Section II. Personnel procedure and policy manual. Introduction. Personnel policy. Personnel procedures. Wages, hours, and benefits administration. Relocation policy. Section III. Community and public relations. Employee membership in community organizations. Corporate gifts policy and budget. Section IV. Appendix. Forms exhibit. Other. Address: Walworth, Wisconsin 53184.

6153. Kikkoman Foods, Inc. 1973? Employee handbook. P.O. Box H, Walworth, WI 53184. 16 p. Undated. 19 x 10 cm. [Eng]
• ***Summary:*** Contents: Sangyo damashi (Our company spirit is expressed in this phrase which means that we always endeavor to enrich the daily life of people everywhere by adding to the joys and benefits of good eating.) Welcome. Our plant. Our product (Soy sauce). Our process. Training. Organization chart of Kikkoman Foods, Inc. Probationary period. Wages and benefits. Rules and regulations. Grievances. Adverse business condition adjustments. Hours of work and payment schedules (three 8-hour shifts). The end or the beginning? President's message to employees. Address: Walworth, Wisconsin.

6154. Oles, Shayne. 1973? The new Zen cookery: Practical macrobiotics. Woodland Hills, California: Shayfer Corporation. 86 p. Undated. Index. 22 cm. Spiral bound.
• ***Summary:*** A revised edition of the first American macrobiotic cookbook, containing a wide variety of recipes from many sources. The cover is light orange. In the lower right corner is a sumi-e type brush illustration of some grasses and flowers. All recipes are numbered. The recipe numbers and page numbers are a little different from those in the 1966 edition published by Ignoramus Press in Los Angeles. Pages 59-62 (recipe nos. 210-21) are about Miso soybean paste. Pages 62-64 (recipe nos. 222-28) are about Tamari soy sauce.

Herman Aihara (Nov. 1990) has no idea why there are two versions of this book, both undated. Shayne Oles must have published one or both of these after Herman Aihara started the George Ohsawa Macrobiotic Foundation (any time after 1969). Only Shayne Oles would know. One clue is given in *Macrobiotics: Yesterday and Today* by Ron Kotzsch (1985, p. 170). "In 1966 Lou Oles, who with his wife Shane [sic, Shayne] had managed the revived Ohsawa Foundation, died, and Shane asked Herman [Aihara] to assist her. Herman began to travel to Los Angeles once a month to give lectures at the Foundation headquarters. He was also instrumental in the publishing of Ohsawa's books, which were selling well on the East Coast as well as the West. By 1969, however, dissention had developed over the role of Shane's new husband in the organization. Herman resigned. In 1970 the Ohsawa Foundation dissolved. Aihara, who had moved to San Francisco [from Carmichael, near Sacramento], established the George Ohsawa Macrobiotic Foundation as a new educational and publishing organization."

No. 293, a recipe for "Grain coffee pudding," calls for "1 cup grain milk powder" [perhaps Kokkoh]. No. 300 is "Ohsawa coffee," a "grain coffee." Address: President of Ohsawa Foundation, California.

6155. Photograph of original Los Angeles Erewhon crew at the Culver City warehouse, southern California, around 1972-73. 1973? Undated.
• ***Summary:*** Note: This photo, taken by Roy Steevensz, was sent to Soyinfo Center by Norio Kushi and Peggy Steevensz, daughter of Roy Steevensz.

6156. Photograph of people seated around a low wooden eating table enjoying a macrobiotic breakfast at The Kushi House at 7357 Franklin Ave., Hollywood, California. 1973? Undated.
• ***Summary:*** Note: This photo, taken by Roy Steevensz, was sent to Soyinfo Center by Norio Kushi and Peggy Steevensz who writes: "Another view of main dining room, the table in the back is the breakfast room and beyond that is the pantry where every morning there was miso soup and some whole grain porridge. The stoneware vase with the grain stalk is now in my home."

6157. Hashida, W. 1974. Flavour potentiation in meat analogues. *Food Trade Review* 44(1):21-32. Jan. [55 ref]
• ***Summary:*** In Japan, the use of soybeans for production of spun, textured, or powdered vegetable proteins increased from 6,536 tons in 1968 to 15,895 tons in 1971, while the use of wheat protein [gluten] in these foods grew from 5,605 tons to 11,414 tons during the same period. In 1971 some 21 firms were engaged in the production of protein meat analogs in Japan. Address: Fuji Oil Co Ltd., Japan.

6158. Kaibara, Ekiken. 1974. Yôjôkun: Japanese secret of good health. Translated by Masao Kunihiro. Tokyo: Tokuma Shoten Publishing Co. Ltd. vii + 133 p. Preface by Ayanori Onishi of the Japan Society of Medical History. No index. Jan. 21 cm. [Eng]
• ***Summary:*** Contents: Preface. 1. What is health preservation. 2. How to keep health. 3. Food and drink: What and how. 4. Repressing sexual desire. 5. The five sensory organs. 6. Easing nature and bathing. 7. Prudently guarding

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against illness. 8. Selection of a doctor: How to avoid a quack or charlatan.

"The original texts of this book are those of 'Yôjôkun,' published in Japanese by Chûôkôron-sha Inc., Tokyo, in 1969, and by Tokuma Shoten Publishing Co. Ltd. in 1968, and are adapted under the direction of Ayanori Onishi." The author lived 1630-1714, and this book was written in 1713. The Preface notes that the importance nurturing mental discipline lies at the very core of the author's art of staying healthy. Among his other works is *Yamato Honzo* (*Japan's Herbal*), which is still valued today and well known even abroad. A Soviet scholar has even termed it "the first great work on natural history." The German physician and naturalist Philipp Franz von Siebold (1796-1866) called Kaibara "the Aristotle of Japan."

Kaibara, who has been called the "grandfather of macrobiotics," was an avid observer of the natural and human world. He traveled widely and wrote pioneering works on botany, geography, herbal medicine, and on popular manners and morals. At the age of seventy he retired from active life, and, free to sift through a lifetime of experience and learning, wrote the *Yôjôkun,* which includes the old sage's views on health and longevity. He begins by asserting that physical well-being and long life are the natural conditions of mankind.

In Chapter One he writes: "The art of health preservation entails, first of all, keeping away from things harmful to one's body, i.e., the inner desires–the desire for food and drink, sexual indulgence, sleep, endless talk, and the seven emotions: joy, anger, worry, pensiveness, sadness, fear, and surprise–and the outer evils–the four atmospheric aspects: wind, cold, heat, and dampness... An important factor in suppression of the inner desires is temperance in eating and drinking... One should refrain from satisfying sexual desire and try to preserve one's energy. Sleep should be confined to standard hours. Oversleep is to be avoided... Of particular importance is to take a walk of a few hundred paces after meals... The art of health preservation begins with mental placidity. The way to achieve mental placidity is to keep one's mind calm and one's spirit unruffled... The human body is meant to last a hundred years... One should not rely on acupuncture, moxibustion, or medicine... A saint always expounds on the delights of living." And sickness, like health, is something which mankind creates. Quoting the *Tao Te Ching,* Kaibara observes "One's life is in one's own hands." Sickness comes only when one has willfully abused oneself. "Illness never comes without reason."

In Chapter 3, Kaibara discourses at length on the subject of food and drink. The author, a Japanese physician, recommends a balanced diet to protect against chronic diseases. Meat and sake should be consumed in moderation. "A person should prefer light, simple meals. One must not eat a lot of heavy, greasy, rich food. One should also avoid uncooked, chilled, or hard food (p. 54)... Of everything that one eats and drinks, the most important thing is rice, which must be eaten in ample amounts to ensure proper nutrition (p. 61)... Do not eat between meals or immediately before going to bed. After eating take a short walk to stimulate circulation. Massage the stomach and abdomen lightly to encourage digestion...

The section titled "Bean paste" (p. 67) begins: "Bean paste [miso] has a soft quality and is good for the stomach and intestines. Soy sauce and the liquid that drips off bean paste [tamari] have a sharper quality than bean paste and are bad for people who suffer from diarrhea. Nor should vinegar be taken in too large amounts, for it is bad for the spleen and stomach... One must not eat too much of foods that are salty, vinegary [sour], or hot." One should also avoid tobacco.

In the chapter titled "Repressing Sexual Desire," Kaibara states that the great human frailties are gluttony and lust. He agrees with the Chinese sages that one should practice sexual abstinence in youth to reserve one's vitality and vigor. He cites the *Chien Chin Fang* by Sun Szu-miao which talks about the frequencies of sexual intercourse: "At twenty years of age, people should have a discharge [of semen] no more than once in a period of four days, at thirty once in eight days, at forty once in sixteen days, and at fifty once in twenty days. At sixty a person should no longer discharge his energy sexually unless he is particularly vigorous physically, in which case he can do so once a month." Kaibara believes that it is very important to conserve sexual energy since it deeply affects the function of the kidneys, and the kidneys are the seat of vital energy for all the other organs. Address: Japan.

6159. Kikuchi, Saburo. 1974. Soy protein development in Japan (Especially for isolated soy protein). *J. of the American Oil Chemists' Society* 51(1):189A-90A. Jan. Proceedings, World Soy Protein Conference, Munich, Germany, Nov. 11-14, 1973.
• ***Summary:*** Contents: Development of soy protein in Japan yesterday and today. Development of isolated soy protein in Japan. Isolated soy protein made by Fuji Oil. Address: Fuji Oil Co., Ltd., Higashi-ku, Osaka, Japan.

6160. Kinderlehrer, Jane. 1974. Using soybeans instead of meat. *Prevention* (*Emmaus, Pennsylvania*). Jan. p. 168-78.
• ***Summary:*** Ever since the price of meat began to skyrocket, substitutes for meat have been featured in American food columns. A large ad in the *Wall Street Journal* shows one soybean regally encased in a jeweled pill box with the caption "Life pill for an over crowded world."

But the soybean should not be presented as a meat analogue–a fancy name for imitation, fabricated, or synthetic–in part because it is not a "complete protein." However this is not a problem when you understand how to combine complementary proteins, and how to inactivate the soybean's trypsin inhibitor–by high pressure steam cooking

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whole soybeans, or by transforming the soybean into milk or "bean curd." Dr. Royal Lee suggests a method for cooking whole soybeans: Put a cup of soybeans in a quart of water, then put this in the refrigerator and let it stand for 24 hours. Change the water 4 times during that 24-hour period. The beans can then be cooked as you would regular beans such as navy beans–boiled for 20 minutes with constant stirring.

If you have a borderline iodine deficiency or suffer from a sluggish thyroid, the soybean may not be for you. The soybean also contains a shortage of calcium compared to its high phosphorus content. "Since the body requires more than twice as much calcium as phosphorus, it is a good idea to use a calcium-rich complementary food if you use much soy.

Next come three recipes: Soysesame pancakes (with "½ cup soy flour"). Soy balls (with "½ cup soy powder"). Soy cheeseburgers (with "3/4 to 1 cup soybeans {preferably small variety}. Crack or split beans in food mill. Soak overnight and cook in the soaking water for two hours with these ingredients:...").

You can also enjoy the nutritional benefits of soybeans in the form of soy grits or soy meal (which need much less soaking and cooking than whole soybeans). Or try green soybeans (more attractive and delicious than fresh lima beans). Describes how to remove the pods and cook these as a vegetable.

"While the soy is certainly the greatest bean of them all, it is still a bean."

"Enjoy your soybeans and you may find, as Mrs. Mito Umeda [of Kumamoto, Japan] did, that they lead to longevity." According to an A.P. release of 25 March 1973 (which appeared in the *Milwaukee Journal,* 1 April 1973), she is believed to be the oldest woman in Japan at age 110. She said of her long life: "I eat any kind of food, but I never miss taking soybean flour as well as fruit once a day."

6161. Prendergast, K. 1974. Protein hydrolysate–A review. *Food Trade Review.* Jan. p. 14, 16-21. [15 ref]
• ***Summary:*** Contents: Introduction. Enzymic hydrolysis. Alkaline hydrolysis. Acid hydrolysis. Manufacturing process. Raw materials. Cost effectiveness. Ease of application. Temperature stability. Water solubility. Shelf life. Safety. Nutritional. Lack of solubility in oils and fats. Hygroscopicity. Lack of specific individual flavours. Applications: Why are HVP's necessary?, soups, gravies and bouillons, meat and poultry products, fish products, sauces, savoury snacks, unusual applications, maillard reaction products, novel protein. Analysis and flavouring principles.

"The use of protein hydrolysates to improve the flavour of foods originated many hundreds of years ago in the Far East with the development of traditional soy sauce, which was made by the action of mould enzymes on steamed soyabeans and wheat. Then, in 1912, several patents were granted to Ikeda in Japan, and over the next sixty years enormous advances were made in hydrolysate technology. Now, by process refinement and formulation, manufacturers can produce grades which are tailor-made to an individual food product's requirements. Furthermore, whereas 30 to 40 years ago most manufacturers had just one or two grades, which were used for every product type, suppliers can now frequently offer a range of thirty hydrolysates, each with its own individual properties, character and flavour."

To make HVP, protein and hydrochloric acid are cooked at an elevated temperature. When the hydrolysis is complete, the material is neutralized with sodium hydroxide or sodium carbonate to a pH in the range 4.8 to 6.0. A black sludge called humin is removed by filtration, then the filtrate is debittered and decolorized / bleached using an activated carbon. After a final filtration the resulting HVP can be spray-dried to make a powder, concentrated to a paste in vacuum pans, or sold as a liquid. Address: Hercules Powder Co., Ltd.

6162. Satouchi, Kiyoshi; Tomohiko, M.; Matsushita, S. 1974. Characterization of inhibitor protein for lipase in soybean seeds. *Agricultural and Biological Chemistry* 38(1):97-101. Jan. [17 ref]
• ***Summary:*** An inhibitor of pancreatic lipase and of fungal lipases was isolated from soybeans. Address: Research Inst. for Food Science, Kyoto Univ., Kyoto, Japan.

6163. Takeuchi, Tokuo; Yokoo, Yoshio. 1974. [Studies on peptides in miso and soy-sauce. XI. Effect of *koji* addition on the proteolytic patterns of soybean *miso* manufactured with an enzyme preparation]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 52(1):58-61. Jan. [2 ref. Jap; eng]
• ***Summary:*** Four types of soybean miso was made by several different combinations of the commercial enzyme Biosaime A, which was prepared by the water extraction of wheat bran koji made with *Aspergillus oryzae.* The enzyme was combined in different proportions with *koji* (0 to 100%), and the amount of free and bound amino acids in each miso was measured. Address: Food Research Inst., Aichi prefecture, Nishi-ku, Nagoya, Japan.

6164. Watanabe, Tokuji. 1974. Government role and participation in development and marketing of soy protein foods. *J. of the American Oil Chemists' Society* 51(1):111A-15A. Jan. Proceedings, World Soy Protein Conference, Munich, Germany, Nov. 11-14, 1973. [14 ref]
• ***Summary:*** Contents: Abstract. Introduction. Japan's soybean supply and demand. The present soybean protein food market in Japan. Administrative aspects with respect to soybean protein foods. Research and development projects concerning soybean protein foods and their achievements. References. Address: National Food Research Inst., Ministry of Agriculture & Forestry, Tokyo, Japan.

6165. Yasuda, Kosaku. 1974. Soy proteins in meat-like

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products in Japan. *J. of the American Oil Chemists' Society* 51(1):195A-96A. Jan. Proceedings, World Soy Protein Conference, Munich, Germany, Nov. 11-14, 1973.
• ***Summary:*** Contents: Introduction. Spun soy protein. Textured vegetable protein.

Concerning spun soy protein fiber: About ten years ago Nisshin Oil Mills, Ltd. "started research work on utilization of soybean meal as new products for human consumption. In 1968 top management of our company decided to enter into the spun soy protein business and built a new, modern commercial plant which is the only commercial plant in Japan built to help avoid shortage of meat products in the future. In the beginning we had many problems. These are discussed below." Flavor, color, chewiness, processing cost and labeling. "We organized a new society, Association of Vegetable Protein Products, of which Y. [Yukio] Sakaguchi, president, Nisshin Mills, is chairman. This organization is composed of representatives from more than 15 companies that deal with vegetable protein, including wheat protein [gluten]." Address: Nisshin Oil Mills, Ltd., Tokyo, Japan.

6166. Pond, Elizabeth. 1974. Flying-soybean ceremony heralds Japan spring. *Christian Science Monitor.* Feb. 8. p. 7.
• ***Summary:*** Tokyo–*Setsubun* (the bean-throwing ceremony) marked the official end of winter in Japan. It is said that if you catch and eat the small roasted "soybeans that are thrown at Setsubun to drive away winter and the devil, then you will also enjoy good luck, health, and prosperity throughout the year.

Since Setsubun is a source of income for Buddhist shrines and Buddhist temples, both try to attract as big a crowd as possible by enticing TV celebrities, sumo wrestlers and geishas to participate in the throwing.

A famous place to celebrate Setsubun in Tokyo is the Yokokawa Inari temple.

6167. Ohkuro, Isamu; Suzuki, Kakuyoshi; Ito, S.; Komatsuzaki, T. 1974. Shokuin-yô saikin (nattô-kin, nyûsankan-kin) fuku kônai chûsha no hatsuka nezumi ni oyobosu eikyô [Influences of intraperitoneal injection of esculent bacteria (*Bacillus natto* and Lactobacillus) on the mouse]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 88(2):115-20. Feb. 10. [10 ref. Jap]
Address: Dep. of Microbiology, Tokyo Medical College, Tokyo; The Kohno Clinical Medical Research Inst., Tokyo. All: Japan.

6168. Kushi, Michio. 1974. Natural agriculture and food processing. *Michio Kushi Seminar Report* (*Brookline, Massachusetts*) No. 2. Feb. 12. p. 1-4. Edited by Ane & Mark Riegel.
• ***Summary:*** On Feb. 12 Mr. Kushi, a macrobiotic teacher, lectured on: Soybeans. Making tofu: Lemon juice and vinegar vs. nigari. Making natto.

For making tofu, Kushi recommends using nigari rather than lemon juice or vinegar, since the yang nigari balances the yin soybean.

The soybean, "according to our Unifying Principle of macrobiotics, belongs to the yin category. And if you are taking plenty of soybeans, then you become a fool... if you cook kombu together with soybeans, the taste is very good, and nutritionally it is a better balance."

Soybean milk is easy to make. It can often be a substitute for cow's or goat's milk. Soybean milk is yin. If you give this to a baby for a long period, the baby becomes very yin. It is better to give soybean milk for a short period. Address: Brookline, Massachusetts.

6169. Dresden, Donald. 1974. Japan Inn: A good show, visually and gastronomically. *Washington Post.* Feb. 17. p. PO34.
• ***Summary:*** Dining: The Japan Inn, now in its 3rd year of operation, located at 1715 Wisconsin Ave., NW (Georgetown), continues to rank as one of the finest Japanese restaurants in Washington, DC. To make the broth for Miso soup, begin with a Japanese seaweed called "sea tangle" [kombu], then remove it after it has imported its flavor. Add dried bonito flakes to produce a delicate, fish-tasting broth. "Bean cake [tofu], mushrooms, and chopped green onions finish the dish."

Shabu-shabu comes with two dipping sauces. One of these is made by mixing soy [sauce], vinegar, two kinds of sake, seaweed and dried bonito flakes. The other contains sesame seeds, oil, and paste. Shabu-shabu "also contains hot pepper, aged soy bean cake, soy sauce and two kinds of sake, one of them [mirin] sweet."

Note: The meaning of "aged soy bean cake" is unclear. It could be fermented tofu, although that is rarely used as an ingredient in Japanese cookery.

6170. Kushi, Michio. 1974. Natural agriculture and food processing. *Michio Kushi Seminar Report* (*Brookline, Massachusetts*) No. 3. Feb. 26 and 27. p. 5-30. Edited by Ane & Mark Riegel.
• ***Summary:*** On Feb. 26 Mr. Kushi, a macrobiotic teacher, lectured on: Tekka–"Tekka is used not only as a condiment, but also for medicinal use. Tekka is made from three different roots–carrots, burdock, and lotus roots." The "volume of miso is flexible... Homemade tekka is traditionally made in a cast iron frying pan." The Japanese word "tekka" derives from *tetsu* (which means iron) and *ka* (fire). "For medicinal use, yang miso is better."

Miso and miso manufacturing, including how to make malt (rice koji) (8 pages). Note: This section indicates that Mr. Kushi has some basic knowledge of the subject but there are many errors. 1. Koji is not malt (which refers to soaked, germinated cereal grains), but molded cereal grains or soybeans. 2. Koji kin is not malt bacteria, but koji molds.

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3. One does not add enzymes to miso and enzymes do not grow. Even modern miso factories do not add enzymes when making miso. 4. The entire mixture is not stirred after 20-25 days to add oxygen. Kushi says you must keep miso for a least 6 months, but to cure sickness it must be kept for 2-5 years. Miso soup can compensate for the bad qualities of meat and eggs–so everyone should eat miso soup daily. Soup stocks and miso soup.

On Feb. 27 he discussed: General outline for making shoyu–soy sauce (4 p.), including discussions with Kikkoman on making natural shoyu starting with whole soybeans. In the early years after 1973, Kikkoman wanted to make natural shoyu and sent Kushi several samples, but he turned them all down, in large part because Kikkoman wanted to use defatted soybean meal instead of whole soybeans. Erewhon is buying shoyu from 3 companies in Japan. But Kushi says the quality is declining compared to five years ago [i.e., 1969], when it had powerful healing effects when taken with bancha or kuzu. He adds: "Around Boston or on our Ashburnham land, I really hope we can begin to make miso or soy sauce." Kushi says that now, after pasteurization, coloring and flavoring is added [not true, except in HVP soy sauce]. "Traditionally [in Japan] for this they used natural herbs. For a sweeter taste and darker color they traditionally used kanzô [kanrô?] or 'sweet grass = sweet herb.'"

"Formerly, until modern technological methods started to be applied, almost each village made their own shoyu like this, either as a joint community project, or someone with money made it and sold it to several villages."

Using bean and grain sprouts–moyashi (including soy sprouts). Other soybean products: Fried tofu (two methods for agé). Ganmodoki. Kori-tofu or koya-tofu (freeze-dried tofu). Soybean milk ("Soy milk is very yin." Note: Most Japanese and Japanese scientists consider soymilk to be an "alkaline" {*arukari-sei*} beverage, which therefore promotes good health). Yuba. In the discussion (p. 28), yogurt made by leaving soymilk unrefrigerated and "Chinese fermented tofu... fu nyu" are mentioned. The U.N. [United Nations] recommendations on food, using vegetable proteins.

Note: This is the earliest English-language document seen (April 2013) that uses the term "freeze-dried tofu" to refer to dried-frozen tofu. Freeze drying, which is an expensive, modern, high-tech process that uses a vacuum chamber to dry a frozen food, is not a good term to use for this traditional Japanese food which is air-dried naturally. Address: Brookline, Massachusetts.

6171. Gerner, Bob. 1974. Log of trip to Japan to study traditional natural foods, 28 Feb.–2 March 1974. Part I (Log–unpublished). Westbrae Natural Foods Inc., Berkeley, CA 94710. 26 p. Unpublished log. Handwritten. 20 x 8 cm.
• ***Summary:*** 1974 Feb. 28. Meet Bill Shurtleff and Mr. Masa Miyashita of Kikkoman export dept. (good man, speaks fluent English) at the Imperial Hotel (*Teikoku Hoteru,* built in the 1920s by Frank Lloyd Wright) in Tokyo. Talk for 4 hours. Westbrae hires Shurtleff as an interpreter and guide.

March 1. Dinner at Sasa-no-Yuki, beautiful old restaurant that specializes in tofu cuisine.

March 4, Monday. Visit Kikkoman in Noda with Shurtleff and Miyashita. Tour Plant #7, then Plant #4 (the Goyo-Gura), which produces the emperor's shoyu in the traditional, natural way. "Saw 5 batches of moromi mash from 1 month old to 12 months old, and tasted each one. Delicious. Great color change between the 1 month and the 12 month moromi. We saw all the traditional tools. The moromi vats were made of cedar and last approximately 200 years." See a movie on how shoyu is made. Lunch at a sushi shop. Visit two miso retail shops with Shurtleff near his home. One had 42-45 types of miso (mostly rice miso, with 1 each Hatcho, barley, and cooked miso), the other 32-35 types. Tasted many and learned the differences. I buy Saikyo sweet white miso and Hatcho miso.

March 5, Tues. Attend a cooking class at Lima Ohsawa's house, then have dinner with Lima and the class members. Sick for the next 2 days.

March 9, Sat. Call then meet Mr. Kazama of Mitoku. He represents Erewhon. We may import through Kikkoman's Pacific Trading. Plan trip to Sendai Miso-Shoyu. Sendai is interested in using organic soybeans to make shoyu but would like a contract stating that all of it will be purchased when done. Dinner at the natural foods restaurant, Hakumon run by a Frenchman named Pierre.

March 11, Mon. Meet Shurtleff early at Tokyo station. Take bullet train (Shinkansen) to visit two Hatcho miso plants (Hayakawa Kyuemon Shoten, and Ota Shoten in Okazaki city, Aichi prefecture). Both plants claim to be over 600 years old. They use modern steamers and koji rooms. They pile 4-6 tons of rocks atop each large vat of miso, age it for 2 summers. It becomes very mellow when fully aged. They also use about half of their Hatcho miso to make Akadashi miso. It also contains caramel coloring, barley syrup, MSG, shoyu, a white miso, and preservatives. They sell a lot of Akadashi but only a little Hatcho miso. Lunch at an udon noodle shop that hand makes and cuts the noodles. Lots of slurping. Then visit a plant that makes real tamari and shoyu. All the tamari is mixed with junk. Train to Kyoto; stay at Friends World College. Note: This is the earliest English-language document seen (March 2012) that contains the term "real tamari."

March 12, Tues. Visit a tofu maker, a yuba maker (*Yuba Han*), then the company that makes Saikyo sweet white miso. The owner lies to us initially about his miso aging and caramel coloring (which tastes and looks like tar). Then he reverses himself without batting an eye. Lunch at a 300 year old Zen vegetarian restaurant (*Okutan* near *Nanzenji* temple); so beautiful that I start crying. Fantastic place. Light snow falling by the pond. Enjoy Simmering Tofu (*Yu-dofu*)

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in a broth. Then we go to a 400-year old tofu restaurant (*Nakamura-ro*) at a shrine (*Gion*) for dessert of *amazake* and *Dengaku* (skewered and braised with sweet miso). On to a second miso factory. It is a bore and the owner does not seem sincere but he has a great reputation among macrobiotics. He makes both natural and sweet white miso. Shurtleff visited him last year. For white miso the soybeans are boiled; for red miso they are steamed. Some white miso contains sodium thiosulphate bleach. Visit another yuba shop. They use granite grinding stones to make soymilk, cast iron pot to cook it in and copper skimming tables. A very beautiful place. Meet Ty Smith at a soba shop. He is a chain smoker, just quit working for Muso, and promoting a cooperative effort between Janus, Chico-San, Erewhon, and The Well to import foods from Japan. Evening at Jittoku coffee house, owned by an American, in a large old Japanese treasury (kura). Back to Tokyo by train. Talk until 1:00 A.M.

March 14, Thurs. Meet Kazama and Shurtleff, and take express train to Sendai Miso-Shoyu. We are treated royally by Mr. Muro. Long introduction and discussion. Visit their 2 plants, one modern, one traditional, natural. They make only rice miso. Their production of natural miso is more than all that imported to America by Erewhon and Janus. They age their natural shoyu 18-24 months at the request of Michio Kushi and Erewhon. They have 9 aging vats for the first year, then it is switched to other tanks. They invite us to have a shoyu taste test among 3 products: Kikkoman regular shoyu, Sendai regular, Sendai natural. Both Bill and I choose Kikkoman as best; good aroma, color, and taste. They congratulate us on our good taste. Sendai regular had very strong salty taste. We both liked the Sendai natural least; good color, no aroma, very mild taste. Sendai people say only one year is needed to ferment shoyu naturally. We might sell them organic soybeans (we had purchased 12 truckloads from a farmer) and get shoyu back in 1 year. We meet the president (Sasaki?), born 1928. Elegant geisha-hosted tempura and sushi dinner with president, 2 vice presidents, production manager, and a consulting professor (Shibasaki sensei). After dinner to a traditional bar for *doburoku* (thick, unrefined sake with a low alcohol content [or was it nigori-zake?]), then a sushi house. Shurtleff leaves for Tokyo on night train.

March 16, Sat. Visit Shurtleff and Aoyagi's home for lunch. We have dried-frozen tofu main dish, salad with creamy tofu dressing, strawberries with tofu whipped cream. Delicious. Then we learn how to make tofu at home. It's easy. I'll make it at home in California, then at our Westbrae Natural Foods retail store on Gilman Street (Note: This led to a long series of tofu classes by Gerner, Liz Horowitz, and later Shurtleff & Aoyagi; The retail store changed its name in late 1976 to Gilman Street Gourmet).

Note 1. This is the earliest document seen (April 2006) concerning Westbrae Natural Foods.

Note 2. This is the earliest English-language document seen (Jan. 2012) that contains the term "creamy tofu dressing" (or "dressings") a term coined by Shurtleff and Aoyagi in *The Book of Tofu* (p. 108).

Note 3. This is the earliest English-language document seen (April 2013) that uses the term "dried-frozen tofu."

Note 4. This is the earliest English-language document seen (Oct. 2013) that contains the term "Tofu whipped cream" (regardless of capitalization). Continued. Address: President & Chairman of the Board, Westbrae Natural Foods Inc., 1224 10th St., Berkeley, California 94710.

6172. Gerner, Bob. 1974. Log of trip to Japan to study traditional natural foods, 28 Feb.–2 March 1974. Part II (Log–unpublished). Westbrae Natural Foods Inc., Berkeley, CA 94710. 26 p. Unpublished log. Handwritten. 20 x 8 cm. • ***Summary:*** Continued: March 19, Tues. Take bullet train to Kyoto to meet Steve Earle of Muso Shokuhin. We 3 go to Okayama to see Fuchu Miso, that makes mugi miso (the barley miso sold in our store) and sweet white miso. The president's wife is the epitome of Japanese woman. For lunch we have tofu burgers with Italian sauce and mushrooms in a bento made by Akiko. Delicious. Take a boat to Shodo-shima where Marushima Shoyu Co. is located. Island is also famous for toasted sesame oil. Arrive at a ryokan at 6:30 P.M. VIP treatment. Bath before dinner and served in private room by geisha. Too much fish! Note: This is the earliest English-language document seen (April 2013) that contains the term "tofu burgers."

March 20, Wed. Miso soup for breakfast. Visit Marushima Shoyu where Muso gets its "natural" shoyu for export to America. They have the newest wheat roasters (they roast it with sand), biggest presses. We see cement aging tanks in a temperature-controlled room, then onto a large red building with 150 aging tanks. But we see no whole soybeans, only soybean meal (*dasshi daizu*). "I feel the owner is a liar and this is a bogus operation. The scene gets heavy and ugly. Bill is great and presses on with questions." The owner claims that 40% of their shoyu is natural, aged for 3 years and made with whole soybeans; 60% made with soybean meal, temperature controlled for 7 months. Thus there should be about 120 vats of natural versus 60 regular. But where is the natural? Their faces turn red. We have caught them red handed. The owner take us to one musty, dirty old building with 25 vats, only 8 of which contain shoyu, some only half full. Lots of cockroaches. Looks like no one ever goes here. Still no sign of a single whole soybean. Uneasy departure. Steve Earle is embarrassed. We take a train to Tokyo. We present Earle/Muso with a list of inconsistencies and ask for a written reply.

March 21, Thurs. Visit Mr. Kazama's miso factory (*Ikeda Kojiro Miso Shoten* in Kawaguchi-shi near Tokyo), that makes barley miso, the only brown rice miso in Japan, and shoyu. Call Ty Smith of Muso. He says Muso was very happy with our findings concerning the problems at

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Marushima, and that they have contacted a new source in Kyushu. Marushima said their president died a year or so ago and his son took over. They have lost the old feeling and tradition.

March 22, Fri. 6:00 A.M. Meet with Bill Shurtleff at his tofu master's tofu shop (*San-Gen-Ya,* run by Mr. Toshio Arai). We watch how he makes tofu. Beautiful place (12 feet square) attached to their home. Beautiful people; they don't speak English. Both make tofu starting early in the morning. He delivers in the afternoon and she sells out of the shop. He gave me hot rich soymilk (from *kinugoshi*) with wild mountain honey. Both incredible. So sweet and delicious. They also serve us freshly made agé, kinugoshi, and natto. Lunch at Shurtleff and Aoyagi's home: Noodles and tofu, Chinese fried tofu, tofu pudding, agé, kinugoshi, and mikan orange. We go over my notes from the miso factory. We copy all of his notes. Then I leave, very sad, but the friendship will remain. Akiko is a remarkable lady. Meet Mr. Kazama and go to Pacific Trading. Lousy meeting with Mr. Masaaki Miki (sales manager), and Masa Miyashita (export dept). Go to airport.

Results of the trip: (1) Westbrae started (about 9 months later) to import many varieties of miso, plus shoyu, and other products from Mr. Kazama in Japan. Bob Gerner was the founder, president, and chairman of the board of Westbrae; (2) Bob Gerner and Liz Horowitz taught "Tofu and Miso Cookery Classes" in Berkeley during 1976; (3) Westbrae published and distributed widely two brochures, *What is Miso?* (May 1976) and *What is Tofu?* (July 1976) written by Shurtleff and Aoyagi; (4) In 1976 Westbrae Natural Foods Inc. decided to sell its retail store at 1336 Gilman St. in order to focus on being a distributor and importer. The store had been losing money. Bob Gerner bought it in June 1976 for the low price offered by the highest bidder. He remodeled the store, renamed it Gilman Street Gourmet, and re-opened it in Sept. 1976. In the spring of 1977 Gerner added a deli to the store; there he made and sold Tofu Burgers, Tofu Treasure Balls, and Tofu Steaks Sauteed in Ginger Sauce. The same week that the deli opened, Gerner sold 3,000 to 4,000 of his new Tofu Burgers out of the Westbrae booth at the New Earth Exposition in San Francisco. Bob's nephew and sister (Margaret) made the tofu burgers. The burgers sold equally well at the same Expo in 1978 and 1979; (5) Shurtleff and Aoyagi wrote *The Book of Miso* and their New-age Foods Study Center moved toward becoming Soyfoods Center.

Note: In late November 1974 Mr. Kazama came to a meeting at Pajaro Dunes by Santa Cruz, sponsored by The Well. The idea was to set up a natural foods trade association. Erewhon wanted to control all imports of Japanese natural foods from Japan. Janus and The Well both had to import through Erewhon. They said Westbrae must buy through them via The Well (Roger Hillyard/Pure & Simple), and pay a 5% commission. Kazama had to defer to them. Gerner refused and they backed off. Ty Smith, now head of Erewhon, was upset that Westbrae was not paying a commission. Gerner told him "Tough." So Westbrae ended up importing from Kazama. Address: President & Chairman of the Board, Westbrae Natural Foods Inc., 1224 10th St., Berkeley, California 94710.

6173. Hallab, A.H.; Khatchadourian, H.A.; Jabr, I. 1974. The nutritive value and organoleptic properties of white Arabic bread supplemented with soybean and chickpea. *Cereal Chemistry* 51(1):106-12. Jan/Feb. [22 ref]

• ***Summary:*** Soybean flour used in this study was obtained from Yoshihara Oil Mill, Ltd., Osaka, Japan. It was defatted, heated with live steam, and fortified with 0.15% DL-methionine. Bread made from wheat flour alone contained 11.57% protein. With 4, 6, 8 and 10% of soya bean flour it contained 13.24%, 13.84%, 14.62%, and 15.40% protein respectively.

The net protein utilization (NPU) of the bread made from wheat flour alone for rats was 37. With the four levels of soya bean flour it increased to 50, 50, 54, and 55. Bread made with 10% soya bean flour was recommended for use in orphanages and refugee camps. Address: 1. Assoc. Prof.; 2. Research Asst.; 3. Research Asst. All: Dep. of Food Technology and Nutrition, American Univ., Beirut, Lebanon. Jabr's current address: Food Chemist, Ghandour Factory, Beirut, Lebanon.

6174. *Japan in Pictures.* 1974. Bill Shurtleff, a perfect mania for bean curd. American who has come to Japan to study Zen. 16(1):16-17. [1 ref. Eng]

• ***Summary:*** Shurtleff is a 31-year-old American who has come to Japan to study Zen meditation and tofu. Five large,

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black-and-white photos of Shurtleff show him: (1) Deep-frying *"ganmodoki"* [tofu burgers] at San-Gen Ya, the shop of tofu master Toshio Arai in Nerima-ku, Japan, where Shurtleff is an apprentice, learning how to make tofu in the traditional Japanese way. (2) Ladling cooked soybean puree (*gô*) out of the cauldron into the pressing sack. (3) Standing next to Mr. Arai. Much of the equipment in the shop can be seen as Mr. Arai talks about making tofu. (4) With Mr. and Mrs. Arai, sitting on the step that leads from their tofu shop into their home. (5) One sitting in full lotus position practicing meditation in the home of Mr. and Mrs. Kinjiro Aoyagi in Nerima-ku. His head is shaved and a small altar is in the background. Another article on previous pages of this issue discusses a new method for making instant tofu. Address: Japan.

6175. *Japan in Pictures.* 1974. Bean curd, a subsidiary food as delicious as meat. Instant bean curd developed in Japan. 16(1):12-15. [1 ref. Eng]

• ***Summary:*** The first 2 pages of this article contain 6 color photos showing tofu in Japanese-style (Yu-dofu, Dengaku, Sukiyaki, and Clear Soup), and Chinese-style (Sheng Pan Tofu, Guo Tie Tofu) recipes. "A block of bean curd weighing 340 grams, measuring 7 x 10.5 x 3.5 centimeters and being sold for US$0.20, contains as much as 21 grams of protein. To take this much protein, one must drink 3 bottles (or 600 cc) of cow's milk at the cost of US$0.35.

The conventional (traditional) process for preparing bean curd is described. "In Japan as many as 38,000 bean curd makers are operating on a small scale. Under these circumstances the bean curd industry has been far from modernized."

The next two pages, titled "Modernization of bean curd making," compare the traditional process for making tofu (6 black-and-white photos show the Yuba Han yuba shop in Kyoto) with a modern process developed by House Food Industrial Company, and used to make "House Hontofu" at their new modern factory in the city of Sano, 100 km north of Tokyo. Two photos are given of the equipment in the plant and 6 of the package and how this instant bean curd [silken tofu] is prepared at home. At the modern plant, a mixture of ground soybeans and water "is applied to a centrifugal separator, which separates it into soymilk and refuse. The soymilk, which has been concentrated by being heated, is sprayed into a tank heated to 100ºC, a process which dehydrates the milk to produce a bean curd base in powdered form [powdered soymilk]. A unit quantity of this powder is packed in an aluminum-foil bag containing nitrogen gas, which is put on the market accompanied by a small amount of coagulant.

"Process to prepare bean curd on the spot. Put a bag of 'Hontofu' in 600 cc of water, which is to be agitated [with a whisk]. Boil about 3 minutes. Mix the accompanying coagulant [glucono delta-lactone] immediately after the flame is put out. Transfer the substance into the container [a plastic box shaped like a cake of tofu]. Leave it for about 20 minutes and a block of bean curd is ready. Bean curd taken out of container [into a bowl of water]." Address: Japan.

6176. Nihon Jozo Kogyo K.K. 1974. Marufuku tane-koji (miso-yô) [Marufuku koji starter for miso]. Koishigawa 3-26-3, Bunkyo-ku, Tokyo, Japan. 1 p. Feb. Manufacturer's catalog. [Jap]
• ***Summary:*** Describes 9 types and 17 varieties of koji starter for miso, with prices and amounts of koji each will make. Address: Tokyo, Japan. Phone: 03-814-2738 or 9.

6177. Photograph of people at the Erewhon warehouse–Boston. 1974. Boston, Massachusetts.
• ***Summary:*** These photos were sent in 2009 by Patricia Smith, who worked at Erewhon. They are not dated and the names of some people are unknown.

Concerning the date and place: Mark Ripa (Jan. 2011) says: "I think both photos were taken the same day, in the winter of either late 1973 or early 1974. They were taken next to the front windows of the third floor at 31 Farnsworth Street, South Boston (adjacent to the Erewhon warehouse at 33 Farnsworth). 31 Farnsworth was a three floor building

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adjacent to the six floors of 33 Farnsworth. That floor was used for storage by the Erewhon warehouse. *East West Journal* occupied multiple floors at 31 Farnsworth at the time. I don't remember the context other than it was a department photo of the 'warehouse crew.' Don't remember any other department photos. The photos were taken, I think, by Nik Amartseff (responsible for creating Erewhon labels and product development at the time). He may also have worked for EWJ. Last I heard Nik was living in Vermont."

(1) Photo of Mark Ripa (at Erewhon, Boston), wearing a beard, white suit (top and bottom) and necktie. On the photo, to his right, is written: "I'm Swami Bananananda and I'm here to say"–a take-off of the lyrics to a popular tune advertising Chiquita bananas, which begin: "I am Chiquita banana and I've come to say, Bananas have to ripen in a certain way..." Mark notes: "The two lines written on my photo by persons unknown, perhaps inspired by my borrowed white suit"

Mark wrote to Patricia Smith (Oct. 2010): "My title at Erewhon [Boston] changed over the years. I went back to a resume to clarify the following: April 1972 to Feb. 1974–Packaging line worker, miller's apprentice.

Feb. 1974 to Nov. 1974–Head miller.

Nov. 1974 to Aug. 1975–Buyer / merchandiser for the Star Market account.

Aug. 1975 to Oct. 1976–Buyer, assistant product development manager. Inventory control manager.

Oct. 1976 to June 1978–Purchasing manager. Product development manager.

June 1978 to Oct. 1979–Quality control manager.

"I had my hand in a few Erewhon labeled products, most of which were manufactured by copackers, notably organic corn chips, potato chips (I think I was the first to market a tamari potato chip), apple juice and apple juice blends (I remember formulating apple spice juice and apple mint juice on my kitchen stove) and Mark's Natural Spaghetti Sauce (2 varieties)–the first spaghetti sauce to have tamari as an ingredient (Michio Kushi wanted to balance the tomatoes with tamari, which was more workable than miso) and bagels (how could I forget the bagels–but they were discontinued as they molded before their time)."

(2) People who worked at Erewhon, Boston. Mark Ripa is in the 2nd row, far left.

John Fogg, who worked at Erewhon, Boston, identifies the people in this group as follows: Front row (three men, left to right): Dan Seamens, Don Lorenson (great guitar player, supervisor in shipping), and Tony Harnett.

Back row (seven men, L-R): Mark Ripa (probably a purchaser by then), Roger, unknown, Bill West (worked in the warehouse or was a truck driver; ended up as Trucking Manager), Warren Murrah (Receiving Manager), Paul Campbell.

Evan Root adds (Jan. 2001). Tony Harnett is now known as Anthony Harnett. "Anthony and Hugo van Seenus bought the small 'Bread and Circus' store in Brookline, Massachusetts. Soon after, Anthony bought out Hugo and developed it into a group of big supermarket sized natural food stores, with a very high quality standard. In 1990 Whole Foods bought him out for $26 million."

Steve Zoller adds (Jan. 2011): These were all macho warehouse guys who looked down on the "prods" (production guys) upstairs. The main erewhon building was at 33 Farnsworth St. I believe this was taken in the attached building (31 Farnsworth, I think). I base this on what looks like imports that were stored in that building, on the 1st floor. I would definitely date this later than the spring 1975 catalog photo.

Updates (from Steve): Dan Seamens–is at the WF Regional office in Cambridge. Bill West–married someone from erewhon (forget her name) and moved to New Mexico. Late 1980's I saw him last and he worked for a juice or soda company. Warren Murrah–Married Susan Stamps (David's sister) and worked at New Balance (maybe 1980?). Diane Markovitz–moved to St. Augustine, Florida, around 1977 to be with Greg Leonard (Tree of Life). Anthony Valenti–Married Carol (a former erewhonian); I last saw him as a waiter at a high class / priced restaurant in Boston.

6178. Watanabe, Tokuji. 1974. *Tofu* and its derived products. In: International Symposium on Protein Foods and Concentrates, Proceedings. Mysore, India: Central Food Technological Research Inst. (CFTRI). See p. 286-301. Held 27 June–4 July 1967 at CFTRI, Mysore. *
Address: Japan.

6179. Ziemba, John V. 1974. Authentic soy sauce brewed in Wisconsin. *Food Engineering* 46(2):58-60. Feb.
• ***Summary:*** Gives a step-by-step description of the method used by Kikkoman to make shoyu in Walworth, Wisconsin. Eight photos show 2 different views of the outside of the plant and 6 of major steps on the inside. Both mold culture and yeast culture are mentioned. Address: Senior Editor, Food Engineering magazine, Chicago.

6180. Dosti, Rose. 1974. Making nutrition culturally acceptable: Project for Chinese elderly. *Los Angeles Times.* March 28. p. H1.
• ***Summary:*** Every afternoon the banquet room at the Hong Kong restaurant is filled with elderly Chinese from the Los Angeles area. Dr. Genevieve Ho, a nutritionist at the University of California Agricultural Extension Service designs the menus and recipes, but also gives talks on nutrition in Chinese–while stressing the importance of calcium, vitamin A, and protein in the diet.

Sardines (bones and all) over a bed of bean curd supply plenty of calcium. A recipe is given for Sardines with bean curd.

Ground seasoned fish, seasoned with green onion and

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ginger, "is formed into walnut size balls and sauteed in oil to serve with braised bean curd," for a dish that is rich in both calcium and protein.

Dr. Ho also talks about avoiding salty foods such as bean paste, fermented black beans, pickles, and salt fish.

A photo shows a group of happy Chinese seniors seated at a round table. Dr. Ho (standing) also looks very happy.

6181. Akiya, Toshimi; Araki, Chuji; Igarashi, Kiyoko. 1974. Novel methods of evaluating deterioration and nutritive value of oxidized oil. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 29. p. 207-11. March. [15 ref. Eng; jap]

• ***Summary:*** "The peroxide content of an oxidized oil is of limited value in estimating the toxicity of the oil, because some decomposition products of peroxides are also injurious to health." Because peroxides are easily destroyed by heat, frying fats can have low peroxide contents even when they are highly deteriorated.

The researchers prepared oxidized soybean oil having PV [peroxide values] of 10, 110, 180, and 380. They found the method based on the mortality of chicken embryos following injection of oil into the yolk sac "to be much more sensitive and reproducible than tests based on the growth rate of weanling rats or mice fed deteriorated oils."

Reprinted from *Lipids* 8(6):348-52 (1973). The paper was first presented at the symposium "Biological Significance of Autoxidized and Polymerized Oils," JOCS-AOCS Joint Meeting, Los Angeles, California, April 1972. Address: National Food Research Inst., Shinjo Branch, 4-19 Ishikawa-cho, Shinjo-shi, Yamagata-ken 996, Japan.

6182. Goto, Kenzo. 1974. Nattô no nenshitsu-sei fumi seibun ni tsuite. I. Nattô zenshi-shitsu kôsei shibô-san sosei to shishitsu seibun no bunkaku [The lipid-origin in flavor constituents of natto. I. Fatty acid composition and fractionation of total lipids]. *Research Bulletin of the Obihiro Zootechnical University* 8(3):501-07. March. [12 ref. Jap; eng]

• ***Summary:*** No significant difference was found in the fatty acid compositions of the total lipids in natto (a fermented whole soybean products) and soybeans. The predominant fatty acids, in descending order of predominance, are linoleic acid, followed by oileic, linolenic, and stearic acid.

The total lipid profile has at least 8 components, the main ones being triglycerides, free fatty acids, diglycerides, monoglycerides, and traces of polar lipid. Address: Lab. of General Chemistry, Obihiro Zootechnical Univ., Obihiro, Hokkaido, Japan.

6183. Kiuchi, Kan; Ohta, Teruo; Fujiie, Hiroko; Ebine, Hideo. 1974. Daizu tansui kabutsu no kôso-teki bunkai ni kansuru kenkyû. I. Bacillus subtilis No. 17 no hemiseruraaze no seisei to seishitsu [Studies on enzymatic hydrolysis of soybean polysaccharides. I. Purification and properties of hemicellulase from *Bacillus subtilis* No. 17]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 29. p. 170-75. March. [22 ref. Jap; eng]

• ***Summary:*** Reprinted from *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 19(12):585-90 (1972). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6184. Kiuchi, Kan; Ohta, Teruo; Kato, Nao; Ebine, Hideo. 1974. [Studies on enzymatic hydrolysis of soybean polysaccharides. II. Purification and properties of hemicellulase from *Bacillus pumilus* No. 24]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 29. p. 176-80. March. [18 ref. Jap; eng]

• ***Summary:*** Reprinted from *Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 20(6):239-43 (1973). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6185. Saio, Kyoko; Watanabe, Tokui. 1974. [Distribution of inorganic constituents (Calcium, phosphorus and magnesium) in soybean seed and their changes in food processing]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 29. p. 188-91. March. [9 ref. Jap; eng]

• ***Summary:*** Reprinted from *Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 19(5):219-22 (1972). Address: National Food Research Inst., MAFF, Koto-ku, Tokyo, Japan.

6186. Saio, Kyoko; Kajikawa, Masahiro; Watanabe, Tokui. 1974. [Deamidation of soybean CIF protein]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 29. p. 192-94. March. [4 ref. Jap; eng]

• ***Summary:*** CIF (cold insoluble fraction) protein is a unique type of protein. In chemistry, an "amide" is one of three kinds of compounds. "Deamidation is a chemical reaction in which an amide functional group is removed from an organic compound. In biochemistry, the reaction is important in the degradation of proteins because it damages the amide-containing side chains of the amino acids asparagine and glutamine" (Source: Wikipedia, Nov. 2008).

Reprinted from *Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 19(7):321-23 (1972). Address: 1&3. National Food Research Inst., MAFF, Koto-ku, Tokyo, Japan; 2. Food Research Labs., Takeda Chemical Industries, Ltd., Jusho-Nishinocho, Higashiyodagawa-ku, Osaka.

6187. Saio, Kyoko; Arai, K.; Watanabe, Tokui. 1974. Fine structure of soybean seed coat and its changes in cooking.

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Shokuhin Sogo Kenkyujo Kenkyu Hokoku (*Report of the National Food Research Institute*) No. 29. p. 195-200. March. [6 ref. Eng; Jap]
• ***Summary:*** Reprinted from *Cereal Science Today* 18(7):197-201 (1973). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6188. Shurtleff, William. 1974. Report on visit to Kikkoman Shoyu Co. and their Goyo Gura, Noda, Japan. March 4. Tokyo, Japan. 3 p. Unpublished typescript.
• ***Summary:*** Kikkoman makes shoyu at the Goyo Gura in the traditional way, using traditional equipment. It is a beautiful place. A detailed description of the process and equipment is given. Address: Tokyo.

6189. Singh, K.B. 1974. A review of the origin of soybean. *SABRAO Journal* 6(1):99-101. March. [11 ref]
• ***Summary:*** Contents: Introduction. Place of origin. Species relationships. Conclusion. A brief review with no original information. Address: Dep. of Plant Breeding, Punjab Agricultural Univ., Ludhiana, India; Present address: ICRISAT, Begumpet, Hyderabad 500016, India.

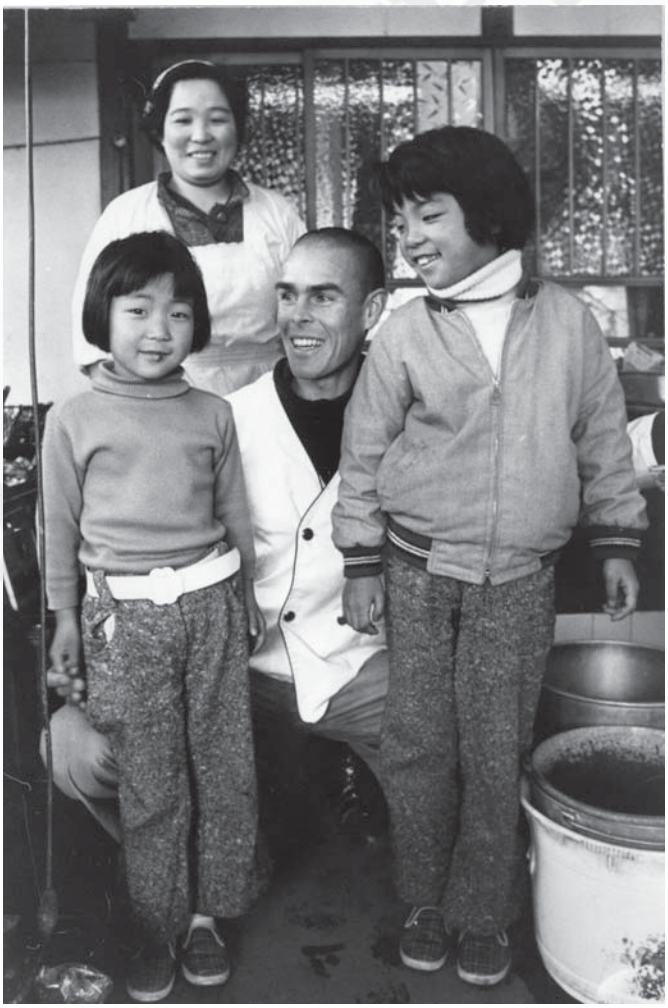
6190. Taira, Harue; Taira, Hirokadzu. 1974. [Influence of location on the chemical composition of soybean seeds. V. Influence of variety and location]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 29. p. 21-26. March. [9 ref. Jap; eng]
Address: National Food Research Inst., MAFF, Tokyo, Japan.

6191. Taira, Harue; Taira, Hirokadzu; Saito, Masataka. 1974. Daizu no ryûdo, hinshu oyobi saibai-nendo ga kagaku seibun sosei ni oyobosu eikyô [Effect of size of seed, variety, and crop year on the chemical composition of soybean seeds. I. Protein, carbohydrate and ash contents]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 29. p. 27-34. March. [10 ref. Jap; eng]
Address: National Food Research Inst., MAFF, Tokyo, Japan.

6192. Taira, Harue; Taira, Hirokadzu. 1974. Influence of location on the chemical composition of soybean seeds. IV. Amino acid composition. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 29. p. 75-86. March. [17 ref. Eng; jap]
• ***Summary:*** Reprinted from *Proceedings of the Crop Science Society of Japan* (*Nippon Sakumotsu Gakkai Kiji*) 42(2):185-96 (1973). Address: National Food Research Inst., MAFF, Koto-ku, Tokyo, Japan.

6193. Tanaka, Yoshikazu; Umeda, Keiji; Hashizume, Kazumoto; Watanabe, Tokuji. 1974. [Effect of ionizing radiation on soybean protein. I. Gelation of cathode-ray irradiated soybean protein solutions]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 29. p. 201-06. March. [18 ref. Jap; eng]
• ***Summary:*** Reprinted from *Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 20(4):137-42 (1973). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6194. William Shurtleff during his apprenticeship at Sangen-ya tofu shop, Nerima-ku, Tokyo, Japan (Photograph). 1974.



• ***Summary:*** In front of Shurtleff are Mr. and Mrs. Arai's two daughters. Standing in the background is Mrs. Arai, who worked each morning with her husband making tofu. She did all of the deep-frying. Behind her is her home; the tofu shop is under the same roof as the family home.

6195. Yoshikawa, Seiji. 1974. Shoyu no kikiaji shiken no kaiseki ni tsuite [Analysis of the results of taste-testing of shoyu]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report*

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of the National Food Research Institute) No. 29. p. 277-82. March. [Jap]
• ***Summary:*** Reprinted from *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 68(6):412-17 (1973). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6196. Hashizume, Kazumoto; Nakamura, N.; Watanabe, T. 1974. Daizu tanpakushitsu no teion shori ni yoru seijô henka. V. Kaimenjô tanpaku sozai no seizô-hô no kairyô [Studies on the changes of the properties of soybean protein by freezing. V. Improved production of new textured protein by freezing]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 21(4):141-45. [4 ref. Jap; eng]
Address: National Food Research Inst., Ministry of Agriculture & Forestry, Shiohama 1-4-12, Koto-ku, Tokyo, Japan.

6197. Hashizume, Kazumoto; Kosaka, K.; Koyama, E.; Watanabe, T. 1974. Daizu tanpakushitsu no teion shori ni yoru seijô henka. IV. Daizu tanpakushitsu no tôketsu ni yoru fuyôka o riyô shita shin tanpaku sozai no seizô-hô [Studies on the changes of the properties of soybean protein by freezing. IV. Production of new textured protein by freezing]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 21(4):136-40. [7 ref. Jap; eng]
Address: 1,3-4. National Food Research Inst., Ministry of Agriculture & Forestry, Koto-ku, Tokyo.

6198. Hashizumi, Kazumane; Iwane, Takeo; Watanabe, Tokuji. 1974. Kôri-dofu no moya tanshuku ni kansuru kenkyu [Studies of reduction of the moya (aging period) in the dried-frozen tofu manufacturing process]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 21(4):146-150. [Jap]*

6199. Kameda, Yukio; Ouhiro, S.; Matsui, K.; Kanatomo, S.; Hase, T.; Atsusaka, T. 1974. Antitumor activity of *Bacillus natto.* V. Isolation and characterization of surfactin in the culture medium of *Bacillus natto* KMD 2311. *Chemical and Pharmaceutical Bulletin* 22(4):938-44. April. [11 ref]
• ***Summary:*** In order to find a strain which had the strongest cytolytic [dissolution or disintegration of cells] activity on Ehrlich ascites carcinoma cells (solid type), the authors isolated 113 strains of *Bacillus natto* from straw collected in various parts of Japan, and measured the cytolytic activity of each by the cylinder plate method. One strain, tentatively called KMD 2311, was found to have the strongest cytolytic activity. Two types of cytolytic substances were found in this enzyme. One was found to be identical with surfactin; it accounted for about 20% of the cytolytic activity. Address: Faculty of Pharmaceutical Sciences, Kanazawa Univ., 13-1 Takara-machi, Kanazawa, Japan.

6200. Takeuchi, Tokuo. 1974. Studies on peptides in miso and soy-sauce. XII. Low molecular weight peptide in soybean miso. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 52(4):256-67. April. [12 ref. Eng]
Address: Food Research Inst., Aichi prefecture, Nishi-ku, Nagoya, Japan.

6201. Wanamaker, George E. 1974. Price incentives for soybeans could boost EC's production. *Foreign Agriculture.* May 20. p. 2-4.
• ***Summary:*** The European Community (EC)–leading market for U.S. soybeans- is considering a proposal to include soybeans in its common farm support program. A revised proposal recommending a Common Agricultural Policy (CAP) for soybeans was submitted to the Council of Ministers by the EC Commission on April 18, 1974. An earlier Commission proposal was approved "in principle" by the EC Council in early 1974. The EC's common farm policies were initiated in 1962. Oilseeds, particularly soybeans and meal, remain one of the most important agricultural commodities not subject to the EC's variable levy. Duty-free bindings on soybeans were negotiated by the U.S. in 1961, well before the EC oilseed CAP of 1967. The EC Commission indicated that the proposed support system could expand EC production of soybeans to 100,000 tons annually by 1978. Last year, the Community's total soybean output amounted to an insignificant 800 tons from about 9,900 acres [0.08 tons/acre or 2.7 bu/acre yield], predominantly in France, and probably only for seed.

The stated purpose of including soy-proteins in a CAP is to decrease the Community's growing dependence on imports, particularly of soybean meal for livestock feeding. Experimental production of soybeans has already been undertaken on 1,000 acres in southwest France. The projected rise in EC soybean acreage would probably occur largely in France, replacing corn area. Although Japan remained the leading market for U.S. soybeans and meal in 1973, the four next most important markets were West Germany, France, Denmark, and the UK. This large U.S. market share is a result of booming demand for livestock products in the EC. Address: Fats and Oils Div., Foreign Agricultural Service.

6202. Hashimoto, Hikotaka; Yokotsuka, Tamotsu. 1974. [Studies on sediment of shoyu. VIII. Mechanisms of sediment formation during the heating of raw *shoyu* (soy sauce)]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 52(5):328-34. May. [10 ref. Jap; eng]
Address: Central Research Laboratories, Kikkoman Shoyu Co., Ltd., Noda-shi, Chiba prefecture, Japan.

6203. Kitamura, Keisuke; Okubo, K.; Shibasaki, K. 1974. The purification of soybean 11S globulin with ConA-Sepharose 4B and Sepharose 6B. *Agricultural and Biological*

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Chemistry 38(5):1083-85. May. [12 ref. Eng]
Address: Faculty of Agriculture, Dep. of Food Chemistry, Tohoku Univ., Sendai, Japan.

6204. *Soybean Digest.* 1974. The Far East. May. p. 10-13.
• ***Summary:*** The countries of Korea, Taiwan, and Japan have long been important customers of U.S. soybeans. American Soybean Assoc. market development efforts in each of these countries are discussed. In Japan, the main goals are to increase consumption of soybean oil and meat. "In July 1972, a contract was signed between ASA and Yoshihara Oil Mill Ltd., one of Japan's leading oil manufacturers, to test market and promote identified 100% soy oil on a joint basis. Under the contract, ASA reimburses Yoshihara for 50% of their advertising costs up to a set figure.

"Yoshihara came out with three newly designed packs in varying sizes with the Japanese word 'Daizu' which means 'soybean' on the container front which are being marketed in the Tokyo and Osaka areas. Yoshihara has exercised maximum efforts in merchandising their new products...

"During the first phase of the joint ASA/Yoshihara program, Yoshihara sold 2,200,000 lbs. of identified soy oil, not including oil that was sold through Mitsui brand nor the identified soy oil sold as part of gift sets. Yoshihara has set a precedent by identifying their oil products which, most likely, will be followed by other processing companies in Japan."

Also discusses ASA efforts to introduce new soy foods in Japan through the school lunch program. In 1973 the item given the top rating was "Sloppy Joe," which contained 70% hamburger and 30% soy protein.

6205. Toi, Koji; Kakuta, Akio. Assignors to Ajinomoto Company, Inc. 1974. [Soybean protein films]. *Japanese Patent* 74 62,555. June 18. 3 p. Application filed 18 Oct. 1972. (Chem. Abst. 81:154059k). [Jap]*
• ***Summary:*** Carboxymethylated soybean protein yields good, thin packaging films. Thus 12.8 parts carboxymethylated soybean protein are stirred with 1.2 parts sodium hydroxide and 100 parts water, then spread on a paper.

6206. Asano, Mitsuo; Miyamoto, Yoshihiro; Okubo, Kazuyoshi; Shibasaki, Kazuo. 1974. [Studies on biosynthesis of 7*S* and 11*S* proteins, the main components of soybean protein. II. Preparation of the initial protein fraction by column chromatography and the some physicochemical properties]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 21(6):261-66. [Jap]*

6207. Kaizuma, Norihiko; Miura, Shoei. 1974. Variations of seed protein percentage and sulfur-containing amino acid content among various leguminous species. *Ikushugaku Zasshi* (*Japanese J. of Breeding*) 24(3):125-32. June. [21 ref. Eng; jap]
• ***Summary:*** "The authors investigated the intertribal and intergeneric variations of protein percentage and sulfur-containing amino acid among various leguminous species. Market distinctions were recognized among *Glycineae, Phaseoleae, Vicieae,* and *Trifolieae.* Soybean (*Glycine max*) was in one of the groups richest in both of protein percentage and sulfur-containing amino acid content among the leguminous species examined... One of the most striking features is that, of all the species tested, soybean (*G. max*), wild soybean (*G. soja*), and semi-wild soybean (*G. gracilis*), had the richest content not only in protein but also in sulfur-containing amino acid." Address: Faculty of Agriculture, Iwate Univ., Morioka, Japan.

6208. *Foreign Agriculture.* 1974. Koreans expand soybean output by planting rice paddy dikes. July 8. p. 8-9.
• ***Summary:*** Korea, which doubled its imports of U.S. soybeans last year, is again promoting a program to boost domestic oilseed production by planting soybeans on rice paddy dikes. This practice, which was mandatory under the Japanese occupation, had been abandoned until revived last year. In 1973, "dike-bean" acreage was estimated at 86,485 acres. The Ministry of Agriculture and Forestry (MAF) estimates that the maximum area for dike-beans now ranges from 93,900 to 135,900 acres. A significant portion of the crop harvested daily in the summer to be consumed as a cooked, green vegetable, much as Americans eat lima beans. Nearly all of Korea's soybean production is consumed as food. Industry sources estimate that 70% is used in homes for making soy sauce and paste, 20% for bean curd, and 10% for bean sprouts. Address: Office of U.S. Agricultural Attaché, Seoul.

6209. Ohkuro, Isamu; Suzuki, Kakuyoshi; Ito, S.; Komatsuzaki, T. 1974. Nattôkin zenshori hatsuka nezumi no ôshoku budô kyûkin kansen-shi ni taisuru teikôsei [Resistance of mice pretreated with *Bacillus natto* to lethal challenge with *Staphylococcus aureus*]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 89(1):35-40. July 10. [6 ref. Jap]
Address: Dep. of Microbiology, Tokyo Medical College, Tokyo; The Kohno Clinical Medical Research Inst., Tokyo. All: Japan.

6210. Toi, Koji; Kakuta, Akio. Assignors to Ajinomoto Company, Inc. 1974. [Carboxymethylated soybean proteins]. *Japanese Patent* 74 76,782. July 24. 3 p. Application filed 28 Nov. 1972. (Chem. Abst. 82:44977w). [Jap]*
• ***Summary:*** Carboxymethylated soybean protein salts as hydrophilic agents for cosmetics, films, ointments, and polyester textiles.

6211. United Press International (UPI). 1974. Ralston in

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Japan venture. *New York Times.* July 31. p. 51.
• ***Summary:*** "St. Louis, July 30 (UPI)–The Ralston Purina Company announced today it was joining the Fuji Oil Company of Osaka, Japan, in a venture to manufacture in Japan structured soya protein food products developed by Ralston Purina."

These will be used as extenders for fish, poultry and meat products.

Note: This is the earliest document seen (Jan. 2014) concerning the joint venture that would soon become known as Fuji-Purina.

6212. Greenshields, Bruce L. 1974. Changes in exchange rates: Impact on U.S. grain and soybean exports to Japan. *USDA Economic Research Service, ERS Foreign* No. 364. 17 p. July. [21 ref]
• ***Summary:*** "The U.S. dollar/Japanese yen exchange rate changed several times in 1971-73 after a long period of stability. The rate had been 360 yen per dollar from April 24, 1949, to August 28, 1971, when the yen floated. Changes that occurred thereafter resulted in a 32 percent increase in the purchasing power of the Japanese yen in the U.S. export market by the end of 1973." Address: Economist, Foreign Demand and Competition Div.

6213. *Sunset* (*Menlo Park, California*). 1974. Tofu in 1974: In this inflationary year tofu makes great budget sense. But this protein custard is a mystery to too many cooks. 153:104-06. July.
• ***Summary:*** This pioneering and very important, positive article was generated (at least in part) by an Azumaya P.R. campaign at a time when meat prices were skyrocketing.

"As food prices rise, Westerners are learning about soybean curd, an inexpensive protein food sold most often under its Japanese name, *tofu.* Oriental cooks have long known the value of this nearly tasteless substance with the texture of custard. (The Chinese call it *dow foo.*) And now various styles are becoming more widely available.

"Some people may hesitate to try tofu for fear their families won't accept it. They should realize that tofu is bland and readily assumes the flavors of whatever ingredients you use with it. The recipes here all have Oriental flavors, including such favorites as sweet and sour, teriyaki, and sushi; all are simple and quick to prepare. But the versatility of tofu makes it an appropriate ingredient for other dishes ranging from appetizers and soups to main dishes and desserts.

"The companies that make the various styles of tofu are frequently small family-run operations; products and their names vary slightly from company to company..."

"For all types of tofu, soybeans are ground, mixed with water, and cooked until a milky liquid [soymilk] is extracted and drained off. A coagulant is added to set the liquid, making a curd. How the curd is handled determines the product."

A table (with 4 columns) describes six types of tofu: (1) Fresh soybean pudding (called Dow foo fah in Chinese and having no Japanese name) is sold in portions of about 1 lb water packed in plastic tubs. (2) Soft tofu (called Suey dow foo in Chinese and Kinugoshi in Japanese) is sold in 3/4 to 1-lb blocks water-packed in plastic tubs. (3) Medium-firm tofu (Japanese style, called Dow foo in Chinese and Tofu in Japanese) is sold in 1 to 1¼-pound blocks water-packed in plastic tubs or cartons. (4) Hard tofu (Chinese style, called Dow foo yuen in Chinese and having no Japanese name) is sold as two or more slices (about 6 oz each) water-packed in bags or plastic tubs. (5) Raw-fried tofu (called *Hung siu dow foo* in Chinese and *Nama-age* in Japanese) is sold in slices or sticks of various sizes dry-packed in bags or plastic tubs. (6) Deep-fried tofu puffs (called *Dow foo bok* in Chinese and *Age* {ah-gay} or *abura-age* in Japanese) are sold in small dense cubes usually dry-packed about 15 in a 5-oz package (Chinese product) or in large puffy pieces usually dry-packed about 3 in a 1½-oz package (Japanese product).

Note: This is the earliest English-language document seen (April 2013) that contains the term "fried tofu puffs" or the term "Deep-fried tofu puffs" or the term "Raw-fried tofu."

Photos show (1) Tofu slices taken from the rinsing tank and being packed into plastic tubs at Azumaya, (2) A large photo shows 8 types of Japanese- and Chinese-style tofu on a table near a wok and skimmer: Medium firm tofu, Fresh soybean pudding, Soft tofu (Japanese style), Soft tofu (Chinese-style), Hard tofu, raw fried tofu, Deep-fried tofu puffs (Chinese-style), and Deep-fried tofu puffs (Japanese-style). (3) Teriyaki-glazed raw-fried tofu cubes.

Recipes are given for Tofu and water cress soup, Tofu orange almond pudding, Stir-fried chicken and tofu, Tofu teriyaki appetizers, Fried tofu salad with peanuts, Fried tofu with pork sauce, Rice-filled agé appetizers (Sushi), and Sweet and sour tofu.

6214. American Soybean Assoc. 1974. The gold that grows (Color motion picture). Hudson, Iowa. 20 minutes. 16 mm. Summarized in Soybean Digest, Nov. 1974, p. 16, May 1975, p. 45, and June 1976, p. 36. *
• ***Summary:*** This color movie, released in 1974 by the American Soybean Assoc., is designed to tell the American farmer how his funds are being used to develop, improve, and maintain a profitable market for his soybeans. Featuring Earl Butz, ASA foreign staff members, and foreign industry leaders, the film shows soybean market promotion activities in Europe, East Asia, and Latin America.

A fast-moving international documentary on soybean products and their uses, this film covers soybean meal in Europe, livestock production and soy oil promotion in Italy, soy foods in the Orient [Japan] and Latin America, soybean meal in poultry production in Japan and Mexico plus the

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educational programs that back up these projects.

Soybean Digest (May 1975, p. 45) estimated that "3½ million people have viewed ASA's story on film, since its release in Aug. 1974." In 1975 it won the CINE Golden Eagle award.

6215. Continental Grain Co. 1974. You wouldn't think it, but she consumed a ton of grain and soybeans last year (Ad). *Soybean Digest.* Aug. p. 5.
• ***Summary:*** The top half of this full-page ad shows a slender ballerina doing a pose on the floor. The text reads: "Assuming she's an average American, she at about 300 lbs. of grain in the form of baked goods and other cereals and soy products.

"But that's the least of it. She ate 178 lbs. of beef–which took 600 lbs of feed concentrate [mostly corn and soybeans] to produce. She ate 61 lbs. of pork–which took 535 lbs. of feed concentrate. She ate 51 lbs. of chicken and turkey, plus 292 eggs–which took 500 lbs of feed concentrate.

"She consumed 120 quarts of milk, 14 lbs. of cheese, 5 lbs. of butter, and other dairy products–which took 210 lbs of feed concentrate. Add it all up and you'll see what we meant by a ton [2,000 lbs.] of grain and soybeans. The point is this: we Americans consume an extremely generous portion of the grain we produce–mostly in the form of meat.

"In the European Common Market, per capita meat and poultry consumption is only 60% of ours. In the Soviet Bloc, less than 50%. In Japan, only 10%.

"The grain and soybeans we don't consume go into exports to help us achieve a favorable balance of trade. You might say its a case of having our cake and meat as well." Address: 2 Broadway, New York, NY 10004.

6216. György, Paul; Murata, K.; Sugimoto, Y. 1974. Studies on antioxidant activity of tempeh oil. *J. of the American Oil Chemists' Society* 51(8):377-79. Aug. [4 ref]
• ***Summary:*** A powerful water-soluble antioxidant has been isolated from tempeh and recognized as 6, 7, 4'-trihydroxyisoflavone. Crude oil extracted from dried tempeh (with 2 parts hexane and 1 part alcohol and recovered by evaporation of the solvents) contains this antioxidant, and when small amounts of this oil are added to typical vegetable oils or lard it protects them from autoxidation, i.e. prevents the typical rise in their peroxide value, even after exposure to air and at temperatures of up to 60ºC for many weeks. "This mixture appears to be, at present, the best natural way of preserving various kinds of oil in fresh condition for long periods of time. Soy oil, which under ordinary commercial conditions (in bottles without complete elimination of air), develops undesirable flavor within a few months, retains, for an almost indefinite period of time when mixed with a small amount of tempeh oil, its normal physical, chemical, and gustatory qualities."

The tempeh isoflavone, however, did not show any protective antioxidant effect when it was added to soybean powder or soybean oil. Address: 1. Dep. of Pediatric Research, Philadelphia General Hospital, Philadelphia, Pennsylvania 19104; 2-3. Faculty of Science of Living, Osaka City Univ., Osaka, Japan.

6217. Hirota, Takako; Goto, S.; Katayama, M.; Funahashi, S. 1974. Note: Fractional analyses of soybean sterols in four classes. *Agricultural and Biological Chemistry* 38(8):1539-40. Aug. [4 ref]
Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Bunkyo-ku, Tokyo 113, Japan.

6218. Kinugasa, Yosuke. 1974. Takokuseki kigyô e no senryaku–Gendai Nihon kigyo bunseki: Kikkôman Shôyu K.K. [Toward a strategy of multinationalism–An analysis of modern Japanese companies: Kikkoman Shoyu Kabushiki Kaisha]. *Kikkoman Shoyu Kabushiki Kaisha Hanbai Shiryo* No. 694. p. 12. Aug. Reprinted from Keizai Jurai, 4 & 5 (July/Aug. 1974). [Jap]*
• ***Summary:*** This serial publication from Kikkoman is more a series of sales materials.

6219. Saio, Kyoko; Sato, Iwao; Watanabe, Tokuji. 1974. Food use of soybean 7S and 11S proteins: High temperature expansion characteristics of gels. *J. of Food Science* 39(4):777-82. July/Aug. [12 ref]
• ***Summary:*** The authors studied aburage [deep-fried tofu pouches], which is one of Japan's most popular foods derived from Tofu, soybean curd. Thin sliced Tofu, after being dehydrated by pressing, is deep-fried twice, first in oil at low temperature (110-120ºC) and then at high temperature (180ºC). During the low-temperature deep-frying, the Tofu gel swells to more than 3 times its original area and its texture becomes very porous.

The effect of different coagulant types and concentrations, pH levels, and ratio of 7S to 11S proteins was studied. Aburage expands more when made with a calcium-type than with an acid-type coagulant. Calcium chloride works very well, an expansion increases with its increasing concentration and the increased use of NaCl in the buffer. 11S proteins expand better. Address: 1&3. National Food Research Inst., MAF, 12-4-1 Shiohama, Koto-ku, Tokyo; 2. Kyowa Hakko Kogyo Co., Tokyo.

6220. Seim, D. 1974. Japanese complain: You don't deliver the quality soybeans you grow. *Farm Journal* 98:34. Aug. *

6221. Yamamoto, Shusaku; Hirooka, Hitoshi. 1974. Partial purification and properties of glutaminase from *Aspergillus sojae. Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 52(8):570-76. Aug. [50 ref. Eng]
• ***Summary:*** "In Japan, glutaminase (EC 3.5.1.2, L-glutamine amidohydrolase) from *Aspergillus sojae* is important as

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an enzyme which catalyzes the conversion of glutamine to glutamic acid in the *shoyu* brewing process." Address: Research Section, Kansai Plant, Kikkoman Shoyu Co., Ltd., Takasago, Hyogo, Japan.

6222. Yamamoto, Shusaku; Hirooka, Hitoshi. 1974. Production of glutaminase by *Aspergillus sojae. Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 52(8):564-69. Aug. [11 ref. Eng]
• ***Summary:*** High-quality shoyu contains a high concentration of glutamic acid, which is essential to the good taste of shoyu. Shoyu molds were tested for their ability to produce the enzyme glutaminase, which catalyzes the conversion of glutamine into glutamic acid. Various conditions of mold culture were also tested. A mutant strain of *Aspergillus sojae,* derived from a selected strain, was found to produce high-quality shoyu. Address: Research Section, Kansai Plant, Kikkoman Shoyu Co., Ltd., Takasago, Hyogo, Japan.

6223. Dosti, Rose. 1974. Inside those tiny tiers in a Japanese picnic: Colorful array finger food. *Los Angeles Times.* Sept. 5. p. L1.
• ***Summary:*** When preparing for a picnic, the Japanese put their food in a three-tiered box named a *jyubako* [jûbako], which is often wrapped in a *furoshiki* (large handkerchief). One of the dishes served at Japanese picnics is Inari-sushi [Inari-zushi], "a tofu-filled football-shaped hors d'oeuvre,..."

The recipe for "Inari-sushi" begins: "Cut fried tofu in halves (to form half-moon with pocket). Pour boiling water over tofu and let stand for 15 seconds to remove oils from tofu. Drain. Then cook in dashi..."

6224. *Soybean Digest.* 1974. Still no soybean futures trading in Japan. Sept. p. 38.
• ***Summary:*** "Soybean futures prices have been so wild that the Japanese have decided to postpone re-opening futures trading in imported soybeans in Tokyo. Trading in soybeans was originally suspended by the Tokyo Cereal Exchange last July due to the wild price springs surrounding the export embargo announcement. Officials had planned to begin trading again when times got to be a little more normal, but weather in the U.S. has caused a new round of wild fluctuations this summer that will delay indefinitely the resumption of soybean futures trading in Japan."

6225. Tsai, Kuo-Hai; Lu, Ying-Chuan; Oka, H.I. 1974. Mutation breeding of soybean for the resistance to rust disease. *SABRAO Journal* 6(2):181-91. [10 ref. Eng]
• ***Summary:*** "Soybean is a new crop in Taiwan. There were no bean-producing varieties when we initiated our soybean breeding experiment in 1949; all native varieties were of green-manure type. Tests of introduced varieties showed that there were 2 adaptive cropping seasons, the spring (seeded in Feb.-March) and the summer (seeded in July). Later, fall cropping (seeded in early Oct.) became required for profitable rotation with rice." Address: 1-2. Food Crop Research Inst. and Dep. of Agronomy, National Chung-Hsing Univ., Taichung, Taiwan 400; 3. National Inst. of Genetics, Mishima City 411, Japan.

6226. Brown, Lester R.; Eckholm, Erik P. 1974. Our dietary habits: Should they be changed? For what reasons? *Vital Issues* 24(2):104. Oct. [1 ref]
• ***Summary:*** This Vital Issue is drawn from the authors' forthcoming book *By Bread Alone* (Praeger 1974). "Since the time of Malthus, the world food problem has been seen as a food-population problem. Currently population growth continues to generate demand for more food, but, in addition, affluence has emerged as a major claimant on world food resources." It examines the encouraging shift from beef and animal products to vegetable sources of protein, and the economy, ecology, health issues, inefficiency, and waste in beef production. A chart gives per capita meat consumption (including poultry but not fish) for various countries in 1960 and 1972, and the percentage increase during that time as follows (pounds per year): USA (208, 254, +22%), Australia (234, 235, 0%), France (168, 212, 26%), Canada (167, 211, 26%), United Kingdom (158, 171, 8%), West Germany (144, 192, 33%), Sweden (109, 112, 3%), USSR (80, 104, 30%), Italy (70, 136, 94%), Yugoslavia (62, 75, 21%), Spain (51, 96, 88%), Japan (14, 41, 364%). Address: 1. Senior Fellow; 2. Associate Fellow. Both: Overseas Development Council, Washington, DC.

6227. Hashimoto, Hikotaka; Yokotsuka, Tamotsu. 1974. Studies on sediment of shoyu. IX. Role of hydrophobic bonds among protein molecules in sediment formation during heating of raw *shoyu* (soy sauce). *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 52(10):747-58. Oct. [50 ref. Eng]
Address: Central Research Laboratories, Kikkoman Shoyu Co., Ltd., Noda, Japan.

6228. **Product Name:** [Marusan Soymilk (Plain, or with Barley Malt Syrup and Konbu); Mineral Soymilk (Plain, or with Barley Malt)].
Foreign Name: Marusan Doujan (or Doujang) (Plain or Bakuga-iri); Mineraru Doujan (or Doujang) (Plain or Bakuga-iri).
Manufacturer's Name: Okazaki Marusan K.K. (Marusan-Ai Co., Ltd.).
Manufacturer's Address: 1 Aza Arashita, Niki-cho, Okazaki-shi, Aichi-ken 444-21 Japan.
Date of Introduction: 1974 October.
Wt/Vol., Packaging, Price: 180 ml foil retort pouch (Doi-Pak).
How Stored: Shelf stable; refrigerate after opening.

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New Product–Documentation: K. Tsuchiya. 1982. Dec. Tonyu [Soymilk. 2nd ed.]. p. 72. In Oct. 1974 Okazaki Marusan introduced 4 soymilk products, each in 180 ml Doi Pak: Mineraru Doujan, Mineraru Doujan Bakuga-iri, Marusan Doujan, and Marusan Doujan Bakuga-iri.

Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that Okazaki Marusan first made commercial soymilk in Japan in 1974.

Label. 1983. Tetra Brik carton, 200 ml. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center; Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-68, 70-71. Their first soymilk, called Doujang (or Doujan, the Chinese word for "soymilk") contained extracts of pearl barley and konbu (a mineral-rich sea vegetable) and was sold at health food stores. In 1979 they introduced a 250-ml gable top carton and in 1980 a 200-ml Tetra Brik. By 1982 Marusan was Japan's second largest soymilk manufacturer. They may have been the largest, since much of their soymilk was sold in bulk to other companies, who repackaged it and sold it under their own brands.

Soya Bluebook. 1987. p. 90.

6229. Saito, Takahide; Iso, N.; Mizuno, H.; Kaneda, H.; Suyama, Y.; Kawamura, S.; Osawa, S. 1974. Conformational change of a natto mucin in solution. *Agricultural and Biological Chemistry* 38(10):1941-46. Oct. [30 ref]
• ***Summary:*** The mucin obtained from a natto sample was found to be composed of 58% gamma-polyglutamic acid and 40% polysaccharide. Address: Dep. of Food Science and Technology, Tokyo Univ. of Fisheries, Konan, Minato-ku, Tokyo, Japan.

6230. *Soybean Digest.* 1974. The international outlook of the soybean market. Oct. p. 8-10.
• ***Summary:*** Contents: Introduction. Western Europe. Italy (Ferruzzi). Japan. Taiwan and Korea. Latin America.

"Italy: ASA's [American Soybean Assoc.] already made a solid start in expanding soy oil prospects in Europe with an identified soy oil campaign now in its second year in Italy. Watts calls the agreement with Ferruzzi and Company the one outstanding market development activity carried out in Europe recently.

"'Di Soia Si Vivra' (with soy we live), Italian housewives heard again and again during the advertising campaign. And soy oil sold. 'After 7 months, over 50% of the Ferruzzi production at his two plants was identified soy oil. After 12 months, 96% of it was identified soy,' Watts says. 'In the 12 months of the campaign about 20 million lbs. of soy oil were sold to the Italian people.'

"A major competitor began a similar campaign on its own only a few weeks after Ferruzzi started his promotion effort. 'Now, at least 11 brands of soy oil are on the shelves in Italy,' reports Watts."

Note: This is the earliest document seen (April 2007) concerning the work of Ferruzzi and Co. with soybeans.

A pie chart shows 1974-75 soybean sales commitments: EEC 45%, other Western Europe 6.1%, Japan 21.9%, China 4%, other 4%, undesignated 19.5%.

Tables show: (1) U.S. soybean exports (July to June fiscal year basis) for two years (1972-73, and 1973-74) in quantity (million bushels) and value (million dollars) to: EEC, Spain, Canada, Israel, Japan, Soviet Union, China, Taiwan, unidentified (transshipments), other. (2) U.S. soybean meal exports; the five biggest buyers are West Germany, Japan, Italy, Netherlands, and Poland-Danzig. (3) U.S. soy oil exports; the five biggest buyers are Pakistan, Peru, Mexico, Canada, and Yugoslavia.

6231. Sugimoto, Hiroshi. 1974. Treatment of soybean spent solubles by means of yeast cultivation. *J. of Food Science* 39(5):934-38. Sept/Oct. [31 ref]
• ***Summary:*** "Spent solubles from the preparation of soybean protein isolates and heat-coagulable whey proteins account for about one-fourth of the original dry weight of defatted soybean flakes." These spent solubles usually have been disposed of as sewage. However, because of their high biological oxygen demand (BOD) or chemical oxygen demand (COD), they present a serious waste disposal problem. Some yeast strains, particularly *Candida quilliermondii* or *Debaryomyces kloeckeri* (*D. hansenii*) grow very well on the spent solubles without supplementation. Address: Central Research Lab., Kikkoman Shoyu Co. Ltd., Noda-shi, Chiba-ken, Japan.

6232. Claiborne, Craig. 1974. Traditional dining in Japan: In the evening and in the morning, too. *New York Times.* Nov. 3. p. 80.
• ***Summary:*** He enjoyed shioyaki, a wedge of fresh salmon, briefly salted and then broiled. It was accompanied "by a piping hot bowl of miso or bean or bean curd soup containing small squares of bean curd and midget-size brown wild mushroom caps,..."

In giving a history of oden restaurants in Japan, the writer explains that they were established as places where men could express their frustrations, hurt feelings or pent-up anger. Oden portions are typically large in size. Choices include "deep-fried bean curd patties (ganmodoki) made with chopped vegetables."

6233. Oberdorfer, Don. 1974. The Japanese have a word for it: Sushi. *Washington Post.* Nov. 7. p. E12.
• ***Summary:*** Describes a visit to a neighborhood tofu shop in Tokyo–one of 8,200 in Tokyo and 72,000 throughout Japan. On Nov. 11 they give special discounts in observance of "Sushi Day," a festival the shopkeepers established a few years ago. Sushi originated in China about 1,700 years ago, but the Japanese have developed the modern version.

A photo shows the "chief clerk of the sushi parlor

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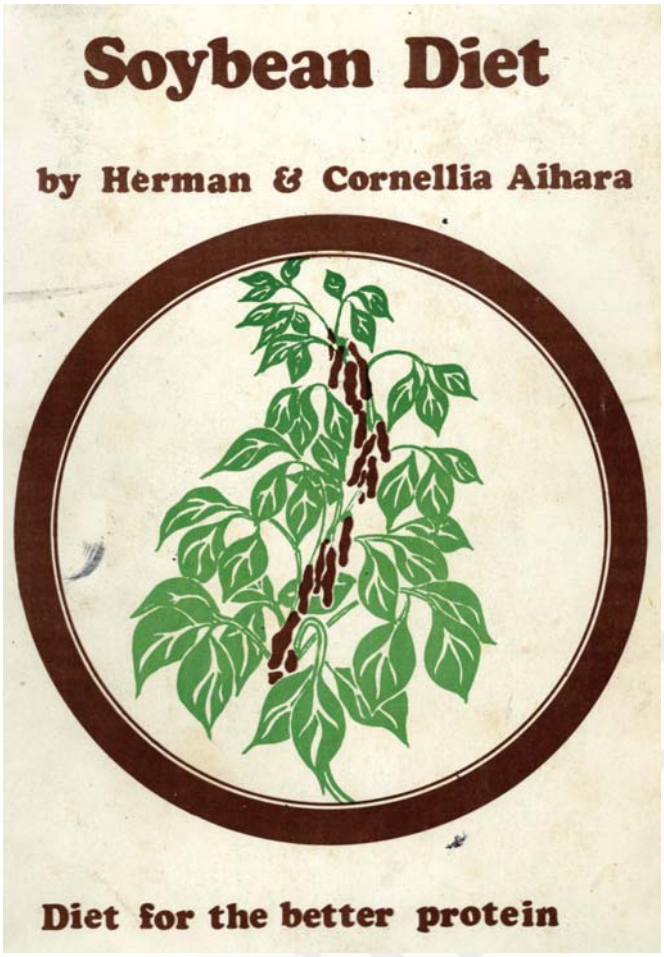
making 'inari sushi,' beancurd coverings fill with vinegared rice,..."

6234. Aihara, Herman. 1974. Soybean diet: Diet for the better protein. Oroville, California: George Ohsawa Macrobiotic Foundation. xi + 164 p. Nov. Illust. Index. 21 cm.



• ***Summary:*** This book is an expanded version of "Miso and Tamari" (1972). Contents: Preface. Introduction. 1. Theory: Steak vs. gasoline, is animal protein indispensable, protein requirements, essential amino acids–law of all or nothing, minimum daily requirement of essential amino acids.

2. Miso: Introduction, the origin of miso, kinds of miso, ingredients, how to make miso, value of miso, miso in the treatment of tuberculosis, how to make miso at home using mugi koji, recipes using miso for warmer seasons, recipes using miso for colder times.

3. Tamari or traditional soy sauce: History, chemical change of tamari, how to make tamari soy sauce at home, how to use soy sauce, soy sauce cooking for warmer times, soy sauce cooking for colder times.

4. The other soybean and high protein foods: How to make tofu at home, how to make tofu plaster, how to make

agé–deep fried tofu at home, how to make seitan at home. 4A. Tofu, seitan, and gluten cooking for warmer times: How to make tofu, nigari, and bulk tofu at home, how to make wheat gluten, seitan and fresh wheat *fu* at home. 4B. Tofu, seitan and gluten cooking for colder times. Appendix: Cutting styles, useful information. Bibliography.

Large photos near front of book show: (1) Herman Aihara. (2) Cornellia Aihara looking very happy at her stove. Address: Oroville, California.

6235. *Soybean Digest.* 1974. "Sloppy Joes" introduce new soy food to Japan. Nov. p. 20.

• ***Summary:*** "'Sloppy Joes'–hamburgers containing 30% [textured] soy protein introduced to Japanese school children in 1972 have resulted in widespread use of textured soy protein by Japanese consumers." A 1972 survey of 301 school children by the Japanese School Lunch Menu Study Institute showed that they liked Sloppy Joes more than hamburger. Now many chain stores and supermarkets have started selling Sloppy Joes. Daibi, the largest supermarket in Japan has started selling Sloppy Joes in their cafeteria.

6236. *Soybean Digest.* 1974. East meets West in soybecue sauce. Nov. p. 38.

• ***Summary:*** "A Japanese scientist has added soybean miso to American barbecue sauce in a new East-meets-West food, 'soybecue' sauce. Ichiro Ouchi, studying at the USDA research laboratory in Peoria, Illinois, replaced part of the

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catsup in conventional barbecue sauce with red miso, a fermented soy food, to formulate the new sauce...

"Mr. Ouchi is studying the use of miso made from U.S. soybeans in American foods like meat sauces, salad dressings and snack dips and spreads. His research with Hwa Lih Wang, biochemist, and Dr. C.W. Hesseltine is sponsored by the Shinshu Miso Association, an organization of Japanese companies."

6237. **Product Name:** Sunwheel Organic Hatcho Miso, Mugi Miso, Tamari, and Shoyu.
Manufacturer's Name: Sunwheel Foods (Importer-Distributor). Made in Japan. Imported from Muso Shokuhin.
Manufacturer's Address: London, England.
Date of Introduction: 1974 November.
How Stored: Shelf stable.
New Product–Documentation: CSP form filled out by Simon Bailey. 1988. Sept. 28. Gives date of introduction as 1974. In 1984 Sunwheel divided and sold its Sunwheel brand to Northumbrian Fine Foods. Its high quality Japanese products are now imported by Clearspring Natural Grocer. Peter Bradford is the contact person. Japanese agent is Mitoku. Various Japanese manufacturers.

Interview with Bill Tara, founder of Sunwheel. 1991. Aug. 18. By late 1974 Sunwheel Hatcho Miso, Mugi Miso, and Tamari were on the market, imported from Muso (Yuko Okada) in Japan. By 1979 Sunwheel was sold to a larger health food company.

6238. Ohkuro, Isamu; Suzuki, K.; Ito, S.; Komatsuzaki, T. 1974. Nattô-kin zenshochi ni yoru ôshoku budô kyûkin teikô hatsuka nezumi no momo to kessei-to no kôso [Enzymatic activity of the spleen and serum in mice with *Staphylococcus aureus* resistance induced by pretreatment with *Bacillus natto*]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 89(6):383-88. Dec. 10. [10 ref. Jap]
Address: Dep. of Microbiology, Tokyo Medical College; and Kohno Clinical Medical Research Inst., Tokyo.

6239. Hughes Markets. 1974. Happy New Year '75 (Ad). *Los Angeles Times.* Dec. 26. p. K20.
• ***Summary:*** The section titled "Foods of the Orient" includes: Kikkoman soy sauce, one gallon can $3.29. "JFC Kinako 7 oz. pkg. Soy bean flour–35¢. Misuzu Koya Dofu 3.5 oz. box. Dried Soybean Cake [Dried frozen tofu]–69¢... Age [Deep fried tofu pouches, sold in the fresh produce dept.] 59¢ package."

Also includes Tempura batter mix, New crop botan rice, Motohiko Sapporo maki–Rolled Tangle [konbu]. Azuma yokan–Bean jelly [azuki]. JFC or Hime Shitake–Shiitake dried mushrooms. Hime kampyo [kanpyo]–Dried gourd strips. Take waribashi–Bamboo chopsticks. Kamaboko. Blue chip stamps.

6240. *SoyaScan Notes.* 1974. Chronology of soybeans, soyfoods and natural foods in the United States 1974 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1974 March. The first issue of *Vegetarian Times* published by Paul Obis in Chicago.

1974 April. Bob Gerner (of Westbrae) and William Shurtleff (guide) travel throughout Japan searching for quality sources of traditional miso and soy sauce. Right after the trip, Westbrae starts importing these products.

1974 Aug. 9. President Nixon, elected in 1968 and 1972, resigns after the Watergate scandal. Gerald Ford succeeds him as president. Butz continues as Secretary of Agriculture.

1974. Brazil passes West Germany to become the world's second largest soybean crusher, after the U.S.

1974 late. Miles Laboratories / Worthington introduces the Morningstar Farms line of meat analogs based on spun soy protein fiber. Sold nationally at U.S. supermarkets.

1974 late. The Farm in Summertown, Tennessee, publishes *Yay Soybeans!,* a 14-page booklet containing many innovative soyfoods recipes, such as "soy ice cream–ice bean," soy yogurt," "soy cheese," "soy cheesecake," "soy mayonnaise," and "soysage" (a meatless okara & soymilk sausage). Most of the dairylike products were made with fresh or cultured soymilk. The Farm now grows 150 acres of soybeans to feed its community of 800 people. It has just established Plenty, a non-profit corporation "To help share out the world's food, resources, materials, and knowledge equitably for the benefit of all."

1974. The Farm in Summertown, Tennessee, publishes *Hey Beatnik,* which contains the earliest know use of the term "Soy Dairy." The Farm's soy dairy now makes 60 gallons of soymilk a day at a total cost of $0.30 per gallon.

1974. *Tofu Recipes,* the first book on tofu in English, written and self-published by Grace Kikuchi in Ann Arbor, Michigan. Spiral bound and 47 pages long, it gives a recipe for homemade tofu and uses tofu largely with fish and meat.

1974 Nov. World Food Conference in Rome. Delegates from 130 UN member countries adopt an international strategy to overcome world hunger and malnutrition.

1974-1975? Eden Foods starts to import natural foods, including miso and shoyu, from Japan.

6241. Tsumura, Haruo; Hashimoto, Y.; Kubota, H. Assignors to Fuji Oil Company, Ltd., Japan. 1974. Preparation of soy cheese. *U.S. Patent* 3,857,970. Dec. 31. 1 p. Application filed 17 April 1973. [5 ref]
• ***Summary:*** "The soy cheese... is made without milk solids by coagulating a fermented emulsion containing soy milk and a fat composition with about 0.05 to about 1.0 weight percent of a coagulant selected from the group consisting of aldonic acid lactones, uronic acid lactones, and mixtures thereof. A flavor producing proteolytic enzyme can be added to the soy milk before formation of the emulsion, to the

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emulsion prior to fermentation, or to the cooked curd without adversely affecting the texture and body of the resultant soy cheese."

Note: This is the earliest English-language document seen (Jan. 2005) with the term "soy cheese" in the title.
Address: 1. Osaka; 2. Izumi; 3. Izumiotsu. All: Japan.

6242. Ebine, Hideo. 1974. Miso no shokuhin tenkabutsu no mondai [The problems of food additives used in miso]. *Shoku no Kagaku* (*Food Science Journal*) No. 21. p. 46-53. Dec. [Jap]
Address: Norinsho Shokuhin Sogo Kenkyujo, Hakko Bu-cho.

6243. Inamori, Michisaburo. 1974. Namemiso to miso no kakô [Finger-licking miso and processing miso]. *Shoku no Kagaku* (*Food Science Journal*) No. 21. p. 77-88. Dec. [Jap]
Address: Kaneju Shokuhin K.K., Japan.

6244. Kawamura, Moriyasu. 1974. Amamiso [Sweet red miso]. *Shoku no Kagaku* (*Food Science Journal*) No. 21. p. 54-60. Dec. [Jap]
Address: K.K. Hinode Miso Jozo, Moto.

6245. Kawamura, Wataru. 1974. Miso no rekishi [History of miso]. *Shoku no Kagaku* (*Food Science Journal*) No. 21. p. 14-20. Dec. [Jap]
• ***Summary:*** This entire issue contains articles written by Japan's best miso researchers. Address: Shokubutsushi-ka, Japan.

6246. Kitagawa, Isao; Yoshikawa, M.; Yosioka, I. 1974. Structures of three soybean saponins: Soyasaponin I, II, and III. *Chemical and Pharmaceutical Bulletin* 22(12):3010-13. Dec. [12 ref]
Address: Faculty of Pharmaceutical Sciences, Osaka Univ., Japan.

6247. Kondo, Hiroshi. 1974. Miso bunka-ron [Comments on miso as a culture]. *Shoku no Kagaku* (*Food Science Journal*) No. 21. p. 89-90. Dec. [Jap]
Address: Shokubutsu-shi Kenkyu-ka (Food history researcher).

6248. Matsushita, Zenichi. 1974. Miso no shurui [Varieties of miso]. *Shoku no Kagaku* (*Food Science Journal*) No. 21. p. 21-25. Dec. [Jap]
Address: Chuo Miso Kenkyujo, Tokyo, Japan.

6249. Miyasaka, Masaaki. 1974. Kansô miso [Dried miso]. *Shoku no Kagaku* (*Food Science Journal*) No. 21. p. 72-76. Dec. [Jap]
Address: Miyasaka Jozo K.K., Japan.

6250. Miyazaki, Motoyoshi. 1974. Miso no eiyô [Nutritional value of miso]. *Shoku no Kagaku* (*Food Science Journal*) No. 21. p. 32-34. Dec. [Jap]
Address: Kokuritsu Eiyo Kenkyujo.

6251. Nakano, Masahiro. 1974. Miso no jukyû no genjô to shôraisei [The present condition and the future prospects for the demand and supply of miso]. *Shoku no Kagaku* (*Food Science Journal*) No. 21. p. 26-31. Dec. [Jap]
Address: Professor, Meiji Daigaku Nogakubu.

6252. **Product Name:** [Vita Tofu].
Foreign Name: Vita Tofu.
Manufacturer's Name: Nepal Soya Industries (Soya Food Industry; Kathmandu Tofu Shop).
Manufacturer's Address: 9/374 Bhedashing, Jamguthi, Kathmandu, Nepal.
Date of Introduction: 1974 December.
New Product–Documentation: Soyfoods Center Computerized Mailing List. 1983. June 20.

Letter from Miss Ruth Angove, Nutrition Advisor, United Mission to Nepal, G.P.O. Box 126, Kathmandu, Nepal. 1983. Aug. 16. Concerning the small tofu shop you asked about in your letter of 20 Nov. 1982, two men work there, Achyut Anand Baidja [Achutananda Vaidya; apparently the owner from the Newar ethnic group], and Bhenda Singh. The address is Jyanguthi 9/374, Kathmandu. "He is employed at the Government Food Research Lab., and has been in Japan in 1974, where he learned the tofu process and bought a small presser. He makes tofu in a dark room off a filthy courtyard. It is not fly screened. Soaked beans were draining on a piece of old fly screening and two small boys sitting on the floor were cutting up buffalo meat for sun drying. He told me that it is difficult to do the process in Nepal. He delivers to the vegetable market in the morning. The stall holder keeps the tofu in water in an old and dirty plastic bowl. The water gets dirtier all day at in present temperature (30ºC) spoilage is rapid. He has applied for a loan for a cabinet freezer. In my opinion, conditions in downtown Kathmandu are totally unsuitable for food industry! I enclose a copy of his leaflet. He has a copy of the large *Book of Tofu."*

The leaflet (4.5 by 7.75 inches, black on pink, written in Nepali) says: "High protein food. Vita Tofu. To prepare: 1. Cube the tofu, fry it in oil, add to any curry, vegetable, or meat dish; mix and serve. 2. Crumble the tofu by hand, fry in oil, and mix with tomato, onions, and spices as desired. 3. Fry sliced tofu. Sprinkle with salt and serve.

"Tofu can be used to increase the protein for small children, pregnant women, and old people. We can prepare tofu for parties and functions given 24 hours notice. We are keen to serve you.

"Soya Food Industry, Kathmandu."

Letter from Mr. T.B. Gubhaju of Nepal Tofu Factory,

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Kathmandu. 1991. Oct. 6. "A company named 'Nepal Soya Industries' was run by Mr. Achutananda Vaidya before 1983. The name of the product was Vita Tofu. This company was closed long ago, perhaps between 1983 and 1985. So far as I know, this company had only a grinding machine and a press. The owner, Mr. Achutananda Vidya, who was born in Nepal, got training in brewing from Japan. The company was located at 9/374 Bhedashing, Jamguthi, Kathmandu. I met Mr. Vaidya in the Government Food Research Lab in 1983 when we discussed the tofu business in Nepal. So far as I know, Mr. Vaidya had to close his tofu production company for the following reasons: 1. He was in Government services so he could not pay more attention to his private business. 2. He did not have the requisite equipment for tofu production."

Letter from Mr. T.B. Gubhaju of Nepal Tofu Factory, Kathmandu, followed by phone call. 1992. Aug. 19 and Sept. 7. He believes that members of the family of Mr. Achutananda Vaidya had started selling tofu in Nepal long before 1983. He is still trying to collect specific information and he has Mr. Vaidya's phone number. Mr. Vaidya, who speaks good English, told him that members of his family began making tofu in Nepal in about 1974-1977–but Mr. Vaidya did not know the exact dates.

Letter from Mr. T.B. Gubhaju of Nepal Tofu Factory. 1992. Sept. 22. Mr. Achutananda Vaidya resides at 9/374 Bhedashing, Jamguthi, Kathmandu. Phone: 229130. His uncle, Mr. Raghubir Baidya, started making tofu in 1970, but had to stop after a few months. For further details, please contact Mr. Vaidya.

Letter from Mr. Achutananda Vaidya of Nepal Soya Industries. 1992. Dec. 26. "I started making tofu in 1974. I did not have any connection with my uncle in starting my tofu company, however I did have a chance to see him make tofu at his residence in Kathmandu, and from that time I got the idea in my mind to make tofu myself. I learned the details of the process in Nepal from Mr. Akifumi Nakamura of Kobe, Japan, a member of the Japan Overseas Cooperation Volunteers (JOCV), who worked at the Central Food Research Laboratory in Kathmandu, which was also my office in 1974. I worked together with him as a counterpart for two years learning how to make tofu."

His business card notes: "Food Technology in Brewing from Japan. Products & Suppliers: Tofu (Vita), Soyamilk (Vitabean milk), Soya Curd, Soya Sauce, & Miso."

His Curriculum Vitae notes that he was born on 28 Dec. 1947, resides at 9/374 Bhedasingh, Kathmandu, and is married. See also his letter of 19 Jan. 1993.

Letter from Mr. Achutananda Vaidya of Nepal Soya Industries. 2002. April 12. He started to make and sell this tofu in Dec. 1974.

6253. Ogata, Mikio. 1974. Karamiso [Salty miso]. *Shoku no Kagaku* (*Food Science Journal*) No. 21. p. 61-65. Dec. [Jap]
Address: Fukuoka Kogyo Shikenjo, Fukuoka-ken, Japan.

6254. Predicasts, Inc. 1974. World manufactured soybean foods. Special Study No. 108. Predicasts, Inc., 200 University Circle Research Center, 11001 Cedar Ave., Cleveland, OH 44106. vi + 93 p. Dec. 24. No index. 28 cm. Research Analyst: Frederick M. Ross.
• ***Summary:*** Contents: 1. Introduction. 2. Summary. 3. Economics of Soybean Foods: Soybeans, soy flour, meat extenders (based on extruded textured soy flour), synthetic meat (based on spun isolates). 4. Industry structure: General, $1,000 million food and feed giants (ADM, Cargill, Central Soya, General Mills/Takeda Chemical, Nabisco, Ralston Purina/Fuji Oil, and Esmark [Swift]), other major manufactured soy food companies (Unilever, General Host [New York], Miles Laboratories/Worthington & Kyowa Hakko Kogyo, A.E. Staley Mfg. Co., Stange [Chicago, Illinois], Chambers & Fargus [Humberside, England]), food industry structure. 5. Demand for manufactured soybean products: Demand for meat & substitutes, supply of natural meat, demand for meat substitutes, demand for soy flour. 6. North America: United States, Canada. 7. Latin America: General, Argentina, Brazil, Mexico, Other Latin America (Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay). 8. West Europe: General, France, West Germany, Italy, Spain, United Kingdom, Other West Europe. 9. East Europe: General, Hungary, Poland, USSR, Other East Europe. 10. Africa: General, Egypt, Nigeria, South Africa, Other Africa & Mideast. 11. Asia: General, China, India, Indonesia, Japan, Pakistan, Other Asia. 12. Oceania: Australia, New Zealand, Other Oceania.

Most sections contain numerous tables, mostly on meat and meat substitute consumption, and raw protein consumption, by country. Address: 200 University Circle Research Center, 11001 Cedar Ave., Cleveland, Ohio 44106. Phone: 216-795-3000.

6255. Ueda, Atsumu. 1974. Kôji ni yoru miso no seizô [Miso production using koji]. *Shoku no Kagaku* (*Food Science Journal*) No. 21. p. 35-40. Dec. [Jap]
Address: K.K. Hinode Miso Jozo Moto, Japan.

6256. Wood, R. Bruce. comp. 1974. Soviet soybean varieties: An annotated bibliography. Urbana, Illinois. 187 p. Photocopied from 5 x 8-inch typed file cards. [20 ref. Eng]
• ***Summary:*** Chapters are divided by regions. A history of the named regional varieties developed is given, along with the source of the germplasm, the name of the plant breeder(s), and the organization with which he or she worked, a description of the plant (incl. morphology, maturity, composition, seed weight {weight of 1000 seeds}, yield), citations for the source of the above information, and in some cases a translation and/or explanation of the name in English. Amur region (Amur Oblast and Khabarovsk Kray) grain varieties and fodder varieties (p. 1-27). Maritime

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(Primorskiy) Kray grain and fodder varieties (p. 28-36). Central Asian fodder varieties (p. 37-38). Georgian grain varieties (p. 38). North Caucasian grain varieties (p. 48-54). Ukranian grain varieties (p. 55-64). Moldavian grain varieties (p. 65-68). Prospective varieties and/or those undergoing trials (p. 68-154). Baltic varieties (Latvia and Lithuania; p. 154-64). Varieties of undetermined origin (p. 164-).

Page 1 states that a number of varieties were developed at the "former Amur Oblast State Agricultural Experiment Station in Blagoveshchensk, now the All-Union Scientific Research Institute of Soy." Many of the stock plants were chosen during the period from 1930 to 1939. Page 43 notes: "Imeretinskaya (mestnaya): This old-variety population is one of three major ecologic types grown for more than 90 years [i.e. since 1884 or before] in the Georgian SSR. (The other two variety populations are Guriyskaya and Chiaturskaya.) This material was originally imported from China, Korea, and Japan. Attempts were made during the 1st Five-Year Plan (1928-32), when the USSR first began to cultivate soy on a large scale, to subject these local populations to the selection process in order to develop purer lines with stable and more desirable characteristics. These were then used for hybridization. According to Enken (1971, 125), these crosses did not yield positive results. The breeders were apparently successful, however, in developing purer strains of the local material, for Imeretinskaya mestnaya was in commercial production by 1930 (Vul'fson, 1935, 59), and first regionalized for the Georgian SSR in 1933 (Generalov, 1968, 146). As such it was one of the first Soviet domestic soy varieties, and one of several original varieties still having regional status after more than 40 years."

The Amur Oblast State Agricultural Experiment Station was organized in 1923-24. "The Amur Yellow Population should not be confused with the soy population used by the pre-Revolutionary Amur Experiment Station in 1912-18, which had a different composition."

Page 188 shows the leading Soviet soybean varieties in 1970, ranked by sown acreage: Salyut 216, Amur region, 346,900 ha (hectares). Khabarovskaya 4, Amur region, 141,267 ha. Amurskaya 41, Amur region, 100,995 ha. Primorskaya 494, Maritime Kray, 76,191 ha. Primorskaya 529, Maritime Kray, 65,233 ha. Primorskaya 762, Maritime Kray, 21,300 ha. Amurskaya 310, Amur region, 18,321 ha. Yubileynaya, Amur region, 14,755 ha.

Table 2 lists the names of all soybean varieties entered in the 1962-69 state variety trials, together with the organization that developed each variety.

Note: This is the earliest document seen (Feb. 2005) concerning the cultivation of soybeans in Latvia. This document contains the earliest date seen for the cultivation of soybeans in Latvia (1974). The source of these soybeans is unknown. Address: Urbana, Illinois.

6257. Yoshii, Hisao. 1974. Mame miso [Soybean miso]. *Shoku no Kagaku* (*Food Science Journal*) No. 21. p. 66-71. Dec. [Jap]
Address: Aichi-ken Shokuhin Kogyo Shikenjo.

6258. Yoshii, Hisao. 1974. Kôsozai riyô ni yoru miso no seizô [Miso production using enzymes]. *Shoku no Kagaku* (*Food Science Journal*) No. 21. p. 41-45. Dec. [Jap]
Address: Aichi-ken Shokuhin Kogyo Shiken-jo.

6259. Soyfoods Center. 1974-1985. Soyfoods Media (Scrapbook). 3 vols. Lafayette, California. 38 x 32 cm.
• ***Summary:*** These three large professional artist scrapbooks, with imitation leather covers and about 28 metal rings that hold each acetate sheet protector, holds popular articles from important newspapers and magazines with a large circulation that document the origins and early years of he soyfoods movement in the United States from the mid-197s to the mid-1980s. Each binder holds about 38 acetate sheets and roughly 75 articles displayed in chronological order. The three volumes have a combined total weight of 18½ pounds. They contain basically two types of articles: (1) Articles about the work of William Shurtleff and Akiko Aoyagi in the United States and Japan. (2) Articles about soyfoods in general and about other companies.

Book 1 covers the period 1974-1978. Book 2 covers the period 1979-1980. Book 3 covers the period 1981-1985.

As of May 2009, all three volumes are owned by Soyinfo Center, 1021 Dolores Dr., Lafayette, California. Contact William Shurtleff. Address: P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

6260. Azumaya, Naoki. 1974. Nattô-kin ni yoru bitamin B-2 seisan ni kansuru kenkyû. I. Co^{2+}, Cu^{2+}, Mn^{2+}, Al^{3+} no eikyô [Study on vitamin-B production by natto bacteria. II. The effect of cobalt, copper, and manganese positive divalent ions, and of aluminum positive trivalent ion]. *Kumamoto Joshi Daigaku Gakujutsu Kiyo* (*J. of Kumamoto Women's University*) 26(1):12. [Jap]*

6261. Deshimaru, O.; Kuboki, K. 1974. Artificial diet of prawn. *Nihon Suisan Gakkai shi* (*Bulletin of the Japanese Society of Scientific Fisheries*) 40:413-19. *
• ***Summary:*** A diet containing 6% soybean oil-cod liver oil was effective for the growth of prawns (*Penaeus japonicus*).

6262. Echigo, Takashi; Takenaka, Tetuo. 1974. Mitsubachi ni yoru hachimitsu-chû yûki-san no seisei [Production of organic acids in honey by honeybees]. *Noka* (*Agricultural Chemistry*) 48(4):225-30. [16 ref. Jap; eng]
• ***Summary:*** Glucono lactone is a natural constituent of honey. Address: Dep. of Agricultural Chemistry, Tamagawa Univ., Machida, Japan.

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6263. EMBRAPA (Empresa Brasileira de Pesquisa Agropecuaria). 1974. Anteprojeto de Implantacao do Centro Nacional de Pesquisa da Soja [Groundwork for implementation of a National Center for Soybean Research]. Vinculado ao Ministerio da Agricultura, Brasilia, DF. 113 p. [Por]*
• ***Summary:*** In 1908 the soybean crop was introduced to the state of Sao Paulo by Japanese immigrants and into Rio Grande do Sul in 1914 by Professor E.C. Craigg of the Federal University of Rio Grande do Sul. EMBRAPA stands for *Empresa Brasileira de Pesquisa Agropecuaria* (Brazilian Enterprise for Research on Farming and Cattle Raising).

Note: This is the earliest document seen (June 2009) concerning EMBRAPA. Address: Brasilia, Brazil.

6264. **Product Name:** [Fuji Pure (spun soy protein fiber)].
Foreign Name: FujiPua.
Manufacturer's Name: Fuji Oil Co. Ltd.
Manufacturer's Address: Toyama Building 121, 2-chome Azuchi-cho, Higashi-ku, Osaka, Japan.
Date of Introduction: 1974.
Ingredients: Defatted soybean meal.
How Stored: Shelf stable.
New Product–Documentation: Fuji Seiyu K.K. (Fuji Oil Co.). 1977. Fuji Seiyu 25 Nen-shi: Showa 21 nen 11-gatsu–Showa 51 nen 3-gatsu [Fuji Oil Company Ltd.: 25-year history, Nov. 1946 to March 1976]. Tokyo: Fuji Oil Co. 622 p. See p. 443. This was the first spun soy protein fiber made in Japan.

6265. Hayashi, U. 1974. [Study of the cause of increase in nitrogen content in the course of manufacture of natto. I. Preliminary experiments on fluctuations in total nitrogen during processing of *Bacillus natto* medium and during culture]. *Reports of Teikoku Joshi Daigaku Laboratory of Natto* 49:1-9. [Jap]*

6266. Hayashi, U. 1974. [Study of the cause of increase in nitrogen content in the course of manufacture of natto. II. Study of the method of estimation of nitrogen in soybean and soybean products]. *Reports of Teikoku Joshi Daigaku Laboratory of Natto* 49:10-20. [Jap]*

6267. Hayashi, U. 1974. [Study of the cause of increase in nitrogen content in the course of manufacture of natto. III. On the fluctuations in all-nitrogen with the growth of *Bacillus natto*]. *Reports of Teikoku Joshi Daigaku Laboratory of Natto* 49:21-29. [Jap]*

6268. Hayashi, U. 1974. [Study of the cause of increase in nitrogen content in the course of manufacture of natto. IV. Experiment to confirm the ability of *Bacillus natto* to utilize atmospheric nitrogen by means of stable isotope Nitrogen-15]. *Reports of Teikoku Joshi Daigaku Laboratory of Natto* 49:30-34. [Jap]*

6269. Hayashi, U.; Narasc, A.; Oura, Y. 1974. [Food hygienic studies on microbial contamination of eggs. Part II. Relation between use of feed comprising added natto and microbe in egg]. *Reports of Teikoku Joshi Daigaku Laboratory of Natto* 49:35-39. [Jap]*

6270. Kanematsu, Hiromu; Chimi, K.; Maruyama, T.; Niiya, I.; Imamura, M.; Oshiba, K.; Kawakita, H.; Matsumoto, T. 1974. Shokuyô yushi no seisei kakô kôtei ni yoru yûki enso-kei zanryû nôyaku no genshô [Removal of chlorinated pesticide residues from crude oils and fats by processing procedures]. *Yukagaku* (*Oil Chemistry*) 23(1):49-52. (Chem. Abst. 80:094365). [10 ref. Jap; eng]
Address: 1-5. Zaidan Hojin Nihon Shokuhin Yushi Kensa Kyokai, Nihonbashi Hama-cho 3-27-8, Chuo-ku, Tokyo-to, Japan; 6-7. Osaka Shiritsu Eisei Kenkyu-jo.

6271. **Product Name:** [Smoked Tofu (Mushroom, Chestnut, or Walnut)].
Manufacturer's Name: Komatsugawa Tofu Co. and Meiji Foods Co.
Manufacturer's Address: Japan.
Date of Introduction: 1974.
Ingredients: Incl. deep-fried tofu pouches, firm tofu, seasonings.
Wt/Vol., Packaging, Price: One 100 gm piece packed in oil in a sardine can. Retails for $0.65.
How Stored: Shelf stable.
New Product–Documentation: Shurtleff & Aoyagi. 1979. Tofu & Soymilk Production. p. 159. "Made from deep-fried tofu pouches stuffed with mashed firm tofu and seasonings."
Note: This is the earliest commercial smoked tofu made or sold in Japan.

6272. Kon, Masayo; Itô, Hiroshi. 1974. Hamanattô ni kansuru kenkyû. II. Seihin-chû no biseibutsu [Study on Hamanatto. II. The microorganisms in the product]. *Kaseigaku Zasshi* (*J. of Home Economics of Japan*) 25(1):21-26. [Jap]*

6273. Konno, S.; Na Lampang, Arwooth; Chotiyarnawong, A. 1974. Introduced soybean varieties in Thailand. Bangkok: Thailand Department of Agriculture (Mimeo). Unpublished manuscript. *

6274. McGinity, Richard C. 1974. Kikkoman Shoyu Co., Ltd. Unpublished Harvard Business School Report. 18 p.
• ***Summary:*** A Harvard Business School case study, with abundant statistics and insights into the company's internationalization. Address: Research Assoc., Harvard Business School, [Cambridge, Massachusetts].

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6275. **Product Name:** [Soymeal brand Soymilk (Sweetened, or Orange)].
Foreign Name: Soymeal.
Manufacturer's Name: Nikken / Tokyo Soymeal Co.
Manufacturer's Address: Nakakami-cho 110, Akishima-shi, Tokyo 196, Japan. Phone: 0425-43-1815.
Date of Introduction: 1974.
How Stored: 7 oz Pure-Pak cartons. Retail prices: See below.
New Product–Documentation: Shurtleff & Aoyagi. 1979. *Tofu & Soymilk Production.* Page 229 gives a detailed description of the process for making Soymeal brand soymilk based on a plant visit by William Shurtleff in 1977. It states: "The Nikken Company in Tokyo is a large maker of both sweetened and orange soymilk, producing about four thousand 7-ounce Pure-Pak cartons daily at the rate of 5,000 cartons per hour. In 1977, the sweetened soymilk sold for $0.21 per carton and the orange for $0.28. The former contains 12.1% solids (8.5% before formulation), 3.0% protein, 3.2% fat, 5.5% sugars, and 0.51% ash. The remarkably long shelf life (20 days) is made possible by strict cleanliness and thorough pasteurization. The live bacteria count per milliliter of milk averages 30; the legal limit for soymilk is 3,000 and for dairy milk 50,000. The total equipment, which is mostly modern stainless steel, was worth $230,000 at 1977 prices not including the packager which was worth $46,000. The patent holder for the process, Mr. Kanji Tsuchiya, is extremely helpful and has over 30 years of experience making soymilk."

Page 313 gives the company's name as "Nikken (Soymeal Co.)," the address, and phone number.

Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that Tokyo Soymeal first made commercial soymilk in Japan in 1974.

Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64. The company name is given as "Tokyo Soymeal."

6276. Yang, Charles Y. 1974. Soybean rust. *AVRDC, Seminar Series.* 22 p. *
• ***Summary:*** A good overview of soybean rust. This fungal disease "has been recorded in the northeastern, central, and southwestern provinces of China. It has also been reported in the USSR, Korea, Okinawa, Taiwan, the Philippines, Australia, Ceylon, India, Malaysia, Thailand, Cambodia, and Vietnam. Cultivated varieties of soybean known to be rust resistant in the past are now susceptible. Taichung 4 had much more field tolerance to soybean rust, with relatively fewer pustules, than other cultivated varieties. Two physiological races of this rust have been identified through their characteristic pathogenic reactions... It is believed that there can be 6-8 cycles of the rust produced within one growing season" (from AVRDC 1992, #452). Address: Kyushu Univ., Japan.

6277. Abe, Koryû; Tsuji, Shigemitsu. 1974. Tôfu no hon [The book of tofu]. Tokyo: Shibata Shoten. 328 p. Illust. Index. 19 cm. [1 ref. Jap; eng+]
• ***Summary:*** This book contains one of the best histories of tofu published to date, including a good summary of Shinoda's research on tofu history.

Contents: Part I: Preface. 1. Various documents on tofu. 2. The origin of tofu. 3. Tofu as a food and soybeans. 4. Production methods of tofu and second generation products. 5. Chinese tofu seen from documents. 6. The legend of Liu An, king of Huai-nan of (*Wainan ô Ryûan*), and tofu. 7. The legend of Toroshijû and tofu. 8. Japanese tofu seen from documents.

Part II: The *Tofu Hyakuchin.* Part III: A selection of 100 modern tofu recipes.

On page 4 is an interesting quote by the Chinese Buddhist master/priest Yinyuan Longqi (Ingen), who lived 1591-1673. He introduced the Obaku sect of Zen Buddhism to Japan and erected the famous Manpuku-ji temple at Obaku, Uji, Japan (south of Kyoto) in 1661. It was named after the Wanfu / Manpuku-ji Temple at Obakusan, Fukien [Fujian] province, China, which was the leading Zen temple in China at the time (Joya 1960, p. 745, 326). In Japan, he was surprised to find tofu unlike any he had known in China. In praise of this new softer type of tofu, he composed an intricate yet simple proverb which is known to this day. It described both the character of Japanese tofu and that of a man who wishes to pass freely and peacefully through this fleeting, illusory world. The proverb reads: *"Yo no naka wa, mame de shikaku de yawaraka de, mata rôjaku ni nikumare mo sezu..."* Each of the three middle lines has a double meaning, allowing the poem to be read either: (1) "In this world, made of soybeans, square / clean(ly) cut, soft, and not disliked by old and weak people"; or (2) "In this world, practicing diligence (or healthy/hard working), being proper and honest, having a kind heart, and not disliked by old and weak people."

Page 66: The earliest known reference to tofu was in the *Qing Yilu* (Jap: *Seiiroku*), written during the Northern Song dynasty [960-1127] by Tao Ku (Jap: *Tôkoku*). In this work it explains why the early name for tofu (Jap: *Shôsaiyô* = vice governor's mutton) appeared. This is the story about a poor vice-governor named *Jishû* (in Japanese). He was very poor and couldn't afford to buy mutton, so he bought a few pieces of tofu every day and ate it as a side dish with rice. Seeing this, people in that area began to call tofu the "vice-governor's mutton." This story tells us that tofu was widely consumed by the people, and was less expensive than mutton. After the appearance of the *Quing Yilu* tofu began to be mentioned much more often in the literature. But during the Northern Song dynasty, since tofu was regarded as a poor-man's food, people didn't write about it so much.

Page 74-84: 6. Life of Lord Liu An, of Huai-nan. I have

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already mentioned that the theory that tofu was discovered or first made by Lord Liu An some 2,000 years ago depended largely on the *Bencao Gangmu* (Jap: *Honsô Komoku*) by Li Shizen, which appeared in 1596 during the Ming dynasty. And in the poems by *Shuki* (?). Although we are not sure whether or not this was an historical fact, I think there was a reason for it. Therefore, in this chapter, I would like to go into the relationship between Liu An's colorful life and tofu a little more deeply. The best early source about the life of Lord Liu An is the *Shiji* (Jap: *Shiki*), "Records of the historian," by Sima Qian which appeared in about 90 BCE.

Page 329 tells about the authors (autobiographical): Koryû Abe was born in 1922 (Taisho 11) in Tokyo. He graduated from *Nippon Daigaku, Geijutsu-gakubu, Bungaku-ka* (literature). In 1968 he went to work for K.K. Japan Art-sha. In Dec. 1971 he self-published a facsimile edition of the ancient classic *Tofu Hyakuchin.* He is presently editor of Japan Art-sha's *Hôchô-Geijutsu* (The art of the knife) and a consultant to Daitô Chôrishi-kai (Big East Cooking Society).

Shigemitsu Tsuji was born in 1920 in Kyoto. He graduated from Kyoto Nishô, then apprenticed as a cook in the restaurant Sagano in Tokyo. He later joined the army and served as a special cook to the head officer. After World War II he became the 11th owner of Nakamura-ro, a famous Kyoto restaurant. He is presently a cooking instructor for NHK, ABC, and MBS television stations, and special instructor at the following cooking schools: Osaka Abenotsuji Chôrigakkô, Kyôto Ryôri Gakkô, and Tôkyû Cooking School. Address: Tokyo, Japan.

6278. Aihara, Cornellia. 1974. How to make miso using mugi koji (fermented barley). *Macrobiotic* (*The*) (*Chico, California*) No. 98. p. 53-55.
• ***Summary:*** Gives a large-scale recipe using 30 lb soybeans, 20 lb barley, 15 lb salt, and 7 cups barley koji. The mugi koji can be ordered from Janus Natural Foods, 1523 Airport Way, Seattle, Washington 98134. Or from Chico-San Inc., 1144 West First St., Chico, California 95926. Address: Chico, California.

6279. Altschul, Aaron M. ed. 1974. New protein foods. Vol. 1A. Technology. New York, NY: Academic Press. xiv + 511 p. [1750* ref]
• ***Summary:*** Contains 10 chapters by various authors. Five of these are cited separately. Address: Dep. of Community Medicine & International Health, Georgetown Univ. School of Medicine, Washington, DC.

6280. Butler, W.H. 1974. Aflatoxin. In: I.F.H. Purchase, ed. 1974. Mycotoxins. Amsterdam, Netherlands: Elsevier Publishing Co. xiii + 443 p. See p. 1-28. Chap. 1. [145 ref]
• ***Summary:*** An excellent review of the literature and history of the discovery of aflatoxin. Although the biological activity of the aflatoxins was not recognized until 1960-61, there is evidence that these compounds produced liver disease before that time. There are numerous reports from the 1950s on similar liver disease in guinea pigs, rats, and dogs fed toxic groundnut meal. "There have been many reports since 1935 of high incidence of hepatomas in hatchery-raised trout from Italy, France, Japan, and the United States. Although it is not possible to attribute this directly to aflatoxins it would appear that these compounds are the most likely causative agents" (p. 2).

Aflatoxins are most widely found on peanuts and peanut meal. Yet it has been found that *Aspergillus flavus* does not invade groundnuts to any significant extent prior to harvest (Austwick & Ayerst 1963). "Aflatoxin has been found as a natural contaminant in many types of food including peanut, cottonseed meal, corn, cassava, rice, soya beans, wheat, sorghum, and barley" (Wogan 1968).

Austwick & Ayerst (1963) "demonstrated that the most important factor in the growth and production of aflatoxin by *A. flavus* was the relative humidity surrounding a natural substrate. At a humidity at less than 70% very few fungi will grow on stored foods but with a relative humidity of 85% and a moisture content of 30% within the groundnut *A. flavus* is able to produce aflatoxin."

Table 1 shows the chemical properties of ten different aflatoxins; for each it gives the name, molecular formula, molecular weight, melting point, 362-363 nm absorption (e), and fluorescence emission (nm). Figures 1 and 2 show the chemical structures of the ten aflatoxins. Address: MRC [Medical Research Council] Toxicology Unit, Medical Research Council Labs., Woodmansterne Rd., Carshalton, Surrey (Great Britain).

6281. Ciancio, Pedro N. 1974. La soja y el problema alimentario del Paraguay. ed. 2 [The soybean and Paraguay's nutritional problem. 2nd ed.]. Asunción, Paraguay: Imprenta Nacional. 585 p. 22 cm. [50 ref. Spa; eng]*
• ***Summary:*** At head of title: *Ciencia de la nutrición* (*metabolismo*). Address: Prof., Dr., Asunción, Paraguay.

6282. Ikenaka, T.; Odani, S.; Koide, T. 1974. Chemical structure and inhibitory activities of soybean proteinase inhibitors: Assignment of seven disulfide bridges of Bowman-Birk proteinase inhibitor. In: H. Fritz et al. eds. 1974. Proteinase Inhibitors: Proceedings of the 2nd International Research Conference (Bayer-Symposium V). New York, Heidelberg, Berlin: Springer-Verlag. See p. 325-43. Held 16-21 Oct. 1973 at Grosse Ledder. [20 ref]
• ***Summary:*** "One of the most fundamental studies to understand the inhibition mechanism of proteinase inhibitors is to elucidate the amino acid sequence of the inhibitors... Kunitz soybean trypsin inhibitor, isolated and crystallized by Kunitz, consists of 181 amino acid residues including 2 disulfide bridges and the complete amino acid sequence of the inhibitor was determined by us." A diagram shows the

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covalent structure of the Kunitz trypsin inhibitor.

Note: Bayer-Symposium V was held in Grosse Ledder at the same time as the Second International Research Conference on Proteinase Inhibitors. The First International Research Conference on Proteinase Inhibitors was held on 4-6 Nov. 1970 in Munich, Germany. Address: Dep. of Biochemistry, Niigata Univ. School of Medicine, Niigata 951, Japan.

6283. Iwata, Hisayoshi. 1974. Shokuhin kagaku [Food science]. Tokyo: Yokendo. 370 p. Illust. Index. 22 cm. [150+* ref. Jap]
Address: Tokyo, Japan.

6284. Kato, Tesshin. ed. 1974. Tamago, tôfu ryôri [Egg and tofu cookery]. Tokyo: Nihon Keizai Shinbun-sha, Shopping-shitsu. 98 p. Illust. No index. 19 cm. [Jap]
• ***Summary:*** Contents: 43 easy-to-make egg and tofu recipes, each accompanied by color photos. Useful ideas for daily life. Address: Tokyo, Japan.

6285. Kawamura, Wataru; Tada, Kazue. 1974. Misoshiru hyakka [Encyclopedia of miso soups]. Tokyo: Kosei Shuppansha. 230 p. Illust. No index. 19 cm. [Jap]
• ***Summary:*** Contents: Part I: Lecture of the miso scholar (sensei) (by Wataru Kawamura): 1. How to make delicious miso soups (recipes). 2. A talk about miso. 3. A talk about dashi soup stocks. 4. True stories. 5. About garnishes for soups. 6. Miso soups and health. 7. Topography/geography of miso. Part II: 100 selected miso soups in spring, summer, fall and winter (by Kazue Tada). In the beginning: Spring. Summer. Fall. Winter. Miso soups of homeland country villages (recipes). Miso teacher's quick memos (hints). Address: Miso teacher, 2-4-7 Kugenuma, Tachibana, Fujisawa-shi, Kanagawa-ken 251, Japan.

6286. Kobayashi, Keizô. 1974. Shôjin ryôri nyûmon [Entry gate to Zen vegetarian cookery]. Tokyo: Shibata Shoten. 230 p. Illust. 22 cm. [Jap]
• ***Summary:*** The author was born in 1930. Address: Formerly asst. head cook at Eiheiji Zen Monastery. Now head priest, Rinsho-ji, Tateoka, Murayama-shi, Yamagata prefecture.

6287. Koito, Hirai. 1974. Kodaishoku nyûmon: Ayamatta gendai shokuseikatsu-ni kakumei o [The entrance gate to our ancient way of eating: Revolution to correct our mistaken modern way of eating]. Tokyo: Daiyamondo-sha. 8 + 231 p. 19 cm. [Jap]*

6288. Kôno, Tomomi. 1974. Shôyu fudoki [Shoyu throughout the provinces]. Tokyo: Mainichi Shinbunsha. 205 p. [Jap]*

6289. Masuda, Koh. editor in chief 1974. Kenkyusha's new Japanese-English dictionary. 4th edition. Tokyo: Kenkyusha. xiii + 2111 p. 27 cm. [Eng; jap]
• ***Summary:*** The first edition of this superb dictionary was published in 1918, the second in 1931, and the third in 1954. The words are listed in alphabetical order. Some of the definitions of soy-related terms are quite poor. Examples:

Daitokuji natto: not listed.

edamame: "green soybeans." [Better: Green vegetable soybeans, or Edamamé].

Hamananatto: not listed.

Hamanatto: not listed.

hiryôzu: not listed.

kinugoshi [tofu]: fine-grained *tofu.*

kogori-dôfu = kôya-dôfu.

Note. This is the earliest English-language document seen (April 2013) that uses the the term *kogori-dôfu* or the term *kôya-dôfu* to refer to dried-frozen tofu.

koikuchi shoyu: not listed.

kôji: *"koji."* Good.

miso: *"miso."* Good. Also defines: [ama-miso]: slightly-salted miso.

[miso-koshi]: a miso strainer.

[miso mame]: a soybean; a soya (bean).

[miso-shiru]: miso soup. And many more.

nattô: "fermented soybeans." [Better: Whole soybeans fermented with *Bacillus subtilis*]. Nattô-jiru: "Miso soup with minced fermented soybeans." Good.

nomame: not listed.

okara: bean-curd (*tofu*) refuse; lees of bean curd.

omiotsuke [Jap: Misoshiru] See miso [Miso soup; word used by women only].

otsuke [Jap: Misoshiru] Miso potage (soup).

saishikomi shoyu: not listed.

shitaji: soy. See shôyu.

shôyu: "soy (sauce)." Better: Soy sauce.

tamari: "(a kind of) soy; soy sauce; sauce from refined soy."

tôfu: "bean curd [cheese]; *tofu.*

[yaki-dofu]: "roasted bean curd."

[tofu itcho]: a piece (cake) of bean curd.

[tofu-ya]: "a tofu dealer (seller, maker)."

tônyû: "soybean (soya) milk." [Better: Soymilk, soya milk, or soybean milk].

tsurumame: not listed.

usukuchi shoyu: not listed.

yuba: "dried bean curds" [sic. Better: The protein-lipid film formed atop soymilk when it is heated].

6290. National Institute of Agricultural Sciences, Hiratsuka. 1974. [Seed storage catalogue]. Japan: Ministry of Agriculture and Forestry, NIAS. [Jap]*
• ***Summary:*** The Japanese germplasm collection is stored at NIAS, which was started in 1965. They had 1472 entries in

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1979.

6291. Nihon tabemono hyakka [Encyclopedia of Japanese foods]. 1974. Tokyo: Shinjin Butsu Orai-sha. [Jap]*

6292. Ohsawa, Lima. 1974. The art of just cooking. With Nahum Stiskin. Hayama, Japan and Brookline, Massachusetts: Autumn Press. 216 p. Illust. by Maurice Owen. Index. 19 x 23 cm. Reissued in 1984 as Macrobiotic Cuisine by Japan Publications, NY. 175 p. [26 ref]

• ***Summary:*** This work is based on Lima's Japanese-language book titled *Macrobiotic Cookery* (1971). In 1953, at age 54, Lima Ohsawa first ventured beyond the shores of her native Japan. She and her husband, Georges Ohsawa, left on their first world tour. In 1955-56 they spent time with Dr. Albert Schweitzer in Lambarene, Gabon. "Being vegetarian Dr. Schweitzer was always very interested in the nutritional assets of the soybean and asked me to show him different ways to prepare it" (p. 10). During this and many subsequent travels, Lima learned many traditional, natural recipes from around the world.

Contains numerous Japanese macrobiotic style recipes. Page 32 gives good definitions of miso and shoyu. Soy-related recipes include: Brown rice with soybeans (p. 53). Inarizushi (p. 55). Brown rice porridge with vegetables and miso (p. 58). Soya omochi (mochi with soya flour). Burdock with miso and lemon peel (p. 90). Broccoli and radish with miso dip (p. 92). Carrot with green beans and tofu (p. 95). Ninjin shiro-ae (with "½ cake of *tofu,* drained and mashed (p. 173)," p. 95). Cucumber with wakame and walnut miso (p. 96). Cucumbers with miso and sesame (p. 97). Onion nitsuke with miso (p. 100). Onion goma-miso-ae (onion with sesame miso, p. 100). Eggplant nabeshigi-yaki (with miso, p. 101). Scallion and aburage nitsuke (p. 101). Scallion dengaku (with miso, p. 102). Renkon ikada age with kuzu-lemon sauce (p. 103). Kabocha miso ni (p. 106). Kabu miso-ae (turnips with sesame miso, p. 109). Daikon age rolls (with aburage, p. 114). Vegetable skewers with koya-dofu (dried-frozen tofu, p. 114). Kombu with shoyu (p. 117). Renkon miso inro (lotus root tempura with miso, p. 123). Coltsfoot buds with miso (p. 126). Wakame miso soup (p. 137). Mugi-miso soup (p. 137). Sake-no-kasu jiru (miso soup with sake lees, p. 137). Go jiru (soybean potage with aburage, p. 141). Oden with ninjin and gobo kombu maki (with aburage, p. 146).

Condiments and pickles (p. 154-57): Gomashio (sesame-salt). Tekka miso (sauteed vegetables with miso). Shigure miso (moist tekka). Miso sauté. Soybeans with miso and burdock. Soybeans with miso. Miso pickles (fall and winter). Sauces, spreads and salad dressings (p. 161-63): Lemon shoyu. Ginger shoyu. Orange shoyu. Tsuje-jiru dipping sauce (with shoyu). Goma joyu sauce (with shoyu). Scallion miso. Walnut miso. Citron miso. Goma miso (sesame).

Beans (p. 165-78). Black bean ni (the black beans are actually black soybeans. Soak 1 cup soybeans overnight in 3 cups water. "Drain the beans through a strainer reserving any soaking water." Add enough fresh water to equal 4 cups then pour this liquid into a heavy saucepan. Add the soaked beans, bring to a boil over high heat. Reduce heat to low, cover and simmer for 2+ hours, or until tender. Add water during cooking if liquid completely evaporates. Toss pan to stir. When done, season with a dash of salt and/or shoyu. "In Japan this exquisitely sweet dish [nimame] is a must on New Year's Day. It gets even sweeter after standing for a day or two." Cooking soybeans with a small strip of *kombu* helps to soften them). Gomoku-mame (soybean nitsuke).

Tofu ryori (p. 173-78; "Tofu or bean curd is rich in vegetable protein. Although it is rather *yin* in our classification of foods, the recipes I have included here balance its *yin* characteristics with *yang* so don't hesitate to use it occasionally. It's delicious in miso soup, stews and *nabe,* and as a dish by itself. It is available at Oriental food shops and can also be made at home."). Homemade tofu (p. 174; 3 cups soybeans plus nigari make 1 lb. tofu; also describes how to make nigari {sea brine} by dampening 5 lb. sea salt). Variation: Homemade grilled tofu. Unohana pouches (with okara and aburage). Gammodoki. Tofu with kuzu sauce. Tofu roll. Koya-dofu sandwich. Tofu nitsuke. Chinese dow-foo oroshi-ae. Tofu mold (with kuzu). Tofu tempura. Goma dofu (sesame tofu).

Note 1. This is the earliest English-language document seen (April 2013) that contains the term "grilled tofu."

Squid and scallion miso-ae (p. 183). Salmon head soup (with soybeans, p. 183). Surimi shinoda (with aburage, p. 184). Red snapper in miso. Koi koku (with miso, p. 184). Egg tofu (p. 185). Amazake manju (sweet sake dumplings, p. 198). Amazake (homemade, using glutinous "sweet" brown rice, p. 207).

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The section titled "*Kofu:* Wheat Gluten" (p. 85-86) includes recipes for Homemade kofu (wheat gluten, including Kofu loaf and Seitan), and Kofu cutlet. "First introduced to Japan from China by Buddhist monks, *kofu* became a very popular food in Zen temples. It is delicious in soups and stews and mixed with sautéed vegetables. *Kofu* cutlet looks, feels, and tastes like meat." Seitan is made by simmering 5 cups cold wheat gluten, separated into small pieces, for 3 hours in shoyu, sesame oil, and minced gingerroot.

Dandelion coffee (made from minced and dry roasted, ground dandelion root) and Yannoh (prepackaged grain coffee, made from 5 different grains) are described on p. 206-07.

The book, which contains many fish recipes, begins with a nice photo of Lima at age 75–she looks 20 years younger–and ends with a good glossary. Lovely illustrations, a wealth of original information on Japanese foods.

Note 2. This is the earliest document seen (July 2000) that mentions "Tekka miso" (spelled that way).

Note 3. This is the earliest English-language document seen (Feb. 2005) that used the word "kofu" to refer to wheat gluten. Address: Tokyo, Japan.

6293. Okada, Chiyoko; Kataoka, E.; Togano, T.; Tamura, S.; Suzuki, T. 1974. Nyûfu no ippan seibun, amino-san oyobi kihatsu-san ni kansuru kenkyû [Analysis of some components, amino acids and volatile acids of nyufu (fermented soybean curd)]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 27(7):309-15. [10 ref. Jap; eng]

• ***Summary:*** Nyufu is made by partial dehydration of tofu followed by inoculation with *Actinomucor repens*. After the mold mycelium covers the surface, it is immersed in soy sauce moromi mash for aging. During ageing, the moisture content decreases, while the contents of salt, reducing sugars, and amino nitrogen increase. Only small amounts of lysine and amino-butyrate are found in nyufu. Formic and acetic acids can be detected at every step, whereas propionic acid and isobutyric acid can be detected only in the moromi mash and nyufu. Isovaleric acid is found in nyufu. Butyric acid is found after inoculation with the mold. Address: 1-3. Dep. of Nutrition, Tokyo Univ. of Agriculture; 4-5. National Food Research Inst., Tokyo.

6294. Okura, Nagatsune. 1974. Seiyû roku, On oil manufacturing. Illuminated by Matsukawa Hanzan. An English translation of the original 1836 Japanese ed. Translated by Eiko Ariga and edited by Carter Litchfield. With added commentaries by Richard C. Rudolph and Carter Litchfield. New Brunswick: Olearius Editions. 79 p. [Eng]*

• ***Summary:*** The first edition in English consisted of 1,000 copies, including many fine reproductions of woodblock prints, printed on only one side of rice paper, bound in the classic Japanese form by stitching at the rear and enclosed in a folder with bone clasps. Illustrations show the equipment and processing steps for extracting vegetable oil from oilseeds.

6295. Radley, R.W. 1974. Soya bean adaptation to the cool, maritime climates of Northern Europe, with special reference to the U.K. *Outlook on Agriculture* 8(1):3-9. [15 ref]

• ***Summary:*** "Sharp increases in soya bean prices, and restrictions on US exports, have stimulated interest in the possibility of growing this crop in NW Europe. The principal limitations are temperature–especially at night–and daylength. One variety has often yielded well, experimentally, in Southern England, but in general yields are at present too uncertain and the lowest pods too near the ground. Development of better-adapted varieties would call for substantially increased research effort."

Table 1 shows that during the period 1961-70 the UK imported about US$50 million worth of soybeans and soybean products each year. Imports of whole soybeans decreased from a peak of 294,000 tonnes in 1964 to only 38,000 tonnes in 1970–worth $6.2 million. Imports of soya oil rose from 18,000 tonnes in 1961 to 61,000 tonnes in 1970 (worth $17.2 million) and imports of soya cake and meal rose from 142,000 tonnes in 1961 to 248,000 tonnes in 1970 (worth $28.5 million). A shortfall in Peruvian fishmeal from March 1972 onwards increased the demand for soybeans and soy products.

Production of soybeans in Europe is largely confined to Romania, Bulgaria, and Yugoslavia which together in 1972 produced no more than 188,000 tonnes on about 169,000 ha (average yield = 1.11 tonnes/ha). The location and extent of soybean production in Japan is of real significance for northern European countries. Japan cultivates about 90,000 ha/year of soybeans, largely on the northernmost island of Hokkaido, which, as Sven Holmberg (1956) writes "is the only country in the world where soya beans are grown as a major crop in a relatively cool and partly marine climate."

In 1973 Dr. E.S. Bunting of the Plant Breeding Institute, Cambridge, sowed several varieties of soybeans at Oxford; these included Fiskeby V (bred by Algot Holmberg & Soner A B in Sweden), Altona (the earliest of the varieties commercially available in Canada), and two Russian varieties grown in Eastern Siberia–Saliut 216 and Amurskaja 41 (both reputed to be cold-tolerant). Fiskeby 5 gave the best grain yields. Also on 21 May 1973 the author planted 110 varieties of soybeans (including Fiskeby V) at Silsoe, Bedfordshire, and showed how critical the planting date is in terms of germination. In 1974 Summerfield conducted controlled environment studies at Reading University.

"Eleven year (1960-70) growth and yield data for Fiskeby V grown at Norrköping, Sweden (latitude 58º 36'N), supplied to Bunting (1973, private communication) by Holmberg, indicate that the variety requires a 'heat-

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sum' of approximately 825 degree-days above 0ºC to bring about flowering and between 1,880 and 2,000 degree-days for completion of its growth cycle. The mean number of days from planting to harvest in the eleven year period was 133 but, perhaps more important, the range was from 115 to 165, reflecting to some extent the seasonal variation in temperature... (see also Holmberg 1956)."

"Fiskeby V would appear to be the only variety worthy of serious consideration in Britain at the present time... [but] for the crop to be a contender for a place in British agriculture, the variety will need further improvement through breeding."

"The real question is whether or not there is sufficient evidence at this stage for a higher level of research resources to be channelled into the crop." Address: National College of Agricultural Engineering, Silsoe, Bedford, England.

6296. Sandler, Sandra Takako. 1974. The American book of Japanese cooking. Harrisburg, Pennsylvania: Stackpole Books. 192 p. Illust. Index. 24 cm.

• ***Summary:*** The author, a third generation Japanese-American, reveals the secrets of successful Japanese-style cooking–specifically for the American cook. The three introductory chapters discuss tofu (p. 16, 23, 29, 36), shoyu (p. 20), and miso (p. 27, 35). Soy-related recipes include: Seafood in miso sauce (p. 54). Shellfish in soy-mirin sauce (p. 55). Miso soups (p. 57-59). Tofu & scallions soup (p. 60-61). Instructions for sprouting beans (incl. mung- and soybeans, p. 72-74). Vegetables with tofu & sesame dressing (with white miso, and "white sesame seeds, toasted and ground," p. 77-78). Eggplant and green peppers with miso dressing (p. 78-79). Fried okara (p. 79-80). Sweet cooked soybeans (p. 82). Inari-zushi (p. 89-90). Fish misoyaki (p. 111). Miso abalone (p. 112-13). Beef misoyaki (119-20). Sukiyaki (with tofu and soy sauce, p. 121-22). Pork and tofu (p. 135-36). Stuffed tofu (p. 138-39). Chicken teriyaki (with soy sauce, p. 145). Fresh tofu (p. 154-55). Homemade tofu (p. 155-57). Deep-fried tofu (p. 157). Batter-fried tofu (p. 158). Yakidofu (p. 158-59). Aburage (p. 23, 159). Fox noodles (p. 167-68). Udon in miso shiru (p. 168). Tempura and udon (p. 168-69). San bai zuke (p. 175).

Also discusses azuki beans (p. 23, 178), sweet azuki bean paste (*koshi-an*), sesame seeds, sesame oil (p. 28), sea vegetables, and mochi.

6297. Shinoda, Osamu. 1974. Chûgoku shokumotsu-shi [History of foods and diet in China]. Tokyo: Shibata Shoten. 389 p. Illust. Index. 21 cm. [Jap]

6298. Totten, George O. 1974. Japanese industrial relations at the crossroads: The Great Noda Strike of 1927-1928. In: Bernard S. Silberman and H.D. Harootunian, eds. 1974. Japan in Crisis–Essays on Taisho Democracy. Princeton, NJ: Princeton University Press. See p. 398-436. Proceedings of the Conference on Taishô Japan held at Quail Roost, North Carolina, in Jan. 1970. [49 ref. Eng]

• ***Summary:*** A detailed analysis of the strike against the Noda Shoyu Co. (today's Kikkoman) which had long-lasting, nationwide significance in Japan. "Up until three years after the First World War, the Noda workers led what could only be described as truly impoverished and wretched lives. They were recruited through four local bosses (*oyakata*) who got a rake-off on the workers' yearly wages which they negotiated with the company. Each worker had to sign a yearly contract, or more correctly a promissory note, to work for a year, stating the name of a guarantor as well as the *oyakata.* Four-fifths of the workers lived in shabby shelters provided by the plant, where they slept in two rows and ate the poor and scanty food provided by the company. This practice grew up because most of the workers were too poor to maintain a household."

The Noda local of the Japan General Federation of Labor (*Nihon Rôdô Sôdômei Noda shibu*) was founded on 15 Dec. 1921 by Koizumi Shichizô. It was comprised initially of about 300 workers at Plant 15 in Noda. The first strike, starting on 16 March 1923, lasted 28 days and ended in a compromise. In 1925 Japan's first Universal Manhood Suffrage Act was passed, enabling males over age 25 to vote, without any tax qualifications, thus politically emancipating much of labor for the first time and opening the door for labor-based political parties.

The great Noda strike began on 16 Sept. 1927, when the Noda Shoyu Co. had to close 16 of its 17 plants because 1,358 of the 2,092 employees had decided to strike to secure some 7 demands for better pay and working conditions. The main implicit demand was recognition of the union as a body with the right to bargain collectively. "In the following months, the company carried out several large-scale firings, first issuing an ultimatum to return to work, so that by December 20, 1927, all those on strike were officially discharged. Work had gotten back under way in Plant No. 17 10 days after the strike started, and as time went by the other 16 plants were replenished with some 550 temporary workers. By December, 80 per cent of pre-strike production was reached with 1,350 employees at work, 300 of whom had dropped out of the strike, and of these 150 were clerks, not plant workers... The company hired ultra-nationalist bully gangs to come in and rough up the strikers." The strike finally ended on 19 April 1928, more than 7 weary months (218 days) after it started. It was the longest strike in Japan prior to World War II. In effect, it destroyed the union. Only 300 of the 1,047 fired were allowed to return to work.

6299. Wakisaka, Toshio. 1974. Oya Hakata to koyadofu: Yachiyo-chô sangyô hattatsu shi [Oya hakata and dried-frozen tofu. History of industrial development in Yachiyo-cho]. Japan: Hyogo prefecture. 171 p. For tofu, see p. 82 to end. [5 ref. Jap]

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• ***Summary:*** Hakata-ori is a type of weaving, originally from Kyushu (S.E. Japan). Oya is a small place in Yachio-cho, in Hyogo prefecture. This book is about two of Yachio-cho's famous products, Hakata woven silk and dried-frozen tofu (Koya-dofu). Koya-dofu was introduced to Yachiyo-cho, Kadota-Mura in 1852, when Teijiro Moriwaki (according to his diary) brought it back from Mt. Koya.

6300. Watanabe, Tokuji; Ebine, H.; Okada, M. 1974. New protein food technologies in Japan. In: A.M. Altschul, ed. 1974. New Protein Foods. Vol. 1A. Technology. New York: Academic Press. 511 p. See p. 414-53. Chap. 9. [80 ref]
• ***Summary:*** Contents: Introduction: Soy products, fish products, enzyme applications. Tofu: General description, new materials, new type products, large-scale production, trends in cost, kori-tofu and aburaage. Miso: General description, new technologies, new type products, problems of mycotoxin, packaging and preservation, trends in cost and consumption. Kamaboko and fish sausage–fish jelly: General description, new technologies, new materials–frozen surimi, packaging and preservation, trends in consumption. Textured vegetable protein: Soybean protein curd, wheat gluten, soybean protein sponge. Hydrolyzed vegetable protein (HVP). New enzyme applications: Liquefied fish protein concentrate (LFP), collagenase for poultry processing, removal of beany flavor from soybean by enzyme treatment, microbial rennet. The protein food structure of Japan.

Fig. 13 (p. 47) shows 3 pie charts, each giving the percentage of protein intake per capita from various sources at three different time periods. In 1921-25 only 9% of the total protein came from animal sources (6% from fish and 3% from other animal sources); 42% came from rice, 21% from soybeans, and 14% from cereal grains other than rice. In 1951-55, shortly after World War II, some 23% of the total protein came from animal sources (17% from fish and 6% from other animal sources–such as milk, eggs, chicken, pork, and beef); 32% came from rice, 15% from soybeans, and 20% from cereal grains other than rice. In 1969, some 30% of Japan's total protein intake came from animal sources (21% from fish and 19% from other animal sources); 22% came from rice, 12% from soybeans, and 13% from cereal grains other than rice. Thus the main trend seen during this period is the steady increase in the percentage of protein from animal sources and the corresponding decrease from plant sources. Source: Food Balance Sheet. 1970. Ministry of Agriculture and Forestry. Fig. 14 shows that these trends are apparently related to increasing per capita income and GNP. Address: 1-2. National Food Research Inst., Ministry of Agriculture and Forestry, Tokyo, Japan; 3. Tokai Regional Fisheries Research Lab., Fishery Agency, Ministry of Agriculture and Forestry, Tokyo, Japan.

6301. Watanabe, Tokuji; Ebine, H.; Okada, M. 1974. New protein food technologies in Japan: Hydrolyzed vegetable protein (Document part). In: A.M. Altschul, ed. 1974. New Protein Foods. Vol. 1A. Technology. New York: Academic Press. 511 p. See p. 441-42. Chap. 9. [7 ref]
• ***Summary:*** "HVP is produced from defatted soybean meals or wheat gluten by hydrolysis with hydrochloric acid followed by neutralization. This method was first employed by Ikeda (1908) in his pioneering work which led to methods for the production of MSG. Thereafter, much effort was given to improve the processing, the quality of the crystals of MSG, and the utilization of the residues containing many amino acids. The production of HVP was also begun in shoyu factories to provide material for mixing with tradition soy mash [moromi] in order to reduce the time required for fermentation, to increase the yield, and to accentuate the flavor. The major demand for HVP in Japan is as an ingredient of shoyu and *tsukudani* (preservable foods made from fish, meat, pulses [such as soybeans], or vegetables seasoned with shoyu, HVP, sugar, and other condiments)." The amount of liquid HVP (with a nitrogen content of 2.4%) added to shoyu annually is estimated to be 120,000 tons.

"Defatted soybean meal or wheat gluten is hydrolyzed with approximately 18% of hydrochloric acid and filtered. The filtrate is condensed by vacuum distillation to eliminate residual hydrochloric acid and volatile organic substances, and neutralized with sodium hydroxide or sodium bicarbonate to a pH value of 4.8-6.0 The neutralized liquid is then filtered and condensed again by vacuum distillation, followed by deodorization and decolorization if necessary. Paste HVP is prepared by concentration up to 80-85% of dry matter. Spray-dried powder or its pellet are also available.

"Hydrolysis by enzymes has been investigated, particularly for making shoyu. There are some patents on the hydrolysis by enzyme preparations from several origins for making HVP, although these processes have not yet been industrialized (Yoshida et al. 1959; Saito 1961; Iimura et al. 1962; Otani and Kagoshima 1964; Ikeda 1965a)." Address: National Food Research Inst.

6302. Yabuki, Teisuke. 1974. Tônyû no shinpi [The wonders of soymilk]. Tokyo: Sanrodo. 164 p. [Jap]
• ***Summary:*** This is Japan's first book on soymilk, written by the man who makes Luppy, Japan's first widely popular soymilk.

6303. American Soybean Assoc. 1974? Soybeans: From America's fertile soils the worlds versatile protein resource. Hudson, Iowa. 16 p. Undated. No page numbers. All color.
• ***Summary:*** On a page titled "Utilization," color photos show many soy products including: Milnot (can), Worthington Soyameat (can), Nabisco Sociables (paperboard box), Candied Pernuts: Toasted Soybeans (paperboard box), Bac*Os (glass jar), Crisco (shortening; can), Hain Soy Oil (glass jar), Dream Whip: Whipped Topping Mix (paperboard box), Hamburger Helper (paperboard box), Worthington

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Veja-Links (can), RG Lecithin (jar), Yoshihara Oil Mill, Ltd. Golden Soybean Salad Oil (can, 2 sizes), and 3 brands of bottled soymilk made in Korea. Another page shows Soyor bottled soy oil. The addresses of American Soybean Association offices in Hudson, Iowa (USA), Tokyo (Japan), Taipei (Taiwan), Brussels (Belgium), Hamburg (West Germany), Vienna (Austria), and Mexico City (Mexico) are given. Address: Hudson, Iowa.

6304. Chuo Miso Kenkyujo. 1974? Miso no hanashi [About miso]. Tokyo: Zenkoku Miso Kogyo Kyodo Kumiai Rengokai. 10 p. Undated. [Jap]
• ***Summary:*** An excellent source of statistics on types of Japanese miso and composition by type. Contains many color tables. Address: Tokyo, Japan.

6305. San-Jirushi Jozo K.K. 1974? San-Jirushi, go-annai [Introduction to San-Jirushi]. Kuwana-shi, Central Japan. 6 p. Manufacturer's catalog. Undated. [Jap]
Address: Meisei-dori 1-572-1, Kuwana-shi 511, Mie-ken, Japan.

6306. Andreas, Dwayne O. 1975. Presentation on ADM. Paper presented to the New York Society of Security Analysts. 11 p. Jan. 21. Unpublished manuscript.
• ***Summary:*** Mr. Andreas has been processing soybeans and other agricultural commodities constantly since 1938. Four of ADM's top executives come from competing companies: Mr. Walker from Ralston [Purina], Mr. Burket from Central Soya, Mr. Randall from Cargill, and Mr. Bean from Anderson-Clayton. In 1965, thanks to an entirely new technology that was developing for soybean processing, ADM was transformed from a conglomerate into a non-conglomerate focusing on food technology. "Thanks to a great job that had been done in research, ADM received basic patents on TVP (Textured Vegetable Protein; TVP is a registered trademark). This knowledge was immediately commercialized and TVP has been very successful... it is now produced by some 12-13 different companies."

"The Marshall Plan developed Western Europe and Japan into the greatest cash customers that the United States ever had... This global internationalizing of food distribution had the effect of disorienting much of the entire food processing industry. That is, a plant that was not located so that it had access to the world markets might have become worthless or obsolete overnight. And dozens did."

Currently ADM has about 17% of the soybean processing business in the U.S., 17% of the wheat milling, 25% of the barley malting, 25% of the margarine oil business, 30% of the linseed oil, and 27% of the durum flour business (the basic flour for making pasta products).

A four-horse team is pulling ADM in a certain direction for the future. "One is the edible soy business which includes our TVP and soy flours, in which we are the leaders, and will soon include our soy protein concentrates. It is inevitable that edible soy proteins will increase in use over the next 20 years by leaps and bounds on a worldwide basis. And it is for no other reason than economic compulsion. The cost of making good quality high protein edible products out of soy is so low compared to other protein sources that it is just a matter of how long it will take the food companies to learn how to use it in more ways. In the soy flour business many soy flours are now being used to replace dried milk products just as margarine once replaced butter and this use is due to grow substantially in the next few years. The soy fortified bread and roll products you saw today are examples of how protein levels can be boosted by 50% with little or no increase in cost. ADM is the largest producer in the world of soy flour.

"TVP business has an enormous potential, maybe largely outside of the United States. In every country where there is a balance of payments problem, and where they are importing meat, we get a terrific tail wind from the government in selling TVP...

"The second thing going in our favor is the continuing worldwide expansion of the margarine business. Margarine is replacing butter, and that's a trend that is unstoppable. This trend is fundamental to our business, since about eighty percent of all of our fats and oils, corn oil, soybean oil, go in margarine.

"A third part of our business which has almost unlimited future growth is the soybean meal portion, where we make a refined [dehulled] grade of soybean meal that's used by the poultry industry all over the world. Under today's technology, poultry is by far the cheapest form of meat that's commercially produced. It will expand very much faster than either pork or beef, because it's so much cheaper and so easy to produce, and that business will continue to grow enormously, worldwide.

"The fourth horse of our four-horse team is the corn refining business." We produce corn syrup and fructose [two different products], which are experiencing very rapid growth in demand. Two other very good firms, Standard Brands and the A.E. Staley Co. are now producing fructose, but suddenly most of the soft drink people have decided to use fructose, creating an enormous demand. So "we changed our plans and now plan to produce about 480 million pounds of fructose by next winter and to double that by sometime in 1976."

So the four-horse team pulling ADM into the future is edible soy products, margarine, soybean meal, and refined corn sweeteners (corn syrup and fructose). Address: Chairman and CEO of ADM.

6307. Hashizume, Kazumoto; Shiratori, Makoto; Nakamura, Noriko; Wataname, Tokuji. 1975. Tôfu seizo ni okeru tônyû no chôsei jôken ni kansuru kenkyû. I. Kanetsu-ji no tônyû nôdo ga tôfu no seijô ni oyobosu eikyo [Study of the conditions for preparing soymilk for manufacturing tofu.

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I. Effects of soymilk concentration during heating on the quality of tofu]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 22(1):37-41. [8 ref. Jap]* Address: 1, 3-4. National Food Research Institute, Ministry of Agriculture and Forestry.

6308. Mikoshiba, Kimito. ed. 1975. Daizu no tsukurikata [How to grow soybeans]. Tokyo: Nosan Gyoson Bunka Kyokai. 278 p. Illust. 19 cm. [Jap]

6309. Pearce, Jean. 1975. Jean Pearce's How to get things done in Japan. Vol. 1. Tokyo: Japan Times Ltd. [iv] + 245 p. Jan. Index. 19 cm. [Eng]
• ***Summary:*** This book is composed of reprints of the popular and informative articles, answering questions from readers on a wide variety of subjects, that Jean Pearce wrote in her column in *The Japan Times* from 1 Jan. 1972 to 27 July 1974; they appear in this book in chronological order.

From 16 Oct. 1973 (p. 76): "Health foods" are now widely available in Japan, but familiar products are not always to be found. You can, however, find many soybean products, including natural soy sauce, and natural miso. "Try Nihon Kenko Shizenshoku in Shinbashi [Tokyo], phone 573-4181, or Shizenshoku Center in Shibuya, 461-7988. Both have restaurants that serve natural foods only."

Note: On pages 77-78 is a good history of Calpis.

From 8 Jan. 1974 (p. 118-19): "Health food remains a subject of interest... The basic Japanese diet, with a little discretion in the use of salt, is a health faddist's delight. Also on natural foods, a shop (Ishii Shoten, 1-2-7 Nishikata, Bunkyo-ku [Tokyo], phone 811-2457 in Japanese), that still makes by traditional methods roasted soybeans from mid-December through June, far superior, I'm told, to any of the imported varieties... 'A nice low-cal snack, and a good hors d'oeuvre...' They come with or without salt."

From 5 Feb. 1974 (p. 134): "A woman wants to learn how to make tofu. I have a recipe but I don't think I'll give it again. It is very difficult to do and the end result is more often failure than success. However, anyone can buy instant tofu at most Japanese food stores. It's easy to make, will be better than trying to do it yourself, and is inexpensive, ¥80 the last time I bought it but it has no doubt gone up. It makes two squares. The nigari she asks about is bittern, necessary for thickening [curding, coagulating]. Tofu is now available in many foreign countries. If you don't know where to look, call anyplace listed under Buddhist in the classified directory. Ask where they buy theirs."

From 12 March 1974 (p. 154-55): "Tofu lovers, united! There are lots of them and their sympathy was with the woman who was denied a do-it-yourself recipe in this very column. So kinder hearts provide the following.

"Two collectors [Shurtleff and Aoyagi] are compiling a book of tofu recipes, which includes a number for making tofu, using various solidifiers and soybean products. I'll let you know when it's published.

"A book, *Tofu Recipes,* was published by a tofu enthusiast after a year's visit to Japan. It is her first literary endeavor, a labor of love which will be understood by anyone who is a tofu devotee. Grace Kikuchi tells you how to make it and how to use it, relying on childhood memories and modern innovations. I'll be in the kitchen when I finish this column. You can be equally inspired if you send your order to Grace Kikuchi, 260 Sumac Lane, Ann Arbor, Michigan, U.S.A. Enclose $2.00. Somehow."

From 7 May 1974 (p. 184-85): "There is a new health food [natural food] restaurant in Tokyo, Hakumon ("White Gate"), just across from the Chuo University exit to the Shin Ochanomizu Station on the Chiyoda subway line, phone 291-9762. French owner Jimmy Dejeammes... I'd like to go back daily for the tofu that they make. Try the mochi made of brown rice and prepared in a variety of ways... All bread is baked there; high nutritional value... Among the beverages is Soyalac, made of soybean milk." It is made and distributed here by Saniku Shokuhin, the Seventh Day Adventist health food company. Neuroca, a Swiss coffee substitute, is also available at Hakumon. Phone before you go. Hakumon may be moving soon. Address: The Japan Times, Tokyo, Japan.

6310. Kushi, Michio. 1975. The unifying principle in the world of biology; Natural agriculture and home food processing. *Michio Kushi Seminar Report* (*Brookline, Massachusetts*). Winter. No. 5. Feb. 11. p. 13.
• ***Summary:*** A student asks "Should miso be boiled or not?" Kushi answers: "It doesn't matter. Again, it depends upon what you want. If you want to have yin type of miso with plenty of enzymes present in the soup to aid in good digestion, then you should not boil the soup after adding the miso. But, if you would like to have a strong miso soup which will make you yang, then you can boil it. This is a very controversial argument among macrobiotic people: should miso be boiled or not. It is a controversy not only in America but all over the world." Address: Brookline, Massachusetts.

6311. *Foreign Agriculture.* 1975. Japan's imports of U.S. soybeans down in 1974; Some gain now. Feb. 24. p. 9.
• ***Summary:*** The Japanese Soybean and Supply Consultative Council estimates that soybean imports from the U.S. for all of the Japanese fiscal year 1974 will be 3.08 million tons. In addition to the 3.1 million tons of soybeans that the U.S. provided in calendar 1974, the People's Republic of China is expected to have shipped another 230,000 tons, and Brazil about 50,000 tons. Total Japanese soybean utilization in 1974 is estimated at 3.6 million tons, including 2.76 million tons used by the crushing industry and 730,000 tons for traditional foods. Address: Office of U.S. Agricultural Attaché, Tokyo.

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6312. Fukushima, D. 1975. Tônyû no kagaku. Tokushu: Tônyû inryô no kaihatsu [The science of soymilk]. *Shokuhin Kaihatsu* (*Up-to-Date Food Processing*) 10(2):20-26. [34 ref. Jap]
Address: Noda Sangyo Kagaku Kenkyusho.

6313. Ishino, K.; Okamoto, S. 1975. Molecular interaction in alkali denatured soybean proteins. *Cereal Chemistry* 52(1):9-21. Jan/Feb. [30 ref]
Address: Dep. of Agricultural Chemistry, Tokyo Noko Univ., Fuchu, Tokyo, Japan.

6314. *Soybean Digest.* 1975. Soy oil makes steady gains in Japan. Feb. p. 37.
• ***Summary:*** "Identified soy oil is making steady gains in the Japanese market through the cooperation of ASA [American Soybean Association], the Foreign Agricultural Service (FAS), and Yoshihara Oil Mill, according to Jack Yamashita, ASA assistant director in Japan.

"Prior to the beginning of the program in June 1972, there was no identified soy oil available to Japanese consumers." During the 1st 14 months, 961 tons of identified soy oil were sold, increasing to 1,772 tons during the next 12 months.

Yoshihara Oil Mill purchases more than 350,000 metric tons (MT) of soybeans valued at over $105 million, practically all from the U.S.

6315. Tabuchi, Ichiro. 1975. Nijû seiki no mana: Majikku beenzu no deban; Daizu-nyû no eikyô narabini chiryô kôka ni kansuru hôkoku. II. ["The manna of the 20th century." Magic beans' turn to go on stage: Report on the nutritional and therapeutic effects of soymilk]. *Shokuhin Kaihatsu* (*Up-to-Date Food Processing*) 10(2):27-31. Feb. [3 ref. Jap]
• ***Summary:*** Contents: Introduction. About the soymilk and Soyalac program. (Soyalac is made by San-iku Foods in Japan.) Nutritional and healing effects of formulated soymilk (*chôsei daizunyû*). Summary of clinical experiments with premature infants who were fed soymilk and then had body measurements taken, as reported by Dr. W.B. Omans et al. in the 1963 *Journal of Pediatrics* (62:98). Experiments on raising infants on soymilk at the Shanghai Hospital (*Eisei Byôin*) in China. Report on dairy milk allergies and their cures. Follow-up research on users of Soyalac. Experiments on the effects of soymilk on the growth of elementary and high school students. Conclusion.

Note: This is the earliest Japanese-language document seen (Aug. 2013) that uses the word *daizunyû* ("soybean milk") or the term *chôsei daizunyû* ("formulated soybean milk") to refer to soymilk. Address: San-iku Foods, Japan.

6316. Takeda, Kenneth Y.; Sakuoka, Richard T. 1975. Vegetable soybeans. *University of Hawaii Cooperative Extension Service, Home and Garden Vegetable Service* No. 14. 2 p. Feb.
• ***Summary:*** Contents: Climatic requirements. Soil management and fertilization. Planting. Irrigation and cultivation. Insect control. Disease control. Harvesting. Seed availability.

"Soybeans can be grown year round in most locations in Hawaii by planting the best adapted varieties. Kailua and Kahala, 2 vegetable-type soybean varieties developed by the University of Hawaii, yield well in Hawaii. Vegetable soybean varieties developed in Japan will give good growth and production only when planted between March and August."

"Vegetable soybeans are ready to harvest about 65 to 70 days after planting. The whole plant is usually pulled when a majority of the pods are well-filled, but before the pods turn yellow." Address: 1. Asst. Specialist in Horticulture; 2. Seed Specialist.

6317. Yamaguchi, Yuzo; Hattori, Renzo; Kikuchi, Mitsuo; Moroe, Tatsuo. 1975. Kôji-kin busei hôshu i yoru tônyû no dasshu to karuboniru kagôbutsu no kangen ni tsuite [Deodorization of soymilk and reduction of carbonyl compounds by the conidiospores of *Aspergillus oryzae*]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 49(2):113-18. Feb. [11 ref. Jap]
Address: Central Research Lab., Takasago Perfumery Co. Ltd., Tokyo, Japan.

6318. McCormick, Sally. 1975. Azuma Sukiyaki House: Authentic Japanese cuisine and atmosphere!–5120 N. Broadway, Chicago (Advertorial). *Chicago Tribune.* March 15. p. G10.
• ***Summary:*** Azuma is Chicago's oldest and finest Japanese restaurant. "The Azuma dinner includes Sukiyaki, a generous portion of prime rib slices with fresh mushrooms, bamboo shoots, Tofu (soy bean cakes), Shiratake [Shirataki] (yam noodles) [thin konnyaku noodles] and assorted fresh vegetables." Azuma also serves Cold tofu [Hiya-yakko], Miso shiru [Miso soup], Beef Teriyaki, Chicken Teriyaki and Salmon Teriyaki. Four photos show Azuma Sukiyaki House.

Note: A similar ad appeared in the 9 Oct. 1975 (p. N17) issue of this newspaper.

6319. Japan Food Corporation. 1975. Kikkoman soy sauce: Now available at most supermarkets (If not, please ask them to stock.) (Ad). *Toronto Star* (*Ontario, Canada*). March 19. p. E2, E4.
• ***Summary:*** These are two tiny ads on two separate pages of this issue of the newspaper. On the left side of each ad is an illustration of a bottle of Kikkoman soy sauce. The name of the advertiser is not given.

The first ad contains only the text shown above.

The text of the second ad reads: "Kikkoman soy sauce. Low in calories. High in proteins."

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Note: This is the earliest document seen (Nov. 2009) that mentions "Kikkoman" in the Toronto Star. Address: Toronto, Canada.

6320. Kushi, Michio. 1975. The unifying principle: Excerpt from the *Book of Miso* by Aveline Kushi. *Michio Kushi Seminar Report* (*Brookline, Massachusetts*). Winter. No. 9. March 24. p. 25-31. [2 ref]
• ***Summary:*** Contains a description of "What is miso?" by Michio Kushi, and the "Song of Miso," a poem translated from the Japanese book *Miso Daigaku* by Mr. Kan Misumi. Its many Japanese terms are explained in footnotes. Address: Brookline, Massachusetts.

6321. Hashizume, Kazumoto; Kosaka, Kazuhisa; Koyama, Emiko; Watanabe, Tokuji. 1975. [Studies on the changes of the properties of soybean protein by freezing. IV. Production of new textured protein by freezing]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 30. p. 193-97. March. [7 ref. Jap; eng]
• ***Summary:*** When a soybean protein solution is frozen and stored, the protein becomes insoluble after thawing. This insolubilization is promoted by the presence of free sulfhydryl (SH) groups in the protein, heat denaturation, and the addition of a small amount of urea before freezing.

The resultant insolubilized protein forms a translucent porous mass, resembling a sponge. When this mass is mixed into sausage at the level of 40% by weight, it prevents the separation of free water and resulted in no significant difference in texture compared with ordinary sausage.

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 21(4):136-40 (April 1974). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6322. Hashizume, Kazumoto; Nakamura, Noriko; Watanabe, Tokuji. 1975. [Studies on the changes of the properties of soybean protein by freezing. V. Improved production of new textured protein by freezing]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 30. p. 198-202. March. [4 ref. Jap; eng]
• ***Summary:*** The best texture is obtained when the soybean protein solution is frozen at -20ºC. At a colder temperature, the resulting texture is too fine and weak. At a warmer freezing temperature (-5ºC) the texture is very coarse.

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 21(4):141-45 (April 1974). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6323. Hashizume, Kazumoto; Iwane, Takao; Watanabe, Tokuji. 1975. [Studies on reduction of the moya (aging) period in the kori-tofu making process]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 30. p. 203-07. March. [12 ref. Jap; eng]
• ***Summary:*** To make kori-tofu [dried frozen tofu]. fresh tofu is frozen then aged in a storage room at -1 to -3ºC for about 3 weeks. During this period, called *Moya,* the frozen tofu develops its unique sponge-like structure, however the process requires a great deal of time and energy.

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 21(4):141-45 (April 1974). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6324. Kaizuma, Norihiko; Taira, Harue; Taira, Hirokadzu; Fukui, J. 1975. [On the varietal differences and heritabilities for seed protein percentage and sulfur-containing amino acid contents in cultivated soybeans, *Glycine* max Merrill]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 30. p. 168-74. March. [12 ref. Jap; eng]
• ***Summary:*** Fifty-five Japanese soybean varieties were tested. The protein content ranged from 34.8% to 49.1%. The varieties with the highest protein content were: Kosodefuri 49.1%, Gokuwase-hayabusa 48.5%, and Gokuase-edamame 47.1%.

The methionine content ranged from 0.67 to 0.6 gm per 16 gm of nitrogen. The cystine content ranged from 0.62 to 1.22 gm per 16 gm of nitrogen. The total sulfur-containing amino acid content (methionine + cystine) ranged from 1.29 to 2.15 gm / 16 gm of nitrogen. The varieties with the highest total sulfur-containing amino acid content were: Kosodefuri 2.15, Gokuwase-hayabusa 2.08, Sango-wasedaizu 2.08, and Gokuase-edamame 2.06. Reprinted from *Japanese J. of Breeding* 24(2):81-87 (1974). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6325. Kon, Masayo; Ito, Hiroshi. 1975. Hamanatto ni kansuru kenkyu. II. Seihin-chu no biseibutsu [Studies on "Hama-natto." II. Microflora in products of "Hama-natto"]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 30. p. 232-37. March. [8 ref. Jap; eng]
• ***Summary:*** Hamanatto, a salty fermented soybean product, is made only in the district around Lake Hamana in Shizuoka prefecture. There are two methods of making Hamanatto: (1) Using artificial inoculation with molds belonging to the genus *Aspergillus,* the method used at Yamaya and at Horinji. (2) Using natural inoculation and fermentation by organisms living in the koji room (*muro*), the method used at Daifukuji. Note: This is the earliest document seen (Nov. 2011) stating that Hamanatto [fermented black soybeans] were made at Horinji temple in Hamamatsu.

The main microorganisms that are considered to play an important part in making Hamanatto belong to the *A. oryzae*

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molds and to the *Streptococcus* and *Pediococcus* bacteria. The *A. oryzae* strain is dark olive-green and produces strong proteolytic, but not amylolytic, enzymes. Reprinted from *Kaseigaku Zasshi* (*J. of Home Economics of Japan*) 25(1):21-26 (1974). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6326. Matsumoto, Kosai. 1975. Ume no kenko-hô; Ume no rekishi to sono kôyô [The ume plum way to health: The history of the Japanese plum and its effectiveness]. Tokyo. 251 p. No index. 18 cm. [Jap]
Address: Japan.

6327. Mustam, Muhammad. 1975. How to make tempeh at home and prepare Indonesian-style recipes using it (Interview). Conducted by William Shurtleff in Tokyo, Japan, March. 1 p. transcript. Conducted by William Shurtleff.
• ***Summary:*** Note: William Shurtleff and Akiko Aoyagi, living in Tokyo, were first introduced to tempeh in March 1975, when friends at The Farm, a large spiritual community in Tennessee, sent them *The Farm Vegetarian Cookbook,* which had just been published. They read the section on tempeh with great interest.

That same week, on an introduction from the Indonesian Embassy, they visited Mr. Muhammad Mustam, a former tempeh maker living in Tokyo. He and his wife showed Shurtleff and Aoyagi how to make tempeh on a home scale; they were surprised at how quick and easy the process was. Two days later the Mustams invited Shurtleff and Aoyagi back to their home and used the freshly-made tempeh to prepare a feast of their favorite tempeh recipes. Their guests later wrote in the preface to their *Book of Tempeh:* Such appealing textures and savory flavors we had rarely tasted before. We were so impressed that we included the Mustams' tempeh making method and five recipes in our *Book of Tofu* that was just going to press."

In Indonesia, typical tempeh makers use 10 liters of soybeans at a time, and they prepare the tempeh in their own home. They soak the beans for 24 hours, then tread them underfoot in tightly woven bamboo baskets that are about 50 cm deep and 3 feet in diameter; the water drains out slowly due to the tight weave.

At home, rub soaked soybeans with one hand to remove the hulls, then float them off with running water. It is okay if the beans are split lengthwise into halves (two cotyledons), but try not to break the beans into small pieces. Then simmer the dehulled beans for 45 minutes over low heat and allow them to stand in the cooking water overnight; this causes a mild acid to form. Rinse and drain 5-6 times to give a milder, finer flavor. Add fresh water and cook over low heat for 15 minutes (the beans are still quite firm), then pour into a strainer and allow to cool to room temperature. Wash hands. Crumble 1½ teaspoons ragi (Indonesian tempeh starter cake, which looks like a tan cake of pressed sawdust) over the beans and mix it in. Spread the inoculated soybeans on a piece of aluminum foil (7 by 9 inches). Fold over all 4 sides to form a cake 4 by 3 by ½ inch thick. Seal the packet. Allow to stand at room temperature for 48 hours.

The Mustams prepared the following recipes: Tempeh Goreng, Tempeh Kemul, Tempeh Bacham, Tempeh Kering.

Note: This is the earliest document seen (Jan. 2012) that describes how to make tempeh at home, by hand. Address: Former Indonesian tempeh maker, living in Tokyo, Japan.

6328. Saio, Kyoko; Watanabe, Tokuji; Kaji, Matsukami. 1975. Food use of 7S and 11S proteins: Extraction and functional properties of their fractions. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 30. p. 175-81. March. [12 ref. Eng; jap]
• ***Summary:*** Reprinted from *J. of Food Science* 38(7):1139-1144 (1973). Address: 1-2. National Food Research Inst., MAFF, Shiohama, Koto-ku, Tokyo, Japan; 3. Food Research & Development Laboratories, Meiji Seika Kaisha, Ltd., Kawasaki, Kanagawa prefecture, Japan.

6329. Saio, Kyoko; Watanabe, Tokuji. 1975. Food use of 7S and 11S proteins: High temperature characteristics of gels. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 30. p. 182-87. March. [12 ref. Eng; jap]
• ***Summary:*** Reprinted from *J. of Food Science* 39(4):777-82 (1974). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6330. Saio, Kyoko; Sato, Iwata; Watanabe, Tokuji. 1975. [Functional properties of heat-induced gel prepared from crude fractions of soybean 7S and 11S proteins]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 30. p. 188-92. March. [8 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 21(5):234-38 (May 1974). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6331. Taira, Harue; Taira, Hirokadzu. 1975. [Influence of location on the chemical composition of soybean seeds. VI. Amino acid composition (continued)]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 30. p. 33-42. March. [6 ref. Jap; eng]
Address: National Food Research Inst., MAFF, Tokyo, Japan.

6332. Tajima, Makoto. 1975. [The amino acid composition of new protein products for food from soybean]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food*

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Research Institute) No. 30. p. 208-10. March. [18 ref. Jap; eng]
• ***Summary:*** These six new soy protein products include: (1) 7S-rich protein–high in lysine. (2) 11S-rich protein. (3) Sponge protein–low in lysine + methionine. (4) Soya milk protein #1 (freeze-dried). (5) Soya milk protein #2 (vacuum-dried). (6) Okara protein (treated with cellulase enzyme)–which had the highest protein quality of all.

Reprinted from *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 27(6):295-97 (1974). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6333. Japan Food Corporation. 1975. Kikkoman sauce: Now available at most supermarkets (If not, please ask them to stock.) (Ad). *Toronto Star* (*Ontario, Canada*). April 2. p. E3.
• ***Summary:*** "Here are six good reasons why: Possibly the most rewarding flavour discovery you will ever make. No hydrolized protein, no corn syrup, no caramel, no artificial flavour or colour. Just brewed naturally for 12 months. Brewed purely of select quality soy beans, wheat, salt & water (nothing else) [except koji starter culture, spores of the mold *Aspergillus oryzae*]. Recommended by Good Housekeeping. Winner of 30 major international awards for quality, taste and excellency. And you'll like it.

"Send one Kikkoman label by scraping off any portion and 25 cents for your Kikkoman 'Ikebana' and recipe ideas (The label is well pasted)."

An illustration shows a bottle of Kikkoman soy sauce.

Note: The title of the ad calls the product "Kikkoman sauce," not "Kikkoman soy sauce." Address: 25-6 Connell Court, Toronto, M8Z 1E8 Canada. Phone: (416) 252-5728.

6334. Miller, Harry W. 1975. Re: On soymilk, tofu, and their production. Letter to William Shurtleff, c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan, April 30. 2 p. Typed, with signature on aerogram.
• ***Summary:*** "Yesterday Apr. 28 your letter arrived and it was so helpful and interesting. I am answering your enquiries as best I can. The first is the hot and the cold grind. Soybeans are finding their way in so many types of foods these days and I think you will find depending on their place in the foods we will find varying procedures. On account of costs economy must be considered. Our research tells us that grinding with Stone Buhrs and disintegration with blenders equal same water soluble amount of solids. On a large scale Grinders are cheaper than disintegrators but [for] small production blenders are better.

"Also our findings keeping the temperature under 150 degrees Fahr. of the slurry before filtering gives us approximately the same yield as [if] brought to 212 degrees [boiling]. So when we make soy milk the higher temperature to filtering brings out of the fiber more of the bean taste. This is a question debatable, I know.

"When making ToFu we bring the slurry just up to boiling and our directions is wrong on saying the water extract is treated same for tofu as for soy milk. We know that long boiling or high pressure for at least 7 to 8 minutes at 100 Centigrade is needed to rid the bean of trypsin inhibiter or perhaps gas former. But not for the tofu. The figure of adding 556 grams cerelose or corn syrup to 16 lbs or 7½ kilos soy extract for milk is rather high, more than 7%. Though 7% is about the standard for carbohydrate in Mother's Milk. And we are inclined to follow the formula of human milk rather than Cows Milk for mankind. In our regular milk formula we aim to add 6% carbohydrate, as carbohydrates of soybeans are questionable.

"Providing you get the soy flavor out in processing. I agree that soymilk is good with less corn syrup. The sheet I sent you is the first run off and it needs some corrections and the sugar content should be lowered 1¼%. I have tried to calculate what the total solids are in your finished soy milk. Your water dilution may be less than ours. Out of 5 pounds of soybeans we make 50 pounds of soy milk, slightly over 6 gallons. To this has been added 3 pounds cerelose, 3O grams salt, 1 pound of corn oil. The resulting milk tests 13% solids.

"You make reference to our cutting the curd in 2 inch squares. It is general practise in cheese makers in this country to cut the curd by that, as the curd begins to form you run a sharp-edged stick, or in cheese plants a stainless steel long knife passing three the slit area is curd, so that the curd gathers together between the cuttings, and they know when best to separate and place in cheese pressing boxes. This may not be necessary in soy curd but it seems to be a guide to us when to place and or transfer to the cheese pressing box.

"We surely have something to learn [about] how to make so much Tofu out of a pound of soy beans. Your beans may be a little heavier in protein as we find the large beans we get yield more protein, but not that difference. We have reached 3 pounds but that depends on when we stop dewatering the curd, but any curd more than 3 pounds out of 1 pound of soy beans is hard to handle. But on Tofu we have much to learn, however on Soymilk and building up of maximum yield of total water soluble solids as also taste wise, that is getting rid of the beany flavor, we have definitely made progress and I think moved ahead of any that we have heard of. As for mouth feel, possibly more concentrated formula may be acceptable. The ratio of ingredients we take to the human milk formula and not cows milk made to rear a calf, a hairy animal and rapid grower. I did not have time this evening to review you chapter 10 on soy milk, as I am writing this at home and it is filed at my office with Loma Linda Foods. We have had experience in the above named coagulants, tried them all except sea water and sea salt. We mostly prefer Calcium sulphate and Glucono delta Lactone for convenience.

"I know that the Japanese are very meticulous in making the soy curd, and the people of using same. To translate their

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methods in writing, you have done very well, but still I can assure you that experience is needed in this field. Soy milk and Tofu the world as for western nations has yet to learn to use. Thanks for your letter and your points well taken and I remain, very sincerely yours, Harry Miller.

"Bill, I have written this letter at the end of a very busy day with many interruptions, so it is so poorly typed I almost decline to mail it but it does explain to you what we are doing. I assure you that soy foods are very hard to put over in U.S.A. but people are learning, they are very sensitive to soy flour and Tofu also soy Milk well made has a field for the future. HWM."

Note: Dr. Miller was age 95 years, 9 months and 28 days when he wrote this letter by himself, using a manual typewriter. He was born on 2 July 1879 in Ohio. Address: M.D., 11384 Norwood Ave., Riverside, California 92505.

6335. Kozaki, Michio. 1975. Tônan Ajia no hakkô shokuhin [Southeast Asian fermented foods]. In: Nippon Shokuhin Kogyo Gakkai (Japanese Society for Food Science and Technology). 1975. 22nd Convention: Special Lectures and Symposium. See p. 12-20. [Jap]
Address: Tokyo Nogyo Daigaku, Sakuraoka 1-1-1, Setagaya-ku, Tokyo, Japan.

6336. Okubo, Kazuyoshi; Waldrop, A.B.; Iacobucci, G.A.; Myers, D.V. 1975. Preparation of low-phytate soybean protein isolate and concentrate by ultrafiltration. *Cereal Chemistry* 52(2):263-71. March/April. [18 ref]
• ***Summary:*** "Phytic acid, the hexaorthomonophosphate ester of *myo*-inositol, occurs at fairly high levels in grains and oilseeds as the calcium magnesium salt, phytin. In soybean meal, roughly 70% of the total phosphorus is accounted for by phytin."

The authors describe a process for removal of phytate from defatted soybean meal to produce low-phytate protein concentrates and isolates. The process involves two steps: (1) dissociate the phytate from the protein; (2) Remove the dissociated phytate from the protein by ultrafiltration using a membrane permeable to phytate but impermeable to protein.

The section titled "Ultrafiltration Experiments" (p. 265) states that the retentate was maintained "at a constant volume throughout the dialysis by ultrafiltration (diafiltration). During diafiltration... the retentate was analyzed for total phosphorus. Upon completion of diafiltration, the retentates were recovered by freeze drying and analyzed for nitrogen and phosphorus." Page 268 describes "Phytate removal by diafiltration" and the chemical composition of "soybean protein isolates prepared by diafiltration." Page 270 states that "Diafiltration is an efficient way to prepare protein concentrates low in phytate from defatted soybean meal and flours." It works better than acid leaching. Good results were obtained with diafiltration of a soybean slurry (pH 3.0) containing calcium chloride (0.5 M).

Note 1. This is the earliest English-language document seen that uses the word "diafiltration" in connection with soybeans.

Note 2. This is the earliest English-language document seen (Aug. 2003) that contains the term "soybean protein isolate" (or "soybean protein isolates"). Address: Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai, Japan, and Corporate R&D Dep., The Coca-Cola Company, Atlanta, Georgia 30301.

6337. Shokyo Tsushinsha K.K. [Shoyu Assoc. Communications Co.]. 1975. Zenkoku shôyu gyôsha meibo [Directory of shoyu companies in Japan, by prefecture]. Tokyo. 29 p. April. [Jap]
Address: Tokyo.

6338. *Soybean Digest.* 1975. Brazil–Coming on strong. April. p. 12-13.
• ***Summary:*** Brazil's production of soybeans is growing rapidly, aided by support from the Brazilian government, West Germany and Japan. ACAR (The Association of Credit and Rural Assistance) provides "both interest-free loans and technical assistance to farmers interested in developing land, with soybeans as a top priority now..."

The article quotes the opening lines of four Reuters News Service stories from early 1975: (1) "Washington, DC, Feb. 6–Brazil will have a sharp increase in the availability of soybeans, soybean meal and oil for export over the coming year, according to a USDA field dispatch..."

(2) "Brasilia, Jan. 29–President Ernesto Giesel has announced approval of a Brazilian government plan to develop 1.3 mil. square kilometers (about 50 mil. acres) of scrublands in the Brazilian middle west... The area... could double Brazil's production of soybeans..."

(3) "Rio de Janeiro, Jan. 31–West German and Brazilian farm cooperatives will form a joint company to increase soybean production in Brazil and guarantee supplies to Germany..."

(4) "Brasilia Feb. 13–An official Japanese technical mission began a 6-day visit to investigate possibilities for private joint ventures in agricultural development in Minas Gerais State..."

The "soybean price boom began 2 years ago." A graph shows Brazilian soybean production from 1968-69 (50 million bushels) to 1974-75 (320 million bu).

6339. Watanabe, Ken; Watanabe, Tomonori; Okamoto, Ssusmu. 1975. Yuba no makushitsu ni taisuru shishitsu no kanyo ni tsuite [On the contribution of lipid to the properties of yuba film]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 22(4):143-47. [9 ref. Jap]
• ***Summary:*** Early scientific study on yuba products.
Address: Faculty of Agriculture, Tokyo Noko Univ., Fuchu-shi, Tokyo.

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6340. Kojima, Yoshiko. 1975. Visit by ASA Japanese Young Executive Soy Protein Study Team (Interview). Conducted by Dr. Walter Wolf of NRRL, Peoria, Illinois 61604, May 5. 1 p. transcript.
• ***Summary:*** Miss Kojima is the ASA interpreter. U.S. soybeans give better yields of tofu than domestic (Japanese) or Chinese soybean. Consequently about 80% of the tofu in Japan is made from U.S. soybeans.

6341. Rothschild, Emma. 1975. A reporter at large [The world food economy and the 1974 World Food Conference near Rome, Italy]. *New Yorker.* May 26. p. 40-44, 49-50, 52, 54, 56, 58, 62-66, 68-70, 72-73, 76. See p. 50, col. 3.
• ***Summary:*** The world is in the midst of a food crisis. To many it seems to be a result of drought and natural disaster. But actually is a "sign of lasting insecurity in the world food economy. It is political and economic, and it could have been avoided." As with petroleum problems, it has been "caused by the decisions and policies of people and governments."

The World Food Conference, convened in November 1974, brought together more than 5,000 delegates including many high government officials. From the USA: Henry Kissinger (secretary of state), Earl Butz (secretary of agriculture), and Dr. Don Paarlberg (chief economist at the USDA). The Flanigan Report tried to analyze the world food crisis. William R. Pearce, a vice-president of Cargill, Inc., "said that in the nineteen-sixties the United States 'had excess capacity in corn and soybeans,' and therefore set out to encourage the development of a different diet pattern around the world.'" It encouraged the use of feed grains in meat production. American grain exports increased from 32 million tons in 1971 to 76 million in 1973. Canada and Australia also had huge grain exports. The USSR, Japan, and the European countries (collectively) each now feeds more than 100 million tons of grain to its animals. The USDA had succeeded in reducing U.S. surpluses.

6342. Satô, Kyôzô; Shôji, Yukitsugu. 1975. Moromi no netsu nendô-ritsu no sokutei [Measurement of heat transmission in moromi]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 53(5):303-05. May. [8 ref. Jap; eng]
• ***Summary:*** When making shoyu (soy sauce), in order to warm moromi from outside to the desired fermentation, we would like to know how heat is transferred from the heating surface of the fermenter inward. Address: Dep. of Mechanical Engineering, Faculty of Engineering, Tohoku-gakuin Univ., Tagajo, Miyagi prefecture, Japan.

6343. Tada, Tetsunoke. 1975. Myoyaku: Ume no kôyô 115. Ume wa naze kiku ka? So nazo o toita [Amazing healing agent: 115 effective uses of Japanese plums. Why is ume effective? Its mystery solved]. Tokyo: Kôdansha. 223 p. No index. 18 cm. Series: Orangebacks. [Jap]

Address: Japan.

6344. Miller, Harry W. 1975. Re: On soymilk, tofu, and their production. Letter to William Shurtleff, c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan, June 4. 2 p. Typed, with signature on aerogram.
• ***Summary:*** "Your much appreciated letter has been neglected along with considerable other correspondence. Two reasons we have been on a very crowded program of Research and that I have been away for a time. I do thank you for your notes on some of the items that we have written you.

"First point about the Cooking of soy milk. We are agreed on use of blender for home minimizing of soy bean particle size, though we do have a small Mexican mill use to grind soaked corn and works well but is hand driven and time consuming, can use for making peanut butter as well costs around US $15.00, hard to buy in U.S.A. The double boiler works quite well with brine in outer chamber and commercial salt is cheap here, but I also agree that by constant stirring, boiling can be carried on safely. The Chinese have an ideal system of steam jet cooking in which the lower chamber of a welded together double boiler in which steam is generated in the bottom pan and led by a pipe to the bottom of the cooking chamber so that you get no scorching and active boiling by the release of live steam into the milk of the upper pan. Its simple and takes the place of the steam boiler, except its adapted for milk and To fu making.

"Regards the richness of soymilk, we find the Americans like that thin soymilk best. Possibly its because the soy flavor is more diluted. The rule here in formulation is to make a gallon of Soy Milk out of one pound soybeans.

"As Soy milk keeps well for a week under refrigeration (40 degrees Fahr.) so the house wife likes to grind cook and prepare a weeks supply of soymilk for the family. But as yet the home method of making soymilk is just in the beginning and not many do it.

"You refer to the high percentage of cerelose used here in soymilk as compared with acceptance in Japan. Let me explain our position about the formulation of Soy Milk. The ratio of fat, protein and carbohydrate differs greatly as between cows milk, mare milk, pigs milk, water buffalo milk, human Milk and other animals. These proportions are reflected in the rate of growth, the question of a large hair coating as in the cow and sheep, the energy requirement as for energy nature does not choose to use Protein for combustion to work, its function is to repair muscles or care for protein loss in secretions and body regulators such as the ductless glands, Thyroid, adrenals etc., etc. for wach [?] animals growth an analysis should be the guide, for the first year of growth supplied by milk is a good guide. Human milk formula is fat 3.5%, protein 1.7 percent, Carbohydrate 6 to 7%. For an adult after growth 35 to 50 grams seems

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adequate Protein. Therefore we lean strongly to a standard formula for Soy Milk should be fat 3 to 3.5%, Protein 2 to 2.4%, Carbohydrate 6%. In a one to seven or eight dilution the soybean will yield almost 3% protein, a half the needed fat and so we add 2% fat in the form of liquid vegetable oil and as for carbohydrate edible carbohydrate is rated very low possibly not more than 1% so we add 5% sugar and prefer the cereal sugars with low sweetening effect such as corn syrup.

"Such a milk as I have just described and what we are making and aiming at can be used in cooking, baking as also for general beverage purposes.

"Now just a final word on Tofu, and we have much to learn to get 8 [?] pounds of marketable Tofu out of one pound of soybeans. Since To fu is exposed to heat after its made as milk is not, thus we pressure cook milk 10 minutes and Tofu just brought to boiling point and then curdled. In Tofu Making here when the curd jells, by raking a paddle a few times thru same seems to hasten the curd preparation to be transferred to the pressing box. It need not be two inches 3 or 4 inches divisions. What you have written on soymilk and Tofu is most interesting. Regret delays. with best wishes, very sincerely, Harry W. Miller.

"We have much to learn and am now working on making a loaf Cheese. We have made some progress and believe that we shall solve the problem in time." Address: M.D., 11384 Norwood Ave., Riverside, California 92505.

6345. Freckmann, James K. 1975. Soybean crops draw attention of growth areas. *Foreign Agriculture* 13(23):10-11. June 9.

• ***Summary:*** Summarizes the regional conference on soybeans at Addis Ababa in October 1974. The following developing countries are trying to stimulate soybean production:

"Ivory Coast: Crash program started in 1974 to grow soybeans for seed on about 173 acres. About 2,500 acres are to be sown in 1975... Tanzania: Soybean production was first tried in 1907. About 1,800 acres sown to soybeans are in various trials as an intercrop for small farmers and another 2,000 acres have been sown in a peanut area. Japanese are seeking rights to grow soybeans for export to Japan.

Ethiopia: About 60 metric tons of soybeans were grown in 1973 and about 80 tons in 1974 for the Food Nutrition Institute for use in human (baby care) nutrition. About 700 tons of soy flour were imported from the United States in 1974...

India: Area sown to soybeans may reach about 750,000 acres by 1980, compared with about 210,000 acres in 1974. Twelve processing plants, of which five are solvent extraction plants, average 50 tons of beans per day. These plants have a total capacity of 83,000 tons annually, but are now processing only about 40,000 tons. Nigeria: Government has plans to plant 100,000 acres by 1980 for export crops...

Sierra Leone: Some trials have been carried out since 1966, but no commercial production has been tried or contemplated...

Ghana: Soybean production was first tried in 1906, with poor results. In 1972, the Government decided to try again in hope of reducing large imports of soymeal and oil. Trials are still being conducted. About 1,300 acres are to be sown to soybeans in 1975...

Rwanda: Soybeans were grown on about 4,000 acres in 1974, and plans are to increase this area to 10,000 acres over the next few years. All current production is for domestic food... A French aid group is encouraging production. Sri Lanka: Soybean crops were first tried in 1947. Varietal testing is now being conducted, and about 5,000 acres were planted in 1974 on rice land as a rotational crop. Iraq: About 13,000 acres were assigned to a seed multiplication scheme in 1974... Saudi Arabia: Varietal testing is planned."

Note 1. This document contains the earliest date seen for soybeans in Ghana, or the cultivation of soybeans in Ghana (1906). However there is good reason to distrust this very early date, since no source is given and since many earlier reports give the date of introduction as 1909.

Note 2. This document contains the earliest date seen (June 2007) for soybeans in Iraq, or the cultivation of soybeans in Iraq (1974; one of two documents). The source of these soybeans is unknown. Address: U.S. Agricultural Attaché, Nairobi, Kenya.

6346. Shurtleff, William. 1975. Letters: Tofu and miso. *East West Journal.* June 15. p. 3.

• ***Summary:*** "For the past four years, I have been living in Japan, studying and writing books about tofu and miso. This summer, the Japanese cook and artist with whom I have been working, Akiko Aoyagi, and I will be visiting communities and natural food centers around the United States teaching about these fine, traditional soybean foods so high in protein and low in cost. Anyone interested in learning to cook with or prepare tofu or miso on a family, community, or commercial scale, please write..." Address: c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: (03) 925-4974.

6347. Associated Press (AP). 1975. Foreign customers urge U.S. to improve soybeans' quality. *Japan Times.* June 20. p. 10.

6348. *Los Angeles Times.* 1975. 3 ways to picnic. June 29. p. R10.

• ***Summary:*** These three ways include the all American picnic, the bicycle picnic for vegetarians, and the Japanese-style picnic. A popular dish in the Japanese-style picnic is Inarisushi [Inari-zushi] (Cone sushi). One of the key ingredients is *aburage,* which is "deep fried soybean curd

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available in Oriental food stores."

6349. Imai, S.; Matsumoto, I. 1975. Aka-kara miso ni okeru teien-sei Torulopsis-gun no bunpu to bunri kabu no dôtei [Population of halophilic *Torulopsis* in red and salty miso and their identification]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 70(6):413-15. June. [12 ref. Jap]
Address: Niigata-ken Shokuhin Kenkyusho, Niigata, Japan.

6350. Machida, Yoshiro. 1975. Tôfu seizôgyô no susumubeki michi [The path the tofu industry should follow]. *Shokuhin to Kagaku* (*Food and Science*) 8(6):58-60. June. Special issue (Tokushu). [10 ref. Jap]
Address: Tokyo, Japan.

6351. Machida, Yoshiro. 1975. Suisan neriseihin to shite no daizu tanpaku kaado [Using soymilk curds like fish pastes]. *Japan Fudo Saiensu* (*Japan Food Science*) 3(3):41-45. June. Bessatsu. [5 ref. Jap]
Address: Sugiyama Industrial Chemical Research, Tokyo, Japan.

6352. Matsuoka, Hiroatsu; Fuke, Yôko. 1975. Daizu-nyû o riyô shita chiizu-yô shokuhin no seizô ni kansuru kenkyû. III. Zenshi daizu-nyû kara no seizô [Research on the production of a cheese-like food using soymilk. III. Manufacture from soymilk made from whole soybeans]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 22(9):436-42. [Jap]*

6353. Musha, Soichiro; Takahashi, Y. 1975. Daizu tanpakushitsu no gyôko katei o riyô suru suichu no biryô kinzoku no hoshû [Studies on the enrichment of trace metals utilizing the coagulation of soybean protein. I. Enrichment of trace metals in water utilizing the coagulation of soybean protein]. *Bunseki Kagaku* (*Analytical Chemistry*) 24(6):365-70. June. [25 ref. Jap; eng]
Address: 1. Dep. of Applied Chemistry, College of Engineering, Univ. of Osaka Prefecture, Mozuume-machi, Sakai-shi, Osaka, Japan; 2. Industrial Research Labs., Kao Soap Co., Ltd., 1334, Minato-yakushubata, Wakayama-shi, Wakayama, Japan.

6354. Saio, Kyoko; Terashima, Masahiko; Watanabe, Tokuji. 1975. Food use of soybean 7S and 11S proteins: Heat denaturation of soybean proteins at high temperature. *J. of Food Science* 40(3):537-40. May/June. [11 ref]
• ***Summary:*** In this paper, qualitative changes in proteins of heat-induced gels solubilized with various solvents, are reported. Address: 1&3. National Food Research Inst., Tokyo; 2. Fuji Oil Co. Ltd., Osaka, Japan.

6355. Saio, Kyoko; Terashima, Masahiko; Watanabe, Tokuji. 1975. Food use of soybean 7S and 11S proteins: Changes in basic groups of soybean proteins by high temperature heating. *J. of Food Science* 40(3):541-44. May/June. [10 ref]
• ***Summary:*** This paper seeks to clarify the change/s in basic groups of 7S and 11S proteins during heating at 100ºC to 170ºC.

Table 2 shows that the gross structure of the subunits remains intact during heating to about 125ºC, and is little degraded as the temperature rises to 150ºC. However above 150ºC the structure is degraded.

The solubility shows a rapid decrease during heating to 105ºC, then a slow increase during heating from 105ºC to 150ºC, followed by a rapid increase as the temperature rises above 150ºC.

The binding force shows a rapid increase during heating to 105ºC, then a slow decrease during heating from 105ºC to 150ºC, followed by a rapid decrease as the temperature rises above 150ºC. Address: National Food Research Inst., Tokyo.

6356. *Soybean Digest.* 1975. Programs promote soy foods. June. p. 22.
• ***Summary:*** On 1 March 1975 some 250 school lunch cooks in Takamatsu, Shikoku, Japan participated in a seminar on the uses of soy protein to reduce the cost of school lunch meals, which still providing good nutrition for the children. Sponsored by the American Soybean Association, the prefectural government school officials, and the Japanese School Lunch Institute, this seminar was one of four held in Japan during the year. Another such seminar was held in Yokkaichi City, and Miss Yoshiko Kojima of ASA gave a presentation on the use of soy proteins in the U.S. school lunch program.

6357. Heaton, James. 1975. Pearl of the Ryukyus: Okinawans salute the sea around them in Expo '75. *Los Angeles Times.* July 20. p. F1.
• ***Summary:*** Naha, Okinawa–The first American of distinction to visit Okinawa was Commodore Matthew Calbraith Perry. He didn't stay long, for he was on his way by ship to Japan, "where he succeeded in persuading the Japanese to open their doors to the outside world after a self-imposed 250-year isolation." Most Americans who have since visited wore a military uniform.

Ocean Expo '75 opens today and will be a major attraction until Jan. 18, 1976. Several large photos show the multi-billion dollar expo.

The writer dined in a ryotei, a typical Okinawan restaurant in Naha, where the dishes he enjoyed included "jimani-tofu [sic, jimami-tofu] (bean curd made from peanuts)."

6358. Razowski, Józef; Yasuda, Tosiro. 1975. On the Laspeyresiini genus *Matsumuraeses* Issiki (Lepidoptera, Tortricidae). *Acta Zoologica Cracoviensia* (*Krakow, Poland*)

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20(2):89-106. July 31. [17* ref. Eng]
• ***Summary:*** The known species of the genus *Matsumuraeses* are reviewed. A key for the identification of the males based on the genitalia is included. One new species is described and redescriptions or notes are given of others. The genus was originally established as monotypic by Issiki in 1957. The host plants are mainly *Papilionaceae.* Only *Matsumuraeses phaseoli* (Matsumura; originally named *Semasia phaseoli* Matsumura in 1900) and *M. falcana* (Walsingham; originally named *Eucelis falcana* Walsingham in 1900) are pests of the soybean.

M. phaseoli uses as its host plants: Azuki beans and soybeans (*Glycine max* and *Glycine hispida*). Distribution: Japan (Hokkaido, Honshu, Shikoku), North Korea (Phiongjang-si district), and USSR (Amur district).

M. falcana uses *Glycine max* as one of its hosts. Distribution: Japan (Hokkaido, Honshu, Shikoku, Kyushu), China (Zi-kawy), Taiwan, Nepal.

M. capax is a new species, which uses as its host the leaves of *Astragalus membranaceus* Bunge in March and April. Its distribution includes Mongolia. It is not clear in which countries the insects were found growing on soybeans. Address: 1. Inst. of Systematic and Experimental Zoology, Polish Academy of Sciences, Krakow, Slawkowska 17 [Poland]; 2. Entomological Lab., College of Agriculture, Univ. of Osaka Prefecture 7491: Mozuumemachi, Sakaim Osaka, Japan.

6359. *Daizu Geppo* (*Soybean Monthly News*). 1975--. Serial/periodical. Tokyo, Japan: Daizu Kyokyu Antei Kyokai (Soybean Supply Stabilization Assoc.). Mr. Eiichi Kimura, editor. Frequency: Monthly. [Jap]
• ***Summary:*** This interesting magazine began publication in July 1975, shortly after the American soybean embargo of 1973, primarily to help Japanese commercial soybean buyers keep informed on the status of soybeans worldwide. However the magazine also contains many interesting articles on soyfoods, including some of historical interest. Address: #2 Makoto Bldg. 5F, 1-4-4 Toranomon, Minato-ku, Tokyo 105, Japan.

6360. Erewhon Trading Co. [Los Angeles, California]. 1975. Wholesale price list. July 1975. Culver City, California. 10 p. Catalog and price list.
• ***Summary:*** On the front cover is a copy of an analysis of carrots performed by Agri-Science Laboratories Inc. of Los Angeles. They contain no Organo-phosphates–None detected as Parathion < 0.010 ppm.

Products include: Whole grains. Cereals. Flours–Freshly milled whole grains (incl. Raw soy flour, organic). Beans (incl. Soybeans, organic, Texas {10 or 16 lb}, Soybean flakes, organic, Texas). Butters (incl. Peanut butter, Sesame butter). Applesauce. Carbonated drinks. Juice. Chips. Goodies. Nik's Snaks. Granola. Soybean products: Tamari soy sauce (4 sizes, 8 oz to 4.7 gal). Hacho miso, soybean paste (1 lb or 44 lb). Mugi miso, Barley-soybean paste (1 lb or 44 lb). Kome miso, Rice-soybean paste (1 lb or 44 lb). Sea vegetables. Specialties (incl. Kuzu arrowroot, umeboshi {Plums pickled in brine}, Sesame salt). Seeds. Nuts. Fresh produce–Organic. Dried fruit–Bulk. Dried fruit–Packaged. Books and flyers (Deaf Smith County Cookbook, Oil Story, Pasta Cooklet). Redwood rennetless natural cheeses (Raw or pasteurized). Pasta (Bulk or packaged, incl. Soya-rice shells). Salt. Oils (incl. Soy oil). Erewhon packaged goods: Grains, cereals, flowers, seeds, beans. Teas. Celestial Seasonings bulk herb teas or tea bags. Cosmetics. Cooking utensils.

Inserted is a letter on Erewhon letterhead from Loren M. Spector, general manager, dated 1 July 1975. It begins: "Dear customers: Please find enclosed our summer price list." On the back are "July specials." Address: 8454 Steller Dr., Culver City, California 90230. Phone: (213) 836-7569.

6361. Fujii, Hisao; Shiraishi, A.; Kaba, H.; Shibagaki, M.; Takahashi, S.; Honda, A. 1975. Itohiki nattô ni okeru ijô hakkô to nattô-kin fuaaji [Abnormal fermentation in natto production and *Bacillus natto* phages]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 53(7):424-28. July. [7 ref. Jap; eng]
Address: Faculty of Home Life Science, Fukuoka Woman's Univ., Kasumigaoka, Fukuoka, Japan.

6362. Honorof, Ida. 1975. "Miso"–the miracle soybean food: Man does not live by amino acids alone. *Report to the Consumer* 5(106):104. July. [4 ref]
• ***Summary:*** Contains a long translation by Herman Aihara of Dr. Akizuki's account of miso soup curing victims of the Nagasaki atomic bomb. Address: P.O. Box 5449, Sherman Oaks, California 91493.

6363. Musha, Soichiro; Takahashi, Yoshihisa. 1975. Daizu tanpakushitsu no [Enrichment of trace amounts of gold in water utilizing the coagulation of soybean protein and its determination by atomic absorption spectrometry and emission spectrography. Enrichment of trace metals utilizing the coagulation of soybean protein. II.]. *Bunseki Kagaku* (*Analytical Chemistry*) 24(7):395-99. July. [22 ref. Jap]
• ***Summary:*** By adding fixed amounts of soybean milk (the collector), and delta-gluconic lactone (GDL; the coagulant), to a sample solution containing trace amounts of gold, then heating the mixture to boiling in order to coagulate the protein, 99% of the remaining gold could be recovered. The coagulum (tofu) was separated from the suspension by a centrifuge and burned to ashes using a low-temperature plasma asher. Details for the optimum conditions are given.

"The proposed method was applied to the determination of gold at the order of (0.01–1) parts per billion in the sample solutions such as water, 3% NaCL water and artificial sea water. This method was also applied to the

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determination of gold in common salts." Address: 1. Dep. of Applied Chemistry, Faculty of Engineering, Univ. of Osaka Prefecture, Mozuume-machi, Sakai-shi, Osaka, Japan; 2. Industrial Research Laboratories, Kao Soap Co., Ltd., 1334, Minato-yakushubata, Wakayama-shi, Wakayama, Japan.

6364. Thanh, Vu Huu; Okubo, K.; Shibasaki, K. 1975. The heterogeneity of the 7S soybean protein by Sepharose gel chromatography and disc gel electrophoresis. *Agricultural and Biological Chemistry* 39(7):1501-03. July. [13 ref. Eng] Address: Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai, Japan.

6365. Watanabe, Ken; Okamoto, Ssusmu. 1975. Yuba himaku no soshiki to sono keisei ni tsuite [The texture yuba film and its formation process from soybean proteins]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 22(7):325-30. [9 ref. Jap]*
• ***Summary:*** Early scientific study on yuba products. Address: Faculty of Agriculture, Tokyo Noko Univ., Fuchu-shi, Tokyo.

6366. Ichiyama, Morio. 1975. Noda no rekishi [History of Noda]. Nagareyama, Chiba prefecture, Japan: Ron Shobo. 301 p. First ed. published in 1958 under title: Chiba-ken Noda Kyodoshi. [Jap]
• ***Summary:*** In the section titled "People from Noda who became known worldwide," the first person profiled is Shinzaburo MOGI (p. 263-65). "Mr. Shinzaburo Mogi, 5th son of the 5th Shichirouemon, was born in 1872 Feb. 27 at Noda. He studied at Tokyo Kosho (later Hitotsubashi Univ.), then left school after graduation. In 1892 he went to the USA. Initially, he worked for a milk company in Toronto, Canada. Then he worked at the Chicago [Illinois] branch office of Yamato Shokai. In 1897 he established Yamato Yunyu Co., an import company, and became its president. In 1913 he received Mr. Tsuneo Tanba as a general manager, to manage the soy sauce plant [?]. Under Mr. Tanba were Mr. Kitazawa and Mr. Kunihara.

Yamato Shokai was a company in Yokohama. whose president was Mr. Takeshi Oba. Its capitalization was 1,000,000 yen stock, half of the money put up by Junjiro Ishii and half by Mr. Shichirouemon Mogi. In 1907 in Denver [possibly some city other than Denver, Colorado?, says Ken Mogi IV] he managed a soy sauce plant. Later in Toronto, Canada, he had a relationship with a soy sauce plant. But neither of these soy sauce plants was successful. At International Trading he worked with Mr. Ichizaeomn Morimura (see History of Yokohama [which Ken Mogi says he would like to read]).

Mr. Tsuneo Tanba (a collector of ukiyo-e [color wood-block prints of everyday life in old Japan]), who worked under Mr. S. Mogi, said that Mr. S. Mogi, a Unitarian Christian, did not smoke or drink alcoholic beverages. He loved soy sauce, and he never left any soy sauce on his plate after a meal. He said: "I am not willing to go back to Noda. I do not want to manage a soy sauce plant in Noda."

When he was a student, Mr. S. Mogi helped Mr. Tokuzo Fukuda (later a famous scholar) by giving him 2.5 to 3 yen every month. Mr. S. Mogi asked his father to give Mr. Fukuda 6-9 yen per month for 1½ years. The father did not understand the situation so he visited S. Mogi's dormitory and found out the facts and was satisfied. On 1 Dec. 1946 Mr. Shinzaburo Mogi died.

Note 1. Translated by Kenzaburo "Ken" Mogi IV from the edition of 1975 (Showa 50 Aug. 1), for William Shurtleff of Soyfoods Center. Ken Mogi spent a great deal of time trying to find evidence that his ancestor, Shinzaburo Mogi, started a soy sauce plant in Denver, Colorado. He visited Denver in search of evidence. As of 2004 he stated that this was still a theory, NOT a proven fact.

Note 2. As of Feb. 2007, it is unclear whether or not Shinzaburo Mogi ever started a soy sauce plant in Denver, Colorado, or anywhere else in North America. There is no firm evidence that he did, only the memories of two people and some photos of the foundations of an old building. One of them, Tsuneo Tanba, is mentioned above. Yet Mr. Tanba gives no details. Note 3. Mr. Morio Ichiyama was born in 1897. Address: Noda, Japan.

6367. Butz, Earl; Abe, Shintaro. 1975. The Butz-Abe Understanding, 1976-1978. Washington, DC. 3 p. Unpublished typescript. 28 cm.
• ***Summary:*** "The Butz-Abe Understanding grew out of a meeting between the then U.S. Secretary of Agriculture and the Japanese Minister of Agriculture (and Forestry) on August 12, 1975 in Washington [DC]. The details of the Understanding were specified in a November 7 letter by Butz to Abe (a copy is attached), outlining 'trade targets for the coming three years for grains and soybeans.'"

"There were two important developments in the early seventies [1970s] that were precursors to this agreement. First, as a result of worldwide shortfalls in grain production in 1972, U.S. wheat and corn exports increased 80 and 50 percent, respectively, over the previous year with large volumes going to the centrally planned economies, notably the USSR. This represented a major shift in the pattern of the U.S. trade. Until 1972, U.S. agricultural exports to the centrally planned economies, with the exception of Eastern European countries, were negligible. Whereas the USSR was a residual market for U.S. wheat in 1971 (No. 42), by 1972 it became number one, and likewise in 1973. This situation was similar for coarse grains. The USSR purchased no coarse grains from the United States in 1970 but then became the second most important U.S. market in 1972 and 1973. Japan, on the other hand, traditionally had been a stable market for U.S. agricultural commodities, purchasing large quantities of coarse grains, wheat, and soybeans annually for many years.

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The USSR is not the only country that has shown irregularity in the size of its grain purchases from the United States, but because of the abruptness of its entry into the market and the size of its purchases, it had an important impact on U.S. and world commodity prices. In light of this, and the fact that other countries were becoming more and more dependent on imported grains, Japan was interested in securing its grain supplies from its most important supplier of agricultural products, namely the United States.

"The soybean embargo in 1973 was the second precursor to the Butz-Abe Understanding. Because soybeans were in short supply in mid-1973, as an inflation-fighting measure, the U.S. secretary of Commerce imposed an embargo on the sport of soybeans, cottonseed and various meal and oil products from these commodities until all controls were lifted on September 21. The soybean embargo and the tripling of oil prices in 1973 are still mentioned as the two most important "shocks" to the Japanese economy during the early seventies. However, whereas the tripling of oil prices had a real and lasting effect on its economy, the soybeans embargo was viewed as a symbolic of Japan's vulnerability to interruptions in food supplies resulting from policies in major exporting countries. In actuality, the embargo did not affect the volume of soybean imports that year since Japan imported a record volume from the United States in 1973."

In 1974 Mr. Abe was named Minister of Agriculture, Forestry and Fisheries, the first of four Cabinet posts he held. Later he served as chief Cabinet secretary, Minister of International Trade and Industry, and Foreign Minister. He died in May 1991 at age 67. Address: 1. Secretary of Agriculture, USA; 2. Minister of Agriculture, Forestry and Fisheries (MAFF), Japan.

6368. Fukuyama, M.; Hirai, K.; Murata, K. 1975. Hakkô daizu, tenpe no kôsan kasei kôyô ketsu-sei inshi no shosei-shitsu [Properties of antioxidative and antihemolytic factor isolated from tempeh, fermented soybeans]. *Seikagaku* (*Biochemistry*) 47(8):771. Aug. Presented at the 48th Annual Meeting of the Japanese Biochemical Society. [1 ref. Jap]

6369. **Product Name:** [Tofu].
Foreign Name: Tofu.
Manufacturer's Name: Tofu shop.
Manufacturer's Address: Colonia San Juan de Yapacaní, lowlands of Bolivia. Phone: 2-5194.
Date of Introduction: 1975 August.
New Product–Documentation: Tsuguyoshi Suzuki, et al. 1981. *Ecology of Food and Nutrition* 11(2):107. Nov. "Changing food consumption of Japanese immigrants in the lowland of Bolivia." In July and August 1975 members of this community could buy tofu at a tofu shop in their community. The community was organized in 1955, and could have started as early as that date. Note: This is the earliest known commercial soy product made in Bolivia.

6370. Weaver, Greg; Thompson, Jay F. 1975. Re: Making tofu at The Zen Center, Rochester, New York. Letter to William Shurtleff, c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan, Sept. 29. 3 p. Handwritten, with signature.
• ***Summary:*** "Received your letter / tofu instructions a little over a month ago–many thanks! We've made the tofu 3 times, with great success... We'd very much like to make tofu on a larger scale now... Is it possible to send on instructions for a community scale operation? deepest gratitude for this."

Note: This is the earliest document seen (March 2013) concerning the company that later became Flying Cloud Tofu (May 1977), then The Tofu Shop (1977), then Northern Soy (1979), in Rochester, New York. Address: 1. The Zen Center, 7 Arnold Park, Rochester, New York 14607; 2. 21 Girton Place, Rochester, NY 14607.

6371. Food Systems Branch and Research Branch, Agriculture Canada; Grain Marketing Office. Industry, Trade and Commerce. 1975. Plant proteins in Canada: Utilization for human food. Canada. iii+ 163 p. Sept. 28 cm. [25+ ref]
• ***Summary:*** The title page depicts this as "An assembly of information describing protein crops, status of ingredient manufacturers and marketing, potential markets, research effort, government incentives and regulations, protein status reports, and sources of information."

Contents: Introduction. Protein crops: 1. Trends in breeding Canadian protein crops. 2. Statistical summaries, by crop, of production area, yield, production, farm price, farm value and protein yield.

Manufacturing: 1. Manufacturers, distributors, and vegetable protein associations in Canada, U.S.A., United Kingdom, Australia and Japan (incl. Canadian Vegetable Protein Association, Don Mills, Ontario; Food Protein Council (USA)). 2. Extraction processes for broad bean protein, oilseeds, soybean protein, rapeseed protein, wheat gluten, oat protein, corn refining, alfalfa protein.

Markets: 1. Canada's position in world plant protein markets. 2. Canada's position in world gluten markets. 3. Projected growth of plant protein food ingredients.

Tariffs: 1. Tariff description, by country and BTN number. 2. Canadian tariffs on vegetable flours, protein, oilseeds, oilcake and meal. 3. Countries entitled to British Preferential Tariff, Most Favoured National Customs Tariff, General Tariff, General Preferential Tariff.

Regulations: 1. Status of plant protein under Canadian Food and Drug Regulations. 2. Canadian regulations–protein and fat content in simulated and extended meat products. 3. Problems in evaluating protein quality. 4. Aspects of current U.S. legislation. 5. Proposed revised regulations for plant protein in U.S.A.

Government incentives: 1. Federal government

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assistance programs. 2. Provincial government assistance programs. 3. POS Pilot Plant Corporation.

Research effort: 1. Estimate of research effort, in man-years, on utilization of plant protein in Canada. 2. Non-exhaustive list of research topics on plant protein in Canada.

Status of Canadian plant protein development: 1. Canadian role in development of plant proteins. 2. Production and utilization of sunflower. 3. Current status of leaf protein. 4. Status of rapeseed protein. 5. SCP status. 6. Review of buckwheat as a potential source of human food. 7. Status of oat protein.

U.S.A. situation: 1. Review of "U.S. Plant Protein Situation." 2. Non-conventional food sources. Major sources of information on plant proteins. Address: Canada.

6372. Food Systems Branch and Research Branch, Agriculture Canada; Grain Marketing Office. Industry, Trade and Commerce. 1975. Japanese vegetable protein Manufacturers (Document part). In: Plant Proteins in Canada: Utilization for Human Food. 1975. Canada. iii+ 163 p. See p. 51. Sept. 28 cm. [1 ref]

• ***Summary:*** The following Japanese companies make soy (S) or wheat (w) protein products: 1. Ajinomoto Co. Inc. (s). 2. Azaki Gulico Co., Ltd. (w). 3. Kyowa Hakko Kogyo Co., Ltd. (s). 4. Showa Sangyo Co., Ltd. (s). 5. Shin Shin Industrial Co. Ltd. (w). 6. Takeda Chemical Industries, Ltd. (s). 7. Nisshin Flour Milling Co. Ltd. (w). 8. The Nisshin Oil Mills, Ltd. (s). 9. Nihon Koyu Co., Ltd. (s). 10. Nippon Shinyaku Co. Ltd. (w). 11. Nippon Flour Mills Co., Ltd. (w). 12. Nippon Tampaku Kogyo K.K. (s). 13. Fuji Oil Co., Ltd. (s). 14. K.K. Yokoo Shoten (w). 15. Yoshihara Oil Mill Ltd. (s). 16. Morinaga & Co. Ltd. (w).

"The above named companies have formed a Japanese Vegetable Protein Food Products Association."

Source: Grain Marketing Office, Trade Commissioner Service of I.T. & C. [Department of Industry, Trade and Commerce]. Address: Canada.

6373. Kaizuma, Norihiko. 1975. Studies on the theoretical basis of seed protein improvement in soybeans. *Iwate Daigaku Nogakubu Hokoku* (*J. of the Faculty of Agriculture, Iwate University* [*Japan*]) 12(3):259-62. Sept. [13 ref. Eng]

6374. Lin, Hai-yin. 1975. Tôfu raisan [In praise of tofu]. [*Journal name unknown*]. Sept. p. 64-67. Translation from Lin et al. 1975 Chung-kuo toufu (Chinese tofu). [Jap; eng+]

6375. *Soybean Digest.* 1975. Far East soybean demand to grow. Sept. p. 21.

• ***Summary:*** "H. Nakamura, director of Hohnen Oil Co. Ltd., in Tokyo, explained that the demand for soybeans in Japan is determined largely by the amount of demand for soybean meal."

Japanese soybean processors are concerned with the effects of the 1973 U.S. soybean embargo, hope for more stable soybean prices, and wish that America would develop soybean varieties for different uses and with different compositions (such as high protein or high-oil varieties).

"Assessing the potential of future soybean exports from the People's Republic of China, Nakamura said any increase in Chinese soybean production will probably be absorbed in the domestic market. The Chinese consume only 10 kilograms of soybeans per capita per year, compared to more then 30 kilograms per capita in both Taiwan and Japan, he noted.

"'Low yields of soybean production in China (12 to 13 bu/acre) indicate a great potential for increasing Chinese soybean production in the future,' he said. 'China could at least double its soybean production on the same acreage as today.'"

6376. *NHK Kyo no Ryori* (*Tokyo, Japan*). 1975. Jiman ryôri: Biru Shurutorefu. Tôfu [Recipes I am proud of: Bill Shurtleff and tofu]. Oct. 1. p. 84-85. [Jap]

• ***Summary:*** This magazine is published by Japan's largest and most popular television station, NHK public TV. The contents are taken from NHK-TV programs. This one shows Bill Shurtleff and Akiko Aoyagi teaching Japanese how to make tofu at home. Black-and-white photos show: (1) Shurtleff, wearing an apron, ladling soymilk curds from a metal pot into a cloth-lined forming box (tofu kit). (2) Pouring soaked soybeans into a blender. (3) Straining the soymilk from the fiber. (4) Ganmodoki salad with tofu mayonnaise. (5) Ganmo burger sandwich. (6) Shurtleff and Aoyagi, seated cross-legged on tatami mats, with a large meal prepared in front of them.

6377. Erewhon Trading Co. 1975. Erewhon talking food. Miso and tamari (Ad). *East West Journal* 5(10):43. Oct. 15.

• ***Summary:*** A lengthy description of how traditional miso and tamari (shoyu) are made in Japan and some philosophical reflections on the processes and ancient wisdom that created them. Address: Boston, Massachusetts.

6378. Brown, Lester R. 1975. The politics and responsibility of the North American breadbasket. *Worldwatch Paper* No. 2. 45 p. Oct. No index. 22 cm. [3 ref]

• ***Summary:*** North America has emerged as a major supplier of food to the rest of the world. World grain trade has changed dramatically during the past 40 years. Grains now occupy more than 70% of the world's cropland area. Prior to World War II (in the period 1934-1938), all of the world's geographic areas except Western Europe (which imported 24 million metric tons) were net exporters of grains. Latin America was the world's leading grain exporter (9 million metric tons), followed by North America (5 MMT), and Eastern Europe and the USSR (5 MMT). Asia exported 2 MMT.

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However since that time Asia has turned from a small grain exporter to the world's largest grain importer (47 MMT in 1976, led by Japan, China, and India). Other regions with large grain imports are Eastern Europe and the USSR (27 MMT), Western Europe (17 MMT), Africa (10 MMT), and Latin America (3 MMT). In 1976 North America exported 94 MMT of grain, and Australia and New Zealand exported 8 MMT. The main reason for this change is the varying rates of population growth. Areas with high population growth rates have not been able to grow enough food to keep up with population. Many countries in these regions have a population growth rate of 3% or more per year which, if allowed to continue, will lead to a nineteenfold population increase within a century. Japan (with a population equal to nearly half that of North America squeezed into an area smaller than California) is the world's leading food importer, relying on imports to feed 62% of its 110 million people.

Brazil has recently emerged as a soybean exporter. Address: Worldwatch Inst., 1776 Massachusetts Ave., Washington, DC 20036.

6379. Erewhon Trading Co., Inc. 1975. Erewhon harvest '75. Boston, Massachusetts. 48 p. Oct. Catalog and price list.
• ***Summary:*** On the front cover, a brown and white photo shows a rustic farmer, holding a pitchfork, standing by his horse and hay wagon with wife and child. On the rear cover, Erewhon's president, Tyler Smith, writes a poetic passage about the beauty of wheat. Products include: Grains: Lone Pine in Arkansas grows organic short grain and long grain brown rice. Wehah Farms in California grows organic short grain brown rice and non-organic sweet brown rice [glutinous rice]. Baker in Louisiana grows organic medium grain brown rice. Organic hard red winter wheat is grown in Nebraska and in Deaf Smith, Texas. Organic hard red spring wheat is grown by Ted Whitmer in Montana and Ricke in Minnesota. Organic hard amber durum wheat is grown by Whitmer in Montana. Organic soft white pastry wheat is grown by Wild Winds in New York. Other organically grown grains are pearled barley (Idaho), whole unhulled buckwheat for sprouting, hybrid yellow or white corn (Deaf Smith), open-pollinated yellow corn (Minnesota), blue corn, whole oats, and rye. Cereals include organic soy flakes from Deaf Smith (25 lb). Flours include organic soybean flour (25 lb, steelground, full-fat). Pasta (packaged or bulk) includes Japanese soba, Soy Rice Shells.

Snacks from "Erewhon L.A." include Chico-San Yinnies, and Date-Nut Delight. Nik's Snaks (p. 8): This full page lists about 30 products. Of these, eleven are "tamari-roasted" whole-food snacks. The 30 products are sold in 5 sizes: 2.5 oz, 3.5 oz, or 6 oz. pick-up packages, or 25 lb bulk. The soybeans (dry roasted with tamari, no salt) are sold only in 25 lb packs. Other tamari-roasted seeds include: Spanish peanuts, sunflower seeds, roasted almonds (all 2.5 oz or 25 lb), cashews or pumpkin seeds (25 lb). Non tamari-roasted products include: Raisin walnut mix. Roasted mixed nuts. Raw mixed nuts. Raisin nut mix. Peanut raisin mix. Trail mix (Honey almond granola, roasted peanuts, raw sunflower seeds, date pieces, raisins, and sea salt). Honey almond granola. Chia seeds. Bee pollen. Alfalfa seeds. Date sugar. etc. Erewhon Aztec organic corn chips. Baked goods from Cable Springs Bakery in Cambridge, Massachusetts. Fruit juices from Erewhon, Heinke's, Knudsen, Lehr's (natural grape juice from Germany), and Biotta (Swiss Vegetable juices).

Dairy Products: Cheeses from Alta Dena (also kefir and yogurt) in California, Superior Cheese Co. in Massachusetts, Redwood Natural Cheese Co. in California. Also Favorite Foods yogurt.

Dried fruit, including organically grown Monukka and Thompson raisins, prunes, dates, apricots, apples, Bing cherries, black mission figs, and Calimyrna figs. Peanut-, apple-, sunflower-, and sesame butters. Sesame tahini. Pure & Simple "fruit butters sweetened with honey only; terrific old-fashioned jams (apple, apricot, peach, plum, raspberry, strawberry, grape, cherry). Erewhon apple sauce. "Pumpkin Sour" apple sauce and apple butter made in Plainfield, Vermont. Tree of Life fresh fruit preserves from Florida (8 varieties).

Seeds & nuts, incl. Erewhon organic soybeans in 1-lb packs, and Erewhon organic stoneground soybean flour in 24-oz packs. Arrowhead Mills packaged products, incl. Bulghur-soy grits (24 oz), Soy flakes (16 oz, organic), Roasted soy flour (24 oz, organic). Beans, incl. Aduki (25 lb, from Japan or Mainland China), yellow soybeans (50 lb, organic, New York), black soybeans (25 lb, non-organic from Japan, or organic from New York), green soybeans [dry] (25 lb, organic). Erewhon granola (17 products, including various sizes), Arrowhead Mills granola, Back to Nature granola (unsalted).

Oils, incl. Arrowhead Mills soybean oil (pints, quarts, or 5-gallon jug). Honey. Baking, incl. Premose barley malt, and Yinnies grain syrup from Chico-San. Tea, incl. 2 pages from Celestial Seasonings, and Erewhon Mu tea (9 or 16 herbs), Lotus root tea, Kukicha-branch twig tea. Springwater.

Tamari & Miso: 4 pages of descriptions and prices for Hacho miso (all misos are sold in 1 lb or 44 lb keg), Mugi miso, Kome miso, Tamari soy sauce [actually shoyu] (8 oz, pints, quarts, ½ gallons, gallons, or 4.7 gallon tin), Barley koji (1 lb). Specialties, incl. Unrefined sun-dried sea salt with natural trace minerals from the north coast of Brittany in France, Tekka, kuzu, umeboshi, sesame salt, Herbamare salt, nigari, brown rice vinegar, non-alcoholic beer (Birell, Kingsbury), Bambu instant coffee substitute.

Fearn Soya Foods: Soya granules, Soy-O wheat cereal, Soy-O corn bread & muffin mix, Soy-O bran muffin mix, Soy-O pancake mix–buckwheat, Soy-O pancake mix–wholewheat, Sesame burger mix, Natural soya powder.

Sea vegies: Agar-agar, dulse, hiziki, kombu, wakame,

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nori seaweeds (a description of each is given).

Erewhon certified organic produce, incl. Daikon grown in California. Soaps, incl. Cattier clay products and Dr. Bronner's Peppermint castile soap, Orjene, Nature's Gate, Tom's Natural Soap.

Cookware, mostly imported from Japan, incl. Soy [sauce] dispenser, 4½ inch. Growing [sprouts and sprouters]. Cast iron. Flyers, incl. Talking Food series, Natural recipes (3 by 5 inch tear-off pads. Soy-related recipes include: Soy au gratin, Soy casserole, Miso soup, Soyburgers, and Soy loaf).

A map shows Erewhon's delivery region (Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey) and schedule. The company also has an office near New York City at 303 Howe Ave., Passaic, New Jersey 07055. Phone 212-594-6455.

Note 1. This is the earliest document seen that uses the word "vegies" (spelled as such, one of two documents) to refer to vegetables, or "Sea vegies" to refer to sea vegetables (edible seaweeds).

Note 2. This is the earliest document seen (May 2006) that uses the term "trail mix" to refer to a non-perishable mixture of dried fruits, seeds, nuts, roasted soybeans, granola, etc. to be eaten as a snack, as when hiking or walking. Nik Amartseff coined the term "trail mix" and launched the first commercial trail mix product through Erewhon Trading Co. in 1974. At the time, Nik was studying and practicing macrobiotics in Boston, Massachusetts. By the late 1970s several brands of trail mix were on the market in both natural food stores and supermarkets; by the 1980s there were many, as it became a mainstream American snack.

This catalog cover was reprinted with permission from the Michio and Aveline Kushi Macrobiotics Collection, Archives Center, National Museum of American History, Smithsonian Institution, Washington, DC. Address: 33 Farnsworth Street, Boston, Massachusetts 02210. Phone: 617-542-1358.

6380. Erewhon [Los Angeles, California]. 1975. Erewhon. November/December 1975. Culver City, California. 22 p. Catalog and price list.

• ***Summary:*** On the front cover is an illustration (line drawing) of Benjamin Franklin, wearing a fur hat and glasses. Below is a quote from his *Poor Richard's Almanac* (1739): "Keep thy shop and thy shop will keep thee." Other quotes are scattered throughout the catalog.

Products include: Pasta (packaged and bulk). incl. Soya-Rice Shells (organic) "Eat to live, Live not to eat." Bulk staples–Grains (including Sweet Rice from California), flours (freshly milled whole grain), cereals, beans (incl. organic soybeans and soybean flakes from Texas), seeds. "Knowledge like a rich Soil, feeds if not a world of Corn, a world of weeds." Erewhon packaged staples–Grains, flours, cereals, beans (incl. organic soybeans), seeds. "A long life may not be good Enough, but a good Life is long Enough."

Granola. More packages–Arrowhead grains, cereals, and beans, Fearn Soya Foods (from Fearn Soya Products, incl. Soy-O-Pancake Mix {Wholewheat or Buckwheat}, Soya Powder {Natural or Low Fat}), Earthwonder meals-in-a-bag. Arrowhead Mills The Simpler Life food storage program (nitrogen packed in #10 metal cans; incl. soybeans and soy flakes). Juice. "They that cannot Obey, cannot Command." Spreads (nut butters {peanut butter, sunflower butter, sesame butter, sesame tahini} and fruit butters {Pure and Simple, sweetened only with honey}). Rocky Hollow Herb Farm's line of organic and natural herbs, spices, and essential oils. "Time is an Herb that cures all Diseases." Goodies: Nik's Snaks, chewies (incl. pemmican), chips (incl. Mother Earth Tamari Chips, Corn Munchies–Pure & Simple). "To lengthen thy Life, lessen thy Meals." Rennetless cheese from Redwood Natural Foods. Dried fruit (bulk or packaged, incl. calymyrna figs, medjool dates, monukka raisins). Tamari & miso (Tamari soy sauce–4 sizes aged 2 years, Hacho miso–3 sizes aged 2 years, Mugi miso–3 sizes aged 18 months, Kome miso–3 sizes age not given). Vegetable oils (incl. Arrowhead Soy Oil in 3 sizes). Garden fresh produce. Sea vegetables. Herb teas (incl. Celestial Seasonings). "Make Haste slowly." Body care (incl. Tom's soap and shampoos, Dr. Bronner's soaps, Cattier products), "When the well's dry, We know the worth of Water." Potpourri: Condiments (incl. "kuzu arrowroot, umeboshi (plums pickled in brine)," cookware (Quaker City grain mill, Corona stone mill, Mac steel utility knife, Soy sauce dispenser), publications). "Hunger is the best Pickle." Important stuff (Ordering information). "Drive thy Business, let it not Drive Thee."

On the last page, John Fountain extends "grateful appreciation to all those whose positive accomplishments have created Erewhon: Lima and George Ohsawa, Aveline and Michio Kushi, Cornellia and Herman Aihara, Michel Abehsera, Yvette & Jacques DeLangre, William Dufty, Frank Ford, Paul Hawken, Carolyn Heidenry, Roger Hillyard, Bob Kennedy, Bruce McDonald, Tommy Nakayama, Shane and Lou Olds [sic, Shayne Oles], Fred Rohe, Dr. Pietro Rotundi, Evan Root, Tyler Smith, Bill Tara, our customers, staff, suppliers, and growers, Susan and Lou Remy and all." Address: 8454 Steller Dr., Culver City, California 90230. Phone: (213) 836-7569.

6381. *Gyosai* (*Japan*). 1975. Tôfu go-hyaku-chin. Tôfu ni miserareta aoi-me no shugyô-sô Biru Shurutorefu-shi [Five hundred favorite tofu recipes. The blue-eyed Zen monk who has become fascinated with tofu–Bill Shurtleff]. Oct. p. 100-01. [Jap]

• ***Summary:*** Describes Shurtleff's work with tofu. Three photos show him (in an upstairs room at the Aoyagi home in Nerima-ku, Tokyo), talking, practicing sitting meditation in full lotus, and sitting beside a meal featuring tofu dishes served on the floor. A sidebar contains photos of 4 Western-

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style tofu dishes with a brief description of how each is prepared.

6382. Lovett, Paul S.; Bramucci, Michael G. 1975. Plasmid deoxyribonucleic acid in *Bacillus subtilis* and *Bacillus pumilus*. *J. of Bacteriology* 124(1):484-90. Oct. [23 ref]
• ***Summary:*** The authors found two plasmids from *Bacillus subtilis* strains; they named them pMB1 and pMB2 and gave the molecular weight of each. The plasmids were present in several copies per chromosome.

Since the word "natto" does not appear in this article, the writers may well have been unaware that *Bacillus subtilis* has long been used in Japan to produce a popular fermented food from soybeans–natto.

Although the function of these plasmids has not been determined, the authors suggest the usefulness of these plasmids for the construction of recombinant DNA molecules.

Contains 7 figures, including 5 graphs and 2 electron micrographs of plasmids pMB1 and pMB2 (with a bar showing their approximate size in micrometers).

Note: This is the earliest document seen (Jan. 2012) that contains the word "plasmids" (or plasmid) in connection with the bacterium *Bacillus subtilis* which causes the natto fermentation. Address: Dep. of Biological Sciences, Univ. of Maryland Baltimore County, Catonsville, Maryland 21228.

6383. Shurtleff, William. 1975. Chronology of early tofu and miso classes in California and Hawaii: 25 Oct. 1975 to 14 Feb. 1976. Lafayette, California. 1 p. Unpublished manuscript.
• ***Summary:*** Each class started with a talk about soybeans, soyfoods protein, world hunger, and meatless/vegetarian diets. Then a series of about 25 color slides demonstrated how to make tofu at home. Other slides showed favorite tofu recipes and how tofu was made in a traditional Japanese shop.

1975 Oct. 25–We do our first real "Tofu Class" at Westbrae Natural Foods in Berkeley, California, arranged by Bob Gerner and Liz Horowitz. Thrilling to have an audience of about 14 interested people. On Oct. 30 at Westbrae 16 people attend, and on Nov. 8, 18 people.

November tofu classes: Nov. 14th–Rainbow Grocery (arranged by Bill Crolius), 23rd–Esalen Institute in Big Sur (John Russel).

December tofu classes. 2nd–We do a big tofu class in living room of 790 Los Palos Dr. with lots of publicity from a big newspaper article on our work; 47 attend. 4th–Acalanes (Sandy Hills, 89 attend), 6th Westbrae (Bob Gerner), 7th–San Francisco Vegetarian Society (Dixie Mahy, 67 attend), 8th–Seventh-day Adventist Pacific Union College (Mary Eighme, 48 attend), 11th–Dawn Horse Bookstore in S.F. (Moe).

1975 Dec. 12–*Book of Tofu* in hand. Since we started it on 22 Oct. 1972, it had taken just about three years to write.

Dec. 13–Sept. 1976–I hand deliver *The Book of Tofu* to many bookstores and food shops that wish to sell it, typically selling 4–50 per stop at 40% discount: Communion Vegetarian Restaurant #2, Nutrition in a Nutshell, Open Sesame, Lafayette Natural Foods, San Francisco Vegetarian Society, Kinokuniya Bookstore, Rising Sun (440 Judah St. in San Francisco), Diablo Oriental Foods, San Jose Tofu Co., Soko Hardware, Effie Chow & East West Academy, Ted Nordquist (1536 Versailles Ave., Alameda, CA 94501), The Wok Shop (804 Grant Ave., SF), Westbrae Natural Foods, etc. By 24 July 1976, I had distributed 266 copies.

December tofu classes after we have our book: 13th & 14th–Jacques Delangre (Paradise, CA), 16th–East West Academy (Effie Chow), 17th–Westbrae, 18th–San Francisco Zen Center (Ed Brown), 19th–Fairfax (M. Squire).

Tofu classes/lectures in January 1976 in Northern California: 5th–Westbrae, 7th–St. Andrew's Church in Walnut Creek (Dorothy Headley), 8th–Kepler's Bookstore (Jeffrey Shurtleff & Hank Maiden) 12th–Odiyan, where I see David Mastrandrea after many years, 14th–Berkeley Co-op Natural Food Center at 1414 University Ave. (Susan Kishi, with Ted Nordquist and Janet Fehring [Ahava] helping to make tofu dip; 105 attended), 15th–San Francisco Medical School and East West Academy of Healing Arts (Effie Chow), 17th–Persimmon (Peter Godfrey), 20th–United Energy Co-op (Sri Ramon).

Jan. 16-18–Visit Bubba Free John at his community. Do and film a program on tofu.

Jan. 20-30?–Tofu trip to Los Angeles with mom and Akiko. Many tofu and miso classes. 22nd–East West Academy of Healing Arts (Effie Chow in a church), 24th–weird Los Angeles Vegetarian Society (Blanche Leonard, 150 people attend), 25th–East West Center (P. Retzsky), 27th–Dr. Harry Miller and Loma Linda Foods (70 attend), 29th–Ojai (Luke Gatto). We visit Frazier Farms, a huge natural foods supermarket in Escondido, then go to San Diego for an interview with *Well Being* magazine (David & Barbara Salat).

Feb. Tofu classes: 4th–Walnut Creek Co-op, 6th–Albany church (Nancy Dohur).

Feb. 10 to Oahu, Hawaii. Feb. 12th–tofu class for Seventh-day Adventist group (Naomi Yamashiro, 80 attend), 13th–Honolulu, Hawaii, Kyukendall Hall at Univ. of Hawaii at Manoa (David Lee "Kalm" Sukowske, 140 attend). Then Feb. 14 arrive in Japan. 30-minute KQED TV special on tofu we made shown in California after we left. Expected viewership is estimated at 45,000.

In summary, from October 1975 until February 1976 we did 35 tofu and miso programs in California and Hawaii plus numerous media appearances and interviews. 1,300 people attended these classes. We requested that an admission of no more than $1 per person be charged. Our honoraria, shared with the sponsors, totaled $600. We also sold 366 copies of

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our books.

Note 1. This is the earliest document seen (Dec. 2001) concerning a natural foods retail chain–Frazier Farms natural foods supermarket.

Note 2. This is the earliest document seen (Aug. 2013) concerning the work of Ted Nordquist with soyfoods. Address: 790 Los Palos Dr., Lafayette, CA 94549.

6384. Erewhon Trading Co. 1975. News from nowhere (Japanese fermented foods–Miso, tamari, and koji). *East West Journal.* Nov. 15. p. 29.

• ***Summary:*** The subtitle states: "Erewhon news from Nowhere is a regular *East West Journal* column providing information about food. We hope that this will be a valuable educational service, enabling readers to select what they eat knowledgeably. If you require more information about food, we invite you to visit us at our retail stores." Note that though the column is written in the first person, no author is given.

"In my opinion the most fundamental change in the creation of traditional fermented foods occurred with the shift of the Japanese rural-based economy after World War II. The movement of the population to the cities and the emphasis on production and manufacturing by large numbers of city dwellers who consumed increasingly larger amounts of food created a demand for soybeans beyond the capacity of the rural of the rural population's productivity. The Japanese turned to America for their soybeans and began to use varieties that did not lead to the fine product to which the native beans had formerly contributed. The result was an economic necessity for research, carried out by American and Japanese technicians, and the results created several basic changes in the manufacturing process.

"First, the koji mold was investigated, and out of the hundreds of strains of mold bacteria [sic] present in the traditional mold culture, certain strains were isolated and propagated for their effectiveness to create the fermentation under laboratory conditions. Thus, new strains of 'hybrid' cultures were developed that would break down the American beans of inconsistent quality. The technicians failed to see the process as a whole, not realizing that the long-term fermentation and great attention in handling the raw materials at different stages was an art that depended on a great variety of naturally occurring bacteria to produce an environment where natural competition worked to strengthen the culture."

"Except for the small number of true traditional makers in Japan, I would say that Americans in their own backyards will, within the next ten years, be producing finer miso and tamari than the majority of producers currently working in Japan." Address: Massachusetts.

6385. Jameson, Sam. 1975. Japan's small business flexes muscles and giants back away. *Los Angeles Times.* Nov. 23. p. F1.

• ***Summary:*** Until May 1973, the Japanese government had an elaborate set of restrictions that prevented foreign investors from entering specific fields. Now a new type of Japanese business protectionism is beginning to rear its head. Fields traditionally dominated by small or household businesses are trying to prevent large firms from entering these fields. Keidanren, the main Japanese trade group representing large enterprises, took note of this concern by issuing a set of "guidelines" designed to avoid friction between big and small businesses.

In July, Yakult, a large yogurt manufacturing firm, officially notified the Ministry of Agriculture, that it was abandoning a "plan to begin manufacturing tofu (bean curd), a staple made in traditional family-run shops in neighborhoods throughout the country."

"All four opposition political parties have jumped on the issue, promising protection for 'the little guy' against 'the power of massive capital'–the same argument that was used for years against foreign investment." Address: Times staff writer.

6386. Hashizume, Kazumoto; Nakamura, N.; Watanabe, T. 1975. Influence of ionic strength on conformation changes of soybean proteins caused by heating, and relationship of its conformation changes to gel formation. *Agricultural and Biological Chemistry* 39(11):1339-47. Nov. [18 ref] Address: National Food Research Inst., Ministry of Agriculture and Forestry, Tokyo, Japan.

6387. Shurtleff, William; Aoyagi, Akiko. 1975. Tofu as a food. *Macrobiotic* (*The*) (*Chico, California*) No. 110. p. 14-24. Nov. [2 ref]

• ***Summary:*** Excerpted from the forthcoming Book of Tofu.

The magazine's editor notes: Tofu is also good for external plasters, especially on a head injury or concussion, etc. However it is not advisable to use it on heart area injuries, as tofu is very yin, and could weaken the heart.

Tofu as food should be balanced with Tamari or Miso, or eaten with fish, burdock or any other yang food. This will balance its yin quality. Address: Lafayette, California.

6388. *Soybean Digest.* 1975. New soy foods–Japanese make switch. Nov. p. 24.

• ***Summary:*** Today "ASA [American Soybean Assoc.] market development is introducing in Japan a new form of soy protein in answer to the increasing westernization of Japanese tastes and to the high prices of meat and fish in Japan. The result is a boom in the new use of soy protein products, which take the form of textured soy protein meat extenders and meat substitutes, soy-fortified bread and macaroni products and soy milk. Only negligible amounts of soy protein materials were used in these types of foods in 1970... New soy protein was first introduced in the form of

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'sloppy joes' in the Japanese school lunch program in 1972 by ASA."

6389. Canaday, John. 1975. A neotraditional Japanese 'farmhouse' that delights in good food and service: Restaurant reviews. *New York Times.* Dec. 5. p. 55.
• ***Summary:*** Includes a review of the Japanese two-star restaurant Robata (30 East 61st Street, New York City). The word "robata" means "by the fireside," referring to the sunken open-hearth fireplace (*irori*) in a traditional Japanese farmhouse.

"A very good surprise was grilled bean curd, and we recommend it heartily. Charred on the grill, it comes in a vinegary sauce that goes beautifully with the curd's bland innards beneath the smoky taste of the crust."

Note: This is the earliest English-language document seen (April 2013) that contains the term "grilled bean curd;" it refers to grilled tofu.

6390. *SoyaScan Notes.* 1975. Chronology of soybeans, soyfoods and natural foods in the United States 1975 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Feb. Gale Randall starts America's first commercial Caucasian-run tempeh company in Unadilla, Nebraska.

March. Alec Evans starts the first of the new breed of Caucasian-run tofu shops in Corvallis, Oregon, named Welcome Home Bakery and Tofu Shop.

March. "Safe protein-calorie ratios in diets. The relative importance of protein and energy intake as causal factors in malnutrition" by P.R. Payne of the Department of Human Nutrition, London School of Hygiene and Tropical Medicine, published in the *American Journal of Clinical Nutrition.* Payne argues convincingly that food energy (calories) is more of a problem than protein.

April 29. Saigon falls, ending the Vietnam war.

July. Freezing weather in Parana, Brazil, kills many coffee trees, leading to a big expansion of soybean acreage.

Aug. 3-8. The first World Soybean Research Conference held in Champaign, Illinois, with 600 participants from nearly 50 countries. The 1073-page proceedings, edited by L.D. Hill, are published in 1976.

Aug. Japan Vegetable Protein Food Association founded to promote modern soy protein products, primarily soy protein isolates.

Oct. 25. William Shurtleff and Akiko Aoyagi conduct their first Tofu Class at Westbrae Natural Foods, Berkeley, Calif. Eight people attend. Also in 1975 Gordon Bennett becomes president of Westbrae.

Oct. "The Traditional Tofu Craftsman and His Shop," the first of the new wave of soyfoods articles, published in East West Journal. Contains excerpts from the forthcoming *Book of Tofu* by Shurtleff & Aoyagi.

Nov. 9-12. First Latin American Conference on Soy Protein, organized by the American Soybean Assoc., held in Mexico City.

Dec. 12. *The Book of Tofu* by Shurtleff and Aoyagi published by Autumn Press. This book launches the tofu boom and soyfoods movement in America.

Dec. Ganesha, a craftsman in Berkeley, makes America's first tofu boxes, handcrafted of wood.

Dec. 1975 to Jan. 1976 Shurtleff and Aoyagi do a Tofu and Miso California Tour, with 40 public programs in the Los Angeles Area and northern California.

* *The Farm Vegetarian Cookbook* published by The Farm's Book Publishing Co. in Summertown, Tennessee. Expanding on the ideas in *Yay Soybeans!* (1974), it contains many soyfoods recipes, plus the first popular information on tempeh and the first tempeh recipes to be published in any European language.

* Textured soy protein concentrates developed and introduced by three companies, incl. Griffith Laboratories and Central Soya (Response).

* Vitasoy soymilk in Hong Kong is first sold in Tetra Pak cartons.

* Latin American soybean production tops 10 million metric tons, up 10-fold since 1967.

* National Soybean Research Center (CNP-Soja) established at Londrina, Parana, Brazil, within EMBRAPA (The Brazilian Research Organization for Agriculture), to stimulate research and coordinate the efforts of the state programs.

6391. Autumn Press, Inc. 1975. Imagine... (Ad for The Book of Tofu by Shurtleff and Aoyagi). *Macrobiotic* (*The*) (*Chico, California*) No. 111. p. 61. Dec. [1 ref]
• ***Summary:*** "Imagine... How strange it would seem if in the world's greatest wheat-producing country most of the people had never tasted bread. Yet no less unusual is the present situation in America, the world's greatest producer of soybeans, where the majority of people have not yet tasted, seen or even heard of tofu."

The Book of Tofu is 8½ x 11. 336 pages and has over 300 illustrations, $6.95.

"A family of foods developed over thousands of years in China and Japan, tofu is East Asia's way of using soy protein to complement a diet low on the food chain. Now available commercially across America in over 10 different forms, tofu can also be made at home–for pennies! Quick-and-easy to use in almost every conceivable type of Western-style preparation ranging from dips to desserts, these time-tested natural foods open new vistas of creative, healthful menu-planning–while offering a revolutionary approach to meeting the world's critical food requirements.

"*The Book of Tofu* contains: Over 500 recipes culled from East and West. Easy-to-follow instructions for making 7 varieties of tofu (plus soymilk, yuba and tempeh) at home

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and on a community scale. An illustrated description of the art of making tofu in a traditional Japanese shop. The most detailed glossary of Japanese foods ever compiled in English. And much, much more."

Note: This is the earliest advertisement seen that mentions tofu. Address: P.O. Box 469, Soquel, California 95073.

6392. Kiuchi, Kan; Ohta, Teruo; Ebine, Hideo. 1975. Changes in lipid components of miso-dama koji. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 53(12):869-74. Dec. [6 ref. Eng]
• ***Summary:*** "A large amount of lipids [such as oil and lecithin] is contained in miso, especially soybean miso, since soybean is the raw material of miso." However the free fatty acid content of miso dama was higher than that of soybeans. Address: National Food Research Inst., Ministry of Agriculture and Forestry, Shiohama, Koto-ku, Tokyo, Japan.

6393. **Product Name:** [Tofu].
Manufacturer's Name: Le Bol en Bois.
Manufacturer's Address: 35, rue Pascal, 75013 Paris, France. Phone: 707-272-4.
Date of Introduction: 1975 December.
New Product–Documentation: Shurtleff & Aoyagi. 1978, Dec. *The Book of Tofu* (Ballantine pocketbook edition). "Appendix B: Tofu Shops and Soy Dairies in the West." p. 401. Owner: Mr. Noboru Sakaguchi: a combination natural foods restaurant and tofu shop.

Richard Leviton. 1983. Oct. 16. Trip to Europe with American Soybean Assoc. According to Bernard Storup of Societe Soy, in 1982 Le Bol en Bois in Paris was making about 2,500 lb/week of tofu, but now they are probably down to 1,200 lb/week with competition from Societe Soy.

Toyo Shinpo. 1984. March 21. Mr. Sakaguchi runs a tofu shop and natural food store. He makes 250-300 cakes/day of tofu. Half is sold in the shop and restaurant, the rest is distributed to Japanese restaurants in Paris. Le Compas. 1986. March-April. p. 32.

Form filled out by Anthony Marrese based on an interview with Mr. Hirayama. 1989. Nov. Mr. Sakaguchi is the owner of Daizou and Mr. Takatoshi Hirayama is the tofu production manager. Le Bol en Bois started in the 1970s as probably the first macrobiotic restaurant in Paris. They made tofu for their own use and their outside business grew slowly. In 1985 Tama (an importer and distributor of Japanese natural foods) and Daizou (a food manufacturing company) were made separate business divisions of Le Bol en Bois restaurant and health food store. The three companies employ about 50 people, 6-7 in food production.

Business card from "Bol en Bois." 1989 "Store, macrobiotic restaurant, natural products, new specialized library. 35-40, rue Pascal 75013 Paris."

Interview with Mr. Noboru Sakaguchi, founder of Le Bol en Bois, by David de Korsak. 1990. June 14. An invoice plus personal recollections prove that Mr. Sakaguchi opened Le Bol en Bois on 2 Sept. 1974 and began commercial tofu production in Nov. or Dec. 1975. For details, see interview.

6394. *Macrobiotic* (*The*) (*Chico, California*). 1975. Miso as a replacement for meat. No. 111. p. 39. Dec.
• ***Summary:*** "Miso is Yang. It replaces meat, being as Yang as meat. One who eats miso every day will soon have no desire to eat meat. The Yang mineral salts he craves are amply supplied by miso. Without miso, it is difficult to remain healthy and free of disease. With miso, for the intestines, the root of all disease, are maintained in a healthy condition. Animal foods which are not digested completely easily breed bacteria which are toxic... Carnivorism is a short term adventure, always reckless and dangerous, that ends in tragedy and disease..."

6395. Shurtleff, William; Aoyagi, Akiko. 1975. The book of tofu: Food for mankind. Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. Illust. by Akiko Aoyagi. Index. Dec. 28 cm. Rev. ed. 1977 Autumn Press, Brookline, MA. [53 ref]
• ***Summary:*** This pioneering work started the "tofu revolution" in America. Contents: Preface. Acknowledgments. Part I. Tofu: Food for mankind. 1. Protein East and West. 2. Tofu as a food: Introduction, rich in high quality protein (NPU, biological value, protein score, amino acid content), high protein complementarity (tofu contains an abundance of lysine, an essential amino acid that is deficient in many cereal grains; increase usable protein by combining tofu with wheat, rice, corn, etc.), easy to digest, an ideal diet food, low in saturated fats and free of cholesterol, rich in vitamins and minerals, a health-giving natural food, backbone of the meatless / vegetarian diet, free of chemical toxins, low in cost, easily made at home, quick & easy to use, versatile.

3. Getting started: Introduction, buying and storing tofu, basic ingredients (whole-wheat flour, miso {rice-, barley-, and soybean miso, special Japanese miso, Chinese chiang}, oil, brown rice, salt, shoyu {natural shoyu, shoyu, Chinese soy sauce, synthetic or chemical soy sauce}, sugar, vinegar, monosodium glutamate {MSG}), Japanese kitchen tools (each illustrated), preparatory techniques (salt rubbing, rinsing and pressing leeks and onions, soaking burdock root, reconstituting dried sea vegetables {dried hijiki, wakame, agar}, wheat gluten and kampyo [kanpyo], parboiling, cutting tofu and vegetables, using sesame seeds, toasting nori, preparing a steamer), basic recipes (soup stocks and broths {dashi}, basic shoyu dipping sauces {*tsuke-jiru*}, miso toppings {sweet simmered miso / *nerimiso,* miso sauté / *abura miso,* special miso toppings and dipping sauces, finger lickin' miso, and regular miso}, miso salad dressings, nut and seed butter toppings, spreads and dressings, basic sauces, rice, noodles and other basic preparations).

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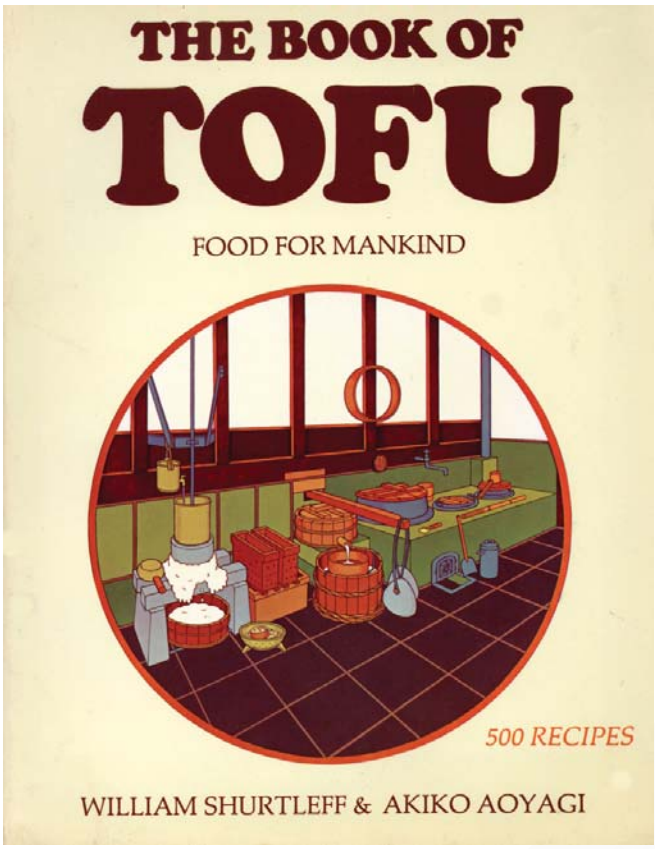

Our favorite tofu recipes (lists about 80 recipe names for each of the different types of tofu, plus soymilk, yuba, whole soybeans, gô, okara, and curds; very favorites that are also quick and easy to prepare are preceded by an asterisk).

Part II. Cooking with tofu: Recipes from East and West (500 recipes). 4. Soybeans: History of soybeans and "soybean foods," cooking with whole dry soybeans, roasted soybeans (*iri-mame*), fresh green soybeans (*edamame,* incl. a recipe for "Sweet emerald bean paste {*Jinda*}),*"* kinako (roasted full-fat soy flour, incl. Japanese health food treats such as *kinako amé, gokabo, kokusen, kankanbo,* and *abekawa mochi*), soybean sprouts (*daizu no moyashi*), natto ("sticky fermented whole soybeans," with "gossamer threads"), tempeh (fermented soybean cakes), Hamanatto and Daitokuji natto (raisin-like natto), modern western soybean foods (natural soy flour [full-fat], soy granules, defatted soy flour and grits, soy protein concentrates, soy protein isolates, spun protein fibers, textured vegetable protein {TVP}, soy oil products). 5. Gô (a thick white puree of well-soaked uncooked soybeans). 6. Okara or Unohana. 7. Curds and whey. 8. Tofu (includes history, and preparatory techniques: Parboiling, draining, pressing {towel and fridge method, slanting press method, sliced tofu method}, squeezing, scrambling, reshaping, crumbling, grinding, homemade tofu (basic, from powdered soymilk, fermentation method related to soymilk yogurt), tofu quick and easy {incl. Chilled tofu–Hiya-yakko}, tofu dressings, spreads, dips and hors d'oeuvre {incl. Creamy tofu dressings and dips, Tofu mayonnaise dressing, Tofu tartare sauce, Tofu cream cheese, Tofu sour cream, Tofu cottage cheese, Tofu guacamole}, tofu in salads {Western style and Japanese style salads incl. Shira-ae}, tofu with sandwiches and toast, tofu in soups {Western style and Japanese style soups, incl. miso soup}, tofu in sauces, tofu in breakfast egg dishes, tofu baked, tofu sautéed, stir-fried or topped with sauces {incl. Mabo-dofu [Ma Po doufu]}, deep-fried tofu, tofu with grains, tofu broiled {incl. Tofu dengaku}, tofu simmered in one-pot cookery and seasoned broths, tofu steamed, tofu desserts {incl. Tofu whipped cream or yogurt, Banana tofu milkshake, Tofu icing, Tofu ice cream, Tofu cheesecake, Tofu-peanut butter cookies}).

9. Deep-fried tofu: Thick agé or nama-agé (incl. *atsu-agé* meaning "thick deep-fried tofu," "three-cornered agé" {*sankaku-agé*} in Kyoto, agé cubes {*kaku-agé*}, "five-color agé" {*gomoku-agé*}), ganmo or ganmodoki (incl. *hiryozu / hirosu,* "Flying Dragon's Heads," "treasure balls," "Ganmo treasure balls"), agé or aburagé (incl. *kiji,* "agé pouches," "crisp agé", *kanso aburagé,* "agé puffs," "fried soybean cakes," "hollow agé cubes," "Smoked tofu," p. 189-91, 197).

Note 1. This is the earliest English-language document seen (April 2013) that contains the following terms related to deep-fried tofu (p. 180-90): "Thick agé," *nama-agé, atsu-agé, Hiryozu,* "Dragon," "Flying Dragon's Heads," "treasure balls," "five-color agé," *gomoku-agé,* "Ganmo treasure balls." "fresh or raw deep-fried tofu," "three-cornered agé," *sankaku-agé,* "agé cubes," *kaku-agé, kiji.* "agé pouches," "crisp agé," *kanso aburagé,* "agé puffs," "fried soybean cakes," or "hollow agé cubes."

10. Soymilk. 11. Kinugoshi ("*Kinu* means 'silk'; *kosu* means 'to strain'; well named, kinugoshi tofu has a texture so smooth that it seems to have been strained through silk." It is made from concentrated soymilk). 12. Grilled tofu (incl. sukiyaki). 13. Frozen and dried-frozen tofu. 14. Yuba (incl. many meat alternatives such as Yuba mock broiled eels, Buddha's chicken, Buddha's ham, sausage). 15. Tofu and yuba in China, Taiwan, and Korea (incl. Savory tofu {*wu-hsiang kan*}*;* see p. 258 for illustrations of many meat alternatives, incl. Buddha's fish, chicken, drumsticks, and duck, plus vegetarian liver and tripe, molded pig's head, and molded ham). One type of Korean soybean miso is called *kotsu jang* [sic, *kochu jang*]. When tofu is served with miso [Korean-style, *Tenjang*] as the dominant seasoning, and with rice, "it becomes the popular *Tenjang Chige Pekpem"* (p. 262). 16. Special tofu.

Note 2. This is the earliest (and only) English-language document seen (March 2009) that uses the word "Tenjang" to refer to Korean-style soybean jang (miso).

Part III–Japanese farmhouse tofu: Making tofu for more and more people. 17. The quest. 18. Making community tofu. 19. The traditional craftsman. 20. Making tofu in the traditional way.

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Appendices: A. Tofu restaurants in Japan; many are vegetarian: In Tokyo: Sasa-no-yuki / Sasanoyuki, Goemon, Hisago, Sanko-in, Shinoda-zushi, Dengaku (south of Tokyo in Kamakura). In Kyoto: Nakamura-ro, Okutan, Takocho, Izusen, Junsei, Nishiki, Hakuun-an, Rengetsu, Sagano, Sorin-an. Tea ceremony cuisine (*Kaiseki ryori*), Zen temple cookery or Buddhist vegetarian cookery (*Shojin ryori*), Tea ceremony cookery from China (*Fucha ryori*), Wild gathered cookery (*Sansai ryori*). A directory of these and others, with addresses and phone numbers, is given (p. 312).

B. Tofu shops in the West (Directory of 43 shops in the USA, 3 in Europe, and 3-7 in Latin America {Mexico City, Rio de Janeiro and Sao Paolo, Brazil}). C. People and institutions connected with tofu. D. Table of equivalents. Bibliography. Glossary. Index. About the authors (autobiographical sketches; a photo shows Shurtleff and Aoyagi, and gives their address as New-Age Foods Study Center, 278-28 Higashi Oizumi, Nerima-ku, Tokyo, Japan 177). Sending tofu in the four directions.

Pudding recipes include: Rice pudding with gô and apple (p. 76, incl. 2 cups soymilk). Tofu chawan-mushi (p. 147; Steamed egg-vegetable custard with tofu). Tofu fruit whips (p. 148). Tofu rice pudding (p. 150, incl. 1 cup soymilk). Tofu custard pudding (p. 152). Soymilk custard pudding (p. 208). Brown rice pudding (p. 208, with 2 cups soymilk). Soymilk chawan-mushi (p. 209). Chawan-mushi with yuba (p. 249).

Dessert recipes include: Tofu whipped cream or yogurt (p. 148; resembles a pudding or parfait). Tofu ice cream (p. 149, with chilled tofu, honey, vanilla extract and salt). Banana-tofu milkshake (p. 149). Tofu cream cheese dessert balls (p. 149). Tofu icing (for cake, p. 149). Tofu cheesecake (p. 150). Tofu-pineapple sherbet (p. 151). Also: Soymilk yogurt (cultured, p. 205). Healthy banana milkshake (p. 206). On p. 160 is a recipe for "Mock tuna salad with deep fried tofu."

Note 3. This is the earliest English-language document seen (Sept. 2013) that uses the term "Tofu ice cream" to refer to soy ice cream or that contains a recipe for "Tofu ice cream."

Note 4. This is the earliest English-language document seen (April 2013) that uses the term "Tofu Cheesecake" and the first to give a recipe for a tofu cheesecake.

Note 5. This is the earliest English-language document seen (Oct. 2013) that uses the term "Tofu sour cream" (p. 109) or that contains a recipe for "Tofu sour cream."

Note 6. This is the earliest English-language document seen (April 2013) that uses the term "tofu milkshake" or that gives a recipe for a shake made with tofu.

Note 7. This is the earliest English-language document seen (Jan. 2012) that uses the term "sticky fermented" to refer to natto.

Note 8. This is the 2nd earliest English-language document seen (April 2013) that uses the term "dried-frozen tofu."

Note 9. This is the earliest English-language document seen (April 2013) that describes preparatory techniques for tofu (p. 96-98).

Note 10. This is the earliest English-language document seen (April 2013) that contains the term "smoked tofu."

Note 11. This is also the earliest English-language document seen (April 2013) that uses the term "kinugoshi tofu" to refer to silken tofu.

Note 12. As of March 2007, the various English-language editions of this book have sold more than 616,000 copies.

Note 13. This is the earliest English-language document seen (Aug. 2011) that contains the term "Modern Western soybean foods" (see p. 69), a term that Shurtleff would soon (by 1983) replace by the more accurate "Modern soy protein products."

Note 14. This is the earliest published English-language document seen (Jan. 2012) that contains the term "creamy tofu dressings" (or "dressing").

Note 15. This is the earliest English-language document seen (Sept. 2012) that contains the term "Soymilk yogurt."

Note 16. This is the earliest document seen (Oct. 2012) that contains an adequate or detailed description of how to make yuba at home.

Note 17. This is the earliest English-language document seen (June 2013) that contains the term "whole dry soybeans."

Note 18. This is the earliest published English-language document seen (Oct. 2013) that contains the term "Tofu whipped cream" (regardless of capitalization). This term appears on pages 113, 148 (with recipe), 149, 153, and 179. Address: c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: (03) 925-4974.

6396. Shurtleff, William; Aoyagi, Akiko. 1975. What is miso? *Macrobiotic* (*The*) (*Chico, California*) No. 111. p. 27-38. Dec.
Address: Lafayette, California.

6397. Shurtleff, William; Aoyagi, Akiko. 1975. Yuba [in Japan] (Document part). In: W. Shurtleff and A. Aoyagi. 1975. The Book of Tofu. Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. See p. 238-49.
• ***Summary:*** On the front cover of *The Book of Tofu* is a color illustration of Yuba Han, a traditional yuba shop in Kyoto, by Akiko Aoyagi. The tofu forming boxes are not in the actual yuba shop.

Contents: Introduction (What is yuba, how it is made in commercial shops, history, yuba shops in Japan). Types of yuba in Japan: Fresh yuba (*nama yuba*), half-dried yuba (*nama-gawaki or han-gawaki*), dried yuba (*kanso- or hoshi-yuba*). The varieties of yuba in Japan (with illustrations): Fresh yuba sheets (*nama-yuba*), flat yuba sheets (*hira- or*

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Fig. 96. Steaming table in a yuba shop

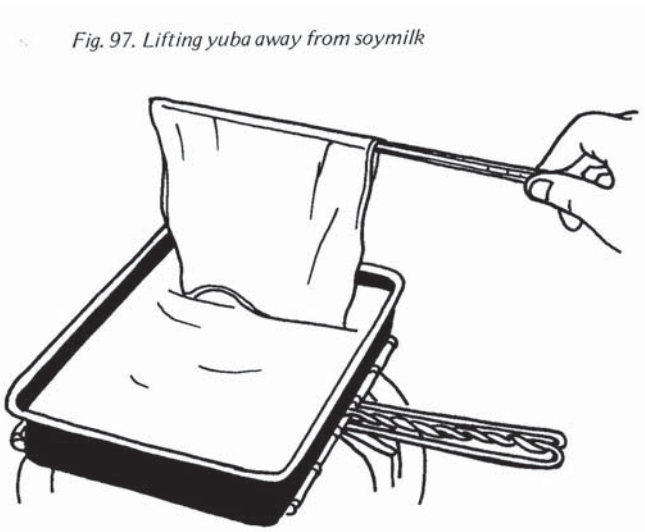
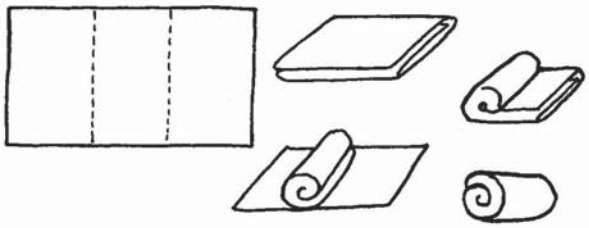


Fig. 97. Lifting yuba away from soymilk



yuba cylinder from one end with a (green) bamboo dengaku skewer (or two foodpicks) and deep-fry for about 1 minute until golden brown. Spread tops of rolls with the miso and top with a sprinkling of sesame seeds. Serve while crisp and hot.

The freshly deep-fried rolls —called *Agé-maki* Yuba— may also be served as is, sprinkled with a little shoyu. Simmered in Sweetened Shoyu Broth (p. 40), they make a tasty addition to soups and *nabe* dishes.

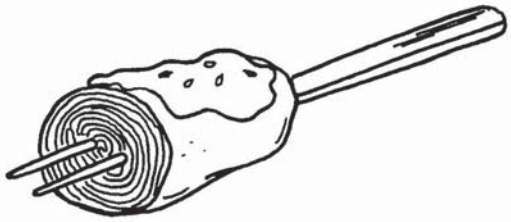


Fig. 100. Deep-fried Yuba Dengaku

taira-yuba), fresh yuba rolls (*maki-yuba*), long yuba roll (*komaki*), small yuba rolls (*kiri-komaki*), tied yuba (*musubi-yuba*), large yuba spirals (*omaki-, futomaki-, or uzumaki-yuba*), ginkgo-leaf yuba, *Oharagi-yuba* (slightly flattened roll tied with a thin piece of kombu), sweet yuba (*amayuba or ama-yuba*), fresh yuba trimmings (*kirehashi*), yuba flakes (*kuzu-yuba and mimi*), trough-shaped yuba (*toyuba or to-yuba*). An illustration (line drawing) accompanies each variety.

The chapter begins: "If you have ever simmered a pot of milk over very low heat or set a bowl of hot milk aside to cool, you have no doubt noticed the thin, delicate film that soon forms on the milk's surface. The longer it is allowed to set, the firmer and thicker it becomes. And if you have ever tried lifting this film off and tasting it, you may well have found it to be soft, warm, and delicious. In the same way, if fairly thick soymilk is gently heated, a thin film soon covers its surface. In Japan this film is called yuba, and since ancient times it has been considered a true delicacy. It is easily prepared at home, and since it is best when fresh and warm, yuba made in your own kitchen and served as an hors d'oeuvre or as part of a meal will have a tenderness and fragrant richness that can far surpass that of the yuba ordered from even the finest traditional shops."

Reconstituting dried yuba. Homemade fresh yuba–How to make fresh yuba at home: Variations–half-formed yuba (*tsumami-agé*), large sheets of fresh yuba, fresh yuba rolls (*maki-yuba*), dried yuba.

Yuba recipes: Yuba hors d'oeuvre (15 recipes, mostly Japanese- or Chinese-style). Chinese-style deep-fried yuba hors d'oeuvre: Yuba chicken (*ssu-chi or suji*), deep-fried Buddha's yuba, yuba nori roll, yuba drumstick (*Sso-tsai*), glutinous rice roll. Yuba in salads, soups, and sauces (2 recipes). Yuba in sandwiches, egg dishes, and oven cookery (one recipe). Yuba sautéed and deep-fried (5 recipes,

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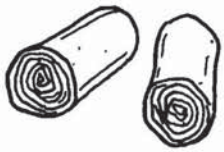


Fresh Yuba Rolls (*Maki-yuba*): A "long roll of fresh yuba" is about 16 inches long and 1 inch in diameter. It is made by folding a piece of fresh or sweet yuba lengthwise into halves, laying it lengthwise on a second sheet together with fresh yuba trimmings, and rolling the second sheet up lengthwise. "Small rolls of fresh yuba" are prepared by cutting this long roll into 1½-inch lengths.

Long Yuba Roll (*Komaki*): About 1 inch in diameter and 15 inches long, *komaki* are prepared by rolling fresh yuba trimmings in several fresh yuba sheets. After partial drying, the roll is wrapped in still another sheet of fresh yuba, dried again, and then trimmed at both ends.

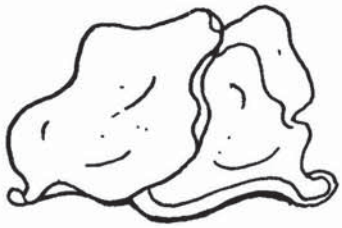
Small Yuba Rolls (*Kiri-komaki*): Prepared by cutting a long yuba roll into 1½- to 2-inch lengths, these delicate rolls are used in thin soups, one-pot cookery, or with sautéed vegetables.

Tied Yuba (*Musubi-yuba*): Prepared from a piece of regular or yellow fresh yuba about ½ inch wide and 5 inches long, *musubi-yuba* is tied into a simple loop and used in thin soups.

Large Yuba Spirals (*Omaki-*, *Futomaki-*, or *Uzumaki-yuba*): To make yuba spirals, about 40 sheets of half-dried yuba are rolled up to form a long cylinder 1½ to 2 inches in diameter and 1½ feet long. This is wrapped in a single sheet of fresh yuba, dried until crisp, then cut crosswise into discs about ½-to 1-inch thick. They are used widely in thin soups, one-pot cookery, and seasoned broths.

Ginkgo-leaf Yuba: Prepared by cutting fresh yellow or regular fresh yuba sheets with a cookie cutter, these dried pieces resemble 3-inch-diameter ginkgo leaves and are used as a garnish in thin soups and on top of sushi.

Oharagi Yuba: This slightly-flattened yuba roll, tied with a thin piece of *kombu*, is about 2½ inches long, 2 inches wide, and ¾ inch thick. It is prepared by loosely rolling one sheet of half-dried yuba inside a sheet of fresh yuba, tying the oval-shaped roll with 5 strips of *kombu*, then cutting the roll crosswise into fifths. (This variety derives its name from the large bundles of firewood tied around the center with a length of rope which the women of Ohara village near Kyoto are famous for carrying on their heads.)



Sweet Yuba (*Amayuba*): This is the last sheet of yuba lifted (and often partially scraped) from the bottom of the steaming tray. It has a sweet rich flavor and slightly reddish color. Thicker and less delicate than most yuba, its edges are often ragged and uneven. Eaten fresh and warm at the yuba shop, it is ambrosial. It is usually dried and sold in large pieces of various sizes in sealed cellophane bags. The least expensive of all types of yuba, sweet yuba is, in our opinion, the most delicious, especially when deep-fried, lightly salted, and served like potato chips. Dried pieces may be added to soups, egg dishes, or sautéed vegetable preparations.

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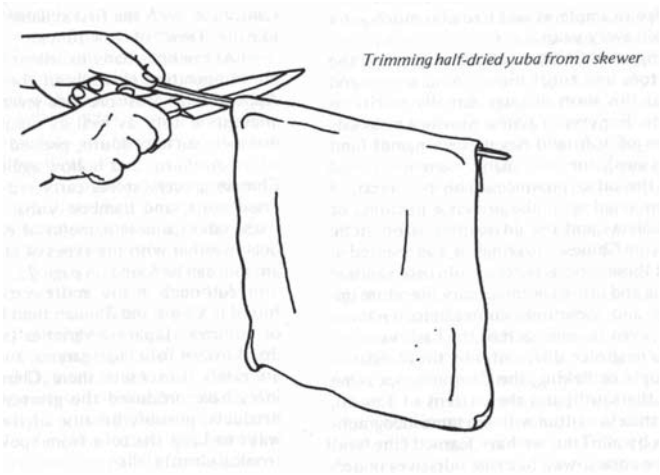

including *Tamago yuba with ankake sauce, Kenchin maki, shinoda maki, and yuba harumaki*). Yuba with noodles or with rice and sushi. Yuba in one-pot cookery and seasoned broths (Incl. *Happosai*). Yuba steamed (Incl. *Chawan-mushi, Yuba kenchin-maki,* and *Yuba shinjo*). Chinese-style steamed yuba (Yuba-filled steamed buns, Pressed yuba with peanut sauce).

"Sweet yuba (*Amayuba*)*:* This is the last sheet of yuba lifted (and often partially scraped) from the bottom of the steaming tray. It has a sweet rich flavor and slightly reddish color. Thicker and less delicate than most yuba, its edges are often ragged and uneven. Eaten fresh and warm at the yuba shop, it is ambrosial. It is usually dried and sold in large pieces of various sizes in sealed cellophane bags. The least expensive of all types of yuba, sweet yuba is, in our opinion, the most delicious, especially when deep-fried, lightly salted, and served like potato chips. Dried pieces may be added to soups, egg dishes, or sautéed vegetable preparations" (p. 241).

Note 1. A full-page illustration (p. 258) shows many types of Chinese yuba mock meats (meat alternatives).

Note 2. This is the earliest English-language document seen (Oct. 2012) that gives the Japanese names for many popular types and varieties of yuba, and suggests a useful English equivalent for each, for example: Fresh yuba (*nama yuba*), sweet yuba (*amayuba* or *ama-yuba*), etc. An illustration shows each of the many types and varieties.

Note 3. This is the earliest English-language document seen (Oct. 2012) that gives a variety of authentic Asian yuba recipes, including both Japanese and Chinese. Many of these recipes are illustrated.

The word "yuba" appears on 59 pages of this book; pages 4, 8, 12, 21-25, 52, 70, 73, 117, 118, 120, 125, 128, 136, 147, 152, 177, 190, 203-205, 209, 236-250, 252, 257-59, 261, 262, 310-12, 316, 330-34, rear cover. Address: Lafayette, California.

6398. Shurtleff, William; Aoyagi, Akiko. 1975. Natto (sticky fermented whole soybeans) (Document part). In: W. Shurtleff and A. Aoyagi. 1975. The Book of Tofu. Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. See p. 67-68.

• ***Summary:*** "Natto are prepared (commercially or at home) by steaming soaked soybeans until they are soft, inoculating the warm (104ºF) beans with the bacteria *Bacillus natto,* and then allowing them to ferment for 15 to 24 hours in a humid environment at about 104ºF. The dark-brown beans have a fairly strong and unusual aroma and flavor, and a sticky, slightly slippery surface texture. When lifted from the bowl with chopsticks (fig. 13), like some varieties of melted cheese, they form gossamer-like threads. Although most whole soybeans are somewhat difficult to digest, natto are highly digestible because the beans' complex protein molecules have been broken down by the bacteria during fermentation. A whole, natural food, natto contains 16.5 percent protein and are rich in vitamins B-2, B-12, and iron. In Japan and in Japanese grocery stores in the West, natto are sold in small (3 to 4 ounce) packages wrapped in straw, from which they traditionally received bacteria for fermentation. Generally served as a topping for rice, natto are also used in miso soups and *Aemomo*-dressings, or sautéed with vegetables. In the provinces, they are mixed with a little sugar and served as an hors d'oeuvre. About 50,000 tons of soybeans are made into natto each year in Japan, about one-fourth the amount used to make either miso or shoyu."

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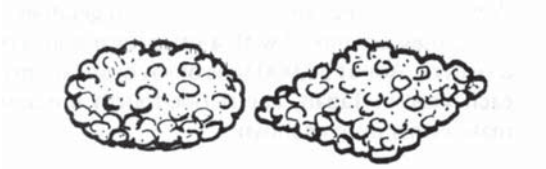
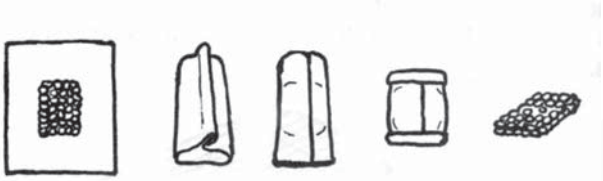
Recipes are given for: Natto topping for brown rice. Natto miso soup. Illustrations show: (1) Natto wrapped in rice straw during the soybean fermentation. (2) Natto's gossamer threads.

Note: This is the earliest document seen (Oct. 2010) that uses the word "sticky" or the term "sticky fermented whole soybeans" to describe Japanese natto. Address: Lafayette, California.

6399. Shurtleff, William; Aoyagi, Akiko. 1975. Tempeh (fermented soybean cakes) (Document part). In: W. Shurtleff and A. Aoyagi. 1975. The Book of Tofu. Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. See p. 68-69.





• ***Summary:*** "These cakes of cooked soybeans, bound together by a fragrant, white mycelium of *Rhizopus* mold, have a delectable flavor: fried or deep-fried, they taste remarkably like fried chicken or veal cutlets. Rich in protein (18.3% fresh or 48.7% dried), tempeh is also highly digestible, and *Rhizopus* serves as an effective deactivator of trypsin inhibitor (p. 70). Like other fermented soy products (miso, shoyu, natto) and sea vegetables, tempeh is one of only a few non-meat sources of vitamin B12.

"For centuries prepared daily on a cottage scale throughout Indonesia (where it is a basic food for millions of people and makes use of more than 50 percent of the country's soybean crop), tempeh is also an important staple in New Guinea and Surinam, and is eaten on a small scale in Malaysia and Holland. Its adaptability to household industries and its low cost should make it, like tofu, a food of worldwide commercial interest during the coming decades.

"Tempeh can be prepared without difficulty in any Western kitchen using either whole soybeans, okara (p. 81), or cooked grains (wheat, rice, barley, or rye) fermented alone or mixed with soybeans. In Indonesia, ½ cup portions of partially cooked, inoculated soybeans are wrapped in banana leaves, tied, and fermented. For larger scale preparation, use (stainless steel) trays with 1/8-inch holes every 2 inches throughout the top and bottom, or similarly-perforated, sausage-shaped plastic bags 1½ inches in diameter. Be sure that all containers are well washed since even small amounts of oil or salt hinder mold growth.

"The starter is available from the U.S. Department of Agriculture, Northern Regional Research Lab., 1815 N. University Ave., Peoria, Illinois 61604. The Farm (p. 316) is now making up a brochure on tempeh preparation which will soon be available with the starter.

"To prepare new starter, carefully scrape darkened (sporulated) mycelium from the surface of freshly fermented cakes or from the wrapper or tray in which tempeh was fermented. Mix with 1 teaspoon (sterile) water and use in place of commercial starter.

"Homemade Tempeh: Makes 6 cakes.

"1 cup soybeans, washed and soaked for 18 hours in a mixture of 1 quart water and 1 teaspoon vinegar or lactic acid.

"½ teaspoon tempeh starter (*Rhizopus oligosporus* mold spores).

"Squeeze beans firmly and repeatedly with one hand in soaking water to remove all seed coats, then carefully pour off water and coats. Refill soaking container with water and repeat until all coats are removed. Combine drained beans and 4 cups water in a pot, bring to a boil, and simmer for 60 minutes. Drain beans, rinse 4 to 5 times under water, then drain well. Allow to cool to body temperature, then mix in starter. Divide inoculated beans into 6 equal portions, placing each at the center of a 7 by 9 inch piece of aluminum foil.

"Fold over sides, then ends of foil, sealing tightly, to form a 4- by 3- by ½-inch thick 'package.' Place packages in a warm clean place or incubator and allow to stand for 24 hours at 88º (or as long as 30 hours at 78º), or until beans are bound together into a cake by a fragrant white mycelium. For best flavor, serve these fresh tempeh cakes as soon as possible, cooked in any of the following ways:

"Deep-fried or Fried: Deep-fry cakes (or pan-fry on both sides) until crisp and golden brown. Serve topped with shoyu, ketchup, Worcestershire, or any of the following Basic Sauces (pp. 48 to 49): Onion, Mushroom, Sweet & Sour, Ketchup-Worcestershire, or Tomato & Cheese. Also delicious in sandwiches and soups.

"Tempeh Goreng (Savory Cutlets): Score both surfaces of 3 fresh tempeh cakes to a depth of 1/8 inch. Combine 3 tablespoons water, ½ teaspoon salt, ½ clove of crushed garlic, and ¼ teaspoon coriander. Add tempeh, marinate for 5 minutes, and drain well. Deep-fry in (coconut) oil (p. 130). Serve as an accompaniment for rice dishes, topped with red-pepper sauce (*sambal*) if desired.

"Tempeh Kemul (Crisp Chips): Cut 3 tempeh cakes horizontally into paper-thin slices; sun-dry for 5 minutes if desired. Combine 6 tablespoons (rice) flour, 1 clove of crushed garlic, ½ teaspoon salt, and ¼ teaspoon coriander. Mix in enough (coconut) milk to form a fairly thin batter, then add tempeh slices and allow to stand briefly. Deep-fry until crisp, and serve like potato chips. For variety use a well-salted tempura batter.

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"Tempeh Bacham [Bachem] (Rich Fillets): Combine in a skillet ¼ grated onion, ½ teaspoon salt, 3 to 4 tablespoons brown sugar, and 1½ cups water. Add 3 tempeh cakes (cut crosswise into fourths), bring to a boil, and simmer until all liquid has evaporated. Deep-fry cakes and serve as for Tempeh Goreng.

"Tempeh Kering (Fiery Sauté): Cut 3 tempeh cakes into paper-thin ½-inch squares; sun-dry for 1 to 2 hours if desired. Deep-fry and drain well. Sauté ½ clove of crushed garlic and ½ minced onion in 3 tablespoons oil for 5 minutes. Add 2 tablespoons each brown sugar and water, 1 to 2 minced red peppers, ½ teaspoon salt, and spices (*salam, laos, asam*) to taste: sauté for 2 minutes more. Add tempeh slices and sauté for 4 more minutes. Scoop out tempeh with a slotted spoon or spatula, drain briefly over wok or skillet, and serve as a topping for cooked rice.

"In Soups: Add diced fresh tempeh to soups and simmer for 30 minutes. Season with salt, miso, or shoyu.

"Baked or Roasted: Bake at 350º for about 20 minutes, or until nicely browned and fragrant. If desired, use as the basis for a pizza-type preparation, or serve topped with any of the sauces mentioned above."

Illustrations show: (1) Small round and square cakes of tempeh. (2) How to fold inoculated, cooked soybeans a small packet when making Indonesian-style homemade tempeh.

Note 1. This is the earliest published document seen (Oct. 2011) that describes how to make tempeh at home. The process was learned from an Indonesian couple, Mr. and Mrs. Mustam, in Tokyo, Japan, in March 1975.

Note 2. On 1 Sept. 1975 Shurtleff (in Tokyo) sent a copy of the section on "Tempeh" (typeset galley proofs) from this book to Cynthia Bates at The Farm (Summertown, Tennessee) and requested her comments. Address: Lafayette, California.

6400. Shurtleff, William; Aoyagi, Akiko. 1975. Hamanatto and Daitokujinatto [Daitokuji-natto] (Raisin-like natto) (Document part). In: W. Shurtleff and A. Aoyagi. 1975. The Book of Tofu. Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. See p. 69.

• ***Summary:*** "Hamanatto is a unique variety of natto soybeans which looks like raisins except that its surface has a grayish black tinge and is smooth and soft. Hamanatto beans have a pleasant, somewhat salty flavor resembling that of mellow Hatcho miso. Sprinkled over rice or rice gruel, served as an hors d'oeuvre with green tea, or cooked with vegetables as a seasoning, they add zest to bland dishes. A similar type of natto, called *Daitokujinatto,* is prepared in Daitokuji temple in Kyoto. Hamanatto are also widely enjoyed in China where they are known as *toushih"* [douchi, doushi, dow see].

Note: This is the earliest English-language document seen (Nov. 2011) that uses the word "toushih" to refer to fermented black soybeans. Address: Lafayette, California.

6401. Shurtleff, William; Aoyagi, Akiko. 1975. The book of tofu: Food for mankind (Illustrations–line drawings). Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. Illust. by Akiko Aoyagi. Index. Dec. 28 cm. Rev. ed. 1977 Autumn Press, Brookline, MA. [53 ref]

• ***Summary:*** Continued: Illustrations (line drawings, both numbered and unnumbered) show: A hearth in a traditional Japanese farmhouse with tofu dengaku roasting around a bed of coals in a sunken open-hearth fireplace. An old Japanese plum tree blossoming in winter. Three pieces of skewered tofu dengaku with a sansho leaf atop each in a special serving box. A sprig of sansho with berries. Stylized top of a soybean plant in a circle. Fig. (4) Tofu products available in the West (tofu, dofu, kinugoshi, thick agé triangles, cubes, and cake, agé and agé puffs, hollow agé cubes, soymilk, tofu pudding, doufu-ru {white and red}, ganmo {patties, small balls, and treasure balls}, grilled tofu, dried-frozen tofu, instant powdered tofu, okara, dried yuba, soymilk curds, pressed tofu, savory tofu). A wooden cutting board and Japanese broad-bladed vegetable knife (*nagiri-bôcho*) with vegetables and tofu on a woven bamboo tray.

Note 1. This is the earliest English-language document seen (April 2013) that uses the term "treasure balls" to refer to Chinese-style tofu mixed with various finely-chopped vegetables, rolled into balls, and deep-fried tofu. (8) A wooden keg of red miso and a plastic bag of barley miso. (9) Shoyu in a metal can, wooden keg, glass bottle, and table-top dispenser. Traditional Japanese kitchen tools: *Miso-koshi* (woven bamboo strainer used in making miso soup). cutting board, Japanese vegetable knife, wooden spatula, bamboo rice paddle (*shamoji*) and spoon, woven bamboo colander or tray (*zaru*), suribachi, Japanese grater (*oroshi-gané*), *sudaré* (bamboo mat), pressing sack for tofu or soymilk, serrated tofu-slicing knife, tawashi scrub-brush (made of natural palm fiber), wok with draining rack and wooden lid, stir-frying ladle and spatula, long cooking-chopsticks, mesh skimmer, deep-frying thermometer, Chinese bamboo steamer (*seiro*), charcoal brazier (*konro, shichirin*), broiling screen. Covered pot steamer. Small lidded pottery pot. More kitchen tools (p. 50-51). (10) A soybean measuring box (*isshô-bako*). (11) The soybean plant. Two views of a soybean seed with seed coat, hilum, and hypocotyl labeled. A bag full of soybeans. Roasted soybeans in a woven bamboo tray (*zaru*). Edamamé in the pods. Three shapes of kinako treats. Soybean sprouts. Natto on a bamboo mat (*sudare*). Natto wrapped in rice straw as it ferments. A hand holding chopsticks that lift natto up from a bowl of natto–connected by gossamer threads. Tempeh (round and square pieces). Wrapping a small packet of inoculated soybeans to make tempeh. (15) Two Japanese women in traditional clothing using hand-turned grinding stones (quern) to grind soaked soybeans when making tofu. (16) Push-pull grinding stones. (17) Motor-driven grinding stones. (18) Water-powered millstones. (19) Wind-powered

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millstones. (20) Unohana. (21) A tofu maker sitting on a traditional lever press that presses soymilk from the okara in a pressing sack on a rack. A heavy iron skillet. (22) Folding okara omelet pouches. Okara doughnuts. (23) A bamboo colander. (24) A tofu maker weighting a colander with a brick so that whey will collect in it. (25) Ladling whey from curds; it foams! (27) A horse drinking whey from a wooden vat. Soymilk curds in a bamboo mat. (28) Ladling curds for Awayuki. (29) Fresh tofu in a plastic tub. (30) A tofu maker placing a weight on pressing lids as tofu is pressed in settling boxes (forming boxes). Transferring tofu-filled settling box to sink. Cutting a block of tofu into cakes under water. Eggplant halves in a yin-yang dance. Preparatory techniques used with tofu (slanting press, sliced tofu, squeezing, scrambling, reshaping, crumbling). (32) Utensils for making tofu at home. (33) Three designs for a homemade settling container. (34) Preparing homemade tofu (a-l). (35) Removing tofu from a farmhouse-style settling container (forming box). (36) Chilled tofu. Iceberg chilled tofu. A hot, moist, white towelette (*o-shibori*) is used to wipe the face and hands before (or occasionally after) a meal. Tofu salads in three Japanese pottery dishes. Japanese soups in three types of containers. (37) Chrysanthemum tofu. (38) Tofu poached egg. Tofu-stuffed green peppers. A wok. (39) Filling a wok with oil. (40) Testing oil temperature in a wok. (41) Deep-frying tofu tempura–and (42) Serving it in a shallow bamboo basket. (43) Making *Kaki-agé*. (44) *Dengaku Hoshi* (from *Tofu Hyaku Chin*). (45) Skewered Tofu dengaku. Preparing Tofu dengaku in old Japan (from Hokusai's sketchbooks). (46) A variety of skewers. (47) Chinese firepots. (48) A Simmering Tofu wooden serving container heated by coals from within. (49) Miso oden. (50) Tofu wrapped in rice straw. (51) Nanzenji wrapped tofu. (52) Gisei-dofu. (53) Serving freshly deep-fried agé. (54) The deep-frying area of a traditional tofu shop. (55) Deep-frying tools. (56) Wooden bamboo tray with raised sides. Chinese cleaver. (57) Nori-wrapped sushi with agé (making and serving; six drawings). Eating noodles from old Japan (from Hokusai's sketchbook). (58) Preparing homemade noodles. (59) The Oden man on a winter's eve. A pottery bowl of Oden. Kombu rolls. (60) Making konnyaku twists. (61) Nishime in a multi-layered lacquerware box. (61) Pressing tofu for thick agé in a tofu shop. (62) Deep-frying tofu for thick agé. (63) A tofu maker with deep-fried thick agé triangles on screen trays.

Note 2. This is the earliest English-language document seen (May 2012) that contains the terms "deep-fried thick agé triangles" (p. 181) or "hollow agé cubes" (p. 23).

(64) Stuffing thick agé. (65) Thick agé stuffed with onions. (66) Pressing tofu for ganmo. (67) Adding seeds and vegetables. (68) Deep-frying ganmo. (69) A farmhouse open-hearth fireplace with nabe kettle. (70) Preparing homemade ganmo. Ganmo balls in a draining tray. Ganmo cheeseburger. (71) Cutting tofu to make agé slices (*kiji*). (72) Deep frying agé. (73) Opening agé into pouches. Agé treasure pouches.

Note 3. This is the earliest English-language document seen (April 2013) that contains the term "treasure pouches" or the term "Agé treasure pouches" They refer to a Kyoto-style delicacy made with deep-fried tofu pouches.

(74) Agé pouches sealed with foodpicks. Inari shrine with Shinto torii. (75) Kampyo-tied pouches [kanpyo]. (76) Making rolled agé hors d'oeuvre. (77) Tofu maker ladling gô (fresh soy puree) into a cauldron. (78) Stirring down the gô. Pressing soymilk from okara with a hand-turned screw press. (79) Serving fresh soymilk in a tofu shop. Six Japanese commercial soymilk products. Little girl at The Farm (Summertown, Tennessee) seated on a small chair drinking a cup of soymilk. Chinese breakfast soymilk soup with deep-fried crullers (*Siento-chiang* with *yu-chiao tsao pi*). (80) Takigawa-dofu. (81) Tofu maker pouring the soymilk for kinugoshi tofu. (82) Adding solidifier. (83) Trimming kinugoshi from sides of box. (84) Modern lactone kinugoshi (with GDL). (85) Modern kinugoshi factory. (86) Sasa-no-Yuki's Gisei-dofu container. (87) Kinugoshi with ankake sauce. The entrance way to a traditional Japanese restaurant featuring tofu. Traditional metal skewer for making grilled tofu. (88) Traditional tofu maker grilling tofu over a charcoal brazier (*hibachi*). Grilling tofu in a traditional open hearth. (89) An early method of elaborate grilling. Pieces of tofu on different types of skewers. Farmhouse sukiyaki with grilled tofu. (90) Tying frozen tofu with rice straw. (91) Drying farmhouse frozen tofu. (92) Pressing frozen tofu at home. (93) Deep-fried frozen tofu with cheese. (94) Making deep-fried frozen tofu sandwiches (*Hakata-agé*). (95) Frozen tofu wrapped in kombu. (96) Steaming table in a yuba shop. Ten different types / shapes of yuba. (97) Lifting yuba away from soymilk. (98) Yuba sashimi. (99) Yuba envelopes. (100) Deep-fried yuba dengaku. (101) Folding yuba into bundles. Trimming half-dried yuba from a skewer. (102-113) Tofu and yuba in Taiwan, China, and Korea (see separate record). Sesame tofu in pottery bowl. (114) Traditional farmhouse tofu, tied into a package with rice straw rope. (115) Shirakawa-go farmhouses with water-powered rice-dehusker in foreground. (116) Making seawater tofu at Suwanose. Mortar and pestle for pounding mochi. Making community tofu: Western metal hand mill, hand-turned stone mill apparatus, faces of upper and lower stones, colander and cloth, two shapes of cooking pots, Japanese farmhouse earthen cooking stove, cooking pot set on cut-off oil drum, ladle, two wooden paddles, pressing rack, pressing okara, lever press, pressing sack, wooden settling [forming] container with cloths. (117) Making nigari with salt in bamboo colander, a traditional "salt boat" for refining salt of nigari. (119) Country farmhouse tofu (5 illust.). (121) Morning shopping at a tofu shop. (122) Diagram of a tofu-shop floor plan. (123) Modern pressure with hydraulic press. (124) Modern centrifuge with 3 soymilk barrels. Thirty-one unnumbered illustrations showing every step in

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making and selling tofu in a traditional Japanese shop (p. 299-306). (125) Cutting tofu for Dengaku (from *Tofu Hyaku Chin*). (126) Ladies busy making dengaku (from *Tofu Hyaku Chin*). (127) Hearth at Nakamura-ro. (128) The garden at Okutan. Six types of Japanese sea vegetables: Hijiki, aonori, wakame, agar, nori, kombu. (129) Japanese vegetables (27 illustrations). Address: c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: (03) 925-4974.

6402. Shurtleff, William; Aoyagi, Akiko. 1975. Sukiyaki (Document part). In: W. Shurtleff and A. Aoyagi. 1975. The Book of Tofu. Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. See p. 224-25.

• ***Summary:*** "A Japanese cookbook written over 350 years ago contains the following recipe for Sukiyaki: 'Obtain either wild goose, wild duck, or antelope, and soak the meat in *tamari* shoyu. Heat a well-used Chinese plow (*kara-suki*) over an open fire. Place the meat on the plow, garnish with thin rounds of *yuzu,* and broil on both sides until the color changes. Serve and be happy.'

"The word sukiyaki–pronounced skee-ya-kee–means 'broiled on the blade of a plow.' Although the modern preparation generally features beef as the basic ingredient, sukiyaki was traditionally prepared with wild game, fowl, fish, or shellfish. Wild boar was also a favored ingredient, and seafoods such as tuna, yellowtail, whale, wreath shells, and scallops were and, in areas such as Kyoto, still are widely used in the dish.

"Before reaching its present form, sukiyaki passed through a number of unusual historical transformations. The earliest preparation was undoubtedly developed by farmers, hunters, and fishermen who broiled their catch over an open fire using a plow or whatever other utensil was available. Since the earliest plow, the predecessor of the present *nabe,* was nothing but a flat iron plate, it was unable to hold cooking liquids. It was probably for this reason that the meat came to be marinated or basted with tamari shoyu, a technique that is still practiced in some Japanese restaurants. Gradually, sake or *mirin* came to be used in the marinade, various vegetables and grilled tofu were broiled with the meat, and the traditional flat plow or griddle became inadequate to hold the juices of this cornucopia of new ingredients. A new container was needed, and at this point, the ancient tradition of broiling wild meat on a plow merged with the newly-imported tradition of *shippoku,* a type of beef-*nabe* cookery which originated about 300 years ago, just after the first contact with Western traders and missionaries.

"Developed in the international port town of Nagasaki, *shippoku* was said to have its historical culinary roots in Holland, Portugal, China, and Korea. As a result of the merger, the original sukiyaki ingredients eventually came to be cooked in heavy iron or Korean-style stone pots, and the dish was served as a one-pot meal prepared at the table. Consequently 'sukiyaki' became a misnomer, for the new dish was neither broiled nor prepared on a griddle-like plow. But neither was the new sukiyaki a true *nabe* dish, since its ingredients were not simmered in a seasoned broth. Rather, this unique Japanese creation straddled three categories: it was a broiled dish insofar as the meat was first cooked in a sizzling-hot pan; it was a *nabe* dish since it was a one-pot prepared at the dining table; and it was a *nimono,* or simmered dish, insofar as the meat and vegetables were simmered together in a rich mixture of shoyu, sake, and dashi.

"Up until this time, the Japanese had never apparently considered using beef or other livestock in sukiyaki. According to a popular legend, *kamado-gami,* the god of the kitchen hearth, is said to have instructed the Japanese people in ancient times to refrain eating the meat of all four-legged animals, especially of livestock. This admonition was reinforced by the nation's emperors and the vegetarian teachings of Buddhism, so that for about 1200 years–from the 8th century until the 19th century–most Japanese did not eat meat. However with the arrival of Christianity in the 16th century, the eating of beef was also forbidden, and sukiyaki was once again prepared exclusively with seafood, wild game, or poultry. Those who developed a longing for broiled meat, but who were not allowed to prepare it in the family's common pot or in the presence of those who kept the faith, were compelled as a last resort to prepare their sukiyaki the traditional way, substitution using a plow or mattock for the kettle and enjoying the forbidden delicacy alone and in secret in the barn, field, or forest. This tradition of 'underground sukiyaki' is said to have continued until about 1900.

"With the opening of Japan to the West in the mid 19th century and the relaxation of traditional prohibitions, meat eating gradually became fashionable in the cities. Yet most Japanese tasted their first beef with considerable trepidation, having been warned by priests and traditionalists that their action was an affront to their ancestors and that dire consequences would befall them. Little by little, however, beef sukiyaki came to be accepted.

"The first Japanese who worked up the courage to actually eat beef did not prepare it Western-style as steak or roast beef. Rather, they cut the meat into paper-thin slices, employing the same method they had used for centuries to prepare *sashimi,* or raw fish. And they seasoned this meat with shoyu in much the same way they would season simmered vegetable or tofu dishes. Many Japanese probably ate their first beef in the form of sukiyaki, and different parts of the country soon developed unique styles of serving it. To this day in the Kyoto area, restaurants place dispensers of shoyu, *mirin,* and sugar on the table and allow each guest to season his food to taste, whereas restaurants in Tokyo have developed their own unique mixtures of these ingredients to form standard cooking liquids.

"Throughout the world people now associate sukiyaki

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with fine Japanese cookery. In a sense, this is ironic because Japanese cuisine makes relatively little use of meat, and much of sukiyaki's historical influence came from abroad. The ancient delicacy of Japanese hunters and the imported *nabe* preparation have now been totally transformed to become Japan's most famous international dish. And although tofu plays a relatively inconspicuous role in creating the flavor of this dish, sukiyaki has nevertheless been the vehicle whereby thousands of Westerners have had their first taste of 'soybean curd.'

"Although most present-day sukiyaki uses beef as the featured ingredient, our recipe uses ganmodoki–mock goose–in deference to the earliest traditions of using wild fowl. Homemade frozen tofu and frozen thick-agé, the textures of which resemble that of tender beef, make excellent substitutes. Although regular tofu is occasionally used in sukiyaki, grilled tofu is generally preferred for its ability to absorb the flavors in the rich broth; its substantial, almost meaty texture; its ability to keep its form during the frequent stirring; and its barbeque flavor. In Japan, more grilled tofu is used in sukiyaki than in any other type of cuisine." A recipe follows. Address: Lafayette, California.

6403. Shurtleff, William; Aoyagi, Akiko. 1975. Soymilk (Document part). In: W. Shurtleff and A. Aoyagi. 1975. The Book of Tofu. Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. See p. 199-210. Chap. 10.
• ***Summary:*** Contents: Making soymilk in a Japanese tofu shop as part of the tofu-making process. Comparative analysis of the composition of soymilk, dairy milk, and mother's milk (human), each adjusted to the same percentage of water (88.6%) (with table). "Vegetable milks" prepared from other nuts (almonds, peanuts, walnuts, and coconut) and seeds (sunflower and sesame). Low cost of fresh soymilk, in East Asia and on The Farm (Summertown, Tennessee). Soymilk in Taiwan. History of Vitasoy and K.S. Lo. UNICF / FAO / WHO soymilk plant making Saridele dry soymilk in Indonesia. Smaller plants in Manila, Philippines, and Bangkok, Thailand. History of the work of Dr. Harry W. Miller in China (starting in 1936) and the USA (Soya Lac / Soyalac, 1939). Current status of soymilk sold as a beverage in Japan: Sold in tetrapak cartons or, in condensed form, in cans. Sold "in a variety of flavors (plain, honey, barley-malt, strawberry or chocolate) in virtually all natural and health food stores and at most supermarkets; some types are even dispensed from vending machines or delivered door to door." "Many Japanese tofu makers used to deliver a bottle of soymilk each morning to a large number of their regular customers, but the tradition has gradually declined with the increasing availability of commercial soymilk and the post-was trend toward drinking dairy milk." Address: Lafayette, California.

6404. Shurtleff, William; Aoyagi, Akiko. 1975. The book of tofu: Food for mankind (Recipes and food types with Japanese names). Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. Illust. by Akiko Aoyagi. Index. Dec. 28 cm. Rev. ed. 1977 Autumn Press, Brookline, MA. [53 ref]
• ***Summary:*** Teriyaki sauce (p. 48). Ankake sauce (p. 49). Sushi rice (Rice in vinegar dressing, p. 51). Gomashio (Sesame salt). Gari (Sweet vinegared gingerroot, p. 51). Budomame (Sweet soybeans, p. 62). Kombu mame, kuro mame, gomoku mame (p. 62). Iri-mame (Roasted soybeans, p, 63). Edamame (Fresh green soybeans, p. 63). Jinda (Sweet emerald bean paste [made with edamame], p. 64). Kinako (Roasted full-fat soy flour, p. 64). Abekawa mochi (with kinako, p. 65). Kinako amé or genkotsu amé (Kinako candy, p. 66). Daizu no moyashi (Soybean sprouts, p. 67). Natto (Sticky fermented whole soybeans, p. 67). Hamanatto and Daitokujinatto (also spelled Daitokuji-natto) (Raisin-like natto, p. 69). Gô (Fresh soy purée, p. 70+). Gôjiru (Thick miso soup with gô, p. 74). Bakudan agé (Deep-fried gô patties, p. 76). Okara or unohana (p. 77+).

Unohana-jiru (Chilled okara soup, p. 79). Unohana no iri-ni (Okara & vegetable sauté, p. 81). Unohana-iri (Unsweetened fried okara, p. 82). Unohana dango (fried okara patties, p. 82). Sushi okara chakin (Okara omelet pouches, p. 84). Oboro (curds, p. 87). Oboro-dofu (Warm soymilk curds, p. 90). Awayuki (homemade curd dumplings, p. 90). Karashi-dofu (Curd dumplings with mustard, p. 90). Gomoku-dofu (Five-color tofu, p. 105). Hiya-yakko (Chilled tofu, p. 105). Menoha-dofu, nameko-dofu (p. 106). Ryanban-doufu (Chinese-style chilled tofu, p. 107). Imokake-dofu (Chilled tofu with glutinous yam and egg, p. 107). Tofu no misozuke (Tofu pickled in miso, p. 110). Kanten-dofu (Jelled tofu, p. 114). Aemono and Shira-ae ("White salad," p. 114+, 160). Arare no aemono (Hailstones salad, p. 115). Suimono (Clear soup, p. 119). Kikka-dofu (Clear soup with chrysanthemum tofu, p. 120). Kenchin-jiru (p. 120). Tamago-toji (Japanese-style tofu, eggs & onions). Nanjen-dofu or Iritsuke-dofu (Chinese-style egg tofu, p. 123). Kenchin-yaki (p. 126). Iridofu [Iri-dofu] (Crumbly scrambled tofu, p. 128). Mabo-dofu [Ma po doufu] (Chinese-style tofu with red pepper sauce, p. 128). Hao-yu doufu (Chinese style oyster sauce & tofu, p. 129). Fanchie-dofu (Chinese-style tofu & tomatoes, p. 129). Tofu no kara-agé (Crisp agé slices, p. 131). Unagi-dofu (Tofu mock eels, p. 132). Kaminari agé (Thunderbolt tofu, p. 132). Agédashi-dofu [Agedashi-dofu] (Deep-fried tofu in dipping sauce, p. 133). Tendon (Deep-fried tofu with rice and broth, p. 133). Tofu furai (Breaded tofu cutlets, p. 134). Tempura (and batter and dipping sauce, p. 134). Zosui or Ojiya (Rice gruel, p. 138). Tofu dengaku (p. 139). Tofu teriyaki (p. 141). Yudofu or Tofu no mizutaki (Simmering tofu, p. 142). Nabeyaki-udon, Nabeyaki-soba, Udon-tsuki (p. 144). Yosenabe (p. 144). Miso oden (p. 145). Yukinabe (The snow pot, p. 148). Niyakko (p. 145). Tsuto-dofu or Komo-dofu (Simmered tofu wrapped in rice straw, p. 146). Tofu chawan-mushi (Steamed egg-vegetable custard,

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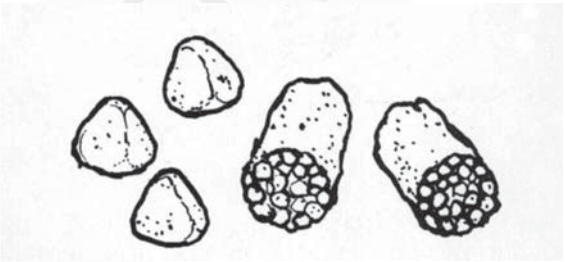
p. 147). Nanzen-ji no Tsusmi-dofu (Nanzen-ji wrapped tofu, p. 147). Yuzu-gama (Yuzu treasure pot, p. 147). Naruto-dofu (Tofu spiral in butterbur leaves, p. 147). Gisei-dofu (Tofu cheesecake-like dessert, p. 152). Datémake [Datemaki] (Tofu-egg roll, p. 153). Noppei-jiru (Noppei soup, 163). Kinpira (Agé with carrots and burdock root, p. 167). Yaki-soba (Fried buckwheat noodles with deep-fried tofu, p. 168). Chahan or yaki-meshi (sizzling rice with deep-fried tofu, p. 168). Soboro (p. 169). Norimaki-zushi (Nori-wrapped sushi with agé, p. 170). Kitsune domburi (Fox domburi, p. 172). Kitsune soba or udon (Fox noodles, p. 172). Yamakake soba (Buckwheat noodles with grated glutinous yam and agé, p. 172). Hiyashi-soba (Noodles & deep-fried tofu in chilled broth, p. 172). Nikomi udon (Ganmo simmered with homemade noodles and miso, p. 173). Kabayaki or Yaki-Shinoda (Agé mock broiled eels, p. 174). Oden (p. 175-78). Nishime (p. 178-79). Horoku-yaki (Thick agé stuffed with onions, p. 183). Hiryozu (Ganmo treasure balls, p. 188). Inari-zushi (Vinegared sushi rice in sweetened agé pouches, p. 194). Fuku-bukuro (Agé treasure pouches with crunchy vegetables, p. 195). Takara-zutsumi (Sacks of gold, p. 195). Shinoda-maki (Matchstick vegetables wrapped in agé pouches, p. 195). Kinchaku and takara-bukuro (Drawstring purses and treasure bags, p. 196).

Note: This is the earliest English-language document seen (April 2013) that contains the term *Fuku-bukuro* or the term "treasure bags." They refers to a way of preparing deep-fried tofu pouches.

Hasami-age (Mashed potatoes deep-fried in agé pouches, p. 196). Shinoda-maki (Agé cabbage rolls, p. 197). Shinoda mushi (Steamed agé with tofu and vegetables). Soymilk chawan-mushi (p. 209). Yose-dofu (Jelled and molded soymilk dishes, p. 209). Takigawa-dofu (Swirling jelled soymilk, p. 210). Shikishi-dofu (Kinugoshi custard, p. 216). Kinugoshi tofu dishes from Sasa-no-yuki (p. 217-19): Hiya-yakko, yuzumiso-dofu, gisei-dofu, ankake-dofu, kijoyu, chiri-meshi, kuya-dofu or kuya-mushi, iridofu. Yaki-dofu (p. 220). Sukiyaki (p. 224-25). Koya-dofu or kori-dofu (Dried-frozen tofu, p. 226+). Tamago-toji (Frozen tofu with eggs and onions, p. 231). Gyoza [Chinese jiaozi] (p. 232). Oranda-ni (Deep-fried frozen tofu in lemon sauce, p. 234). Soboro (Grated frozen tofu rice topping, p. 234). Hakata-agé (Deep-fried frozen tofu sandwich, p. 235). Koya-dofu no kombu maki (Frozen tofu wrapped in kombu, p. 236). Sanshoku gohan (Three-color brown rice, p. 236). Fukuyose-ni (Frozen tofu simmered in sweetened broth, p. 236). Abekawa-dofu (Frozen tofu rolled in sweetened kinako, p. 237). Yuba (p. 238-42). Nama-yuba (Fresh yuba). Nama-gawaki or han-gawaki yuba (Half-dried yuba). Kanso- or hoshi-yuba (Dried yuba). Hira- or taira-yuba (Flat yuba sheets). Maki-yuba (Fresh yuba rolls). Komaki (Long yuba rolls). Kiri-komaki (Small yuba rolls). Musubi-yuba (Tied yuba). Omaki-, futomaki- or Uzumaki-yuba (Large yuba spirals). Oharagi yuba (Slightly flattened yuba roll tied with a thin piece of kombu). Amayuba (Sweet yuba). Kirehashi (Fresh yuba trimmings). Kuzu-yuba or mimi (Yuba flakes). Toyuba (Trough-shaped yuba, p. 242). Kaori yuba (Sweet miso deep-fried in fresh yuba, p. 244). Yawata-maki (Yuba-burdock root roll, p. 245). Toji yuba (deep-fried yuba with ginkgo nuts and lily bulbs, p. 245). Yuba no kabayaki (Yuba mock broiled eels, p. 245). Maze-gohan or Gomoku-zushi (Five-color sushi rice with agé, p. 169). Suhuo-t'ui (Homemade Buddha's ham). Tamago-toji yuba (Raw eggs cooked over hot yuba, p. 247). Tamago yuba (Deep-fried yuba in ankake sauce, p. 248). Kenchin-maki (Large yuba rolls with tofu and vegetables). Yuba shinjo (Yuba steamed with eggs, p. 249). Address: c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: (03) 925-4974.

6405. Shurtleff, William; Aoyagi, Akiko. 1975. Kinako (Roasted full-fat soy flour) (Document part). In: W. Shurtleff and A. Aoyagi. 1975. The Book of Tofu. Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. See p. 64-66.



• ***Summary:*** This section begins: *"Kinako* is a tan or beige flour made by grinding whole roasted soybeans. It has a nutty flavor and fragrance and contains over 38 percent protein. Many of Japan's most popular confections are dusted with a light coating of sweetened kinako. These confections usually consist of a grain such as mochi (pounded glutinous rice), or steamed, pounded millet filled with an (sweetened adzuki bean paste). In the Kyoto area alone more than twelve popular confections are prepared with a covering of sweetened kinako. In a number of Japanese health-food treats (such as *kinako amé, gokabo, kokusen,* and *kankanbo*) kinako serves at the main ingredient; it is mixed with mizuame to give a chewy taffy-like texture and rich sweetness. We feel that kinako itself and a number of the following preparations–especially Kinako Butter, Kinako Candy, and Kinako Coffee–could be produced in cottage industries and sold commercially with excellent results. A delicious and inexpensive source of high-quality protein, kinako is generally sold in ¼-pound bags and used in small quantities."

Recipes include: Homemade kinako. Kinako butter [homemade soynut butter]. Creamy kinako butter. Kinako-peanut-sesame spread (with peanut butter and sesame butter). Kinako in brown sauces and roux. Kinako in breads and muffins. Sweetened kinako. Abekawa mochi (This is the most popular way of using kinako in Japan). Chinese-

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style kinako & peanut butter balls ("These sweet, almost crumbly delicacies are a favorite in China where they are sold commercially). Kinako candy (*Kinako amé* or *Genkotsu amé;* variations: *Kokusen* or *Kankanbo, Gokabo*). Kinako high-protein bars. Kinako coffee.

Kinako is also called for in a recipe for Abekawa-dofu (Frozen tofu rolled in sweetened kinako) (p. 237). Address: Lafayette, California.

6406. Shurtleff, William; Aoyagi, Akiko. 1975. Roasted soybeans (*Iri-mame*) (Document part). In: W. Shurtleff and A. Aoyagi. 1975. The Book of Tofu. Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. See p. 63.

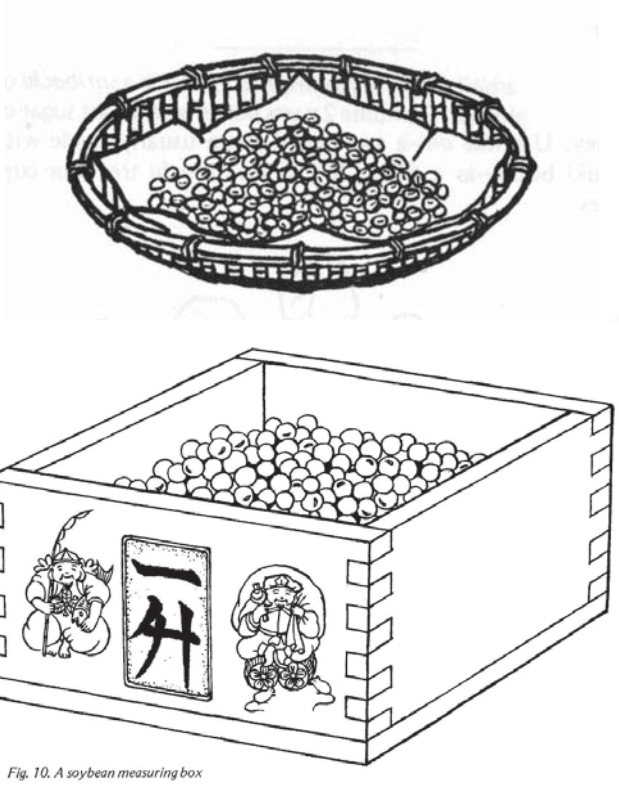

Fig. 10. A soybean measuring box

• ***Summary:*** "Many delicious varieties of roasted soybeans or soy nuts are now available in the West in natural food and health food stores. Dry-roasted varieties contain a remarkable 47 percent protein. (By comparison peanuts contain only 27 percent protein and almonds and cashews only 19 percent.) They are usually lightly salted and have a nut-like flavor and crunchy crisp texture. Oil-roasted varieties are available salted or unsalted with plain, garlic, or barbeque flavors, and contain 37 percent protein.

"Roasted soybeans can be eaten like peanuts as a snack, or used to add a crunchy texture and nutlike flavor to a wide variety of salads, sauces, casseroles, and miso preparations. In the West roasted soybeans are also used in health food 'candy' such as soy honey- or nut bars. In their ground form, they are used in commercial soy spreads.

"In Japan, these are the 'beans of good fortune' (*fuku mame*) enjoyed on the first day of the lunar spring. Roasted beans covered with multiple coatings of sugar, starch, and nori are sold commercially as *Mishima mame* and served as a sweet snack. Green soybeans, roasted with salt until they have a crunchy texture and greenish-beige color, are sold as *Irori Mame."*

Contains recipes for: Homemade roasted soybeans (makes 3 cups). Roasted soy grits. Address: Lafayette, California.

6407. Shurtleff, William; Aoyagi, Akiko. 1975. Soybean sprouts (*Daizu no moyashi*) (Document part). In: W. Shurtleff and A. Aoyagi. 1975. The Book of Tofu. Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. See p. 66-67.

• ***Summary:*** "One of the world's finest diet foods, soybean sprouts contain less calories per gram of protein than any other known vegetable food. Although mung bean sprouts are the most popular both in the West and in East Asia, soybean sprouts are inexpensive, tasty, and easy to prepare at home. Most contain both the bright yellow soybean and the sprout root which will grow to a length of 3 to 5 inches in 5 to 7 days. Soybean sprouts may be served as a green vegetable throughout the year either parboiled in fresh salads (where they serve as a good source of vitamin C) or in soups, sautéed, or baked dishes.

"Homemade Soybean Sprouts: Makes 3 to 6 cups.

"1 to 1½ cups dry soybeans.

"Prepare a sprouter by making small holes in the bottom of a 10- to 12-inch-deep plastic container, milk carton, or coffee can. Pour in soybeans to a depth of at least 2 inches, then place sprouter in a slightly larger pot and fill with water to more than cover beans. Cover pot and allow beans to soak for 4 hours (no longer). Lift out sprouter and drain beans being careful not to mix or agitate them. Cover sprouter and place in a dark place at 72ºF. Rinse beans 3 to 4 times daily by sprinkling with water, again taking care not to mix them. Repeat for 5 days or until sprouts are about 4 inches

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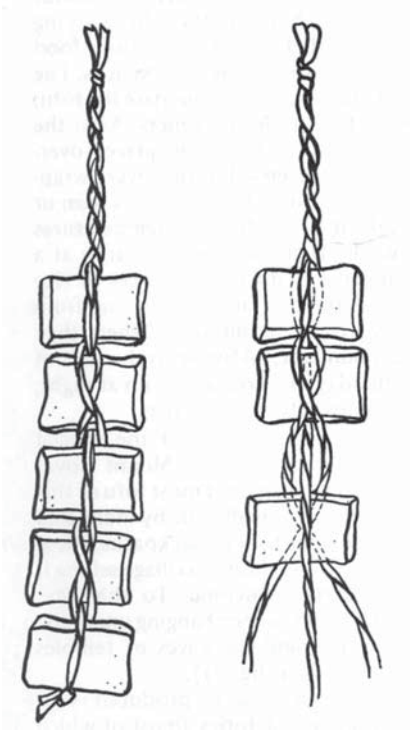
long. Transfer sprouts to a large pot and rinse with plenty of water; pour off loose hulls and remove unsprouted beans. Refrigerate unused sprouts in a sealed container." Note: The above recipe first appeared in the 1983 Ten Speed Press edition of this book (p. 66).

Contains recipes for: Soybean sprouts salad with tofu. Egg foo yung with soybean sprouts and tofu. Chop suey or chow mein with soybean sprouts and tofu. Address: Lafayette, California.

6408. Shurtleff, William; Aoyagi, Akiko. 1975. Frozen and dried-frozen tofu (Document part). In: W. Shurtleff and A. Aoyagi. 1975. The Book of Tofu. Hayama-shi, Kanagawa-

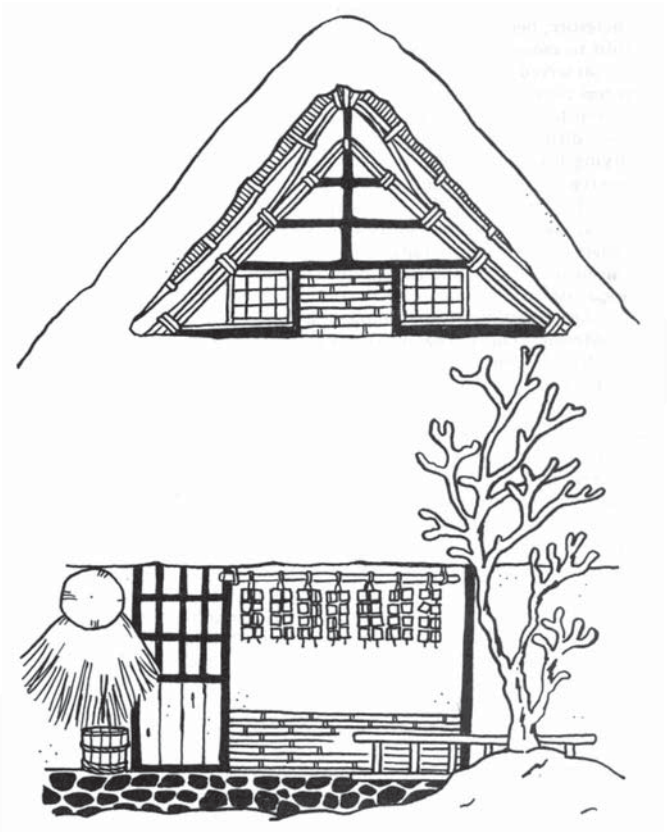


ken, Japan: Autumn Press. 336 p. See p. 226-37.

• ***Summary:*** Contents: Introduction. Dried-frozen tofu: Origin of tofu at Mount Koya some 750 years ago by a Shingon priest, how Koya-dofu is made Mt. Koya, dissemination to farms and villages, by the Edo Period (1600-1868) Koya-dofu was known throughout Japan, Takeda Shingen experiments with dried-frozen tofu in Nagano (no drying shed), history of tofu made in automated factories, discovery of ammonia, the largest factory today, how dried-frozen tofu is sold in Japan today.

Reconstituting frozen and dried-frozen tofu: Frozen tofu, dried-frozen tofu. Storing and cooking dried-frozen tofu. Homemade frozen tofu. Homemade dried- frozen tofu.

Recipes for dried-frozen tofu (25 recipes). Address: Lafayette, California.



6409. Shurtleff, William; Aoyagi, Akiko. 1975. Okara or unohana (Document part). In: W. Shurtleff and A. Aoyagi. 1975. The Book of Tofu. Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. See p. 77-85.

• ***Summary:*** This chapter begins: Unohana (*Deutzia scabra*) is a tiny white flower that grows in thick clusters on briar bushes and blossoms in the spring (Fig. 20). In 1869, the haiku poet Basho, on his last long trek to the back country of northern Japan, wrote of unohana in his journal:

Mounting towards the Shirakawa barrier
"Autumnal winds" hummed in my ears,
"The maple" stood imagined,
But leafgreen branches haunting too,
Against unohana white white briars,
As if pushing through snow. (Cid Corman translation)

The word "unohana" is also used in connection with tofu. After gô is ladled into a cauldron of boiling water and simmered, it is transferred to a heavy cloth sack set on a rack on top of a wooden curding barrel. The sack's mouth is twisted closed and the sack is pressed. In farmhouses a grinding stone is set atop the sack; in tofu shops the sack is pressed either with a traditional lever (fig. 21) or with more modern equipment. In each case liquid soymilk filters through the sack into the curding barrel. The soybean pulp–called okara or unohana–remains in the sack. The soymilk is eventually made into tofu; the okara has its own special uses.

Okara is beige in color and has a crumbly, fine-grained texture. Some Westerners have remarked–only half in jest–

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Unohana

Fig. 21. A traditional lever press

that its appearance reminds them of moist sawdust. But the Japanese, in line with their ancient tradition of honoring even the simplest and most humble of foods, place the honorific prefix *o* before the word kara, which means "shell, hull, or husk." Thus o-kara means "honorable shell." In Chinese it is called "child of tofu lees" (*doufu chatsu* [*dou zha, douzha, doufu-zha*]), "soy lees" (*docha*), or "tofu's head" (*douto*) in contrast with the soft curds which are called the "tofu's brain." Trying to translate any of these words into descriptive English is almost impossible; terms such as "soybean lees, grounds, mash, pulp, fines, residue, dregs," or the like hardly do justice to this fine food.

Note: This is the earliest English-language document seen (June 2013) that uses the word "lees" or the terms "tofu lees" or honorable shell, or soybean lees, to refer to okara (see p. 22, 77).

When Japanese refer to okara as an ingredient in cooking, they call it unohana, in honor of Basho's tiny white blossoms. And, indeed, it deserves this high evaluation for, when properly prepared, it is a tasty and nutritious food which serves as an important ingredient in traditional Japanese cuisine. Okara dishes are available in most delicatessens and at many fine restaurants. Light and almost fluffy, okara absorbs flavors well and gives body to sautéed vegetable dishes, soups, casseroles, breads, and salads.

The most important constituent of okara is what nutritionists and doctors call "dietary plant fiber" and now consider to be an essential part of every well-balanced diet. Fiber, by definition, is indigestible. Composed of carbohydrates found in the outer bran layers of whole grains and the cell walls of natural vegetables and pulses, it passes unchanged through the human digestive tract performing two key functions: it provides the "bulk" or "roughage" necessary for regular bowel movements and the prevention of constipation; and it absorbs toxins (including environmental pollutants) and speeds their passage out of the body.

The recent re-evaluation of the importance of fiber-rich foods such as okara has resulted from the recognition of three dangerous trends in the dietary patterns of most industrialized nations: (1) our intake of dietary fiber is now only 20 percent of what it was one hundred years ago due both to the rapid rise in the consumption of sugar, meat, fats, and dairy products (all of which contain no fiber) and the decrease in the use of grains and vegetables; (2) a large proportion of the grains we do consume are in their refined, processed forms (such as white bread, rice, or pasta) which have been stripped of their fiber-rich (and nutritious) outer layers; (3) the average person has a steadily increasing intake of toxic substances from both food additives and the environment. Serving okara, therefore, allows us to make use of natural soybeans in the most holistic and health-giving way.

Containing about 17 percent of the protein in the original soybeans, okara itself consists of 3.5 percent protein by weight, or about the same proportion found in whole milk or cooked brown rice. While it is perhaps unfortunate that all of this protein is not transferred to tofu, its presence in okara is just that much more reason for utilizing this byproduct of the tofu-making process.

The tastiest and most nutritious okara is that removed in the process of making kinugoshi tofu, a variety made from very thick soymilk. Since this okara is pressed only once, it retains a great deal of the soymilk's flavor and nutrients, and has an obviously moist, cohesive texture. In the process of making regular tofu in tofu shops, soymilk is filtered through first a coarsely woven and then a finely woven sack. The small quantity of very fine-grained okara that collects in the second sack is usually pressed by hand (rather than with a press) so that it, too, retains a large portion of the soymilk taste and food value. During the winter months when the cold air ensures their freshness, both varieties are shaped

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into 4½-inch-diameter balls or sealed in small plastic bags to be sold for a few pennies per pound. Some tofu makers present okara to their customers free of charge as a token of appreciation for their patronage.

Before World War II, most tofu-shop okara was sold for use in cooking. Young apprentices at the shop were often allowed to cook the day's okara any way they wished and then sell their creations from door to door. At New Year's, okara croquettes and other tasty dishes, made and sold in this way, earned an impoverished apprentice a little pocket money.

In some parts of China, okara is pressed into cakes about 6 inches in diameter and 1 inch thick, and allowed to ferment for 10 to 15 days until each is covered with a mycelium of white mold. The cakes are dried for a few hours in the sun, then deep-fried or cooked with vegetables and sold as a nutritious flavoring agent called meitauza [okara tempeh]. In Indonesia, a similar product called ontjom is said to be well liked for its tasty almond-like flavor.

In Japan, a typical tofu shop produces about 15 gallons of okara daily, or roughly 1 gallon for each gallon of dry soybeans used. But at most, only one gallon or so of this is retailed. The remainder is picked up daily at the shop by local dairymen who feed it to their cows to stimulate milk production and enrich the milk's nutrient content. In China, many tofu makers run small hog farms and use okara as their principal source of fodder. Okara also works well as an organic mulch and fertilizer, or as a free, high-protein pet food. (In Japan it is now used commercially in dried dog- and cat foods.)

Nursing mothers have used okara for centuries to enrich their milk and stimulate its flow. It also serves as a traditional cure for diarrhea. Wrapped in a cloth and used to rub down the household woodwork, okara's natural oils coat and darken the wood, thus serving as a wax and polish.

At present in the United States, okara is available at some Japanese and Chinese groceries and, of course, at all tofu shops. But the easiest way to obtain okara is to prepare Homemade Tofu (p. 99) or Soymilk (p. 204). If you prepare enough tofu for two people, you will have as a byproduct about 1 cup of okara, or enough for two to four servings.

Then come instructions for "Roasting or parching okara" and for "Homemade okara."

The chapter ends with 7 pages of okara recipes, grouped as follows: Okara in salads. Okara in soups. Okara in sauces. Okara with eggs. Okara baked. Okara stir-fried, sautéed, and deep-fried (incl. Okara burgers and okara tempeh). Okara with grains and sushi. Okara desserts.

Note 1. This book contains the most information about okara and the most okara recipes of any book published in English to date. Before publication of this book, okara was very difficult to obtain in the West, except directly from Asian tofu shops. Soon, however, people started making their own tofu at home (often using tofu kits) and many new tofu shops sprang up and became sources of fresh okara.

Note 2. This book (and its companion, *Tofu & Soymilk Production*, 1979) were largely responsible for the word "okara" becoming widely used in English.

Note 3. Within 5 years after the book's publication the importance of fiber in the diet began to be widely publicized. Address: Lafayette, California.

6410. Shurtleff, William; Aoyagi, Akiko. 1975. Glossary (Document part). In: W. Shurtleff and A. Aoyagi. 1975. The Book of Tofu. Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. See p. 319-29.

• ***Summary:*** Aburae. Agar: see sea vegetables. Akame: see beni-tade. Amazake. Aojiso: see beefsteak. Aonoriko: see sea vegetables. Asanomi: see hemp seeds. Asatsuki: see chives. Azuki beans. Bamboo shoots (*Takenoko*). Bean sprouts (*Moyashi*). Beefsteak plant (*Shiso*): Beefsteak buds and blossoms (*Mejiso* and *hojiso*), Beefsteak seeds (*Shisonomi*), Green beefsteak leaves (*Aojiso*), Red beefsteak leaves (*Shisonoha*). Beni-shoga: see gingerroot. Beni-tade. Biifun: see noodles. Bonito flakes (*Hana katsuo*). Bracken fern (*Warabi*). Bread crumb flakes (*Panko*). Burdock root (*Gobo*). Butterbur (*Fuki*). Chinese cabbage (*Hakusai*). Chives. Chrysanthemum leaves (*Shungiku*). Cloud-ear mushroom: see mushrooms. Daikon. Eggplant (*Nasu*). Enokidake: see mushrooms. Fish sausage (*Neri-seihin* or *surumi* [*surimi*]). Flax seeds: see hemp seeds. Fuki: see butterbur. Gingerroot (*Shoga*): Gingerroot shoots (*Shin shoga* or *yanaka shoga*), Red pickled gingerroot (*Beni-shoga*). Ginkgo nuts (*Ginnan*). Glutinous yam (*Tororo imo*). Gobo: see burdock root. Gyoza. Hakusai: see Chinese cabbage. Hana katsuo: see bonito flakes. Harusame: see transparent noodles. Hasu: see lotus root. Hemp seeds (*Asanomi*). Hijiki: see sea vegetables. Hokkaido pumpkin: see kabocha. Horenso: see spinach. Ito konnyaku: see konnyaku. Jinenjo: see glutinous yam. Junsai. Kabocha. Kabu: see turnip. Kampyo. Kanten: see sea vegetables. Karashi: see mustard. Katakuriko. Katsuobushi: see bonito flakes. Kikurage: see mushrooms. Kinako: see p. 64. Kinome. Kombu: see sea vegetables. Konnyaku: Konnyaku threads (*Ito konnyaku*), Konnyaku noodles (*Shirataki*). Kuzu. Leek (*Negi* or *naganegi*). Lily bulb (*Yurine*). Lotus root (*Renkon* or *hasu*). Mandarin orange (*Mikan*). Matcha. Mejiso: see beefsteak plant. Mikan: see mandarin orange. Mirin. Miso: see p. 31. Miso pickles: see pickles. Mizuame. Mochi (*Cakes of pounded glutinous rice*). Moyashi: see bean sprouts. Mushrooms (*Kinoko*): Cloud-ear mushroom (*Kikurage*), Enokidaké, Matsutaké, Nameko, Shiitaké, Shimeji. Mustard (*Karashi*). Myoga. Nagaimo: see glutinous yam. Nameko: see mushrooms. Natto: see p. 67. Negi: see leek. Niboshi. Nigari. Nira: see chives. Noodles (*Menrui*): Soba, Udon, Rice-flour noodles (*Biifun*), Somen, Ramen. Osmund fern (*Zenmai*). Panko: see bread crumb flakes. Pickles (*Tsukemono*), Cha-ts'ai, Narazuké, Takuan. Powdered green nori: see sea vegetables. Renkon: see lotus

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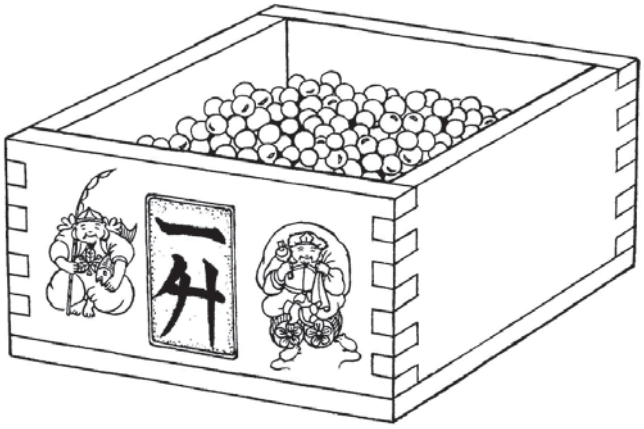
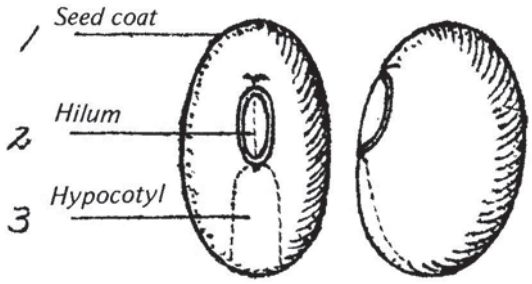
root. Rice flour (*Joshinko*). Sake (*Rice wine*). Sansho pepper (*Kona-zansho*). Sato imo: see taro. Satsuma imo: see sweet potato. Scallions. Sea vegetables (*Kaiso*): Agar (*Kanten*), Hijiki, Wakame. Sesame seeds (*Goma*). Seven-spice red pepper (*Shichimi togarashi*). Shiitake: see mushrooms. Shinachiku: see bamboo shoots. Shiso: see beefsteak plant. Shoga: see gingerroot. Shungiku: see chrysanthemum leaves. Snow peas (*Saya endo*). Soba: see noodles. Spinach (*Horenso*). Sweet potato (*Satsuma imo*). Takenoko: see bamboo shoots. Taro. Teimo: see glutinous yam. Togarashi pepper. Transparent noodles (*Harusame*). Kombu (*Kobu* or *konbu*). Nori: Powdered green nori (*Aonoriko* or *aonori*). Trefoil (*Mitsuba*). Tsukune imo: see glutinous yams. Turnip (*Kabu*). Udo. Udon: see noodles. Umeboshi. Uri melon. Wakegi: see leek. Warabi: see bracken fern. Wasabi. Wheat gluten (*Fu*). Wild onion (*Nobiru*). Wonton skin. Yama imo: see glutinous yam. Yamato imo: see glutinous yam. Yatsugashira: see taro. Yurine: see lily bulb. Yuzu. Zenmai: see Osmund fern. Address: Lafayette, California.

6411. Shurtleff, William; Aoyagi, Akiko. 1975. Soybeans (Document part). In: W. Shurtleff and A. Aoyagi. 1975. The Book of Tofu. Hayama-shi, Kanagawa-ken, Japan: Autumn Press. 336 p. See p. 55-62.



The soybean plant



• ***Summary:*** The section titled "Cooking with whole dry soybeans" (p. 59) begins: "In Japan, soybeans are only occasionally cooked at home. To save time and the cost of lengthy cooking, most people purchase ready-made soybean dishes, usually at the local delicatessen. Many of these store-bought preparations contain large amounts of shoyu and/or sugar to serve as natural preservatives. Whole (tan) soybeans are also available commercially deep-fried in a sweetened batter and sold as Soy Brittle (p. 62), while black soybeans are often used in confectionery treats.

"But when most of us in the West set out to use soybeans, we usually start with those available in their whole, dry form at natural food stores and supermarkets. Presently the least expensive known source of usable protein, whole soybeans are also rich in iron, and vitamins B-1, and B-2. A truly remarkable food, they contain 1½ times as much protein as any other legume (34% to 38%), and are low in carbohydrates. Many recent cookbooks, especially those emphasizing natural foods, have begun to include a wide variety of recipes using boiled or baked soybeans in Western-style salads, soups, casseroles, and spreads.

"Fresh, new-crop soybeans–the tastiest type–are generally available from the beginning of November. When storing large quantities, always use cloth rather than plastic sacks. When soybeans are kept over long periods, a small harmless moth and its eggs may appear among the beans. These can be easily removed by sifting and then exposing the beans to direct sunlight for one day.

"Once you decide to make soybeans, tofu, and soymilk a basic part of your diet, buy a 60- to 100-pound sack of

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food- or seed grade beans at greatly reduced prices from a wholesaler or farmer's supply store; avoid the little packages retailed at inflated prices.

"To ensure best flavor, digestibility, and deactivation of trypsin inhibitor (see p. 70), soybeans must be cooked–preferably pressure cooked–until they are very soft; a single bean should be easily crushed between the thumb and ring finger or between the tongue and roof of the mouth. The beans should also be thoroughly soaked in plenty of water (see graph, p. 289), the water discarded, and new water used for cooking; this helps remove the oligosaccharides believed to cause flatulence. When pressure cooking, some cooks add 1½ teaspoons oil for each cup of beans in order to prevent the seed coats from clogging the steam escape valve; some also prefer to add salt and seasonings before pressure cooking. If cooking the beans at only 10 pounds pressure, double the cooking times given in the following recipes."

After recipes for pressure cooked soybeans, and boiled soybeans, are 15 Western-style soybean recipes followed by the following named Japanese recipes: Budomame (Sweet soybeans). Kombu mame. Kuro mame. Gomoku mame.

Illustrations show: (1) A 1 *shô* (1.8 liter) wooden measuring box (*masu*) widely used in Japan for measuring soybeans, grains, etc. The sides are joined by finger joints. (2) A soybean plant. (3) Basic parts of a single soybean.
Address: Lafayette, California.

6412. Li, Shih-chen. comp. 1975-1977. Shinchû kôtei kokuyaku honsô kômoku [Collected essentials of herbs and trees. Illustrated compendium of pharmacopoeia. Translation of the *Pen-ts'ao kang-mu* from the Chinese into Japanese by SUZUKI Shinkai under the direction of KIMURA Koichi]. Tokyo: Yoshundo Shoten. For tofu and fermented tofu see vol. 7, p. 224, 256, and Vol. 12, p. 177. [Jap]*
• ***Summary:*** The culmination of the materia medica tradition in Japan. Contains a very early reference to fermented tofu.
Address: China.

6413. Azumaya, Naoki. 1975. Nattô-kin ni yoru bitamin B-2 seisan ni kansuru kenkyû. I. Mg^{2+}, Ni^{2+}, Zn^{2+} no eikyô [Study on vitamin-B production by natto bacteria. III. The effect of magnesium, nickel, zinc, and lead positive divalent ions]. *Kumamoto Joshi Daigaku Gakujutsu Kiyo* (*J. of Kumamoto Women's University*) 27(1):81. [Jap]*

6414. Fukushima, D.; Horiuchi, T.; Nishio, M. 1975. [Fermented soymilk]. *Open Japanese Patent* 50-35,364. [Jap]*
Address: Kikkoman.

6415. Hayashi, Koreichi; Nagao, Kazumi. 1975. Nattô no eiyô-ka ni kansuru jikken-teki kenkyû. VI. Missen hozon de eiyô-ka no masu shuin ni tsuite [Experimental study on the nutritional value of natto. VI. The main factor in increasing the nutritional value during storage under tight sealing]. *Teikoku Gakuen Kiyo* (*Memoirs of the Teikoku Women's University*) 1:13-20. [Jap]*

6416. Hayashi, U.; Narasc, A.; Oura, Y. 1975. [Experimental study on the nutritional value of natto. V. Relationship between preservation of natto and its nutritive value]. *Teikoku Gakuen Kiyo* (*Memoirs of the Teikoku Women's University*) 1:7-12. (Chem. Abst. 85:45330d). [Jap]*

6417. Inoue, Tatsu. 1975. Kôri-dofu no chozô-chû no henka ni tsuite. II. Kona-jo kôri-dofu no abura to bônan-sei no henka [Changes in dried-frozen tofu during storage. II. Changes in oil, swelling, and elasticity of powdered dried-frozen tofu]. *Kagawa Daigaku Kyoiku-gaku Kenkyu Hokoku* 25(2):121. [Jap]*

6418. Kozaki, Michio. 1975. Tônan Ajia no hakkô shokuhin [Southeast Asian fermented foods (Abstract)]. *Proceedings of the 22nd Annual Meeting of the Japanese Society of Food Science & Technology.* p. 29. [Jap]
Address: Tokyo Nôgaku Daigaku.

6419. Maki, Mitsufusa; Ishida, Tokuo. 1975. Nattô no nenshitsu-butsu seisei ni kansuru jôken-teki kentô [Investigation of the conditions of viscous substance production in natto]. *Yonezawa Joshi Tandai Kiyo* No. 10. p. 51. [Jap]*

6420. **Product Name:** [Sasa-no-Yuki brand Buro-Dofu (Sealed Lactone Silken Tofu)].
Manufacturer's Name: Morinaga Milk Industry Co., Ltd.
Manufacturer's Address: Shiba 5-33-1, Minato-ku, Tokyo 108 Japan.
Date of Introduction: 1975.
Wt/Vol., Packaging, Price: 10.5 oz Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
Nutrition: Per 5.25 oz: Calories 80, protein 7 gm, carbohydrate 4 gm, fat (45% of calories) 4 gm, sodium 40 mg.
New Product–Documentation: Talk with S. Ikegami. 1981. Jan. 14. This product was introduced before the law protecting small tofu makers in Japan was passed in 1976.

Note: This is the earliest commercial tofu product seen made by Morinaga.

6421. Nakamura, Yasuhiko. 1975. Okara no suiyô-sei, tôseki-sei seibun no kôsan kasei ni tsuite [Anti-oxidation of water soluble and diffusable components of okara]. *Kagoshima Daigaku* p. 19. [Jap]*

6422. **Product Name:** [Proton M {Powdered Soymilk}].
Foreign Name: Proton M.

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Manufacturer's Name: Nihon Tanpaku / Japan Protein Industry Co. Ltd.
Manufacturer's Address: Higashi-cho 1920, Ogawa, Kodaira-shi, Tokyo, Japan. Phone: 0423-41-0831.
Date of Introduction: 1975.
New Product–Documentation: Shurtleff & Aoyagi. 1975. *The Book of Tofu.* Page 202 shows an illustration of a carton of powdered soymilk named Proton.

Shurtleff & Aoyagi. 1979. Tofu & Soymilk Production. p. 313. Gives the company name as "Nihon Tanpaku," and the address shown above. "A maker of powdered soymilk sold under the brand name Proton M and containing 42 to 45% protein.

Soya Bluebook. 1981. p. 63. The company name is given as Japan Protein Industry Co. Ltd. The address is given as: 1920 Ogawahigashi-cho, Kodaira City, Tokyo, Japan.

6423. Norinsho. 1975. Tôfu seizogyô no jittai to tenbô [The Japanese tofu industry: Present status and outlook (Brochure)]. Tokyo: Norinsho. 4 p. [5 ref. Jap]
Address: Tokyo, Japan.

6424. **Product Name:** [Soyalac {Soymilk} (Plain, or Cocoa)].
Foreign Name: Soiyarakku Sutoreeto, Kokoa Soiyarakku.
Manufacturer's Name: San-iku Foods.
Manufacturer's Address: 1-1 Nagaurataku, Sodegaura-machi, Kimizu-gun, Chiba-ken 299-02, Japan.
Date of Introduction: 1975.
Wt/Vol., Packaging, Price: 250 gm can.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Both products purchased by William Shurtleff and Akiko Aoyagi in Japan. 1975-1976.

K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Soiyarakku Sutoreeto, and Kokoa Soiyarakku were introduced in 1975 by Saniku Fuuzu in a 425 gm can and distributed nationwide.

6425. Saxon, E.A. 1975. Food consumption in Japan: A review of selected Japanese data and research results. *Bureau of Agricultural Economics, Australia, Occasional Paper* No. 32. *

6426. Shitomi, Hanao; Ouchi, Mayumi. 1975. Tôfu ni tsuite [About tofu]. *Seitaku Gakuen Tandai Kiyo* No. 8. p. 117. [Jap]*

6427. Shurtleff, William. 1975. Famous and fine tofu restaurants in Japan. Higashi-Oizumi, Nerima-ku, Tokyo, Japan. Unpublished manuscript.
• ***Summary:*** Contains detailed descriptions (with address and recipe names based on visits) of Sasa-no-Yuki (Tokyo), Goemon (Tokyo), Hisago (Tokyo and Kamakura), Sanko-In (Tokyo), Shinoda-Zushi (Tokyo, Inari-Zushi), Tofuya (Tokyo), Otako (Tokyo, Oden), The Natural Food Center (Tokyo, Macrobiotic restaurant), Dengaku (Kamakura Dengaku Cuisine), Okutan and Junsei (Nanzenji, Kyoto, Simmering Tofu), Nakamura-Ro (Niken-jaya, Yasaka-Jinja, Kyoto, Kaiseki, chef Shigemitsu Tsuji), Rengetsu (Kyoto, Tofu cuisine), Izusen (Kyoto), Takacho (Kyoto, Oden), Sorin-An (Kyoto, Yuba cuisine), Seizan Sodo (Arashiyama near Kyoto), Sagano (Arashiyama), Nishiki (Arashiyama), Ohara (Arashiyama, Simmering tofu and Kaiseki), Takemura (Arashiyama, simmering tofu and kaiseki), Haku-Un-An (Manpuku near Uji, Fucha-Ryori).

A condensed version of this was published in The Book of Tofu. Address: Tokyo, Japan.

6428. Staron, T. 1975. Obtention des protéines à partir des graines oléagineuses par des méthodes microbiologiques

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[Obtaining protein from oilseeds using microbiological methods]. *Revue Francaise des Corps Gras* (*Paris*) 22(11-12):579-89. [40 ref. Fre]*
• ***Summary:*** Discusses some important East Asian fermented foods, including miso, shoyu, and tempeh. Note: This is the earliest record on soyfoods in the IALINE database from CDIUPA. Address: INRA, Stat. Antibiotiques Bioconversions, Chartres, France.

6429. Taguchi, Kuniko; Kawabata, Noboru. 1975. Nattô no nenshitsu-butsu ni kansuru kenkyû. II. [A study of the viscous substances in natto. II.]. *Kyoto Furitsu Daigaku Gakujutsu Hokoku B* (*Scientific Reports of the Kyoto Prefectural University, B*) No. 25. p. 7-12. [Jap]*

6430. Amano, Motonosuke. 1975. Chûgoku nôgaku shôroku [Bibliography of Chinese agriculture]. Tokyo: Ryukei Press. [Jap]*
• ***Summary:*** Wang Yuhu's 1964 bibliography with a number of critical revisions.

6431. Amano, Motonosuke. 1975. Chûgoku konosho ko [Researches on ancient Chinese agricultural works]. Tokyo: Ryukei Press. [Jap]*
• ***Summary:*** A companion volume to his Bibliography of Chinese Agriculture containing much more detailed bibliographic information on the key works.

6432. Aoki, Hiroshi. 1975. Daizu no kenkô-hô [The way to health using soybeans]. Tokyo: Arrow Shuppansha. 206 p. [Jap]
Address: Japan.

6433. Circle, S.J.; Smith, A.K. 1975. Soybeans: processing and products. In: N.W. Pirie, ed. 1975. Food Protein Sources. Cambridge, London, New York, Melbourne: Cambridge University Press. xx + 260 p. See p. 47-64. [88 ref]
• ***Summary:*** Contents: Introduction. Agronomy: Varieties, cultivation, yields. Soybean composition. Protein nutritional value. Traditional processing into nonfermented foods: Soybeans as a table vegetable ("cooked green soybeans. "Certain large-seeded varieties are often referred to as 'garden' or 'vegetable' type soybeans in contrast the better known {smaller seeded} 'field' type"), soy milk, tofu (soybean curd), yuba, kinako, salted soybeans, soybean sprouts. Traditional processing into fermented foods: Miso and shoyu, tempeh. Others (p. 55) include: natto, hamanatto, sufu (soy cheese), tao-tjo, kochu chang, ketjap, ontjom, and yogurt-like products.

Contemporary processing without defatting: 'Debittering' by aqueous treatment, whole bean processing, full-fat flour ("Extrusion cooking to produce full-fat soybean flour has received considerable attention"), soy milk and curd. Contemporary defatting processes: Defatting by aqueous processing, defatting with organic solvents, composite flour ("Substitutes or extenders for wheat flour in baked goods and pasta products are termed 'composite flours,' whether or not they contain some wheat." Many of these include soy protein products), soy flours, protein concentrates, protein isolates and textured soy products (Based on "protein fractionation after hexane defatting of soy meal." Recipes for using soy protein products in foods are available from several publications–which are listed). Address: Anderson Clayton Foods, W.L. Clayton Research Center, 3333 Central Expressway, Richardson, Texas 75080.

6434. Crocker (H.S.) Co., Inc. 1975. Barbecue basics. 4th ed. San Bruno, California. 16 p. Index of recipes. 18 cm.
• ***Summary:*** The recipes in this booklet promote the products of various companies, including Kikkoman International Inc. (San Francisco, California 94115; soy sauce), Miller Brewing Co. (Milwaukee, Wisconsin; beer), McCormick and Co. (spices), Zee towels, etc. On the color cover are bottles of Kikkoman teriyaki sauce and all-purpose soy sauce. Address: San Bruno, California.

6435. Egami, Tomi. 1975. Misoshiru to miso ryôri [Miso soup and miso cookery]. *My Life Series* (*Tokyo: Gurafu-sha*). No. 46. 66 p. Illust. 26 cm. [Jap]
• ***Summary:*** Contents: The food table at our home. Miso and me. Pure and right natural miso, by Masahiro Nakano. Varieties of miso from various areas, by Wataru Kawamura. Miso soup. Nerimiso [sweet simmered miso]. Dengaku. Furofuki daikon. Tokoroten. Nuta. Miso-yaki [broiled with miso]. Name miso [finger-lickin' miso]. One-pot cookery. Miso pickles. Cooked with miso. Chinese-style miso cooking. Noodle cooking. Miso confections. Homemade miso. Contains many recipes. Address: Head, Egami Cooking School, Tokyo.

6436. Harlan, Jack R. 1975. Crops & man. Madison, Wisconsin: American Society of Agronomy. xi + 295 p. Illust. 24 cm. Foundations of Modern Crop Science Series.
• ***Summary:*** Table 2-1 (p. 57) lists "The world's 30 leading food crops in terms of estimated edible dry matter" in descending order of annual production. For each is given: Annual production in million metric tons, annual or perennial, ecological origins (Mediterranean, savanna, woodlands, tropical forest, highlands, coastal, or prairie), self- or cross-fertilizing, ploidy level. The top ten crops are: Wheat (468), maize (429), rice (330), barley (160), soybean (88), cane sugar (67), sorghum (60), potato (54), oats (43), and cassava (41). The soybean (No. 5) originated in northeastern China; it is an annual which originated in the woodlands, is self-fertilizing, with a ploidy level of 4. A large proportion of the maize, barley, soybean, sorghum, oats, and rye are fed to animals in the "developed" countries, but serve as human food elsewhere (p. 80).

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Fig. 5-1 (p. 108) shows a schematic diagram of primary, secondary, and tertiary gene pools. Since a hybrid has been made by crossing the soybean with its wild perennial relative, and since "embryo rescue was used, the relationship seems to be at the GP-3 level."

Pages 152-53 show major gene banks in the international system. The two major soybean collections are in the USA (USDA), and Japan (NIAS, Tsukuba).

Page 198 discusses "Recorded history." "The soybean is first mentioned in 664 BC in connection with tribute paid to the Chou by the Shan-Jung (Mountain Jung) tribe." Hemp (Cannabis) is mentioned seven times in the *Book of Odes* (*Shih Ching*). "The agriculture that evolved on the north China uplands was based on the millets, soybean, and a suite of fruits and vegetables" (p. 199).

The section titled "Soybean" (p. 206) contains details on the cultivated plant and its wild ancestor–which is a "small, slender creeping vine bearing a few small pods with small, black seeds. The plant is widely distributed from southern Siberia, through Manchuria, throughout the eastern coastal plain of China, and westward to Szechuan. It is rather weedy, and is often found in city parks under the shade of trees. Presumably, it was once a woodland or temperate forest plant before the natural vegetation was removed for agriculture. The changes under domestication have been enormous.

"Evolution of bush types from vines is common under domestication... The viny ancestral types are usually retained as well, and trailing forms of soybean are still grown for fodder."

The following plants are also discussed: adzuki (*Vigna angularis,* p. 73), amaranth (p. 17-18, 76-77, 80, 95, 221), Bambara groundnut (Voandzeia, 71, 182), Cannabis (hemp, p. 55, 70, 74, 147, 198, 200), peanut (p. 57, 59, 77, 153, 187, 225, 227-28, 232), *Pueraria lobata* (p. 67, 75, 200; see also Yam-bean), quinoa (p. 77, 233), sesame (15, 72, 75, 198, 213), and winged bean (p. 75). Address: Prof. of Plant Genetics, emeritus, Crop Evolution Lab., Dep. of Agronomy, Univ. of Illnois, Urbana, Illinois.

6437. Kajiura, Itsugai. 1975. Shôjin ryôri kuden [The oral tradition of Buddhist vegetarian cookery]. Tokyo: Daihôrinkaku. 346 p. Illust. 19 cm. [Jap]*
• ***Summary:*** Originally published by Daihôrin for 5 years under the title *Shôjin Ryôri Tsurezuregusa.* Shôjin ryôri is the Buddhist vegetarian cookery developed in Japan, largely in and around Zen temples. *Tsurezuregusa* was a famous literary book; the term means something like "unfocused or scattered writings." Address: Japan.

6438. Laulima, Hui O. 1975. Okinawan cookery and culture. Hawaii: Published by the Author. 187 p. Illust. 22 cm. *
• ***Summary:*** Contains several tofu recipes.

6439. Moncrieff, R.W. 1975. Man-made fibres. 6th ed. New York and Toronto: John Wiley & Sons. A Halsted Press Book. 9 + 1094 p. See p. 289-90. 23 cm.
• ***Summary:*** Today, the nylons, the polyesters, and the acrylics are the dominant fibers, having replaced large amounts of cotton and wool. In part 2 of this book, titled "Fibres Made from Natural Polymers," chapter 8, "The first rayons" (p. 157-61) notes that the first rayons were developed, starting in the 1830s, as "artificial silk" from natural sources of cellulose, especially wood-pulp. The first practical process for making artificial silk (later called rayon) was invented by Count Hilaire de Chardonnet and patented in 1885; large amounts of Chardonnet silk were first produced starting in the 1880s. The process for making viscose rayon was discovered in 1891 by C.F. Cross and E.J. Bevan, then patented in 1892. "The greatest single factor in the development of the viscose process has undoubtedly been the support given to it by Courtaulds, Ltd. The pioneer work was undoubtedly carried out by Courtaulds, Ltd., who not only founded and developed an important new industry, but also introduced it to America under the name "The American Viscose Co." In 1900 world production of viscose rayon was about 1,000 tons. In 1920 it as 15,000 tons and in 1940 it was 1,100,000 tons. Note: Courtaulds, Ltd. was a pioneer in making a spun soy protein fiber named Kesp for food uses in the UK, starting in 1973.

Chapter 17 in Part 2, titled "Casein fibres" (p. 307-09) discusses Lanital, Aralac, Fibrolane, and Merinova. In 1904 Todtenhaupt disclosed a method of making casein filaments, but they were brittle and lacked sufficient resistance to water to withstand wet processing. Early attempts by him and others to make a commercially successful casein fibre were unsuccessful, and it was not until 1935 that the problem was really solved by an Italian named Ferretti, who conducted his research from 1924 to 1935. He succeeded in making pliable fibres with certain wool-like characteristics. The Italian rayon manufacturer Snia Viscosa purchased Ferretti's patents and began large-scale production of casein fibre, named Lanital (*lana* means "wool" in Latin) from milk. In 1937 they made 1,20 tons Lanital.

Chapter 18 in Part 2 is titled "Ardil, Vicara, Soybean." It is very similar to the same chapter in the 1963 edition. Ardil fiber is made from peanuts (groundnuts), and Vicara from corn (maize) protein.

Chapter 19 discusses nylon, which was a product of the genius of Wallace H. Carothers. This brilliant organic chemist left his academic life at Harvard University to undertake fundamental research work in 1928 with the huge American chemical combine of E.I. du Pont de Nemours & Co. He was interested in fibers made of polyesters and polyamides. By 1938 the du Pont Co. was making nylon at a small pilot plant in Wilmington, Delaware. In the UK this fiber is spun by I.C.I. Ltd. (the huge chemical combine) at Doncaster, Pontypool, and Gloucester. Address: United Kingdom.

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6440. Muso Co. Ltd. 1975. Foods from Japan: Miso. Osaka, Japan. 7 p. [Eng]
• ***Summary:*** Contents: Introduction. Hacho miso. Mugi miso. Kome miso. How to make miso soup. Address: Osaka, Japan.

6441. Nori kenkô-hô [The way to health through nori]. 1975. Tokyo: Mainichi Newspaper Publishing Co. [Jap]*

6442. Ohta, Teruo. 1975. Nattô kenkô-hô [The natto way to good health]. Tokyo: Futaba Books. 242 p. Illust. No index. 18 cm. [28 ref. Jap; eng+]
• ***Summary:*** This interesting, comprehensive book, by a scientist and expert on the subject, discusses all aspects of natto. Contents: Preface (p. 3). 1. History of natto and its mystery (p. 15). When did natto bacteria appear on earth? The mystery of ancient natto. The first meeting of ancient humans and sticky beans (*neba mame*). Natto is preserving food which was nurtured by the climate where people opposed the government. Why was the Japanese palate better? The amazing wisdom of the Japanese race–"Ancient fermented foods." *Tôshikyô* was a salty natto (*kata natto*) of 2,200 years ago. Natto originated during the Heian period [A.D. 794-1185]. Medicinal natto which Japanese monks kept secretly in olden times. The god of childbirth and princess natto (*hime natto*). Reasoning the "Natto Road." Village natto (*mura natto*) of Tanba, Yamaguni (p. 40). Shoyu-flavored natto started during the Muromachi period [1336-1573]. War provisions in field campaigns and natto. The military commanders of the Sengoku period also used Jinchô natto. Vendors calling out "Natto! Natto!" started during the Edo period (1600-1868). People who challenged the secrets of natto. The dark period of natto making. The mystery of the straw wrapper (*wara zuto*) and the Japanese people. The power of natto, which was studied by even the German army. The Japanese Army and navy studied the power of natto thoroughly (p. 60). Strong ally natto in the time of food shortage. The elite of the foods of the future. Mysterious medicinal effects of natto found in folklore.

2. The homeland of natto (p. 71). From *Hime natto* to *Daraku nabe*–Fukushima prefecture. *Teramichi natto* of Yonezawa and Goto natto–Yamagata prefecture. The early, noncommercialized form of Yukiwari-natto was Goto natto, made with natto, koji, and salt, fermented together for 1 month. Since the middle of the Edo period (about 1735) it has been made in Yamagata prefecture, mostly in farmhouses. It is widely served over rice, mixed with a popular type of diced miso pickle. One commercial manufacturer is Maruyome Shokuhin in Yonezawa city, Yamagata prefecture. Yukiwari-natto looks like Finger Lickin' Miso. The legend of kuromame [black soybeans] of Kiyomasa-kô–Kumamoto prefecture. Pounded natto (*tataki natto*), "Ito" and "Oito"–Kyoto. Tôzô and ôzutsu natto–Chiba prefecture. Mito natto which was sold in train stations along the Jôbansen line–Ibaraki prefecture. Straw-wrapped natto (*warazuto natto*) and natto mochi of Omi–Shiga prefecture. Iwadeyama natto which was eaten by Hachiman Taro Yoshiie–Miyagi prefecture. Is hikiwari natto ancient natto?–Aomori prefecture. Fluffy natto (*fukkura natto*) in large cooked rice containers (*hettsui*)–Saitama prefecture. Stood still at Kawanakajima saying "Nantoshô" ("What to do?")–Nagano prefecture. Naisho mame in the pitch dark–Gunma prefecture. The origin of natto culture–Yokote's hikiwari natto–Akita prefecture.

3. The secret of eating natto (p. 95). What are fermented foods. Super abilities of wonderful microorganisms. Comrades of microorganisms. Why cooked soybeans become natto. The natto bacterium is a magician. The useful component of amazing natto. Natto is the last natural food. Stamina food gives endurance to modern people. Natto protein is of high quality. Natto is an excellent maker of amino acids. Natto vitamins which are used by famous people to increase their stamina. The stickiness of natto is a bunch of active strong enzymes. The wondrous abilities of enzymes. Natto has a strong power to prevent sickness. If you take acidic food continuously, the body's resistance will decrease. Natto is a wonderful alkaline food. There are many unsolved mysteries related to natto. To research the secret of very strong multiplication. The Japanese are an advanced country in terms of soybean utilization. It is important that a true health food should have good balance.

4. Medicinal effects of natto (p. 141). Common colds run away when they see natto. Dysentery and typhoid run away too. Skin disease such as favus and scabies–and natto. When the blood pressure rises, eat natto first. A feeling of faintness when you try to stand up is a sure sign of anemia. If you eat natto–no constipation problems. If you get fat during middle age, start a natto diet. The ideal food to prevent heart disease. Arteriosclerosis and natto. Natto strengthens the liver. The big news–natto bacteria control cancer. Natto keeps you from getting very drunk. Eating natto makes beautiful white skin. White rice and natto are ideal a mealtime. Natto–a strong ally of the stomach. Natto bacteria condition the intestines. Natto has the power to remove radioactivity. Challenge the eternal youth and longevity with natto. Natto and mustard pack a double whammy.

5. How to make natto at home (p. 171). How to grow natto bacteria well. Steps in making natto. Various methods of incubation. The method of making natto at home. This is how natto was made in the old days. How to select good natto. How to measure the freshness of natto. The secret of small-bean natto. The difference between domestically grown and imported soybeans.

6. How to eat natto well (p. 199–with many natto recipes). Unique ways of eating natto over rice. Various natto soups. Deep fried natto dishes. Fun one-pot cookery. Snacks. Natto miso and dried natto. Famous preserved natto foods in

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the various provinces. Other uses and hints.

7. Chronology of natto from 10,000 B.C. to the present (p. 217-39). Key early dates include the following: Heian period: 1051–The legend of Minamoto (Hachimantaro) Yoshiie and natto began (Note: Minamoto Yoshiie was a famous Japanese warrior who lived 1039-1106). The Oshû Kaido [Oshu] became known as the natto road. 1062–Abe Sônin (or Abe Sadamune) started to make "Tôhoku Natto" (a type of sticky natto) in the Hida or Higo region of Kyushu, and was respected by the local people there. 1068–The word "natto" (*usu-shiokara natto;* lightly salted natto) first appeared in the *Shin Sarugakuki* by Fujiwara Akihira.

Kamakura period: Fermented black soybeans became very popular among the samurai and monks. 1129–Zen master Dogen of the Soto sect returned from Sung-dynasty China and introduced Buddhist Vegetarian Cookery (*shojin ryôri*) to Japan. 1211- Samurai (*bushi*) during the Kamakura period eat brown rice and fermented black soybeans (*shiokara natto*) for stamina. 1332–Soybeans were cultivated on a fairly large scale on land near Kamakura by the Tokugawa shogunate (*bakufu*). From these were made fermented black soybeans and other soyfoods which were quite widely used. 1334–During the Nanbokuchô period Kôgen Hôô appeared. In the Jôshôkôji in Tanba Yamaguni made Warazuto Natto and taught the process to the villagers. It was also called Yamaguni Natto, and remains there to this day.

Muromachi Period: The popularization of regular natto started as itohiki natto became "O-ito." The *Teikun ôrai* contained recipes using fermented black soybeans (*shiokara nattô*). Fermented black soybeans were eaten by people as *tenshin* or *ochauke* with tea. Natto and tofu were widely served with Buddhist Vegetarian Cookery (*shojin ryôri*). Natto soup (*nattô-jiru*) originated. 1450–In the *Shôjin gyorui monogatari* [A comic tale of the great war between vegetarian foods and animal foods], natto appears as a person named Nattô Tarô Itogasane. 1532–The *Daiso ryôri-sho* (The Daiso cookbook) contains a detailed recipe for how to make natto soup (*nattô-jiru*).

Note: This is the earliest document seen (Jan. 2012) that mentions Yukiwari-natto (with or without a hyphen). Continued. Address: National Food Research Inst., Tokyo, Japan.

6443. Ohta, Teruo. 1975. [Science and technology of natto production]. In: Nattô Enkaku-shi (Natto History and Development). Tokyo: Sankei Press. 367 + 51 p. See p. 325-63. [Jap]*

6444. Ohta, Teruo. 1975. Nattô kenkô-hô [The natto way to good health (Continued–Document part II]. Tokyo: Futaba Books. 242 p. [28 ref. Jap; eng+]
• ***Summary:*** Continued: Page 218: Doki natto is in an earthenware pot.

Page 220: Kusa-no-ki natto is fermented wrapped in tree leaves, which may also harbor natto bacteria. See illustration.

Page 222: Picture of Tohoku natto.

Page 223: Yamaguni natto and Sandara-bochi natto. Still made in Niigata for use mainly as a gift.

Page 224: Ito, Oito, Natto Taro.

Page 226-27: Hamana natto, Goto natto, Mushiro natto, kombu natto is a type of tera natto [fermented black soybeans]. Hachi natto: Incubate topped with straw in a suribachi.

Page 228: Momen natto and zaru natto. An illustration shows that a zaru is quite deep.

Page 230: Hishi natto: Made in the middle of winter. Miso natto, shiru natto, kibako natto, jubako natto, oke natto, hachi natto. Illustration with 1 sho measure of beans.

Page 232: Tofuya natto, kaki natto, warazuto natto = tsuto natto = tsutoiri natto.

Page 233: In illustration shows tataki natto, itohiki natto.

Page 234: Korumame, ogi natto (fan shaped), Hanzawa-shiki natto yoki, kyogi natto.

Page 236: Take no kawa natto, kyogi natto (kyo is the warp in weaving), poly natto, sudare natto.

Page 238: Roketto natto, jinko kyogi natto, kappu (cup) natto, PSP (polystyrene paper) yoki, tomobuta PSP natto.

Page 240: Aluminum yoki, monaka natto (like Tai-yaki, eat the whole thing). Note 1. The preceding pages would enable one to write an illustrated history of natto containers. This is the earliest document seen (Jan. 2012) that mentions PSP (polystyrene paper) containers used to package natto.

Note 2. There are many good cartoons about natto in this book. Address: National Food Research Inst., Tokyo, Japan.

6445. Roig y Mesa, Juan Tomas. 1975. Diccionario botánico de nombres vulgares Cubanos [Botanical dictionary of Cuban vernacular names]. Havana, Cuba: Editorial Pueblo y Educación. Illust. 20 cm. [Spa]*
• ***Summary:*** The soybean (Soya) was introduced to Cuba in 1904 by the EEA (*Estación Experimental Agronómica de Santiago de Las Vegas,* currently INIFAT, the Experimental Agronomical Station) from the USA, but it was possibly already found in the Isla de la Juventud, used by the Japanese to prepare a kind of cheese called 'tofu.' (*dau phu* in Vietnamese).

Note 1. This document contains the earliest date seen for soybeans in Cuba (1904), or the cultivation of soybeans in Cuba (1904 or 1904; one of three documents). The source of these soybeans was the USA.

Note 2. Although these soybeans were introduced in 1904, they may not have been cultivated until 1905 (see Cruz 1906).

Note 3. The author was born in 1877. The 1st edition was published in 1928 (3 vols, 48 plates).

6446. Sato, Yoshiya. 1975. Kikkôman no keiei [History of

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Kikkoman operations]. Tokyo: Yomiuri Shinbun-sha. [Jap]*
• ***Summary:*** The story of Kikkoman's development told from the company's viewpoint.

6447. Shimizu, Keiichi. 1975. Miso to umeboshi: Nihonjin no chie. San-zen nen mae ni hakken sareta kenkô shoku [Miso and umeboshi salt plums: The wisdom of the Japanese. Health foods discovered 3,000 years ago]. Tokyo: Tokyo Sports Shinbunsha. 252 p. Illust. 18 cm. Series: Tosupo Bukkutsu. [Jap]*
• ***Summary:*** Keiichi Shimizu was born in 1907.

6448. Shokuryo-cho. 1975. Miso no seizô oyobi ryûtsû kijun [Regulations governing the manufacture and distribution of miso]. Tokyo. 274 p. Illust. 21 cm. [10+ ref. Jap]*

6449. Wright, Louise. 1975. History of Lea & Perrins Worcestershire Sauce (Document part). In: Louise Wright. 1975. The Road from Aston Cross: An Industrial History, 1875-1975. Imperial House, Leamington Spa, Warwickshire, England: Smedley–HP Foods Ltd. 84 p. See p. 30-37. 25 x 19 cm.
• ***Summary:*** Continued (p. 30): "Another important matter was on the move: A merger between HP Sauce Ltd. and the world famous makers of Worcestershire sauce, Lea & Perrins. Mr. John Wheeley Lea and Mr. William Perrins went into partnership in 1823. Mr. Lea was druggist in Worcestershire; his friend had a chemist's shop in Evesham. Over their Christmas festivities, they decided two heads were better than one and on New Year's Day [1823] pooled their resources to develop the Worcester business as Lea & Perrins. They set up as wholesalers and retailers of pharmaceuticals, toiletries, cosmetics and groceries. Long before the days of ice-cream parlours and Coca-Cola, their shop on Broad Street, Worcester, became the precursor of the modern American drug-store.

"Both men were analytical chemists. Both were aware of the advantages of marketing their own products and their fist catalogue listed more than three hundred items. Although trading from a quiet country town, they kept themselves informed and studied world trade. Aware of the rapid growth of Queen Victoria's empire, they also realised that the industrial revolution was rapidly altering Birmingham and the Black Country. Soon their medicinal products were in great demand throughout the Midlands. Later they opened a chemist's shop in London, patronised by Queen Adelaide.

"Their concentrated Essence of Sarsaparilla was recommended for scorbutic affections (scurvy), cutaneous (skin) diseases and for freeing the system from the ill-effects of taking mercury. They recommended Taraxacum (dandelion coffee) for liver complaints because of its gentle diuretic and diaphoretic effects. Presumably their customers were sufficiently conversant with medical terms to know that a diuretic excites the discharge of urine and a diaphoretic produces perspiration.

"Mr. Lea & Mr. Perrins were perfecting their medicines, hair lotions and marrow pomades when Marcus, Lord Sandys visited the shop in Worcester. Late Governor of Bengal, he had retired to his country estate at nearby Ombersley Court, and would be obliged if they would make up one of his favourite Indian sauces. They obliged. Having already arranged their own supplies of spices and dried fruits, from Asia and the Americas, they had the ingredients to hand. Scrupulously following his lordship's recipe, they made the required quantity, plus some for themselves. One taste was enough. The sauce was ghastly: an unpalatable, red hot, fire water. His lordship was entirely satisfied. The remainder however was consigned to a cellar below the shop and there it stayed until the annual spring cleaning and stocktaking.

"It was on the point of being poured away when Mr. Lea and Mr. Perrins detected its appetising aroma. Tasting it once again they discovered it had matured into a rare and piquant sauce. The sauce was saved, more was made. Customers were persuaded to try the new Worcestershire Sauce, and did not need more persuasion: the sauce was an instant success. Sales rose. In 1842, Lea & Perrins sold 636 bottles. In 1845, a manufactory was set up in Bank Street, Worcester. Ten years later the yearly sales were up to 30,000 bottles of Worcestershire Sauce. Travellers covered Great Britain and there were agencies in Australia and the United States. As well as sauce, they found a steady export market for their medicines. No sensible traveller left England without a Lea & Perrins medicine chest."

"By 1862, the firm's international trading had become an extensive two-way traffic. An American firm in New Jersey was asking them to find an English market for hermetically sealed 3 lb cans of fresh fruits, tomatoes, green corn and oysters.

"When it became necessary to build a new factory in Midland Road, Worcester in 1897, Mr. Lea & Mr. Perrins used the latest steel girder construction. The factory rises over vast cellars, which house hundreds of casks of maturing sauce and maturing raw materials. No anchovy is allowed into the cellars under a year old. It matures for at least another year before being used in the sauce manufacture. The steel girders of the cellar roof, which supported the circular yard and its traffic of one ton drays in 1897, are now having to be re-inforced to take 32 ton freight-liners. A royal warrant was granted to the firm by Edward VII in 1904 and has been proudly held ever since. It helped alleviate trouble with imitations of their sauce. In the High Court of Justice in 1906, Mr. Justice Swinfen Eady decreed that no firm other than Lea & Perrins be allowed to call their Worcestershire Sauce, 'The Original' or 'The Genuine'.

"In 1823, William Perrins' son married Sarah Dyson of Huddersfield. Their grandson christened Charles William Dyson, was known as Dyson Perrins. A benefactor to the City of Worcester, to his home town of Malvern and to his

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old University of Oxford, where he developed his great love for the earliest printed books... He also inaugurated the Dyson Perrins Porcelain Museum at Worcester.

"After the First World War, Lea & Perrins rapidly expanded. When the merger with HP Sauce Ltd. was settled by mutual agreement in 1930, it had been a private limited company for some time. The branch in the United States, Lea & Perrins Inc., was not officially brought into the new company until a year later, but a gentleman's agreement between the two boards had sufficed while the trans-Atlantic marriage was being formally established. The amicable relationship dated back to Mr. Lea and Mr. Perrins.

"The believed in having friendly dealings with their overseas agents. Foremost among them were their New York agents, John Duncan & Sons. Established since 1819 as importers of wines, quality foodstuffs and preserves, they began to handle Worcestershire Sauce in 1840. Soon, they were handling ever-increasing amounts. During the succeeding forty years, close friendship developed between the two family businesses; indeed, the Duncans have adopted Dyson as one of their own family names.

"By 1875, the demand for Worcestershire sauce had spread throughout the United States. It was agreed to import the sauce in casks and bottle in New York. On the personal side the friendship between the families became so strong that the secret formula was divulged and the rights of manufacture granted to the Duncans. After eight years of manufacture in their various New York factories, they acquired in 1910 a nine storey building in West Street. Following their partnership with HP Sauce Ltd., they remained in West Street until expansion forced them to move to the Industrial Park at Fair Lawn, New Jersey." Continued. Address: Warwickshire, England.

6450. Wright, Louise. 1975. History of Lea & Perrins Worcestershire Sauce (Document part–Document part II). In: Louise Wright. 1975. The Road from Aston Cross: An Industrial History, 1875-1975. Imperial House, Leamington Spa, Warwickshire, England: Smedley–HP Foods Ltd. 84 p. See p. 30-37. 25 x 19 cm.

• ***Summary:*** Continued: Fair Lawn, near Route 4 out of New York, is an industrial park. Behind the lawns and dignified facades "Lea & Perrins Inc. alone produce 500 bottles of sauce every minute of every working day. The company is now a member of the Imperial Foods Group, but retains its American identity, with its own board of directors and its own purchasing and marketing procedures. The company has been marketing HP Sauce for some years." It is known as HP Steak Sauce.

An early engraved advertisement titled "The First Introduction" (facing p. 32) shows an innkeeper or restaurateur introducing Lea & Perrins' Sauce to three well-dressed gentlemen at a table. Two photos (facing p. 33) show: 1. A view of the front of the Lea & Perrins factory, built at Midland Road, Worcester, in 1897. 2. "The disastrous fire in 1964, which destroyed much of the building. With fine cooperation by management and employees, the sauce manufacture was held up for a mere 10 days."

In the New Zealand town of Te Wairoa, destroyed by a volcanic eruption in 1886, an undamaged bottle of Lea & Perrins Worcestershire sauce was found preserved by the volcanic dust. It is on display in the museum there (p. 34).

Plate 51 shows three ads published in 1871 by Lea & Perrins in three Australian newspapers (the *Coulburn Herald, Bathurst Free Press,* and the *Manaro Mercury*) to caution people against purchasing fraudulent imitations of their "celebrated Worcestershire Sauce." The two agents in Australia were Montefiore, Joseph & Co. (Sydney), and John Lee & Co. (Maitland). The sauce was exported by Lea & Perrins (Worcester) and by Crosse and Blackwell (London); it was sold by "Grocers and Oilmen universally."

Plate 54 states: "Lea & Perrins have been exhibiting since the historic Chicago Exhibition [in Illinois] in 1876, which celebrated the first hundred years of American Independence. The vase and bottled where were displayed there, are on permanent exhibition in the entrance hall of the offices of Lea & Perrins Inc., New York." Plate 55 shows the products of HP Sauce Ltd. and Lea & Perrins Ltd. on display at the British Industries Fair of 1949. Pages 42-43 discuss problems faced by Lea & Perrins in Worcester during World War II. "An army medical unit had taken over their factory, leaving only a small, sealed section in which to continue the highly secret process of making the sauce... One sniff was enough; there is no mistaking a cask of five-year-old anchovies." Lea & Perrins soon moved its bottling machinery from Worcester to Aston Cross. Plate 59 shows a empty glass bottle of Lea & Perrins sauce from 1880.

Plate 60 shows seven old Lea & Perrins Worcestershire sauce bottles. The oldest two, made of green glass with glass stoppers, were both filled in 1866. Two others are from about 1870. The earliest one with a label is from 1920. Plate 83 shows old bottles (with labels) of Worcestershire Sauce made by other manufacturers in Kobe, Japan; Cardiff, Wales; Hamburg-Altona [Germany; Altona became part of Hamburg in 1937]; the United Kingdom, and Portugal. Address: Warwickshire, England.

6451. Yanase, Giryô. 1975. Yûki nôgyô kakumei [The organic farming revolution]. Tokyo: Daiyamondo-sha. 5 + 242 p. Illust. 19 cm. Series: Daiyamondo Gendai Sensho. [Jap]*

• ***Summary:*** About organic farming in Japan, the effect of agricultural chemicals on the environment, and vegetarianism. The author was born in 1920.

6452. Yunoki, Manabu. 1975. Nihonshu no rekishi [History of Japanese sake]. Tokyo: Yuzankaku. 332 p. Illust. 21 cm. [174* ref. Jap]

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• ***Summary:*** The first pages of this book contain many beautiful illustrations (line drawings) and photos of the traditional method for making sake–which in many ways resembled the ways for making miso and shoyu. Pages 25-27 describe the world's first pasteurization (*hi-ire*) of a food product–which was Japanese sake. It is recorded in the *Tamon-in Nikki* (*Tamon-in Diary*) of 20 May 1569. It was done by the monk Eishun. Address: Professor of Economics, Kansai Gakuin Daigaku, Japan.

6453. Zenkoku Margarine Seizo Kyodo Kumiai. 1975. Nijûnen no ayumi [20 year progress / history of the Japan Margarine Production Assoc.]. Tokyo: ZMSKK. 81 p. [Jap]

6454. Zenkoku Natto Kyodo Kumiai Rengokai (Japanese National Natto Assoc.). ed. 1975. Nattô enkaku-shi [Natto history and development]. Tokyo: Zenkoku Natto Kyodo Kumiai Rengokai. 367 + 51 p. Illust. No index. 21 cm. [208 ref. Jap]

• ***Summary:*** Name of organization with diacritics is: *Zenkoku Nattô Kyôdô Kumiai Rengokai.* The name of this trade association has also been translated as "Japanese United Society of Natto Makers."

Contents: Natto (p. 15). Memories of natto and the school lunch program (p. 16). Record of going towards prosperity (p. 17). At the publication of Natto Enkaku-shi (p. 18).

Yayoi period to 21st Century (p. 19). Origin of natto and also new and old natto (p. 23). Natto chronology and general history of Japan (p. 63): (1) History of cultural aspects of natto (p. 63). (2) Zenkoku Natto Kyôdô Kumiai Rengokai (Zennoren; Japanese National Natto Association) chronology (1939-1974) (p. 85).

History of the Japanese National Natto Association (p. 109). People who contributed towards the development of natto (p. 154): Jun HANZAWA (p. 158). Jirô MIURA (p. 165).

Topography of natto (Natto in the provinces, p. 171). Appendix. Topography of natto in illustrated map (p. 172).

Methods of making the various types of provincial natto (illustrated) (p. 199): (1) How to make straw wrap Containers (p. 200). (2) Hinoyama (or Hiyama? or Hinoki Yama?) natto = Cedar mountain natto (p. 201). (3) Iwamuro (rock room) natto (p. 202). (4) Kama (cauldron) natto (p. 203). (5) Tsuchi (earth/soil/dirt) natto (p. 204). (6) Kotatsu (charcoal body warmer) natto (p. 205). (7) Taru (vat) natto (p. 206). (8) Yuki (snow) natto (p. 207). (9) Oke (tub) natto (p. 208). (10) Yutanpo (hot water bottle) natto (p. 209). (11) Bara (loose) natto (p. 210). (12) Hoshikusa (hay) natto (p. 211). (13) Yamaguni (mountain country) natto (*hôsei natto*) (p. 212). (14) Hettsui (wooden container for cooked rice) natto (p. 213). (15) Hikiwari (ground and cracked) natto (p. 214). (16) Taihi netsu riyô (making natto using heat from compost) natto (p. 215). (17) Sumigama (kama-oven for making charcoal) natto (p. 216). (18) Usu (mortar) natto (p. 217). (19) Momen (cotton) Natto (p. 218). (20) Sakadaru (upside-down vat) natto (p. 219). (21) Tsurushi (hanging) natto (p. 220). Illustration of natto containers and equipment (p. 222).

Appendix. Medicinal effects (properties) and nutritional properties of natto (illustration) (p. 242).

Healthy eating with natto (p. 243). Natto contains enzymes for an activate life (p. 245). Natto protein in the secret to good health (p. 250). Boosting your energy with vitamin B-2 from natto (p. 255). The mysterious power of natto (p. 258). Japanese stomach cancer and natto (p. 264).

Mini natto dictionary (*mame jiten*) (p. 281).

Natto cookery: 100 selected recipes (p. 295).

Future prospects of the natto industry (p. 322). The importance of natto production technology (p. 325). Directory of Japanese National Natto Association (*Zenkoku Natto Kyôdô Kumiai Rengôkai*) *members.*

Advertisements of related companies. Address: Tokyo, Japan.

6455. Japan Kori-Tofu Assoc. 1975? [Guide of Kori-tofu]. Nihonbashi 3-1, Chuo-ku, Tokyo, Japan. 4 p. Undated. [Jap; Eng]
Address: Tokyo, Japan.

6456. Autumn Press, Inc. 1976. Imagine... (Ad for The Book of Tofu by Shurtleff and Aoyagi). *Mother Earth News* No. 37. Jan. p. 153. [1 ref]
• ***Summary:*** This exact same ad first appeared in Dec. 1975 in *Macrobiotic* (The) (Chico, California), No. 111. p. 61. Address: P.O. Box 469, Soquel, California 95073.

6457. Hesseltine, C.W. 1976. Miso no shinki yôto [New uses for miso]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 263. p. 5-7. [Jap]
• ***Summary:*** Translated by Dr. Hideo Ebine. Address: NRRL, Peoria, Illinois.

6458. Kitagawa, I.; Yoshikawa, M.; Yosioka, I. 1976. Saponin and sapogenol. XIII. Structures of three soybean saponins: soyasaponin I, soyasaponin II and soyasaponin III. *Chemical and Pharmaceutical Bulletin* 24(1):121-29. Jan. [25 ref]
Address: Faculty of Pharmaceutical Sciences, Osaka Univ., Japan.

6459. Mega, Tomohiro; Matsushima, Yoshio. 1976. Affinity chromatography of glycosidases: Preparation and properties of affinity column adsorbents. *J. of Biochemistry* (*Tokyo*) 79(1):185-94. Jan. [11 ref. Eng]
• ***Summary:*** Discusses Takadiastase and soybean glycosidases. Uses partially purified glycosidase mixtures from Takadiastase and soybeans. Address: Dep. of

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Chemistry, Osaka Univ. College of Science, Toyonaka, Osaka 560.

6460. Koyama, M. Assignor to Shinshu Miso Company. 1976. Process for producing processed low salt soybean paste. *U.S. Patent* 3,937,844. Feb. 10. 3 p. Application filed 20 Dec. 1974. [3 ref]
• ***Summary:*** "An improved process for producing soy bean paste miso by adding lactic acid at the early stage of fermentation to effect lowering of the pH, thereby resulting in a salt content of less than 10%...

"The improved process according to this invention comprises the steps of adding 0.05–0.5% (75% density) lactic acid or organic acid into the conventional components of bean paste at its early stage, lowering the PH of said paste at said early stage, brewing and ripening said paste with salt less than 10%." Address: Tokyo, Japan.

6461. Osaka, Motomi; Hashimoto, Yukio. Assignors to Laboratorios Del Dr. Esteve SA (Barcelona, Spain). 1976. Bean-odor-free soy bean product and its production. *U.S. Patent* 3,937,843. Feb. 10. 6 p. Application filed 4 Dec. 1973. [3 ref]
• ***Summary:*** "A process for preparing a bean odor-free soy bean product which comprises subjecting a soy milk to lactic fermentation in the presence of a lactic acid bacterium as a starter and subjecting the resultant fermented soy milk to distillation under reduced pressure, the soy bean product being suitable for the manufacture of a nutritional drink or beverage product free from a bean odor due to its high protein concentration and excellent palatability." Address: 1. Osaka, Japan; 2. Izumiotsu, Japan.

6462. Yim, Susan. 1976. One man's bread, another man's tofu. *Star-Bulletin* (*Honolulu, Hawaii*). Feb. 12. p. D-1, D-2. [1 ref]
• ***Summary:*** About the work of William Shurtleff and Akiko Aoyagi. A photo shows the two holding their *Book of Tofu.* "Five thousand copies of the book came out in December [1975], and all were sold in a week. There will be a second printing soon." During Shurtleff's first year in Japan, in 1971, he lived in Kyoto on 30 cents a day. His key source of protein was tofu.

"They will present a lecture tonight at 7:00 at the Kailua Seventh-Day Adventist Church. They will speak again tomorrow night at 7 at the University of Hawaii's Kuykendall Hall." Address: Star-Bulletin writer.

6463. Koshiyama, I.; Fukushima, D. 1976. Purification and some properties of gamma-conglycinin in soybean seeds. *Phytochemistry* 15(1):161-64. Feb. [36 ref]
• ***Summary:*** Gamma conglycinin is a 7S globulin and one of the four major antigenic components in soybean globulins. It was purified and found to be homogeneous. Address: Noda Inst. for Scientific Research, 399 Noda, Noda-shi, Chiba-ken 278, Japan.

6464. Shurtleff, William; Aoyagi, Akiko. 1976. Soybean foods from Japan (Letter to the editor). *Organic Gardening and Farming.* Feb. p. 15-16.
• ***Summary:*** "For the past 4½ years, I have been living in Japan doing research and writing a book about two of East Asia's most important soybean foods: tofu and miso, both of which seem to hold real promise of becoming basic sources of high-quality, low-cost protein throughout the world.

"This spring, Ms. Akiko Aoyagi, the Japanese cook and artist with whom I have been working, and I plan to travel throughout the United States visiting natural food centers, communities, and other interested groups. We will be conducting cooking classes, giving talks, and showing slides about these remarkable foods. We will also give demonstrations on the preparation of tofu and miso on a family, community or commercial scale. If anyone is interested in having us visit your area, please contact us at 790 Los Palos Drive, Lafayette, Cal. 94549." Note: At this time Shurtleff & Aoyagi were still living in Tokyo. They returned to Lafayette, California on 23 July 1976, and left from there on their Tofu & Miso America Tour on 29 Sept. 1976. Address: Lafayette, California.

6465. Kozaki, Michio. 1976. Fermented foods and related microorganisms in Southeast Asia. *Proceedings of the Japanese Association of Mycotoxicology* No. 2. p. 1-9. March 20. [16 ref]
• ***Summary:*** Table 1, "Main fermented foods using molds, yeasts or bacteria in Southeast Asia," contains four columns: Name of fermented food, raw materials, main related microorganisms, and remarks (incl. names in other countries). Fermented foods listed include amazake (tapé / tapeh in Indonesia, with *Rhizopus* spp. instead of *Aspergillus oryzae*), tempeh, sufu, ontjom, natto (soy bean fermented with *Bacillus subtilis* var. *natto;* Teranatto [fermented black soybeans] is same as original miso, Taosi in Philippines).

Table 2, "Main fermented foods using molds plus bacteria, molds plus yeasts, yeasts plus bacteria and molds, or yeasts plus bacteria in Southeast Asia," contains the same four columns. Fermented foods listed include soy sauce (*Aspergillus oryzae, Saccharomyces rouxii, Pediococcus halophilus;* called Jan [kanjang] in Korea and Thua nao [sic] in Thailand), Miso (same 3 microorganisms as in soy sauce). Address: Tokyo Univ. of Agriculture, Dep. of Agricultural Chemistry, 1-1, Suragaoka, Setagaya-ku, Tokyo.

6466. McCormick, Sally. 1976. Azuma Sukiyaki House: Gracious dining in an Oriental setting–5120 N. Broadway, Chicago (Advertorial). *Chicago Tribune.* March 20. p. A19.
• ***Summary:*** "The Azuma dinner includes Sukiyaki, a generous portion of prime rib slices with fresh mushrooms,

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bamboo shoots, Tofu (soy bean cakes), Shiratake [Shirataki] (yam noodles) [thin konnyaku noodles] and assorted fresh vegetables." Azuma also serves Beef Teriyaki, Chicken Teriyaki, Salmon Teriyaki, and "Bata-Yaki (prime beef slices cooked with vegetables and served with lemon-soy sauce),..." Two photos show Azuma Sukiyaki House.

6467. *Foreign Agriculture.* 1976. Outlook better for soybeans in three Far East markets. March 22. p. 2-4.
• ***Summary:*** The improved forecast is for Japan, Taiwan, and South Korea. Once virtually free of competition for the important Japanese soybean market, the U.S. must now reckon with Brazil as a competitor, while facing Malaysian palm oil in the vegetable oil market. Brazil's soybean exports to Japan last year, for instance, probably totaled only about 60,000 tons, compared with the 2.8 million tons of U.S. beans. The cost of shipping Brazilian beans to Japan in 1975 averaged $5-$10 per ton more than from the U.S. This difference reflected the longer distances from Brazilian ports, plus Brazil's use of smaller ships. The 10-day-longer shipping time from Brazil is especially important in Japan, where timeliness of cargo is a key market factor.

There is only one major oilseed crusher and meal supplier in Korea. The Government production plan calls for self-sufficiency in soybeans and the country has launched a strong drive in this direction. Current Korean production of soybeans totals about 311,000 tons. The low-oil variety of bean produced in Korea is best suited for food use (e.g. miso).

Taiwan is the largest per capita consumer of soybeans in the Far East, with a per capita soybean oil consumption of about 11 pounds in 1975 (out of 13 pounds for all vegetable oils).

6468. Hashizume, Kazumoto; Shiratori, Makoto; Nakamura, Noriko; Watanabe, Tokuji. 1976. [Studies on the preparation conditions of soybean milk for tofu making: I. Effects of the ratio of water to soybean and ionic strength in the preparation of soybean milk on the properties of tofu]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 31. p. 192-96. March. [8 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 22:38 (1975). Address: 1,3-4. National Food Research Inst., MAFF, Koto-ku, Tokyo, Japan; 2. Tokiwareitou Co., Ltd., Ina-shi, Nagano-ken.

6469. Hashizume, Kazumoto; Watanabe, Tokuji. 1976. [Studies of acid or alkali treatment of soybean protein: Note]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 31. p. 197-99. March. [18 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 49(6):331-33 (1975). Address: National Food Research Inst., MAFF, Shiohama-cho, Koto-ku, Tokyo, Japan.

6470. Hashizume, Kazumoto; Nakamura, Noriko; Watanabe, Tokuji. 1976. Influence of ionic strength on conformation changes of soybean protein caused by heating and relationship of its conformation changes to gel formation. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 31. p. 200-08. March. [18 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 39(7):1339-47 (1975). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6471. Ito, Hiroshi. 1976. Hamanattô [Hamanatto]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 71(3):173-76. March. [Jap; eng+]
• ***Summary:*** Contents: Introduction. A brief history of Hamanatto. Methods of production: Yamaya and Horinji methods, Daifukuji method. The microbiology and chemistry of Hamanatto fermentation. Hamanatto's special characteristics. Serving Hamanatto. Conclusion. Acknowledgments.

Two flowcharts show Hamanatto production methods at Horinji and Daifukuji. Tables: 1. Distribution of various microorganisms in Hamanatto (cells per gram) at Yamaya, Horinji, Daifukuji. 2. Nutritional composition of Hamanatto (from Yamaya, Horinji, and Hamana), Daitokuji natto, and regular sticky natto. 3. Composition of free amino acids (mg per 100 gm defatted, and gm per 10 gm protein) in Yamaya Hamanatto, Daitokuji natto, Yamaya Hamanatto, soybean miso (temperature controlled- and natural fermentations), and Hatcho miso. 4. Composition of Hamanatto fats. 5. Volatile acids in Hamanatto. 6. Aromatic compounds in Hamanatto.

In Japan, there are basically two types of natto: Regular natto (*itohiki-natto*) and salty natto (*shiokara-natto*). Generally the word 'natto' refers to the former but in Shizuoka prefecture in and around Hamamatsu city a type of salty natto called *hamanatto* is famous. Totally unrelated to regular natto except in name and the fact that both are fermented soyfoods, it is actually a close relative of soybean miso in terms of its flavor and the way it is produced. However unlike miso, the soybeans retain their original form, uncrushed, and the product has its own unique flavor and aroma. Another type of salty natto is Kyoto's Daitokuji-natto.

A brief history of hamanatto: Hamanatto originated in ancient China and is one of the progenitors of today's miso and shoyu. Many old documents show that its relatives *kokusho* ('grain chiang') and *teranatto* ('temple natto') were brought to Japan from ancient China. A type of fermented, salt-preserved cooked soybeans called *tou-ch'ih kyo* was

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excavated together with articles buried with one *Mao-tai,* a ruler of the early Han dynasty who lived about 2200 years ago. This was the earliest form of hamanatto. According to the first scholars and envoys from Japan to T'ang dynasty China, *chiang* and *kuki,* both progenitors of miso and shoyu, were introduced to Japan from China. Records show that the great T'ang dynasty Buddhist master Ganjin, who came to Japan by boat in 753, brought with him 1428 gallons of 'sweet kuki,' an early type of salty natto. The first mention of salty natto in Japan appears in Fujiwara Akihara's *Shinsaru Gakki / Shin Sarugakuki,* written in 1286 [Note: Others give the date as 1068]. The first character of the word 'natto' means 'to pay, supply, or dedicate;' the second means 'bean or soybean.' According to the *Honcho Shokkan,* written in 1697, the first character was derived from the fact that natto were first prepared in Japanese temple kitchens which are known as *na-ssho,* the place which supplied the monk's food. Since the propagation of salty natto throughout Japan was done primarily by temples, they also came to be known as 'temple natto' (*tera-natto*)*.* They served as an important source of protein and savory seasoning in the Buddhist vegetarian diet. Kyoto's Daitokuji-natto, Ichimei Ikkyuji-natto, and Tenryuji-natto, each made in temples, and the Hamanatto made at Daifukuji and Horinji temples in and around Hamamatsu city are popular to this day. Hamanatto first became known when the monks of Daifukuji temple presented some to the seventh Ashikaga shogun, Ashikaga Yoshikatsuko, during the 1400s. during the Warring States Period (1467 to 1568) they also presented Hamanatto to lords of the families of Imagawa Toyotomi, and Tokugawa.

Note: This is the earliest document seen (Nov. 2011) that mentions "Ikkyuji" or "Ichimei Ikkyuji" in conjunction with Daitokuji natto.

Because of its unique flavor and aroma and good keeping qualities, hamanatto became known throughout Japan. in some cases the skin of sansho seeds (Japanese pepper; *Zanthoxylum piperitum*) were mixed in and the product called *kara-natto* ('spicy natto'). When Toyotomi Hideyoshi undertook his Korean campaigns, he took lots of hamanatto with him. When he arrived in the ancient province of Hizen in northwest Kyushu, just before his soldiers embarked in boats to Korea, he gave this food the same name, *kara-natto,* but written with characters which mean 'beans for subjugating T'ang dynasty Korea.' This name, he hoped, would bring him luck in his campaign. After returning to the Hamamatsu area in central Japan, he donated land to makers of hamanatto to encourage their craft.

Later, when Tokugawa Ieyasu took over Hamamatsu castle, he used hamanatto as soldiers' provisions. Each year the local monks gave hamanatto as a gift to the shogun, who in turn used it as a New Year's offering. Still later, produced by temple cooks and craftsmen, it was given as a New Year's gift to parishioners; it also had a symbolic meaning since the word for soybeans (*mamé*) has also come to mean healthy and robust. In 1968 Yamaya, a producer of tamari shoyu (soy sauce) under the direction of Suzuki Yasuke, attempted to make an improved version of the product previously prepared at Daifukuji temple and first affixed the name 'hamanatto.' Thus the name of the product developed in the following order: *shiokara-natto* ('salty natto). *kara-natto* (T'ang dynasty natto), *hamana-natto,* and *hama-natto.* To this day, Daifukuji has maintained its own special method of production, but this too has been commercialized.

Methods of production: Today hamanatto is prepared by two methods: the traditional method handed down from generation to generation since ancient times, and the modern industrialized method which made improvements on the traditional method without harming the special flavor and aroma. Yamaya company and Horinji temple use closely related methods; the former is industrialized while the latter is a handmade process using koji starter. Daifukuji uses a different traditional process without koji starter since the ancient incubation room, wooden trays, and rice-straw covering mats are each permeated with starter mold spores. The soybean koji (molded soybeans) is combined with brine and put into vats for the second fermentation in September. Since the room temperature during the koji making (first fermentation) is 20º to 25ºC (68-77ºF) no special incubation heat source is needed. Yet since the molds propagate naturally, without special inoculation, the koji making takes a long time, up to ten days.

There are numerous points of difference from regular miso production; when making salty natto [fermented black soybeans] the soybeans are not crushed; the koji is incubated with brine in a keg or vat with a heavy pressing lid; and the final product is sun-dried. At the factory, the soybeans are only partially reconstituted [by soaking in water] until they reach 1.5 to 1.6 times their dry weight; this takes 2 hours in winter and 1½ hours in summer. They are then drained and allowed to stand for 4-5 hours so the absorbed water penetrates deeper. If they are drained for too long, the beans become hard. They are then steamed for 4-5 hours [at atmospheric pressure] and allowed to stand overnight in the steamer. At Daifukuji, the unsoaked beans are dropped into boiling water, parboiled for 7-8 minutes, steamed for 7-8 hours in a 2 meter deep steamer, then allowed to stand in the steamer until the next morning. Care is taken that the beans are not crushed or dehulled. Nowadays, since it is known that the process of leaving the beans overnight in the steamer lowers their net protein utilization and makes them more difficult for the enzymes to digest, this step is generally omitted. Traditionally it was always used to darken the beans; there were apparently no problems with bacterial contamination, perhaps because the reaction of sugars and amino acids under heat produces substances which reduce the proliferation of bacteria and yeasts. In fact, the overnight period in the steamer may have been done expressly to encourage this effect. Continued.

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6472. Ito, Hiroshi. 1976. Hamanattô [Hamanatto (Continued–Document Part II)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 71(3):173-76. March. [Jap; eng+]

• ***Summary:*** Continued. The steamed beans are then spread on a thick rice straw mat (*mushiro*), drained well, sun dried, sprinkled with roasted barley flour, and mixed until each bean is well coated. The straw mat helps to absorb excess water. In factories, the roasted flour is premixed with koji starter (*Aspergillus oryzae* mold spores). They dried the straw mat and used it year after year. Molds such as *A. oryzae, A. soyae,* and *Rhizopus* species inoculated the beans during mixing with the flour. The mixture is covered for one night with rice straw mats, then the next day transferred to wooden koji trays, which are arranged in the koji incubation room to make koji. Care must be taken that excess heat does not develop during fermentation, lest alien bacteria proliferate and the product's flavor and aroma decline. To prevent this, the koji mycelium is broken up three times by hand in the trays during the incubation.

At factories, the finished koji is sun-dried for 4 to 5 hours in winter (Hamamatsu is famous for its dry fall winds) or for 2 hours in summer so that the moisture content is reduced to below 30 to 35 percent. IF this drying is insufficient, after the beans have been put into the vats they easily get crushed. The vat used is a 19-gallon wooden vat or a small wooden tub. The koji is divided among several vats, brine made by combining salt with boiled water is added, a pressing lid equal to twice the weight of the vat contents is set in place, and the mixture is allowed to ferment for 80 to 90 days in summer or 150 days in winter. (In some places (Daifukuji), unpasteurized shoyu is used in place of brine).

The use of a heavy pressing lid is preferable since it causes the fermentation to proceed slowly; a light one helps it to go faster, but the soybeans more easily lose their form. At temples they sliver the middle skin of sansho seeds and place these at the bottom of the vat, then add the finished koji and finally the brine. In factories they add a more concentrated brine and ferment the mixture for at least 2 months. The fermentation room (*kura*) should have good air circulation and ventilation, otherwise the product may develop and unpleasant moldy or musty odor.

After draining off the brine scooping the beans out of the vats, they are spread on rice straw mats (traditionally *mushiro* from the Ryukyu islands; today *tatami* matting), sun-dried, and sifted to remove small pieces, which are discarded. In a separate process, gingerroot is cut thinly, soaked in boiling water, sun dried, and soaked in moromi (shoyu mash) for about 10 days to make pickled gingerroot. Sansho seeds are also added to some types.

The microbiology and chemistry of Hamanatto fermentation: The molds found in fresh hamanatto koji and commercial hamanatto, in addition to *Aspergillus oryzae,* include *Rhizopus* species and *A. niger.* Hamanatto such as that made at Daifukuji using a low incubation temperature (20-25ºC) and a long time contains a large proportion of *Rhizopus* on the surface of the soybeans. Moreover the amylase and protease enzymes in these molds are weaker and less active than those from the koji used for commercial shoyu or miso. For this reason the soybeans are not broken down, but rather remain in their whole form. If the koji is made mechanically, the enzyme strength and quality increases. The incubation proceeds more quickly in summer since the temperature is higher; the koji is ready in 3 days.

In general during the koji production, amylase, protease, and pepsidase activity reach a maximum at 50 hours, but in order to dry it, it must be left longer which causes the activity to decrease. In addition to molds, lactic acid bacteria and film yeasts, which are related to *Pediococcus,* are found in all hamanatto; they are mixed in during contact with the straw mats. If air circulation during koji production is poor, lactic acid bacteria proliferate more than usual. Unlike most lactic acid bacteria, they ferment soybean sugars creating undesirable effects, but do not ferment lactose. After the koji-brine mixture is in the vats, film yeasts proliferate among the various flavors; at 45 days they are most abundant, then later decrease. Especially on the surface of vats with poor air circulation, they are found as a white mold. These yeasts produce hamanatto's unique aroma.

Hamanatto's special characteristics: Because the fermentation time is long, the color turns a dark brown. The form of the beans is well preserved. The composition of nutrients is shown in figure 2. Compared with regular natto, hamanatto has less moisture and more salt. Free amino acids are shown in figure 3. Those abundant are glutamic acid, leucine, and proline, while cystine, tryptophan and methionine are the most scarce. Compared with soybean miso, arginine, cystine, and histidine are also relatively scarce. Since soybean miso undergoes an even longer fermentation than hamanatto the difference is the amino acids freed from the soybeans, which is particularly enhanced by protease enzymes from the koji molds. Hamanatto flavor is rich and full-bodied, somewhat like that of soybean miso, but with a special aroma, more tartness, and a unique flavor component that Japanese call *egumi.* The latter, related to oil rancidification, imparts what some describe as a subtle harsh or unpleasant stimulation to the tongue or throat. Kiuchi et al, in 1976, in an analysis of hamanatto lipids, found that this egumi originates from linoleic acid. Hamanatto fats, unlike those of regular natto, are more than 70 percent of free fatty acids. The majority of fats in both natto and soybeans are triglycerides, with other fat components being relatively low. The lipase in hamanatto koji breaks down a large percentage of the fats but the composition of the resulting fatty acids is not different from those found in soybeans; in both cases, linoleic acid comprises more than 50 percent of the total.

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Hamanatto's volatile acids and aromatic compounds are shown in figures 5 and 6. The aroma of Yamaya's hamanatto was superior to that of Daifukuji or Hamana. This aroma was very poor just after the koji was made but during the ripening of various flavors, isobutyl aldehyde, isobutyl alcohol, and various amines decrease together with a decrease in the poor aroma. However if the air circulation is bad while making koji or during the vat fermentation, alien microorganisms proliferate, leaving an undesirable aroma.

6473. Ito, Hiroshi. 1976. Hamanattô [Hamanatto (Continued–Document Part III. Continued)]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 71(3):173-76. March. [Jap; eng+]
• ***Summary:*** Continued. Serving Hamanatto: Hamanatto is used both as a seasoning and as a protein source. Like Daitokuji-natto it is sprinkled as a seasoning over hot rice in a small bowl, then doused with hot green tea to make the popular Ochazuke. It may also be served as an hors d'oeuvre with sake, used in place of tea cakes with whisked green tea as Chauke, or served as a rice seasoning in box lunches like shoyu-simmered kombu. Since ancient times it has been used in Zen Temple Cookery as a source of subtle flavor, diced and mixed with grated daikon, sprinkled with vinegar, or used in the Chinese tofu dish Mabo-dofu. Its abundance of glutamic acid and nucleic acids enrich the flavor of any food with which it is served.

Conclusion: Hamanatto, a progenitor of today's miso and shoyu, has been made by traditional methods since ancient times. Long lasting, it embodies the fermentation and nutritional wisdom of our forebears. Thus its scientific study reveals new and valuable information. In its traditional processing methods there are points that should be improved, yet today it is a long lasting food with its own distinctive characteristics.

Acknowledgements: I would like to thank the Yamaya and Hamana companies for supplying documents and samples, and allowing me to quote selected portions; Professor Kayo Kon of Shizuoka Women's University; and my colleagues at the National Food Research Institute, Kan Kikuchi, Teruo Ota, and Shinkuni Sasachi.

Figures show: (1) Hamanatto production methods: Flow charts of the Yamaya-Horinji method (Horinji is in parentheses), and of the Daifukuji method.

Tables show: (1) Distribution of microorganisms in Hamanatto made by Yamaya, Horinji, and Daifukuji. For each maker, there is one column for surface and another for interior. The types of microorganisms are: General bacteria, micrococcus, streptococcus, pediococcus, halophilic lactic acid bacteria, firm-forming yeasts, and molds (Mostly *Aspergillus oryzae* and *Rhizopus* species).

(2) Nutritional composition of three varieties of Hamanatto (Yamaya, Horinji, Hamana), Daitokuji natto, and regular "stringy" (*itohiki*) natto.

(3) Composition of free amino acids in various fermented foods: (A) Yamaya Hamanatto, Daitokuji Natto (both in mg per 100 gm defatted); (B) Yamaya Hamanatto, Daitokuji Natto, Soybean miso (made at controlled temperature), Soybean miso fermented at natural ambient temperature (all four in gm per 100 gm of protein); (C) Hatcho miso (in mg per gm). In the far left column 18 amino acids are listed.

(4) Composition of Hamanatto lipids. The four vertical columns are: TG = Triglycerides. DG = Diglycerides. ST = Cholesterol. FFA = Free fatty acids, MG = Monoglycerides. The four horizontal rows are: Soybeans, dry. Soybeans, steamed. Natto. Hamanatto.

(5) Hamanatto volatile acids. (6) Hamanatto aromatic compounds.

6474. Kiuchi, Kan; Suzuki, Tatsuro; Ohta, Teruo. 1976. Screening of flavor-producing yeasts in soybean cooking drain. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 31. p. 226-32. March. [12 ref. Eng; jap]
• ***Summary:*** Cooking drain refers to the waste water left over after cooking soybeans while making miso.

Reprinted from *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 53(6):386-92 (1975)–as "Studies on the utilization of soybean cooking drain exhausted in miso fermentation (I)." Address: 1&3. Div. of Applied Microbiology, National Food Research Inst., MAFF, Koto-ku, Tokyo, Japan; 2. Suzusei Shokuhin Co., Ltd., Yamane-cho, Ichinoseki, Iwate.

6475. Kiuchi, Kan; Suzuki, Tatsuro; Ohta, Teruo. 1976. Conditions for the growth and production of flavor of the yeasts in soybean cooking drain. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 31. p. 233-41. March. [8 ref. Eng; jap]
• ***Summary:*** Reprinted from *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 53(6):386-92 (1975)–as "Studies on the utilization of soybean cooking drain exhausted in miso fermentation (II)." Address: 1&3. Div. of Applied Microbiology, National Food Research Inst., MAFF, Koto-ku, Tokyo, Japan; 2. Suzusei Shokuhin Co., Ltd., Yamane-cho, Ichinoseki, Iwate.

6476. Norinsho. 1976. Nihon shokuhin hyôjun seibunhyô [Food composition tables for Japan. 2nd ed]. Tokyo: Ishiyaku Shuppan K.K. 180 p. March 25. Index. 15 x 21 cm. [Jap]
• ***Summary:*** The first edition of this book was published on 15 Jan. 1964. The first revised edition (130th printing) was published on 25 Jan. 1969. This is the second revised edition (265th printing), published on 25 March 1976. Also published by Joshi Eiyo Daigaku Shuppan-bu.

For soybeans and soyfoods, see pages 33-35, 69, and 74 (basic nutritional composition), and 111-12 (amino acid

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composition).

Page 88, No. 812: Amazake. Per 100 gm. Calories 101, moisture 74.0 gm, protein 2.4 gm, fat 0.1 gm, carbohydrates (sugars 22.7 gm, fiber 0.6 gm), ash 0.2 gm, calcium 74 mg, phosphorus 25 mg, iron 0.4 mg, vitamin A 0 mg, vitamin B-1 0.08 mg, vitamin B-2 0.06 mg, nicotinic acid 0.06 mg, vitamin C 0 mg.

A later edition (after 1976), containing at least 298 pages, gives details on the following soy-related foods (p. 76-80): Japanese-grown whole soybeans (dry, or boiled). Whole dry USA-grown soybeans. Whole dry Chinese-grown soybeans. Green immature soybeans (edamame; raw, or boiled). Soybean sprouts (raw, or boiled). Defatted soybeans (whole, or dehulled). Kinako (soybeans roasted and ground). Budô-mame (soybeans boiled with shoyu). Momen tofu (regular). Kinugoshi tofu (silken). Soft tofu. Packed tofu. Okinawa tofu. Yaki-tofu (grilled). Nama-age. Abura-age. Ganmodoki. Kôri-dofu. Tofu-chikuwa (steamed type, or roasted type). Natto (fermented soybeans): Itohiki-natto, Goto natto, or tera-natto.

Miso: Rice-koji miso (sweet type, light yellow type, dark yellow type). Barley-koji miso. Soybean-koji miso. Dried miso. Kinzanji miso. Hishio-miso.

Other: Okara. Soymilk (regular, reconstituted, or soft drinks). Yuba (wet, or dried).

Page 254 gives the amino acid composition of soybeans and various soyfoods. Page 298 gives the protein scores, amino acid values, and chemical scores of selected foods. Page 8 gives the energy conversion factor for tofu, agé, and yuba.

6477. Nunomura, N.; Sasaki, M.; Asao, Y.; Yokotsuka, T. 1976. Identification of volatile components in shoyu (soy sauce) by gas chromatography-mass spectrometry. *Agricultural and Biological Chemistry* 40(3):485-90. March. [15 ref]
Address: Central Research Labs., Kikkoman Shoyu Co., Noda, Japan.

6478. Nunomura, N.; Sasaki, M.; Asao, Y.; Yokotsuka, T. 1976. Isolation and identification of 4-hydroxy-2(or 5)-ethyl-5(or 2)-methyl-3(2H)-furanone, as a flavor component in shoyu (soy sauce). *Agricultural and Biological Chemistry* 40(3):491-95. March. [8 ref]
Address: Central Research Labs., Kikkoman Shoyu Co., Noda, Japan.

6479. Saio, Kyoko; Shiratori, Makoto. 1976. [Expansion property of soybean protein gel heated in different salt solutions]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 31. p. 171-75. March. [1 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 21:556 (1974). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6480. Saio, Kyoko; Murase, Makoto. 1976. [Formation of lysinoalanine on alkaline treatment of soybean protein]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 31. p. 176-82. March. [14 ref. Jap; eng]
• ***Summary:*** Lysinoalanine was formed in soybean protein depending on the pH, temperature, and time of alkaline treatment. The higher the pH, temperature and time, the larger the amount of lysinoalanine formed–although relatively small amounts were formed in soy products.

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 22:30 (1974). Address: 1. National Food Research Inst., MAFF, Koto-ku, Tokyo, Japan; 2. Food Research Inst., Aichi prefecture, Nishi-ku, Nagoya.

6481. Saio, Kyoko; Terashima, Masahiko; Watanabe, Tokuji. 1976. Food use of 7S and 11S proteins. Heat denaturation of soybean proteins at high temperature. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 31. p. 183-87. March. [11 ref. Eng; jap]
• ***Summary:*** Reprinted from *J. of Food Science* 40(3):537-40 (May/June 1975). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6482. Saio, Kyoko; Terashima, Masahiko; Watanabe, Tokuji. 1976. Food use of 7S and 11S proteins. Changes in basic groups of soybean proteins by high temperature heating. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 31. p. 188-91. March. [10 ref. Eng; jap]
• ***Summary:*** Reprinted from *J. of Food Science* 40(3):541-44 (May/June 1975). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6483. *Soybean Digest.* 1976. Japanese to help produce even more Brazilian [soy] beans. March. p. 44.
• ***Summary:*** "Brazil continues to look ahead to much greater agricultural production, with soybeans a key crop, in a massive land development plan backed by Japanese funds. Brazilian and Japanese officials met in mid-February to work out further details of the plan to turn a huge wasteland area of about 7.5 million acres stretching over 3 states into farmland to produce mainly soybeans and corn. The joint venture is Japan's biggest overseas cooperative agricultural development and is part of Japan's effort to diversify her overseas food supply sources, officials say. The U.S. currently provides over 90% of Japan's soybeans, but that share will probably dwindle if the Brazilian development project is a success."

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6484. Taira, Harue; Taira, Hirokadzu; Saito, Masataka. 1976. Daizu no ryûdo, hinshu oyobi saibai-nendo ga kagaku seibun sosei ni oyobosu eikyô. II. Shishitsu ganryô oyobi shibôsan sosei [Effect of size of seed, variety, and crop year on the chemical composition of soybean seeds. II. Oil content and fatty acid composition]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 31. p. 150-60. March. [26 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 43(4):482-92 (1974). Address: 1-2. National Food Research Inst., MAFF, Koto-ku, Tokyo, Japan; 3. Hokkaido Prefectural Central Agricultural Experiment Station, Naganuma, Hokkaido.

6485. Taira, Harue; Taira, Hirokadzu. 1976. Daizu no ryûdo, hinshu oyobi saibai-nendo ga kagaku seibun sosei ni oyobosu eikyô [Effect of size of seed, variety, and crop year on the chemical composition of soybean seeds. III. Oil content and fatty acid composition of soybean seeds grown in the U.S.A. and China]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 31. p. 161-70. March. [18 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 22:42 (1975). Samples of 11 soybean varieties from the USA and 10 varieties from China were investigated. Address: National Food Research Inst., MAFF, Koto-ku, Tokyo, Japan.

6486. Yanagimoto, Masakatsu; Saito, Yoshio; Ebine, Hideo. 1976. [Cultivation of koji mold on sewage from soybean cooker]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 31. p. 221-25. March. [11 ref. Jap]
• ***Summary:*** "Sewage" may refer to the solids from the waste water left after cooking the soybeans.

Reprinted from *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 70(6):424-28 (1975). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6487. Wallace, Richard. 1976. Re: Interest in making natto. Letter to William Shurtleff at New-Age Foods Study Center (278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan), April 23. 1 p. Handwritten.
• ***Summary:*** "I am a beginner and would like to know how to obtain the bacteria 'Bacillus Natto' used in making natto. I would appreciate hearing from you. Thank you. Sincerely yours..."

Note: This is the earliest dated document seen in which "New Age Foods Study Center" (the predecessor of Soyfoods Center) is mentioned. Address: 2357 Reed Way, Hayward, California 94541.

6488. Morgans, Jim. 1976. Re: *The Mother Earth News* plans publish excerpts from *The Book of Tofu.* Letter to William Shurtleff at New-Age Foods Study Center (278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan), April 26. 1 p. Typed.
• ***Summary:*** "Thanks for your letter of March 27 and February 9 (to John Shuttleworth). And, by the way, its our pleasure to run excerpts from your fantastic book. I hope that you will try to stop in and see us here in the fall. (We're anxious to try out some of those tofu dishes you kindly offered to prepare!)." Discusses the excerpting schedule.

Note: This is the second earliest dated document seen in which "New-Age Foods Study Center" (the predecessor of Soyfoods Center) is mentioned. Address: Associate editor, The Mother Earth News, P.O. Box 70, Hendersonville, North Carolina 28739.

6489. Akioka, Akihiko. 1976. Daizu tanpaku no seizô to riyô [Production and utilization of soy proteins]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 64-71. April. [Jap]
Address: Nisshin Seiyu (K.K.) Research Lab.

6490. Aoki, Hiroshi. 1976. Daizu tanpaku shokuhin no tekusuchaa [The texture of soy protein foods]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 59-63. April. [Jap]
Address: Otsuma Joshi Daigaku Kyôju [Prof., Otsuma Women's Univ., Japan].

6491. Ebine, Hideo. 1976. Jôzô genryo to shite no daizu [Soybeans as an ingredient in food fermentations]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 45-49. April. [Jap]
Address: Shokuhin Sôgô Kenkyû-jo ôyô Biseibutsu Buchô.

6492. Fujii, Yutaka. 1976. Daizu tanpaku no suisan neriseihin e no riyô [Use of soy proteins in fish cake products]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 96-102. April. [Jap]
• ***Summary:*** In about 1960 soy protein curds first started to be used in fish paste products in Japan. But it is only recently that soy proteins have come to be used widely as an extender or substitute in such products. Address: Tôkai-ku Suisan Kenkyû-jo Riyô-bu [Tokai-ward Marine Research Lab., Utilization Dep.].

6493. Fujimaki, Masao; Arai, Sôichi. 1976. Daizu tanpaku no fureebaa [The flavor of soy protein]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 55-58. April. [Jap]
Address: Tôkyô Daigaku Nôgaku-bu [Dep. of Agronomy, Tokyo Univ., Japan].

6494. Iwao, Hirono. 1976. Daizu no eiyô-ka [The nutritional value of soybeans]. *Shoku no Kagaka* (*Food Science*

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Journal) No. 29. p. 50-54. April. [Jap]
Address: Kokuritsu Eiyô Kenkyû-jo, Oyô Shokuhin Buchô [National Nutritional Research Lab.].

6495. Kawashima, Ryôichi. 1976. Daizu no saibai to hinshu [Soybean cultivation and varieties]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 31-37. April. [Jap]
• ***Summary:*** An interesting graph on p. 31 shows soybean acreage in Japan from 1877 to 1973. From 1877 the area rose very slowly to a peak of about 500,000 ha in 1907, then fell to a low of about 220,000 ha in 1947. The area jumped immediately after World War II to 420,000 ha, stayed there for about 4 years, then began a rapid decline, dropping to an all-time low of about 80,000 ha in 1973. Address: Nôrinshô Gijutsu Kaigi Kenkyû-jo, Japan.

6496. Kiuchi, Kan; Ohta, T.; Itoh, H.; Takabayashi, T.; Ebine, H. 1976. Studies on lipids of natto. *J. of Agricultural and Food Chemistry* 24(2):404-07. March/April. [16 ref. Eng]
• ***Summary:*** The lipid contents and compositions of three products were measured: Itohiki natto (2.8% lipids), Yukiwari natto (10.9%), and Hama-natto (6.4%). Yukiwari natto is made by mixing Itohiki natto with rice koji and salt, then aging the mixture at 25-30ºC for 15 days.

The gas chromatographic pattern of fatty acid composition of Hama-natto is similar to that of soybeans, however 78% of the total lipids in hamanatto is free fatty acids.

Note 1. This is the earliest English-language document seen (Jan. 2012) that mentions "Itohiki natto."

Note 2. This is the earliest English-language document seen (Dec. 2011) that mentions "Yukiwari natto." Address: Div. of Applied Microbiology, National Food Research Inst., Tokyo.

6497. Kojima, Yoshiko. 1976. Amerika ni okeru daizu tanpaku no kaihatsu [The development of soy proteins in America]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 27-30. April. [Jap]
Address: American Soybean Association, Tokyo, Japan.

6498. Kudo, Shiro. 1976. Kôri-dôfu [Dried-frozen tofu]. *Shoku no Kagaku* (*Food Science Journal*) No. 29. p. 122-27. April. [Jap]
• ***Summary:*** It is said that the commercial production of frozen tofu started during the Momoyama period (1568-1600). It was made using the traditional, natural method of freezing the tofu outdoors in the snow, then allowing it to dry naturally. Centers of production included Mt. Kôya (Kôya-san), the Osaka-Kyoto area (Kinki Chihô), the Shinshu area (Shinshu Saku), the northeastern provinces (Tôhoku Chihô), Hokkaido, and the Matsuzen Chihô.

The earliest written description seen of the method for making frozen tofu appeared in the *Honcho Shokkan* (1690-1695, by Hitsudai HITOMI). That method was very similar to the method used today. Later, two basic methods evolved: The Koya method and the Shimi-dofu method. They differed only in the steps after the tofu was frozen outdoors in the snow. In the Koya method, the tofu underwent 5 days of standing at freezing temperatures (*moya*) to develop a fine-grained texture, was thawed in hot water, drained, and dried in a heated shed (*hoiro*). In the Shimi-dofu method, the tofu underwent 1 day of moya, was allowed to thaw and drain naturally, was tied with rice straw, hung outdoors in the air under the eaves, and subjected to repeated drying in the daytime sun and freezing again at night, until it was dry.

Starting in about 1700, Buddhist Vegetarian Cookery (*shôjin ryôri*) became very popular in the Kyoto-Osaka area. Frozen tofu was introduced and spread among the people of southwestern Japan and the island of Shikoku. Because of its growing popularity, a new and improved method for making the tofu (the Koya method) was developed that was better than the Shimi-dofu method. Shimi-dofu was made mostly in farmhouses and not much attention was paid to marketing the product. The process has not changed much up to the present time.

A flow chart (p. 122) compares the processes for making dried frozen tofu using the new method vs. the traditional method.

1900 (Meiji 34)–An artificial freezing method was invented and used commercially. That made the unstable quality for frozen tofu more stable and enabled it to be made at any season of the year (not just during the winter) and in any part of Japan (not just in very cold regions).

1913 (Taisho 2)–The Koya method (frozen tofu method) was imported to Nagano prefecture, where Shimi-dôfu had been produced traditionally. In Nagano there was quite a different attitude from that found in Kansai (the Osaka / Kyoto area). The owners of factories studied the techniques, and with great effort, expanded their market in the Kansai area. At that time in Kansai, consumers wanted their dried frozen tofu to be soft when they eat it. As a result the expanding and softening process (bônan kakôho) was invented.

1925 (Taisho 14)–They added starch into the stage of making fresh tofu to get the soft tofu.

1928 (Showa 3)–They invented the method for adding sodium bicarbonate (baking soda; *jû-tansan soda*) to frozen tofu during the drying stage.

The next invention was the use of ammonia gas. They found that technique accidentally when they tried to remove the sour flavor of mold that grew of tofu, using ammonia. When they used ammonia gas, the tofu expanded and grew soft. This was the most dramatic event for the history of frozen tofu. After this invention of Shinshu Frozen Tofu, this tofu became accepted among consumers in the Osaka / Kyoto (Kansai) area and developed a good reputation.

During that time the manufacturers switched to artificial

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freezing from natural freezing and frozen tofu entered the age of mass production.

But only manufacturers in Nagano prefecture could make tofu all year round. They won the market from makers of traditional shimi-dofu and ended up with 90% of table production of frozen tofu in Japan.

Page 124: 2-3 years ago they invented a new method of not using ammonia, because frozen tofu processed with ammonia had a bad smell and only 3 months shelf life, and got rancidified very quickly–so that consumers had to store the product in a refrigerator.

Note: In 1974 (Showa 49) frozen tofu production in Japan was 13,000 tonnes, worth 8,300 million yen. A typical package of 100 gm sold for 47-85 yen. There were 21 manufacturer in Japan; each used from 1 to 30 tonnes of soybeans per day. Four large manufacturers controlled 80% of the market. By contrast, the retail value of fresh tofu was about 10 times as much as that of frozen tofu. Address: Vice President, Asahimatsu Kori-dofu K.K., Japan.

6499. Okamoto, Susumu. 1976. Yuba [Yuba]. *Shoku no Kagaku* (*Food Science Journal*) No. 29. p. 128-32. April. [Jap]
Address: Tokyo Nôkô Daigaku Kyôju [Prof., Tokyo Univ. of Agriculture and Industry].

6500. Oshima, Masako. 1976. Daizu tanpaku shokuhin no kikaku-ka [Standardization of soy protein foods]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 110-115. April. [Jap]
Address: Norinsho Shokuhin Ryûtsû Kyoku, Shôhi Keizai-ka [Ministry of Agriculture, Office of Food Circulation, Consumer Economics Dep.].

6501. Saibi, Kyôko. 1976. Daizu shushi no soshiki kôzô [The structure/morphology of soybean seeds]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 38-44. April. [Jap]
Address: Nôrinsho Shokuhin Sôgô Kenkyû-jo [National Food Research Institute].

6502. Saio, Kyoko. 1976. Soybeans resistant to water absorption. *Cereal Foods World* 21(4):168-73. April. [6 ref]
• ***Summary:*** Small, hard soybeans do not absorb water well and thus do not work well in making most traditional East Asian foods. They were found to contain higher amounts of crude fiber and calcium than normal soybeans. The seed coat of the hard beans was also higher in calcium and more dense and tough than that of normal soybeans. Also, microscopic investigation revealed that the micropyle was covered with the outside palisade cells. This fact may account for the failure of hard beans to absorb water. A scanning electron microscope shows the micropyle of hard and normal soybeans. An illustration (line drawing) shows the outside of a soybean; the hypocotyl, micropyle, hilum, and chalaza are labeled. Address: National Food Research Inst., Ministry of Agriculture & Forestry, 12-4-1 Shiohama, Koto-ku, Japan.

6503. **Product Name:** [Soyalac {Soymilk} (Reduced Sugar, or No Added Sugar)].
Foreign Name: Soiyarakku (Gentô, Mukatô).
Manufacturer's Name: San-iku Foods.
Manufacturer's Address: 1-1 Nagaurataku, Sodegaura-machi, Kimizu-gun, Chiba-ken 299-02, Japan.
Date of Introduction: 1976 April.
Wt/Vol., Packaging, Price: 425 gm can.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Both products tasted by William Shurtleff in Hayama, Japan, at the home of Nahum and Beverly Stiskin while doing final proofreading and editing on *The Book of Miso.* 1976. May 19-23.

K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Soiyarakku Gentô was introduced in April 1976 and Soiyarakku Mukatô in June 1976. They are both now sold by Saniku Fuuzu in a 425 gm can and distributed nationwide.

6504. Shibasaki, Kazuo. 1976. Tônyû no kagaku [The science of soymilk]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 84-90. April. [Jap]
• ***Summary:*** Includes an early history of soymilk. Address: Tohoku Daigaku Nogakubu, Shokuryo Kagaku-ka, Kyoju [Prof., Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai, Miyagi-ken, Japan].

6505. *Shoku no Kagaku* (*Food Science Journal*). 1976. Daizu tanpaku shokuhin [Soy protein foods]. No. 29. 132 p. April. [Jap]
• ***Summary:*** Each of the 21 articles in this issue is cited separately.

6506. Takasaka, Kazuhisa. 1976. Daizu tanpaku no chikuniku kakô e no riyô [Utilization of soy protein in processed meat]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 80-83. April. [Jap]
Address: Nihon Shokuniku Kakô Kyôkai [Japan Meat Processing Assoc.].

6507. Tsuchida, Kôji. 1976. Daizu no juyô [Soybean demand]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 15-26. April. [Jap]
Address: Nôrinsho Shokuhin Ryûtsû Kyoku Shokuhin Yushi-ka (Ministry of Agriculture and Forestry).

6508. Tsuchiya, Kunio. 1976. Daizu shokuhin no ayumi to sono shôrai-sei [The progress / history of soyfoods and their future prospects]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 9-14. April. [Jap]
Address: Nôrinsho Shokuhin Ryûtsû Kyoku Shokuhin Yushi-

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ka (Ministry of Agriculture and Forestry).

6509. Tsuzumi, Tarô. 1976. Daizu seiyu kôgyô to daizu-yu no riyô [Soy oil mills and the use of soybean oil]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 103-09. April. [Jap]
Address: Shôwa Sangyô [Showa Sangyo K.K., Kobe factory].

6510. Watanabe, K.; Okamoto, S. 1976. Yuba-jô himaku no seisei to bussei [Formation of yuba-like films and their physical properties]. *Nyu Fudo Indasutori* (*New Food Industry, Tokyo*) 18(4):65-77. April. [27 ref. Jap; eng]
• ***Summary:*** Second Japanese study on yuba production. Address: Tokyo Noko Daigaku, Nôgaku-bu.

6511. Watanabe, Nagao. 1976. Daizu tanpaku no seika e no riyô [Use of soy proteins in confectionery]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 91-95. April. [Jap]
Address: Shoku Seikatsu Kaihatsu Kenkyû-jo, Japan.

6512. Watanabe, Tokuji. 1976. Dentô-teki daizu tanpaku shokuhin: Tôfu to aburage [Traditional soy protein foods: Tofu and deep-fried tofu pouches]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 116-21. April. [Jap]
Address: Director, National Food Research Inst. (Japan).

6513. Watanabe, Tokuji. 1976. Shokubutsu-sei tanpaku shokuhin ni okeru daizu no kachi [The value of soybeans among vegetable protein foods]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 3-8. April. [Jap]
• ***Summary:*** This is the first of 21 articles in this issue about soy protein foods (*daizu tanpaku shokuhin*). In 1976 in Japan, per capita consumption of animal protein is about 17 gm/day or 6.2 kg/year. Address: Director, National Food Research Inst. (Japan).

6514. Yasumatsu, Katsuji; Misaki, Masaru. 1976. Shin daizu tanpaku shokuhin no ippan kakô shori [General processing of new soy protein foods]. *Shoku no Kagaka* (*Food Science Journal*) No. 29. p. 72-79. April. [Jap]
• ***Summary:*** Table 8 shows the demand for soy protein products in the USA in thousand tons in 1974 and 1980– including defatted soy flour (13.5, 27.0), soy protein concentrates (8.0, 16.0), isolated soy proteins (3.5, 18.0), granular soy proteins (6.5, 45.5), and soy protein fibers (*senijô daizu tanpaku*) (1.0, 3.5). Totals in 1974 and 1980 (32.5, 110.0).

Two pie charts on page 79 show changes in the market for soy protein products from 1974 to 1980. Address: Takeda Yakuhin Kôgyô (K.K.) Shokuhin Jigyô-bu [Takeda Pharmaceutical Co., Inc., Japan].

6515. Fuji Oil Company, Ltd. 1976. Improvements in and relating to cheese. *British Patent* 1,434,298. 5 p. Application filed 23 Oct. 1973. Complete specification published 5 May 1976.
• ***Summary:*** This invention relates to "methods of making firm, cutable, processed cheese-like, products from soy cheese as a part or the major ingredient thereof." It is a fact that "natural soy cheeses are not readily adaptable as a raw material in conventional processes for making processed cheese."

Various soy cheeses are described. Some are fermented, made with soymilk extracted from defatted soybean protein. Some are non-fermented, engineered soy-based cheeses made with soy protein isolate and carrageenan. Address: Azuchimachi 2-12, Higashiku, Osaka, Japan.

6516. Crum, Maggie. 1976. Tofu–will it be the staff of life. *Contra Costa Times.* May 19. p. 13. [1 ref]
• ***Summary:*** About the work of William Shurtleff and Akiko Aoyagi. A photo shows the two co-authors holding up their *Book of Tofu.* "The popular tofu enthusiasts are currently back in Japan, where they are working on their second book, whose subject is miso... Come summer, Bill and Akiko will return to the United States to begin a lecture/demonstration tour in over 100 towns and cities." Contains 4 tofu recipes. Address: California.

6517. *Food Product Development.* 1976. Product brief: Tofu mix. Soybean curd. House Food Industry Co., Osaka, Japan. 10(4):88. May.
• ***Summary:*** A large black-and-white photo shows a package of House (*Hausu*) Hon Tofu, for making [silken] tofu at home. In the box is a packet of powdered soybean milk and a packet of glucono delta lactone coagulant mixed with a little lactose. To prepare, mix the powdered soymilk with hot water in a pot to make soymilk. Then stir in the coagulant and allow to firm. Cool in cold water.

6518. Satouchi, Kiyoshi; Matsushita, Setsuro. 1976. Purification and properties of a lipase inhibiting protein from soybean cotyledons. *Agricultural and Biological Chemistry* 40(5):889-97. May. [17 ref]
• ***Summary:*** An inhibitor of castor bean lipase was isolated from soybeans. The mode of inhibition is discussed. Address: Research Inst. for Food Science, Kyoto Univ., Kyoto, Japan.

6519. Will, Joanne. 1976. Sushi: Oriental party morsels. *Chicago Tribune.* June 27. p. D8.
• ***Summary:*** "As sushi accompaniments, Mrs. Yamaguchi suggests serving a clear, hot Japanese soup garnished with tofu (bean curd), egg strips or mushrooms,..." One type of sushi is a rice-filled seaweed roll. Three photos show how to make sushi at home. Address: Food editor.

6520. Bol en Bois. 1976. Fabrication du tofu [Production of

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tofu (Brochure)]. 35, rue Pascal, 75013, Paris, France. 3 p. 5th printing, May 1979. [8 ref. Fre]
• ***Summary:*** A typed description with illustrations (line drawings) of how to make 900 gm of tofu at home from 300 gm of soybeans and nigari. Cites *The Book of Tofu* by Shurtleff & Aoyagi as a source. The company also publishes leaflets on soyfoods: Number 1: Tofu et okara (Tofu and okara), 1.5 Fr. Number 7: Tamari, shoyu et leurs coleurs (Tamari, shoyu and their colors), 2.0 Fr. Address: Paris, France.

6521. **Product Name:** [Fujipur SP-90 (Spun Soy Protein Fibers)].
Foreign Name: Fujipur SP-90.
Manufacturer's Name: Fuji Purina Protein Ltd. Subsidiary of Fuji Oil Co. and Ralston Purina.
Manufacturer's Address: Sumiyoshi-cho 1, Izumisano, Osaka, Japan. Offices: Time Building, 9th floor, Kanda Suda-cho 1-28-2, Chiyoda-ku, Tokyo.
Date of Introduction: 1976 June.
New Product–Documentation: *Soybean Digest Blue Book.* 1976. p. 48.

6522. **Product Name:** [Midori Soymilk (Mild, or Pure)].
Foreign Name: Midori Tônyû (Mairudo, Piyuwa).
Manufacturer's Name: Kyushu Nyugyo.
Manufacturer's Address: Kyushu, Japan.
Date of Introduction: 1976 June.
Wt/Vol., Packaging, Price: 200 ml, probably Pure Pak type carton.
How Stored: Refrigerated.
New Product–Documentation: Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that Kyushu Nyugyo (Kyushu Milk Co.) first made commercial soymilk in Japan in 1976.

K. Tsuchiya. 1982. Dec. Tonyu [Soymilk. 2nd ed.]. p. 72. Note: Midori means "green" in Japanese.

6523. Lesieur, Bernard. 1976. Salad and cooking oils. *J. of the American Oil Chemists' Society* 53(6):414-16. June.
• ***Summary:*** Pie charts show the following: 1. World consumption of oils and fats in 1973: Consumer products (salad & cooking oils 45%, animal & vegetable fats 21%, margarine 19%, butter 15%) and raw materials (animal fats 19%, soybean 18%, butter 15%, lauric & palmitic 13%, sunflower 8%, cottonseed 7%, peanut 7%, rapeseed 6%, olive 4%, miscellaneous 3%).

2. U.S. consumption of oils and fats in 1973: Consumer products (salad & cooking oils 37% (of which soybean oil is 72%, cottonseed oil 15%, corn oil 75), animal & vegetable fats 32%, margarine 22%, butter 9%) and raw materials (soybean 55%, animal fats 12%, lauric & palmitic 10%, butter 9%, cottonseed 8%, miscellaneous 6%).

3. European Economic Community consumption of oils and fats in 1973: Consumer products (salad & cooking oils 39% (of which soybean oil is 30%, olive oil 22%, peanut oil 19%, rapeseed 15%, sunflower 12%), butter 25%, margarine 24%, animal & vegetable fats 12%), and raw materials (butter 25%, animal fats 21, lauric & palmitic 14%, soybean 12%, olive 9%, peanut 8%, rapeseed 6%, miscellaneous 5%).

4. Japanese consumption of oils and fats in 1973: Consumer products (salad & cooking oils 62%, animal & vegetable fats 20%, margarine 13%, butter 5%) and raw materials (soybean 39%, rapeseed 20% lauric & palmitic 13%, fish oil 8%, butter 5%, animal fats 5%, rice bran 5%, cottonseed miscellaneous 5%). Also shows a chart for Brazil. Address: Director, Lesieur-Cotelle et Associés, Boulogne Sur Seine, France.

6524. Mustakas, G.C. 1976. Present situation and future outlook of soy protein foods. Paper presented at ASA conference, soy and food industry and research institutes of Japan and Taiwan. See p. 13-29. Held May 28 in Tokyo and June 1 in Osaka, Japan.
• ***Summary:*** Contents: 1. U.S. food utilization. 2. Activities at the Northern Regional Research Laboratory as related to world feeding programs. 3. Public acceptance of soy foods. Address: NRRL, Peoria, Illinois.

6525. Shurtleff, William. 1976. Notes on making shoyu from visit to Sendai Miso-Shoyu Co. in Sendai, Japan. Tokyo, Japan. 2 p. Undated. Unpublished typescript.
Address: c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: (03) 925-4974.

6526. Shurtleff, William. 1976. Koji starter for miso and shoyu. Nerima-ku, Tokyo, Japan. 1 p. Front and back. 28 cm. Undated (June?). Catalog.
• ***Summary:*** This typewritten, photocopied, 2-page leaflet describes 9 different types of koji starter for: Red miso, barley miso, soybean miso, mellow barley miso, sweet white miso, light-colored miso, fast white miso, amazake or pickling, or shoyu. All 9 types are available from: Mitoku Trading Co., Attn: Mr. Akiyoshi Kazama, C.P.O. Box 780, Tokyo 100-91, Japan. Phone: 03-201-6706. Address: c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: (03) 925-4974.

6527. *Soybean Digest.* 1976. [American Soybean Assoc.] Activities, publications, market development program, educational films, affiliated states. June. p. 34-37.
• ***Summary:*** Contents: Activities: Objectives, government, annual conferences, answers your questions. Publications: *Soybean Digest,* Gold Book issue of *Soybean Digest* (published each June as a marketing guide and reference for soybean producers), Blue Book issue of *Soybean Digest* (published each June is the directory of the soybean industry), and *Soybean Profits* newsletter (published 32

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times a year–weekly during the harvest and fall marketing season–devoted to: (1) Exchange of high-yield ideas among panel members, (2) Market intelligence information from a worldwide network of authorities). Membership (active or contributing. Note: The number of ASA members is not given). Market development program (started in 1956 in Japan; Fifteen states now have legislated checkoffs: Minnesota, Iowa, Illinois, Georgia, Florida, Arkansas, Texas, North Carolina, South Carolina, Mississippi, Louisiana, Alabama, Virginia, Kentucky, and Nebraska).

Educational films: Farmer for the world, The gold that grows, Japan–Your growing cash customer, More from less (no-tillage farming), and Soybeans to grow (Elanco).

Affiliated states (24): Alabama Soybean Producers Association: Organized 1968. Arkansas Soybean Association: Organized Aug. 1974 [sic, Aug. 1964]. Florida Soybean Producers Association: Organized March 1969. Georgia Soybean Association: Organized 1968. Land of Lincoln Soybean Association (Illinois): Organized Nov. [sic, Sept. 10] 1964. Indiana Soybean Growers Association: Organized Sept. 1966. Iowa Soybean Association: Organized Dec. 1974 [sic, Dec. 1964]. Kansas Soybean Association: Organized Dec. 1972. Kentucky Soybean Association: Organized April 1970. Louisiana Soybean Association: Organized Jan. 1967. Michigan Soybean Association: Organized March 1974. Mid-Atlantic Soybean Association: Organized March 1970 (Delaware, Maryland, Pennsylvania, and New Jersey). Minnesota Soybean Growers Association: Organized 1962 [Dec. 6]. Mississippi Soybean Association: Organized Dec. 1963. Missouri Soybean Association: Organized Feb. 1966. Nebraska Soybean Association: Organized March 1969. North Carolina Soybean Producers Association: Organized 1966. Ohio Soybean Association: Organized March 1966. Oklahoma Soybean Association: Organized Aug. 1975. South Carolina Soybean Association: Organized Jan. 1966. Tennessee Soybean Association: Organized Feb. 1966. Texas Soybean Association: Organized Jan. [sic, Feb. 20] 1967. Virginia Soybean Association: Organized Feb. 1968. Wisconsin Soybean Association: Organized July 1973.

6528. Itoh, Joan. 1976. Everything there is to know about tofu. Review of *The Book of Tofu* by Shurtleff and Aoyagi. *Japan Times.* July 10. p. 7.
• ***Summary:*** "'The Book of Tofu' by William Shurtleff and Akiko Aoyagi is just about the most complete book one can imagine on the subject. It is written much like a textbook, educating the reader in a delightful way with large easy-to-read print, charts, statistics and scores of drawings that makes everything they are talking about absolutely clear. The enthusiasm that the authors feel about this food comes through and they make a very good case of why all of us should become tofu fans."

"Besides all this, it has the most detailed glossary of Japanese foods ever compiled in English and that alone is almost worth the price of the book for the foreigner living in Japan.

"Needless to say, the authors have put a fantastic amount of research and work into their project. There just isn't anything left out, even lists of tofu shops now operating in America and western Europe. It is a work that they can well be proud of because it is going to be a tremendous help to a great many people.

"One gets the feeling that this is a book that could not have been written any other time but now. Maybe the fact that the authors are into Zen meditation has something to do with the whole simple, honest feeling about the book. It reflects a blend of cultures. hard work, liberation, idealism and, most of a1l, a kind of awareness and concern for mankind. The book of tofu is a cookbook with a message and buying it might be one of the best ways you could spend ¥2,500."

Note: Immediately below this review is another titled "Key Elements of Soto Zen Expounded." It reviews a new book, *Zen Master Dogen: An Introduction with Selected Writings,* by Yuho Yokoi with Daizen Victoria. Shurtleff originally went to Japan to study Soto Zen meditation and translate Dogen's writings into English, then switched to writing about tofu. How perfect!

6529. Oshikubo, Junichi. 1976. Za bukku obu tôfu. Amerika de oo-uke [The Book of Tofu: Well accepted in America]. *Sankei Shinbun* (*Tokyo*). July 24. p. 16. [2 ref. Jap]
• ***Summary:*** About the work of William Shurtleff and Akiko Aoyagi, authors of *The Book of Tofu* and *The Book of Miso.* Photos show: (1) The two seated on tatami mats on the floor of an upstairs room at the Aoyagi home in Tokyo, with 3 Western-style tofu recipes in front of them. (2) Covers of their two books. Shurtleff, an American, has been doing tofu research for 3 years. *The Book of Tofu* contains 500 recipes including tofu salad dressings, atsu-age with eggs, etc. Explains how Shurtleff got interested in tofu and the world food crisis. Address: Tokyo, Japan.

6530. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo*). 1976. American publicizes tofu through book. July 24. [1 ref. Eng]
• ***Summary:*** About American Zen trainee William Shurtleff, age 35, of California. With Akiko Aoyagi he has written a book on tofu. He is now visiting Japan again. "In 1971 he first came to Japan with the aim of undergoing training in Zen... While he was doing Zen in Kyoto, Shurtleff was captivated by the taste of tofu and also by its cheapness."

6531. *Asahi Shinbun* (*Asahi Daily News, Tokyo*). 1976. Nihon to watakushi. Kondo wa Miso no Hon o [Japan and I. This time its a book on miso. Bill Shurtleff, the American food researcher who wrote *The Book of Tofu*]. Aug. 16. p. 4. [2 ref. Jap]

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• ***Summary:*** Two photos show Shurtleff talking and one shows the cover of *The Book of Tofu.* Address: Japan.

6532. Tonomura, Tamihiko. 1976. Researcher on tofu, miso: Bill Shurtleff. *Asahi Evening News.* Aug. 23. Monday. [Eng]
• ***Summary:*** Contains a biography of Shurtleff and a history of how and why he wrote *The Book of Tofu,* which is now in its third printing and has sold 30,000 copies. Photos show: (1) Shurtleff talking. (2) The cover of *The Book of Tofu.* Note: Akiko Aoyagi, co-author, artist, and cook. is not mentioned. Address: Asahi Shinbun writer, Japan.

6533. Doorn, Wil van. 1976. Lima, the European Erewhon. *East West Journal.* Aug. p. 21-22, 24-25. [Eng]
• ***Summary:*** This is an interview with Pierre Gevaert, co-owner and manager of Lima natural food factories in St. Martens, Latem, Belgium. Gevaert was working for world peace before George Ohsawa visited in May 1957. In early 1959 Gevaert started to produce large quantities of miso and tamari soy sauce at St. Martens Latem, Belgium, with the help of two Japanese specialists that Ohsawa had sent. The company, named Lima, was officially started in March 1960, though they had been producing food for almost 3 years under the name "Sesame."

In 1962 Lima started to contract with farmers to grow grains organically; they were the first company in Europe to do this, in part because they were so familiar with organic agriculture themselves. "Using the knowledge gained from our own experience, we taught many farmers to grow their produce organically again in the traditional manner." Brown rice was grown in the south of France. In 1967, after operating at a loss for many years, a businessman-consultant named Edouard van der Seelen advised them to halt production of miso and tamari. Sales were good but the products took 3 years to mature.

Pierre is a Catholic who has practiced macrobiotics for 19 years.

Note: This is the earliest document seen (Jan. 2014) concerning the soyfoods movement in Europe.

6534. Ohlund, Tim. 1976. Re: Work with miso and koji in Sweden. Letter to William Shurtleff at New-Age Foods Study Center, Aug. 2 p. Handwritten.
• ***Summary:*** "Dear friend. I have been very impressed with your articles on tofu and tempeh in such magazines as *East West Journal* and *Mother Earth News.* I have been working in this area on a very small scale since about 5 years ago, when I got into macrobiotics in Japan under Nahum Stiskin. Since then I have been living in Sweden studying Japanese and Chinese at Uppsala University as well as managing a truck garden (biodynamic) during the summers."

He has been growing Japanese vegetables in Sweden–with good results. "I've also been working with a new variety of soybean suited for this northern climate. This year I have a very good crop of them. The last two winters I've been making up batches of miso just to see how it would go and gain some experience at it. It is not yet as I would like it, but that will take some time. What I really need at this time is some good literature on the subject. My friend and I have combed the library at the university here and found much important information on tofu, tempeh, and lactic acid fermentation in *Applied Microbiology* and *Journal of Food Science,* etc." He requests more information and contact people. He may make another trip to Japan in the next year or shortly thereafter to do research. Address: Box 559A, 19063 Örsundsbro, Sweden.

6535. Ohsawa-Japan. 1976. List of macrobiotic food products & related items. Tokyo, Japan. 2 p. Single sided.
• ***Summary:*** Printed with black ink on white paper. Soy related products: Soya bean sauce (shoyu). Soya bean paste (miso). Mugi miso. Kome (koji) miso. mame miso. Tekka. Black [soy] beans (Kuromame). No prices are given. Address: 11-5 Ohyamacho, Shibuyaku, Tokto, Japan. Phone: (03) 465-5021.

6536. Shurtleff, William; Aoyagi, Akiko. 1976. Miso to wa? [What is miso? Translated into Japanese by Tsutomu Mochizuki]. Shinshu Miso Research Inst., Nagano-shi, Japan. 15 p. [1 ref. Jap]
• ***Summary:*** A Japanese-language translation of the English-language pamphlet "What is Miso?" originally published by Westbrae Natural Foods in on 1 May 1976. Dr. Mochizuki was interested in this western viewpoint on miso. Address: Authors: 790 Los Palos Dr., Lafayette, California 94549; Translator: Director, Shinshu-Miso Research Inst., Nagano-shi, Japan.

6537. *Soybean Digest.* 1976. Japanese firm identifies U.S. soy oil (Photo with caption). Aug. p. 30.
• ***Summary:*** The caption below this ¼-page photo reads: "One of the largest oil refiners in Japan, Hohnen Oil Co., is celebrating the U.S. Bicentennial and identifying U.S. soy oil on its new salad oil container. While previous identified oil campaigns have been regional, the new oil will be distributed through the Mitsukoshi chain which has stores in the major population centers across Japan. If sales go according to schedule, Hohnen plans to make the new design a permanent member of their salad oil line. ASA Far East Director Lloyd Reid, Dr. Nakamura, Hohnen Oil Co., and Larry Thomasson, U.S. ag attache to Japan, examine the red, white and blue container."

6538. Greer, Gery. 1976. A look at traditional Japan. *Chicago Tribune.* Sept. 19. p. C13.
• ***Summary:*** The writer has traveled to Shirakawa-go, a picturesque and traditional village in the Sho River Valley, high in the Japanese "Alps." The huge thatched-roof houses,

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built 100 to 250 years ago, with their steeply sloping roofs, are built in the style called *Gassho-zukuri* ("fingertips held together as if in prayer"). Traditionally, the smoke and soot from each home's central sunken, open-pit fireplace coated and preserved the straw and wood, so that the thick roofs lasted 70 years. The houses were built without nails or hinges; the wood was fastened together firmly with wooden pegs and handmade ropes.

Each October the quiet village is transformed as throngs arrive for the annual *Doburoku Matsuri* ("moonshine festival"). "Doburoku is unrefined sake (rice wine) and it is thick, milky, and potent."

A visitor can stay at a *minshuku* (a private home turned into a sort of hostel) which is usually less expensive than a *ryokan* (traditional Japanese inn). The *minshuku* typically serves two meals. "Usually dinner will consist of one whole small fish cooked in soy sauce, various mountain vegetables and weeds, *miso* soup... with *tofu* (bean curd), *tsukemono* (Japanese 'pickles,' usually pickled cabbage, cucumber, and ginger), and rice.

Breakfast, which is almost identical, "includes a raw egg in place of the vegetables. Break the egg into the bowl provided, add soy sauce, beat slightly with your chopsticks and pour over the [steaming hot] rice"–which partially cooks the egg.

Note: The historic village of Shirakawa-gô, in Gifu prefecture of central Japan (northwest of Tokyo), is one of Japan's UNESCO World Heritage Sites.

6539. Hashimoto, Yukio; Sunada, Fumiyuki. Assignors to Fuji Oil Company, Ltd. (Osaka, Japan). 1976. Soy cheese spread and process for preparing the same. *U.S. Patent* 3,982,025. Sept. 21. 4 p. Application filed 9 Dec. 1974. [6 ref]

• ***Summary:*** Prepare a fermented soy cheese, as described in Japanese Patent Open Publication No. 471/1974; it is prepared by fermenting soy milk with a lactic acid-forming cheese starter culture to form a curd. Mix with this soy cheese an edible oil or fat, a cheese emulsifying melting agent, and water. Then vigorously agitate this mixture at an elevated temperature to liquefy and homogeneously emulsify the ingredients, thereby forming a product having a paste-like consistency. Address: 1. Izumiotsu, Japan; 2. Osaka, Japan.

6540. Iso, Naomichi; Mizuno, H.; Saito, T.; Takeuchi, H.; Suyama, Y.; Kawamura, S.; Ogawa, H. 1976. The viscometric behavior of a natto mucin in solution. *Agricultural and Biological Chemistry* 40(9):1871-75. Sept. [20 ref]

• ***Summary:*** The natto bacterium, *Bacillus subtilis* produces polyglutamic acid (PGA) and mucin; the latter substance is considered to be similar to PGA. This study found that the structure / conformation of the mucin molecule and the way it flows depend on the pH of mucin solution used. The molecule is randomly coiled at pH 5.7 but changes to a rod-like molecule at pH 4.3. A 2% solution behaves as a thixotropic flow at pH 5.7 but as a Newtonian flow at pH 4.3.

Photos (taken with an electron microscope) show: (1) Electron micrograph of a natto mucin at Ph 6.5. (2) Electron micrograph of a natto mucin at Ph 2.5.

Also contains four graphs. Address: Dep. of Food Science and Technology, Tokyo Univ. of Fisheries, Konan, Minato-ku, Tokyo, Japan.

541. Kitamura, K.; Takagi, T.; Shibasaki, K. 1976. Subunit structure of soybean 11S globulin. *Agricultural and Biological Chemistry* 40(9):1837-44. Sept. [12 ref] Address: 1&3. Faculty of Agriculture, Dep. of Food Chemistry, Tohoku Univ., Sendai, Miyagi-ken 980, Japan; 2. Inst. for Protein Research, Osaka Univ., Suita 565, Japan.

6542. Kobayashi, Takashi. 1976. Insect pests of soyabean in Japan and their control. *PANS: Pest Articles and News Summaries (England)* 22(3):336-49. Sept. [9 ref. Eng]

• ***Summary:*** A key source of information on soybean insects in Japan. The author's name is incorrectly written on the title page as "Y. Kobayashi." Address: Tohoku National Agriculturl Experiment Station, Akahira 4, Morioku, Japan.

6543. Kozaki, Michio. 1976. Tônan Ajia no miso to shôyu [Southeast Asia's miso and shoyu]. *Miso no Kagaku to Gijutsu (Miso Science and Technology)* No. 271. p. 1-7. Sept. [Jap]

6544. Miyako Oriental Foods, Inc. 1976. Price list, Sept. 1, 1976: Miso. 404 Towne Ave., Los Angeles, CA 90013. 1 p.

• ***Summary:*** Gives package size, wholesale and suggested retail prices for Yamaizumi Miso and Yamajirushi (Shinshu Type) Miso. The latter is divided into shiro miso, aka miso, and koji miso. For example, the suggested retail price of a 2-pound bag of aka miso is $2.19. In the upper left corner is *Yama-chan,* the company logo, showing a cute child eating miso soup with chopsticks. Address: Los Angeles, California. Phone: (213) 488-1678 Factory.

6545. Shurtleff, William; Aoyagi, Akiko. 1976. The book of miso. Hayama-shi, Kanagawa-ken, Japan, Soquel, California, and Brookline, Massachusetts: Autumn Press. 256 p. Sept. Illust. by Akiko Aoyagi. Index. 28 cm. Revised ed. 1981. New York, NY: Ballantine Books, 620 p. [60 ref]

• ***Summary:*** "soim/1976-5403a+b" Contents: What is miso? Preface. Acknowledgments. Part I. Miso: Savory, High Protein Seasoning. 1. Soybeans, protein and the world food crisis. 2. Miso as a food. 3. The miracle of fermentation. 4. The varieties of miso: Introduction. An overview: Natural vs. quick miso, salty vs. sweet miso, red vs. white miso, chunky miso and koji miso vs. smooth miso, expensive vs.

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inexpensive miso, miso from the provinces.

Regular Miso: Rice miso (red / aka, light-yellow / shinshu, mellow red / amakuchi akamiso, mellow beige / amakuchi tanshoku, mellow white / shiro koji, sweet red / edo or edo ama-miso, sweet white / Kyoto shiro miso), barley miso (karakuchi mugi, mellow barley / amakuchi mugi), soybean miso / mamé miso (miso-dama, Hatcho miso, soybean miso / mame miso, tamari miso). Special Miso: Finger lickin' miso / Namemiso (Kinzanji miso, moromi miso, hishio, namémiso, natto miso, goto miso), sweet simmered miso / nerimiso. Modern Miso: Akadashi miso, dehydrated or freeze-dried miso, low-salt / high-protein miso.

Part II. Cooking with Miso (400 recipes). 5. Getting started. 6. Recipes from East and West: Miso toppings, miso in dips & hors d'oeuvres, miso in spreads & sandwiches, miso dressings with salads, miso in soups & stews, miso in sauces, miso with grains, beans & tofu, miso in baked dishes, miso sautéed & simmered with vegetables, miso in grilled dishes, miso in deep-fried dishes, miso & eggs, miso in desserts, miso pickles, koji cookery.

Part III. The Preparation of Miso. 7. Making miso at home and in communities. 8. Japanese farmhouse miso (incl. miso-dama). 9. The traditional miso shop. 10. The modern miso factory.

Appendixes: A. A brief history of chiang, miso, and shoyu: Introduction, Chinese chiang, early Japan, the Nara Period (710 A.D. to 784 A.D.), the Heian Period (794 A.D. to 1160 A.D.), the Kamakura Period (1185 A.D. to 1333 A.D.), the Muromachi Period (1336 A.D. to 1568 A.D.), tamari–the forerunner of shoyu (Priest Kakushin returns to Japan from China, where he learned how to make Kinzanji miso, settles at Kokoku-ji temple near town of Yuasa, discovers tamari), miso during the Edo Period (1603 A.D. to 1867 A.D.), the development of shoyu the Meiji and Pre-war Periods (1867 A.D. to 1941 A.D.), modern times, transmission to the West.

B. The varieties of Chinese chiang, Korean jang and Indonesian Tao-tjo. C. The chemistry and microbiology of miso fermentation: Introduction, koji starter molds, making koji starter, making koji–the first fermentation, cooking the soybeans, preparing the miso–the second fermentation, the finished miso. D. People and institutions connected with miso: In Japan–Miso research scholars and institutes, exporters of natural miso and koji to the West, traditional or semi-traditional shops making natural miso, Japan's ten largest miso factories (gives the production in tons/year for several companies), other well-known miso makers. Makers of koji starter and koji, Japanese restaurants specializing in miso cuisine. North America–Miso research scholars and institutes, commercial miso makers, companies importing Japanese miso, koji, or koji starter, individuals interested in miso. Europe (Belgium, England, France, Germany, Holland, Italy, Portugal) and Latin America (Brazil, Costa Rica, Mexico, Venezuela). E. Miso additives. F. Miso with seafoods, chicken, and meat. G. Table of equivalents. H. So you want to study miso in Japan? Bibliography. Glossary. About the authors (autobiographical).

Note 1. This is the earliest English-language book seen (July 2000) that has the word "miso" in the title. It is also the first book in the Western world written entirely on the subject of miso.

Note 2. This is the earliest document seen (July 2000) that mentions "Hatcho miso" (spelled that way–which is now the correct romanization). Hatcho is a Japanese place name meaning (approximately) "Eighth Street."

Note 3. This is the earliest document seen (Sept. 2002) that contains industry and market statistics on individual miso companies.

Note 4. This is the earliest document seen (March 2009) that gives illustrated details about commercial miso production.

Note 5. An advertisement on the inside rear cover of the paperback edition of this book announced that the authors were preparing *The Book of Sea Vegetables.* That book was half researched and written but never published because of concern with pollutants in sea vegetables, and increased interest in soyfoods. Address: 790 Los Palos Dr., Lafayette, California 94549.

6546. Shurtleff, William. 1976. New-Age Foods Study Center: Basic purposes and activities (Leaflet). Lafayette, California. 1 p. Single sided. Sept. 28 cm.

• ***Summary:*** "1. To work toward creative, low-cost solutions to the present world food/protein crisis by doing basic research and writing books... Our special interests include soybean products (tofu, miso, tempeh, shoyu, etc.), sea vegetables, whole-grain bread, and kuzu.

"2. To aid in the spread of the ideas found in our writings by regularly responding to invitations from any part of the world to do lecture/demonstrations and cooking classes."

3. To encourage the adoption of meatless and vegetarian diets which help make the best use of the planet's precious food resources, are low in cost, conducive to the development of a healthy body and clear mind, kind to animals, and ecologically sound.

"4. To encourage people in the West to begin commercial or community production of tofu, miso, and tempeh...

"5. To provide centers where people can come to learn more about our work and to begin their own study of basic important foods. In Japan, we assist people in studying with tofu- and miso masters..."

"6. To work actively to promote the key concept of food self-sufficiency and simpler, low-cost lifestyles that are harmonious with the needs of the planetary ecosystem. Likewise to encourage deeper understanding of selfless service, and of daily life and work as a spiritual practice.

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"7. To provide a catalog of publications and materials related to our work. We invite you to contact us and we hope we may be of service to you." Address: New-Age Foods Study Center, 790 Los Palos Dr., Lafayette, California 94549. Phone: (415) 283-3161.

6547. Shurtleff, William; Aoyagi, Akiko. 1976. Tamari (Document part). In: William Shurtleff and Akiko Aoyagi. 1976. The Book of Miso. Hayama-shi, Kanagawa-ken, Japan, Soquel, California, and Brookline, Massachusetts: Autumn Press. 256 p. See p. 50, 219-21. Sept. Illust. by Akiko Aoyagi. Revised ed. 1981. New York, NY: Ballantine Books, 620 p. [60 ref]

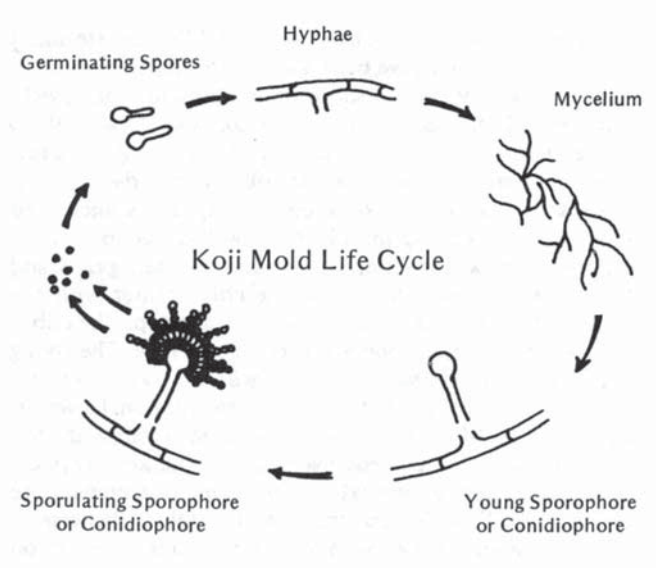
• ***Summary:*** In Chapter 5, "Getting started," in the section on "Basic ingredients," is a subsection titled "Tamari" which states (p. 50): "A close relative of shoyu, tamari is prepared from a koji which contains only soybeans and no wheat; it has a distinctive, slightly strong flavor and aroma, a dark brown color, and a fairly thick consistency. Produced either as a byproduct of tamari miso (p. 44) or as a food in its own right, it is now rarely used in its natural form, being generally made into *sashimi-damari* by mixing it with miso-damari (see below), *mizuamé,* cane sugar, caramel, and often preservatives. Although not widely used in Japan, it remains fairly popular in Kyoto and central Japan, where it is used as a seasoning for *sashimi* (raw fish). In ancient times tamari was widely used in its natural form and highly prized as a fine seasoning, having much the same flavor as a best-grade Chinese soy sauce. Today, an increasing amount is made synthetically.

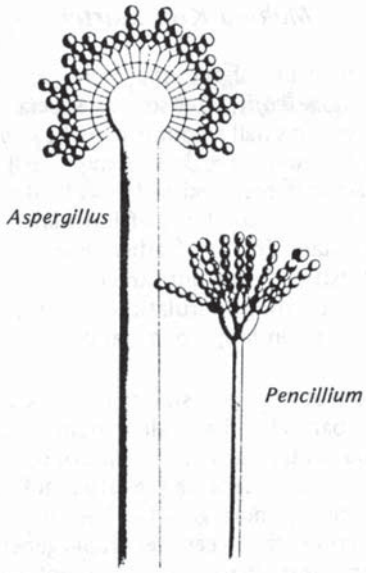
"*Miso-damari*–also called *uwahiki*–is the tamari-like liquid that accumulates in *any* variety of miso during fermentation. Thicker and richer than tamari, it is gathered only in very small quantities and is not sold commercially. A delicious by-product of most homemade miso (it rises to the surface in summer and settles in winter), it may be used like shoyu and is especially delicious with hors d'oeuvres.

In "Appendix A: A brief history of chiang, miso and shoyu," is a section (p. 219-21) titled "Tamari: The forerunner of shoyu." Address: 790 Los Palos Dr., Lafayette, California 94549.

6548. Shurtleff, William; Aoyagi, Akiko. 1976. The book of miso (Illustrations–line drawings) (Document part). Hayama-shi, Kanagawa-ken, Japan, Soquel, California, and Brookline, Massachusetts: Autumn Press. 256 p. Sept. Illust. by Akiko Aoyagi. [60 ref]

• ***Summary:*** Continued: Illustrations (line drawings, both numbered and unnumbered) show: The two Japanese characters for miso. Three men "Putting Hatcho miso to bed" by piling nearly round river stones on top of a huge vat; the pyramid shape makes the pile earthquake proof. A child holding a sheaf of grain. A round *zaru* (woven split bamboo tray) with a circle of salt in the middle. A square wooden





Conidiophores of **Aspergillus** and **Penicillium**

measure (*isshô-baku*) filled with soybeans. The top of rice and barley plants showing grains and leaves. A wooden vat of red miso tied with rice-straw ropes. A miso maker standing by large wooden vats of two different sizes, with braided bamboo hoops. A well stocked miso shop in Japan (at Kichijoji train station, Tokyo). A woman standing behind two deep earthenware crocks filled with miso; balls of miso are in a basket. A sunken open-hearth fireplace (*irori*) in a traditional Japanese farmhouse with a pot hanging over the coals on a hook (*jizai kagi*) and tofu dengaku being grilled around the coals, their skewers stuck into the ash.

Nine wooden kegs of different kinds of miso piled up on 3 levels. A field of soybeans planted in rows. A hand holding soybeans pods still attached to the stem. A soybean pod split open to show the beans. (1) Bar chart of protein

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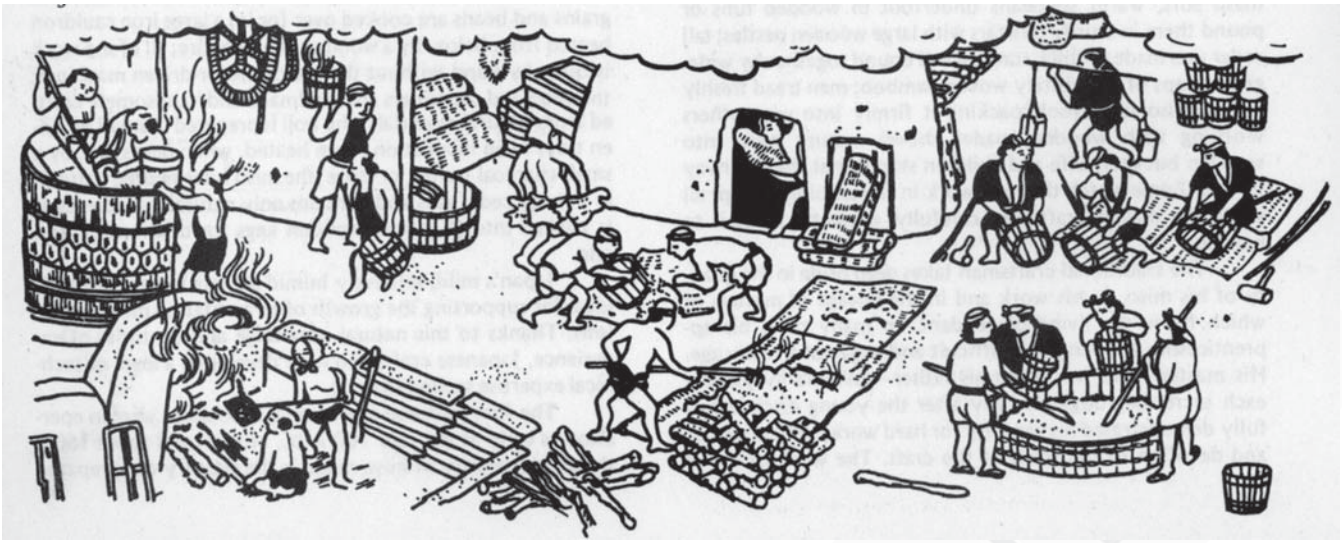

from different sources vs. protein returned. (2) Diagram of energy flow through two different food chains, one with a steer in the middle, the other with direct consumption of soy and grains. (3) Development aid from affluent nations as a percentage of GNP (1960-1971). Stylized soybean plant growing out of a stylized Planet Earth. Miso gift pack, with poly bags of rice, barley, and Hatcho miso. A Japanese pipe *kiseru*. (6) Graph of intestinal cancer vs. meat consumption among females in selected countries; the more meat consumed, the more cancer. Miso aging (from *Miso Daigaku*). (7) The varieties of miso and their characteristics (full-page table). (8) The percentage of salt in different miso varieties.

(9a) Map of Japan showing where the different types of miso originate. (9b) Map of Japan showing geographical miso preferences. A head of rice. (10) Famous sub-varieties of salty rice miso. Two heads of barley. Table about two types of barley miso. Two sets of soybean leaves with pods. Table about three types of soybean miso. The Japanese characters for Hatcho Miso. (11) A wooden sign in a Hatcho miso office: "Supplier to the Imperial Household." (12) Two cross-section views of a tamari miso vat. A small pottery crock of sweet simmered miso (*Nerimiso*). Packages of different types of modern miso: Peanut miso, akadashi miso, low-salt, high protein miso, Instant miso soup with dried frozen tofu, leeks, wakame. (14) Different types of miso packaging, both traditional and modern. A sample miso label. (13) Varieties of miso available in the West, plus characteristics of each. Squeezing a bean of miso out of the cut corner of a plastic bag. Three different shoyu containers. Six different types of tofu on a cutting board. (15) Oriental kitchen tools (utensils; full page). A small crock of salt with a wooden spoon in it.

Suribachi and modern sesame seed grinder. Tofu preparatory techniques. Broiling tofu with chopsticks on a broiling screen. Four forms of kombu. Two stylized crossed sheaves of rice. A traditional farmhouse kamado (raised earthenware cooking area). Pottery crock. Black and white sesame seeds and plant. Yuzu. Sprig of kinome. Head of garlic. Two burdock roots. Two leeks (*negi*). Making broiled miso. Hoba miso. Kaiyaki miso. Yubeshi miso. Wakame plant. A bowl of miso soup. A woman drinking hot miso soup next to a vending machine. Vegetables cut for miso soup (*mi* or *gu*). Table of the most popular ingredients in miso soup. How to make miso soup at home (4 views). Miso-koshi (woven bamboo strainer). Mad monks grinding miso. (19) Full-page table of miso soup throughout the four seasons. Shiso / beefsteak leaves. Kabocha. Daikon. Irori and jizai kagi (sunken farmhouse fireplace and overhead hanging hook). Woman serving miso by a sunken / open hearth fireplace. Woman kneeling, grinding miso with a pestle (*suri kogi*) in a *suribachi* (serrated earthenware mortar / mixing bowl).

(20) Rice patties with nori (*o-musubi, o-nigiri*). Bamboo noodle tongs. Homemade noodles in a pot. (21) Broiled mochi wrapped with nori. (22) Steamed tofu. A Chinese cleaver, with its tip stuck into a chopping block. Cultivated shiitake mushrooms growing on a log. Kabocha. Daikon. (23) Miso oden. Doténabé [Dotenabe]. Konnyaku twists. Dengaku Hoshi. Tofu dengaku (2 pieces, skewered; 3 pieces skewered in a box). Japanese eggplant (*nasu*) scored and Shigiyaki. Deep-frying with a wok. Lotus root stuffed with miso. (24) Deep-fried sandwiches. (25) Gashouse eggs. (26) Layered omelets. Japanese bamboo steamer. Kashiwa mochi. Selling miso pickles. Two pickling containers. (27) Salt-pressing. Air-drying daikon and turnips (*kabu*). Miso pickles with tea and chopsticks. Amazaké at the Nakamura-ro restaurant.

Note: This is the earliest English-language document seen (July 2012) that uses the term "Amazaké" to refer to amazake.

How to make miso at home: Utensils, ingredients, and process (7 figures). (29) Miso fermentation crocks. Corona hand-mill. Soft mat koji.

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(30) Proportions by weight of basic ingredients for various homemade misos; full-page table. (32) Utensils for homemade koji and koji starter. (33) Miso flow chart. (34) Composition of nutrients in 100 gm of basic miso ingredients. (35) Process for homemade rice koji (9 figures). (36) Graph of changes in koji temperatures. Woman leaning over miso vat.

Japanese farmhouse miso: Traditional country farmhouses (2 views). Raised farmhouse kitchen hearth, caldrons and earthenware dais (*kamado*). (38) Farmhouse floor plan. A kura (family treasury and storehouse). Two bamboo colanders. Pounding miso at Suwanose. Making miso in a traditional farmhouse (9 figures). Farmhouse soybean miso made with *miso-dama* (miso balls) (5 figures).

The traditional miso shop: (39) A 17th century workplace (2 figures). (40) Tsujita shop floor plan. Koji trays. (41) Insulated fermentation box. (42) The small tools (full-page). (43) Shop with 2 cauldrons. (44) Steamer and cauldron. (45) A fermentation vat. (46) Shop floor at vat's rim. Preparing traditional rice miso (31 figures). Making koji using natural mold spores. Stacked koji trays. Making miso in a semi-traditional shop (5 figures). Hatcho miso; company and vats (2 views).

The modern factory (2 figures).

A brief history of chiang, miso, and shoyu (incl. evolution of Chinese characters). Hideyoshi Toyotomi and a robber on the bridge (Hatcho miso history). Making miso-damari. Inside a Kikkoman shoyu factory around 1900. Traditional shoyu seller.

Chinese chiang in earthenware jars in a courtyard. Korean jang; selling it and making at home. The koji mold life cycle. Conidiophores of Aspergillus and Penicillium. (48) The interaction of basic miso components during fermentation. (49) Temperature control curves for four quick misos. Edo period shoyu production. Woman cutting tofu for Dengaku and women busy making dengaku, both from the book *Tofu Hyaku Chin*. Cartoon of a man pouring himself sake, yet thinking of miso soup. Ebisu with fishing rod and big fish under left arm. Tamari shoyu pouring out of spigot at base of miso vat. Traditional Japanese kitchen utensils. Sunken fireplace (*irori*) with huge carved wooden overhead hook hanging from braided rice straw rope. Photo (in Nerima-ku, Tokyo) with brief biography of William Shurtleff and Akiko Aoyagi. Address: 790 Los Palos Dr., Lafayette, California 94549.

6549. Shurtleff, William; Aoyagi, Akiko. 1976. Appendix A: A brief history of chiang [jiang], miso and shoyu (Document part). In: William Shurtleff and Akiko Aoyagi. 1976. The Book of Miso. Hayama-shi, Kanagawa-ken, Japan, Soquel, California, and Brookline, Massachusetts: Autumn Press. 256 p. See p. 214-26. Sept. Illust. by Akiko Aoyagi. [60 ref]
• ***Summary:*** Contents: Introduction. Chinese chiang [jiang]. Early Japan. The Nara period (710-784 AD). The Heian period (794-1160 AD). The Kamakura period (1185-1333 AD). The Muromachi period (1336-1568 AD). Tamari: The forerunner of shoyu. Miso during the Edo Period. The development of shoyu. The Meiji and pre-war periods (1867-1941). Modern times. Transmission to the West.

Illustrations: Evolution of Chinese characters. Hideyoshi Toyotomi and a robber on the bridge (Hatcho miso history, p. 219). Making miso-damari (p. 220). Inside a Kikkoman shoyu factory around 1900 (p. 222-23). Traditional shoyu seller (p. 226).

Page 219: "The origins of modern shoyu can be traced more clearly to the mid 1200s when the Japanese priest Kakushin returned from China, having learned there the technique for preparing Kinzanji miso. Establishing himself at Kokoku-ji temple near the town of Yuasa..." Address: 790 Los Palos Dr., Lafayette, California 94549.

6550. Ishiwata, Hajimu. 1976. [Studies on *in vivo* formation of nitroso compounds. VII: *In vitro* formation of nitrite by mixing different kinds of foods]. *Shokuhin Eiseigaku Zasshi* (*J. of the Food Hygienic Society of Japan*) 17(5):369-73. Oct. (Chem. Abst. 86:70351). [7 ref. Eng]
Address: National Inst. of Hygienic Sciences, 18-1, Kamiyoga 1-chome, Setagaya-ku, Tokyo, Japan.

6551. Kimura, Shuichi; Suwa, J.; Ito, M.; Sato, H. 1976. Development of malignant goiter by defatted soybean with iodine-free diet in rats. *Gann* (*Tokyo*) 67:763-65. Oct. [4 ref]
• ***Summary:*** Female rats which were fed an iodine-free diet containing 40% defatted soybean meal for 6-12 months showed thyroid carcinomas. This effect, however, was completely prevented by iodine supplementation.

Note: It is difficult for people in developed countries to consume an iodine-free diet unless they consume no table salt. Since 1924 most table salt in the USA has been "iodized," which means that an iodine source, such as potassium iodine / iodide is added in amounts necessary to supply the recommended daily allowance. However in 1983 there were an estimated 400 million iodine-deficient persons in the less developed regions of the world, and an estimated 112 million in the more developed regions. The best known natural goitrogens are found in cabbage and cassava. Address: 1-3. Dep. of Food Chemistry, Faculty of Agriculture; 4. Dep. of Oncology, Research Inst. for Tuberculosis. All: Tohoku Univ.

6552. Koshiyama, I.; Fukushima, D. 1976. A note on carbohydrates in the 11s globulin of soybean seeds. *Cereal Chemistry* 53(5):768-69. Sept/Oct. [12 ref]
Address: Noda Inst. for Scientific Research, 399 Noda, Noda-shi, Chiba-ken, Japan.

6553. McDowell, John R. ed. 1976. The history of Hendricks County, Indiana, 1914-1976. Indianapolis, Indiana:

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Hendricks County Historical Society. Printed by White Arts Inc. 640 p. See p. 117-18, 473-75. Oct. 28 cm.

• ***Summary:*** Hendricks County was created in 1824.

In the chapter on "Agriculture" is a long passage about the pioneering work of Adrian A. Parsons excerpted from *The Prairie Farmer* (11 Jan. 1930, p. 6, 26). In Chapter 4, titled "Biographies," the section on "Adrian A. Parsons family" (p. 473-75; written by Lee Parsons, a great-grandson of Adrian Parsons, a grandson of Adrian's second child, Norman E. Parsons, and son of Edgar Barker Parsons {born 10 Sept. 1905}) states: Adrian A. Parsons, son of Y. and Elvira Swain Parsons, was born on 7 Nov. 1846 in Guilford County, North Carolina. In 1852 Nelson moved his family to Indiana, ultimately settling in Washington Township, Hendricks County. A second son, Oliver E. Parsons, was born on 12 Jan. 1854.

Adrian served in the Union Army for 2 years during the Civil War, with Company I, Ninth Indiana Cavalry; he enlisted in Dec. 1863 at age 17. On 14 Dec. 1864, while on a scouting mission near Franklin, Tennessee, against General Hood's Confederate raiders, he suffered a severe gunshot wound during an ambush. He was taken to a nearby log cabin and left to die. After five days near death, drinking from a spring to which he could crawl, he was discovered by a member of his unit, who took him to a makeshift Union "hospital" in a cotton shed. Waiting five more days for medical attention, he managed to survive–amazingly–but this brush with death left Adrian with reduced physical vigor the remainder of his long life. "Ironically, this like resulted at least indirectly in the work which was to become his most significant contribution to Hendricks County, and indeed to Indiana and the entire nation–the development of the soybean as a major commercial farm crop."

After returning from the Civil War, Adrian continued his education, studying at Danville Academy [for several years; it higher than high school but lower than college] and Earlham College [for one term for teacher preparation; Located in Richmond, Indiana, founded 1847], and subsequently both farmed and taught school. On 10 April 1870, at about age 23, Adrian married Mary Anne Fox, daughter of Barney and Hannah Gossett Fox. This union, lasting until Mary's death on 27 Oct. 1922, produced nine children. Their youngest, Frank, died on 22 Oct. 1918, during World War I. Adrian served as Hendricks County Recorded from 1882 to 1886.

"Intellectual curiosity more than compensated for the physical limitations Adrian's Civil War wound imposed. The soybean was known by few farmers in the United States and was grown as little more than a novelty plant, when, in 1886, Adrian Parsons imported a batch of 'soja' seed from Japan to grow experimentally.

"It was originally thought that the bean could be used as a substitute for coffee, but Adrian soon realized the soybean had far greater value as feed for livestock. Each succeeding year he increased his soybean acreage, always experimenting with the culture and utilization of the corp.

"Beginning in the 1890s, Adrian Parsons reported his work with the soybean in articles and letters submitted to a number of farm publications. The United States Department of Agriculture became interesting in his work and remained in touch with him for many years.

"It should be noted that Adrian Parsons began growing the soybean two years before the Agriculture Experiment Stations came into existence. The practical experience he gained and reported in his writing complemented the scientific experimentation with the plant done by the Experiment Stations in later years.

"In his early years of growing the soybean, Adrian was not without detractors. During a visit to the Parsons farm shortly after the turn of the century, a Liberty Township farmer commented that Adrian would regret bringing 'that weed' into the county. Only a few years were to pass before this critic's own family [the Edmondson family] began reaping the benefits of this uncommon 'weed.'

"By the early decades of the 20th Century, Adrian and several of his sons were growing hundreds of acres of soybeans in Hendricks County, at a time when the crop was only beginning to be widely cultivated in other portions of the Midwest.

"Around this time, Adrian's experimentations resulted in the development of a new variety of soybeans. Family members recall that one year he found a single plant growing in his bean field which displayed superior characteristics, of which the primary one was the fact that the mature pods did not shatter as badly as did the pods of existing varieties.

"Adrian transplanted this plant in his garden, and the next season planted its seed. The plant's distinctive characteristics were passed on, and ultimately a new variety of soybean was established. It was named Mikado, and was distributed through seed houses in Ohio and Iowa.

"Adrian Parsons followed other pursuits. However, developing and promoting the soybean as a useful farm crop was his primary interest."

Adrian Parsons died on 1 Aug. 1929. Today his descendants number in the hundreds, and many of them still reside in Hendricks County, Indiana. "The nine children of Adrian and Mary Anne Parsons were: Lester Wharton (B. December 22, 1871), Norman E. (B. January 17, 1873), Ethel (B. August 11, 1875), William Nelson (B. April 8, 1878), Edith (B. April 28, 1880), Gilbert (B. June 27, 1883), Mary (B. May 16, 1885), Chester Adrian (B. June 22, 1887) and Frank Harrison (B. February 11, 1889; D. October 22, 1918)." There follows a long genealogy of each of his nine children.

A large portrait photo shows the Adrian Parsons family in 1908, including Adrian and his wife, all nine of their children, and many grandchildren.

Note: Talk with Lee Parsons. 2000. April 8. One day,

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right after this book was published, Ruth Pritchett, the acknowledged authority/expert on the history of Hendricks County who had long lived in Liberty Township, came up to Lee in the local post office and asked him if he knew anything about the biography of Adrian Parsons and the soybean in the new county history book. Lee admitted that he had written it. She slapped him on the shoulder, started laughing, and said "Good for you! Those Edmondsons always did think they were better than anyone else." Even though Lee hadn't mentioned the Edmondsons in his biography, she had "read between the lines."

6554. *Feedstuffs.* 1976. Japan considers U.S. soybeans as protein sources in diets, ASA says. 48(46):1. Nov. 8.
• ***Summary:*** The Ministry of Agriculture and Forestry is helping to finance the Japan Vegetable Protein Food Assoc. Proposals for a 200-mile economic zone for fishing could cause Japan to lose about 5 million tonnes/year of fish.

6555. United Press International (UPI). 1976. Tofu-burger no junk food. *Bangor Daily News* (*Maine*). Nov. 18. p. 1-2.
• ***Summary:*** Students will soon be able to munch on tofu-burgers in the University of Maine at Orono school dining hall. Anne S. Johnson, assistant manager of dining halls, said the new tofu-burger is part of an attempt "to wean students at the university away from junk foods and empty calories."

"Mrs. Johnson was introduced to the new vegetarian fare through a food book written by Bill Shurtleff and Akiko Aoyagi. She hopes to have the item on the dinner menu by early next month." "About 150 of the university's dormitory students line up nightly to consume vegetarian fare at the Wells Common Dining Hall... The cost of preparing the vegetarian meal is no greater than for the regular one."

A photo shows Barbara Hill, a student at the University of Maine, as she is about to take her first bite of a Tofu-Burger, a Japanese inspiration that contains no meat.

Note: This is Maine's largest daily newspaper. Many other newspaper articles were generated by this UPI story. Three (from unknown newspapers) are titled: "Tofuburgers in dining hall." "Shamburger deluxe." "Maine tofuburgers."

6556. Bernard, R.L.; Hittle, C.N. 1976. United States national soybean germ plasm collections. *INTSOY Series* No. 10. p. 182-85. R.M. Goodman, ed. Expanding the Use of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign).
• ***Summary:*** A full-page table (p. 183) gives the following information on soybean germ plasm collections worldwide: Country and curator, address, number of accessions, nature and origin of accessions. There are major collections in the following places: Toulouse, France (500 accessions). Amravati, Haharashtra (1,800), and Pantnagar, Uttar Pradesh (4,000), India. Bogor, Indonesia (400). Hiratsuka, Kanagawa prefecture (2,928), and Iwate University, Morioka (200 Glycine species), Japan. IITA, Ibadan, Nigeria (2,000). Harbin, and Kirin Province, China. Pretoria, South Africa (600). Suweon (300 Glycine species), and Cheong Kyang, Seoul (1,300), Korea. Algot Holmberg and Soner AB, Norrkoping, Sweden (1,200). AVRDC, Tainan (9,000), and Taichung (2,800), Taiwan. Urbana, Illinois (4,100), and Stoneville, Mississippi (1,700), USA. Leningrad, USSR (2,500).

There are additional collections in Australia, Bulgaria, Hungary, Philippines, [Southern] Rhodesia (Salisbury [Harare]), and Romania.

Table 1. Divisions of USDA soybean germ plasm collections (Urbana, Stoneville, Total). Table 2. Maturity grouping of the USDA soybean germ plasm collection, 1976 (In the northern region [maturity group 00 to IV] there are 237 named varieties, 51 FC [Forage Crop] strains, 2,999 P.I. [Plant Introduction] strains, and 3,287 total. In the southern region [maturity group V to IX] there are 101 named varieties, 39 FC [Forage Crop] strains, 1,514 P.I. strains, and 1,654 total).

Table 3. History of soybean introductions into the United States. The earliest period given is 1898-1907; the great surge in soybean introductions was in 1929-32 during the Dorsett-Morse expedition to East Asia; A total of 11,594 strains have been introduced. Table 4. Maturity grouping and origin of accessions through 1976 in USDA wild soybean (Glycine soja Sieb. and Zucc.) germ plasm collection (there are 361 accessions; Country of origin: Japan 180, Korea 134. China and Taiwan 32. USSR 15). Table 5. Species distribution of USDA perennial Glycine collection, 1976 (8 species [*G. canescens, G. clandestina, G. falcata, G. latrobeana, G. tabacina, G. tomentella, G. wightii*] and 161 accessions from Australia, India, Africa, Taiwan, Japan, Philippines, Ethiopia).

Note: The assignment of FC numbers began in about 1911 and was discontinued in 1957. Address: USDA.

6557. Ebine, Hideo. 1976. Fermented soybean foods. *INTSOY Series* No. 10. p. 126-29. R.M. Goodman, ed. Expanding the Use of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign). [11 ref]
• ***Summary:*** Contents: Introduction. Miso. Shoyu. Natto. Conclusion. Literature cited. Discussion.

Production of fermented soyfoods in Japan in 1974 was as follows: Miso 587,228 tonnes (metric tons; this miso was made from 191,621 tonnes of whole soybeans, 2,200 tonnes of defatted soybean meal, 102,104 tonnes of rice, 22,280 tonnes of barley, 80,265 tonnes of salt).

Shoyu 1,213,350 tonnes (made from 14,278 tonnes of whole soybeans, 176,138 tonnes of defatted soybean meal, 176,319 tonnes of wheat, 209,674 tonnes of salt).

Natto 90,000 tonnes (made from 47,000 tonnes of whole soybeans). "In 1960 the National Food Research Institute initiated a project to develop a new type of soybean

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food in order to comply with a request from UNICEF to supply a nutritious protein food for children. The product thus developed is processed in the following way: soaked soybeans are first cooked in an autoclave at 121ºC for 30 minutes. A starter of *B. natto* is then added to the hot, cooked soybeans and mixed well. The inoculated soybeans are fermented at 42ºC for 8 to 10 hours. The fermented soybeans are then passed through a chopper and spread over trays for vacuum dehydration. The dried material is made into a powder for use as an ingredient, mixed with wheat flour, in biscuits. In animal feeding experiments this new food had an absorption rate of 83 percent and a biological value of 63 percent, a notable improvement compared with the absorption rate and biological value of raw soybeans."

"An ancient legend indicates that the technology for making soybean foods with the aid of microorganisms originated in China. These foods and the manufacturing process involved were introduced into Japan between 500 and 600 A.D." Address: Applied Microbiology Div., National Food Research Inst., Ministry of Agriculture and Forestry, Tokyo, Japan.

6558. Goodman, Robert M. ed. 1976. Expanding the use of soybeans. *INTSOY Series* No. 10. xv + 261 p. Proceedings of a Conference for Asia and Oceania. Held Feb. 1976 in Chiang Mai, Thailand (College of Agric., Univ. of Illinois at Urbana-Champaign). [100+ ref]
• ***Summary:*** Content: Introduction. Opening addresses. General sessions: Production, protection, utilization and economics.

Symposia: Soybean rust. Biology and control of major insect pests of Asian soybeans. Breeding tropical soybeans. Small scale soybean processing: What is needed? Extension research to the village farmer.

Country reports: Current status of soybean production and research in–Australia, Bangladesh, India, Indonesia, Iran, Japan, Korea, Malaysia, Philippines, Kingdom of Saudi Arabia, Sri Lanka, Thailand.

Closing address, by R.W. Howell. List of contributed papers. Abbreviations and units of measure.

Note: Many papers presented at this conference are cited separately. Address: Dep. of Plant Pathology and INTSOY, Univ. of Illinois, Urbana, IL.

6559. *INTSOY Series.* 1976. Conference delegates. No. 10. p. xii-xv. R.M. Goodman, ed. Expanding the Use of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign).
• ***Summary:*** The following number of participants came from the following countries: Australia (3). Bangladesh (4). Hong Kong (1). India (4). Indonesia (20). Iran (6). Iraq (1). Japan (6). Malaysia (12). Pakistan (1). Philippines (9). Puerto Rico (4). Saudi Arabia (3). Singapore (2). South Korea (3). Sri Lanka (5). Switzerland (1). Taiwan (8). Thailand (120). United Kingdom (2). USA (17).

Ten patrons of the conference are also listed.

6560. Kobayashi, Takashi. 1976. Pod borers and the seed pest complex in Asian soybeans. *INTSOY Series* No. 10. p. 171-73. R.M. Goodman, ed. Expanding the Use of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign). [7 ref]
• ***Summary:*** "The major pod borers found in Japan include the soybean pod borer, *Etiella zinckenella* (Treitschke); the Azuki pod worm, *Matsumuraeses phaseoli* Matsumura; and *M. falcana* (Walsingham)." Also discusses: Factors that influence damage by seed pests: Regional variation in damage by seed pests, prediction of damage caused by insects, control of seed pests by insecticides, cultural control of insect pests of seed. Address: Tohoku National Agric. Exp. Station, 4 Akahira, Shimokuriyagawa, Morioka, 020-01, Japan.

6561. Ohtsuru, Masaru; Kito, M.; Takeuchi, Y.; Ohnishi, S. 1976. Association of phosphatidylcholine with soybean protein. *Agricultural and Biological Chemistry* 40(11):2261-66. Nov. [8 ref]
Address: 1-2. Research Inst. for Food Science, Kyoto Univ., Kyoto 611, Japan; 3-4. Dep. of Biophysics, Kyoto Univ.

6562. Order forms containing names and addresses of people who purchased publications or materials from New-age Foods Study Center in November 1976 (Archival collection). 1976. Lafayette, California. Order forms filled out by the person who placed the order.
• ***Summary:*** BOT2 = The Book of Tofu, Vol. 2–later titled Tofu & Soymilk Production. BOM = The Book of Miso. BOM2 = The Book of Miso, Vol. 2–later titled Miso Production. WIT = What is Tofu? pamphlet. WIM = What is Miso? pamphlet. TB = Tofu box. TK = Tofu Kit. NN = Natural nigari. CTE = Catalog of commercial tofu-making equipment. CKS = Catalog of koji starter for miso or shoyu.

November: Evan Root of Erewhon, Inc., 33 Farnsworth St., Boston, Massachusetts 02210 (plus follow-up letter of 15 March 1977 from same address). Alec Evans, Welcome Home Bakery, 231 S.W. 2nd St., Corvallis, Oregon 97330 (BOT2, TK, Tofu Cassette). Ira Leviton, Corncreek whole grain bakery, 60 Elm St., S. Deerfield, Massachusetts 01378 (100 WIT, 100 WIM, TB). Lulu Yoshihara, General Delivery, Denman Island, BC, V0R 1T0, Canada (BOM2). Jean Celle (According to the Book of Tofu he started a company, however, there is no proof that it exists), Fondation Macrobiotique Vellave, 36 bis, Avenue Charles Du Puy 43700, Brives Charensac, France (BOT2, BOM2, CKS). Frank Konishi, Southern Illinois University at Carbondale, Carbondale, Illinois 62901 (BOT). Tim Redmond, Eden Foods, 4601 Platt Rd., Ann Arbor, Michigan 48104 (BOT2, BOM2, CTE, CKS). Bernadette of Lifestream Natural Food Store, 1813 West 4th Ave., Vancouver, BC V6J 1M4,

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Canada (50 WIT, 50 WIM). K.K. Fung, 4661 Chancellor Cove, Memphis, Tennessee 38118 (BOM, BOT2, BOM2, NN, CTE, CKS). Dr. Tsutomu Mochizuki, c/o Shinshu Miso Research Institute, 1014 Minamiagata Machi, Nagano City 380 Japan (3 BOM). Max Sprenger, Knorr Research Institute, Leutschenbachstrasse 46, CH 8050 Zurich, Switzerland (BOM, BOT2, BOM2, 3 WIT, 3 WIM, CTE, CKS). Vegetarian, Inc., 1310 W. Main, Urbana, Illinois 61801 (BOT2, 2 BOM2, NN, CTE, CKS). Wholistic Health Education Foundation, 715 Monroe Ave., Rochester, New York 14607 (BOM2, 50 WIT, 50 WIM, NN, CTE, CKS). Bruce Walker, 2131 Red Deer Road, Saskatoon, Saskatchewan, S7K 1C8, Canada (BOT2, BOM).

Note: This is the earliest document seen (July 1999) that contains the word "wholistic." Address: New-Age Foods Study Center, 790 Los Palos Dr., Lafayette, California 94549. Phone: (415) 283-3161.

6563. Rejesus, Romeo S. 1976. Insect pest diversity and succession in Asian soybeans. *INTSOY Series* No. 10. p. 97-103. R.M. Goodman, ed. Expanding the Use of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign). [18 ref]

• ***Summary:*** Lists a large number of insect pests. Contents: Introduction. Pest diversity: Insects and other arthropods in Philippine soybeans, insect diversity in other Asian countries. Pest succession: Wet season, dry season. Developmental approach. Appendix I is a partial list of soybean insect pests in the following Asian countries: Indonesia, India, Solomon Islands (Stapley 1972; 2 species), Micronesia (Gressitt 1954, 14 species on soybeans), and Thailand (Napompeth 1975, 13 species).

Note: Gressitt (1954) did NOT mention soybeans in Micronesia. Address: Dep. of Entomology, College of Agriculture, Univ. of the Philippines at Los Baños, College, Laguna, Philippines.

6564. Sanbuichi, Takashi; Watanabe, Iwao. 1976. Soybean production in Japan. *INTSOY Series* No. 10. p. 237-38. R.M. Goodman, ed. Expanding the Use of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign).

• ***Summary:*** "Each year Japan produces approximately 120,000 metric tons of soybeans on 90,000 hectares. About 30 percent of this yield is raised on the northern island of Hokkaido, where large-scale farming is practiced. Especially in the northeastern part of Hokkaido, soybeans are a very important crop... Throughout the country the average soybean yield is about 1.4 metric tons per hectare, but during the past four years production in the Tokachi District of Hokkaido has risen to between 1.8 and 2.0 metric tons per hectare...

"In Japan soybeans are used principally as a source of edible oil and protein foods, such as miso (bean paste), shoyu (soy sauce), tofu (soybean curd), and natto (fermented soybeans). The soybeans produced in Japan usually have large seeds, a high protein content, and are of a quality suitable for producing high quality soy products...

"In general, early varieties are cultivated in the high latitudes and late varieties in the low latitudes, but on the southern island of Kyushu early varieties are occasionally used. Known as summer soybeans, they are sown in the spring and harvested in the summer. Late varieties, which are called autumn soybeans, are sown in summer and harvested in the autumn...

"Results show that large-seeded varieties produce high yields. Soybeans grown in the northern parts of Japan usually have larger seeds than those raised in southern areas. It is believed that the marked difference between day and night temperatures and the favorable soil moisture content during the early stages of plant growth account for the large size of soybean seeds grown in the north. The author observed a serious decrease in seed size when Japanese varieties were introduced into Thailand...

"Soybeans are raised in several types of areas in Japan. Traditionally they have been planted beside the footpaths in paddy rice fields. Intercropping with wheat is another old cultural practice, although both practices are seldom used today. Because of the over-production of rice in Japan, the government has recently recommended that soybeans be cultivated in rice fields." Address: 1. Tokachi Agric. Exp. Station, Memuro, Kasai-gun, Hokkaido; 2. National Inst. of Agricultural Science, Nishigahara, Kita-Ku, Tokyo. Both: Japan.

6565. Shurtleff, William. 1976. Report on visit to Kikkoman plant in Walworth, Wisconsin. Lafayette, CA 94549. 2 p. Nov. Unpublished manuscript.

• ***Summary:*** Contains a detailed description of the ingredients and process used to make shoyu at this plant. The moromi (mash) ages for an average of 6 months. The heating / pasteurization process serves four basic purposes. Kikkoman produces about 2.5 million gallons/year of shoyu at Walworth. About 150,000 to 200,000 gallons of so-called tamari are imported from Japan for sale at natural food stores; this is about 6-8% of total shoyu. Kikkoman has 85% of the U.S. Asian-American trade and about 1/3 of the supermarket trade. Address: 790 Los Palos Dr., Lafayette, California 94549.

6566. Spiekerman, David. 1976. Four vegetable treasures from Japan. *Organic Gardening and Farming* 23:58-60, 62. Nov.

• ***Summary:*** The four are: Gobo or domestic burdock, the Hokkaido pumpkin (kabocha), black soybeans, and the Japanese eggplant. "The black soybean is the easiest of these Far Eastern vegetables to grow." After 70 days of growing, the plants flower and produce fruit.

"Unlike the common black bean, the black soybean

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is one food few Americans have eaten. When cooked, it is sweeter than any bean in the world. It is a high-protein sweet, which the Japanese feature during festive occasions. Prepare them like any bean, though they cook firmer than most. The Japanese believe the Hokkaido [pumpkin] strengthens the liver, whereas the black soybean strengthens the kidneys. So uncommon is the bean that it retails for over $1.50 per pound."

6567. Vajragupta, Chalermsri. 1976. Small-scale equipment for oil extraction. *INTSOY Series* No. 10. p. 122-25. R.M. Goodman, ed. Expanding the Use of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign).
• ***Summary:*** Contents: Introduction. Pretreatment process: Raw materials, cooker, flake roller, expeller. Solvent extraction process. Refining process: Degumming and neutralization, water washing treatment, bleaching treatment, deodorizing treatment.

"An oil-seed laboratory, including an oil-seed pilot plant, was established in 1972 as a part of the Thai-Japanese Soybean Project." Address: Agricultural Chemistry Div., Dep. of Agriculture, Bangken, Bangkok, Thailand.

6568. Earl, Johnrae. 1976. Queen: In full sail on a sea of satisfaction. *Chicago Tribune.* Dec. 5. p. C13.
• ***Summary:*** Tokyo Tea Garden, a true diamond in the rough, is a tiny restaurant at 5 W. Superior St. that serves authentic Japanese cuisine. "For those who want to go the whole way, there's dried sea seed, salted fish eggs, cold soy bean cake [Hiya-yakko], and fried soft won ton. The house soup was made with soy bean paste [miso]." It was unusual but tasty.

6569. Pearce, Jean. 1976. Getting things done: Expanding dietary horizons [Miso]. *Japan Times* (*Tokyo*). Dec. 19. [Eng]
• ***Summary:*** "... when you begin experimenting with the 400 recipes introduced in "The Book of Miso" by William Shurtleff and Akiko Aoyagi which I have been quoting, you will likely become an ardent supporter of this highly nutritious food. There are also joyful drawings by Akiko and pages of general information about healthful food and living, culture and customs, and the history of foods, that make fascinating reading. Bill is a dedicated promoter of healthful products that can help overcome the food crisis which, for many of our world's people, is not something to be worried about in the future; the hunger is now.

"I would like to reprint the whole book for you, but instead I'll urge you to get a copy as soon as possible and begin learning about miso. Combine it with 'Tofu' for a Christmas gift combination that will be gratefully received by the growing number of people who are interested in good health, conservation, ecology, efficient utilization of natural resources–in other words, all of us. You'll find the books at most stores handling English-language publications." A small photo shows Jean Pearce.

6570. Miller, Harry W. 1976. Re: Your good work in introducing foods from the soya bean. Letter with Christmas card to William Shurtleff at New-Age Foods Study Center, Dec. 21. 1 p. Typed with signature.
• ***Summary:*** "My Dear Mr. Shurtleff–Your name comes to mind very often on account of our close association in the interest of nutrition to the people in America, and I feel you have done a wonderful job in educating the people regarding the value of using foods from Soya Beans. I think now that I have secured three of your Tofu books, but they are all gone, loaned and not returned, so I am ordering another to have sent to my home address on this envelope. I would be glad to mail a check for the exact amount including Postage so if you will send me that by return postage I will send a check for the same at once as I need some data you have given in same.

"Dr. Tojima Yamagata, Minister of Forestry and Agriculture for Japan, paid me a visit about a month ago and has supplied me with some recent pamphlets from his Dept. on Soy Milk. I have wondered if at anytime you are planning a trip to the Los Angeles or Riverside area. The book store here at La Sierra usually handles your book but they are all sold out. Therefore I am hastening to order from you direct, and always glad to hear from you, Yours very sincerely, Harry W. Miller, M.D."

This is a poignant letter and card. On 26 July 1977 Dr. Miller's wife, Mary E. Miller, (now a widow) sends the money Dr. Miller owed for *The Book of Tofu* he ordered and adds: "Please forgive my husband for this long delay, he died on Jan. 1 of this year. He went into the hospital on Nov. 19 of last year and never recovered from a severe heart attack at the age of 97." Address: M.D., 11384 Norwood Ave., Riverside, California 92505.

6571. *Miami News* (*Florida*). 1976. Join in Orange Bowl celebration with lunch & fashion show: The onlooker. Dec. 28. p. 2B.
• ***Summary:*** "Tonight from 7 to 9:30, there's a 'tofu and miso workshop, taught by Bill Shurtleff, author, appropriately enough, of the 'Book of Tofu' and the 'Book of Miso.' The workshop's a production of the East-West Foundation, and its to be held at St. Stephens Church. 2950 MacFarland Rd., Coconut Grove. The cost to get in is $1.50.

"Then, tomorrow from 3 to 6 p.m. Mr. Shurtleff holds a tofu-miso cooking class that costs $3 per chef, and its to be held at 6051 W 46th Terrace. For more information call 661-4495."

The East-West Foundation, founded by Michio Kushi, promotes macrobiotics.

6572. Okada, Katsuto; Ogasa, Katsuhiro; Kuwahara, Kunisuke. Assignors to Morinaga Milk Industry Company, Ltd. (Tokyo, Japan). 1976. Method of manufacturing an

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aseptic soya bean curd. *U.S. Patent* 4,000,326. Dec. 28. 12 p. Application filed 31 July 1975. [2 ref]

• ***Summary:*** Soybean juice is continuously sterilized at 135ºC for 2 seconds after which it is flowed to an aseptic brick filling machine, where it is mixed with glucono delta-lactone and a divalent metal salt. The resulting liquid mixture is continuously filled into containers in an aseptic atmosphere, after which the containers are immersed in hot water to coagulate the mixture.

Note: This patent described a major innovation in tofu packaging. Address: 1&3. Tokyo, Japan; 2. Yokohama, Japan.

6573. *SoyaScan Notes.* 1976. Chronology of soybeans, soyfoods and natural foods in the United States 1976 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Feb. KQED-TV in San Francisco airs a 30-minute special titled "Tofu." It is an interview with William Shurtleff and recipe preparation by Akiko Aoyagi.

March. "The Joys of Soy" by Brenda Bortz, published in *Organic Gardening and Farming* magazine is the first major popular article on tempeh in America. In June, *Prevention* magazine runs a cover story on tempeh.

April. Soybeans: Brazil as a Competitive Force by J.M. Schultz and W.P. Mason submitted as a Harvard Business School MBA thesis. One of the best early in-depth analyses.

April. The second of the new wave of commercial Caucasian-run tofu shops is started by Peter and Judy Beane in Portland, Maine. There were at least 7 small commercial Caucasian-run tofu shops in America by the end of 1976.

May-June. *Mother Earth News* publishes the first of five long articles on soyfoods, each excerpted from *The Book of Tofu.*

June 2-5. First International Workshop on Low-Cost Extrusion Cookers held at Colorado State University, with 51 participants. Organized by Judson Harper and Richard Jansen, with funding from USAID through USDA. The 173-page proceedings, edited by Wilson and Stumpf, are published shortly thereafter. Cereal-soy blends are seen as having great promise for production in developing countries.

This year cereal-soy blends are first produced in Third World countries using low-cost extrusion cookers: Thriposha in Sri Lanka and Maisoy in Bolivia.

July 20. What is Tofu? pamphlet by Shurtleff and Aoyagi published by Westbrae Natural Foods in Berkeley.

Aug. 6. New-Age Foods Study Center established by Shurtleff and Aoyagi in Lafayette, California. The name was changed to The Soyfoods Center in Sept. 1980.

Aug. Larry Needleman of The Learning Tree in California introduces America's second tofu kit, which soon becomes the best-seller nationwide.

Aug. Farm Food Company, a branch of The Farm in Tennessee, opens America's first soy deli, in San Rafael, California. They serve tofu sandwiches, salads, salad dressings, and cheesecakes; tempeh burgers, deep-fried tempeh cutlets, tempeh with creamy tofu topping, and Indonesian delight (tempeh strips); soymilk ice cream, shakes, yogurt, mayonnaise, and whipped creme; soybean stroganoff and burritos; and TVP chili. They essentially launched the concept of second-generation soyfood products.

Sept. 23. *The Book of Miso,* by Shurtleff and Aoyagi published by Autumn Press.

Sept. 29. Shurtleff and Aoyagi begin "Tofu and Miso America Tour." They do 70 public programs nationwide and travel 15,000 miles in their white Dodge van, continuing until 3 Feb. 1977. In the van they carry hundreds of copies of *The Book of Tofu* and *The Book of Miso* and many of Larry Needleman's tofu kits, plus little bags of natural nigari, all of which they sell at their programs. They usually have meals and spend the night with the people who have sponsored and organized their program. They also visit numerous soyfoods producers and researchers, including The Farm in Tennessee from Dec. 21 to Jan. 2. After the tour, tofu shops started in most of the areas where they spoke.

Sept. Dr. Kenneth Bader becomes executive director of the American Soybean Association. With the help of increasing funding from checkoff programs, he ushers in an era of growth, and increased activity and strength for ASA.

Oct. 13-15. Seminars on the use of soy protein for foods and meal for feeds are held in Moscow, sponsored jointly by the U.S. Foreign Agricultural Service, the American Soybean Assoc., and the Food Protein Council. More than 200 Soviet officials attended.

Oct. *The Joy of Soy,* by Sylvia E. Anderson self-published in New Jersey.

Nov. Island Spring starts making tofu in Vashon, Washington. Founded by Luke Lukoskie and Sylvia Nogaki.

Dec. The term "soyfoods" (spelled as one word) is coined by Benjamin Hills of Surata Soyfoods in Eugene, Oregon, for use in their company name. It is first used in a book (*Tofu & Soymilk Production*) by Shurtleff and Aoyagi in July 1979, and as a magazine title in July 1980.

Dec. Morinaga Milk Industry Co. in Japan is granted the world's first patent on a method for manufacturing aseptically packaged tofu (in Tetra Brik cartons), U.S. Patent 4,000,326.

* Kibun, in Japan, introduces East Asia's first commercial fermented soymilk products, a line of acidophilus soymilk drinks brand-named Soena.

* Beginning of the rise of the modern soymilk industry in Japan. This is the first year that a significant amount of soymilk was sold.

* Kikkoman soy sauce passes La Choy to become America's best selling brand of soy sauce. The three major soy sauce markets are consumer retail, restaurants and other institutions, and industrial (for food processors). La Choy may still be the leader in consumer retail; Kikkoman leads in

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restaurants.

* Beef consumption in America peaks at 95.4 pounds per capita. It had risen rapidly from 38.6 lb/person in 1930. After 1976 it falls steadily, hitting 75 lb/person in 1985.

* National Soybean Research Program established in Brazil, building upon the National Soybean Project (1972) and the National Soybean Research Center (1975).

6574. Harrison, Gil. 1976. The Brazilian competition: Will we meet it? *Soybean Digest.* Dec. p. 20-21.
• ***Summary:*** In 1969 no one thought of Brazil as a producer of soybeans; the country's annual soybean production was only 35 million bushels [0.95 million metric tons]. "However, in 1976 the world was astonished to learn that Brazil had surpassed mainland China" to become the world's No. 2 producer of soybeans with a record harvest of 426 million bushels [11.6 million metric tons].

"How did Brazil, Paraguay, Argentina, Colombia and Bolivia get into the soybean business in the first place? There are five explanations. (1) U.S. export embargo [from June 27 to July 2, 1973] that artificially raised world prices until it was profitable for even the most inefficient producers to grow soybeans; (2) U.S. Government help through the Agency for International Development, which provides financing, funding and technology for soybean production; (3) U.S. private industry (in the form of seed companies, farm machinery salesmen, fertilizer producers and insecticide and herbicide manufacturers) is constantly looking for export markets for its products and gives away technology along with sales contracts with overseas farmers; (4) Japanese technical assistance to increase soybean production in a 320 million acre area of marginal frontier land in Brazil; and (5) an urgent need for a highly marketable foreign exchange earner."

"The Brazilian farmer realizes only too well that he is a marginal producer with production costs much higher than the U.S. and that he is at the mercy of world market prices. He would welcome help in the form of market development to increase domestic demand."

Concludes with eight steps that U.S. soybean farmers, through their appointed spokesman, ASA, should take to retain their profitability and growth in soybean production. Address: American Soybean Assoc., Mexico and Northern Latin America Regional Director.

6575. Kawashima, Masao. 1976. Shiramine chihô no shoku seikatsu to ken-dôfu [Hard tofu in the food-life dietary pattern in the region of Shiramine, Japan]. *Chori Kagaku* (*Science of Cookery*) 9(4):205-09. Dec. Illust. [Jap]
• ***Summary:*** Note: Shiramine is a small town in Ishikawa prefecture, in the Hokuriku region of north-central Japan. Address: Habutae Tofu K.K.

6576. Matsuda, Yutaka. 1976. The etymology of soy. *Kwansei* [*Kansai*] *Gakuin University Annual Studies* 25:3-4. Dec. Nishinomiya, Japan. [3 ref. Eng]
• ***Summary:*** "British and American dictionaries including OED (*Oxford English Dictionary*) consider the Japanese word *shôyu* to be derived from Chinese. Is this theory reliable? No!

"OED states that the word is derived from Chinese *shi-yu, shi-yau* (*shi* salted beans, *yu* oil), and *Universal English Dictionary* (1932), *American College Dictionary* (1960), *Random House Dictionary* (1966). *Oxford Dictionary of English Etymology* (1966), *Chambers Twentieth Century Dictionary* (1972) have followed suit. This Chinese pronunciation *shi* appears to represent a character meaning fermented soybeans with salt [fermented black soybeans]. On the other hand, the character meaning fermented soybeans and wheat with salt is transcribed *chiang* in present-day standard Chinese [according to the *pinyin* system established in China in 1957]. *Webster's Third New International Dictionary* (1961) [Web. III] picks out *chiang-yu* as the origin of the Japanese term, and *Klein's Comprehensive Etymological Dictionary* (1967), *American Heritage Dictionary* (1969) [AHD], *Webster's New World Dictionary, College Edition* (1970) also adopted the *chiang* theory.

"In Japan *shi* had been eaten before the Taiho Rei Statute (701), but *shô* rather than *shi* was to the Japanese taste, and *shôyu* squeezed from chiang was used instead of shi-you squeezed from shi. It follows that the OED theory–the *shi* theory cannot be supported.

"The Web. III theory–the *chiang* theory is also doubtful. Web. III and AHD note that the Japanese term *shôyu* is derived from Pekinese, but it is hardly plausible that the compound should come from Modern Standard Chinese, because *shiyau-yu* appeared already in the latter half of the 15th century and the very word itself was entered in the Japanese dictionary published in 1597. Indeed the Chinese characters chiang and you were introduced from Ancient China but the compound word chiang-you [pronounced shoyu in Japanese] was coined in Japan, as today's Japanese dictionaries such as *Shin Jigen* (1968) and *Shin Kanwa Jiten* (1973) label the term as Japanese-made. As a matter of fact, several other compounds coined in Japan have been reexported to China: *tetsuzuki* (procedure) and *torishimari* (control), which seem to have been exported from Japan in the earlier periods of the 20th century, are now used in China, too, pronounced *shôuoxû* and *qûdi,* respectively [as written in pinyin]. The characters pronounced *haken* in Japanese and *bàqáan* in Chinese, meaning hegemony, which is so crucial a compound related to the Shino-Japanese [sic, Sino-Japanese] peace treaty under negotiation that the treaty conclusion depends on whether or not the compound will be included in it, also was coined in Japan. Along with these, the compound word shoyu/chiang-you has been imported from Japan and is pronounced in the Chinese way.

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"Perhaps noticing a marked difference between *chiang-yu* and *shôyu, Webster's New Collegiate Dictionary* (1973) has given up the *chiang* theory and has put forward a new one [Jap. *shôyu,* fr. Chinese (Cantonese) *shi-yaû,* lit. soybean oil]. *Shi-yaû* might be Cantonese *chi you.* Anyway the new theory is nothing but a variant of the OED theory.

"In conclusion, we may duly state that *sôyu* or *soyu* which was the dialectical form of *shôyu* in the latter half of the 17th century was borrowed through Nagasaki into Dutch as *soya* and *soja,* and then from Dutch into English as *soya* and *soy.* The theory that Japanese *soi* was directly adopted into English as *soy* is unsupportable because there was no opportunity at all of direct contact between Japanese and English in those days, though there is a possibility that dialect form *sôi* or *soi* might have existed in Nagasaki at that time." Address: Nishinomiya, Japan.

6577. Pearce, Jean. 1976. Jean Pearce's How to get things done in Japan. Vol. 2. Tokyo: Japan Times. [v] + 295 p. Dec. Company and organization index. General index. 19 cm. [Eng]

• ***Summary:*** The preface begins: "Dear friends, Over the past twelve years, I have been answering letters from both Japanese and foreign readers about this always interesting, often baffling, country." This book is a compilation of those answers / columns, with two helpful indexes. Under each title will be found at least one (but sometimes more) of Jean's responses–but no date and no initial writer's name.

"Sing a song of soybeans" (p. 35-37, two answers). "An American here is dependent upon a Japanese tofu maker for his supply of soybeans. He would like to find a commercial source. Somehow it doesn't seem right to buy soybeans from a tofu maker to make one's own tofu. By the time he reads this he may have found a 15-kilo bag of soybeans at his door. Yoshida Bungo Shoten, one of the largest wholesale dealers in soybeans, is the most cooperative company I've contacted."

"Another man who appreciates soybeans is Rinshiro Kato. He is marketing a soybean derivative called Togen, a powder made from the most nutritious parts of the soybean mixed with wheat flour with similar food values. A 500-gram can costs ¥3,000 and provides a month's supply" at the rate of 3 spoonfuls a day. "The company also makes a Togen cookie with sesame seeds, konbu and honey."

"Learn a little" (p. 170-71): "Tofu. I've been using it for years in all kinds of ways. Yet I never knew about pressing it. This removes the water. Japanese would have you wrap a square of regular (*momengoshi*) tofu (it won't work with the finer textured kinugoshi) in a *tenugui* [thin towel] and gently squeeze out the water. I wrap mine in a towel and put a breadboard on top with a filled teakettle to weight it down. An hour or so later the tofu has an entirely different texture."

Note: This is the earliest document seen (April 2013) that contains the word *momengoshi* (regardless of hyphenation); it refers to regular or "cotton" tofu.

There are three basic types of soy sauce: *Koikuchi* is by far the most widely used. *Usukuchi* is light tan–the choice for lighter color foods like tofu and white fish. The taste is about the same as *koikuchi. Tamari* is slightly thicker, slightly stronger, and frequently used for *sashimi.* "It is made without wheat and is the favorite in the Nagoya area."

"Tofu" (p. 228-29): "A man asks for an unusual recipe that may appeal to those who don't like tofu." If all the traditional and Western ways leave you cold, try this: "Cut tofu in one-inch cubes. Put in a jar and cover with gin. Let it age for two weeks or so, and then you have tofu cheese."

The residue [okara] left after grinding and straining tofu is high in food value. You can buy a plastic bag full for ¥20 of so early in the morning from your favorite tofuya-san. Use it as a food or "put it in a cloth bag and polish your floors. In the old days that was how the Japanese achieved that lovely soft finish we all admired."

Good tofu restaurants in Tokyo are Sasa-no-Yuki not far from Uguisudani station and Goemon, in Bunkyo-ku, up the hill from the Hakusan subway station.

Good books about tofu are *The Art of Just Cooking,* by Lima Ohsawa. *Tofu Recipes,* by Grace Kikuchi. *The Book of Tofu,* by Shurtleff & Aoyagi. Address: [Tokyo, Japan].

6578. Thanh, Vu Huu; Shibasaki, Kazuo. 1976. Major proteins of soybean seeds. A straightforward fractionation and their characterization. *J. of Agricultural and Food Chemistry* 24(6):1117-21. Nov/Dec. [29 ref]

• ***Summary:*** The authors determined the optimum condition for simultaneous fractionation of the 7S and 11S globulins, the two major reserve soybean proteins. Address: Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai, Japan.

6579. **Product Name:** [Soy Milk (Dairylike, Coffee, or Strawberry)].
Foreign Name: Asasyoku [Asashoku] Soy Milk, Soi Miruku.
Manufacturer's Name: Asahi Shokuhin.
Manufacturer's Address: Factory: Mochida Azacho-machi 1991, Oaza, Gyoda-shi, Saitama-ken 361, Japan. Phone: 1485-55-2351.
Date of Introduction: 1976.
Wt/Vol., Packaging, Price: 500 ml Pure-Pak cartons.
How Stored: Refrigerated.
New Product–Documentation: Product with Labels (Pure Pak cartons) purchased in 1976 at a Seiyu department store in Tokyo, Japan. Also in 1976 William Shurtleff visited the plant in Saitama where this soymilk was made. Leaflet. 8½ by 11 inches, color. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center.

Brochure (8 pages, black and white, in Japanese). 1978? Asashoku Soi Miruku. On the cover is a photo of the carton.

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Brochure (8 pages, black and white, in Japanese). 1978? Asahi Sokuhin K.K. On the cover is an aerial photo of the soymilk plant in Saitama Prefecture–surrounded by rice fields.

Shurtleff & Aoyagi. 1979. Tofu & Soymilk Production. p. 313. "Asahi Shokuhin, Factory: Mochida Azacho-machi 1991, Oaza, Gyoda-shi, Saitama-ken 361. Tel. 1485-55-2351. Head office: Higashi-kan 3-gai, Yamanote Bldg., Minami Ikebukuro 1-19-12, Toshima-ku, Tokyo 171, Japan. Tel. 03-987-2175. Attn. Mrs. Sato, Eigyo-bu. Maker of what we consider to be Japan's most delicious dairylike soymilk; plain (vanilla), coffee, and strawberry flavors. Sold in 500 cc cartons at Seiyu department stores." Note: This was an outstanding and innovative product, including its packaging in large, low-cost cartons.

Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that Asahi Shokuhin first made commercial soymilk in Japan in 1976.

K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 73. States that Asashoku Soimiruku in 500 ml L cartons was first introduced in April 1982.

6580. Hayashi, Koreichi; Nagao, Kazumi; Tosa, Sachiyo; Yoshioka, Hideaki. 1976. Nattô no eiyô-ka ni kansuru jikken-teki kenkyû. VIII. Nattô tenka-shoku to SHR no ketsuatsu to no kanren ni tsuite [Experimental study on the nutritional value of natto. VIII. The relationship between a diet containing natto and the blood pressure of SHR]. *Teikoku Gakuen Kiyo* (*Memoirs of the Teikoku Women's University*) 2:9-17. [Jap]*

6581. Hayashi, Koreichi; Nagao, Kazumi; Wakabayashi, Keiko; Takahashi, Hiromi. 1976. Nattô no eiyô-ka ni kansuru jikken-teki kenkyû. XI. Nattô-shoku ni okeru reshichin, mechionin, keiran oyobi gyûniku no hosoku kôka [Experimental study on the nutritional value of natto. IX. The effect of substituting lecithin, methionine, chicken, eggs, or beef for natto in the diet]. *Teikoku Gakuen Kiyo* (*Memoirs of the Teikoku Women's University*) 2:19-24. [Jap]*

6582. Ito, H. 1976. [The flavor of miso: A review of the literature]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 71(7):500-04. July. [37 ref. Jap]* Address: Food Research Inst., Ministry of Agriculture & Forestry, Fukugawa, Tokyo, Japan.

6583. Japanese Ministry of Agriculture and Forestry. 1976. [Fermented soymilk]. *Japanese Patent* 51-22,070. [Jap]*

6584. Kanematsu, H.; Maruyama, T.; Niiya, I.; Imamura, M.; Suzuki, K.; Kutsuwa, Y.; Murase, I.; Matsumoto, T. 1976. Shokuyô yushi no seisei, kakô kôtei ni okeru biryo seibun no kyôdô ni tsuite. II. Kôka kôtei ni okeru PCB, yûki enso-kei noyaku no shôchô [Studies on the behavior of trace components in oils and fats during processing for edible use. II. Variation in the amount of PCB and organochlorine pesticides during the hydrogenation process]. *Yukagaku* (*Oil Chemistry*) 25(1):42-46. (Chem. Abst. 84:104013). [7 ref. Jap; eng]

• ***Summary:*** Five types of organochlorine pesticides and PCB (polychlorinated biphenyl; a family of highly toxic chemical compounds) were added to purified soybean oil and the oil was hydrogenated under 11 different conditions. The amounts of residual organochlorine pesticides and PCB were determined, and it was found that they decreased markedly by hydrogenation–but the degree of decrease was not uniform. Address: 1-4. Japan Institute of Oils, Fats & Other Foods Inspection Foundation, Nihonbashi Hama-cho 3-27-8, Chuo-ku, Tokyo-to, Japan; 5-7. Asahi Electro Chemical Co. Ltd., Tokyo. 8. Nihon Univ., College of Science & Technology, Kanda-Surugadai 1-8, Chiyoda-ku, Tokyo.

6585. **Product Name:** Kikkoman Instant Miso-Shiru Soy Bean Soup Mix [Shiro (White), or Aka (Red)].
Manufacturer's Name: Kikkoman Corporation.
Manufacturer's Address: Noda 278, Chiba-ken, Japan.
Date of Introduction: 1976.
Ingredients: Incl. miso (soybeans, rice, salt), dried green onions (negi), dried wheat gluten cakes (fu), dried seaweed, bonito extract, and MSG (monosodium glutamate).
Wt/Vol., Packaging, Price: 1.83 oz foil pouch retails for about $1.07 (May 1980).
How Stored: Shelf stable.
New Product–Documentation: *Food Product Development.* 1980. May. p. 26. Label in both Japanese and English. Front panel shows a drawing of a miso soup cup with a happy face on it. Each pouch contains 5 individual serving packets.

6586. Komatsuzaki, T.; Ohkuro, I.; Kohno, T.; Ito, S. 1976. [Virulence and lipase of bacillus natto]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 93:403-08. [Jap]*

6587. **Product Name:** [Soymilk].
Manufacturer's Name: Kyushu Milk Co. Ltd.
Manufacturer's Address: Moto-machi 4311, Oita-shi, Oita-ken 870, Japan.
Date of Introduction: 1976.
New Product–Documentation: Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64. "A new era [in soymilk production in Japan] began in 1976 when Kyushu Milk Co., a long-established middle sized dairy milk company, started making soymilk."

6588. Machida, Yoshiro. 1976. Tônyû gyôkai no tenbô to kongo [A view of the soymilk industry and its future]. *Shokuhin Kaihatsu* (*Up-to-Date Food Processing*) 11(6):20-26. [Jap]

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• ***Summary:*** This article is from a special issue titled "New Trends in Soymilk Development" (*Tônyû Kaihatsu no Shin Dôkô*). Address: Shokuhin Gijutsu Kenkyusho-cho, Gijutsu-shi.

6589. Mori, T.; Murai, O.; Miyawaki, K.; Ohta, K. 1976. Reito edamame no fumi to genka no chozo jotai narabi no kako hoho no kankei [Relationship between the flavor of green vegetable soybeans and the method of storing and of processing the green vegetable soybeans]. *Kagawa-ken Nogyo Shikenjo Kenkyu Hokoku* (*Kagawa Prefecture Agricultural Experiment Station, Research Report*) 28:83-87. [Jap]*

6590. Mori, T.; Kubo, T.; Murai, O.; Miyawaki, K.; Ohta, K. 1976. Edamame no hinshu oyobi wa shuki to reito yogenka to shite no teisei ni tsuite [Relationship between green vegetable soybean varieties and their maturation times and characteristics of the raw materials in freezing]. *Kagawa-ken Nogyo Shikenjo Kenkyu Hokoku* (*Kagawa Prefecture Agricultural Experiment Station, Research Report*) 28:79-82. [Jap]*

6591. Nakano, Masahiro; Ebine, H.; Ito, H. 1976. On the miso, a Japanese traditional fermented food, in view of ecological system of fermentation microorganisms depending on the types of miso products. In: H. Dellweg, ed. 1976. Abstracts of Papers, Fifth International Fermentation Symposium (Germany). See p. 363.
Address: 1. Faculty of Agriculture, Meiji Univ., Japan; 2. National Food Research Inst., Tokyo.

6592. Nisshin Oil Mills. 1976. Tônyû inryô no seizô-hô [Method for making soymilk beverage]. *Japanese Patent* 51-36340. [Jap]
Address: Nisshin Seiyu K.K., Tokyo, Japan.

6593. Okamoto, Susumu. 1976. Yubamaku no seisei to riyô [Formation of yuba films and their utilization]. *Chori Kagaku* (*Cookery Science*) 9(3):17. [Jap]*

6594. Okubo, Kazuo. 1976. Tônyû o chûshin to shita saikin no kenkyû [Recent research that centers on soymilk]. *Shokuhin Kaihatsu* (*Up-to-Date Food Processing*) 11(6):33-38. [24 ref. Jap]
• ***Summary:*** This article is from a special issue titled "New Trends in Soymilk Development" (*Tônyû Kaihatsu no Shin Dôkô*). Address: Yamagata Daigaku Kyoiku Gakubu Eiyo, Skokuhin Gaku Kenkyushitsu, Shokuhin Kaihatsu.

6595. Ota, K. 1976. [Vegetable growing in rice paddy fields converted from rice culture: Cropping patterns and varieties in soybean culture]. *Nogyo Oyobi Engei* (*Agriculture and Horticulture*) 51:677-79; 51:770-72; 51:885-88. [Jap]*
Address: Japan.

6596. Otsuki, Kôzô; Kawabata, Noboru; Taguchi, Kuniko. 1976. Nattô-kin no kintai-gai seruraaze oyobi kishinaraaze [Extra fungal body cellulase and xylanase? of the natto bacterium]. *Kyoto Furitsu Daigaku Gakujutsu Hokoku* (*Scientific Reports of the Kyoto Prefectural University*) No. 27. p. 21. [Jap]*

6597. Otsuki, Kôzô; Kawabata, Noboru; Taguchi, Kuniko. 1976. Nattô-kin no kintai-gai seruraaze oyobi kishinaraaze [Extra fungal body cellulase and xylanase of the natto bacterium]. *Kyoto Furitsu Daigaku Gakujutsu Hokoku B* (*Scientific Reports of the Kyoto Prefectural University, B*) No. 27. p. 21-26. [Jap]*
• ***Summary:*** Note: *Webster's Dictionary* defines xylan (a term first used in about 1894) as "a yellow gummy pentosan [a type of polysaccharide, or complex carbohydrate] that yields xylose on hydrolysis and is abundantly present in plant cell walls and woody tissue." Thus xylanase is the enzyme that hydrolyzes xylan.

6598. Otsuki, Kôzô; Kawabata, Noboru; Taguchi, Kuniko. 1976. [Studies on the cellulase and xylanase in the culture medium of *Bacillus subtilis* var. *natto*]. *Kyoto Furitsu Daigaku Gakujutsu Hokoku B* (*Scientific Reports of the Kyoto Prefectural University, B*) No. 27. p. 11-15. [Jap]*

6599. **Product Name:** [Soymilk].
Manufacturer's Name: Soken-sha K.K.
Manufacturer's Address: 724 Katakura-cho, Kanagawa-ku, Yokohama-shi 221, Japan. Phone: 045-491-1441.
Date of Introduction: 1976.
New Product–Documentation: Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that Soken-sha first made commercial soymilk in Japan in 1976.

K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 73. Sôken-sha introduced Benibana Tônyû (in plain and cocoa flavors) in Aug. 1982 in 200 ml long-life packs and distributed it nationwide.

Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64. The contact person is Mr. Kamoi.

6600. Taira, Harue; Taira, Hirokadzu; Kaizuma, Norihiko; Fukui, J.; Matsumoto, S. 1976. [Varietal differences of seed weight, protein and sulfur-containing amino acid content of soybean seeds]. *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 45(3):381-93. [35+ ref. Jap; eng]
• ***Summary:*** These studies sought to determine the effect of varietal differences on seed weight (dry weight), protein content (moisture free basis), and sulfur-containing amino acid content in the protein (N x 6.25; methionine, cystine, and methionine + cystine) of 1,110 samples of soybean seeds

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grown in 1970 at Kariwano, Akita, Japan.

For all the samples, the weight of 100 seeds ranged from 2.6 gm to 47.0 gm, with a mean value of 20.4 gm, and a coefficient of variation of 35.59%.

The protein content ranged from 29.81% to 53.29%, with a mean value of 39.82% and a coefficient of variation of 7.71%.

The methionine content ranged from 0.78% to 1.34%, with a mean value of 1.03% and a coefficient of variation of 7.71%.

The cystine content ranged from 0.85% to 2.36%, with a mean value of 1.40% and a coefficient of variation of 17.14%.

The total sulfur-containing amino acids (methionine + cystine) content ranged from 1.66% to 3.52%, with a mean value of 2.43% and a coefficient of variation of 11.93%.

Concerning the mean value of each group classified by place of origin of the variety, the weight of 100 seeds was smallest in Southeast Asia (10.0 gm) and largest in Tohoku [northeastern provinces], Japan (24.2 gm).

Protein content was lowest in Europe (35.98%) and highest in Southeast Asia (43.35%).

Methionine content was lowest in the Chugoku [southwestern] region of Japan (0.93%) and highest in Southeast Asia (1.14%). Cystine content was lowest in Hokkaido [Japan's northernmost main island] (1.32%) and highest in Europe (2.02%). The content of total sulfur-containing amino acids was lowest in Chugoku (2.30%) and highest in Europe (3.13%). Address: 1-2. National Food Research Inst., Ministry of Agric. & Forestry, Koto-ku, Tokyo; 3-4. Faculty of Agric., Iwate Univ., Morioka; 5. Tohoku National Agric. Exp. Station, Kariwano, Akita. All: Japan.

6601. Takahashi, S. 1976. [Studies on the cause of bitter taste and ammonia in manufactured fermented soybeans]. *Ehime-ken Kogyo Shikenjo Kenkyu Hokoku* (*Bulletin of the Industrial Research Institute of Ehime Prefecture*) 14:13-18. (Chem. Abst. 87:116606. 1977). [Jap; eng]*

6602. Tsuchiya, Kanji. 1976. Tônyû seizô gijutsu-sha no teigen [A proposal from a technician concerning soymilk production]. *Shokuhin Kaihatsu* (*Up-to-Date Food Processing*) 11(6):27-32. [Jap]

• ***Summary:*** This article is from a special issue titled "New Trends in Soymilk Development" (*Tônyû Kaihatsu no Shin Dôkô*). Address: K.K. Soimiiru (Soymeal).

6603. Utaka, K.; Fukazawa, C. 1976. Gelation mechanism of soybean proteins treated by ficin. In: 1976. Report of the 39th Daizu Shokuhin Kaihatsu Kenkyukai. Tokyo, Japan. See p. 3. *

• ***Summary:*** Ficin, a plant proteolytic enzyme, was able to coagulate soymilk. The resulting curd had a very bitter taste, but it could be improved if the ficin was purified by column chromatography.

6604. Yamashita, Akira. 1976. Tôfu no seizo katei ni okeru shishitsu seibun no hendô ni tsuite [Changes in the lipid composition of tofu during the manufacturing process]. *Obihiro Otani Tandai Kiyo* [Jap]*
Address: Obihiro, Hokkaido, Japan.

6605. **Product Name:** [Natto Miso].
Foreign Name: Nattô Miso.
Manufacturer's Name: Yoshida Shohachi Shoten K.K.
Manufacturer's Address: Takashima 1-382, Shimabara-shi, Nagasaki-ken, Japan. Phone: 0957-62-4107.
Date of Introduction: 1976.
New Product–Documentation: Shurtleff and Aoyagi. 1976. *The Book of Miso.* p. 43, 239. Shurtleff and Aoyagi. 1983. *The Book of Miso,* 2nd ed. p. 42, 258 (R.1). "Natto Miso: Prepared in the area of Nagasaki since the 1700s, natto miso contains a relatively large proportion of soybeans which gives it an appearance similar to the famous sticky fermented soybeans called *natto,* although there are no real natto in natto miso. Containing whole soybeans, barley koji, slivered kombu, gingerroot, and, in some modern varieties, *mizuamé* (a natural honeylike sweetener extracted from rice [rice syrup], millet, or barley), this miso is fermented at the natural temperature for about 30 days. One delicious and very popular variety, now widely available in the United States, is free of preservatives, artificial or refined sweeteners, and all other additives–proving that it can still be done. We would prefer to see this and all similar misos labeled as 'Finger Lickin' Miso;' we feel the general term is more appealing and less confusing." Page 258 states that the maker of this traditional, natural product is Yoshida Shohachi Shoten.

6606. Chen, Tung-ta. 1976. Chûgoku-shiki yôjô-hô [Chinese rules for good health]. Kyoto: PHP Kenkyujo. 215 p. 18 cm. [Jap]

6607. Claiborne, Craig. 1976. Craig Claiborne's favorites from the New York Times. Vol. 2. New York, NY: Quadrangle / New York Times Book Co. 442 p. See p. 58. Illust. Index. 28 cm.

• ***Summary:*** The Foreword begins: "We are endlessly impressed with the subtle yet seemingly rapid increase in the sophistication of American taste."

After the recipe for "Hunan lamb," we read (p. 58): "Note: There are two kinds of soy sauce used in Chinese cookery. Thin or light soy is the most commonly found in supermarkets. Dark or heavy soy sauce, widely available in Chinese and other Oriental stores, has a greater viscosity."

The section titled "The Japanese grill" (p. 214-18) mentions "dark soy sauce," "light soy sauce," "misoshiru," and "miso (bean paste)." Address: New York.

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6608. Davis, Glenn C.; Minor, Harry C. 1976. Weeds as a factor in soybean production in southern Brazil. In: L.D. Hill, ed. 1976. World Soybean Research [Conference I: Proceedings]. Danville, Illinois: Interstate Printers and Publishers, Inc. xvii + 1073 p. See p. 411-19. [10 ref]
• ***Summary:*** "The soybean is not new in Brazil. Gustavo D'Utra referred to soybean cultivation in Bahia in 1882. In 1908 the crop was introduced it the state of Sao Paulo by Japanese immigrants and into Rio Grande do Sul in 1914 by Professor E.C. Craigg of the Federal University of Rio Grande do Sul."

Contents: Introduction. Weeds in soybeans in Brazil. Conclusions. References. Address: EMBRAPA / U.S. Agency for International Development (USAID) / The Univ. of Wisconsin, Londrina, Parana, Brazil.

6609. Hattyo Miso Kakkyu Goshikaisha. 1976. The history and general condition of Hattyo Miso Kakkyu Goshikaisha. Aza, Okan-dori 69, Hatcho-cho, Okazaki-shi, Aichi-ken, Japan. 4 p. Also published in Japanese as Hatcho Miso no O-hanashi. [Eng]
• ***Summary:*** This company is said to have been established in 1362 A.D. Reorganized as Hayakawa Kyuemon Shoten Co. in 1932. Name changed to Hatcho Miso Kakkyu Goshi-gaisha in 1963. Mr. Kyuemon Hayakawa is the 18th proprietor. Many tankas (Japanese odes of 31 syllables) on Hatcho miso were composed by famous poets. The plant is located beside the Yahagi River. They began to sell miso to the Imperial Household in December 1892. In March 1953 Prince Akihito took Hatcho miso on his European tour. Since 1959 six Antarctic expeditions have taken Hatcho with them. Address: Okazaki, Aichi, Japan.

6610. Hayashi, Minao. 1976. Kandai no bunbutsu [Han dynasty civilization and objects]. Tokyo: Tokyo Daigaku, Jimbun Kagaku Kenkyujo. 576 p. [Jap]*
• ***Summary:*** Bo (1982): This book contains a simple drawing of soy sauce making equipment. It shows a hole in the bottom of an earthenware chiang crock, from which liquid soy sauce can be drawn off. The Chinese also put a basket into the crock to draw off the liquid. This is the strongest known evidence that soy sauce existed at the time of the Han dynasty. But it is better to think that its production stems as far back as the Ch'in (221-206 B.C.) or Warring States (403-221) periods.

Note: Hayashi, born in 1925, is a famous Japanese archaeologist, and art- and cultural historian.

6611. Hitomi, Hitsudai; Shimada, Isao. 1976. Honchô shokkan [A mirror of food in this dynasty. 5 vols.]. Tokyo: Heibonsha. 18 cm. Translation from the 1697 Chinese-language edition by Isao Shimada of the *Pen chao shih chien.* [Jap]*
• ***Summary:*** See Hitomi 1695. He died in 1701.

6612. Iwadare, Shoji. 1976. Miso, nattô, tôfu kenkô-hô [Miso, natto, tofu: The way to health]. Tokyo: Yomiuri Shinbun-sha. 238 p. Illust. 18 cm. [Jap]
• ***Summary:*** Soyfoods Center has done a 10-page typed translation of the natto section of this book. Contents: Legends of natto's origin: Pinch hitter in times of food shortage, natto's stringiness surprised people of the Yayoi period (200 B.C.–A.D. 250), Hachimantaro Yoshiie–Natto's first public relations agent (1051-1085), calling out "natto, natto" starting in the Edo period (1603), areas where natto is popular today.

The technical revolution in natto production: Pioneers of commercial natto production (Drs. Yabe, Sawamura, Hanzawa), University Natto sold by Hokkaido University, what kind of natto is most delicious?

The effectiveness of natto: The procreative power of natto bacteria promotes long life in people who eat natto, natto can cure diarrhea, natto suppresses typhus and cholera bacteria (in 1936 Dr. Matsumura, a Kyoto University bacteriologist, found with rabbits that natto bacteria actually killed typhus bacteria), natto does the following–helps people with weak stomach and intestines, prevents intestinal gas, fights cancer (Kameda 1967), prevents radiation harm (via dipicolinic acid, which was first discovered in natto and later found in all bacterial cells; it binds heavy metals like radioactive strontium and expels them from the body), prevents infant milk allergy, contains vitamin B-2 which increases stamina, rejuvenates the cells.

Natto throughout the provinces: Hikiwari natto from Tsugaru, Hikiwari natto from Akita (the birthplace of natto is said to be Oyashin-machi in Yokote city, Akita prefecture; charred soybeans mixed with Yayoi period earthenware pottery from 2,000 years ago have been excavated from ruins at nearby Mt. Komori), Hettsui natto from Saitama prefecture, Naisho mame from Gunma prefecture, small-bean natto from Mito, Tataki natto from Kyoto, Koru mame from Higo.

Seasonal natto recipes: Spring, summer, fall, winter, all four seasons.

Natto's springiness surprised people of the Yayoi period (200 BC–250 AD): There are various legends regarding the origin of natto but all begin with the meeting of cooked soybeans and rice straw. No documents record this origin. Yet soybeans and rice straw are known to have existed in Japan since the Yayoi period. Perhaps a piece of rice straw fell into a portion of leftover soybeans. In pit dwellings with rice straw roofs, rice straw littered the floor and the rooms were warm. At the proper temperature (how?) the beans would develop stickiness/strings and a good flavor result. The subtle sweetness of rice straw added to the unique aroma. Some may have eaten the natto sprinkled with salt. Once you've tasted natto you can never forget the flavor.

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Some women may then have incubated natto next to their bodies overnight in bed. The Yayoi era is concealed in the transmission of Hikiwari natto since ancient times in the northeast prefectures.

There is also the legend that cooked soybeans were offered at household Shinto shrines on which there was often a rope of braided rice straw (*shimenawa*). (The first character of the word natto means "to offer.") The bacteria from the straw may have inoculated the beans; it is generally thought that they were developed in Japan.

Hachimantaro Yoshiie was a general of the Genji clan during the wars of 1051 and 1085. One night during the war the soldiers were cooking soybeans for horse fodder when they were suddenly attacked. They quickly packed the beans into a rice-straw sack (*tawara*), tied the bag to a horse's back and battled for several days. Finally, the battle over, they took the bundle off the warm horse's back and opened it to find that the cooked soybeans had fermented to become natto. In the second war, Yoshiie had captured a fortress in Sankanbu Akita in northern Japan. He wanted to give cooked soybeans to the local farmers as a gift but since he was in a hurry and had no other container, he put them in a rice-straw sack and gave it to them. All were surprised when, after several days, the beans gave off a unique odor and were stringy. The farmers liked the flavor and soon adopted natto as a food. Yoshiie, having enjoyed natto, recommended it to his fellow men. The farmers soon learned of this and began producing natto. The tradition has been passed down from generation to generation.

After his conquests in Northern Japan, Yoshiie's army returned to Kyoto and he taught people along the way how to make natto. The people of Sankanbu in Akita, far from the sea, had little fish or other animal protein in their diet and must have delighted in natto. The route taken by Yoshiie back to Kyoto has been called the 'natto road.'

Page 141: The word "natto" first appeared in 1286 in the *Shinsaru Gakki,* by Fujiwara Myoe,... Address: Tokyo, Japan. President of Manyu Eiyo KK. Teaching at Nihon Daigaku Daigaku-in and Meiji Daigaku Nôgaku-bu. Prof. at Shobirin Joshi Tanki Daigaku.

6613. Iwadare, Shoji. 1976. Miso, nattô, tôfu kenkô-hô [Miso, natto, tofu: The way to health. Shiokara natto, kara natto, and tera natto] (Document part). Tokyo: Yomiuri Shinbun-sha. 238 p. Illust. 18 cm. [Jap]

• ***Summary:*** Page 141: The word "natto" first appeared in 1286 in the *Shinsaru Gakki,* by Fujiwara Myoe, whose epicurean sister was said to love *shiokara natto* or salty natto [fermented black soybeans]. The ingredients used to make this salty product are 100 kg soybeans, 100 kg barley flour, and 30 kg salt. It is also called T'ang natto (*kara-natto*) and was used as an hors d'oeuvre with saké or in place of tea cakes (*chauke*) with tea.

Tera-natto used as gifts at O-bon and New Years: At Nara's temples Kofukuji and Todaiji, the monks made salty natto and gave them to the parishioners at O-bon and New Years. Later the tradition was transmitted to Kyoto and became the now famous Daitokuji natto and Tenryuji Natto (?), each varieties of "T'ang natto" (*kara-natto*) or "shiokara-natto."

Note: This is the earliest (and only) document seen (Nov. 2011) which states that salty natto [fermented black soybeans] were made at Kofukuji temple in Nara.

All these types contain salt, are inoculated with a mold, have a dark color (and no strings), and have a long shelf life. Today at Daitokuji one can still see the splendid *Nassho* (offering place or natto place) which, according to the book *Honcho Shokkan,* was given this name since that was where natto were (originally?) made [and used as an offering]. Natto were an important protein source for the vegetarian monks.

Differences between tera-natto [salty natto] and itohiki-natto [stringy, unsalted natto]: Tera-natto first came to be made by monks in temples. These savory fermented black soybeans and chunks were close relatives of miso and shoyu. Japanese Buddhist monks who went to China to practice during the T'ang dynasty (618-906) learned how to make these condiments and brought the knowledge back to Japan, where they made them in temples. They are made with molds (mainly *Aspergillus oryzae*) rather than bacteria (which are used to make itohiki natto). Cooked soybeans are dusted with roasted wheat or barley flour which is mixed with mold spores, incubated until a mycelium forms, sun-dried, pickled in brine with seasonings, then sun-dried again. Daitokuji natto is crushed then reshaped into lumps, while Hamanatto, made at Daifukuji is sold as is. When Tokugawa Ieyasu (military ruler / shogun of Japan, 1600-1603) conducted his military campaign in Korea [1592] he had large quantities of Hamanatto produced as food for his soldiers; later it became a commercial product, today's Hamanatto. The "natto" that appear in ancient documents are mostly these fermented black soybeans [salty, fermented soybeans]. Address: Tokyo, Japan. President of Manyu Eiyo KK. Teaching at Nihon Daigaku Daigaku-in and Meiji Daigaku Nôgaku-bu. Prof. at Shobirin Joshi Tanki Daigaku.

6614. Japanese National Miso Assoc. 1976. Miso digest [Miso digest]. Tokyo: Zenkoku Miso Kogyo Kyodo Kumiai Rengokai. 48 p. 13 x 18 cm. [Jap]

• ***Summary:*** Full of useful and up-to-date information about miso in Japan. On the cover, printed with light purple ink on white, is a fisherman, seated on stylized waves, holding a sea bream under his left arm. Address: Japan.

6615. Kagaku Gijutsu Kyoiku Kyokai. 1976. Shôyu no kagaku [The science of shoyu]. Tokyo?: Zaidan Hôjin Kagaku Gijutsu Kyôiku Kyôkai. 63 p. Series: Seikatsu no Kagaku, No. 8. Saddle stitched. 26 cm. [Jap]

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• ***Summary:*** Company name with diacritics is: Kagaku Gijutsu Kyôiku Kyôkai.

6616. Kaizuma, Norihiko. 1976. Japanese germplasm collection. In: L.D. Hill, ed. 1976. World Soybean Research [Conference I: Proceedings]. Danville, Illinois: Interstate Printers and Publishers, Inc. xvii + 1073 p. See p. 298-305. [5 ref]
• ***Summary:*** Contents: Introduction. Present system and situation of the preservation of cultivated soybeans: National preservation system, preservation situation in the breeding centers. Wild soybean collection: Present situation of the collection, characteristics of the wild soybean. Address: Faculty of Agriculture, Iwate Univ., Ueda, Morioka, Iwate-ken, Japan.

6617. Kikkoman K.K. 1976. Dai 58 ki hôkoku-sho. Showa 50 nen 1 gatsu 1 nichi–Showa 50 nen 12 gatsu 31 nichi [58th annual financial report. From 1 Jan. 1975 to 31 Dec. 1975]. Tokyo, Japan. 13 p. 19 cm. [Jap]
• ***Summary:*** Written entirely in Japanese with no photos. Address: Tokyo, Japan.

6618. Koshiyama, I.; Fukushima, D. 1976. Physico-chemical studies on the 11S globulin in soybean seeds: size and shape determination of the molecule. *International J. of Peptide and Protein Research* 8(3):283-89. [43 ref]
Address: Noda Inst. for Scientific Research, Noda-shi, Chiba-ken, Japan.

6619. Masui, Sadao. 1976. Tomorokoshi, ingen, edamame, endo, soramame [Corn, string beans / French beans, green vegetable soybeans, peas, broad beans / fava beans]. Tokyo: Nihon Hoso Shuppan Kyokai. 142 p. Color illust. 19 cm. Series: NHK shumi no engei, sagyo 12-ka getsu, No. 3. [Jap]*
• ***Summary:*** Sadao Masui was born in 1917. Address: Japan.

6620. Matsumoto, Nobumasa. 1976. Shôyu monogatari [The tale of shoyu]. Japan: Kikkoman Shoyu Co. Ltd. 172 p. [Jap]*
• ***Summary:*** A superficial pocketbook about Kikkoman only, but containing some interesting historical information.

6621. Nagano-ken Kori-dofu Kogyo Kyodo Kumiai. 1976. Kenko na karada to tabemono. Jissho sareta kôri-dôfu no shinka. Seijinbyô no yobô to biyô [A healthy body and food: Reevaluation of the true value of dried-frozen tofu. Prevention of geriatric diseases and beauty care]. Nagano-ken. 20 p. 21 cm. [Jap]
• ***Summary:*** This research shows that consumption of dried-frozen tofu lowers blood cholesterol in human beings. The experiment used a crossover design. This report was presented by Dr. T. Miyoshi (of Tokushima Univ. Medical Dept.) at the International Nutrition Conference held 3-9 Aug. 1975 in Kyoto, Japan. It is based on research conducted by Dr. T. Fukui (presently director of the National Nutrition Research Center) and his group of 6. The 3-month study was conducted in the fall of 1974, when Dr. Fukui was a professor at Tokushima Univ. Medical Dept. There were 6 human subject, 4 men and 2 women, ages 27-62. In the experiment, each person consumed his or her regular diet for 4 days, then meat-centered meals for 10 days, then meals based on dried-frozen tofu for 39 days, then regular meals for 18 days, then meat centered meals for 9 days. Recipes are given. Cholesterol levels for each person were monitored and graphed. They rose during the meat-eating period, dropped during the tofu-eating, and rose again during the meat-eating period. Address: Nagano, Japan.

6622. Nakamura, Hiroshi. 1976. Daizu no keizai. Sekai no daizu seisan, ryûtsu, shôhi no jittai [Soybean economics. Present status of world soybean production, trade, and consumption]. Tokyo: Saiwai Shobo. 180 p. [Jap]
Address: Hohnen Oil Co.

6623. Nippon Torui Kikin Kyokai. 1976. Daizu ni kansuru bunken mokuroku [List of documents on soybeans and soyfoods]. Tokyo: NTKK. Vol. 2, post 1961. 93 p. [Jap]
Address: Tokyo, Japan.

6624. Nix, Janeth Johnson. 1976. Adventures in oriental cooking. San Francisco, California: Ortho Book Division, Chevron Chemical Company. 96 p. Illust. (color). 28 cm. Ortho book series.
• ***Summary:*** By "Oriental" this book means mostly China and Japan. Soy related: Crisp chicken teriyaki (with soy sauce made into teriyaki sauce, p. 14). Tofu salad (with 1 pound soybean cake, p. 15). Fu yu spareribs (with ¼ cup *fu yu,* fermented bean cake, p. 19).

The section on "Ingredients and equipment" (p. 22-31) begins with a full-page color photo in which we can clearly see: Azumaya tofu in a white plastic film-sealed tub, a plastic bag of "salted black bean" [fermented black soybeans] (ingredients: Black beans, ginger and salt), small pieces of deep-fried tofu, miso in plastic tubs, Kikkoman soy sauce in a large rectangular can, Aji-no-Moto in a red can, etc. The text discusses: Soy sauce ("The one essential ingredient in Chinese and Japanese cooking"). Japanese sauces, seasonings, and pickles ("For example, besides soy sauce, you can find low-sodium soy sauce {for specialized diets}, sukiyaki sauce, teriyaki sauce, and soup base for noodles," p. 24).

Note: This is the earliest English-language document seen (May 2011) that mentions "low-sodium soy sauce."

Chinese sauces, seasonings, and pickles, incl. the following which contain soy sauce: oyster sauce, brown bean sauce, Szechwan bean sauce, sweet bean sauce, hot bean

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sauce. Fermented black beans.

Bean cake–fresh and fried ("Soybean cake is almost as much a staple in Oriental cooking as rice." The regular type is called tofu in Japan and dow-foo in Chinese. But there are other varieties: softer, firmer, dried, fried {comes in cubes, squares, and oblongs...} Fermented bean cake, also called red bean curd, white bean curd, or *fu yu,"* is often sold in jars. Miso, used mainly in Japanese cooking, comes in many colors).

Bean sprouts mean mung bean sprouts. Foods from the sea include Japanese kombu and nori.

In this same section is a sub-section (p. 30-31) titled "The language of Oriental cooking," a glossary that includes: Aburage. Age-zushi. Aka-miso. Buta-dofu ("Pork with soybean cake"). Dow foo pok ("Fried soybean cake"). Fu yu ("Fermented soybean cake, used as a seasoning"). Hoisin ("Thick, slightly sweet Chinese sauce made from a soybean base"). Kitsune-zushi: See Age-zushi. Miso ("Red or white soybean paste"). Miso shiru (Japanese miso soup). Miso-yaki (Broiled food that has been marinated in miso). Monosodium glutamate (A white, crystalline flavor-enhancing agent). Nori. Norimaki. Shiro miso ("White soybean paste"). Shoyu ("Japanese soy sauce"). Sukiyaki. Sumiso. Suribachi. Surikogi. Tempura. Teriyaki. Tofu. Umeboshi. Wakame. Wok. Yin and Yang.

Soy related: Miso soup recipes (3, p. 34). Age-zushi (p. 52). Melting spareribs with black bean sauce (with 2 tablespoons fermented black beans, p. 63). Pork roast with miso (p. 64). Stuffed bean cake (with fried bean cake, p. 64). Sukiyaki (with 1 pound square tofu {soybean cake} cut into 1-inch squares, p. 66-67).

In the section on Oriental vegetables is a long sub-section titled "Soybeans" (with a color photo of green soybeans growing on a plant, p. 94-95) which includes how to grow them in a home garden. The soybean plant has its own time clock, which gets its signal for flowering from the sky. "Short nights (long days) delay flowering; long nights (short days) speed up flowering." Soybeans need a special inoculant of nitrogen-fixing bacteria. Describes how to cook and shell the beans in the pods, and to serve them cool, while still in the pod, as is commonly done in Japan.

6625. Ogura, Shigenari. 1976. Shizen chiyu-ryoku o ikase: Nanbyo chiryo no kimete? [Activate the natural healing power: This is the best way to treat difficult diseases]. Osaka, Japan: Sogen-sha. 14 + 312 p. Illust. 19 cm. [Jap]*
Address: Japan.

6626. Oiso, Toshio. 1976. History of food and diet in Japan. *Progress in Food and Nutrition Science* 2(1):35-48.
• ***Summary:*** Contents: 1. Fundamental conditions in the history of the food habits of the Japanese. 2. Age of primitive food (Origin of Japanese culture–2nd century B.C.). 3. Age of stabilized rice-eating habits (2nd century B.C. to first half of 3rd century). 4. Ancient tomb age (Latter half of third century to 6th century). 5. First age of tabooing of meat eating (6th century to 8th century). 6. Age of formalization of food habits.

7. Age of warriors' [samurai] diet (13th century to first half of 15th century). 8. Age of Zen-styled food in vogue (Latter half of 15th century to first half of 16th century. 9. Age of imported food culture (Latter half of 16th century to first half of 17th century). 10. Age of completion of Japanese feod (Latter half of 17th century to first half of 19th century). 11. Age of Japanese-Western mixed diet (Latter half of 19th century to the present). 12. Acknowledgements.

Japan has relatively little arable land. Many ancient Japanese rice grains have been found in remains from the Yayoi Era, both round-grain rice (*Oryza sativa*) and elongated rice (*Oryza sativa indica*). Buddhism (and its precept against killing or eating meat) was introduced to Japan in the middle of the 6th century; production of dairy foods gradually faded out. In China the Han culture was flourishing. A centralized nation with an emperor was established at this time.

In the warrior's diet we find unpolished / brown rice, rice cake (mochi), fermented bean past (miso), salted plum (umeboshi), and soy sauce. "Salt was regarded as the most indispensable item" (p. 41). Temples made and sold foods.

In the age of Zen-styled foods the tea ceremony *Chanoyu*) was in vogue, brought to completion by Sen no Roikyu (1521-1591); it was accompanied by the development of the "Kaiseki-style dinner" (*Kaiseki ryôri*). A labeled diagram of this dinner is given–shown from two angles.

After the Tokugawa regime was founded, the shogunate closed Japan to foreigners and most foreign influence; this continued for 219 years, as Japanese food and menus became standardized.

In 1867, the last Shogun abandoned the rule of the Tokugawa clan, which had lasted for 263 years. Emperor Meiji became Japan's ruler and national isolation was ended.
Address: National Inst. of Nutrition, 1-Toyamacho, Shinjuku, Tokyo, Japan.

6627. Okamoto, Susumu; Watanabe, Ken. 1976. Yuba [Yuba]. Tokyo: Tokyo Noho Daigaku Shokuhin Kagaku Kenkyushitsu Dosokai. 159 p. [Jap]*
Address: Tokyo Nôkô Daigaku Kyôju [Prof., Tokyo Univ. of Agriculture and Industry].

6628. Ortiz, Elisabeth Lambert; Endo, Mitsuko. 1976. The complete book of Japanese cooking. Philadelphia, Pennsylvania: M. Evans and Co., Inc.; Dist. by Lippincott. viii + 250 p. Illust. by Marion Krupp. Index. 24 cm.
• ***Summary:*** A very interesting, well researched, and accurate Japanese cookbook. The illustrations are excellent. Each recipe has its Japanese name in large bold letters and

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a translation directly below in smaller letters. A hallmark of her writing is that she prefers to use the native language words and terms (e.g., shôyu) rather before giving her translation of them (e.g., soy sauce). This is helpful, since many of her translations have not withstood the test of time. In some cases, however, she fails to catch nuances or chooses to ignore them; e.g., *momen tôfu* should actually be *momen-dôfu,* and *kinugoshi tôfu* should actually be *kinugoshi-dôfu.* Unfortunately, she uses the term "bean paste" to refer to two very different foods: miso and *azuki-an* (see p. 214, 242). A large number of recipes call for various types of *tôfu* ("bean curd") or *miso* ("bean paste)."

Seaweeds (p. 4): "The one single thing that distinguishes Japanese cooking is the use of seaweeds." Kombu is used to make dashi. Nori and wakame are use in many ways.

"The soy bean plays a dominant role in the Japanese kitchen. It comes in the form of *shôyu* (soy sauce), *usukuchi shôyu* (light soy sauce), *momen tôfu* (bean curd), *kinugoshi tôfu* (silky bean curd), *yakidôfu* (broiled bean curd), *koyadôfu* (freeze-dried bean curd), red and white *miso* (bean paste), and so on. Despite their common origin, the products of this versatile bean manage to be very different.

Note 1. This is the earliest document seen (April 2013) that uses the word "silky" or the term "silky bean curd" to refer to *kinugoshi tôfu.*

Note 2. This is the earliest English-language document seen (April 2013) that uses the term *koyadôfu* or the term "freeze-dried bean curd" to refer to dried-frozen tofu.

Soy-related recipes include: Asparagus with malted bean paste (with "moromi miso" and "usukuchi shoyu," p. 27). Dengaku (Bean curd with bean paste, p. 28). Stuffed lotus root (with white miso and mustard, p. 30). Noppei-jiru (vegetable and fried bean curd soup, with "1 *namaage* {type of fried bean curd}" or "2 pieces *aburaage* {fried bean curd}, p. 35). Kenchin-jiru (vegetable soup, with "1 *momen tôfu* {bean curd} weighing about 8 ounces," and "4 tablespoons *miso* {bean paste}, p. 36). Clear soup (suimono) with okra and bean curd (p. 38). Clear soup with bean curd and wakame (p. 38). Satsuma-jiru (Miso soup with mixed vegetables, incl. red and white miso, p. 45). Miso soup with tofu and shungiku (p. 46). Miso soup with wakame (incl. red and white miso, p. 46). Miso soup with oysters and bean curd (p. 47). Sekihan (pink rice with azuki beans, p. 57). Miso udon (p. 63). Kitsune udon (noodles with aburaage, p. 67). Inari-zushi (fried bean curd stuffed with vinegared rice, p. 79). Sole with bean curd and mushrooms (p. 88). Salmon steamed with bean curd (p. 90-91). Mackerel with red miso (p. 95). Fish marinated in miso (p. 102). Clams in miso, mustard, and vinegar sauce (p. 105). Oysters in vinegared miso sauce (p. 106). Satsuma-agé (with mackerel and bean curd cakes, p. 116-17). Oden (with "4 *ganmodoki* {fried bean curd balls}" and "1 *yakidôfu* {broiled bean curd}, about 7 ounces drained weight," p. 120-21). Kaki no dotenabe (oysters with bean paste, p. 124-25). Yudofu (simmered bean curd, p. 130). Sukiyaki (Sautéed beef and vegetables, with "2 *yakidôfu* {broiled bean curd}, 134-35). Grilled beef with bean paste (p. 146). Nikumiso (chicken and vegetables pickled in bean paste, p. 159). Eggplant with bean paste (p. 163). Green beans with bean paste (p. 168). Daikon with fried tofu (p. 171). Turnips with bean paste (p. 173). Cucumber and soy bean sprouts with sesame seeds (p. 183). Spinach salad with tofu (p. 186).

A short section titled "Bean curd dishes" (p. 187) notes that "the soy bean is the youngest of the bean family, going back only to about 3500 B.C." Beans in the Middle East go back to 7000 B.C. and in Mexico they go back to 5000 B.C. But the soy bean "makes up in versatility what it lacks in age."

Recipes Fried bean curd with hijiki (with "2 pieces *aburaage* {fried bean curd}," p. 187). Sole with bean curd (188-89). Deep-fried bean curd with bonito flakes (p. 190). Dried bean curd with vegetables (with "4 *kôyadôfu* {dried bean curd}" and "2 teaspoons *usukuchi shôyu* {light soy sauce}, p. 191). Kûya-mushi (bean curd, chicken, and vegetable custard, p. 192-93). Simmered bean curd and chicken (p. 193). Takara bukuro (treasure bags with aburaage, p. 194). Tofu no shirô-ae (p. 195). Hiya-yakko (garnished cold bean curd, p. 196; *Kinugoshi tôfu* {silky bean curd} may be used). Chrysanthemum flower bean curd (p. 197). Nabeyaki Denraku [Dengaku?] (bean curd with white and red bean paste, p. 198). Pork with bean curd (p. 198-99). Ni-yakko (bean curd with dried bonito flakes, p. 199). Sokuseki misozuke (instant pickled vegetables with bean paste, p. 210). Koshi-an (red bean paste, with "1½ red *azuki* {adzuki} beans," p. 213-15). New year dishes: Kuromame (black soy beans simmered in soy sauce and sugar, p. 220).

Glossary (excellent, p. 228-36)–Soy-related terms: Aburaage, azuki bean, fu (wheat gluten cake), ganmodoki, kinako, kinugoshi tôfu, kôji, koshi-an (powdered azuki paste), kôyadôfu, kôridôfu, kuzuko, mirin, miso, misozuke, mochi, momen tôfu, moromi miso, namaage, nattô, shôyu, teriyaki ("a technique of glazing foods in a soy sauce and mirin mixture either in a skillet or on a grill"), tôfu ("soy bean curd, usually refers to *momen tôfu"*), umeboshi, usukuchi shôyu, yakidôfu, yuba. Address: Both: New York.

6629. Ota, Teruo. 1976. Shokutaku no hakko shokuhin: subarashii koyo to katei de no tskurikata [Fermented foods on your dining table: Their wonderful effect and how to make them at home]. Tokyo: Chisan Shuppan. 290 p. Illust. 18 cm. [30+ ref. Jap]*

6630. Shinoda, Osamu; Akiyama, Tomiko. 1976. Tôfu no hanashi [Tales about tofu]. Kyoto: Shinshin-do Shuppan. 143 p. Illust. Includes many color photos. No index. 18 cm. [Jap]
• ***Summary:*** Contents: Cultural history of tofu. To tofumakers. Tofu recipes. Writings about koyadofu. About tofu. The Japanese and tofu. The author lived 1899-.

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6631. Simoons, F.J. 1976. Geographic perspectives on man's food quest. In: Dwain N. Walcher, N. Kretchmer, and H.L. Barnett, eds. 1976. Food, Man, and Society. New York and London: Plenum Press. xv + 288 p. See p. 31-53. [46 ref]
• ***Summary:*** Discusses: (1) Pakka and kachcha [kaccha] foods, which relate to Hindu dietary laws. Pakka food contains ghee (clarified butter), a very costly fat believed to promote health and virility. Hindus regard raw foods as possessing the greatest purity; they will accept them even from untouchables.

(2) Dairying: It seems to have been first practiced in about 4000 B.C. in the Near East and North Africa (Simoons 1971). The nonmilking zone embraces all of Southeast Asia from Burma eastwards as well as most of East Asia including China, Korea, and Japan. Much of Africa is also non-dairying; in Africa dairying spread southward from Kenya after the start of the Christian era. People generally did not consume dairy milk if it caused gas intestinal and/or cramps, diarrhea, or even vomiting. Nearby dairying peoples were the Mongols and Tibetans.

The failure of dairying to spread throughout Asia and Africa does not involve a single cause but rather a series of factors from culture, environment, and ecology. Also, most people (70-100%) above age 3 in the nonmilking zone have low levels of the intestinal enzyme lactase that hydrolyzes lactose (milk sugar) into glucose and galactose, which can be readily absorbed by the body. This, it should be emphasized, is the same condition that prevails in other land mammals, and it is believed to be the normal pattern found among primitive men. Address: Dep. of Geography, Univ. of California, Davis, Davis, California 94616.

6632. Solomon, Charmaine. 1976. The complete Asian cookbook. New York, NY: Summit Books. 511 p. Illust. Color plates. Index. 29 cm.
• ***Summary:*** This artistic cookbook is loaded with full-page color plates plus a good glossary. Soy-related recipes include: Bean curd omelettes (Tahu telur, from Indonesia, p. 188). Fried bean curd with peanuts (Tahu goreng kacang, from Indonesia, p. 204). Fried bean curd with soy sauce (Tahu goreng kecap, from Indonesia, p. 204). Fried fish with salted soya beans [miso] (Ikan goreng tauceo, from Malaysia, p. 224). Bean curd in salted soya bean paste [tofu in miso] (Taukwa tauceo, from Malaysia, p. 233). Bean curd and bean sprouts [probably mung bean sprouts] (Taukwa dan taugeh, from Malaysia, p. 233). Stuffed soy bean cake [with fried tofu] (Tauhu sod sai, from Thailand, p. 316). Glutinous rice and soybean sauce (Nuoc leo, from Vietnam, p. 341). Soup with bean curd (Canh dau hu, from Vietnam, p. 342). Misu tomato sauce (with red misu = red miso, from the Philippines, p. 351). Bean curd in barbecue sauce (Chu hau jeung mun dau fu, from China, p. 414). Bean curd with crab sauce (Hai yook par dau fu, from China, p. 414). Ginger soy sauce (See yau ghung jeung), Chilli soy sauce (See yau laht jiu jeung), Black bean sherry sauce (Dau see sheung jing jeung, with canned salted black beans = fermented black soybeans), Black bean garlic sauce (Suen tau dau see, with fermented black soybeans) (from China, p. 431). Sesame seed sauce (Cho kanjang, from Korea, p. 451, with "4 tablespoons light soy sauce"). Dumpling soup (Mandoo, from Korea, p. 453, with "1 square fresh bean curd" and "2 tablespoons light soy sauce"). Soup of soybean sprouts (Kong namul kuk, from Korea, p. 453, with 500 gm soy bean sprouts and 1 tablespoon soy sauce). Rice with fried bean curd (Kitsune domburi, from Japan, p. 460). Steamed egg custard with tofu (Kuya mushi, from Japan, p. 471). Bean paste soup (Miso shiru, from Japan, p. 477). Sushi in fried bean curd (Inari-Zushi, from Japan, p. 480).

Soy-related glossary entries (p. 485-502) include: Aburage. Akamiso. Black beans, salted (Chinese: dow see = salted black beans). Bean curd (Chinese: dow foo; incl. yellow bean curd, dried bean curd, red bean curd). Chinese bean sauce (ground = *mor sze jeung* or chunky = *min sze jeung* similar to Malaysian *taucheo* or *tauceo*). Dow foo pok (Chinese-style fried bean curd). Miso. Mushroom soy (Soy sauce flavored with mushrooms during the last stage of processing). Soy sauce (light or dark, shoyu, kecap manis). Yellow beans, salted (=salted yellow beans). Yellow bean paste.

Note 1. It is also the earliest document seen (April 2012) that uses the term *kecap manis* to refer to sweet Indonesian soy sauce.

Interesting glossary entries (p. 485-502): Aburage, bean curd (fresh, yellow, dried, red), black beans, salted (Chinese: *dow see;* made from soy beans, heavily salted and sold in cans and jars), Chinese bean sauce (ground or chunky, like Malaysian taucheo or tauceo), fish sauce (Vietnamese: *nuoc mam.* Burmese: *ngan-pya-ye.* Thai: *nam pla.* Tagalog: *patis*). Miso. Mushroom soy (Soy sauce flavored with mushrooms during the last stage of processing). Red misu (See miso). sesame seed (Hindi: *till.* Sinhalese: *thala.* Malay: *bijan.* Chinese: *chih mah.* Japanese: *goma.* Indonesian: *wijen*). Sesame oil ("The sesame oil used in Chinese cooking is extracted from toasted sesame seeds..."). Sesame paste ("Sesame seeds, when ground, yield a thick paste similar to peanut butter. Stores specialising in Middle Eastern foods sell a sesame paste known as *tahini,* but this is made from raw sesame seeds, is white and slightly bitter, and cannot be substituted for the Chinese version–which is made from toasted sesame seeds, and is brown and nutty"). Wakame. Wasabi or wasabe. Yellow beans, salted (Very similar to canned salted black beans, but lighter in color). Yellow bean paste (It is not really yellow, but brown. Sold in cans).

Note 2. This is the earliest English-language document seen (March 2009) that uses the word "tauceo" to refer to Indonesian-style miso.

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6633. Troll, Walter. 1976. Blocking tumor promotion by protease inhibitors. In: P.N. Magee, S. Takayama, T. Sugimura, T. Matsushima, eds. 1976. Fundamentals in Cancer Prevention. Tokyo: University of Tokyo Press. xvii + 433 p. See p. 41-55. Proceedings of the 6th International Symposium of The Princess Takamatsu Cancer Research Fund, Tokyo, 1975. Also published by University Park Press. [33 ref]
• ***Summary:*** The feeding of a soybean diet rich in protease inhibitors was shown to delay the onset of 2-stage carcinogenesis in mouse skin. Address: Dep. of Environmental Medicine, New York Univ. Medical Center, New York, NY.

6634. Urano, Chikako. 1976. Azuki to kinako [Azuki and kinako]. Tokyo: Margaret / Shueisha. 188 p. 18 cm. [Jap]
• ***Summary:*** This is a work of juvenile fiction. Chikako (born in 1946) is a pioneering manga artist.

6635. Vermeer, J. 1976. Government policies affecting the production, marketing, and prices of soybeans. In: L.D. Hill, ed. 1976. World Soybean Research [Conference I: Proceedings]. Danville, Illinois: Interstate Printers and Publishers, Inc. xvii + 1073 p. See p. 671-83.
• ***Summary:*** Contents: World soybean production. Kinds of policies. U.S. policies. Brazilian policies. Policies of the People's Republic of China. Japanese policies. Policies of the European Community. Policies of Canada. Policies of Australia. Summary. Address: Asst. Director, Commodity Economics Div., ERS USDA, Washington, DC.

6636. Walker, Egbert H. 1976. Flora of Okinawa and the Southern Ryukyu Islands. Washington, DC: Smithsonian Institution Press. ix + 1159 p. See p. 583-84. With the assistance and collaboration of many Okinawan, Japanese, Chinese, and Western botanists. 27 cm. [7 ref]
• ***Summary:*** The genus *Glycine* is called the "Daizu Zoku." In this geographical area are found two species of perennial wild soybeans (*G. koidzumii* and *G. clandestina*), plus the cultivated soybean, *G. max.*

Glycine koidzumii Ohwi is known locally as Miyako-jima tsurumame (i.e. "Miyako island vine bean"). It is the same as *Glycine soja.* It was first described in 1943 by Ohwi in *Shokubutsu Bunrui Chiri* (*Acta Phytotaxonomica et Geobotanica*) 12:110. It was named for Genichi Koidzumi, a Japanese botanist (1883-1953). The type specimen of this species, collected by Koidzumi in Miyako, is probably in the Kyoto herbarium, but was not seen by the author.

Glycine clandestina Wendl. is known locally as Bako-Yabu-Mame. This vernacular name appears on the label of the type of *Glycine pescadrensis* Hayata in the herbarium of the National Taiwan University. This is based on the following citation which mentions *G. pescadrensis:* Hayata, Bunzo. 1920. Icones plantarum Formosanarum. Contributions to the flora of Formosa. 9:26. (As syn. determined by Hermann). This species has been reported in Okinawa.

The soybean, G. max, is called "Ufuchija" in Okinawa. Address: Botanist Emeritus, Smithsonian Institution, Washington, DC.

6637. Wang, H.L.; Mustakas, G.C.; Wolf, W.J.; Wang, L.C.; Hesseltine, C.W.; Bagley, E.B. 1976. An inventory of information on the utilization of unprocessed and simply processed soybeans as human food. Peoria, Illinois: USDA Northern Regional Research Center, Interdepartmental Report. AID AG/TAB-225-12-76. 197 p. AID contract report. Undated. No index. 27 cm. Spiral bound. [65 ref]
• ***Summary:*** Contents: Introduction. Home and village traditional soybean foods by country. 1. Soybean food uses and production in Asia. Soaking dry soybeans. In China: Tou chiang (soybean milk; preparation, ways of serving), tou fu (soybean curd; yen-lu is the Chinese name for nigari), tou fu nao (soft curd), tou fu kan (dry / firm bean curd), chien chang (pressed tofu sheets), yu tou fu (fried tou fu), tung tou fu (frozen tou fu), tou fu pi (protein-lipid film; yuba), huang tou ya (yellow bean sprout or soybean sprout), mao tou (hairy bean, green soybean, or immature soybean), dry soybeans (roasting and frying, stewing and boiling), roasted soybean flour. Fermented soybean foods. Production and consumption of soybeans (China and Taiwan).

Japan: Tofu (soybean curd), kinugoshi tofu, processed tofu products (aburage or age, nama-age and ganmo), kori tofu (dried-frozen tofu), yaki tofu (grill tofu), yuba (protein-lipid film), soybean milk, gô (ground soybean mash), daizu no moyashi (soybean sprouts), edamame (green vegetable soybeans), whole soybeans, kinako. Fermented soybean foods: Production and consumption.

Korea: Tubu (soybean curd), soybean sprouts, whole soybeans (green soybeans, parched or roasted soybeans, boiled soybeans), soybean flour ("Soybeans are first roasted and then ground to a flour. The flour is extensively used as an ingredient in various food preparations." Note: This is the earliest document seen (Nov. 2012) that mentions roasted whole soy flour in Korea–however no Korean name of this roasted soybean flour is given), soysauce, bean paste [Korean soybean miso], natto (no Korean name is given), production and consumption of soybeans.

Indonesia: Tahu or tahoo (soybean curd), bubuk kedele (soybean powder), tempe kedele, tempe gembus [the name in Central and East Java for okara tempeh], oncom tahu [the name in West Java for okara onchom], other soybean products (soybean sprouts, green soybeans, roasted and boiled soybeans, kecap or soysauce, tauco or bean paste [miso]), food mixtures (Saridele, Tempe-fish-rice or TFR, Soy-rice baby food, soybean residue [okara]-fish-rice), production and consumption of soybeans.

To make bubuk kedele (p. 58): "Soybeans of the white

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variety are roasted until no beany flavor can be detected. They are ground into a powder and mixed with such spices as garlic and chili. Bubuk kedele is kept in a jar and served on special occasions with a rice product, longtong (rice wrapped in banana leaves and boiled for 3 to 4 hours). Bubuk kedele is always homemade and is eaten by everyone" (Source: I. Gandjar 1976, personal communication).

Note 1. This is the earliest English-language document seen (Nov. 2012) that uses the word *bubuk* or the term *bubuk kedele* to refer to Indonesian roasted soy flour.

Thailand. Philippines: Soybean sprouts, soybean coffee, soybean cake (made from equal amounts of soybean flour and wheat flour), soybean milk, tou fu and processed tou fu products, production and consumption. Burma. India. Malaysia. Nepal. Singapore. Sri Lanka (Ceylon). Vietnam. West Asia [Middle East; Iran and Turkey]. References–Soybean food uses in Asia.

2. Soybean food uses and production in Africa. Ethiopia: Injera, wots and allichas, kitta, dabbo, dabokolo, porridge. Kenya. Morocco. Nigeria: Whole soybeans, soybean paste, corn-soy mixtures (soy-ogi). Tanzania. Uganda. Production. References–Soybean food uses in Africa.

3. Soybean food uses and production in Europe [both Eastern and Western]. 4. Soybean food uses and production in Latin America. Argentina. Bolivia. Brazil. Chile. Colombia. Ecuador. Guyana. Paraguay. Peru. Uruguay. Venezuela (fried arepas with textured soy). Mexico: New village process, commercial developments of soy-based food products, Gilford Harrison, Ruth Orellana, Seguras Social. Honduras. Costa Rica. Panama. Dominican Republic. Jamaica. Haiti. Trinidad. References–Soybean food uses in Latin America.

5. Soybean food uses and production in North America. United States: Oriental populations, vegetarian communes, The Farm in Tennessee. Canada. References–Soybean food uses in North America. 6. Soybean food uses in Oceania. Australia. New Zealand. 7. Summary of soybean food uses. Traditional soybean foods: Soybean milk, soybean curd and processed soybean curd products, protein-lipid film, soybean sprouts, tempe (tempeh), green soybeans, boiled soybeans, roasted soybeans, soybean flour, soysauce, fermented soybean paste, fermented whole soybeans [Toushih, hamanatto], natto, fermented soybean curd. Experimental soybean foods: Whole soybean foods, soybean paste, soy flour, soy beverage. Production and consumption.

8. Recent simple soybean processes, other than traditional. Simple village process for processing whole soybeans: Equipment, process, sanitation requirements, quality of product, evaluation of product in formulas and procedures for family and institutional use in developing countries. NRRC village process. Foods from whole soybeans developed at the University of Illinois (drum dried flakes, canned and homecooked soybeans, soy beverages and beverage products, spreads, snacks).

Ways of cooking and serving soybeans in the American diet. 9. Industrial processes. Industrial production and selling prices of edible soybean protein products. 10. Barriers to acceptability and utilization of soybeans in food and research recommendations: Availability. Cultural and social factors. Texture. Flavor. Nutrition and food safety. Technology development. Technology transfer. Research recommendations [concerning each of the above barriers].

Concerning Morocco: Cereal-soy blends have been used extensively in Morocco; in fiscal year 1974 some 14.7 million lb were shipped to Morocco. Mmbaga (1975) reported that soy flour is being used in making porridge, with 1 part soy flour to 3 parts maize / corn flour.

Tables show: (1) Soybean production and imports in Taiwan, 1962-1975 (tonnes = metric tons, p. 33). Production rose from a 53,000 tonnes in 1962 to a peak of 75,200 tonnes in 1967, then fell to 61,900 tonnes in 1975. Imports skyrocketed from 62,400 tonnes in 1962 to a record 827,300 tonnes in 1975. (2) Consumption of soybean foods in Taiwan, 1964-1974 (kg/capita/year, p. 34). Total soybean foods not including tofu rose from 1.08 kg in 1964 to a peak of 2.61 kg in 1972 then fell to 1.99 kg in 1974. Consumption of tofu (80% water) rose from 18.75 kg in 1964 to a peak of 33.89 kg in 1972, then fell to 32.04 kg in 1974. (3) Supply and disposition of soybeans in Japan, 1971-1974 (p. 49). Total supply is beginning stocks, plus domestic production, and imports. Total disposition is crushing, plus traditional foods and feed. In 1974 imports accounted for 87.5% of the supply, and crushing accounted for 71.0% of the disposition. (4) Whole soybeans used in the production of traditional foods in Japan, 1970-74 (tonnes / metric tons, p. 50). Tofu and others rose from 508,000 in 1970 to 539,000 in 1974. Miso rose from 177,000 in 1970 to 192,000 in 1974. Shoyu rose from 13,000 in 1970 to 14,000 in 1974. (5) Defatted soybean meal used in the production of traditional foods in Japan, 1970-74 (tonnes / metric tons, p. 51). Shoyu rose from 163,000 in 1970 to 176,000 in 1974. Tofu and others was constant at 130,000 from 1971 to 1973. Miso decreased from 4,000 in 1970 to 2,000 in 1974. (6) Production of traditional soybean foods in Japan, 1970-74 (tonnes / metric tons, p. 52). Tofu and others rose from 1,867,800 in 1970 to 2,264,900 in 1973. Shoyu rose from 1,334,1000 in 1970 to 1,455,800 in 1974. Miso rose from 552,200 in 1970 to 587,200 in 1974. (7) Production and food use of beans [various types] and consumption of some soybean products in Korea, 1964-1967 (p. 56-57). In 1967 consumption (in tonnes / metric tons) was: Bean curd 290,000. Bean sprouts 270,000. Bean sauce 69,700. Bean paste 27,700. Total: 11.6 kg per capita per year. (8) Soybean production in Indonesia, 1960-1974 (p. 65). It rose from 442,862 tons in 1960 to 550,000 tons in 1974. (9) Consumption of soybeans in various parts of Indonesia in 1970 (p. 66). (10) Production of soybean foods in the province of Central Java, 1968-1972 (tons, p. 67). Kecap rose from 914,695 in 1968 to 1,524,000 in 1972. Tahu

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decreased from 18,570 in 1978 to 17,000 in 1972. Tempe rose from 506 in 1968 to 39,000 in 1972. (11) Area planted to soybeans and total soybean production in Thailand, 1964-1974 (p. 70). Area rose from 213,000 rais (6.25 rais = 1 ha) in 1964 to 1,016,000 rais in 1974. Production (in metric tons) rose from 31,300 in 1964 to 252,400 in 1974. (12) Utilization of soybeans by soybean-consuming countries, 1964-66 (based on FAO 1971 Food Balance Sheets, 1964-66 average, p. 150). The countries leading in per capita consumption (kg/person/year) are: China (PRC) 6.7. Japan 5.1. Korea(s) 5.0. Singapore 4.3. Indonesia 2.8. Malaysia 2.6. Taiwan (ROC) 1.1. (13) Amounts of cereal-soy blends distributed under Title II, Public Law 480 in fiscal year 1974 (p. 152-155). (14) U.S. exports of full-fat soy flour, 1974-75 (p. 156). Address: Northern Regional Research Center, Agricultural Research Service, Department of Agriculture, Peoria, Illinois 61604.

6638. Yoshimura, Akira. 1976. Sangyô-damashii: Mogi Keizaburô no hito to keiei [The soul of an industrialist: The character and management of Keizaburo Mogi]. Tokyo: Nihon Noritsu Kyokai. 197 p. Interview by A. Yoshimura; Analysis and interpretation by Yoshiya Sato. [Jap]*

6639. Japan Vegetable Protein Food Assoc. 1976? Vegetable protein food in Japan. Tokyo, Japan. 8 p. Undated. 26 cm.
• ***Summary:*** "Since its establishment in February 29, 1969, by the associated vegetable protein food manufacturers, the New Protein Food Association has been promoting the production, sales, quality improvement and publicity of vegetable protein. In August, 1975, the Ministry of Agriculture and Forestry, impelled by the necessity of enhancing the utilization of vegetable protein, founded a juridical corporation, Japan Vegetable Protein Food Association. Its membership has increased to 20 manufacturers at present.

"The Association was granted funds in 1976 by the Ministry of Agriculture and Forestry for a survey of the actual usage of vegetable protein and for its promotion and development."

A bar chart shows that production of vegetable protein [mostly soy protein and wheat gluten] in Japan has grown from 24,217 tons in 1970 to 41,149 tons in 1976. Of this, 45% is sold as a dried powder, and 43.9% is frozen. Address: Rainbow Building, 9th Floor, 2-15-17, Nishi-shinbashi, Minato-ku, Tokyo 105, Japan. Phone: (03) 591-2524, 3011.

6640. John Deere Co. 1976? Japan, you growing cash customer (Color motion picture). Moline, Illinois. 14 minutes. 16 mm. Reviewed in Soybean Digest, June 1976, p. 36. *
• ***Summary:*** This film describes the great transformation taking place in Japanese life, and features the role played by U.S. soybeans and feed grains. Japan needs over $2,500 million worth of food and fiber each year from other countries–the equivalent of the output of 11 million U.S. farm acres. Japan's rise in living standards has been the world's fastest.

6641. Muso Shokuhin. 1976? Distributors of Muso foods in Canada, South America, Europe, and Australia (Leaflet). Osaka, Japan. 1 p. Undated.
• ***Summary:*** The name, address, and phone number of each company is given. Canada: Lifestream Natural Food, Inc. (British Columbia). Manna Foods, Inc. (Ontario).

South America: Zentro Macrobiotico de Venezuela.

Europe: Societe Traplun (France). Unimave S.C.A.R.L. (Portugal). Urtekram (Denmark). V.Z.W. Voedselcollektief (Belgium). Manna (Holland). Centro Dietetico Macrobiotico Italiano (Italy). Centro Macrobiotico Italiano (Italy). Harmony Foods (England). Kameo (France). P.V.B.A. Lima (Belgium). Moder Jord & Söner (Sweden). Reformhaus Rahlstedt (West Germany). Schwarzbrot (West Germany). Dr. Naturopata SER (Spain). Eduardo Galamba De Sa Pires (Portugal).

Australia: True Health Aides Pty. Ltd. (Sydney). Address: 1-43 Otedori, Higashi-ku, Osaka, Japan. Phone: (06) 945-0511.

6642. Seta, M. 1976? [Brief chronology of Yamasa Shoyu Co. Ltd.] (Interview). Conducted by W. Mark Fruin with a director of Yamasa Shoyu Co. in Choshi, Japan. 14 p. transcript. Undated. Unpublished manuscript. [Jap; eng+] Address: Director, Yamasa Shoyu Co., Choshi, Japan.

6643. Takai, Wataru. 1976? History of Takai Seisakusho Co., Ltd., 1917-1975. Ishikawa-ken, Japan. 3 p. Undated. Unpublished manuscript. [Eng]
• ***Summary:*** "Date of establishment: July, 1917.

"Capital: 31 million yen.

Major executives:

"The President: Motoo Takai.

"Vice-president: Akio Takai.

"Executive director: Akira Takai

Size of this factory:

The head office: Site 8,156 sq. meters. Building: 4,808 sq meters.

"Matsuto factory: Site 1,875 sq. meters. Building: 1,047 sq meters.

History of our company:

1917 July–Takai brotherly company was established, and production of bean curd machine and its selling were begin.

1931 April–The old name was replaced by Takai Co., Ltd.

1946 Jan.–The name was replaced by Takai Mfg. Co., Ltd.

1957 Jan.–A bean curd automatic manufacturing machine was developed

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1958 Aug.–This company was commended as a superior enterprise by the Smaller Enterprises Agency.

1958 Dec.–The ex-president Kamejiro Takai was conferred *Shiju-hosho* (Violet Ribbon Medal)

1959 Nov.–Our company was given a governor's special prize at the ceremony of awarding an honor of a corporation of a society of invention.

1960 April–The 7th anniversary of the operation of the patent system, our company was given a prize of invention at the nationwide ceremony of a corporation of invention.

1960 Sept.–Our company received a subsidy for the experiment of invention from the Scientific Technique Agency.

1960 Oct.–The ex-president was decorated with the Fifth Order of Merit with the *Zuihosho.*

1961 April–An organization of agency "A nation wide Takai society" was formed.

1962 July–A new factory was built at Inari, Nonoichi-machi Ishikawa-gun, Ishikawa-prefecture.

1962 July–Our company was given a governor's special prize at the local ceremony of a corporation of a society of invention.

1963 April–Our company was given a prize of invention at the nationwide ceremony of a corporation of a society of invention.

1965 Nov.–Our company was commended officially as a superior factory in labor management by a Labor Standard Office in Ishikawa-prefecture.

1966 Jan. Our company was named "a model factory of rationalization of the smaller enterprises" by the Smaller Enterprises Agency.

1966 Aug.–Our company was telecasted nation wide by NHK educational television titled "Industrial operation–establishment of a long-range plan".

1969 Jan.–Our company was given a citation as a superior corporation by a Taxation Office in Natsuto-city.

1969 April–A large-sized bean curd plant was built at Nada-Kobe co-operative association.

1969 Nov.–Our company was telecasted nationwidely by NHK educational television titled "A new age of operation–A plan of mechanization for making 10 million cakes of bean curd".

1970 July–Our company was commended officially as a superior factory in safe management of factories by a Labor Standard Office in Ishikawa-prefecture.

1971 Oct.–A large bean curd plant was built in the Republic of Korea.

1972 May–A smaller bean curd plant was developed.

1974 Feb.–Matsuto branch factory was built at Miyamaru-machi Matsuto-city.

1974 March–Our company was commended as a superior factory in rationalization of the use of electricity by Hokuriku Electric Society.

1974 June–IBM computers introduced.

1974 Oct.–Our company was commended on account of co-operation of traffic transportation.

6644. Walsh, E.J. 1976? Preliminary evaluation of soybeans under Irish conditions–1974. *University College, Dublin, Faculty of General Agriculture, Research Report* For the year 1974-75. See p. 80-82. Undated.

• ***Summary:*** This article appears in the section on crop breeding. In 1974, 129 soybean varieties were grown at Lyons [near Dublin, at 54º 48.7'north latitude] in the Irish Republic. These soybeans were collected from breeders in five countries as follows: USA (48 varieties), Bulgaria (42), Poland (31), Japan (7), and Sweden (1 variety, Fiskeby V). "The objective of this study was to determine which, if any, of these varieties had potential for improving plant protein production in Ireland." A single plot (1-2 rows about 6 feet in length) of each variety was planted on 14 May 1974. On October 12, approximately 150 days after planting, all varieties were examined and pod development noted. Table 54 (p. 81) gives a summary of the results. Only 19 varieties produced flowers and only 12 varieties produced pods. Of those 12 varieties, 8 were from Poland, two from Japan (Okura I and Tenpoku wase), and one each from Sweden (Fiskeby V) and the USA (Pando). The number of days from planting to flowering, if detected, ranged from 91 to 102.

Conclusions: "(a) No variety worthy of serious consideration exists within the broad array of varieties evaluated. (b) The twelve varieties which produced pods may have potential as parents in a breeding programme geared towards the development of adapted varieties."

Note 1. These soybeans were tested near Dublin which is about 100 miles (1.5º) north of Cork.

Note 2. Will soybeans grow in Ireland? Probably! Southern Ireland (e.g. Cork) is at about 52º north latitude and the northern tip of Ireland is at 55º 20 min. The Kalmar-Oland region of Sweden, where the Fiskeby varieties of soybeans were grown commercially, is at 56º-57ºnorth latitude, though it enjoys a longer frost-free season than many soybean growing areas in Hokkaido. A large number of strains ripen in Sweden as far north as Norrköping, 58º30' north latitude. Starting in 1934, fairly large areas of soybeans were grown on Henry Ford's Fordson Estate at Boreham, Essex, England, which is about 35 miles northeast of central London, at 51º45.4' north latitude, i.e. at about the same latitude as southern Ireland. Address: M.Agr.Sc., PhD, Dep. of Farm Management, University College, Dublin, Irish Republic.

6645. *Food Engineering.* 1977. World's largest soy isolate plant: Ralston Purina opens new 100,000 square foot facility. 49(1):68-69. Jan.

• ***Summary:*** The $15 million facility was officially opened last month in Pryor, Oklahoma, by Ralston Purina's Protein Division. The production capacity is highly confidential,

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however it can be said that the new plant doubles the combined capacity of Ralston's two existing isolate plants in Memphis, Tennessee (opened in June 1973), and Louisville, Kentucky.

During the past 3½ years Ralston has worked with Fuji Oil Co. of Osaka, Japan, to form and operate a joint venture named Fuji Purina Co. Ltd. in Japan.

Nine different soy protein isolates, each with different functional properties, will be produced in the new plant: Edi-Pro A, Edi-Pro N, Supro HD-90, Supro 350, Supro 610, Supro 620, Supro 630, Supro 640, and Supro 710. A description of the properties of each is given.

6646. Kagawa, Ryo. 1977. Shokuhin seibunhyô [Food composition tables for Japan]. Tokyo: Joshi Eiyo Daigaku Shuppan-bu. 145 p. Jan. 15 x 22 cm. [Jap]
• ***Summary:*** For tables of information on soybeans and soyfoods, see p. 21-22. Includes Kinako, soymilk, regular tofu, kinugoshi tofu, fukuro-iri tofu, yaki-dofu, abura-age, namaage, ganmodoki, kori-dofu, yuba, okara, natto, hamanatto, miso, red miso, light yellow salty miso, red salty miso, soybean miso, powdered miso. Address: Japan.

6647. Matsumoto, I.; Imai, S. 1977. [Utilization of halophilic *Torulopsis* in red miso making]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 72(1):74-77. Jan. [18 ref. Jap]*
• ***Summary:*** A mixed culture of *Saccharomyces rouxii* and *Torulopsis versatiolis* (10:1) produced a red miso superior in quality to the ordinary red miso incubated with only *S. rouxii*. Address: Niigata-ken Shokuhin Kenkyusho, Niigata, Japan.

6648. Shurtleff, William; Aoyagi, Akiko. 1977. What is tempeh? Lafayette, California: New-Age Foods Study Center. 14 p. Unpublished manuscript. Jan. Published as a 4-page tan leaflet later in 1977 with the addition of 4 Los Angeles tempeh shops. Revised, published edition, Oct. 1980. Also reprinted by many tempeh shops under their logo. Unpublished manuscript.
• ***Summary:*** Contents: Introduction. A rich source of nutrients. Tempeh in Indonesia. A brief history of tempeh. Making tempeh at home: Homemade soy tempeh (using 2½ cups soybeans), homemade okara- or coconut press-cake tempeh, homemade grain- or grain & soy tempeh. Storing & preserving tempeh. Favorite tempeh recipes: Deep-fried tempeh. Pan-fried tempeh. Tempeh chips. Tempeh, lettuce & tomato sandwich. Tempeh burger, and 11 others. Soybeans and the world food crisis. Making tempeh starter at home. Making tempeh in a community or commercial shop. People & institutions connected with tempeh: Research scholars and institutes in North America, tempeh shops in America (7), individuals interested in tempeh in America (4), research scholars and institutes in Indonesia and Japan (5). Address: 790 Los Palos Dr., Lafayette, California 94549.

6649. Yasai engei daijiten [Big encyclopedia of vegetable gardening]. 1977. 1502 p. See p. 1002-03. 27 cm. [Jap]
• ***Summary:*** Contains 2 pages about growing green vegetable soybeans (edamamé). Address: Japan.

6650. *SoyaScan Notes.* 1977. The origin and early history of Bean Machines (California) and Takai Tofu & Soymilk Equipment Co. (Japan) (Overview). Feb. 9. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** 1977 Feb. 3–William Shurtleff and Akiko Aoyagi return home to 790 Los Palos Dr., Lafayette, California. Their four-month, 15,000-mile Tofu & Miso America USA tour ends. This was a huge, exciting, exhausting odyssey, that bore abundant fruit in the founding of new tofu shops almost everywhere they spoke.

Feb. 9–Meeting at 790 Los Palos Dr. in Lafayette with The Farm folks and Larry Needleman leads to establishment of Bean Machines Inc. (BMI), with Larry Needleman as owner and president. The Farm (Robert Dolgin and David Sandler, Farm Foods, 820 "B" St., San Rafael, California 94901) place a firm order for a Japanese (Takai) tofu system.

Feb. 12–Shurtleff and Aoyagi leave the USA and fly to Japan, arriving at Haneda Airport on Feb. 13. Shurtleff's main focus is to find a Japanese manufacturer of tofu and soymilk equipment that would like to develop an English-language illustrated catalog and establish a program for selling its equipment (plus other traditional small-scale equipment, made by other companies, that new American tofu makers may wish to order). From the American Soybean Association in Tokyo, Shurtleff learns about Takai Seisakusho, a tofu equipment manufacturer with long history (founded in 1917) and good reputation, located in Kanazawa, Japan.

March 28–Using a plain, typed form, Farm Foods (Dolgin and Sandler) order 16 pieces of tofu and soymilk equipment at a cost of $4,168. On the form is typed: "Please mail all orders prepaid to: Bean Machines, Inc., P.O. Box 829, Corte Madera, CA 94925."

March 30–Mary Pung, co-owner of Swan Foods, 8850 S.W. 116th St., Miami, Florida 33176 orders 8 pieces of tofu equipment for $4,973. Needleman forwards these two orders to Shurtleff in Japan.

1977 March 31. Larry Needleman applies for a Fictitious Name Statement for Bean Machines Inc. with the County of Marin. Larry and Bill Shurtleff are given as the owners

April 5–During two days of discussions and negotiations with Wataru Takai, son of the owner and young Director of the Overseas Department, who speaks good English, Shurtleff and Mr. Takai establish Takai Tofu & Soymilk Equipment Company and draft a long-term contract. Shurtleff stays two nights at the home of Wataru Takai and

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his wife.

June 5–The contract drafted on April 5 is finally signed by both Shurtleff and Takai. At the top of the document is Takai's new logo, designed by Akiko. It shows a lever, with a soybean as the fulcrum, moving the world.

June–Akiko soon gets more involved in designing Takai's first English-language catalog and letterhead, and Shurtleff works with Takai in giving accurate descriptions of each piece of equipment and each whole system.

July 19–Shurtleff and Aoyagi leave Japan (from Haneda) and fly to America (California).

1977 Aug. 16–The first English-language Takai Catalog arrives at our Center. This catalog was printed with green and black ink on glossy white paper.

1977 Oct. 14–Shurtleff signs Bean Machines, Inc. (BMI) contract with Larry Needleman. He comes for dinner with a friend.

Oct. 19–Mr. Takai writes William Shurtleff a typewritten letter on the new Takai letterhead about 5-6 issues that he would like to see resolved as soon as possible. He wants to learn more about Underwriters Laboratories and their safety standards in the USA.

Oct. 30–Larry Needleman sends out the first BMI packets to existing tofu makers and potential customers.

Dec. 21–Mr. Takai writes Larry Needleman (at Bean Machines Inc., P.O. Box 881, San Rafael, CA 94901) a typewritten letter on the new Takai letterhead about equipment prices landed in San Francisco or Boston without BMI commissions.

1978 March 31–Mr. Takai sends Larry Needleman a 4-page typed letter which includes a new price list including 3% insurance.

April 4–Mr. Takai writes Larry Needleman (P.O. Box 76, Bodega, CA 94922): "Thank you for your orders. We shall send you Pro-Forma Invoice. Please open your L/C [Letter of Credit]. Shipment within one month after receipt of L/C."

1978 May 1–Bean Machines issues its typewritten (on yellow letterhead) Price List #2 covering 44 different pieces of equipment. "Whole system prices are not yet complete." The rear is devoted to "Ordering information and terms of sale." At about the same time, BMI sends out its first "Order form"–on white letterhead.

1978 May–Shurtleff and Aoyagi visit Wataru Takai's home in Kanazawa, Japan, to work on his tofu & soymilk equipment catalog.

1978 July 16–Wataru Takai arrives in the USA in preparation for the 1st Soycrafter's Conference in Ann Arbor, Michigan and to supervise the installation of a Takai system at Tokyo Food Co. in San Mateo.

July 26–The first Takai catalog of small and medium scale tofu equipment (printed with dark brown ink on glossy white paper) arrives in the USA.

At the historic Soycrafter's Conference. Larry Needleman is elected executive director. After the conference, Mr. Takai, with Needleman and Shurtleff, travel (July 30-Aug. 9), around the eastern United States visiting tofu companies.

1978 Nov. 7–Larry Needleman sends Wataru Takai a 4-page "Takai / BMI Contract" for his consideration and eventual signature.

1979 Feb. 14. Takai catalog of large scale tofu and soymilk equipment arrives. Printed with dark green ink on glossy white paper.

1979 May–BMI issues its Price List #5 for Takai Catalog of Small and Medium-sized Equipment.

1979 Sept. 16–Larry Needleman sends Wataru Takai a 2-page, typed, single spaced "Chronological list of Takai problems." The first of the 14 problems was "Nov. 1978–L/C expired because Takai didn't ship quickly enough. BMI extended the L/C but it expired again because of delay in Takai shipping."

1980 Jan. 19–New Takai small scale equipment catalog; 1,500 to USA, 500 to Japan.

1980 Feb. 27–Larry Needleman writes Shurtleff that he owes Shurtleff a total of $496.98 in 1979 commissions. "As far as payment of these commissions and repayment of the principal of your $3,500 loan to BMI, it is our intention to pay NAFSC both of these as quickly as possible."

1980 July 23–Larry Needleman says BMI will stop being Takai's agent.

1980 Aug. 22–Shurtleff writes Takai and encloses a letter from Bean Machines Inc. in which Larry Needleman explains that he is no longer an agent for Takai. "He has found it almost impossible to communicate with you and has finally decided to give up trying."

1980 Sept 18–Takai sells a tofu production plant to Heilongjiang Province Foreign Trade Import Company, Harbin, China. Takai will send 2-3 engineers for installation.

1981 May 17–Mr. Takai writes Richard Leviton that he would definitely like to display his Sub-System S30C at the Soyfoods Conference at Fort Collins, Colorado. He encloses $100 for the balance of the payment.

1981 June–Larry Needleman announces that he has developed and is now selling the Bean Machines BMI Model 100 Disintegrator–The "Mini Mite," a stainless steel soybean grinder which can grind 100 pounds of dry soybeans per hour and sells for $1,485.00. Detailed specifications are given along with 3 photos (one full page).

1981 Dec. 19–Mr. Takai writes Shurtleff a handwritten letter from Jakarta, Indonesia on Sari Pacific Jakarta Hotel. He is now getting orders for equipment from KOPTI Indonesia; he has met with Mr. A.R. Noor of Kopti, who plans to travel to the USA in Jan. 1982 and would like to visit and talk with Shurtleff. Takai plans to go to Bangkok and Hong Kong after Jakarta. "We will do good business in South East Asia."

1986 April 27–Larry Needleman sells Bean Machines

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Inc. (BMI) to Wally Rogers, plus Steve Fiering and Larry Needleman. As part of the deal, Shurtleff sells his interest in the company for about $4,900, plus $1,340 of overdue back commissions.

6651. Rice, William. 1977. Building a philosophy around the whole grain. *Washington Post.* Feb. 10. p. E1, E6.
• ***Summary:*** Jeane Rosoff, who doesn't eat meat, teaches macrobiotic cooking at St. John's Church in Lafayette Square on Saturdays for the East-West Foundation.

"Macrobiotics is a word that brings looks of horror to the faces of nutritionists. Fathered by a Japanese, George Ohsawa, it is based on the Asian principle of yin-ying, which are opposite but complementary forces.

In "A Diet for the Living," Dr. Jean Mayer, wrote that "Ohsawa's call, if followed faithfully, is that of a Pied Piper who can lead young people to a totally inappropriate and miserable death." Four recipes are given: Miso soup. Pressure cooked brown rice. Tofu mayonnaise. Broccoli with tofu mayonnaise.

6652. Thanh, V.H.; Shibaski, K. 1977. Beta-conglycinin from soybean proteins. Isolation and immunological and physicochemical properties of the monomeric forms. *Biochimica et Biophysica Acta* 490(2):370-384. Feb. 22. [28 ref]
Address: Dep. of Food Chemistry, Tohoku Univ., Sendai, Japan.

6653. Nakadai, Tadanobu; Nasuno, Seiichi. 1977. The action of acid proteinase from *Aspergillus oryzae* on soybean proteins. *Agricultural and Biological Chemistry* 41(2):409-10. Feb. [14 ref]
• ***Summary:*** Until recently it has long been considered that large amounts of free amino acids are liberated from proteins by the hydrolytic action of acid protease from *Aspergillus oryzae.* However recent reports indicate that the liberation of free amino acids in miso brewing is due to the action of carboxypeptidase of the mold. This investigation clearly indicates that "free amino acids are liberated from soybean protein by the hydrolytic action of both acid proteinase and acid carboxypeptidase of *A. oryzae* in the miso brewing, but not liberated by the hydrolytic action of only acid proteinase." Address: Noda Inst. for Scientific Research, Noda, Chiba, Japan.

6654. Shurtleff, William; Aoyagi, Akiko. 1977. Excerpts from: *The Book of Miso,* and *The Book of Tofu. Macrobiotic* (*The*) (*Chico, California*) No. 117. p. 18-21. Feb. [2 ref]
Address: 790 Los Palos Dr., Lafayette, California 94549.

6655. *Soybean Digest.* 1977. Seminars in Japan [by Japan Vegetable Protein Food Assoc.]. Feb. p. 39.
• ***Summary:*** "Mr. Y. Sakaguchi, president of the Japan Vegetable Protein Food Assn. (JVPFA), related at a press conference held in Tokyo in November that JVPFA, in cooperation with ASA and Wheat Associates, sponsored 34 seminars during 1976. JVPFA is a quasi-government organization promoting the use of vegetable protein in the Japanese diet and is a close cooperator of ASA. These seminars for snack food manufacturers, hospital and other institutional food managers, company cafeteria managers and school lunch nutritionists were presented on the high nutritional value of vegetable protein and methods of incorporating these foods into diets.

"Mr. Y. Yoshida, director of the Fats and Oils Division of the Ministry of Agriculture and Forestry, reviewed recent nationwide publicity made through the Vegetable Food Protein Assn. He also provided information on a survey of vegetable protein use among food processors and homemakers. The introduction of vegetable protein into the school lunch program by the Ministry of Agriculture and Ministry of Education was discussed. Production volume of vegetable protein and the establishment of the JAS mark (Japan Agricultural Standard) on vegetable protein were other topics of consideration during the press conference."

6656. *Kenko na Katei* (*Healthy Household, Tokyo*). 1977. Daizu tanpaku ga sekai o sukuu. Zenbei nanajû kasho de miso to tôfu kôenkai [Soy protein can save the world: Miso and tofu lectures at 70 places throughout America]. March 1. p. 6. [Jap]
• ***Summary:*** Photos show: Shurtleff and Aoyagi standing by their white Dodge van on their Tofu & Miso America Tour. Holding a plate containing a cake of freshly made tofu. A map shows the route taken by their tour. Address: Japan.

6657. Birnbaum, Alfred. 1977. Re: Homemade natto, and favorite natto recipes. Letter to William Shurtleff at New-Age Foods Study Center, Lafayette, California, March 23. 1 p. Handwritten (pencil).
• ***Summary:*** "Homemade nattô: Soak 2 cups soybeans (preferably having been picked over first to remove any split or otherwise undesirable beans) in 4 cups of water for 6-8 hours, or overnight. Cook over low heat approximately 3-4 hours, adding more water if necessary, until beans test soft enough to be mashed between fingers. Strain the beans (saving stock for other cooking uses) and transfer to insulating fermenting boxes (I use plastic tofu tubs in plastic bags which are then wrapped in two layers of towels or blankets and are put in an unlit oven). If one's fermenting boxes are not too well insulated, rapid completion of this step in order to retain as much of the heat as possible is desirable. Also, inoculating each box of natto with approximately 2T. of "starter", either natto from the previous batch or commercial natto, or if available, a culture of pure *Bacillus natto,* considerably improves results.

"Allow to ferment 2-4 days (using my makeshift

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equipment, I allow it to ferment 3 days on the average.) Store in refrigerator or cool place

"The large yellow soybeans most readily available in the U.S. give acceptable results, but smaller varieties such as used in Japanese commercial natto production are best from the standpoints of taste, texture, and appearance." Address: Tama-sô No. 1, Inokashira 1-28-30, Mitaka-shi, Tokyo 181, Japan. Phone: 0422-47-7130.

6658. Eden Foods. 1977. Spring and summer catalog 1977. 4601 Platt Rd., Ann Arbor, MI 48104. 53 p.
• ***Summary:*** On the cover are bags, trays, and scoops filled with natural foods. Page 25 states that Eden now sells Tamari Soy Sauce (Eden, or Marushima), plus Hacho, Mugi, and Kome Miso. This is the earliest catalog seen in which Erewhon's name is not listed after any tamari or miso products.

On page 25 is the first record of "Eden Tamari: Natural Shoyu" which is sold in 8 oz, pints, quarts, or 1 gallons cans. A photo shows the quart bottle with label, and the dispenser. It is "made from whole soybeans and naturally fermented in wooden kegs for 30 months... The Muso Shokuhin Company has been supplying the macrobiotic community of the United States with tamari, miso and sea vegetables for the last ten years. All of Eden's Japanese imports are supplied by Muso." Address: Ann Arbor, Michigan. Phone: (313) 973-9400.

6659. Kiuchi, Kan; Ohta, Teruo; Itoh, Hiroshi; Takabayashi, Tokuji; Ebine, Hideo. 1977. Studies on lipids of natto. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 32. p. 257-61. March. [16 ref. Eng; jap]
• ***Summary:*** Reprinted from *J. of Agricultural and Food Chemistry* 24(2):404-07 (March/April 1976). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6660. Kiuchi, Kan; Ohta, Teruo; Ebine, Hideo. 1977. Accumulation of diglycerides and monoglycerides and decrease of unsaturated fatty acids in miso. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 32. p. 262-67. March. [8 ref. Eng; jap]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 23:455-60 (1976)– as "Studies on lipids of soybean foods. II." Address: National Food Research Inst., MAFF, Koto-ku, Tokyo, Japan.

6661. Kiuchi, Kan; Ohta, Teruo; Ebine, Hideo. 1977. [Changes in lipid components of miso-dama koji]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 32. p. 268-73. March. [6 ref. Jap; eng]
• ***Summary:*** Reprinted from *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 53(12):869-74 (1975). Address: National Food Research Inst., MAFF, Shiohama, Koto-ku, Tokyo, Japan.

6662. Okada, Y.; Takeuchi, T. 1977. [Salt-restricted miso: A review of the literature]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 72(3):181-84. March. [54 ref. Jap]*
• ***Summary:*** The high salt content of miso limits its use. Production of a low-salt miso using ethanol as a preservative is proposed. Address: Aichi State Food Research Inst., Nagoya, Japan.

6663. Saio, Kyoko. 1977. Soybeans resistant to water absorption. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 32. p. 220-25. March. [6 ref. Eng; jap]
• ***Summary:*** Reprinted from *Cereal Foods World* 21(4):168-73 (April 1970). Address: National Food Research Inst., MAFF, Koto-ku, Tokyo, Japan.

6664. Tabuchi, Ichiro. 1977. Tônyû no chichi Miraa hakase: Soibinzu wa nijû seiki no mana desu yo [Dr. Miller, the father of soymilk: "Soybeans are indeed the manna of the 20th century"]. *Shin Eiyo* (*New Nutrition*) No. 90. p. 90-96. March. [Jap]
• ***Summary:*** The story of how Dr. Miller, San-iku Gakuin, and San-iku Foods pioneered soymilk in Japan. Contains 3 photos of Dr. Miller. Address: Nihon San-iku Gakuin Kôtô Gakkô, Fuku-Kôchô, Japan.

6665. Taira, Harue; Taira, Hirokadzu; Kaizuma, Norihiko; Fukui, Juro; Matsumoto, Shigeo. 1977. [Varietal differences of seed weight, protein and sulfur-containing amino acid content of soybean seeds (Continued)]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 32. p. 25-66. March. [6 ref. Jap; eng] Address: National Food Research Inst., MAFF, Tokyo, Japan.

6666. Taira, Harue; Taira, Hirokadzu; Kaizuma, Norihiko; Fukui, Juro; Matsumoto, Shigeo. 1977. [Varietal differences of seed weight, protein and sulfur-containing amino acid content of soybean seeds]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 32. p. 207-19. March. [19 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 45(3):381-83 (1976). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6667. Tanaka, Teruo; Kuroda, Motoko; Sakaguchi, Kenji. 1977. Isolation and characterization of four plasmids from *Bacillus subtilis. J. of Bacteriology* 129(3):1487-94. March. [24 ref. Eng]

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• ***Summary:*** The article begins with some background: "Extrachromasomal deoxyribonucleic acid (DNA) elements have been found in sporeforming bacteria such as *Bacillus pumilus* (Lovett et al. 1973, 1975 and 1973), *Bacillus subtilis* (Lovett et al. 1975), and *Bacillus megaterium* (Carlton & Helinski 1969). Lovett and Bamucci (1975) have found two plasmids from *B. subtilis* strains..." The molecular weight of each is given. "Although the function of these plasmids has not been determined, the authors suggested the usefulness of these plasmids for the construction of recombinant DNA molecules." Recently Lovett and co-workers have succeeded in introducing a *Bacillus pumilus* plasmid into *B. subtilis* where the plasmid expressed its ability to produce bacteriocin (a proteinaceous toxin that inhibits the growth of bacteria).

"If a genetic engineering system were established in *B. subtilis* [instead of in *Escherichia coli,* which is presently used], it would be a safer system, since this group of bacteria is nonpathogenic, grows aerobically [requires air / oxygen for growth], and does not inhabit the human body."

Contains 7 figures and two tables. Fig. 3 is four electron micrographs of circular plasmid DNA; plasmids pLS11, pLS12, pLS13, and pLS14 are shown.

A plasmid is an extra-chromosomal DNA molecule separate from the chromosomal DNA which is capable of replicating independently of the chromosomal DNA. In many cases, it is circular and double-stranded. Plasmids usually occur naturally in bacteria, but are sometimes found in eukaryotic organisms (Source: Wikipedia).

Note 1. This is the earliest document seen (Jan. 2012) that contains the word "plasmids" (or plasmid) in connection with natto or with the bacterium *Bacillus subtilis* which causes the natto fermentation.

Note 2. This is the earliest document seen (Jan. 2012) that mentions research conducted on the natto bacterium by Teruo Tanaka or Mitsubishi or by the Mitsubishi Kasei Institute of Life Sciences (Tokyo, Japan). Tanaka went on to publish numerous other important papers about plasmids and natto.

Note 3. This is the earliest document seen (Jan. 2012) that contains the word "Extrachromasomal"(or the word "chromosome") in connection with natto. Address: Mitsubishi Kasei Inst. of Life Sciences, 11 Minamiooya, Machida-shi, Tokyo, Japan.

6668. Yasui, Akemi; Koizumi, Hideo; Tsutsumi, Chuichi; Matsunaga, Ryuji. 1977. [Collaborative study on the precision of an improved Kjeldahl method with titanium dioxide and copper sulfate as a catalyst. I. Determination of the nitrogen contents in the roasted flour of soybean, whole wheat, wheat flour and highly milled rice]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 32. p. 108-14. March. [5 ref. Jap; eng]

• ***Summary:*** The Kjeldahl method in analytical chemistry is a method for the quantitative determination of nitrogen in chemical substances developed by Johan Kjeldahl in 1883. Address: National Food Research Inst., MAFF, Tokyo, Japan.

6669. *Foreign Agriculture.* 1977. Japan's 1977 soybean imports may rise slightly. April 4. p. 5.
• ***Summary:*** The country's fats and oils industry reflects the sluggish pace of Japan's economic recovery from the "petroleum shock" of recent years. Increasing palm oil imports were a major factor contributing to excessive supplies of oils in Japan. As a result of rising stocks, member companies of the Japan Oil Processors Association (JOPA) have been forced to curtail operations for a few months until inventories of both oils and meals are drawn down to normal levels. Soybean planted area in Japan declined about 5% to 83,000 hectares in 1976, despite a 10% rise in the Government support price of $21.28 per bushel. The 1976 soybean production dropped 13% to 109,500 tons.

6670. Iso, James. 1977. Southeast Asia–emerging growth market for soybeans. *Foreign Agriculture.* April 11. p. 2-4.
• ***Summary:*** With rising incomes and changing eating habits whetting their appetite for meat and quality protein foods, four nations of Southeast Asia–the Philippines, Thailand, Malaysia, and Singapore–are turning to the world market for more livestock feed ingredients. Brazil–by gearing up its export program–has recently gained a substantial foothold in these markets. And soybeans and soybean products also have come from Asian suppliers like the People's Republic of China (PRC), Indonesia, and even Japan, the latter exporting soybean meal crushed from U.S. soybeans. Philippine imports of soybean meal in recent years have varied between 50,000 and 70,000 tons a year. The Philippines also is a viable market for soy proteins for food, thanks to the presence there of three major U.S. meatpackers. Some 50% of the processed meat produced by these firms has contained soy protein since the product's introduction into the Philippines in 1969. Ground red meat containing 20% soy protein enjoys good consumer acceptance. Owing to the large Chinese population in the Philippines, food soybean consumption already is significant. Although domestic soybeans make up the major supply for traditional foods, such as bean curds [tofu] and soy sauce, some 500-600 tons of these beans must be imported each month.

Thai soybean production has yet to make much headway. Thailand's climatic and soil conditions apparently have not been conducive to expansion, despite attempts by local growers and some Japanese interests to establish a large-scale industry in the highlands. In 1976, the country produced about 155,000 tons of soybeans, of which 20,000 tons were exported and the rest either used domestically for food or crushed. This year, if the Government approves, a

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multimillion-dollar soy protein plant will be constructed with the possibility of producing 10,000 tons of a soy infant food annually and 2,000 tons of meat analogue. The Institute of Feed Research and Product Development–a private Government-backed research organization affiliated with Kasetsart University–has spearheaded textured soy protein (TSP) and soy flour research. Malaysia is mainly noted for its huge and rapidly growing production of palm oil.

Although its population of 2.25 million is dwarfed by that of the rest of Southeast Asia, Singapore plays a disproportionately large role in the region's trade. This is because it is a major transshipment port for the region–and for Malaysia in particular. Most of the imported soybeans are crushed, although significant volumes of beans also are used in producing traditional soy foods for the large Chinese population. The only major soybean crusher outside of the Philippines is located in Singapore, an operation which the management anticipates will crush 100,000 tons of soybeans in calendar 1977. One firm is using soy proteins in canned foods, soy sauce, soft drinks, combined milk, and other products. Address: Foreign Market Development, Oilseeds and Products, Foreign Agricultural Service.

6671. Loetterle, Fred. 1977. Ton yu to tofu [Soymilk and tofu]. *California Living.* April 17. p. 40, 42, 44.
• ***Summary:*** About making tofu and soymilk at Azumaya. "With the precision of a great orchestra, 35 tofu makers dance through six dawns a week to coax the pre-soaked golden soybean into that meal of magic, that all-in-one soup-to-nuts food–tofu the humble, tofu the magnificent, tofu the quintessential actor/actress among all cuisine. Tofu! Tofu? Doufu? Dowfu? What is it, anyway? Is it some bloodless meat fashioned from the cooled and crushed essence of the soybean? Is it a cheese, formed as it is from the soymilk squeezed from the steamed beans and solidified by seawater or a related refinement such as calcium chloride? Is it a chewy bean cake, a jelly-like steak, ambrosia? Is it the world's longest running recipe...?

There are three tofu makers in San Francisco: "Azumaya Inc. of 95 Boutwell Street, the Wo Chong Co. of 1001 16th Street, and the Wo Hop Co. of 759 Clay Street. Also, there is one in South San Francisco (Quong Hop's, at 161 Beacon Street, a tradition in or near San Francisco since 1906), another one in Oakland and two in San Jose." Azumaya, at 95 Boutwell St., is run by four brothers (George, Jack, John, and Bill). It was founded on 17 January 1937 in a basement at 1636 Post Street, between Bush and Laguna streets. The Mizono's parents were Saichi and Matsuyo Mizono. "Their father was strengthened by a daily dish of the tofu he loved so well, usually enjoyed as boiled yudofu..." Tofu was made in old copper kettles using a stone grinder. "'We used to hand-crank everything,' recalls Bill. Brother John adds: 'Tofu has really snowballed in the last few years. Everybody here is getting into it as a new food. I think there is no limit to its popularity, because it's so good for your diet.'" The company also produces kinugoshi tofu, and (in a converted doughnut machine) agé. The regular tofu now sells locally for $0.50/lb. Today they use 1,600 to 2,400 lb of Arkansas soybeans a day. Annual gross sales are now $1 million compared to $600,000 in 1969, when they moved into their fourth and present headquarters.

Includes a detailed description of the tofu-making process, and several semi-recipes. Tofu is referred to twice in the article as "soybean cake." Photos show: (1) "Pulling cheesecloth in preparation of removal of tofu from tray." Two men are working by hydraulic presses that press the cloth-wrapped curds into tofu in shallow, perforated stainless-steel forming boxes. (2) "Compressing the coagulated tofu." One man is pulling down on a metal, ratcheting lever press. (3) "Packaging tofu." Three men are placing the curds in shallow plastic tubs. The author closes with a strong recommendation for *The Book of Tofu* by Shurtleff and Aoyagi.

Note 1. This is the earliest English-language document seen (Aug 2013) that uses the term "ton yu" (only in the title) to refer to soymilk; the Japanese word for soymilk is ***tônyû.***

Note 2. This is the earliest English-language document seen (April 2013) that uses the word "dowfu" to refer to Chinese-style tofu.

6672. Dolgin, Robert. 1977. Re: Information on a heat sealing machine for tofu, Varipack trays, and polyethylene film. Letter to William Shurtleff in Japan, April 19. 1 p. Typed, with signature on letterhead.
• ***Summary:*** Contains detailed descriptions of the machine, trays, and film. The Varipak trays are available from Sealright Corp. in Los Angeles. Rolls of polyethylene film can be purchased from the Richmond Corp. in Redlands, California. Eddie Okita [in Los Angeles] also has film and packaging machines, but his cheapest models [automatic] run up from $2,000 and package 1,200 pieces per hour.

"We are definitely interested in the small sealers you have, so send brochure and info on them ASAP. Also send the 6 stainless steel settling boxes you ordered.

"We would like to have definite confirmation on the insurance, the agent, and the shipping route, because Westbrae has told us that they will not cover insurance, and that they are not particularly interested in bringing equipment over in their container.

"Payment via a letter of credit would be preferable for us, if possible for you. If not, let us know how payment should be made."

Farm Foods has placed an order for tofu equipment, which Shurtleff is working to expedite in Japan and to answer Dolgin's questions.

The letterhead contains the words "The Farm Food Co." written in large arch. Below the company name is a circular logo, which shows rows of crops (soybeans) in a field

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converging in the distance at the foot of three mountains. Below that in much smaller letters: "Specializing in Vegetarian Foods." Below that and to the left is the address; to the right is the phone number. Address: The Farm Food Co., 820 B St., San Rafael, California 94901. Phone: 415-454-3797.

6673. Shurtleff, William; Aoyagi, Akiko. 1977. Koji & koji starter for miso and shoyu. Lafayette, California: New-age Foods Study Center. 3 panels each side. Each panel: 22 x 9 cm. April 26. Catalog.
• ***Summary:*** This is a revised, expanded, typeset (by Jan Herhold), and illustrated (by Akiko Aoyagi) version of a similar leaflet first printed in June 1976. Printed with black ink on saffron colored (yellowish orange) paper, it begins by noting: "Now you can easily make your own miso or natural shoyu (soy sauce) at home using either high-quality, reasonably-priced koji or koji starters available in the United States; illustrated instructions are given in *The Book of Miso.*

Part I describes two types of koji: Firm granular koji, and soft mat koji. Part II describes nine different types of koji starter for which are sold in three textures: Spore-powder texture, whole-grain texture, and meal texture. The nine different types of koji starter are for: Red miso, barley miso, soybean miso, mellow barley miso, sweet white miso, light-colored miso, fast white miso, amazake or pickling, or shoyu. All the above are made by the prestigious Japan Brewing Company (*Nihon Jozo Kogyo*), which employs only the very finest traditional, natural methods.

Sources of ready-made koji: Miyako Oriental Foods (Los Angeles, California), Westbrae Natural Foods (Emeryville, California), Chico-San Food Co. (Chico, California), and Janus Natural Foods (Seattle, Washington). Sources of koji starter: Westbrae Natural Foods sells the 5 most widely used koji starters; all are imported from Mitoku Trading Co., Tokyo, Japan. Address: Lafayette, California.

6674. Bernardino, Minnie. 1977. Tofu: Oriental food whose American time has come. Puddinglike soy curd adds taste, nutrition. *Los Angeles Times.* April 28. Part VI. p. 1, 10, 11.
• ***Summary:*** Better known by its Japanese name (the Chinese call it dow foo), tofu is fresh bean curd made from soybeans. The curds are formed when a coagulant is added to set the milky liquid [soymilk]. "The subsequent processing methods result in a variety of tofu products that differ only in firmness and texture."

"In Los Angeles the majority of tofu products are locally manufactured by the Matsuda-Hinode Tofu Co. which was started by the Yamauchi family in Hawaii about 30 years ago." The company makes a variety of tofu products "including soft to very soft tofu, medium-firm or Japanese-style tofu, and the hard or Chinese-style tofu that is popular for stir-fry dishes. They also make partially cooked styles such as the broiled block of tofu [grilled tofu], deep-fried tofu puffs (age or aburage in Japanese) and the raw-fried tofu (nama-age)."

Gives recipes (some from *The Book of Tofu,* by Shurtleff & Aoyagi) for: Yosenabe. Stuffed fried tofu. Tuna tofu patties. Tofu-orange almond dessert. Mushroom and onion casserole with tofu. Tofu tartare sauce. Pressed bean curd fry. Four photos show tofu being made at Matsuda-Hinode (overhead view of cutting large sheets into blocks in cooling tank) and in dishes. Address: Staff writer.

6675. Japan Food Research Laboratories. 1977. Analysis certificate for Morinaga brand aseptically packaged tofu (soy bean curd). 52-1 Motoyoyogi-cho, Shibuya-ku, Tokyo, Japan. 1 p. Report 6120678-15.
• ***Summary:*** Product was produced by Morinaga Milk Industry Co. Ltd. on 22 Dec. 1976. Assay was conducted 15 April 1977. Moisture 89.1%, crude protein (N x 5.71) 4.7%, crude fat 2.8%, crude ash 0.6%, carbohydrate 2.8%, total solids 10.9%, vitamin B-1 0.12 mg/100 gm, vitamin B-2 0.04 mg/100 gm, nicotinic acid 0.23 mg/100 gm. Address: Tokyo, Japan.

6676. Kondo, Hitoshi; Nakatani, H.; Hiromi, K. 1977. Studies on action pattern of amylase-catalized hydrolysis of amylose using TNS fluorescence as a probe. *Agricultural and Biological Chemistry* 41(4):631-34. April. [20 ref. Eng]
• ***Summary:*** This is a new method for following the hydrolytic reaction of amylose. Taka-amylase EC-3.2.1.1 is discussed. TNS stands for 2-p-toluidinylnaphthalene -6-sulfonate. Soy is mentioned only in a very minor way; Crystalline Beta-amylase from the soy bean was used in the experiment. Address: Lab. of Enzyme Chemistry, Dep. of Food Science and Technology, Faculty of Agriculture, Kyoto Univ., Sakyo-ku, Kyoto, Kyoto 606.

6677. Matsui, Katsuhiko; Atsusaka, T; Higaki, M.; Sasaki, K. 1977. Purification and properties of leucine dehydrogenase of *Bacillus natto* KMD 1126. *Chemical and Pharmaceutical Bulletin* 25(4):761-66. April. [14 ref]
• ***Summary:*** Leucine dehydrogenase is an enzyme, which has high substrate specificity. "The optimum pH for oxidative deamination was 10.7, where it was 9.5 for reductive amination. The molecular weight of the enzyme was 360,000 daltons as determined by gel filtration on Sephadex G 200." This enzyme had no antitumor effects on Ehrlich ascites carcinoma bearing mice. Address: Faculty of Pharmaceutical Sciences, Kanazawa Univ., 13-1 Takara-machi, Kanazawa, Japan.

6678. *Mother Earth News.* 1977. Plowboy interview: Bill Shurtleff and Akiko Aoyagi. No. 44. March/April. p. 8-18.
• ***Summary:*** The best wide-ranging discussion of Shurtleff and Aoyagi's work with tofu in America and Japan. Contains a color photo of the two standing next to the white Dodge

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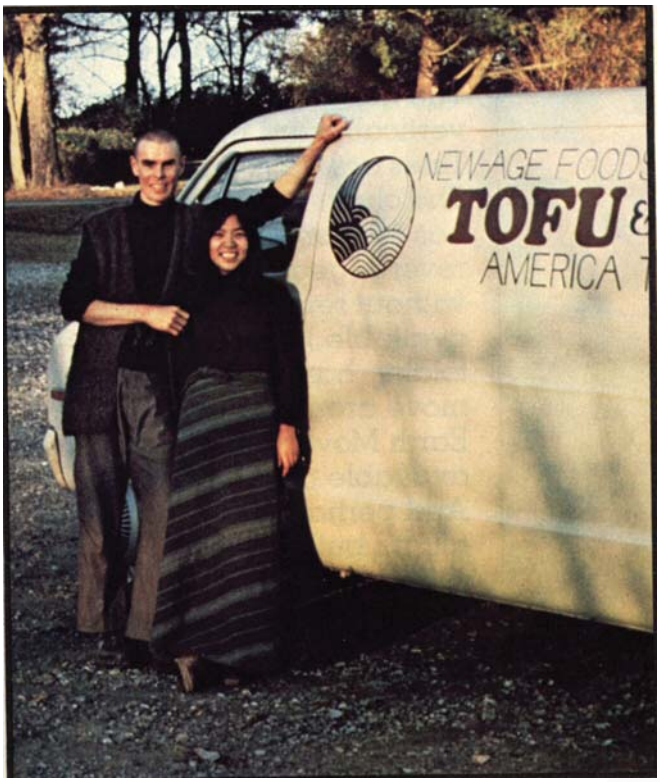

van in which they are doing a Tofu & Miso America Tour.

Most of the basic ideas in this interview are those which Shurtleff has been presenting in about 70 public lecture programs as part of a nationwide tour that he and Akiko are doing to raise awareness of human population growth worldwide, world hunger, the wastefulness and cruelty of the feedlot system, and the many benefits of foods made from soybeans.

6679. Ochiai-Yanagi, Sonoe; Takagi, T.; Kitamura, K.; Tajima, M.; Watanabe, T. 1977. Reevaluation of the subunit molecular weights of soybean 11S globulin. *Agricultural and Biological Chemistry* 41(4):647-53. April. [31 ref]
Address: 1,4-5. National Food Research Inst., Ministry of Agriculture & Forestry, Koto-ku, Tokyo 135, Japan; 2-3. Inst. for Protein Research, Osaka Univ., Suita, Osaka 565.

6680. Iso, James Y. 1977. Japan looks to the U.S. for more food-quality soybeans. *Foreign Agriculture.* May 16. p. 6, 16.
• ***Summary:*** When the People's Republic of China (PRC) cut back on its soybean exports last year because of a poor domestic harvest and disruption of marketing channels by the devastating earthquake, Japanese manufacturers of miso, tofu, and other native soy foods were among the first to feel the pinch, having traditionally bought large quantities of PRC soybeans. Their shift could lead to perhaps a 100,000-ton gain in U.S. exports of food-quality soybeans to Japan.

"In 1976, the U.S. shipped about 520,000 tons of these food-use soybeans to Japan out of total U.S. soybean sales there of 3.2 million tons and Japan's total soybean imports of 3.5 million. Japan received another 132,000 tons of food beans from the PRC and a few thousand tons from other supplying countries.

"Adding to this a domestic production of 60,000 tons puts Japan's total soybean use in traditional foods last year at about 750,000 tons.

"Each year, Japan uses about 720,000 tons of soybeans in traditional foods, including roughly 350,000 tons of tofu (bean curd), 180,000 of miso (bean paste), and 70,000 of natto (fermented beans). The remaining tonnage goes into other native products, such as kinako (processed [dry roasted] beans) and frozen tofu, and into fresh soybean consumption.

"Manchurian beans, produced in the colder regions of North China (usually north of 43º latitude), have long been considered the best tasting for fermented foods like miso and natto."

"Outside of the PRC, the varieties of beans preferred by the food manufacturers are found in colder climates, such as Canada and the northern regions of the United States." Several "Japanese trading firms involved in importing food-type beans have come to prefer soybeans produced in Indiana, Illinois, Ohio, and Michigan. These beans, known among the trade as IOM (Indiana, Ohio, Michigan) beans, made up close to 500,000 tons of the food beans imported by Japan last year and go largely into tofu and related foods." Note: This is the earliest English-language document seen (Jan. 2008) that uses the abbreviation "IOM" in connection with soybeans.

"Around 55,000 tons of 'identity-preserved' varieties also were imported last year." Producers are looking for a large bean with a white hilum and high protein and carbohydrate content. All food beans must be #1 grade quality. Talks with miso/natto manufacturers have revealed that U.S. varieties Amsoy, Corsoy, Kanrich, and Beeson meet this general description. However, a bean with all the desired features comparable to the PRC's, particularly as related to taste, is not as yet commercially available in the U.S. Address: Foreign Market Development, Oilseeds and Products, Foreign Agricultural Service.

6681. Bernardino, Minnie. 1977. What is this thing called tofu? *Washington Post.* May 26. p. F25.
• ***Summary:*** This article is very similar to her article titled "Tofu: Oriental food whose American time has come. Puddinglike soy curd adds taste, nutrition" in the *Los Angeles Times* on April 28 (p. I1). A description of tofu plus 7 recipes. Address: Los Angeles Times.

6682. Ishikawa, Shigeru. 1977. China's food and agriculture: A turning point. *Food Policy* 2(2):90-102. May. [19 ref]
• ***Summary:*** "'Food grains' are defined here, as indicated

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in Table 1, as inclusive of paddy rice, wheat, coarse grains, potatoes, and soybeans. In Chinese official statistics on agricultural production, `food grain crops' (the translation of *liang-shih tso-wu*) comprised only the first four crops of the above and soybeans were listed separately when these statistics were regularly published (namely, the years for 1949-1950). But in the same period, the statistics for internal trade and consumption used the term 'food grain' (*liang-shih*) as comprising all the above five crops.

"When government sources in later years disclosed the production figures of *liang-shih* on a fragmental basis, it is not entirely certain whether they referred to it in terms of the former or the latter definition. Recently, there are unconfirmed reports that the official definition of *liang-shih tso-wu* production has been changed to include soybeans." Address: Inst. for Economic Research, Hitotsubashi Univ., Kunitachi, Japan.

6683. Kitamura, Keisuke; Takagi, T.; Shibasaki, K. 1977. Renaturation of soybean 11S globulin. *Agricultural and Biological Chemistry* 41(5):833-40. May. [23 ref] Address: 1&3. Faculty of Agriculture, Dep. of Food Chemistry, Tohoku Univ., Sendai, Miyagi-ken 980, Japan; 2. Inst. for Protein Research, Osaka Univ., Suita, Osaka 565, Japan.

6684. Hayashi, Kazuya; Mizunuma, Takeji; Yokotsuka, Tamotsu. Assignor to Kikkoman Shoyu Company, Ltd. (Japan). 1977. Process for producing koji for fermented food products. *U.S. Patent* 4,028,470. June 7. 7 p. Application filed 8 June 1976. [2 ref]

• ***Summary:*** "Producing koji for fermented food products by modifying an unmodified koji-substrate composed of a vegetable protein material and a vegetable carbohydrate material, inoculating a koji mold in the resulting modified koji-substrate, and cultivating it, wherein said cultivation is carried out in the presence of 0.1 to 1.2% by weight, based on the water content of the modified koji-substrate, of acetic acid added. This process is suitable for use in the manufacture of fermented foods such as soy sauce, miso, or sake." Address: 1. Kashiwa, Japan; 2. Noda, Japan; 3. Nagareyama, Japan.

6685. Birnbaum, Alfred. 1977. Re: Homemade natto and natto recipes. Letter to William Shurtleff at New-Age Foods Study Center, June 11. 5 p. Handwritten (in pencil) and signed.

• ***Summary:*** "Dear Bill–I enclose more in the way of nattô recipes, which I hope will prove of interest to you. I also wish to clarify some things in my description of the natto-making process: namely that the bacteria are aerobic and so the fermenting beans should not be placed in air-tight containers (I place my bean-cultures in plastic tofu tubs and cover–but I do not seal–with foil or plastic bags before putting in any insulated environment e.g., wrapping with towels and placing in unheated oven); secondly, more cooking than the cited 3-4 hours may be necessary to achieve the desired degree of softness in the soybeans depending on the pre-soaking time and cooking flame (an all-day 'slow-cooker' crock-pot might prove the ideal in cooking the beans, although extremely energy consuming).

"I hope that your research in Indonesia went well and that the upcoming conference on seaweeds will prove equally successful.

"Please let me know if there is anything I might be able to do for you, I hope I will be able to meet you sometime. Gasshô, Alfred.

"P.S. I made my first tofu with the Learning Tree kit from the New-age Center. I know of few investments better than those of acquiring self-sufficiency skills–your teaching has let me know the rewards of making tofu. Thank you."

"Further suggestions for natto: Use in Okonomiyaki [savory Japanese-style pancakes]. Roll in hakusai [cabbage] leaves in a sudare and top with goma-ae [ground sesame-seed] dressing."

On pages 2-5 are some of Alfred's favorite natto recipes: (1) Nattô "cutlets" á la Pokarski–Adapted from a traditional Russian dish. With Paprika sauce. It calls for "1½ c. nattô, ground or blended in a blender or suribachi to a paste ('nattô butter')."

"Yaki nattô or Nattô agé-yaki: Perhaps my favorite nattô dish, enjoyed even by persons who normally dislike the taste of nattô. Spoon natto by the tablespoonful into agé [deep-fried tofu] pouches (4 tablespoons each on the average) and pan-fry in oil or butter over medium heat approximately 3-5 minutes on each side. Drain on drip-screen or paper towels. Serve while still steaming hot with a dip of shoyu, karashi [Japanese-style mustard] and chopped green onions, or grated daikon and ginger."

Chilaquiles con nattô: An adaptation of a Mexican "platillo pobre" (poor-person's dish). Sauces for Chilaquiles: Salsa verde (green enchilada sauce), salsa roja (red enchilada sauce), molé poblano (a dark rich chile sauce...).

"I assume that you already have or can easily obtain recipes for the following standard nattô dishes: Nattô shiru [soup]. Iwate nattô mochi (mochi-wrapped nattô). Nattô maki-zushi [natto in sushi]. Nattô-kake soba" [Natto over buckwheat noodles].

Nattô oroshi agé. Nattô aé [six different combinations]. Address: 1048 West 39th Place, Los Angeles, California 90037.

6686. *Foreign Agriculture.* 1977. Japan to import more soybeans in 1977. June 27. p. 8-9.

• ***Summary:*** The U.S. will supply about 92% of these imports. Palm oil imports soared 40% last year to 153,500 tons–mainly as a result of palm oil's lower price compared with that of soybean oil. To encourage greater soybean and

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rapeseed production, the Government has annually increased its support level for both crops. Although additional increases are expected this year, it is generally recognized that these support and incentive payments will not result in a substantial diversion of rice to soybeans and rapeseed. Despite a total Government support level, including production incentive payments of $21.28 per bushel for soybeans and $14.49 per bushel for rapeseed, area and production of both crops decreased in 1976. Consumption data show that over 75% of soybean oil used in Japan is consumed directly as cooking or salad oil, with the market almost equally divided between home use (retail sales) and institutional use (restaurants, fast-food outlets, etc.). Of the remainder, about three-quarters is used for food processing and the rest for nonfood usage. Vegetable oils account for nearly 75% of Japan's consumption of edible fats and oils.

6687. Ebine, Hideo; Kiuchi, Kan; Ohta, Teruo; Takabayashi, T. 1977. [Miso lipids and the relations between free fatty acids and the quality of miso]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 24(6):295-99. [Jap]*

6688. Erewhon Trading Co., Inc. 1977. Erewhon: Our traditional foods are the foods of the future. *East West Journal.* June. p. 67. [3 ref]
• ***Summary:*** This informative advertisement is largely about miso. Erewhon imports Hacho [Hatcho] miso from Japan; the source company first made Hacho miso in 1337. "We are grateful to Muso Shokuhin Company of Japan, a macrobiotic natural foods company, for originally distributing hacho miso to the United States through Erewhon and for the work they continue to do in developing sources of high-quality organic foods for Japan and the rest of the world. Erewhon is also grateful to Mr. A. Kazama of Mitoku Company, Ltd., of Tokyo, for encouraging the development of large-scale miso production without the use of chemical additives to speed the aging process. When Mr. Michio Kushi, the founder of Erewhon first convinced Mr. Kazama of the sizable market for naturally produced miso, he initiated a search which resulted in the president of Sendai Miso Company agreeing to produce enough to keep up with the demand.

"Recently a brown rice (genmai) miso has been added to the Erewhon line of imported foods. Based on the traditional techniques and standards, this new variety was two and a half years in development before Mr. Ko Haga, brewmaster of Sendai, produced what he considered a successful brown rice koji, or starter."

"Sendai uses a regionally grown rice, called Sasanishiki, which is highly regarded in Japan, and the soybeans used are the 'Prize' variety grown organically in Minnesota by farmer Ed Ricke."

Last year 85 tons of traditionally produced miso were imported into the United States from Japan. Erewhon now has 3 locations in the USA, in addition to the headquarters and main warehouse at 33 Farnsworth St.: 342 Newbury St., Boston, Massachusetts 02115; 1731 Massachusetts Ave., Cambridge, MA 02138; 1 Civic Center Plaza, Hartford, Connecticut 06103. Address: 33 Farnsworth St., Boston, Massachusetts 02210.

6689. **Product Name:** [Fuji Pur {Spun Soy Protein Fibers} (SP-90, 100, MM, FF)].
Manufacturer's Name: Fuji Purina Protein Ltd. Subsidiary of Fuji Oil Co. and Ralston Purina.
Manufacturer's Address: Sumiyoshi-cho 1, Izumisano-shi, Osaka-fu, Japan. Offices: Kanda Suda-cho 1-28-2, Chiyoda-ku, Tokyo.
Date of Introduction: 1977 June.
New Product–Documentation: *Soybean Digest Blue Book.* 1977. p. 36.

6690. Kobayashi, Takashi. 1977. Insect pests of soybeans in Japan. *ASPAC* (*Asian and Pacific Council*) *Food and Fertilizer Technology Center, Technical Bulletin* (*Taiwan*) No. 36. 24 p. June. [19 ref]
Address: Tohoku National Agric. Exp. Station, Japan.

6691. Kushi, Michio. 1977. The book of macrobiotics: The universal way of health and happiness. San Francisco, California: Japan Publications, Inc. x + 182 p. June. Illust. Index. 26 cm.
• ***Summary:*** Many followers of macrobiotics consider this to be the author's classic work on the subject. The preface tells briefly how Mr. Kushi got involved with macrobiotics and came to America. He began to lecture in New York in 1955. His teachings began to spread, especially after 1963. By Feb. 1977 he has conducted 5,000 lectures and seminars in America and Europe. One Appendix is titled "A Historical Review of the Macrobiotic Movement in North America" (p. 168-71).

Concerning foods made from soybeans, the book discusses miso (p. 51-52), protein (p. 69), tamari (p. 51-52, 131-33), tekka (52, 133), and tofu plaster (130; "more effective than an ice pack to draw out fever"). Concerning smoking, the author believes that it "does not contribute to produce lung cancer" if the smoker eats a proper traditional (macrobiotic) diet (p. 115).

"In 1949, Michio Kushi, during his postgraduate studies at Tokyo University, was inspired by the teaching of George Ohsawa. He came to the United States in connection with the World Federalist movement. Besides him, Aveline Tomoko Yokoyama in 1951, Herman Aihara in 1953, Cornellia Chiko Yokota, Romain Noboru Sato and his brothers Junsei Yamazaki, Shizuko Yamamoto, Noboru Muramoto and others came to the United States during the following years. After experience with various enterprises they respectively began to teach macrobiotics, mainly in New York. George

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and Lima Ohsawa also visited America from Europe to conduct seminars. Macrobiotic summer camps, restaurants, and food stores began to operate on a small scale with many American people. Educational activity was organized as the Ohsawa Foundation at that time. However, on the occasion of the Berlin Crisis in 1961, the major active people related to the macrobiotic movement made an 'exodus' to Chico, California. Robert Kennedy, Lou Oles, Herman Aihara and others began Chico San, Inc., as a food manufacturing and distributing company, and established the Ohsawa Foundation in California. Later, the Foundation moved to Los Angeles, its main activity being publishing George Ohsawa's works. The San Francisco center was established. At a later date, Jacques and Yvette de Langre [DeLangre], Joe and Mimi Arseguel and many others shared educational activities in California and other areas of the West Coast.

"In the meantime, after educational activity in New York, besides several seminars on Martha's Vineyard and various local colleges, Michio and Aveline Kushi moved to Boston in order to concentrate on education for the younger generations. They organized the East West Institute in Cambridge which later moved to Wellesley and then transferred to Boston. To meet the increasing demand for good food, a small basement food store, Erewhon, was opened. Erewhon was managed and developed over the years by the Kushis, Evan Root, William Tara, Roger Hillyard and Paul Hawken. Erewhon was followed by a small restaurant, Sanae, managed at different times by Evan Root, Tyler Smith, and Richard Sandler. Lectures by Michio Kushi continued for five years in Arlington Street Church, Boston, with repeated visits to many major U.S. cities. Erewhon developed into a larger store, on Newbury Street in Boston, and added its wholesale operation from a warehouse on the South Shore, Boston Wharf, distributing constantly to an increasing number of natural food stores. The warehouse facility has been managed by Paul Hawken, William Garrison, Tyler Smith, and currently Jeff Flasher and other associates as well as the Kushis. Erewhon further established a Los Angeles store which also developed into a wholesale operation–managed over the years by the Kushis, William Tara, Bruce Macdonald, and currently by John Fountain and Thomas DeSilva...

"The *East West Journal*, a monthly newspaper, established in 1970–managed over the years by Ronald Dobrin, Jack Garvey, Robert Hargrove, and currently Sherman Goldman, Lenny Jacobs and other associates–is continuing to introduce to the wider society, the new vision for the present and future world. Educational activities directly concerned with teaching and other educational projects have been administered since 1973 by the East West Foundation, a nonprofit educational organization managed by the Kushis, Edward Esko, Stephen Uprichard, and other associates." Address: Boston, Massachusetts.

6692. Shurtleff, William; Takai, Wataru. 1977. Contract between Takai Seisaku-sho and New-age Foods Study Center. Ishikawa-ken, Japan. 1 p. 36 cm.
• ***Summary:*** Shurtleff contacted Takai, as the largest and oldest manufacturer of tofu equipment in Japan, and asked if he had a catalog of his equipment. Wataru Takai said the company had only leaflets in Japanese. Thus, they agreed that Takai needed an English-language catalog of tofu equipment, the first such catalog ever to be created–worldwide. Shurtleff agreed to create such a catalog on two terms: (1) First that he and Akiko would do the work as a consultant for Takai and charge for their time. (2) That they would agree upon a long-term contract that would be mutually beneficial to both organizations. This is that contract, which deals with the following issues: (1) Flow chart (ordering procedure from NAFSC getting an enquiry or order to Takai shipping the equipment). 2. Commissions–based on the yen sale value of individual pieces of equipment. 3. Catalog will contain tofu equipment made by other manufacturers–so it would contain all equipment needed by Western tofu makers and they would have a choice of products. 4. Reduction of commission when orders placed are solicited by Takai or Jetro. 5. Ongoing consulting by Shurtleff. 6. Contract validity–18 months. The contract was signed on 5 June 1977. It is written on Takai's new English-language letterhead, designed by William Shurtleff and Akiko Aoyagi. The logo shows a lever on top of a soybean moving the world. The first order went to Robert Dolgin at Farm Foods in San Rafael, California. Address: 1. Founder, New-age Foods Study Center, Tokyo, Japan; 2. Overseas manager, Takai Seisakusho, 307 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan. Phone: (0762) 48-1355.

6693. Wang, Hwa L. 1977. Re: Tempeh starter and questions concerning tempeh. Letter to William Shurtleff at New-Age Foods Study Center, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan, July 6. 2 p. Typed, with signature on letterhead.
• ***Summary:*** Dr. Wang encloses a package of tempeh starter which Shurtleff requested in his letter of June 18. She then answers four questions that Shurtleff asked related to tempeh. Address: USDA ARS North Central Region Northern Regional Research Lab., 1815 North University St., Peoria, Illinois 61604.

6694. Magida, Phylis. 1977. Make your picnic cuisine 'to go' with ethnic flair: Eats. *Chicago Tribune.* July 8. p. A1.
• ***Summary:*** Describes how people picnic in many different countries, and where to buy these ethnic supplies in the Chicago area. In Japan, when people picnic, they take several lacquered boxes filled with movable trays, each filled with a variety of foods designed to keep well without refrigeration. At Tenkatsu's Restaurant (3365 N. Clark St.) buy an order of beef teriyaki, accompanied by at least one of the following:

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"... *hiya dofu* [chilled tofu] (a rectangle of protein-rich soybean curd that looks like a white molded custard, 85 cents)."

Then walk three doors to Star Market (3349 N. Clark St.) "and buy an eight-piece combination box of *futomaki* (four small seaweed rolls stuffed with rice), and *inari* (four small ovals of deep-fried bean curd)." Eat these at room temperature. Total price at Star: $3.75.

6695. Yokotsuka, Tamotsu. 1977. "Shoyu": Japanese fermented soy sauce. Paper presented at SCOGS (Select Committee on GRAS Substances) Hearing. 17 p. Held 26 July 1977 at the Hilton Hotel, Bethesda, Maryland. Unpublished manuscript.
• ***Summary:*** Reports on the acute and long term effects of feeding shoyu to mice and rats. Concludes that the acute toxicity of shoyu was accounted for by the toxicity of its sodium chloride content. Address: Kikkoman Shoyu Co. Ltd., 339 Noda-Shi, Chiba-ken, Japan.

6696. Kanazawa, Akio; Teshima, Shin-ichi; Tokiwa, Shigeru. 1977. Nutritional requirements of prawn. VII. Effect of dietary lipids on growth. *Nihon Suisan Gakkai shi* (*Bulletin of the Japanese Society of Scientific Fisheries*) 43(7):849-56. July. [32 ref. Eng]
• ***Summary:*** The survival and growth of prawns (*Penaeus japonicus*) kept on a soybean oil diet were extremely low. However, all diets containing pollack residual oil were found to improve both survival and growth. The fastest growth was attained in the prawn group receiving 8% short necked clam lipid. Address: Faculty of Fisheries, Kagoshima Univ., 4-50-20 Shimoarata, Japan.

6697. **Product Name:** [Midori Soymilk (Mild, or Pure)].
Foreign Name: Midori Tônyû (Mairudo, Piyuwa).
Manufacturer's Name: Kyushu Nyugyo.
Manufacturer's Address: Kyushu, Japan.
Date of Introduction: 1977 July.
Wt/Vol., Packaging, Price: 500 ml, probably Pure Pak type carton.
How Stored: Refrigerated.
New Product–Documentation: K. Tsuchiya. 1982. Dec. Tonyu [Soymilk. 2nd ed.]. p. 72. Note: Midori means "green" in Japanese. This is a larger size version of their first soymilk launched in Aug. 1976.

6698. *Organic Gardening and Farming.* 1977. Branch-beans. 24(7):128-30. July.
• ***Summary:*** "These green soybeans are a 'gustatory treat,' but you'll have to grow your own because 'buying them in the market is impossible.' Here's how it's done." The author, who lives in a coastal California valley, decided to plant soybeans. "My family uses vegetable protein heavily in our diet, and soybeans, as almost everyone now knows, give a lot of high-grade vegetable protein. Beyond this reason, however, was our love of green soybeans. My wife, who comes from Japan, introduced me to *edamame* or 'branch-beans,' and now all of us look forward to late summer when the branch-beans come into season..."

The author purchased three garden soybean varieties: Pickett (85 days to mature) from Park Seed Company, Kanrich (103 days) from Burpee, and Fiskeby V (68 days) from Thompson and Morgan. One key to the success of the crop was to buy and use some bean inoculant, which is sold under various brand names.

"My wife prepares the branch-beans by first washing them, pod and all. Then she puts them in boiling water, salts to taste, cooks until tender, drains and serves. For those who like to spend a lot of time in the kitchen, removal of the beans from their pods is time-consuming but not difficult. Rather than put this extra burden on the cook, my family likes branch-beans so much that they are served in their pods so each person can pop out his own. Hold the bean pod up to your mouth and squeeze. The green beans pop into your mouth, and the pod can be discarded in a bowl put on the table for that purpose."

Note: This is the earliest English-language document seen (June 2009) that uses the term "branch-beans" (literal translation of eda + mame) to refer to green vegetable soybeans.

6699. Imai, T.; Takagi, S. 1977. [Improvement of soybean protein characteristics with fats]. *Japanese Patent* 77 96,762. Aug. 13. [Jap]*

6700. Aoki, S.; Aihara, S.; Kikuchi, K. 1977. [On some conditions of the fermentation process affecting natto quality]. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 1(1):13-17. [Jap]*

6701. Hayashi, U.; Nagao, K.; Ueda, T.; Kitamura, K. 1977. [Nutritional value of natto with precooked ramen]. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 1(1):25-36. (Chem. Abst. 91:90001. 1979). [Jap]*

6702. Hayashi, U.; Nagao, K.; Ueda, T.; Kitamura, K. 1977. [Studies on nutrition of natto. X. Effect of various calcium salts on growth of rats]. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 1(1):63-69. (Chem. Abst. 91:90001. 1979). [Jap]*

6703. New-age Foods Study Center. 1977. Farming the sea–Sea vegetables in Japan: A colorful evening program by William Shurtleff and Akiko Aoyagi based on years of study in Japan (Poster). Lafayette, California. 1 p. Aug. 30 x 26 cm. Black on yellow.
• ***Summary:*** This program was held at the International Seaweed Symposium, Univ. of California at Santa Cruz.

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"Featuring: 150 color slides about nori, wakame, kombu, hijiki, agar and many others. Special slides about chlorella (microalgae) cultivation. Favorite sea vegetable recipes served. Free brochures of recipes and basic information.

"Date: Tuesday, August 23. Time: 8:00 p.m. Place: U.C.S.B. Ellison Hall Complex. Admission: Free! Open to the public." Note: This is the 2nd earliest English-language document seen (June 2008) with the term "sea vegetables" in the title, and the earliest since World War II. Address: [P.O. Box 234, 1336 Bickerstaff St./Rd., Lafayette, California 94549].

6704. Kiuchi, Kan; Ohta, T.; Itoh, H.; Takabayashi, T.; Ebine, H. 1977. Studies on lipids of natto. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 1(1):71-80. Aug. [16 ref. Eng]

• ***Summary:*** "The lipid contents and compositions of three kinds of natto, Itohiki-, Yukiwari-, and Hama-natto, were investigated. The lipid contents of the finished products of Itohiki-, Yukiwari-, and Hama-natto were 5.0, 6.4, and 17.3% respectively. The lipid composition was determined by high-speed liquid chromatographic analysis."

"When fermented by *Bacillus natto,* the surface of the soybean is covered with characteristic viscous substances consisting of a polymer of glutamic acids. Yukiwari-natto is made by mixing Itohiki-natto with rice koji and salt, aged at 25-30ºC for 15 days. Hama-natto is made by using soybean koji."

Reprinted from *Journal of Agricultural and Food Chemistry* (April 1976, p. 404-07). This paper is part IV of the series "Studies on Lipids in Soybean Foods."

Note: This is the earliest English-language document seen (Nov. 2011) that uses the word *Hama-natto* (hyphenated) to refer to fermented black soybeans–a completely different food from natto. Address: Div. of Applied Microbiology, National Food Research Inst., Ministry of Agriculture and Forestry, Koto-ku, Tokyo, Japan.

6705. Lane, Joshua. 1977. Vegetable soybeans (Letter to the editor). *Alternatives* (*Miami, Florida*) 1(8):5. Aug.

• ***Summary:*** "Just a quick comment on your well-done sprouting article. There are different types of soybeans; a vegetable type of soybean differs from a standard soybean by being higher in protein and having a lower oil content. It also does not [sic] contain the trypsin inhibitor that is found in the standard soybean. It has been developed as a vegetable rather than as a oil type soybean.

"The Chinese and Japanese have been using vegetable soybeans for centuries. It makes much better tofu and produces a higher yield than regular soybeans. Vegetable soybeans are higher priced than the standard soybean; the reason is that the vegetable soybean has a yield per acre which is considerably lower than the standard soybean." Address: Hollandale, Florida.

6706. Matsui, Katsuhiko; Tamegai, Y.; Miyano, A.; Kameda, Y. 1977. Purification and properties of alanine dehydrogenase from *Bacillus natto* KMD 1126. *Chemical and Pharmaceutical Bulletin* 25(8):2061-66. Aug. [17 ref]

• ***Summary:*** Alanine dehydrogenase is an enzyme, which has high substrate specificity. Address: School of Pharmacy, Hokuriku Univ., 3 Ho, Kanazawa-machi, Kanazawa 920, Japan.

6707. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*). 1977--. Serial/periodical. Tokyo: Natto Kagaku Kenkyu-kai. Vol. 1, No. 1. Aug. 1977. [Jap]

• ***Summary:*** In 1979 published at 1-7-10 Moto Asakusa, Koto-ku, Tokyo 135, Japan.

6708. Shurtleff, William; Aoyagi, Akiko. 1977. Miso production: The book of miso volume II. Lafayette, California: New-Age Foods Study Center. 62 leaves. Aug. 16. Illust. by Akiko Aoyagi Shurtleff. No index. 28 cm.

• ***Summary:*** Contents: Introduction. 1. Setting up a traditional shop–Tools and ingredients: The miso shop building, larger equipment (most vats and other wooden equipment are made of Japanese cedar, *sugi = Cryptomeria japonica,* which is durable in the presence of water, heat, and salt, and has a pleasant fragrance), smaller tools, ingredients. 2. Making red miso in a traditional shop. 3. Making red miso in a semi-traditional shop. 4. Making Hatcho and Mellow white miso in semi-traditional shops. 5. Making koji starter

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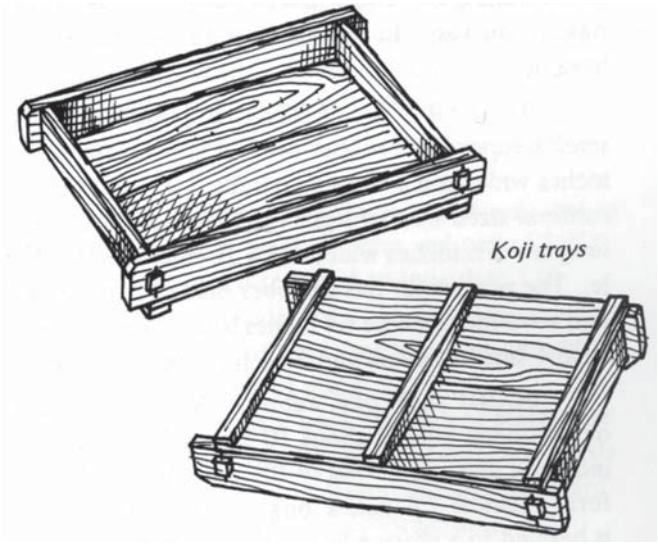

in a semi-traditional or modern shop. 6. Making light yellow miso in a modern factory. Appendixes. A. People interested in starting commercial miso shops in North America. B. Sources of miso making equipment and ingredients. C. About the New-Age Foods Study Center [renamed Soyfoods Center, then Soyinfo Center].

Illustrations related to koji by Akiko Aoyagi (most of which first appeared in *The Book of Miso,* 1976, pages 170-208) show: (1) Making koji on a traditional koji mixing floor. (2) Top and bottom views of traditional wooden koji trays. (3) Packages of different types of koji starter. (4) A box of firm granular koji. (5) Soft mat koji. (6) The koji process at the start of Making Red Miso in a Traditional Shop.

Note 1. This is the first book published by New-Age Study Center (renamed Soyfoods Center in 1980).

Note 2. This is the earliest English-language book seen (March 2009) devoted entirely to commercial miso production. Address: P.O. Box 234, 1336 Bickerstaff St./Rd., Lafayette, California 94549.

6709. Shurtleff, William; Aoyagi, Akiko. 1977. Tofu & soymilk production: The Book of Tofu, volume II. Lafayette, California: New-Age Foods Study Center. 128 p. Aug. 1. Illust. by Akiko Aoyagi Shurtleff. No index. 28 cm.
• ***Summary:*** A rough photocopied manuscript with a yellow cover, created in response to a letters from many people requesting information on how to start a tofu shop. This book was published in finished form in 1979 under the same title, Tofu and Soymilk Production (336 p.).

Contents: 1. So you want to start a tofu shop or soy dairy? 2. Setting up shop; The community shop, the traditional shop, the steam-cooker shop, the pressure cooker shop, the soy dairy, the modern factory. 3. Ingredients. 4. Scientific data concerning the tofu-making process. 5. Tofu. 6. Firm tofu. 7. Using okara and whey. 8. Deep-fried tofu: Cutlets, burgers, and pouches. 9. Soymilk. 10. Soymilk ice cream, yogurt, kefir, mayonnaise, and cheese. 11. Silken tofu & soft tofu (Silken tofu is made from concentrated soymilk). 12. Lactone silken tofu. 13. Grilled tofu. 14. Wine-fermented tofu. 15. Dried-frozen tofu. 16. Yuba.

Appendix A: People and institutions connected with tofu & soymilk production. B: Sketches of tofu and yuba shops in Japan. C: So you want to study tofu in Japan? D: Table of equivalents.

Note 1. This is the earliest English-language document seen (April 2013) that uses the term "silken tofu" to refer to Japanese *kinugoshi* tofu.

Note 2. This is the earliest English-language document seen (Oct. 2011) that uses the term "wine-fermented tofu." Address: New-Age Foods Study Center, P.O. Box 234, Lafayette, California 94549; 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan.

6710. Tanaka, Teruo; Koshikawa, Takako. 1977. Isolation and characterization of four types of plasmids from *Bacillus subtilis* (natto). *J. of Bacteriology* 131(2):699-701. Aug. [9 ref. Eng]
• ***Summary:*** *Bacillus natto* is now classified as *Bacillus subtilis* by the 8th edition (1974) of *Bergey's Manual of Determinative Bacteriology.* Closed circular deoxyribonucleic acids (covalent) were found in 10 strains of *Bacillus natto.* These can be classified into four types based on their molecular weights and on the patterns formed in agarose gel electrophoresis after digestion. These four types are numbered and described. Address: Mitsubishi Kasei Inst. of Life Sciences, 11 Minamiooya, Machida-shi, Tokyo, Japan.

6711. Yang, Charles Y. 1977. Past and present studies on soybean rust incited by *Phakopsora pachyrhizi* Syd. *Bulletin of the Institute of Tropical Agriculture, Kyushu University* 2:78-94. Aug. Reprint monograph at NAL. [30+ ref. Eng]
• ***Summary:*** "Soybean rust, caused by *Phakopsora pachyrhizi* Syd., is the most serious soybean disease in Asia and Australia and is a potential threat to other soybean production regions." Address: Kyushu Univ., Japan.

6712. Lemov, Penelope. 1977. Family out: A weekly guide to family dining. *Washington Post.* Sept. 8. p. C12. Section D (D_C_12).
• ***Summary:*** The Mikado Restaurant (4707 Wisconsin Ave., NW), Japanese and moderately priced, offers "Natto, fermented soy beans." Also fish Teriyaki.

6713. Needleman, Larry. 1977. Re: Questions and new developments concerning Bean Machines Inc. Letter to Wataru Takai, Takai Tofu & Soymilk Equipment Co., 307 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan, Sept. 20. 4 p. Typed, with signature.
• ***Summary:*** The letter begins: "Thank you for the handsome catalogues. I hope that this is the beginning of a long and

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prosperous relationship. This is a long letter with many questions to make the transition from Bill Shurtleff to Bean Machines Inc. I hope our future correspondence will be less complicated.

"Like Bill, I would like to earn a modest income while providing equipment to my customers at the lowest possible price. I am therefore concerned with keeping my costs as low as possible. From a commercial standpoint this policy will make Takai and BMI the leaders in the field. Some of the CIF prices that Mitoku quoted Bill and which appeared in his catalogue were substantially lower than the CIF prices you have just sent." Address: Bean Machines Inc., California.

6714. Kushi, Aveline. 1977. Re: Why George Ohsawa coined the term "tamari" about 20 years ago to refer to naturally-fermented shoyu. Letter to William Shurtleff at New-Age Foods Study Center, Sept. 28. 5 p. Handwritten.
• ***Summary:*** Ohsawa coined this term at the request of Lima Foods in Belgium. Address: 62 Buckminster Rd., Brookline, Massachusetts 02146.

6715. East West Foundation. 1977. Food policy recommendations for the United States: Statement of Michio Kushi, September 21, 1977. 359 Boylston St., Boston, MA 02116. 32 p. 28 cm.
• ***Summary:*** On September 21, 1977, Michio Kushi and several associates, including Dr. Robert Mendelsohn, M.D., met in Washington with members of the White House staff. The meeting, which lasted approximately two hours, began with a 45 minute presentation of a series of recommendations by Michio Kushi, a description of the activities and goals of the East West Foundation (founded 1972), and a history of Erewhon (fiscal 1978 sales estimated at $10 million). An outline of the East West Journal's position on various political, social, and economic applications of the national food policy was also included in the meeting's agenda.

Recommendations for seasoning foods and to aid digestion of grains, was traditional foods such as pickled vegetables and naturally fermented soy bean products (such as soy sauce, miso, tempeh, etc.). Note: Dr. Mendelsohn died in about May 1988. Address: Boston, Massachusetts. Phone: 617-536-3360.

6716. Sakakibara, Masaki; Noguchi, Hajime. 1977. Interaction of 11S fraction of soybean protein with calcium ion. *Agricultural and Biological Chemistry* 41(9):1575-80. Sept. [29 ref]
• ***Summary:*** Calcium salts have long "been used to precipitate soybean proteins in order to make a soybean cake ('Tofu' in Japanese)."

When calcium chloride was added to an 11S protein solution, the volume increased to a constant saturated value with increasing calcium chloride concentration. Then the volume decreased with concentrations above 0.04 M calcium chloride. "By CD measurements it was shown that the addition of 0.05 M calcium chloride did not cause any change in the secondary structure of the protein molecules." Address: Dep. of Food Science and Technol., Faculty of Agriculture, Nagoya Univ., Nagoya, Japan.

6717. *Wall Street Journal.* 1977. Ralston Purina venture in Japan. Oct. 13. p. 18.
• ***Summary:*** St. Louis–The Ralston Purina Company announced that it has formed a joint venture with Fuji Oil Co., Osaka, to market soy proteins in Japan.

"The joint venture, Fuji Purina Protein Ltd., will market soy protein products manufactured by both Ralston and Fuji Oil."

6718. Dee, Joel. 1977. Re: Interest in importing instant miso soup mix from Japan. Letter to William Shurtleff at New-age Foods Study Center, Oct. 24. 3 p. Typed, with signature on letterhead.
• ***Summary:*** This letter follows our telephone conversation of Oct. 20. Asks Shurtleff in Japan to help set up the project. Address: CeDe Candy, Inc., P.O. Box 271, Union, New Jersey 07083. Phone: (201) 964-0660.

6719. *Los Angeles Times.* 1977. Japan: Top market for U.S. soybeans. Oct. 27. p. H25.
• ***Summary:*** Japan now imports 55,000 tons of soybeans a year from the United States, which makes Japan the leading customer for U.S. soybeans in the world, according to USDA figures.

The Japanese use soybeans in a variety of traditional foods including "tofu (soybean curd of which 10 million bricks are sold daily in Japan), miso (fermented soybean paste, the basis for the soup served in most Japanese restaurants [and homes]), aburage (deep-fried tofu) or natto (fermented cooked soybeans), kinako (roasted soybean powder) and shoyu (soy sauce). The use of soy in bread, biscuits and noodles consumes 15,220 tons of soybeans each year."

Exports of soybeans and soy products (such as soybean oil and meal) have played an important positive role in the U.S. balance of trade and the U.S. farm economy.

6720. **Product Name:** [Seitan].
Foreign Name: Seitan.
Manufacturer's Name: Jonathan.
Manufacturer's Address: Holleweg 89, 2070 Ekeren (near Antwerp), Belgium. Phone: 031-64.41.73.
Date of Introduction: 1977 October.
Ingredients: Whole wheat, tamari soy sauce, ginger, kombu.
Wt/Vol., Packaging, Price: 250, 500 and 1000 gm trays with transparent plastic film lid.
How Stored: Refrigerated.

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New Product–Documentation: This is the earliest known commercial seitan product in Europe. Jos van de Ponseele (Jos is pronounced like the first syllable in Joseph) was the person responsible for starting seitan production at Jonathan.

Typed letter written in Oct. 1977 on Jonathan letterhead (Jonathan was at Holleweg 89; at the top of the letterhead was an illustration of two seagulls and a round yin-yang (*t'ai chi*) symbol) showing that that company was selling Seitan (a vegetarian steak) and Goulash (made with seitan)–among other things.

Letter from Sjon Welters. 1982. April 16. "Jonathan is a macrobiotic food company. They produce a wide assortment of macrobiotic products, such as... seitan..."

Label sent by Jos van de Ponseele. 1988. 6.25 by 10.5 inches. This card-stock sleeve fits over the product. Color photo of two slices of seitan on a wooden plate with brown rice, onion rings, mushrooms, and lettuce. The product name, Seitan Natural in English, or Seitan Naturell in German, is written in white on a reddish-orange band. Ingredients: water, wheat*, soya flour*, wheat gluten, soya sauce, sea salt, sea-weed, spices * = Organically grown. Nutritional composition: Minerals 1%, vegetable proteins 20%, vegetable fats 0.3%, carbohydrates 3%. 110 calories (Kcal) per 100 gm. The product is sold frozen in a 200-gm tray. "Vegetable product. Use: Open lid with a sharp knife. Spread mustard or sprinkle tamari on the slices and allow them to fry in a pan. Pieces of seitan are delicious in all sorts of stews as in e.g. sauce bolognese with chopped seitan." Code CINAB. Best before 12/89.

Letter from Mark Callebert of Lima Foods in Belgium. Jonathan started to make seitan in 1978 in a plant they built at Holleweg, Ekeren (Hoogboom), Belgium.

Letter (fax) from Jos van de Ponseele and Magda Verfaillie of Mycelia b.v.b.a. in Gent, Belgium, in response to an inquiry. 1992. July 6. Jonathan was the first company in Europe to make seitan for sale commercially. Jos van de Ponseele, the founder of Jonathan, first learned about seitan during a 9-month stay [with his wife and family] at the Kushi Institute in Boston, Massachusetts, from March to December 1976. There he tasted the seitan prepared by Aveline Kushi. He thought it would be a good meat substitute for the growing group of vegetarians in Europe. [Note: Jos was a butcher with a large meat processing operation before he became a macrobiotic vegetarian]. In Boston, he learned how to make seitan on a home scale from Tamara Uprichard. Then, at the very end of his stay in Boston, he started up medium-scale production of seitan with two Americans; he no longer remembers the name of the company or the names of his American partners. They sold seitan to macrobiotic study houses in Boston and to the Erewhon retail store.

Returning to Belgium, he founded Jonathan. The name "Jonathan" came from a famous book titled *Jonathan Livingston Seagull* [by Richard Bach, 1970]. Jos hired a man named Ludo Peeters as his first employee and they set up the business in a garage at Holleweg 53, 2180 Ekeren, near Antwerp, Belgium. The company's first product, made entirely by hand, was plain fresh seitan. It was introduced some time in 1977. The product name on the label was simply Seitan, written in 4 languages (Dutch, French, German, and English). It was packaged in 250, 500, and 1000 gm carton dishes with a transparent plastic film lid. With seitan, the big challenge for Jos was to introduce an entirely new and valuable product to the market. Two months after introducing seitan, Jonathan started making tofu and soymilk. Ludo continued to work at Jonathan for many years, eventually becoming managing director.

In 1979 Jonathan introduced a fresh seitan burger, then in Jan. 1980 the company moved to its present location at Antwerpsesteenweg 336, B-2080 Kapellen, Belgium. At the new location they introduced a number of new seitan products: Seitan Paté (Feb. 1980, sterilized), Seitan Goulash (late 1980, sterilized), and Seitan Schnitzel (1981, fresh). From 1985 on, Jonathan introduced a series of different ready-to-eat meals in which seitan was a major ingredient. Jos sold Jonathan and left on 1 April 1989.

Talk with Tamara Uprichard. 1992. July 7. She lived in the same Boston macrobiotic study house with Jos and his wife and family. She remembers Jos as being a very gentle, hard-working, and well-organized man.

Talk with Ludo Peeters. 1992. July 9. Ludo started working at Jonathan on 28 Aug. 1978. He made seitan with Jos from the very first day; they were Jonathan's only workers at the beginning and they worked in a garage at Holleweg 58 (the address never changed). Jonathan's first product was seitan, followed by tofu and soymilk. Ludo thinks that the seitan was introduced in Nov. 1978. The original ingredients were water, wheat, soy sauce, soy flour or meal, salt, kombu, and ginger. The soy flour improved the flavor and nutritional value. He will look for a document to prove the date of introduction.

6721. Machida, Yoshiro. 1977. Tôfu, aburage no kagaku [The science of tofu and deep-fried tofu pouches]. Tokyo: Shokuhin Gijutsu Kenkyusho. Oct. 14. 6 p. [Jap]
Address: Fuchu-shi, Tokyo.

6722. Shurtleff, William; Aoyagi, Akiko. 1977. The book of kudzu. Brookline, Massachusetts: Autumn Press, and Lafayette, California: Soyfoods Center. 102 p. Illust. by Akiko Aoyagi Shurtleff. Index. 28 cm. Reprinted in 1985 by Avery Publishing Group, Inc. (Wayne, New Jersey). [79 ref]
• ***Summary:*** Contents: Acknowledgments. Kudzu (poem) by James Dickey. 1. The ancient genie. 2. Cooking with kudzu (70 recipes): Basic recipes, sauces, soups, jelled salads, deep-fried preparations, grains with kudzu powder, primary food made from kudzu powder, special tofu with kudzu, jelled desserts, Japanese-style jelled confections, thickened beverages, kudzu noodles, kudzu leaves, shoots, flowers,

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and roots. 3. Healing with kudzu. 4. Making kudzu powder. 5. Weaving with kudzu. 6. Kudzu and the ecosystem. Appendices: A. Real kudzu powder and its imitations. B. Institutions and people connected with kudzu. Bibliography. Glossary.

Kinako (roasted soy flour) is mentioned several times in this book: "Kudzu Mochi... is a bite-sized mound of jelled kudzu sprinkled with a layer of *kinako* (roasted soy flour) and a little natural sweetening" (p. 11).

A recipe for Kinako tofu calls for "10½ tablespoons kinako" (p. 38).

A recipe for Kudzu mochi states: "This is probably the most popular way of using kudzu powder in Japanese confectionery." The recipe calls for "6 tablespoons kinako (roasted soy flour)" (p. 43).

Three recipes on p. 45 call for the use of kinako: Lima Ohsawa's kudzu mochi. Milk kudzu mochi, and Ouda no goko. Address: New-Age Foods Study Center, P.O. Box 234, Lafayette, California 94549.

6723. Yoshino, U.; Iwasaki, Y.; Okubo, M.; Okuyama, T. 1977. [Effect of storage conditions on soybean protein]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 24(10):526-29. [Jap]*

6724. Shurtleff, William. 1977. Report on visit to small-scale, modern natto factory in Tokyo, run by Mr. Noboru Ose. Tokyo, Japan. 1 p. Nov. 10. Unpublished typescript.
• ***Summary:*** This visit was made with Alfred Birnbaum and James Udesky. Contains a detailed description of how natto is made in a modern factory (Ose Noboru Natto, Kugayama 5-7-22, Suginami-ku, Tokyo 168, Japan), which uses 1,200 1,200 kg of dry soybeans daily. The owner is head of the Japanese National Natto Association. Separate color slides also show the process. To make 150 kg (one batch) of finished natto–Ingredients: 90 kg of dry soybeans. 1½ small plastic spoonsful (about 1/16 teaspoon) of pure-culture liquid natto starter (*Bacillus natto*) dissolved in 1.5 liters boiled water.

Wash the soybeans twice thoroughly then soak overnight in water (12 hours in summer, 18 hours in fall or spring, 24 hours in winter). Drain the beans well then place in a large pressurized steamer. Steam at 14.7 pounds pressure for 25 to 30 minutes, then release the pressure, open the cooker, tilt it forward, and scoop the beans into a large aluminum bowl (4 ft. diameter, 14 inches deep). Allow to stand for 5 to 10 minutes, then thoroughly mix in the inoculant. Discard any excess liquid that settles to the bottom. Run or spoon the beans into a tray, cover them with a sheet of perforated plastic (1/8-inch-diameter holes every 1½ inches), and cover the tray loosely with a plastic lid and put it in the incubation room. Keep at 40-43ºC (104º to 108ºF) for 14 to 15 hours. Actually the temperature is regulated as follows: It starts at 40ºC (104ºF) and is gradually increased to 50ºC (122ºF) at 8 hours; it remains the same until 13 hours. At that time it is gradually reduced to 35ºC (95ºF) at 15-16 hours. Do not allow the temperature to rise above 55ºC (131ºF). Once this process is finished, put the tray into a cold storage room and cool for 1 night. The cooling reduces the moisture content through evaporation. Now with plastic boxes the natto cools more slowly.

The traditional natto process: Soak as above then boil at atmospheric pressure for 7 hours. Inoculate as above or (a) mix in natto from a previous fermentation [but it gets bad after 2 to 3 generations since undesirable microorganisms propagate], or (b) use bacteria naturally occurring on rice straw [except that when pesticides and herbicides are used on the rice, the number of bacteria is reduced to about 15% of the natural count]. Wrap hot natto in rice straw and put in the *kotatsu* (charcoal heater under a table covered by a blanket) to get 40ºC temperature, then wrap it in a blanket and keep it at this temperature for 2 to 3 days and nights. In the West, a yogurt incubator works well.

It is said that a longer incubation produces better flavored natto. Perhaps short fermentation tastes milder with a subtle vanilla or chocolate flavor, whereas long-incubated natto has a stronger, more distinctive flavor, and more of an alcoholic aroma. Address: c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: (03) 925-4974.

6725. Shurtleff, William. 1977. Report with color slides on trip to Ose Noboru natto factory in Tokyo, Japan. Nerima-ku, Tokyo, Japan: New-Age Foods Study Center. 1 p. Unpublished manuscript. Nov. 10.
• ***Summary:*** Shurtleff took some color slides of the natto-making process on this one-day trip to this small-scale, modern natto factory in Suginami-ku, Tokyo, with Alfred Birnbaum and James Udesky. We study, photograph, and write up the process. Mr. Ose is head of the Japanese Natto Assoc. Met Alfred Birnbaum for the first time.

The slides / photos are now in a numbered set as follows

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followa (see next page)::

1. Natto or fermented whole soybeans is a traditional food that originated in the Northeast part of Japan over one thousand years ago. The dark brown natto beans have a sticky-slippery surface so that lifted from a bowl, they form gossamer threads. Natto's flavor and aroma are strong and distinctive, with not-so-subtle ammonia overtones–some people love them, other people don't. Traditionally natto was made and sold wrapped in rice straw as you see to the left. Now it is sold in shallow polystyrene trays.

2. Here you see the beans inside the traditional rice-straw wrapper; in some farmhouses they are still prepared in this way. Bacteria on the rice straw naturally inoculate the beans.

3. Here are various types of natto packaging used in Japan. Some natto is made with cracked soybeans (hiki-wari natto), some contains pieces of kombu. Most types are served with a little shoyu (natural soy sauce) and mustard.

4. A typical Japanese supermarket carries a large selection of natto types.

5. To make natto in a modern plant, soaked soybeans are steamed under pressure until tender.

6. While still warm (40*C) they are inoculated with natto starter (Bacillus natto). Or they can be inoculated at home with 10 to 20 percent of commercial natto.

7. They are then scooped by hand into individual shallow containers...

8. ... which are closed, placed into incubation racks...

9. ... and stacked in incubation rooms at about 40*C for 15 to 24 hours, after which time they are ready to eat. A whole food requiring no additional cooking, natto is generally served as a topping for rice or noodles, sauteed with vegetables, or used in soups or Japanese salads (aemono). Today natto is prepared in more than 1,000 commercial shops and is widely available at Japanese food markets in the West. Cracked natto (*hikiwari-natto*) and finger lickin' natto (*yukiwari natto,* containing rice koji and salt) are also popular in Japan. A close relative of natto from northern Thailand, called thua-nao, is sold as a savory paste (containing salt, garlic, onion, and red chilies) or as sun-dried chips. Address: c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: (03) 925-4974.

6726. Herb, C.; Williams, Bev. 1977. Tsumago a step back in time. *Los Angeles Times.* Nov. 13. p. M20.
• ***Summary:*** Tsumago is a historic town, a living museum, relatively untouched by time, in the Japan Alps, southwest of Tokyo. Few Americans visit, or even know it exists–although many Japanese visit. The food is authentic, and is not adjusted for tourists. "Breakfast can include a raw egg mixed with soy sauce at the table and then poured over steaming hot rice. Another breakfast treat is steaming hot soup with various vegetables, seaweed and soy bean curd." A photo shows one of the town's narrow lanes.

6727. Betbeze, Merrie. 1977. Pesky kudzu has culinary merits. *Tuscaloosa News* (*Alabama*). Nov. 20. p. 2C, 14C.
• ***Summary:*** This is a review of *The Book of Kudzu,* by Shurtleff and Aoyagi. Most people in the Deep South see kudzu as "a green menace that strangles and destroys the crops and gardens they have worked so hard on.

"But surprisingly to some (maybe most) Americans, kudzu is a useful product that has been an important part of the Chinese culture for over two thousand years, accordingly to a recently published book on kudzu.

"Kudzu has been used for weaving, cooking, and healing in the Chinese and Japanese cultures, according to a book by William Shurtleff and Akiko Aoyagi.

"Today the kudzu root is being made into a powder and used by some Americans mainly for cooking, the author said." It is now being sold in natural food stores throughout the United States–although there is not much demand for it in Tuscaloosa.

Recipes are given for: Kudzu, shoyu and vegetable sauce. Fried eggplants with kudzu and sesame sauce. Mock cheesecake. Egg and onion miso soup. Corn soup with kudzu. Fragrant kudzu-thickened clear soup (with tofu). Fresh fruit jelled salad. Guacamole jelled salad. Deep-fried rice balls. And more.

A large photo shows kudzu vines that cover poles, trees, and shacks. Address: Staff writer.

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6728. *Toyo Shinpo* (*Soyfoods News*). 1977. Shurutorefu-shi to tezukuri tôfu [Mr. Shurtleff and homemade tofu]. Nov. 21. [1 ref. Jap]
• ***Summary:*** Describes the work of Shurtleff, author of *The Book of Tofu*. Address: Tokyo, Japan.

6729. Needleman, Larry. 1977. Re: New developments with Bean Machines Inc. and tofu kits. Letter to William Shurtleff at New-Age Foods Study Center (c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan), Nov. 29. 4 p. Typed, with signature on letterhead.
• ***Summary:*** This letter is written on printed Bean Machines stationery. "The last couple of weeks before you left brought us closer together. Debbie and I miss you both. I hope your flight was enjoyable and by now you are reunited with your [Aoyagi] family." Larry and Debbie are planning to move to Bodega on Dec. 17, into a 100-year-old house on December 17th. Their new address will be: Box 76, Bodega, CA 94922. They are anxious to get back to the country. Debbie's child, Brian Joseph, "is fine, laughing a lot, and each day brings a new unfolding with him."

Larry authorizes Bill Shurtleff to open an account with Mr. Hibaya and place an order for 40 pressing sacks and 30 straining bags–plus other items. Details are included on equipment instruction manuals, installation, operating, cleaning and maintenance instructions.

Larry expects his first order of tofu equipment from Takai to be worth about $10,000. He hopes that Takai will be able to ship the order by 1 Jan. 1978.

An invoice dated 14 Oct. 1977 is enclosed from The Learning Tree for 12 tofu kits (boxed), $7.17 each, total $86.04.

Also enclosed is a Fictitious Business Name Statement for Bean Machines, Inc. (206 Baltimore, Corte Madera, California 94925), filed with the County of Marin. The application date and filing date is 31 March 1977. Needleman and Shurtleff are listed as the two owners. Address: Bean Machines Inc., P.O. Box 881, San Rafael, California 94901. Phone: (415) 456-7034.

6730. Bale, M.D.; Greenshields, Bruce L. 1977. Japan: Production and imports of food. An analysis of the welfare cost of protection. *USDA Economic Research Service, Foreign Agricultural Economic Report* No. 141. 20 p. Nov. See p. 15. [17 ref]
• ***Summary:*** "Soybeans grown in Japan are used in food products... Domestic production currently supplies 21% of the domestic demand for food use; the balance comes from China and the United States. By 1985/86, plans call for increasing the level of domestic production to 60 percent of quantity demanded. Domestic soybean production is encouraged by incentive payments which raise producer prices above world levels, thus giving rise to a net welfare loss... Consumption rose from 4.9 kilograms per capita in 1955/56 to 6.2 kilograms in 1975/76, or a total of 637,000 tons in 1975/76... In 1955/56, production was almost 507,000 tons, while by 1975/76 it had fallen to 126,000 tons." Address: Washington, DC.

6731. Chang, C.H.; Lee, S.R.; Lee, K.H.; Mheen, T.I.; Kwon, T.W.; Park, K.I. 1977. Fermented soybean foods. Paper presented at Symposium on Indigenous Fermented Foods, Bangkok, Thailand. Summarized in K.H. Steinkraus, ed. 1983. Handbook of Indigenous Fermented Foods. New York: Marcel Dekker, Inc. ix + 671 p. See p. 465-66, 482-87.
• ***Summary:*** Contents: Korean soy sauce: Kanjang (is made by primitive methods in the home), steps in preparation, microbiology, biochemical changes (p. 465-66). Korean doenjang and kochujang: Description (Soy sauce and miso were introduced to Japan, from Korea, during the Nara period {645-793 AD}), patterns of consumption (Daily per capita consumption of doenjang and kochujang are estimated to be about 15 gm and 10 gm, respectively), steps in preparation (utensils, substrates, essential microorganisms), control of process, biochemical changes, economics of production and distribution.

Note: This is the earliest English-language document seen (March 2009) that uses the word "kochujang" to refer to Korean-style red pepper and soybean paste (miso).

Illustrations show: (17) Flow sheet: Production of Korean doenjang (soybean paste). Soak soybeans, boil, mash, form into balls, wrap in rice straw, and incubate under rafters until covered with mold (*meju*). Crush, mix with salt brine, and ferment for 6 months to obtain doenjang. (18) Flow sheet: Production of Korean kochujang (soybean paste). Soak soybeans, boil, mash, suspend in rice straw sacks until overgrown with mold (*meju*). Crush, sun-dry, and pulverize to obtain 10 liters of crushed meju. Add cooked gelatinous rice flour (2 liters), hot pepper flour (0.5 to 0.7 liters), kanjang (Korean soy sauce), dried beef, jujube flour, honey, and salt brine. Mix. Ferment for 2 months to obtain kochujang.

A table (p. 487) shows the amino acid composition of doenjang. Address: 1. Food & Nutrition Dep., Sacred Heart Women's Univ., Bucheon, Kyungki-do, South Korea.

6732. Ebine, Hideo. 1977. Japanese miso. Paper presented at Symposium on Indigenous Fermented Foods, Bangkok, Thailand. Summarized in K.H. Steinkraus, ed. 1983. Handbook of Indigenous Fermented Foods. New York: Marcel Dekker, Inc. ix + 671 p. See p. 468-79. Address: Applied Microbiology Div., National Food Research Inst., Ministry of Agriculture, Forestry, and Fisheries (MAFF), Japan.

6733. Hayashi, U. 1977. Japanese natto. Paper presented at Symposium on Indigenous Fermented Foods, Bangkok, Thailand. Summarized in K.H. Steinkraus, ed. 1983.

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Handbook of Indigenous Fermented Foods. New York: Marcel Dekker, Inc. ix + 671 p. See p. 530-45.
• ***Summary:*** The section in Steinkraus (1983), titled "Miscellaneous Oriental fermentations" (p. 530-45) discusses two different types of fermented foods: (1) Itohiki natto (from Japan) and Thua-nao (from Thailand); and (2) Hama-Natto (from Japan) and related products (which we call "fermented black soybeans," involving a mold fermentation). However each type is discussed separately, with part (1, p. 530-45) coming before part (2).

Contents of part (1): Description. Patterns of consumption. Steps in production. Microorganisms. Yields of product. Biochemical changes. Nutritional value. Economics of natto production.

Itohiki natto: In northern Thailand, thua-nao serves as an alternative for fermented fish. In Japan (according to USDA 1958) there were about 800 natto factories nationwide, including roughly 80 in Tokyo.

The essential natto bacterium, *Bacillus natto* is an aerobic Gram-positive, spore-forming rod, closely related to *B. subtilis. B. natto* SB 3010 presently seems to be the variety best suited to making natto since its rapid growth on steamed soybeans leads to a partial degradation of protein to amino acids.

Natto mucilage is composed mainly of an acidic glycopeptide. Address: 5-13-11 Minami Tanabe, Higashisumiyoshi-ku, Osaka-shi 546, Japan.

6734. Hesseltine, C.W.; Wang, H.L. 1977. Contributions of the Western World to knowledge of indigenous fermented foods of the Orient. Paper presented at Fifth International Conference on Global Impacts of Applied Microbiology, Nov. 1977, Bangkok, Thailand. 32 p. In: Steinkraus 1983, p. 607-22. [28 ref]
• ***Summary:*** Contents: Introduction. 1. Training of teachers and technicians. 2. Scientific aspects of the fermentation process. 3. Breeding of microorganisms for strain improvement. 4. Introduction of pure culture strains. 5. Substrate changes caused by enzymes. 6. Studies on the nutritional value of fermented foods. 7. New uses for traditional fermentations. 8. Developing an awareness of the importance of studying indigenous foods. References cited.

Photos show: (1) The interior of a Japanese sake brewery (wood block print, from Atkinson 1881). (2) Dr. Ryoji Nakazawa (1878-1974; supplied by Dr. T. Hasegawa). (3) Dr. K. Saito, who discovered the tempeh fungus, *Rhizopus oligosporus* (supplied by Dr. T. Hasegawa). (4) *Rhizopus oligosporus* (Saito 1905). (5) Ragi (Eijkman 1894). (6) Chinese yeast cakes (Eijkman 1894). (7) The complete kit for making tempeh, from Farm Foods, Summertown, Tennessee (shows brown paper ag, with large front and back labels). Address: NRRC, Peoria, Illinois 62604.

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6735. Hymowitz, T.; Newell, C.A.; Carmer, S.G. 1977. Pedigrees of soybean cultivars released in the United States and Canada. *INTSOY Series* No. 13. 23 p. Nov. (College of Agric., Univ. of Illinois at Urbana-Champaign). [17 ref]
• ***Summary:*** Contents. Introduction. Abbreviations. Pedigrees of soybean cultivars released in the United States and Canada (Five-column table, p. 4-15). Strain identification. Parentage of strains. Registration of soybean cultivars. References.

The 337 soybean varieties listed in this publication, named or released from 1889 to 1976, are currently (1977) in the USDA germplasm collection, and were released in the USA and Canada. "Cultivars having an experimental strain pedigree and preceded by an asterisk, and the strain is underlined" (e.g., Beeson, Bonus, Bragg). This information was compiled from many sources, including USDA Bureau of Plant Industry Bulletins.

In the information on early soybean varieties below (adapted from the 12-page "Pedigrees" table), column 1 is the year introduced to the USA, column 2 (separated by a comma) is the cultivar name, 3 is the Maturity Group, 4 is the pedigree (P.I. is the "Plant Introduction" number and F.C. is the "Forage Crop" number, both from the USDA, Beltsville, Maryland), and column 5 is the year named or released. Only the early (pre-1915) introductions are listed here, in chronological order:

1889, Medium Green or Guelph, III, 1903 and 1907.

1889, Kingston, IV, P.I. 17255 (From Japan), by 1907.

1894, Easycook, VI, P.I. 34702 (From Shantung Prov., China), by 1923.

1900 or before, Mammoth Yellow, VII, Unknown, Unknown.

1900, Wisconsin Black, I, P.I. 5039 (From Paris, France), by 1910.

1901, Austin, V, P.I. 17263 (From Pingyang [Pyongyang / P'yongyang], Korea), by 1910.

1901, Ebony, IV, P.I. 6386 (From Pingyang, Korea), by 1907.

1901, Haberlandt, VI, P.I. 6396 (From Pingyang, Korea), by 1910.

1901, Midwest, IV, P.I. 6556 (From Central China), by 1922.

1901, Tokyo, VII, P.I. 8424 (From Yokohama, Japan), by 1910.

1902, Hollybrook, V, Rogue in Mammoth Yellow, by 1910.

1905, Cloud, III, P.I. 16790 (From Hangchow, China), by 1910.

1905, Tarheel Black, VIII, P.I. 14952 (From Shanghai, China), by 1923.

1906, Elton, I, P.I. 20406 (From Khabarovsk, USSR), by 1910.

1906, Habaro, I, P.I. 20405 (From Khabarovsk, USSR), by 1913.

1906, Morse, IV, P.I. 19186 (From Newchang, or Yingkow [Newchwang or Ying-k'ou / Yingkou], Manchuria), by 1910.

1906, Peking, IV, P.I. 17852B (From Peking, China), by 1910.

1906, Wilson, IV, P.I. 19183 (From Newchwang, Manchuria), by 1910.

1907, Chestnut, III, Selection from Habaro, by 1910.

1907, Shingto, III, P.I. 21079 (From Teiling, Manchuria), 1910.

1907, Virginia-N, IV, P.I. 19186D (Selection from Morse), by 1920.

1907, Virginia-S, V, P.I. 19186D (Selection from Morse), -.

1908 [sic, ca. 1943], Acadian, VIII, P.I. 60406 x F.C. 04910, 1943.

1908, Arisoy, VIII, P.I. 86736 (From Konosu, Japan), 1930.

1908, Arlington, V, P.I. 22899 (From Paotingfu [later Baoding, Hebei], China), by 1910.

1908, Barchet, VIII, P.I. 23232 (From Shanghai, China), 1923.

1908, Biloxi, VIII, P.I. 23211 (From Tangsi, China), by 1917.

1908, Columbia, III, P.I. 22897 (From Paotingfu, China), by 1910.

1908, Hong Kong, IV, P.I. 22406 (From Hong Kong), by 1910.

1910, Manchuria, I, P.I. 28050 (From Harbin, Manchuria), by 1912.

1910, Minsoy, 0, P.I. 27890 (From Paris, France), ca. 1926.

1910, Soysota, I, P.I. 28019 (From Naples, Italy), by 1923.

1911, Black Eyebrow, II, P.I. 30744 (From Wulukai, Manchuria), by 1917.

1911, Hoosier, I, P.I. 30746 (From Wulukai, Manchuria), by 1927

1911, Manchu, III, P.I. 30593 (From Ninguta, Manchuria), by 1917

1911, Mandarin, I, P.I. 36653 (From Pehtuanlintza, Manchuria), by 1920.

1911, Otootan, VIII, (From Taiwan via Hawaii), by 1923.

1911, Wea, II, P.I. 30600 (From Shuangchengpu, Manchuria), ca. 1926.

1912, A.K. (F.C. 30761), IV, Selection from A.K., by 1940.

1913, Dunfield, III, P.I. 36846 (From Fanchiatum Sta., Manchuria), by 1923.

1914, Arksoy, VI, P.I. 37335 (From Pingyang, Korea), -.

1915, Hahto, VI, P.I. 40118 (From Wakamatsu, Japan), by 1921.

Talk with Ted Hymowitz. 1998. July 5. Ted and his

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colleagues created a computerized database, with the data entered on 80-column paper punch cards, using software that Sam G. Carmer borrowed from Washington State University. In hindsight, Ted wishes he had divided the column titled "Year named or released" into two. The first would be "Year named" and the second would be "Public release." This database no longer exists. The many thousands of punch cards were discarded after Sam Carmer died. Address: Dep. of Agronomy, Univ. of Illinois.

6736. Lin, C.F.; Su, Y.C.; Wan, Wen-Hsiang; Sooksan, R.; Gongsakdi, S.; Pichyangkura, S. 1977. Chinese red rice: Anka (Ang-kah). Paper presented at Symposium on Indigenous Fermented Foods, Bangkok, Thailand. Summarized in K.H. Steinkraus, ed. 1983. Handbook of Indigenous Fermented Foods. New York: Marcel Dekker, Inc. ix + 671 p. See p. 547-53.
• ***Summary:*** Contents: Description. Patterns of production and consumption. Steps in production. Microbiology. Biochemistry. Toxicology. Economics.

Anka is also known as ang-kak, angkak, angquac, beni-koji, aka-koji, and red rice. It is used and is a commercial product in the southern provinces of China, in Taiwan, the Philippines, Thailand [and Okinawa].

In Taiwan, approximately 200 tons/year of anka are made. The average yearly per capita consumption here is about 12 grams.

Historically, Anka was apparently first noted in the Yuan (Mongol) dynasty (1260-1368). It was introduced to Taiwan by wine makers from Fukien [pinyin: Fujian] province of southern China about 100 years ago (Su and Wang, 1977). It is used to add both color and flavor to many foods including *hung-lu chiu* (red soybean cheese) [fermented tofu], and *fu chiu* (rice wine). A number of countries are gradually adopting natural pigments to replace coal-tar dyes, which may be carcinogenic. With anka there is no evidence of toxicity or carcinogenicity.

Figures show: (26) Flow sheet for the production of Chinese *chu chong* (from Su and Wang, 1977), starting with rice (stream 1) and *Monascus purpureus* (anka), Saccharomyces formosensis, polished glutinous rice, and rice wine (stream 2), which yields 2 liters *chu kong tsaw,* the inoculum. (27) Flow sheet for the production of Chinese red rice (from Su and Wang, 1977). (3) Flow sheet for the production of red rice in Thailand (from Sooksan and Gongsakdi, 1977).

There is one table.

6737. Matsuoka, Hiroatsu; Fukuya, Yôko. 1977. Nyûsan hakkô ni yoru daizu-nyû kaado no keisei to sono jukusei [Formation of soymilk curds and their maturation by lactic acid fermentation]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 24(11):553-58. [Jap]*

6738. Murata, Kiku. 1977. Antioxidants and vitamins in tempeh. Paper presented at Symposium on Indigenous Fermented Foods, Bangkok, Thailand. Summarized in K.H. Steinkraus, ed. 1983. Handbook of Indigenous Fermented Foods. New York: Marcel Dekker, Inc. ix + 671 p. See p. 38-40.
• ***Summary:*** "Murata attributed the improved nutritive value of tempeh to stabilization of the oil by antioxidants produced during the fermentation and synthesis of B vitamins. Stored tempeh does not develop rancidity" because the mold produces an isoflavone (factor 2) which acts as an antioxidant. "The antioxidant is not effective in preventing autoxidation of soybean oil and soybean flours" (p. 40).

Note: Autoxidation is any oxidation that occurs in open air or in presence of oxygen and/or ultraviolet (UV) radiation and forms peroxides and hydroperoxides. Address: Dep. of Food and Nutrition, Teikoku Women's Univ., 173-6 Thoda-cho, Moriguchi City 570, Japan.

6739. Norinsho. 1977. Nihon no Daizu [Japan's soybeans]. Tokyo: Chikyu-sha. 349 p. Nov. [Jap]

6740. Ohta, Teruo. 1977. Japanese natto. Paper presented at Symposium on Indigenous Fermented Foods, Bangkok, Thailand. Summarized in K.H. Steinkraus, ed. 1983. Handbook of Indigenous Fermented Foods. New York: Marcel Dekker, Inc. ix + 671 p. See p. 545-47.
• ***Summary:*** In Steinkraus (1983) this part is titled "Japanese Hama-natto and related products." Contents: Introduction. Steps in production. Essential microorganisms (incl. Yukiwari natto). Biochemical changes. Outlook for expanded use. Address: Applied Microbiology Div., National Food Research Inst., Ministry of Agriculture, Forestry, and Fisheries (MAFF), Japan.

6741. Shurtleff, William. comp. 1977. Large natural food distributors, health food distributors, and book distributors in North America. Lafayette, California. 1 p. Undated. Unpublished typescript.
• ***Summary:*** Most of the following companies are presently distributing *The Book of Tofu, The Book of Miso* and *The Book of Kudzu* published by Autumn Press. For each, the company name (listed alphabetically) and address are given:

Large natural food distributors (28): Arrowhead Distributing (Denver, Colorado), Beautiful Foods (Philadelphia, Pennsylvania), Cc Grains (Seattle, Washington), Chico-San Inc. (Chico, California), Clear Eye (Rochester, New York; $3 million/year in sales), Dari Farms Natural Foods (Tolland, Connecticut), Eden Foods (Ann Arbor, Michigan; Phone: 313-973-9400. Tim Redmond, Michael Potter), Erewhon (Cambridge, Massachusetts; Phone: 617-354-2001. John Fogg, President), Erewhon West (Vernon, California; Phone: 213-582-6144. James Silver),

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Japan Food Corp. (JFC–South San Francisco, California; also in New York), Laurelbrook Foods (Raleigh, North Carolina), Llama Trading Co. (Greenfield, Massachusetts), Midwest Natural Foods (Ann Arbor, Michigan), Pure and Simple/The Well (San Jose, California; Pure & Simple changed to 1045 Pepitone, San Jose, CA 95110; Jon Hoefler), Rainbow Distributing (Denver, Colorado), Reality Natural Foods (Haleiwa, Oahu, Hawaii), Redwood Natural Foods (3245 Santa Rosa Ave., Santa Rosa, California; Greg Hartman. Phone: 707-546-5878). Rock Island Foods (Ignacio, California), Shadowfax (Binghamton, New York), Starflower (Eugene, Oregon), Tree of Life (Augustine, Florida), United Naturals (Eureka, California), Westbrae (Emeryville, California), Lifestream Natural Foods (Vancouver, British Columbia, Canada), Manna Foods (Scarborough, Ontario, Canada).

Large health food distributors (8–also carry books): Akin (Tulsa, Oklahoma), Akin Southeast (Jacksonville, Florida), Balanced Foods (Bergen, New Jersey), Collegedale Distributors (Collegedale, Tennessee), Foods for Health (Phoenix, Arizona), Health Foods Inc. (Des Plaines, Illinois), Kahan and Lessin (Los Angeles, California), Natures Best (El Segundo, California).

Large booksellers [distributors] (3): Nutribooks Corp. (Denver, Colorado), Bookpeople (Berkeley, California), Landstrom (South San Francisco, California).

6742. Yamada, Koichi. 1977. Recent advances in industrial fermentation in Japan: Bioengineering report. *Biotechnology and Bioengineering* 19(11):1563-1621. Nov. [28 ref]
• ***Summary:*** Table 1 shows the production of miso, shoyu, and vinegar in Japan from 1968 to 1974. Production of both miso and shoyu have increased only slowly. Miso production increased from 538,156 tonnes (metric tons) in 1968 to a peak of 590,137 tonnes in 1973, then fell slightly to 587,228 tonnes in 1974.

Shoyu production increased from 1,026,643 kl (kiloliters) in 1968 to a peak of 1,274,987 kl in 1973, then fell slightly to 1,199,155 kl in 1974.

Advances in miso production: Halophilic (salt tolerant) bacteria such as *Pediococcus halophilus* and *Streptococcus faecalis,* and halophylic yeasts such as *Saccharomyces rouxii, Torulopsis versatilis,* and *Torulopsis etchellisii* were shown to be the more important strains. Pure cultures of these strains were used as starters for miso fermentation. Since much time, work, and skill are required to make traditional koji, commercial enzyme preparations with high polypeptidase activity and high proteinase activity are used for evoking the full flavors of miso.

Advances in shoyu production: A new type of cooker which can cook soybean meal at high temperatures for short times is now being used, and advances in koji technology have raised the enzymatic activity and lowered the level of contaminating microorganisms. As a result, nitrogen utilization has been raised to 90% from 60% in 1945 and the time required for ripening the moromi mash has decreased to 4-6 months from one year or more in the past.

Table XIX titled "Production of microbial enzymes in Japan" shows 7 major and 8 minor commercial enzyme preparations, the number of makers of each, the output per year (in tonnes and yen), and the main microorganisms used to make each. By far the most important enzyme in terms of tonnage is α-amylase (11,000 tonnes, 10 makers, *Aspergillus oryzae*), followed by protease (1,050 tonnes, 18 makers, *Aspergillus oryzae*), then glucoamylase (400 tonnes, 8 makers, *Aspergillus niger*). Address: Univ. of Tokyo and Sapporo Beverages Ltd., Tokyo 153, Japan.

6743. Yokotsuka, Tamotsu. 1977. Japanese shoyu. Paper presented at Symposium on Indigenous Fermented Foods, Bangkok, Thailand. Summarized in K.H. Steinkraus, ed. 1983. Handbook of Indigenous Fermented Foods. New York: Marcel Dekker, Inc. ix + 671 p. See p. 437-51. [50+ ref] Address: Kikkoman Corp., 339 Noda, Noda-shi, Chiba-ken, Japan 278.

6744. Cooney, John E. 1977. Selling American: Top soy sauce brewer in Japan shows how to crack U.S. market. Kikkoman studied the ways of the West, advertised on TV, moved in slowly. Some areas still won't buy. *Wall Street Journal.* Dec. 16. p. 1, 29.
• ***Summary:*** The fascinating–well researched and well written–story of how Kikkoman used Western marketing methods and TV advertising to put shoyu (the Japanese word for soy sauce) in millions of Americans kitchens. In one of their popular commercials, a chef, "resplendent in traditional white garb and floppy hat, is cooking hamburgers. 'Ah,' he says, 'you want to know my secret recipe?' Turning a little bottle of Kikkoman to the camera he sprinkles some on the sizzling meat. 'Add Kikkoman to almost anything,' he says."

In this way Kikkoman has been working to convince Americans that soy sauce is as American as hamburgers. To learn how to persuade the mass market takes time, especially for a foreign company that is also a pioneer. Kikkoman has been patient–studying American marketing techniques, working slowly but steadily–according to Shinichi Suzuki, presently head of Kikkoman's subsidiary in San Francisco, California. In 1957, when Kikkoman Corp. founded its U.S. subsidiary, soy sauce was unknown to many Americans. Moreover, many Americans at the time considered Japanese products inferior.

During World War II, Kikkoman has been stripped of its overseas holdings in Asia; now the company was eager to expand again, and it viewed the U.S. as a logical place to begin. It already has a small base here, since it had been exporting Kikkoman shoyu to Japanese Americans since the 19th century. It had also been importing large amounts of American soybeans and wheat to make shoyu in Japan,

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then shipping some of its shoyu (which contained mostly water) back to America–rather inefficient. Moreover, since the U.S. had defeated Japan in World War II, conquering the American mass market would be an especially sweet triumph.

Caution has long been a cornerstone of Kikkoman's business philosophy. The company traces its origins back to the 17th century when two families, the Mogis and Takanashis, began making shoyu in Noda, Japan. Shoyu is said to have come to Japan in the 6th century, when Buddhism was introduced. The new religion, advocating a vegetarian diet, prohibited the eating of meat and fish, which has long been used to make seasonings and sauces. These traditional products were slowly replaced by plant-based products, such as fermented shoyu and miso, and flavorful konbu (kelp) and shiitake mushrooms.

Gradually Kikkoman grew to become Japan's largest maker of soy sauce. Today shoyu is as widely used in Japan as table salt in America, and annual per capita consumption is Japan is about 2.5 gallons (10 liters) a year. "Japan has captured 35% of the market and its name is as familiar as Coca-Cola is here."

In 1957, the U.S. soy sauce market, then only $1 million a year was dominated by two brands, LaChoy (now owned by Beatrice Foods) and Chun King (now belonging to R.J. Reynolds Industries Inc.). Both companies had lines of Chinese foods and both made their soy sauce without using fermentation by a quick, chemical process. The few Americans who knew about soy sauce thought of it as a seasoning to be used in Oriental cookery.

Kikkoman hired an advertising agency, Grey Advertising, Inc., owned by Richard Guggenheim. He urged Kikkoman to Americanize soy sauce, and to emphasize its versatility as a seasoning. Kikkoman also had to explain that what goes under the name "soy sauce" in America would never be called that in Japan–because it was considered inferior.

Kikkoman chose to educate Americans using the most expensive but effective medium–TV. The ads explained how Kikkoman is specially brewed and aged, like beer. The American brands are made chemically. The slogan: "Add quality; add Kikkoman." A key decision was made to price Kikkoman a few cents higher than

Because TV advertising was so expensive, Kikkoman decided to educate one region at a time–starting in San Francisco, where its subsidiary was based. The advertising was effective, and by 1959 Kikkoman was ready to educate Los Angeles. Over the next 10 years, going slowly, one region at a time, Kikkoman expanded across America. As it grew, it used food brokers on the belief that "maintaining its own sales force would be too expensive; it still uses them."

In 1970, because of Kikkoman's cautious growth strategy, their shoyu was first distributed nationwide. In 1973 the company opened its first shoyu plant in the Western world, in Walworth, Wisconsin. By 1976 U.S. sales of Kikkoman products had grown to $11 million. In 1977, for the first time, the parent company in Japan stopped subsidizing its subsidiary's budget for advertising ($1 million) and promotion. By comparison, the parent company, with about $350 million/year in sales spends about $5 million on advertising–or 1.4% of sales.

Has Kikkoman's cautious approach been effective? First, Kikkoman is now the leading soy sauce brand in America. Second, a survey by Grey Advertising "found that two-thirds of all U.S. households had tried soy sauce and 61% of them are 'users,' that is, they buy more soy sauce when they run out."

6745. Birnbaum, Alfred. 1977. Re: Report on trip to Moriguchi Kakko Shokuhin, maker of Daitokuji natto [Daitokuji fermented black soybeans], with color slides. Letter to William Shurtleff at New-Age Foods Study Center, Dec. 24. 1 p. Handwritten and signed.

• ***Summary:*** The name, address, and phone number of the company's two locations are written in Japanese characters (Jc); see below. The company was founded 98 years ago [i.e. in about 1879]. At the first location in Kyoto, the company makes regular [sticky] large- and small-bean natto. At the second location, the company makes Daitokuji natto. Mr. Nakano (full name written in Jc) has 40 years experience making various types of natto [and fermented black soybeans].

A brochure states that Daitokuji natto was brought from Tang (?) China by monks to Murasaki-no (Jc) where it has been passed down for 650 years. The main ingredients are soybeans, barley, and salt which undergo a healthful, natural process for approximately 3 months, and because of the process later will not spoil. Daitokuji natto is said to have a subtle flavor (Jc, i.e. a flavor such that one cannot say exactly from where it comes)... a flavor reminiscent of Zen. Good with tea, extra special in *o-chazuke.*

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Daitokuji natto is a salt-natto rather than a sticky (*nebari*) natto. It keeps for 1½ years. Largely made as a tourist product.

The plant in Shiga prefecture makes approximately 1,200 kg/year of Daitokuji natto. The plant was moved to Shiga 5 years ago to provide the space needed for sun-drying the product on a large scale. A single vat holds approximately 25 kg.

Ingredients: Soybeans 15 kg (large beans are preferred because the ratio of contained seed to skin is larger and the beans are sweeter). Barley flour 10-15 kg. Rice koji 3-5 gm (1 handful). Salt 1½ kg.

Procedure: 1. Steam beans as for regular natto until completely soft. 2. Roast barley flour, add together with koji and mix thoroughly. 3. Ferment at approximately 33ºC (30-35ºC) for about 2 days in incubation room as for koji. Note: Higher temperatures used for sticky natto would turn the beans black. 4. Add 18% salt solution–1½ kg salt dissolved in 20 liters water; mix and let stand for about 3 days. 5. Move the vats outdoors to sun-dry (35-40ºC) for approximately 3 months; cover the vats at night or during bad weather.

Summer months are preferred for making Daitokuji natto because of the need for sun-drying–usually started in mid-July to August.

Daitokuji natto is also made in traditional wooden vats on a semi-small scale at Ikkyuji temple south of Kyoto (address in Jc and phone number given) as a product for tourists.

The following slides / photos in a numbered set, taken by Alfred, show how Daitokuji natto [Daitokuji fermented black soybeans] are presently made at Ikkyuji: (25) Five-foot diameter wooden vats in which Daitokuji natto are fermenting, outdoors. The wooden lids are not weighted. (26) The process is very similar to that for Hamanatto fermented black soybeans, except that unroasted barley flour is used, the brine fermentation lasts only 3 days, no gingerroot or sansho seeds are added, and the soybean koji is mashed than reshaped into soybean-sized balls. (27) At Ikkyuji all fermentation takes place outdoors in a lovely courtyard, surrounded by tile-roofed buildings. (28). Two men standing by the two wooden vats, which may be left uncovered. (29) A view looking down into a vat of Daitokuji natto, from which the brine has been removed. We like both Hamanatto fermented black soybeans and Daitokuji fermented black soybeans, but we prefer the former, since the latter have a sharper, slightly saltier flavor. (30) The Chinese ancestor of both these products is called *douchi,* which we see here next to the bag in which it is sold. Address: Tama-sô No. 1, Inokashira 1-28-30, Mitaka-shi, Tokyo 181, Japan. Phone: 0422-47-7130.

6746. *SoyaScan Notes.* 1977. Chronology of soybeans, soyfoods and natural foods in the United States 1977 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Jan. 12. Laughing Grasshopper tofu shop starts making tofu in Millers Falls, Massachusetts. Founded by Richard and Kathy Leviton, Tom Timmins, and Michael Cohen in April 1976, it soon becomes the largest of the new breed of Caucasian-run U.S. tofu manufacturers. It was renamed The New England Soy Dairy in Nov. 1977, Tomsun Foods, Inc. in 1984, and Tomsun Foods International in 1986.

Jan. The Soy Plant starts making tofu inside Wildflower Community Bakery at Ann Arbor, Michigan. Steve Fiering is one of the organizers of America's first soyfoods co-op.

Jan. 20. Jimmy Carter inaugurated as president of the United States. Bob Bergland is Secretary of Agriculture.

March. Surata Soyfoods starts making tofu in Eugene, Oregon. America's second worker-owned soyfoods cooperative, organized by Benjamin Hills.

April 5. Takai Tofu & Soymilk Equipment Co. in Japan works with consultant William Shurtleff to acquire an English name, develop a unified equipment catalog, and establish international operations.

May. Flying Cloud Tofu (soon renamed The Tofu Shop, then Northern Soy) starts tofu production in Rochester, New York. Founders are Greg Weaver, Greg Mello, and Andy

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Schecter.

May 10-June 7. Shurtleff and Aoyagi travel to Indonesia to do field research on tempeh in preparation for a book on the subject.

Aug. 16. *Miso Production* by Shurtleff and Aoyagi published by New-Age Foods Study Center, the Center's first publication.

Sept. Article in *Mother Earth News* announces that tempeh starter and split whole soybeans are available from newly founded Farm Foods at The Farm in Tennessee. Orders start to pour in. Farm Foods continues The Farm's tradition, with a great deal of creative and influential work with soyfoods.

Sept. Swan Foods starts operation in Miami Florida, run by Robert Brooks and Mary Pung. They produce America's first commercial soymilk yogurt. After doing extremely innovative pioneering work with second generation tofu products and advertising them nationwide, they go out of business in Dec. 1978 from trying to grow too fast.

Sept. White Wave starts making tofu in a bathtub in Boulder, Colorado. Founded by Steve Demos.

Oct. The Tofu Shop, America's second soy deli, opens in Telluride, Colorado. Founded by Matthew Schmit, it was later renamed Far Pavilions.

Oct. 14. Bean Machines Inc., America's first supplier of tofu and soymilk equipment, begins operations in California under the direction of Larry Needleman. Most of their equipment is imported from Takai in Japan.

Oct. *Soycraft,* a newsletter and America's first periodical focusing on soyfoods, begins publication. Initiated by David and Danette Briscoe of Lawrence, Kansas.

Nov. Redwood Natural Foods, Inc. in Santa Rosa, California, launches the world's first vacuum packed tofu. Redwood developed the packing process using tofu made by Quong Hop & Co.

Nov. Paul Duchesne starts selling Fried Rice & Tofu Sandwiches in Fairfax, California. His operation later becomes Wildwood Natural Foods.

* *The Heartsong Tofu Cookbook,* by Bob and Toni Heartsong self-published in Florida.

* Passage of the 200 mile offshore fishing limit law has a major impact on Japan's protein supplies, increasing interest in and use of soy protein products.

* By the end of 1977 there are at least 13 commercial Caucasian-run tofu shops in America.

* The Food and Agriculture Organization of the United Nations (FAO) establishes a European Cooperative Network on Soybean in which 14 countries participate, exchanging information on soybean production.

* Genentech becomes the first company founded specifically to apply recombinant DNA techniques for commercial purposes.

* In China, under new post-Maoist economic policies, soybean acreage starts to increase after almost 20 years of decline based on grain-first policies. Soybean production began a slow increase in the mid-1960s, despite declining acreage.

6747. Tseng, Rose Y.L.; Smith-Nury, E.; Chang, Young Sook. 1977. Calcium and phosphorus contents and ratios in tofu as affected by the coagulants used. *Home Economics Research Journal* 6(2):171-75. Dec. [12 ref]

• ***Summary:*** Three commercial brands of tofu (all made by Azumaya in San Francisco) were analyzed. The firm tofu, coagulated with calcium sulfate, contained over 4 times as much calcium and over twice as much phosphorus as the softer silken tofu coagulated with glucono delta lactone. The calcium / phosphorus ratios of the firm and soft tofu samples were 2.0-2.5/1 and 1/1, respectively.

The amount of calcium in the tofu depended on the method used to measure it: (1) a titration method modified from the Association of Official Agricultural Chemists (1970) and (2) a method using the atomic absorption spectrophotometer. For tofu coagulated with calcium sulfate, by the first method it contained 208-209 mg of calcium per 100 gm, whereas by a second method it contained 166-170 mg/100 gm. "Tofu, a high protein food, is a good source of dietary calcium. Since the average American diet has a high phosphorus content and a low calcium/phosphorus ratio, tofu, particularly the firmer kind [made with a calcium coagulant], also would result in a better calcium/phosphorus ratio." The recommend ratio of calcium to phosphorus in the human diet is 1 to 1, however the average American diet has a ratio of 1 to 2.8. Address: Dep. of Home Economics, San Jose State Univ., San Jose, California 95192.

6748. Shibata, Atsuko; Matsumoto, Shinji; Ohara, Tetsujirô. 1977-1978. Yuba seizô-chû ni okeru seisei yuba no kagaku-teki sosei narabini shishitsu ni tsuite [Chemical composition and fat content of yuba films during production of yuba]. *Tokyo Nogyo Daigaku Nogaku Shuho* (*J. of Agricultural Science of the Tokyo Agricultural College*) 22(1-4):180. [Jap]*

6749. Azumaya Inc. 1977. Tofu recipes–Series two. Strawberry Shortcake Pie, Tofu Bouillabaisse, Tofu-Eggplant Parmigiana, Tofu with Vegetables, Tofu and Mushroom Meatloaf, Nama-Age with Beef (Tear-off recipe pad). San Francisco, California 94124. 6 recipes. Each recipe: 7.5 x 17 cm.

• ***Summary:*** With a color photo on each tear-off recipe. Each recipe "Copyright 1977."

Note: *Webster's Dictionary* (1985) defines bouillabaisse (derived from French), a word first used in English in 1855, as "1: a highly seasoned fish stew made with at least two kinds of fish. 2: Potpourri."

6750. Birnbaum, Alfred. 1977. Report on visits to Yamaya,

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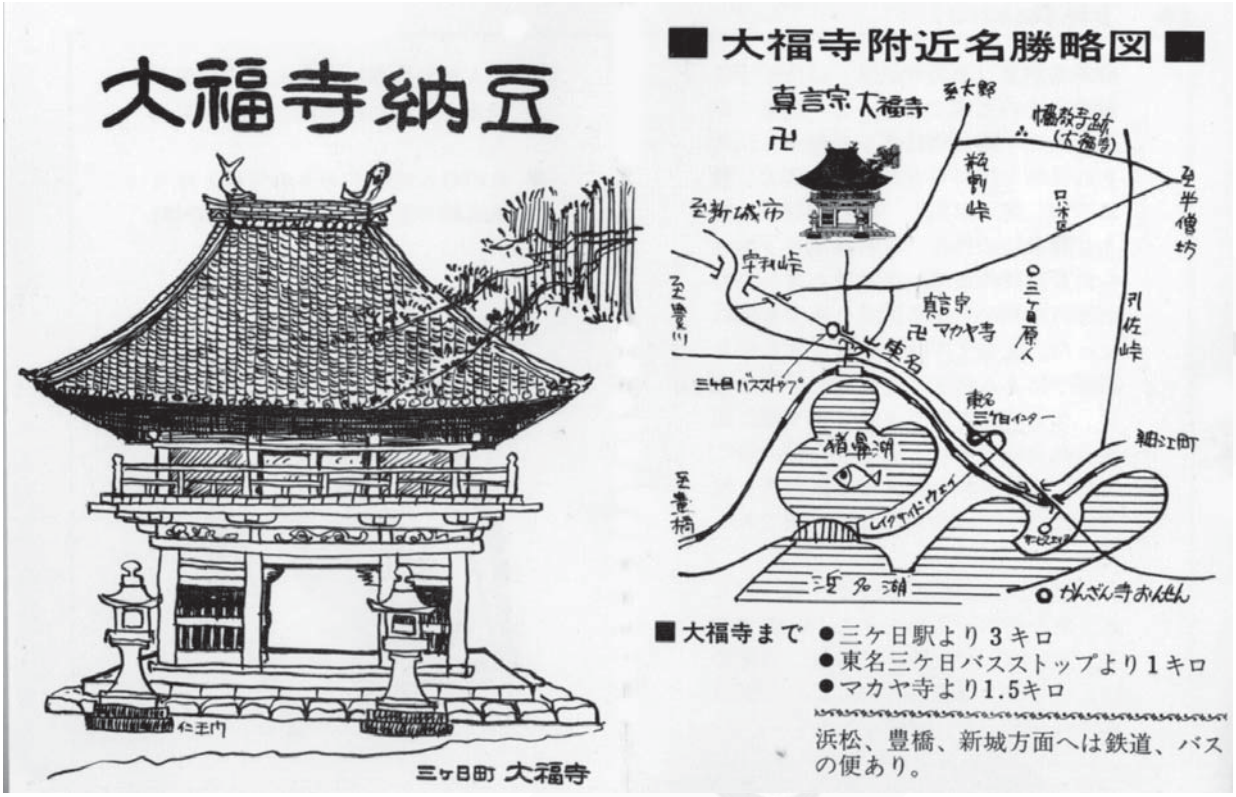

Daifukuji, and Hôrinji–makers of Hamanatto (fermented black soybeans). Japan. 3 p. Unpublished manuscript. Undated.

• ***Summary:*** Yamaya: Process Alfred observed in the plant: Wash soybeans in a trough, soak them in a big wooden vat, pull plug at bottom of vat and drain fast so that beans on bottom are not soaked longer than those on top. Put soybeans in a 6-foot-deep steamer without pressure and blow in steam through many small holes in bottom. After steaming, leave overnight in steamer with lid on. Empty into pushcarts from lower door in steamer. Dump beans into mats (*mushiro*) that have been spread on floor indoors, break up any clumps of beans by hand (to aid koji growth), but do not crush individual beans. Fan bean with an electric fan to cool and dry.

Put roasted wheat flour (*kosen*) in bags. Mix roasted wheat flour and koji starter in winnowing basket (*mi*), then scatter mixture by hand over beans on straw mats. With two men holding opposite ends of straw mat, toss beans on mat to mix beans with flour and starter. Transfer mixture onto a conveyor belt which runs it into a modern koji incubation room (*muro*) where it is spread in a later 6 to 7 inches thick. After incubation for 20-25 days (temperature any stirring schedule are unknown), pipe the koji out onto a south-facing metal roof (at an angle of 15-20º to the horizontal) onto a piece of 3 by 6 foot polyethylene sheeting (which is sanitary, gives long use, and is inexpensive). After drying, drop the soybeans down a hole in front of a fan that blows away spores from the surface of the beans; if these are left on, the beans get bitter (*nigai*) during the second fermentation. Catch beans in small wooden kegs and transfer them to wooden kegs that hold 4.76 gallons (*4-to daru*). Pack soybeans in firmly in each keg without crushing with a wooden implement.

Put pressing lids atop beans on bottom row of vats, then top with heavy pressing weighs or a second row of vats and weights. The heavier the weights, the firmer the beans remain and the less likely to mash. Yamaya's yearly production is about 50 metric tons (tonnes).

Gingerroot: Cut into pieces 3/4 inch square by 1/16 inch thick. Put in a separate keg, just cover with soy sauce (*shoyu*). Pickle for 6 months to 2 years to get pickled gingerroot

The vibrator: put soybeans into hopper atop vibrator. One man breaks up any clumps of beans by hand, then drops them onto a vibrating screen (1/8 inch mesh); the man at the bottom adds pickled ginger by hand. Alfred is not sure where this step goes in the process.

Mr. Suzuki, the manager, says that, in Japan, only 1 person in 100 likes hamanatto.

Hamana has stopped making hamanatto; Yamaya is now their supplier.

Mr. Suzuki estimates that Horinji makes 3 tonnes a year and that Daifuku makes 2 tonnes a year. Alfred got the facts later.

Daifukuji: A pretty Shingon sect (Buddhist) mountain temple at the end of a long lane of cedars, 1 hour drive northwest of Hamamatsu. After Japan's war with Korea,

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Toyotomi Hideyoshi (lived 1537-1598; a daimyo warrior and Japan's 2nd great unifier) gave lands to Daifukuji. They say they were the first place to make hamanatto. Today Daifukuji is very small and primitive; they were sold out of their hamanatto product when Alfred arrived. The head says it does not keep well in warm weather; mold grows on the soybeans. In the fall they make Hamanatto at most 4-5 times a week, and are finished in April or May.

Each time Daifukuji makes 1 (*koku*) or 750 kg of hamanatto, and they do this 5 times a year, from July to September; 150 to 200 kg dry soybeans makes 750 kg hamanatto. They do not use koji starter (*tane koji*) since the spores exist naturally in the koji trays and in the incubation room. They steam the soybeans in a wooden steamer that is placed over a caldron in which water is boiling; the steamer has 4 layers and each is square. They let the soy beans steam in the steamer overnight. A key ingredient is the middle hull of *sansho* pepper (*Zanthoxylum piperitum; sanshô no ki no chûkawa*) which is pickled in soy sauce (*shoyu*). This hull is removed, sun-dried, then pickled in 2 vats, 1 *koku* capacity each, with a pressing lid on each. After pickling, they are sun-dried for one day. Albert did not learn anything about the composition of the brining liquor or how long it takes. 50% is consumed locally (in the area of Hamamatsu) and the remaining 50% is consumed elsewhere–sold mostly in Tokyo department stores. It is sold out by the end of March. It is eaten as a side dish with rice, mixed with grated daikon and topped with shoyu. Also eaten atop hot rice, with green tea poured over the top (*ochazuke*). Sugar-coated hamanatto sold is a confection in Kyoto. Hôrinji [Horinji] is a Rinzai Buddhist temple. They make hamanatto in the spring and fall when they are not busy. They sell them at the front gate of the head temple (*honzan*), which is Hokoji in Okuyama, and at Seibu department stores. They are seasoned with gingerroot and sansho seeds (*sansho no mi*). The soaked soybeans are steamed in an open-top cooker at 0.1 to 0.2 kg per square centimeter pressure from 8:00 in the morning to 3:30 in the afternoon–about 7-8 hours. Then the steam is stopped and the beans are allowed to stand in the steamer overnight so that they darken–from yellow to brown. Then, in the morning, the beans are put into wooden koji trays which are stagger-stacked and incubated in the koji incubation room (*muro*) at 27-28ºC. with the occasional use of a small kerosene heater, (maximum temperature 35ºC) for 3 days to make soybean koji. On the second day, the beans in each tray are stirred by hand. When done, the soybean koji is sun-dried for 1 day on straw mats. Then they are pickled, under a pressing lid and weight, in 2/3 parts new salt water and 1/3 part old tamari soy sauce. Each wooden tub (*taru*) holds 45 kg for finished product. When finished, after about 6 months of pickling, the plug at the base of each wooden tub is pulled and the contents allowed to drain. The tamari that drains off is saved for use with a subsequent batch.

The gingerroot is processed separately. It is sliced into thin rounds, pickled in salt water and tamari, under a pressing lid and weight of about 20 kg, for 1-12 months–typically about 1 month. The sansho is also pickled separately, like the gingerroot, for 1-12 months. Only the finished gingerroot is mixed with the final product; the sansho is sold separately with the product in a bag. This year Horinji made 3 tons of hamanatto. The owner guesses that Yamaya made about 50 tons and Daifukuji about 5 tons.

Two small undated leaflets (in Japanese), one titled "Horinji Hamanatto," the other "Daifukuji Natto" each tells about the product and its history. They were given to Alfred during his visit to each place. Address: Tama-sô No. 1, Inokashira 1-28-30, Mitaka-shi, Tokyo 181, Japan. Phone: 0422-47-7130.

6751. Fukuya, Yôko; Matsuoka, Hiroatsu. 1977. Shihan tôfu-chû no seibun bunseki–Karushimu o chûshin ni [Analysis of the composition of commercial tofu–Focus on calcium]. *Tachikawa Tandai Kiyo* 10:53. [Jap]*

6752. Ikuta, Midori; Ishikawa, Keiko; Saito, Ritsuko; Okamoto, Susumu. 1977. Yuba tori tekusuchii shokuhin seizô no kokoromi [An attempt to produce textured foods from yuba]. *Showa Joshi Daigaku Gakuen* No. 52. [Jap]*

6753. Ishima, T.; Ohta, T. 1977. Statistical analysis of fermentation process in natto making. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 1:5-11. [Eng]*

6754. Kanai, Mieko; Miyazawa, Fumio. 1977. Shihan yôki-iri tôfu saikin osen jittai [Bacterial contamination in commercial packaged tofu]. *Jissen Joshi Daigaku Kasei Gakubu Kiyo* No. 14. p. 51-54. [Jap]*

6755. Kedo, S.; Aoki, J.; Ayabe, K.; Hayashi, U. 1977. [On package for processing of natto. II. Influence of preservation in refrigerator]. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 1:49-58. [Jap]*

6756. Kedo, S.; Hayashi, U. 1977. [Effect of storage on vitamin B-2 content of fermented soybean natto]. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 1:59-62. (Chem. Abst. 91:106784). [Jap]*

6757. **Product Name:** [Soena {Soymilk} (Lactic [Acidophilus], Celery, Carrot, Plain)].
Foreign Name: Soiina.
Manufacturer's Name: Kibun Health Foods K.K.
Manufacturer's Address: 1-11-8, Shin-Sayama, Sayama-shi, Saitama-ken, 350-13, Japan.
Date of Introduction: 1977.
Wt/Vol., Packaging, Price: Wide-mouth cup with foil lid.
How Stored: Refrigerated.
New Product–Documentation: Only the lactic (acidophilus)

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one of these soymilk products is cultured/fermented. Color photo from a Kibun brochure shows the product (Celery Cocktail) in the package (a cup) with a straw in the top.

Fukushima. 1978. In: American Soybean Assoc. ed. International Soya Protein Conference, Proceedings. Hudson, Iowa: ASA. p. 40. "Recently, a new fermented drink using soybeans appeared on the market. This product is a drink which is made by the fermentation of soy milk by lactic acid bacteria."

Shurtleff & Aoyagi. 1979. Tofu & Soymilk Production. p. 313. "Kibon Foods, Odakyu Kashiwagi Biru 8-gai, Nishi Shinjuku 7-7-30, Shinjuku-ku, Tokyo 160, Japan. Tel. 03-365-5011. Attn. Mr. Mizumachi. Maker of Soena lactic soymilk drinks, and dairylike soymilk in Tetra Brik cartons."

Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that Kibun first made commercial soymilk in Japan in 1977.

Brian Fitzpatrick. 1982. Soya Milk in Asia. States that Kibun first launched soymilk in Japan in 1976.

Poster (see next page), 6 by 8.5 inches, color. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center.

6758. Kon, Masayo; Yamada, Yûzô; Ueyanagi, Fumiko. 1977. Hamanattô ni kansuru kenkyû. III. Hamanattô yori bunri sareta kôbo no seijô [Research on fermented black soybeans (Hamanatto). III. General properties of yeasts isolated from hamanatto]. *Kaseigaku Zasshi* (*J. of Home Economics of Japan*) 28(3):202-05. [15 ref. Jap]
• ***Summary:*** "Twenty-six strains of yeast were obtained from 'Hama-Natto,' a salty fermented food produced from soy bean near the Lake Hamana, Shizuoka prefecture. All the strains had a salt-tolerant activity and grew in a medium containing 20% sodium chloride, and 14 of these strains had a capacity of being grown even in a 26%-NaCl medium.

"These strains have been classified in the genera *Saccharomyces, Debaryomyces* and *Torulopsis. Saccharamoyces rouxii* was the most abundant and found in the products of Yamaya, Horinji and Hamana. *Debaryomyces* strains were only obtained from a product of Daifukuji, whereas several ones of *Torulopsis* were found from all products." Address: 1&3. Shizuoka Joshi Daigaku (Women's Univ.); 2. Shizuoka Daigaku.

6759. Kon, Masayo; Yamada, Yûzô; Ueyanagi, Fumiko. 1977. Hamanattô ni kansuru kenkyû. III. Hamanattô yori bunri sareta taien-sei kôbo no dôtei [Research on fermented black soybeans (Hamanatto). IV. Identification of salt-tolerant yeasts isolated from hamanatto]. *Kaseigaku Zasshi* (*J. of Home Economics of Japan*) 28(3):206-10. [4 ref. Jap]
• ***Summary:*** "Of the salt-tolerant yeasts isolated from 'Hama-Natto', the following 26 strains were identified: *Saccharomyces rouxii* Boutroux (6 strains), *Debaryomyces formicalius* Golubev et Bab'eva (4 strains), *Deb. cantarellii* Capriotti (1 strain), *Torulopsis etchellsii* Lodder et Kreger-van Rij (2 strains), *T. mannitofaciens* Onishi et Suzuki (1 strain), *T. apicola* Hajsig (1 strain), *T. domercquii* van der Walt et van Kerken (5 strains), *T. magnoliae* Lodder et Kreger-van Rij (3 strains), *T. candida* (Saito) Lodder (1 strain) and unidentified species of *Torulopsis* (2 strains)." Address: 1&3. Shizuoka Joshi Daigaku (Women's Univ.); 2. Shizuoka Daigaku.

6760. Kushi, Aveline. 1977. Macrobiotic cooking with miso. *Order of the Universe* (*Boston, Massachusetts*) 5(11):26-31.
• ***Summary:*** Excerpts from Aveline's new book, including 7 recipes and her illustration of a miso keg.

"When we first came to this country about 25 years ago, there were almost no good-quality whole foods available... We lived in New York near Columbia University. We could order one keg of Hacho [Hatcho] Miso once or twice a year from Japan in order to obtain the essential nutrients necessary for those who don't eat very much animal food. I am very grateful for Kiyuemon Hayakawa's several-hundred-year tradition of strong miso in Japan.

"Today, the importation of miso from Japan to the United States must be at least 10,000 times what it was 25 years ago. We are able to enjoy high quality miso like Barley Miso, Rice Miso, Brown Rice Miso, and others...

"I began writing this book about miso seven years ago; I now think it has fermented enough. During those seven years I gained a little more confidence through experience in teaching cooking, and also miso has become more familiar to the Western public."

6761. Maki, Mitsufusa; Satô, Sachio; Ishida, Tokuo. 1977. Yamagata-ken ni okeru chiiki shokuhin ni kansuru kenkyû. I. Hôsô tôfu ni tsuite [A study of the local food in Yamagata prefecture. I. Packaged tofu]. *Yamagata Kenritsu Yonezawa Joshi Tandai Fuzoku Seikatsu Bunka Kenkyujo Hokoku* No. 4. p. 1-24. [Jap]*

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6762. Matsuoka, Nobu; Hiji, San. 1977. Daizu moyashi no bitamin C no bunseki oyobi soshiki kagaku-teki kentô [Analysis of vitamin C and histochemical investigation of soy sprouts]. *Joshi Tandai Kaseigaku Kenkyukai Kiyo* No. 5. p. 33. [Jap]*

6763. Morinaga Milk Co. 1977. Manufacturing process of soy bean curd. 1 p. Confidential. Unpublished manuscript.

6764. Murata, H. 1977. [Effect of administration of *Bacillus natto* upon weaning piglets]. *Nippon Jui Shikai Zasshi* (*J. of the Japan Veterinary Medical Association*) 30:645-49. [Jap]*

6765. **Product Name:** [Salt-Free Rice Miso (Jepron Light Yellow Plain, or Regular Flavored; Dark Brown Rich Flavored)].
Foreign Name: Mu-En Miso, Jepuron.
Manufacturer's Name: Nagano Miso Co.
Manufacturer's Address: Tenjin 3-9-29, Ueda-shi, Nagano-ken 386, Japan.
Date of Introduction: 1977.
New Product–Documentation: Japanese Patent. 1981. No. 1,048,853; U.S. Patent. 1983. No. 4,311,715. Letters from Hideki Oka of Nagano Miso Co. to William Shurtleff of Soyfoods Center. 1981. Feb. 9 and March 16. He encloses samples of three types of miso and asks for comments, which are: "We liked III Hi-Jepron 5% NaCl best, II Jepron Salt-free second best, and I Hi-Jepron salt free third best."

Nagano Miso Co. 1982. "Jepron, a protein rich food material." Shurtleff & Aoyagi. 1983. The Book of Miso. 2nd ed. p. 230, 258. "In 1977 Nagano Miso Co. introduced the world's first salt-free miso; in 1978 it started to be marketed as Jepron."

6766. Nagano Miso Co. 1977. Composition of salt-free miso, red and yellow, including free and total amino acids. Tenjin 3-9-29, Ueda-shi, Nagano-ken 386, Japan. 4 p.
• ***Summary:*** The light yellow variety contains 53.4% moisture, 14% protein, 7.2% oil, 1.5% fiber, 1.2% ash, 19.3% sugars, 3.4% ethanol, and 85.9 mg/100 gm salt. Ph is 5.7. 193.5 calories per 100 gm. Address: Nagano-ken, Japan.

6767. Nakanjing, K.; Horikawa, C.; Tsugi, A.; Hayashi, U. 1977. [On package for processing of natto. II. Influence of preservation at room temperature]. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 1:37-48. [Jap]*

6768. **Product Name:** [Soymilk].
Manufacturer's Name: Natural Foods.
Manufacturer's Address: Japan.
Date of Introduction: 1977.
New Product–Documentation: Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that Natural Foods first made commercial soymilk in Japan in 1977.

Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64.

6769. Nukaya, A.; Masui, M.; Ishida, A.; Ogura, T. 1977. [Salt tolerance of green vegetable soybeans]. *Engei Gakkai Zasshi* (*J. of the Japanese Society for Horticultural Science*) 46:18-25. [Jap]*

6770. Ogawa, Hideko; Sato, H.; Murayama, N. 1977. [Content of erucic acid in Japanese food aburaage (fried soybean curd or tofu pouches)]. *Sagami Joshi Daigaku Kiyo* (*Bulletin of the Sagami Women's College*) No. 41. p. 25-28. (Chem. Abst. 89:195703). [Jap]*
• ***Summary:*** Rapeseed oil produced from Asian strains contained more erucic and linolenic acids than that produced from European strains. This was reflected in the content of the 2 fatty acids in aburage. All panelists in organoleptic tests preferred aburage fried in rapeseed oil over that fried in either soybean oil or peanut oil. Address: Sagami Women's Univ., Sagamihara, Japan.

6771. Ohkuro, I.; Komatsuzaki, T.; Okamura, Y.; Ito, S. 1977. [Examination for the virulence in lipase active strains of *Bacillus natto*]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 94:81-93. [Jap]*

6772. Ohkuro, I.; Komatsuzaki, T.; Kawashima, M.; Kuriyama, S. 1977. [Influence of intraperitonal inoculation of mice with *Bacillus natto* on the mouse weight and fate of the organism]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 85:231-36. [Jap]*

6773. Shikata, Hideo; Tsukiyama, R.; Ishigami, Y.; Nishiyama, T.; Moriguchi, S. 1977. Amazake no seibun ni tsuite. I. Tô no teiryô [Components in amazake. I. Determination of sugar composition]. *Nihon Shoyu Kenkyujo Zasshi* (*J. of Japan Soy Sauce Research Inst.*) 3(3):105-10. [10 ref. Jap; eng+]
• ***Summary:*** Not long ago, amazake had been declining in popularity as a sweet drink in Japan. However recently its popularity has begun to recover, probably due to the growing interest in natural foods.

In the Ryuno area, light shoyu (*usukuchi shoyu*) has long been made with amazake as an ingredient; it augments the sugar which was consumed during the fermentation, adds its own bouquet, and helps prevent coloration.

The authors found, using paper chromatography (PPC) and other techniques on five types of amazake, that amazake contains about 40% sugar. 50-80% of the total sugar in amazake is glucose, followed by 3.3–9.1% of isomaltose and maltotriose, and 5.5–8.9% of nigerose, maltose, and kojibiose.

Also discusses the changing content of fructose,

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saccharose, panose, and isomaltotriose. Address: Research Laboratories, Higashimaru Shoyu Co., Ltd., Tatsuno, Japan.

6774. Staron, T. 1977. Obtention des protéines à partir des graines oléagineuses par des méthodes microbiologiques [Obtaining protein from oilseeds using microbiological methods]. In: T. Staron, ed. 1977. Les Nouvelles Sources de Proteines Alimentaires. Recueil de Travaux et de Conferences. Luce: INRA. See p. 137-63. [42 ref. Fre]*
• ***Summary:*** A review of some important East Asian fermented foods, including miso, shoyu, and tempeh. Address: INRA, Stat. Antibiotiques, Bioconversions, Luce.

6775. Sunada, K.; Tsuchiya, T; et al. 1977. [Processing test of natto with soybeans grown for natto]. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 1:19-24. [Jap]*

6776. Toya, N. 1977. [Studies on vitamin B-2 production by *Bacillus natto.* IV. Effects of carbon sources and nitrogen sources]. *Kumamoto Joshi Daigaku Gakujutsu Kiyo* (*J. of Kumamoto Women's University*) 29:85-89. (Chem. Abst. 92:20501. 1980). [Jap]*

6777. Toya, N. 1977. [Studies on vitamin B-2 production by *Bacillus natto.* V. Effect of purine bases and pyrimidine bases]. *Kumamoto Joshi Daigaku Gakujutsu Kiyo* (*J. of Kumamoto Women's University*) 30:62-65. (Chem. Abst. 92:20502. 1980). [Jap]*

6778. Tsukiyama, R.; Maeda, T.; Miyashita, K.; Shikata, K.; Ishigami, Y. 1977. [Components in amazake. II. Amino acids, organic acids composition, and other components]. *Nihon Shoyu Kenkyujo Zasshi* (*J. of Japan Soy Sauce Research Inst.*) 3(5):205-09. [46 ref. Jap]
• ***Summary:*** One of the best analyses seen of the nutritional composition of amazake. Note the large bibliography. Address: Research Laboratories, Higashimaru Shoyu Co., Ltd., Tatsuno, Japan.

6779. Berlan, Jean-Pierre; Bertrand, J-P.; Lebas, L. 1977. The growth of the American 'soybean complex.' *European Review of Agricultural Economics* 4(4):395-416. Translated from Revue Tiers-Monde 17:66 (April-June 1976) by Adda and Jean-Pierre Berlan. [10 ref. Eng]
• ***Summary:*** Contents: Summary. Developments in the production and use of soybean in the U.S.A.: The origins of the American 'soybean complex,' the War [World War II]. The post-war period and the international expansion: The U.S. livestock production model and European livestock production. Prospects: Direct use in human food, adapting the soybean to the taste of the white man, or adapting the white man to the taste of the soybean? Conclusions. Address: INRA, Paris, France.

6780. Chang, Kwang-chih. 1977. Introduction. In: K.C. Chang, ed. 1977. Food in Chinese Culture. New Haven, CT, and London: Yale Univ. Press. 429 p. See p. 1-21.
• ***Summary:*** This book looks at food through a cultural framework, rather than a chemical or anthropological one. One of "the best ways of getting to a culture's heart is through its stomach." The Japanese scholar "Shinoda Osamu has almost singlehandedly carved out the field of Chinese food studies..." "Paleolithic hunters the world over relied heavily on animal flesh, which was cooked by a very small number of techniques." China's major legumes are the soybean, broad bean, peanut, and mung bean. Peanuts and sweet potatoes were brought to China by coastal traders during the Ming period.

Despite the "continuous introduction of dairy products and processes throughout the early historical periods, and despite the adoption of some dairy delicacies by the upper strata of society during the T'ang period, milk and dairy products, to this date, have not taken a prominent place in Chinese cuisine."

In China, the key distinction is between *fan,* grains and other starch foods, and *ts'ai,* vegetable and meat dishes. Fan is considered the main or primary food, and ts'ai the supplementary or secondary food. Grains have almost a sacred nature in Chinese food thought. Moreover, one should eat frugally and never overindulge in food.

"The overriding about food in China–in all likelihood an idea with solid, but as yet unrevealed, scientific backing–is that the kind and the amount of food one takes is intimately relevant to one's health. Food not only affects health as a matter of general principle, the selection of the right food at any particular time must also be dependant upon one's health condition at that time. Food, therefore, is also medicine." There are underlying principles governing the choice of food. "The bodily functions, in the Chinese view, follow the basic *yin-yang* principles. Many foods are also classifiable into those that possess the *yin* quality and those of the *yang* quality. When yin and yang forces in the body are not properly balanced, problems result. Proper amounts of food of one kind or the other may then be administered (i.e. eaten) to counterbalance the yin and yang disequilibrium... This belief is documented for the Chou period, several centuries before Christ, and it is still a dominant concept in Chinese culture." Many Chinese also distinguish between hot and cold foods.

Pages 17-18 note that one of the foods presented at graves is "dried bean curd." Address: Prof. of Anthropology, Harvard Univ., Massachusetts.

6781. Chicago Board of Trade. 1977. What in the world is happening to the price of soybeans? And why? Chicago. 16 p.
• ***Summary:*** Contents: Introduction, by William D. Hagerty,

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Jr. (chairman) and Warren W. Lebeck (president). What in the world is happening to the price of soybeans? And why? Why a shortage of soybeans? Soybean prices and future markets. The world situation. The final chapter.

"Four years ago, in the spring and summer of 1973, a series of seemingly unrelated events occurred in distant parts of the world. To mention but several: a change in ocean currents off the coast of Peru; the decision in Washington to officially devalue the U.S. dollar; drought that parched Africa and parts of Asia; an unparalleled boom in Western Europe and Japan. Their point of economic convergence was the world soybean market. The price of soybeans in Chicago soared to a record $12.90 a bushel and, in European markets, well above that."

"Subsequent to 1973, the price of soybeans sharply receded, declining to less than half their historic highs. Increased prices, as is their function, had given farmers the necessary incentive to increase production and the resultant larger supplies brought sharply lower prices. Too low! Generally depressed prices in the planning and planting months of 1976 caused farmers to shift several million acres of fertile cropland to other, more profitable crops. Soybean demand, however, was still clearly on an opposite course. The result is that soybean prices once again, in the spring of 1977, climbed to double digits." Address: Literature Services, Dep. SB, Chicago Board of Trade, LaSalle at Jackson, Chicago, Illinois 60604.

6782. Editorial Committee for the 30-Year History of the Kikkoman Labor Union. ed. 1977. Kikkôman Shôyu rôdô kumiai sanjûnen-shi [Thirty-Year history of the Kikkoman Labor Union]. Noda: Kikkoman Shoyu Rodo Kumiai. 350 p. [Jap]*
Address: Noda, Japan.

6783. Fuji Seiyu K.K. (Fuji Oil Co.). 1977. Fuji Seiyu 25 Nen-shi: Showa 21 nen 11-gatsu–Showa 51 nen 3-gatsu [Fuji Oil Company Ltd.: 25-year history, Nov. 1946 to March 1976]. Tokyo: Fuji Oil Co. 622 p. [Jap]
• ***Summary:*** An excellent company history, containing many good photos. Chapter 19 (p. 417-448), titled "Road to the industrialization of soy protein," has been given a separate, detailed record. Address: Tokyo, Japan.

6784. Fuji Seiyu K.K. (Fuji Oil Co.). 1977. Daizu tanpaku kogyo-ka e no michi [Road to industrialization of soy protein. Part I (Document part)]. In: Fuji Seiyu K.K. 1977. Fuji Seiyu 25 Nen-shi: Showa 21 nen 11-gatsu–Showa 51 nen 3-gatsu [Fuji Oil Company Ltd.: 25-year history, Nov. 1946 to March 1976]. Tokyo: Fuji Oil Co. 622 p. See p. 417-30. [Jap]
• ***Summary:*** Outline: As a major Japanese soybean crusher, processing whole soybeans into soybean oil and defatted soybean meal, Fuji Seiyu produced large amounts defatted soybean meal. In 1962-62 Fuji Seiyu began to make *Fuji Takaramame* (a by-product of tofu powder) and *Proplus* using soy protein from defatted soybean meal, even though these were not considered to be good soy protein products.

In 1967 Fuji developed isolated soy protein (containing more than 92% protein) from defatted soybean meal, and started to sell this FujiPro isolated soy protein. Since it was a completely new product and little was known about it, sales were slow in the beginning. But later it started to be sold to makers of second generation meat products (such as sausages or ham).

In 1969 Fuji started to sell Fuji Nikku ("Fuji Meat"), which is a textured protein product (*soshiki tanpaku seihin*) and this expanded their market among hamburger and hamburger ball (meatball) makers. Based on the above experience, Ralston Purina (America's leading soy protein manufacturer) got to know Fuji and invited the company to do a joint venture. Three years later, in Dec. 1973, the two companies contributed 200 million yen and founded a joint company named Fuji Purina Protein K.K. In 1974 they started to make and sell *FujiPur / FujiPua* (for "Fuji Purina"), a spun soy protein fiber. Presently, Fuji Seiyu is trying to expand into new, undeveloped markets for soy protein foods (p. 418).

For 1964 the Food Bureau (*Shokuryo-chô*) of Japan's Ministry of Agriculture, planned the following usage of soybean meal: Food 347,000 metric tons (tonnes). Feed 691,000 tonnes. All but 69,000 tonnes of the food use went for miso, shoyu, and tofu. Of this 69,000 tonnes, 40,000 tonnes went for soy protein foods (such as breads, biscuits, doughnuts, shortcake, ice cream, fish paste products, cheese, soup, etc.) and 30,000 tonnes for glutamic acid / MSG (p. 419).

Fuji decided to industrialize soy protein very early and also to make isolated soy protein their main soy protein product. Other Japanese companies that tried to enter the soy protein market failed because they produced only soy protein concentrate (p. 420).

Fuji Seiyu finished their research on isolated soy protein at the end of 1966, then started test production in their 1-tonne pilot plant. In June 1967, they started to build their full-scale plant, and finished by the end of the year; it had a capacity of 100 tonnes/month. The company named its first product Fuji Pro; this isolated soy protein contained more than 90% protein and about 6% moisture (p. 421).

Then the company found that they could use Fuji Pro in fish paste products, so they tried to sell it to companies making such products. But these manufacturers were very conservative, so after 6 months Fuji gave up and began selling it to secondary meat producers (p. 423).

The meat industry was also very conservative, but after many visits to these companies, Fuji got to understand them better. Some of these companies were already importing soy protein from the USA and using it in their meat products.

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Fuji's research & development department developed a sausage containing Fuji Pro and presented samples to the meat processors; they made many repeat visits. In 1968 Fuji received an order from a large meat processor; after that they received orders from medium and small processors one after another. In Nov. 1968 Fuji's sales finally reached 100 tonnes/month. Later, after many careful investigations, the Japan Agricultural Standards (JAS) decided to make isolated soy protein a JAS product with a standard of identity for use in ham, sausages, etc. In this way, sales of Fuji Pro expanded. But there was also another reason for expansion: Exports! Actually exports started earlier and were easier than sales to the domestic Japanese market. And it was because of the demand from abroad that Fuji decided to build their first full-scale plant in 1967, even though they didn't have any clear idea about their domestic sales. Fuji's exports went Shoemaker, a Dutch food company; this relationship started in about 1964 (p. 424).

At that time the Dutch company was selling soy protein made by Central Soya in the USA. Being dissatisfied with the product's quality and prices, they looked to Japanese oil makers to produce these products. They contacted several companies, including Fuji Seiyu, which answered their inquiry and told them: "We are still study isolates, but we have a product that contains 50% protein." They sent Shoemaker a sample of Fuji Takaramame. However Shoemaker wanted a soy protein isolate, so no business was transacted. But from that time on, the two companies stayed in close communication and began to exchange information. Shoemaker asked Fuji to develop a soy protein isolate, provided important suggestions concerning the research, and sent Fuji a report of the European market for such a product. Shoemaker's cooperation played an important role in the development of Fuji's isolated soy protein.

Initially, Fuji had placed heavy emphasis on developing soy protein products for second generation fish paste products, but after considering the potential demand in Europe, Fuji started to research soy proteins for meat products such as ham and sausage. Fuji Pro was developed to be highly elastic, emulsifiable, and water soluble–characteristics desired by the European market. Fuji sent some samples. Before they started commercial production, they signed a contract with Shoemaker as a sales agent; it named Fuji as a IPSO (International Protein Sales Organization) and exporter. Thus, it was because of the European market that Fuji could start commercial production without a domestic market, and it was this European market that enabled Fuji to sell isolates in Japan. Everything seemed backwards. For example, some Japanese from the meat industry went to Europe to study that industry. There they learned that soy protein (named IPSO) was being used in ham and sausages. Returning to Japan, they discovered to their surprise that the soy protein was made in Japan by Fuji. In 1969 Fuji's contribution to Japanese exports (oil and protein) was honored with an award (p. 425-26).

A knowledge of the overseas market for soy protein was a great help to Fuji as its soy protein products began to serve an international market. This also gave ideas for development of new products–starting with meatlike soy protein products. They received news from Bernard Hawley in England that textured soy protein products had been developed in the USA. Hawley was a nutritionist and a consultant (Hawley & Associates) and Fuji began to use his consulting services in April 1966 (p. 428). Hawley made many trips to Japan and he and Mr. Nishimura (the president of Fuji Seiyu) became great friends. In 1967 Fuji sent Hawley to the USA and asked him to study the market for textured soy proteins and the send Fuji a market report (p. 429). Meanwhile, the company president and a man from the planning department also went to the USA to study the market; they soon decided to start making textured soy protein immediately. They visited Wenger Manufacturing Co. in the USA, signed a contract in April 1968, and received a machine [extrusion cooker] that year. Actually they bought only the main body of the machine from Wenger; the other parts (including the power mill) were invented and designed by Fuji technicians (p. 430). Continued. Address: Tokyo, Japan.

6785. Fuji Seiyu K.K. (Fuji Oil Co.). 1977. Daizu tanpaku kogyo-ka e no michi [Road to industrialization of soy protein. Part II (Document part)]. In: Fuji Seiyu K.K. 1977. Fuji Seiyu 25 Nen-shi: Showa 21 nen 11-gatsu–Showa 51 nen 3-gatsu [Fuji Oil Company Ltd.: 25-year history, Nov. 1946 to March 1976]. Tokyo: Fuji Oil Co. 622 p. See p. 431-48. [Jap]

• ***Summary:*** Continued (p. 431): In 1969 Fuji Nikku ("Fuji Meat"), a textured soy protein product, was introduced and production started. At that time Texgran, a similar product made by Swift & Co. (USA) was being sold in Japan, but Fuji Nikku was the first such product to be made in Japan (70% protein, wet type). Many tests were made to determine the size and shape (p. 430-31). Finally Fuji decided to produce both large and small piece, in both wet and dry form.

The next problem was to find a market for the product in Japan. In 1969 they tried demonstrations at department stores in Tokyo, but sales were very slow. Fuji concluded that it was too early to sell the product to retail customers. Then they developed flavored and seasoned varieties of Fuji Nikku in tomato sauce, sold canned. Next they fried it for sale to portable food vendors, but that failed too. They produced only three lots before stopping. In 1969 Mr. Hariaki (presently director of the protein department) succeeded in selling 100 tonnes/month to a large company that made hamburgers and meatballs–the first sales of Fuji Nikku, caused largely by high meat prices. But when meat consumption fell, so did sales of Fuji Nikku (p. 433).

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In 1970 the Osaka branch of Fuji Seiyu sold 5 million yen of soy protein products; the Tokyo branch sold 10 million yen. Production grew and these two became independent as the Protein Division.

In about 1971 many new soy protein products were introduced in Japan (see large table, p. 435); major manufacturers included Nihon Tanpaku and Nihon Koyo. Now competition started. In 1971 a total of 15,000 metric tons of soy protein was made in Japan; Fuji accounted for about 50% of this. In 1972 Fuji bought a company which was producing protein under Nikka Oil. Fuji also did some joint ventures with Hohnen Oil Co. on their oil and protein project. In 1969 Ralston Purina had established its own research organization, Nihon Purina Corp. Their first joint venture was with Taiyô Gyogyo for pet foods. In Dec. 1973, after various trials and decisions, Ralston Purina invited Fuji to do a joint venture. Fuji Oil Co. and Ralston Purina decided to start their joint venture with one of Ralston Purina's products, Edipro-200, a spun soy protein fiber. They wanted to make it in Japan (p. 440-41). In July 1974 Fuji Purina Protein K.K. was founded capitalization of 200 million yen, contributed equally by both companies. The first product they made was named FujiPur (for "Fuji Purina"), the spun soy protein fiber. It sold quite well to companies making products from beef. One day they appeared on a popular Japanese TV program and Fuji's artificial meat was fed to a baby tiger; the animal wouldn't eat it. That was embarrassing! (p. 445).

Fuji Pro (soy protein isolate) was first sold to hamburger makers and then to makers of fish paste products. Around 1971 it was sold to makers of ready to eat frozen food (*osôzai*). For the future, the company is aiming at health foods and drinks, dairy products, confectionery, hospitals, schools, factory cafeterias, retort packages, etc. (p. 446).

In about Dec. 1974 Fuji started to sell soy protein food at retail for home use–rather than as an ingredient or raw material. Thus it took FujiPro 10 years and it took Fuji Takaramae 15 years to establish soy protein in Japanese society. Address: Tokyo, Japan.

6786. George, Susan. 1977. How the other half dies: The real reasons for world hunger. Montclair, New Jersey: Allanheld, Osmun & Co. xxix + 308 p. Index. 21 cm. [500+* ref]
• ***Summary:*** Soybeans are discussed in several places: Between 1972 and 1973 U.S. soybean production increased by 25% (p. 9).

Chapter 4, titled "Technology: Now who pays to do what to whom?" shows that no new technology, not even a new crop is neutral in the effects it has on different classes of people. A report on soybeans in Brazil commissioned by the French Government Center for External Trade showed that they are becoming an increasingly important crop there. Since Brazil can produce and sell its crop between the two U.S. soybean harvests, the government's official agricultural policy encourages Brazilian farmers to grow more soybeans since they are a profitable export crop. The price of soybeans is attractive, so farmers have abandoned corn, a traditional crop, as well as wheat (to a lesser extent) because soybeans demand less fertilizer. Since soybean production is easily mechanized, fewer Brazilians need be employed. Soybeans are usually crushed to make oil and meal. This complex processing technology is being taken over by the world's most competent processors–large multinational agribusiness firms, such as Cargill and Bunge. Small Brazilian processors are going bankrupt. Since Brazil's infrastructure for transporting and loading the soybeans is substandard, the World Bank has been kind enough to contribute half the price of new private export corridors to the seaports, which the Brazilian government has kindly declared necessary for the multinationals. No doubt the Brazilian soybean industry will be profitable for multinational agribusiness, but what will be the consequences for ordinary Brazilians. From 1970 to 1972, the price of corn, a traditional staple food and feed, has risen 60%, while the price of chicken has gone up 33%. Soybeans have drastically decreased the amount of land previously used for growing the *feijao* or black bean–another staple crop and key human protein source; during this period its price jumped by 275%. Rice production also suffered from the soybean competition. All of these developments hurt average Brazilians, and especially the poor.

In addition, real estate prices is areas best suited to soybean production have risen dramatically; one hectare in Rio Grande do Sul, which sold for 1,500 cruzeiros in 1972, sold for less than 10,000 cruzeiros less than a year later. Thus, smaller farmers with less mechanization are losing out to those who can afford to buy more than and agricultural equipment. Soybean production in Brazil directly counteracts the efforts of the Brazilian government to limit inflation (p. 67-69).

Chapter 6, titled "Planned scarcity," notes that in the USA, one acre in 6.5 is now planted to soybeans. Europe is only 2% self-sufficient in plant protein production. After World War II, Europe introduced American hybrid corn to replace local varieties; though the yield was higher, the protein content was lower. Thus a new protein source had to be found for feeding livestock, and U.S. soybean meal seemed to be the most rational and inexpensive solution. Export of soybean meal from the U.S. to Europe jumped from only 47,000 tons in 1949 to nearly 5 million tons in 1972-73. Major U.S. processors set up crushing mills in Europe. In short, the entire post-war European livestock industry has been developed on the basis of extensive use of low-price soybean meal. The U.S. established a "near-monopoly position for supply not only of Europe but of Japan and other nations."

Discusses the 1973 U.S. soybean export embargo, which began in June and sent prices soaring to $12 a bushel, from $2. The embargo was removed 3 months later and

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at year's end it became clear that the scare over shortages was unwarranted. The Food for Peace program introduced soya oil into countries like Spain and Tunisia that had never before tasted anything but their own olive oil. Even the butter-rich Netherlands now consumes more imported soy margarine than butter. "Far be it from me to suggest collusion I can't prove, but it is at least evident who profits from higher prices and who suffers. A futures market in soya meal was opened in London in April 1975 as a measure that might check price fluctuations." Yet the key fact is that European countries do not produce soybeans, nor any alternative protein crop.

Discusses the new effort to extend the use of soya beyond feeding animals by promoting TVP, and the international conference held at Munich, Germany, in Nov. 1973. Earl Butz (U.S. Secretary of Agriculture) led the American delegation; Hubert Humphrey stated: "Food is a new form of power. Food is wealth. Food is an extra dimension in our [U.S.] diplomacy." "Americans presented 24 out of the 38 papers (including 13 by agribusiness representatives and 10 by USDA people). Only one was by a nutritionist. "One sees absolutely no alternative to continued US MNC (multinational corporation) control of the world plant-protein production and prices." "The only rational way to offset price and foodstock manipulation by the giant traders would be to have grain stocks held in government hands, to be released or held back as the market situation demanded." The grain traders are "frantically opposed to any reserve system..." (p. 122-25).

Chapter 8, titled "Food aid?... Or weapon," discusses: Importance of feedgrains exports, Soybean Council of America, American Soybean Association, PL 480, promotion of soybean exports to Spain, Iran, and Korea, Ralston Purina and Cargill, Food for Peace counterpart funds used to finance research in recipient countries, "common defense" military expenditures (p. 172, 176).

Chapter 11, titled "What can 'they' do?" discusses alternative food sources, single-cell protein (SCP), America's energy-devouring food-production system which could exhaust U.S. fossil fuel reserves within 25 years, research by DuPont showing that when soybeans are experimentally flooded by carbon dioxide, they quadruple yields and fix more nitrogen (p. 239-40). Address: A Smith College graduate now studying at the Sorbonne. Fellow of the Transnational Inst.

6787. Igata, Sadaaki. 1977. Nihon kodai kokumotsu-shi no kenkyû [Research on the ancient history of cereal crops in Japan]. Tokyo: Yoshikawa Kobunkan (Koshikawa Bunkan). p. 130-49, 170. [3 ref. Jap; eng+]

• ***Summary:*** Introduction: Soybeans seem to have originated in East- or Southeast Asia. Origin of cultivation: (1) Literature" Soybeans are mentioned in the *Kojiki.* Norinaga Motoari accepted the myth of the Five Grains and thought that soybeans and the other four grains had been cultivated since the age of the Gods. Soybeans and adzuki beans are grouped together and mentioned as "beans" in the *Nihonshoki.*

(2) Archaeological study: According to a report in the journal *Toro* (Japan Archaeology Society, p. 358), wild soybeans (*tsurumame*) were excavated from the ruins of Toro.

On pages 148-49 is a section on *Edamame* (Green vegetable soybeans), which notes that the *Engishiki* (A.D. 927) describes the offering of fresh, podded soybeans at Buddhist temples. According to Taichi Fukazawa's report, soybeans were found in a pit in Komoriyama, Senya Village, Senhoku-gun, Akita prefecture, Japan. See "The pit from which grains were excavated," by R. Moriomoto (1933).

According to Dr. Nobuo Ito of Tohoku University, the naturally carbonized layer of soybeans dates back to the 1st or second century.

According to *Nara-cho shokuseikatsu no kenkyu* [Research on the eating habits of the Nara period (A.D. 710-784) in Japan], by S. Sekine (1969, p. 30), soybeans were excavated not only from the Komoriyama ruins, but also from the Yasuda Okayama ruins in Mioka Village, Kumage-gun, Yamaguchi prefecture, Japan, and from the Iba ruins in Hamamatsu city, Shizuoka prefecture, Japan.

Mr. Yoshinori Segawa mentioned that soybeans were found in the ruins of Taguchiyama, Maikata city, Osaka (*Sankei Shinbun Morning News,* 29 Sept. 1974). In summary, archaeological evidence from the Komoriyama ruins suggests that soybeans were grown in Japan by the 1st or second century A.D.

Comparison of Korea and Japan: Soybeans were cultivated in the southern Korean peninsula along with several kinds of grains, and these were found in the ruins of an army storage house in [illegible place name], Korea. These grains and beans date back to the middle of the 7th century A.D., but the earliest known mention of soybeans in Korean literature dates from the middle of the third century A.D. The author concludes that soybean cultivation seems to have started in Japan before it began in Korea, indicating that soybeans were not imported but were probably domesticated from wild soybeans.

Soybeans also appear in the *Sankoku-shiki* (Vol. 1, No. 1; Vol. 2, No. 2., Vol. 4, No. 4, and Vol. 23, No. 1).

Mr. Matsumoto wrote *Shina ni okeru Giso oyobi Shaso, Shimin seikatsu, kochi seido, kokumotsu no meisho no kenkyu* (A study of the Giso and Shaso storage houses, and the life of the Shimin people, the cultivated field system, and the names of grains). Page 148 states that "shu" includes both soybeans and azuki beans, and page 166 states that before the 6th century, both soybeans and azuki beans were cultivated. The "Five Grains" always includes "shu."

Process of cultivation: Soybeans and azuki beans are mentioned as emergency foods used to relieve shortages

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in A.D. 840. (See the *Zoku Nihon Koki,* vol. 9, and the *Reishûkai,* vol. 13). Therefore soybeans must have been grown widely, since they were offered to the government in place of millet when farmers could not afford millet in difficult situations.

According to the *Nihon Sandai Jitsuroku,* vol. 14, in March of A.D. 867 Japanese farmers burned the holly mountain to grow soybeans. This seems to indicate these farmers' active attitude toward growing soybeans.

In the 8th and 9th centuries, soybeans were grown in the Omi, Tanba (or Tamba), [two areas whose characters are not recognized], Bizen, Bitchu, Bingo, Kii, Awa, Sanuki, and Iyo areas. These are mainly centered around the Inland Sea area (*Seto-naikai*) of southern Honshu (Japan's main island).

The *Engishiki* (vol. 24) states that a certain island [characters not recognized] offered 24 *to* (1 *to* = 18 liters or 4.76 gallons) of soybeans.

Note: Concerning areas mentioned above in Japan in the 8th and 9th centuries: According to a map titled "The provinces of Japan" in *A history of Japan to 1334,* by George Sansome (1958, p. 2). Omi was located by today's Lake Biwa (Japan's largest lake), northeast of Kyoto. Tanba is located in the Kyoto area. Bizen, Bitchu, and Bingo are located adjacent to and directly north of the Inland Sea. Kii occupied what is today Wakayama prefecture and part of Mie prefecture. Awa, Sanuki, and Iyo were provinces on the northern side of Shikoku island.

6788. Iijima, Tadashi. 1977. Preparation of soymilk from soy cotyledons by extraction with sodium bicarbonate solution. MSc Thesis, Dep. of Food Science, University of Illinois. 76 p.
• ***Summary:*** The author received his BSc degree from Chiba Univ. in Japan in 1972. Contents: Introduction. Literature review: World food shortage, soybeans, preparation of soymilk. Materials and methods: Materials, methods, analytical methods, organoleptic evaluation. Results and discussion: The effect of soybean dehulling temperature on the quality of resulting soymilk, effect of conditioning soybeans and soy flour on yield of soymilk, extraction conditions, effect of homogenization pressure and temperature on yield and quality of soymilk, proximate composition of soymilk, evaluation of alkali processed soymilk. Summary and conclusions. List of references. Appendix. Address: Dep. of Food Science, Univ. of Illinois.

6789. Kikkoman Corporation. 1977. Kikkoman today & tomorrow: Savory meals for people all over the world (Brochure). Noda City, Japan: Kikkoman Shoyu Co., Ltd. 17 p. [Eng]
• ***Summary:*** An attractive booklet with many color photos. On the cover are many small color photos of people's faces, Manhattan (New York), pyramids, a koala bear, etc. Contents: What is Kikkoman? Dedicated to progress through excellence. Photo of the Kikkoman plant at Noda. A word from our president–Katsumi Mogi. How we began... Where we are (History of shoyu and Kikkoman). Kikkoman soy sauce production method. The secret of Kikkoman's unique flavor. Kikkoman's technology probes into tomorrow's foods. The Central Research Laboratories "Our goal is to make life better through the advanced application of food science." Photo of Kikkoman's family of quality products. International flavor in the global society. A bright future, rich in variety. The Kikkoman family tree (of companies). The Kikkoman Group (directory). Kikkoman sales network in Japan. Address: Kikkoman, Noda, Japan.

6790. Kikkoman Shoyu Co. Ltd. 1977. The Kikkoman cookbook: Your way to better flavor! Kikkoman Shoyu Co. Ltd., 1-3 Kayaba-cho, Nihonbashi, Chuo-ku, Tokyo 103, Japan. 80 p. Illust. No index. 26 cm. Distributed by Van Nostrand Reinhold Co., New York. [Eng]
• ***Summary:*** Originally titled *The Kikkoman Way of Fine Eating.* Copyright 1973. Address: Tokyo, Japan. Phone: 03-669-1111.

6791. Kitagawa, Isao; Yoshikawa, Masayuki. 1977. Selective cleavage of glucuronide linage in oligoglycoside. *Heterocycles* 8:783-811. [27 ref]
• ***Summary:*** "In the course of structural studies on oligoglycosides such as saponins, acid hydrolysis has been commonly used for cleavage of the glycoside linkage between the aglycone and the carbohydrate residue."

"In this review we describe the outline of four selective cleavage methods for the glucuronide linkage in oligoglycoside (saponin) which have been recently developed in our laboratory. There are photolysis, lead tetraacetate degradation, acetic anhydride and pyridine degradation, and anodic oxidation."

There are five soya saponins having glucuronide linkages between oligoglycosides and oleanene triterpenes. Address: Faculty of Pharmaceutical Science, Osaka Univ., 133-1, Yamada-kami, Suita, Osaka 565, Japan.

6792. Kodama, K.; Yoshizawa, K. 1977. Sake. *Economic Microbiology* 1:423-75. A.H. Rose, ed. Alcoholic Beverages. [200* ref. Eng]
• ***Summary:*** Contents: Outline of sake brewing. History of sake brewing. Taxation and classification of sake. Production and consumption. Industrial production of sake: Raw materials, preparation of koji, preparation of moto (yeast starter), preparation of moromi, filtration, pasteurization, storage and bottling, treatment of waste water. Conclusion. Address: 1. Kodama Brewing Co. Ltd., Iitagawa, Akita prefecture, Japan; 2. National Research Inst. of Brewing, Tokyo, Japan.

6793. Krich, Ken. 1977. Re: New pamphlets on tofu and

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miso available from Westbrae Natural Foods. Letter to food distributors and manufacturers. 1 p. Undated. Typed, with signature on letterhead. [2 ref]

• ***Summary:*** "For several years Westbrae has felt a major commitment to popularizing Japanese foods in this country. During a time when shortages of protein have become such a problem, the knowledge of soy-based foods is greatly needed by more people. Both miso and tofu are extremely healthy and inexpensive sources of protein and other nutritional benefits... yet many consumers are still not familiar with these products.

"To fill this information gap we asked Bill Shurtleff and Akiko Aoyagi, authors of *The Book of Tofu* and *The Book of Miso,* to write readable pamphlets on these topics. The authors have lived in Japan for the past five years studying and writing about traditional Japanese foods. You are probably familiar with their book(s)... I have taken the liberty of enclosing two copies of each pamphlet..."

"You may order either or both of these pamphlets with either the Westbrae logo, your logo, or no logo." This letter is printed on recycled paper. Address: Distributor Sales, Westbrae Natural Foods, Inc., 1224 10th St., Berkeley, California 94710. Phone: 415-524-0506.

6794. Matsumoto, Kosai, II. 1977. Traditional herbs for natural healing: Japanese plums (*ume*) and shelf mushroom (*reishi*)**.** Settsu City, Osaka, Japan: Kosai Matsumoto Office. 147 p. Illust. No index. 21 cm. [10 ref. Eng]

• ***Summary:*** Contents: Introduction. Letters of support. Part I: History of the Japanese plums (*Ume*)–born in China and raised in Japan. Japanese plums introduced as medicine. The use of Japanese plums as a protection against various diseases. Salted plums (Umeboshi) during the Samurai period. Plantings and location of the valuable plum trees. Plum extract, 160 years old. Plum extract's efficacy was accepted by both the Japanese army and navy. Relationship of Japanese plums for restoring acid-alkaline balance. Japanese plums are known as king of alkaline foods. The value of citric acid of Japanese plums. Chemical composition of Japanese plums. Why is citric acid good for your health Citric acid also metabolizes sugar. What is the citric acid cycle. Umeboshi conquers the Himalayas. Japanese plums have powerful antibacterial properties. Even radioactivity can be combatted by Japanese plums. Ume can balance your spirit (like a good tranquilizer). The unique properties of the Japanese plums. Ume has immediate effect on hangovers. Pregnant women need Japanese plums. The secret of beautiful skin. Ume as a source of stamina. A Japanese plum a day slows the aging process. The effective prevention of anemia. How to treat food poisoning with Ume. The best way to prevent a cold. Ume goes to work instantly on stomach pains. Ume has a remarkable effect on liver troubles. Good news for people who are suffering from stomach ulcers. The problem of high blood pressure. Plums for Athlete's foot, snake bites, and as a unique contraceptive. Japanese plums as seen through the eyes of oriental medicine... The best is yet to come. How to properly select Japanese salted plums. Japanese traditional health foods using plums.

Part II: Reishi–The shelf mushroom or monkey seat mushroom (*Polyporaceae*) of Japan.

The recipe section, titled "Japanese traditional health foods using plums" includes some that call for soy: Soy sauce with plum extract (p. 74; a good dressing for wakame seaweed salad). Crushed bean curd [tofu] with plum sauce (p. 80). Tasty dressings using salted plums (with soy sauce, p. 81). Plum dip (with soy sauce, p. 84).

A section titled "Soy beans" (p. 125) states: "The high level of vegetable fat and protein make soy beans the ideal food for daily health."

A map of Japan inside the front cover and facing page shows the nine major plum growing areas: From north to south they are: Mito Kairakuen Garden (Ibaragi [Ibaraki]). Yoshino plum district (Tokyo). Hyakusoen park (Tokyo). Soga plum district (Kanagawa). Atami plum gardens (Shizuoka). Mizunoo plum forest (Osaka). Kitano shrine (Kyoto). Tsukigase (Nara). Minabe plum forest (Wakayama). The spectacular flowers bloom in Feb. and March, moving from south to north.

A note/ad on page 146 states: "For your information. This book along with the following products are available from Soken Trading, Inc., P.O. Box 1705, Sausalito, California: Meitan Granules, Plum (Ume) Extract, Handpicked Umeboshi (Salted Plums), Plum Candy, and Kobai Reishi." A color photo on the rear cover shows Mr. Kosai Matsumoto II. He has three written other books about umeboshi and reishi. Address: 4-14-1 Shojaku, Settsu City, Osaka, Japan. Phone: 06-383-0911.

6795. Mote, Frederick W. 1977. Yüan and Ming. In: K.C. Chang, ed. 1977. Food in Chinese Culture. New Haven, CT, and London: Yale Univ. Press. 429 p. See p. 193-257. [38 ref]

• ***Summary:*** The Yuan (Mongol) dynasty (when China was under alien Mongol rule) lasted from +1271 to 1368. The Ming dynasty (when China was again ruled by Chinese) lasted from +1368 to 1644. In 1644 the Ming fell to the bandit Li Tzu-ch'eng, and Manchu invaders from the north [Manchuria] captured Peking, then soon conquered the rest of China–ushering in the Ch'ing dynasty (1644-1912). Note: The Ming period is one of the great eras of orderly government and social stability in human history. A population averaging around 100 million people lived during 276 years in comparative peace.

Page 212 notes that the growth of the palace eunuch staff is an important feature of early Ming government. The *Huang Ming tsu-hsün-lu* (Ancestral Admonitions), issued first in 1381 during the reign of the Ming founder,

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stipulated that separate bureaus within the palace eunuch staff be designated. The imperial wine bureau oversaw the production of wines, soybean meal, tofu, etc.

Page 200 notes that during this period "consumption of meat was very low and seems to have remained stable at low levels for many centuries... Because China also used virtually no dairy products, to maintain nutrition they had to supply protein, calcium, fats, and vitamins in many ways quite different from those our society employs. Vegetables, in one way or another, supplied all of those things. The soybean undoubtedly was the most important diet adjunct, being richer in protein than equivalent weights of red meat, richer in digestible calcium than equivalent amounts of milk, and also being an important source of oil and certain vitamins. Excellent cooking oils also were made from sesame seed, rape seed, and other plant materials (*T'ien-kung k'ai wu,* trans. by Sun and Sun, 1966, p. 215-21)."

Pages 240-41 note, under "Special ingredients: The Japanese specialist in the history of Chinese food and eating, Shinoda Osamu," has remarked that "Traditional China's diet was strikingly different from the Japanese in two respects: the consumption of oils and fats was four or five times higher in China, and everyday cooking demanded more basic materials. The things required to keep an ordinary kitchen going day by day in Yüan and Ming times are sometimes enumerated in the entertainment literature, encapsulated in the formula of 'the seven things.' Shinoda refers to 'Yüan drama' for one enumeration of those, probably having in mind the line spoken by a busy housewife: 'From the moment I get up in the morning, I'm busy with the seven things–fuel, rice, oil, salt, soy sauce, vinegar, and tea' (*San-shih chung,* p. 261)."

Also discusses: Peanuts (p. 198). Notes that during the last century and a half of the Ming period, from roughly 1500 to 1650 a number of important new crops entered China: Maize, sweet potatoes, peanuts, and tobacco. Vegetarianism (p. 221-25, 242). At private ceremonial banquets, vegetarian foods resembling forbidden meat dishes were served.

Pages 201 states: "Fish were commonly farmed in the ponds, regularly harvested, and sold live in the markets." However no mention is made of soybeans being fed to the fish. Address: Prof. of East Asian Studies, Princeton Univ., Princeton, New Jersey 08540. Phone: 609-452-4284.

6796. Nagayama, Hisao. 1977. Nattô no shinpi [The mystery of natto]. Tokyo: Arrow Shuppansha. 220 p. Illust. 19 cm. [14 ref. Jap]

• ***Summary:*** Contents: 1. The mystery of ancient natto (p. 11). The super power of natto bacteria. The mystery of fermentation and *saru zake.* Anthropoids and natto bacteria. The ancestors of Japanese are elephant hunters. People in the Jomon period were extremely omnivorous. Curiosity and *doki natto* (natto in earthenware containers). Natto that is 2100 years old was excavated. Mysterious Queen Himiko's beauty diet. Ancient natto as medicine.

2. Natto as a secret weapon in military provisions (p. 36). Natto's super power. The mystery of the Natto Road. Legend of the ancient path of Oshu. Oshu natto that went to Kyushu. Kato Kiyomasa's black soybeans (*kuromame*). Natto as a energy source for military commanders in the Sengoku period. The role of soybeans in the Russo-Japanese War. Natto on battleships of Japan's Pacific Ocean fleet in World War II. The German army paid attention to the power of natto.

3. A humorous history of natto (p. 57). Humorous *Hime Natto.* The mystery of *wara tsuto* (natto in a straw package) and *shimenawa* (a sacred Shinto straw rope and festoon). A petticoat government and *tataki natto* (pounded natto). The popularity of Edo sickness and *natto-jiru* (natto soup). The appearance of *natto-jiru* in classical documents. Natto protein saved the people who survived the great 1923 earthquake in Tokyo. The romance of *Yamataikoku* and longevity foods.

4. The topography of natto (p. 76). Stylized, illustrated map of natto in Japan. College natto in Sapporo. Vegetable natto. Hikiwaru natto in Tsugaru. Kônô natto. Bridegroom and bride natto. Natto musume (natto daughter). Rare taste food of natto "tozo." Hiyama natto in Akita Ondo (a famous folk dance song). *Masamune no Hôryô Natto. Deba natto. Ichiya natto no kuumondine. Goto natto. Teramichi natto. Hamanatto. Hatsu muko to natto wa nibange. Aizu no tsurushi natto. Sakata no O-shôgatsu sama. Yukiguni no daraku-jiru. Natto hachi. Romantic na hime natto. Momen natto. Yoi natto, yoi o-shôgatsu. Masakado no hoshinatto. Nakôdo natto. Mito natto. Yamaoku no natto-zato. Naisho mame. Shinobi no natto oke. Hettsui natto no ôzuto. Isshô natto. Natto chinmi no tôzô. Arakawa no momen natto. Edo no zaru natto. Okukido no Heike natto. Hate, hate nantoshô.*

Ancient natto. Hamanatto. *Natto chanoko. Shotoku Taishi no warazutsu natto. Ogi natto. Tanba no Yamaguni natto. Gosho no hôsei natto. Kaori no daizu. Take no kawa natto. Fuyugomori natto. Kaga no natto-jiru. Kôbashii korumame. Munetada natto.*

5. The wonders and medicinal effects of natto (p. 119). 6. Delicious ways of eating and cooking natto (p. 170–with many recipes). 7. An easy method for making natto (p. 202).

A photo on the rear cover shows Mr. Nagayama. Address: Shoku Bunka Kenkyusho, Toyotama-kita 4-31, Nerima-ku, Tokyo, Japan.

6797. Nakase, Kenji. 1977. Miso shôyu shiso Hotto Enmyô Kokushi [The Zen priest who introduced miso and shoyu to Japan: Hotto Emmyo Kokushi, or Kakushin (1207-1298)]. Kyoto: Zenkoku Jokai Shinbunsha. 292 p. Appendix: Miso and shoyu supply adjustment regulations. [Jap]

• ***Summary:*** A scholarly, carefully researched book on the early history of miso and shoyu in Japan.

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6798. Nihon Yushi Kyokai [Japan Oils and Fats Assoc.]. 1977. Nihon Yushi Kyokai 15 nen-shi [Japan Oils and Fats Association 15-year history]. Tokyo. 313 p. [Jap]
• ***Summary:*** Pages 1-9 contain a detailed chronology of the fats and oils industry in Japan from A.D. 97 to 1973. Address: Japan.

6799. Nosan Gyoson Bunka Kyokai. 1977. Nôgyô gijutsu taikei. Sakumotsu-hen. Vol. 6 [Outline of agricultural arts and techniques. Crops. Vol. 6]. Tokyo: Nôsan Gyôson Bunka Kyokai. See p. 3-7. [Jap]
• ***Summary:*** Page 4 shows 2 pie charts with statistics from the year 1974. The 3,500,000 tonnes of whole soybeans consumed in Japan are used as follows: Soy oil 78% of the total, tofu and products 10.5% (except frozen tofu), miso 5.5%, natto 1.5%, frozen tofu 1.3%, kinako (roasted soy flour) 0.4%, shoyu 0.2%, and other 2.6%. The 2,20,000 tonnes of defatted soybean meal are used as follows: Livestock feed 84.6%, shoyu 7.5%, tofu 4.1%, miso 0.3%, other food uses 2.0%, other nonfood uses 1.5%.

A graph on page 7 shows soybean production in Japan and soybean imports. Imports were static from about 1895 to 1918 at about 100,000 tonnes, then they rose rapidly to about 1,000,000 in 1944. They dropped to almost zero following Japan's defeat in World War II, then starting in about 1954, skyrocketed, reaching 1 million tonnes in about 1960, 2 million tonnes in about 1968, and 3 million tonnes in about 1970. After about 1954, soybean production in Japan dropped steadily. Address: Japan.

6800. Purchio, Adhemar. 1977. Search for B-1 aflatoxin and similar fluorescent compounds in 'misso' [miso]. *Mycopathologia* 58(1):13-17. [5 ref. Eng]
• ***Summary:*** Reports the "results obtained using thin layer chromatography (TLC) with three different solvent systems and spectrophotometric analysis in order to differentiate between actual B-1 Aflatoxin and Aflatoxin-like substances. Twenty 'Misso' substances were studied and we could detect Aflatoxin in 3 of them. An Aflatoxin-suspected substance was also isolated. No Aflatoxin-producing *Aspergillus* was isolated from the samples analysed.

"Twenty samples of 'Misso' [miso] (a kind of condiment prepared with fermented rice and soybean) for human use were investigated. Eighteen of them were prepared in small industries [miso shops] in the state of Sao Paulo and two others... were obtained from families of Japanese origin which used in their preparation an old home process. This includes the fermentation of rice and soybean after previous contact with the open air and further natural mold contamination. Excluding the last two samples, all the others had been picked up in some supermarkets in Sao Paulo." Address: Faculdade de Medicina da Univ., de Sao Paulo Depto. de Microbiologia, C.P. 2921, Sao Paulo, Brasil.

6801. Seki, Nobuo; Sakaya, Hiroshi; Onozawa, Tetsuhiko. 1977. [Studies on proteases from Antarctic krill]. *Nihon Suisan Gakkai shi* (*Bulletin of the Japanese Society of Scientific Fisheries*) 43(8):955-62. [12 ref. Jap; eng]
• ***Summary:*** Proteases were extracted from Antarctic krill (*Euphausia superba*). Through purification, they were separated into two trypsin-like proteases and a protease of unknown specificity. The trypsin-like proteases inhibited the activity of soy-bean trypsin inhibitor. Also mentions myosin. Address: Lab. of Biochemistry, Faculty of Fisheries, Hokkaido Univ., Hakodate [Japan].

6802. Shiraishi, Daiji. 1977. Nomikui koto koto ten [Dictionary of drink and food]. Tokyo: Shibata Shoten. 246 p. Shoku Bunka no Hakken series #3. Japanese summary by Kawakami 1978. [Jap]
Address: Japan.

6803. Sho Sugyo; Ka Shiyo. 1977. Shi Ryûkyû-rokô [Reports of the messengers to Ryukyu]. In: Naha-shi Shiryo-hen, Sakuhoshi-roku Kankei Shiryo (Yomikudashi-hen) [Naha City Research Materials Concerning the Reports to the Chinese Emperor Made by the Messengers to Ryukyu]. No. 1. Vol. 3. Naha-shi Kikaku-bu Henshu-shitsu Henshu [Compiled by the Naha city Planning Dept., Editorial Room]. See p. 28, 37. [Jap]*

6804. Shu, Ko. 1977. Ryûkyû koku shi ryaku [A short history? of the Ryukyu kingdom]. Tokyo?: Sanichi Shobo. See p. p. 340, 365. [Jap]*

6805. Svenska Ambassaden; Nippon Shokubutsu Gakkai. 1977. Bicentenary celebration of C.P. Thunberg's visit to Japan, Kyoto and Nagasaki, 17-25th May 1976. Tokyo: Royal Swedish Embassy; Nippon Shokubutsu Gakkai. ix + 105 p. Illust. Maps. [Eng]*
• ***Summary:*** Note: "The Royal Swedish Embassy and the Botanical Society of Japan held a nine-day commemorative meeting in May 1976."

6806. Takai, R. 1977. Edamame [Green vegetable soybeans]. In: Shigeru Shimizu, ed. 1977. Yasai Engei Daijiten (Encyclopedia of Vegetable Gardening). Tokyo: Yokendo. 2 + 2 + 20 + 1502 p. See p. 1002-06. Illust. (12 p. of color plates). 27 cm. [Jap]*
Address: Japan.

6807. Takai Seisakusho. 1977. Takai Seisasakusho no kikai [Takai tofu production equipment leaflets (Portfolio)]. Takai Manufacturing Co., 1-1 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan: Takai Seisakusho. 25 inserts. [Jap]
• ***Summary:*** William Shurtleff contacted Takai Seisakusho, the largest and oldest manufacturer of tofu equipment in

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Japan, and asked if he could place an order for Farm Foods in San Rafael. Wataru Takai said that all the information about his equipment was on single-sheet color leaflets printed on both sides in Japanese. They agreed that Takai needed an English-language catalog of tofu equipment, the first such catalog ever to be created. The following glossy color leaflets (most numbered, all undated; each 25.5 x 18 cm, and printed with black and one color of ink on glossy white paper) were given to Shurtleff to use as the basis for his work: 1. Grinders. 2. To-100 system. 3. TM-100 system. 4. Boilers. 5. Mini-Star and other complete systems. 9. Hydraulic press. 10. Jack press, forming box table, and modern forming box. 11. Pressure cookers. 12. Tandem pressure cookers, and whole modern system. 13. Automated yaki-dofu broiler. 15. Three metal sinks, metal curding vat, tofu cutter, tofu forming box, silken tofu box and cutter. 16. Deep mixing plate, simple lever press. 17. Ganmodoki mixing machine. Draining racks. 18. Mechanized deep fryers. 20. Two-chamber manual deep-fryer. 24. Rotary feeder–to move soybeans. 28. Pump. 30. Mechanized tofu press. 32. Case washer. 33. Continuous roller extractors (4 models). 35. Mechanized soymilk maker. 36. Mechanized soybean soaker and washer. 37. Mechanized tofu cooling tank. 38. Automated TGS-2 whole system. 39. Automated whole system. 40. Automated TGS whole systems (Nos. 1-4 and 10). 134. Automated tofu factory TGS 7-9.

Unnumbered leaflets: TM-100 whole system and other equipment (blue). Micro mini-plant TGS-4 (green). Order form. Address: Ishikawa-ken, Japan.

6808. Takai Seisakusho. 1977. Takai no tôfu kikai [Takai tofu production equipment (Brochure)]. Takai Manufacturing Co., 1-1 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan: Takai Seisakusho. 6 p. [Jap]

• ***Summary:*** On the cover are two square arrays of dots, one green and one blue, offset slightly to give the impression of three dimensionality. In the lower right is the address and phone number of Takai headquarters and five branches.

When the brochure is opened, the two left panels contain six large black-and-white photos: (1) Outside of factory No. 2. (2) Inside factory No. 2 with finished equipment standing on the floor. (3) An aerial view of the long bay of factory No. 1 showing many machines under construction. (4) Eight draftsmen at work in the design room. (5) Three women office workers in a modern office. (6) The exterior of factory No. 1. In the upper left of the far left panel is basic information about the company, which was founded in 1917. The inner right panel shows photos of five Takai tofu and soymilk systems, with a description of each. On one back panel are photos of four more larger systems. On the other back panel is a chronology of the company. Address: Ishikawa-ken, Japan.

6809. Talking Food Company. 1977. Miso & tamari (shoyu): Foods steeped in culture (Leaflet). Charlestown, Massachusetts. 2 panels each side. Each panel: 21.5 x 14 cm. [2 ref]

• ***Summary:*** Printed with red ink on off-white paper. Contents: Introduction. Fabulous fungus from antiquity. Secret life of molds. B12 and the protein profile. Beyond vitamins. Is miso pasteurized? Miso and tamari in the USA. Recipes (3).

"In 1976 over 85 tons of traditional miso and 100,000 gallons of traditional tamari were shipped to natural food distributors in the USA by Muso Shokuhin of Osaka and Mitoku Ltd. of Tokyo."

Others in this series (copyrighted 1977) are: "More on sugar and how it got that way" (4 p.). "Fiber: Grandmother was right" (4 p.). Address: Charlestown, Massachusetts 02129.

6810. Yokotsuka, Tamotsu. 1977. Shokuhin Kagaku Daijiten: Shôyu [McGraw-Hill encyclopedia of food, agriculture & nutrition: Soy sauce]. Tokyo: McGraw-Hill Kodansha. See p. 309-310. [Jap]

• ***Summary:*** History: Hishio and Kuki production techniques came to Japan from China and Korea. According to the Taiho Ritsuryo (702 A.D.), various types of Hishio and Kuki and Miso (this is the Misho character–NOT the present Miso one) were made from soybeans in the Hishio Tsukasa of the Kunaisho. It is in later times that they started to use the liquid which was separated from the above three as seasonings. In the Kamakura (1185-1333 A.D.) period in the Wakayama prefecture they collected the liquid accumulated in the bottom of Miso Oke. In the Muromachi period (1338-1573 A.D.) they added water to miso and squeezed it to extract the liquid (called Usudare or Taremiso). Shoyu (which is different from miso) was first mentioned in Ekirinbon Setsuyoshu (1597 A.D.). Address: Kikkoman Corporation, Noda, Japan.

6811. Takahashi Yuzo Kenkyusho. 1977? Tokkyo–Takahashi-shiki junsei baiyo. Katei-yô. Takahasi fukugo kassei nattô-kin [Patent–Takahashi method of pure culture fermentation. For home use: Takahashi complex activated natto bacteria; live cultures for strong natto bacteria (Leaflet)]. Yamagata city, Japan: TYK. 1 p. Undated. [Jap]

• ***Summary:*** Company name with diacritics is: Takahashi Yûzô Kenkyusho. Uses a question and answer format. Address: Yamagata-shi, Yôka-machi, 2 chome, 1 ban 990-91. Phone: Yamagata (0236) 22-4001.

6812. Takahashi Yûzô Kenkyusho. 1977? Nattô seizô no yôten [Key points in natto production]. Yamagata city, Japan: TYK. 6 p. Undated. [Jap]

• ***Summary:*** Company name with diacritics: Takahashi Yûzô Kenkyusho. Uses a question and answer format. Address: Yamagata-shi, Yôka-machi, 2 chome, 1 ban 990-91. Phone:

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Yamagata (0236) 22-4001.

6813. Kanda, H.; Wang, H.L.; Hesseltine, C.W. 1978. Method of producing soybean milk yogurt. *U.S. Patent* 4,066,792. Jan. 3. 1 p. Application filed 22 Sept. 1976. [3 ref]
• ***Summary:*** Soymilk is mixed with cow's milk whey solids (preferably 2%) and sucrose (4-5%), then sterilized, mixed with an aqueous gelatin solution (up to 1.5%), rapidly cooled to 30-35ºC, inoculated with equal parts of 2 strains of *Lactobacillus acidophilus* (NRRL B-1910 and B-2092), and incubated at 35-40ºC for 16-24 hours to produce a non-dairy yogurt.

See also: Japanese Examined Patent 5,628,130 (1981). Address: 1. Zushi, Japan; 2-3. NRRC, Peoria, Illinois.

6814. American Soybean Assoc. ed. 1978. International Soya Protein Food Conference, Proceedings. Hudson, Iowa: ASA. 136 p. Held 25-27 Jan. 1978, Republic of Singapore. No index. 29 cm. [328 ref]
• ***Summary:*** Contains 34 papers, largely about the use of modern soy protein products. Individual papers are cited separately. The "registration list" (p. 127-35) is a detailed directory of participants and the press. The eight "Exhibitors" (p. 136) were American Soybean Association (Hudson, Iowa), DeKalb County Exports Inc. (Ottawa, Illinois), Intercom News (Kansas), Japan Vegetable Protein Food Association (Tokyo), Kikkoman Shoyu Co. Ltd. (Tokyo), Ralston-Purina (St. Louis, Missouri), United Vegetable Oil Co. (Pte) Ltd. (Singapore), and Wenger International Inc. (Kansas City, Missouri). Address: Hudson, Iowa.

6815. Aoki, Hiroshi. 1978. New soy protein food market and products in Japan. In: American Soybean Assoc., ed. 1978. International Soya Protein Food Conference, Proceedings. Hudson, Iowa: ASA. 136 p. See p. 66-69.
• ***Summary:*** Contents: Introduction. General survey of the new soy protein food products in Japan. Influence of the establishment of 200-mile economic zones. Utilization of new soy protein products for traditional soybean foods. Concluding remarks.

Chronology of new soy protein food development:

1955–Undenatured, solvent-extracted, defatted soybean flakes start to be produced for use in tofu production. These flakes became the bases if the new soy protein products in Japan.

1960–Defatted soy flour for bread and confections.

1961–Soy protein concentrates for fish products.

1962–Soy protein extracts for dairy and meat products.

1965–Soy protein isolates.

1970–Spun soy protein fiber, and textured and structured protein.

Soymilk, which has not been a real traditional food in Japan (unlike China) can be viewed as a new protein product. Though no commercial trials have yet succeeded, very recent test market trials made by several manufacturers of soymilk made from whole soybeans and also from soy protein isolates, seem to suggest some possibilities of success. Address: Otsuma Women's Univ., Tokyo, Japan.

6816. *Daizu Tanpaku Shinbun* (*Soy Protein Newspaper*). 1978. Sekai no tôfu ni. Amerika demo yasuuri ga [Tofu becomes internationalized. Even in America, bargain prices]. Jan. p. 5. [Jap]
• ***Summary:*** Sato Shoji's criticism of Soyfoods Center & Shurtleff.

6817. Fukushima, D. 1978. Soy sauce manufacturing techniques. In: ASEAN Soy Sauce Committee, ed. 1978. Report of the ASEAN Workshop on Soy Sauce Manufacturing Techniques. Singapore. 252 p. See p. 138-47. Address: Kikkoman, Walworth, Wisconsin.

6818. Fukushima, Danji. 1978. Fermented soybean protein foods in Japan. In: American Soybean Assoc., ed. 1978. International Soya Protein Food Conference, Proceedings. Hudson, Iowa: ASA. 136 p. See p. 39-42.
• ***Summary:*** There are three major kinds of fermented soybean foods in Japan: Shoyu, miso, and natto. "In Japan, about 439,500 tons of soybeans and defatted soybeans are used as the materials of these fermented soybean foods. Among these, 175,000 tons are used for shoyu, 195,000 tons are used for miso, and 69,000 tons are used for natto."

Table 1 shows the consumption of soybeans and defatted soybeans in Japan in 1976 for foods (1,026,000 tonnes) and feeds (1,980,000), for a total of 3,006,000 tonnes. Foods are divided into fermented (shoyu, miso, natto; 439,500 tonnes) and non-fermented (tofu and aburage, kori-tofu, and others; 586,500 tonnes). For non-fermented soyfoods 466,500 tonnes of soybean are used for tofu and aburage, 29,000 tonnes for kori-tofu, and 91,000 tonnes for other products.

"Recently, a new fermented drink using soybeans appeared on the market. This product is a drink which is made by the fermentation of soy milk by lactic acid bacteria. There are many patents related to these kinds of products, including a yogurt type, in Japan. Therefore many new fermented soybean foods may appear on the market in the future."

Other tables show: (2) Typical composition of different kinds of shoyu. (3) Annual production of purely fermented, semi-fermented, and chemical shoyu in 1976. (4) Annual production of Japanese Agricultural Standard mark shoyu in 1976. (5) Chemical composition of major types of miso.

Figures (flow sheets) show: (1) Shoyu manufacturing process. (2) Rice miso manufacturing process. (3) Natto manufacturing process. (4) Shoyu manufacturing process. Address: Noda Inst. for Scientific Research, Kikkoman Shoyu Co., Tokyo, Japan.

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6819. Fukushima, D. 1978. Quality evaluation of soy sauce. In: ASEAN Soy Sauce Committee, ed. 1978. Report of the ASEAN Workshop on Soy Sauce Manufacturing Techniques. Singapore. 252 p. See p. 148-58. [Eng]
Address: Director of Research, Noda Inst., Tokyo.

6820. Herron, Steve. 1978. Local elevator sells soybeans direct: Farmers get more for their beans at this Iowa co-op. *Soybean Digest.* Jan. p. 13.
• ***Summary:*** Last year Farmers Co-operative Elevator at Albert City, Iowa, sold 695,000 bushels direct to a Japanese grain buying firm. Not many regional co-ops export grain for dollars. "By making direct sales, the elevator saves brokers commissions." That means about 10 cents more per bushel for the farmer. Of all the grain handled by co-ops in Iowa, only 7% is exported. About 80% of the soybeans grown in the Albert City area have white hilums, making them good for human consumption. Manager Bruce Anderson hopes to contract a year in advance for a certain quantity and quality of soybeans. The Japanese are interested in large quantities of good quality edible, white hilum soybeans.

About 2½ years ago Anderson first made contact with a Japanese trading firm. He visits their New York office regularly. They come to Albert City once in the summer and once at harvest time to see how the soybeans are handled, stored, and separated. The process builds confidence. "The Japanese like to know who they're dealing with. They like to do business with people they feel they can trust."

6821. **Product Name:** Meipron (Bland Soy Protein Product).
Manufacturer's Name: Meiji Seika Kaisha, Ltd.
Manufacturer's Address: 2-4-16 Kyobashi, Chuo-ku, Tokyo, Japan. Phone: 03-271-1757.
Date of Introduction: 1978 January.
How Stored: Shelf stable.
New Product–Documentation: Brochure. 1978. Jan. 18. 4 p. "Meipron." Reference No. MPP/01/03.

6822. Sakaguchi, Yukio. 1978. Government-industry promotion programs for vegetable protein [in Japan]. In: American Soybean Assoc., ed. 1978. International Soya Protein Food Conference, Proceedings. Hudson, Iowa: ASA. 136 p. See p. 116-17.
• ***Summary:*** Contents: Current situation of soya protein foods in Japan. Outline of activities of Japan Vegetable Protein Food Association: Joint activities with related organizations, seminars for institutional food service people, seminar at universities, seminars for food processors, seminars for the consumer, publicity programs, standard and improvement of labelling of vegetable protein foods.

Discusses the history of the New Protein Food Council (founded 1969) and the Japan Vegetable Protein Food Assoc. (founded Aug. 1975). The latter is a quasi-government organization that presently has 20 food processors as members. Address: President, Japan Vegetable Protein Food Assoc., Tokyo, Japan.

6823. Tsen, Cho C. 1978. Soy flour and protein used in bread and pasta products. In: American Soybean Assoc., ed. 1978. International Soya Protein Food Conference, Proceedings. Hudson, Iowa: ASA. 136 p. See p. 95-101. [22 ref]
• ***Summary:*** Contents: Use of surfactants (dough conditioners). Modifications of processing conditions. Short-time dough process (K-state process) for making soy-fortified breads. Various soy products. Acceptability of soy-fortified breads (buns). Recent development of soy-fortified bread in several Japanese schools. Nutritional evaluation of soy-fortified bread. Soy fortified flour. Soy-fortified pasta products. Summary. Address: Kansas State Univ.

6824. Villa-Abrille, Carlos. 1978. Marketing of extended meat products in Third World countries. In: American Soybean Assoc., ed. 1978. International Soya Protein Food Conference, Proceedings. Hudson, Iowa: ASA. 136 p. See p. 110-15. [1 ref]
• ***Summary:*** Contents: Statement of the problem. Applications. Case studies: Ralston Purina (reasons for developing the product, quantification and qualification of demand, determination of product type and form, communicating the value, conclusion), Pure Foods Corporation (reasons for developing the product, quantification and qualification of demand, conclusion). Summary.

Per capita consumption (kg/person) of total red meat in specified countries in 1975, in descending order of amount is: Uruguay 104, Australia 101, Argentina 98, New Zealand 95, United States 83, Canada 73, Belgium-Luxembourg 73, West Germany 68, France 67, United Kingdom 57, USSR 45, Taiwan 20, Japan 16. Address: Pure Foods Corp., Manila, Philippines.

6825. Wang, Jun Ryun; Lee, Yang Hee. 1978. Traditional soybean foods in Korea. In: American Soybean Assoc., ed. 1978. International Soya Protein Food Conference, Proceedings. Hudson, Iowa: ASA. 136 p. See p. 43-47. [13 ref]
• ***Summary:*** "The origin of soy sauce and paste in Korean literature dates back to 683 A.D. (Shinmu King 3rd year of the United Silla period). Since an old Japanese literature [document], *Hwameyruitsuroku* [*Wamyô Ruijusho;* Collections of Japanese Names, by Subject], of Heyan [Heian] records that 'Maljang (Meju) is a Korean soy sauce and paste' and a record on Maljang was also observed in the ruins of Nara, it is evident that soy sauce and paste were introduced from Korea to Japan during the Nara period (645-793 A.D.). Therefore, it is believed that the beginning of

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their consumption in Korea should be in the third century of Kokuryo period."

"Soybean has been a major protein source in the Korean diet." In 1976 some 442,803 tonnes (metric tons) of soybeans were used in Korea as follows: oil and defatted meal 28.5%, curd (*tubu,* or tofu) 24.5%, paste (*doenjang*) 18.3%, soy sauce (*kanjang*) 10.6%, soy sprouts (*kongnamul*) 9.0%, hot soy paste (*kochujang,* made from meju, hot pepper flour, and cooked glutinous rice) 6.6%, soymilk (*kongkuk*) 0.14%, and other 2.4%. Other includes roasted soy flour (*konggomul,* used for coating rice cakes [mochi]), fried tofu (*yubu*), salted natto paste (*jeonkukjang / cheonkukjang*). *Doebiji* is fresh soybean puree, made by grinding soaked soybeans. When used as a food, it is usually cooked with vegetables, kimchi, and meat. Meju is balls of soybean koji like Japan's miso-dama. All fermented Korean soybean foods except Joenkukjang are prepared from meju. Its characteristic flavor results from *Aspergillus, Penicillium,* and *Mucor* species of molds on the surface of the balls and *Bacillus subtilis* on the inside. Damsuejang is a quick fermented soy paste made by crushing meju to a powder, adding a warm brine solution, then allowing it to ferment and ripen.

Note: This is the earliest English-language document seen (March 2009) that uses the word "Damsuejang" to refer to Korean-style soybean paste (miso).

The above usage is the equivalent of 12 kg per capita per year. The daily per capita consumption of soy sauce (kanjang) is 20 ml, of soybean paste (doenjang) is 15 gm, and of hot soybean paste is 10 gm. Most of the soy sauce (64%), doenjang (82%), and kochujang (76%) and all of the salted natto paste (joenkukjang) and quick fermented soy paste (damsuejang) are produced at a household level and consumed directly.

Both soybean production and imports have grown in recent years. In 1970 production was 231,994 tonnes, and imports were 36,291 tonnes for a total of 268,285 tonnes. In 1976 production was 294,949 tonnes (up 27% over 1970), and imports were 147,854 tonnes (4 times as much as in 1970) for a total of 442,803 tonnes (up 65% over 1970). Address: Korea Food Development Centre, Seoul, South Korea.

6826. Watanabe, Tokuji. 1978. Traditional non-fermented soybean foods in Japan. In: American Soybean Assoc., ed. 1978. International Soya Protein Food Conference, Proceedings. Hudson, Iowa: ASA. 136 p. See p. 35-38. [7 ref]

• ***Summary:*** Contents: Introduction. Tofu and deep fried tofu. Kori-tofu. Miscellaneous. Conclusion.

In 1960 soyfoods supplied 15.6% of the daily per capita protein supply of 69.4 gm. In 1975 they supplied 12.7% of the 78.8 gm. The leading sources in 1975 were (1) fish and seaweed, (2) rice, (3) soyfoods, (4) wheat. Address: Kyoritsu Woman's Univ., Hitotsubashi 2-2-1, Chiyoda-ku, Tokyo, Japan.

6827. Clough, Jean. 1978. Kitchens that dish up naturally good food. *Chicago Tribune.* Feb. 3. p. A1.

• ***Summary:*** The Plowshare Cafe (6155 N. Broadway) serves macrobiotic food and is also a health foods store. They use foods grown locally, in season. In addition, all meat, dairy products, tropical fruits, most sweeteners, and many spices are not served. The Macro-plate ($2.50) includes brown rice, miso soup and sea vegetables. Miso "is a black creamy paste made of fermented soy beans." The sea vegetables included hiziki seaweed in tamari sauce. Also offered was a sandwich with seitan (made of gluten), "tofu, soy mayonnaise, sesame seeds, carrots, and natto miso, a less-aged miso that includes barley and ginger. Its a granular to be sprinkled on rice or sandwiches."

New Earth Cafe and Mama Peaches are also vegetarian restaurants. Address: Dr.

6828. *Toyo Shinpo* (*Soyfoods News*). 1978. Aamondo iri tôfu seeru de honkaku hatsubai: Kakihara Jôzô. Aitsugu shinshutsu, ninki yobu aamondo seihin [A start of full-blown sale of tofu with almonds: Kakihara Jôzô. One after another coming out with popular almond products]. Feb. 21. p. 3. [Jap]

• ***Summary:*** Kakihara Jozo is one of Japan's oldest natto makers. In the spring of 1977 they started making natto with almonds mixed in. The almonds improve the flavor of natto by reducing the strong smell. The company adds 10-15% almonds by weight in small chunks. 100 gm (regular size) retails for 85 yen, whereas 50 gm (mini size) retails for 40 yen.

The consumption of natto in the Kansai region (Kyoto–Osaka–Kobe) is only about 10% as much as in the Kanto region (Tokyo–Yokohama).

This company used to make shoyu, but they quit making shoyu and started to make miso and natto. Photos show: (1) A man. (2) Various natto products.

6829. **Product Name:** [Thick Soymilk].
Foreign Name: Tônyû Pururu.
Manufacturer's Name: Furuta Shokuhin Kogyo (Furata Foods Co.).
Manufacturer's Address: Japan.
Date of Introduction: 1978 February.
Wt/Vol., Packaging, Price: 60 gm poly cup.
How Stored: Refrigerated.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 73. This product was introduced in Feb. 1978 in a 60 gm poly cup, and distributed nationwide. Name of company with diacritics is: Furuta Shokuhin Kogyo.

6830. Hymowitz, Theodore. 1978. Sri Lanka Soybean

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Development Program. Report No. 17. University of Illinois, Urbana, Illinois: INTSOY. 3 p. Contract No. UNDP/SRL/73/007-1/AGOF INTSOY.
• ***Summary:*** Hymowitz arrived in Sri Lanka on 15 Jan. 1978 and departed on 27 Jan. 1978. Discusses soybean production research. "Examination of the *Glycine* sheets at the Herbarium, Botanical Garden, Peradeniya, revealed that soybeans have been tested in Sri Lanka as far back as 1899. The seed was introduced from Japan." Address: Dep. of Agronomy, Univ. of Illinois.

6831. *Sankei Shinbun* (*Japan*). 1978. Kanada de miso o tsukuritai ["I want to make miso in Canada"]. Feb. [Jap]
• ***Summary:*** About Lulu Yoshihara, who is learning to make miso in Japan. Two photos show her working in a miso shop.

6832. *Toyo Shinpo* (*Soyfoods News*). 1978. Nattô seizô sôchi no gôrika (Jô). I. Nattô to sono seizô setsubi. Nattô Sanbyakuchin [Making nattô making equipment to be more rational and streamlined. I. Nattô and its production equipment. 300 Unique Natto Recipes]. March 11. [Jap]
• ***Summary:*** *300 Unique Natto Recipes* is a new cookbook, which includes some natto history. A restaurant specializing in natto, having a repertoire of over 300 dishes, is Hotel Sun Route in Awamori. They serve only natto dishes. The owner, Mr. Isamu Naraoka, loves natto and has been developing these recipes for the past 10 years. Examples include: Yamakake ryori, makimono ryori, nimono ryori, mushimono, mizumono, Pikata-fu, agemono, and nabemono ryori.

6833. Salao, Andy. 1978. Meet the tofu master [William Shurtleff]. *Expressweek* (*Manila, Philippines*). March 16. p. 31.
• ***Summary:*** Tofu master William Shurtleff, a 37-year-old American, is recognized in the US and Japan as one of the leading authorities on natural foods. He visited the Philippines at the International Conference on the Winged Bean held in January, 1978, and "went all the way to Quezon City to see the factory, which is operated by Cherry Food Industry. Its manager, Aida Yu, was thrilled to meet the tofu master." The company manufactures Nippon Tofu, which is made from thick soymilk and packed in a thick-walled polyethylene container, which is thermally sealed and will keep for 2-3 months. Contains a brief biography of Shurtleff and numerous extracts from *The Book of Tofu*. A photo shows Shurtleff looking at the company's tofu equipment.

6834. Tsumura, Haruo; Hashimoto, Yukio. Assignors to Fuji Oil Company, Ltd. (Osaka, Japan). 1978. Processed cheese-like product containing soy cheese. *U.S. Patent* 4,080,477. March 21. 6 p. Application filed 28 Oct. 1975. [3 ref]
• ***Summary:*** "A processed cheese-like product containing soy cheese as a part of the major ingredient is made by adding both a casein-containing substance derived from animal milk and a cheese emulsifying melting salt to natural soy cheese." This mixture is then agitated under relatively high shearing conditions, while heating to a temperature of 85ºC for a period sufficient to form the mixture into a softened, flowable consistency. The product is pasteurized, then the softened mixture is run into a suitable container and cooled. An excellent processed cheese results.

"The natural soy cheeses used in the invention can be any conventional soy cheese which has a protein content substantially made up of soy protein and preferably is formed by fermentation of soy milk with a lactic acid cheese starter culture and forming a curd from the fermented broth with conventional soy cheese coagulating agents..." Address: 1. Osaka, Japan; 2. Izumiotsu, Japan.

6835. Kiuchi, Kan; Ohta, Teruo; Ishima, Toshio; Takabayashi, Tokuji; Ebine, Hideo. 1978. [Miso lipids and the relations between free fatty acids and quality of miso]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 33. p. 209-13. March. [9 ref. Eng; jap]
• ***Summary:*** Reprinted from *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 24:295-99 (1977). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6836. Ochiai-Yanagi, Sonoe; Takagi, Toshio; Kitamura, Keisuke; Tajima, Makoto; Watanabe, Tokuji. 1978. Reevaluation of the subunit molecular weights in soybean 11S globulin. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 33. p. 178-84. March. [31 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 41:647-53 (1977). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6837. Shurtleff, William; Aoyagi, Akiko. 1978. Beikoku ni okeru miso [Miso in America]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 289. p. 11-15. March. [1 ref. Jap]
Address: New-Age Foods Study Center, c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: (03) 925-4974.

6838. Taira, Harue; Taira, Hirokadzu; Saito, Masataka; Mori, Yoshio; Fujimori, Ikuo. 1978. [Influence of dry treatment after harvest on quality of soybean seeds. I. Physical properties, chemical composition, and suitability for food processing]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 33. p. 155-62. March. [14 ref. Jap; eng]
• ***Summary:*** Reprinted from *Proceedings of the Crop Science Society of Japan* (*Nippon Sakumotsu Gakkai Kiji*) 46:67-74 (1977). Address: National Food Research Inst., MAFF,

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Tokyo, Japan.

6839. Taira, Harue; Taira, Hirokadzu; Ozawa, Eiji; Sasaki, Kunitoshi. 1978. [Chemical composition of soybean seeds grown by drained paddy field culture]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 33. p. 163-70. March. [27 ref. Jap; eng]
• ***Summary:*** Reprinted from *Proceedings of the Crop Science Society of Japan* (*Nippon Sakumotsu Gakkai Kiji*) 46:103-10 (1977). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6840. Taira, Harue; Taira, Hirokadzu. 1978. Daizu no ryûdo, hinshu oyobi saibai-nendo ga kagaku seibun sosei ni oyobosu eikyô [Effect of size of seed, variety, and crop year on the chemical composition of soybean seeds. IV. Protein, carbohydrate and ash contents of soybean seeds grown in the U.S.A. and China]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 33. p. 171-77. March. [18 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nippon Shokuhin Kogyo Gakkaishi* (*J. of Food Science and Technology*) 23:6-12 (1976). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6841. *Toyo Shinpo* (*Soyfoods News*). 1978. Nattô seizô sôchi no gôrika (Ge): Bimyô na hakkô no tejun. Kikai-ka, gôri-ka niwa genkai [Making nattô making equipment to be more rational and streamlined. II. Very sensitive fermentation steps. There is a limit to making natto the fermentation natto process mechanical and streamlined]. April 1. p. 4. [Jap]

6842. *Toyo Shinpo* (*Soyfoods News*). 1978. "Kurorera Nattô" no misuterii: Kishi kaisei naruka. Nisemono ôkô raberu no inshô kiezu. Katô Kiyomasa ga sôshi no setsu mo. Nattô no kigen wa itsugoro? [Chlorella Nattô mystery: If they could only wake up from death and recover? Poor imitation products are on the market, and the bad impressions is not going away. There is a theory that Katô Kiyomasa invented nattô. But roughly when did natto originate?]. April 21. [Jap]

6843. *Erewhon News* (*Newbury Street*). 1978. Erewhon–Happy Birthday!! April 17-23. p. 1.
• ***Summary:*** "This weeks marks the twelfth anniversary of Erewhon Natural Foods. It was right here in Newbury Street twelve years ago that Michio and Aveline Kushi, along with a few young friends, bagged the first Brown Rice and bottled the first Tamari that have since become Erewhon standards and the backbone of the Natural Foods movement in America." Address: 342 Newbury Street [Boston, Massachusetts]. Phone: 262-3420.

6844. Mori, Masao. 1978. Moyashi kôgengaku to sono bunka [Thoughts on bean sprouts and their culture]. *Ajinomoto-sha Ajiko News* No. 61. 9 p. April 30. [Jap; eng+]
• ***Summary:*** In 1974, consumption of all kinds of sprouts in Japan reached 260,000 tonnes/year. Per capita consumption is one of the highest among vegetables. The main seed sprouted is black mappe (*kokuryoku-tô*). In the old days, soybeans and mung beans (*ryoku-tô*) were the two most widely sprouted seeds. In Japan, sprout production as an industry started in the first decade of the 20th century, and after the Great Kanto Earthquake of 1923 it grew rapidly. During the period from about 1910 to 1915 the popularity of Chinese cooking grew rapidly in Japan. Because sprouts are widely used in Chinese cookery, they became firmly settled in the food tastes of regular Japanese. During the period from 1945 to 1965, the number of sprout products increased significantly. Producers were located mostly in the large cities of Yokohama, Tokyo, Osaka, and Kobe. Among the producers who joined the Japanese Bean Sprout Industry Association (*Mame Moyashi Kogyô Kumiai*) were 34 small producers and 667 individuals (insiders). The outsiders who didn't join the Association increased too.

The new seed for sprouting, black mappe [*Vigna mungo*], was originally imported from Burma only, but later Thailand entered the market, and became the main source of the beans starting in about 1965. In 1975 this seed cost less than 100,000 yen/tonne, but by 1977 the price had doubled, making it difficult for small producers to buy black mappe. So they started to mix mung beans with black mappe, but this made it difficult to produce sprouts of uniform quality.

The reason the Japanese switched from using soybeans and mung beans to using black mappe had to do with an incident in Nagasaki between China and Japan. The Chinese said the Japanese had treated their flag with disrespect. They got mad and for a while stopped trading with Japan–although the two countries are now becoming friendly again. Yet only a very small amount of soybeans and mung beans are imported from China.

It is believed that humans discovered the fact that seeds sprout in about 10,000 to 5,000 B.C. In the early Han dynasty, before the Christian era, the emperor of China wrote that "sprouts give health," and recorded their health effects. In Japan, the earliest record of bean sprout production dates from the Northern and Southern dynasties period (*Nanboku-cho*) (1336-1392). There is a legend that before that time the Chinese who landed by boat (accidentally) in Kyushu or Shikoku introduced sprouts to Japan. It is known that soy sprouts were made in Korea at an early date. There was a theory among the people in the sprout industry that soy sprouts were introduced to Japan when KATO Kiyomasa brought at least one Korean soy sprout maker to Japan at the time of Toyotomi Hideyoshi's war there (during the 1590s). Kato is said to have ordered the Korean to make soy sprouts using spring water from Suizenji park in Kyushu, and these sprouts are said to be Japan's first commercial sprouts–but

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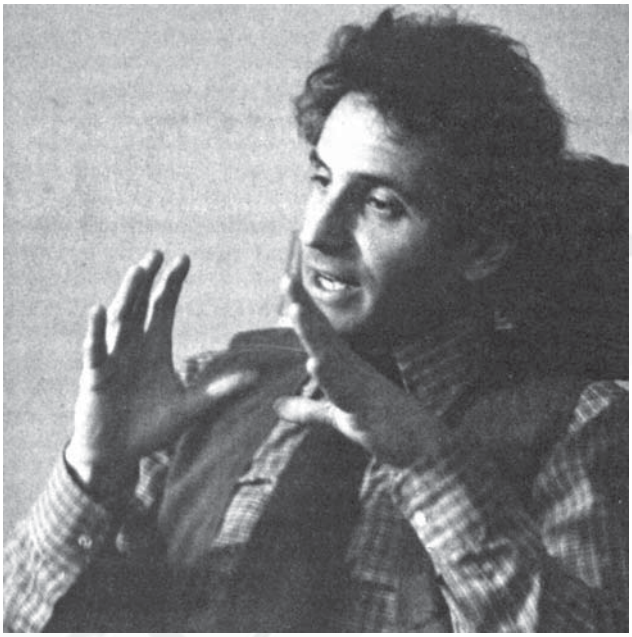
there is so solid evidence or documents to prove that this really happened.

Japan's sprout industry consists almost entirely of small producers. In Kagoshima there are 75 producers–the largest number in any one part of Japan. Tokyo, Chiba, and Saitama together have 85 producers. Also Ashikaga in Tochigi prefecture (north of Tokyo) produces large amounts of sprouts. There are about 1,282 sprout producers in Japan. Of these 611 companies (with a 49% market share) have 1-5 workers, 553 companies (43%) have 6-20 workers, 95 companies (7%) have 21-50 workers, 13 companies (0.1%) have 51-100 workers, and 10 companies (40.1%) have 101-200 workers.

Professor Tadayoshi TAZAKI of Tokyo Agricultural and Industrial University (*Tôkyô Nôgyô Kôgyô Daigaku*), Agricultural Dept., proved that ethylene (*echiren*) gas can be used to produce fat sprouts–it prevents them from growing long and thin. Address: Shokuryo Gakuin Kyoju Kyoritsu Joshidai Koshi, Japan.

6845. Goldman, Sherman; Smith, Tyler. 1978. The two worlds of a small publisher: An interview with Nahum and Beverly Stiskin. *East West Journal.* April. p. 67-69.



• ***Summary:*** Nahum and Beverly Stiskin traveled to Japan and founded *Autumn Press.* "Over the last two years, EWJ has excerpted several of their remarkable books, including *The Book of Tofu, The Book of Miso,* and *The Book of Kudzu* [by Shurtleff & Aoyagi] which bring the world of the Orient to a new generation of modern Western readers, cooks, and healers."

The Stiskins established Autumn Press by publishing *Looking Glass God* which Nahum wrote after arriving in Japan in 1969. They borrowed money from their family and had the first edition printed by a local Japanese printer. Then they worked with Lima Ohsawa on her *Art of Just Cooking.*

For the first four years the company grew slowly, blunder by blunder. They both had to take other jobs in order to support themselves. Both their families felt they were making a great mistake by publishing books on subjects of little interest. But they were trying to contribute to a renaissance they saw happening. Their books deal with both theory and practice, from a wholistic perspective, and they try to address major issues confronting humans and society. They published feminist poetry by Ellen Bass and poems by the Korean dissident Kim Chi Ha.

The Book of Tofu has been Autumn Press' biggest success, with 90,000 copies in print after two years. Nahum believes that introducing tofu to the United States "is going to prove truly revolutionary. I think we see that revolution going on around us." Both are working to change the world. Four photos show Nahum Stiskin; one shows Beverly. Address: 1. Editor; 2. Contributing editor.

6846. Okamura, T.; Steinberg, M.P.; Tojo, M.; Nelson, A.I. 1978. Water binding of soy flours as measured by wide line NMR. *J. of Food Science* 43(2):553-55, 559. March/April. [12 ref]
Address: 1&3. Lab. of Food Technology, Obihiro Univ., Obihiro, Hokkaido, Japan; 2&4. Dep. of Food Science, Univ. of Illinois, Urbana, IL.

6847. Shurtleff, William; Aoyagi, Akiko. 1978. Morinaga silken tofu: Package and pamphlet design for the American market. New-Age Foods Study Center, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. 9 p. Unpublished manuscript.
• ***Summary:*** In Feb. 1978 Mr. Tadaharu Nishide of Morinaga Milk Industry Co., Ltd. asked Shurtleff and Aoyagi to redesign the Morinaga tofu package, and develop new text and a recipe for the package, plus a new recipe booklet. It was suggested that the product be named "Ever-Fresh Silken Tofu." The recipe was for "Creamy Tofu Dressing." The package colors were blue, yellow, and brown on white. Address: Tokyo, Japan. Phone: 03-925-4974.

6848. Shurtleff, William. 1978. Re: Proposal for establishing a Soycrafters Union or Cooperative in North America. Letter to all "Soycrafters in North America," April. 2 p. Typed, with signature on letterhead.
• ***Summary:*** This open letter, written on NAFSC letterhead and dated April 1978, was submitted to *Soycraft* newsletter, where it was published in June 1978 (which see). It led to the first national meeting of soycrafters in Ann Arbor, Michigan, on 28-30 July 1978 and the founding of the Soycrafters Association of North America at that meeting.

The letter begins: "Dear Soycrafters of North America: There has recently been growing interest in North America in

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starting a Soycrafters Union or Cooperative, perhaps along the lines of Japanese National Tofu, Miso, Shoyu, Natto, etc. Unions [Associations]. Such a development would seem to represent a great leap forward, of benefit to many in the expansion of consciousness and production of quality soyfoods in the Western world."

Note 1. This is the earliest document seen (Jan. 2003) in connection with the Soycrafters Association of North America (SANA).

Note 2. This is the 2nd earliest document seen (Sept. 2011) that contains the word "soyfoods." Address: Director, New-Age Foods Study Center, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: (03) 925-4974.

6849. Wells, Patricia. 1978. What is this thing called tofu? *New York Times.* May 3. p. 19-20. Reprinted in the Boston Herald-American. June 15.
• ***Summary:*** "In the early 1970s the Hashizume Bean Cake Corporation came to life as a minor cottage industry tucked away in the basement of a giant red brick factory in Long Island City. Each day it churned out a few hundred pressed soybean cakes, or tofu, and supplied the handful of Japanese restaurants and Oriental specialty stores in business at the time in the New York area.

"Today, thanks to what one company representative called 'the American-natural-organic-people'... seven trucks loaded with tofu leave the steamy Hashizume factory each day."

"A combination of events awakened the West to the wonders of tofu. One was the 1975 publication of *The Book of Tofu,* an Autumn Press cookbook and resource manual that caught on quickly with natural food followers. The other is tofu's nutritional attributes.

"While traditionally Oriental tofu companies as Hashizume and Tanaka & Company, which is on Manhattan's West Side (326 Amsterdam Ave. at 75th St.), have profited from the Westernization of tofu, young, counterculture entrepreneurs throughout the country have taken advantage of the growing demand." These include the "Laughing Grasshopper New England Soy Dairy" (which now makes 5 tons of tofu a week, that's 20,000 cakes). "Other successful American-run tofu factories have mushroomed in Bethlehem, Massachusetts [actually New Hampshire; Crystal Springs], Summertown, Tennessee, and Island Springs, Washington" [sic, Island Spring, Inc., Vashon, Washington]. A description of the process for making tofu at Hashizume is given.

Page 20 is titled "The West wakes up to the wonders of tofu." "Following are recipes using tofu in both Oriental and Westernized versions. The Oriental recipes are included in *The Book of Tofu.* The others were developed by the people at Laughing Grasshopper and the Crystal Hills Tofu Shop in Bethlehem, N.H.: Tofu clam dip, Maple walnut bars, Tofu manicotti, Chilled tofu, Shoyu dipping sauce, Raspberry pudding, and Miso soup with tofu and onions."

6850. Freiman, Jane Salzfass. 1978. Sushi: A 'fast-food' fish dish from Japan. *Chicago Tribune.* May 12. p. B1.
• ***Summary:*** Begins with a description of sushi and the different types (such as nigiri sushi and maki sushi), then continues with a review of six sushi restaurants in or near Chicago. "Like other arts practiced in Japan, the preparation of sushi is an effortless performance requiring great skill." Sushi has been prepared in Japan since the mid-1700s. Each bite of sushi (a finger food) is dipped in a tiny sauce of shoyu or soy sauce just before it is eaten.

At Hamehachi the writer enjoyed "two delicious, sweet, stuffed deep-fried bean cakes called *inari sushi.* A complete order of six *inari sushi* is $3." Two photos show a *sushi-ya* (sushi chef, sushi-master) at work in his sushi bar or restaurant.

6851. West, Kenneth J. 1978. Re: Visit from soy sauce manufacturers in Japan. Letter to Dr. Walter Wolf, U.S.D.A., 1815 University Ave., Peoria, Illinois 61604, May 23. 1 p. Typed, with signature on letterhead.
• ***Summary:*** Mr. Michiro Kotegawa and his son Daisure are planning to visit Dr. Wolf on the morning of June 22. Mr. Kotegawa is vice-president of a large soy sauce manufacturing plant in Japan. Address: Pacific Grain Co., 201 West North St., Farmer City, Illinois 61842. Phone: 928-2185. Cable: "Pacgrain".

6852. **Product Name:** [Mamy {Soymilk} (Orange, or Pineapple)].
Manufacturer's Name: Agro-Nippo Produtos Alimenticios Ltda.
Manufacturer's Address: Av. José Alves de Mira 185, Piribuba, Sao Paulo, Brazil.
Date of Introduction: 1978 May.
Wt/Vol., Packaging, Price: 200 ml plastic bags, ready to drink.
New Product–Documentation: Letter from Jane Cadwell Pautz. 1982. May 29.

Letter (e-mail) from Jaime Nakamura of Brazil. 2012. Oct. 9. "I am attaching a form from Public Division of Food (Sao Paulo State's Health Secretary), dated 3 May 1978, when samples of Mamy were collected in order to develop product tests. Mamy was the first soymilk produced in Brazil and, we believe, the first in the world to combine soymilk + fruit juice. Mamy was launched before 1978 initially in its pure format as usual soymilk produced in Japanese market (without any mix).

When Mamy was launched, it was impossible to be registered, since there were not laws to embrace that 'different milk.' The Brazilian President showed some kind of rejection regarding the taste of this new product–bad words in media. After all the investments, the Agro-Nippo

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team decided to find a solution to face these difficulties. After some tries, they decided to mix the juice of local fruits to minimize the strong taste of soymilk. And it worked! This is just a summary regarding the history of this company / brands.

The docs I'm sending to you are in Portuguese–anyway, I have the originals in my hand. There're more similar documents.

I hope to keep in touch with you in order to collaborate to enrich this kind of data and information.

6853. Japan Food Research Laboratories. 1978. Analysis of natural nigari. Tokyo, Japan. 1 p. [Eng]
• ***Summary:*** This is a report (analysis certificate no. 11040896) of natural nigari submitted by the Natural Salt Spread Association of Japan. The sample was received on 26 April 1978 and the assay conducted on 15 May 1978 at Laboratory No. 1.

Arsenic: not detected (below 0.1 ppm [parts per million]). Lead: 1.50 ppm. Zinc: 0.10 ppm. Total mercury: not detected (below 0.1 ppm). Iron: 11.3 mg%. Signed: H. Suda, inspector.

Note: See also the analysis of nigari conducted in Oct. 1977 by Curtis & Tompkins in San Francisco, California, for Westbrae Natural Foods. They analyzed only the lead content and found 1.75 ppm–16% more than was found by this Japanese laboratory. Address: Tokyo Head Office: 52-1 Motoyoyogi-cho, Shibuya-ku, Tokyo.

6854. Mori, H. 1978. Shôwa 52 nendo ni okeru shôyu, miso no kenkyû gyôseki [Review of annual achievements in shoyu and miso research]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 73(5):351-69. May. [532 ref. Jap]
• ***Summary:*** This important Japanese-language article, published each year in the May issue of this periodical, has two parts: (1) A review of the past year's major discoveries and developments in the fields of miso and soy sauce in Japan. (2) A bibliography related to those discoveries and developments. Address: Noda Sangyo Kagaku Kenkyusho.

6855. Nihei, Takao. 1978. Hawai ni okeru Nihon-shu, miso, shôyu no rekishi [A history of Japanese sake, miso, and shoyu in Hawaii]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 73(5):346-50. May. [Jap]
• ***Summary:*** In 1868, the first year of the Meiji Period, the first 153 Japanese immigrants arrived in Hawaii on board the three-masted sailing ship Scioto (Saioto-go). They brought with them miso and shoyu. This article otherwise contains no mention of soyfoods.

Note: This document contains the earliest date seen for soybean products in Hawaii (1868); soybeans as such had not yet been reported by that date. Address: Honolulu Shuzo Seihyo Gaisha.

6856. Okamoto, Susumu. 1978. Factors affecting protein film formation. *Cereal Foods World* 23(5):256-62. May. [10 ref]
• ***Summary:*** A very interesting and original technical paper about yuba which contains 55% protein and 25% lipids. For example: Electron microscope observations show that yuba consists of minute oil droplets, less than 5 microns in diameter, distributed irregularly throughout a protein membrane (Fig. 1). Address: Showa Women's Univ., Taishido, Setagaya-ku, Tokyo.

6857. *Daizu Nippo.* 1978. Beikoku de tôfu e no kanshin. NY Times mo kiji [Increased interest in tofu in the U.S. Even an article in The New York Times]. June 8. p. 4. [Jap]

6858. Shurtleff, William. 1978. Report with color slides on trip to Suzuki Jozo, Daifuku-ji, and Yamaya in central Japan to study method for making savory soy nuggets (*Hamanatto*). Nerima-ku, Tokyo, Japan: New-Age Foods Study Center. 1 p. Unpublished manuscript. June 8.

• ***Summary:*** We have coined the term "soy nuggets" to refer to a family of traditional fermented soyfoods that are known throughout East Asia. In China they are called shih, chi, touch'ih, or douchi. The two most popular varieties in Japan are Hamanatto (savory soy nuggets) and Daitokuji natto (Daitokuji soy nuggets). The Philippines and Malaysia have tausi or tao-si (soy nuggets).

Note: On 21 Nov. 2011 we decided, after 30 years of questioning, to change our name for this category of soyfoods to "fermented black soybeans" instead of "soy nuggets." We did this largely to conform more closely to current usage in English, where they are generally called "fermented black beans."

Soy nuggets are unrelated to regular sticky natto except both are fermented whole soybeans; soy nuggets are inoculated with a mold (*Aspergillus oryzae*) rather than a bacterium, are not sticky, are salted, and originated in China (rather than Japan) more than 2,200 years ago. Here we see savory soy nuggets and Daitokuji soy nuggets. Both look something like dark-brown to grayish raisins and have

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a savory, slightly salty flavor resembling that of mellow Hatcho miso.

Shurtleff took many color slides of the Hamanatto process on this one-day train trip to Yamaya. The slides / photos are now in a numbered set as follows: 10. Close-up of Hamanatto (savory soy nuggets) and Daitokuji natto on white plates. Sprinkled over rice or rice porridge, served as an hors d'oeuvre with green tea or sake, or used as an ingredient in miso soups or cooked vegetables, they add zest to otherwise bland dishes. Some Westerners sprinkle them over curry or spaghetti sauces, or fried eggs. 11. Six different Hamanatto packages from Japan. 12. A closer view of the six packages. 13. Four more packages of traditional Hamanatto products. 14. One large maker of Hamanatto is Suzuki Jozo. Located near Hamamatsu in Central Japan, they also make shoyu. Their process for Hamanatto goes as follows: Soak soybeans for two hours, steam cook, then leave in the cooker overnight.

15. The next morning remove beans from cooker, crumble to break up any lumps, spread on rice-straw mats, then inoculate by sprinkling on the starter, *Aspergillus oryzae* mold spores. 16. Transfer inoculated beans by conveyor into the koji incubation room. 17. The room is a large shallow stainless steel box perforated with many holes to allow for air circulation. Here the beans are left to ferment at 35ºC (95ºF) for 4 days. 18. On the fourth day, dry the soybean koji in the sun on mats on the rooftops for 5 hours. 19. Put the koji in 70-liter (18.5 gallon) wooden vats, put on a heavily weighted pressing lid, pour in a 10% salt solution to cover the koji, and allow to ferment at the ambient temperature for 2 to 4 months. 20. After fermentation is complete, drain off the liquid tamari, spread the soy nuggets on mats on the rooftop, and sun-dry for 5 hours to make the finished product.

21. Savory soy nuggets (Hamanatto) are said to have originated in Hamamatsu at this temple, Daifukuji, about 350 years ago, and they are still produced there today. The photo shows the front gate to the temple. 22. Here we see the incubation trays, fermentation vats, and pressing weights that are used. 23. Here is the steamer in which the soaked soybeans are steamed. 23A. After being mixed with one-tenth their weight of roasted wheat or barley flour plus a little koji starter, they are placed in shallow wooden trays and incubated at 35ºC for 4 days to make a unique type of soybean koji. 23B. After the 2-4 month salt fermentation, the product in a small wooden vat looks like this. 23C. The liquid tamari is drained of and the product is briefly sun-dried. 24. Then it is mixed with a small amount of slivered gingerroot pickled in moromi (shoyu mash) and salt-pickled sansho seeds (shown here) to make the finished product.

Note 1. This is the earliest English-language document seen (Nov. 2011) that uses the term "savory soy nuggets" to refer to Hamanatto. By 1987 Shurtleff preferred to call these "Hamanatto soy nuggets."

Note 2. This is the earliest English-language document seen (Nov. 2011) that contains the term "Daitokuji soy nuggets."

Note 3. This is the earliest English-language document seen (Nov. 2011) that uses the word "douchi" to refer to soy nuggets, or the word "Daifukuji" (a temple name) in connection with soy nuggets. Address: c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: (03) 925-4974.

6859. Sheraton, Mimi. 1978. Restaurants: Stuffed cabbage and sushi on East Side. *New York Times.* June 9. p. C14.
• ***Summary:*** This is a review of Hatsuhana, a Japanese sushi restaurant at 17 East 48th St., New York City. "Advised by a Japanese friend, we ordered natto, a pungent mix of fermented [soy] beans, tuna fish and scallions; nuta, a sensual blend of raw fluke [flounder, a type of flatfish] and scallions in a satiny yellow sauce made of soy bean paste [miso], lemon and sake." Also salmon teriyaki, and "wrappings of spinach-green seaweed." All sushi and sashimi, nuta and natto are recommended.

6860. Kotegawa, Michiro. 1978. Visit with Dr. Wolf at NRRL (Interview). Conducted by Dr. Walter Wolf of NRRL, Peoria, Illinois 61604, June 22. 2 p. transcript.
• ***Summary:*** Mr. Kotegawa and his son visited Pacific Grain Co. (Farmer City, Illinois) and were referred to Dr. Wolf by Jerry West. Mr. Michiro Kotegawa was accompanied by his son, Daisure, who is at Stanford University working on his MBA degree (he has completed the 1st year and has one more to go). Also accompanied by his wife and daughter-law (?).

Fundokin Soy Co. makes 10,000 tons of miso per year in Japan; 60% of this is barley miso and 40% is rice miso. Their barley is imported from Australia.

Fundokin is one of the top 10 soy sauce manufacturers in Japan. They produce 12,000 tons of soy sauce per year.

The soybeans used for miso (and by other companies for tofu) are M-1, Amsoy, Corsoy, Harosoy and Chinese soybeans; all these are white hilum soybeans. They also buy defatted soybean meal from a soy oil company in Japan; they prefer high-protein meal.

Mr. Kotegawa is interested in a source of 4-ethyl guaiacol [4 ethylguaiacol; 4-EG]. A diagram of the molecule is shown. Note: It is a phenolic compound with the molecular formula $C_9H_{12}O_2$. Dr. Wolf was unanble to find it listed in any of the chemical catalogs.

The business card of Michiro Kotegawa is attached; one side is in Japanese, the other is in English. Address: President, Fundokin Soy Co., Ltd., Usuki City, Oita, Japan.

6861. Nihei, Takao. 1978. Hawai ni okeru Nihon-shu, miso, shôyu no rekishi. Nihon-shu II. [A history of Japanese sake, miso, and shoyu in Hawaii; Sake. II]. *Nippon Jozo Kyokai*

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Zasshi (*J. of the Society of Brewing, Japan*) 73(6):446-52. June. [21* ref. Jap]
Address: Honolulu Shuzo Seihyo Gaisha.

6862. Saio, Kyoko; Watanabe, Tokuji. 1978. Differences in functional properties of 7S and 11S soybean proteins. *J. of Texture Studies* 9(1/2):135-57. June. [21 ref]
• ***Summary:*** 11S protein differs from 7S protein in that it makes much harder tofu gels which are more sensitive to the effect of phytic acid, and in which the S-S bonds appear to predominate. "The 11S protein precipitates faster and forms larger aggregates" [curds]. 11S gels have a higher water holding capacity and higher tensile values, and they expand more when heated.

Traditional soy protein foods in Japan include: Tofu: a protein gel coagulated from soybean milk. Kori-tofu: freeze-denatured, dried and porous tofu gel. Aburage: Tofu-gel expanded by deep-frying. Yuba: thin film formed on the surface of soybean milk. Kinako: flour of roasted soybeans. Miso: fermented salty paste of cooked soybean and rice mixtures. Soysauce: fermented salty liquid of cooked soybean and wheat. Address: 1. National Food Research Inst., Ministry of Agriculture & Forestry, Shiohama 1, Koto-ku, Tokyo, Japan; 2. Kyoritsu Women Univ., 2-2, Hitotsubashi Kanda Chiyoda-ku, Tokyo, Japan. Watanabe's present address: Kyoritsu Woman University, 2-2, Hitotsubashi Kanda, Chiyoda-ku, Tokyo.

6863. Shurtleff, Bill. 1978. News from New-Age Foods Study Center. *Soycraft* (*Lawrence, Kansas*) 1(3):3-5. June.
• ***Summary:*** This open letter begins: "Dear Soycrafters of North America: There has recently been growing interest in North America in starting a Soycrafters Union or Cooperative, perhaps along the lines of Japanese National Tofu, Miso, Shoyu, Natto, etc. Unions [Associations]. Such a development would seem to represent a great leap forward, of benefit to many in the expansion of consciousness and production of quality soyfoods in the Western world."

The author then summarizes five major functions of Japanese national trade associations related to soy products, and suggests how each of these be adapted to present American conditions and consciousness which are very different from those in Japan: Purchasing soybeans, maintaining a list of member shops, doing "soyfood publicity," publishing a newsletter, and establishing and running a nationwide center, information clearing house, and school for teaching production of low-technology "soyfoods" to people from both developed and developing countries.

"How might this basic model be adapted to the United States? First, since soyfoods are still quite new in the USA, we might want to form one united front cooperative or union for all soycrafters or producers of soyfoods, rather than trying to form individual unions for tofu & soymilk, miso, tempeh, shoyu, etc. Given such a joint union, it would seem that all of the functions performed by the Japanese unions would be of great potential value to producers in North America. The key point, however, is that for the Union to work it must be financially viable and sound. Thus it must be created and supported by individual members who understand clearly that its functions are in their best interest, both in the short and long run."

"Second, we must remember that the number of shops presently producing soyfoods here is still very small. We have the names of 95 tofu shops and/or soy dairies in the United States plus 6 more in Canada, 9 tempeh shops, 8 miso shops, and one shoyu factory (Kikkoman). Of these, about 41 of the tofu shops and soy dairies, 5 of the tempeh shops, and 2 of the miso shops are 'new-age' types, newly started by Caucasian Americans. This latter group would probably form the initial nucleus of the Soycrafters Union, however after the benefits of membership could be clearly demonstrated, the more conservative Japanese producers might be eventually interested in joining."

"At the proposed First North American Soycrafters Convention to be held in Ann Arbor [Michigan] July 28-30 the above suggestions might be discussed one by one..."

At the end of the article is a form which new or existing tofu or soymilk manufacturers in the U.S. are invited to fill out and return to Shurtleff so that he can list them in the next edition of *The Book of Tofu.* Its asks for the name, address, and phone number of the company, the person(s) in charge, the date tofu or soymilk production started, the approximate cost of getting started, the average quantity of soybeans used per week, the soyfoods produced (in order of importance), the main pieces of equipment purchased, and equipment the company plans to purchase in the near future.

Note the early use of the terms "soyfoods" and "soyfood" in this article. The term "soyfoods" was coined by Surata Soyfoods of Eugene, Oregon, in Dec. 1976.

Note 2. This is the earliest document seen (Feb. 2013) that contains the term "low technology" (or "low tech"). Shurtleff coined this term to refer to soyfoods that could be made, and had long been made, using simple, traditional technologies, appropriate to Third World countries or relatively poor areas. Address: Director, New-Age Foods Study Center, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: (03) 925-4974.

6864. Birnbaum, Alfred. 1978. Re: Natto, the word *kara* and the history of early Japanese-Korean relations, and sea vegetables. Letter to William Shurtleff at New-Age Foods Study Center, Lafayette, California, July 12. 1 p. Handwritten (in pencil) and signed.
• ***Summary:*** Alfred will try to finish translating the chapter on Nattô from *Daizu Shokuhin* before he leaves Japan for southern California on about Aug. 10; he has found certain scientific terms hard to translate.

He has been reading a somewhat controversial Japanese-

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language publication titled *Nihon no naka no Kankoku bunka* (*Korean culture inside Japan*). It states that the Japanese word *kara* (as in *kara-natto*), meaning simply "from the continent" was first applied to Korea, from Korea's Sam-Han & Three Kingdoms periods and Japan's Kofun (A.D. 250-552), Asuka (552-645), and Nara (646-794) periods–before Japan had any relations with China. The first usage was the Chinese character (1 Cc = 1 Chinese character given) which, although it appears to refer to Han dynasty China, was adapted by the early Korean Japanese "Kara" clan (which Alfred believes later became the *Higashi-no-Aya* clan). The next usage was (1 Cc, pronounced "kara"), as in Sam-Nan clans of Korea and the Karakuni Jinja (4 Cc) in Nara (still extant). Then the character changed to (1 Cc), still meaning "Korea" (not salty), and finally (1 Cc)–all pronounced *kara*.

Note: This is the earliest English-language document seen (Nov. 2011) that contains the term "kara-natto."

Alfred was introduced to these studies in early Japanese-Korean relations and the falsifications in the *Kojiki* etc. by a Korean linguist in Los Angeles. It became obvious how twisted the stories on the Japanese side became and how anxious the ancient ruling class Japanese (who were largely Korean) was to prove it was separate and unrelated to Korea.

Concerning Hama-natto [from Yamaya]: It is a special product of Hamamatsu, used as an accompaniment to rice, tea, or fried egg yolks. Two sources give two processes.

He still hopes to find time for a trip to Kyoto, and he is still interested in working together on a book about sea vegetables. During Aug. he will stay with his parents in Rancho Palos Verdes, California. From Sept. he will be visiting a friend in Columbia, Maryland. Address: Tama-sô No. 1, Inokashira 1-28-30, Mitaka-shi, Tokyo 181, Japan. Phone: 0422-47-7130.

6865. Birnbaum, Alfred. 1978. Re: Hama-natto [or Hamanatto]. Letter to William Shurtleff at New-Age Foods Study Center, Lafayette, California, July 12. 1 p. Handwritten and signed.

• ***Summary:*** Concerning Hama-natto [from Yamaya / Yama-ya]: It is a special product of Hamamatsu, used as an accompaniment to rice, tea, or fried egg yolks. Two sources give two processes.

Process No. 1: Mix 2 liters of large steamed soybeans with 1 liter of roasted barley- or wheat flour. Add koji and incubate in a koji incubation room (30-35ºC) for 3-4 days. Then dry the product in the sun until its moisture content has dropped to 20-25%. Prepare a salt solution by mixing 0.5 liters salt with 2 liters water. Mix this salt solution with the dried molded soybeans in a vat, and place a pressing lid on top, weighted with a stone. Allow to ferment for several months. Remove and sun-dry, or add shoyu and sliced ginger. Note: The source of these instructions is given in Japanese: *Daizu–Sono tokuksei to tabekata* [Soybean: Their special features and ways of using them as food], by Masaaki. Kobayashi

Process No. 2: This is less precise. Cook large soybeans in salty *tsuyu*, composed largely of water seasoned with shoyu. Add koji and roasted barley- or wheat flour. Ferment for several months. Then add [finely slivered or diced] gingerroot (Ryûzô Nakano).

The package: Yamaya-ya Hamanatto, Main office: Shizuoka prefecture, Hamamatsu city, Naruko-machi, 8 banchi. Factory: Shizuoka prefecture, Hamakita city, Komatsu, 4880 banchi.

The nutritional composition of the Yamaya product is given: Protein 25.41%. Fat 10.44%. Non-nitrogenous substances [carbohydrates; *muchitsu-butsu*] 12.62%. Fiber 2.95%. Ash 14.51%. Moisture 34.07%. Per 100 gm: Vitamin B-1 0.21 mg. Vitamin B-2 0.53 mg. Calories 246. Address: Tama-sô No. 1, Inokashira 1-28-30, Mitaka-shi, Tokyo 181, Japan. Phone: 0422-47-7130.

6866. Elias, Stanley. 1978. In Japan, puffing goes continuous. *Food Engineering* 50(7):58-59. July.

• ***Summary:*** For the past several years, Kikkoman Shoyu Co., Ltd. has been using a continuous explosion puffing system, based on superheated steam, for treating granulated soybeans prior to further processing. Developed in-house, this system has also been tested on wheat and polished rice. The residence time is as short as 5 seconds, the pressure up to 15 psi (15 kg per square cm), and the capacity up to 4 tons/hour. After Japanese and U.S. patents are secured, Kikkoman plans to license the manufacturing rights to Kurimoto Iron Works. A schematic diagram shows the process. Photos show: (1) The control panel. (2) The puffing chamber and discharge hopper. (3) The rotary transfer valve, a key component. Address: Technical Editor.

6867. Hashizume, K.; Ka, Ginran. 1978. Karushiumu-en to gurukono deruta rakuton de gyôko saseta tôfu no sai ni tsuite [Difference between types of tofu coagulated with glucono-delta-lactone and calcium salts]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 25(7):383-86. [11 ref. Jap]
Address: National Food Research Inst., Ministry of Agriculture & Forestry, Shiohama-1, Koto-ku, Tokyo, Japan.

6868. Hashizume, Kazumoto; Maeda, Masamichi; Watanabe, Tokuji. 1978. [Relationship of heating and cooling conditions to hardness of tofu]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 25(7):387-91. [11 ref. Jap; eng]*
Address: National Food Research Inst., Ministry of Agriculture & Forestry, Shiohama-1, Koto-ku, Tokyo, Japan.

6869. Nicholas, C.J. 1978. Analysis of selected shipments of U.S. and other soybeans received in Japan, 1972-76. *Agricultural Research Service* ARS-NE-92. 26 p.

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• ***Summary:*** Contents: Summary. Introduction. Method of study. Foreign material. Oil and protein content. Poisonous seeds and insect infestation. Weight analyses. Comparison of soybeans from Brazil and China. Conclusion.

"Most Japanese receivers expressed some dissatisfaction with the quantity of foreign material in the shipments they received; however, they were primarily concerned with the oil content and protein (nitrogen) content of the soybeans, weight shortages, and insect infestations.

"The Japanese importers mostly commented on the low oil content of the U.S. soybeans in comparison with that of the Brazilian soybeans. They wanted soybeans containing over 19 percent of oil. In most cases the oil content of U.S. soybean shipments sampled in 1973-76 was under 19 percent, whereas, in the Brazilian soybean shipments, it averaged over 20 percent."

"The presence of poisonous seeds, such as morningglory and crotalaria, among soybeans requires that additional steps be taken by oil processors to remove the seed residues. Most U.S. shipments contained poisonous seeds in greater quantity than the legal Japanese limit." Address: USDA, Beltville, Maryland.

6870. Nihei, Takao. 1978. Hawai ni okeru Nihon-shu, miso, shôyu no rekishi. Miso, shôyu. Fu: Nenpyô oyobi raberu nado [A history of Japanese sake, miso, and shoyu in Hawaii: Miso and shoyu. With a chronology, copies of sake and shoyu labels, and a directory]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 73(7):542-49. July. [14 ref. Jap]

• ***Summary:*** By far the best history of miso and shoyu in Hawaii, this work is a treasure. Address: Honolulu Shuzo Seihyo Gaisha.

6871. People attending the foundation meeting of the Soycrafters Association of North America, July 28-30, 1978, Ann Arbor, Michigan. 1978. Ann Arbor, Michigan. 3 p. Unpublished typescript.

• ***Summary:*** This is a typed list of the names, addresses, and (in some cases) phone numbers of the 69 people who attended this landmark meeting. 1. Doug Morris, Tucson Tofu, 1716 E. Factory Ave., Tucson, Arizona 85716, 602-624-7741. 2-4. Susan Kalen, Jerry MacKinnon & Steve Fiering, The Soy Plant, 211 E. Ann St., Ann Arbor, Michigan. Phone: 313-663-0500. 5-6. Carol Ann & Timothy Huang, Yellow Bean Trading Company, 4414 Buckingham, Detroit, Michigan 48224.

7. Dick Moore, Miller/Moore Apiaries, P.O. Box 171, Martindale, Texas 78655. 8-9. Pat & Jay Gibbons, Crystal Hills Tofu Shop, 1 Jefferson St. Box 752, Bethlehem, New Hampshire 03574. Phone: 603-869-2677. 10. Robin Mallor, 848 Tappan St. #20, Ann Arbor, Michigan 48104. 11. Randall Yamauchui, Hinode Tofu, 526 S. Stanford Ave., Los Angeles, California 90504.

12. Elizabeth Martin, Claymont Society [Happy Dragon Tofu], Box 112, Charleston, West Virginia 25414. Phone: 304-725-4437. 13-14. Pam Sharp & Greg Murphy, 52 Prospect Ave., Sea Cliff, New York 11579. 15-16. Herschel & Carmen Cook, 8521 Lotus, Skokie, Illinois 60077.

17. Yoshiharu Uchida, 6825 N. Sheridan Rd., Chicago, Illinois. 18. Rebecca Miller, 7467 N. Marshfield, Chicago, Illinois. 19. Wataru Takai, Takai Seisakusho, 5-65 Yokogawa, Kanazawa, 921 Japan. 20. Zeev Steven Berg, 570 Montgomery Street, Brooklyn, New York 11225.

21-23. Barbara Stutz & Rob Davis & Kay Thorbeck, (In the process of naming our shop), 8745 S. Rockport Road, Bloomington, Indiana 47401. 24. Steven Heller, 160 East 88th St., New York, New York 10028. 25. Ken Lee, Toy Enterprise, 658 N. Broadway, Los Angeles, California 90012. 26. Mary Lee Purrington, 225 Rose Ave., Salem, Ohio 44460.

27. Bob Barbarite, Hashizume Foods, 5th Floor Front 33 Union Square West, New York, New York 10003. 28. Rodney Yamauchi, Aala Tofu, 513 Kaaahi St., Honolulu, Hawaii 96813. 29. Bill Shurtleff, P.O. Box 234, Lafayette, California 94549. 30-31. Tim Waters & Terrie Rogers, Celebration Tofu, Bellingham Tofu Works, 2112 J. St., Bellingham, Washington 98225, 206-676-1989.

32. Steve Demos, White Wave Tofu, 1738 Pearl, Boulder, Colorado 80302. 33. John Stielstra, Morning Glory Alley. Inc., 1214 Regent St., Madison, Wisconsin 53715. 34. John Shiflett, Pippins Inc., 8405 Holly St., Laurel, Maryland 20810. 35-36. Andy Schecter & Greg Weaver, The Tofu Shop, 277 N. Goodman St., Rochester, New York 14607.

37-39. JoAnn Yoshimoto & Verena Krieger & Brian Schaefer, It's Natural, 502 Main St., Evanston, Illinois 60202. 40. Kathryn Bennett-Clarke, Southwest Tofu, Rt. 2 Box 234, Santa Fe, New Mexico 87501. 41. Amy Pincus, Magic Bean Co-op., 3227 N. Humboldt Ave., Milwaukee, Wisconsin 53212.

42. Chico Wagner, Mantis Organics, 9409 Cameron Rd., Austin, Texas 78753. 43-45. Denise Alexander & Les Karplus & Dave Parker, Vegetarian Inc., 132 S. Market, Champaign, Illinois 61820, 217-359-8843. 46. Jim Wilks, Swan Food Corp., 5758½ Bird Rd., Miami, Florida 33155, 305-667-7141. 47-48. Don Nicolson & Sue White, New Day Tofu Products Inc., 5912 Liberty Rd., Baltimore, Maryland 21207, 301-944-4673 & 301-655-0854.

49-50. Jamie Stunkard & Pat Aylward, Joy of Soy, 1307 2nd Ave., Minneapolis, Minnesota 55405, 612-374-3184, 612-379-2390. 51. John Seed, Bodhi Farm, The Channon, N.S.W. 2480, Australia. 52-53. Lora Mermin & Chris Burant & Deborah Backman, Madison Tofu Co-op, 903 Williamson St. Madison, Wisconsin 53703, 608-251-0595. 54. Steve Heidenry, Magic Bean Co-op, 3046 N. Cambridge St., Milwaukee, Wisconsin 53211.

55. Ed Brown, Magic Bean, 2463 N. Booth St., Milwaukee, Wisconsin 53212. 56. Benjamin Hills, Surata

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Soyfoods, 518 Olive Street, Eugene, Oregon 97401, 503-485-6990. 57. Larry Needleman, Bean Machines, Inc., P.O. Box 76, Bodega, California 94922, 707-876-3341.

58-59. Carol & John Hargadine, Nupro Foods/Soywaze Tofu, 1227 City Park Ave., Fort Collins, Colorado 80521. 60. Jack Mizono, Azumaya Inc., 95 Boutwell St., San Francisco, California 94124. 61. Dan Burke, Pacific Soybean & Grain Ltd., 495 De Haro St., San Francisco, California 94107. 62. George Hanley, 4425 Charles St., Dearborn, Michigan 48126, 581-7343. 63. Dan Tucker, 854 Hawkeye Park, Iowa City, Iowa 52240, 319-354-1250.

64. Paul Beeson, 207 N. Acacia St., Solona Beach, California 92075, 714-481-6914. 65. Keith Almeida, 26 W. Main St., Clinton, Connecticut. 66. Jean Huffman, P.O. Box 444, Lecanto, Florida 32661.

67-68. Keith Hintz & Dave Koressel, Magic Bean Co-op, 2234-A N. Booth, Milwaukee, Wisconsin 53212, 414-374-2873. 69. Tom Timmins, New England Soy Dairy Inc., 305 Wells Street, Greenfield, Massachusetts 01301.

6872. Photographs of people making tofu at New England Soy Dairy in Greenfield, Massachusetts, 31 July 1978. 1978. Greenfield, Massachusetts.

• ***Summary:*** These five black-and-white photographs (each 3½ by 5 inches) were taken on 31 July 1978 by William Shurtleff, when he and Wataru Takai visited the Soy Dairy shortly after the Soycrafters conference in Ann Arbor, Michigan. The photos and their negatives are now located in the Soyfoods Center archives. They show: (1) Grinder, pressure cooker and hydraulic press in operation. (2) Richard Leviton stirring nigari into hot soymilk in a curding barrel. (3) Richard Leviton ladling curds into a forming tray on a pressing table. (4) Shohaku Okumura, a Japanese Buddhist monk, cutting the finished tofu with a special stainless steel knife; a circular cooling tank, filled with water, is in the background. (5) Ditto, with Wataru Takai in the background.

6873. Photographs taken at the foundation meeting of the Soycrafters Association of North America in Ann Arbor, Michigan. 1978. Ann Arbor, Michigan.

• ***Summary:*** These photos were taken (by an unknown photographer from The Soy Plant) during the First Annual Soycrafters Conference (July 1978), hosted by The Soy Plant in Ann Arbor. Six of the photos are black-and-white, 5 by 7 inches, two each taken during an afternoon meeting in an herb shop, during lunch, and during a demonstration of making tofu by members of The Soy Plant. People clearly visible include Les Karplus, Kathryn Bennett-Clarke, Ken Lee, Andy Schecter, Pat Aylward, William Shurtleff, Larry Needleman, Jean Huffman (Lecanto, Florida), Jerry MacKinnon (cutting a large block of tofu into cakes), and Steve Fiering (pouring soaked soybeans into the hopper of a grinder).

Seven of the photos are color, 3½ by 5 inches, one each taken during the first evening meeting and during an afternoon meeting, and five taken during a demonstration of making tofu and other soyfoods by members of The Soy Plant. Clearly visible are Steve Fiering, Jerry MacKinnon, William Shurtleff, Andy Schecter, Dan Ecclestone, and Yasuo ("Yoshi") Yoshihara.

Two large (8½ by 11 inches) photos show Mike Kelly, dressed in a white T-shirt and apron: (1) Holding a ladle as soymilk runs into the filter cloth over a curding vat; (2) Ladling curds into a cloth-lined forming box.

There are also thirty tiny (1 by 1½ inches) black-and-white photos in the form of proof sheets. Clearly visible are Steve Fiering and Jerry MacKinnon (The Soy Plant), Jack Mizono (Azumaya), Steve Demos (White Wave), Christopher Hills (Surata Soyfoods), Jamie Stunkard and Pat Aylward (Joy of Soy), and Brian Schaefer (Evanston, Illinois).

Talk with Steve Fiering, a founder of The Soy Plant in Ann Arbor. 2000. Dec. 3. Chris Coon of The Soy Plant might have taken the above photos. The Fourth Avenue Food Co-op was around the corner from The Soy Plant's location at 211 East Ann St. They had a small herb section in their building. When The Soy Plant took over 211 East Ann St. they had one room of extra space facing the street. The food co-op moved their herb section into that room and expanded it to fill the room. They shared a portion of the rent on the space with The Soy Plant. The herbs were sold in gallon glass jars displayed on floor-to-ceiling wooden shelves.

6874. Shurtleff, William. 1978. Report on trip to first meeting of Soycrafters Association of North America (Ann Arbor, Michigan, July 28-30), and subsequent trip around USA with Mr. Wataru Takai visiting tofu companies (July 30 to Aug. 9). P.O. Box 234, Lafayette, CA 94549. 2 p. Aug. Unpublished manuscript.

• ***Summary:*** July 16-23–Mr. Takai (Director of the Overseas Department for Takai Tofu & Soymilk Equipment Co. in Ishikawa-ken, Japan) flies into San Francisco, California, from Japan. He stays in San Francisco, and is present at the installation of a Takai tofu system at Tokyo Foods (Tokyo Food Co.; Mr. Horinouchi) in San Mateo, south of San Francisco. Shurtleff drives Mr. Takai to visit various tofu makers in the San Francisco Bay Area: Traditional Tofu in Oakland (meet with Ray Nagai and Gary Sato, who are having lots of problems), Azumaya in San Francisco (Bill Mizono), Quong Hop in South San Francisco (Stanley Lee), and Wo Chong in South San Francisco (Walter Louie).

July 24–Shurtleff and Aoyagi drive Mr. Takai to Lake Tahoe, where they all stay for two days and one night at the Shurtleff family cabin near Meeks Bay. July 26–The first Takai catalog of small and medium scale tofu equipment (printed with dark brown ink on glossy white paper) arrives in the USA.

July 27–Takai and Shurtleff fly together from San

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Francisco to Ann Arbor, Michigan, on an afternoon flight.

July 28-30–Meeting in Ann Arbor of about 70 soycrafters (mostly tofu makers) from around the United States. The conference opens on the evening of Friday, July 28. The first meeting is held upstairs in a large room at the University of Michigan student union–slide shows and discussions. Attendees stay in the university dormitory–which is largely empty since it was summer. On Saturday there are meetings and practical workshops throughout the day at The Soy Plant, 211 E. Ann St., several blocks from the university. Mr. Takai notes: "New tofu makers are young vegetarian. Almost all Caucasian with long hair and beards. They eat tofu instead of meat." On Sunday, July 30, the Soycrafters Association of North America is founded. Steve Fiering, Jerry MacKinnon, Sue Kalen, and co-workers at The Soy Plant (211 East Ann St.), in Ann Arbor, Michigan, organized and hosted the meeting–which was a great success. We elected an executive director (Larry Needleman of Bean Machines, California) and a Steering Committee [board of directors] of six: Tom Timmins, New England Soy Dairy, Massachusetts. Lester Karplus, Vegetarian, Inc., Illinois. Steve Fiering, The Soy Plant, Michigan. Steve Demos, White Wave Tofu, Colorado. Kathryn Bennett-Clarke, Southwest Tofu, New Mexico. Bill Shurtleff, New-age Foods Study Center, California.

After the meeting, Shurtleff and Takai travel around the United States, by airplane and rented cars, visiting existing tofu companies.

July 31, Monday–Fly from Ann Arbor to Boston, Massachusetts. From Boston we drive (using a rented car) to the New England Soy Dairy (Tom Timmins and Richard Leviton) and Nasoya (John Paino and Bob Bergwall); both are quite new companies. Mr. Takai notes: "New England was very woody and beautiful. First saw soy mayonnaise at the New England Soy Dairy; it was served in a dip at dinner. Nasoya extracted soymilk with a big hydraulic press." Mr. Takai noted that Japanese eat tofu itself, whereas Americans generally use it as an ingredient in recipes.

Aug. 1–Spend the afternoon in Boston's Chinatown visiting two or three old and well-established tofu makers. While walking through a fancy building in the area, Shurtleff first sees someone (a secretary) using a word processor.

Aug. 2, Wed.–Fly from Boston to New York City. Visit Hashizume (Mr. Yokoyama) and Tanaka-ya (Mr. Murakami), both well established tofu makers run by Japanese Americans. We then take the run-down, graffiti-scrawled subway to visit Tokyo Food Processing Corp. (c/o Japan Food Corp.) at 40 Varick Ave., Brooklyn (Terry Terahira and Mr. Shimazaki); this is also an established Japanese-American company that makes tofu and other Asian foods in a bombed out-looking, scary part of the city. Mr. Shimazaki notes that tofu is starting to become popular in America, and their tofu is selling well. One afternoon Shurtleff is invited to be on the Gary Null Show (radio) to talk about tofu. While in New York City, Shurtleff stays with Larry Needleman at the home of his parents (Hy & Sylvia, in New Hyde Park, just outside New York City), while Mr. Takai stays at a hotel in the city. One night Needleman and Shurtleff have dinner with Mr. Takai, as his guest, at the Rainbow Restaurant in Manhattan, near the top of some skyscraper. Mr. Takai had a black-and-white photo taken of the three seated at a dinner table; it appeared in the Japanese newspaper *Hokuriku Chunichi Shinbun* on 14 Sept. 1978, and Mr. Takai kept the original. Soyfoods Center also has a copy (8 by 10 inches, filed at Soyfoods Center). Our last morning in New York City (Saturday, Aug. 5), we three travel by subway to the southern tip of Manhattan and take a ride on the Staten Island Ferry.

Aug. 6, Sunday–Shurtleff and Takai fly to Miami, Florida, to visit Swan Foods, founded by Robert Brooks and Mary Pung; a new and extremely innovative company making tofu and soymilk (with organic soybeans), plus a line of soy yogurt, tofu cheesecakes, etc. and full-page nationwide ads. Mr. Takai recalls that Mr. Brooks wanted to start a chain of tofu businesses across the United States. Shurtleff conducts (and tapes) a long interview with Robert Brooks and Pung, and visits their home and tofu plant.

Aug. 8–Fly from Miami to Summertown, Tennessee, to visit The Farm Tofu Shop (Alan Praskin). Mr. Takai recalls visiting Light Foods in St. Louis, Missouri, to deal with problems in their FM50 roller extractor.

Aug. 10–Fly from Tennessee to Denver, Colorado, to visit Denver Tofu (Mr. & Mrs. Haruhisa Yamamoto; an old, well-established Japanese-American company, which now filters all water used to make tofu). Shurtleff travels to nearby Boulder, Colorado, to visit White Wave on Pearl Street (Steve Demos, very new and small tofu maker).

Aug. 11–Fly from Denver to Los Angeles. Visit Hinode-ya (Mr. Yamauchi; an old, well-established Japanese-American company, perhaps the largest in America).

Aug. 12–Fly from Los Angeles to San Francisco.

Note: Mr. Takai's notes of his itinerary, which he wrote for himself in Japanese before and after the trip, indicate that he arrived in San Francisco on Aug. 12. But Shurtleff's notes indicate that he arrived in San Francisco and Lafayette on Aug. 9 (Wednesday). Shurtleff has clear memories of visiting Denver Tofu and White Wave, but no memories of visiting Tennessee or Los Angeles on this trip. Mr. Takai does not recall visiting Lake Tahoe. Address: New-age Foods Study Center, Lafayette, California.

6875. *Soybean Digest.* 1978. Far East market expands. July/Aug. p. 8, 10-SID.

6876. Rubenstein, Judith. 1978. Tofu: New Age hotcakes. *Fresh Ink* (*Northampton, Massachusetts*) 1(18):1, 7. Sept. 21. [1 ref]

• ***Summary:*** About the New England Soy Dairy, which now

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employs 20 people (14 production workers) and produces, on average, 2,400 lb/day of tofu containing 8.6 to 10% protein. The company has five owners, who constitute its board of directors. "Three of their employees are Japanese monks who live in nearby Charlemont. Their presence adds to the already spiritual atmosphere of the plant." Bud Foster's Supermarket in Greenfield was the first regular grocery to carry the New England Soy Dairy's tofu, and now Food Mart carries tofu as a regular item in 23 stores and Stop and Shop is starting to sell it as a specialty item.

Photos by Lionel Delevingne show: The inside of the plant with Ira Leviton (age 31 and a vegetarian) cutting tofu. Leviton pouring curds into cloth-lined forming box. Ira and Kathy Leviton, and Tom Timmins, standing behind a round soaking tank filled with cakes of fresh tofu.

6877. Lachman, Gaella; Elwell, Christian. 1978. Making miso in America. *East West Journal.* Sept. p. 54-59.
• ***Summary:*** A colorful account of making 1,000 lb of miso in the spring of 1978 with Noboru Muramoto at Asunaro, on Mt. Veeder, at 4600 Cavedale Road, Glen Ellen, California 95442. Phone: (707) 996-5365. Christian writes in the introduction that several years ago, upon returning from India and recovering with a serious bout with jaundice, he came across Naboru [sic] Muramoto's book, *Healing Ourselves* (Avon Books, 1973), "one of the few reliable guides to preventive medicine now available." After this he began to use food as medicine for the first time. Within a year he was attending seminars by Michio in Boston, Massachusetts, and learning about macrobiotics. He later learned that Mr. Kushi and Mr. Muramoto had both been students of George Ohsawa. While in Boston, Christian met Gaella, his wife to be. They left Boston to visit California, and from January to April 1978 they studied at Asunaro Eastern Studies Institute (established in the fall of 1976) in Glen Ellen, California, with Mr. Muramoto. By mid-April, in addition to miso, they had also learned to make soy sauce, saké, tofu, seitan, mochi, bran pickles, sauerkraut, tekka [miso], and bread. Natto making is also taught. A large photo shows the two of them cooking soybeans for making miso.

Note: Talk with Christian Elwell. 1996. Sept. 7. While Christian and Gaella were at Asunaro, Thom Leonard visited for a few days. Thom and Christian met and talked, recognized that they had a lot in common, and stayed in touch afterward. Christian eventually purchased Thom's Ohio Miso Co. He was already making miso experimentally, and he had plans to go back to Ohio to make commercial miso.

6878. Hughes Markets. 1978. Final five weeks... (Ad). *Los Angeles Times.* Oct. 12. p. I27.
• ***Summary:*** The section titled "Foods of the Orient" includes:

Yamasa soy sauce, 1 gallon can $4.05.

Seaweed, Yamamotoyama momi nori 0.7 oz. $0.79. Soy bean paste, Yamajirushi shiro miso 32 oz. $1.55.

6879. Tanaka, Teruo; Sakaguchi, Kenji. 1978. Construction of a recombinant plasmid composed of *B. subtilis* leucine genes and a *B. subtilis* (natto) plasmid; its use as a cloning vehicle in *B. subtilis* 168. *Molecular & General Genetics* 165(3):269-76. Oct. 24. [Eng; ger]*
• ***Summary:*** *B. subtilis* stands for *Bacillus subtilis* the bacterium that causes the natto fermentation. Address: Mitsubishi Kasei Inst. of Life Sciences, 11 Minamiooya, Machida, Tokyo, Japan.

6880. Howes, Charles D. 1978. Re: Seventh-day Adventist soymilk plants. Letter to William Shurtleff at Soyfoods Center, Oct. 1 p. Typed. [1 ref]
• ***Summary:*** Lists the soymilk plants in Central & North America (4, in Mt. Vernon, Ohio; Sonora, Mexico; Montemorelos, Nueva Leon, Mexico; San Pedro Sula, Honduras), Asia (2, in Chiba-ken, Japan, and in Poona, India), and the Middle East (1, in Cairo, Egypt). Address: Loma Linda Foods, 13246 Wooster Rd., P.O. Box 388, Mount Vernon, Ohio 43050. Phone: (614) 397-7077.

6881. Jacobs, Leonard. 1978. Menage: Where can I get information about traditional Japanese foods–like miso, soy sauce, umeboshi, sea vegetables–that are sold at my natural food store? L. Paulsen, Chicago, Illinois. *East West Journal.* Oct. p. 12.
• ***Summary:*** Answer: One of the largest exporters of these foods, Muso Co., has recently printed a series of pamphlets describing how these products are made and the nutritional value of each. The pamphlets are available from: Stephen Earle, Muso Co., Ltd., Nishishinmachi 1-2-18, Wakae, Higashi-Osaka 578, Japan. Address: Publisher, East West Journal.

6882. Kameda, Yukio; Kanatomo, S.; Matsui, K.; Nakabayashi, T.; Ueno, K.; Nagai, S.; Ohki, K. 1978. Nattô-kin no kôshu yôsei. VI. Nattô-kin no sansei suru eeruriihi fuku suigan saibô yôkai kassei no kaiseki [Antitumor activity of *Bacillus natto.* VI. Analysis of cytolytic activity on Ehrlich ascites carcinoma cell in the culture medium of *Bacillus natto* KMD 1126]. *Yakugaku Zasshi* (*J. of the Pharmaceutical Society of Japan*) 98(10):1432-35. Oct. [13 ref. Jap; eng]
• ***Summary:*** By using the new sheet method, it was shown that the culture filtrate of *Bacillus natto* KMD 1126 had a cytolytic activity on Ehrlich ascites carcinoma cells.

"As a result of the analysis of the cytolytic activity, surfactin (I), protease (II), and an acidic substance (III) were separated from the culture filtrate. I, II, and III had no cytolytic but a mixture of I, II, and III showed cytolytic activity, the same as that of the culture filtrate." Address:

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School of Pharmacy, Hokuriku Univ., and Faculty of Pharmaceutical Sciences, Kanazawa Univ. [Japan].

6883. Paschal, E.H., II; Ellis, M.A. 1978. Variation in seed quality characteristics of tropically grown soybeans. *Crop Science* 18(5):837-40. Sept/Oct. [13 ref]
• ***Summary:*** "Twenty-four soybean collections were grown in two different seasons in Puerto Rico to determine the extent of variation in the incidence of seed infection by fungi and its effect on seed viability under tropical conditions." Seed quality is a major obstacle to the expansion of soybean production in the tropics, where there is high temperature and humidity. Yet soybeans have been cultivated for ages in Southeast Asia (as in Indonesia) where conditions are unfavorable to the production of high quality seed, so varieties that perform well under these conditions might exist. INTSOY as initiated research to improve seed quality in soybean varieties adapted to tropical conditions. This study found that many of the varieties that yielded seed with superior quality were, indeed, from Southeast Asia.

Table 1 shows the origin or parentage of 24 soybean accesses. Twenty of these have PI (Plant Introduction) numbers and four have names: Arisoy, Hardee, Improved Pelican, and Jupiter. The origin of those with PI numbers is: Australia, Brazil, Colombia, Guatemala, Hawaii, India, Indonesia, Japan, Philippines, Surinam, Tanzania, and Thailand. Address: Dep. of Agronomy, Univ. of Illinois, Urbana, IL, and Dep. of Crop Protection, Univ. of Puerto Rico, Mayaguez, PR 00708.

6884. Shurtleff, William. 1978. Protein source for the future. *PHP* (*Japan*). Oct. p. 8-18, 79-82. Illust. 18 cm.
• ***Summary:*** Contents: Introduction. Ten reasons why soybeans will be the protein source of the future: 1. Optimum land utilization. 2. Lowest cost source of protein in almost every country of the world. 3. High nutritional value. 4. Time tested for over 2,000 years. 5. Remarkably versatile. 6. Appropriate technology ("Traditional soyfoods can be produced in cottage industries"). 7. New dairylike products. 8. Soybeans are hardy and adaptive. 9. Free nitrogen fertilizer from nodules on soybean plants. 10. Great productivity potential.

Discusses new patterns of soy protein utilization, with specific reference and descriptions of tofu, soymilk, tempeh ("Indonesia's most popular soyfood"), miso, shoyu, whole dry soybeans, roasted soybeans, fresh green soybeans, soy flour, kinako, soy sprouts, and textured soy protein (TVP), yuba, and natto. Concludes with a discussion of new developments in the Western world.

Note: This is the earliest English-language document seen (Aug. 2013) that contains the word "dairylike" (written as one word) in connection with soyfoods. Address: New-Age Foods Study Center, P.O. Box 234 (951½ Mountain View Dr.), Lafayette, California 94549. Phone: 415-283-2991.

6885. Ishino, Michio. 1978. [Re: Ako Kasei and natural nigari in Japan]. Letter to William Shurtleff at New-Age Foods Study Center, Nov. 3. 1 p. Typed, without signature. [Jap; eng+]
• ***Summary:*** Describes the product, its import from China, and various regulations concerning it. Address: Ako Kasei Co. Ltd., 329 Sakoshi, Ako-shi, Hyogo-ken 678-01, Japan.

6886. Lindsay, Anne. 1978. Try Oriental options: Easy-to-prepare Japanese recipes. *Toronto Star* (*Ontario, Canada*). Nov. 15. p. C1-C2.
• ***Summary:*** Japanese recipes include: Gomoku gohan (Rice with vegetables; with "2 cakes aburaage {fried bean curd}, cut into matchstick size, julienne strips," and "¼ cup soy sauce"). Sukiyaki (with "2 pieces tofu {fresh bean curd} cut into one-inch pieces"). Sukiyaki sauce (with "½ cup soy sauce").

Note: A very good description of authentic sukiyaki and how to make it.

6887. Nicholson, Tom; Cumming, J.B., Jr.; Sylvester, M. 1978. Bosses with an accent. *Newsweek* 92:80. Nov. 27.
• ***Summary:*** An American working at the Kikkoman Shoyu soy-sauce factory in rural Wisconsin has made a happy discovery; most Japanese make excellent employers. The factory is owned by the Japanese, staffed at the top with talented Japanese managers, and permeated by a Japanese worldview and way of doing business–including loyalty to the company and a consensus style of management. Both American workers and Japanese employers have difficulty adjusting to the new arrangement, but both are trying and–generally–succeeding.

6888. Nomura, Abraham; Henderson, B.E.; Lee, J. 1978. Breast cancer and diet among the Japanese in Hawaii. *American J. of Clinical Nutrition* 31(11):2020-25. Nov. [16 ref]
• ***Summary:*** The authors studied the diets of 6,860 men to examine the relationship between soy consumption and breast cancer risk. Soy intake was measured twice: Once during the period 1965-1968 and again during 1971-1975. During the first period, no association was observed between soy intake and breast cancer. However for the second period an inverse association was found between intake of miso soup and risk of breast cancer; the more miso soup consumed, the lower the rate of breast cancer. And a trend was found toward an inverse association between intake of tofu and subsequent risk of breast cancer; the more tofu consumed, the lower the rate of breast cancer.

Note: This is the earliest document seen (May 2000) indicating that soy may prevent breast cancer in humans. Address: 1. Director, Japan-Hawaii Cancer Study; 2.

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Advisor, Japan-Hawaii Cancer Study; 3. Biostatistics consultant, Japan-Hawaii Cancer Study. All: Kuakini Medical Center, Honolulu, Hawaii 96817.

6889. Nunomura, N.; Sasaki, M.; Asao, Y.; Yokotsuka, T. 1978. Shoyu (soy sauce) volatile flavor components: Basic fraction. *Agricultural and Biological Chemistry* 42(11):2123-28. Nov. [23 ref]
Address: Central Research Labs, Kikkoman, Noda, Japan.

6890. *SoyaScan Notes.* 1978. Chronology of soybeans, soyfoods and natural foods in the United States 1978 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan. 25-27. International Soya Protein Food Conference held in Singapore, sponsored by the American Soybean Association. 400 people from 24 countries participated.

Jan. *Whole Foods* magazine starts publication in Berkeley, California, founded by Steven & Henrietta Haines, and Jim Schreiber. The first issue features an article titled "Making Money Making Tofu," about five tofu companies. Westbrae has a full-page color ad titled "Someday all of this will be as familiar as apple pie," showing five types of miso plus sea vegetables.

Feb. 17. Laughing Grasshopper tofu shop changes its name to New England Soy Dairy, Inc., the first company to use the term "soy dairy" in its name. Also in 1978 White Wave in Boulder, Colorado, publishes a charming poster announcing, "We've got an alternative. White Wave Soy Dairy." An illustration shows a man leading his cow, standing under a beanstalk, looking in wonder at the seeds, soybeans.

March. The Cow of China, America's third soy deli, run by White Wave, opens in Boulder, Colorado. It is later renamed Good Belly Deli.

April. Nasoya Foods Inc. starts making tofu and soymilk in Leominster, Massachusetts, inside a former dairy. Founded by John Paino and Robert Bergwall. May. 3. "What is this Thing Called Tofu" by Patricia Wells published in *The New York Times.*

May 22-25. Keystone Conference on Soy Protein and Human Nutrition held in Keystone, Colorado, organized by Ralston Purina. 105 registrants. The world's top researchers on the subject present 34 papers demonstrating a new scientific understanding of the quality of soy proteins for human nutrition. The influential 406-page proceedings, titled *Soy Protein & Human Nutrition,* are published in 1979, edited by Wilcke, Hopkins, and Waggle.

May. The Soy Deli opens at The Soy Plant in Ann Arbor, Michigan. America's fourth soy deli.

June. Brightsong Tofu, founded by Joel Brightbill and Bob Heartsong, starts making tofu in Redwood Valley, California. Sharon and Richard Rose bought the company in June, 1980 and in Nov. 1980 started The Real Food Tofu Cafe, a soy deli, adjacent to it.

June 26. First Takai catalog of tofu and soymilk equipment published, written by William Shurtleff. The first publication of its type in English, it helps start many new soyfoods companies.

July 28-31. First Soycrafters Conference held at The Soy Plant in Ann Arbor, Michigan. Conceived and organized by Steve Fiering. 75 people attend. The Soycrafters Association of North America (SANA) is founded, with Larry Needleman as the first president and a board of directors.

Sept. First issue of *Soyanews* published in Sri Lanka.

Oct. *The Farm Vegetarian Cookbook* (revised ed.) by Louise Hagler published by The Farm's Book Publishing Co. in Tennessee.

Oct. Morinaga Milk Co. in Japan starts to export their tofu in aseptic Tetra Brik cartons worldwide. They issue a color recipe booklet to accompany their tofu.

Oct. Kendall Food Co. starts to make America's earliest known commercial amazake in Brookline Village, Massachusetts. Amazake is made from koji, as are miso and shoyu. Not even in Hawaii was commercial amazake made before this.

Oct. 29-Nov. 3. World Conference on Vegetable Food Proteins held in Amsterdam, The Netherlands. More than 1,000 participants. Sponsored by the American Soybean Assoc. and others.

Nov. The Tofu Shop, America's fifth soy deli-restaurant, opened in Rochester, New York, by Greg Weaver. Large and very creative menu. Later called The Tofu Gardens, and The Lotus Cafe.

Dec. American Soybean Association moves its headquarters from rural Hudson, Iowa, to St. Louis, Missouri, into greatly enlarged, modern offices.

Dec. *The Book of Tofu* (extensively revised, Americanized edition), by Shurtleff and Aoyagi published by Ballantine Books in a mass-market paperback edition. By 1987 the two editions have sold over 450,000 copies.

Dec. *Tofu Goes West,* by Gary Landgrebe published by Fresh Press.

Dec. *How to Cook with Miso,* by Aveline Kushi published by Japan Publications.

Dec. *Tofu Madness,* by Olszewski published by Island Spring tofu company in Washington.

Dec. Growing use of the term "shoyu" and less misuse of the term "tamari" in publications, indicating awareness of the difference between these two types of soy sauce.

* *Peaking Out on Tofu,* by Matthew Schmit self-published in Colorado.

* Soymilk Piima, resembling the traditional Finnish cultured dairy product, first made (on a home scale) by Pat Connolly in southern California.

* Soy oil: The King with no crown. A series of studies initiated by the American Soybean Assoc. in 1978 showed,

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surprisingly, that although soy oil is by far America's widely used oil (accounting for 84% of all vegetable oils and 58.3% of all edible oils and fats), most consumers are simply not aware that they are using soy oil. When 1,200 female heads of households were asked "What oils can you think of?" only 17% mentioned soy oil (52% mentioned corn oil, 36% peanut oil, and 23% safflower oil), and only 7% reported having purchased soy oil in the past 6 months. The ASA Market Development Foundation promptly began a campaign to increase product recognition and loyalty, improve product image, and to encourage manufacturers worldwide to identify soy oil on product labels. The slogan used is shown at the start of this paragraph.

6891. **Product Name:** [Tofu].
Manufacturer's Name: Japanese Tofu Shop (name unknown).
Manufacturer's Address: Rio de Janeiro, Brazil.
Date of Introduction: 1978 December.
How Stored: Refrigerated.
New Product–Documentation: Shurtleff & Aoyagi. 1978, Dec. *The Book of Tofu* (Ballantine pocketbook edition). "Appendix B: Tofu Shops and Soy Dairies in the West." p. 400. There are at least two Japanese tofu shops in Rio de Janeiro, Brazil. Owner: Unknown.

6892. Kushi, Aveline Tomoko. 1978. How to cook with miso. New York, NY: Japan Publications Trading Co. 127 p. Dec. Illust. Index. 26 cm.
• ***Summary:*** Contents: Foreword. Preface. Introduction. 1. How to use miso for soup. 2. Miso soup recipes. 3. Miso condiments and relishes. 4. Miso sauces and spreads. 5. Side dishes with miso. 6. Miso pickles. 7. Miso for fun. 8. Make your own miso. Glossary. Standard tables of food composition.

"Happiness is the realization of one's eternal dream." Michio Kushi says that "The cooking of food is the highest of all human arts." Page 25, under "Special suggestions for miso," notes that miso soup with mochi stops bed-wetting, and gives a mother who has just had a baby strength to recover more quickly and also help in producing milk for breastfeeding. "Miso soup is good for relieving the effects of tobacco toxication, or too much smoking. In the old days in Japan, the long tobacco pipes were often washed in miso soup. It was said that this made them very clean. The morning after drinking too much alcohol, miso soup is very effective for restoring energy and clear thinking. When you burn your skin, if at that time you don't have any tofu or green vegetables available to apply to the burn, you can use miso as a healing paste."

The section titled "What is miso? (Comment from Michio Kushi)" (p. 27) states: "According to Japanese mythology, miso was a gift to mankind from the Gods, to assure man's health, longevity, and happiness. Miso has been an important food in the Orient since the beginning of its civilization, and now is becoming a popular food in the West." Note: The source of this mythological idea is not given.

Pages 55-57 contain a "Basic Recipe for Homemade Seitan," but it is not used with miso.

6893. *Politics Today.* 1978. Soy sauce for the goose. 5:64. Nov/Dec.
• ***Summary:*** This articles focuses on opposition by Japanese *mikan* (mandarin orange) growers to U.S. orange exports to Japan. But it notes: "Half of U.S. exports to Japan are agricultural products. The U.S. market hold is so complete that without the Midwest's soybean production, there might be no soy sauce on the table at Tokyo's famous restaurant, Benihana of New York. Indeed, as much as 80 or 90% of the soybeans, wheat, corn, animal feed, and lumber consumed in Japan comes from America."

6894. Shurtleff, William; Aoyagi, Akiko. 1978. From discards to delicacies [Okara]. *PHP* (*Japan*) 9(12):19-28. Dec. (From The Book of Tofu). [1 ref]
• ***Summary:*** Discusses the many uses of okara or unohana, the residue left over from making tofu or soymilk. Contains 8 recipes. Address: New-Age Foods Study Center, P.O. Box 234, Lafayette, California 94549.

6895. Thompson, Robert L. 1978. Brazil's expanding soybean production. *Soybean Digest.* Nov/Dec. p. SID-4, 6, 8, 10.
• ***Summary:*** "Japanese immigrant farmers introduced soybeans into Brazil over 65 years ago. However, the crop remained relatively unimportant until the late 1960's. Area planted to soybeans increased from 171-thousand hectares in 1960 to 5.1-million hectares in 1974...

"Soybean production is concentrated in the southern states where it got its start. Rio Grande do Sul and Parana account for 85% of production... For the three largest producing states as a whole, 88.4% of the increase in soybean area came at the expense of other crops and pasture, only 11.6% from new land...

"In the 1960's, when there was considerable excess coffee production in the world, the Brazilian government paid farmers to take out old coffee trees and plant another crop. In Parana some of this land was put into soybeans. Also, Parana is far enough south in Brazil to get frosts that damage coffee trees several years each decade. The severe frost of July 1975 killed over half the coffee trees in Parana and required the rest to be severely pruned back. Instead of replanting coffee many of these hectares went into soybeans, to produce a 'sure' crop the following year, instead of having to wait 3-5 years for the coffee trees to come into full production. (In addition, where coffee was replanted, soybeans were often planted in the rows between the trees

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for the first couple of years to reap some income from the land.)

"Brazil's wheat policy provided another stimulus. To an extent, soybeans got their start in Rio Grande do Sul doublecropping with wheat... A National Center for Soybean Research [CNPSo] was established in Londrina, Parana in 1976..." Address: Asst. Prof., Agricultural Economics Dep., Purdue Univ., Indiana.

6896. Ajinomoto K.K. 1978. Ajieki [Ajieki, HVP soy sauce (Brochure)]. Tokyo, Japan. 8 p. [Jap]
Address: Tokyo.

6897. **Product Name:** Seitan.
Manufacturer's Name: East West Center.
Manufacturer's Address: Moctezuma St., Ensenada, Baja California, Mexico. Phone: 52-667-61005.
Date of Introduction: 1978.
How Stored: Refrigerated.
New Product–Documentation: Talk with Carlos Richardson of Gold Mine. 1992. July 10. The first seitan sold commercially by Gold Mine (in about 1989) was purchased from Arturo Beamonte at the East West Center in Ensenada, in Baja California, Mexico.

Talk with Ygnacio Beamonte at the East West Center in Ensenada, Baja California, Mexico. 1992. July 13. Ygnacio and his wife, Loretto, began to make and sell seitan commercially in 1978 at East West Center on Moctezuma St., in Ensenada. He learned the seitan process in seminars taught by Jorge Badillo, a naturopathic doctor, who lived in Ensenada and introduced macrobiotics there; he now lives in Seattle, Washington. Jorge Badillo learned how to make seitan from Roy Steevensz at the East West Center and Kushi House in Hollywood. Later they moved to Melrose Ave. There are at least 2 places in Latin America making seitan. For details contact the Great Universal Brotherhood, an international organization which was started in Venezuela by Dr. La Ferriere (a famous French teacher) in the 1950s, and now teaches lacto-ovo vegetarianism, yoga, etc. In Mexico City and other big cities in Mexico people have started making gluten but not seitan. Ygnacio's brother, Arturo, started making seitan at the East West Center in about 1984. Then he moved to Oregon. In about 1986-87 he moved to the East West Center in San Diego, where he took over as seitan maker from David Jackson (who now lives in Arizona). The East West Center in San Diego no longer exists. In about 1989 Arturo returned to Ensenada and has been the seitan maker there from that time until today.

Ygnacio and Arturo taught the East West Center in Los Angeles a new process for making seitan using iridea [*Iridaea cordata*] seaweeds in place of kombu to make the seitan softer and creamier.

6898. Fuji Oil Company. 1978. Improvements in and relating to cheese. *British Patent* 1,518,952. *
• ***Summary:*** A non-fermented, engineered cheese made with both soy protein isolate and milk proteins.

6899. Fujii, Yoshimasa; Yamada, Jirô; Akimura, Kumiko; Kawamoto, Yumiko; Tabata, Harumi; Hashimura, Yoshiko. 1978. Studies on the quality of soybean curd. *Yamaguchi Daigaku Kyoiku Gakubu Kenkyu Ronbun* 28(2):79. [Eng]*

6900. Fukui, J.; Sunaga, S.; Kaizuma, Norihiko. 1978. [Comparative investigation on inter-strain variation in the growing periods of Siberian, USSR, northeastern Chinese, South Korean, and Japanese strains of wild soybean (*Glycine soja*)]. *Iwate Daigaku Nogakubu Hokoku* (*J. of the Faculty of Agriculture, Iwate University* (*Japan*)) 14(2):71-80. [Jap]*

6901. Furuda, M.; Akegawa, T. 1978. Reito edamame no hinshu ni oyobosu buranchingu no eikyo [The influence of blanching on frozen edamame varieties]. *Niigata-ken Shokuhin Kenkyu Hokoku* (*Niigata Food Research Report*) No. 15. p. 9-15. [Jap]*

6902. **Product Name:** [Jonnapu Soymilk (Coffee)].
Foreign Name: Jonnapu Koohii.
Manufacturer's Name: Kenbi-sha K.K.
Manufacturer's Address: 4-22-40, Takadono, Asahi-ku, Osaka 535, Japan.
Date of Introduction: 1978.
Wt/Vol., Packaging, Price: 300 ml poly container.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Jonnapu Koohii was introduced in a 300 ml poly container in 1978 and distributed nationwide.

6903. *Meditation* (*Tokyo, Japan*). 1978. Tôfu (2) [Tofu (2)]. No. 4. p. 144. [Jap]
• ***Summary:*** Contains four illustrated Western-style tofu recipes from *The Book of Tofu,* by Shurtleff and Aoyagi of New-Age Foods Study Center, 278-28 Higashi Oizumi, Nerima-Ku, Tokyo. 03-952-4974. The recipes are: Tofu peanut butter-banana spread. Tofu-cheese souffle. Onion soup with tofu. Tofu salad with grated carrots, raisins, and walnuts.

6904. Morinaga Milk Industry Co., Ltd. 1978. Morinaga brand Ever-Fresh Silken Tofu (soybean curd). Natural soy protein; Recipes: Fried Tofu & Fried Eggs, Crisp Pan-Fried Tofu, Tofu, Lettuce & Tomato Sandwich, Creamy Tofu Dressing or Dip, Silken Tofu & Strawberry Whip, Breaded Tofu Cutlets, Creamy Tomato & Tofu Soup (Leaflet). Tokyo, Japan. 6 panels each side. Each panel: 10.5 x 6 cm.
• ***Summary:*** This color leaflet, designed for Morinaga by Akiko Aoyagi and William Shurtleff, describes what tofu is and contains 7 recipes. It was used mainly in the USA to

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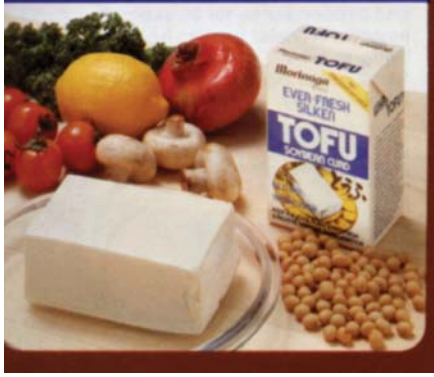
NATURAL SOY PROTEIN

Morinaga
BRAND
EVER-FRESH SILKEN
TOFU
SOYBEAN CURD



WHAT IS TOFU?

TOFU is one of the world's most popular sources of high-quality, low-cost protein. Yet unlike most other protein sources, TOFU is entirely free of cholesterol and very high in polyunsaturated fats.Excellent also for dieters, it contains only 52.6 calories per 100-grams! TOFU is, in short, the ideal food for every health-minded person.

A traditional, natural food discovered by a Chinese prince in 164 B.C., TOFU is now prepared fresh each morning at 38,000 shops in Japan alone, plus over 100 shops in America. It is the most important soy protein food throughout East Asia, a protein backbone of the diet for more than one billion people.

Remarkably versatile, TOFU can become a key ingredient in many of your favorite Western-style dishes including dressings, dips, spreads and hors d'oeuvres; salads, sandwiches, soups, and sauces; egg, vegetable, and grain preparations; barbecued and deep-fried specialties, casseroles, and even desserts . . . as the following tasty recipes show.

After opening the carton, keep it refrigerated and serve within 2 days. Slight separation of water from TOFU (as from yogurt) is perfectly normal.

Morinaga SILKEN TOFU

This SILKEN TOFU is packaged in a revolutionary new way—developed by Morinaga—that allows the TOFU, which contains no preservatives of any kind, to stay as fresh as the day it was made for up to six months *without refrigeration.* Even on hot summertime travels, picnics, or camping trips, it will never lose its freshness. The secret lies in the Tetrapak container, developed in Sweden and now used throughout the world, especially in areas without refrigeration. The mixture of pasteurized soymilk and coagulant is run into the package under highly sanitary conditions, sealed, and heated in water to form the TOFU. The laminated Tetrapak container thereafter keeps out all spoilage microorganisms.

Morinaga SILKEN TOFU is made with thick soymilk which gives it a rich and creamy flavor and silken smooth consistency, plus enough body and firmness that you can puree it, slice it, or fry it like regular TOFU. Since it is not packed in water, it is easier and neater to use than regular TOFU. and it retains its full natural sweetness, since it is made without separation of curds and whey. Delicate and tasty as a fine custard, it is perfect for

CREAMY TOFU DRESSING OR DIP

Makes 1½ cups

1 pack Morinaga SILKEN TOFU
2 tablespoons lemon juice
3 to 4 tablespoons oil
½ teaspoon salt
1 teaspoon natural soy sauce (shoyu)
½ to 1 clove of garlic, crushed
½ teaspoon dill seeds (optional)
2 tablespoons minced parsley

Combine all ingredients but the parsley in a blender and puree for 30 seconds, or until smooth. Serve chilled, topped with a sprinkling of the parsley. Delicious served over salads like a thick Roquefort dressing, as a dip with fresh vegetable slices or potato chips, as a topping for various cooked vegetables, or even as a sandwich spread. Store refrigerated or frozen.

Or, substitute ½ teaspoon curry powder and 2 to 3 teaspoons minced onion for the garlic and dill. Stir in parsley.

SILKEN TOFU & STRAWBERRY WHIP

Serves 4

1 pack Morinaga SILKEN TOFU
2 cups (7 oz.) strawberries
2 tablespoons honey
Several drops of pure vanilla extract

Combine TOFU, 1 cup strawberries, and the honey and vanilla in a blender; puree for 30 seconds, or until smooth. Spoon into four custard cups and top each portion with 3 to 5 strawberries. Serve chilled.

For variety, substitute 2 cups (7 ounces) fresh pineapple or peach chunks for the strawberries; or add ½ cup cold milk (soy or dairy) and puree to make a refreshing and healthful milkshake.

BREADED TOFU CUTLETS

Serves 2

1 pack Morinaga SILKEN TOFU, cut crosswise into 8 slices, each ½ inch thick
3 tablespoons whole wheat flour
Dash of salt and pepper
1 egg, lightly beaten
¾ cup bread crumbs, bread crumb flakes (panko), or corn meal
½ cup oil for shallow-frying
¼ cup ketchup
2 tablespoons Worcestershire sauce

ArrangeTOFU slices between triple layers of a clean dishtowel and allow to stand for 10 to 15 minutes to reduce moisture. Mix flour, salt, and pepper, then dust TOFU slices in flour mixture, dip into beaten egg, and dust with bread crumbs. Heat the oil in a large skillet and shallow-fry for 2 minutes on each side until crisp and golden brown. Mix ketchup and Worcestershire sauce; serve as a topping for the hot TOFU.

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promote Morinaga tofu.

Note: This is the earliest document seen (Feb. 2013) that contains the term "Ever-Fresh" in connection with tofu or that uses that term to describe a aseptically packaged tofu. Address: 5-33-1 Shiba, Minato-ku, Tokyo 108, Japan.

6905. Nakano, S.; Kato, Y. 1978. [Effect of ascorbic acid supply to a natto diet on the growth of rats. II. Urinary excretion of ascorbic acid in rats fed a natto diet supplemented with ascorbic acid]. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 2:69-73. (Chem. Abst. 91:90030). [Jap]*

6906. Nihei, Takao. 1978. Hawai no Nihonshu, miso, shôyu no rekishi [History of sake, miso, and shoyu in Hawaii]. Thesis, Hawaii. 5 + 21 + 18 leaves (some folded). Illust. Portraits. 28 cm. [Jap]
• ***Summary:*** Handwritten manuscript, with news clippings, photographic prints, forms, bottle labels, and other miscellanea affixed throughout text. Includes bibliographical references (leaves 104-109) and a biography of the author. Address: Honolulu Shuzo Seihyo Gaisha.

6907. Nose, Yukiko; Suzuki, Akiyo; Takei, Kumiko. 1978. Tôfu no chozô kikan-chû no saikin-sû [The number of bacteria in tofu during storage]. *Tachikawa Tandai Kiyo* 11:1-4. [Jap]*

6908. Ohkuro, I.; Komatsuzaki, T.; Kawashima, M.; Kuriyama, S. 1978. [Influence of sodium chloride on colonies and lipase of natto bacilli]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 97:171-74. (Chem. Abst. 91:52616. 1979). [Jap]*

6909. **Product Name:** [Tofu].
Foreign Name: Tofu or Tau-Fu.
Manufacturer's Name: Roland A. di Centa.
Manufacturer's Address: Via Maffei, Milan, Italy.
Date of Introduction: 1978.
New Product–Documentation: Letter from Roland A. di Centa. 1993. Aug. 9. Roland was one of the first people to introduce soyfoods to Italy. He was very interested in macrobiotics and was a close friend of Michio Kushi. "My interest in food was to heal people with food and I had a lot of success using a holistic approach to help people with major diseases. For all these cures I used a lot of miso, tempeh, and tofu. Good miso was available. However tempeh and tofu had to be locally produced. I cured people from 1980 until about 1985." Roland started to make and sell tofu in Italy in 1978. He made it by himself out of his apartment at Via Maffei, Milan, Italy. For details on how he got started, see the 1993 letter cited above.

6910. Suemitsu, R.; Sasakawa, K.; Hori, T.; Yamamoto, H.; Sawai, M. 1978. [Production of maltose by immobilized *Bacillus natto* H74-B cells]. *Doshisha Daigaku Rikogaku Kenkyu Hokoku* (*Scientific and Engineering Review of Doshisha University*) 19:22-30. [Jap]*

6911. Suemitsu, R.; Chinzei, H.; Idei, K. 1978. [Isolation and identification of surfactin from the culture broth of *Bacillus natto* H74-B]. *Doshisha Daigaku Rikogaku Kenkyu Hokoku* (*Scientific and Engineering Review of Doshisha University*) 19:139-45. [Jap]*

6912. Suzuki, T.; Ohta, T. 1978. [Studies on the properties of commercial natto starters]. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 2:33-39. Reprinted in: Shokuhin Sogo Kenkyujo Kenkyu Hokoku (Report of the National Food Research Institute) 34:266-72. 1979. [Jap]* Address: Japan.

6913. Takahashi, F.; Hirami, K.; Torano, E. 1978. [Effect of ascorbic acid supply in a natto diet on the growth of rats]. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 2:53-61. (Chem. Abst. 91:90029. 1979). [Jap]*

6914. Takatsuka Marugo Shokuhin. 1978. Kaisha annai [Introducing our company]. Soya 3-41-10, Ichikawa-shi, Chiba-ken, Japan. 11 p. Manufacturer's catalog. Color. [Jap]
• ***Summary:*** The company was founded in March 1894 as Takatsuka Marugo Seika Shijo Yugengaisha. In Nov. 1908 they established their first tofu plant. Jan. 1957: Started making bean sprouts (probably mung beans) Oct. 1965: Bought their first automatic tofu forming machine, a second one following in Oct. 1973. Today the company makes mung sprouts, soybean sprouts, sushi age (tofu pouches), ganmodoki, nama age, inari age, abura age, yaki-dofu, tofu.

Note: This is the earliest document seen (April 2013) that uses the term *sushi age* to refer to deep-fried tofu pouches. Address: Chiba-ken, Japan.

6915. Uemura, Yoshie. 1978. Daizu tanpaku ni kansuru kenkyû–Hikiniku to no kongô [Study on soybean protein–Utilization mixed with ground meat]. *Hijiyama Joshi Tandai Kiyo* No. 12. p. 37. [Jap]*

6916. Weiser, C.J. 1978. Plant cold hardiness seminar, summary and general remarks. In: P.H. Li and A. Sakai, eds. 1978. Plant Cold Hardiness and Freezing Stress: Mechanisms and Crop Implications. New York: Academic Press. Illust. 28 cm. *
• ***Summary:*** Contents: Vol. 1. Proceedings of an International Plant Cold Hardiness Seminar held in St. Paul, Minnesota, November 2-4, 1977, sponsored by The United States National Science Foundation, The Japan Society for the Promotion of Science (*Nihon Gakujutsu Shinkokai*), The College of Agriculture, University of Minnesota.

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Vol. 2. Proceedings of an International Seminar on Plant Cold Hardiness, held in Sapporo, Japan, August 11-14, 1981.

Includes a summary of the papers presented at the First European International Symposium on 'Winter Hardiness in Woody Perennials,' September 1977.

6917. Yamamoto, T.; Harabuchi, Y.; Mukai, M.; Kedo, S.; Naruse, A.; Hayashi, U. 1978. [Studies on *Bacillus natto.* I. Making natto by continuous cultivation]. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 2:41-52. [Jap]*

• ***Summary:*** The title may be: Effect of number of inoculations in media on production of sticky material. Address: Japan.

6918. Yano, R.; Koto, R.; Takeda, K. 1978. Carbon dioxide content in *natto. Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 2:75-78. (Chem. Abst. 91:122369). [Eng]*

6919. Yoshikawa, Koichi. 1978. Sosen no sugureta tôfu-zukuri to gendai no shinpo. Nigari tôfu, aburaage no kihon. Kôen yôshi [Our ancestors' superior way of making tofu and modern progress. The basics of nigari tofu and tofu pouches. Lecture outline (Brochure)]. Yoshikawa Shoji Co., Honmachi Wako Building, 2-50 Kita-Kyuhoji-machi, Higashi-ku, Osaka, Japan. 4 p. [Jap]

• ***Summary:*** Yoshikawa believes that tofu is most delicious when made in the traditional way, using their nigari as a coagulant. Address: Osaka, Japan.

6920. Yoshikawa, Ritsuko; Kawakami, Masako; Okamoto, Susumu. 1978. Okara no kansô to tanpakushitsu chûshutsu ni tsuite [The drying and protein extraction of okara]. *Seikatsu Kagaku Kiyo* No. 466. p. 219. [Jap]*

6921. Araki, Nancy K.; Horii, Jane M. 1978. Matsuri–Festival: Japanese American celebrations and activities. San Francisco, California: Heian International Publishing Co. 140 p. Illust. Index. 20 cm.

• ***Summary:*** Japanese words are used in this book whenever possible, followed by their translation into English.

In the chapter titled *Oshôgatsu* (New Year's) is a section on Mochi tsuki (pounding mochi) (p. 27). Freshly pounded mochi is delicious when eaten with a garnish of grated daikon (giant white radish) mixed with sesame seeds and soy sauce. It can also be seasoned with soy sauce and wrapped in nori, "or a mixture of sugar, salt and *kinako* (soybean flour).

In the same chapter is a recipe for Ozôni (traditional soup with mochi) (p. 46). One optional ingredient is *"tofu* (bean cake)." Address: San Francisco.

6922. Beuchat, Larry R. 1978. Food and beverage mycology. Westport, Connecticut. AVI Publishing Co. x + 527 p. See p. 224-42. Illust. Index. 23 cm. [300+* ref]

• ***Summary:*** Chapter 9, "Traditional fermented food products" (p. 224-53), by Larry R. Beuchat, is cited separately.

In Chapter 13, "Metabolites of fungi used in food processing" (p. 368-96), by R.J. Bothast and K.L. Smiley, the section on enzymes (p. 378) begins: "Fungal enzymes have been used for hundreds of years, especially in the Orient. However, modern industrial enzyme technology probably started with Takamine (1894) [Note: In Sept. 1894 he was issued two U.S. Patents for "Process of making diastatic enzyme," Nos. 525,820 and 525,823] and his work with *Aspergillus oryzae.* Today many industrial enzymes are of fungal origin." These include α-amylase (from *Aspergillus oryzae* and *A. niger*), glucoamylase, pectic enzymes or pectinases, naringinase, invertase (sucrase), α-galactosidase, lactase (Beta-D-galactosidase), protease (from *Aspergillus oryzae*), rennet (called rennin, if pure; from *Mucor pusillus, Mucor miehei,* or *Endothia parasitica;* used in many types of cheeses), and glucose oxidase, cellulase, lipase, catalase.

There are also chapters on: 14. "Myctoxins," by N.D. Davis and U.L. Diener. 15. "Methods for detecting mycotoxins in foods and beverages," by L.B. Bullerman. 16. "Methods for detecting fungi in foods and beverages," by B. Jarvis. Address: Assoc. Prof., Dep. of Food Science, Agric. Exp. Station, Univ. of Georgia, Experiment, GA.

6923. Calkins, Peter H.; Huang, Kuang-Rong. 1978. Soybean production in Taiwan: A farm survey. *AVRDC Technical Bulletin* No. 11 (78-89). 27 p. (Shanhua, Taiwan). [15 ref. Eng]

• ***Summary:*** Describes profitability and yield from soybean, the motivations and problems of farmers, and the reaction of farmers in the past to measures such as the extension of improved varieties. Since 1973 scientists at the Asian Vegetable Research and Development Center (AVRDC) have been working to improve soybean's contribution to consumer diets and farmer incomes in Asia. In Taiwan soybean is used as a source of cooking oil, "milk, beancurd, sprouts, fresh seed, dried seed, flour and a green vegetable (the stems and leaves are fried)." It is also used to make textured vegetable protein products such as artificial chicken and fish; when cooked with miso, soysauce, and various spices, these "are practically indistinguishable from the real versions. Entire banquets of rice and little else but soybean are routinely served in the vegetarian restaurants and Buddhist monasteries of Taiwan."

"In 1976, the government of Taiwan started guaranteeing a price of US$277/tonne to encourage farmers to plant more soybeans. The response has been modest, largely because soybeans have not been as profitable as competing winter crops, such as adzuki beans." Table 1 (p. 2) shows that between 1967 and 1976, the area planted to soybeans in Taiwan decreased from 52,000 ha to 36,000

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ha, the farm price increased from US$188/tonne to $256/tonne, production decreased from 75,000 tonnes to 53,000 tonnes, but imports increased dramatically from 347,000 to 780,000 tonnes (more than doubling). Thus the total supply/consumption of soybeans in Taiwan (domestic production + imports) increased from 422,000 tonnes to 833,000 tonnes, while domestic production as a percentage of total consumption decreased from 18% to 6%.

"Before 1945 most soybean cultivars in Taiwan were of local origin, with an average yield of only 500-600 kg/ha. However, the government introduced Japanese cultivars such as 'Shih-shih' and Palmetto' in 1952. Since the early 1960s, scientists in Taiwan have also worked to develop improved cultivars by crossing cultivars introduced from abroad (in this report, the former will be termed 'improved' and the latter 'introduced' cultivars). As a result, the percentage of farmers planting introduced and improved cultivars has increased steadily, from about 53% in 1963 to 92% in 1976 and yield has risen to 1.5 tonnes/ha." Address: 1. Assoc. Agricultural Economist; 2. Research Assistant. Both: AVRDC, Shanhua, Taiwan.

6924. Hokama, Shuzen. 1978. Konko kenju. Kohon to kenkyû [Dictionary of women in the Ryukyu kingdom. Comparisons of old texts and research materials]. Tokyo?: Koto?kawa Shoten. See p. 68. [Jap]*

6925. Isakari, Kiyo; Hirakawa, Aiko. 1978. Shokuhin-chû no karushiumu ni tsuite. XII. Gyôko-zai no chigai ni yoru tôfu no karushimu, rin ganryô to tekusuchaa [The calcium content of foods. XII. Differences in calcium content, phosphorus content, and texture of tofu depending on the type of coagulant used]. *Saga Joshi Tanki Daigaku Kenkyu Kiyo* No. 12. p. 16-23. [Jap]
Address: 1. Saga Daigaku, Kyôiku-bu Kyôju (Prof., Dep. of Education, Saga Univ., Japan).

6926. Iwaki, Mitsuro; Roechan, M.; Saleh, N.; Sugiura, M.; Hibino, H. 1978. Identity of mycoplasma-like agents of legume witches' brooms in Indonesia. *Contributions, Central Research Institute for Agriculture* (*Bogor, Indonesia*) No. 41. 11 p. [4 ref]
• ***Summary:*** *Webster's Dictionary* defines Witches' Broom as "an abnormal tufted growth of small branches on a tree or shrub caused especially by fungi or viruses." Witches' broom is one of the most important diseases of legume plants and causes damage to peanuts, soybeans, and mungbeans in many parts of Indonesia. Witches broom on peanuts and soybeans can be transmitted from one plant to another by the leafhopper *Orosius argentatus.* Mycoplasma-like organisms occurred in the phloem tissue of the infected plants. Address: 1&5. Plant Pathologists, Pests and Diseases Div., Central Research Inst. for Agriculture, Bogor, Indonesia under Indonesia-Japan Joint Food Crop Research Program on leave from Inst. for Plant Virus Research, Tsukuba, Ibakari, Japan; 2-3. Asst. Plant Pathologists, Pests and Diseases Div., Central Research Inst. for Agriculture, Bogor, Indonesia; 5. Plant Pathologist, Inst. for Plant Virus Research, Tsukuba, Ibakari, Japan.

6927. Kasahara, Kayoko. 1978. Daitokuji-nattô kôki seibun [Volatile flavor components of Daitokuji-natto (fermented black soybeans)]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 31(2):171-75. (Chem. Abst. 89:195686w). [4 ref. Jap; eng]
• ***Summary:*** "Volatile flavor components of Daitokuji Natto were studied by GC-MS [gas chromatography-mass spectrometry], IR, and GLC [gas liquid chromatography] analyses.

"Seven carbonyls (acetaldehyde,...), an alcohol (furfuryl alcohol), and eight acids (acetic, propionic, isobutyric, *n*-butyric, isovaleric, isocaproic, *n*-caproic and phenylacetic acid) were identified, and a carbonyl and four bases were tentatively identified." Address: Dep. of Biochemistry, Okayama Univ. Medical School, Okayama, Japan.

6928. Kawakami, Kozo; Shinoda, Osamu; Hirata, Mario; Matsushita, Sachiko; Yoshikawa, Seiji. ed. 1978. Ryôri bunken kaidai [Bibliography of ancient documents on Japanese foods, each extensively annotated]. Tokyo: Shibata Shoten. 298 p. Illust. 22 cm. Discoveries in Food Culture series, Vol. 5. [304 ref. Jap]
• ***Summary:*** Part I of this work lists 200 old Japanese food/cookery books, each published prior to 1868, in alphabetical order. This book is exceptionally well researched and valuable. The author was born in 1928. The name of each is written in Chinese characters (*kanji*) with *furigana* attached to show how to pronounce them. (Unfortunately, no pronunciation help is given with authors' names.) The publication date and a 1-page summary of the contents is given. These 200 books were selected from well over 500 candidates based on 5 rules: They are not about medicinal uses, crop cultivation, or industrial food production (including oil extraction, flour milling, etc.); in the fields of confectionery and pickles, only the most famous books are included; some exceptions to the first four rules were made where inclusion was deemed of special interest to the reader.

Part II is 104 related books about food and cooking, listed chronologically.

Appendix 1 explains how to do research using old documents. Appendix 2 is a chronology of the 200 books from the year 1200 to the present. Appendix 3 is an index to the books in Part II, listed alphabetically by title. Note: There is no index in this book that allows one to see on which pages or in which books a certain food (such as natto) is mentioned. Address: Nôgaku Hakase, Shusai, Ryori Genten Kaidai, Japan.

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6929. Kawamura, Wataru. 1978. Miso shôyu [Miso and shoyu]. Tokyo: Tokyo Shobo-sha. 376 p. 22 cm. Series: Nihon no Aji Meicho Senshû (Selected Great Books on Japanese Taste). Reprinted in 1983 as *Miso shoyu no hyakka* [*Encyclopedia of miso and shoyu*]. [Jap]
• ***Summary:*** Contents: Topography of miso in Japan (*Miso fudoki,* p. 7). Miso in festivals, rituals, customs, and sacred rites (*Miso saijiki,* p. 92). History of miso (p. 120). Classical miso cookery (short recipes, p. 139). Collection of beautiful words about miso in proverbs, poems, and songs (p. 169). A short history of shoyu (p. 187). Documents: History of miso and shoyu (p. 195). Kojiruien–Inshoku-bu (Food & drink section, on shoyu, p. 354). Chronology of miso (p. 366-72). Address: 2-4-7 Kugenuma, Tachibana, Fujisawa-shi, Kanagawa-ken 251, Japan.

6930. Kawamura, Wataru. 1978. Miso shôyu no hyakka [Encyclopedia of miso and shoyu]. Tokyo: Tokyo Shobo-sha. 376 p. 22 cm. Series: Nihon no Shokubunka Taikei (Japanese Food Culture Collections), no. 10. [Jap]
• ***Summary:*** This is a reprint of the author's 1978 book *Miso shôyu* [*Miso and shoyu*]. Address: 2-4-7 Kugenuma, Tachibana, Fujisawa-shi, Kanagawa-ken 251, Japan.

6931. Marukome Miso K.K. 1978. Go annai [Introduction (Brochure)]. Nagano, Japan. 10 p. 30 cm. [Jap]
• ***Summary:*** Contents: Introduction. About the company: Aerial color photo, statistics (factory is 39,000 square meters, annual production of miso is 30,000 tons/year), chronology of company (started in 1854). The miso production process, with 10 color photos including one of an automated koji room. The company's products (9 color photos, incl. Maru-chan). Film strips / Clips from color TV commercials. Map showing location of regional plants and sales offices. Marukome soybean farm in New South Wales, Australia. Address: Nagano City, Japan. Phone: (0262) 26-0255.

6932. Mitsubishi Kasei. 1978. Tônyû no eiyô kôka [Nutritional effect of soymilk]. Tokyo: MK. 38 p. [27 ref. Jap]

6933. Miyamoto, Tsuneichi; Shioda, Tetsuo. 1978. Shokuseikatsu no kôzô [The structure of Japanese food life]. Tokyo: Shibata Shoten. 266 p. Shoku Bunka no Hakken series #2. Japanese summary by Kawakami 1978. [Jap] Address: Japan.

6934. Murai, Gensai. 1978. Shoku seikatsu kokoroe-cho: Shokumotsu ni kansuru jûhachi nenkan no kenkyû [Things to be aware of in your way of eating: Eighteen years of research on foods]. Tokyo. 212 p. 20 cm. [Jap]*
• ***Summary:*** This originally appeared in the author's *Shôsetsu Shoku-dôraku* published in 1920.

6935. Nagata, Tairei. 1978. Fucha ryôri no rekishi. Fu "Fucha Ryôri-shô" gendai-go yaku [History of Fucha cookery. Supplement: Modern translation of the *Fucha Ryôri-sho*]. Japan. 172 p. Illust. 4 plates. 22 cm. [20+ ref. Jap]*
• ***Summary:*** The author was born in 1911. Fucha ryori is a type of Japanese vegetarian cookery, adapted from its Chinese ancestor.

6936. Nihon Yushi Kyokai [Japan Oils and Fats Assoc.]. 1978. Seiyu yôran [Handbook of oil processing]. Tokyo. [Jap]
• ***Summary:*** Pages 1-9 contain a detailed chronology of the fats and oils industry in Japan from A.D. 97 to 1973. Address: Japan.

6937. Passmore, Jacki. 1978. All Asian cookbook: Japan, China, Korea, India, Malaysia, Singapore, Indonesia, Laos, Thailand, Burma, Cambodia, Vietnam, Philippines, Sri Lanka. Secaucus, New Jersey: Chartwell Books. 224 p. Illust. (color photos). Index. 29 cm.
• ***Summary:*** Soy-related recipes: Vietnam: Soya sauce pork (Thit bho to, p. 71, with light soya sauce). Malaysia and Singapore: Mixed vegetables with salted black beans [fermented black soybeans] (the black beans are crushed, p. 103). Stuffed beancurd, peppers and black mushrooms (with 6 pieces hard beancurd, each 5 cm {2 inches} square, p. 103). Fried beancurd squares (Taukwa goreng, with 6 squares hard beancurd and dark soya sauce, p. 103). Chinese soup with pickled vegetables, beancurd and mixed meat (with 2 squares soft beancurd, p. 106).

Indonesia: Sweet pork (Babi kecap, with sweet soya sauce {kecap manis}, p. 118). Soya sauce sambal (with dark soya sauce, p. 124). Mixed vegetable soup (Sayur campur, with 2 cakes soft beancurd, p. 126).

Philippines: Lumpia (with dark soy sauce in the sauce, p. 136).

China: Fish with hot bean sauce (with hot bean paste or hoisin sauce, p. 146). Lobster with salted black beans and chili (p. 11). Stewed spare ribs with salted black beans (p. 159). Mixed green vegetables with salted black beans (p. 163). Hotpot of vegetables and beancurd (with 8 squares soft beancurd, p. 164). Ma po beancurd (with 6 squares soft beancurd, p. 166). Cold beancurd salad (with 6 squares soft beancurd, p. 166). Fried beancurd (with 8 squares soft beancurd, p. 166). Sharks fin soup (with dark soya sauce, p. 167). Wonton soup (with light soya sauce, p. 168).

Japan: Soya bean paste (miso, homemade from canned chick peas + soya sauce!, p. 178). Tuna glazed with miso (Gyoden, with dark miso paste, p. 180). Sukiyaki (with 3 squares soft bean curd, p. 187). Braised pork and leek rolls (Teriyaki, with light soya sauce, p. 188). Fried eggplant in miso sauce (with white miso paste, 194). Miso soup (miso shiru, with diced bean curd and white miso paste, p. 195).

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The Glossary includes: Bean paste, hot (made from chilies and soya beans, La do ban jiang, Chinese). Bean paste, salted (also known as yellow bean paste, made from soya beans, Taucheo, Chinese). Bean paste, sweet (either tien mien jiang or do ban jiang, made from soya beans, Chinese. See also hoisin sauce). Beancurd. Beancurd 'cheese,' fermented (in brine with chilies, wine, and spices, Dofu ru, Chinese). Beancurd skin [yuba] (yellowish, almost transparent sheets). Beans, salted, black: See Salted black beans. Kecap manis (Sweet, slightly thick soya sauce, Indonesian, Malaysian). Miso (Japanese). Soya sauce (light, dark, and sweet). Tahu (Malaysian): See beancurd. Taucheo (Chinese): See Bean Paste, salted. Taukwa (Chinese, hard beancurd). Tien mien jiang (Chinese): See Bean paste, sweet. Tofu (Japanese): See beancurd. Vinegar and soya sauce dip: "A sharp-flavoured Korean accompaniment made by blending 3/4 cup light soya sauce, 3 tablespoons white wine vinegar, 3 tablespoons ground sesame seeds and 2 teaspoons finely chopped spring onions. Serve in individual sauce bowls." Yellow bean paste: See Bean paste, salted.

Note: This is the earliest document seen (Feb. 2011) that contains Vietnamese recipes that use soy as an ingredient. Address: Australian-born food writer.

6938. Takahashi, Takeshi. 1978. Miso no kôyô [The virtues of miso]. Tokyo: Arrow Shuppansha. 215 p. [Jap]*

6939. Asahi Shokuhin K.K. 1978? Asashoku soimiruku [Asahi Foods Company's soymilk (Leaflets)]. Saitama-ken, Japan. 7 p. Undated. [Jap]
• ***Summary:*** These two leaflets discuss the company's product in detail.

6940. Asahi Shokuhin. 1978? Asashoku soi miruku [Asahi Shokuhin soymilk]. Saitama-ken, Japan. 8 p. Undated. [Jap]

6941. Birnbaum, Alfred. 1978? Re: Yuki-wari natto. Letter to William Shurtleff at New-Age Foods Study Center, Lafayette, California. 1 p. Undated. Handwritten in pencil.
• ***Summary:*** "A nattô resembling miso, featuring the nebari [stickiness] of nattô and the sweetness of koji. A two-fermentation product.

"Process: Regular nattô is minced finely with koji, shoyu and (kombu) dashi and fermented at 30º to 33ºC for 30-40 days."

Note: This top portion of page 2 of some letter from Alfred has been separated from the body of the letter; hence the lack of date and address.

6942. Kyoto Prefecture, Norinbu, Nosan Fukyuka. 1978? Kyôto-fu ka ni okeru tezukuri miso no jittai: 52 nendo seikatsu kaizen fukyû kadai shushu jigyô hôkoku [The present status of homemade miso in Kyoto prefecture: 1977 report of the enterprise to collect and popularize subjects that will improve the quality of daily life]. Kyoto. 65 p. Undated. Illust. 26 cm. [Jap]*

6943. **Product Name:** Marukome Country-style Miso Soup [With Wakame].
Foreign Name: Marukome Inaka Miso-shiru (Wakame Iri).
Manufacturer's Name: Marukome Miso K.K.
Manufacturer's Address: Nagano, Japan.
Date of Introduction: 1978?
Ingredients: Country-style (*inaka*) miso, dried wheat gluten (*fu*), wakame, negi onion, bonito powder, kombu, monosodium glutamate (*kagaku chômiryô*).
Wt/Vol., Packaging, Price: 4 packets, each 36 gm.
How Stored: Shelf stable.
New Product–Documentation: Package with Label sent by Dr. Walter Wolf of Peoria, Illinois. 2000. Aug. 5. The colorful package has a use-by date of 1978 Jan. 25. Size: 5¼ by 6½ inches. Foil pouch. Color photo of a reddish-brown bowl of miso soup. In the lower left is Maru-chan, the company logo.

Note: Below the list of ingredients we read that the company also makes Shinshu Miso and Akadashi Miso.

6944. Nihon Shoyu Kensa Kyokai [Japan Shoyu Inspection Assoc.]. 1978? Kensa jisshi yôryô, an [Points to watch in conducting practical inspections, proposals]. Tokyo. 8 p. Undated. [Jap]
Address: Tokyo.

6945. Yamaya K.K. 1978? Meibutsu–Yamaya hamanatto yuraiki (fu meshiagari-kata) [Famous products–Yamaya hamanatto: Origin and how to eat it (fermented black soybeans) (Brochure)]. Japan. 6 panels. Undated. 13 by 9 cm each. Front and back. [Jap]
• ***Summary:*** See next page. The cover of this small brochure is printed with reddish-brown ink on green, and the title in a vertical rectangle with black and red characters on white. The background of the cover panel shows an illustration of Hamamatsu from Hiroshige's "Fifty-three stages of the Tôkaido."

Of the 3 inside panels, the first two give the company history. The previous company, started in the Ansei period (1854-1860) was named Yamaya Tamari-ya. The company founder was Yosuke (or Yasuke) Suzuki.

One back panel begins: Natural foods (*Shizen shokuhin*)*:* Suggestions for use–with tea, sake, or beer, as is, or in a mixture with grated daikon and vinegar. Or put on ochazuke (a mixture of rice and tea). On the bottom half of that panel is a map showing how to get to the company.

On the middle back panel is a cartoon illustration showing two Japanese men seated under a pine tree enjoying a meal. Along the bottom is the company name, address, and phone number. Address: K.K. Yamaya factory, Shizuoka prefecture, Hamamatsu city, Naruko-machi 8 banchi. Phone:

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浜納豆由来記

此の浜納豆の由来は今を去る事およそ六百年の昔、遠州三ケ日町大福寺の僧がこれを製し独自の風味と保存の効く所よりあまねく全国に知れわたり山椒の皮のからきを混ずる所からこれをから納豆と称した、その昔征韓の役起るや秀吉公肥前の那古耶に御出陣の際この唐納豆を下物に充てられ 唐納豆の字はからをおさめてまめといふ語に通ずる所より吉兆であると賞せられそれより七十名の御朱印の他に納豆料除地を賜り爾後徳川氏浜松御在城の日より元旦を吉例とし毎年之を進献しまり代々将軍家も賀上の例台には必ず是を添えられたとの事です、この唐納豆は浜名の郷より出づるをもって一名浜名納豆とも呼ばれた

からかわの

猫にあらねはさみせんの
いとをも ひかぬ浜名納豆

蜀山人

安政年間弊社の前身 ヤマヤ溜屋商店主人鈴木弥助翁は特にその秘法を伝授され其の後研究に研究を重ね折から東海道線開通を機に旅行く人々に停車場売りとして産声を上げ爾来茲にその売行を示し戦後は九州北海道は勿論遠く故郷を偲ぶハワイの邦人達の間にも喜ばれる様になりました

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Hamamatsu (0534) 52-2181 (main).

6946. *GOMF News* (*Oroville, California*)**.** 1979-1984. Serial/periodical. George Ohsawa Macrobiotic Foundation. Jan. 1979 to May 1984. Frequency: Monthly.
• ***Summary:*** Preceding title: The Macrobiotic. Succeeding title: Macrobiotics Today. Each issue is dated.

6947. Birnbaum, Alfred. 1979. Re: Comments on new condensed edition of *The Book of Tofu.* Letter to William Shurtleff at New-Age Foods Study Center, Jan. 26. 1 p. Handwritten (in pencil) and signed.
• ***Summary:*** He received the condensed version from Shurtleff and Aoyagi. "I think that the compact format should reach a large readership. Excellent work!"

"I particularly liked your having created a separate section on 'Fermented Tofu,' and of course, I noticed your updating the sections on nattô, Daitokuji nattô & hamanattô. No doubt you did considerable revision.

"On rereading some parts of the original edition for comparison I did have some questions (I am not sure if I had brought them up with you or not):

"P. 312, unabridged. 4 Chinese characters (Cc). You have read as 'Nishiyama Sodo,' though when I went there I was told it was called 'Saizan Sodo.' (Incidentally it was there that I had what I consider probably the finest tofu dinner I can remember).

pp. 309, 312, unabridged; p. 385 revised = 4 Cc. I have always heard this read as 'Fusa Ryôri,' not 'Fucha,' though perhaps the case is the same as with 2 Cc, which can alternatively be read 'sado' or 'chado' [the way of tea]. Note: Major Japanese dictionaries and glossaries all say *fucha ryôri.*

"Incidentally, have you seen the new Shufu-no-tomo English translation out on *Shojin Cooking* ($7.95)?"

6948. Belleme, John. 1979. Re: Starting a new miso company with Sandy Pukel and Michio Kushi. Letter to William Shurtleff at New-Age Foods Study Center, Jan. 1 p. Undated. Handwritten, with signature on letterhead.
• ***Summary:*** "Dear Bill–Last weekend Sandy, Michio and I got together in Boston to discuss the miso factory. We agreed on a few points. I know you are interested in the project so would like to keep you posted. Also, we need your opinion on a few points.

"First, thanks for sending your miso book, I have read it and found it very informative. We are now going full steam ahead. I am learning Japanese. Michio is going to Japan in May to set up an apprenticeship program for me. Sandy and I have started looking for the land..."

"Bill, If you were going to make miso in the U.S., based on climate, what state would you choose? Thanks, John Belleme."

Talk with John Belleme. 1999. Nov. 8. This letter was probably written in late December 1978 or very early January 1979. John dictated the letter to his wife, Jan, who actually wrote it. He can tell that because the handwriting is legible and there are no spelling mistakes. This idea later became Oak Feed Miso, Inc., then American Miso Co.

Note: This is the earliest document seen (April 2009) connected with American Miso Co., which started making miso in Aug. 1981 in Rutherfordton, North Carolina. John and Jan Belleme were the head miso makers. They learned how to make miso with the Onozaki family in Japan. Address: Oak Feed, 3030 Grand Ave., Coconut Grove, Florida 31333. Phone: 448-0076 (restaurant); 448-7595 (store).

6949. *Food Engineering.* 1979. Fermented protein foods: Japan has made considerable progress in fermentation technology using vegetable protein ingredients. 51(1):ef-16-17. Jan.
• ***Summary:*** This article is based, in part, on a similar one by Dr. Danji Fukushima of Kikkoman Foods, Inc. (Walworth, Wisconsin). Contents: Introduction. Variety of fermented foods. Important role in the diet. Eight good reasons for using fermentation in the production of foods (says Dr. C.W. Hesseltine). Hydrolyzed vegetable protein (HVP). MSG and Maggi.

A photo shows 2 cartons of Kibun Soena and two glasses of this fermented soymilk.

6950. *GOMF News* (*Oroville, California*)**.** 1979. Tamari quality. Jan. p. 4.
Address: 1544 Oak St., Oroville, California.

6951. Ishima, Toshio. 1979. [Correlation between sensory evaluation of miso and its chemical analysis]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 34. p. 252-57. Jan. [4 ref. Jap; eng]
• ***Summary:*** Reprinted from *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*)**.** No. 286. p. 26-31 (1977). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6952. Ishima, Toshio; Ohta, Teruo. 1979. Nattô seizô kôtei ni okeru hakkô kôtei no kôtei kaiseki [Statistical analysis of fermentation process in natto making]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 34. p. 258-65. Jan. [1 ref. Jap; eng]
• ***Summary:*** The best induction time was 2-3 hours for optimal natto viscosity and hardness. A faster rate of temperature increase improved the appearance and color of natto, but caused a deterioration in viscosity. The longer the temperature of the natto beans remained over 50ºC, the greater the viscosity. Glutamic acid polymer formation reaction continues at this temperature. From multiple regression analysis, taste, appearance, and viscosity were the

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most important sensory characteristics, in that order.

Reprinted from *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*). No. 1. p. 5-11 (1977). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6953. Manabe, Masaru; Matsuura, Shinji. 1979. [Studies on the fluorescent compounds in fermented foods. V. The behavior of fungi during miso and shoyu fermentation and aflatoxin inspection]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 34. p. 79-83. Jan. [9 ref. Jap; eng]
Address: National Food Research Inst., MAFF, Tokyo, Japan.

6954. Morinaga Milk Industry, Ltd. 1979. Morinaga Ever-Fresh Silken Tofu tastes as fresh as made this morning (Ad). *Whole Foods* (*Berkeley, California*) 2(1):35. Jan.
• ***Summary:*** See next page. This full-page black-and-white ad shows a large photo of a package of this tofu. "Six month shelf life. No preservatives. No refrigeration." Exclusive distributor is Mutual Trading Co., Inc., 431 Crocker St., Los Angeles, California 90013.

Note: This is the earliest Morinaga tofu ad seen (March 2013) in the United States. Address: Japan.

6955. Ochiai-Yanagi, Sonoe; Fukuzawa, Chikafusa; Harada, Kyuya. 1979. Formation of storage protein components during soybean seed development. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 34. p. 178-84. Jan. [25 ref. Eng; jap]
• ***Summary:*** "Formation and accumulation of protein components and their subunits in developing soybean seeds were investigated ultracentrifugally, electrophoretically and immunologically from flowering until maturity." Immunological specificity of mature 7S globulin was clearly detected 40 days after flowering, whereas that of 11S globulin was seen after at least 50 days of flowering.

Reprinted from *Agricultural and Biological Chemistry* 42:697-702 (1978). Address: National Food Research Inst., MAFF, Tokyo 135, Japan.

6956. Ochiai-Yanagi, Sonoe; Miyauchi, Hiroko; Saio, Kyoko; Watanabe, Tokuji. 1979. Modified soybean protein with high water-holding capacity. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 34. p. 185-96. Jan. [11 ref. Eng; jap]
• ***Summary:*** Reprinted from *Cereal Chemistry* 55:157-67 (1978). Address: National Food Research Inst., MAFF, Tokyo 135, Japan.

6957. Sakaguchi, Kinichiro. 1979. Shôyu no ruutsu o saguru [Searching for the roots of shoyu]. *Sekai* (*The World*) No. 398. p. 252-66. Jan. [Jap; eng+]
• ***Summary:*** A fascinating enquiry into the early history of fermented soyfoods by one of Japan's most eminent microbiology professors. For details, see *The Book of Miso,* and *History of Soybeans and Soyfoods,* both by Shurtleff and Aoyagi.

Yokotsuka (1986, p. 325) cites this as Sakaguchi. 1981. "Searching for the route of shoyu." *SEKAI* 398:252-266. This magazine is published by Iwanami Shoten in Tokyo.

"The *Chou-li* states that this jiang was made by mixing the meat of animals, birds, and fish with millet koji and salt, then pickling it in wine in a crock for a hundred days. It is quite remarkable that even at this early date the Chinese were consciously using the enzymes produced by the koji molds (whose airborne spores fell on the substrate naturally, rather than by deliberate inoculation), to make fermented foods such as jiang and fermented grain-based alcoholic beverages. It is also clear from the context that jiang was regarded as a highly prestigious food and a delicacy."

"Today's shoyu traces its ancestry back through early shoyu, then through the four fermented soyfoods tamari-shoyu, tamari miso, Hatcho miso, and savory fermented black soybeans (*Hamanatto*), and ultimately back to Chinese fermented black soybeans (*chi*). Miso, he asserts, traces its ancestry back through early Japanese misos and hishio to jiang. In the shoyu lineage, the koji is always made with either soybeans alone or a mixture of soybeans and cracked or ground wheat, whereas in the miso lineage the koji is usually (except for soybean misos) made from grain. Sakaguchi believes that the fundamental biochemical consequences of this difference in koji substrates are of much greater importance than the more superficial differences of consistency or form that have led researchers up until now to group solid or semisolid fermented soyfoods in the miso lineage and liquid products in the shoyu lineage. Thus it is not obvious that liquid shoyu stems from mushy jiang. In shoyu, the *Aspergillus oryzae* molds grow directly on the soybeans (and wheat) during the koji fermentation and their enzymes begin to digest the koji substrates, then continue to digest the soybeans (and wheat) during the subsequent brine fermentation. This *in vivo* and *in vitro* extended hydrolysis leads to the formation of complex metabolic compounds, a higher degree of protein hydrolysis and liquefaction, and the production of a richer and stronger flavor in shoyu than in miso. Sakaguchi argues that miso has a 3,000 year history dating from the development of jiang during the Chou dynasty in China, whereas shoyu has a 2,000-year history dating from the development of fermented black soybeans (*shih*) during the Han dynasty.

"It is important to note here that the ancient Chinese language seems to indicate that soy sauce derives from jiang and not from *shih,* as evidenced by the Chinese word for soy sauce, *jiangyou,* meaning 'the liquid extracted from jiang.' Moreover, most Chinese jiang and fermented black soybeans have both always been made with a soy-based koji. Sakaguchi's analysis is helpful, but lacking on a few points.

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The jiang has not, as Sakaguchi argues, been made with a grain-based koji. Even in the earliest description of Chinese soybean jiang in the *Ch'i-min yao-shu* (described in detail in the Miso chapter) the koji is made primarily from soybeans. Thus while retaining the essence of Sakaguchi's argument, we would suggest that it be modified slightly to say that *both* shoyu and miso trace their ancestry back to *both* fermented black soybeans (*shih,* which existed prior to 206 BC) and to soybean jiang (which existed prior to AD 500).

"Dr. Sakaguchi considers there to be three main reasons that shoyu and miso were not developed in the West: (1) very few Westerners ever learned how to make koji using molds; (2) they had virtually no soybeans until the 20th century; and (3) the basic flavoring components of shoyu and miso, especially natural L-glutamic acid and inosinic acid, were traditionally unknown in the West."

"In 1944 Kinichiro Sakaguchi and Koichi Yamada discovered a new species of *Aspergillus* mold, which appeared widely in shoyu koji; they named it *Aspergillus sojae."*

Photos show: (1) Three ancient earthenware jars, from about the 1770s (Thunberg's time), in which shoyu was pasteurized and shipped to Europe. Address: Professor of fermentation science, Tokyo Univ.

6958. Shurtleff, William; Aoyagi, Akiko. 1979. The book of tofu: Food for mankind. Condensed and revised. New York, NY: Ballantine Books. A division of Random House, Inc. xii + 433 p. Jan. Illust. by Akiko Aoyagi Shurtleff. Index. 18 cm. [60 ref]

• ***Summary:*** This book has been extensively revised and updated. Many names of Japanese tofu have been Americanized. Contents: Preface. Acknowledgements. 1. Protein East and West. 2. Tofu as a food. 3. Getting started: Favorite tofu recipes. 4. Soybeans. 5. Fresh soy puree. 6. Okara (Soy pulp). 7. Curds and whey. 8. Tofu & firm tofu. 9. Deep-fried tofu: Deep-fried tofu cutlets, deep-fried tofu burgers & treasure balls (tofu treasure balls, p. 269), and deep-fried tofu pouches. 10. Soymilk. 11. Silken tofu. 12. Grilled tofu. 13. Frozen & dried-frozen tofu. 14. Fermented tofu. 15. Yuba. Appendices: A. Tofu restaurants in Japan. B. Tofu shops and soy dairies in the West. C. Varieties of tofu in East Asia. D. Table of equivalents. Bibliography. Glossary. Contains 250 recipes and 100 illustrations. Price: $2.95.

This new edition features: (1) New recipes: Over fifty new American-style tofu recipes including Creamy Tofu Dressings, Tofu Teriyaki, Tofu Burgers, Tofu Eggless Egg Salad, and the like. The key to the book is an updated list of favorite tofu recipes plus suggestions for incorporating them into a weekly menu (p. 56). (2) New sections: An extensive new introduction to Soy Protein Foods (p. 66), dairylike products made from tofu (p. 150), dairylike products made from soymilk (p. 302) including soymilk yogurt (fermented), ice cream, kefir, mayonnaise, whipped cream, popsicles, buttermilk, and soy shakes. (3) New chapters: Fermented Tofu and Varieties of Tofu in East Asia. (4) New basic methodologies: The key recipes for homemade tofu and homemade soymilk have been simplified and improved. (5) Updates: A complete listing of the 120 tofu shops and soy dairies now operating in the West; over 60 Caucasian-run shops have opened in the past two years. (6) New Americanized tofu names: Including deep-fried tofu burgers, deep-fried tofu cutlets, deep-fried tofu pouches, deep-fried tofu puffs, silken tofu, wine fermented tofu, and fresh soy puree. A major goal of this book is to coin English names for tofu products that will catch on and come to be used in labeling commercial products, in cookbooks, etc. (7) No sugar.

Note 1. This is the earliest English-language document seen (April 2013) that contains the following terms related to deep-fried tofu: "fried tofu cutlets" or "deep-fried tofu cutlets" (p. v, to refer to *nama-agé*), "fried tofu burgers" or "deep-fried tofu burgers (to refer to *ganmodoki*), "tofu treasure balls" or "deep-fried tofu treasure balls" (p. v, 269, to refer to *Hiryozu*), "fried tofu pouches" or "deep-fried tofu pouches" (p. v, to refer to *aburagé*).

Page 110: "In Japan, tofu is also called *momen-goshi* ('cotton-filtered') to distinguish it from its popular counterpart *kinu-goshi* ('silken tofu')." Note 4. This is the earliest English-language document seen (April 2013) that uses the term "silken tofu."

Note 5. This is the 2nd earliest English-language document seen (Oct. 2011) that contains the term "Wine-fermented tofu" (p. 361).

In Jan. 1988 a new printing (but not a new edition) of this book (the 13th), slightly revised, appeared. It had a new cover and many new small illustrations. The subtitle was "Protein Source of the Future–Now!" The heading: "The World's Bestselling Book on Tofu." Address: New-Age Foods Study Center, P.O. Box 234, Lafayette, California 94549.

6959. Shurtleff, William. 1979. Protein source for the future. *Cosmos* (*NSW, Australia*) 6(6):1, 4-5. Jan.

• ***Summary:*** Gives ten reasons why soybeans will be the protein source of the future: 1. Optimum land utilization. 2. Lowest cost protein. 3. High nutritional value. 4. Time tested. 5. Remarkably versatile. 6. Appropriate technology. 7. New dairylike products. 8. Hardy and adaptive. 9. Free nitrogen fertilizer. 10. Energy and resource efficient. "All of these ten factors work together synergistically, reinforcing one another, to give added weight to the prediction that soybeans will be a key protein source for the future on plant earth."

Note: This information was published in July 1979 in *The Book of Tempeh* (p. 21-24). Address: Lafayette, California.

6960. Shurtleff, William; Aoyagi, Akiko. 1979. Soybeans

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(Document part). In: William Shurtleff and A. Aoyagi. 1979. The Book of Tofu. New York: Ballantine Books. 433 p. See p. 58-75. Chap. 4.
• ***Summary:*** Contents: Introduction. Soy protein foods– Traditional non-fermented soyfoods: Whole dry soybeans, soynuts, roasted soybeans, fresh green soybeans, soy sprouts, natural soy flour and soy grits, roasted soy flour (kinako).

Traditional fermented soyfoods: Tempeh, miso, shoyu (Japanese natural soy sauce), natto (fermented whole soybeans, including Japan's cracked natto {*hikiwari natto*} and finger lickin' natto {*yukiwari natto,* containing rice koji and salt}, and thua-nao from northern Thailand), soy nuggets (inc. Japan's Hamanatto and Daitokuji natto).

Modern western soyfoods (developed using high-level technology): Soy flakes, defatted soy flour and grits, soy protein concentrates, soy protein isolates, spun soy proteins, textured soy proteins (TVP is an ADM brand name), textured soy concentrates, soy oil products. Address: P.O. Box 234, Lafayette, California 94549.

6961. Suzuki, Tatsuro; Ohta, Teruo. 1979. Shihan nattô-kin no seishitsu ni kansuru kenkyû [Studies on the biological properties of commercial natto starters]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 34. p. 266-72. Jan. [7 ref. Jap; eng]
• ***Summary:*** The modern process of making natto uses a suspension of pure culture *Bacillus natto* spores as the starter culture. "The biological properties of four kinds of commercial natto starters which were" used for making natto in 1974 were investigated.

Eleven strains of natto bacteria separated from four commercial natto starters showed different characteristics on plate cultures. Seven strains were identified as *Bacillus natto* and four strains as *Bacillus lichenifomis.* Of the later four strains, each contained two types of bacillus spores at the level of 10^8 per 1 ml or 1 gram.

The 7 strains of *Bacillus natto* showed differences between one another in "the strength of hydrolysis of starch or gelatin and the production of acetyl methyl carbinol."

Note: 3-Hydroxybutanone, also known as acetoin or acetyl methyl carbinol, is a colorless or pale yellow to green yellow liquid with a pleasant buttery odor (Source: Wikipedia, Oct. 2008). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6962. Taira, Harue; Taira, Hirokadzu; Yoshio, Mori; Ushirogi, Toshizo; Fujimori, I.; Kawasaki, Y.; Suzuki, N.; Koyatsu, H.; Takei, R. 1979. Daizu shushi no kansô shori hôhô to sono hinshitsu ni tsuite. III. Teisui-bun ganryô shushi no kansô shori ga shushi no butsuri-teki seijô oyobi kakô tekisei ni oyobosu eikyô to tôfu oyobi nattô no kôjô seizô shiken [Influence of dry treatment after harvest on quality of soybean seeds. III. Influence of low moisture seeds drying on the physical properties and suitability for food processing and factory production of tofu and natto]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 34. p. 19-28. Jan. [9 ref. Jap; eng] Address: National Food Research Inst., MAFF, Tokyo, Japan.

6963. Taira, Harue; Taira, Hirokadzu; Saito, Masataka. 1979. Daizu no ryûdo, hinshu oyobi saibai-nendo ga kagaku seibun sosei ni oyobosu eikyô. V. Kariumu, rin, maguneshiumu oyobi karushiumu ganryô [Effect of size of seed, variety, and crop year on the chemical composition of soybean seeds. V. Potassium, phosphorus, magnesium, and calcium content]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 34. p. 169-77. Jan. [15 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nippon Sakumotsu Gakkai Kiji* (*Proceedings of the Crop Science Society of Japan*) 46:483-91 (1977). Address: National Food Research Inst., MAFF, Tokyo, Japan.

6964. Wang, H.L.; Mustakas, G.C.; Wolf, W.J.; Wang, L.C.; Hesseltine, C.W.; Bagley, E.B. 1979. Soybeans as human food: Unprocessed and simply processed. *USDA Utilization Research Report* No. 5. iv + 54 p. Jan. Slightly revised, July 1979. Jan. No index. 28 cm. Compiled for USAID. [50+ ref]
• ***Summary:*** Contents: Introduction. 1. Soybean food uses in Asia. China: Soaking dry soybeans, tou chiang (soybean milk), tou fu (soybean curd), processed tou fu products, tou fu pi (protein-lipid films), huang tou ya (soybean sprouts), whole soybeans, fermented soybean foods, production and consumption.

Japan: Tofu (soybean curd), kinugoshi tofu, processed tofu products, yuba (protein-lipid film), soybean milk, gô (ground soybean mash), daizu no moyashi (soybean sprouts), whole soybeans (edamame {fresh green soybeans}, whole dry soybeans, kinako), fermented soybean foods: Production and consumption.

Korea: Tubu (soybean curd), processed tubu product, soybean sprouts, whole soybeans (green soybeans, parched or roasted soybeans, boiled soybeans), soybean flour ("Soybeans are first roasted and then ground into flour. The flour is used extensively as an ingredient in food preparations." Note: The name of the roasted soy flour is not given), fermented soybean foods (Soy sauce and [soy] bean paste are commonly used in Korea as flavoring agents. Natto is also enjoyed). production and consumption [of soybeans in Korea].

Indonesia: Tahu or tahoo (soybean curd), bubuk kedele (soybean powder. "Soybeans of the white variety are roasted until no beany flavor can be detected. They are ground into a powder and mixed with such spices as garlic and chili"), tempe kedele, tempe gembus [the name in Central and East Java for okara tempeh], oncom tahu [the name in West Java for okara onchom], other soybean products (soybean sprouts,

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green soybeans, roasted and boiled soybeans, kecap {soy sauce}, tauco {soybean paste}), food mixtures, production and consumption.

Thailand: Tofu (*tauhu*), soy sauce, green soybeans in the pods (*tourae*).

Philippines: Soybean sprouts, soybean coffee, soybean cake, soybean milk, tou fu and processed tou fu products, production and consumption.

Burma. India. Malaysia. Nepal. Singapore. Sri Lanka (Ceylon). Vietnam. Middle East. References–Soybean food uses in Asia.

2. Soybean food uses in Africa. Ethiopia: Injera, wots and allichas, kitta, dabbo, dabokolo, porridge. Kenya. Morocco. Nigeria: Whole soybeans, soybean paste, corn-soy mixtures (soy-ogi). Tanzania. Uganda. Production. References–Soybean food uses in Africa.

3. Soybean food uses in Europe and U.S.S.R.

4. Soybean food uses in Latin America. Argentina. Bolivia. Brazil. Chile. Colombia. Ecuador. Guyana. Paraguay. Peru. Uruguay. Venezuela. Mexico: New village process, commercial developments. Honduras. Costa Rica. Panama. Dominican Republic. Jamaica. Haiti. Trinidad. References–Soybean food uses in Latin America.

5. Soybean food uses in North America. United States. Canada. References–Soybean food uses in North America.

6. Soybean food uses in Australia. 7. Summary of soybean food uses. Traditional soybean foods: Soybean milk, soybean curd and processed soybean curd products, protein-lipid film, soybean sprouts, tempe (tempeh), green soybeans, boiled soybeans, roasted soybeans, soybean flour, soy sauce, fermented soybean paste, fermented whole soybeans, natto, fermented soybean curd. Experimental soybean foods: Whole soybean foods, soybean paste, soy flour, soy beverage. Production and consumption.

8. Simple village process for processing whole soybeans: Equipment, process, sanitation requirements, quality of product, evaluation of product in formulas and procedures for family and institutional use in developing countries. NRRC village process. 9. Industrial production and selling prices of edible soybean protein products.

10. Barriers to accepting and using soybeans in food: Availability. Cultural and social factors. Texture. Flavor. Nutrition and food safety. Technology development. Technology transfer.

Tables: (1) Soybean production, imports, and total supply in Taiwan, 1962-1975. (2) Consumption of soybean foods in Taiwan, 1964-1974 (incl. tofu, which increased from 18.75 kg per person per year in 1964 to 32.04 kg per person per year in 1974). (3) Supply and disposition of soybeans in Japan, 1971-1974. (4) Metric tons of whole soybeans used in the production of traditional foods (miso, shoyu, tofu and others) in Japan, 1970-1974, etc. Address: NRRC, Peoria, Illinois.

6965. *Whole Foods* (*Berkeley, California*). 1979. The food of the future. 2(1):22-24. Jan.

• ***Summary:*** The article begins: "Why devote an entire issue of *Whole Foods* to the subject of soyfoods? Soyfoods are a rapidly growing part of the natural foods industry..."

"The bringing of the 'Soyfoods Revolution' to the natural foods industry is the work of individuals, toying and playing with new recipes in their own kitchens and shops. No person deserves more credit for this revolution than William Shurtleff who, along with Akiko Aoyagi, wrote *The Book of Tofu*, and told us all how to do it. (An updated pocket-size version of *The Book of Tofu* is just off the presses of Ballantine Press.) Shurtleff travels the globe, sharing his expertise on soyfoods, covering topics as specific as chip-dip recipes and as broad as the role of soybean production in future patterns of world protein hunger.

"Other individuals, most of them with small soyfoods shops of their own, met recently to form the Soycrafters Association of North America (SANA), which is likely to serve as the backbone of the Soyfoods Revolution in the natural foods industry. [Note: This historic first meeting was held on 28-30 July 1978 at The Soy Plant in Ann Arbor, Michigan.] SANA selected Larry Needleman as its first president. Needleman, whose Bean Machines, Inc. imports the prime line of Takai tofu and soymilk equipment from Japan, has been a major source of information about soyfoods equipment for our industry.

"Needleman wrote about the spirit of the new organization at its first gathering in Ann Arbor.

"'Imagine a group of seventy people representing enthusiastic dedication (almost to the point of craziness) to the production and distribution of tofu and other soyfoods, gathered in an informal setting in a university town in the Midwest, with meetings scheduled from nine in the morning till eleven at night–and you've got a good idea of what went on... 'Sharing began immediately. Groups of people gathered here and there and began asking each other about their shop or organization. Those passing by would hear a familiar word such as 'yield' of [sic, or] 'pressure-cooker' and just stopped to join the conversation. It was apparent that here was a gathering destined to be stimulating and mutually beneficial...

"'The first evening, Bill Shurtleff set up a slide show about tofu and miso production in Japan. The presentation ran the gamut from small, traditional shops built over their own well, to large, fully-automated factories turning out tens of thousand of pounds per day. Bill answered questions and added a personal touch to the showing because he had shot the photos himself over a period of years, and was familiar with the language, traditions and production of the Japanese...

"'On Saturday morning, The Soy Plant showed us their method of producing tofu and soymilk. Those with less experience absorbed information and asked questions,

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and those with more experience volunteered information, clarified points and offered suggestions. Then Wataru Takai, the overseas manager for Takai Tofu and Soymilk Equipment Co., Japan's largest manufacturer of this equipment, explained principles behind each step of production, and the uses of the equipment...

"'At a later session, it was remarked that many soyfoods producers are operating on an inefficient and labor-intensive basis. Some felt this was a good way to begin, first becoming intimate with the steps of production and developing a market 'track record,' and then using that base to upgrade production by purchasing more sophisticated equipment. Others felt that the time and energy involved in putting together a makeshift shop which was outgrown in about six months would be better spent in the capital to start at higher technological level...

"'In one of the most popular and exciting discussions of the conference, the consensus of the group was that tofu and soymilk were the foods that Americans have been waiting for. A list of related products that have been marketed with incredible success included tofu burgers, no-egg salad, honey soymilk ice cream, tofu chip-dips and dressings, flavored soymilk, tofu 'mayonnaise,' and pressed, marinated tofu. There was unanimous agreement that it was these new soyfoods that would capture the interest and palate of middle America, people who had turned up their noses at that tasteless white cake of tofu floating in water...

"'Later we discussed the problems of proper storage and display of our products. In US food markets, tofu has usually been sold with Oriental foods in the vegetable section. Getting it moved to a cooler, more appropriate cheese display case, where it will stay fresh longer and compete favorably with dairy products, has met with resistance...

"'In the evening, another slide show by Bill Shurtleff showed us how tempeh, a key protein source for millions of people in Indonesia, is quickly and simply produced as a cottage industry in their homes. Having sampled this unusual food at lunch, we were eager to learn about it because it was delectable. Somewhere between a deep-fried fish cake and Kentucky fried chicken in flavor and texture, it lent itself to use in a seemingly endless variety of ways...'

"Toward the end of the conference, discussion turned to marketing and finance. It was found that some firms lacked capital for growth, while others had enough capital but needed greater management skills to keep up with the growing demand for soyfoods. That demand is not uniform nationwide. Different regions show various levels of consumer awareness, interest in, and acceptance of soyfoods. Printed hand-out sheets and cooking classes were suggested as promotional efforts were an important part of the creation of a desirable image for soyfoods.

"Before leaving Ann Arbor, the participants formed the Soycrafters Association of North America as a trade association to promote soyfoods and exchange information among the members. With the founding of SANA, the Soyfoods Revolution took its longest recent stride. Soycrafters were no longer isolated persons, groups and shops, but had become a nationwide network devoted to the same purposes, sharing their experiences for mutual benefit and the ultimate benefit of the American consumer."

Note: The word "soyfoods" is used throughout this article.

6966. Molotsky, Barbara. 1979. Of hearts and intimate hours. *Chicago Tribune.* Feb. 9. p. B1.
• ***Summary:*** If you want to be left alone, visit Fuji, a Japanese restaurant at 76 W. Lake St. "Take tea for two in one of three private tea houses..." "The sukiyaki features sliced beef, soy bean cake [tofu], bamboo shoots, fresh mushrooms, and assorted fresh vegetables prepared at your table and priced at $8.50."

6967. *GOMF News* (*Oroville, California*). 1979. Nigari/Tofu quality. Feb. p. 4. *
Address: 1544 Oak St., Oroville, California.

6968. Yamashita, Michiko; Arai, S.; Imaizumi, Y.; Amano, Y.; Fujimaki, M. 1979. A one-step process for incorporation of L-methionine into soy protein by treatment with papain. *J. of Agricultural and Food Chemistry* 27(1):52-56. Jan/Feb. [20 ref]
Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Tokyo, Japan.

6969. Kudo, Shiro; Ishino, K.; Akaba, K. Assignors to Asahimatsu Koridofu K.K., Nagano, Japan. 1979. Preparation of a cheese food. *U.S. Patent* 4,144,358. March 13. 1 p. Application filed 7 Jan. 1977. [7 ref]
• ***Summary:*** Describes a fermented cheese made from ground whole soybeans and dairy cheese. The agitated mixture is fermented by the enzymatic action of microorganisms in the natural cheese. Address: Asahimatsu, Iida, Japan.

6970. *Toyo Shinpo* (*Soyfoods News*). 1979. Nattô senka: Nattô no hozonshoku [Natto specialty products: Preservable types of natto]. March 21. p. 13. [Jap]
• ***Summary:*** Many recipes for making natto are given.

Note: Dr. Teruo Ohta says that the Tohoku region of Japan has the highest natto consumption at 200 gm per person per month. Next comes the island of Hokkaido and the Kanto region, each at 100-150 gm per person per month. In the Kansai (Kyoto–Osaka–Kobe) and Kyushu regions it is only about 50 gm per person per month. In 1968 there were about 1,600 commercial natto makers in Japan and they produced 80,000 tons of natto. In the old days, natto took 2-7 days to ferment.

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6971. Fukushima, D. 1979. Fermented vegetable (soybean) protein and related foods of Japan and China. *J. of the American Oil Chemists' Society* 56(3):357-62. March. [10 ref]
• ***Summary:*** Contents: Abstract. Introduction. Soy Sauce: Fermented soy sauce: Japanese and Chinese styles of soy sauce and their characteristics. Manufacturing process. Comparison of fermented soy sauce with chemical soy sauce. Fermented soy paste. Chinese soybean cheese (sufu). Fermented whole soybean (natto). New fermented soybean products.

Tables show: (1) Types of fermented soy sauce (shoyu) in Japan. The five types are koikuchi shoyu [regular shoyu] (85.4% of total; 1.050 million kiloliters a year), usukuchi shoyu [light-colored shoyu] (11.1%), tamari shoyu (2.2%), shiro shoyu [clear shoyu] (0.4%), and saishikomi shoyu [twice-fermented shoyu] (0.3%).

(2) Consumption of whole soybeans and defatted soybeans in Japan, 1976 (one-third is for foods, especially shoyu, and two thirds is for feed).

(3) Typical composition of soy sauces recognized by the Japanese government. The five types are the same as those discussed in Table 1, however their names are spelled out in full.

Note 1. This is the earliest English-language document seen (April 2012) that uses the word "saishikomi" or the term "saishikomi shoyu" to refer to twice-fermented shoyu, which is one of Japan's five basic types of shoyu.

Note 2. This is the earliest English-language document seen (April 2012) that uses the term "shiro shoyu" to refer to light shoyu, which is one of Japan's five basic types of shoyu.

(4) Annual production of soy sauce by grade, as graded by the Japanese Agricultural Standard (JAS) in 1976. The 3 grades are special (53.4% of total), upper (26.0%), standard (12.9%), non-JAS mark (7.7%). Total production is 1.226 million kiloliters.

(5) Chemical composition of major types of miso in Japan. The five types are rice miso (sweet, semisweet, and salty), barley miso (semisweet), and soybean miso (salty). For each is given the color, aging time, chemical composition, and total tonnage produced.

Figures show: (1) Flow sheet for making koikuchi (regular) shoyu. (2) Flow sheet for making tamari (regular) shoyu.

(3) Two chromatograms comparing the organic acids of fermented and chemical (HVP) soy sauce. Fermented soy sauce has an abundance of lactic acid, whereas HVP soy sauce has an abundance of formic acid.

(4) Flow sheet for making rice miso. (5) Flow sheet for making sufu [fermented tofu]. (6) Flow sheet for making natto. (7) Flow sheet for making fermented soy milk drink. One such drink appeared on the Japanese market last year. *Lactobacillus casei, L. acidophilus,* and *L. bulgaricus* are typically used as starters for fermented soy milk drinks.

Concerning fermented whole soybean (natto): It is a traditional fermented food that originated in the "northern parts of Japan 1,000 years ago." It is usually served with shoyu and mustard.

A portrait photo shows Danji Fukushima. Address: Kikkoman Foods, Inc., P.O. Box 69, Walworth, Wisconsin.

6972. Fukushima, D. 1979. Additional comments on traditional fermented foods. *J. of the American Oil Chemists' Society* 56(3):379-80. March. [2 ref]
• ***Summary:*** See also p. 357-62. Address: Kikkoman Foods, Inc., P.O. Box 69, Walworth, Wisconsin.

6973. Hesseltine, C.W. 1979. Other fermented foods. *J. of the American Oil Chemists' Society* 56(3):380-81. March.
• ***Summary:*** Discusses four more examples of traditional fermentations that have been industrialized: Kaffir beer (Bantu beer), the new Kikkoman plant in the USA, mahewu (sour maize from South Africa), and tempeh. Address: NRRC, Peoria, Illinois.

6974. Inouye, Jun; Shanmugasundaram, S.; Matsuyama, T. 1979. Effects of temperature and daylength on the flowering of some photo-insensitive soybean varieties. *Japanese J. of Tropical Agriculture* 22(4):167-71. March. [13 ref. Eng; jap]
• ***Summary:*** If suitable varieties are available, soybeans can (theoretically) be cultivated year round in the tropics and sub-tropics. Among the photo-insensitive soybean varieties, the presence of two growth types was recognized. Address: 1&3. Inst. of Tropical Agriculture, Kyushu Univ., Fukuoka 182, Japan; 2. AVRDC, Taiwan.

6975. **Product Name:** [Mapron Soymilk (Plain, with Orange Juice, Coffee Mix, or Fruit Sour {Apple & Prune})].
Foreign Name: Mapuron Tônyû (Sutoreeto, Orenji Kajû-iri, Koohi Mikksu, Fruutsu Sawaa).
Manufacturer's Name: Mitsubishi Chemical Foods Co., Ltd. (Mitsubishi Kasei Shokuhin).
Manufacturer's Address: Ginza 5-13-12, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1979 March.
Wt/Vol., Packaging, Price: 200 ml Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Shurtleff & Aoyagi. 1979. Tofu & Soymilk Production. p. 313. "Mitsubishi Chemical Industries Ltd., Marunouchi 2-5-2, Chiyoda-ku, Tokyo 100, Japan. Tel. 03-283-6659. Mr. Hideyuki Fukuzawa, manager, foods and food additives dept., New Enterprise division. Maker of isolate soymilk and soymilk kefir."

Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that Mitsubishi Kasei Shokuhin first made commercial soymilk in Japan in 1979.

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K. Tsuchiya. 1982. Dec. Tonyu [Soymilk. 2nd ed.]. p. 72. In March 1979 Mitsubishi Kasei Shokuhin launched Tonyu Mapuron (in Sutoreeto, Orenji Kajû-iri, Koohi Mikksu, and Fruutsu Sawaa flavors) in 200 ml aseptic cartons.

Labels. 1983. Tetra Brik carton, 200 ml. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center; Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-68. By 1982 Mitsubishi was Japan's third largest manufacturer of soymilk. Soya Bluebook. 1987. p. 90. Mitsubishi Chemical Industries, Ltd., Food Division, Marunouchi 2-5-2, Chiyoda-ku, Tokyo 100, Japan. Plant at Kurashiki-shi.

6976. Sakaguchi, Yukio. 1979. Opening remarks–Vegetable proteins in fermented foods and other products. *J. of the American Oil Chemists' Society* 56(3):356. March.
• ***Summary:*** "Miso, or soybean paste, one of the most important fermented soybean foods, was originally made in China. A missionary who was sent [from Japan] to China learned its production and modified it into a product suited to the Japanese taste in the 7th century. About 185,000 tons of soybeans are used for miso production annually.

"Another major fermented soybean food is soy sauce which was originally developed by the Zen Monk Kakushin in 1234. He also visited China and discovered that the liquid portion from Miso was very delicious. This liquid became the base for soy sauce, an essential ingredient in the Japanese diet. Soy sauce required the annual use of nearly 175,000 tons of soybean meal, the equivalent of 222,000 tons of soybeans.

"Natto, the third major fermented soybean product of Japan, originated in our country. In 1087, a ruler in the northern part of Japan discovered natto to be part of local farmers' diets. Today, nearly 60,000 tons of soybeans are consumed in its production.

"As Japan continues to draw from its historic past for a source of soy-based foods, we also are full participants in the new era of sophisticated vegetable protein foods. To promote utilization and production of this product, the Japan Vegetable Protein Food Association was organized in 1975."

A photo shows Dr. Yukio Sakaguchi. Address: Japan Vegetable Protein Food Assoc., 9th Floor, Rainbow Building, 2-15-17 Nishi-Shinbashi, Minato-ku, Tokyo, Japan.

6977. Shanmugasundaram, S. 1979. Varietal development and germplasm utilization in soybeans. *AVRDC Technical Bulletin* No. 13 (78-102). 36 p. March. (Shanhua, Taiwan). [90 ref]
• ***Summary:*** An excellent overview of the subject. Contents: Introduction. Historical background of soybeans. Botany of the soybean. World trends in soybean production. Strategies in varietal development: U.S.A., Japan, Republic of China (Taiwan). International programs: Illinois–India, Asian Vegetable Research and Development Center (AVRDC), Program for International Research, Improvement and Development of Soybeans (PIRIDS)–International Soybean Resource Base (INTSOY), International Institute of Tropical Agriculture (IITA), Thailand–Japan, Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA). Concepts for future development.

Table 2 gives the taxonomic status and nomenclatural history of the soybean. Table 3 lists vernacular names of the soybean in 36 countries or regions of the world. Gives a brief history of soybean breeding and germplasm collections in each of the major soybean countries. Address: Asian Vegetable Research & Development Center, Shanhua, Taiwan.

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6978. Sipos, E.F.; Endres, J.G.; Tybor, P.T.; Nakajima, Y. 1979. Use of vegetable protein in processed seafood products. *J. of the American Oil Chemists' Society* 56(3):320-27. March. [21 ref]
• ***Summary:*** Contents: Abstract. Introduction. Soy protein products–description and manufacture. Soy protein products–functionality. Soy protein products–nutrition. Fish-soy products–U.S.A. and Europe: Flaked, minced or comminuted flesh, fish muscle augmentation system. Fish-soy products–Japan. A photo shows one of the authors. Address: 1-3. Central Soya Co. Inc., Food Research, Ft. Wayne, Indiana; 4. Protein Food New Enterprise Div., Meiji Seika Kaisha, Ltd., Tokyo, Japan.

6979. Taira, Harue; Taira, Hirokadzu; Kunii, Teruo; Fujimori, Ikuo. 1979. Daizu shushi no kansô shori hôhô to sono hinshitsu ni tsuite: II. Chûryû shushi ni okeru butsuri-teki seijô oyobi kakô tekisei no henka [Influence of dry treatment after harvest on quality of soybean seeds. II. Physical properties and suitability for food processing of the middle seed-size variety]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 34. p. 13-18. March. [9 ref. Jap; eng]
Address: National Food Research Inst., MAFF, Tokyo, Japan.

6980. Thomson, W.A.B. 1979. Infant formulas and the use of vegetable protein. *J. of the American Oil Chemists' Society* 56(3):386-88. March. [15 ref]
• ***Summary:*** Contents: Abstract. Infant formulas and the use of vegetable protein. A photo shows Thomson. Table 2, titled "Soy-based infant formulas," gives the name, product form (P = powder. R = ready to eat. C = concentrated liquid) and manufacturer or each. Bon Lact, P, Wakodo Pharmaceuticals, Japan. Espelin, P, Med-Nim (PTY) Ltd., South Africa. Isomil, R C P, Abbott Laboratories (Ross), USA. Lactopriv, P, Topfer, West Germany. Mull-Soy, C, Syntex Laboratories, USA. Multilac, P. Carlo Erbe S.p.A., Italy. Neo-Mull-Soy, R C, Syntex Laboratories, USA. Nursoy, R C, Wyeth Laboratories, USA. Nutri-Soja, C P, N.V. Nutricia, The Netherlands. Prosobee, R C, Mead Johnson, USA. Sobee, P, Mead Johnson, USA. Soja Semp, C, Semper, Sweden. Soyalac, R C P, Loma Linda Foods, USA. i-Soyalac, C, Loma Linda Foods, USA. Vegebaby, R, Laboratoire Sopharga, France. Address: PhD, Ross Laboratories, 625 Cleveland Ave., Columbus, Ohio.

6981. **Product Name:** [Bon Lact {Soy-Based Infant Formula} (Powder)].
Foreign Name: Bon Lact.
Manufacturer's Name: Wakodo Pharmaceuticals.
Manufacturer's Address: Kaji-cho 2-12, Kanda, Chiyoda-ku, Tokyo, Japan. Phone: 03-252-0331.
Date of Introduction: 1979 March.
New Product–Documentation: Shurtleff & Aoyagi. 1975. *The Book of Tofu.* p. 202. "One type of powdered soymilk, called *Bonlact,* is especially formulated for infants and growing children." An illustration shows the cylindrical container.

Thomson. 1979. *Journal of the American Oil Chemists' Society.* March. p. 386-88.

6982. **Product Name:** [Senibon {Powdered Soymilk}].
Foreign Name: Senibon.
Manufacturer's Name: Wakodo Pharmaceuticals.
Manufacturer's Address: Kaji-cho 2-12, Kanda, Chiyoda-ku, Tokyo, Japan. Phone: 03-252-0331.
Date of Introduction: 1979 March.
New Product–Documentation: Shurtleff & Aoyagi. 1979. Tofu & Soymilk Production. p. 313. "A maker of powdered soymilk brand-named Senibon." The company's name is given as simply Wakodo. The address and phone number shown above are also given.

6983. Yasuda, K. 1979. General situation on utilization of vegetable proteins for foods in Japan. *J. of the American Oil Chemists' Society* 56(3):338-40. March.
• ***Summary:*** Contents: Abstract. Introduction. Discussion.
Address: Nisshin Oil Mills, Yokohama, Japan.

6984. Borsook, Henry. 1979. Henry Borsook–How it was: Oral history. *Engineering and Science* (*Caltech*). March/April. p. 23-39.
• ***Summary:*** This outstanding interview by Mary Terrall covers a wide variety of subjects, including the early history of multi-purpose food and Meals for Millions. "Borsook, noted for his work in protein synthesis and for his contributions to the field of nutrition, was born in London, England, in 1897, and came to Caltech in 1929. After retirement from Caltech in 1968, he continued his research until 1978 at the University of California at Berkeley. The Borsooks are now living in Santa Barbara.

MT (p. 27): Let's go back to the 1940s when you started to develop multipurpose food. HB: Yes, and the beginning of that story is really about Clifford Clinton, who was the son of missionary parents. In "China, as a child, he had seen famine, and he'd made a boyhood resolve that if he could ever do anything about helping hungry people, he would. So it was not surprising that when he grew up he went into the restaurant business." During the depression, starting in 1931, "he advertised that anyone who came to his cafeteria between 2:00 and 4:00 [in the afternoon] could get a free meal." Later he felt the offer was being taken advantage of, "so he charged a nickel for a meal. The last time I ate there, which was more than ten years ago, the menu said, 'You can order what you like–and you can pay what you like.'

"When the war came, with the enormous expansion

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of the armed forces from a couple of hundred thousand to twelve million, the army needed advice on how to feed a lot of people in camps quickly. And so they called in consultants from the restaurant business, and Clinton was one of those consultants.

"Then, one afternoon in early 1945–he'd phoned first–he and his wife and his public relations man [Ernest Chamberlain] came to see me. And before he began to talk his wife intervened and said, 'I want to apologize because my husband is coming here with a perfectly ridiculous proposal. I tried to dissuade him from coming but he's very stubborn, and so I want you to know that I feel a bit ashamed.' So I said, 'Well, you needn't be. You're here. Make yourselves comfortable and let's listen.'

"So Clinton began to talk, and he said that anybody who thought about it could see the war coming to an end, that in the countries where the war had been going on a lot of people were going to be hungry, and that there was going to be a shortage of food in Europe and Asia, and he wanted to do something about it. And he said he wanted me to do this–I was to devise a food where a meal would provide one-third of the Recommended Daily Allowances of everything, but it was to weigh not more than two ounces and it was to cost not more than three cents, it was not to offend any religious taboo, there should be an abundant supply of all the ingredients, and it wouldn't draw on the kinds of food Americans are accustomed to eat. (I said, 'You needn't worry–at that price."). Also it had to have an indefinite shelf life, be possible to eat in a variety of ways, and not take any special equipment to cook–a can of water and a stick of wood underneath should do it.

"And so we went on. I turned to his wife and I said, 'Well, it's not so wild as you may think, but there are two restrictions I would put on it. It's scientifically impossible to provide a third of the Recommended Daily Allowances in two ounces of anything. It is just not possible. We need about 700 or 800 calories as a minimum, and the most that two ounces would supply would be about 140 or 150 calories.' Secondly, I said, "I don't think it would be practical to put vitamin C in because we really don't know how to keep it.' At that time we didn't. But I said, 'Otherwise we could provide protein that's as good as meat or milk, and we could add all the vitamins and minerals that they need in two ounces, and I don't think it need cost more than about 3 cents a meal.' So he agreed and gave Caltech the sum of $5,000, which I was to use to develop this food.

"The food itself was no problem. I had a pretty good idea how to do it. It had to be a vegetable protein; animal proteins were too dear [expensive]. The best vegetable protein was soybean protein, and I knew that during the war we–the government–had greatly expanded the growth of soybeans for their oil. But after the oil was extracted, what was left over [the cake or meal] was thrown down the sewer. It was just wasted. So I knew this would be very cheap, and I knew it was available in large quantities. The vitamins and minerals I knew were also very cheap and there would be no problem about adding them.

"What I wanted the money for was to hire a cook who could develop recipes on how to use the food, how it should be cooked in different ways. And that was done. At the end of a year it was all ready, and we had a whole lot of recipes. One of the fruit and vegetable dehydrator companies in Los Angeles undertook to make it according to the recipe I had drawn up, and that was done. We decided to call it 'multipurpose food': MPF.

"Neither Clinton nor I wanted to patent this food, and we agreed that we would give the information to anybody who asked for it. But that wasn't going to get the food to hungry people, so Clinton, who was a religious man, set up this Meals for Millions Foundation, a nonprofit organization. I was one of the cofounders with two or three others. He hired a woman by the name of Florence Rose and his publicity man, Ernest Chamberlain, was the other, who really were the foundation. They sent out the appeals for money, they raised the money, bought the food, and so on.

MT: "So they raised the money from other sources. It wasn't just his money?

HB: "No, I don't think he put in much money after that, but it was certainly his idea, both to get such a food and then to set up the Foundation to give the food to people who needed it. And I know that when we had the food ready we thought it would be useful if the Food and Nutrition Board [of the National Academy of Sciences] would approve of it. We sent some to them, and they said, 'No, we believe that a good diet consists of meat, milk, fresh fruit, fresh vegetables, and this is not that.' So for more than ten years [1946-1956], we had no government support–in fact, government opposition. So the money was raised from private groups. Two large charitable organizations very soon began to give us large sums of money–$50,000 to $100,000 at a time–and we would send the food where they told us to. They were Catholic World Relief and Church World Service."

MT: "So other organizations made the arrangements with countries where the food was going?"

HB: "Yes, After we had the food, we arranged for the shipping." It was a very gratifying experience. "From the beginning I had insisted... that the formula was only one example." Other nutrients, such as peanut meal, could be used in countries were soybeans are not available. "The actual director of the Foundation was Florence Rose, and we sent her around the world. She had no trouble getting the Japanese to make a Japanese equivalent, and they did a very good job. And then in India she got the head of their Central Food Technological Research Institute to put together an Indian version of MPF, and he [V. Subrahmanyan] did a first-class job.

"I think we gave this man about $5,000 and he put together–out of peanut meal and chick pea meal, adding

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vitamins and minerals–a food that was every bit as nutritious as ours. He did a very good job of testing first on mice and rats, then on children who were malnourished. Then he persuaded an Indian businessman who had some money to put up a pilot plant near Madras [in southeast India; renamed Chennai in 1996], and the city of Madras undertook to buy the whole production for use in their school lunch program. They got going, and the Minister for Agriculture for India from New Delhi told people from the provinces [states] to come down to Madras, look, and copy it.

Then along came some representative from CARE, who said to the City Council of Madras, 'Look, we'll give you all the dry skim milk you want for nothing. Why do you spend your money on this food?' That killed the project for quite a long time, but it has started up again. Two missionaries in northern India, where they have soybeans, have arranged for the manufacture, and they're beginning to get it used and widely distributed.'

MT: "Now?"

HB: "Yes, they did this entirely on their own, without any connection with us at all. But now, to come back a little, it was clear that charity would only go so far, and it would be much better if these people learned how to help themselves. So we set up a school at the Meals for Millions Foundation in Santa Monica, where we teach three classes a year. It runs for 12 weeks with about a dozen students from different parts of the world, on scholarships of one kind or another, and they learn how to make food like MPF from what they have. We do more than that..."

MPF was always made with soy grits as the main ingredient, not with soy flour. Grits are a better material and a better word.

"The Meals for Millions Foundation was founded in 1946 and miraculously is still going, stronger than ever, really." Address: Prof. of Biochemistry, Emeritus, Caltech.

6985. **Product Name:** [Meiji Sunglow Soymilk (Plain)].
Foreign Name: Meiji San-guroo Tônyû (Pureen).
Manufacturer's Name: Meiji Milk Products Co. Ltd. (Meiji Nyugyo) (Marketer). Made in Japan by Marusan.
Manufacturer's Address: Kyobashi 2-3-6, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1979 April.
New Product–Documentation: Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that Meiji Nyugyo first made commercial soymilk in Japan in 1980.

K. Tsuchiya. 1982. Dec. Tonyu [Soymilk. 2nd ed.]. p. 72. Meiji Nyugyo launched Meiji San-guroo Tonyu (Pureen) in a 200 ml long-life (aseptic) carton in March 1981.

Soya Bluebook. 1984. p. 62. "Sungrow Soy Beverage." Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64. Tremendous momentum was added to the new soymilk boom "in April 1979, when Meiji Milk Co., Japan's second largest dairy milk company (sales of $1,400 million in 1982), started to sell Sunglow soymilk (made by Marusan but with the Meiji brand). Meiji first began to make their own soymilk in their own plant in March 1981."

6986. **Product Name:** Kome Miso.
Manufacturer's Name: Shin-Mei-Do Miso Co.
Manufacturer's Address: 5 Wren Road, Denman Island, BC, Canada V0R 1T0. Phone: 604-335-0253.
Date of Introduction: 1979 April.
Ingredients: White rice koji, soybeans, salt, water.
New Product–Documentation: Letter/Order from Lulu Yoshihara. 1976. Nov. She orders a copy of *The Book of Miso, Vol. II.*

Letter from Lulu Yoshihara. 1981. Sept. 9; Martin. 1982. Comox District Free Press. Sept. 17; Leviton. 1983. Soyfoods. Winter. p. 36-37; Shurtleff & Aoyagi. 1983. Book of Miso. 2nd ed. p. 238. The company was started in April 1979 by Lulu Yoshihara. Leviton. 1982. In a Small Bright Building. Yasuo (nickname "Yoshi") grew up on a farm in Japan and already knew how to make miso. The shop can make about 10,000 lb of miso in a typical year. Yasuo & Lulu Yoshihara run the business.

Talk with Yasuo Yoshihara. 1996. March 22. Their first miso was a white rice miso named "Kome Miso." It was sold only to natural- and health food stores. His business is active and growing. They make brown rice miso and barley miso, each sold in 450 gm and 4.5 kg plastic tubs. Lulu does the bookkeeping.

6987. Watanabe, Tokuji. 1979. Developments in the processing of traditional soybean foods in Japan. In: Hideo Chiba, et al., eds. 1979. Proceedings of the Fifth International Congress of Food Science and Technology (1978-Kyoto). Tokyo: Kodansha Ltd.; Amsterdam and New York: Elsevier Scientific Publishing Co. xi + 436 p. See Chapter 2.1, p. 66-73. Illust. Author index. Subject index. 26 cm. Series: Developments in Food Science, Vol. 2. [9 ref]
• ***Summary:*** Chapter 2, titled "Efficient utilization of food resources," has three parts, of which this is the first. Contents: Introduction. Tofu (incl. "packed tofu" using GDL as a coagulant). Kori-tofu. Miso. Soy sauce (shoyu). Natto. Conclusion. A figure shows five flow-sheets, one for making each of the different foods mentioned above.

The importance of soybeans as a food ingredient in Japan is evident from the fact that nearly 1 million metric tons of soybeans, including those used after oil extraction, are consumed each year to make tofu, kori-tofu, natto, miso, soy sauce, and other foods. "The development of automated equipment for continuous processing has made mass production of these foods possible, ensuring evenness of quality and lowness of price, to the benefit of consumers." Address: Kyoritsu Women's Univ., 2-2-1 Hitotsubashi, Chiyoda-ku, Tokyo 101, Japan.

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6988. Yoshida, Hiromi; Kajimoto, Gorô. 1979. Qualitative and quantitative changes in sterol lipids of cotyledons of germinating soybeans. *Agricultural and Biological Chemistry* 43(4):705-12. April. [30 ref]
Address: Faculty of Nutrition, Kobe-Gakuin Univ., Tarumi-ku, Kobe, Japan.

6989. Kijima, Atsushi; Tozaki, Shigenobu; Yamada, Masahiko. Assignors to Meiji Seika Kaisha, Ltd. (Tokyo, Japan). 1979. Method of removing objectionable flavors and odors from textured soy protein. *U.S. Patent* 4,152,465. May 1. 10 p. Application filed 1 July 1977. [6 ref]
• ***Summary:*** The process of heating textured soy protein to 80-145ºC under pressure removed green beany odors and flavors without creating bitterness. "Green beany flavors and odors characteristic of soybean can be removed to a satisfactory extent from a textured soy protein by a method comprising (i) the first step of treatment wherein the soy protein is retained at a temperature of from 80º to 145ºC for a suitable period of time while the water content of said soy protein is maintained at a predetermined value, and (ii) the second step of treatment wherein said moistened soy protein treated in the first step is kept in contact with a flow of superheated steam at a temperature of from 105ºto 160ºC."
Address: 1&3. Yokosuka, Japan; 2. Fujisawa, Japan.

6990. Brown, Marlene. 1979. How to put together a co-op party. *Better Homes and Gardens* 57(5):128, 130, 132, 138-42, 184. May.
• ***Summary:*** The menu for a traditional Japanese dinner includes "Chilled tofu hors d'oeuvres." "Garnished chunks of chilled tofu (also called soybean curd) set the stage for this Far Eastern presentation. Assemble the tofu on a bed of crushed ice at the party site..." Shabu-shabu includes tofu and soy sauce.

6991. Shurtleff, William; Birnbaum, Alfred; Aoyagi, Akiko. 1979. Agreement to write a book on Daitokuji natto and hamanatto [fermented black soybeans]. Lafayette, California. 2 p. June 2. Unpublished manuscript.
• ***Summary:*** This is the basic outline for a book contract, signed when Alfred visited Bill and Akiko in Lafayette, California. Authorship: William Shurtleff & Akiko Aoyagi, with Alfred Birnbaum.

Note: This book was never completed since Alfred's interests changed. Address: 1&3. New-Age Foods Study Center, Lafayette, California; 2. California and Japan.

6992. Bianchini, Gilberto. 1979. Re: Plans to start a tofu shop in Rimini, Italy. Letter to Wataru Takai at Takai Seisakusho in Japan, June 30. 2 p. Typed, with signature. [Eng]
• ***Summary:*** "Ref.: Your letter of March 14, 1979. Dear Sir, As I said in my letter from Berkeley, California, I'm starting a tofu shop in Rimini, Italy. I do not have any automated machinery yet, and I'm working on a small scale, hoping to expand.

"I've solved some difficulties in coping with Italian government laws regarding soybean products; my immediate need is a hot sealing machine, for a good hygienic standard of packing the tofu cakes, and actually this machine is all that I can afford to buy from your Company. As I told you, my shop will surely be of interest in the future for other people from Health Food Centers in Italy.

"For the diffusion of this product, I'm going to distribute in most parts of the country some leaflets explaining what I experienced about soybean products in my visit to tofu producers in the USA. I am not in any condition at the moment of importing and selling your equipment, but my shop, when completely finished, will be a good showroom for others interested."

He then asks for prices of equipment (especially HS-KYO-300) CIF (if possible) to the Italian port of Livorno (preferably) or Genova. He also requests a complete chemical analysis of the natural nigari sold by Takai.

"Post Scriptum: I plan to pay a visit in the future to Japan; I am studying Oriental medicine and philosophy, and I appreciate very much your country's culture and tradition."
Address: Via Cuoco 9, 47037 Rimini, Italy. Phone: 0541-33670.

6993. Kamata, Yoshiro; Okubo, K.; Shibasaki, K. 1979. Decrease of the soybean glycinin digestibility in excess denaturation: Effect of refolding. *Agricultural and Biological Chemistry* 43(6):1219-1223. June. [17 ref. Eng]
Address: 1&3. Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai; 2. Lab. of Nutrition and Food, Faculty of Education, Yamagata Univ., Yamagata. All: Japan.

6994. **Product Name:** [Tofu].
Foreign Name: Tofu.
Manufacturer's Name: La Soyarie.
Manufacturer's Address: 25 rue St. Etienee, Hull, QUE, J8X 1H5, Canada. Phone: 613-235-5356.
Date of Introduction: 1979 June.
Ingredients: Organically grown soya beans (*Feves de soja biologiques*), water, magnesium chloride (*chlorure de magnesium*).
Wt/Vol., Packaging, Price: 500 gm.
How Stored: Refrigerated.
New Product–Documentation: Won. 1979. The Ottawa Journal (ONT, Canada). Nov. 28. p. 35. Crosby. 1979. The Citizen (Ottawa, ONT, Canada). Dec. 4. p. 58. "Miracle tofu a busy way of life for couple."

Soyfoods Center. 1980. Sept. Tofu shops and soy dairies in the West (2 pages, typeset). Gives the company's name,

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address, and phone number. Owners: Koichi & Francine Watanabe.

Label. 1983. 5.5 by 4.5 inches. Plastic film. Red and black on clear film. "No preservatives. To keep fresh, replace water daily." A bit of information, "that may amuse you [from Steve Rowat, March 29, 1989]. Koichi Watanabe who runs La Soyarie in Hull, Quebec, and who left Japan at age 17, and whose brother runs a tofu operation in Japan, learned to make tofu by reading *The Book of Tofu,* in English, like I did."

6995. Nunomura, N.; Sasaki, M.; Yokotsuka, T. 1979. Isolation of 4-hydroxy-5-methyl -3(2H)-furanone, a flavor component in shoyu (soy sauce). *Agricultural and Biological Chemistry* 43(6):1361-63. June. [13 ref]
Address: Kikkoman, 399-Noda, Noda-shi, Chiba-ken 278, Japan.

6996. Shurtleff, William. 1979. The tofu and soymilk industry in the United States (News release). Lafayette, California: New-Age Foods Study Center. 1 p. June.
• ***Summary:*** The first statistics compiled on the U.S. soyfoods industry. "There are presently 150 tofu shops and soy dairies in the U.S. Ninety of these, mostly run by Caucasian Americans, have opened within the past 3 years since publication of *The Book of Tofu;* they now have about 35% of the industry sales. The remaining 60 are Japanese and Chinese run; they have an estimated 65% of the market. The industry has a brisk sales growth rate of 25% per year.

"The largest tofu factory in the U.S. is the Matsuda-Hinode company in Los Angeles; they produce about 16,000 pounds of tofu a day under fourteen different labels. The largest of the new breed of Caucasian-run plants is the New England Soy Dairy in Greenfield, Massachusetts. Founded in 1977, it now produces some 4,500 pounds of tofu a day and expects revenues of $750,000 in 1979. In its April 12 front page story on the tofu industry, *The Wall Street Journal* focused on The New England Soy Dairy.

"The U.S. tofu and soymilk industry presently uses approximately 7000 tons of dry soybeans per year.

"In July of 1978, tofu and soymilk producers founded the Soycrafters Association of North America (SANA), an educational and trade association. Its quarterly publication *Soycraft* is the primary source of information on soy protein foods in the Western World. For details contact:

"Ira Leviton, president
"Soycrafters Association of North America
"305 Wells St.
"Greenfield, MA 01301

"Worldwide, the tofu and soymilk industry is rapidly expanding. There are presently a total of 211,000 producers, including 38,000 in Japan, 158,000 in mainland China, 11,000 in Indonesia, 2500 in Taiwan, and 1470 in Korea. The largest tofu factories, located in Japan, produce over 100,000 pounds of tofu a day (15,000 tons a year) and the largest soy dairy [Vitasoy], located in Hong Kong, produces 500,000 bottles of soymilk a day (150 million bottles a year).

"Most of the new tofu shops and soy dairies in the U.S. have gotten into production using the technical manual *Tofu & Soymilk Production* by William Shurtleff & Akiko Aoyagi (who also wrote *The Book of Tofu,* which now has over a quarter million copies in print). This technical manual is available for $17.50 from:

"New-Age Foods Study Center
"P.O. Box 234
"Lafayette, CA 94549. Tel: 415-283-2991." Address: 790 Los Palos Manor, Lafayette, California 94549.

6997. Taira, Harue; Taira, Hirokadzu; Mori, Y.; Ushirogi, T.; Fujimori, I. 1979. Daizu shushi no kansô shori hôhô to sono hinshitsu ni tsuite. VI. [Influence of dry treatment after harvest on quality of soybean seeds. VI. Suitability for food processing of stored seeds]. *Nippon Sakumotsu Gakkai Kiji* (*Japanese J. of Crop Science*) 48(2):291-302. June. [11 ref. Jap; eng]
Address: 1. National Food Research Inst., Ministry of Agriculture, Forestry and Fisheries, Yatabe, Ibaraki 300-21.

6998. *East West Journal.* 1979. Cooking for health: *How to Cook with Miso,* by Aveline Tomoko Kushi (Ad). July. Inside rear cover.
• ***Summary:*** This full-page ad (black, white, and red) has a form for ordering the book for $6.95 plus $1.50 postage and handling from the *East West Journal* in Brookline, Massachusetts. This ad (black and white) also appeared in the Nov. 1979 (p. 3) issue of this magazine.

6999. *Food Product Development.* 1979. Oriental sauces thrive on ethnic food boom. 13(7):58. July.
• ***Summary:*** Discusses two new sauces made by Kikkoman Shoyu Co., Ltd. of Noda, Japan: Japanese-Style Steak Sauce (resembling Japanese Tonkatsu Sauce; $0.79 for a 12-oz bottle) and Sweet & Sour Sauce ($0.69 for a 9.5-oz jar). The ingredients of each are given. The addition of soy sauce, an ingredient not found in Kikkoman Tonkatsu Sauce, makes the Steak Sauce better suited to American tastes. Both sauces have been on the market a little more than 6 months, contain soy sauce as an ingredient and flavor enhancer (not as a base), and are made and packaged in California. Kikkoman did taste panel tests using a consulting form that employs about 200 housewives from northern California.

Note: It is not clear whether the soy sauce used in the two products is made by Kikkoman in Japan or in Walworth, Wisconsin.

7000. Midwest Soya International, Inc. 1979. MSI (Ad). *Soycraft* (*Greenfield, Massachusetts*) 1(1):Inside front cover. Summer.

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• ***Summary:*** This full-page black-and-white ad states that the company, which has been in existence for approximately four years, is interested in supplying special quality light hilum soybeans for your food use. The company was formed primarily to ship food quality containerized soybeans to East Asia–especially Japan. MSI grows soybeans and has two grain facilities, in northern and central Iowa. Address: P.O. Box 741 (209 Franklin), Cedar Falls, Iowa 50613. Phone: 319-277-6121.

7001. Needleman, Larry. 1979. Tofu study tour in Japan. *Soycraft* (*Greenfield, Massachusetts*) 1(1):40-41. Summer.
• ***Summary:*** Discusses visits to Takatsuka Marugo, Tengu Tofu, Izumiya Shokuhin, Tokyo Tofu, and Takai Tofu & Soymilk Equipment Co. Address: Bodega, California.

7002. Ohta, Naokazu; Kuwata, G.; Akahori, H.; Watanabe, T. 1979. Isoflavonoid constituents of soybeans and isolation of a new acetyl daidzin. *Agricultural and Biological Chemistry* 43(7):1415-19. July. [14 ref]
• ***Summary:*** The flavonoids of defatted soybeans were studied using a linear gradient high-performance liquid chromatographic (HPLC) procedure developed by the authors. They isolated and characterized two new soy isoflavones; one is 6"-O-acetyl daidzin, and the other (called compound III) is unknown. They also isolated daidzin, daidzein, genistin and genistein. The structures of the 6 known soybean isoflavones are shown. Address: 1. Dep. of Food Science, Kumamoto Women's Univ., Kumamoto; 2. Research Inst., Morinaga & Co., Ltd., Yokohama; 3. Faculty of Agriculture, Kyushu Univ., Fukuoka. All: Japan.

7003. Shurtleff, William; Aoyagi, Akiko. 1979. Tofu & soymilk production: A craft and technical manual. Lafayette, California: New-Age Foods Study Center (Renamed Soyfoods Center in Sept. 1980). 336 p. Illust. by Akiko Aoyagi Shurtleff. Index. July. 28 cm. First published in Aug. 1977 as a rough photocopied manuscript with a yellow cover. [223 ref]
• ***Summary:*** Contents: Preface. 1. How to start a tofu shop or soy dairy. 2. Setting up shop; The community or village shop; The traditional caldron shop; The steam cooker plant; The pressure cooker plant; The soy dairy; The automatic steam cooker plant; The modern factory. 3. Ingredients. 4. Sanitation and safety. 5. Principles of tofu & soymilk production. 6. Tofu. 7. Firm tofu, pressed tofu & smoked tofu. 8. Foods made from tofu: Introduction, creamy tofu dressing, tofu chip dip, tofu mayonnaise, tofu cream cheese, cottage cheese, sour cream, tartare sauce, tofu eggless egg spread or missing egg salad, tofunafish spread or salad, tofu rice salad, tofu cheesecake (Sprucetree Baking Co. and White Wave), tofu pies, tofu creamies or tofu-coconut cream bars, tofu tarts, tofu turnovers, tofu puddings, fruit whips, custards and parfaits, tofu cinnamon rolls, tofu whipped cream, tofu icing and cream cakes, marinated tofu (fried or baked, p. 166), tofu jerkey [sic, jerky] (p. 166), teriyaki tofu, tofu teriyaki, savory baked tofu, savory pressed tofu (with five spice powder, *wu-hsiang toufu-kan*), nori rolls with brown rice & tofu, tofu & brown rice burgers, tofu baby foods, tofu in ready-made sandwiches. 9. Using okara, whey, curds & hulls. Deep-fried tofu (cutlets, cubes, burgers, treasure balls, burger balls, pouches, puffs). 11. Soymilk. 12. Dairylike products made from soymilk: Frozen soymilk desserts (soymilk ice cream, frozen soymilk yogurt, soymilk sherbets, soysicles, frozen soymilk custard, ice soymilk), fermented or cultured soymilks (soymilk yogurt, acidophilus soymilk, soymilk kefir, soymilk piima, soymilk buttermilk and other fermented milks), soymilk cheeses (unripened fresh, unripened soft {quark, queso blanco, panir, etc.}, ripened soymilk cheeses), soymilk mayonnaise, soy shakes and energy drinks, soymilk eggnog (soy nog), soymilk whipped cream, chip dips, puddings, custards. 13. Silken tofu & pressed silken tofu (Silken tofu is made from concentrated soymilk). 14. Lactone silken tofu (GDL). 15 Grilled tofu. 16. Fermented tofu. 17. Dried-frozen tofu. 18. Yuba. Appendix A: Resources. People & institutions connected with tofu & soymilk production. B: Weights, measures & equivalents. Bibliography. About the New-Age Foods Study Center.

See ¼-page ads in *East West Journal.* 1979. Dec. p. 4. 1980. Jan. p. 19.

Note 1. This is the earliest English-language book seen with the term "soymilk," spelled as one word, in the title.

Note 2. This is the earliest document seen (Feb. 2002) that mentions tofu jerky or any kind of soy jerky.

Note 3. This is also the earliest English-language document seen (April 2013) that uses the word "quark," or "queso blanco" in connection with soy cheese or tofu.

Note 4. This is the earliest English-language document seen (Sept. 2012) that contains the term "cultured soymilks" (or "cultured soymilk").

Note 5. This is the earliest English-language document seen (Sept. 2012) that contains the term "ripened soymilk cheeses" (or "ripened soymilk cheese").

Note 6. This is the 2nd earliest English-language document seen (April 2013) that uses the term "smoked tofu," but the first that uses it in its modern sense.

Note 7. This book contains the most detailed and complete descriptions seen to date (Oct. 2012) of how to make tofu, soymilk, and yuba on a commercial scale.

Note 8. This book was first printed on 1 Aug. 1977 in a photocopied and rough-typed edition with a yellow and black cover.

Note 8. Reviews of this book appeared in many publications: (1) Richard Leviton. 1980. *Soycraft* (Massachusetts). 2(1):63-64. Winter. "An indispensable operating manual for soyfoods entrepreneurs... The illustrations alone make the book a valuable reference tool... a sustained inspiration. The only book of its kind in English."

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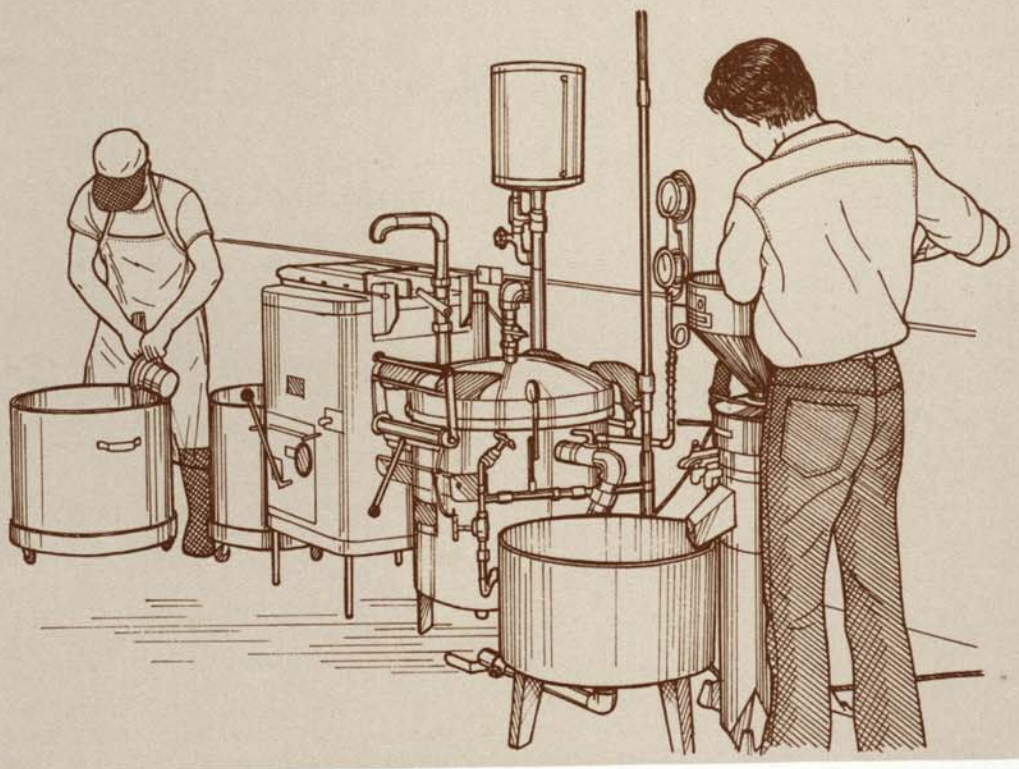
TOFU & SOYMILK PRODUCTION

THE BOOK OF TOFU , VOLUME II



WILLIAM SHURTLEFF & AKIKO AOYAGI

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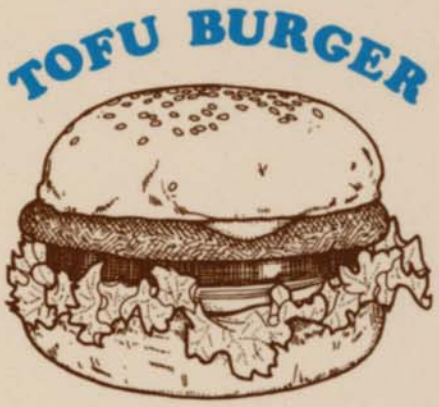
START YOUR OWN TOFU PLANT OR SOY DAIRY

Tofu plants and soy dairies are now starting up all over the world in response to the burgeoning need for delicious and healthful sources of high-quality, low-cost protein. Making tofu and soymilk is not only a rewarding ancient/futuristic craft and source of right livelihood, it offers a practical yet revolutionary approach to meeting the world's critical food requirements.

After more than seven years of research, including extensive field studies in Japan, America, Taiwan, Korea, and Indonesia, William Shurtleff and Akiko Aoyagi, authors of the bestselling *Book of Tofu*, which has over a quarter million copies in print, now present . . .

TOFU & SOYMILK PRODUCTION

- A beautiful new craft and technical manual describing in rich detail how to start and run your own tofu plant or soy dairy on any of seven scales, from a community or village shop up to a modern factory.
- Over 430 informative illustrations; 336 pages
- Entire chapters on starting your business, selecting equipment and ingredients, sanitation, production principles.
- How to make tofu burgers or cutlets, creamy tofu dressings, tofu cheesecakes, dairylike soymilk, soymilk yogurt, ice cream, cheese, shakes, and mayonnaise, silken tofu, wine-fermented tofu, dried-frozen tofu, and ambrosial yuba.
- Hundreds of addresses of resource people and institutions plus a lengthy Bibliography and Index.
- A guidebook to a new vocation and a new way of life.



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(2) *Food Chain* (Intermediate Technology, England). 1997. No. 20. March. p. 6. Address: New-Age Foods Study Center, P.O. Box 234, Lafayette, California 94549.

7004. Shurtleff, William. 1979. Report on trip to second annual meeting of Soycrafters Association of North America (Amherst College, Massachusetts, July 26-29), and subsequent visit to Rochester, New York. P.O. Box 234, Lafayette, CA 94549. 2 p. Aug. Unpublished manuscript.
• ***Summary:*** July 15–9:45. Akiko and I fly to New York City from Lafayette. The previous day our *Book of Tempeh* had arrived from Harper & Row, and we took it with us to the conference. Stay in a hotel near a park, with fear of being mugged or robbed in this unfriendly city.

We attend and I speak at Buckminster Fuller's World Games (about world hunger and world resources) in New York City. Have a nice talk there with Robert Rodale.

Akiko and I meet Uri Geller at his home / apartment–at his invitation, because he knows and admires our Book of Tofu; he is a very nice, healthy man with world-famous psychic abilities. He bends my house key before my eyes by psychic force, without touching it; I carry that useless house key on my key chain for years and show it to many people. Uri also replicates a drawing I made of a stick figure standing with both hands held high under a rayed sun; he was sitting across the room and could not see what I had drawn.

I do about 3 live radio broadcasts for Gary Null (WBAI Natural Living) and visit his home for taping segments; he is a bachelor. Also do an evening program on soyfoods for Annemarie Colbin at her home. And we have dinner at The Cauldron (that makes tofu–and probably tofu cheesecake–we visit the kitchen) and Souen (which makes tofu cheesecake), both macrobiotic restaurants.

While in New York City, Akiko and I visit our editors at Harper & Row headquarters–many stories up in Manhattan.

July 22–Overnight at Ira and Kathy Leviton's home at Sunrise Farm, 100 Heath Road., Colrain, Massachusetts.

July 24? Visit Michael and Shelley Cohen's Tempeh Works, which is preparing to open in a gas station in Greenfield, Massachusetts (production officially began on Oct. 1). I take 3 pages of handwritten notes and many photos for our forthcoming book *Tempeh Production* (see p. 95-98). I first describe each piece of equipment in the shop and illustrate some, then describe the process (20 lb of dry beans makes 52 lb of tempeh), and finally draw a detailed floor plan of the shop. This was the first batch of tempeh Michael had ever made in this shop. He sold 200 lb of tempeh to the Soycrafters Conference later that week.

July 25. Our book *Tofu & Soymilk Production,* published by our New-Age Foods Study Center, arrives from the printer (Braun Brumfield) in Ann Arbor, Michigan. It is the first book we have self-published properly, and the first to contain an ISBN (our second, 0-933332-01-7) and an LCCN.

July 26-29 (Thurs. to Sun.) Second Annual Soycrafters Association of North America (SANA) conference at Hampshire College in Amherst, Massachusetts, organized and run by Ira / Richard Leviton. 230 people attend. It is Akiko's first SANA conference. A magnificent event. Also first issue of *Soyfoods* magazine out, published by Leviton. One evening there is a square dance. I recall Jon Lee of New England Soy Dairy being a superb square dancer. I meet Paul Duchesne. Steve Earle from San Jirushi gives a wooden speech on the history of his company and the tamari they make.

RICHARD LEVITON

July 30-31. After the conference, with Richard Leviton driving and Jeremiah Ridenour on board, we visit The Tofu Shop, a soy deli at 686 Monroe Ave., Rochester, New York, founded by Andy Schecter, Greg Weaver, and Norman Holland. Very interesting. Ira takes lots of photos for an article in *Soyfoods* magazine. One nice one shows Akiko and Jeremiah Ridenour seated in the Deli at a table which is loaded with soyfoods dishes ready to eat.

While in Rochester, Shurtleff presented a lecture and slide show to 150 people at the Eisenhart Auditorium in the Rochester Museum and Science Center; it was sponsored by The Tofu Shop.

Aug. 2–We arrive back in Lafayette. Address: New-age Foods Study Center, Lafayette, California.

7005. Shurtleff, William; Aoyagi, Akiko. 1979. Using okara, whey, curds & hulls (Document part). In: W. Shurtleff and A. Aoyagi. 1979. Tofu & Soymilk Production: A Craft and Technical Manual. Lafayette, California: New-age Foods

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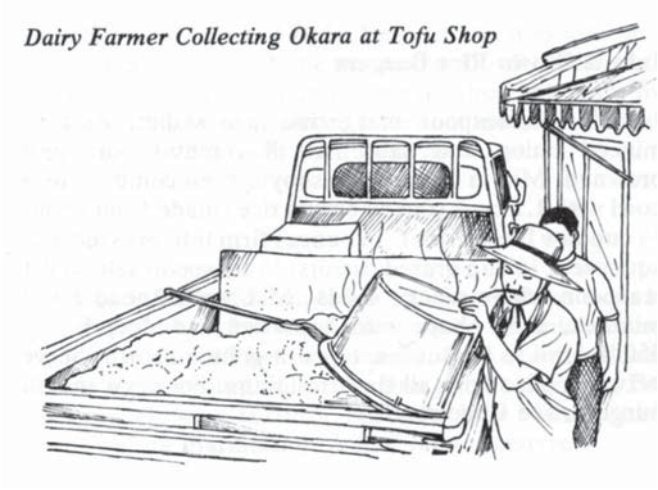
Study Center. 336 p. See p. 168-71. Illust. by Akiko Aoyagi Shurtleff. Index. July. 28 cm.



• ***Summary:*** This chapter begins: Okara (pronounced oh-KAR-uh), the insoluble residue from tofu or soymilk production (also known as soypulp or soy pulp) and whey are two byproducts of the tofu-making process.

Both can be put to a number of creative uses, which can serve as potential sources of income and utilize their nutrients. Curds can be sold at low prices for institutional use or as a ready-to-serve snack. Hulls can be ground to make soy bran.

Okara: Every pound of dry soybeans made into tofu or soymilk generates about 1.1 pounds or 2.5 cups (0.15 gallons) of well pressed, firmly packed okara, containing 76 to 80% moisture, 20 to 24% solids, and 3.5 to 4.0% protein. On a moisture free basis, this okara contains 23.6 to 24.0% protein, 8.1 to 15.2% fats, and 12.0 to 14.5% crude fiber. And it contains some 17% of the protein from the original soybeans. Not only is okara a rich source of dietary fiber, it contains higher quality protein (as measured by PER, protein efficiency ratio) than any other fraction in the tofu making process (Hackler et al., 1963, 1967), largely due to its high content of cystine, a limiting sulfur-containing amino acid. (Lysine is the first-limiting amino acid in okara.) To measure various PER values, soymilk was cold extracted and cooked at 100ºC for 1 hour. The numbers in parentheses are PER values: milk casein (2.86), okara (2.71), dehulled soybeans (2.51), tofu (2.20; coagulated with glacial acetic acid), soymilk (2.11), soy whey (1.93).

In poorer countries, a majority of the okara is used as food. With the growing awareness of the importance of crude fiber in human diets, okara can be utilized in foods specially formulated with a high fiber content. Plain or with the addition of suitable flavorings, okara can easily be dehydrated on a drum dryer to make a dry staple; the Johnson Boiler Co. in Japan makes drum dryers specifically designed for drying and flaking okara. Dried okara might be able to be milled to produce a high-fiber soy flour, which could be used as is in breads or roasted like kinako. The first three uses described below are nonfood.

Livestock Fodder: Most of the okara from Japanese and American tofu shops and soy dairies is fed to dairy cattle or hogs. Generally a local farmer picks it up from the shop daily in his truck and pays a small price for it (several cents a pound); in cities, some shops give it away or even have to pay farmers to truck it away. In China many makers of tofu, soymilk, or yuba run a hog farm adjacent to their shop and use the okara as a primary fodder source. Ruminants (cows, sheep, buffalo) can digest crude fiber (okara) and use it as a nutrient source. Monogastrics (chickens, hogs) cannot utilize nearly as much. While this way of using okara may be the most convenient, it is relatively wasteful of nutrients and brings only a low financial return.

Organic Compost: Added to a compost pile or turned directly into the soil, okara adds valuable nitrogen and organic nutrients, while helping to aerate and lighten heavy soils. Contact organic gardeners.

Pet Food: Okara makes a good addition to household or commercial dog or cat foods. In Japan some large factories sell much of their output to pet food manufacturers.

Soysage: This tasty sausage-like food, developed by The Farm in Tennessee, is now produced commercially at a number of U.S. tofu shops and soy dairies, and may be the simplest and best way to utilize okara. Packed with nutrition, it can easily be produced in large quantities.

White Wave in Boulder uses this recipe. Mix the following ingredients in a VCM-40 and blend well on low speed: 56 cups (15% gallons) okara, 21 cups each wheat germ and whole-wheat flour, 14 cups nutritional yeast, 10½ cups oil, 4 cups shoyu, 14 tablespoons each oregano, prepared mustard, and garlic, 9.3 tablespoons allspice, ½ cup salt, 6.7 tablespoons each fennel and sage, and 1 tablespoon cayenne, and a little diluted liquid smoke (hickory smoked water). (Some producers add enough soymilk to give the desired consistency.) Pack in specially made stainless steel tubes (each tube is 3 inches in diameter, 12 inches long, open at both ends, and capable of being opened and closed via a lengthwise overlap seam.) Seal both ends of tube with heavy aluminum foil. Fill a large pot with 2 to 3 inches of water, set a rack above the water, and stand the tubes upright on the rack. Steam cook at atmospheric pressure for 45 to 60 minutes, then allow to cool for easy removal. Open tube along side, slide out soysage, and cut it crosswise into 8-ounce disks, which are sold wrapped in plastic wrap. To serve, they are sliced into thin rounds and fried in oil on both sides until crisp and golden brown, then served like breakfast sausages (with scrambled tofu), used in sandwiches or pizza, or mashed and used like a vegetable pate.

Crystal Hills Tofu Shop makes several hundred pounds of soysage each week; it contains okara, whole wheat flour, wheat germ, nutritional yeast, oil, soy sauce, honey, herbs,

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and spices. Our favorite recipe is given in *The Book of Tofu* (Ballantine).

Baked Goods: Many tofu shops connected to bakeries use their okara like bran to add natural fiber and protein, and to give a crumbly texture to breads, muffins, brownies (usually made with carob), fudge, cookies (okara coconut macaroons or okara peanut butter cookies), okara & tofu gingerbread, or other baked goods. Try recipes for Wonderful Okara & Barley Flour Muffins, and for pancakes, waffles, leavened breads, and chapaties in *The Book of Tofu.* Okara might also work nicely in Japanese-style rice crackers (*senbei*). Okara contains 14.5% fiber on a dry weight basis versus only 4% for wheat bran; large amounts may cause intestinal distress in some individuals.

Okara Tempeh: One of the most delicious and creative ways we know of to use large amounts of okara is in the form of okara tempeh, a popular Indonesian fermented food that consists of okara (alone or mixed with soybeans) bound together into cakes or patties by a fragrant mycelium of *Rhizopus* mold. The spore starter is now available in North America and the fermentation takes only about 22 hours. The finished product, sliced and fried until crisp and golden brown, has a flavor described variously as reminiscent of "southern fried chicken," "savory veal cutlets," or "seafood fillets." The concept of a tofu and tempeh shop operating together (as many do in Indonesia) is most interesting, and several tofu shops in North America are now preparing both okara and soy tempeh. For full details see our *Tempeh Production* (New-Age Foods Study Center) and *The Book of Tempeh* (Harper & Row).

Okara Granola: White Wave Soyfoods in Boulder, Colorado uses okara, cashews, sesame meal, safflower oil, salt, and maple syrup. For our favorite recipe, see *The Book of Tofu.* Someone should also develop an okara granola (candy) bar that is not too sweet.

Okara Party Mix: Develop your own using toasted okara, nuts, sunflower seeds, shredded coconut, raisins, etc.

Soysage Pâté: At White Wave, this pate is served in delicious sandwiches. Ingredients include: soysage, tofu, soymilk mayonnaise, mustard, celery, pickles, and sunflower seeds. It is served on onion-herb bread with alfalfa sprouts, tomato, and pickle. Okara & Vegetable Saute: A number of tofu shops in Hawaii and Japan use their okara to prepare this dish which is sold chilled through delicatessens or natural food stores. For our favorite recipe see The Book of Tofu.

Okara Burgers: Also called Okara & Grain Burgers these were developed by Swan Foods in Miami, Florida. Ingredients include organic brown rice, okara, carrots, onions, garlic, whole-wheat flour, corn oil, sesame seeds, rolled oats, and sea salt. Mix the okara in a VCM with dry-cooked rice (use 2 volumes water to 1 rice), plus diced onions and carrots, garlic powder, a little flour, and the remaining ingredients. Puree well, then put the mixture through a Hollymatic Burger Press; the patties, which are not as firm as burger patties, drop out on patty paper. Freeze immediately or okara will sour. To serve, bake at 350ºF for 40 minutes (or deep-fry); serve between buns or toast with trimmings. Better than soyburgers but not as good as tofu burgers. For our recipe, see *The Book of Tofu.*

Okara Onchom: Another popular Indonesian fermented food, onchom (also spelled ontjom) is a close relative of tempeh, made and served in the same way but using a different starter culture, *Neurospora.* The finished product has overtones of flavor reminiscent of walnuts or almonds. Starter cultures for commercial use are available in small quantities from Dr. H.L. Wang, USDA/NRRC, 1815 N. University St., Peoria, IL 61604. Preparation is described in *The Book of Tempeh,* Professional Edition.

Other Food Uses: Okara can be used in salads (with mayonnaise, sliced vegetables, and seasonings), in miso as a substitute for part of the whole soybeans, as a primary ingredient in dry breakfast cereals, or as a hamburger extender. Address: Lafayette, California.

7006. *Nichi Bei Times* (*San Francisco*). 1979. Tofu factory that just grew and grew. Aug. 1. *
• ***Summary:*** About tofu at Azumaya.

7007. Saio, Kyoko. 1979. Tofu–Relationships between texture and fine structure. *Cereal Foods World* 24(8):342-45, 350-54. Aug. [8 ref]
• ***Summary:*** A very thorough, detailed and complex discussion of the subject with 21 figures and 1 table. Many of the figures are amazing scanning electron microscope images of different types of tofu, and seven are graphs. Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fishery, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken, Japan.

7008. Suwa, Junichi; Koyanagi, T.; Kimura, S. 1979. Studies on soybean factors which produced goiter in rats. *J. of Nutritional Science and Vitaminology* (*Tokyo*) 25(4):309-15. Aug. [8 ref. Eng]
• ***Summary:*** The goitrogenic factor in soybeans appears to be concentrated in the curd, but the goitrogenicity of soybean curd was not eliminated by proteolytic digestion. This report supports the findings of Sharpless et al. (1939) that rats fed soybeans required twice as much dietary iodine as control animals to prevent goiter. The method for making soybean curd is described and illustrated on page 311. Address: Lab. of Nutrition, Faculty of Agriculture, Tohoku Univ., Sendai, Miyagi 980, Japan.

7009. Aishima, T. 1979. Classification of soy sauce on principal components in GC profiles. *Agricultural and Biological Chemistry* 43(9):1905-10. Sept. [15 ref]
Address: Noda Inst. for Scientific Research, Noda-shi,

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Chiba-ken, Japan.

7010. Aishima, T. 1979. Objective evaluation of soy sauce by statistical analysis of GC profiles. *Agricultural and Biological Chemistry* 43(9):1935-43. Sept. [24 ref] Address: Noda Inst. for Scientific Research, Noda-shi, Chiba-ken, Japan.

7011. Esko, Wendy. 1979. Introducing macrobiotic cooking. Tokyo: Japan Publications. 144 p. Foreword by Aveline Kushi. Preface by Edward Esko (both written June 1978). Illust. by Bonnie Harris. Index. 26 cm. Reprinted in 2006 by Square One Publishers (Long Island, NY, 240 p.).
• ***Summary:*** The author was introduced to macrobiotics in upstate New York in about 1971. This is her first book on macrobiotics. It was originally published under the title of *An Introduction to Macrobiotic Cooking* by the East West Foundation, 17 Station Street, Brookline, Massachusetts 02146. Though copyrighted in 1978, the first edition appeared in Sept. 1979. The fourth printing was May 1981.

The chapter titled "Beans including tofu and natto" gives descriptions of and recipes for making: Japanese black beans (black soybeans, p. 54; "These beans are therapeutic for the sexual organs and will relieve an overly yang condition caused by too much animal food or fish.") Soybeans (p. 54. "These beans are the most yin of the bean family... It is recommended that soybeans be eaten only occasionally as a separate side dish. Because they are very yin, they should be cooked with yang vegetables such as lotus root or burdock, for balance. The best way to eat soybeans is in the form of *tofu, okara, natto, tempeh,* and, of course, miso and tamari.") Tofu, and Homemade tofu (curded with nigari, p. 54-55). Okara (p. 55-56). Tofu and corn. Tofu, onions and water cress. Dried tofu (dried-frozen, p. 57). Yuba (dried soy milk; how to make at home). Vegetables and dried soy milk (p. 57). Ganmodoki (Tofu and jinenjo patties, p. 57-58). Natto (description and how to make at home, p. 58-59).

Other soy-related recipes include: Tofu soup (p. 68). Miso soup (p. 69-70, basic, or quick). Watercress miso soup (p. 71). Daikon and sweet rice dumpling soup (with miso). Chinese cabbage and tofu miso soup (p. 71). Aveline Kushi's miso stuffed lotus root (p. 86). Tofu dressing (p. 91). Miso-tahini spread (p. 92). Miso-sesame spread (p. 92). Miso-lemon sauce (p. 93). Tofu dip (p. 93). Miso with scallions (p. 95). Tamari (description, p. 95). Tekka (made with Hatcho miso, p. 96). Miso pickles (p. 100-01). Tamari pickles (p. 101). Tofu plaster (p. 130). Ume-Sho-Kuzu drink (with umeboshi, tamari and kuzu, p. 131). Ume-sho-bancha (with tamari, p. 131). Use of tamari, miso, and tekka (p. 132).

Also includes instructions for making amasake at home (p. 116; it is a natural sweetener made from fermented sweet rice), and a recipe for Amasake bread (p. 107), instructions for making seitan at home (p. 46-47, using 3½ lb of hard spring or hard winter whole wheat flour; spring wheat flour produces a much softer texture of seitan than the winter variety), and recipes for seitan stew, seitan-barley soup, sauteed vegetables and seitan, stuffed cabbage with seitan, and seitan croquettes (p. 47-49), plus recipes for leftover seitan (p. 125). Address: East West Foundation, near Boston/ Cambridge, Massachusetts.

7012. Hymowitz, T.; Kaizuma, Norihiko. 1979. Dissemination of soybeans (*Glycine max*)*:* Seed protein electrophoresis profiles among Japanese cultivars. *Economic Botany* 33(3):311-19. Sept. [22 ref]
• ***Summary:*** Seed protein electrophoresis is shown to be a powerful tool for resolving problems of taxonomy, evolution, and paths of dissemination of domesticated plants. By the use of these seed protein banding patterns, which act like silent fingerprints, the movement of germplasm and the paths of dissemination of soybeans to and within Japan may be clarified.

Seed protein extracts from 477 cultivated Japanese soybean varieties were analyzed by polyacrylamide gel electrophoresis to determine the distribution of the alleles three trypsin inhibitor loci (Ti-a, Ti-b, Ti-3c) and two special protein loci (Sp1-a, Sp1-b) with respect to the maturity group and area of adaptation of each variety. A map (Fig. 2) shows Japan divided into 5 geographical areas. About 60% of the soybean varieties had the Ti-a allele. The frequency of the Ti-b allele was found to be highest in southeastern Japan and lowest in northeastern Japan. The Ti-c allele, discovered in 6 varieties, was traced to two possible sources adapted to the Tohoku area.

In conclusion, the writers conclude that the present population of cultivated Japanese soybean varieties was developed from two distinct sources of introductions: (1) A short-season crop cline or summer-season type having almost exclusively the Ti-a Sp1-b genotype. (2) The full-season crop cline having either the Ti-a Sp1-b or T1-a Sp1-b genotype. The full-season crop cline probably came from north-central China through to Japan. The short-season crop cline appears to have evolved in either Korea or on Kyushu, Japan's southernmost main island.

The problem of determining the origin of the short-season crop cline "is complicated by the fact that the movement of soybeans from Korea to Japan and vice versa across the Korea Strait has been going on since at least the third century A.D. and perhaps earlier."

Contains 3 figures and four tables. Address: 1. Crop Evolution Lab., Univ. of Illinois; 2. Iwate Univ., Morioka, Iwate, Japan.

7013. Kohei, Homma. 1979. Kikkôman jûgyôin shimin seikatsu chôsa [Survey on the lifestyle of Kikkoman employees]. Rikkyo Daigaku Shakaigaku Kenkyushitsu. 39 p. [Jap]*

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7014. Tanaka, Teruo. 1979. Restriction of plasmid-mediated transformation in *Bacillus subtilis* 168. *Molecular & General Genetics* 175(2):235-37. Sept. *
Address: Mitsubishi Kasei Inst. of Life Sciences, 11 Minamiooya, Machida, Tokyo, Japan.

7015. Tanaka, Teruo. 1979. *recE4*-Independent recombination between homologous deoxyribonuceic acid segments of *Bacillus subtilis* plasmids. *J. of Bacteriology* 139(3):775-82. Sept. [18 ref]
• ***Summary:*** Note: As scientists move ever closer to the heart of matter, the descriptions of what they observe, and the words and terms they use, become increasingly incomprehensible to the lay reader. Yet this research is the cutting edge of science.

This is such an article, about plasmids, a particular region of the *Bacillus subtilis* chromosome, and how new plasmids are regenerated. Address: Lab. of Microbiological Chemistry, Mitsubishi Kasei Inst. of Life Sciences, Minamiooya 11, Machida-shi, Tokyo, Japan.

7016. *North Pacific Union Conference Gleaner* (*Portland, Oregon*). 1979. Obituaries: Jones, Dorothea Van Gundy. Oct. 1. p. 31.
• ***Summary:*** "Dorothea Van Gundy Jones was born Feb. 16, 1903 in San Jose, California, and died Aug. 30, 1979 in Sedro Woolley, Washington. She leaves to mourn two daughters Lois Bower of Redding, California, and Evelyn Mundall of Belize, Central America; one sister, Dr. Mary Charlotte Holmes of Sulphur Springs, Arkansas; a niece, Sue Muff, Sedro Woolley; a cousin, Dr. Lloyd Waller of Chehalis, Washington. After graduating from Pacific Union College, she worked as a dietitian for the White Memorial Hospital, dietitian for La Sierra College for two years and taught three years at Walla Walla College. For 23 years, she was internationally known nutritionist for Loma Linda Foods. Her lectures on nutrition took her around the world; to India, Bangkok [Thailand], Indonesia, the Philippines, Japan, Australia, New Zealand as well as to most major cities in the U.S."

7017. Barton, David. 1979. Foods from the Far East. *Whole Foods* (*Berkeley, California*). Oct. p. 28-34, 54.
• ***Summary:*** Mutual Trading Co. is making 500 tons of miso a year, and this is expected to increase by 10-15% in 1980. Their miso sales are up 300% in 5 years. Erewhon wholesale sales by product for the year ended June 1979 were: Miso $100,000, shoyu $200,000, tofu $110,000. Japanese trade commission figures for 1978 natural food imports are: Miso $625,528, and shoyu $1,466,909.

7018. Hashizume, Kazumoto; Noguchi, Akinori. 1979. [Identification of vegetable protein in animal protein products by electrophoresis. I. Identification of vegetable protein in animal protein products by SDS polyacrylamide gel electrophoresis]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 35. p. 252-58. Oct. [10 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 25(11): (1978).
Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7019. Kawaguchi, Yutaka. 1979. Kaado no soshiki ni oyobosu daizunyû no kanetsu shori, gyôkozai oyobi kôbo sesshu no eikyô [Effects of heat treatment of soymilk, coagulants and yeast inoculation on the texture of soy-curds]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 26(10):434-41. [10 ref. Jap; eng]
• ***Summary:*** "The conditions of curd preparation from soymilk suitable for making cheese-like fermented soy protein foods were examined... Seven coagulants including 4 kinds of salts and 3 kinds of acids, and lactic fermentation using *Streptococcus thermophilus* as a starter were tested for preparing curd from soymilk... The curd by lactic fermentation with inoculation of lactic starter and yeast gave the most smooth body like cheese along with the decrease of hardness, springiness and chewiness during the incubation."
Address: Yamanashi Prefectural Agriculture and Forestry High School, Nishiyahata Ryuo-cho, Nakakoma-gun, Yamanashi-ken.

7020. Kiuchi, Kan; Suzuki, Osamu; Ohta, Teruo; Sato, Emiko; Ebine, Hideo. 1979. [Studies on lipids of soybean foods. VII. Isolation of halotolerant yeasts capable of assimilating linoleate in miso]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 35. p. 224-30. Oct. [20 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 25(9): (1978).
Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7021. Ohta, Teruo; Takano, Kenji; Nikkuni, Ikumi; Hashizume, K.; Saio, K. 1979. Shokuhin-yô daizu no chôki hokan-chû no hinshitsu henka [Soybean quality change and its influence on food processing]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 35. p. 56-70. Oct. [6 ref. Jap; eng]
• ***Summary:*** As soybeans were stored for 1 year, the changes in their quality were measured and the effects of these changes on natto, tofu, and aburage were investigated under different temperatures (15, 25, and 35ºC) and humidity (RH = Relative Humidity 60, 70, and 80%). New crop (recently harvested) soybeans grown in the USA and China were used

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in this experiment.

Soybean quality deteriorated with time, and there were definite measurable changes in the ability to germinate / sprout, acid values, titratable acidity, Nitrogen Solubility Index (NSI), solids extracted in soakwater, and extraction rates of protein and solids into soybean milk.

The passage of time in storage led to harder cooked beans for natto, lower yield of soybean milk and tofu, lower coagulation rate in tofu, and less ability to expand during deep frying in aburage.

Increased temperatures and relative humidity increased the rate of soybean quality deterioration as measured above, and increased RH caused more deterioration than the increased temperature. Therefore, soybeans awaiting processing into natto, tofu, or aburage should be stored in a cool, dry place. Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7022. Saio, Kyoko; Hondo, Masaaki. 1979. [Phytic acid determination in vegetable protein products]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 35. p. 48-51. Oct. [6 ref. Jap; eng]
Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7023. Taira, Harue; Taira, Hirokadzu; Mori, Y.; Ushirogi, T.; Fujimori, I. 1979. Daizu shushi no kansô shori hôhô to sono hinshitsu ni tsuite. IV. [Influence of dry treatment after harvest on quality of soybean seeds. IV. Suitability for food processing of stored seeds]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 35. p. 160-71. Oct. [11 ref. Jap; eng]
• ***Summary:*** The effects of dry treatment (drying) after harvest on the physical properties, chemical composition, and suitability for food processing of soybean seeds were investigated. The heat treatments were natural drying and air drying using heated and non-heated air at 20, 30, and 40ºC.

The seeds were then stored at 15ºC with RH (Relative Humidity) of 65% and 75%, at 30ºC with RH of 65% and 75%, and at room temperature and humidity in a paper bag for 30, 60, 120, 180, 270, and 360 days, respectively. These various storage conditions were further investigated for their effects on suitability for food processing.

At a given RH, the seed moisture rose as the temperature rose; many figures are given. Seed quality degenerated as storage time increased. The following decreased: absorbability of water in seeds, rate of germination, extractability of protein from soaked seeds by hot water, pH of soybean milk, and ratio of weight of steamed seeds to raw seeds. And the following increased: soluble matter and protein in soak water, moisture content, hardness and darkness of color of steamed seeds.

Conclusion: Soybeans should be stored in a cool, dry place, ideally at a temperature of 15ºC (50ºF) or below and an RN of 75% or below. Remarkable deterioration was observed at 30ºC with RH of 75%. Seeds heat dried at 40ºC showed a significant decrease in suitability for making miso, natto, or cooked soybeans. Tofu making was less affected by drying the seeds with heated air.

Reprinted from *Proceedings of the Crop Science Society of Japan* (*Nippon Sakumotsu Gakkai Kiji*) 48(2):291-302 (1979). Address: 1-2. National Food Research Inst., Ministry of Agriculture, Forestry and Fisheries (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 3-4. Hokkaido Prefectural Central Agric. Exp. Station, Naganuma, Hokkaido 069-13.

7024. Taira, Harue; Taira, Hirokadzu; Asahi, Yukimitsu; Iguchi, Takeo. 1979. [Influence of fertilizer and planting density on chemical composition of soybean seeds. II. Protein, oil, carbohydrate and ash content of summer soybean seeds]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 35. p. 42-47. Oct. [8 ref. Jap; eng]
Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7025. Taira, Hirokadzu; Taira, Harue; Kaizuma, Norihiko; Fukui, Juro. 1979. [Subgeneric and specific differences in the chemical composition of the seed in the genus *Glycine*]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 35. p. 150-59. Oct. [21 ref. Jap; eng]
• ***Summary:*** "The chemical composition of the seed of the genus *Glycine* was investigated on *Glycine max* (8 samples), *G. gracilis* (4 samples), and *G. soja* (7 samples) belonging to the subgenus *Soja,* and *G. tabacina* (3 samples) and *G. tomentella* (2 samples) belonging to the subgenus *Glycine."*

The "highest oil and potassium content and the lowest phosphorus and calcium content were observed in *G. max* [the cultivated soybean], and the highest protein content and the lowest oil content were observed in *G. soja* [the wild soybean].

Reprinted from *Proceedings of the Crop Science Society of Japan* (*Nippon Sakumotsu Gakkai Kiji*) 47(3):365-74 (1978). Address: 1-2. National Food Research Inst., MAF, Koto-ku, Tokyo 135, Japan; 3-4. Faculty of Agriculture, Iwate Univ., Morioka 020.

7026. Yasui, Takeshi; Hase, Saki. 1979. [Quantitative determination of oligosaccharides in beans and their products by gas liquid chromatography]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 35. p. 303-08. Oct. [13 ref. Jap; eng]
• ***Summary:*** Reprinted from *J. of the Japanese Society of*

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Starch Science, 25(4):234-39 (1978). Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7027. Hondo, Satoshi; Mochizuki, Tsutomo. 1979. [Studies on saccharides in miso. II. Polysaccharides in soybean-steamed waste water and miso]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 26(11):461-68. [Jap; eng]*

7028. Kushi, Aveline. 1979. Cooking with miso. *East West Journal.* Nov. p. 56-57, 59-61.
• ***Summary:*** Excerpts from the book *How to Cook with Miso,* by Aveline Kushi. "Putting miso in soup is the ideal way to use it every day. It is advisable for any condition, for any kind of person." Generally, people with a yin, or passive type of condition, should prepare a more yang (strong) type of miso soup, and people with a yang, or active type of condition, should make a more yin (light-tasting) type.

7029. Nakamura, Hideyuki; Mohri, Yoshiharu; Muraoka, Ichiro; Ito, Katsumi. 1979. [Studies on fermented food containing Antarctic krill. I. Production of soy sauce with cryo-ground Antarctic krill (*Euphausia superba*)]. *Nihon Suisan Gakkai shi* (*Bulletin of the Japanese Society of Scientific Fisheries*) 45(11):1389-93. Nov. [Jap]
Address: 1. Kazami Co. Ltd., Sukedo, Ashikaga, Tochigi prefecture 326; 2. Nippon Reizo K.K., Kumegawa-cho, Higashimurayama, Tokyo 189. Both: Japan.

7030. Sato, Tetsuo; Someya, Y.; Shiga, K.; Hashizume, K. 1979. Daizu tanpakushitsu o konyu shita nyûseihin-chû no daizu tanpakushitsu no kenshutsu-hô [Detection of soybean protein in soybean protein blended dairy products]. *Chikusan Shikenjo Kenkyu Hokoku* (*Bulletin of the National Institute of Animal Industry*) No. 36. p. 121-26. Nov. [11 ref. Jap; eng]
• ***Summary:*** Soy protein was mixed with ice cream or processed in proportions ranging from 0 to 100%. The mixtures were subjected to polyacrylamide gel electrophoresis (PAGE) or sodium dodecyl sulphate (SDS) at pH 4.0 to develop a formula for estimating the soy protein concentration. Comparison of densitograms for milk, cheese, egg yolk, egg white, wheat and soybean proteins indicated that PAGE with urea at pH 9.4 gave sufficient separation to distinguish milk from non-milk proteins but not to distinguish between non-milk proteins. Using SDS, milk and soybean proteins could be distinguished from each other and from egg and wheat proteins. Address: Hiroshima Daigaku Seibutsu Seisan Gaku-bu, Shokuhin Kagaku Kôza, Japan.

7031. **Product Name:** Mugi Miso. Renamed Barley Miso in about 1981.
Manufacturer's Name: Shin-Mei-Do Miso Co.
Manufacturer's Address: 5 Wren Road, Denman Island, BC, Canada V0R 1T0. Phone: 604-335-0253.
Date of Introduction: 1979 November.
Ingredients: Barley koji, soybeans, salt, water.
New Product–Documentation: Talk with Yasuo Yoshihara. 1996. March 22. Their second miso, introduced in November 1979, was a barley miso named "Mugi Miso." Sold only to natural- and health food stores, it was renamed "Barley Miso" in about 1981.

7032. Shurtleff, William. 1979. Rapid growth of tofu shops and soy dairies in North America (News release). Lafayette, California: New-Age Foods Study Center. 1 p. Nov.
• ***Summary:*** "There are presently 164 tofu shops and soy dairies in North America and, as shown in the accompanying graph, the increase in numbers is rapidly accelerating. Ninety-six of these run by Caucasian Americans have opened in the past 3 years since publication of *The Book of Tofu,* by Shurtleff & Aoyagi, which has sold over a quarter of a million copies. The industry has a brisk sales growth rate of 25 to 30% a year, and uses an estimated 35% of the industry sales; the 68 Oriental shops have 65%.

"The largest tofu factory in the U.S. is the Matsuda-Hinode company in Los Angeles; they produce about 16,000 pounds of tofu a day under 14 different labels. The largest of the new breed of Caucasian-run plants is the New England Soy Dairy in Greenfield, Massachusetts. Founded in 1977, it now produces some 4,500 pounds of tofu a day and expects revenues of $750,000 in 1979. In its April 12 front page story on the tofu industry, *The Wall Street Journal* focused on The New England Soy Dairy...

"Worldwide, the tofu and soymilk industry is rapidly expanding. There are presently a total of 211,000 producers, including 38,000 in Japan, 158,000 in mainland China, 11,000 in Indonesia, 2,500 in Taiwan, and 1,470 in Korea. The largest tofu factories, located in Japan, produce over 100,000 pounds of tofu a day (15,000 tons a year) and the largest soy dairy, located in Hong Kong, produces 500,000 bottles of soymilk a day (150 million bottles a year).

"Most of the new tofu shops and soy dairies in the U.S. have gotten into production using the technical manual *Tofu & Soymilk Production* by William Shurtleff & Akiko Aoyagi, which has just been published in both paperback and hardback editions." Address: P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

7033. Ashford, Moyra. 1979. Sambas and scholarship: Japanese find the good life, exert influence in Brazil. *Los Angeles Times.* Dec. 20. p. D11.
• ***Summary:*** An estimated 700,000 Japanese reside in Brazil. But are they Japanese or Brazilians? In May 1888, slavery was officially abolished in Brazil. The first wave of Japanese immigration to Brazil began on 28 April 1928, when the steamship Katsuo Maru left the port of Kobe with 781 Japanese (incl. 198 families) on board. They arrived

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in Santos, Brazil, on June 5, all dressed in Japanese or Western dress. Brazilians were astonished. Most of the first immigrants came to Brazil to work on coffee plantations. Their goal was to get rich quick, and return to Japan. The first wave, which brought about 190,000 Japanese, lasted until 1941, when World War II began.

The second wave, which brought about 50,000 Japanese, lasted from about 10 years, from 1953-1962. These Japanese joined existing Japanese rural communities and intended to stay.

The third stage began in 1963 and is still going on, coincided with Brazil's economic miracle [and the dramatic growth in Brazil's soybean production]. It brought more companies than individuals. Address: Latin America Daily Post.

7034. *SoyaScan Notes.* 1979. Chronology of soybeans, soyfoods and natural foods in the United States 1979 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Jan. Yvonne and Irene Lo incorporate The Soya Bean Products Co., N.A. in San Francisco as a marketing company and immediately begin to import and distribute Vitasoy, the world's most popular soymilk, to Canada from their parent company in Hong Kong. It is not yet sold in America due to an FDA ban on aseptic Tetra Pak cartons.

Jan. Soycrafters Association of North America headquarters moves to Colrain, Massachusetts. Richard Leviton takes over as Director. Decides to edit and publish *Soycraft* magazine.

Jan. "The Soyfoods Revolution" published as a cover story by *Whole Foods* magazine.

Jan. 15-18. Second International Workshop on Low-Cost Extrusion Cookers held in Dar es Salaam, Tanzania, with 43 participants.

Feb. Takai catalog of large scale equipment published.

Feb. 9. Judith Rubenstein, institutional consultant for the New England Soy dairy, initiates a correspondence with Carol Tucker Foreman, Director of Child Nutrition programs at USDA, on the subjects of tofu standards and acceptance of tofu in USDA Child Nutrition Programs, including the school lunch program. Four letters are exchanged between Feb. and Aug. 1979. This is the start of work of tofu standards and tofu in school lunch programs.

Feb. *Natural Foods Merchandiser* magazine starts publication, founded by Doug and Karen Greene.

March 11. KOPTI is founded in Indonesia. It soon functions as an active, effective trade association for Indonesian tempeh and tofu manufacturers. By June 1986 it has more than 12,000 members from 40 cooperatives, and is promoting mechanization of production.

March. Soycrafters Assoc. and Quong Hop & Co. have adjoining booths at the New Earth Expo in San Francisco. 6,000 people sample free tofu burgers, tofu chip dips. Farm Foods sells Ice Bean (soymilk ice cream) and tofu cheesecakes. Gilman Street Gourmet sells tofu burgers.

March. Oak Feed Miso Company founded by Sandy Pukel, John Belleme, and Barry Evans. Joe Carpenter, Michio Kushi, and James Kenny are also involved. It is soon renamed American Miso Co.

March 26-29. World Soybean Research Conference II held at North Carolina State University. The 897-page proceedings, edited by F.T. Corbin, are published in 1980.

March. Food Protein Council holds International Soybean Fair in Washington, D.C. Many Congressmen, consular officials, etc. attend and sample soy protein products and tofu dips.

March. The Ohio Miso Company, founded by Thom Leonard and Richard Kluding, begins production in Ohio. America's first Caucasian-run miso company.

March. Richard Leviton takes a 3-week soyfoods research trip to the Midwest. Establishes many important contacts.

April. *New England Soy Dairy Product and Merchandising Guide* published.

April 12. "Good Old Bean Curd Is Suddenly Popular, But You Call It Tofu" by W.M. Bulkeley published as a front page article in *The Wall Street Journal.*

May 24. "The Americanization of Bean Curd," an expansion of Bulkeley's April article, published in the *Washington Post.*

May. Quong Hop & Co. in San Francisco introduces vacuum packed firm tofu, tofu cutlets, tofu burgers, and teriyaki tofu. Each of the latter three products is the earliest known product of its type in America.

June. *The Tofu Cookbook* by Kathy Bauer and Juel Andersen published by Rodale Press.

June 29. An internal FDA memorandum is prepared by FDA headquarters personnel to set forth the agency's views on the attributes of tofu. Publication of a "pull date" on tofu packages is encouraged.

July. Farm Foods starts national advertising of tempeh starter and tempeh kits.

July. David Mintz, owner of Mintz's Buffet, a kosher Jewish deli in New York City, first learns of tofu from Pesach Lazaroff, a young Jewish vegetarian. That summer Lazaroff spends many hours working with Mintz as a paid consultant, developing kosher tofu recipes. Mintz later becomes rich and famous for developing Tofutti, a soy ice cream.

July. *The Book of Tempeh,* by Shurtleff and Aoyagi published by Harper & Row in both large-format paperback and professional hardcover editions. The world's first book about tempeh.

July. *Tofu & Soymilk Production,* by Shurtleff and Aoyagi published by The Soyfoods Center. This is the first book to use the term "soyfoods" in English.

July 17. "Tofu–The Oriental Way to High-Protein, Low-Calorie Meals" published by *Family Circle.*

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July 23. Judith Rubenstein (see Feb. above) writes the Commissioner of the FDA requesting that the agency establish a standard of identity for tofu. She notes that the Director of Nutrition and Technical Services for USDA suggested that FDA give top priority to this issue. Issues of imitation tofu products and bacterial contamination are raised.

July 26-29. Second Soycrafters of North America Conference: "Producing and Marketing Soyfoods," held at Hampshire College, Amherst, Massachusetts, organized by Richard Leviton and financed on a shoestring. A major milestone for the U.S. soyfoods industry. 230 people attend and the content is a great success, but Leviton loses $1,000 on the venture. The first issue of Soycraft magazine, written and published (1,900 copies) by Leviton, is distributed at the conference. In the keynote address, Shurtleff notes that the biggest challenges facing the industry are to build a strong trade association with adequate funding, and to develop soyfoods standards.

July. *Alimentacion Integral Para Una Vida Plena: Los Mil Usos de la Soya* (*Integral Nutrition for a Full Life: The Thousand Uses of Soya*), by Blanca Dominguez published by Editorial Posada in Mexico. The country's first book on soyfoods.

Aug. Robert Rodale and Rodale Press gives strong support to *Soycraft* magazine, with ads and a nice mention in an article, which brings in 135 subscriptions in November.

Sept. The Soycrafters Apprenticeship Program is started by Luke Lukoskie at Island Spring, Vashon, Washington. Here people can spend about 3 weeks getting hands-on experience in making tofu, soymilk, and tempeh.

Sept. Tempeh Works, America's first Caucasian-run commercial tempeh shop in a commercial building and making only tempeh, starts production in Greenfield, Massachusetts. Founded and run by Michael Cohen.

Sept. Many articles about the Amherst Soyfoods Conference published in national magazines, such as *New Age*.

Sept. New England Soy Dairy opens America's first in-house tofu & soymilk sanitation laboratory.

Sept. "Chinese Cuisine: Bean Curd" by Nina Simonds published in Gourmet magazine.

Nov. 26. A fire destroys Eden Foods warehouse and $800,000 inventory. The company, struggling for life, moves to rural Clinton, Michigan.

Oct. The Great American Tofu Cookbook by Patricia McGruter published by Autumn Press.

Dec. Rodale Press contacts Richard Leviton to announce plans to do a Soybean Newsletter, with Leviton as editor. The idea later falls through.

Dec. *Frijol Soja* (Soybeans) published in Peru by INTSOY.

Dec. *The Soysage Cookbook,* by Cloud and Burdett self-published in Vermont.

* San-J tamari starts to be imported to America from Japan.

* California and Maine become the second and third states to enact organic labeling laws. California's becomes a model and a standard for many other similar laws, and it is cited on many soyfood product labels. By 1988 there are 12 states with organic laws, and 5 more planned.

* Tofu production in Japan tops 1.1 million metric tons for the first time.

* Soybean research in America begins to shift from emphasis on production to emphasis on utilization.

* Syntex corporation of Palo Alto, California, recalls its soymilk Neo Mull Soy after it is found to be missing a key nutrient, chloride. Many children who used this product were mentally damaged.

* Lauhoff Grain Corp. acquired by Bunge.

* 1979-82. Years of the "salt craze." Growing concern with the level sodium in American food products begins to hurt sales of miso and shoyu. Continued.

7035. Aishima, T.; Nagasawa, M.; Fukushima, D. 1979. Differentiation of the aroma quality of soy sauce by statistical evaluation of gas chromatographic profiles. *J. of Food Science* 44(6):1723-27, 1731. Nov/Dec. [19 ref] Address: 1-2. Noda Inst. for Scientific Research, Noda-Shi, Chiba-ken, Japan; 3. Kikkoman Foods Inc., P.O. Box 69, Walworth, Wisconsin 53184.

7036. Dussaigne, A.; Dronne, Yves. 1979. Les protéines nouvelles en alimentation humaine [The new proteins in human nutrition]. Rungis, France: Institut National de la Recherche Agronomique (INRA). 111 p. Dec. [97 ref. Fre]
• ***Summary:*** Contents: Introduction. List of 30 tables. Part I: The protein industry. Definition and characteristics of proteins. The quantitative structure of the protein industry (the world protein industry, the French protein industry). Qualitative aspects of the protein industry. Energy problems in the protein industry.

Part II: New proteins in human nutrition. Supply and demand. Products derived from soya: Powdered products, textured products. The domains of utilization: Restaurants, the food industry. Regulations that are in force: In the USA, in Europe (France, Britain, European Union). The structure of the supply: Overview, manufacturers (American, European, Japanese, those in other countries). Development of consumption in the principal markets: The American market, European, Japanese.

Part III: Perspectives on development of new proteins. The nature and present utilization of new proteins: Importance of terminology, characteristics of the potential markets (Third World countries, developed countries). Consumption of new proteins and the economic environment. Bibliography (in chronological order). Address: France.

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7037. Hondo, Satoshi; Mochizuki, Tsutomo. 1979. [Studies on saccharides in miso. III. Effects of saccharides on the formation of texture and color of miso]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 26(12):509-13. [Jap; eng]*

7038. Tajiri, Takashi. 1979. Mamerui moyashi no seizô to sendo hojisei ni kansuru kenkyû. II. Mamerui moyashi no sendo hoji ni oyobosu chozô ondo to hôsô shizai [Studies on production and keeping quality of bean sprouts. II. Effect of packaging materials and storage temperatures on the keeping quality of bean sprouts]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 26(12):542-46. [6 ref. Jap; eng]
• ***Summary:*** The shelf life of soy sprouts, mung bean sprouts, and adzuki bean sprouts was studied in 6 packaging materials. PVDC (Saran Wrap) and PVDC laminated with cellophane were found to be suitable packaging materials. Shelf life at 0-5ºC was 14-15 days for soy sprouts, versus 10-11 days for the other two types of sprouts. Address: Lab. of Food Process, Faculty of Agriculture, Kinki Univ., Kowakae, Higahsi-Osaka, Osaka-fu.

7039. Takahashi, N.; Sasaki, R.; Chiba, H. 1979. Enzymatic improvement of food flavor. IV. Oxidation of aldehydes in soybean extracts by aldehyde oxidase. *Agricultural and Biological Chemistry* 43(12):2557-62. Dec. [15 ref]
• ***Summary:*** The conversion of aldehydes to less objectionable flavor compounds by using aldehyde dehydrogenase and aldehyde oxidase was effective in reducing the beany odors of soybean flour. Address: Dep. of Food Science & Technology, Faculty of Agriculture, Kyoto Univ., Kyoto 606, Japan.

7040. Yamamoto, Hiroki; Tatsuyama, K.; Egawa, H.; Sadaoka, N. 1979. Parakooto to no daizu konryû-kin no zôshoku to konryû keisei ni oyobosu eikyô [Effects of paraquat on the growth of *Rhizobium japonicum* and root nodule formation of soy bean plant]. *Shimane Daigaku Nogakubu Kenkyu Hokoku* (*Bulletin of the Faculty of Agriculture, Shimane University*) No. 13. p. 177-80. Dec. [7 ref. Jap]
• ***Summary:*** Paraquat, an herbicide, clearly inhibits the growth of *Rhizobium japonicum.* Address: Faculty of Agriculture, Shimane Univ., Matsue 690, Japan.

7041. American Soybean Assoc. and Ciba-Geigy Corp. 1979. World soybean report: National Convention of the American Soybean Assoc. St. Louis, Missouri: ASA. 9 p.
• ***Summary:*** "World Soybean Report was a 60-minute television simulcast linking four continents for the first time via the Atlantic, Pacific and domestic satellites for a live broadcast. Represented on the program were soybean experts from the U.S., Japan, Brazil, and Western Europe.

"The program, sponsored by Ciba-Geigy Corporation's Agricultural Division, was broadcast exclusively Mon., Aug. 13, 1979, at the national convention of the American Soybean Association in Atlanta, Georgia, to give members up-to-the- minute status reports and projections of soybean production and consumption in the major exporting and importing areas of the world.

"Participating in the program were Dr. Hiroshi Nakamura, director of the Hohnen Oil Company, Japan; Paulo Roberto Vianna, executive director of Brazil's Commission for Financing Production; Johannes M. Randag, president of the International Association of Seed Crushers, the Netherlands; and Merlyn Groot, president of the American Soybean Association.

"Ciba-Geigy hopes this report proves helpful to soybean growers making marketing decisions in the months ahead."

Contents: "EEC to remain stable importer of soybeans," by Johannes M. Randag. "U.S. soybean growers committed to expanding research, production and use," by Merlyn Groot. "U.S. now meeting all requirements of Japanese soybean industry," by Dr. Hiroshi Nakamura. "Brazilian soybean production to continue upward trend," by Paulo Roberto Vianna (with 3 tables and 1 graph). Questions and answers.

An illustration (line drawing) on the cover shows a satellite with signals connecting it to Earth.

7042. Ebine, Hideo. 1979. Tenpe ni tsuite [On tempeh]. *Nihon Shoyu Kenkyujo Zasshi* (*J. of the Japan Soy Sauce Research Institute*) 5(3):121-23. [Jap]

7043. Gamo, Masato; Koda, Munetsugu. 1979. [Improvement of water-based adhesives by using isocyanates. III. Improvement of the adhesive properties of soybean flour-based adhesives]. *Nippon Setchaku Kyokaishi* (*J. of the Adhesion Society of Japan*) 15(8):300-04. (Chem. Abst. 92:23695u). [Jap]*
• ***Summary:*** The waterproofing properties of soybean flour-based adhesives for plywood were improved by adding Millionate MR solution. Address: Faculty of Agriculture, Tokyo Univ. Agric. Technol., Tokyo, Japan.

7044. Iwata, Takashi; Shirahata, Kei-ichi. 1979. [Keeping quality of green soybeans. I. The factors concerning postharvest quality deterioration and the effects of atmosphere and whole plant packaging]. *Engei Gakkai Zasshi* (*J. of the Japanese Society for Horticultural Science*) 48:106-13. [Jap]*

7045. **Product Name:** [Plus Soymilk (Dairylike, Lactic Fermented, Fruit [Mikan Orange, Apple & Pineapple Mix], or Coffee/Barley Malt Syrup)].
Foreign Name: Purasu Tônyû.

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Manufacturer's Name: Kibun Health Foods Co.
Manufacturer's Address: 1-11-8, Shin Sayama, Sayama-shi, Saitama-ken 350-13, Japan.
Date of Introduction: 1979.
New Product–Documentation: Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64, 68-70. States that Kibun began making soymilk in 1977. By 1982 Kibun was the largest soymilk manufacturer in Japan and in the world.

7046. Ko, Tokubo. 1979. Kankoku no hakkô shokuhin [Korean fermented foods]. *Hakko to Kogyo* (*Fermentation and Industry*) 37(3):202-11. [75* ref. Jap]
• ***Summary:*** Shoyu and varieties of miso: 1. Historical background: The major foods used in Korea that contain soy are soy sauce (kan jang), soybean miso (doen jang), and red-pepper miso (kochu jang). Also there are jonkutsu jang, tamusu jang (makujang) and jupu jang. The suffix jang is the same as the Chinese chiang and the Japanese hishio, meaning mash. The origins of the varieties of shoyu and miso are not clear. But there was a character, tojang, in "Ronko" which was written by Oju? of the Gokan period. Also, there are some references to jang in the Analects of Confucius (Lun yu; Jap. Rongo). They indicate that jang existed years before Christ. In the "Kaitoyakushi?" there is a quotation from "Shintosho?" (618-907) that "shi" (fermented black soybeans or misodama) was a well known product of Bokkai (north of the Yellow Sea) in those days (Sakueki). It is thought that jang first appeared in Manchuria (Manshu was called Kokuri in those days) where soybeans were originally grown. Soybeans later spread to China and Japan.

In Korea the oldest record of any variety of jang was found in *Sangokushiki* (683) as "shôshi?". This indicates that people were already making shoyu and miso quite early on. In the *Ch'i-min yao-shu* (AD 530-550) a method of shi (or kaki) making was recorded. We guess that shi was the predecessor to today's meju (= misodama). The classic book Kyukosetsuyo? that was compiled in 1554 (Richo? period–Meisoo 9) is the oldest book that contains the techniques for making the Korean varieties of jang. About 8 different methods of production were recorded, amongst them the sink gan (chinjangho) and zojangho methods. In those days, meju (= misodama) was called misho. It is written that they steamed the soybeans, roasted and ground the wheat, then mixed the soy and the wheat in a 2:1 ratio. From this they made koji and dried it in the sun. That method was very similar to the koji-making method used in Japan. In Japan it was called kokori, hishio, or misho. Later, shoyu became known as jang? Miso became massho? and then returned to being called misho. Address: Presently: Tokyo Daigaku Biseibutsu Kenkyusho #3 Kenkyubu. Formerly: Seoul, South Korea. Tokoku Daigaku Shokuhin Kogakubu.

7047. Kobayashi, S.; Honda, T.; Hayashi, U. 1979. Hydrolysis of food proteins by proteases of *B. natto. Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 3:21-29. [Eng]*

7048. Komatsuzaki, T.; Ohkuro, I.; Kuriyama, S.; Kawashima, M. 1979. [Lipolytic activity of natto bacilli in the presence of sugar or casein, and the influence of salt on this activity]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 99:211-16. [Jap]*

7049. Komatsuzaki, T.; Ohkuro, I.; Kawashima, M.; Kuriyama, S. 1979. [Lipolytic activity of natto bacilli in the presence of sugar or casein, and the influence of salt on this activity]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 101:219-22. [Jap]*

7050. Komatsuzaki, T.; Ohkuro, I.; Kawashima, M.; Kuriyama, S. 1979. [The difference in unspecifically immunizing effects among strains of natto bacilli]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 99:343-45. [Jap]*

7051. Kubo, S.; Takagi, C.; Kedo, S.; Yamamoto, T.; Hayashi, U. 1979. [Studies on *Bacillus natto.* II. Continuous cultivation of *B. natto* on various agar media]. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 3:57-66. [Jap]*
Address: Japan.

7052. *Meditation* (*Tokyo, Japan*). 1979. Daizu wa eiyô no haha [Soybeans are the mother of nutrition]. No. 7. p. 42-44. [Jap]
• ***Summary:*** About the work of William Shurtleff, age 38, with soybeans, tofu, and miso. A photo shows Shurtleff.

7053. Sato, T.; Aoki, M.; Suzuki, S.; Numata, K.; Miyao, S. 1979. [On the shelf life of natto]. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 3:13-20. [Jap]*

7054. Shurtleff, William. 1979. Names and addresses of makers of soy nuggets [fermented black soybeans] in Japan. Tokyo, Japan. 1 p. Unpublished manuscript. Handwritten, pencil.
• ***Summary:*** Note: Daitokuji natto and Hamanatto are both traditional Japanese types of fermented black soybeans.

At Daitokuji they may start in mid-July or August. Daitokuji natto we call "Savory soy chunks." (1) Moriguchi Kakko Shokuhin. Phone: 076-491-3568 or 492-0682. Mr. Nakano Takazo. Ushiwaka-cho 22, Murasaki-taki, Kita-ku, Kyoto 603. They also make large and small bean natto in Kyoto.

(2) Moriguchi factory in Shiga prefecture. Phone: 07495-2-1165. Nagahama Kojo, Kao-do, Umi-cho, Sakata-gun, Shiga-ken 526. Attention: Mr. Nakano Takazo. They have 40 years experience. Make 1,200 kg/year.

(3) Ikkyu, Daitokuji-nai [inside Daitokuji], Kita-ku,

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Kyoto. They make traditional Daitokuji natto but may be secret.

(4) Ikkyu-ji. Phone: 07746-2-0193. Aza-maki, Tanabe-cho, Kyoto-fu, 610-03. A second maker of Daitokuji natto. They seem to have taken the Ikkyu-ji name and started to compete with the original maker at Daitoku-ji. They make only 6 kegs a year, each keg holding 25 kg. 150 cm diameter and 75 cm deep. For temple and tourists. Only use the traditional process. Small scale. Makes ichi-mei Ikkyu-ji natto.

(5) Jofukuji natto. Are they in Nara?

(6) Tenryuji natto: Make at Tenryu-ji, Ukyo-ku, Kyoto–in Kyoto's Arashiyama district. Founded in 1339, it is the head temple of the Tenryu branch of Rinzai Zen Buddhism.

Hama-natto–which we call "Savory soy bits." (1) The top scholar is Hiroshi Ito at the National Food Research Institute. Phone: 645-9911.

(2) Factory: K.K. Yamaya shoyu. Phone: 053-587-0621. Komatsu 4880. Hamakita-shi, Shizuoka-ken 434. Attn: Mr. Suzuki Tsumotsu. Mechanized koji. Old vats. Makes miso and shoyu too. 30 minutes from Hamamatsu by Enshu railroad. Office in Hamamatsu city, Naruko-cho 8.

(3) K.K. Hamana. Phone: 053-433-6211. Joko-cho 1356. Hamamatsu-shi 431-32. Attn: Saito Shigeo. Eigo no Okiai. Mr. Suzuki.

(4) Daifuku-ji. Phone: 05352-5-0278. Related to Tokugawa Ieyasu. Mikkabi-cho, Fukunaga, Inasa-gun, Shizuoka-ken 431-14.

(5) Horinji. Phone: 0534-71-0838. Mr. Matsuyama Gizen (very nice). Tomitsuka-cho 1976, Hamamatsu-shi 432.

(6) Yamaya (new, from July 1976). Mr. Suzuki. Zaimoku-cho 30, Hamamatsu-shi 430. Address: c/o Aoyagi, 278-28 Higashi Oizumi, Nerima-ku, Tokyo 177, Japan. Phone: (03) 925-4974.

7055. So, Enshi. 1979. Taiwan no hakkô shokuhin [Fermented foods of Taiwan]. *Hakko to Kogyo* (*Fermentation and Industry*) 37(2):102-12. [Jap; eng+]
• ***Summary:*** Includes a good map of Taiwan and its prefectures. In 1976 there were 433 soy sauce manufacturers in Taiwan. Taiwanese divisions of grading soy sauce plants numbered as follows: A (Ko) class, 39; B (Otsu) class, 12; C (Hei) class, 223; others 159. They produced the equivalent of 1,681,870 dozen bottles/month. Each bottle contains 540 ml of soy sauce, so 12 bottles contain 6,480 ml or 6.48 liters or 1.712 gallons. Thus Taiwan produces 10.89 million liters a month or 130.71 million liters/year of soy sauce. This is equivalent to 2.878 million gallons a month or 34.53 million gallons a year. Taipei prefecture produced 46.8% of this total, followed by Changhwa prefecture with 10.7%.

Soy sauce was initially made by monks. Because they didn't eat meat, it gave them important protein and fat. Gradually, it became more popular and spread to all parts of China. Monks also transmitted the method of soy sauce production to Japan and all over East Asia. It is said that around 1230 A.D., the Zen monk, Kakushin of Kofukuji, Kishu Yura, went abroad to southern Sung in China and brought back to Japan fermentation methods of Miso and Kinzanji Miso.

There are 3 types of soy sauce produced and sold in Taiwan today: (1) Tou-yu, soy sauce (*daizu shoyu*) which originated in China, (2) Inyu, black bean sauce which is the traditional Taiwanese soy sauce, and (3) Chemically prepared soy sauce (*kagaku shoyu*) which was invented in Japan. Processing techniques for making Koji and pressure-straining methods have made great progress in recent years. Address: Kokuritsu Taiwan Daigaku Kyoju, Ken Nogyo Kagaku Kenkyu-jo sho-cho, Nôgaku Hakase.

7056. Tanegashima, C.; Ishiyaki, Y. 1979. [Studies on the volatile flavor components of commercial natto]. *Mukogawa Joshi Daigaku Kiyo. Shokumotsu-hen* (*Bulletin of the Mukogawa Women's College, Food Science Series*) 27:37-38. (Chem. Abst. 96:141377. 1982). [Jap]*

7057. Tsurumaki, Y.; Sano, M.; Hayashi, U. 1979. [Proteases of natto]. *Natto Kagaku Kenkyu Kaishi* (*J. of the Natto Research Society*) 3:67-72. (Chem. Abst. 93:44103k). [Jap]* Address: Japan.

7058. Aihara, Cornellia. 1979. The calendar cookbook. George Ohsawa Macrobiotic Foundation, 1544 Oak St., Oroville, CA 95965. 253 p. [unnumbered]. Illust. by Nan Schleiger. Index. 17 x 24 cm.
• ***Summary:*** This macrobiotic cookbook is designed for cooking with the seasons. Breakfast and dinner menus are given for every day of the year. A glossary gives brief descriptions of the Japanese foods listed in the recipes. For example: "Tamari: traditional soy sauce (*shoyu*) made without chemicals. Tofu: curdled soy milk. Tekka: condiment of miso and vegetables cooked a long time." All recipes are numbered.

Soy-related recipes include: 2d. Baked mochi with kinako. 4. Kombu, age, albi nishime. 5. Black bean nishime [these are almost certainly black soybeans]. 8. Amasake. 8a. Amasake kanten. 13. Natto with pickled daikon leaves. 18. Vegetable miso soup. 20. Mackerel with ginger miso. 28 Wakame miso soup. 32. Kidney beans with miso. 35 Onion miso. 46. Burdock, carrot and lotus root with oily miso. 60. Vegetable oden (with stuffed age). 63. Collard greens with age nitsuke. 64. Home-made age (deep-fried tofu). 73. Home made natto I and II. 75. Northern white beans with miso. 80. Home made tofu and nigari. 80a. Clear soup with tofu and shingiku [sic, *shungiku* = chrysanthemum leaves]. 80b. Tofu-scallion miso soup. 82. Amasake cake with cream cheese frosting (3-layer, using 1 lb of dairy cream cheese). 87. Wheat gluten (made from 10 cups whole wheat flour and 4 cups unbleached white flour). 87a. Seitan (with wheat gluten

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and tamari soy sauce). 87b. Fresh wheat fu (with wheat gluten). 87c. Boiled fu. 87d. Fried fu (Gluten cutlet). 87e. Cutlet kabobs (with cooked wheat gluten). 97. Scallion miso. 100. Okara nitsuke (okara is "soybeans which are leftover after making tofu"). 132. Amasake cake. 135. Amasake yeasted doughnuts. 138. Vegetable kabobs with lemon miso sauce. 159. Koi-koku (carp soup with barley miso). 161. Amasake cake with fruit and nuts. 177. Buckwheat dumpling miso soup. 183. Cooked vegetable salad miso ai (miso dressing). 191b. Tomato sauce with miso. Amasake cookies. 197. Onion cream miso soup. 199. Soybean soup. 220. Tofu, snow peas and white rice miso soup. 229. Cucumber with miso. 233. Fresh corn tortillas with scallion and oily miso. 236. Toasted rice balls with soy sauce or miso. 244. Barley miso soup. 245. Tekka [miso]. 251. Pan-fried eggplant with lemon-miso sauce. 257. Green pepper with sauteed miso. 259. Tofu with mustard sauce. 261. Goma tofu (made from sesame butter and a little tamari soy sauce). 263a. Parsley miso pickles. 263b. Miso pickles. 266. Amasake wedding cake. 274. Shingiku miso soup. 290. Tofu with kuzu sauce. 294. Soybean nitsuke. 304. Kombu, dried tofu, age nitsuke. 305a. Millet and soybean soup. 329. Amasake crescent cookies. 333. Tofu-egg clear soup with watercress.

The Acknowledgments section begins: "After the French Meadows Summer Camp sponsored by the George Ohsawa Macrobiotic Foundation in 1972, I looked over the menus of the meals I served at camp. In revising them, I had the idea to keep a one-year record of menus. I thought this would be a practical, everyday help for those people beginning to cook...

"Since then, seven years passed." Address: Oroville, California.

7059. Aoki, Hiroshi; Ito, Kiyoe. 1979. Chôri to daizu [Cooking and soybeans]. Gakken Shoin K.K., Tokyo. 173 p. Illust. Index. 22 cm. [151 ref. Jap]

• ***Summary:*** Contents. I. Cooking and soybeans. II. Soybean molecules and soybean protein. III. Cooking and traditional soy protein foods. 1. Cooked whole soybeans (nimame), green vegetable soybeans (yude-mame, edamame), soy sprouts. 2. Roasted soy flour (kinako). 3. Tofu. 4. Deep-fried tofu pouches and tofu burgers (aburaage and ganmodoki). 5. Dried frozen tofu (kori-dofu). 6. Yuba. 7. Natto. 8. Tempeh. 9. Soymilk. 10. Miso (Miso soup, miso-ni, ae-mono). 11. Shoyu. IV. Cooking and new soy protein products. Address: 1. Prof., Otsuma Joshi Daigaku; 2. Prof., Tokyo Gaku Gei Dai.

7060. Barer-Stein, Thelma. 1979. You eat what you are: A study of ethnic food traditions. Canada: McClelland & Stewart, Ltd. xii + 13-624 p. Index. 23 cm. [550+* ref]

• ***Summary:*** This is largely a compilation of information from many other books and articles. On the cover is a color painting of The Gardener (or Vertumnus), from his series, The Four Seasons, c. 1590, by Giuseppe Arcimboldo (or Arcimboldi) of Milano.

In Chapter 12, on China, the section titled "Meats and alternates" (p. 110-13) notes that the soybean is called the "Chinese Cow" [sic, "Cow of China"] because of its versatility. Soybeans are used as whole dry beans and as sprouts, or they can be made into a firm white curd called "Chinese cheese" [sic], which can be used in many different ways. Soybean milk may be used in much the same way that westerners use cow's milk. They are fermented to make the favourite condiment, soy sauce. "Bean curd sauce is fermented bean curd that is packed in jars and sold as red bean curd sauce or white bean curd sauce,..." Cantonese names for soy products are (p. 111-12): Mien chiang: A syrup-like sweet bean paste. Dow-foo (tofu). Foo yu (fermented tofu). Tiem jook (dried yuba, broken into pieces [sweet dried yuba sticks]). Wow doo [Wu dou]. Black soybeans. Dow see [doushi, fermented black soybeans]: Salted, fermented black bean paste [sic, fermented black soybeans] often garlic flavoured and used in small amounts as a condiment or seasoning.

In Chapter 30, on Japan, the section titled "Meats and alternates" (p. 336-37) notes that products made from soybeans include: (1) "Shoyu, a sweetish soy sauce made from wheat and barley [sic], soybeans, salt, and water." (2) Miso, or "fermented soybean paste," used mostly for flavouring soups [miso soup]. (3) Tofu, or soybean curd, is a staple in Japanese cookery. "Its smooth, custard-like texture and bland flavour make it an ideal ingredient. It is extremely versatile and readily absorbs other flavours. Many "restaurants in Japan take great pride in their tofu dishes."

In Chapter 31, on Korea, the section titled "Fruits and vegetables" (p. 350-51) discusses soybeans and their products at length. Soy sauce is used to season *kim* (nori) and other edible seaweeds. Soy sauce is an ingredient in "hot pepper mash" [*kochu jang*]. Soybeans are used to make "soybean mash" [*doen jang*]. Dry soybeans are roasted in an iron pot, then ground, and the roasted soy flour is used as a garnish over rice cakes [mochi] or plain cooked rice; children enjoy eating the coarser roasted bits that are sifted out of roasted flour or meal. Soybeans sprouts are eaten lightly cooked as a vegetable. Soybeans are also made into tofu (*tu bu*); a brief description of the process is given, in which the drained curds are left in their hemp bag to form a firm cake, which may be cut, dipped into soy sauce, or fried in sesame oil. "Oil can also be made from the soybeans, but it is not commonly used or prepared."

Although commercial soy sauce, made in factories, is now widely available, many Korean households still prepare their own soy sauce each fall. Boiled soybeans are pounded, molded into a cone shape, and set to dry until hard. They are then wrapped with rice straw, hung from eves, rafters or ceilings, and allowed to ferment for several weeks [until they become *meju*]. During the winter, these fermented cones may be stored in huge rice-straw bags kept in a cool place.

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In the spring, break the cone into small pieces and place in a large earthenware jar, nearly filled with water. Add salt, spices, red peppers, and a few charcoal lumps. Leave this in the sun for a few days [sic, 30-60 days] until the molded soybean chunks float to the top and the resulting liquid turns black. Ladle out and filter the black liquid, then boil it to make soy sauce. The solids remaining in the jar are used as soybean mash [after the charcoal is removed].

A portrait photo of the author, with a brief biography, appear on the rear cover and in the Introduction. Address: Ph.D. student, Ontario Inst. for Studies in Education, Toronto, Ontario, Canada.

7061. Bhatnagar, P.S. 1979. Soybean–For more protein, more oil, and better returns to farmers (The status paper). Pantnagar, India: All India Coordinated Research Project on Soybean (ICAR). G.B. Pant University of Agric. & Technology. 31 p. [17 ref]

• ***Summary:*** Contents: Introduction. World production and nutritional value. Soybean in India. All India Coordinated Soybean Research Project. Place of soybean in India cropping system. False apprehensions on competition of soybean with groundnut. Commercial production of soybean in India. Problems in expansion of soybean. Black soybean vs. yellow soybean. Food uses of soybean: Nutritional quality, pattern of utilization in U.S., pattern of utilization in Japan, suggested utilization pattern for India. Antinutritional factors in soybean–only a myth. Feed uses of soybean for livestock and poultry: Soybean meal–an ideal poultry feed. Address: Project Coordinator, Pantnagar, India.

7062. Fukuo, Takeshirô. 1979. Nihon kodai no 'hishio' no seishitsu ni tsuite–sono shôyu taru koto no teishô [On the nature of hishio in ancient Japan–an essay on the soy sauce of the time]. In: Fukuo Takeshiro, ed. 1979. *Nihon Shi Senshû* [Anthology of Japanese History]. Osaka: Fukuo Takeshirô Sensei Koki Kinenkai. See p. 455-70. [Jap]*

• ***Summary:*** The prototype of soy sauce, a semi-liquid flavoring named *hishio*, was probably in use in Japan as early as the 8th century.

7063. Hasegawa, Takezi [Takeji]. 1979. An historical view of the development of Japanese industrial culture collections. In: P. Matangkasombu, ed. 1979. Proceedings of the Fifth International Conference on Global Impacts of Applied Microbiology. Bangkok: GIAM V Secretariat. xxxviii + 535 p. See p. 488-90. Held 21-26 Nov. 1977 in Bangkok, Thailand. [3 ref]

• ***Summary:*** The history of modern microbiology in Japan began with three key publications by foreign scientists who were studying sake in Japan. The first two, by the German scientist Korschelt, were published in 1876 and 1878. The third, by R.W. Atkinson, an professor from Britain, was published in 1881. These works aroused the interest of the Japanese government in the scientific administration of traditional fermentation industries. "Government interest in these industries led to the founding of the National Brewing Research Institute in 1904. One of its main research project was the microbiological study of sake brewing. To this end, numerous strains of microorganisms were collected for study in close cooperation with the University of Tokyo. In its first several years, the institute retained two excellent microbiologists, K. Saito and R. Nakazawa." A brief biography of each is given.

A chart shows the complex genealogy of Japanese culture collections. Japan's earliest culture collection began in the early 1890s at the Faculty of Agriculture, University of Tokyo. The second started at the Faculty of Agriculture, Hokkaido University in about 1920. In 1951 the Japan Federation of Culture Collections (JFCC) was founded. Today it is comprised of the 7 main culture collections in Japan: 1. The Faculty of Agriculture, Hokkaido Univ. 2. Inst. of Applied Microbiology, Univ. of Tokyo. 3. The Faculty of Agriculture, Univ. of Tokyo. 4. Inst. of Fermentation, Osaka. 5. Faculty of Technology, Hiroshima Univ. 6. Nagao Inst., Tokyo. 7. Faculty of Technology, Osaka Univ. Address: Inst. for Fermentation, Osaka Univ., Japan.

7064. Kohler, Jean Charles; Kohler, Mary Alice. 1979. Healing miracles from macrobiotics: a diet for all diseases. West Nyack, New York: Parker Publishing Co. 290 p. Index. 24 cm. [70* ref]

• ***Summary:*** This book is by and about people who were cured of cancer, apparently by following a macrobiotic diet, lifestyle, and worldview.

Miso soup is mentioned on pages 29, 30, 112, 122, 161, 169, 173. Miso-tahini spread p. 208. Miso, tekka, p. 131. Shoyu, p. 169. Soybeans, p. 122, 169. Soy ice cream, p. 214. Tamari, p. 112, 169. Tofu, p. 178 ("you can often find some tofu {some natural-foods stores are equipped to handle this perishable bean-curd}").

Seitan is mentioned on pages 202, 216, and 218.

The index also contains many entries for seaweed (edible), sesame oil, sesame seeds, sugar, sunflower seeds, tahini, umeboshi plum, vegetarian diets and nutrition, Zen, etc.

At age 16, while visiting a shrine in Akita (in northeastern Japan), Michio Kushi had a profound spiritual experience, which is described at length (p. 88). "I saw... that everything was being; everything was radiating light. I could then understand that everything is living, everything is breathing, including plants, grasses, trees, birds, and even houses, stones, and soil; everything without exception. Then I understood that life is nothing but light and vibration, or waves, and the universe is full of life, and is one continuity, yet is manifested in everything and every being."

Michio visited an organization in Tokyo named the World Government Organization. To Michio's surprise, the

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young people there "talked about food and cooking rather than world government. They introduced Michio to their teacher: Nyoichi Sakurazawa, whose name in the Western world was George Ohsawa."

"Ohsawa never spoke to Michio about food. It was always the view of the Universe he talked about–and of yin and yang."

Jean Charles Kohler (husband) was born in 1916 and Mary Alice Kohler (wife) was born in 1917.

7065. L'Aurore. 1979. La cuisine au tofu: Un art Japonais [Tofu cuisine: A Japanese art]. Quebec, Canada: L'Aurore. 192 p. Illust. No index. 14 x 22 cm. [Fre]
• ***Summary:*** Contents: I. Introduction: Table of derivatives of soybeans. Some numbers [statistics]. II. Tofu: Utensils, coagulants, method of preparation of tofu, method of preparation of kinugoshi tofu. Other preparations: Soymilk. Soymilk yoghurt [yogurt]. III. Getting started: Fundamental ingredients, tools of the art, techniques for preparing foods. Fundamental recipes: Bouillons, sauces to accompany basic soy sauce, preparations to accompany basic miso, basic sauces, rice, noodles, sesame salt, grilled soybeans, kofu [wheat gluten]. Recipes using gô, okara, tofu, soymilk, kinugoshi tofu, yuba. Glossary. Useful addresses. Bibliography.

Note 1. This book is largely based on and pirated from *The Book of Tofu* by Shurtleff and Aoyagi (1975).

Note 2. This is the earliest French-language document seen (April 2013) that mentions silken tofu, which it refers to as *kinogoshi***.** Address: Quebec, Canada.

7066. Miura, H. 1979. Shonai no Bon no mijiman: dadachamame–edamame [Good taste of the local O-bon festival: dadachamame–green vegetable soybeans]. In: Noko to Engei Henshu-bu: Furusato no Yasai–Nihon Yasaishi (Local Vegetables–Japanese Vegetable Magazine): Tokyo: Seibundo Shinkosha. 2 + 5 + 370 + 4 p. See p. 47-49. Illust. 22 cm. [Jap]*
Address: Japan.

7067. Murai, Yasuhiko. 1979. Kyô ryôri no rekishi [History of Kyoto cuisine]. Tokyo: Shibata Shoten. 310 p. Shoku Bunka no Hakken series #4. Japanese summary by Kawakami 1978. [Jap]*
Address: Japan.

7068. Nakano, Masahiro. 1979. Tezukuri no kenkô shokuhin: Hakkô riyô no subete [Handmade healthy fermented foods]. Tokyo: Nosan Gyoson Bunka Kyokai. 227 p. Illust. 18 cm. [Jap; eng+]
• ***Summary:*** Describes how to prepare homemade soymilk cheese (p. 139-42), soymilk yogurt (p. 155), tempeh, and miso (16-39, 84-91), and fermented tofu (p. 117-24). Address: Tokyo, Japan.

7069. NHK. 1979. Tôfu ryôri [Tofu cookery]. Tokyo: Nihon Hoso Kyokai. 128 p. Illust. No index. 19 cm. [Jap]
• ***Summary:*** Contents: Part I: Japanese style tofu recipes. Boiled/simmered (niru), steamed, broiled, fried, sauteed, tossed salad (with tofu dressing), soups, other, okara, deep-fried tofu cutlets, deep-fried tofu pouches, kôya-dofu. Part II: Chinese style tofu recipes. Tossed salad, steamed, boiled/simmered, deep fried, deep-fried tofu cutlets, deep-fried tofu pouches. Address: Tokyo, Japan.

7070. Ogawa, Hiroshi. 1979. Noda no taru shokunin [The craftsmen who make wooden kegs in Noda]. Nagareyama, Chiba prefecture, Japan: Ron Shobo. 150 p. Series: Furusato Bunko. [20+ ref. Jap]*

7071. Okita Enterprises, Inc. 1979. Masuko Sangyo Miniplant: Tofu & soy milk machine. 960 E. 12th St., Los Angeles, CA 90021. 12 p. Undated. 28 cm.
• ***Summary:*** A photo on the cover shows the Masuko Sangyo Miniplant on a blue background. Okita Enterprises is the sole agent in the USA for the equipment shown in this catalog. Okita has a training center at 723 S. Stanford Ave., Los Angeles, California 90021. The body of the catalog shows photos and gives details on the following equipment: The Miniplant and related parts (p. 2-5). The Super Masukoroider, a soybean grinder with special non-permeable grinding stones made by Masuko Sangyo K.K. in Japan (p. 6-7). Various sizes of manual and automatic tray packagers, the smallest of which is the Monkey Packer 1 (p. 8-9). The new Asahi Container (tofu pressing and forming box), made of stainless steel and Tofu-Tex "cloth" by Toyo Plant in Japan. Address: Los Angeles, California. Phone: (213) 629-2206.

7072. Okita Enterprises, Inc. 1979. Sany Ace "Unit": Unit type sanitary plant [Automatic tofu & soy milk machine]. 960 E. 12th St., Los Angeles, CA 90021. 6 p. 30 cm.
• ***Summary:*** On the cover is a photo of the Sany Ace plant on a blue and white background. The manufacturer is Sato Shoji Co. Ltd. in Japan. Okita Enterprises is an importer of this equipment. Contents: DEvelopment of the "Sany Ace (Unit)." Characteristics of Sany Ace. Flow sheet, with the names and a mechanical drawing of each piece of equipment in the system. Features of the grinding unit, boiling unit, and squeezing unit (with a photo of each). Option: Advanced separator for labor saving: Vibrating screen, Brown squeezing unit (with photos of both). Address: Los Angeles, California. Phone: (213) 629-2206.

7073. Okita Enterprises, Inc. 1979. Rietz Manufacturing Co. 960 E. 12th St., Los Angeles, CA 90021. 4 p. Undated. 28 cm.
• ***Summary:*** A black-and-white photo on the front cover

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shows a Rietz disintegrator on a green background. A black-and-white photo on the rear cover shows a Rietz tofu and soymilk cooker on a white background. The inside two pages show mechanical drawings of these two pieces of equipment integrated into the OK-FRSB 1000 tofu plant, which has a capacity of 10-15 gallons/minute. The text states that this "could very well become the Tofu plant of the future." Note: Rietz (c/o Bepex Corp.) is located in Santa Rosa, California. Address: Los Angeles, California. Phone: (213) 629-2206.

7074. Okita Enterprises, Inc. 1979. Brown International Corp. Sato Shoji Co., Ltd. 960 E. 12th St., Los Angeles, CA 90021. 4 p. Undated. 28 cm.
• ***Summary:*** A black-and-white photo on the front cover shows a Brown 2202 disintegrator-extractor on an orange-brown background. Black-and-white photos on the other three panels show the following pieces of equipment, each on a white background. (1) Okita-type separation unit consisting of a Sweco Separator and a Brown Extractor. (2) Brown 3900 continuous process screw extractor. (3) Sany Ace unit, made by Sato Shoji Co., Ltd. of Japan. Address: Los Angeles, California. Phone: (213) 629-2206.

7075. Okita Enterprises, Inc. 1979. Automatic tray packager: US 900 ss–electro-mechanical press, and US 90 ssa–compressed air press (Leaflet). 960 E. 12th St., Los Angeles, CA 90021. 1 p. Undated. 28 cm.
• ***Summary:*** A black-and-white photo on the front cover shows one of these large packaging units on a white background. The packaging machine is "for tofu, seafood, pickled vegetables, or any other product that may require a water tight seal." Produces 500 to 1,500 packages/hour. The dimensions of each machine are given. Address: Los Angeles, California. Phone: (213) 629-2206.

7076. Riker, Tom; Roberts, Richard. 1979. Directory of natural and health foods: A sourcebook for dietary revolution. New York, NY: Putnam (A Paragon Book). 320 p. Index. 37 cm.
• ***Summary:*** The first part of this book (p. 7-49) consists of essays on natural foods and nutrition (some reprinted). Part two is a commercial catalog/directory of natural foods available in 1979; it lists and describes (with may photos and labels) products from most of the major U.S. natural foods manufacturers. An Index (p. 293-308) lists participating companies alphabetically.

Soy-related products include: Hain Super-E Soy Oil and Crude [unrefined] Soy Oil (Los Angeles, California, p. 55). Health Valley Soy Moo (Montebello, California, p. 56). Edward & Sons Miso-Cup (Union, New Jersey, p. 57). Family Orchards Fruit & Nut mixes, incl. Back Packer+*, Hi-Fiber Mix+, Hi-Iron Mix+, Hi-Protein Mix+*, Hiker's Helper, Mixed Nuts*, Mountain Munchies*, Tamari Mixed Nuts* (+ = contains Soy Nuts; * = contains Tamari Peanuts) (Berkeley, California, p. 60-61). Niblack Tamari Pumpkin Seeds (Pepitas), Tamari Roasted Sunflower Seeds, Liquid Lecithin, Granular Lecithin (Rochester, New York, p. 72-73). Arrowhead Mills Unrefined Soybean Oil (Hereford, Texas, p. 75). Good Morning New England Granola incl. Cashew-Raisin Bran-ola (with okara soy fiber), Happy Trails Mix (with roasted soynuts) (Amherst, Massachusetts, p. 79). Elam's Soy Flour (Broadview, Illinois, p. 81).

A long section on Erewhon and its products (p. 84-108) is probably the reproduction of an Erewhon catalog. Erewhon is now located at 3 East Street, Cambridge, MA 02141. Following several pages about the company and its philosophy and standards, each of its major products is discussed in detail, often with nutritional analyses. A label for Soy Flour (organically-grown stone-ground, 24 oz.) is shown; the main recommended use is for making soy milk! A major part of the presentation is titled "Japanese food guide." Products described include: Umeboshi (2 pages): Plums pickled in brine (umeboshi). Umeboshi paste. Plum concentrate (*bainiku ekisu*). Miso (2 pages): Hatcho, waka-Hatcho, soybean, barley, brown rice, rice, and natto miso varieties. Tekka (made with Hatcho miso). Sweets made from mizu ame [rice syrup]. Nigari. Gomashio. Koji starters for various types of miso or shoyu. Goma-muso (60% barley miso and 40% whole sesame seed butter). *Gomamiso furikake* (with barley miso, whole roasted sesame seeds, and shredded nori seaweed). Kombu candy. Kokkoh. Dried tofu (*Kohya-dofu*). Brown rice sake. Mirin. Gluten cakes (*Kuruma-fu*). Seitan (Gluten cooked in shoyu). Rice crackers seasoned with tamari soy sauce. Kuzu (3 pages). Tamari and shoyu (4 pages; Johsen Shoyu is made in Sendai and tamari is made by San-jirushi Co.). Seaweeds (4 pages): Kanten, arame, hijiki, kombu, ne-kombu, nori, seasoned nori, kanten, kanten flakes, wakame, and mekabu.

Good Food brand Soy-Millet Bread (Austin, Texas, p. 120). Arrowhead Mills Bulgur-Soy Grits (p. 121). Erewhon Morning Cereal, and Infant Cereal (each containing soy beans). Chico-San Black Soybeans (imported), and Azuki Beans (Dainagon imported small red), and Lima Soy Sauce (Chico, California, p. 126-27). Arrowhead Mills 7 Grain Cereal, and Deaf Smith Crunch (granola-type cold cereal) (each contains soybeans, p. 130).

The section on pages 188-197 is titled "Soy." It lists Farm Foods Tempeh Kit, Tempeh Starter, Natural Nigari for Curding Tofu, Soyflour, Whole Cleaned Soybeans, Good for Ya Textured Vegetable Protein (Summertown, Tennessee, p. 189). New England Soy Dairy Tofu (with many tofu recipes, Greenfield, Massachusetts, p. 192-96).

The Redwood Sprouter Co. sprouter containing Soy Sprouts (1976, Austin, Texas, p. 202-04). Worthington Foods (a photo shows their line of 38 products). Millstone Burger-Like (with soy flour and TVP), Wheat Fries (with wheat gluten), Tender Cuts (with wheat protein and soy flour) (Penryn, California, p. 222-23). Sunrise Health Products

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Lecithin Granules (p. 274-75).

7077. Sato Shoji Co. Ltd. 1979. Hôsô-dôfu shisutemu [Bean curd product system]. Nakano 3-33-9, Nakano-ku, Tokyo, Japan. Manufacturer's catalog. [Jap; Eng]
• ***Summary:*** On the cover, a large rectangular color photo in a blue frame shows a a cake of tofu, served as chilled tofu with a dab of ginger on top, in a glass bowl, with green shiso leaves on one side. Near it is a pair of wooden chopsticks on a stand and a second smaller glass bowl. All three of these items are set atop eight pieces of green bamboo, which are on a background of white pebbles. On the inside 3-page spread, a color photo shows Sato's modern Sany System. Since 1958 Sato has specialized in tofu packaging machines. Its Sany Ace System is widely used. "Bean curd is protein source in the world!" On the back page is a flow sheet of the Sany System, plus three color photos showing finished and packaged tofu products, a case of packaged tofu, and the tofu displayed in the refrigerated section of a department store. Address: Tokyo, Japan.

7078. Sato, Yoshiya. 1979. Fûmi o uru otoko-tachi: Yonjû oku nin shijô ni idomu Kikkôman [The men who sell flavor: Kikkoman challenges a world market of 4 billion people]. Tokyo: Nihon Rikuruto Senta. 245 p. No index. 18 cm. [Jap] Address: Member of newspaper inspectors committee (Shinbun Kansa Iinkai Iin).

7079. Shishikura, Soken; Abe, Koryû. 1979. Shôjin ryôri [Zen vegetarian cookery]. Tokyo: Shibata Shoten. 3 + 233 + 20 p. Illust. (some color). 27 cm. Series: Gendai Nihon Ryôri Zenshû, No. 9. [Jap]*
• ***Summary:*** The first author was born in 1901, and the second author in 1925.

7080. Taguchi, Hisaharu; Yoshida, T.; Ocampo, T.A.; Sawada, H. 1979. Microbial utilization of industrial waste: Soy bean whey from an edible oil factory. In: P. Matangkasombu, ed. 1979. Proceedings of the Fifth International Conference on Global Impacts of Applied Microbiology. Bangkok: GIAM V Secretariat. xxxviii + 535 p. See p. 466-75. Held 21-26 Nov. 1977 in Bangkok, Thailand. [9 ref]
• ***Summary:*** Uses *Torulopsis candida* yeast. Address: Dep. of Fermentation Technology, Faculty of Engineering, Osaka Univ., Yamada-kami, Suita-shi, Osaka 565, Japan.

7081. Takenaka, Haruko. comp. 1979. Nihon kaseigaku bunken-shu 1969-1978 [Bibliography of home economics 1969-78]. Tokyo: Nihon Kasei Gakkai (Japan Home Economics Assoc.). 678 p. See p. 52-57. [275 ref. Jap]
• ***Summary:*** Bibliographies are given for soybeans (protein), soybeans (other nutrients), tofu, natto, other soyfoods, and azuki beans. Address: Nihon Joshi Daigaku, Kaseigaku-bu [Home Economics Dep., Japan Women's Univ.].

7082. Wang, Hwa L.; Hesseltine, C.W. 1979. Mold-modified foods. In: H.J. Peppler and D. Perlman, eds. 1979. Microbial Technology. 2nd ed. Vol. 2. Fermentation Technology. New York: Academic Press. 544 p. See Vol. 1, p. 95-129. [90 ref]
• ***Summary:*** Volume 1. Microbial processes. Volume 2. Fermentation technology. Contents: 1. Introduction. 2. Soy sauce. 3. Miso. 4. Hamanatto. 5. Sufu [fermented tofu]. 6. Tempeh. 7. Ang-kak (red rice, used as a color agent). 8. Absence of mycotoxins in fermented foods. 9. Conclusions.

For each food is given: General description, method of preparation, composition [chemical / nutritional]. In addition for tempeh is given: Tempeh-like products, biochemistry and physiology of *Rhizopus oligosporus,* changes occurring during fermentation, nutritional value.

"Soy sauce "is known as chiang-yu on China, shoyu in Japan, kecap in Indonesia, kanjang in Korea, toyo in the Philippines, and see-iew in Thailand. In the Western World the product is often referred to as soy sauce." Japan is the leader worldwide in sauce production; it has the largest fermentation plant and uses the most advanced technology.

Hamanatto: Products similar to Japan's hamanatto are known as tou-shih in China, tao-si in the Philippines, and tao-tjo [sic] in the East Indies [Indonesia]. A typical process for making hamanatto in Japan, based on information supplied by Dr. T. Kaneko of Nagoya Univ., Japan, is as follows: Wash soybeans, then soak, steam until soft, drain, and cool. Mix with parched wheat flour in the ratio of 2 parts soybeans to 1 part flour. Inoculate the soybeans with a short- or medium-stalked strain of *Aspergillus oryzae.* Incubate for 1-2 days until the beans are covered with a fragrant mycelium and have become soybean koji. Pack the soybeans in a container [wooden keg] with (for example) 2.5 kg soybean koji, 650 gm salt, 3.6 liters water and some freshly sliced gingerroot. Cover the container tightly and age under pressure for 6-12 months. Remove beans from liquid and dry them in the sun to give hamanatto. The composition of the brine may differ among manufacturers.; thus the finished hamanatto differs somewhat in taste and appearance. "Japanese hamanatto is rather soft, having a high moisture content. Chinese tou-shih has a much lower moisture content... and therefore is not so soft. Tao-tjo tends to have a sweet taste because sugar is often added to the brine."

Shoyu in Japan: Although there are more than 4,000 shoyu makers in Japan, the largest 4-5 companies produce about 50% of the total.

Note: A wide variety of dairy cheeses, especially of French origin, are made with surface mold growth. Typical varieties are Camembert, Coulommiers, and Brie. Address: NRRC, Peoria, Illinois.

7083. Yamaguchi, Momoo; Kojima, Setsuko. eds. 1979. Wa-Ei Nihon bunka jiten [A cultural dictionary of Japan]. Tokyo:

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Japan Times. vii + 408 p. See p. 108. 19 cm. [Eng; jap]
• ***Summary:*** A very useful book with excellent definitions of Japanese words in English. It is divided into nine parts; No. 2 is titled "dietary habits" (p. 79-131). Each definition has four parts: (1) The word is written in romanized English, with diacritical marks and a hyphen in compound words. (2) The word is written in characters. (3) A long definition is given in English. (4) Related words and "see also" words are given (romanized) and key words in the definition are defined in Japanese (Chinese characters).

Words only distantly related to soy are preceded below by an asterisk. Soy-related words: abekawa-mochi (with "sweetened yellow soybean powder–kinako"), abura-age (fried soybean curd), aemono, age-dama, age-dashi ("soybean curd fried lightly without a tenpura batter"), Aji-no-moto ("a popular brand of monosodium glutamate"), ama-zake, * an (sweet bean jam = azuki-an; Can be strained {*koshi-an*} or mashed {*tsubushi-an*}), dengaku-tofu, doburoku, eda-mame, fu ("dried, bread-like pieces of wheat gluten"), fucha-ryori ("Chinese-style vegetarian dishes served in some Japanese temples of Chinese origin"), gan-modoki, goma-ae, goma-shio (widely used with sekihan), hiya-yakko, inari-zushi, isobe-maki (with mochi, soy sauce and nori), kara-age, kashiwa-mochi (stuffed with sweet [azuki] bean paste), kina-ko ("yellowish soybean powder"), kishimen (seasoned with soy sauce and topped with a few pieces of fried bean curd), kitsune udon (seasoned with soy sauce and topped with a few pieces of fried bean curd), koji, koya-dofu, * kuzu-manju (a ball of sweet redbean paste {azuki-an} with a covering of kuzu starch), kuzu-mochi (with kinako), masu (a small square measuring box, usually made of Japanese cypress {*hinoki*}. The three sizes measure 0.18, 0.9 and 1.8 liters. It is constructed by dovetailing, without the use of nails or adhesive. It is used for measuring soybeans, cereal grains, or for drinking saké), miso, miso-shiru, miso-zuke, * mochi, nabe-mono (often contain tofu; examples are sukiyaki, yose-nabe, and mizu-taki), nama-gashi (traditional Japanese confections made with beans and/or glutinous rice, cooked but not baked), natto, * nori (a dried sheet of laver, a seaweed), * oboro (related to sushi, not soy), oden, * ohagi (coated with sweet redbean paste {*azuki-an*}), shiru-mono (the two basic types are clear soup and miso soup), * shiruko (sweet beanpaste soup with mochi; see zenzai), shojin-age, shojin-ryori, shoyu, suki-yaki, sukiyaki-nabe, suri-bachi, suriko-gi [suri-kogi], sushi, sushi-ya, teri-yaki, tofu, * ume-boshi (a Japanese pickled plum), wa-gashi (Japanese-style confectionery), wakame, warishita (soy sauce flavored seasoning), washoku = nihon-ryori, yaki-dofu, yaki-mono, yakko-dofu, yu-dofu, * zenzai ("a thick kind of sweet redbean soup").

Page 24 defines hiragana (lit. flat kana) as "The cursive form of *kana* script, one of the two sets of Japanese syllabary writing. *Hira-gana* is more commonly used than the other set called *kata-kana.* It is usually used for writing inflectional endings and function words not represented by Chinese characters (*kanji*)*."* Address: Tokyo, Japan.

7084. Yoshikawa, Koichi. 1979? [The correct way of making tofu and deep-fried tofu]. Yoshikawa Shoji Co., Honmachi Wako Building, 2-50 Kita-Kyuhoji-machi, Higashi-ku, Osaka, Japan. 24 p. [Jap; eng+]*
• ***Summary:*** Soyfoods Center has done a 16-page translation of this booklet. Address: Osaka, Japan.

7085. Shurtleff, William; Aoyagi, Akiko. 1980. Miso production: The book of miso volume II. Rev. 2nd ed. Lafayette, California: New-Age Foods Study Center (Renamed Soyfoods Center in Sept. 1980). 80 p. Jan. Illust. by Akiko Aoyagi Shurtleff. Index. 28 cm. [82 ref]
• ***Summary:*** This book describes how to start and run a commercial shop making miso on any of three scales. Contents: Introduction. 1. Setting up a traditional shop: Tools and ingredients. 2. Making red miso in a traditional shop. 3. Making red miso in a semi-traditional shop. 4. Making Hatcho and Mellow white miso in semi-traditional shops. 5. Making koji starter in a semi-traditional or modern shop. 6. Making light yellow miso in a modern factory. Appendix A: Resources; People and institutions connected with miso production. Bibliography. Measures, weights & equivalents. The Soyfoods Center. Address: New-Age Foods Study Center, P.O. Box 234, Lafayette, California 94549.

7086. Ebine, Hideo. 1980. Re: Answers to questions about miso, especially spray dried and freeze-dried miso. Letter to William Shurtleff at Soyfoods Center, Feb. 19–in reply to inquiry. 2 p. Typed translation of original letter only.
• ***Summary:*** Discusses: How to spray dry and to freeze dry miso; advantages and disadvantages of each. Of the roughly 200,000 tons of fresh miso made in Japan, less than 3-4% of the total is dehydrated. Thus, about 10,000 tons. Of this, an estimated 80% is freeze-fried and 20% spray dried. Dehydrated miso is used mainly in instant miso soups. The biggest maker of freeze-dried miso in Japan is Yamajirushi Miso in Nagano prefecture.

New developments with miso in Japan: Stricter sanitary codes for manufacturers. Less use of food additives. Sorbic acid-K (*Sorubin-san K*) is mostly phased out. Sulphite used to bleach soybeans is no longer used. Miso consumption in Japan is no longer increasing. More Japan-grown soybeans and rice are used in miso, which greatly improves the quality. Address: Applied Microbiology Div., National Food Research Inst., Ministry of Agriculture, Forestry and Fisheries, Yatabe, Ibaraki-ken, Japan.

7087. Aburai, Hiroko. 1980. Chôshi Shôyu Jôzôgyô Koyô Rôdô [Labor employment in the Choshi Shoyu fermentation industry]. *Kinsei* (*Modern History*) 4:24-40. Feb. [Jap]* Address: Japan.

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7088. Marusan, Inc. 1980. Instant energy in a bowl. Marusan introduces naturally delicious instant miso soups (Ad). *Whole Foods* (*Berkeley, California*). Feb. p. 5.
• ***Summary:*** The top half of this full-page color ad is a photo showing yellow boxes and foil packets of this instant miso soup, and two bowls of the miso soup. The text begins: "Marusan Instant Miso Soup is an ideal pick-me-up for those who want a quick and convenient meal supplement at home, on the job, or when travelling." The products are imported by offices in New Jersey and Rosemead, California. Address: P.O. Box 507, Bergenfield, New Jersey 07621. Phone: (201) 385-5367).

7089. McGregor, Otis. 1980. Report from Ontario [Soya-Bean Growers' Marketing Board]. *Soycraft* (*Colrain, Massachusetts*) 1(2):10-11. Winter.
• ***Summary:*** "The Ontario Soya-Bean Grower's Marketing Board is a growers' board. In 1949, soybean growers in Ontario petitioned the Agriculture Department to establish a marketing plan and soybeans were declared as a regulatory commodity under the Ontario Farm Products Act. Soybean production in Ontario started in tests plots at the Ontario Agricultural College, Guelph, in 1893. By 1927, O.A.C. evaluated over 100 varieties. The Harrow Research Station began soybean plots in 1923 and later produced such varieties as Harman, Hardome, Harasoy, Harlan, Harcor, Harwood.

"Soybean acreage in Ontario competes with field corn."

Soybean production in Canada is 98% of Ontario origin. Ontario is deficient in production to meet the needs of the three crushing plants which now possess a daily production capacity of 3,550 tons. To be self-sufficient, production would require 1.2 million acres. Last crop year, the Ontario crushers purchased 13 million bushels from the U.S. which enter Canada tariff-free.

"In 1954, the Board, endeavoring to achieve greater competition in the marketplace, exported soybeans to Europe. In 1974, with the variety Harwood, the Board entered the human consumption market in Japan. Harwood, having a greater water-soluble protein, soon became distinguished in that market for tofu and miso.

"The Board negotiates on behalf of its 16,000 growers, the terms and condition of sales from the farm-gate to dealers and processors."

"Editor's note: Soybeans that the Board markets, suitable for tofu-making, include Hodgson, Wells, Harosoy 63, Harcor, Amsoy 71, Maple Arrow, and Evans." Address: Secretary-Manager OSBGMB, Box 1199, Chatham, ONT Canada N7M 5L8, Canada.

7090. Nunomura, N.; Sasaki, M.; Yokotsuka, T. 1980. Shoyu (soy sauce) flavor components: Acidic fractions and the characteristic flavor component. *Agricultural and Biological Chemistry* 44(2):339-51. Feb. [24 ref]
Address: Kikkoman, Noda, Japan.

7091. Ohta, Naokazu; Kuwata, G.; Akahori, H.; Watanabe, T. 1980. Isolation of a new isoflavone acetyl glucoside, 6"-O-acetyl genistin, from soybeans. *Agricultural and Biological Chemistry* 44(2):469-70. Feb. [6 ref]
• ***Summary:*** The authors isolated and characterized a new soy isoflavone, described as an unknown isoflavone (compound V) in the July 1979 issue of this journal. It is 6"-O-acetyl genistin. Its chemical structure is also given. Address: 1. Dep. of Food Science, Kumamoto Women's Univ., Kumamoto; 2. Research Inst., Morinaga & Co., Ltd., Yokohama; 3. Faculty of Agriculture, Kyushu Univ., Fukuoka. All: Japan.

7092. *Soycraft* (*Colrain, Massachusetts*). 1980. Roundtable: "I believe in the gas station on every corner, tofu shop myth." 1(2):60-62. Winter.
• ***Summary:*** Comments by and photos of Luke Lukoskie of Island Spring, Richard Kaneda of Kanai Tofu Factory, Tom Timmins of New England Soy Dairy, Steve Demos of White Wave, Kathryn Clarke of Southwest Tofu. Comments also by Bill Shurtleff of New-Age Foods Study Center, Bob Bergwall of Nasoya Foods, Steve Fiering of The Soy Plant, Robert Dolgin of Farm Foods, and Norman Holland of Northern Soy.

7093. Strayer, George M. 1980. The battle of the coconut cow. The early days of the American soybean industry and its surprising similarity with today's soyfoods movement. *Soycraft* (*Colrain, Massachusetts*) 1(2):50-53. Winter.
• ***Summary:*** Contains an excellent history of Strayer's work with soybeans, and an early history of the American Soybean Association. So far as George has been able to determine, his father, Bert Strayer, "was the first man west of the Mississippi River to use a combine on soybeans." One had been used successfully the year before by the Garwood brothers in Illinois. "We worked with the International Harvester Company and bought the first of their combines to be used on soybeans. It was a power take-off drive machine with a folding platform. The outer end of the cutting platform folded up so that the combine could be driven through farm gates. It was a machine designed for farm use on grains and for a one-man operation. We soon learned that on soybeans the operation was a two-man job–one man driving the tractor and keeping the cutting platform in the right position on the rows, while the other man controlled the cutting height while riding on the tractor platform.

"For a period of several years, we had the only combine being used on soybeans in this entire area. The combine carried a tank, the top of which held about twenty-five or thirty bushels that could be removed from the tank by driving a wagon or truck under the edge of the tank and pulling a

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lever which opened four holes along the tank bottom and allowed the soybeans to run out."

In Sept. 1927 George Strayer attended his first meeting of the American Soybean Association, held at the University of Illinois. "One thing that sticks indelibly in my mind is a statement made by W.K. Kellogg, of Kellogg's cereals, Battle Creek, Michigan. He said: 'Some day people in the U.S. will realize how foolish it is to feed one hundred pounds of soybeans to livestock and get back a very small poundage of meat products which have a protein inferior to the protein fed to the livestock."

The "Battle of the coconut cow," as Strayer calls the margarine-butter controversy, was the battle to get margarine legalized in America. First they had to work on the federal level, which took six years of cooperative work by the soybean, cotton and the margarine industries. "Then we went into fourteen different states to change the state laws. We were successful in getting a small tariff placed on coconut oil in favor of soybeans at the federal level.

"In September 1940, the Board of Directors of the ASA met in Dearborn, Michigan and decided we needed a publication because here we are, growing soybeans all over the country, but who knows what's going on, what's being grown, the same thing soycrafters are now discussing. I took the job as editor of the *Soybean Digest* and we started out with sixteen pages and had a heck of a time finding advertising to support it. Before my career as editor ended, the magazine was going into seventy countries with as high as one hundred twenty pages per issue. It was designed for people who grew soybeans, giving them the kind of information soybean growers needed. And the growing association went just as far as we could in promotional and legislative work to protect the interests of soybean growers.

"During the World War II period, the U.S. acreage in soybeans doubled, then redoubled, because we had been dependent on other areas of the world for our fats and oils, but the supply lines were cut off. At the end of the war we had far more soybeans than we could assimilate. Have you ever eaten white margarine? It tastes the same as yellow margarine, but doesn't look nearly as good. Back then we had a federal law that said it was all right to make margarine, put it in a plastic bag, and put in a little capsule of yellow coloring matter which the consumer would work through the bag [by squeezing the bag innumerable times] to color the margarine. The legislation banning the sale of yellow margarine and making the sale of white margarine difficult went back to the days of the 'coconut cow' which had been a major issue before soybeans came into the picture to any extent. Right after the war we went to Washington and spent enough time there to have the federal margarine law changed to allow the manufacture and sale of colored margarine. Margarine is now in second place as a user of soybean oil in the U.S. and margarine consumption is approximately twice as much per capita as butter. When we were working on changing the law, it was the reverse."

"The German army had used soy protein during the war and issued a soybean cookbook to army chefs on how to use soy protein, soy flour in army diets. Our basic answer was, yes, soy protein will eventually become a major part of the protein source for Germany, just as it will in much of the world."

"In 1955 I was asked to go to Japan to make a study of whether American soybean growers ought to be looking at Japan as a market for our beans. Keep in mind that soybeans came to us from the Orient and here we were talking about selling soybeans back to Japan. I spent seven weeks there and visited many miso, tofu, natto, kinako and tempeh [sic] plants, and I decided that, yes, there was a market. But the first thing a Japanese buyer would tell me was, you can grow excellent soybeans in the U.S. but why do we get such poor quality beans from you? One of the first things we did was change the federal grading standards in a manner which made it possible for the Japanese buyer to purchase soybeans on a federal grade that was meaningful. In 1956 I did the same job in ten countries of northern Europe and wherever I went, I heard the same story about poor quality soybeans. At that time we were in the process of changing the grading standards through public hearings. Today more than fifty percent of all soybeans grown in the U.S. go into the export market as raw soybeans, meal, or oil.

"Prior to World War II we were not an exporter of soybeans. A quarter of my time between 1955 and 1967 was spent outside the U.S. contacting potential buyers; I also helped establish the Japanese-American Soybean Institute, an unheard of concept previously because the miso makers didn't talk to the oil crushers or tofu makers. There was no liaison, no cooperation among the commodity groups–each operated independently.

"Our first job was to form this institute with representatives from each of the trade groups on the Board. Today Japan imports over one hundred million bushels of soybeans each year from us–our largest customer for U.S. soybeans outside our own country.

"Soy protein is the most successful food ingredient in the world because it is the most nearly complete of all the known vegetable proteins. There is no other vegetable protein grown widely and in quantity that can begin to match soy protein, It is the most nearly balanced in the ten essential amino acids of any vegetable protein. When we talk about soy protein, we mean something that has a potential far beyond anything we have yet realized,..."

Photos show: (1) George Strayer, happily lecturing. (2) A $75,000 grain combine, used to harvest soybeans. (3) Harvested soybeans being discharged into a waiting truck at a small New England farm. Address: President, Agricultural Exports, Hudson, Iowa.

7094. *Toyo Shinpo* (*Soyfoods News*). 1980. Nattô no rûtsu wa

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Jawa? [Did natto originate in Java?]. March 1. [Jap]

7095. *Toyo Shinpo* (*Soyfoods News*). 1980. Nattô no rekishi: Shôhisha-sô no kakudai ga kyûmu. Kairyô kuwaeta howaito nattô [History of natto: There is an urgent need to expand the consumer market. Improved white natto]. March 1. p. 3. [Jap]
• ***Summary:*** A photo shows several packages of natto.

7096. *Asahi Shinbun.* 1980. Tôfu go osuki ni natta. Gaijin Baabaa-san no ryôri hoho [She's grown to love tofu. How foreigner Linda Barber cooks it]. March 26. [Jap]
• ***Summary:*** American Linda Lee Barber teaches a class in Tofu Cooking at the Kobe YMCA. A photo shows her, wearing a white cooking apron, seated between two Japanese women, holding a plate of tofu dishes. Address: Japan.

7097. Belleme, Jan. 1980. Re: Studying miso-making with the Onozaki family in Yaita, Japan (Letter to the editor). In: Edward Esko and Wendy Esko. 1980. Macrobiotic Cooking for Everyone. Tokyo: Japan Publications, Inc. 272 p. See p. 138-39. Nov.
• ***Summary:*** "John and I arrived in Tokyo late in October. After a few days there, we visited the Sendai Miso-Shoyu (Soy Sauce) Company and then went to Yaita (about halfway between Tokyo and Sendai) to meet our miso teacher. This experience has surpassed our wildest dreams. We are living with this family in their 300-year old grass-roofed house in a very traditional part of rural Japan. This family has been on this land for over 500 years.

"The miso shop is perfect for our study. It's fairly small and very traditional–most of the work is done by hand, with the aid of just a few simple machines. The Onozakis make no compromises in terms of quality. They make a 1½ year kome [rice] miso aged in huge cedar vats held together with braided bamboo. This miso, very mellow, delicious, and unpasteurized, can be eaten every day without becoming tired of it. We work alongside the Onozakis 6½ days a week, so we have gotten a great deal of experience. For the whole month of March, Mr. Onozaki has put John in charge of making the *koji,* which is the most important and difficult part of making miso. He is to make all the decisions regarding temperature, seeding, and ventilation, so by the time we leave we should feel confident enough to do it on our own.

"The family consists of a 78-year-old grandmother, her son and his wife, and three daughters. They are a very hard-working, thoughtful, and humble family of samurai descent. The women in the area, and Mrs. Onozaki in particular, are just unbelievable. Mrs. Onozaki does the work of three people and doesn't even know it. She (and most women around here) know everything they need to know, from childcare to gardening, cooking, pickling, natural remedies (both foods and herbs), sewing, flower-arranging, and keeping their husbands happy. I have so much to learn from her. I have never seen her angry, in fact she is usually smiling and has a great sense of humor.

"Our schedule is intense. Before breakfast, I must wash our clothes in ice-cold mountain water (they have no hot running water), clean our room, and steam the rice. After a simply breakfast we begin work at 8:00. The work is hard and long and the conditions over the past 2½ months have been either extreme cold or extreme hot (cold in the shop, hot in the *koji* room). After work we have dinner, wash up, and retire to our room for a few hours of studying, writing, taking notes on what we learned during the day, etc.

"For the past 2 months the average morning temperature in the house has been 0ºC (35ºF.). The only heat is provided by the *kotatsu,* or the small table with a built-in heating unit."

"The old people are our favorites–we love to listen to their stories. They're incredibly strong and hard-working; many working well into their 70's and even 80's. For just one of several examples, there's a 79-year old man working here now. He's doing the plaster work on the Onozaki's new storage building. Every morning he's up at 6, eats breakfast, packs a light lunch and takes off on his 10-speed for the bitter-cold 5-mile ride to work. He works out there by himself all day, every day. I could go on and on about the old folks–there's the 70 year-old barrel-maker who came to repair 3 of Mr. Onozaki's miso vats; the 69 year-old 'traveling saleslady' who walks from house to house with a huge pack of wares on her back; the 85 year-old man who came bicycling up on his day off to buy some miso; the 78 year old grandmother we live with, etc., etc. They are such an inspiration to us.

"We are the only foreigners living for miles around and the only Americans most of these people have ever talked to, so of course we attract a great deal of attention. Recently we have attracted the attention of the media. It all started when a local newspaper came to interview us and take our picture. This was followed by a magazine story, then Japan's leading national newspaper, the *Asahi,* came. This resulted in one live radio interview, another magazine story and two fifteen minute TV stories on 2 national networks. All of this interest took us very much by surprise. They are mostly interested in our views on American foods as opposed to traditional foods, our ideas on Japanese tradition, and the relationship between food, health, and tradition. So, as you can see, this has been a most rewarding experience..." Address: Yaita, Japan.

7098. Daizu Kyokyu Antei Kyokai (Soybean Supply Stabilization Assoc.). 1980. Kokusan daizu riyô sokushin taisaku chôsa [Investigation into measures to promote the utilization of soybeans grown in Japan]. Tokyo. 261 p. March. [Jap]
Address: #2 Makoto Bldg. 5F, 1-4-4 Toranomon, Minato-ku, Tokyo 105, Japan.

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7099. Daizu Kyokyu Antei Kyokai. 1980. Gaiyo [About the Japan Soybean Supply Stabilization Association]. Tokyo: DKAK. 12 p. March 31. 26 cm. [Jap]
• ***Summary:*** Name of organization with diacritics is: Daizu Kyôkyû Antei Kyôkai. This association was founded on 26 Dec. 1974, following the U.S. soybean embargo in 1973. It has 8 member associations, including the Japanese national tofu, dried-frozen tofu, natto, miso, shoyu, oil, oil importer, and coarse grain associations. The name and address of each is given. Address: #2 Makoto Bldg. 5F, 1-4-4 Toranomon, Minato-ku, Tokyo 105, Japan. Phone: 03-591-3879.

7100. Hase, Saki; Yasui, Takeshi; Nagashima, Shigeru; Ohta, Teruo. 1980. Daizu chozô-chû no hinshitsu henka ni tsuite: Tôrui oyobi denpun no dôkô [Change in quality of soybeans during storage: Change in sugars and starch content]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 36. p. 7-13. March. [11 ref. Jap; eng]
• ***Summary:*** Soybeans imported from the United States (IOM = Indiana, Ohio, Michigan) and China, as well as two different kinds of soybeans grown in Japan for making natto were stored at different temperatures (15, 25 and 35ºC) and relative humidities (RH) (60, 70 and 80%).

"Changes in the content of sugars and starches in these samples during storage were as follows: (1) All samples tested showed a similar pattern of change of sugars during storage." (2) Under the conditions of 15ºC and 60 or 70% RH, virtually no change in sugars was observed during storage for 12 months. (3) A greater change was found at 15ºC and 80% RH than at 25ºC and 60% RH. (4) An increase in raffinose content concomitant with a decrease in stachyose content was clearly observed at 25ºC and 80% RH. (5) At the start of storage, the samples contained little low molecular weight sugars except pinitol, but the content of these sugars increased significantly during storage. These sugars included such sugar alcohols as sorbitol and galactitol. Glucose and galactose showed only a slight increase. (6) No change in starch content "was detected in these samples except for the one Japanese sample which showed a decrease during storage at 25ºC and 35ºC." Address: 1-3, 4 National Food Research Inst.; 4. Okame Natto.

7101. Nikkuni, Sayuki; Itoh, Hiroshi; Takagi, Hitoshi; Suzuki, Tadano; Ebine, Hideo. 1980. [Utilization of soybean cooking drain]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 36. p. 163-70. March. [30 ref. Jap; eng]
• ***Summary:*** A study of how to use the water left over after cooking soybeans at miso factories–and typically run down the drain. Address: 1-2, 4-5. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 3. Kojiya Sanzaemon Co., Ltd., Toyohashi-shi, Aichi-ken.

7102. O'Neill, Kevin. 1980. Tempe: A traditional food for tomorrow. *Indonesia Circle* (*Univ. of London*) No. 21. March. p. 54-59. [13 ref]
• ***Summary:*** An interesting introduction to tempeh. "Nothing certain is known of its introduction into Indonesia but one might guess that it was during the time of regular trade between South China and Indonesia starting about A.D. 1000. One Sundanese name for soya-bean is *kacang jepun* (Japanese bean) which might be significant."

"Pure culture fermentation of *Rhizopus* [to make tempe] was developed in the United States early in the 1960s.

"Editor's note: It has recently come to our attention that Dr. J. Hedger and Mr. T. Basuki of the Department of Botany and Microbiology, University College of Wales, Aberystwyth, have been experimenting with *tempe* production and, indeed, plan to start a *tempe* factory in Britain. Mr. Basuki has produced a four-page roneo [mimeograph] leaflet, *Tempe–an Indonesian fermented soybean food,* which provides a clear and concise guide for the home *tempe*-maker, and Professor Hedger wrote a script for the BBC2 program "Tomorrow's world", on *tempe* which was broadcast in the summer of 1979...

"Finally, readers will be interested to know that ready-made *tempe* can sometimes be bought at Lee's Emporium, Dyne Road, off Kilburn High Road, in north-west London. I.C. Glover." Address: American Indonesian Chamber of Commerce.

7103. Taira, Harue; Taira, Hirokadzu; Kokubu, Yoshijiro; Otake, Shigeto. 1980. Shihan (Murasaki han?) byôkin ni yoru higai daizu no kakô tekisei [Suitability for food processing of purple specked soybean seeds caused by *Cercospora kikuchii*]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 36. p. 14-20. March. [7 ref. Jap; eng]
Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7104. *Vegetarian Times.* 1980. Japanese remove "soybean taste." No. 36. March. p. 14-15.
• ***Summary:*** "Scientists at the Dep. of Food Science and Technology at Kyoto Univ. have found a way to treat defatted soybean extract with an enzyme which removes the 'beany' flavor that many people find disagreeable."

7105. *Toyo Shinpo* (*Soyfoods News*). 1980. Daizu no shinpi: Nattô yobina-kô, kosei o shimesu [The mystery of soybeans: Thoughts on the names of natto that express personalities or characteristics]. April 1. p. 3. [Jap]
• ***Summary:*** Contains a nice illustration of a "Zaru natto seller (*Zaru nattô uri*)."

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7106. *Toyo Shinpo* (*Soyfoods News*). 1980. Tôfu o sôzai ni shita gaikokujin no "Ryorikyôshitsu" kôhyô. Kôbe Jogakuin kôshi Linda Lee Barber-san [Foreigner's cooking class using tofu as an ingredient has a good response. Kobe Women's School teacher Linda Lee Barber]. April 11. [Jap]
• ***Summary:*** Linda Barber, an American home economics and lifestyle teacher, has the theme "Cooking with Love." She says "I like tofu very much." There is a steady stream of applicants for her "Tofu Cooking" classes at the Kobe YWCA, and for the next year twice as many classes each month are planned. Three photos show Linda Barber in a white apron making tofu on a kitchen scale and teaching Japanese about Western-style tofu cookery.

7107. Kikkoman International Inc. (KII). 1980. Kikkoman: the company and its soy sauce (Interview). *SoyaScan Notes.* April 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Shurtleff and Aoyagi visited Kikkoman's office in Japantown, armed with a list of questions.

Why doesn't Kikkoman use alcohol as a preservative in their shoyu in the USA? (1) Some people, such as Seventh-day Adventists, object to its use in foods. (2) There is a high tax on U.S. products containing added alcohol (ethyl alcohol = ethanol); for shoyu it is about $0.15 per gallon of shoyu. (3) Kikkoman believes that sodium benzoate, which has been approved by the FDA, is safe. It is contained in some natural foods such as dry shiitake mushrooms and cranberries.

Kikkoman conducted a chemical analysis of San Jirushi tamari. The regular contains 2.5% ethanol (alcohol) and the low-salt (low-sodium) contains 3.5%. Ordinarily tamari in Japan contains only about 0.1% ethanol. Therefore they must be adding alcohol as a preservative and not listing it on the label. This tamari also contains 6-10% carbohydrates. If it contained no wheat, it have only 5-6% carbohydrates. Therefore they must be adding wheat.

Saccharomyces rouxii and Torula are yeasts, not molds; they can eventually form a white film on the surface of shoyu. They are salt tolerant. Most are killed by heat treatment (*hiire;* also called pasteurization). In the old days, Japanese would just filter off this white film.

To make their shoyu (soy sauce) Kikkoman uses a specially made soybean meal called *kakko daizu.* More of the natural soybean oil is left in it, and the nitrogen solubility index (NSI) is 25-30% instead of the typical 10%. It has a flaky rather than a meal-like, texture. Who makes it for Kikkoman in the USA? At Walworth, Wisconsin, is any soybean oil left over from the process? If yes, what is done with it?

In Japan Kikkoman uses whole soybeans in their Tokusen (Special) grade soy sauce. Why?

Beatrice Foods makes La Choy soy sauce (America's #2 brand) and RJR Foods made Chun King, but Del Monte recently bought RJR Foods, so Del Monte now makes Chun King.

The three JAS (Japanese Agricultural Standard) shoyu grades (in Japan) are Tokkyu (which has 1.50 or more grams of nitrogen per ml volume of shoyu = w/v), Jokyu and 1.35 to 1.49 gm, and Hyojun has 1.2 to 1.35 gm. Higher in nitrogen than all of these is Tokusen, which is not recognized by JAS. Who uses the word Tokusen? Kikkoman does. U.S. shoyu is equivalent to Tokkyu in nitrogen content. Kikkoman makes no Hyojun grade. More than 90% is Tokkyu. Grades lower than Tokkyu are made by Kikkoman only on special request. The specific gravity of shoyu is 1.19.

In Japan, the real name for "tamari" is tamari shoyu. The definition of tamari shoyu from the Ministry of Agriculture (*Norinsho*) is vague. The word *kikaku* means "standard of identity."

Hawaiian-style shoyu is called amakuchi (sweet); it is made in Japan but sold in Hawaii, not in the USA. It does not have an identity in the JAS standards, but it is considered a type of *koikuchi* (regular shoyu). After fermentation, a natural sweetener (typically *kanzo,* an extract of liquorice root) is added. It contains less salt than typical *koikuchi.*

Milder soy sauce (Kikkoman's green label) has the salt removed after fermentation by use of the ion exchange membrane method–the same used to extract salt from sea water. This is done after pressing but before heating.

Lots of HVP / chemical soy sauce is made and consumed in Kyushu–Japan's southernmost main island; lots of it is sweet.

After shoyu is pressed, the oil layer on top and the bottom layer of high molecular weight substances are both discarded. The middle is the choice. The process is called "clarification" (*seicho*).

Kikkoman says the last time they made a product made by blending shoyu of different ages (1, 2, and 3 years old) was in the 1940s. Ask Dr. Yokotsuka or Fukushima. In 1967 Kikkoman was making a Tokusen consisting of a mixture of 1 year and 2 year fermented shoyus. They called it an 18-month shoyu. If they now had to return to "naturally fermented" with temperature control (*tennen jôzô*) they would ferment the shoyu for 1 year, then mix winter *shikomi* and summer *shikomi.*

The Chinese traditionally did temperature controlled fermentation by placing the large earthenware jars in a courtyard in the sunlight.

Concerning heat treatment or pasteurization (*hiire*), people nowadays like a lighter colored shoyu than formerly. Kikkoman's heat treatment is done using a plate heater at 82ºC. There are two methods of heating: (1) Put hot shoyu into a large open top tank and allow it to cool very slowly. During this time, lots of the natural alcohol evaporates off (0.3 percentage points of the total). (2) Run the shoyu through a plate cooler after a plate heater. Get details of times and temperatures from Drs. Yokotsuka or Fukushima.

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After heat treatment there are almost no enzymes left in the shoyu. All the molds have been killed but a small number of spore-forming bacteria and yeasts survive–about 10 to 100 per ml.

Semichemical shoyu is called *shinshiki shoyu* ("new-style shoyu") in Japanese. Kikkoman stopped making it about 15 years ago. There are an estimated 4 commercial shoyu makers in Hawaii and 24 in the United States, but only 5 of those in the U.S. make fermented shoyu; the rest just mix ingredients to make quick HVP soy sauce. One can do this in a small room. The American Soybean Association might have the addresses of these companies. Why are they not in the Soya Bluebook? One may be in Seattle [Washington]. The shoyu makers in Hawaii are Diamond & Marumasa, Honolulu Sake and Shoyu, Aloha Shoyu, and Island Shoyu. U.S. shoyu makers include Jan-U-Wine and Sona, both in Los Angeles, Chinese Maid, and Reese Finer Food Co.

In making shoyu, something is filtered with a ceramic filter. What? And at what stage?

The emperor of Japan does not use shoyu made by Kikkoman at their Goyo Gura in Noda. It is forbidden for him to use any special products. No one is allowed to supply him specially–even as a gift. The imperial household must pay for everything on the open market.

Dehydrated shoyu is most widely used in dehydrated instant ramen–in the broth packet; it is also used in making beef jerky and salami / sausages.

In making tamari shoyu, salt water is always added (to the presscake?) to get *assaku tamari,* which is usually called niira tamari. Why didn't San Jirushi mention this?

What is *bansui? Ichiban* ("number one") is the shoyu itself. The 2nd extraction (*ni-ban*) is made by washing the presscake with salt water; this is called shokuen-sui. Only makers of low-quality shoyu do this nowadays. *Ensan* means hydrochloric acid; it is used in making HVP.

To make saishikomi shoyu, the koji is mixed with shoyu rather than with salt water. Saishikomi is also called kanro shoyu; it is used to season sashimi and sushi.

HVP/ chemical soy sauce costs 10-15% less than Kikkoman.

Shiro shoyu is made in Nagoya. They roast the soybeans and steam the wheat. See flow chart. The moromi is fermented for 3 months. It is salty, and is used in *nimono* (dishes simmered in broth). It is 1/3 as light as usukuchi = much lighter than usukuchi. Usukuchi does not add rice koji any more. They add mirin instead.

The character for *hishio* first appeared in Japan in about 600 AD. In which document? Hishio Tsukasa? Continued. Address: San Francisco, California.

7108. Kikkoman International Inc. (KII). 1980. Kikkoman: the company and its soy sauce. Part II (Interview). *SoyaScan Notes.* April 17. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued: Yamasa, Higeta and Kikkoman do not use any HVP in making shoyu. In the USA, HVP is made with stronger hydrochloric acid (HCL) than is used in Japan, so the former takes less time to make and is lower in quality.

Formic acid and levulinic acid are the main ones that show up on gas chromatograms of chemical soy sauce.

Most Chinese soy sauce made in the USA contains HVP says Kikkoman. See also interview with David Hall on this same date.

In their color film, Kikkoman showed that they were using whole soybeans since at that time all of their exported soy sauce was made with whole soybeans. Note: The use of whole soybeans also looks better and raises less questions. Concerning Kikkoman's reluctance to use the word "mold" in connection with koji, a key ingredient in soy sauce: Dr. Hesseltine used the word "yeast" instead of the correct word "mold" to describe the making of koji. Japanese are comfortable with the world "mold" in connection with food, but most Americans are not–even though many enjoy mold-ripened cheeses.

Sendai shoyu is not really traditional shoyu since: (1) They don't use little wooden koji trays. (2) They use koji starter (moreover, pure culture koji starter) rather than airborne yeasts. (3) Traditionally neither yeasts nor bacteria were added to the moromi. (4) Traditionally, moromi was made only during the cold months; if it were produced during the summer, it was made with chilled water to slow down the fermentation process. How was the water chilled?

Ajinomoto is a major maker of HVP, a tan liquid. How is it shipped? As a liquid or a solid?

Kikkoman says the term *tennen jôzô* ("naturally fermented") refers to the way they make shoyu. We say it means fermented at the natural temperature of the environment without any heat control. Is there any formal definition of *tennen jôzô?* Must it be made with whole soybeans? This creates a lot of environmental pollution during disposal of the salty oil. Ask Haga-san at Sendai.

Fermented shoyu is *hon-jôzô.* Semichemical shoyu is *shinshiki-jôzô.*

Farmer Jones uses shoyu in curing bacon and in making liverwurst ("liver sausage").

Note: Liverwurst is an anglicisation of the German word, "Leberwurst." Liverwurst normally contains pigs' livers, rather than calves' livers and also contains veal. Most liverwurst varieties are spreadable. The sausage is usually made with pork. Only about 10-20% of the sausage is actually made using pork liver, which is enough to give it a distinctive liver-taste. Other ingredients are meat, fat, and spices including ground black pepper, marjoram, allspice, thyme, ground mustard seed, or nutmeg (Source: Wikipedia, at Liverwurst, Sept. 2011). Address: San Francisco, California.

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7109. *Toyo Shinpo* (*Soyfoods News*). 1980. Tôfu ryôri no barieeshon [New ways of cooking with tofu]. April 21. [Jap]
• ***Summary:*** Linda Lee Barber, an American home economics and lifestyle teacher, presents three Western-style tofu recipes. A small photo shows Barber.

7110. Belleme, John. 1980. Making miso in Japan. *GOMF News* (*Oroville, California*). April. p. 2.
• ***Summary:*** This is a letter sent by John Belleme, the last manager of the Oak Feed Store (a macrobiotic food shop at 3030 Grand Avenue, Coconut Grove, Florida), to Jim Kenney, current manager at Oak Feed. John and his wife, Jan, are presently in rural northern Japan studying miso making from a "traditional clan called the Onozaki." John starts: "This is our 11th day at the Onozaki koji-ten. We've settled into a daily pattern now. Our schedule is very, very intense. However, like the Onozakis, we never seem to get tired. It is obvious to us already that the energy in this fine miso originates in our garden, is transformed in the kitchen and transmuted in our bodies. We then work this energy into the miso with our hands." John then describes in detail how the miso is made by hand there. It is aged for about 18 months. After 6 months, and again after 12 months the entire contents of the vat is turned upside down, by shoveling. "Mr. Onozaki gets up at 4 a.m. after sleeping no more than five hours and I've never seen him a bit tired..." Address: Northern Japan [10 miles north of Yaita city, Tochigi prefecture].

7111. Beshoar, John M. 1980. Japan: Soybean imports to rise, decrease seen for soybean meal. *Foreign Agriculture.* April. p. 30.
• ***Summary:*** Includes a table showing Japan's imports of soybeans and soybean meal by country of origin, calendar 1976-80. Address: Agricultural Attaché, Tokyo.

7112. Saio, K.; Nikkuni, I.; Ando, Y.; Otsuru, M.; Terauchi, Y.; Kito, M. 1980. Soybean quality changes during model storage studies. *Cereal Chemistry* 57(2):77-82. March/April. [14 ref]
• ***Summary:*** Because of uncertainties in international soybean trade, the Ministry of Agriculture, Forestry, and Fishery in Japan is planning to set aside soybean reserves to avoid possible shortages. This article analyzes changes in soybeans stored under conditions that cause significant changes in qualities important to food uses of soybeans–such as tofu. Address: 1-3. National Food Research Inst., Ministry of Agriculture, Forestry, and Fishery [Japan].

7113. **Product Name:** Brown Rice Miso.
Manufacturer's Name: Shin-Mei-Do Miso Co.
Manufacturer's Address: 5 Wren Road, Denman Island, BC, Canada V0R 1T0. Phone: 604-335-0253.
Date of Introduction: 1980 April.
Ingredients: Brown rice koji (only a little bran removed), soybeans, sea salt, water.
Wt/Vol., Packaging, Price: 450 gm plastic tub.
New Product–Documentation: Talk with Yasuo Yoshihara. 1996. March 22. Their third miso, introduced in April 1980, was Brown Rice Miso. They put the brown rice through a rice polisher to remove a just little bit of the bran; this is necessary so the koji culture can grow. This miso is sold only to natural- and health food stores.

7114. Yoneda, Soei. 1980. Shôjin ryôri, osôzai: Take-no-Gosho fû [Zen vegetarian cookery, side dishes: Kyoto Take-no-Gosho style]. *Kurashi no Sekkei* (*Designs for Living*) No. 131. 196 p. April. Illust. 30 cm. (Tokyo: Chuo Koronsha). [Jap]
• ***Summary:*** Filled with hundreds of lovely color photos of prepared dishes, steps in preparation, Zen temples and their art treasures, gardens, and buildings. Many of the recipes include soyfoods, especially tofu, miso, shoyu, and okara. Includes a color portrait of Soei Yoneda (p. 5) and the story of her life and work (p. 165-67). Address: Abbess, Sanko-in Zen temple, Honcho 3-1-36, Koganei-shi, West Tokyo (Musashi Koganei Station).

7115. Earle, Steve. 1980. Re: Tamari and other types of shoyu in Japan. Letter to William Shurtleff at Soyfoods Center, May 7. 5 p. Typed, with signature on letterhead. [2 ref]
• ***Summary:*** A long, excellent letter containing detailed answers to ten questions from Shurtleff about tamari in Japan.

"Dear Bill, Thank you for your two recent letters of April 13th and 18th. I must apologize for the delay in reply, however various guests from overseas have kept me away from the office.

"All of your questions have been taken up with our technical staff, and in particular with our plant manager, Mr. Nakamura. The matters to do with the Kikkoman lab tests are the most urgent, however I will choose to address them separately. The following pertains to your questions of April 13th.

"You may want to cross-reference some of this information with Kikkoman or other suppliers. I respect your right, and would even encourage, you to do so, however I would ask that in doing so you do not show or pass on our letters, either in original or copy. I would like to ask this of you as a personal favor.

"1. Ref your questions 1, 2, & 3: I am enclosing a copy of the most recent Japan Agricultural Standard (JAS) schedule as it pertains to Shoyu. In addressing the JAS schedule it is a good idea to remember that these standards are subject to the political influence of the major shoyu manufacturers (most notably Kikkoman). Note for example that the `total nitrogen` requirements for the different grades

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('tokkyu', 'jokyu', and 'hyojun') are more stringent for 'tamari-shoyu` than for `koikuchi-shoyu`.

"As the Shoyu industry is a good bit larger than the Tamari industry Tamari is classified as a Shoyu ('tamari-shoyu`), whereas from a historical perspective it should obviously be the other way around.

"The five official classes of shoyu are, as you say, `koikuchi-shoyu`, 'usukuchi-shoyu`, 'tamari-shoyu`, 'saishikomi-shoyu`, and 'shiro-shoyu`. Each of these are graded 'tokkyu', 'jokyu', or 'hyojun' according to total nitrogen, organic constituent ('ekisu'), alcohol, color, and other criteria.

"A recent addition to this schedule is a grading above 'tokkyu' which is called 'tokusen' and requires a nitrogen content of 1.65% for koikuchi and 1.76% for tamari-shoyu.

"As mentioned above, the nitrogen and ekisu criteria for tamari-shoyu are consistently higher than are those for koikuchi-shoyu, even though the two are often sold in the same market places.

"There are no stipulations regarding proportions of soybeans to wheat in tamari-shoyu other than that the ingredient in the production of the koji should be predominantly soybeans. Mr. Nakamura says however that it is generally agreed within the industry that tamari-shoyu contains no more than 15-20% wheat. The JAS definitions are evidently not very strict or binding, as San-Jirushi has the option of calling its 'Honjozo' class product either tamari-shoyu or koikuchi-shoyu.

"Your definition of 'tamari' as being made entirely from soybeans and 'tamari-shoyu' being made with up to 20% wheat is essentially the same one that we have used in our marketing through San-Jirushi International to distinguish between the two classes of product. We ask you to bear in mind however that same definitions are not necessarily subscribed to in Japan: All tamari is classified as 'tamari-shoyu,' and a product containing a small proportion of wheat may be referred to as tamari.

"One further distinction between tamari-shoyu and shoyu which should perhaps be made clear in your book is the purpose for using wheat in the respective products, aside from the proportions used, The koji in shoyu, as you know, is made loose ("bara-koji") whereas the koji used in tamari and tamari-shoyu is made in extruded balls ("miso-dama"). while the wheat used in shoyu is an essential ingredient to the koji and contributes significantly to the flavor and aroma of the finished product, the wheat in tamari-shoyu is used primarily to provide the gluten necessary to form the miso-dama when defatted soybeans are used. It makes a difference of less than half a percent in the carbohydrate content of the finished product and does not add significantly to flavor,

"2. Ref your question no. 6: Our conflicting statements regarding salt content are indeed misleading. They are due to different criteria used in the U.S, and Japan; JAS stipulates that salt and other nutrients be measured in terms of grams per 100 ml while the FDA requires that they be stated in grams per 100 grams. 16% is the JAS figure and `3.3% is grams per 100 grams. Note likewise that Kikkoman Shoyu contains 17.5g salt by the Japanese method and 14g by the U.S. method.

"3. Ref your questions 7 & 8: San-Jirushi currently produces about thirteen different soy sauce products. Many of these are for specialized industrial purposes (such as the rice-cracker industry) and others are sold under private label. The major products however are: 'Kibiki' (2 Chinese characters), 'Sashimi-damari`, 'Ryotei Tamari' (4 Cc), 'Takujo-Shoyu' (4 Cc), 'Tokusen-Honjozo' (5 Cc), 'Honjozo' (3 Cc), 'Jokyu' (2 Cc), and 'Tei-En' (2 Cc).

"Of the above, 'Ryotei-Tamari' and 'Takujo-Shoyu' are registered product names that belong to San-Jirushi. 'Kibiki' and 'Sashimi-damari' are accepted generic terms within the industry. 'Tokusen,' 'Honjozo,' and 'Jokyu` are all defined by JAS.

"San-Jirushi produces about 8,000 kl of soy sauce per year, Approximately half of this is 'Honjozo' class. Another 25% is 'Tokusen' class (9 sui), and the remaining 25% is divided between the other classes. 'Kibiki' class is sold predominantly to the rice-cracker industry,

"I should also mention to you that San-Jirushi produces 8,000 kt [kilotons] of miso per year. The majority of this is akadashi and mame miso, which means that we produce more soybean miso than any other single company (more for example than Marusan or Kakukyu).

"4. Ref your question no, 4: The cylinder that stands in the center of the vat is commonly called "sashioke" (3 Cc) or "do-oke" (2 Cc), The ones used at San-Jirushi are of barrel-like construction made from wooden staves and bound

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typically with bamboo, The top end is wider than the bottom end, so that the bottom end of one will fit snugly into the top end of a second one, Ordinarily two sections joined this way are used in one vat.

"The sashi-oke is stood in the vat when it is empty and the moromi is filled in around it. It is not actually perforated: There are notches in the bottom end which make mousehole-like openings when faced against the bottom of the vat,

"There is a second kind not used here made from bamboo strapped together into a cylinder shape which does allow the liquid to seep in from the side.

"San-Jirushi evidently prefers the wooden type as it keeps all of the liquid circulating from bottom to top.

"Liquid is scooped from the sashi-oke with long-handled ladles and poured on top of the vat (ordinarily over the stones resting on top), This operation is called "Kakuhan" (2 Cc) and is performed ideally twice a day during the first two months of fermentation. Thereafter it is reduced to once a day, or once every several days as is judged necessary by the attendant. Kakuhan is necessary in order to keep the moromi ("miso" [mash]) moist at the top, as well as the bottom, of the vat.

"5. Ref your question no, 11: The answer to your questions regarding the addition of salt-water during the 'assaku' procedure is an emphatic No: San-Jirushi does not wash the press cake with salt-water or add salt-water at any time during the pressing procedure as it is felt that this is detrimental to the quality of the product, It may be a common practice among other manufacturers however.

"6. Ref your question no 5: The name 'tamari' does not seem to have appeared until the Kamakura era, The records we referred to are the ones from the Nara period mentioning 'hishio', notably (8 Cc) *Todaiji Shosoin Monsho.* It has been interpreted from these writings, and particularly the characters used in naming the different forms of hishio, that the original type of grain hishio (2 Cc) which came from China was made entirely from soybeans, and that the liquid from it, or else a moromi-like form of it, was used as a seasoning. The *Todaiji Shosoin Monsho* was written in the first half of the 8th century, so perhaps our statement should have read '8th century' instead of '7th.' I have been told however that there is earlier mention of hishio–maybe you know if this is so." Continued. Address: San-Jirushi Corp., 1-chome, Meisei-dori, Kuwana, Mie 511, Japan. Phone: (0594) 22-3333.

7116. Earle, Steve. 1980. Re: Tamari and other types of shoyu in Japan (Continued–Document part II). Letter to William Shurtleff at Soyfoods Center, May 7. 5 p. Typed, with signature on letterhead. [2 ref]

• ***Summary:*** Continued. "7. Ref. your question no. 10: Based upon our knowledge of the industry (not, in other words, on official figures) the major producers of tamari-shoyu are as follows in order of size. I don't have a handy access to their addresses however perhaps you could find these out through the Japanese business office in San Francisco.

"San-Jirushi (Mie Prefecture)
"Yamami (Aichi, near Nagoya)
"Nakagawa Jozo (Aichi)
"Ichibiki (Aichi)
"Yamaizumi (Aichi)
"Kanami (Aichi)
"Kameya Gomei (Aichi)
"Sato Jozo (Aichi)
"Yamashin (Aichi)

"Morita is the same as Yamaizumi. Okazaki Marusan is, I believe, the second largest producer of miso in Japan, however they do not produce tamari.

"The product they are now marketing in the U.S. is not sold in Japan, and is not considered suitable for sale according to the standards within the industry It is (by their own admission) the liquid that comes off of the top of their vats of soybean miso. Because of its high ammonia content it is in most cases thrown away, or else added to aminosan-eki to produce low cost products.

"These last comments are not meant as accusations, as I respect Marusan's right to sell where they can find a market. It is the feeling of San-Jirushi however that their product reflects poorly upon the 'tamari' name.

"8. Ref your question no. 10: I would be happy to read over your draft before it goes to print and can perhaps offer advice and suggestions. In the event however that you do draw on any of the material supplied from here I would request that you make mention of San-Jirushi and/or my name where it is appropriate in the chapter.

"If there are other ways we can be of help, please let me know. Mr. Sato has suggested supplying photographs to be used for illustration purposes; if these would be useful too you let us know which parts of the plant you would want portrayed.

"We appreciate your interest and will hope to hear from you again. With best wishes,..."

cc. San-Jirushi International.

On 18 April 1980 William Shurtleff wrote Steve Earle asking if San-J was correctly representing the ingredients in and composition of the tamari it was selling in the USA. Tests by Kikkoman U.S.A. seemed to indicate that San-J was misrepresenting its tamari. Earle admitted that the tamari sold by San-J in the USA was indeed being misrepresented–as follows:

8 May 1980. Dear Bill.

"The following is with regard to your letter of April 18th concerning the tests done on our product by Kikkoman, U.S.A.

"The results obtained by Kikkoman are quite accurate and correspond in fact with the nutritional information that we are circulating. We admit that the samples in question are indeed misrepresented. The product contained is one

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manufactured for the Japanese market and differs slightly from the descriptions in our San-J advertising.

"This is a mistake. At the time that the product was being formulated for bottling and shipment there was apparantly a misunderstanding at the technical end of our operation as to which product was required. The formula used entails a blending of sake-mirin prior to pasteurization. The mirin serves primarily as a flavoring and secondarily helps to preserve the product. It is high in alcohol and natural sugars, which accounts for the high figures for alcohol and carbohydrate in the finished product.

"Mirin is quite commonly used this way in the soy sauce industry. Kikkoman for example uses it in their products here in Japan. The big difference of course is that they list it on the label.

"We did not discover that the product had been mistaken until very recently, and are both most embarrassed and most concerned as a result. I would like to ask, Bill, that you trust the problem is being attended too and that you please keep it entirely confidential until it is resolved. Please also understand that the samples tested by Kikkoman were in fact 'samples,' and that the product has not as yet been sold in any significant volume.

"Subsequently San-J Tamari will in fact be the pure tamari as described on our label and in our advertising, and we will also issue new nutritional data accordingly.

"Your cooperation in this matter will be deeply appreciated. Thank you, and best regards..." Address: San-Jirushi Corp., 1-chome, Meisei-dori, Kuwana, Mie 511, Japan. Phone: (0594) 22-3333.

7117. Kudo, Shiro; Hayashi, Mitsuyoshi. Assignors to Asahimatsu Kori-dofu K.K. 1980. Process for producing fibrous food materials. *U.S. Patent* 4,204,005. May 20. 7 p. Application filed 16 Dec. 1977. 1 drawing. [9 ref]
• ***Summary:*** Whole soybeans are soaked in water until fully hydrated (40-55% water). Then they "are passed through a very narrow gap between two grindstones [see drawing] which rotate at high speed (the size of the gap and the sped of rotation depend on both material and desired product but 0.2 mm or less is favorable when fibrous protein is to be made from soybeans)." In this grinding process the whole soybeans are converted into fibers in less than one second. Address: Japan.

7118. Bannar, Robert. 1980. Let's talk tofu. *Food Engineering* 52(5):126-28. May.
• ***Summary:*** Contents: Introduction. What is tofu (Shurtleff, New England Soy Dairy). How do you serve tofu? How do you make tofu? (discusses Morinaga tofu). Tofu, step by step. Nutritional data: Tofu vs. lean beef. A photo shows a package of Morinaga Ever-Fresh Silken Tofu.

7119. *Food Product Development.* 1980. Oriental specialty miso expands market horizons. 14(5):26. May.
• ***Summary:*** About Kikkoman Instant Miso-Shiru Soy Bean Soup Mix, available in red (aka) and white (shiro). "Following the lead of its soybean cousin tofu, miso is beginning to break away from its limited market in gourmet, ethnic, and health food stores and filter into select supermarkets." A photo shows the front of the two packages, written in both Japanese and English.

7120. Mori, H. 1980. Shôwa 54 nendo ni okeru shôyu, miso no kenkyû gyôseki [Review of annual achievements in shoyu and miso research]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 75:384-410. May. [625 ref. Jap]
• ***Summary:*** This important Japanese-language article, published each year in the May issue of this periodical, has two parts: (1) A review of the past year's major discoveries and developments in the fields of miso and soy sauce in Japan. (2) A bibliography related to those discoveries and developments. Address: Noda Sangyo Kagaku Kenkyusho.

7121. Okada, M.; Miyura, Y.; Komeyasu, M. 1980. [Effect of heat treatment on flavor of soy milk]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 27(5):245-51. May. [Jap; eng]*

7122. **Product Name:** [Soyalac {Soymilk} (New Plain Type)].
Foreign Name: Soiyarakku Neo Sutoreeto Taipu.
Manufacturer's Name: San-iku Foods.
Manufacturer's Address: 1-1 Nagaurataku, Sodegaura-machi, Kimizu-gun, Chiba-ken 299-02, Japan.
Date of Introduction: 1980 May.
Wt/Vol., Packaging, Price: 250 gm can.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Neo Sutoreeto Taipu was introduced in May 1980 by Saniku Fuuzu in a 250 gm can and distributed nationwide.

7123. Tanimura, Wahachiro; Kamoi, I.; Obara, T. 1980. Daizu kakô shokuhin no toripushin inhibitaa ni kansuru kenkyû. II. Moyashi seizô-chû no toripushin inhibitaa no shôcho ni tsuite [Study on trypsin inhibitor in soybean foods. II. Distribution of trypsin inhibitors during processing of soybean sprouts]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 27(5):240-44. May. [7 ref. Jap; eng]
• ***Summary:*** Trypsin inhibitor (TI) activity in soy sprouts was determined after different germination times. Sprouting reduced TI activity; soybean sprouts had about 80-85% of the TI activity found in soaked unsprouted soybeans. More than 99% of the TI activity of soy sprouts was found in the cotyledon, and the rest was contained in the axis (sprout). After 4 days of germination, the cotyledon contained 64.6

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mg of TI activity and the axis 0.83 mg. Boiling in water for 5 minutes completely inactivated the inhibitor from the cotyledon, but that of the axis still remained. Address: 1. Dep. of Nutrition; 2. Dep. of Agricultural Chemistry. Both: Tokyo Univ. of Agriculture, Setagaya-ku, Tokyo 156, Japan.

7124. Tanimura, Wahachiro; Kamoi, I.; Obara, T. 1980. Daizu kakô shokuhin no toripushin inhibitaa ni kansuru kenkyû. III. [Study on trypsin inhibitor in soybean foods. III. Distribution of trypsin inhibitors in green soybean (edamame) during cultivation]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 27(5):245-51. May. [Jap; eng]*
Address: 1. Dep. of Nutrition; 2. Dep. of Agricultural Chemistry. Both: Tokyo Univ. of Agriculture, Setagaya-ku, Tokyo 156, Japan.

7125. Westbrae Natural Foods. 1980. Wholesale food catalog: Spring 1980. Emeryville, California: Westbrae. 23 p. 22 by 28 cm.
• ***Summary:*** On the cover, the lettering is in dark blue and dark red on a tan background. Contents: Westbrae juices. Honey butters. Unsweetened spreads. Preserves. Applesauce. Nut butters (Almond butter roasted, cashew butter roasted, cashew butter raw, cashew-peanut-date butter, raw sesame tahini, toasted sesame tahini, peanut butter crunchy, peanut butter smooth, peanut butter crunchy salted, organically grown Valencia peanut butter crunchy). Cereals (mostly granola, incl. cashew granola, maple almond granola).

Trail mixes: Bay to Breakers trail mix (with sunflower seeds and Valencia peanuts, both roasted and coated with shoyu), Chisholm trail mix (with sunflower seeds, cashew pieces, and almonds, each roasted and coated with shoyu).

Roasted nuts (bulk, 12-25 lb; * = 9 oz package also available): Tamari almonds*, Tamari cashews*, Tamari Chisholm mix*, Tamari Valencia peanuts, Tamari pepitas (pumpkin seeds), Tamari sunflower seeds*, Tamari nutroaster's mix*, Deluxe tamari nut mix, roasted Spanish [peanuts] splits for butter stock, roasted Valencia peanuts. Packaged nuts.

Wholegrain pasta (incl. Soy linguini). Westbrae miso (imported from Japan): Red miso, brown rice miso, barley miso, Hatcho miso, soybean miso, natto miso. Cold Mountain miso (made in Los Angeles): Light yellow, mellow white, red. Sea vegetables: Kombu, hijiki, arame, wakame, nori. Atlantic Mariculture dulse.

Westbrae tamari and other Asian foods: Johsen shoyu-tamari, Traditional (true) tamari–wheat free, White tiger tofu sauce, natural nigari, agar flakes and sticks, umeboshi salt plums, rice wine vinegar, brown rice wine vinegar, ramen with soup stock.

Helpful tools (incl. Learning Tree tofu kit, wok, vegetable steamers, vegetable brush, utility knife). Informational pamphlets: What is miso? What is tofu? Miscellaneous (incl. falafel mix, tabouleh mix, Ak Mak crackers, sea salt, mayonnaise, black spiced olives, kosher dill pickles). Oils. Sweeteners. Bakery products. Dried fruit. Beans (incl. azuki beans, soybeans). Grains. Nuts and seeds. Non edible (drums, jars, and bottles). Glossary of manufactured products showing ingredients. Address: 4240 Hollis St., Emeryville, California 94608; 4841 Eastern Ave., City of Bell, CA 90201 (10 miles southeast of Los Angeles). Phone: (415) 658-7518 (orders).

7126. Gevaert, Pierre. 1980. Re: Early work with tamari and miso in Europe. Letter to William Shurtleff at Soyfoods Center, June 11–in reply to inquiry. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "Your note about the misuse of the term 'tamari' is correct." Lima started producing tamari in 1968. It first appeared on the market in 1961, under the name "tamari." Production continued until 1966. "Our shoyu, called and registered as 'tamari' at George Ohsawa's request, was a dark, rather thick liquid very similar to real tamari even though our product was made from 5% soybeans and 50% wheat. I think this was because we aged the product for at least 3 years, and some of it was even older because we could sell only a small part of the production. In 1967 we had such large stocks of miso and tamari that we stopped their production and cured our weak financial situation by selling off these stocks. We still remember the good Lima Tamari, and when we started to import from Japan, we always mixed at least 1/3 of Japanese tamari to approach our own quality.

"This month we will produce a good quality of miso in our French artisanal factory running on water energy." Address: P.V.B.A. Lima, Edgar Gevaertdreef 10, 9830 Sint-Martens-Latem, Belgium. Phone: (09) 82.41.76.

7127. *Daizu Tanpaku Shinbun* (*Soy Protein Newspaper*). 1980. [Ministry of Agriculture (Norinsho) report on the Japanese tofu industry]. June 15. [Jap]
• ***Summary:*** Percentage of tofu shops using various amounts of dry soybeans per day: 0-30 kg 32.0%, 30-60 kg 31.5%, 60-300 kg 28.1%, 300+ kg 8.4%.

Various types of ownership: Sole proprietorship 81.6%, limited co. (Ltd.) 10.3%, corporation 4.9%, cooperative and other 2.3%.

When the tofu shops were started: After 1945 56.0%, before 1941 15.8%, Taisho period 10.2%, Meiji period (1868-1912) 8.8%, pre-Meiji 0.7%, after 1967 8.5%.

Source of income: Tofu making only 73.4%, tofu plus another job 26.6%.

Number of workers in tofu plant: 1 worker 18.5%, 2 workers 28.4%, 3 workers 16.8%, 4 workers 12.6%, 5-9 workers 14.2%, 10-19 workers 4.7%, 20 or more workers 4.8%.

The biggest problem for the small shops is that the large plants sell their tofu at very low prices.

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7128. Yokotsuka, Tamotsu. 1980. Re: Brief chronology of shoyu in Japan. Letter to William Shurtleff at Soyfoods Center, June 15. 1 p. [2 ref. Eng]
• ***Summary:*** 1521. The characters used today for the term shoyu were first used in Japan in the *Ekirin Bonsetsu Yoshu.* Prior to this time the characters hishio, mame-bishio, etc. were commonly used.

1532. Today's characters for shoyu were first used in a cooking book, the Daiso Ryôri-sho.

1558 A brewer in Noda sent tamari to Kawanaka-jima. Address: Kikkoman, Noda, Japan.

7129. *Daizu Geppo* (*Soybean Monthly News*). 1980. [Soybeans in Hokkaido]. June. 38 p. [Jap]

7130. DeRoin, Nancy. 1980. Tofu: Versatile soybean curd, miracle food of the East, comes West. *Cuisine.* June. p. 32-38, 40, 73-75. [1 ref]
• ***Summary:*** A cover story, with elegant color photos by John Stewart. In Japan, the author visited Taku Watanabe, director of Kyoto's famous Junsei restaurant which specializes in tofu, Sasa-no-yuki restaurant in Tokyo, Okutan and Takocho restaurants in Kyoto, and 120-year-old Morika tofu factory outside Kyoto. Contains tips for buying and storing tofu plus Japanese-type tofu recipes.

7131. Higuchi, T. 1980. Daizu o chûshin to shita Hokkaidô nôgyô [Soybean-centered Hokkaido agriculture]. *Daizu Geppo* (*Soybean Monthly News*). June. p. 2-3. [Jap]
Address: Nosan Bucho, Hokuren Nogyo Kyodo Kumiai Rengokai.

7132. Kikkoman Corporation. 1980. Kikkoman: Management and performance (Brochure). 399 Noda, Noda City, Chiba 278, Japan. 4 p. 18 x 15 cm.
• ***Summary:*** This is a financial statement as of 2 June 1980. U.S. $1.00 = ¥224. Lists the company's directors. Katsumi Mogi is president. Sales increased from about $180 million in 1970 to about $500 million in 1979, or three-fold in ten years, and at an average annual growth rate of 13.3%. Capitalization has grown from about $16 million in 1968 to $33.48 million in 1980. The total annual demand for soy sauce in Japan is about 324 million gallons. Kikkoman's yearly production is about 110 million gallons, or about 34% of the total. Address: Noda, Japan. Phone: (0471) 233-5610.

7133. Sunada, Kiyoshi. 1980. Dôsan daizu no hinshu kairyô [Varietal improvement of Hokkaido soybeans]. *Daizu Geppo* (*Soybean Monthly News*). June. p. 13-21. [Jap]
Address: Hokkaido Ritsu Tokachi Nogyo Shikensho.

7134. Tojo, Hayato. 1980. Tokachi no daizu saibai ni tsuite [On soybean cultivation in Tokachi (Hokkaido, Japan)]. *Daizu Geppo* (*Soybean Monthly News*). June. p. 5-12. [Jap]
Address: Nosan Kacho, Tokachi Nogyo, Kyodo Kumiai Rengokai.

7135. *Toyo Shinpo* (*Soyfoods News*). 1980. Shinseihin: "Mugi" "Genmai" Nattô. Daizu wa hitotsubumo haitte imasen [New products: "Barley" "Brown Rice" Natto. Not a single soybean is included]. July 1. [Jap]
• ***Summary:*** A photo shows the front of four new natto packages. These two types of natto are made using only cereal grains, without the use soybeans or any other beans. However the cereal grains are cooked in soybean cooking liquid; their natto-like strings come from this soybean liquid, which contains 0.17% protein. This is a good way of using leftover natto cooking liquid. The grains have no natto smell; with a light taste, they are good as part of a bread-based breakfast.

Note: There used to be a chlorella natto, but it was involved in a scandal and disappeared from the market. There was also kombu natto–a nice concept.

7136. Reed, M.H. 1980. A tour of Japanese cuisine. *New York Times.* July 20. p. WC1.
• ***Summary:*** There are now nine Japanese restaurants in Westchester. This is a review of each of those restaurants, in order of preference. Note: Westchester County is the southernmost county in mainland New York State, located just north of Long Island. The county seat is White Plains. Connecticut is on the east and the Hudson River is on the west.

The first restaurant is Koto–the reviewer's favorite. They serve a "hearty misoshiru soup;... fried bean curd with a fine dipping sauce (age-dashi-tofu), sukiyaki (one cooks one's own here...)."

7137. Dimock, Janet. 1980. Practicing macrobiotics: Hilltown couple seeks to improve quality of their lives. *Daily Hampshire Gazette* (*Northampton, Massachusetts*). July 30. p. 16.
• ***Summary:*** The Winston Donovan family of Huntington Road is moving to Boston to be near the Kushi Institute, where Winston has studied macrobiotics with Michio Kushi since January. Their daughter, Traci, aged 17, will go too. Winston ran a home-building business, but 2½ years ago he "found himself in the hospital (at the age of 38) recuperating from a heart attack and diagnosed as suffering from 'an incurable kidney disease,' he said. The next step was a dialysis machine and a kidney transplant, the doctors projected...

"At this point they seriously began to consider macrobiotics. Support for the idea was forthcoming from Dr. William Shevin, formerly of the Worthington Health Center, who introduced them to foods such as tofu (a soybean product). Since that time, Donovan explained that

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he is off medication and he sees a doctor only for a periodic checkup." A photo shows Winston and Joan Donovan.

7138. Kimura, Yuko. comp. 1980. Amerika-jin no kangaeta okara ryôri [Okara recipes developed by an American (William Shurtleff)]. Tokyo. 40 p. Illust. 14 x 20 cm. Translated from *The Book of Tofu* by Miyuki MIE. [1 ref. Jap]
• ***Summary:*** Contents: Forward (preface). Menu. Okara recipes. Tofu salads. About the translators. Address: 1-10-3, Tamagawa Gakuen, Machida-shi, Tokyo 194, Japan.

7139. Saio, Kyoko; Baba, Keiko. 1980. [Microscopic observation of soybean structural changes during storage]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 27(7):343-47. [Jap; eng]*

7140. Shurtleff, William; Aoyagi, Akiko. 1980. Das Miso-Buch: Nahrung fuer alle Band 1 [The book of miso: Food for mankind. Vol. 1]. Soyen, West Germany: Ahorn Verlag. 266 p. July. Illust. by Akiko Aoyagi Shurtleff. Index. 23 cm. A co-production of Ost-West Bund e.V. and Ahorn Verlag. Translated from English by Rainer Bosch and Gudrun Klein. [43 ref. Ger]
• ***Summary:*** Contents: What is miso? Foreword. Acknowledgments. Part I. Miso: Nutritional value and varieties. 1. Soybeans, protein and the world food crisis. 2. Miso as a food. 3. The miracle of fermentation. 4. The varieties of miso.

Part II. Cooking with Miso (400 recipes). 5. Getting started–principles, kitchen utensils, preparation. 6. Recipes from East and West. Part III. The Preparation of Miso.

Part III. The production of miso. 7. Making miso at home and in communities. 8. Japanese farmhouse miso. 9. The traditional miso shop. 10. The modern miso factory. Appendixes: A. The history of chiang, miso, and shoyu, and their historical significance. B. The chemistry and microbiology of miso fermentation. C. Miso additives. D. Miso with seafoods, chicken, and meat. E. When you want to study miso in Japan. F. People and institutions worldwide connected with miso. G. Natural food stores in German-speaking countries. Bibliography. Glossary. About the authors and their work (autobiographical).

Published in both hardcover and paperback editions. Address: New-Age Foods Study Center, P.O. Box 234, Lafayette, California 94549.

7141. *Soyfoods.* 1980. Soyfoods to the American taste: An interview with Drs. Clifford Hesseltine and Hwa L. Wang. 1(3):58-62. Summer. [1 ref]
• ***Summary:*** Dr. Hesseltine has just returned from a six-week trip to East Asia. In Taiwan he studied soy sauce fermentation and gave advice on setting up a national collection of microorganisms used in soybean fermentations. In Indonesia he attended an international symposium on various aspects of fermentation as a method a processing foods, with an emphasis on soybeans in Southeast Asia. "These people look to us in the West as far as science is concerned. Suddenly we see scientific institutions in the U.S. and now in Europe being interested in high protein foods made from soybeans. The East Asians follow and say, 'Well, if its very interesting for the West, then we should be interested in it.'" There is increasing interest in traditional, lightly-processed soyfoods.

Way back in 1963 the NRRL did research on making tempeh perforated plastic bags. Today, "on the island of Java, 90 percent of tempeh is now produced using plastic bags, including the tempeh I saw being sold on the street,..."

Dr. Wang, who was born and raised in China, recently returned there to visit family. She noted: "To me, it is a very sad story... Even tofu is rationed now. You can't buy tofu every day, probably once a week." "Soy sauce is not hard to get. Miso never had as much importance as in Japan... Tofu and soymilk are the two foods that were very common before. We stayed at a hotel and we only had soymilk once a week, in the morning for breakfast. And tofu, I don't even remember having eaten any."

"Dr. Hesseltine: Natto is one of the most rapidly growing fermented soyfoods in Japan, which surprised me, over something like miso. Natto has become more popular because it's supposed to be the great aid for digestion. In the new form, natto is much more acceptable as a food because the old, traditional type is sticky (it's a real mess) and this isn't. This is coated, so what you get is like small peanuts coated with powder; they don't stick to your hands."

Dr. Hesseltine: "What I saw in Taiwan really fascinated me–pressed tofu sheets [*pai-yeh*]. We would like to see the soycrafters making some recommendations [for us] as to practical areas of research for soybeans."

Portrait photos show (1) Dr. Clifford Hesseltine. (2) Dr. H.L. Wang. Two photos of each, seated. Address: NRRC, Peoria, Illinois.

7142. Takahashi, N.; Kitabatake, N.; Sasaki, R.; Chiba, H. 1980. Enzymatic improvement of food flavor. V. Oxidation of aldehydes in Soybean extracts by an NAD+ -regenerating system made up of aldehyde dehydrogenase and diaphorase. *Agricultural and Biological Chemistry* 44(7):1669-70. July. [6 ref]
• ***Summary:*** The conversion of aldehydes to less objectionable flavor compounds by using aldehyde dehydrogenase and aldehyde oxidase was effective in reducing the beany odors of soybean flour. Address: Dep. of Food Science & Technology, Faculty of Agriculture, Kyoto Univ., Kyoto 606, Japan.

7143. Yoshihara, Lulu. 1980. Shinmei-do Miso Company.

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Soyfoods 1(3):10. Summer.
• ***Summary:*** In this letter, the author tells of the founding, activities, products, and production process of this small miso company. Her husband and co-worker, Yoshi, is Japanese. They have the capacity to make 80 gallons/week of miso but are operating below capacity for lack of space and firewood. Their main miso variety is rice (kome) miso. Barley miso will be ready in early 1981 and brown rice miso will be ready in the fall of 1981. "Our markets are the Japanese food coops and natural food stores. We started in spring 1979 and have just sold our first miso. Our first experimental batch was made in February 1977." Address: Shinmei-do Miso Co., Wren Rd., Denman Island, BC, Canada, V0R 1T0.

7144. Ochi, Hirotomo; Blenford, D.E. 1980. The soy sauce explosion: Worldwide demand for this centuries-old Japanese food ingredient has been stimulated by the development of new drying techniques to produce it in powder form. *Food Processing Industry* (*UK*) 49(585):25, 27, 29. Aug.
• ***Summary:*** Natural flavors are increasingly in demand worldwide. The many different kinds may be divided into three main types: (1) Extracts, as from beef, chicken. bonito, mushroom, or onion. (2) Fermented products, e.g. soy sauce or wine. (3) Hydrolyzed products, such as HVP or yeast.

"Soy sauce (or Shoyo sauce [sic, shoyu]) is a liquid seasoning which was originally developed in Japan [sic] via the fermentation process. There are two main types of soy sauce in Japan, strong and weak [sic] (koigushi [sic, koikuchi] and usugushi [sic, usukuchi]). In 1977 an estimated 1,200 million liters of soy sauce was made in Japan, equivalent to about 10 liters per person per year.

During the 1960s, with the development of new drying techniques, soy sauce and various extracts were introduced in powdered form. The most popular method of drying was spray drying. Using dextrin, gelatin, or gum as carriers, the powders were made using 70-90% soy sauce solids together with 10-30% of the carrier. Table 1 gives the chemical composition of two typical soy sauce powders. HVP powders are inferior to soy sauce powders.

In Japan one of the major applications for soy sauce powder is for instant and cup noodle soups. In 1977 the production of these two products was 2.6 billion meals, requiring the use of 3,000 tons of soy sauce powder. The total amount of soy sauce powder made in Japan in 1977 was 4,000 to 4,500 tons.

Soy sauce powder, which was first produced in the 1960s, can be made using either of 3 processes, each of which has advantages and disadvantages: (1) Spray drying was the most popular drying method. Using dextrin, gelatin, or gum as carriers, the powders contained 70-90% soy sauce solids and 10-30% of carrier. (2) Freeze drying, gives the product with the best flavor but the processing costs are very high and four times as much energy is used as in spray drying. (3) Continuous vacuum drying takes place in a vacuum chamber under conditions of low temperature and short residence time. It was developed by Nikken Food Co. in Japan. Energy consumption is much less than with spray drying and the soy sauce flavor is unchanged. The resulting products, in the form of granules or porous powders, have excellent solubility. Address: 1. President, Nikken Food Co., Komaba 1-37-7, Meguro-ku, Tokyo, Japan.

7145. Ferretti, Fred. 1980. Brown rice and whole grain at Amherst. *New York Times.* Sept. 3. p. C1.

7146. Dwan, Lois. 1980. Trader Vic's: Divided, not conquered. *Calendar* (*Los Angeles*). Sept. 7. p. 98. Sunday.
• ***Summary:*** Trader Vic Bergeron, born in 1902, started his first restaurant, Hinky Dinks, in Oakland. In 1938 he announced he was going to go fancy, and sent everyone home to put on a jacket. Now he owns 20 fine restaurants extending from San Francisco (opened in 1951) to the Beverly Hills Hilton (opened in 1955) to Tokyo, from London to Munich. Today Trader Vic "is into tofu," as is his vice president, Chan Wong. "He rolls it into little balls with minced ham and spices, coats them with Japanese bread crumbs (*panko*), deep fries. He serves big chunks of *tofu* in a sauce with thin beef. He makes a terrine with chicken livers and *tofu,* garlic, mace, nutmeg, brandy... No cholesterol. Fantastic." A photo shows Trader Vic seated at his desk, smiling and gesturing. Address: Los Angeles.

7147. *Toyo Shinpo* (*Soyfoods News*). 1980. Shokubunka kenkyûka Nagayama-shi, Nihon sôzô gakkai de kôen: Sekai ni rui o minai kansei sareta shokuhin nattô [Mr. Nagayama, a food culture researcher, lectured at a creative Japanese academic meeting: There is only one complete food like nattô in the world]. Sept. 11. [Jap]
• ***Summary:*** During the natto fermentation, vitamin B-2 increases fivefold. Natto sells best in the winter, whereas tofu sells best in the summer. A photo shows Mr. Nagayama standing in front of a blackboard, holding some papers.

7148. Kushi, Michio. 1980. Re: Thoughts on phasing out use of the word "tamari" to refer to naturally fermented shoyu. Letter to William Shurtleff at Soyfoods Center, Sept. 13. 1 p. Typed, with signature.
Address: 62 Buckminster Rd., Brookline, Massachusetts 02146.

7149. Soyfoods Center. 1980. Re: Morinaga Ever-Fresh Silken Tofu. Letter to U.S. natural and health food distributors, Sept. 17. 2 p. Typed, without signature on letterhead.
• ***Summary:*** This form letter, written by William Shurtleff, begins: "As you well know, one of the brightest new stars on the natural- and health foods horizon is *tofu.* Recent statistics

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published by the Soycrafters Association of North America show that $33.7 million of tofu (retail value) were sold in the U.S. during the past year, and that the market is expanding at the remarkable rate of 25 to 30 percent a year!"

Soyfoods Center has been working as a consultant for the Morinaga company of Japan, which is one of Japan's largest and oldest producers of fine foods... Morinaga has developed a high-quality new product called Morinaga Ever-Fresh Silken Tofu. This tofu is packaged in a revolutionary new way–developed by Morinaga–that allows the tofu to stay as fresh as the day it was made for up to six months without refrigeration or preservatives of any kind... The secret lies in the Tetra Pak container, developed in Sweden and now used throughout the world."

"For you, as a distributor of natural and health foods, this tofu has several important advantages: 1. No refrigerated distribution required." 2. No spoilage losses or returns. 3. Wonderful silken-smooth texture. 4. Color recipe brochure. 5. Excellent price. 6. Private branding available. 6. Free trial offer.

"Free sample offer: Please clip here. YES. Please send me one carton of Morinaga Ever-Fresh Silken Tofu and 24 free color recipe brochures, free of all charge and obligation." A form for the person's name, company name, address, and phone is provided. "Please return this form to: The Soyfoods Center, P.O. Box 234, Lafayette, California 94549." Address: P.O. Box 234, Lafayette, California 94549. Phone: (415) 283-2991.

7150. *Japan Economic Journal* (*Tokyo*). 1980. Fuji Oil Co. (Osaka, Japan) has developed the world's first filled cheese, made by adding vegetable oils and soybean protein to skimmed milk after fermentation and maturation. Sept. 23. p. 14. *

• ***Summary:*** It is cheaper than ordinary cheese, possesses cheese's unique flavor and has low cholesterol. For now the firm will sell it to confectioners.

7151. Thalman, Margaret Morse. 1980. Re: William J. Morse, her father, and their trip to East Asia. Letter to William Shurtleff at Soyfoods Center, Sept. 23. 3 p. Handwritten.

• ***Summary:*** "Here is our itinerary after leaving Dairen [today's Dalian, Manchuria], Aug. 20, 1930.

Aug. 22–Arrive Heijo, Korea (Pyongyang).
Sept. 17–Leave Heijo for Seoul.
Sept. 21–Leave Seoul for Heijo.
Sept. 25–Leave Heijo.
Sept. 29–Arrive Mukden, Manchuria.
Oct. 1–Kungchuling.
Oct. 4–Arrive Dairen.
Oct. 19–Leave Dairen.
Oct. 20–Arrive Peiping, China.
Nov. 9–Leave Peiping.
Nov. 10–Arrive Dairen.
Dec. 18–Leave Dairen (by ship).
Dec. 21–Arrive Kobe, Japan.
Dec. 22–Nara & Kyoto.
Dec. 23–Leave Kyoto (8 a.m.). Arrive Tokyo (5 p.m.).
1931–Remained in Tokyo until...
Feb. 17–Left Tokyo.
Feb. 26–Arrive Honolulu, Hawaii.
March 4–Arrive San Francisco, USA.

"Discovered another small notebook that my father had kept from Feb. 18, 1929 to Oct. 6, 1929. On Feb. 23 he wrote:

"'In the afternoon went to Vitacolor Motion Picture Lab where we saw the new Vitacolor motion pictures which were excellent. Had a long talk with Mr. Dupont, the inventor.

"'Feb. 25–In the afternoon went to Vitacolor Lab to see colored movies taken by Mr. Dorsett. Obtained our colored motion stuff and bid goodbye to Mr. Dupont.'"

"In Tokyo, Hokkaido and Dairen they rented offices, set up darkrooms and developed their own still and motion picture films.

"Mr. Beattie was interested in chestnut blight. Mr. and Mrs. Beattie met us when we first arrived in Tokyo and were very helpful in showing us around the city.

"Mr. Dorsett's main interest was in persimmons." Address: 22 Interlaken Rd., Eastchester, New York 10709.

7152. Sass, Lorna J. 1980. A couple on a tofu mission in the West. *New York Times.* Sept. 24. p. C3. Reprinted in the San Francisco Chronicle. Nov. 12. p. 22.

• ***Summary:*** About William Shurtleff and Akiko Aoyagi, authors of *The Book of Tofu.* A large photo shows each person. "The two people most responsible for catapulting tofu from the wok into the frying pan are William Shurtleff and Akiko Aoyagi." In the early 1970s they began to work on introducing this inexpensive foodstuff, high in protein and free of cholesterol, to the United States. Concerned that there is a world food crisis, they are committed to the philosophy expressed in the book *Diet for a Small Planet,* that if people in Western cultures relied on beans and grains rather than meat, the problem would start to improve. Shurtleff says that they wanted to find a way to make soy foods appealing to Big Mac [hamburger] fans. "'We decided to try to do for tofu and other soy foods what Johnny Appleseed did for apples.'"

A graduate of Stanford University in physics and industrial engineering, Shurtleff first became interested in natural foods and a healthy diet starting in 1968, while living at the Tassajara Zen Mountain Center near Carmel Valley, California. In 1971 he went to live in Japan where, as a student with little money, he found he could eat for as little as 30 cents a day by relying on tofu as his major source of protein. There he met Miss Akiko Aoyagi, a Tokyo-born fashion designer who was also fine cook. Using the seven different types of Japanese tofu, she prepared her favorite

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tofu recipes for him. A turning point came when they shared a meal at Japan's oldest haute cuisine tofu restaurant [Sasa-no-yuki, in Tokyo].

At the time they had no publishing experience and only about $100 between them. Yet within several weeks they had found a publisher and were hired on a part-time basis by an American company to do interpreting, that paid enough to free them to research the subject thoroughly for the next four years.

In December 1975 their first book, *The Book of Tofu,* as published by Autumn Press, a small publisher originally headquartered in Japan and now in Massachusetts, interested in both tofu and vegetarianism. The book was received so enthusiastically–over 100,000 copies are now in print, that Ballantine Books decided last year to publish a revised mass market pocket-book edition.

In 1975 they founded the New-Age Foods Study Center, with offices in Tokyo and Lafayette. Their center has published three volumes: *Tofu and Soymilk Production* ($17.95), *Tempeh Production* ($15.95), and *Miso Production* ($17.95). These books are directed at people interested in manufacturing "soy foods." In 1978 they helped to found the Soycrafters Association of North America. Last July the association held its third annual conference.

Lorna Sass is also the "general editor of the forthcoming reprint series of significant historical cook books." Address: Culinary historian, New York.

7153. Weiss, Martin G. 1980. Re: Recollections of William Morse and work with soybeans (Continued–Document part II). Letter to William Shurtleff at Soyfoods Center, Sept. 26. 3 p. Typed, with signature.

• ***Summary:*** Continued: "You may enjoy just a bit of irony. After the collections made by W.J. and Dorsett, Japan overran China. After World War II when we were on friendly terms with China, we were told that the Japanese had mandated that standard varieties would be grown throughout and many of the village varieties were lost. We then had requests for seed of some of their old varieties–and Dorsett's and W.J.'s accurate notes enabled us to replace some of the varieties lost to China!

"Back to W.J. While in the Orient he became very fond of Chinese and Japanese foods. He brought recipes back. When I was invited to his home in Takoma Park, D.C., he took delight in preparing the Japanese dish, Suki Yaki [sukiyaki], on a grill while we were sitting at the table–just like the Japanese girls do in Tokyo. And, it was just as delicious as the Suki Yaki I've eaten in Tokyo!

"Every year, W.J. would make a field trip–to the State Agricultural Experiment Stations with an interest in soybeans. In the early days he would allocate a small amount of Federal funds to each State who wanted to try soybeans–just a little 'seed money.' He looked forward to those trips, and, particularly when he acquired assistants stationed in the States. He would take us along to visit the adjoining States.

In his capacity as 'Soybean Project Leader,' he was just that. He was never dictatorial, never demanding. As long as his employees were 'trying' he seemed satisfied. You were on your own. If asked advice he would give a kindly opinion. He dearly loved to visit 'his boys' as he called us.

"Every winter 'his boys' would gather at Urbana to survey plans for the ensuing year, and he liked nothing better than to spend an evening with 'his boys.' The ideal evening–meet in a bar and have a few drinks (his chief assistant, Mr. Cartter, was a Christian Scientist so he was never invited) and then to a Chinese restaurant for an oriental dinner.

"A personal note (may help you)–his wife [Edna] was diagnosed by 'us boys' as being very dominating, unfriendly, and almost anti-social. She seemed 'severe.' We thought she dominated W.J. That's why he loved his field trips and an evening with his boys–he could, and did, relax!

I've rambled on and on. But it may serve to give you background. In summary, W.J. would never rank high in this era of forceful and domineering executives. He was a kindly man, always willing to encourage and give moral support to his subordinates. He was loved by all, and his employees worked hard–they never wished to disappoint him."

Sincerely,..."

Note: Talk with Martin Weiss. 1980. Oct. 4. I should visit the USDA National Agricultural Library in Beltsville, Maryland. While there, find out where Morse's films and the original report of his 1929-31 trip to the Orient.

Weiss was a youngster compared with Morse; they all called him 'Mr. Morse.' "We looked up to him too much–with respect or reverence or something like that.

Morse's office in Beltsville had no maps on the walls. It did have "a raft of files and many food samples. A typical government office."

Weiss knew that Morse smoked but was not aware that he was a heavy smoker.

Weiss was a professor of plant breeding and genetics at Iowa State University; that's important. Address: 11122 Emack Rd., Beltsville, Maryland 20705.

7154. Zell, Fran. 1980. Restaurants: Johnny's–With a split personality at your service. *Chicago Tribune.* Sept. 28. p. D12.

• ***Summary:*** Includes a review of the Japanese restaurant Kyori, 316 N. Michigan Ave. "You can make a meal on the appetizers alone, which include such tasty little side dishes as *agedofu,* ($2.25), three cubes of deep-fried *tofu* in a ginger sauce;..." Chicken teriyaki is also served. Address: Restaurant critic.

7155. Belleme, John. 1980. Re: Building a miso factory in North Carolina. Pasteurizing miso and selling dry koji. Letter to William Shurtleff at Soyfoods Center, Sept. 29. 2 p. Typed, without signature or letterhead.

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• ***Summary:*** "Our miso project is going quite well. This summer I located the remaining equipment in New Jersey and ordered our vats from Arrow Tank Co. in Buffalo [New York]. The owner is stone deaf; it was an interesting afternoon.

"We are now leveling the site for the miso factory. It's going to be one of those metal Butler buildings, about 4,000-sq-feet. Besides the miso project, we are working on other projects such as building a structure for summer camps, shiitake mushroom farming, and preparing our land for growing soybeans. There's just Jan. and I, so our hands are full."

While in Japan, John noticed that Mr. Onozaki's wife and most older traditional people never boil their miso soup. "People go out of their way to buy Mr. Onozaki's unpasteurized miso. These people believe that there is a very beneficial bacteria in miso which is killed by heat. More specifically, old people in rural Japan strongly feel that if you smoke, it is best to drink unpasteurized miso every day.

"On the other hand, the people at Sendai [Miso Shoyu Co.] and Michio [Kushi] believe this is nonsense. I have great faith in the wisdom of tradition. People that live close to the earth do not waste their time if not for good reason. Also, the people at Sendai pasteurize all exported miso, much of which is sold by Erewhon." John asks Shurtleff's opinion on these matters.

John would like to sell some of the koji he makes as dry koji. He asks how to dry it and the effect of drying on the enzyme activity of the koji. "Finally, do you know anything about the nutritional benefits of koji in making amasake or pickles?"

Talk with John Belleme. 1980. Oct. 3. The rebuilt cypress vats are 7 feet tall and 5 feet in diameter. Each costs $1,000 with stainless steel hoops. John is deeply interested in macrobiotics. Address: Route 3, Box 541, Rutherfordton, North Carolina. Phone: (704) 287-2940.

7156. Aihara, Cornellia. 1980. Corneliasan's corner: Tamari. *GOMF News* (*Oroville, California*). Sept. p. 3-4.
• ***Summary:*** George Ohsawa called his soy sauce 'Ohsawa Soy Sauce,' when he started teaching macrobiotics in Europe around 1957. He made a Frenchman the sole distributing agent for macrobiotic foods imported from Japan. This agent later began to import cheap, poor quality soy sauce from Japan under the name 'Ohsawa Soy Sauce.' As a result, Ohsawa had to import traditional natural soy sauce from Japan once again. He could no longer use the name 'Ohsawa Soy Sauce' because the other importer had copyrighted the name. Ohsawa therefore called the traditional natural soy sauce imported from Japan 'tamari'–even though, in the strict sense of the word, it was not tamari.

"Tamari sauce was a historical precursor to soy sauce and is available today in very limited quantities. It is a by-product of a particular type of miso that is made with only salt and soybeans (with a bit of koji enzyme). Its flavor and taste-enhancing qualities are not as distinctive as natural traditional soy sauce.

"*The Calendar Cookbook* was published last year but was written in 1972 when I was using natural soy sauce; in this as well as in *Macrobiotic Child Care* (1979) I called it 'tamari.' This was a mistake. I meant natural soy sauce, not tamari. Really, tamari means the liquid that comes to the bottom of the barrel under stone pressure when making miso... Making 100 pounds of miso, only one or two cups of tamari come. But I don't like to take this tamari off–I mix it up with the miso. If you remove it, the miso is less sweet... I never used tamari in my cooking.

"Last summer in Japan, Mr. Murata of Ohsawa Japan introduced us to the Yamaki factory. They are using good quality salt, not commercial government salt." Address: GOMF, 1544 Oak St., Oroville, California 95965.

7157. Inoue, Yoshimaru; Edahiro, M.; Ohara, M.; Zaizen, H.; Numata, T.; Miyazaki, N. eds. 1980. Sekai no daizu shokuhin [World soyfoods]. Tokyo: Nogyô Gijutsu Kaikan. 109 p. Sept. 25. 21 cm. Series: Nobiyuku Shokuhin No. 49-50. [15 ref. Jap]
• ***Summary:*** Contains detailed information and statistics on the world soyfoods market. Contents: 1. Soyfoods in Asia. 2. Soyfoods in Africa. 3. Soyfoods in Europe and the Soviet Union. 4. Soyfoods in Latin America. 5. Soyfoods in North America. 6. Overview of soybean food utilization. 7. Village-style processing of whole soybeans. 8. Barriers to utilization of soybeans in foods. Address: JETRO (Japan External Trade Organization)–Nôsei Chôsa Iinkai, Japan.

7158. Nihon Keizai Shinbun. 1980. San-Jirushi Jozo K.K. "Honmono no tamari-shôyu" o shuryoku ni [San-Jirushi Jozo K.K. Focusing on making real tamari-shoyu]. In: 1980. Chubu [Chihô] no Chuken 170-sha [Directory of 170 Medium-sized Corporations in Central Japan]. Nagoya: Nihon Keizai. See p. 326-227. [Jap]
• ***Summary:*** A brief history of and introduction to San Jirushi. Address: Japan.

7159. Hodgson, Moira. 1980. Restaurants: Sushi and more and new Italian. *New York Times.* Oct. 10. p. C22.
• ***Summary:*** A review of Sushiko, a small Japanese restaurant in New York City between Broadway and Eighth Avenue, which has a "sushi bar." Inexpensive side orders include: "Natto, mustard-colored fermented soybeans, gooey and unusual, were seasoned with mustard, chopped scallions and soy sauce, and had an extraordinary and subtle flavor, tasting slightly smoky, resembling food that has been cooked over charcoal. Bean curd came in large moist squares in a bowl of water, accompanied by a sauce of dried tuna [sic, bonito] flakes and scallions mixed with soy."

Paper-thin yakinori (toasted nori) could be used as a

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wrap for natto. Spectacular nasu shigiyaki was an eggplant sliced in half, covered with miso sauce, and grilled. Misoshiru [miso soup] is a rich brown soybean soup. Tofu is added to a tossed American-style salad.

7160. Ellis, Merle. 1980. A reunion with Japanese food: The butcher. *Los Angeles Times.* Oct. 16. p. K10.
• ***Summary:*** "If good food, simple preparation, beautiful presentation and economy are some of the things you look for in a meal, look to the Japanese."

Three recipes are given. Mizutaki means (literally) "water + boiling." "Legend has it that Samurai warriors (and ancient Mongolian warriors in China before them) used their helmets to cook a meal of whatever was at hand in a helmet full of boiling water." That is mizutaki. A "Mongolian hot pot" is a special utensil used for this dish, when available. The mizutaki recipe calls for "1 block tofu (soy bean cake) cut in 1-inch cubes." The Mizutaki sauce recipe calls for ¼ cup soy sauce.

Note: This article, titled "Japanese cuisine: Simple, beautiful and economical" also appeared in the *Hartford Courant* (Connecticut) (Oct. 16, p. E12). Address: Staff writer.

7161. Institute of Food Technologists' Expert Panel on Food Safety and Nutrition. 1980. Monosodium glutamate (MSG). A scientific status summary. *Food Technology* 34(10):49-53. Oct. Also published in Sourcebook on Food and Nutrition, 3rd ed. 1982. p. 135-39. [38 ref]
• ***Summary:*** Glutamic acid is one of the most common natural amino acids. The various salts of glutamic acid are used to enhance flavor. The sodium salt of glutamic acid, usually called MSG (for monosodium glutamate), is by far the most widely used glutamate, although potassium, ammonium, and calcium glutamates have been used in low-salt formulations as salt substitutes.

In East Asia, cooks have long used the sea vegetable *Laminaria japonica* (called "kombu" in Japanese) to make a tasty soup stock. The link between the seaweed flavor and glutamate (first isolated in 1866) was discovered by Professor Kikunae Ikeda of the University of Tokyo in 1908. He demonstrated that kombu contained generous amounts of glutamate and that it was the seaweed component responsible for food flavor enhancement. The Japanese began production of glutamate almost immediately. Thirty years passed before it was produced in North America from corn and wheat gluten. Today, MSG is produced in the USA from sugar beet molasses in a fermentation process. Or it may be extract directly from sugar beets.

"Glutamate is ubiquitous in nature and is present in both food and the human body, either as one of the amino acid building blocks of protein and peptides, on in its free form. The glutamate bound into a protein structure has no flavor enhancing properties–only the free form has that, and then only the 'L isomer.' Protein-rich foods such as human milk, cow's milk, cheese, and meat have a high content of bound glutamate, while most vegetables contain little, because of their low protein content. However many of these vegetables–such as mushrooms, tomatoes, and peas–do have high levels of *free* glutamate. In fact, some investigators have suggested that this explains the effectiveness of mushrooms and tomatoes in enhancing the flavor of other foods, in much the same way as seaweed."

"Glutamate exists as part of the human body in both free and bound form. The human body contains 14 to 17% protein, of which about one-fifth is glutamate. An adult weighing 70 kilograms (156 pounds) contains, on the average, 2 kilograms (4.4 pounds) of glutamate in his protein... The free glutamate concentration of the brain is about 100 times as in the blood." Address: Chicago, Illinois.

7162. Mochizuki, Tsutomo. 1980. Re: Bacteria found in the greatest numbers in traditional Japanese miso. Letter to William Shurtleff at Soyfoods Center, Oct.–in reply to inquiry. 1 p.
• ***Summary:*** The most abundant bacterium in traditional Japanese miso is *Pediococcus halophilus,* a lactic acid bacterium. No other prevalent species are found. Note: Dr. Mochizuki, an expert on miso, retired in 1982. Address: Shinshu-Miso Research Inst., Nagano city, Japan.

7163. Nagata, Y.; Imaizumi, K.; Sugano, M. 1980. Effects of soya-bean protein and casein on serum cholesterol levels in rats. *British J. of Nutrition* 44(2):113-21. Oct. [35 ref]
• ***Summary:*** Secretion of neutral and acidic steroids in rats was increased when the low-fat, cholesterol-free diet contained isolated soy proteins. Address: Lab. of Nutrition Chemistry, Kyushu Univ. School of Agriculture, Fukuoka 812, Japan.

7164. Noda, Kosaku; Igata, K.; Horikawa, Y.; Fujii, H. 1980. Synthesis of gamma-glutamyl peptides catalyzed by transamidase from *Bacillus natto. Agricultural and Biological Chemistry* 44(10):2419-23. Oct. [25 ref]
• ***Summary:*** It is well known that the sticky mucilage of natto is a mixture of polyglutamic acid (PGA) and fructan produced by *Bacillus natto.* Address: Lab. of Biochemistry and Lab. of Microbiology, Fukuoka Women's Univ., Higashi-ku, Fukuoka 813, Japan.

7165. United States, and Japan. 1980. UJNR–U.S./Japan Cooperative Program in Natural Resources (Brochure). Hyattsville, Maryland. 12 panels. 22 x 9 cm each. Front and back. [Eng]
• ***Summary:*** At the top of the front panel is an American flag. At the top of the back panel is a Japanese flag. The UJNR was established in 1964. It now includes 17 panels. Address: USDA, 459 Federal Bldg., 6505 Belcrest Rd., Hyattsville,

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Maryland 20782.

7166. Barber, Linda. 1980. Re: Thinking of writing a book about natto in English. Letter to William Shurtleff & Akiko Aoyagi at New-Age Foods Study Center, Nov. 7. 1 p. Handwritten (aerogram).
• ***Summary:*** Thank you for sending a copy of *Tofu and Soymilk Production.* "I'm spinning from all the new information."

"I wrote to you before about my work with tofu in Japan and now I'm beginning to study natto as well. Through my interest in tofu I met Hisao Nagayama (author of *Natto no Shimpi* and free lance writer about food culture). He wants to work with me, hopefully, to get a book about natto in English. I really feel honored but because of our language barrier, there are many problems. I remembered that the Center has many resources and, I hope, about natto! I don't need the slides you advertized in your catalog, but any other information would be great! Could you let me know what is available and how much it would cost?"

"Thank you..."

Note 1. Linda and a Japanese author wrote a booklet (25 pages) in Japanese titled *Tôfu, Nattô Ryôri* [Tofu and Natto Cookery] which was published in Japan in 1981.

Note 2. Nishinomiya is a city located in Hyogo prefecture, Japan, between the cities of Osaka and Kobe. Address: c/o Kobe College, 4-1 Okadayama, Nishinomiya, 662 Japan.

7167. Oka, H.; Itoga, K.; Mochizuki, T. Assignors to Nagano Miso Company. 1980. Muen kôtanpaku shokuhin genryô no seizô-hô [Salt-free miso]. *Japanese Patent* 55-44587. Nov. 13. 12 p. [12 ref. Jap]
• ***Summary:*** The patent for the world's first salt-free miso. Note: A similar patent was granted on 28 May 1981. Japanese Patent 1,048,853. Address: Chuo 5-6-2, Ueda-shi, Japan.

7168. Watanabe, Hidekazu. 1980. Re: Early work by San-iku Foods in Japan with tofu and soymilk. Letter to William Shurtleff at Soyfoods Center, Nov. 20. 5 p. Handwritten, with signature on letterhead. [Jap; eng]
• ***Summary:*** Starting in about 1955 Dr. Harry Miller began to recommend that the Saniku school in Japan serve soymilk instead of dairy milk to its students. But the school decided not to do this because they thought the taste of the soymilk was not very good and it was considered less nutritious than cow's milk; moreover, it would cost a lot of money to buy soymilk equipment.

In 1957 Mr. Hanzo Ueda (who had previously worked at the post office in Hachioji and was a Seventh-day Adventist) was running a tofu shop. He and Mr. Hidekazu Watanabe were making soymilk at the tofu shop, packing it in 180 ml bottles, and selling it around Hachioji–under Dr. Miller's guidance.

In 1959 people from the Saniku school visited the tofu shop and gained confidence. They bought similar (but not identical) equipment, and started to produce soymilk at the school. They bottled it in 180 ml containers and started to serve it to 500 students at every meal.

Ten years later, in 1969, they started to produce Soyalac infant formula soymilk with help from Loma Linda Foods in America. They produced it at College Health Foods–a separate organization from the Saniku school.

Dr. Miller gave us helpful advice on technical and nutritional matters, and furthermore he always supported our spirit and spirituality as we developed the soymilk plant (1959) and the infant formula (1969). In 1969 Luppy Kôsan began to make Luppy soymilk. This was the first really serious commercial soymilk product in Japan.

Note: See also Mr. Watanabe's follow-up letter of July 1981. Address: San-iku Foods, Sodegaura-machi, Chiba-ken 299-02, Japan.

7169. Fabricant, Florence. 1980. Authentic and traditionally Japanese. *New York Times.* Nov. 23. p. LI27.
• ***Summary:*** This is a review of the Japanese restaurant Kura Barn, 479 New York Ave., Huntington [on the north shore of Long Island]. One of the favorites is "fried tofu."

"Tofu, the snowy, slippery soybean curd that has no flavor whatever but plenty of nutritional value, is transformed into mildly seasoned patties, deep-fried and bathed in a rich black mushroom sauce for a particularly splendid appetizer." Address: Restaurant critic.

7170. Andoh, Elizabeth. 1980. At home with Japanese cooking. New York, NY: Alfred A. Knopf. 254 p. Illust. by Michiko Fujiwara. Index. 25 x 22 cm.
• ***Summary:*** A beautiful, intimate and very useful book, approachable and suffused with a unique tranquility and charm. The illustrations (line drawings) are exquisite.

Contents: Acknowledgments. Introduction. A note about the romanization of the Japanese language (Hepburn system). In the Japanese kitchen: Techniques and equipment–Grilling, broiling, steaming, braising and simmering, frying, dry roasting, grinding, crushing and mixing, using knives (four types, and how to hold and use them), skewering, straining and mashing, grating, pots and pans, miscellaneous equipment (chopsticks, rice paddle, rice tub, flat fan, bamboo mats, bamboo trays, metal mold, etc.). Meals and menu planning. The recipes: Soups, rice, noodles, braised and simmered foods, grilled and skillet-grilled foods, deep-fried foods, steamed foods, mixed, sauced and tossed foods, pickles, sweet things and beverages. In the Japanese kitchen: Foodstuffs. Suggestions for ordering Japanese foodstuffs, A glossary of Japanese terms.

The very helpful glossary includes (soy related): Abura agé: fried bean curd [tofu]. Aka miso: dark bean

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paste [miso]. Daizu: dried soybeans. Eda mamé: fresh soybeans. Kikkoman: brand name of soy sauce. Kinako: soy flour [roasted]. Marukomé miso: brand name of medium fermented bean paste. Miso: fermented bean paste. Miso shiru: soup thickened with fermented bean paste. Natto: fermented sticky soy beans. Okara: by-product of fresh tofu-making. Saikyô miso: light bean paste, a brand and regional name. Sendai miso: dark bean paste, a brand and a regional name. Shinshû Ichi miso: medium bean paste, a brand and regional name. Shiro miso: white (or light) bean paste. Shôyu: soy sauce. Teri yaki: glaze grilling. Tôfu: bean curd. Usu kuchi shôyu: thin or light soy sauce. Yuba: thin brittle sheets of soy milk (by-product of tôfu-making).

Note: This is the earliest English-language document seen (April 2013) that uses the word *Abura-agé* (hyphenated with diacritics) to refer to deep-fried tofu pouches.

Also includes: Each of the basic sea vegetables / sea greens used for food in Japan (ao nori, hijiki, konbu, nori, wakamé, etc.). Umé-boshi: pickled plums.

The book contains excellent recipes and descriptions (see the index) using bean curd [tofu] (7 recipes), eda mamé (1), fried bean curd (*abura agé*) (5), grilled bean curd (*yaki-dôfu*) (3), miso (17), and soybeans, dried (1); natto is not mentioned.

Elizabeth concludes the Introduction by explaining: "What I've tried to write here is the very book I wish I'd had with me when I started out fourteen years ago."

About the author (last page and with portrait photo on inside rear dust jacket): Elizabeth, who was raised in New York and graduated from the University of Michigan, traveled to Japan in 1966 to study Japanese, lived with the Andoh family on the island of Shikoku, and married into that family two years later. Shortly after her marriage, she enrolled in a class at the Yanagihara School of Classical Japanese Cooking, where she studied for six years. She has a daughter, Rena, to whom this book is dedicated.

The copyright page states: "Many of the recipes which appear here were originally printed in slightly different form in *Gourmet* magazine, 1975, as part of a 6-part series entitled 'The Seasonal Japanese Kitchen,' by Elizabeth Andoh." Address: Tokyo, Japan.

7171. Barber, Linda Lee. 1980. Let's cook: A beginner's cook book–starring "Pooh," the culinary cat. Translated by Kazuko Kagotani and Tomoko Matsuda. Kobe, Japan: Published by the author. 102 p. Nov. Illust. No index. 30 cm. Comb bound. [Eng; Jap]

• ***Summary:*** Letter (e-mail) from Linda Barber. 2012. July 7. A bi-lingual step-by-step cookbook for children that uses tofu and kinako in the recipes. I developed the recipes, my sister Wendy, illustrated them, and my assistants Kazuko and Tomoko translated them. I haven't seen anything like this before. I wrote this while I was in Japan in the early 80's. It is self published.

The recipe for "Tofu cheesecake" (p. 64-67) calls for many ingredients including "momen-dofu" (450 gm), 2 eggs, crumb crust, natural sugar, yogurt cheese, lemon, etc. The crumb crust and yogurt cheese must be prepared in advance; the recipes are in this book.

The recipe for "Power flour" (p. 68-69) calls for Kinako. To make this Power flour: Measure into a bowl: 1 kg all purpose flour, 5 tablespoons nonfat dry milk granules, 5 tablespoons wheat germ, and 5 teaspoons kinako. Mix well. "Store in a cool place in a covered container, and use this flour mixture when a recipe calls for flour." This recipe alone contains 15 illustrations. Many subsequent recipes in this book call for Power flour.

The recipe for "Moon bread" (p. 78-81) calls for 450 gm "momen tofu" and produces croissants with a tofu filling.

The recipe for UFO's (p. 82-85) begins: "This cookie has an Unidentified Food Object... tofu! They are really out of this world with a glass of milk!!!" Address: Kobe College, 4-1 Okadayama, Nishinomiya 662, Japan.

7172. Esko, Edward; Esko, Wendy. 1980. Macrobiotic cooking for everyone. Tokyo: Japan Publications, Inc. 272 p. Nov. Foreword by William Tara, Director, Community Health Foundation, London, England. 26 cm. [50 ref]

• ***Summary:*** The authors studied in Japan (mostly Kyoto), from Sept. 1978 to May 1979, at which time they returned to Boston. In the summer of 1979 "more than 100 delegates from various regional centers throughout the United States and Canada met in Boston for the first North American Congress of Macrobiotics." Part I of this book discusses the theory of macrobiotics and Part II gives recipes. Unfortunately, the book has no index, and the bibliography gives no years of publication. There are chapters on: Seitan, fu, and noodles (incl. soba), and Sea vegetables.

Soy-related recipes include: Brown rice and soybeans (p. 90). Miso soft rice (p. 96). Somen with deep-fried tofu (p. 118). Kenchin soup (with deep-fried tofu cubes and tamari, p. 130). Okara soup (p. 132). Miso soups (p. 137-143; 12 recipes are given plus a long letter from Jan Belleme, about how she and her husband, John, who arrived in Japan in late October 1979, are now living with the Onozaki family and studying miso-making there–p. 138-39). Sauteed cucumbers and miso (p. 154). Boiled cabbage, sweet corn, and tofu (p. 155). Udon-vegetable bane (with deep-fried tofu, p. 159). Steamed kale and tofu (p. 161). How to make sprouts (incl. soybean sprouts, p. 177).

Chapter 5 is titled "Bean dishes, including tofu and natto." It states (p. 178-79, without citing the source) that "In China and Japan there is a proverb, 'A man who eats too many beans becomes a fool.'... Lima beans and soybeans are both very yin, and require thorough chewing. They should be eaten only on occasion and in small quantities... Kombu can be placed on the bottom of the pot when cooking chickpeas, soybeans, lima beans or kidney, pinto and navy beans. I

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have found that kombu definitely improves their flavor, and because of its high mineral content, creates a very balanced dish." To pressure cook soybeans so that they do not clog the steam escape valve, first boil them for 30 minutes. Skim the foam off the top as it rises, and when no more foam rises to the surface you may place them in a pressure cooker and continue cooking until done. Recipes include: Japanese black beans (black soybeans). Soybeans with kombu and burdock. Soybeans with lotus root and salmon. Following a long discussion of tofu, Homemade tofu. Tofu with scallions. Tofu with bonito flake broth. Baked tofu with miso/lemon sauce. Broiled tofu. Tofu loaf. Steamed tofu rolls. Deep-fried tofu cakes. Aburage (Age or deep-fried tofu). Stuffed age pouches. Okara. Okara croquettes. Sautéed natto. Natto rice or noodles. Natto tempura. Dried natto.

Note 1 This is the earliest English-language document seen (April 2013) that uses the term "broiled tofu" to refer to grilled tofu.

Hijiki with soybeans (p. 193). Hijiki and deep-fried tofu (p. 194). Tempuraed tofu-nori rolls (p. 198). Koi-koku (Carp miso soup, p. 220). Daikon and tamari. Scallion miso. Green peppers and miso (p. 224). Miso condiments (p. 226). Tamari. Moromi (p. 227). Rutabaga-tamari pickles (p. 233). Quick miso pickles (p. 234). Tofu tamari dressing (p. 236). Tofu-sesame dressing. Shiro-miso-tofu dressing. Miso dressing (p. 237). Tamari-lemon dressing. Tamari-rice vinegar dressing. Miso-tahini dressing (p. 238). Miso-rice vinegar dressing. Miso walnut dressing. Miso-tahini spread. Sesame miso spread. Miso-nut spread (p. 239). Lentil-miso spread. Lima bean miso spread (p. 240). Tofu dip (p. 243). Amazake (p. 247-48). Clear broth soup with tofu & scallions (p. 253). The glossary lists many soy products plus azuki beans, sea vegetables (many types), gluten, koji, kuzu, mochi, natto, nigari, okara, seitan, tekka, tempeh, umeboshi, unohana (okara), and yuba.

Macrobiotic periodicals include: *East West Journal* (Brookline, Massachusetts). *Kushi Institute Study Guide and Kushi Inst. Newsletter* (Brookline, MA). *The Order of the Universe* (East West Foundation, Brookline, MA). *The Macrobiotic Review* (East West Foundation, Baltimore, Maryland). *Spiral* (Community Health Foundation, London). *Le Compas* (Paris). Note: The date each periodical began publication is not given.

The lengthy section on seitan (p. 110-13) gives a detailed recipe for making seitan at home using the short method and 3½ lb hard spring wheat flour or hard red winter wheat flour. The broth is made with kombu and tamari. Seitan recipes include: Seitan stew. Seitan fried rice. Stuffed mushrooms (with sauce). Stuffed squash or Hokkaido pumpkin. Address: Boston, Massachusetts.

7173. Griffith, G.R.; Meilke, K.D. 1980. A description of the market structure and agricultural policies in five regional oilseed and oilseed product markets. *University of Guelph, School of Agricultural Economics and Extension Education, Publication* AEEE/80/13. 107 p. Nov. [157 ref]
• ***Summary:*** Contents: 1. A summary of the market structure and agricultural policies in five regional oilseed and oilseed product markets. 2. The Canadian oilseed and oilseed product market–description and policies. 3. The Japanese oilseed and oilseed product market–description and policies. 4. The European Community oilseed and oilseed product market–description and policies. 5. The U.S. oilseed and oilseed product market–description and policies. 6. The Brazilian oilseed and oilseed product market–description and policies. Bibliography. Address: Guelph, Ontario.

7174. Iwaki, M.; Roechan, M.; Hibino, H.; Tochihara, H.; Tantera, D.M. 1980. A persistent aphidborne virus of soybean, Indonesian soybean dwarf virus. *Plant Disease* 64(11):1027-30. Nov. [15 ref]
• ***Summary:*** Reports the Indonesian soybean dwarf virus (ISDV), found only in Indonesia and Thailand. This virus is distinct from soybean dwarf virus (SDV). Address: 1-3. Pests & Diseases Div., Central Research Inst. for Agriculture, Bogor, Indonesia.

7175. Shurtleff, William; Aoyagi, Akiko. 1980. Que es el tofu? Traducido por Corina Gutman [What is tofu? Translated into Spanish by Corina Gutman]. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549 USA. 6 p. Nov. [3 ref. Spa]
• ***Summary:*** Contents: Introduction. A family of distinctively varied foods. A storehouse of high-quality protein. Low in saturated fats: free of cholesterol; an ideal diet food. Natural backbone of the meatless diet. Buying and storing tofu. Making tofu at home and in communities. Soybeans, tofu, and the world food crisis. Tofu shops in Japan. Cooking with tofu (13 recipes). Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

7176. Tsuchiya, Kunio. 1980. Minami no tôfu, kita no tôfu: Hiden–Rokujô-dofu o tazunete [Southern tofu, northern tofu: Secrets of the art–A visit to Rokujo tofu]. *Daizu Geppo* (*Soybean Monthly News*). Nov. p. 22-32. [Jap]

7177. *Toyo Shinpo* (*Soyfoods News*). 1980. [Nutritional analysis of tofu using various coagulants]. Dec. 1. [Jap; eng+]
• ***Summary:*** Table 1 gives the nutritional composition of two types of tofu: Regular handmade tofu, and lactone silken tofu (made by machine). Analyses are given for three types of regular tofu, each made with a different coagulant/curding agent. For each of these four types of tofu, the content of water, protein, fat, calcium, and magnesium per 100 gm is given.

The calcium content (per 100 gm) of the four types of tofu is as follows, with the coagulant shown first: calcium

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sulfate 139 mg, natural nigari 42 mg, magnesium chloride 36 mg, lactone silken tofu coagulated with GDL (glucono delta lactone) 14 mg. Note that tofu coagulated with calcium sulfate contains more than 3.8 times as much calcium as that coagulated with magnesium chloride (refined nigari).

The tofu curded with calcium sulfate contains 89.0% water, 3.6% protein, 1.7% fat, and 25 mg of magnesium. The tofu curded with magnesium chloride (refined nigari) contains 88.6% water, 5.3% protein, 2.9% fat, and 84 mg of magnesium.

Table 2 compares the nutritional composition of machine-made lactone silken tofu (given above) with handmade silken tofu that contains a chemical additive (Glycerin fatty acid ester = *Guriserin shibosan esuteru*) used to prevent burning while cooking the soybean puree, and improve the tofu yield and texture; each type is coagulated with GDL. The calcium content is 14 mg vs. 129 mg.

Table 3 shows tofu yield using 3 different coagulants: From 1 kg of soybeans a manufacturer can get: 2.75–3.25 lb of tofu coagulated with nigari; 3.50–4.00 lb of tofu coagulated with calcium sulfate; or 4.50–5.00 lb of tofu coagulated with GDL.

The analyses were conducted by the Omiya Consumers' Living Center in Japan.

7178. Wakana, Teruo; Okubo, Kunio; Hanaoka, Yutaka. Assignors to Kibun Company, Ltd. (Tokyo, Japan). 1980. Process for producing soybean milk. *U.S. Patent* 4,241,100. Dec. 23. 4 p. Application filed 11 Sept. 1978. [10 ref]
• ***Summary:*** Unsteeped soybeans are boiled in an alkaline aqueous medium for a few minutes to inactivate the lipoxygenase enzyme before grinding the beans. "A process for producing soybean milk without undesirable beany flavor or bitterness and giving soft and pleasant feel to the tongue, which comprises cooking unsoaked soybeans in an aqueous medium for as short a period as practicable, grinding the boiled soybeans while bringing them into contact with a sodium bicarbonate aqueous solution at a relatively high temperature, extracting the soyprotein and other water soluble components from the ground soybeans and removing a substantial amount of the solids from the slurry." Address: 1. Hidaka, Japan; 2. Ogose, Japan; 3. Akishima, Japan.

7179. Sheraton, Mimi. 1980. Restaurants: Sushi and East Side Italian. *New York Times.* Dec. 26. p. C26.
• ***Summary:*** This is a review of Takezushi, a Japanese sushi restaurant with two branches in New York City: 11 East 48th St. and 101 West 45th St, at the Avenue of the Americas. Three basic types of sushi are offered: nigiri sushi, nori sushi, and chirashi sushi. Takezushi offers an earthy miso soup. "The 45th Street branch offers a few additional specialties that must be requested–natto, a mix of fermented soy beans, egg yolk and scallions;..."

7180. Akizuki, Tatsuichiro. 1980. How we survived Nagasaki. *East West Journal.* Dec. p. 10, 12-13.
• ***Summary:*** Describes the use of brown rice and miso in saving victims of the atomic bomb blast.

7181. Barber, Linda. 1980. Color slides taken at a small tofu shop in rural Japan. Kobe, Japan. 1 p. Based on e-mail of 2 Nov. 2012.

• ***Summary:*** Linda took these color slides at a tofu shop in a very rural farm town in Japan while on a trip that friends arranged for her. She writes (Nov. 2012). "I loved the old tools and the owners / makers who were a mother and son. It was like going back in time." (1) A traditional stone grinder mounted on stone supports, surrounded by traditional tofu-making utensils. (2) Soaked soybeans being ground between granite stones, which are now turned by a motor. The fresh soy puree runs down into a metal can.

(3) Stirring the soy puree as it cooks and foams up in the caldron. (4) Ladling the cooked soy puree into a coarse pressing sack–as the steam rises.

(5) After the soymilk has been pressed out, only okara (soybean residue) remains in the flattened pressing sack. (6) While stirring hot soymilk with a paddle in the curding vat,

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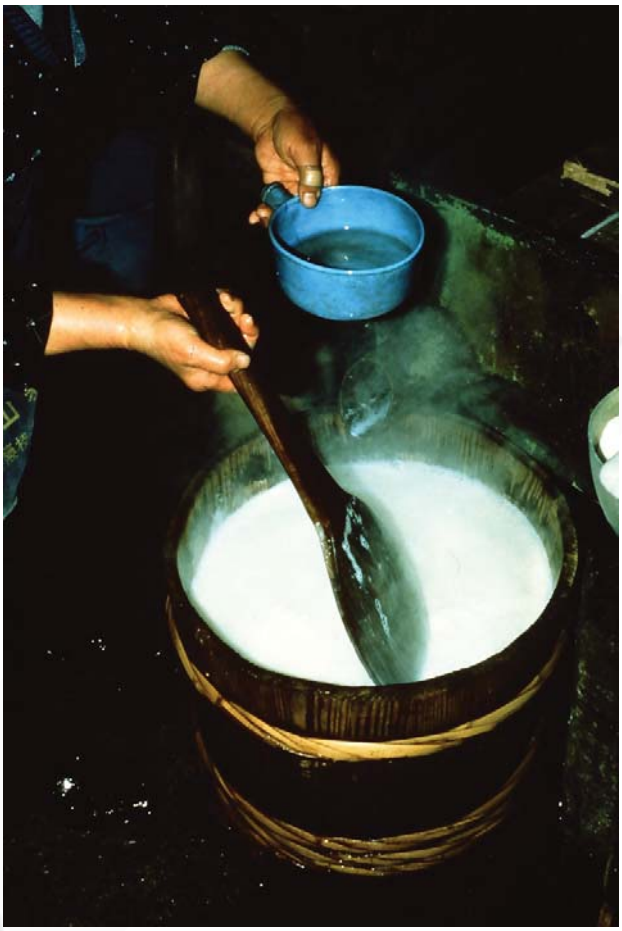

the mother prepares to pour in a nigari solution slowly so as to transform the soymilk into curds and whey.

(7) Ladling the curds into a cloth-lined wooden forming box. (8) Pouring the last of the curds from curding vat into the cloth-lined forming box, where they will be pressed into tofu.

(9) A young man (at another tofu shop) carefully cutting a large block of tofu in the cooling sink into individual cakes of tofu, which will remain under water in the sink until they are sold. Address: Resident Director of Practice House and Oral English Instructor, Kobe College, 4-1 Okadayama, Nishinomiya, Japan.

7182. Inagaku, Naoka. 1980. Minami no tôfu, kita no tôfu: Hakusan fumoto–Hakusan no kata tôfu o tazunete [Southern tofu, northern tofu: At the foot of Mt. Hakusan–A visit to Hakusan very firm tofu]. *Daizu Geppo* (*Soybean Monthly News*). Dec. p. 27-29. [Jap]

• ***Summary:*** Hakusan is a mountain in Ishikawa prefecture, western Japan (Honshu), south of Kanazawa, on the Gifu border. 8,862 feet tall with 5 peaks, it is an extinct volcano that last erupted in 1554.

7183. Kito, Makoto; Nakayama, Moriko; Kanamoto, Ryuhei; Saio, Kyoko. 1980. Occurrence of a protein-phospholipid

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complex in soybean oil. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 37. p. 221-22. Dec. [8 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 43(10):2219-20 (1979). Address: 1-3. Research Inst. for Food Science, Kyoto Univ., Uji-Kyoto 611; 4. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 300-21, Japan.

7184. *Madison Survey & Alumni News* (*Madison, Tennessee*). 1980. Obituaries: Ella Mae Webber. Dec.
• ***Summary:*** Ella (Verney) Webber was born 17 June 1886 in southern Michigan, and died 22 Oct. 1980, at age 94, at Dunlap, Tennessee. In 1912 she was married to Perry A. Webber. In 1913 they were appointed by the General Council (G.C.) Foreign Missions Board to go to Japan, where they pioneered Seventh-day Adventist educational work in that country. From a very small beginning in the crowded compound in Ogikubo, a suburb, the school has grown into Japan Missionary College with hundreds of students.

Their two sons, Alfred B. Webber and Harry V. Webber, were born in 1919 and 1923 respectively. After a year in Hawaii, the Webbers were sent back to Japan in 1925 to move the college into the country. The buildings were erected by the teachers and students. Industries were started and farm work carried on. The Food Factory, small in its beginnings, grew into a major industry.

Feeling the need for more education, in 1928 the Webbers enrolled in Michigan State University. After 3 years of training, several years were spent at Madison College, where they taught and Ella earned her B.S. degree in 1935. Also in 1935 the G.C. Mission Board again asked the Webbers to return to Japan to carry on the school program of the Japan Missionary College.

In 1953 the Webbers started a self-supporting work at Mount Akagi, Japan. This pioneering program included educational, industrial, and medical work.

Before retiring, Ella again taught at Madison college. Before Perry's passing in January, 1973, much of Ella's time was spent in his care. Her later years were spent in Lodi, California, with her son, Alfred, until he received his appointment to return to Japan, then she moved to Wildwood [Wildwood Sanitarium, a self-supporting Seventh-day Adventist convalescent home and health care facility in Wildwood, northern Georgia].

They returned again to Madison in 1959, and worked there for about ten years until Perry's health failed. He died at Wildwood Sanitarium and was buried in their cemetery.

The last 5 months of her life were spent at Stone Cave Institute, Dunlap, Tennessee. She died in a hospital in Dunlap and was buried in Wildwood Cemetery Hill. She is survived by her two sons–Dr. Alfred B. Webber, missionary in Tokyo, Japan; Dr. Harry V. Webber of Modesto, California; and 5 grandchildren.

7185. Taira, Harue; Taira, Hirokadzu; Kokubu, Yoshijiro; Otake, Shigeto; Takezaki, Chikara. 1980. Shihan (Murasaki han?) byôkin ni yoru higai daizu no ippan seibun sosei [Chemical composition of purple specked soybean seeds caused by *Cercospora kikuchii*]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 37. p. 16-24. Dec. [9 ref. Jap; eng]
• ***Summary:*** The purple specks caused by the fungus *Cercospora kikuchii* is the most common disease which develops on the soybean seed coat. Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7186. Udaka, Kyoko; Fukazawa, Chikafusa. 1980. [Changes in soybean reserve protein components and protein body formation during seed development]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 37. p. 223-36. Dec. [22 ref. Jap; eng]
• ***Summary:*** Contains 8 electron micrographs and 3 scanning electron micrographs. Figure 1, an electron micrograph of a thin section of a developing soybean cotyledonary cell, and subsequent related figures show: CW = cell wall. V = vacuole. N = nucleus. Nu = nucleolus. DP = dense particle of protein. ER = endoplasmic reticulum. RER = rough endoplasmic reticulum. Ve = vesicule. PB = protein body. St = starch granule. AP = amyloplast. Cyt = cytoplasm. Vm = vacuole membrane (tonoplast). PB' = vacuole-like body with a scattering of electron-dense material.

Reprinted from *Michurin Seibutsugaku Kenkyu* (*Studies in Michurin Biology*) 14(1):27-40 (1978). Note: "Michurin Biology" (from Russia during the oppressive Lysenko era) included the study of acquired characteristics. Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2. Div. of Biochemistry, NFRI, and Div. of Food Chemistry, Tokyo College of Domestic Science, Tokyo.

7187. Williams, Dudley G. 1980. Japan's newest soybean crushing firm to open plant in Kyushu. *Foreign Agriculture* 18(12):19-20. Dec.
• ***Summary:*** Japan's oilseed crushing industry is the largest export customer for U.S. soybeans, taking 3.7 million tons in 1979. The new plant, which will have a capacity of 10,000 to 17,000 metric tons per month of soybeans will be Japan's 12th devoted almost exclusively to soybean crushing. Most of the country's large soybean crushing plants are located at dockside in Yokohama and Kobe. Of Japan's 1979 soybean imports totaling 4.13 million metric tons, Kobe handled the most (24.4%), followed by Yokohama (18.1%), Chiba 12.5%, and Nagoya 10.4%. Address: U.S. Agricultural Counselor, Tokyo.

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7188. *Soya Bluebook.* 1980-1994. Serial/periodical. St. Louis, Missouri: American Soybean Assoc. Called Soybean Blue Book from 1947-1966; Soybean Digest Blue Book from 1967-1978; Soybean Digest Bluebook in 1979; Soya Bluebook from 1980 to 1994.

• ***Summary:*** A directory and information book (general and statistical) for the soybean production and processing. In 1987 the *Soya Bluebook* contained seven major sections: Organizations (incl. Associations), Soy Directory (Crushers, Soyfoods, Industrial Products), Soybean Manufacturing Support Industries, Marketing and Auxiliary Services, Soy Statistics, Glossary, Standards and Specifications. Well indexed, with color maps. In the early 1980s the Bluebook started to include many more foreign soyfood manufacturers.

The book contains many tables, including: "World Soybean Production," which gives area and production in specified countries (1974-1980). In 1980 this included: North America: Canada, Mexico, United States. South America: Argentina, Brazil, Bolivia, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay. Europe: Bulgaria, France, Hungary, Romania, Spain, Yugoslavia. Soviet Union. Africa: Egypt, Ethiopia, Nigeria, South Africa, Tanzania, Uganda, Zaire. Asia: Burma, China (Mainland), Taiwan, India, Indonesia, Iran, Japan, Kampuchea [Cambodia], Korea (north), Korea (South), Philippines, Thailand, Turkey, Vietnam. Oceania: Australia. World total.

In early 1988 the American Soybean Association sold the *Soya Bluebook* to Soyatech, owned by Peter Golbitz. His first print run was 8,800 copies. Yellow pages were added. In Dec. 1989 Soyatech announced that in 1988 estimated readership was 10,265 in 55 countries. 33.6% of the buyers were soybean processors / manufacturers, 28.7% were importers, exporters, transporters or marketers, 15.0% were suppliers of soybean processing or handling equipment and manufacturing support services, 9.9% were consultants, booksellers, or periodicals, 8.7% were organization or government agencies, and 4.1% were colleges, universities, libraries, and information centers. By region, 64.3% were sold in North America, 15.2% in Europe, 9.1% in Asia / Pacific / Oceania, and 9.1% in Latin America.

The 1991 Soya Bluebook appeared in Aug. with a new larger (8½ by 11-inch) format and 264 pages. The indexing system is more complete and the pages are tabbed for easy access to each section. The "reference" section was expanded by adding nutritional information on soyfoods, a new chart of soyfoods products, and soybean oil trading standards.

Health Foods Business. 1992. Nov. p. 218. *Soya Bluebook* now reports its circulation to be 3,000.

Talk with Joy Froding of Soyatech. 1995. Jan. 12. The 1994 print run of Soya Bluebook was 2,300 copies. An estimated 4 people read each copy.

Price of the Soya Bluebook (1 book sent to USA, Canada, or Mexico): 1992 = $28 (if paid before June 1; $38 afterward). 1993 = Same price. 1994 = $38 (no prepayment discount; Available July 1994; this book has fold-out indexing tabs and 272 pages. The order form announcing the '94 Soya Bluebook states: "For 47 years Soya Bluebook has served as *the* noted information source for the world's soybean industry"). Starting in Jan. 1994 four issues of *Bluebook Update* are available free of charge to all who subscribe to or are listed in *Soya Bluebook.* 1995-96 = $38 ($48 after 1 June 1995; then in Nov. 1995 the price is raised to $58; incl. indexing tabs, 292 pages). This 1995-96 issue is titled "Soya Bluebook Plus: the annual directory of the world oilseed industry." Crops featured on the front cover are "soya, corn, cottonseed, palm, canola, rapeseed, and sunflower." Address: St. Louis, Missouri; Bar Harbor, Maine (After Jan. 1988).

7189. **Product Name:** [Soy Flake Number 1].
Foreign Name: Daizu Fureeku No. 1.
Manufacturer's Name: Ajia Protein.
Manufacturer's Address: Main Office: Miyanomori Palace, Miyanomori 4 jo, 11 chome, Chuo-ku, Sapporo-shi, Japan. Phone: (011) 644-1760.
Date of Introduction: 1980.
Ingredients: Whole soybeans.
Wt/Vol., Packaging, Price: 15 or 30 kg (33 or 66 lb).
How Stored: Shelf stable, 10 month shelf life.
New Product–Documentation: Leaflet. 1983. *Daizu Fureeku No. 1: Gyokai no machinozonde ita kakumei-teki genryô desu* [Soy flake Number 1: The revolutionary ingredient that the industry has long been waiting for]. 4 p. Describes whole (non-defatted) soybean flakes that are used to make tofu in Japan. Stored under the proper conditions (in a cool, dry, dark place), they are guaranteed to keep their quality for 10 months. They are packaged in quantities of 15 kg and 30 kg (33 or 66 lb). An annotated flow sheet of the process for using the flakes to make tofu is given.

A table shows that from 30 kg of Soy Flake No. 1, a tofu maker can obtain 400 cakes (400 gm each) of regular tofu, compared with only 250 cakes if whole soybeans were used. This implies that the flakes give a 60% higher yield of tofu per unit weight than whole soybeans.

The address of the factory is Aza-Toyoni, Hirô-machi, Hirô-gun, Hokkaido.

Talk with (call from) Art Mio of Morinaga. 1990. March 28. He says that Morinaga has used these flakes to make tofu, and the resulting tofu is more bitter than that made from whole soybeans.

Letter from David Nichols of Nichii Co. of America. Asia Protein Co. was established in 1977 by Mr. Chikaarashi; they started to make soy flakes in 1980.

Leaflet (3 panels each side) sent by Nichii Company of America (Torrance, California 90505). 1993. Jan. 28. "Science meets the soybean. And tofu will never be the same again."

Ad (full page, black, green, and red) in *Natural Foods*

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Merchandiser. 1993. Feb. p. 93. "Science meets the soybean. And tofu will never be the same again."

Ad (full page, black, blue, orange and green) in *Vegetarian Times.* 1993. July. p. 83. "Whose tofu do you buy?" "Spring Creek Natural Foods? Southwest Soyfoods? Wildwood Natural? Marjon Specialty? Fresh Tofu Inc? The Soy Shop? Nasoya? Mori-Nu? The Farm? Quong Hop? Northern Soy? Island Spring? What about White Wave or Tree of Life? Answer: They all offer a reduced fat tofu! Tell them you want 'Reduced Fat" tofu."

Same ad but half page in Vegetarian Times. 1993. Sept. p. 74.

Note: This is the earliest document seen (June 2013) concerning Nichii Co. and soy.

7190. **Product Name:** [Soymilk (Plain, Vanilla, Coffee)].
Foreign Name: Tônyû (Banira, Koohii).
Manufacturer's Name: Chiba Seisen Shokuhin Kogyo. (Chiba Fresh Foods Manufacturing Co., Ltd.).
Manufacturer's Address: 1788 Mizunuma Chonan-machi, Chosei-gun, Chiba-ken 297-01 Japan.
Date of Introduction: 1980.
New Product–Documentation: Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that Chiba Seisen Shokuhin Kogyo first made commercial soymilk in Japan in 1980.

K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. This company introduced Tônyû, Tônyû Banira, and Tônyû Koohii in 300 ml puroo packs. No date of introduction is given. packs.

Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64.

7191. Fukakura, Noriko; Asano, M.; Murata, K. 1980. Daizu hakkô shokuhin no shikô-sei ni kansuru kenkyû [Survey on the acceptability of tempeh]. *Bulletin of Teikoku Gakuen* No. 6. p. 33-39. [8 ref. Jap; eng]
• ***Summary:*** A survey on the acceptability of tempeh was carried out by 50 members of a taste panel at the authors' school in Osaka, Japan. "The results of the survey indicated that the appearance of tempeh was lower than that for flavor, taste, stickiness, and texture. More than 76% of the panel members favored tempeh over natto (the result may be different if a survey is carried in Kanto district). Among methods of cooking tempeh, deep fat frying was most favored. Salt was evaluated as the best seasoning for tempeh rather than coriander or curry. The panel also compared the meat burger, the meat with soyprotein burger, and the tempeh burger. The meat only was given the highest rating, the meat with soybean protein second, the tempeh burger was the lowest. However, it was found that the tempeh burger could be acceptable." Address: Teikoku Women's Univ., 173, 6-chome, Todacho, Moriguchi-shi, Osaka, Japan.

7192. Hinode Tofu Company. 1980. Hinode Tofu. Natural soy protein (Leaflet). Los Angeles, California. 1 p.
• ***Summary:*** This color leaflet describes 6 tofu types with 8 recipes. Address: 526 Stanford Ave., Los Angeles, California 90013.

7193. Iwaki, M.; Thongmeearkom, P.; Tsuchizaki, T.; Honda, Y.; Sarindu, N.; Vonghiranpinyo, L.; Tochihara, H.; Deema, N. 1980. Virus diseases of soybean in Thailand. Paper prepared for the 2nd Southeast Asian Symposium on Plant Diseases in the Tropics. Kasetsart University, Bangkok. See p. 78. *
• ***Summary:*** Reports the Indonesian soybean dwarf virus in Thailand.

7194. **Product Name:** [Morning Star {Venus} Natto].
Foreign Name: Myôjô Nattô.
Manufacturer's Name: Kabushikigaisha Myôjô Shokumotsu Kenkyûsho (Marketer-Distributor). Made by Kabushikigaisha Teito Shokuhin.
Manufacturer's Address: 5-7-22 Kugayama, Suginami-ku, Tokyo-to, Japan. Marketer address: 4-14-26 Musatsu?, Mitaka-shi, Tokyo-to, Japan. Phone: 0422-49-3151 (Marketer)..
Date of Introduction: 1980.
Ingredients: [Not listed].
Wt/Vol., Packaging, Price: 85 gm. Retails for ¥40 in Tokyo.
How Stored: Refrigerated.

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New Product–Documentation: Product with Label purchased in about 1980 in Kichijoji, Tokyo. White on red, and red on white. Surprisingly no ingredients are listed, but the ingredients are probably water, soybeans, and natto culture (*Bacillus subtilis*). The front panel reads: Across the top, 6 medium-size white characters: Living natural food (*Ikita shizen shokuhin*). In lower right, many small white characters: Name of marketing company.

Across the top, upside down, in small red letters on white:

This product is made by using the most vital nattô bacteria which was added to the highest class domestic soybeans, for the best among natto products.

The nattô's strong bacteria controls the bad bacteria in your body to make your stomach pleasant.

No additives are used.

7195. Kawashima, M.; Kuriyama, S.; Komatsuzaki, T.; Ohkuro, I. 1980. [Influence of continued cultivation on various properties of natto bacilli]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 101:287-91. [Jap]*

7196. Komatsuzaki, T.; Ohkuro, I.; Kawashima, M.; Kuriyama, S. 1980. [The difference in influence of capillary permeability caused by acetic acid among strains of natto bacilli]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 101:113-16. [Jap]*

7197. **Product Name:** [Hikiwari Natto].
Foreign Name: Hikiwari Nattô.
Manufacturer's Name: Made for Seibu Stoaa by Satô Shokuhin Kôjô.
Manufacturer's Address: Japan.
Date of Introduction: 1980.
Ingredients: Soybeans.
Wt/Vol., Packaging, Price: 85 gm. Retails for ¥40 in Tokyo.
How Stored: Refrigerated.
New Product–Documentation: Product with Label purchased in about 1980 at Seibu Department Store, Kichijoji, Tokyo. Blue and gold on white plastic film. Made from soybeans grown in Japan. With a tiny packet of mustard inside.

7198. Matsui, K.; Kikuno, K.; Kameda, Y. 1980. Reactivity and function of sulfhydryl groups in alanine dehydrogenase of *Bacillus natto* KMD 1126. *Chemical and Pharmaceutical Bulletin* 28:1503-08. (Chem. Abst. 93:91050. 1980). *

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7199. Matsumoto, H.; Take, T. 1980. [Studies on the utilization of bean curd lees. II. Selection of the *B. natto* strain]. *Niigata Daigaku Kyoikugakubu Kiyo, Shizen Kagaku Hen* (*Memoirs of the Faculty of Education, Niigata University, Natural Science*) 22:53-63. (Chem. Abst. 95:131133). *

7200. Ohkuro, I.; Komatsuzaki, T.; Kuriyama, S.; Kawashima, M. 1980. [The loss and recovery of mucilage of natto bacilli by continued cultivation]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 101:207-09. [Jap]*

7201. Roberts, I.M.; Bain, R.A.; Saxon, E.A. 1980. Japanese agricultural policies: Their origins, nature and effects on production and trade. *Bureau of Agricultural Economics, Australia, Policy Monograph* No. 1. *

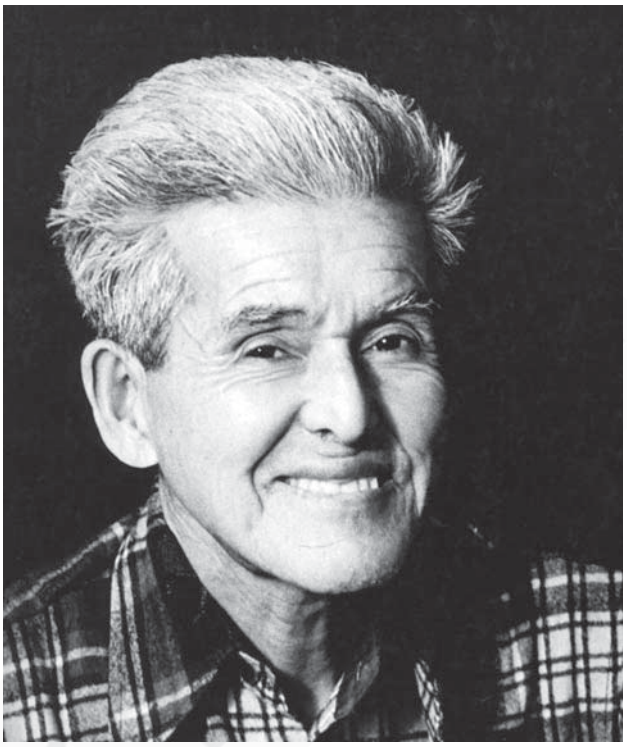
7202. Tanaka, Teruo. 1980. Cloning vehicles for the homologous *Bacillus subtilis* host-vector system. *Gene* 10:131-36. *
Address: Mitsubishi Kasei Inst. of Life Sciences, 11 Minamiooya, Machida, Tokyo, Japan.

7203. Yasai Shikenjo (Vegetable Experiment Station, Tokyo). 1980. Yasai no chiho hinshu [Varieties of vegetables for Japan's different provinces]. Tokyo: Yasai Shikenjo. See p. 70-75. [Jap]*
• ***Summary:*** Regular soybeans and green vegetable soybeans are discussed on pages 70-75. Address: Tokyo, Japan.

7204. Aihara, Herman. 1980. Learning from salmon. Oroville, California: George Ohsawa Macrobiotic Foundation. xiii + 156 p. Illust. No index. 22 cm.
• ***Summary:*** This is a collection of Herman Aihara's writings, over the past 20 years, compiled by Sandy Rothman, editor of GOMF. Each article or essay is dated. Contains a good early history of macrobiotics in the USA, and of Chico-San (p. 26-35).

Herman was born Nobuo Nishiyama on 28 Sept. 1920 in Arita, Kyushu, Japan. In about 1940 Herman started to attend George Ohsawa's lecture meetings. He was fascinated by the philosophical part of Ohsawa's teaching (yin and yang) but showed little interest in the food, which was cooked by Ohsawa's students. These meals consisted of brown rice, hijiki seaweed, carrots, burdock and red beans [azuki beans]. Herman was in college where his classmates laughed at him for his interest in yin and yang, which were considered old, obsolete ideas in Japan. His classmates were busy digesting 20th century Western science–on their way to becoming the future engineers of Sony, Toyota, Datsun, and Toshiba (p. 2).

During his first year in college, Herman was chosen for the crew of a rowboat race representing his class. He was the heaviest among the crew, so he was positioned as



number one. He trained every day during the summer. In the hot weather he ate shaved ice with sugar syrup. His stomach cramped. Since he thought he understood macrobiotics, he ate salt to balance the yin of the ice and sugar. "What a silly mentality."

After graduating from college, he began to cook for himself–but he became weak and skinny. His friend became worried, since he was "one of the most athletic students" (p. 4). But the real cause of his sickness was arrogance; he thought he understood macrobiotics but his practice was unwise. During World War II he worked at his father's factory. When the war ended in 1945 he lived at home. Since food was very scarce in those days (they had to buy foods on the black market) he ate whatever his mother cooked–including white rice and sugar.

He started to learn social dancing in the newly opened dance halls. "Social dance was a new fashion after American forces occupied Japan. When people were starving to death just after the war, I was a playboy, chasing sexy girls at various dance halls.

"My father worried about my behavior and hurried my marriage. I married because my parents were agreed, but I myself was not much attracted to her. My wife committed suicide before our marriage passed one year. It was the end of autumn. She climbed a mountain alone, drank poison, and died without giving anyone her reasons." Herman was shocked and depressed for a long time. He lost his mind for a month. "How pitiful a man I was. My wife could not rely on me" (p. 5).

Herman decided to become an independent man and he chose George Ohsawa as his life's teacher and he asked

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Ohsawa if he could stay at his unique school. Ohsawa's teaching was about how to understand and acquire infinite freedom, absolute justice, and eternal love. He inspired his students greatly, and told them it was their own fault if they were not happy. The food you eat is one of the most important factors that influences a person's health and happiness.

Herman landed in San Francisco in 1952 at age 32 to start a new life. His wife was sick, and two of their babies died.

Before March of 1961 Ohsawa visited Europe and saw many beautiful macrobiotic restaurants and clinics in Belgium, France, Italy, Germany, Switzerland, and England. The Lima factory in Belgium produces macrobiotic foods. Macrobiotic restaurants include Au Riz Dore, and Longue Vie.

Like the salmon, Ohsawa took his most adventurous trip late in his life (p. 77). He held his first American macrobiotic lectures in 1960 on Long Island, New York. They lasted for 2 months. At that time Herman was manager of the first macrobiotic food store in the USA, in New York City [Named Ginza, it had been started by Herman in 1960.] In 1960 Herman went to Europe to solve visa problems, then in about late 1960 he returned to New York and started publication of *Macrobiotic News,* a magazine that contained mostly Ohsawa's lectures. In 1961 Ohsawa returned to New York for a summer camp in the Catskill Mountains. After the camp he said that followers of macrobiotics should leave New York because nuclear war was immanent. 36 people, including 15 families, decided to move to Chico, California, which they had calculated was the safest place from nuclear fallout. Arriving in Sept. 1961, they soon founded Chico-San, which was the first macrobiotic food production and distribution company in the USA. The first store was in the basement of a small shop. Herman began to import miso, tamari, and other traditional, natural foods from Japan (p. 31).

Some followers of macrobiotics stayed in New York to keep up the Ohsawa Foundation and food store. One customer got sick and died [Beth Ann Simon died in Nov. 1965]. The FDA came in and closed the store. Bob Kennedy became president of Chico-San and soon began America's first successful production of Rice Cakes.

Herman moved to San Francisco in about 1971 (p. 35). At the end of 1970, John Deming Jr. had given him some land in Mendocino. In Sept. 1972 a fire, started by a rice-cake machine, burned down the Chico-San factory (p. 34) and most of its inventories of food. Chico-San started making money in about 1978.

Western medicine is interested only in treating symptoms. Medical professionals are largely ignorant of the influence of diet on health, and even block the development of the dietary approach to healing.

Page 155: "The author: Herman Aihara was born in Arita, a small town in southern Japan, on September 28, 1920. The town is famous for its production of porcelains called *Imari-ware* or *Kakiemon-ware.* Imari is the name of the port from which Arita porcelains were shipped to Europe... His birth family was too poor to support ten children, and so at the age of nine Herman was adopted into his uncle's home in Tokyo. His family name was changed to Aihara. He grew up without knowing his actual mother... His 'stepfather' owned a factory that produced iron materials for the national railways and telephone companies, and Herman chose metallurgical engineering as a life work. He was accepted by the school of engineering at the reputable Waseda University." Address: Oroville, California.

7205. Akizuki, Tatsuichiro (Shinichiro). 1980. Taishitsu to shokumotsu: Kenkô e no michi [Physical constitution and food: The way to health]. Tokyo: Kuriei Shuppan-bu. 61 p. [Jap]

• ***Summary:*** Author's first name is given as Tatsuichiro. Kawamura says this is mistaken.

7206. Bell, Richard E. 1980. Soybeans in world trade. In: F.T. Corbin, ed. 1980. World Soybean Research Conference II: Proceedings. Boulder, Colorado: Westview Press. xv + 897 p. See p. 763-66.

• ***Summary:*** Soybean trade is growing very rapidly. In 1977-78 the volume of world trade in soybeans and soybean products totaled 35.6 million tonnes (metric tons); this was up 66% for 5 years earlier. Last year the value of world trade in soybeans and products was more than $8.5 billion.

In 1977-78 world utilization / consumption of soybeans was a record 77 million tons; 85% of these soybeans were crushed for oil and meal. Only in East Asia are soybeans used on a large scale for human food.

In recent years, the growth in world soybean consumption is the result of two trends: (1) Rapid expansion in world demand for high protein feed, especially in North America, Europe, the Soviet Union, and parts of East Asia; and (2) Growth in world demand for edible vegetable oil, especially in developing countries. North American and Western Europe have shown the largest growth in soybean consumption, followed by the Soviet Union and Eastern Europe.

In Brazil, soybean production has increased 13 fold during the past 10 years, and nearly 80% of the increase was exported as beans, meal or oil, with most of these exports headed for Western and Eastern Europe.

As a result of rising world demand, prices received by farmers have risen about 45% in the last 5 years, in real currencies–adjusted for inflation. The higher prices have, of course, further encouraged expansion of soybean acreage. In the U.S. soybeans have passed both corn and wheat to become the top cash crop.

In Brazil, government policies have actively encouraged

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soybean production while also protecting the country's soybean crushing industry through a combination of tax incentives, export subsidies, and export controls on raw soybeans. Argentina has also increased its soybean production in recent years, but not nearly as much as Brazil.

Government policies have also encouraged greater consumption of soybeans in Western Europe, especially in the European Community (EC)–and in the Soviet Union and Eastern Europe, by trying to raise living standards by increasing meat consumption.

In Japan, international policies limiting offshore fishing have encouraged more livestock production and consequently the demand for soybean meal used as a feed.

Twenty years ago the European Community made a commitment during a world-wide trade negotiation not to impose any import duty / charge on soybeans imported into EC countries. "This concession is the most important one ever granted an agricultural product in international trade negotiations and is in large part responsible for the large growth in soybean consumption in Western Europe in recent years."

Japan plans to make a similar concession in the world trade negotiations soon to be concluded in Geneva, Switzerland. At that time, the world's two largest soybean importers will be committed by treaties to the duty-free entry of soybeans.

An extremely important development in the world soybean market was the emergence in 1978-79 of the Soviet Union as a net importer (estimated at 70,000 metric tons) of edible oils and fats for the first time in history. There is no indication that this trend will be reversed. Address: Executive Vice President, Riceland Foods, Stuttgart, Arkansas 72160.

7207. Carter, O.G.; Skurray, G.R.; Cunich, J.; Honey, S. 1980. Quality assessment of Australian soybean varieties for the production of Japanese foods (Abstract). In: F.T. Corbin, ed. 1980. World Soybean Research Conference II: Abstracts. Boulder, Colorado: Westview Press. 124 p. See p. 35.
• ***Summary:*** Japan imports 3,600,000 tonnes (metric tons) of soybeans each year for use as food and crushing. Previous studies have shown that the ratio of 7S to 11S proteins and the ratio of phosphorus to nitrogen are important in determining the texture of tofu. However this study shows that these ratios are not as important as the amount of calcium sulfate used as a tofu coagulant. Variation in the first two ratios could be counteracted by changing the amount of calcium sulfate used. Address: Hawkesbury Agricultural College, Richmond, NSW 2753, Australia.

7208. Doi, Tadao; Takeshi, Morita; Chonan, Minoru. 1980. Hôyaku Nippo jisho [Vocabulary of the language of Japan]. Tokyo: Iwanami Shoten. xxxiv + 862 p. 27 cm. [Jap; Por]
• ***Summary:*** This is a Japanese-language translation of the original 1603 edition, *Vocabulario da Lingua de Iapam,* the second earliest dictionary of the Japanese language compiled by Europeans. Soy-related terms in this dictionary, which are translated from the original hard-to-read Portuguese into modern Japanese, are described in detail at the reference for the original 1603 dictionary, which see.

In the Forward, the author notes that this is the entire translation of the Nagasaki edition of the Japanese Portuguese Dictionary. The original title is *Vocabulario da Lingoa de Iapam com a declacaraçao em Portugues* (Japanese dictionary with explanation in Portuguese), published in 1603 by the Japanese Society of Jesus (Nihon Iezuzu-kai). In 1604 a second dictionary was published, titled *Arte da Lingoa de Iapam Composta Pello Padre Iaao Rodriguez* (1604-1608).

Christian priests traveled by boat to Japan to teach the Japanese Christianity. As a result, they left many historical documents. Francis Xavier first arrived in Japan in 1549 and only 54 years later his group published this remarkable Japanese dictionary. The year 1603 was also the year that Tokugawa Ieyasu became the shogun (Seiitaishogun, or highest ranking samurai), founding the Tokugawa Shogunate or Edo period. In Japanese history it was the turning point at which the country changed from the medieval period to the modern one. This dictionary is a very unique mirror which reflects this period and is regarded as an important document that raises many questions in Japanese cultural history. The dictionary is indispensable in Japanese linguistic history since it contains many Japanese words of the period with explanations in Portuguese. In those days the Japanese had dictionaries that focused on Chinese characters (kanji) and simple dictionaries for waka and renka poems. This dictionary picked up a wide range of words from daily conversation, organizing and defining them in modern dictionary form. The original edition was stored in a secret place in Europe, inaccessible to Japanese, who therefore had to largely depend on a 19th century French translation by Leon Pajes. A rotogravure edition of the book stored at Oxford University entered Japan during the Taisho period (1912-1926) and was studied. Only recently was a facsimile copy of the original edition published, and it is being used increasingly.

This dictionary was produced by the Japanese Society of Jesus [Jesuits] to further their goal of spreading Christianity. The 1603 dictionary was developed to help the priests understand dialects, lower-class speech, and the confessions of the local common people. The 1604 dictionary focused on the speech of the upper classes and more educated people. Thus the 1603 dictionary collected words the priests needed to understand, while the 1604 dictionary collected those that they wanted to use.

7209. Fukuoka, Toshihiko. 1980. Kikkôman: Aji no waarudo burando [Kikkoman: The world brand for flavor]. Tokyo: K.K. Asahi Sonorama. 187 p. Illust. No index. 18 cm. Series:

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Za kaisha shiriizu no. 52. [8 ref. Jap]

7210. Fukushima, Danji; Hashimoto, Hikotaka. 1980. Oriental soybean foods. In: F.T. Corbin, ed. 1980. World Soybean Research Conference II: Proceedings. Boulder, Colorado: Westview Press. xv + 897 p. See p. 729-743. [7 ref]

• ***Summary:*** Contents: Fermented soybean foods. Non-fermented soybean food. Conclusion. References.

The following statistics show the amount (tons) of whole soybeans / defatted soybean grits / total of whole and grits consumed for various soybean foods and feeds in Japan in 1976.

Fermented soyfoods: Shoyu (soy sauce) 10,000 / 165,000 / 175,000, miso 190,500 / 5,000 / 195,500. Natto 69,000 / 0 / 69,000.

Non-fermented soyfoods: tofu and aburage (fried tofu pouches) 411,500, 55,000 / 466,500. Kori-tofu (dried-frozen tofu) 29,000 / 0 / 29,000. Others 16,000 / 75,000 / 91,000.

Animal feeds: 30,000 / 1,950,000 / 1,980,000. Thus total use for foods and feeds is whole soybeans 756,000. Defatted soybean grits 2,250,000, total of both 3,006,000. By type of use, animal feeds account for 65.9% of total Japanese usage of whole soybeans and defatted grits, non-fermented soyfoods account for 19.5%, and fermented soyfoods account for 14.6%. The top three food users are tofu (466,500 tons, 45.5% of all food uses), miso (195,500), and shoyu (175,000). There are 35,000 tofu plants in Japan.

Fermented soybean foods described are shoyu (soy sauce; 5 types), miso (3 basic types, 6 varieties), sufu (Chinese soybean cheese), tempeh (fermented soybean cake), natto (fermented whole soybeans; itohiki-natto and hama-natto), and fermented soymilk (recently a new fermented soybean product appeared on the market in Japan. It is a soy milk drink fermented by lactic acid bacteria).

Non-fermented soybean foods described are tofu (soy milk curd), aburage (fried tofu pouches), kori-tofu (dried-frozen tofu), yuba (coagulant film of soy milk), kinako (roasted soybean powder), moyashi (soybean sprouts), and soybeans. Production, chemical composition, and use of each of these foods is discussed.

Figures (flow sheets) show: (1) Shoyu manufacturing process. (2) Rice miso manufacturing process. (3) Sufu manufacturing process. (4a) Tempeh manufacturing process. (4b) Natto manufacturing process. (5a) Tofu manufacturing process. (5b) Kori-tofu manufacturing process. Address: Kikkoman Foods Inc., P.O. Box 69, Walworth, Wisconsin 53184.

7211. Hyoe, Murakami; Richie, Donald. eds. 1980. A hundred *more* things Japanese. Tokyo: Japan Culture Institute. 215 p. Illust. (some color). 22 cm. [Eng]

• ***Summary:*** The section titled *Daizu* (soybeans, p. 48-49) begins with the often-told story of Ogyû Sorai (1666-1728), one of the outstanding Confucian scholars of the Edo / Kamakura period and official tutor to the shogun. When Sorai was young and poor, he was unable to afford any food other than okara, the lees of tôfu (soybean curd). The local tofu maker would occasionally take pity on him and treat him to a feast of fresh tofu. Yet far from being malnourished or sick from his okara diet, the young man thrived on this protein-rich food, and went on to become a great man.

The great soy triumvirate–soy sauce, miso, and tofu–towers high in Japanese cookery. Other foods from the soybean are soy milk, soy oil, and yuba.

A song from the Edo period states: "The nightingale stays far from the crowds.

"Twelve kilometers from the saké shop,

"Eight kilometers from the tofu shop."

A large photo shows a tofu-maker cutting cakes of tofu.

A yatai (p. 66) is a movable nighttime street stall from which food and drink are sold. They are a compact wooden restaurant on wheels. The food may include oden, fried bean-curd cakes [fried tofu].

On pages 44-45 is a section on "Umeboshi (pickled plums) and on pages 46-47 a section on "Kaisô (algae; seaweed [sea vegetables]). These include wakame, which is invariably found floating in the morning's miso soup. Also nori, tengusa / agar, hijiki, and konbu. Address: Tokyo.

7212. Ichiyama, Morio. 1980. Noda no Shôyu-shi [History of shoyu in Noda]. Noda, Japan: Ron Shobo. 128 p. [Jap] Address: Noda city.

7213. Ikeda, Yasaburo. 1980. Zuihitsu zuisô: tsuketari chosaku mokuroku, jisen nenpu [Revisiting my essays: With an attached chronological listing selected by the author]. Tokyo: Kadogawa shoten. 517 p. 20 cm. Series: Ikeda Yasaburo chosaku-shu, Vol. 10. [Jap]*

• ***Summary:*** The first chapter of this book is titled "Edamame wa namaiki da" [Green vegetable soybeans are conceited / impudent / impertinent]; this essay was first published in 1961 as a book. Yasaburo Ikeda lived 1914-1982. Address: Japan.

7214. Imai, Yoshitsugu. 1980. Anata no kenko o mamoru, tônyû no subete [All about soymilk to keep you healthy]. Aichi Prefecture, Japan: Marusan Shokuhin. 86 p. [Jap]

7215. Iwamoto, H. 1980. General aspects of Japanese fermented foods. In: Proceedings of the Oriental Fermented Foods. Food Industry Research and Development Institute, P.O. Box 246, Hsinchu, (300) Taiwan. iv + 229 p. See p. 31-45. Held 10-14 Dec. 1979 in Taipei, Taiwan. 15 tables. 2 figs.

• ***Summary:*** The fermented foods indigenous to Japan which are made from protein-rich materials can be grouped into two types: the soybean group and the fish group. The former, which includes miso, shoyu, and natto, is the more popular

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Table 2. Production of soybean in Japan and USA (m/t)

Year	Production		Import to Japan	
	Japan	USA	Total	from USA
1930	388,600			
1935	288,600	1,330,890		
1940	314,200	2,124,073		
1945	170,400	5,527,233		
1950	446,900	8,144,361		
1955	507,100	10,170,129		
1960	417,600	15,113,236		
1965	229,700	23,014,067		
1970	126,000	30,911,089	3,243,790	2,952,449 (91%)
1975	125,600	42,279,200	3,333,753	3,041,186 (91%)
1976	109,500	34,425,246	3,554,343	3,286,815 (92%)
1977	110,800	48,226,752	3,602,450	3,427,801 (95%)
1978	187,900	50,199,088	4,260,041	4,142,540 (97%)

and production is very large. The author presents an early history and genealogy of miso, shoyu, and natto based on the Japanese-language writings of Prof. K. Sakaguchi and Prof. M. Nakano. Shi [fermented black soybeans] were recently found in an ancient Chinese tomb of the 2nd century B.C. "The word *shoyu* or *chiang-yu* never appeared in any old Chinese manuscripts. Nevertheless I wonder if the origin of Japanese shoyu might be the Chinese *chiang* in the Ming dynasty or an earlier period. Anyhow, the question is still: When did the Chinese start making koji from a mixture of soybean and wheat? And when and where was filtration of soybean *chiang* successfully commenced. As for the later, it is quite possible that the filtration was started in Japan."

In 1977 the following amounts of fermented soyfoods were produced in Japan: miso 620,902 tonnes (using 190,000 tonnes of whole soybeans and 1,579 tonnes of defatted soybean meal), shoyu 1,228,244 tonnes (using 11,788 tonnes of whole soybeans and 180,000 tonnes of defatted soybean meal), and natto 120,000 (using 71,000 tonnes of whole soybeans).

Table 2 shows soybean production in Japan and the USA every 5 years from 1930 to 1978. Production in Japan was 388,600 tonnes in 1930, 288,600 tonnes in 1935, 314,200 tonnes in 1940, 170,400 tonnes in 1945, 446,900 tonnes in 1950, 507,100 tonnes in 1955 (a peak), 417,600 tonnes in 1960, 229,700 tonnes in 1965, 126,000 tonnes in 1970, 125,600 tonnes in 1975, 109,500 tonnes in 1976 (a low), 110,800 tonnes in 1977, 187,900 tonnes in 1978. The first year for which imports are shown is 1970, when 3,243,790 tonnes were imported, 91% of which from the USA. In 1978 4,260,041 tonnes were imported, 97% from the USA.

Table 6 shows miso production in Japan from 1967 to 1976. Factory production grew from 535,000 tonnes in 1967 to a peak of 650,000 tonnes in 1973, down slightly to 630,000 tonnes in 1976. Farmer (household) production decreased steadily from 207,000 tonnes in 1967 (39% of factory production and 26% of total production) to 67,000 tonnes in 1976 (11% of factory production and 10% of total production). Total production and annual per capita consumption decreased from a peak of 789,000 tonnes in 1967 (7.8 kg/capita) to a low of 697,000 tonnes in 1976 (6.5 kg/capita).

Table 7 shows the number and capacity of miso factories in Japan and their production in 1959, 1968, and 1977. The number of factories decreased dramatically during this 18-year period (to from 2,987 to 1,996), but the total amount of miso produced increased from 503,000 tonnes to 621,000 tonnes, and the percentage of all miso made by large factories (those making 3,751 tonnes/year or more) rose from 15% to 52%, while the percentage of all miso made by small factories (those making 1-375 tonnes/year) decreased from 29% to 14%.

Table 8 shows the materials used in making shoyu in Japan from 1968 to 1977. The amount of whole soybeans

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decreased from 15,000 tonnes to 9,000 tonnes, the amount of defatted soybean meal increased from 147,000 tonnes to 176,000 tonnes, the amount of wheat increased from 127,000 to 178,000 tonnes, and the amount of salt from 170,000 tones to 204,000 tonnes. The amount of amino liquor (HVP) decreased from 140,000 tonnes to 89,000 tonnes.

Table 9 shows shoyu production in Japan from 1967 to 1976. Factory production grew from 1,201 kiloliters (kl) in 1967 to a peak of 1,403 kl in 1973, down slightly to 1,349 kl in 1976. Farmer (household) production decreased steadily from 20 kl in 1967 (1.67% of factory production 1.63% of total production) to 9 kl 1976 (0.66% of factory production and 0.66% of total production). Total production and annual per capita consumption increased from 1,221 kl 1967 (12.0 liters/year) to a high of 1,411 kl in 1973 (12.6 liters/year), then down slightly to 1,355 kl in 1976 (11.9 liters/year). Table 10 shows that in 1977 there were 3,135 shoyu factories in Japan. Of these, 2,654 (85% of the total) were in the smallest scale, having 10 or fewer employees, while 5 had 201-300 employees, and 8 had 301 or more employees.

Fig. 2 shows the percentage of shoyu that is distributed through various channels as it moves from the factory to large or small consumers. Address: College of Agriculture, Meiji Univ., Ikuta, Tama-ku, Kawasaki-shi, Japan.

7216. Kikkoman International Inc. 1980. The endless possibilities of Kikkoman (Brochure). [San Francisco, California]. 16 p. 21 x 21 cm.

• ***Summary:*** A color booklet with a large label from Kikkoman soy sauce on the front and rear covers. Opposite each page of recipes is a full-page color photo of one of the preparations. Contents: The family of Kikkoman. Meat. Seafood. Grills. Poultry. Vegetables. Large or small, Kikkoman comes in a package that's right for your business.

7217. Lu, Gwei-Djen; Needham, Joseph. 1980. Celestial lancets: A history and rationale of acupuncture and moxa. Cambridge, London, New York, New Rochelle, Melbourne, Sydney: Cambridge University Press. xxi + 427 p. Illust. Index. 26 cm. [300+* ref]

• ***Summary:*** Contents: List of illustrations. List of tables. List of abbreviations. Authors' foreword. 1. Introduction. 2. The *ching-lo* system and its classical theory. 3. Historical growth of the system. 4. Moxibustion. 5. Therapy and analgesia; physiological interpretations. 6. Influences on other cultures. 7. The lore of vital spots. 9. Conclusions. Bibliographies.

This is a wonderful, scholarly study of two of the most ancient therapeutic techniques of Chinese medicine. "Acupuncture is the implantation of very thin needles into subcutaneous connective tissue and muscle at a great number of different points on the body's surface: moxibustion is the burning of *Artemisia tinder* (moxa) either directly on the skin or just above it. For 2500 years the Chinese have used both techniques to relieve pain and to heal a wide variety of illnesses and malfunctions.

"Dr. Lu and Dr. Needham, in this preview of an important section of *Science and Civilisation in China,* give a full historical account of acupuncture and moxibustion in the theoretical structure of Chinese medicine, and combine this with a rationale of the two techniques in the light of modern scientific knowledge. The book is in no sense a clinical manual: rather is it a contribution, judicious and enlightened, to that oecumenical medicine which will eventually combine all the true powers discovered in China and Europe."

Authors' Foreword: "Many conclusions which had formerly to based on philological arguments about the dating of texts, have now received dazzling confirmation from archaeological discoveries, as for example the four manuscripts on silk which contain descriptions of the acu-tracts and were recovered only very recently from the Han tombs of the -2nd century at Ma-wang-tui. These scrolls reveal a development of acupuncture a good deal earlier than the *Nei Ching.* And from that same -2nd century there are the acupuncture needles found among the grave-goods of the Prince of Chung-shan, Liu Shêng. Or one could instance the acupuncture texts intended to accompany those life-size bronze figures demonstrating acu-points which were introduced first in the +11th century, texts which were later discovered inscribed on stone tablets that had been buried in the gate bastions of a city wall. It is to be expected that future archaeological finds will throw much further light on the development of Chinese medicine as a whole."

"The *Huang Ti Nei Ching* (Yellow Emperor's Manual of Corporeal Medicine) is the oldest and most famous of the Chinese medical classics... We date the *Su Wên* part of it (Questions (and Answers) about Living Matter) in the -2nd century, and the *Ling Shu* (Vital Axis) in the -1st." Acupuncture is first discussed in this remarkable book.

Concerning moxa, page 171 states that it was often desired to apply the stimulus of a heat treatment only, without actual cautery. This was called *wên chiu* (warming moxibustion) or "moxa that left no scar on the skin. The classical way of doing this was to use a layer of some vegetable substance between the skin and the burning incense-like cone. One technique was to have it burn down on a layer of soya-bean paste (*tou chiang chiu*); or else a slice of garlic, or a slice of ginger could be interposed."

Note: This is the earliest English-language document seen (March 2009) that uses the term "soya-bean paste" to refer to miso–in this case *tou chiang / doujiang* (Chinese-style miso).

Pages 268-69 state: "It was throughout the second half of the +17th century that information about acupuncture began to attract the attention of Europeans. The very first writer, so far as we can see, who spoke about acupuncture was the Dane Jacob de Bondt (1598-1631) who in his

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capacity as surgeon-general for the Dutch East Indian Company at Batavia had come into contact with Chinese and Japanese physicians." The first illustrations (four) of the acupoints in the Western world appeared in Willem ten Rhijne's book of +1683. Andreas Cleyer in his *Specimen Medicinae Sinicae* (1682) gave detailed illustrations of acupuncture (p. 276-83). The German naturalist Englebert Kaempfer (1651-1716) gave the clearest account to date of acupuncture which he observed among the Japanese (p. 287-92). Address: 1. Assoc. Director; 2. Director. Both: East Asian History of Science Library, Cambridge, England.

7218. Mogi, Koya. 1980. Recent progress of soy sauce manufacturing in Japan. In: Proceedings of the Oriental Fermented Foods. Food Industry Research and Development Institute, P.O. Box 246, Hsinchu, (300) Taiwan. iv + 229 p. See p. 88-101. Held 10-14 Dec. 1979 in Taipei, Taiwan. 13 tables. 6 figs. [2 ref]

• ***Summary:*** Contents: Introduction. Manufacture: Treatment of raw materials, koji making, aging, pressing, refining. High temperature and short time cooking method. The following tables are included: 1. Classification of shoyu (5 kinds, 3 grades, 3 production methods). 2. Some characteristics of different kinds of shoyu (kinds, color, soybean:wheat ratio). 3. Typical composition of 5 different kinds of shoyu. 4. Differences in koikuchi shoyu grades (total nitrogen, soluble solids except NaCl, alcohol). 5. Differences in shoyu production methods (hon-jozo, shinshiki, amino acids liquid mix). 6. Shoyu production of different kinds in 1977 (koikuchi 917,738 kl = 85% of total, usukuchi 124,829 kl = 11.6% of total, tamari 23,437 kl = 2.2% of total, shiro 4,456 kl = 0.4% of total, saishikomi 3,072 = 0.3% of total). 7. Shoyu production in different grades in 1977 (special 59.3% of total, upper 27.5%, standard 13.2%). 8. Shoyu production by different methods in 1977 (hon-jozo 66.9% of total, shinshiki-jozo 28.4%, amino acids liquid mix 4.7%).

The innovation of treating soybeans using the high temperature and short time cooking method increased the yield of shoyu very much and was patented in Japan, the USA, and Canada. The protein in raw soybeans is undenatured and cannot be hydrolyzed (digested) by the enzymes of koji molds. Therefore it is necessary to denature the soybean protein by cooking so that it can be hydrolyzed. "The phenomenon of the so-called 'N-property' (turbidity nature) appears, if portions of soybean protein remain undenatured. 'N-property' is the phenomenon that *shoyu* becomes turbid when it is diluted and heated. This is the appearance of insoluble form of undenatured protein and remarkably diminishes the commercial value of *shoyu.*

"Undenatured protein is soluble in water, especially saline water, and goes into the product. If the product contains undenatured protein, 'N-property' described above appears as a coagulant when *shoyu* is diluted to the concentration fitted to the specified cuisine and/or further heated. However, excess denaturation also makes soybean protein undecomposable by proteolytic enzymes. Thus, over-denaturation results in a decrease of the yield of *shoyu* and an increase of the production cost.

"Steam cooking has been used as a means to increase digestibility of soybean protein. Technical know-how of so-called 'NK-method' developed by Mr. Tateno *et al.* of the author's company in 1952 has been generally used by many soy sauce manufacturers. It was an epoch-making method of soybean treatment in *shoyu* making. Before that time, the utilization rate of nitrogen was about 66 to 70%. A utilization rate of nitrogen is defined as a percentage of soluble nitrogen in *moromi* mash to total nitrogen in the raw materials used. In this method, soybeans are cooled rapidly after cooking to prevent excess denaturation. Soybeans are steamed at 0.9 to 1 kilogram per square centimeter gauge pressure for 30 to 60 minutes (average 45 minutes) and then cooled as soon as possible with the aid of jet condenser to reduce the pressure inside the cooker. Thus, the utilization rate of nitrogen attained by the 'NK-method' is 81 to 82%. After many years, the 'NK-method' was first replaced with 'high temperature and short time cooking method' in about 1970.

"It has long been believed that the treatment of the 'NK-method' is best with steam at 0.9 kilograms per square centimeter for 30 to 60 minutes and that either higher temperature or longer time causes excess denaturation and decrease of the utilization rate of nitrogen. However, the author's results of bench-scale experiments indicate better digestibility of soybeans when the conditions of higher temperature and shorter time are used for denaturation of protein." Address: Kikkoman Shoyu Co., Ltd., Plant No. 7, 339 Noda, Noda-shi, Chiba-ken, Japan.

7219. Nagahori, Takashi; Motai, H.; Okuhara, A. 1980. Shôyu no N-nitoroso amin seisei yokusei busshitsu [On the substances in shoyu to suppress the nitrosation of dimethylamine]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 33(3):151-60. [39 ref. Jap]

• ***Summary:*** Amino acids in shoyu competitively inhibit formation of nitrosamines from nitrite and amines. Shoyu, miso, and protein hydrolysates suppress nitrosation by 60-70%, by means of Van Slyke reactions between amino acids in the soyfoods and nitrites. Rates of suppression are: regular (*koikuchi*) shoyu 62-65%, tamari shoyu 69-79%, and rice miso 71-77%. Address: Central Research Labs., Kikkoman Shoyu Co. Ltd., Noda, Japan.

7220. Nagai, S.; Nishio, N. 1980. Biochemical engineering problems on solid state culture. In: Proceedings of the Oriental Fermented Foods. Food Industry Research and Development Institute, P.O. Box 246, Hsinchu, (300) Taiwan. iv + 229 p. See p. 218-26. Held 10-14 Dec. 1979 in Taipei, Taiwan. 1 table. 10 figs. [11 ref]

• ***Summary:*** The production of wheat tempeh cultured with

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Rhizopus oligosporus is studied. Contents: Introduction. Static cultivation without aeration. Static cultivation with forced aeration. Dynamic cultivation without aeration (in a small drum fermenter). Dynamic cultivation with forced aeration. Engineering problems.

During tempeh production, the substrate temperature increased remarkably due to the metabolic heat generation; a major problem is removal of this heat. Also a large amount of moisture was produced due to a respiration reaction; this increases the substrate moisture content and may cause quality problems. Address: Dep. of Fermentation Technology, Faculty of Engineering, Hiroshima Univ., Hiroshima, Japan.

7221. Nakamura, Hiroshi. 1980. Desirable qualities of soybeans–Japanese viewpoints. In: F.T. Corbin, ed. 1980. World Soybean Research Conference II: Proceedings. Boulder, Colorado: Westview Press. xv + 897 p. See p. 1-9.
• ***Summary:*** The author believes that both protein and oil contents should be incorporated in soybean quality standards. "I think efforts should be made to develop different varieties for different uses, so that soybeans could be traded on an oil or protein basis in the future." Address: Hohnen Oil Co., Ltd., Tokyo, Japan.

7222. Orf, J.H.; Kaizuma, Norihiko; Hymowitz, T. 1980. Six soybean seed protein electrophoretic variants. *Seed Science and Technology* 8(3):401-06. [15 ref]
Address: 1&3. Dep. of Agronomy, Univ. of Illinois, Urbana; 2. Faculty of Agriculture, Iwate Univ., Morioka, Iwate, Japan.

7223. Ryukyu Shinpo. comp. 1980. Higaonna Kanjun zenshû [Complete works of Higaonna Kanjun]. Tokyo?: Daiichi Shobo. See vol. 8, p. 302. [Jap]*

7224. Saito, Masataka; et al. 1980. Daizu no seitai to saibai gijutsu [The soybean: Its life and cultivation technology]. Tokyo: Nosan Gyoson Bunka Kyokai. 428 p. [240+ ref. Jap]
• ***Summary:*** Contains many chapters by various authors.

7225. Sanbuichi, T. 1980. Cool weather tolerance in soyabean breeding. In: R.J. Summerfield and A.H. Bunting, eds. 1980. Advances in Legume Science. Royal Botanic Gardens, Kew, Richmond, Surrey, England. xvi + 668 p. See p. 287-88. [9 ref]
• ***Summary:*** The Tokachi district is located in the eastern part of Hokkaido, Japan's northernmost island. In years of normal weather, the average yield of soybeans in the Tokachi District is much larger than the average for all of Japan, but it decreases very seriously in cool years. At the Tokachi Agricultural Experiment Station, where soybeans have been bred for more than 50 years, cool weather tolerance is one of the most important objectives. Address: Tokachi Agric. Exp. Station, Memuro-cho, Kasai-gun, Hokkaido, Japan.

7226. Shandler, Nina; Shandler, Michael. 1980. How to make all the "meat" you eat out of wheat: International gluten wheat "meat" cookbook. New York, NY: Rawson, Wade Publishers, Inc. xiv + 241 p. Index. 24 cm. [10 ref]
• ***Summary:*** How to make and use wheat gluten in a vegetarian diet, with 250 American and international recipes. Contents: Acknowledgements. Author's note. Part I. Introducing wheat "meat": 1. The cost of the meat-centered diet: How meat consumption affects ecology, economy and health, food economy, fuel conservation, water reserves and pollution, heart disease, cancer and meat eating, premature aging, chemical residues in meat, medical costs. 2. Introducing wheat "meat": a low-cost, homemade alternative to meat (gluten meats cost about $0.15 per serving). 3. How to make "meat" from wheat: Preparing raw gluten (from 7 cups whole wheat flour), seven varieties of wheat "meat," cutlets (a veal substitute), steak (a mock beef steak), ground gluten (a hamburger taste-alike), spiced links (an alternative to sausage), roast with a beef flavor, seawheat (a clam alternative), poultry pieces (chicken-flavored wheat "meat), using the reserved starch, bran and germ: Gluten-free crackers, and cold crunchy cereal.

Part II. Hundreds of international ways to serve wheat "meat": 4. All-American wheat meat recipes. 5. Mexican wheat "meat" food. 6. Latin American. 7. British. 8. French. 9. Spanish. 10. Italian. 11. Austrian. 12. Greek. 13. African. 14. Indian (from India). 15. Chinese. 16. Japanese wheat "meat" cooking.

Note 1. Tamari soy sauce and miso are used to flavor a number of recipes in this book. Other soy-related recipes include: Spiced bean curd and cutlet (with tofu, p. 212). Spares with black beans (mock spare ribs with "Chinese prepared black beans [fermented black soybeans], p. 216). Family-style bean curd (with tofu, p. 219). Poultry with orange-flavored soy sauce (p. 228-29). Seawheat in soy and ginger sauce (p. 229). Seawheat with bean curd and vegetables in casseroles (p. 230). Seawheat with vinegared miso (p. 231). Note 2. This book does not mention "seitan," but a Japanese recipe titled "Seawheat in Soy and Ginger Sauce" is quite similar; It uses tamari soy sauce and grated gingerroot, and kombu is used in making Seawheat, a clam alternative. A photo on the inside back dust jacket shows Nina and Michael Shandler.

Talk with Michael Shandler in Amherst, Massachusetts. 1992. Jan. 14. He and Nina became vegetarians in 1969. They were first introduced to wheat gluten in about 1970; at that time they were served gluten steaks by a friend, Jayanti Peterson, in Santa Cruz, California. At the time their book was published, they were probably not aware of "seitan." They did not know of any other books on gluten when they were writing their book–which is why no gluten books are listed in their bibliography. The book sold about 2,000 copies

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in hardcover and 5,000 to 6,000 in quality paperback; it went out of print 6-7 years ago. They have had many requests for the book since it went out of print. He is an organization development consultant and Nina is a child psychologist. Food is their hobby. Their best-selling book is *The Complete Guide and Cookbook for Raising your Child as a Vegetarian* which has sold over 50,000 copies (Shocken & Ballantine). Address: Amherst, Massachusetts. Phone: 413-549-1671.

7227. Shibasaki, M.; Suzuki, S.; Tajima, S.; Nemoto, H. Kuroume, T. 1980. Allergenicity of major component proteins of soybean. *International Archives of Allergy & Applied Immunology* 61(4):441-48. *
• ***Summary:*** Allergenic activities of major component proteins of soybean 11S-, 7S- and 2S-globulins were examined by the radioallergosorbent test (RAST) and by RAST inhibition experiments with the sera from soybean-sensitive patients.

7228. Shufu-no-tomo sha. 1980. Wa-yô-ka no tôfu ryôri [Japanese, Western, and Chinese-style tofu cookery]. Tokyo: Shufu-no-tomo-sha: Shufunotomo Bunka No. 568. 84 p. Illust. No index. 19 cm. [Jap]
• ***Summary:*** Contents: Healthy menu. New discovery of taste. Making tofu recipes more filling by adding some oil. The main character of the diet. Tofu side dish for wines (sake). Contains many recipes.

The entire rear cover contains a color ad for Higashimaru Shoyu (usukuchi), and shows the label in a size that all ingredients are legible. Address: Tokyo, Japan.

7229. Tsuchiya, Kanji. 1980. Tônyû: Yomigaetta dentô shokuhin [Soymilk: Traditional food that's make a comeback]. Tokyo: Shokuhin Kenkyusha. 176 p. 2nd edition published in Dec. 1982. Illust. 17 cm. [Jap]
• ***Summary:*** This is the best book seen on soymilk in Japanese. For contents and details, see the enlarged 2nd edition (Dec. 1982). A portrait photo on the rear cover shows the author, Kanji Tsuchiya, and gives a brief biography. Address: Technical consultant, Okazaki Marusan, Japan.

7230. Tsuji, Shizuo; Sutherland, Mary. 1980. Japanese cooking: A simple art. New York and Tokyo: Kodansha International. 518 p. Introduction by M.F.K. Fisher. Illust. (510 line drawings by Yoshito Suzuki. 16 color pages, mostly photos). Index. 27 cm.
• ***Summary:*** This is a beautiful and informative book by a great Japanese chef, though the awkward English terminology often sounds like "Japlish." The illustrations are very nicely done, but the artist's name does not appear in the book. Tsuji is the author of 29 books on gastronomy, travel, and music. His basic thesis is that "like Japanese and poetry, cooking is simply the result of an acute awareness of the seasons, Freshness and naturalness are the *sine qua non* of Japanese cuisine."

This definitive treatise on Japanese cooking, the most complete and well-thought-out to date, is written by the head of the *Ecole Technique Hoteliere Tsuji,* the technical hotel school in Osaka, Japan. This is the "largest school training professional chefs in Japan," according to the publisher.

The excellent "Ingredients" section (p. 53-100) gives detailed descriptions (with Japanese characters) of: Azuki beans (p. 55). including red rice (*sekihan*) and "sweet red-bean paste" (*an*). Bean curd (*tôfu,* p. 56-61) incl. *momen* tofu (regular; "The type described here as 'regular' is known in Japan as *momen*–'cotton' tofu... 'Cotton' bean curd is the type most commonly used in Japan"), *kinu-goshi* (silk tofu), *yakidôfu* (lightly broiled or grilled bean curd), atsu-age or nama-age (thick cakes), aburage or usu-age (thin deep-fried tofu), ganmodoki (mixed tofu), *kôya-dôfu* or *kôri-dôfu* ("freeze-dried bean curd"), *yuba* ("soybean milk 'skin'" [soybean milk skin]), *okara* ("bean curd pulp or 'lees'").

Note 1. This is the earliest English-language document seen (April 2013) that contains the term *atsu-age* or the term *usu-age* or the term "thin deep-fried tofu" (all regardless of hyphenation), all of which refer to types of Japanese of deep-fried tofu.

Miso (p. 76-77) incl. shiro-miso, Shinshû-miso, inaka-miso, Hatchô miso, akadashi miso. Soybeans and edamame. Soy sauce (shôyu, p. 90-93) incl. Natural Japanese soy sauce, synthetic soy sauce, Kikkoman, light soy sauce (*usukuchi shôyu*), tamari ("In Japanese cooking tamari is generally used as a dipping sauce or a base for basting sauce such as Yakitori Sauce"). "Dutch traders in Nagasaki in the seventeenth century exported soy sauce to Europe, and it was the secret seasoning served at the court banquets of Louis XIV of France" (sic). Kuzu (p. 93-94). Wheat gluten (p. 98, 60).

Soy-related recipes include: Making soups (p. 151-56). Miso soup (*Miso-shiru,* p. 156-57). Ginger soy sauce (*Shôga-jôyu,* p. 172). Ponzu sauce (p. 172, with soy sauce and tamari). Mustard-vinegar miso sauce (*Karashi-su-miso,* p. 172-73). Dengaku, dengaku miso toppings, and bean curd dengaku (*Tôfu dengaku*) (p. 190-93). Teriyaki (p. 199-202, 370; the meaning in the United States is now different from the original meaning in Japan. Definition and history, homemade teriyaki sauce, teriyaki yellowtail, chicken teriyaki, steak teriyaki). Egg "tofu" (*Tamago-dôfu,* p. 216). Dressings for aemono (salads, p. 246, incl. white tofu dressing, white miso dressing, red miso dressing). Rice with miso soup and pickles (p. 270-71). Nori-roll sushi (*Nori-maki,* p. 300, with freeze-dried bean curd). Fox noodles (*Kitsune udon,* p. 312). Pickling vegetables (*Tsukemono,* p. 315, 318, with miso). Pureed corn soup (*Tômorokoshi surinagashi-jiru,* p. 347, with miso). Thunder soup (*Kaminari-jiru,* p. 349, with "1 cake *tôfu* (bean curd)" and "2-3 cakes thin deep-fried *tôfu* {*aburage or usuage*}, cut into julienne strips). Potatoes simmered in miso (*Jaga-imo*

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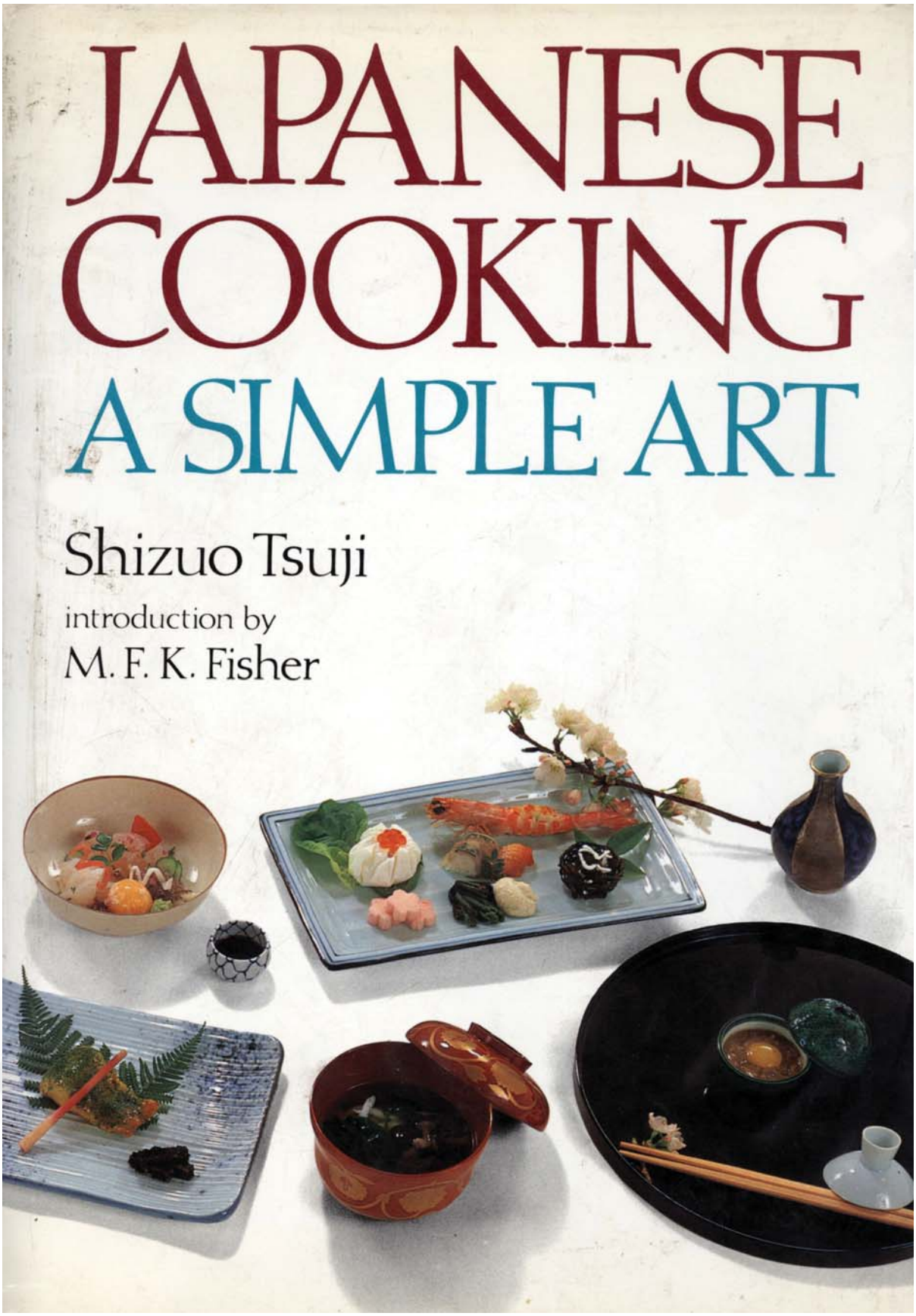

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miso-ni, p. 393). Radish with white miso sauce (*Furofuki daikon,* p. 394). Chinese cabbage and deep-fried tofu (*Age-dôfu hakusai-ni,* p. 398). Tortoiseshell tofu (*Tôfu bekkô-ni,* p. 398-99). Fried and simmered freeze-dried tofu (*Kôri-dôfu age-ni,* p. 399-400). Gold purses (*Fukuro,* p. 400, with thin deep-fried bean curd). Deep-fried tofu (*Agedashi-dôfu,* p. 412-13). Green beans with sesame-miso dressing (*Sandomame goma-miso ae,* p. 420). Savory okra (cold) (*Okura wasabi-joyu,* p. 420-21). Tangy white salad (*Shirazu-ae,* p. 421-22). "River Bank" oyster stew (*Kaki dote-nabe,* p. 433-34, with miso). Simmering tofu (*yudôfu,* p. 436-37). Mushroom rice (*Shiitake gohan,* with "1 cake thin deep-fried bean curd (*aburage* or *usuage*)," p. 438-39). Soybeans in the pod (*Edamame,* p. 471-72).

Murasaki (p. 287): Japanese love *sushi* so much that they have developed a special aficionado's vocabulary. "At a *sushi* restaurant, you do not ask for soy sauce as *shôyu,* but, rather, as 'purple,' or *murasaki.* Every shop has its own house sauce, made by reducing soy sauce or thicker *tamari* sauce over heat with *saké, mirin,* bonito flakes and so on." Since the resulting sauce is darker than regular soy sauce, the name *murasaki* seems appropriate.

The recipe for Abe River mochi (Abe-kawa mochi) uses "1 cup kinako (roasted soybean flour)" as a major ingredient (p. 469).

Concerning azuki beans (red beans; characters small + bean) (p. 55): "This small, red bean is the legume you will most frequently encounter in Japanese cooking besides soybeans (*daizu*). It is used in the cooking of many countries, so it is stocked in most supermarkets throughout the United States. For some historical reason this bean is commonly spelled *adzuki.* This spelling is a Victorian romanization; phonetically, *azuki* is correct.

"These beans are steamed with glutinous rice on special occasions to make the festive red rice (*sekihan;* p. 280). They are more commonly boiled with sugar to make sweet red-bean paste (*an*), which forms the base of a large percentage of Japanese sweet confections (see p. 327). *An* is made in two textures: smooth puree (*koshi-an*) and 'chunky,' with beans partially crushed (*tsubushi-an*). If there is no time to make *an* from scratch, ready-made *an* is available canned and stocked in most Japanese food stores."

Note 2. This is the earliest English-language document seen (March 2006) that uses the term "sweet red-bean paste" to refer to sweet azuki bean paste [*azuki-an*], or the term "smooth puree" to refer to *koshi-an,* or the term "chunky" to refer to *tsubushi-an.* Address: Tsuji Professional Culinary Inst., Osaka, Japan.

7231. Wang, H.L. 1980. Research on Oriental fermented foods at the Northern Regional Research Center. In: Proceedings of the Oriental Fermented Foods. Food Industry Research and Development Institute, P.O. Box 246, Hsinchu, (300) Taiwan. iv + 229 p. See p. 1-14. Held 10-14 Dec. 1979 in Taipei, Taiwan. 6 tables. [21 ref]

• ***Summary:*** Contents: Introduction. Objectives and approaches. Introduction of pure culture strains. Enzymes produced by the molds. New compounds formed by the molds. Nutritional value of fermented foods. Conclusion.

"Not until the late 1950s were studies on Oriental food fermentation begun in the United States at the Northern Regional Research Center in Illinois and the Agricultural Experiment Station in Geneva, New York. The United States Department of Agriculture under Public Law 480, has also provided grants to foreign countries for research on fermented soybean foods. These arrangements have broadened our knowledge of the size and scope of Oriental food fermentations.

"The original objective of our Center's research with respect to Oriental food fermentations was to solve the problems involved in the use of U.S. soybeans by the Japanese *miso* industry. The results of that research project stimulated our interest in Oriental food fermentations, especially those based on soybeans." Address: NRRC, Peoria, Illinois.

7232. Wilson, Robert Arden; Hosokawa, Bill. 1980. East to America: a history of Japanese in the United States. New York, NY: William Morrow and Company, Inc. 351 p. Illust. 24 cm. *

7233. Glutamate Association. 1980? A fact finding guide to monosodium glutamate. 5775 Peachtree-Dunwoody Rd., Suite 500-D, Atlanta, GA 30342. 8 p. Undated.

• ***Summary:*** Contents: Introductory information about this book. What is MSG? How MSG is used. How MSG is made. How MSG works. History of MSG. MSG and the body. Safety of MSG. Hypersensitivity. MSG and sodium in the diet. Identifying MSG. Regulation of MSG. Glutamate–a remarkable substance. Summary.

MSG is the sodium salt of glutamic acid, and an amino acid. "The various forms of glutamic acid are generically referred to as glutamate." MSG is a fine, white crystal which imparts no characteristic flavor of its own. "MSG works well with some foods already containing high levels of glutamate such as meats, poultry, seafood, and some vegetables." "An estimated 50% loss in the natural glutamate content of some vegetables has been observed within 24 hours after harvesting."

History of MSG: Japanese cooks have used kombu (*Laminarina Japonica*), a sea vegetable, since ancient times to make their favorite soup stocks. They were not aware that kombu "contained generous amounts of naturally occurring free glutamate, and it was this substance that enhanced the flavor" of their soup stock.

"The link between seaweed, monosodium glutamate, and flavor was discovered in 1908. In that year, Professor Kikunae Ikeda of the University of Tokyo isolated

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monosodium glutamate while experimenting with the dried seaweed in an attempt to unlock the flavor enhancing secret. He believed that what the Japanese called 'umami,' or tastiness, existed in addition to the basic tastes–sweet, sour, salty and bitter–and could be crystallized from foods.

"Dr. Ikeda became so impressed with the effect of MSG on food flavor that the production of monosodium glutamate was immediately undertaken on a commercial basis in Japan. Production in the United States began in the 1940's. Today, MSG is manufactured in 15 countries throughout the world accounting for a volume of approximately 200,000 tons annually."

Tables show: (1) The glutamate content of various foods. (2) Comparison of glutamate ingested in foods with glutamate added to foods as a flavor enhancer. Address: Atlanta, Georgia.

7234. Morinaga Milk Co. 1980? The wonder food from Japan! Morinaga brand Ever-Fresh Silken Tofu (Poster). Shiba 5-33-1, Minato-ku, Tokyo 108, Japan. 1 p. Undated. 36 x 41 cm. [Eng]

• ***Summary:*** "Your body will love the high plant protein... Your waistline, the low calories... And your heart, the total absence of cholesterol."

Note: This poster is in a wooden frame and can be hung on a wall. In the lower right corner is a pouch where recipes can be placed on the poster. Address: Tokyo, Japan.

7235. *New York Times.* 1981. Dining out guide: Japanese restaurants. Jan. 4. p. D55.

• ***Summary:*** This is a list of the 11 best Japanese restaurants in New York City based on reviews that appeared in the New York Times. One of these is Hatsuhana, which features a sushi bar. Among the recommended dishes is "natto, a pungent mix of fermented [soy] beans,..."

7236. Belleme, John. 1981. The master of hoops. *East West Journal.* Jan. p. 60-65.

• ***Summary:*** Mr. Arai (*Arai-san*) of Japan is a master cooper or maker of barrels and vats (*oke-ya-san*). Standing only 4 feet 8 inches tall, he is also a local legend, herbal doctor, and, folk singer, and the best talker in the community. "In the seven months my wife Jan and I spent studying fermented foods in the village of Shimo Isano, north of Tokyo, we

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met many of these hardy oldsters. However Arai-san is exceptional; his skill, strength, and wittiness are rare at any age." The Bellemes' miso teacher was Mr. Onozaki. Tells how Mr. Arai makes traditional wooden Japanese barrels, and gives a personality sketch. "He does not experience his life as a fleeting moment in time but rather as part of an ancestral stream flowing out of ancient history.

Large photos show: 1. Jan Belleme and Mr. Arai (full page). 2. Mr. Arai collecting and splitting large pieces of bamboo, then braiding them into the large hoops that hold together a wooden vat. 3. Mr. Arai making a small pickle barrel. 4. Then drinking saké after work.

7237. Chico-San, Inc. 1981. Chico-San products: A catalog of unique natural foods. P.O. Box 1004, Chico, CA 95927. 28 p. Revised Jan. 1981.
• ***Summary:*** Contents: A message from the president, J. Robert Kennedy. Chico-San rice products: Rice Cakes (6 varieties; plain, millet, or buckwheat, each salted or unsalted), Carob Crunch (carob-coated rice cakes in plain or mint flavors), Golden Rice Nuggets, Yinnies candies (Taffy made from rice and barley; Caramel made from rice, barley, oat powder, raisins, almonds, sesame oil, coconut, rice bran, lecithin, natural vanilla, and agar agar).

Yinnies brand Rice Syrup ("A pure, natural sweetener made from rice, water, and barley malt..."). "How Yinnies brand Rice Syrup is made: Chico-San's process involves the conversion of the natural starches in the rice into complex sugars. Extended low temperature cooking allows the enzymes from the malted grains to create a fermentation which occurs in a liquid mash. After an optimum period of fermentation, the process is halted and liquid squeezed from the mash. This liquid is then vacuum cooked at low temperature, bringing the syrup to the proper consistency." Yinnies brand rice syrup and refined sugar comparison. This rice syrup is high in maltose.

How Chico-San guarantees Oriental-type organically-grown brown rice (describes in detail how the rice is grown in California). Chico-San whole grains, seeds and beans (Incl. organically-grown brown rice, sweet brown rice, sesame seeds, black soybeans, and azuki beans). Chico-San condiments: Lima soy sauce, soybean puree (miso, in 3 types, mugi, kome, or hacho), barley koji, kuzu, malt vinegar malt vinegar, salt plums, nigari (for tofu making), sesame oil (light or dark), tekka. Chico-San imported seaweeds: Hijiki, kombu, wakame, nori, sea vegetable gelatin (kanten). Herb teas and other products. Chico-San cookbooks. Chico-San special recipes–including recipes for Sesame miso spread, Black soy beans, Azuki beans, and Wakame miso soup. Address: Chico, California.

7238. Fukushima, Danji. 1981. Re: History of tofu in Japan. Letter to William Shurtleff at Soyfoods Center, Jan. 22–in reply to inquiry. 1 p. Typed, with signature on letterhead. [2 ref]
• ***Summary:*** Tofu was first introduced into Japan in the 8th century; from that time until about the 12th century it was called "okabe." Source: Tomomi Kono. 1970. *Encyclopedia Japonica.* Tokyo: Shogakukan. Vol. 13, p. 227. Please see enclosed photocopy.

Fermented tofu originated in China in the 5th century A.D. Source: T. Watanabe, H. Ebine, and T. Ota. 1971. *Daizu Shokuhin.* Tokyo: Korin Shoin. p. 196. Please see enclosed photocopy.

In Japan today, several factories produce 50,000 to 100,000 packages of packaged tofu per day.

By separate mail, Dr. Fukushima is sending a copy of a color slide showing Kibun's Soena. Address: Kikkoman Foods, Inc., Walworth, Wisconsin 53184.

7239. Kamen, Sy; Kamen, Betty. 1981. The tofu connection (filmstrip). New York, NY: Cold Spring Harbor. *
• ***Summary:*** This entertaining and educational color filmstrip, created and produced by Sy and Betty Kamen, consists of two different parts, each of 79 frames and lasting 15 minutes. Part One, "The Making of Tofu," depicts how tofu is made in both the traditional Japanese shop and in a large-scale American tofu plant. Part Two, "Tofu–America Style," features a cooking class led by Madeline Fox of the New England Soy Dairy. She prepares tofu meatballs and buckwheat spaghetti, tofu sloppy joes, tofu salad, tofu dip, tofu fruit cream, and tofu chocolate mousse.

The Tofu Connection is available from Encore Visual Education Inc., 1235 South Victory Boulevard, Burbank, California 91502 (Catalog No. 203); the price is $46 for both filmstrips and audio cassettes. Address: Cold Spring Harbor, New York.

7240. Kawaguchi, Yutaka; Matsuoka, H. 1981. [Free fatty acids and neutral volatiles in cheese-like soy protein food using *Saccharomyces fragilis* as a starter]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 28(1):8-13. [Jap]*
Address: Yamanashi Prefectural Agriculture and Forestry High School, Nishiyahata Ryuo-cho, Nakakoma-gun, Yamanashi-ken.

7241. Nakano, Masahiro. 1981. Shio to miso [Salt and miso. I-IV.]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 323. p. 4-8. Jan.; No. 324. p. 2-8. Feb.; No. 325. p. 2-9. March; No. 326. p. 2-11. April. [Jap]
Address: Zenkoku Miso Gijutsukai Rijicho.

7242. Shurtleff, William; Aoyagi, Akiko. 1981. Que es el miso? Traducido por Corina Gutman [What is miso? Translated into Spanish by Corina Gutman]. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549 USA. 4 p. Jan. [3 ref. Spa]

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• ***Summary:*** Contents: Introduction. Delightfully varied; highly versatile. A nutritional treasure trove. The varieties of miso (including a table). The preparation of miso. Traditional natural miso and quick modern miso. A brief history of miso. Buying, storing, and using miso. Miso in Japan. Traditional Japanese miso shops and modern factories. Making miso at home. Favorite miso recipes. Address: Authors: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

7243. Tsuchiya, Kunio. 1981. Minami no tôfu, kita no tôfu: Aizu Tajima no tsuto-dofu ni tsuite [Southern tofu, northern tofu: Tsuto-dofu from Aizu Tajima]. *Daizu Geppo* (*Soybean Monthly News*). Jan. p. 39-47. [Jap]
• ***Summary:*** Aizu Tajima is a place in the northeast prefectures (Tohoku Chiho), near the border of Fukushima prefecture and Tochigi prefecture. During the Edo period it was a major town through which travelers passed. Tsuto-dofu is wrapped in a bamboo mat (*sudare*), then boiled in water until small holes form in the tofu.

7244. Fabricant, Florence. 1981. A good place to sample sushi: Dining out. *New York Times.* Feb. 1. p. LI17.
• ***Summary:*** This is a review of the two-star Japanese restaurant Taiko. Recommended dishes include "fried bean curd appetizer."

"Hot appetizers of deep-fried bean curd, the squares of tofu finished with a crunchy coating and seasoned with a gingery sauce..."

"Rich miso soup with diced bean curd provides a warmly restorative interlude between the main courses, especially on a biter winter evening."

Sukiyaki casserole includes "bean curd in a soy-based broth."

Note that the word "soy" (used by itself, at this late date) refers to soy sauce.

7245. Stop & Shop. 1981. Happy Chinese New Year! (Ad). *Hartford Courant* (*Connecticut*). Feb. 1. p. V5.
• ***Summary:*** "La Choy, 10 ounce bottle–Soy Sauce–69¢... Soy bean cake–Tofu 1 pound package–89¢." Also includes Azumaya egg noodles, egg roll wrappers, wonton wrappers (each in a 1-lb. package).

7246. Wakai, Ted. 1981. Dictionaries and raw fish (Letter to the editor). *Los Angeles Times.* Feb. 1. p. I14.
• ***Summary:*** Discusses the meanings of the words "sushi" and "sashimi." Not all sushi contains raw fish. His understanding is that "that sushi is a type of rice dish or delicacy made in a variety of sizes, shapes, recipes, appearances, tastes, etc. It comes rolled in seaweed [nori] or egg omelette, rolled into a ball, pushed through a mold, filled into a bag of deep-fried bean curd, loose, etc." Address: Oxnard, California.

7247. Takeda Chemical Industries, Ltd. 1981. Display ad: Report by Mr. Shinbei Konishi, President. *Times* (*London*). Feb. 4. p. 20, cols. 1-2.
• ***Summary:*** Includes a financial summary and a summary of the activities of each of the company's divisions. In April 1980, the Food Products Division introduced "'Soft Shoyu Takeda,' a low-salt soy sauce." Address: Japan.

7248. Hymowitz, Theodore. 1981. Re: Introduction of vegetable soybeans to America. Letter to William Shurtleff at Soyfoods Center, Feb. 5. 1 p. Typed, with signature on letterhead. [1 ref]
• ***Summary:*** William "Morse was the first to popularize vegetable soybeans [in the USA] and indeed the Dorsett-Morse expedition [to East Asia] introduced a great many 'vegetable type' soybeans into the U.S. However, Hahto, a vegetable type soybean was introduced into the U.S. from Japan in 1915. Vegetable type soybeans are nothing more than large seeded soybeans. Hahto seed weighs 27.8 grams per 100 seed. Morse mentions Hahto on page 7 of the U.S.D.A. Farmers Bulletin No. 1520 [April 1927]. He also mentions the variety Easycook which was first introduced into the U.S. in 1894. So please forget about Morse being the first to introduce vegetable soybeans in the U.S. Rather he recognized the potential of soybeans as a vegetable crop and introduced many such accessions into the U.S.

"There are vegetable type soybeans in China. In fact I had some in Shanghai."

Note: William Morse was aware of the suitability of the Hahto variety for use as "immature or green soybeans" as early as 1923, when he and C.V. Piper showed a photo of shelled Hahto soybeans with pods in their classic book *The Soybean* (p. 222). The caption below the photo reads: "Seeds and pods of the Hahto variety of soybeans, the seeds being especially valuable as a green vegetable." Morse was also aware of the special characteristics of Easycook and Hahto as mature or dried beans. On page 259 of the same book we read: "The Easycook and Hahto varieties need no more preparation than the ordinary bean as they cook up very readily." Address: Prof., Plant Genetics, Dep. of Agronomy, 1102 S. Goodwin Ave., Turner Hall, Univ. of Illinois, Urbana, IL 61801.

7249. Webber, Harry. 1981. Perry Webber, Madison College, and Madison Foods (Interview). Conducted by William Shurtleff of Soyfoods Center, Feb. 8. 2 p. transcript.
• ***Summary:*** Harry Webber, the son of Perry A. Webber, attended Madison College from 1930 to 1935, then 1939-1943. He left in 1943 to go to medical school. Harry remembers the foods served at Madison. Vigorost was a gluten meat invented by Perry. There was also Nutmete or Notmete, and several others. They were served to students and widely retailed at health food stores. Ed Bisalski, the sales manager, traveled around the USA selling these foods.

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Perry Webber first went to Madison in about 1931. He earned his doctoral degree at Michigan State, graduating in about 1930-31, then went to Madison. Years before that he had been a missionary in Japan.

Harry went to Japan with his father, Perry, for 3 years. Harry's mother has written a biography of Perry; he will send Soyfoods Center a copy. Emmanuel Missionary College asked that she write the book. His interest was in food chemistry. He was head of the chemistry department at Madison. In the early 1930s he got interested in soy.

P.A. Webber and his family went to Japan from 1935 to 1939, then came back to the USA just before World War II, and went to Madison College–where Perry did lots of work with soyfoods.

Perry Webber was good friends with Dr. Harry Miller and he got interested in soymilk through Dr. Miller, probably first in Japan. He visited with Dr. Miller in Japan and saw his program, but Perry was interested in soymilk before 1935. His brother was in Tokyo at the Adventist hospital.

Sam Yoshiwara knew Perry Webber well and was one of his students in Japan. Perry sponsored him to come to the USA. Sam worked in the food factory at Madison College.

There is a small book about Sutherland and Madison by a man who taught Spanish at Madison. Address: M.D., 913 Meadowwood Dr., Modesto, California 95355. Phone: 209-521-1410 OF. 209-529-4291 HM.

7250. Elwell, Christian. 1981. Re: Ohio Miso Company, now owned by the Elwell family, has been renamed South River Miso Co. Letter to William Shurtleff at Soyfoods Center, Feb. 12. 1 p. Handwritten, with signature on letterhead.
• ***Summary:*** "Dear Bill, Please find enclosed a copy of two fliers we have sent out to our customers. The dated inventory notice I have just sent to our wholesale customers. The other sheet, announcing our move to Conway, Massachusetts, as the South River Miso Co., has been sent out to old customers of Ohio Miso in December, 1980, and to answer enquiries as they come in.

"I am making design plans for our building at present. We plant to be in production here in the fall of 1981.

"I am particularly pleased with the two year barley miso this year, which Thom made in Ohio in spring, 1979. Upon sampling this miso, Michio Kushi said it was of a quality that he would recommend it to patients and for people using miso in healing through macrobiotics. One of our aims is to be able to provide a steady supply of this and 3 year barley miso of consistent quality. I am sending along a sample to you under separate cover.

"With best wishes, Christian Elwell."

One leaflet/flier, handwritten on tan paper and titled "Dear friends, old and new," begins: The Ohio Miso Company has changed ownership. As of November, 1980, the Elwell family has purchased... The other lists miso varieties, prices, and inventory. Address: South River Miso Co., South River Farm, Conway, Massachusetts 01341. Phone: (413) 369-4057.

7251. Howse, Eric. 1981. Seventh-day Adventist work with soyfoods worldwide (Interview). Conducted by William Shurtleff of Soyfoods Center, Feb. 12. 2 p. transcript.
• ***Summary:*** Howes was the International Director at the General Conference in Washington, DC, until he retired. Soyfoods are a rapidly growing component of Adventist food work worldwide. Discusses: Sanitarium Health Food Co. in Australia, DE-VAU-GE in West Germany, Granose Foods in England. A major new component is low-cost extruders making TVP. Address: 6471 Penn National Drive, Fayetteville, Pennsylvania 17222. Phone: 717-352-7239.

7252. Sheraton, Mimi. 1981. Restaurants: Tempura treats, a neighborhood spot. *New York Times.* Feb. 13. p. 58.
• ***Summary:*** This is a review of Inagiku, a Japanese restaurant inside the Waldorf-Astoria at 111 East 49th St. They serve "soba (cold buckwheat noodles enlivened with soy sauce and scallions),..." and "small dishes such as nimono, a combination of simmered vegetables and bean curd [tofu]..." Also teriyaki fish.

"At one dinner we asked a waiter for natto, a cool side dish of fermented soybeans in a spicy, eggy sauce..."

7253. Hesseltine, C.W. 1981. Aflatoxins in soyfoods (Interview). *SoyaScan Notes.* Feb. 18. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Concerning the 1969 *Time* magazine article on aflatoxins in homemade miso and soy sauce in Korea–There is a lot of incorrect information in the literature based on a problem with determining aflatoxins, since not all things that fluoresce are aflatoxins. A test for fluorescence needs to be followed by a chemical test. He found that one-third to one-half of all oats sampled in the USA contained fluorescent material that looked like aflatoxin–but was not. The oats were fed to animals and no problems resulted.

A study in Japan showed that when homemade miso was properly inoculated, it contained no aflatoxins, but when inoculated with natural spores, it did contain some aflatoxins. He has never seen any figures on the aflatoxin content of the latter miso. He has seen no evidence to indicate that there are problems with aflatoxins in naturally inoculated homemade misos. Good studies conducted in Japan have found aflatoxins in homemade miso but they were found only in a few samples and the levels were so low that there was no problem. No aflatoxins have ever been found in commercial misos as far as he knows. In short, he feels there is no risk is consuming any type of miso.

Dr. Hesseltine is now on a low-sodium diet and has therefore started eating a lot of tofu. In addition, he and Dr. Wang are conducting an interesting study on microbial spoilage of tofu. Address: NRRC, Peoria, Illinois.

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7254. Yoshimura, Sam. 1981. Re: Chronology of work at Madison Foods and reminiscences. Letter to William Shurtleff at Soyfoods Center, Feb. 20. 2 p. Typed, with signature.

• ***Summary:*** 1937-1943. Sam attended Madison College and received a B.S. degree in nutrition in 1941. "At that time extensive study on soy beans and human nutrition was conducted at the college under the direction of Francis Dittes, (Ph.D. in nutrition) Phillip Chen, (Ph.D. in chemistry) and Perry Webber (Ph.D. in nutrition). Madison Foods (owned by the college) was manufacturing various canned and dried vegetable protein products including Kre-O-Soy (soy milk) and Cheze-O-Soy (seasoned tofu) and marketed them nationally. I received valuable experience working in the food plant.

1943-1946. Sam went to Emmanuel Missionary College located in Berrien Springs, Michigan (now renamed Andrews University), and received a B.S. degree in agriculture in 1945.

1945-1956. Sam returned to Japan and re-established San-iku Foods (owned by the Japan Missionary College). The college was closed during World War II. The company made canned and baked products based on wheat and soy proteins and marketed them extensively, including at Mitsukoshi, Seibu and other department stores. A series of pilot scale tests of soy milk production was conducted under the direction of Dr. Harry Miller. However, they did not start commercial production due to the somewhat weak public response to the product.

1956-1963. He worked for Madison Foods in Tennessee, where he was responsible for managing the production, research, and development program. Various canned vegetable protein products were produced. Madison Burger based on wheat and soy protein and improved Cheze-O-Soy were well accepted by the market. At the beginning of 1962, production of Infa Soy using Dr. Harry Miller's formula, was started under the direction of his son, Willis Miller; J.B. Craw was general manager at that time.

1963-1964. Sam left Madison Foods and went to work for Madison Hospital (owned by the organization). He was assigned to develop economical vegetable protein products suitable for hospitals, schools and other institutions. A series of frozen products including the so-called "Sam's Chicken," made with wheat protein [gluten] and tofu, were formulated. The product was well accepted by institutions as it had a torn chicken-like texture. "It was a least expensive product. I understand a dish prepared with Sam's Chicken (supplied by Southern Missionary College) received recognition at the International Restaurant Show in Chicago several years ago.

1965 to present. He joined Worthington Foods after Worthington acquired Madison Foods. Worthington sent him to Africa Basic Foods Inc. in Uganda, East Africa, to assist development of soy protein products. During his 6-month stay the company produced soy milk, tofu, CSM (combination of corn, soy and powdered skim milk) and other high protein products for hospitals and the school lunch program. It was a missionary project for the company to take part in solving kwashiorkor problems. It was an unforgettable and rewarding experience for Sam. He is a staff member of the R&D department, especially assigned to develop new products. He is also a professional member of the Institute of Food Technologists.

For information regarding Krem-O-Soy and other products from the early days of Madison Foods, contact Dr. Register (Chairman, Dep. of Nutrition, Loma Linda Univ.) or Dr. Shirou Kunihara at the same university. They were students at Madison College and did R&D work for the food plant. The son of Dr. Philip Chen (deceased) is at the Weimar Institute, Box A, Weimar, California 95736. Address: 8200 Colonial Meadows, Westerville, Ohio 43081. Phone: 614-882-0625.

7255. Kawashima, Masao. 1981. Kôri-dôfu to shite no genryô daizu [Soybeans as raw materials for dried-frozen tofu]. *Daizu Geppo* (*Soybean Monthly News*). Feb. p. 9-21. [Jap]

Address: Habutae Tofu K.K., Kikaku, Kagaku Kenkyu-shitsu-cho, Kanazawa-shi, Ishikawa-ken 921, Japan.

7256. Shurtleff, William. 1981. Dr. Harry Miller: Taking soymilk around the world. *Soyfoods* 1(4):28-36. Winter.

• ***Summary:*** Contents: Introduction. Growing up (1879-1902): Birth, early contact with Dr. J.H. Kellogg, marriage. Early years in China (1903-1911). Washington, DC (1912-1925). Pioneering soymilk in China (1925-1939): Research, development of plant, destruction of plant 13 Aug. 1937, U.S. patent, No. 2,078,962 for soymilk process and equipment, work before return to U.S. Introducing soyfoods to America (1939-1949): In Mt. Vernon, new products, work with AMA, American Soybean Assoc. speaker and lifetime member 1958, contact with K.S. Lo and Vitasoy. Research and work around the world (1949-1977): Quick visit to Shanghai, death of second wife, sale of International Nutrition Foundation, Taiwan work, Indonesian plant, Trinidad, Libya, Japan, old age and relationship with William Shurtleff, the "Great Man." Contains 5 photos, and a sidebar titled "Early History of Soymilk."

Among the many people who pioneered in bringing soyfoods to America and to the West, two men of great vision, dedication, and perseverance deserve special mention: Dr. Harry W. Miller and William J. Morse. Dr. Miller, the well-known 'China Doctor'(after his biography by that title), was a world-famous missionary doctor and surgeon, and founder of more than 15 Seventh-day Adventist hospitals around the world. He was one of those unique individuals who was both a dreamer and a doer, and who inspired almost everyone who knew him.

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"Like W.J. Morse, he considered it his personal 'responsibility to awaken the West to the wonders of the soybean and to promote its use as food. (But where Morse was interested in soybean agronomy, livestock feeding, and food, Miller was interested only in food uses.) Dr. Miller can also be considered the founder of the modern soymilk renaissance in Asia. The development and popularization of soyfoods, and especially soymilk, was his lifelong hobby and despite his other numerous and demanding careers, he never lacked the time, over a span of almost 75 years, to continue his ongoing research and work in this new field that he loved so well.

"Growing Up (1879-1902): The first of five children of Amanda Ehlers and John Oliver Miller, Harry was born in a log cabin on a farm in the small town of Ludlow Falls, Ohio (just north of Dayton) on 2 July 1879. His father was a school teacher. He later wrote that he delighted in working on the family farm but found it 'disgusting' to have to kill and eat the animals he had raised. When he was 12, Harry's parents became Seventh-day Adventists. Two years later, after much study, at the annual camp meeting, he and a friend decided to be baptized and become Adventist church members.

"At age 15 Harry entered secondary school at the Adventist-run Mt. Vernon Academy in Mt. Vernon, Ohio. He loved the strict, puritan atmosphere, the vegetarian diet, and the teachings of the church. In 1898, at age 19, he enrolled in medical school at the newly opened, Adventist-run American Medical Missionary College in Battle Creek, Michigan, which was associated with Dr. John Harvey Kellogg's Battle Creek Sanitarium (founded in 1866), the largest and most progressive medical institution of its kind in America at that time, and the birthplace of modern dietetics. Opposing the popular cures of the day (drugs, bleeding, etc.), the sanitarium recommended diet (especially a simple grain-based vegetarian diet), exercise, hydrotherapy and good mental health as the foundations of healthful living and natural healing. These teachings had a lifelong effect on Miller.

"Working to pay his own tuition, room, and board, Miller led guided tours through the sanitarium and food factory, which forced him to learn more about the various foods (America's first meat analogs and breakfast cereals) and how they were made. Miller was deeply influenced by the personality and teachings of Dr. J.H. Kellogg, who personally taught a number of the classes Miller attended, treated him like a son, and helped put him through college. One of America's great pioneers of both nutrition and of soyfoods, Kellogg stressed to the small class the importance of preventive medicine, nutrition, and diet. He strongly opposed the use of alcohol, tobacco, caffeine, and narcotics. Miller later noted that almost all the students in the small class lived past the age of 90; Kellogg lived to age 91, Miller to 97½ and one classmate to 101.

"Miller graduated in 1902 and was married to a classmate-doctor, Maude Thompson, the same year. During an internship autopsy, Dr. Miller cut his finger badly and suddenly contracted systemic blastomycosis, an infection considered at the time to be fatal. With deep faith he prayed to God, promising that if he were to be healed, he would go anywhere in the Lord's service. To the astonishment of his doctors, Miller was miraculously healed. This greatly deepened his faith. Shortly thereafter a call came from the Adventist church for a missionary doctor in China. Miller accepted the challenge. For the rest of his life he prayed for his patients before all operations (minor or major), and, according to others, apparently his great faith was rewarded by their recovery.

"Early Years in China (1903-1911): In October 1903, Dr. Miller and Maude, together with another physician couple, sailed for China, stopping briefly in Japan. In Kobe, at the home of fellow Adventists, Myrtle Lockwood first introduced Miller to soyfoods serving an entree called Tofu Loaf, with which Miller was particularly impressed. In China the couple went deep into the interior, near the center of Honan Province, where they found great poverty and malnutrition. They both learned Chinese, dressed like the local people, and even adopted the hair style of a long queue and shaved pate. They also ate Chinese foods, and soon Miller was visiting local tofu shops, learning about and sampling tofu, yuba, curds, soymilk, and the like. He found that tofu was much more widely consumed than soymilk, although the latter was quite widely used as a spicy hot breakfast soup and a warm, sweetened beverage. Dr. Miller later said (1961) that many Chinese and other East Asians told him that they did not drink much soymilk since they believed it caused them intestinal disturbances, which tofu did not. Perhaps this was why soymilk was not generally fed to infants-and children.

"In 1905, Dr. Miller's beloved wife died suddenly of an unknown disease. He was 26. 0ut of his deep sadness grew an even deeper commitment to help the impoverished and suffering millions of China. After a brief return to America two years later, where he married Marie Iverson, Miller returned to Shanghai. Two daughters were born in 1908 and 1910. Then Dr. Miller contracted a severe unknown disease and was forced to return to America in 1911.

"Washington, D.C. (1912-1925): Miller eventually managed to heal himself of what he later learned was a vitamin deficiency illness called sprue. During recovery he taught the Bible at Mt. Vernon Academy, his former alma mater and in 1912 his first son. Harry Willis, Jr., was born. Soon he was called to the position of medical superintendent and surgeon of the Adventist-run Washington Sanitarium and Hospital, which he developed into a Mecca for congressional leaders of the day. He became consulting physician to three U.S. presidents. In Washington he pioneered new techniques of thyroid goiter surgery, which lowered fatalities from 50

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percent to about one percent. He eventually performed over 6,000 goiter surgeries around the world. In Washington he also met Dr. W.J. Morse and Dr. J.A. LeClerc, both soy pioneers from the USDA. He later wrote that these men filled him with 'inspiration, enthusiasm, and information,' and both later made frequent visits to Miller's soymilk plant in Ohio. In 1915 a fourth child, Clarence, was born.

"Prior to 1917 the Sanitarium had used a lot of dairy products on its vegetarian menus, but in that year, with World War I under way, all milk supplies from the local dairy were requisitioned by the Walter Reed Military Hospital. The sanitarium bought its own herd, but the problems that Miller found with contamination, animal disease (tuberculosis), and the like, convinced him of the need to develop a good alternative to dairy milk. In the small food plant connected with the hospital, where several soyfoods were already being produced for use in the lacto-vegetarian diet, Miller began a few basic soymilk experiments in 1925." Continued. Address: Lafayette, California.

7257. Shurtleff, William. 1981. Dr. Harry Miller: Taking soymilk around the world (Continued–Document part II). *Soyfoods* 1(4):28-36. Winter.

• ***Summary:*** Continued. "Pioneering Soymilk in China (1925-1939): In 1925 Miller accepted the church's invitation to return to Shanghai to develop a network of Adventist health care facilities, the first of which was the Shanghai Sanitarium and Hospital, which opened January 1, 1928, with Dr. Miller as medical director. Deeply touched by the high infant mortality rate caused by malnutrition, Dr. Miller began again in 1926 to turn his attention to soymilk, working on it steadily in his spare time at a small food plant located behind the hospital building. A growing number of orphaned infants began to appear at the hospital. Their only hope of finding food was to find a wet nurse or to be fed cow's milk, which was very expensive in China and which not all infants tolerated well.

"Dr. Miller was determined to develop a soymilk that had good flavor and digestibility, could be formulated to nutritional equivalency to mother's milk, was low in cost, and had a good storage life. Preparing his soymilk at the small soy plant in the typical Chinese way, with cold extraction of the soymilk from the okara, followed by cooking, he began to study ways to remove the beany flavor and make the soymilk more digestible.

"On his medical travels in other parts of China, and in Korea and Japan, he visited tofu shops and studied their methods. He believed that the beany flavor resulted from natural oils in the soybean; perhaps if the soymilk were spray dried and then reformulated with fresh soy oil, the flavor would improve.

"In the early 1930s, returning to America on furlough, he purchased the necessary equipment for a small soy dairy and had it shipped to China; a motorized stone mill, an American extractor, and a small homogenizer. Soon he was making improved formulated soymilk for the babies, patients, and staff at the Shanghai Sanitarium. The Chinese, too, liked the flavor. Some friends cajoled that it was 'undignified for a talented surgeon to be always playing around with beans.' Miller was undaunted, yet the beany flavor persisted.

"One day, in the mid 1930s, the breakthrough came as he was standing in the kitchen of the compound working with slurry from a tofu maker. He later wrote: 'I heard a divine voice behind me that said "why don't you cook it longer with live steam?" No one had ever thought of that before. Soon the staff and patients noticed the improved flavor and digestibility, and he added some soy oil or peanut oil during homogenization to make it even better. With new enthusiasm he began more baby feeding experiments. Soymilk was added to what was called the sanitarium's 'Universal Diet,' which also included whole wheat bread and half polished rice, plus other soyfoods. During a trip to the Philippines at this time he learned from refiners of coconut oil that steam distillation and flash pasteurization improved flavor of foods containing fats by driving off volatile oils and gases.

"So promising was the new product that Miller began to move forward on three fronts: controlled feeding studies on infants, establishment of a commercial soy, dairy, and application for a U.S. patent. In 1932 Dr. Miller had established the Vetose Nutritional Laboratory for furtherance of his research. For two years (1936-37) he fed formulated soymilk to several hundred small children at the Shanghai Clinic, running control tests with fresh cow's milk and various types of American and European prepared baby foods. The study turned out well and the results were published in the April 1936 issue of the prestigious *Chinese Medical Journal*, an English-language publication read widely in the U.S. and China. Here it was officially noted that babies could be nourished from birth fully as well with soymilk as with animal milks. This led to increased interest in the product. Dr. Miller later wrote: 'I regarded that work as of far greater importance than the building up of the sanitarium because it had to do with the preservation of thousands of lives that otherwise would be lost if they did not have a proper substitute for mother's breast milk, since cow' milk is beyond the economic level of the Chinese people and almost all Oriental races.' In later years follow-up infant feeding studies were done by other researchers using Dr. Miller's soymilk at the Indigent Hospital in the Philippines, at Tokyo University, and at Ohio State University at the Children's Hospital in Columbus, Ohio.

"In January 1936 Dr. Miller and his oldest son, Willis (who did much of the plant design and equipment construction and was the production manager), opened a full-scale soy dairy, the first of its kind in the world, on Pingliang Road in Shanghai, not far from the Shanghai clinic. The milk was cooked with live steam in open-top kettles. Soon a fresh

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liquid beverage, called Vetose Soya Milk, was available in natural, chocolate, and acidophilus flavors, in half-pint and quart bottles. The tangy acidophilus, cultured, bottled (but not sterilized) and delivered chilled was a real favorite. Ice cream was sold to institutions and meat analogs were under development. Production skyrocketed, doubling each month. Eventually the entire city of Shanghai had a soymilk route with thousands of families receiving door to door deliveries (by three-wheel pedicycles with carts behind them) of 3,000 quarts and 4,000 half-pints a day. The commercial product sold for less than dairy milks and cost less than one-fourth as much to produce. The soymilk proved so successful that it was soon included in rations for the Chinese army. A system for making dehydrated soymilk was also set up using a locally made Grey Jensen spray dryer; the government planned to use the dehydrated soymilk in rations that were lighter in weight and could be stored longer.

"But the Japanese were now invading China and on August 13, 1937, just eight months after the plant opened, it was totally destroyed by Japanese crossfire and bombs. (At the same time another soy dairy was being run by Julean Arnold of California and Nellie Lee, a Chinese, both of the China Nutritional Aid Council, in Dr. Fu's Children's Hospital in Shanghai. They provided their soymilk to 25,000 to 37,000 refugee children a day and distributed millions of biscuits containing 40 percent okara from their soy dairy.) The Japanese occupied Shanghai in November, 1937, and soon thereafter the Shanghai Sanitarium was closed, to become a refugee center. The political situation forced Miller to leave Shanghai.

On May 4, 1937, while his Shanghai soy dairy was still in full swing, Dr. Miller was awarded U.S. Patent No. 2,078,962. He introduced methods for eliminating beany flavor, and for the use of a centrifuge, and an homogenizer. In the patent he referred to his product as 'vegetable milk;' however subsequent pressure from the powerful dairy industry and the USDA convinced him to Latinize the name to Soya-Lac. This term was first used in late 1939 for Miller's first American soymilk; the spelling had been changed to the present one-word Soyalac by September 1941.

"Miller's patented process was as follows: Soak 1 part by weight of soybeans in 8 parts of water at 60 to 75ºF for 6 to 10 hours. Grind well in a burr mill, adding a little water while grinding, to produce a mixture of 20 gallons water and 25 pounds ground beans. Extract the soymilk through a fine cloth in a centrifuge at 2,500 RPM in either of two ways: (1) before heating; or (2) after bringing to a boil, stirring constantly, in a caldron and simmering briefly. Now to the simmering soymilk add 7 pounds each grain sugar (dextrose, maltose) and oil plus 3 ounces salt. Return to the boil and simmer, stirring constantly, for 30 to 60 minutes, or until the flavor changes from 'beany' to 'nutty.' Homogenize in a colloid mill or homogenizer to give a milk containing 3.5 to 4 percent protein and 5 percent fat. Cool, bottle, and refrigerate, or dehydrate.

"From late 1937, Dr. Miller was in Hankow-Wuhan establishing the Wuhan Sanitarium Hospital, where he also had a small soy dairy. Eventually over 15,000 Chinese refugees, escaping the Japanese troops in the north, filled the hospital compound. Finally in January 1939, as the war got too hot, Dr. Miller left China and returned to America in April of that year." Continued. Address: Lafayette, California.

7258. Shurtleff, William. 1981. Dr. Harry Miller: Taking soymilk around the world (Continued–Document part III). *Soyfoods* 1(4):28-36. Winter.

• ***Summary:*** Continued. "Introducing Soyfoods to America: Undaunted, Dr. Miller returned to the U.S., convinced that soymilk was destined for worldwide acceptance. He decided to settle in Mt. Vernon, Ohio, where he had formerly gone to school and later taught. Dr. Miller's oldest son, Willis, had returned from Shanghai after the plant there had been destroyed and in 1938 started his own business, Miller's Soy Foods, in Utica, New York. Later that year it moved to Washington, DC, and was successfully marketing canned soymilk, okara spreads, and gluten cutlets.

"When Dr. Miller returned to the U.S. he suggested that he and his son go into business together; Willis liked the idea. Working with his son, Dr. Miller set up a company called the International Nutrition Foundation and then began searching for a suitable site in Mt. Vernon for their new soy dairy. Soon they found a 140-acre farm, containing a number of fine springs, located several miles outside of town–and for the remarkably low price of $7,000. Dr. Miller borrowed money from his brother Clarence to purchase this farm, then moved into the one large house on the property. Willis moved his soyfoods equipment from Washington, DC, into a garage near the house and got the plant running while the new buildings were being built. In April 1939 Clarence, Dr. Miller's second son, left his job in Washington, DC, and went to Mt. Vernon to help with the work; he later became accountant and treasurer of the soy business. To help raise money for the soymilk operation, Dr. Miller set up a private part time medical practice, with an office in one wing of the local hospital. Although he had very little money, Dr. Miller made plans for a 60- by 130-foot building, which he planned to enlarge later by adding a second story. A local high school had been recently torn down and he obtained all the bricks for free if he would haul them away. So each evening after his medical work was done, Dr. Miller and his sons trucked the bricks over to their land, cleaned them, and built the new soy dairy building. The surgeon's skilled hands were not too delicate for the rough work. The original building still stands strong; today it houses the office, lab, and pilot plant where Loma Linda still makes Soyalac.

"The new plant was completed in the fall of 1939 and

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the first products, canned Soya Lac (made in a pressure cooker and fortified with vitamins and minerals) and Soy-A-Malt were available late that year; powdered Soya Lac was first produced in 1940. But contrary to Miller's expectations, the American public was simply not ready for soymilk; acceptance was painfully slow. He decided that, in order to survive, he would have to develop new products, try to get his soymilk approved by the American Medical Association, and, in the meantime, sell his soymilk and related soyfoods to ready markets in East Asia.

"With his typical boundless energy, Dr. Miller, now 61 years old, started by setting up a plant near the soy dairy to can fresh green soybeans of the tasty, large-seeded or vegetable variety, which were grown on the farm. Partially because of the mushrooming growth of interest in soyfoods during World War II (due to the rationing and high prices of meat, milk, eggs, and cheese), these found a ready market and became his most profitable product, with 40,000 cases a year being sold at supermarkets and health food stores around the Midwest by 1943. The company's best selling product (which was not as profitable due to the high production costs) was Miller's Cutlets, a canned gluten entree. He began to develop other meat analogs similar to those developed initially by Dr. J.H. Kellogg at Battle Creek. He now perfected his acidophilus soymilk but sold it only to the local Mt. Vernon hospital since he did not want to kill the culture by sterilization required for long distance distribution. (In 1934, Kellogg had patented a similar acidophilus soymilk.) He made tofu from his basic soymilk and did extensive experiments, working with Ohio State University, in making a fermented tofu cheese; tofu was pressed as hard as possible, inoculated with Cheddar microorganisms, then allowed to ripen. The product was fairly good but often excess moisture in the tofu led to the growth of unfriendly bacteria. Next came a soymilk ice cream. Dr. Miller put all of his medical income into the soyfoods business and by 1940 the company was producing an exciting line of vegetarian soyfoods and meat substitutes, sold nationwide, mostly at health food stores. A pamphlet of that year lists the following, all sold under the brand name 'Miller's': Soya Lac, a liquid soymilk in natural and chocolate flavors sold in 13 ounce and 30 ounce cans. Soy-A-Malt, spray dried soymilk in natural and chocolate flavors in one-pound cans. Soya Sauce, produced in South China. Soya Curd, made by coagulating Soya Lac with lactic acid to make curds, then blending this with tomato puree, pimento, and soy sauce. Soya Loaf, made from a seasoned mixture of okara (soy pulp and gluten). Soya Spread, for sandwiches, also made from okara and sold in 16-ounce jars. Whole Soya Bean Flour, a naturally alkaline full-fat soy flour. Green Soya Beans, canned, vegetable type. Giant Soya Beans, cooked and canned mature vegetable-type soybeans, and Soya Beans with Tomato Sauce, edible soybeans canned with tomato puree and malt.

"Products added years later included Vegetable Chili Con Carne and Vegetable Chop Suey, both sold in 16-ounce jars with wheat gluten used in place of meat. In 1942 Kellogg's Battle Creek Food Company had a similar line of soyfoods: Soy Protose (a meat analog), Soy Gluten Wafers, canned Green Soybeans, Soy Flour, Soykee (soy coffee), and Soy Acidophilus. A few years later Dr. Miller developed Vege-Links, the world's first meatless wiener, made of seasoned okara and wheat gluten packed in a sausage casing, and Vege-Chee, a cheese analog made of curdled soymilk."

Note: This is the earliest English-language document seen (Oct. 2013) that uses the term "cheese analog" to refer to a Western-style soy cheese.

"During the years that he was developing new products, Dr. Miller made countless trips to the American Medical Association trying to convince them that the research he had done in China proved that his Soyalac was an acceptable substitute for dairy milk in feeding both infants and adults. But the AMA, apparently strongly influenced by the dairy industry, refused to grant any recognition to the product. Finally, after one fruitless trip, a member of the board took Dr. Miller aside and explained frankly that he would never get endorsement for his product unless he started to market his product specifically for that 7 percent of U.S. infants who are allergic to cow's milk, and avoided unfriendly comparisons with cow's milk. Dr. Miller was not too pleased, since he had hoped that soymilk would gradually replace cow's milk in the American diet. He felt that soymilk made much more efficient use of the world's land to feed people, and that it was a lower cost, more healthful product of comparable nutritional value. Yet he reluctantly accepted the AMA's advice and within a few months had their approval. Soyalac began to be prescribed by physicians for allergic infants and soon started to sell quite well." Continued. Address: Lafayette, California.

7259. Shurtleff, William. 1981. Dr. Harry Miller: Taking soymilk around the world (Continued–Document part IV). *Soyfoods* 1(4):28-36. Winter.

• ***Summary:*** Continued. "From 1939 to 1941 most of Miller's powdered soymilk and some of his other soyfoods were sold in the Philippines and China. However World War II cut off his business, so he began to promote his soymilk more vigorously in the U.S. not only as an allergy-free infant formula that would not clog the nipple, but as a healthful beverage that alkalized the bloodstream and was good for diabetics, postoperative patients, ulcer and colitis patients, and those with atherosclerosis.

"Before World War II started, Dr. Miller had set up a branch of his International Nutrition Laboratory and a Soymilk plant in the Philippines at 41 Nagtahan in Manila. It was run by Paul Sycip (pronounced SIS-up), a private Chinese Christian (but not Adventist) businessman, who had come briefly to Mt. Vernon to learn Miller's process, and

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buy equipment. Miller was in the Philippines helping to set up the plant when the Japanese attacked. During the war the Japanese stole all of the soymilk equipment but did not harm the building. In 1948 Mr. Sinclair Pinnick, a foreman at the Mt. Vernon plant since 1944, went to the Philippines, took new equipment, and got the plant reestablished. It produced regular soymilk, the first ever in the Philippines.

"The expanding success of Soyalac encouraged the growth of competing products but Dr. Miller didn't mind. A true evangelist, he was happy to see the message finally reaching the people.

"To fully appreciate Dr. Miller's great energy and diverse talents, we should note that during the early 1940's, as he developed, produced, and marketed his line of innovative new soyfoods, he also maintained an active medical practice, partially because the other two doctors at the hospital where he worked were called for military duty, and partially to support his work. Prior to World War II he would fly to the Philippines about once a year, do 12 to 15 thyroid surgeries a day for two to three weeks, give half of his income to the hospital there, then return to America with the balance. In 1942 he and his brother bought the local hospital in Mt. Vernon where he worked; his son Clarence came in to manage, renovate, and expand it. Miller was the only surgeon in Knox County (population 35,000).

"At his Mt. Vernon soy dairy, Miller was always the first one to start the day's work. One day, while experimenting with a new formula, he cut off end of his finger in a food grinder. He calmly picked up the severed part, walked into his office, and sewed it back on.

"During the years he spent introducing soyfoods to America, Dr. Miller was one of the most active supporters of the American Soybean Association, a regular speaker at conventions and contributor of articles to the Soybean Digest. His first speech was "The Role of the Soybean in Human Nutrition" (1940) and his first article "Soybeans and the Orient" (1943), was followed by "Feeding the World with Soya" (1946), "Survey of Soy Foods in East Asia" (1948), and others. Then in September 1958 he was made an honorary member of the Association and awarded a gold medal.

"By the late 1930s the seeds that Dr. Miller had planted in East Asia began to sprout. It is interesting to note that most of the remarkable expansion of interest in and production of soymilk that has taken place throughout Asia during the last half of the twentieth century can trace its origins directly back to the work of Dr. Miller.

"While Dr. Miller was in Shanghai, an Adventist named Howard Hoover had come and learned the soymilk process, then started his own soy dairy and health food plant in a mission school in Canton in about 1938. This was the first offshoot.

"In 1940 Mr. K.S. Lo of Hong Kong asked Hoover if he would help him set up a plant. Hoover got approval from Miller, then went to Hong Kong and designed Lo's first plant. [Note: K.S. Lo recalls the origin of has company quite differently; we accept his version of the story]. By 1940 Lo's Hong Kong Milk Factory was making homogenized soymilk and selling it in natural and chocolate flavors, like dairy milk, in standard half-pint bottles sealed with a paper cap and hood. The soymilk was sweeter and a little thinner than Miller's and had more of the natural (so-called beany) flavor, which the Chinese prefer. By 1942, when the Pacific War broke out, Lo's company had gone broke. But in 1945, after the war, the company reopened as the Hong Kong Soya Bean Products Co., Ltd, and reintroduced their product, now called Vitasoy, not as a milk substitute, but as the world's first soymilk soft drink. By 1974 Vitasoy passed Coca Cola to become Hong Kong's best selling soft drink, with sales of 150 million bottles a year. In the meantime many other large soymilk plants had started up in Singapore, Malaysia, and Thailand.

"In 1948 the Chinese Quartermaster Department, with the help of Dr. Miller's son, Willis, set up the largest soymilk plant in the world in Shanghai, using a process patterned after that used in Ohio, to make spray-dried soymilk. Costing over $1,000,000, it had a capacity of 5 tons of dry soymilk every 12 hours. The dried soymilk would be mixed with puffed rice, pressed into wafers, and packed into cans, then opened in the field and soaked with hot water for rations. The plant was completed and ready for operation (Dr. Miller was at the dedication ceremony) just prior to the Communist takeover of Shanghai in 1949.

"Research and Work Around The World (1949-1977): In 1949, at age 70, Dr. Miller accepted the invitation of the Adventist church to take over the direction of the Shanghai Sanitarium and reestablish a soy dairy there. China was in the throes of revolutionary war and Shanghai was still held by the Nationalist forces. A daring pilot dropped Miller at the besieged Shanghai airport, hardly pausing to stop. But Shanghai fell to the Communists in May 1949; Miller was soon evacuated, and returned to America.

"In 1950 Dr. Miller's second wife died. Shortly thereafter he decided to sell his Mt. Vernon business. There was the increasing pressure of running a food plant and although sales were good ($1.25 million gross in 1950) profits were only $120,000 due to high taxes. He wanted to devote more of his time to research and medicine. Although offered a large sum of money by a private company outside the Adventist denomination, he decided to divide the company into two parts, the meat analogs and the soymilk plus related products, and sell these to Adventist-run firms. In June 1950 he sold the meat-analog part of his business (gluten meats, nut loaves, frankfurters, etc.) to Worthington Foods in Worthington, Ohio, a private company owned by Adventist laymen that had been making meat analogs since 1939. They bought the patents, recipes and formulas, equipment, technology, and good will that went with Miller's

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meat analog business. Most of these analogs contained no soy. Worthington kept the brand name "Miller's" for several years thereafter as they sold Miller's Cutlets, Miller's Burger, Miller's Stew, Vege-Links, and the like. Willis Miller worked with Worthington for some time after the sale.

"In early 1951, Dr. Miller sold the rest of his business at a very low price (book value) to Loma Linda Foods of Riverside, California. This sale included the Mt. Vernon land, buildings, equipment, technology, and recipes and formulas for soymilk, canned fresh green soybeans, Vege-Cheese (a canned tofu cottage cheese) and related products. All these products continued to be produced in Ohio. Loma Linda Foods, an integral part of the Seventh-day Adventist Church, was founded in 1906 and had run a plant in Riverside making meat analogs, soymilk, and other foods since 1936. Dr. Miller had always believed that the process for making soymilk was not something that he had originated; the key to it had been a gift to him from a higher power. Thus, he felt it was simply not his to sell. So he gave the process to the Adventist church but sold the rest of the business to Loma Linda Foods (they operate the Mt. Vernon plant to this day), and loaned them the money to buy it. They paid him in installments and he returned half of the money to them for them to set up laboratories and a pilot plant in their headquarters at 11503 Pierce Boulevard in Riverside (the town was then called Arlington). Here he established the International Nutrition Research Foundation, which he further endowed heavily with his own funds; 95 percent of its future research was on soyfoods. He bought a home nearby. For the three years following his wife's death he worked intensively on soyfoods research. In 1951 Loma Linda first introduced Soyagen, a lightly fortified soymilk for adults to match their Soyalac for babies. Miller did extensive work on further eliminating the beany flavor from soymilk using a vacuum pan and flash pasteurization. By 1958 his labs had developed new and improved soymilks, soy cream, improved acidophilus soymilk and ice cream, cottage cheese, a soy-cream cheese spread, cholesterol-free cheese, and a non-dairy margarine." Continued. Address: Lafayette, California.

7260. Shurtleff, William. 1981. Dr. Harry Miller: Taking soymilk around the world (Continued–Document part V). *Soyfoods* 1(4):28-36. Winter.

• ***Summary:*** Continued. "In 1953, at the age of 74, he married for a third time (his wife was about 35) and shortly thereafter was asked to establish an Adventist Sanitarium in Taipei, Taiwan. With it, of course, he started a soy dairy at a school, which supplied the school, the Sanitarium, and the surrounding community with soymilk daily. In 1956, when it came time for Miller to leave Taiwan, Generalissimo Chiang Kai-shek personally gave him China's highest award, the Blue Star of China, in appreciation for his tireless service to the people of China in saving the lives of thousands of infants with the use of soymilk and in establishing some twelve sanitarium-hospital clinics. At the time, the Generalissimo, who had been a former patient of Dr. Miller's, recalled how he had become so fond of the sanitarium's soymilk that he had once sent his private plane over 1,000 miles to Shanghai to replenish his supply.

"In 1954 the World Health Organization became interested in Miller's work with soymilk. His oldest son, H.W. (Bill) Miller supervised the construction of a joint FAO / UNICEF soymilk plant in Yogyakarta, Java, Indonesia, which opened in 1957 and produced about two tons a day of a spray-dried soymilk called Saridele.

"After filling in for other surgeons in Trinidad and Libya from 1956 to 1957, Miller went to Japan in 1957 to spend seven months as medical director and surgeon at the Tokyo Sanitarium-Hospital. He was now 79. Despite his busy medical routine, he found time to set up a small soymilk pilot plant in the hospital kitchen where they made soymilk, soy whipping cream, soy ice cream, and soy spread, which were served to the staff and patients. In cooperation with the Japanese Ministry of Health, he then developed the concept of helping existing small tofu producers to set up a soymilk operation right in their shops by adding on a boiler, pressure cooker, homogenizer, cooler, and bottler. The equipment could be installed for less than $2,000 and would enable each plant to produce 150 pounds of tofu and 200 gallons of soymilk a day using three trained workers. Miller personally helped at least one small rural tofu shop set up such a system; their soymilk was sold fresh and hot or cold and bottled for half the price of fresh dairy milk.

"Starting in about 1955 Dr. Miller began to recommend that the Adventist-run Japan Saniku School serve soymilk instead of cow's milk to the students; however the staff hesitated because of questions about its nutritional value and flavor. In 1957 two Japanese Adventists, Mr. Hidekazu Watanabe and Mr. Hanzo Ueda (who ran a tofu shop at the time) started making Japan's first soymilk on a small scale in Hachioji, Tokyo, bottling it in 180-ml bottles, and selling it locally. Mr. Watanabe later described the great value to them of Dr. Miller's ongoing technical, nutritional, and spiritual guidance.

"After some time, directors of the Saniku School visited the small soymilk plant, liked the soymilk flavor, and understood its nutritional value. In 1959 they bought similar equipment, set up a small plant in the school, and started to produce soymilk, which was bottled in 180-ml bottles and served to the students at every meal. In 1969 the Saniku School set up an independent food production company called College Health Foods (which later became today's Saniku Foods) and through it, with the help of Loma Linda Foods in America, began to produce Soyalac soymilk infant formula. That same year, the Luppy Soymilk Company started and went on to produce Japan's first widely popular commercial soymilk.

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"By 1980 Japan's largest soymilk producers were Kibun Foods (33,000 pacs a day), Saniku Foods (23,000 pacs a day), Okazaki Marusan (23,000 pacs a day), and Mitsubishi Kasei (18,000 pacs a day), A typical pac is 200 ml (6.8 fluid ounces).

"Prior to 1960, a small soymilk plant similar to those established by Miller in Japan, was set up at the Adventist-run Mountain View College in Central Mindanao, Philippines. The college farm raised edible soybeans and the 700 students were served fresh soymilk each morning for breakfast and fresh tofu for lunch.

"In 1960 Dr. Miller again accepted the invitation of the Adventist church to start a new hospital, this time in Hong Kong. As always, it was accompanied by a little soymilk plant. By 1960 soy dairies had also been established in Hong Kong at the South China Union College and at an Adventist-run college in Bandung, Indonesia.

"Dr. Miller spent most of his time from 1960 to 1973 in East Asia. He practiced surgery until the age of 93. In 1961 his biography *China Doctor* by Raymond S. Moore was published by Harper & Bros. In 1963 Dorothea Van Gundy Jones in *The Soybean Cookbook* wrote: 'Certainly Dr. Miller has done more than any other person to introduce soybeans and soybean products, especially the milk, to the population of this country.'

"In 1973 Dr. Miller formally retired from medical practice and returned to California, where he spent the last few years of his life doing the work he loved so much: soyfoods research. He lived about one mile from Loma Linda Foods in Riverside, and he walked to work each morning. He continued his experiments with tofu and soymilk, making improved acidophilus soymilk, tofu-based cheese, and cheese spreads. He made a good tofu-based Cheddar cheese but could not make it melt. His later years were not as productive as they might have been since, in old age, he had lost most of his sense of smell; when he would ask others how new products tasted, they would often tend to flatter him instead of giving an honest and objective response. Yet this work was still of real potential value.

"In 1972 the Southern Asia Division of the Adventist church asked Mr. Pinnick of Mt. Vernon to go to India to set up a soymilk plant at their Spicer Memorial College in Poona. In March 1973 Dr. Miller flew over from Hong Kong to help the operation get started. Pinnick writes: 'He would work all day with us at the plant (at age 94) then spend nearly-every evening speaking to some group on healthful living. There seemed to be no limit to his endurance.'

"Starting in 1975, while in Japan, I exchanged numerous letters with Dr. Miller. He typed each letter himself and was always full of questions about new developments in tofu and soymilk production in Japan. In 1976 he sponsored and hosted a program about tofu and soymilk that my wife and I did for several hundred members of the faculty and community of Loma Linda University, La Sierra campus. During the day of our visit he took us through his pilot plant and described his latest experiments making tofu-based fermented cheese spreads. He seemed extremely alert and well informed.

"Dr. Miller died on New Year's Day, 1977, at the age of 97, just as he was getting ready to go to his beloved church.

"Harry Miller was a shining example of what the Chinese call 'The Great Man.' He dedicated his life to the welfare of all beings, human and nonhuman. He chose a life of voluntary simplicity, finding his real joy in giving. Close associates estimate that, in professional fees alone, he turned over some $2.5 million to the hospitals, church, and nutritional work with which he was connected. Spiritual values were at the center of his life. Though world famous, he was the most humble of men; though very busy, he had time for each person who needed him. His vision was fifty years ahead of his time. He left an indelible impression on the world. Would that he could he here with us now to see the blossoming of his work in America and around the globe.

"The author wishes to give special thanks to Dr. Miller's two sons, Willis and Clarence, and to Glen Blix, plant manager at the Loma Linda Mt. Vernon plant, for extensive information provided in interviews and letters. For a bibliography of Dr. Miller's publications, send a SASE to *Soyfoods* magazine." Address: Lafayette, California.

7261. Shurtleff, William. 1981. Early history of soymilk. *Soyfoods* 1(4):31. Winter.

• ***Summary:*** Note: This was published as a sidebar to the article "Dr. Harry Miller: Taking soymilk around the world."

"It is important to understand Dr. Miller's soymilk research, writing, and product development in their proper historical perspective.

"Soymilk is thought to have been developed in China by Liu An, King of Huai-nan in about 164 B.C. In most parts of China, soymilk has long been used as a spicy hot breakfast soup (*sien tou-chiang*) or as a warm, sweetened beverage (*t'ien tou-chiang*). Yet it had not traditionally been used as a substitute for mothers milk or cow's milk in infant feeding. and its nutritive value for infant feeding was virtually unknown. By 1923, as described with photographs by Piper and Morse in their classic, *The Soybean,* a soymilk factory in Changsha, China (p. 231) was selling soymilk in bottles, each sealed with paper, and carried in baskets suspended from shoulder poles. This was 13 years before Dr. Miller's soy dairy opened in Shanghai.

"The first known mention of soymilk in a Western publication was in 1895 by H.C. Prinsen Geerligs, a Dutch scientist who lived and traveled in Southeast Asia, and wrote an article entitled *'Einige Chinese Voedingsmiddelen Mit Soyabonen Bereid'* [Some Chinese Foods Made with Soybeans]. The first English-language article on soymilk, entitled 'Soybeans and Soybean Products,' was published by H. Trimble in 1896 in the *American Journal of*

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Pharmacology. In 1906 Katayama in Tokyo, Japan, wrote 'Condensed Vegetable Milk,' and in 1907 J. Rurah published the first article on infant formulas entitled 'The Soybean in infant Feeding' in *Archives of Pediatrics,* followed in 1910 by 'The Soybean as an Article of Diet for infants.' Some 30 journal articles had been published by 1928 and at least 66 by 1936. In 1926 Dr. Ernest Tso of the Peking Union Medical College published his first of many studies in English on feeding infants water-extracted soymilk. Entitled 'Soybean Milk–Infant Feeding,' it appeared in the *American Journal of Physiology.* He published five more similar studies prior to 1931.

"The first patent for soymilk was issued to Li Yu Ying in Britain in 1910. A German patent was issued to Goessel in 1911. The first U.S. patents were issued to Goessel (1913), Li Yu Ying (1913) and Monahan and Pope (1915); the latter was the first issued to American citizens. By the time Dr. Miller started his soymilk research in 1925, some 30 patents had been granted; there were 66 patents by the time Dr. Miller received his in 1936.

"Soymilk was being produced in the West as early as 1911, when a Chinese plant near Paris was reported to produce soymilk, fermented soymilk, tofu, soy sauce, soy flour, soy bread, soy preserves, etc. (Beltzer 1911). Allergy to cow's milk and lactose intolerance stimulated the development of the first soy-based infant formulas in the U.S. Most of these were made from soy flour and contained the fiber in the soymilk. In 1929 Mead Johnson Co. produced the first soy-based infant formula in America. Called Sobee, it was made from a mixture of full-fat soy and barley flours homogenized with olive oil, had a dark tan color and beany flavor, and contained many complex carbohydrates that led to intestinal gas (flatus) and poor-smelling stools, but in 1929 it was a godsend to infants allergic to cow's milk (Sarett 1976). Also in 1929 Dr. Ernest Tso in Peking published a nutritional study of Sobee, entitled 'A Vegetable Milk Substitute in North China,' in the *American Journal of Physiology.* (At this time Dr. Miller knew both Dr. Tso and Sobee well). The second commercial soymilk in America was developed by Dr. Julius F. Muller. In 1934, while director of allergy research for the Borden Company, he developed a soymilk product for his own child, who was highly allergic to dairy milk. in 1936-37 this liquid milk, made from homogenized soy flour, was introduced by Borden as Mull-Soy. In 1934 Dr. J.H. Kellogg received the first U.S. patent on a method for making acidophilus soymilk; Miller had produced a similar product in China in 1936.

"By 1935 Henry Ford was running a soymilk pilot plant near his main automobile factory in Michigan. By 1936 Loma Linda Foods was making soymilk in southern California. By 1938 Dr. Miller's son, Willis, was making canned soymilk in New York and Washington, DC, and in early 1939 Jethro Kloss had written *Back to Eden* containing many creative soymilk recipes and he may have been producing soymilk at his health food factory near Nashville, Tennessee... all this prior to Dr. Miller's introduction of Soyalac to America in the fall of 1939.

"Although it is clear that Dr. Miller was not the first to do research on soymilk, receive a patent, or produce a commercial product, he still deserves great credit for almost single-handedly popularizing the use of soymilk on a large scale around the world, especially for feeding infants suffering from allergies or malnutrition, for starting the first large scale commercial soy dairy in East Asia and assisting in the foundation of many subsequent ones, and for producing the first major commercial fiber-free soymilk in America, a product that was generally considered to be better tasting and less prone to clog nipples than the various flour-based products, although at least one set of tests showed it to have a significantly lower protein quality as measured by PER (Gyorgy 1962).

"Although Dr. Miller originally intended soymilk for general consumption, it has come to be most widely used in America for feeding babies. Today, the U.S. infant formula market is comprised of 75 percent dairy milk based products and 25 percent soymilk; Soyalac has only five to six percent of the latter market (all competing products are made from soy protein isolates). A full 75 to 80 percent of all Loma Linda's soymilk goes to feed babies." Address: P.O. Box 234, Lafayette, California.

7262. Tajiri, Takashi. 1981. Mamerui moyashi no saibi to sendo hoji ni kansuru kenkyû. IV. Mamerui moyashi no saibaichû no ganyu seibun no shôchô to shûkaku tekiki [Studies on cultivation and keeping quality of bean sprouts. IV. Suitable harvest time relative to the changes in nutritional components during cultivation of bean sprouts]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 28(2):79-84. [7 ref. Jap; eng]
• ***Summary:*** Soy, mung (*Vigna radiata*), and adzuki (*Vigna angularis*) bean sprouts were cultivated under optimum conditions. Vitamin C contents were at a maximum after 5 days in all 3 species, the majority of the vitamin being in the hypocotyl. Total protein and fat content fell rapidly in the 4-5 days after sprouting, but levels of both constituents were significantly higher in soy sprouts. The optimum sprouting time was concluded to be 4-5 days. Address: Lab. of Food Process, Faculty of Agriculture, Kinki Univ., Kowakae, 3-4-1 Higashi-Osaka-shi, Osaka-fu, 577 Japan.

7263. Tanaka, Teruo; Kawano, N.; Oshima, T. 1981. Cloning of 3-isopropylmalate dehydrogenase gene of an extreme thermophile and partial purification of the gene product. *J. of Biochemistry* (*Tokyo*) 89(2):677-82. Feb. [28 ref. Eng]
• ***Summary:*** "Amplification [purification] of specific enzymes has been achieved by the recent technology of recombinant DNA." This paper describes another method using a recombinant plasmid. The gene of an extreme

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thermophile, *Thermus thermophilus* HB8, which codes for a leucine biosynthetic enzyme, was cloned in *E. coli* using the recombinant plasmid, pBR322 as a vector. Address: Lab. of Biochemical Reactions and Biocatalysts, Mitsubishi-Kasei Inst. of Life Sciences, Minamiooya, Machida, Tokyo 194, Japan.

7264. Ohta, Teruo. 1981. Re: Answers to questions about natto. Letter to William Shurtleff at Soyfoods Center, March 4. 1 p. Handwritten, with signature on letterhead. [Jap]
• ***Summary:*** The six largest prefectures in Japan in terms of annual natto production and per capita expenditure.

(1) Ibaraki prefecture makes 27,000 metric tons/year. In Mito city the annual per capita expenditure on natto is ¥4,789.

(2) Miyagi prefecture makes 18,000 metric tons/year. In Sendai city the per capita expenditure is ¥2,569.

(3) Hokkaido prefecture (island) makes 9,000 metric tons/year. In Sapporo city the per capita expenditure is ¥2,375.

(4) Tokyo city (*Tokyo-to*) makes 4,500 metric tons/year. In Tokyo city the per capita expenditure is ¥1,737.

(5) Tochigi prefecture makes 2,700 metric tons/year. In Utsunomiya city the per capita expenditure is ¥3,028.

(6) Aomori prefecture makes 1,800 metric tons/year. In Aomori city the per capita expenditure is ¥3,894.

1. The character for natto first appeared in the Shin Sarugakuki (1058-68), by Fujiwara Akihira, however this concerned fermented black soybeans not itohiki natto.

4. Natto research was published in 1905 by Dr. Shin Sawamura.

5. The English translation of *kosokin* is *Bacillus subtilis.*

6. The English translation of *eiyo saibo* is "vegetable cell."

7. Dr. Hanzawa Makoto of Hokkaido University was the father of modern Natto production.

9. In *Daizu Shokuhin* Dr. Ohta states that the ratios of ingredients for making natto hishio are (by weight) natto 5, koji 4, and salt 1.

12. Today in Japan, most commercial natto makers use only one strain of natto bacteria, not two. Address: Tsukuba, Japan.

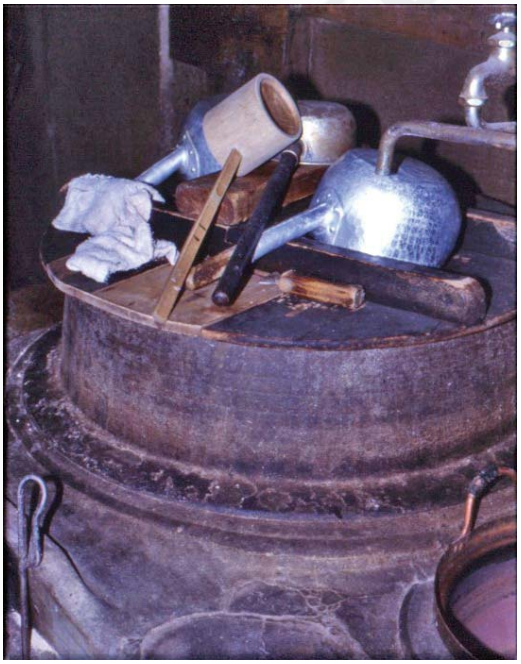
7265. Sheraton, Mimi. 1981. Restaurants: East side steak and side dishes of Japan. *New York Times.* March 20. p. C16.
• ***Summary:*** This is a review of the one-star Japanese restaurant Aikahana (at 1034 Second Ave. in New York City). Recommended dishes include "deep-fried bean curd with special sauce."

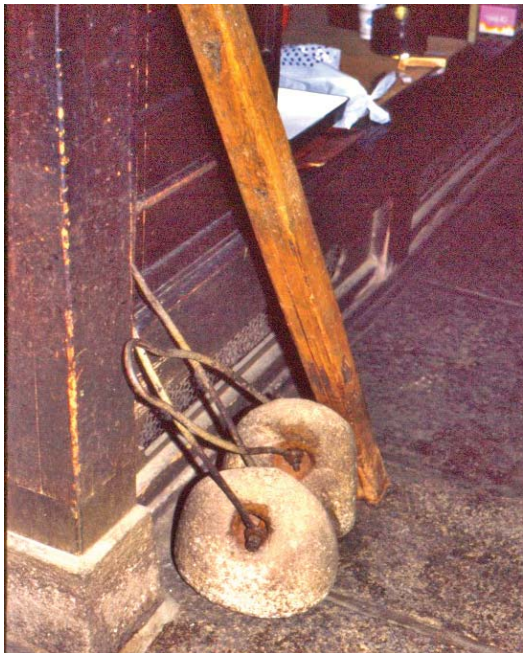
Aikahana "offers one of the most complete and interesting listings of the small side dishes that most Japanese restaurants reserve for their Japanese customers and rarely include on the English menus."

The writers favorite small side dishes include "squares of bean curd in ice water [chilled tofu; *hiya yakko*], which made them as firm and delicate as fresh farm cheese; bean curd fried in a fresh brown sauce with shrimp;..."

7266. Watanabe, Tokuji. 1981. Re: History of tofu in Japan. Letter to William Shurtleff at Soyfoods Center, March 29–in reply to inquiry. 2 p. Handwritten, without signature. [Jap; eng+]
Address: Kyoritsu Women's Univ., Tokyo.

7267. Barber, Linda. 1981. Report with color slides on trip to Yuba Han in Kyoto, Japan. Kobe, Japan. 1 p. Based on e-mail of Jan. 2012.





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• ***Summary:*** Linda took these color slides during a trip in 1981 to Yuba Han, an old yuba making company in Kyoto. She got the idea of visiting Yuba Han from *The Book of Tofu,* by Shurtleff & Aoyagi. Photos show:

(1) Top of a traditional caldron (with ladles, dippers and a water source) where soaked, ground soybeans are cooked. (2) Traditional stone weights and wooden lever used to press thick soymilk from okara in pressing sack. (3) From soybeans to yuba.

(4) Soymilk cooked in large flat pans. Film forming on top of milk. Film has been lifted off, drained and then rehung on dowels / long round sticks to dry. (5) Craftsman (yuba maker) taking off films of soymilk and preparing to stretch over dowels. (6) Craftsman standing between two double rows of simmering soymilk in steamy room. (7) Craftsman working on far side of two rows of yuba trays. (8) Fresh yuba and drying yuba hanging on dowels over frames in which yuba is forming. (9) Ditto. (10) Yuba hanging on dowels as it dries. (11) Flat pieces of dried yuba in a box, ready to be sold. (12) Fresh yuba used as a wrap around a filling of tofu and vegetables. Address: Resident Director of Practice House and Oral English Instructor, Kobe College, 4-1 Okadayama, Nishinomiya, Japan.

7268. Barber, Linda. 1981. Color slides taken at a small tofu shop in Kyoto where she worked for a month. Kobe, Japan. 1 p. Based on e-mail of 9 May 2012.

• ***Summary:*** Linda took these color slides in early 1981 in Kyoto, Japan, at a small neighborhood tofu shop (whose name she does not remember) where she worked for a month. The shop was owned and operated by a husband and wife under the same roof as their home.

(1) A 60-kg sack of whole soybeans grown in Japan. (2) Soaked and drained whole soybeans in a woven bamboo colander, with dipper, shortly before grinding. (3) Tofu shop utensils: Metal caldron and hand turned screw press for pressing soymilk from okara. (4) Tofu shop utensils: Wooden curding vat (foreground), metal pressing box (rear), and nigari in earthenware vessel on floor. (5) Mixture of simmering soybean puree and water rising in the caldron, ready to be stirred down by bamboo defoamer rod / whisk resting in bowl of defoamer (*awakeshi*). (6) Steaming cooked

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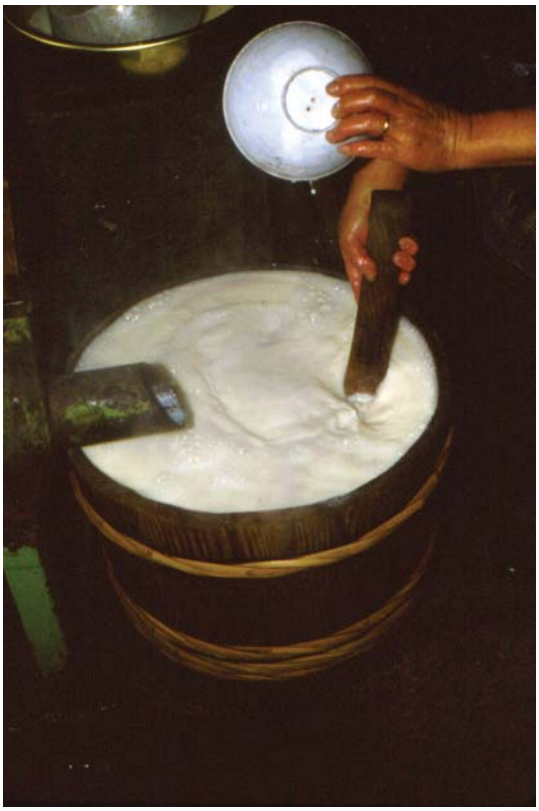

soy puree being ladled by from caldron into pressing sack. (7) Soymilk pressed from okara in pressing sack runs into wooden curding barrel. A new batch of soybean puree is cooking in the background. Forming cloths line perforated forming box in foreground. (8) Soymilk pressed from okara runs through fine-mesh straining cloth into wooden curding barrel. (9) Wife wrings last of soymilk out of straining cloth into curding barrel. (10) Stirring nigari coagulant into hot soymilk in curding barrel. (11) Ladle of soymilk curds in ladle set in cloth-lined forming box. (12) Curds pressed to make tofu, ready to be cut into cakes. (13) Tofu cut into cakes next to cooling sink. Address: Resident Director of Practice House and Oral English Instructor, Kobe College, 4-1 Okadayama, Nishinomiya, Japan.

7269. Fukushima, D. 1981. Soy proteins for foods centering around soy sauce and tofu. *J. of the American Oil Chemists' Society* 58(3):346-54. March. [41 ref]

• ***Summary:*** Contents: Abstract. Introduction. Soy sauce varieties: Koikuchi, usukuchi, tamari, saishikomi, and shiro shoyu. Soy sauce manufacturing process (for each of the 5 types). Miso. Other fermented products: Tempeh and natto. Tofu and related products: Regular and silken tofu, dried-frozen tofu, deep-fried tofu. Fermented tofu (Sufu). Other soy products: Soy milk, fermented soy milk beverages, yuba.

This paper discusses traditional Oriental soy protein foods which are growing rapidly in popularity in the USA among non-Asian-Americans.

"Generally speaking, soy sauce is divided into two groups: fermented soy sauce and chemical soy sauce. Fermented soy sauce has a long history as a human food, whereas chemical soy sauce has a history of only several decades. In fermented soy sauce, the proteins and carbohydrates contained in the materials are hydrolyzed very slowly under mild conditions below 30ºC for over six months, whereas in chemical soy sauce they are hydrolyzed quickly by hydrochloric acid at 80ºC for 8-10 hours. Chemical hydrolysis is a cheap and rapid process, but during the hydrolysis, various secondary reactions occur and produce undesirable compounds, e.g. dark humins, furfurol, dimethyl sulfide, hydrogen sulfide, levulinic acid and formic acid, which are not present in fermented soy sauce. Furfurol, dimethyl sulfide and hydrogen sulfide, which have strong, bad odors in themselves, are derived from pentose, methionine, and sulfur-containing amino acids respectively. Furthermore, tryptophane, one of the nutritionally important amino acids, is destroyed almost completely. As shown in Figure 1 [two chromatograms], the main organic acid of fermented soy sauce is lactic acid, whereas the main organic acid of chemical soy sauce is formic acid. Levulinic acid, present in chemical soy sauce, does not exist naturally.

"To improve the odors of chemical soy sauce, semichemical soy sauce was devised. It is made by hydrolyzing raw soybeans with a lower concentration of

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hydrochloric acid (7-8%) as the first step, followed by fermenting the hydrolysate with osmophilic yeasts in the presence of wheat koji." In Japan, chemical soy sauce is not used as a soy sauce in itself, but as an extender for fermented soy sauce.

Table 1 gives the typical chemical composition (per 100 ml) of the five varieties of traditional soy sauce in Japan, including Bé [Baumé; a measure of the relative density of liquids], sodium (koikuchi is lowest at 17.6%, usukuchi is highest at 19.2%), total nitrogen (koikuchi has 1.55 gm, tamari has 2.55 gm or 65% more), formol nitrogen, reducing sugar, alcohol (koikuchi is 2.2%, by far the highest), pH (ranges from 4.6 to 4.8), and color.

A brief description of each of the five traditional varieties: (1) Koikuchi: This "dark-colored" shoyu is by far the most popular of the five types of fermented soy sauce in Japan, comprising 85% of the total. It is an all-purpose seasoning with a strong aroma, complex flavor, and deep, reddish-brown color. These characteristics are mainly derived from the use of equal amounts of wheat and soybeans in the koji; (2) Usukuchi [light-colored] shoyu is characterized by a lighter, red-brownish color and a milder flavor and aroma. It is used mainly for cooking when one wishes to preserve the original flavor and color of the food itself. As in koikuchi, equal amounts of soybeans and wheat are used in the koji, but the fermentation is done under conditions which prevent the development of a dark color. (3) Tamari shoyu has a higher amino acid content, but it lacks aroma. The koji is made primarily from soybeans with little or no wheat. (4) Saishikomi (twice-fermented) shoyu is made using equal amounts of wheat and soybeans in the koji, but using raw (unpasteurized) soy sauce instead of salt solution, which is mixed with the harvested koji. Saishikomi is characterized by aroma and full-bodied taste. (5) Shiro (clear, or "white") shoyu is made by using a very high ratio of wheat to soybeans in the koji, and further by fermentation under conditions which prevent dark color development. It is characterized by a very light yellow to tan color, though the amino acid content is very low because of the low soybean content in the koji. Flow sheets (Figures 2-5) show the process for manufacturing koikuchi, usukuchi, and tamari shoyu. Each has three basic parts: Koji making process, brine fermentation process, and refining process.

Concerning soy sauce production and consumption: The total annual production of soy sauce in Japan in 1979 reported by the Japanese Agricultural Standard (JAS) was 1,252,431 kiloliters (kl). In 1979 in Japan, about 70% of the soy sauce products in Japan were purely fermented, 25% contained some semichemical soy sauce, and the remaining 5% contained chemical (HVP) soy sauce. The most recent estimates of annual consumption of soy sauce in the USA are as follows: Fermented soy sauce 17,850 kl; Chemical (HVP) soy sauce 25,500 kl. Within fermented soy sauce, production of koikuchi soy sauce is estimated to be 16,500 kl/year.

In Japan an "instant tofu powder" is actually a spray-dried soy milk. This product was made and introduced by *Nihon Tanpaku Kogyo* (Japan Protein Industry) about 15 years ago (ca. 1966) and was used mainly as a raw material for making regular or silken tofu in order to save time. "Recently, however [1973], the product was placed on the market as an instant powdered tofu [named *Hausu Hontôfu*] by Hausu [House] Foods Co."

Other figures show: (5) Manufacturing process of rice miso. (6) Manufacturing processes of soy milk used for making tofu, regular tofu, and silken tofu. (7) Manufacturing process of freeze-dried tofu (kori-tofu). (8) Manufacturing process of fermented soy milk beverage. *Lactobacillus casei, L. acidophilus,* and *L. bulgaricus* are usually used as starters. One such product recently appeared on the market in Japan.

A photo shows D. Fukushima. Address: Kikkoman Foods, Inc., Walworth, Wisconsin 53184.

7270. Hymowitz, T.; Kaizuma, Norihiko. 1981. Soybean seed protein electrophoresis profiles from 15 Asian countries or regions: Hypotheses on paths of dissemination of soybeans from China. *Economic Botany* 35(1):10-23. March. [30 ref]

• ***Summary:*** This is a remarkable, pioneering paper that presents new evidence, based on seed protein electrophoresis, concerning the paths of dissemination of the soybean from its place of origin in northeast China.

Soybean seed protein extracts from 1,603 accessions obtained from 15 Asian countries or regions (not including Japan) were analyzed for the presence of alleles of 2 proteins. The countries were: Northeast China [Manchuria] (661 accessions), Korea (417), India (219), south and central China (142), Thailand (34), Indonesia (33), Philippines (20), Taiwan (18) USSR (16), Nepal (14), Malaysia (13), Vietnam (5), Afghanistan (5), Pakistan (4), and Burma (2). Three alleles of the Kunitz trypsin inhibitor, designated as Ti-a, Ti-b, and Ti-c, are electrophoretically distinguishable from one another by their Rf values. The seed protein beta-amylase has 2 alleles, designated as Sp1-a and Sp1-b, which are electrophoretically distinguishable from one another by their Rf values.

About 94% of all accessions had a Ti-a allele. "Only the Korean and Central Indian soybean populations have a high frequency for the Ti-b allele. Within Korea, the soybeans from those districts that lie closes to Korea have a high frequency for the Ti-b allele whereas the soybeans from those districts that lie closest to China have a low frequency for the Ti-b allele. The Ti-b allele is not present in soybeans from the Philippines, Vietnam, Thailand, Malaysia, Burma, Nepal, Pakistan, and Afghanistan. Only 1 accession each from Taiwan and Indonesia have the Ti-b allele.

"The Sp1-a allele is not present in soybeans from Taiwan, Vietnam, Thailand, Malaysia, Indonesia, Burma, Pakistan, and Afghanistan. The highest frequency of the

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Sp1-a allele occurs in soybean germ plasm from northern India and Nepal.

Soybean germ plasm pools: "At present we recognize 7 soybean [germ plasm] pools (SGP) in Asia which are as follows: (1) northeast China and the USSR; (2) central and south China; (3) Korea; (4) Japan; (5) Taiwan and southeast Asia; (6) north India and Nepal; and (7) central India. The eastern half of north China, where the soybean emerged as a domesticate around the 11th century B.C. is considered the most probable center for dissemination of germ plasm...

"The soybeans from Asia (including Japan) were divided into 3 gene centers... The primary soybean germ plasm pool, or in Vavilov's terminology the primary gene center, is China... From the first century A.D. to the Age of Discovery, soybeans were introduced and land races were established in Japan, southeast Asia and southcentral Asia. These regions comprise the secondary gene center for soybeans... Japan should be considered a very active microcenter and northern India a passive microcenter within the secondary gene center.

"Central India may be considered a recent or tertiary soybean gene center. Another tertiary soybean gene center lies within the U.S., while incipient tertiary centers are being established in South America and Europe. The concept of primary, secondary and tertiary gene centers unifies time and space relationships with regard to the establishment of new genetic combinations within the species *Glycine max.* Another feature of this concept is that it establishes the foundation upon which future soybean germ plasm collection activities can be built."

Maps show: (Fig. 2) Korean peninsula divided into 9 districts showing geographical distribution of the Ti and Sp1 alleles. (Fig. 3) India, with 5 states outlined, showing geographical distribution of the Ti and Sp1 alleles. One of these states is Assam, which includes the Brahmaputra valley; soybeans analyzed from Assam contain no Ti or Sp1 alleles.

Paths of dissemination: Fig. 4 is a map on which an oval shows the primary gene center of the soybean in China (in the region about 200 miles southeast of Beijing, in the moist, low plain near the mouth of the Yellow River (*Huang Ho*), largely in Hopei and Shantung provinces) and on which arrows show the paths of dissemination of the soybean from China to Korea, Japan, Taiwan, Malaysia, Indonesia, and northern India. "By combining seed protein banding data with available historical, agronomic and biogeographical literature, we have developed an hypothesis concerning the dissemination of the soybean from China to other countries or regions in Asia. Our ideas are based partly upon the pioneering studies of Nagata (1960) who primarily used physiological and morphological data to point out possible paths of dissemination of the soybean from China to the rest of the world.

"In developing our hypothesis, we identified 2 major restraints concerning the movement of the soybean. One restraint is physiological and the other historical. Due to the fact that soybeans are day-length sensitive, they spread much easier between east and west than between north and south. Hence, in the dissemination process quantum latitudinal movement of soybeans was rare. Secondly, according to Ho (1975) the movement of the soybean out of its home area did not take place until the seventh century B.C. Therefore, the trial and error period for the adaptation, establishment and dissemination of the soybean from region to region within China, after the seventh century B.C., proceeded at a very rapid rate. As part of the dissemination process, the soybean was moved back and forth across geographical areas as a consequence of wars, famine, emigration, immigration, and trade.

"The suggested paths of dissemination of the soybean from the eastern half of north China to other regions in Asia are shown in Figure 4 and summarized below:

"1. The soybeans grown in the U.S.S.R. (Asia) came from northeast China.

"2. The soybeans grown in Korea are derived from 2 or 3 possible sources–northeast China, north China and the introduction of soybeans from Japan especially in the southern part of Korea.

"3. The soybeans grown in Japan were derived from the intermingling of 2 possible sources of germ plasm–Korea and central China. Most probably the first points of contact were in Kyushu and then the soybean slowly moved northward to Hokkaido. In addition the soybean moved southward from Kyushu to the Ryukyu Islands where they came in contact with the soybeans moving northward from Taiwan.

"4. The soybeans originally grown in Taiwan came from coastal China.

"5. The germ plasm source for the soybeans grown in southeast Asia is central and south China.

"6. The soybeans grown in the northern half of the Indo-Pakistan subcontinent came from central China.

"7. The soybeans grown in central India were introduced from Japan, south China and southeast Asia." Address: 1. Prof. of Plant Genetics, Dep. of Agronomy, Univ. of Illinois; 2. Assoc. Prof., Faculty of Agriculture, Iwate Univ., Morioka, Iwate, Japan.

7271. Kanda, H. 1981. Utilization and quality standards of vegetable proteins for foods in Japan. *J. of the American Oil Chemists' Society* 58(3):441-43. March.
Address: Nisshin Oil Mills, Yokohama, Japan.

7272. Manabe, Masaru; Goto, Tetsuhise; Tanaka, Kenji; Matsuura, Shinji. 1981. [The capabilities of the *Aspergillus flavus* group to produce aflatoxins and kojic acid]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 38. p. 115-20. March. [46 ref. Jap; eng]

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• ***Summary:*** "Recently, kojic acid was found to be mutagenic by the Ames test..." It is "generally known that koji-molds used in Japanese fermented food industries can produce kojic acid. Most strains of koji-molds are classified into the *Aspergillus flavus* group, specifically *Asp. oryzae."* Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7273. **Product Name:** [Meiji Sunglow Soymilk (Plain)].
Foreign Name: Meiji San-guroo Tônyû (Pureen).
Manufacturer's Name: Meiji Milk Products Co. Ltd. (Meiji Nyugyo).
Manufacturer's Address: Kyobashi 2-3-6, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1981 March.
Wt/Vol., Packaging, Price: 200 ml aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. Tonyu [Soymilk. 2nd ed.]. p. 72. Meiji Nyugyo launched Meiji San-guroo Tonyu (Pureen) in a 200 ml long-life (aseptic) carton in March 1981.

Soya Bluebook. 1983. p. 63. "Sungrow Soy Beverage." Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64. Note that Meiji started to market Sunglow soymilk, made and private labeled for them by Marusan, in April, 1979.

7274. Nagata, Y.; Tanaka, K.; Sugano, M. 1981. Further studies on the hypocholesterolaemic effect of soya-bean protein in rats. *British J. of Nutrition* 45(2):233-41. March. [38 ref]
• ***Summary:*** Secretion of neutral and acidic steroids in rats was increased when the low-fat, cholesterol-free diet contained isolated soy proteins. Address: Lab. of Nutrition Chemistry, Kyushu Univ. School of Agriculture, Fukuoka 812, Japan.

7275. Shanmugasundaram, Subramaniam. 1981. Varietal differences and genetic behavior for the photoperiodic responses in soybeans. *Bulletin of the Institute of Tropical Agriculture, Kyushu Univ. Japan* 4:1-61. March. [61 ref]
• ***Summary:*** Based on his PhD thesis submitted to Kyushu Univ. Contents: Introduction. Varietal screening for less photoperiod sensitivity on flowering: General environment of AVRDC, screening under the 16-hour photoperiod treatment in spring season sowing, screening under the 16-hour photoperiod treatment in autumn season sowing. Photoperiodic response and temperature response on flowering of less photo-sensitive varieties: The flowering response of varieties to seasonal variation, relationship between earliness and photoperiodic response on flowering of less photo-sensitive varieties, effects of temperature and photoperiod on the flowering of some less photo-sensitive soybean varieties.

Influence of photoperiod on several characteristics and yield in less photo-sensitive varieties: Changes of several characters and yield in several growing seasons, varietal differences for the photoperiodic response on several characters and yield. Breeding behavior of the photoperiodic response on flowering and its relationship to the time of flowering: Developing a screening technique to identify the photoperiodic response of each F2 plant, the genetic behavior of the photoperiodic response on flowering, its relationship to the time of flowering and its relevance in breeding tropic-adapted soybeans, inheritance of time to flowering under short day conditions. Summary and conclusions. Contains 27 tables and 31 figures. Address: Assoc. Plant Breeder and Legume program leader, The Asian Vegetable Research and Development Center (AVRDC), Shanhua, Tainan, Taiwan.

7276. Shurtleff, William; Aoyagi, Akiko. 1981. The book of miso: Food for mankind. Revised. New York, NY: Ballantine Books. xx + 618 p. March. Illust. by Akiko Aoyagi Shurtleff. Index. 18 cm. [82 ref]
• ***Summary:*** Contents: What is miso? Preface. Acknowledgments. Part I. Miso: Savory, High Protein Seasoning. 1. Soybeans, protein and the world food crisis. 2. Miso as a food. 3. The miracle of fermentation. 4. The varieties of miso: Regular Miso: Rice miso (red / aka, light-yellow / shinshu, mellow red / amakuchi akamiso, mellow beige / amakuchi tanshoku, mellow white / shiro koji, sweet red / edo or edo ama-miso, sweet white / Kyoto shiro miso), barley miso (karakuchi mugi, mellow barley / amakuchi mugi), soybean miso / mamé miso (miso-dama, Hatcho miso, soybean miso / mame miso, tamari miso). Special Miso: Finger lickin' miso / Namemiso (Kinzanji miso, moromi miso, hishio, namémiso, natto miso, goto miso), sweet simmered miso / nerimiso. Modern Miso: Akadashi miso, dehydrated or freeze-dried miso, low-salt / high-protein miso.

Part II. Cooking with Miso (400 recipes). 5. Getting started. 6. Recipes from East and West. Part III. The Preparation of Miso. 7. Making miso at home and in communities. 8. Japanese farmhouse miso. 9. Traditional and modern miso production.

Appendixes: A. A history of chiang, soy nuggets [fermented black soybeans], miso, tamari, and shoyu. B. Other East Asian misos: Chiang, jang, taucho, and tausi. C. The microbiology and chemistry of miso fermentation. D. People and institutions connected with miso. E. Miso additives. F. Miso with seafoods, chicken, and meat. G. Measures, weights, and equivalents. H. So you want to study miso in Japan? Bibliography. Glossary.

Note: This is the earliest English-language document seen (Nov. 2011) that uses the term "fermented black soybeans" to refer to Fermented black soybeans. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

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7277. Suzuki, Yasuhira; Tsuchiya, Kunio. 1981. Minami no tôfu, kita no tôfu: Hikyo–Gokanoshô ni tsutawaru "miso-zuke" tôfu o tazunete [Southern tofu, northern tofu: Unexplored regions–A visit to "miso-pickled tofu" that has been handed down for generations in Gokanosho]. *Daizu Geppo* (*Soybean Monthly News*). March. p. 34-45. [Jap]
• ***Summary:*** Gokanoshô is a village in Kumamoto prefecture. South of it are two smaller villages named Gokimura and Izumimura, as shown on a map. There they make tofu that is pickled in miso.

7278. Taira, Harue; Taira, Hirokadzu; Ushirogi, Toshizo; Tanimura, Yoshimitsu; Wada, Tuguo; Kawasaki, Yoshihiro; Suzuki, Norio; Koyatsu, Hiroyasu; Takei, Reiko; Kikuchi, Shiyoko; Tamura, Katsuichi. 1981. Daizu shushi no kansô shori hôhô to sono hinshitsu ni tsuite. V. Daizu shokuhin e no kakô tekisei oyobi tôfu, nattô no kôjô seizô shiken [Influence of dry treatment after harvest on quality of soybean seeds. V. Qualities for soybean food processing and tests for factory production qualities for soybean food processing and tests for factory production of tofu and natto]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 38. p. 23-32. March. [12 ref. Jap; eng]
• ***Summary:*** Two harvesting methods and 4 drying methods were tested. Address: 1-2. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 3-4. Hokkaido Prefectural Central Agric. Exp. Station, Naganuma, Hokkaido.

7279. Taira, Harue; Taira, Hirokadzu; Matsukawa, Isao; Sanbuichi, Takashi; Horie, Masaki. 1981. [Influence of fertilizer and planting density on chemical composition of soybean seeds. I. Protein, oil, carbohydrate and ash content]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 38. p. 151-64. March. [23 ref. Jap; eng]
• ***Summary:*** Reprinted from *Proceedings of the Crop Science Society of Japan* (*Nippon Sakumotsu Gakkai Kiji*) 49:205-18 (1980). Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7280. Webber, Alfred B. 1981. Perry Webber, Madison College, and Madison Foods (Interview). Conducted by William Shurtleff of Soyfoods Center, April 3. 2 p. transcript.
• ***Summary:*** Alfred is a son of Perry Webber. Perry's first interest in soyfoods started in Japan, during his first stay there in 1912. He loved Japanese food, and he ate lots of it, but he especially liked Inari-zushi, which contained aburage [deep-fried tofu pouches]. He used to go to the Shinoda sushi-ya, a sushi shop in Kanda (now Awajicho)–stopping in on his way to language school. At one time they named a type of sushi type after him, calling it the "Webber Sushi. He was used in some of their promotional material. Perry was also very fond of tofu and of miso soup, but he got interested in soyfoods via aburage. The thought is was a delicious form of protein, not known or used in U.S.

2. Perry met Dr. Harry Miller in about 1936 when Miller was a missionary in China; a number of meetings were held in Shanghai. Alfred was attending the SDA Far Eastern Academy in Shanghai, when his dad came from Japan to China. The main reason for Perry's trip was for him to set up a research lab for analyzing soymilk products in Dr. Miller's soymilk plant in Shanghai. Perry was biochemist and had graduated with a PhD.

Not much soy used in the early days of Saniku Foods. In 1935 Saniku started using soy, he thinks. But mostly they used puffed rice and wheat, and nutmeat.

Madison Foods had difficulty processing soy flour to make into milk, before it was made into tofu. They ordered a mill from Japan for this and began grinding whole soaked soybeans to make tofu. Perry liked plain tofu and wanted to sell it like this in the U.S., but at Madison they wanted to season it to make "Soy Cheese" [seasoned tofu]. Perry helped to develop Vigorost (which Alfred loved) and Yum.

Alfred thinks production of soymilk at Madison was started in 1935-37, when Perry had returned to Japan. During those years it really became a commercial product. When Perry returned to Madison in 1939-40, Madison was already well into production. So Alfred does not know to what extent Perry helped to develop it.

Another person who knows details is Sam Yoshimura, a student of Perry's in Japan. He is the best man to talk to about production of soyfoods in the U.S. He was a great friend of Perry's, and he developed new food products.

Perry was treasurer of the American Soybean Association (ASA) in about 1933 or 34. He may have been secretary too. Alfred went with Perry to the ASA convention at Baton Rouge, Louisiana, where Perry gave a slide show and lecture on soybeans and soyfoods in the Orient. Alfred also went with Perry to the research labs at Ford Motor Co. and talked with Edsel Ruddiman; they did not meet Henry Ford, however Perry gave a talk to leading Ford research scientists.

Perry was a great friend of Dr. John Harvey Kellogg. He did research work for the Kellogg Food Co. He visited Dr. Kellogg and talked about soyfoods. He also developed preservatives for crackers for the Sanitarium Food Co.

Alfred suggests I talk with Ed Bisalski, who is now in Arkansas. Address: M.D., 24424 Univ. Ave., No. 122, Loma Linda, California 92354.

7281. Sammons, Robert L. 1981. A very low bow to Japanese cuisine. *Los Angeles Times*. April 12. p. H10.
• ***Summary:*** "Tokyo–In Japanese cooking, emphasis is

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placed on enhancing rather than eclipsing the natural flavors of the food–and as with most things Japanese, those flavors generally are subtle."

At Shirakawago, a restaurant in Shinjuku, Tokyo, you dine in an ancient wooden farmhouse built in the Gassho (praying hands) architectural style. Brought from the Japan Alps in 1958, it transports you back to the Edo period.

Zakuro, a restaurant in Asakusa, you can enjoy Tokyo's most delicious *shabu-shabu* (beef and fresh vegetables). The latter "vary with the season, but mushrooms, soy bean curd [tofu], bamboo shoots, spinach, green onions and chrysanthemum leaves are usually included." All are cooked in a pot at the table and served with a number of sauces.

At Nabeya you can enjoy paper-thin slices of *fugu* (blowfish) "dipped in a piquant sauce (soy and shredded ginger)" an eaten like any other sashimi–except that *fugu,* if not properly prepared, can be poisonous.

7282. *Toyo Shinpo* (*Soyfoods News*). 1981. Karushiumu iri "kenkô nattô", (Kabushikigaisha) Tokusan-sha ga hatsubaichû: Ippanryûtsû nimo ryôkô. Gakkô kyûshokuyô shokuhin ni jitsuyô ninka sareteiru karushiumu "Karunaa." Gakkô kyûshoku deno nattô juyô fueru, Karushiumu Nattô no shûhen ["Healthy Nattô" with calcium added is on the market, made by Tokusan-sha (KK): It has a good reputation with a regular distribution too. School lunch program usage approved calcium (natto) "Kalner." The demand for natto increased school lunches because of calcium nattô]. April 21. p. 16. [Jap]

• ***Summary:*** A photo shows the front of four new natto (with calcium added) packages.

7283. Aumayr, Andrea; Hara, Toshio; Ueda, Seinosuke. 1981. Transformation of *Bacillus subtilis* in polyglutamate production by deoxyribonucleic acid from *B. natto. J. of General and Applied Microbiology* (*Tokyo*) 27(2):115-23. April. [21 ref]

• ***Summary:*** A specific regulator gene (or genes) is reported to be involved in PGA production of *Bacillus natto.* The gene could be transferred from *Bacillus natto* Asahikawa to *Bacillus subtilis* Marburg 168 by the DNA-mediated transformation.

Note: This is the earliest document seen (Jan. 2012) that mentions the Asahikawa strain of *Bacillus subtilis* (*natto*). Address: 1. Dep. of Food Science and Technology, Faculty of Agriculture, Kyushu Univ., Hakozaki, Fukuoka 812, Japan.

7284. Belleme, John. 1981. The miso-master's apprentice. *East West Journal.* April. p. 51-54.

• ***Summary:*** Describes how John and Jan Belleme learned to make miso at the Onozaki household in Japan. They were located in an old Japanese farming village 10 miles north of Yaita city [Tochigi prefecture]. They plan to set up a miso-making operation in Rutherfordton, North Carolina. The Onozaki family started making fermented foods on a large scale 200 years ago, at first saké, and later koji (fermented rice). Now the family makes about 120 tons of natural miso each year. Mr. Takamichi Onozaki is the miso master. The process for making the miso is described in detail. Based on a 6½-day weekly cycle, it begins when 1,500 pounds of rice is milled, washed, and soaked overnight. All of the koji is handmade. Onozaki miso is now sold in America at natural food stores or can be purchased in 11-pound boxes from Oak Feed Stores (3030 Grand Avenue, Coconut Grove, Florida 33133).

Photos show: (1) A wedding portrait of the Onozakis in traditional Shinto robes taken 25 years ago. (2) Mrs. Itsuko Onozaki, the miso master's wife, today. (3) The Onozaki's thatch-roofed home, seen from the back hillside. (4) Traditional living room with *kotatsu*s (heated tables). (5) Jan chats with Onozaki grandmother, age 78. (6) Mrs. Onozaki and a neighbor wash rice for miso. (7) Koji is transferred from a huge wooden fermentation crib into wooden trays. (8) Jan, Mrs. Onozaki, and a cousin pour hot soybeans into a grinder; they will be extruded to a paste, then blended with koji. (9) John Belleme washes soybeans in a huge pressure cooker. (10) In front of gigantic cedar vats, Mr. Onozaki and John scrape mature koji from koji trays in preparation for making miso. (11) Seated around the *kotatsu,* Onozaki grandmother reads from the family scroll while John listens. John and Jan Belleme. The miso-making process in Japan.

7285. Kotzsch, Ronald Ernst. 1981. Georges Ohsawa and the Japanese religious tradition. PhD thesis, History of Religions, Harvard University, Cambridge, Massachusetts. 360 p. April 1. 28 cm. [75 ref]

• ***Summary:*** The best history of macrobiotics written up to this time. Full of original, interesting, and often humorous material. Contents: 1. An overview of Japanese religious life. 2. Ishitsuka Sagen and the origins of Macrobiotics. 3. Georges Ohsawa, the early years: 1893-1929. 4. First sojourn in the West: 1929-1935. 5. Return to Japan in Crisis: 1936-1939. 6. The war years: 1940-1945. 7. The post-war years: 1945-1953. 8. The world journey of the penniless samurai: 1953-1966. 9. Ohsawa as a religious thinker. 10. Ohsawa as the Japanese religious tradition. 11. The prophet in his own land and elsewhere. Conclusion. Footnotes. Bibliography. Address: Harvard Univ., Cambrige, Massachusetts.

7286. Okada, Y.; Amano, T.; Takeuchi, T.; Yoshii, H. 1981. Jôzô shokuhin no teishokuen-ka ni kansuru kenkyû. IX. Teishokuen tamari no seisaku ni tsuite [Study on the reduction of salt concentration in fermented foods. IX. On the making of low-salt tamari]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 28(4):201-07. [12 ref. Jap; eng]

Address: 1-3. Food Research Inst., Aichi prefecture, 2-1 Shinpukuji-cho, Nishi-ku, Nagoya-shi 451, Japan; 4. Tokyo

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Nogyo Daigaku Jozo Gakka (Tokyo Univ. of Agriculture, Dep. of Brewing), Sakura-oka 1-1-1, Setagaya-ku 156, Tokyo.

7287. Okada, Y.; Yoshii, H.; Takeuchi, T. 1981. Jôzô shokuhin no teishokuen-ka ni kansuru kenkyû. X. Teishokuen tamari no hinshitsu ni tsuite [Study on the reduction of salt concentration in fermented foods. X. On the quality of low-salt tamari]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 28(4):208-15. [5 ref. Jap; eng]
Address: 1. Food Research Inst., Aichi prefecture, 2-1 Shinpukuji-cho, Nishi-ku, Nagoya-shi 451, Japan; 2. Tokyo Nogyo Daigaku Jozo Gakka (Tokyo Univ. of Agriculture, Dep. of Brewing), Sakura-oka 1-1-1, Setagaya-ku 156, Tokyo.

7288. *Soybean Digest.* 1981. 25 years in Japan. Largest soybean customer. April. p. 48.
• ***Summary:*** In 1956, 25 years ago, when U.S. soybeans producers began market development efforts in Japan, imports to that country totaled only 717,000 tonnes (metric tons) valued at only $5.5 million. The standard cooking oil was rapeseed. Today, Japan is the largest consumer of soybeans as human food, Soybean meal in livestock feeds has increased to over 2.4 million tonnes and soy oil commands a 47% share of the total Japanese vegetable oil market. A photo shows Yoshiko Kojima, American Soybean Assoc. nutrition specialist in Japan, who helped started the first ASA program in Japan 25 years ago.

In 1980 Japan imported 4.4 million tones of soybeans. Some 97% (4.3 million tonnes) originated in the USA. Value: Over $1 billion. Last year the Japanese soybean industry invested $3.55 in market promotion activities for every $1 invested by U.S. farmers and government.

7289. *Toyo Shinpo* (*Soyfoods News*). 1981. Tônyû shijô no ?? [Soymilk market in Japan]. May 11. p. 3. [Jap]
• ***Summary:*** Mr. Machida estimates that the amount of soymilk produced in Japan was 4,000 tonnes (metric tons) in 1978, 8,000 tonnes in 1979, and 10,000 tonnes in 1980, worth 300 million yen (US$13 million). The retail price for 200 ml averages 60 yen. Much effort is being put into promoting the slogan "Drink the healthful alkaline beverage" on TV. In March of this year, Meiji Nyugyo started making SunGlow Soymilk.

7290. *Hawaii Herald.* 1981. Honolulu sake: Bending with the winds of change. May 15. p. 6-7.
• ***Summary:*** A history of the Honolulu Sake Brewery and Ice Co., which was started in about 1908 and is still in business. Originally called the Honolulu Japanese Sake Brewing Co. Ltd., it is said to be the first sake brewery in the Western world. Numerous trials (such as Prohibition and Hawaii's warm climate) marked its history, but continual innovation led to survival. When World War II started a law prohibiting the use of rice in making sake was enforced. So the company switched to making shoyu. Under the label of Marumasa Soy sauce and later Diamond Shoyu, the locally made products soon became popular in Hawaii. It was another innovation that kept the company alive. Owners include Tajiro, Daizo, and Shinzaburo Sumida. Photos show the plant in 1912 and the delivery trucks in 1919. Address: Hawaii.

7291. Bisalski, Ed. 1981. Madison Foods (Interview). Conducted by William Shurtleff of Soyfoods Center, May 30. 2 p. transcript.
• ***Summary:*** Edwin M. Bisalski, along with Perry A. Webber and Frances L. Dittes, was one of Madison's soyfoods pioneers. Ed was born in 1903 in Pennsylvania. He arrived at Madison in 1931 as a college student, then in Sept. 1933 he went to work with Madison Foods, eventually being made General Manager and Chairman of the Board, a post he held until March 1945. During this time he did an outstanding job building up the small food company, introducing soyfoods to America and to other Adventist Groups, getting endowments, enlarging the plant, and directing soyfoods research and development efforts. In 1935, Bisalski spoke about soyfoods and Madison at the American Soybean Association's annual convention / meeting at Evansville, Indiana. In 1939 U.D. Register and Shiro Kunihara joined Madison Foods' R&D staff and made key contributions at this critical stage.

In 1941, under his direction, a major expansion of Madison Foods took place. A practically new plant, with one section five stories high, was constructed. The work was completed in Oct. 1942 at a cost of $35,000. By late 1942 Madison was distributing its foods to the 48 states and to some countries overseas. In 1945 Bisalski left the food company to finish his education. Shortly thereafter, also because of the end of World War II, sales began to fall, so it was never necessary to use the new plant to capacity. During the 1950s sales continued to drop sharply; during that decade, Madison foods just managed to break even.

In 1946 Ed received his BS degree in nutrition from Madison then did graduate study in nutrition and education at Peabody College and Michigan State University. In 1948 he returned to Madison Foods this time as sales manager, a position he held until leaving in 1951 to continue private work in the area of healthful foods. He later became a science teacher, retired in 1971, and in 1981 (at age 78) was writing a book on nutrition. Address: 3123 E. Miller Rd., Bancroft, Michigan 48414. Phone: 517-634-5203.

7292. **Product Name:** [Asashoku Soymilk (Dairylike, Coffee, or Orange)].
Foreign Name: Asashoku (Soimiruku, Koohii, Orenji).
Manufacturer's Name: Asahi Shokuhin.
Manufacturer's Address: San Shain 60 40F, 3-1-1,

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Higashi-Ikebukuro, Toshima-ku, Tokyo 170, Japan.
Date of Introduction: 1981 May.
Wt/Vol., Packaging, Price: 200 ml Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Products with Labels (Tetra Brik cartons), purchased in Tokyo in June 1983. 200 ml. Each carton has an illustration of a lion on 3 panels. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center.

K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk*. 2nd ed.]. p. 73. States that these 3 flavors, in 200 ml Tetra Brik cartons, were introduced in May 1981, and distributed to most of central Japan.

7293. Fillip, Janice. 1981. The amazing tofumobile. *East West Journal*. May. p. 38-40.
• ***Summary:*** Marc Horwitz has developed and runs a bicycle-powered vehicle for delivering tofu from Wildwood Natural Foods in downtown Fairfax to local natural foods stores. A state champion bike racer and avid cyclist. Marc takes about two and a half hours to service his route in Marin County. Paul Duchesne (whose photo is shown) recalls that an article in *East West Journal* that mentioned a book on tofu production (*Tofu & Soymilk Production* by Shurtleff & Aoyagi) inspired the founding of the business. Wildwood presently produces about 240 lb/day of tofu. Horwitz "envisions a time when the neighborhood tofu route joins the neighborhood paper route as a revenue source for local kids. The dream of a tofumobile network may be realized in the near future. Paul Orbuch and Marc Horwitz are discussing the logistics of combining automobiles and tofumobiles to deliver Wildwood products to Berkeley, a community 25 miles across san Francisco Bay from Fairfax."

Note: Talk with Paul Duchesne. 1989. Aug. 26. This vehicle was Paul's idea, inspired by the bicycle driven by Japanese tofu makers. Paul and Marc developed the actual vehicle together. Address: California.

7294. Hesseltine, C.W. 1981. Future of fermented foods. *Process Biochemistry* 16(3):2-6, 13. April/May. [11 ref]
• ***Summary:*** Discusses shoyu, miso, natto, and tempeh in Korea, the USA, and Japan. There are nine factors that favor the increased use of fermented foods. Address: NRRC, Peoria, Illinois.

7295. Mori, H. 1981. Shôwa 55 nendo ni okeru shôyu, miso no kenkyû gyôseki [Review of annual achievements in shoyu and miso research]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 76(5):300-28. May. [683 ref. Jap]
• ***Summary:*** This important Japanese-language article, published each year in the May issue of this periodical, has two parts: (1) A review of the past year's major discoveries and developments in the fields of miso and soy sauce in Japan. (2) A bibliography related to those discoveries and developments. Address: Noda Sangyo Kagaku Kenkyusho.

7296. Ochi, H.; Blenford, D.E. 1981. The soy sauce explosion. *Food Technology in Australia* 35(5):242, 244. May.
• ***Summary:*** This is a reprint of an article with the same title first published in August 1980 in *Food Processing Industry* (UK). Address: Nikken Food Co., Tokyo, Japan.

7297. San-Jirushi International, Inc. 1981. This old timer solves some modern processing problems (Ad). *Food Processing* (*Chicago*) 42(5):126. May.
• ***Summary:*** "Who would believe a 1200-year-old natural

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seasoning could prove effective for: (1) enhancing and retaining natural flavors in frozen and canned foods and snacks, and (2) reducing sodium in processed foods without leaving them dull and bland."

"San-J Tamari is brewed from whole soybeans only, in a traditional process that dates from the 7th century.

"By laboratory analysis, San- Tamari contains 30% more organic protein than any popular soy sauce sold in the U.S. This protein, in the form of 18 amino acids, enables San-J Tamari to effectively replace salt as an all-purpose, reduced-sodium seasoning."

A large vertical photo shows a 61 fl. oz. plastic bottle of SanJ Tamari. Address: 3235 Boulevard, Colonial Heights, Virginia 23834. Phone: (804) 520-1513.

7298. Sano, Rinji. 1981. Minami no tôfu, kita no tôfu: Tôfu kasutera no kokyô [Southern tofu, northern tofu: The birthplace of tofu kasutera]. *Daizu Geppo* (*Soybean Monthly News*). May. p. 36-40. [Jap]
• ***Summary:*** The Japanese word *kasutera* comes from the Portuguese *castella* meaning a spongecake. It is probably named after the kingdom of Castile, which is now in Spain. Japanese kasutera is a damp, rich, sweet spongecake with a light, delicate texture. It is made from flour, eggs, malt syrup, and a mixture of finely granulated large-crystal sugar.

In Yokote city, Akita prefecture, scraps of tofu are sometimes added to the ingredients when making this delicious and popular spongecake; it is served with tea.

7299. Sugiyama, Mieko; Griffis, Gil. 1981. Japan–Soybean market extraordinary. *Soyworld* (*American Soybean Association, St. Louis, Missouri*) 3(2):1, 4-5. Spring.
• ***Summary:*** A concise overview.

7300. Wang, Hwa L. 1981. Oriental soybean foods: Simple techniques produce many varieties. *Food Development* 15(5):29-34. May.
• ***Summary:*** Methods of preparation are given for the following soyfoods: Tofu, soy sauce, miso, hamanatto, sufu, tempeh, natto. A table gives local names, descriptions, and uses for traditional East-Asian non-fermented soyfoods: "Fresh green soybeans (mao-tou, edamame)," soybean sprouts (huang-tou-ya, daizu no moyashi), soybean milk (tou-chiang), protein-lipid film (tou-fu-pi, yuba), soybean curd (tofu, tou-fu, tubu, tahoo, touhu, taufoo, dou-fu, dan-fu), and soybean flour (tou-fen, kinako). Local names, organisms used, substrate, and description of the product are given for traditional East-Asian fermented soyfoods: soy sauce, miso, hamanatto, sufu, tempeh, and natto.

Note: This is the earliest English-language document seen (April 2013) that uses the word "taufoo" to refer to Chinese-style tofu. Address: NRRC, Peoria, Illinois.

7301. Hale, William C. 1981. Re: Etymology of the terms soy and soya. Letter to William Shurtleff at Soyfoods Center, June 2. 1 p. Typed, with signature on letterhead (photocopy).
• ***Summary:*** "English borrowed the words *soy* and *soya* from the Dutch around the end of the seventeenth century. The Dutch, as merchants, had direct contact with the Japanese at this time, which is why we borrowed our words from their word *soja.* The Dutch word is probably from Japanese *shôyu,* soy. It is really impossible to tell at this point what is the relationship between Japanese *shôyu* and Chinese (Pekingese, Pinyin transcription) *jiànyóu.* Some of our sources indicate that the compound *shôyu* was formed in Japanese first and that the Chinese formed their own compound (in characters) on the model of the Japanese." Address: Etymologist, G.&C. Merriam Co., 47 Federal Street, Springfield, Massachusetts 01101. Phone: 413-734-3134.

7302. Phillips, Kathryn. 1981. It's tough to be a tofu tycoon but Stein finally is on his way. *San Diego Union.* June 8. p. B-2.
• ***Summary:*** "Will soybean curd become a household word? Gary Stein, age 32, is father of San Diego's first full-scale tofu factory... About 3 years ago, Stein, a vegetarian who has been eating tofu since 1971, decided to get serious about a hazy dream he had of someday opening a tofu shop. He became an apprentice of sorts to Haruki and Mitchiko Koba at Oriental Groceries in downtown San Diego. The Kobas make about 90 lb of tofu each day for a few restaurants and regular customers. After about 13 months, Stein was ready to strike out on his own. The problem was money. Digging up financing for the novel business took some creative thinking. He received about $2,000 through a weekly newspaper advertisement promising readers that for a $100 investment, they would receive 1 lb of tofu a week until the investment was returned. Other money to start the business came in from relatives, friends and, in some cases, strangers who had heard about Stein's plans."

"He signed a lease on an abandoned service station next to a health-food restaurant at Fifth and Quince... Problems with the boiler and in getting certain equipment from Japan delayed the expected January opening about 5 more months. The factory is now turning out about 130 lb of tofu each day, and he and partner Sean Meloy hope to be making 300 lb daily in a few months to sell to local restaurants and markets." Stein is a tall, slender man who meditates 2½ hours each day and studies Taoism. Address: San Diego, California.

7303. Iino, Catherine. 1981. Sushi: When the urge hits, yield, then deal with the leftovers later. *Washington Post.* June 11. p. E1, E22.
• ***Summary:*** When her brother came to visit and wanted Chinese food for dinner, she "steamed the fish [rockfish] with black bean sauce." This article includes a recipe for

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"Steamed bass with Chinese black bean sauce," whose ingredients include "1 tablespoon preserved black beans (available in Oriental groceries)." Then: "Press the black beans with one side of a cleaver to crush," then saute the beans and garlic in sesame oil to release their flavors. Spread this mixture over the fish, then sprinkle on ginger.

Note: This is the earliest document seen (Sept. 2008) in all major U.S. newspapers digitized by ProQuest that uses the term "preserved black beans" to refer to fermented black soybeans. The new term appears in only 3 documents, in 1981, 1989, and 1999.

7304. Shurtleff, William; Aoyagi, Akiko. 1981. History of fermented soymilk and its products. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 19 p. June 28. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction: Relatively recent, advantages of fermentation. History of acidophilus soymilk from Li Yu-ying and Beltzer (1910-1912). History of investigations on the growth of lactic acid bacteria in soymilk from Gehrke and Weiser (1947). History of soymilk yogurt. History of fermented soymilk cheeses. History of soymilk piima and viili. History of soymilk kefir, kumiss, and buttermilk. Address: Lafayette, California. Phone: 415-283-2991.

7305. Akimoto, Kouchi; Kuroda, Suketoshi. 1981. Seisen edamame no firumu hôsô to hinshitsu [Quality of green soybeans packaged in perforated PE/PP [polyethylene / polypropylene] film]. *J. of the Japanese Society for Horticultural Science* 50(1):100-07. June 30. [7 ref. Jap; eng] Address: Faculty of Agriculture, Gifu Univ., Kakamigahara-shi, Gifu prefecture 504, Japan.

7306. *Daizu Geppo* (*Soybean Monthly News*). 1981. Saikin no tônyû shijô o kataru [Discussion of Japan's soymilk market today]. June. p. 4-23. [Jap]
• ***Summary:*** On May 22 industry leaders from various companies met to discuss the market. The industry is only about 10 years old. In 1980 the value of soymilk was estimated to be about 3,000 million yen, and in 1981 it was 5,000 million yen. About 3,000 tons of soybeans are used to produce soymilk compared with 450,000 tons for tofu. Soymilk and cow's milk complement one another as products, rather than competing. One is animal and the other is vegetable. Kids need more animal protein and adults need more vegetable protein. Soymilk gives stamina whereas dairy milk gives growth. The price of soymilk is a little higher than that of dairy milk. About 10% of Japanese are allergic to dairy milk. Kibun makes soymilk potage (thick and creamy soup) and also ice cream. Drinking a 50:50 mixture of soymilk and dairy milk gives a better flavor and complementary nutrition. At any department of the Kibun company they answer the phone by saying "Tonyu no Kibun" (Kibun, the soymilk company).

7307. *Daizu Geppo* (*Soybean Monthly News*). 1981. Tônyû-rui no Nihon Nôrin Kakaku (JAS) ni tsuite [Japan's JAS standards for soymilk]. June. p. 24. [Jap]
• ***Summary:*** This is the earliest document seen (Sept. 2000) concerning soymilk standards or a standard of identity for soymilk.

7308. **Product Name:** [Kibun Soymilk Ice Cream].
Manufacturer's Name: Kibun.
Manufacturer's Address: Tokyo, Japan.
Date of Introduction: 1981 June.
How Stored: Frozen.
New Product–Documentation: Shurtleff & Aoyagi. 1985. Tofutti & Other Soy Ice Creams. p. 94. "Japan's first modern soymilk ice cream was made by Kibun no later than June 1981." Soya Bluebook. 1987. p. 92. Address: Shinbashi 3-2-5, Minato-ku, Tokyo 105.

7309. **Product Name:** [Midori Soymilk (Plain, Soft, with Barley Malt Syrup, or Fermented)].
Foreign Name: Midori Tônyû (Sutoreeto, Sofuto, Bakuga, Hakko).
Manufacturer's Name: Kyushu Nyugyo.
Manufacturer's Address: Kyushu, Japan.
Date of Introduction: 1981 June.
Wt/Vol., Packaging, Price: 200 ml aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. Tonyu [Soymilk. 2nd ed.]. p. 72. Note: Midori means "green" in Japanese.

7310. **Product Name:** [Soyalac Healthy Child {Soymilk}].
Foreign Name: Soiyarakku Genki na Ko.
Manufacturer's Name: San-iku Foods.
Manufacturer's Address: 1-1 Nagaurataku, Sodegaura-machi, Kimizu-gun, Chiba-ken 299-02, Japan.
Date of Introduction: 1981 June.
Wt/Vol., Packaging, Price: 425 gm can.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Soiyarakku Genki no Ko was introduced in June 1981 in a 425 gm can and distributed nationwide.

7311. Shurtleff, William; Aoyagi, Akiko. 1981. Survey of tofu production in the United States. Lafayette, California. 1 p. June. Unpublished manuscript.
• ***Summary:*** This is a handwritten (in pencil) table with 8 columns: (1) Shop name. (2) Type of shop. (3) Date interviewed. (4) Lbs of [whole] dry soybeans per week. (5) Lbs of tofu per week. (6) Size of building (square feet). (7) Sales ($). (8) Notes.

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The survey began in April 1977 and continued to Jan. 1981. Only key information in each row will be included below.

The Soy Plant [Ann Arbor, Michigan]. March 1979. 2,000 lb/week of tofu. Jan. 1981. 5,600 lb/week of tofu.

Rochester Tofu [New York]. Jan. 1978. 1,000 lb/week of tofu.

Surata Soyfoods [Eugene, Oregon]. June 1978. 900 lb/week of tofu.

Island Spring [Vashon, Washington state]. June 1978. 5,500 lb/week of tofu. Jan. 1981. 2,300 lb/week of tofu.

Lecanto Tofu [Lecanto, Florida]. April 1978. 600 lb/week of tofu.

The Farm [Soy Dairy, Summertown, Tennessee]. June 1977. 1,125 lb/week of tofu.

New England Soy Dairy [Greenfield, Massachusetts]. March 1979. 4,050 lb/week of dry soybeans and 22,500 lb/week of tofu. Nov. 1978. 8,250 lb/week of tofu.

Swan Foods [Swan Gardens; Montana or Florida]. Confidential.

Ota Tofu Co. [Portland, Oregon]. April 1977. 4,165 lb/week of tofu.

Quong Hop & Co. [South San Francisco, California]. 10,000 lb/week of dry soybeans and 32,000 lb/week of tofu.

Azumaya [South San Francisco, California]. March 1979. 18,000 lb/week of dry soybeans. Building is 40,000 square feet. They are building a new, larger tofu factory.

Matsuda-Hinode [Los Angeles, California]. 27,000 lb/week of dry soybeans.

Northern Soy [Rochester, New York]. Aug. 1980. 2,000 lb/week of dry soybeans.

White Wave [Boulder, Colorado]. $450,000 sales in 1980. Jan. 1981. 5,833 lb/week of tofu.

Joy of Soy [Minneapolis, Minnesota]. June 1981. 4,000 lb/week of tofu. Traditional Tofu [Oakland, California]. June 1981. 15,000 lb/week of tofu.

Sunshine Soy Co. [Danny Paolucci, Coral Gables, Florida]. June 1981. 3,750 lb/week of tofu.

Panda Food Products [Woodhaven, New York]. June 1981. 14,000 lb/week of tofu (sold in bulk).

Nasoya Foods [Leominster, Massachusetts]. Jan. 1981. 11,700 lb/week of tofu.

Note: In 1979 the U.S. tofu industry used about 7,000 tons/year of dry soybeans. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

7312. Sugimoto, Hiroshi; Nishio, M.; Horiuchi, T.; Fukushima, D. 1981. Improvement of organoleptic quality of fermented soybean beverage by additions of propylene glycol alginate and calcium lactate. *J. of Food Processing and Preservation* 5(2):83-93. June. [10 ref]

• ***Summary:*** A fermented soybean beverage having a low viscosity and protein content (with 5.5% acidity {w/v} as lactic acid) was prepared by lactic acid fermentation of soymilk with *Lactobacillus casei.*

During the fermentation, an undesirable off-flavor that developed could be significantly reduced by the addition of propylene glycol alginate (PGA). A powdery-gritty sensation could be masked by addition of calcium lactate with the PGA. Address: Central Research Labs., Kikkoman Corp., 399 Noda, Noda-shi, Chiba-ken 278, Japan.

7313. Watanabe, Hidekazu. 1981. Re: Early work by San-iku Foods in Japan with tofu and soymilk. Letter to William Shurtleff at Soyfoods Center, July 19. 2 p. Handwritten. [Jap]

• ***Summary:*** Discusses the early history of this product. "The Ueda Tofu Shop in Hachioji helped with the development of our first soymilk in 1957; I was there at the time. In those days our name was *San-iku Gakuin Shokuhin-bu,* not San-iku Foods. The purpose was to provide a place of labor for the students and opportunities to learn food processing. It was not a business. Dr. Perry Webber was the principal of our school at the time. I think that our company did not make commercial soymilk before 1957. The food company is said to have been founded in 1928 in connection with the school, but legally it did not become an independent company until December 1970."

Note: In 1969 the food company, named College Health Foods (later renamed San-iku Foods), introduced Soyalac soymilk. Address: San-iku Foods, Sodegaura-machi, Chiba-ken 299-02, Japan.

7314. *Toyo Shinpo* (*Soyfoods News*). 1981. [Japanese soymilk companies and their products]. July 21. p. 25. [Jap]

• ***Summary:*** A large and very interesting table shows that 14 companies are now selling soymilk in Japan, and 7 companies are making it. For each company is given: Soymilk product name in Japanese [and English]. Volume (all are 200 ml). Retail price in yen: Either 70 or 80 yen. Package type (all are Tetra Brik Aseptic; each has a straw attached to the back). Shelf life: All are 60 days.

The manufacturers are: (1) Kibun Foods: Plain Soymilk (Tonyu Sutoreeto [Straight]). Vegetable Soymilk (Tonyu Yasai). Fruit Soymilk (Tonyu Kaju). Barley Malt Soymilk (Tonyu Bakuga).

(2) Okazaki Marusan: Marusan Soymilk (Marusan Tonyu). Marusan Orange (Marusan Orenji). Marusan Barley Malt (Marusan Bakuga).

(3) Mitsubishi Kasei: Maburon. Maburon Orange (Maburon Orenji). Maburon Coffee (Maburon Koohii). Maburon Honey (Maburon Hachimitsu).

(4) Meiji Nyugyo: Sunglow Soymilk (Sanguroo Tonyu).

(5) Midori Shokuhin. Midori Soymilk Plain (Midori Tonyu Sutoreeto). Midori Soymilk Soft (Midori Tonyu Sofuto).

(6) Asahi Shokuhin: Soymilk (Soimiruku). Soymilk Orange (Soimiruku Orenji). Soymilk Coffee (Soimiruku Koohii).

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(7) Saniku Foods: Soya Neo Cocoa (Soia Neo Kokoa).

Note: A large black-and-white photo in this issue or a nearby issue this year shows 25 different soymilk packages, including 3 Soyalac cans.

7315. Bader, Kenneth. 1981. Re: History of the American Soybean Association. Letter to William Shurtleff at Soyfoods Center, July 25–in reply to inquiry. 1 p. Handwritten, without signature.

• ***Summary:*** Dr. Bader and staff answered six questions: (1) In what years were each of the ASA overseas offices opened? Tokyo, Japan 1956. Hamburg, Germany 1969, and again in 1969. Taipei, Taiwan 1970. Brussels, Belgium 1970. Mexico City, Mexico 1971. Vienna, Austria 1974. Madrid, Spain 1976. Seoul, Korea 1979. Singapore 1979.

(2) What is the present size of the ASA overseas staff? 50. St. Louis staff? 110. Total American staff? 134.

(3) What was ASA membership in 1955? 5,400. In 1960? 5,900. In 1970? 12,368. What is present ASA membership? 20,028.

(3) How many soybean growers does the ASA represent in the 24 states having checkoff programs? 510,000.

(4) What is meant by the term "Third Party Services" in your annual budget? It is your main source of income! "It is the value of funds and services in joint projects provided by soybean and related trade organizations, private firms, institutes, and other parties. In other words, if ASA invests $10,000 in a soy oil promotion project and it is matched by $20,000 in the same project by a manufacturer, we count the $20,000 a 'third party funds.'"

(5) When was the Human Nutrition Center opened in Mexico? Early 1980. What are a few of its main activities related to soyfoods? "Identify and introduce acceptable soy food dishes in Latin America. Train nutritionists on soy products. Work with governments and institutions on soy nutrition." Address: CEO, American Soybean Assoc., St. Louis, Missouri.

7316. Barber, Linda. 1981. Report with color slides on trip to natto maker, Marumiya, in Kumamoto City, Kyushu, Japan. Kobe, Japan. 1 p. Based on e-mail of Jan. 2012.

• ***Summary:*** Linda took these color slides during a trip to this natto maker in southern Japan.

(1) Soybeans (usually small in size) cooked in a pressure cooker.

(2) Soybeans inoculated with natto bacteria and put into large bins.

(3) Lots of bins!

(4) Beans are wrapped in rice straw for fermentation The rice straw was used at this factory, but natto was also fermented in foam trays as shown in last slide. Wonder if the rice straw is still used?

(5) Wrapped packages are laid in plastic basket trays for fermentation.

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(6) Plastic basket trays of wrapped inoculated soybeans in temperature controlled rooms for fermentation.

(7) Natto unwrapped.

(8) Sticky strings of good natto.

(9) Typical serving suggestion.

(10) Natto sushi.

(11) Six natto products from this factory (from top left to bottom right): Tokyo Natto. Tokuyo Natto. Oyako Natto, Kawa-muki Natto. Natto packaged in rice straw. Small packet of natto (with orange cover). Address: Resident Director of Practice House and Oral English Instructor, Kobe College, 4-1 Okadayama, Nishinomiya, Japan.

7317. Barber, Linda. 1981. Tofu banzai. *Soyfoods* No. 5. p. 8. Summer.

• ***Summary:*** "Japan has over a 1000-year history of tofu cuisine. When most Japanese e hear 'tofu' they think of the traditional dishes: Yudofu*, Dengaku, Hiya yakko, and of tofu as an ingredient in stews and soups. But through the tofu cooking class at the Kobe YWCA, over 100 women have learned what Americans know about tofu. Now when the students hear 'tofu' they think of tofu cheesecake, tofu pizza, okara coffee-cake, and tofu mayonnaise. Altogether they have learned over 25 recipes and have the skill to adapt and create recipes using okara and tofu instead of milk, cheese, or eggs.

"Why all this new interest in tofu? For three main reasons: (1) rising cost of food–tofu is still one of the cheapest sources of protein available in Japan. (2) The Japanese are fascinated by foreign foods and their diets are gradually changing toward Western-style foods. (3) The informed Japanese consumers are trying to eliminate 'instant' and other chemical-polluted foods from their diets, thus tofu and other traditional natural foods are taking on a new importance. Also, cooking with tofu requires very little time, skill, or special equipment in order to produce attractive, nutritious, low-cost menus. Even children have enjoyed preparing okara fudge, tofu shakes, and tofu cheese rolls!

"Besides making Western-style tofu foods, the class has learned how to make tofu at home. In the past, this skill was learned at home, and passed on from mother to daughter. But now this craft is hardly ever practiced at home. The students of the YWCA felt that they wanted to know how to make delicious nigari tofu so that this part of their history would be preserved in their homes. Along with making tofu, the women learned about the storage of tofu, nutrition, soybean economics, and the value of whey. During this 'tofu seminar' the participants also saw how to freeze-dry tofu to make tofu chunks* and how to preserve okara so it can be used in a variety of ways later on. For most of the students this was the first time they could see how tofu was made. Tasting the warm, sweet tofu, they agreed that this was the best tofu they had ever eaten. This special lecture was so popular that it had to be repeated in the spring.

"Since that class these students have reported that they make tofu at home at least once a week 'just to keep in practice' and

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because 'my husband likes it!' Probably the biggest result of the class was the change in attitude of the student's families toward tofu. One parent said her son was upset that she didn't keep tofu in the refrigerator at all times. 'When he comes home from school he wants to make tofu cookies. It's funny. He never cared for tofu before, and he always hated being in the kitchen!'

* Yudofu–simmered squares of tofu served with a dipping sauce. Dengaku–tofu broiled on a stick with a variety of miso toppings. Hiya yakko–chilled tofu served with a sprinkling of shoyu, green onions, and shaved bonita. Tofu chunks–tofu that is frozen at home, thawed, seasoned, and dried in a slow oven. This can be stored for long periods of time without refrigeration and later reconstituted and used like ground meat.

Photos shows Linda Barber in a kitchen in Japan teaching five Japanese women how to make tofu. Address: Kobe, Japan.

7318. Belleme, John. 1981. The miso master with a big heart: Making miso in a Japanese village. *Soyfoods* No. 5. p. 64-66. Summer.
• ***Summary:*** Describes how John and Jan Belleme learned to make traditional Japanese miso from the Onozaki family in a small farming village 10 miles north of Yaita, in Tochigi prefecture. Contains 5 photos of the miso-making process and a detailed description of that process.

7319. Koyanagi, Tatsuo; Nakahara, K.; Uehara, A. 1981. Kôsankazai (BHT) o ataeta rato no hatsuiku shôgai ni oyobosu daizu shokuhin oyobi mechionin no tenka kôka [Effects of soybean foods and methionine on the growth of rats fed with an antioxidant (BHT)]. *Eiyogaku Zasshi* (*Japanese J. of Nutrition*) 39(4):165-70. July. (Chem. Abst. 95:218965 1981). [13 ref. Jap; eng]
• ***Summary:*** BHT = Butylated hydroxytoluene. The growth of rats fed with 0.3% BHT was stunted, but it was least stunted when they were fed with fortified natto. In the preparation of natto, the addition of 1% methionine to the soybeans at the time of soaking in water did not give rise to any disagreeable flavor; so fortification with methionine at this level appears to be a practical way to improve the nutritional value of natto. Address: Tokiwa Junior College [Mito City, Ibaraki Pref., Japan].

7320. Lindell, Wallace A. 1981. ASA marks 26 years of soybean market development in Japan. *Foreign Agriculture.* July. p. 26.
• ***Summary:*** In 1956, the year the American Soybean Assoc. opened an office in Japan, U.S. exports of soybeans to that country totaled 570,000 tons, valued at $5.4 million. 4 million tons of U.S. soybeans worth more than $1,100 million went to Japan in 1980. Here are some ASA gains over the years since 1956: Japan's production of formula feed has grown from about 1 million tons to 22.5 million tons, and the soybean meal component of the feed has more than doubled, from 5% to over 11%. Dairy cattle numbers have increased by 4 times to 2 million head. The swine herd has expanded from 1.1 million head to 10 million. There was virtually no broiler industry in 1956; today there are approximately 130 million broilers in feed on any given day. Soy oil, then a pariah in the consumer market, now represents 46% of Japanese vegetable oil production, and production of new types of soy protein foods, nonexistent in 1956, is increasing by 15% a year. Address: Acting editor, Foreign Agriculture, Foreign Agricultural Service.

7321. Nakano, Masahiro. 1981. Seimin yôjutsu no shi. Koten e no kaiki. I. [Fermented black soybeans in the Ch'i-min Yao-shu: A new look at ancient classic documents]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 329. p. 2-10. July. [Jap]
Address: Central Miso Research Inst., Shinkawa 1-26-19, Chuo-ku, Tokyo 104, Japan.

7322. Shurtleff, William; Aoyagi, Akiko. 1981. Das Tofu-Buch: Nahrung fuer alle Band 2 [The book of tofu: Food for mankind. Vol. 2]. Soyen, West Germany: Ahorn Verlag. 288 p. Illust. by Akiko Aoyagi Shurtleff. Index. July. 23 x 21 cm. Translated from the English by Rainer Bosch and Gudrun

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Klein. [43 ref. Ger]
• ***Summary:*** Contains 500 recipes. Contents: How to use this book. Preface. Acknowledgements. 1. Protein East and West. 2. Tofu as a food. 3. Getting started. 4. Soybeans. 5. Fresh soybean puree (*Frisches Sojapüree*). 6. Okara. 7. Soymilk curds and soymilk (*Sojaquark und Sojamolke*). 8. Tofu (History, how to make at home, basic preparatory techniques). 9. Recipes for regular and firm tofu. 10. Deep-fried tofu: tofu cutlets, burgers, and pouches (*Vorfritierter Tofu: Tofuschnitzel, Tofuburger, Tofutaschen*). 11. Grilled tofu (*Gegrillter Tofu*). 12. Frozen and dried-frozen tofu (*Gefrorener Tofu und gefriergetrockneter Tofu*). 13. Fermented tofu (*Fermentierter Tofu*). 14. Soymilk (*Sojamilch*). 15. Silken tofu (*Seidentofu*). 16. Yuba. 15. Tofu and yuba in China, Taiwan, and Korea. 17. Farmhouse tofu for large families. 19. The ethos and tradition of handmade tofu production. 20. Making tofu in a traditional shop. Appendices: A. Tofu restaurants in Japan. B. Varieties of tofu in East Asia. C. People and institutions connected with tofu worldwide (Incl. directory of tofu manufacturers). D. Sources of supply for tofu production. Bibliography. Glossary. Favorite tofu recipes. About the authors and their work (autobiographical). Tofu–An opportunity for poor and rich lands. The tofu kit (from Sojaquelle in West Germany and Oekullus in Switzerland).

Note 1. This is the earliest publication seen (April 2013) that uses term "Tofurei" to refer to tofu shops / manufacturers. The term was coined by Gabriele Furth-Kuby of Ahorn Verlag.

Note 2. "Sojaquark" is used to refer to soymilk curds rather than to tofu. Published in a hardcover edition only.

Note. This is the earliest German-language document seen (Sept. 2013) that mentions soy cream cheese (p. 104), which it calls *Tofu-Käsecreme*. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

7323. Shurtleff, William. 1981. William Morse: The father of soybeans in America (Continued–Part II). *Soyfoods* No. 5. p. 56-60. Summer.
• ***Summary:*** Continued: "It is truly remarkable that the authors were able to write such a complete and detailed book when neither of them had been to East Asia. (Morse would later spend two years there; 1929-1931.) Most of the book was actually written by Morse who, nevertheless, kindly listed Piper as the senior author. He gathered his information and photographs by extensive correspondence with researchers throughout East Asia and apparently drew heavily on a large collection of books on Chinese agriculture called the Swingle Collection, named after Walter T. Swingle of the Office of Crop Physiology, who spoke Chinese, had traveled extensively in the Orient collecting plants and the books, and had housed them at the USDA library, where Morse did much of his research. Decades ahead of its time, *The Soybean* soon became the standard work on the subject and was referred to by many as 'the soybean bible.' Dr. Piper died in February 1926 at the age of 69.

"Morse's fine work was already starting to give real substance to Piper's dream. In 1920, Morse helped to found the American Soybean Association (ASA) and thereafter helped to unify and direct an ongoing program of research and experimentation. Morse distributed seed from new introductions to anyone interested in soybeans. Among his closest contacts at the State Agricultural Experiment Stations were W.L. Burlison in Illinois and C.B. Williams in North Carolina. As late as 1927, most soybean agronomy research was still done on plots in Washington, D.C. outside the USDA south building. Morse sent out seeds to the states but farmers had problems; they shattered at maturity, were hard to harvest, and were abrasive on the binder canvas in those days before combines. Thus in the early years the tide of interest in soybeans ebbed and flowed. Doubters were always ready to laugh at anyone who talked of the soybean becoming a major U.S. farm crop. But this only served to spur Morse on to greater efforts. He was a very effective extension worker with many contacts, a deep knowledge of his subject, and good intuition. His desk at the USDA soon became the clearing house for information about the soybean. In 1927 he wrote: 'We may keep this work going and place the soybean where it belongs–in the King row with King Corn and King Cotton.'

"The Dorsett-Morse Expedition to East Asia (1929-1931): In the late 1920s it became evident to the USDA that the soybean had definite promise as a crop in America and it was decided to send W.J. Morse and P.H. Dorsett to East Asia for two years on what was officially known as the Oriental Agricultural Exploration Expedition (but which people interested in soy usually call the Morse Expedition) to 'make investigations regarding the utilization of the soybean in Oriental countries and the securing of varieties that might be of value to widespread American conditions' (Morse, 1929). In 1929 when the expedition left, Morse was age 45 and had worked on soybeans with the USDA for 22 years. Dorsett (1862-1943), now age 67, was a plant explorer from the USDA Office of Plant Introduction; he was described by a fellow agricultural explorer, David Fairchild, as one of the most ingenious and indefatigable workers he had ever known. Whereas Morse was a specialist, interested in soybeans, Dorsett was a generalist, interested mainly in persimmons, but also in grasses, forages, and other plants.

"During the expedition, Morse and Dorsett kept detailed daily journal notebooks, which were typewritten after the trip and bound in 17 hardback volumes. These volumes, primarily the work of Dorsett, also contain correspondence plus thousands of black-and-white photographs taken by both men. In the bound volumes there are several references to a 'special report on the soybean and its products' that Morse intended to write. Apparently he never completed it, although

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he did complete detailed chapters on tofu and soymilk. The only original copy of the documents described above is in the archives of the American Soybean Association in St. Louis, Missouri. [Note: As of 2011, it is in Rare and Special Collections, at the National Agricultural Library, Beltsville, Maryland].

"The group arrived in Tokyo on March 18, 1929, and set up headquarters. In August they traveled to Hokkaido, the northernmost island of Japan and center of soybean production, where they studied both soybean cultivation and food uses. In December 1929 they returned to Tokyo and spent full time until March 1930 collecting soyfoods and studying their production and use. On April 1, 1930, they arrived in Dairen, Manchuria, to study soybean cultivation and oil extraction. Dorsett left Morse in the summer of 1930 and went to Peking. He did not rejoin Morse on the trip, although he wrote regularly. Morse went to Korea on August 22, to Mukden in Manchuria on September 29, back to Dairen, the oil-processing capital of East Asia, and then to Peking on October 20; Morse apparently spent only 20 days in China on the entire trip. In late December they took a ship from Dairen back to Kyoto and then Tokyo. On February 17, after several more months of soyfoods research in Tokyo, they sailed for America, arriving in San Francisco on March 4, 1931. Morse's collection efforts–months of tramping through the fields of East Asia–were a bonanza. He discovered that almost every village in the Orient had its own distinctive soybean varieties, developed during thousands of years of close cultivation and inbreeding. Unlike their Western counterparts, Chinese farmers didn't think of looking for improved varieties in nearby villages and then growing these in their own village. They loyally grew the varieties that had been handed down by their honorable ancestors, and wouldn't dream of growing a variety handed down by someone else's ancestors. Morse's major accomplishments on the expedition were: (1) he collected approximately 4,600 distinct soybean seed samples representing roughly 2,000 soybean varieties and including 150 large-seeded vegetable type varieties collected mostly in Korea and Japan; all of these were introduced into the U.S. germplasm collection; (2) he realized for the first time the superiority and potential of the vegetable-type soybeans for food use and later played the leading role in propagating them and teaching others of their value; (3) he developed a much better understanding of soybean growing methods and technology; and (4) he collected more than [commercial] 250 food products made from soybeans, which he took back to America, and did by far the most extensive studies on soyfood production of any Westerner up to that time.

"In his journals and letters, Morse wrote more than once that he was 'amazed at the extent to which the soybean was used for food in Japan.' He was intrigued by the techniques for making tofu, miso, shoyu, natto, and other soyfoods, spent many days in small shops with producers, and described their processes in great detail, taking hundreds of pages of typed text with hundreds of photographs.

"The two-year trip was a tremendous adventure for both Morse and Dorsett. Morse later remarked that he considered it the highlight of his career. He was finally able to fully grasp the great potential of the soybean, which he had only been able to glimpse through his years of reading and work in America." Continued. Address: Soyfoods Center, P.O. Box 234, Lafayette, California.

7324. Shurtleff, William. 1981. William Morse: The father of soybeans in America (Continued–Part IV). *Soyfoods* No. 5. p. 56-60. Summer.

• ***Summary:*** Continued: "Moreover, in the U.S. only about 11,350 tons of soybeans (a mere 0.02 percent of the total U.S. crop) are used directly as food in a lightly processed form that allows the virtues of the vegetable-type bean (better flavor and texture, higher protein, larger seeds) to shine through. About half of the U.S. vegetable-type soybeans are exported to soyfoods producers in Japan and Europe and half are used for American soyfoods. The major uses, in order of importance, are for tofu, soynuts, soymilk, whole canned (mature) soybeans, and tempeh.

"Bill Morse was a strong supporter of the American Soybean Association. He was at the founding meeting in 1920 and was elected president three times (1924, 1925, and 1932). Pioneer soybean grower, E.F. 'Soybean' Johnson later said that 'for many years the ASA existed mainly through Morse's untiring efforts.' He was the mainspring that kept the clock ticking year after year through good times and bad. In 1944 George Strayer said: 'Morse might be called the 'daddy' of the American Soybean Association as well as of the soybean in America, since our organization has probably leaned on him more than any other man through the years. He has always been a guiding light and missed few if any meetings (except 1929-31 when he was in Asia). It is doubtful if anyone can equal his record.'

"Morse was a highly competent researcher and a prolific writer. Between 1910 and 1950 he wrote some 87 articles and bulletins on soybeans and soyfoods, including The Soybean–in addition to making hundreds of speeches. Many of his articles appeared in publications of the American Soybean Association. He was editor of the Association's first publication in 1928 entitled *Proceedings of the American Soybean Association,* which contained 192 pages of papers given at the annual ASA conferences between 1925 and 1927. He contributed several papers to this volume, including 'The Distribution of Soybeans in the U.S.' (1927). He was also a frequent contributor to the *Soybean Digest,* which the ASA started in November 1940.

"The first article on soyfoods run by *Soybean Digest* was an article by Morse about vegetable-type fresh green soybeans entitled 'Shanghied... A Super Food' (July 1941). His second article was also on vegetable-type soybeans,

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'Soys in Food: Future of Vegetable Varieties' (September 1945). In 1951 he wrote 'What's in a Name,' describing the significance of the poetic names given to varieties of soybeans in East Asia.

"In November 1949, when Morse retired after 42 years of service, he was known throughout the world, but especially in the U.S. and East Asia, for his work on soybeans and soyfoods. In 1907, when he started work, the soybean was such a small crop that no records of its production were kept. One measure of the success of his work is the amazing expansion of the crop from about two million bushels in 1919 to 9.4 million in 1929, 91 million in 1939, and 200 million in 1949.

"On retirement, Morse turned his work over to Martin G. Weiss, a professor of plant breeding and genetics from Iowa State University. From his home in Takoma Park, Maryland, where he had lived since 1917, Morse moved to Eastchester, New York, next door to his daughter, Margaret, who had accompanied him on the trip to East Asia. During the last ten years of his life he worked from time to time on his book on soyfoods (which, unfortunately, he never finished), did a lot of reading and gardening (he planted his own vegetable-type soybeans and enjoyed them each spring as fresh green soybeans, or later in the season, as mature cooked soybeans), and kept in active touch with the world of soybeans and soyfoods through many visitors and an extensive correspondence. He continued to enjoy soyfoods in his home meals.

"On the morning of July 30, 1959, at age 75, William J. Morse died of a cerebral hemorrhage at his home in Eastchester, New York.

"The work of Bill Morse runs like a bright thread through the whole tapestry of soybean and soyfood development in the Western world. We can pay no greater tribute to the man than to carry on his work and help fulfill his dream.

"For their help in providing information related to this article, the author would like to thank Mrs. Walter Thalman (Morse's daughter), George Strayer, Martin G. Weiss, Theodore Hymowitz, Jackson Cartter, R.W. Howell, and Verna Donavan." Address: Soyfoods Center, P.O. Box 234, Lafayette, California.

7325. Yokotsuka, Tamotsu. 1981. Recent advances in shoyu research. In: George Charalambous and G.E. Inglett, eds. 1981. The Quality of Foods and Beverages: Chemistry and Technology. Vol. 2. New York: Academic Press. 390 p. See p. 171-96. Proceedings of a Symposium of the Second International Flavor Conference. Held 20-21 July 1981 at Athens, Greece. [140 ref]

• ***Summary:*** Contents: Introduction. Manufacture: Treatment of raw materials, koji making, mash making and aging, pressing, refining. Flavor evaluation of koikuchi shoyu. Flavor components of shoyu. Some recent research and technological progress in shoyu manufacturing: Treatment of raw materials, koji molds and koji making, control of mash (temperature of mash, period of mash fermentation, microbes in mash), refining (pressing of mash, pasteurization, color of shoyu). Safety problems regarding koji molds and shoyu. Address: Kikkoman Corp., Noda-shi, Chiba-ken, Japan 278.

7326. Sass, Lorna J. 1981. Soy foods: Versatile, cheap and on the rise. *New York Times.* Aug. 12. p. C1, C6. Widely syndicated.

• ***Summary:*** The article begins: "Soy foods have come west and, apparently, are here to stay. No longer restricted exclusively to the world of woks and cleavers, soybeans in America are now patted into soyburgers, and tofu (soybean curd) is puréed into soy mayonnaise, baked into 'cheesecake' and fried as 'cutlets,' while soy milk emerges from the blender as a frothy carob shake or from the freezer as cantaloupe 'ice cream.'

"Because soy foods are an inexpensive source of protein, low in fat and completely cholesterol-free, they have been attracting more and more attention among the growing number of weight-conscious, health-conscious and dollar-conscious Americans. Until recently, soy sauce was the only soy product familiar to most Americans.

Contains a long discussion of David Mintz (owner of Mintz's Buffet, a kosher delicatessen at 1040 Third Avenue at 62nd Street). He makes a tofu ice cream, and a tofu-spinach quiche. "A large Japanese company wants to buy exclusive rights to distribute Mintz's tofutti 'ice cream' in Japan. 'The more dishes I make with tofu, the better my business is,' said Mr. Mintz." He is frequently called upon to cater "tofu weddings."

Also discusses Light Foods in St. Louis (Missouri), and the Rochester Soy Deli (in New York). "Two of the people most responsible for introducing soy foods to Americans are William Shurtleff and his wife, Akiko Aoyagi, who in 1975 wrote 'The Book of Tofu,' a comprehensive cookbook and introduction to the untapped potential of soy foods as an alternate source of protein."

There follow seven recipes featuring tofu and tempeh: Mintz's tofu herb dip. Breaded tofu cutlets (with frozen tofu. Might also be called "Fillet of tofu," plus a note on how to freeze tofu at home). Tofu tartare sauce. Tempeh salad. Carob-tofu-mint pie. Whole wheat pastry crust (with soy milk and soy oil). Lotus Cafe not-dogs (meatless hot dogs).

Next comes a section titled "Learning more about soy: A listing of useful books." For example: "There is no more thorough book on the history and myriad Oriental forms of tofu than the profusely illustrated *"Book of Tofu,"* by William Shurtleff and Akiko Aoyagi (Autumn Press / Random House; 334 pages; $8.95). First published in 1975, it is credited by most tofu cookbooks as the one that 'spread the light.' The hundreds of recipes, mostly Oriental in style, will fascinate adventurous cooks. Beginners may

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prefer the condensed, somewhat more Americanized version (Ballantine, 433 pages, $2.95)."

The long article ends with a helpful sidebar titled "How to buy and store tofu." "A four-ounce piece of tofu (bean curd) sells for about 30 cents..." One main difference "between the tofu sold in health food stores and the Oriental-style tofu sold by many greengrocers is the type of coagulant used. Tofu from health food stores is almost always made with nigari (primarily magnesium chloride and trace mineral elements derived from evaporated seawater), while Oriental tofu makers generally use calcium sulphate."

A photo shows Katherine Iselin with some of the special sandwiches at the Tofu Shop, a fast-food soy deli in Rochester, New York. She is wearing a Soyboy Tofu T-shirt. On the wall behind her is the restaurant menu.

Note: A similar article titled "Out of the wok and into the frying pan" appeared in *The Durham Sun* (9 Sept. 1981, Section B).

Another similar article titled "More budget-conscious Americans are hitting the soy–its not just sauce" appeared in the *Chicago Tribune* (29 Oct. 1981, p. W_A21).

7327. Hooten, Dan. 1981. Dawson Mills' protein analog plant. Protein prices. Isolate markets. Functional properties desired by industry (Interview). *SoyaScan Notes.* Aug. 17. Conducted by Walter J. Wolf of NRRC, Peoria, Illinois.
• ***Summary:*** Dawson Mills invested $11 million in their protein analog plant. It was intended to have a capacity of 9.5 million lb/year but was actually capable of producing only about 400,000 lb/month or 4.8 million lb/year.

Soy protein prices (per lb): Flours and grits: $0.14. Concentrates: $0.31-33. Isolates: $1.02–from Ralston Purina and Grain Processing Corp. $0.90–from ADM. Note that ADM is working off inventory that they have accumulated since start-up. A number of Central Soya's former isolate customers have gone to other suppliers.

Isolate markets: (1) Health foods. (2) Infant formulas–Some doctors go to soy formulas directly to avoid potential allergy problems with cow's milk. (3) Milk products. (4) Meat emulsions–In Europe fat, water and isolate are emulsified and then frozen. This emulsion is later mixed with meat in the preparation of products that are "stuffed into casings or cans."

Japan is still a net importer (2-3 million lb/yr) of isolates.

Functional properties desired by industry: (1) Film forming ability–with strength. (2) Casein-like properties (the imitation cheese market is now about 150 million lb–uses 40 million lb of casein). Casein sells for $1.35-$1.40/lb. Address: Dawson Food Ingredients.

7328. *Toyo Shinpo* (*Soyfoods News*). 1981. Tôfu zukuri wa nintai desu. Linda Lee Barber [Making tofu takes patience. Linda Lee Barber]. Aug. 21. p. 7. [Jap]

7329. Shurtleff, William; Aoyagi, Akiko. 1981. The soybean plant: Botany, nomenclature, taxonomy, domestication, and dissemination history. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 62 p. Aug. 28. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Botany and plant characteristics. Etymology of the term "soybean" and vernacular names. History of soybean taxonomy and scientific names. Origin, domestication, and dissemination in Asia. Individual country dissemination in Asia. Dissemination to Europe. Dissemination in the U.S. South America and Africa. Address: Lafayette, California. Phone: 415-283-2991.

7330. Spencer, Colin. 1981. Mean bean. *Guardian* (*England*). Aug. 28. p. 7.
• ***Summary:*** Ironically, the protein-rich soy bean is the dullest of all the dried peas and beans. Few of the soy-bean recipes in cookbooks sound even vaguely appetising. Soy beans were first grown in England at Kew in the late 1700s. Most soy beans stocked in wholefood shops are round and beige, but some are small and black; they both taste about the same. Describes how to soak, then cook whole soybeans so as to inactivate the "'trypsin inhibitor,' which blocks an trypsin enzyme essential for the digestion of protein." They should be cooked for 4-5 hours or pressure cooked for 25 minutes. After cooking, the whole soy beans can be crushed (with a potato masher) or pulped in a blender to yield a thick grainy puree. Describes various ways of preparing the cooked pulp. "Served with a miso sauce, these soy bean croquettes can be far more delicious than they sound."

In the USA, small "packets of dry roasted soy beans, salted like peanuts," are sold in plain, salted, garlic, and barbeque flavors. Describes how to roast your own at home, using an oiled baking tray. "Toss the roasted beans in a flavoured salt." Or you can grind the unsalted roasted beans to make kinako. "In Japan they sweeten kinako and use it to coat confectionery. It must be the only example of chewy treats which could be good for you."

Gives recipes for: Sesame dry soybeans. Soybean Russian salad. Soy bean fritters. Black soy bean casserole.

7331. Hara, Toshio; Aumayr, Andrea; Ueda, S. 1981. Characterization of plasmid deoxyribonucleic acid in *Bacillus natto:* Evidence for plasmid-linked PGA production. *J. of General and Applied Microbiology* (*Tokyo*) 27(4):299-305. Aug. [14 ref]
• ***Summary:*** Describes the discovery of a 5.7-kilobase plasmid, pUH1, which contains the gamma-glutmyl transpeptidase (gamma-GTP) gene responsible for polyglutamic acid production. Address: 1, 3. Dep. of Food Science & Technology, Faculty of Agriculture, Kyushu Univ., Hakozaki, Fukuoka 812, Japan; 2. Dep. of

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Microbiology, Innsbruck Univ., Innsbruck 6020, Austria.

7332. Kushi, Aveline. 1981. My favorite tempeh recipes: Cooking with a versatile Indonesian staple. *East West Journal.* Aug. p. 62-65.
• ***Summary:*** "Tempeh became popular in this country about two years ago. Bill Shurtleff was largely responsible, and I will always be grateful to him for this. Tempeh is not available in Japan, so I did not eat it while I was growing up.

"Tempeh is a very nice *whole* food. It gives great energy, especially to vegetarians, and it is very appealing to someone who is craving animal foods."

"I'm in my fifties and I stopped menstruating several years ago. The first time I ate tempeh–it was pan-fried with just a brush of oil, and cooked with onions and tamari–my menstruation returned for a time! So I think that tempeh perhaps helps to increase sexual vitality for women and strengthen men's and women's sexual organs." Contains 11 tempeh recipes: Tempeh with arame (a sea vegetable). Kinpura (with burdock and tempeh). Cabbage-roll tempeh. Tempeh with vegetables. Fried rice or noodles and tempeh. Paella without fish. Tempeh in soup. Tempeh macaroni salad. Barley stew with tempeh. Shish-ke-bab. Tempeh with kombu, daikon, and shiitake. A large photo shows Aveline Kushi smiling and cutting carrots. A large ad (p. 65) shows *The Book of Tempeh* by Shurtleff & Aoyagi.

7333. Lukoskie, W.M. Luke. 1981. Island Spring is pleased to announce that we are now distributing two fine brands of nigari (Leaflet). Vashon, Washington. 1 p. Typed, with signature on letterhead. Single sided. 28 cm.
• ***Summary:*** For the past year, Island Spring has sold Akoho Kasei unrefined nigari, a product of China imported through Japan. It has been filtered and contains beneficial trace elements and minerals. It sells for $24.80 per 20 kg F.O.B. Seattle.

The new line of refined nigari (magnesium chloride) is made by Yoshikawa, the oldest nigari maker in Japan. Approved by the FDA, it sells for $18.00 per 20 kg F.O.B. Seattle. Island spring will rebate $2.00 per bag for the Akoho nigari and $1.00 per bag for the Yoshikawa product to the Soycrafters Assoc. of North America. Address: P.O. Box 747, Vashon, Washington 98070. Phone: (206) 622-6448.

7334. **Product Name:** [Soymilk (Dairylike, or with Barley Malt Syrup)].
Foreign Name: Tônyû (Shiro, Bakuga-iri).
Manufacturer's Name: Nagano Tomato.
Manufacturer's Address: Japan.
Date of Introduction: 1981 August.
Wt/Vol., Packaging, Price: 195 gm can.
New Product–Documentation: Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that Nagano Tomato first made commercial soymilk in Japan in 1981.

K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. These products were introduced in Aug. 1981 in 195 gm cans and distributed nationwide.

Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64.

7335. Nakano, Masahiro. 1981. Seimin yôjutsu no shô. Koten e no kaiki. II. [Chiang in the Ch'i-min Yao-shu: A new look at ancient classic documents]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 330. p. 2-8. Aug. [Jap]
Address: Tokyo, Japan.

7336. Nakayama, Y.; Saio, K.; Kito, M. 1981. Decomposition of phospholipids in soybeans during storage. *Cereal Chemistry* 58(4):260-64. July/Aug. [12 ref]
Address: 1. Research Inst. for Food Science, Kyoto Univ., Uji-Kyoto 611, Japan; 2. National Food Research Inst., MAFF, 2-1-2 Kannondai, Yatabe-cho, Tsukuba-gun, Ibaragi 300-21, Japan t.

7337. Okita Enterprises Inc. 1981. Presents tofu and beansprout study tour of Japan (Leaflet). Los Angeles, California. 2 p. Front and back. 28 cm.
• ***Summary:*** This second annual tour will run from Sept. 24 (leaving Los Angeles for Tokyo) to Oct. 3. It will be led by Hideyoshi Okita, president of Okita Enterprises Inc. and organized by Japan America Tours. The price: $1,365.55.
Address: Los Angeles, California.

7338. *Soyworld* (*American Soybean Association, St. Louis, Missouri*). 1981. ASA honors Kojima for service to U.S. farmers. 3(3):8. Summer.
• ***Summary:*** Petite Yoshiko Kojima commands great respect in the Japanese food industry. Ms. Kojima joined ASA's Tokyo staff in 1956 when American soybean growers opened their first foreign office. In the 1960s, she "initiated the first soy foods seminar in Japan, escorted study teams to the U.S., developed and distributed soy food recipes and participated in food shows. Today Japan's soy-food industry is the world's single largest buyer of American variety soybeans. At a recent 25th anniversary program presented for the Japanese soybean industry, in honor of ASA's 25 years in Japan, ASA President Frank Ray presented Ms. Kojima a special plaque in recognition of her service to U.S. soybean producers.

A photo shows Yoshiko Kojima holding the plaque; Frank Ray is in the background.

7339. Suzuki, A.; Hizukuri, S.; Takeda, Y. 1981. Physicochemical studies of kuzu starch. *Cereal Chemistry* 58(4):286-90. July/Aug. [40 ref]
Address: 1. Lab. of Food Science, Osaka Women's Univ.,

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Daisen-cho, Sakai 590, Japan.

7340. Shurtleff, William; Aoyagi, Akiko. 1981. History of the American Soybean Association. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 17 p. Sept. 8. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction. Founding in 1920, reorganization in 1925: Description of annual meetings, publication of *Proceedings of the American Soybean Assoc.* and circular. Expanded activities in 1930s: Regional Soybean Lab., NSPA, Soya Foods Council, retrospect and tribute to workers. Turning point in 1940, hiring of Strayer and what he did: Strayer biography, early history of *Soybean Digest* (ASA's magazine), work during 1940's and World War II, articles, honorary members in 1946, first Bluebook in 1947, postwar work. The 1950's: First Economic Cooperation Administration (ECA) mission to Europe in 1949, trips to Europe in 1952 and 1954, trip to Japan in 1955 and its effects, establishment of Soybean Council of America. The 1960's: In 1962 the Minnesota Soybean Growers Association, the first affiliated state soybean association, was founded; by 1981 some 22 other state soybean associations had been founded. Growers' fund market development in 1966, history of checkoff. 1970's: Move to St. Louis in 1978, publication program, efforts required for rise in soybean production. 1980's: Major programs, organization, membership and funding, budget, overseas offices and exports, staff, education and publications. Address: Lafayette, California. Phone: 415-283-2991.

7341. Yoshihara, Lulu. 1981. Re: History of and update on Shin-Mei-Do Miso Company. Letter to William Shurtleff at Soyfoods Center, Sept. 9. 3 p. Handwritten, with signature.
• ***Summary:*** "Shin-Mei-Do Miso started commercial production in April 1979. I studied miso making with the traditional masters at Maruman Miso Company in Iida City, Nagano Prefecture, Japan. Maruman still operates a *tezukuri* [hand crafted] shop as well as a huge factory and I was able to compare both processes and the resulting kinds of misos. Last spring my husband, Yoshi, visited them and received many compliments about our miso, as well as constructive criticism.

"We make two types of miso: *Kome* (organic soybeans, Kokuho Rose rice, sea salt, well water) age 1-1½ years, and *Mugi* (organic soybeans, Canadian barley, sea salt, well water) aged 22 months (2 summers).

"We also have 2 experimental batches of *genmai* [brown rice] miso made with whole organic brown rice (Lone Pine). This fall we will start making moromi miso, a type of naturally sweet finger-lickin' miso from a recipe we received from our teacher in Japan.

"This summer Yoshi and two local carpenters built a new addition to our miso workshop..." Address: Shin-Mei-Do Miso Co., Wren Rd., Denman Island, BC, Canada, V0R 1T0.

7342. Shurtleff, William; Aoyagi, Akiko. 1981. Englebert Kaempfer: History of work with soyfoods. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 8 p. Sept. 20. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction. Early life: Born Sept. 16, 1651, traveled to Sweden, as secretary to Swedish Ambassador traveled to Persia and stayed until 1685, decided not to return to war-torn Germany, traveled to Indonesia, arrived in Japan (island of Deshima) Sept. 1690. Japan: Basic situation, 2 annual trips to Edo (today's Tokyo), return to Europe in 1693. *Amoenitatum Exoticarum:* Background, writings about soybeans and soyfoods, Kaempfer's death in 1716. Kaempfer's history of Japan: Background, section about soybeans and soyfoods, present locations of Kaempfer's original writings. Address: Lafayette, California. Phone: 415-283-2991.

7343. *Asahi Shinbun* (*Asahi Daily News, Tokyo*). 1981. Misoshiru igai na kôyô [Miso soup's unexpected good effects: It lowers the death rate from stomach cancer, heart disease, and cirrhosis of the liver]. Sept. 27. [1 ref. Jap; eng+]
• ***Summary:*** "People who drink miso soup daily are not likely to die from stomach cancer." This was the result of research by Dr. Takeshi Hirayama and his group. He is head of the Epidemiology Division, at the National Cancer Center Research Institute. Miso soup was also found to lower the death rate from stomach ulcers, heart disease, and cirrhosis of the liver (*kankôhen*). This research will be reported next month in Sapporo at a meeting of a Japanese epidemiology society. Note: A long summary of this article appeared in the Oct. 1 issue of *Toyo Shimpo* (p. 1).

7344. Shurtleff, William; Aoyagi, Akiko. 1981. Dr. Harry W. Miller: History of his work with soyfoods. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 21 p. Sept. 29. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction. Growing up (1879-1902): Birth, early contact with Dr. J.H. Kellogg, marriage. Early years in China (1903-1911). Washington, DC (1912-1925). Pioneering soymilk in China (1925-1939): Research, development of plant, destruction of plant 13 Aug. 1937, U.S. patent, No. 2,078,962 for soymilk process and equipment, work before return to U.S. Introducing soyfoods to America (1939-1949): In Mt. Vernon, new products, work with AMA, American Soybean Assoc. speaker and lifetime member 1958, Vitasoy. Research and work around the world

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(1949-1977): Quick visit to Shanghai, death of second wife, sale of International Nutrition Foundation, Taiwan work, Indonesian plant, Trinidad, Libya, Japan, old age and relationship with William Shurtleff, the "Great Man."

See http://www.soyinfocenter.com/HSS/harry_miller.php Address: Lafayette, California. Phone: 415-283-2991.

7345. Aiba, Shuichi. 1981. Development of microbial industry in Japan. *Kukem Dergisi* (*J. of KÜKEM, Turkey*) 4(2):1-6. Special Issue of the Second National Congress of Culture Collections and Industrial Microbiology (KÜKEM). [Eng]

• ***Summary:*** Contents: Preface. Brief history of development: Up to 1945, 1946-1960, 1961-1980, 1981. Economic aspects: Vista, antibiotics, amino acids (esp. glutamate), nucleotides, enzymes, miscellaneous (citrate, gluconic acid). Epilog.

The modern fermentation industry, characterized by mechanization and quality control, was motivated and triggered by the appearance of antibiotics. Before 1945, besides the brewing of alcoholic beverages, the Amylo-process and acetone-butanol were the most representative of large-scale fermentations in the pre-war and during the war days. In the former, starchy materials were saccharified aerobically by the use of *Aspergillus oryzae.* The period from 1946 to 1960 was characterized by two major developments: the emergence of the penicillin industry and the production of amino acid (glutamic acid) by fermentation. Bioengineering became sophisticated. During the period 1961-1980 biochemical engineering and computers came to be widely used.

The fermentation industry in Japan is large. In 1974 it produced $8,404,000,000 worth of products. The largest segments were liquor $6,300,000,000 (75.0% of the total), antibiotics $1,183,000,000 (14%), fermented foods $550,000,000 (6.5%), amino acids $250,000,000 (3.0%), and other (nucleotides, yeast, ethanol, enzymes, organic acids) $121,000,000 (1.5%).

The main amino acid is glutamic acid, of which the Ajinomoto Co. has almost 50% of the market. Production peaked at 100,000 tons/year in 1971 and had fallen to 73,000 tons by 1975. The main nucleotides are inosinic acid and guanylic acid. The main enzymes are alpha-amylase (12,000 tons/year), protease (1,500 tons/year), and glucose isomerase (300 tons/year). Miscellaneous includes citrate, lactic acid, and gluconic acid (each organic acids). Genetic manipulation of microorganisms is expected to revolutionize the fermentation industry.

Note: This periodical about microbiology is published twice a year by the Center for Culture Collections of Microorganisms (KUKENS) in Istanbul, Turkey. Address: Prof. Dr. Dep. of Fermentation Technology, Faculty of Engineering, Osaka Univ., Yamada-kami, Suita-shi, Osaka, Japan.

7346. **Product Name:** [Soymilk Dessert].
Foreign Name: Tônyû Dezaato.
Manufacturer's Name: Asahi Foods (Asahi Fuuzu).
Manufacturer's Address: Japan.
Date of Introduction: 1981 September.
Wt/Vol., Packaging, Price: 60 gm plastic cup.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Tônyû Dezaato was introduced in Sept. 1981 by Asahi Fuuzu in a 60 gm plastic cup and distributed nationwide.

7347. Murray, Megan Baldrige. 1981. Watakushi tachi mo aratamete minaosubeki kamo. Nyuu Yooku no tôfu fiibaa [Perhaps we should reconsider it. New York's tofu fever]. *Japanese Cosmopolitan* (*Tokyo*). Sept. [Jap]

• ***Summary:*** This is the Japanese version of a manuscript written in English on 30 June 1981 (which see). Across the center of the Japanese-language article is an English-language sign that reads: "Mintz's Buffet. Strictly Kosher. Party Catering."

7348. Nakano, Masahiro. 1981. Wamyôshô, Senchû wamyô ruijûshô oyobi Wakan sansai zue (no miso to shi). Koten e no kaiki. III. [Miso and fermented black soybeans in the *Wamyosho, Senchu Wamyo Ruijusho* and *Wakan Sansai Zue:* A new look at ancient classic documents]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 331. p. 11-19. Sept. [Jap]
Address: Tokyo, Japan.

7349. Shimada, A. 1981. Shoku seikatsu ni okeru misoshiru no ichizuke [The importance of miso soup in the Japanese diet]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) No. 331. p. 2-10. Sept. [10 ref. Jap]

• ***Summary:*** Ninety percent or more of the miso in Japan is used as an ingredient in soups. Address: Akita Daigaku Igaku-bu, Eiseigaku Kyoshitsu.

7350. Shurtleff, William; Aoyagi, Akiko. 1981. What is real tamari? *East West Journal.* Sept. p. 16, 18-19.

• ***Summary:*** A guide to natural soy sauces. Explains why George Ohsawa coined the misnomer "tamari" in about 1960 for Lima Foods in Belgium to refer to natural shoyu. Contains a recipe for using 20 lb of soybeans to make real tamari at home. Address: Soyfoods Center, Lafayette, California.

7351. Shurtleff, William; Aoyagi, Akiko. 1981. Miso production. 2nd ed. Lafayette, California: Soyfoods Center. 80 p. Illust. by Akiko Aoyagi Shurtleff. Index. Sept. 28 cm. [82 ref]

• ***Summary:*** With this printing only the name of the publisher has been changed to Soyfoods Center from New-Age Foods Study Center.

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Print history: Pre-publication: 100 photocopy copies. 1977 Aug. 16: 300 paperback copies. 1979 Oct.: 405 paperback. 1981 Sept.: 876 paperback. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

7352. Shurtleff, William; Aoyagi, Akiko. 1981. History of Seventh-day Adventist soyfoods cookbook authors. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 6 p. Oct. 1. Unpublished typescript. Available online at www.soyinfocenter.com.

• ***Summary:*** A comprehensive history of the subject. Contents: Introduction: First recipes by Kellogg in 1919. Dittes, *Food for Life,* 1935: see chapter on Madison Foods. Dorothea Van Gundy: *La Sierra Recipes* (1936), *The Soybean Cookbook* (1963), birth, education (1924-28), work with father at La Sierra Industries (1927-35), start of work with Loma Linda Foods (LLF), 1960 marriage to Ed Jones, revision of Mildred Lager's books to create *The Soybean Cookbook,* sales to date, lectures for International Nutrition Research Foundation, disposition, character, editor of *Today's Food* at Loma Linda Foods, trip to Japan (fall 1964), death at age 76 (1979). Jethro Kloss, *Back to Eden,* 1939. Philip Chen, *Soybeans for Health, Longevity, and Economy,* 1956. Frank and Rosalie Hurd, *Ten Talents,* 1968. Edyth Cottrell, *The Oats, Peas, Beans, and Barley Cookbook,* 1974. Address: Lafayette, California. Phone: 415-283-2991.

7353. Boyer, Robert A. 1981. Development of meatlike products based on spun soy protein fibers. Part II (Interview). *SoyaScan Notes.* Oct. 11. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Now somewhat desperate, Boyer decided to try a meat company anyway. He went to Swift & Co. in Chicago, Illinois, in 1950 and they immediately liked these ideas and bought exclusive rights to the patent from 1950-1954 (in 1955 they converted to nonexclusive). In 1950, the war scarcity psychology still prevailed. American consumers and food produces had watched in astonishment during the war as meats became so scarce and expensive that only a few could afford them. Thus it was easy to sell the notion that even after the war, as world population continued to rise, plant proteins would play an increasingly important role in diets throughout the world. Boyer worked with Swift for five years, but in considerable secrecy. Swift told him that if their Livestock Relations Department found out that Swift was doing research on meat analogs, "all hell would break loose." Eventually Swift made and test marketed new soy protein products. However in 1952-53 livestock producers in America were in such bad shape economically that they marched on Washington, DC, demanding a better price for their products. Swift, fearing the possibility that the media might get word of their new project and come out with headlines reading "Swift Making Synthetic Meats from Soy Protein," decided to shut down the project. None of the products was ever marketed commercially.

In 1951-52 Unilever bought a license from Boyer for spun protein isolate production throughout the rest of the world. Boyer went to England and worked with Unilever in their peanut protein isolate plant and research labs near Liverpool. Here, for the first time, his process was used in the making of sausages containing fibers of peanut protein isolate.

In 1956 Boyer returned to America and went immediately to Worthington, who had now been thinking about taking a license on Boyer's spinning patent for seven years. The first food-grade soy protein isolates were just becoming available, so the company bought the patent rights for the health food industry and asked Boyer to work with them as a consultant. Worthington eventually did more with Boyer's discovery than any company in America.

After Worthington purchased Boyer's license (for the health food trade), other large food companies followed suit: Ralston Purina, General Mills, and Nabisco. General Foods developed their own related process. In 1962 Boyer joined the research staff of Ralston Purina as a Protein Scientist; he worked there until his retirement in 1971, at which time he became a Protein Consultant for Miles/Worthington.

After General Mills took a license on Boyer's product, they built a commercial-sized fiber spinning plant at Cedar Rapids, Iowa, and developed their Bontrae line which featured Bac-O's, a spun fiber analog resembling cooked bacon bits and launched in 1965. The venture was impressive in scope and the product was a real sensation, the biggest thing that had happened to Boyer's idea to date. (The product is now made with extruded soy flour.) The whole venture had a profound effect on the thinking of other large food producing companies concerning soy protein foods. Boyer was now spending 50% of his time with Worthington and 25% each with General Mills and Ralston.

Boyer's years of research eventually began to pay off in terms of handsome royalties from his patents, of which he now had more than thirty, some shared with Ford. These lasted until the patent expired in 1971. Now any company can use the protein spinning process without having to buy a license or pay fees. In 1981 the main American companies using spun protein fibers in foods were Worthington Foods, Dawson Mills in Minnesota (which bought General Mills' equipment), Loma Linda Foods in California, and Ralston Purina. In Europe there are two companies in the Netherlands, one in Denmark (Nutana), and one in Belgium using food-grade spun protein fibers. In Japan, Nisshin Oil Mills Ltd. built the first plant to spin edible soy protein fibers in 1968. In 1976 Fuji Purina Protein Ltd., a subsidiary of Fuji Oil Co. and Ralston Purina, introduced Fujipur SP-90 spun soy protein fibers.

Most manufacturers of meat analogs in the U.S. agree that the general market has been disappointing, but that the idea is simply ahead of its time, which will inevitably come

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as meat prices continue their rapid rise. The vegetarian or "motivated" market (and especially the Seventh-day Adventist sector) showed a steady increase each year. No sales figures are available on the total market size.

When asked in 1980 how he liked the newest generation of meat analogs, Boyer replied that he found the quality disappointing, since the producers have to make compromises in equipment and processing to keep costs down. A researcher can get much better textures and flavors in his lab working by hand. Another problem is the subtle beany flavors that result from isolates and from typical defatted soy meal rather than specially defatted soy meal that can be made to contain almost no beany flavor. Boyer eats store-bought meat analogs (including bacon bits) from time to time but not as a regular part of his diet. He prefers Worthington products to Loma Linda. He likes meat, too, and also uses tofu quite a bit.

How about the future? Harkening back to the years of his work with Ford, Boyer said in 1981, "We're at the Model T stage right now with analogs. I'm impatient to get to the Lincoln Continental stage." He feels that the products still have a very bright future, and that when the price of meats rises to 10 or 20% above those of the analogs, sales will start a period of steady growth. Address: 632 Edgewater Dr., Apt. 731, Dunedin, Florida 33528. Phone: 813-734-2415.

7354. Fuller-Rowell, Steve. 1981. Re: Translations of and comments on selected quotations concerning soybeans and soyfoods from the book *Daikanwa Jiten* [Chinese-Japanese historical dictionary]. compiled by Tetsuji Morohashi (Tokyo, 1955-60). Letter to William Shurtleff at Soyfoods Center, Oct. 14. 36 p. Typed, with signature. [Eng]
• ***Summary:*** The one-page cover letter is followed by English-language translations of the major early references related to soybeans and soyfoods. Address: 860 Monte Rosa Drive, Menlo Park, California 94025.

7355. *Hartford Daily Courant* (*Connecticut*)**.** 1981. 'Sideways sushi' full of memories: Notes from Laurel's Kitchen. Oct. 21. p. E7.
• ***Summary:*** Carol has very fond memories of the time her judo instructor, Fukuda sensei (a woman) gave her a lesson in Japanese cooking. The main dish was a vegetarian version of sushi–the scattered kind [*maki-zushi*] rather than rolled sushi. The ingredients included tiny cubes of carrots (barely cooked) "and small pieces of a deep-fried tofu 'pouch' sold in Oriental markets," as well as shiitake mushrooms, thin strips of omelet, and crumbled sheets of nori sea weed (optional). A recipe for "Sideways sushi" is given. Address: Staff writer.

7356. Tsuchiya, Kanji. 1981. Yuyô shujitsu kara naru nyûjô mata wa funjô no shokuhin seizô-hô [Method of making milklike food or powdered food from oilseeds]. *Japanese Patent* 44,701. Oct. 21. [Jap]
• ***Summary:*** This is the author's key patent for a machine used to inactivate enzymes in soybeans for soymilk. Marusan and Kibun now use this machine, a diagram of which is given on the last page.

7357. Sass, Lorna J. 1981. More budget-conscious Americans are hitting the soy–its not just sauce. *Chicago Tribune.* Oct. 29. p. N_B19.
• ***Summary:*** This article first appeared as: Sass, Lorna J. 1981. "Soy foods: Versatile, cheap and on the rise." *New York Times.* Aug. 12. p. C1, C6.

7358. Asahimatsu Shokuhin. 1981. Asahimatsu sanjû-nen no ayumi [Asahimatsu Shokuhin: Thirty-year progress / history]. Iida-shi, Nagano-ken, Japan: Asahimatsu. 290 p. Oct. 18. Illust. No index. 23 cm. [Jap]
• ***Summary:*** Contents: History of kori-dofu. 1. History of the early days. 2. When the company began. 3. The spirit of starting the business. 4. The birth of Asahimatsu Kori-dofu K.K. 5. Becoming an independent business. 6. The construction of a new factory and problems producing soft kori-dofu. 7. The challenge of becoming first in the industry. 8. The reality of becoming first in the industry. 9. The aim of becoming a "unique first-class food business." 10. The 30th year: A new start for progress. Documents. Time table. Postscript.

Chronology:

1904–Artificially frozen tofu was displayed at the Fourth Industrial Exhibition in Japan.

1923–The Matsuo Kori-dofu Union was established.

1925 Dec. 25–The Association of Kori-dofu Unions in Nagano prefecture was established.

1930–The Anonymous Asahimatsu Improved Kori-dofu Union was established.

1932–The Anonymous Asahimatsu Improved Kori-dofu Union was reorganized as Asahimatsu Improved Kori-dofu Company, Ltd.

1932–Misuzu-dofu Sales Union (predecessor of the present Misuzu Tofu, Inc.) was established.

1935–Responsibility-guaranteed Suwa Sales Union (the predecessor of the present Daiya Tofu, Inc.) was established.

1937–Kori-dofu Union of East Tsukuma County in Matsumoto City (the predecessor of Miyama Tofu, Inc.) was established.

1939–The All Japan Kori-dofu Association was founded.

1939–The factory for making artificially frozen tofu was built in Matsuo village by Asahimatsu Improved Kori-dofu Company, Ltd.

1940 May–The All Japan Kori-dofu Union Association was established in order to serve as an organization controlling the distribution of soybeans, the raw material.

1941–The Asahimatsu Improved Kori-dofu Company, Ltd. built a branch factory in Korea.

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1943–The All Japan Kori-dofu Industry Union Association was established under an order given by the Ministry of Agriculture and Forestry.

1944–The All Japan Kori-dofu Industry Union Association was re-established as The All Japan Kori-dofu Industry Control Union.

1945–The Asahimatsu Improved Kori-dofu Company, Ltd. gave their factory to Fujikura Aircraft Industry Company, Ltd. to be used as a munitions factory.

1945 Aug. 15–The Korean branch factory of Asahimatsu Improved Kori-dofu Company, Ltd. was closed due to the termination of World War II.

1945–The All Japan Kori-dofu Industry Control Union was dissolved.

1947 March–The All Japan Kori-dofu Industry Association was established and joined the Japan Soybean Association.

1950 Dec. 19–The Asahimatsu Kori-dofu Company, Ltd. was established having a total capital of 3,750,000 yen.

1950–The naturally frozen tofu industries were struck by the unusually warm winter.

1951 Jan. 19–The factory of the former Asahimatsu Improved Kori-dofu Company, Ltd. (4873 Matsuo village) was purchased from the Fujikura Aircraft Industry Co., Ltd. and reconstruction of the factory began.

1951 April–The Soybean Control Order was abolished.

1951 May 15–The Asahimatsu Improved Kori-dofu factory started operation. The average daily production was 30 sacks (1 sack = 60 kg = 132 lb) of soybeans. Labor productivity per unit was 13.90 hours/1,000 cuts.

1952–The products of Kansai (the Kyoto-Osaka area) and the natural products from all areas in Japan declined steeply.

1953 Feb.–The All Japan Kori-dofu Industry Cooperative Union Association was founded.

1954 July 1–Asahimatsu's factory was designated by the Ministry of Labor as a model plant having safety and sanitation management.

1956 Aug.–The second construction of the SupeCo style dryer was completed. A current style thawing machine was installed which made the flow of operation continuously automatic.

1957 Nov.–The third construction of a freezing process and boiler was completed. A combustion machine for coal powder was introduced. A new chimney for the boiler was built. The average daily productivity was 112 sacks.

1958 Oct.–'Asahi-dofu' was used as food by the observation party of Showa base at the South Pole.

1958–Competitive sale of kori-dofu began.

1959 March–The first TV commercials for the Kori-dofu industry began in the Osaka area.

1959 Jan. 1–The 'meter' rule was put into practice.

1959–A specialized dryer for cubes was newly installed. Sprinkler-type thawing equipment was completed. The complete continuous operation by exchanging labor made the increase in productivity possible after the completion of the third construction.

1960–The average daily productivity: 154 sacks. Productivity of labor per unit: 7.50 hours/1000 cuts.

1962 July–Began sales of soft tofu.

1962–Began refrigeration of products.

1963 Feb.–Frequent occurrence of browned and hardened products.

1963 July–Tenryû plant began full-scale operation.

1963 Oct. 24–Success in making the products soft. Became number one in both quality and productivity among the industries.

1963 Nov. 1–Awarded by the Japan Food Sanitation Association an official commendation for having a well controlled sanitary plant. Began to use heavy oil as boiler fuel at Iida plant. The average daily productivity: At Iida plan, 97 sacks; at Tenryû plant, 136 sacks. Productivity of labor per unit: 6.50 hours/1000 cuts (at both Iida plant and Tenryû plants).

1964 July 7–Awarded by the Nagano Labor Standards Bureau of Ministry of Labor an official commendation for having a well controlled and safe plant. Stabilization of quality of 'soft' products.

1966 Oct.–Shinshu Tofu Co. Ltd. was entirely destroyed by fire.

1966 Nov. 1–Awarded by the Minister of Health and Welfare an official commendation for having a sanitary plant.

1966 Nov.–Misuzu-tofu Co. Ltd. expanded its plants and began to make 'soft' products.

1967 July 1–Asahi-dofu Sales Co. Ltd. was founded.

1967 July–Development at Iida plant of a forming box which does not require removal of whey.

1967 Dec.–Daiya Tofu Co. Ltd. began a plant to work in concert with Asahimatsu Kori-dofu Co. Ltd.

1968 April–Daiya Tofu Co. Ltd. tied up with Asahimatsu Kori-dofu Co. Ltd. Asahimatsu has 53% of the Japanese market.

1968 June 22–Asahi Dofu Sales Co. Ltd. was dissolved. Shinshû-dofu Sales Co. Ltd. was established. Ginseki Kori-dofu Co. Ltd. consigned production to Misuzu Kori-dofu Co. Ltd. Established a sales company entering into partnership with Misuzu Kori-dofu Co. Ltd.

1969 March–Decision to install a test plant which treats liquid effluent waste by the lagoon method inside Asahimatsu Kori-dofu Company's plant.

1969 July 21–'New Asahi-dofu' began to be sold.

1970–Wrapping and boxing machines were introduced at the Iida plant. Specialized dryer for cubes was completed. Percentage of good products at Iida plant is 96% and that of Tenryû plant is 95.3%. The average daily productivity at the Iida plant: 232 sacks, and at the Tenryû plant: 224 sacks. Productivity of labor per unit at the Iida plant: 3.97 hours/1000 cuts, and at the Tenryû plant: 3.28 hours/1000

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cuts.

1970 Jan. 1–Genichi Akaba became the new president of Asahimatsu Kori-dofu Co. Ltd.

1970 May–Genichi Akaba, the president of Asahimatsu Kori-dofu Co. Ltd. took office as the chief director of the Kori-dofu Industry Association Union of Nagano prefecture.

1971 Aug. 17–An overseas training program was established. The first trainee was sent to the University of Illinois. A liquid waste management facility was completed.

1972–Operations began in January in the Iida plant and in August in the Tenryû plant. 'Asahikoya with Seasoning' was developed and began its sales with a test market.

1972 Aug. 17–A second trainee was sent to the University of Illinois.

1973–'Asahikoya with Seasoning' was introduced to the public in the Tokyo market. Misuzu Tofu Co. Ltd. began to sell Koya-dofu with seasoning.

1975 Jan.–Tie-up with Mitsubishi Shoji in sales. President Fukui of the National Nutrition Research Institute and the nutritionist Kozu reported the results of an experiment using kori-dofu for preventing anemia.

1976 July–The machine for dehydrating okara at the Tenryû plant began operation.

1976 Oct. 23–The 30th anniversary of Asahimatsu Company was celebrated and a party was held. The percentage of good products at the Iida plant was 96.0%; at the Tenryû plant was 96.4%. The average daily productivity at the Iida plant was 244 sacks (1 sack = 60 kg of soybeans); at the Tenryû plant was 251 sacks. The productivity of labor per unit at the Iida plant was 1.99 hours/1000 cuts; at the Tenryû plant was 1.80 hours/1000 cuts. Address: 1008 Dashina, Iida-shi, Nagano-ken 399-25, Japan.

7359. *East West Journal.* 1981. A soyfoods trailblazer looks back... & ahead [Interview with Dr. C.W. Hesseltine]. Oct. p. 30, 32-33.

• ***Summary:*** This interview was conducted by William Shurtleff of Soyfoods Center.

"Shurtleff: How did you become interested in soyfoods?

"Hesseltine: In 1958 a Japanese man, Kazuo Shibasaki, came to work for us here at USDA. Shibasaki was one of Japan's leading researchers in the area of fermented foods, particularly miso. He came to the United States to help us develop fermented food products and to help improve the quality of our soybeans so that they could be used in fermented soyfoods.

"Shurtleff: Did you feel then that there was any potential for soyfoods in the U.S.?

"Hesseltine: Not really. I didn't have any interest in the field to know what the potential was. But about a year after Shibasaki arrived we began to notice something and organized meetings involving people interested in soyfoods. Soyfood products were available for sampling. I remember having one of our meetings in a local hotel in Peoria. We were serving miso on crackers and on cucumbers, and the chef of the hotel, who had nothing to do with the meeting, came in and tried some of the miso spread and really became interested in it.

"Shurtleff: How did the interest in miso and tempeh grow over the years? When did you find America knocking at your door, so to speak?

"Hesseltine: There was no sudden interest in the two foods. It was gradual as we continued to publish papers on the value of miso and tempeh in the mid-1960s.

"Shurtleff: Which has sparked the greatest interest?

"Hesseltine: I think it's been in tempeh, for the simple reason that we've done more work with tempeh than most other fermented soyfoods. Also in comparison to, say, miso or shoyu the process of making tempeh is much simpler. And tempeh is a food that you can consume in large quantities without the problem of eating too much salt.

"Shurtleff: Roughly how many people have written requesting tempeh starter kits for use at home over the past five years?

"(Tempeh starters are packages of spores to start the fermentation of the soybeans. -Ed.)

"Hesseltine: It's hard to estimate. I think we've sent out 30,000 to 40,000 starters, and there are repeats on that, but I would guess that represents about 20,000 different individuals.

"Shurtleff: Has there been an interest comparable to that for any other [NRRC] food project that you know of?

"Hesseltine: No, nothing on that scale. Even back in the penicillin days, there was no such response."

A photo shows Dr. Hesseltine talking with people at the 1981 Soycrafters Association Convention.

Note: Dr. Hesseltine says that okara can be used as a feedstock for making ethanol (ethyl alcohol) and methanol. Address: Chief, Fermentation Lab., USDA/NRRC, Peoria, Illinois.

7360. Sugawara, Akiko. 1981. Amerika no tôfuyusan [American tofu company (K. Tanaka & Co. in New York City)]. *Living Book.* Nov. 11. p. 82. [Jap]

• ***Summary:*** Sugawara, Akiko. 1981. The Living Book (Japan). Nov. 11. p. 82. In this 3 by 4 inch sidebar to a larger article on tofu, color photo shows the front of K. Tanaka & Co. in New York, Founded in 1903, the company is located on Amsterdam St. The 45 year old owner, Mr. Keisuke Murakami, succeeded to the shop ownership 20 years ago. His tofu sells for $0.50 a piece. He previously worked for Pan Am. The shop also sells other Japanese foods. His 3 workers also make Spinach Tofu Pie and Tofu Lasagna. Address: 326 Amsterdam Ave., New York, NY (Manhattan's West Side).

7361. J.D. 1981. Nofu [The Koba family of Oriental Groceries in San Diego will soon stop production of

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handmade tofu]. *Reader* (*San Diego, California*). Nov. 25. p. 3. City Lights section.
• ***Summary:*** "Chill news is blowing through San Diego's Japanese-American community: Haruki and Michiko Koba are going out of business. This means soon, very soon, it will be impossible to buy handmade tofu anywhere in Southern California." The Kobas have made tofu by this painstaking process for the past 33 years; but now the city is buying the building which houses their oriental groceries storefront, with plans to demolish it and replace it with a park. "The Kobas will be moving out sometime shortly after the beginning of next year. (The city offered to help them relocate, but the couple decided it wasn't worth the trouble to move the business.) They first began paying $45 a month for a single room in the building in late 1947, not long after Haruki was discharged from the U.S. Army. Born in Coronado, he had studied business at the University of Redlands until the outbreak of the war, when he volunteered for the service (and fought in France and Italy). When he got out, he and his wife had the chance to buy the foundering tofu business, which another second-generation Japanese-American had been operating unsuccessfully."

"Haruki had a cousin in Tokyo who wanted to emigrate to the United States, so the cousin worked in a tofu factory there [in Tokyo] to learn the manufacturing process, then came to San Diego to aid the Kobas."

"They rise before dawn and usually by 6 in the morning Haruki and Michiko arrive at the storefront, where Haruki grinds about 13½ lb of yellow soybeans. He uses an old electric grinder equipped with volcanic stones... He harbors a few other secrets which he declines to divulge." Toward the end of the tofu-making process, Michiko fills wooden forms with the softly congealed curd. The Kobas sell the 1½-lb cakes in the front of the store for $0.89 apiece. "Up to last year, Haruki also sold them (along with the fried tofu cakes called *age,* which Michiko also makes) from the back of a truck. Just like a milkman, he plied a regular route."

Contains a nice photo of Mr. and Mrs. Koba.

7362. Caloussis, Mr. 1981. Nestle's work with soymilk (Interview). *SoyaScan Notes.* Nov. 27. Conducted by William Shurtleff of Soyfoods Center. [Eng]
• ***Summary:*** Nestle is now making and marketing soymilk in Malaysia and Singapore. The Singapore venture started in 1979; it is doing well. Nestle owns the controlling interest, with minority local ownership. They are now test marketing their soymilk in Thailand. Nestle is also test marketing a powdered soymilk to health food markets in the Philippines. Named "Vita," it is made at a pilot plant in Japan. Nutrend is a weaning food product made in the Philippines from locally grown soybeans and wheat.

Thimonnier in Lyons, France, makes Flexi-pouch, but it is more expensive [than aseptic packaging] when you take into consideration the cost to deliver one unit.

Maggi is owned by Nestle; seasonings are their main products. Maggi really grew on its dehydrated soups–an instant food at the start of the industrial revolution. Kempthal is near Zurich, and Maggi is still located there. The original owner was Julius Maggi in Switzerland. This story is told in a book on the history of Nestle, which Mr. Caloussis will send. The man in charge of Nestle public relations is Mr. Edward Fasel in Vevey, Switzerland.

Concerning Nestle and infant formulas: In the late 1900s Mr. Nestle started making infant weaning foods out of cow's milk and cereal. Today each country has its own independent marketing program. The problem for Nestle started in England with a book titled *The Baby Killers.* Then another group in Nestle spoke out against Nestle, and Nestle sued them. This got big, negative press coverage. Infant formulas are only 3-4% of Nestle's business. The company's best-selling products are Nescafe (coffee) and various milk products.

7363. Suzuki, Tsuguyoshi; Okazaki, M.; Kashiwazaki, H.; Moriyama, M.; Takemoto, T-I. 1981. Changing food consumption of Japanese immigrants in the lowland of Bolivia. *Ecology of Food and Nutrition* 11(2):103-16. Nov. [13 ref. Eng]
• ***Summary:*** During a 3-day period in July and August 1975, dietary records of 34 households of Japanese immigrants in the lowlands of Bolivia were analyzed for the amounts and types of food consumed. The colony of Japanese immigrants, *Colonia San Juan de Yapacaní,* was established in 1955 on the basis of a governmental agreement between Bolivia and Japan. From 1955 until 1974 a total of 297 households, including 1,649 individuals, immigrated into the colony; the majority came during the first ten years. Among the items consumed were soybean products (not including soy sauce; consumed by 79.4% of the households), *tsukudani* (small fish cooked in soy sauce), wakame, nori, and kombu (3 sea vegetables), *furikake* (a seasoning containing nori), and azuki beans. "Among legumes, soybeans occupied the top position even after excluding the consumption of soybean sauce. The usual preparation was miso (soybean paste fermented and salted) and tofu (soybean curd), raw or fried, which the colonists could buy from a tofu shop in the colony."

Adzuki beans were boiled with glutinous rice and served at celebrations. "Immigrants procured the seed from Japan or Brazil and cultivated the beans." Also served was *kintsuba* (a sweet adzuki bean cake). One of the most widely used seasonings was soybean sauce, used in 85.3% of the households. Address: 1. Dep. of Human Ecology, School of Health Sciences, The Univ. of Tokyo, Tokyo, Japan.

7364. Keirn, Esta. 1981. History of Oriental Show-You Company in Columbia City, Indiana (Interview). *SoyaScan Notes.* Dec. 5. Conducted by William Shurtleff of Soyfoods Center. [1 ref]

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• ***Summary:*** The Oriental Show-You Company began production of Japanese-style fermented soy sauce (shoyu) in Columbia City, Indiana, in 1924. The company had been started in 1918 in Detroit, Michigan, by Shinzo Ohki, a Japanese man, who began by importing shoyu and tea from Japan. In 1922 Mr. Ohki went to Japan to learn the method for making shoyu, then late that year he moved his business to Columbia City and by 1924 was making shoyu, along with mung bean sprouts. Chow Mein noodles, Chop Suey, and Jigg's Corn Beef and Cabbage. The company was quite small, making about 12,000 gallons of shoyu a year; this was sold mostly in the Midwest, and only east of the Mississippi River. In 1932 Mr. Esta Keirn joined the company and soon became production manager. In 1946 the company published a 15-page booklet titled "Oriental Recipes," showing show to use shoyu. In 1963 [sic, 1943] Beatrice Foods (which had sold La Choy HVP soy sauce since the early 1930s) acquired the company and Mr. Keirn stayed on to supervise production of Beatrice's first fermented shoyu. Beatrice still makes a fermented shoyu.

The only other early maker of shoyu that Keirn knows of was a Japanese man in San Francisco who started in about 1945-46. Keirn talked with him, obtained a sample of his shoyu, and analyzed it. Keirn heard rumors of a little Chinese soy sauce producer in New York City but was never able to talk with him or to get a sample of his product. Keirn has no documents, articles, or price lists. Address: 401 Catherine Ave., Columbia City, Indiana 46725. Phone: 219-248-8742.

7365. Burns, Ken. 1981. Re: George Ohsawa and a brief history of macrobiotics in America. Letter to William Shurtleff at Soyfoods Center, Dec. 9–in reply to inquiry. 7 p. Typed, with signature. [1 ref]

• ***Summary:*** An excellent, in-depth history by a very knowledgeable source, who occasionally teaches a course in Boston on the history of macrobiotics in the USA. With numerous fond personal recollections and character sketch of Ohsawa. 1959 Dec.–Ohsawa first visited the USA. 1960 Jan.–He published, in mimeograph form, his astonishing book *Zen Macrobiotics* in English in New York City. "Although not in great detail, here he introduced miso, tamari, and tofu to the general public. The first two especially quickly become essential ingredients in the diet of almost all macrobiotic people in the US.

"During January, February, and March [1960] he lectured extensively at the Buddhist Academy in New York City. He returned to the US in July and lectured at the First American Summer Camp on Long Island daily for two months.

"The Second American Summer Camp was held in July and August of 1961. I am not sure whether he was present or not. This was in Wortsboro, New York. In that year also, thirteen macrobiotic families left New York and moved to Chico, California on his advice. The next year, 1962, they founded the first American macrobiotic food distribution and processing center in this country.

"In 1963, in the summer he came to the US again and lectured in Boston, NYC, and at the Chico Summer Camp.

"In 1964, he lectured at the Big Sur Summer Camp.

"In 1965, he lectured at Mayoro Lodge near Pulga, California.

"In 1966, on April 24th [or 23rd] he died in Japan.

"All in all, George Ohsawa visited this country either five or six times, each time lecturing, and speaking to the people individually without rest. He was ceaselessly active. I have heard many anecdotes concerning him during that period. As best I can determine, his affect on people was quite simply shattering–they had never seen anything like it.

"According to Madame Ogawa (who spoke in great and loving detail of him at the 1981 French Meadows Summer Camp) he was a very sharp dresser and had quite an eye for beauty in the female of the species. She was so obviously still in love with this 'terrible man.'

"Jacques DeLangre... never tires of telling about the time when they were descending the mountain after a long and intensely yangizing summer camp. Their car rounded a bend and there!, suddenly!, was a huge patch of luscious juicy *blackberries!* The car as though it had a mind of its own, screeched to a halt, all the doors flew open, and all the passengers were catapulted into the middle of that patch. It would be hard to imagine a clearer, cleaner-cut example of the attraction of yang to yin. Their ecstatic reverie was broken, a few moments later, by the sound of another car coming around the bend. 'Oh my God, it's Ohsawa himself; what will he say?' (In those days people were, understandably, a little naive in their application of yin and yang.) Well, that second car did just exactly what the first one had done–the screeching halt, the doors flying open, and of a sudden there was George Ohsawa right in the middle of that patch too, crying out in his basso profundo voice, 'Oh blackberries, they are sooo delicious!'

"That voice–possibly there is the key to understanding Ohsawa's impact in this country; I didn't personally meet him; he died about a month after I began macrobiotics in 1966. But I have heard him on many tapes, poorly-recorded as most of than were. And I have spoken to others who did know him personally, and sooner or later they get around to mentioning his voice. Peter Magnusson here in Boston describes it as the kind of voice that rattled the windows. I have done a course here in Boston I call 'The Healing Power of the Spoken Word;' and for that course I have listened to all the recordings of the great speakers of this era that I can get my hands on–Kennedy, Churchill, Roosevelt, William Jennings Bryan, John L. Lewis, etc. Probably the best orator in the world today (or was anyway, I haven't heard him lately) is Fidel Castro. His is a warm, rich, full voice, capable of a startling range of thoroughly human emotions–from the righteous indignation and anger of an oppressed people

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through endless shades and nuances to a profoundly warm and compassionate voice that might be that of your very best friend. Take that voice in account and you can understand Castro's success against seemingly insurmountable odds in Cuba. Well, I can tell you of an even better voice–that of Ohsawa. Peter Magnusson goes on to say that when he spoke it seemed as if the very world itself was speaking. As I have said above, his was a profoundly rich, deep voice, ranging from bass to baritone. But at the same time it was very delicate, sensitive, and poised, as ready to go up as down, as ready to go left as right–flexible! But the one quality that his voice had that I have never heard equaled I can sum up with one adjective–Vibrant.

"Probably this is not the kind of material you can use in your book, but I have taken a lot of time here on it anyway. The reason is that all the discussions I have heard about Ohsawa and his impact on this country have centered on what he said and not how he said it. Otherwise, how are we to explain how he was able to inspire so many people, along than Michio and Aveline Kushi, Herman and Cornellia Aihara to literally give up everything and come to a strange land to struggle against apparently insurmountable odds. Because that's what they did, arriving here penniless, operating on a wing and a prayer so to speak. And it is to them that we must go in the next chapter of this little story:"

Note: People were also attracted to the great sense of happiness, vitality, love of life (*joie de vivre*), and purpose that Ohsawa radiated. Continued. Address: Boston, Massachusetts.

7366. Burns, Ken. 1981. Re: George Ohsawa and a brief history of macrobiotics in America (Continued–Part II). Letter to William Shurtleff at Soyfoods Center, Dec. 9–in reply to inquiry. 7 p. Typed, with signature. [1 ref]
• ***Summary:*** Continued: "Michio Kushi, giving up a promising career in some area of international politics, arrived in New York in 1949. Still a little uncertain, and actually quite new to the macrobiotic way of life, himself, he did not immediately begin to teach the macrobiotic way of life on a full-time basis. Besides, his English wasn't sufficient, and he had to work full-time to support himself. To do this he engaged in many types of work such as managing a department store, elevator operator, and other types of odd jobs. Also, at this time, he had some connection with Columbia University. (Whether as a student or as a teacher or both, I am not quite sure. Maybe, if this is important, you could contact him, but I don't know if he would have the time to answer you.)

"In 1951, he was joined by Aveline (Tomoko) Kushi who had lived for a year and a half in Ohsawa's school 'Maison Ignoramus' near Tokyo. In 1961, instead of going to Chico as many other macrobiotic families did on the advice of George Ohsawa, they stayed in New York, not long afterward finding their way to Boston. Just how this happened I am a little uncertain. According to Peter Magnusson whom I have mentioned above, there was a certain fellow, whose name is probably forever lost, who was from this area and who convinced them that this was where they would have their greatest success. After all, the great ideological movements, the ones that had affected this country mast profoundly, had come, mainly, out of New England.

"So, it was in 1963, I think, they arrived here, living successively in Cambridge, Wellesley, and Brookline. From this time dates the tradition of study house–always they had a full complement of 'students' with them–many of whom were withdrawing from psychedelic drugs and perfectly outrageous 'lifestyles.' They must have thought Americans were very strange people, indeed, (At least the ones they knew.) But if they didn't, their neighbors sure did. By some magic or sleight-of-hand, they always managed to end up in some rather elegant houses in some rather elegant neighborhoods. Thus, in one or more cases, they were asked by the authorities to move.

"But, sure enough, it was here in the Boston area that they had found a medium in which they could really function well. Not long after, regular lectures were started in the Arlington Street Church where we would troop dutifully and eagerly in under the watchful eyes of a bust of William Ellery Channing, one of the founders of American Unitarianism. In the beginning, there weren't many people present at these talks–maybe six, eight or ten. (And even in the spring of 1967 when my wife and I arrived after spending a year in Detroit knocking our heads against this strange thing called 'macrobiotics' there might be only twelve, fourteen or sixteen.)

"But the spirit of adventure and camaraderie was simply exquisite. And the lectures were tremendously exciting–one moment we would be on the outer rim of the Milky Way Galaxy, examining its structure, and the next moment we would be examining the spirals on our fingertips. People who were here when we got here and whose names you may have heard were Evan Root, Bill Gleason, and Paul Hawken (and by the way, I think Paul Hawken has a company out there in your area–maybe you can contact him). Also Joe Leis and Jim Gronemeyer whose whereabouts I don't know. Not long afterward came Bill Tara and Ron Kotzsch who are still active in macrobiotics. The Word was out and people were coming from everywhere.

"In 1965 Erewhon was started, also on a wing and a prayer, right in the Kushi's home in Brookline. It moved in 1966, I think to a location on Newbury Street [April 1966 to 303-B Newbury St., below street level] where I used to see Mr. Kushi putting rice and aduki beans in little white paper bags. Evan Root and Paul Hawken originally managed the store [Evan first, then Paul Hawken more than a year later] and later on Bill Tara also had a hand in it. But it was definitely Paul Hawken who set his stamp on the store, and

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who had the most to do with it becoming what it eventually became–the largest handler of macrobiotic and natural foods in the country. At present there is a little difficulty there, but if you know the history of Erewhon, you cannot help but be convinced, as am I, that everything will came out all right.

"Also in 1965, certainly in 1966, Mr. Kushi began to travel around the country giving talks on macrobiotics as well as consultations. I wonder if his experience in other cities was anything like his experience in Detroit. It simply never dawned on us that he might need any money for traveling expenses, etc. I wouldn't be surprised if on a lot of these tours Michio Kushi didn't arrive back home with a lot less money than he started out with.

"But now I must get down to the gist, the 'nitty-gritty' of this story. There is something that is not explained here. The tremendous success of macrobiotics in this country is not really explained here. Of course some people will say that macrobiotics has not been a tremendous success. But I say it has. If you will look at its history from beginning to end, noting that it has never received any funding or any support from powerful organizations, that it has always operated on a wing and a prayer (I'll use that phrase again), then I think you can agree with me that its success has been miraculous.

"Well, one of the chief reasons for that is to be found in the behaviour of Mr. Kushi. Over the years he has literally given himself away, literally used himself up so many times over that you would swear there is simply nothing left to use up anymore. He has seen hundreds of thousands of people in formal consultations and as many more in informal consultations. And an awesomely large percentage of these consultations have been with crazy, sick, and desperate people anywhere and any time of the day or night. (And I ought to know, I was one of them.) I am not being overly sentimental here, nor am I stretching anything to make something seem true that isn't true. As a matter of fact, for various reasons I sometimes wish it weren't true, because for some people it has led to a 'cult of the personality' that limits their own development.

"To round out the list of macrobiotic developments that are more or less Boston based: The *East West Journal* commenced publication in January of 1971, its purpose being 'to explore the unity underlying apparently opposite values: Oriental and Occidental, traditional and modern, visionary and practical.' I think that's pretty well what it has done; and in the process it has helped more people to substantially change their lives than any publication I know of. Although many dedicated and talented people have been involved with it over the years, the two people who have had the most to do with creating and directing the *East West Journal* have been Lennie Jacobs and Sherman Goldman." Continued. Address: Boston, Massachusetts.

7367. Burns, Ken. 1981. Re: George Ohsawa and a brief history of macrobiotics in America (Continued–Part IV). Letter to William Shurtleff at Soyfoods Center, Dec. 9–in reply to inquiry. 7 p. Typed, with signature. [1 ref]

• ***Summary:*** "Even a short history of the macrobiotic movement in the US would be incomplete without the mention of two more people. The first of them is Shizuko Yamamoto who arrived in this country in June, 1965, at the suggestion of George Ohsawa. Having improved her own health tremendously through receiving and giving Shiatsu massage, as well as through the practice of Okido as taught by Masahiro Oki, once in this country she began to practice and eventually to teach these techniques. With them, she has deeply impressed (that could work out to be a pun, couldn't it?) many tens of thousands of people with the power of Oriental medicine. And since she invariably accompanies her treatment with macrobiotic dietary advice, she has no doubt caused many thousands of individuals to change their diet for the better–individuals who would not have done so merely on the strength of a verbal approach. But once again–going beyond the facts–what Shizuko has really accomplished in those thirty thousand treatments and in those hundreds of massage seminars in the US and Europe is to show people the spirit of Oriental medicine and of macrobiotics. I have seen her do this many times, and all I can say is that it is an awe-inspiring spirit indeed.

"Finally, I think it just to make some mention of a man who has not been active in macrobiotic circles for some seven or eight years; Michel Abehsera. Coming to New York in 1961 from France where he had studied with Ohsawa, he was part and parcel of the macrobiotic scene there throughout the sixties. He was a friend of and co-worker with the Kushis and the Aiharas, worked at the Ohsawa Foundation, and somewhere around 1968, opened a beautiful macrobiotic gourmet restaurant called, I believe, l'Epicerie. I think his greatest contribution, though, came in the form of two books: *Zen Macrobiotic Cooking* in 1968 and *Cooking for Life* in 1970. The both of them made macrobiotic cooking open to a wider public. Better cook books may have come after–I can't be certain about that–but none so charmingly and humanely written. Michel did a fair amount of lecturing in those days, making at least two cross-country tours, but eventually he withdrew from macrobiotic activity (around 1972) and completely devoted himself to the study and practice of Hasidic Judaism. Speaking for myself alone, I can say that his presence is sorely missed in the macrobiotic world.

"This brings me to the end of this 'little' history of the macrobiotic movement in this country. To go into it in any detail at all would require me to write a book of many hundreds of pages–there is an enormous cast of colorful characters waiting to troop out upon the stage on a moment's notice. If I called in one, I would have to call in them all–there wouldn't be any end to it.

"I don't know, however, how much help this will be to you with your book. At very least, maybe this can help

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you in the search for more information. I have asked John Belleme (Route 3, Box 541, Rutherfordton, North Carloina 28139) who has recently started making miso on a large scale to contact you. At any rate, I wish you the best of luck with your book–I look forward to seeing it in print. If I can be of any further help to you, please contact me.

"Cordially & Sincerely, Ken Burns." Address: Boston, Massachusetts.

7368. Earle, Steve. 1981. Re: Origin of the term "tamari" and history of San-Jirushi. Letter to William Shurtleff at Soyfoods Center, Dec. 19. 2 p. Typed, with signature on letterhead. [2 ref]
Address: San-Jirushi Corp., 1 Meisei-dori, Kuwana, Mie 511, Japan. Phone: (0594) 22-3333.

7369. Hughes Markets. 1981. Christmas (Ad). *Los Angeles Times.* Dec. 21. p. I19.
• ***Summary:*** The section titled "Foods of the Orient" includes: Kikkoman soy sauce, gallon can–$4.35. Fresh age, Hinode 1.8 oz.–83¢. Kikkoman 10 oz. Tempura Sauce–95¢. JFC soy bean flour 7 oz. Kinako–69¢. Hime black [soy] beans 6.35 oz., Kuromame amani–99¢. Wheat cake [sic, dried frozen tofu] 3.5 oz. Misuzu Koya Dofu–$1.19.

Also includes: Umeya frozen Mochi. Kokuho rice. Hime rolled kelp–Honporo Maki. Hime dried seaweed–Sushinori [Sushi nori]. Kikkoman sweet cooking sake–Aji Mirin. Ozeki sake. Bamboo tips. Dried gourd strip–Kezuka Kampyo [Kanpyo]. Rice vinegar–Mitsukan Su. Sliced pickled ginger–Miyako Kizami Shoga. Dried mushrooms–Miyako Shiitake. M.S.G.–Asahi Aji.

Note: Hughes now has 21 stores in the greater Los Angeles area–all open 24 hours a day. "We welcome food stamp shoppers."

7370. Yokotsuka, Tamotsu. 1981. Re: Earliest known use of the word *chiang-yu.* Letter to William Shurtleff at Soyfoods Center, Dec. 22. 1 p. Handwritten on letterhead. [1 ref]
• ***Summary:*** "As far as I know the first or earliest references to *chiang-yu* may be in Japan. It is in the *Ekirinbon-setsuyoshu* publicised in 1597 in Japan." Address: Senior Vice President, Kikkoman Corp., 339 Noda, Noda-shi, Chiba-ken 278, Japan. Phone: 0471 (24) 1111.

7371. *SoyaScan Notes.* 1981. Chronology of soybeans, soyfoods and natural foods in the United States 1981 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan. *Soyfoods* magazine issue No. 4 published. Silver cover. 10,000 copies published. Steve Fiering loans SANA money for mailing it and agrees to make a loan for a test mailing.

Jan. Union activity begins at New England Soy Dairy.

Jan. Boxed tofu (1 lb. vacuum packed in a box with a window) first made by Zakhi Soyfoods in Fort Wayne, Indiana. This important innovation of packaging tofu in a box was later employed by New England Soy Dairy (1982), Quong Hop & Co. (1983), Swan Gardens (1983), and White Wave (1985).

Jan. Hain Food Co. starts nationwide color ads for Natural Onion and Jalapeno (Soy) Bean Dips.

Jan. Travis Burgeson of Pacific Tempeh near San Francisco, CA, introduces the world's first commercial tempeh burger.

Jan. Paul's Tofu & Tempeh, the first European tempeh company in Europe outside of the Netherlands, opens in England.

Jan 20. Ronald Reagan inaugurated as president of the United States. His Secretary of Agriculture is John R. Block. The regulatory climate in Washington begins to shift toward less federal regulation and more encouragement for industries to regulate themselves. The Republican administration favors free-market policies with less government regulation and involvement.

Jan. 23. Legume, run by Gary and Chandri Barat, is incorporated in New York, then that month moves to Verona, New Jersey.

Feb. 2. Island Spring in Washington becomes America's first unionized tofu plant.

Feb. San-Jirushi International starts its first major American ad campaign using the slogan "San-J is the real tamari." The full-color, full-page national ads aim to clarify the confusion between tamari and shoyu created by the macrobiotic movement.

Feb. Soyfoods Unlimited tempeh plant starts operation in San Francisco area. It is the most modern U.S. tempeh plant, although output is small.

Feb. Vitasoy soymilk and Morinaga tofu start to be imported and sold in the USA from Hong Kong and Japan respectively, immediately after the FDA lifts its ban on aseptic Tetra Pak type cartons. Morinaga tofu was sold by Beech Nut California Corporation, a joint venture with

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Beech Nuts Food Corp., established in 1977 in San Jose, California.

Feb. "Soyfoods Catching On" by Judith Brown published in *USDA National Food Review.* About tofu and tempeh.

Feb. Many tempeh plants switch to using GEM cultures tempeh starter.

March 1. Svadesha Pflanzen-Feinkost, West Germany's first commercial tofu company, starts production. Founded by Swami Anand Svadesha (Rudiger Urban) in Fuerth im Wald.

March. Institute of Food Technologists meeting at New England Soy Dairy. Tour, dinner, and speeches.

March. Richard Leviton on National Public Radio's "All Things Considered" talks for 10 minutes about soyfoods to 2 million people.

March. *The Book of Miso,* by Shurtleff and Aoyagi published by Ballantine Books in a mass market paperback edition.

April. USDA decides to establish tofu standards, then announce them in the Federal Register, but this plan is dropped in September, amid controversy over changes in the School Lunch Program.

April. Dr. Cook at Kansas State University publishes a paper on the possible inhibitory effects of soy proteins on nonheme iron absorption in humans. USDA becomes concerned.

April. *Tofu at Center Stage,* by Gary Landgrebe published by Fresh Press. First tofu cookbook containing many recipes calling for use of meat.

April. Bean Machines introduces new sanitary disintegrators/ grinders for tofu and soymilk production.

April. "The Miso-Master's Apprentice," by John Belleme published in *East West Journal.*

May. "The Amazing Tofumobile," by Janice Fillip, about Wildwood Natural Foods, published in *East West Journal.* Revival of interest in small tofu shops in areas where there is a high density of interest and high food consciousness, and rediscovery of soyfoods craftsmanship.

May. *Tofu Boken* by Ted Nordquist and Tim Ohlund published by Aros Sojaprodukter in Sweden. Europe's first book on tofu.

June. *Tofu Fever in New York,* by Megan B. Murray notes that David Mintz is making 275 gallons of tofu ice cream a week. This is the earliest known publication on his work with soy ice cream. He had been making it for 3-4 months.

June. "Surprise, It's Soy" by Barbara Bassett published in *Bestways.*

June. FIND/SVP survey of the U.S. tofu industry and tofu consumer survey published. 33% of respondents in major metropolitan areas were aware of tofu and 10% had purchased it. Predicts market will grow 32% a year for the next 6 years... an over-optimistic prediction.

June 29. "Trader Vic Bergeron Offers Timely Tips for Tofu" by Rose Dosti published in *Los Angeles Times.*

July. *Soyfoods* magazine is incorporated by Richard Leviton, and offers stock.

July 8-12. Fourth Annual Soycrafters Convention at Colorado State University. 240 people from 18 nations attend, 210 pay. First National Tofu Cheesecake Bakeoff and Soyfoods Equipment / Supplies Expo in the western world.

July. Mary Tolan selected Registered Young Dietitian of the Year by the American Dietetic Association. Invited to present speech on "Tofu–Food of the Future" at ADA convention in Philadelphia.

July. *Tofu Cookbook,* by Sally Sheppard published by Jack's Beanstalk.

July. "Soybean Ice Creams: Getting your Licks In" by Richard Leviton published in *Vegetarian Times.*

July. Soyfoods Center is working to build the world's largest library of documents on soyfoods, each with a bibliographic card, filed by author. Also building a large library of color slides on soyfoods.

Aug. "Tofu, Tofu Everywhere," by Karen Dukess published in *The New York Times'* Business section.

Aug. "Soyfoods: The Future Is Here but Are You Ready" by Alan Richman published by *Health Foods Business* as a cover story.

Aug. 12. "Soy Foods: Versatile, Cheap and on the Rise" by Lorna Sass, and "A Source of Quality Protein" by Jane Brody published in *The New York Times,* and syndicated nationwide.

Aug. "My Favorite Tempeh Recipes" by Aveline Kushi published in *East West Journal.*

Aug. *Delights of Tofu,* by Fox, O'Connor and Timmins published by New England Soy Dairy.

Aug. *Das Tofu Book,* by Shurtleff and Aoyagi published in Germany by Ahorn Verlag.

Sept. "Soyfoods Report" published by *Natural Food Merchandiser.*

Sept. *Home Soyfood Equipment,* by Ray Wolf published by Rodale Press.

Sept. 13. At SANA Board of Directors Meeting held near San Francisco, the Soycrafters Association of North America has its name changed to Soyfoods Association of North America to broaden scope and support base.

Sept. SANA and The Soyfoods Center do a major press release on soyfoods production and consumption in America to 250 key media. Many magazines publish this report and conduct radio interviews.

Sept. Okita Enterprises takes 22 tofu and bean sprout makers to Japan for a 10-day tour. SANA executives Richard Leviton and Luke Lukoskie make important contacts with Japanese tofu trade officials and publications.

Sept. USDA publishes tofu regulations in the Federal Register, then withdraws entire school lunch revisions and revokes permission given to the Santa Cruz (Calif.) school

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system to use tofu in school lunches.

Sept. Dr. Hirayama of the National Cancer Center in Japan announces that miso soup is effective in combating stomach cancer and stroke.

Oct. "Things Go Better With Soyburgers: The New All-American Food" by Richard Leviton published in *East West Journal* as a cover story.

Oct. *Cook with Tofu,* by Christina Clarke published by Avon Books in mass market edition.

Oct. John Belleme's American Miso Corp. begins miso production in North Carolina.

Oct. Workers at Hinode Tofu Co. in Los Angeles go on strike for 2 weeks.

Oct. *Nasoya Tofu Cookbook,* published by Nasoya Foods.

Oct. *O Livro da Soja,* by Jane Cadwell published in Brazil by Editora Ground. One of the country's first books on soyfoods.

Nov. 10. Erewhon, America's natural foods pioneer, files for Chapter 11 reorganization under the U.S. bankruptcy laws. On 2 April 1982 Erewhon is sold to Nature Food Centers.

Nov. Autumn Press, publisher of *The Book of Tofu,* original edition, files for Chapter 11 bankruptcy.

Nov. New England Soy Dairy announces 28-Day Self Life Advantage Pasteurized Tofu in a 2/3 page ad in *Natural Foods Merchandiser.*

Nov. Soyfoods Unlimited advertises tempeh burgers in *Natural Foods Merchandiser.*

Nov. The Ministry of Agriculture and Forestry in Japan announces a Japanese Agricultural Standard (JAS) for soymilk. The soymilk boom in Japan starts.

Dec. *Juel Andersen's Tofu Kitchen* published by Bantam Books in mass- market paperback.

Dec. "World's Best Tofu Cheesecake" by Richard Leviton published in *Vegetarian Times.*

Dec. Food Protein Council, a trade association, changes its name to Soy Protein Council, since all of its members make only soy protein products.

Dec. *La Soya y Sus Derivados* (*Tofu, Tempeh, Miso*), by Shurtleff and Aoyagi published by Quadernos de Natura in Mexico.

Dec. *The Tofu-Miso High Efficiency Diet,* by Yoshiaki Omura M.D. published by Arco Publ.

Dec. *Cooking with Tofu.* by Mary Anna DuSablon published by Garden Way.

Dec. There are now 158 tofu manufacturers and 41 tempeh manufactures in the USA.

Dec. The Farm Vegetarian Cookbook published as *Soja Total* in German.

* Global economic activity is shifting from the Atlantic to the Pacific. In 1981 Asia passed Europe to become the largest market for U.S. agricultural products. In fiscal 1981 Japan bought $6,700 million worth of U.S. farm products.

* Soybean breeders, which have formerly focused their research efforts on increasing quantity (yield) of soybeans, now start to give more attention to quality (composition). Increasing total protein, methionine, and oil, and decreasing linolenic acid and antinutritional factors are priorities.

* U.S. soybean exports reach their peak this year of 25 million metric tons (tonnes). By 1987 they have fallen to 18 million tonnes, a 28% drop, due largely to competition from Brazil and Argentina, and to foreign subsidies. The market changes from a seller's to a buyer's market.

7372. Aishima, T. 1981. Glass capillary chromatographic profiles of soy sauce aroma correlated with sensory assessment. *Agricultural and Biological Chemistry* 45(12):2847-53. Dec. [22 ref]
Address: Noda Inst. for Scientific Research, Noda-shi, Chiba 278, Japan.

7373. Kiang, Y.T. 1981. Inheritance and variation of amylase in cultivated and wild soybeans and their wild relatives. *J. of Heredity* 72(6):382-86. Nov/Dec. [17 ref]
• ***Summary:*** The cultivated soybean is *Glycine max* and the wild soybean is *Glycine soja.* Eleven wild relatives include *Neonotonia wightii,* which is a perennial with long climbing vines. It is widely distributed in Africa, Southeastern Asia, and Taiwan, and is commonly called the perennial wild soybean. Seed of *Neonotonia wightii* showed no amylase activity except in two accessions from South Africa. Some enzymes of cultivated soybeans have been studied electrophoretically, but there is only one brief report of isozyme analysis of the wild soybean (*Glycine soja*).
Address: Assoc. Prof. of Plant Science and Genetics, Univ. of New Hampshire, Durham, NH 03824.

7374. Kitamura, Keisuke; Kaizuma, Norihiko. 1981. Mutant strains with low level of subunits of 7S globulin in soybean (*Glycine max* Merr.) seed. *Ikushugaku Zasshi* (*Japanese J. of Breeding*) 31(4):353-59. Dec. [16 ref. Eng; jap]
Address: Dep. of Agriculture, Faculty of Agriculture, Iwate Univ., Morioka, Japan 020.

7375. Marking, Syl. 1981. Checkoff: An export builder? Part II. *Soybean Digest.* Dec. p. 37, 40, 42.
• ***Summary:*** "U.S. farmers now export more soybeans–worth a whopping $8.6 in 1980–than they grew in 1965." Export expansion statistics for many countries are given: Japan–The Japanese paid $1 billion for U.S. soybeans in 1980. In 1956 about 20 million bushels of U.S. soybeans were used in Japan, compared with about 160 million in 1980–an 8-fold increase in 24 years. Some 95% of the soybeans consumed in Japan are U.S. soybeans. The Japanese presently use more than 36.7 million bushels of U.S. soybeans for direct human consumption.

North Europe: In 1960, about 40 million bushels of U.S.

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soybeans were exported to this 6-nation region–mostly to Germany. That figure as jumped to about 170 million bushels in 1980. Soy oil consumption has risen from 367,000 metric tons in 1977 to 550,000 in 1980–a 50% increase.

Mexico: In 1980, Mexico imported about 55 million bushels of U.S. soybeans. Oilseed crushers predict that Mexico will be crushing 3 million metric tons of soybeans (120 million bushels) by 1985.

Southeast Asia: Just before 1975, when U.S. soybean market development started here, Southeast Asia imported about 16 million bushels a year. In 1981 that figure will rise to about 55 million bushels.

Taiwan: Since 1969, annual U.S. soybean exports have grown by 14%. In 1985 Taiwan is expected to import 60 million bushels of U.S. soybeans.

Every checkoff dollar invested by U.S. soybean farmers is matched by at least two dollars from other sources.

7376. Shurtleff, William; Aoyagi, Akiko. 1981. La soya y sus derivados: Tofu, miso, tempeh [The soybean and its products: Tofu, miso, tempeh]. *Quadernos de Natura* (*Editorial Posada, Mexico*) No. 20. 87 p. Dec. [3 ref. Spa]
• ***Summary:*** Contents: Introduction: The miracle of soya, by Ma. Teresa Piazza. 1. Soya: Source of protein. Ten reasons that soy will be the protein source of the future. 2. Tofu: Introduction A family of distinctive foods. A storehouse of high-quality protein. Cost of protein from different sources. Low in saturated fats: free of cholesterol; an ideal diet food. Natural backbone of the meatless diet. Buying and storing tofu. Making tofu at home and in communities. Soybeans, tofu, and the world food crisis. Table of different tofu varieties. Tofu shops in Japan. Our favorite tofu recipes.

3. Miso: Introduction. Delightfully varied; highly versatile. A nutritional treasure trove. The varieties of miso (including a table). The preparation of miso. Traditional natural miso and quick modern miso. A brief history of miso. Buying, storing, and using miso. Miso in Japan. Traditional Japanese miso shops and modern factories. Making miso at home. Our favorite miso recipes (contains 16 recipes).

4. Tempeh: Introduction. Rich in protein and vitamin B-12. Tempeh comes west (a brief history). How tempeh is made. The miracle of fermentation. Buying and storing tempeh. Tempeh for Latin America. Our favorite tempeh recipes (contains 8 recipes).

Note: This book is largely a Spanish-language translation of three English-language brochures written by the authors in the late 1970s: What is tofu? What is miso? What is tempeh? Chapter 1 is summarized from the first chapter of *The Book of Tempeh.* Address: Soyfoods Center, P.O. Box 234, Lafayette, California.

7377. Tsuchiya, Kanji. 1981. Processing equipment for soy milk. English translation of a Japanese article in Beverage Japan (31 Dec. 1981, p. 18-23). 13 p. Unpublished manuscript.
• ***Summary:*** An excellent technical work by one of Japan's leading authorities on soymilk product and equipment, who is also Marusan's chief soymilk technician. Contents: 1. Worldwide interest in health foods and the soymilk boom. 2. The basic way of thinking about processing soymilk. 3. Processing and equipment. Flowcharts, ingredients, dehulling and enzyme inactivation (dry heating, soaking in hot water, grinding in hot water, grinding in water without oxygen, intercepting air with nitrogen, steaming), grinding and separation, formulation and sterilization, deodorization and homogenization. Address: Seikensha Co., Midori 4-18-2, Sumida-ku, Tokyo. Phone: 03-634-2061.

7378. Wolf, Walter J. 1981. Foreign travel report. Peoria, Illinois. 4 p. Dec. 18. Typed, with signature.
• ***Summary:*** "Country visited: Japan, Oct. 10-21, 1981. Purpose of trip: (a) Participate in the U.S./Japan Cooperative Program in Natural Resources (UJNR), Protein Resources Panel Meeting; (b) participate in UJNR panel study tour; (c) visit research institutes and industrial laboratories working on soybean proteins; and (d) participate in symposium on soy protein foods. Summary: The UJNR meeting in Tsukuba included 10 presentations by seven Japanese research workers from six different research institutes and three U.S. scientists from three USDA regional research centers. Topics discussed included... (f) single cell protein production from soybean cooking waste waters; (g) soybean storage; (h) food uses of soy protein; and (i) nutritional evaluation of soy proteins. The study tour included a visit to a miso and soy milk factory which was impressive and confirms earlier reports that soy milk has become very popular in Japan in the past 5 years. Visits to industrial laboratories revealed that soy proteins are now used in a large variety of foods. Flavor is one of the last problems holding back development of soy protein-based foods."

The UJNR program, initiated in 1964, plays an important role in implementing the policy of scientific cooperation between the United States and Japan. The protein panel was organized in 1968, and there are now 17 different panels in UJNR.

Dr. Ebine reported that about 790,000 metric tons (29 million bushels) of soybeans are used in traditional Japanese foods–miso, natto, tofu. Organizations visited included Okazaki Marusan Co. Ltd (makes miso, soy milk, and soy yogurt), Research Institute for Food Science of Kyoto University at Uji, Nisshin Oil Mills Ltd., Ajinomoto Co., Inc., Fujipurina Protein Ltd. (Fuji Oil Co. has a joint venture with Ralston Purina Co.). Address: Leader, Meal Products Research, Oilseed Crops Lab., Northern Regional Research Center, Peoria, Illinois 61604.

7379. **Product Name:** [Lecithin].
Manufacturer's Name: Ajinomoto Co. Inc.

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Manufacturer's Address: Kyobashi 1-5-8, Chuo-ku, Tokyo 104, Japan. Plant at Yokohama.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 56.

7380. Ajinomoto, K.K. 1981. [Soy protein product]. *Japanese Patent* 5,636,900. [Jap]*
• ***Summary:*** Solvent extraction of soy protein with aqueous ethanol removed undesirable odor and taste components from soy products.

7381. Chiba, H.; Sasaki, R.; Yoshikawa, M.; Ikura, K. 1981. [Storage of soybean under high temperature and low humidity]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 34(3):201-09. [Jap]*

7382. Dronne, Yves. 1981. Le problème mondial du soja [The problem of soybean worldwide]. Paris: Institute National de la Recherche Agronomique. [Fre]*
• ***Summary:*** Gives details on Japanese consumption of industrially processed plant proteins (tons/year of defatted soybean meal equivalent): Unfermented: Tofu 84,200, Dried-frozen tofu 22,400, Other products. including texturized soy protein 87,800. Fermented: Soy sauce 173,000, miso 157,400, natto 55,200. Total: 580,000

Concerning Japanese consumption of new "purified" protein in tons/year. In 1971/1977 total consumption was 27,300/44,000. Of this the amount made from soybeans was 15,900/17,000 and the amount made from wheat gluten was 11,400/27,000. As for the texture, the amount sold in the form of a powder was 17,400/19,600 and the amount sold in textured form was 9,600/24,400.

In 1977, of powdered products, the amount from soybeans was 9,500 (6,000 isolates and 3,500 concentrates) and from gluten 10,100. Of the textured products, the amount from soybeans was 7,500 (6,000 dry extruded, 1,500 moist, and no paste), whereas the amount from gluten was 16,900 (200 dry extruded, 12,000 moist, and 4,700 paste). Address: Paris, France.

7383. **Product Name:** [Soy Flour].
Manufacturer's Name: FPPM Limited.
Manufacturer's Address: SKF Building, Shiba-Daimon 1-9-1, Minato-ku, Tokyo, Japan.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 63.

7384. **Product Name:** [FujiPro-M/SP, and IPSO-M/SP Isolated Soy Protein].
Manufacturer's Name: Fuji Oil Co. Ltd. (Fuji Seiyu).
Manufacturer's Address: Nissei Midosuji Hachimancho Building, 6-1 Hachiman-cho, Minami-ku, Osaka, Japan.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 63. Toyo Shinpo. 1984. June 1. Fuji Seiyu now has a Soy Protein Foods Corner (Daizu Tanpaku Shokuhin Konaa) in an Osaka Department store.

7385. **Product Name:** [FujiPro-C, and Ipso-C Concentrated Soy Protein].
Manufacturer's Name: Fuji Oil Co. Ltd. (Fuji Seiyu).
Manufacturer's Address: Nissei Midosuji Hachimancho Building, 6-1 Hachiman-cho, Minami-ku, Osaka, Japan.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 63. Toyo Shinpo. 1984. June 1. Fuji Seiyu now has a Soy Protein Foods Corner (Daizu Tanpaku Shokuhin Konaa) in an Osaka Department store.

7386. **Product Name:** [Ipsotex Fujinik {Textured Soy Protein}].
Manufacturer's Name: Fuji Oil Co. Ltd.
Manufacturer's Address: Nissei Midosuji Hachimancho Building, 6-1 Hachimancho, Minami-ku, Osaka 542, Japan.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 58.

7387. Hattori, Terumitsu. 1981. Re: Answers to questions about the history of shoyu. Letter to William Shurtleff at Soyfoods Center. 4 p.
Address: Kikkoman, San Francisco.

7388. Hirayama, Takeshi. 1981. [Does daily intake of miso reduce gastric cancer risk?]. Paper presented at 40th Annual Meeting, Japan Cancer Assoc. 1 p. English abstract. [Jap; Eng]
• ***Summary:*** Daily intake of miso was found to significantly reduce gastric cancer in an ongoing study of 122,261 males and 142,857 females aged 40 or above in 29 health center districts in Japan 1966-78, the rates being 171.9, 210.2, 246.0, and 255.9 in males and 77.8, 85.3, 97.5, and 113.6 in females in daily, occasional, rare, and non-consumers respectively. These relationships remained significant when observed by smoking habit and socio-economic status. The observed beneficial effect could come from substances in the miso, but it is also possible that this just reflects the effects of some other substance(s) closely associated with the intake of miso soup, such as green-yellow vegetables. Address: Epidemiology Div., National Cancer Center Research Inst., Tokyo, Japan.

7389. **Product Name:** [Lecithin].
Manufacturer's Name: Hohnen Oil Co. Ltd.
Manufacturer's Address: Mitsui Life Insurance Building, 1-2-3 Ohtemachi, Chiyoda-ku, Tokyo, Japan. Plants at

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Shimizu & Kobe.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 56.

7390. **Product Name:** [House Mabo-dofu Seasoning Sauce Mix].
Foreign Name: Hausu Maaboo-dôfu no Moto.
Manufacturer's Name: House Shokuhin Kogyo.
Manufacturer's Address: Japan.
Date of Introduction: 1981.
Ingredients: Sugar, sesame oil, spices, soy sauce, lard, starch, oyster sauce, salt, monosodium glutamate, soy bean paste, red pepper, beef extract, citric acid.
Wt/Vol., Packaging, Price: 7 oz (200 gm). In foil packet in paperboard box with full-color photo on cover.
How Stored: Shelf stable.
New Product–Documentation: Label in Japanese. Distributed in the USA by Nishimoto Trading Co., Los Angeles, CA 90058. Mix diced tofu with this sauce to make the popular Chinese recipe, Mabo-dofu.

7391. **Product Name:** [Textured Soy Protein].
Manufacturer's Name: Japan Protein Co. Ltd.
Manufacturer's Address: Sumiyoshi-cho, Izumisano, Osaka, Japan.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 58.

7392. **Product Name:** [HiProton Whole Fatted Spray Dried Soy Protein, Proton-SA No. 1 Defatted Spray Dried Soy Protein].
Manufacturer's Name: Japan Protein Industry Co. Ltd. [Nihon Tanpaku].
Manufacturer's Address: 1920 Ogawahigashi-cho, Kodaira City, Tokyo, Japan.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 63.

7393. **Product Name:** [Proton-NA No. 1 Isolated Soy Protein].
Manufacturer's Name: Japan Protein Industry Co. Ltd.
Manufacturer's Address: 1920 Ogawahigashi-cho, Kodaira City, Tokyo, Japan.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 63.

7394. Kanda, H.; Hesseltine, C.W.; Wong, F.E. Assignors to Nisshin Seiyu K.K. 1981. [Method for making soybean milk yogurt]. *Japanese Examined Patent* 5,628,130. [Jap]*
• ***Summary:*** Dried whey and sweetener are mixed with soybean milk, the mixture is heat sterilized and stabilizers are added. After cooling, the mixture is cultured with a combination of *Lactobacillus acidophilus* NRRL B1910 and *L. acidophilus* NRRL B-2092 in roughly equal proportions. These strains can utilize the raffinose in soybean milk, responsible for flatulence, and at the same time contribute to the removal of the beany taste. In an example, 20 gm dried whey and 50 gm sugar were added to 1 liter soybean milk and the product was incubated at 37ºC for 24 hours. It had a pH of 4.2 and combined 9 times to 8 viable cells/gm; it kept well at 5ºC for 19 days and had an acceptable flavor and smell. Address: 1. Nisshin Seiyu K.K.; 2. USDA NRRC, Peoria, Illinois.

7395. Kawamura, Wataru. 1981. Amerika-ban Miso no hon [The Book of Miso published in America]. *Shin Eiyo* (*New Nutrition*) p. 62-66. Month unknown. [1 ref. Jap]
Address: Japan.

7396. Kobayashi, T. 1981. Insect pests of soybeans in Japan. *Tohoku National Agricultural Experiment Station, Miscellaneous Publication* (*Japan*) No. 2. 39 p. *
Address: Japan.

7397. **Product Name:** [Soy Protein].
Manufacturer's Name: Kyowa Hakko Kogyo Co. Ltd.
Manufacturer's Address: Otemachi 1-6-1, Chiyoda-ku, Tokyo, Japan.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 63.

7398. **Product Name:** [Togurt {Soymilk Yogurt} (Strawberry)].
Foreign Name: Tôguruto.
Manufacturer's Name: Marusan-Ai Co., Ltd.
Manufacturer's Address: Okazaki-shi, Aichi-ken 444-21, Japan. Phone: 0564-45-3111.
Date of Introduction: 1981.
Ingredients: Soymilk, strawberry jam, barley malt syrup, gelatin, agar, calcium chloride.
Wt/Vol., Packaging, Price: 100 gm round paper cup with foil lid.
How Stored: Refrigerated.
New Product–Documentation: Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 61. "In 1981 Marusan-ai introduced Japan's first soymilk yogurt." Package with Label sent by Dr. Walter Wolf of Peoria, Illinois. 2000. Aug. 5. On 16 Oct. 1981 Dr. Wolf visited the Okazaki Marusan Co. in Okazaki, Japan, and (according to his "Foreign Travel Report" of 18 Dec. 1981) picked up a sample of this "yogurt-like product called 'Togurt' which is flavored with is flavored with fruit. Mouth feel and flavor of Togurt were very good." Package: 1.75 inches diameter (lid) by 2¼ inches tall. White,

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yellow, and red on pink, with blue letters on white on the back. A color photo shows a small glass dish of the soy yogurt, with a little whipped cream and a strawberry on top. "Yogurt-style. A fermented food."

7399. Matsui, K.; Fukuda, K.; Kameda, Y. 1981. Chemical modification of amino groups in alanine dehydrogenase from *Bacillus natto* KMD 1126. *Chemical and Pharmaceutical Bulletin* 29:485-89. (Chem. Abst. 94:152584. 1981). *

7400. **Product Name:** [Maxten {Textured Vegetable Protein}].
Manufacturer's Name: Miles-Kyowa Co. Ltd.
Manufacturer's Address: Aoyama Building 2-3, Kita-Aoyama 1-chome, Minato-ku, Tokyo, Japan.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 58.

7401. **Product Name:** [Mitsukan Ma-Bo Tofu Seasoning Mix].
Foreign Name: Mitsukan Ma-Bo Tôfu no Moto.
Manufacturer's Name: Nakano Vinegar Co. Ltd.
Manufacturer's Address: Japan.
Date of Introduction: 1981.
Ingredients: Dehydrated soy sauce, powdered miso, sugar, potato starch, salt, powdered chili paste, dehydrated chicken extract, dehydrated garlic, dehydrated ginger, dehydrated oyster extract, monosodium glutamate (to enhance flavor).
Wt/Vol., Packaging, Price: 1.89 oz (54 gm). 2 foil packets in paperboard box with color photo of recipe on front. $1.08.
How Stored: Shelf stable.
New Product–Documentation: Label in Japanese. Mix diced tofu with this sauce to make the popular Chinese recipe, Mabo-dofu. Recipe on back.

7402. **Product Name:** [Nikko-Mame Defatted Soybean Flakes for Shoyu and Miso, Sakae-Mame Soy Flour for Tofu, ProtFlour Soy Flour for Food and Milk Replacer, Nikoprotein High Protein for Food].
Manufacturer's Name: Nihon Koyu Co. Ltd.
Manufacturer's Address: No. 32 Bungocho, Higashi-ku, Osaka, Japan.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 63.

7403. **Product Name:** [Lecithin].
Manufacturer's Name: Nihon Koyu Co. Ltd.
Manufacturer's Address: No. 32 Bungocho, Higashi-ku, Osaka, Japan. Plants at Kurashiki, Mizushima, Okayama.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 56. Offices at Fukuoka, Hiroshima, Nagoya, Okayama, Osaka, Takamatsu, Tokuyama, Tokyo.

7404. **Product Name:** [Nikofimee {Spun Soy Protein Food}].
Manufacturer's Name: Nihon Koyu Co. Ltd.
Manufacturer's Address: No. 32 Bungocho, Higashi-ku, Osaka, Japan.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 58.

7405. **Product Name:** [Nikko-Mame {Defatted Soybean Meal for Shoyu and Miso}, and Sakae-Mame {Soybean Meal for Tofu}].
Manufacturer's Name: Nikko Oil Mills Co. Ltd.
Manufacturer's Address: Kanda Ogawamachi 2-12, Chiyoda-ku, Tokyo, Japan.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 63; 1982. p. 67, 76.

7406. **Product Name:** [Nisshin Lecithin].
Manufacturer's Name: Nisshin Oil Mills, Ltd.
Manufacturer's Address: Shinkawa 1-23-1, Chuo-ku, Tokyo, Japan. Plants at Kobe & Yokohama.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 56.

7407. Ryo, S.; Baba, K. 1981. [Effects of natto (soybean) intake in lactation on the increase of vitamin K in human milk]. *Shusanki Igaku* (*Perinatal Medicine*) 11:1191-95. (Chem. Abst. 96:5278). [Jap]*

7408. Saio, K. 1981. [Soybean storage and processing]. *Nogyo Oyobi Engei* (*Agriculture and Horticulture*) 56(1):143-49. [Jap]*
Address: Japan.

7409. **Product Name:** [Showa Soy Flour, and Sangyo-Mame Soy Flour {For Making Tofu}].
Manufacturer's Name: Showa Sangyo Co. Ltd.
Manufacturer's Address: Uchikanda 2-2-1, Chiyoda-ku, Tokyo 101, Japan.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 63; 1986. p. 87; 1987. p. 78. Sangyo-Mame is still being made.

7410. **Product Name:** [Showa Lecithin].
Manufacturer's Name: Showa Sangyo Co. Ltd.
Manufacturer's Address: Uchikanda 2-2-1, Chiyoda-ku, Tokyo, Japan.
Date of Introduction: 1981.

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New Product–Documentation: Soya Bluebook. 1981. p. 56.

7411. Tsuchiya, Kanji. 1981. Tônyû seizô no shin gijutsu to sôchi kara hôsô made [New technology and equipment for soymilk production, including packaging]. *Beverage Japan* 4(2):18-24. Translated as "Processing equipment for soy milk". [Jap; eng]
Address: Director, Malsan Food Co., Ltd., Tokyo, Japan.

7412. Tôfu seihin to eiyô [Tofu products and nutrition]. 1981. Aichi Prefecture, Japan: Aichi Prefecture Tôfu Shokô Kyokai. [Jap]*
• ***Summary:*** This booklet contains 13 chapters, one of which is about soyfoods and health. The trypsin inhibitors in tofu and soymilk are said to be effective in treating diabetes.
Address: Japan.

7413. **Product Name:** [Yakult Soymilk (Dairylike)].
Foreign Name: Yakuruto Rakkumii.
Manufacturer's Name: Yakult (Yakuruto Honsha).
Manufacturer's Address: Japan.
Date of Introduction: 1981.
Wt/Vol., Packaging, Price: 200 ml Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Toyo Shinpo (Soyfoods News). 1982. July 21. "The soymilk industry and market in Japan." States that Yakuruto first made commercial soymilk in Japan in 1981.

Label, Tetra Brik carton, 200 ml. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center; Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64.

Note: In 1971 in Japan more than 17 million bottles a day of a beverage containing live lactobacilli were consumed. Most of these were made by Yakuruto [Yakult] (Yakult Institute for Microbiological Research, Kunitachi-shi, Tokyo, Japan).

7414. **Product Name:** [Gotoku Soy Flour].
Manufacturer's Name: Yoshihara Oil Mill Ltd.
Manufacturer's Address: Naka Noshima 3-6-32, Kita-ku, Osaka, Japan.
Date of Introduction: 1981.
New Product–Documentation: Soya Bluebook. 1981. p. 63; 1986. p. 87. Company name is now Yoshihara Oil Mills Ltd. Address is now Uchisaiwai-cho 1-2-2, Chiyoda-ku, Tokyo, Japan.

7415. Akizuki, Tatsuichiro. 1981. Nagasaki 1945: The first full-length eyewitness account of the atomic bomb on Nagasaki. Translated by Keiichi Nagata. London, Melbourne, and New York: Quartet Books. 158 p. Edited and with an introduction by Gordon Honeycombe. [Eng]
• ***Summary:*** In the chaos that followed the explosion of the atomic bomb over Nagasaki, Dr. Akizuki tirelessly tended nearly 200 seriously-ill patients. Today he still works in that hospital. The book describes Dr. Akizuki's feelings that miso helps alleviate the effects of radiation. A powerful and moving account. Address: Japan.

7416. Aoki, Hiroshi. 1981. Misoshiru sanbai kenkô-hô [Three bowls of miso soup daily for good health]. Tokyo: Goma Books. 220 p. Illust. 20 cm. [Jap]
• ***Summary:*** Miso soups and health recipes. He worked for food companies, including Ajinomoto, for 30 years on development of new soy protein foods. A popularizing book. Discusses Hirayama.

Contents: Preface. Why are miso soups and soyfoods appreciated again now? 1. The many benefits from eating

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miso soups and soyfoods every day. 2. The Japanese people have forgotten the goodness of miso soups and soyfoods. 3. Healthy soyfoods: From miso to soymilk (miso, natto, shoyu, tofu, deep-fried tofu pouches, dried-frozen tofu, yuba, okara, kinako {roasted whole soy flour}, soymilk, soy oil). 4. Miso soups and soybean cooking make a healthy body. Soybean recipes which are suited to people in the younger generation. Mother's favorite recipes are good for health, too. Appendix. Maps of Japan showing areas of miso soups and natto.

7417. Barber, Linda; Matsuda, Tomoko. 1981. Tôfu, nattô ryôri [Tofu and natto cookery]. Kumamoto City, Kumamoto prefecture (on the island of Kyushu), Japan: Marumiya Co. 25 p. Illust. (color photos). No index. 22 cm. [Jap]

• ***Summary:*** Contents: Recipes of tofu and natto: 13 western style, 2 Japanese.

Note: A photo shows Linda (left) with co-author, Tomoko Matsuda; she translated Linda's recipes into Japanese. She was also Linda's assistant at Kobe College, and she traveled everywhere that Linda went as a friend and translator. She also helped Linda with food styling.

7418. Barber, Linda. 1981. Color slides taken during a visit to a shoyu maker in Japan. Kobe, Japan. 1 p. Based on e-mail of 9 May 2012.

• ***Summary:*** Linda took these color slides in 1981 somewhere in Japan. The factory, whose name she does not remember, was automated and fairly large. They made Daisho-brand shoyu.

(1) Labeled bottles showing the ingredients used in making shoyu: Defatted soybean meal, wheat, salt, and koji starter.

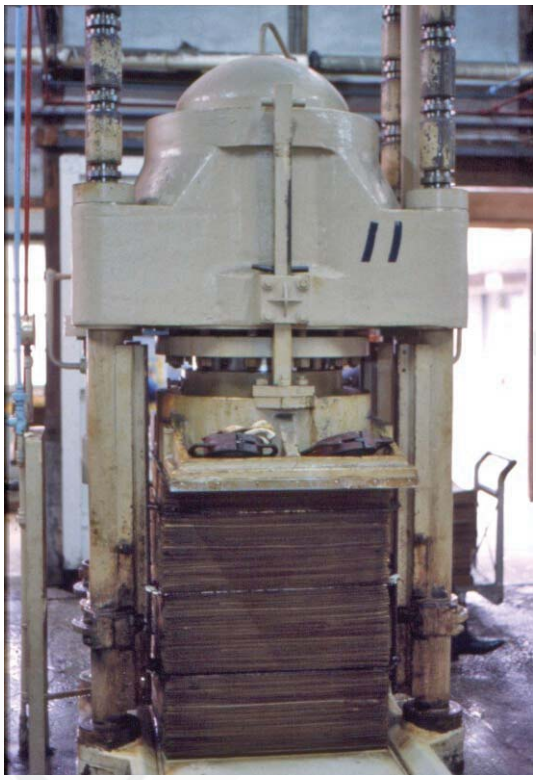
(2) Salt in a concrete storage area.

(3) A large automated koji-making room.

(4-5) Two views of a woman working at the plant. She is looking at moromi that has just been run into a pressing sack.

(6) A hydraulic press, slowly pressing out the shoyu, leaving behind residue in the sacks.

(7) Bottles of Daisho shoyu in crates. Address: Resident Director of Practice House and Oral English Instructor, Kobe



College, 4-1 Okadayama, Nishinomiya, Japan.

7419. Barber, Linda. 1981. Color slides of making soymilk curds and tofu at home in Japan. Kobe, Japan. 1 p. Based on e-mail of 9 May 2012.

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• ***Summary:*** (1) Fresh homemade soymilk curds, ready to be served, seasoned with soy sauce. (2) Fresh homemade tofu, placed in cold water in a bowl to be chilled. (3) Homemade frozen tofu; its spongy porous texture absorbs sauces like magic. (4) Tofu can be used as a source of protein in a wide variety of dishes–including many healthy desserts. Address: Resident Director of Practice House and Oral English Instructor, Kobe College, 4-1 Okadayama, Nishinomiya, Japan.

7420. Bernard, R.L.; Nelson, R.L. 1981. USDA Germplasm Collection Inventory–1900 to 1977. Urbana, Illinois: University of Illinois. 37 p. Typed Ms.

• ***Summary:*** "Information on the origins of introduced United States and Canadian named varieties and all strains identified by FC numbers and PI numbers introduced through 1977 (PI 420.388).

"This is a working paper. Please report any errors to R.L. Bernard, Turner Hall, Univ. of Illinois, Urbana, Illinois 61801. A final document will be issued later in 1981.

"Soybean Germplasm Manual 1."

Gives contact information for the Northern Collection (Maturity Groups 000 to IV, Richard Bernard and Randall Nelson) at the Univ. of Illinois, and the Southern Collection (Maturity Groups V to X, Edgar Hartwig and Calton Edwards) at Stoneville, Mississippi.

This detailed work consists of a 3-page introduction followed by many tables.

This "collection of soybean cultivars, herein referred to as strains, from throughout the world" is maintained by the USDA "in cooperation with the Illinois and Mississippi Experiment Stations. The collection is in two sections, the northern or early-maturing strains... at Urbana, Illinois, and the southern or late-maturing ones... at Stoneville, Mississippi. The collection was established in 1949 with the objective being to obtain and maintain all significantly different soybean strains from throughout the world with emphasis on land races of eastern Asia, where soybeans originated. It was initially assembled by L.F. Williams at Urbana and E.E. Hartwig at Stoneville under the supervision of M.G. Weiss, leader of USDA Soybean Investigation, and J.L. Cartter, director of the U.S. Regional Soybean Laboratory [at Urbana, Illinois].

"The strains of the collection may be divided into three parts corresponding to their designations: 1. United States and Canadian named varieties (cultivars)...

"2. FC strains consisting of foreign introduction and domestic strains identified by a series of numbers assigned by the former Forage and Crops section of the USDA. This series was used until about 1956.

"3. PI strains, consisting of foreign introductions identified by the system described in the following section.

"In addition to the soybean germplasm collection outlined above, collections of genetic types and isolines, wild soybeans (*Glycine soja*), and perennial *Glycine* species are maintained, and lists of this material are available from the curator at Urbana."

"In 1949 when this collection was established they were able to gather from the USDA and various state experiment stations 1,521 strains, which is *19%* of the original 7,873 introductions made through 1944."

"The last page of Table 1 [p. viii] shows the results of the two large Asian collecting expeditions, the first by USDA plant explorer P.H. Dorsett [and his son, Jim] in 1924 to 1927, and the second by Dorsett and USDA soybean specialist W.J. Morse in 1929-1931. The soybeans obtained by them (5,417 varieties) represent 69% of the total received from 1900 to 1944 and make up 82% of the pre-1945 strains in the present collection."

"The major additions in recent years have been the 861 from Japan in 1977 and the 1,823 from South Korea in 1976."

"Maturity Group 00 was split into 000 and 0 in 1981 with the earliest ones in 000."

"The varieties introduced up until about 1908 (36) are mostly hay-type varieties. Those from 1910 to 1927 (61) are mostly grain-type and include virtually all of the introductions ancestral to the present U.S. commercial varieties. Those of 1929 and 1932 (41) were from the Dorsett and Morse expedition and are mostly vegetable types released for human food and home-garden use."

Tables: (1) PI numbers assigned by year, and number of strains in the USDA Soybean Germplasm Collection. The last page of Table 1 shows that from 1924 to 1927 Dorsett sent back 966 soybean PI numbers of which 260 (26.9%) are still in the collection. From 1929 to 1932 Dorsett and Morse sent back 4,451 soybean PI numbers of which 986 (22.2%) are still in the collection.

(2) A statistical history of soybean introduction.

(3A) Soybeans introduced from 1900 to 1944 by country and within country by year.

(3B) Soybeans introduced from 1945 to 1977 by country and within country by year.

(4) Number of strains in the Collection by country.

(5) Number of strains in the Collection by maturity group.

Origins of introduced soybeans which became U.S. and Canadian named varieties.

Origins of soybean strains identified by FC numbers.

Origins of soybean strains identified by PI numbers.

Note: This unpublished typescript was updated and published in two volumes in 1987 as INTSOY Series No. 30 and in 1989 as INTSOY Series No. 31. Both are extremely useful and interesting. Address: Urbana, Illinois.

7421. Brown, Lester R. 1981. Building a sustainable society. New York, NY: W.W. Norton & Co. xiii + 433 p. Index. 21 cm. [686* ref]

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• ***Summary:*** Contents: Preface. 1. Introduction. Part I: Converging demands. 2. Eroding the base of civilization (example of reasons for the collapse of one of the major centers of Mayan civilization in Guatemala): The historical expansion of cropland, thinning topsoil, spreading deserts–the human hand, the loss of irrigated land, conversion of cropland to nonfarm uses, the cropland prospect. 3. Biological systems under pressure: Deforesting the earth, deep trouble in oceanic fisheries, grasslands for 3 billion ruminants, per capita consumption trends, future resource trends, oil–the safety valve. 4. Twilight of the age of oil: The rise of oil, our petroleum culture, the emergence of OPEC, the decline of oil, giving up on nuclear power, coal–the stopgap, beyond the age of oil. 5. The changing food prospect: The loss of momentum, the North American breadbasket, growing food insecurity, land productivity trends, substituting fertilizer for land, the grain-livestock economy, the new food-fuel competition, the food price prospect. 6. Emerging economic and social stresses: Competing demands, rereading Ricardo, a new source of inflation, slower economic growth, rising unemployment, social stresses.

Part II: The path to sustainability. 7. Population–a stabilization timetable: The existing projections, the changing backdrop, a stabilization timetable, the family planning gap, social improvement and fertility, incentives for smaller families, China's one-child family program, inflation as a contraceptive force, a gradual awakening. 8. Preserving our resource underpinnings, land-use planning, ensuring soil security, stabilizing biological systems, reforesting the earth, preserving the web of life, beyond the throwaway society, conserving energy. 9. Renewable energy–turning to the sun: Wood as a fuel, energy from waste, planting energy crops, falling water, harnessing the wind, tapping the earth's heat, rooftops as collectors, electricity from sunlight, solar architecture, the renewable energy potential. 10. The shape of a sustainable society: The changing global energy budget, a sustainable transportation system, the resurgence of agriculture, new industries, new jobs, the future of urbanization, simpler life-styles among the affluent, third world reinforcement, greater local self-reliance, from the growth to sustainability. 11. The means of transportation: Urgency of the transition, role of the market, financial carrots and sticks, change through regulation, financing the transition, reorienting R&D programs, role of leadership. 12. The institutional challenge: Overcoming vested interests, the role of corporations, religions–an ecological theology, universities–getting involved, public interest groups, the communications media. 13. Changing values and shifting priorities: Values in transition, voluntary simplicity, conspicuous frugality, equity–the two dimensions, redefining national security, a new economic yardstick, a sense of excitement. Notes. Acknowledgments.

In the chapter titled "The Changing Food Prospect," a table (p. 106) shows per-capita meat and poultry consumption in selected countries in 1978 (in kilograms): USA 111, France 86, Poland 79, USSR 51, Brazil 32, Japan 29, China 21, India 1.1. "One way of increasing meat production when food supplies are tight is to switch to those animals such as chicken that convert grain into meat most efficiently. Pages 107-08 discuss soybeans: "In spite of efforts to raise the efficiency of grain conversion into livestock products, competition between people and livestock for scarce grain supplies seems certain to intensify as pressures on the world's agricultural resource base increase. While the growing demand for animal protein has not so far raised the share of the grain harvest fed to livestock, it has generated an enormous demand for soybean meal for livestock rations. Since 1950, the world soybean harvest has multiplied fivefold, climbing from 18 million tons to 85 million."

"As rising affluence has converted the global appetite for livestock products into effective demand, the market for soybeans, an ideal protein complement to cereals in livestock and poultry rations, has grown rapidly. Growth has been particularly rapid since 1970 when the world fish catch leveled off. Between 1970 and 1980, the world soybean harvest has doubled from 42 million tons to 85 million tons, with nearly all the increase being consumed by livestock."

The great challenge for our planet in the 1980s is to build a sustainable society. The three main threats to civilization are (1) Soil erosion, (2) Deterioration of three biological support systems (forests, grasslands, and ocean fisheries), and (3) Rapid depletion of oil reserves with no alternatives in place. Our world has a short-term focus, to wring as much as possible from the land while destroying it in the long run.

"Eight centuries before Christ, a Mayan civilization began in the lowlands of Guatemala. For more than seventeen centuries its population grew steadily until suddenly, around A.D. 900, the society collapsed. Within decades the population fell to one-tenth its previous level. The apparent reason: soil erosion." Address: Worldwatch Inst., Washington, DC.

7422. Ethnic Studies Oral History Project. 1981. Uchinanchu: A history of Okinawans in Hawaii. Honolulu, Hawaii: Ethnic Studies Program, University of Hawaii at Manoa. xxvii + 631 p. Plus 3 unnumbered pages of plates. Illust. Index. 25 cm.

• ***Summary:*** Chapter 6, titled "Issei life histories," includes a history of Tsuru Yamauchi (p. 488-509, based on an interview with Michiko Kodama), the mother of Shoan Yamauchi, who founded Hinoichi Tofu, the largest tofu company in the United States.

Tsuru Kamiawa was born in 25 Dec. 1890 (Meiji 23; the year of the tiger) in Shuri, Okinawa, into a poor family that had once been "of samurai lineage." When she was

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age 3, the family moved to the countryside, to Itoman and Ahagun, where she was raised. When she was about 13 or 14 [1903-04] she learned to make tofu, grinding the [soy] beans by hand early in the morning. She made one kettleful each morning, then sold it on a sidewalk where things were for sale. She also tended her own agricultural field, where she grew and harvested various crops.

She was married in about 1908 (Meiji 41) as a "picture bride," to Shokin Yamauchi, who was the eldest of four boys and two girls. At the time of the marriage, he was away in Kauai, Hawaii, cutting sugarcane, so she went to live with his parents–who were kind to her, but who also lived in a small, crowded rented house of one room. There was a tofu shop next door, and she was careful never to waste tofu or okara.

In 1910 she went to Wapiahu, Hawaii (on a 15-day trip by ship via Japan), to meet her husband for the first time. They lived deep in the canefields, where her husband worked, in one big crowded cottage in Camp 35. In 1911 she had her first child, a daughter. They usually ate tofu once a week only, but they had it twice in one week only about once a month. The people who made it carried it by foot from Wapiahu to sell it to them. The sugarcane workers worked hard, six days a week, with only Sunday off. They moved to Camp 1 and then to Camp 10, where they lived for 8 years in the middle of the canefields. For breakfast they now had miso soup and daikon pickled in miso. By the age of 30 Tsuru had had 4 children, most born with a midwife and all without a doctor. The children's grandfather on their husband's side [i.e., her husband's father, Mr. Yamauchi, had come to live with them in Hawaii].

Around 1919, after being away from home for 8-9 years, she returned with her 4 children to visit parents in Itoman, Okinawa. After 4 years in Okinawa, she return alone to Hawaii to be with her husband; later on they called their children one by one to be with them in Hawaii. In Hawaii she found a job where her husband was then working, at the Hawaii Military Academy on 18th Avenue. She worked in the boarding school–even though she spoke almost no Hawaiian or English. She had three more children in 1925, 1927, and 1929–bringing the total now to seven. When Mr. Yamauchi decided to start working for the Ewa landing pier, she worked as a housemaid (for very little money), until 1937, when she started to work at Libby's cannery–starting at 30 cents an hour. She worked at Libby's for three years (during the pineapple season), then during the off-season she worked at a tuna canning factory for 20 cents an hour. It smelled terrible. Around that time she also did housecleaning in Kahala, two or three houses a week. Their small income helped to pay for the elder children's school tuition in Japan.

Then on 15 July 1940, with almost no money, they purchased an existing tofu shop [Haruko Uyeda Tofu] and renamed it Aala Tofu Co. She made the tofu and ran the shop; her husband had a job gardening. In 1938 her boy came back from Okinawa. He helped her to make tofu while he was going to school. "Later this boy [Shoan Yamauchi] when to the States and is now involved in the tofu business in a big way. He had gone to America for a vacation, intending to play, but he started making tofu there and lives in Los Angeles."

In Hawaii the tofu was made differently from the way she had learned to make it in Okinawa; in Hawaii the okara was cooked with the slurry before it was removed. Since they had no machines at that time, it took a long time to make tofu and was hard work. They got up and started work at 1-2 o'clock in the morning. They ground the [soy] beans with a stone mortar [sic, hand-turned stone mill].

Kanai Tofu, run by Mr. Kanai, is the oldest tofu shop in the area. "We've been doing it for 40 years and he was before us. There was one more on River Street, Green Mill, which used to be on Maui, came afterwards. After the war others also came up–Aloha Tofu and other smaller ones that do the work themselves. Many are Okinawans" (p. 505). At the shop they also made and sold *age* (fried bean curd), konnyaku, and okara. Pig keepers would buy the okara very cheaply for feed.

The tofu business stopped for about 3 weeks after Pearl Harbor and the start of war. Then business was good and tofu sold well because of food shortages. In 1942 they started a noodle shop (*saimin-ya*) to augment their income. They used their age to make "cone sushi." During the war, their son [Shoan Yamauchi] doing tofu went into the U.S. army when his number came up. Fortunately, there was no internment of Japanese or Okinawans in Hawaii.

Today, one of their boys is in jewelry; three are in tofu. Her girl who was born in Okinawa now lives in California with her family. Tsuru was age 91 at the time of this interview. Her life consisted mostly of ceaseless hard work and poverty. Life is good now in Hawaii.

Note: Tsuru Yamauchi died in 1990 in Hawaii. Address: Manoa, Hawaii.

7423. Hashiba, H.; Okuhara, A.; Iguchi, N. 1981. Oxygen-dependent browning of soy sauce and some brewed products. *Progress in Food and Nutrition Science* 5:93-113. (Pergamon Press). [18 ref]
Address: Central Research Laboratories, Kikkoman Shoyu Co. Ltd., Noda-Shi, Chiba-ken, Japan.

7424. Hinode Tofu Company. 1981. Hinode Top Silken Tofu. Natural high protein (Leaflet). Los Angeles, California. 4 panels each side. Each panel: 22 x 9 cm.
• ***Summary:*** This color leaflet contains 8 tofu recipes from *The Book of Tofu* by Shurtleff & Aoyagi: Tofu mushroom meatloaf. Chinese chilled tofu. Salmon tofu salad with sesame dressing. Crisp-pan-fried tofu. Deep fried tofu. Eastern omelet. Tofu with vegetables. Tofu fruit pudding.

Other panels: The joy of tofu (nutrition). Tofu and you

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(protein; how silken tofu is made). Top silken tofu (firmer than kinugoshi tofu, pasteurized in the package). Easy to use and enjoy. Up to 60 day shelf life under refrigeration. Address: 526 Stanford Ave., Los Angeles, California 90013.

7425. Kikkoman Corporation. 1981. Photocopies of Kikkoman labels. Kikaku Senden-bu (Planning and Marketing Dept.), Tokyo, Japan. 10 p. Unpublished manuscript. 28 x 44 cm.
• ***Summary:*** These photocopies of Kikkoman soy sauce labels were taken from company scrapbooks. Labels are shown from the following years: 1951, 1953, 1955, 1957, 1958, and 1969. Each label contains text in both English and Japanese. The 1951 label reads: "The 'Kikkoman' Shoyu. Brewed by Nodashoyu Co., Ltd. Made in Japan. The 1969 label reads: "The 'Kikkoman' Shoyu. Brewed by Kikkoman Shoyu Co., Ltd. Product of Japan. Address: Tokyo, Japan.

7426. Kikkoman K.K. 1981. Dai 63 ki hôkoku-sho. Showa 55 nen 1 gatsu 1 nichi–Showa 55 nen 12 gatsu 31 nichi [63rd annual financial report. From 1 Jan. 1980 to 31 Dec. 1980]. Tokyo, Japan. 15 p. 19 cm. [Jap]
• ***Summary:*** Written entirely in Japanese with no photos. Address: Tokyo, Japan.

7427. Kimura, Yuko. comp. 1981. Amerika-jin no kangaeta miso ryôri [Miso recipes developed by an American (William Shurtleff)]. Tokyo. vii +108 p. Illust. 13 x 19 cm. Translated by the Ajisai Group, in Ms. Kimura's English class. [1 ref. Jap]
• ***Summary:*** Contents: Forward (preface). Menu. Dips. Hors d'oeuvres. Spreads. Sandwiches. Dressings for salads. Salads. Sauces. Desserts. Address: 1-10-3, Tamagawa Gakuen, Machida-shi, Tokyo 194, Japan.

7428. Kusumoto, Kenkichi. 1981. Miso raisan [In praise of miso]. Tokyo: Kobunsha. 262 p. Illust. 18 cm. [22 ref. Jap]
• ***Summary:*** Superficial talks/essays. About famous Japanese favorite miso soups and miso soups in each season.

Contents: Preface. 1. In praise of miso soups! 2. Miso soups throughout the four seasons. 3. Country village miso soups. 4. Topography/geography of miso. 5. Topography/geography of miso soups. 6. Miso soups and Haiku (poems). Address: Professor, Tanaka Chiyo Junior College, Meguro-ku, Tokyo, Japan.

7429. Meilke, Karl D.; Griffith, G.R. 1981. An application of the Market Share Approach to the demand for soyabean and rapeseed oil. *European Review of Agricultural Economics* 8(1):85-97. [23 ref]
• ***Summary:*** The authors use this approach to estimate demand for total vegetable oils and soybean oil in the USA, Canada, Japan, and the European Community (EC), and rapeseed oil in Canada. The results imply that the demand for rapeseed oil is more elastic than the demand for soybean oil in all regions, and that the demand for both rapeseed and soybean oil is by far the most elastic in the EC. Address: 1. Univ. of Guelph, ONT, Canada; 2. New South Wales Dep. of Agriculture, Australia.

7430. Mogi, Masatoshi. 1981. Miso to gojûnen [Miso and fifty years]. Noda, Japan: Published by the author. 232 p. [Jap]*
Address: Kikkoman Central Research Lab.

7431. Omae, Kinjiro; Tachibana, Yuzuru. 1981. The book of sushi. Tokyo, New York and San Francisco: Kodansha International Ltd. Distributed through Harper & Row. 127 p. Foreword by Jean-Pierre Rampal. Illust (some color; 40 color plates). Index. 27 cm.
• ***Summary:*** Shôyu (soy sauce) is discussed in depth on pages 99-100. The section titled "Sushi shop vocabulary" (p. 20) states that *murasaki* refers to soy sauce, which is usually called "shoyu."

The section on "Materials" (p. 56) states that soy sauce is absolutely essential to sushi–as essential as rice, rice vinegar, wasabi (nose-tinglingly sharp when freshly grated), pickled ginger, nori, and tea.

Natto and tofu (p. 49) are mentioned as sushi ingredients. Address: 1. Former chairman, Tokyo Sushi Assoc., then president of the Federation of Japan Sushi Shops.

7432. Omura, Yoshiaki. 1981. The tofu-miso high efficiency diet. New York, NY: Arco Publishing, Inc. xvi + 221 p. Index. 21 cm. [70 ref]
• ***Summary:*** Contents: Acknowledgments. Foreword. A natural, balanced diet for health, weight loss, and longevity. 1. The benefits of a diet based on traditional Japanese foods. 2. How being overweight affects your health. 3. Why certain foods? What is needed to maintain health (The key concept is balance). The diet plan: Changing your eating habits. 4. What is misoshuru? Miso, tofu, and seaweed. 5. The first two weeks: Rapid weight loss. 6. The third week: Transition. 7. The maintenance diet. How to calculate your individual calorie requirements. Food plan. Adapting Japanese foods and cooking methods. 8. Representative Japanese and American menus. 9. Japanese foods and how to shop for them. 10. Some Japanese cooking methods which you can adapt to American foods. 11. Some recipes for Japanese dishes. Changing your lifestyle. 12. Exercise. 13. The mental side of losing weight: How your mind can help your body. Appendices: 1. Charts and records for your personal use. 2. Nutritional information on miso, tofu, seaweed, and green tea. 3. Vitamins. 4. Distributors of Japanese foods. Bibliography: Cookbooks and foodbooks, nutrition books and articles, books in Japanese, books and articles on health and weight control by alternative approaches. Notes.

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7433. Photograph of various types of Chinese and Japanese of soy sauce sold in the San Francisco Bay Area. 1981.
• ***Summary:*** Back row (left to right): Superior Soy, Longevity Brand Soy Sauce, Superior Soy, and Westbrae White Tiger Tofu Sauce. The first three brands are Chinese style.

Front row (L-R): Westbrae tamari, illegible, Kikkoman soy sauce in table-top dispenser, illegible. Longevity Brand Soy Sauce.

The Chinese brands were purchased in San Francisco Chinatown by William Shurtleff, who also shot the photo at home on Mountain View Dr. in Lafayette, California.

7434. Sakaguchi, Koichi. 1981. Tomago no okazu, tôfu no okazu 500 sen [500 selected egg side dishes and tofu side dishes]. *Kamakura Orange Series* No. 2. 274 p. Illust. Index. 26 cm. (Kamakura Shobo, Tokyo). [Jap]
• ***Summary:*** Contents: Recipes–Eggs: Omelet, frying, boiling, tojiru, poaching, scrambling, steaming, raw, soups (Japanese, western, Chinese styles), sandwiches, drinks, lunch ideas, good cooking information–Do you know about eggs? Tofu: Raw, sauteed, stir-fried, fried, cooked in sauce, steamed, salads (*aeru*), soups (Japanese, western, Chinese styles), broiled, okara, deep-fried pouches, koya-dofu, deep-fried, ganmodoki (tofu burgers), good cooking information–Do you know about tofu? Writing about my challenge in tofu making. How to make menus.

American Linda Barber is mentioned on page 242.

7435. Sakata, Dai. 1981. Furushô Masakichi den [Biography of Masakichi FURUSHO]. Kumamoto, Japan: Aso-sha. 261 p. [Jap]*
• ***Summary:*** Mr. Furusho was a merchant in Kumamoto, Kyushu, Japan. His father started making shoyu in 1906 (Meiji 39) and received a kunsho award for promoting business.

7436. Sanford, James H. 1981. Zen-man Ikkyû. Chico, California: Scholars Press. xv + 321 p. Plus 7 unnumbered leaves of plates. See p. 279. Illust. Index. 24 cm. Series: Harvard Studies in World Religions, No. 2. (Harvard Univ. Center for the Study of World Religions). [126* ref]
• ***Summary:*** Chapter 5, "Tokugawa tales," explains (p. 245) that this compilation, made during the Tokugawa or Edo period (1600-1867), contains about 200 different stories collected about Ikkyû. While these collections purport to be a sort of popular biography of the eccentric figure, "few contain any certain biographical data save the most obvious sort, such that Ikkyû was a Zen monk of the 15th century who was known for his odd ways." Some of the talks are clearly not biographical.

The section titled "Poems for patriarchs" (p. 277-79) contains a poem that Ikkyû is said to have written a poem on the back of a painting of the Japanese Buddhist patriarch, Nichiren. The 2nd line read: "Priests like two piles of bean flour" (*Mame no ko ni fun Bôzu*). "Mame no ko" is an early word for *kinako* or "roasted soy flour." According to the endnotes, this poem is from: Tsujimoto Motosada. 1844. *Ikkyû shokoku monogatari.* 2 vols. In Kôda rohan, ed. 1911. Nihon Bungei Sôsho, Vol. 18. Tokyo: Tôô-dô.

Given the above words of caution, we cannot be sure that Ikkyû ever wrote the words *mame no ko,* and if he did, when.

Note: Ikkyû, a Zen priest, lived 1394-1481. A "Chronological table" (p. xiv-xv) includes Ikkyû's connections with Daitoku-ji, a Zen temple in northern Kyoto:

"1440–Ikkyû serves briefly as Abbot at Abbot of Daitoku-ji's Nyôi-an.

"1444–Nippô Sôshun appointed Abbot at Daitoku-ji.

"1447–Ikkyû attempts protest suicide after turmoil at Daitoku-ji.

"1452–Ikkyû settles into his Katsuro-an hermitage in Kyoto.

"1453–Daitoku-ji burns.

"1467–Onin war begins. Katsuro-an is destroyed.

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Daitokuji-burned.

"1474–Ikkyû appointed Abbot of Daitoku-ji; effects major rebuilding.

"1481–Ikkyû dies." Address: Chapel Hill, North Carolina.

7437. Shurtleff, William; Aoyagi, Akiko. 1981. Qu'est-ce le tofu? Traduction et mise en page: L'équipe de l'Informatek, Quebec [What is tofu? Translated into French by the folks at Informatek, Quebec, Canada]. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549 USA. 16 p. [Fre]
• ***Summary:*** Contents: Introduction: What is tofu? A family of distinctively varied foods. A storehouse of high-quality protein. A pillar of vegetarian nutrition. An ideal food: Low in saturated fats, free of cholesterol; an ideal diet food. Buying and storing tofu. Making tofu at home and in communities. Soybeans, tofu, and the world food crisis. Tofu shops in Japan. Cooking with tofu (13 recipes). Address: Authors: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Informatek: 688 St-Jean, Québec, G1R 1P8, Canada. Phone: Quebec: (418) 522-5386.

7438. Shurtleff, William; Aoyagi, Akiko. 1981. Miso soup protects against cancer. Lafayette, California. 3 p. 28 cm.
• ***Summary:*** This is mostly a translation by Aoyagi of an article about "Miso soup's unexpected good effects" from *Asahi Shinbun,* 27 Sept. 1981. A heavily edited version was published in *East West Journal* (Jan. 1982, p. 42-43). Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

7439. Soei, Zenni. 1981. Shôjin no osôzai: Tôfu ryôri [Zen vegetarian cookery, daily recipes: Tofu cuisine]. *Kurashi no Sekkei* (*Designs for Living*) No. 140. 168 p. Illust. No index. 29 cm. (Tokyo: Chuo Koronsha). [Jap]
• ***Summary:*** Contents: Preface. Takenogosho and tofu cookery. How to make momen [regular Japanese style] tofu using the easy home method. Nutrition of tofu and prevention of adult diseases. Non-tofu tofu. Introduction to Sanko-in temple. Tofu recipes: Broiled tofu, deep-fried tofu, okara, dried-frozen tofu, yuba. Meaning of inertia. Watching the moon.

7440. *SoyaScan Notes.* 1981. When were small-seeded soybean varieties bred specifically for making natto first released or licensed, and by whom? (Overview). Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1915–*Ko-tsubu-daizu* ["small-seeded soybean"]. "40112. No. 7... used for *miso* and *natto.*" Received 8 March 1915 'From an exhibition in Kawamata, near Fukushima City.' Source: USDA Bureau of Plant Industry, Inventory. 1918. "Seeds and plants imported by the Office of Foreign Seed and Plant Introduction during the period from January 1 to March 31, 1915. Nos. 39682 to 40388." No. 42. 123 p. April 17. See p. 69.

Traditional–Jizuka. Smallest, from Ibaraki prefecture. Source: Ontario Soya-Bean Growers' Marketing Board. 1982. "Canadian soyabean mission, South East Asia, Feb. 12th–27th, 1982: Mission member reports." Chatham, Ontario: Ontario Soya-Bean Growers' Marketing Board. 12 p. Feb.

Traditional–Suzuhime. Small, from Hokkaido. Source: Ontario Soya-Bean Growers' Marketing Board. 1982. "Canadian soyabean mission, South East Asia, Feb. 12th–27th, 1982: Mission member reports." Chatham, Ontario: Ontario Soya-Bean Growers' Marketing Board. 12 p. Feb.

Traditional -

1981–Nattawa. MG-0. Developed by Agriculture Canada, Ottawa. Source: Richard Bernard 1992. "Additions to Table 6 of USDA Technical Bulletin 1746."

1981–Hartz 936X. MG-6. Sources: Griffis and Widermann. 1992. *Ibid.* p. 6.

1983–Chico. MG-00. Source: Griffis, Gil; Wiedermann, Lars. 1992. "Marketing food-quality soybeans in Japan: A manual on how to profit from the niche market in Japan for value-added soybeans. 5th ed." St. Louis, Missouri: United Soybean Board. 25 p. (Report). See p. 5-6.

1985–Canatto. MG-000. Developed by Agriculture Canada, Ottawa. Source: Richard Bernard 1992. "Additions to Table 6 of USDA Technical Bulletin 1746."

1985–King Natto. MG1. Sources: Griffis and Widermann. 1992. *Ibid.*

1986–Nattoking 86. Developed in Canada by N.R. Bradner of King Grain. Source: Beversdorf, W.D.; Buzzell, R.I.; Ablett, G.R.; Voldeng, H.D. 1995. "Soybean." In: A.E. Slinkard and Douglas R. Knott, eds. 1995. Harvest of Gold: The History of Field Crop Breeding in Canada. Saskatoon, Saskatchewan: University Extension Press, Univ. of Saskatchewan. ix + 367 p. See p. 153-66. Chap. 13. See p. 9.

1986–Vance. MG-V. Sources: (1) Griffis and Widermann. 1992. *Ibid.* (2) University of Illinois, Dep. of Agronomy. 1993. "USDA Soybean Germplasm Collection: Public varieties (United States and Canada)." Urbana, Illinois. 3 p. Feb. 16. Unpublished typescript. Beversdorf, W.D.; Buzzell, R.I.; Ablett, G.R.; Voldeng, H.D. 1995. "Soybean." In: A.E. Slinkard and Douglas R. Knott, eds. 1995. Harvest of Gold: The History of Field Crop Breeding in Canada. Saskatoon, Saskatchewan: University Extension Press, Univ. of Saskatchewan. ix + 367 p. See p. 153-66. Chap. 13.

1987–Nattoking 87. Developed in Canada by N.R. Bradner of King Grain. Source: Beversdorf et al. 1995, p. 9

1988–NattoKing K87, Nattoking 88. MG-1. Developed in Canada by N.R. Bradner of King Grain. Source: Beversdorf et al. 1995, p. 9. Griffis & Widermann. 1992. *Ibid.*

1989–Camp. MG-V. Developed by Virginia Agricultural Experiment Station. Source: Richard Bernard 1992.

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"Additions to Table 6 of USDA Technical Bulletin 1746."

1989–IL1 and IL2. Developed by University of Illinois Agricultural Experiment Station. University of Illinois, Dep. of Agronomy. 1993. "USDA Soybean Germplasm Collection: Public varieties (United States and Canada)." Urbana, Illinois. 3 p. Feb. 16. Unpublished typescript.

1989–Minnatto. MG-0. Developed by Minnesota Agricultural Experiment Station. Source: Richard Bernard 1992. "Additions to Table 6 of USDA Technical Bulletin 1746."

1989–Nattosan. MG-0. Developed by Agriculture Canada, Ottawa. Source: Richard Bernard 1992. "Additions to Table 6 of USDA Technical Bulletin 1746."

1989–Hartz 914 and Hartz 922. MG-6. Sources: Griffis and Widermann. 1992. *Ibid.* p. 6.

1989–SS201 and SS202. Developed at Iowa Agricultural Experiment Station. Bernard, Richard L. 1999. "Summary of research & breeding programs for food type soybeans." Urbana, Illinois. 3 p. Feb. Unpublished typescript.

1989–Suzumaru [Suzu-maru]. Developed by the Hokkaido Central Agricultural Experiment Station, Hokkaido, Japan. Sources: (1) Biological Abstracts, Vol. 87. No. 9. It yielded 30.9 tonnes per hectare on average in performance tests during 1984-1987. (2) Hosoi, Tomohiro; Kiuchi, Kan. 2003. "Natto–A food made by fermenting cooked soybeans with *Bacillus subtilis* (*natto*)." In: Edward R. Farnworth. 2003. *Handbook of Fermented Functional Foods.* Boca Raton, Florida: CRC Press. 390 p. See p. 227-50. Natto makers prefer to use certain soybean varieties such as Suzuhime and Suzumaru which are grown in Hokkaido, Kosuzu in Iwate, Miyagi, and Akita Prefectures, and Natto-Shoryo [= Natto-kotsubu] in Ibaraki Prefecture. These Japanese cultivars are registered with the Ministry of Agriculture, Forestry and Fisheries (MAFF).

1989–TNS. Developed in Canada by Harvey Voldeng at CES in Ottawa. Sources: (1) Source: Beversdorf et al. 1995, p. 9. (2) Bernard, Richard L. 1999. *Ibid.*

1989–Vanatto. Developed in Virginia, USA. Source: Chowning, Larry S. 1989. "Soybean marketing efforts in Japan earn state honor for local farming operation." *Southside Sentinel* (Urbanna, Virginia). Feb. 2. Recently, Montague Farms (owned by Bill Taliaferro of Center Cross in Essex County) introduced Vanatto (which stands for Virginia Natto), a brand of Virginia-grown soybeans for the specific purpose of making natto. For nearly 5 years, the Taliaferros worked to develop the market in Japan, knocking on doors. "Since establishing the market in Japan, the Taliaferros have over 40 growers in Maryland and Virginia growing the small variety of soybean used to make natto.

1994–Pearl. Developed by Thomas Carter, USDA plant breeder stationed at North Carolina State University (NCSU). Pearl is adapted to North Carolina growing conditions. Source: *Seed World.* 1994. "Soybean tailored to natto market." June. p. 58.

1995–Danatto. Bernard, Richard L. 1999. *Ibid.*

Pureunkong–1997. Plant Breeding Abstracts, Vol. 67 states: Pureunkong was selected from the cross between the local cultivar Chungsaek- namulkong (green seed coat) and L78-379 made in 1982.

2003–Natto-Shoryu. Grown in Ibaraki Prefecture. Source: Hosoi and Kiuchi, 2003.

Date unknown–Chohakuzan. Bernard, Richard L. 1999. *Ibid.* Chohakuzan is a small-seeded parent used for breeding natto-type soybeans. Address: Founder, Soyinfo Center, Lafayette, California.

7441. Teraoka, Hisayuki; Morii, F.; Kobayashi, J. 1981. Shokuhin-chû ni fukumareru 24 shu no genso ryô oyobi ichi nichi no genso sesshu-ryô ni tsuite [The concentrations of 24 elements in foodstuffs and the estimate of their daily intake]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 34(3):221-39. See p. 232-35. [Jap]

• ***Summary:*** The 24 chemical elements whose concentrations are given are: potassium (K), phosphorus (P), magnesium (Mg), calcium (Ca), sodium (Na), iron (Fe), silicon (Si), zinc (Zn), manganese (Mn), aluminum (Al), copper (Cu), boron (B), strontium (Sr), lead (Pb), titanium (Ti), barium (Ba), nickel (Ni), vanadium (V), molybdenum (Mo), silver (Ag), cadmium (Cd), cobalt (Co), tin (Sn), and chromium (Cr).

Concentrations (in micrograms per 100 gm) of these elements were measured in the following soyfoods: Soybeans 1,200, tofu (momen/regular) 410 (average of 2 samples), tofu (natural foods, probably made with nigari) 280, tofu (kinugoshi/silken) 280, and natto 770.

These aluminum concentrations were about average compared with the other foods tested. Examples of foods with much higher aluminum concentrations were: kombu seaweed 33,000, tsukushi (a vegetable) 22,000, white sesame seeds 4,400.

Note: This is the earliest document seen (Aug. 2002) that gives the concentration of aluminum in soybeans or soyfoods. Address: Inst. for Agricultural and Biological Sciences, Okayama Univ., Kurashiki, Okayama, Japan.

7442. Yokotsuka, Tamotsu; Sasaki, M. 1981. Risks of mycotoxin in fermented foods. *Advances in Biotechnology* 2:461-66. [37 ref. Eng]

• ***Summary:*** "In the production of Japanese fermented foods such as shoyu, miso, and sake, the major enzyme source is *Aspergillus* molds such as *A. oryzae* and *A. sojae.* Many investigators have failed to find a single aflatoxin producer among the *Aspergillus* molds used for food fermentation. Some cultures produced fluorescent compounds having Rf values resembling those of aflatoxins, further investigations, however, indicated that these compounds were 7 kinds of nontoxic pyrazine compounds including flacacol, isocoumarin compounds, lumichrome, and other compounds than aflatoxins. *Aspergillus* molds were also checked for

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their production of Aspergillic acid, Beta-nitropropionic acid, kojic acid, and oxalic acid. Results indicated no possible hazard caused by these compounds in Japanese fermented foods." Address: Kikkoman Corp., Noda-shi, Chiba-ken, Japan.

7443. Yuryo Yushutsujin Kyogikai. 1981. Yuryô to no ayumi: 30 nen-shi [30-year progress / history of oils and fats in Japan]. Tokyo: YYK. 419 p. [Jap]
• ***Summary:*** Chapter 15 contains a history of the work of the American Soybean Association with soy oil in Japan.

7444. [Japan miso export statistics]. 1981. In: 1981. Okura-sho Yushutsu Tsukan Tokei-hyo. Tokyo, Japan.
• ***Summary:*** Gives miso export statistics for 15 countries. For each country gives: 1980 weight and 1981 weight (in kg). Percentage increase. 1980 and 1981 price in yen. Percentage price increase. The top countries, in descending order of amount exported are (with the 1981 weight in kg for each): USA 834,303. Singapore 94,988. Netherlands 67,767. Canada 46,178. England 40,371. West Germany 39,966. Australia 39,432. Iraq 34,509. Indonesia 30,620. Hong Kong 28,940. France 27,959. Belgium 26,625. Taiwan 25,238. Italy 18,755. Saudi Arabia 18,627. Total for all miso exports to all countries 1,524,008. Address: Tokyo, Japan.

7445. Morinaga Milk Co. 1981? Morinaga brand Ever-Fresh Silken Tofu. For your body–vegetable protein. For your heart–no cholesterol. For your waistline–low calories (Poster). Tokyo, Japan. 1 p. 35 x 51 cm. Color. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center. Undated. [Eng]
• ***Summary:*** A stylish presentation of tofu. Address: Tokyo, Japan.

7446. *Nitto-Kyo News* (*Japan Soymilk Association News*). 1981? Serial/periodical. Tokyo, Japan: Nihon Tonyu Kyokai (Japan Soymilk Association). Frequency: Monthly. [Jap]
• ***Summary:*** Soyinfo Center owns: No. 25 (10 Jan. 1983) to No. 44 (10 Nov. 1984). Plus a cover letter. Address: Ogura-Biru, Shimbashi 2-11-8, Minato-ku, Tokyo 105, Japan.

7447. *Tetra News*. 1981? Soymilk becomes new mainstay of product lines at Okazaki Marusan Co. Undated.
• ***Summary:*** Okazaki Marusan Co. was established in 1952 and has grown rapidly in the past 3 decades to become one of Japan's five major miso manufacturers. Miso presently accounts for over 80% of the company's total sales revenues. Mr. Michinobu Nabeta, Managing Director, says the company's short-term objective is "to become a health foods manufacturer."

"The first product resulting from Marusan's R&D program for soymilk launched a decade ago was 'Doujan' (Chinese for soymilk) which was commercialized eight years ago. 'Doujan contains the essence extracted from pearl barley and kelp and is a health food that is marketed through a health-conscious consumer organization that has a good reputation,' Mr. Nabeta comments.

"It's Marusan Tonyu (soymilk) in a 250 ml gable-top carton went on sale 2 years ago, and last year Tonyu in a Tetra Brik Aseptic 200 ml carton was introduced... The company's 'Tonyu,' 'Orange Tonyu' and 'Malt & Tonyu,' all in Tetra AB cartons [and on the market by 21 July 1981 in 200 ml cartons] are distributed nationwide to supermarkets; thus, the sale of these products is growing.

"In recent years the soymilk market [in Japan] has expanded steadily, and it is estimated that the market will grow from ¥3,100 million in 1980 to ¥5,000 to ¥6,000 million this year. 'The market will reach ¥6,000 million or thereabouts this year; many believe the market will grow by 30% in 1983, though part of the industry predicts a ¥10,000 million market. In the future we expect the market to grow to a ¥50,000 million to ¥60,000 million market, or comparable to the tomato juice market. Our company and other soymilk suppliers hope that the soymilk market will eventually share 10% of the cow's milk market,' Mr. Nabeta says."

"The company has been tapped by some U.S. companies [including Eden Foods] for soymilk manufacturing ventures in the U.S., but Mr. Nabeta believes the company should concentrate on the domestic market, at least for the time being."

7448. *Toyo Shinpo* (*Soyfoods News*). 1982. [Lots of talk of nigari and many interested in calcium sulfate]. Jan. 1. [Jap]
• ***Summary:*** Last year nigari was not used that much; but there was much talk about it.

7449. *Toyo Shinpo* (*Soyfoods News*). 1982. [Japanese national tofu statistics for 1981]. Jan. 1. [Jap]
• ***Summary:*** In 1981 in Japan, the average amount of money spent on tofu per family was 6,274 yen, which bought about 87 cakes of tofu. The amount spent on aburage [deep-fried tofu pouches] per family was 3,534 yes, which bought about 93 pieces.

In 1980 the amount of soybeans used nationwide was 319,568 tonnes (metric tons) for tofu and 112,108 tonnes for deep-fried tofu pouches and tofu burgers (aburage and ganmodoki).

In 1981 the amount of soybeans used nationwide was 328,557 tonnes for tofu and 115,157 tonnes for deep-fried tofu pouches and tofu burgers (aburage and ganmodoki).

7450. Evans, Barry. 1982. Re: The American Miso Company announces the opening of its miso shop in North Carolina. Linden's Elf Works is sole agent in marketing and distribution. Letter to Friends of The American Miso Company, Jan. 4. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "Dear Friends–We at The American Miso

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Company are proud to announce the opening of our miso shop in Western North Carolina. This long awaited dream of making American miso has evolved from a genuine need here in the United States for an unpasteurized miso made with organic ingredients and fermented under natural conditions in large wooden vats."

"Through the joint efforts of producer John Belleme and his teacher, Takamichi Onozaki from Yaita, Japan, we are now making absolutely delicious miso that will strengthen the body and delight the palate.

"The Lindenself Foundation, doing their business as Linden's Elf Works, located in Piedmont, North Carolina, has been appointed as the sole agent in marketing and distribution of The American Miso Company brand products... Their address is Route 1, Box 43-D, Rougemont, North Carolina. Your phone contact is John Troy at... 919/364-2723. Enclosed is the Linden's Elf Works distributor price sheet which includes all the pertinent information for your upcoming Spring catalogue. With kindest regards, Barry Evans, President."

Note 1. This letter was precipitated by Erewhon Trading Company's announcement in Nov. 1981 that it was filing for Chapter 11 bankruptcy. Note 2. This is the earliest document seen (June 2000) that mentions the company's new name, "The American Miso Company." Note 3. This is the earliest document seen (July 2000) that John Troy of Elf Works in connection with miso or soy.

Note 4. Talk with Barry Evans, owner of American Miso Co. 2000. June 29. Linden's Elf Works never distributed any miso made by AMC; Great Eastern Sun, Barry's new company, was the distributor. During the first year or two, John Troy purchased a significant percentage of the miso made by AMC for his sauces and dressings. To this day, he remains an important friend and advisor, but the percentage of miso he buys is now quite small. Joel Dee, a pioneer with his Miso Cup, worked with John Troy. Joel lived in the little town Saluda, North Carolina, where John Belleme lives today. Last year, Joel introduced Organic Miso Cup using miso from AMC; he is now a significant customer. Address: President, The American Miso Company, Rutherfordton, North Carolina.

7451. Iizuka, Hiroshi. 1982. Re: Early history of shoyu. Letter to William Shurtleff at Soyfoods Center, Jan. 8. 2 p. Typed, with signature on letterhead. [1 ref]
• ***Summary:*** As Dr. Yokotsuka suggested in his letter [of 22 Dec. 1981], the word *chiang-yu* seems most likely to have been used for the first time in Japan. The first reference in Japan [to shoyu or chiang-yu] is generally regarded as the Ekirinhon-setsuyoshu [Ekirinbon]. The best history of shoyu he can think of is the Kikkoman Shoyu-shi (1968). "The best shoyu historian that we know is Mr. Morio Ichiyawa [sic, Ichiyama], the author of the original edition of the above-mentioned book. Mr. Ichiyama used to work for Kikkoman and was long engaged in the compilation of the company's history. After having served as the [Noda] City Museum Curator, he leads a retired life in Noda City. He is 85 years old." Address: Senior Asst. Manager, Planning, International Operations Dep., Kikkoman Corp., 25 Kanda Nishiki-cho 1-chome, Chiyoda-ku, Tokyo 101, Japan. Phone: 03-233-5610.

7452. Stone, Dave. 1982. History of Ralston Purina's work with edible soy protein products (Interview). Conducted by William Shurtleff of Soyfoods Center, Jan. 13. 1 p. transcript.
• ***Summary:*** In 1961 Ralston Purina made its first edible soy protein product, a soy protein isolate.

In the mid-1960s Ralston started to make a textured soy flour, Supro-50. They still make this but do not emphasize it much.

In 1970 Ralston opened Purina Protein Europe, in Brussels. This was a sales and marketing office that imported Ralston Purina products from the U.S. It is still going great.

In Oct. 1962 Ralston introduced its first spun soy protein fiber (named Textured Edi-Pro).

In 1972 Ralston introduced its first soy/dairy blend (Dairy-Pro).

In 1973 Ralston Purina started its joint venture (named Fuji Purina) with Fuji Oil Co. of Japan; it is still in operation.

In 1977 Ralston introduced its first textured soy protein isolate; it was in granule form.

In 1979 in Ieper, Belgium, Ralston opened a plant making a line of isolate products made from soybean flakes purchased on the open market in Europe.

Edi-Pro was an isolated soy protein.

Ralston's protein division buys its raw materials from the Ralston Commodities Group. Address: Protein Div., Ralston Purina Co., St. Louis, Missouri. Phone: 314-822-3187.

7453. Sheridan, Margaret. 1982. Touring a tofu factory 6,000 miles east of the Orient. *Chicago Tribune.* Jan. 14. p. 1, 3.
• ***Summary:*** Tofu is on the rise in America, where there are now about 150 tofu shops. Although a growing number of supermarkets are now selling tofu, and more restaurants are serving it, it is still new to many Americans. There are four tofu factories in Chicago; this article is based on a visit to one of them, MU Tofu, run by Rebecca and Yoshihara Uchida. The word "MU" comes from her maiden name, Miller, two years ago, and his family name, Uchida. They met in 1977, when they both worked in the field of cameras. "A common interest, tofu and its manufacture, started to jell when he was transferred back to Japan. She followed, they married," and decided to start a tofu shop. So they apprenticed themselves to a tofu maker–who thought they were crazy. Describes how soft and firm tofu are made at MU Tofu. "Uchida believes tofu has the same marketing potential as yogurt." He believes it will become part of the

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American diet. Includes recipes for Tofu lasagna, Potato surprise, Cheese tofu dip, and Tofu carrot cake. A photo shows Yoshihara Uchida removing tofu from a metal forming box.

Note: This is the second earliest document seen (Feb. 1999) which compares the potential market for tofu with the current market for yogurt.

7454. Oka, Hideki; Itoga, Keiji; Mochizuki, Tsutomu. Nagano Miso K.K. (Nagano, Japan). 1982. Method of preparing albumin rich foodstuff raw materials. *U.S. Patent* 4,311,715. Jan. 19. 8 p. Application filed 3 March 1980. [6 ref]

• ***Summary:*** "In preparing miso like albumin rich foodstuff raw material, malt of rice or the like is sterilized with ethyl alcohol or an aqueous solution thereof, the sterilized malt is admixed with steamed or boiled soya beans and the resulting mixture is aged at a temperature of 20ºC-50ºC for about one week or more." Address: 1. Ueda, Japan; 2-3. Nagano, Japan.

7455. Sass, Lorna J. 1982. Budget-conscious Americans are hitting the soy–its not just sauce. *Chicago Tribune.* Jan. 21. p. S_A151.

• ***Summary:*** This article first appeared as: Sass, Lorna J. 1981. "Soy foods: Versatile, cheap and on the rise." *New York Times.* Aug. 12. p. C1, C6. It first appeared in the *Chicago Tribune* on 29 Oct. 1981 (p. N_B19).

7456. Homma, Seiichi; Fujimaki, Masao. 1982. Effect of water activity on lipid oxidation and browning of Kori-tofu [dried-frozen tofu]. *Agricultural and Biological Chemistry* 46(1):301-04. Jan. [20 ref. Eng]

• ***Summary:*** Decreasing water activity (Aw) was found to be a practical way to reduce browning. Address: Dep. of Food & Nutrition, Ochanomizu Univ., Ohtsuka 2-1-1, Bunkyo-ku, Tokyo 112, Japan.

7457. Ichishima, Eiji; Kato, M.; Wada, Y.; Kakiuchi, H.; Takeuchi, M.; Takahashi, T.; Takimami, K.; Hirose, Y. 1982. Spore fatty acid composition in *Bacillus natto,* a food microorganism. *Food Chemistry* 8(1):1-9. Jan. [23 ref. Eng]

• ***Summary:*** Natto is a popular and economical fermented food in Japan. In 1976, 124,000 metric tons (tonnes) of natto were produced. The growth of *Bacillus natto* on the surface of natto soybeans creates compounds that are parts of its characteristic tastes and flavors, such as tetramethylpyrazine. Address: 1-6. Dep. of Agricultural and Biological Chemistry, Tokyo Noko Univ., Fuchu, Tokyo 183, Japan; 7-8. Central Research Labs., Ajinomoto Co., Inc., Suzukicho, Kawasaki 220, Japan.

7458. Morinaga, Takamasa. 1982. [Re: On saishikomi or double-fermented shoyu]. Letter to William Shurtleff at Soyfoods Center, Jan.–in reply to inquiry. 2 p. [Jap; eng+]

• ***Summary:*** Saishikomi shoyu is said to have originated in about 1780 in Yanai city, Yamaguchi prefecture; this is written in the History of Yanai city in Yamaguchi-ken. (Note: Yamaguchi prefecture is the southwestern-most prefecture on Honshu, Japan's main island, located just to the north of Kyushu.) Traditionally saishikomi shoyu was produced in the five prefectures in the Chugoku-Chiho of southwestern Honshu: Yamaguchi, Shimane, Hiroshima, Okayama, and Tottori. Recently, however, its has begun to spread throughout Japan.

In the old days, saishikomi shoyu was another name for *Kanro Shoyu.* The latter was a special item (*tokusan-hin*) of Hiroshima and Yamaguchi prefectures, but there is very little documentation for this early product. Later [after World War II] the two names were unified by the Japanese Agricultural Standards (*Nihon Norin Kikaku*).

Generally saishikomi shoyu is used as a "pouring shoyu" (*kake-shoyu*), especially valued on sashimi and sushi. But recently it is also starting to be used as an all-purpose shoyu in cooking.

According to the Japan Agricultural Standards (JAS) there are two types of saishikomi shoyu: *Honjozo* type (traditionally fermented) and *shinshiki-jozo* type (semi-fermented using HVP = *aminosan-eki*). Yamaguchi prefecture produces the largest amount of *Honjozo.* The three largest manufacturers of this product, in descending order of size, are: Yanai Shoyu Ltd., K.K. Sagawa Shoyu-ten, and K.K. Shimaya. K.K. Shimaya produces a "Soft Type" of Saishikomi (1.8% total nitrogen) which is developing a good reputation.

The above-mentioned *shinshiki-jozo* type of saishikomi shoyu is also made in Chugoku-Chiho, but mostly on the northern side, bordering the Japan Sea in Tottori and Shimane prefectures. In addition, Kinoene Shoyu K.K. of Noda city in Chiba prefecture also started to sell this type of saishikomi. They use up to 20% of an ingredient named "sweetness extract (*Umasa Ekisu*)." Address: K.K. Shimaya, Fukukawa 637, Oaza, Shin-Nanyo-shi, Yamaguchi-ken, Japan.

7459. Shurtleff, William; Aoyagi, Akiko. 1982. Miso soup: Safeguard against cancer. *East West Journal.* Jan. p. 42-43.

• ***Summary:*** This article is mostly a translation by Akiko Aoyagi of an article about "Miso soup's unexpected good effects" from *Asahi Shinbun,* 27 Sept. 1981. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

7460. Taira, Harue; Katoh, Kazuhisa; Okazaki, Koichiro; Ishida, Shigeki; Kawasaki, Yoshihiro; Shimokawara, Hiroshi; Takei, Reiko; Kikuchi, Syoko; Murakami, Shunichiro; Okubo, Soichiro. 1982. Daizu shijitsu no kansô shori hôhô to sono hinshitsu ni tsuite. VI. Tei-suibun ganryô shijitsu no futsûgata konbain shûkaku–kansô shori ga shijitsu no kakô tekisei oyobi tôfu, nattô no kôjô seizô shiken ni oyobosu

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eikyô [Influence of dry treatment after harvest on quality of soybean seeds. VI. Influence of combine harvesting and drying of low moisture seed on qualities for soybean food processing and tests for factory production of tofu and natto]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 39. p. 23-31. Jan. [7 ref. Jap; eng]

• ***Summary:*** Two harvesting methods and 4 drying methods were tested with the middle-sized seed variety Kitamishiro (Table 1). Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2-4. Hokkaido National Agric. Exp. Station, Memuro, Hokkaido, Japan.

7461. Wood, Brian J.B. 1982. Soy sauce and miso. *Economic Microbiology* 7:39-86. Jan. A.H. Rose, ed. Fermented Foods. [50 ref]

• ***Summary:*** Contents: 1. Introduction. 2. The preparation of soy sauce: Introduction, preparation of raw materials (the beans, wheat), mixing, koji, moromi. 3. Of beans, microbes, and miso: Beans, microbes, miso. 4. Trade in soy sauce: Introduction, statistics. Table 1 (p. 64-66) shows exports of soy sauce in 1978, in tonnes (metric tons) from Hong Kong, Korean Republic, Singapore, Japan, and total, to almost every country in the world (with each country's population in millions), grouped by region as follows:

1. North America: Canada, USA (#1)–Regional total imports: 6,052.3 tonnes.

2. South and Central America [and Caribbean]: Argentina (#3 in region), Bolivia, Brazil, Chile, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Mexico (#2), Nicaragua, Panama, Paraguay, Surinam, Venezuela (#1), Granada, Jamaica, Trinidad and Tobago, total. Former Dutch West Indies–Regional total imports: 1,046.4 tonnes.

3. Europe: Austria, Belgium, Czechoslovakia, Denmark, Finland, France (#4 in region), Germany (West #3), Greece, Italy, Netherlands (#2), Norway, Portugal, Spain, Sweden, Switzerland, UK (#1), USSR–Regional total imports: 3,017.7 tonnes.

4. Near and Middle East: Bahrain (#3), Egypt, India, Iran (#2), Iraq, Jordan, Kuwait, Oman, Qatar, Saudi Arabia (#1), United Arab Emirates, Yemen Arab Republic–Regional total imports: 1,193.5 tonnes.

5. Far East and Western Pacific: Brunei, Hong Kong (#3 in region), Indonesia, Japan, Korea (South), Macao, Malaysia (#2), Philippines, Sabah (#1; A state of Malaysia from 1963; Formerly British North Borneo), Sarawak (A state of Malaysia from 1963), Singapore, Taiwan, Thailand–Regional total imports: 3,139.4.

6. Pacific and Australasia: Australia (#1 in region), Cook Islands, Christmas Islands, Fiji, Guam (#2), Nauru, New Caledonia, New Hebrides, New Zealand, Oceania n.c.s. (#3), Papua New Guinea, Portuguese Timor, Samoa and Tonga, Solomon Islands, Tuvalu (Ellis Island), U.S. Oceania–Regional total imports: 1,647.5 tonnes.

Note: This is the earliest document seen (March 2010) concerning soybean products (soy sauce) in Kiribati (Christmas Islands), in Nauru, in Qatar, in Portuguese Timor (later renamed Timor-Leste [East Timor]) or in Tuvalu. This document contains the earliest date seen for soybean products in Kiribati (Christmas Islands), in Nauru, in Qatar, Portuguese Timor, or in Tuvalu (1978); soybeans as such have not yet been reported.

7. Africa: Algeria, Canary Islands, Ethiopia, Gambia, Ghana, Kenya, Libya, Malagasy, Malawi, Mauritius (#2 in region), Nigeria, South Africa (Republic of, #1), Sudan, Réunion Islands (#3), Tanzania, Zaire. Other African countries–Regional total imports: 365.7 tonnes. World total imports: 15,731.5 tonnes, of which 6,192.8 tonnes from Hong Kong, 1,233.5 tonnes from South Korea, 1,713.6 tonnes from Singapore, 6,591.6 tonnes from Japan. The value in pounds sterling and in pounds sterling per tons of soy sauce is given for each exporter.

Other tables show: (2) Soy sauce exports (in tonnes and value) each year from 1976 to 1976 from Hong Kong, South Korea, Singapore, and Japan. A large percentage of Hong Kong's exports are re-exports (probably from China). (3) Total soy sauce exports from Japan, 1976-1978, by container type, with amount and value. (4) Soy sauce and miso production in Japan every 5 years from 1965 to 1978 (in tonnes). (5) Soy sauce and miso production in Japan for export in 1976, 1977, and 1978. Miso production (in tonnes) averaged about 40% of soy sauce production, and miso exports (in tonnes) averaged about 13% of soy sauce exports. (6) Imports of soy sauce into Hong Kong, Singapore, and the USA from exporting countries in 1978 (with figures for exports from China in 1976 and 1977). (7) Re-exports of soy sauce (made in China) from Hong Kong and Singapore in 1978 to major importing countries worldwide, by region, by country. Small countries that are the destination of this soy sauce include: Honduras, Nicaragua, Panama, Venezuela, Trinidad and Tobago, Former Dutch West Indies [also called Netherlands Antilles; they are part of the Lesser Antilles and consist of two groups of islands in the Caribbean Sea: Curaçao and Bonaire, just off the Venezuelan coast, and Sint Eustatius, Saba and Sint Maarten, located southeast of the Virgin Islands. The islands form an autonomous part of the Kingdom of the Netherlands], Pakistan, Saudi Arabia, United Arab Emirates, Brunei, Sabah, Sarawak, Fiji, Nauru, Oceanea (non-U.S.), Oceanea (U.S.), Papua, Samoa and Tonga, Solomon Islands, Ghana, Malagasy Republic, Togo. Total from Hong Kong: 2,945.3 tonnes, and from Singapore 109.5 tonnes.

(8) Exports of miso (in tonnes) from South Korea and Japan in 1978 to major importing countries worldwide, by region, by country. The leading importers are: USA (622), Saudi Arabia (353), Singapore (66), Bahrain (64),

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Netherlands (38), Iran (29), Iraq (29) France (28), German Federal Republic (23), Smaller importers include: Chile, Guyana, Surinam, Bangladesh, Iran, Iraq, Jordan, Kuwait, Quatar, Saudi Arabia, United Arab Emirates, Yemen Arab Republic, Sabah, Fiji, Guam, New Hebrides, Papua New Guinea, Samoa, Solomon Islands, Algeria, Canary Islands, Ghana, Kenya, Libya, Mozambique, South Africa Republic, Zaire.

Note: This is the earliest document seen (June 2007) concerning soybean products (miso) in Quatar. This document contains the earliest date seen for soybean products in Quatar (1978); soybeans as such have not yet been reported.

(9) Exports of miso from South Korea and Japan in 1976, 1977, and 1978 (quantity and value each year; no importing country names are given).

5. Tour of South East Asia: Technical and scientific aspects, trade aspects. 6. Acknowledgments. References

The chapter on Trade states: Soy sauce and soy paste (miso) are traded between all countries of South East Asia. The Korean Republic's exports nearly quadrupled in tonnage. The Kikkoman Company's production facility in Wisconsin produced 21,6000 tonnes of soy sauce in 1978. This was equal to 3 times the total exports from Japan in the same year. Japan's total share of the world soy sauce market remains very healthy. Miso exports are still small in comparison with soy sauce. On a rising market Japan's exports still only represent 0.2% of its annual miso production; "clearly there is considerable room for expansion here."

Miso is of greater relative importance to Korea than it is to Japan. Among the European countries, Belgium and Holland import the greatest amount of miso on a per capita basis. Spain imports a fair amount of miso. The U.S.A. and Canada had total miso imports totaling about 10% of their soy sauce imports.

"In Thailand, there are about 50 soy sauce factories, the majority of which are small, producing less than 100 kilolitres per year, although it should be noted that most of them also produce soybean paste and soybean cheese [probably tofu]. The total annual consumption of soy sauce in Thailand is estimated at about 6,000 kilolitres (about 7,200 tonnes).

"In Malaysia, there are about 140 soy sauce factories producing in total an estimated 5.5 million gallons of soy sauce per year according to the proprietor of a leading brewery in Kuala Lumpur. This is about 21,000 tonnes per annum" (p. 84). Address: Dep. of Applied Microbiology, Univ., of Strathclyde, Glasgow [Scotland], U.K.

7462. Wollner, Joel. 1982. History of Erewhon, macrobiotics, and soyfoods in America (Interview). Conducted by William Shurtleff of Soyfoods Center, Feb. 2. 2 p. transcript.

• ***Summary:*** Evan Root was the first attendant at the Erewhon retail store, below street level at 303-B Newbury Street. He lacquered the walls with Michio. Evan is a great storyteller, very intelligent. The initial store was just one room, about10 by 20 feet. Very few people came in to buy food, so it was more like a stock room than a store. Some evenings there were lectures there. Redwing Books now occupies that space. Most of the food (a tin of miso, a keg of tamari) was just being sent by the Kushis' friends from Japan as gifts; it didn't go through customs.

The Kushis got nigari and made tofu at home. It was not for sale, but for dinner guests and cooking classes. Joel made some tofu using lemon juice when nigari was not available.

As tofu started to become more popular, Erewhon started to buy it from a tofu maker in Boston's Chinatown. First they just bought and sold that tofu, but before long (in about 1973-74) they convinced him to start making nigari tofu for them. They guaranteed to buy what he made, and they sold him the nigari at cost. This might have been the first nigari tofu made in USA. A lot of nigari tofu is still made in Boston's Chinatown. Joel thinks the tofu maker was located on Tyler, Street, perhaps Yah Kee. Nigari came in 66 pound sacks from Japan. Erewhon also sold small quantities of nigari in the retail store. Chinatown was Erewhon's main source of tofu until Laughing Grasshopper appeared.

What was the macrobiotic movement's contribution to the history of soyfoods in the United States? Macrobiotic teachers and students talked and wrote about them, ate them, and sold them. They felt soyfoods were an important part of a good diet. They educated people and developed a market for soyfoods. Few Americans had eaten miso and tofu at home before 1966–the year Erewhon started. Macrobiotics were the first Caucasian Americans to really use soyfoods regularly. Before that, soyfoods (except perhaps soy sauce) were just interesting oddities. Once could say that the macrobiotic movement introduced soyfoods to America.

As for tofu, Joel thinks that Michio Kushi's students misinterpreted his remarks about tofu being yin. Macrobiotics now eat tofu regularly, 3-4 times a week. There are endless ways to prepare it. It's been years since Joel has heard that tofu is "too yin."

What did *The Book of Tofu* (published in Dec. 1975) do for tofu? It expanded its relevance for the Western diet. Before that book, most of the tofu in the United States was consumed by people of East Asian ancestry.

Charles Kendall played a key role in making and introducing natto, mochi, and amazake to Caucasian Americans. He made these foods in his home and sold them locally. Initially, it was not a formal / legal business. But today his business, Kendall Foods, sells $500 a week of these three foods. He has been making natto for 4-5 years. He was America's first Caucasian natto maker. Natto was served in macrobiotic restaurants in Boston.

The latest soyfood to hit Boston has been tempeh. It's been a phenomenal success. Macrobiotics are going crazy

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over it. Thom Leonard has been giving lots of tempeh classes for the past 1½ years. For more than a year, lots of sandwich makers in Boston have been making and selling tempeh sandwiches. Tempeh is made into cutlets, burgers, tempeh mock-tuna salad. Why is it so popular? Because it is rich and meaty in texture and flavor–the opposite of rice. Most macrobiotics crave rich, meaty foods.

Ron Kotzsch is very close to the Kushis. A very unpretentious person with a wonderful sense of humor, he is now teaching in North Carolina. He is friends with Helen and Scott Nearing. He toured China and Japan with John Denver, the singer and songwriter–who did a benefit for Michio's new college.

How does Joes see the future of Erewhon? He thinks the company will focus on manufacturing only. Now is the critical time. He'd give Erewhon a 30-70% chance of survival. Address: Boston, Massachusetts.

7463. Takase, Katsumaro. 1982. Re: History of Higashimaru Shoyu K.K. and light-colored (usukuchi) shoyu. Letter to William Shurtleff at Soyfoods Center, Feb. 5–in reply to inquiry. 1 p. [Jap; eng]
Address: 100-3 Tominaga, Tatsuno-cho, Tatsuno-shi, Hyogo prefecture 679-41, Japan.

7464. Dwan, Lois. 1982. In Japanese dining, let the chef do the worrying. *Los Angeles Times.* Feb. 7. p. L94.
• ***Summary:*** This article contains many errors. *Teri* is not the word for sauce, but rather that word for "shine" or "shining." *Miso-shiru* (miso soup) is not made from "fermented bean-cake" but from fermented soybean paste.

7465. Hillyard, Roger. 1982. History of Erewhon, natural foods, and macrobiotics in America. Part I (Interview). Conducted by William Shurtleff of Soyfoods Center, Feb. 7. 2 p. transcript.
• ***Summary:*** Roger got involved with macrobiotics in San Francisco in about 1965. He lived in San Francisco, was doing light shows at the Avalon Ballroom, read the book *You are All Sanpaku* [by Sakurazawa Nyoiti (George Ohsawa); English version by William Dufty], and got involved. Also in about 1965, Herman Aihara and Bob Kennedy used to come to town to lecture in a church on Oak Street. Bill Tara and Paul Hawken, who were filmmakers, lived in a warehouse on lower Mission St. described in the *Electric Kool-Aid Acid Test,* by Tom Wolfe (largely about Ken Kesey and the Merry Pranksters). "A little macro scene started. We heard that Boston was macro Mecca."

Roger arrived in Boston in Oct. 1969. Erewhon started when Michio and Aveline Kushi were living in Cambridge, Massachusetts; in their basement they had a little food, which they would sell to people who came to hear Michio lecture. "The food was but a vehicle to the larger teaching. The food is like an asana or yoga posture, but the goal is enlightenment. You can get stuck on the food. That is why Michio had very, very little involvement in Erewhon's food business. His focus was on the philosophy of macrobiotics and spreading it."

The Erewhon store was (at the time) in the basement of today's Redwing Books. Evan Root started the store, but he wanted to get out of it into a restaurant. Paul Hawken took over the sleepy little store. Bill Tara (who was from Santa Cruz) also worked there for a while. The tiny store had few customers, a very limited selection of products, and a little mail order business. Shortly after Roger arrived, the Erewhon store at 342 Newbury Street opened–in Nov. or Dec. 1969. Bruce Macdonald and Jim Docker helped to renovate the new store. The whole thing was called Erewhon Trading Co. In Feb. 1970 Roger started to work in this retail store.

Shortly thereafter, Paul Hawken went to Japan. At that time the only companies importing food from Japan were Chico-San and Infinity Foods in New York; both were macrobiotic. Erewhon bought from them, and then started doing a little wholesaling. After Paul went to Japan, Erewhon started importing directly from Japan. Paul got in touch with Mr. Kazama and helped to get Mitoku into the natural food export business. Kazama was an old friend of Obiyashi, who was an old friend of Michio Kushi's from Columbia University. Muso was shipping to Chico-San and Infinity. Erewhon imported from Muso and Kazama. Roger thinks Mitoku started in about 1970-71. Before that they sold soccer shoes and cranes. The fact that Paul was in Japan was instrumental in getting Erewhon's imports started.

The Erewhon retail store would sometimes get huge shipments, such as a 40-foot-long truck of rice that filled up the whole Erewhon storeroom. It was something like Kokuho Rose [a brand of short grain brown rice grown by Koda Bros. in Dos Palos, California]; it was not organically grown. There was really no room for it, and no refrigeration. At about this time the Lundberg Brothers in California started growing brown rice organically. At one time a boxcar of 100,000 lb of Lundberg rice arrived, so Erewhon needed more warehouse space. Also involved were Jean Allison (from California) and Wally Gorell (from the San Francisco Calliope Co). In about mid-1970 Erewhon leased a 10,000 square foot warehouse space on the 5th floor of 33 Farnsworth St. [a big brick warehouse] in Boston. The space had a nice milling room. Then the wholesale business took off. Roger left Boston in April 1971. He had been running both the distributing company and the wholesale company, but there was a store manager. The retail store expanded into its back room. Then the wholesale business grew like mad. Orders came from non-macro natural foods stores, from new macro groups, etc.

How did the natural food movement get started? As Roger recalls, it was not started by macros. In about 1966 or 1967 Sunset Natural Foods became New Age Foods,

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an early natural foods store run by Fred Rohe. The natural food movement sprung out of the new consciousness–the counterculture–as did macrobiotics. The macrobiotic movement fed the natural foods movement. One Erewhon customer was Mr. Natural in Carbondale, Illinois. Although he was not a macro, he bought miso, tamari, rice, etc. There were lots of other non-macro stores like that too. But there were also lots of macro stores. Bill Tara opened a store and macro center on the 14th floor of a downtown building in Chicago; out of that grew Food for Life. Tom Waxman started Essene in Philadelphia, Pennsylvania. These were two mini-Erewhons. Each started as a small retail store, then became a wholesaler. Erewhon provided the model.

Erewhon set up a branch distributor in Canada, which later became Manna Foods, with Gene Newman, a macro. Westbrae was a Berkeley political organization started by Bob Gerner, making granola. Erewhon West was connected with Bruce Macdonald. Bill Tara, with Aveline Kushi's prodding, started the Erewhon store in Los Angeles; it did a little distributing. Bruce Macdonald went to Los Angeles, then Bill Tara left for England–Roger doesn't know why. Erewhon West started growing. Jimmy Silver ran the Big Sanae, which became the Seventh Inn. Roger then went to Texas and in Jan. 1972 he worked with Deaf Smith for about a year. Later Erewhon West was sold to John Fountain, but really to John Demming–as a separate business from Erewhon.

The Well [a wholesale and distribution company in San Jose, California] was an offshoot of Fred Rohe's New Age Foods, ca. 1969-1970. It was never macrobiotic. Fred sold stock in his business, had 2 stores in San Francisco, then opened a big natural foods store [actually a supermarket] named New Age Natural Foods on California Street in Palo Alto. The whole thing was a fiasco; the Palo Alto store never made money.

Deaf Smith Farms was established as a joint venture between Erewhon and Arrowhead Mills; it never worked out. In April 1971 Bruce Macdonald started a marketing company named Pure & Simple. In March 1972 Roger started working at the Well in San Jose. Bruce went to Green Mountain Grainery in Boulder, Colorado. Gradually The Well became Pure & Simple, and started importing from Mr. Kazama and Muso.

Paul Hawken was the first person to work with farmers to get them to grow grain organically for Erewhon. One of these was Carl Garrich of Lone Pine, Arkansas–after Erewhon moved to 33 Farnsworth Street. Roger did a lot of work with farmers at Arrowhead Mills, but not connected with macrobiotics.

Major macrobiotic wholesale distributors: Erewhon East and West, Laurelbrook (later), Food for Health, Essene, Manna in Canada (later). Llama (later) was not macro.

Macrobiotics played the major, primary role in introducing soyfoods to America. A little was also coming through Japan Foods [San Francisco] and Nishimoto [Trading Co., Los Angeles]. The macros made these foods available, but don't overcredit it; the time was ripe and it just happened. The main contribution of macrobiotics was simply making these foods available and teaching about them. Michio always said that macrobiotics is not just about food and the diet.

"It was frightening when we stopped to think about it. The business was doubling and tripling at a crazy rate." Roger still has his early notes but no accounting books. Continued. Address: California.

7466. Hillyard, Roger. 1982. History of Erewhon, natural foods, and macrobiotics in America. Part II (Interview). Conducted by William Shurtleff of Soyfoods Center, Feb. 7. 2 p. transcript.

• ***Summary:*** While Roger was in Boston, no tofu was sold at the Erewhon retail store at 342 Newbury St.–since there was no refrigeration and no room. He thinks tofu was introduced after Erewhon got 33 Farnsworth St.

The trickiest question, which has no place in this book, is about work as a disciple / discipline vs. for money / as business. Work can be a spiritual practice (*karma yoga*), and that is how many of the early workers at Erewhon viewed it.

Roger does not know why so many people left Erewhon. Maybe Michio Kushi planned it that way. He does not know why Erewhon went bankrupt; maybe it was because the company was undercapitalized, there was no worker equity, and Michio did not know American business. "Maybe Michio did not care so much. Distributing foods was always a minor focus for Michio."

Other macrobiotic food distributors outside the U.S. were Lima in Belgium (by far the earliest), Harmony and Sunwheel in England, and some company in Italy. Address: California.

7467. Shurtleff, William; Aoyagi, Akiko. 1982. History of research on the nutritional value, biochemistry, and therapeutic usage of soybeans and soyfoods. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 59 p. Feb. 13. Unpublished typescript. Available online at www.soyinfocenter.com.

• ***Summary:*** A comprehensive history of the subject. Contents: Introduction. Part I: Soyfoods nutrition and traditional East Asian diets. Need for cooking to maximize nutritional value. The cereal-legume protein model to maximize protein quality and quantity, and reduce degenerative diseases. Food processing techniques to reduce flatulence. Medicinal uses of the soybean. Part II: Modern research on soyfoods nutrition. Protein overview. The First Food, Agriculture, and Nutrition Revolution, 1850-1920. Diabetic diets and soyfoods. Vitamins overview. World War I and soy nutrition. Protein quality, 1880-1920. The 1930's: The Great Depression, the Great Drought, acid-base

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balance in foods. The 1940's: Soybean trypsin inhibitors, soy fortified breads, essential amino acids. The 1950's: Overview, soymilk formulas and infant feeding. The 1960's: The Second American Agriculture, Food, and Nutrition Revolution; diet and coronary heart disease, soybean trypsin inhibitors update, soyfoods and flatulence. The 1970's: Changing U.S. diet, interest in soyfoods, reappraisal of the value of animal and plant proteins, world hunger (protein vs. calories debate), critiques of protein quality measurement, human protein studies, coronary heart disease and diet, soyfoods and cholesterol, cancer and diet, antinutritional factors in soybeans, mineral bioavailability, breeding soybeans to upgrade nutritional quality. The 1980's: Future and outlook. Address: Lafayette, California. Phone: 415-283-2991.

7468. Hayashi, Kazuya. 1982. [Re: Use of enzymes in modern shoyu production in Japan]. Letter to William Shurtleff at Soyfoods Center, Feb. 15. 5 p. Handwritten, without signature. [Jap; eng]

• ***Summary:*** Dr. Hayashi specializes in the use of enzymes (especially protease) in shoyu at Kikkoman's Central Research Laboratory. 1. Use of enzymes with shoyu in Japan: The use of added commercial enzymes was approved by the newly revised Japan Agricultural Standard (JAS, 1980). The use of an enzyme-treated solution in "new-type shoyu" [*Shinshiki*] and amino-acids mixed type shoyu was approved. However only a few commercial products in Japan today are actually made with the use of commercial enzymes because (1) the enzymes are too expensive, (2) the effect of the enzymes is not significant since most manufacturers use the "all-koji" method, and (3) in a salt solution of high concentration, the effect of the enzymes is greatly reduced. Examples of actual current use: The Shono Starch Co. Ltd. uses enzymes form making a product named "Umamigen." Corn is treated with an enzyme solution in making shoyu. Kikkoman has a patent on making shoyu using 100% enzyme solution. It calls for the use of yellow koji enzyme (peptidase) and glutaminase. The quality is fine but the product is too expensive. This method is good when the presence of aflatoxins could be a problem. In the future a low-salt, high-temperature digestion method may allow the use of enzymes (cellulase digestion, peptidase digestion).

2. High temperature fermentation method: This research was started in about the 1920s. The research on low-temperature fermentation began in about the 1930s. In the early period, this was called the *sokujo* or "rapid method" of fermentation; the temperature was raised to 30-35ºC. The quality was bad due to elution of some key flavor components, and because the glutamic acid content was lower. Also, the environment was not favorable to microbial growth. Use of the low-temperature method produces better quality shoyu. Use salt water (less than 5ºC) for starting. For the first 15-30days, keep at 15ºC. After one month, raise the temperature to 25-27ºC to complete the fermentation, then maintain at about 20ºC. This is suitable for the breakdown of the material by bacteria.

3. Addition of yeasts and lactic acid bacteria to the shoyu fermentation process began around the 1960s. Only the yeast *Saccharomyces rouxii* is used in practice. *Torulopsis* is for experimental use only. Lactic acid bacteria are not yet adapted to actual production. Use of epoxy-lined tanks is also important.

4. Bansui (using a second pressing of the shoyu): Only a few shoyu makers use this method since the product quality is bad and it cannot be sold. For details, see Kimura 1914.

5. Chemical shoyu: During the Taisho period (1912-1926) and Showa period (1926+) Dr. K. Kurono/Koruna Kanraku at the Fermentation Research Institute did early work. The use of amino acids spread. In the early Showa period Ajinomoto company was a leader under Dr. Hori Shinichi. During the period 1945-55 Mieki, a glutamic acid solution, was produced in large quantities (180,000 kiloliters). Improvement of amino acid solution purification led to cheap but tasty shoyu. Then came new-type (*Shinshiki*) shoyu. Bunzo Rokusho and the Mantetsu [Manchurian Railway] Research Institute did research in the early Showa period. During the period 1945-55 new-type shoyu making became widespread. Defatted soybean meal was digested with a weak acid and wheat koji was added to make shoyu.

6. History of the use of POBB (Para-oxy Butyl Benzoate): 1924–Sabalitscka discovered this food preservative. 1934–Dr. Kurono tested the effect on shoyu. 1937–Its use was approved for use in shoyu by the Japanese government. 1948–Use was approved as a food additive. The effect is great but the solubility is low.

7. Making koji for miso: The use of koji boxes is more popular, but the rotary drum is also used.

8. The future of the shoyu manufacturing process: Treatment of raw material and koji making will be spontaneous and automatic. Use of outdoor fermentation tanks. Continuous pressing. Improve sanitation by using a closed system. Digestion without salt. Liquid fermentation. Automatic control of microorganisms. Introduction of computerized system. Use of new raw materials and new microorganisms. Introduction of the fixed-enzyme method. Use of membrane filtration method. Address: Central Research Lab., Kikkoman, Noda, Japan.

7469. *Toyo Shinpo* (*Soyfoods News*). 1982. Zenkoku hanbai [Table shows wholesale and retail prices of tofu in each prefecture in Japan]. Feb. 21. p. 5. [Jap]

• ***Summary:*** The average wholesale price of 1 cake (400 gm) of tofu is 68 yen.

7470. Ishii, Masaaki. 1982. Miso production and consumption in the United States (Interview). *SoyaScan Notes.* Feb. 23. Conducted by William Shurtleff of Soyfoods

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Center.
• ***Summary:*** As of Sept. 1981 Miyako Oriental Foods makes more than 500 tonnes (metric tons) of miso a year. U.S. mainland miso consumption is about 1,500 tonnes. Of this, 834 tonnes is imported from Japan. Address: Manager, Agriculture, JETRO, Japan Trade Center, Bank of America Tower, 555 S. Flower St. 24th Floor, Los Angeles, California 90071.

7471. Tallent, W.H. 1982. Shoyu update. *Northern Regional Research Center, Notes from the Director* No. 1493. p. 2-3. Feb. 26.
• ***Summary:*** "On February 22-23, Drs. H. Hashimoto (manager, quality control) and D. Fukushima (executive vice president and general manager) of Kikkoman Foods, Inc., visited the Center [NRRC]. Their Walworth, Wisconsin, plant, which began producing fermented shoyu in 1973 with a capacity of 2.6 million gallons per year, now has expanded to produce about 5.2 million gallons. Their fermentation is based upon wheat and soybeans. Currently they have about 45% of the soy sauce business in the United States and sales are increasing rapidly.

"Total U.S. sales of soy sauce in 1956 was about 1 million dollars (consumption 15 ml per capita per year); this has now increased to 100 million dollars (148 ml per capita per year). Many years ago we supported yeast genetic work on this fermentation based upon Dr. L.J. Wickerham's (NRRC, retired) demonstration that the shoyu yeast had mating types and that improved strains could be developed in a genetic improvement program.

"Kikkoman now has a whole line of dehydrated products based on shoyu that are used to make instant teriyaki sauce for chicken, beef, and seafood. A relatively new product is a steak sauce that contains applesauce, shoyu, spices, and salt. H.L. Wang and C.W. Hesseltine (FL [Fermentation Lab]) supplied the Kikkoman visitors with information on tempeh and pointed out the similarities of the preparation of this food with their method of producing koji for the shoyu fermentation. Drs. Hashimoto and Fukushima also talked with W.J. Wolf and other Meal Products Research (OC [Oilseed Crops]) members concerning isoflavone analysis, phosphatidyl-choline autoxidation, and nutritional properties of soybean proteins." Address: Center Director.

7472. **Product Name:** [Soymilk Mousse with Barley Malt Syrup].
Foreign Name: Bakuga-iri Tônyû Muusu.
Manufacturer's Name: Asahi Foods (Asahi Fuuzu).
Manufacturer's Address: Japan.
Date of Introduction: 1982 February.
Wt/Vol., Packaging, Price: 2 x 100 gm plastic cup.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Bakuga-iri Tônyû Muusu was introduced in Feb. 1982 by Asahi Fuuzu in 2 x 100 gm plastic cups and distributed nationwide.

7473. Kanno, Akishige; Takamatsu, H.; Takano, N.; Akimoto, T. 1982. Nattô ni kansuru kenkyû. I. Nattô seizô kôtei ni okeru toseibun no dôkô [Studies on natto. I. Change of saccharides in soybeans during manufacturing of natto]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 29(2):105-10. Feb. (Chem. Abst. 96:161110). [29 ref. Jap; eng] Address: Asahi Shokuhin Co. Ltd., 180-2 Wado, Ushibori-machi, Namekata-gun, Ibaraki-ken, 311-24 Japan.

7474. Leviton, Richard. 1982. Silken tofu and fried pouches: Inside the Japanese tofu industry. *Soyfoods.* Winter. p. 18-25.
• ***Summary:*** Leviton is on a 15-day tour of Japan's tofu industry. He is part of "Okita Enterprises' whirlwind tofu and beansprout study tour, expertly arranged by Hideyoshi Okita and Charles Ishikawa of Los Angeles. Twelve tofu entrepreneurs and eight bean sprout enthusiasts [total 20] will bus their way through Tokyo traffic for 8 days in late September [1981] searching for the state-of-the-art of the Japanese tofu industry, and two of us will remain another week for more far-flung tofu travels."

Discusses: Takatsuka Marugo (the world's largest tofu factory; it makes 50 tons/day of tofu), Kinugoshi, Ikuta, Yahima Tofu Food Co. ("Yahima's lagoon wastewater treatment system, located underground, processes 350 tons of plant water daily"), Asahi Shokuhin (Established in 1972, it is today owned by Seiyu Stores. "Asahi Shokuhin has three factory locations employing 420 workers and a product line that includes six styles of tofu {totaling 100,000 packages each 10½ ounces}, konnyaku {yam starch cake}, noodles, natto {3,000 packs}, soymilk {10,000 units each 200 ml}, deep-fried tofu cutlets {80,000} and fresh juices–on a daily basis), Asahimatsu Kori Tofu Co. (a 30 year old firm that controls 53% of Japan's dried frozen tofu market. It owns what is "probably Japan's 2nd largest tofu factory and, possibly, its most automated. At each of Asahimatsu's three plants, 400,000 cakes {½ ounce} of dried frozen tofu {*kori-dofu*} are produced daily, five days a week. The company is situated deliberately in this fairly remote montane region near the Tenryu River because the combination of cold winter weather and abundant fresh water were originally favorable manufacturing conditions"), Japan Packaged Tofu Assoc. (One of Japan's two tofu trade associations; the other is the more traditional All Japan Tofu Association. "JPT Chairman Shunichi Minamoto explains that packaged lactone silken tofu {*juten-dofu*} has become popular in Japan in only the last ten years but today there are 67 manufacturing plants and 25,000 JPT members; *juten-dofu* has captured 10% of the tofu market as well." The average daily production of one plant is 30,000 cakes {made from 2,284 kg of soybeans} compared with 700 cakes for traditional "cut" tofu). Ninomiya Tofu Factory ("a

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showcase for equipment designed and installed by Norimoto Ikeba, president of Toyo Plant Company, a production design outfit... At Ninomiya we examined Toyo Plant's stainless steel continuous trough-style cooker and their linear version of the carousel curder that can accommodate a coagulant blend of magnesium chloride and calcium sulfate"), Dr. Yoshiro Machida (president of Japan's Food Engineering Research Institute, who offered tofu-making tips), Ikuta Tofu Co., Takai Tofu & Soymilk Equipment Co. (in Kanazawa, Japan), Oga Tofu Factory in downtown Kanazawa, the fabled corner tofu shop (Both of such shops visited "were works of art, exceptionally clean, tidy, and aromatic and were filled with the joy of making tofu"), *Toyo Shinpo* newspaper (a thrice-monthly newspaper for Japan's soyfoods industry. The editors said that 85% of all tofu today is sold through supermarkets and that the number of factories has decreased by 10,000 in the past ten years. Yet annual per capita tofu consumption remains high, in a population of 110 million, 10 million cakes of tofu are consumed daily, or 40 x 10½-ounce packages per person per year), tofu moves into supermarkets, soymilk in Japan (is made by at least five principal companies, including Mitsubishi, Kibun, Asahi Shokuhin, Kyushu Milk, Okazaki Nagoya, and sales have skyrocketed to $250 million since 1976. Industry experts link this boom with the introduction of UHT aseptic Tetra Pak technology in which 80% of the soymilk is packaged), Linda Barber and new excitement about tofu ("An American home economist teaching at Kobe Girls College in Nishinomiya, Ms. Barber has appeared on national television demonstrating tofu mayo, tofu Bavarian creme pie, tofu quiche, tofu tea bread, and tofu ice cream; she has been the subject of six articles in *Toyo Shinpo,* and interviewed on Radio Japan"). Contains many photos of huge tofu factories and small, traditional neighborhood tofu shops.

A sidebar, titled "What an American tofu-maker learned," by Richard Leviton, gives seven main points plus other observations. There is no mention of bean sprouts in Japan. Address: 100 Heath Rd., Colrain, Massachusetts 01340. Phone: 413-624-5591.

7475. **Product Name:** [Malvabo Barley Miso, Rice Miso].
Foreign Name: Malvabo Kornmiso, Rismiso.
Manufacturer's Name: Malvabo.
Manufacturer's Address: Malvabo, 19 063 Örsundsbro, Sweden. Phone: 0171-60456.
Date of Introduction: 1982 February.
Wt/Vol., Packaging, Price: 400 gm. Packed in a plastic tofu package.
How Stored: Shelf stable.
New Product–Documentation: Shurtleff & Aoyagi. 1983. The Book of Miso. 2nd ed. p. 255. The company is listed as Aros Sojaprodukter, Bergsvagen 1, 19063 Örsundsbro, Sweden. Run by Ted Nordquist & Tim Ohlund. Phone: 01-716-0456.

Talk with Ted Nordquist. 1985. Jan. 7. The miso is made in 12-15 crocks, each containing 30 liters. Tim Ohlund handles it. He opens one crock every 3rd or 4th month. The contents is sold when he opens it. Ted thinks it tastes fantastic, better than imports. Tim reads and experiments a lot. It is a mellow miso, mild and not very salty.

Talk with Ted Nordquist. 1988. March 27. Tim Ohlund is making miso in the basement of Ted's plant, Aros Sojaprodukter. He has been making it since about 1979, but Ted is not sure when Tim started to sell it commercially. His company is Malvabo, which is the name of the town where he lives. He is very interested in microbiology. He makes many different kinds of miso: wheat, oat, etc. He has about 20 crocks with 30 kg in each crock. He used to be an owner of Aros, but Ted bought him out in 1984.

Talk with Ted Nordquist. 1990. Nov. 23. The miso company has always been owned by Tim, never by Aros. From the beginning, Tim made the koji at home in Malvabo near Örsundsbro, then cooked the soybeans and mixed and ground them with the koji and salt at Aros. He fermented the miso in the basement of Aros in 30-100 liter ceramic crocks. Initially Tim operated without a company name and sold the miso directly to stores and individual customers. Then in late 1988 he started and registered his first company, named Timoteus, which makes and sells two products: miso and koji. Tim is now employed by Ted, manufacturing and delivering tofu, but Tim still makes miso; he does not make tempeh.

Letter from, then talk with, then letter from Tim Ohlund, founder and owner of Malvabo and of Timoteus Kojiprodukter HB. 1991. May 14 and May 30 and June 5. Tim was born in Seattle, Washington, and raised in America, but with Swedish ancestry. He first visited Sweden as a tourist in Dec. 1967 and liked it so much he decided to live there some day. But he was drafted into the U.S. Army for 2 years, spending 1 year in Vietnam. After being discharged in Fort Lewis, USA, he traveled directly to Japan to pursue his interest in Zen Buddhism. He spent 10½ months in Japan practicing Zen meditation. There, in Aug. 1970, he also became acquainted with miso (he was very interested in it, but didn't learn how to make it) and with macrobiotics. He left Japan and took the train across the USSR to meet his parents in Sweden. He has lived in Sweden since that time (1971). In Sweden his interest in both miso and macrobiotics grew. He started reading about miso, then he decided to returned to Japan in the summer of 1973 to study food processing (including miso and tofu making) for 2½ months. He lived in Kyoto and learned a little about miso there and in Hida Takayama–but not enough to make his own miso. Back in Sweden he read books on miso by macrobiotic teachers Herman Aihara and Michio Kushi. Using their instructions, he started to experiment with making miso and koji at his home named Malvabo (pronounced MAL-vuh-bo), at 19063 Örsundsbro, Sweden in Jan. 1975. The instructions

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didn't work and for the first 2 years the results were "quite disastrous." He first was able to make koji and miso after reading *The Book of Miso* by Shurtleff and Aoyagi, and scientific journal articles by Hesseltine and Steinkraus.

When Aros Sojaprodukter began making tofu in Örsundsbro in Feb. 1981, Tim was a part owner and he was able to expand his miso production using space in the Aros basement. But production was still on a small, experimental scale and none of the miso was sold.

In Feb. 1982 Tim first started to sell the barley miso and rice miso he was making at home; initially he sold only very small amounts, and only directly to friends. The first year he sold about 35 kg of rice and barley miso to friends. Tim wanted to sell organic miso made with all organically grown ingredients, but initially he could not obtain organic polished rice or barley. In Sept. 1983 he first produced an organic miso using oat koji and yellow peas–but not for sale. In April 1984 he started using the brand and company name "Malvabo" (address 19063 Örsundsbro, Sweden) and first sold miso to a retail food store–actually to several stores. The brand "Malvabo" appeared on the hand-written labels for his rice and barley miso. Tim was the first person in Sweden or in Scandinavia to make miso commercially. At the time he started, two type of miso were being imported from Japan: Regular miso by Japanese food stores in Stockholm, and macrobiotic/natural food miso via Lima in Belgium. Natural Hatcho miso had been in Sweden in small quantities since at least 1971.

In Sept. 1985 Tim first sold the organic miso he had developed in late 1983. Then in 1986 he and his family moved from the house name Malvabo to another house on the same farm named Härvstagård. In Nov. 1988 Tim registered his company: Timoteus Kojiprodukter Handelsbolag (HB), Härvstagård, 19 063 Örsundsbro, Sweden. Phone: 0171-65106. The largest amount of miso he has ever sold in one year is about 1,000 kg. He has never made any other fermented soyfoods commercially, except tempeh. Tim wasn't able to register his company name (after waiting nearly 2 years for the bureaucratic processing) as a trademark. Now he may have to change the name or remain small and lay low. Another big multinational company has a product with a similar name and also a grain-based foodstuff.

Innovations: Tim has been developing an oat koji since 1977, and has been making an oat-yellow pea miso, and a barley-yellow pea miso since 1978. In Feb. 1980 he started using water-lock stoneware crocks with superior results. His products have succeeded because of better flavor, use of organic ingredients, and because they are produced in Sweden and not pasteurized. See also Timoteus Kojiprodukter. 1988, Nov.

7476. Ontario Soya-Bean Growers' Marketing Board. 1982. "Canadian soyabean mission, South East Asia, Feb. 12th–27th, 1982: Mission member reports." 1982. Canadian soyabean mission, South East Asia, Feb. 12th–27th, 1982: Mission member reports. Chatham, Ontario: Ontario Soya-Bean Growers' Marketing Board. 12 p. Feb. 12 p. Feb. 24 x 11 cm. [Eng]

• ***Summary:*** Contents: Comments, by Peter H. Epp, Chairman. Japan: Home Shokuhin Tofu Manufacturing Co., Komatsuya Shokuhin (natto mfg. plant), Nihon Miso (manufacturing plant), Japan Miso Assoc., Japan Tofu Assoc., Federation of Japan Natto Manufacturers' Cooperative Society, Wako Shokuryo Co. (makes natto; Jacob Hartz in Arkansas supplies them with "936X" variety small-sized natto soybeans; Wako also supplies Nihon Miso Mfg. Plant), X-Can Far East Ltd. Korea: Seoul meeting at embassy, Chung's Food Ltd., Agriculture and Fisheries Development Corp., Korean Soybean Curd Cooperative Manufacturing Assoc. Singapore: Okura & Company Ltd., Eng Huat Pte. Ltd., Intraco. Malaysia: Yeo Hiap Seng Co. Ltd. (the largest manufacturer of soymilk in Malaysia and Singapore). Follow-up. Conclusion.

Each of the following members of the mission wrote a chapter in this book, discussing each visit mentioned in the contents: Peter H. Epp, Bernard Calhoun, Otis McGregor, Richard I. Buzzell, M.D. Pennell (General Manager, R&D, H.J. Heinz Company of Canada Ltd.), Michael Loh (Export Development Specialist, Ontario Ministry of Agriculture and Food).

Details are given on the soybean characteristics desired for each type of soyfood product, especially in the chapter by Dr. Buzzell. Popular soybean varieties include: For Miso: Enlei [Enrei], Fujimejiro, Harcor.

For natto: The main natto specifications are: 1. Seed size–small but fully developed, less than 5.0 mm diameter if possible. 2. Round seed. 3. Total sugar content < 22%. 4. Oil content > 19%. 5. White / yellow hilum. Best natto varieties: Jizuka (the smallest, from Ibaraki prefecture) and Suzuhime (small, from Hokkaido), "two domestic [Japanese] varieties used for superior quality natto, were priced at $100 U.S. for 60 kg. The U.S. varieties which have been, and are being used presently, are not satisfactory. Both Nattawa and Pioneer 1677 varieties should adapt well to the natto product." Jennett (H24) from the USA is good. (p. 5, "Natto specifications Japan, unnumbered page near rear).

For tofu: Amsoy, Coles, Harcor.

Letter from Fred Brandenburg of OSGMB. 1994. Nov. 9. "Regarding export promotion before 1982, any activities would have been part of larger government sponsored trade missions. For example, in 1979 Otis McGregor participated in a mission to Asia which was co-ordinated by Michael Loh. It included a number of marketing boards and associations from Canada."

Note: This is the earliest document seen (Dec. 1998) that (apparently) mentions the soybean variety Enrei. Address: P.O. Box 1199, Chatham, ONT N7M 5L8, Canada. Phone: 519-352-7730.

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7477. Ontario Soya-Bean Growers' Marketing Board. 1982. Canadian soybean mission to Japan, Korea, Singapore, Hong Kong, Malaysia. Chatham, Ontario, Canada. 12 p. Feb. 24 x 11 cm. [Eng; jap; kor]
• ***Summary:*** Small portrait photos (p. 2) show mission members: P. Epp, B. Calhoun, A. Ford, O. McGregor, Michael Loh, Dr. R. Buzzell, M. Pennell. The first four men are from the Ontario Soya-Bean Growers' Marketing Board. Address: P.O. Box 1199, Chatham, ONT N7M 5L8, Canada. Phone: 519-352-7730.

7478. **Product Name:** [Haimaru / Haimiru Soyalac {Soymilk} (Plain, or Cocoa)].
Foreign Name: Haimaru Kokoa, Haimaru Soiyarakku.
Manufacturer's Name: San-iku Foods.
Manufacturer's Address: 1-1 Nagaurataku, Sodegaura-machi, Kimizu-gun, Chiba-ken 299-02, Japan.
Date of Introduction: 1982 February.
Wt/Vol., Packaging, Price: 180 gm foil retort pouch (standing pouch).
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Haimaru Kokoa, and Haimaru Soiyarakku were introduced in Feb. 1982 by Saniku Fuuzu in a 180 gm standing pouch and distributed nationwide.

7479. Shurtleff, William; Aoyagi, Akiko. 1982. Tofu & soymilk production: A craft and technical manual. Lafayette, California: Soyfoods Center. 336 p. Illust. by Akiko Aoyagi Shurtleff. Index. Feb. 28 cm. [223 ref]
• ***Summary:*** The contents is identical to that of the original Aug. 1979 edition, but the publisher's name has changed to Soyfoods Center from New-Age Foods Study Center. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

7480. Suzuki, Hiroshi. 1982. Daizu kakô shokuhin no hinshitsu [Quality of processed soybean foods]. *Nyu Fudo Indasutori* (*New Food Industry*) 24(2):42-49. Feb. [2 ref. Jap]
• ***Summary:*** Discusses mostly natto and tofu. This journal is published by the Tokyo Metropolitan Agric. Exp. Station. Address: Tokyo-to Nogyo Shikenjo.

7481. Belleme, John. 1982. Re: New developments at American Miso Co. Letter to William Shurtleff at Soyfoods Center, March 3. 2 p. Typed, without signature or letterhead.
• ***Summary:*** "We got a really good response from our light miso. People reported using it for dressings, dips and even desserts. We have decided to market our white miso through our wholesale company in bulk only during the winter. We also plan to market a mellow barley and a mellow rice miso, both of which should have a good shelflife.

"Mr. Onozaki just visited our factory for two weeks. He said our koji is some of the best he has ever seen. I was really worried about our koji and his comments settled my anxious mind. He also said our long-term miso is developing fine.

"The ownership of our factory is finally settled. The following will not be participating: Erewhon, Michio [Kushi], Mitoku, Johsen, Oak Feed and Sandy Pukel. This leaves only Barry Evans and myself, we are now the sole owners."

"I am sending you 10 pounds of Mr. Onozaki's rice miso. It is hopefully just like the miso we are making. We are getting a really good response from the East Coast macros; they love Mr. Onozaki's miso. Last year we imported 20,000 pounds.

"Barry and I are starting a wholesale company in Asheville. It's tentatively called Great Eastern Sun Trading Company. We are specializing in hard-to-get macrobiotic foods–will send you a catalog in a few weeks."

Note 1. This is the earliest document seen (March 2006) that mentions Great Eastern Sun, a macrobiotic trading company in North Carolina.

Note 2. On 31 May 1982 John wrote a 2-page typed letter to Dr. Hiroshi Ito at the National Food Research Institute asking for help in making a white miso. Address: Route 3, Box 541, Rutherfordton, North Carolina. Phone: (704) 287-2940.

7482. Root, Evan. 1982. Re: History of macrobiotics. Letter to William Shurtleff at Soyfoods Center, March 4–in reply to inquiry. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "Here is my reply to your questionnaire." Discusses Sanae, Erewhon, Paul Hawken, Michio Kushi. The original Erewhon store started in April 1966 at 303-B Newbury St. Prior to that, some food sales were done from the Kushi's home on a very small scale.

In Oct. 1967, Paul Hawken took over the management of Evan Root moved up the street to commence renovations for Sanae Restaurant. Paul was the main force in expanding and developing Erewhon in the early days. Prior to him it was mainly a cracker barrel style store where people came in to talk philosophy and swap recipes, whether or not they bought anything.

Sanae opened its doors to the public in Feb. 1968.

In the early days of Erewhon one of the suppliers not to be overlooked is Japan Food Corporation. From them we bought seaweeds, fish flakes, gourd strips, and most importantly from your point of view, Hatcho miso. Chico-San and Infinity Foods were in operation before Erewhon and we got most of the Japanese items from them except for a couple of kegs of miso that Junsei Yamaguchi put up in the Kushi's basement.

I do not know this for a fact, but I have speculated

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that the early tamari that was available when I first got into macrobiotics in 1964 may have been, in fact, real tamari as I distinctly remember that it was thicker and richer than what became available a little later. Address: Relationships, 39 Harvard St., Brookline, Massachusetts 02146. Phone: 617-739-3300.

7483. Fabricant, Florence. 1982. Japanese food with inventiveness: Dining out. *New York Times.* March 7. p. LI19.
• ***Summary:*** This is a review of the two-star Japanese restaurant Asahi Tokyo (2 Village Square, Glen Cove, New York). Recommended dishes include "fried bean curd." One of the many delicious appetizers is "squares of deep-fried bean curd with a tangy dipping sauce..."

7484. Aihara, Herman. 1982. Re: Introducing miso and soy sauce to America. Letter to William Shurtleff at Soyfoods Center, March 15–in reply to inquiry. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "Miso and 'tamari' were imported in America by Ginza, Inc., managed by H. Aihara, in 1961 in New York City. The brand name was not remembered.

"After 16 families moved to Chico and started Chico-San, Chico-San imported Marushin soy sauce and miso. Ohsawa arranged the manufacture and export in Japan. Ohsawa always supervised and examined the products.

"Ohsawa told us to call natural soy sauce 'tamari'. The reason is, he named natural soy sauce 'Ohsawa Soy Sauce' in Europe and gave its sole agency to someone else. This guy started to import bad soy sauce and called it 'Ohsawa Soy Sauce.' Then, Ohsawa began importing a good one by himself, but could not use the name 'Ohsawa Soy Sauce.' Therefore, he called soy sauce 'tamari.' (A mistake, I think.) Chico-San has been importing the best quality of miso and soy sauce (named 'tamari') even though the cost was higher than other, lower grades." Address: President GOMF, P.O. Box 426, Oroville, California 95965.

7485. Hohn, Jane R. 1982. Re: History of HVP. Letter to Mr. Milan Drake, Beatrice Foods, La Choy Food Products Co., 901 Stryker St., Archbold, Ohio 43502, March 16. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "Dear Mr. Drake: It was certainly a pleasure meeting you last week and discussing HVP's. I think we have found suitable answers for your questions about HVP's.

"1. Who made the first HVP and where? Was it Maggi in Switzerland or Ikeda in Japan. Ans: We think China and Japan made the first soy sauce as acid hydrolysates. Fermented soy sauce was made, probably, as far back as 3,000 B.C.

"2. When was HVP commercialized and in what products? Ans: We believe the Chinese and Japanese made acid hydrolyzed HVP prior to 1940. No definite data available on this.

3. When and how was it first used in the U.S.? Ans: Huron Milling Co. made HVP in 1934. Liquid was sold as #6 Sauce for use in soy sauce. Dry powders were sold to the U.S. Government for use in C-Rations during World War II.

"4. When and by whom was it first used in soy sauce? Ans: We think LaChoy used it first in the U.S. #6 liquid was sold for this purpose. The Chinese may have used it prior to this, but again, we don't know for sure." Address: Hercules Incorporated, PFW Div., 33 Sprague Ave., Middletown, New York 10940. Phone: (914) 343-1900.

7486. Rothman, Sandy. 1982. Re: History of work with macrobiotics and soyfoods in America. Focus on Herman and Cornellia Aihara, and Chico-San. Letter to William Shurtleff at Soyfoods Center, March 17. 5 p.
• ***Summary:*** Also discusses Alcan Yamaguchi, Zen Teahouse, Paradox, Michio Kushi, Musubi, Irma Paule. Address: GOMF, Oroville, California.

7487. Lopez, Alejandro. 1982. El trabajo del maestro Ejo Takata con la soya en Mexico [Re: The work of Zen master Ejo Takata with soya in Mexico]. Letter to William Shurtleff at Soyfoods Center, March 19. 3 p. Typed, with signature. [Spa; eng]
• ***Summary:*** In 1969 Rev. Ejo Takata, a Japanese Zen monk and later Zen master who first arrived in Mexico in 1967, began his work with soyfoods. That year, while traveling in the mountains of Oaxaca state, he became aware of the malnutrition among the Mixes and Mazatecos Indians. With the help of the Japanese agronomist Toshihiko Onuki and of a group of Mexicans from the School of Agriculture of Chapingo and of his Zen A.C. community, he established an experimental soybean farm in Oaxaca and promoted the cultivation of soybeans and the use of soyfoods among the Indian communities. He taught the Indians how to make soymilk and how to use the okara (soy pulp) in making corn tortillas. He gave demonstrations in more than 100 communities and in almost all of these the soyfoods were received with such enthusiasm that they became and remain a part of the daily diet. They are made from soybeans now grown locally by the Indians. In 1971 Takata and co-workers opened a dining room at the Universidad Nacional Autonomo de Mexico. During the next 6 months they gave demonstrations and prepared 200 meals a day based on soyfoods including soymilk, okara with green vegetables, tortas with fresh soy puree, tofu in various recipes, crackers (*galletas*), breads, etc. In 1972 they began to give soyfoods demonstrations to the National Workers Syndicate of the ISSSTE, and to peasants and farm workers' organizations. They traveled widely into the countryside and their presentations and food were always well received. This work played a significant role in paving the way for soyfoods in Mexico. In 1973 the President of Mexico, Lic.

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Luis Echeverria, at a reception, recognized Rev. Takata for the work he had done with soybeans and soyfoods, then inaugurated a national soy program. In 1976 Takata and colleagues established an organization to teach appropriate technology (for food and energy), including soyfoods production. This work expanded in 1981 to the application of Japanese low-cost soyfoods equipment to small businesses, and participation in a national food program called Sistema Alimentario Mexicano (SAM). Takata and his co-workers have demonstrated vividly what individuals can do to help bring soybeans and soyfoods to the people in a country where they are not known. Address: Lic. Alejandro Lopez, Zen A.C., Ave. Revolucion #2036, San Angel, Mexico, DF, Mexico.

7488. *Toyo Shinpo* (*Soyfoods News*). 1982. T-shyatsu [Yoshikawa Shoji is giving away American T-shirts to people who buy his nigari or sumashiko]. March 21. [Jap]
• ***Summary:*** This sort of idea for publicity didn't used to exist. Tofu makers are now very interested in T-shirts and a lot of them have been ordered.

7489. Kojima, Yoshiko. 1982. Re: The soymilk industry in Japan. Letter to William Shurtleff at Soyfoods Center, March 25–in reply to inquiry. 4 p. Typed, with signature on letterhead.
• ***Summary:*** In Japan, at present the four largest soy milk makers are given below in descending order of production [largest first]:

1. Kibun Health Foods K.K., 1-11-8, Shin-Sayama, Sayama-shi, Saitama pref. 350-13. Tel. No. 0429-53-7001.
2. Okazaki Marusan K.K., 1, Aza Arashita, Niki-cho, Okazaki-shi, Aichi-pref. 444-21. Tel. No. 0564-45-3111.
3. Mitsubishi Chemical Foods Co., Ltd., 5-13-12, Ginza, Chuo-ku, Tokyo 104. Tel. No. 03-542-6499.
4. Kyushu Milk Co., Ltd., 4311 Moto-machi, Oita-shi, Oita-pref. 870. Tel. No. 0975-43-4135.

About 40 companies are producing soy milk in Japan. Those who are the members of Soy Milk Association are shown on the attached sheets.

The first commercial soy milk in Japan was made in 1959 by Saniku Foods–Food Div. of Seventh Day Adventist group in Japan under the instruction of Dr. Harry Miller.

With best regards, Sincerely,...

The attached sheets are titled "List of soy milk producing companies in Japan who belong to the Japan Soymilk Association." The name, address, and phone number of 17 companies are given. These include the four largest soymilk makers given on page 1. Address: Associate Country Director for Human Nutrition, American Soybean Association, 11th Floor, Akasaka Tokyu Building, 2-14-3 Nagata-cho, Chiyoda-ku, Tokyo 100, Japan.

7490. Rothman, Sandy. 1982. Re: Meeting with Bob Kennedy and Herman Aihara. Additional criticisms of William Shurtleff. Letter to William Shurtleff at Soyfoods Center, March 26. 1 p. Typed, with signature.
• ***Summary:*** "As mentioned before, not only would a proper visit and interview with Bob and Herman have provided the cheapest, least stressful means of obtaining your research–it would have also brought a current relationship with the two principals into current focus."

Accompanying this letter are three pages of typed comments by Rothman (on the back of GOMF letterhead) concerning Shurtleff's chapter titled "History of Macrobiotics and soyfoods" and answers to Shurtleff's numbered "Questions about history of macrobiotics and soyfoods" (1982), plus the pages 1-18 of the chapter carefully edited. Also pages 2, 7-10, and 15-17 edited by Herman Aihara, and page 9 edited by Peter Milbury. Address: GOMF, 902 14th St., Oroville, California 95965. Phone: (916) 533-7702.

7491. Kushi, Michio; Kushi, Aveline. 1982. Re: History of work with macrobiotics and soyfoods in Boston. Letter to William Shurtleff at Soyfoods Center, March 29. 2 p. Typed, without signature on letterhead.
• ***Summary:*** These are answers (dictated to a typist) to a list of questions sent by William Shurtleff of Soyfoods Center.

1. Why were George Ohsawa's students given Western names? "Right after the second world war, and after the Americans took over Japan, George Ohsawa wanted everyone to speed up their lifestyle. For this reason he gave Western names to his students, taking those names from Western heroes born in the same month. We think that perhaps it was his intention to have them go to America to spread macrobiotics. As a teacher, George Ohsawa adopted the western style of having his students call him by his first name, George. Almost all his students were given new names."

5. Prior to 1959, which macrobiotic teachers were in New York? "Michio Kushi was lecturing and giving seminars in New York at that time, along with other friends."

9. When was the Ohsawa Foundation in New York City established? By whom? "The Ohsawa Foundation was founded in 1960 or 1961, by Michio, Irma Paule and other friends. Michio was the first President of the 2nd Avenue location. The Musubi Restaurant was by Mr. Sato, Alcan Yamaguchi, and Junsei Yamazaki. Irma Paule was later to take over the East West Foundation and set up the 2nd Avenue location.

12. When and where were Michio and Aveline married? They were "married in 1953 in New York. They [first] met in New York but had been corresponding from Japan through George Ohsawa's study house [Maison Ignoramus?] before that time.

13. Cornellia and Herman [Aihara] were married in New York and had also been corresponding from Japan.

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14. What was Musubi in New York City? Musubi "was a restaurant and food store but not a gift shop. They sold miso and shoyu from Japan the George Ohsawa had sent."

16. When did Michio Kushi start and stop lecturing at Arlington Street Church in Boston? "He started in 1965 and stopped in 1970."

18. When did Michio organize the first East West Institute? "1965."

19. When did the Kushis move from New York to the Boston area? What prompted this? "In 1963 [sic, March, 1964] Aveline and the children moved to Martha's Vineyard [an island off the south of Cape Cod in Massachusetts] for 6 months because it was a much better environment for natural living. Michio was still working in New York. In September 1963 [sic, 1964] they moved to Cambridge, Massachusetts with Michio, who at that time stopped all business and put all his efforts toward macrobiotic education. The death of Beth Ann Simon and the FDA crackdown came after Erewhon was established.

20. Erewhon started in the Kushi home in 1963 in Cambridge. In 1965 [sic. April 1966] it was established as a company on Newbury St.

25. When did Sendai Miso Shoyu start making natural shoyu. Who set this up? When did they start to sell it? "Mr. Kazama [of Mitoku] set it up" and would know the answers to the other questions. Address: 62 Buckminster Rd., Brookline, Massachusetts 02146.

7492. Kordel, Lelord. 1982. Low-protein diet unwise–Can be dangerous to health: Eat and grow younger. *Japan Times.* March 31. p. 11.
• ***Summary:*** The author does not advocate a vegetarian diet, but rather advocates a high-protein diet with plenty of meat and believes that "high-starch dishes" are bad.

7493. Baba, Keiko; Saio, Kyoko. 1982. [Comparison of soybean tissue extracted with different solvents]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 40. p. 206-08. March. [7 ref. Jap; eng]
• ***Summary:*** The solvents used were hexane, defatted with *n*-hexane then washed with alcohol, chloroform, chloroform-methanol, methanol, and acetone. Eight photomicrographs show the microstructure (5000 x magnification) of cotyledonary tissue, with the following structures labeled: CW: cell wall. PB: protein body. Sp: Spherosome. The soybeans used were 1976 IOM soybeans.

Reprinted from *Agricultural and Biological Chemistry* 44:1265-67 (1981). Address: 1. Oils and Fats Research Labs., Ajinomoto Co., Inc., 7-41 Daikoku-cho, Tsurumi-ku, Yokohama-shi 230; 2. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7494. **Product Name:** [Soymilk Yogurt].
Foreign Name: Tônyû Yooguruto.
Manufacturer's Name: Furuta Shokuhin Kogyo (Furata Foods Co.).
Manufacturer's Address: Japan.
Date of Introduction: 1982 March.
Wt/Vol., Packaging, Price: 80 gm poly cup.
How Stored: Refrigerated.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 73. This product was introduced in March 1982 in an 80 gm poly cup, and distributed nationwide. Name of company with diacritics is: Furuta Shokuhin Kôgyô (Furata Foods Co.).

7495. *Jiba Sanpin Kanren Joho Kensaku Repooto* (*Market Survey on Production of Goods, by Product Type and Location*). 1982. Wagakuni shôyu gyôkai to kaigai shijô dôkô [The shoyu industry in Japan and market conditions overseas]. No. 56. 7 p. March. [Jap]
• ***Summary:*** Gives current production figures for each of 5 types of Japanese soy sauce (koikuchi, usukuchi, tamari, saishikomi, shiro), each of 3 fermentation methods, and each of 3 grades, by prefecture. Plus total production and exports by year. Address: Nihon Boeki Shinkokai Kaigai Keizai Joho Center, Tokyo.

7496. **Product Name:** [Koshin Soymilk Pudding].
Foreign Name: Kôshin Tônyû Purin.
Manufacturer's Name: Koshin Nyugyo (Koshin Milk Co.).
Manufacturer's Address: Japan.
Date of Introduction: 1982 March.
Wt/Vol., Packaging, Price: 100 gm Styrofoam cup with legs.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 73. This product was introduced in March 1982 in a 100-gm cup with Styrofoam legs, and distributed in many parts of Japan. Company name with diacritics is: Kôshin Nyûgyô.

7497. **Product Name:** [Koshin Soymilk (Orange, Strawberry, With Blueberry Sauce)].
Foreign Name: Kôshin (Orenji, Sutoroberii, Buruuberri Soosu-iri).
Manufacturer's Name: Koshin Nyugyo (Koshin Milk Co.).
Manufacturer's Address: Japan.
Date of Introduction: 1982 March.
Wt/Vol., Packaging, Price: 100 gm Styrofoam cup with legs.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 73. These products were introduced in March 1982, each in a 100-gm cup with Styrofoam legs, and distributed in many parts of Japan.

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Company name with diacritics is: Kôshin Nyûgyô.

7498. **Product Name:** [Sujaata Original Soymilk].
Foreign Name: Sujaata no Gen Tônyû.
Manufacturer's Name: Nagoya Seiraku.
Manufacturer's Address: Japan.
Date of Introduction: 1982 March.
Wt/Vol., Packaging, Price: 500 ml long-life Pure Pak carton.
How Stored: Refrigerated.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that this product was introduced in March 1982 in a long-life Pure Pak and distributed nationwide.

7499. Nakayama, Yoriko; Saio, Kyoko; Kito, Makoto. 1982. Decomposition of phospholipids in soybeans during storage. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 40. p. 196-200. March. [12 ref. Eng; jap]
• ***Summary:*** Reprinted from *Cereal Chemistry* 58:260-64 (1981). Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7500. **Product Name:** Fuju Soy Sauce (Koikuchi Shoyu).
Manufacturer's Name: Nepal Soya Industries.
Manufacturer's Address: 9/374 Bhedashing, Jamguthi, Kathmandu, Nepal. Phone: 229130.
Date of Introduction: 1982 March.
Ingredients: Soybean, wheat, salt, water, Japanese Sozae [starter culture].
Wt/Vol., Packaging, Price: 1 liter.
How Stored: Shelf stable.
New Product–Documentation: Letter from Mr. Achutananda Vaidya of Nepal Soya Industries. 1992. Dec. 26. He started making tofu in Kathmandu in 1974. "In 1979-80 I was invited to Japan for 9 months training at the Akita Prefecture Brewing Laboratory. During that time I also learned in detail the processes for making soy sauce, miso, and soyamilk. During that period I also got a chance to read *The Book of Tofu, The Book of Miso, Miso Production,* and *The Book of Tempeh* all of which helped me very much. I still have all those books. In 1985 I was invited by the Rotarians of Akita-Aomori to return to Japan for 1 month to receive further technical training in making tofu, miso, soy sauce, soyamilk, moyashi (sprouts), koji, fruit fermentations for wine, etc. Today I produce tofu, soy sauce, and miso in my small factory in Kathmandu." His business card notes: "Food Technology in Brewing from Japan. Products & Suppliers: Tofu (Vita), Soyamilk (Vitabean milk), Soya Curd, Soya Sauce, & Miso."

Letter from Mr. Achutananda Vaidya of Nepal Soya Industries. 2002. April 12. He started to make this soy sauce in March 1982. A label sent in April 2002 is for "Fuji Soya Sauce (Natural Fermentation)." Red and white on blue.

7501. Saio, Kyoko; Nikkuni, Ikumi; Ando, Yoko; Otsuru, Masaru; Takeuchi, Yutaka; Kito, Makoto. 1982. Soybean quality changes during model storage studies. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 40. p. 189-95. March. [14 ref. Eng; jap]
• ***Summary:*** Reprinted from *Cereal Chemistry* 57:77-82 (1980). Address: 1-2. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7502. Saio, Kyoko; Baba, Keiko. 1982. [Microscopic observation on soybean structural changes in storage]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 40. p. 201-05. March. [14 ref. Jap; eng]
• ***Summary:*** Contains 14 labeled light micrographs (600 x magnification) and transmission electron micrographs (up to 10,000 x magnification) of cotyledonary tissues of soybeans (both control and stored). The labels show: Pb: protein body, sp: spherosome, cw: cell wall, and s: starch granule.

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 27:343-47 (1980). Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2. Oils and Fats Research Labs., Ajinomoto Co., Inc., 7-41 Daikoku-cho, Tsurumi-ku, Yokohama-shi 230.

7503. Saio, Kyoko; Baba, Keiko. 1982. [Identification of vegetable proteins in fabricated foods]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 40. p. 209-14. March. [20 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 27:604-09 (1980). Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2. Kyoritsu Women's Univ., 1 Kandahitotsubashi, Chiyoda-ku, Tokyo 101.

7504. *SoyaScan Notes.* 1982. Chronology of Great Eastern Sun Trading Company in North Carolina. 26 Jan. 1994. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1982 March–The company is founded by Barry Evans. Martin Roth is the first manager. The original purpose is to be a distributor for the miso made by American Miso Company. But the company soon decides to import Japanese macrobiotic products from Mitoku (the first order was placed in Jan. 1982) and later to become a manufacturer.

1984 July–Great Eastern Sun starts to import Ah Soy (soymilk, in chocolate, vanilla, and original flavors). Made

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in Japan by San-iku Foods, and sold in a stand-up foil retort pouch, it soon becomes very popular. Don DeBona is the first product manager. Address: 92 Macintosh Rd., Asheville, North Carolina 28806.

7505. Taira, Harue. 1982. [Quality of soybean seeds grown in Japan. I. Physical properties, chemical composition, and suitability for food processing]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 40. p. 35-54. March. [32 ref. Jap; eng] Address: National Food Research Inst., Japan.

7506. Taira, Harue; Taira, Hirokadzu; Mikoshiba, Kimito. 1982. [Effect of variety and cropping year on the oil and total carotenoids content and color of soybean seeds]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 40. p. 130-40. March. [17 ref. Jap; eng]
• ***Summary:*** Reprinted from *Proceedings of the Crop Science Society of Japan* (*Nippon Sakumotsu Gakkai Kiji*) 50:98-108 (1981). Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7507. Tajiri, Takashi. 1982. Jinkô taiyô tôshô-sha ni yoru mame-rui moyashi saibai no kairyô. VIII. [Studies on cultivation and keeping quality of bean sprouts. VIII. Improvement of bean sprouts production by intermittent treatment with carbon dioxide]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 32(3):159-69. [Jap]*
Address: Lab. of Food Process, Faculty of Agriculture, Kinki Univ., Kowakae, 3-4-1 Higashi-Osaka-shi, Osaka-fu, 577 Japan.

7508. Tally, Gene. 1982. The Coca-Cola Company's work with soymilk in Brazil (Saci) and Mexico (Samson) (Interview). Conducted by William Shurtleff of Soyfoods Center, April 2. 2 p. transcript.
• ***Summary:*** The Coca-Cola Co.'s (CCC) first protein drink was a whey product in Surinam–the forerunner of Sansom in Mexico. Gene is quite sure that none of the early Samson products contained soy. The trademarks say that the protein source can be whey or soy but all have been whey.

CCC has never marketed a soy based beverage outside of Brazil–where they marketed Saci. Coke's first financial success with a protein fortified beverage was with whey Samson in Mexico. In Brazil, soy Saci was a financial disaster. After inflation gets under control in Brazil, CCC will try a joint venture there with mass market retail soymilk. They will steer clear of government programs such as the school feeding program.

In Japan, Fuji Purina does not like to produce soy protein isolate because the effluent causes environmental problems and expenses. They do make some but they buy most of what they use or sell from Ralston Purina in the USA. Address: Coca-Cola Co., Atlanta, Georgia.

7509. Shurtleff, William; Aoyagi, Akiko. 1982. History of soymilk and dairylike soymilk products. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 53 p. April 4. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction. Etymology. Four stages of growth. Part I: History in Chinese-speaking Asia. Origin and early development. Roots of East Asia's soymilk renaissance. Hong Kong and Vitasoy. Singapore. Taiwan. Part II: History in non-Chinese speaking Asia. Japan. India. Philippines. Vietnam. Indonesia. Thailand. Malaysia. Korea. Sri Lanka. Part III: History in Europe. The early years (1739-1919). 1920-1939. 1940-1959. 1960-1980. Part IV: History in the United States. The early years (1898-1919). 1920-1939. 1940-1959. 1960-1980. Part V: History in Latin America and Africa. Part VI: Soymilk overview and future. Part VII: Dairylike soymilk products (nonfermented). Soymilk ice cream, 1918. Soymilk cream and whipped cream, 1932. Soymilk custards and puddings, 1935. Soymilk mayonnaise, 1936. Soymilk shakes, 1944. Soy nog, 1944. Nonfermented soymilk cheese, 1973. Other.

Note: This is the earliest English-language document seen (Dec. 2003) that contains the term "soymilk shakes" (or "soymilk shake"). Address: Lafayette, California. Phone: 415-283-2991.

7510. Hawken, Paul. 1982. History of Erewhon and macrobiotics in America. Part I (Interview). Conducted by William Shurtleff of Soyfoods Center, April 18. 3 p. and 5 p. transcripts.
• ***Summary:*** Hawken played an important and very innovative role in establishing the natural foods industry in America and in building Erewhon into a major distributor of macrobiotic and natural foods.

Chico-San imported foods from Tokyo CI (Centre Ignoramus); Muso didn't exist at that time.

The Kushis never made tofu or nigari tofu. They were not big tofu eaters, largely because tofu was considered too yin–ridiculous. Then people started craving it, and buying it from Chinatown. But the tofu they bought was not made with nigari.

By the mid-1960s there were roughly 300 to 2,000 people actively involved with macrobiotics in the USA–including Michio Kushi's students, Herman Aihara's students, and those in New York and Boston.

Beth Ann Simon had started using heroin again before she died [on her No. 7 macrobiotic diet]. The family covered it up, blaming Japanese and tamari. But she was not the only one who died. George and Lima Ohsawa's only child died

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within a year of being born in Tokyo (according to Lima) from excess salt.

Erewhon was started by Aveline Kushi, not by Evan Root. Paul does not know who gave Erewhon its name [it was Aveline Kushi]; of course, it is "Nowhere" scrambled, as in the title of the famous 1872 novel by Samuel Butler about a utopian island divested of machinery. Originally various people would drive to Pennsylvania to see the Mennonites and Walnut Acres. It was a buying club for students who lived in the Kushi's house in Cambridge, Massachusetts. Foods such as wheat, [whole-wheat] flour, oatmeal. Nothing imported from Japan. It was started with $500 cash in the basement of the Kushi's house. It backed into being a store since it was cheaper to buy larger quantities. The food was divided up into little bags and a price was written on each. It was sort of a way of buying food for people at the Kushi's house, like Aveline doing her shopping for 10-12 people in the first big macrobiotic study house. It began to outgrow the house and outside students wanted good food. It was never seen as a business or a money-making venture. Good food was so difficult to get in those days.

Another source of good food was Infinity Foods in New York City, started and owned by Howard Rower; they had a warehouse and were wholesaling by mid-1965. Soon Howard was importing miso and tamari (shoyu / soy sauce) from Tokyo CI. "This 'guaranteed' its quasi-medicinal effects. Otherwise it didn't work. It was actually the best food–really." Then Howard started to import directly from the manufacturers of miso and shoyu in Japan: Hatcho miso and Marushima shoyu (whose owner knew Ohsawa intimately). Paul visited Marushima in 1969. Paul thinks Marushima bought their shoyu from other shoyu factories on the island, or maybe they made it in the early days. Paul thinks there is a big difference in taste between shoyu made from whole soybeans and that made from defatted soybean meal (*dasshi daizu*). Paul was suspicious of Marushima shoyu in 1970; he demanded that Muso Shokuhin change to Johsen [Sendai Miso Shoyu] as their source; Johsen has a long history and the owner was also one of Ohsawa's cronies.

Paul left Erewhon in 1973. He went to Japan three times. The first trip was in March 1969, when he set up Mitoku in the natural foods business; before that they were an importer of hockey equipment. Muso was called Osaka CI; neither of those two companies were exporters before that time.

In the early days of the below-ground store in Boston, more of the foods came from Lima Foods in Belgium than from Japan. The miso and shoyu in those day came from Infinity Foods in New York City. They did not carry tofu because there was no refrigeration. None of the food was sent by the Kushis' friends.

In the early days of that store, Evan Root just tended the store, which had sales of about $20–$30 a day. The store was Aveline's idea. Evan was Aveline's lover–and not the only one. The store was originally called simply "Erewhon." Paul later added the words "Trading Co." when he incorporated it in the late fall of 1967. Paul and Aveline each owned 50% of the corporation. During its first year as a corporation, sales went from $1,000/month to $9,000/month–and not because it was macrobiotic. Erewhon was the first natural food store (as opposed to health food store) in America. It sold no pills. Many of the customers were not macros; they wanted whole foods. In mid-1968, as Paul was ready to leave Erewhon, someone came into the store and asked: "How do you know the oil is cold-pressed? And how do you know the grains are organically grown? He couldn't answer. So he wrote letters and found out that most were not what they claimed to be. Then Paul decided to use Erewhon to create a true food supply. He went directly to farmers. He didn't trust anyone. The idea was to know where the food came from and to have no middlemen between Erewhon and the producers.

In Oct. 1968 the little Erewhon retail store moved up and across the street to a new location at 342 Newbury Street. At that time they began to sell wholesale and to import from Japan, by correspondence with Mr. Kazama. The first import order from Japan, dated Aug. 1968, was *aka miso* (red rice miso–superb) from Sendai Miso Shoyu and Marushima shoyu. Soon customers who used to drive 400 miles to buy staples from Erewhon started to open their own stores. The natural foods business mushroomed. Erewhon started selling tofu in 1968 at 342 Newbury; they got it from a Chinese tofu maker in Boston. Nigari came in much later, after 1973. Neither Evan nor anyone else wanted to work at or run Erewhon; they all wanted to teach macrobiotics.

Paul was selling whole dry soybeans at that time, but mostly non-macros were eating those soybeans. Erewhon's first supplier, in mid-1968, was a wheat grower in North Dakota. Carl Garrich in Lone Pine, Arkansas, was much later. Paul got his first soybeans from a guy in a boxcar who was an insurance salesman, but who worked one day a week selling soybeans and wheat. Paul also bought soybeans from Deaf Smith County, Texas. Paul knew Frank Ford of Deaf Smith County in the early days. Paul was vice president of Arrowhead Mills before Roger Hillyard even worked for them. He ground his flour in a boxcar.

Paul wrote a long and detailed article about the early history of Erewhon titled "Erewhon: A biography. The view within," published in the Aug. 1973 issue of *East West Journal*. He was upset at the time. It was critical of the Kushis, and Paul explained why he was about to leave Erewhon. Robert Hargrove, editor of the journal, ran it anyway. Since then, Erewhon's history has been sanitized. Continued. Address: California.

7511. Hawken, Paul. 1982. History of Erewhon and macrobiotics in America. Part II (Interview). Conducted by William Shurtleff of Soyfoods Center, April 18. 3 p.
• ***Summary:*** Continued: Erewhon grew rapidly. One year

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after moving to the new location they had sales of $35,000 to $40,000 a month, both wholesale and retail. Paul thinks Erewhon had a retail catalog from 1967 to 1970. Paul was president (until 1973, when he left) and half owner. Then he left for Japan. Before leaving he made a great error, by signing over his half of the stock to the corporation in case something happened to him. It was put in escrow, but he could never get it back. When Paul left for Japan, Roger Hillyard, Bill Tara, Bruce Macdonald, and Jim Docker were all working for Erewhon. He had hired many or all of them, and everything was in place for takeoff. Erewhon did not get its big brick warehouse until July 1970.

When Paul first went to Japan in the spring of 1969, He traveled with Mr. Kazama of Mitoku, visited many factories, and set up sources. He tried to find out where Tokyo CI and Osaka CI were getting their foods. He was in Japan for about 9 months, from March to December.

When he returned, he opened [sic] Erewhon in Los Angeles; Roger Hillyard was still in charge of Erewhon in Boston. Then he moved to San Francisco and started Organic Merchants with Fred Rohe, and started writing "The Sugar Story," "The Oil Story," and other leaflets. His main interest was now in providing accurate information about foods. In mid-1970 Erewhon stopped its mail order catalog and business when it moved into the brick warehouse.

Originally Erewhon West (Los Angeles) and Erewhon Boston were one; about 4 years later they split in two.

When Paul left in 1973, Erewhon was contracting directly with something like 57 farms in 35 states producing organically grown foods, including lots of produce. This program began in 1968, included the Lundberg Brothers (who grew brown rice organically in Northern California), and led to the wholesale business. Paul and Erewhon helped many other natural food companies to get started.

The Natural Food Distributors Association [Organic Merchants] was not successful because it was Paul's idea and he left. Lack of money and fundraising were secondary. His goal was to see cooperation in the industry.

In conclusion Paul says: "Read the article [in *East West Journal*] and then we should talk again. You'll have a lot more questions." He asks Shurtleff to send him a photocopy of the article as well as the final draft of the chapter on the history of macrobiotics (including Erewhon); he'll be glad to recheck it. Address: California.

7512. Shurtleff, William; Aoyagi, Akiko. 1982. History of tofu. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 119 p. April 21. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction. Etymology. Part I: History of tofu in China. Origin and developments to 960 A.D. Sung dynasty, 960-1279. Yuan (Mongol) dynasty, 1279-1368. Ming dynasty, 1368-1662. Ching dynasty, 1662-1912. Developments from 1912-1948. The People's Republic of China, 1949-1980's. Part II: History of tofu in Japan. Introduction and early development (to 1185). Kamakura period, 1185-1333. Ashikaga/Muromachi, 1338-1600. Edo/Tokugawa period, 1600-1868. The Meiji period, 1868-1912. Development from 1912-1939. The war and postwar period, 1940-1959. The modern period, 1960-1982. Part III: History of tofu in South and Southeast Asia. Korea. Taiwan. Malaysia and Indonesia. Vietnam. Philippines. Thailand, Sri Lanka, and India. Part IV: History of tofu in Europe, 1613-1982. Part V: History of tofu in the United States. The early years, 1896-1919. 1920-1939. 1940-1959. 1960-1975. 1976– the awakening of American interest in tofu. Rise of the new American tofu industry. New England Soy Dairy = Tomsun Foods, Inc. from April 1984. Tofu innovation in America. Tofu in foodservice institutions. Growth of the tofu industry. Future of the U.S. tofu industry. Part VI: History of tofu in Latin American and Africa. Part VII: History of frozen and dried-frozen tofu. Frozen tofu. Dried-frozen tofu in Japan. Dried-frozen tofu in the West. Part VIII: History of other special types of tofu. Firm tofu. Pressed tofu. Smoked tofu. Deep-fried tofu. Grilled tofu. Silken tofu. Lactone silken tofu. Address: Lafayette, California. Phone: 415-283-2991.

7513. Shurtleff, William; Aoyagi, Akiko. 1982. History of okara (soy pulp) and soy bran. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 11 p. April 22. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction. Part I: History of okara (soy pulp). Etymology of okara. Part II: History of okara in East Asia. General. China. Japan. Other East Asia. Part III: History of okara in the West. Europe. United States. Part IV: History of okara in the Third World. Part V: History of soy bran. Address: Lafayette, California. Phone: 415-283-2991.

7514. Shurtleff, William; Aoyagi, Akiko. 1982. History of yuba. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 15 p. April 26. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction, definition. Etymology. Part I: History of yuba in East Asia. China and environs. Japan. Part II: History of yuba in the West. Europe. United States.

Japan: There has been considerable speculation about when and how yuba was introduced to Japan. Some have said that it was brought by Chinese Buddhist monks as early as the 10th century, others that it was brought back by Japanese monks visiting China in the 13th century. It is also said that Masashige Kusunoki, a famous samurai, used it as provisions during the siege of Chihaya castle during the 14th century. Yet the earliest known written reference to the food appears in the *Wakan Sanzai Zukai* (1711), with the next known references being in the *Isei Teikun Ourai* (c.

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1730), *Kyonan Rubetsu-shi* (1813), and *Kotto-shu* (Santo 1815). Japan's oldest existing yuba shop started in 1716, so it is quite likely that yuba existed on a commercial scale by the late 1600s, if not earlier. It may well have been used from time to time as a food in Buddhist temples centuries earlier. As noted at Etymology above, it was probably introduced from China, but it may also have been developed independently in Japan.

Japan's earliest center of yuba production and utilization was in Kyoto, the ancient capital, which remained the center during the 1980s. Yuba has the strongest gourmet image of all Japanese soyfoods, and Kyoto yuba soon developed strong associations with both the vegetarian cuisine of the Buddhists and with the elegant cuisine of the nobility and aristocracy. It soon became one of the indispensable delicacies in both Zen Temple Cookery (*Shojin Ryori*) and in the exquisite Tea Ceremony Cuisine (*Kaiseki Ryori*). In the *Shojin Ryori Kondate-shi,* published between 1818 and 1830, about half the recipes included yuba in one form or another, eloquently attesting to its popularity. A children's song (whose date or origin is probably in the early 1800s) sung in Kyoto near the base of Mt. Hie, the home of a famous complex of Buddhist temples, asks "What do the monks eat on Mt. Hie?" The response is "Yuba no tsukeyaki," the name of a yuba preparation. During the 1970s and 1980s in Kyoto, in restaurants serving Shojin or Kaiseki cuisine, yuba might well appear in more than half the dishes in a typical six-course meal. Some Japanese restaurants, such as the beautiful Sorin-an near Kyoto, specialize in yuba cuisine. Gradually the Japanese developed many unique forms and ways of folding yuba, plus a number of ready-to-eat yuba delicacies (deep-fried chips, pouches, and rolls) that were unknown in China and which have become popular tourist items in Kyoto. Shurtleff and Aoyagi (1975) have given illustrated descriptions of each of these types.

The Kyoto yuba industry traces its origins to at least the early 1700s. The four oldest existing yuba shops started in 1716, 1791, 1804, and 1833. The owner of the oldest shop is now the ninth generation. A picture of one of the oldest and most beautiful shops, Yuba Han, appears on the cover of The Book of Tofu (Shurtleff and Aoyagi 1975). Kyoto's yuba shops have always been small, family-run operations, often connected with the family home. Of the 20 shops existing in 1981, 4 started during the Edo period (1600-1868), 5 during the Meiji period (1868-1912), 4 during the Taisho period (1912-1926), and only 6 started after 1926. Thus the industry is old and well established. In 1874 the German Ritter gave a nice 85-word description of how yuba was made in Kyoto, noting that a little wood ash was added to the soymilk to raise the pH."

"The number of yuba shops in Kyoto has gradually decreased from the peak of 67 in 1911. It fell to 35 in 1919, then climbed to 55 in 1929, and finally decreased slowly to 20 in the late 1970s. Number of employees ranged from 172 in 1911 to 71 in 1925, then back up to 151 in 1955, the last year for which we have data. Sales reached a peak of 183,506 yen in 1929 and were 52,433 yen in 1955 (Tanaka 1955). By the 1970s the Japanese yuba industry used less soybeans than any other Japanese soyfood industry, only several hundred metric tons a year (Watanabe 1969). And a typical shop used only 50-150 pounds of dry soybeans a day to make 400 to 1,200 sheets of yuba. One pound of dry soybeans yields about 0.5 pounds of yuba on a dry weight basis. Partly because it is still made on a very small scale by slow, traditional, labor-intensive methods, and partly because of its image as a gourmet food (rather than a food for the people, as it is in China), yuba in Japan in 1975 sold for about 15 times as much per pound (fresh or dry) as it did in China. Starting in the mid-1970s some modernization of the small shops (especially heating the soymilk with pressurized steam) took place, but most traditional yuba craftsmen prefer their traditional and very beautiful methods. In 1982 there were two yuba trade associations in Kyoto. One, consisting of the six oldest companies, was the *Kyoto Yuba Kumiai;* the other, consisting of 10 shops in Kyoto and one in nearby Otsu was the *Kyoto Yuba Seizo Hanbai Jigyo Kyodo Kumiai.* The two do not cooperate much with each other.

"In 1980, in addition to the 20 yuba shops in Kyoto, there were 3 in Utsonomiya and Nikko (the other main yuba center, 60 miles north of Tokyo), 1 in Otsu (just east of Kyoto), and an estimated 7 elsewhere in Japan, for a total of 31. Gross net sales of the yuba produced in Kyoto were 520 million yen, or about $2.3 million. This was estimated to be 80% of the total sales and production of all yuba in Japan." Address: Lafayette, California. Phone: 415-283-2991.

7515. Dreyer, Lawrence. 1982. Re: International fair and symposium on soya products in Salzburg. Letter to William Shurtleff at Soyfoods Center, April 27. 2 p. Typed, with signature. [Eng]

• ***Summary:*** "The Way of Nature (*Weg der Natur*), a foundation, was established in Austria with the express purpose of disseminating information about macrobiotics, food, and their relationship to our health. Each of the founding members have had at least 2 months training at a temple in Japan." The foundation plans to hold an international fair named Bio Life 2000 in Salzburg from 17-20 Nov. 1982. "The foundation has, for the past two years been linked to a Natural Food Shop and has been, for this period, producing tofu and miso. This shop will be represented at the Fair and will be exhibiting and selling macrobiotic foods, snacks, and drinks. To run concurrently with the Fair, the Foundation is also planning a symposium on Soya products, Miso, Tofu, Tempeh, etc.

"The program will include lectures and discussions on planting and growing soya beans, making soya products, the suitability and advantages of soya products in the diet of Mankind with particular emphasis on the peoples

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of the West, and the substitution of soya products for animal products as a source of protein. There will also be demonstrations on cooking natural foods and the production of tofu and miso.

"The symposium will be conducted in both English and German and possibly also in French. The media, press, radio and TV have all expressed a keen interest in this fair, so a wide coverage is assured. We would be delighted if you, as the initiator of the use of tofu in the West, would be prepared to participate in this fair."

Note: A handwritten letter from Lawrence Dreyer (1983 Feb. 15) states that this fair was never held. His company is still producing tofu with equipment purchased in Japan a couple of years ago. Address: Director.

7516. Endo, Y. 1982. [Re: Yamashin shiro shoyu (clear shoyu)]. Letter to William Shurtleff at Soyfoods Center, April 30–in reply to inquiry. 2 p. Handwritten, with signature on letterhead. [Jap; eng+]

• ***Summary:*** Shiro shôyu was invented by the people of Mikawa-koku, Shinkawa-machi (presently Aichi-ken / Aichi prefecture, Hekinan-shi), after getting a hint from the seasoning liquid (*uwajiru*) that rises from Kinzanji-miso. The latter is a type of finger lickin' miso (*namémiso*) which was tasty, light colored and was made about 180 years ago–at the end of the Edo / Tokugawa period, Kansei-Bunka. That area is well known for making tamari (which has a dark color and strong flavor) and red miso (*akamiso*) from the old days. It was probably from necessity that the local people worked to develop a seasoning that brings out the flavor of each food.

Therefore shiro shôyu is a very local product. It is made mainly in Aichi prefecture. At present, the largest manufacturer is Yamashin Shoyu K.K. [the writer's company].

Shiro shôyu is different from regular Japanese [*koikuchi*] shôyu in that it has less fragrance and a lighter color. Therefore it is used in foods that require a subtle flavor, such as *nimono, chawanmushi, suimono* (clear soups), noodle dishes, etc. In early times, it was considered to be the best seasoning for enhancing the flavor in the food itself, and was used only in high class restaurants, noodle shops, etc. More recently, it has become popular among regular householders. For Japanese love subtle tastes and the natural colors of foods; this shôyu doesn't mess up either of these. In Western-style cooking it is good is soups, stews, cabbage rolls, gratin, etc. In Chinese cooking try it in ramen noodles, sweet and sour pork (*subuta*), *happosai,* stir-fried vegetables, etc. In Japanese cooking it is tasty in clear soups, soba (buckwheat noodles), udon noodle broth (*tsuyu*), vegetable cooking, omelets (*tamago yaki*), and *zoni* (meatless soup with mochi and vegetables).

"Although you asked for early documents, we are not aware of any. Nor do we know how shiro shôyu was used in the olden days. In our company we have no old records; they were destroyed by fire. We are very sorry that we cannot help you on that.

"We have heard one interesting story. At the end of the Edo / Tokugawa period, in 1857 (Ansei 4), Townsend Harris, the United States' ambassador, brought a letter from president James Buchanan [president 1857-1861] and visited Edo Castle to meet with the 13th shogun, Tokugawa Iesada (ruled 1853-1858). In the Willow Room (*yanagi no ma*) of Edo Castle they had a meal and shiro shôyu made by our company was used, under the name of Mikawa Shiro Tamari.

"Instead of answering your individual questions, we would like to give you this overview. Please excuse us. If you need further details, please let us know." Address: Yamashin Shoyu K.K., 3-36 Nishiyama-cho, Hekinan-shi, Aichi-ken 447, Japan.

7517. Mizono, Jack. 1982. History of Azumaya (Interview). *SoyaScan Notes.* April 30. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Azumaya started in about 1920 in Stockton. Jack does not know the name of the man who started it. A Mr. Teranishi bought the company in 1926 and moved it to San Francisco in about 1928. His son took over the business in 1930 and ran it until 1936, then sold it to Mr. Sakamaki, who ran it for 6-12 months, then in Feb. 1937 sold it to George and Jack Mizono, and their mother and father. The father was named Saichi Mizono.

George, the eldest brother, worked at Azumaya from the time his family bought it. The father loved tofu. Jack joined them as soon as he graduated from high school. The business was closed during World War II, but after the war the 4 brothers ran it. It was very slow, a real struggle. In the early 1960s business started to pick up. At that time, they delivered direct to stores. The Berkeley Co-op was their first account outside the Japanese stores. They sold tofu to the Co-op loose, in bulk, before Azumaya began individual packaging. After Azumaya began packaging, there was resistance from the Co-op. People complained and feared bad sanitation. Address: Azumaya Inc., 1575 Burke Ave., San Francisco, California 94124. Phone: 415-285-8500.

7518. Palucci, Jeno. 1982. Brief history of Chun King soy sauce (Interview). *SoyaScan Notes.* April 30. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Jeno founded Chun King in 1945. The company first began selling ready-made soy sauce in about 1947.

Note: A search of the U.S. Patent and Trademark Office database shows that the "Chun King" trademark (more specifically a "Word Mark") was first used and first used in commerce on 1 Jan. 1948 and was first registered (by Chun King Corporation, Duluth, Minnesota) on 16 Sept. 1957. The trademark was to be used for "Various canned unitarily packed foods." A list of these foods is given, and includes "Soya Sauce." Actually Chun King registered two

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similar "Word Marks. Both have the word "Chun" written in rounded Oriental-looking letters above the word "King." Both words are the same height, the same width, and the same "typeface" or design. In one, the wards are written in outline letters and in the other in solid black letters.

Chun King never made fermented soy sauce. They bought their nonfermented soy sauce by the barrel from a plant in Toledo, Ohio, run by the Donofrio Brothers, then repackaged it under the Chun King label. He does not remember the company's name but their technician was a man (perhaps Lou Minor) who had worked for La Choy. This man first got Jeno interested in soy sauce before he started buying from A.E. Staley. In the late 1940s and 1950s Jeno was not aware of any fermented soy sauce being made in the USA; it was all made from HVP. Kikkoman introduced fermented soy sauce to the USA by importing it from Japan.

Jeno thinks Chun King may initially have bought its soy sauce from A.E. Staley Mfg. Co.–but he is not sure. It was shipped by the barrel. Starting in the late 1950s, Jeno bought HVP from Staley and started blended his own soy sauce; he recalls that Staley sold both HVP and blended soy sauce.

When Jeno started selling soy sauce, La Choy had about 60% of the U.S. market and the remaining 40% was divided up among Chinese-, Japanese-, and Korean-American manufacturers. One Polish fellow in Chicago, Illinois, named Ben Gee, was also in the business. In the 1950s it became a battle between La Choy and Chun King, and in the end, when Jeno sold out, Chun King was definitely the market leader. But now La Choy has again taken the lead. Chun King is trying to re-capture the lead with a big ad campaign and a catchy jingle.

Jeno is quite sure that all Chun King soy sauce is presently made in Cambridge, Maryland. The company's plant used to be in Duluth, Minnesota, but after he sold the company, the Duluth plant was closed, and he bought it back.

Jeno also grew mung bean sprouts; he tried sprouting soybeans but was not successful. Address: Jeno's Inc. (Pizza), 525 Lake Ave. South, Duluth, Minnesota 55802. Phone: 218-723-5555.

7519. Chico-San, Inc. 1982. Choice imported natural foods (Ad). *Bestways.* April. p. 65.

• ***Summary:*** A half-page black-and-white photo shows Lima Ohsawa, wearing a kimono and carrying a tray of Japanese foods, including Lima Soy Sauce. "Top quality natural foods and condiments are imported from Japan under the

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supervision of Mrs. Lima Ohsawa, Chico-San's specialist in macrobiotic foods."

Chico-San imports from Japan include Lima Soy Sauce, soybean puree (miso), mineral-rich mercury-tested seaweeds, azuki beans, black soybeans, barley koji, kuzu, nigari, and tekka. "Soon, a companion for Lima Soy Sauce–Lima Tamari–Wheat Free–Whole soy beans–Rice & zestful–Naturally brewed in wooden casks for about 2 years." Address: Chico, California 95926.

7520. Hara, T.; Fujio, Y.; Ueda, S. 1982. Polyglutamate production of *Bacillus subtilis* (*natto*). *J. of Applied Biochemistry* 4(2):112-120. April. [26 ref]*
• ***Summary:*** Mechanism of formation of viscous material of "natto" using DNA transformation as a genetic technique, growing on steamed soybeans. Address: Japan.

7521. Jacobs, Leonard. 1982. The Chico-San story: Popularizing rice cakes in America. *East West Journal.* April. p. 58-61.
• ***Summary:*** A history of Chico-San, including Bob Kennedy. "In 1981 Chico-San and Arden, the two companies who manufacture rice cakes on a national scale, sold approximately 9 million bags of rice cakes to natural foods stores."

In 1968 "Chico-San was beginning to work on a project which would change the entire course of natural foods in the U.S." That year, "Bob Kennedy, Chico-San's president, had begun negotiating with the Lundberg brothers of Wehah Farm in Richvale, California for them to grow totally organic brown rice. The vision of Kennedy and his associates encouraged these farmers to invest considerable time and energy in a very risky project. The Lundbergs were successful, and this success has been an inspiration and incentive for many other large-scale farmers to grow grains organically–a development that has had far-reaching consequences on the health of millions of people.

The story of Chico-San and Bob Kennedy is one of a dedication to quality that is continually renewed and strengthened. But the development of Chico-San was not always so clear. Kennedy was a studio trumpet player in the 1950s, working for the Columbia Broadcasting Company in New York City. 'I was feeling good and didn't really have any serious health problems, but around 1960 I heard of a Japanese man who was lecturing on natural health care and Oriental philosophy, and I was interested,' Kennedy recently said. This man was George Ohsawa, the teacher of macrobiotics, whom Kennedy eventually met at a summer camp in upstate New York in July of 1960. 'Ohsawa's message was very inspiring, and a few of us felt compelled to put his ideas into practice immediately,' Kennedy recalled.

Ohsawa, after a trip to Japan, returned to America near the end of that year and lectured on the possibility of nuclear war as a result of U.S. / Soviet tensions. He warned that New York City could be one of the first cities to be destroyed and advised his students to leave. Several key members of this early group began to search out areas of the country that would be safe from bombs or fallout and that would also be suitable for growing rice.

They finally decided on the town of Chico in the Sacramento Valley in Northern California, an area of fertile farmland, where rice was already being grown. They felt confident that eventually organic brown rice would also grow there. Thus, in October, 1961, thirty-two of these early pioneers left New York City to travel across the country in a caravan of VW buses, vans, and station wagons, to settle in Chico, California. The American pioneering spirit had been reinforced with Ohsawa's spirit of adventure and change–a combination that set them on the path they are still traveling today.

The group was considerably diverse, including five professional trumpeters, a painter, a wood-carver, a Harvard economist, a TV soap opera star, an engineer, and a social worker. Most of these early settlers have since moved on to other things, but not all. Dick Smith, one of the trumpeters, is now vice president of Chico-San and continues to work there, but now with his three children. Kennedy's wife and two of their four children also work with the company. And Herman and Cornellia Aihara, both of whom had been students of Ohsawa in Japan, have remained involved with Chico-San, although their primary interests are in macrobiotic education through lectures and cooking classes.

"But back in 1961 Aihara and Kennedy were the originators of the food company. They decided to call it Chico- San, 'san' being the Japanese word signifying respect. Aihara had contacts in Japan for importing foods such as miso, tamari soy sauce, umeboshi plums, and sea vegetables. They began a small food store in the city of Chico to introduce these products to the local community, which did not, however, buy them. 'Unfortunately, Japanese foods were not what people had in mind when they considered health foods,' Kennedy said. 'The only way we could get any sales was to begin some sort of classes on the value of these foods and macrobiotics in general.' So Kennedy and Aihara began travelling up and down the Coast giving lectures on philosophy and Oriental medicine. However, even with these classes, sales were not justifying the type of products these men were offering.

"The next step was to introduce a small bakery into the back of the store. Keeping true to their macrobiotic ideals, the bread they baked was an unyeasted loaf made from freshly ground whole wheat, and the best quality oil, sea salt, and water available; no sweeteners were added. Again they had put their principles ahead of conventional business practices and bottom line motives, and again they had created a product with limited immediate demands. So when Ohsawa visited Chico in the summer of 1963 for a lecture series, Kennedy confided in him about the difficulties

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they were experiencing. Ohsawa laughed at the idea of difficulties standing in the way of ideals and mentioned that a new possibility for a popular food product might be rice cakes. Apparently puffed rice cakes were well-liked in Japan and machines were available to mechanically manufacture them." Continued.

7522. Jacobs, Leonard. 1982. The Chico-San story: Popularizing rice cakes in America (Continued–Part II). *East West Journal***.** April. p. 58-61.

• ***Summary:*** Continued: "By the end of the year, Ohsawa had located an old rice cake machine in Japan and shipped it to Chico. Kennedy had it refurbished and assembled and began the first rice cake manufacturing in America. (Basically, rice cakes are made by soaking rice, adding measured portions into individual molds, heating them under pressure, and then releasing the pressure so they puff uniformly and take on the shape of the mold.) However, this first machine was manually operated and required a strenuous effort to stamp out individual crackers. Since the operation of the machine was sending the employees to the chiropractors more and more frequently, Kennedy redesigned it to operate more automatically. Eventually he created a design which worked fairly easily, and they began selling the rice cakes as quickly as they could manufacture them.

"To ensure the quality of the rice, Kennedy and Aihara started searching for the best rice farmers in the area. Eventually they found a Farmer Koda who was growing a strain of short grain brown rice 200 miles south of Chico [Koda Farms in South Dos Palos]. Although his rice was of excellent quality, he was located in an area of cotton growers who used large quantities of chemicals. Kennedy felt compelled to find another farm which was relatively free of surrounding chemicalized agriculture and which would be willing to experiment with growing completely organic brown rice. In 1968 he signed a contract with the Lundberg's of Wehah Farm [Richvale, California], guaranteeing the purchase of their first organic crop. This was a considerable risk on each side, since at best the farmers felt the yield would be half as much as the conventional crop, and even then the weeds and insects, especially during the paddy stage, would be extremely competitive with the rice. However, the experiment proved successful, and we all have been benefiting ever since. (Other farmers have since begun producing organic brown rice, most notably Farmer Garrich of Lone Pines Farm in Arkansas.)

"Interestingly, with the recession of 1973 and 1974, the price of organic rice increased quite a bit and the demand for organic rice cakes decreased considerably, so Chico-San discontinued the organic rice cakes–selling only organic rice. However, by 1976, they were able to reintroduce the organic rice cakes and the demand has again been on the up-swing.

By the late '60s/early '70s the FDA began a close scrutiny of the relationships between food companies and educational programs. They would not allow promotion of foods based on educational or health claims. As a result Kennedy and Aihara established the George Ohsawa Macrobiotic Foundation (GOMF) to continue the educational activities separately from the food company. Kennedy became the director of Chico-San, Aihara the director of GOMF. This relationship has proved very productive for both sides as each continues to promote the other. Aihara is still involved in the selection and quality control of the food products, and he gives weekly classes to approximately thirty-five of the seventy-five staff members of Chico-San. Kennedy began to devote himself completely to the development of the food company.

"In addition to enlarging the ware- house space, Kennedy looked for ways to expand and improve the product line. In 1974 he brought Junsei Yamaguchi into the company to begin manufacturing miso and tamari soy sauce according to Chico-San's standards. Chico-San also began to produce yinnie rice syrup, a traditional sweetener Kennedy had discovered on one of his trips to Japan. Yinnie syrup is a whole grain product made from malted wheat and rice and has a much lower concentration of refined sugars than most other malted grain sweeteners such as barley malt or corn syrup. During this time Chico-San had acquired additional rice cake machines purchased from Japan, but Kennedy felt that these machines could be improved. Eventually he developed a completely hydraulic machine which was capable of increasing the supply of rice cakes up to the market demand. Unfortunately, soon after they got the new machine into production, it shorted out, blew up, and caused a fire which totally destroyed the Chico-San warehouse, all the incubating miso and tamari, and the majority of their other products. The founders of Chico-San had escaped the threat of destruction in New York, but over a decade later they witnessed their almost total devastation in California.

"However, by that time the company had developed a strong reputation in the market. In addition, Kennedy was willing to withstand considerable odds and start from scratch. So within a year of the fire (and a loss of $250,000 beyond the insurance settlement), he began again with a larger warehouse and what he considered to be better rice cake machines. Presently, Chico-San is making rice cakes twenty-four hours a day, seven days a week. It is selling these cakes in the natural foods stores, and has distribution in the supermarkets and (under the label of Landau and Kemach) in the Jewish Kosher foods stores. Kennedy is also attempting to get his rice cakes into the institutional food services, such as hospitals and prisons, but finds this to be very slow. 'The bureaucracies involved are very difficult to work with. But we do have a few public schools in California using rice cakes in the lunch programs,' Kennedy claims.

Although Chico-San never got back into miso and tamari production, it did expand its own product line by increased importing of traditional macro- biotic foods

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from Japan. These include Lima Soy Sauce (named after George Ohsawa's wife, Lima), miso, barley koji, kuzu, and rice malt vinegar; the sea vegetables hijiki, kombu, wakame, nori, and kanten; nigari (for making tofu); tekka (a condiment rich in iron); umeboshi plums; and the Japanese teas kukicha, mu, and renkon (lotus root). In this country Chico-San makes yinnie syrup, yinnie taffy candies, rice cakes, carob-covered rice cakes, and rice nuggets. Chico-San also publishes the *Chico-San Cookbook,* which was written by Cornellia Aihara. The products sold by Chico-San undergo close scrutiny by Kennedy, Smith, and Herman Aihara. They are very careful about quality control and generally agree about standards. One exception has been the carob-covered rice cakes. It is difficult to solidify the carob without adding some type of refined sweetener. Although they have been experimenting with yinnie syrup, at this point they are using fructose but without consensus within the company as to whether it is a healthful ingredient. Besides the manufacturing company in Chico, Kennedy is planning to reopen the Chico-San retail store. He has also opened up a warehouse and rice cake plant near Trenton, New Jersey and is considering opening up another outside of London [England]. In addition, Kennedy and Aihara went to Japan in early December, 1981, to conclude formal discussions with the Ohsawa C.I. macrobiotic teaching organization in Tokyo, concerning the creation of a distribution company called Ohsawa U.S.A. Lima Ohsawa's sister, Flora, will be in charge of this company which will allow for the increased distribution of many Japanese macrobiotic specialty foods.

7523. Kawamura, Wataru. 1982. Daizu to daizu shokuhin no hakubutsu-shi. Tenpe to wa? [Natural history of soybeans and soyfoods. What is tempeh?]. *Daizu Geppo* (*Soybean Monthly New*s)**.** Feb. p. 26-30; March p. 43-45; April p. 27-29. [Jap]
Address: 2-4-7 Kugenuma, Tachibana, Fujisawa-shi, Kanagawa-ken 251, Japan.

7524. Leviton, Richard. 1982. Tôfu, soifûdo kamu Uesto [Tofu & soyfoods come West (Leaflet)]. Colrain, Massachusetts. 2 panels each side. Each panel: 22 x 18 cm. [Jap]
• ***Summary:*** This is a description of the 1982 Soyfoods Conference in Seattle, Washington (July 6-14), for people in Japan who wish to attend, a day by day description of the 10-day itinerary plan (cost: $2,250, which includes airfare, lodging, conference fee, bus tickets, Disneyland tickets, and 5 dinners), and an application form.

A photo shows Richard Leviton and Luke Lukoskie standing in front of Mt. Fuji, a tall volcanic mountain in Japan.

As Luke recalls (e-mail of 30 May 2011): In 1982 he and Richard Leviton and approximately 18 other soyfoods professionals from the USA did an 8-day tour of Japan. Richard was listed as managing director and Luke as chairman of the board of the International Soyfoods Association–an organization created for the purpose of this trip. Address: Soyfoods Association of North American, 100 Heath Rd., Colrain, Massachusetts 01340. Phone: 413-624-5591.

7525. Shurtleff, William; Aoyagi, Akiko. 1982. Survey of tofu production in the United States and Canada. Lafayette, California. 1 p. April. Unpublished manuscript.
• ***Summary:*** This is a typewritten table with 8 columns: The three main ones are (1) Company name. (2) Date started operations. (3) Tofu production in April 1982 (in 1,000 lb/week). Companies are arranged in descending order of tofu production.

Hinode Tofu Co. (Los Angeles, California; 1937?). 140.
Azumaya, Inc. (South San Francisco, California; 1920?). 110.
Aloha Tofu Co. (Honolulu, Hawaii; 1950?). 60.
Quong Hop & Co. (South San Francisco, California; 1906). 43.
England Soy Dairy (Greenfield, Massachusetts; Jan. 1977). 36.
C.R. Food (Los Angeles, California; April 1979). 28.5.
Wy Ky (Los Angeles, California; July 1970). 28.
Wo Chong & Co. (San Francisco, California; 1928). 24.
Kanai Tofu Factory (Hawaii; 1923). 16.
Traditional Tofu (Oakland, California; 1978?). 17.
Mighty Soy, Inc. (Los Angeles, California; Aug. 1980). 16.6.
Eastern Foods Corp. (Minneapolis, Minnesota). 15.
Panda Food Products (Woodhaven, New York; 1981). 15.
Nasoya Foods (Leominster, Massachusetts; April 1978). 12.
Island Spring (Vashon, Washington; Dec. 1976). 12.
Swan Gardens (Miami, Florida). 12.
Sam Sung Food Inc. (Washington, DC; 1980). 11.
Ota Tofu Co. (Portland, Oregon; 1919). 10.4.
Victor Food Products (Scarborough, Ontario, Canada; Feb. 1978). 10.
Hashizume Food Products (New York City, New York; 1969). 10.
Soyfoods of America (Duarte, California; 1981?). 10.
White Wave (Boulder, Colorado; Sept. 1977). 9.
The Soy Plant (Ann Arbor, Michigan; Sept. 1977). 7.
Chicago Tofu Co. (Chicago, Illinois; 1960). 6.
Nomura Tofu Co. (Chicago, Illinois; 1975). 6.
Northern Soy (Rochester, New York; May 1977). 6. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

7526. *Soybean News.* 1982. Pioneer developer of soybeans for the North deceased. Dr. Sven A. Holmberg. 33(3):4.

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April.
• ***Summary:*** Dr. Holmberg, Head of the Holmberg Soybean Breeding Institute at Fiskeby, Norrköping, Sweden, passed away on 10 Nov. 1981 at the age of almost 88 years.

In the 1930s he had become interested in the soybean and speculated about its possibilities in Sweden. In 1938 he studied soybean breeding in the USA, and in 1939-40 he made his first expedition to Japan and Sakhalin. In the severely cold climate of the Hokkaido islands he found soybean types which he considered valuable for breeding in Sweden. In 15 years he developed strains which matured and yielded comparatively well in middle Sweden, where Fiskeby is located. In 1957 he returned to the Far East [East Asia] to collect more material. In 1970, when almost 70 years old, he made a third expedition to Siberia and Japan. "In the meantime he studied soybean breeding in the USA and Canada. He learned that his breeding material was successfully used in North American programs. Dr. Holmberg cooperated and counseled with Dr. J.W. Lambert, soybean breeder, University of Minnesota.

"The most interesting [and commercially important] varieties bred by Dr. Holmberg are Fiskeby V, Brävalla, and Träff. Although other promising varieties are in early stages of development, it is anticipated it will take 15 to 20 more years for soybeans to reach major crop status in Swedish agriculture according to a friend. The intention of Dr. Holmberg was to make the crop food for man.

"A friend has written 'Sven Holmberg has done the fundamental work with soya bean for Northern Europe. The inheritors of his material and his ideas will have to fulfill his work. This is the best way to honor the man who devoted himself so enthusiastically and so intelligently to the breeding of soya bean in the North.'"

A photo shows Sven A. Holmberg in his later years, standing in a field of soybeans. He is facing the camera, wearing a long black coat, holding a sheaf of papers in his left hand and a cane in his right.

7527. Watanabe, Atsuo; Ohtani, Toshio; Nikkuni, Sayuki; Baba, Tohru; Ohta, Teruo. 1982. [The efficacy of ultrafiltration treatment of the drained water from steaming of soybeans in natto processing]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 29(4):245-49. April. [7 ref. Jap; eng]* Address: 1-3, 5. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 4. Kagoshima State Lab. of Agriculture.

7528. Watanabe, A.; Ohtani, T.; Nikkuni, S.; Baba, T.; Ohta, T. 1982. [Operating condition of ultrafiltration of the drained water from steaming of soybeans in natto processing]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 29(4):250-54. April. [4 ref. Jap; eng]*

7529. **Product Name:** [Agricultural Cooperative Mirusoy Soymilk {Some varieties contain dairy milk}].
Foreign Name: Nôkyô Mirusooi {Shuruibetsu wa nyû-iri}.
Manufacturer's Name: Zenkoku Nokyo Chokuhan (National Agricultural Cooperative Direct Sale).
Manufacturer's Address: Japan.
Date of Introduction: 1982 April.
Wt/Vol., Packaging, Price: 500 ml paper pack.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. These products were introduced in April 1982 in 500 ml paper packs and distributed Tokyo, Osaka, and Nagoya. Some varieties contained dairy milk. Name of organization with diacritics is: Zenkoku Nôkyô Chokuhan.

7530. Reed, M.H. 1982. Japanese spot bridges East, West. *New York Times.* May 2. p. WC23.
• ***Summary:*** This is a review of the Japanese restaurant Ichi Riki in Nyack, New York. Recommended dishes include agedofu and salmon teriyaki.

"For instance, it would have been a pity to miss the superb example of agedofu–silken bean curd deep fried to 'meatiness' and flavored with daikon and dashi;..."

Note: This is the earliest English-language document seen (April 2013) that contains the term "silken bean curd."

7531. Shurtleff, William; Aoyagi, Akiko. 1982. History of green vegetable soybeans and vegetable-type soybeans. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 24 p. May 12. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction: Comparison of green vegetable soybeans and whole dry soybeans, vegetable versus field types. Etymology: green vegetable soybeans and vegetable type soybeans. Part I: History of green vegetable soybeans in East Asia. General: How grown and used. China from 2nd century B.C. Japan. Korea and other East Asia. Green vegetable soybean leaves as a food. Part II: History of green vegetable soybeans in Europe. Part III: History of green vegetable soybeans in the United States. Early developments (1855-1929). William Morse and the popularization of vegetable-type soybeans. The 1930's, research and development. World War II (1940-45). The postwar period (1946-1974). 1975-1982. Part IV: History of green vegetable soybeans in Third World countries. Address: Lafayette, California. Phone: 415-283-2991.

7532. Shurtleff, William; Aoyagi, Akiko. 1982. History of whole dry soybeans. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 28 p. May 19. Unpublished typescript. Available online at www.soyinfocenter.com.

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• ***Summary:*** A comprehensive history of the subject. Contents: Introduction: How to categorize. Etymology. Part I: History of whole dry soybeans in East Asia. General. China. Japan. Other East Asia. Part II: History of whole dry soybeans in Europe and Australia. Early developments (1793-1899). 1900-1939. 1940-1982. Part III: History of whole dry soybeans in the United States. Cultural background: Poor man's food with poor image. Early developments (1855-1899). 1900-1929: World War I commercial products, USDA work, Seventh-day Adventists. 1930-1959: World War II growth of interest and commercial products, recipes, drop of interest 1946-1959. 1960-1982. Part IV: History of whole dry soybeans in Third World countries. Address: Lafayette, California. Phone: 415-283-2991.

7533. Shurtleff, William; Aoyagi, Akiko. 1982. History of soynuts and soynut butter. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 14 p. May 21. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction. Etymology. Part I: History of soynuts in East Asia. China. Japan. Other East Asia. Part II: History of soynuts in Europe. Part III: History of soynuts in the United States. Part IV: History of soynut butter. East Asia. United States. Europe. Address: Lafayette, California. Phone: 415-283-2991.

7534. Shurtleff, William; Aoyagi, Akiko. 1982. History of soy sprouts. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 19 p. May 25. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction–soy versus mung. Etymology. Part I: History of soy sprouts in East Asia. China. Korea. Japan. Other East Asia.

Part II: History of soy sprouts in Europe. Part III: History of soy sprouts in the United States. Early developments (1896-1939). World War II and the 1940's. 1950-1969. 1970-1982. Part IV: History of soy sprouts in the Third World. Address: Lafayette, California. Phone: 415-283-2991.

7535. Shurtleff, William; Aoyagi, Akiko. 1982. History of roasted soy flour, soy coffee, and soy chocolate. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 20 p. May 29. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction. Etymology. Use of the term "roasted whole soy flour." In Korean, *konggaru* means "roasted soybean powder." Part I: History of roasted soy flour in East Asia. China. Japan. Other East Asia. Part II: History of roasted soy flour in Europe. Part III: History of roasted soy flour in the United States. Part IV: History of roasted soy flour in the Third World. Part V: History of soy coffee. Europe. USA. East Asia. Part VI: History of soy chocolate. Europe. USA. Part VII: History of roasted soynut butter. Part VIII: Outlook for roasted soy flour.

Etymology: In China as early as the third century BC, roasted soy flour was known as *tou hsieh* ("bean powder or shavings"). By the 1700s it was also called *tou fen* ("bean flour") and by the 20th century it was called *huang tou* in standard Chinese (Mandarin) and *wong-dow* in Cantonese. Both terms mean "yellow bean." It is not known when these terms originated.

In Japanese in olden times, roasted soy flour is said to have been called *mame-ko* ("bean flour," written with the same characters as tou fen in Chinese). Later (the date is unknown) it came to be called kinako ("yellow flour"). Roasted soy flour is called *bubuk kedele* in Indonesian and *konggomul* in Korean.

In English, most of the early references to roasted soy flour were descriptive / indirect, such as "roasted soybeans ground into a fine powder" (Piper and Morse 1923). It was also referred to as "roasted bean flour" (Horvath 1927), "kinako" (Smith 1958) and "roasted full-fat soy flour" (Harper and Lorenz 1974; Shurtleff and Aoyagi 1975). The shortened term "roasted soy flour" was first used in 1976 by Shurtleff and Aoyagi in their *Book of Miso.* On packaging, to emphasize the fact that the flour is not defatted, it may be labeled "Roasted Whole Soy Flour."

Roasted soy flour is called *gerostetes sojamehl* in German and *harina de soya tostada* in Spanish. No French name is known.

Note. This is the earliest English-language document seen (Nov. 2012) that contains the term "roasted whole soy flour." Address: Lafayette, California. Phone: 415-283-2991.

7536. *Daizu Geppo* (*Soybean Monthly News*). 1982. Tottori meisan, tôfu chikuwa [Tofu chikuwa, famous product of Tottori prefecture, Japan]. May. p. 30-39. [Jap; eng+]
• ***Summary:*** It was first produced about 120-150 years ago, in the late Edo or early Meiji periods. To use up leftover tofu, tofu makers mixed it with starch, shaped it into dumplings, and steamed it. In later years they mixed in fish paste. The formula now is: tofu 55-65%, fish meat 25-35%, starch, seasonings (salt, sugar) 10%. The preparation is described.

7537. Fitzpatrick, Brian. 1982. Soya milk in Asia. In: Theng Chye Yam, W-L Kwik, and C-Y Fong, eds. 1982. Proceedings of Food Conference 1982. viii + 382 p. See p. 261-62. Held 16-20 May 1982 in Singapore. Publ: Singapore Inst. of Food Science & Technology.
• ***Summary:*** Contents: History. Consumption of soymilk. Nutrition. Soymilk- the product. Unprocessed raw materials suitability. Clarified and suspended products. Packaging. Yields for clarified and suspended. Product mix (yogurt, tofu,

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ice cream). Present market.

Recent introductions of commercial soymilk products include: Green Spot Bangkok (1960), Coca Cola test market of SACI in Brazil (1969), Singapore Cold Storage (1969), Kibun, Japan (1976), and Ace Canning (1980). Address: Alfa-Laval South East Asia, Singapore.

7538. Leviton, Richard. 1982. Discovering Japanese soyfoods. *Vegetarian Times* No. 57. May. p. 60-62, 65. [1 ref]
• ***Summary:*** Recently Richard Leviton traveled to Japan with a group of Americans to get a firsthand look at the Japanese soyfoods industry. There he got his first look at the fabled neighborhood corner tofu shop. He discusses tofu (the Japanese consume 10 million cakes a day) and tofu manufacturers (large and small), types of tofu include silken tofu (called kinugoshi), fresh soft tofu called momen. "In the typical supermarket we counted as many as 60 different soyfood items (often several brands or product sizes), ranging from fresh miso and tofu to packaged soymilk and shoyu, natto, dried frozen tofu, yuba rolls and kinako powder."

Also: Takatsuka Marugo (a large tofu maker that churns out 100,000 lb/day of tofu), Yuba Han (a traditional yuba shop in Kyoto), Asahimatsu Kori-dofu Co., natto, Hamanatto, soymilk, cooked soybeans with wakame, soy sprouts, kinako powder, packaged green soybeans in the pods, miso (fresh and freeze-dried), Linda Barber (an American home economist who is teaching at Kobe Girl's College in Nishinomiya, and also teaching American-style tofu recipes to Japanese housewives via television and the print media), and Sasa-no-Yuki, a 279-year old restaurant that specializes in tofu cookery.

Photos show: (1) Eleven different tofu dishes in bowls as served at Sasa-no-Yuki restaurant in Tokyo. (2) A man hanging up fresh yuba at Yuba Han. (3) Members of the group seated on tatami mats on the floor around a huge table enjoying dishes served at Sasa-no-Yuki. Address: 100 Heath Rd., Colrain, Massachusetts 01340. Phone: 413-624-5591.

7539. Mori, H. 1982. Shôwa 56 nendo ni okeru shôyu, miso no kenkyû gyôseki [Review of annual achievements in shoyu and miso research]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 77(5):281-312. May. [743 ref. Jap]
• ***Summary:*** This important Japanese-language article, published each year in the May issue of this periodical, has two parts: (1) A review of the past year's major discoveries and developments in the fields of miso and soy sauce in Japan. (2) A bibliography related to those discoveries and developments. Address: Noda Sangyo Kagaku Kenkyusho.

7540. Moriyama, Yukiko. 1982. Quick & easy tofu cookbook. Tokyo: Joie. c/o J.P. Trading Inc., 300 Industrial Way, Brisbane, CA 94005. 104 p. May. Illust. Index. 27 cm.
• ***Summary:*** Contents. Introduction. Preparation tips. Recipes–1. Cheese 2. Egg. 3. Just tofu. 4. Meat. 5. Sea foods. 6. Vegetables. 7. Salad. 8. Soup. 9. Dessert.

Reissued in 1988 under a new title: "Quick & Easy. A taste of tofu: Mastering the art of tofu cooking."

7541. **Product Name:** [Nisshin Soymilk (Plain, Coffee, of Mixed Fruits)].
Foreign Name: Sutoreeto, Koohii, Furuutsu Mikksu.
Manufacturer's Name: Nisshin Oil Mills, Ltd. (Nisshin Seiyu K.K.).
Manufacturer's Address: Shinkawa 1-23-1, Chuo-ku, Tokyo, Japan.
Date of Introduction: 1982 May.
Wt/Vol., Packaging, Price: 200 ml Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 73. These products were introduced in May 1982 in 200 ml Tetra Brik cartons, and distributed only in the Kantô, Tôkai, Chubu, and Kinki regions, which is most of central Japan from Tokyo to Osaka.

7542. Shurtleff, William; Aoyagi, Akiko. 1982. Soyfoods directory and databook. 1st ed. Lafayette, California: Soyfoods Center. 21 p. May. 28 cm. 2nd ed. published in June as Soyfoods Industry: Directory and Databook. 56 p. [24 ref]
• ***Summary:*** A detailed study of the rapidly emerging soyfoods industry and market. Contains original statistics compiled by the Soyfoods Center through interviews with companies. Contents: 1. Names and addresses of soyfoods manufacturers in the Western world, plus major soymilk, miso, shoyu, and yuba manufacturers in East Asia. 2. Analysis of the soyfoods industry in the U.S. 3. Soyfoods production statistics for America and the West. 4. America's prime soyfoods market regions. 5. The tofu industry in the West: Three-year analysis of the tofu industry in the West. The U.S. Tofu market: overview and outlook. Graph of number of tempeh and tofu manufacturers in the West. North America's twenty largest tofu manufacturers. 6. Analysis of the soymilk industry in the United States. 7. Key institutions working with soyfoods in the West.

Note: This is the first market study published by Shurtleff and Aoyagi. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

7543. **Product Name:** [Tempeh].
Foreign Name: Tempeh.
Manufacturer's Name: Traditions du Grain.
Manufacturer's Address: 16 Avenue Jean-Jaurès, 94400 Ivry, France. Phone: 46.71.89.88.
Date of Introduction: 1982 May.
New Product–Documentation: Note: Ivry is a suburb of

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Paris, located about 7 km (4 miles) southeast of the city's center. Letter from Sjon Welters. 1982. April 16. Traditions du Grain is a macrobiotic centre which is setting up a tempeh shop. They will start in summer. Contact Jean Luc Alonso, 16 Rue Jean Jaureo, Ivry 92200, France. Soyfoods Center Computerized Mailing List. 1982. July 23. Owner: Jean Luc Alonso. No phone.

Letter from Anita Dupuy and Jean Luc Alonso of Traditions du Grain. 1983. May. "We introduced tempeh 1 year ago on a commercial scale. I think there is no other tempeh production in Paris (or France) on a commercial scale."

Richard Leviton. 1983. Oct. 16. Trip to Europe with American Soybean Assoc. Jean Luc Alonso, a tempeh maker 20 miles from Paris at Traditions du Grain, runs France's first tempeh shop. Ad in Le Compas. 1986. No. 26. p. 34.

Talk with (call from) someone from France. 1989. Dec. 11. Jean Alonso and Rachel Revesz are starting a new tempeh shop in Bergerac, France, to make soya tempeh. The company has no name yet.

Letter from Rachel Revesz. 1989. Dec. 11. "The former tempeh-workshop in Paris was called Tradition [sic, Traditions] du Grain. It existed for 2½ years. Jean-Luc Alonso was selling only in Paris and its suburbs. The production and sales were small. Nobody knew about tempeh and the work needed for making it known exceeded his financial capabilities. Ten years later, after more experience in macrobiotics and business, we plan to start our new project. It will be a plant of 600 square meters located in the countryside 9 km from Bergerac in Dordogne, near Bordeaux, with a maximum production (during the first year) of 12,000 pieces of tempeh (300 gm each) per month. We also plan to produce 10,000 tempeh burgers and 10,000 croquettes monthly, as well as a bit of fried tempeh, all prepared with spring water. They will be vacuum packed. Before starting, we did a market study, which gives us hope. During the first year we will be 3 persons working in the enterprise, which will be called Enzo Future Foods, located in Queyssac, 24140 Villamblard, France."

Letter from Roland A. di Centa. 1993. Aug. 9. Roland was one of the first people to introduce soyfoods to Italy. He was very interested in macrobiotics and was a close friend of Michio Kushi. "My interest in food was to heal people with food and I had a lot of success using a holistic approach to help people with major diseases. For all these cures I used a lot of miso, tempeh, and tofu. Good miso was available. However tempeh and tofu had to be locally produced. I cured people from 1980 until about 1985... Tempeh: There was only tempeh available for Paris, made by a lady there named Anita Dupuy, who delivered to Le Bol en Bois (a macrobiotic restaurant in Paris) and to some consulates and embassies (such as the Philippines). As I was busy elsewhere I sent Giovanna Mazzieri (of Milan, Italy) to Paris to study the process [in Feb. 1983]. Anita taught Giovanna how to make tempeh. Giovanna was a very busy lady and a fan of macrobiotics after I healed her husband of a very difficult disease. She was very smart and she produced tempeh in Milan in about 1980 [sic 1983]. It was perfect and of very good quality. It was sold in a few health food stores." Anita Dupuy is at Rue du 18 Juin, 25-94400 Vitry [Ivry?], France. Vitry [Ivry?] is a suburb of Paris.

Letter from Giovanna F. Mazzieri. 1993. Oct. 6. She went to Paris for one week in February 1983 and Anita Dupuy taught her how to make and cook with tempeh. At the time, Anita was definitely selling her tempeh to many shops in Paris, including Le Bol en Bois, other natural food or macrobiotic shops, and also to the Indonesian Embassy in Paris. She returned to Milan, Italy and made tempeh non-commercially starting in mid-1983.

7544. Tsuchiya, Kunio. 1982. Minami no tôfu, kita no tôfu: Tottori meisan "Tôfu chikuwa" o tazunete [Southern tofu, northern tofu: A visit to "tofu chikuwa," a famous product of Tottori prefecture]. *Daizu Geppo* (*Soybean Monthly News*)**.** May. p. 30-39. [Jap]
• ***Summary:*** Ordinarily the Japanese word *chikuwa* refers to a kind of fish paste.

7545. **Product Name:** [Yakult Soymilk (Plain, Coffee, Orange, With Corn)].
Foreign Name: Yakuruto Rakkumii (Tônyû Pureen, Koohii, Orenji, Koon).
Manufacturer's Name: Yakult (Yakuruto Honsha).
Manufacturer's Address: Japan.
Date of Introduction: 1982 May.
Wt/Vol., Packaging, Price: 200 ml Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Toyo Shinpo (Soyfoods News). 1982. May 1. Yakuruto has started selling four flavors of soymilk (Plain, Orange, Corn, Coffee) in Tetra Brik cartons for about 80 yen per pack, They are buying the soymilk from Mitsubishi Kasei, but they are planning to develop their own fermented soymilk later.

K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 73. States that Yakult (a famous Japanese maker of fermented dairy milk products) introduced these 4 products in May 1982, in 200 ml long-life packs, and distributed them in Tokyo, Nagoya, and Osaka.

Product with Label (200 ml Tetra Brik carton) purchased in Tokyo in June 1983. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center; Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64.

7546. **Product Name:** [Soymilk (Plain, Coffee, or Banana)].
Foreign Name: Pureen, Koohii, Banana.
Manufacturer's Name: Yamato Shokuhin (Yamato Foods).
Manufacturer's Address: Japan.

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Date of Introduction: 1982 May.
Wt/Vol., Packaging, Price: 200 ml blow-molded polyethylene pack (*buro yôki*).
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. These products were introduced in May 1982 in 200 ml buro packs.

7547. Shurtleff, William; Aoyagi, Akiko. 1982. History of fermented black soybeans (formerly soy nuggets) (shih or chi, douchi or doushi, hamanatto, Daitokuji natto). Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 27 p. June 4. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction. Etymology. How fermented black soybeans are made. Part I: History of fermented black soybeans in China. Early developments; Han Dynasty (206 B.C.-229 A.D.). Developments from the third to the 16th century. The *P'en-tsao Kang-mu* (1578). 17th to 20th century.

Part II: History of fermented black soybeans in Japan. Early developments (746-1700's). Daitokuji fermented black soybeans in Kyoto (*Daitokuji natto*). Savory fermented black soybeans in Hamamatsu (*hamanatto*). Modern developments with fermented black soybeans (1900-1982).

Part III: History of fermented black soybeans in Southeast Asia. Philippines (*tausi* or *tao-si*). Malaysia (*tao si*).

Part IV: History of fermented black soybeans in the West. Europe. United States.

2011 Dec. For updated and greatly expanded free information on this subject, on our website go to "Historical Bibliographies and Sourcebooks on Soy," then click on the corresponding subject. A lengthy digital book will appear in PDF format. It is searchable using Adobe Acrobat or Adobe Reader. Address: Lafayette, California. Phone: 415-283-2991.

7548. Wells, Patricia. 1982. Fast food on the fast track: On–or near–Japan's railroads, box lunches are first-class fare. *New York Times.* June 20. p. XX37.
• ***Summary:*** "In much of the world, fast food has become a synonym for mediocre, mass-produced fare." But not so in Japan. The *ekiben* (box lunch for train travelers) has a long tradition of high quality, inexpensive, healthful food. A part of almost every box lunch is a tiny container of soy sauce for seasoning.

One excellent part of this box lunch, "a favorite of Japanese children, is inari zushi, seasoned rice wrapped with fried bean curd or tofu that's been boiled in a sweet sauce."

7549. Bo, Thi-an. 1982. Hishio to shôyu no engen to sono seisan gijutsu ni tsuite. I. [On the origins of chiang and shoyu, and their production technology. I.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 77(6):365-71. June. [9 ref. Jap; eng]
• ***Summary:*** This is one of the most interesting and carefully researched articles seen up to this time on this subject. The author (Ho Keian in Japanese), is a Chinese graduate of Iwate University in Japan. He sent this article to the university alumni association on the university's 80th anniversary. Shoyu has become a world-class seasoning. Even in Moscow they have built plants to produce soy sauce and chiang (miso).

The earliest chiang was made with meat, fish, and shellfish; later, as agriculture advanced, beans and grains were used. The two main types of chiang are (I) those made using flesh as a main ingredient and (II) those made solely from plants. The flesh chiangs can be further subdivided: IA. Those made from animal and bird flesh. IA1. Made without bones (mentioned in the Shih Ching [Classic of Food], the Chou Li [Rituals of the Chou Dynasty, 3rd century B.C.], the Li Chi [Book of Rites, 2nd to 3rd century B.C.], and the I Li); IA2., Made with a large amount of liquid (mentioned in the Chou Li and Li Chi); IA3. Made with flesh and bones (mentioned in the Chou Li, I Li, and Ch'i-min Yao-shu [Essential techniques for the peasantry of Ch'i, written by Chia Ssu-hsieh in A.D. 535]); IB. Made with fish or shellfish, including IB1. Fish chiang (mentioned in the Chou Li, Ch'i-min Yao-shu), and IB2. Fish intestine chiang (mentioned in the Ch'i-min Yao-shu). The non-flesh or vegetable chiangs (II) can be divided into: IIA. Those made with beans including IIA1. Chiang (mentioned in the Chou Li (3rd century B.C.), Lun Yu [Analects of Confucius, after 479 B.C.], Shih Chi [The Historical Record by Ssu-ma Ch'ien, ca. 90 B.C.], and Chi Chiu P'ien [48 to 33 B.C.]). IIA2. Bean (Soybean) chiang (tou-chiang, mentioned in the Ch'i-min Yao-shu). IIA3. Small (Red/Azuki) bean chiang (mentioned in the Nung Sang I Shih Chi Yao [+1314]). IIB. Chiang made from other vegetable materials including: IIB1. Wheat chiang (mentioned in the Shih Ching); IIB2. Wheat flour chiang (mentioned in the Pen-ts'ao Kang-mu [Compendium of Materia Medica, by Li Shih-chen, A.D. 1578-97] and the Chü Chia Pi Yung Shih Lei Ch'uan Chi [+1301]); IIB3. Coconut chiang (Mentioned in the Ch'i-min Yao-shu); IIB4. Barley chiang (mentioned in the Pen-ts'ao Kang-mu); and IIB5. Mustard chiang (mentioned in the Li Chi and Chih Ching).

It is interesting to note that the earliest meat and fish chiang was made with koji, typically millet koji. Koji is also used today to make some of the fish sauce called Shottsuru in Akita prefecture in Japan. Shottsuru has a 3,000 year history.

The use of the terms "hai" (meat chiang) and "chiang" in the Chou Li imply that some chiang was made from ingredients other than meat. An illustration from the Han dynasty shows a hole in the bottom of a chiang pot for drawing off soy sauce. The *Ssu Min Yüeh Ling* by Ts'ui Shih from the Later Han (25-220 A.D.) uses the term "ch'ang

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chiang" to refer to refined/filtered soy sauce. The *Ch'i-min Yao-shu* also uses two terms for refined chiang that seem to be referring to types of soy sauce. Thus it seems relatively sure that chiang has a history of about 3,000 years from the Chou dynasty (1122-256 B.C.) and soy sauce has a history of over 2,000 years since the Ch'in (221-206 B.C.) or Han (206 B.C.–A.D. 220). In the literature of the T'ang dynasty it is not rare to use soy sauce for medicinal purposes.

Soy sauce came from chiang, which was made from soybeans and wheat flour or wheat; it is still widely produced today. But from shih (fermented black soybeans) came tamari and kuan-tou soy sauce (kuan-tou is a region in Fukien / Fujian in southeast China). Only soybeans were used to make these types of soy sauce. The first tou-shih (fermented black soybeans) was made from soybeans only, with *Aspergillus oryzae* mold. If salt was added, the product was called hsien tou-shih; if none was added, it was called tan tou-shih. Later they started to use *Mucor* (as in Szechuan tou-shih) or *Rhizopus* mold species. Today most tou-shih is made with Aspergillus. This is the ancestor of tamari shoyu and kuan-tou soy sauce. Address: Iwate Daigaku Nôgaku-bu, Sogaku 80 shunen no gosukuji ni kaete; Present address, China.

7550. Bunka Shuppan Kyoku. 1982. Miso no hon: Tsukutte tabeyô. The miso [The book of miso: Let's make and eat]. Tokyo: BSK. 96 p. June. Illust. 25 cm. [Jap]
• ***Summary:*** This colorful book, with many color and black-and-white photos, is packed with Japanese miso recipes. Pages 18-21 describe how to make koji at home in a home-made incubator. Pages 30-31 are a review by Wataru Kawamura of *The Book of Miso* by Shurtleff and Aoyagi; includes a photo of the two authors. Page 22 describes how to use koji to make amazake. Address: Shibuya-ku, Tokyo, Japan.

7551. Katsuta, Keiko; Hayakawa, I.; Nomura, D. 1982. Teinôdo dope no rinjinoaranin bôshi kôka to bôshi tokusei [Inhibition of lysinoalanine formation and spinnability of low protein concentration dope]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 56(6):435-40. June. [13 ref. Jap; eng]
• ***Summary:*** A large amount of lysionalanine (LAL) was found in spun soy protein fibers. Various methods for inhibiting its formation were studied. Describes dopes for the preparation of synthetic fibers from soybean protein, inhibition of lysinoalanine formation, and spinnability. The amount of LAL increased in direct proportion with increasing protein concentration; this might be attributed to the increased frictional heat generated by the high viscosity dope. "Low temperature and low alkali treated fibers prepared from 14% protein showed decreased LAL formation." Address: Dep. of Food Science and Technology, Faculty of Agriculture, Kyushu Univ., Hakozaki, Higashi-ku, Fukuoka 812, Japan.

7552. **Product Name:** Vege-Pro (Soymilk) [Coffee & Malt, Blended Juices, Plain (Dairylike), or Lactic Fermented].
Manufacturer's Name: Kibun Health Foods Co.
Manufacturer's Address: Saitama-ken, Japan.
Date of Introduction: 1982 June.
Ingredients: Coffee: Water, soybean, corn syrup, malt extract, corn oil, coffee extract, caramel (color), calcium lactate, sucrose fatty acid ester, salt, artificial flavor, carrageenan. Blended Juices: Water, soybean, corn syrup, orange, apple and pineapple juice from concentrate, propylene glycol, citric acid, calcium lactate, carotene, paprika, artificial flavor.
Wt/Vol., Packaging, Price: 6.75 fluid oz, 200 ml Tetra Brik Aseptic carton.
How Stored: Refrigerated.
Nutrition: Per 6.75 fl oz.: Coffee: Calories 140, protein 4 gm, carbohydrate 20 gm, fat 5 gm. Blended Juices: Calories 110, protein 3 gm, carbohydrate 22 gm, fat 2 gm.
New Product–Documentation: Labels. 1984. 2.5 by 3.25 inches by 1.5 wide. Paper carton. Coffee: Red, black, yellow, white on brown. Bird flying over coffee beans illustration. Blended Juices: Red, green, black, white on yellow. Bird flying over fruit illustration. Vegetable: Red, yellow, black, white on green. Bird flying over trees illustration. "Vege-Pro tastes so much richer than ordinary vegetable juice. Enjoy this extra-refreshing blended vegetable drink that supplies protein and vitamins. What a delicious way to treat yourself to good nutrition everyday." Tetra Brick packages, 3 color, 200 ml. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center. "Vegetable protein drink." Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 33, 46.

7553. Kitagawa, Isao; Yoshikawa, M.; Wang, Hui Kang; Saito, M.; Tosirisuk, V.; Fujiwara, T.; Tomita, K. 1982. Revised structures of soyasapogenols A, B, and E, oleanene-sapagenols from soybean. Structures of soyasaponins I, II, and III. *Chemical and Pharmaceutical Bulletin* 30(6):2294-97. June. [14 ref. Eng]
• ***Summary:*** There are five soya saponins having glucuronide linkages between oligoglycosides and oleanene triterpenes. Address: Faculty of Pharmaceutical Sciences, Osaka Univ., 1-6, Yamada-oka, Suita, Osaka 565, Japan.

7554. **Product Name:** [Meito Soymilk (Plain, Coffee, Grapefruit, or Fruit Mix)].
Foreign Name: Meitô Tônyû (Pureen, Koohii, Gureepu Furuutsu, Furuutsu Mikksu).
Manufacturer's Name: Kyôdo Nyûgyô (Kyodo Nyugyo Cooperative Milk Co.).
Manufacturer's Address: Japan.
Date of Introduction: 1982 June.
Wt/Vol., Packaging, Price: 200 ml Tetra Brik Aseptic

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carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 73. States that these products were introduced in June 1982 and distributed nationwide. Name of company with diacritics is: Kyôdo Nyûgyô.

7555. **Product Name:** [Mapron Soymilk (Dairylike with Honey)].
Foreign Name: Mapuron Tônyû (Hachimitsu-iri).
Manufacturer's Name: Mitsubishi Chemical Foods Co., Ltd. (Mitsubishi Kasei Shokuhin).
Manufacturer's Address: Ginza 5-13-12, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1982 June.
Wt/Vol., Packaging, Price: 200 ml Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. Tonyu [Soymilk. 2nd ed.]. p. 72. In June 1982 Mitsubishi Kasei Shokuhin launched Tonyu Mapuron (in Hachimitsu-iri flavor) in 200 ml aseptic cartons.

7556. **Product Name:** [Marusan Soymilk (Dairylike or with Barley Malt Syrup)].
Foreign Name: Marusan Tônyû, Bakuga Tônyû.
Manufacturer's Name: Okazaki Marusan K.K. (Marusan-Ai Co., Ltd.).
Manufacturer's Address: 1 Aza Arashita, Niki-cho, Okazaki-shi, Aichi-ken 444-21 Japan.
Date of Introduction: 1982 June.
Wt/Vol., Packaging, Price: 500 ml Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. Tonyu [Soymilk. 2nd ed.]. p. 72. In June 1982 Okazaki Marusan introduced 2 soymilk products, each in 500 ml long-life cartons: Marusan Tonyu, and Bakuga Tonyu. These products are distributed mostly in central Japan (in the Chûbu Chiho), in the area around Okazaki.

7557. Shurtleff, William; Aoyagi, Akiko. 1982. Soyfoods industry: directory and databook. 2nd ed. Lafayette, California: Soyfoods Center. 56 p. June. 28 cm. [24 ref]
• ***Summary:*** A detailed study of the rapidly emerging soyfoods industry and market. Contains original statistics compiled by the Soyfoods Center through interviews with companies. Contents: 1. Terminology: The many types of soyfoods. I. Traditional low-technology soyfoods. 1A–Nonfermented soyfoods: Fresh green soybeans, whole dry soybeans, soynuts and soynut butter, soy sprouts, whole soy flour & grits, roasted soy flour [kinako] & soy coffee, soymilk and dairylike soymilk products, tofu (eight types), okara or soy pulp, yuba.

1B–Fermented soyfoods: Tempeh, miso, soy sauce, shoyu & tamari, natto & thua-nao, fermented tofu & soymilk, soy nuggets [fermented black soybeans] (Hamanatto & tou-ch'ih).

II. Modern soy protein foods: Defatted soy flour, grits & flakes, soy protein concentrates, textured soy protein products, soy protein isolates.

III. Soy oil products: Soy salad oil & cooking oil, soy oil margarine & shortening, soy lecithin.

2. Soyfoods industry directory: Names and addresses of over 850 soyfoods manufacturers in the Western world, plus major soymilk, miso, shoyu, and yuba manufacturers in East

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Asia. 3. Analysis of the soyfoods industry in the U.S.

4. Trends in U.S. and world soybean production: Graph of world soybean production (1922-1979) including graphs for the world total, USA, Asia total, and Latin America. Graph of U.S. soybean production, yields, and exports (1924-1979).

5. Analysis of the tofu industry in the West: The U.S. tofu market: overview and outlook. Graph of the number of tofu (and tempeh) manufacturers in the West from 1975 to 1982. Four-year analysis of the tofu industry in the West. Listing of North America's largest tofu manufacturers and their weekly tofu output. Japan's largest tofu manufacturers and their daily output. Favorite tofu, soymilk, and tempeh recipes as served at U.S. soyfoods, delis, cafes, and restaurants, or marketed as ready-to-serve products. Books on tofu published in America.

6. Analysis of the tempeh industry in the West: Graph of number of tempeh manufacturers. Recipes. Listing of North America's largest tempeh manufacturers and their weekly output.

7. Analysis of the worldwide soymilk industry: Analysis of the soymilk industry in the United States. Analysis of the soymilk industry in Japan. Major Japanese soymilk companies and their products.

8. Analysis of the soy sauce / shoyu and miso industries worldwide. Statistics on fermented soyfoods in East Asia. The soy sauce market in the United States (1981). U.S. imports of soy sauce. Graph (1947-1981. Source: U.S. General Imports, Schedule A. Commodity by Country. U.S. Dept. of Commerce, Bureau of Census). U.S. imports of soy sauce. Table (1947-1981. Source: U.S. General Imports, etc. See above). The shoyu / soy sauce market in Japan. Graph. (1886-1980. Includes: Number of manufacturers. Per capita consumption. Shoyu production. Kikkoman's market share (%)). The miso market in Japan. Graph. (1930-1980. Includes: Per capita consumption. Total miso production. Factory production. Number of manufacturers. Home production. Amount of soybeans used). Overview of the miso market in the United States. Miso exports from Japan (1981). Japan's ten largest miso manufacturers and their output.

9. Other: Analysis of the soynuts industry in the U.S. North America's larger soyfoods delis, cafes & restaurants. The soybean crushing industry; overview.

10. Soyfoods terminology and standards (Glossary of soyfoods terms): I. Traditional nonfermented soyfoods: Fresh green soybeans, okara, roasted soy flour (soy coffee, soy chocolate), soybeans, soymilk (soymilk ice cream, soymilk soft serve, frozen soymilk yogurt, soymilk mayonnaise, soy shakes, soy nog, soymilk whipped cream), soynuts, soy sprouts, tofu (regular tofu, deep-fried tofu {deep-fried tofu cutlets called nama-age or atsu-age in Japan, deep-fried tofu burgers or burger balls, called ganmodoki or hiryozu in Japan, deep fried tofu pouches (called aburage in Japan; the words "deep-fried" may be dropped from the names after the initial usage, and in recipes or on package labels, if desired}), silken tofu {made without separation of curds and whey, called kinugoshi in Japan; modern types, all made with glucono delta-lactone as coagulant, and all known in Japanese as juten-dofu, are packaged lactone silken tofu, bagged lactone silken tofu (fukuro-dofu), sealed lactone silken tofu (buro-dofu), and Ever-Fresh Lactone Silken Tofu (in Tetra-Pak}), grilled tofu, frozen and dried-frozen tofu. (Note 1. It is illegal to describe the latter product as "freeze-dried tofu," since freeze-drying is a completely different process), terms associated with making tofu {fresh soy puree, a coagulant or curding agent, forming box, filter bag or pressing sack, tofu comes in cakes, not blocks}), whole soy flour, flakes and grits, yuba.

II. Traditional fermented soyfoods: Fermented soymilk products (soymilk yogurt {Soy Yogurt, Soyogurt, Soygurt}, acidophilus soymilk, soymilk kefir, viili, piima, buttermilk {Soy Kefir, etc.}), fermented tofu (wine-fermented tofu, brine-fermented tofu), miso (rice miso, barley miso, soybean miso, Chinese soybean chiang), natto (thua-nao from Thailand and kinema from Nepal; all are non-salted), fermented black soybeans [fermented black soybeans] (Chinese fermented black soybeans know as shih, tou-ch'ih, tou-shih, or dow-si; savory fermented black soybeans called Hamanatto in Japan, Daitokuji fermented black soybeans called Daitokuji natto in Japan, Philippine fermented black soybeans called tausi or tao-si in the Philippines, Indonesian soy nugget paste called tauco, formerly spelled tao-tjo, Malaysian soy nugget sauce called tao-si), soy sauce (shoyu. The five basic types of Japanese shoyu are: regular shoyu called koikuchi shoyu in Japanese, light-colored shoyu called usukuchi shoyu, tamari shoyu, clear shoyu called shiro shoyu, and rich shoyu called saishikomi shoyu), tempeh, other fermented soyfoods.

Note 2. This is the earliest document seen (Sept. 2012) that uses the word "Soygurt" to refer to soy yogurt.

III. Soy oil and modern soy protein foods: soy oil, defatted soy flour, flakes and grits, soy protein concentrate, soy protein isolate, textured soy protein products (TSP, TVP is a registered trademark of the Archer Daniels Midland Company and cannot be used as a generic name for this product), meat analogs (foods typically made from spun soy protein fibers to resemble meat, fish, or poultry products).

11. Names of soyfoods around the world: Names of 40 products. Brazilian / Portuguese names. British English names. Chinese names (fermented tofu is Toufu-ju or Sufu). French names, German names. Japanese names. Spanish names.

12. Key institutions working with soyfoods in the West: The Soyfoods Center, Soyfoods Association of North America, INTSOY, American Soybean Association, Bean Machines, Inc., Soycrafters Apprenticeship Program, USDA Northern Regional Research Center, Sojaquelle.

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About The Soyfoods Center.

Note 3. This is the 2nd market study published by Shurtleff. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

7558. **Product Name:** [Soymilk (Barley Malt Syrup, Orange, or Dairylike)].
Foreign Name: Tônyû (Bakuga, Orenji, Chôsei).
Manufacturer's Name: Sugiyo.
Manufacturer's Address: Japan.
Date of Introduction: 1982 June.
Wt/Vol., Packaging, Price: 200 ml Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 73. These products were introduced in June 1982 in 200 ml Tetra Pak and paper pack cartons, and distributed nationwide.

7559. Tajiri, Takashi. 1982. Jinkô taiyô tôshô-sha ni yoru mame-rui moyashi saibai no kairyô [Studies on cultivation and keeping quality of bean sprouts. VI. Improvement of bean sprouts cultivation by the application of artificial sunlight lamp (Studies on cultivation and keeping quality of bean sprouts. IV.)]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 29(6):359-65. June. [8 ref. Jap; eng]
• ***Summary:*** Sprouts of soybeans, mung beans, and adzuki beans cultivated in dark chambers at 30ºC were improved by application of artificial sunlight from a lamp at 2500 lux for 1 hours each day from 48 hours after planting. The sprouts were elongated and thickened, weight increase was accelerated, and vitamin C content was considerably increased. The cultivation period was shortened by 1-2 days. Both lower intensity light (500 lux) and higher intensity (5,000 and 10,000 lux) gave comparatively less favorable results. Address: Lab. of Food Process, Faculty of Agriculture, Kinki Univ., Kowakae, 3-4-1 Higashi-Osaka-shi, Osaka-fu, 577 Japan.

7560. Tamura, Shôzaburo. 1982. Re: History of the Japan National Miso Association. Letter to William Shurtleff at Soyfoods Center, June–in reply to inquiry. 3 p. Handwritten, translation of original letter only. [Jap; eng+]
• ***Summary:*** The Japan National Miso Association (*Zenkoku Miso Kogyô Kyôdô Kumiai Rengôkai*) was founded on 17 Nov. 1960. Japan's first nationwide miso trade association was founded on 11 Jan. 1940. Its name was *Zenkoku Miso Kogyô Kumiai Rengôkai.* In 1944 [during World War II] it became a controlled company (*Tôsei Gaisha*), and in 1948 its name was changed to *Zenkoku Miso Kogyô Kyôkai.* Finally in 1960 it became the present *Zenkoku Miso Kogyô Kyôdô Kumiai Rengôkai.*

According to Dr. Hideo Ebine, the earliest known article on miso published in a scientific journal was: Kellner, O. [Oskar Johann]; Nagaoka, M.; Kurashima, Y. 1889. "Researches on the manufacture and composition of miso.'" *Bulletin of the College of Agriculture, Tokyo Imperial University* 1(6):1-24. Dec. Dr. Ebine is head of the Central Miso Research Center, which is in the same building as the miso association.

Concerning statistics on the amount of miso produced in Japan over the past century: There are good statistics on shoyu since it has been taxed nationwide since the Meiji period, but there are no such reliable statistics on miso because it was not taxed, and also because a great deal of miso was made in individual homes in the early days. Address: Zenkoku Miso Kogyô Kyôdô Kumiai Rengôkai, Tokyo, Japan.

7561. *Toyo Shinpo* (*Soyfoods News*). 1982. Kontesuto [Tofu cooking contest]. July 1. [Jap]
• ***Summary:*** Recipes are given for the top three winning recipes in the content: (1) Tofu layer cheesecake. (2) Soy cake pizza. (3) Tofu white mousse.

7562. Japan Packaged Tofu Association. 1982. U.S. Soycrafts Study Tour: Member list. Japan. 3 panels each side. Each panel: 19.4 x 10 cm.
• ***Summary:*** This glossy black-and-white leaflet gives a portrait photo and basic information about each of the 22 Japanese who will attend the Seattle soyfoods conference. For each person the following information is given: Member of the Packaged Tofu Association: Yes or no (all are members). Name written in Japanese characters. Name written in Roomaji (Roman letters, last name first). Name of person's company, his position, and the full company address. The leader of the group is Mr. Minemoto Shunichi of Asahi Foods Co. in Tokyo.

Note: Mr. Wataru Takai may have helped to organize this group, although he was not a member of it.

7563. Shurtleff, William; Aoyagi, Akiko. 1982. History of natto and its relatives. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 39 p. July 17. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction. Etymology. Part I: History of natto in Japan. Sources of information. Theories of origin. Heian period (794-1185). Kamakura period (1185-1333). Muromachi period (1338-1600). Edo (Tokugawa) period (1600-1868). Meiji period (1868-1911). Taisho period (1912-1925). Showa period (1926-1981 and beyond). Popular types of Japanese natto. Natto in the prefectures. Pictures of natto containers. Part II: History of relatives of natto in East Asia. Unsalted / bland fermented black soybeans in China. Joenkuk-jang in Korea. Thua-nao in Thailand. Kinema in Nepal. Sere in Bali, Indonesia. Part III: History of natto in

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Europe. Part IV: History of natto in the United States.

Note: This is the earliest English-language document seen (Jan. 2012) that uses the word "Joenkuk-jang" to refer to Korean-style natto. Address: Lafayette, California. Phone: 415-283-2991.

7564. *Toyo Shinpo* (*Soyfoods News*). 1982. Tônyû no peeji: 2-3 baizô no urigae o tassei. Sudeni 150 oku shijô keisei no koemo [The soymilk industry and market in Japan: Sales have increased 2-3 fold to an estimated 15,000 million yen per year]. July 21. p. 26. [Jap; eng+]

• ***Summary:*** Industry sources say that the Japanese soymilk market has already reached about 15,000 million yen. The order in which companies started making or marketing soymilk is: 1959 San-iku Foods. 1969 House Shokuhin. 1972 Ishihara Food Center. 1974 Tokyo Soymeal, Kenbi-Sha, Okazaki Marusan. 1976 Asahi Shokuhin, Soken-sha, Kyushu Nyugyo. 1977 Kibun, Natural Foods. 1979 Mitsubishi Kasei Shokuhin. 1980 Chiba Seisen Shokuhin Kogyo, Meiji Nyugyo. 1981 Yakuruto, Nagano Tomato, Morinaga Nyugyo. 1982. Seven-Up Inryo. Among these, House Shokuhin and Tokyo Soymeal have discontinued.

Major Japanese brands of soymilk, aseptically packaged in Tetra Brik cartons are (percentages indicate market share): Kibun Foods (Plain, Yogurt flavored, Fruit, Barley Malt & Coffee), 41.7%; Okazaki Marusan (Plain, Orange, Barley malt), 23.3%; Mitsubishi Kasei (Maburon plain, Orange, Coffee, Honey), 10.0%; San-iku Foods (Soya Neo Cocoa), 8.0%; Kyushu Nyugyo, 6.0%; Meiji Nyugyo (Sun-Glow), 5.8%; Kenbisha, 2.5%; Asahi Shokuhin (Plain, Orange, Coffee), 2.5%; Soken-sha, 1.3%; and Natural Foods, 1.3%. Most sizes are 200 ml, which retail for 75 yen with a 60 day shelf life.

Companies with the largest number of different soymilk products are: (1) Okazaki Marusan has 15 products including soymilk in a Pure-Pak carton (500 ml for 150 yen) and in a can (195 gm); (2) Kyushu Nyugyo has 13 products incl. Midori Tonyu; (3) San-Iku Foods has 10 products, including canned soymilk; (4) Kibun has 8 products. Mitsubishi Kasei is taking a different approach; they have only 5 items (honey, coffee, fruits, sour, and plain) but are aiming at large production.

Kibun's sales have been very good, especially after they switched to the Brik Pak-type carton. Last year they had sales of 2,500 million yen and they are aiming to double that this year. Industry analysts believe that Kibun will be the industry leader for a while.

Mitsubishi Kasei established Mitsubishi Kasei Shokuhin in January of this year, and transferred all soymilk sales to that new department. They are hoping this year's sales will be three times as large as last years, hopefully 1,800 to 2,000 million yen. They are now constructing a new soymilk plant in Okayama, and when it is done they hope sales will reach 8,000 million yen.

Okazaki Marusan has grown 20-fold in the past 5 years. They predict this year's soymilk sales to be 2,000 million yen.

A photo shows 24 soymilk products. Most are in Brik Pak Aseptic cartons. Three Soyalac products are in cans. One product is in a retort pouch.

7565. *Toyo Shinpo* (*Soyfoods News*). 1982. Kissaten de ninki jôshôochû. Tôfu "aisukuriimu" mada mada uremasu. Jishin tappuri no tenchô. Mr. Pû [Tofu ice cream is becoming popular in tea parlors, such as Mr. Poo's. He has confidence he sell a lot more]. July 21. [Jap]

• ***Summary:*** Soymilk ice cream is selling well in this tea house at 380 yen for a dish. The owner calls it "tofu ice cream." The owner, Mr. Yamanouchi, got the idea when he traveled to Los Angeles. He has been selling it for 4 years, since 1978.

Note: This is the earliest Japanese-language document seen (Sept. 2013) that mentions soy ice cream, which it calls *Tôfu "aisukriimu."*

7566. *Toyo Shinpo* (*Soyfoods News*). 1982. *Nattô no Hon* hakkan: Ryôri 80 hin o shôkai. Bunka Shuppan Kyoku, Nagayama-shi ra kyôcho [*The book of Natto* is published: Introducing 80 recipes. Co-authored by Bunka Shuppan Kyoku and Mr. Nagayama]. July 21. [Jap]

• ***Summary:*** A photo shows the front cover of the book, which retails for ¥1,200. At top of book's title page (in English): "Natural Taste in Kitchen." Below the Japanese title: "The Nattow."

7567. *Toyo Shinpo* (*Soyfoods News*). 1982. [Quick soymilk cooling machine, manufactured by Toritsu Reiki Seizo K.K.]. July 21.

• ***Summary:*** The counter-top machine is for keeping retail soymilk cool. The company is located at 4-26-6 Ueno, Taito-ku, Tokyo 110, Japan. Phone: 03-841-0330.

7568. **Product Name:** [Asashoku Soymilk (Plain, or Dairylike)].
Foreign Name: Gen Tônyû, Asashoku Soimiruku.
Manufacturer's Name: Asahi Shokuhin.
Manufacturer's Address: San Shain 60 40F, 3-1-1, Higashi-Ikeburo, Toshima-ku, Tokyo 170, Japan.
Date of Introduction: 1982 July.
Wt/Vol., Packaging, Price: 1 liter Pure Pak cartons.
How Stored: Refrigerated.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 73. States that these 2 products, in "L packs" (1 liter Pure Pak cartons), were introduced in July (Gen) and August (Soimiruku) of 1982, and distributed to most of central Japan.

7569. Barber, Linda. 1982. Natto: The taste of Japan.

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Soyfoods. Summer p. 70-71.

• ***Summary:*** "Some people say that the taste of Japan is a bowl of miso soup, but I would have to say it is natto, Japan's original soyfood. Unlike miso or tofu, natto was discovered in Japan. The story goes that someone wrapped his meal of cooked soybeans in straw (the 'baggie' of 1000 years ago), and after a couple of days, unwrapped the bundle and found *Itohiki* natto. These fermented soybeans, held together by slippery filaments, were soon to become the traditional topping to a bowl of rice served at breakfast and dinner to millions of Japanese people.

"Today, natto is made by soaking washed soybeans overnight, then draining and pressure cooking them. After another draining, the beans are inoculated with *Bacillus subtilis* (*Bacillus natto*) while still warm, scooped into perforated plastic bags and wrapped in straw (or they often are sometimes run into styrofoam containers that have holes for air circulation), then incubated at 40-45ºC (104-113ºF) for about 14-18 hours.

"Care is taken in not letting the natto get too hot. In natural fermentation the beans produce some heat on their own and keeping the temperature below 55ºC (121ºF) is important. After the 14 hours, the natto is put into cold storage, wrapped with a labeling band, boxed and shipped. One of the charms of natto is that it takes very little space or complicated equipment to manufacture.

"Not only is natto easy to produce, but it has high nutrition going for it too! This soyfood is 17% protein, 60% water, 10% fat, 10% carbohydrates, 2% fiber, 2% ash. As for other nutrients, natto has 0.07 mg vitamin B1, 0.50 mg B2, 1.1 mg niacin, 3.3 mg iron and 90 mg calcium. Also, research has shown that when we compare cooked soybeans with natto, the levels of thiamine, riboflavin and B12 are higher in natto thanks to the fermentation process.

"Yet, some experts say that the most beneficial characteristics of natto can't be found on a nutrition chart. The wonder of natto lies in its bacterial medicinal qualities. Do the digestive enzymes present in natto prevent or cure digestive diseases? Or is natto only beneficial because it is a good natural food and an excellent source of protein that the body can easily assimilate because of the fermentation process? Without being caught in the medical discussion crossfire, it can be said for sure that natto is a nutritious food that can give any diet a new flavorful zing.

"Many people, even those with adventurous taste buds, find natto as a food quite a challenge. Actually, only about half of the Japanese care for it. Even so, most bars, sushi shops, and Japanese-style restaurants offer natto as daily fare.

"In Japan, natto is served in many ways. And now, with the rising cost of food, natto has taken on new dimensions. Once served only as a topping for rice or in miso soup, creative Japanese cooks now serve natto sushi, natto spaghetti, natto udon (wide, white wheat noodles), natto omelet, natto gyoza, natto sandwiches, natto tempura, chopped natto with cuttlefish, deep fried natto, natto salad, natto with mochi, and even a liqueur made with natto.

"After getting over my initial 'gag' reaction to eating natto, I was pleasantly surprised to find it tasted very much like a strong, rare cheese, I soon began making natto pizza, natto lasagna, and toasted natto sandwiches. At only 25 calories for 100 grams (3½ oz) my mind was turning spins developing recipes for this marvelous slippery stuff.

"Natto lends itself to western-style dishes quite nicely. How about natto fettucini, natto crepes, natto French onion soup, natto tortillas, natto frittata, nattoburgers, baked potatoes with natto topping, fried eggplant with natto, natto egg salad, or natto moussaka? My latest natto creation is Natto Dip: Mix together 2 cups tofu mayonnaise, ½ cup chopped green onions, l/8 teaspoon pepper, ½ cup chopped parsley, 10 oz. cooked and chopped spinach, ¼ cup natto, and salt (or shoyu) to taste. Serve with crackers or raw vegetables. Superb!

"Once you purchase a carton of natto you can keep a supply going like you do yogurt, but expect to buy a fresh starter every 3 or 4 batches. For home-style natto, boil soaked soybeans, drain and add a cube of purchased natto. Mix, and put into containers. I suggest styrofoam cups, fast food containers, or paper cups. Make sure they are clean and free from any other bacteria. Cover the inoculated beans with clear wrap (make holes with a hot needle for air ventilation). Set the cups, or containers, in a foam ice chest or wrap in a heating pad, or simply use a yogurt maker. lncubate for about 18 hours.

"If at the end of 18 hours your product is grayish in color, and forms a long string (filament) when you touch your finger to the surface, you know you've succeeded. Chill the natto, then enjoy it in one of the ways suggested above. You can always have natto on hand as it freezes well too!

"Before you say 'Naa' to natto, let me give you some hints that will make natto easy for you to swallow:

"1. The most important is to make sure that the natto you buy is *fresh.* It should be grayish in color with a little odor. When you touch natto, a lone string will form–the longer the better. Natto has a shelf life of about 1 week (I prefer to eat mine the day I buy it). If the natto is bad, it will taste bitter, smell very strong, and may even have mouldy spots or crystals on the surface. Junk it!

2. "Eat it as the Japanese do, in small amounts. The most traditional way is to mix the natto with a raw egg yolk, chopped green onion, mustard and a dash of shoyu. Scoop a little of this onto your next bowl of rice. I've also had this condiment served in a small dish alongside a cold beer. I'm sure it would make a hit even in Milwaukee!

"3. To get over the natural gooeyness of natto, serve it in foods where you would expect, and want, some 'slip.' Natto acts like melted cheese. How about glueing a taco together with a topping of natto?

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"Another type of natto I like is dried natto (*hoshi natto*). Sold as a snack food, this soyfood is very salty in taste, resembles raisins coated with flour, and is unslippery to the touch. Yet, it has a gooey mouthfeel. Enjoy this type with a cup of green tea, or sprinkle a few grains on a bowl of rice. As a break from tradition, chop up a few and use them as a salty seasoning to whatever you cook: soups, stews, casserole baked goods, or even apple pie.

"In reading or talking about natto, one often runs across the kind referred to as *Hamanatto.* Unlike *Itohiki* natto, this 'natto' is made by a different process and uses the bacteria [sic, mold] *Aspergillus oryzae.* Hamanatto originated in China. Nutritionally it is 34% water, 28% protein, 14% fat, 13% carbohydrate, 2% fiber, 10% ash. Calcium is listed as 140 mg, iron 8.3 mg, and sodium as 2,900 mg.

"As you can see from the sodium count, Hamanatto is quite salty and the taste is reminiscent of Hatcho miso. Blackish and chunky, this 'natto' is sometimes referred to as 'Soy Nuggets' [fermented black soybeans], or 'Raisin-like Natto' by some Westerners.

"No matter how you eat it, natto is an intriguing soyfood. This natural, whole food is indeed a taste of Japan, and after 1000 years it's still going strong in a world of fast foods.

"The author, a trained home economist who lived in Japan for many years, has recently returned to her home in Wisconsin."

Photos (taken by Linda Barber in July 1981) show: (1) Natto sold retail, packaged in rice straw. (2) Some natto being lifted, using chopsticks, up from a package of natto. Four photos showing "How natto is made" commercially in Japan. (3) The soybeans are steam cooked. (4) Then inoculated with natto bacteria. (5) Run into containers and incubated 14-18 hours. (6) Then packaged, boxed, and shipped.

Note: This is the earliest document seen (Jan. 2012) that mentions *hoshi natto* ("dried natto"). Address: Japan and Wisconsin.

7570. Bo, Thi-an. 1982. Hishio to shôyu no engen to sono seisan gijutsu ni tsuite. II. [On the origins of chiang and shoyu, and their production technology. II.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 77(7):439-45. July. [9 ref. Jap; eng]
Address: Iwate Daigaku Nôgaku-bu, Sogaku 80 shunen no gosukuji ni kaete; Present address, China.

7571. *Daizu Geppo* (*Soybean Monthly News*). 1982. Rokujô [Rokujo-dofu]. July. p. 31. [Jap; eng+]
• ***Summary:*** This is a type of very firm tofu from Yamagata prefecture, which was originally created as a vegetarian katsuobushi (dried bonito) on Mt. Koya.

7572. *Daizu Geppo* (*Soybean Monthly News*). 1982. Matsuyama no kansôage [Dried Aburaage from Matsuyama]. July. p. 26. [Jap; eng+]
• ***Summary:*** Gives a description of his it is made. It contains 3.5% moisture and 52.9% fat versus 44% moisture and 31.4% fat for regular age (tofu pouches). It will keep for 3 months in a cool place. Four companies in Matsuyama now make it.

7573. Fruin, W. Mark. 1982. Three centuries of Kikkoman: Growing pains & organizational change. I. *Soyfoods.* Summer. p. 58-60.
• ***Summary:*** Contents: Introduction. Family specialization as the key to success. Beyond the limits of the family. Becoming a corporation.

"The first family in Noda to specialize in shoyu fermentation was known as the Kashiwa household. It was initiated in 1764 when a son of Takanashi Hyozaemon, descendant and namesake of the first Takanashi to brew shoyu in Noda in 1661, was adopted into the family of Mogi Shichizaemon of the same town. He was adopted for the express purpose of marrying Shichizaemon's daughter." Two years later after the marriage, "this couple established a separate branch household (a formal legal and religious process) to engage exclusively in the manufacture of shoyu, they unknowingly founded a dynasty which would guide the fortunes of the shoyu industry in Noda and in Japan for the next two centuries. Because it was specialized [in] shoyu fermentation, the Kashiwa household quickly became the largest independent brewer in Noda. Even after 1887 when most of the local brewers, including the Kashiwa house, formed a cartel, the head of the Kashiwa family was normally the chief officer of the cartel association, and in 1917 when eight Mogi and Takanashi families formed a company, the first president of the Noda Shoyu Company, Limited (precursor to the Kikkoman Corporation) was Mogi Shichirouemon, the Fifth, head of the Kashiwa line."

Photos show: (1) Three different techniques for pressing the sauce from fermented mash, around 1923, at Noda, Japan. (2) A forklift truck in the warehouse of the Kikkoman plant in Walworth, Wisconsin.

7574. **Product Name:** [Soymilk (Plain, With Vegetable Juice, Fruit, Barley Malt Syrup)].
Foreign Name: Tônyû (Sutoreeto, Yasai, Kajû, Bakuga).
Manufacturer's Name: Kibun Health Foods Co.
Manufacturer's Address: Saitama-ken, Japan.
Date of Introduction: 1982 July.
Wt/Vol., Packaging, Price: 200 ml Brik Pak Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Toyo Shimpo. 1982. July 21. Product with Label purchased at department store in Japan. 1983. June. For a detailed analysis of this and many other Japanese soymilk products collected in Tokyo in June 1983 see: Shurtleff, William; Aoyagi, Akiko. 1984. *Soymilk*

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Industry and Market: Worldwide and Country-by-Country Analysis. 2 vols. Lafayette, California: Soyfoods Center. Feb. 28 cm. See Vol. 1, p. 162-66.

7575. **Product Name:** [Cheerio Soymilk].
Foreign Name: Cherio Tônyû.
Manufacturer's Name: Seven-Up Inryo (Sebun Appu Inryo).
Manufacturer's Address: Japan.
Date of Introduction: 1982 July.
Wt/Vol., Packaging, Price: 250 gm can.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Toyo Shinpo. 1982. July 21. "The soymilk industry and market in Japan." States that Seven-up Inryo first sold commercial soymilk in Japan in 1982.

K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Cherio Tônyû was introduced before Dec. 1982 by Sebun Appu Inryô in a 250 gm can.

Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64.

7576. *Toyo Shinpo* (*Soyfoods News*). 1982. Bungei Shunjû ni mo tofu [Bungei Shunjû and other famous publications are writing about tofu]. Aug. 1. [Jap]
• ***Summary:*** In addition to tofu, they are also writing about vegetable protein and their relation to good health.

7577. *Toyo Shinpo* (*Soyfoods News*). 1982. Yoshikawa Shoji [Yoshikawa Shoji has opened a branch office in Seoul, Korea]. Aug. 11. [Jap]
• ***Summary:*** A photo shows the office.

7578. Ebine, Hideo. 1982. Re: Retirement from the National Foods Research Institute, Japan. Chapter on nyufu. Kibun's soy yogurt. Letter to William Shurtleff at Soyfoods Center, Aug. 13. 1 p. Handwritten, with signature on letterhead. [Eng]
• ***Summary:*** On 1 April 1982, Ebine retired from the National Food Research Institute (NFRI).

In the 1971 book *Daizu Shokuhin* (by Watanabe, Ohta, and Ebine), the chapter on *Nyufu* [fermented tofu] was written by Ohta.

In 1981 Kibun started to sell commercial soy yogurt in Japan. Address: Japanese Society of Food Science and Technology, 2-1-2 Kannondai, Yatabe-machi, Tsukuba-gun, Ibaraki 305, Japan.

7579. Richman, Phyllis C. 1982. Do it yourself sushi: Japanese call the style temaki and most can master it. *Washington Post.* Aug. 15. p. D1.
• ***Summary:*** The section titled "Condiments" notes that those used to make sushi always include ginger, "soy sauce; *wasabi* (Japanese horseradish);..."

"Interesting possibilities: *umeboshi* (salted plums, pitted and mashed);... slices of dark, fleshy *shiitake* mushrooms marinated in sugared soy sauce;... *natto* (fermented soybeans);..."

7580. Hagiwara, Y. Assignor to Japan Natural Food Company Ltd. 1982. Soy sauce from tear grass and process for production thereof. *U.S. Patent* 4,346,114. Aug. 24. 6 p. Application filed 25 Feb. 1981. [3 ref]

7581. Gall, N. 1982. The Brazilian connection. *Forbes* 118:118-22. Aug. 30.
• ***Summary:*** "Brazil now earns as much from soybeans as from coffee. In that startling fact is the story of a great crop migration–and a moral for U.S. farm policy makers." In 1973 when President Nixon announced an embargo on the export of U.S. soybeans, the Marubeni Trading Co. of Japan bought 50,000 acres of land in the Dourados region of what is now the state of South Mato Grosso. As Marubeni hoped, soybeans thrived there. Since the Nixon embargo, between 1974 and 1981, America's share of the world soybean trade has dropped from more than 90% to 67%.

7582. Adolphe, D. 1982. Canola–Canada's no. 1 oilseed. *Notes on Agriculture* (*Guelph, Ontario*) 18(1):5-7. Aug.
• ***Summary:*** "'Canola' is the term now applied to those special modern rapeseed varieties with five percent or less erucic acid and three milligrams per gram or less glucosinalates, measured normally. The name refers to the seed, oil, meal, protein extractions and seed hulls, from, or of, varieties known in the industry as 'double low' rapeseed.

"History suggests that rapeseed was cultivated as early as the 20th century B.C. in India and was introduced to China and Japan at about the time of Christ."

"Ancient civilizations in Asia and along the Mediterranean used rapeseed oil for lighting [illumination] because it produced a smokeless white flame.

"Rapeseed was grown in Europe as early as the 13th Century and during later centuries developed acceptance for both cooking and lighting."

In Canada, commercial rapeseed production began in 1943 following the blockade of Asian and European sources of rapeseed oil in the early 1940s [during World War II]. The oil was urgently needed as a lubricant for the rapidly increasing number of marine engines in naval and merchant ships. Since the early 1960s rapeseed acreage has increased dramatically in Western Canada and spread across the three prairie provinces. Canola was developed in Canada in the 1970s.

"Canola is used entirely for its oil and protein content. It contains 40 percent oil by weight. Rapeseed oil was limited to industrial uses until 1958 when it was classed as an edible oil for human consumption in Canada.

"Canola is the greatest supplier of vegetable oil to

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the Canadian market. In 1980, Canola oil accounted for 46.8 percent of the edible oil market and soybean oil 31.9 percent."

"Canola oil is used mainly in the production of margarines, shortenings, and salad oils."

"The most popular use of canola oil is in cooking and salad oils..."

Note: This is the earliest document seen (Jan. 2005) that mentions "canola oil." Address: Canola Council of Canada, 301-433 Main St., Winnipeg, Manitoba, R3B 1B3, Canada.

7583. **Product Name:** [Thick Soymilk Coffee].
Foreign Name: Tônyû Pururu Koohii.
Manufacturer's Name: Furuta Shokuhin Kogyo (Furata Foods Co.).
Manufacturer's Address: Japan.
Date of Introduction: 1982 August.
Wt/Vol., Packaging, Price: 60 gm poly cup.
How Stored: Refrigerated.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 73. This product was introduced in August 1982 in a 60 gm poly cup, and distributed nationwide. Name of company with diacritics is: Furuta Shokuhin Kôgyô.

7584. McGregor, Otis. 1982. Soybeans–The human consumption approach. *Notes on Agriculture* (*Guelph, Ontario*) 18(1):13-14. Aug.
• ***Summary:*** "In 1974 the Ontario Soya-bean Growers' Marketing Board launched a program directed to the human consumption market... In 1974 the Ontario soybean export market represented a single shipment of white hilum soybeans to Japan for processing into tofu, miso and natto. Today tofu and miso are becoming popular in Ontario.

"Since 1975 the Ontario Soy-Bean Board has experienced remarkable success in moving soybeans into the human consumption market and the diets of Canadians. Two cookbooks have been printed by the Board and distribution has exceeded 70,000. Tofu shops have emerged in Ontario, to the extent that franchising is in the offing. Toronto has restaurants serving soybean meals... Today, the Ontario Soya-Bean Growers' Marketing Board actively promotes whole soybeans in one pound bags in various supermarkets." Address: Ontario Soya-bean Growers' Marketing Board, Chatham, ONT, Canada.

7585. **Product Name:** [Meiji Sunglow Soymilk (With Barley Malt Syrup)].
Foreign Name: Meiji San-guroo Tônyû (Bakuga).
Manufacturer's Name: Meiji Milk Products Co. Ltd. (Meiji Nyugyo).
Manufacturer's Address: Kyobashi 2-3-6, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1982 August.
Wt/Vol., Packaging, Price: 200 ml aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. Tonyu [Soymilk. 2nd ed.]. p. 72. Meiji Nyugyo launched Meiji San-guroo Tonyu (Pureen) in a 200 ml long-life (aseptic) carton in March 1981.

Soya Bluebook. 1983. p. 63. "Sungrow Soy Beverage." Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64. Note that Meiji started to market Sunglow soymilk, made and private labeled for them by Marusan, in April, 1979.

7586. Nagata, Y.; Ishiwaki, N.; Sugano, M. 1982. Studies on the mechanism of antihypercholesterolemic action of soy protein and soy protein-type amino acid mixtures in relation to the casein counterparts in rats. *J. of Nutrition* 112(8):1614-25. Aug. [30 ref]
• ***Summary:*** Secretion of neutral and acidic steroids in rats was increased when the low-fat, cholesterol-free diet contained isolated soy proteins. Address: Lab. of Nutrition Chemistry, Kyushu Univ. School of Agriculture, Fukuoka 812, Japan.

7587. Pure Sales. 1982. Some soy sauces are called tamari. But they're not! San-J is the real tamari (Ad and poster). *East West Journal.* Aug. Inside front cover.
• ***Summary:*** This ad is a combination of black-and-white and color. In black-and-white are 5 quarts of so-called tamari under the following brands: Westbrae, Erewhon (2), Llama, and Pure & Simple. In color are 2 bottles of San-J Tamari (wheat free, in 5.7 oz refillable dispenser and 20 oz glass bottle). The text explains that this real tamari is: Made only from soybeans. Mellower, smoother, richer than regular soy sauce. More protein than regular soy sauce. San-J Tamari will enhance any dish. A concentrated, economical product. Address: 250 Newport Center, Newport Beach, California 92660. Phone: (714) 760-1076.

7588. Sattilaro, Anthony; Monte, Tom. 1982. Physician, heal thyself: A doctor's remarkable recovery from cancer and the diet he's convinced was responsible. *Life.* Aug. p. 62, 64, 68, 70. [1 ref]
• ***Summary:*** "This article was excerpted from *Recalled by Life: The Story of a Recovery from Cancer,* (c) 1982 by Anthony J. Sattilaro with Tom Monte, due from Houghton Mifflin in September."

Four years ago, Dr. Sattilaro, President of the Methodist Hospital in Philadelphia, was dying of cancer. Today, after changing his lifestyle [primarily by adopting a macrobiotic diet, including brown rice, miso soup, and sea vegetables,], prescribed by Deny Waxman and Michio Kushi, he is totally free of this disease. Several photos show Dr. Sattilaro–and two x-rays of his upper body. Address: 1. M.D., Philadelphia [Pennsylvania].

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7589. **Product Name:** [Safflower Soymilk (Plain, or Cocoa)].
Foreign Name: Benibana Tônyû (Pureen, Kokoa).
Manufacturer's Name: Soken-sha K.K.
Manufacturer's Address: 724 Katakura-cho, Kanagawa-ku, Yokohama-shi 221, Japan.
Date of Introduction: 1982 August.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. Sôken-sha introduced Benibana Tônyû (in plain and cocoa flavors) in Aug. 1982 in 200 ml long-life packs and distributed it nationwide.

7590. *Toyo Shinpo* (*Soyfoods News*). 1982. [Feeding okara to escargot (land snails)]. Sept. 1. [Jap]
• ***Summary:*** Wikipedia (June 2013) says of Escargot: "Escargot is a dish of cooked land snails, usually served as an appetizer in France and in French restaurants. The word is also sometimes applied to the living snails of those species which are commonly eaten in this way." The species most often eaten is *Helix pomatia.*

This *Toyo Shinpo* article states that these snails eat okara and any other vegetable foods, such as cabbage, daikon, carrots, Chinese cabbage, rice bran, leftover rice, bread, noodles, etc.

The snails are being sold to first class hotels and restaurants.

7591. Shurtleff, William; Aoyagi, Akiko. 1982. History of soybean crushing: Soy oil and soybean meal. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 157 p. Sept. 16. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction: Description of soybeans are transformed into oil products and meal. Etymology. Basic concepts. Terminology. Processing (brief description of modern hexane solvent extraction and refining). History of soybean crushing worldwide: Oil and meal production and trade. History of soybean crushing in China (to 1949): Origins and early references, early observations by foreigners, the crush-stone mill and wedge press, uses of soy oil in China. History of soybean crushing in Manchuria (to 1949). History of soybean crushing in the People's Republic of China (1949-1980's). History of soybean crushing in Japan. History of soybean crushing in Europe: Early references and research (1855-1909), introduction of soy oil and meal to Europe (1907-1919), the interwar period (1920-1939), the war and postwar period (1940-1959), the modern era (1960-1982). History of soybean crushing in the United States–oil and meal: Early references and research (1893-1909), introduction of soy oil and cake to America (1910-1919), establishing America's soybean crushing industry (1920-1929), takeoff of the U.S. soybean crushing industry (1930-1939), soybean oil and meal during World War II and the 1940's, modern soybean crushing and oil refining processes, developments during the 1950's (oil), soybean meal and the American meat-centered diet, 1960-1982, problems with the meat centered diet and feedlot system, changes in meat and poultry consumption, new protein models, the future. History of soybean crushing in Third World countries: Third World–three routes to soy oil use, Brazil, Mexico and Argentina, India, Sri Lanka. Address: Lafayette, California. Phone: 415-283-2991.

7592. Martin, Debra. 1982. 1000 years old and very new [Shin-Mei-Do Miso]. *Comox District Free Press* (*Canada*). Sept. 17. Friday.
• ***Summary:*** Six years ago, Lulu and her husband, Yoshi Yoshihara moved to Denman Island from Vancouver, where Yoshi worked as a projectionist for Pacific Cinemathique. He continued to commute from the Island to work, seeing his family only once a week–an arrangement that was not satisfactory. So they both decided to figure out a way to make a living on the island.

An idea came from a cookbook [*The Book of Miso*] she purchased in Seattle [Washington] at a Japanese supermarket. They already knew about miso, so they tried making some small experimental batches at home. But they soon decided the only way to really learn the process would be from a Japanese master.

"Lulu took their four-year-old son and went off to Japan for eight months, staying with Yoshi's mother, and then with a family that operated a large miso factory in Iida City, located in a mountainous part of Japan with a climate similar to Denman Island's.

"She was fortunate to be taken under the wings of a miso master who had worked at the factory for 40 years and was in charge of the hand-made miso division there."

"This hands-on experience gave her an idea of what the koji should look like, taste like, and smell like, knowledge hard to gain from books.

Lulu and Yoshi started making miso in earnest from 1979. Photos show: (1) Yoshi standing by a stack of koji trays in sauna-like koji incubation room. (2) Lulu at her stove making miso soup. (3) Yoshi standing on a ladder by a wooden vat of miso, handing a pail down to Lulu. (4) Different Shin-Mei-Do miso products, packaged and bulk.

7593. Ohta, Teruo. 1982. Tenpe wa kôtanpaku shokuhin [Tempeh is a high-protein food]. *Zenkoku Shokuhin Shinbun* (*National Food News*) No. 433. Sept. 21. [Jap]
• ***Summary:*** The oil in tempeh becomes rancid more slowly than most oils. Tempeh starter culture is sold at supermarkets in Indonesia. The author is planning to use electrical engineering (*denshi kôgaku*) to help make tempeh starter culture. Address: Nosuisho Shokuryo Sogo Kenkyujo, Oyo Biseibutsu Bucho: National Food Research Inst. (Shokuhin

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Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7594. Rasmussen, Carol. 1982. Japan's delicacies lose nothing in translation at Star Market. *Chicago Tribune.* Sept. 23. p. N_B1 or W_B1.
• ***Summary:*** "We in the United States are known for our culinary curiosity." We're learning to eat raw fish and Japanese sushi. A good place to explore Japanese food and culture is Star Market, 3349 N. Clark St. in Chicago. The small grocery store is owned and run by two Japanese couples. It is the epitome of order, neatness, cleanliness and warm hospitality.

The various type of tofu include: (1) *"Kinu goshi"* [*Kinugoshi*], which "has been silk-screened [sic, curded as a gel, without separation of curds and whey] so that its texture is very fine like silk." (2) *"Momen goshi,* which is regular tofu." and (3) "tofu pouches" that can be stuffed with vinegared rice, cooked chopped vegetables, soy sauce and sugar [to make a type of sushi named *Inari-zushi*].

7595. Hara, Toshio; Ueda, Seinosuke. 1982. Regulation of polyglutamate production in *Bacillus subtilis* (*natto*)*:* Transformation of high PGA productivity. *Agricultural and Biological Chemistry* 46(9):2275-81. Sept. [30 ref. Eng]
• ***Summary:*** The viscous or "sticky" material in natto, produced by *Bacillus subtilis,* consists of polysaccharide (levan-form fructan) and polyglutamate (PA). Address: Dep. of Food Science & Technology, Faculty of Agriculture, Kyushu Univ., Hakozaki, Fukuoka 812, Japan.

7596. Leviton, Richard. 1982. In a small bright building: Cottage soy industries on Vancouver Island. Colrain, Massachusetts. 15 p. Sept. Unpublished typescript.
• ***Summary:*** Discusses Sooke Soyfoods (Wayne Jolley), Thistledown Soyfoods, Shin Mei Do Miso, and Metta Tofu. Note: This article was commissioned by *East West Journal* but never paid for or published. For a good summary, see: *Soyfoods.* 1983. Winter. p. 36-37. "Cottage soy industries thrive on Vancouver Island."

Concerning Shin Mei Do on Denman Island: Lulu Yoshihara recalls: In 1976 we picked up *The Book of Miso* at Uwjimaya department store in Seattle [Washington]. It didn't look like it would be all that hard [to make miso] or take that much time or technology. Plus miso wasn't perishable and didn't need to be marketed right away. Ray [Lipovsky] was already here doing tofu and that gave us the idea we could do a little home soy business on the island and make a living. So I went to Japan in 1977 to find a miso teacher. We've been together since 1971. Address: Colrain, Massachusetts 01340.

7597. Miyako Oriental Foods, Inc. 1982. Re: Invitation to open house of new miso factory (Folded card). Baldwin Park, California. 2 panels. [Eng; Jap]
• ***Summary:*** One panel is in English, the facing panel in Japanese. "You are cordially invited to an open house of our new Miso factory... on Friday, September 24, 1982 5:00 p.m. to 7:00 p.m., 4287 Puente Avenue, Baldwin Park, California 91706. Phone: (213) 962-9633. Sadao Nakagaki, Chairman. Noritoshi Kanai, President. Teruo Shimizu, Factory Manager." At the bottom of the English panel is a map showing the way to the new facility. Address: Baldwin Park, California.

7598. Quirk, Beatrice Taylor. 1982. Ah, so you want to try miso: A mountain couple is practicing the ancient art of making this Japanese food. *Carolina Lifestyle.* Sept. p. 23-25.
• ***Summary:*** Describes the work of John and Jan Belleme, and their American Miso Co. in Rutherford County, North Carolina. John Belleme is a 39-year-old Florida native who worked as a research biologist for the Veterans Administration in Miami, dealing mostly with cancer and chemotherapy. Thinking that there had to be a better way to deal with it, John started reading about natural foods, natural lifestyles, and traditional medicines in traditional cultures. In the mid-1970s the Bellemes adopted a macrobiotic diet, which is based on grains and includes only foods from the local environment. They eat no animal foods or dairy products, but they do eat fish.

Then in 1979 they left for Japan to study miso making with Takamichi Onozaki and his family, with whom they lived and worked for 8 months–in their 300-year-old home. They then returned to North Carolina, and spent almost a year building their miso factory, which began production in Sept. 1981. They made about 90,000 lb of light and dark miso in the first 9 months of operation.

A photo shows Jan Belleme and Japanese helpers preparing rice to make koji. Contains recipes for Light miso dressing for salad, Miso-broiled fish, and miso soup. Address: Charlotte, North Carolina.

7599. Ushijima, S.; Hayashi, K.; Murakami, H. 1982. The current taxonomic status of *Aspergillus sojae* used in shoyu fermentation. *Agricultural and Biological Chemistry* 46(9):2365-67. Sept. [11 ref]
Address: 1-2. Central Research Laboratories, Kikkoman Corp., 399 Noda, Noda-shi, Chiba 278, Japan; 3. The Brewing Society of Japan, Takinogawa 2-6, Kita-ku, Tokyo 114, Japan.

7600. Hirabayashi, Satoshi. 1982. Re: Enclosing documents you requested in your letter of July 31. Letter to William Shurtleff at Soyfoods Center, Oct. 1. 3 p. Typed, with signature on letterhead. [1 ref]
• ***Summary:*** He encloses photocopies of 12 Japanese-language documents that Shurtleff had been unable to find in the USA and requested from Kikkoman. He also cites

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three documents that were requested but that Kikkoman was unable to find.

Also tells Shurtleff how to obtain a copy of the cookbook *Practical Shoyu Cooking: Delicious Dishes with Japanese Soy Sauce,* by Chu Shinojima and Tamako Ashihara, It is distributed in the USA by Japan Publications Trading Co., which has offices in San Francisco and New York City. Address: Manager, International Operations Dep., Kikkoman Corp., 25 Kanda Nishiki-cho 1-chome, Chiyoda-ku, Tokyo 101, Japan. Phone: 03-233-5610.

7601. *Toyo Shinpo* (*Soyfoods News*). 1982. Tônyû ôte meekaa. Zokuzoku to setsubi zôkyô. Gosanke no shea arasoi shiretsu. Shijô 40% nerau Kibun. Kôchô no Nisshin wa jisha seisan e [Japan's biggest soymilk manufacturers: They have greatly improved their capabilities. The 3 big makers (Kibun, Marusan, Mitsubishi) are competing vigorously for market share. Kibun is aiming at 40%. Nisshin plans to produce its own soymilk]. Oct. 1. p. 1. [Jap]

• ***Summary:*** Sales of soymilk in Japan have doubled every year. By August of 1982 soymilk sales had already reached 5,000 million yen, which is double that of last year. Kibun is constructing two new soymilk plants; one each in Gifu prefecture and Hiroshima prefecture. They are expected to open in April 1983 and each plant will be able to produce 300,000 cartons per day. After these two plants open, Kibun will have a total production capacity of 1,200,000 cartons/day which is 40% of Japan's total soymilk industry capacity.

In June Okazaki Marusan completed the equipment to produce soymilk in large cartons (500 ml each). They now produce 300,000 cartons/day of 200 ml each, and 4,000 cartons/day of 500 ml. So far this year, up to September, Marusan has sold about 3,000 million yen of soymilk. They are hoping to expand their market share to 30% from their former 10%.

Mitsubishi Kasei Shokuhin was founded in February of this year; it became an independent company from Mitsubishi Kasei Kogyo. Their production at Kashima in Ibaraki prefecture is 270,000 cartons/day, each 200 ml. Mitsubishi is constructing a new plant at Kurashiki (Mizushima), in which they can produce 300,000 cartons/day (200 ml each). After these two new plants open Mitsubishi will have a capacity of 600,000 cartons/day. After the spring of 1983 they expect to be Japan's second largest soymilk manufacturer, with a capacity of 600,000 cartons/day and sales of 5,000 million yen/year. They are planning to open two more plants in the Chukin and Kyushu areas next year.

Meiji Nyugyo started to sell soymilk in March 1981 with a brand made by another company and private-labeled for them. In July 1982 they opened a new plant of their own. By March 1983 they hope to have soymilk sales of 1,500 to 2,000 million yen. Their former sales were 500 million yen. They have plans to expand production and hope to become the industry's second largest producer as soon as possible.

7602. Miko Seisakusho. 1982. Nigari tofu kikai ni [Machine for making natural nigari tofu (Ad)]. *Toyo Shinpo* (*Soyfoods News*). Oct. 11. p. 8. [Jap]

• ***Summary:*** A full page ad. A photo shows the machine.

7603. Noda, F.; Sakasai, T.; Osaki, K.; Akao, T. 1982. [Quick brewing of soy sauce]. *Japanese Patent* 1,120,398. Oct. 28. [Jap]*

• ***Summary:*** Attempts to shorten the time for soy sauce production have included a quick hydrolysis of raw materials with no or low salt content; another was a process divided into anaerobic lactic acid fermentation, aerobic yeast propagation, and anaerobic alcohol fermentation.

7604. Tallent, W.H. 1982. UJNR Toxic Microorganisms Panel. *Northern Regional Research Center, Notes from the Director* No. 1524. p. 3. Oct. 29.

• ***Summary:*** The meeting was held at the Food Research Inst., Univ. of Wisconsin, from Oct. 17-22. United States was represented by Dr. C.W. Hesseltine, NRRC. "In scientific sessions, 2½ days were devoted to mycotoxin and bacterial toxins. After a tour of the Biotron on the University of Wisconsin Campus, the panelists visited the Kikkoman plant at Walworth, Wisconsin. This plant in 10 years has doubled in size; it now uses 30,000 acres of soybeans and at least as many acres of wheat in soy sauce (shoyu) production. The operation is controlled by 6 team leaders, who develop consensus decisions with others in their groups. The terms 'foreman' and 'supervisor' are never used. Turnover of employees is only a tenth that of American companies, and absentee figures are only a fifth of that found in industries in the surrounding area. Last year production of shoyu amounted to 5 million gallons in this plant. Shoyu is sold in various quantities, up to 50-gallon drums; these larger quantities are sold to other [food] companies for flavoring purposes.

Note: Lite shoyu is being discussed. This plant supplies the U.S., Canada, and parts of Europe. The fermentation tanks are 17,000 gallons capacity. Address: Center Director.

7605. Chico-San, Inc. 1982. Would the *real* Tamari please stand up!? (Ad). *New Age Journal* (*Boston, Massachusetts*). Oct. p. 7.

• ***Summary:*** Chico-San thanks San-J for exposing the practice of labeling soy sauce as Tamari. Chico-San's Tamari is real! "It contains no wheat and is brewed naturally from only whole soybeans, water and sea salt." Address: P.O. Box 1004, Chico, California 95927.

7606. Kanasugi, Goro. 1982. Yokubatta negai [A greedy wish]. *Daizu Geppo* (*Soybean Monthly News*). Oct. p. 8-9. [Jap]

• ***Summary:*** The author, vice-president of the Japanese

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Natto Association, would like to see tempeh become popular throughout Japan. Address: Zenkoku Natto Kyodo Kumiai Rengokai, Fuku Kaicho.

7607. Newell, C.A.; Hymowitz, T. 1982. Successful wide hybridization between the soybean and a wild perennial relative, *G. tomentella* Hayata. *Crop Science* 22(5):1062-65. Sept/Oct. [22 ref]

• ***Summary:*** "Hybrids between the soybean [*Glycine max* (L.) Merr.] and a wild perennial relative, *G. tomentella* Hayata, were obtained for the first time through in vitro ovule culture. The F-1 plants were vegetatively vigorous and resembled the wild male parent morphologically. The chromosome numbers were consistent with a hybrid origin. The plants flowered profusely but were sterile." The use of wild perennial *Glycine* species might become feasible for broadening the germplasm base of the soybean.

"The genus *Glycine* Willd. as currently delimited is divided into two subgenera, *Glycine* and *Soja* (Moench) F.J. Herm." Within the subgenus *Glycine,* five species are found only in Australia: *G. canescens, G. clandestina, G. falcata, G. latifolia,* and *G. latrobeana. G. tabacina* is found in Australia, South China, Taiwan, the Ryukyu Islands, Mariana Islands, and other South Pacific Islands. *G. tomentella* is found in Australia, South China, Taiwan, Philippines, and Papua New Guinea.

Note: This is the earliest document seen (May 2001) describing wide hybridization and the successful transfer of genes from one species of *Glycine* to another, i.e., between the cultivated soybean (*Glycine max*) and its wild perennial relative. Address: Dep. of Agronomy, Univ. of Illinois, Urbana.

7608. Omori, Ichiro. 1982. Re: History of soy oil extraction in Japan using mechanical pressure. Letter to William Shurtleff at Soyfoods Center, sent via Ms. Kojima of American Soybean Assoc., Tokyo, Oct.–in reply to inquiry. 1 p. Typed.

• ***Summary:*** Year–Company–City–Capacity

1905. Inoue Mamekasu Seizôjo. Kobe. 60 tonnes/day.

1906. Nippon Mamekasu Co., Ltd. Nagoya. 10 tonnes/day.

1908. Yamamoto Hiryo-ten. Kamezaki, Aichi prefecture. 10 tonnes/day.

1909. Sugihara Shoten Handa Branch. Handa, Aichi prefecture. 10 tonnes/day.

1910. Matsushita Mamekasu Seizojo. Yokohama. 120 tonnes/day.

1910. Mansan Mamekasu Seizojo. Handa, Aichi prefecture. 45 tonnes/day.

1913. Yokohama Mamekasu Seizo Co., Ltd. Yokohama. 100 tonnes/day.

1915. Iguchi Seiyujo. Kamezaki, Aichi prefecture. 90 tonnes/day.

1915. K.K. Marujyu Shokai. Moji, Kyushu. 50 tonnes/day.

1917. Suzuki Mamekasu Seizojo. Yokohama. 20 tonnes/day.

1917. Toyo Mamekasu Seizo Co., Ltd. Kobe. 25 tonnes/day.

1917. Miike Seiyu Shokai. Miike, Kyushu. 35 tonnes/day.

Note 1. Mamekasu means "soybean meal or cake." Hiryo means "fertilizer." Daizu means "soybean." Seiyu means "oil mill." Note 2. Nikkan Yushi is a trade newspaper company that publishes "Daily Oils and Fats" newsletter and a bimonthly newsletter titled "Proil." The latter focuses on soy protein, wheat gluten, and the oil industry. Address: President, Nikkan Yushi, Japan.

7609. Omori, Ichiro. 1982. Re: History of soy oil extraction in Japan using solvents. Letter to William Shurtleff at Soyfoods Center, sent via Ms. Kojima of American Soybean Assoc., Tokyo, Oct.–in reply to inquiry. 1 p. Typed.

• ***Summary:*** Year–Company–City–Capacity

1913. Okada Hiryo-jo. Kamezaki-cho, Aichi prefecture 35 tonnes/day.

1913. Hirano Daizu Kogyo Co., Ltd. Imazu, Hyogo prefecture. 70 tonnes/day.

1914. Nihon Kairyo Mamekasu Co., Ltd. Kawasaki. 40 tonnes/day.

1914. Daizu Hyohaku Co., Ltd. Matsumoto, Nagano prefecture. 30 tonnes/day.

1914. K.K. Housan Mamakasu [Mamekasu?] Seizojo. Handa, Aichi prefecture. 10 tonnes/day.

1914. Gosan Shokai. Osaka. 20 tonnes/day.

1915. Osaka Arukari Co., Ltd. Nagoya Plant. Nagoya. 50 tonnes/day.

1915. Otaru Seiyu Co., Ltd. Otaru. 9 tonnes/day.

1917. Yokohama Seiyu Hiryo Co., Ltd. Yokohama. 25 tonnes/day.

1917. Suzuki Shoten Seiyubu. Shimizu. 500 tonnes/day.

1917. Suzuki Shoten. Naruo Plant. Naruo, Hyogo prefecture. 250 tonnes/day.

1917. Tokai Seiyujo. Atsuta, Aichi prefecture. 20 tonnes/day.

1917. Osaka Arukari Co., Ltd. Matsumoto, Nagano prefecture. 6 tonnes/day.

1917. Abe Mameabura Seizojo. Nagoya. 80 tonnes/day.

1917. Nihon Seiyu Co., Ltd. Kobe. 40 tonnes/day.

1917. Nihon Seiyu Co., Ltd. Takasago, Hyogo prefecture. 10 tonnes/day.

1917. Nikka Seiyu Co., Ltd. Wakamatsu, Kyushu. 100 tonnes/day.

Note: Mamekasu means "soybean meal or cake." Hiryo means "fertilizer." Daizu means "soybean." Seiyu means "oil mill." Address: President, Nikkan Yushi, Japan.

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7610. Saio, K.; Kobayakawa, K.; Kito, M. 1982. Protein denaturation during model storage studies of soybeans and meals. *Cereal Chemistry* 59(5):408-12. Sept/Oct. [8 ref]
Address: National Food Research Inst., Ministry of Agriculture, Forestry, and Fisheries, 2-1-2 Kannondai, Yatabe, Tsukuba, Ibaraki, 305 Japan.

7611. Sugano, M.; Ishiwaki, N.; Nagata, Y.; Imaizumi, K. 1982. Effects of arginine and lysine addition to casein and soya-bean protein on serum lipids, apolipoproteins, insulin, and glucagon in rats. *British J. of Nutrition* 48(2):211-21. Oct. [31 ref]
Address: Lab. of Nutrition Chemistry, Kyushu Univ. School of Agriculture, Fukuoka 812, Japan.

7612. Tajiri, Takashi. 1982. Jinkô taiyô tôshô-sha ni yoru mame-rui moyashi saibai no kairyô. VII. [Studies on cultivation and keeping quality of bean sprouts. VII. Improvement of bean sprouts production by the intermittent treatment of ethylene gas]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 29(10):596-604. [Jap]*
Address: Lab. of Food Process, Faculty of Agriculture, Kinki Univ., Kowakae, 3-4-1 Higashi-Osaka-shi, Osaka-fu, 577 Japan.

7613. Ikeda Sangyo Co., Ltd. 1982. Tennen nigari tofu [Machine for making natural nigari tofu (Ad)]. *Toyo Shinpo* (*Soyfoods News*). Nov. 1. p. 6. [Jap]
• ***Summary:*** A full page ad. A photo shows the machine. A similar ad by this same company appeared in the Dec. 1 issue (p. 5).

7614. Takahashi Shoten 1982. Tennen nigari tofu [Machine for making natural nigari tofu (Ad)]. *Toyo Shinpo* (*Soyfoods News*). Nov. 1. p. 8. [Jap]
• ***Summary:*** A full page ad. A sidebar mentions the Association for Respecting Natural Nigari Tofu.

7615. *Toyo Shinpo* (*Soyfoods News*). 1982. Beikoku no tofu buumu [Tofu boom in the United States]. Nov. 1. p. 1. [Jap]
• ***Summary:*** About 160 companies are now making tofu in the USA.

7616. Nelissen, Tomas. 1982. Re: Jakso and soyfoods in the Netherlands. Letter to William Shurtleff at Soyfoods Center, Nov. 9. 2 p. Typed, with signature on letterhead.
• ***Summary:*** "Maybe you still remember me from the time we were in Japan; once we met at Kichijoji station, next to Mitaka station. You tasted my genmai [brown rice] miso at a coffee-bar (next door).

"At this moment I am living in Holland with my wife Yvonne and two children. We set up a farm called Jakso. The whole idea is about becoming self-sufficient from the 30 hectares of land (including 6 hectares of fruit trees), a sourdough bakery, a soyfoods workshop, a futon workshop and educational activities.

"For the three workshops we "cut" the big barn into two halves and made a third floor. We built a very nice wood-burning bakery which produces all kinds of bread, cookies and savories. The soyfoods workshop makes tempeh and tofu, as well as seitan. Year-round we produce an average of about 1,500 pieces of tempeh a week at 210 grams each, about 50 kg of tofu a day and a little less than 100 kg of seitan.

"We distribute our products all over Holland... in a 100 km circle around the farm. Our future products will be miso, shoyu, amasake and mushrooms. These are the products we studied in Japan for about 4 years...

"There are 12 people working on the farm (plus 7 children)... The meals are on a macrobiotic base." Address: Director, Jakso, St. Natuurlijke Land- en Tuinbouw, Voorne 13, 6624 KL Heerewarden, Netherlands. Phone: 08877-2189.

7617. *Toyo Shinpo* (*Soyfoods News*). 1982. Seibu Shokuhin-kan ni okeru... [In newly opened Tokyo food department store there are two tofu retail shops]. Nov. 21. [Jap]
• ***Summary:*** In the newly opened Seibu Food Department Store (Ikebukuro, Tokyo) there are two tofu retail shops. One is "Homemade Tofu Shop Asahi" (*Tezukuri Tofu no Mise Asahi*) where Japanese soybeans and natural nigari are used to make fresh tofu in the department store. The price, 180 yen per cake, is high.

The other one is Tanaka Tsune; they bring tofu from Kyoto every morning. The price, 190 yen per cake, is also high. Yet both are selling very well.

7618. Aihara, Herman. 1982. History of work with macrobiotics and Chico-San (Interview). Conducted by William Shurtleff of Soyfoods Center, Nov. 29. 5 p. transcript.
• ***Summary:*** Oroville is located about 23 miles southeast of Chico, California. Shurtleff visited Herman Aihara at his home with a tape recorder and about 75 questions.

The first East West Institute in New York City was established in about 1960 by Lao Shastri, a woman disciple of George Ohsawa. She studied Sanskrit at Cambridge, and was a distinguished scholar and an authority on the subject. It was her idea to have such an institute. She met Ohsawa in India and he advised her to stop eating sugar. She was in New York City when Ohsawa was there; he stayed at the Riverside Buddhist Academy, a cultural center. She was a very aggressive woman but very quiet, and she wore a sari. She convinced famous people to be directors of the Institute. She lived at what became Herman's house before Herman came to the USA. She died while relatively young, not long after late 1961.

In 1965, about 4 years later, Michel Abehsera, re-opened

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and activated the East West Institute.

Lima Ohsawa's maiden name was Sanae Tanaka. Her second marriage was to George Ohsawa.

Ohsawa's first name was Nyoichi, not Joichi. Yukikazu was has original first name, written with the same Japanese characters. He just took "Georges" as his French name. Larry Korn says Joichi became "Georges."

The village was named "Hi no Haru." Ron Kotzsch got it wrong. Herman has heard this 100 times.

The correct spelling of Kaibara's given name is Ekiken, not Ekken.

Herman does not know of Lima Ohsawa's daughter, Fumiko. But he heard that her second child, Mari, died of excess salt.

The system of yin-yang (*in-yo*) was first used by Ohsawa in about 1929 in a book of lectures entitled *Shokuyo Kogi Roku* (*Lectures on Macrobiotics / Macrobiotic Studies*); he has a copy at home. He was still working in the Shokuyo-kai. Ask Hashimoto Masanori, who is doing a lot of research on Ohsawa and early macrobiotic history, at Nippon CI in Tokyo.

Before Ohsawa's first visit to the United States there was a little bit of talk about macrobiotics with Michio Kushi at Michio's apartment, with a few people coming in but no real lectures. So Ohsawa's first series of lectures was the first real transmission of macrobiotics to the USA. Michio and Herman did not know much about macrobiotics before Ohsawa's first visit. Herman studied with Ohsawa in Japan for only 1 month, and Michio had met Ohsawa only 3-4 times. Herman came to the USA to study the helicopter aviation industry, not to teach macrobiotics; he studied at a technical institute in Brooklyn. However Herman read a lot of Ohsawa's books in Japan. So when Herman came to the USA he was personally very interested in macrobiotic philosophy (not so much in the diet, but with no thought of teaching).

Aveline Kushi came to the USA a long-time student of Ohsawa. She believed the diet was very important and she influenced Michio.

After Ohsawa's first series of lectures, Herman got interested in teaching macrobiotics. Why did Ohsawa stay with Harman? Most others were afraid of him. It is not correct to say that Herman was Ohsawa's closest student. Michio was also close because of lots of correspondence he had had with Ohsawa. Ohsawa tried to convince Michio of the value of macrobiotics.

When did Michio change careers? He had been at Columbia University for about 1 year. Then, on his own, he got the idea of working for world government ["a one-worlder"], to promote "one peaceful world. Herman has a draft of Michio's paper on this subject, including publications and schools, by about 1952-53. Michio was in Europe in 1952. Ohsawa said that "One Peaceful World" must include diet. At that point Michio started his serious interest in macrobiotics. Michio was initially involved in business.

In 1955 Azuma, a small gift shop selling Japanese handcrafts, was opened at 802 Lexington Ave. at 62nd St. by Cornellia and Herman Aihara, Michio, and Roland Sato. Michio focused his efforts on this business–not on teaching macrobiotics. In 1956 Michio and Herman started Ginza, a similar gift shop down town at 9 West 8th Street; they did not include Roland Sato who was very angry at this time. Both of the gift shops were very successful. They were established to impress Takashimaya–a leading department store chain in Japan [see Emerson 1958]–and to prove that a branch of Takashimaya could be successful in New York City.

Michio was an interpreter in the U.S. Dept. of the Interior to guide foreign visitors; he earned $45 per day. One visitor was the director of Takashimaya, Michio convinced him to start a branch of Takashimaya in New York City. Michio then worked for Takashimaya, and eventually rose to become vice president of the branch.

Musubi was started by Alcan Yamaguchi in the fall of 1960 (not in the late 1950s), near Greenwich Village. Zen Tea House was different; it was also started in 1960, but by an American, after Ohsawa's first lectures. After that, Musubi (another restaurant) was established. Herman did not supply the carpentry (as stated in Shurtleff's draft history of macrobiotics in the USA). Miso and shoyu were served in both restaurants.

At Ginza, starting in 1956, Herman sold a little food; people came to buy food there after Ohsawa's lecture, including miso and shoyu. It was the only place in the USA you could buy macrobiotic foods. It was a back-room operation and the food was imported from Ohsawa Japan. As soon as Ohsawa started lecturing in the U.S. he imported 20 [wooden] kegs of shoyu. It was sold at intermissions and after his lectures.

Junsei Yamazaki first arrived at Chico in 1963, stopped only briefly, then went to New York City that same year. Thus, Yamazaki was not connected with Musubi in 1960, but he did help them starting in 1963, when Michio was managing the shop at a new location. In 1960 Herman sometimes helped Alcan Yamaguchi at Musubi.

The first summer camp on Long Island was about 2 months long, with lectures by Ohsawa only on weekends. Some people stayed during the week. 1,000 to 2,000 people attended.

The Ohsawa Foundation in New York City was founded in 1961 by Michio, Irma Paule, etc. Herman was in Europe at the time. He left for Europe in about Jan/Feb. of 1961 and returned in the fall. Then he was elected president of the Ohsawa Foundation.

Herman's first macrobiotic publication was *Macrobiotic News,* which started in 1960; its maximum circulation was several hundred. It continued until he moved to Chico in 1961, and then was re-continued.

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The macrobiotic periodical *Macrobiotic Monthly* was started in Los Angeles in 1965 by Herman and Lou Oles. Its title then changed into the *Macrobiotic.* It ceased publication in 1978. Its maximum circulation was over 1,000.

Publishing at Chico started in 1962. Herman's present periodical is *GOMF News,* which has a circulation of about 650. Concerning books that Herman and Cornellia have written: *Miso and Tamari* has sold about 10,000 copies (lots through Nutribooks). *Soybean Diet* has sold about 10,000 copies. *The Dô of Cooking* (1972, four seasonal volumes) has sold about 10,000 copies. *The Calendar Cookbook* (1979) has sold about 5,000 copies. The *Chico-San Cookbook* was first published in 1972. But *Zen Cookery* has sold about 50,000 copies.

Attendance at French Meadows summer camps was about 100 to 200. Address: Oroville, California.

7619. Aihara, Herman. 1982. History of work with macrobiotics and Chico-San. Part II (Interview). Conducted by William Shurtleff of Soyfoods Center, Nov. 29. 5 p. transcript.

• ***Summary:*** Continued: Chico-San imported their first Japanese foods from Herman personally. At that time, there was no Muso and no Nippon CI. Ohsawa Japan (which started in about 1965) was the trading / export company and Nippon CI was devoted to education. Before Muso was "Three Boys," the "Three L" (*San-L*) company. Ohsawa told them to take charge of exports. Then Mr. Okada took over from them. Osaka was PR and education. "Three L" (which started in about 1962 in Osaka) was whom Chico-San was importing from. George Ohsawa kept a careful watch over what was being exported from Japan. Chico-San later imported from both Muso (Osaka) and Ohsawa Japan (Tokyo). Note: Did Ohsawa have two trading companies? If so, why?

The first edition of *The Book of Judgment* was printed in Japan in about 1956, then revised in 1966. There is no publication date in the book. This book came after *Zen Macrobiotics.* It is actually *The Philosophy of Oriental Medicine* (subtitled The Book of Judgment), probably first written in French.

Herman has just started writing a biography of Ohsawa, but he is too busy, so it will not be finished for a long time.

The Ohsawa Foundation in Paris was started by 1956 by George Ohsawa. The Ohsawa Foundation in Tokyo started before 1960. The Ohsawa Foundation in Los Angeles was started in 1965 by Lou Oles, an older Jewish trumpet player. The Ohsawa Foundation of New York was founded in 1961 by Michio Kushi and Irma Paule. The name "GOMF" was coined in 1970.

Herman has a green 8½ by 11 inch edition of *Zen Macrobiotics.* Herman says the date was about 1960. It shows that the Ohsawa Foundation then existed in New York, Paris, Brussels, and Tokyo. It also contains lots of recipes. I copied some pages. Copyright date of the fifth edition was 1966, Ignoramus Press, the Ohsawa Foundation, 1424 N. Curson Ave., Los Angeles.

Michio Kushi was Ohsawa's senior student in the sense that he came to America first. I should omit the concept that Herman was Ohsawa's closest associate. Herman and Michio simply have different styles. Michio has broad appeal; he has started a mass movement, and is more businesslike. Herman appeals to a small group, deeply; he works more with individual students.

Lou and Shayne Oles got involved with macrobiotics during the second summer camp, in 1961. They traveled with the group from New York to Chico. He was a famous trumpet player, worked with Benny Goodman. In California he emphasized publishing more than his trumpet. His first publication was titled *Spiral;* 1-2 issues were published. Then *Macrobiotic Monthly.* After Beth Ann Simon's death, Chico-San was separated from educational work. Lou Oles went to Los Angeles and that year established the Ohsawa Foundation; he did education and publication. He published three books: *Zen Macrobiotics, Book of Judgment,* and *Guidebook for Living.* Jacques DeLangre helped him. Lou died in 1967 of cancer. He got depressed when George Ohsawa died; he started drinking coffee, which may have activated his cancer growth. Shayne continued his work. Lima asked Herman to be president, so he traveled to Los Angeles once a month. In those days they sold lots of *Zen Cookery* books. The Ohsawa Foundation in Los Angeles closed in about 1970.

Yes, Ohsawa was age 72 when he died. He died April 24 (Japan date) in Japan.

The spirallic multidimensional scale from yin to yang was Peter Milford's idea, not Herman's. It is generally a linear scale.

Infinity Foods, founded by Howard Rower, is still in existence. Herman thinks they started in about 1962, and they imported foods from Japan.

Chico-San established only one organic grower–the Lundbergs for rice. The controversy was complicated. The Lundbergs and Bob Kennedy of Chico-San made a contract. Eventually there was a lawsuit between Chico-San and Lundberg [but it was resolved before it went to court]. Herman thinks Lundberg sued Bob Kennedy.

In 1963 Herman went on the lecture circuit with Bob Kennedy as they tried to educate people about the macrobiotic foods that Chico-San was selling.

The first summer camp without Ohsawa was 1967 (or perhaps 1968).

Macromuse is published in Washington, DC, by Michael Rosoff. It started in 1981.

Chico-San was founded in Jan. 1962. In Nov. 1962 Chico-San's first location (a retail store) opened, downstairs with hearing aid company. It moved upstairs to a different location and opened on 6 March 1962; they had an open

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house.

In 1973 the Aiharas established the Vega Institute, a residential program for macrobiotic studies in San Francisco. Then in 1974, they moved the Vega Institute and the George Ohsawa Macrobiotic Foundation to Oroville, a town southeast of Chico, where the Aiharas continued their work, together with their students. Herman and Cornellia Aihara moved to Oroville instead of Chico because it was more rural and because Peter Milbury, a high school teacher in Oroville, knew of some good land. The Ohsawa Foundation in San Francisco bought the land, and then they moved. Herman owns the Vega Institute on Oak Street.

Junsei Yamazaki came to the USA in 1963. Ohsawa told him to help Americans grow brown rice. First he tried in New York, but there was not enough sun. He originally graduated with a degree in fermentation from a major Japanese university, but he then became a rice farmer. Then in New York City he went to work with Michio at Musubi near Takashimaya–for little pay. The Chico group invited him to Chico. He worked on the rice cake machine–again poor pay. Like Herman he also worked with orchids.

In 1971 Herman invited Noboru Muramoto to be on his lecture trip. His first guest was Alcan Yamaguchi in 1970. Herman read Muramoto's articles in a Japanese magazine. He had family problems in Japan and was happy to stay here. Herman was his guarantor, and he became a permanent resident.

Chico-San began baking in March 1962 in an upstairs store; Herman was the first baker.

Herman talked with Michio Kushi this summer. They have a friendly relationship but both are very busy.

Junsei Yamazaki's plans with Chico-San are not clear; he may end up working on his own.

A good Japanese-language biography of George Ohsawa is *Kakumei-ji,* by Matsumoto Ichiro; he interviewed Lima Ohsawa.

Herman likes the term "a macrobiotic" better than "a macro" or "a macrobiotic student / follower."

Cornellia arrived in the U.S. in 1955.

The Ohsawa Foundation did not move from Chico to Los Angeles; it never existed in Chico–only in Los Angeles.

Overview of macrobiotic contribution. Typical Americans overemphasize the importance of protein (even though nutritionists may not agree). Most people who stop eating meat start consuming more dairy products. Macrobiotics avoid dairy products and go straight to grains plus legumes–with little mention of protein.

Mari Metz has a good color photo of Herman and Cornellia together.

Erewhon was hurt by high interest rates and inflation.

In 1960 the handbound book Zen Macrobiotics was made in Herman's apartment in New York City. In it Ohsawa used the word "syoyu" [shoyu]. He changed to tamari because when he introduced soy sauce to Europe he initially called it "shoyu." He then gave exclusive distribution rights to a European to distribute Ohsawa's selected shoyu. The man called it "Ohsawa Shoyu," but then in about 1960-61 he started importing low-quality shoyu from Japan and selling it under the same brand name. Ohsawa could do nothing to stop him. That was when Ohsawa started using the word "tamari" to refer to natural shoyu. Herman heard this story directly from George Ohsawa–whose name in Japanese is pronounced OH-sawa.

Herman says a healthy person may eat 12-16 ounces of tofu a week, but it is not recommended for cancer patients who need a diet that is more yang.

Herman came from Kyushu, moved to Tokyo at age 9. He likes natto. Address: Oroville, California.

7620. Aihara, Cornellia. 1982. Macrobiotic kitchen: Key to good health. Tokyo: Japan Publications, Inc. 140 p. Illust. Index. 26 cm.
• ***Summary:*** This book was originally published under the title *The Chico-san Cookbook* (1972). This completely revised and enlarged edition was published in Nov. 1982. Address: Chico, California.

7621. Barber, Linda. 1982. Tofu sampler. Menomonie, Wisconsin: University of Wisconsin-Stout Print Shop. 24 p. Nov. 22 cm. [7 ref]
• ***Summary:*** A saddle-stitched (stapled) booklet of creative American-style tofu recipes with an orange cover and black lettering. Contents: What is this thing called tofu? Tofu mayonnaise. Deviled tofu salad. Tofu mayo dip. Tofu cheese rolls. Tofu burgers. Chinese steamed buns with tofu. Nail soup (with heart-warming story about the hobo who came for dinner). Tofu pancakes. Tofu quiche. Easy pie crust. Tofu jumbles. Tropical tea bread. Dark mystery cake. Chocolate tofu creme. Tofu ambrosia pudding. Banana cream pudding or pie filling. Tofu cheesecake. Bread crumb crust. Tofu carrot cake. Tofu nog. Tofu peach frozen dessert. One more idea [about a beautiful geisha in Japan who used tofu externally as an aid to beauty]. A sampler of soyfood books [cites 7 books].

E-mail from Linda Barber Pike in reply to questions after she sent booklet to Soyinfo Center. 2012. May 11. "The booklet was developed for a presentation I gave to the Vocational, Technical and Adult Education meeting in Wausau, Wisconsin, November 19th, 1982. The title of my workshop was 'Creativity with Tofu... The Food of the Future,'

"The first printing was done by the print staff at the University of Wisconsin-Stout, Menomonie, Wisconsin. About 30 booklets were printed. I was a grad student earning a Masters degree in Vocational and Adult Education. I completed the degree in 1983. I used the booklet as a take home for the participants. There were about 30 home economics teachers there.

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The second printing was done about 16 years later; I was married and a teacher. I used it for my students who were enrolled in the foreign foods class, Family Consumer Science Department, Carmel High School, Carmel, Indiana, 1998. The reason the pages are out of order in this booklet, second printing (1998) is that the student print shop at Carmel High School messed up... I had about 35 students enrolled in this class. About 40 booklets were printed in second printing. This booklet is very typical of what we used to make for our students for classroom use and hopefully, the participants in both situations would take the booklet home and use the recipes! Address: Menomonie, Wisconsin.

7622. Greenwood, Rebecca. 1982. Smokey Mountain miso: Traditional and modern methods unite to create a fine domestic miso. *East West Journal.* Nov. p. 50-53.
• ***Summary:*** About John and Jan Belleme and the American Miso Co., located in the Smokey Mountains [sic, Great Smoky Mountains] in the small town of Rutherfordton, North Carolina. The company started making miso in August 1981 and now makes 5,000 pounds a month. "John has a determined air about him. You get a sense that here is a man who, if he's going to do anything, is going to do it all the way." John's main interest is in making high-quality miso.

Almost all miso sold in the U.S. today is made by a fully automated process and pasteurized. The Bellemes spent seven strenuous months studying miso-making with Takamichi Onozaki in Japan. They now have three goals in making miso: (1) Sell unpasteurized miso–which should be refrigerated. (2) Produce miso using traditional methods, including wooden vats, handmade koji, and slow, natural fermentation–rather than the faster and more commonly used forced heat method. (3) Use the high quality ingredients, including certified organically grown soybeans and rice, unrefined sea salt, and deep well water. This miso will be distributed by Great Eastern Sun Trading Co. which is partially owned by the Bellemes' friend and fellow investor, Barry Evans, of Miami, Florida.

The American Miso Co. is located on 100 acres of rural land and consists of two buildings totalling some 3,400 square feet. The small building is used for storage and milling rice. The big one is where the miso is made and aged–for up to 18 months in huge, custom-made cypress vats which hold 8,000 pounds of miso each. When each vat is full, it is topped with 1,000 pounds of rocks which add pressure during the fermentation. Presently three types of miso are aging here: three short term (Sweet White Miso, Mellow Rice Miso, and Mellow Barley Miso) and one long term (Red Brown Rice Miso).

The secret of good miso lies in making good koji–by hand. John removes up to 90% of the bran from the rice for short-term miso, but only 10-30% for long-term miso. The company's pride is its koji room.

The Bellemes' dream is greater than just making miso. They have started constructing another home on their rural property to accommodate students in a living and learning environment. Each summer they plan to hold workshops which will include miso-making, gardening, natural foods cooking, philosophy, and meditation. A large photo shows John Belleme standing by the soybean cooling table and as the huge steamer basket overhead discharges a load of freshly cooked soybeans.

Note: The Great Smoky Mountains (often shortened to Great Smokies) is a range of the Appalachian Mountains extending along the North Carolina-Tennessee boundary. A part has been set aside as Great Smoky Mountains National Park. Address: Co-director, Rocky Mountain Inst. of Macrobiotics, Boulder, Colorado.

7623. JETRO (Japan External Trade Organization). 1982. Beikoku no miso shijô [The American miso market]. Los Angeles, California: Nihon Boeki Shinkokai. 32 p. Nov. [7 ref. Jap]
• ***Summary:*** Contains detailed statistics on the total U.S. market and on individual miso manufacturers in the contiguous 48 states and Hawaii. Of the miso consumed in the USA, about 63% is consumed by Asian Americans and 37% by Caucasian Americans. The age of miso consumers: 20s 10%. 30s 32%. 40s 26%. Fifties 32%. Sixties 10%. Address: Nihon Boeki Shinkokai, Los Angeles, California.

7624. Kushi, Michio. 1982. Cancer and heart disease: The macrobiotic approach to degenerative disorders. Tokyo: Japan Publications, Inc. 224 p. Nov. Illust. Index. 26 cm. [50* ref]
• ***Summary:*** Contents: Foreword, by Michio Kushi. Foreword by Edward Esko. 1. The macrobiotic approach, by Michio Kushi. 2. Cancer and diet. 3. Diet and heart disease. 4. Macrobiotics, preventive medicine, and society. 5. Case histories. Appendixes: Food policy recommendations for the United States, by Michio Kushi. East West Foundation–Diet and health related activities, 1972-1982. Bibliography.

Many of the subchapters in this book are written by physicians. For example, William P. Castelli, M.D., contributed a 5-page original article titled "Lessons of the Framingham Heart Study." There are also articles by Robert S. Mendelsohn, M.D., Keith Block, M.D., and Christiane Northrup, M.D. Miso, tempeh, natto, tofu, and soy sauce are all discussed as foods that can be used to help in the prevention and cure of these two major diseases. Address: Brookline, Massachusetts.

7625. McNeil, Maggie. 1982. Asian markets hungry for U.S. products. *Soybean Digest.* Nov. p. 30d.
• ***Summary:*** Global economic activity is shifting from the Atlantic to the Pacific. In 1981 Asia passed Europe to become the largest market for U.S. agricultural products. Now 4 of our top 10 ag markets are in East Asia. In FY

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1981 Japan bought over $6,700 million worth of U.S. farm products. China and Korea each bought over 2,000 million, and Taiwan over $1,000 million.

7626. Oak Feed. 1982. Catalog and price list. Coconut Grove, Florida. 1 p. Back to back. 36 cm.
• ***Summary:*** At top of page 1: "Your Japanese connection: Importers and wholesale distributors of macrobiotic foods. Lowest wholesale prices available. Abbreviations: E = Erewhon. M = Mitoku. W = Westbrae. * = New product. Contents: Miso and tamari. Sea vegetables. Tea. Noodles. Condiments. Vinegars, pickles & mirin. Beans. Crackers. Miscellaneous foods. Kitchen utensils. Body care products. Medicinal products.

Miso and tamari: Onozaki miso (11 lb or 44 lb). Tamari-filled dispenser (W). Organic shoyu (Lima Ohsawa). Authentic tamari (4.75 gal. or dispenser). Hatcho miso (M). Soybean mame miso (M). Mugi (barley) miso (unpasteurized). Mugi miso (W). Genmai (brown rice) miso (W). Genmai (brown rice) miso (unpasteurized, 44 lb). Organic brown rice miso (unpasteurized, 22 lb). Kome (white rice) miso (W). Instant miso soup (light or red, M). Soba (buckwheat) miso (M). Natto miso (22 lb or 2.2 lb).

Condiments: Goma muso. Goma muso furikake (M). Tekka. Jinenjo tekka (M). Seitan condiment. Umeboshi. Roasted sesame oil. Black sesame salt. Black tahini.

Also: Barley miso pickles. Aduki beans [azuki]. Black soybeans. Kuzu. Address: 3030 Grand Ave., Coconut Grove, Florida 31333. Phone: (305) 448-7595.

7627. **Product Name:** [Marusan Soymilk Soup (Potage Style)].
Foreign Name: Marusan Tônyû Suupu.
Manufacturer's Name: Okazaki Marusan K.K. (Marusan-Ai Co., Ltd.).
Manufacturer's Address: 1 Aza Arashita, Niki-cho, Okazaki-shi, Aichi-ken 444-21 Japan.
Date of Introduction: 1982 November.
Wt/Vol., Packaging, Price: 180 ml pack. Retails for ¥130 per pack.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Article in Toyo Shinpo (Soyfoods News). 1982. Nov. 1. Marusan's 6 new products. Soymilk Soup (potage style). Shelf life: 70 days at regular room temperature. 180 gm per pack; 30 packs per case. 1 pack costs 130 yen. Heat a pack in boiling water for 5 minutes, then serve.

7628. *Toyo Shinpo* (*Soyfoods News*). 1982. [Recipes for tofu cheesecake and Chocolate cream pie]. Dec. 1. [Jap]
• ***Summary:*** A photo shows both prepared dishes.

7629. *Toyo Shinpo* (*Soyfoods News*). 1982. [Mitsubishi Kasei expands their soymilk production]. Dec. 1.
• ***Summary:*** Mitsubishi is building soymilk plants in Kurashiki-shi (city) and Ibaragi-ken (prefecture). The plants are expected to be completed sometime in the spring of 1983.

At that time Mitsubishi will become the 2nd largest soymilk maker in Japan, after Kibun. They are also planning to develop and sell yogurt-type soymilks. Their goal is 1.6 million packs per day (50,000 metric tons/year).

7630. *Toyo Shinpo* (*Soyfoods News*). 1982. [Daie, large supermarket and department store company, has launched their own brand of soymilk]. Dec. 1.
• ***Summary:*** Daie is pronounced dai-EH. The brand will be Captain Cook Cut & Balance. They have four flavors: Plain soymilk (200 ml). Coffee soymilk (200 ml). Mixed fruits soymilk (200 ml). Soymilk ice (ice cream?) (500 ml).

7631. Cauwenberghe, Marc van. 1982. Re: George Ohsawa's early work with soyfoods from 1956, especially miso and soy sauce. Letter to William Shurtleff at Soyfoods Center, Dec. 2. 5 p. [12 ref]
• ***Summary:*** The earliest document seen, written by Ohsawa, that mentions miso is the *Guide Pratique de la Medicine Macrobiotique d'Extreme-Orient,* which appeared in 1956. He arranged for miso and soy sauce to be imported to Europe from Japan and he organized the production of miso and soy sauce in France and Belgium in the Lima Foods factory by putting two of his Japanese students, Clim Yoshimi and "Jim" Takanami, to work there. Both are still living in Belgium. Clim's address: c/o Kusa, Sportstraat, 319, 9000 Gent, Belgium. The home-made tofu he sells at his store is known as the best.

Klim wrote a book in Japanese on macrobiotics titled *Shin Shokuryo-ho,* which he translated into English as Macrobiotics–The biological and physiological foundation of Zen. It contains recipes using miso, tamari, soy sauce, and tofu. "In 1972 I attended cooking classes by Aveline Kushi where she was teaching tofu making and tofu recipes. In 1974 Michio Kushi gave a month long seminar on natural agriculture and food processing. This included the preparation of tofu and miso. The seminar was published in the series 'Michio Kushi Seminar Reports.'" Address: East West Foundation, 62 Buckminster Rd., Brookline, Massachusetts 02146. Phone: 617-734-3853.

7632. Kojima, Yoshiko. 1982. Re: The kinako industry in Japan. Letter to William Shurtleff at Soyfoods Center, Dec. 13–in reply to inquiry. 2 p. Typed, with signature on letterhead. [Jap]
• ***Summary:*** There is a kinako trade association in Japan: Zenkoko Kinako Kogyo Kai (National Kinako Manufacturers Association), c/o Nihon Shokuryo Shinbun, 2-9-19, Shibaura, Minato-ku, Tokyo 108, Japan. Phone: 03 (455) 5701. Contact person: Mr. Yasuo Tanaka.

There are about 60-70 kinako manufacturers in Japan

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and 19 of them belong to this association.

The estimated annual usage of dry soybeans is about 8,000 tons and the total production of kinako is about 7,200 tons annually. Large makers are thought to have a monthly output of 25-30 tons per month.

One such large maker is Ogawa Sangyo Co., Ltd., 6-31, Edogawa, Edogawa-ku, Tokyo 132, Japan. Phone: 03 (680) 4306.

One small traditional maker is Tanaka Seifun-Jo, 3-28, Minami-Ohi, Shinagawa-ku, Tokyo 140, Japan. Phone: 03 (761) 8275.

The names and addresses of two other comparatively large makers are given.

Ms. Kojima is unable to find any estimates concerning the annual usage of soybeans for *iri-mame* (dry roasted soybeans) in Japan. Address: Associate Country Director for Human Nutrition, American Soybean Association, Tokyo, Japan.

7633. *SoyaScan Notes.* 1982. Chronology of soybeans, soyfoods and natural foods in the United States 1982 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Jan. White Wave in Colorado is the first company to get its tofu placed in the yogurt / dairy case in supermarkets.

Jan. Legume, Inc. launches Tofu Lasagna, frozen in a box. It is soon followed by Tofu Ravioli.

Jan. *The Incredible Tofu Cookbook, California Style,* by Immegart and Dansby self published.

Jan. New England Soy Dairy launches "Year of the Dog" Chinese New Year tofu promotion and nets 47% immediate sales increase.

Jan. Island Spring survives industry's first publicized tofu recall and the discovery of new tofu spoilage microorganism, *Yersinia enterolitica.*

Jan. ADM becomes sponsor of "This Week with David Brinkley" on Sunday ABC TV, with 4.4 million viewers.

Jan. Soyfoods Unlimited in California introduces tempeh burgers and ships them air freight to East Coast markets; Pacific Tempeh in California follows suit.

Feb. Yuba is first produced and sold commercially in the Western world by Ken Lee of Soyfoods of America, in Duarte, southern California. Trial production had begun in Nov. 1981.

Feb. *Soyfoods* magazine No. 6 (yellow cover) published.

Feb. Many large ads run by San-J (tamari), New England Soy Dairy, and Legume in major national trade journals.

Feb. Unicorn Restaurant in Miami has $15,000 gourmet, soy / natural foods banquet to welcome chef Ron Pikarski, who makes elegant tofu dishes and carves a swan from soy butter.

Feb. Nasoya buys $50,000 Kutter vacuum-packaging machine, which helps to popularize this packaging style for tofu.

March. *Tofu Fantasies,* by Juel Andersen published by Creative Arts.

March. USDA issues new school lunch regulations, fails to approve tofu for use.

March. Inaccurate, damaging article on iron binding by soy proteins appears in San Francisco Chronicle and Los Angeles Times.

March. Fifteen soyfoods companies exhibit at Natural Foods Expo, Anaheim, CA. Richard Leviton gives key speech. 5,000 visitors see expo. Pacific Tempeh unveils new full-color tempeh burger poster.

March. Big increase in European soyfoods companies; there are now 11.

March. Name of *The Beanfield* newsletter changed to *Soyfoods Monthly.*

March. Great Eastern Sun trading company founded in North Carolina by Barry Evans.

April. At New York's International Food Show, Quong Hop, Yeo's, and President brand soymilks, and Veda's Bayou Delights (tofu / tempeh pot pies) exhibit. ADM serves soy isolate ice cream and soymilk.

April. Quong Hop unveils its new Soy Deli marketing concept for retail using posters and tofu entrees sold frozen.

April. Jack's Beanstalk in Utah does creative work at introducing tofu to institutions. Develops 30 bulk recipe cards scaled to 100 servings.

April. ADM unveils work with glucono delta-lactone (GDL) and soy isolates in making tofu.

April. *Toyo Shimpo,* Japan's tofu newspaper, gives extensive coverage to upcoming Soyfoods Come West conference in Seattle.

May. Island Spring releases two 5-minute color video tapes demonstrating tofu cooking for showing in supermarkets.

May. Public schools in Hawaii granted permission to use tofu in meals.

May. *Soyfoods Directory and Databook.* by Shurtleff and Aoyagi published by Soyfoods Center, the first book of its type listing all soyfoods companies and industry and market statistics, 21 pages. Second edition published in June as *Soyfoods Industry: Directory and Databook,* 52 p.

May. William Shurtleff and Mark Fruin receive a grant from Kikkoman to write a book on soy sauce.

May. *Cook with Tofu,* by Christina Clarke is 2nd runner-up in R.T. French's Tastemaker awards for cookbooks.

May. Clearway Tofu sponsors the first Mother's Day Tofu Fair in Santa Cruz, California, with tofu recipe competition, music, and prizes.

June. Vitasoy USA runs color display ads for soymilk on San Francisco buses.

June. Kibun of Japan exhibits four flavors of soymilk in Tetra Pak cartons at National Restaurant Show in Chicago.

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June 16. *The New York Times* runs an article on Dieter Hannig, Director of Food Research for Hilton Hotels. His many tofu recipes on microfiche are sent to 86 Hiltons worldwide.

June. Bestways magazine begins 3-part series on soyfoods by Bonnie Mandoe.

June. *The Soy Dairy: A Way to Save the Small Farm,* by MacCormack published by Sunbow Farm.

June. *The Book of Nigari Technique* (in English) published by Yoshikawa Kagaku in Japan.

June. Metta Tofu Products in Denman Island, B.C., Canada, introduces Frozen Buddha soymilk ice cream.

June. Haarmann & Reimer debuts flavors for tofu and okara at IFT convention in Las Vegas.

June. Royal American Foods is launched in Kansas City with $1 million startup capital to sell TVP entrees, tofu-like products via multi-level marketing system.

June. Granny Goose Potato Chips does extensive radio advertising in California for a new potato chip. Ad makes frequent, positive reference to tofu. First national radio ads mentioning tofu.

June. Farm Foods presents Ice Bean at American Booksellers Convention at Anaheim, California, along with previews of their new tofu cookbook.

July. "Discover Tofu" published by *Cosmopolitan* magazine.

July. Farm Foods receives a U.S. trademark for "Ice Bean" as a soy ice cream.

July. Light Foods excites NNFA convention in New Orleans with debut of Light Links, the world's first tofu hot dogs.

July. Eden's Orchard tofu / soymilk ice cream introduced in New York by Heller Enterprises.

July. Richard Jennings announces a new formula for okara / barley tempeh; later purchases Southwest Soyfoods, relocates company in Santa Fe, New Mexico. Continued.

7634. *SoyaScan Notes.* 1982. Chronology of soybeans, soyfoods and natural foods in the United States 1982 (Continued) (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued. July. Turtle Island releases liquid tempeh starter to industry.

July. *Soyfoods* magazine No. 7 published by Richard Leviton, with 4-color cover (brown border) and glossy paper.

July. Bean Machines introduces its new Continuous Pressurized Slurry Cooker. July. *Tofu: Einladung ins Schlaraffenland* (Tofu: Introduction to the Land of Milk and Honey), by Walter Daenzer published by Verlag Bewusstes Dasein in Zurich, Switzerland (in German). Europe's third tofu book.

July. *Using Tofu, Tempeh & Other Soyfoods in Restaurants, Delis & Cafeterias,* by Shurtleff and Aoyagi published by The Soyfoods Center.

July. Soyfoods Come West, the Fifth Annual Soyfoods Convention and Expo, in Seattle draws 250 people from 12 nations and makes a profit. Plans are made for a new tofu trade group to represent the larger manufacturers. Gary Barat of Legume and Steve Snyder lead this effort to break away from SANA.

July. *Diet for a Small Planet,* by Frances Moore Lappe, a completely revised edition, published by Ballantine Books. Over 2 million copies of the book have been sold since 1971. The new edition contains many new soyfoods recipes, including 8 tofu and tempeh recipes submitted by Shurtleff and Aoyagi as part of a recipe contest.

Aug. The BBC of London, England, runs a 30-minute program on the U.S. tofu industry and market.

Aug. "Why Are Soyfoods Catching On?" by Judy Brown published in *Whole Life Times.*

Aug. Soy Protein Council in Washington, D.C. releases filmstrip on soy proteins.

Aug. *Tofu, Tempeh, Miso & Other Soyfoods,* by Richard Leviton published by Keats. 32 p., 15,000 copies printed.

Aug. Mexico announces that it can no longer meet its foreign debt repayment obligations. The first major debtor nation to do so.

Sept. New England Soy Dairy launches herb and spice preflavored tofu in colorful boxes. This is an important innovation in tofu packaging.

Sept. Miyako / Cold Mountain Miso in Los Angeles moves into new plant, has $15,000 reopening party.

Sept. Dr. C.W. Hesseltine, at USDA Northern Regional Research Lab., receives $50,000 research grant to study shelf life of tofu, tempeh, miso.

Sept. *Soyfoods Labels, Posters, and Other Graphics,* compiled and edited by Shurtleff and Aoyagi, published by Soyfoods Center. 185 p.

Sept. Soyfoods Unlimited runs full-page color ads for tempeh burgers in national magazines: *Vegetarian Times* and *New Age.*

Sept. Richard Leviton plans to move to Ann Arbor. Steve Fiering offers to recapitalize Soyfoods magazine and buy typesetting equipment. Plan dropped by Fiering in October.

Oct. Legume Inc. has its first of many public stock offerings; raises $100,000 from sale of stock plus $100,000 from a loan. Legume thus becomes the first of the new wave of soyfoods companies to be publicly owned. In Nov. 1983 Legume raised $600,000 more, two-thirds from sale of stock and one-third from debt.

Oct. Richard Leviton does "Soyfoods in the Heartland" nationwide tour with 13 programs, 11,000 miles. Net loss of $300 but lots of fun.

Oct. *Tofu Cookery,* by Louise Hagler published by The Farm's Book Publishing Co.

Oct. *Tofu Cookery* by Fusako Holthaus published by Kodansha, New York. Japan's first tofu book aimed at the

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American market. Both this and the Farm's tofu book are America's first tofu books with color plates.

Oct. Beatrice Wittels' CSC sponsors World Food Day in Philadelphia, with speech by Richard Leviton and soyfoods banquet. 200 people, including a Pennsylvania senator, attend.

Oct. South River Farm Miso Co. opens in Massachusetts as nation's second Caucasian-run miso manufacturer. It was formerly Ohio Miso Co.

Oct. "The Hilton Hotel's Gourmet Tofu Dishes" by Clare Barrett published by *Vegetarian Times.* Dishes made from Dieter Hannig's tofu recipes are shown in full color.

Nov. Unicorn Restaurant in Miami prepares three tofu turkeys for Thanksgiving Day.

Nov. Restaurant Business magazine praises Legume products as "tasty, superb."

Nov. Whole Life Expo held in New York. Farm Foods gives speech on soyfoods.

Nov. "Mainstreaming Soyfoods" by Richard Leviton published by *Vegetarian Times.*

Nov. Campbell Soup makes offer to buy Legume stock. Quaker Oats is reported to make tender to buy any of America's largest tofu makers. But nothing happens.

Nov. Pacific Tempeh introduces nitrogen-flush vacuum packaging for tempeh.

Nov. Well Bean Soy Deli in Santa Cruz changes its image to "Fast Natural Foods" after soy deli sales sag.

Nov. *East West Journal* publishes article on The Bridge tofu company in Connecticut.

Nov. Lane County Natural Foods Assoc. sponsors large, Natural Horizons Expo in Eugene, Oregon. Richard Leviton gives speech. Surata Soyfoods and Devi's Country Soy Sausages have exhibits.

Nov. *Quick & Easy Tofu Cookbook,* by Yukiko Moriyama published by Joie in Japan. Aimed at American market; over 400 full-color photos but poor English translation.

Nov. *La Magie du Tofu* (The Magic of Tofu), by Tremblay and Boyte published by Stanke in Montreal. Canada's first original tofu cookbook. It becomes a best-seller.

Nov. *Le Plaisir de la Cuisine au Tofu* by Marie Poirier published by Unisoya in Quebec, Canada.

Nov. *Cooking with Tempeh,* by Claire Seguin published by Higher Ground Press. America's second tempeh cookbook.

Dec. Robert Davis of Light Foods helps establish a soup kitchen in St. Louis; will provide okara and tofu scraps free of charge to the city's indigent.

Dec. Nasoya restyles their tofu dips as "Vegi-Dips" in new containers.

Dec. Soyfoods of America runs $2,800 large display ad in Los Angeles Times (circ. 1 million) with tofu recipes.

Dec. *Washington Post,* in the Style section, says frozen yogurt is "Out" and frozen tofu desserts are "In."

Dec. Swan Gardens, Miami, after 3 years of R&D, announces informally that it has three flavors of "meltable" cheeselike tofu. It is introduced as Soya Kaas in Feb. 1986.

Dec. *Le Tofu dans le Cuisine Macrobiotique,* by Eddie H. Hara published in France by Editions de la Maisnie.

Dec. Since 1974, 25 books on tofu have been published in the U.S. In 1981 and 1982 publication of books on tofu in North America and Europe reaches its peak, with 12 published each year.

Dec. There are seven brands of tempeh burgers on the market; four brands of frozen tofu ravioli; 8 brands of soy ice creams.

7635. Aihara, Cornellia. 1982. Traditional barley miso and koji. *GOMF News* (*Oroville, California*). Dec. p. 3.
• ***Summary:*** Describes how to make each on a home scale yielding about 100 pounds. Address: GOMF, 902 14th St., Oroville, California 95965.

7636. Eden Foods, Inc. 1982. George Ohsawa first introduced "tamari" to North America. The product he gave us was a traditionally brewed SHOYU... (Ad). *East West Journal.* Dec. p. 11. Also in Vegetarian Times, Jan. 1983, p. 36.
• ***Summary:*** "..., made of soybeans, wheat, water & sea salt, fermented for many months and pressed.

"He called it Tamari because he thought that Shoyu was too difficult a word for Westerners to say and because it would differentiate Shoyu from commercial, chemical soy sauces.

"In Japan, Tamari is the by-product of making soybean miso, from soybeans, sea salt, and water. A very small amount of this is made compared to the amount of Shoyu brewed. In Japan, Tamari is most commonly used in food processing while Shoyu is used in cooking and on the table. Both are excellent foods. The original 'Eden Tamari-Shoyu' is macrobiotic soy sauce. This is the product Eden has marketed as Tamari since 1967, because George Ohsawa called it 'Tamari.'

"Recently, real Tamari (Wheat Free) has been imported into the U.S.A. Mr. Ohsawa did not anticipate this. Now there are two products on the market being called Tamari. Shoyu & Tamari"

Note: This is an early macrobiotic effort to distinguish between tamari and shoyu. "Eden offers: Tamari Natural (Shoyu) Soy Sauce and Tamari Wheat Free." Address: Clinton, Michigan 49236.

7637. Eden Foods, Inc.; Muso Shokuhin. 1982. What was once a flight of fancy... (Ad). *Vegetarian Times.* Dec. p. 24.
• ***Summary:*** This full-page color ad shows the colorful Muso crane logo flying at the top. Across the bottom in bold letters is written "Eden." The page is filled with boxes of

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macrobiotic natural food products imported by Eden from Muso in Japan. These include: Bulk miso, bulk kuzu, ramen, bulk sea vegetables, bancha tea, natural soy sauce (tamari), umeboshi, soba miso, Hacho miso, and vegetable brush. In the background is a landscape of terraced rice paddies. Address: [Clinton, Michigan].

7638. Hara, Toshio; Aumayr, Andrea; Fujio, Y.; Ueda, S. 1982. Elimination of plasmid-linked polyglutamate production by *Bacillus subtilis* (*natto*) with acridine orange. *Applied and Environmental Microbiology* 44(6):1465-58. Dec. [21 ref]
• ***Summary:*** Natto is a traditional Japanese fermented food produced from soybeans by *Bacillus subtilis* (*natto*). It consists of a polysaccharide (levan-form fructan) and a polyglutamate (PGA). The composition of its viscous material is mainly gamma-PGA, containing D- and L-glutamate in varying proportions.

Three known strains of *Bacillus subtilis* (*natto*) are Asahikawa, F, and M. Address: Dep. of Food Science and Technology, Faculty of Agriculture, Kyushu Univ., Hakozaki, Fukuoka 812, Japan.

7639. Kim, Kil Hwan. 1982. Kohng, dubu wa kohng nah mul eh kwah hak [The science of soybeans, tofu and soy sprouts]. Seoul, South Korea: Korean Science Foundation. 211 p. Dec. Illust. Index. 21 cm. [200+ ref. Kor]
• ***Summary:*** Contents: I. Soybeans. Introduction. World soybean production: Areas of production, quantities produced, amount produced in Korea, amount imported to Korea, chemical composition of all soybeans. How to use soybeans: Foods and processed soybean foods (sauces, tempeh, natto), industrial uses. Nutritional composition of soybeans: Common components, protein and amino acids (protein, essential amino acids, necessary protein intake, necessary amino intake, chemical score, biological value of soybean protein, the need to heat soy protein, the use of soy protein as a protein supplement), soybean oil (components of soybean oil, oil assimilation / absorption), other nutritional components (carbohydrates, vitamins, minerals), references.

II. Tofu. Introduction. Kinds of tofu and production: Soybean curd (production in factories, production at home, instant tofu, kinugoshi tofu, grilled tofu, frozen tofu, how to freeze and dry tofu). Movement of nutritional values during tofu processing: Movement of common nutrients, movement of amino acids. Nutritional components of tofu: Tofu protein, tofu protein as a protein supplement, digestion of tofu, calories in tofu, fat and cholesterol, minerals and vitamins, toxins, *hwe bun* in tofu. Tofu and group meals: School meals in Japan, in America, in Korea. Tofu factories and associations involved with tofu: Member list of food associations in Korea, regular member and extra member list of tofu packaging associations in Japan, directory of tofu shops and factories in North America, in Europe, in other countries, list of companies selling tofu coagulants, list of tofu restaurants in Japan. References.

III. Soy sprouts. Introduction. Production of soy sprouts: Soybean varieties, selecting and washing the soybeans, soaking, watering the sprouts, machines for cultivating soy sprouts, maintenance. Nutritional composition of soy sprouts: Common nutrients, increase of vitamin C during growth, changes in vitamin C during heating, changes in riboflavin during heating. Glossary.

Soybeans arrived in Korea in about 200 B.C. (p. 11). Contains many useful tables. Address: Korea.

7640. Kudo, Kenichi; Sano, Rinji; Sato, Jirô. 1982. Daizu kakô shokuhin no shôhi to eiyô ni kansuru jakkan no kôsatsu [Thoughts on soyfoods consumption and nutrition]. Tokyo: Daizu Kyokyu Antei Kyokai. 22 p. Dec. [Jap]
Address: Daizu Kyokyu Antei Kyokai (Soybean Supply Stabilization Assoc.), Minato-ku, Tokyo, Japan.

7641. Shurtleff, William; Aoyagi, Akiko. 1982. History of soya in Third World countries to which they have recently been introduced: Latin America, Indian Subcontinent, Africa, and the Middle East. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 5 p. Dec. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction: Third World countries in which soy is "new." History and potential in "new" Third World countries: When introduced to each region, active history started in 1960 (protein gap) and 1970's: International Soybean Program (INTSOY), American Soybean Association (ASA), high prices, international conferences, call for further research, the potential: population and hunger. Basic approaches to introducing soybeans and soyfoods: Can't introduce like rice or wheat, need utilization training, how to get it, whole dry soybeans in Brazil and India, the traditional trickle-down approach (Japan–all village centered, Korea, Indonesia), the national integrated approach (examples of it–Sri Lanka, basic components: Cooperative funding, training center, well educated and inspired teachers, a publication, farm extension workers and farmers, soyfoods extension workers and resident students, soyfoods users–food industry and institutional, the people/villagers), the single enterprise integrated approach (examples of it, Soya Production and Research Association, Uganda, CARE in Costa Rica, teach farmers, guarantee crop, make food, advertise it), the commune village integrated approach (examples–the Farm, teach farmers, establish communal business, all use the food), the free market-government aid/extension/research approach (examples–Egypt, Brazil, oil mills and exports), the soyfoods missionary/mass movement approach or village uplift (examples–Blanca Dominguez, soyfoods movement in America, show others, they teach others, encourage starting of small businesses, broad-based,

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teach all over via books, programs, later start schools). Soyfoods applications: Oil, flour, textured soy flour (TSF), as is, traditional vs. new countries. Production and marketing approaches: Soybean crushing plant (oil and defatted meal, meal to fortify or TSF), middle level low-cost extrusion or soy dairy, small decentralized village and cottage industries, all traditional countries took this approach. Address: Lafayette, California. Phone: 415-283-2991.

7642. Tsuchiya, Kanji. 1982. Tônyû. Shinban [Soymilk. 2nd ed.]. Tokyo: Shoku no Joho-sha. 223 p. First edition was published in 1980. Illust. 17 cm. [Jap]

• ***Summary:*** This is the best book seen to date on soymilk in Japanese. A detailed chronology of tofu and soymilk is given on pages 173-76. Over 20 years ago, when Mr. Tsuchiya was plant manager of the *Kyôdo Nyûgyo* dairy milk plant at Matsumoto, he became interested in using soy protein to replace dairy protein. Although soybean crushers had investigated the use of defatted soybean meal, the techniques for removing the beany flavor and smell were not yet good enough to allow substitution of soy protein for milk solids. At that time there was a shortage of imported nonfat milk for use in ice cream bars. It was said that a small numbers of manufacturers of the inexpensive ice cream products were already using some soy protein to increase their over-run. "Discovering this, Nisshin Seiyu, after some research, found a method of removing the beany smell by fermentation with a yeast; they asked if Kyodo Nyugyo could make a test run of 10 kg of spray-dried soymilk in our plant. So they dissolved soy powder (*daizu-ko;* which had been defatted at a low temperature) in water, added yeast, waited until the reaction was finished, diluted it with some water, and put it in a spray dryer. Yet the spray drying caused some protein denaturation and an increase in the viscosity of the soy powder, which made it difficult to pump the solution to the top of the spray dryer. Glucose was used to replace half the soy powder. The spray-dried powder would not dissolve in water and the resulting mixture had a muddy brown color, a flavor that was too sweet, and a beany flavor. It was useless. They had discovered that defatted soybean meal and nonfat dried milk behave differently. Defatted soybean meal contains about 20% sugars, but less than 1/3 of these are water soluble and many have a very complicated structure and high viscosity."

Therefore they started to study the basic nature of defatted soybean powder (*dasshi daizu-ko*) and after much trial and error, in 1961 they applied for a Japanese patent on "The method of refining defatted soybean powder" (*Dasshi daizu-ko no seisei hôhô*). They were issued the patent (#16,658) in 1962. The key to the success of this patent was the use of meta potassium bisulfite (*meta jûaryusan karium*), which lowers the viscosity, bleaches it and increases the amount of soluble nitrogen. Not enough of the beany flavor had been removed, yet at that time it was an excellent product, which could be used in place up to 30% of nonfat dried milk to make an ice cream product without a beany flavor. Mr. Masaharu Sato (who is presently head of the soybean department of Kyodo Nyugyo's central research lab) was the person who contributed most to the discovery. He is now conducting research on tofu and soymilk. "I still see him often since we are both members of Soyfoods Development Study Group (*Daizu Shokuhin Kaihatsu Kenkyû-kai*). He recently told me, 'After that incident, I became captivated by soy protein.'"

"After about 2 years of research, during the summer we received an order from Nisshin Seiyu for 200 tons of soy protein. Our plant had been losing money for a long time, and this discovery helped to make some profit during my time of work there. I will never forget it. I feel real gratitude to Nisshin Seiyu for helping us to become captivated by soybeans."

At about that time dairy farmers throughout Japan began to compete with one another in a price war which lowered milk prices. The battle between them and the owners of dairy milk companies got worse and worse. Among the leaders of this struggle were progressive dairy farmers in Matsumoto. "Although we made soy powder very secretly, one of the plant workers, who was the son of a dairy farmer, leaked the secret. This caused an uproar (we were using soy powder instead of dairy milk) and the local farmers asked us to stop immediately. However we decided to continue making soy powder for various reasons: (1) We had to fulfill the order that we had accepted; (2) Since we simply processed soy and sold it to another company, this had no effect on our plant's use of unprocessed dairy milk; (3) The soy business allowed out plant to operate profitably and this allowed us to return some money on the dairy farmers' investment." For a variety of complex reasons related to this conflict, Mr. Tsuchiya was fired as plant manager for Kyodo Nyugyo's Matsumoto dairy milk plant. Though his retirement was very near, he left the dairy industry without regret to continue his research on soy powder (p. 14-19).

"Meeting with Dr. Miller: During the period 1965-1969 I was involved in the founding of Taiwan Ryokusô Kogyô Kôshi, and I took a leadership role in constructing modern plants to make powdered soymilk and chlorella. One of the leaders in the chlorella industry, the late Dr. Yoshio Takechi, was in charge of the chlorella cultivation department and I was in charge of chlorella product development and of powdered soymilk production. In 1966 Dr. W.A. [sic, Harry W.] Miller (who was a founder of Loma Linda Foods) and his son visited our company, under the guidance of Dr. Taisei of Taikei University. At that time Dr. Miller stood on the platform atop our spray dryer, which was 20 meters tall and had 500 liters/hour capacity. Admiring it, he said: 'I've never seen a soymilk plant which has this much facilities!' He also tasted the soymilk (from which the beany flavor had been removed) and said 'I wonder if you have to refine soymilk

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to this degree for Chinese people.' His words left a strong impression in my memory. Sure enough, when the factory was completed and we launched our canned soymilk powder, we heard Chinese saying, 'This is not real soymilk. It's an imitation.' But we did a good marketing campaign and soon the soymilk started selling. When my 2-year contract ended, I returned to Japan. After that, the products produced in this plant were used as food for the Taiwanese army and were not sold to the public. Moreover, because of the chlorella boom in Japan, the spray dryer was used for chlorella and soymilk production stopped. Since I had great expectations for this plant, I was greatly disappointed.

"Right after I returned to Japan in 1970, I was asked to provide technical assistance to Keijô Shison Shokuhin Kenkyusho, a research lab in Korea headed by pediatrician Son Zaien. I visited there several times and even drafted a floor plan, then suddenly the Japanese government told me that the money which had been available for helping Koreans was no longer available, so I could do no more" (p. 18-21; see p. 53 for more on soymilk in Korea). Continued. Address: Technical consultant, Okazaki Marusan, Japan.

7643. Tsuchiya, Kanji. 1982. Tônyû. Shinban [Soymilk. 2nd ed.] (Continued–Document part II). Tokyo: Shoku no Joho-sha. 223 p. First edition was published in 1980. Illust. 17 cm. [Jap]

• ***Summary:*** Continued. Pages 31-32. In the literature of Japan's Muromachi period it is written that after eating confections (*tenshin* such as okashi, oyatsu) they ate light and simple food (*tanpaku na tabemono*). One of the latter was called *tofu no uwamono,* which means yuba.

A flow diagram (p. 35-36) gives Chinese names of soymilk, yuba, fermented tofu, etc.

Part III (p. 39-64) titled "Soymilk around the world," has chapters on the USA, Korea, Hong Kong, China, Taiwan, Southeast Asia, and Europe. Soymilk in America (p. 47-52) includes a 1975 table showing major manufacturers of soymilk and soy-based infant formula, their location, and the names of their products. Soymilk in Korea (p. 53-54): In 1968 the Keijo Shison Shokuhin Kenkyujo made soymilk using the regular tofu making equipment adjusted to make a product as similar as possible to dairy milk, then bottled it in cider bottles, pasteurized it, and sold it. They made 500 to 800 bottles a day and sold it nationwide. It was brownish in color and tasted like soybean cooking liquid; there was no comparison between that and today's soymilk in quality. The head of this research lab was Dr. Son Zaien, who also ran the children's hospital and was a professor of pediatrics at Seoul Medical University. As a pediatrician his concern was that the soymilk promote the growth and health of children; he was not concerned about its acceptance among adults. The children accepted it within 2-3 days. Later, in May 1982, Tsuchiya visited Korea again. They had developed their own method of making soymilk and the soymilk plant had been expanded. Now they produced 500,000 bottles a day (180 cc each, retort sterilized); they call it Vegemil / Vegemeal. It contains added fat and sugar to make it closer to dairy milk., but the sugar content is 10%, which is sweeter than Japanese soymilk. The plant is built on a lot of 4-5,000 tsubo and has 24 retort sterilizers; each machine has 2,500 bottles capacity. Tôhô Yuryô, as part of a Korean technical joint venture with Kibun in Japan, is going to make 120-130,000 Tetra Brik cartons (each 200 cc). Also other dairy milk makers (Sojû and Sangan) are going to have some sort of equipment to start making soymilk. Also, I head that Tôa Shokuhin (K.K.), a pharmaceutical company, is planning a joint venture with Meiji in Japan to make soymilk.

Also, Lotte Chilsung Beverage Co. is planning to use Marusan's (Japan) technology to make soymilk. They are constructing a plant to start to making soymilk in Feb. 1983.–The population of Korea is about 40 million and the GNP 24,000 million won (unit of currency) a year; it is the largest in Asia. But it is a tough war for market share among these fine companies.

Soymilk in Taiwan (p. 57-61): People who were born in Taiwan [the former Japanese colony of Formosa (1895-1945)] have Japanese food habits and don't like soymilk as much as the Chinese. Also, Taiwanese young people don't like soymilk much. In mainland China people only drink water that has been boiled and cooled–just as they do with tea. The same with soymilk. They boil soymilk in a flat pan (*hira-nabe*) for 20-30 minutes before selling it. The buyers don't buy it without seeing that it has been properly boiled. If you cook soymilk in a flat pan for a long time, you can eliminate much of the beany smell and flavor, the antidigestion substances, and harmful bacteria. They don't care about a little burned flavor, bitterness, or beany flavor. But this is ancient wisdom. There they continue to drink soymilk up to this day and it is still very popular. It is said that the annual sale of soymilk in Taiwan is about 5,000 million yen.

In China, sellers of ice candy (like ice Popsicles) call out loudly *kaishui bingo. Kaishui* means boiled and cooled water. *Bingo* means Popsicle.

In the Philippines, about 10 years ago, the University of the Philippines developed soymilk and a blend of soymilk and coconut milk for American children. It was test marketed among the students and teachers of elementary schools, junior and senior high schools, and universities. It was acceptable only to comparatively well educated people. A 200 ml bottle (about 7 ounces) sold for 15 cents, making it more expensive than most other drinks. The taste was plain but the bean smell was not completely removed. In October 1982 Dr. William G. Padorina and other economically influential people came to Japan at the request of President Ferdinand Marcos and studied Marusan's soymilk plant. They are planning a Food Development Symposium in Feb. 1983 and they would like to have nutritious soy products

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that contain coconut oil (they account for 70% of the world's production). They have asked Marusan to cooperate in the effort.

In Denmark, a company named Starna [Nutana?] makes various soyfoods such as textured soy flour (*daizu nikku*), defatted soymilk, and soymilk. They are selling these products in Denmark and neighboring countries. *The Book of Tofu* by Shurtleff and Aoyagi is mentioned on pages 46 and 117.

Okazaki Marusan makes a soy yogurt named *Tôgurt / Tôguruto* in Japanese. The character *tô,* which means bean, is also the first character in the word *tôfu* (p. 71). Address: Technical consultant, Okazaki Marusan, Japan.

7644. Tsuchiya, Kanji. 1982. [Soymilk in Japan, and its history (Document part)]. In: Kanji Tsuchiya. 1982. Tônyû. Shinban [Soymilk. 2nd ed.]. Tokyo: Shoku no Joho-sha. 223 p. First edition was published in 1980. [Jap]

• ***Summary:*** Building a plant specialized in making soymilk (p. 21-24): After my two overseas attempts ended in failure, I returned to studying the basics. With the help of a friend, I had a soymilk test plant (55 liters/hour) built on the outskirts of Sendai, in the Tohoku region. There I worked on making soymilk with less beany flavor and better digestibility. Over a period of about 2½ years I completed development of a new heating system (Japanese Patent No. 19,928 issued in 1973), and also completed a report on digestibility of soymilk with my co-worker Kazuhiro Ootomo. In order to test the results of my research, I went to Tokyo in 1974. I found an investor, taught my techniques to Tokyo Soymeal K.K., spent 9,000,000 yen, and started to build a soymilk plant in the Tokyo area. At about this time other early soymilk manufacturers like House Luppy, Soyalac, etc. were building the market slowly but steadily, making about 10,000 to 20,000 packs/day. Our company, Tokyo Soymeal, cut into this market share, and spent 3 very tough years. But finally we were producing 6,000 packs/day and we first started to break even financially. Our soymilk product, named Soymeal, marketed as a soft drink, had a good flavor and was accepted as a new type of soymilk by consumers.

"However I realized at that time that soymilk was being sold only in the health food market. Because of that, no regular mainstream consumers bought our soymilk since distributors placed it only in Diet- and Health food stores, and in the drug section of other stores. Thus our share of the milk or beverage markets was extremely small, and expansion was difficult. Our next step was to change consumers preconceptions about soymilk.

"I want to make a tasty soymilk: Rather than placing emphasis on health or medical care, beauty care, changing one's constitution, etc. I wanted to make a soymilk product that was simply delicious and nutritious. But unfortunately our Soymeal company had to close its plant in December 1978 because the landlord sold the land on which the plant was located. This land was located next to the Tachikawa U.S. military base, and when the U.S. army gave the land back to the Japanese government, the price of land in the whole area rose. Thus our landlord wanted to sell his land too.

"In order to use my past effort and experience to make a new start, I was planning to build a plant in the Chûbu area. I did not have the means to do this by myself, but by good fortune, in 1979 Okazaki Marusan K.K. decided to help this enterprise and I was accepted as a member of their company. And furthermore it is planned to build a plant that can produce 4 times as much soymilk as plants that existed in May 1980. I would like to produce the best soymilk in Japan. The Japanese Department of Food, Agriculture, and Forestry is now studying soymilk with the intent of establishing a JAS standard in 1980."

Pages 50-52 show a chart of different brands of soymilk and soy-based infant formulas sold in the USA, with the name of the manufacturer, ingredients, and/or composition. These include: Loma Linda Food Co. of Arlington, California (Soyagen [liquid or powder], Soyalac); Mead Johnson & Co. of Evansville, Indiana (Metrecal, Sobee); Dietetic Food Co. Inc. of Brooklyn, New York (Diamel no Sorina); Ovaltine Food Products of Villa Park, Illinois (Ovaltine, 2 types which contain soy protein); Gerber Food Products of Fremont, Michigan; Plus Products of Los Angeles, California; Borden Co. of New York (Mullsoy, 2 types); Pavo Co. Ice of Minneapolis, Minnesota.

Early history of soymilk: In the *Teikun Orai,* written during the Muromachi (Ashikaga) period in Japan, the word *tofu-kan* appears in the section titled *Shojin Ryori* (Buddhist Vegetarian Cookery). That word used to mean "tofu soup" but it actually refers to what Japanese today call soymilk (*tônyû*). In the book *Sôgo Daisô-shi,* written in about 1417-1473 by Ise no Jôshin, there is a section on cooking okara (*unohana*). Mr. Tsuchiya thinks this soup was similar to today's soymilk except that the okara had not been removed. The author was the ancestor of Ise no Teijô, who lived during the Tokugawa (Edo) period and wrote that the word *Tofu-kan* should actually be pronounced *Tofu-ko,* and means "soup" (*shiru*). When the last character is pronounced "kan" it means "yokan." Note: Could Mr. Tsuchiya be confusing Manpukuji's tofukan (hard tofu) with the word tofukan that means soymilk?

A table (p. 72-75) lists all Japanese soymilk products made to date, including the name of the manufacturer, the exact date of introduction, range of distribution, package size and type, and retail price. Products sold by the following companies are listed: Kibun, Okazaki Marusan, Mitsubishi Kasei Shokuhin, Meiji Nyugyo, Kyushu Nyugyo, Nisshi Seiyu, Asahi Shokuhin, Kyodo Nyugyo, Yakuruto Honsha, Furuta Shokuhin Kogyo, Morinaga Nyugyo, Sugiyo, Koshin Nyugyo, Kenbi-Sha, Saniku Foods / Fuuzu, Nagoya Seiraku, Nagano Tomato, Zenkoku Nokyo Chokuhan (Nokyo),

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Yamato Shokuhin, Sokensha, Ishihara Fuudo Senta, Chiba Seisen Shokuhin Kogyo, Asahi Fuuzum Sebun-Irebun (7-11), Fukushima-ken Rakuren, Nacuraru Fuuzu (Natural Foods), Sebun Appu Inryo (7-Up). This entire table has been translated by Soyfoods Center; printed copies are filed with the book. The word processing filename is d:\w\hss\MilkJap1.doc. In addition, most of these soymilk products have a commercial soy products (CSP) record in the SoyaScan database. Address: Technical consultant, Okazaki Marusan, Japan.

7645. **Product Name:** [Natto, Agé, Okara].
Foreign Name: Natto, Ague, Okara.
Manufacturer's Name: Agro-Nippo Produtos Alimenticios Ltda.
Manufacturer's Address: Av. José Alves de Mira 185, Piribuba, Sao Paulo, Brazil.
Date of Introduction: 1982.
New Product–Documentation: Letter from Jane Cadwell Pautz in Sao Paulo, Brazil. 1982. May 29. The company sells natto, sprouts (mung bean type), agé (*ague*)*;* sometimes they sell the okara in the open market.

Note: We have no idea when each of these products was introduced. This is the earliest known commercial natto maker in Brazil.

7646. **Product Name:** [Essam Protein-S,L, Prorich, and Ajipron-E,M,S].
Manufacturer's Name: Ajinomoto Co. Inc.
Manufacturer's Address: Kyobashi 1-5-8, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1982.
New Product–Documentation: Soya Bluebook. 1982. p. 61.

7647. **Product Name:** [Fuji Pure-SP {Structured Soy Protein}].
Manufacturer's Name: FPPM Limited.
Manufacturer's Address: SKF Building, Shiba-Daimon 1-9-1, Minato-ku, Tokyo, Japan.
Date of Introduction: 1982.
New Product–Documentation: Soya Bluebook. 1982. p. 62.

7648. Fruin, W. Mark; Tsunehiko, Yui. comp. 1982. The 200 largest industrial firms in Japan for 1918. Unpublished manuscript. Updating of original 1980 document.
• ***Summary:*** This table is published in Mark Fruin's book "The Japanese Enterprise System" (1992, Oxford). Address: 1. Prof. of History, California State Univ., Hayward.

7649. **Product Name:** [New Soyeese {Structured and Textured Soy Protein}].
Manufacturer's Name: Fuji Oil Co. Ltd.
Manufacturer's Address: Nissei Midosuji Hachimancho Building, 6-1 Hachimancho, Minami-ku, Osaka 542, Japan.
Date of Introduction: 1982.
New Product–Documentation: Soya Bluebook. 1982. p. 62.

7650. Iwata, Takashi; Sugiura, H.; Shirahata, K. 1982. [Keeping quality of green soybeans by whole plant packaging]. *Engei Gakkai Zasshi* (*J. of the Horticultural Association of Japan*) 51:224-30. [Jap; eng]*

7651. Kajimoto, G.; Shibahara, A.; Yamashoji, S. 1982. [Changes in the contents and composition of lipids, fatty acids, tocopherols, and sterols in soybean seed during maturation]. *Eiyo to Shokuryo* (*J. of Japanese Society of Food and Nutrition*) 35:345-50. [Jap]*

7652. Katou, T.; Fukushima, T.; Akazawa, T. 1982. Differences in the content of amino acid, sugars and composition of fatty acids between edamame and normal soybean. *J. of the Japanese Society for Horticultural Science* 51:(supplement 2):537. *

7653. **Product Name:** [Kikkoman Instant Shiro Miso Soup (Soybean Paste Soup, White)].
Foreign Name: Shiro Misoshiru.
Manufacturer's Name: Kikkoman Corporation.
Manufacturer's Address: Noda 278, Chiba-ken, Japan.
Date of Introduction: 1982.
Ingredients: Powdered miso, dried seaweed, wheat gluten, bonito powder, monosodium glutamate, dried green onions, disodium inosinate, disodium guanylate.
Wt/Vol., Packaging, Price: 1.4 oz (40 gm). Foil packed containing 4 individual packets. Each makes 2/3 cup.
How Stored: Shelf stable.
New Product–Documentation: Label. 1982. 5.5 by 7 inches. Plastic packet. Orange, red, brown and green on white. Full color picture of wooden bowl of soup on tray. Foil packets inside are 2.75 by 4 inches. Red, brown and black on white. Bowl of soup on front, instructions on back. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center. "Distributed by Kikkoman Corporation, Noda 278, Japan." Text on label in both English and Japanese.

7654. **Product Name:** [Kikkoman Instant Aka Miso Soup (Soybean Paste Soup, Red)].
Foreign Name: Aka Misoshiru.
Manufacturer's Name: Kikkoman Corporation.
Manufacturer's Address: Noda 278, Chiba-ken, Japan.
Date of Introduction: 1982.
Ingredients: Powdered miso, dried seaweed, wheat gluten, bonito powder, monosodium glutamate, dried green onions, disodium inosinate, disodium guanylate.
Wt/Vol., Packaging, Price: 1.4 oz (40 gm). Foil packet

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containing 4 individual foil packets. Each makes 2/3 cup.
How Stored: Shelf stable.
New Product–Documentation: Label. 1983. 5.5 by 7 inches. Plastic packet. Red, purple, black and brown on white. Full color picture of wooden bowl of soup on tray. Individual packets are 2.75 by 4 inch foil. Red, brown and black on white. Picture of bowl of soup on front, instructions on back. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center. "Distributed by Kikkoman Corporation, Noda 278, Japan." Text on label in both English and Japanese.

7655. *Kurima.* 1982. Okinawa no shoku: Tôfuyô [Okinawan foods: Tofuyo fermented tofu]. No. 9. p. 164. [Jap; eng+]
• ***Summary:*** Some people compare *tofuyo* with Chinese-style fermented tofu (*funyû*), however tofuyo has a more complicated flavor. It is good to drink millet brandy (*awamori*) as you nibble on tofuyo. People used to make tofuyo at home but it takes too much time, so nowadays it is found mainly at specialized restaurants.

Tofu is cut into squares about 1 inch on a side and the pieces are dried in the shade for a few days until they get slimy. They are washed with millet brandy and immersed in rice malt which has been moistened with millet brandy. You may start to eat tofuyo after one month, but it seems to reach its peak of flavor after 6 months. Tofuyo is a type of cheese created in Okinawa, where tofu and millet brandy are loved. It is sold at Urizen, 388-5 Anni, Naha city, Okinawa. Phone: 0988-85-2178. Hours: 5:30 p.m. to midnight. Closed the 2nd and 4th Sunday of each month.

Note: As of Nov. 2011 *awamori* is made from Thai-style long-grained Indica rice (not millet) and black koji mold, indigenous to Okinawa; after distillation it is often aged like whiskey.

7656. Maki, Toshio. 1982. Shokuhin oyobi kankyô-chû no N-nitoroso kagô-butsu–sono ganryô to bakuro-ryô ni tsuite [N-nitroso compounds in foods and the environment–the occurrence and exposures]. *Eisei Kagaku* (*J. of Hygienic Chemistry*) 28(5):249-58. [Jap]*
• ***Summary:*** Volatile and non-volatile N-nitrosamines were sampled in foods. The highest volatiles were in broiled dried fish, chewing tobacco, niboshi (dried small sardines), and smoked and flavored fish.

0.1 to 0.8 micrograms per kilogram (parts per billion, ppb) of N-nitroso-dimethylamine (NDMA) was detected in miso and shoyu. Similar amounts were also found in other Japanese foods. The author thinks that there is no danger in consuming these foods because of the very small amounts of NDMA, mostly less than 1 ppb.

7657. Marusan Inc. (Importer). Made in Japan. 1982. Kori-Tofu (Natural Dried-Frozen Tofu) (Brochure). 1 Branca Rd., East Rutherford, NJ 07073. 4 p.
• ***Summary:*** Contains nutritional information and 14 recipes.
Address: East Rutherford, New Jersey.

7658. **Product Name:** [Soymilk].
Manufacturer's Name: Meito Milk Co.
Manufacturer's Address: Japan.
Date of Introduction: 1982.
New Product–Documentation: Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64.

7659. Mori, S.; Nunomura, N.; Sasaki, M. 1982. Correlation between sensory preference and compounds of Japanese soy sauce flavor (Abstract). In: Abstracts of Papers Presented at the Annual Meeting of the Agricultural Chemical Society of Japan. See p. 36. *
Address: Central Research Labs., Kikkoman Shoyu Co., Noda, Japan.

7660. **Product Name:** Angel Brand Mabo Tofu Sauce.
Manufacturer's Name: Morinaga Milk Industry Co., Ltd.
Manufacturer's Address: 5-33-1 Shiba, Minato-ku, Tokyo 108, Japan.
Date of Introduction: 1982.
Ingredients: Water, vegetable oils (soybean oil, sesame oil), soy sauce, tomato catsup, garlic, sugar, modified food starch, textured vegetable protein (soy flour and caramel coloring), ginger, salt, potato starch, monosodium glutamate, tobanjan (brown bean sauce) waxy corn starch, beef extract, hydrolyzed plant protein, dehydrated leek, chicken extract, oleoresin, paprika, disodium inosinate, disodium guanylate, yeast extract, spices.
Wt/Vol., Packaging, Price: 5½ oz (156 gm).
How Stored: Shelf stable.
New Product–Documentation: See next page. Label. 1982. 6.5 by 3.25 inches. Red, blue, green and black on yellow. Color photos show: (1) A package of Morinaga Ever-Fresh Silken Tofu. (2) A shallow blue and white dish of tofu rectangles in Mabo Tofu Sauce. Two illustrations show how to prepare this tofu dish: (1) Pour Angel Mabo Tofu Sauce into saucepan, add Angel Tofu, cut into ½ inch cubes. (2) Simmer and stir gently at times for two minutes. If more minced meat is required, add to the mixture according to your taste.

7661. **Product Name:** [Soy Flour, Soy Protein Concentrates, Soy Protein Isolates].
Manufacturer's Name: Nikka Fats & Oils Co. Ltd.
Manufacturer's Address: Edobori 1-5-16, Nishi-ku, Osaka. Plants at Fukuoka, Kita-Kyushu, Wakamatsu.
Date of Introduction: 1982.
New Product–Documentation: Soya Bluebook. 1982. p. 67.

7662. **Product Name:** [Nikko Lecithin].

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Manufacturer's Name: Nikko Oil Mills Co. Ltd.
Manufacturer's Address: Kanda Ogawamachi 2-12, Chiyoda-ku, Tokyo, Japan.
Date of Introduction: 1982.
New Product–Documentation: Soya Bluebook. 1982. p. 59.

7663. Ogi, Masahiro. 1982. Sekai Nippon-shoku taizen. Hato-tachi no sekai senryaku. Nihon shoku o sekai ni hiromeru otokotachi no mune ni aru mono [Japanese foods worldwide. The doves' world strategy. Things in the hearts of men who introduce Japanese foods to the world]. *Bungei Shunju* (*Literary Arts, Spring and Fall*) No. 1. p. 370-80. New Year's Special Edition. [Jap]
• ***Summary:*** In addition to Kikkoman, shoyu, and Mark Fruin, discusses pickles, sushi, sake, and instant ramen (Cup O'Noodles).

7664. **Product Name:** [Marusan Soy and Azuki Milk].
Manufacturer's Name: Okazaki Marusan K.K. (Marusan-Ai Co., Ltd.).
Manufacturer's Address: 1 Aza Arashita, Niki-cho, Okazaki-shi, Aichi-ken 444-21 Japan.
Date of Introduction: 1982.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Talk with Ron Roller of American Soy Products. 1992. Feb. 26. One interesting product is a soy & azuki milk, which Marusan launched in about 1982; Ron is not sure if it is still on the market.

7665. Okubo, K.; Furubayashi, Y.; Takahashi, K. 1982. [Flavor of glycosides contained in soymilk]. *Shokuhin to Kaihatsu* (*Food Processing*) 18(6):16-21. [Jap]*
• ***Summary:*** Saponins and their aglycones/aglicons, sapogenols, in soybeans contain bitter flavors. Saponin A has the greatest intensity of bitter flavor, about 3 times that of saponin B and sapogenol A. Therefore saponin is very important as a compound responsible for the bitter flavor in soymilk. 73% of Saponin A resides in the soybean cotyledon, 8% in the hypocotyl, and 19% in the hull. Though the hypocotyl and hull account for only 7.2% of the weight of a typical soybean, they contain 27% of the Saponin A. Therefore the first step in the most modern soymilk processes is the removal of the hull and cotyledon by dehulling to remove about one-third of the beany flavor.

7666. Ryo, S. 1982. [Food and vitamin K in breast milk]. *Shusanki Igaku* (*Perinatal Medicine*) 12:1101-06. (Chem. Abst. 97:214711). [Jap]*

7667. **Product Name:** [Soyees].
Foreign Name: Soiizu.
Manufacturer's Name: San-iku Foods.
Manufacturer's Address: 1-1 Nagaurataku, Sodegaura-machi, Kimizu-gun, Chiba-ken 299-02, Japan.
Date of Introduction: 1982.
New Product–Documentation: Letter from San-iku Foods. 1990. June. This product was introduced in 1982.

7668. **Product Name:** [Vege Hamburg {Meatless Hamburger}].
Foreign Name: Beji Hanbaagu.
Manufacturer's Name: San-iku Foods.
Manufacturer's Address: 1-1 Nagaurataku, Sodegaura-machi, Kimizu-gun, Chiba-ken 299-02, Japan.
Date of Introduction: 1982.

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New Product–Documentation: Letter from San-iku Foods. 1990. June. This product was introduced in 1982.

7669. Shin-Mei-Do Miso Company. 1982. What is miso (Leaflet). Denman Island, British Columbia, Canada. 2 p. Front and back. 28 cm.
• ***Summary:*** Side 1 is an introduction to miso. Side 2 is recipes, plus a plug for *The Book of Miso,* by Shurtleff & Aoyagi. Address: Denman Island, BC, Canada, V0R 1T0. Phone: 335-0253.

7670. Song, Puju; Wishnok, J.S.; Tannenbaum, S.R. 1982. [Determination of volatile nitrosamines in soy sauce]. *Zhonghua Yufangyixue Zazhi* (*Chung-hua Yu Fang I Hsueh Tsa Chih; Chinese J. of Preventive Medicine*) 16(3):147-49. (Chem. Abst. 97:108644e). [Chi]*
• ***Summary:*** Nine commercial soy sauces. purchased at U.S. retail stores, and including representative samples from Hong Kong, China, Thailand, Japan, and Korea, were examined for the possible presence of volatile N-nitroso compounds. All samples contained substances which gave positive responses on a nitrosamine-selective detector (Thermal Energy Analyzer; TEA). These signals, in addition, disappeared or were reduced following ultraviolet irradiation; this behavior is characteristic of nitrosamines. Two of the TEA-positive substances had gas chromatogram retention times and gas-chromatogram-mass spectrometer behavior suggestive of *N-nitrosodimethylamine* and *N-nitrosomorpholine,* respectively. Address: Beijing Medical College, Beijing, China.

7671. **Product Name:** [Soymilk].
Manufacturer's Name: Takeda Yakuhin.
Manufacturer's Address: Japan.
Date of Introduction: 1982.
New Product–Documentation: Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64.

7672. **Product Name:** [Lecithin].
Manufacturer's Name: Toyo Oil Mills Co. Inc. Subsidiary of Ajinomoto Co. Inc., Tokyo.
Manufacturer's Address: 230 Shinminato, Chiba-shi 260, Japan.
Date of Introduction: 1982.
New Product–Documentation: Soya Bluebook. 1982. p. 59; 1985. p. 79. Brand is now given as Ajinomoto Lecithin.

7673. **Product Name:** [Yamashin Shiro Shoyu {Clear Soy Sauce}].
Manufacturer's Name: Yamashin Shoyu Co. Ltd.
Manufacturer's Address: Nishiyama-cho 3-36, Hekinan-shi, Aichi-ken 447, Japan.
Date of Introduction: 1982.
New Product–Documentation: Letter from Yoshiko Kojima, Associate Country Director for Human Nutrition, American Soybean Assoc., Tokyo. 1982. March 25. Yamashin is Japan's largest maker of shiro shoyu. The company's address is given.

Corti Brothers website. 2006. July 22. www.cortibros.biz. A color photo shows a bottle of this soy sauce in a clear bottle against a light wood background. The label has black Japanese characters on a white background. The near-black sauce is in a clear bottle. Price: $6.99 per bottle (360 ml; #6039). Quantity in stock: 0 (zero). "Rarer is the white soy sauce, Shiro Shoyu, made from wheat rather than soy. It is made in central Japan and is used when you do not want to change the color of a dish. It is darkish amber in color. The scent and flavor are lightly smokey, meaty, and very pleasant, but light. This is the soy sauce to use when you want a delicate flavor."

7674. **Product Name:** [Soymilk].
Manufacturer's Name: Zenno.
Manufacturer's Address: Japan.
Date of Introduction: 1982.
New Product–Documentation: Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64, 74. Zenno is Japan's biggest co-op.

7675. **Product Name:** [Soymilk and Dairy Milk Blend].
Manufacturer's Name: Zenno.
Manufacturer's Address: Japan.
Date of Introduction: 1982.
New Product–Documentation: Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64, 74. Zenno, Japan's biggest co-op, introduced a soy-dairy blend in 1982 but dropped it after 6 months.

7676. Adachi, Iwao. 1982. Nihon shokumotsu bunka no kigen [Origins of Japanese food culture]. Tokyo: Jiyu Kokuminsha. 470 p. See p. 69-70, 113. [Jap; eng+]
• ***Summary:*** Kinako (Yayoi period): Also called "mametsuki" in Japanese, kinako is written with characters that mean "yellow soy flour." In the *Wamyosho,* it is called "Daizu-iri" or "Mametsuki." From these expressions we can learn that since ancient times, people have pounded soybeans in a mortar (*usu*). Stone mortars came to Japan during the Nara period (A.D. 710-784) and finally became popular among the people in about the middle of the Edo/Tokugawa period. Kinako was brought to Japan from China through Korea. Kinako is probably mentioned in the *Engi Shiki.* At a certain festival the people served at the altar 5 measures each of magarimochiki and mametsuki, and 10 measures of daizumochiki. These may have been the early names for kinako-mochi and/or azuki mochi.

Tamari: The original form of shoyu was tamari. The by-product of tamari was miso. And the original form of miso was *kuki* [fermented black soybeans], which was a seasoning

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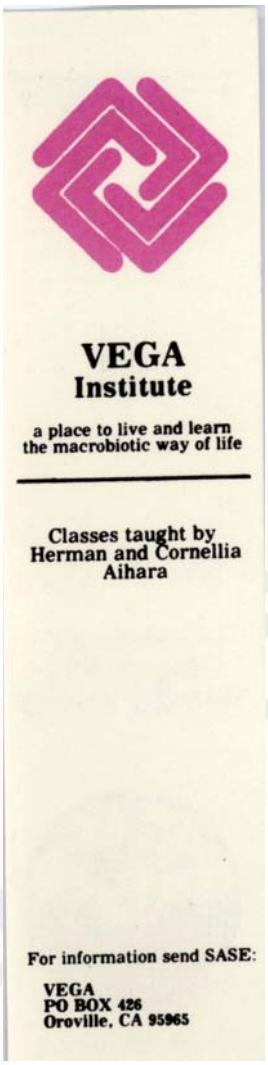
developed in China. More on the history of kuki is given under "miso." The government office (yakusho) for miso was built at the imperial court (kyutei) in A.D. 701 (Taiho 1). Therefore tamari started there at the same time. In the book *Yamato Honso* (Japanese materia medica) by Ekiken Kaibara, tamari (written with the characters for bean + oil) was mentioned. But on the sign board (kanban) of Yuasa Shoyu (which was started in the Tenshô period, 1573-1592), Tamari Shoyu was written (and "tamari" was written with the single character for "tamaru"). In the *Vocabulary of the language of Japan* (1603; Nippo Jisho) tamari was defined in Portuguese: "Tamari, a very delicious liquid taken from miso which can be used as a seasoning when cooking foods." Furthermore, in the *Oshufushi* (1684) it is written that "The liquid from shoyu is tamari." During the Middle Ages (chûsei) in Japan, shoyu was written with the characters for bean + oil, but during the Tenshô period (1573-1592) it came to be written with the single character for "tamaru." Tamari and shoyu were first distinguished during the Kyôhô period (1716-1735). In the Chubu region of central Japan (Chûbu-Chiho; Toyama, Ishikawa, Fukui, Yamanashi, Nagano, Gifu, Shizuoka, and Aichi prefectures) one special kind of miso, which is a by-product of shoyu, is called "tamari-miso."

7677. Aihara, Cornellia. 1982. The *dô* of cooking: Complete macrobiotic cooking for the seasons. Oroville, California: GOMF Press (George Ohsawa Macrobiotic Foundation). 230 p. Illust. by Carl Campbell. Index. 28 cm.

• ***Summary:*** This is a compendium of four seasonal cookbooks, each with the title *The Dô of Cooking* (*Ryorido*), first published individually in 1971. Contents: Preface. Introduction. Selecting good foods. The secret of cooking. Spring. Summer. Autumn. Winter. Glossary. Cutting styles. Topical index (within each major food category {grains, grains with vegetables, seaweeds, beans and tofu, etc.}, recipes are listed alphabetically). Recipe index (of all recipes).



Contains many recipes calling for: Miso, natto, tofu (regular, deep-fried, and frozen). Also: Amazake, azuki beans, kuzu, mochi, sea vegetables, seitan (wheat gluten), sesame seeds and gomashio.

Near the front of the book is a biographical sketch and photo of Cornellia Aihara. She was born in 1926 in Fukushima, Northern Japan. She learned macrobiotics from George Ohsawa when he came to her town (Aizuwakamatsu) for lectures; this changed her life. While in school, she began corresponding with Herman Aihara, who was living in New York. In 1955 he invited her to New York. Although they had never met, she trusted him and went to American with only ten dollars in her pocket. They were married soon after her arrival in New York. There they engaged in retail business. When Mr. and Mrs. Ohsawa came to the USA from Europe, Cornellia studied macrobiotic cooking by helping Mrs. Lima Ohsawa at the first macrobiotic summer camps on Long Island in 1960; in the Catskill Mountains in 1961; at the University of California at Chico in 1963; and at the Big Sur Camp in 1964. Since 1961 Cornellia has devoted her life to the teaching of macrobiotic cooking, childcare, home remedies, and philosophy. Since 1965 Cornellia and Herman Aihara have organized fourteen macrobiotic summer camps in California; her cooking has been the biggest attraction.

On the cover is a large color photo of freshly prepared food, including slices of deep-fried tofu. Address: 902 14th St., Oroville, California 95965.

7678. American Soybean Assoc. 1982. Tofu and the American soybean. *Checkoff Successfile.* Japan #105. 2 p.
• ***Summary:*** Contents: Summary. The problem. ASA's program and execution. Results. "In 1958 Japan's tofu industry used only 955,000 bushels of U.S. soybeans. Government restrictions and the tofu industry's quality

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standards held back the growth of U.S. imports by the tofu industry." Meanwhile Japanese tofu makers were using nearly 8 million bushels of soybeans grown in Japan or imported from China.

Step 1. ASA arranged for two senior Japanese food scientists to spend several months at USDA's Northern Regional Research Lab in Peoria, Illinois. They conducted research on tofu and miso to determine which U.S. soybean varieties worked best. "At the same time, ASA, the Japan Tofu Association, and the Food Research Lab of the Japanese Ministry of Agriculture repeated the tests using various varieties of U.S. soybeans.

"The result was the development of a soft tofu production method, which gave reduced loss of water-soluble proteins and higher yields of tofu [because the tofu contained more water]. "Most important to U.S. farmers it was discovered that U.S. soybeans were the most suitable to the new process."

Next a "series of technical seminars were held in which demonstrations were presented to illustrate the superior quality of U.S. soybeans and the new processing methods." Gil Griffis, ASA director for Asia, says, "We succeeded in destroying the myth that only Japanese and Chinese soybeans could serve the tofu market."

ASA's next goal was to increase tofu consumption in Japan. In cooperation with the Japan Tofu Association, ASA conducted a nationwide series of cooking classes from the back of a kitchen-equipped bus that traveled from city to city. New tofu recipes were developed to appeal to the young homemaker. Several of the cooking seminars were televised, thus expanding the audience. "In addition, attractive posters were created and displayed outside nearly 25,000 tofu shops in Japan.

"Results: After 22 years of promoting U.S. soybeans to the Japanese tofu industry, the U.S. has made great inroads into the market. Last year Japan's tofu industry used nearly 17 million bushels of soybeans. Nearly 16 million bushels of the total industry purchases [about 94%] came from the U.S.–the production of over half a million acres of U.S. soybeans."

A large graph shows "Consumption of whole soybeans in foods" from 1975 to 1980 [in Japan]. Tofu and others has risen from 525,000 tonnes (metric tons) to about 590,000 tones. Miso has remained unchanged at about 180,000 tonnes. Photos show: (1) ASA's Ms. Kojima with a Japanese man making tofu in a traditional shop. (2) An ASA cooking class attended by women. (3) A Kentucky Fried Chicken outlet in Japan. Address: St. Louis, Missouri 63141.

7679. American Soybean Assoc. 1982. Selling rice and soy in the Japanese market. *Checkoff Successfile.* Japan #106. 2 p.
Address: St. Louis, Missouri.

7680. American Soybean Assoc. 1982. Selling soybean oil in Japan. *Checkoff Successfile.* Japan #102. 2 p.
Address: St. Louis, Missouri.

7681. American Soybean Assoc. 1982. American style salad bars help increase soy oil use in Japan. *Checkoff Successfile.* Japan #104. 1 p.
Address: St. Louis, Missouri.

7682. American Soybean Assoc. 1982. Selling soy to Japanese hog producers. *Checkoff Successfile.* Japan #103. 2 p.
Address: St. Louis, Missouri.

7683. American Soybean Assoc. 1982. Better diet for Japanese poultry means use of more U.S. soybeans. *Checkoff Successfile.* Japan #101. 2 p.
Address: St. Louis, Missouri.

7684. American Soybean Assoc. 1982. Looking for a larger share of the institutional oil market in Japan. *Checkoff Successfile.* Japan #107. 2 p.
• ***Summary:*** Hohnen Soybean Salad Oil. Address: St. Louis, Missouri.

7685. American Soybean Assoc. 1982. ASA consultants solve problems, spread information. *Checkoff Successfile.* Technical Consultants #1300. 2 p.
• ***Summary:*** "Problem: Foreign livestock producers need technical assistance in developing profitable livestock industries and formulating balanced feed rations. Oil processing techniques must be modernized to increase efficiency.

"Program: The ASA technical consultant program was launched in 1957 when the first ASA-sponsored consultant went to Japan to help the fledgling Japanese hog industry.

"Results: Since 1957, ASA has sent more than 200 highly trained animal nutritionists, soybean oil technicians, veterinarians and other experts to 76 nations. Altogether, ASA has coordinated and sponsored almost 500 technical trips to help foreign customers improve livestock and processing industries. Their assistance shows customers that U.S. farmers 'service what they sell–a key factor in increasing demand for U.S. soybeans and products.'"
Address: St. Louis, Missouri.

7686. Bunka Shuppan Kyoku. 1982. Tôfu no hon: Tsukutte tabeyô [The book of tofu: Let's make and eat]. Tokyo: Bunka Shuppan Kyoku. 94 p. Illust. Index. 25 cm. [Jap]
• ***Summary:*** Packed with recipes and color photos, this book also describes how to make tofu at home (a wooden tofu kit is pictured on page 95), and gives a brief history of tofu (by Abe Koryu), with two early woodblock prints. One print (p. 91) from the *Wakoku Shoshoku E-zukushi,* by Hisakawa

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MORONOBU (a famous Japanese artist of the Edo period) (1685) shows a Japanese man carrying two water-filled wooden tubs of tofu suspended by 4 ropes at each end of a shoulder pole. He is selling tofu, probably in Kyoto. To his left is walking a kimono-clad woman, with a similar wooden tub (covered with a cloth but probably containing tofu) atop her head. She probably bought the tofu from him. Both people are bare footed. The caption says: "Please eat tofu. I came all the way from Nara."

The other print (p. 92) titled "Tofu seller" (*Tofu uri*) from the book *Shichijû-ichiban Shokunin-zukushi Uta Awase*, by Mitsunobu TOSA (1657) shows a Japanese woman seated on her heels in the seiza position on the ground behind a short table (about 4 inches high, 4½ feet long, and 14 inches wide). On the table is one large cake of tofu (about 10 inches square and 3 inches high) and four smaller pieces (each about 6 inches square and 1 inch high).

7687. Dunn, John R.; Reynolds, B.J.; Eversull, E.E.; Skinner, R.A.; Thurston, S.K. 1982. Cooperative involvement and opportunities in oilseeds. *ACS Research Report* No. 13. v + 47 p. 28 cm. [28 ref]

• ***Summary:*** A very important and original report showing the relationship between all aspects of soybeans and other oilseed crops in the USA, and between cooperative and noncooperative soybean processors. Contents: Highlights and recommendations. Oilseed crop production: Soybeans, cottonseed, peanuts, flaxseed, sunflowerseed. Overview of cooperative oilseed system: Cooperative oilseed flows, cooperative organizational approaches, vertical integration by individual cooperatives, horizontal coordination by groups of cooperatives, vertical coordination by groups of cooperatives. Oilseed crushing: Soybeans, cottonseed, sunflowerseed / flaxseed, peanuts, potential new locations for cooperative crushing, parts inventory for processing cooperatives. Processing plant output: Soybean plant output, cottonseed mill output. Processing plant costs: Soybean plant costs, cottonseed plant costs, economies of scale. Raw product marketing. Oilseed pricing mechanisms. Transportation of oilseeds and oilseed products: Cooperative control of transportation modes, transportation by cooperative soybean processors. Refining, product manufacturing, and marketing: Demand for vegetable oil products, vegetable oil refining, increasing cooperative refining activity, marketing of vegetable oil products, manufacturing and marketing meal products, cooperative brand name oilseed products, retail product quality assurance association. The export markets for U.S. oilseeds: Global demand for oilseeds, global oilseed processing, world oilseed trade flows. Cooperative involvement in oilseed exporting: cooperative export flows, level of cooperative involvement, considerations for expansion of cooperative exporting, advantages and risks for cooperatives in oilseed exporting, the need for unified cooperative export efforts. Challenges for oilseed cooperatives: Rail transportation, energy, growth, competitive pressures and the need for coordination. Selected oilseeds references. Appendix tables.

Tables related to soy: (1) Regional shares of U.S. regional soybean production; Averages for 1959-69, 1970-79, 1976-79. (6) Soybean crushing capacity; total cooperative and noncooperative. Cooperative share of crushing capacity, 1971-1979 crop years. (7) Number of soybean crushing mills, U.S. total, co-op, and non-coop. Average mill capacity; U.S., co-op and non-co-op, 1971-1979 crop years. (8) Soybean crushed, U.S. total, cooperative crush, nonco-op crush, cooperative share of total crush, 1971-1979 crop years. (9) Utilization of soybean crushing capacity; U.S. overall average, noncooperative average, 1971-1979 crop years.

(10) Soybean crushing capacity shares and cooperative shares of crushing capacity, by region, 1979. (11) Soybean crushing capacity and proportion of soybean production which may be crushed within each region, 1979. (12) Structural characteristics of the domestic soybean processing industry in terms of plant numbers and capacities, 1979. (16) Production of soybean oil and oil products by cooperatives, 1971-1979 crop years (Million pounds and percentage; Crude oil, degummed oil, lecithin and by-products, refined oil, hydrogenated oil). (17) Soybean meal production by cooperatives, 1971-1979 marketing years (Thousand tons and percentage; Total, high protein meal, low protein meal, mill feed production).

(20) Processing costs for cooperative soybean processing plants, 1971-1979, alternative years. (24) Soybean receiving methods by cooperative plants, 1971-1979 crop years (by rail, cooperative owned truck, other truck). (25) Soybean meal shipment methods by cooperative plants, 1971-1979 (by rail, co-op truck, other truck, barge). (26) Soybean oil shipment methods by cooperative plants, 1971-1979 (by rail, truck, barge). (27) U.S. utilization of soybean oil, by products, by crop years, 1964-1979 (million lb): Shortening, salad and cooking oil, margarine, other edible, total food, total non-food, total domestic disappearance.

(30) Total and per capita consumption of fats and oils, food and industrial products, USA, 1963-1979 (million lb and per capita) (butter, lard, margarine, shortening, edible oils, all [oleaginous] food products, all industrial products, all products). (31) Margarine: Fats and oils used in manufacture, United States, 1965-1979 (incl. soybean, cottonseed, peanut, corn, coconut, safflower, other vegetable, lard, beef tallow). (32) Shortening: Fats and oils used in manufacture, United States, 1965-1979 (incl. soybean, cottonseed, peanut, etc.). (34) Selected oilseeds, vegetable oils, and oilseed cakes and meals: value of U.S. exports, annual 1973-1979. (35) Major U.S. oilseed and products exports, 1973-1979 (Soybeans, sunflowerseed, cottonseed, peanut). (36) Global soybean annual crushing capacities of

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major markets, 1979 (Soybean importing countries: Belgium & Luxembourg, Denmark, France, Italy, Netherlands, UK, West Germany, Spain, Poland, Yugoslavia, Soviet Union, Japan, Korea {Rep. of = South}, China {PRC}, Taiwan, Mexico, subtotal 42%. Soybean exporting countries: USA, Brazil, Argentina, subtotal 58%). (37) U.S. soybean exports by region or country of destination, 1973-1979.

(40) Volumes of soybeans handled by regional and interregional cooperatives and regional cooperative share of total farm soybean sales, 1972-1979 marketing years. (41) Soybean shipments to cooperative and noncooperative port elevators, 1973-1979. (42) Soybean shipments to ports by port area, by regional cooperatives, 1973-1979 (Atlantic, Gulf, Great Lakes, Pacific, total). (43) Percent of regional cooperatives' soybean sales shipped to port areas 1972-1979. (44) Cooperative port elevator capacities and share of total capacity, by port area, 1980.

Figures: (1) Bar chart: Oilseed production by commodity for selected years, 1959, 1969, 1979. (2) Map of oilseed production areas, USA, 1979. (3) Cooperative export channels for raw oilseeds. (4) Cooperative channels for oilseed products. (5) Cooperative coordination paths (Complete integration, vertical integration, single activity, intercooperative coordination). (6) Bar chart: Oilseed crush shares by commodity for selected years (1959, 1969, 1979). (7) Bar chart: Oilseed production percentage crushed domestically by commodity for selected years. (8) Map: Cooperative oilseed processing plants, 1979. (9) Soybean products. (10) Flow chart: Vegetable oil refining process. (11) Map: Edible fats and oils refining plants, with maximum capacity by region, 1975. Continued. Address: USDA Agricultural Cooperative Service (ACS). Phone: 202-475-4929.

7688. Ebine, Hideo. 1982. Fermented soybean foods in Japan. In: S. Saono, F.G. Winarno, and D. Karjadi, eds. 1982. Traditional Food Fermentation as Industrial Resources in ASCA Countries. xvii + 259 p. See p. 41-52. Proceedings of a technical seminar, held 9-11 Feb. 1981 at Medan, Indonesia.

• ***Summary:*** Production statistics for miso and natto from 1970-1979 were presented. Miso increased from 552,207 tonnes in 1970 to a peak of 590,137 tones in 1973, followed by a gradual decrease to 567,776 tons in 1979. Natto production increased from 100,000 tonnes in 1970 to 158,000 tonnes in 1979. Statistics on the production of fermented black soybeans (Tera Natto or Hama Natto) are not available, but are roughly estimated at 10,000 tons.

An outline is then given of the chemical composition of the different types of miso and natto as well as their methods of manufacturing. Of the many beneficial characteristics of miso, the following are worthy of note: it has strong antioxidative activity, a strong buffering activity, and a bactericidal like effect against pathogens.

"Natto is one of the typical and popular soybean foods in the Japanese diet. It is classified into 2 major types; one is called Hama Natto which resembles soybean miso in colour and flavour; the other is called itohiki natto. When referred to simply as natto, it generally means itohiki natto. Natto is a unique soybean food, fermented by *Bacillus natto.* The surface of fermented natto is covered with characteristic viscous and slimy substances consisting of *B. natto* cells and polymers of glutamic acid." Address: Applied Microbiology Div., National Food Research Inst., Ministry of Agriculture, Forestry and Fisheries, Yatabe, Ibaraki-ken, Japan.

7689. Eiyo Kaizen Fukyukai. 1982. Gendai shôyu shô-jiten: Shôyu no chishiki no arekore [Little encyclopedia of modern shoyu. Various facts about shoyu (Brochure)]. Tokyo: EKF. 19 p. [Jap]
Address: Tokyo.

7690. Grain legumes production in Asia. 1982. Tokyo: Asian Productivity Organization. 550 p. [10+ ref]

• ***Summary:*** Section V, "Country reports on the status of grain legumes production," includes the following chapters:

12. China, Republic of [Taiwan], by Chih-Kang Chao.
13. India, by Tejwant Bolaria.
14. Indonesia, by Justika S. Raharsjah.
15. Japan, by Y. Tanaka and S. Konno.
16. Korea, Republic of [South Korea], by Young-Hyun Hwang.
17. Nepal, by M.P. Bhartai.
18. Pakistan, by M. Mumtaz Ali.
19. Philippines, by Federico B. Ballon.
20. Sri Lanka, by A.S. Kunasingham. Address: Tokyo, Japan.

7691. Gunji, Atsutaka. 1982. Abunai shokuhin senshû [One thousand dangerous foods]. Tokyo: National Shuppan. 188 9. [Jap]*

• ***Summary:*** The section in soy sauce was translated by Jun Makino and published in Crackerbarrel (Chico, California). 1983. April. p. 6. As follows: "Most Japanese soy sauce makers depend on inferior quality defatted soybeans for their main ingredients. The suppliers of these defatted soybeans are fertilizer dealers, who also sell them for livestock feed and fertilizer... In order to make an inexpensive product, many soy sauce makers have adopted the dubious practice of buying the waste water by-product of monosodium glutamate manufacturing. This waste water is used in the processing of acid-hydrolyzed soy sauce to improve its poor flavor.

"Japan's top soy sauce manufacturers produce approximately 380,000 kl [kiloliters] of soy sauce each year, and 170,000 kl of that is chemical soy sauce used in mixture... During 1975 to 1979 some 224 patents on soy sauce manufacturing technology were obtained..." Address: Prof. of Food Technology, Meiwa Women's College, Japan.

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7692. Haas, Peggy Wagoner; Gilbert, L.C.; Edwards, A.D. 1982. Fresh green soybeans: Analysis of field performance and sensory qualities. Kutztown, Pennsylvania: Rodale Research Center, and Rodale Test Kitchen. 25 p. No. NC-81-9. 28 cm. [2 ref]
• ***Summary:*** "This study of fresh green soybean lines and varieties was conducted over a 2-year period [May 1980 to Dec. 1981] at the Rodale Research Center." Both field performance and sensory qualities of the soybeans were investigated. "It is hoped that more interest in this valuable garden crop will be generated among seed companies and plant breeders. The appeal of fresh green soybean varieties merit their inclusion in seed catalogs." Varieties with large seeds (where 100 seeds weigh more than 20 gm) were selected.

Varieties that received the highest "mean overall likeability" from a taste panel were Prize (from Burpee Seed Co., Warminster, Pennsylvania; "bright green color; loose hulls; sweet, nutty, buttery flavor"), Mikawashima (from Takii & Co., Kyoto, Japan), and Early Green Okuhara.

Table 4 (p. 17) shows the best varieties identified in this study. Part I shows eight varieties found to be exceptional in both field and sensory qualities: Altona and Envy (from Johnny's Selected Seeds, Albion, Maine), Okuhara Early Green, Improved Hakucho, Hakucho 3, and Early Hakucho (from Takii & Co.), Early Green Okuhara (Redwood City Seed Co., Redwood City, California), and Edible Soybean (Burgess Seed & Plant Co., Bloomington, Illinois). Part II shows varieties and lines which tasted as good as those in Part I but which showed some undesirable plant habits when grown in Eastern Pennsylvania: Prize (from Burpee), Disoy (Gurney Seed Co.), Prize (Earl May Seed Co.), Mikawashima (Takii & Co.), Tsurunoko (Redwood City Seed Co.), and Jefferson (USDA Soybean Germ Plasm Collection–Not available commercially).

Table I shows 1981 field performance summary of 30 fresh green soybean varieties: Foe each variety is given: RRC#, variety name or pedigree number, source, days to plump green, number of days beans in table ready condition, weight in grams of pods from 100 plants, relative plumpness of pods filled with beans (5 = pods very plump, beans large & round within pod), plant height in cm at mature green stage, relative plant canopy rating (5 = excellent coverage), plant stature and distinctive field characteristics. Named varieties tested: Elf, Jefferson, Frostbeater, Prize, 36 Hodgson, Fiskeby V, Disoy, Prize, Altona, Wilkin, Envy, Panther, Okuhara Early Green, Takii's Extra Early, Fulbasket, Improved Hakucho, Hakucho 3, Mikawashima, Early Hakucho, Express Green, Tsurunoko, Early Green Okuhara, Edible Soybeans, Butterbean. Address: Kutztown, Pennsylvania.

7693. Hara, Eddie H. 1982. Le tofu dans la cuisine macrobiotique [Tofu in macrobiotic cuisine]. Paris: Guy Tredaniel. Éditions de la Maisnie. 85 p. Illust. No index. 25 cm. Preface by Clim Yoshimi. [Fre]
• ***Summary:*** This attractive book, featuring 36 recipes, starts with one for homemade tofu, and includes recipes for tofu mayonnaise, tofu omelets, salads, soups, bread, tofu hamburger, tofu steak, and desserts. Address: Japanese photographer living in France.

7694. Hayashi, Harutaka. 1982. Shinsen tôfu hyakuchin [One hundred new tofu favorites]. Tokyo: Chuo Bunko. 260 p. No index. 16 cm. [1 ref. Jap]
• ***Summary:*** Contents: Preface. Introduction. Contains 100 recipes in Japanese alphabetical (IROHA) order. Tofu Hyakuchin new selected edition. [A modern edition of old *Tofu Hyakuchin* book.] Dengaku. Various thoughts on tofu. Address: Obaku, Japan.

7695. Hirayama, Takeshi. 1982. Relationship of soybean paste soup [miso soup] intake to gastric cancer risk. *Nutrition and Cancer* 3(4):223-33. [15 ref. Eng]
• ***Summary:*** Consumption of miso soup was found to protect against stomach cancer, as long as the soup's salt concentration was kept to a minimum. "Daily intake of soybean paste soup was found to significantly reduce standardized mortality rates for gastric cancer in an ongoing large-scale prospective study of 122,261 males and 142,857 females aged 40 and above in 29 Japanese health center districts, 1966-1978. The gastric cancer standardized mortality rates were 171.9, 210.2, 240.0, and 255.9 per 100,000 males, and 77.8, 85.3, 97.5, and 113.6 per 100,000 females in daily, occasional, rare, and noningesters, respectively... The risk-reducing effect has also been observed in case-control studies in the past, for both males and females and in urban and rural areas. This beneficial effect could arise from selected compounds such as protease inhibitors and/or other nutritious substances included in the soybean, but it is also possible that it merely reflects the effect of some frequent accompaniment to soybean paste soup, such as green-yellow vegetables...

"According to the national nutritional survey conducted by the Ministry of Health and Welfare in 1979 for 6,000 randomly selected households (21,000 persons), 40.5% of Japanese ingest soybean paste soup daily at breakfast. Another 6.7% ingest it at their evening meal."

In both men and women smokers, frequent consumption of miso soup was found to protect against stomach cancer (Table 3).

"Recently, an animal experiment bearing on the present issue was conducted in Korea [Kim, J.P.: Personal Communication, Oct. 1981]. Rats were fed various gastric carcinogens, and incidence of gastric cancer was reported to be significantly lower in those animals also fed soybean paste soup." Address: Epidemiology Div., National Cancer

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Center Research Inst., Tsukiji 5-1-1, Chuo-ku, Tokyo, Japan 104.

7696. Holthaus, Fusako. 1982. Tofu cookery. Tokyo: Kodansha International. 159 p. Illust. Index. 27 cm. Though published in Japan, this book was sold mainly in America.
• ***Summary:*** Contents. Introduction. Recipes: 1. Hors d'oeuvres. 2. Soups. 3. Main dishes. 4. Salads. 5. Sauces, dips, and spreads. 6. Breakfast and lunch. 7. Baking. 8. Desserts. Address: Japan & Washington state.

7697. Iibuchi, Sadaaki; Yano, Yoshimasa; Kawashima, Masao; Nakagawa, Keizo. 1982. Energy analysis of a kori-dofu plant. *J. of Food Engineering* 1(1):17-29. [35 ref]
• ***Summary:*** In a plant which used 13 operations to process 6 tons/day of soybeans to make dried-frozen tofu (kori-tofu), total energy consumption per 1 kg of dried-frozen tofu was 27.1 MJ of fuel energy plus 8.3 MJ of electrical energy. This total of 35.4 MJ of energy required to produce 1 kg of product is rather high compared to the energy required to make other foods. The waste-water treatment consumed more energy than the entire manufacturing process. The analysis was made in 1980 on a plant owned by Habutae Tofu Co. Ltd., Kanazawa-shi, Japan. The term "exergy" (the ability of work) is used frequently. Address: 1-2. Dep. of Agricultural Chemistry, The Univ. of Tokyo, Tokyo 113, Japan; 3-4. Habutae Tofu Co. Ltd., Kanazawa-shi, 921, Japan.

7698. Kanoe, M.; Kido, M.; Komatsu, T.; Toda, M. 1982. Growth inhibitory effect of *Bacillus natto* on several microorganisms of animal pathogenicity. *Bulletin of the Faculty of Agriculture, Yamaguchi University* (*Yamaguchi*) 33:1-24. [Jap; eng]*
Address: Yamaguchi Univ.

7699. Ko Swan Djien. 1982. Indigenous fermented foods. *Economic Microbiology* 7:15-38. A.H. Rose, ed. Fermented Foods. [67 ref]
• ***Summary:*** Contents: 1. Introduction. 2. Foods fermented by moulds: Roles of the moulds. 3. Foods fermented by bacteria: Fermented vegetable products, fermented fish products, fermented seeds (natto, thua-nao, dagé), fermented starch-rich raw materials (fermented maize products, fermented rice products, fermented cassava), fermented plant juice.

4. Foods fermented by a mixture of moulds and yeasts: Ragi, micro-organisms, fermented starch-rich raw materials.

5. Foods firstly fermented by moulds [as in making koji], followed by a fermentation with a mixture of bacteria and yeasts (the salt-tolerant yeasts are species of *Saccharomyces* and *Torulopsis;* the bacteria are species of *Pediococcus* and *Streptococcus*)*:* Tane koji, soy sauce, other fermented soybean products (tauco {porridge or dry consistency}, miso, hamanatto {which is soft and has a high moisture content}, tou-shih {which has a much lower water content than hamanatto and is therefore not so soft}. These "fermented soybean products are also used as flavouring agents in cooking as well as table condiments or as a side dish").

6. Specific aspects of fermented foods: Mould species, lactic-acid bacteria, yeasts, salt. 7. Acknowledgement. References.

Concerning soy sauce (p. 30-31): "Japanese *shoyu* is made from equal amounts of soybeans and wheat." The "raw materials are inoculated with tane koji which contains spores of selected strains of *Aspergillus oryzae* and *A. soyae.* In less sophisticated soysauce factories throughout South East Asia, mould species grow spontaneously on the soybeans by natural contamination from the air and from the bamboo trays on which soybeans of former batches were incubated (Bhumiratana et al., 1980). The moulds involved are species of *Aspergillus, Rhizopus,* or *Mucor.* Some Indonesian *kecap* manufacturers inoculated the cooked soybeans with tempe [tempeh] inoculum which contains spores of *Rhizopus oligosporus."*

Tables: (1) Conferences discussing aspects of indigenous fermented foods (1977-1981, chronological). (a) Symposium / Workshop on Indigenous Fermented Foods, Nov. 21-26, 1977, Bangkok, Thailand. (b) World Conference on Vegetable Food Proteins, Oct. 29–Nov. 3, 1978, Amsterdam, The Netherlands, (c) Symposium on Fermented Foods, Nov. 22, 1978, London, England. (d) International Symposium on Oriental Fermented Foods, Dec. 10-14, 1979, Taipei, Taiwan. (e) United Nations University Workshop on Research and Development Needs in the Field of Fermented Foods, Dec. 14-15, 1979, Bogor, Indonesia. (f) VIth International Fermentation Symposium, July 20-25, 1980, London, Ontario, Canada. (g) Eighth Conference of Association for Science Cooperation in Asia (ASCA), Feb. 9-15, 1981, Medan, Indonesia.

(2) Origins of various fish sauces. (3) Origins of various fish pastes. (4) Names given in various countries to an inoculum used to manufacture food products. (5) Names given in various countries to fermented glutinous rice (*Oryza sativa glutinosa*). (6) Names given in various countries to rice wine. (7) Names given to soy sauce in different countries (*Chiang-yu* in China, *Kan jang* in Korea, *Kecap* in Indonesia, *Shoyu* in Japan).

Note: This is the earliest English-language document seen (April 2012) that uses the term "Kan jang" to refer to Korean soy sauce. (8) Soybean foods produced by a two-stage fermentation (*Hamanatto and miso* in Japan, Soy sauce in the Orient, *Taoco* in Indonesia, *Tao-si* in the Philippines, and *Tou-shih* in China). Address: Dep. of Food Science, Agricultural Univ., Wageningen, Netherlands.

7700. Kudo, Kenichi; et al. 1982. Nihon no daizu to sekai no

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daizu no seisan ni kansuru jakkan no kôsatsu [Thoughts on soybean production worldwide and in Japan]. Tokyo: Daizu Kyokyu Antei Kyokai. 22 p. Aug. [Jap]
Address: Daizu Kyokyu Antei Kyokai (Soybean Supply Stabilization Assoc.), Minato-ku, Tokyo, Japan.

7701. Kushi, Micho; Kushi, Aveline. 1982. Macrobiotic dietary recommendations. East West Foundation, P.O. Box 850, Brookline Village, MA 02147. 48 p. 22 cm. [15 ref]
• ***Summary:*** Contents: Introduction. Standard dietary recommendations. Recommended daily proportions. Foods to reduce or avoid for better health. Way of life suggestions. Daily reflections. Suggestions for patients with cancer or other serious illnesses. Special dishes. Home remedies. Baby food suggestions. Kitchen utensils. Nutritional considerations. East West Foundation information. Glossary. Bibliography.

Compiled with the help of Edward Esko, Murray Snyder, Bill Spear and Bill Tara. Address: Brookline Village, Massachusetts. Phone: -.

7702. Machida, Yoshiro. 1982. Atarashii tônyû no kenkô-hô [Soymilk: The new way to good health]. Tokyo: Jukai Shuppan. 127 p. [Jap]*

7703. Mheen, T.I.; Kwon, T.W.; Lee, C.H. 1982. Traditional fermented food products in Korea. In: S. Saono, F.G. Winarno, and D. Karjadi, eds. 1982. Traditional Food Fermentation as Industrial Resources in ASCA Countries. xvii + 259 p. See p. 63-81. Proceedings of a technical seminar, held 9-11 Feb. 1981 at Medan, Indonesia. [13 ref]
• ***Summary:*** Discusses and gives a flow sheet and nutritional analysis for the following fermented soybean products: Meju, kochujang (soybean paste with red pepper added), doenjang, kochujang. "According to the available old literatures, the history of soybean cultivation for food uses in the Orient dates back to 4,000–5,000 years ago in China, 2,000 years ago in Korea, and 1,000 years ago in Japan (KIST, 1970; Watanabe et al. 1971)." Address: 1-2. Korea Inst. of Science and Technology, Seoul, Korea; 3. Korea Univ., Seoul, Korea.

7704. Nagai, Masaki; Hashimoto, Tsutomu; Yanagawa, Hiroshi; Yokoyama, Hideaki; Minowa, Masumi. 1982. Relationship of diet to the incidence of esophageal and stomach cancer in Japan. *Nutrition and Cancer* 3(4):257-68. [8 ref. Eng]
• ***Summary:*** In a study of food intake in 1,040 Japanese households, consumption of tofu was negatively related to these two cancers–after adjustment for income, population ratio of census industry, and other dietary variables. Thus, high rates of tofu consumption were associated with low rates of these cancers. An inverse association between the consumption of miso soup and stomach cancer seen in women was not significant on multivariate analysis. Address: 1-3. Dep. of Public Health, Jichi Medical School, Tochigi-ken, Japan.

7705. Nagano Miso Co. 1982. JEPRON, a protein rich food raw material. Ueda city, Nagano prefecture. 8 p.
• ***Summary:*** Describes production using ethyl alcohol, and composition of the three types. Address: Nagano prefecture, Japan.

7706. Nakano, Eisha; Stephan, Barbara B. 1982. Japanese stencil dyeing: Paste-resist techniques. New York and Tokyo: Weatherhill. ix + 143 p. Index. 27 cm. [46* ref]
• ***Summary:*** Both authors are women living in America. Eisha Nakano, a graduate of the junior division of the Women's University of Fine Arts, Tokyo, is a stencil artist with long experience teaching katazome (stencil dyeing) to Westerners. The katazome process consists of cutting a paper stencil, preparing the resist paste (made of glutinous rice flour [*mochiko*] and rice bran [nuka]), choosing and preparing the fabric or paper which will be dyed, applying the paste to the fabric or paper using the stencil, letting the paste dry, preparing and applying sizing to the fabric or paper, dyeing the fabric by applying the dye or pigment with a brush, sometimes steaming the fabric, then washing off the paste to reveal the design, and finishing the fabric. The cloth is not dyed in the areas where paste was applied; thus katazome is the direct opposite of the silk-screen technique. Soybeans have traditionally been used in the katazome process in two ways: As sizing and as pigment-binding agents.

Chapter 6, "Sizing the fabric," states (p. 69-73). "The sizing most widely used for katazome, however, is *gojiru* [actually uncooked diluted soybean liquid, or soymilk], a liquid extracted from soaked and ground soybeans. The reason that soybeans are such a good sizing agent is not just that they are cheap and plentiful but also that they are rich in protein, which has adhesive-like qualities. Once the liquid is brushed onto the cloth, the protein begins to undergo a structural change, known as denaturation, whereby it is rendered insoluble. This not only makes the sizing permanent; it also helps reinforce the bond between the fiber and the subsequently applied dye, ensuring good colorfastness... As sizing, the soybean liquid is highly diluted, so the effect is little more than a light starching."

To prepare the soybean sizing for 5-6 meters (16-20 feet) of narrow-width cotton fabric, choose a dry warm day. Soak about ¼ cup (50 gm) whole soybeans in ample water for 5-6 hours in summer or overnight in winter. Drain off the water and have ready an equivalent volume of fresh water. Crush the softened soybeans in a blender or suribachi, adding the fresh water as necessary. Pour the liquified [liquefied] soybeans into a cloth filter bag made of organdy or coarse muslin then squeeze over a bowl to extract the

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concentrated uncooked soymilk, whose volume should be about equal to that of the swollen beans. Now dilute the concentrated soymilk with 8 to 10 parts water, or until it has the translucence of nonfat milk. Now apply the soybean liquid sizing to the fabric using a wide brush following the details given. Stretch the fabric tight and allow it to dry. The soybean liquid must be used fairly quickly, lest it spoil.

Concentrated soybean liquid is also used in traditional Japanese pigment dyeing as a thinner and binder for many pigments. "Pigments differ from dyes in that they are opaque, are insoluble in water, and have little or no affinity for textile fibers. Instead of penetrating the fabric, the finely ground particles lie on the surface, held by any number of film-forming binders. In traditional Japanese dyeing, this binder has generally been derived from soybeans... In traditional pigment dyeing, the color is bound to the fabric through a change in molecular structure that occurs when the protein found in the soybeans dries and turns into an insoluble compound. For the color to be fast, the soybean liquid with which the pigment is mixed must be fairly concentrated, much more so than when used as sizing." Whereas the volume of water added to concentrated soybean liquid for sizing is 8-10 parts, for mixing pigments it should be 1 part for detail or accent color, or 3 parts for background color. After dyeing, the color is fixed with alum solution.

Talk with John Marshall (24 July 1991), a Berkeley artist who was apprenticed to a natural dyer in Japan from 1971-1976 and who uses natural plant dyes: Protein is used in a number of ways in ethnic textile dying. The Japanese and Chinese use soymilk as their source of protein. The people in Pompei used egg white / albumin, while those in Okinawa use dairy milk. The purpose is to coat the fabric and to serve as a primer or *gesso* on which the natural dyes are applied. Real gesso is powdered marble and a binder. In Japan, a dyer would stretch a piece of fabric made from any natural fiber, then apply the soymilk to it using a brush; 1 coat is usually enough but some artists use 2-3 coats. John makes his own soymilk from whole soybeans; he learned how in Japan as part of the dye process. In traditional Japanese dyeing the cloth was not immersed or dipped in the soymilk. Let the cloth dry until it is no longer wet, then it is ready to be dyed, for example using tie-dye (dunked), paste-resist (made from powdered glutinous rice and bran; leave it stretched, as with katazome), batik (with wax resist), or a solid color. Address: 1. Cincinnati, Ohio; 2. USA.

7707. Nippon Shokuryo Shinbun-sha. 1982. Shokuhin sangyô jiten [Encyclopedia of the Japanese food industry. 3rd ed. 2 vols.]. Tokyo: NSS. 528 p. [Jap]
• ***Summary:*** Contains substantial entries for the following soy-related foods: Tofu and tofu products (p. 81-87), frozen and dried-frozen tofu (p. 96-97), natto (p. 98-101), and vegetable oils (p. 107-13). Address: Japan.

7708. Ohara, Teruko; et al. 1982. Tôfu hyaku chin now [One hundred favorite tofu recipes, now]. Tokyo: Shibata Shoten. 130 p. Illust. 19 cm. [Jap]
• ***Summary:*** Contains 100 recipes. Contents: Preface. Western style tofu cookery, by Teruko Ohara. Japanese style tofu cookery, by Hiroshi Fukuda. Chinese style tofu cookery, by Yutaka Yamamoto.

7709. Sattilaro, Anthony J.; Monte, Tom. 1982. Recalled by life. Boston, Massachusetts: Houghton Mifflin Co. x + 223 p. No index. 22cm.
• ***Summary:*** "Four years ago, Dr. Sattilaro, President of the Methodist Hospital in Philadelphia, was dying of cancer. Today, after changing his lifestyle [primarily by adopting a macrobiotic diet], prescribed by Michio Kushi, he is totally free of this disease. Before this book was published, his remarkable story appeared in *Life Magazine* and the *Saturday Evening Post,* and he has told his story on television." Address: M.D., Philadelphia.

7710. Schlessinger, David. ed. 1982. Microbiology. Washington, DC: American Society for Microbiology. xi + 420 p. Illust. Author index. Subject index. 27 cm. [Eng]
• ***Summary:*** This book is divided into an introductory note (by Schlessinger) plus five parts. Part 1 (p. 3-77) is titled "The *Bacillus subtilis* chromosome: Structure, implication, modification and molecular cloning," which is in turn divided into 19 chapters by various authors, as follows: 1. Isolation of *Bacillus subtilis* genes from Charon libraries. 2. Recombination between phage and plasmid vectors in *Bacillus subtilis.* 3. *Bacillus subtilis* α-amylases: Regulation of production and molecular cloning. 4. Virulent Phage ø1E1*metB*+-mediated transduction dependent on transformation competence in *Bacillus subtilis.* 4. Construction of a *Bacillus subtilis* plasmid and molecular cloning in *B. subtilis.* 5. Ribosomal genes in *Bacillus subtilis*: Comparison with *Escherichia coli.* 6. Heterospecific gene expression. 7. Physical map of the rRNA genes of *Bacillus subtilis.* 8. RNA processing in *Bacillus subtilis.* 9. Structure and function of the region of replication origin in the *Bacillus subtilis* chromosome. 9. Is membrane association necessary for the initiation of chromosome replication? No. 10. Novel promoters on the *Bacillus subtilis* chromosome. 11. Mapping bacteriophage SP01 transcription. 12. Functions of *Bacillus subtilis* RNA polymerase core-associated polypeptides. 13. Molecular events during transformation in *Bacillus subtilis.* 14. Site-specific restriction endodeoxyribonucleases in Bacilli. 15. Genetic study of restriction endonucleases in *Bacillus subtilis.* 16. High frequency of recombination at a particular site of the phage M2 genome. Address: Mitsubishi-Kasei Inst. of Life Sciences, 11 Minamiooya, Machida-shi, Tokyo, Japan.

7711. Shanmugasundaram, S. 1982. Role of AVRDC in

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soybean and mungbean improvement [for the developing tropical countries]. In: 1982. Grain Legumes Production in Asia. Tokyo: Asian Productivity Organization. 550 p. See p. 137-50. [28 ref]
• ***Summary:*** Contents: Introduction. Soybean. Importance of soybean in the Asian region. Important changes in agronomic practices. Breakthroughs in varietal development.

Tables: (1) Soybean area, production, yield, imports and exports for selected Asian countries: Taiwan (ROC; 19,000 ha; 1,644 kg/ha), India, Indonesia (755,000 ha; 795 kg/ha), Iran (70,000 ha; 150,000 metric tons; 2,143 kg/ha), Japan (100,000 ha; 2,000 kg/ha), Korea (Rep. of = South; 260,000 ha; 1,350 kg/ha), Nepal (19,000 ha; 650 kg/ha), Philippines, Sri Lanka, Thailand (160,000 ha; 783 kg/ha), China (PRC; 14,430,000 ha; 925 kg/ha) [1979 & 1980]. (2) Yield response of post-rice soybean crop to irrigation and tillage. (3) Effects of different soybean sowing methods on plant stand and yield. (4) Soybean responses to *Rhizobium japonicum* inoculum. (5) Effect of fungicide seed treatment on soybean plant stand when grown in rice stubble culture with excessive soil moisture after sowing. (6) Soybean germplasm collections available in Asian countries. (7) Soybean varieties and their characteristics identified as moderately resistant to soybean rust. (8) Soybean varieties immune to soybean mosaic virus. (9) Soybean varieties susceptible to soybean mosaic virus but are symptomless. (10) Wild soybean, (G. soya Sieb and Zucc.) accessions least affected by beanflies, (*Melanagromyza sojae* and *Ophiomyia centrocematis*) at AVRDC. (11) Soybean varieties less affected by pod borer, *Etiella zinckenella* at AVRDC. (12) Major soybean varieties grown by farmers in different countries until 1972. (13) Major soybean varieties developed after 1972 and grown by farmers until 1980. (14) Performance of AVRDC selection compared to local cultivars in Indonesia. (15) Yield of six soybean cultivars in four locations during summer in a district trial experiment. Address: AVRDC, Shanhua, Taiwan.

7712. Shufu-no-tomo-sha. 1982. Tônyû wa konnani kiku [Soymilk works this well]. Tokyo: Shufu-no-tomo-sha. 184 p. [Jap]*

7713. Suzuki, Fukumatsu; Konno, Shoshin. 1982. Regional report on grain legumes production in Asia. In: 1982. Grain Legumes Production in Asia. Tokyo: Asian Productivity Organization. 550 p. See p. 15-93. *

7714. Takai, Motoo. 1982. Tôfu seizô no chiekku pointo [Check points for making tofu]. Takai Tofu & Soymilk Equipment Co., 1-1 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan: Takai Seisakusho. 13 p. [Jap]
Address: Ishikawa-ken, Japan.

7715. Takara Shuzo K.K. 1982. Shirozake no dentôteki seizô-hô [Re: Traditional method of making shirozake]. Letter to William Shurtleff at Soyfoods Center. 3 p. Handwritten. [Jap]
• ***Summary:*** Company name with diacritics is: Takara Shûzo K.K. Address: Japan.

7716. Tanaka, Teruo. 1982. Construction of a *Bacillus subtilis* plasmid and molecular cloning in *B. subtilis.* In: David Schlessinger, ed. 1982. Microbiology. Washington, DC: American Society for Microbiology. xi + 420 p. See p. 15-18. 27 cm. [17 ref. Eng]
• ***Summary:*** "My associates and I have elaborated seven classes of plasmids from 37 *B. subtilis* strains, including the *B. natto* strains used for fermentation of soybeans." Address: Mitsubishi-Kasei Inst. of Life Sciences, 11 Minamiooya, Machida-shi, Tokyo, Japan.

7717. Tsuruta, Shizuka; Nagayama, Hisao. 1982. Nattô no hon: Tsukutte tabeyô [The book of natto: Let's make and eat]. Tokyo: Bunka Shuppan Kyoku. 94 p. Illust. No index. 25 cm. [Jap]
• ***Summary:*** This attractive book, filled with color photos and recipes, is a popular and fun introduction to Japanese natto. There are also chapters on making natto at home using rice straw and making natto in a commercial factory. The words "The Nattow" are written on the cover in English. Note: The author translated *The Farm Vegetarian Cookbook* into Japanese.

7718. Yokotsuka, Tamotsu. 1982. Industrial application of proteinous fermented foods. In: S. Saono, F.G. Winarno, and D. Karjadi, eds. 1982. Traditional Food Fermentation as Industrial Resources in ASCA Countries. xvii + 259 p. See p. 145-80. Proceedings of a technical seminar, held 9-11 Feb. 1981 at Medan, Indonesia. [130 ref]
• ***Summary:*** Contents: Introduction. Japanese shoyu: Koikuchi, usukuchi, tamari, shiro, saishikomi, fish-soy, JAS grades. The soysauce produced in other Oriental countries (Korea, Taiwan, Singapore, southern China; Inyu, tamari-style). Miso. Manufacture: Koikuchi shoyu (treatment of raw materials, koji making, mash making and aging, pressing of the mash, refining), tamari shoyu, miso. Some recent research and technological progress in shoyu and miso manufacturing: Whole and defatted soybeans as raw materials, treatment of raw materials, koji molds, koji making, control of mash, refining (pressing of the mash, pasteurization), product (colour, flavour, flavour components).

Tables: (1) Annual production of 5 different kinds of shoyu in Japan, and total, 1979. (2) Typical composition of 6 different kinds of shoyu (analyzed by Kikkoman Shoyu Co., Ltd., 1978). For each gives: Be (Baume), NaCl, total nitrogen, formol nitrogen, reducing sugars, alcohol %, and pH. (3) Composition of 7 types of typical Japanese miso

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(Ebine, 1980). (4) NK cooking method of soybeans as compared to the conventional method (Tateno and Umeda, 1955). (5) Chemical analyses of shoyu fermented from soybeans denatured by methanol and by conventional cooking (Yamaguchi, 1954). (6) Analysis of liquid part of shoyu mash after 40 days prepared from defatted soybean meal denatured by ethanol, isopropanol, or NK cooking (Fukushima and Mogi, 1955, 1957). (7) Effect of cooking conditions of soybeans on the enzymatic digestibility of protein (Yokotsuka et al., 1966). (8) Cooling speed and digestibility of protein. (9) Fraction of proteases produced by *Aspergillus sojae* through Sephadex G-100 (Nakadai, 1977). (10) Changes of viable counts of yeast in shoyu mash (Mogi Keitaro et al., 1968).

Figures: (1) Flow sheet–Koikuchi shoyu fermentation. (2) Flow sheet–Miso fermentation. (3) Cross-sectional illustration–Continuous soybean cooker: Screw type and net conveyor type. (4) Temperature change of materials during koji cultivation by the conventional method using wooden trays (Shibuya, 1969). (5) Koji cultivation at 25ºC (Haga et al., 1967). (6) Preferable temperature change of the materials during 3-day koji cultivation (Haga et al., 1967). (7) Temperature change of the materials during mechanical koji cultivation with a through-flow system of aeration during 3 days (Shibuya, 1969). (8) Temperature change of the materials during mechanical koji cultivation with a through-flow system of aeration during 4 days (Shibuya, 1969). (9) Koji culturing machines with a through-flow system of aeration: Rectangular type, circular type (batch), circular type (continuous). Address: Kikkoman Corp., Noda-shi, Chiba-ken, Japan.

7719. Yoneda, Soei; Hoshino, Koei; Schuefftan, Kim. 1982. Good food from a Japanese temple. Tokyo, New York, and San Francisco: Kodansha International. 224 p. Illust. Index. 27 cm.

• ***Summary:*** An outstanding, beautiful book, the best seen to date on Buddhist Vegetarian Cookery (*shojin ryori*)–after you get past the poor, almost embarrassing introduction, written by Robert Farrar Capon of New York. The author, Sôei Yoneda, is a great Zen Abbess and cook, and a visit to Sankô-in, a Rinzai nunnery, is an unforgettable experience. The recipes are arranged by season: Spring, summer, autumn, winter, all seasons. For every recipe, both a Japanese and an English-language name are given. Soy-related recipes include: Soybean rice (*mame gohan,* p. 73). Unohana rice (with fried okara, p. 75). Thick-rolled sushi (with dried-frozen tofu, p. 75). Tofu rice (p. 80). Soy bean dashi (p. 82). Miso soups (p. 85-88; 14 recipes, one for each month but two for Jan. 1 and 2–White miso Ozoni and Zen temple ozoni–and one for all seasons–Saké lees soup). Pickling with miso (p. 89). Rape blossoms with miso-mustard dressing (p. 93). Bamboo shoots with vinegar-miso dressing (p. 98-99). Quick oden (with tofu, p. 107-08). Green beans with miso dressing (p. 113-14). Eggplant with miso sauce (p. 123). Zucchini with sesame-miso sauce (p. 129). Steamed zucchini with three-color miso (p. 130-31). Jade nuggets (*kizami nattô no ao-jiso age,* p. 136). Pine cones (*matsukasa,* with tofu, p. 151). Miso-pickled vinegared konbu kelp (p. 153). Crisp turnip with sesame-miso dressing (p. 158). Amazake (p. 162). Daikon with miso sauce (*daikon oden,* p. 170). Brussels sprouts with miso sauce (p. 179-80). Dried-frozen tofu mélange (p. 181-82). Not exactly hamburger ("patties" with dried-frozen tofu and okara, p. 182). Simmered dried-frozen tofu (p. 182-83). Dried-frozen tofu tempura (p. 183). Konnyaku in miso dressing (p. 184). Fried unohana (*iri unohana,* with thin deep-fried tofu and okara, p. 187; "The mash or lees (*okara*) remaining after making tofu are inexpensive, plentiful, and nourishing–ideal everyday temple food. By itself *okara* is not interesting, but it is brought to life by the addition of a little oil and a few other ingredients"). Inari-zushi (p. 189-90). Grilled usuage (with thin deep-fried tofu, p. 190). Deep-fried usuage (p. 190-91). Golden sushi rolls (with usuage, p. 191). Rôbai (Sanko-in fresh wheat gluten, p. 192-93). Deep-fried dried yuba (p. 195). Fried and simmered dried yuba (p. 196). Sesame "tofu' (with kuzu, p. 196-99). Almond tofu (p. 202). Salt-grilled tofu (from old Naniwa, today's Osaka, p. 203-04). Steamed tofu loaf (p. 206). Salad with white [tofu] dressing (*shira ae,* p. 206-07). Steamed tofu cup (*otôfu no chawan mushi,* p. 208). Deep-fried tofu in thick sauce (p. 209). Tofu sauté (*yaki-dofu no atsuyaki,* p. 213). Bean flowers (*nattô no mochi gurumi,* p. 215). Buckwheat-miso topping (p. 215-16). Miso mayonnaise (with sweet white Saikyo miso, p. 216-17).

Contains 17 pages of color photos showing dishes prepared from recipes in this book. The 510 delicate illustrations (both line drawings and simple brush paintings) clarify and enhance the text throughout. See next page.

In 1987 this book was re-issued with a new title: The Heart of Zen Cuisine: A 600-year Tradition of Vegetarian Cookery. Address: 1. Abbess, Sanko-in Zen temple, Honcho 3-1-36, Koganei-shi, West Tokyo (Musashi Koganei Station).

7720. Yoshikawa-Shoji Co. Ltd. 1982. The book of nigari tofu & nama-age tofu technique. Honmachi Wako Building, 2-50 Kita-Kyuhoji-machi, Higashi-ku, Osaka, Japan. 18 p. 26 cm. [Eng]

• ***Summary:*** This company, founded in 1861, is the oldest maker of nigari in Japan today. They make two three types: Maruzen Micro Neoekis (in fine granular, and an older flake style), and traditional solid nigari in cans. Micro Neoekis, introduced 20 years ago, is purified magnesium chloride.

Contents: Characteristics of nigari tofu. Micro-Neoekis. Real nigari and delicious tofu. Which nigari is best for tofu? Basic characteristics of nigari. Storage of nigari. General method of making tofu. Varieties of tofu. How to make high quality products. Characteristics of high quality soymilk for tofu. How to judge the quality of soymilk. How to make

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GOOD FOOD from a JAPANESE TEMPLE

Soei Yoneda
Abbess, Sankō-in Temple

introduction by
Robert Farrar Capon

a 600-year tradition of simple, elegant vegetable cookery

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soymilk. Other comments. How to make regular tofu. When is more coagulant needed? When is less coagulant needed? Methods for coagulation with nigari. How to add Micro-Neoekis. How to make silken tofu. Reasons for failure. How to make packaged tofu. Reasons whey appears. How to make tofu for deep-frying. Major points to observe in coagulation. How to coagulate. Magnesium chloride 1,2 method. How to make egg tofu. Address: Osaka, Japan. Phone: 06-261-6767.

7721. **Product Name:** ["Flowers of Soya" {Whole Soybean Flakes}].
Foreign Name: Daizu-no-Hana.
Manufacturer's Name: Asahimatsu Kori-dofu K.K.
Manufacturer's Address: Dashina 1008, Iida-shi, Nagano-ken 399-25, Japan. Phone: 026-526-9031.
Date of Introduction: 1982?
Ingredients: Soybeans.
How Stored: Shelf stable.
New Product–Documentation: S. Kudo and M. Hayashi. Assignors to Asahimatsu Kori-dofu K.K. U.S. Patent 4,204,005. May 20. "Process for producing fibrous food materials."

Kyoko Saio. 1986. Interactions among traditional and emerging processing technologies observed in Japanese food industries. In: V.H. Potty, et al. eds. Traditional Foods: Some Products and Technologies. p. 213-14. To make this product, soybeans are immersed in water, ground, steamed, and texturized in a stone mill, dried, tempered, and packed. The product is marketed with the help of Takeda Yakuhin Kogyo Co. Ltd.

7722. Chico-San, Inc. 1982? From yesterday comes today's tamari... or, shoyu, shoyu, who's got the shoyu. Chico, California. 10 p. Undated.
• ***Summary:*** About San-J tamari. Address: Chico, California 95927.

7723. Fountain, M.S. 1982? Multimarket positioning of natural tamari (Leaflet). Colonial Heights, Virginia. 1 p. Single sided. 28 cm. No. 14. Undated.
Address: San-J International, 3236 Boulevard, Colonial Heights, Virginia 23834.

7724. **Product Name:** [Rakuo Soymilk].
Foreign Name: Rakuô Tônyû.
Manufacturer's Name: Fukushima-ken Rakuren.
Manufacturer's Address: Japan.
Date of Introduction: 1982?
Wt/Vol., Packaging, Price: 200 ml long-life pack.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Rakuô Tônyû was introduced before Dec. 1982 by Fukushima-ken Rakuren in a 200 ml long-life pack.

7725. **Product Name:** [Soymilk (Plain, or with Barley Malt Syrup)].
Foreign Name: Tônyû, Tônyû Bakuga-iri.
Manufacturer's Name: Natural Foods (Nachuraru Fuuzu).
Manufacturer's Address: Japan.
Date of Introduction: 1982?
Wt/Vol., Packaging, Price: 195 gm can.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Tônyû and Bakuga-iri Tônyû were introduced before Dec. 1982 by Nachuraru Fuuzu in a 195 gm can.

7726. **Product Name:** [Soymilk].
Foreign Name: Tônyû.
Manufacturer's Name: Seven-Eleven (Sebun Irebun).
Manufacturer's Address: Japan.
Date of Introduction: 1982?
Wt/Vol., Packaging, Price: 200 ml long-life pack.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: K. Tsuchiya. 1982. Dec. *Tonyu* [*Soymilk.* 2nd ed.]. p. 74. States that Tônyû was introduced before Dec. 1982 by Sebun Irebun (7-11) in a 200 ml long-life pack. Note: 7-11 is a U.S. based convenience food store chain.

7727. *Toyo Shinpo* (*Soyfoods News*). 1983. Ima, naze tônyû no buumu nano ka? Tônyû no rekishi wa furui [Why is there now a soymilk boom in Japan? Soymilk has a long history]. Jan. 1. [Jap]

7728. *Toyo Shinpo* (*Soyfoods News*). 1983. [Soymilk: The big three companies, Kibun, Marusan, and Mitsubishi Kasei control over 60% of the market]. Jan. 1. p. 38. [Jap]
• ***Summary:*** Last year their soymilk sales in Japan were: Kibun about 5,000 million yen. Okazaki Marusan about 3,500 million yen. Mitsubishi Kasei about 2,000 million yen.

7729. Kennedy, J. Robert. 1983. History of Chico-San and macrobiotics in America (Interview). Conducted by William Shurtleff of Soyfoods Center, Jan. 6. 2 p. transcript.
• ***Summary:*** Rice cake production started in Canada.

The following are not that important: (1) The conflict over Erewhon buying organic brown rice from the Lundbergs. (2) Erewhon taking away Chico-San's New York market (Bob didn't even know this). (3) Lawsuit (that never went to court) between Chico-San and Lundberg.

The initial contract with the Lundbergs to grow brown rice exclusively for Chico-San was risky for Chico-San; they agreed to pay higher prices if the yield was low. Michio and Paul Hawken tried to get the Lundbergs to break the contract. Bob does not know who went to who. Did the Lundbergs go to Erewhon or vice versa? Why did this happen? Problems

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arose in the third year of the contract. The first year, the Lundbergs grew only 67-70 acres of brown rice, which Chico-San sold by the end of January. The second year, Chico-San also sold all the rice that the Lundbergs grew. The third year was the fire at Chico-San, and Chico-San was unable to sell all the rice they had agreed to sell. Michio came to California with Aveline and they tried to talk the Lundbergs into selling some organic brown rice to Erewhon. But there was no conflict. Michio used to phone Bob Kennedy at nights in those days asking if Erewhon could buy organic brown rice at no profit to Chico-San. Bob said "no." That is not a conflict, and there were no bad feelings.

There was no lawsuit between the Lundbergs and Chico-San–just some litigation prior to what could have been a lawsuit, concerning the third year and the fire. Chico-San was out of business for almost a year because of that fire, and could not sell all the rice they had contracted to sell that year. The litigation led to changes in the original contract: (1) Chico-San could and would pay for the rice over an extended schedule. (2) The Lundbergs could sell the organic brown rice to other customers.

Why is Chico-San a loner in the natural food industry? They are a manufacturer and importer which uses other distributors; they do not generally distribute themselves–unlike Erewhon. However now they have some big trucks, used to distribute their own products in the San Francisco Bay Area.

Erewhon was able to take away Chico-San's New York market because Erewhon was price cutting; Kennedy refused to cut prices. Also, Erewhon sold direct to some markets, delivering their own products in their own trucks–unlike Chico-San which generally used other distributors. Many other companies besides Erewhon did this too. Most of those companies are gone now, but Chico-San remains!

Whenever Paul Hawken would talk to Bob Kennedy he always seemed to have a chip on his shoulder [a sort of grievance].

Initially Chico-San had an exclusive agreement with Ohsawa. Chico-San broke that in deference to Michio when Aveline set up Erewhon. This is a big, important point that should not be forgotten.

Ohsawa's first lectures in the USA, in early 1960, were at the Buddhist Academy in New York City.

There were two main reasons the group that formed Chico-San left New York and traveled to California: Rice (most important) and nuclear safety. Ohsawa strongly supported the group's efforts. Ohsawa tried to set up Japanese companies to supply Chico-San, but it was difficult. Then Muso Shokuhin [Muso Foods], in Osaka, came into the picture, and Chico-San started to order from them. Then they went back to ordering from Tokyo. There were some problems between the export companies in Tokyo and Osaka. Ohsawa Japan was the export company and Nippon CI was the educational arm.

The amount of miso and shoyu that Chico-San sells today is proprietary [confidential] information. Chico-San is now in serious talks with some manufacturers in Japan.

Chico-San started to make rice syrup in 1972. Bob traveled to Japan twice, visited some *amé* [rice syrup] makers, and got information on quantities, temperatures, etc. It's a fermentation process.

Chico-San expects to have a new rice cake plant in New Jersey in operation by December 1981. The plant will make only rice cakes but Chico-San will store

warehouse some of its Japanese foods in the plant. The next plant after that will be in Canada, then one in Europe after that. If these are successful, Chico-San will add distribution of Japanese products. They will sell both organic brown rice (from the Lundbergs and from Arkansas) and non-organic commercial brown rice–each clearly labeled.

What are Chico-Sans plans concerning miso and shoyu? In collaboration with Ohsawa Japan, two Japanese makers of miso and shoyu are very interested in coming to the U.S. and helping Chico-San to set up a plant in the U.S. They would provide technical assistance and be part shareholders / investors. Junsei Yamazaki plans to return to the Chico area, possibly this spring. He studied fermentology, so he may be the process overseer.

In 1961 Chico-San received its first imports from Japan, from Tokyo, from George Ohsawa himself. Previously Herman Aihara in New York had ordered these imports from George Ohsawa. He had received 2-3 shipments before Chico-San was incorporated. George Ohsawa encouraged Muso to get started. Three companies tried to get started and folded before Muso took root. Bob will try to find the details (date and products) of Chico-San's first shipment from Muso. Bob also has George Ohsawa's early correspondence.

Bob would like to read the final draft of Shurtleff's History of Macrobiotics. Peter Milbury will look at it too. Address: Chico, California.

7730. Sheraton, Mimi. 1983. Restaurants: Japanese fare for theater nights. *New York Times.* Jan. 14. p. C18.
• ***Summary:*** This is a review of Sushiko, a Japanese restaurant at 231 West 55th St., between Broadway and Eighth Ave. in New York City. They sell: "fried half-eggplant mellowed with miso sauce, topped with sesame seeds; soybean cakes [tofu] in seaweed soup with vegetables; oshitashi [o-shitashi, o-hitashi], a salad of marinated spinach with soy sauce and crunchy flakes of dried bonito, and natto, winy, fermented soybeans in an egg and scallion sauce."

And "zaru soba, cold buckwheat noodles with soy sauce, horseradish and scallions were refreshing." "Broiled fish, meats and poultry, done teriyaki-style are stringy and less interesting..."

7731. Hawken, Paul. 1983. More history of Erewhon and macrobiotics in America (Interview). Conducted by William

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Shurtleff of Soyfoods Center, Jan. 16. 2 p.
• ***Summary:*** The following are Hawken's comments on a draft history of Erewhon, by Shurtleff. Erewhon was not the "General Motors of the natural foods industry." What vanity! By 1980 various natural food distributors had expanded until they were 2-4 times as big as Erewhon–and very profitable. Erewhon was known throughout the industry as being undercapitalized, mismanaged, a laggard, behind the times. Its market share declined from 1973 on. By that time, Landstrom [in Southern California] had crossed over from health foods to natural foods and had sales of $100 million a year.

Erewhon was not the victim of runaway expansion–unless you mean expansion of new products. From 1973 to 1981 Erewhon barely managed to double its sales–and it did this largely by adding new products such as vitamins, jam, yogurt; these products were in conflict with its basic philosophy of good food. After a while it would sell almost anything, but its core business and market share were declining. Inflation was another major factor that helped to double its dollar sales. There was lots of movement but very little real growth from 1973 to 1981.

The story of the relationship between the Lundberg brothers, Chico-San, and Erewhon concerning organically grown rice is not well known. Bob Kennedy still does not believe this story. In 1968 [sic, fall 1969; see Hawken 1973, "Erewhon: A biography"], before the Lundbergs signed a rice contract with Chico-San, two [sic, one] of the brothers walked into the Erewhon store in Boston [Massachusetts] and said, "We're growing organic rice; do want to buy some? Paul said, "Sure." They went back to Chico-San but Chico-San said, "Don't worry, we'll sell the rice to Erewhon." The risks on Chico-San's part were overstated. Paul knows the contract well. The Lundbergs were appalled to see Chico-San's mark-up on their rice; Chico-San basically doubled the price per pound. Paul said he would not buy rice from Chico-San at that price. Though very likeable people, the Lundbergs didn't realize how the contract would restrict them and their market. The Lundbergs put pressure on Chico-San to lower their prices on rice, and Chico-San did. However Paul is sure that Chico-San was unable to sell the volume of rice that it had contracted to buy. And this was long before the fire at Chico-San. So the contract was broken. The Lundbergs had been desperately looking for a way to get out of that contract. During that time Paul had set up Carl Garrich (Lone Pine, Arkansas [in March 1971]) as a grower of organic rice for Erewhon. After the contract was broken, Paul and Erewhon designed the Lundberg's rice bag using a Currier & Ives design. Paul believes that "people should know where their food is coming from." Erewhon had no pretensions of controlling organic rice.

Chico-San had been putting out the word in the rice valley of northern California that they wanted to buy organic rice. It was the Lundbergs, however, who developed a very clever method for growing the rice to Chico-San's basic specifications–no chemicals. The Lundbergs came to Erewhon before actually growing the rice, or at least before harvesting it.

Paul was shocked when he first heard of the contract between Chico-San and Lundberg. By trying to control this rice, Bob Kennedy blew it. Chico-San had an exclusive for only 2 years; it probably expired at the end of the 2nd year, before the fire. Erewhon was definitely buying rice from the Lundbergs before Chico-San burned down.

Chico-San was upset at all the natural food companies up and down the East Coast and even in California–Food for Life, Janus, and others. Erewhon's whole mission was to get good food to the people. Chico-San's rice was expensive because it underwent so many mark-ups. Chico-San had antipathy to all macrobiotics other than their own version. Paul had no antipathy for Chico-San. The Lundbergs deserve the credit.

The issue of Paul's losing his Erewhon stock. This is not correct as written. The macrobiotic movement has a huge gap between the stated goal and the reality. The falling out in which Paul was involved concerned what he viewed as Michio's dishonesty. When Paul came back from Japan, he did not realize that the stock was no longer his. A year later, when he drew up a stock ownership plan, he said that he wanted his stock back. Michio said he would give it back to Paul but not to the others. It wasn't that clear. He never said "No, you can't have your stock back." Michio is somewhat anti-Semitic and very rich. Address: California.

7732. Uchi, Osamu; Hatanaka, Chiaki. Assignors to Mitsubishi Chemical Industries Limited (Tokyo, Japan). 1983. Method for extracting ingredients of oil-containing seeds. *U.S. Patent* 4,369,198. Jan. 18. 8 p. Application filed 15 Aug. 1978. [9 ref]
• ***Summary:*** This patent concerns soymilk. "A method for extracting ingredients of oil-containing seeds comprising triturating [crushing] uncrushed seeds, which have not been soaked in water, in deoxygenated hot water of from 70ºC to the boiling point under the anaerobic condition is disclosed. By this method, the ingredients of oil-containing seeds can be extracted with higher extraction rate, lower viscosity, lower peroxide value and reduced odor." Address: 1. Fujisawa, Japan; 2. Tokyo, Japan.

7733. Pantry Supermarkets. 1983. Buy one, get one free! (Ad). *Los Angeles Times.* Jan. 20. p. SG3.
• ***Summary:*** The section titled "Oriental foods" states: "Hinode shirataki (yam noodles) 9 oz.–50¢. Hinode natto (steamed soybeans) 5 oz.–49¢. Hinode Japanese tofu 19 oz.–59¢." Address: Los Angeles Co. and southern California.

7734. Nisshin Oil Mills, Ltd. 1983. [Cosmetics containing partially hydrolyzed soybean proteins]. *Japanese Patent*

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8,310,512 A2. 5,810,512. Jan. 21. 5 p. Application filed 9 July 1981. [Jap]*
Address: Japan.

7735. Pantry Supermarkets. 1983. 4 double coupons! (Ad). *Los Angeles Times.* Jan. 27. p. SG3.
• ***Summary:*** The section titled "Pantry savings Oriental foods" states: "Hinode tofu 59¢ each.

"Your choice:
"Japanese–19 oz.
"Kinugoshi–12 oz.
"Chinese–20 oz.
"Hinode Age, 1½ oz. 79¢.
"Kokuho Rose rice, No talc. 25 lb. bag. $7.99." Address: Los Angeles.

7736. Arasaki, Seibin; Arasaki, Teruko. 1983. Vegetables from the sea: Low calorie, high nutrition, to help you look and feel better. Tokyo: Japan Publications. 196 p. Illust. (color plates and line drawings). Index. Jan. 26 cm. [Eng]
• ***Summary:*** This is probably the best English-language book written about sea vegetables. Contents: Preface. Part I: General information. Introduction. 1. In the human diet: In general, in Japan. 2. Dietary and medical applications: Chemical composition (polysaccharides, proteins, amino acids and peptides, fats and lipids, vitamins, minerals, nutritional value, pigments), flavor and taste (specific Japanese seaweeds as foods), medical applications (antilipemic and blood-cholesterol reducing substances, blood anticoagulants, antitumoral {anti-cancer} effects, antibiotics, toxic compounds, medical uses of alginate), folk medicine, thalassotherapy and algotherapy, longevity. 3. Biology of the algae: Differences, pigment systems, photosynthetic products and storage substances, land and marine vegetation, life-spans and seasonality, generation alterations. 4. Harvesting and farming: General (Monostroma and Enteromorpha), brown algae (Laminariales and Undaria, artificial cultivation), red algae (Porphyra, Eucheuma and Gelidium), freshwater algae. 5. Processing and preserving: General, amanori and aonori, green algae (*Caulerpa,* sea grapes), brown algae (wakame, kombu, arame and hijiki, mozuku), red algae, nostoc freshwater algae, domestic algae. 6. Illustrations of major sea vegetables.

Part II: Cooking with sea vegetables. Kombu (*Laminaria*). Wakame (*Undaria pinnatifida*) and Matsumo (*Analipus japonicus*). Hijiki (*Hizikia fusiforme*). Arame (*Eisenia bicyclis*). Asakusa nori (*Porphyra tenera*). Tosakanori (*Meristotheca papulosa*). Kanten (*Agar*). Green laver (*Enteromorpha*).

Index of scientific names of sea vegetables. Index of Japanese names of sea vegetables. List of recipes. Address: 1. Prof. and lecturer on Fisheries Botany and Marine Ecology, Univ. of Tokyo and Nihon Univ., Japan; 2. Prof. Kobe-Yamate Women's College, Lab. of Biochemistry.

7737. Kennedy, Robert. 1983. A message from our president [History of Chico-San]. *Crackerbarrel* (*Chico, California*) 1(1):2. Jan.
• ***Summary:*** This article, which gives a brief history of Chico-San, Inc., is in the first issue of a new Chico-San newsletter.

"There is a lot of excitement at Chico-San these days. Twenty years have passed since we opened in a little basement room to grind sesame seeds by hand for gomasio [gomashio], and repack bulk shipments of miso and shoyu (then called tamari) from our suppliers in Japan. From that meager beginning, Chico-San has become a leader in many areas of food manufacturing and distribution and has gained annual sales substantially in the millions.

"We are grateful for our achievements and we are proud that the complement of Chico-San employees had the loyalty, talent, tenacity and integrity that it took to bring us to this satisfying twenty-year plateau, I refer to this as a plateau because we are now reorganizing our efforts to put more emphasis on our Japanese imports. These are quality foods, called for in George Ohsawa's macrobiotic dietary precepts, that are not yet manufactured in this country.

"It was in 1959 that George Ohsawa with Lima Ohsawa first introduced his philosophy of the Far-East and his concepts of diet to the U.S. public. It was in New York City where hundreds of people attended his 'dinner lectures.' The food was orchestrated by Lima while George took care of the philosophy and other pertinent subjects.

"It was from these lectures that 32 people collected under the umbrella of Ohsawa's teachings and moved to Chico, California where they could work together to pass along what they were learning.

"Some of the names–Herman & Cornellia Aihara, Alvin & Nina Bauman. Dick & Penny Smith, Bill & Dorothy Salant, Teal Ames, me and my wife, Betty.

"As we camped on the way from New York to Chico, we had nightly campfire meetings during which time we defined and prioritized our purpose for moving. Everyone agreed that first on our list of priorities would be to set up a food company that would provide the best available products necessary to the macrobiotic dietary instructions of Ohsawa. All of us were working on various degrees of health problems and we knew that our physical and mental betterment would parallel the quality of the food we ate. It was our resolve then that Chico-San, Inc., our new company name, would carry only the best foods available. This has been our policy and it is our responsibility to people who seriously relate good health to good food.

"Chico-San was incorporated in March 1962, and after Chico-San had been in business a few months the health food industry began seeing food products with foreign-sounding names on its shelves–names such as Tamari–Miso–Kombu–Hijiki–Kuzu–etc. All products first introduced by Chico-San.

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Later on Chico-San introduced the first organically grown rice to the health food industry, while our rice cakes became one of the industry's most popular sales items.

"In 1972 Chico-San was consumed by fire of such severe consequences that we were put out of business for almost a year. When we did return it was necessary for us to concentrate on our most popular items. These were items that we manufactured–rice cakes–rice syrup–candies made of rice syrup–these products would give us our best chance to regain solvency because they offered better profit margins.

"We continued to carry the Japanese products because it was our responsibility to those that had come to depend on Chico-San for quality, however by this time there were several companies [including Erewhon] competing for the sale of the Japanese products. Through their price cutting policies a market was created that was not profitable, consequently they had to lower their costs by buying products from dubious sources. Many such companies have since gone bankrupt.

"Twenty years ago when Ohsawa's macrobiotic diet was new to America it was taken with scepticism but now that there have been many dramatic cures accorded to it, its popularity is gaining by great strides. This makes Chico-San's responsibility greater than it has ever been because more and more people are being attracted to the Ohsawa regimen.

"Since Chico-San started it has always been the Ohsawas, both Lima and George, who have given Chico-San its quality control regarding the Japanese imports. We have only carried products recommended to us by them and chosen by them for their own use. Since Mr. Ohsawa's death several years ago Mrs. Ohsawa was given the recognition by people world-wide for being the most knowledgeable person in regard to her husband's work.

"Chico-San uses Ohsawa Japan, Inc. in Tokyo as its only supplier for its imports, This is a company started by George Ohsawa and now run by Lima Ohsawa's sister, Flora Tanaka. The very strict supervision of the company and the uncompromising attitude of its employees comes from years of collective study under Ohsawa.

"Jun Makino, a representative to Chico-San. Inc. from Ohsawa Japan, Inc. in Tokyo, has recently joined us in Chico. He is now busily engaged in translating hordes of material being sent to us from Ohsawa Japan. pertaining to macrobiotic foods and how they have traditionally been used.

"This additional information will appear in our newsletters; it will also be included in our pamphlets and catalog as space and time permit.

"Jun will be in charge of our Japanese imports and will also take over our mail order department.

"Peter Milbury is back with us to help with our expanded efforts. Peter is our operations director, a job designed to assist me as president in the performance of executive duties,

"We have added several others to our complement, so that we can increase our effectiveness as a macrobiotic foods supplier. We'll introduce them to you in future issues of the newsletter because we would like you to get to know the people that supply your food.

"Our excitement on our 20th anniversary is genuine as we confirm our dedication of 20 years ago. to bring you the best quality available."

Also includes articles on imports from Japan and winter recipes using miso and soy sauce. Address: Chico-San, Inc., P.O. Box 810, Chico, California 95927.

7738. *Toyo Shinpo* (*Soyfoods News*). 1983. Tônyû bureddo [Soymilk bread now made and sold by Shin-Shin Do] Feb. 1. [Jap]

7739. *Toyo Shinpo* (*Soyfoods News*). 1983. [Yakult is distributing its soymilk by the same route as its long-famous probiotic product]. Feb. 1. [1 ref. Jap]
• ***Summary:*** Grandmothers and others on bicycles deliver it door to door.

People predict that soymilk added to foods (such as bread, noodles, etc.) will grow faster than that used as a beverage. Address: Japan.

7740. *Toyo Shinpo* (*Soyfoods News*). 1983. [Kirin, the big beer maker, is now selling and distributing Koiwai Soymilk in a can]. Feb. 1. [Jap]
• ***Summary:*** It is sweetened with barley malt syrup (*bakuga iri*).

7741. Hattori, Terumitsu. 1983. The soy sauce / shoyu industry in the United States (Interview). *SoyaScan Notes*. Feb. 4. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The production of soy sauce in the United States has been growing (on average) at 7-8% a year since about 1970, and Kikkoman production has been growing at 13% a year during that same period.

Kikkoman presently makes 20,000 kl (kiloliters) a year; estimated total U.S. production (fermented + HVP) is 40,000 kl/year. Imports of soy sauce to the USA are 10,000+ kl/year. Thus in 1982 total US consumption was 50,000 kl (58,750 metric tons) per year. Kikkoman produced about 50% of the soy sauce made in the USA; this was 40% of total U.S. consumption.

In Feb. 1983 U.S. per capita consumption was 216.1 ml = 253.9 gm = 14.65 tablespoons of shoyu.

Conversion figures–Relative density: (1) Regular shoyu: 1.17 to 1.18 (so 1 gallon weighs 9.8 lb). (2) Milder shoyu: 1.13 to 1.14. Usukuchi shoyu (20% salt): 1.19 to 1.20. 1 million gallons = 3.785 million liters = 3.785 kiloliters. 1 kiloliter = 264.18 U.S. gallons = 2,200.6 lbs of water.

Note: Comparing this with miso. In Sept. 1981 total

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U.S. miso consumption (production + imports) was 1,500 metric tons. This is only 2.5% as much as U.S. soy sauce consumption. So per capital U.S. miso consumption = 6.34 gm/year = 1.1 tablespoons per year. 1 level tablespoon of miso weighs 17.3 gm. 1 level teaspoon of miso weighs 5.76 gm. 1 tablespoon of regular shoyu weighs 17.33 gm. Address: Kikkoman International Inc., 50 California St. #3600, San Francisco, CA 94111. Phone: 415-956-7750.

7742. Kushi, Aveline. 1983. Miso in Boston (Interview). *SoyaScan Notes.* Feb. 12. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Aveline thinks Junsei Yamazaki made miso in New York then brought it to Cambridge before the group went to Chico, California. Best to ask him. Aveline and others called Yamazaki to ask him to come to Cambridge to make miso there; he came and made miso and rice cakes, then he brought the things [such as miso] he had made elsewhere. She can't remember where; it could have been, either Cambridge or New York–probably New York.

Aveline does not remember who the first Caucasian to make miso in America was. But in about 1973 Aveline held some informal miso-making classes for those interested in doing so. They brought ready-made store-bought koji and made miso using that koji. She held these classes in several places. At each class they made about 1 keg = 18 liters. They also made mochi.

Aveline always calls George Ohsawa "Sakurazawa sensei." Important.

In about 1978-79, after Aveline's book *How to Cook with Miso* was published [in Dec. 1978], Yamazaki came to Boston to teach koji-making. Address: Brookline, Massachusetts.

7743. Leonard, Thom. 1983. Pioneering work with miso in America (Interview). *SoyaScan Notes.* Feb. 12. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** In the fall of 1974, Thom Leonard made his first batch of barley koji and barley miso using a recipe in Herman Aihara's new book titled *Soybean Diet.* The 80-pound batch of miso was aged in a soy sauce keg from Hong Kong. He then made 80-pound batches of chunky wheat miso in the fall of 1975 (he later pickled tofu in it) and of barley miso in early 1976. After moving to Fayetteville, Arkansas, he and Jim Hemminger made larger scale miso equipment and on 15 April 1977 packed their first 35-gallon cedar vat with brown-rice miso. Soon over 1,000 lb were aging in the vats. This miso was sold to and distributed by the Ozark Cooperative Warehouse.

Thom and Richard Kluding founded the first Caucasian-run miso company in North America, Ohio Miso Co. in Monroeville, Ohio. They began production on 13 March 1979. By Jan. 1980 Ohio Miso was making several varieties of miso: brown rice, barley (one or two year), mellow brown rice, mellow red, and black soybean; output was 2,400 lb/week.

Then in the spring of 1980 Leonard and Kluding split up, largely because of interpersonal problems. In the summer of 1980 Leonard taught miso classes at the macrobiotic Spiral Inn and Moniteau Farm in Missouri. Then in late 1980 he taught 2 classes on making miso, natto, tofu, and tempeh at the Kushi Institute in Boston, Massachusetts, with 30-40 people per class. In 1981 and 1982 he taught 8 similar classes out of his home in Boston, plus four 3-day residential workshops on the same subjects. All were sold out every time. In 1983 he plans to travel Ireland to start a miso plant in County Kilkenny. Friends of his own several old buildings. The Irish government will help pay startup costs, covering 45% of the required startup capital plus 25% of the rent for the first 5 years. He hopes to start in July 1983 and to be producing miso by late 1983. He hopes to make 100,000 to 200,000 pounds of mostly barley miso, both mellow barley and 12-24 month barley miso. Thom's constitution is so yang that he can't eat much miso–which is also very yang. But this week he enjoyed miso soup twice, which is more than he has had for the past year.

Note: Thom and his wife went to Ireland but they never started a miso plant or commercial miso production there. Address: Brookline, Massachusetts.

7744. Root, Evan. 1983. Miso in Boston (Interview). *SoyaScan Notes.* Feb. 12. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** When Evan arrived in Boston in March 1966, there were three 18-liter kegs in the Kushi basement containing aging miso that had been made by Junsei Yamazaki. Evan is not sure when Junsei made them, but probably on the East Coast.

He can't remember any early people making miso. Now Thom Leonard is teaching miso-making classes at the Kushi Institute and Christian Elwell is making miso on his own. It seems to Evan like lots of people are doing it now. Address: Brookline, Massachusetts.

7745. Yamazaki, Junsei. 1983. Work with miso and macrobiotics in America (Interview). *SoyaScan Notes.* Feb. 12. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** In May 1963 Junsei first arrived in the U.S. in San Francisco, from Japan. He first went (by bus) to Chico, California, to help with the installation of small rice cake machines. After the July 1963 summer camp at French Meadows, California, he went to New York, arriving in August. Initially, he did nothing with soyfoods in New York. But there was a group in New York, composed or a woman or women; he can't recall the name. It was not Irma Paule, but rather some woman whose husband had died in a car accident. They asked him to teach them how to make miso, and he taught her how to make miso.

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Initially Herman Aihara (pronounced AI-ha-ra) had to work as a guard to earn money in Chico; the macrobiotic group in Chico had no income. Some group raised money for him to do something in New York or Chico.

In about Nov. 1963 Michio Kushi opened the Genpei restaurant on the first floor of the Diamond Jim Building on 46th Street in New York City. In the basement Junsei made koji, then used it to make about 100 pounds of miso. He showed the process to a Caucasian woman and child. The miso was not used in the restaurant. Junsei took it to Boston, Massachusetts, where it was used by Michio and Aveline Kushi themselves.

In March 1964 Junsei returned to Chico-San in Chico, California. While making rice cakes there, he made miso in the interim. Starting in about 1965, when Chico moved to a bigger place, he made about 20 whiskey barrels full of miso; each barrel held 320 lbs of miso. He did not really teach miso making to anyone. The real teacher of miso among macrobiotics was Mr. Noboru Muramoto.

In Boston, Erewhon wanted to make miso within their building. They asked Yamazaki to tell them the best place, so he went to Boston. He did not teach any classes to students then, unlike what Aveline recalled.

In 1980 Junsei and his wife bought land in Orland, in northern California (Zip code 95963). He wants to make miso using good ingredients, either cooperatively or in individual homes. He is now working as a guard for a construction firm. He also wants to grow ume plum trees for making umeboshi [salt plums]; he tried this in Washington state but failed. Address: Orland, California.

7746. Kendall, Charles. 1983. Early work making miso in America (Interview). *SoyaScan Notes.* Feb. 13. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In about 1974 Charlie heard that someone up at Erewhon Farms in New Hampshire, a macrobiotic community, had made miso. That person was part of a group of people who tried to start a farm in New Hampshire. In 1976 Charles made a batch of miso at home using ready-made store-bought koji and following instructions from one of Michio Kushi's lectures.

Note: At Tassajara Zen Mountain Center (in the Santa Lucia Mountains, California), the students made miso long before 1974. The method was transmitted by Zen priests from Japan. Ask Loring Palmer and Ed Brown for more details. Address: Ashburnham, Massachusetts.

7747. Palmer, Loring. 1983. How to make the "bean revolution" succeed in America. Miso making at Tassajara (Interview). *SoyaScan Notes.* Feb. 13. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** If the "bean revolution" is ever to succeed in American, we must learn the Julia Child method for getting rid of the flatulence-causing substances in beans. Loring learned this from someone at the Minneapolis, Zen Center (Minnesota), and it may also be in her book on beans.

Soak the beans in 10 times their volume of water. Then bring to a boil. Allow to cool and discard the water. Again add the same amount of water, cook the beans as required, then discard the cooking water again. Serve the beans. Since flatulence factors or oligosaccharides are water-soluble sugars, most will dissolve in the water and be discarded with it. This method can also be used in cooking the soybeans for miso.

Loring has no memories of making miso at Zen Mountain Center at Tassajara in the Santa Lucia Mountains; he was in San Francisco when we made miso at Tassajara. In 1972 Loring made miso from ready-made koji, a process he learned from Herman Aihara. Address: Boulderado Hotel, Boulder, Colorado.

7748. Rankin, Blake. 1983. Early work making miso in America (Interview). *SoyaScan Notes.* Feb. 13. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In late 1975 and early 1976 George Gearhardt taught a number of miso classes on the West Coast; Blake did not. But George Gearhardt and Blake made miso back in 1974-75, after Blake returned from a trip to Japan. The maximum in the works was 500 pounds–back in the days when they owned Janus Natural Foods, in Seattle. In early 1974 they made a number of small batches, then when those turned out well they made a number of larger batches at Janus. They made barley miso first using bulk dried koji from Japan, but for big batches, in 1975, he had redwood koji boxes made and they made koji themselves, using Janus' kitchen. At the end of 1975, when doing a 30-day koji run he did informal classes inviting 6 people from the Seattle Zen Center. A single big batch was 40-50 pounds; then some people in the Zen center made miso using the groups koji. Blake also made miso using eastern Washington soft white wheat.

How did Blake learn to make miso? Probably from notes he had taken in Japan while visiting miso plants there–plus (maybe) Herman Aihara's books and maybe some comments from Junsei Yamazaki. His notes alone would not have been detailed enough. Blake does not know of any Caucasians who made miso in the USA before he did. The only person he knows who made miso in the USA before he did is Junsei Yamazaki.

Blake lost all his notes at the time of Janus' bankruptcy. When Blake returned from Japan at the end of the 1970s, the miso was all gone.

Blake does not know where George Gearhardt is now–probably in Spokane or Seattle. Cooking classes at the Federal Way Natural Food Store. He imports Taiwan tatamis for $72 each plus shipping. Blake left in Aug. or Sept. to go to Japan. George moves a lot. Address: Washington state.

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7749. Milbury, Peter. 1983. Soy sauce and tamari analysis: Meeting with Tomio Kitani of Yamaki Co. Chico, California: Chico-San Inc. 4 p. Feb. 14. Unpublished manuscript.
• ***Summary:*** Present at this meeting to discuss soy sauce quality were Bob Kennedy, Jun Makino, Peter Milbury (Chico-San), T. Murata (Ohsawa Japan), and Tomio Kitani (Yamaki Co.). There are 2 ways to tell if soy sauce is made by natural fermentation of whole soybeans, or if it is "mixed with acid hydrolyzed defatted soybean meal." (1) Visit the maker and dip into the moromi. (2) Use a combination of sensorial and laboratory testing. Address: Chico-San Inc., P.O. Box 810, 1264 Humboldt Ave., Chico, California 95927. Phone: 916 891-6271.

7750. Arikawa, Minoru. 1983. Work with miso in America (Interview). *SoyaScan Notes.* Feb. 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The Norio Company was started in 1919 by Mr. Masaichi Norio in San Francisco, at 1531 Geary St. He made only *shiro miso* (probably sweet white, mellow white, or light yellow miso) and exported most of it to Hawaii. In about 1932 the company was moved to 1532 Post St., on the outskirts of San Francisco's Japan-town. There it was run by Mr. and Mrs. Minoru Arikawa and son, who were relatives of the founder. The U.S. government forced the family to close the business (then making about 180,000 lb of miso a year) when World War II started in late 1941. They resumed after the War but retired in 1972 and the business was closed to make room for a high-rise condominium.

In 1941 Fujimoto was the biggest miso maker in the continental USA. He thinks there were three miso manufacturing companies in the continental USA, all on the West Coast.

He thinks Yamaizumi was started in Los Angeles in the 1930s, probably by a man from Fukuoka. He thinks Yamaizumi was both the company name and the brand name. Address: San Francisco, California. Phone: 415-387-7217.

7751. Milbury, Peter. 1983. Chico-San, miso, and soy sauce (Interview). *SoyaScan Notes.* Feb. 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Bob Kennedy thinks that Junsei Yamazaki made a total of 20 barrels of miso from 1965 to 1972. Only 3-4 were in the building that was burned down by the fire at Chico-San. The rest came to maturity and were mixed with imported miso. Mr. Yamazaki also made about 3 barrels of fermented shoyu (soy sauce) at Chico-San in about 1965. Chico-San feels that SANA (Soyfoods Assoc. of North America) should establish soy sauce terminology, standards, and an analysis program. Importers could help set it up to protect themselves.

Mr. Kitani is Chico-San's advisor for fermented soyfoods. He is a manufacturer in Japan. Chico-San now has a four-stage plan to make miso and shoyu in Chico. 1. Import bulk miso from Mr. Kitani and let it age in Chico. Adjust the ambient temperature by opening and closing doors and windows. 2. Make miso in Chico using koji imported from Japan under refrigeration. 3. Make koji in Chico. 4. Make shoyu in Chico. Address: Chico-San, Chico, California.

7752. Milbury, Peter. 1983. Junsei Yamazaki's work with miso and shoyu at Chico-San. Work of Mr. Kitani (Interview). Conducted by William Shurtleff of Soyfoods Center, Feb. 17. ½ p. transcript.
• ***Summary:*** Bob Kennedy thinks Mr. Yamazaki made a total of 20 barrels of miso from 1965 to 1972. Only 3 to 4 were destroyed by the fire. The rest came to maturity and was mixed with imported miso. Mr. Yamazaki also made about 3 barrels of fermented soy sauce at Chico-San–in about 1965.

Peter believes SANA should develop soy sauce terminology, standards, and analysis techniques. Importers would use these to protect themselves.

Mr. Kitani, a manufacturer, is Chico-San's fermented foods advisor. Chico-San now has a four-stage plan to make miso and shoyu. 1. Import bulk miso from Mr. Kitani and let it age in Chico. Adjust the ambient temperature by opening and closing doors and windows. 2. Make miso in Chico using koji imported from Japan under refrigeration. 3. Make koji in Chico. 4. Make shoyu in Chico. Address: Chico-San Inc., P.O. Box 810, 1264 Humboldt Ave., Chico, California 95927.

7753. Miyashita, Masa. 1983. Re: Soy sauce in Europe. Letter to William Shurtleff at Soyfoods Center, Feb. 21–in reply to inquiry. 2 p. Typed, with signature on letterhead. [Eng]
• ***Summary:*** There are presently no manufacturers of fermented soy sauce in Europe. The following is an estimate of the amounts and types of soy sauce are consumed in Europe: Japanese fermented 1,800,000 liters; Chinese fermented 1,500,000 to 2,000,000 liters. Indonesian style 1,000,000 to 1,500,000. Chemically made (HVP) or mixed 600,000 liters.

Per capita consumption of all types is about 17 ml/year, and about 5 ml/year for Japanese-style soy sauce. Both figures are far below their corresponding U.S. figures. The main markets are the UK and the Netherlands. Kikkoman's share of the Japanese soy sauce market in Europe is about 70%. Kikkoman's sales in terms of volume are growing at about 6% a year. Kikkoman has no immediate plans to build a shoyu manufacturing plant in Europe. The main emphasis now is on broadly promoting interest in Japanese culture, and more narrowly on Japanese food culture. Address: Kikkoman Trading Europe GmbH, Duisburger Strasse 3, D-4040 Neuss, West Germany. Phone: (02101) 2 20 89.

7754. Shurtleff, William; Aoyagi, Akiko. 1983. History of miso and soybean jiang. Soyfoods Center, P.O. Box 234,

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Lafayette, CA 94549. 82 p. Feb. 21. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction. Etymology. Part I: History of soybean jiang in China. Early Chinese non-soybean jiang. Early Chinese soybean jiang (100 B.C. to 599 A.D.). 600 to 1899. The Twentieth Century. Part II: History of soybean jiang/jang in Korea and Southeast Asia. Dissemination of jiang from China. Korea. Indonesia. Vietnam. Malaysia. Part III: History of miso in Japan. Introduction; origins not clear. Early non-soybean hishios (before 700 A.D.). The Nara period (710-784 A.D.); Ganjin 754. The Heian period (794-1160 A.D.). The Kamakura period (1185-1333). The Muromachi period (1336-1568). The Edo or Tokugawa period (1603-1867). The Meiji and pre-war periods (1867-1940). The postwar period, modern times (1941-1982). Part IV: History of miso in Europe. Early European references (1597-1899). 1900-1949. 1950-1982. Part V: History of miso in the United States and Canada. Early developments (1896-1929). 1930-1959. Growth of interest in miso (1960-1982). Part VI: History of miso in other countries. India. Israel. Latin America. Address: Lafayette, California. Phone: 415-283-2991.

7755. *Toyo Shinpo* (*Soyfoods News*)**.** 1983. [Soybean recipes: Curry, omelet, tempura]. Feb. 21. [Jap]
• ***Summary:*** Photos show: (1) Soybean curry. (2) Omelet with soybeans.

7756. Ebine, Hideo. 1983. Re: Dipicolinic acid and retirement from the National Foods Research Institute, Japan. Letter to William Shurtleff at Soyfoods Center, Feb. 22. 1 p. Typed, with signature. [Eng]
• ***Summary:*** Note: *The Book of Miso,* by Shurtleff and Aoyagi (1976) states (p. 26): "In 1972, a number of Japanese scientists doing agricultural research stimulated by Dr. [Shinichiro] Akizuki's writings discovered a substance in miso which they called Zybicolin. Produced by miso and natto yeasts, it has the ability to attract, absorb, and discharge from the body radioactive elements such as strontium. The discovery received front-page coverage in all of Japan's major newspapers." Yet Shurtleff never cited the actual article–in part because he learned of it just as *The Book of Miso* was about to go to press.

Director Ebine has tried to locate the article mentioned above but has not been able to find it–and he has never heard of it, although he has long been a miso research scientist. Zybicolin is probably "dipicolinic acid," which is found in miso and natto, and which has a strong combining activity to minerals including radioactive minerals such as strontium.

Ebine retired from the National Food Research Institute (NFRI) in March 1982 and immediately (in April 1982) began his present work as director of the Central Miso Research Institute. Address: Director, Central Miso Research Inst., Shinkawa 1-24-19, Chuo-ku, Tokyo 104, Japan.

7757. Nasuno, Seiichi. 1983. Re: N-nitroso compounds and nitrosamines in Japanese fermented soyfoods. Letter to William Shurtleff at Soyfoods Center, Feb. 23–in reply to inquiry. 2 p. Typed, with signature on letterhead. [5 ref. Eng]
• ***Summary:*** "We have an official certificate from the National Institute of Health (NIH) of Japan to certify that the regular Kikkoman soy sauce is free from volatile nitrosamines on the basis of the examination of volatile N-nitroso compounds in a soy sauce product performed on January 23, 1978, at the NIH of Japan.

"The test was performed by a Shimadzu gas chromatograph equipped with an alkali-flame ionization detector and minimum detection limit for N-nitrosodimethylamine was 0.1 ng (1 ppb in soy sauce)."

"Nitrosamines are reaction products of nitrite and amines. Very small amounts of nitrite and amines were found in cereals such as rice, wheat and soybeans used as raw materials for miso and shoyu making. Moreover, amino acids in shoyu competitively inhibit nitrosamines formation from nitrite and amines."

"In conclusion, we feel that the problem of nitrosamines in miso and shoyu is not serious and that miso and shoyu are quite safe in the viewpoint of cancer risks." Note: Five references are cited in the letter to document each point. Address: Director, Bioscience Lab., Kikkoman Corp., Central Research Laboratories, 399-Noda, Noda-Shi, Chiba-ken, Japan. Phone: 0471-24-1111.

7758. Smith, Grant. 1983. The current soy sauce industry and market in the United States (Interview). Conducted by William Shurtleff of Soyfoods Center, Feb. 23. 2.2 p. transcript.
• ***Summary:*** Interpreting U.S. soy sauce statistics is difficult. Early production statistics are probably low and later statistics are probably high due to three possible points of confusion: (1) Are the figures only for soy sauce or for soy sauce plus teriyaki sauce? If they include teriyaki sauce, that would be a terrible distortion since teriyaki sauce contains about 20% soy sauce and 80% other ingredients–such as vinegar, water, seasonings, etc. What percentage of Kikkoman's total liquid volume is teriyaki sauce and what percentage of teriyaki sauce is shoyu? Kikkoman likes to include teriyaki sauce in their overall numbers to prove that they are number one. Some non-Kikkoman teriyaki sauce is junk. (2) The problem of gallons and pounds in Kikkoman's output. In the trade journals, the Kikkoman plant was described as having a capacity of 25 million pounds. But 10,000 kiloliters is 2.5 million gallons. The design of their fermenters suggests 2.5 million gallons annual output. Staley only makes concentrates. (3) SAMI data does not include Kikkoman's burgeoning foodservice and restaurant business.

Smith thinks that looking only at soy sauce statistics,

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Kikkoman is no bigger than LaChoy. In Japan, roughly one-third of all soy sauce is nonfermented.

Grant Smith likes Kikkoman soy sauce and uses it in his own cooking. Austin Co. built the plant in Walworth, Wisconsin, to 2.5 million gallons capacity. Address: A.E. Staley Co, Decatur, Illinois.

7759. Marbach, William D.; Ukai, Nancy. 1983. Tokyo's soybean blockade. *Newsweek.* Feb. 28. p. 63.
• ***Summary:*** "Archer-Daniels-Midland of Decatur, Illinois would like to export soy isolate to Japan so that it can cash in on the latest Japanese health-food craze–soybean milk. (Making soybean milk, or *tonyu,* from soy isolate is simple: just add water, flavors and heat). The trouble is that ADM's soy isolate is a threat to an industry the Japanese would like to develop to replace the old-fashioned way of making tonyu by crushing and boiling the beans.

"When ADM applied to the Japanese Ministry of Agriculture for a 'Japan Agricultural Seal' (JAS)–without which Japan's quality-conscious consumer would resists the product–the request was denied. 'According to the Japanese Agricultural Standard, whole soybeans must be the main ingredient of soy milk,' the ministry ruled...

"'The product must already be on the Japanese market before we consider it a candidate for the JAS mark,' said one ministry official. A Japanese Catch-22...

"Fuji Oil Co., a big soybean processor, already makes lower-grade isolate for other products and is reportedly getting ready to enter the booming $100 million tonyu [soymilk] market." Address: Tokyo, Japan.

7760. Coyle, William T. 1983. Japan's feed-livestock economy: Prospects for the 1980s. *USDA Economic Research Service, Foreign Agricultural Economic Report* No. 177. iii + 79 p. Feb. [64 ref]
• ***Summary:*** Consumption of livestock products during the 1980s by Japanese consumers will grow at a slower rate than during the period 1960-1980. Much of the feeds for Japan's livestock will be imported from the USA. By 1990 it is estimated that Japan will be importing about one-third more U.S. grains and soybeans than are imported at present. The Japanese market for imported beef will also grow. Japanese imports of soybeans are expected to reach 6 million tons by 1990. Japan has only about 1% as much arable land as the USA. Address: Agricultural Economist, USDA, Economic Research Service, Washington, DC 20250.

7761. Fruin, W. Mark. 1983. Three centuries of Kikkoman: Growing pains & organizational change. II. *Soyfoods.* Winter. p. 52-55. [1 ref]
• ***Summary:*** "Editor's Note: In Part One, Mark Fruin recounted Kikkoman's origins as a family specialization in 1661 that expanded into a community cartel, then a corporation by 1917. In this concluding section, the author follows the Kikkoman story through the trauma of strikes, antitrust and competition in the 1920s to their current international status.

"The Great Noda Strike of 1927-28: Major change is rarely accomplished without cost, and part of the cost of incorporation in 1917-18 was a succeeding decade of labor difficulties culminating in the Great Noda Strike of 1927-28. The strike and the turmoil leading up to it were caused to a considerable degree by the incorporation of the Noda Shoyu Company. The incorporation, we have said, was motivated largely by the opportunity for a much expanded market for Noda shoyu made possible by advances in production and distribution technology (biochemical and mechanical advances in shoyu fermentation as well as the development of local and more distant railway connections). Unfortunately, such advances in the technology of production and distribution far outstripped the methods of labor organization then prevalent in the shoyu industry.

"Factory workers in pre-World War One Japan were still a minority, relative to those employed in farming and in shop work. Except for textile workers (who were female, young, and closely supervised), most factory hands were male, at least in their twenties, and poorly educated. Such workers were not employed for long at the same factory because either the demand for workers was erratic or the supply of workers was itself uncertain. This latter point was related to the nature of labor organization in Japan at that time.

"Factory workers were of two sorts. Perhaps most were seasonal workers, taking off from the farm for temporary factory work during the winter months. Others worked year-round and they did so typically as members of a work-gang. Work gangs or crews were hired out by labor contractors and supervised by labor bosses. In the case of the Noda Shoyu Company, this resulted in a system of labor organization called internal contracting in which gangs or crews of workers were hired by outside contractors and supervised by foremen within factories while the owner-managers of the enterprise had little or no direct control over workers and over the pace or design of work. Owners, in this sense, were not managers of the production process.

"Incorporation of the Noda Shoyu Company was propelled by technical change and the opportunities this created in the marketplace. Yet such opportunities could not be realized without a thorough reorganization as well as centralization of the production process. Not only were the steps of production and distribution becoming increasingly interdependent through mechanization but such interdependency required a more skilled and better managed workforce.

"The Mogi-Takanashi brewers who had formed the company in 1917, turned to this problem of labor organization by 1919. What they proposed was revolutionary. Their plan was to transform the seasonal, decentralized, and piecemeal character of labor organization into something

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more permanent, centralized, and systematic. This was to be accomplished by converting independent labor contractors into factory foremen, by rewarding workers with better pay and more opportunity for promotion, by studying the production process and rationalizing its flow, and by setting standards of work performance. In short, the company officers sought to restructure the nature of factory work and the character of the employment system. Given this far-reaching plan, it is understandable that many workers, seeing a total reforging of their livelihood and lifestyle, rebelled.

"Labor troubles had appeared in Noda as early as 1921 but the real difficulties did not emerge until 1925 and 1927-28. During these later years, many but not all of the workers of the Noda Shoyu Company as well as many laborers from ancillary industries in town struck the company under the leadership of the Yuaikai, later renamed the Sodomei or General Federation of Labor in Japan. This slightly left-of-center union had been losing ground in Japan since the end of World War One when the economic downturn following the conclusion of hostilities and an ideological fragmentation within the union movement itself had weakened the movement in Japan and dispirited its leaders and followers.

"Largely in an effort to revive its earlier momentum and to regroup its failing leadership, the Sodomei union targeted the Noda Shoyu Company as a major site of its union efforts after 1925. This led to the longest strike on record in prewar Japan lasting in Noda for 218 days in 1927-28. In spite of the duration of the strike, the union had miscalculated: the resolve of the Mogi-Takanashi owners held fast; the dissatisfaction of the workers diminished, and the strength of the union leadership deteriorated. The Sodomei union was so disgraced and demoralized by its failure in Noda that it never regained sufficient internal cohesion or external support to effectively direct workers again in prewar. Japan. The Noda Shoyu Company, by contrast, through its victory in the strike, was able to centralize, monitor, and control workers and the work process, so that the company could become the most important shoyu maker in Japan. The market share of the company which had never exceeded 8.8% before 1926 had become, by 1936, 14.5% of the market.

"Antitrust and Competition: For two decades, the Noda Shoyu Company ran without serious difficulty, even surviving the ravages of the Pacific War without damage to plant and equipment. It was only *after* the war that the company suffered from the war, when it fell afoul of the peacetime policies of the American-led Allied Occupation of Japan. In order to disarm Japan and to prevent another rise of militarism, the victorious allies launched a comprehensive program of reform with the aim of democratizing the country. Part of this called for the deconcentration of economic power in Japan and to pursue this, antitrust regulations, modeled after those found in the United States, were introduced into Japan.

"The Noda Shoyu Company was caught in this antitrust program, not so much because its own market share was overwhelming but more because it cooperated with other makers on matters of output and price. This had been the practice among brewers in Japan since before the turn of the century, as illustrated by the founding of the Noda Shoyu Brewers' Cartel in 1887.

"Occupation policies sought to undo this collusion by bringing antitrust charges against the Noda Shoyu Company and four other major makers in the early 1950s. The charges were upheld and the Noda Shoyu Company was forced not only to relinquish the cornerstone of its prewar marketing position but also, as a consequence, to develop a new marketing strategy for the future. Moreover, a drop in the per capita consumption of shoyu in Japan at the end of the 1950s further compounded the difficulty of determining a new direction for the firm.

"The senior managers of the company, descendants of the original Mogi-Takanashi brewers who incorporated in 1917, decided, as their ancestors had done four decades earlier, to alter dramatically the complexion of shoyu manufacture in Noda. They abandoned completely the market-sharing and price-fixing agreements of the prewar period and substituted in their place a strategy of high volume, low cost production and distribution of their product–a strategy of all-out competition against other producers in Japan. In this, they were entirely successful, raising their market share from 14% in 1952 to a one-third share by 1980." Continued. Address: Dep. of History, California State Univ., Hayward.

7762. Fruin, W. Mark. 1983. Three centuries of Kikkoman: Growing pains & organizational change. II (Continued, Document part II). *Soyfoods.* Winter. p. 52-55. [1 ref]
• ***Summary:*** Continued: "The company succeeded by advertising its product widely and by embarking on an ambitious consumer education program. A planning and research department to coordinate these efforts was founded in 1957-58. Research teams were formed to study the amount and fluctuation of demand; at house-to-house consumer education program was begun and this was backed up by extensive media promotion. The goal of all of this was not only to sell more Kikkoman shoyu but also to make an old and rather traditional Japanese product seem new and even somehow modern; that is, to create a new image for shoyu.

"New distribution channels to supermarkets, chain, and department stores were opened, and the entire distribution network for shoyu was streamlined, expanded, and better managed. Various sizes and shapes of containers for shoyu were test marketed. The most popular of these, such as the Mann-Pack which combined a number of different Kikkoman products, were sold nationwide.

"In short, once Kikkoman ended its market-sharing agreements and turned wholeheartedly to expanding its market share (at the expense of others), the challenge was

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no longer whether enough shoyu could be made but whether or not it could be sold. Kikkoman proved it could be sold, and in the process became an aggressive marketing-oriented enterprise, trans- forming not only its own structure but also the image of shoyu itself: from a local East Asian sauce into an international best-selling seasoning.

"The Internationalization of Kikkoman: Once Kikkoman expanded production and reorganized their firm, it was natural enough to look overseas for new markets. The forecasting, sales, and marketing tools that had been developed for the home market were applicable to foreign markets as well. The Noda Shoyu Company (renamed the Kikkoman Shoyu Company in 1964 and the Kikkoman Corporation in 1980) had acquired some international experience before World War Two when as much as 10% of production was shipped overseas. Most of this, however, was in the so-called yen bloc or Japanese colonial territories. The postwar internationalization of shoyu, by contrast, has had different marketing aims as Kikkoman has sought to sell shoyu in North American and Western European markets to persons of non-Japanese descent.

"Kikkoman had exported small amounts of its shoyu to these Western markets before the war, and even after the war during the anti-trust hearings of the 1950s, the company had continued to sell limited amounts of its shoyu in the North American market, especially in Hawaii and on the West Coast. Such sales were almost entirely to Japanese and Japanese-American customers, however.

"When the company decided to vastly expand production and distribution of shoyu, it knew that it would have to expand beyond this limited overseas market. In 1956, Kikkoman entered the American market more completely by convincing a number of Safeway stores to carry shoyu. In the next year, Kikkoman International Inc., a wholly owned American subsidiary of Kikkoman in Japan, was established and soon located permanently in San Francisco. After a decade of 20 to 30% rates of increase in annual sales, Kikkoman contracted in 1967 with Leslie Food Company, a subsidiary of Leslie Salt Company in Oakland, California, to bottle Kikkoman Soy Sauce on a commission basis shipped in bulk from Japan. Another four years of continued increases in sales (increases now in the range of 15 to 20% annually) convinced Kikkoman that it could successfully make and sell shoyu on its own in North America. Following an exhaustive property search through five Midwestern states and after a spirited campaign to persuade local voters of the economic and ecological safety of locating a shoyu plant in their town, Kikkoman opened its first wholly-owned North American shoyu factory in Walworth, Wisconsin, in 1973. The plant had a 2.5 million gallon capacity in the initial year of operation.

"Subsequent events have shown Kikkoman to be absolutely correct in its decision to open a plant in the United States: not only have sales continued to rise at the rate of about 10% a year but the American embargo on the sale of soybeans to Japan in 1973-74 was nicely side-stepped by Kikkoman as a result of its Wisconsin plant; Moreover, the transportation costs of shipping both raw materials to Japan and finished goods from Japan were avoided, thereby saving about 25% of the total production cost of fermenting shoyu in Japan for sale in the United States.

"The increased sales of Kikkoman in this country, however, have less to do with the cost savings accrued from local manufacture than with the decision to market shoyu in North America as an all-purpose, international seasoning rather than one limited to Oriental cooking. Even though the Asian American population is one of the more rapidly growing ethnic populations in the United States and in spite of the increasing popularity of Asian food here, increases in the sales of Kikkoman shoyu have outstripped both developments.

"This is possible because Kikkoman Shoyu is positioned as a general seasoning, good with anything and good over everything. Although most Japanese would blanch at many of the ways shoyu is used in the United States–as an ice cream topping, for example–the managers at Kikkoman International only smile at the versatility of their product and the imagination of delighted American users.

"Takanashi Hyozaemon and his descendants in Noda would have been pleased."

Photos show: (1) The interior of a typical shoyu plant in 1923, with rows of vats for the moromi fermentation. (2) The sort of river boats used to carry shoyu to Tokyo in the mid-1920s. Address: Dep. of History, California State Univ., Hayward.

7763. Leviton, Richard. 1983. Profile: Hinode Tofu Company. *Soyfoods.* Winter. p. 33-36.

• ***Summary:*** Hinode, America's largest tofu producer, with 1981 sales of $3.85 million, makes 150,000 pounds of tofu a week (30,000 lb/day) in the 15,000 square foot plant on 2 floors. 5,400 pounds of soybeans are used each day, 5 days a week. The company employs 60 people, with 50 in production at $4.50/hour plus medical insurance and benefits. Hinode handles at least 6 dealer brands (worth 10% of their tofu volume) and 20% of Hinode brand tofu is sold outside California. The emphasis today is to restrict private labeling and to promote the Hinode trademark instead. 85% of the tofu is sold at supermarkets and 15% at natural/health food stores. All tofu has been made with calcium sulfate since 1981. The shelf life of the pasteurized (60 minutes at 180ºF or 82ºC) is 28 days. The challenge is to get a fresh tofu texture after pasteurization.

In 1939 Yamauchi's mother purchased the Aala Tofu Co. in Hawaii, a company Shoan's brother still manages today. In 1947, after studying tofu-making at Aala, Shoan Yamauchi moved to Los Angeles and bought the existing Hinode Company; in 1957 he bought the Matsuda Tofu Co. Both

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plants produced handmade tofu in traditional, kettle-style shops. By 1957 Yamauchi had 22 employees making tofu. The Hinode plant had 5,500 square feet and Matsuda 4,500; between them they made about 3,000 pounds of tofu a day (2,000 cakes weighing 24 oz. each).

During the next 12 years, Yamauchi relocated one or another of his plants three times. In 1969 he consolidated them at 526 Stanford Street, purchased new, more productive equipment, and increased total volume to 7,500 pounds daily. He had 27 workers and turned $1 million in sales. In 1981 the company was traumatized when the 75% Mexican labor force voted to unionize–a strife-filled time. Then in 1982 Yamauchi committed his company to undoubtedly the most ambitious expansion plan to date. He spent $600,000 on new tofu equipment featuring new Nagasawa and Sany Ace systems and slated another $500,000 for construction of a new 16,000 square foot warehouse and processing building across the street. Steve Snyder joined Hinode in 1980 as western sales manager. Mr. Yamauchi owns a prosperous Santa Ana restaurant and a large interest in Airtight Containers. He is preoccupied with tofu quality, which he considers the key to success. John Yamauchi, age 22, is being groomed to take over the company sometime in 1983.

Peak seasons are Christmas, New Years, and Chinese New Years: sales typically rise 15%. Special products include tofu cutlets (4,000 units/week at 5 oz.) and tofu pouches (30,000 puffs/week at 1 oz. each).

Photos show: (1) Nine packages of tofu made by Hinode. (2) Shoan Yamauchi, age 66, standing in front of equipment in his plant. (3) Plant manager Phil Higa standing in front of the 110,000 capacity soybean silos. (4) Shoan Yamauchi holds pasteurized water-packed Hinode tofu, predated for a 28-day shelf life. (5) Overhead view of one of Hinode's two production floors, about 7000 square feet. (6) Hinode's marketing team, Phyllis Friar and Steve Snyder. (7) The main production floor. (8) A worker stands beside a large cooling tank that holds some of Hinode's daily tofu output of 30,000 pounds. Address: 100 Heath Rd., Colrain, Massachusetts 01340. Phone: 413-624-5591.

7764. Noguchi, A.; Kugimiya, W.; Haque, Z.; Saio, K. 1983. Physical and chemical characteristics of extruded rice flour and rice flour fortified with soybean protein isolate. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 41. p. 123-28. Feb. [18 ref. Eng; jap]
• ***Summary:*** Reprinted from *J. of Food Science* 47:240-45 (1982). Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7765. Okubo, Kazuyoshi. 1983. Tôfu no hanashi [The story of tofu]. Yamagata-ken Tofu-Aburage Shogyo Kumiai. 20 p. [Jap]
Address: Yamagata-ken, Japan.

7766. Shurtleff, William; Aoyagi, Akiko. 1983. The soyfoods industry and market: Directory and databook 1983. 3rd ed. Lafayette, California: Soyfoods Center. 112 p. Feb. No 28 cm. [191 ref]
• ***Summary:*** 1. Introduction Soyfoods Industry Directory. 2. Directory of Soyfoods Manufacturers. Tofu. Tempeh. Soymilk. Soy Sauce/Shoyu, Soynuts & Soynut Butter, Miso. Soy Sprouts, Whole Dry Soybeans, Whole Soy Flour & Grits. Fermented Soymilk Products, Fermented Tofu, Roasted Soy Flour, Natto, Yuba, Soy Nuggets. Soy Delis & Restaurants, Soyfoods Marketer-Distributors. Modern Soy Protein Products (Isolates, Concentrates, Textured). Meat Analogs, Soy Oil and Products

3. Directory of Soyfoods Support Industry: Goods & Services. Ingredients: Soybeans, Tofu Coagulants, Cultures. Equipment and Packaging. Industry Services and Associations: Distributors of Soyfoods. Trade Associations, American Soybean Association Offices. Soyfoods Manufacturer's Reps, Consultants, Educators, Demonstrators, Training Centers, Publishers, Importers. Soyfoods databook: Industry and market analyses: 4. Historical. 5. The Soyfoods Industry and Market in the U.S. Overview, The Many Types of Soyfoods, Production Statistics on All Soyfoods, Prime Market Regions, Prime States, Asian Soyfoods Market in the U.S., Gallup Poll on Attitudes Toward Soyfoods, Major Media Coverage of Traditional Soyfoods (1975 on).

6. The Tofu Industry and Market in the U.S. Overview, Projections, Number of Tofu Manufacturers (1975 on), Four-Year Industry Analysis, North America's 32 Largest Tofu Companies and their Weekly Output, Japan's Largest Tofu Companies, Books on Tofu Published in the U.S. and Abroad. 7. Soyfoods Restaurants, Delis, and Cafeterias. America's Larger Operations with Startup Costs, Average and Weekly sales, Favorite Recipes. 8. The Tempeh Industry and Market in the U.S. Largest U.S. Manufacturers and their Output. 9. The Soymilk Industry and Market in the U.S. and Japan. The U.S. Soymilk Industry, Number of Soymilk Manufacturers Worldwide (1976 on), The Soymilk Industry in Japan, Major Japanese Soymilk Brands, Sales of Vitasoy in Hong Kong (1941 on). 10. The Soy Sauce Industry and Market in the U.S. and Japan. The U.S. Soy Sauce Market, U.S. Soy Sauce Imports, Production, and Consumption, Shoyu Market in Japan (1886-1980s).

11. The Miso Industry and Market in the U.S. and Japan. The U.S. Miso Market, U.S. Miso Imports, Production, and Consumption, Miso Exports from Japan by Country, The Miso Market in Japan (1930-80s), Japan's Ten Largest Miso Manufacturers. 12. Other Traditional Soyfoods. 11. Statistics on Fermented Soyfoods Production in East Asia, The Soynuts Industry and Market in the U.S. 13. The Soybean Crushing and Oil Industries and Markets. The U.S. Soybean Crushing Industry; Major Crushers, World

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Production of Major Edible Oils and Fats (1955-80s), U.S. Soy Oil Utilization (1930-80s), Number and Capacity of U.S. Soybean Mills (1934-80), Relative Dollar Values of Soy Oil and Soybean Meal (1932-80s). 14. The Modern Soy Protein Products Industry and Market. U.S. Soy Flour and Grits Production (1930-80s), U.S. Production of Isolates, Concentrates, and Textured Soy Protein Products (1967-80s). 15. Soyfoods Terminology and Standards.

16. Names of Soyfoods Around the World. Brazilian / Portuguese, British English, Chinese, French, German, Japanese, Spanish. 17. Soybean Production Around the World: Tables & Graphs (1920-80s). World Production, USA Production and Yields, U.S. Soybean Prices (Actual and Inflation Adjusted), Major U.S. States, Canada, Latin America, Europe, Africa, Date of Countries Reaching 10,000 Metric Tons, National Production. 18. Key Institutions Working with Soyfoods Worldwide. Key Institutions in the West, in Europe, in the Third World. About the Soyfoods Center. 19. Measures, Weights, and Equivalents.

As of May 1982, America's four largest tempeh makers (in lb/week) are Pacific Tempeh (5,000, California, started 1980), Tempeh Works (4,250, Massachusetts, started 1979), Soyfoods Unlimited (3,000, California, started 1981), White Wave (1,900, Colorado, started 1979). About 17,455 lb/week of tempeh are sold by 15 companies in the USA.

Reviewed by Walter J. Wolf in *Cereal Foods World* (Oct. 1983). Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

7767. *Soyfoods.* 1983. Cottage soy industries thrive on Vancouver Island. Winter. p. 36-37.

• ***Summary:*** Wayne Jolley's Sooke Soyfoods, which opened in early 1981, produces 1,800 lb/week of nigari tofu. Thistledown Soyfoods, run by Jan Norris, opened in October 1981. Each week the company produces 350 lb of tofu, 150 lb of tempeh (vacuum packed), and 75 lb of soy pate from okara. At Shin Mei Do Miso, Lulu and Yoshi Yoshihara have been making miso since 1979. They now produce 10,000 lb of 3 styles of miso each year. Metta Tofu is owned by "Ray Lipovsky, who might be North America's original cottage tofumaker as he's been coagulating soymilk with sea water since 1975... Besides producing 600 pounds of nigari tofu every week, Lipovsky is hot on the trail of Frozen Buddha, his multi-flavored line of frozen soymilk ice cream, already producing 360 gallons weekly."

Also on the island in Victoria, though too large for the cottage scale, is Dayspring Soycraft Corporation, operated by Michael Hsieh. Hsieh, a trained dentist, and his brother, Steven, and their families, emigrated to British Columbia from Taiwan and decided to launch a pressure cooker tofu plant in 1982.

7768. Taira, Harue; Takagi, Hideo; Kokubun, K.; Koyama, S.; Hoshino, S.; Miyauchi, N. 1983. Kokusan daizu no hinshitsu. II. Futsû hatake to suiden tenkan saibai daizu shijitsu no kagaku seibun sosei oyobi kakô tekisei no sai [Quality of soybean seeds grown in Japan. II. Differences in the chemical composition and suitability for food processing between upland and drained paddy field cultures / crops]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 41. p. 14-33. Feb. [33 ref. Jap; eng]

• ***Summary:*** The chemical composition and suitability for making tofu, miso, natto and cooked whole soybeans were investigated with 78 seed samples of 31 varieties which were grown in upland and drained paddy fields at five Agricultural Experiment Stations in 1980.

The qualities tested were chemical composition (moisture, protein, and oil content) and suitability for food processing as measured by weight of 100 seeds, weight increase ratio of soaked seed, germination ratio, solid matter content of soaking water, solid matter extractability, pH, color of soybean milk, weight increase ratio by steaming, moisture content, softness, and color of steamed seeds. Drained paddy field cultivation, as compared with upland cultivation, gave high moisture and heavy weight of 100 seeds, and low *x* color value of soybean milk and steamed soybean seeds.

From the results of contribution ratios, it was shown that the moisture content of soybean seeds was influenced by cultural conditions, whereas the chemical composition of protein and oil, and all the suitabilities for food processing were influenced by variety. Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305; 2. Hokkaido Agric. Exp. Station, Hitsujigaoka, Sapporo, Hokkaido; 3. Tohoku National Agric. Exp. Station, Kariwano, Akita; 4. Hokuriku National Agric. Exp. Station, Joetsu, Niigata; 5. Niigata Agric. Exp. Station, Nagaoka, Niigata; 6. Ehime Agric. Exp. Station, Dogoichiman, Matsuyama, Ehime. All: Japan.

7769. Yasuda, Masaaki; Uechi, Gensaku; Miyazato, Koshin. 1983. Tôfuyô seizô ni mochiiru beni kôji no seizô [Studies on the manufacture of Okinawan fermented tofu (*tofuyo*). V. Production of red koji with *Monascus* sp. for production of tofuyo]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 30(2):63-67. [11 ref. Jap; eng]

• ***Summary:*** Red koji (*beni-koji*), made my growing *Monascus* mold on steamed rice, is an important material for manufacturing *tofuyo* (red soybean cheese). Optimum conditions for producing red koji were investigated. Two kg of steamed rice inoculated with 120 gm of koji starter (tané-koji, ground in water) was wrapped in a cloth and incubated at 32ºC. After 38 hours of incubation, the temperature of the materials was controlled (kept from overheating) by mixing them by hand. When the moisture level in the koji

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dropped to 30% or less, the koji was sprayed with water to add moisture. By these treatments, the growth of the mold and the formation of red pigment in the koji were markedly enhanced. Optimum incubation time for the koji after inoculation was 150 hours (6¼ days). The highest production of enzyme activities and pigment from the koji was obtained by using autoclaved non-glutinous rice; these two factors were not affected by storage conditions of -20ºC for 12 months. The alpha-amylase and saccharifying amylase of the koji were alcohol-tolerant, but the protease was not.

Note: This is the earliest document seen (Nov. 2011) that describes how to make tofuyo or fermented tofu on a commercial scale. Address: Dep. of Agricultural Chemistry, University of the Ryukyus, Okinawa.

7770. Oka, Tadashi. 1983. [History of the soymilk industry in Japan]. *Toyo Shinpo* (*Soyfoods News*). March 1. [Jap]
• ***Summary:*** In 1957 (Showa 32) one tofu maker in Hachiôji, Tokyo, was making several hundred 180 cc bottles of soymilk and selling it. This tofu maker was a Seventh-day Adventist and it is said that he received Dr. Harry W. Miller's guidance when learning how to make soymilk.

It is said that after visiting this tofu shop, in 1959 Saniku Gakuin [a Seventh-day Adventist school] decided to serve soymilk in their school lunch program.

So Seventh-day Adventists pioneered modern soymilk in Japan.

Around 1962 Nihon Tanpaku Kôgyô [Kogyo, K.K.] ordered Japan's self-defense forces (*jieitai*) to do taste tests of their soymilk. This company was making soymilk powder and selling it, so they were looking for a market for their product. But there were some problems with its heavy smell, so that flavored soymilks (such as orange) were popular, but their plain soymilk was not well accepted.

Mr. Kanji Tsuchiya, who had been working for Kyôdô Nyûgyô (Kyodyo Nyugyo, a dairy milk company) for more than 10 years, got very interested in developing soymilk. In 1965-69 he helped to set up a soymilk plant in Taiwan (capacity 500 liters/hour). But the soymilk made in his plant didn't have its natural beany flavor, so Taiwanese consumers thought it was fake. Dr. Harry W. Miller, who visited his plant at that time, told him that he didn't have to refine soymilk that much for Chinese customers.

Mr. Teisuke Yabuki, of Japan's Ministry of Agriculture (Monbu-sho, Gakumu, kyoku-cho) started soymilk research because of Ryukichi Sekiya, who was interested in soymilk and used lactic acid bacteria to remove the beany flavor when making soymilk. He conducted taste tests and a kindergarten and an elementary school, but the taste was unacceptable and nobody was interested. He asked other people to do this research but didn't get good results. Mr. Yabuki asked if he could do his research and development on soymilk and asked Onihara (Shinnojo?) at Tokyo Agricultural University (*Tokyo Nôgyô Daigaku*) to do the research. At that time Mr. Yabuki was the president of Yakult (Jôtô Yakuruto Hanbai K.K.). He continued Mr. R. Sekiya, spent 9 years and a lot of money, and at last in 1968 he was able to start a small scale soymilk pilot plant. He bottled his soymilk and gave it away to his friends, to test the product and the process; his energy went into his product No. 1.

In Oct. 1969 Mr. Yabuki named his soymilk Luppy and started selling it. This was exactly 10 years after Nihon Saniku Gakuin started to provide soymilk in their own way.

But Mr. Yabuki was the president of Yakult at that time; he was selling about 13,000 bottles per day of Yakult [a small probiotic beverage] and had about 500 workers. He had to build a soymilk plant in Sept. 1968, found Luppy Tanpaku Kagaku Kenkyûsho and chose the package (Tetra Pak Aseptic) for his soymilk. Finally he was asked to choose between Yakult and Luppy. He suffered a lot but finally chose Luppy, resigning as president of Yakult. Mr. Yabuki had been using the Yakult sales and distribution network to sell his soymilk. On 31 Dec. 1972 he severed his relationship with Yakult.

It happened this way. When Mr. Yabuki was talking to Yakult's main office (*honsha*) House Shokuhin Kôgyô K.K. got interested in soymilk and started trying to persuade Mr. Yabuki into working for them. House Shokuhin Kôgyô K.K. made powdered tofu and had been selling it and were interested in soyfoods.

In April 1973 House Luppy (K.K.) was founded. Mr. Yabuki became its president and took responsibility for making the company's soymilk; House Shokuhin took charge of marketing and selling the soymilk.

A large food manufacturing company like House entering the soymilk was expected to have a big effect on expanding that market.

In 1973, soymilk brands in Japan were: (1) Soyalac (canned) made by Saniku Foods. (2) Shinko White made by Shinkô Shôbai. (3) Bonlact made by Wakôdo (Wakodo). (4) Luppy made by House Luppy. Because of expensive packaging and the use of fructose and honey, Luppy was quite a bit more expensive than the others (45 yen per 180 cc at that time).

In Nov. 1974 Tokyo Soymeal started. The technician Kanji Tsuchiya, who was from Kyôdo Nyûgyo, helped to make this soymilk plant. Mr. Tsuchiya's main idea was to make good-tasting soymilk in a clean, modern plant, resembling a dairy milk plant.

A chronology looks like this:

1959–Nihon Saniku Gakuin.

1969 Oct.–Luppy Tanpaku Kagaku Kenkyusho (Yakult / Yakuruto).

1971–Saniku Foods.

1972 April–House Luppy (New company from Luppy Tanpaku Kagaku Kenkyusho). They closed in 1979.

1973 Nov.–Tokyo Soymeal. They closed in Dec. 1978.

1975 July–Asahi Shokuhin.

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1976–Kyodo Nyugyo.
1976–Marusan.
1977–Kibun / Kibon.
1981–Mitsubishi. But Mitsubishi had started testing soymilk in about 1972.

7771. *Toyo Shinpo* (*Soyfoods News*). 1983. Issetai atari nenkan oyobi ikkagetsu-kan no hinmoku-betsu shishutsu kingan [Amount of money spent and amount of soyfood products consumed per household per year and per month in Japan, 1977-1982]. March 1. [1 ref. Jap]
• ***Summary:*** Gives figures for tofu, ganmodoki, natto, other, shoyu, miso, soy oil, and margarine. Tofu consumption is lowest in February and highest in August, followed by July, May, and June. Natto consumption is highest March then February, and lowest in August. Shoyu consumption is highest in July then May, and lowest in January then February. Miso consumption is highest in April then May, and lowest in January. Soy oil consumption is highest in July and lowest in January. Address: Japan.

7772. *Toyo Shinpo* (*Soyfoods News*). 1983. [Yukijirushi Milk Co., one of Japan's largest milk companies, started selling soymilk on 10 March 1983]. March 1. [Jap]
• ***Summary:*** Their brand name is Yukijirushi Soymilk (*Yukijirushi no Tonyu*). They are selling three flavors: (1) Plain–90 yen retail. (2) Barley Malt Coffee–100 yen retail. (3) Yogurt flavor–100 yen retail.

Each is sold in 250 cc Tetra Brik cartons with 90 days shelf life. From one pack you can get all your vitamin E requirement for one day (a man needs about 10 mg, and each pack contains 15 mg). Yukijirushi is buying raw soymilk material from Nisshin and making it into their soymilk now. A photo shows the front of each of the 3 packages.

7773. *SoyaScan Notes.* 1983. How to eat natto (Overview). March 22. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** David and Suzanne Greenslade: The only way they ever ate natto in Japan was: Put 1 packet of natto in a bowl. Add 1 raw egg, 1 tablespoon shoyu [Japanese-style soy sauce], and ¼ minced green onion (*negi*). Stir vigorously with chopsticks. Pour over hot rice and eat. OK to mix with the rice. It was served that way all over Japan and in Los Angeles.

Akiko Aoyagi Shurtleff, who was born and raised in Tokyo, never ate natto this way. She added to the natto: *katsuobushi* (shaved, dried, fermented and smoked skipjack tuna {*Katsuwonus pelamis,* sometimes referred to as bonito}, minced green onion, shoyu and Japanese-style mustard {*karashi*}).

In the Japan's northeast prefectures (*Tôhoku Chihô*) Akiko has heard that some people use sugar instead of soy sauce.

7774. Kawamura, Wataru. 1983. Re: Miso in America, and new edition of *The Book of Miso.* Letter to William Shurtleff at Soyfoods Center, March. 4 p. Handwritten, with signature and stamped seal. [1 ref. Jap]
• ***Summary:*** Mr. Kawamura, widely known in Japan as "Miso Sensei" (miso teacher), is the author of many books about miso and miso soup. He is deeply interested in the many different kinds of miso in Japan and their history. Address: 2-4-7 Kugenuma, Tachibana, Fujisawa-shi, Kanagawa-ken 251, Japan. Phone: 0466-22-1351.

7775. Krieger, Verena. 1983. Re: History of work with tofu in Japan, Illinois, and Switzerland. Letter to William Shurtleff at Soyfoods Center, March. 2 p. Typed, without signature. [1 ref. Eng]
• ***Summary:*** "The year of 1973 I spent in Japan, where I got to know tofu and learned how to make it. The following years I spent in the U.S., working at several natural foods restaurants using soyfoods as important parts of the menu. The last of these jobs was at It's Natural (Brian Schaefer), where we made our own tempeh. We were also the first (and an important) customer of Mu-Tofu of Chicago.

"In 1979 I returned to Switzerland, where I first started to sell a Tofu-Set [tofu kit, for making tofu at home], using it in private cooking classes. (The publication 'So mache ich Tofu,' is the instruction booklet, accompanying the set, written by me and printed by the Ahorn-Verlag.)

"In 1980, just before going to the Soyfoods Conference in Illinois, I approached Morga, asking them if they were interested in producing tofu. They had all the right equipment and I even went there to make tofu for them once, but we could not come to terms, since they wanted to sell a sterilized tofu with long shelf life at room temperature. But such tofu was already on the market from Belgium, made by Lima. I wanted the fresh product.

"I then started to make tofu in my home kitchen for a local vegetarian restaurant. In the spring of 1981, I heard about Hans-Ruedi Oppliger, who was then also making tofu in his home kitchen for a natural foods store. I contacted him and we decided to join efforts in creating a market. But it was only after 'Yesterday Steak, Tomorrow Tofu' was published that we could start full scale production. We set up the Sojalade with 3 other people and founded a co-op. This co-op has now 9 members and both Hans-Ruedi and I are still part of it. (Hans-Ruedi does not have a shop of his own.) The Sojalade was set up in August 1981, but Restaurant Sesam in Bern and Restaurant La Moisson (both macrobiotic) had been making tofu for their own use for several months, or even years before us. Soyana started their tofu production in February 1982.

"The Sojalade is now also working on a project to help organic farmers get started with soybean cultivation... By the spring of 1983 interest in tofu production has become

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quite considerable. Therefore, the Sojalade has instituted a small apprenticeship program, where we train people in tofumaking for at least ten days. Since we can only take one person at a time, we already have a waiting list till June."

Update: 1990 April 9. Verena is now writing cookbooks, and has 5 in print. One on beans just been published. Her tofu cuisine is still in print. A condensed version has been taken over and distributed by Migros. She is no longer involved with Genossenschaft Tofurei, which is quite a distance from her home. She was on the board of directors but she keeps in touch and she still has some money involved.

Note: This is the earliest document seen (Feb. 2013) that mentions Migros in connection with soy. Address: Bruchmattstr. 24, CH-6003 Lucerne, Switzerland. Phone: 041-22 50 34.

7776. *Soyanews* (*Sri Lanka*). 1983. Preparing soya sauce. 5(7):2. March.
• ***Summary:*** "The Bureau of Ceylon Standards is presently engaged in the formulation of a standard specification for Soya Sauce." A flow chart shows how traditional Japanese soya sauce (shoyu) is made. Proportions are given. For more details, see *The Book of Miso,* by Shurtleff and Aoyagi.

7777. Taira, Harue. 1983. [Quality of soybean seeds grown in Japan. III. Correlation between physical properties, chemical composition, and suitability for food processing pairs]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 42. p. 27-39. March. [39 ref. Jap; eng]
Address: National Food Research Inst., Japan.

7778. Taira, Harue; Taira, Hirokadzu; Fujinami, Hiroko; Matshita, Zenichi; Ebine, Hideo; Ushirogi, Toshizo; Fujimori, Ikuo. 1983. Daizu shushi no kansô shori hôhô to sono hinshitsu ni tsuite. VII. [Influence of dry treatment after harvest on quality of soybean seeds. VII. Quality of food processing and test for miso making]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 42. p. 18-26. March. [12 ref. Jap; eng]
Address: 1-2. National Food Research Inst., Ministry of Agriculture, Forestry and Fisheries (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 3. Central Miso Research Inst., Shinkawa, Chuo-ku, Tokyo; 4. Hokkaido Prefectural Central Agric. Exp. Station, Naganuma, Hokkaido 069-13.

7779. *Toyo Shinpo* (*Soyfoods News*). 1983. [How much will Japan's soymilk market expand]. April 1. [Jap]

7780. *Toyo Shinpo* (*Soyfoods News*). 1983. [Using okara in Western-style recipes]. April 1. [Jap]
• ***Summary:*** Recipes are given for a salad, a pâté, and cookies.

7781. Sheraton, Mimi. 1983. Restaurants: Sushi and sashimi, the best in the city. *New York Times.* April 15. p. C1-2.
• ***Summary:*** This is a review of Hatsuhana, a Japanese restaurant at 17 East 48th St., between Fifth and Madison Ave. in New York City. "Natto, a combination of raw fish with an earthy cheeselike paste of aged soy beans, is wonderful whether you have it with a white-flesh fish, tuna, clams, squid or the most subtly flavored toro–fatty tuna. A sunny yellow vinegar sauce made of lemon juice, bean paste [miso] and sake is the basis of nuta, a salad made with plain or fatty tuna, white fish, clams or squid."

"The eye-opening wasabi horseradish should be mixed into soy sauce before sushi and sashimi are dipped in, and lacy slivers of radish [daikon] add a nice contrast."

7782. Hughes Markets. 1983. Foster Farms chicken (Ad). *Los Angeles Times.* April 21. p. M25.
• ***Summary:*** The section titled "Oriental Foods" includes:
Hinode tofu, 19-oz pkg. $0.59
Morinaga tofu, 10 oz. box [aseptic] $0.49.
Yamasa soy sauce, 1-gal. can $4.45.
Sesame cookies, Tohato Harvest, 7 oz. $0.89.
Ramen, Yee Fu Mein 3 oz. pkg. 5 for $1.00.

7783. Shurtleff, William; Aoyagi, Akiko. 1983. History of soy oil margarine. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 46 p. April 28. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction: What is margarine? Etymology. Overview of world margarine production and trade. Part I: History of margarine in Europe. Origins (1869-1899). Hydrogenation and World War I (1900-1919). The interwar period (1920-1939). World War II and the postwar years (1940-1959). The modern period (1960-1982). Part II: History of margarine in the United States. The early years (1871-1899). Hydrogenation and World War I (1900-1919). Two slow decades (1920-1939). Wartime advances and breakthrough (1940-1959). The modern period (1960-1982). Part III: History of margarine in other countries. Indian Subcontinent. East Asia and Japan. Latin America and Africa. Address: Lafayette, California. Phone: 415-283-2991.

7784. *Crackerbarrel* (*Chico, California*). 1983. Are natural soy sauces really natural? Laboratory analysis shows some are not! 1(2):1, 6. April.
• ***Summary:*** Recent laboratory analyses... States that three of four brands tested contain 0.91-0.98% glycerin. "A natural soy sauce should have a minimum of 1.0% glycerin. If the sample has less than 0.5% glycerin, then it must have been made from defatted soybeans." Two brands contain levulinic

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acid (12-17%). Alcohol content ranges from 1.26 to 2.52%.

The four brands of soy sauce commonly sold in American natural foods stores showed the presence of artificial additives in two of them. The tests were performed last November, by the Japan Food Research Laboratories, in Tokyo.

Chico-San pioneered the importation of natural soy sauce over 20 years ago. Address: Chico-San, Inc., P.O. Box 810, Chico, California 95927.

7785. Leviton, Richard. 1983. The Westbrae story. *East West Journal.* April. p. 22-26, 28-29.
• ***Summary:*** An excellent history of Westbrae Natural Foods. Westbrae was founded in late 1970 by Robert Gerner, Kristin Brun, and Margaret and Bob Ortiz. The foursome secured an abandoned supermarket at 1336 Gilman Street and opened for business in Feb. 1971. Their main products were granola and dried pears. In 1971 Gordon Bennett, finishing a 2-year stint as a conscientious objector, was driving a Goodwill Industries truck in Berkeley while living at Zen Center. He stopped by one day at Westbrae for lunch, asked for a job, and soon found himself hired part time to sweep and move cases. In 1972 they started distributing foods and in the late fall of 1973 the group purchased their Gilman Street store and relocated the warehousing to a new 2,000 square foot building nearby at 1224 10th St., Berkeley, California 94710.

In Feb/March 1974 Gerner (then president and chairman of the board) went to Japan and traveled the country with guide and interpreter William Shurtleff (who was studying tofu in Japan) to search for quality sources of soy sauce, miso, and other traditional Japanese natural foods. About 9 months thereafter Westbrae began to import natural foods from Japan via Mr. Kazama of Mitoku. By late 1974 annual sales had reached $2 million. Between June and Sept. 1976 the retail store at 1336 Gilman Street was renamed from Westbrae Natural Foods to Gilman Street Gourmet. In September 1977, Westbrae Natural Foods moved its warehouse and offices to Emeryville from Berkeley, into a much larger building. "Today Westbrae is a successful, confidant, and growing $7 million corporation of 25 employees at work in a bustling 50,000 square foot warehouse sandwiched between Oakland and Berkeley in Emeryville, California." Gordon Bennett (whose photo is shown) is president. Over the years the company has had a strong interest in soyfoods. Address: 100 Heath Rd., Colrain, Massachusetts 01340.

7786. Makino, Jun. 1983. Imported from Japan: A visit to the Yamaki Miso-Shoyu Company. *Crackerbarrel* (*Chico, California*) 1(2):1, 6. April.
• ***Summary:*** Mr. Tomio Kitani is the company's owner and a third generation master maker of soy sauce and miso. The factory is relatively small. It uses whole soybeans, organically grown locally, and does not pasteurize the miso. Mr. Kitani's grandfather started the company over 58 years ago. He recommends that miso be aged for more than a year. Chico-San is now importing this miso to America. Address: Chico-San, Inc., P.O. Box 810, Chico, California 95927.

7787. Nakadai, Tadanobu; Aishima, Tetsuo. 1983. [Statistical estimation of key enzymes determining the viscosity and filtration rate of soy [sauce] mash (*moromi*)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 57(4):307-11. April. [13 ref. Jap; eng]
Address: 1. Central Research Labs., Kikkoman Co.; 2. Noda Inst. of Scientific Research. Both: Noda, Japan.

7788. Saio, Kyoko. 1983. Furukute atarashii shokuhin, tônyû [Old and new food, soymilk]. *Shoku no Kagaku* (*Food Science Journal*) No. 71. p. 58-71. April. [12 ref. Jap]
Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan: Tanpakushitsu Kenkyu Shitsu-cho.

7789. Schick, Rabbi Michael. 1983. How Chico miso and soy sauce are made kosher. *Crackerbarrel* (*Chico, California*) 1(2):4-5. April.
• ***Summary:*** The author, traveling from San Francisco with Jun Makino (director of imports for Chico-San Inc.), visited Mizoguchi Soy Sauce Inc. in Honjo/Kimitsu, Chiba prefecture, Japan, owned by Mr. Hideo Mizoguchi. The business is over 100 years old. He gives a description of the process for making miso and shoyu at the plant, illustrated by 3 photos. He then visited Meiji Seifun Co. in Fukuyama/Hiroshima and described the miso process. He certified all products kosher, for import by Chico-San. Address: Chico-San, Inc., P.O. Box 810, Chico, California 95927.

7790. *Shokuhin Nippon* (*Japanese Foods*). 1983. [Special issue on soymilk in Japan]. 15(5):1-104. April. [Jap]
• ***Summary:*** On the cover is a photo of Kibun soymilk in a Tetra Brik package. Address: Japan.

7791. *Soybean Digest.* 1983. Move over Cola (Letter to the editor). April. p. 4.
• ***Summary:*** "On page 80 of the February 1983 issue of Soybean Digest, you reported the popularity of a soybean drink among the Japanese. As soybean producers, we were very interested and would like more information on this beverage.

"E.S. Reed, Elizabeth City, North Carolina.

"'Soymilk is an inexpensive and easy way for protein-deficient people to upgrade their diets,' says Steve Chen, ASA director of Taiwan. That 's a major reason why the protein-rich drink is so popular in Eastern countries.

"Making soymilk is basically a three-step process: soaking soybeans and grinding them in water and straining the mixture. The process is an old one-discovered by the

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Chinese about 2000 years ago. Later modifications have added new flavors: vanilla, strawberry, peanut, chocolate, milk, coffee and apple.

"Japanese soymilk industry sources predict that by 1985 the soymilk industry in Japan will use 3.6 million bushels of soybeans. So the popular drink also provides a good market for US. soybean exports.–Ed."

Note: ASA (American Soybean Association) is starting to get interested in soyfoods! But only overseas, so far.

7792. *Soyfoods Monthly* (*Colrain, Massachusetts*). 1983. Soyfoods Association rejuvenated at first meeting of new board, new goals. 3(4):1. April.
• ***Summary:*** "Thirty two industry members attended a 2 hour planning session of the new Soyfoods Association in Anaheim, February 7 and appointed board of directors and officers. Michael Austin was selected the new Executive Director following Richard Leviton's resignation. Board members include: Gary Barat, Legume (President), Yvonne Lo, Vitasoy USA (Vice President), Tom Timmins, New England Soy Dairy (Vice President), Dan Burke, Pacific Soybean (Treasurer), Richard Leviton, *Soyfoods Magazine* (Secretary), Travis Burgeson, Pacific Tempeh; Michael Fountain, SanJi [San-J] Int'l.; Jim Miller, Quong Hop; Jack Mizono, Azumaya; Morris Shriftman, Tree of Life; Robert Tepper, Farm Foods; Shoan Yamauchi, Hinode Tofu Co. An initial pledge of $12,000 from 14 companies was received at this organizational meeting."

7793. Sunset international vegetarian cook book. 1983. Menlo Park, California: Lane Publishing Co. 96 p. April. Illust. 28 cm. Retitled Vegetarian Favorites in 1987.
• ***Summary:*** This book is by the editors of Sunset books and Sunset magazine; the supervising editor is Maureen Williams Zimmerman. A table titled "Choosing nutritiously" (p. 5) shows that soybeans are a good source of thiamin (B-1), niacin, vitamin B-6, folic acid, calcium, and iron. Another table titled "Protein partnerships" (p. 7) states that soybeans and soyfoods (soybean curd/tofu, soy flour, soy milk, and tempeh), like dairy products and eggs, have no limiting amino acid. Soy-related recipes include: Miso grilled mushrooms (p. 14; Japan). Golden tofu cauliflower soup (p. 34; Thailand). Greens & tofu in peanut sauce (p. 48; Thailand). Stir-fried tofu & vegetables (p. 50; Vietnam). Whole wheat & soy pasta (p. 52). Mandarin pancakes with spicy tofu filling (p. 70; China). Address: Menlo Park. Phone: 415-321-3600.

7794. Taira, Harue. 1983. Daizu no hinshu kairyô. Saibai to hinshitsu [Soybean varietal improvement. Cultivation and quality]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 78(4):241-48. April. [43 ref. Jap] Address: National Food Research Inst. (Nôrin Suisan-shô Shokuhin Sôgô Kenkyu-jo) [Tsukuba, Japan].

7795. *Tofu no Kagaku to Gijutsu: Kako to Kaihatsu* (*The Science and Technology of Tofu: Processing and Development*). 1983--. Serial/periodical. Published originally by Daizu Tanpaku Kaihatsu Kyokai, Okubo Kenkyu-shitsu, Shokuhingaku-ka, Tohoku University, Sendai-shi, Miyagi-ken, Japan. Later by Mr. Teruo Masuda, president of Zenkoku Daizu Tanpaku Kenkyu-kai (Japanese National Soy Protein Research Society) and Sanyu Shoji KK, Tangi-cho 1, Hachioji-shi, Tokyo-to, Japan. Vol. 1, No. 1. April 1983. [Jap]
• ***Summary:*** According to Toyo Shinpo (1 May 1988, p. 16), this periodical is not for sale, but is given away upon request. It contains a lot of scientific and technical information on tofu production. Publication re-commenced in March 1988 with Vol. 3, No. 1.

Letter from Mr. Teruo Masuda. 1988. Sept. 3. He is planning to resume publication as a serial. The first new issue, Volume 3, Number 1 was published in March 1988 by the Zenkoku Daizu Tanpaku Kenkyukai (Japanese National Soy Protein Research Society). This was an organization of about 50 to manufacturing companies throughout Japan to study scientific production of tofu. Mr. Masuda's company makes and sells tofu equipment. Address: Tokyo, Japan. Phone: 0426-91-3885.

7796. Dreyer, Lawrence. 1983. Re: Work with soya in Austria. Letter to William Shurtleff at Soyfoods Center, May 1. 3 p. Handwritten, with signature. [Eng]
• ***Summary:*** "Herr Anton Wolf was here yesterday and told me that only 100 hectares of soybeans were planted in Austria in 1982. The yield was about 2,500 kg/ha."

Dreyer's main work is as the architect of the additions they are making to their facilities in Wiener Neustadt. At present they have a small shop and restaurant. There will be a new area for producing tofu on a small scale, gluten, mochi, bread. "At present we produce a limited quantity of tofu with equipment bought in Japan... A group of people loosely related to us uses a small centrifuge to make soymilk. This group has also recently started making tempeh... I have given copies of your chapter on "History of Soya in Austria" to Anton Wolf." Address: Weg der Natur, Austria.

7797. *Toyo Shinpo* (*Soyfoods News*). 1983. [Kanazawa Tofu Association has developed a soymilk sold in gusseted plastic pouches]. May 1. [Jap]
• ***Summary:*** It is sold in tofu shops and at kiosks in or near train stations. A photo shows the front of the package.

7798. Richard, Lou. 1983. History of Fearn Soya Foods (Interview). Conducted by William Shurtleff of Soyfoods Center, May 6. 1 p. transcript.
• ***Summary:*** Elwood has Dr. Fearn's files. Lou called Elwood and Elwood said he will send (loan) Soyfoods Center

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everything he has. Lou will send (loan) Soyfoods Center some coins and invoices from about 1935. In about 1947-49 Dr. Fearn's secretary, Renee, went home with lots of the company records.

Fearn Natural Foods was at 1206 N. 31st Ave., Melrose Park. In 1955 they moved to 355 West Ontario. Then in 1968 they moved to their present address at 4520 James Place in Melrose Park, Illinois. In 1982 the company name was changed from Fearn Soya Foods to Fearn Natural Foods.

Lou is quite sure Dr. Fearn died in 1947–not 1949. since that was the first year he (Lou) started to work in the company; he graduated from 8th grade in 1947. In 1949 he was a sophomore in high school.

A box arrived from Fearn via UPS in early May 1983, several days after this interview. It contained a wealth of early documents in 21 different files. The names of the files were: 1. Stubs of cancelled checks, 1946-47. 2. Walker = Purchase order to Fearn from H.W. Walker Co. in Chicago. 3. Harriett Assoc. (anti-Communism). 4. Large ledger of orders received in 1937. 5. Small ledger of orders received in 1936-37. 6. Dr. Fearn's circulars and labels, old. 7. Miscellaneous bills, 1947. 8. Vitona. 9. P.A. [Paul] Richard. 10. Personal, Dr. Fearn (incl. lots of photos, but no good ones of him). 11. Products, processes, machinery (Dr. Fearn). 12. Professional correspondence, as with Le Clerc. 13. Miscellaneous deals and ventures (Dr. Fearn). 14. Manufacturers (incl. Loma Linda). 15. Golden Mix. 16. Financial, incl. cancelled signed checks. 17. Fearn Foods = Fearn International. 18. Correspondence–Malcolm McBride and Viana deal. 19. Miscellaneous old trucking bills & unusual items. 20. English connections. 21. Correspondence, Belleville in Southern California.

Included in the shipment were many coins that Dr. Fearn apparently collected during his travels, including coins from the following countries–listed alphabetically. The number of coins from each country, and the range of dates that appear on the coins are shown in parentheses. Note that Dr. Fearn was probably in a particular country on or after the latest date: Austria (3, 1924-1925), Belgium (4, 1870-1917), Canada (3, 1842-1918), China (40, all undated, but "10 cash" token coins with square hole in center, minted from 1853-1861), Germany (Deutsches Reich, 45 coins, 1874-1927), Great Britain (6, 1856-1922), Japan (7, 1889-1923), Luxembourg (2, 1906-1916), United States (1, 1916). Address: Melrose Park, Illinois 60160.

7799. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo*). 1983. Niowanai nattô [Natto that doesn't smell: Tempeh]. May 20. Evening ed. p. 14. [Jap]
• ***Summary:*** Tempeh is very different from natto: it is fermented with a mold, whereas natto is fermented with a bacterium. Natto is indigenous to Japan, whereas tempeh is indigenous to Java, and neither is widely consumed in the country of the other. Yet both are fermented soyfoods.

Natto is growing more popular as a breakfast food in Japan–related to the growing interest in natural foods, vegetable protein, and riding the same wave of popularity as soymilk. Young people are eating less rice. In 1982 each family in Japan spent ¥1,531 on natto, up 12% from the previous year. Dr. Teruo Ohta says one reason Japanese have the greatest longevity is because they eat a lot of plant protein instead of animal protein. Representative of these plant protein foods are soyfoods. But miso and shoyu contain salt, and tofu and soymilk contain no dietary fiber. Natto (like tempeh) is doubly good in that it contains fiber but no salt.

But the rice Japanese usually eat with natto is steadily decreasing; will this eventually cause a decrease in natto consumption as well? Maybe only those older than middle age are the main natto consumers.

This article uses the term "tempeh natto" three times. Note: We think this is unfortunate and confusing. Last year Dr. Ohta visited natto plants in Indonesia. Medical research shows natto is good for health.

Did natto originate in China? Was that Chinese natto salted or not? Was it disseminated by Buddhist monks to Japan and Southeast Asia?

Next month the Japanese National Natto Association will send a delegation to Java (Indonesia) to study tempeh.

7800. *Toyo Shinpo* (*Soyfoods News*). 1983. [Tamura Yakuhin has created a new company, Tamura Kassei K.K. which is selling soymilk in a new type of Pure Pak carton]. May 21. [Jap]
• ***Summary:*** This carton is a five-layer laminate: Polyethylene, paper, polyethylene, aluminum, and polyethylene. The soymilk stays fresh at room temperature for 60 days. The brand is Tamura Tonyu, sold in 3 flavors: 1. Plain Soymilk (*Jun Tonyu*) in 200 and 300 ml. 2. Dairylike Soymilk (*Chosei Tonyu*) in 200 and 300 ml. 3. Soymilk Soup (*Tonyu Suupu*) in 80 and 300 ml.

The soymilk, made by a new natural method, has a good flavor.

7801. *Zenkoku Shokuhin Shinbun* (*National Food News*). 1983. Nattô Kenkyû-kai no kappatsu na katsudô (nattô-kin tenpe) o Zennôren tsûjô sôkai [The Natto Study Group's vigorous activity (with "tempeh natto") at the Japan Natto Association's general meeting]. No. 452. May 21. [Jap]
Address: Japan.

7802. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo*). 1983. Amerika-jin ga kangaeta nihon ryôri [Japanese foods an American developed]. May 25. [Jap]
Address: Tokyo, Japan.

7803. Ikawa, Kazuhisa. 1983. Higashi Ajia fukugo bunka-ken. Tôfu bunka to nattô no toraianguru [East Asia's culture

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complex. Tofu culture and the natto triangle]. *Asahi Shinbun* (*Asahi Daily News, Tokyo*). May 28. p. 11. [Jap]

7804. Ikawa, Kazuhisa. 1983. Ajia fukugô nattô-ken: Tôfu bunka to Nattô toraianguru [Asia's multi-combined natto zone: Tofu culture and the natto triangle]. *Mainichi Shinbun* (*Mainichi Daily News, Tokyo*). May 28. p. 11. [Jap]
• ***Summary:*** Contains three maps showing the "natto triangle." The three points on the triangle lie at Japan (natto), Java (tempeh), and Bhutan + eastern Nepal (kinema).

Note: All these foods are un-salted, however tempeh is fermented with a mold whereas natto and kinema are both fermented with bacteria. Therefore, Java should not be part of the "natto triangle."

7805. Hara, Toshio; Ueda, S.; Sakaki, Y. 1983. Restriction endonuclease mapping of pUH1 in *Bacillus subtilis* (*natto*): Note. *Agricultural and Biological Chemistry* 47(5):1143-44. May. [14 ref]
• ***Summary:*** Figures show: (1) "Agarose gel electrophoresis of fragments of pUH1 digested with two restriction endonucleases."

(2) A "restriction endonuclease cleavage map" of the circular plasmid pUH1. There are ten cleavage points.

Note: This is the earliest document seen (Jan. 2012) that shows this remarkable circular illustration of a plasmid, a type of DNA which is separate from the chromosomal DNA and which is capable of replicating independently of the chromosomal DNA. Address: 1-2. Dep. of Food Science & Technology, Faculty of Agriculture, Kyushu Univ., Hakozaki, Fukuoka 812, Japan; 3. Research Lab. for Genetic Information, Kyushu Univ. School of Medicine, Maedashi, Fukuoka 812, Japan.

7806. Hesseltine, C.W. 1983. Food fermentation research and development. In: K.T. Achaya, ed. 1983. Proceedings of AHARA 82, First AFST (I) International Conference on Food Science and Technology. See p. 65-67. Held 23-26 May 1982 at Bangalore, India.
• ***Summary:*** Discusses the amounts of miso, shoyu, and natto produced in Japan. In Korea in 1978 an estimated 51,237 metric tons of soybean paste, 97,830 kiloliters of soy sauce, and 33,525 metric tons of gochoojang (hot pepper paste) were produced. Also discusses the amounts of tofu, tempeh, and miso made in the USA. Address: USDA, Peoria, Illinois.

7807. Iwaki, Mitsuro; Thongmeearkom, Pornpod; Honda, Y.; Deema, N. 1983. Soybean crinkle leaf: A new whitefly-borne disease of soybean. *Plant Disease* 67(5):546-48. May. [9 ref]
• ***Summary:*** Soybean crinkle leaf virus (SCLV), transmitted by the whitefly (*Bemisia tabaci*) in a persistent manner is a new disease reported from Thailand. Address: 1&3. Inst. for Plant Virus Research, Tsukuba Science City, Yatabe, Ibaraki, 305 Japan; 2&4. Div. of Plant Pathology and Microbiology, Dep. of Agriculture, Bangkhen, Bangkok 9, Thailand.

7808. **Product Name:** [Kibun Soymilk (With Coffee, With Fruit Juice, Tonyu, Yogurt-Type)].
Manufacturer's Name: Kibun Co. Ltd.
Manufacturer's Address: Tokyo, Japan.
Date of Introduction: 1983 May.
Ingredients: With Coffee: Soybeans, water, glucose, fructose, malt extract, coffee powder, corn oil, coffee flavor, salt.
Wt/Vol., Packaging, Price: HK$1.20 per 200 ml carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Imported by: Kibun Foods Singapore PTE, Ltd., 15, Fishery Port Road, Singapore 2261. When William Shurtleff was in Singapore in May 1983 he purchased these four products and saved the labels. The products are made in Japan.

7809. Steinkraus, Keith H.; Cullen, R.E.; Pederson, C.S.; Nellis, L.F.; Gavitt, B.K. eds. 1983. Handbook of indigenous fermented foods. New York, NY: Marcel Dekker. ix + 671 p. May. Illust. Index. 26 cm. Microbiology Series, Vol. 9. [200+ ref]
• ***Summary:*** Contents: Foreword by E.J. Da Silva. Preface. 1. Indonesian tempeh and related fermentations: Protein-rich vegetarian meat substitutes. 2. Indigenous fermented foods involving an acid fermentation: Preserving and enhancing organoleptic and nutritional qualities of fresh foods.

3. Indigenous fermented foods in which ethanol is a major product: Types and nutritional significance of primitive wines and beers and related alcoholic foods.

4. Indigenous fermented amino acid / peptide sauces and pastes with meatlike flavors (p. 433-571): Introduction.

(A) Soy sauces: Japanese shoyu: Koikuchi, usukuchi, and tamari; Chinese chiang-yu, by Tamotsu Yokotsuka (p. 437-51). Taiwanese soy sauce, by Liu (p. 451-56). Malaysian soy sauce: Kicap, by Ong, Mercian, Poesponegoro and Tanuwidja (p. 456-61). Indonesian soy sauce: Kecap, by Saono, Poesponegoro and Tanuwidja (p. 461-65). Korean soy sauce, by Chang (incl. homemade kanjang and meju, p. 465-66). Taiwanese black bean sauce: Inyu, by Jan et al. (p. 466-67). Philippine taosi [fermented black soybeans], by Steinkraus (p. 467).

(B) Fermented soybean pastes: Japanese miso, by Ebine, Shurtleff and Aoyagi (p. 468-79). Indonesian tauco, by Saono et al. and Winarno (p. 479-82). Korean Doenjang and kochujang, by Chang, Shurtleff and Aoyagi (p. 482-87).

(C) Fermented fish-shrimp sauces and pastes (p. 487-526).

(D) Fish-soy sauce and fish-soy paste, by Ismail (p. 526-30).

(E) Miscellaneous Oriental fermentations. Japanese natto (itohiki natto), by Hayashi and Ota (p. 530-45). Japanese Hama-natto (hamanatto) and related products (incl.

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yukiwari natto, p. 545-47). Chinese red rice: Anka (Ang-kah [ang-kak, angkak]), by Lin, Su and Wang, Sooksan and Gongsakdi, and Pichyangkura (p. 547-53). Chinese sufu, by Su and L.-P. Lin (incl. nyufu, p. 553-61). Note: Chapter 4 contains about 195 references.

5. Mushrooms: Producing single cell (microbial) protein on ligno-cellulosic or other food and agricultural wastes.

6. General papers related to indigenous fermented foods: Contributions of the western world to knowledge of indigenous fermented foods of the orient, the importance of microbial genetics in indigenous food fermentations, new uses for traditional food fermentations, mycotoxin problems in indigenous fermented foods and new methods for mycotoxin analysis.

Less widely known fermented foods include: Idli, dosa (dosai, puda), dhokla, khaman (with soy, 131-35), enjera (162), tef/teff (164), wot (165), hopper (173), kishra (175), lambic (179), ogi (with soy, 189-98), mahewu (203), gari (208), dahi (249-57), srikhand and lassi (256-57), laban rayeb, laban zeer, yogurt (257-59; cultured soy yogurt is mentioned on p. 616), liban, mast, mass, taw (260), tairu (with soy, 260-65), kishk or kushuk (267), Metchnikoff (266), trahanas or tarhanas (271-76), rabdi, jalebi (275), koumiss (276), kefir (277-80).

Alcoholic beverages and foods: Honey wine, mead, metheglin (305), tej (306), sugar cane wines, basi, bubod, binubudan (307), palm wine or toddy (315-28), pulque (328-37), kaffir (344), tesguino (352), bouza (357), pito (358), busaa (365) sake (373-79), yakju and takju (379), tape = tapeh (381-400), ragi (381), tapuy (400), lao-chao (402), madhu (406), brem (408), tropical vinegar (410-14), nata (414-20), tea fungus (421), nuoc-mam (516-21).

Reviewed in Scientific American (Nov. 1983, p. 37), and in Bio/Technology (1984. p. 364). Address: Inst. of Food Science, Cornell Univ., Geneva, New York.

7810. Wakabayashi, Keiji; Ochiai, M.; Saito, H.; Tsuda, M.; Suwa, Y.; Nagao, M.; Sugimura, T. 1983. Presence of 1-methyl-1, 2,3,4-tetrahydro-β-carboline -3-carboxylic acid, a precursor of a mutagenic nitroso compound, in soy sauce. *Proceedings of the National Academy of Sciences, USA* 80(10):2912-16. May. [33 ref]

• ***Summary:*** Japanese-style fermented soy sauce (shoyu) was found to contain precursors of bacterial mutagens. The authors postulated that these substances may be related to the relatively high incidence of stomach cancer in Japan, which is 8-fold higher than that observed in the united states. The model advanced by these researchers holds that nitrite in the gastrointestinal tract (from consumption of vegetables containing nitrate) might react *in vivo* with the mutagen precursors in soy sauce, resulting in generation of one or more carcinogenic nitroso compounds. Address: National Cancer Research Inst., Tsukiji 5-1-1, Chuo-ku, Tokyo 104, Japan.

7811. Yokotsuka, Tamotsu. 1983. Nihon no shôyu [Japanese shoyu]. Paper presented at spring meeting of Nihon Kagaku Kai at Doshisha University, Kyoto, Japan. 6 large-format pages. Handwritten, unpublished manuscript. [Jap] Address: Kikkoman Corp., Noda-shi, Japan.

7812. Kanasugi, Goro. 1983. Tempe no hôkoku to setsumei [Tempeh: Report and explanation]. *Zenkoku Shokuhin Shinbun* (*National Food News*) No. 453. June 1. p. 2. [Jap]

• ***Summary:*** Tempeh recipes developed and tested by Mr. Kanasugi include karinto, otsumami, subuta-style yakimeshi, curry rice, tempeh sauteed with vegetables or with pickles, gyôza, harumaki (spring rolls), croquettes, cutlets, agé balls fukumeni style, steamed bread, saka manju, egg bread, Kinzanji miso, Tekka miso, sanbaizu aenuta, jashiki-agé, mameita, Inari-zushi, norimaki, oden, fukumeni, shio mamemochi, ohagi, hijiki nikomi, salad, stew, etc.

In Japan it is very difficult to omit all of the meat from a traditional meat recipe, so Mr. Kanasugi leaves in 10-20% for flavor, and substitutes tempeh for the rest. His dream is to establish a chain of specialty tempeh restaurants in Japanese cities. He would like to ask a professional cooking teacher to develop some popular tempeh recipes suited to the needs and tastes of the people.

7813. Leviton, Richard. 1983. Notes from a visit to Eden Foods of Michigan. 19 p. June 4. Unpublished typescript.

• ***Summary:*** These notes were condensed into an excellent article in *East West Journal* (April 1984) titled "The organic Garden of Eden: A Michigan-based natural foods company stresses quality and fidelity." Address: 100 Heath Rd., Colrain, Massachusetts 01340. Phone: 413-624-5591.

7814. Tara, Bill. 1983. Re: Comments on William Shurtleff's "History of Macrobiotics" manuscript. Letter to William Shurtleff at Soyfoods Center, June 9. 2 p. Typed, with signature on letterhead. [1 ref]

• ***Summary:*** "I would check the reference to Paul Hawken *owning* 50% of the stock in Erewhon. My reason for this is as follows: During this period of time there were many discussions which took place between myself, Paul, the Kushi's and others regarding an equitable distribution of stocks in the company to the management. No plan was ever finalized. Paul's desire was 50% for himself. Michio and Aveline were hesitant since that would have meant that future stock participation by management would be severely limited. It was my understanding that the upshot of these discussions was that Aveline would hold the shares in her name in trust until such time that an equitable proposal was put forward by management. In lieu of stock participation, many employees including Paul, myself & Roger Hillyard were given cash bonuses and extensive time off from our work to pursue our own travels and study. (Paul went to

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Japan under such an arrangement, Roger traveled through the U.S. and I traveled through Europe.)"

"Paul did not 'set-up' Mitoku & Muso. They were already in operation and exporting. Paul did however, cement a good relationship with these companies and make more efficient arrangements for shipping and quality control.

"As per Paul's shock regarding the shares. I can only say as stated above, plus the fact that what you want and what you have are two different things, if the shares had been legally his, they could not have been taken away and Paul could never be accused of having been ignorant of the law in business matters."

"Erewhon in Los Angeles was started by myself and Aveline Kushi. I had moved to Los Angeles to set up a center there immediately after establishing a center in Chicago [Illinois] and getting the shop opened. The shop was opened in 1970 and our original purchase of miso and tamari were made through Chico-San. We later received our first direct shipment from Japan prior to Paul's arrival. I was joined by Bruce Macdonald and we began distribution up the California coast as far north as San Francisco, distributing miso and tamari as well as some Japanese condiments and seaweeds to small co-ops and natural food shops. Our biggest customers were the co-ops in Berkeley and Fred Rohe in San Francisco."

"What can I say regarding Paul's impression of Erewhon in 1970? We were all younger then. My impression was that Erewhon was a very happy place to work at Farnsworth Street. There was a high degree of comradery [camaraderie] and a poor understanding of business. The words arrogant and dogmatic were words often used to describe Paul–rightly or not.

"Bill, I hope these comments are not in any way taken to be disparaging of Paul and his involvement in the natural foods movement. His energy and vitality combined with his sharp business sense was one of the main driving forces behind the wide distribution of Japanese foods. Combined with Michio's educational work, this forged the beginning of the wide acceptance that we are now seeing for many of the traditional food items. It would be sad, I think, to allow Paul's own personal frustrations to overly color what was an exciting and adventurous experience for all involved." Address: The Kushi Institute, P.O. Box 1100, Brookline, Massachusetts 02147. Phone: (617) 731-0564.

7815. Shurtleff, William. 1983. In Beijing (June 10-11) (Document part). In: William Shurtleff. 1983. Log of Soyfoods Research Trip to China and Japan: 29 May to 10 July. Lafayette, California: Soyfoods Center. 117 p. See p. 20-23. Unpublished manuscript.

• ***Summary:*** Soy sauce, miso, and fermented tofu (*doufu-ru*) are all sold at one type of store, a pickle shop that sells salted foods. I visited one of these named *Tien Yuan Jiang Yuen.* A color photo shows various types of soy sauce sold in Beijing.

In the market, the sign above the soyfoods section reads *Douzhi Shipin.* In this section they sell *fuzhu* (bamboo yuba [dried yuba sticks]), Doufu-fen (a type of soy flour made in Beijing), cubes of fried tofu (1 inch on a side, called *doubao*).

Note: This is the earliest English-language document seen (April 2013) that contains the term *doubao.*

In 1949 the East Asiatic Co. (which is owned by rich Danes) was the leading exporter of soybeans from China. They started exporting soybeans from China in the 1920s. When exporting, they had offices in Dalien (Dairen), Harbin, etc. The company now has about 80,000 employees worldwide. It is the biggest company in Denmark and the biggest foreign trading company in China, except for several Japanese companies such as Marubeni, Nissho Iwai, etc.

June 11, Saturday. Beijing seminar #1 in downstairs room. Talk with Mr. Chen of the Food and Fermentation Research Institute. Mr. Chen says the most popular vegetable oils in China are: 1. Peanut. 2. Soy (not generally refined). 3. Rapeseed.

Two organizations do research on soyfoods in Beijing: (1) His Food and Fermentation Research Institute (under MinLight, the Ministry of Light Industry); three people who work there are Mr. Chen, Mr. Dai Jiakun, and Mrs. Xu Lin. (2) Beijing Municipal Food Research Institute; contact Mr. Dai Xinjun (Dong [East] Zongbu Lane, Beijing).

Four acid tests for the buyer of any soymilk process and equipment: (1) Equipment cost (fixed). (2) Processing cost (including labor, energy, water, etc.). (3) Soymilk flavor. (4) Protein and solids recovery (percentage).

The Chinese name for thin pressed tofu sheets ("1,000 sheets / 1,000 folds) is Qianzhang or Baiyeh.

The best local markets (which have more variety of produce in the winter) are: Chongwen Vegetable Market and Xidan Vegetable Market (Chinese characters are given for both). The Chinese term for "soyfoods" is *dadou shipin* ("soybean products").

There is a new Chinese method (in Shanghai) for continuous pressed tofu sheets.

Commercial soy products made by Mr. Chen's institute: (1) Formulated soymilk for infant food. (2) Soy protein concentrate. (3) Later a modern soymilk plant will use this to make (1). Plain and sweetened soymilk in glass bottles, plus fruit (citrus = orange flavor) and malt. There are some technical problems with using plastics bags as soymilk containers; they leak and are fairly expensive. Later he will work on a lactic soymilk drink.

Research on soy sauce: Improved method. Low salt, done in factories in Beijing and Shanghai.

Most soy oil in Beijing is not refined. People like the flavor OK, but they do not know the refined flavor. Rapeseed oil is used mostly in South China. In Beijing, mostly peanut and soy oil; peanut is more expensive and has a higher class image. Rapeseed is the cheapest but people don't like it.

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The debate over more meat vs. more protein. Recently Chinese officials have come to understand the problem better. Send him *Diet for a Small Planet,* by Lappé.

In 3-4 months, Mr. Chen will send me an article about soyfoods in China–Tell Ira Leviton.

I visit a bookstore and buy a pinyin dictionary and a book (published last year in Chinese) about tofu. Visit the Forbidden City and a very famous square in central Beijing. Address: P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

7816. Foley, Terrence B. 1983. Work with soybeans and soyfoods in China (Continued–Part II) (Interview). In: William Shurtleff. 1983. Log of Soyfoods Research Trip to China and Japan: 29 May to 10 July. Lafayette, California: Soyfoods Center. 117 p. See p. 27-28. Unpublished manuscript.

• ***Summary:*** Continued. Soy oil: 90% is degummed crude, packed in 55 gallon drums and distributed by trucks. Shanghai is the leading center of oil refining. Only 20% of China's internal is solvent extracted; the rest is expelled. Largest plant is 350 tonnes/day, solvent extracting. Most are 50-150 tones/day. Oil is rationed. In retail shops it's pumped out of 55-gallon drums into your personal bottle, about 1 liter/month. Only about 5-10% of all soy oil in China is refined, and much of that by commercial crushers.

People in Northeast China and Shanghai like soy oil especially. Canton only uses peanut oil. It's also a function of price. After refining, they make margarine, shortening, and dressings in Shanghai. In China, there is a problem with sickness from eating raw veggies in salads.

The Chinese are extremely conservative with food. They do not like foreign food. During his soymilk tour to Japan, the group ate no Japanese food at all on the trip. They found a Chinese restaurant for every meal!!!

Do the Chinese prefer refined soy oil to crude?

In 1997, the U.S. Wheat Association built a full-scale bakery in China. Ed Quinones and Dennis Blankenship were very excited about the potential of soymilk worldwide. Quinones is the regional manager for Asia and Latin America. He is Terry's boss. A 6 man team & the American Soybeans Association agreed to build China a soymilk pilot plant. Now, they want a big one, with one factory equaling 2,000 L/hr. Mr. Pan thinks 2,000 L/hr is the ideal plant size. The China soybean embargo also affects the ability to raise funds for the Chinese market. Everyone likes the idea but doesn't have the money beyond $30,000 for the demo plant.

Cyrus Eaton's company pioneered trade with the Communists. It got together with Farmland, the largest agricultural co-op in the USA. Gene Vickers and Bob Bergland of Farmland-Eaton (in Crystal City, Virginia) are working on the Manchuria plant project. He is concerned that they may not be up to it. He hears that it's off.

Question #8. No idea; total blank. Only 5% of the soybeans in China are used for feed. There is a lot of unease and soybean trips and inhibitors. A little soybean meal is still used for fertilizer. Most solvent extraction is done with variants of the Rotocel design, not the Desmet.

Question #13. Everyone fries everything, like doufu and soy sauce. There is a great need for milk. Soy flour won't succeed until the Ministry of Commerce does better toasting or does subsequent toasting in food plants. There is great potential in China for tofu and soymilk. The Chinese system "falls apart in the middle from bureaucratic sludge."

There are no trade associations in the Chinese soyfoods industry; this is one reason for the slowness to modernize.

The Chinese don't know much about soy protein isolates and concentrates, but they are convinced they can be used to advantage. They want to make them in China, not import them. They aren't sure which applications are best. There are lots of applications for tofu and soymilk production. USA uses concentrates and isolates in modern foods; China has no modern foods.

Alfa-Laval. The concept of offering soymilk to Beijing on a 1 year trial basis is still under discussion and isn't yet finalized. John Wilson will decide. It's probably about 500 liters/hr, not 2000 liters/hr. It's not yet in the bag, at all. That project will not obviate the need for the American Soybean Association's $30,000 pilot plant. In Shenyang and Shanghai, he's not sure whether or not Alfa-Laval has contracts, but they have made some progress. These are autonomous municipalities, so they have their own funds.

The crux of the American Soybean Association's programs are teams and technical travel. Terry wants to draw more on East Asian trips. Countries are at various stages of development here, but the Chinese have no interest in low level technology. All third world countries must have the *best,* yet they espouse self-sufficiency, not small-is-beautiful. They eschew foreign or traditional things.

Soybean acreage in China: Heilongjiang. World Bank. Heilongjiang is reducing soybean acreage by 20%.

Exports from China: Exported meal. Low price, low quality. The cost of U.S. soybeans delivered to South China is probably less than the cost of soybeans "imported" from Heilongjiang.

The Chinese have never imported much U.S. soybeans, around 500,000 tonnes maximum. They cut this off after the textile quotas squabble, only because it wasn't important to them. This is a symbolic gesture. They could do without it. Terry expects they will be a *net* soybean importer over the next 5-10 years. Brazil has no export office in China, but does have a few traders.

Terry does not know how much soybeans are grown on the banks of rice paddies or about the Jilin seminar, as he was not invited. He's not interested in Chinese expansion of soybean production and, like Susan, does not think it will expand much.

American Soybean Association dispenses technology;

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China must receive and implement it.

In Beijing, the Chinese eat fermented black soybeans when they have a fever.

The word for "soybean" is *da dou*, not *huang dou. Da dou fen* refers to soy meal and cake. *Dou bing* is soybean cake.

The American Soybean Association (ASA) is like an agricultural extension office. They dispense publications and do translations.

Foley does not now get *Soyfoods* magazine. What a shame.

American Soybean Association is committed to upgrading Chinese soybeans and animal technology.

There is a 25% discount on books bought by Foley from us. Send him a list of all of our books and check history materials.

Foley would like Leviton to come to China when he visits East Asia but visas are nightmarish to get, as are hotel reservations.

The tofu and soymilk production plant in Tientsin (which is Peking's port) is under the Ministry of Commerce. Also, there are oil plants in the southern suburbs.

We talked for a long time about the need for a Soyfoods Industry Directory in China, giving names, addresses, phone numbers, and key contact people of major organizations or researchers involved actively with soyfoods. We made a sample table of contents. Terry will follow up on this. Perhaps give it to Beth as a project. I met Beth in the Beijing Hotel that night and we discussed it. Address: Director, China Office, American Soybean Assoc.

7817. Andersen, Kurt. 1983. "The new Ellis Island." *Time.* June 13.
• ***Summary:*** A neighborhood of Japanese immigrants was thriving in downtown Los Angeles in Little Tokyo when Beverly Hills was empty land. The area was renamed Bronzeville during World War II when its residents were interned; but now it has been retaken by the Japanese, and is again a main gathering spot for the roughly 175,000 Japanese-Americans scattered around the county. "A brand new, $12.6 million cultural complex provides reminders of home: a lush, still garden of camphor and golden-rain trees, a sleek theater for Japanese-language productions, a brick plaza for a snack of age tofu (deep-fried soybean curd) and a stroll."

7818. *Soybean Update.* 1983. Demand focus–Where the big bean markets are (Special feature). June 13. p. 3-6.

7819. Okada, Mrs. 1983. Kibun's interest in and involvement with soymilk (Interview). Conducted by William Shurtleff of Soyfoods Center, June 21. 1 p. transcript.
• ***Summary:*** Kibun was founded in 1938 as a company selling foods from the sea (seafoods such as *kamaboko, tsukudani, Oden no zairyo*). In 1969 Mr. Nozaki of the R&D department started research on soymilk. In 1973 a laboratory for soymilk was set up in Saitama city, Saitama prefecture. and commercial soymilk production started there in 1977. The product, brand-named Soena, was sold in 200 ml wide-mouth cups. The first flavors, all introduced that year, included a lactic fermented product, pineapple, etc. (see slide).

In about 1973 Kibun started to diversify out of just foods. Today they are a conglomerate, with more than 50 companies, including companies doing advertising, food engineering, publicity, and selling computers.

Kibun does not use the traditional Illinois method, or any variation thereof. They couldn't use it since Mitsubishi bought the rights to the Illinois patent for the Japanese market and Kibun bought the rights for overseas. So Mr./Dr. Nozaki developed and patented a new method; there are many patents, including equipment patents (the food engineering company makes these machines).

Over the years they have launched many flavors including vegetable juices with soymilk (carrot) but in June 1983 they have just 4 flavors, of which plain is the best seller. Their lactic flavored product is new and has always been fermented. In May 1983 they opened two new soymilk plants, one in Hiroshima and one in Gifu, both bigger than the original Saitama plant.

Their working arrangement at present with Alfa-Laval is *not* a typical joint venture. Alfa-Laval is in the business of selling equipment. When they find a client they agree, according to a contract existing between Alfa-Laval and Kibun, to tell the potential client that their preferred soymilk process supplier is Kibun. Thus Alfa-Laval is like a matchmaker for Kibun. Kibun then signs a separate contract with the potential soymilk manufacturer. It could be a joint venture or a license of the Kibun patents and technology, including patented equipment, made by Kibun's food engineering company.

Kibun's soymilk operations are run by a separate company called Kibun Health Food Co., established in 19 (exact date unknown).

Mr./Dr. Nozaki would be willing to meet with me, but what would we discuss? Its all secret.

Does Alfa-Laval get a kickback from introducing a potential client to Kibun? Address: Home Economist for Kibun, Japan. Phone: 544-2781.

7820. Tsuchiya, Kanji. 1983. Soymilk industry and market in Japan (Interview). Conducted by William Shurtleff of Soyfoods Center in Japan, June 26. 2 p. transcript. [Eng]
• ***Summary:*** We saw this large sign (1 by 3 feet) in a local tofu shop window: *Mainichi Ippai. Tofuya no jun Tonyu*– which means: "A glassful every day! Pure / Plain soymilk from your local tofu shop."

All Tetra Brik Aseptic soymilk is much more expensive

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than cow's milk.

In the 2nd edition of Tsuchiya's book, only the production section has been changed; it contains a newer and more complete description of the soymilk production process.

Lord Liu An of Wainan who supposedly invented tofu was from the far south of China, near Vietnam. Tie this into the Java tofu discovery.

See p. 220 of Tsuchiya's book for a tofu and soymilk chronology.

Get used books in Japan at Kanda used bookstores.

Of the various books Tsuchiya owns on the history of Japanese foods, the best is the tattered old book, *Nihon Shokumotsu-shi,* by Adachi and Sakuria. 1934. See Kinako (p. 203). Okara (p. 291).

Cows milk came to Japan from China in the *Kotoku Tenno* era, in Choreki 3rd year.

Heian Period, first used the character for milk (in the word Raw / Fresh Milk) in the *Shinsen Seishiroku* (2 Chinese characters given).

In Tsuchiya's Soymilk book, p. 36. *Toju* = bean liquid, first appeared in the Kamakura period, in the book *Jidai Kamonjo.*

Kibun bought Alfa-Laval machines but they did not work; they had to be cleaned every 4 hours. So Kibun developed a steam infuser that injects steam into the plate heater. Kibun did not apply for a patent. Alfa-Laval now makes the machine Kibun invented, and also has no patent. With a patent you reveal a secret process. It's too risky.

Mr. Yamauchi of Hinode often visited with Marusan in Japan.

In Japan, Marusan is thought to be No. 1 in total soymilk production and sales–if you include bulk soymilk. Marusan has 3 soymilk factories in Okazaki, plus one each in Chiba and Aichi. Bulk soymilk is canned by other companies and used in bread, etc.

There was a big jump in soymilk production in Japan in 1982.

Companies that Marusan sells soymilk to resell it under their own brand.

Mitsubishi also sells a lot of bulk soymilk.

To date, 25 companies have been permitted to use the JAS mark.

Companies who buy Marusan's bulk soymilk include Sakura Shokuhin, Dai Tonyugyo, Nagano Tomato, and 2-3 others. Second largest soymilk maker in (total production) is Kibun. No 3 is Mitsubishi (which makes lots of bulk), Meiji and Asahi are tied for 4th.

Defoamer. Most soymilk makers use a defoamer. Silicon resin is popular but expensive. They also use monoglycerides or sugar esters. Marusan uses a high temperature process that requires no chemical defoamer.

To make lactic fermented soymilk inoculate it with *L. Bulgaricus* and *L. thermophilus,* and hold at 37ºC for 18-20 hours to produce lactic acid. Some products are sold with lactic acid bacteria still alive. These are sold as dairy products and often have 3% added milk solids.

Marusan makes a firm soymilk yogurt sold only in Aichi Prefecture in plain, strawberry, and orange flavors, in a *happo styrol* package shaped like a Quonset hut. When was it introduced?

Many Japanese soymilks use calcium lactate to fortify the product with calcium. It coagulates the milk but the structure is later broken up with an homogenizer.

Tsuchiya prefers to use calcium carbonate, which does not dissolve or coagulate.

For emulsifiers, monoglycerides are outlawed. Sugar esters (*shoto no shibosan* ester) are okay. Some researchers believe that monoglycerides cause cancer = are carcinogenic.

Chakukoryo are artificial / synthetic flavors = chemically synthesized.

Marusan prefers to use maltose, a complex sugar, since it does not brown upon high temperature treatment or get caramelized or bitter.

Asahi no longer uses the defatted soymeal method. It is too expensive.

Since about 1981 all major manufacturers of soymilk in Japan have used roughly the same process. Tsuchiya published a key article on the basic process. Marusan was not upset, and within 6 months all had standardized their processes. This process is based on the 1967 Cornell discovery of the effect of heat on lipoxygenase enzymes.

Adding sodium bicarbonate improves the protein recovery, but its use is not allowed in pure (*jun*) soymilk except to neutralize old beans... and then one need not list it on the label.

The KEY is to crush the soybeans before adding boiling water, otherwise there is off flavor development at the center of the beans. Marusan has a patent; see page 131 of 1st edition of Tsuchiya's Soymilk book. #28385? Kibun has no patents.

Ask Tsuchiya all relevant DTD questions.

Tsuchiya has a 1932 Encyclopedia (*Hyakka Jiten*). Copy p. 1169 soymilk, p. 1184 tofu. See also Mame maki, kinako, moyashi, Okashi.

Kibun bought 50 copies of Tsuchiya's book on Soymilk.

Compare Marusan and Kibun flavors. Tsuchiya is a consultant for Marusan. Marusan has: 1. No additives. 2. High temperature processing.

Kibun makes no plain/pure soymilk.

Marusan is thinking of building a plant in Los Angeles, perhaps with Hinode / Mr. Yamauchi.

Does Kibun use any other artificial flavors besides milk flavor?

Which company (when) first used the present soymilk process in Japan? What are the key "know how" steps? Address: Tokyo [Technical consultant, Okazaki Marusan, Japan].

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7821. Yokotsuka, Tamotsu. 1983. Re: Answers to questions about shoyu and its history. Letter to William Shurtleff at Soyfoods Center, June 26. 4 p. Handwritten, on letterhead. [Jap; eng+]

• ***Summary:*** A photo shows: Dr. Kazuya Hayashi (left) and Dr. Tamotsu Yokotsuka (right). Address: Kikkoman, Noda, Japan.

7822. Yokotsuka, Tamotsu. 1983. Thoughts on shoyu: Terminology and history (Noda, Japan, June 28-29) (Interview). In: William Shurtleff. 1983. Report on Soyfoods Research Trip to Hong Kong, China, Singapore, and Japan: May 29 to July 10, 1983. Lafayette, California: Soyfoods Center. 117 p. See p. 69-83. Unpublished manuscript. Address: Noda, Japan.

7823. *Nikkei Sangyo Shinbun* (*Japan Economics and Industry News*). 1983. Daizu hakkô no shizen shokuhin. Torigoe Seifun. Tokushu kin tsukai. Kusami naku [A natural fermented soyfood: Tempeh is made by Torigoe Seifun using a special microorganism to get rid of beany flavor]. June 30. p. 15. [Jap]
• ***Summary:*** Fukuoka prefecture–Torigoe Seifun announced that from the middle of July they will start to make tempeh (tenpe) on a commercial scale and sell it nationwide to institutions. In September it will be sold to retailers–natural food stores, restaurants, department food stores, and supermarkets. The company plans to make and sell 15 tonnes a month. A description is given of how the tempeh is made. In about 1975 Torigoe Seifun started to R&D on tempeh together with the department of Agriculture at Kyushu University. Mr. Heiki, president of Torigoe, thinks tempeh will become a regular part of the food life of Japan.

Note: This story was also run on the same day in other major Japanese newspapers: *Mainichi Shinbun* (p. 8). *Yomiuri Shinbun* (p. 10). *Nishi Nihon Shinbun* (p. 8). A photo of sliced tempeh ovals, cubes, and sticks appeared in the last two articles.

7824. Pike, M.C.; Krailo, M.D.; Henderson, B.E.; Casagrande, J.T.; Hoel, D.G. 1983. 'Hormonal' risk factors, 'breast tissue age' and the age-incidence of breast cancer. *Nature* 303(5920):767-70. June 30. *
• ***Summary:*** Showed that the approximately six-fold higher rates of breast cancer in the USA than in Japan were not due to differences in age at first birth, nulliparity or age at menopause, but that differences in age at menarche and post-menopausal weight could explain some 70% of the difference in rates. They suggested that the remaining difference in breast cancer rates may be due to differences in hormone levels in the premenopausal period.

7825. *Dairi Fuudo* (*Daily Foods Science*). 1983. [Special issue on soymilk]. June. [Jap]
• ***Summary:*** The cover shows 4 different soymilk containers in a red, blue, and white photo. Address: Japan.

7826. Davis, William L. 1983. Japan: Surge in soy milk popularity could benefit U.S. *Foreign Agriculture.* June. p. 22.
• ***Summary:*** The growing popularity of soy milk in Japan is good news for U.S. soybean farmers. Current production is estimated at 70,000 tonnes/year, valued at $87.5 million. The industry expects the market to expand to over $260 million as several large firms are now starting production. Currently 11 major firms are producing soy milk. Tofu shops also market soy milk. Soy milk puddings are also now on the market. Address: Agricultural Counselor, Tokyo.

7827. Fruin, W. Mark. 1983. From philanthropy to paternalism in the Noda soy sauce industry: Pre-corporate and corporate charity in Japan. *Business History Review* 61:168-91. Summer. *

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Address: Menlo Park, California.

7828. **Product Name:** [Meiji Sunglow Soymilk Ice Cream (Vanilla, or Chocolate)].
Foreign Name: Meiji Sanguroo Tônyû Aisu (Banira, Chokoreeto).
Manufacturer's Name: Meiji Milk Co. Ltd.
Manufacturer's Address: 2-3-6- Kobayashi, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1983 June.
Ingredients: Soymilk, sugar, vegetable oil, flavors, emulsifier, stabilizer, calcium sulfate, salt, vitamin C, colors.
Wt/Vol., Packaging, Price: White plastic tub.
How Stored: Frozen.
New Product–Documentation: Label. 1983, undated. Blue, red, green, and white. Shurtleff & Aoyagi. 1985. Tofutti & Other Soy Ice Creams. p. 94. This is Japan's best-selling brand of soy ice cream. 500 ml sells for 350 yen ($1.48).

Note: This is the earliest Japanese-language document seen (Sept. 2013) that uses the term *Tônyû Aisu* to refer to soy ice cream.

Alfa-Laval. 1988, June. Soyfoods: Old traditions with new potentials. p. 9. Shows a color photo of the front of the package.

7829. Shurtleff, William. 1983. Yuba: The creamy film on soymilk. Often sold in the U.S. as "bean curd skins," this popular Chinese soyfood has a rich taste and surprising uses. *Soyfoods.* Summer p. 73-76.

• ***Summary:*** This is primarily a history of yuba with five black-and-white photos of yuba being made at Yuba Han in Kyoto.

"When soymilk is gently heated in shallow, open pans at 80 to 90ºC, a creamy-yellow, bland-flavored, concentrated protein-lipid surface film gradually forms. This is called yuba. The films are successively removed from the soymilk surface using a long skewer, hung to air dry, and marketed as fresh or dried sheets, sticks, or chips, or made into a variety of meatlike textured protein products.

Nutritional Analysis

per 100 grams dry weight basis

calories	432
moisture	8.7%
protein	52.3%
fat	24.1%
carbohydrates	11.9%
calcium	270 mg
sodium	80 mg
phosphorus	590 mg
iron	11.0 mg
niacin	2.0 mg
thiamine	0.20 mg
riboflavin	0.08 mg

"In standard Chinese (Mandarin), yuba is called *tofu-p'i,* which means 'tofu skin' or 'tofu film'. It is less commonly known as *tofu-i* ('tofu robes') and *yu p'i* ('oil skin'). According to the *Pen Chao Shih Chien* (1695), at that time this food was most widely called *tofu-lao,* where the character *lao* refers to either an old woman or a wet nurse.

"Yuba is actually a Japanese word. As presently written, the character *yu* means 'hot water' and the *ba* means 'leaf' or 'flat thing.' The etymology of the present term, however, is both obscure and complex, being intricately linked with the early history of the food itself. Reference to this food first appeared in Japan in the *Pen Chao Shih Chien* published in 1695.

"The next mention of yuba was in the *Wakan Sanzai Zukai* (1711), which referred to it as *tofu-p'i,* the present Chinese term. Interestingly the text notes that 'The wrinkled look of the film resembles (the skin of) an old woman.' This explanation seems to imply that the earlier term *lao* or *uba* was used because of the similarity of yuba and an old woman's face. The term yuba first appeared in 1813 in the *Kyonan Rubetsu-shi.* This new term's origin was explained as follows.

"'On Yuden Mountain, a sacred holly mountain in the feudal province of Dewa, there was an inn, Kinshiya Inn, visited by many pilgrims who came to the mountain to pray. The esteemed vegetarian cuisine was prepared by an old woman who was very skilled at making a variety of delicious foods from ground soybeans and soymilk. One of the foods was a thin film, which she fried before seasoning it. Others liked it so much that they began to make it themselves

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sometimes in the shape of bags and squares. In Kyoto, the capital, they used it in vegetarian dishes. Since the new food had been created by the old woman of Yuden Mountain, people named it yuba, where *yu* is taken from the Yu of Yuden mountain, meaning 'hot water' and *ba* is the character for 'old woman.'

"There are also other explanations of the origin of the term. For example, *uba* (Tofu-p'i has traditionally been called yuba; however, this is a mispronunciation. Its real name is uba.) may be written with two characters meaning 'upper' and 'waves,' signifying that it is the 'upper waves of tofu.' It is not clear when or why the present characters meaning 'hot water' and 'leaf' came to be used, but they are thought to be of relatively recent origin.

"In early times, yuba was probably heated in shallow, circular, round-bottomed pots over a bed of coals. The round sheets of yuba, each draped over a skewer, were dried slowly over a weak bed of coals. This method can still be seen in some villages in Taiwan.

"Worldwide, yuba is most widely used in China, Taiwan, Japan and Hong Kong. Sold fresh or dried, generally in sheets, at prices anyone can afford, yuba is also made into a remarkable variety of ready-to-eat foods. The 'bamboo yuba' made by rolling up fresh yuba sheets, then hanging them over a line to dry, so they come out looking like a V-shaped beige rope, with each leg about 7 inches long, are also popular, as is the thick sweet yuba that forms on the bottom of the pan during simmering.

"The world's first meat analogs, made from yuba, were developed in China, probably at least several hundred years ago, probably by Buddhist chefs in temples, monasteries, or Buddhist vegetarian restaurants. The earliest process for making these 'meatless meats' probably consisted of rolling sheets of yuba around a filling of minced and seasoned pieces of yuba, tying closed the bundles with string, and steaming for 30 to 50 minutes, or until a meaty texture and flavor developed. The finished products are still widely sold as vegetarian sausages, drumsticks and liver.

"Later, sheets of fresh or rehydrated yuba were mixed with various seasonings (usually including soy sauce) and packaged into the hollow two-piece molds (typically shaped like a chicken or fish), which were then clamped shut and steamed for about 50 minutes. When the form was opened, behold: a perfectly shaped, tender chicken–with no bones. The finished product was then usually deep-fried (whole), carved, and served. Monks would enjoy these exotic dishes on special occasions and Buddhist laymen would enjoy them on the traditional 'meatless' days, the first and fifteenth day of each lunar month. Today in any major Chinese or Taiwanese city, one can view in the display case of the many Buddhist vegetarian restaurants (as well as in market stalls) almost perfect replicas of plucked hens, roosters, and ducks, light brown fish (complete with fins, gills, eyes, and mouth), juicy hams, tripe, liver, and rolled meats, all made from yuba and bearing such fanciful names as Buddha's Chicken or Buddha's Duck. Rich red sausage links hang in rows and deep-fried drumsticks are handsomely arranged on a large platter, together with a life-sized pig's head-made of yuba, of course.

"Since earliest times, there have been thousands of small yuba producers throughout China. However in the early 1970's, a number of large, modern factories came to be built in Hong Kong and Taiwan using updated methods. The soymilk was heated with steam from a boiler, the soymilk was run into the steaming trays using pipes and gravity flow, while the yuba was made in both round and square compartments, and much of it was dried indoors using dry steam heat. Production costs dropped, output skyrocketed, and the yuba began to be sold worldwide, mostly in overseas Chinese food stores and restaurants.

"Chinese-style yuba eventually began to spread to areas with large Chinese populations in Southeast Asia. Today in Malaysia, for example, one can find dried yuba strands (*tau ki* or *fu chok*), dried yuba sheets (*tau put*), sweet thick yuba (*t'im chok*), vegetarian sausage (*chak tie*), vegetarian duck (*chai ak*), vegetarian salted fish (*chai kiam hu*), or vegetarian meat (*chai tu kar*). Similar foods, such as yuba sausage, are found in Singapore." Address: Soyfoods Center, Lafayette, California.

7830. Shurtleff, William. comp. 1983. Main Japanese soymilk manufacturers and their products–June 1983. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549 USA. 4 p. Unpublished typescript.

• ***Summary:*** This table contains six columns: Manufacturer, brand name, package size, type of packaging, launch date, and distribution (nationwide).

The manufacturers are: Kibun. Okazaki Marusan. Mitsubishi Kasei Shokuhin. Meiji Nyugyo. Kyushu Nyugyo. Nisshin Seiyu. Asahi Shokuhin. Kyodo Nyugyo. Yakuruto Honsha. Furuta Shokuhin Kogyo. Morinaga Nyugyo. Sugiyo. Koshin Nyugyo. Kenbi-sha. Saniku Foods (Saniku Fuuzu). Nagoya Seiraku. Nagano Tomato. Zenkoku Nokyo Chokuhan (Nôkyô). Yamato Shokuhin. Sokensha (Sôkensha). Ishihara Fuudo Sentaa. Chiba Seisen Shokuhin Kogyo (Kôkyô). Asahi Fuuzu. Sebun Irebun (7-11). Fukushima-ken Rakuren. Nacuraru Fuuzu (Natural Foods). Sebun Appu Inryo (Seven-Up). Address: Lafayette, California.

7831. Shurtleff, William. 1983. Soymilk seminars in China, May-June 1983, and proposals for future DTD work with soymilk. Singapore. 12 p. 28 cm.

• ***Summary:*** This report begins: "1.1 The Key Question DTD must face and study in depth is the potential for soymilk worldwide during the next 5-20 years in East Asia (especially China), the Third World in general, and in industrialized nations.

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"Will soymilk be a minor part of DTD's income (l-2%) or does it have the potential of being 20-30% of sales in 10 years? If the latter is true, then it is essential that DTD start now to develop a stronger commitment to soymilk and greater expertise in this field.

"1.2 Evidence of Potential Growth

"1.2.1 Hong Kong–This was the first market for modern soymilk, pioneered by Vitasoy (soydrink made by Hong Kong Soya Bean Products Company Ltd.) from l945. Vitasoy's production grew from 50 million packs in l962 to 100 million in 1970, to 130 million in 198l. Yeo Hiap Seng and Coca-Cola Hi-C also have significant shares of the Hong Kong market.

"1.2.2 Japan–Production nationwide grew from 4 million litres in 1978 to 46 million litres in 1982, worth US$61 million.

"1.2.3 South East Asia–Since 1975 soymilk has taken off in all these nations except Indonesia. Competition is fierce.

"Major Untapped Markets–China is unquestionably the largest untapped market. It has a long tradition of using soymilk, is interested in modernization, is committed in 'Masterplan 2,000' to greatly expanding production of both soy and dairy milk, has a major need for the nutrients of soymilk (protein, calories, minerals), and could make many products from this milk such as ice cream, ice stick, yoghurt, tofu, yuba, etc. This China market is as big as all others combined." Address: Singapore.

7832. Shurtleff, William. 1983. Yuba: The creamy film on soymilk (Continued–Document part II). *Soyfoods.* Summer p. 73-76.

• ***Summary:*** Continued. "There has been considerable speculation about when and how yuba was introduced to Japan. Some have said that it was brought by Chinese Buddhist monks as early as the 10th century, others that it was brought back by Japanese monks visiting China in the 13th century. It is also said that Masashige Kusunoki, a famous samurai, used it as provisions during the siege of Chihaya castle during the 14th century. Japan's oldest existing yuba shop started in 1716, so it is quite likely that yuba existed on a commercial scale by the late 1600s, if not earlier. It may well have been used from time to time as a food in Buddhist temples centuries earlier.

"The earliest center of yuba production and utilization in Japan was in Kyoto, the ancient capital, which remains yuba's center to this day. Yuba has always had the strongest gourmet image of all Japanese soyfoods, and Kyoto yuba soon developed strong associations with both the vegetarian cuisine of the Buddhists and with the elegant cuisine of the nobility and aristocracy. Yuba soon became one of the indispensable delicacies in both Zen Temple Cookery (*Shojin Ryori*) and in the exquisite Tea Ceremony Cuisine (*Kaiseki Ryori*).

"A children's song (whose date of origin is probably in the early 1800s) sung in Kyoto near the base of Mt. Hie, the home of a famous complex of Buddhist temples, asks 'What do the monks eat on Mt. Hie?' The response is 'Yuba no tsukeyaki,' the name of a yuba preparation. Today in Kyoto, in restaurants serving *Shojin* or *Kaiseki* cuisine, yuba might well appear in more than half the dishes in a typical six-course meal. Gradually the Japanese developed many unique ways of folding yuba, plus a number of ready-to-eat yuba delicacies (deep-fried chips, pouches, and rolls) that were unknown in China and which today are popular tourist items in Kyoto.

"The Kyoto yuba industry traces its origins to at least the early 1700s'. The four oldest existing yuba shops started in 1716, 1791, 1804, and 1833. The owner of the oldest shop, Yuba Han, is now the ninth generation. Kyoto's yuba shops have always been small, family-run operations, often connected with the family home. Of the 20 shops existing in 1981, 4 started during the Edo period (1600-1868), 5 during the Meiji period (1868-1912), 4 during the Taisho period (1912-1926), and only 6 started after 1926. Thus the industry is old and well established.

"The number of yuba shops in Kyoto has gradually decreased from the peak of 67 in 1911. It fell to 35 in 1919, then climbed to 55 in 1929, and finally decreased slowly to 20 in the late 1970s. A typical shop used only 50 to 150 pounds of dry soybeans a day to make 400 to 1,200 sheets of yuba. (One pound of dry soybeans yields about 0.5 pounds of yuba on a dry weight basis.)

"Gross net sales of the yuba produced in Kyoto was about $2.3 million, estimated to be 80% of the total sales and production of all yuba in Japan.

"The earliest known reference to yuba by an American was by Langworthy in 1897; he published a nutritional analysis, which was reprinted by Abel of the USDA in 1900. In 1905 Oshima published the results of Japanese nutritional research in English. In 1914 Loomis noted that Chinese-style yuba (*toufu-p'i*) was being imported to the U.S. 'in the form of vitreous, brittle, yellowish sticks.' In 1923 Piper and Morse published 1½ pages of by far the best information to date in English, (plus a photograph of sheets of yuba hanging to dry on sticks over steaming pans of soymilk) and two nutritional analyses of yuba. In 1926 Horvath wrote that in China up to 30 yuba films were removed from soymilk and sold separately at a high price before selling the low-fat milk. In 1927 Horvath gave a nutritional analysis of 5 types of Chinese and Japanese yuba, using data from Embrey, Adolph, and the Tokyo Hygienic Laboratory.

"In the U.S. yuba has long been served in a variety of dishes at most Chinese restaurants, where it is called 'bean curd skin,' the literal translation of the Chinese name *toufu-p'i.* The first company in America to make ready-to-eat yuba delicacies was The Soy Plant in Ann Arbor, Michigan. In the spring of 1980 Jura McDowell developed Yuba Rolls

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using yuba made on a kitchen scale. It was cut into 3½-by-5-inch rectangles, filled with seeds, sauteed vegetables, and seasonings, then rolled tightly. The next year a Tempeh Dog was developed by wrapping soybeans, in inoculated to make tempeh, in a sheet of yuba then incubating the roll. It came out looking like a hot dog.

"In 1981 the first yuba manufacturing company in the Western world, Soyfoods of America, began operation in Duarte, California, near Los Angeles (see Soyfoods, No. 6, 1982). The owner, Mr. Ken Lee and his technical director Lawrence Wu, both Chinese Americans, built a modern, semi-mechanized plant, drawing on Wu's research in modernizing yuba production. While their main market initially was to be stores which imported yuba from East Asia (especially Hong Kong), they also hoped to reach the Caucasian market.

"The first known scientific study of yuba (in any country) was done in 1970 by Mr. L.C. Wu at the University of Florida who wrote his MS thesis ('Lipid-Protein Films for Human Consumption') on yuba. Wu and his colleague, R.P. Bates, published subsequent detailed studies in 1972, 1973, and 1975 of methods for increasing the yield and quality of yuba, and of the basic endothermic polymerization involved in yuba formation. In 1975 they discussed texturization, noting that 'these films, when properly laminated, make good meatlike structures.' Also, they reported, without using binders, desired flavors can be incorporated into the films. Their method of alkali extraction, while giving a high yield of yuba, gave a very low PER (1.26). Also in 1975 H.O. Jaynes and W.N. Chou at the University of Tennessee developed a method for making yuba from soy protein isolates using oven drying in Teflon-coated pans.

"Does yuba have a future in the West? I think so. Because it is expensive, only small amounts can be used as wrappers and delectable fillings to make exciting new foods, such as tasty hors d'oeuvres, crisp yuba chips (more delicious than potato chips), and meat analogs, but the development of less labor-intensive, more mechanized methods for making yuba would do wonders in aiding its increased use." Address: Soyfoods Center, Lafayette, California.

7833. *Soyfoods.* 1983. Profile: Azumaya tofu company. Summer. p. 34-37.

• ***Summary:*** One of the best studies of Azumaya ever published, including an in-depth history. The family-run company, which has 70 employees, is now America's second largest tofu manufacturer, making 110,000 pounds/week of tofu and shipping it to 20 states. The plant, with 6,000 square feet of tofumaking space, starts operation at 3:00 A.M. each morning. The 147,000 Asian Americans in San Francisco are a major market.

Jack Mizono's parents bought the business from a Mr. Sakamaki in June 1937. According to Jack, "Azumaya Company had been founded in Stockton, California, in 1920 by a Mr. Teranishi, who later moved it, in 1927, to San Francisco; in Feb. 1936 he sold it to Sakamaki."

"In 1937 Azumaya was processing soybeans on Post Street in a nondescript building all of 35-by-40 feet, or 1,000 square feet. In 1940 the rent went up considerably and they moved to Geary Street, setting up shop in the basement of a 25-by-40 foot building. Their equipment was traditional: stone grinder, gas steamers, large kettles, brick-reinforced wok cookers; they hand-scooped soymilk into flour sacks, hand twisted them, then hung them from hooks to lever press out the soymilk. Jack and brother George were Azumaya's principal tofumakers then but their parents still helped with the tofu pouches, burgers, and grilled tofu.

"Jack didn't like tofumaking too much. The work started at three in the morning, he wasn't making a living from it, he had to paint houses, refinish floors on weekends, and his wife, Aya, worked as a seamstress. I'll try this for a few years to help my parents, Jack said to himself. For the generation of new Caucasian tofu companies, this would seem like 1976 all over–the good old traditional, laborious, back-straining, unprofitable, daylong adventure.

"The war in 1941 seriously disrupted the business and their lives. The Mizono family was involuntarily 'resettled' in a government camp in California; after a few years there, Jack was sent to Utah, then to New York City where he worked 6 months in the shipyards. Then he was drafted into the U.S. Army. Finally in 1947 the Mizono family reassembled in San Francisco to re-open Azumaya."

"Azumaya remained on Geary Street for about 10 years until their neighborhood underwent 'redevelopment' and the Mizonos lost their occupancy rights. Once again they packed up their tofu plant and in 1957 settled on [855] Golden Gate Avenue where they invested $25,000 in constructing a 25-by-75 foot building (to which they added an additional 25-by-100 feet soon after). They were still using the labor intensive manual tofumaking tools.

"Around this time, Jack Mizono made the acquaintance of Mr. Kunishi, the proprietor of Sacramento Tofu Company, which had opened in the Capitol in 1948. Kunishi introduced Mizono to high technology Japanese equipment and showed him the proper import channels. In 1957, when Azumaya ordered its first pressure cooker system and hydraulic press, Jack's brothers, John and Bill, joined the company and together the four Mizonos ran the plant. In production 6 days weekly, Azumaya began making 7,200 pounds of tofu a week.

"Then in 1968 the Mizono clan made a move that would continue to favorably affect their business for the next 15 years. Packaging. Shoan Yamauchi of Hinode Tofu Company in Los Angeles had already begun to package tofu in 21 ounce sealed plastic tubs and had acquired a special blow-mold form from Sealright Containers. Yamauchi agreed to supply Mizono with tofu tubs which Azumaya initially

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sealed with a laborious primitive hand sealer until 1971 when they bought a semi-automatic Japanese model. At the time, Azumaya was making 3 weekly deliveries to accounts in the East Bay, and 4 to San Jose, but the bulk of their tofu sales were right in San Francisco. With the new packaging system on line, facilitating wider distribution and longer shelf life, their tofu sales nearly doubled in the next year.

Once again it came time to move the plant. This time, in 1970, it was to [95] Boutwell Street. Redevelopment had edged them out and Azumaya needed more production space for expanding sales. The brothers sold their Golden Gate building, took the $40,000 to buy the new equipment and construct a 40-by-120 foot building to which they soon added another 30-by-120 feet. In 1973 they added noodles to their product line and downscaled the size of their packaged tofu from 21 ounces to 16 ounces for supermarkets.

"In 1975 they began shipping tofu out of state, a smart move apparently, as in 1983 about 50% of Azumaya sales were out of state. In 1978 noodle production represented only 20% of their business but by 1983 pasta madness had blossomed and noodles are half their wholesale business. The company began to grow fast. By 1978 Azumaya's gross sales topped $1 million; by 1980 their tofu production was 48 bushels [60 lb each] of soybeans a day, 6 days weekly, or about 43,000 pounds of tofu every week.

"In late 1979 Azumaya purchased 2½ acres of land and began the process of moving into their present, very modern plant. Once installed at Burke Avenue, Azumaya introduced pasteurization to obtain a longer shelf life for their widely, and increasingly wider, distributed tofu. Tofu lovers in Illinois, Missouri, Oregon, Georgia, and Massachusetts are now able to buy Azumaya brand tofu." Regular and firm tofu are code dated for 21 days, silken for 30 days. Azumaya investigated vacuum packaging but dismissed it because they found it couldn't produce a dependably long shelf life and it tended to compact the tofu, making the texture undesirably dense; a 19-ounce block ended up weighing only 16 ounces after the 2-hour treatment.

"Once a year Jack travels to Japan to monitor the latest tofu and noodle equipment innovations." His tofu equipment can now process 18 bushels (1,080) lb of dry soybeans an hour to yield 3,000 pounds of tofu an hour (yield = 2.77). Last year Azumaya switched from the Sweco vibrating screen to the traditional roller extractor. A detailed discussion is given of Azumaya's progressive employee benefit package, including medical insurance, bi-annual bonuses, pensions, and profit sharing. In total in 1982, these benefits "cost Azumaya $40,000 for medical insurance, $120,000 for pensions and profit sharing, and $45,000 in bonuses and raises–$2,928.57 per employee, to be exact. With a program as comprehensive as this, it is not too surprising that Azumaya operates productively and it doesn't have a union, nor is likely to."

Photos show: Three views of the inside of the plant. Azumaya's products. John, Dorothy, Aya, and Jack Mizono.

7834. **Product Name:** [Torigoe Gold Tempeh (Semi-Prepared Fingers, or Patties)].
Foreign Name: Goorudo Tenpe / Gold Tempe.
Manufacturer's Name: Torigoe Seifun (Torigoe Flour Milling Co.).
Manufacturer's Address: 6-5-2 Hakozaki-Futo, Higashi-ku, Fukuoka, Kyushu 812, Japan. Phone: 092-651-3269.
Date of Introduction: 1983 June.
Ingredients: -
New Product–Documentation: See next 2 pages. Talk with and Label from Kazuhiro Takamine, from the R&D Dept. of Torigoe Flour Milling Co. Ltd. 1984. Feb. 5. This was Japan's first commercial tempeh product, launched by Torigoe in June 1983. The 'tempeh fingers' were dipped into a batter, dusted with bread crumbs, packed in a shallow tray, together with 2 packets of tartar sauce, and sold frozen. The consumer would then deep fry them to serve crisp and crunchy with the sauce. The patties were made by pressing the ground trimmings from the patties into patties, then proceeding as for the fingers.

Five-page color brochure (in Japanese) titled "Torigoe Tempe." Brought by Kazuhiro Takamine. 1984. Feb. 4. New product. Beloved in the 21st century, born from soybeans, 100% fermented natural food. Shows tempeh fingers, patties, and cubes–with recipes.

Shurtleff & Aoyagi. 1985. History of Tempeh. p. 66-68. Soya Bluebook. 1987. p. 95.

7835. Wang, H.L.; Swain, E.W.; Kwolek, W.F.; Fehr, W.R. 1983. Effect of soybean varieties on the yield and quality of tofu. *Cereal Chemistry* 60(3):245-48. May/June. [14 ref]
• ***Summary:*** Tofu was made on a laboratory scale from five U.S. and five Japanese soybean varieties. Protein content of the soybeans was positively correlated with the protein content and the protein:oil ratio of the resulting tofu (dry basis). The tofu yield was positively correlated with protein recovery during processing, but not with the protein content of the soybeans. Varieties that have a light hilum and high protein content are preferred for making tofu.

Table 1 (p. 246) shows the physical and chemical properties of 5 U.S. and 5 Japanese soybean varieties. The U.S. varieties (Coles, Vinton, Weber, Hodgson, and Corsoy) contain, on average (on an as-is basis) 42.18% protein (range 40.8% to 45.1%), 18.8% oil (range 17.9% to 19.4%), and 19.24 gm per 100 beans (range 17.74 gm to 24.71 gm for Vinton). The Japanese varieties (Kitamusume, Tokachi-Nagaha, Wase-Kogane, Yuuzuru, and Toyosuzu) contain, on average (on an as-is basis) 42.84% protein (range 40.8% to 45.2%), 18.0% oil (range 17.3% to 19.4%), and 23.69 gm per 100 beans (range 17.53 gm to 35.51 gm for Yuuzuru). Thus, the American soybeans contain, on average, 1.5% less protein and 4.6% more oil than their Japanese counterparts,

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and the weight per 100 seeds is 18.2% less. Address: 1-3. NRRC, Peoria, Illinois. 4. Dep. of Agronomy, Iowa State Univ., Ames.

7836. Kanasugi, Goro. 1983. Re: Thanks for meeting with the Natto Association in Japan to discuss tempeh. Letter to William Shurtleff at Soyfoods Center, July 5. 1 p. Handwritten, with signature. [Jap]
• ***Summary:*** On 2 July 1983 an interesting meeting was held at the Natto Association headquarters in Tokyo, Japan. Five leaders of the Association, Dr. Teruo Ohta and Kiyoaki Katoh from the National Food Research Institute (NFRI), William Shurtleff from Soyfoods Center, and Mrs. Yasuko Torii (author of books on natural foods and farming) met for 6 hours to discuss developments with tempeh in the USA and strategies and tactics for introducing tempeh to Japan. This is a thank-you note for attending that meeting and the dinner afterwards. Address: Shimo-cho 3-6, Omiya-shi, Saitama-ken 330, Japan. Phone: 048-644-1323.

7837. Tsuchiya, Kanji. 1983. Gusseted foil retort pouches (Interview). Conducted by William Shurtleff of Soyfoods Center in Japan, July 6. 1 p. transcript. [Eng]
• ***Summary:*** In Japan this pack is called a "stand pack." The process patent and machines are owned by Robert Bosch GmbH in West Germany. The packaging and printing in Japan is done by Toppan Insatsu, a big printing company. There is very little problem with leakers outside the filling plant. The product can be stored at room temperature without problems, especially if it is hot packed (at 95ºC). The filling process resembles that for Tetra Pak, but no hydrogen peroxide (*kasanka suiso*) is used. If it is not hot packed, it is usually retorted, like a can. The laminated plastic material will withstand this. Marusan was the first in Japan to introduce this pack, in about 1981. They now have 2 machines, each putting out 6,000 packs an hour.

Tsuchiya thinks this is the *best* pack for China and other Third World countries. The hot pack product would have a storage life at room temperature of 1 month without refrigeration; only 1 in 10,000 would spoil. Address: Tokyo [Technical consultant, Okazaki Marusan, Japan].

7838. *SoyaScan Notes.* 1983. Early history of fermented black soybeans in China and Japan (Overview). July 10. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Fermented black soybeans are a fermented, salted soybean product that comes in small soybean-sized chunks that are very dark brown or black in color, fairly firm, and very salty. Used as a seasoning, fermented black soybeans have many names worldwide. In English cookbooks they are often called "fermented black beans" or "salted black beans." In China they are called Douchi or Doushi (in pinyin), Tou-shih or Toushih, Tou-ch'ih, or Dow-si or Dow See (in Canton). They are China's oldest known soyfood. In 1972 fermented black soybeans were unearthed from a Han dynasty tomb–Mawangdui #1–in the eastern suburbs of Changsha in Hunan, China. They were dated from the Western Han Dynasty (206 B.C. to 24 A.D.). Daitokuji Natto are said to have been introduced to Japan by Ikkyu Sojin (lived 1396-1481), a famous priest and Zen master of the Rinzai sect, and a literary figure noted for his eccentricities. In 1474 he became head of Daitokuji temple, located in the northern part of Kyoto. It is said that he learned the method for making fermented black soybeans originally transmitted from China and passed it on to his students and disciples, one of whom founded Ikkyu, a small shop that in the 1980s was located just outside the gates of Daitokuji's huge compound. Ikkyu, the first commercial producer of Daitokuji natto, has carried on the tradition to this day, largely as a secret transmission.

Note: This is the earliest document seen (Nov. 2011) which states that the tradition of making Daitokuji natto is said to have been started by Ikkyu Sojin (lived 1396-1481).

Another traditional maker of these Kyoto-style fermented black soybeans is Ikkyuji, located south of Kyoto. It is said that the priest Ikkyu left Daitokuji for Ikkyuji and took the fermented black soybean tradition with him. Ikkyuji's fermented black soybeans, a unique product, are called *Ichimei Ikkyuji Natto.* In 1984 about 330 pounds a year were made in traditional wooden vats for tourists.

Fermented black soybeans (specifically *Daitokuji natto*) have long been a part of the *Shojin Ryori* (Buddhist Vegetarian Cookery) tradition in Japan; they are best known at the temple named Ikkyuji (also called Ikkyu-dera).

Note: Most of the above information was collected by William Shurtleff and Alfred Birnbaum in 1978 during visits to several old manufacturers of fermented black soybeans in Japan.

7839. *Zenkoku Shokuhin Shinbun* (*National Food News*). 1983. Tenpe nattô kenkyû keika to suishin kikaku [Progress in research on "tempeh natto" and plans to make it succeed]. No. 456. July 11. p. 6. [Jap]
• ***Summary:*** Dr. Ohta studied tempeh for 30 years under Dr. Masahiro Nakano. The Japanese Natto Association is trying to obtain a patent on the tempeh making process, and hopes to publish a tempeh cooking pamphlet. Address: Japan.

7840. *Zenkoku Shokuhin Shinbun* (*National Food News*). 1983. Shisatsu Haken-in kikoku hôkoku Zennôren Tenpe kenkyû-kai [The Japan Natto Association's Tempeh research group presents its homecoming report after being sent to study tempeh]. No. 456. July 11. p. 6. [Jap]
• ***Summary:*** On 18 June 1983 the group had a regular meeting and listened to the report of the tempeh study group that has just returned from Indonesia. Mr. Ose, the chair, told the members that it is unfortunate that the mass media are doing stories on tempeh before it is firmly established in and

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adapted to Japanese culture. He asked members of the group to please refrain from publicizing tempeh before it is ready.

7841. Ota, Mr. 1983. Mitsubishi Trading Company's interest in and involvement with soymilk (Interview). Conducted by William Shurtleff of Soyfoods Center, July 18. 2 p. transcript.

• ***Summary:*** Mr. Ota is in the USA trying to find a company to do a joint venture making soymilk in America, for two purposes. (1) To sell powdered soymilk in Japan, especially to the baking industry, and especially small bakers, who cannot buy liquid soymilk in bulk. (2) To sell soymilk in USA to help offset or underwrite the costs of (1).

In Japan, Marusan, Kibun, and Mitsubishi all have the same installed capacity for soymilk production.

Recently Kibun, a relatively small company, underwent a severe cash flow crisis by overdoing their expansion. So they had to turn to Kamogawa Kikai, a much larger company, and ask them to make most of their soymilk. Kamogawa is a Kibun associated company. I think Kibun makes only 30% of their own milk. Kamogawa can borrow money much more easily than Kibun. Marusan is also vulnerable for the same reason.

Mitsubishi Shoji (the Trading Co) thinks that Meiji will eventually be the strongest soymilk supplier in Japan. All soymilk makers can be divided into three major types: (1) Smaller companies making soymilk as one of various products (Marusan, Kibun), (2) Dairy Companies (Meiji, Morinaga, Yukijirushi), and (3) Soft Drink and Beer Companies (Kirin, etc.).

All soymilk makers in Japan are now making big profits. The ex-factory production and overhead costs for one 200-ml pack of soymilk, including the package itself is about 25 to 30 yen ($O.105 to $0.126). Of this, by far the biggest portion is the carton, and a Tetra Brik carton costs about 10 yen ($0.042); it costs slightly less for big manufacturers who have more bargaining power to negotiate with Tetra Pak. Mitsubishi says that in most cases there is no need to sell soymilk in Tetra Pak in Japan, and predicts that many companies will soon abandon it for less expensive packaging, such as Pure-Pak, which costs about half as much as Tetra Pak. Meiji will be strongest for three reasons: 1. They have very good dairy experience and dairy distribution routes. 2. They can easily use Pure-Pak or have big bargaining power to get lower Tetra Pak Prices. 3. The head of the company, Mr. Shimaura, wants to greatly expand Meiji's soyfoods operations.

Japanese have three basic beliefs conducive to soymilk sales that Americans don't have. 1. Plant protein is better than animal protein. 2. Alkaline foods are good for health. 3. Soyfoods are good for you.

In the old days (pre-1960s), soymilk didn't taste good, but it was thought to be good for you. Samurai drank soymilk in Kyushu. The big improvement in soymilk flavor has bean one major reason for its recent rise in popularity.

Nowadays Kibun and Marusan are doing lots of TV advertising. There are even articles in porno magazines claiming that drinking soymilk will increase one's sexual energy and potency. The vitamin E in soymilk also is thought to help this and to slow the aging process.

Japanese consumers of soymilk tend to be those with an above average level of education. Many drink soymilk for rational reasons, which (says Mitsubishi) is why most prefer dairylike to plain. In Japan plain is called *Jun* (pure) and dairylike is called plain.

Soymilk was Mitsubishi Kasei's first food product–ever! Mitsubishi bought equipment and know how from House Shokuhin (when?). Mitsubishi sells lots of soymilk to other companies, who package it under their own brand.

Meiji's soymilk production process is almost entirely automated. Only 3 workers are required. One to discard defective packages, one to package cartons in crates, and one for general checkup and inspection.

IOM (Indiana, Ohio, Michigan) soybeans have high moisture content. Kibun uses IOM, which is why they do not make plain (*Jun*) soymilk. But IOM cost $295 a tonne (metric ton) whereas the better quality Beeson, an identity preserved soybean, cost $506 a tonne, or about 71% more. Yet from the farmer, both cost the same. The difference is mostly in the handling costs.

In Japan there is no formal/JAS distinction between whole soy flour and powdered soymilk. They are used interchangeably and both called "soymilk." Many companies in Japan now make one of these two products, as for use in breads, noodles, etc. The sales in 1982 were 3 billion yen ($1O.98 million), increasing to an expected 7 billion yen in 1983. Because of high energy costs for drying soymilk in Japan, Mitsubishi is considering producing powdered soymilk in America, using Beeson soybeans. Whole soy flour is called *zenshi daizu-fun* = full-fat soy flour. Virtually all of the Tetra Pak soymilk in Japan is sold refrigerated–even though it need not be. The canned soymilk may or may not be refrigerated. Address: Mitsubishi Shoji.

7842. *Toyo Shinpo* (*Soyfoods News*). 1983. Beikoku de no daizu shokuhin no genjô. Beikoku wa ima tenpe buumu. Nihon demo chikaku ryûkô. Amerika de katsuyaku-chû no Shurtleff fusai ni kiku [The current status of soyfoods in America, where there is now a tempeh boom. Will it soon become popular in Japan? Let's ask the Shurtleffs, who are at the center of the activity in America]. July 21. p. 30-31. [Jap]

• ***Summary:*** Photos show Shurtleff and Aoyagi. Many other photos (from Soyfoods Center color slide sets) show tempeh and other soyfoods in America.

7843. *Toyo Shinpo* (*Soyfoods News*). 1983. [Tofu shop soymilk: Many have a soymilk dispenser that is succeeding]. July 21. p. 36. [Jap]

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• ***Summary:*** 90 tofu shops in Kobe have a soymilk dispenser. Customers can drink soymilk on the spot or buy 1 liter of soymilk for 380 yen, including the cost of the container (polyethylene).

In Aichi, soymilk is most popular among people in their 40s, Most like a paper pack rather than a can, plastic, etc.

7844. Noda, F.; Sakasai, T.; Osaki, K.; Akao, T. 1983. [Continuous quick brewing of soy sauce]. *Japanese Patent* 1,159,337. July 25. [Jap]*
• ***Summary:*** Attempts to shorten the time for soy sauce production have included a quick hydrolysis of raw materials with no or low salt content; another was a process divided into anaerobic lactic acid fermentation, aerobic yeast propagation, and anaerobic alcohol fermentation.

7845. **Product Name:** [Dried Natto].
Foreign Name: Hoshi Nattô.
Manufacturer's Name: Azuma Shokuhin K.K.
Manufacturer's Address: Tochigi-ken, Japan. Phone: 0268-24-9313.
Date of Introduction: 1983 July.
Ingredients: Soybeans.
Wt/Vol., Packaging, Price: 80 gm. in plastic bag. Retails for ¥180 in Tokyo (July 1983).
How Stored: Shelf stable, 6 month shelf life.
New Product–Documentation: Product with Label

purchased in July 1983 by William Shurtleff at a department store in Tokyo, Japan. The label, printed black on red, is 1.75 by 4.5 inches wide on each side. The total package is 6 by 5 inches. Shelf life: 6 months. How to store: Keep in a sealed glass jar.

Back panel. Dried natto (*hoshi nattô*) has existed in Japan since ancient times. (Note: Natto was probably made in farmhouses, then sun-dried to preserve it). Now we make it in a modern factory. Eat it as *ochazuke* (put it atop a bowl of rice, then pour tea over it), or with beer. Or store it as an emergency food.

Note: As of Jan. 2012 the dry natto is still in the plastic bag, and smells fine.

7846. Fukushima, Danji. 1983. Fermented soy foods in the United States. *INTSOY Series* No. 25. p. 117-19. B.J. Irwin, J.B. Sinclair, and Wang Jin-ling, eds. Soybean Research in China and the United States (College of Agric., Univ. of Illinois at Urbana-Champaign).
• ***Summary:*** Although chemically hydrolyzed soy sauce is widely consumed, fermented soy sauce has an annual growth rate of 15%. La Choy and Chun King, the two largest producers of chemical soy sauce, are assumed to have a combined annual production of 20,000 kiloliters. Most of the fermented soy sauce is produced by Kikkoman Foods, Inc. and annual production has reached 19,000 kiloliters.

Soy sauce manufacturing consists of three main processes: koji making, brine fermentation, and refining. Major improvements in the soy sauce process are (1) high temperature short time cooking of the soybean flakes to increase the yield, (2) use of an artificial mutant of *Aspergillus sojae* which produces twice as much proteolytic enzyme, (3) use of automatic koji making equipment, and (4) use of *Pediococcus halophilus* and *Saccharomyces rouxii,* and proper temperature control during brine fermentation. Address: Kikkoman Foods, Inc., Walworth, Wisconsin.

7847. Hinode Tofu Co. 1983. Hinode summer series of tofu recipes (Leaflet). Los Angeles, California. 8 panels each side. Each panel: 7.5 x 12.7 cm.
• ***Summary:*** The 8 color recipes include: Fruit Smoothies, Tofu Cheese-less Pie, Fruit Salad with Tofu Dressing, Broccoli a la Hollandaise, Tofu Crab Quiche, Tofu Banana Nut Bread, Enchilada Tofu Casserole, Minestrone Soup.

On the last panel is a coupon: 15¢ off on your next purchase of Hinode Tofu. And: "If you know anyone else who would like a set of Hinode's Summer Series of Tofu Recipes, send a self-addressed, stamped envelope to: Hinode Summer Series, 526 Stanford Ave.,..." Address: 526 Stanford Ave., Los Angeles, California 90013.

7848. Hymowitz, Theodore. 1983. Germplasm collection, management, and evaluation: The subgenus *Glycine.* *INTSOY Series* No. 25. p. 69-70. B.J. Irwin, J.B. Sinclair,

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and Wang Jin-ling, eds. Soybean Research in China and the United States (College of Agric., Univ. of Illinois at Urbana-Champaign).

• ***Summary:*** "The genus *Glycine* Willd. is composed of two subgenera, *Glycine* and *Soja* (Moench) F.J. Herm. The soybean, *G. max* (L.) Merr., and its wild progenitor *G. soja* Sieb. and Zucc., together make up the subgenus *Soja.* Both species are annual and diploid with 2n=40, and hybridization between them can be readily effected. Together they form the primary gene pool of the cultivated soybean.

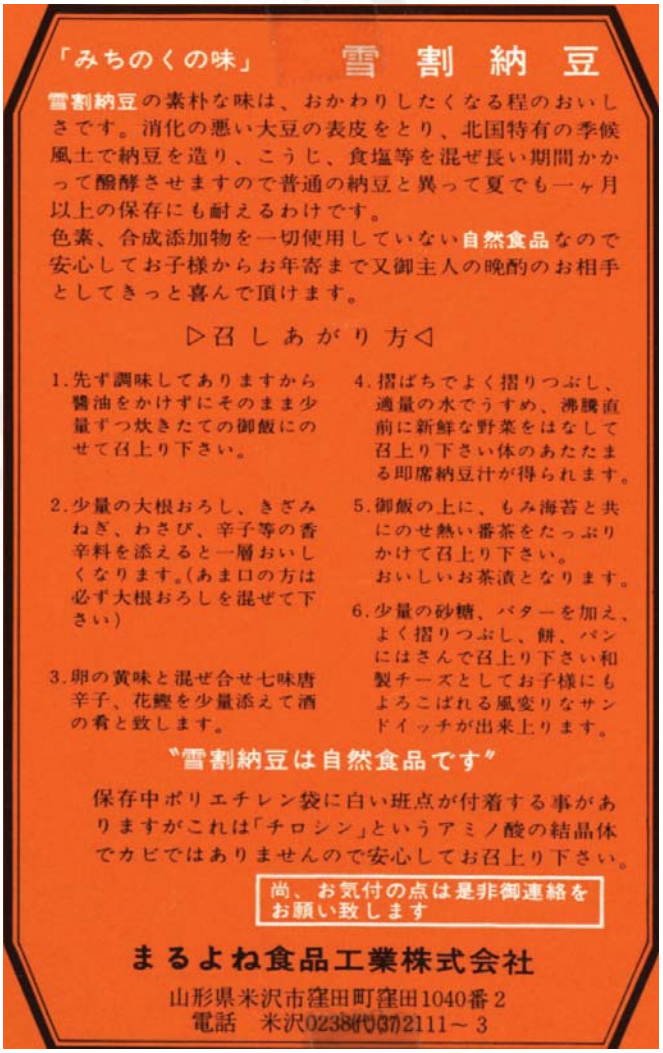
"The subgenus *Glycine* comprises seven wild perennial species: *Glycine canescens* F.J. Herm., *G. clandestina* Wendl., *G. falcata* Benth., *G. latifolia* (Benth.) Newell and Hymowitz, and *G. latrobeana* (Meissn.) Benth. are diploids (2n=40) native to Australia; *G. tabacina* (Labill) Benth. is predominantly tetraploid (2n=80) with occasional diploids, and distributed in Australia, Taiwan, and the Ryukyu Islands [Japan], as well as several countries in the South Pacific; and *G. tomentella* Hayata represented by tetraploid (2n=80) forms in China (Taiwan), the south coast of China and northern Philippines, and diploid, tetraploid, and aneuploid (2n=38, 40, 78, 80) forms in Australia. From a taxonomic standpoint the members of the subgenus *Glycine* also are candidates for gene exchange with the soybean, and therefore potentially useful for broadening the germplasm base of the crop.

"Preliminary investigations have shown that the perennial species carry resistance to diseases such as soybean rust, yellow mosaic virus, and powdery mildew. Physiological traits exhibited by perennial material such as drought tolerance, salt tolerance, and day neutrality also may be of potential use." Address: Prof. of Plant Genetics, Univ. of Illinois at Urbana-Champaign.

7849. **Product Name:** [Kikkoman Instant Tofu Miso Soup (Soybean Paste Soup with Tofu)].
Foreign Name: Tôfu Misoshiru.
Manufacturer's Name: Kikkoman Corporation.
Manufacturer's Address: Noda 278, Chiba-ken, Japan.
Date of Introduction: 1983 July.
Ingredients: Powdered miso, dehydrated tofu, dried seaweed, monosodium glutamate, powdered yeast extract, powdered dried bonito, dehydrated leek.
Wt/Vol., Packaging, Price: 1.5 oz (30 gm). Foil packet containing 3 individual foil packets. Makes 2/3 cup.
How Stored: Shelf stable.
New Product–Documentation: Label. 1983. 5.5 by 7 inches. Plastic packet. Brown, red, green, and yellow on white. Full color picture of wooden bowl of miso soup on tray. Individual foil packets inside are 2.75 by 4 inches. Brown, black and red on white. Picture of bowl of soup on front, instructions on back. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center. "Distributed by Kikkoman Corporation, Noda 278, Japan." Text on label in both English and Japanese.

Note: This is the earliest known commercial soy product that uses dried-frozen tofu as an ingredient.

7850. **Product Name:** [Yukiwari Natto].
Foreign Name: Yukiwari Nattô.
Manufacturer's Name: Maruyone Shokuhin Kogyô K.K.
Manufacturer's Address: 1040-2, Kubota, Kubota-cho, Yonezawa-shi, Yamagata-ken, Japan. Phone: Yonezawa 0238 (main), (37) 2111-3.
Date of Introduction: 1983 July.
Ingredients: Soybeans.
Wt/Vol., Packaging, Price: 160 gm. Retails for ¥180 in Tokyo.
How Stored: Refrigerated.



New Product–Documentation: Product with Label purchased in July 1983 in Tokyo. Black and white on orange background. Paperboard box. Surprisingly, no ingredients are listed on the package. However the ingredients are probably water, soybeans, natto starter (*Bacillus subtilis*), rice (made

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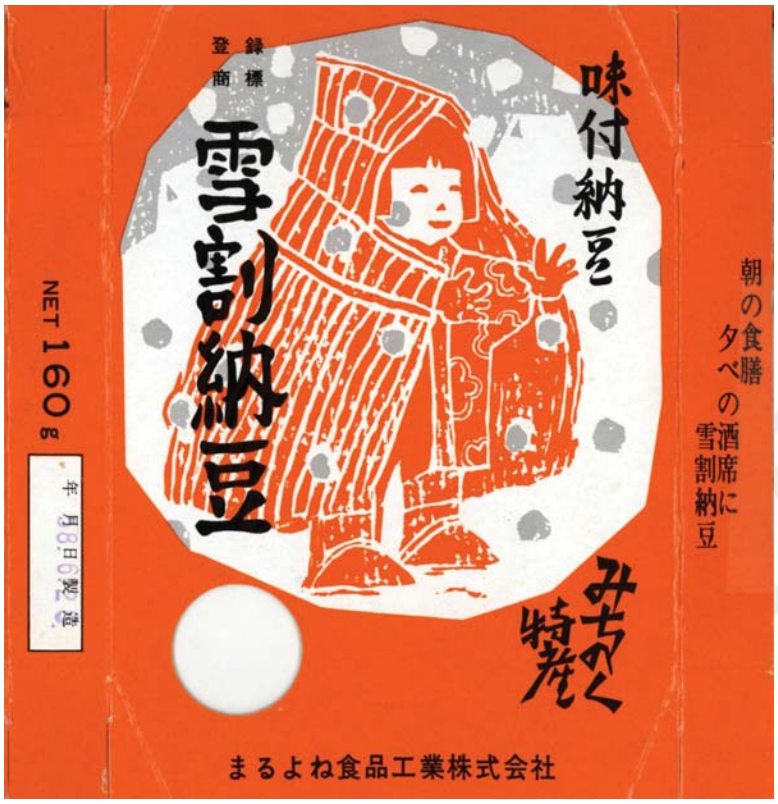

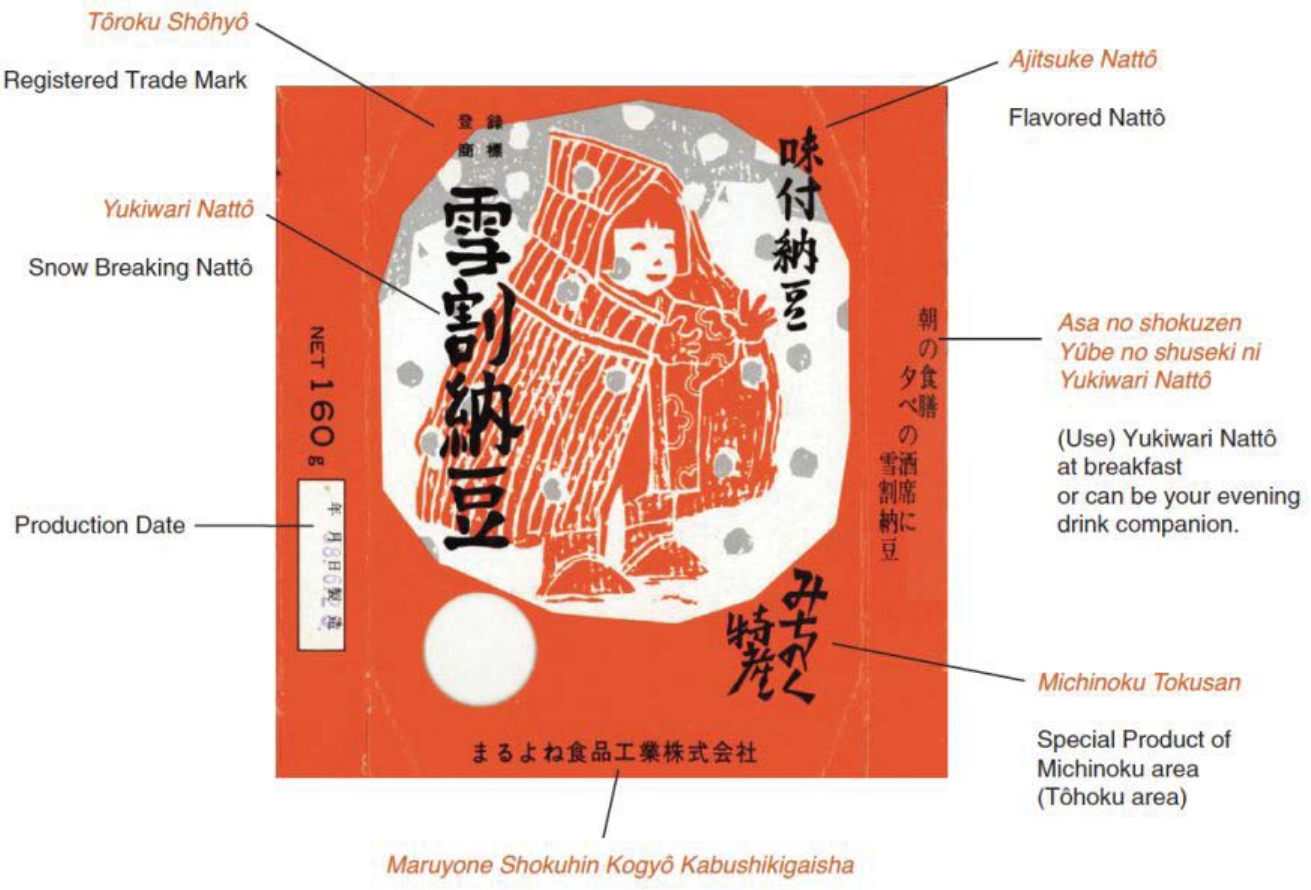

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into koji using Aspergillus oryzae mold culture), and salt.

The front panel reads: Upper left, 4 small Chinese characters: Registered trademark (*tôroku shôhyô*). Down left side, 4 large bold Chinese characters: Yukiwari Natto ("snow-breaking natto"). Down upper right, 4 medium-size Chinese characters: Flavored / seasoned natto (*ajitsuke nattô*). Down far right, many small Chinese characters: Use yukiwari natto at breakfast, or it can be your evening drink companion (*Asa no shokuzen. Yûbe no shuseki ni Yukiwari Natto*). Lower right, 6 medium size characters: Special product of the Michinoku area [Yamagata prefecture, northeast prefectures (Tohoku Chiho), Japan] (*Michinoku tokusan*). Across the bottom, in many small characters is the name of the manufacturer, Maruyone Shokuhin...

The back panel reads: Taste of Michino-ku, Yukiwari Nattô.

The simple taste of Yukiwari Nattô is delicious and makes you ask for more. It has a one-month shelf life even in summer because, after removing the hard to digest outer hulls of soybeans to make it into nattô, we then add kôji and salt and ferment it for a long time. Since this natural food has no artificial coloring nor additives, it can be enjoyed by anyone from young kids to seniors–or your husband's drinking companion.

How to eat it:

1. It is already seasoned. You can eat it over freshly cooked rice without adding any shoyu.

2. Add a little bit of graded daikon, chopped green onion (*negi*), and wasabi or *karashi* mustard (a mixture of ground mustard seeds and horseradish; hotter than European mustard) to make it even tastier. If you have a sweet palate, please be sure to mix in graded daikon.

3. Mix with egg yolk, seven-spice red pepper (*shichimi togarashi*), and/or bonita flakes to make a side dish for your drink.

4. Grind well in your *suribachi* (traditional mortar), add some water and cook it in a pot, then just before it comes to a boil, sprinkle in some fresh vegetables to make an instant natto soup (*nattô-jiru*).

5. Serve it over a rice in a bowl, sprinkle on some nori, and add boiling hot bancha tea to make delicious *ochazuke.*

6. Add a bit of sugar and butter, then and mash it. Spread it on mochi or bread. It becomes a Japanese-style cheese-like food and this unusual sandwich will be enjoyed by kids.

Yukiwari Nattô is a Natural Food. Some white spots found in the polyester bag during storing, it is not a mold. It is called tyrosine (*chiroshin*), a type of amino acid so you can eat it safely.

Note: Ohta (1975, p. 228) says that *Goto Natto,* which appeared in the early 1600s, is the ancestor of Yukiwari natto; it appeared as a special / famous product (*meibutsu*) of Yamagata prefecture, Yonezawa-Chiho.

7851. Norin Suisan-sho, Nosan Engei Kyoku, Hatasaku Shinko-ka. 1983. Daizu ni kansuru shiryo [Statistics concerning soybeans]. Tokyo, Japan. 157 p. 26 cm. [Jap]

• ***Summary:*** This yearly report, published by Japan's Ministry of Agriculture, Forestry, and Fisheries (MAFF), is packed with detailed statistics on soybean production, trade, and utilization in Japan. The table on p. 129 gives statistics on miso production, shipments, and use of raw materials by prefecture and for Japan as a whole. In 1981 Japan produced 575,782 tonnes of miso and shipped 578,610 tonnes. Raw materials used were 14,417 tonnes of domestically grown whole soybeans, 167,539 tonnes of imported whole soybeans, 103,611 tonnes of polished rice, 24,667 tonnes of polished barley, 476 tonnes of defatted soybean meal, 71,325 tonnes of salt, and 96 tonnes of cornmeal (used mainly in Nagano and Hyogo prefectures). The top 5 miso producing prefectures were Nagano (164,510 tonnes; 28.6% of Japan's total), Aichi (54,529), Niigata (38,156), Aomori (28,602), and Hokkaido (25,908). The source of these statistics is: Shokuryô-cho, Kakô Shokuhin-ka, Kome Mugi Kakô Shokuhin Seisan Dotai, Tokei Chosa.

The table on p. 130 gives similar statistics on shoyu for 1981. In 1981 Japan produced 1,190,618 kiloliters (kl) of shoyu and shipped 1,118,799 kl. Raw materials used were 6,473 tonnes of whole soybeans, 175,205 tonnes of defatted processed soybean meal (*dashi kakô daizu*), 177,407 tonnes of wheat, 204,777 tonnes of salt, and 80,642 kl amino acid liquid (*amino-san,* either purchased or made on site). The top 7 shoyu producing prefectures were Chiba (424,498 kl; 35.7% of Japan's total), Hyogo (203,374) Aichi (59,201 kl), Kagawa (45,430 kl), Fukuoka (36,575 kl), Oita (31,860 kl), Mie (30,354 kl), The source of these statistics is the same as for the miso statistics, above.

The table on p. 132-33 gives statistics on consumption of shoyu (in 100 ml), miso (100 gm), whole soybean foods (yen), tofu (cakes = *cho*), aburagé and ganmodoki (yen), natto (yen), and other soyfoods (yen) from 1963 (Showa 38) to 1981. Under shoyu, miso, and tofu is given the amount of money spent (*kingaku*), the quantity purchased (*sûryô*), and the price. Annual shoyu consumption per household has decreased from 30.5 liters in 1963 to 16.3 liters in 1981. Annual miso consumption per household has decreased from 18.4 kg in 1963 to 12.1 kg in 1981. Tofu consumption per household has remained about constant, with 87.3 cakes in 1963 and 86.9 cakes in 1981. A breakdown is also given for each food by annual household income, with 5 income levels. One grouping is for all households (including those with a retired head of household or on welfare) and the other is only households with at least one working member. In each case, the higher the household income, the greater the consumption. In the case of tofu, for example, households with an annual income of less than 2.65 million yen consumed 76.1 cakes of tofu, while households with an annual income of more than 5.8 million yen consumed 99.3 cakes. Next is a breakdown by age of head of household.

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Generally, the younger the head of household, the less the consumption. In the case of tofu, households whose head was 24 years or younger consumed 55.5 cakes/year, while households whose head was age 60-64 consumed 95.4 cakes. The source of these statistics is the *Kakei Chosa Nenpo* (*Sôri-fu, Tôkei-kyoku*).

The table on pages 134-35 shows consumption per household by geographical area of the same foods as the previous table. Geographical areas include: all of Japan, all cities, cities with 50,000 or more population (broken down into large, medium, and small), cities with less than 50,000 population, towns and villages (*machi* and *mura*), 14 major regions, and large cities. Note: Statistics by prefecture are not given. In the case of tofu, the highest consumption is cities with less than 50,000 population (92.0 cakes), while the lowest is in medium-sized cities with more than 50,000 population (84.2 cakes). The regions with the highest tofu consumption are Tohoku (the northeast prefectures; 101.9 cakes) and Chugoku (southwest provinces; 98.1 cakes), while the lowest two are Hokkaido (58.3 cakes) and Okinawa (72.3 cakes). The cities with the highest annual tofu consumption per household are Toyama city (118.9 cakes), Morioka city (118.4), Yamaguchi city (107.9), Matsuyama city (102.9), Fukushima city (102.8), Tokushima city (102.0), Fukui city (100.7). The source of these statistics is the same as for the statistics on p. 132-33.

Tables on pages 136-39 give a detailed nutritional analysis of soybeans and each of 23 soyfoods made in Japan. The following minerals are listed: calcium, phosphorus, iron, sodium, and potassium. Vitamins: A (retinol, carotene, international units), B-1 (thiamine), B-2 (riboflavin), niacin, and C. Soybeans grown in Japan contain, on average, 35.3% protein and 19.0% fat, compared with 33.0% protein and 21.7% fat for soybeans grown in the USA, and 32.8% protein and 19.5% fat for soybeans grown in the China. Address: Tokyo, Japan.

7852. **Product Name:** [Natto].
Foreign Name: Nattô.
Manufacturer's Name: Seiyu Stooa K.K. (Marketer-Distributor). Made by Asahi Shokuhin K.K.
Manufacturer's Address: (1) Seiyu: 1-18-21, Minami Ikebukuro, Toshima-ku, Tokyo, Japan; (2) Asahi Shokuhin: 1911 Naga-cho, Mochida-aza (?), Oo-aza, Gyôda-shi, Saitama-ken, Japan.
Date of Introduction: 1983 July.

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Ingredients: Whole soybeans.
Wt/Vol., Packaging, Price: 100 gm. Retails for ¥38 in Tokyo (July 1983).
How Stored: Refrigerated.
New Product–Documentation: Product with Label purchased in July 1983 by William Shurtleff at a Seiyu department store in Tokyo, Japan. The label, printed brown and pea green on white, is 5 by 6 inches wide. At the far right are the names and addresses of the marketer and the distributor. To the left of that, in white characters on a pea-green background: Small seeded, whole soybeans. Below that is the weight (100 gm) and Seiyu's price (38 yen). The two large brown characters in the center read (from top to bottom): "Natto." To the left of that, in white characters on a pea-green background: Mustard [packet] included. Below that, in smaller brown characters: Refrigeration: Please keep it in a refrigerator and eat it as soon as possible. At the far left, in small brown characters: Contains no chemical additives, such as preservatives or artificial coloring. We try our best for good quality. If, by chance, you find any bad product, please take it to the store where you bought it so that they can give you a replacement.

7853. **Product Name:** [Vanilla Safflano (Soymilk Ice Cream)].
Foreign Name: Safflano Tônyû Aisu.
Manufacturer's Name: Soken-sha.
Manufacturer's Address: 724 Katakura-cho, Yokohama, Kanagawa-ken 221, Japan.
Date of Introduction: 1983 July.
Ingredients: Soymilk, kappuring sugar, unrefined sugar, safflower oil, stabilizer, vanilla bean, lemon extract.
Wt/Vol., Packaging, Price: 140 ml x 3 per pack.
How Stored: Frozen.
New Product–Documentation: Label. 1983, undated.

Drawing of Jack and the Beanstalk on the box. Shurtleff & Aoyagi. 1985. Tofutti & Other Soy Ice Creams. p. 94-95.

7854. *Toyo Shinpo* (*Soyfoods News*). 1983. [Mitsubishi this year will increase the number of its soymilk vending machines in Japan to 3,000]. Aug. 1. [Jap]
• ***Summary:*** They now have 2,000.

7855. Richie, Donald. 1983. Tofu cooking: The Asian bookshelf. Book reviews / features. *Japan Times*. Aug. 6 (8/6/83).
• ***Summary:*** "Tofu is certainly the single Asian food best known in the West" [assuming that soy sauce is considered a seasoning rather than a food].

Tofu originated in China, where it is said to have been invented by an official of the T'ang dynasty [618-907].

"During the Han dynasty [202 BC to AD 220] it is said, overly honest and/or underpaid government staff were called 'tofu officials.'

Note: There is an obvious contradiction here.

Tofu "first entered Japan during the Nara period [710-794] having been brought back by Japanese envoys. Since there were mostly priests tofu was a welcome adjunct to their diet. Buddhist vows prohibited their eating meat–and in the Zen sect they could not eat fish either.

"The earliest document concerning tofu in Japan shows that it was fully domesticated by 1183." In 1782 a best-seller, published in Osaka, was titled "One Hundred Rare Tofu Recipes" [*Tofu Hyaku-chin*].

In Japan, tofu is served in ways that "retain the delicate tofu taste." By contrast, in China, "tofu is often prepared with meat or fish and serves mainly as a nutritional base.

"The West had long known Chinese tofu but it was not until Japanese food became popular abroad that tofu became loved for itself. At the same time the health-food boom occurred and shortly after that appeared a most important tofu document, *The Book of Tofu* by William Shurtleff and Akiko Aoyagi. Tofu had arrived in the West." Address: Japan.

7856. *Toyo Shinpo* (*Soyfoods News*). 1983. [Gojiru]. Aug. 11. [Jap]
• ***Summary:*** Asia Protein is developing a Gojiru dry mix to add to miso soup.

7857. *Toyo Shinpo* (*Soyfoods News*). 1983. [The main reasons for Japan's soymilk boom]. Aug. 11. [Jap]
• ***Summary:*** Japanese are getting more interested in health. Concept of the healthy elite; the elite must be healthy. Influence of U.S. vegetarians. Popularization of long-life [Aseptic / UHT] packaging [which has a long shelf life, even without refrigeration]. The flavor of soymilk has improved greatly. Mass communications in Japan took an interest in soymilk. Japan's dairy milk industry (Meiji Nyugyo, etc.)

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got interested in soymilk which gave a impetus to the new industry.

JAS [Japanese Agricultural Standards] were established for soymilk.

Note: The above are not in any particular order. They came out of a conference on soymilk.

7858. *Zenkoku Shokuhin Shinbun* (*National Food News*). 1983. Zennôren Ose kaichô kôki kôsô [Japan Natto Association's chief for the second half of the year, Mr. Ose, and his plan]. No. 458. Aug. 11. p. 1. [Jap]
• ***Summary:*** Mr. Ose would like to get a patent on the tempeh process which the association has developed.

7859. Torii, Yasuko. 1983. Re: New developments with tempeh and tofu in Japan. Letter to William Shurtleff at Soyfoods Center, Aug. 14. 2 p. Typed, without signature (carbon copy). [Eng]
• ***Summary:*** Tempeh: "(1) There was a seminar on soyfoods on Aug. 5. The topics were: 'Tofu and Japanese foods in the U.S.,' by Prof. Okubo. 'Does tempeh fit into the Japanese diet,' by Prof. Katsuyoshi Tsujimura of Tokyo. A party was held after the seminar to celebrate the 15th anniversary of the Soyfoods Development Association. Many businessmen showed interest in tempeh.

"(2) Mr. Kato of the Ministry of Agriculture [*Nôrinsho*] arranged for a meeting for Nihon Kogyo KK and Kyodo Press on Aug. 9. I prepared soy and okara tempeh, and Mr. Kato brought Torigoe's tempeh. According to Mr. Kato, articles on tempeh will be distributed to many local papers thru Kyodo Press. Nihon Kogyo seems to be interested in producing [tempeh] starter. A few researchers are going to visit the U.S. in September to attend a convention and they hope to visit some tempeh and tempeh starter factories in California. Is it possible to make such arrangements for them?

"(3) Mr. Sakata of Shibata Shoten [a publishing company] visited Natto Kumiai [Japan Natto Association] and attended the soyfoods seminar. A final decision concerning publication will be made in a few days.

"(4) Natto Kumiai has distributed tempeh cultures to some members to study production. A meeting is scheduled in September and I was asked to attend and talk about tempeh."

Also discusses: Publication of The Book of Kudzu in Japanese. The Book of Tofu on NHK-TV. Address: Kamitsuchidana 324, Ayase-shi, Kanagawa-ken 252, Japan. Phone: 0467-76-0811.

7860. Kanasugi, Goro. 1983. Re: Work with tempeh in Japan. Letter to William Shurtleff at Soyfoods Center, Aug. 23. 2 p. Typed, without signature. [Jap]
• ***Summary:*** Ose Noboru, head of the Natto Assoc. is very ill so work to introduce tempeh to Japan is not advancing well. In 1981 Teruo Ohta brought tempeh back from Indonesia and introduced it to the Natto Assoc. in May when he lectured about it at Hanamaki hot springs (*onsen*) in Iwate prefecture. In Sept. 1981 he presented another lecture on tempeh to the Association at Yamanashi prefecture. In May 1983 at the Ueno restaurant (*Seiyoken*) in Tokyo the Natto Assoc. decided to pursue tempeh research and popularization, including recipe testing. Ohta and Kanasugi will be advisors on the project. Mr. Ebara is in charge of tempeh cultures. In June 1983 the Natto Association sent a team of 3 men to Indonesia to study tempeh. Mr. Kanasugi, Mr. Hisao Nagayama (a natto historian), and Mr. Kikuo Chiba spent 5 days in Jakarta, Bogor, and Yogyakarta, looking at tempeh production and visiting KOPTI. The trip was successful and on their return (on June 18) they presented a report. In July the Natto Assoc. founded a research laboratory in Omiya city (Saitama prefecture) and at the end of July it started to produce tempeh spores for members of the Association only, and (perhaps) to introduce tempeh as "tempeh natto" in Japanese confections and as a meat extender. The year 1983 has been proclaimed as the "first year of tempeh in Japan" (*Tenpe Gannen*). Address: Shimo-cho 3-6, Omiya-shi, Saitama-ken 330, Japan. Phone: 048-644-1323.

7861. Ohsawa, Lima. 1983. "Tamari" ni tsuite [Re: Concerning the word "tamari"]. Letter to Bob Kennedy, President of Chico-san, Inc. in California, Aug. 24. 2 p. Typed, translation of original letter only. [Jap]
• ***Summary:*** This letter was written to Bob Kennedy in response to his request for information on the origins of the use (actually misuse) of the term "tamari" by George Ohsawa and the macrobiotic movement. The translation is by Akiko Aoyagi of Soyfoods Center.

"In about 1958 or 1959 George Ohsawa gave a lecture at a university in Hamburg, West Germany. The lecture hall was packed with some 400 to 500 people. Among them was a young man whose name I don't clearly recall (perhaps it was Egel?). He was running an organic school in Germany. After the lecture he came to Mr. Ohsawa and earnestly enquired about various aspects of the Unique Principle.

"At that time there was also some talk about shoyu. As soon as he tasted this shoyu, he registered the word 'shoyu' as his own trademark and brand name, so that only he could sell it under this name. We came to know about this later and thought that it was a terrible thing for him to do. We were troubled by his action, for in Germany the law concerning registered trademarks was very strict. Therefore, in Germany, we were unable to call shoyu by its proper name, 'shoyu.' Out of sheer necessity, we decided to call shoyu by the name 'tamari.' After that, people in Europe started to call shoyu by the name 'tamari.'

"In Japan we call the liquid from soybean miso by the name 'tamari shoyu,' and it has been used in fine restaurants and for high class recipes. It is a type of shoyu.

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"After this incident, shoyu came to be called tamari. People overseas started to become familiar with the product and its new name, and they came to be used regularly." Address: Tokyo, Japan.

7862. Belleme, John. 1983. Re: Problems at American Miso Co. Progress on white miso. Letter to William Shurtleff at Soyfoods Center, Aug. 30. 1 p. Typed, with signature on letterhead.
• ***Summary:*** After a year of confusion and misunderstanding, the problems at American Miso Co. may be nearing a final resolution. About three months ago, John hired a lawyer. A draft of the final contract between him and the majority shareholder has been passed back and forth recently. He hopes it will be signed in the near future.

John has learned a great deal about white miso through constant experimentation–and very little from Japanese correspondence. He now understands the basic process for making unrefrigerated white miso. At present, Great Eastern Sun, the miso company's sole distributor, is selling about 50,000 pounds of white miso annually. It does very well unrefrigerated, but needs to be refrigerated for long-term storage. Address: Route 3, Box 541, Rutherfordton, North Carolina. Phone: (704) 287-2940.

7863. **Product Name:** [Marusan Sukoyaka (Healthy) Tempeh].
Foreign Name: Marusan Sukoyaka Tenpe.
Manufacturer's Name: Marusan-Ai Co., Ltd.
Manufacturer's Address: Aza-Arashita, 1 Jungi-cho, Okazaki city, Aichi prefecture 444-21, Japan. Phone: 0564-45-3112.
Date of Introduction: 1983 August.
Ingredients: Soybeans, culture.
Wt/Vol., Packaging, Price: 250 gm vacuum pack.
How Stored: Frozen.
New Product–Documentation: Letter from Naoki Kawai. 1984. Gives a brief history of Marusan's work with tempeh. Their first commercial tempeh product was launched in Aug. 1983, a few months after Torigoe's tempeh product. Shurtleff & Aoyagi. 1985. History of Tempeh. p. 68-70. Soya Bluebook. 1987. p. 95.

Color leaflet. 1989, received. 5 by 7 inches. Full color. 4 panels. Front panel shows sliced tempeh, fried tempeh cutlets, and kabobs, and nori-wrapped tempeh fingers. Inside gives nutritional information. Back panel gives 6 Japanese style tempeh recipes with a color photo of each finished dish. Label received from Ebata sensei. 1989. Aug. 4.25 by 3.12 inches. Green on white. Self adhesive. "Fermented soyfood. Please store at -18ºC." Illustration of 4 soybean leaves. Note: This tempeh is quite thick, 1 to 1 1/8 inches thick.

Form filled out by Naoki Kawai. 2001. June. Marusan-Ai stopped making tempeh in 1990. Mr. Kawai still works for Marusan-Ai; the address has not changed.

7864. **Product Name:** [Soy Harmony Powdered Soymilk {With Added Vitamins and Methionine} (Prune, or Royal)].
Manufacturer's Name: Nihon Harmony K.K.
Manufacturer's Address: Tokyo, Japan.
Date of Introduction: 1983 August.
Wt/Vol., Packaging, Price: Can.
New Product–Documentation: Toyo Shinpo. 1984. Feb. 21. It can be added to hamburger, meatballs or other meat dishes to give more protein or made into a drink or dessert. 450 gm can costs 4,000 yen.

7865. Oshikiri, Susumu. 1983. Okara o shuzai to suru shokuhin no seihô [Process for manufacturing a food in which okara is the main ingredient (Okara tempeh)]. *Japanese Patent Application* 155,358. Application filed 24 Aug. 1983. [Jap]*

7866. Shurtleff, William. 1983. Log of soyfoods research trip to Hong Kong, China, Singapore, and Japan: May 29 to July 10, 1983 (Unpublished report). Soyfoods Center, P.O. Box 234, Lafayette, CA 94549 USA. 117 p. Aug. Unpublished manuscript.
• ***Summary:*** Contents: Hong Kong: K.S. Lo and Vitasoy. May 29 (Sunday)–Plane from Hong Kong to Guangzhou City (Canton) in Guangdong (Kwantung) province. China: Guangzhou (May 29-30), Zhengzhou, Beijing, Harbin, Beijing #2 (Scurlock, Chen Xi-Hau, Joe Rakosky, Terrence Foley, local markets, vegetarian deli). Singapore: STS and Anders Lindner, Alan Yeo, American Soybean Association (Don Bushman, Sabrine Lee, Lars Wiederman).

Japan: Seiyu department store, Kibun, ASA Tokyo (Ms. Kojima), Kanji Tsuchiya, Japan Soymilk Assoc., Sano Rinji, Kikori, Prasad and natural foods, Goro Kanasugi and tempeh, Tsuchiya soymilk #1, Kikkoman at Noda (Yokotsuka #1, Mizunuma, Plant #6 modern, Yokotsuka #2, Goyo Gura, Noda Museum, Noda Library, Mr. Ichiyama), Morinaga, Kikkoman Tokyo, Japan Packaged Tofu Assoc., Natto statistics, Asahimatsu, Natto-tempeh meeting, Mr. Katoh, Nakano Masahiro, Mr. Iitsuka of Kikkoman, Daizu Shokuhin Kaihatsu, Tsuchiya #2, Nagayama, soynuts, oil association, kinako, Ishige, Mr. Mori and soy sprouts, Katoh, Arai-san, Kodansha, Nagayama and kinako, Dr. Nakano #2, Arai shoyu, Tsuchiya #3, Tenmi. Address: Lafayette, California.

7867. Shurtleff, William; Aoyagi, Akiko. 1983. The book of tofu. 2nd ed. Berkeley, California: Ten Speed Press. 336 p. Illust. by Akiko Aoyagi Shurtleff. Index. Aug. 28 cm. [321 ref]
• ***Summary:*** Three parts of this new edition have been extensively revised and updated: (1) "Tofu Makers in the West" (p. 313-16) has been updated and now includes 310 tofu producers in the Western world (with the name, address,

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phone number, and contact person for each company), arranged by state or foreign country. This is the only tofu book containing such a directory.

(2) The "Bibliography" (p. 319-324) has been greatly expanded and updated. It now contains 321 publications on tofu, including all known scientific and nutritional journal articles, the 33 books about tofu written in North America since publication of the first edition of *The Book of Tofu* in 1975, and other key articles and books about tofu from East Asia and Europe, the earliest from Europe dating back to 1613!

(3) An updated listing of "People and Institutions Connected with Tofu" in the U.S. and around the world, including researchers, major tofu manufacturers in Japan, trade associations, publications, equipment dealers, and tofu apprenticeship programs.

The "Glossary" (p. 325-27) has been condensed to make space for the expanded bibliography and back matter. There is a new page about the Soyfoods Center (p. 333). The page "About the Authors" (autobiographical) has been expanded, and the photograph has been updated. "Sending Tofu to the Four Directions" (p. 335) and the inside rear cover have both been updated. Still contains 500 vegetarian recipes–both western and eastern style.

Note: A news release of 17 Aug. 1983 states: "The Book of Tofu, which introduced the Western world to tofu and inspired the founding of more than 200 tofu shops and soy dairies in North America, has sold 340,000 copies to date, making it the world's best-seller on this popular new 'protein source of the future.'" Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

7868. *Toyo Shinpo* (*Soyfoods News*). 1983. Tônyû paudaa [Soymilk powder; Kyushu Nyugyo {Kyushu Milk Co.} is developing it]. Sept. 1. [Jap]
• ***Summary:*** It has no soy or "beany" flavor and dissolves well.

7869. *Toyo Shinpo* (*Soyfoods News*). 1983. Tônyû paudaa [Marusan changed its name to Marusan-Ai in Jan. 1983]. Sept. 1. [Jap]
• ***Summary:*** The word "Ai" is written with the character meaning "Love." Marusan has also launched a new Matcha (green tea) soymilk, but Nisshin came out with that flavor first.

7870. *Toyo Shinpo* (*Soyfoods News*). 1983. [Japan soymilk sales in 1982 were 12,500 million yen, up 56% over 1981]. Sept. 1. [Jap]

7871. Tsuchiya, Kanji. 1983. Re: Soymilk in Japan. Letter to William Shurtleff at Soyfoods Center, Sept. 6. 1 p. Handwritten. [Eng]
• ***Summary:*** "Thank you for sending me your book with your letter. I am very glad you described the Tokyo Soy Meal-Nikkan soymilk process and my work."

Thank you also for telling other soymilk companies about me and my work. At the end of July I received a letter from Mr. Anders Lindner of Soya Technology Systems (STS) in Singapore. He asked if he could me meet here in Japan in September. I replied saying that would be fine. We have not yet decided a date. Sincerely,... Address: Tokyo [Technical consultant, Okazaki Marusan, Japan].

7872. Shurtleff, William; Aoyagi, Akiko. 1983. William J. Morse and Charles V. Piper: History of work with soyfoods. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 26 p. Sept. 10. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction: Transformation of soybean from curiosity to main crop, Morse key man. Early years (1884-1929): Birth and university, early breeding work under Piper at USDA, joint writings with Piper, *The Soybean* in 1923, tribute to Piper. The Dorsett-Morse expedition to East Asia: Purpose of expedition, 2 main objectives and minor objectives, participants and Washington, DC, contact (Ryerson), previous expeditions, departure, gear, Japan March-Oct. 1929, periodic writing, photos, collections, seasonal cycle, 2 trips to Hokkaido, 6 weeks in Korea, back to Japan until April 1930, Manchuria (Dairen) April-Oct. 1930, Dorsett ill, Morse's first trip to Korea, Morse letter to Burlison and American Soybean Growers Association, little soyfood in Manchuria, Dorsett to Peking, Morse's last trip to Korea, Morse's hectic 19-day trip to China, Morse back to Dairen, Morse to Japan Dec. 1930–Feb. 1931, Morse's return to USA Feb. 17, 1931, Dorsett's return March 27, trip a great adventure, strong friendship, 2 letters from Dorsett to Morse, logs, photos, and notebooks, special reports (*Soybeans in Manchuria* and articles for *Soybean Digest*), 4 major accomplishments of expedition, conclusion (a landmark). Later years in America (1931-1959): Return to USA, descriptions of his character, work in USA with soyfoods, continued breeding work, long-term results of collecting efforts not what they might have been, supporter of American Soybean Association, writing career, retirement, growth history of soybean crop, death at age 75 in 1959, tribute. Address: Lafayette, California. Phone: 415-283-2991.

7873. Hattori, Terumitsu. 1983. The soy sauce market in the USA (Interview). Conducted by William Shurtleff of Soyfoods Center, Sept. 19. ½ p. transcript.
• ***Summary:*** His rough estimate of market shares, including imports, is as follows: Kikkoman 40%. LaChoy 30%. Chunking 12%. Imports from Hong Kong, China, Taiwan, and Korea 9%. Imports from Japan 8%. Other USA HVP soy sauce 1-2%.

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The products imported from Taiwan, Korea, and China are about 90% Shinshiki shoyu [a mixture of HVP and fermentation], as judged by levulinic acid assays. He does no know when this started. If levulinic acid is in the shoyu, it contains HVP.

Three types of Pearl River Bridge soy sauce are now being imported to the USA: Light, dark, and mushroom. Only one (the light?) has little or no levulinic acid. In a month, he'll have more accurate data. Address: Kikkoman Marketing & Planning Inc., 50 California St., Suite 3600, San Francisco, CA 94111.

7874. Fruin, W. Mark; Shurtleff, William. 1983. A soyfoods training center network: Soyfoods technology transfer from the United States and Japan to East, Southeast, and South Asia. Palo Alto, California. 29 p. 28 cm.
• ***Summary:*** Contents: 1. Introduction. 2. Japan: Asia's leading source of soyfoods technology. 3. America: World's leading supplier of soybeans. 4. Soybeans in U.S.-Asian economic and trade relations. 5. The aims of this proposal. 6. Groups interested in expanding food uses of soybeans in Asia. 7. The Sri Lanka success story. 8. United States-Japan soyfoods technology transfer. 9. Project investigators, collaborators, advisors. 10. Conclusion.

"This proposal calls for research in East Asia and America leading to the development of a basic plan and strategy for the establishment of a network of soyfoods training centers in East Asia, starting in the Peoples' Republic of China, India, Indonesia, and Thailand. Numerous large organizations in Japan, the United States, and East Asia are vitally interested in this area. We intend to involve them in the development of the basic concept and its implementation."

Note: This Fulbright grant proposal was submitted on 28 Sept. 1983 to Ms. Jennifer Keefe, Program Officer, Council for International Exchange of Scholars, Eleven Dupont Circle, N.W., Washington, DC 20036. Accompanying it were CVs for Fruin and Shurtleff, plus letters supporting the project from the following collaborators: Kanji Tsuchiya (Japan), Gunnar Lynum (American Soybean Assoc. director for Japan), Tokuji Watanabe (Prof., Food Science Lab., Kyoritsu Women's Univ., Japan), Harold E. Kauffman (INTSOY Director, Urbana, Illinois), Michael A. Phillips (Director, Market Development, ASA, St. Louis, Missouri), and P.S. Bhatnagar (All India Coordinated Research Project on Soybean, G.B. Pant Univ. of Agriculture and Science, Pantnagar, UP, India). Address: 1. Prof., 4060 Amaranta Ave., Palo Alto, California 94306; 2. Director, Soyfoods Center, P.O. Box 234, Lafayette, CA 94549.

7875. International Symposium on Soybean, September 26-October 1, 1983: Abstracts. 1. In the tropics and subtropics. 2. In tropical and subtropical cropping systems. 1983. Tsukuba, Japan: Office of the Secretariat of the Agriculture, Forestry, and Fisheries Research Council, Ministry of Agriculture, Forestries, and Fisheries. 36 p. Sept. 27 cm. [Eng]
• ***Summary:*** The Foreword is by S. Shanmugasundaram (AVRDC Symposium Chairman) and Ken Ichi Hayashi (Secretary of the TARC Organizing Committee). Address: Tsukuba, Japan.

7876. Ito, Kiyoe. 1983. Soy beans as a source of protein in Japan. In: Ajia-Chiku Kokusai Kaseigaku Kaigi Hokoku (Proceedings of the International Asian Conference on Nutrition). See p. 60-61. Held Aug/Sept. 1983. [Eng]
• ***Summary:*** Rice cultivation began in Japan about 2,000 years ago. Buddhism was imported to Japan from China through Korea, and with it the prohibition against eating meat [of four-legged animals]. "Therefore, the diet and cuisine depended exclusively on rice, bean, vegetables, and fish. Especially, soy beans have been widely used as materials for plant protein foods such as miso (fermented soy bean paste), tofu (bean curd), shoyu (soy sauce), yuba (dried soy milk film) and others." Also describes the increasing westernization of the Japanese diet, especially after World War II. Address: Tokyo Gakugei Univ., Tokyo, Japan.

7877. Leviton, Richard. 1983. Report on soyfoods research trip across America, September 1983. Colrain, Massachusetts. 8 p. Unpublished typescript.
• ***Summary:*** Visited or discusses: Grainaissance (makes amazake and mochi), Brightsong (Dik / Richard Rose), Sonoma Specialty Foods (California), Northern Soy (Rochester, New York), Southwest Soyfoods (Richard Jennings), White Wave (Steve Demos, Boulder, Colorado), Quong Hop & Co. (South San Francisco, California), Modern Fare (Loveland, Ohio), Soyfoods Unlimited (Valerie, Gary and John Robertson, San Leandro, California). Soyfoods Center (Lafayette, California), Soyfoods of America (Doug Fiske and Ken Lee, Los Angeles), Real Foods (Polk St., San Francisco), Tumaros (Los Angeles), Unicorn (Terry Dalton, Florida), Japantown and Rainbow Grocery (San Francisco), Berkeley Natural Grocer and Berkeley Co-op (Bob Gerner, California), Hinode Tofu Co., Edensoy, Farm Foods, New England Soy Dairy, and Nasoya (Leominster, Massachusetts). Legume (Gary & Chandri Barat, New York City), Lotos / Lotus Cafe (Greg Weaver, Rochester, New York).

NRRL (Hesseltine and Wang, Peoria, Illinois): Their work is in mixed starter culture fermentation, vitamin B-12 work. Japanese man from Tokyo to work one year on natto at NRRL, paid by Japanese government. B-12 can withstand some heat during cooking and the percentage of B-12 lost depends on the initial percentage present. Natto research: examine all Japanese publications for review article. Experiment using U.S. soybeans to make natto since the Japanese buy Chinese beans for their thinner seed coat. See

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what happens to the oil to protein ratio during fermentation. Natto as such has no possibilities in the U.S. as it is a slimy food with a rotten smell; hard to tolerate. There might be vitamin B-12 in natto produced by *Bacillus subtilis.* Koreans have done lots of B-12 research with kimchee and other pickled vegetables. Earl Swain died this summer of a heart attack at age 36. Natto research will help U.S. soybean exports. USDA bureaucrats are making it difficult for Dr. Hesseltine to do natto research. They have 65 objectives, but Dr. Wang's projects don't fit any of them clearly, so they won't mention "food" in their research outlines, just fermentation methods. Secretary of Agriculture John Block [served 1981-86 under President Ronald Regan] says the U.S. needs more ag exports and more basic information about crops uses, so he is in support of this natto research.

Out of business: Michiana Soyfoods, St. Ignatius shop, Sunshine Soy, Heartsong, probably Joy of Soy and a Korean shop in Salt Lake City, Utah.

Concerning soymilk: 10. In Oak Park, Illinois, a natural foods retailer says Edensoy outsells San-J by two to one. (Note: San-J imports "To-Neu Natural Soy Beverage" made in Japan by Kibun). Teenagers buy the carob Edensoy along with popcorn in the store, and use it as a soft drink. But most retailers say the Eden package [stand-up foil retort pouch] is a disaster; it is impossible to open without scissors, then if you squeeze, it sometimes spills out. San-J [in a Tetra Brik carton] is convenient but the taste is poor and the front graphics are confusing–too many words and images. According to Shurtleff, both are inferior products compared to Japan's best.

22. Concerning Edensoy at the NNFA show in Denver, Colorado: Mike Potter says "it went over great." He sold two container loads right away. People liked the package and the taste. About 4,000 people sampled it and were "generally amazed." The results were as good as they could want; it generated interest and excitement. Now they are setting up the distribution system. Address: 100 Heath Rd., Colrain, Massachusetts 01340. Phone: 413-624-5591.

7878. Shurtleff, William; Aoyagi, Akiko. 1983. The book of miso. 2nd ed. Berkeley, California: Ten Speed Press. 278 p. Illust. by Akiko Aoyagi Shurtleff. Index. Sept. 28 cm. [223 ref]

• ***Summary:*** Contents: What is miso? Preface to the second edition. Preface to the first edition. Acknowledgments. Part I. Miso: Savory, High Protein Seasoning. 1. Soybeans, protein and world hunger. 2. Miso as a food. 3. The miracle of fermentation. 4. The varieties of miso: Regular Miso: Rice miso (red / aka, light-yellow / shinshu, mellow red / amakuchi akamiso, mellow beige / amakuchi tanshoku, mellow white / shiro koji, sweet red / edo or edo ama-miso, sweet white / Kyoto shiro miso), barley miso (karakuchi mugi, mellow barley / amakuchi mugi), soybean miso / mamé miso (Hatcho miso, soybean miso / mame miso, tamari miso). Special Miso: Finger lickin' miso / Namemiso (Kinzanji miso, moromi miso, hishio, namémiso, natto miso, goto miso), sweet simmered miso / nerimiso. Modern Miso: Akadashi miso, dehydrated or freeze-dried miso, low-salt / high-protein miso.

Part II. Cooking with Miso (400 recipes). 5. Getting started. 6. Recipes from East and West. Part III. The Preparation of Miso. 7. Making miso at home and in communities (incl. Homemade natural shoyu, and Homemade namémiso, p. 184). 8. Japanese farmhouse miso (how to make miso at home). 9. The traditional miso shop. 10. The modern miso factory. Appendixes: A. A history of miso and soybean chiang. B. Other East Asian misos: Chinese chiang, Korean jang and Indonesian Taucho. C. The microbiology and biochemistry of miso fermentation. D. Miso manufacturers in the West. E. People and institutions connected with miso. F. Miso with seafoods, chicken, and meat. G. Measures, weights, and equivalents. H. So you want to study miso in Japan? I. Miso additives. Bibliography [223 references]. Glossary. About the authors (autobiographical). The Soyfoods Center.

In May 1993 a new printing of this book appeared, containing many small changes made by the authors. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

7879. Shurtleff, William. 1983. Notes from a phone talk with Richard Leviton concerning his trip across the USA in Sept. 1983 visiting soyfoods companies and giving talks. Lafayette, California. 3 p. Sept. Unpublished manuscript.

• ***Summary:*** Discusses: Nasoya, New England Soy Dairy (doing radio ads and videos in supers; making 45,000 lb/week of tofu), Hinode tofu, Lotus Cafe, Penguino's (chocolate is their favorite soy ice cream favorite), Northern Soy and Wegman's, Vegetarian Times, Emperor of Japan to give Dr. Clifford Hesseltine a high medal at the end of November, Bob Davis plans to move to Nevada City (California), Kraft bought 15 Okita packaging machines. Richard Jennings, his marriage, Southwest Soyfoods, and chilled water as an alternative to pasteurization; his shop in Ecuador is now closed. Nasoya makes 22,000 lb/week of tofu with no outside money. David Mintz was on Good Morning America talking about Tofutti. The Farm (Summertown, Tennessee) now makes only liquid soymilk, no powder. Tom Leonard and Jim Hemminger are selling tofu to Community Mercantile. Leonard was in Arkansas in 1977, first batch of miso in Dec. 1978. Now makes 500 lb/week. Well Spring is a new miso maker in Colorado. White Wave (Boulder, Colorado) is making 12,000 lb/week of tofu and doing well financially, has new frozen entrees & nut butters, tofu lasagne. Edensoy is outselling SanJ soymilk by 2 to 1. Time magazine Sept. 19 insert. American Dietetic Assoc. will list tofu as a good protein source. Jim Cooley of Lawrence, Kansas. He started making tofu in 1977. Legume

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Inc.'s new product line out Oct. 5; lists names of each product. Address: P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

7880. Shurtleff, William; Aoyagi, Akiko. 1983. Appendix A: A history of miso and soybean chiang [jiang] (Document part). In: William Shurtleff and Akiko Aoyagi. 1983. The Book of Miso. 2nd ed. Berkeley, California: Ten Speed Press. 278 p. See p. 214-41. Illust. by Akiko Aoyagi. [223 ref]
• ***Summary:*** Contents: Introduction: Etymology. Soybean chiang in China: Early Chinese non-soybean chiang, 600-1899. Soybean chiang in Korea and Southeast Asia: Dissemination of chiang from China, Korea, Indonesia, Vietnam, other Southeast Asia.

History of miso in Japan: Introduction, early non-soybean hishios (before AD 700), the Nara period (AD 710-784), the Heian period (AD 794-1160), the Kamakura period (1185-1333). The Muromachi period (1336-1568), the Edo or Tokugawa period (1603-1867). A brief overview of origins. the Meiji and pre-war periods (1867-1939), World War II and the postwar period: Modern times (1940-1983).

History of miso in Europe: Early European references, 1900-1949, 1950-1982.

History of miso in the United States and Canada: Early developments (1896-1929), 1930-1959, growth of interest in miso (1960-1982; Shibasaki and Hesseltine at the NRRC, Peoria, Illinois, Ichiro Ouchi, the macrobiotic movement, Herman Aihara, George Ohsawa, Miso and Aveline Kushi in Boston, Massachusetts, Noboru Muramoto, George Gearhart, Thom Leonard, Allen Ginsburg and Gary Snyder, Mt. Tamalpias, Tassajara Zen Mountain Center, Miyako Oriental Foods, Kanemasa Miso Co., Ohio Miso Co., Shin-Mei-Do, American Miso Inc., South River Miso Co., Joel Dee and Miso-Cup), miso's future in the West.

Miso in other countries: Israel, India, Latin America (Brazil, Mexico), Africa.

Illustrations: Evolution of Chinese characters. Hideyoshi Toyotomi and a robber on the bridge (Hatcho miso history, p. 219). Making miso-damari (p. 220). Graph of the miso market in Japan (1880-1980) (p. 226). Ohio Miso letterhead and logo (p. 238). U.S. miso imports, production and consumption (1970-1983) (p. 240). Page 219: "The origins of modern shoyu can be traced more clearly to the mid 1200s when the Japanese priest Kakushin returned from China, having learned there the technique for preparing Kinzanji miso. Establishing himself at Kokoku-ji temple near the town of Yuasa..." Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

7881. Takai, Motoo. 1983. Tôfu kikai no kiseki [History of tofu equipment]. Takai Tofu & Soymilk Equipment Co., 1-1 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan. 132 p. Illust. No index. 19 cm. [Jap]

7882. Nakano, Masahiro. 1983. Re: Introducing tempeh to Japan. Letter to William Shurtleff at Soyfoods Center, Oct. 1–in reply to inquiry. 2 p. Handwritten. [Jap]
• ***Summary:*** One of Japan's greatest living microbiologists, Dr. Nakano and co-workers introduced tempeh to Japan. They were the first to make it on a small (noncommercial) scale and serve it to others. But they were never interested in popularizing it–then or now. He was a scholar and research microbiologist for a nonprofit organization. He is now retired. "When I was in the Japanese Army in Java, although I was fortunate in having a chance to see and hear things in my field of interest, I did not do actual research. I have a subconscious desire to avoid developing the things I learned there."

The Taiwan Governor-General's Research Institute (*Taiwan Sotokufu Kenkyujo*) was founded in 1909. Dr. Ryoji Nakazawa, the great microbiologist, worked at that lab from 1907 until 1940, when he returned to Japan; he died in 1975 at age 96. For more on tempeh, see Dr. Nakazawa's *Taikan Kinen Ronbun-shu,* his collected papers compiled and published when he retired. Dr. Nakano started to work at this Taiwan lab in 1934. Address: Dr., Kugayama 1-2-7, Suginami-ku, Tokyo 168, Japan. Phone: 03-334-6911.

7883. Reed, M.H. 1983. Where China and Japan meet: Dining out. *New York Times.* Oct. 2. p. WC25.
• ***Summary:*** This is a review of the one-star restaurant Sakura (56 Garth Road, Scarsdale, New York), which has both Japanese and Chinese menus–although the Japanese dishes were preferred.

"Good, too, were age-tofu [fried tofu] and cold yakidofu [grilled tofu], fragile blocks of silken bean curd complemented nicely by a sharp sauce sprinkled with bonito flakes."

7884. Potter, Michael. 1983. Edensoy and Eden Foods (Interview). *SoyaScan Notes.* Oct. 3.
• ***Summary:*** Eden Foods has already sold 3 containers of Edensoy, imported from Japan. Each container holds 61,800 foil packs. People taste the carob first and they like it. But in both Australia and the UK, they switched to plain, making it the most popular there.

The Eden Foods warehouse was burned by arsonists outside the company. The principals took a lie detector test and passed with flying colors, then the insurance company refused to pay; so they had to settle out of court. Address: CEO, Eden Foods, Clinton, Michigan. Phone: 544-2781.

7885. Noda, Fumio; Hayashi, K.; Mogi, K.; et al. Assignors to Kikkoman Shoyu Company Ltd. (Chiba, Japan). 1983. Method of producing koji products. *U.S. Patent* 4,407,826. Oct. 4. 8 p. Application filed 17 Sept. 1981. Application also filed in Japan on 12 Sept 1978. [6 ref]

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• ***Summary:*** "In a method for producing a fermentation product which comprises inoculating a mold in a substrate and cultivating it, the improvement which comprises adding

"(A) at least one compound selected from the group consisting of salts of aliphatic carboxylic acids having 1 to 4 carbon atoms, and

"(B) at least one compound selected from the group consisting of chlorous acid, hypochlorus acid, sulfurous acid, hyposulfurous acid, pyrosulfurous acid, salts of these acids, hydrogen proxide, bleaching powder, chloramine-B, chloramine-T, halazone and acrylamide

"at any time ranging from a step of preparing the substrate to the step of cultivation." Address: 1. Kamagaya; 2. Kashiwa; 3. Noda. All: Japan.

7886. Wilson, John C. 1983. Early work with soymilk and recent developments (Interview). *SoyaScan Notes.* Oct. 4. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Wilson has been involved with soymilk since 1967, when he was technical manager for Cold Storage Group (CSG) in Singapore and Malaysia. His background was in dairy technology. To help CSG launch a soymilk, he studied traditional tofu processes in Singapore, then mechanized the process. He set up CSG's first line in Kuala Lumpur in 1969, actually at Petaling Jaya, a satellite of Kuala Lumpur. The soymilk was sold under the Magnolia brand, but owned by CSG.

This was not the first soymilk in the area. Alfa-Laval sold Yeo Hiap Seng a UHT plant for soymilk operation in about 1967, and another in 1969.

Note: The 2nd plant in Singapore Shurtleff visited was owned by Cold Storage Group.

Wilson joined Alfa-Laval in 1971. Alfa-Laval was researching soymilk from a particular angle, with no success. By 1977 Wilson had been in Africa and Australia. He found a big demand for soymilk plants in Asia.

For Ace Canning, he designed the Lam Soon plant in Kuala Lumpur, Malaysia.

In 1978 sold a plant to Kickapoo, in Bangkok, Thailand, with reduced beany flavor soymilk, but strong cooked = burnt flavor. They copied the overcooked flavor of Greenspot, overcooked through sterilizing in the bottles.

Legislation in Bangkok says manufacturers must add 50% by weight of soybeans of nonfat dry milk (NFDM). This makes it a healthy product, if not it's a luxury product. Greenspot got this legislation passed after people developed a taste for Greenspot's product. Greenspot has been in business since the mid-1960s. That legislation has been in force from the mid-1970s until now. So it forces all soymilk to contain NFDM. There is a heavy tax on pure soymilk without NFDM.

Nestle started in about 1980 in Bangkok. They have not done well. But they had bad luck with Bonus in Singapore. The Department of Health banned its production claiming it was not properly sterilized.

The greatest successes: Vitasoy #1 in Southeast Asia. Kibun #1 in Japan. Kibun has now commissioned three new factories, which are now on stream. They use machinery from Alfa-Laval and from others. Alfa does the engineering, Kibun does the formulation

Alfa-Laval and Kibun have an agreement which was signed in late 1982. If a customer licenses the process from Kibun, Alfa-Laval will supply the plant. Kibun will supply technical know-how, formulation, and quality control, and receive the license fee direct. There are separate fees and no kickbacks between Alfa-Laval and Kibun. and Alfa-Laval can supply anyone else with plants. Kibun is expert in formulation and Alfa-Laval is strong in plant design.

The Japanese soymilk process is basically the Illinois process with a clarifier toward the end. He is surprised that the Illinois Patent office is not complaining. The basic concept is to inactivate the enzymes at the bean stage before grinding. However cooking prior to grinding dramatically lowers the protein yield to 40-45%. The key to a standardized way of comparing yields (of protein) is to specify an acceptable level of remaining fiber, which he suggests be l% or less by volume after a standard centrifugation test. If you have less fiber, you get much lower yields. We need an international standard for fiber.

Lawrence Johnson at the University of Texas claimed 82-85% protein yield with steam injection (*Journal of Food Science* 46(1): 239-43, 48) but Alfa-Laval's tests showed that it didn't work.

Wilson has a super set of color overhead projector slides on soymilk. Invite him back again to do a show for us.

Kibun uses its own process with Alfa-Laval equipment, not Alfa-Laval's process. Kibun licenses others to use its process then usually asks Alfa-Laval to supply the plant. Alfa-Laval buys grinders from Switzerland.

Alfa-Laval's most important contribution is not just the equipment but the automated system and automatic cleanup = clean in place (CIP). Perhaps their main component is the Sterilizer. Two types = Steritherm or VTIS = Vacu therm. Japanese like this, but its expensive and expensive to run. And it strips out added fruit aromas.

Wilson (1983) said that US laws on UHT are ridiculous and antiquated. Makes it very expensive to build machines for the US market. The real problem is Not the hydrogen peroxide problem.

In killing = inactivating enzymes, the protein solidified in the fiber like hard-boiled eggs.

Alfa-Laval is in the lead in simplifying and automating tofu plants. They are now testing a plant that allows 1 man and a computer to make tofu from beans to packaging.

Cost effective soymilk: Absolute lowest output is 11OO liters/hr. Practical lowest is 1500 liters/hr. Local laws affect the price. They have many systems for different markets; China different from Japan. The really economical plant is

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2,000 liters/hr.

The three key considerations in determining a plant are (1) The type of soymilk (beany or not) desired. (2) The type of packaging. (3) The output in liters per hour. Address: Soya Process Product Manager, Alfa-Laval, Box 1008, S-221 03, Lund, Sweden.

7887. Oda, Lorraine. 1983. Tofu enjoys increasing popularity. *Hawaii Herald.* Oct. 7. p. 5. Friday.
• ***Summary:*** Jack Tsuneyo Uyehara manages Aloha Tofu Factory Inc. His father, Kamesaburo, brought the plant in 1951 from a pig farmer, Kamehachi Shimabukuro, who used the okara for pig feed. Back then the factory was located on Dillingham Blvd. and produced only tofu and abura-age. Today the plant on Akepo Lane in Kalihi produces each week: 3,500 pieces of soft, firm, and mini-tofu, 6,000 pieces of aburage, 2,000 packages of natto, and enough atsu-age and nama-age to supply stores in Oahu. The four Uyehara brothers run the company.

Note: This is the earliest document seen (Dec. 2001) that contains industry or market statistics for natto by individual companies. Address: Editorial Asst., Honolulu.

7888. Wakayama, Mary. 1983. The oldest sake factory in the West: From 1908 to 1983. *Hawaii Herald.* Oct. 7. p. 1, 4.
• ***Summary:*** A history of the Honolulu Japanese Sake Brewing Co. Ltd., which started in 1980 when Tajiro Sumida began making sake in Honolulu for Japanese laborers in Hawaii. Starting more than 25 years ago, under the direction of an expert brewmaster, Takao Nihei, who received the Japan Brewery Association's award for excellence in 1970, the quality of the sake has improved tremendously. Takara Masamune and Musume are Honolulu Sake's foremost sake products. The company also manufactures shoyu (Diamond shoyu, Marumasa Soy Sauce, Island Shoyu, as well as Diamond Teriyaki Sauce), vinegar (Diamond-Su) and mirin (Takara Masamune). A photo shows that "Honolulu Japanese Sake Brewing Co. Ltd." Address: Hawaii.

7889. Leviton, Richard. 1983. Société Soy, France's largest tofu manufacturer (Document part). In: R. Leviton. 1983. Report of Trip to Europe with American Soybean Assoc. 82 p. Unpublished manuscript. See Oct. 16.
• ***Summary:*** This tofu plant in Cerny, the largest in France, is distinguished for its dairy style machinery innovations. Bernard Storup is the 4th generation of a cheesemaking family; his brother, a cheese specialist, went to cheese school. Societe Soy uses 6 workers two days a week to produce 5,000 lb/week of tofu and 10,000 Tofu Croques (burgers) in 6 flavors. Burger sales are rising rapidly, and may hit 20,000 by Dec. 1983. Both products are vacuum packed for a 3 week shelf life, refrigerated. They use the "tofou" spelling and Soy not soja for the company name so they could trademark both in France. They plan to replace their Takai W30-C system with dairy style equipment. The new equipment has curd tanks on a raised platform; the curds flow into a 4x12 foot stainless steel shallow bed trough. One or two large pneumatic presses press the whole lot, then it gets cut all at once. The company reached break-even after 12 months. Their tofu wholesales for 14 French francs/ kg which is $0.80/lb. Breakeven is 2,000 lb/week of tofu. Bonneterre distributes 40% of their tofu. Bonneterre started in 1963 but in 1980 nearly went bankrupt and was acquired by a large dairy company [Triballat].

Societe Soy began production in Sept. 1982. France has at least 5 other tofu manufacturers, whose weekly output combined is about 3,500 lb. Paris, then the Marseilles, Mediterranean Coast, are the best markets in France for Tofu, and the typical customer is female, educated, age 25-35. The 13,000 Japanese and 200,000 Chinese in Paris can't get enough tofu. Paris has 3-5 small tofu producers, but sprouts are their main line. Societe Soy tofu has 12.3% protein, 24 day shelf life with hot packing at 60ºC, no cooling tank involved, pasteurization after vacuum packing in vertical steam tank. The company is energetic, professional, and quite aware of sanitary procedures and the need for appropriate packaging. The future of tofu is believed to lie in mixing it with other foods, possibly meat or cheese, or to follow the Asiatic example of using strong spices. Tofu needs a strong, memorable flavor. Americans have been too strict in their essentially vegetarian approach to formulating soyfoods.

For financing, Bernard got 25,000 francs then 60,000 francs from banks for a novel business plan competition that he won twice. His total initial investment was 250,000 francs or US$30,000; half of this came from the government. Address: Colrain, Massachusetts.

7890. Lindner, Anders. 1983. Soymilk worldwide and STS (Interview). Conducted by William Shurtleff of Soyfoods Center, Oct. 20. 1 p. transcript.
• ***Summary:*** On Oct. 20 Anders Lindner, managing director of STS, visited Soyfoods Center, where this interview was conducted.

Seikensha built all the key Marusan soymilk equipment. Anders was shown through the Marusan plant in Okazaki.

Seikensha is a 55-year-old company. Ask for their catalog. They are now building small soymilk plants and dehulling equipment.

Deodorizer is the name for the vacuum stripper,

STS's best prospects for soymilk plants are in South Africa, Cameroon, Indonesia, India, Thailand, maybe Sinaloa, Mexico, China, and Taiwan. Taiwanese want to use soy protein isolates to keep investments low.

Tetra Pak's biggest competitor is Pure-Pak. Ex-Cell-O / Excello Corp. makes Pure Pak Machines. They make their money on the machines, and license the packaging to many local companies. Tetra's biggest competitor for aseptic

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packaging is Jagenberg Co. in Germany. Their packaging system is called Block Pack (sp?) Their aseptic system is called Combi Bloc. Get their address from the German consulate. Address: STS, Singapore.

7891. Hara, Toshio; Zhang, J-Ren; Ueda, Seinosuke. 1983. Identification of plasmids linked with polyglutamate production in *Bacillus subtilis* (*natto*). *J. of General and Applied Microbiology* (*Tokyo*) 29(5):345-54. Oct. [26 ref]
• ***Summary:*** "Fourteen of 18 strains of *Bacillus subtilis* (*natto*) were found to harbor plasmids." Twelve strains, which required biotin for growth and produced a viscous substance, contained a single plasmid species. These plasmids, which included four whose names are given, "were classified into the same type of pUH1, the functional plasmid encoding gamma-glutamyltranspeptidase (gamma-GTP) gene," based on their molecular weights and restriction patterns.

The regulatory gene for polyglutamate synthesis is encoded on a 5.7 kb plasmid, pUH1.

Note: Plasmids of this type are known as "natto bacterium plasmids."

Whereas many strains of *Bacillus subtilis* have been found to "contain a number of endogenous plasmids, the physiological role of these plasmids has not yet been identified." Address: Dep. of Food Science & Technology, Faculty of Agriculture, Kyushu Univ., Hakozaki, Fukuoka 812, Japan.

7892. IBPGR. 1983. Genetic resources of soyabean. Rome, Italy: International Board for Plant Genetic Resources, Secretariat. 19 p. 30 x 21 cm. Oct. IBPGR Working Group on the Genetic Resources of Glycine Species, held at the International Soybean Program (INTSOY) at the University of Illinois, Urbana, 9-11 Aug. 1982. [2 ref]
• ***Summary:*** This report, distributed free to developing countries but with restricted distribution to developed countries, was written after an ad hoc Working Group on the Genetic Resources of *Glycine* was held. A minimum list of descriptors is included. Address: Crop Genetic Resources Centre, Plant Production & Protection Div., FAO, Via delle Terme di Caracalla, 00100, Italy.

7893. Inano, Mitsuko. 1983. On behalf of soybeans. *Nutrition Today.* Sept/Oct. p. 24-25. [1 ref]
• ***Summary:*** A large illustration on the top half of the first page shows Commodore Perry lined up on the left with many soldiers and flags. On the right is a single Japanese man, with head bowed, holding a small pot containing one small soybean plant. The caption reads: "A member of the Japanese court presents Commodore Perry with a soya plant brought back to the 'western world." For years after that, the soybean was known as the 'Japan Pea."

The author recalls that one of her favorite snacks as a child in Japan was "green soybeans" grown by her mother in the back yard. She describes how they were prepared and eaten. "Then in the evening they were served to father as the accompaniment to his before-dinner drink."

When I encountered the phrase 'for human consumption' or 'for human use' in article on soybean research in recent years, I became annoyed and frustrated. Long forgotten is that fact that for centuries people in certain parts of the world have been using soybeans as a staple food..." Address: PhD, RD, Dep. of Home Economics, Univ. of Arkansas, Fayetteville.

7894. Kitamura, K.; Davies, C.S.; Kaizuma, Norihiko; Nielsen, N.C. 1983. Genetic analysis of a null-allele for lipoxygenase-3 in soybean seeds. *Crop Science* 23(5):924-27. Sept/Oct. [18 ref]
Address: 1-2. Post-doctoral associate, of Agronomy, Purdue Univ., West Lafayette, Indiana 47907; 3. Prof. of Plant Breeding, Iwate Univ., Morioka, Japan; 4. Assoc. Prof. of Agronomy and Research Geneticist, USDA-ARS, Purdue Univ., West Lafayette, Indiana 47907.

7895. Nagayama, Hisao. 1983. Kenkô-shoku nattô [Natto, the health food]. Tokyo: Nosan Gyoson Bunka Kyôkai (Asakusa 7-61, Minato-ku). 209 p. Illust. 19 cm. [Jap]
• ***Summary:*** This popular book, filled with funny (sometimes naughty) cartoons discusses all aspects of natto, its history, nutritional value and health benefits, how to make natto at home, and even how to grow soybeans. It contains 80 natto recipes, each illustrated. The book was first printed in Oct. 1983; 6th printing Sept. 1986. Hisao Nagayama was born in 1934. Address: Toyotama-kita 4-31, Nerima-ku, Tokyo, Japan. Phone: 03-992-3735.

7896. Okada, Noriyuki; Hadioetomo, Ratna Siri; Nikkuni, S.; Katoh, K.; Ohta, T. 1983. Vitamin B-12 content of fermented foods in the tropics. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 43. p. 126-29. Oct. [7 ref. Eng]
• ***Summary:*** Vegetarian foods containing significant amounts of vitamin B-12 per 100 gm according to a biological assay method using *Lactobacillus leichmanii* were: tempeh (Indonesia) 4.6 mcg (micrograms), natto fermented soybeans (actually thua-nao, Thailand) 1.5 mcg, and fermented tofu (Singapore, also called Sufu) 1.1 mcg. Flesh-based foods with a high B-12 content included Ka-pi shrimp paste (Thailand) 5.3 mcg, kung-jom fermented shrimp (Thailand) 2.5 mcg, fish sauce, 3 month fermentation (Thailand) 2.4, and fish sauce (Thailand) 1.3 mcg, and fish sauce (Japan) 1.0 mcg.

Of these foods transported from tropical countries, tempeh was especially interesting because it is made of soybeans and had the highest B-12 content of any food measured. However not all tempeh samples contained such

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large amounts. "For example, a fresh sample of tempeh which was transported from Indonesia as rapidly as possible contained a very low amount, 0.7 mcg/100 gm, and tempehs prepared in the laboratory by using the tempeh-making fungus, *Rhizopus oligosporus,* contained only 0.02 to 0.06 mcg/100 gm. However the low vitamin B-12 content in tempeh which was transported from Indonesia increased to a value of 8 mcg/100 gm when the sample was incubated at 30ºC, unlike in the tempeh prepared in the laboratory. It is probable that microorganisms accompanied with tempeh-making fungus were associated with the production of vitamin B-12 in Indonesian tempeh. Further studies will be required to identify the microorganisms capable of producing vitamin B-12, and useful for the fermentation food industry." Address: 1,3-5. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2. Bagian Mikrobiologi, Departemen Botani, Fakultas Pertanian, Institut Pertanian Bogor, Jl. Raya Pajajaran, Bogor, Indonesia.

7897. Okada, Noriyuki; Tabei, Hideo; Mori, K.; Katoh, K.; Yanagimoto, M. 1983. Baioassei-hô de kenshutsu sareru nattô no bitamin B-12 chi ni tsuite [On the vitamin B-12 values detected in natto by applying a microbiological assay method]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 43. p. 121-25. Oct. [12 ref. Jap; eng]
• ***Summary:*** "Natto has long been considered to contain vitamin B-12. The B-12 content of natto determined by a microbiological assay method using *Lactobacillus leichmannii* ranged from 0.01-0.08 micrograms/100 gm. These values are almost the same as those reported by other authors. Although the commercial nattos analysed were not perfectly pure products, the possibility that the B-12-like activities detected in natto were produced by contaminants could be ruled out, since comparable values were found in purely fermented nattos made by using several strains of *Bacillus natto* isolated from commercial samples. However *B. natto* did not produce detectable amounts of B-12 in the liquid medium in which *B. megaterium,* known as a B-12 producer, did. Moreover the response of the natto extract to *L. leichmannii* was different from that of the B-12 standard and that of the 'natto' extract made by using *B. megaterium.* It is probable that the B-12-like activities detected in natto did not correspond to that of B-12." Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

7898. Taira, Harue; Takahashi, Haruo; Okano, Hirobumi; Nagashima, Shigeru. 1983. Kokusan Daizu no hinshitsu. IV. Ibaragi-ken daizu saibai hinshu no nattô kakô tekisei [Quality of soybean seeds grown in Japan. IV. Suitability of soybean varieties grown in Ibaraki prefecture for natto production]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 43. p. 62-71. Oct. [28 ref. Jap; eng]
Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305; 2. Ibaraki Food Research Institute. Higashi Ibaraki-gun, Ibaraki-ken; 3. Ibaraki Agric. Exp. Station, Mito, Ibaraki-ken; 4. Okame Natto Honpo Ltd., Higashi Ibaraki-gun, Ibaraki-ken. All: Japan.

7899. Taira, Hirokadzu; Suzuki, Norio. 1983. Nattô no shishitsu kanryô oyobi shibôsan sosei [Lipid content and fatty acid composition of natto]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 43. p. 58-61. Oct. (Chem. Abst. 101:71315. 1984). [8 ref. Jap; eng]
Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2. Taishi Shokuhin Kogyo Ltd., Towada, Aomori prefecture, Japan.

7900. Shurtleff, William; Aoyagi, Akiko. 1983. George Ohsawa and the macrobiotic movement: History of work with soyfoods. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 46 p. Nov. 10. 28 cm. Unpublished typescript. Available online at www.soyinfocenter.com. [92* ref]
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction: Acknowledgement of Ron Kotzsch. The roots of macrobiotics: *Yellow Emperor's Classic of Internal Medicine,* Shinto classics, Ekiken Kaibara (1630-1714), Nanboku Mizuno (late 1700's–early 1800's), Sagen Ishizuka (1850-1910), Manabu Nishibata. The life of George Ohsawa (1893-1966): To Paris 1929-36, return to Japan and World War II, Internationalism 1946-53, ran school Centre Ignoramus, "world journey" 1953 to India, Africa, then Paris, started Muso Shokuhin (macrobiotic food company) in Osaka, Japan, in 1959, work in Europe 1956-66, earliest reference seen to soy (miso) in 1956, first visit to New York City Dec. 1959, post-visit institutions, second visit 1960, first American macrobiotic summer camp on Long Island, exodus to Chico, California, Aug. 1961 to escape feared nuclear war, establishment of Chico-San, move of Michio and Aveline Kushi to Boston in 1963, *Zen Cookery* 1963, *Zen Macrobiotics* second edition 1965, growth of the movement, Beth Ann Simon's death blamed on macrobiotics in 1965, response of U.S. Food and Drug Administration is to close N.Y. Ohsawa Foundation, Ohsawa's general macrobiotic teaching, view of Western civilization as one in crisis, with fundamental biological change required to improve it, death in 1966 in Tokyo at age 72 of cardiac failure, seen as sage by his followers, seen as inconsistent crackpot by his critics, work carried on by wife Lima and by his students. Development of macrobiotics in Boston: Kushi's lectures and classes from 1965, early food sales from house, Erewhon's start in 1966 and subsequent growth, establishment of

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organic suppliers in the U.S., first imports from Japan 1968, 1970 natural foods boom, National Food Distributors Association, *East West Journal,* Autumn Press founded in Japan by macrobiotic student from Boston, Boston institutes, centers, and foundations from 1972 on, increasing popularity of soyfoods (tofu, tempeh, and miso) in Boston, Erewhon from 1973 to bankruptcy in 1981 and sale to Ronald Rossetti in 1982. Development of macrobiotics in New York City: Void after departure of Aihara group and Kushis, establishment of Infinity Foods in mid-1960's, Michel Abehsera's restaurants, cookbooks, and tour. Development of macrobiotics in California: Influence of Chico-San on natural foods movement to 1970, Lundberg rice 1968-69, Yamazaki miso and shoyu 1970, 1972 fire in Chico-San warehouse, educational activities and institutions, growth of Chico-San, Noboru Muramoto. Nutritional views of macrobiotic diets: General critical attitude from 1965 to 1977, not countered by macrobiotic leaders, scientific studies pro and con, specific critique of the diet, turnaround in attitude since 1977 (*Dietary Goals* published by U.S. Senate's McGovern Committee), Dr. Mendelsohn, Nathan Pritikin, cancer cures and Anthony Sattilaro (1980). Macrobiotics in Europe and Latin America: First European company Lima N.V., other distributors, centers, publications, tours, active in South America since 1954. A major contribution: Type of overall influence on soyfoods, number of followers in 1981. Address: Lafayette, California. Phone: 415-283-2991.

7901. Shurtleff, William; Aoyagi, Akiko. 1983. George Ohsawa and the macrobiotic movement: Noboru Muramoto (Document part). Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 46 p. See p. 39-40. Nov. 10. 28 cm. Unpublished typescript.

• ***Summary:*** "In June 1971 Noboru Muramoto emigrated to America from Japan and lived with the Aiharas in San Francisco at GOMF. In Japan he had studied Chinese literature and philosophy at Tohoku University and Kanazawa University, then began his own study and practice of herbal medicine. He had begun studying Ohsawa's writings in 1942, then studied with Ohsawa after 1964, while running a family business cleaning the cotton from futons. In 1973 he gave a series of lectures in New York which were published that year as the popular book, *Healing Ourselves* (Avon/Swan House). Many uses of miso and natural shoyu were given; soybeans and tofu were not recommended in the book, except that tofu was used in making poultice-like 'plasters' for use in healing. In 1974 Muramoto started Rising Sun, a macrobiotic storefront containing the Herb Tea Co. in San Francisco. Here he gave classes on making miso and shoyu. In November 1976 he acquired Top of the World Ranch on 140 acres of land near Glen Ellen, California, and established Asunaro Institute, a residential program of macrobiotic studies. He also published a newsletter 'Asunaro Notes.' At Asunaro he set up a regular shop for making miso and shoyu, complete with a nice koji incubation room. Many unique and American-style misos were developed, including some made with peanuts, garbanzos (chickpeas), azuki beans, and even natto. A number of Americans apprenticed at the miso-shoyu school. A nice article about the school, 'Making Miso in America,' appeared in the *East West Journal* (Lachman 1978). In March 1979 Muramoto displayed his miso and shoyu equipment and samples of his products at the famous New Earth Exposition in San Francisco. He also sold these products at Rising Sun, and some customers swore that they were the best in America."

Note: On 11 Jan. 1976 William Shurtleff attended a class on how to make miso at Rising Sun (Judah Street, San Francisco), given by Noboru Muramoto. Jimmy Udesky was there, as were about 15 other people.

On 19 Sept. 1977 William Shurtleff and Akiko Aoyagi visited Muramoto sensei at his place, Asunaro, in Glen Ellen, California. He makes miso there and teaches miso making. Shurtleff interviews him about his life and history of interest in macrobiotics and soyfoods. We stay overnight and help him the next morning with royalty problems connected with his book *Healing Ourselves;* he is quite sure he is not being paid the royalties due based on his contract with the publisher. Address: Lafayette, California. Phone: 415-283-2991.

7902. Aoyagi, Kazuko; Aoyagi, Akiko; Shurtleff, William; Bennett, Gordon. trans. and comp. 1983. Japanese standards for soy sauce ("shoyu"): English-language translation. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549 USA. 14 p. Nov. [1 ref. Eng]

• ***Summary:*** Contents: Translators introduction: Brief history of shoyu standards in Japan and the USA. 1. Definition of fermentation methods: Basic fermented method (*honjozo hoshiki*), semifermented HVP method (*shinshiki jozo hoshiki*), semifermented HVP and acid HVP mixed method (*aminosaneki kongo hoshiki*), semifermented HVP and enzyme HVP mixed method (*koso shorieki kongo hoshiki*), semifermented HVP–acid & enzyme HVP mixed method (*aminosaneki koso shorieki kongo hoshiki*), semifermented HVP–enzyme & acid HVP mixed method (*koso shorieki aminosaneki kongo hoshiki*). 2. Definition of varieties of shoyu: Regular shoyu (*koikuchi shoyu*), light-colored shoyu (*usukuchi shoyu*), tamari (*tamari shoyu*), double-fermented shoyu (*saishikomi shoyu*), clear shoyu (*shiro shoyu*).

3. Standards for varieties of shoyu: Regular shoyu, light-colored shoyu, tamari, double-fermented shoyu, clear shoyu. 4. Analytical methods: Degree of color, total nitrogen content, soluble solids, alcohol content, direct reducing sugar. 5. Labeling requirements: Items to be listed, particulars for each item listed, prohibited terms.

Brief history: "In 1963 the Japanese Ministry of Agriculture and Forestry (*Norinsho*), with the support of the Japanese Shoyu Association, set the first JAS (Japanese

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Agricultural Standards) for shoyu. The 1963 JAS shoyu standards were revised in July 1970 with Norinsho Notification #974. Companies choosing voluntarily to make their shoyu to these standards were allowed to print the prestigious JAS mark on their labels. These standards were revised again in 1980.

"In January 1976 in the United States the Federal Supply Service of the General Services Administration established America's first soy sauce standards for use by all federal agencies. The classified all soy sauce into two types: Type I–Soy Sauce (fermented), and Type II–Soy Sauce (non-fermented). These standards were revised on 5 May 1978 as Fed. Spec. EE-S-610G.

"In late 1983 the Japanese shoyu standards were first translated into English and work began to adapt them to American needs and conditions." Address: 1. Albany, California; 2-3. Soyfoods Center, P.O. Box 234, Lafayette, California 94549; 4. Westbrae Natural Foods, P.O. Box 8711, Emeryville, CA 94662.

7903. Hesseltine, C.W. 1983. The safety of shoyu. Paper presented to the Japan Soysauce Brewers' Assoc. meeting. 36 p. Held 29 Nov. 1983, Tokyo. [33 ref]
• ***Summary:*** Historical background: In 1953, Dr. Hesseltine went from the fermentation industry to the Northern Regional Research Laboratory (Peoria, Illinois) as head of the ARS [Agricultural Research Service] Culture Collection. He had only a faint idea of how shoyu was made and he had never heard of miso, natto, or tofu. Shortly after his arrival, probably in 1953, he received a visit from Prof. Kin-ichiro Sakaguchi of the University of Tokyo, an authority on traditional Japanese fermented foods and one of the founders of the modern fermentation industry in Japan. Records show that in 1953 Dr. Sakaguchi received cultures from the ARS collection. His laboratory trained many students and much of his work was directly related to food fermentations involving soybeans and cereals.

In 1948 Dr. A.K. Smith of the NRRL visited Japan and China and recognized the tremendous amount of soybeans being used as human food. "The Western world had little or no understanding of the importance and use of these foods in the diet of Oriental people. He strongly recommended to anyone who would listen that there should be research on these foods and an exchange of scientists." In 1949 and later in 1958 Dr. Smith published a detailed report of his travels. In late 1958 two eminent Japanese scientists, Dr. Kazuo Shibasaki and Dr. Tokuji Watanabe arrived in Peoria to study traditional soybean foods. Dr. Shibasaki (who later became Professor of Agricultural Chemistry at Tohoku University) worked with Dr. Hesseltine on miso fermentation, and Dr. Watanabe worked with Dr. Smith on tofu.

"Before the year was up I became utterly fascinated with the process of making koji and with the delicious foods that could be made from the lowly soybean. But even broader than these studies on fermented foods was the concept of the solid state fermentation and the enzymes that could be made with this technique. Ever since that year of work with Dr. Shibasaki, I have been interested in fermented foods–not just those used in Japan, but worldwide." Address: NRRC, Peoria, Illinois.

7904. Kanasugi, Goro. 1983. Tempe o Nihon de tsukuru [Making tempeh in Japan]. *Shin Eiyo* (*New Nutrition*) No. 168. Nov. [Jap]
• ***Summary:*** The Natto Association had a meeting where members brought 100 tempeh dishes. A cooking teacher was there and she made 5-6 tempeh dishes from tempeh made by Mr. Kanasugi; they were very popular. The members made their tempeh as follows: First the Association obtained tempeh starter from Indonesia and propagated it in a room at Mr. Kanasugi's plant. They distributed the starter to the members, who then made tempeh and used the tempeh to make dishes. Mr. Kanasugi owns a restaurant named Mame-no-ko ("child of the soybean"), where he serves tempeh in place of meat. For example, diced tempeh is served with vegetables, or made into tempura or karinto. He also makes *okoshi,* a crunchy millet (*awa*) based confection containing 20% tempeh. Ground tempeh is mixed into a ground beef cutlet. The guests like tempeh served in these ways. The Natto Assoc. is thinking of publishing a book on tempeh. A photo shows Goro Kanasugi and various tempeh dishes. Address: Zenkoku Natto Kyodo Kumiai Rengo-kai, Fuku Kaicho.

7905. Leviton, Richard. 1983. Report of soyfoods research and speaking trip to Europe with American Soybean Assoc., Oct. 8–Nov. 15, 1983. Colrain, Massachusetts. 82 p. Unpublished typescript. 28 cm.
• ***Summary:*** Describes visits to or discusses: ASA Belgium (Dennis Blankenship, Rita Batens, Michael Martin), Parma, Euvepro Conference, Parmalat, Guy Coudert and Dr. Sabin president of ONIDOL, Anuga, Jonathan, Société Soy (Bernard Storup, Jean de Preneuf), Le Bol en Bois, Budapest (Hungary), Agrimpex (Hungary), Migros, Sojalade / Die Genossenschafts Tofurei (Verena Krieger), Galactina, Soyana (Walter Daenzer), Alpro (Belgium; Philip Vandemoortele and Christian Daems), Aarhus (Denmark), Witte Wonder, Manna, Cauldron Foods Ltd. (Phillip Marshall, Peter Fagan). Contains a directory of principal people contacted, listed by country. Those not mentioned above are: England: Wild Oats Wholefoods (Mike & Loes Abrahams), British Arkady Co. (Bill Pringle), Sunworld Inc. (David White), Health Foods Manufacturers' Association (Britain). Belgium: ASA, Le Paradoxe (Dota Figuera). China Trading, Ralston Purina (A.G. van der Horn), Premier Foods (Pauline Six Chan). Italy: Cargill SpA (Claudio Rocchietta), Parmalat SpA (Dr. Alberto Rota, Mr. Barilla), ASA (Sergio Monari). France: Robert Bonneterre, Aux Rayons Verts. Germany: European

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Federation of Health Products Manufacturers (Wolfgang Reinsch, Bad Homburg). Hungary: Central Food Research Inst. (Balint Czukor), Agrimpex (Potori Karoly). Denmark: Danish Turnkey Dairies, Det Gronne Kokken. Netherlands: Witte Wonder Products (Niko van Hagen), Manna (Hans den Hoed), Albert Heijn Supermarkets, Dutch Seed Crushers & Oil Processors Assoc. (Dr. C.J.M. Meershoek). Switzerland: Sojalade (Verena Krieger), Soyana (Walter Daenzer). Austria: Tom Brennan.

Bound in the back of the report are photocopies of labels and promotional materials (graphics) from the following companies: Witte Wonder, Société Soy (Cerny), Cauldron Foods, Manna, Dansk Tofu (Sdr. Vinge Gl. Mejeri, 8860 Ulstrup), Sojalade, Bonneterre, Mutter Erde, Genossenschaftstofurei Engel (Dorfplatz, Ottenbach).

Note: This is the earliest document seen (May 2005) that mentions Parmalat in connection with soy.

Migros (p. 18-19) is Switzerland's biggest supermarket / department store; it sells some whole wheat products. Consumers oppose them for their size, but they attract foreign customers. Natural foods people are very political; they are opposed to Third World imports. Migros is expected to start selling tofu soon. Address: 100 Heath Rd., Colrain, Massachusetts 01340. Phone: 413-624-5591.

7906. **Product Name:** [SunSeed Tempeh].
Foreign Name: San Shiido Tenpe.
Manufacturer's Name: Marukin Shokuhin Kogyo (Marukin Foods).
Manufacturer's Address: 380 Yoyasu-machi, Kumamoto-shi 860, Kyushu, Japan.
Date of Introduction: 1983 November.
New Product–Documentation: Label. 1983, undated. 5.5 by 11 inches. Red, white, blue, and orange. Nihon Keizai Shinbun. 1983. Dec. 1. Nebaranai natto.

Leaflet sent by Moto-o Kira. 1984. June. Marukin no tenpe. San Sheedo. Leaflet sent by Moto-o Kira. 1984. June. Kyushu Daizu Shokuhin Kogyo Kumiai (Kyushu Soyfoods Industry Association).

Shurtleff & Aoyagi. 1985. History of Tempeh. p. 73-74.

7907. Shurtleff, William; Aoyagi, Akiko. 1983. Tofu & soymilk production. 2nd ed. Lafayette, California: Soyfoods Center. 344 p. Illust. by Akiko Aoyagi Shurtleff. Index. Nov. 28 cm. [223 ref]
• ***Summary:*** Some information in Chapter 1, Appendix A, and many advertisements have been changed. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

7908. Shurtleff, William; Bennett, Gordon. 1983. Proposal for a Soy Sauce Council of North America. Lafayette, California: Soyfoods Center. 2 p. Unpublished typescript. 28 cm.
• ***Summary:*** Contents: Definition. Purpose. Membership. Funding. Communication, proposals, and voting. Initial activities: Standards, soy sauce press release program. Your participation.

"Definition: The Soy Sauce Council of North America (commonly referred to as the "Soy Sauce Council") is an organization within the Soyfoods Association of North America." This idea was proposed by the authors, a cover letter, questionnaire (containing 10 questions, mostly related to terminology), and 4-page list of potential members were drafted, and a mailing was done to all potential members. Eleven companies responded to the questionnaire and their responses were tabulated. The respondents were: Chico-San, Erewhon, Granum, Kikkoman-Wisconsin, Kikkoman-International, Mandarin Soy Sauce, Mountain Ark, Pure Sales, San-Jirushi, Westbrae, and Mark Fruin.

But Michael Austin and at least one other leader of the Soyfoods Association did not like the idea, so it was never implemented. Address: 1. Director, Soyfoods Center, Lafayette, California; President, Westbrae Natural Foods.

7909. Yasuda, Masaaki. 1983. Tôfuyô to beni kôji [Okinawan fermented tofu (tofuyo) and red koji]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 78(11):839-42. Nov.; 78(12):912-15. Dec. [72 ref. Jap; eng+]
• ***Summary:*** How to eat tofuyo (p. 839): In the *Gyozen Honzo* (*Food Herbal*) (1832, a book about food and medicine) the physician TOKASHIKI Tsûkan Peichin wrote: Tofuyo has a delicious flavor and is good for the stomach. It makes eating a pleasure and is good for various types of sickness" (Ref. #9; Note: This book contains the earliest direct reference seen (June 2012) to tofuyo. Peichin refers to a high-ranking officer). It seems that tofuyo was consumed by the upper classes during the Ryukyu Ocho period in Okinawa and it was also used as a food for recovering after a sickness, and as a side dish. According to old people in Okinawa, Tofuyo was popular among upper class people in Shuri or Naha, during the Taisho period (1912-1926) and at the beginning of the Showa period (1926+). It was eaten with tea by ladies or with millet brandy (*awamori*) by men. But it was too for the regular people to afford. The best way to eat tofuyo is to place one cube of it (2-3 cm on a side) on a small dish and eat it with chopsticks or a toothpick a little bit at a time.

Note on the geography and history of the Ryukyu Islands (also called Luchu or Loochoo Islands): This chain of islands extends in a 600-mile long arc southward from the southern tip of Kyushu (Japan's southernmost main island) down to Taiwan. It includes Okinawa, Sakishima, and the Amami island groups. The population in 1970 was 945,000. The chief town is Naha on Okinawa. History: In 1372 these islands came under the political influence of China. In 1451 they became a tributary to Japan as well as China, and 1609 a Japanese protectorate (part of Satsuma-Han). Thus the islands have long had cultural ties with both Japan

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and China. During Japan's Edo period (1600 to 1868) the kingdom of Ryukyu formally belonged to China, but in fact it was more closely tied with the Satsuma Han, a powerful domain in southern Kyushu. Like China and Japan, Ryukyu had its own emperors and dynasties. The imperial palace was on the island of Okinawa, in the southern city of Shuri. Imperial messengers (*sakuho-shi*) were frequently sent to Okinawa from China and there were cultural exchanges between the two countries. In 1871 the Meiji government in Japan made Ryukyu part of Kagoshima prefecture. In 1872 they made it Ryukyu-Han. After this change, Shôtai (lived 1845-1901) became king of the Ryukyu-Han. In 1879 Ryukyu became an integral part of Japan. Under the Japanese, the Amami group belonged to Kagoshima prefecture and the Okinawa and Sakishima groups constituted Okinawa prefecture. In 1945, after World War II, it was placed under a U.S. military government. In 1966 it received local self-government, and in 1972 was returned to Japan.

History of tofuyo in Okinawa (p. 839-40). The earliest document seen concerning soybeans in Okinawa appeared in 1534 in the *Record of the Messengers to Ryukyu* (*Shi Ryukyu Roku;* Ref. #16). Thereafter soybeans became a widely grown crop (Ref. #17). The *History of Ryukyu* by Ryukyu Opu (1713, Ref. #19) noted that it was not clear at the time when and how tofu came to the country. Although this uncertainty still remains, tofu is thought to have arrived in Ryukyu in the mid-1600s. According to the *Various Records of the Messengers to Ryukyu* written by Osho? (Wang-shu?, Ref. #18) in 1683, tofu was widely available at that time in Okinawan market places. being produced by many companies. It was an important food not only for the local people, but also for the Chinese imperial messengers (Refs. #20-22). Okinawa's tofu was a firm tofu, made in the Chinese way by pressing the soymilk out of the okara before cooking it. This method was also traditionally used in Korea and southern Japan (in Kumamoto–Itsugi-mura, Yamaguchi, Ishikawa, and Koichi prefectures). The method was probably introduced to Okinawa by Chinese imperial messengers or by exchange students, although it could have been brought from Japan by Buddhist monks, who served it in their temple cuisine.

Note: For much more detail about the history of tofu-ru in the Ryukyu islands, please see "History of Fermented Tofu" on Google Books and on the Soyinfo Center website. Address: Dep. of Agricultural Chemistry, University of the Ryukyus.

7910. *Nihon Shokuryo Shinbun* (*Japan Food News*). 1983. Nebaranai nattô. Marukin Shokuhin Sangyo SunSeed. Shôhin-ka ni seikô [The natto that isn't sticky–SunSeed Tempeh from Marukin Foods. They succeeded in commercializing it]. Dec. 1. [Jap]
• ***Summary:*** A photo shows a packet of Marukin SunSeed Tempeh.

7911. *Toyo Shinpo* (*Soyfoods News*). 1983. Izen juyô junchô [The demand is still strong for soymilk in Japan]. Dec. 1. [Jap]
• ***Summary:*** It is said in regular newspapers and food industry newspapers that in 1983 soymilk industry sales reached 35,000 million yen and are expected to grow well in 1984. But Mr. Okayama of the soymilk association thinks the figure was more like 25,000 million yen, and that next year the industry will reach 35,000 million.

Sales in 1980 were 3,000 million yen. In 1981 6,000 million yen. In 1982 12,000 million yen.

Plain soymilk (Jun) showed the best growth, and 200 ml was the most popular size. Large volume packages didn't sell well. In summer dairylike soymilk (*chosei tonyu*) and soymilk drinks (*tonyu inryo*) sold well but as a year-round product plain soymilk (nothing added) was the best seller.

1982 sales up to August were: Kibun 9,500 million yen. Nisshin Seiyu 2,700 million yen. From Sept. 1982 to Sept. 1983 Marusan-Ai almost reached their goal of 6,500 million yen.

7912. *Toyo Shinpo* (*Soyfoods News*). 1983. [Kibun is still the biggest soymilk maker in Japan, with a 45% market share]. Dec. 1. [Jap]

7913. *Toyo Shinpo* (*Soyfoods News*). 1983. [Study of health food buyers in Saitama prefecture, Japan]. Dec. 1. [Jap]
• ***Summary:*** The biggest buyers of health foods in Japan are women in their 50s and 60s; they are more interested in men. Sea vegetables and vinegar are the two health foods used most frequently (both are alkaline foods and are rich in minerals).

When asked which foods they believed are good for their health, these women replied: Sea vegetables 89.3%. Vinegar 87.9%. Yogurt 71.6%. Health tea 34.4%. Prunes 22.6%. Sports drinks 16.0%.

7914. Mikami, Yasuo. 1983. Re: The soymilk market in Japan. Letter to Richard Leviton, Director, Soyfoods Association of North America, Sunrise Farm, Heath Rd., Colrain, MA 01340, Dec. 7. 1 p. Typed, with signature on letterhead. [Eng]
• ***Summary:*** "We thank you for your visit to our stand at the ANUGA in Cologne. You may recall, we discussed the situation of soybean products such as soy milk, soy protein etc in Japan.

"Soy milk market of Japan has been surprisingly expanded during this several years and the total consumption of this year will be one hundred million dollars which is approximately 3 percent of regular cow milk market.

"We are also interested in soy products market in U.S.A.

"We shall be grateful if you will let us have the

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contemporary situation and the forecast of soy products including To Fu [tofu], soy milk and etc. in United States.

"We do hope to hear from you soon, and remain. Very truly yours,..." Address: Marketing Div., Nisshin Oil Mills, Ltd., Shinkawa 1-23-1, Chuo-ku, Tokyo 104, Japan..

7915. Hesseltine, C.W. 1983. Awards from the Emperor of Japan and the Japanese Shoyu Association. Nitrosamines and the safety of shoyu (Interview). Conducted by William Shurtleff of Soyfoods Center, Dec. 16. 1 p. transcript. Address: NRRC, Peoria, Illinois.

7916. Breuls, René F. 1983. Re: Tempeh production by a natto manufacturer in Japan. Letter to Cynthia Bates at Farm Foods, Summertown, Tennessee, Dec. 19. 1 p. Typed, with signature on letterhead.

• ***Summary:*** "The natto producer which we have been supporting and provided with samples so far has produced the best Tempeh in Japan. They have interested the Natto Association to backup their efforts. Dr. Ohta, the advisor to the Natto Association, is receiving small [tempeh] samples from the U.S.A. which he gives to our people to continue their experiments. We do not know from where in the U.S.A. he receives them.

"Our natto producer is now getting a number of natto producers together to start a joint venture tempeh factory. Because of contamination hazards the producers cannot use their own natto factories although the equipment is not so much different.

"In Southern Japan some marketing trials are made to see consumer reactions to this new soy product. It is expected that next year the Tempeh will be launched in Japan with all the necessary advertising and promotion.

"We will supply the spore powder when it will be required in commercial quantities. Please find enclosed our cheque for US$70. Please send us 100 gram spore powder so our people can familiarize themselves with it." Address: Asiatic Company Ltd., C.P.O. Box 1942, Tokyo 100-91, Japan. Phone: (03) 273-0773.

7917. *Toyo Shinpo* (*Soyfoods News*). 1983. Kankoku demo tônyû buumu [Soymilk boom in Korea, too]. Dec. 21. p. 1. [Jap]

7918. Hughes Markets. 1983. Merry Christmas! (Ad). *Los Angeles Times.* Dec. 22. p. I30-I131.

• ***Summary:*** Two full pages of ads. The section titled "Happy holidays from Hughes Markets!" (p. I30) includes: "Fresh Hinode age [deep-fried tofu pouches] 1.5 oz. pkg.–79¢. Kikkoman soy sauce gallon can–$4.39. Kikkoman Aji Mirin, 10 oz. bottle, sweet cooking sauce–$1.59. Hime kuromame amani 6.35 oz. can, Black [soy] beans–95¢."

The section titled "Foods of the Orient holiday specials!" (p. I31) includes: "JFC Kinako 7 oz. pkg. Soy bean flour–69¢... Misuzu koya tofu, 3.5 oz box Wheat cake [sic, Dried frozen tofu]–$1.15." Also: "Hime sushinori dried seaweed, Kikkoman tempura sauce, Su Hiro kombu maki Rolled kelp, Umeya frozen mochi."

7919. Shurtleff, William; Aoyagi, Akiko. 1983. History of soy flour, grits, flakes, and cereal-soy blends. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 128 p. Dec. 24. Unpublished typescript. Available online at www.soyinfocenter.com.

• ***Summary:*** A comprehensive history of the subject. See also: History of Roasted Soy Flour. Contents: Part I: What are soy flour, grits, flakes, and cereal-soy blends? Introduction: Developed in the West, difference from roasted soy flour. Soy flour. Soy grits and flakes. Cereal-soy blends = soy-fortified blended foods. Etymology and nomenclature: German, French, U.S. English, U.S. whole soy flour, British English. Overview of world soy flour history.

Part II: History of soy flour, grits, and cereal-soy blends in Europe and Australia. The early years (1767 to 1899). 1900 to 1919. Between two wars (1920-1939). 1940-1959. 1960 to 1983.

Part III: History of soy flour, grits, flakes, and cereal-soy blends in the USA. The early years (1767-1919). 1920 to 1939. The 1940's and World War II. Meals for Millions and multi-purpose food. 1960 to 1980's. Food for Peace Program. Low cost extrusion cookers. Soy flour, grits, and flakes in America.

Part IV: History of soy flour, grits, and cereal-soy blends in Canada.

Part V: History of soy flour, grits and cereal-soy blends in Asia. Introduction. Bangladesh. China. India. Indonesia. Japan. Korea. Philippines. Sri Lanka (Thriposha). Taiwan. Thailand. Vietnam.

Part VI: History of soy flour, grits, and cereal-soy blends in Latin America. Introduction. Bolivia. Brazil. Chile. Colombia. Costa Rica. Ecuador. Guatemala. Guyana. Mexico. Paraguay. Peru. Venezuela.

Part VII: History of soy flour, grits, and cereal-soy blends in Africa. Introduction. Ethiopia. Ghana. Kenya. Nigeria. Rwanda and Burundi. South Africa. Tanzania. Uganda. Zimbabwe.

Part VIII: History of soy flour, grits and cereal-soy blends in the Middle East.

Note: This is the earliest English-language document seen (Nov. 2013) with the term "cereal-soy blends" in the title. Address: Lafayette, California. Phone: 415-283-2991.

7920. *SoyaScan Notes.* 1983. Soymilk and dairy milk prices in California, December 1983 (Overview). Dec. 28. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** In Lafayette, California, whole fluid cow's milk retails for $0.39/pint (1 pint = 16 ounces) and nonfat cow's milk retails for about $0.43/quart. Milk is the least

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expensive popular beverage, less expensive than Coca-Cola, beer, or orange juice. Prices of unflavored fluid soymilks are as follows: Vitasoy, 8.4 oz. Tetra Brik sold to the Asian-American market $0.35 (which is the equivalent of $0.67 per pint), Quong Hop Soy Fresh 10.16 oz. Pure Pak carton $0.59 ($0.89/pint), Wildwood Yosoy pint plastic bottle $1.05, Brightsong Honey-Vanilla pint plastic bottle $1.08, San-J To-Neu 6.76 oz. Tetra Brik $0.74 ($1.75/pint), Edensoy 6.0 oz. retort pouch $0.74 ($1.97/pint). Vitasoy, the least expensive soymilk, is 1.72 times as expensive as cow's milk. The average price of the pint equivalents of all 6 U.S. soymilk products mentioned above is $1.24 a pint (which would be $2.48/quart). Thus the average soymilk in a typical pack is 3.53 times as expensive as dairy milk per unit volume.

7921. Hughes Markets. 1983. Happy New Year! (Ad). *Los Angeles Times.* Dec. 29. p. J24-25.

• ***Summary:*** The section titled "Foods of the Orient holiday specials" includes: Kikkoman soy sauce, gallon can–$4.25. Fresh Hinode age, 1.8 oz.–79¢. Kikkoman 10 oz. JFC soy bean flour 7 oz. Kinako–69¢. Kikkoman Tempura Sauce 10 oz bottle–$1.09. Hime Kuromame amani, Black [soy] beans–95¢. Misuzu Koya Dofu 3.5 oz. box Wheat cake [sic, Dried frozen tofu]–$1.15.

Also includes: Frozen Umeya mochi. Shirakiku bamboo tips. Ozeki sake. New crop Kokuho rice. Hime sushinori [Sushi nori] Dried seaweed. Kikkoman Aji mirin–Sweet cooking sake. Mitsukan Su–Rice vinegar. Miyako kizami shoga–Sliced pickled ginger. Miyako shiitake–Dried mushrooms. Tamandi Sushipoko–Sushi seasoning. Kezuka kampyo [kanpyo]–Dried gourd strip. Suhiro Kumsu Maki–Rolled kelp [konbu].

7922. *SoyaScan Notes.* 1983. Chronology of soybeans, soyfoods and natural foods in the United States 1983 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Jan. 16. Larry Needleman decides to sell Bean Machines. Looking for a buyer. Jan. 24. "Legume, Company Finds Niche Selling Frozen Foods Made with Tofu, published by The Wall Street Journal.

Feb. *Soyfoods* magazine No. 8 published by Richard Leviton. Blue cover, 5,000 copies

Feb. 6-8. Sixteen soyfoods companies exhibit at the Natural Foods Expo. in Anaheim, California. A new trade association named Soyfoods Association of America (SAA) is formed; it is basically a restructured version of the original Soyfoods Association of North America, which was founded in July 1978 and which now ceases to be active. SAA elects a new board of directors; Michael Austin is chosen new Executive Director and Gary Barat of Legume becomes new President. Fourteen companies pledge $12,000. Headquarters established in New York City.

Feb. 7. The First Great Tofu Burger, a dry mix, made in Oakland, introduced at Anaheim Natural Foods Expo.

Feb. 18. Wm. Shurtleff has idea for forming a Soy Sauce Council to help encourage soy sauce companies to join Soyfoods Association, develop soy sauce terminology and standards, and eliminate mislabeling.

Feb. Jack's Beanstalk, innovative tofu company in Salt Lake City, goes out of business.

March 10. *Soyfoods Industry and Market: Directory and Databook 1983* published by Soyfoods Center, accompanied by glossy flyer and catalog of professional publications and services.

March 10. *Tempeh Primer,* by Juel Andersen and Robin Clute, published.

March 14. Connecticut Agricultural Experiment Station, in Bulletin 810 "Quality of Tofu and Other Soy Products," reports high bacterial and coliform counts. A virtual expose, revealing the tofu industry's erratic quality control, it gets wide media coverage and hurts sales of New England and New York tofu companies.

March. Hinode Tofu Co. starts major tofu ad and coupon campaign, with full-page ads in four national magazines. Most extensive national publicity ever done for tofu. Triggers lawsuit from a rice company over the Hinode brand, with which Hinode Tofu Co. is subsequently forced to part.

April 27-30. Six soyfoods companies exhibit at Whole Life Expo in San Francisco, as part of Soyfoods Association's booth. Shurtleff presents a speech and color slide show.

April. Hartz Seed Co. is purchased by Monsanto.

May. *The Au Naturel Tofu Manual,* by Chloe & Abraham Fox self-published in Canada. Vol. 1 is *Tofu Recipes for Families.* Vol. 2 is *Modern Jewish Tofu Cooking.*

May 3. Michael Austin mails out Soyfoods Association Charter Member letter. By year's end $18,000 in membership fees had been raised.

May 4. Richard Leviton decides to move to California.

May 8-11. Hinode Tofu Co. exhibits five flavors of Tofu Parfait at the prestigious and influential Food Marketing Institute convention in Chicago, a major national supermarket convention, attended by 20,000.

May 9. Dr. Hwa L. Wang of USDA NRRC speaks on "Tofu and Tempeh as Potential Protein Sources in the Western Diet" at the American Oil Chemists' Society symposium on "Potential New Protein Sources" in Chicago.

May 16. Quong Hop & Co. introduces the first Soy Deli cooler display case to Raley's supermarkets in Reno and Sacramento. In July they introduce the idea to Safeway supermarkets in California. By August there are Soy Delis in ten Safeway supermarkets in the San Francisco Bay Area.

May 18. The New York Times article on "Bacteria in Soy Products" as a follow-up on the Connecticut tofu contamination report.

May 24. Wm. Shurtleff goes to China for three weeks to study soyfoods, sponsored by Danish Turnkey Dairies;

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the first trip for this purpose since Dr. A.K. Smith of the USDA went there in 1949. Shurtleff writes 75-page report on *Soybeans and Soyfoods in China: 1949-83.* After China, Wm. and Akiko Shurtleff spend 3 weeks studying the soymilk industry and market in Japan.

May 31. Leviton and Wang speak on the soyfoods industry at Iowa State University conference on grains and legumes.

June. Worthington Foods introduces Tofu Garden Patties, developed for the health food market as part of a larger new line of natural food products, all sold under the Natural Touch brand. This is a new trend for the company and they commit money to promoting it. In 1984 they launch Okara Patties (which contain okara as the 4th ingredient).

June. *Quantity Tofu Recipes for Institutions & Restaurants,* by Gary Landgrebe published by Soyfoods magazine and Fresh Press.

June. *The Magic of Tofu,* by Jane O'Brien of Ireland published by Thorsons in the UK.

June. *Tofu: Not Just for the Health of It,* by Jana H. Crutchfield self-published.

June. *Handbook of Indigenous Fermented Foods,* edited by Keith H. Steinkraus, published by Marcel Dekker. Extensive original material on traditional soyfoods. It soon becomes a classic.

June. *Soyfoods* magazine No. 9 published, 7,000 copies. *Soyfoods Newsletter* published in new typeset, 4-page format with new design.

June. Torigoe Seifun, Japan's fifth-largest flour miller, starts production of tempeh. This is the earliest known commercial tempeh ever made in Japan.

July 1. Quong Hop & Co. purchases Pacific Tempeh Co.

July. INTSOY publishes *Proceedings of the First China/USA Soybean Symposium,* held July 1982 at the University of Illinois.

July 3-Aug. 22. Richard Leviton in England, lectures on soyfoods in London and Leicester, and does some soyfoods research.

July 25. Soyfoods Association meeting in Denver. Tom Timmins, president of Tomsun Foods Inc. (one of the companies seriously affected by negative publicity on tofu quality) is asked to be head of the Soyfoods Association's Standards Committee, and to appoint people to work with him on the development of standards, especially tofu standards. In October he sends a 4-page survey letter concerning soyfoods standards to the 18-person Soyfoods Association Standards Committee that he has appointed.

July 28-Aug. 2. Second US/China Soybean Research Symposium, held in Jilin, China

July. NNFA show in Denver. Eden Foods surprises the natural foods industry by launching designed-for-America Edensoy in plain and carob flavors. Made in Japan by Marusan-Ai and exported by Muso, it is packed in a 6-ounce retort pouch. San-J's To-Neu brand soymilk is also debuted in Tetra Brik cartons.

Eden Foods is the first Caucasian-American company to import soymilk, and their gamble soon pays off; sales skyrocket, sparked by an extensive magazine advertising campaign. Between Sept. and Dec. 1983 over 1 million packs are sold. A host of competitors rush to follow Eden's lead... and many of them go to Muso. Eden objects.

July 31. Fifth Anniversary of the founding of the Soyfoods Association of North America.

Late July. Hot, dry summer weather heats up the price of soybeans from $6/bu to over $9.50/bu in August and September, falling back to $8 in December.

Aug. 15. *Time* magazine article on stylish ice creams has a paragraph on Tofutti soy ice cream.

Aug. 15. Delegation of four soyfoods experts from People's Republic of China spends 5 hours at The Soyfoods Center. First stop of the first Chinese soyfoods team to visit the USA.

Aug. 15. Soyfoods Center makes the first photocopy of the entire Log of the Dorsett-Morse Expedition to East Asia, 1929-31. 6,170 pages. The only original is owned by the American Soybean Assoc. in St. Louis.

Aug. Farm Foods serves Ice Bean soymilk ice cream at the American Soybean Association convention in Nashville, Tennessee.

Sept. Legume in New Jersey, in their second public stock offering in 15 months, raises an additional $400,000 ($300,000 net).

Sept. Continental Soyfoods, run by Pat Aylward in Minneapolis, goes out of business.

Sept. 9. Leviton leaves Massachusetts, moves Soyfoods magazine to Encinitas, California. But he decides to leave there a week later.

Sept. 21. New Ten Speed Press edition of *The Book of Miso,* by Shurtleff and Aoyagi published. Extensively revised. Shows miso consumption in U.S. has increased 300% since 1975.

Sept. 25. Open House at new headquarters of Soyfoods Center for 30 people, including Nancy Dailey, who is writing a major story on soybeans for *National Geographic* magazine, and for Richard Leviton, newly arrived in California. Shurtleff shows color slides of soyfoods in China.

Sept. 26–Oct. 1. Symposium on "Soybean in Tropical and Subtropical Cropping Systems" held at Tsukuba, Japan. About 200 people attended. Proceedings were published in 1985.

Sept. 28. Soyfoods Center buys its first computer and begins computerization, which soon leads to development of the world's three largest computerized databases focusing on soyfoods and the soybean industry–from which this chronology is compiled.

7923. *SoyaScan Notes.* 1983. Chronology of soybeans, soyfoods and natural foods in the United States 1983

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(Continued) (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued. Oct. 9 to Nov. 14. Leviton travels to Europe as a consultant for the American Soybean Association. Gives six speeches on soyfoods in Italy, Belgium, Denmark, France, Netherlands, and Hungary. The 50-minute speech in Italy is about the soyfoods industry in the USA, presented to 150 members of EUVEPRO, the European Vegetable Protein Association. Leviton studies soyfoods throughout Europe, the first representative of the American soyfoods movement to do so. He reports that virtually all tofu in Europe is vacuum packaged. On Oct. 28, ASA Belgium Office expresses interest in sponsoring a European Soyfoods Conference and a European Soyfoods Newsletter. Leviton writes a 56-page report on the trip.

Oct. New England Soy Dairy starts to sell its tofu under the Tomsun brand.

Oct. The world's first spray-dried tofu is introduced by Clofine Dairy & Food Products of Linwood, New Jersey. St. Peter Creamery first began spray-drying soymilk powder in late 1984, and tofu in the summer of 1985, under the Oberg patent.

Oct. Kikkoman: Company, Clan, and Community (358 p.) by W. Mark Fruin published by Harvard University Press as part of their series Studies in Business History.

Oct. Major reorganization of The Farm in Tennessee. It is no longer a cooperative. Every participant must pay his/her own way. All workers earn wages. The soy dairy sells its tofu and soymilk to Farm residents. Farm Foods becomes an independent, for-profit corporation.

Nov. Hymowitz and Harlan's "The Introduction of the Soybean to North America by Samuel Bowen in 1765" published in Economic Botany. This brilliant piece of historical research pushes the introduction date back 39 years, and shows that by the late 1760s Bowen, in Georgia, was making soy sauce and exporting it to England. It also credits Benjamin Franklin with the earliest known reference by an American to tofu, in 1770.

Nov. 11. Wm. Shurtleff and Gordon Bennett (Westbrae Natural Foods) mail out a packet including proposed U.S. soy sauce standards, English translation of Japanese Shoyu Standards, and proposal for formation of a Soy Sauce Council to 60 companies connected with soy sauce in the USA.

Nov. Soyfoods Assoc. officers meet with David Mintz of Tofu Time (maker of Tofutti) asking him to either use tofu as an ingredient in Tofutti or drop the term "tofu" from his product name and stop stating or insinuating that his product contains tofu.

Nov. 11. William Shurtleff writes a strongly worded letter to Mintz threatening to report the matter to the Securities and Exchange Commission and the FDA if Mintz fails to stop deceptive practices. Mintz quickly re-adds tofu to Tofutti.

Nov. 19. House Shokuhin Kogyo, a major Japanese food company, invests $2.5 million in Hinode Tofu Co. in Los Angeles as part of a joint venture to expand tofu production.

Nov. 25. Dr. Clifford W. Hesseltine of the USDA NRRC receives the award of the Third Class of the Order of the Rising Sun from the Emperor of Japan in recognition of the meritorious services he has rendered: proving the safety of Japan's traditional fermented foods, training Japanese scientists, and promoting technical cooperation in the field of food fermentation between the United States and Japan.

Dec. New England Soy Dairy, in a half-page article in *Inc.* magazine, is named as one of America's 500 fastest growing small private companies.

Dec. Inari Trading Co. in Michigan develops a delicious Christmas Soynut Sampler with seven flavors of Super Soys, including yogurt-coated, carob-coated, and butter-toffee. Runs full page color ad in Soybean Digest.

Dec. *International Bibliography of Soybeans* (3 volumes, 2,500 pages) published in Brazil. 19,571 references total, under 75 subject headings, all published during 1970-1982. Volume III contains author and subject indexes. Mostly soybean agronomy, but 1,584 references on soyfoods.

Dec. 1. The title of *Soyfoods Monthly* is changed to *Soyfoods Newsletter.*

Dec. 5-7. Symposium on Soybean Utilization held at Ibadan, Nigeria, Sponsored by IITA. First event of this type in Africa.

Dec. 8. Tofu Time Inc. in New York raises $3.2 million ($2.4 million net) in their first public stock offering, to finance national marketing of Tofutti soy-based ice cream.

Dec. 10. Doug Fiske becomes majority owner (55%) of *Soyfoods* magazine, Leviton owns 45%. Fiske will take over most publishing responsibilities. Leviton moves to San Francisco Bay Area.

Dec. Soyastern starts to make tofu in West Germany. By 1987 they are the country's largest tofu manufacturer, making 4,000 kg/week.

* *Eurosoya,* the annual publication of the European Cooperative Network on Soybean, begins.

* Soymilk production peaks in Japan at 116,724 kl. By 1986 it has fallen to 43,392 kl, which is only 37% of the peak.

1983 New Trends:

New Capital and Expertise are Flowing into the Soyfoods Industry, leading to many exciting new ideas and products and marketing programs. A dozen or so large companies with nationwide marketing are emerging.

New Emphasis on Soyfoods Marketing, now that production techniques have been fairly well mastered, is seen throughout the industry, and is reflected in new editorial and advertising policies of *Soyfoods* magazine.

Brand-Name Promotion by larger companies is surpassing generic or commodity promotion.

Stylish Second-Generation Products, prepared

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convenience soyfoods, are appearing with better product quality, better marketing and promotional programs, and better packaging and graphics. These are the fastest growing component of the soyfoods industry.

Extensive Professional Advertising of Soyfoods in natural and health food consumer magazines, as by Legume, Eden Foods, San-J, Hinode, Edward & Sons, and Pure & Simple. Each of these companies run very attractive, professional ads. Brightsong Light Foods has top graphics for a small company.

Exhibits at National Trade Shows are now a matter of course: The Natural Food Merchandiser show, followed by the National Nutritional Foods Association (NNFA) show are most popular.

Tofu Market Control is Increasingly Concentrated in the hands of large manufacturers, who distribute nationally and have professional marketing. Most companies are getting much more professional, but many small tofu companies are going out of business. The total number of companies is stabilizing.

Soymilk Makes its First Big Splash in the American Caucasian Market, led by Eden Foods' Edensoy. Vitasoy has big plans for early 1984. Vitasoy had the largest total imports in 1983, but mostly sold to the Asian-American market. Large new soymilk plants are planned to open in 1985.

East Asian Soymilk Sales are Skyrocketing, leading to a general soyfoods Renaissance, and reevaluation of traditional soyfoods staples. Production of soymilk in Japan tops 100,000 metric tons (tones) for the first time, reaching 116,724 tonnes, up 71% over last year. The per capita consumption of soybeans in Japan is 5.8 kg/year, up 3.6% from last year.

Soy Ice Cream is becoming fashionable. Made with tofu, soymilk, and/or isolated soy protein, it is emerging as a major way that Americans are discovering soyfoods.

Tofu industry is vulnerable to sanitation and credibility problems as vividly demonstrated by the Connecticut quality / contamination report in March and subsequent adverse publicity, and by a Tofutti mislabeling incident in November. The industry urgently needs standards and better sanitation. Tofu souring and spoilage is the tofu industry's number one problem.

The Soy Deli Concept: Defunct or Ready for Takeoff? No new openings and some closings. But more and more natural food and vegetarian restaurants are starting to use soyfoods, and Chinese and Japanese restaurants are increasing their traditional use. In Soyfoods No. 9, Leviton calculated that as much as 16% of all tofu made in the U.S. is being served in restaurants, but this figure is probably far too high. Most promising, plans by Tofu Time/Tofutti to open a chain of natural, fast food restaurants featuring tofu, soymilk and other soyfoods could bring the Soy Deli concept new life and widespread publicity as a healthful alternative to McDonald's, Burger King, and the like.

European Soyfoods Industry is Flourishing, with lots of innovation. Large producers of tofu and tempeh are emerging in the Netherlands.

Tempeh is Starting to Take Off in Japan and interest is rising rapidly: 13 articles were published on tempeh in Japan this year, followed by 20 in both 1984 and 1986.

7924. Kamata, Yoshiro; Kato, Takehiro; Yamauchi, Fumio. 1983. [Denaturation of protein in steamed soybeans]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 30(12):704-08. [Jap; eng]*

7925. Tsuchiya, Kunio. 1983. Tenpe Gannen no hassoku o tataete. Daizu shokuhin no kakumeiteki yakuwari [In praise of the first year of tempeh in Japan. The revolutionary role of soyfoods]. *Daizu Geppo* (*Soybean Monthly News*). Dec. p. 24-30. [Jap]

7926. **Product Name:** [Furusato Miso].
Foreign Name: Furusato Miso.
Manufacturer's Name: American Biofoods, Inc.
Manufacturer's Address: P.O. Box 62, Hazlet, NJ 07730.
Date of Introduction: 1983.
Ingredients: Water, soybeans, rice, salt.
Wt/Vol., Packaging, Price: 16 oz.
How Stored: Refrigerated.
New Product–Documentation: Label. 1983, undated. 5.25 by 6 inches. Plastic. Red, green, yellow and white. Recipes for miso soup and dressing. "No chemical preservatives added."

7927. **Product Name:** [Asahi Kôya-dofu (Dried-Frozen Tofu)].
Foreign Name: Asahi Kôya-dofu.
Manufacturer's Name: Asahi Shokuhin K.K.
Manufacturer's Address: Nagano-ken, Japan.
Date of Introduction: 1983.
How Stored: Shelf stable.
New Product–Documentation: This colorful Japanese-language label was purchased in Japan in mid-1983. It is orange, red, yellow and black on white. On the front panel, a color photo shows a prepared dish containing two pieces of dried frozen tofu, 5 snow peas, a mushroom, and a shrimp. Logo: JAS seal of approval.

7928. Daizu Fureeku No. 1: Gyokai no machinozonde ita kakumei-teki genryô desu [Soy flake Number 1: The revolutionary ingredient that the industry has long been waiting for (Leaflet)]. 1983. Hokkaido, Japan. 4 p. [Jap]
• ***Summary:*** Describes whole (non-defatted) soybean flakes that are used to make tofu in Japan. Stored under the proper conditions (in a cool, dry, dark place), they are guaranteed to keep their quality for 10 months. They are packaged in quantities of 15 kg and 30 kg (33 or 66 lb). An annotated

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flow sheet of the process for using the flakes to make tofu is given.

A table shows that from 30 kg of Soy Flake No. 1, a tofu maker can obtain 400 cakes (400 gm each) of regular tofu, compared with only 250 cakes if whole soybeans were used. This implies that the flakes give a 60% higher yield of tofu per unit weight than whole soybeans.

The address of the factory is Aza-Toyoni, Hirô-machi, Hirô-gun, Hokkaido.

7929. Eden Foods, Inc. 1983. Process for making soy milk [in Japan, by Marusan] (Leaflet). Clinton, Michigan. 2 panels each side. Each panel: 28 x 21.6 cm. Undated.
• ***Summary:*** Printed with dark green ink on glossy white paper. The purpose of this very interesting leaflet is to give a detailed technical description of the process for making and packaging (in retort pouches) Edensoy soymilk, and to give a floor plan showing the different pieces of equipment used and their location in the building. We applaud Eden Foods for their openness in disclosing exactly how their soymilk is made and packaged.

"Process for making soy milk (the numbers refer to the machines on the diagram): "Cleaned soybeans are fed through a cyclone chamber (105) removing loose skins and hulls. Then the beans are mechanically compressed (crushed slightly) to loosen the skins away from the rest of the bean (106). Next into the enzyme invalidator (106) where they are slowly augured through and cooked with steam, which enters the chamber at 266 ºF, and pressure, which is maintained at 57 lb/sq. in. (201).

"Steam is continuously being added and removed. This releases and destroys enzymes that cause undesirable smells. Enzymes are carried away in the spent steam. The soybeans are in this enzyme invalidator (201) for 30 seconds. From here they go into a grinder (203) and are mixed with hot water (80-85%) and then pumped into the ultrimizer colloid mill (205) where the particle size is reduced to pass through a 200 mesh screen. This is then pumped into a centrifuge (207), which removes the fiber down to about 11.5% solids. This liquid is then decanted in the receiving tank (208) and then deaerated by vacuum in the deaerating tank (209). Soy liquid is now moved to agitating blending tanks (211), and then pumped to seasoning tanks (213), where other ingredients are added. The liquid is now between 122ºF and 140ºF. It is now moved to the first homogenizer (216) and then back to the seasoning tanks (211).

"From there it goes into pasteurizing and smell removing (218) where it is heated with steam and pasteurized at between 266ºF and 275ºF. It is now moved to the high pressure homogenizer (219) and homogenized at 194ºF and 220 lb/sq. inch. The liquid is now passed through a plate cooler (220) where its temperature is reduced to 35 ºF and stored in aseptic tanks (221).

"CIP unit (222) is used to flush and clean the system.

"Once moisture has been introduced to the beans, the only surface that the mash or liquid comes in contact with is SUS 316L stainless steel.

"The soy milk has a specific gravity of between 1.03 and 1.04. The percent of solids is controlled by testing the soy milk after production, then adding the other ingredients to bring it up to standard.

"The soy liquid is tested for solids, pH, Brix: first, after mixing with other ingredients, second, just before packaging, and third, after it comes out of the retort."

"Process for packaging and retort sterilization of soy milk." The same kind of detailed description is given. "The filling machine is a Bosch Form, Fill, and Seal Machine, model number BMR-200ST. It is in a separate packaging room.

"The film used is an RF-P high temperature laminate manufactured by the Toyo Seikan Kaisha Co., Ltd. of Japan." Address: 701 Tecumseh Rd., Clinton, Michigan 49236. Phone: (517) 456-7424.

7930. Hinode Tofu Co. 1983. Tofu: The nutritious ingredient of 1,001 delicious meals (Leaflet). 526 Stanford Ave., Los Angeles, CA 90013. 1 p. Single sided. 28 cm. Also run in numerous magazines, with a coupon. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center.
• ***Summary:*** "With no taste of its own, it tastes like whatever you mix it with. It can be sweet as apples, hot as chili, or tart as lemons. Colorless, it takes on the color of other ingredients. Red with tomato. Green with spinach. You can make it crumbly, chewy, or silky smooth in texture, depending on preparation. It is low in fat and calories. It has no cholesterol. It's a low-cost source of high-quality protein." Address: Los Angeles, California.

7931. Hinode Tofu Co. 1983. Fitness food. High in protein; low in saturated fats, calories and carbohydrates; devoid of cholesterol: Hinode Tofu is the nutritious ingredient of 1,001 delicious meals (Leaflet). Los Angeles, CA 90013. 1 p. Single sided. 28 cm. Color. Run in numerous magazines, with a coupon.
• ***Summary:*** "High in protein, low in saturated fats, calories and carbohydrates, devoid of cholesterol: Hinode Tofu is the nutritious ingredient of 1,001 delicious meals." Address: 526 Stanford Ave., Los Angeles, CA 90013.

7932. **Product Name:** [Soy Flour, Soy Protein Concentrates, Soy Protein Isolates].
Manufacturer's Name: Hohnen Oil Co. Ltd.
Manufacturer's Address: Mitsui Life Insurance Building, 1-2-3 Ohtemachi, Chiyoda-ku, Tokyo, Japan. Plants at Shimizu & Kobe.
Date of Introduction: 1983.
New Product–Documentation: Soya Bluebook. 1983. p. 6.

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7933. Kasubuchi, Hiroaki. 1983. Kôyadôfu no rekishi to seihô [History and method of producing dried-frozen tofu]. *Shoku no Kagaku* (*Food Science Journal*) No. 72. p. 98-101. [Jap]
• ***Summary:*** Contains numerous photos. Address: Shiga-ken-ritsu Nagahama Nogyo Koko Kyoju.

7934. Kibun Co. Ltd. 1983. Protein-packed alkaline superdrink (Soymilk) (Poster). Tokyo, Japan. 1 p. 26 x 20 cm. Color. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center. [Eng]
• ***Summary:*** See next page. "Kibun Soymilk is chock-full of the pure vegetable protein of the soybean, the most nutritious legume available to man. Drink sustaining Kibun Soymilk each morning and start the day in a truly healthy style."

A color photo shows a glass of soymilk on a glass table in front of a pilots cap and a folded newspaper. In the lower right corner is a carton of Kibun soymilk. Address: Japan.

7935. **Product Name:** [Soymilk: Lactic Fermented].
Foreign Name: Tônyû, nyûsan hakkô.
Manufacturer's Name: Kibun.
Manufacturer's Address: Tokyo, Japan.
Date of Introduction: 1983.
Wt/Vol., Packaging, Price: Tetra Brik aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Label, Tetra Brik carton. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center.

7936. Komatsuzaki, T.; Ohkuro, I.; Kuriyama, S.; Kawashima, M. 1983. [Influence of carrageenan on the non-specifically immunizing effects of natto bacilli]. *Igaku to Seibutsugaku* (*Medicine and Biology*) 106:163-67. [Jap]*

7937. **Product Name:** [Ganmo, Tofuburger]
Foreign Name: Ganmo, Tofuburger.
Manufacturer's Name: La Soyarie.
Manufacturer's Address: 25 rue St. Etienee, Hull, QUE, J8X 1H5, Canada.
Date of Introduction: 1983.
Ingredients: Ganmo: Tofu, carrots, onions, sunflower seeds, yam, sea salt. Deep-fried in sunflower oil. Tofuburger: Same + herbs and spices
How Stored: Refrigerated.
New Product–Documentation: Label. 1983. 3 patties per package.

7938. Morinaga. 1983. The supermarket profit makers. Morinaga ever-fresh Angel silken tofu. The favorite new food for Western tastes (Poster). Morinaga Milk Industry Co., Ltd. 5-33-1 Shiba, Minato-ku, Tokyo 108 Japan. 2 p. Color. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center.

7939. **Product Name:** [Nisshin Soymilk (Fruit {Prune-Apple}, or Matcha {Powdered Green Tea})].
Manufacturer's Name: Nisshin Oil Mills, Ltd. (Nisshin Seiyu K.K.).
Manufacturer's Address: Shinkawa 1-23-1, Chuo-ku, Tokyo, Japan.
Date of Introduction: 1983.
Wt/Vol., Packaging, Price: 200 ml Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Labels, Tetra Brik carton, 200 ml. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center. Soya Bluebook. 1984. p. 62.

7940. Nisshin Oil Mills, Ltd. 1983. The Nisshin Oil Mills, Ltd. Nisshin, Shinkawa 1-23-1, Chuo-ku, Tokyo 104, Japan. 12 p. Manufacturer's catalog. [Eng]

7941. Obara, Tetsujiro. 1983. "Daizu Kaihatsu" hakkan 15 shûnen o shuku toshite [Celebration of the 15th anniversary of the publication of *Soybean Development*]. *Shokuhin Kaihatsu* (*Up-to-Date Food Processing*) 18(6):23-31. [Jap]
• ***Summary:*** A nice, large photo (p. 23) shows Dr. Obara. On pages 24-31 are ½-page comments by 17 Japanese soy-industry leaders (with a small, round photo of each) concerning this 15th anniversary. Among those featured are Yoshiko Kojima and Kanji Tsuchiya (who also discusses the history of his work with soymilk in Japan). Address: Tokyo Kyoiku Daigaku Meiyo Kyôju. Tokyo Nôgyô Daigaku Kyakuin Kyôju.

7942. Okubo, Kazuyoshi; Furabayashi, Y.; Takahashi, M. 1983. Tônyû no haitôtai seibun ni motozuita teimisei ni tsuite [Improvement of the soymilk and tofu process based on the behavior of undesirable flavor components such as glycosides]. *Shokuhin Kaihatsu* (*Up-to-Date Food Processing*) 18(6):16-21. [14 ref. Jap]
• ***Summary:*** Describes methods for improving the flavor of soymilk and tofu based on the elimination of undesirable taste components, such as glycosides. The isoflavone aglucones have a much more astringent and bitter taste than the isoflavone glucosides. Address: Yamagata Daigaku Kyoiku Gakubu, Shokuhin Eiyogaku Kenkyu Shitsu.

7943. Shindo, E. 1983. [Soy sauce imported from Hong Kong]. *Nihon Shoyu Kenkyujo Zasshi* (*J. of the Japan Soy Sauce Research Inst.*) 9(2):71-72. [Jap]*
• ***Summary:*** The general composition of five brands of soy sauce imported from Hong Kong, retailing in Japan for 180-350 yen/liter were compared with Kikkoman soy sauce (which retailed in Japan for 500-700 yen/liter). Address: Japan Soy Sauce Research Inst., Tokyo, Japan.

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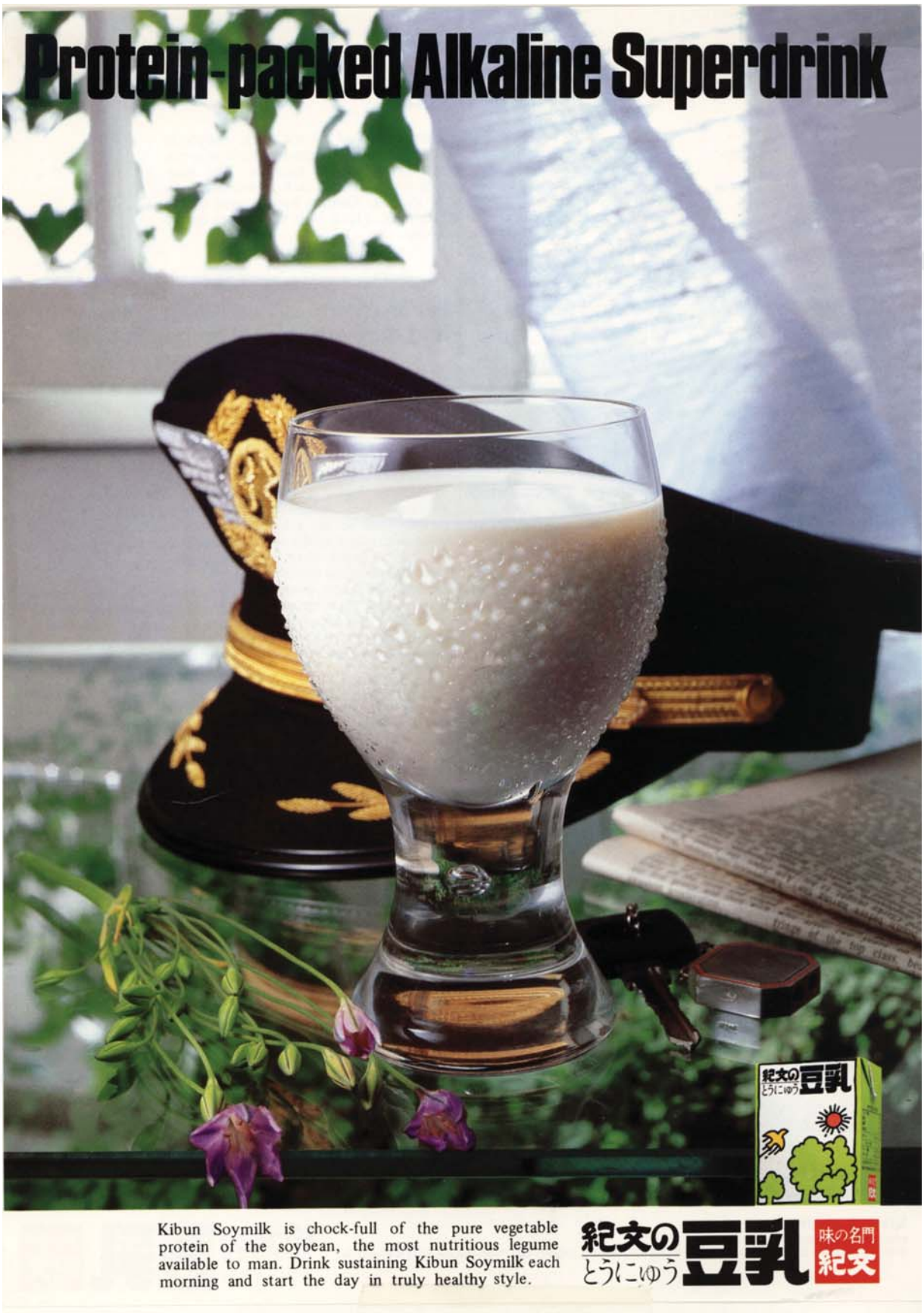

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7944. **Product Name:** [Soy–Cow's Milk–Wakame Extract Blend].
Foreign Name: Tônyû 60% + Gyûnyû 30%–Wakame Ekisu 10%.
Manufacturer's Name: Sujiyata Payaki.
Manufacturer's Address: Nagoya, Japan.
Date of Introduction: 1983.
How Stored: Refrigerated.
New Product–Documentation: This colorful Japanese-language label was purchased in Japan in mid-1983. It is blue, green, red, and yellow on white. On the front panel is the yellow silhouette of a boy (Urashima Taro) riding on a sea turtle.

7945. **Product Name:** [Tempeh Natto (actually this is tempeh)].
Foreign Name: Tenpe Nattô.
Manufacturer's Name: Takashin Shokuhin (Takashin Foods).
Manufacturer's Address: Tachibana 1-29-2, Sumida-ku, Tokyo 131, Japan. Phone: 613-5311.
Date of Introduction: 1983.
How Stored: Refrigerated.
New Product–Documentation: Letter, Label and leaflet sent by Mr. Mitsuaki Yamanaka of Takashin. 1984. May.
Shurtleff & Aoyagi. 1985. History of Tempeh. p. 75.

7946. **Product Name:** [Soymilk].
Manufacturer's Name: Tamura Kasei.
Manufacturer's Address: Japan.
Date of Introduction: 1983.
New Product–Documentation: Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 63-64.

7947. Tsumura, ? 1983. Shinpen tôfu hyakuchin-jo [Introduction to a new edition of the *Tofu Hyakuchin*]. *Hachiju Nendai* (*The 1980s*) No. 14. p. 26-29. [Jap]
• ***Summary:*** The title of the *Tofu Hyakuchin*, Japan's most famous early tofu cookbook, may be translated "One hundred rare and favorite tofu recipes."

7948. Tsumura, ? 1983. Mame no hanashi arekore [Assorted stories about beans]. *Hachiju Nendai* (*The 1980s*) No. 14. p. 30-31. [Jap]
• ***Summary:*** In Japanese culture, beans are considered to be powerful in getting rid of evil and in bringing good health–as in the *mame-maki* ceremony of throwing roasted soybeans at Setsubun. Black soybeans are always included in dishes served at New Years, and beans are generally a part of festive occasions and meals. Part of the reason for this has to do with the word "mame," which can mean either bean or "diligent." Thus, "Mame ni hataraku" means to work diligently. When people visit a sick person in Japan, that person usually gives the visitors rice cooked with azuki beans (*o-sekihan*); the beans and the colors symbolize both celebration and regaining health (so one can work diligently).

During the Japanese New Year, a decoration of pine boughs, bamboo, and plum branches (named *kado-matsu*) is set at the front gate of each house to symbolize the hope that the New Year will bring vigor and long life, strength, steadfastness, and virtue. Stalks of the soybean plant are sometimes also included in the *kado-matsu.*

7949. Tsumura, ? 1983. Shinpen tôfu hyakuchin [A new edition of the *Tofu Hyakuchin*]. *Hachiju Nendai* (*The 1980s*) No. 15. p. 72-73; No. 16. p. 52-53, 68-71; No. 18. p. 70-71. No. 19. p. 66-67; No. 20. p. 72-73. [Jap]

7950. Tsuruta, Shizuka. 1983. Kodomo-tachi no tsutaeyô, wasurekaketa kono aji o! [Let's tell our children about this wonderful flavor that they may have forgotten!]. *Hachiju Nendai* (*The 1980s*) No. 14. p. 20-25. (Publisher: Yasô-sha). [Jap]
• ***Summary:*** About traditional Japanese handmade tofu and the handmade tofu shop. Note: The author, a woman, translated *The Farm Vegetarian Cookbook* into Japanese.

7951. *Wagakuni no Yushi-jo* (*Japan's Oils and Fats Situation*). 1983. Serial/periodical. Tokyo: Norin Suisan-sho, Shokuhin Yushi-ka. Annual. [Jap]
• ***Summary:*** The 1983 edition, for example, contains 190 pages.

7952. Westbrae Natural Foods. 1983. Tamari vs shoyu (from a company that sells both) (Poster). Emeryville, California. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center.
Address: Emeryville, California.

7953. Yokotsuka, Tamotsu. 1983. Scale-up of traditional fermentation technology [for shoyu production] (Review). *Korean J. of Applied Microbiology and Bioengineering* 11(4):353-71. [143 ref. Eng]
Address: Kikkoman Corp., Noda-shi, Japan.

7954. Yoshida, Shuji. 1983. Kabi ga tsukuru tabemono. Indoneshia no hakkô shokuhin [Indonesian mold fermented foods]. *Kikan Minzokugaku* (*Ethnology Quarterly*) 25:98-107. [Jap]
• ***Summary:*** Contains many photos of tempeh being made commercially and served in Indonesia. Address: Kokuritsu Minzokugaku Hakubutsukan (National Ethnology Museum).

7955. **Product Name:** [Snow Brand Soymilk (Coffee, or "Yogurt Flavored")].
Foreign Name: Yuki-jirushi no Tônyû (Koohii, Yooguruto Fureebaa).
Manufacturer's Name: Yuki-Jirushi Milk Co.

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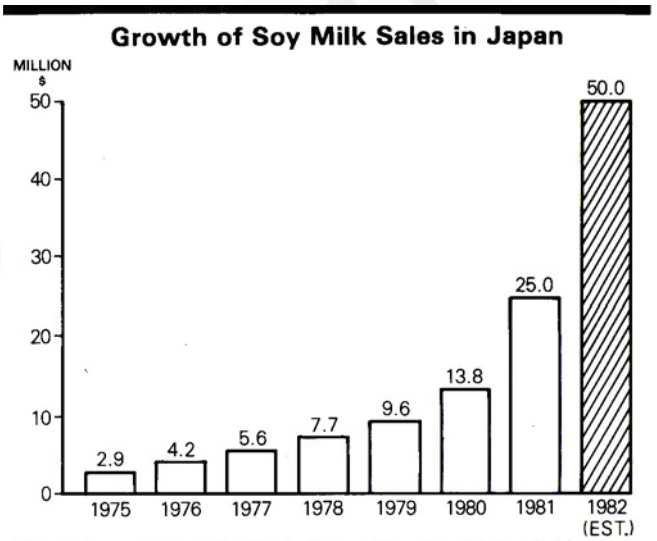
Manufacturer's Address: Tokyo, Japan.
Date of Introduction: 1983.
Wt/Vol., Packaging, Price: 200 ml Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Label, Tetra Brik carton, 200 ml. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center; Shurtleff & Aoyagi. 1984. Soyfoods Industry & Market. p. 63-64, 66. This is Japan's largest dairy products company, with sales of $1,776 million in FY 1982.

Color photo on cover of Journal of the American Oil Chemists' Society. Dec. 1984. The 250 ml Tetra Brik carton is dark blue, light blue, and white on beige.

7956. American Soybean Assoc. 1983. ASA helps quench Asian thirst for soymilk. *Checkoff Successfile.* Asia #804. 2 p.
• ***Summary:*** Problem: Soymilk has been a staple in China for centuries. "But the 'beany' taste limited its appeal. Also, in many areas soymilk was made and sold by roadside vendors, and production was inefficient or unsanitary.

"Program: ASA promoted soymilk in Japan, Taiwan, Korea and Singapore. ASA staff worked with food companies to stimulate large scale soymilk production. ASA technicians helped develop new, appealing soymilk flavors. ASA participated in food shows, gave demonstrations and sent out educational pamphlets depicting soymilk's health benefits and good taste.

"Results: Asian soymilk consumption has soared. Consumption in Japan is expected to jump over 200 percent from 1981 to 1982, using almost 1 million bushels of soybeans. Korean soymilk consumption has doubled, requiring over 1 million bushels of beans. Taiwan consumers are drinking over 180,000 gallons of soymilk daily, using over 950,000 bushels of soybeans annually."



The rapid growth of soymilk sales in Japan reflects the nutritious drink's increasing popularity in Asia.

A bar chart shows "Growth of soy milk sales in Japan" from 1975 to 1981, with 1982 estimated. The growth has been exponential.

7957. Azumaya Inc. 1983. Tofu! New way to serve the world's oldest meat substitute. Meet the bean that thinks it's meat. San Francisco, California 94124. 1 p. Undated. 21 x 43 cm.
• ***Summary:*** This two-color poster is printed yellow and white on brown. To the left is a yellow soybean cartoon character (registered trademark), whose two arms are held up in a gesture of joy, legs are short and feet are oval. His big smile comes up to the level of his eyes and eyebrows. Below him is written in white: "Hi! I'm li'l soy." In the lower right corner: "Write for recipes. Send self-addressed stamped envelope to: Consumer Services, Azumaya Inc." Beside the address is the Azumaya company logo: The letter "A" inside a sort of four-leaf clover with four arrows pointing at it. Address: 1575 Burke Ave., San Francisco, California 94124.

7958. Bertrand, Jean-Pierre; Laurent, Catherine; Leclercq, Vincent. 1983. Le monde du soja [The world of soya]. Editions La Decouverte/Maspero, 1, place Paul-Painleve, 75005 Paris, France. 128 p. 18 cm. Series: Repères. [32 ref. Fre]
• ***Summary:*** Contents: Introduction. Part I: The global economy of soya. 1. Processing and utilization of soya. 2. The world market for soya. 3. The actors in the world soy market. 4. The formation of the price of soya.

Part II: From colonial soya to American soya. 1. Soya and the colonial era. 2. The genesis of the American soy complex. 3. The victorious battle of soya on the domestic American market. 4. American soya and its conquest of the world. 5. The politics of the principal importing countries (incl. France and Japan).

Part III: Soya and the international crisis–destabilization. 1. The time of the 1973 soya embargo. 2. Soya, the new jewel of Brazilian agriculture. 3. The new exporters: Argentina and Paraguay. 4. The new demands: USSR and other Eastern European countries, China, some developing countries. 5. The new dynamic of the international economy of oleo-proteins: a general instability.

Part IV: The soya model–what consequences and what alternatives? 1. Brazil: The down side of the miracle. 2. Tunisia: Soya oil mixed with olive oil. 3. France: Consequences of the development of the soy model and research on alternatives. 4. Vegetable proteins versus animal proteins. Conclusion. Bibliography.

A 2nd edition was published in 1984. Address: France.

7959. Decker, C.D.; Holt, S.K.; Westerling, D.B. 1983. Gelling proteins. In: Roy E. Martin, ed. 1983. Third National Technical Seminar on Mechanical Recovery & Utilization of Fish Flesh. Washington, DC: National Fisheries Inst. vii +

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581 p. See p. 324-47. Held 1-3 Dec. 1980 at Raleigh, North Carolina. [9 ref]
• ***Summary:*** Reviews studies concerning the use of isolated soy protein with minced fish in some Japanese food products. Minced fish is the basis for surimi, a wet fish protein which is the major ingredient in various traditional Japanese fish paste products–such as kamaboko. Alaska pollock is the fish used to make surimi. When properly manufactured, isolated soy protein can have excellent gelling properties. It has been commercially successful in gelling minced fish in Japan. Ralston Purina has worked with Fuji Oil Co. of Japan in developing products. Address: Ralston Purina Co., St. Louis, Missouri.

7960. Friese, Eberhard. 1983. Philipp Franz von Siebold als fruher Exponent der Ostasienswissenschaften: ein Beitrag zur Orientalismusdiskussion und zur Geschichte der europaisch-japanischen Begegnung [Philipp Franz von Siebold as an early an early exponent and advocate of knowledge of East Asia: A contribution to the discussion of the Orient and the history of the meeting of Europe and Japan]. Bochum, Germany: N. Brockmeyer. 364 p. Indexes. 21 cm. Series: Berliner Beitarge zur sozial- und wirtschaftswissenschaftlichen Japan-Furschung, Nr. 15. [Ger; eng; jap]*
• ***Summary:*** Philipp Franz von Siebold lived 1796-1866.

7961. Fruin, W. Mark. 1983. The origins of shoyu (Document part). In: M. Fruin. 1983. Kikkoman: Company, Clan and Community. Cambridge, MA: Harvard University Press. xiv + 358 p. See p. 14-16. [4 ref]
• ***Summary:*** "The production of shoyu, one of the traditional products manufactured in the countryside [of Japan], grew enormously during the Tokugawa Period (1603-1867) because of a dramatic increase in its market, primarily urban residents. Whereas before the 17th century only 1 or 2 percent of the Japanese population lived in cities, by 1725 roughly 20 percent did so. The increased demand for shoyu was met primarily through an increase in capacity based on the entrance of new producers and the expansion of established brewers...

"The forerunner of modern shoyu appears to have been *miso tamari,* the liquid that forms during the process of fermenting rice or soybeans to make a soft, cheeselike product. The most popular and likely story of shoyu's origins relates how Kakushin, a Japanese Zen priest who had studied at the Kinzanji Temple in China, returned to Japan in the middle of the 13th century and began preparing a type of miso that became a well-known local specialty of Yuasa, the town near Kakushin's temple in the province of Kii (today's Wakayama prefecture). By the end of the 13th century the liquid had come to be called tamari and was sold commercially along with the miso. From such beginnings, a great variety of experimentation with the ingredients and methods of tamari fermentation was launched. Although tamari probably found favor initially in Buddhist monasteries as a condiment for a vegetarian diet, the popularity of tamari-type seasonings was related more to the prevalence of battlefields than of meditation halls during the period of civil wars that raged across Japan from the thirteenth to sixteenth centuries. Soldiers apparently found the versatility and transportability of the seasonings to their liking. Shoyu, which evolved from these tamari seasonings by adding wheat to the fermentation mash, appeared during the 16th century.

"The first soy sauce made in the area of modern Noda was brewed in about 1560 by Iida Ichirobei and respectfully presented as tribute taxes to the local warrior family in the following years. The Iida family, ostensibly fleeing the carnage and confusion of the Onin Wars (1467-1477) in the Home Provinces around Kyoto, arrived in the area of Noda early in the 16th century and by mid-century were engaged, among other pursuits, in the manufacture of tamari, a type of soy sauce that by now was made entirely from soy beans...

"Iida's first brew was closer to tamari than shoyu in consistency, taste, and aroma...In Eastern Japan the manufacture of a shoyu rather than tamari soy sauce like Iida's seems to have originated in or near the town of Choshi at the mouth of the Tone River on the northeastern tip of the Boso Peninsula, which guards the entrance to Tokyo Bay like an extended crab's claw. The Hamaguchi families of Choshi originated as branch households of the main Hamaguchi house of Hiromura village in Kii, not surprisingly the same province where Kinzanji miso and miso-tamari appeared and where the Hamaguchi of Hiromura were among the earliest commercial brewers of shoyu in Japan.

"The Hamaguchi transplants in Choshi, along with Tanaka Genba and his descendants, began the manufacture of shoyu early in the 17th century. Higeta shoyu was first produced here in 1616, Yamajo in 1630, and Yamasa in 1645.

"It was not until the latter half of the 17th century, however, that Noda followed Choshi in the manufacture of a soy sauce that was closer to shoyu than the thick, dark tamari was. In 1661 Takanashi Hyozaemon XIX began brewing shoyu in Noda; using a work force of twenty that included fifteen contract laborers, he produced 3,000 gallons his first year." Address: Prof. of History, California State Univ., Hayward.

7962. Fujimori, Ikuo. 1983. Daizu. Shizen kindaabukku [Soybeans. Natural children's book]. Tokyo: Fureberu-kan K.K. 30 p. Illust. by Akira SETO. 26 cm. [Jap]
• ***Summary:*** A children's book with superb color illustrations. Shows how to make natto, tofu, and soy sprouts at home. A large color photo (p. 10-11; 2-page spread), titled "All made from soybeans," shows kinako, miso, shoyu, soymilk, yuba in a bowl of clear soup, ganmodoki, abura-age, cooked whole soybeans (*nimamé*), okara sauteed with vegetables, dengaku (made with tofu and miso), and atsu-

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agé. Address: Daizu kairyo no dai-ichi ninsha [President, Takeya Miso Co., Nagano, Japan].

7963. Hesseltine, C.W. 1983. Microbiology of Oriental fermented foods. *Annual Review of Microbiology* 37:575-601. [50 ref]
• ***Summary:*** Contents: Introduction. Historical account. Importance of mixed cultures. Microorganisms used.

"The Japanese Food Agency, Ministry of Agriculture, Forestry, and Fisheries (1979), gave the following figures for 1979: miso, 567,776 tons; shoyu, 1,252,431 kiloliters; and natto, 158,000 tons. In Korea, 35% of the 442,803 metric tons of soybeans produced is fermented. Indonesia uses about 75,600 tons of soybeans in making tempeh.

"There is considerable ancient writing in Chinese publications about foods made by fermentation, but the first scientific reports are only about 100 years old. From 1878 until the beginning of World War I, there was an explosion of papers and reports dealing with fermented foods and drinks... In general, studies between 1881 and 1914 were devoted to the description of the product and the local name and to the isolation and description of the microorganisms associated with the fermentation. A number of organisms new to science were described and illustrated. Additional information was given on the action of the fungus on the substrate, suggested uses of the fungus in processes that could be exploited in European technology, and a description of the substrate preparation, food use, and native methods of food preparation.

"This period of research ended abruptly with the advent of World War I, as the exchange of students and cooperation between Japan and Germany ceased. Food fermentation studies resumed in the 1950s and today considerable interest exists. This renewed interest stems from the concern with nutrition, the great enthusiasm for vegetarian and natural foods, the search for less expensive, high-protein foods, the influence of foreign students studying in the West, the need to expand export markets, the need to add products to convenience foods to add zest and flavor, and the interest in the activities of microorganisms used in fermented foods." Address: NRRC, Peoria, Illinois.

7964. Hoshikawa, Kiyochika. 1983. Encyclopedia of Japan: Soybeans. San Francisco and Tokyo: Kodansha International. See vol. 7, p. 239. [Eng]
• ***Summary:*** Soybeans were introduced to Japan in the early years of the Yayoi period (ca. 300 B.C. to ca. A.D. 300) and have continued to be one of Japan's main food crops. Of the annual Japanese consumption of about 3,500,000 tonnes (metric tons), about 2,600,000 are crushed to make soybean oil and meal. Domestic production is presently (1978) about 190,000 tonnes/year, with Hokkaido producing the most. Besides these, about 100,000 tonnes of soybeans are produced in Japan for green soybeans (*edamame*), which are boiled in the pods and shelled while eaten as a snack, often with beer. Small quantities are also grown for green livestock feed.

Note: This is the earliest document seen (July 2001) which states that edamame are consumed with beer. Address: Japan.

7965. Joshi Eiyo Daigaku. 1983. Tôfu kukkingu [Tofu cooking]. Tokyo: JED Shuppan-bu. Kyo no Okazu No. 9. 128 p. Illust. Index. 19 cm. [Jap]
• ***Summary:*** Contents: From tofu in Japanese to tofu in English: Modern thoughts on tofu. Ikuko Hisamatsu's healthy tofu menu: Homemade tofu, western style tofu recipes, second generation tofu products and recipes, okara, natto, soymilk. Fujiko Sakami's Japanese style recipes: Homemade second generation tofu products taste better, Japanese style tofu recipes, okara. Seiko Osato's Chinese-style recipes: Introducing the taste of the homeland of tofu in China, Chinese second generation tofu products. Other comments: The history of tofu, the roots of tofu, the challenge of homemade tofu, tricks of Western style tofu recipes, European and American tofu cooking. Note: A color photo accompanies each recipe. Address: Tokyo, Japan.

7966. Konishi, Kiyoko. 1983. Japanese cooking for health and fitness. Tokyo: Gakken Co. Ltd. 120 p. Introduction by Susan F. Stirn (U.S. Embassy, Tokyo). Illust. (color photos). No index. 27 cm. Produced in conjunction with Kikkoman. [Eng]
• ***Summary:*** This attractive book, with many large color photos on glossy paper is crippled by lack of an index. Soy-related recipes include: Miso soups (p. 23, 25). Photos (p. 26) show small packets of Kikkoman's Instant Miso Soup. The photo of sukiyaki includes a bottle of Kikkoman Sukiyaki Sauce (which contains soy sauce); the Sukiyaki recipe includes "1 block tofu." A large photo (p. 39) includes a Kikkoman soy sauce dispenser. Grilled salmon with teriyaki sauce (the sauce contains sugar, sake or dry wine, mirin and soy sauce, p. 60). Tempura (the dipping sauce contains dashi, mirin, and soy sauce, p. 64). Salmon-tofu balls (with "1 block tofu," p. 69). Salad of tuna and wakame with soy sauce dressing (p. 72). Salad of short-necked clams with miso dressing (p. 73). Soybeans cooked with chicken wings (with "10 ounces {300 gm}, or about 2 cups dried soybeans," p. 85).

The section titled "Tofu and other dishes" (p. 89-97) includes Fresh tofu with condiments (*Hiyayakko,* p. 92; a photo, p. 90, shows a Kikkoman soy sauce dispenser). Sauteed tofu topped with shrimp and vegetables (p. 92). Tofu sauteed with ground chicken and vegetables (p. 93). Boiled vegetables with tofu dressing (p. 93). A glossary each (hard to use) covers fish and shellfish; vegetables, grains, seaweed varieties, and processed foods; seasonings, spices and seeds. One full-page photo (p. 102) shows processed

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foods, including: Thin, deep-fried tofu (*abura-age*). Thick, deep-fried tofu (*atsu-age*). Bean curd (*tofu*). A second full-page photo (p. 103) shows seasonings, spices and seeds, including: Five forms of Kikkoman regular soy sauce (*shoyu*)–dispenser, 150 ml glass bottle, 250 ml plastic bottle, and low-salt (green label, 500 and 250 ml). Two varieties of soybean paste (*miso*). Bottles of Kikkoman soup base for noodles and tempura (*memmi* [*menmi*]), sukiyaki sauce, teriyaki sauce, extract of bonito (*katsuo-dashi*), and extract of kelp (*konbu-dashi*). Japanese horseradish (fresh *wasabi*). White sesame seeds, black sesame seeds, and sesame oil (*goma-abura*).

A full page (p. 106) titled "Japanese cooking and soy sauce" discusses: Kikkoman soy sauce–a long history (it was first made in 1630). How does Kikkoman soy sauce gain is flavor, color, taste and aroma. Why is Kikkoman called the "liquid spice"? How to preserve the fine quality of Kikkoman. Address: Tokyo, Japan.

7967. Koshiyama, Ikunori. 1983. Storage proteins of soybean. In: W. Gottschalk and P. Hermann, eds. 1983. Seed Proteins: Biochemistry, Genetics, Nutritive Value. The Hague, Boston, and London: Martinus Nijhoff / Dr. W. Junk. viii + 531 p. See p. 427-50. [104 ref]
• ***Summary:*** Contents: Introduction. The composition of soybean storage proteins. Isolation and characterization of soybean storage protein components (globulins, ultracentrifugal components or fractions, subunit structure).

"The 11S globulin. Among the ultracentrifugal components, the initial effort of the isolation was done for the 11S component. The partial purification and characterization of the 11S component were first studied by Wolf and coworkers, and the first ultracentrifugal pure isolation was accomplished in 1965 [by Mitsuda, Kusano, and Hasegawa in Japan]... Immediately thereafter, the 7S protein was isolated in ultracentrifugally pure state [by Koshiyama]." Address: Central Research Lab., Kikkoman Shoyu Co., Noda-Shi, Chiba-Ken, Japan.

7968. Kushi, Michio; Jack, Alex. 1983. The cancer prevention diet: Michio Kushi's nutritional blueprint for the relief and prevention of disease. New York, NY: St. Martin's Press. xi + 460 p. Index. 22 cm. [32 ref]
• ***Summary:*** In this book, cancer preventing effects are attributed to miso (p. 50-51, 220-21, 304-06), and to soybeans (p. 51, 154-55, 293, 306). Natto, soymilk, tamari, tempeh, and tofu are also discussed.

Pages 50-51 note: "A ten-year study completed in 1981 by the National Cancer Center of Japan reported that people who ate miso soup daily were 33 percent less likely to contract stomach cancer than those who never ate miso soup. The study also found that miso was effective in preventing heart and liver diseases...

"Soybeans, a major source of protein in the macrobiotic diet, have been singled out as especially effective in reducing tumors. The active ingredient in soybeans is called a protease inhibitor. Laboratory tests show that soybeans and certain other beans and seeds containing this factor added to the diet prevent the development of breast, stomach, and skin tumors. Whole soybeans and soy products, including miso, tamari soy sauce, tofu, tempeh, and natto are staples of the macrobiotic diet... At St. Luke's Hospital in Nagasaki, a group of macrobiotic doctors and patients who had survived the atomic bombing on August 9, 1945 subsequently protected themselves against potentially lethal doses of radiation on a diet of brown rice, miso soup, sea vegetables, and sea salt."

Pages 220-21 contain a long excerpt from the account of Dr. Tatsuichiro Akizuki, director of internal medicine at St. Francis's Hospital in Nagasaki. He survived the world's first atomic bomb attack on 9 Aug. 1945. He believed that the main reason that neither he nor any of his co-workers at the hospital suffered or died from radiation was because of their diet, based on miso, brown rice, and sea vegetables.

Pages 293, and 304-06 summarize a number of publications which seem to show that consumption of soybeans, miso, or soymilk may prevent cancer. Pages 391-99 contain soyfoods recipes. Address: Boston, Massachusetts.

7969. Ohara, Teruko; Sakami, Fujiko; Osato, Seiko. 1983. Mame mame hyakuchin now [One hundred favorite bean recipes, now]. Tokyo: Shibata Shoten. 132 p. Illust. Index. 19 cm. [Jap]
• ***Summary:*** Contents: Preface. Western style bean cookery, by Teruko Ohara. Japanese style bean cookery, by Fujiko Sakami. Chinese style bean cookery, by Seiko Osato. Contains many color photos of edamame (ready to eat) and green vegetable soybeans in prepared dishes.

7970. Okamoto, Nobuhiro. 1983. Shin, tôfu no ryôri [Fresh, new tofu cookery]. Tokyo: Gurafusha. 64 p. Illust. (chiefly color). 26 cm. Mylife series no. 173. [Jap]*
Address: Iiyamachi, Nagano-ken, Japan.

7971. Otsuka, Shigeru. 1983. Encyclopedia of Japan: Soy sauce. San Francisco and Tokyo: Kodansha International. See vol. 7, p. 239. [Eng]
• ***Summary:*** The prototype of soy sauce was *hishio,* a pasty substance made by adding fish to salt; it is known to have been made in the Yayoi period (ca. 300 BC–ca. AD 330). Shoyu as we know it today was first made in Japan during the Muromachi period (1333-1568).

Koikuchi shoyu, the most widely used type, is fermented for a relatively long time and is relatively thick. Usukuchi shoyu is fermented for a shorter time. "The addition of amazake (a sweet rice wine) gives the latter a delicate color, flavor, and aroma, making it suitable for seasoning

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vegetables, white-fleshed fish, and clear soups."

There are also local varieties and variations of soy sauce. In Akita prefecture, *shottsuru* is made with fish; it is pale yellow and contains no soybeans. In the Nagoya area, light-colored shiro shoyu is made. Since aroma is most important, it is recommended that shoyu be added just before a dish is ready to be served. Also, once the container is opened the flavor and color of shoyu begin to deteriorate, so it should be used quickly. Address: Japan.

7972. Otsuka, Shigeru. 1983. Encyclopedia of Japan: Tôfu. San Francisco and Tokyo: Kodansha International. See vol. 8, p. 35. [Eng]

• ***Summary:*** (bean curd). Tofu is said to have been first made by the Chinese 2,000 years ago and introduced to Japan in the 7th century. Describes briefly how tofu is made and the different types of tofu. Aburaage and namaage are made by frying tofu from which excess water has been pressed. Gammodoki is made the same way, with bits of carrot and sesame seeds added. Koridofu is made by freezing and drying tofu. Okara, the substance left after extracting the liquid *tônyû,* has a unique texture and flavor. Yakidofu is made by toasting squares of bean curd made firm by extracting excess water. The *Tofu Hyakuchin,* a cookbook written during the Edo period (1600-1868) lists 100 methods of cooking tofu. It can be used in soups or sukiyaki. As yudofu, it is kept warm in a pot of hot water and seasoned with a dipping sauce of soy sauce, minced scallion, and spices. As hiyayakko, it is eaten the same way but chilled. As dengaku tofu, it is covered with a miso mixture and broiled. Address: Japan.

7973. Questions on the history of tempeh in Japan (Overview). 1983. Lafayette, California. 1 p. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Contains 15 questions. Address: Founder and Director, Soyfoods Center, Lafayette, California.

7974. Sams, Craig; Sams, Ann. 1983. The brown rice cookbook: A selection of delicious, wholesome recipes. New York and England: Thorsons Publishers Inc. 128 p. Illust. by Clive Birch. Index. 20 cm.

• ***Summary:*** Page 14 gives a description of soya sauce, shoyu, tamari, and miso. Soy-related recipes include: Miso soup with brown rice (p. 30). Miso sauce (p. 54). Tamari sauce (p. 55). Miso rice (p. 125). Craig Sams has also written a book titled *About Macrobiotics.*

"In the early 1960's many people in Europe and the U.S.A. were attracted to the ideas of Georges Ohsawa, a Japanese who had rediscovered the importance of dietary balance in traditional Eastern medicine." He taught macrobiotics, a dietary system in which brown rice plays a major role. "In the world of pop music the expression 'brown rice sandwiches' was used in association with the musicians who adopted wholefood diets." Then in the mid-1970s came the bran boom with an upsurge of interest in sources of dietary fibre, including brown rice.

Why did brown rice ever lose its once pre-eminent position to white rice? "The answer lies partly in the fact that while white rice will keep almost indefinitely, brown rice should be fresh. It attracts insects once it has been husked, so it needs more care in storage and more attention to efficient distribution." White rice also cooks more quickly.

"Pythagoras would not let his students eat beans because he believed they inhibited the higher intellectual processes. However, it is likely that this was because the prevalent bean of classical Greece was the fava bean–harmless in itself but with a hard brown skin which, if regularly eaten, can lead to favism, symptoms of which are deterioration of vision and mental faculties."

7975. *SoyaScan Questions.* 1983. Questions about the history of tempeh. Further research needed. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** 1. Learn more about the early history of tempeh in Indonesia before 1875. There must be some earlier references by missionaries, travelers, traders, etc.

2. Learn more about tempeh (tou chiah ping) in China.

3. Were there no references to tempeh by Indonesians prior to Soetan in 1956? Not even dictionaries?

4. How does the vitamin B-12 content of fresh tempeh compare with that of cooked (boiled, fried) tempeh?

5. Which was the first commercial European tempeh Co? Firma E.S. Lembekker in Jan.1959? Ask them about Firma ENTI?

6. Where was ENTI founded? When did they start to sell tempeh commercially? Where did the April 1946 founding date come from? Europe? van Dappern?

7. Did Robert van Dappern learn to make tempeh from the man who started Firma ENTI? If not, from whom? When did he move his plant to Kerkrade (about 1972-73)? When did he buy the $1 million plant (about 1980-81)? In mid-1982 was production 7,000 lb/wk or 10,000 lb/day as Ike said? How much tempeh does he make now each day? Each week?

8. What have Hedger and Basuki done with tempeh at Wales and what are they planning to do (O'Neill 1980)? Did they ever start a tempeh plant?

9. How many pages does Nakazawa have on Rhizopus? Does he mention tempeh at Penicillium?

10. Who wrote the early article on tempeh at Kyushu University, Japan, that interested Torigoe?

11. Get full citations for and copies of the following documents: Wigman, pre 1900.

12. Did Ohta or Karauchi write an early article on tempeh in about Showa 7 or 8 (1932-33)? Ohta mentioned this.

13. Try to get the article (about 1947-48) from Nosan

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Seizo, written by Ohta Teruo or Nakano Masahiro.

14. When did the *Natto Gyokai News* (or any natto newspaper) publish its first article on tempeh. I'd like to get copies of all early and recent important articles it has published.

15. Dr. S.O. Robson, Netherlands. Reward of $1 per year for citations on tempeh prior to 1875. Maximum $100.

16. K.K. Fuji was interested in Japan since 1980, says Dr. Wang at NRRC. Who are they? Who is Nihon Kogyo?

17. Get samples of Michael Cohen's new tempeh bags and labels.

18. Get answers to all the questions I wrote to Watanabe and Takamine in Kyushu.

19. Who made the early tempeh starter in Japan?

20. KOPTI: Please send me the names and locations by city of Indonesia's five largest tempeh companies. How many kg of tempeh does each make per week?

21. Get a full bibliographical citation for Kawarai.

7976. Steinkraus, K.H. 1983. Industrial applications of Oriental fungal fermentations. In: J.E. Smith, D.R. Berry, and B. Kristiansen, eds. 1983. The Filamentous Fungi. 4 vols. Fungal Technology. London: Edward Arnold. See p. 171-89. Chap. 7. Illust. Index. 24 cm. [35 ref]

• ***Summary:*** Contents: Introduction. The koji principle. Soy sauce / Japanese shoyu as indigenous fermentations. Japanese miso. Japanese saké. Indonesian tempe / oncom–fungal fermented traditional meat analogues. Indonesian tapé ketan and tapé ketella fermentations. Conclusions. Address: New York State Agric. Exp. Station, Geneva, NY 14456.

7977. Sugano, Michihiro. 1983. Hypocholesterolemic effect of plant protein in relation to animal protein: Mechanism of action. In: M.J. Gibney and D. Kritchevsky, eds. 1983. Animal and Vegetable Proteins in Lipid Metabolism and Atherosclerosis. New York, NY: Alan R. Liss, Inc. ix + 177 p. See p. 51-84. (Current Topics in Nutrition and Disease, Vol. 8). [99 ref]

• ***Summary:*** Discusses the cholesterol-lowering effect of soy protein. Address: Lab. of Nutrition Chemistry, Kyushu Univ. School of Agriculture, Fukuoka 812, Japan.

7978. Tada, Tetsunosuke; Masaaki, Hirano. 1983. Tôfu tsû [Connoisseur of tofu. 6th ed.]. Tokyo: Tokyo Shobosha. 303 p. + 5 unnumbered pages of plates. Illust. 22 cm. Series: Nihon no Shokubunka Taikei no. 16). [Jap]

• ***Summary:*** Previously published in 1978 as *Tôfu.* Tada Tetsunosuke is the lead author, compiler and editor (*hencho*)*;* Hirano Masaaki is the interpreter, narrator, commentator (*kaisetsusha*)*.*

7979. Torii, Yasuko. 1983. Shizen-ha resutoran gaido [Dining naturally in Japan]. Tokyo: Shibata Shoten. 295 p. Illust. 19 cm. [Jap]

7980. Tsuji, Sachiko; Tsuchiya, F.; Kurata, M.; Okuyama, K.; Shiota, Y. 1983. Hiroshima-ken Tôbu oyobi Okayama-ken Seibu ni okeru shihan tôfu no hinshitsu chôsa [Investigation of the qualities of commercial tofu in eastern Hiroshima prefecture and western Okayama prefecture]. *Kaseigaku Zasshi* (*J. of Home Economics of Japan*) 34(5):293-99. [13 ref. Jap]

Address: Fukuyama Shiritsu Joshi Tanki Daigaku (Fukuyama Women's Junior College).

7981. *USDA Plant Inventory.* 1983. Plant material introduced January 1 to June 30, 1980 (Nos. 436991 to 443013). No. 188, Part I. 529 p.

• ***Summary:*** Soybean introductions: *Glycine max* (L.) Merrill. Fabaceae.

"Donated by Dr. N.I. Korsakov, Division of Grain Legume Crops, N.I. Vavilov Institute of Plant Industry, Leningrad, Soviet Union." All these varieties are designated "VIR" (Vavilov Inst.).

437069-437085. Amur Region and Far East

437124-437128. Gurijscaja and Imeretinscaja, Georgian SSR.

437129A-B. Irkutsk Region (Oblast) of Russia.

437130-437134. Gibrid ASS, Kazakh SSR.

437135-437148. Khabarovsk Province, USSR [on right bank of Amur River]

47149-437171. Krasnodar Province, USSR.

437172-437175. Kuybyshev Region, USSR.

437176-437178. Latvian SSR.

437179-437188. Lithuanian SSR.

437189-437303. Bel'tscaja, Bessarabea, Biruintsa, Brynzenscaja, Corichevava, CSchi, Dobruzanca, Errj, Moldavscaja, Rajner, Scorospelca, Staroucrainea, Vengerca nizcaja, Vysocoroslaja, Moldavian SSR.

437304. Moscow Region. 437305-437312. North Osetian [Ossetian] ASSR (An autonomous republic in the southeastern Russian SFSR on the north slopes of the Central Caucasus Mountains, bounded on the north by Stavropol Kray; Renamed Alania in 1991; capital Vladikavkaz).

437313-437315. Novosibirsk Region, USSR.

437316-437520. Primorsky Province, USSR [Maritime Province in Russian Far East, bordering on Sea of Japan, China and North Korea. Administrative center and soybean port: Vladivostok].

437521. Stavropol Province, USSR.

437522. Tshuvashskaja ASSR.

437523-437524. Turkmen SSR.

437525-437549. Ukranian SSR.

437550. Uzbek SSR (later Uzbekistan).

437551-437552. Voranezh Region, USSR.

437553-437813. Peoples Republic of China.

437814-438273. China, Northeast [formerly Manchuria] incl. Charbin [Harbin], Elita, Manczurscaja.

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438274-438295. Japan (many named varieties).
438296-438309. South Korea (Republic of Korea).
438310-438312. North Korea.
438312-438341. Algeria.
438342. Argentina.
438343-438513. Australia, Bulgaria, Canada, Czechoslovakia, France, West Germany, East Germany, Hungary, India, Indonesia, Israel, Italy, Morocco, Nepal, Netherlands, Poland, Portugal, Romania, Sweden (13 Fiskeby varieties), United States (26 named varieties), Yugoslavia.
440913. Wild soybean from China. "Donated by Kirin Academy of Agricultural Sciences, Kungchuling, Kirin Province. Received through W.O. Scott, Dep. of Agronomy, Univ. of Illinois, Urbana. Received March 1980. Collected 1979.
440927-440943. *Glycine canescens* F.J. Herman. From Australia. "Donated (but not collected) by T. Hymowitz, Dep. of Agronomy, Univ. of Illinois, Urbana. Received Aug. 1979.
440944-440974. *Glycine clandestina* Wendl. From Australia. Donated by T. Hymowitz.
440975. *Glycine falcata* Benth. From Australia. Donated by T. Hymowitz.
440976-440977. *Glycine latrobeana* (Meissn.) Benth. From Australia. Donated by T. Hymowitz.
440978-440980. *Glycine latifolia* (Benth.) Newell & Hymowitz. From Australia. Donated by T. Hymowitz.
440981. *Glycine tabacina* (Labill.) Benth. From Fiji. Donated by T. Hymowitz. Collected 1930. Sigatoka, Viti Levu, Fiji. Collected by Greenwood. Wild.
440982-440997. *Glycine tabacina* (Labill.) Benth. From Australia. Donated by T. Hymowitz.
440998-441011. *Glycine tomentella* Hayata. From Australia. Donated by T. Hymowitz.
441012-441013. *Glycine tomentella* Hayata. From China. Donated by T. Hymowitz.
441339-441383. *Glycine max* (L.) Merr. Soybean. From Indonesia (East Java, Central Java, West Nuca Tanggara [West Nusa Tenggara, incl. Lombok and Sumbawa islands, in eastern Indonesia]). Donated by S. Djojoderdjo and Soebekti, Univ. of Gadjah Mada, Jogjakarta [Yogyakarta].
442003-442004. From China, Peoples Republic of. Donated by Institute of Crop Breeding and Cultivation, Chinese Academy of Agricultural Science, Beijing. Received through G. Liang, Dep. of Agronomy, Kansas State Univ. [Manhattan, Kansas], March 1980.
442005-442021. From South Korea. "Donated by Applied Genetics Laboratory, Korea Atomic Energy Research Inst., Seoul Received through R. Loiselle, Plant Gene Resources of Canada, Ottawa.
442022-442045. *Glycine max* (L.) Merr. Soybean. From Poland. "Donated by Plant Breeding and Acclimatization Inst., Radzikow / Warszawy. Some also from the Soviet Union and Yugoslavia.
442834. *Glycine max* (L.) Merr. Soybean. From China, Peoples Republic of. "Donated by T.C. Tso, Tobacco Laboratory, USDA, Beltsville, Maryland." Collected from a market near Quilin, Kwansi Province.
Note: In Part II: 445842-445849. From. Thomas A. Lumpkin, Zhejiang Academy of Agricultural Sciences, Hangzhoe, Zhejiang, China. Address: Washington, DC.

7982. Isobe, Shosaku. 1983? Konpura shôyu [Konpura shoyu (Leaflet)]. In: Shokuhin Zakki, Mukashi to Ima. No. 19. Undated. [1 ref. Jap]

7983. Kikkoman Corporation. 1983? [All-purpose seasoning. Since 1630. Kikkoman naturally brewed soy sauce. Brewed by Kikkoman Foods, Inc. in the U.S.A. (Brochure)]. 23 p. Undated. No place of publication given. [Jap]
• ***Summary:*** This color booklet gives an artistic introduction to Kikkoman's many activities and products (both soy and non soy, such as tomato sauces, wines, etc.) Only the rear cover is in English.

7984. **Product Name:** [Korumame (Dried Salted Natto)].
Manufacturer's Name: Marumiya K.K.
Manufacturer's Address: Obayashi 287, Otsu-cho, Kikuchi-gun, Kumamoto-ken, Japan.
Date of Introduction: 1983?

7985. Nisshin Oil Mills, Ltd. 1983? [Soybean proteins (Catalog)]. Japan. 1 p. Undated. [Jap]
• ***Summary:*** This 1-page color leaflet shows 5 soy protein products made by Nisshin. For each, a photo shows the product in a shallow white bowl, and a nutritional analysis is given; for the first three the package (a 10 kg multiwall paper sack) is also shown. The products are: Soymee S (textured soy protein, 51% protein and 1% fat, probably textured soy flour). Sol-P 600 (powdered product for use in various kinds of fish paste, based on soy protein concentrate; 64% protein and 1% fat). Sol-P-S (powdered soymilk, 27.5% protein and 28.5% fat). Imitation bacon bits (31.5% protein and 39.4% fat). Full fat soybean flour (39% protein and 20% fat). Address: Japan.

7986. Takahashi Yuzo Kenkyusho. 1983? Nattô seizô-hô [Method for making natto at home (Leaflet)]. Yamagata-shi, Japan. 1 p. Undated. [Jap; eng+]
• ***Summary:*** This company makes *Nattomoto,* a dry, commercial natto starter. A copy of the label accompanies the pamphlet. The pamphlet explains: 1. Choose 1 kg well dried, new crop soybeans. Remove any bug-eaten or immature beans, as well as sand, stones, dust, etc.
2. Wash well and soak in 2½ their volume of water overnight to allow them to expand well. The average soaking time is 12 hours in summer, 24 hours in winter.

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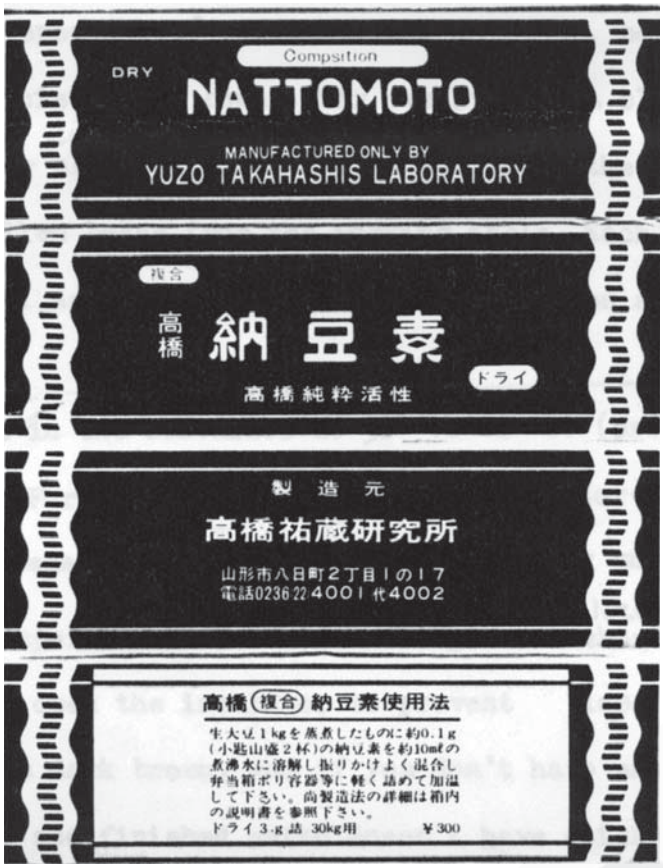

3. Drain off the water and discard. Steam-cook the soybeans as follows: Cook for 8-9 hours in a cooking pot or 5-6 hours in a square *seiro* steamer [see *The Book of Miso,* p. 176]. The cooked beans should be yellowish dark brown in color and you should be able to crush them easily between your thumb and finger tip.

4. Drain the cooked beans in a clean colander. When they are still hot, dissolve 0.1 gm (2 heaping spoonfuls) of Takahashi natto starter in 10 ml boiled and cold water; sprinkle this on the beans. Mix evenly with a clean spatula. Quickly pack the inoculated soybeans into a heat resistant container (metal, glass, or Tupperware plastic) and cover it. Do not touch the beans with your fingers or pick up any beans that may have fallen from the work table.

5. Incubate the beans in the container at 38ºC to 42ºC (ideally 40ºC or 104ºF) for 20-24 hours. For your incubator, a chicken incubator is ideal, but you can use a heater or boiler room, a homemade incubator (box with a heat source underneath), etc. But the temperature should never exceed 42ºC. During incubation, do not open the incubator to prevent loss of moisture. If you overheat, the natto becomes dark brown, and if there is not enough moisture it becomes too dry and crumbly, has a bad taste, and the sticky natto strings do not develop properly.

6. After incubation, remove container from incubator and leave to cool.

There is also a short "Easy lunch box natto making method." A Japanese lunch box is metal. Using this method, if you cook the soybeans well, you don't have to worry about the moisture. Address: 2-1-17 Yoka-machi, Yamagata-shi 990-91, Japan.

7987. Tsuchiya, Kunio. 1983? Daizu no juyô to ryûtsû ni tsuite [On soybean demand and distribution]. Kumamoto Prefecture, Japan: Kumamoto-ken Keizai-ren. 39 p. Undated. [12 ref. Jap]
• ***Summary:*** A rich and compact source of statistics, with much time-series data, about soybeans in Japan. Address: Kumamoto prefecture, Japan.

7988. *Toyo Shinpo* (*Soyfoods News*). 1984. Wadai no "tenpe." Seihin shôkai. Sono hinshitsu to saikin no ugoki. Shokuhin gakusha mo hyôka [People are talking about tempeh. Product introduction. Its quality and latest trends. Food researchers also value it]. Jan. 1. p. 29. [Jap]
• ***Summary:*** At the end of 1983 Torigoe Seifun started test marketing tempeh at a major department store in Kyushu. Taste testing done among college girls in Japan shows that they prefer tempeh (76.4%) to natto. Torigoe Seifun says that after marketing tempeh to industrial users (institutions and food processors) at 1,500 yen/kg, they have received many enquiries. They haven't decided the price for home use yet. Their goals: (1) Tempeh production of 15,000 kg/month; (2) Sales of 100 million yen from July–Dec. 1983; (3) In three years their sales goal is 2,000 million yen.

7989. *Toyo Shinpo* (*Soyfoods News*). 1984. [Main additives to soymilk in Japan]. Jan. 1. [Jap]
• ***Summary:*** Preservative (*hozon ryo*). Antioxidant (*sanka bôshizai*). Artificial flavor and/or fragrance (*chakko*). Sweetener (*kanmi*). Emulsifier (*nyûka*). Foam extinguisher (*awakeshi*). pH regulator (*pH chôsei*). Quality improver (*hinshitsu kairyo*). Coagulant (*gyôki, gyôkozai*).

7990. Rakosky, Joseph, Jr. 1984. Rich Freeze, Central Soya's soy ice cream (Interview). *SoyaScan Notes.* Jan. 12. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Dr. Rakosky started work with The Glidden Co. as a bacteriologist, then went with Glidden to Central Soya in 1958. By 1963 Central Soya had begun development of a soy ice cream based on their Promine-brand isolated soy proteins. A memo dated 21 April 1964 referred to a pilot-plant run to produce a dry mix for the product. In 1965 the innovative new non-dairy frozen dessert was granted a registered trademark: Rich Freeze. The product was initially developed for a company in Japan since that country had a shortage of dairy products. But there were many problems–for example, they had to remove all sugar to avoid huge import duties. Using a Taylor Soft Serve machine Central Soya prepared samples using the dry mix and gave them out in Japan, but finally the deal fell through.

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Then, in about 1970, Central Soya gave out more samples at a big international food convention in Washington, DC, and at ANUGA in Europe (spiked with brandy). They also talked with the U.S. navy about using it on ships. The fat was coconut fat and it was a good product, but it was never commercialized. He thinks this was the world's first soy ice cream made from soy protein isolates. Address: 5836 Crain St., Morton Grove, Illinois 60053. Phone: 312-966-7660.

7991. Chico-San, Inc. 1984. Why does Chico-San bother to import soyfoods? (Ad). *Natural Foods Merchandiser.* Jan. p. 9 (unnumbered) of 12-page color advertising insert. Soyfoods Pavilion '84. Marketing soyfoods in America.
• ***Summary:*** A 4½ by 7½ inch black-and-white ad. Because the quality of fermented soyfoods made in Japan is considered better. Chico-San's miso-shoyu master is Mr. Tomio Kitani. He uses Japanese soybeans and sea salt rich in minerals. His Nama Shoyu, which takes 4 years to make, is the only unpasteurized soy sauce available in America. It is also the only shoyu with a salt content lowered by techniques not involving extraction or additives. "Taste is the difference."

This ad also appeared in *Macromuse* (1984, Spring, p. 35). Address: Chico, California 95926.

7992. Erewhon, Inc. 1984. Made in Japan 400 years ago (Ad). *Natural Foods Merchandiser.* Jan. p. 3 (unnumbered) of 12-page color advertising insert. Soyfoods Pavilion '84. Marketing soyfoods in America.
• ***Summary:*** This 8½ by 11 inch ad begins: "To the ancient Japanese shoyu masters, making the finest possible soy sauce was more than just a matter of pride. It was a matter of necessity. Because, in medieval Japan, no one served inferior shoyu to a shogun twice." "Our great taste comes naturally." The full-page color photo shows the tips of two chopsticks on the edge of a small bowl containing shoyu for dipping sauce. Above that are sliced fish and orange fish eggs. In the lower left a bottled labeled (confusingly) "Erewhon Shoyu Tamari." Note: Shoyu and tamari are different types of soy sauce.

7993. *Food Engineering.* 1984. American shoyu: Like pizza, tacos, kielbasa and Danish. 56(1):47. Jan.

7994. Hinode Tofu Co.; Azumaya, Inc. 1984. The #1 and #2 tofu producers in America support the Soyfoods Association of America (Ad). *Natural Foods Merchandiser.* Jan. p. 11 (unnumbered) of 12-page color advertising insert. Soyfoods Pavilion '84. Marketing soyfoods in America.
• ***Summary:*** A small (2½ by 3¼ inch) black-and-white ad. Address: Los Angeles, California; 2. San Francisco, California.

7995. Ikeda, Kisha. 1984. Neage shoten ni ugoku kotoshi no shôyu gyôkai [Shoyu industry shaken by price increases]. *Sake-rui Shokuhin Tokei Geppo* (*Monthly Statistics on Alcohol and Foods*). Jan. p. 17-24. [Jap]

7996. San-J International, Inc. 1984. Some soy sauces are called tamari. But they're not. San-J is the real tamari (Ad). *Natural Foods Merchandiser.* Jan. p. 7 (unnumbered) of 12-page color advertising insert. Soyfoods Pavilion '84. Marketing soyfoods in America.
• ***Summary:*** A full-page color ad. Four photos show bottles of San-J Tamari, and San-J Tamari and Teriyaki Crackers (wheat free and baked; made with whole brown rice).

This ad also appeared the summer issue (p. 7) of *Soyfoods* magazine. Address: Colonial Heights, Virginia 23834.

7997. Shin Mei Do Miso. 1984. Denman Island Miso (Unpasteurized) (Leaflet). Denman Island, British Columbia, Canada. 1 p. Front and back. 22 cm.
• ***Summary:*** Side 1 is an introduction to miso plus one recipe and a plug for *The Book of Miso,* by Shurtleff & Aoyagi. Side 2 is 4 miso recipes. Printed with brown ink on beige paper. Address: Denman Island, BC, Canada, V0R 1T0.

7998. Soyfoods Assoc. of America. 1984. Soyfoods Pavilion '84. Marketing soyfoods in America (Ad). *Natural Foods Merchandiser.* Jan. 12-page color advertising insert.
• ***Summary:*** Contains large color ads by Legume Inc. (6 frozen tofu entrees), Erewhon, Inc. (shoyu tamari), Vitasoy (USA), Inc. (natural and coconut soy drink, sweetened with maple syrup), San-J International, Inc. (tamari, teriyaki sauce, tamari crackers, teriyaki crackers), Tofu-Time, Inc. (Tofutti "nondairy tofu frozen dessert"), Eden Foods, Inc. (Edensoy soy beverage in plain and carob flavors, retort pouch), and Westbrae Natural Foods (natural ramen in 100% whole-wheat, buckwheat, brown rice, mushroom, seaweed, miso, 5-spice, and curry flavors).

Contains black-and-white ads by Westbrae Natural Foods (shoyu, tamari, and soy sauce), Chico-San, Inc. (imported miso and soysauce), Fantastic Foods, Inc. (tofu burger mix), Penguino's, Inc. (dairy-free frozen dessert), Nasoya Foods (Firm Style Tofu, Soft Style Tofu, Marinated & Broiled Tofu, Tofu Burgers, Tempeh, Tempeh Burgers, Tofu Vegi-Dip [Creamy Dill, Soyannaise, Bleu Cheese, Onion, Creamy Garlic], Corn Cakes [Plain with Bran, Blueberry, Cranberry]; Non-soy products in the "Oriental Cuisine" line include Fresh Noodles, Wonton Skins, Egg Roll Wrappers), Hinode Tofu Co. and Azumaya, Inc. ("The #1 and #2 tofu producers in America").

The only article, whose author is not given, is titled "Soyfoods Pavilion debuts at Natural Foods Expo '84." On the front cover of the insert is a list of members of the Soyfoods Association of America (formed in Feb. 1983)

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that participated in Natural Foods Expo '84. In addition to the advertisers mentioned above, they include: Farm Foods, Laughing Moon Food Co., Paradise Distributors, Inc., Soyfoods Magazine, Tempeh Works, Inc., and White Wave, Inc. Address: 526 East 20th St., New York, NY 10009.

7999. Westbrae Natural. 1984. Soy sauce made complicated (Ad). *Natural Foods Merchandiser.* Jan. p. 5 (unnumbered) of 12-page color advertising insert. Soyfoods Pavilion '84. Marketing soyfoods in America.
• ***Summary:*** This 8½ by 11 inch black-and-white ad begins: "Many people call traditional soy sauce 'tamari.' This labeling is illegal in Japan, where this soy sauce can only be called by its correct name, 'shoyu.' Some natural food companies avoid the Japanese law by importing *shoyu* and relabeling it as *tamari* in the U.S., where no soy sauce standards exist as yet." A photo shows 10 Westbrae soy sauce products in various sizes, including: Mild soy sauce. Traditional tamari. Tamari. Traditional shoyu. Organic shoyu. Visit booths 652-656 in the Soyfoods Pavilion.

8000. Yasuda, Masaaki; Hokama, Ikuo. 1984. Tofuyo seizo ni kansuru kenkyu. VI. Tôfuyô seizô ni mochiiru genryô tôfu no seizô [Studies on the manufacture of Okinawan fermented tofu (*tofuyo*). VI. Production of tofu for use in making tofuyo]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 31(1):19-23. [7 ref. Jap; eng]
• ***Summary:*** "Tofuyo is a traditional food in Okinawa, and is made from soybean curd with koji, salt, and awamori (distilled liquor)." It was found that the texture of the tofu affects the quality of the tofuyo. The texture is, in turn, affected by the type of coagulant and its concentration, and the pressure under which the curds were pressed to make tofu. The best conditions were as follows: Final concentration of the calcium sulfate coagulant: 20 mM. Final pressure on the curds: 38 gm per square centimeter. Hardness of the curd: 110,000 to 110,000 dynes per square centimeter. Final moisture of the curd: about 76%.

The best quality of Tofuyo was obtained when tofu of hardness 200,000 to 300,000 dynes per square centimeter was gradually dehydrated at room temperature (25ºC). Hardness of the finished tofuyo: 14-18 dynes per square centimeter. Address: Dep. of Agricultural Chemistry, University of the Ryukyus.

8001. Burgeson, Travis; Takamine, Kazuhiro. 1984. Making tempeh and tempeh burgers at Pacific Tempeh and Torigoe (Interview). Conducted by William Shurtleff of Soyfoods Center, Feb. 5. 2 p. transcript.
• ***Summary:*** Details of the processes are given.

8002. Yoshihara, LuLu. 1984. Re: Varieties of Shin-Mei-Do miso, ingredients, ages, and prices for 10 lb post paid. Letter to Lorenz A Schaller, California, Feb. 13–in reply to inquiry. 1 p. Handwritten, with signature on letterhead.
• ***Summary:*** Red miso, 1½ years, $25.15. Barley miso, 2 years, $25.15. Brown rice miso, nearly 3 years, $26.35.

A business card (printed with brown ink on beige paper) accompanies the letter.

8003. *Toyo Shinpo* (*Soyfoods News*). 1984. Soi Haamonii [Soy Harmony is a powdered soymilk]. Feb. 21. [Jap]
• ***Summary:*** Last year, on 1 Aug. 1983 Nihon Harmony KK (a corporation) was established. They are producing powdered soymilk using US soybeans and adding vitamins and methionine. You can add this powder to hamburger, meatballs, or any meat dishes to give them more protein. Or use it as a drink or dessert. A 450 gm can costs 4,000 yen. Flavors: Prune and Royal.

8004. Aoki, H.; Shirase, Y.; Kato, J.; Watanabe, Y. 1984. Emulsion stabilizing properties of soy protein isolate mixed with sodium caseinates. *J. of Food Science* 49(1):212-16. Jan/Feb. [25 ref]
Address: Food Processing Lab., Faculty of Home Economics, Otsuma Women's Univ., Sanban-cho, Chiyoda-ku, Tokyo 102, Japan.

8005. **Product Name:** [Tofu].
Foreign Name: Tofu.
Manufacturer's Name: Fernost Markt Nippon Ya, Kondo GmbH.
Manufacturer's Address: Faulmanngasse 5, A-1040 Vienna, Austria.
Date of Introduction: 1984 February.
New Product–Documentation: Letter from C. Martinez, Secretary for American Soybean Assoc. in Brussels, Belgium. 1984. Jan. 9. This is a tofu shop in Vienna. Soyfoods Center Computerized Mailing List. 1984. Feb. 7. Talk with Guenter Ebner of Sojarei Ebner-Prosl. 1990. May 28. He is not aware of this company.

8006. Fuke, Yoko; Matsuoka, Hiroatsu. 1984. Preparation of fermented soybean curd using stem bromelain. *J. of Food Science* 49(1):312-13. Jan/Feb. [8 ref]
• ***Summary:*** Investigates production of a cheese-like food from soymilk by treatment with a plant protease enzyme. Bromelain is a proteinase / protease obtained from the juice of the pineapple. Stem bromelain was used successfully as a coagulant for soymilk, but the resulting product had a slight bitterness. Address: Dep. of Food and Nutrition, Lab. of Food Chemistry, Tachikawa College of Tokyo, Akishima, Tokyo 196, Japan.

8007. Kotzsch, Ronald E. 1984. Natural foods pioneer Erewhon: An industry leader's tough fight to survive. *East West Journal.* Feb. p. 24-29.

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• ***Summary:*** A very well written and accurate history of Erewhon from its founding in 1966, to its declaration of Chapter 11 bankruptcy in the fall of 1981. The company was able to clear its $3 million indebtedness by paying 11 cents for each dollar owed. In early 1982 "the company was sold by the Kushis to Ron Rossetti, owner of the Nature Food Centres retail chain. Later that year [in July] Rossetti accepted as financial partners Charles T. Verde and Cynthia C. Davis, who became respectively president and vice president of marketing. Since then the operation has been totally in their hands. Erewhon has a production facility at Natick, Massachusetts." A photo shows Davis and Verde with 5 Erewhon products.

"The story of Erewhon is a dramatic one. Founded in Boston in 1966 on the thinnest of shoestrings it soon began to grow at a phenomenal rate. By the mid '70s it was the most powerful force in the burgeoning natural foods industry, respected as a leader and innovator, with annual sales of over ten million dollars. Several troubled years culminated, however, in 1981 with a petition for protection under the Chapter Eleven 'bankruptcy' statute. Only a change in ownership and management prevented the disappearance of the company altogether. Phoenix-like, it has continued but is substantially changed. Erewhon's history is instructive as well as dramatic. It reveals something basic about the nature of 'new age' or idealistic, service-oriented business, and the perils of success, as well as failure, for those who practice it.

"In 1965 Michio and Aveline Kushi, a Japanese couple in their forties, moved to Boston. Their purpose was to teach macrobiotics, the philosophy, way of life, and diet formulated by their mentor, Georges Ohsawa. They rented a house on a side street in North Cambridge. Michio began to lecture in the evenings, and Aveline prepared meals for the lecture guests and gave cooking classes.

"The core of their message was simple. Food is a primary factor in physical health, and also in emotional, psychological, and even spiritual well-being. The key to health and happiness is a proper diet, based on whole cereal grains, beans, and indigenous vegetables and fruits. As Ohsawa had written: 'Food is the basis of life. If food is good then all else will be good as well.'

"Those who came and were convinced wished, of course, to follow the recommended diet. Its elements however were difficult or impossible to obtain. One could no more buy organically grown brown rice in Boston in 1965, than one could purchase samples of the British crown jewels. So the Kushis ordered extra sacksful of rice, oats, wheat flour, and kegs of miso and tamari, stashed them in their hall closet, and began to sell to students.

"In April, 1966, with the help of young former actor Evan Root, the Kushis rented a small basement store on Newbury Street in Boston. With shelving and counters made from planking and cinder blocks, they began to sell a modest array of whole foods. These were macrobiotic staples, with an occasional jar of sesame or apple butter thrown in for excitement. Root and the Kushis decided to name the store 'Erewhon' after the utopia in Samuel Butler's novel, an imaginary place where people had to take responsibility for their own health and where it was a crime to get sick.

"Erewhon was a company therefore founded not on the profit motive but out of a desire to serve the public. From the outset it had two primary aims: to make available the highest quality natural whole foods, and to educate the public in the importance and proper use of these foods. The store was a natural and necessary extension of the educational activities of the Kushis, and their hope to effect positive healthful change in individual lives and in the society as a whole. At base, it was a kind of missionary enterprise.

"Root managed the tiny business for about a year, then left to start Boston's first macrobiotic restaurant. Shortly thereafter, Paul Hawken and Bill Tara arrived from the never-never land of San Francisco's Haight-Ashbury to study with the Kushis. Bright, energetic, gifted with business sense and intuition and committed to the Kushis and their ideas, the two took over and began to develop Erewhon. They moved the store to a larger, more attractive site, greatly expanded the product offering, and began a mail order department. The business began to take off rapidly–more rapidly perhaps than anyone anticipated or hoped.

"The next decade was a period of headlong and often dizzying growth for Erewhon; It began to manufacture and distribute its own product line. It opened retail outlets in Los Angeles, Hartford, Cambridge, and Brookline. In a short time it had grown into a large, influential and respected corporation. Throughout, it strove to remain true to its ideals of quality and education. Rather than merely responding to consumer demand the company sought to help the public understand the importance of quality food products. It succeeded to a remarkable degree. Erewhon's most impressive accomplishments were that it:

"+ originated and developed the term and concept of 'natural foods' (a direct translation of the Japanese *shizenshoku*) to distinguish its products from the pills and elixirs of the older 'health food' industry.

"+ manufactured, or contracted manufacturing, according to strict specifications a product line that set industry standards for purity and quality.

"+ developed new sources of quality commodities. For example, it encouraged a farm in Arkansas to grow organic rice, promising to then buy and market the crop.

"+ established the 'down-home country store' ambiance as a model for natural foods stores. The plain wood floors and panelling, the bulk bins and indirect lighting, influenced scores of new businesses.

"+ showed broad ecological and social concern: in its retail outlets it encouraged bulk sales to avoid wasteful packaging; it began to use biodegradable cellophane for its packaged foods; it supported coops and communes through

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direct wholesale transactions; and it began to distribute to supermarkets in order to reach the general public.

"+ published educational flyers and pamphlets on food and nutrition, and used its packaging to provide information to the consumer." Continued.

8008. Kotzsch, Ronald E. 1984. Natural foods pioneer Erewhon (Continued–Part II). *East West Journal.* Feb. p. 24-29.

• ***Summary:*** Continued: "In these years the company was unique not only in its activity in the marketplace but in its internal organization as well. Erewhon was basically an extended family, held together not by blood bonds but by common beliefs and aspirations. The Kushis, 'Mom and Pop,' exercised an ultimate but benevolent authority. Day to day management and much long term policy making was in the hands of a succession of young, idealistic 'adopted sons,' Hawken and Tara, followed by Roger Hillyard, Bruce MacDonald, Ty Smith, Bill Garrison, Jeff Flasher, and others. Most of the employees at all levels were macrobiotic and were committed to the Erewhon mission. Hence there was little or no gulf between managers and workers. All wore the same outfit of jeans and vests, and went to the same lectures and parties. All ate their macrobiotic lunch provided free in the company lunchroom. People worked hard for modest wages but were recompensed by a clean, harmonious environment, and by job security. One could leave for an extended period and return assured of a position. The company took care of its own.

"There were of course tensions, but they were minor and in retrospect seem almost humorous. There was the great debate, for example, over whether the retail store should carry tomatoes, potatoes, bananas, and other reasonably wholesome but not strictly macrobiotic foods. The decision in the end was 'yes,' the rationale being that if people wanted these foods, Erewhon should give them the best available. It couldn't expect every customer to be macrobiotic. In general it was a heady, idyllic period.

"Somewhere, somehow, though, things began to go wrong. A decision was made to move the factory and warehouse to a large facility in East Cambridge and to expand the product line and the distribution network. The transfer and expansion took much more time, energy, and money than anyone expected. Large bank loans were made just when interest rates were skyrocketing. Suddenly the company found itself deeply in debt, struggling to keep up repayment schedules. Meanwhile, because of rising production costs, smaller profit margins, and increased competition, revenue from sales decreased. Anxious to generate more cash, Erewhon expanded its product line even more, including yogurt and cheeses, vitamins and supplements. Amid an atmosphere of ideological compromise there were more loans, more interest, more pressure.

"Within the company serious problems of morale and loyalty were developing. At the new expanded facility the family model of organization ceased to pertain. Fewer and fewer of the employees were actually macrobiotic. It was growth and size that led to difficulties among the lower echelons, the people roasting granola and loading rice on trucks. Doing dull work for a large impersonal company, even when it has a grand, altruistic design, is still doing dull work for a large impersonal company.

"There were indications of theft, waste, malingering, and abuse of privilege throughout the company. Between the managers and the workers a perceivable gap opened. Separation was followed by resentment and discontent. There was a unionization initiative, a strike, and then a movement to 'de- unionize' the company. In the end the union was voted out. The cost, in legal fees, was a quarter of a million dollars, and in time, energy, and harmony, almost incalculable.

"As a result of these various pressures the company became less and less able to pay its bills. Finally, in the fall of 1981, it filed for bankruptcy under Chapter Eleven–a front page story in the *Boston Globe.* The natural foods industry's Rock of Gibraltar had begun to slip beneath the waves.

"Every failure has much to teach us. In Erewhon's near fatal crisis one key lesson may be that 'small is beautiful.' For an organization fueled by idealism and held together by personal commitment, growth past a certain point is a dangerous gamble. Many, perhaps most, of Erewhon's difficulties stemmed from the decision (perhaps never explicitly made) to expand as much as possible. This led to a rate of growth which the company simply was not able to handle. An organization presided over by 'Mom and Pop' and managed by 'inspired amateurs,' few of whom had prior management training or experience, was not ready to cope with the pressures and decisions. Educated, shrewd professionals were needed. When high-priced consultants were finally brought in, it was too little too late.

"The disaster could perhaps have been avoided. Erewhon might have consciously rejected the intoxicant of growth and decided to remain small. It could have remained a local purveyor of macrobiotic products and used its resources to establish similar firms or franchises in other regions. The bananas, yogurt, and vitamins might have been left to others. Even had it not chosen to limit its size, Erewhon might have avoided serious problems with preemptive innovations. A few competent business people early on might have helped. The labor relations crisis might have been avoided by introducing job rotation, a profit-sharing plan, and employee stock options. Had the Kushis, who remained sole owners throughout, been more willing earlier to share that ownership and control, financial partners could have been taken in. The cash flow and interest payment problems would have been eased.

"Of course, with the cheap wisdom of hindsight, it is

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easy to array above the smoldering ruins the 'what if's' and the 'might have been's.' The fact remains that as it was organized and run the company could not survive in the slack economy of 1979-1981.

"Happily though, Erewhon did not disappear. In early 1982, after several months in the limbo of negotiation, the company was sold by the Kushis to Ron Rosetti, owner of the Nature Food Centres retail chain. Later that year Rosetti accepted as financial partners Chuck Verde and Cynthia Davis, who became respectively president and vice president for marketing. Since then the operation has been totally in their hands.

"Recently I met with Verde and Davis, who were accompanied by Jeanne Bock, a pre-Chapter Eleven employee of Erewhon who now handles public relations for the company. Verde, an affable, energetic man in his forties, has a master's degree in marketing, and worked for years in management and marketing at Mennon and Gillette. Davis is a tall, articulate, business-like woman with a Harvard MBA and also with experience at Gillette. We sat in a plush meeting room at Erewhon's production facility in Natick, Massachusetts and discussed the company's recent past, its present, and its future."

The rest of the article is about plans for Erewhon's future.

8009. Nagasawa, Taro; Miyakawa, H.; Mizuguchi, K.; Kato, R.; Shimamura, S.; Kuwahara, K.; Kawashima, T.; Okonogi, S. 1984. Tônyû no kanetsu shori ga tôfu no iro, kôdo tokuni hozonsei ni oyobosu eikyô [Effect of heat treatment of soymilk on color, consistency and particularly keeping quality of tofu]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 31(2):92-103. [21 ref. Jap; eng]

• ***Summary:*** Tofu made from soymilk thermally processed by the newly-developed HGU method had a better flavor and kept fresh longer than tofu made from typical UHT processed soymilk. By allowing spore-forming microorganisms to germinate before the final heat treatment, the latter can be conducted at 125ºC, rather than the typical 130ºC. Address: 1. Faculty of Agriculture, Tamagawa Univ., 6-1-1 Tamagawagakuen, Machida-shi, Tokyo 194; 2; 2-6,8. Central Research Lab., Morinaga Milk Indsutry Co. Ltd., 4-4-22 Meguro, Meguro-ku, Tokyo 153, Japan.

8010. Shurtleff, William; Aoyagi, Akiko. 1984. Soymilk industry and market: Worldwide and country-by-country analysis. 2 vols. Lafayette, California: Soyfoods Center. Vol. 1, 199 p. Vol. 2, 100 p. Feb. 28 cm. [165 ref]

• ***Summary:*** A comprehensive overview, worldwide, with extensive historical information. The first study of its type, with many statistics, graphs, and tables. Volume 1 is the market study, and Volume 2 is black-and-white copies of soymilk labels and other graphics.

Contents: 1. Introduction. 2. Directory of soymilk manufacturers and related companies worldwide. 3. Definitions and varieties of soymilk. 4. Overview of world soymilk industry and market, and future outlook. 5. United States soymilk industry and market. 6. Japan. 7. Korea. 8. China. 9. Taiwan. 10. Hong Kong. 11. Singapore and Malaysia. 12. Southeast and South Asia: (13. Vietnam. 14. Thailand. 15. Philippines. 16. Indonesia. 17. India. 18. Sri Lanka). 19. Europe (Incl. Plamil Foods in England, Tetra Pak Group in Sweden, Alfa-Laval and John Wilson in Sweden, Danish Turnkey Dairies–DTD and Soya Technology Systems (STS), Alpro / Vandemoortele in Belgium, Nestle, F. de Selliers in Belgium, Dansk Soyakagefabrik in Denmark, Lima Andiran in France, Galactina in Belp, Switzerland, and Semper A.B. in Sweden).

20. Latin America. 21. Africa. 22. History of Vitasoy in Hong Kong. 23. Two modern soymilk manufacturing processes: Marusan and Alfa-Laval. 24. Etymology of the word "soymilk" worldwide. 25. Analysis of ingredients in 49 popular Japanese soymilk products. 26. Bibliography. 27. About the Soyfoods Center. A table on p. 12 gives an overview of world soymilk production in 1983 ranked in descending order of annual per capita consumption. These statistics do not include China (PRC) or soy-based infant formulas, usually made from soy protein isolate. 1. Taiwan, 210 million liters, 11.1 liters / capita, growing at 30% per year. 2. Hong Kong, 39.1 million liters, 7.5 liters / capita, growing at 10% per year. 3. Singapore, 11.2 million liters, 4.7 liters / capita, growing at 15% per year. 4. South Korea, 67.0 million liters, 1.60 liters / capita, growing at 60% per year. 5. Malaysia, 21.4 million liters, 1.53 liters / capita. 6. Japan, 131.8 million liters, 1,10 liters / capita, growing at 101% per year. 7. Thailand, 50.0 million liters, 1.00 liters / capita. 8. USA, 9.6 million liters, 0.04 liters / capita. Total world production: 548.3 million liters.

Page 36 gives an overview of the U.S. market for soy-based infant formulas and adult soymilk. Production of soy-based infant formulas (on a ready to serve basis) in 1983 was as follows: Ross Laboratories made 14,720,000 gallons of Isomil (i). Mead Johnson made 14,080,000 gallons of Prosobee. Loma Linda made 2,240,000 gallons of Soyalac. And Wyeth Labs made 960,000 gallons of Nursoy. Thus 32,000,000 gallons of soy-based infant formula were made in the USA in 1983.

Also in 1983, consumption of soymilk by adults in the USA was as follows: 1,743,000 gallons were made by specialized soymilk manufacturers in the USA (Loma Linda Soyagen 1,000,000 gallons; Worthington Soyamel 670,000 gallons, Miller's Soy (private label) 73,000 gallons). 690,000 gallons were imported (328,000 gallons of Vitasoy by Vitasoy USA, 254,000 gallons of Yeo's by YHS, 50,000 gallons of Edensoy by Eden Foods, 25,000 gallons of President by President, 25,000 gallons of Kibun by Kibun, 8,000 gallons of To-Neu by San-J International).

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250,000 gallons were made fresh by tofu companies (45,000 gallons by Mighty Soy, 41,000 gallons by Victor Foods [Scarborough, Ontario, Canada], 39,000 gallons by Quong Hop & Co., 35,000 gallons by Wy Ky, and 90,000 gallons by others).

Yield. 1 ton of raw soybeans yields approximately 4,320 gallons of soymilk. Conversion: 3.785 liters = 1 gallon.

On page 56 is a table of "Large natural food distributors in the US" with the dollar figure being estimated annual sales in millions of dollars."

1. Rainbow Distributing (Denver, Colorado) $13.
2. Arrowhead Mills (Hereford, Texas) $12.
3. Eden Foods (Clinton, Michigan) $10.
4. Rock Island Foods (Ignacio, California) $10.
5. Westbrae Natural Foods (Emeryville, California) $9.
6. Pacific Rim (Seattle, Washington) $7.
7. Cornucopia Natural Foods (Coventry, Rhode Island) $7.

Total estimated sales for the top 7 distributors: $68 million a year.

Note: This book was favorably reviewed by: (1) Andrew C. Peng, Professor, Food Processing and Technology, Dep. of Horticulture, The Ohio State University, Columbus, Ohio, in *Food Technology* Oct. 1984, p. 160. (2) Toyo Shinpo (Soyfoods News, in Japanese). 1984. Aug. 1. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8011. Shurtleff, William; Aoyagi, Akiko. 1984. Brief history of Alfa-Laval's work with soymilk worldwide (Document part). In: Shurtleff and Aoyagi. 1984. Soymilk Industry and Market: Worldwide and Country by Country Analysis. Vol. 1. 177 p. See p. 120-22.

• ***Summary:*** "Alfa-Laval, the world's largest supplier of dairy plants and systems, with some 10,000 employees, celebrated its hundredth anniversary in Sweden in 1983. It was a pioneer in the development of UHT (ultra high temperature) sterilization plants for dairy milk in the early 1960s. Continuous process UHT, guaranteeing milk and juices a shelf life of a month or more without refrigeration, and giving milk a much better flavor than autoclaved sterilized milk, caught on rapidly in Europe and many developing countries. By 1978 UHT milk, which slowly replaced pasteurized and refrigerated milk, had about 40% of the market in Europe. Alfa-Laval made UHT systems based on both direct heating (injection of high pressure steam into the milk flow to bring the temperature up to 135–140ºC) and indirect heating (in a plate heater, to 140ºC for 4 seconds). Alfa-Laval's direct system was called VTIS (Vacu-Therm Instant Sterilizer) and their indirect system, considered the more advanced and economical of the two, was called Steritherm.

"Starting in the early 1960s Alfa-Laval began to sell soymilk system components to soymilk manufacturers in East Asia. The UHT VTIS system was found to work very well, since the vacuum stripped off beany flavors. Alfa installed a VTIS for Yeo Hiap Seng in 1967 and one for Hong Kong Soya Bean Products Co. (makers of Vitasoy) in 1974.

"A key man behind Alfa-Laval's growing interest in soymilk is John Wilson, who got involved with soymilk in 1967, as technical manager for the Cold Storage Group (CSG) in Singapore and Malaysia. His background was in dairy technology. To help CSG launch a soymilk product, he studied traditional tofu processes in Singapore, then mechanized them. He set up CSG's first soymilk line in Petaling Jaya, a suburb of Kuala Lumpur, Malaysia, in 1969, and then another in Singapore later that year.

"In 1971 Wilson joined Alfa-Laval and started developing complete process lines for soymilk, based on a suspended (unfiltered) product made from full-fat enzyme-active soy flour. But only one plant for making suspended soymilk was ever sold (to Africa in 1982). In 1978 soymilk technology R&D was centered under John Wilson in Alfa-Laval, at Lund, Sweden. Systems for making clarified (filtered) soymilk with low bean flavor were developed.

"Alfa-Laval sold complete soymilk lines to Lam Soon (Ace Canning) in Kuala Lumpur, Malaysia (operation started in December 1979) and Kickapoo, in Bangkok, Thailand (from Feb. 1981). By early 1984 they had sold equipment or entire plants to at least twelve soymilk manufacturers in East Asia, including many of the largest (Hong Kong Soya Bean Product Co., Kibun, Dong Bang, President, Siam Food Prods., etc.).

"In 1981-82 Alfa stepped up its soymilk activities dramatically. It published attractive and informative 10-to-15-page large-format booklets on soymilk and its production in English, Chinese, and French, and began heavy promotion worldwide. Alfa-Laval went after the China market in a big way. They offered to install a soymilk plant in Beijing for the Ministry of Light Industry to use for one year, free of charge on a trial basis. Their 12-page brochure in Chinese on soymilk (*Douru*) was widely circulated. During a 3-month period in 1983 they sent five soymilk delegations to China, and began to set up an office in Hong Kong, run by a China trader with ten years experience, to focus on the China market.

"In late 1982 Alfa-Laval and Kibun (in Japan) formed a powerful alliance by signing an important, interesting, and unorthodox agreement. Alfa-Laval supplied Kibun with some of Kibun's original soymilk equipment, but eventually Kibun had to modify it extensively. Now, when Alfa-Laval finds a new equipment client, they tell the client, according to the agreement, that Kibun is their preferred supplier of the soymilk process. Kibun then signs a separate contract with the client for technical assistance, including product formulation and quality control. This could be a joint venture, a license for Kibun patents and technology, and/or purchase of actual patented equipment made by Kibun's food

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engineering company. Likewise, when Kibun licenses others to use its process, it often asks Alfa-Laval to supply the plant. There are no kickbacks between Alfa-Laval and Kibun. The arrangement works nicely since Alfa-Laval is strong in plant design, while Kibun is strong in processing technology and formulation. Yet Kibun holds no soymilk patents.

"Alfa-Laval has made a major contribution to soymilk production by being the world's first company to develop and sell an automated soymilk system. Their system is based on their UHT sterilizer, and incorporates an automated clean-in-place cleanup system. By inactivating the soybean enzymes at the bean stage, before grinding, the system produces a good-tasting soymilk. The economical plant size has a capacity of 2,000 liters/hr, with 1,500 liters/hr the economical minimum." Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8012. Shurtleff, William; Aoyagi, Akiko. 1984. K.S. Lo and the history of Vitasoy in Hong Kong and North America. (Document part I). In: Shurtleff and Aoyagi. 1984. Soymilk Industry and Market: Worldwide and Country by Country Analysis. Vol. 1. 177 p. See p. 130-153.

• ***Summary:*** Starting in the late 1950s a renaissance of interest in soymilk began in East Asia, eventually spreading from its center in Hong Kong to all countries in the area, and from there to other parts of the world. The company that inspired this development was K.S. Lo's Hong Kong Soya Bean Products Co., Ltd. (HKSBP), makers of the world-famous soymilk, Vitasoy. As of 1984, no person alive had done more to further the world's interest in soymilk (or in soyfoods) than K.S. Lo.

Early Years (1910-1944). Lo Kwee Seong was born on 2 February 1910 in Kwangtung, China. At age 10 he went to Malaya with his mother and at age 20 he went to Hong Kong. In 1935 he graduated from the University of Hong Kong with a BA degree in commerce and business. After graduation he joined the company where his father worked and was soon appointed Hong Kong manager of the firm's real estate branch.

The story of Vitasoy begins in the winter of 1937, when K.S. Lo, then 27 years old, happened to be in Shanghai on other business. There he attended a talk entitled "Soya Bean: The Cow of China," presented by the American Julean Arnold, then the commercial attaché to the American Embassy in Nanking, and actively involved in relief work using soymilk. Lo later wrote (1964), "Arnold called the soybean the 'Cow of China' and practically attributed to it the preservation of the Chinese race. He said the fact that the Chinese as a race were able to maintain their physical fitness for over 5,000 years in a land where meat was so rare was entirely due to the people's inclusion of soybeans in their diet. I was impressed by his talk and came away with soybeans stuck in my mind." Even after Lo returned to Hong Kong, Arnold's message kept returning to him.

Several years later, in 1939, following the Japanese invasion of China, the first wave of Chinese refugees arrived in Hong Kong. A refugee camp was set up in Argyle Street, Kowloon. A small group of volunteers, including Lo, went to see what could be done to help. Most of the refugees were sick or suffering from malnutrition, including beri-beri and pellagra. Seeing this, Lo again recalled Julean Arnold's message of the promise of the soybean. With the group of friends he raised some money and purchased some soybeans and brown sugar, a stone mill, a kettle, and some cheese cloth. The group set up a small soymilk shop right in the camp and taught the refugees how to make soymilk for themselves. Each refugee received one bowlful every morning. Lo later wrote: "The results were quite startling, as many of them showed significant improvement in their health after the first month. This little experiment gave me full confidence in the nutritional value of soy bean milk and I decided to make it available to the masses of people in Hong Kong who could not afford to buy cow's milk" (Lo, personal communication, March 1981).

In 1939 Lo and four of his friends got together and formed The Hong Kong Soya Bean Products Company (HKSBP), with paid-up capital of HK$15,000. (The company name was expanded to The Hong Kong Soya Bean Products Company, Ltd. in March 1940). The original plant and processing equipment, designed by the founders and located at Causeway Bay (on the site where the Plaza Hotel now stands), officially began operations on 7 March 1940. In his inaugural speech, Lo stated that the company's aim was to provide nutritious soymilk for the masses at the lowest possible price–an aim that has not changed over the years. In those days, when nutritional deficiency diseases such as beri-beri and pellagra were still widely prevalent in Hong Kong, this aim was doubly urgent and important. Yet the day after the plant opened, exactly nine bottles of the product, called VITAMILK, were sold. A dozen delivery boys delivered Vitamilk door-to-door each morning. The strongest supporter of the fledgling operation was a Brit, Dr. Selwyn-Clarke, then director of Medical and Health Services. The only government official aware of the nutritional value of soymilk, he gave orders that all government hospitals should use the new product instead of cow's milk for all third-class patients.

The first few years were filled with problems. Lo wrote in 1964: "We soon found that, even among us Chinese to whom the soybean was by no means new, there was a strong prejudice against soy milk. They not only did not believe its nutritional values, but they also thought it could cause diarrhea, indigestion, and stomach ache. At that stage the taste of our product, too, left much to be desired. Many customers found it hard to take, because of the strong beany flavor and the slightly bitter taste. Another problem we had to face was the keeping quality of the soy milk. We followed the dairy industry by packing it in standard half-pint milk

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bottles and sealing them with a paper cap and hood. They spoiled even quicker than milk unless they were kept under refrigeration all the time. As they were packed like dairy milk, we had no choice but to market them as a milk substitute. It was not until years later that we found it was a mistake to adopt such a marketing approach. For among the Chinese community, giving milk to children was considered to be a Western luxury, which only the very rich could afford. And of course to the rich, cost was no problem."

Sales continued to be slow, only 300-400 bottles a day. During the summer, sometimes as many bottles spoiled as were sold. Something had to be done. Lo began working with Dr. Y.T. Chiu, who had a written his PhD thesis at Cornell University in 1927 on methods for improving soymilk and its production, and in 1929 had published an article on the subject in China. Their goal was to get locals schools to start using Vitamilk. Speeches on soymilk and nutrition by Chiu were followed by tasting sessions conducted by Lo at the schools. The idea worked. In fact it was a major breakthrough, and today schools remain the company's single most important customer. After the first year, distribution was extended from Hong Kong Island onto the Kowloon peninsula on the mainland. There a combination soymilk cafe and distribution depot was set up. The spot proved popular with students and young people.

In the spring of 1941, Howard Hoover, who had started and run a small Seventh-day Adventist soy dairy in Canton (Guangzhou), had left that city after it fell to the Japanese. While waiting to return to the US he worked with Lo for 6 months. He taught Lo how to homogenize coconut oil into the soymilk to give it a richer flavor then helped to install the company's first Cherry Burrell homogenizer.

By mid-1941 sales of Vitamilk had risen to 1,000 bottles a day. But that was far below the break-even point, and by December 1941, when World War II broke out, the company went broke. Lo, abandoned by his partners, had sunk HK$30,000 of his own money into the venture.

Sixteen days later Hong Kong surrendered to the Japanese. Four months after the occupation Lo left for Free China (the part of China not occupied by Japanese), taking with him his family of four children. They finally settled down as refugees in a small town called Linshan on the border between Kwantung and Kwansi, west of Canton. Here again the soybean provided Lo with a livelihood and probably saved the family's life. Lo put up a makeshift building and called it The Cafe. After buying a stone mill, he started to make soymilk and home-made cakes, and thus made a living until World War II was over. Their fifth child, Irene, was born during this hard time. Lo's wife had no breast milk to feed her since she had not nursed the other children. Irene was thus raised on soymilk which, the family felt, saved her life. Continued. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8013. Shurtleff, William; Aoyagi, Akiko. 1984. K.S. Lo and the history of Vitasoy in Hong Kong and North America. (Continued–Document part V). In: Shurtleff and Aoyagi. 1984. Soymilk Industry and Market: Worldwide and Country by Country Analysis. Vol. 1. 177 p. See p. 130-153.

• ***Summary:*** Continued. An overview of HKSBP's market position in the early 1980s showed the following. By 1980 sales (by number of cartons or bottles) of the many and varied non-soy Vita products had passed sales of Vitasoy. Sales of Vitasoy were growing steadily, from 130 million Tetra Brik cartons and bottles (converted to 250-ml equivalents) in 1980 to 150 million in 1983, for a 5% compound annual growth rate in a mature market. In 1983 all products made by HKSBP's accounted for 35% of the Hong Kong Beverage market, second only to the Swire/Coca-Cola Company's products with 42%. Vitasoy, which had had no competition from brand-named soymilks since 1961, suddenly had to worry about competitors again. Nestle's Bonus (launched in 1978), President's soymilk (launched in 1980), and Coca-Cola's Hi-C soymilk (launched June 1982) took away some of Vitasoy's market monopoly. Yet in 1983, according to Hong Kong Beverage Association statistics, Vitasoy had a commanding 96% of the fast-paced Hong Kong soymilk market, versus only 4% for Hi-C. Bonus and President had insignificant shares. Hong Kong had the world's second highest per capita consumption of soymilk (after Taiwan), about 8.2 liters a year. In 1983 Vitasoy was given a new slogan which proclaimed: "Taste the Feeling."

In 1980-81 Vitasoy prices in Hong Kong dollars were as follows: Bottles, 60 cents for 7 oz. and 80 cents for 10 oz. of plain Vitasoy and 80 cents for 8 oz. of malted Vitasoy; Tetra Brik (250 ml or 8.45 oz.), 90 cents for plain and $1.00 for malted. Ingredients in the plain (sweetened) Vitasoy sold in Hong Kong were water, soybean solids, soy oil, cane sugar (5.5%), and salt, plus vitamins A, B-1, B-2, and niacinimide. The exported Vitasoy contained no added vitamins. A typical 250-ml carton of Vitasoy for export contained 100 calories, 16 grams (6.1%) carbohydrates, 5 grams (2.0%) protein, and 3 grams (1.1%) soy oil. In 1981 the company had sold more Vitasoy in bottles than in Tetra Pack, but sales of the latter had increased by 50% a year since 1978. In 1983 sales in Tetra Pak led bottles 6 to 4.

For HKSBP China represented the great untapped market of the future, but also the great unknown. In 1983 HKSBP made two small but important new moves into China, building on experience from the Kwong Ming Dairy Farm. First, the company began to export Vitasoy to China's new Special Economic Zones. And second, they worked with the Chinese on a venture in Shanghai called Jing Jiang United Food Processing Co. Ltd. Initially HKSBP worked as a technical consultant on the project, but negotiations were underway for a joint venture. In August 1983 the plant's first product, Vita orange drink, was produced for a national sports meet. It is hoped that soymilk, perhaps called Vitasoy,

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will be the company's next product.

Vitasoy in North America. Vitasoy was the first Asian soymilk to be imported to North America. This venture was pioneered by K.S. Lo's two entrepreneurial daughters, Yvonne and Irene. Yvonne, who actually ran the operation, had graduated from a Canadian university then worked for 6 years as a city planner in Toronto, before realizing that her heart was really in business and marketing. In January 1979 Yvonne and Irene incorporated The Soya Bean Products Co., N.A. Inc. (SBPC) as a marketing company for HKSBP's products in North America. They opened headquarters that month on Bush Street in San Francisco, then began immediately to market and distribute plain and malted Vitasoy in Canada, in 8.4-oz. (250-ml) Tetra Brik cartons. In February 1981 they introduced the same products to the USA, immediately after the FDA lifted its ban on Tetra Pak (because of a disproven concern over hydrogen peroxide residues from sterilization). By 1982 some 3.2 million cartons of Vitasoy a year were being sold in the US and Canada.

The venture was so successful that in April 1982, to raise capital and facilitate long-term operations with Hong Kong, Yvonne and Irene sold their company to HKSBP, which renamed the US affiliate Vitasoy USA, Inc. The parent company now took a serious interest in the US market. In 1983 sales of Vitasoy increased to 5 million cartons, up a whopping 60% from the previous year. The 1983 figure equaled 328,125 gallons or 1.24 million liters. An estimated 90% of this soymilk was sold to the Oriental market; of this, 80% was sold to Chinese, and the rest to Vietnamese, Filipinos, and other ethnic groups. Roughly 45% of all Vitasoy was sold in the three western coastal states. Vitasoy distributed its own products in the San Francisco Bay Area (the single area of greatest sales), northern California, Oregon, and Washington. Other companies, appointed by Vitasoy, sold the product in southern California, and elsewhere in the US and Canada, in 10 market areas designated as having a high concentration of Oriental Americans.

In 1983 Vitasoy was by far America's leading imported soymilk, accounting for just under 50% of total soymilk imports. Heady with success, Vitasoy USA announced in late 1983 that it would launch two American-style products in March 1984 at the big natural foods trade show in Anaheim, California. These would be called Vitasoy Original and Vitasoy Coconut. Each would bear the subtitle: "Natural Soy Drink, Sweetened with Maple Syrup." They would be marketed to the natural and health food trades as a healthful and nutritious beverage, under the slogan "Taste the Goodness." Marketing to mainstream consumers was also planned. Prices in the two markets were expected to be $0.65 and $0.55 respectively (maple syrup was a major part of the product cost), as compared with $0.35 for Vitasoy with a higher water content, sweetened with sugar, sold in the Asian-American market.

In developing these products Vitasoy USA did extensive and thorough, original research on American attitudes to and taste preferences for soymilk. Working with American marketing and product development professionals, they ran "focus group" and "intercept" studies. In September 1982 Yvonne Lo and Hilton Tsui issued a 59-page in-house report titled Market Study of Soymilk Beverage, packed with original information, plus an overview of the US beverage industry and a marketing plan.

Most important, the company announced in late 1983 (after an unsuccessful attempt to acquire majority ownership of the New England Soy Dairy) that it had purchased land in Brisbane, California (just south of San Francisco) and had signed a contract to build a large soymilk plant there. This plant, scheduled to open in 1985, would clearly introduce a new stage in the history of soymilk in America, for HKSBP would be the first major Asian soymilk manufacturer to start a plant in the West.

The Present and Future. The year 1984 saw the Hong Kong Soya Bean Products Co., Ltd. as the world's third largest manufacturer of soymilk (after Kibun in Japan and Chung's Food in Korea), and one of the largest exporters. The tiny size of the Hong Kong market (only 5.2 million people, compared with 120 million in Japan and 42 million in Korea) had been a major factor limiting the company's growth. But now HKSBP was poised on the edge of an era of great potential growth in a world market. The challenges of internationalization, diversification, public versus family ownership, exports versus local manufacture, marketing Asian products in the West, company name changes with diversification, etc. all bear striking resemblance to those faced by Kikkoman, as discussed in Chapter 79 of our book *History of Soybeans and Soyfoods.* We expect that HKSBP, though much smaller than Kikkoman, will follow many of the same patterns; hopefully it will be as successful as Kikkoman has been.

The relatively small Hong Kong market will play a smaller and smaller role in the company's future. The greatest potential for growth may well lie in China. Efforts to introduce Vitasoy into school lunch programs in Third World countries and to help such countries make better use of domestic soybeans for human nutrition could bear great fruit in countries such as Mexico, India, Argentina, Brazil, Paraguay, and Indonesia. In these areas, domestic joint-venture plants probably hold greater promise than imports, since they help rather than hurt foreign exchange balances. Note: Three updates:

1990 Aug. 3–Vitasoy acquires Nasoya Foods (Leominster, Massachusetts).

1990 Sept. 24–Company name changed to Vitasoy International Holdings from Hong Kong Soya Bean Products Co. Ltd.

1993 May 27–Vitasoy acquires Azumaya Inc. (South

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San Francisco, California). Azumaya (Originally Azumaya Tofu Seizo-sho) had been making tofu in San Francisco since at least 1930. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8014. Shurtleff, William; Aoyagi, Akiko. 1984. Japan: Soymilk industry and market (Document part). In: Shurtleff and Aoyagi. 1984. Soymilk Industry and Market: Worldwide and Country by Country Analysis. Vol. 1. 177 p. See p. 63-81.

• ***Summary:*** Historical. Soymilk was not a part of the traditional diet in Japan, as it was in China. Cow's milk, which entered Japan in about 1000 A.D., likewise, never became a part of the basic diet. Reference to soymilk (then called *toju* or "bean liquid") may have appeared as early as the 1100s, but the first clear reference was not published until 1895, when Inouye did one of the world's first nutritional analyses of soymilk, and compared it to cow's milk. In 1906 Katayama wrote two articles on soymilk; in one he described preparation of a fermented soymilk cheese, similar to Swiss cheese. Yet both Inouye and Katayama wrote in English. In 1924 Sato Yoshitane wrote a book called *Daizu Kakko,* which is said to contain the earliest known reference to the word soymilk (*tônyu*), written with the present characters.

From this time on (and perhaps from an earlier date) some Japanese (an estimated 1% of the population) would order fresh soymilk from their local tofu shop, usually for health-related reasons, as in diabetic diets or for mothers who had difficulties with breast feeding, or because it was thought or found to be a health-giving beverage.

The earliest known commercial production of soymilk in Japan dates back to the influence of Dr. Harry Miller. In 1957 two Japanese Seventh-day Adventists, following his inspiration, started making soymilk in Hachioji, Tokyo, and selling it locally in 180 ml cartons. In 1958 Dr. Miller set up a small soymilk plant in the kitchen of the Adventist Tokyo Sanitarium. It was used to make soymilk, soy whipping cream, soymilk ice cream, and soy spread, which were served to the staff and patients. In 1959 a small soymilk plant was established in the Seventh-day Adventist Saniku School. From this year, Japan's oldest existing soymilk company, Saniku Foods, traces its origin.

A chronology of the starting date of Japanese soymilk companies is as follows. Only three, each followed by an asterisk, are no longer in business:

During the period from 1973 to 1976 soymilk started to become quite popular in Japan, largely because of developments in processing technology that made it possible to produce soymilk with a bland (non-beany) flavor, and because of promotion by the new soymilk companies. In 1974 Japan's first major book on soymilk was published. By 1976 the Japanese were making the best soymilk in the world–by Western standards.

A new era began in 1976 when Kyushu Milk Co., a long-established, middle sized dairy milk company, started making soymilk. Tremendous momentum was added to this new direction in April l979, when Meiji Milk Co., Japan's second largest milk company also started to sell soymilk (made by Marusan but with the Meiji brand). Meiji first began to make their own soymilk in their own plant in March 1981. That same month Morinaga Milk Co. was licensed by Mitsubishi to distribute their soymilk. Quickly thereafter each of the other major Japanese milk companies (Meito, Yuki-jirushi) followed suit, joining the wave of the future rather than fighting it. Their analysis was that fundamentally soymilk and cow's milk were complementary rather than competing products, and that making soymilk would allow a company to expand its market size by reaching people who did not ordinarily drink cow's milk. In retrospect, this analysis has proven to be correct.

What has since often been called "The Soymilk Boom" really started in Japan in about 1981-82. The main reasons for this were:

1. A growing interest among Japanese in good health and nutrition, through improved diet. A corollary of this was the concept that the elite should be especially healthy, both to improve their own performance and well being, and to set an example for others. The American health, natural foods, soyfoods, and vegetarian movements all had a significant influence on Japanese attitudes toward good health.

2. Improved soymilk quality/flavor, and a growing number of varieties and flavors.

3. Popularization of packaging (such as Tetra Brik aseptic cartons) that would give the soymilk a long shelf life, allowing nationwide distribution from one large soymilk plant.

4. Strong interest and support by the media/mass communications followed, after 1981, by extensive advertising and promotion on TV (especially by Kibun and Marusan), in the print media, and with in-store demos by soymilk companies.

5. The aggressive marketing of soymilk by all of Japan's major milk companies.

6. The establishment of Japanese Agricultural Standards (JAS) for soymilk in May 1981.

7. Large numbers of tofu shops starting selling fresh soymilk (containing its natural "beany" flavor), starting in about mid-1982.

8. Large manufacturers and distributors of beverages and related food products started to buy soymilk in bulk from manufacturers, then to market and distribute it under their own labels. Examples: Kirin Beer, Kagome (a large ketchup maker), Suntory, etc.

From 1978 to 1983 the soymilk market in Japan, on average, more than doubled each year, making it the fast growing food market in Japan! Many new brands started appearing in 1982 and there was a big jump in production. Soymilk was the star and darling of the media and it played

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1959 Saniku Foods

1962 Nihon Tanpaku Kogyo

1969 Luppy Tanpaku*

1972 Ishihara Food Center

1973 House Luppy*

1974 Tokyo Soymeal*, Kenbi-sha, Okazaki Marusan/Marusan Ai

1976 Asahi Shokuhin, Soken-sha, Kyushu Milk Co.

1977 Kibun, Natural Foods

1979 Mitsubishi Foods

1980 Chiba Seisen Shokuhin Kogyo

1981 Yakult, Nagano Tomato, Meiji Milk Co., Morinaga Milk Co.

1982 Seven-Up Inryo, Meito Milk Co., Zenno, Takeda Yakuhin

1983 Yuki-jirushi Milk Co, Tamura Kasei. There are rumors that Kikkoman and Ajinomoto may start soon.

Market Size and Growth Rate: The following statistics show the increase in size of the Japanese soymilk market:

Year	Production (Metric Tons)	Ex-Factory Value (Million Yen)	Ex-Factory Value (Million US$)	Raw Soybeans Used (Metric Tons)
1975			2.9	
1976			4.2	
1977			5.6	
1978	4,000		7.7	
1979	8,000		9.6	
1980	10,000	3,000	13.8	
1981	17,280	6,000	25.0	3,000
1982	68,245	13,000	61.2	9,039
1983	131,750 est	25,000 est	108.2	17,500 est

Source: Japan Soymilk Assoc., Norin Suisan-sho, and Kanji Tsuchiya, 1983-84.

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Leading Soymilk Manufacturers and their Market Share. All major soymilk companies can be divided into three types: (1) Medium sized food companies making soymilk as one of various products (Marusan, Kibun), (2) Huge dairy companies (Meiji, Morinaga, Yuki-jirushi), and (3) Soft drink and beer companies (Kirin, etc.).

Toyo Shimpo (21 July 1982) gave the market shares of major soymilk manufacturers as follows. Inexplicably, the total comes to 110.1%

1. Kibun Foods 41.7%
2. Okazaki Marusan..... 23.3%
3. Mitsubishi Kasei..... 10.0%
4. Saniku Foods 8.0%
5. Kyushu Milk Co. 6.0%
6. Meiji Milk Co. 5.8%
7. Kenbi-sha 2.5%
8. Asahi Shokuhin 2.5%
9. Soken-sha 1.3%
10. Natural Foods 1.3%

Others 7.7%

These figures can be misleading, however. In mid-1983 Kibun, Marusan, and Mitsubishi all had the same installed capacity for soymilk production. One top industry analyst claimed that Marusan's actual production was larger than Kibun's, but that much of Marusan's soymilk was sold in bulk to other companies (Sakura Shokuhin, Dai Tonyu-gyo, Nagano Tomato, and 2-3 others), who repackaged and sold it under their own brands, or used it in breads, etc. After Marusan in total (including bulk) production were Kibun,

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a major role in enhancing the image and sales of all soyfoods in Japan.

Market Size and Growth Rate: The following statistics show the increase in size of the Japanese soymilk market: Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8015. Tsumura, Takashi; Tsuruta, Shizuka; Inoue, Mamehiko. 1984. Kenko-shoku tôfu [Tofu, the health food]. Tokyo: Nobunkyo (Nosan Gyoson Bunka Kyokai). 236 p. Tezukuri Nihonshoku Shirizu (Handmade Japanese Foods Series). [27 ref. Jap]

• ***Summary:*** The third author, Mr. Inoue, opened his tofu shop in 1981 and is making tofu coagulated with natural nigari. The second author, Ms. Tsuruta, translated *The Farm Vegetarian Cookbook* into Japanese. This book is not vegetarian. Contents: Part I. Japanese tofu cookery. Chinese and Korean tofu cookery. Futuristic tofu cookery. Part II. The real face of tofu. How tofu is made. How to make tofu by yourself. History of Japanese and Chinese tofu. Part III. One statement from a tofu maker. Aiming for traditional tofu production.

This book contains numerous old illustrations (line drawings) of tofu in Japan. Page 208 shows a tofu vendor carrying two tubs of tofu at the ends of a shoulder pole (tenbin). He is wearing a straw hat, Japanese kimono, and high wooden clogs (geta). It is from the book "Illustrated Edo Period Food Life Dictionary" (Zusetsu Edo Jidai Shoku Seikatsu Jiten), compiled by the Society for the Study of the History of Japanese Customs (Nihon Fuzoku Shigaku-kai).

Page 209 shows the interior of a tofu shop from the Edo period. It adjoins the family home. A woman with a child on her back is grinding the soybeans in a hand-turned stone mill. A man is sitting on the end of a lever press, pressing the soymilk out of the okara. It is from the book "Illustrations of Edo Period Occupations" (Edo Shobai Zue), illustrated by Kazuma MITANI.

Page 210 shows a tofu makers wife cutting tofu above a cooling tank. It is from a book on Japanese occupations (Shokunin Zokushi Hokkugo), with illustrations by Yui Nashimoto. Address: 1. Freelance writer; 2. Author, vegetarian cooking specialist, co-owner of a natural foods restaurant, and translator of the Farm Vegetarian Cookbook; 3. Owner of tofu shop Shonan Mamehiko in Shonan, Kanagawa-ken.

8016. Knoblauch, Mark. 1984. Restaurants: Kotobuki's creative Japanese dishes as pretty as a picture. *Chicago Tribune.* March 4. p. K10.

• ***Summary:*** This is a review of the Japanese three-star restaurant in Chicago. The restaurant features sushi and sashimi. *"Inari sushi* ($5.25 for 7 pieces), popular in Japan, doesn't show up often on this side of the Pacific. This type wraps sushi's mounds of vinegared rice in pockets of deep-fried bean curd." It never contains any fish, so some like to order it with raw tuna as a side dish. An unusual version of teriyaki is pork *miso-zukeyaki,* which is pork marinated in miso, then cooked teriyaki style.

8017. Shurtleff, William; Aoyagi, Akiko. 1984. History of soy protein concentrates, isolates, and textured soy protein products. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 25 p. March 4. Unpublished typescript. Available online at www.soyinfocenter.com.

• ***Summary:*** A comprehensive history of the subject. Contents: Definition of types of products. Part I: History of modern soy protein products from origin to 1964. Soy protein isolate: Tofu, Nagel in New York 1903, Beltzer in 1911, Ajinomoto in 1919, Cone and Brown patent in 1928, Glidden (first plant in U.S. for production of industrial grade soy protein isolate) in 1935, first study of use of soy isolates in food (Woodruff at University of Illinois, 1938), Glidden first company in the West to produce a soy protein isolate for use in food (1939, enzyme-modified), Glidden first with large-scale production of non-enzyme modified isolates (1957), Worthington Foods introduced Soyamel in 1952 (first soymilk based on isolate). Soy protein concentrates: First developed and introduced in Germany in 1925, first commercial food-grade concentrates and first patent from Griffith Laboratories in 1959. Textured soy protein products: Developed in China 1,000 years ago, made from tofu or yuba, earliest Western meat analogs developed by John Harvey Kellogg about 1896 (without soy), first synthetic industrial protein fiber (Lanital, made from casein) introduced in Italy 1936, first industrial (non-food) soy protein fibers in 1938 from Robert Boyer of Ford Motor Co. (used for upholstery), Boyer got patent for use in food (1951), rights purchased by Worthington, Dr. Harry Miller's soya loaf in 1939, Worthington first to produce a meat analog based on spun soy protein fibers in 1960, textured soy flour (TSP or TVP) introduced as food ingredient in U.S. in 1964.

Part II: History of modern soy protein products in the U.S. from 1965 to 1981. 1964 Belden report from Harvard Business School *Protein Paradox.* Commercial Protein Foods Studies Program of the U.S. Agency for International Development (AID) encouraged U.S. firms to develop protein foods for the Third World in 1967. General Mills Bac-O's test marketed 1966. Producers. February 1971 breakthrough when USDA authorized use of TVP in school lunch programs. 1972 *Soybeans. Chemistry and Technology,* edited by Smith and Circle, contained all the research on nutrition and processing up to that time. 1973 high beef prices led to beef-soy retail blends. Appearance of TSP cookbooks, starting in 1971. First World Soy Protein Conference held in Munich, Germany, in 1973. In 1974 Miles Laboratories/Worthington Foods introduced Morningstar Farms meat analogs, the first soy protein meat analog entrees marketed to mainstream America. Textured

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soy concentrates and other concentrate developments. New developments with isolates. New flavorings. New textured soy flour development. 1978 Keystone Conference on soy protein and human nutrition sponsored by Ralston Purina. Problems with government regulation.

Part III: History of modern soy protein products outside the U.S. and Europe (1960-1981): Japan. China. Other Asia: Philippines, India, Sri Lanka. Latin America: Colombia, Mexico. Address: Lafayette, California. Phone: 415-283-2991.

8018. Kawarai, Kumiko; Kikuchi, Kyoji; Aoki, Sadao. 1984. Tenpe hakkô katei ni okeru seibun no henka [Change in nutrients during tempeh fermentation]. *Tochigi-ken Miso Shoyu Gijutsu Kaishi* (*Tochigi Prefecture Miso and Shoyu Technical Journal*) No. 34. p. 28-32. March 15. [Jap] Address: Tochigi-ken Shokuhin Kogyo Shidosho.

8019. Storup, Bernard. 1984. Re: New developments at Société Soy. Letter to William Shurtleff at Soyfoods Center, March 22. 3 p. Typed, with signature on letterhead (photocopy). [Eng]

• ***Summary:*** "A brief history of Société Soy: Oct. 1981–Sept. 1982. Search for a place to settle near Paris, choose and install equipment. The company's first commercial production began in June 1982.

"Oct. 1982–May 1983. Production of tofu (firm for the natural food market and soft for the Japanese community–30,000 Japanese living in Paris); distribution by our own means in Paris only.

"From May 1983. Nationwide distribution of firm tofu–vacuum packed, 24 day shelf-life–and tofuburgers (called 'Croque Tofou') by Paris based distributors (actually, from Rungis, which is the biggest market of its kind in the world, and a key point for fresh products for western Europe).

"We carry 5 types of burgers (see labels), with 26 day shelf-life (we could put 2 months, according to a strict microbiological survey we ran, but prefer to shorten it in order to have a more regular rotation).

"This week have begun a nationwide advertising promotion for 'tonic burgers' (in Paris subway, on the national radio); it is run by a fast food chain that wants to promote a more dietetic way of eating. We make the burgers.

"We should double our production within the next 6 months; We don't really have time to develop new products, at least for this year.

"We are presently making 2,500 kg/week of tofu, including 1,400 kg/week of burgers; one year ago we were making 1,000 kg/week.

"Some news from Europe: Several types of soymilk have recently been put on the market: Lima Soya Drink, Sojal, and Soyo.

"I think the biggest tofu manufacturer in Europe is Vanka-Kawat in Rijswijk, Holland. They sell about 30,000 pieces of tofu (250 gm and 450 gm) per week, mostly for the Asian (Indonesian) community. They also make sprouts and tempeh. They have an automatic plant with only European equipment; there is no way to visit it.

"The French dairy lobby (France is the world's leader in cheese consumption) has recently clearly defined its new priorities: fight by all means against all kinds of substitutes for dairy products–above all soymilk." Address: Société Soy, Plateau de l'Ardennais, 91590 Cerny, France. Phone: (6) 457 52 01.

8020. Vansickle, Janice. 1984. Bean worth weight in gold. *Windsor Star* (*Essex County, Ontario, Canada*). March 26. p. B1-B2.

• ***Summary:*** Soybeans are now Essex County's major field crop and the third largest cash crop in Ontario province (with a value of more than $203 million in 1982), but few people know what happens to the golden nuggets after they leave the farm. Most of the soybeans are crushed in Canada to make soybean oil and meal. Last week the Ontario Soya-Bean Growers' Marketing Board held a symposium in Toronto titled "Ontario soybeans–A journey into the next century." Sheldon Hauck, vice-president of the Soy Protein Council in the USA and one of the speakers estimated that soy protein is an ingredient in over 2,500 readily available grocery store items. Contains a nice history of the soybean in Canada. Ontario now exports soybeans to 20 countries, "including major shipments to Japan, which buys only top quality soybeans and turns them into soyamilk, soyaflour, tofu, miso–a soyapaste for soup–and natto–a fermented soybean used as an appetizer." Speaker after speaker confirmed a bright future for soybean exports. Moreover, all supermarkets in Windsor now carry tofu, a soya curd. Soy oil is found in margarine and cooking oils. Soy protein appears in soya sauce, simulated bacon bits, and infant formulas. The H.J. Heinz Company in Leamington has been working with the marketing board to develop a line of processed soybean products for the retail market.

Ontario's three soybean crushing plants are experiencing hard times, in part due to competition from canola oil (which enjoys subsidized freight rates); they are operating at 62% of capacity and could be forced to shut down. Photos show: A pair of cupped hands holding soybeans. Peter Epp, chairman of the Ontario Soybean Growers Marketing Board.

Note: This is the earliest English-language document seen (March 2009) that uses the term "soyapaste" to refer to miso. Address: Star agriculture reporter.

8021. *Mainichi Shinbun* (*Mainichi Daily News*). 1984. Miso wa gan ni tsuyoi [Researchers say miso is a good anticancer agent]. March 31. p. 1. [1 ref. Jap; eng+]

• ***Summary:*** See English version of this in the *Mainichi Daily,* April 1.

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8022. Gotoh, K. 1984. Historical review of soybean cultivation in Japan. *Tropical Agriculture Research Series* No. 17. p. 135-42. March. International Symposium on Soybean in the Tropics and Subtropics. [24 ref. Eng]
• ***Summary:*** Contents: Abstract. Before the Meiji era (-1866): Dissemination, instructions to farmers. Traditional cultivation (1867-1945): Characteristics of this period, special methods of cultivation. Scientific approaches (1946-1977): Characteristics of this period, genetic resources, cultivation practices recommended, physiological studies, planting density, differences between record yields and average yields. Recent situation (1978-): Take-off in yields, problems in the near future.

"The time when the soybean was introduced from the northern part of China to Japan is not precisely known. The earliest reference to soybean appeared in the Kojiki (completed in 712 AD) and Nihonsyoki [Nihonshoki] (in 720 AD). They referred also to rice, barley, Italian millet (*Setaria italica* Beauv.), Japanese millet (*Echinochloa frumentacea* Link), and adzuki beans (*Vigna angularis* (Willd.) Ohwi and Ohasi). Thus, it appears that soybeans were grown as one of the important crops in olden times."

Nagata (1959) proposed that soybeans first entered Japan in the northern part of the country, having been disseminated from Korea. Prior to that they had arrived in Korea from north China. "Nagata's assumption that soybean may have been introduced to the northern part of Japan seems plausible. In 1932 and 1933 at the Komoriyama ruins located in Senhata, Akita Prefecture, which date back to the Jyômon (Jômon) era (see Note) carbonized soybeans and hulled rice were found in an old house. The dating of this specimen of soybean was not performed since radio-carbon was not available at that time. As will be mentioned later, a large number of land races have been found in Tohoku, as a result of extensive surveys conducted in the early 1950s. Apart from the Nagata's hypothesis it is probable that soybeans may have been first introduced as an important medicinal herb and later as a food crop into the ports along the Japan Sea.

"Instructions to farmers: *Engishiki* (completed 927 AD) which described in detail the regulations on crop products (for example, exchange rates of soybeans with bundles of rice and barley for yearly tribute), stated that the Kinki, Chugoku, and Shikoku districts [all located in southwest Japan, from Kyoto in the northeast to just above Kyushu in the southwest] were the main soybean production areas, as shown in Fig. 1.

"*Seiryôki* (published around 1560) which is the oldest Japanese book of agronomy, identified two types of soybeans, namely summer and autumn types. *Aizu-nôsyo* (1684) and *Hyakusyô-denki* (around 1688) described in detail the characteristics of many cultivars, and various cultivation practices, namely ridging and intercropping with barley. *Nôgaku-zensyo* (1697) outlined the principles and practices of soybean management already widely applied, and mention was made of vegetable beans (Edamame) [green vegetable soybeans]. *Kôka-shunjyû* (1707) described special types of soybeans, such as boiled soybeans (Nimame). This book also described how to grow soybeans on dikes or levees between paddy fields. *Seikei-zusetsu* (1804) outlined the methods of soybean production as recent practices."

Note: According to Fairbank, Reischauer, and Craig's *East Asia: Tradition and Transformation* (1973, p. 327): "The earliest neolithic culture, named Jômon for its characteristic "cord-pattern" pottery, spread throughout Japan about 6,000 years ago. The Jômon people lived in sunken pit dwellings and subsisted by hunting, fishing, and gathering nuts, roots, and shellfish. They left behind extensive shell mounds and a wealth of pottery, unsurpassed in richness and imaginativeness of design by any other stone-age culture in the world." Note that they did not practice agriculture. In the third century B.C. Jômon culture was replaced by Yayoi culture in western Japan and by the end of the first century B.C. it had spread as far east as the Kantô plain. Address: Faculty of Agriculture, Hokkaido Univ., Nishi 9, Kita-ku, Sapporo, Japan.

8023. Gotoh, K. 1984. Historical review of soybean cultivation in Japan: Traditional cultivation (1867-1945) (Document part). *Tropical Agriculture Research Series* No. 17. p. 137-38. March.
• ***Summary:*** "1. Characteristics of this period: When the Meiji era started in 1867, acreage of cultivated soybean was approximately 400,000 ha with grain yields of 0.5 ton/ha on the average. In 1908 the acreage became the largest during the history of soybean production in Japan, namely, 487,700 ha, and the highest production was recorded in 1920, namely, 547,800 tons.

"Since the beginning of the Showa era in 1926, imports of soybeans have increased. Imports accounted for 60% of annual consumption in 1928 and 70% in 1938. Thus, acreage of soybeans decreased gradually, especially in the Kanto and Tosan areas, in contrast with the increase of production in Hokkaido.

"As for the cultivars, Iwate No 2 and Ou No 13 were released in 1920 and 1929 in Tohoku. They were bred through artificial crossing. Norin No 1 and No 2 were released from the Ibaraki Agricultural Experiment Station in 1939 and 1940 in Kanto. Dairyu-hodaka and Nagaha-hadaka derived from crossing were released in 1936 and 1939 in Hokkaido. Thus before the time of release of these cultivars, land races and strains derived from pure line selection were grown in Japan.

"Determinant type of cultivars was mainly grown. Dewamusume was the first indeterminate cultivar recommended in Honshu and it was released in 1977 from the Tohoku Agricultural Experiment Station. The reason why the indeterminate type was not grown remains unknown.

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It can be inferred that the slightly larger variation of grain size in the indeterminate type than in the determinate type may not be favorable for marketing. One of the interesting characteristics of soybeans in Japan is the size of grains which are large. Furthermore, there are many kinds of grains with varying size and seed coat color which have been produced for special usages.

"Fertilizers used consisted of ashes, barnyard manure, rice bran, and dried fish (sardines), when available. In 1904 superphosphate was applied...

"So far the scale of soybean cultivation per farm had been rather small. In the areas where upland crops were grown, soybeans were produced under marginal and poor conditions, and in the areas where paddy rice was grown soybeans were grown on dikes for farmer's own consumption. According to the results of a survey conducted in 1961, ratio of amounts of commercial use to total products was 49% on the average throughout Japan. The scale was such that only Hokkaido and Iwate Prefecture produced more than 200 kg per farm.

"2. Special methods of cultivation: In the cultivation of soybeans on the dikes of paddy fields damage due to dry conditions and various pests (diseases and insects) is limited. Due to the presence of sparse stands, sunshine and wind easily pass through the canopy and fairly high yields of grains with high quality could be obtained. However, there were some disadvantages. For instance, the decrease of rice yields was somehow inevitable and weeding was rather laborious.

"Transplanting of seedlings was practiced extensively. Planting date was earlier (for instance 10 days) than the usual date, and seedlings 15 to 30 days of age after planting were used. Transplanting caused growth depression, and thus plant height was reduced. Flowering was delayed, but maturity was hastened...

"Topping has been widely applied. It also depresses the growth. When topping is performed in the early stages of growth, secondary branches are increased, and flower and pod numbers are also considerably increased. Flowering and maturity are delayed slightly. In this treatment deep root system may be obtained. Cultivars adopted for topping treatment should have many branches. They must be sown earlier than the usual date. Since topping reduces growth remarkably, it must be applied under fertile soil conditions.

"Ridging is generally practiced in soybean cultivation as well as weeding, and lodging may be prevented to some extent...

"During this period intercropping systems were occasionally adopted, with soybeans being grown mainly with cereals (barley and common millet (*Panicum miliaceum* L.)) and cotton." Address: Faculty of Agriculture, Hokkaido Univ., Nishi 9, Kita-ku, Sapporo, Japan.

8024. Gotoh, K. 1984. Historical review of soybean cultivation in Japan: Scientific approaches (1946-1977) (Document part). *Tropical Agriculture Research Series* No. 17. p. 138-40. March.

• ***Summary:*** "1. Characteristics of this period: Extensive research work on soybean breeding and cultivation started after World War II. Nagata (1955) wrote a book on soybeans in a comprehensive manner, based on domestic and foreign information. It may be said that Nagata's publication was the first well written Japanese book on soybeans.

"The progress of research works was compiled by Saito (1972; breeding), by Kaizuma and Fukui (1972; quality breeding), by Konno (1972; physiology) and by Matsumoto and Ohba (1972; production techniques) in the Proceedings of the Symposium on Food Legumes held at the Tropical Agriculture Research Center in 1972.

"In the early stage of this period, production of soybeans for oil was attempted. However, since the quantity of soybeans imported from the USA increased, especially after 1961 when the Japanese market was opened for soybean importation, production became restricted to protein use or food.

"During this period the constraints on soybean production were analysed in each area in Japan...

"Thus breeding for overcoming these hazards was undertaken and cultivars showing cool weather tolerance, cyst nematode resistance, virus disease resistance, resistance to several important diseases, and lodging resistance were released in each location.

"One of the important objectives of breeding was to obtain cultivars with white hilum of grains which was requested from the processing industry, especially for miso production. Thus, 30 of a total of 43 cultivars released from 1961 to 1977 had white hilum. As mentioned previously, large seed size was preferred for consumption, and the cultivars with large seed size became predominant. However, several cultivars with small seeds were maintained for natto production.

"2. Genetic resources: During the period 1952-1954 surveys on land races of soybeans were conducted and the data were summarized in 1957. According to the results, Tohoku had abundant genetic resources. Almost all of the land races were grown in dikes surrounding paddy fields and some were used for soiling under alluvial and diluvial soil conditions and for the cultivation of vegetable beans.

"It was well known that the wild soybean (*Glycine soya* Sieb. *et* Zucc.) is native to Japan, except for Hokkaido. However, in 1973 this variety was observed along the river Saru in the Hidaka area of Hokkaido and thereafter along several rivers there...

"3. Cultivation practices recommended: Several research workers attempted to introduce modern technology for the management of soybeans...

"4. Physiological studies: Fukui and Arai (1951) classified cultivars, based on the length of growth from

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germination to flowering and flowering to maturity. This classification which does not correspond with the maturity groups of the USA is widely used in Japan. Groups Ia, Ib, and IIa belong to the so-called summer type, IIb, IIc, IIIb, and IIIc to the intermediate type, and IVc and Vc to the autumn type, respectively...

"5. Plant density: Although progress has been made in the understanding of soybean characteristics as a crop, the cultivation of soybean in practice is still based on sparse planting on an individual plant basis. This concept may be due to the fact that under the hot and humid conditions prevailing in Japan luxuriant growth and severe lodging are likely to be associated. Thus plant growth must be inhibited and the number of branches must be increased for increasing the number of nodes in turn results in the increase in the number of pods. Consequently, cultivars bred before 1960 were generally adapted to such growing conditions. However, several cultivars bred after 1961 had a stiff stem and seemed to be adapted to dense planting. These findings suggest that the plant type has been changing from the branching type to the main stem type in which a larger proportion of pods occurs on the main stem, and lodging resistance becomes far more important.

"6. Differences between record yields and average yields: During this period record yields were obtained in several Agricultural Experiment Stations and in some yield contests as outlined in the paper of Gotoh (1982). However, the average yield of soybeans was low as usual, namely, less than 1.5 tons." Address: Faculty of Agriculture, Hokkaido Univ., Nishi 9, Kita-ku, Sapporo, Japan.

8025. Kiuchi, Kan; Mori, Yutaka; Nikkuni, Sayuki. 1984. [Isolation of microorganisms from specially prepared miso]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 45. p. 14-18. March. [15 ref. Jap; eng]
Address: National Food Research Inst., Japan.

8026. Konno, S. 1984. Soybean production in Japan. *Tropical Agriculture Research Series* No. 17. p. 95-102. March. International Symposium on Soybean in the Tropics and Subtropics.
• ***Summary:*** Abstract. Trend in soybean production. Trends in supply and consumption of soybeans. Methods of cultivation currently applied in Japan. Soybean research and extension. Government participation in and support of soybean production. Future prospects of soybean production and main constraints. Discussion. Tables: (1) Production and trade of soybeans in Japan. (2) Soybean consumption in Japan. (3) Varieties registered during the last decade. Figures: (1) Soybean production by region in Japan (1983). (2) Planting and harvesting time of soybean in Japan. (3) Centers for breeding and research on soybean affiliated to the Ministry of Agriculture, Forestry and Fisheries in Japan. Address: Tropical Agriculture Research Center, Yatabe, Tsukuba, Ibaraki 305, Japan.

8027. Miwa, Misao; Momma, Takayuki; Fukazawa, Chikafusa. 1984. [Construction of soybean genomic library]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 44. p. 91-94. March. [13 ref. Eng; jap]
Address: National Food Research Inst., Japan.

8028. Mogi, Ken. 1984. The history of shoyu (soy sauce) brewing in the United States. The story of the Oriental Show-You Company. San Francisco, California: Kikkoman. 3 p. March. Unpublished manuscript. Combined with a subsequent interview of Ken Mogi by W. Shurtleff on 20 April 1984.
• ***Summary:*** "Early in this century, Mr. Shinzaburo Mogi, one of the Mogi family's ancestors, tried to make shoyu in America. Mr. Mogi was born in 1872 and later came to America in about 1892. He studied at college in Maryland but had an eye problem so he gave up studying and returned to Japan. In 1904, the year his daughter Katsuko was born, he was in Toronto selling Japanese bicycles, involved in a trading business unconnected to Kikkoman. According to the memory of Mr. Tsuneo Tanba, who worked with Mr. Mogi very closely (and later told his story to Morio Ichiyama, Kikkoman historian), Mr. Mogi managed a shoyu plant in Denver, Colorado, in 1907; it was not successful. Later, he had some contact with a shoyu project in Toronto, Ontario, Canada. Though I traveled to Denver, I could not get any information on this."

Note: On 7 Feb. 2005 Ken Mogi wrote William Shurtleff at Soyfoods Center (in response to some questions about the existence of the Denver soy sauce plant): "I talked with Komiya. Mr. Shinzaburo Mogi had the New Testament reading meeting with 5-6 people during lunch break when Mr. S. Mogi was living in Noda [Japan] during World War II. Mr. Komiya told me that he remembered that Mr. S. Mogi mentioned the Denver story." However Ken Mogi is does not know (1) if S. Mogi ever wrote anything about a soy sauce plant in Denver, (2) when and where S. Mogi told this story to Mr. Tanba, and (3) when and where Mr. Tanba told Mr. Ichiyama about S. Mogi's supposed soy sauce plant in Denver. Ken Mogi encloses a photo of Mr. Shinzaburo Mogi at about age 30.

Mr. Mogi's daughter, Mrs. Katsuko Yoshida, who is living in Tokyo, does not remember anything about Denver or her father starting a soy sauce plant in Denver. However she did tell me the story about "Oriental Shoyu" in Indiana.

Katsuko lived in Chicago with her parents in the 1920's (maybe 1920-1926). Mr. Mogi worked for Yamato Shokai, selling Japanese silks. They found the product "Oriental Shoyu" in the market and were very much impressed. They visited the plant in Indiana and later Mr. Mogi became a

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stockholder in that company.

Mr. Esta Keirn started employment with the Oriental Show-You Co. on 28 Oct. 1932 as a [mung] bean sprout washer. He continued until 1 Nov. 1961, when the company was sold to Beatrice Foods Inc. and turned over to La Choy Food Products. Mr. Keirn worked for La Choy for 8 years. He never met Mr. Mogi but he heard several things about him from Mr. Ohki.

Shinzo Ohki, the founder of the company and one of 8 children, was born in 1884 in Kamakura, Japan. He immigrated to the USA in 1901, landing in Seattle, Washington. Eventually he ended up in Columbia City, Indiana, where he graduated from high school. He then graduated from college in New York City. Upon graduation he started in business as a tea merchant in Detroit. To expand his line, he imported soy sauce in small wooden kegs from Japan. This he bottled and sold along with his tea. He could not expand his tea business but the soy sauce business kept growing.

Wishing to expand by adding other products to his line, he returned to Columbia City, took in a partner to gain capital, and set up in a vacant canning plant (Vance Canning Co.). This is when he incorporated and took the name of Oriental Show-You Company, Inc. Then, in 1917, Mr. Ohki went to Japan to obtain the formula (and also a wife) and some instruction in making soy sauce so he could manufacture his own. Upon coming back to Columbia City, Indiana, he enlisted the help of someone from the USDA to work out the koji culture. Fermentation was set up in large wooden beer vats. Equal parts soybeans, wheat, and salt were aged for 24 months, then pressed and bottled. According to Mr. Keirn, the company produced as much as 30,000 gallons of shoyu in one year. The plant in Columbia City was vacant for some time and now most of it has been torn down, but the adjacent adobe and brick buildings are still standing.

Note 1. Much of this story was published in the Japanese-language newspaper *Rocky Mountain Jiho* (Denver, Colorado), 25 Jan. 1984. p. 4.

Kenzaburo's great grandfather was the first president of Noda Shoyu K.K. (today's Kikkoman). Shinzaburo Mogi was the latter's brother.

Note 2. The story was also written by Marilee Kreps in about 1984 under the title "Shoyu pride: Columbia City's soy sauce factory one of many in the United States." The name of the newspaper, which was published in Columbia City, Indiana, is now known–nor is the date or page. It states: "Until 1962 the company, located on Factory Avenue, was a thriving business in this town, and contrary to what some believe, it was [named] the 'Shoyu Company,' not the 'Show-You Company.'" The Oriental Shoyu Company was established in 1917 by Shinzo Ohki in Columbia City. The factory was closed in 1961.

Note 3. On 7 Feb. 2005 Kenzaburo Mogi IV of Kikkoman, Japan, sent William Shurtleff a hand-drawn map showing the location of the four buildings that were part of the Oriental Show-You Company in Columbia City, Indiana. They were located between the railroad track and Factory Avenue, near Line street. These photos show: (1) The office building. (2) The printing and boiler shop building. (3) The remains of the soy sauce plant, with hand-drawn arrows pointing the areas on the cement floor used for the moromi tank, koji making, and pressing. (4) Close-up of the cement base of the moromi tank. (5) Close-up of the space on the cement floor, between the moromi tank and outside wall, where the heater was. (6) Close-up of the area used for pressing (*assaku*) the soy sauce from the moromi. (7) Mr. Esta Keirn standing in a grassy field in front of the chow mein building, which once shared a wall with the soy sauce plant. (8) Granite tombstone of the founder, Shinzo Ohki (1883-1967) and his wife, Taka (1889-1963). (9) Mr. Esta Keirn. Address: Kikkoman Marketing and Planning Inc., P.O. Box 784, San Francisco, California 94101.

8029. Mori, Yutaka; Kiuchi, Kan; Tabei, Hideo. 1984. [Flavor components of miso: Basic fraction]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 44. p. 158-63. March. [21 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 47(7):1487-92 (1981). Address: Div. of Applied Microbiology, National Food Research Inst., Yatabe, Tsukuba-gun, Ibaraki 305, Japan.

8030. Ojima, M. 1984. Closing remarks. List of Participants. *Tropical Agriculture Research Series* No. 17. p. 167-79. March. International Symposium on Soybean in the Tropics and Subtropics.
• ***Summary:*** This symposium was made possible by the close cooperation of AVRDC and TARC (Tropical Agriculture Research Center) along with assistance from the Agriculture, Forestry and Fisheries Research Council. Address: Chief of the First Crop Div., National Agriculture Research Center, Japan.

8031. Ontario Soya-Bean Growers' Marketing Board. ed. 1984. Ontario Soybean Symposium. Ontario soybeans...a journey into the next century (Proceedings). Chatham, Ontario, Canada: OSGMB. 319 p. Held 18-20 March 1984 at Toronto, Ontario, Canada. No index. 29 cm. [3 ref. Eng]
• ***Summary:*** Contains 30 papers by various authors; most are cited separately. Address: Chatham, ONT, Canada. Phone: (519) 352-7730.

8032. Saio, Kyoko. 1984. Dietary pattern and soybean processing in Japan today. *Tropical Agriculture Research Series* No. 17. p. 153-61. March. International Symposium on Soybean in the Tropics and Subtropics. [1 ref. Eng]
• ***Summary:*** Abstract. Consumption of soybeans in Japan.

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Varieties and processing of soybean foods. Traditional technology for modern products and emerging technology applied to traditional foods. Reference. Discussion. Tables: (1) Intake of Kcal/day/person. (2) Intake of protein/day/person. (3) Intake of fat/day/person. (4) Comparison of intake of nutrients among various nations. (5) Supply and demand of whole soybeans in Japan. (6) Detailed use of whole soybeans supplied for food. Figures: (1) Flow sheet of Momen Tofu preparation. (2) Flow sheet of Kori Tofu preparation. (3) Flow sheet of Shoyu (soy sauce) preparation. (4) Flow sheet of Kome Miso preparation. (5) Flow sheet of soy milk preparation. (6) Manufacture of vegetable protein products. Address: National Food Research Inst., Yatabe, Tsukuba, Ibaraki 305, Japan.

8033. Sim, William J. 1984. Farmers' experiences and experiments with growing soybeans [in Ontario, Canada]. In: Ontario Soya-Bean Growers' Marketing Board. ed. 1984. Ontario Soybean Symposium. Chatham, Ontario, Canada: OSGMB. 319 p. See p. 73-78.
• ***Summary:*** The author grows 500 acres of soybeans in Ontario. Soybean production in Canada is subsidized by the federal government. "Until 1973, the only export of any consequence was to the United Kingdom, mainly because of the preferential trade benefit. This was phased out in the early 1970s and export sales greatly diminished. In 1973, after years of frustration, the Soybean Board subsidized a shipment of about 30,000 bushels to Japan for the human consumption market, mainly miso and tofu. Since then, the quality of Ontario soybeans has become so renown in the Pacific Rim countries that 1982 exports to this area accounted for 2.2 million bushels. The potential of this market is almost unlimited...

"In summary, I would like to say that I am excited about our soy production. It is like a new lease on life to grow something other than corn. We'll probably never get rich at it, but we'll enjoy trying." Address: Farmer, Moore township, Lambton County, ONT, Canada.

8034. Suzuki, Steven. 1984. Pacific Rim potential for edible soybeans. In: Ontario Soya-Bean Growers' Marketing Board. ed. 1984. Ontario Soybean Symposium. Chatham, Ontario, Canada: OSGMB. 319 p. See p. 224-41.
• ***Summary:*** Soybeans were first exported from Canada about 12 years ago when a Japanese house approached the Ontario Soybean Grower's Marketing Board for a trial shipment to Japan. The trial worked out very well and in a short time Ontario's soybean exports became a multi-million dollar business. Ontario soybeans are very clean, the quality is comparable to Japanese and Chinese soybeans, and the supply is consistent. However the price is high in relation to Chinese and U.S. soybeans. As a result, Ontario soybeans are sold in high-priced markets, as for making premium quality miso or soyamilk. The supply of Chinese soybeans is irregular. Address: Manager, Grain Trading Section, Okura & Co. America Ltd., New York, NY.

8035. Taira, Harue; Kokubun, Kijiro. 1984. [Quality of soybean seeds grown in Japan. V. Differences in the chemical composition of seeds of various ecotypes cultivated in upland and drained paddy fields]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 44. p. 62-73. March. [22 ref. Jap; eng]
Address: 1. National Food Research Inst., Japan; 2. Tohoku National Agric. Exp. Station, Kariwano, Akita Pref., Japan.

8036. *Tropical Agriculture Research Series.* 1984. International symposium on soybean in the tropics and subtropics. No. 17. xi + 179 p. March. Held Sept. 26 to Oct. 1, 1983 at Tsukuba, Japan. [227 ref. Eng]
• ***Summary:*** This symposium was jointly sponsored by the Tropical Agriculture Research Center (TARC) in Tsukuba, Ibaraki, Japan, and the Asian Vegetable Research and Development Center (AVRDC) in Taiwan. The inaugural address is by S. Nakagawa, director of TARC. The keynote address is by G.W. Selleck, Director General of AVRDC. The welcome address is by H.E. Kauffman, director of INTSOY. The welcome address is by K. Yanagi, Director-General, Economic Cooperation Bureau, Ministry of Foreign Affairs, Japan. List of participants (directory of 223 people from 26 countries). Organizing committee (directory). A photo taken in Tsukuba shows the participants. Address: Tropical Agriculture Research Center, Ministry of Agriculture, Forestry and Fisheries, Yatabe, Tsukuba, Ibaraki, 305 Japan.

8037. Watanabe, Atsuo; Ohtani, Toshio; Nikkuni, Sayuki; Baba, Tohru; Ohta, Teruo. 1984. Nattô seizô haisui no ûkôryô ni kansuru kenkyu. I. Gengai roka hôhô ni yoru nattô haisui shori no kôka [Utilization of the drained water from natto processing. I. The efficacy of ultrafiltration treatment of the drained water from steaming of soybeans in natto processing]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 44. p. 112-16. March. [7 ref. Jap; eng]
Address: 1-3, 5. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 4. Kagoshima State Lab. of Agriculture.

8038. Watanabe, Atsuo; Ohtani, Toshio; Nikkuni, S.; Baba, T.; Ohta, T. 1984. Nattô haisui shori ni okeru gengai roka jôken no kentô [Operating condition of ultrafiltration of the drained water from steaming of soybean in natto processing: Utilization of the drained water from natto processing (II)]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 44. p. 117-21. March. [4 ref. Jap; eng]
• ***Summary:*** "In order to recover valuable components from

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the waste water drained from steaming soybeans during natto processing, the operating conditions of ultrafiltration of the supernatant from isoelectric point sedimentation, including washing of the membrane to maintain membrane performance, were studied."

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* 29(4):250-54 (1982). Address: 1-3, 5. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, 2-1-2 Kannon-dai, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305; 4. Kagoshima State Laboratory of Agriculture, 5500, Kamifukumoto-cho, Kagoshima-shi, 891-01. All: Japan.

8039. Wernham, Les. 1984. Exports–Problems and opportunities [for Canadian soybeans]. In: Ontario Soya-Bean Growers' Marketing Board. ed. 1984. Ontario Soybean Symposium. Chatham, Ontario, Canada: OSGMB. 319 p. See p. 246-53.
• ***Summary:*** Soybean exports from Ontario have expanded dramatically during the past 10 years; in 1982 they reached a high of 132,000 tonnes worth $44 million. The East Asian market including Japan, Korea, Hong Kong, and Malaysia accounted for 81% of Ontario's export soybean sales in 1983, with an additional 8% going to Europe. The main buyers in 1982 were: Japan 47,414 tonnes, Netherlands 19,545 tonnes, Singapore 18,039 tonnes, Indonesia 16,652 tonnes, Hong Kong 15,234 tonnes.

Most of these soybeans are sold for human consumption. "For example, one of Sweden's foremost pharmaceutical manufacturers has in the past years been that country's largest single importer of Canadian soybeans. Taking about 3,000 tons annually, this company produced a patented intravenous nourishment called Intralipid." Tiny soybeans (5 mm diameter or less) are used to make bean sprouts and natto. For soybean exports, freight constitutes an average 21% of the net delivered cost to the buyer in his country. They are shipped in bagged or bulk (20 or 40 foot) containers. The main focus of breeding should be to develop varieties that do not carry a common bitterness or beany flavor. Address: Grain Manager, King Grain, Chatham, ONT, Canada.

8040. *Mainichi Daily.* 1984. Researchers say miso good anticancer agent. April 1. p. 12 (B). Sunday. Summarized in East West Journal as "Miso and Cancer Update," July 1984, p. 11. [1 ref. Eng]
• ***Summary:*** Miso contains substances capable of controlling the growth of cancer. This finding was announced by a team from Tohoku Univ. in Sendai, Japan, headed by Prof. Shuichi Kimura. A formal report will be presented at the meeting of the Agricultural Chemical Society of Japan to be held this month in Tokyo. "The finding also confirms the popular belief in the effectiveness of miso soup against cancer, especially stomach cancer. The specific anticancer substances in miso appear to be combinations of fatty acids and ethanol, or ethylesters of fatty acids. The most effect of these is linolenic acid ethylester. In all, these anticancer ethylesters of fatty acid content account for some 0.5% of miso. Yet they are 'so effective against cancer that 10 milligrams, or the amount in an ordinary cup of miso soup, can completely eradicate the toxicity of 5 micrograms of benzypyrene, a powerful carcinogen,' according to Prof. Kimura. 'One kilogram of beef, entirely charred, can produce only 1 microgram of this carcinogenic chemical, thus indicating how miso soup is effective against cancer.'"

8041. Kawamura, Wataru. 1984. Re: Miso in America. Letter to William Shurtleff at Soyfoods Center, April 9. 1 p. Handwritten, with signature. [1 ref. Jap]
• ***Summary:*** Mr. Kawamura is widely known in Japan as "Miso Sensei" (miso teacher). Address: 2-4-7 Kugenuma, Tachibana, Fujisawa-shi, Kanagawa-ken 251, Japan. Phone: 0466-22-1351.

8042. Hesseltine, C.W. 1984. Re: NRRL history and culture collection. Dr Church, Dr. Raper, and Dr. Thom. Letter to William Shurtleff at Soyfoods Center, April 10. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "In 1984 the NRRL culture collection contained 77,000 strains of molds, yeasts, and bacteria. It was staffed by 6 full-time curators," of which two maintained the mold collection.

According to Dr. Raper, Dr. Church left USDA and went to a small college in Urbana, Ohio. Dr. Raper also provided a number of accounts about Dr. Thom.

"You might be interested to know that we have Dr. Thom's original notebooks and his entries of the Aspergilli and Penicillia. I also rescued a drawerfull of correspondence on soy food going back into the 20's and perhaps earlier about miso, shoyu, and other soy foods. For instance, there is one folder with nothing but Japanese and Chinese labels of soy foods." Address: Chief, Fermentation Lab., USDA/NRRC, Peoria, Illinois.

8043. Simpson, Rita J. 1984. Re: 1982 statistics on production of soybean-based products in Tetra Brik packages. Letter to William Shurtleff at Soyfoods Center, April 18. 1 p. Typed, with signature on letterhead.
• ***Summary:*** The products include plain and flavored soybean milk, plus tofu (million liters):

Japan 51.0
Hong Kong 15.0
Malaysia 11.5
Korea 7.0
Thailand 4.0
Singapore 2.5

"Our international office is aware of your need for the 1983 statistics and I will forward them when received."

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Address: Vice President, Information, Brik Pak Inc., P.O. Box 802605, Dallas, Texas 75380. Phone: 214 934-0338.

8044. Sterngold, James. 1984. On foot in Hokkaido: Much of the northern isle is parkland. *New York Times.* April 29. p. XX9, XX32.
• ***Summary:*** The writer stays at a spa near Mount Asahi. The standard Japanese breakfast begins with a bowl of rice and salty broiled fish, generally salmon. "Then there is natto. This is a gooey, though plain tasting, concoction of fermented soybeans said to be packed with nutrition, but a little much for some sensibilities first thing in the morning. Even many Japanese wrinkle their noses at the mention of natto the way many Americans do the first time they hear of eating raw fish. Also common are raw egg and nori [pressed seaweed], which are eaten with the rice."

8045. Cusumano, Camille. 1984. Tofu, tempeh, & other soy delights: Enjoying traditional Oriental soyfoods in American-style cuisine. Emmaus, Pennsylvania: Rodale Press. x + 261 p. Illust. Index. April. 23 x 20 cm.
• ***Summary:*** Each chapter on a specific food describes (with illustrations and nutritional information) how to prepare that food at home, followed by many recipes. Contents: 1. The coming age of soyfoods cuisine. 2. Tofu 3. Tempeh. 4. Soymilk. 5. Japanese soyfoods. 6. Whole dry soybeans. 7. Fresh green soybeans. 8. Soy sprouts. 9. Soy flour and soy grits. 10. Soy sauces. 11. The soyfoods pantry.

Scattered throughout the books are 1-page descriptions of various American soyfoods companies, each accompanied by a black-and-white photo. Photos show: Greg Weaver and two other workers at The Lotus Cafe, Rochester, New York (p. 83). Sharon Rose of Brightsong Light Foods, Petaluma, California (p. 142). Steve and Sara Yurman of The Soy Shop, Atlanta, Georgia (p. 169). A craftsman cutting tofu at Tomsun Foods, Greenfield, Massachusetts (p. 195). Toby Alves of Blair Island Natural Foods Restaurant, Eugene, Oregon. A worker making brown rice and tofu sandwiches at Wildwood Natural Foods, Fairfax, California (p. 235). The company is owned by Bill Bramblett, Paul Orbuch, and Frank Rosenmayer.

Note: As of Sept. 1989 some 25,688 copies of this book had been sold by Rodale Press. It was sold out and will not be reprinted. Address: Rodale Press, Emmaus, Pennsylvania.

8046. Leviton, Richard. 1984. Japanese soyfoods. In: Camille Cusumano. 1984. Tofu, Tempeh, & Other Soy Delights. Emmaus, Pennsylvania: Rodale Press. x + 261 p. See p. 144-49.
• ***Summary:*** Contents: Brief biography of Leviton and introduction. Deep-fried and grilled tofu treats: age, atsuage, ganmo, yaki-dofu, doufu-gan. Tofu haute cuisine (at 280-year-old Sasa-no-Yuki in Tokyo, dried-frozen tofu, wine-fermented tofu). Delights of soymilk and yuba (incl. Yuba Han). Natto, miso, and savory soy condiments (incl. Hamanatto or "savory fermented black soybeans," thua nao from Thailand, and natto miso). And still more: Cooked soybeans with wakame, "soy sprouts packed in a sausagelike clear tube, green soybeans in the pods, *kinako* powder (a flour made from dry roasted soybeans, used as a basis for confections or nut butters), freeze-dried instant miso soup powder, instant silken tofu powder (just add water and stir), and dry meat sauces for tofu." Address: 100 Heath Rd., Colrain, Massachusetts 01340. Phone: 413-624-5591.

8047. Leviton, Richard. 1984. The organic Garden of Eden: A Michigan-based natural foods company [Eden Foods] stresses quality and fidelity. *East West Journal.* April. p. 18, 20-23.
• ***Summary:*** A good history of Eden Foods (although the early dates are incorrect), which has blossomed from a student-run co-op in Michigan in 1967, to a nationally recognized name in 1984. Based on an interview with Mike Potter, who had become interested in macrobiotics in 1967 when, sick with hepatitis in California, he met Herman and Cornellia Aihara and found that macrobiotics "all articulated my own intuition." Potter is now a seasoned businessman, with 13 trips to the People's Republic of China and 7 to Japan.

"Eden's beginnings are a little vague, Mike Potter explains... In July 1967 a group of students in Ann Arbor began distributing macrobiotic staples from Boston. This effort eventually led to a co-op called Eden Foods; in 1968 it became a full-fledged, though small, retail store. Around 1969 Potter visited Ann Arbor and the brand new Eden Foods. At the time, he was busy managing a natural foods store in nearby Birmingham [Michigan].

"In these days Judy and Bill Bolduc and Tim Redmond owned the 1,500 square foot Eden store. By 1971 the group was milling flour and baking granola and they asked Mike [Potter] to become a manager with an ownership position. In 1973 they moved the manufacturing end into a much larger building a half block away, and sales topped $175,000 a year. By late 1973 Eden was sharing a building with competitor Midwest Natural Foods and co-distributing products. They also relocated their retail store, adding on a natural foods restaurant and a whole grain bakery, and employed 25 people. By 1972 Potter and the Bolducs had begun to distribute their products using first a Dodge van, then a couple of refrigerated twenty-food trucks. But all this relocating and moving the retail store about, which had been underwriting the wholesale and manufacturing aspects, used up their cash flow. Financial troubles ensued. Mike bought out the Bolducs. 'I can make this thing work, he told them.

"Potter traveled to Japan and made important contacts with Muso, a leading macrobiotic supplier. Eden imported Erewhon-branded products directly from Japan. They started searching Michigan farms for organic crops... A cornerstone

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of Eden policy since 1973 is support of local Michigan farmers. Eden supports sixteen farms in Saginaw Bay which grow organic grains and beans (and three organic rice growers elsewhere) for a total of 6,000 acres [in 1984]–up from 1,000 in 1977... In 1977 Eden opened Turtle Island restaurant, which stayed open until the fire. In 1978 Eden started to advertise in magazines. But the company had grown wobbly, bureaucratized, and unwieldy."

"Late in the evening of November 26, 1979 the Eden warehouse was consumed and destroyed by flames... An estimated $800,000 in inventory, machinery, and supplies were lost, much of it irreplaceable, since the eventual insurance settlement covered barely one half the loss. Most old-timers at Eden agree that the fire was ultimately highly beneficial... 'The fire was constructive,' says Ron Roller. 'The energy here was stagnated, with too many departments each claiming a turf. The management was in disarray; a change was needed...' The Eden of 1979–2,400 products, 100 employees, a natural foods restaurant, a whole grain bakery, a retail store in Ann Arbor, several tractor trailer trucks, a $50,000 computer with eight terminals, a 10,000 square foot building–burned to the ground. Eden, somehow, was out of operation for only two weeks after the fire. Immediately it began to function in an empty 5,000 square foot building next door (the truck garage). They got the cash flowing again on an inventory staggeringly depleted. The insurance company gave them a depressingly small advance against damages and refused to settle on the claim. Eden was advised to declare bankruptcy." About a year after the fire, construction on the new building was completed. By 1980 Eden had moved into this 20,000 square foot building at 701 Tecumseh Road in the tiny town of Clinton, Michigan, (population 2,000) about 60 miles southwest of Detroit. It was 27 months [2¼ years] before the final settlement.

In 1982 Eden imported 25 container loads (each weighing 35,000 lb) of Japanese natural foods, including natto miso and buckwheat miso. Ron Roller is now purchasing manager, Bena Burda is sales manager, Bill Swaney is production manager, and Kathy Nohr is office manager. Cliff Adler and Mike Gorman are also key co-workers. The company has nine shareholders, of whom seven are daily employees. Address: 100 Heath Rd., Colrain, Massachusetts 01340. Phone: 413-624-5591.

8048. *Macrobiotics Today* (*Oroville, and Chico California*). 1984--. Serial/periodical. George Ohsawa Macrobiotic Foundation. April 1984 to present. Frequency: Monthly, then bimonthly.
• ***Summary:*** Preceding title: GOMF News. Each issue is dated. All issues from Aug. 1984 to May 1985 had the subtitle: Natural Living. Place of publication changed in Jan. 2001 to Chico, California.

Note: The Jan/Feb. 1990 issue was designated Vol. 30, No. 1, and was also described as the 250th issue. At that time the magazine frequency changed from monthly to bimonthly, which it remains. As of April 2011 the current issue is Vol. 51, No. 3. So this periodical is in its 51st year, always published by the same publisher.

Carl Ferré states in an e-mail of 10 May 2011: "Herman was listed as publisher from May 1985 until he died February 25, 1998. (By the way, Cornellia died on the same day, February 25. eight years later)."

8049. Ohta, Teruo. 1984. Seijinbyô o fusegu to Amerika de hyôban no Jawa nattô, tenpe [Tempeh, Java natto, prevents geriatric diseases and is popular in America]. *Watashi no Kenko* (*My Health*). April. p. 66-69. [Jap]
Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan: Bucho, Norin Suisansho.

8050. Okazaki, H.; Kano, U.; Kimura, S. 1984. [Investigation of the anti-mutagenic substance in miso]. Paper presented at the annual meeting of the Agricultural Chemistry Society of Japan. 1 p. English abstract. Held 1-4 April 1984 in Tokyo. [Jap; Eng]
• ***Summary:*** No mutagens were found in miso. Some antimutagens were identified in the lipid fraction of miso. Ethylester of unsaturated fatty acids, especially that of linolenic acid, showed a strong anti-mutagenic effect. Ethylester of linolenic acid seemed to be formed from linolenic acid which was liberated from the glycerides in soybeans by the microorganisms in miso and ethyl alcohol produced by the yeast during fermentation of miso.

8051. Shurtleff, William; Aoyagi, Akiko. 1984. Soyfoods industry and market: Directory and databook 1984. 4th ed. Lafayette, California: Soyfoods Center. 203 p. April. 28 cm. [325 ref]
• ***Summary:*** Traditional soyfoods, which include tofu, tempeh, soymilk. miso, soy sprouts, soynuts and soy sauce accounted for $465 million in annual domestic retail sales. High-tech, modern soy protein foods, which include soy flour and grits, soy protein isolates and concentrates, extrusion textured soy flour and meat analogs, totaled $501 million. When the two sectors are tallied together, Americans spent $966 million in 1984 for soyfoods... not including soy oil or exported products. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8052. Shurtleff, William; Aoyagi, Akiko. 1984. Yooroppa ni okeru miso no rekishi [History of miso in Europe]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) 32(4):213-20. April. [221 ref. Jap]
• ***Summary:*** This is part 1 of a translation in 4 parts by Taeko Ebine of the chapter on the "History of Miso" from *The Book of Miso* by Shurtleff and Aoyagi. A facsimile of the entire bibliography of that book is printed on pages 217-

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220. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8053. *Tetra News* (*Singapore*). 1984. Hai! Its the soya-milk boom in Japan. April. p. 8-10.

8054. *Presse* (*La*) (*Montreal, QUE, Canada*). 1984. Le soya, la protéine de l'avenir pour les gens d'ici [The soybean, protein source of the future for people here?]. May 2. [Fre]
• ***Summary:*** Canada is now a major exporter of soybeans to East Asia. Some return in the form of soymilk and tofu.

8055. Maglaty, Jeanne. 1984. Behind the scenes: A hectic day in model's life. *Hartford Courant* (*Connecticut*). May 4. p. C1.
• ***Summary:*** New York–This is about fashion model Connie Cook, who is always on the go. Starting at 9:20 in the morning, her day ended at 11:30 p.m. with a fitting session at Arnold Scaasi's studio on Fifth Avenue.

"'Once I get there he doesn't let me stop for food,' Cook said over a Japanese dinner of grilled bean curd, sushi and two Kirin beers, before the Scaasi appointment."

8056. Tsuchiya, Kanji. 1984. Re: Soymilk in China, Hong Kong, and Japan. Letter to William Shurtleff at Soyfoods Center, May 12. 5 p. Handwritten. [Jap]
• ***Summary:*** Thanks for the complimentary copy of your book *Soymilk Industry and Market* (SIM). "The content is really outstanding. This is the world's most detailed and in-depth report on soymilk, and I doubt anything will surpass it in the future."

He recommended it at a special soymilk seminar. Ms. Kojima of ASA reviewed it in *Nittokyo News* (Japan Soymilk Assoc. Newsletter). He'll try to get it reviewed in *Toyo Shimpo* and he'll recommend that Marusan buy a copy at future meetings.

His recent trip to China: In Hong Kong he found Kibun soymilk in department stores. He met with Vitasoy's asst. director. He found Vitasoy deodorizing technology far inferior to that of Japan. Vitasoy agrees and wants to improve it. The plant is old fashioned. He says they soak the soybeans, then grind. Really? Their milk is too sweet.

In Peking, they have decided to install a 350 liter/hr test plant he designed in the Central Government's Heikokyo division, food fermentation Industry Science Research Lab, which is 30 km northwest of Beijing. He went there to discuss installation and train the workers. The site is now under construction. For 2 days he met with technologists, who asked many good questions. It is a 3-stage plant, compact, all automatic and continuous, like a scaled-down Marusan plant that will fit in a space 5 x 10 meters. Improved design will give 10% higher yield than Marusan's plant. They are also planning to make tofu with it, leaving the okara in to give a higher tofu yield and firmer texture.

This equipment will be shipped from Tokyo at end of May and arrive in Peking in mid-June. No packaging equipment has yet been ordered. They plan for now to sell in bottles thru refrigerated outlets.

(p. 4). The same type of plant exactly will be installed in the Liaoning Food Industry Research Lab. in Shenyang city. He held a 3-day workshop there. The equipment will be shipped from Tokyo in mid-July. He will go back there in 3 months. Starting on June 18 somewhere in these northeast provinces there will be a 1-week soymilk expo and workshop. In June he'll go back to these two places to help with production runs. On SIM p. 93 the following is a more detailed explanation of what happened. At that time 20 engineers from the Peking Government were sent to visit the Marusan plant. They came in 5 or 6 groups at different times. Tsuchiya took them on tours of the plant. They said that in China there is a long history of making soymilk so they don't need to learn anything from Japan.

They felt the Japanese were too sensitive about beany flavor, so Japanese equipment was not suited to make soymilk for Chinese tastes, and moreover they didn't want to spend/waste all that much money. But they later realized, after researching the details of the processes and equipment used by Kibun, Alfa Laval, and DTD that Marusan had the equipment that they needed, so they decided to order it.

Page 5: Part of the equipment they ordered will be made by Seikensha, which made most of the equipment in each Marusan plant. If test results in China are good, they will install full-scale plants of 2,000 to 4,000 liter capacity in various places in China. They want to keep production decentralized and small enough so that the equipment does not stand idle.

China's knowledge of sanitation and complex technology is too rudimentary to allow aseptic packaging. He thinks they will either retort or perhaps for groups that use a lot at one time (communes, schools, factories) ship it fresh and chilled in bulk.

Other provinces that have asked Marusan for bids are Henan, Hebei, Fujian, and Canton (Guangzhou). So it looks like Tsuchiya will be busy for the next 2-3 years.

Best wishes. Address: Tokyo [Technical consultant, Okazaki Marusan, Japan].

8057. Fruin, W. Mark. 1984. History of Higeta Shoyu Co. 4060 Amaranta Dr., Palo Alto, CA 94306. 4 p. May 15. Unpublished manuscript.
• ***Summary:*** Higeta shoyu is one of the oldest brands of soy sauce in Eastern Japan, tracing its history back to the Hamaguchi brothers who migrated at the beginning of the 17th century from Hiromura in Wakayama prefecture (across the river from Yuasa, the birthplace of shoyu in Japan) to Choshi on the eastern tip of the Miura Peninsula, which curves around the top of Tokyo Bay. The Black Current, which runs northward from Wakayama to Choshi, carried

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the Hamaguchi brothers' ships. They had the foresight to transport shoyu from its place of origin in western Japan to the newly opened vistas in the 17th century of Tokyo and the Kanto plain hinterland.

Around 1615 the elder of the two Hamaguchi brothers established Hiroya, a food distribution company in Tokyo (then Edo), while the younger brother ventured into the manufacture of Yamasa shoyu. For the next several centuries, Yamasa was noted as a good but local shoyu, indistinguishable from other local brands except for the access to the Tokyo market, which it enjoyed through Hiroya.

In 1914 the elder Hamaguchi joined with two other Choshi families, Tanaka Genba and Fukui Kichibei, to form the Higeta Shoyu Co. Ltd. Each family continued to produce their own brands of shoyu but around 1925 Higeta, which had been Tanaka Genba's brand, became the sole company brand. An ambitious plan of expansion of expansion was drafted to leapfrog Higeta over Yamasa its local rival. But Higeta became overextended and in 1937 Kikkoman stepped in and purchased 80% of Higeta's outstanding shares.

As Higeta was brought into the fold of Kikkoman companies, the involvement of the original investors changed. Tanaka Genba gradually withdrew. The Fukui family remained active in the company until the 1970s, but then they too withdrew. Only the elder branch of the Hamaguchi has stayed with the firm throughout the postwar era, and they now constitute the firm's top management and own some 30 percent of the company stock; the Mogi-Takanashi families from Kikkoman control another 20 percent (Kikkoman had to divest itself of Higeta during the economic deconcentration programs of the Allied Occupation of Japan); the wider Hamaguchi family claims another 20 percent, with the remaining shares widely scattered.

Higeta differs noticeably from the other major shoyu companies in Japan. Most importantly, since 1966 it has relied entirely on Kikkoman for its marketing, concentrating its energies instead on manufacturing. This has saved Higeta the expense of trying to establish its name as a national brand. It spends less than 3 percent of its sales on advertising, and most of this is directed toward institutional sales, where Higeta is strong. It dominates the market for shoyu in noodle shops in Tokyo, for example, claiming 80 percent of soba and udon shops. Overall, about 65 percent of sales go to such institutional customers and 35 percent of the home market.

Because Higeta has relied on Kikkoman for its marketing since 1966, most of its line of minor products, like miso and sauce, have nearly disappeared through the lack of an independent marketing effort. In fact, 90 percent of its sales come from the sale of shoyu, and 90 percent of the shoyu it makes is koi-kuchi [koikuchi] or Eastern style shoyu. In short, Higeta is a single-product company.

But the single-mindedness of Higeta is its strength. It leads Japan in shoyu production know-how. Higeta, for example, in cooperation with Hitachi Ltd. was the first maker to automate the koji culturing step of production, reducing the labor force required for this stage from 250 to 30 people. Indeed, Higeta, because of these strengths, is the third largest maker in Japan with 7 percent of the total production, even though the Higeta brand is only the fourth largest selling shoyu in Japan. This difference is explained by the fact that Higeta's production excellence is so well established than many firms buy filtered but unrefined shoyu from Higeta to brand as their own product.

Higeta's manufacturing superiority comes from the concentration of all of its production and brewing know-how in just one plant in Choshi since 1973. The highly efficient design of this factory means that Higeta has the lowest operation costs of any company in the industry and even Kikkoman is not above buying shoyu from Higeta to sell as its own. Nevertheless, the lack of marketing muscle means that most Japanese only sample Higeta in their favorite noodle shops.

Higeta is known among afficiandos for its quality. This is derived from a combination of color, aroma, and taste which is unique among large mass producers of shoyu. Address: Palo Alto, California. Phone: 415-858-2226 or 327-0857.

8058. Murata, Kiku. 1984. Re: History of her work with tempeh. Letter to William Shurtleff at Soyfoods Center, May 16–in reply to inquiry. 2 p. Typed, with signature. [Eng]

• ***Summary:*** Her profession is biochemical nutritionist.

One of the first companies to make tempeh in Japan was Marusan-Ai Co., best known as a miso manufacturer (1 Aza Arashita, Niki-cho, Okazaki City, Aichi prefecture, 444-21, Japan. Phone: 0564-45-3111). They started research on tempeh production about 10 years ago. In Feb. 1984, after introduction of tempeh to dieticians, they started to distribute tempeh for the school lunch program. For that purpose they made a pamphlet (which Murata sensei will send to Shurtleff with copies of requested papers). They also started to sell tempeh to caterers. They presently make about 30 metric tons per month of tempeh.

She initially went to Dr. Gyorgy's laboratory to work on the mechanisms of cirrhosis production in animals fed a high sugar diet. Then she gradually got involved with tempeh.

Note: For details see the book *History of Tempeh: A Fermented Soyfood from Indonesia* by Shurtleff and Aoyagi (1985). Address: Teikoku Women's Univ., 173-6 Thodacho, Moriguchi City, Osaka, Japan. Phone: 06-902-0791.

8059. *Toyo Shinpo* (*Soyfoods News*). 1984. Tônyû men [Soymilk noodles are made by Ajia Protein, a soymilk maker]. May 21. [Jap]

• ***Summary:*** A soba maker is buying soymilk from Ajia

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Protein [Asia Protein] to put in his soba.

8060. *Toyo Shinpo* (*Soyfoods News*). 1984. Tônyû Fuea nado [Japan Soymilk Association will hold soymilk fairs on May 30 and June 27]. May 21. [Jap]

8061. Torii, Yasuko. 1984. New developments with tempeh in Japan (Interview). Conducted by William Shurtleff of Soyfoods Center, May 25. 4 p. transcript.
• ***Summary:*** This interview, conducted during a visit by Mrs. Torii to Soyfoods Center in Lafayette, California, discusses: Marukin Shokuhin Kogyo in Kumamoto city, Japan, Mr. Goro Kanasugi, the recent start of production of tempeh starter in Japan, tempeh made by Takashin / Takato, René Breuls, sales outlets for tempeh in Japan, Marusan-Ai in Okazaki, update on Torigoe, soybeans in Indonesia, symposium at Tsukuba (Japan) on tempeh and natto, Japan Tempeh Research Society (*Tenpe Kenkyukai,* Korin Shuppan KK, Iriya 1-27-4, Taito-ku, Tokyo), Okinawa fermented tofu (*tofuyo*), Yamagata no Shojin Bushi (dried tofu that is shaved like katsuobushi). Address: Kamitsuchidana 324, Ayase-shi, Kanagawa-ken 252, Japan. Phone: 0467-76-0811.

8062. Kawai, Naoki. 1984. Re: History of Marusan-Ai's work with tempeh. Letter to William Shurtleff at Soyfoods Center, May 30. 2 p. Handwritten, without signature. [Jap; eng+]
Address: Manager, Development Section, Marusan-Ai Co. Ltd., 1 Arashita, Niki-cho, (P.O. Box 444-21), Okazaki-shi, Aichi-ken 444-21, Japan. Phone: 0564-45-3111.

8063. **Product Name:** [Soymilk Noodles].
Foreign Name: Tônyû Men.
Manufacturer's Name: Ajia Protein.
Manufacturer's Address: Japan.
Date of Introduction: 1984 May.
New Product–Documentation: Toyo Shinpo. 1984. May 21.

8064. Cunningham, Isabel S. 1984. Frank N. Meyer: Plant hunter in Asia. Ames, Iowa: Iowa State University Press. xviii + 317 p. Illust. (31 black-and-white photos). General index. Taxonomic index. 24 cm. [70 ref]
• ***Summary:*** An extremely well researched and well written book about America's greatest and most colorful plant explorer, who introduced many soybean varieties to the USA. These include: PI 19184 and PI 19186, both received by the USDA in Aug. 1906.

Contents: Maps. Preface. Acknowledgments. Setting the stage: 1. The past is prologue. 2. In the beginning. 3. Rendezvous with destiny. The first expedition: 4. Stranger in China. 5. The first winter. 6. Journey to the north. 7. The journey continued. 8. Assignment to the Wu Tai Shan. 9. The riches of Shantung (Shandong). 10. A harvest for America. 11. A plant explorer at home. The second expedition: 12. Europe revisited. 13. Bridge to Asia. 14. Delay and frustration. 15. Privation and postponement. 16. The Tien Shan. 17. The Altai Mountains. 18. The alfalfa project. 19. The Volga to the Potomac. 20. Interlude in America. The third expedition: 21. Peking (Beijing) via Siberia. 22. A delayed journey. 23. The long march begins. 24. The border of Tibet (*Xizang*). 25. Lanchow (*Lanzhou*) and return. 26. Departure via Chekiang (*Zhejiang*). 27. Home by a southern route. The fourth expedition: 28. Peking (Beijing) via Japan. 29. *Terra sancta.* 30. The wild pears. 31. Impasse in Ichang (I-ch'ang or Yichang). Journey's end: 32. Aftermath. 33. His contemporaries speak. 34. Meyer's legacy today. 35. Envoi. Appendixes: A. Meyer's plant introductions. B. Meyer germplasm available today. C. Recipients of the Meyer Medal. Notes. Bibliography.

"Ever since Marco Polo's return from fabled Cathay [in 1295] Westerners had longed for the horticultural treasures of China, where earth's richest flora had survived untouched by the Third Ice Age that had covered much of Europe and North America. The Chinese government, however, had limited foreigners for centuries to the open ports of Canton and Macao. After the Opium Wars of the 1840s resulted in greater privileges for Westerners, Robert Fortune, a Scottish plant hunter, spent nineteen years near the treaty ports, occasionally managing to travel two hundred miles into the interior disguised as a Chinese beggar with shaved head and pigtail. Later, amateurs like the French missionary-botanist Father Armand David and the Irish consular official Dr. Augustine Henry collected dried herbarium specimens of many new plants, revealing the richness and variety of China's flora" (p. 6).

At the beginning of the 20th century, a new window of opportunity opened for plant explorers in China. The crushing defeat of the Boxer uprising and the Chinese government in 1901 by the European powers, gave these powers a chance to extend their influence. Plant hunters could finally travel with a fair degree of safety into western China. In 1899 Veitch and Sons, a famous English nursery firm, sent a young collector named Ernest H. Wilson to find the ornamentals described by Father David. Wilson collected seeds of three hundred species, nine hundred pressed specimen, and thirty-five Wardian cases of living plants before he returned to England in 1902. Realizing that agricultural exploration would yield equally great rewards, David Fairchild, head of the infant Foreign Seed and Plant Introduction Section of the USDA, eagerly anticipated sending an explorer to China. But first he needed to find the right man to search vast areas, identify useful plants, and transport them to America.

"In 1889 Beverly T. Galloway, head of the Division of Plant Pathology of the USDA, had brought nineteen-year-old David Fairchild to Washington to join five plant pathologists who were working in attic rooms of the old red

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brick department building. Galloway's Wisconsin classmate, P. Howard Dorsett, soon joined the group. A little later, Fairchild's Kansas State classmate, shy and scholarly Walter T. Swingle, arrived with his growing library of agricultural references in five or six languages. Seeking an opportunity to learn about the flora of foreign countries, Fairchild accepted a Smithsonian fellowship to study in Europe. Aboard ship he met Barbour Lathrop, a well-to-do gentleman who later took him on an extended tour of the Pacific and showed him fruits, grains, and ornamental plants that could be valuable in America. Returning to Washington in 1897, David Fairchild knew exactly what he wanted to do with his life.

"With the help of W.T. Swingle, he conceived a plan to divert twenty thousand dollars of the funds appropriated for the wasteful Congressional Seed Distribution Service in order to finance a section for the specific purpose of introducing new and useful crops into the United States. He enthusiastically presented this idea to the secretary of agriculture, James Wilson, who approved the plan and asked him to organize the new section. Housed on the fifth floor under the eaves of the old Department of Agriculture building and staffed by one teenage secretary, the Foreign Seed and Plant Introduction Section became a reality when Congress passed the revised appropriation bill in July, 1898."

"Though David Fairchild traveled for the next several years as a special agent of the Foreign Seed and Plant Introduction Section, he never forgot his hope of sending a long-term plant explorer to China. In England he visited Augustine Henry to try to persuade that distinguished amateur botanist to return to Asia as a collector for the Department of Agriculture. Though Dr. Henry declined Fairchild's offer, his enthusiastic account of the unexplored fertile plains and useful plants of the western Chinese provinces made a deep impression on David Fairchild.

"He returned to Washington in 1903, determined to initiate agricultural exploration in the Orient. By this time the Foreign Seed and Plant Introduction Section had become a part of the Bureau of Plant Industry directed by Beverly T. Galloway. Galloway agreed that the collector Fairchild sought must be a good botanist who could recognize those plants that were both new and useful; a practical gardener who could gather and transport live material–scions and cuttings as well as seeds; and a man of great endurance who could tolerate all sorts of physical discomforts and walk thousands of miles where no roads existed. Choosing a plant hunter who combined these qualifications became Fairchild's chief concern" (p. 7-8).

In June 1904 Fairchild "began a series of visits to experiment stations and individual correspondents who were testing plants being introduced by the USDA. In Boston [Massachusetts], he called on Charles Sprague Sargent, the director of Harvard's world-famous Arnold Arboretum. Though these two men devoted their lives to related goals, their personalities offered a sharp contrast. Sargent, a Bostonian of ample means, assured social position, and established reputation, was strong-willed and often sarcastic, while the younger man from the Kansas prairies attracted friends everywhere because of his diplomacy and enthusiasm. Sargent mentioned that he was negotiating for the services of E.H. Wilson, who was making his second journey to the Orient for Veitch and Sons. Because of the rivalry that was developing between these two leaders in American plant exploration, this information spurred Fairchild's desire to send a collector to China" (p. 8).

When Fairchild returned to Washington, DC, in October 1904, he had still not met or even heard of Frank N. Meyer. Meyer had arrived in Washington, DC, on 20 Aug. 1901 with a letter of introduction from Hugo de Vries to Erwin F. Smith. Smith found Meyer a modest job as a gardener in the USDA greenhouses in Washington, DC.; here Meyer worked for about 10 months–from 23 Oct. 1901 to 31 Aug. 1902. Then resigned, left Washington, DC, and for the next 4 years he traveled to Mexico and across the USA, stopping to work for the USDA in various places.

For some time, Adrian J. Pieters, who had befriended Meyer and was also of Dutch extraction, and who had directed the Foreign Seed and Plant introduction office during the last months of Fairchild's travels abroad, had been thinking of recommending Meyer to Fairchild as the man Fairchild sought. Eventually Pieters made his recommendation. Similar strong recommendations came to Fairchild from Erwin Smith, Galloway, and George Oliver, Meyer's supervisor in the greenhouses. "In March [1905] Fairchild asked Pieters to wire Frank Meyer to ask whether he would be interested in going to China as an agricultural explorer. At last Fairchild had made his decision; time would test the wisdom of his choice" (p. 9). In Dec. 1905: "En route by sea to Tientsin, at Chefoo (Yantai) Meyer called on Dr. Yamei Kin and Mrs. John L. Nevius, the widow of a medical missionary who had introduced Western fruit trees there. These ladies, friends of David Fairchild, shared their considerable knowledge of the flora of northern china and showed Meyer several fine gardens. They also invited him 'to take many a cup of tea' and to eat a typical Chinese dinner."

"Fairchild (p. 108) requested twelve more tins of the roasted soybean coffee. He had served it to Mrs. Fairchild and Mrs. Bell without their realizing that it was not 'the ordinary coffee used by our family.'"

Talk with Isabel Cunningham. 1998. Aug. 1. Much of the story of how Fairchild and Meyer met is told in Fairchild's superb book, *The World Was My Garden* (1938). See p. 315 etc. Address: 212 Wardour Dr., Annapolis, Maryland 21401. Phone: 301-268-2384.

8065. Fruin, W. Mark. 1984. History of Yamasa Shoyu Co. 4060 Amaranta Dr., Palo Alto, CA 94306. 4 p. Unpublished manuscript.

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• ***Summary:*** Yamasa is the second largest shoyu producer in Japan [after Kikkoman] and one of the oldest in Eastern Japan, having been established in 1645 [sic]. It is located in Choshi, the fishing village at the eastern tip of the Miura Peninsula, where Higeta Shoyu is likewise headquartered.

Note: The Hamaguchi family, originally from Kishu (today's Wakayama prefecture), started making Yamasa *brand* shoyu in Choshi in 1845. But not until 1928 was a company established or incorporated as Yamasa Shoyu Inc. (Source: *Shashi: Choshi Shoyu* (1972)).

Along with Higeta and Kikkoman (located in the city of Noda), Yamasa is one of the big three producers of shoyu in Chiba prefecture in Eastern Japan. Indeed, Higeta and Yamasa were founded by brothers who migrated to Choshi from Hiromura in Wakayama prefecture. One brother, the elder Hamaguchi, went into the food distribution business in Tokyo, opening an enterprise which continues today under the name of Hiroya. The younger brother began to make shoyu–among other endeavors; and that was the start of Yamasa Shoyu.

Yamasa's leadership in the shoyu industry was established early. In 1895, it founded a research laboratory for the study of mechanical and chemical improvements to the process of shoyu fermentation. This may have been the first industrial research laboratory in Japan. At the turn of the 20th century, Gihei Hamaguchi, then the eldest son of the principal owner of Yamasa and himself president of the company at a later time, traveled to England to study chemistry and fermentation technology. Address: Palo Alto, California. Phone: 415-858-2226 or 327-0857.

8066. Fruin, W. Mark. 1984. History of Marukin Shoyu Company. 4060 Amaranta Dr., Palo Alto, CA 94306. 5 p. Unpublished manuscript.

• ***Summary:*** Marukin is the smallest of the Big-5 shoyu makers in Japan, with about 3-4% of the market. It is best known for its location on the island of Shodoshima, in the inland sea. In 1809 Takahashi Bunuemon was the first of many to make shoyu on Shodoshima, inaugurating a local industry that boasted 400 producers by 1878. In fact, Takanashi was not the first but only the first for whom records of his shoyu brewing activities survive.

Marukin was the first joint stock company in Japan established for the purpose of making shoyu. This occurred in 1907 when 165 investors put up 300,000 yen in assets. Most of these investors were shoyu makers themselves, so that Marukin has had a strong communal flavor from the start as the largest amalgamated shoyu maker on Shodoshima island.

Although located in Western Japan and not too far from the Higashi Maru Shoyu Company, Marukin has always been a koi-kuchi [koikuchi] or dark-colored shoyu maker. The techniques of shoyu manufacture were learned, it is said, directly from Yuasa, the seaport in Wakayama prefecture which was the birthplace of shoyu. In all likelihood, the traffic in men and materials to and from Shodoshima during the late sixteenth century, when Osaka Castle was being built, provided the opportunity for learning shoyu manufacturing. By boat, Shodoshima is only a half-day's sail from Yuasa.

Once the techniques of shoyu production were established on Shodoshima, production and producers increased rapidly. From a relatively late start in the early nineteenth century, shoyu producers jumped to 400 in a hundred years and production climbed to rank Shodoshima as one of the major manufacturing sites in Japan. But with so many small makers in competition with one another, the industry was in disorder. Prices were not fixed, quality was poor, shipping schedules were not reliable, and branding was not dependable.

It was at this juncture that Marukin Shoyu was formed in 1907. With the establishment of a joint stock company, a rationalization and regularization of shoyu manufacturing could occur.

In 1905, a shoyu research laboratory was founded by Kinoshita Chujiro who would become President of the Marukin Shoyu Company when it was established two years later. Kagawa prefecture likewise opened a shoyu research facility in 1910.

In 1916, the two research institutes merged, thereby raising the quality of information concerning shoyu manufacturing to all interested parties. By 1930, Marukin Shoyu was being sold in Tokyo and Eastern Japan heralding its transformation from a local to a national manufacturer. In 1934 and again in 1962, three and then four smaller makers were bought up by Marukin Shoyu which aimed to consolidate its position as the fifth largest shoyu maker in Japan both by internal expansion as well as by the acquisition of other shoyu plants.

Even today, some 80 percent of Marukin Shoyu is carried to market by ship. The company owns and leases a fleet of 11-ton freighters which ply the Inland Sea and the coastal waters of Japan. Address: Palo Alto, California. Phone: 415-858-2226 or 327-0857.

8067. Fruin, W. Mark. 1984. History of Higashimaru Shoyu. 4060 Amaranta Dr., Palo Alto, CA 94306. 5 p. Unpublished manuscript.

• ***Summary:*** Higashimaru is known in Japan as the major manufacturer of usukuchi or light-colored shoyu, which is also saltier than regular (koikuchi or dark-colored) shoyu. Light-colored shoyu is associated with Western Japan where it is widely used in the cuisine of Osaka and Kyoto, to season the popular white fish and fresh vegetables. As of 1984 some 80% of light-colored shoyu is sold in Western Japan, yet light-colored shoyu accounts for only about 13% of total shoyu sales in Japan.

Higashimaru is located in Tatsuno City, a castle town

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situated astride the Ibo River in Hyogo prefecture. Because of the favorable inland climate found near Tatsuno and because of the purity of the Ibo River waters, Tatsuno has long been famous for the manufacture of sake as well as shoyu. Indeed sake seems to have been Tatsuno's principal product during the 16th and 17th centuries, but at Nada City near Kobe on the Inland Sea became the leading center for sake brewing, Tatsuno gradually came to specialize in shoyu production.

Shoyu was first made in Tatsuno in about 1567 and by the late 17th century there were more than 100 shoyu makers in the castle town. Many have disappeared. Three of the most successful from among so many at the start of the 20th century were the Asai, Kataoka, and Nakahara households.

These three families joined in 1942 in a partnership to make shoyu. In 1949 they consolidated their efforts behind one brand, Higashimaru, which was formerly the Asai family's brand. Before the Asai family had taken over Higashimaru Shoyu in the mid-1800s, this shoyu had been made by the Lord of Tatsuno, the Daimyo Wakizaka. He had been transferred to Tatsuno in 1672 and was the only aristocrat known to be the founder of a shoyu company in operation today.

Somewhat after the time when Lord Wakizaka established a shoyu plant in Tatsuno, another local entrepreneur–it is not known who–added a step to the shoyu manufacturing process in Tatsuno that remains today one of the most distinctive steps of Higashimaru Shoyu. Around 1809, a sweet sake called amazake, a nonalcoholic rice wine, began to be added to the fermented shoyu (*kiage shoyu*) just before it passed to the pressing and pasteurization stages of production. Address: Palo Alto, California.

8068. Shurtleff, William; Aoyagi, Akiko. 1984. Amerika Gasshû-koku oyobi Kanada ni okeru miso no rekishi [History of miso in the USA, and Canada]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) 32(5):237-40. May. [221 ref. Jap]

• ***Summary:*** This is part 2 of a translation in 4 parts by Taeko Ebine of the chapter on the "History of Miso" from *The Book of Miso* by Shurtleff and Aoyagi. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8069. Yamanaka, Mitsuaki. 1984. Re: The work of Takashin Ltd. with tempeh in Japan. Letter to William Shurtleff at Soyfoods Center, May. 3 p. [Jap]

• ***Summary:*** Our company, Takashin, Ltd. (*Takashin Shokuhin*) is a member of the Japanese National Natto Association (*Zenkoku Natto Kyôdô Kumiai Rengokai*). In early 1983, with director Ose's announcement of *Tempe Gannen* (The First Year of Tempeh) we started basic research on tempeh production and on second generation tempeh products–with other members in full force. From the beginning of 1984, under the leadership of our president Makito Takato, we are making progress on marketing and commercialization. We are also consulting with Oita-sensei, the top tempeh researcher in Japan, from the Ministry of Agriculture and Forestry Research Center (*Nosui-sho Shokuhin Sôgo Kenkyû-sho*).

We are now preparing to build a tempeh plant, with tempeh-making equipment, in order to make consistently good quality tempeh at low price for the market.

To answer your questions: 1. In April 1983 our president attended the Association meeting. Since then we have been doing research on tempeh. As a new fermented food in Japan, tempeh appealed to our president's progressive nature. We believe it has many advantages over natto.

2. July 1983. Right after Mr. Kanasuki / Kanasugi of the association returned from Indonesia, we invited him to our company and asked him to teach us how to make tempeh. In Sept. 1983 we started to sell hamburger with tempeh.

3. We are making and selling both tempeh (40 kg/day) and second-generation tempeh foods (20 kg/day)–such as hamburger, croquettes, cutlets, etc.

4. Monthly production is 1,500 kg.

7. We are selling our tempeh and tempeh products through natural foods restaurants and natural foods stores. We tried to test market our products in regular food stores but it didn't sell well because of lack of promotion and publicity. Address: Tachibana 1-29-2, Sumida-ku, Tokyo 131, Japan. Phone: 048-644-1323.

8070. Shurtleff, William; Aoyagi, Akiko. 1984. History of soy sauce, shoyu, and tamari. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 118 p. June 6. Unpublished typescript. Available online at www.soyinfocenter.com.

• ***Summary:*** A comprehensive history of the subject. Contents: What is soy sauce? Etymology. World overview. Part I: History of soy sauce in China and Taiwan. Early Chinese soy sauces (shih-you and jiangyou). The 1800's. 1900-1948. 1949-1980's (People's Republic of China). Taiwan. Hong Kong. Part II: History of soy sauce in Southeast Asia and Korea. Dissemination and common characteristics. Association of Southeast Asian Nations (ASEAN)–general. Philippines (1912-). Thailand (1974-). Malaysia (1970-). Singapore. Indonesia. Vietnam. Korea. Part III: History of shoyu in Japan. Hishio (jiang), tamari, and other forerunners of shoyu (700-1600). The development of shoyu (1500-1700). Standardization of the shoyu formula (1716-1867). The rise of shoyu in Japan (1750-1867). Overview of origins. Shoyu during the Meiji period (1868-1911). Shoyu from 1912-1945. The postwar period and modern times (1945-1981). Part IV: History of soy sauce in Europe. Part V: History of soy sauce in Australasia and the Pacific. Part VI: History of soy sauce in the United States. Part VII: History of soy sauce in Latin America, Africa, the Indian Subcontinent, and the Middle East.

The period during World War I was one of consolidation

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for the shoyu industry. In 1914 three of the larger manufacturers at Choshi (Higeta, Jigamisa, and Kagidai) merged to become Choshi Shoyu Co. Ltd. In 1917 eight (later nine) major manufacturers in Noda, all related by descent or marriage, withdrew from the Noda cartel and joined to form a corporation, the Noda Shoyu Company, Ltd., which later became Kikkoman Inc. The company began operations on 1 January 1918, and quickly modernized its entire organization. In 1925 it restructured itself by amalgamating four related companies under the control of a holding company, thus greatly increasing its capital and scope. In 1918 Choshi Shoyu Co. changed from a limited partnership to a stock corporation and adopted a common trademark, Higeta. The Hamaguchi family, originally from Kishu, which ran Yamasa in Choshi, chose not to join the Choshi Shoyu Co. Rather, in 1928 they incorporated as the Yamasa Shoyu Co., Inc. Address: Lafayette, California. Phone: 415-283-2991.

8071. Kira, Motoo. 1984. Re: History of Marukin Shokuhin's work with tempeh. Letter to William Shurtleff at Soyfoods Center, June 8. 5 p. Handwritten, with signature. [Jap; eng+]
• ***Summary:*** Marukin Foods: The first natto company to start large-scale production of tempeh in Japan was Marukin Shokuhin (Marukin Foods Industry Co. Ltd.). Located in Kumamoto, Kyushu (Japan's southernmost main island), they were (in 1984) one of Japan's Big Five natto manufacturers, and they also made several other foods such as roasted soy flour (kinako), tofu, and konnyaku. In about 1964 Mr. Hayashi of the Japanese-American Soybean Institute suggested that Marukin start to study tempeh. At that time Marukin was looking for a new product, so Mr. Haruo Kato (the brother of Marukin's president and chief of natto production, research, and development) began with great interest to collect material and investigate this little-known fermented soyfood. Kato obtained tempeh culture from an unknown source in 1964 and was soon making small batches of tempeh. However the company eventually came to believe (incorrectly) that tempeh culture could interfere with the natto fermentation, and taste tests of tempeh led Kato to feel that it might be difficult to introduce tempeh into Westernized diets in Japan. So interest in tempeh waned. In July 1982 Marukin and eleven other small- to medium-sized soyfoods manufacturers from throughout Kyushu joined to establish the Kyushu Soyfoods Industry Association (*Kyushu Daizu Shokuhin Kogyo Kumiai*). Marusan's president, Itsuo Kira, became head of the cooperative Association. To help them compete with larger companies, and supported by Japanese government aid, they built a large and modern factory (6,600 square meters), with a daily capacity of 15 tonnes of natto and 6 tonnes of kinako and soy soup base (*gojiru no moto*). In April 1983, this new natto factory, the largest in Japan, started production, employing 85 workers. Marukin decided to use its former natto factory to make tempeh, since there was a growing interest in soyfoods and healthful foods, and since they already had extensive experience in making fermented soyfoods. In November 1983 Marukin Foods launched SunSeed brand tempeh. An article on the product in the 1 December 1983 issue of the *Japan Food News* (*Nihon Shokuryo Shimbun / Shinbun*) was headlined "nonsticky natto" and by May 1984 they were selling 1,500 packs of 200 gm each (300 kg) daily, about 4,620 lb (2,100 kg) a week or 9,150 kg a month. They were also developing secondary tempeh products, including snack foods, paste-type foods, and fried foods. The person in charge of tempeh production and sales was Moto-o Kira, eldest son of the president, Itsuo Kira, and next to top man in the company. Marukin sold its tempeh in department stores and in supermarkets at their own in-store booths. To promote tempeh, the company employed two professional nutritionists to do demonstrations and lectures at cooking classes. Marukin soon hopes to sell tempeh to school lunch programs. Address: Manager, tempeh production, 380 Yoyasu-machi Kumamoto-shi 860, Japan. Phone: 096-325-3232.

8072. Stinchecum, Amanda Mayer. 1984. Okinawa: Chinese influence. *New York Times.* June 10. p. XX6. Sunday.
• ***Summary:*** Urizun, a restaurant in Naha (Asato 388-5), the capital of Okinawa Prefecture, is a "rare combination of superb food and ambiance." It was started 12 years ago by Tsuchiya Saneyuki, because of his passion for awamori, "the Okinawan liquor distilled from Thai rice and aged like whiskey." Its flavor resembles that of shochu, which is distilled from potatoes in southern Kyushu.

Urizun serves Tofuyo ($1.30), Okinawa-style fermented tofu with a sharp taste. Another popular dish has a dressing of miso and vinegar. Another Okinawan standard is a "creamy white tofu made of peanuts."

Note: The colorful paper wrapper (see next page) for Urizun's tofuyo looks like this. The text (in Japanese) has four parts: (1) The vertical white hiragana character's to the right of large central brown characters are *Urisun no* which means "Urisun's." (2) The small white hiragana characters to their left (called *furigana*) are *Tôfu-yo*. They explain how to pronounce the large central brown characters. (3) The three large central brown Chinese characters are pronounced *Tôfu-yo*. (4) The black characters to the left give the name, address and phone number of the restaurant, Urizun.

8073. Kato, Eihachiro. 1984. Re: Work with natto at the NRRC and in Japan. Work with tempeh in Japan. Letter to William Shurtleff at Soyfoods Center, June 18. 2 p. Handwritten on lined paper; 3 p. transcript. [Jap; eng+]
• ***Summary:*** In Oct. 1983 the author started doing research on natto under Drs. Hesseltine and Wang at the Northern Regional Research Lab. in Peoria, Illinois. In Japan, the soybeans used to make natto are grown mostly in Japan

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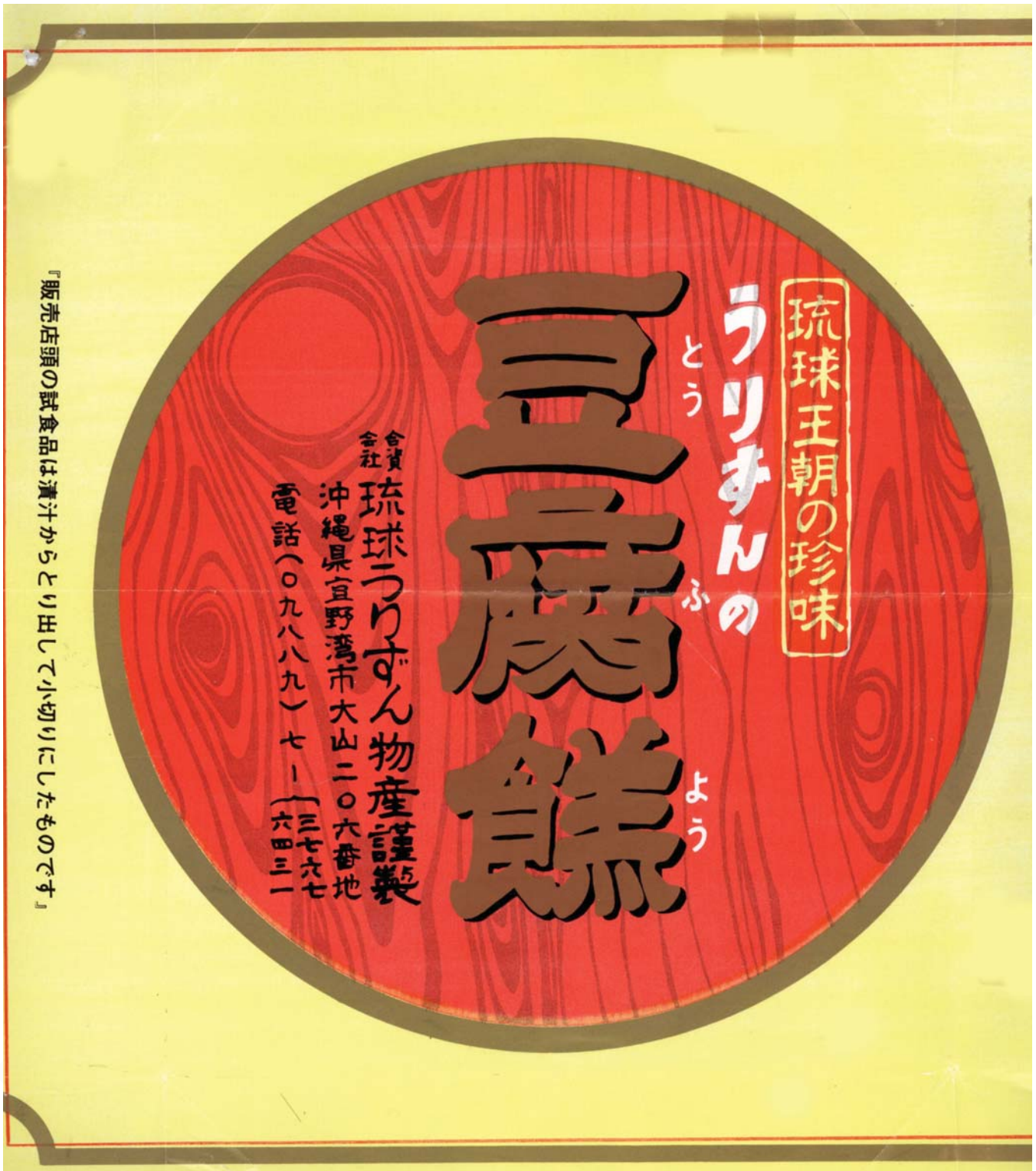

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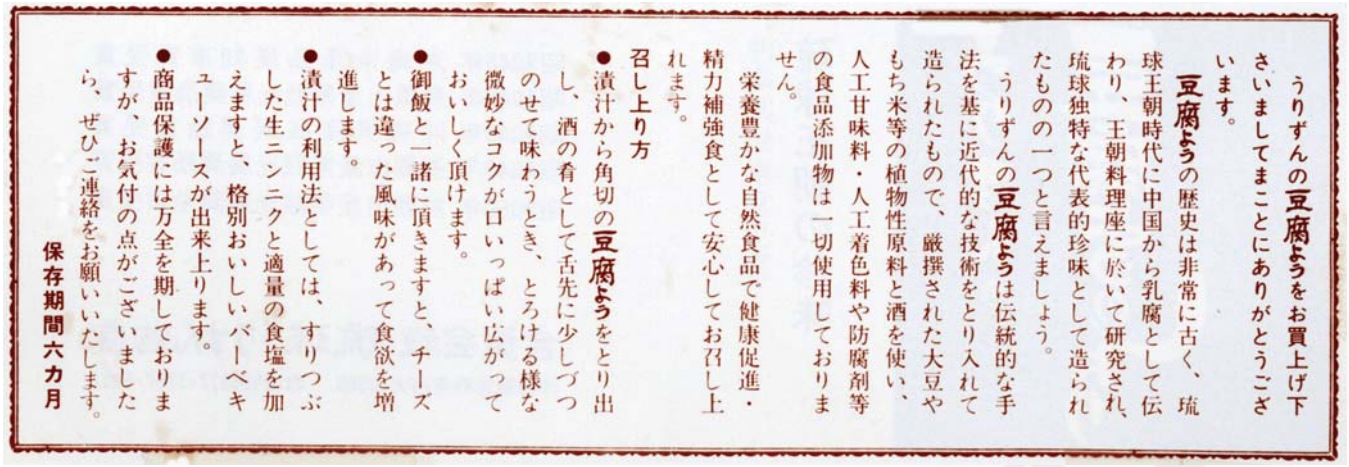

うりずんの**豆腐よう**をお買上げ下さいましてまことにありがとうございます。

豆腐ようの歴史は非常に古く、琉球王朝時代に中国から乳腐として伝わり、王朝料理座に於いて研究され、琉球独特な代表的珍味として造られたものの一つと言えましょう。

うりずんの**豆腐よう**は伝統的な手法を基に近代的な技術をとり入れて造られたもので、厳撰された大豆やもち米等の植物性原料と酒を使い、人工甘味料・人工着色料や防腐剤等の食品添加物は一切使用しておりません。

栄養豊かな自然食品で健康促進・精力補強食として安心してお召し上れます。

召し上り方

●漬汁から角切の**豆腐よう**をとり出し、酒の肴として舌先に少しづつのせて味わうとき、とろける様な微妙なコクが口いっぱい広がっておいしく頂けます。

●御飯と一諸に頂きますと、チーズとは違った風味があって食欲を増進します。

●漬汁の利用法としては、すりつぶした生ニンニクと適量の食塩を加えますと、格別おいしいバーベキューソースが出来上ります。

●商品保護には万全を期しておりますが、お気付の点がございましたら、ぜひご連絡をお願いいたします。

保存期間六カ月

or China. U.S. soybeans are believed to be unsuited for making natto since they remain hard after cooking, and they produce natto that has less sweetness and stickiness (*nebari*) than desired. He is now trying to find U.S. soybeans suited to making natto. He has found that the environment and conditions under which the soybeans are grown has more influence on the natto than the varieties themselves. He thinks that natto has many potential uses in a dried powdered form that could be mixed with other foods. He plans to return to Japan in late Aug. 1984. He has an extensive collection of publications on natto, which he is willing to share.

In Japan, he teaches at Meiji University in the agricultural chemistry dept., fermented foods research lab. He worked under Dr. Masahiro Nakano for a long time when he was there. His father (Haruo Kato) and brother (Itsuo Kira) produced natto after World War II in Kumamoto prefecture, Kyushu. They also tested tempeh for about 15 years. Their company is named Marukin Shokuhin Kogyô K.K. In July 1983 they established the Kyushu Soyfoods Association (*Kyûshu Daizu Shokuhin Kogyô Kumiai*) with Japanese government aid, and in Uto-chi, Kumamoto prefecture, they built a new plant. Marukin shokuhin is mainly handling the sales. Mr. Kato has no direct connection with Marukin. Address: NRRC, Peoria, Illinois.

8074. *Toyo Shinpo* (*Soyfoods News*). 1984. Tenpe honkaku shihan [Marusan-Ai plans to really market tempeh from June 1]. June 21. [Jap]

8075. Ebine, Hideo. 1984. Tenpe no seishitsu to riyô-jô no shomondai [Various problems concerning the character and utilization of tempeh]. *Shokuhin Kogyo* (*Food Industry*) 27(12):20-24. June 30. [16 ref. Jap]
• ***Summary:*** Contains 3 tables and 3 graphs. Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8076. Noguchi, Kazuko. 1984. Tenpe no seijô to chôri kakô [Tempeh, characteristics and cooking]. *Shokuhin Kogyo* (*Food Industry*) 27(12):38-46. June 30. [Jap]
• ***Summary:*** Contains one table with details about: Tempeh sambal. Tempeh soup. Fried tempeh. Tempeh sauce. Also a related bar chart. Plus 12 photos of prepared tempeh dishes. Address: Saga Joshi Tanki Daigaku, Kaseigaku-ka.

8077. Takamine, Kazuhiro. 1984. Tenpe no seizô-hô to riyô o meguru gijutsu-teki hatten to kadai [Technical advances in tempeh production and utilization]. *Shokuhin Kogyo* (*Food Industry*) 27(12):25-33. June 30. [14 ref. Jap]
• ***Summary:*** Contains 10 photos of tempeh. Address: Torigoe Seifun, Fukuoka, Kyushu, Japan.

8078. Watanabe, Tadao. 1984. Tenpe to kôsan kasei [Tempeh and antioxidative activity]. *Shokuhin Kogyo* (*Food Industry*) 27(12):35-37. June 30. [7 ref. Jap]
• ***Summary:*** Contains 2 graphs. Address: Kyushu Daigaku Meiyo Kyoju, Nôgaku Hakase (Dep. of Food Science and Technol., Kyushu Univ.).

8079. Bo, Thi-an. 1984. Tôshi no engen to sono seisan gijutsu ni tsuite [On the origins of fermented black soybeans [douchi] and their production technology. I and II.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 79(4):221-23. April; 79(6):395-402. June. [7 ref. Jap]
• ***Summary:*** A definitive history of the subject. Includes a discussion of *shuidouchi,* which might be called salted Chinese natto; it is fermented with *Bacillus subtilis* and made in Shandong province in China–directly west of South Korea. Address: Iwate Daigaku Nôgaku-bu, Sogaku 80 shunen no gosukuji ni kaete; Present address, China.

8080. Gregg, N. Taylor. 1984. Hagi: Where Japan's revolution began. *National Geographic* 165(6):750-72. June.
• ***Summary:*** The story of the how and why the Meiji Reformation began, in order to meet the challenge of Commodore Matthew C. Perry and the West while holding fast to revered tradition. One hero of the story is Shoin

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Yoshida who, as a young samurai had asked Commodore Perry in 1854 to take him to America. He was convinced that Japan needed to study Western technology to survive. Perry refused and, following the course of honor, he turned himself in and was imprisoned. On 21 Nov. 1859, at age 29, he was executed by the shogun. One feudal domain, the *han* of Choshu, one town, Hagi, and one school, Yoshida's Shoka Sonjoku, were always near the center of the struggle to restore the emperor to power and topple the inept Tokugawa shogunate.

Inserted in this issue is a superb 4-page chronology of Japan titled "Historical Japan." On the other side is an equally fine map of Japan, extensively annotated with key events.

1543–The first Europeans known to have set foot on Japan were three Portuguese shipwrecked on Tanega Shima (located a little southeast of the southern tip of Kyushu). Western commerce, guns, and Christianity arrive with Portuguese traders.

1549–A Jesuit mission headed by St. Francis Xavier landed at Kagoshima and was given permission to preach. By 1614 Christian missionaries could claim 300,000 followers throughout Japan.

1639-1854–Nagasaki, in southwestern Kyushu, was a Christian stronghold and the only port that allowed foreigners–Dutch and Chinese traders. Address: National Geographic Illustrations Staff.

8081. Hashizume, Kazumoto; Ikeda, Toru; Saio, Kyoko. 1984. [Studies in aburage-making. I. The effects of air content in soybean milk on the expansion of tofu-gels in aburage-making]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 31(6):389-94. [Jap; eng]*
Address: National Food Research Inst., Ministry of Agriculture & Forestry, Shiohama-1, Koto-ku, Tokyo, Japan.

8082. Hashizume, Kazumoto; Ikeda, Toru; Saio, Kyoko. 1984. [Studies in aburage-making. I. The relationship of SH and S-S exchange reaction to the expansion of tofu-gels for aburage-making]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 31(6):395-400. [Jap; eng]*
Address: National Food Research Inst., Ministry of Agriculture & Forestry, Shiohama-1, Koto-ku, Tokyo, Japan.

8083. Kanasugi, Goro. 1984. Re: Work with tempeh in Japan. Letter to William Shurtleff at Soyfoods Center, June. 4 p. Handwritten, with signature. [Jap]
• ***Summary:*** Mr. Kanasugi, vice president of the Japan Natto Assoc., started a soyfoods restaurant named Mame-no-ko ("child of the soybean") in Omiya city, Saitama prefecture. By mid-1983 he was serving tempeh there as an alternative to meat in various side dishes: tempura, harumaki (spring rolls), karinto (sweet fried dough cake), curried sauce, sauteed vegetables, croquettes, and various others. He also sells ready-to-eat tempeh dishes at his take-out deli. Many of his recipes contain 10-20% chicken or meat.

Mr. Kawashima of Tsukuba told him that his tempeh has a very good flavor. Lots of big Japanese companies are now looking at tempeh manufacturing. Address: Shimo-cho 3-6, Omiya-shi, Saitama-ken 330, Japan. Phone: 048-644-1323.

8084. Kuishimbo (The Glutton). 1984. June. New soyfoods restaurant or deli. Kuishimbo, Hagiwara 3-13-5, Oita-shi, Oita, Japan.
• ***Summary:*** Toyo Shinpo. 1988. June 1. p. 9. "Sato Shokuhin Kogyo Company has a tofu restaurant called 'The Glutton' in Oita which serves appetizing tofu and fish dishes." Mr. Junichi Sato, president of Sato Shokuhin Kogyo is the owner of the company and restaurant. In addition to being a tofu shop, they also have a fish menu. They are open from 5-12 P.M. every night, except the 1st and 3rd Sundays of each month. They opened for business four years ago.

8085. Shurtleff, William; Aoyagi, Akiko. 1984. Amerika Gasshû-koku oyobi Kanada ni okeru miso no rekishi (2) [History of miso in the USA and Canada (2)]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) 32(6):287-91. June. [221 ref. Jap]
• ***Summary:*** This is part 3 of a translation in 4 parts by Taeko Ebine of the chapter on the "History of Miso" from *The Book of Miso* by Shurtleff and Aoyagi. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8086. Szilard, Paula. 1984. Toothsome tofu pies. *Mother Earth News* No. 87. p. 42-44. May/June.
• ***Summary:*** Gives recipes for: Apricot tofu pie. Banana-coconut tofu pie. Orange tofu pie. Carob-almond tofu pie. "At a time when almost everyone seems to be borrowing ideas from Japan, is it possible that the people of that nation could learn something from us? You *bet* it is!... In less than a decade, Americans have adapted tofu to the Western palate. . . and Occidental cooks have really pioneered the development of a number of tofu desserts. The creations include a mouth watering array of pies, cheesecakes, puddings, cakes, cookies, delicate pastries, and even ice creams!"

8087. Watanabe, Tokuji; Kishi, Asako. 1984. The book of soybeans: Nature's miracle protein. New York, NY: Japan Publications. 191 p. June. Illust. General index. Recipe index. 26 cm. [21 ref]
• ***Summary:*** Contents: Introduction. Part 1. General information: 1. Characteristic traits: Agronomic and other biological characteristics, physical properties, chemical properties, soybean protein, properties of soybeans as food material. 2. Current ways of using and processing

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soybeans: Throughout the world, traditional ways of using and processing, new soybean food products. 3. Tofu and other nonfermented soybean food products: Tofu (Cotton or regular tofu, silken tofu {*kinugoshi*} and soft tofu, packaged tofu, new equipment), deep-fried tofu, dried-frozen tofu (*Kôri-dôfu*), soy milk, yuba, roasted soy flour (*kinako*), soybean sprouts.

Note 1. This is the earliest English-language document seen (April 2013) that uses the term *Kôri-dôfu* to refer to dried-frozen tofu.

4. Miso and other fermented soybean products: Miso, natto, Hama-natto (tera-nattô), soy sauce, sufu, tempeh. 5. Other ways of eating soybeans–Simple traditional Japanese foods: Parched soybeans, boiled soybeans (*budo-mame; hitasahi mame*), beaten and mashed [or ground] soybeans (*go,* or (from edamamé) *zunda or jinda*), molded soybean mash (*jinta-dôfu*), molded mashed soybeans and rice flour (*shitogi*), soybean soybean-mash paste. 6. New soybean protein products.

Note 2. This is the earliest document seen (Nov. 2008) that mentions *zunda.* The text (p. 84) reads: "When fresh green soybeans (edamame) are used in cooking, they are boiled for from ten to twenty minutes; ground; and flavored with salt, sugar, and soy sauce. The resulting dish is called *zunda* or *jinda."*

Note 3. Zunda is a healthy and tasty snack or treat made from mashed edamamé. It is sweet, rich in protein, high in fiber and emerald green. It is said to have originated hundreds of years ago in Japan in Miyagi prefecture. In and around Sendai (capital of Miyagi prefecture) one can find many shops and booths that sell zunda cakes, zunda mochi treats, and zunda shakes, all made from edamamé (green vegetable soybeans). One well-known company in Japan that markets delicious zunda products is Zunda Saryo.

Part 2. Cooking with soybean food products: Tofu, yaki-dôfu (toasted tofu), kôri-dôfu (dried-frozen tofu), nama-agè, abura-agè, gammodoki, yuba (soy-milk film), nattô, miso, soy milk, soybeans, bean sprouts. Afterword. Bibliography.

In the chapter on tofu, pages 43-44 discuss okara or *unohana* (the residue remaining after soy milk production); a photo shows it in a glass bowl. "Though it formerly appeared on many Japanese tables seasoned and cooked with vegetables, today it is most often fed to animals. As the number of animals raised in urban and suburban areas decreases, however, tofu manufacturers are finding it harder to dispose of residue."

Page 99 notes of tofu: "At a certain temple in Kyoto is a plaque bearing the following inscription, which, while comparing this food to religious faith, clearly shows the esteem in which the Japanese people hold tofu. 'Religious faith should be like tofu: it is good under any circumstances. It is good boiled, grilled, or fried. Raw, chilled, served with soy sauce and other seasonings, it is good with steamed rice. Simmered in hot water and flavored, it is good with sake. Because it is soft, old people and sick people welcome it, but children and young people like it too. Men like it, women like it; poor and rich both like it. Though common, it has elegance enough to find a place in the upper class.

"'It cuts clean and well for use in clear broths. It is good in the meatless diets of religious training. It can be crushed for use in miso soup. It is used all the time and in all seasons. It is inexpensive yet numbered among the delicious treats. It is welcomed everywhere, in mountains as well as in big cities. It is well received at dinners for dignitaries and guests yet is convenient enough for college students who do their own cooking. Women especially should be like tofu. The mature and cultivated person should be tender, yet firm, like tofu. Though apparently tasteless, it is delicious. Though apparently ordinary, it is extraordinary.'"

Other ways of eating soybeans (p. 83-84): (1) Parched–"Parched gently in unglazed ceramic dishes made for the purpose," then tossed by people at Setsubun in February around their houses as they chant "'Demon out! Good luck in!' Then they pick up the beans and eat them. Parched soybeans are included in some varieties of *mochi* (glutinous rice cake) and in *okoshi* a confection made of puffed rice bound together with sugar syrup. In the past they were eaten with salt, miso, or soy sauce."

Note 4. In the USA, parched soybeans are called "dry roasted soynuts."

Tables show: (1) World production of soybeans (1977-1982). (2) Price trends in dollars per ton for wheat, soybeans, and corn (1970-1981). (3) Soybean yields in the USA and Japan (1974-1981). (4) Chemical composition of soyfoods: Tofu, abura-agè, kôri-dôfu, yuba, kinako, soybean sprouts, nattô, miso (dark yellow), soy sauce (common), soybean (Japanese). (5) Statistics on production of modern soybean products in Japan (1975-1981). (6) Annual production and prices of modern soy protein products in the USA (May 1983).

Japan once produced a million tonnes (metric tons) of soybeans annually. This figure decreased dramatically during World War II. After the war, as soybean imports from the United States steadily increased, Japan's domestic crop gradually fell to the level of no more than 100,000 tonnes. In 1977 it was 111,000 tonnes, yet by 1982 it had jumped to 226,000 tonnes as rice acreage was reduced.

All photos are black and white. Figures show: (2) Line drawing of soybean plant with flowers and leaves. (2) Cross section of soybean seed-coat and cotyledon. (3) Graph of protein solubility (NSI) of defatted soybean meal at different pH values. (4) Graph of protein solubility (NSI) of defatted soybean meal at different concentrations of calcium chloride. (5) Graph of relationship between time and temperature of soaking soybeans in water (colder water temperature requires longer soak time). (6) Flow sheet for making regular tofu. (7) Photo of regular (*momen*) "cotton tofu." (8) Line drawing of grinder (horizontal type) used with soaked soybeans when

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making tofu. (9) Photo of continuous filter for soy-milk preparation. (10) Photo of small-scale soy-milk processing plant. (11) Line drawing of molding box [forming boxes with lids] for making regular tofu. (12) Photo of yaki-dofu [grilled tofu]. (13) Photo of okara in a glass cup. (14) Line drawing of molding box [forming box] for silken tofu. (15) Photo of silken tofu. (16) Flow sheet for packaged tofu production [GDL]. (17) Photo of packaged tofu in package. (18) Flow diagram of large-scale process for making tofu and abura-agè with 26 pieces of equipment labeled. (20) Flow diagram of continuous process for making packaged tofu [GDL]. (21) Photo of 2 pieces of abura-agè. (22) Photo of deep fryer for making abura-agè. (23) Photo of nama-agè [deep fried tofu cutlet]. (24) Photo of two types of ganmodoki. (25) Line drawing for tofu kneader for ganmodoki production. (26) Photo of kôri-dôfu [dried frozen tofu]. (27) Flow sheet for making dried-frozen tofu. (28) Flow diagram of process for making large-scale dried-frozen tofu. (29) Photo of aseptic carton and glass of soy milk. (30) Flow sheet for making aseptically packaged soy milk. (31) Photo of 5 different forms of dried yuba. (32) Photo of kinako in two clear glass bowls. (33) Photo of soybean sprouts in a woven bamboo basket. (34) Flow sheet for making miso. (35) Three different types and colors of miso on 3 bamboo rice paddles (*shamoji*). (36) Line drawing of cut-away view of traditional pressure cooker (*koshiki*) for rice cooking. (37) Diagram of continuous rice cooker with 7 parts labeled. (38) Line drawing of *Aspergillus oryzae* with conidia (spores), sterigmata, and mycelium labeled. (39) Photo of pieces of koji. (40) Diagram of modern fermentation room for making koji. (41) Cut-away view of miso fermenting in a wooden vat with stone weights above vinyl film on top. (42) Line drawing of a mashing machine for miso. (43) Photo of natto in rice straw wrapper and polystyrene tray. (44) Cross sectional view of pressure cooker for soybeans. (45) Line drawing of rotating mixer to combine cooked soybeans with pure-cultured *Bacillus natto*. (46) Photo of soy sauce table dispenser. (47) Flow sheet for making Japanese soy sauce (shoyu). (48) Transparent view of crusher (roller) for roasted wheat in making soy sauce. (49) Photo of modern stainless steel fermentation tanks / vats (indoors). (50) Photo of a jar and a cup of sufu [fermented tofu]. (51) Diagram showing relationships between modern soy protein foods.

Note 5. Surprisingly, edamamé, one of the most popular soyfoods in Japan, is mentioned only once, in passing (p. 84) in this book.

Photos on the rear cover show Tokuji Watanabe and Asako Kishi. A brief biography of each is given.

Tokuji Watanabe: Born in 1917 in Tokyo, he graduated from the Faculty of Agriculture of Tokyo University in 1941, with Doctor of Agriculture. In 1945 he entered the National Food Research Institute (NFRI), of which he became director in 1971. In 1977 he resigned that position and became a professor at the Kyoritsu Women's University, where he now teaches. Address: 1. D. Agr., Kyoritsu Women's Univ., Tokyo.

8088. Watanabe, Tokuji; Kishi, Asako. 1984. Hama-nattô (Tera-nattô). In: Tokuji Watanabe and Asako Kishi. 1984. The Book of Soybeans: Nature's Miracle Protein. New York, NY: Japan Publications. 191 p. See p. 75-76.

• ***Summary:*** To make Hama-natto: Ingredients: Selected soybeans, wheat, salt, and ginger. Soak soybeans in water at about 20ºC for 3-4 hours, then drain and steam for 5-6 hours. Allow to stand in the steaming vessel overnight [so that their color darkens]. When their temperature has fallen to less than 40ºC, mix soybeans with toasted and ground wheat (sometimes barley is used instead) and inoculate with koji starter (*tane-koji*). Mix well and distribute among shallow wooden koji boxes. Store these [typically in a koji incubation room] at from 30-35ºC for 50 hours, until beans are covered with a fragrant mold mycelium.

Spread out beans and dry in the sun until a mixture that formerly contained 30-35% moisture contains only 20-25% moisture. [The color of the beans will also become still darker]. Place molded beans in a vat, just cover with brine (Baumé 15 degrees), cover with a pressing lid, weight the lid, and allow to stand for 6-12 months. (Sometimes soy sauce is used in place of brine).

Spread the beans on clean lines in a clean place and dry once again in the sun. Finally mix with ginger that has been pickled in soy sauce.

"Hamma-natto retains the shape of the original soybeans but is a lusterless blackish color." It has a high salt content (about 10%) and a low water content (36-38%), and it keeps for a long time. Hama-nattô is a specialty of a city named Hamamatsu in Shizuoka prefecture, which is adjacent to Aichi prefecture; the latter is famous for its soybean miso [including Hatcho miso]. Clearly there is a close relationship between Hama-natto, a sort of salted soybean koji, and varieties of soybean miso.

Note: This is the earliest English-language document seen (Nov. 2011) that uses the term "Tera-nattô" (or "tera-natto") to refer to fermented black soybeans. Address: 1. Kyoritsu Women's Univ., Tokyo.

8089. Watanabe, Tokuji; Kishi, Asako. 1984. Roasted soy flour (*Kinako*). In: Tokuji Watanabe and Asako Kishi. 1984. The Book of Soybeans: Nature's Miracle Protein. New York, NY: Japan Publications. 191 p. See p. 62-63.

• ***Summary:*** Kinako is made by grinding whole roasted soybeans to a fine powder, which is used as an ingredient in a wide variety of Japanese confections and as a coating for mochi. The soybeans used to make kinako must be carefully selected and cleaned. "Chinese soybeans are preferred for their flavor." Some kinako has a greenish color; it is made from whole dry soybeans having green cotyledons and a green seedcoat.

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The select soybeans are first roasted. Traditionally this was done in a flat pan at 160ºC for 10-20 minutes. Recently, however, a kind of rotary roaster used for roasting chestnuts has become popular. Small, smooth stones are added to ensure even heating, and the soybeans are roasted at 220ºC for about 30 seconds. Then they are ground in a high-speed grinder. To produce the best quality kinako, the soybeans are cracked and dehulled before grinding. The powder is then sieved through a 0.4 millimeter mesh screen fitted around the grinder.

In Japan about 200 factories use a total of 6,000 tons of soybeans each year to make kinako. Typical plants have a production capacity of about 80 kilograms (176 lb) per day, however large factories that produce kinako as calf feed can make more than 5 tons a day.

Dry roasting at the proper temperatures destroys harmful trypsin inhibitors and improves the digestibility (and flavor) of soybean protein. However, overheating can destroy lysine, an essential amino acid that is abundant in soybeans. Address: 1. Kyoritsu Women's Univ., Tokyo.

8090. Willigen, John van; Stoffle, Richard. 1984. The Americanization of shoyu: American workers and the Japanese employment system. *Anthrpology and International Business. Studies in Third World Societies* No. 28. p. 125-62. Chapter 10. June. (Serrie Hendrick, ed. Dep. of Anthropology, College of William and Mary, Williamsburg, Virginia). [21 ref]

• ***Summary:*** Contents: Introduction. The nature of the Japanese employment system. Historical background of Kikkoman Foods, Inc. The Kikkoman-Walworth employment system. The organization of the Walworth plant. Recruitment. The Kikkoman training strategy. Evaluation and promotion. Benefits: Direct and indirect. Japanese perceptions of the American worker and work situation. One manager's view of the American worker and job situation. A note on the Kikkoman ethos. Summary and conclusion. References.

Note: The author is an "applied anthropologist." Address: 1. Dep. of Anthropology, Univ. of Kentucky, Lexington, KY 40506; 2. Div. of Social Sciences, Univ. of Wisconsin, Parkside. Phone: 606-257-6920.

8091. Wilson, John C. 1984. The manufacture of soymilk which is not contaminated with undesirable "beany flavor," resulting from enzyme induced oxidation of fats. Paper presented at the Singapore Inst. of Food Science & Technology Symposium. 19 p. Held June 14-15 at the Hyatt Hotel, Singapore. [8 ref]

• ***Summary:*** Introduction: "This paper anticipates a series of questions and tries to inform the reason for things pertaining to our topic according to the perspective from which we see things in 1984." Who are the real giants? Shall we not give tribute?" 1. What is the interest in the world regions for a soymilk without the traditional 'beany flavour'? What need creates an interest, creates a demand of such proportions? China, South East Asia, North East Asia, North America, hippies, vegetarians, tofu, *The Book of Tofu,* by Shurtleff and Aoyagi.

2. What is the history behind the long delayed but sudden phenomenal development of this product? Dr. Harry W. Miller in Shanghai (1936), K.S. Lo (of Vitasoy) in Hong Kong [1941], in-bottle sterilizing by K.S. Lo, development of UHT processing and aseptic packaging by Yeo Hiap Seng in Kuala Lumpur, Malaysia (1967), the advent of the brick shaped aseptic carton. The traditional soymilk process: "Filtering off the fibrous material,... one is left with the basic soymilk extract or soybase to which some sugar is added" (p. 8). Improvements in soymilk flavor: Cornell hot-grind process. University of Illinois hot water blanch method "is the basis of most modern soymilk processing." Developments in Japan since the mid-1970s, which have grown "out of the Illinois process but overcoming the 'chalkiness' by a filtration step using a decanter or some form of continuous filtration." The quality is excellent but the yield of protein is unfortunately only about half compared to the almost 100% achieved by the original Illinois method."

3. What are the developments in the market areas? Soyfoods industry and market statistics published annually by Shurtleff. Trends in: Japan, South East Asia, Indian Subcontinent, Mid East [Middle East], Europe (Flavor is not as good as in Japan. "There is also a political impediment. It would be suicidal to set up a soymilk industry as a 'substitute cow's milk...' considering today's ailing European dairy industry and the militant stand of the European dairy farmer. But as surely as margarine has come and been accepted, a prime quality soymilk will come to Europe. It is a matter of time"). Africa (financing troubles, the good work of IITA in Ibadan, Nigeria). South America ("A market spoilt! Take Brazil–the world's 2nd largest producer and exporter [of soybeans]. People have had inferior quality product almost forced down their mouth"). North America.

4. What is the state of the art in the manufacturing technique for a "bean free" tasting soymilk? (Contains a flow chart with 13 steps, of which No. 10 states: "Blend ingredients: Blend into the soybase the ingredients necessary to a particular formulation, e.g., sugar, vegetable fat, emulsifier–stabilizer, flavouring–aromas," p. 16)

This paper deals with the phenomenal growth of the soymilk industry in northeast Asia, and the likeliness that its influence will spread worldwide in the near future.

Note: This is the earliest English-language document seen (Aug. 2013) that uses the word "soybase" to refer to a concentrated form of soymilk. However, no definition of the degree of concentration or total solids content is given. Address: Soya Process Product Manager, Alfa-Laval, Box 1008, S-221 03, Lund, Sweden.

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8092. Yasuda, Masaaki; Soeshi, K.; Miyahira, M. 1984. Purification and properties of acid protease from *Monascus* sp. No. 3403. *Agricultural and Biological Chemistry* 48(6):1637-39. June. [16 ref. Eng]
• ***Summary:*** Red rice koji (beni-koji), prepared by growing *Monascus* on steamed rice, is an important material used in making red fermented tofu (Tofuyo), which has long been manufactured in Okinawa. The ripening of this food is greatly affected by the quality of the koji, and its protease is thought to be the key enzyme. Although fungal proteases have been studied in depth, information on the enzymes produced by the *Monascus* mold has previously been very limited. Address: Dep. of Agricultural Chemistry, Univ. of the Ryukyus, Nishihara, Okinawa 903-01, Japan.

8093. *Nikkei Sangyo Shinbun* (*Japan Economics and Industry News*). 1984. Indonesia daizu shizen shokuhin. Nihon de tenpe kokusai kaigi [An Indonesian natural soyfood. International tempeh symposium in Japan]. July 13. [Jap]
Address: Tokyo, Japan.

8094. *Toyo Shinpo* (*Soyfoods News*). 1984. [Good quality natto maker invented a new method to produce old fashioned flavor; high quality natto]. July 21. [Jap]
• ***Summary:*** The company name is Hôya Natto K.K. [Hoya Natto], Aoba-cho 2-39-9, Higashi Maruyama-shi, Tokyo, Japan. Phone: 0423-94-6600. The company has 75 workers. Capital: 9 million yen. Capacity: 200,000 packages/month.

Mr. Kiuchi believes that natto should be fermented slowly, for a long time, just like it was made in traditional farmhouses. Ten years ago when he built the new plant, he started to use *issanka tanso* and to slowly increase the fermentation time. Present commercial manufacturers typically ferment their natto for 13-15 hours.

His new process produces stickier and stronger flavored old-fashioned natto. His natto is getting popular among lovers of natto and of natural foods. In this term his sales rose 50% to 430 million yen. He uses only Japanese soybeans which are 3 times as expensive as imported Chinese soybeans. He also uses a method which requires strict control of the temperature of water–which he thinks is very important. He sets the water temperature at 7ºC in winter. He calls this method *sumibi zukuri* (which is also his brand). He mainly uses rice straw, kyôgi bamboo shoot peels, and Japanese rice paper for packages [instead of plastic trays].

8095. Fruin, W. Mark. 1984. History of Yuasa Shoyu and Tezukuri Shoyu Co. 4060 Amaranta Dr., Palo Alto, CA 94306. 3 p. Unpublished manuscript.
• ***Summary:*** Yuasa was the birthplace of shoyu in Japan and the first major center of shoyu production. Today only one company, Tezukuri Shoyu, makes soy sauce in a town where 150 years ago more than 10% of the population were shoyu makers. Tsuneo Kanno, now head of the company, is the fifth generation of Tezukuri Shoyu brewers in Yuasa. He explained the decline of the soy sauce industry in this town in the following way: "Shoyu brewers remained too small too long, and they failed to pay attention to marketing. Even as recently as 1952, there were 23 shoyu makers in Yuasa, but now there is only me." In 1954 he was called back from Waseda University to take over the family business. "With a labor force of 10, 3 family members and 7 paid workers, Kanno produced 149 kiloliters of shoyu in 1983. Most of this, 110 kiloliters, was made from whole soybeans grown in Mimasa, near Okayama City. The wheat was also locally grown in Shiga. Only the salt was imported."

"Today all that is left of the birthplace of shoyu in Japan are Tezukuri Shoyu and a small museum. In 1983, Kanno opened the only museum in Japan devoted exclusively to the history of shoyu. About 100 visitors a month come to the museum to see, among other things, the foot-driven, wooden wheat-cracking machine used 150 years ago and to sample Kanno's Tezukuri Shoyu." Address: Palo Alto, California. Phone: 415-858-2226 or 327-0857.

8096. Marson, Alan. 1984. Tofu: A new health food from Japan. *Bakers' Review* (*Watford, England*). July. p. 31, 34.
• ***Summary:*** "Are bakers in this country missing out on potentially lucrative markets by ignoring some of the current trends in our eating habits?... The consumer is now looking for healthy ingredients in everything that he eats."

"Whether we like it or not, it is a fact that in the U.K. we have a tendency to follow closely on the heels of the Americans when it comes to innovation. This time however, they have got it right, because they have latched on to an ingredient that fulfills many of the criteria for healthier bakery lines. It is called tofu... Tofu is extremely high in protein and yet low in calories. An ideal extender for the health-conscious."

"In the US, the use of tofu is estimated to be growing at the rate of 25-35% per year. There are now 150 plants producing well over 45 million pounds of the food, which in monetary terms means about £25 million worth."

"According to Paul Jones, managing director of Paul's Tofu, suppliers of baked products to Holland & Barratt, he is successfully using tofu in the manufacture of quiches, savoury pasties and cheese cakes: 'I also use it for icing and toppings,' he said. 'It is white, delicate and blends well."

"A domestic version of Tofu is already being sold in this country through Sunwheel Foods–part of the Holgran Group of companies. Roy Harris, the company's sales and marketing director reports that sales last year were up over 35 per cent on the previous year."

"We have already seen the rise of the Vegeburger, and following closely behind is the Tofuburger. Now is the time for bakers to be seeking ways of cashing in on this relatively

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new–but nevertheless enthusiastic–search by the British housewife to find foods that she knows will at least do her family no harm–if not a great deal of good."

"As there would appear to be no cost differential between choosing eggs or tofu as an ingredient, perhaps it would be worthwhile to do a little experimenting on a limited scale, by producing something in the take-away snack line–which in itself is an expanding market and ripe for further growth. Don't be put off by its bland flavour for its is this very blandness which makes it usable for so many different types of dishes. There is no reason why tofu–although a basic food in itself–should not be utilised to a high degree of sophistication, even to gourmet levels."

A large photo shows a package of Morinaga Ever-Fresh Silken Tofu. Address: Holgran Malt Products, England.

8097. Nunomura, N.; Sasaki, M.; Yokotsuka, T. 1984. Shoyu (soy sauce) flavor components: Neutral fraction. *Agricultural and Biological Chemistry* 48(7):1753-62. July. [14 ref]
Address: Soy Sauce Research Lab., Kikkoman Corp., 399 Noda, Noda-shi, Chiba 278, Japan.

8098. Shurtleff, William; Aoyagi, Akiko. 1984. History of tempeh: A fermented soyfood from Indonesia. Lafayette, California: Soyfoods Center. 81 p. July 17. No index. 28 cm. 2nd ed. 1985. 91 p. [375 ref]
• ***Summary:*** Contents: 1. Introduction. 2. Etymology. 3. World Overview. 4-8. History of Tempeh in Indonesia–discusses (for the first time) the world's earliest known reference to tempeh in the *Serat Centini* [also spelled *Serat Centhini*] manuscript, which was probably written in about A.D. 1815. 9-11. History of Tempeh in Europe and Australia. 12-15. History of Tempeh in the United States and Canada. 16-18. History of Tempeh in Japan. 19-23. History of Tempeh in Asia (China, Taiwan, Southeast Asia, India, Sri Lanka). 24. History of Tempeh in Latin America. 25. History of Tempeh in Africa. 27. International Interest. 28. U.S. and Third World Problems.

The world's largest tempeh manufacturers are as follows:

Company name, Country, Year Started, Avg. Weekly Production

1. Marusan-Ai, Japan, 1983, makes 15,148 lb/week = 6,885 kg/week

2. Tempe Production Inc., Netherlands, 1969, makes 13,200 lb/week = 6,000 kg/week

3. Quong Hop/Pacific Tempeh, USA/CA, 1980, makes 7,000 lb/week = 3,182 kg/week

4. White Wave, USA/CO, 1979, makes 5,850 lb/week = 2,659 kg/week

5. Soyfoods Unlimited, USA/CA, 1981, makes 5,800 lb/week = 2,636 kg/week

6. Torigoe Flour Milling, Japan, 1983, makes 5,770 lb/week = 2,623 kg/week

7. The Tempeh Works, USA/MA, 1979, makes 5,500 lb/week = 2,500 kg/week

8. Marukin Foods, Japan, 1983, makes 4,620 lb/week = 2,100 kg/week. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8099. Shurtleff, William; Aoyagi, Akiko. 1984. Amerika Gasshû-koku oyobi Kanada ni okeru miso no rekishi (3) Oyobi sono hoka no shokoku ni okeru miso [History of miso in the USA and Canada (3) And miso in other countries]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) 32(7):308-12. July. [221 ref. Jap]
• ***Summary:*** This is part 4 of a translation in 4 parts by Taeko Ebine of the chapter on the "History of Miso" from *The Book of Miso* by Shurtleff and Aoyagi. The other countries mentioned above are Israel, India, Brazil, and Nigeria. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8100. Tsuchiya, Kanji. 1984. Tônyû to sono hinshitsu hoji [The present status of the soymilk market and the preservation of soymilk quality at factories]. Tokyo: Published by the author. 31 p. July. [Jap; eng]
• ***Summary:*** Part I discusses the background of soymilk production in ASEAN countries and the industrial interest in soymilk worldwide. Part II analyzes quality control at every stage in the process from the viewpoint of production theory, based on modern soymilk plants. Also discusses microbiological control and colloidal research on the physical nature of soymilk. Address: Shokuhin Hinshitsu Hoji Gijutsu Kenkyu-kai (Society for the Study of Food Quality Preservation), Tokyo, Japan.

8101. Tsuchiya, Kunio. 1984. Edamame no mame chishiki [A little information on green vegetable soybeans]. *Daizu Geppo* (*Soybean Monthly News*). July. p. 27-35. No. 109. [Jap]
Address: Daizu Kyokyu Antei Kyokai, Tokyo, Japan.

8102. *Vegetarian Times.* 1984. Japan's big-league vegetarian champs. July. p. 6.
• ***Summary:*** The manager of a Japanese baseball team, the Seibu Lions, which climbed from the cellar to first place, says he attributes the success of his team to the players' switch to a vegetarian, macrobiotic diet. In October 1981, when Tatsuro Hirooka took over as manager of the Lions, he prescribed a dietary change for his players, who had finished in last place the previous season. He limited their meat intake and banned polished rice and sugar. Instead he said his players would eat brown rice (unpolished), tofu, fish, and soymilk. The following spring he cut out the fish. They won the Pacific League championship and the Japan Series in 1983.

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8103. Kira, Motoo. 1984. Re: More history of Marukin Shokuhin's work with tempeh. Letter to William Shurtleff at Soyfoods Center, Aug. 4. 4 p. [Jap; eng+]
• ***Summary:*** Answers to Shurtleff's questions: (1) From the end of last year until the beginning of this year, Marukin was making 1,800 kg/week of tempeh. However presently (July 1984) they make only 15 kg/month in order to use it for developing second generation food. They have stopped making tempeh for the general market.

(2) Marukin's president is named Itsuo Kira.

(3) In July 1982 the twelve manufacturers of natto, kinako, and *gojiru no moto* in Kyushu all got together and founded the *Kyushu Daizu Shokuhin Kogyo Kumiai* (Kyushu Soyfoods Association). In April 1983 we built a large plant in Uto / Udo city on the outskirts of Kumamoto city. The capacity of the plant for making natto is 250,000 shoku per year (1 shoku = 100 kg; so 25 million kg/year). And kinako and Gojiru no moto is 6 tons. Marukin makes 80% of the total production of this plant, and the plant is run by Marukin's people with Marukin's technical assistance.

(4) As I wrote you in my last letter, Mr. Haruo Kato took charge of researching and developing new fermented soyfoods. He was also very interested in tempeh and was doing tempeh research and development when he died on 3 Dec. 1983. He did not leave clear records of the history of his work with tempeh. However his records show that in about 1950 he experimented with making tempeh. In 1963 in Kumamoto he attended a lecture given by Mr. Dr. Iwao at the National Nutritional Research Center and Dr. Kato became deeply interested in the subject of that lecture, "A growth quickening factor in tempeh." He again started his research on tempeh, and in Feb. 1964 Hayashi-kaicho (a leader) and he tried to get a copy of Dr. Iwao's paper as well as tempeh starter culture. "I am sending you the article that was sent by Hayashi-kaicho to Mr. Kato." Address: Manager, tempeh production, 380 Yoyasu-machi Kumamoto-shi 860, Japan. Phone: 096-325-3232.

8104. Kanasugi, Goro. 1984. Re: More on work with tempeh in Japan. Letter to William Shurtleff at Soyfoods Center, Aug. 7–in reply to questions. 2 p. Handwritten. Plus 4 p. translation. [Jap]
• ***Summary:*** To answer your questions: (1) Mame-no-ko restaurant and deli opened on 10 Feb. 1977. (2) Tempeh started to be served at Mame-no-ko in late May 1983. "I got tempeh starter from Teruo Ota sensei and soon tried to make tempeh. It turned out well and the first dish served was tempeh sauteed with vegetables.

(3) My natto and tempeh plant is located about 150 meters (500 feet) away from Mame-no-ko. We make tempeh there about once a month. (4) At Mame-no-ko we use tempeh once or twice a week in various dishes; we use 15-20 kg/month.

(5) At our plant we make 100 to 200 kg/month of tempeh, entirely for use in second generation soyfood products. (6) I would estimate that, on average, about 500 people per day eat the tempeh we make, both at the restaurant and deli and from retail stores.

(7) I depend on Ota sensei for tempeh starter so I don't know who makes tempeh starter in Japan. Soon the research center for making cultures in Tokyo will start making tempeh starter. (8) I think that Takashin started to make tempeh in about Aug. 1983, and that they now make about 50-100 kg/month.

(10) I am enclosing a copy of a *Shin Eiyo* magazine article about tempeh.

Here is my recipe for tempeh jam. I have just received very big news. The Japanese government has announced that it will help development and popularization of tempeh in Japan. They told the Japanese Natto Association that they will lend ¥8.7 million as part of a program to promote practical use of new technologies. Address: Shimo-cho 3-6, Omiya-shi, Saitama-ken 330, Japan. Phone: 048-644-1323.

8105. *Toyo Shinpo* (*Soyfoods News*). 1984. Daizu tanpaku [Soy protein foods]. Aug. 11. [Jap; eng+]
• ***Summary:*** This is a translation of an article about nutrition in some U.S. magazine that mentions tempeh.

8106. Pollack, A. 1984. Technology: The Japanese challenge. Part 18. Japan's biotechnology effort. *New York Times*. Aug. 28. p. D1, D4.
• ***Summary:*** Reprinted in the San Francisco Chronicle. Sept. 4. p. 54, 58. And in The Straights Times (Singapore), Sept. 1, p. 22. Address: Tokyo.

8107. Hildebrand, D.F.; Kito, M. 1984. Role of lipoxygenases in soybean seed protein quality. *J. of Agricultural and Food Chemistry* 32(4):815-19. July/Aug. [37 ref]
Address: 1. Dep. of Agronomy, Univ. of Kentucky, Lexington, KY 40546; 2. Research Inst. for Food Science, Kyoto Univ., Uji-Kyoto 611, Japan.

8108. Hirotsuka, Motohiko; Taniguchi, H.; Narita, H.; Kito, M. 1984. Calcium fortification of soy milk with calcium-lecithin liposome system. *J. of Food Science* 49(4):1111-12, 1127. July/Aug. [15 ref]
• ***Summary:*** "Calcium ion was enveloped with a membrane system before addition of soy protein to prevent soy protein from being coagulated and precipitated by calcium ion. Soy lecithin was first sonicated in calcium salt solution to envelop the calcium ion with a liposomal structure composed of lecithin. Then, the calcium-lecithin liposomes were added to soy protein solution. Precipitation and coagulation were not observed in this soy protein lecithin-liposome system containing 60 mM Ca^{2+}. By this method it was possible to prepare calcium fortified soy milk containing more calcium

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(120 mg/100 gm) than in cow's milk. These results suggest that this calcium-lecithin liposome system is useful for calcium fortification of soy milk."

Note: *Webster's Dictionary* defines liposome (a term first used in 1968) as "an artificial vesicle composed of one or more concentric phospholipid bilayers." Address: 1-2. Fuji Oil Co., Osaka, Japan; 3-4. Research Inst. of Food Science, Kyoto Univ., Uji, Kyoto 611, Japan.

8109. Inamori, Kazuo; Miyauchi, K.; Uchida, K.; Yoshino, H. 1984. Shôyu moromi no hakkô biseibutsu ni kansuru kenkyû. I. Shôyu nyûsan-kin to kobo no sôgo sayo [Microorganisms involved in shoyu moromi fermentation. I. Interaction between *Pediococcus halophilus* and *Saccharomyces rouxii*]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 58(8):771-77. Aug. [20 ref. Jap; eng]

• ***Summary:*** The effect of oxygen supply, initial pH, and inoculum quantity on growth and fermentative ability of *Pediococcus halophilus* and *Saccharomyces rouxii* isolated from shoyu moromi (Japanese soy sauce mash) was studied. Also the interaction of the two organisms in static cultures under aerobic and anaerobic conditions was studied. The major medium used was shoyu koji extract. In mixed culture, at an initial pH of 6.0, growth and lactic acid production of P. halophilus was inhibited by S. rouxii under aerobic conditions; growth of S. rouxii and alcoholic fermentation was inhibited by P. halophilus under anaerobic conditions. At an initial pH of 5.6, growth of P. halophilus declined, regardless of aeration conditions. Similar results were obtained using shoyu moromi medium instead of koji extract medium. Results may be directly applied to moromi fermentation during shoyu production. Address: Research Labs., Yamasa Shoyu Co., Choshi, Chiba-ken 288, Japan.

8110. Nikkuni, Sayuki; Itoh, H.; Tanaka, M.; Ohta, T. 1984. Studies on soybean protein digestion during miso fermentation. I. Changes in SDS polyacrylamide gel pattern of water-insoluble fraction during miso fermentation. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 31(8):502-10. Aug. [14 ref. Eng]*

Address: National Food Research Inst., Ministry of Agriculture, Forestry & Fisheries, Yatabe, Ibaraki 305, Japan.

8111. **Product Name:** [Soymilk Yogurt].
Foreign Name: Tônyû Yôgu.
Manufacturer's Name: Saruda Shoten K.K.
Manufacturer's Address: Fuchu city, Tokyo, Japan.
Date of Introduction: 1984 August.
How Stored: Refrigerated.
New Product–Documentation: Toyo Shinpo (Soyfoods News). 1984. Aug. 21. "Nattô meekaa ga uru. Tônyû yooguruto shohin [Soymilk yogurt sold by natto maker]."

Soymilk yogurt is being sold by a natto maker, Saruda Shoten K.K., which makes equipment for secondary tofu and soymilk products in Fuchu city, Tokyo. This company invented the soy yogurt machine and has created joint ventures with 9 tofu makers and 3 natto makers throughout Japan who are selling the product. Three are in Kyushu, 3 in Tohoku, 3 in Tokai-chiku, 2 in Chugoku, and 1 in Kanto. The soymilk plant is small and automatic, costing about 4,000,000 yen. Then they need a yogurt incubator. Natto makers know fermentation techniques better than tofu makers. They use a Bulgarian yogurt culture. The brand name is Tonyu Yôgu. The product is sold most in supermarkets. A black-and-white photo shows 2 packs of the product.

8112. Sato Co. Ltd. 1984. Jyuten is new tofu. Sato equipment since 1958 (Ad). *Soyfoods.* Summer. p. 5. [Eng]

• ***Summary:*** In this full-page ad, photos show three machines: Continuous soymilk cooker (Sany Ace Special). Okara squeezer (Big Boy II Model). Soymilk filling/packing machine (ST-4000). Note: In Japanese, *Juten* refers to packaged lactone silken tofu. Address: 33-9, Nakano 3-Chome, Nakano-ku, Tokyo 164, Japan. Phone: 03 (382) 0761.

8113. Shurtleff, William. 1984. Japan's first and largest tempeh companies. *Soyfoods.* Summer p. 30-32.

• ***Summary:*** "The first Japanese known to study tempeh and publish information about it was microbiologist Dr. Ryoji Nakazawa in 1928. Following that pioneering work, tempeh research continued at the Department of Applied Microbiology, founded in 1944 within the National Food Research institute, and, during the late 1950s and early 1960s, at the Food and Nutrition Laboratory at Osaka City University. Although information was made available to commercial interests and they were encouraged to develop tempeh products, the idea never took root.

"Despite considerable research on tempeh during the 1960s and 70s, no commercial production took place. In the early 1980s new interest arose among potential producers for various reasons: First, the rising popularity of tempeh in the United States and Europe; second, the growing internationalization of the Japanese diet; third, the increasingly positive image of soyfoods as a source of high-quality nutrition; and fourth, the activities of KOPTI, the new tempeh-makers trade association in Indonesia. In 1982. working with KOPTI in Indonesia and with an eye on the U.S. and European soyfoods markets, Takai, a large Japanese manufacturer of tofu and soymilk equipment, developed and patented a combination cooker and wet dehuller to aid in modernizing the tempeh-making process.

"The first company to take serious interest in commercial tempeh production was Torigoe Flour Milling Co. (*Torigoe Seifun*), the nation's fifth-largest flour miller.

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With wheat quotas fixed by the government and supplies always limited, Torigoe was looking to diversify. In 1975 Hiroto Nakagawa, head of Torigoe's R&D department, received an article on tempeh from Kyushu University's Department of Food Science and Technology. When Nakagawa asked for more details, Dr. Tadao Watanabe in the department asked one of his students, Kazuhiro Takamine, to study tempeh in greater depth. In 1976 Takamine joined Torigoe's R&D group and the company began to do cooperative research with the department at Kyushu University on tempeh and other fermented foods.

"In 1979, with research beginning to look promising, Dr. Watanabe recommended that Torigoe send Takamine to the U.S. for further study. In 1980, working in the University of Minnesota Department of Food Science and Nutrition under Dr. William Breene and with Indonesian Ph.D. candidate Abdul Ribai, Takamine began to realize the great potential of tempeh. In 1981, having returned to Japan with solid practical and theoretical knowledge of tempeh, Takamine set out to convince the management of Torigoe that they should invest in a tempeh plant. But the leaders were hesitant, fearing that tempeh might not be suited to Japanese tastes. For various reasons. company attitudes gradually changed:

"First, Takamine developed a tempeh with an improved and milder flavor. Second, it was learned that the prestigious National Food Research Institute (NFRI) was researching tempeh. Torigoe's head of R&D went to NFRI in February 1983 and showed them Takamine's product. NFRI researchers, surprised and impressed, told other companies that tempeh looked more promising than ever and even persuaded the Japan Natto Association to consider it carefully.

"Third, a growing number of articles on tempeh, many from the NFRI, began to appear in Japanese newspapers. And fourth, Dr. Watanabe from Kyushu began giving lectures to dietitians. nutritionists, and home economists on the high nutritional value of tempeh.

"In June 1983 Torigoe started making tempeh at their Fukuoka flour mill in a pilot plant that cost $50,000 and had a capacity of 33,000 pounds of tempeh a month. They made the key decision not to sell plain tempeh, but rather to make two semi-prepared products. both called Gold Tempeh. One was tempeh cut into pieces the shape of small french-fried potatoes. These were dipped in a batter made of vegetable juices, wheat flour, salt, and spices, dusted with bread crumbs, packed in a shallow tray with two packets of tartar sauce, and sold frozen. The consumer deep fries them to serve crisp and crunchy with the sauce. The second product was made by simply pressing the ground trimmings from the first product into oval patties (no binding was used), then enrobing them in the breaded batter. The products were introduced to a school lunch program in Kyushu and became very popular. They were also test marketed in several natural food stores, again with good results. On June 30, the *Nikki Sangyo Shinbun,* a large Japanese business newspaper, reported on a tempeh press conference held by Torigoe the day before. Following this, in mid-July 1983, Torigoe started commercial-scale production. Sales in 600-gm packs to institutions (schools, hospitals, natural food restaurants) began in July, and sales in 140-gm packs to retailers (natural food stores, department stores and chain supermarkets) started in November 1983. Packaged in beautiful full-color boxes with handsome flyers, the tempeh could be used in Western, Japanese or Chinese-style cookery, or as a snack food. Each of the two forms of Gold Tempeh, weighing 140-gm, cost 250 yen (about $1.05). Nutritional value (17.5% protein, rich in vitamin B-12) was stressed in marketing.

"By early 1984 the company was making 24,200 pounds of tempeh a month, making it the sixth-largest tempeh manufacturer in the world–and the product was only in the test market stage! Sales of about $420,000 were projected for the first year.

"In early 1984 a major, exciting move was made by Marusan-Ai, one of Japan's most dynamic and forward-looking food companies, and one of the country's largest manufacturers of soymilk and miso. Marusan-Ai had been researching tempeh production since the early 1970s. They decided to make their tempeh at their main plant in Okazaki city, Aichi prefecture, and to incubate the tempeh in shallow plastic trays. In January they introduced their tempeh to dietitians and in February they began to distribute pasteurized, refrigerated bulk tempeh (500-gm and 2.5 kg) for use in local school lunch programs and hospitals, and by caterers. They published a 27-page booklet titled 'A New Soy Protein Food for Tomorrow: Marusan's Healthy Tempeh.' which included a description with photographs of their tempeh production process and eight Japanese-style recipes. In April they began selling 125-gm cakes retail to consumers. By May, Marusan was producing 30 metric tons (66,000 pounds) of tempeh a month, making them by far the largest tempeh manufacturer in the world. They have big plans to expand production considerably in June

"Two large natto companies began making tempeh in early 1984: Marukin Shokuhin Kogyo in Kyushu, and Takashin in Tokyo–both prompted by the Japan Natto Association's promotional work for tempeh. Other companies now seriously considering tempeh production include Yukijirushi (Snow brand), Japan's largest dairy products company (with 1982 sales of $1.8 billion), and Kibun, a huge food company and Japan's largest soymilk manufacturer.

"William Shurtleff.

"This article is an excerpt from 'The Tempeh Revolution in Japan.' Copies of the full article are available for $5.00 from The Soyfoods Center. P.O. Box 234, Lafayette, CA 94549, USA. The author would like to learn more about the history of tempeh in Japan. Readers with information may write, in Japanese if necessary, to William Shurtleff at

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the address above. Mr. Shurtleff is now writing History of Soybeans and Soyfoods." Address: Soyfoods Center, P.O. Box 234, Lafayette, California.

8114. Shurtleff, William. 1984. Ideal miso climate. *Soyfoods.* Summer. p. 34.

Climate in Sendai, N.E. Japan, considered ideal for making red miso.

	Air Temperature		Precipitation	
	°C	°F	mm	inches
January	0.6	33.1	42	1.7
February	0.9	33.6	41	1.6
March	3.8	38.8	64	2.5
April	9.6	49.3	85	3.3
May	14.5	58.1	110	4.3
June	18.2	64.8	160	6.3
July	22.1	71.8	170	6.7
August	24.0	75.2	142	5.6
September	20.0	68.0	184	7.2
October	14.0	57.2	132	5.2
November	8.4	47.1	63	2.4
December	3.2	37.8	53	2.1
Year	11.6 avg.	52.8	1,245 total	49.0

* Temperatures are monthly averages from 1941-1970; Sendai elevation is 38.9 meters, or 128 feet above sea level; Sendai latitude is 38.3°N, about the same as Washington, DC, St. Louis, MO, Colorado Springs, CO, Chico, CA, Lisbon, Portugal or Athens, Greece.

• ***Summary:*** Discusses the temperature and precipitation in Sendai, Japan.

"Over the years, various people interested in starting miso companies in North America or Europe have asked us what we consider the ideal climatic conditions. We generally answer that the climate, ideally, should be similar to that of the city of Sendai, North-eastern Japan, where it is relatively cool, even in the summer and quite cold in the winter, where the humidity is relatively high, and where the water and air are both pure.

"The following meteorological data on temperature and precipitation in Sendai, available here for the first time in English, should prove valuable in siting future miso plants. Of course. miso is made throughout Japan. Sweeter misos are usually made in the warmer climates." Address: Soyfoods Center, P. O. Box 234, Lafayette, California.

8115. *Soya Bluebook.* 1984. Industrial product manufacturers, and non-food uses of soy oil in the USA. p. 80-95, 205. Aug.

• ***Summary:*** Product categories are: Adhesives/coatings (7 U.S. companies / 6 foreign companies), industrial lecithin (8/43), industrial soy flour (4/25), industrial soy oil (10/47), paints & varnishes (5/3), resins (5/3), soaps (0/30), soy sterols & tocopherols (3/11), soybean fatty acids (6/36).

In 1982, nonfood utilization of soy oil totalled 205 million lb., or 2.1% of total U.S. soy oil usage (97.9% was for foods). Of this, 96 million lb was used for resins and plastics, 38 millions lb for paint and varnish, 16 million lb for fatty acids, and 55 million lb for other nonfood uses.

Manufacturers of soy sterols and tocopherols include– In the USA: Distillation Products Industries, Kingsport, Tennessee 37662; Durkee Foods Div. of SCM Corporation, Cleveland, Ohio 44115 [Formerly The Glidden Co.]; Henkel Corporation, Minneapolis, Minnesota 55435. In Japan: Ajinomoto Company Inc., Chuo-ku, Tokyo; The Nisshin Oil Mills Ltd., Chuo-ku, Tokyo. In Europe: Cargill B.V., Amsterdam, Netherlands; Industrie Chimiche Italia Centrale S.p.A. (ICC), Ancona, Italy; Italiana Olii e Risi S.p.A., Ravenna, Italy; S.I.O. S.p.A. (SIO), Modena, Italy. There are also 3 manufacturers in Brazil and one in India.

8116. *Soyfoods.* 1984. U.S. tamari plant sited [by San-J International in Virginia]. Summer. p. 34.

• ***Summary:*** The Japanese tamari company, founded in 1804, plans to build a $7 million plant on 28 acres in Chesterfield County, near Richmond, Virginia. "According to Michael Fountain at the company's offices in Colonial Heights, Virginia, a production manager has been hired, imported and/or domestic machinery is being procured and plant design is underway. Tamari. teriyaki sauce and possibly shoyu will be produced at the new plant. The complex will also house administrative offices. Construction is slated to begin in late 1985 or early 1986."

8117. **Product Name:** [Yoshikawa Nigari {For Making Tofu}].
Manufacturer's Name: Yoshikawa Shoji Co.
Manufacturer's Address: Honmachi Wako Building, 2-50 Kita-Kyuhoji-machi, Higashi-ku, Osaka, Japan.
Date of Introduction: 1984 August.
New Product–Documentation: Ad in Soyfoods. 1984. Summer. p. 46. "Since 1861. We've been making high-quality nigari for 5 generations. Factory in Okayama. U.S. Agent: Island Spring."

8118. *Toyo Shinpo* (*Soyfoods News*). 1984. Zennenhi 30% no daun ka. Yume no inryô tônyû ni kageri genshô [Dream drink soymilk sales in Japan down 30% from last year?]. Sept. 11. p. 1. [Jap]

• ***Summary:*** Soymilk sales in Japan reached their peak during the first quarter of last year. This year's first quarter is down about 20% from that figure according to the Japan Soymilk Assoc. (Nihon Tonyu Kyokai). And they expect a drop of 60-70% in the second quarter compared to last year.

During the peak last summer, soymilk sales were 25,000 million yen wholesale and 32,000 million yen retail. At

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that time a continued rise in the market was expected. But since that time the demand has decreased, and total sales this year are expected to be about 30% below those of last year. The basic causes for the drop are: 1. The companies did not develop a good strategy for launching new products. 2. The initial costs for starting soymilk production are high. 3. Soymilk shelf life is short. But the biggest reason was that Kibun, Marusan Ai, Asahi Shokuhin, Mitsubishi, and other large manufacturers expanded their production, then large beer makers (Pokka, Toyô Seiraku, etc.) joined the market. Over-production resulted leading to price wars in the marketplace. Since then a number of smaller companies have dropped out of the market.

8119. Ohta, Teruo. 1984. Nihon yori Amerika de kanshin ga takai tenpe [From Japan to America interest in tempeh is high]. *Toyo Shinpo* (*Soyfoods News*). Sept. 21. [Jap] Address: National Food Research Inst., Tsukuba, Japan.

8120. Ohta, Teruo. 1984. Atarashii daizu hakkô shokuhin: Tenpe, onchom no shiyô [New fermented soyfoods: Use of Tempeh and onchom]. *Toyo Shinpo* (*Soyfoods News*). Sept. 21. [Jap; eng+]
• ***Summary:*** A basic introduction.

8121. Abe, Masahiro. 1984. Re: Enclosing copy of article you requested. Letter to William Shurtleff at Soyfoods Center, Sept. 26–in reply to inquiry. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "We are enclosing herewith a copy of "The East" Vol. IV No. 4 June-July 1968."

Note: On the letterhead, above the company name, we read: "Established 1645." To the left is the Yamasa logo. To the right is the following contact information: "23-8, Kakigaracho, 1-Chome, Nihonbashi, Chuo-ku, Tokyo, Japan.

"Telephone: Tokyo (668) 3171–9.

"Telex: 252-3131 YamasaJ. Cable Address: Yamasa Shoyu." Address: Foreign Trade Dep., Yamasa Shoyu Co., Ltd., Tokyo Office. Phone: (668) 3171 to 9.

8122. Chen, Steve. 1984. Soyfoods in the Far East and USA: Products, markets, trends. In: American Soybean Assoc., ed. 1984. First European Soyfoods Workshop, Proceedings. Brussels, Belgium: ASA. 36 p. See p. C1-C38. Held Sept. 27-28 at Amsterdam, Netherlands. [11 ref]
• ***Summary:*** Contents: Summary. 1. Introduction: Ten reasons why soybeans will be a key protein source for the future. 1. Soyfood products. A. Non-fermented soyfoods: Fresh green soybeans, soybean sprouts, soynuts, soymilk, soy flour, yuba or soy protein film, tofu. B. Fermented soyfoods: Soy sauce, miso, tempeh, natto, fermented tofu, fermented black soybeans (tou-shih, hamanatto). 3. Soyfoods markets and trends in the Far East: Taiwan, China, Japan, South Korea, Indonesia, Malaysia, Singapore, Thailand, Philippines. 4. Soyfoods markets and trends in the U.S. 5. References. Plus 15 tables and 8 figures.

"It is our [American Soybean Association's] strong intention that marketing and consumption of soy protein should not in any way deter the expansion of the production and sale of as much animal protein as the world can be expected to produce in the years ahead. Soy protein foods are being intentionally brought to the market to complement and not necessarily to replace animal protein products."

"Taiwan imported 1.41 million tonnes (metric tons) of soybeans in 1983 and used about 250,000 tonnes as soyfoods for direct human consumption, which made Taiwan one of the highest in per capita consumption of soyfoods (13.2 kg or 29 lb) in the world. In the past 10 years (1974-1983), the consumption of traditional soyfoods showed an average increase of 3% per year as compared to 12% and 8.1% for poultry and soy oil, respectively. The market for packaged soymilk, soy pudding and tofu has also been expanding rapidly in recent years in Taiwan." Table 7 shows the production of soymilk in Taiwan, which grew from 103,600 tonnes in 1974 to 210,000 tonnes in 1983, for an average growth rate of 8.2% a year.

China produces about 9 million tones of soybeans a year, and about half of these are consumed as soyfoods, giving a per capita consumption of 4.5 kg of soyfoods. "An improvement in the general economy and soyfood technology and equipment will bring a sharp increase in soybean demand and more soyfoods consumption."

In South Korea soymilk consumption has increased more than seven-fold in the last 4 years. Currently about 10,000 tonnes of soybeans are used to make 70,000 tonnes of soymilk. "It is projected that soymilk production in Korea will double in 1984 as compared to the previous year."

Indonesia continues to be Southeast Asia's largest consumer of soybeans as food. In 1982/83 soybean consumption was 6.7 kg per capita. Indonesia consumes about 1 million tonnes of soybeans annually, 60-65% of them in the form of tofu and 35 to 40% as tempeh.

Malaysia consumes only about 30,000 tonnes of soybeans per year as food. In Singapore, more than 75% of the population of 2.5 million are Chinese. Therefore tofu, soysauce, and soymilk are the predominant traditional

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soyfoods consumed.

Thailand consumes about 40,000 tonnes of soybeans a year as food, mainly in the form of tofu. The Philippines uses only 5,000 tonnes of soybeans annually for food, mainly as tofu.

To summarize (Table 6), annual per capita consumption of soybeans in various East Asian countries, in descending order of the amount consumed, is as follows: Taiwan 13.2 kg (population 19 million); Japan 8.3 kg (population 120 million); South Korea 7.5 kg (population 40 million); Indonesia 6.7 kg (population 150 million); Singapore 6.25 kg (population 2.4 million); China 4.5 kg (population 1,000 million); Malaysia 2.1 kg (population 14 million); Thailand 0.8 kg (population 50 million); Philippines 0.3 kg (population 15 million). Address: Director, American Soybean Assoc., Room 603, Kwang-Wu Building, No. 386, Tun Hua South Road, Taipei, Taiwan.

8123. Epp, Peter H. 1984. Growers' interest in supplying export markets. In: Ontario Ministry of Agriculture and Food, Market Development Branch. 1984. Workshop on Export Markets for Ontario Soybeans: Edited Proceedings. 45 p. See p. 42-45. Held 5 Sept. 1984 at Wheels Motor Inn, Chatham, ONT, Canada. 28 cm.
• ***Summary:*** In 1954 Ontario soybean growers began to seek export markets when the Ontario Soybean Growers' Marketing Board organized the first export of Canadian soybeans to the United Kingdom.

In the late 1960s, samples of Canadian soybeans were forwarded to Pacific Rim countries to try to determine whether Canadian varieties were acceptable to the tofu and miso markets of those countries.

The replies indicated that Japanese food manufacturers preferred U.S. varieties such as Kanrich, Amsoy, Corsoy, Ohio, and I.O.M. (Indiana, Ohio, Michigan) soybeans.

In 1970 an export promotion booklet titled "Cansoy" was introduced to 52 foreign countries promoting the story of Canadian soybeans.

"Ontario soybean samples continued to be forwarded annually but received no support or interest until the spring of 1972. At that time the C. Itoh people in Toronto indicated the Harwood variety, produced by the Harrow Research Station, possessed qualities favorable to the manufacture of tofu and miso. C. Itoh was willing to purchase a shipment of 750 tons for further testing by some of their customers. The soybean board made several important decisions: (1) To include a letter with the soybeans from the Canadian Grain Commission stating that the shipment consisted of 85-90% Harwood variety soybeans. In other words, the identity of the Harwood variety had been preserved or maintained, and not mixed with other varieties. This marks the start of Canada's identity preserved (IP) program and a strong commitment to providing the soybean characteristics that Asian food products wanted. (2) To pay $6,920 of the total freight and stevedoring costs to Japan.

In Feb. 1982 the OSGMB sponsored its first export mission to Asia–to Japan, South Korea, Hong Kong, Singapore, and Malaysia.

Since the Harwood variety, Dr. Buzzel of the Harrow Research Station has devoted a great deal of time breeding soybean varieties suitable for the edible market. Address: Chairman, Ontario Soya-Bean Growers' Marketing Board, Chatham, ONT, Canada.

8124. Fujimori, Ikuo. 1984. Users' requirements [of soybean varieties] for miso. In: Ontario Ministry of Agriculture and Food, Market Development Branch. 1984. Workshop on Export Markets for Ontario Soybeans: Edited Proceedings. 45 p. See p. 10-11. Held 5 Sept. 1984 at Wheels Motor Inn, Chatham, ONT, Canada. 28 cm.
• ***Summary:*** "In 1983, 1,600 miso makers in Japan produced 570,000 tonnes of miso. They used a total of 181,000 tonnes of soybeans comprised of approximately 121,000 tonnes from China, 20,000 tonnes of domestic soybeans [grown in Japan], and 20,000 tonnes of Canadian white hilum soybeans and others." The desirable characteristics of soybeans for making miso are as follows: A yellow or white hilum. The larger the seed size the better (more than 18 gm per 100 seeds); larger soybeans tend to be more consistent in texture, taste and color. The thinner the hull (seed coat) the better, but not easy to split. The cotyledon cells should be light yellow. The less foreign materials, and damaged and split beans the better; corn is an especially undesirable foreign material. The four key cooked conditions: 1. The texture of the cooked soybeans must be soft; 2. The soybeans should absorb water quickly and thereby cook quickly; 3. The soybeans should have a high carbohydrate content; 4. The color of the cooked soybeans must remain bright yellow. Address: Executive Vice-President, Takeya Miso Co. Ltd., Suwa, Japan.

8125. Hara, Toshio; Shiraishi, A.; Fujii, H.; Ueda, S. 1984. Specific host range of *Bacillus subtilis* (*natto*) phages associated with polyglutamate production: Note. *Agricultural and Biological Chemistry* 48(9):2373-74. Sept. [17 ref. Eng]
• ***Summary:*** On the surface of natto is a "viscous material consisting of polysaccharide (a levan-form of fructan) and polyglutamate (PGA)." PGA consists of L- and D-glutamate in varying proportions.

"The host range of bacteriophages isolated from an abnormal fermented 'natto' completely coincides with the 5.7-kb [kilobase molecular weight] plasmid-harboring strains of *Bacillus subtilis* (*natto*). These findings have led to the suggestion that the infective bacteriophages for *Bacillus* species which can produce PGA as a capsular or extracellular mucilaginous material might recognize PGA as a receptor on phage adsorption." Address: Dep. of Food Science & Technology, Kyushu Univ., Hakozaki, Fukuoka 812, Japan; 2-3. Faculty of Home Life Science, Fukuoka Women's Univ.,

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Kasumigaoka, Fukuoka 813.

8126. Hayashi, Nobu. 1984. Users' requirements [of soybean varieties] for natto and tofu. In: Ontario Ministry of Agriculture and Food, Market Development Branch. 1984. Workshop on Export Markets for Ontario Soybeans: Edited Proceedings. 45 p. See p. 12-14. Held 5 Sept. 1984 at Wheels Motor Inn, Chatham, ONT, Canada. 28 cm.
• ***Summary:*** From January to June 1984 soybeans imported to Japan from the USA had the lowest CIF price (US$331.31 per tonne), followed by soybeans from China ($350.16), with Canadian soybeans being the most expensive ($408.62).

The preferred characteristics of soybeans for natto are: Small in size, round in shape, and clear hilum. Beans should have a firm skin (seed coat) free of cracks. High sugar and amino acid contents. High carbohydrate and low calcium contents. "However the real suitability of the soybeans is determined by the taste of the natto."

The preferred characteristics of soybeans for tofu are: High protein and low oil contents, especially a high nitrogen solubility index (NSI) which affects the yield of tofu. The larger the seed size the better. Hilum color is not a big problem but a light-colored hilum is preferred since it may give a whiter tofu. A thin and firm skin (seed coat) which reduces the soaking time required. "Like natto, the real suitability is known only when the tofu is tasted." For all soybeans, it is very important that the price be competitive. Address: Gomei Shoji Co., Tokyo, Japan.

8127. Just In Foods, Inc. 1984. Miso Master (Ad). *East West Journal.* Sept. p. 8. Expanded ad in East West Journal. 1986. Nov. p. 81.
• ***Summary:*** At the top of this one-third page black-and-white ad is the Miso Master logo, an illustration showing the head and shoulders of a Japanese miso master, with a knotted headband, in front of a large wooden vat of miso. The text reads: "The Miso Master is truly one of Japan's National Treasures. With roots that go back centuries, he is an intimate of the land, knowing its seasons and sharing its changes. He is artist and scientist, blending the best of both tradition and technology.

"The making of Miso is a way of life. To master this life requires hard work, long hours and great sensitivity. Miso is a living good. It is vital and strengthening, full of vitamins and minerals, beneficial bacteria and rich in the highest quality protein. Miso is an extraordinary source of essential nutrition.

"Miso Master products are dedicated to the spirit of the Miso Master. Our Miso is made by hand in the old, traditional way: aged in wood, unpasteurized, using only organic grains and beans, with pure water and salt form the sea. All of the ingredients in our products are the very best: like brown rice vinegar, natural mirin, and delicate grain sweeteners.

"Miso Master products are made with reverence for a way of life. They are both nutritious and delicious, because food that is truly best for you to eat–tastes best too."

Note 1. This ad also appeared in the October issue of this magazine (p. 21).

Note 2. This is the earliest ad seen run by Just In Foods or American Miso Co. It is also the earliest document seen that mentions "Just In Foods." But notice that American Miso Co. is not mentioned! Address: Box 541, Route 3, Rutherfordton, North Carolina 28139. Phone: 704-287-2940.

8128. Kanno, Akishige; Takamatsu, H.; Takano, N. 1984. Nattô ni kansuru kenkyû. II. [Studies on natto. II. Determination of several volatile components produced by *Bacillus natto* in commercial natto]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 31(9):587-95. (Chem. Abst. 102:4669). [37 ref. Jap; eng]*
Address: Asahi Shokuhin Co. Ltd., 180-2 Wado, Ushibori-machi, Namekata-gun, Ibaraki-ken, 311-24 Japan.

8129. Kitamura, Keisuke. 1984. Biochemical characterization of lipoxygenase lacking mutants, L-1-less, L-2-less, and L-3-less soybeans. *Agricultural and Biological Chemistry* 48(9):2339-46. Sept. [22 ref]
• ***Summary:*** The three lipoxygenase isozymes (designated L-1, L-2, and L-3) in crude seed extracts of normal soybeans were resolved clearly by an improved SDS-polyacrylamide gel electrophoresis technique.

Note: An isozyme is an isoenzyme. *Webster's Dictionary* defines isoenzyme (a term first used in 1960) as "any of two or more chemically distinct but functionally similar enzymes." This is the earliest document seen that contains the word "isozyme." Address: Dep. of Agriculture, Faculty of Agriculture, Iwate Univ., Morioka, Iwate 020, Japan.

8130. Loh, Michael. 1984. An overview of export markets for edible soybeans. In: Ontario Ministry of Agriculture and Food, Market Development Branch. 1984. Workshop on Export Markets for Ontario Soybeans: Edited Proceedings. 45 p. See p. 1-9. Held 5 Sept. 1984 at Wheels Motor Inn, Chatham, ONT, Canada. 28 cm.
• ***Summary:*** "Ontario first exported edible soybeans in 1972 and over 12 years have built it into a $40 million business. 1981 was our best year when exports totalled $46 million... The bulk of Ontario's soybean exports are sold to the Far East [East Asia]–Japan ($8 million in 1983), Singapore ($6 million), Hong Kong ($3.5 million), Malaysia ($1 million), Indonesia, and Korea." In these countries soybeans are consumed in the daily diet of the people. In Japan, for example, they are made into miso, tofu, natto, soymilk and shoyu. Korea also makes soy sprouts, Indonesia makes tempeh, and Singapore, Malaysia, and Hong Kong make dried yuba. In addition, sales to the Netherlands, United

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Kingdom, and France are quite significant.

Concerning Ontario's market share of soybean imports for food use: Japan imports 877,300 tonnes, of which 27,000 tonnes or 3.1% is from Ontario. Singapore and Malaysia import 36,000 tonnes, of which 20,000 tonnes or 55.0% is from Ontario. Hong Kong imports 20,000 tonnes, of which 10,000 tonnes or 50.0% is from Ontario.

Japan's sources of its 877,300 tonnes of imported soybeans are as follows: USA 570,000 tonnes (65%), China 280,000 (32%), Canada 27,000, South America 300.

Japan uses its 877,300 tonnes of imported soybeans as follows: tofu 485,000 tonnes (55.3%), miso 180,000, natto 185,000, soymilk 25,000, cooked soybeans 10,000, shoyu 6,500, other 85,800. Within these figures, Ontario's soybeans are used as follows: Miso 20,000 tonnes (11.1% of the total), natto 5,000 tonnes (5.9%), and tofu 2,000 tonnes (0.4%). Address: Export Development Specialist, Ontario Ministry of Agriculture and Food, Toronto, Canada.

8131. Ohta, Teruo. 1984. Kongetsu no kotoba: Muen daizu shokuhin tempe kaihatsu ni omou [Words for this month: Development of tempeh, an unsalted fermented soyfood]. *Daizu Geppo* (*Soybean Monthly News*). Sept. p. 2-3. [Jap]
• ***Summary:*** "In Feb. 1982, as a part of the International Scientific Technology Cooperative Research Project of the Science and Technology Administration (Kagaku Gijutsu-cho), the Agricultural University (Bogor, Indonesia) and the National Food Research Inst. (Japan) decided to do cooperative research on the development of technology for making practical use of microorganisms. As part of the negotiations and field research, I got the opportunity to study the actual situation of tempeh production and consumption in various areas of Indonesia." A photo shows Ohta sensei. Address: Norin Suisan-sho Shokuhin Sogo Kenkyu-jo, Oyo Biseibutsu Bucho [Tsukuba, Ibaraki-ken, Japan].

8132. Taj Majal Hotel (The). 1984. It all started with a tree house... Yes. Today we are happy to be able to offer you so many different ways to pamper your palate (Ad). *Times of India* (*The*) (*Bombay*). Oct. 3. p. 9.
• ***Summary:*** One of the five restaurants in the hotel is the House of Ming, which features: "The magical crispness of Jumbo Prawns. The flavourful wonder of creations like Jade Chicken, Dry Lamb in Chilli Sauce, Bean Curd with Oyster Sauce, Eggplant in Hot Garlic Sauce..." Address: Number One Mansingh Road, New Delhi 110 001, India.

8133. *Toyo Shinpo* (*Soyfoods News*). 1984. Dentô no aji o sekai ni: Nattô no yosa PR [Traditional taste to the world: Promoting natto's good points]. Oct. 3. [Jap]
• ***Summary:*** Contains one large photo of women in a factory apparently packaging natto.

8134. Nakamura, Masao. 1984. Natto gets its due. *Daily Yomiuri* (*Japan*). Oct. 13.
• ***Summary:*** Although more and more foreigners are becoming fond of Japanese food (such as sushi, instant ramen, sashimi, tempura), few are willing to eat natto (fermented soybeans). "Even many Japanese reject natto for its odd flavor and gooey consistency.

"But during the Tsukuba Expo '85 next July at Tsukuba Science City, Ibaraki-ken, an international conference on natto is to be held.

"Natto is salt-free, like Indonesia's 'tempe' and Nepal's 'kinema.' The three are based on fermented soybeans and form a dietary culture common to East Asia."

A small round portrait photo shows Masao Nakamura. Address: Staff writer, Japan.

8135. Torii, Yasuko. 1984. Re: New developments with tempeh in Japan. Tofuyo now sold in Tokyo. Letter to William Shurtleff at Soyfoods Center, Oct. 16. 2 p. transcript. Handwritten on lined paper. [Jap; eng+]
• ***Summary:*** Mrs. Torii thinks that tempeh will spread and become popular in Japan. It is now rapidly growing in popularity.

Mr. Kanasugi's restaurant Mame-no-ko opened in March 1976. He makes the tempeh in a walled-off room in his natto factory.

Takashin tempeh is served as tempeh cutlets at Alicia's in Shimokitazawa, where it is a popular entree.

The first tempeh discussion group (*Danwa-kai*) in Japan was at Kyushu University, Fukuoka, on 30 July 1984. The Japanese-language program is enclosed. The next will be in Tokyo on 9 Nov. 1984. The one after that will be in Osaka. At the first discussion group (as the program shows) the activities were speeches, discussion of winged bean tempeh, tempeh cookery, tempeh in Indonesia, and future activities. Membership is ¥3,000. Watanabe Tadao is in charge.

Preparations are now underway for the international tempeh and natto symposium (Non-Salted Soybean Foods).

Natural House sells tempeh in four places: Aoyama, Shimokitazawa, Kichijoji & Akasaka. The tempeh is made by Kanehara Shoten. Natural House also sells nigari tofu.

Mr. Kanasugi's method makes good, firm, tasty tempeh, with no dewatering. Prof. Watanabe and Mrs. Torii have both visited him and both praised the method. His tempeh miso is very delicious. She gives the recipe. Like Namé Miso it is good on sliced cucumber or with ginger.

Mrs. Torii (whose mother is Okinawan) has found Okinawan fermented tofu (*tofuyo*) sold in Tokyo; she includes a label: Tofu maker: Mr. Y. Yamada. K.K. Maruyama (also known as Okinawa Dento Shokuhin-jigyo Kyôdo Kumiai). Eight pieces in a glass jar retailed for ¥2,000. She found this product sold at two department stores in Tokyo: (1) Seibu Department Store, in Yûrakucho. (2) Matsukakaya, in Ginza. 2-10-26 Matsuo, Naha-shi, Okinawa-ken 900, Japan. Phone: (0988) 63-0236.

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Mrs. Torii says tofuyo is like Chinese-style fermented tofu (*doufu-ru*) except milder and more expensive. She finds it to be delicious. It is sold in a plastic bag inside a book-sized box. It is made by Urizun, a restaurant in Naha, Okinawa. Molded tofu is immersed in a brining liquor of Ryukyu Awamori, which is clear shochu spirits.

Note: Mrs. Torii brought a small sample of *tofuyo* to Soyfoods Center in 1984 during one of her many visits. Shurtleff and Aoyagi both tasted it straight (as is) and found it the most delicious fermented tofu they have ever tasted. It would make a delicious spread on crackers. Address: Kamitsuchidana 324, Ayase-shi, Kanagawa-ken 252, Japan. Phone: 0467-76-0811.

8136. Kantha, Sharmila. 1984. Beancurd and Baratanatyam: A dancer's life seems to be a hard one, specially when on tour. When the dance troupe from Kalakshetra passed through Chengdu during its China tour,... *Times of India* (*The*) (*Bombay*). Oct. 21. p. A5.
• ***Summary:*** Note: "Kalakshetra is a cultural academy dedicated to the preservation of traditional values in Indian art, especially in the field of Bharatanatyam dance and Gandharvaveda music" (Source: Wikipedia Sept. 2010). It was founded in 1936 at Adyar, Chennai [named Madras until 1996], by Rukmini Devi Arundale, along with her husband, Dr. George Arundale.

The Indian dance company was well received in China. It asked for vegetarian meals. Meals of 15 dishes (not including rice, curds, and noodles) were not uncommon. "Beancurd and mushroom, prepared in an extraordinary variety of ways, were practically staple servings." Address: Number One Mansingh Road, New Delhi 110 001, India.

8137. *Nihon Keizai Shinbun* (*Japan Economic Newspaper*). 1984. "Nomu" kara "taberu" e. Tônyû-kei shokuhin [From drinks to foods. Japanese foods based on soymilk]. Oct. 21. p. 20. [Jap]
Address: Tokyo.

8138. *Toyo Shinpo* (*Soyfoods News*). 1984. Nomu kara taberu e. Tônyû-kei shokuhin [From beverage to soymilk-based foods. The once explosive soymilk boom has slowed but soymilk- or soy protein-based foods are rising. This new soymilk market is very active]. Oct. 21. p. 20. [Jap]

8139. Yoshimura, Sam. 1984. Re: Update on work with soyfoods. Letter to William Shurtleff at Soyfoods Center, Oct. 21–in reply to inquiry. 1 p.
• ***Summary:*** Shurtleff writes: "I just read a little blurb about you, written by your wife, that was in the *Madison Survey.* It indicated that you were now in Canada and again making soyfoods. Could I ask a few questions for use in the Adventist chapter of our history book?

1. What is your present address and postal code. Ans: See above.

2. When did you leave Worthington Foods? Ans: Sept. 30, 1981 (Retired).

3. Could you please tell me a little about your new business? When did you start selling products? Are you working alone or with another company? What products do you make? Can you send me some descriptive or promotional literature on your products?

Ans: "Name of company: MGM Brans. I am a technical consultant of the above company. We started selling products in January 1982.

"Our main product is meat analogs–franks, sausages, sandwich slices, chicken nuggets & burgers. Currently we are developing tofu-based meat alternates [alternatives] & other products."

Note: Sam does not send any labels or descriptive literature. Address: Home: 19 Masedale Cres., Willowdale, ONT M2J 3A3 Canada; Plant: MGM Brans, 59-F Howden Rd., Scarborough, ONT M1R 3C7. Phone: 416-473-9254 or 416-752-6600.

8140. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo*). 1984. Nattô, sekai ni shinshutsu [Natto-tempeh is marching into the world]. Oct. 24. [Jap]
• ***Summary:*** This article is entirely about tempeh, yet it is called natto!

8141. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo*). 1984. Nattô sekai ni [Natto is marching into the world]. Oct. 24. [Jap]
• ***Summary:*** This article is about tempeh in general and about the world conference on Asian non-salted fermented foods in July 1985 in Tsukuba, Ibaragi prefecture, Japan.

Prof. Watanabe Tadao (Kyushu University) is the head of the conference. They are planning to invite specialists from Thailand, Indonesia, Nepal, China, Korea, USA, Holland, and Denmark.

The wife of Mr. Kawashima (of Tsukuba University) has been developing tempeh recipes suited to Japanese tastes. This subject was on HNK TV on the 6:30 p.m. "News Center 630," on Oct. 17, 1984. Mrs. Kawashima got interested in tempeh when she was living in Indonesia with her husband (a food researcher); they lived there for a long time.

Photos show: (1) A traditional Indonesian tempeh maker in his shop. (2) Mrs. Kawashima holding a plate of prepared tempeh.

8142. Rakosky, Joseph, Jr. 1984. Soy protein isolate plant in northwestern China (Interview). *SoyaScan Notes.* Oct. 25. Conducted by Walter J. Wolf of NRRC, Peoria, Illinois.
• ***Summary:*** Rakosky stated that a soy protein isolate plant, located in northwestern China, is owned by Fuji Oil Company of Japan. The output, which is only 1,000 tons/year, is exported to Japan.

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According to a paper presented by Xiao Jiajie (Paper No. 2) at the NAS Conference in St. Louis, Missouri, the plant is located in Jilin Province. Address: 5836 Crain St., Morton Grove, Illinois 60053. Phone: 312/966-9660.

8143. Barber, Linda; Lampert, Junko. 1984. The tofu gourmet. Tokyo: Shufunotomo Co. 129 p. Oct. Illust. Index. 27 cm. [Eng]
• ***Summary:*** A beautiful book, packed with superb color photos. Contents. Preface. Preparing, buying, and storing tofu. Recipes–1. Dips, sauces, main dishes. 2. Desserts. On the inside back dust jacket are biographies of Linda Lee Barber and Junko Lampert.

The color dust jacket of the first printing (1984) shows sculpted green kiwis atop a refrigerator tofu cheesecake, whereas that of the second printing (1989) shows a layered "Man's cake" topped with delicate alfalfa sprouts, thinly sliced red radishes, and slivered carrots.

The book was published in London, England in 1986 by Portland House/Windward. Address: Japan.

8144. Nakao, Shinichi; Yumoto, Satoshi; Watanabe, Atsuo; Kimura, Shoji. 1984. Performance of membranes during the treatment of soybean cooking drain from a miso (fermented soy paste) factory by ultrafiltration and reverse osmosis. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 45. p. 348-54. Oct. [10 ref. Eng; jap]
• ***Summary:*** Soybean cooking drain is the water after it is used to cook soybeans but before it is run down the drain. This water was treated by ultrafiltration and reverse osmosis to "study of separation of low molecular weight solutes from higher molecular weight ones, the recovery of valuable materials and the removal of BOD.

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 30(8):442-48 (1980). Address: 1. Inst. of Industrial Science, Univ. of Tokyo, 7-22-1 Roppongi, Minato-ku, Tokyo 106; 2. Nitto Electric Industrial Co., Ltd., 1-2-1 Shimohozumi, Ibaraki-shi, Osaka, Osaka 567; 3. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8145. Nakao, Shinichi; Yumoto, Satoshi; Watanabe, Atsuo; Kimura, Shoji. 1984. Characteristics of gel layer during the treatment of soybean cooking drain from a miso (fermented soy paste) factory by ultrafiltration and reverse osmosis. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 45. p. 355+59. Oct. [10 ref. Eng; jap]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 30(8):449-53 (1983). Address: 1. Inst. of Industrial Science, Univ. of Tokyo, 7-22-1 Roppongi, Minato-ku, Tokyo 106; 2. Nitto Electric Industrial Co., Ltd., 1-2-1 Shimohozumi, Ibaraki-shi, Osaka, Osaka 567; 3. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8146. Ochiai-Yanagi, Sonoe. 1984. Properties of winged bean (*Psophocarpus tetragonolobus*) protein in comparison with soybean (*Glycine max*) and common bean (*Phaseolus vulgaris*) protein. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 45. p. 240-47. Oct. [10 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 47(10):2273-80 (1983). Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2. Hokkaido Prefectural Central Agric. Exp. Station, Naganuma, Hokkaido 069-13; 3. Prefectural Tokachi Agric. Exp. Station, Naganuma, Memuro, Hokkaido 082.

8147. Taira, Harue. 1984. Kokusan daizu no hinshitsu. VI. Zenkoku-san daizu no hinshitsu, seibun, kakô tekisei no hendô to chiikikan, hinshukan sai [Quality of soybean seeds grown in Japan. VI. Regional and varietal differences in the physical properties, chemical composition, and suitability for food processing]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 45. p. 55-62. Oct. [9 ref. Jap; eng]
Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 3-4. Hokkaido Prefectural Central Agric. Exp. Station, Naganuma, Hokkaido.

8148. Taira, Harue; Sunada, Kiyoshi; Sasaki, Koichi. 1984. Kokusan daizu no hinshitsu. VII. Hokkaidô-san kurodaizu no hinshitsu, seibun sosei to kakô tekisei [Quality of soybean seeds grown in Japan. VII. Chemical composition and suitability for preparation of cooked beans of black soybean varieties grown in Hokkaido]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 45. p. 63-69. Oct. [8 ref. Jap; eng]
• ***Summary:*** The two black soybean varieties grown in Hokkaido were Chuseihikarikuro [Chusei-hikari-kuro = medium bright black] and Tokachikuro [Tokachi-kuro = Tokachi black]; the latter was bred in 1984 at the Hokkaido Prefectural Tokachi Agricultural Experiment Station. Tokachikuro, by comparison, showed a significantly large number of cracked seeds, a lower protein content, and a higher oil content. However no differences between the two were observed in their suitability for the preparation of cooked soybeans. In sensory tests for commercial products, Tokachikuro was characterized by large seed size, good taste, and a tendency to change color during cooking. Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken

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305, Japan; 2. Hokkaido Prefectural Central Agric. Exp. Station, Naganuma, Hokkaido 069-13; 3. Prefectural Tokachi Agric. Exp. Station, Memuro, Hokkaido 082.

8149. Watanabe, Tadao. 1984. Daizu to tenpe–Indonesia tenbyô [Soybeans and tempeh–A sketch of Indonesia]. *Daizu Geppo* (*Soybean Monthly News*). Oct. p. 1-5. [Jap]
Address: Torigoe Seifun K.K. Komon; Kyushu Daigaku, Meiyo Kyoju.

8150. Photograph of Kanji Tsuchiya at Soyfoods Center in Lafayette, California, 1984.

• ***Summary:*** Kanji Tsuchiya, soymilk expert and author, visited Soyfoods Center on 10 Nov. 1984 to talk about soymilk. A color photo shows him (left) standing in the upstairs office, in front of bookshelves, with William Shurtleff.

8151. *Ingham County News* (*Michigan*). 1984. Mason snacks in Japan. Nov. 14. p. 13A.
• ***Summary:*** Mason's INARI Ltd. will sell soybean snacks in Japan. A large photo shows INARI president Leonard Stuttman with Toshisada Imai (Tokyu store manager) and Katsuyuki Kato (floor manager of foods) during a visit to Mason in August.

INARI was sell soynut snacks to holiday shoppers in Japan at a Michigan Products Fair Nov. 16-21 in Tokyo's Tokyu department store. The fair will feature over 200 products from 27 Michigan companies. Address: Managing editor.

8152. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo*). 1984. [Japan woman invented okara natto, okara miso, and okara noodles]. Nov. 14. [Jap]
• ***Summary:*** She started making soymilk yogurt at home and had so much okara to deal with that she started experimenting to find new food uses. A former scientist, she now has her own home laboratory in Kogane-shi, Tokyo. A photo shows her at work in her lab.

8153. Associated Press (AP). 1984. Soybean brittle may be next of farmer's goals. *Morning Union* (*The*) (*Illinois*). Nov. 16.
• ***Summary:*** Champaign, Illinois–Len Stuttman, an Illinois native, believes anything the peanut can do, the soybean can do better.

8154. Associated Press (AP). 1984. Develops first confection-coated soybean. *LaSalle News-Tribune* (*Illinois*). Nov. 17.
• ***Summary:*** Champaign, Illinois–Len Stuttman, an Illinois native, believes anything the peanut can do, the soybean can do better. Just before Christmas 1983 he decided to add confection-coated soybeans [butter-toffee, carob, and yogurt] and he ran an ad for mail-order sales in *Soybean Digest.* Farmers ordered 3,000 tins. The largest number of customers was in Illinois. Stuttman's Inari Trading Co. in Mason, Michigan, has 16 employees who buy, roast and flavor special varieties of soybeans grown in Michigan.

Bill Shurtleff of the Soyfoods Center in Lafayette, California, gives an overview of soynuts and the soyfoods industry in the USA.

8155. Associated Press (AP). 1984. Illinois: Say it with soybeans. *Pacific Stars and Stripes.* Nov. 19. p. 9.
• ***Summary:*** Champaign, Illinois–Len Stuttman, an Illinois native, believes anything the peanut can do, the soybean can do better. So he has covered soybeans with butter-toffee, carob and yogurt to go with his line of plain, salted, onion-garlic, and barbecue flavored beans. His full-page ad in *Soybean Digest* proclaims "Give the gift you grow." This year he hopes to double his last Christmas's sales of 3,000 tins.

8156. Associated Press (AP). 1984. Soybeans with pizazz touted as gifts for Christmas. *Grand Rapids Press* (*Michigan*). Nov. 20.
• ***Summary:*** Mason, Michigan–Len Stuttman, an Illinois native, "hoping his 'love affair' with the soybean will have a happy ending, has developed a confection-coated soybean treat he thinks will rival the peanut and make a fine Christmas present."

A large photo shows Irene & Len Stuttman displaying gift samplers of confection-coated soybeans.

8157. Udagawa, Shun-ichi; Sakabe, Fumi; Suzuki, Meiko; Narita, Noriko; Kurata, Hiroshi. 1984. Kansô kakô shokuhin

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no hinshitsu ni kansuru shinkin shiken [Mycological quality of dehydrated food]. *Eisei Shikenjo Hokoku* (*Bulletin of the National Institute of Hygienic Sciences*) No. 102. p. 147-50. Nov. 20. [3 ref. Jap; eng]
• ***Summary:*** 52 samples of dried foods, including 10 miso soups, were obtained from retail outlets in Japan and examined for fungi. Fungi were found in all miso soup and vegetable samples. The highest counts were 2,500/gm, typically in the vegetables. In miso soups, *Eurotium* species and yeasts predominated, followed by *Aspergillus* and *Penicillium.* Attempts to control fungal contamination during the drying and packaging processes are not always adequate. Address: Eisei Shikenjo.

8158. Oka, Hideki. 1984. Re: Development of lactic acid soymilk beverage, "C'est Moi–S." Letter to William Shurtleff at Soyfoods Center, Nov. 21. 2 p. + 7 p. of attached documents. [Eng]
• ***Summary:*** In August he constructed a pilot plant to make this product–with the help of a $65,000 subsidy from the Japanese government. Address: Nagano Miso Co. Ltd., Minami Tokiwadai 1-31-8, Itabashi-ku, Tokyo 154, Japan. Phone: (03) 974-7771.

8159. Associated Press (AP). 1984. State products wow Tokyo fair. *Detroit News.* Nov. 23. p. B-1.
• ***Summary:*** More than 200 products made by 27 Michigan companies were exhibited at a Tokyo trade fair. These included soy nuts made in Mason, Michigan, by INARI Ltd., whose president, Len Stuttman, found the idea of Japanese consumers snapping up a ton of his candied soy nut to be "incredible." In Japanese, the word *Inari* refers to the patron god of farmers. Stuttman praised the Michigan Commerce Department for taking the "pain out of dealing with overseas buyers." A portrait photo shows First Lady Paula A. Blanchard, wife of Michigan governor James Blanchard.

8160. *Foreign Agriculture.* 1984. ASA promoting increased soybean use in Japan. Nov. p. 2.
• ***Summary:*** The American Soybean Assoc. is working with Japanese hog farmers to boost U.S. exports of soybeans. Japan has about 88,000 hog producers, feeding out about 20 million hogs each year. Fishmeal has long been a part of Japanese hog rations and producers are reluctant to change.

8161. Macrobiotic Wholesale Co. (The). 1984. Catalog and price list [Mail order]. 92 McIntosh Road, Asheville, NC 28806. 63 p. 28 cm.
• ***Summary:*** The catalog, effective 15 Oct. 1984, contains 450 new products from 15 new vendors, plus 73 new books. The president of the company is Don DeBona. Soy-related products include miso, shoyu, tamari, nigari, kinako, natto and koji spores, black soy beans, tekka, Ah Soy soy drink (soymilk), and amasake.

One of the many suppliers is The Mitoku Co. Ltd., which "was founded in Tokyo [Japan] in 1968 by Mr. Kazama at the express behest of Michio and Aveline Kushi. In fact, the company was named after MI-chio and TO-moko (Aveline's real name; Aveline was given her name by George Ohsawa) KU-shi." Address: Asheville, North Carolina. Phone: 800/438-4730 or 704/655-1056.

8162. *SoyaScan Notes.* 1984. Early tofu manufacturers in Europe, listed chronologically by country (Overview). Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** All of the following started making tofu before 1985. Countries with the earliest tofu manufacturing are listed first. The month production started, when known, is given after a slash following the year. Thus 1911/06 is June 1911.

France: Usine de la Caséo-Sojaine (run by Li Yu-ying) 1911/06, Two or three tofu shops in and around Paris, including 1-2 at Colombes 1964/03. Alimentation Japonais Osaka 1972, Le Bol en Bois 1975/12, La Rousselie 1978/02, Institut Tenryu 1981/01, SOY (Société Soy) 1982/06, Les Sept Marches 1982/09, Sojatour Tofu Shop 1982/09, Ets. Co-Lu 1983/06, Lagadec Tofu 1983/06, Soja d'Oc 1983/10, Nyingma Dzong 1983/11, Tofu Kuehn 1983?, Sojagral Ouest 1984/12.

Netherlands: Vanka-Kawat 1958, FA. L.I. Frank: Frank Soya 1959?, Heuschen B.V. 1964, Firma Post & Teekman 1965, Stichting Natuurvoeding Amsterdam (renamed Manna Natuurvoeding B.V. in 1982) 1977/09, Hwergelmir: Foundation for a Natural Life 1979/07, Firma Ergepe 1981/01, Stichting Oost West Centrum 1981/01, Michel Horemaus Tofu 1981/01, Witte Wonder Products 1981/04, De Morgenstond 1981/12, Soy-Lin or F.M. Lin 1982/09. Jakso: Center for Agriculture & Craftsmanship (later called Yakso) 1983/06, Vuurdoop 1983/07.

England, UK: Dragon & Phoenix Co. 1966, Wong Chung 1975 or before, Lung Kee 1975 or before, Full of Beans Wholefoods 1978/08, Paul's Tofu & Tempeh 1981/01, Yu's Tofu Shop 1981/01, Cauldron Foods Ltd. 1981/09, The Regular Tofu Co. Ltd. 1981/12, Bean Machine (Wales) 1982, Hong Kong Supermarket 1982/09, Stewart Batchelder Tofu 1983/06.

Belgium: Etablissements Takanami (Takanami Tofu Shop) 1976, Jonathan P.V.B.A. 1977/01, De Brandnetel 1979/07, Unimave Tofu 1980, Aversano Tofu Shop 1981/01, Alternatur 1981/01, Seven Arrows Tofu 1982/04, 1983/10, Vajra 1983/11.

Switzerland: La Moisson 1978, Le Grain d'Or 1981/01, Genossenschaft Sojalade (later renamed Genossenschaftstofurei) 1981/09, Soyana 1982/02, Soy Joy 1982/04, Restaurant Sesam 1982/04, Opplinger Tofu 1982/09, Natural Products Promo Carouge 1982/09, Joya 1982/09, Centre Macrobiotique de Lausanne 1982, Osoja: La Maison du Tofu (later renamed Tofushop Centanin SA)

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1983, Tofurei Pfannenstiel 1983/11, Thieu's Soja Spezialitaet 1983/11, Conserves Estavayer S.A. (Sold at Migros Supermarkets) 1984/06, Galactina Ltd. 1984/11, Berner Tofurei 1984?

Italy: Roland A. di Centa 1978, Gilberto Bianchini of Centro Macrobiotico ed Alimentazione Organica (Community Food). Renamed Centro Macrobiotico Tofu 1978/11, Ohnichi Intl. Foods Co. Lotizzazione Industries 1982/09, Circolo L'Aratro 1982/09, C.D.S. Pianetta Terra Soc. Coop. A.R.L. 1982/12, Aldo Fortis Tofu 1983/06, Fondazione Est-Ouest 1983/06.

Germany: Svadesha Pflanzen-Feinkost 1979, Alexander's Tofu Shop [Nabben] 1981/01, Biogarten 1981/01, Auenland Tofu & Soja Produkte 1982/03, Tofuhaus Belsen (renamed Yamato Tofuhaus Sojaprodukte in Jan. 1984) 1982/07, Thomas Karas und Ingeborg Taschen (associated with Bittersuess; renamed Soyastern Naturkost GmbH in Dec. 1985) 1982/11, Albert Hess Tofuhaus Rittersheim (Later in Tiefenthal) 1983/07, Tofukost-Werk TKW GmbH 1984/05, Christian Nagel Tofumanufaktur 1984/08, Sojatopf (renamed Soto in April 1989) 1984/09.

Austria: Weg Der Natur 1980/05, Tofurei Wels (renamed Schoen Tofurei in 1987) 1982, SoyVita Austria 1983/05, Taiwan Restaurant 1983/06, Walter Brunnader Tofu 1983/06, Soyarei–Erich Wallner Tofu 1983/06, Tofurei Ebner 1983/11, Soyarei Wallner Ebner 1984/02, Fernkost Markt Nippon Ya Kondo GmbH 1984/02, Naturkostladen 1984/02, Sojarei Ebner-Prosl 1984/04, Sojvita Produktions GmbH 1984/06.

Sweden: Aros Sojaprodukter 1981/02.

Denmark: Tofu Denmark (Soy Joy?) 1982/03, Dansk Tofu 1983/06.

Portugal: Unimave Tofu 1980, Shogun Produtos Aliment. 1982/09, Jose Parracho Tofu 1982/09, Próvida Lda. 1984.

Spain: Zuaitzo 1984/03.

8163. Takeyama, Emiko; Fukushima, M.; Okamoto, S. 1984. Daizu no kannetsu shori ga shokumotsu sen'i teiryô ni oyobosu eikyô ni tsuite [Influence of dry heating of soybean on its dietary fiber determination]. *Showa Joshi Daigaki Kiyo.* Nov. p. 1-8. [4 ref. Jap; eng]

• ***Summary:*** The authors noted in a previous paper that kinako was surprisingly high in neutral detergent fiber (NDF) as analyzed by the method of Van Soest. To find out why, they examined soybean flour treated with heat at high temperature–the method used for making kinako. It was discovered that the NDF fraction of dry-heated soybeans contained a nitrogen component, whose amount increased with increased heating. Results suggested that protein and other soluble soybean components became insoluble during dry heating and the products were added to the NDF fraction when dietary fiber was determined. Address: Showa Joshi Daigaku.

8164. *Vegetarian Times.* 1984. People who have popularized vegetarianism. Nov. p. 28-29, 58-60.

• ***Summary:*** Introduces each person with a brief biography (those followed by an * also contain a photo of the person): Paavo Airola*, Mollie Katzen*, Jay* & Freya Dinshah, Alex Hershaft, Andreas Cahling*, Nellie Shriver, Peter Singer, Herman & Cornellia Aihara, Michio Kushi*, Gary Null*, Dick Gregory, the Seventh-day Adventists, Michael Jacobson, Nikki & David Goldbeck*, The Farm (Summertown, Tennessee; Margaret Dotzler*, Louise Hagler*, and Cynthia Bates*), Jim Mason*, Francis Moore Lappé*, Paul Obis, Laurel Robertson, Carol Flinders & Bronwyn Godfrey, Bill Shurtleff & Akiko Aoyagi*.

8165. Wollner, Joel. 1984. Re: Mountain Ark Trading Co. Letter to William Shurtleff at Soyfoods Center, Undated. 2 p. Typed, with signature.

• ***Summary:*** Joel recently left Mountain Ark and moved back to Massachusetts. Sjon Welters is now at Nasoya–on Joel's introduction. He agrees that Macrobiotic people are especially ill-informed about Japanese foods. Last month *East West Journal* ran an article on kuzu. Address: 62 Gilrain Terrace, Florence, Massachusetts 01060. Phone: 413-586-3291.

8166. Kennedy, J. Robert; Milbury, Peter. 1984. The sale of Chico-San to H.J. Heinz Co. (Interview). Conducted by William Shurtleff of Soyfoods Center, Dec. 18. 1 p. transcript.

• ***Summary:*** Peter: Chico-San was sold on 16 Nov. 1984. The sale price is confidential, but it was large and all cash. Bob Kennedy, who will soon be age 65, has a full-time contract for 6 months, then 6 months on a half-time basis, then a retainer after that. Bob sold the business because he could no longer finance the runaway expansion of the rice cake business, and so he could retire to do his own work with food. One big question is what Heinz will do with the macrobiotic product line–mostly imports. The marketing, sales, and product development liaison for Chico-San in Pittsburg is Mary Ann McCullough, Heinz USA, Div. of the H.J. Heinz Co., P.O. Box 57, Pittsburg, Pennsylvania 15230. Phone: 412-237-3812.

Bob: The original intent was to sell only the rice cake portion of Chico-San. But the rice syrup business was also sold. If Heinz wants to get behind the macrobiotic foods with all their financial and with Chico-San macros in control of that division–that's one idea they are now studying. Heinz is interested in the macrobiotic program as a program for the future. But it may not be compatible. Herman Aihara may be hired as a food consultant; he and Peter Milbury might stay in that division. Bob thinks the key is to preserve the quality of the foods, and not to put pressure on small suppliers. Right now he doesn't think it will work, but it might. If it doesn't work out, Bob will set up another company. The

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contract allows him to keep the brand names and buy back inventories. Bob has joint ventures starting to be planned with Japanese friends. Bob has already established a new company to continue his work with macrobiotic foods. He wants to cut his work load and get away from nuts and bolts. "We're not selling just food products; we're selling a philosophy. There are two levels of macrobiotic foods: Medicinal quality foods, and regular products."

Bob's organization starts with Lima Ohsawa, then goes through Ohsawa Japan, then Herman and Bob Kennedy, Peter Milbury, and Joel Wollner. All of this organization could go into the macrobiotic division of Heinz. For example, Heinz could use miso in their barbecue sauces. Address: Chico, California.

8167. Yoshimura, Sam. 1984. Soy ice cream and soymilk at Madison College (Interview). *SoyaScan Notes.* Dec. 30. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Sam arrived at Madison College, Tennessee, in 1937. In about 1940 Mr. Shiro Kunihara, a student from Japan like Sam, made soymilk at Madison and Sam thinks he also made a soy ice cream, working with Harold M. "Pop" Mathews. Both the soymilk and the ice cream were served in the school dining hall when Sam was there. The ice cream was also served in the cafeteria. Mr. Kunihara is retired from Loma Linda University. Address: 8200 Colonial Meadows, Westerville, Ohio 43081. Phone: 614-882-0625.

8168. *SoyaScan Notes.* 1984. Chronology of soybeans, soyfoods and natural foods in the United States 1984 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan. A highly influential 10-year, $150 million study released by the National Heart, Lung, and Blood Institute in Washington, D.C. proves for the first time a direct relationship between high blood cholesterol and the risk of heart attack, the nation's number one killer.

Jan. Legume, Inc. launches an all-natural line of cholesterol-free low-calorie Italian and international gourmet tofu-based frozen entrees in stylish full-color packages: Tofu Tetrazzini, Cannelloni Florentine, Vegetable Lasagna, Tofu Bourguignon, Sesame Ginger Stir-fry, Stuffed Shells Provencale, Tofu Manicotti, and Tofu Lasagna. Jan. Eden Foods becomes the sole import agent for Muso Shokuhin in the United States.

Feb. 25. *Soymilk Industry and Market: Worldwide and Country-By-Country Analysis,* by Shurtleff and Aoyagi published by Soyfoods Center. 177 pages, 640 references. $350.

Feb. Marusan-Ai, Japan's second largest soymilk maker and one of the five largest miso makers, starts to market tempeh. They publish a 27-page tempeh booklet and by May are producing 30 tonnes (66,000 lb.) of tempeh a month, making them the largest tempeh manufacturer in the world. During 1984 at least five Japanese food companies are making tempeh, leading to a mini-boom of this soyfood which was first sold commercially in Japan in 1983.

March 2. Based on responses to his Oct. 1983 survey, Tom Timmins drafts preliminary 3-page tofu standards (2 pages of which are microbiological standards) that he circulates to the Soyfoods Standards Committee, inviting comments. On March 6 Wm. Shurtleff of Soyfoods Center expands these, keys them into the Center's word processor, and returns them to Timmins.

March 2. Problems start between Eden Foods and the U.S. Food and Drug Administration (FDA). FDA sends Eden a strongly worded letter citing eleven claims in Eden's brochures that the agency considers erroneous, including the company's apparent endorsement of Edensoy as an infant formula. FDA asks Eden to recall the brochure in which Edensoy is promoted as "Good for Babies." An infant became ill due to copper deficiency on an Edensoy diet.

March 8. Soyfoods Association of America members have 12 pages of impressive color advertisements and information about soyfoods and the Association in Natural Foods Merchandiser, in preparation for the NFM Anaheim Natural Foods Expo in March. Full-page color ads by Legume, Erewhon shoyu, Vitasoy, San-J, Tofutti, Edensoy, and Pure & Simple soy sauce.

March 11-13. At the Natural Foods Expo at Anaheim, the Soyfoods Association organizes the first Soyfoods Pavilion, a 16-booth cluster of soyfoods companies and products, which is the hit of the Expo and a show of strength for the industry. Lots of delicious free food draws throngs from the 9,000 Expo attendees.

March 11. At Anaheim, Vitasoy launches its first designed-for-America soymilk, in natural, coconut, and chocolate flavors, each sweetened with maple syrup, and imported from Hong Kong. Many subsequent eye-catching, health-oriented full-page color ads are run in national health magazines.

March. American Soybean Association's Belgium Office publishes the first issue of *Soya Foods,* a 6-page newsletter edited by Michael Martin, Protein Market Development Manager. It will be issued three times a year in English, French, Dutch, and Italian. This is a completely new direction for ASA in the Western world... but it doesn't last long.

March 29. First draft of the Tofu Standards, 15 pages double spaced, is compiled by Shurtleff. Timmins allocates $2,000 to retain two Washington, DC, attorneys who are specialists in foods and regulations to assist the committee in developing professional standards. The draft is circulated to 38 people who are asked to respond to a poll on 14 key issues.

March 29. The term "second generation" products is first applied to soyfoods by Wm. Shurtleff in the new tofu standards. A computer-related term indicating one step more

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advanced, it quickly replaces the term "secondary," which has a slightly negative connotation.

April 7. *Soyfoods Industry and Market: Directory and Databook 1984* (4th ed.) by Shurtleff and Aoyagi published by Soyfoods Center. 215 pages, $95.

April 13. Richard Leviton resigns as co-director of *Soyfoods* magazine and decides to discontinue his active involvement in the U.S. soyfoods movement. He plans to go to England to write a novel about King Arthur; he leaves in late April.

April 20. *Tofu, Tempeh, & Other Soy Delights,* by Camille Cusumano published by Rodale Press. It is widely and positively reviewed by national media.

April 27. The term "soymilk" is legalized for use in Canada, after a lengthy and expensive court battle by Victor Food Products. The court ruled that this is the "common and ordinary term" for the product, used since about 1918 in scientific articles and commerce. Thus it cannot be squelched by dairy interests.

April. New England Soy Dairy, America's largest Caucasian-run tofu manufacturer, changes its name to Tomsun Foods, Inc.

May. *Nutritional Cooking* with Tofu by Christine Liu published by Graphique Publishing in Michigan.

May. American Natural Foods (formed in Jan. 1984 by John Troy, creator of miso-containing Hot Stuff) has a private stock offering that raises $150,000. In October ANF debuts a line mainstream American sauces and seasonings, each featuring miso, that are delicious and beautifully marketed.

May. *Die Tofu Kueche* (The Tofu Kitchen), by Verena Krieger, Swiss soyfoods pioneer, published by Tanner + Staehelin Verlag in Zurich. 171 pages with many photos.

June 7. "Tofu" by Barbara Hansen and "Tofu: Americanization of a Soy Food" by Karen Gillingham published in the *Los Angeles Times.*

June. Landstrom Distributing Co. of San Francisco, files for Chapter XI bankruptcy. Keene Distributors of Texas, and Collegedale of Tennessee, both profitable, well-run companies, are also pulled under, innocent victims of the Landstrom collapse. All three units were owned by Nutritional Foods, Inc. and all were major natural / health foods distributors. These bankruptcies seriously hurt the natural foods industry as well as many individual companies; sales and confidence plummeted nationwide. In late 1984 Fillmore Foods purchased Landstrom, and Balanced Foods purchased Collegedale and Keene.

June. Migros, Switzerland's largest supermarket chain, launches Tofu Nature, its own brand of tofu, made at Conserves Estavayer S.A., with widespread publicity and excellent product information on both tofu and soybeans. It is marketed together with dairy products and eggs. The launch was considered a great success; supply was not able to catch up with demand until late December.

June. *The Book of Soybeans,* by Tokuji Watanabe and Asako Kishi published by Japan Publications. 191 p.

July. Kikkoman completes its second major shoyu (Japanese-style soy sauce) plant outside Japan, in Singapore. The 18,000 square meter factory, with a capacity of 3,000 kl (792,500 gallons) a year and 40 employees, costs $14 million. It will make shoyu and teriyaki sauce. Official opening ceremony was Nov. 21.

July. The requirement in effect since 1965 that isolated soy protein used as an ingredient in meat and poultry products must contain titanium dioxide as a tracer, is removed from federal meat and poultry products inspection regulations, following a petition by ADM, Grain Processing Corp., and Ralston Purina.

July 9. "Its Trendy, Tasty and Tofutti" (2/3 page) by J.D. Reed published in *Time* magazine (U.S. circulation 4.3 million). Probably the biggest media coverage for tofu in U.S. history. Tofutti hits the big time!

July 17. *History of Tempeh,* by Shurtleff and Aoyagi published by Soyfoods Center. 102 pages, including 375 references. Continued.

8169. *SoyaScan Notes.* 1984. Chronology of soybeans, soyfoods and natural foods in the United States 1984 (Continued–Part II) (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued. July 26. At the NNFA (National Nutritional Foods Association) show in Atlanta, Great Eastern Sun rolls out Ah Soy, its new line of soymilk imported from Saniku Foods in Japan, in vanilla, chocolate, and plain flavors, in foil retort pouches. After the show, the Soyfoods Association board meets. Steve Snyder replaces Michael Austin as director of SAA. The next day, SAA directors Snyder, Burke, and Barat travel to St. Louis to meet with the staff of the American Soybean Association to discuss possible areas of mutual interest. ASA appears friendly and open minded, and offers to discuss specific future joint projects. A potential line of communication is opened.

July 30. *People* magazine (circulation 2.8 million) article on Tofutti titled (ineptly) "A Happy Zealot Turns Curd (Yuck!) into a Creamy Treat."

July. "The Soyfoods Industry: Growing Like a Beanstalk" by B. Bialick published in *Whole Life Times.*

Aug. 9. *Soyfoods* magazine No. 10 (color cover) published by Doug Fiske. 7,000 copies printed at a cost of $11,200. Magazine's focus has been changed from production to marketing of soyfoods. This is the last issue of this pioneering magazine.

Aug. 12-17. World Soybean Research Conference III held at Iowa State University. Heavy emphasis on soybean production and agronomy; relatively little new material on soyfoods. Soyfoods movement is not represented.

Aug. 20. Ralston Purina introduces Checkerboard Farms

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TenderLean, America's first branded ground beef product consisting of 75% ground lean beef and 25% textured soy protein isolate. Some meat journals are harshly critical and many meat departments refuse to carry it. Ralston withdraws the product.

Aug. 24. Westbrae Natural launches WestSoy Natural, a plain soymilk similar to Ah Soy but lower in price and made with organic ingredients. Imported in a foil pouch from Saniku Foods in Japan, it is the company's first soymilk.

Aug. 31. San-J International Inc. announces that it will construct a soy sauce plant (44,000 square foot, $5 million) in Virginia on a 27-acre site just north of Colonial Heights.

Sept. Chico-san, Inc. introduces unpasteurized miso in a revolutionary "Pressure Release Package," a plastic bag with a one-way valve that allows the escape of the carbon dioxide produced naturally during fermentation.

Sept. 9-14. Gloria Vanderbilt announces that she, in conjunction with Dolly Madison and Frusen Gladje, will launch a tofu ice cream.

Sept. 27-28. First European Soyfoods Workshop held in Amsterdam, The Netherlands, at the Grand Hotel Krasnapolski, organized by the American Soybean Association's Belgium office. ASA reports attendance as 105 people from 14 countries, but participants report a maximum of 50 participants. Talks on tofu, soymilk, tempeh, distribution, and microbiological standards, all later published in the Proceedings. There is a large Expo with soymilk equipment from Alfa-Laval and Soya Technology Systems prominently featured. A very successful event, and another ASA first!

Oct. *The Tofu Gourmet* by Linda Barber and Junko Lampert published by Kodansha in Menlo Park, CA. 129 p. Many color photos.

Oct. 15. "Here Tofutti, There Tofutti," a full-page, very positive article with 2 color photos published in *Newsweek* magazine (circulation 3 million).

Oct. 23. The joint managing directors of the International Food Information Service, owners of Food Science and Technology Abstracts (FSTA, the world's largest, oldest, and most widely used food-related computerized database) visit William Shurtleff at The Soyfoods Center to discuss putting the 6,500 bibliographic records in The Soyfoods Center Library into FSTA, thus making this information available worldwide. Both parties are very interested in the project but technical problems remain to be solved.

Oct. Westbrae Natural Foods launches Malted's, billed as "thick and rich non-dairy soy delights." Marketed like a milkshake and imported from Japan in a foil pouch, they come in three flavors: vanilla, carob, and cocoa-mint.

Oct. Three member team from PLENTY Canada spends one month in Sri Lanka, funded by the Canadian International Development Agency, studying the country's soyfoods program. They learn, teach, and introduce tofu ice cream.

Nov. 13. A.E. Staley Manufacturing Company, America's oldest existing soybean crusher, announces that its soybean crushing operations are for sale.

Nov. 20. Tofu Time's first Tofutti Shop opens in uptown Manhattan, New York. A fast-food retail outlet with a slick, red-and-white plastic, almost gaudy, decor.

Nov. 16. Chico-san Inc. is purchased by H.J. Heinz Co., largely for its rice cake business.

Nov. 21. After years of searching, William Shurtleff, with help from Nancy Florida in Java, discovers an 1815 reference to tempeh in the *Serat Centini,* from the Court in Solo, Java. This pushes the earliest reference to tempeh back 60 years and has it originating in Indonesian rather than in Dutch culture.

Nov. 30. America's first Tofu Standards are issued by the Soyfoods Association's Tofu Standards Committee, in part to help stem the rising tide of products bearing the name "tofu" that contain little or no tofu.

Nov. Galactina, a Swiss manufacturer of soymilks since 1969 (they make Vita Drink / Enteroform, a soymilk sold to in vanilla, chocolate, and strawberry flavors to the dietetic and pharmaceutical markets for tube feeding), starts test marketing tofu in Swiss supermarkets. Attractive recipe booklet attached to each packet, which is pasteurized for a 6-week shelf life.

Dec. Excellent, 19-page cover story on "Soymilk and Soyfoods," published in the prestigious *Journal of the American Oil Chemists' Society.* 1984 is the Society's 75th anniversary.

Dec. Ralston Purina, in its 1984 annual report, notes: "The Company has entered into preliminary agreement with Cargill, Inc., to sell six of the Company's seven soybean [crushing] plants." It also reported strong, steady growth in sales of soy protein products, from about $98 million in 1980 to $152 million in 1984, for an 11.5% compound annual growth rate (but only 4.5% after adjusting for inflation).

Dec. Gloria Vanderbilt's Glace, a soy-based nondairy ice cream, starts being test marketed in Los Angeles, in nine flavors.

Dec. A poll of readers by *Vegetarian Times* magazine finds that 53.1% of readers used tofu one or more times during the past 7 days; 29.4% used it 3 or more times.

Dec. 31. Brightsong Light Foods in Petaluma, California, receives the first funds of a $500,000 equity investment from a Hong Kong investor, who had seen an article praising Brightsong in Venture magazine. Brightsong greatly expands its product development and promotion.

* American Soybean Assoc. phases out its Human Nutrition Dept., headed for years by Judy Trujillo.

* Chicago Board of Trade starts trading options contracts on soybean futures. Continued.

8170. *SoyaScan Notes.* 1984. Chronology of soybeans,

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soyfoods and natural foods in the United States 1984 (Continued–Part III) (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued. 1984 New Trends: Growing Awareness of Dangers of Excess Cholesterol and Fat Consumption. Since cholesterol became a public health issue in the mid-1950s, the medical profession has been uncertain about the degree of its dangers, largely due to lack of medical evidence from long-term human studies. Yet for years the American Heart Association, United States Dept. of Agriculture, and the Soyfoods Association have been urging Americans to lower their blood cholesterol levels by eating less of the foods rich in cholesterol and saturated fats. In Jan. 1984 the long-awaited medical evidence was finally released, dramatically and extremely visibly. There were repercussions throughout the entire food and health care industries. The public started to pay serious attention.

Then on March 26 *Time* magazine ran a landmark cover story on the dangers of cholesterol. On 13 December *The New York Times* ran a major front-page report titled "Panel Suggests Many in U.S. Need to Reduce Cholesterol" containing the "the most far-reaching health recommendations yet made on cholesterol and heart disease" by an expert panel, convened by the National Institutes of Health. Numerous prestigious groups lowered their recommended safe cholesterol intake levels. These developments made soyfoods (which, like all non-animal products are free of cholesterol) look better than ever nutritionally, and increased their consumption significantly.

It has been known for several decades that consumption of polyunsaturated fatty acids (such as those found abundantly in soybeans) reduces serum cholesterol. During the 1970s Americans were encouraged to reduce consumption of saturated fats and cholesterol and increase consumption of polyunsaturates. Now this advice is changing. The new message is to "Reduce the intake of dietary fat." All fat, including polyunsaturated. In fact, these very words now appear as the first of four dietary guidelines on the letterhead of the prestigious American Institute for Cancer Research.

Continued Drop in U.S. Beef and Red Meat Consumption. From a high of 94.4 lb per capita in 1976, beef consumption has steadily declined, falling to 77.3 lb in 1982, a drop of 18.1% in only 6 years. During the same period, total red meat consumption (including pork, lamb, mutton and veal) fell from 163.6 lb to 148.0 lb, a drop of 9.5%. Many consumers switched to lower priced, lower cholesterol chicken, which rose from 42.7 to 52.9 lb per capita. Still, total annual U.S. meat and poultry consumption increased by over 4 pounds during his period (Stucker and Parham 1984).

Rise and Decline of the Soyfoods Association. The Soyfoods Association of America (SAA) got off to a promising start in 1984 with a successful fund raising drive. Then in March, soyfoods companies took 16 adjoining booths to form the Soyfoods Pavilion, capturing the spotlight at the Natural Foods Expo in Anaheim. It looked like the "soyfoods movement" was maturing into the "soyfoods industry." But for the rest of the year the Association was largely inactive. This was disappointment to many, since interest in soyfoods in America had never been higher.

Prior to the founding of SAA in 1983, its active forerunner SANA (Soyfoods Association of North America) had six major ongoing activities: (1) Publication of Soyfoods magazine, a quarterly that actually came out about twice a year; (2) Publication of the monthly Soyfoods Newsletter, a key source of communication within the industry between issues of the magazine; (3) An annual summer Soyfoods Conference and Expo, drawing participants from around the world; (4) Periodic press releases; (5) Writing a steady stream of excellent articles on soyfoods for publication in national magazines; (6) An association phone and mail service to respond to outside enquiries for information.

The person primarily responsible for initiating and carrying out all these activities was Richard Leviton. Though funding was hard to obtain, he worked hard, wasted nothing, and made many personal and financial sacrifices for a cause he believed in. Leviton's many and diverse talents, and especially his talents as a careful researcher and outstanding popular writer, were of tremendous aid to the incipient soyfoods movement. In late April, after 5 years of devoted effort and feeling a bit "burned out," he left the soyfoods movement and moved to England to pursue his long-cherished career as a novelist. Leviton, more than any other person, was responsible for the rapid rise and visibility of the soyfoods movement in America. His departure was a major loss to both the association and the magazine. He and his creative efforts will be sorely missed.

Only the last of the six major activities initiated by Leviton has been continued by the "new" Soyfoods Association. However it did initiate the excellent Soyfoods Pavilion at the annual Natural Foods Expo and it started subscribing to the valuable Luce Clipping Service. There were board meetings in June 1984 and Jan. 1985. By summer of 1984 the Association was looking for a replacement for Executive Director Michael Austin, who was also "burned out." In August he was temporarily replaced by Steve Snyder, former marketing director for Hinode Tofu, but shortly thereafter Snyder was hired as national sales manager by Vitasoy USA. After that there was no executive director. Despite relatively large initial pledges, the Association's balance was always low which meant that, lacking Leviton, activity largely came to a stop. The only significant new activity was the development of tofu standards by the Association's Standards Committee.

Unlike the original Soyfoods Association, the "new" one took little interest in small soyfoods companies, arguing that they had no money. The "new" association was therefore composed mainly of larger companies with regional or

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national distribution and not truly representative of the industry.

Rapid Rise in Soymilk Imports. The boom in soymilk imports, started during the past two years by Vitasoy and Edensoy, accelerated during 1984. New products included Vitasoy's new American flavors, Westbrae Natural's Malteds, and Great Eastern Sun's Ah Soy. All three were very widely advertised in eye-catching color ads. Most of the adult soymilk beverages sold in America are still imported from Japan. Strangely this dramatic development has gone largely unnoticed by the media, which has been focusing its attention on Tofutti.

Two new companies and products were mentioned only briefly by Shurtleff and Aoyagi in their two-volume book *Soymilk Industry and Market: Worldwide and Country-by-Country Analysis,* published in Feb. 1984. The first of these was Westbrae's Malteds and Westsoy. Although Westsoy was launched in August and Malteds in October, sales of both for 1984 were roughly $700,000 or 1.67 million units. They quickly became the best-selling products in the company's history.

From late July when Great Eastern Sun launched Ah Soy, the product was a "fantastic success." During the period from 1 Nov. 1984 to 25 Jan. 1985 (just under one fiscal quarter) 525,000 unit packs of four flavors were sold. By March 1985 Ah Soy accounted for 15-20% of GES's total sales.

Big Food Companies Increasingly Interested in Tofu. Those studying tofu for use in foods include Quaker Oats, CPC International, International Multifoods in Minneapolis, Pillsbury, and Campbell's Soup.

8171. Belleme, John; Belleme, Jan. 1984. Miso, the ABC's of an ageless food. *East West Journal.* Dec. p. 62-66. [1 ref]
• ***Summary:*** Miso is said to break down and discharge cholesterol. Scientists studying Japanese populations have discovered that those who regularly drink miso soup suffer significantly less from some forms of cancer and heart disease. Japan's Tohoku University has recently isolated chemicals from miso that cancel out the effects of some carcinogens.

A fine variety of traditionally-made miso is available in the refrigerator section of natural foods stores in small tubs or the recently introduced plastic bag with a one-way valve that prohibits the entrance of air. For the busy cook who wants to add flavor and protein, miso gives 22 grams of protein per tablespoon. Dark miso has a meat-like quality; light miso, a dairy-like quality. Light, sweet miso contains twice the niacin and 10 times the lactic acid bacteria as dark, saltier miso. Dark miso is higher in protein and because of its larger proportion of soybeans, contains more fatty acids, which have been shown effective as anti-carcinogenic agents.

Sweet miso can be used instead of milk in mashed potatoes or creamed soups, and with tofu and lemon and lemon or rice vinegar in place of sour cream, in salad dressings and sauces. Sweet miso and sake or mirin combine well in sauces. Address: Rutherfordton, North Carolina.

8172. Hymowitz, Theodore. 1984. Dorsett-Morse soybean collection trip to East Asia: 50 year retrospective. *Economic Botany* 38(4):378-88. Dec. [38 ref]
• ***Summary:*** Contents: Introduction. The plant explorers–Dorsett and Morse (a biographical sketch of each). Oriental Agricultural Exploration Trip (gives all key dates, places, and events on the trip). Dorsett-Morse collection. Soybean collection (a detailed discussion, including history and varieties): "This paper is devoted to the analysis of the 4,451 soybean (*Glycine max*) accessions collected by P.H. Dorsett and W.J. Morse during their plant exploration trip to east Asia 1929-1931. Until about 1950 the collection was used primarily for the development of vegetable type soybean cultivars. During this period many of the accessions were lost. Today only 945 of the original 4,451 accessions are available in the United States soybean germplasm collection. From the 1950s to the 1980s, as soybean production increased in the United States, so did plant pathogen problems. The Dorsett-Morse soybean accessions have been extremely valuable to plant pathologists and breeders as sources of resistance to certain pathogens. Individual genotypes in the collection have been used for genetic studies on morphological, physiological and biochemical traits. Due to the development and distribution of higher-yielding soybean cultivars, farmers in East Asia are no longer growing lower-yielding landraces. Although these landraces are now extinct in east Asia, many were collected by Dorsett and Morse and are preserved in the United States soybean collection. Over the years, the Dorsett-Morse collection has increased in value and will be as useful to soybean scientists in the future as it has been in its first 50 years of existence."

"According to Piper and Morse (1923) no more than 8 soybean cultivars were grown in the United States prior to 1898. In 1898, the Office of Foreign Seed and Plant Introduction was established within the United States Department of Agriculture (USDA) to centralize introduction activities. Introduced plants were assigned permanent numbers under the Plant Introduction (P.I.) designation system. The first soybean listed in the P.I. system was P.I. 480 from South Ussurie, Siberia. The seeds were received from Professor N.E. Hansen in March, 1898 (Cook, 1898).

"Between 1898 and 1928, approximately 3,000 accessions of soybeans were introduced into the United States from China, Japan, Korea and India (Bernard, 1983). The collections were made principally by P.H. Dorsett, F.N. Meyer, and C.V. Piper. In the mid-1920s it was apparent to the USDA that the soybean was becoming a major American crop. Funds were allocated to send 2 plant scientists on a major expedition to Japan, Korea and northeast China,

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primarily to collect soybean germplasm and also to collect seed and propagating material of other crops of interest."

"Dorsett-Morse Collection: Dorsett and Morse sent back to Washington, DC, approximately 9,000 accessions of seed and propagating material (Ryerson, 1930). About half the accessions collected were soybeans (Table 1); the other half consisted of representatives from 230 genera. Individually or jointly, Dorsett and Morse collected germplasm from fruit and vegetable markets, food and flower shows, experiment stations, botanical gardens, seed companies, farms, factories making soybean and other food products, processing plants, and from the wild. In certain instances they contacted individuals to make collections of specific indigenous plants. In addition, they pressed 814 herbarium specimens, mostly 5 sheets each. They also brought back boxes containing butterfly, moth, wasp, spider and ant specimens.

"The explorers returned with 3,350 black-and-white still pictures, 6,700 ft of standard black-and-white motion picture negative and 2,400 ft of colored motion picture negative. Lastly, they brought back 210 publications, 341 different soybean food products and 236 bamboo-made articles (Dorsett and Morse, 1928-1931)."

"The Dorsett-Morse collection trip cost approximately $25,000. Even with today's inflated dollars the benefits gained by United States soybean farmers, processors, and consumers greatly exceed the original collection cost."

Talk with Ted Hymowitz. 1998. June 15. In fact, the value to American farmers of one soybean introduced by this expedition, P.I. 88788, which is a source of resistance to soybean-cyst nematode (SCN) races 3 and 4, is greater than the cost of the entire expedition–several times over. Interestingly, it was not until the late 1980s and 1990s, some 60 years after the expedition, that the resistance contained in this one soybean began to be utilized by U.S. soybean breeders. This is a good example of the importance of collecting and preserving germplasm, whose value may not be known until many years later.

Tables show: (1) Soybean accessions introduced into U.S. by Dorsett and Morse and currently available in the U.S. soybean collection: 1929–366 in original collection / 126 currently available. 1930–2,261 / 554. 1931–424 / 206. 1932–1,400 / 59. Total–4,451 / 945 (=21.2% currently available).

Table 2. 41 of their soybean introductions that by simple selection became cultivars in the USA and Canada, with P.I. number, place of origin, and Maturity Group: Cultivar names: Agate, Aoda, Arisoy, Bansei, Bansei (Ames), Cherokee, Chusei, Delsoy, Emperor, Etum, Fuji, Goku, Green and Black, Hakote, Hidatsa, Higan, Hokkaido, Imperial, Jackson, Jefferson, Jogun, Jogun (Ames), Kanro, Kanum, Kura, Magnolia, Mendota, Nanda, Osaya, Rokusun, Sac, Sato, Seminole, Shiro, Sioux, Sousei, Tastee, Toku, Waseda, Willomi, Wolverine.

Table 3. Eight "vegetable-type soybean cultivars developed in the U.S. by hybridization and selection from germplasm introduced by Dorsett and Morse:" Disoy, Kanrich, Magna, Perry, Prize, Shore, Verde, and Yelnanda.

Table 4. Selected soybean introductions by Dorsett and Morse with resistance to certain pathogens: Column 1, organism (Fungal, bacterial, viral, and nematode pathogens). Col. 2, Disease. Col. 3, Source of resistance (PI numbers).

Table 5. Introductions by Dorsett and Morse listed in the soybean genetic type collection: Column 1, lines (11). Col. 2, P.I. number. Col. Description (Narrow leaflet, dense pubescence, black pod, etc.).

Note: This is the earliest English-language document seen (Oct. 2013) that uses the term "landraces" (or "landrace," spelled as one word) to refer to indigenous soybean varieties. Address: Crop Evolution Lab., Dep. of Agronomy, Univ. of Illinois at Urbana-Champaign, Urbana, IL 61801.

8173. *J. of the American Oil Chemists' Society.* 1984. Soymilk: New processing, packaging expand markets. 61(12):1784-93. Dec.

8174. Meilke, Karl D. 1984. An economic profile of the Ontario soybean industry. *University of Guelph, School of Agricultural Economics and Extension Education, Publication* AEEE/84/9. x + 97 p. Dec. Also published in March 1983 under the same title as a 105-page report for Dr. Nelson Ball, Director, Agricultural and Food Development, Agriculture Canada, Toronto, ONT, Canada. 28 cm. [42 ref] • ***Summary:*** Contents: 1. Introduction: The role of soybeans and soybean products in the world oilseeds market, the importance of soybeans in Canada and Ontario, objectives, outline of the study. 2. Ontario soybean production: Soybean production, spatial distribution of production, number of farm production units and trends in their size, costs-of-production, Ontario soybean yields, expected changes in soybean production technology. 3. Ontario soybean marketing: Institutional structure, soybean domestic demand and trade, soybean meal domestic demand and trade, soybean oil domestic demand and trade, tariff structure, soybean marketing, seasonality of Ontario soybean prices. 4. Ontario soybean processing: Soybean processing capacity, technology employed, investment pattern, institutional structure, performance of the processing industry, financial performance, major changes in the processing industry. 5. The international soybean market: Major competitors, cost of production of competitors, recent and expected trends in production for major soybean exporters and importers (United States, Brazil, Argentina, Japan, European Community), policy and economic environment affecting soybean supply and demand. 6. Opportunities for expansion of production, processing and marketing of soybeans. 7. Constraints to expansion of Ontario soybean production, processing and marketing. References.

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Tables: 1.4. Canada's trade in oilseeds and oilseed products, 1970-1982. 1.5. Canada's trade in soybeans and soybean products, 1970-1983. 1.6. Ontario farm cash receipts by commodity, selected years. 2.1 Ontario soybean area, yield, production, average farm price and farm value, 1970/71 to 1983/84. 2.2 Ontario soybean/corn price ratios and soybean production, 1970/71 to 1983/84. 2.3 Ontario soybean production by county, 1972 to 1981, '000 bushels. 2.4 Soybean production as a percent of total cropland, in Ontario, by county, 1976 and 1981. 2.6 Distribution of farms growing soybeans in 1981, by size, for selected counties. 2.7 Trends in soybean production costs and input use, Ontario, 1957-1959, 1973-1974, and 1980. 2.8 Estimated soybean production costs Ontario and the United States, 1980. 2.9 United States and Ontario soybean yields. 2.10 Estimated trend in soybean yields, Canada and the United States, bushels/acre. 3.1 Canada, supply and disposition of soybeans, 1968/69 to 1983/84, 1,000 mt. 3.2 Canada, imports of soybeans by country of origin, 1970 to 1981. 3.3 Canada, soybean exports by country of destination, 1970 to 1981. 3.5 Canada, soybean meal exports by country of destination, 1970 to 1981. 3.6 Canada, imports of soybean meal by country of origin, 1970 to 1981. 3.9 Canada, soybean oil exports by country of destination, 1970 to 1981. 4.1 Imports of soybean meal by province.

Figures: 2.1 Soybean acreage and production in Ontario, 1941-1982. 3.1 Comparison of Canadian (PSO2) and United States (PSO4*ER34) soybean prices, 1968(1)–1982(3). 3.3 Comparison of Canadian (PSM2) and United States (PSM4*ER34) soybean meal prices, 1968(1)–1982(4).

Argentina: Soybean production in Argentina is increasing rapidly, just as it did in Brazil a decade earlier, and for much the same reasons. Argentina's economy is heavily in debt, inflation is high and widespread, the policy environment is uncertain, and there are cash flow problems. However the soybean is seen as part of the solution to these problems. Soybean production has increased from about 0.027 mmt (million metric tons) in 1970/71 (beginning April), to about 0.496 mmt in 1975/76, to an estimated 4.150 mmt in 1982/83 (see table 5.9, from USDA, FAS).

About 85% of the soybeans cultivated win Argentina are double cropped with wheat. They compete for land with cattle and corn. The stage of very rapid growth in soybean production appears to be nearing an end as Argentina's farmers are reaching the limit of the land on which it is easy to grow soybeans.

Soybean crushing has been slow to catch up with production. Table 5.9 shows that the soybean crush increased from 0.021 mmt in 1970/71 to an estimated 1.907 mmt in 1982/83. Because of this, Argentina has become the world's second larger exporter of whole soybeans, exporting 135% more than Brazil in 1982/83. However policies are now in place which will lead to expansion of Argentina's crushing industry. In early 1983, whole soybeans were subject to a 25% export tax while oil and meal were subsidized by 10%.

Exports of whole soybeans from Argentina began in 1973/74 with 0.050 mmt, but returned to zero in 1975/76. Thereafter they skyrocketed from 0.111 mmt in 1976/77 to a peak of 2.776 mmt in 1979/80, falling slightly to an estimated 2.151 mmt in 1982/83.

Exports of soybean meal have been modest, ranging from 0.25 and 0.28 mmt between 1976/77 and 1980/81 (table 5.10, from USDA ARS). But consumption of soybean meal in Argentina has been increasing, approximately doubling between 1973/74 and 1982/83. A similar pattern emerges for soybean oil, but both exports and domestic demand are modest (table 5.11, from USDA ARS).

In the future, Soybean production in Argentina is expected to expand, although not as rapidly as during the last 10 years. The percentage of soybeans crushed in Argentina is expected to increase, and the country's exportable surplus of soybean meal and oil will probably grow.

Japan is the world's single largest importer of soybeans. Between 1970 and 1980 soybean imports to Japan increased by 31%.

Japan produces relatively small and declining amounts of oilseeds; primarily rapeseed, soybeans, and peanuts. Today Japan is a highly developed industrial nation and agriculture contributes only a small amount to the gross domestic product. In 1961 Japan's agricultural land area peaked at 15.1 million acres, declining to about 13.3 million acres in 1978. "The area of orchards, permanent plantations and arable grasslands has increased considerably since 1960, while the area of ordinary upland fields (where oilseeds are grown) has dropped to about one-half its 1960 size."

Brazil: Beginning in the mid-1960s, Brazil started an aggressive export development program. Its goals were: (1) To slow the rate of inflation. (2) To diversify exports. (3) To increase exports of value-added products. (4) To maximize foreign exchange earnings. One commodity that benefited from this program was the soybean. Soybean production in Brazil rose from 1.50 mmt in 1970/71 to 15.20 mmt in 1981-82 (table 5.6, USDA FAS).

Various factors account for the dramatic growth in Brazilian soybean production: (1) The climate in southern Brazil makes it possible to double crop wheat and soybeans. Double cropping is the practice of consecutively producing two crops of either like or unlike commodities on the same land during the same year. The government's high support price for wheat substantially increased wheat area and encouraged double cropping. In 1975 some 50-70% of the soybean area in the major producing areas was double cropped with wheat.

(2) Because of import controls on nitrogen fertilizer, soybeans may have become more attractive to Brazilian farmers as a legume that fixes nitrogen in the soil. Since Brazil has produces relatively little of its own nitrogen fertilizer, and that fertilizer is relatively expensive, soybeans

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are attractive because they require little nitrogen fertilizer and (as a legume) they add their own nitrogen to the soil.

(3) Both Brazilian coffee policy and frosts have contributed to the increase in Brazilian soybean production. During the 1960s, when there was considerable excess in international coffee supplies, the government paid farmers to remove old coffee trees and plant other crops. Especially in the State of Parana, much of the new crop acreage was planted to soybeans. In July 1975, when severe frost killed over 15 percent of the coffee trees in Parana and severely damaged all the rest, much of this newly available land also went into soybeans.

(4) Brazilian soybeans tend to have a relatively higher oil content than their U.S. counterparts (19% vs. 17.7%). So in 1973 and 1974 when vegetable oil prices in world markets rose dramatically, cultivation of soybeans in Brazil became more profitable. As Thompson (1979) writes: "There is simply no other crop or beef which can compete with soybeans on a profit per hectare basis."

(5) Brazil's poultry industry is growing rapidly, so the domestic demand for soybean meal as a protein feed supplement has increased significantly.

Table 5.6 titled "Brazil, soybean supply and disposition," shows that soybean production increased from 1.509 mmt in 1970/71 to 12.835 mmt in 1982/03. The soybean crush increased from 0.932 mmt in 1970/71 to 12.728 mmt in 1982/03. Exports of whole soybeans increased from 0.290 mmt in 1970/71 to a peak of 3.516 mmt in 1975/76, then decreased to 0.810 mmt in 1982/03.

Brazil's policies designed to expand soybean crushing capacity and exports have been very successful; Brazil is presently the world's largest exporter of soy meal and soy oil (tables 5.7 and 5.8). Because of this emphasis on crushing soybeans in Brazil, the country's exports of whole soybeans have decreased since their peak in 1975/76 when exports where 33.5% of domestic production to only 6.3% of total production in 1982/83. Meanwhile, exports of soybean meal have increased from 0.588 mmt in 1970/71 to a peak of 8.582 mmt in 1981/82. And exports of soybean oil meal have grown from 0.003 mmt in 1970/71 to a peak of 1.212 mmt in 1981/82. Address: Ontario, Canada.

8175. *Michigan Food News.* 1984. Michigan products a hit in Japan. Dec.
• ***Summary:*** Candied soynuts in a variety of flavors made by Leonard M. Stuttman of Inari, Ltd. in Mason, Michigan, were one of more than 200 products made by 27 different companies exhibited last month at a special Michigan fair at the Tokyu Department Stores. "'We sent over more than a ton of products and it was gone in the first three days of the six day fair,' says company president Leonard M. Stuttman. INARI, which stands for International Nutrition and Resources, Inc., was founded in 1978 by Stuttman, who had worked for the American Soybean Association. 'Basically I've had a love affair with the soybean since the early 1950's,' he says...

"Stuttman says his soynuts are more like a more nutritious peanut, with a third more protein and less fat. Sixteen people work in his Mason plant on 200 State Street producing the soynuts." A photo shows Leonard Stuttman, president of Inari Ltd., standing with representatives of the Tokyu Department store who selected items for sale at the Michigan Products Fair.

8176. Murakami, H.; Asakawa, T.; Terao, J.; Matsushita, S. 1984. Antioxidative stability of tempeh and liberation of isoflavones by fermentation. *Agricultural and Biological Chemistry* 48(12):2971-75. Dec. [16 ref]
• ***Summary:*** The main isoflavones responsible for the antioxidative activity in tempeh were deduced to be daidzein and genistein. Address: 1&3. Research Inst. for Food Science, Kyoto Univ., Uji, Kyoto 611, Japan; 2. Doshisha Women's College, Imadegawa, Kamigyo-ku, Kyoto 602, Japan.

8177. Okubo, Kazuyoshi. 1984. Kôri-dofu–Seizôhô no hensen, tôketsu jukusei kikan no tanshuku oyobi "yu" kara no yukô seibun no kaishû [Kori-tofu: Development of the processing, reduction of the freeze aging period, and recovery of available materials from "Yu" fraction]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 31(12):814-20. Dec. [50 ref. Jap]
Address: Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai-shi, Miyagi-ken 980, Japan.

8178. **Product Name:** [Naturath {Textured Soy Protein}].
Manufacturer's Name: Ajinomoto Co. Inc.
Manufacturer's Address: Kyobashi 1-5-8, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1984.
New Product–Documentation: Soya Bluebook. 1984. p. 60.

8179. Dickson, T. 1984. Japanese soybean research institutes, including the First International Symposium on Soybeans in Tropical and Subtropical Cropping Systems, Tsukuba, Japan, 26 September to 1 October 1983. Brisbane: Queensland Dept. of Primary Industries. i + 10 p. Study tour report. 30 cm. *
Address: Australia.

8180. Fruin, W. Mark. 1984. Kikkoman during the latter half of the twentieth century. 8 p. Unpublished manuscript.
• ***Summary:*** Kikkoman is the world's largest manufacturer of soyfoods, the leading maker of shoyu in Japan, and one of the most diversified and internationally-minded of Japanese food and beverage companies. Kikkoman has assumed its

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leadership in these areas relatively recently, only since the 1950s. Before World War II, Kikkoman (known then as Noda Shoyu Co.) was not able to garner more than about 10% of the shoyu market in Japan. "The incentive to invest in new production capacity came from the Occupation policy of disbanding producer cooperatives; Kikkoman's growth had been limited by a network of interlocking market sharing agreements among the major shoyu producers, but once Occupation authorities removed these barriers, Kikkoman was free to grow as large as it could." Address: Menlo Park, California.

8181. **Product Name:** [Soy Beverages].
Manufacturer's Name: Fuji Oil Co. Ltd.
Manufacturer's Address: Nissei Midosuji Hachiman-cho Building, 6-1 Hachiman-cho, Minami-ku, Osaka 542, Japan.
Date of Introduction: 1984.
New Product–Documentation: Soya Bluebook. 1984. p. 62.

8182. **Product Name:** [Sashimi Tofu].
Manufacturer's Name: Fuji Oil Co. Ltd.
Manufacturer's Address: Nissei Midosuji Hachiman-cho Building, 6-1 Hachiman-cho, Minami-ku, Osaka 542, Japan.
Date of Introduction: 1984.
New Product–Documentation: Soya Bluebook. 1984. p. 78.

8183. Hesseltine, C.W. 1984. Fermented foods in the Orient with emphasis on soy sauce. *Nihon Shoyu Kenkyujo Zasshi* (*J. of Japan Soy Sauce Research Inst.*) 10(3):69-92. [39 ref. Eng; Jap]
Address: NRRC, Peoria, Illinois.

8184. Hirayama, Takeshi. 1984. Misoshiru inyô to igan shibô ritsu to no kankei ni kansuru ekigaku-teki kenkyû [Epidemiological study on the relation between the consumption of miso soup and standardized mortality rates by gastric cancer]. *Yobo Gangaku* (*Preventive Oncology*). p. 146-57. [15 ref. Jap]
Address: Epidemiology Div., National Cancer Center Research Inst., Tokyo, Japan.

8185. Hirayama, Takeshi. 1984. [Epidemiology of stomach cancer in Japan]. *Japanese J. of Clinical Oncology* 14:159-68. [Jap]*
• ***Summary:*** The author found a significant graded inverse association between the consumption of miso and green/leafy vegetables and stomach (gastric) cancer risk among 122,261 men and 142,857 women followed for 13 years. Address: Epidemiology Div., National Cancer Center Research Inst., Tokyo, Japan.

8186. Ikeda, H.; Tsuno, S. 1984. [The componential changes during the manufacturing process of natto. I. On the amino nitrogen, carbohydrates and vitamin B-2]. *Shokumotsu Gakkaishi* 39:19-24. (Chem. Abst. 103:5183. 1985). [Jap]*

8187. **Product Name:** Wel-Pac Inari Sushi Age: Prepared Fried Soybean Curd.
Manufacturer's Name: JFC International (Importer-Distributor). Made in Japan.
Manufacturer's Address: S. San Francisco, California.
Date of Introduction: 1984.
Ingredients: Fried soybean curd (soybeans, water, soybean oil, salt, calcium sulfate), soy sauce (water, soybeans, wheat, salt), sugar, sorbitol, sweet cooking rice wine, monosodium glutamate.
Wt/Vol., Packaging, Price: 7.58 oz (215 gm).
How Stored: Shelf stable.
New Product–Documentation: Label. 1983. 75.5 by 7 by 1 inches. Paperboard box. Red, dark red, green, yellow, blue and black on white. On the front panel is a color photo of six ready-to-eat Inarizushi on a plate.

8188. Morinaga Milk Industry Co., Ltd. 1984. Morinaga Ever-Fresh Silken Angel Tofu. The favorite new food for Western tastes. Recipes: Shells Italiano, Mini Meat Loaves, Jogger's Energy Shake, Savory Party Dips, Salad Dressings Galore, Sunny Brunch Eggs (Leaflet). Tokyo, Japan. 6 panels each side. Each panel: 11 x 6 cm.
Address: 5-33-1 Shiba, Minato-ku, Tokyo 108, Japan.

8189. **Product Name:** [Tempeh Rice Crackers].
Foreign Name: Tenpe Senbei.
Manufacturer's Name: Morita Beika Honpo.
Manufacturer's Address: Morita Masao, Dote-cho 3-256, Omiya-shi, Saitama-ken, Japan.
Date of Introduction: 1984.
New Product–Documentation: Label. 1984, undated. 1.5 by 3 inches on a 6 by 10 inch cellophane bag. Dark green on light green. "Teyaki senbei" [Hand-baked rice crackers].

8190. **Product Name:** [Daikyu Whipping Agent].
Manufacturer's Name: Nisshin Oil Mills, Ltd.
Manufacturer's Address: Shinkawa 1-23-1, Chuo-ku, Tokyo, Japan.
Date of Introduction: 1984.
New Product–Documentation: Soya Bluebook. 1984. p. 79.

8191. Nunomura, N.; Sasaki, M. 1984. Comparison in flavor compounds between Japanese shoyu and the sauces in other countries (Abstract). In: Abstracts of Papers Presented at the Annual Meeting of the Agricultural Chemical Society of Japan. See p. 129. *
Address: Central Research Labs., Kikkoman Shoyu Co., Noda, Japan.

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8192. Oda, T. 1984. [Effects of artificial diet supplemented soybean-lecithin for fat greenling (*Hexagrammos otakii*) larvae]. *Bulletin of Fisheries Experiment Station, Okayama Prefecture* p. 64-68. For the year 1983. [Jap; jap]*

8193. **Product Name:** [Pure Harvest Soy Drink].
Manufacturer's Name: San-iku Foods.
Manufacturer's Address: Sodegaura-machi, Chiba-ken 299-02, Japan.
Date of Introduction: 1984.
Ingredients: Whole soybeans, barley malt, pearl barley malt, wheat germ, safflower oil, sea salt.
Wt/Vol., Packaging, Price: Retort pouch.
How Stored: Shelf stable.
New Product–Documentation: Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 47. "San-iku Foods has been exporting Pure Harvest Soy Drink to Australia for several years."

Letter from San-iku Foods. 1990. June. This product was introduced in 1984.

8194. Watanabe, Y.; Tada, M.; Kawamoto, K.; Oozumi, G.; Kajiwara, Y.; et al. 1984. [A case-control study of cancer of the rectum and colon]. *Nippon Shokakibyo Gakkai Zasshi* (*J. of the Japanese Society of Gastroenterology*) 81:185-94. [Jap]*
• ***Summary:*** Subjects who consumed whole soybeans and tofu had an 80% lower risk of rectal cancer. Specifically, the authors, in a study involving 65 rectal cancer cases and controls, and 138 colon caner cases and controls, found that the consumption of soybeans and tofu both one to two times a week and three or more times a week, compared with nonconsumption of these foods, was associated with lower rectal cancer risk (Relative Risk = 0.15 and 0.12 respectively). They did not find a significantly decreased risk of colon cancer (Relative Risk = 0.63).

8195. Westbrae Natural Foods. 1984. Westbrae Natural–Traditional foods of Japan (Poster). P.O. Box 8711., Emeryville, CA 94662. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center.
• ***Summary:*** This is a color photo of a large beige metal display rack with six shelves holding products including the following: (1) Samurai snacks, soup plum drops. (2) Tamari brown-rice wafers, Tamari brown-rice crackers. (3) Miso ramen, Instant miso soup. (4) Organic shoyu, tamari, mild soy sauce, Johsen tamari shoyu, Tofu sauce. (5) Kukicha (tea), Umeboshi (salt plums), Shiitake mushrooms, Agar flakes, Kuzu, Miso (in plastic bags; brown rice, red, barley, Hatcho). (6) Seaweeds (Wakame, kombu, hijiki, nori, sushi nori), Jinenjo soba, Somen, Brown rice noodles. At the top is the banner featuring the head of a samurai. One accompanying leaflet (printed black on white) is titled "Westbrae Natural product inventory. 4-foot Japanese foods section." A second leaflet titled "'Ichi-Ban' Westbrae Natural–No. 1 supplier of macrobiotic food in the U.S." lists the products by category. In the upper left corner are the Japanese characters for "Ichi-Ban" above a line drawing of Mt. Fuji. Address: Emeryville, California.

8196. Bertrand, Jean-Pierre; Laurent, Catherine; Leclercq, Vincent. 1984. Soja. Aus dem Franzoesischen von Felicitas Schaetzl [Soya. Translated from the French by Felicitas Schaetzl]. Zurich, Switzerland: Unionsverlag. 130 p. [Ger]
• ***Summary:*** This book gives a very good overview (from the French point of view) of the development of the soybean plant in the context of world agriculture. Contents: 1. The soybean in the world economy: Portrait of a "sacred grain," soybean meal / cake–a high-value feed, soy oil–from diesel motors to ice cream, soy protein–the industrialized protein, producers and users. 2. The soya complex: Consumers and producers without power, the producers–a club with contradictions, the multinationals in the middle of the soya chain, the international wholesale business, the commodity exchange as a barometer.

3. How prices are determined: Subsidy politics in the USA, price guarrantees in Brazil, the price of soybean meal and soy oil. 4. From sacred bean to soya complex–a look back: Colonial times, Europe becomes curious, the American soya complex is born, the struggle over margarine, soybean meal becomes successful, the war as a big opportunity, soya conquers America, soya against cotton–the oil battle.

5. Soya from the Americas conquers the world: The Marshall Plan–the first clever offensive, Public Law 480–food aid with a club-foot, trade pressure under the banner of free trade. 6. The politics of the importing countries: U.S. soya vs. EU cereal grains, France–the model of protein dependency, in the maze of European agrarian politics, Japan–the free way for imports. 7. The embargo of 1973–Trade war and crisis: the exchange awakens.

8. Brazil–The new soybean giant: The export sector is nursed back to health, credit–but not for everyone, the export boom, the equal weight problem. 9. The newcomers–Argentina and Paraguay. Paraguay, a little appendage of Brazil?, startup difficulties in Argentina, help for Soviet stock-farming.

10. The new questions: The Eastern Bloc in the conflict of goals, industrial comeback of the soybean in China, developing countries–meat and oil for the poor? 11. The reverse side of the "Soya Model:" Brazil–Flight from the land, dependency, and hunger, Tunisia–adulterated olive oil, Senegal as loser in the peanut / soya battle, a model of supply dependency.

12. Which alternatives? A "protein plan" in the European Union, better utilization of the green forage stock, industrial amino acids–a way out / escape? 13. Plant- vs. animal protein: Industrial soya protein–food of the future?, the Third

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World, a large market with the ability to pay, a future with contradictions. Address: France.

8197. Bray, Francesca. 1984. Science and civilisation in China. Vol. 6, Biology and biological technology. Part II: Agriculture. Joseph Needham series. Cambridge, England: Cambridge University Press. xxvii + 724 p. Illust. Index. 26 cm. [1487* ref]

• ***Summary:*** Contents: List of 271 illustrations. List of 13 tables. List of 17 abbreviations. Author's note. Introduction: General characteristics of Chinese agriculture, agricultural regions, origins of Chinese agriculture. Sources: The *yüeh ling* or agricultural calendars, agricultural treatises, state-commissioned compilations, monographs, supplementary sources, the content of the Chinese sources and the implications for historical interpretation, a comparison with European tradition. Field systems: Land clearance and reclamation, shifting cultivation, permanent fields. Agricultural implements and techniques: Tillage implements, sowing, fertilisation, weeding and cultivation, harvesting and threshing and winnowing, grain storage. Crop systems: Crop rotation, millets and sorghum and maize, wheat and barley, rice, legumes (incl. soybeans and adzuki beans [*Phaseolus angularis, or hsiao tou*]), oil crops, tuber crops, fibre crops, vegetables and fruits. Conclusions–Agricultural changes and society–stagnation or revolution?: Did China contribute to Europe's agricultural revolution?, agricultural revolution in China?, development or change?

Bibliographies: Abbreviations. Chinese and Japanese books before + 1800: 254 references. Chinese and Japanese books and journal articles since + 1800: 306 references. Books and journal articles in Western languages: 778 references. Note: There are 560 references in Chinese.

"This book is dedicated to the memories of Shih Shen-han of the Northwestern Agricultural College, Wukung, Wang-Yü-hu of the Peking Agricultural College, and Amano Motonosuke of Osaka University, without whose pioneering work on the history of agriculture in China this volume would not have been possible."

The section titled "Monographs" (p. 74-75) notes that farm tools and machines were not considered interesting by Chinese writers. "It would never have occurred to an educated Chinese to attempt to benefit mankind by improving the design of the plow, and there is none of the technical, experimental literature that we find in the West on such topics." Address: Cambridge, England.

8198. Bray, Francesca. 1984. Legumes (Document part). In: F. Bray. 1984. Science and Civilisation in China. Vol. 6, Biology and Biological Technology. Part II: Agriculture. Joseph Needham series. Cambridge, England: Cambridge University Press. xxvii + 724 p. See p. 510-14. [49 ref]

• ***Summary:*** Note: Chinese characters are given for all italicized Chinese words or terms. Although legumes were among the earliest plants to be domesticated in West Asia and the Americas*, there is no solid evidence that legumes were cultivated in China in prehistoric times, even though several species were native to China, and even though legumes played a very important role in Chinese agriculture from the late Chou [ca. 722 B.C.] onwards.

* Footnote: In the Near East and Europe carbonised peas and lentils, assumed to be domesticated, have been identified at farming sites dating as far back as 7000 B.C. Various species of *Phaseolus* beans seem to have been domesticated in Peru and Mexico by the 6th millennium B.C. And groundnuts are believed to have been domesticated in the upper Amazon regions, in South Bolivia and North Argentina well before 3000 B.C.

"Though remains of leguminous species have been found in one or two Chinese neolithic sites, they have been identified as broad beans (*Vicia faba*) and groundnuts (*Arachis hypogaea*)*;* since the former is believed to have been introduced to China from Western Asia in Han times [220 B.C.–220 A.D.] and the latter is a native American species, the authenticity of these identifications is doubtful, to say the least" (Footnote: K.C. Chang. 1977. *The Archaeology of Ancient China,* 3rd revised ed.).

"There are apparently no references to legumes in the Shang oracle records, and the earliest uncontested evidence for the cultivation of leguminous plants in China is found in Chou bronze inscriptions and in the *Shih Ching.* Both these sources refer to a crop called *shu* (Chinese characters given), and the early form of the character clearly depicts the nodules on the roots of the plants (Fig. 237). The term *shu,* though also used to refer to legumes in general, is primarily associated with the soybean, *Glycine max* (L.) Merrill, and its presence in these writings is usually taken to signify the domestication of this crop" (Footnote: Hu Tao-Ching {1963} in fact postulates a much earlier domestication [it must have been domesticated and well known long before it appeared in inscriptions on bronze vessels in 1024 B.C.]; Ping-To Ho {1975, p. 70} believes that domestication occurred about 1000 B.C.)

"In later lexicographical texts the term *shu* is usually qualified when soybeans are referred to: *jung shu, jen shu,* and *ta shu* are mentioned (Footnote: In the *Erh Ya* and its commentary for example), and this does suggest that even in pre-Han times *shu* was used as a generic term for legumes rather than a specific term for soybeans. The modern term for soybean is *ta tou,* 'greater bean,' a term which first appears in the -1st century *Fan Sheng-Chih Shu.* In classical times the term *tou* was applied only to a type of 'wooden vessel or dish containing flesh sauces at sacrifices or feasts' (Bretschneider 1882, vol. II, p. 162), but by Han times it seems that it was also used as a general term for pulse crops, as it still is today.

"Whether or not the unqualified term *shu* in early texts and inscriptions should be understood to refer to soybeans or to legumes in general, there is no doubt that the soybean

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was domesticated in China some time around the beginning of the Chou, for texts describing -7th-century events refer to soybeans (*jung shu*) as novel introductions to the Central States, whereas by the time of Mencius [Meng tzu, c. 371-c. 289 B.C.] they had already become a staple food of the common people (Footnote: P.T. Ho 1975, p. 79).

"The presumed wild ancestor of the soybean, *Glycine ussuriensis* Regel & Maack or *G. soja* L. is native to northeast China and the adjacent areas of Manchuria, Korea, and Japan (Footnote: Hymowitz 1970, 1976), and it may be significant that the cultivated soybean was called *jung shu* for Jung was the name commonly given to the Tungusic tribes of Northeast China in Chou times. The *Kuan Tzu* states that in the -7th century Duke Huan of Ch'i (Footnote: Ch'i covered most of modern Shantung) led an expedition to the territory of the Mountain Jung and brought back 'winter onions and soybeans (*jung shu*) for dissemination throughout the various states' (P.T. Ho 1975, p. 78)."

An alternative interpretation of *jung* and of its (then) homophone *jen* is that it simply meant large and luxuriant (Bretschneider 1882, vol. 2, p. 164), for the soybean is a large, bushy plant which grows up to 6 feet tall. Its modern name of *ta tou* can be attributed to its growth habit, and not to the size of its beans which are only about as big as a lentil. Fig. 238 (*Shou Shih T'ung K'ao,* 1742) shows an illustration of a soy bean plant.

"The soybean's rapid conquest of Chou China is a tribute to its superior qualities, qualities so outstanding that they frequently provoke outbursts of surprising lyricism in modern writers: 'that miracle, that noblest of crops, that wondrous plant, the soybean' (Anderson & Anderson 1977, p. 346)." The ancient Chinese were more moderate in their praise, perhaps because they were unaware of the benefits of modern nutritional analysis. The chief virtues of the soybean for the ancient Chinese "were that it produced good crops even on poor land, that it did not deplete the soil, and that it guaranteed yields even in poor years, so that it made a useful famine crop." It gave 3-4 times the yield of millet. The *Fan Sheng-Chih Shu* says that in former times (presumably the late Chou) it was customary for peasants to plant 5 *mu* per capita of soybeans to guard against famine. Soybeans were widely grown in China from Chou times on, "but they were not held in high esteem for their gastronomic qualities." The Chinese appreciated soybeans most when they were fermented to make sauces (*jiang*) or relishes (*shi*), or transformed into beancurd (*doufu*). These foods were generally made from yellow soybeans, although the *Qimin Yaoshu* (+544) recommends black soybeans. The various fermentation processes were discovered in early times; they improved the soybean's palatability and its nutritional properties. Address: Research Fellow, East Asian History of Science Library, Cambridge, England.

8199. Brennan, Jennifer. 1984. The cuisines of Asia: nine great oriental cuisines by technique. New York, NY: St. Martin's Press. ix + 542 p. Illust. (line drawings). Index. 24 cm.

• ***Summary:*** The "Nine great Oriental cuisines" are those of "China, India, Indonesia, Japan, Korea, Malaysia, The Philippines, Thailand, Vietnam" (as stated on the book's cover). The book contains many recipes, yet it is largely organized into chapters by cooking techniques: barbecuing, steaming, stir-frying / using a wok, deep-frying, etc.

The chapter on "Japan" discusses soybeans, miso, tofu, and shoyu on pages 44-45. Soyfoods are said to be the 2nd largest source of protein in the Japanese diet.

The section on "Soybeans" (p. 97-104) includes a discussion of the names of various soyfoods in different Asian languages and countries. For example: "The basic bean curd is called *tau-fu* in Cantonese, *tau-hu* in Hokkien, and *tofu* in Japanese." Or consider this (p. 99): "During the basic process of making bean curd, at the stage where the bean and water mixture is boiled, a skin or residue forms on the top. This skin [yuba] is skimmed off and dried. It is commercially available in sheets... and in the form of sticks that bear the picturesque name of 'second bamboo' [dried yuba sticks] in Chinese, meaning that they are the second residue from the curd."

There follows a 3-page table titled "Soybean products" (p. 101-03) which has four columns: Description, Chinese name [Cantonese], Japanese name, comments.

Note: Before proceeding, we believe that the design of this table is fundamentally flawed. (1) Why are the names of the basic soyfoods not given in the other languages with which this book is concerned, including Mandarin Chinese, Korean, Indonesian, Vietnamese, Filipino, etc.? (3) Why is no English name given for each basic soyfood product? Sometimes the description is the English name, yet that name is rarely the name a person would use if they were selling the product in an English-speaking country. (3) Why are so many common "soybean products" omitted from this table, such as the various basic other types of Japanese miso and of Japanese shoyu (besides koikuchi shoyu), fermented black soybeans (douchi, dow see), soymilk, soy sprouts, roasted soy flour, whole soy flour, soybean oil, textured vegetable protein, etc. These problems are easily solved with alternate table designs. For example, have one table for each language, with the name of each soyfood product given first in English and then in the language of that country. Put the description and comments in a glossary to avoid repetition. Or, have a glossary entry for each soyfood, with the English name, description, comments.

The table is divided into four basic types of soybean products. After each, we will give the Cantonese name and then the Japanese name, and we will indicate disagreements using [sic]. NL = Not listed.

(1) Bean curd: Tau fu fu [sic] = kinugoshi tofu. Tau fu = momen tofu. NL = yaki tofu [sic, yaki-dofu]. NL = koya

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tofu or kori tofu [sic, koya-dofu or kori-dofu]. Tau fu pok = abura age. Fu chu = yuba [sic, fu chu is dried yuba sticks. Yuba in Mandarin is doufu pi]. fu joke [sic, fu jook] (bean curd sticks) = NL. Tim joke [sic, tiem jook] (sweet bean curd sticks) = NL. tau fu kon [Mandarin: doufu gan; pressed tofu].

(2) Soy sauce: Light = chan ch'an or sang chu = usu kuchi shoyu [sic, not the same]. Dark, medium = see yu chan yan = shoyu [sic, see yu is soy nugget sauce, not made in Japan. Japanese shoyu is not traditionally made in China]. Dark, heavy, sweet = chu yan = NL.

(3) Fermented bean pastes and cheeses. Black bean paste = dau see tau ch'ih = NL. Sweet, white bean paste = NL = shiro miso. White soy cheese [fermented tofu, should be classified under tofu] = pai doufu-ru or foo yee or foo yu = NL. Red soybean paste = NL = aka miso. Red soy cheese or spiced red bean curd = hung doufu-ru or nom yee or nam yu.

(3) Miscellaneous soybean productions. Soy jam = yun shi jeung = NL. Whole fermented soybeans = NL = nato [sic, natto]. Red bean sauce = saang see jeung = NL. Soybeans and malted rice = NL = moromi miso. Hoisin sauce = hoisin = NL.

In the "Basic recipes" section is a recipe for Indonesian dark sweet soy sauce (*ketjap manis*).

The Glossary (p. 499-515) contains the following soy-related entries: "Bean Curd (*tofu,* Japanese; *tao foo,* Chinese; *tahu,* Indonesian and Thai; *tokwa,* Philippines): A curdled, soft, cheeselike preparation made from soybean milk. Used as a source of protein in Asian cooking. Available loose or in packages."

Bean paste, red sweet [from azuki beans]. "Substitute Chinese sweet red bean paste, p. 132."

Bean paste, yellow (Chinese).

"Beans, black salted fermented. (Called dow see in Chinese) These are very salty soybeans, sold in cans in Chinese markets. Used with garlic as a flavoring for fish and pork dishes. substitute: Soybeans, cooked until soft and seasoned with plenty of soy sauce."

Bean sprouts: Usually refers to mung bean sprouts, "although alfalfa and soybean sprouts are also used."

Hoisin sauce: Soybeans are a major ingredient, along with garlic, chili peppers, and various other spices and ingredients.

Miso. Oyster sauce: "A Chinese sauce, made from oysters cooked in soy sauce and brine." Used as a seasoning with cooked foods and as a table sauce. See recipe p. 146.

Red bean sauce: "A strong table sauce made from mashed soybeans." Available in cans from Chinese stores.

Soy sauce

Also contains entries for: Kombu. Monosodium glutamate (MSG; "I do not use it nor do I recommend its use"). Mung beans.

The index contains 28 entries for soybean, 22 for soy sauce, 14 for miso, 6 for bean paste, oyster sauce, teriyaki, 4 for bean curd–deep fried, hoisin sauce, vegetarian dishes, 2 for ketjap, and 1 each for beans–black salted fermented, bean curd–fermented, jam–soy, jang (see miso), milk–soybean, ragi, shoyu (see soy sauce), soybean oil, sukiyaki, tahu, tau-fu or tau-hu (see bean curd), tempe [tempeh], textured vegetable protein (TVP), tofu (see bean curd), tou shih [fermented black soybeans],

About the author (from the rear cover): "Jennifer Brennan grew up in Pakistan and India and has spent many years in Southeast Asia. She is the author of *The Original Thai Cookbook."* She is "Winner of the IACP [International Association of Culinary Professionals] Award for the Best Literary Food Writing."

8200. Bromfield, Kenneth R. 1984. Soybean rust. American Phytopathological Society, 3340 Pilot Knob Rd., St. Paul, MN 55121. 65 p. Monograph No. 11. [124 ref]

• ***Summary:*** This monograph is one of the most important contributions to the understanding of soybean rust. The author reviews the importance of leaf rust in countries where the disease occurs and gives detailed information for each country about when the disease and pathogen were first recorded.

The disease is caused by *Phakopsora pachyrhizi* Sydow. Research on soybean rust...

Early reports on soybean rust in Asia include Japan 1902, India 1906, Taiwan 1914, and Philippines 1914.

The section titled "The Americas" (p. 7) states: In the Americas, the soybean rust pathogen has been reported on a number of leguminous species as *P. pachyrhizi* or as one of its synonyms, the most common being *P. vignae.* Countries from which the pathogen has been reported and the year of first report are: Puerto Rico (1913), Mexico (1917), Cuba (1926), Trinidad (1926), St. Thomas (1926), Colombia (1933), Guatemala (1940), Brazil (1940 as *P. crotolariae,* 1979 as *P. pachyrhizi*), Venezuela (1943), Chile (1962), and Costa Rica (1976).

Note: Letter (e-mail) from Morris Bonde, USDA / ARS Foreign Disease–Weed Science Research Unit. 2005. April 6. The rust reported on soybeans on all these Western Hemisphere countries can be assumed to be *Phakopsora meibomiae.* Address: USDA ARS, Plant Disease Research Lab., Fort Detrick, Frederick, Maryland 21701.

8201. Furusawa, F. 1984. Zunda mochi [Zunda mochi–Made with green vegetable soybeans]. In: F. Furusawa, ed. 1984. *Kikisho Iwate no Shoku-ji* (Iwate Foods): Tokyo: Nosangyo Bunka Kyokai. See p. 206. [Jap]*
Address: Japan.

8202. Hapgood, Fred. 1984. Log of soyfoods research in Japan, Sri Lanka, and China, Oct/Nov., for *National Geographic* magazine (Log–unpublished). 85 p. Unpublished log.

• ***Summary:*** Fred was researching an article about

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the soybean for *National Geographic* magazine. This handwritten log is filed in Soyinfo Center file cabinets by country keyword. Thus, the portion concerning Sri Lanka (p. 13-43, 57-64) is filed with the documents concerning South Asia (AsSo) in 1984. The first person he met in Sri Lanka was Mr. S. Pathiravitana, editor, *Soyanews.*

8203. Just In Foods, Inc. 1984. Cooking with miso–General principles (Card). Rutherfordton, North Carolina. 1 p. Front and back. 12 x 14 cm.
• ***Summary:*** This card, printed front and back, gives a brief, general description of miso. It begins: "Every morning millions of Japanese wake up to a hot, stimulating bowl of miso soup. Miso (pronounced 'mee-so') is a delicious, very versatile fermented soy food. Loaded with protein, high in vitamin B12, essential amino acids and minerals, but very low in fat and calories, miso is a concentrated source of many nutrients." After describing the nutritional and medicinal value, varieties and colors, versatility, and use in miso soup, it concludes: "According to ancient Japanese mythology, miso is a gift from the Gods. We at the American Miso Company are striving to maintain the simplicity and purity of this previous gift."

On the front of the card: An illustration at the lower right shows a wooden keg of miso bound with three ropes that join at the top. The company logo of crossed sheaves of grain in a circle appears at the top right. Address: Box 541, Route 3, Rutherfordton, North Carolina 28139. Phone: 704-287-2940.

8204. Kagaku Gijutsu-cho, Shigen Chosa-kai (Science & Technology Bureau). 1984. Shitei shokuhin seibun hyô [Standard tables of food composition in Japan. 4th ed.]. Tokyo. 370 p. Introduction by R. Kagawa, Joshi Eiyo Daigaku. 28 cm. [Jap; Eng]
• ***Summary:*** Pages 76-80 gives a nutritional analysis of the following Japanese soyfoods: Soybeans: whole domestic (dry, or boiled), USA whole dry, Chinese whole dry. Green immature: raw, or boiled. Soybean sprouts: raw, or boiled. Defatted soybeans: whole, or dehulled. Kinako (roasted, ground soybeans). Budô-mame. Tofu: regular (momen), silken (kinugoshi), soft, packed, Okinawa tofu, grilled (yaki-dofu), nama-agé (deep-fried tofu cutlets), abura-agé (deep-fried tofu pouches), ganmodoki, kori-dofu, Tofu chikuwa (steamed, or roasted). Natto: Itohiki natto, goto-natto, tera-natto (fermented black soybeans). Miso: Rice koji miso (ama miso, light yellow miso, dark yellow miso), barley koji miso, soybean koji miso, dried miso, kinzanji miso, hishio miso. Okara. Soymilk: regular, reconstituted, soft drinks. Yuba: Fresh, or dried.

Page 254 gives the amino acid composition of soybeans, tofu, dried frozen tofu, yuba, okara, natto, and 3 types of miso. Address: Japan.

8205. Kikkoman. 1984. Kikkoman (Singapore) PTE. LTD. (Brochure). Tokyo: Kikkoman Corp. 9 p. [Eng]
• ***Summary:*** Construction of this plant began in Aug. 1983. "The completion of the facility in July 1984 was celebrated with a push-button ceremony to signal the beginning of Kikkoman Soy Sauce production in Singapore." The plant cost $14 million to build. The grand opening of the Kikkoman shoyu plant in Singapore was on 21 Nov. 1984. Located at 7 Senoco Crescent, Singapore 2775, the plant has a production capacity of 3,000,000 liters a year, an area of 18,000 square meters, and 40 employees. Address: Tokyo.

8206. Liu, Chiung-Pi; Shanmugasundaram, S. 1984. Frozen vegetable soybean industry in Taiwan. In: Proceedings of the Symposium on Vegetables and Ornamentals in the Tropics. See p. 199-212. Held 27-28 Oct. 1982 at Universiti Pertanian Malaysia, Malaysia. [Eng; mal]
• ***Summary:*** The term "vegetable soybean" refers to "immature green soybeans, either in pods or as shelled beans." Vegetable soybean varieties were introduced into Taiwan in about 1967 by Japanese trading companies. Frozen soybeans now constitute about 45% of all frozen vegetables exported from Japan, making them the most important and profitable frozen vegetable exported from Taiwan. Approximately 60% of Taiwan's frozen soybeans are exported through Japanese trading firms, especially C. Itoh Co. Ltd., Mitsui Bussan Co. Ltd., Mitsubishi Co. Ltd., Marubeni Co. Ltd., and Toshoku Co. Ltd. In 1981 Taiwan exported 25,000 tons of frozen vegetable soybean pods worth US$21 million to Japan. These frozen exports have been rising steadily since 1975, as shown in Fig. 1.

Although new varieties of vegetable soybeans are now being tested, 95% of the vegetable soybean area in Taiwan is planted with the variety Tsurunoko ("Child of the crane"), known to Taiwanese farmers as #205. In Taiwan an estimated 4,600 ha were planted to vegetable soybeans in 1980, increasing to 5,300 ha in 1981. Most of this area is concentrated in Pintung and Kaohsiung counties in southern Taiwan (just below the Tropic of Cancer), but significant amounts are also planted to the northwest in Changhwa and Taichung counties. The primary cropping season is autumn.

Table 6 shows expenditures (in US dollars per year) on selected foods in Taipei, Taiwan, from 1977 to 1981. The figures 1977–1981 for various soy-related foods are: Soybean curd (tofu) 7.9–7.1. Soybean curd cake (okara) 9.3–8.4. Soybean milk 3.0 (1978)–5.0. Vegetable soybean without pod 2.5–2.6. Soybean 0.5–0.6. Address: AVRDC, Tainan, Taiwan.

8207. Marukin Shokuhin: Nattô tabete, genki naru [Marukin Shokuhin: Eat natto and become healthy]. 1984. Kumamoto, Japan: Marukin. 10 p. 26 cm. [Jap; eng+]
• ***Summary:*** A solid but colorful introduction to Marukin Foods. Address: Kumamoto-shi, Japan. Phone: 096-325-3232.

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8208. Marusan-Ai Co., Ltd. 1984. Myônichi no shoku seikatsu o ninau. Atarashii daizu tanpaku shokuhin. Marusan sukoyaka tenpe [A new soy protein food for tomorrow. Marusan's healthful tempeh]. Okazaki city, Aichi prefecture, Japan: Marusan-Ai. 27 p. [Jap]
• ***Summary:*** Contains 7 recipes.

8209. Saito, Akio. 1984. [Chronology of soybeans in Japan, 1970 to 1984] (Document part). In: Akio Saito. 1985. Daizu Geppo (Soybean Monthly News). Feb. p. 16-18. [Jap]
• ***Summary:*** 1970–Soybean cultivation area in Japan drops to 95,500 ha, falling below 100,000 ha for the first time. Soybean cultivation area in Japan is nearly 10% of total cultivation area for all crops.

1970–Soybean imports rise to 3,243,790 tonnes, passing 3 million tonnes for the first time.

1972–Production of defatted soybean meal reaches 2,035,000 tonnes, topping 2 million tonnes for the first time. Production has risen 2.8 fold during the past decade.

1972–Production of deep-fried tofu pouches (*aburage*) reaches 200,000 tonnes.

1973–Soybean imports reach 3,635,000 tonnes, up 7% over last year despite U.S. export regulations.

1973–Some 2,740,000 tonnes of soybeans, representing about 80% of all soybeans in Japan, are crushed to make soy oil. 1973 Jan. 27–An extraordinary Cabinet meeting is held and the decision is made to import soybeans from the USA urgently. The price of soybeans in late 1972 was 3,000 yen per 60 kg sack but now it has become very difficult to get them even if you pay 15,000 yen per 60 kg. Soybeans are called "yellow diamonds."

1973 June 27–President Richard Nixon sets new regulations for U.S. soybean exports. These give the Japanese tofu, miso, and soy oil industries a big "shock."

1973 July 6–The Japanese government passes a new law that forbids soybean brokers or sellers in Japan from buying up and selling at inflated prices 16 important items–including soybeans.

1973 July 12–The Japanese Department of Commerce announces that it permits the export of soybeans for special food uses, such as tofu and high-quality misos, which were planted under previous contracts.

1973 Sept. 7–The U.S. Department of Agriculture removes all regulations that concern exports of agricultural products.

1973 Oct. 17–OPEC nations decide to regulate the production and supply of crude petroleum. This leads to huge price increases in petroleum products–known in Japan as the "oil shock." Japanese buy up toilet paper and wash detergents causing much confusion.

1974–Good quality miso now retails on average for 251 yen/kg, up 22.4% from last year. The average retail price of shoyu in Tokyo is 434 yen for 3 liters, up 33.5% from last year.

1974 Feb.–The Japanese Ministry of Agriculture and Forestry asks manufacturers of tofu, natto, deep-fried tofu pouches, and dried-frozen tofu to reduce the retail prices of their products to the levels they were at in November 1973.

1974 July 30–In order to get rid of AF2 (a preservative widely used in tofu), the City of Tokyo decides to make a public announcement of all foods which may contain AF2 and announces that food inspections will start immediately, on August 1.

1974 Aug.–The Japanese Ministry of Public Welfare forbids the usage of AF2.

1974 Oct.–The JAS food certification system, formerly applied to widely distributed foods, is applied to tofu, natto, konnyaku, etc., which are foods that are distributed over a small area.

1975–The typical price of Tofu in Tokyo is 60-70 yen per 300 gm. Yet in supermarkets it averages 50 yen, and some sell it for as little as 25 yen.

1976–Soybean production in Japan drops to 109,500 tonnes, the lowest level since 1878 when production statistics started to be recorded.

1978–The soybean cultivation area reaches 127,000 ha, topping 100,000 ha for the first time in 9 years.

1978–Soybean imports rise to 4,260,000 tonnes, topping 4 million tonnes for the first time. This is 4.5 times as much soybean imports as 20 years ago.

1978 Aug.–Unbranded generic foods, such as shoyu, miso, and salad oil, start to be sold. They retail for about 30% less than major branded products.

1979–Tofu production continues to rise, reaching 1,114,000 tonnes, and topping 1.1 million tonnes for the first time.

1980–Production of natto reaches 153,000 tonnes, up 33% compared with 10 years ago (when it was 115,000 tonnes).

1981–The area occupied by registered soybean varieties rises to more than 60% of total soybean area.

1981 Per capita consumption of miso drops below 6 kg/year to 5.9 kg/year, down 30% compared with 20 years ago (when it was 8.4 kg) This is a reflection of the health food movement in Japan.

1981 Sept.–Dr. Hirayama of the National Cancer Center announces that miso soup has some effect on lowering the death rate from stomach cancer, stroke, and sclerosis of the liver.

1981 Nov.–The Ministry of Agriculture and Forestry announces JAS (Japanese Agricultural Standards) for soymilk. The soymilk boom starts. The total yen value of the soymilk by all major Japanese manufacturers is 5,000 million yen.

1982–There are now 77 registered varieties of soybeans cultivated in Japan. Two of these (Norin 1-go and Norin 5-go) have a Norin [Ministry of Agriculture] number, and 25

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have various place names.

1982–Production of soybeans in Japan this year is 226,300 tonnes, and soybean imports are 4,344,000 tonnes–which is only 5% self sufficiency.

1982–Per capita consumption of soy oil rises to 5.1 kg, topping 5 kg for the first time. It is 3 times higher than it was 3 years ago.

1982–Production of defatted soybean meal reaches 2,800,000 tonnes–up 38% over the last 10 years.

1983–Production of soymilk in Japan rises to 116,724 tonnes, topping 100,000 tonnes for the first time. It has risen 71% during the past year.

1983–Per capita consumption of soybeans in Japan is 5.8 kg, up 3.6% during the past year.

1984–The use of soymilk as a beverage is declining in Japan. The movement to use more soymilk as an ingredient in foods (such as noodles, breads, ice creams, and creamy soups) is becoming more active.

1984–Soybean yields in Japan reach 1,770 kg/ha, an all-time record. The old record was 1,540 kg/ha in 1982. Address: Norin Suisansho, Tokei Johobu, Norin Tokeika Kacho Hosa.

8210. Shurtleff, William; Aoyagi, Akiko. comps. 1984. Soyfoods labels, posters & other graphics: 4. Soymilk and soymilk products. Lafayette, California: Soyfoods Center. 148 p. 28 cm.
• ***Summary:*** This book is a collection of black-and-white photocopies of materials ranging in date from 1975 to 1984. The books in this series, each a unique collection of graphic materials, are designed for a number of purposes: (1) To serve as a source of ideas, ingredients, inspiration, legal specifications, and basic guidelines for companies in the process of designing graphics for their own soyfoods company. (2) To document the tremendous diversity of soyfoods products and ways of introducing them to the public. (3) To document, through this, the rise and history of the soyfoods industry and market in the Western World.

Contents: Soymilk: Labels and packages, posters, recipes. Second generation soymilk products.

Note 1. All labels, posters, and other graphics relating to soymilk ice cream are in our book titled *Tofutti & Other Soy Ice Creams.* Most of these contain isolated soy proteins or tofu as the major ingredients.

Note 2. This book contains photocopies of Japanese soymilk packages (the most popular brands in Japan). Translations and analyses of the contents of each of these labels are given in Chapter 25 of Soymilk Industry and Market. Translation includes analysis of ingredients, nutritional composition, percent solids, package type, and shelf life. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8211. Soybeans and soybean products. Quick & easy nutritious Japanese cooking no. 1. 1984. Chiyoda-ku, Tokyo: Joie, Inc. 116 p. Illust. No index. 27 cm.
• ***Summary:*** A beautiful cookbook, in which every recipe is illustrated with a color photo. Contents: Preparation tips. Metric tables. Soybeans with meat. Soybeans with eggs. Soybeans with fish. Soybeans with vegetables. Soybeans with seaweed. Yuba. Unohana [okara]. Natto. Koya-dofu. Ganmodoki. Aburage. Atsuage. Grilled tofu. Tofu salads. Deep-fried tofu. Tofu with oysters or kelp. Tofu with shrimps. Tofu with fish. Tofu with meat. Tofu with vegetables. Tofu soups. Tofu. Preparatory techniques for tofu. Information: Glossary, basic recipes.

Note: The publisher is also listed as Japan Publications, Inc. Address: Joie, 1-8-3 Hirakawa-cho, Chiyoda-ku, Tokyo 102, Japan.

8212. Wood, B.J.B. 1984. Progress in soy sauce and related fermentations. *Progress in Industrial Microbiology* 19:373-409. M.E. Bushell, ed. Modern Applications for Traditional Biotechnologies. [100 ref]
• ***Summary:*** Contents: Introduction. Soy sauce: Introduction, raw materials and koji, the *unami* taste, defatted soybean meal, microbiological considerations, moromi stage of fermentation, refining of and properties of shoyu, patents, work with Japan. Miso. Tempeh. Conclusions.

Tables show: (1) Glossary of terms used in soy sauce and similar fermentations: *Koji, miso* (*hatcho, mame, mugi, genmai, kome*)*, moromi, shoyu* (*koikuchi, usukuchi, tamari, shiro, saishikomi*)*, tamari, teriyaki.* (2) Recently published national standards for soy sauce, miso, etc. (cites 8 standards, 5 from Taiwan and 1 each from Thailand, Malaysia and USA). (3) Recent patents relating to shoyu and miso production and processing: Japanese 1980 shoyu (13 patents), Japanese 1981 shoyu (11), USA 1979 (2), USA 1980 (2), Japanese 1979-1981 miso (8), USA tempeh 1979-1980 (3 patents). (4) Japanese journal titles and their English translations (11 journal frequently cited in FSTA–Food Science and Technology Abstracts). Address: Applied Microbiology Div., Dep. of Bioscience and Biotechnol, Univ. of Strathclyde, Glasgow, G1 1XW, Scotland.

8213. Yamaoka, Masako 1984. A first book of Japanese cooking. Tokyo: Kodansha International. 156 p. Illust. (Photos by Tamihisa Ejiri, some color). Index. 27 cm.
• ***Summary:*** An excellent introduction to Japanese home-style cooking. A color photo (p. 23) shows: Freeze-dried tofu [dried frozen tofu] and the box in which it is sold, thick deep-fried tofu [atsuage, tofu cutlets], thin deep-fried tofu [aburaage, tofu pouches], "silk" tofu, "cotton" tofu, okara in a clear glass bowl, a box of House Hon Tofu Mix [instant homemade silken tofu].

The chapter titled "Ingredients" (p. 25-33) is an excellent glossary Japanese ingredients. Entries include: Agar-agar (kanten). Ginger, fresh (shoga). Ginger, red

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vinegared (beni-shoga), Ginger, sweet vinegared (amazu-shoga). Kelp, dried (konbu). Miso (fermented soybean paste). Nori seaweed (nori). Pickled plum (umeboshi). Sesame seeds (goma). Soy sauce (shoyu). Tofu (tofu; bean curd), incl. okara and the various types shown on page 23. Wakame seaweed (wakame).

Okara is mentioned throughout this book.

A recipe for Homemade tofu (p. 79-80) ("Ultimate freshness and flavor." Making tofu at home also yields a high-protein byproduct known as okara, or tofu pulp, an almost flavorless food substance that absorbs other flavors extremely well and supplies bulk and roughage).

Note. This is the earliest English-language document seen (June 2013) that uses the term "tofu pulp" to refer to okara.

A recipe featuring okara (p. 86) is Okara and vegetable melange (Iriokara, with "1½ cups fresh okara {tofu pulp}, about 9 oz {250 gm"}). A recipe for Simmered soybeans and vegetables (*Gomoku nimame*) (p. 93-94) calls for "1½ cups dry soybeans."

On pages 151-52 is a directory of "Oriental food shops in the United States," arranged alphabetically by state, and within each state by company name. Address: Teacher of home-style Japanese cooking, Japan.

8214. American Soybean Assoc. 1984?. Soybean meal places cost first, tradition second for Japanese hog producers. *Checkoff Successfile.* Japan #108. 2 p. Undated. Address: St. Louis, Missouri.

8215. **Product Name:** [Fuji-Nikku].
Manufacturer's Name: Fuji Oil Co. Ltd. (Fuji Seiyu).
Manufacturer's Address: Nissei Midosuji Hachimancho Building, 6-1 Hachimancho, Minami-ku, Osaka 542, Japan.
Date of Introduction: 1984?
New Product–Documentation: Toyo Shinpo. 1984. June 1. Fuji Seiyu now has a corner called the Soy Protein Foods Corner (Daizu Tanpaku Shokuhin Konaa) in an Osaka Department store.

8216. *Toyo Shinpo* (*Soyfoods News*). 1985. Ninki no aru tôfu ryôri-ten [Popular new tofu restaurants in Japan]. Jan. 1. p. 48. [Jap; eng+]

8217. American Miso Co., Inc. 1985. The secret of Japanese miso comes to America (Ad). *East West Journal.* Jan. 4.
• ***Summary:*** This full-page, black-and-white ad begins: "At last! The ancient traditions of the Japanese miso-making art have been carefully and lovingly carried to America by the American Miso Company, the proud now caretaker of traditions passed down from Master to Miso-Master for many centuries." This miso is made from the finest ingredients, including organic rice, barley, and soybeans. "Last and perhaps most important, our miso is unpasteurized, unlike so many other misos. This leaves intact the beneficial lacto-bacillus and enzymes so essential for proper health and food digestion, and imparts the savory aroma, outstanding character, and mellow taste so prized in unpasteurized miso. The American Miso Company logo, crossed sheaths of grain in a circle, is at the bottom center of the ad.

Photos show: (1) A 1-lb package of the company's barley miso in a plastic bag with a one-way pressure release valve. (2) Jan Belleme, with a baby (Justin) on her back, mixing koji–her hands up to the wrists. (3) A bearded employee [Bob Zullo] moving a huge wooden vat of miso using an hydraulic dolly. Address: Box 541, Route 3, Rutherfordton, North Carolina 28139. Phone: (704) 287-2940.

8218. Fabricant, Florence. 1985. Sushi to go takes off in New York. *New York Times.* Jan. 6. p. C3.
• ***Summary:*** "Japanese restaurants with sushi bars have become commonplace throughout New York City, but now people can have sushi to go, delivered to the door or for pickup."

Review's four restaurants offering such sushi, including Obento Delight (152 Seventh Ave. South). "Inari sushi, consisting of deep-fried bean curd wrappers enclosing vinegared rice, is an interesting change of pace."

8219. Fabricant, Florence. 1985. Biblical name and Japanese food: Dining out. *New York Times.* Jan. 20. p. L_I_19.
• ***Summary:*** This is a review of the two-star Japanese restaurant Naomi (Great Neck, New York). "The list of sushi preparations is one of the most complete you are likely to find and it includes some of the less typical items such as... inari sushi puffs of deep-fried beancurd filled with vinegared rice..."

Note: This is the earliest English-language document seen (April 2013) that contains the term "deep-fried beancurd" (regardless of hyphenation).

8220. **Product Name:** Natural Soya Chips. Low Sodium [Zesty Miso, or Chili Vegetable].
Manufacturer's Name: Edward & Sons Trading Co. (Importer). Made in Japan.
Manufacturer's Address: P.O. Box 3150, Union, NJ 07083.
Date of Introduction: 1985 January.
Ingredients: Incl. okara.
Wt/Vol., Packaging, Price: Bag. Retails for $1.59.
How Stored: Shelf stable.
New Product–Documentation: Ad in Vegetarian Times. 1985. June. Inside front cover. "Crisp & Delicious soybean snacks. The soyfoods revolution marches on with Soya Chips... Natural Soybean Snacks in two scrumptious flavors."

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8221. Fukushima, Danji. 1985. Fermented vegetable protein and related foods of Japan and China. *Food Reviews International* 1(1):149-209. [99 ref]
• ***Summary:*** Introduction. Historical aspects of soy sauce and miso. General description of fermented vegetable protein foods: Soy sauce (varieties, manufacturing, flavor components and quality evaluation), miso, natto, sufu (fermented product of tofu), fermented soy milk. Microbiology, biochemistry and nutrition: Role of koji as enzyme source (unique sources of enzymes, peptidases in koji, role of proteinases and peptidases in koji during protein digestion, role of glutaminase in koji in formation of glutamic acid during protein digestion), effect of heat treatment of soybean proteins on their digestibility and nutritive value (enzyme digestibility and yield of soy sauce, enzyme digestibility and nutritive value of protein), basic mechanisms for protein coagulation, microorganisms during brine fermentation in soy sauce and miso (change of microflora during brine fermentation, properties of *P. halophilus,* properties of *S. rouxii,* properties of *Torulopsis* species), nutritive value, safety and anticarcinogenicity of fermented foods. Future of traditional vegetable protein foods made through fermentation. References. Address: Food Science Research Lab., Kikkoman Corp., Noda-shi, Chiba-ken, Japan.

8222. Harayama, Fuminori; Yasuhira, Hitomi. 1985. Rhizopus-zoku ni yoru miso jôzô ni tsuite. I. [Application of the genus *Rhizopus* for miso manufacturing. I. Studies on fermented soybean food manufacture using various molds]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 80(4):281-86. [17 ref. Jap; eng]
• ***Summary:*** Two strains of *Rhizopus* with high protease activity and low spore-forming capacity, *R. oryzae* IFO 5418 and *R. japanicus* IAM 6002 were used instead of *Aspergillus oryzae.* Miso obtained had more lactic acid and lower pyroglutamic acid contents, less creaminess, harder consistency, more clear color, and flavor with unique aroma compared with ordinary miso. Address: Shinshu-Miso Research Inst., 469-6 Nakagosho, Nagano-shi, Nagano-ken 380, Japan.

8223. Saito, Akio. 1985. Daizu bunka-shi nenpyô [Chronology of soybeans, 122 B.C. to 1984]. *Daizu Geppo* (*Soybean Monthly News*). Jan. p. 12-16; Feb. p. 10-18. 28 cm. [Jap; eng+]
• ***Summary:*** This very interesting, well-researched, and detailed chronology, which is full of new information, focuses on the development of soybeans and soyfoods in Japan. We have divided the contents of the chronology into 9 separate records; the date of each corresponds to the last year in that part of the chronology: 1292, 1599, 1699, 1868, 1899, 1926, 1949, 1969, and 1984. Address: Norin Suisansho, Tokei Johobu, Norin Tokeika Kacho Hosa.

8224. Shirakawa, Takeshi. 1985. Tôfu no hozonsei no kôjô ni kansuru kenkyû. I. Tôfu no hensei henpai ni tsuite [Studies on improving the storability of tofu. I. On the slimy spoilage of tofu (soybean curd)]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 32(1):1-6. Jan. [8 ref. Jap; eng]
• ***Summary:*** *Acinetobacter calcoaceticus* was isolated as the causative organism, secreting viscous polypeptides into the water surrounding the tofu. Address: Takamatsu Branch, Kagawa Prefectural Fermentation & Food Exp. Station, Gohto-cho 587-1, Takamatsu-shi, Kagawa 761, Japan.

8225. Chen, Shi-Jue. 1985. [A breakthrough in flavor! Soynut snacks are delicious and nutritious]. *Min-Sheng Daily News* (*Taiwan*). Feb. 1. [Chi]
• ***Summary:*** "Nutritionists have long agreed on the nutritional value of soybeans, and countless processed soy products are now available. In the last few years, chemists and nutritionists have recommended simpler processing methods which utilize the whole bean. Recently, an American foods firm brought out a new line of whole-bean soy products called 'Soynut Snacks.' The product is beautifully packaged, and reminds one that in progressive food companies, new products are developed with the awareness that nutrition and flavor are equally important. Business firms and manufacturers are also realizing that they can capitalize on this generation's unprecedented emphasis on nutrition.

"Soynut Snacks, much like chocolate candies, are packed in sectioned boxes. There is one compartment for each of the seven flavors of soynuts, including: two candy-coated flavors, carob and butter toffee; and five other flavors: salted, unsalted, onion-garlic, barbecue, and yogurt. The boxes come in three sizes: 327 grams, 623 grams, and 1846 grams, selling at US$ 6.95, $9.95, and $15.25.

"Loose-packed soynuts come in a 25-lb. (11.35 kg) size at US$23.70, and a 5-lb. (2.27 kg) size at us $5.00. Suitable for consumers is a small package weighing 36 grams and selling at 17 cents.

Six or seven years ago, American firms were already marketing Soynut Snacks in two flavors, carob-coated and salted. This apparently novel idea was actually inspired by peanut products. Nevertheless, Soynut Snacks, which use the whole soybean, have even more selling points. Besides being cheaper, they are lower in calories. Their fat content is less than that of egg white. Most importantly, this product has been well received by the public.

"Just before Christmas of 1983, the full line of Soynut Snacks finally appeared. Their largest market was Illinois, as this state is America's principle producer of soybeans. Last year [1984], sales of Soynut Snacks exceeded those of the year before. Last November, Soynut Snacks somewhat unexpectedly sold out during a shopping rush at Tokyo's

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major department store!

"For this generation, nutrition is a primary consideration when choosing snacks and desserts. Accordingly, besides serving as snack food, Soynut Snacks also appear at restaurant salad bars. Sprinkled with a few soynuts, salads are even more delicious and nutritious. Soynuts also add flavor on top of ice cream and in desserts. In Chinese-style breakfasts, soynuts can substitute for peanuts in congee (rice gruel) for a great new taste." An overhead photo shows a round sampler of confection coated soynuts.

8226. *Toyo Shinpo* (*Soyfoods News*). 1985. [Tofu sausage. Made from 100% whole soybeans (Ad)]. Feb. 1. p. 3. [Jap; eng+]

8227. *Toyo Shinpo* (*Soyfoods News*). 1985. Osaka de ninki no aru tôfu ryôri-ten [Popular tofu restaurant in Osaka. Tofu Messengers "Top Chef"]. Feb. 1. p. 6. [Jap; eng+]

8228. Hatsuhana. 1985. Hasuhana (Ad). *New York Times.* Feb. 10. p. 735.
• ***Summary:*** A half-page ad for this Japanese restaurant at 17 East 48th St. Most of the ad is devoted to the menu, which is divided into appetizers and entrees. Appetizers include: "Soy bean [miso] soup. Geso yaki, broiled squid feet with butter, salt or soy bean paste / miso. Hiya yakko, cold soy bean curd [tofu]. Oshitashi [O-shitashi, O-hitashi], spinach prepared in a delicate sesame and soy sauce. Toro natto, chopped fatty tuna with aged soy beans in a cup.

Many of the entrees are nori-wrapped sushi.

8229. *Asahi Shinbun.* 1985. Nihon no daizu kakôgaku manabu. Nepaaru no Baideya-san. Kuni de gijutsu ikashitai. Kyô jôkyô. Hirogaru kaigai kyôryoku no wa [Mr. Vaidya of Nepal is studying soybean processing in Japan. Hoping to use the techniques at home, he arrived today in Tokyo, expanding international cooperation]. Feb. 14. [Jap]
• ***Summary:*** Mr. Vaidya was invited by the Rotary Club to come to Japan to learn how to make soyfoods. He will be learning about tofu, miso, and shoyu. A photo shows Mr. Vaidya making tofu at Senhachi [Senpachi?] tofu shop at Yajima-cho, Yamadera, Japan. Address: Japan.

8230. *Toyo Shinpo* (*Soyfoods News*). 1985. Wara ga te ni hairazu... Pinchi no Mito nattô [Rice straw is hard to get... Mito natto is having a hard time]. Feb. 21. p. 9. [Jap; eng+] Address: Kyoto, Japan.

8231. *Australian Dairy Foods.* 1985. Soy report: Soy blends to overcome disadvantages? Frozen soybean desserts. Technology is here for soy beverages. Feb. p. 46.
• ***Summary:*** Blends of soymilk and dairy milk are being considered in Australia. Address: Australia.

8232. Boyer, Robert A. 1985. Reminiscences: Automotive design–Oral history project. Dearborn, Michigan: Henry Ford Museum and Greenfield Village. 130 p. Accession #1673.
• ***Summary:*** This is the transcript of an interviews conducted by Dave Crippen of the Henry Ford Museum on 7 Feb. 1985 at Mr. Boyer's home in Dunedin, Florida. It covers all aspects of Boyer's work with soybeans at the Ford Motor Co., including: Growing up in Royal Oak, Michigan; his father worked in the accounting department of the Ford Motor Co. at Highland Park, Michigan (p. 1). Boyer's first meeting with Frank Campsall (p. 2). Growing up at the Wayside Inn (the oldest hotel in America, in South Sudbury, Massachusetts, p. 1-6). Attending high school in Framingham, Massachusetts (p. 6). First meeting with Henry Ford when the two ice skated together on the mill pond behind the Wayside Inn (p. 7). Moving to Dearborn in Sept. 1927 to attend Ford's Trade School (p. 7-11). Early work at the chemical plant (quarter-size model of Iron Mountain plant) in Greenfield Village (p. 12-13). Ford's trip to Germany [Peace Ship to Europe, in 1915 during World War I?] crystallized a lot of his thinking. The Great Depression and the origins of his chemurgic thinking. In 1934 the first National Chemurgic Conference was held at Dearborn Inn; Boyer was in charge of the program. Mr. Irenee DuPont attended and Mr. Ford spent a lot of time with him. Before that, the DuPonts and the big banks did not trust Ford. (p. 14). Opening of Greenfield Village in late 1929 on the 50th anniversary of Edison's first successful light bulb (p. 15). Chemical experiments on truckloads of farm crops using a retort; Frank Calvert (p. 16-19).

Experiments starting in about 1933 using hexane as a solvent to extract the oil from soybeans; the Ford Extractor (p. 20-23). Boyer's group wanted to get pure protein from soybeans. So "in the lab we developed our own process for extracting the oil... We used hexane solvent, like dry cleaning. We'd flake the beans and run them through a pipe that was full of hexane on an angle with a screw in it." Hexane solvent is "distilled out of petroleum. It has a very narrow boiling point–66º centigrade. The Ford extractor... got quite a lot of attention. We built it across the street from the chemical plant. It was about 150 feet away. Mounted it all by itself because everybody was afraid of fire." A roof was built over it but no walls. It was probably built in about 1933.

In 1933 at the World's Fair [sic, the Ford Exposition of Progress] in New York City, Boyer's group had a glass model (on a table) of this extractor that used hexane solvent.

Note: Ford boycotted Chicago's A Century of Progress Exposition which opened in 1933, in part to call attention to the company's 30th anniversary; he held his own "industrial fair," first in Detroit and then in New York, in late 1933. *Business Week* described it as "the greatest industrial show ever held." Some 2.3 million people attended the two-week

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show in New York.

A working model of the Ford extractor, using hexane solvent, was at the Chicago World's Fair, starting in mid-1934, in the Ford Industrial Barn. "They would never let you do that today. Too dangerous."

Research on purified soy protein and soy plastics with formaldehyde; Bakelite (p. 24-25). Use of soy oil for foundry core binders for casting the Ford V-8 engine block; thus, the soy experiments are now commercialized. Building a 50 ton/day extractor (p. 26-27). Spinning soy protein fiber like rayon, based on spinning milk protein in Italy. Using the fibers to make wrinkle resistant synthetic wool, a suit of clothes for Henry Ford and others, overcoats, neckties, felt hats. "We also found that these fibers blended in very well with rabbit fur for making men's felt hats. So the Hat Corporation of America took all the fiber we could make. It wasn't very much and they would blend it in with rabbit fur. And they actually had them [the men's felt hats] on the market." Rabbit fur is very expensive (p. 29-36). Ford's suit of clothes contained 65% wool and 35% soy fiber. Boyer leaves Ford Motor Co. in 1943. Problem with fiber was tensile strength, especially wet strength. Ford's interest in this fiber work, and his fitness at age 75 (p. 37-38). Ford "was not a true vegetarian but he was pretty close" (p. 38). Edsel Ruddiman's work with foods (p. 39-47). Boyer and Ruddiman attend American Soybean Assoc. soybean conference in Washington, DC [in Sept. 1932] where they saw "leather-like products that the Chinese make" [yuba]. Boyer tried unsuccessfully to use the idea to make "synthetic leather." USDA's experimental farm in Holgate, Ohio, where many soybeans sent back by W.J. Morse were tested (p. 40-42). Work with soybean milk (p. 43-46). The executive dining room in the Engineering Laboratory. Henry Ford invited Boyer to lunch there about 6 times (p. 45). Development of soy ice cream; lipoxidase enzyme inactivation (p. 45-46).

Visits to Battle Creek, Michigan and Dr. John Harvey Kellogg (p. 47). Boyer's work was with industrial products; the plastic car and structural plastics with hemp, flax, and phenol formaldehyde (soya protein Bakelite resin) (p. 47-64, 70). Making trunk lids using a hydraulic press (p. 50). Ford's famous axe demonstration on a trunk lid (p. 50-52). Lowell Overly and Joe Stewart (p. 53-56, 61, 78-79). Boyer drives the plastic car home (p. 63). Ford's aim with the plastic car: to provide industrial markets for farmers (p. 65). World War II stops plastic car development (p. 65-66). Contract to build an airplane wing of plastic (p. 66-70). The plastic lid and car contain little or no soy (p. 70). Fiberglass and the Chevrolet Corvette (p. 71). Plexiglas and the B-24 bomber made at Willow Run (p. 72). Edsel Ford's death of stomach cancer in the spring of 1943 and its effect on his father, Henry (p. 73-74). Ending work with soy fiber (p. 74).

Boyer leaves Ford in 1943 and goes to work for Drackett Co. in Cincinnati, Ohio. Wife needs to leave Detroit. After 1943 Boyer's career really takes off. Dr. Gangloff (p. 75-77). Use of soy fiber by Drackett in felt hats. "We sold them a lot of fiber and we decided to build a bigger plant." Building a protein plant and a fiber plant in Cincinnati big enough to supply the hat company's demands and larger "than we needed just to supply our fiber operation." They also had a big operation in Cincinnati for high-impact (not structural) plastic (p. 78-80). Drackett's marketing people knew how to market Windex and Drano "but they had no feeling for the soybean operation. So when Mr. Drackett died, they sold the whole soybean plant to Archer-Daniels-Midland (ADM, p. 81-83). Before Mr. Drackett died, Boyer's division had developed commercial soy products, and Drackett was making money on the plastic (phenol formaldehyde plus hemp) and the fiber (p. 81). Use of soy protein as a paper coating (p. 83). ADM finally closes the old Drackett protein plant and sells it to Central Soya, which used the million bushel elevator capacity for storage (p. 83-84).

Shortly after Mr. Drackett died, Boyer left Drackett to work on his edible soy fiber, where he owned patents. "If we can make a fiber from soy protein that resembles the outside of a sheep, why not make a fiber that will resemble the inside (p. 84-86). Idea of building an edible soy protein plant is in Cincinnati, with Mr. Drackett's approval (p. 87). Boyer tries to find companies to license rights to his landmark patent: Virginia Carolina Chemical (Taftville, Connecticut, p. 88); Swift & Co. (p. 89-92); Unilever, which was interested in peanut protein in Africa and at Port Sunlight near Liverpool (p. 92-94, 112-13); General Foods and Nabisco (Fairmont, New Jersey research lab) (p. 94, 99). Unilever and Swift pay licensing fees of $20,000 a year plus consulting fees. General Mills and Ralston Purina (p. 94-95). Why Swift dropped its interest (p. 95-96). General Mills and Bacos (p. 96). Patent expires in 1971 after 17 years (p. 96). Worthington Foods (p. 97). Ralston Purina was getting into protein. In about 1956-58 they "had bought Procter & Gamble's protein plant in Louisville [Kentucky], which was making industrial protein for paper coating" (p. 98). Worthington Foods was too small to make their own soy protein fibers, so Ralston Purina made it for them (p. 78-80). Ralston Purina's great success with edible soy protein and their small conflict: pet food vs. human food (p. 100-01). From 1961 to 1971 Boyer was receiving licensing fees / patent royalties from Ralston Purina, Worthington, and General Mills (p. 102). General Mills and Bacos (p. 103-04). Ralston Purina's patent lawsuit against Far-Mar-Co. Ralston won $8 million. Boyer testified as an expert witness (p. 104-05).

Boyer remarries and retires in 1971 (p. 102, 105, 107). Subsequent work with Miles and Worthington; the Morningstar Farms line (p. 105-08). Companies now spinning soy protein fiber (two in the Netherlands, one in Japan, one in Australia). Ford Foundation was not interested in his work with soy protein for Third World nations (p. 110). Central Soya bought the ADM plant that was located in

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Chicago (p. 113-14). Kellogg's Corn Soya breakfast cereal (p. 114-15). Worthington's Soyloin Steaks; all early Kellogg and Worthington vegetarian products based on wheat gluten (p. 119). When Worthington bought Battle Creek they got their lady research director; she worked at Worthington until she was quite elderly. Boyer visited her in her lab at Battle Creek several times (p. 119-20. Note: Josephine F. Williams was in charge of the lab and product development at Battle Creek, where she worked closely with Dr. John H. Kellogg. She kept similar positions at Worthington Foods, according to Ron McDermott). Henry Ford as a soybean pioneer and visionary. The soybean is now America's No. 2 cash crop and also our second largest earner of foreign exchange. "That really started from Ford. When we first started in 1931, hardly anybody ever heard of the soybean, and Henry Ford's penchant for publicity publicized the soybean... He certainly made it popular and made people become aware of it. Today it's darned important." He should be remembered as the "Father of the Soybean." "I always thought it would be nice if they would rebuild the [Soybean] laboratory [in Greenfield Village] or restore it like it was when we were doing the soybean work and give it the real credit that it deserves..." (p. 120). After Henry Ford died in 1947 his family wanted no part of any of his pet projects. They completely eradicated the old Ford company (p. 121). Henry Ford was deeply interested in the welfare of American farmers. His tractors and Model T were of great use to them (p. 121). Origins of Ford's interest in chemurgy; William Hale and Dow Chemical Co. in Midland, Michigan; the first three chemurgic conferences in Dearborn, Michigan, in May 1935, 1936, and 1937 (p. 122-27). Ford and Ruddiman establish a complete canning line for good-tasting green soybeans on the outskirts of the Ford estate. The equipment was quite expensive. When World War II threatened, Ford gave it to Michigan State University to teach canning to students. (p. 129-30). Boyer's personal impressions of Henry Ford (p. 128-30). Address: 632 Edgewater Dr. #731, Dunedin, Florida 33528.

8233. Kawashima, Noriko. 1985. Tenpe ryôri no are kore [Various aspects of tempeh cookery]. *Daizu Geppo* (*Soybean Monthly News*). Feb. p. 32-35; March. p. 40-43; May. p. 36-41. [Jap]
• ***Summary:*** This 3-part article contains numerous tempeh recipes (Japanese-, Indonesian-, and Western style) and black-and-white photos of them. Address: Tenpe Ryori Kenkyuka (Wife of Kawashima sensei).

8234. Kikkoman International Inc. 1985. Analysis of Kikkoman Instant Soups. 50 California St., Suite 3600, San Francisco, CA 94111. 1 p. Unpublished manuscript. [1 ref]
• ***Summary:*** Gives a complete nutritional analysis for four packaged miso soups (aka miso, shiro miso, tofu, wakame), and Osuimono. They have a moisture content of 2.1–4.4%. Protein is 11.5–23.9%. Typically 10 gm of the dry soup is mixed with 2/3 cup water. Address: San Francisco, California. Phone: 415-956-7750.

8235. Kitagawa, Isao; Saito, M.; Taniyama, T.; Yoshikawa, M. 1985. Saponin and sapogenol. XXXVIII. Structure of soyasaponin A_2, a bisdesmoside of soyasapogenol A, from soyabean, the seeds of *Glycine max* Merrill. *Chemical and Pharmaceutical Bulletin* 33(2):598-608. Feb. [22 ref]
• ***Summary:*** Two new bidesmosides of soyasapogenol A (1), named soyasaponin A-1, and soyasaponin A-2 (7) were isolated from the soybean. The structure of soyasaponin A-2 was elucidated. Address: Faculty of Pharmaceutical Sciences, Osaka Univ., Japan.

8236. Nagai, Morichika; Hisamatsu, Ikuko. 1985. [Healthful cooking with kinako (roasted soy flour). Effective in preventing heart disease, high blood pressure, and cancer]. *Soken Life.* Feb. p. 160-66. [Jap]

8237. Ochiai-Yanagi, Sonoe; Galeazzi, Maria A.; Saio, Kyoko. 1985. Properties of soybeans in model storage studies. *Agricultural and Biological Chemistry* 49(2):525-28. Feb. [6 ref]
• ***Summary:*** Various studies have found that the storage conditions are very important for soybeans that will be used to make food products. Low humidity is especially important, even if the temperature is high, in preserving the original soybean properties, including some enzyme activities.

The acid value of soybeans is determined by grinding the dry soybeans, extracting the oil with petroleum ether, then measuring the amount of potassium hydroxide (KOH) needed to neutralize it.

The varieties Enrei and Koganedaizu were studied. Enrei had large seeds (weighing 35 gm per 100 seeds) and high protein content (78.8 mg of nitrogen per gm of dry weight). When stored under the various conditions tested, the moisture content of Enrei gradually decreased for the first 6 months, then remained constant after that. Address: 1&3. National Food Research Inst., Ministry of Agriculture, Forestry and Fisheries, Kannondai, Yatabe-machi, Tsukuba-gun, Ibaraki 305, Japan; 2. Faculty of Food Engineering and Agriculture, Univ. of Campinas, Cidade Universitaria, Campinas 13100, Brazil.

8238. Robeznieks, Andis. comp. 1985. Facts & figures. *Vegetarian Times.* Feb. p. 17.
• ***Summary:*** $150 million: Total retail sales of American health food stores in 1973.

$2,800 million: Their retail sales in 1983.

53.1: Percentage of *Vegetarian Times* readers who use tofu at least once a week.

$32,000 million: The amount of money Americans

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spend on cigarettes each year.

$11,000 million: Amount of money Japanese government spent on defense in fiscal 1983.

49,275: Number of monkeys and apes used each year in the U.S. for research.

15 million: Number of dogs and cats killed by local humane societies.

8239. Shedlin, Michael. 1985. Tofu: That chameleon of the food world. *Monterey Life* (*Monterey, California*). Feb. p. 12.
• ***Summary:*** Buck and Leslie Patton, owners of Jack and the Beanstalk, make tofu in Carmel Valley Village. They do all the work themselves with the help of one part-time assistant. The Pattons bought the compact production facility in 1983 from the previous owner, who had studied with a Japanese tofu master and passed the techniques on to the new owners. The company has about 60 accounts, delivering to local Japanese restaurants, and to retail food shops and supermarkets, including Safeway. They also distribute in San Francisco, Big Sur, Salinas, Santa Cruz and Tassajara. They make 1,700 lb/week of nigari tofu. A nice 3.5 by 4.5 inch black-and-white photo shows Buck and Leslie Patton in their tofu shop in front of equipment (hydraulic press and pressure cooker), showing Pure-Pak type tofu cartons.

8240. Shurtleff, William; Aoyagi, Akiko. 1985. Tofutti & other soy ice creams: Non-dairy frozen dessert industry and market. 2 vols. Lafayette, California: Soyfoods Center. Vol. 1, 144 p. Vol. 2, 214 p. Index. Feb. 28 cm. [129 ref]
• ***Summary:*** The first study of the rapidly emerging soy ice cream market, based on historical principles. Contents: Volume I. 1. Introduction. 2. What are non-dairy frozen desserts? Standards, terminology, and labeling laws. 3. History of non-dairy frozen desserts. United States and Canada (1918–present), History of Tofu Time Inc. and Tofutti, East Asia (1936-), Europe (1946-), Third World countries (1970-), Australasia and the Middle East.

Pages 75-92, titled "The Tofutti Era and Tofutti Clones, contain histories and descriptions of four categories of non-dairy ice cream companies. Within each category, the companies are listed in the sequence that their products appeared: (1) Small soyfoods companies: Penguino's Inc. (New York), Green World (Idaho), Garden of Eatin' (California), Soy City Foods (Ontario, Canada), The Soy Shop (Georgia), Metta Tofu Co. (British Columbia, Canada), Island Spring (Washington state), Evolutionary Foods (Arizona), Midwest Tofu & Sprouts Co. (Nebraska), Cream of the Bean (Illinois). (2) Soyfoods companies that used a mixture of tofu or soymilk and soy protein isolates to make Tofutti-type products: Brightsong Light Foods (California), Farm Foods (Tennessee), White Wave (Colorado). (3) Dairy companies (or non-soyfoods companies) that launched Tofutti-style products: Presto Food Products (California), Colombo, Inc. (Massachusetts), Honey Hill Farms (California), Continental Yogurt (California), Gloria Vanderbilt / Frusen Gladje Ltd. (New York), Barricini Foods Inc. (New York), Parvelle Corp. (New York), Carvel Corp. (New York), Tuscan Dairy Farm (New Jersey), Golden Seal Riviera Ice Cream Co. (New York). (4) Innovative makers of non-dairy frozen desserts that are not soy-based: Olympus Industries (Washington, Yodolo), and Imagine Foods (Arkansas, Rice Dream).

4. The soy ice cream industry and market in the U.S. and worldwide. 5. Nutritional value of soy ice cream. 6. Directory of people, organizations, and publications connected with non-dairy frozen desserts. 7. Tofu standards and soy ice cream. 8. Technical information on soy ice cream production. Ingredients and sample ingredient listings; Formulas and processing techniques. 9. How to calculate the amount of tofu in a tofu ice cream. 10. Bibliography (129 entries). 11. Index. About The Soyfoods Center.

Volume II. Documents and Graphics Related to Soy Ice Cream. This volume contains early historical and current popular articles, product labels, posters, graphics, and corporate brochures. A rich source of information for marketing and product development, these also document the rapid growth of soy ice creams worldwide. The publication is not paginated. Contents: 12. Early history (1918-1969). 13. Farm Foods and Ice Bean (1974-). 14. Tofu Time and Tofutti (1980-). 15. Other Soy Ice Creams and General (1976-). 16. Technical information on soy ice cream production. This last section lists ingredients and recipes, and discusses regulations, labeling, production processes, and quality of soy-based frozen desserts–largely ice cream, but also popsicles, sherbets, custards, etc. Fermented or cultured soymilks are also discussed briefly.

As of Jan. 1998, both volumes are bound as one.

Note 1. This is the earliest document seen (Oct. 2001) that contains industry or market statistics for soy ice cream by geographical region.

Note 2. This is the earliest English-language document seen (Sept. 2013) that discusses the etymology of soy ice creams and non-dairy frozen desserts.

Note: The story of "The man who introduced David Mintz to tofu and soy ice cream: Pesach Lazaroff," does not appear in this book. The story was not uncovered until Oct. 1986. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8241. Shurtleff, William; Aoyagi, Akiko. 1985. Brief history of Presto Food Products and Mocha Mix (Document part). In: Shurtleff and Aoyagi. 1985. Tofutti & Other Soy Ice Creams: The Non-Dairy Frozen Dessert Industry and Market. Vol. 1. 145 p. See p. 30, 49, 103, 108-09, 113, 117, 131. [2 ref]
• ***Summary:*** Presto Food Products was a pioneer in using isolated soy proteins in non-dairy products. Founded in June 1936 by Melvin S. Morse in Kansas City, Missouri,

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the company acquired a franchise from the Instant Whip Company in Columbus, Ohio to make Instant Whip, an aerosol dairy whipped cream. Sold to the restaurant trade, this was Presto's sole product until 1949. In 1937 Morse started a second plant in Los Angeles. The years of World War II were hard ones, with dairy products in short supply. When the price of butterfat skyrocketed right after the war, Morse asked Dick Borne, an employee in Los Angeles with a background in pharmacy, to develop a line of non-dairy products. Borne and Morse started RGB Laboratories in Kansas City, Missouri, and Borne set to work. A key early innovation was a method (still secret) of reducing soy off-flavors. In 1949-50 Presto in Kansas City introduced the company's first non-dairy product, an aerosol whip topping sold to the restaurant trade in a returnable pint can. In 1950 they brought out Mocha Mix Coffee Creamer, America's first such commercial non-dairy cream replacer, and in 1951 D-Zert Whip Topping. In 1951 Rich Products won a lawsuit in California allowing them to sell Rich's Whip Topping in that state; Morse was in the audience at the suit. Shortly thereafter Presto/California began to make the same products as its Kansas City Division was making. In 1957-58 Presto stopped producing dairy products, focusing only on non-dairy.

In 1964, after 9 years of R&D by RGB Laboratories, Presto Foods launched America's second commercial soy ice cream. Called Affair, it was a delicious product made for Presto by Swift & Co. at their kosher supervised ice cream plant, using soy protein from Central Soya and coconut fat. Targeted primarily to the kosher Jewish market in New York, it was kosher pareve and came in chocolate, vanilla, and strawberry flavors. The demand for the product was there but Presto had great difficulty getting it distributed. The ice cream distributors wouldn't touch it and Presto did not have their own distribution. So it failed and was withdrawn after about a year. In 1965 Presto licensed Nissei Co. in Osaka, Japan to make their soy ice cream, which Nissei was still doing in 1985, although at some point they changed the protein source from isolated soy proteins to casein. It was not until 1981 that Presto Foods tried to introduce a frozen dessert again, this time with Mocha Mix Non-Dairy Frozen Dessert (Borne 1985, personal communication).

In 1959 RGB Laboratories had licensed a small company named Nutritional Food Industries in Wallington, New Jersey, to manufacture Mocha Mix Non-Dairy Creamer and D-zert Whip Topping, using a concentrate produced by RGB Labs. The company was owned by three men, one of whom was named Seymour Heller. The franchise with Nutritional Foods did not work out, so RGB Labs bought the company in the early 1960s, took it over, and lost a lot of money on the deal. Heller signed a five-year non-compete agreement. Thereafter, in 1970, he formed a new company, Heller Enterprises, and launched a line of similar, competing products.

In October 1981 Presto Food Products of Los Angeles introduced Mocha Mix Non-Dairy Frozen Dessert. Now one of America's leading makers of pre-whipped non-dairy toppings, Presto also made the popular Mocha Mix Non-Dairy Creamer, a cream substitute based on soy protein. Mocha Mix Non-Dairy Frozen Dessert, which was free of milk products and cholesterol, and low in saturated fats, was not targeted to the natural food trade since it contained a number of artificial ingredients. Now Presto had its own distribution system and the product's cholesterol-free, polyunsaturated attributes were widely recognized as a nutritional plus. It sold well from the outset, primarily in supermarkets in California and Arizona; it was the first product of its type to become widely available in West Coast supers. While the company does not disclose sales or production figures, and distribution is confined to only two states, Mocha Mix may well be second only to Tofutti in total volume nationwide. Sales are thought to be 2-3 times larger than Ice Bean, and are in the millions of dollars per year.

The main soy ingredient in Mocha Mix is isolated soy proteins. The price of a hard pack quart of Mocha Mix, made in Los Angeles and sold in California supermarkets in 1984 averaged $1.99, which was twice as expensive as the least expensive dairy ice cream, but only 40% as expensive as Tofutti. In terms of nutritional composition, Mocha Mix was very low in protein (less than 1 gm per 4 fluid ounce serving), and fairly low in fat (7 gm per serving; 48% of calories from fat).

Note: This is the earliest document seen (Jan. 1999) that uses the term "cream replacer."

8242. Sugawara, Etsuko; Ito, T.; Odagiri, S.; Kubota, K.; Kobayashi, K. 1985. Comparison of compositions of odor components of natto and cooked soybeans. *Agricultural and Biological Chemistry* 49(2):311-17. Feb. [22 ref]
• ***Summary:*** The authors found nine alkylpyrazines including tetramethylpyrazine in natto at a total level of 24.07 mg/kg. The pyrazines were detected only after the cooked soybeans were inoculated with the natto bacterium, *Bacillus natto.* No beany odor was detected for natto. The authors concluded that pyrazines and sulfur-containing compounds were important contributors to the characteristic odor of natto, and that they may mask the beany odor. Address: 1. Iwate Prefectural Morioka Junior College, Sumiyoshi, Morioka 020, Japan; 2. Dep. of Agricultural Chemistry, Iwate Univ., Ueda, Morioka 020, Japan; 3. Lab. of Food Chemistry, Ochanomitzu Univ., Bunkyo-ku, Tokyo, 112 Japan.

8243. Miller, Bryan. 1985. Restaurants: Sushi and tempura on Park Avenue. *New York Times.* March 8. p. C20.
• ***Summary:*** This is a review of Mitsukoshi, a Japanese restaurant at 465 Park Ave. (at 57th St.). The waitress saved the writer from embarrassment in front of friends. In a

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foolhardy show of bravado, he ordered something called natto sengyo ae, having no idea what it was.

"'Maybe you not like fish guts so much?' she warned discreetly." He left her a large tip.

The word "tofu" appears several times in the review, without its translation "bean curd."

8244. NHK of Japan. 1985. Tôfuyô [Tofuyo, Okinawan fermented tofu]. Television broadcast / documentary. Friday, March 8. [Jap; eng+]

• ***Summary:*** A person from NHK went to Okinawa on 19 Feb. 1985 and visited the market located in Makishi, near the center of Naha city. It was on the last day of the year, the day before New Year's day (*o-misoka*), as celebrated according to the ancient lunar calendar. The market was very crowded since many Okinawans still use the lunar calendar.

Cakes of Okinawan tofu are large and very firm. Tofu is called *rikuni agatta o-tofu,* which means "tofu landed on a shore."

There are about 300 shops in the market but only one shop, Saburô-ya, that sells tofuyo and only about 10% of the customers buy tofuyo. It is sold in a box. Its color is a pretty red. Red koji (*aka-koji, beni-koji*) is used to make it. It is very difficult and time consuming to make at home. Tofuyo is not the most popular food in Okinawa among regular people. In the old days, the royal family treasured it as a special delicacy (*chinmi*) that was largely reserved for them. During the Okinawa dynasty, the royal family lived in the city Shuri, which is today a district in the highlands of Naha, at the southern part of Okinawa island. It was formerly a separate city unto itself and the royal capital of the Ryukyu Kingdom, the site of Shuri Castle. It is believed that the idea for tofuyo came from Chinese fermented tofu. It is difficult to make good tofuyo, and the ageing process takes 3-4 months. Today there are very few people who can still make tofuyo–even in Shuri.

8245. Tokai, Akinori. 1985. Nebari mo nioi mo nai nattô: Tenpe [The natto that has neither stickiness nor smell: Tempeh]. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo, Evening ed.*). March 19. p. 3. [Jap]

• ***Summary:*** A photo shows trays of tempeh being made by a Marusan worker. Address: Japan.

8246. Ballard, Bob. 1985. Ah-Soy! and Great Eastern Sun (Interview). *SoyaScan Notes.* March 21. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Ah-Soy was launched at the NNFA show in Atlanta, Georgia, in the summer of 1984. Initial flavors were vanilla, chocolate, and original (plain). It was made by Saniku Foods in Japan and imported via Mitoku. Carob flavor was introduced in the fall of 1984. Vanilla is now the best seller because it is the most unique. The product is a "fantastic success." The four flavors account for 15-20% of Great Eastern Sun's total sales from 1,100 products. GES only sells to distributors [i.e. it is a master distributor].

Sales reports for the period 1 Nov. 1984 to 25 Feb. 1985 show the following number of units sold (there are 30 units/per case): Vanilla 210,000 units. Original/plain 110,000. Carob 105,000. Chocolate 100,000.

Other GES soyfoods that sell well: Mellow white miso (made by American Miso Co.), 35 lb tub, #9 best seller by dollar volume. Onozaki rice miso, 11 lb tub, #20 best. Mellow white miso, 15 lb tub, #20 best. Instant miso soup from Japan (ranking unknown). This month's sales are annualized. The company is now doing $4 million/year in sales. They used to import freeze-dried tofu; the FDA forced them to change the name to "dried tofu." Shurtleff notes that he prefers the term "dried-frozen tofu."

Another best seller (about #3-5) is their White Cloud Rice Syrup It is made from rice with sprouted barley for malt. Address: Great Eastern Sun, 92 Macintosh Rd., Asheville, North Carolina 28806. Phone: 808-438-4730 or 704 252-3090.

8247. *Toyo Shinpo* (*Soyfoods News*). 1985. Atarashii tôfu gyôsha no atarashii shôhô [New marketing technique for tofu makers. Prefabricated compact capsule tofu shop]. March 21. p. 8. [Jap; eng+]

8248. Kawamura, Noriko. 1985. Dai san kai tenpei ryôri kyôshitsu [Tempeh cooking class number 3: recipes]. Tokyo: Unpublished manuscript. 6 p. March 27. Unpublished manuscript. [Jap]

8249. Australian Department of Immigration and Ethnic Affairs. 1985. A land of immigrants. Australia. 16 p. 28 cm.

• ***Summary:*** Human beings first set foot on the Australian landmass at least 40,000 years ago. Probably originating in Southeast Asia, they were the ancestors of today's Australian Aborigines.

European discovery: The first European visitors to Australia were the Dutch, who explored the Gulf of Carpentaria in 1606 and landed in 1642. In 1642 the Dutchman Abel Tasman discovered Tasmania. In 1688 the English buccaneer, William Dampier, in a stolen vessel, the Cygnet, visited Australia's northwest coast. In 1699 he returned in command of the Royal Navy Ship, Roebuck, to continue his exploration of New Holland, the name the Dutch had given the continent after Tasman's voyages. In 1770 navigator James Cook claimed the eastern part of Australia for Britain; he discovered Botany Bay and named the land New South Wales; it did not come to be called Australia until the 19th century.

A colony is born: "Loss of her North American colonies following the Declaration of Independence on 1776 prompted Britain to seek a new land suitable for penal settlement... Before the revolt of the American colonists

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(1775-83), Britain had been transporting about 1,000 convicts a year, mainly to Virginia and Maryland. Between 1717 and the War of Independence (1775-83), at least 50,000 English convicts were shipped to America. In 1779 Sir Joseph Banks, a botanist with Capt. Cook, first suggested the establishment of British penal colony at Botany Bay, New Holland (Australia). In 1783 an American suggested that American colonists loyal to Britain be resettled in New Holland; actually, most moved to Canada. On 26 Jan. 1788 the first group of 736 British convicts plus several hundred non-convicts arrived at Sydney Cove, Port Jackson, New South Wales, and Governor Phillip founded the settlement at Sydney Cove–a date that is still celebrated each year as "Australia Day" (prior to 1932 called "Foundation Day"). The first party of free immigrants arrived in 1793. The country was first named Australia in 1817 and the entire continent was claimed by Britain in 1829. By the late 18th century, when the first European settlers arrived, an estimated 250,000 to 300,000 Aborigines were living in Australia. Shipping of convicts to eastern Australia was abolished in 1840, but it continued until 1853 in Tasmania and until 1868 in Western Australia. By that time, some 160,000 of them had been sent to Australia.

The Australian Gold Rush: The discovery of gold at Bathurst, about 100 miles northwest of Sydney, New South Wales, in 1851 (3 years after it was discovered in California), and later at Ballarat and Bendigo, north of Melbourne, Victoria, brought a flood of fortune seekers from around the world–including China. The Chinese population on the goldfields increased rapidly, reaching 17,000 by 1855, at which time an act to restrict Chinese entry was passed, thus beginning the policy of "White Australia." In the gold rush decade, more than 600,000 immigrants arrived. [Note that the early gold fields were located in southwest Australia, the same area where soybeans were most widely grown after 1980.] From 1850 to 1860, Australia's non-Aboriginal population grew from 405,356 to 1,145,585. In 1861 there were 40,000 Chinese in Australia. Japanese began to arrive in the late 1800s.

In the second half of the 19th century, gold mining led to the establishment of many coastal and inland centres in Queensland (in northeastern Australia; separated from New South Wales in 1859). Gold drew thousands of miners to fields such as Gympie, Charters Towers and the Palmer River valley; the Mount Morgan mine was established in 1882. Gold also brought people to Western Australia, where the famous goldfields, Coolgardie and Kalgoorlie, were discovered in the second gold rush of 1892-1983. In 10 years Western Australia's population rose from 93,000 (in 1886) to 138,000 (in 1896). From 1851 to 1891, some 1,390,000 were attracted to Australia by the discovery of gold and the subsequent rapid development of agriculture. The 1891 population of 3,174,400 included 46,600 from Asia.

White Australia: In 1901 the Commonwealth of Australia was established, with Canberra as its capital. The Commonwealth Government passed a policy restricting Asian immigration in general. In 1901 Australia's population was 3,773,801–not including Aborigines whose numbers had fallen to about 95,000. Some 77% of the population were born in Australia and 18% in Britain. Roughly 32,000 were Chinese and 3,593 were Japanese-born. This so-called "White Australia" policy that began officially in 1901 prevented the immigration of non-Europeans from more than 50 years. "In 1901 Japanese-born residents of Australia totalled 3,593 but as a result of the Immigration Restriction Act of that year, their numbers declined. During World War II, most returned to Japan or were interned. By 1981, with a non-discriminatory immigration policy, Japanese-born residents of Australia had increased to 8,060.

On 26 Jan. 1949 ("Australia Day") it first became possible for a person to become a citizen of Australia, as the Australian Citizenship Act went into effect. Before that, the nationality status for Australians was simply "British subject."

Starting in the late 1940s, the "White Australia" policy was gradually and increasingly relaxed; it was finally abolished in 1973. Since World War II, immigration has included more than 400,000 refugees. The largest single group has been the 88,112 Indo-Chinese (including 68,000 Vietnamese, many of them "boat people") who arrived between April 1975 [when the USA was defeated in Vietnam] and June 1984. As of 1981, 9.3% of Australia's overseas-born residents had been born in Asia.

Note: These Asians must have brought soybeans and soyfoods to Australia before 1900, but we have yet to see anything published documenting this pioneering work. Indeed, no one knows when and how soybeans first arrived in Australia. Address: Australia.

8250. **Product Name:** [Emile Soymilk Ice Cream (9 flavors)].
Foreign Name: Emiiru.
Manufacturer's Name: Biological Science Laboratory K.K.
Manufacturer's Address: Sano-cho 14, Seigoin, Sakyo-ku, Kyoto, Japan. Phone: 075-751-1633.
Date of Introduction: 1985 March.
How Stored: Frozen.
New Product–Documentation: Toyo Shinpo. 1985. April 11. "New Soymilk Ice Cream in Japan." Made from soymilk and safflower oil, it has 12% overrun and costs 1,000 yen for 470 ml. The product name is like the French name Emile. There are 150 calories per 100 gm. The soy ice cream is made and served in 9 flavors at the shop & restaurant named Veldian, starting March 1985. The capacity of the shop is 2,000 liters/day. The president of the company is Mr. Kichizo Kaneda, age 43.

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8251. Byrne, Maureen. 1985. The future for soyfoods. The first European Soyfoods Workshop was held in Amsterdam by the American Soybean Association, and papers covered subjects from marketing to microbiological standards. *Food Manufacture* (*London*) 60(3):49, 51, 53. March.
• ***Summary:*** This workshop was held on 27-28 Sept. 1984 at the Krasnapolski Hotel, Amsterdam, the Netherlands–organized by the American Soybean Association. Gives a brief summary of each paper presented.

Contains an interesting full-page table (p. 51) in which Oriental soyfoods are classified into two types: Non-fermented and fermented. For each non-fermented food is given the local names, description, and uses. The non-fermented soyfoods are: Fresh green soybeans, soybean sprouts (huang tou ya, Chinese), soynuts (hueh huang tou, Chinese; iri-mame, Japanese), soymilk (tou chiang or tounai, Chinese; tonyu, Japanese; kongkuk, Korean), [roasted] soy flour (huang tou fen, Chinese), soy protein-lipid film (yuba, tou-fu-pi), soybean curd (tofu).

For each fermented soyfood is given the local names, organisms used, description, and uses.

The fermented soyfoods are: Soy sauce, miso, tempeh, natto, fermented tofu, and fermented black soybeans.

Soy sauce includes chiang-yu from China, shoyu from Japan, ketjap from Indonesia, kanjang from Korea, toyo and see-ieu from Southeast Asia.

Fermented black soybeans include tau-shih from China, tao-si from the Philippines, tau-cheo from Malaysia, tauco from Indonesia, and Hamanatto from Japan.

8252. Kawashima, Noriko. 1985. Indonesia no nattô "tenpe" no tabekata [How to eat tempeh, Indonesia's natto]. *Shin Eiyo* (*New Nutrition*)**.** March. p. 55-59. [Jap]

8253. *Kenko* (*Health*)**.** 1985. Yasukute, umai tôfu koso: Byôki taiji no taberu kusuri [Inexpensive, tasty tofu: Medicinal food for conquering sickness]. March. p. 43-71. [Jap]

8254. Kitagawa, Isao; Saito, M.; Taniyama, T.; Yoshikawa, M. 1985. Saponin and sapogenol. XXXIX. Structure of soyasaponin A_1, a bisdesmoside of soyasapogenol A, from soyabean, the seeds of *Glycine max* Merrill. *Chemical and Pharmaceutical Bulletin* 33(3):1069-76. March. [19 ref]
• ***Summary:*** "Five bioactive triterpine-oligoglycosides, named soyasaponins, I, II, III, A-1 (3), and A-2 (2) were isolated from the soybean..." The structure of soyasaponin A-1 was elucidated. Address: Faculty of Pharmaceutical Sciences, Osaka Univ., Japan.

8255. *Kyo no Ryori* (*Today's Food, NHK*)**.** 1985. Tôfuyô [Tofuyo, Okinawan fermented tofu]. March. p. 84-85. Based on an NHK-TV documentary on tofu-yo, broadcast Friday, March 8. [Jap; eng+]
• ***Summary:*** Tofuyo. Even if you can imagine, from its name, that it is a food made from tofu, very few people know what tofuyo is. It tastes like a cheese and there is a similar product in China named *funyu* [fermented tofu]. It is a special delicacy in Okinawa, made from tofu which is fermented in red rice koji and *awamori* (millet brandy). However tofu made in Okinawa is firmer (it contains less water) than regular tofu (*momen-goshi*) made in Japan. And each cake of tofu is large, weighing about 900 gm. Also the method of selling the tofu is a little different; it is not immersed in water but a large piece (containing about 5 cakes) is placed on a wooden cutting board and covered with a kitchen cloth (*fukin*)**.** The tofu seller cuts each cake of tofu according to the customer's desire.

Tofu is essential, as is pork, in the diet and food culture of Okinawans. The most popular dish prepared at home in Okinawa is *chanpurû* [*champuru*] which means "something mixed." It is made from tofu and seasonal vegetables stir fried (or sautéed) together, often with a little meat or fish. Tofuyo, by contrast, is a delicacy most suited for drinking with saké.

Photos show: (1) The inside of a Okinawan shop that makes the island's most popular distilled alcoholic beverage, awamori (millet brandy), in large earthenware vats. There are ten or more old makers of awamori in Naha city (formerly named Shuri). (2) The process for fermenting rice. (3) Freshly made tofu; it is carried to the store in a wooden frame. (4) Wooden presses with heavy weights on top. Soymilk curds are being pressed. (5) To make tofuyo, soak rice koji in awamori for about 10 days. After it becomes soft, grind it in a suribachi. If you have red koji (*beni-koji*)**,** put it in too, and season with salt and sugar. Cut firm tofu into cubes about 3 cm on a side. Sprinkle salt over them. Dry them on a flat woven-bamboo tray in a shady place. When the tofu becomes yellowish, wash them in awamori 2-3 times. Place them in a jar of the seasoned sweet koji and cover. Place the jar in a refrigerator and allow to ferment for 3-6 months. (6) Tofuyo in the jar in which it is ripening. (7) Kôsetsu Shijo (huge indoor market) near Heiwa-dori in Naha city, Okinawa. It is regarded as "the kitchen of Okinawa." (8) In Okinawa, all parts of slaughtered pigs (intestines, ears, legs, etc.) are sold as food in Kosetsu market; nothing is wasted. (8) There are tofu shops in Kosetsu market. They cut tofu into one cake (*cho*) pieces at the request of customers. (9) For more information contact Naha-shi Kankô Kyôkai (Tourist's Bureau), Phone: 0988-68-4887. Senzaki 1-1, Naha city 900, Okinawa.

Note: The NHK TV broadcast on tofuyo was on Friday 8 March 1985.

8256. Mohr, Debra. 1985. Japanese oriented to more uses for U.S. beans. *Soybean Digest.* March. p. 28a, 28d.
• ***Summary:*** Karl Sera (a native of Japan) is ASA's associate country director for Japan–a modern country of 121 million

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people [127.3 million as of April 2013]. A country of limited natural resources, Japan has only 12 million acres of land that can be farmed–and most of that land is planted in rice. But rice is declining in popularity as Japanese tastes, undergoing Westernization, have shifted to meat and meat products.

"The Japanese market for soybeans has increased from 120 million bushels in 1970 to 170 million bushels in 1984." Japan imports 96% of those soybeans from the USA and about 3% from China, Brazil, and Canada."

Sera wishes that Japan had a system for transferring workable, practical knowledge to farmers. He says: "Unfortunately we don't have the land grant university research and extension you have. I believe that's what made agriculture so great in your country" [USA].

Mr. Takahashi, Sera's colleague, recently devised another way to convince hog producers that soybean meal is a better buy than locally produced fish meal.

Takahashi developed microcomputer programs written in Japanese giving that exact cost of hog feed ingredients. At a series of seminars, he showed these programs to the producers. The farmers quickly understood how replacing their traditional fish meal with soybean meal would lead to higher profits. "Now five least-cost ration programs are available in Japan."

Sera believes the big opportunity market for U.S. soybeans in Japan is poultry and dairy feed.

Two photos show Karl Sera: (1) Teaching Indiana farmers how Japanese uses U.S. soybeans. (2) Explaining to Japanese farmers how soybeans can improve livestock feed efficiency–producing faster weight gain at lower cost.

8257. Nabetani, Hiroshi; Watanabe, Atsuo; Horikita, Horiyuki. 1985. [Energy consumption for waste and waste water treatment in food processing. III. Natto (fermented soy bean) processing]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 46. p. 73-77. March. [1 ref. Jap; eng]
Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8258. Nikkuni, Sayuki; Itoh, Hiroshi; Tanaka, Masahi; Ohta, Teruo. 1985. Changes in SDS polyacrylamide gel electrophoretic pattern of water-insoluble fraction during miso fermentation (Studies on soybean protein digestion during miso fermentation part 1). *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 46. p. 281-89. March. [14 ref. Eng; jap]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 31(8):502-10 (1984). Address: 1,2&4. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 3. Gino Miso Co. Ltd., Matsumae-machi, Iyo-gun, Ehime prefecture 791-31, Japan.

8259. Ohtani, Toshio; Nikkuni, Sayuki; Hoshino, Chimaki; Nabetani, Hiroshi; Watanabe, Atsuo. 1985. [Energy consumption for waste and waste water treatment in food processing. II. Miso (soy bean paste) processing]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 46. p. 67-72. March. [2 ref. Jap; eng]
Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8260. Okada, Noriyuki; Hadioetomo, R.S.; Nikkuni, S.; Itoh, H. 1985. Isolation of bacteria producing vitamin B-12 from fermented soybean tempeh from Indonesia. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 46. p. 15-20. March. [20 ref. Eng; jap]
• ***Summary:*** Eighteen samples of tempeh were gathered various from places in Indonesia: Bogor, Ciomas, Cisarua, Pacet Cianjur, Cicurug, Kedunghalang, and Semplak. Bacteria isolated from these tempeh samples were identified. 13 of 33 isolates were identified as *Klebsiella pneumoniae*–which is known to produce vitamin B-12. Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8261. Shinshi, Eiichiro; Manabe, Masaru; Goto, Tetsuhisha; Misawa, Yukiko; Tanaka, Kenji; Matsuura, Shinji. 1985. [Studies on the fluorescent compounds in fermented foods. VII. The degradation of added kojic acid during soy sauce fermentation]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 46. p. 342-47. March. [12 ref. Jap; eng]
Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8262. Shurtleff, William; Aoyagi, Akiko. 1985. The book of tempeh: The delicious, cholesterol-free protein. 2nd ed., revised & updated. New York, NY: Harper & Row. 175 p. March. Illust. by Akiko Aoyagi Shurtleff. Index. 28 cm. [374 ref]
• ***Summary:*** Contains 130 Western-style and Indonesian recipes. Appendix A: "A brief history East and West," is extensively revised from the earlier Professional Edition, and discusses the world's earliest known reference to tempeh in the *Serat Centini* manuscript, which was probably written in about A.D. 1815. The history of tempeh in the Europe, Australasia, in the United States has also been updated and expanded.

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Appendix B: "Tempeh makers in the West" has also been updated and expanded. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549 USA.

8263. Taira, Harue; Hoshino, Shiro. 1985. [Quality of soybean seeds grown in Japan. VIII. Effect of late-season culture with close planting on chemical composition and suitability for food processing]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 46. p. 137-44. March. [14 ref. Jap; eng] Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2. Niigata Agric. Exp. Station, Nagaoka, Niigata, Japan.

8264. Belleme, John. 1985. New developments at American Miso Co. (Interview). *SoyaScan Notes.* April 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In Feb. 1984 (actually 1 Oct. 1983) John sold his ownership in the American Miso Co. to Barry Evans. Originally, John, Sandy Pukel, and Barry each owned one-third of the business. Before that, it had 6-7 owners. First Sandy (under pressure from Barry) sold his one-third to Barry, which made Barry the majority shareholder. After that, Barry let John run the company, which is doing very well in terms of productivity and profitability. They are selling all the miso they can possibly make.

At the time John sold his stock, he set up a new corporation named Just In Foods, Inc. (named after his son, Justin) to make second-generation miso products. John recently sold Just In Foods (which makes Miso Master brand products) to Barry Evans, because John doesn't own a miso plant. John is now a paid consultant for American Miso Co.

Miso Master is a marketing company for miso and miso products, and also a brand name. Chick Peaso is a mellow miso made with chick-peas instead of soybeans; it contains no soy. Introduced in May 1984, it was first sold in bulk from Great Eastern Sun but is now sold in 1-pound plastic bags.

Two tofu-miso dips were introduced in Nov. 1984; they are made by Nasoya using John's miso. They are both selling well, under the Miso Master label. Another new product is a delicious spaghetti sauce produced by Ventrillos in New York; it is made with a very mellow miso, low in salt. John sells John Troy about 35,000 lb/year of mellow miso; that's all Troy uses but Belleme does not make much money on this. Troy's miso mustard has 3-month amakuchi miso in it. John first saw this product in Fukuoka, Japan, made by Toshi Shiroozu, a man who makes mellow white miso for Eden Foods; it was in 1-pound packages, exported by Muso Shokuhin. John had a product named Mellow Ebony Miso, made with black soybeans. It was delicious but the color was grotesque, so he phased it out.

Another new non-profit organization is the Institute for Fermented Foods. Its logo is a pickle barrel with a rock on it borrowed from the book *Miso Daigaku.*

Pretty soon John is going to stop making miso. He is now training Don DeBona, who Barry sent to be trained. After that, John plans to run Barry's Just In Foods full time. John's wife, Jan, is writing a book on Japanese foods. John plans to go back to Japan for a while. Address: North Carolina.

8265. Meyer, Edwin W. 1985. Details on work with The Glidden Company (Interview). Conducted by William Shurtleff of Soyfoods Center, April 8. 4 p. transcript.
• ***Summary:*** Discusses: ADM's solvent extraction plant in Chicago, Norm Witte, Central Soya's Miracle Meal (the world's first dehulled soybean meal made with a desolventizer-toaster; launched in 1952, it revolutionized the poultry industry), Central Soya's first desolventizer-toaster started operation in Decatur in May 1950, Central Soya's soy protein concentrate plants, Robert Boyer and Frank Calvert, Norman F. Kruse [pronounced Cruze], Endre F. Sipos. Elmer B. Oberg.

Say Calumet Harbor, not Calumet River; Ed thinks they acquired the 2 country elevators on the rivers but may have added on something. Ed Wilhelm might know.

Promine was used mostly by a large sausage manufacturer in Detroit, Michigan, for its functional properties. It was looked at but never used by John Morrell & Co., Armour, Swift, or Kraft–which had an all-meat image and mentality; "they never touched it.

Glidden sold Morrell a lot of soybean grits for dog food, for years during the 1930s; Morrell had a dog food company in Iowa, which made a popular canned product.

Ed had to make a rapid exodus from the Glidden Co. on Laramie after ADM bought it. They wanted to get in quickly; he left some important documents behind.

ADM did sell their lecithin through the American Lecithin Co. in the early days, just like Glidden. Ask Joseph Eichberg about the exact nature of the agreement.

Ed wouldn't say that Glidden soy operations Chicago was struggling, but their profits were not up to Glidden's expectations so they were considered a weak division. World War II helped a lot financially, especially since the industrial protein was requisitioned by the U.S. Navy through NFS. Toward the end of the war Glidden was supplying soy flour for the relief programs to the liberated areas, especially Italy.

Oberg is too gracious to say that Central Soya bought Glidden largely for its research team. The main reason was the price was cheap; the whole works for $14 million, including all the elevators. Central got a great deal. Some years later they sold the Calumet Harbor elevators to Cargill for $8 million. At that time Central Soya had only a small development group under Sipos, who is still with them. He reported to Norm Kruse, starting in 1953. True, they basically had no research team. It was of equal importance to

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many others.

Steroids: After 1953 they had a major contract with Charles Pfizer Co. to process steroids and to sell them an intermediate for making corticoid steroids / hormones. That was the main business. They also had a little business with Charles Strauss in Montreal, Canada. "After 1953 we toll processed for Pfizer alone (that means for a given sum you process material for a certain party) so we remained in the steroids business."

Ed was an Abbott–Glidden–Upjohn fellow at Northwestern University. Abbott Labs and Upjohn were very interested in Glidden's work; they were involved in an informal joint research operation. General Mills got into making soy sterols at their Kankakee plant. Glidden put them into the business in a way. Upjohn was buying sterols from General Mills for many years. Upjohn is still using soybeans for their corticoid hormones. General Mills sold that plant to Henkel A.G., a German company.

The forerunner of Promosoy (Central Soya's soy protein concentrate) was Protein 70 (also called Pro-70), developed by E.B. Oberg. The pilot plant was built in 1959 and the full commercial plant later at the Gibson City plant. Pro-70 was developed at Glidden by Sidney Circle. He started working on the concentrate after the soy protein isolate, in about 1953-54. Pro-70 was not commercialized until after Central Soya bought Glidden's Chemurgy Div. in 1958. It was commercialized under the name Pro-70. The term Promosoy was introduced in about 1960 [sic, 1962] with the Gibson City plant. Both were exactly the same product–a soy protein concentrated. Response, their textured soy protein concentrate, was developed later under Ed Meyer's supervision.

The first formula for Rich Freeze was developed by Jim Liggett in about 1963-64; Ed was director of research at the time. It was developed partly for the Japanese market. "We [Central Soya] had an affiliate, Dai Nippon pharmaceutical, which was selling our granular phosphatides in Japan. Dai Nippon also had a few food ingredients, principally plant gums. They thought they might sell Rich Freeze, but they bombed out" [failed].

The Cone and Brown patent which was the basis for Alpha Protein. Address: 1701 N. Sayre Ave., Chicago, Illinois 60635. Phone: 312-637-0936.

8266. *Toyo Shinpo* (*Soyfoods News*). 1985. Tônyû o beesu ni reika [New soymilk ice cream in Japan]. April 11. [Jap; eng+]
• ***Summary:*** Emile soymilk ice cream is made in Kyoto and served at a small restaurant adjoining the shop.

8267. *Toyo Shinpo* (*Soyfoods News*). 1985. [Okara is a serious problem in Japan]. April 11. p. 1. [Jap; eng+]
• ***Summary:*** How to get rid of it? The supply is so much greater than the demand that tofu makers can no longer sell it as a livestock feed, even if they ask only 1 yen per kg.

8268. Jones, Terril. 1985. The Pacific Rim. *Los Angeles Times*. April 19. p. OC C3.
• ***Summary:*** Although the USA is the world leader in serious biotechnology, Japan is now making a serious effort to become the most serious competitor and eventually take the lead. Biotechnology describes the new techniques, developed in the 1970s, to manipulate genes and proteins. For centuries, Japan has been skilled in fermentation technology, a vital process in biotechnology.

"Importance of fermentation: According to the Ministry of International Trade and Industry (MITI), Japan in 1983 had 2,600 breweries [of alcoholic beverages such as sake and beer], 1,187 *miso* bean paste companies, and 2,927 soy sauce manufacturers–more than 7,400 enterprises using fermentation."

The larger companies are in an excellent position to diversify into sophisticated areas of biotechnology. Yamasa Soy Sauce, founded in 1645, "has been able to produce beta interferon by using antibodies–proteins that adhere only to certain substances–that are specific for beta interferon, causing the interferon to precipitate out of solution. Yamasa is the world's first company to make and market these antibodies.

MITI's budget for biotech in fiscal 1985 is $4.23 billion yen ($17 million), up 18% from 1984 and up 40% from fiscal 1983.

8269. Hashimoto, T.; Kimura, H.; Takahashi, K. 1985. [Coagulation of soybean milk by culture of a yeast]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 32(4):255-59. [Jap]*

8270. Kass, Monica. 1985. High-tech soymilk pouch creates market success: Stand-up retortable pouches for soymilk boom in natural-food stores, break into supermarkets. *Packaging*. April. p. 36-37.
• ***Summary:*** On the cover of the magazine and the first page of the article is a large color photo of Westbrae Natural Cocoa-Mint Malted. On the second page is a color photo of ten brands of soymilk in stand-up gussetted retort pouches, the type of soymilk packaging now most popular in America. "Marusan Ai and San-iku Foods are two Japanese companies currently processing and retort packaging soymilk for export to the USA. Marusan forms the retort pouch from multilaminate rollstock supplied by Toyo Seikan Kaisha Co. (Toyo Seikan is licensed by Doy-n-pak [Doypack] to produce the material.) And San-iku Foods retorts soymilk in preformed pouches, also made from the Doy-n-pak patented lamination.

"Sources say the fact that Doy-n-pak's design patent on the stand-up, gusseted pouch runs out this fall has prompted some scrambling among American materials suppliers who

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see the potential of the stand-up pouch and want to establish market position with the pouch.

"American companies importing soymilk in the preformed retort pouch include Westbrae Natural Foods and Great Eastern Sun. Eden Foods Inc. was the first company out with soymilk in the rollstock formed pouch. Structural differences between the two pouch varieties are minimal. The rollstock-formed square-cornered pouch must be opened with a scissors and is somewhat narrower in shape than the round-cornered preformed pouch which has an easy-open feature.

"Lamination for both pouch types consists of an outer layer of PET laminated to nylon, aluminum and an inner layer of polyolefin film that meets FDA food contact material requirements.

"Processing methods Marusan and San-iku use to adapt soymilk to American tastes differ, but both companies retort pouches up to 250ºF giving them an unlimited shelf life.

"Graphics reflect positioning: The real difference between the various retorted soymilks is in positioning. Eden Foods is strictly interested in promoting the product for its nutritional benefits. Great Eastern Sun's soymilk appeals to health-conscious consumers with an eye on trends. And Westbrae has two soymilk varieties. One is a plain soymilk, targeted for the health-conscious crowd. The other is a line of dessert-type malted drinks–'fun' products the company is targeting at younger consumers."

Note: This is the earliest document seen (Sept. 2011) with the term "high-tech" (or "high tech") in the title in connection with soyfoods–in this case soymilk, historically a low-tech product.

8271. Shurtleff, William; Aoyagi, Akiko. 1985. Soyfoods industry and market: Directory and databook 1985. 5th ed. Lafayette, California: Soyfoods Center. 220 p. Index. April. 28 cm. Updated every 1-3 years with a bibliographic supplement. [360 ref]
• ***Summary:*** Contents: 1. Introduction. 2. Directory of soyfoods manufacturers. 3. Directory of soyfoods support industry: Goods & services. 4. The many types of soyfoods. 5. Historical: Historically most important books and serials, earliest references to individual soyfoods. 6. Year in review. 7. Soyfoods industry and market in the U.S. 8. Tofu industry and market in the U.S. and Canada. 9. Soymilk industry and market: Worldwide and in the U.S. 10. Tempeh industry and market in the U.S. 11. Soy sauce industry and market in the U.S. and Japan. 12. Miso industry and market in the U.S. and Japan. 13. Soynut industry and market in the U.S. 14. Natto industry and market in Japan. 15. Statistics on fermented soyfoods in East Asia. 16. Soyfoods in restaurants, delis & cafeterias. 17. Soybean crushing industry in the U.S. 18. Soy oil industry and market in the U.S. 19. Soy flour and cereal-soy blends industry and market worldwide. 20. Modern soy protein products industry and market in the U.S. 21. Soyfoods terminology and standards. 22. Names of soyfoods in major foreign languages (incl. Chinese / pinyin; Hoisin sauce = haixian jiang). 23. Soybean production worldwide and country-by-country. 24. Key institutions working with soyfoods worldwide. 25. Measures, weights, and equivalents. 26. About the Soyfoods Center & soyfoods consulting services. 27. Bibliography.

In February 1977 a Gallup poll in America showed a remarkable shift in the public's awareness of and attitudes toward soyfoods. The sampling of 1,543 adults across the nation found that: 33% believe that soybeans will be the most important source of protein in the future–ahead of fish at 24% and meat at 21%. 55% believe that "soy products have a nutritional value equal or superior to that of meat." 54% reported that they "had eaten foods containing soy protein as a prime ingredient within the past 12 months." Younger age groups living in large cities and those with college or university educations had the most favorable attitudes toward soy protein, indicating that support for soyfoods is likely to grow in the future. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8272. Shurtleff, William; Aoyagi, Akiko. 1985. The natto industry and market. In: William Shurtleff and Akiko Aoyagi. 1985. Soyfoods Industry and Market: Directory and Databook 1985. 5th ed. Lafayette, California: Soyfoods Center. 220 p. See p. 118-20.
• ***Summary:*** See next 2 pages. As the following statistics show, the natto market in Japan has expanded steadily throughout the postwar period. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8273. Utsumi, Shigeru; Kinsella, John E. 1985. Structure-function relationships in food proteins: Subunit interactions in heat-induced gelation of 7S, 11S, and soy isolate proteins. *J. of Agricultural and Food Chemistry* 33(2):297-303. March/April. [41 ref]
Address: Inst. of Food Science, Stocking Hall, Cornell Univ., Ithaca, New York 14853. Utsumi is now at Research Inst. for Food Science, Kyoto Univ., Uji, Kyoto 611, Japan.

8274. Watanabe, Tadao. 1985. The tempe technology in Japan. In: Hermana and Karyadi, eds. 1985. Simposium Pemanfaatan Tempe Dalam Peningkatan Upaya Kesehatan dan Gizi [Symposium on Tempeh Utilization in Efforts for Improving Health and Nutrition]. 148 p. See p. 134-37. Held 15-16 April 1985 in Jakarta. [2 ref. Eng]
• ***Summary:*** Contents: The tempe industry in Japan (no statistics or details are given). The manufacture of tempe in Japan. Cooking of tempe for marketable products (sold in blocks, minced, or sliced and flavored). Some biochemical properties of tempe: Antioxidative activities, volatile compounds in tempe, triglyceride profiles of Tempe Chips (from Indonesia). Address: Kyushu Univ., Japan.

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NATTO PRODUCTION AND CONSUMPTION IN JAPAN

Year	Natto Consumption (Metric Tons)	Population of Japan (Million)	Per Capita Natto Consumption (kg/yr)
1958	39,000	91.77	0.42
1959	41,000		
1960	42,000	93.42	0.45
1961	43,000		
1962	47,000		
1963	47,000		
1964	54,000		
1965	59,000	98.28	0.60
1966	68,000		
1967	85,000	100.20	0.85
1968	99,000		
1969	108,000		
1970	115,000	103.72	1.11
1971	115,000		
1972	122,000	107.60	1.13
1973	122,000		
1974	124,000	110.57	
1975	122,000	111.94	1.09
1976	124,000		
1977	130,000		
1978	135,000		
1979	142,000		
1980	153,000	117.06	1.30
1981	153,000		
1982	169,000	119 est	1.42

Source: Norin Suisansho Shokuhin Yushi-ka; or Sorifu no Kakei Chosa, Tokei Kyokyoku 1983.

These figures show that natto production in Japan, from 1958 to 1982, has grown at the average compound rate of 6.2% a year. This is impressive, especially when we consider that per capita consumption of Japan's two other major fermented soyfoods, shoyu (soy sauce) and miso, have declined during this period. Equally promising, the second-largest annual production increase in postwar history took place in the most recent year (1982), an increase of 16,000 tonnes, or 10.4%. Major reasons for this increase were (1) The growing reevaluation in Japan of the nutritional value of traditional soyfoods; (2) The growing interest in natural foods; and (3) the expansion of natto consumption in western Japan.

Nevertheless, per capita natto consumption is still relatively small, only 1.4 kg a year in 1982, compared with about 12 kg for shoyu and 6 kg for miso.

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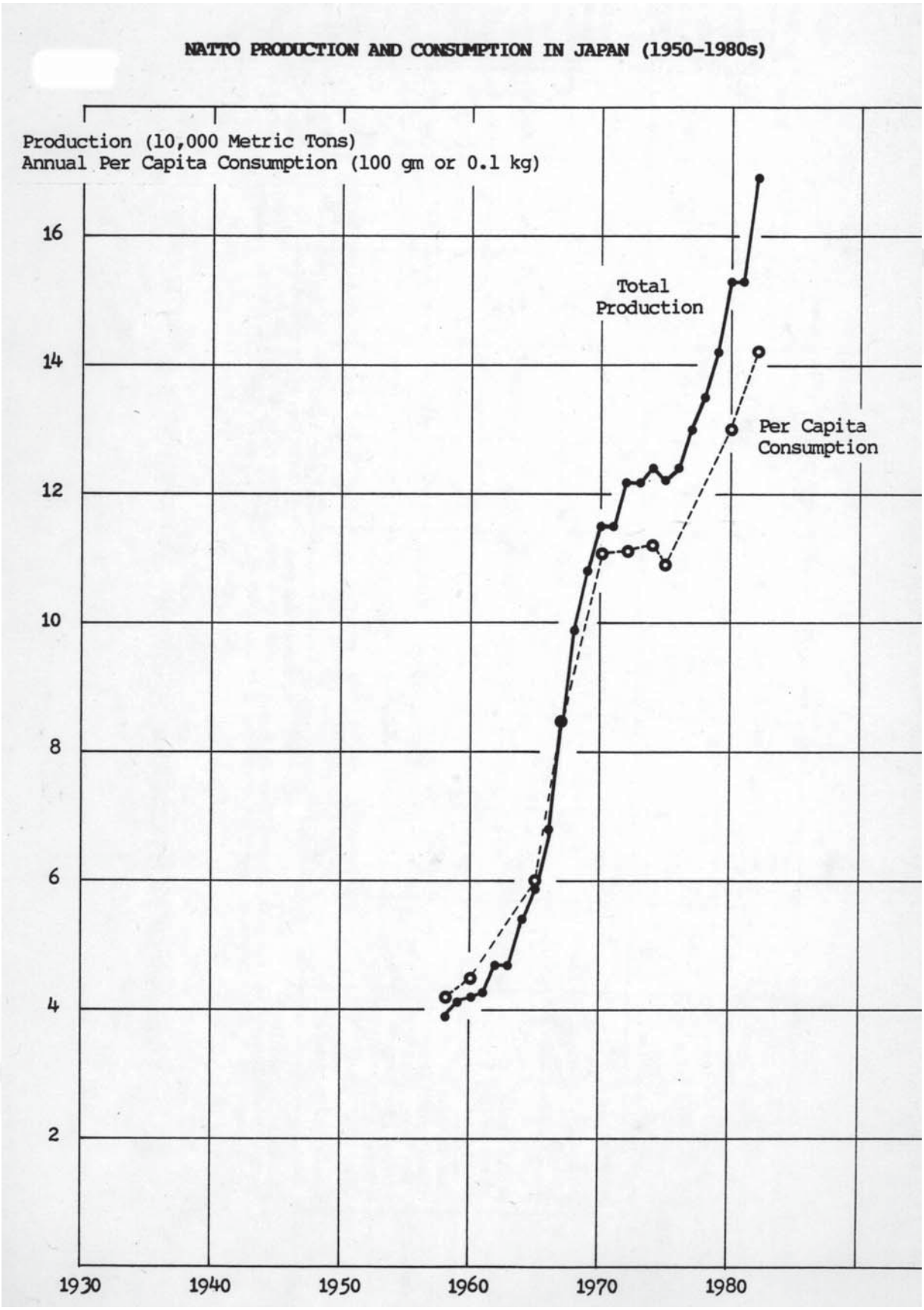

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8275. *Toyo Shinpo* (*Soyfoods News*). 1985. Sukoyaka Tenpe kôhyô. Marusan-Ai [Marusan-Ai's "healthy tempeh" gets good acceptance]. May 1. p. 4. [Jap; eng+]
• ***Summary:*** This tempeh is being sold at the Seibu Department Store in Ikebukuro (Tokyo), and at Mitsukoshi Department Stores in Nihonbashi (Tokyo).

8276. *Toyo Shinpo* (*Soyfoods News*). 1985. Shin seihin rasshu-jidai [A rush of new products: Nestlé will start to sell lactic fermented soymilk in Japan this summer]. May 1. p. 7. [Jap; eng+]
• ***Summary:*** Nestle plans to sell a lactic fermented soy drink named Fandy, which is made from soybeans fermented with lactic acid. The product is sold as a concentrate, and must be diluted with water before you drink it. Their slogan is "A 14-year-old's on-the-rocks" (*mizuwari*). One 330 ml bottle will retail for 415 yen. Address: Kyoto.

8277. *Toyo Shinpo* (*Soyfoods News*). 1985. Tônyû o beesu ni–shin seihin [Tofu and soymilk dessert shop opens in Osaka]. May 1. p. 7. [Jap; eng+]
• ***Summary:*** A tofu and soymilk dessert specialty restaurant will open in April in the Kintetsu department store in eastern Osaka at Fuse city. It will be named Tofeez. It is connected with Furuichian Enterprises which owns the Tofu Kan restaurant. It will serve about 30 soyfoods including tofu ice cream, soymilk bread, tofu burgers, tofu pies, soy yogurt, etc.

On 1 April 1985 a popular Western-style tofu restaurant opened in Nagoya. Named Tcha-na-Time, it is located in the NBN Izumi Building, 1-23-36 Izumi, Higashi-ku, Nagoya, Japan, Phone: 052-951-1877. The owner is Ms. Ishiki. In addition to various soyfoods, they also serve meat and fish. Address: Kyoto.

8278. Kushi, Michio; Kushi, Aveline. 1985. Re: Thank you for sending *The Book of Tempeh.* Letter to William Shurtleff at Soyfoods Center, May 10. 1 p. Typed, with Michio's signature on letterhead. [Eng]
• ***Summary:*** "Dear Bill and Akiko, Thank you for sharing the new edition of the *Book of Tempeh* with us. It should be of great benefit in spreading the use of tempeh both among individual families and in the health food market.

"Thank you for this significant contribution to one peaceful world.

"We send you our best regards and warmest wishes for your continued health and happiness. Sincerely,..." Address: 62 Buckminster Rd., Brookline, MA [Massachusetts] 02146. Phone: (617) 232-6869.

8279. *Asahi Shinbun* (*Asahi Daily News, Tokyo*). 1985. Enbun 1% no miso kaihatsu: Konnyaku o riyô shite. Datsu-en [Marudai has developed 1% salt miso: Removed the salt, added konnyaku]. May 12. [Jap]
• ***Summary:*** Marudai Miso Co. will sell this low-salt miso under the Marutin brand to food processing companies. The story also appeared in Toyo Shimpo (May 21).

8280. Sato Shoji Co. 1985. Satô Shôji kaigai tsuaa. Sato Amerika Repooto. Sekai ni hirogeyô, tôfu tsukuri no wa [Sato Shoji overseas tour: Report from America. Expanding the tofu making circle into the world]. *Toyo Shinpo* (*Soyfoods News*). May 21. p. 8-9. [Jap; eng+]
• ***Summary:*** Aloha Tofu in Hawaii makes cookies with tofu and vegetables.

8281. Murata, Kiku. 1985. Re: Thank you for sending *The Book of Tempeh.* Letter to William Shurtleff at Soyfoods Center, May 17. 1 p. Typed, with signature on letterhead. [Eng]
• ***Summary:*** "Many thanks for sending to me a copy of the new second edition of 'The Book of Tempeh,' which includes A Brief History of Tempeh in an Appendix A.

"'History of Tempeh,' you had kindly sent to me last year and this edition (easy to read) have gave me much knowledge of tempeh and people in the past and present.

"I have greatly impressed your energy to devote your life for soybean products, especially for tempeh from various stand points.

"I am sorry that we could not able to invite you to attend 'Non-salted Soybean Fermentation' to be held July 15-17, 1985. The financial situation is very difficult.

"If possible and if you don't mind, I would like to advertise the new second edition of 'The Book of Tempeh.'

"People who attend the Symposium will also [want] the knowledge of History of Tempeh.

Thank you again for your kindness to send me the results of your energetic, useful and wonderful work.

"With very best wishes to you. Sincerely yours,..." Address: Teikoku Women's Univ., 173-6 Thodacho, Moriguchi City, Osaka, Japan. Phone: 06-902-0791.

8282. **Product Name:** [Tofu Drink].
Manufacturer's Name: Hika Shoten (Japan).
Manufacturer's Address: Japan.
Date of Introduction: 1985 May.
New Product–Documentation: Japanscan Food Industry Bulletin. 1985. 3(3):5. May. "Hika Shoten has found a way to blend orange juice with tofu successfully. The tofu is milled to particle size less than one micron and up to 30% orange juice is added. The resulting beverage is positioned as a yogurt beverage alternative."

8283. Kushi, Michio; Jack, Alex. 1985. Diet for a healthy heart. *East West Journal.* May. p. 34-38. Cover story.
• ***Summary:*** "In the Middle Ages, the Black Death [bubonic plague] earned its reputation by killing about one-third of the population of Europe. Today, cardiovascular disease claims

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the lives of over 50 percent of the people in the United States and in many other advanced industrial societies... heart disease is more deadly than all other modern scourges combined, including cancer and loss of life from car accidents, crime, and war...

"One out of every five men in this country will have a heart attack by age sixty... This year, according to the American Heart Association, 1.5 million Americans will have a heart attack, and 550,000 of them will die."

According to Marstow and Page (1978. *National Food Review.* Dec. p. 28-33. "Nutrient content of national food supply), the fat in the American diet comes from the following sources:

43% cooking and baking fat, salad oils, butter, and margarine.

34% red meat, poultry, and fish.

12% dairy products, not including butter.

4% beans, peas, nuts, soy flour, grits.

4% grains, vegetables, fruits.

3% eggs.

The authors believe that a macrobiotic diet based on natural foods (including miso soup and tofu) can largely prevent heart disease.

A color cover photo, by Robert Kaufman, shows Michio Kushi, dressed in a white apron with a red heart on it, slicing a carrot in a kitchen.

8284. Matsudomi, Naotoshi; Sasaki, T.; Kato, A.; Kobayashi, K. 1985. Conformational changes and functional properties of acid-modified soy protein. *Agricultural and Biological Chemistry* 49(5):1251-56. May. [18 ref]

• ***Summary:*** When soy protein was treated with a mild acid, its functional properties, including its solubility, emulsifying properties, and foaming properties, were greatly improved. Address: Dep. of Agricultural Chemistry, Yamaguchi Univ., Yamaguchi, 753 Japan.

8285. Mori, H. 1985. Shôwa 57 nendo ni okeru shôyu, miso no kenkyû gyôseki [Review of annual achievements in shoyu and miso research]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 78(5):328-59. [766 ref. Jap]

• ***Summary:*** This important Japanese-language article, published each year in the May issue of this periodical, has two parts: (1) A review of the past year's major discoveries and developments in the fields of miso and soy sauce in Japan. (2) A bibliography related to those discoveries and developments. Address: Noda Sangyo Kagaku Kenkyusho.

8286. Morinaga Nutritional Foods, Inc. 1985. Mori-Nu Fresh Tofu recipes (Leaflet). Los Angeles, California. 1 p.

• ***Summary:*** 8 color recipes. Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040.

8287. Shurtleff, William; Aoyagi, Akiko. 1985. History of tempeh: A fermented soyfood from Indonesia. 2nd ed. Lafayette, California: Soyfoods Center. 91 p. May. 28 cm. [402 ref]

• ***Summary:*** A slightly revised and updated version of the July 1984 edition.

This book is now (as of April 2011) available free of charge on Google Books, in full view. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8288. Shurtleff, William; Aoyagi, Akiko. 1985. The Americanization of tempeh (1970 to 1980s) (Continued–Document part III). In: W. Shurtleff and A. Aoyagi, Akiko. 1985. History of Tempeh: A Fermented Soyfood from Indonesia. 2nd ed. Lafayette, California: Soyfoods Center. 91 p. See p. 46-49. May. [402 ref]

• ***Summary:*** Continued. "William Shurtleff and Akiko Aoyagi of The Soyfoods Center in California were also active in helping to introduce tempeh to America. They first became aware of and interested in tempeh in March 1975 in Tokyo after reading *The Farm Vegetarian Cookbook.* In their *Book of Tofu* (1975), they included a recipe for homemade tempeh and seven Indonesian-style tempeh recipes (learned from an Indonesian tempeh maker in Tokyo), the first such recipes ever published in English. This whole section was published in *Mother Earth News* in May 1976. In late 1976, during a two-week visit to The Farm in Tennessee, they wrote (with Cynthia Bates) a 4-page pamphlet titled 'What is Tempeh?' which they enlarged and published in early 1977. In May 1977 they spent a month in Indonesia studying tempeh, and in June their article "Favorite Tempeh Recipes" was published in *Organic Gardening* magazine. In January

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1978 William Shurtleff presented a paper and demonstration on how to make tempeh from winged beans at an International Seminar on Winged Beans in the Philippines.

"In July 1979 Harper & Row published their *Book of Tempeh,* the first book in the world devoted entirely on tempeh. It contained the first sizeable collection of American-style and Indonesian tempeh recipes (130 in all), the first illustrated descriptions of making tempeh, tempeh starter, and onchom (ontjom / oncom) on various scales in Indonesian tempeh shops, the first history of tempeh, detailed discussion of tempeh in Indonesian culture and of the many varieties of Indonesian tempeh, and the first recommendations for commercial names for the more than 30 types of tempeh that could easily be made in the West. It also contained chapters and reviews of the literature on tempeh nutrition and the microbiology and biochemistry of tempeh fermentation, plus the largest bibliography on tempeh to date (including many new Indonesian references), an annotated listing of 61 people and organizations around the world connected with tempeh, and the first list of tempeh companies in the West. By early 1984 16,600 copies of the paperback edition and 960 copies of the enlarged professional hardcover edition had been sold. Between 1976 and 1982 they wrote eight articles on tempeh for popular and trade magazines.

"In March 1980 The Soyfoods Center published *Tempeh Production,* the first book describing how to start and run a commercial tempeh plant in industrialized or Third World countries. In 1981 Shurtleff and Aoyagi wrote a book on tofu, miso, and tempeh that was published in Mexico in Spanish, and in 1982 they published books containing bulk tempeh recipes and tempeh labels. Starting in 1982 Shurtleff did extensive annual surveys of the tempeh industry and market in the USA, which were published yearly by The Soyfoods Center in *Soyfoods Industry and Market: Directory and Databook.* The Center also developed and sold color slide sets on "Tempeh," "Tempeh Production in the USA," and "Tempeh Production in Indonesia." In 1985 The Book of Tempeh will be published in German as *Das Tempeh Buch.*

"Another early pioneer of tempeh in America was Rodale Press in Emmaus, Pennsylvania, best known as the publisher of *Organic Gardening* and *Prevention* magazines. In the spring of 1975 Rodale's R&D department decided to follow up on the work with tempeh done by Hesseltine and Wang at Peoria. In early 1976 R&D food technologist Mark Schwartz began to work with Dr. Wang in Peoria to develop a simple, inexpensive way to make tempeh at home. They devised a tempeh kit including an incubator made from an inexpensive Styrofoam picnic cooler heated by a light bulb. For a Reader's Research Project, they sent the kit with instructions and a questionnaire to 60 readers across the country, and asked for feedback. The unanimous response was that people found the new food easy to make and delicious (Podems 1976). This R&D work led to five major articles in 1976 and 1977. In March 1976 Brenda Bortz in 'The Joys of Soy' introduced tempeh and Rodale's tempeh research to readers of *Organic Gardening* (OG). In January 1977 *OG* ran 'Tempeh Keeps 'em Coming for More Soybeans.' Jack Ruttle, a Rodale staffer, summarized the results of Rodale's research on tempeh to date and gave detailed instructions for making tempeh at home. This was the first major popular article on tempeh published in America. In June *Prevention,* the largest health-food magazine in America, ran a cover story and editorial by Robert Rodale titled 'Tempeh, a New Health Food Opportunity.' He visited America's first Caucasian-owned tempeh shop (run by Gale Randall), encouraged others to start tempeh shops and to 'get in on the ground floor of a new industry,' and predicted that tempeh might well become America's most popular way of using soybeans as part of the 'coming soy boom.' 'Tempeh is on its way up,' he wrote. 'Before long it will be eaten widely and lovingly across this land of ours.' Also in June *OG* published Shurtleff and Aoyagi's 'Favorite Tempeh Recipes' and Wang, Swain, and Hesseltine's 'Calling all Tempeh Lovers.' In addition Rodale Press published books with extensive information on tempeh: *Home Soyfood Equipment* (Wolf 1981) and *Tofu, Tempeh, & Other Soy Delights* (Cusumano 1984). Wolf's book included a new method for making tempeh at home using unsalted soynuts, which took less time and cost only about 28% (10 cents) more per pound than the traditional method. Detailed plans for making a home tempeh incubator were given. *Organic Gardening* (March 1982) summarized Wolf's quick tempeh method.

"Starting in 1971, the American media first began to take an interest in tempeh, when Food Processing magazine, in its 'Foods of Tomorrow' section did an article on 'Specialty Fermented Foods,' discussing their potential acceptability in the American market. It concluded: 'But of all fermented foods, tempeh, with its high ratings in taste, nutritional benefits, and simple, low cost processing techniques, appears to be the most likely candidate for Americanization . . . Tempeh may be one of the next to appear in the US market place.' In May 1976 *Mother Earth News* (Issue #39) ran a long excerpt on tempeh from *The Book of Tofu* by Shurtleff and Aoyagi. Media coverage expanded significantly in 1977. First came the three major Rodale Press articles mentioned above. In September *Mother Earth News* featured 'How we Make and Eat Tempeh Down on the Farm,' and in November *Vegetarian Times* ran 'Tempeh,' In July 1978 *East West Journal* ran its first tempeh story, 'Make Your Own Soyburger' about the Farm's tempeh. These many articles contained recipes and detailed instructions for home preparation, and some gave the address of the NRRC in Peoria, Illinois as a source of free tempeh starter. In less than 18 months, over 25,000 people requested starter and began making tempeh at home. This early media coverage for tempeh was a veritable blitz for a largely unknown food, and

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most of the publications had large circulations. In addition descriptions of tempeh began to appear in popular books, such as Beatrice Hunter's *Fermented Foods and Beverages* (1973).

"The first commercial Caucasian American tempeh shop was started in the winter of 1975 by Mr. Gale Randall in Unadilla, Nebraska." Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8289. Soyfoods Center. comp. 1985--. SoyaScan: Computerized bibliographic database on soybean utilization, history, nutrition, processing, marketing, and production. 1100 B.C. to the 1980s. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549 USA. [33940 ref]
• ***Summary:*** First available for use: May, 1985. Statistics as of 1 Jan. 2000: Total number of records: 59,440. Number of records with abstracts: 45,007 (75.7% of total). Average number of words per abstract: 143. Earliest record: 1100 B.C. Number of records for documents published before 1970: 26,000 (44% of total). Number of records on commercial soy products (mostly soyfoods): 7,702 (13.0% of total). Number of individual commercial soy products listed: 12,683. Percentage of records with information on soybean utilization: 82%. Percentage of records with information on soybean production: 26%. Growth rate of database: 2,000 to 2,500 records/year. Printed formats available: Printed bibliographies on major subjects of interest are published regularly. Availability for custom database searches: Available to anyone. Rates: $0.50/record for 0-300 records printed, minimum $90.00. 300+ records are $0.20 each. Commercial Soy Products, Market statistics, and SoyaScan Notes are $1.50 each. No time-based fee is charged. Availability for online searching: Not available.

8290. Torii, Yasuko. 1985. The Book of Tôfu to no deai: Amerika no tôfu buumu no haikei [My encounter with The Book of Tofu (by Shurtleff & Aoyagi): The background of the tofu boom in America]. *Daizu Geppo* (*Soybean Monthly News*). May. p. 31-35. [Jap]
Address: Nihon Yuki Nogyo Kenkyukai Jonin Kanji.

8291. Tsuchiya, Kunio. 1985. Minami no tôfu, kita no tôfu. Fûdo to tôfu. Shiriizu sôshûhen [Southern tofu, northern tofu. Climate and tofu. Plus overview of the series]. *Daizu Geppo* (*Soybean Monthly News*). May. p. 22-25. [Jap]
Address: Gyomu Bucho, Daizu Kyoku Antai Kyokai.

8292. *Toyo Shinpo* (*Soyfoods News*). 1985. Gan yobô ni daizu seihin ga yûkô [For cancer prevention, soyfoods are effective. Research done by Dr. Nishioka and his group at Doshisha University shows saponins retard mutations]. June 1. p. 1. [1 ref. Jap; eng+]
Address: Hajime NISHIOKA, Kogyo-bu, Seikagaku Kenkyushitsu, Doshisha Univ.

8293. Tsujimura, Katsura. 1985. Re: Thinking about tempeh, salted koji, and natto. Letter to William Shurtleff at Soyfoods Center, June 12. 2 p. Typed, with signature. [Eng]
• ***Summary:*** He thanks Mr. and Mrs. Shurtleff for their present of the new edition of 'The Book of Tempeh,' and makes a few observations about the symposium "Non-Salted Soybean Fermentation" to be held July 15-18 at Tsukuba Science City.

He is interested in understanding the connection between the microorganisms of kinema, thua-nao, natto, and onchom merah of Indonesia (*Neurospora*).

"You have mentioned a food named 'Tou Chiah Ping (soy bean fried cake),' reported and photographed at Beijing [China] in 1931. (p. 155)" Is its Chinese characters [three handwritten characters]?

"Unfortunately you could not get new information by asking 10 Chinese. None of them knew about it. This means that the food was lost or was eaten only by lower classes.

"You have referred to the relation of tou ching ping and tempe. I also imagine tou-chiah-ping was one of the original types of the consumption of soybean-koji, before it was used for enzyme reaction, as in the case of miso production. Salted soybean koji (in Japan it is known variously as Tera-natto, Daitokuji-natto, Hama-natto or Shiokara-natto) is another type of consumption. It improves preservation and serves as an appetizer of boiled rice. From it miso and soya sauce were developed.

"At present grain-koji (made of rice or wheat) is usually used for miso and soya-sauce production. Soybean protein is hydrolyzed by grain-koji. Grain-koji itself is never eaten directly. It is also used as enzyme preparation to hydrolyze starch to make 'Amasake' or as the raw material for 'Sake' making. Whether grain-koji was eaten in ancient time or not, I have no information.

"Natto and 'Oncom merah' are unique products utilizing *Bacillus* and *Neurospora* respectively. I suppose both might developed from failed production of molding.

"There are two kinds of onchom, black onchom and red onchom; the former is made using *Rhizopus,* and is the analogue of tempeh. You have classified this as a type of tempe..."

"Natto resulted from the failure of soybean-koji production, I suppose. Natto developed in northeast Japan, where the climate was cooler than in southeast. One must maintain warm temperature to grow *Aspergillus* to get koji. So they packed the cooked soybean in the straw parcel, and this resulted in the growth of *Bacillus* instead of *Aspergillus*. The wet condition on the surface of boiled soybean may benefit to the Bacillus (unfortunately I have no experimental evidence).

"I am interested that the process of the development of natto and onchom (red onchom), which seem to be resemble each other. Sincerely yours,..." Address: Prof. of Nutrition,

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Higashi Nakano 2-5-5, Nakano-ku, Tokyo 164, Japan.

8294. Torii, Yasuko. 1985. Re: New developments with soyfoods Japan. Letter to William Shurtleff at Soyfoods Center, June 13. 2 p. Handwritten.
• ***Summary:*** Discusses the Soybean Symposium in Tsukuba, The Book of Tempeh, History of Tempeh in Japan, Bruce Walker (who is doing soba research). Marusan's tempeh is not selling very well at Mitsukoshi or other department stores (more and more Japanese like instant foods). Article in Hikari. Two natural foods restaurants named Alicia and Healthy-Kan are doing lots with tempeh on their daily menus. She learned a new method for making homemade soymilk from Miyazaki Gakusha: Drop 200 gm clean whole soybeans into 400 cc boiling water. Allow to return to the boil, then boil for 4 to 4½ minutes; this inactivates lipoxygenase. Turn off the heat and add 700 cc water. Soak for 5-6 hours. Blend until smooth in a blender. Bring to a boil and simmer for 8 minutes, Strain and serve. Address: Kamitsuchidana 324, Ayase-shi, Kanagawa-ken 252, Japan. Phone: 0467-76-0811.

8295. Hosaka, Yaoji. Assignor to Toyu Food Co-Operative Corp. (Saitama, Japan). 1985. Process for manufacturing flavored and patterned tofu. *U.S. Patent* 4,525,373. June 25. 6 p. Application filed 1 June 1983. 11 drawings. [5 ref]
• ***Summary:*** This is an invention for "tofu steak," which is a flavored and patterned cake of tofu. It is grilled on a steel plate like beefsteak. The pattern comes from the bottom of the forming box. Address: Yashio, Japan.

8296. Takamine, Kazuhiro. 1985. Re: Thanks for new edition of book. Glad to see history of tempeh in Japan. Letter to William Shurtleff at Soyfoods Center, June 25. 2 p. Typed, with signature on letterhead.
• ***Summary:*** "I was delighted to hear from you and received your kind complimentary copy of new edition, *The Book of Tempeh.*

"I felt so happy to know that what I talked with you in Lafayette was introduced" in the history section of this book [p. 153-54]. That section "reminded me of the time I spent in your house and many ideas of promotion of tempeh in Japan given through Akiko-San's cooking and talks with your friends.

"I have some additional information on our tempeh factory. Torigoe started to make tempeh at new factory from July 1984. This factory has a capacity of l00 tonnes of a plain tempeh a month. Torigoe determined to build a new factory at the end of 1983 in order to meet the expectation of demand in the future. We designed the fermentation room to be controlled automatically, direct shock freezing system and also purification facility for sewerage disposal controlled under microbes and so on.

"We hope tempeh business will grow steadily year by year and your activity will spread out all over the world through tempeh.

"Please give my best regards to Akiko-San. Sincerely yours,..." Address: Torigoe Flour Milling Co., Ltd., Yoshii-machi, Fukuoka-ken 839-13, Kyushu, Japan. Phone: 094375-3121.

8297. Aoki, Sadao. 1985. Nattô oyobi tenpe no seizô ni tsuite [Natto and tempeh production]. *Daizu Geppo* (*Soybean Monthly News*). June. p. 10-18. [Jap]
Address: Hakko Shokuhin Bucho, Tochigi-ken Shokuhin Kogyo Shidosho.

8298. Egami, Yukio. 1985. "Chûgoku nôgyô chiri" no naka no daizu [Soybeans in "Chinese agricultural geography"]. *Daizu Geppo* (*Soybean Monthly News*). June. p. 33-38. [Jap]
Address: Senmu Riji, Daizu Kyoku Antai Kyokai.

8299. Kushi, Aveline; Jack, Alex. 1985. Aveline Kushi's complete guide to macrobiotic cooking: For health, harmony, and peace. New York, NY: Warner Books. xvii + 414 p. June. Illust. Index. 23 cm. [36 ref]
• ***Summary:*** Index entries include: Miso 61, Tofu 50, Tamari 19, Tempeh 17, Whole dry soybeans 6, Natto 3, Soymilk 3, Yuba 1. This book calls ganmodoki "Tofu Croquettes" and further states that "*Gan* means 'crane' and *modoki* means 'looks like.'" Among the 31 chapters are ones titled Beans (incl. basic black soybeans, and brown rice with black soybeans); Tofu, Tempeh, and Natto (including yuba); Sea Vegetables; Condiments and Garnishes (incl. miso), and Fish and Seafood.

Under "Black Soybeans" (p. 257) we read: "These nice shiny beans are also called Japanese black beans. They have a strong, delicious taste. Their juice is said to make the voice clear and beautiful. Throughout Japan, mothers prepare their children for music tests and singing lessons with this dish. Black soybeans are also used medicinally to help discharge animal toxins from the body." Note: This is the earliest macrobiotic cookbook seen that uses the term "Black soybeans" in a recipe title. All previous macrobiotic cookbooks called them "Black beans."

Contains recipes for homemade tofu, tempeh, and natto. Address: Brookline, Massachusetts.

8300. Belleme, John. 1985. Update on American Miso Co. (Interview). *SoyaScan Notes.* July 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** About 18 months ago [in Feb. 1984] John sold his interest in American Miso Co. to his partner, Barry Evans. Barry now owns all of the company; he is not interested in teaching interns. The company's core market is hard-core macros. They must sell 500,000 pounds/year just to break even. Address: P.O. Box 457, Saluda, North Carolina 28773.

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8301. *Asahi Shinbun* (*Asahi Daily News, Tokyo*). 1985. "Mirai shoku"–nattô: Tsukuba de kokusai shinpojiumu [Food of the future–Natto: International symposium in Tsukuba]. July 13. [Jap]
• ***Summary:*** While focusing on the international symposium on non-salted fermented soybean foods, held in Tsukuba, Japan, this article discusses tempeh as a type of natto. A map shows the natto triangle–including kinema, thua nao, and tempeh–passing through Japan, Nepal, Thailand, and Indonesia. Address: Japan.

8302. *Mainichi Shinbun.* 1985. Kaze no uta: Nattô kanpa [Song of the wind: Natto donations]. July 16. [Jap]
• ***Summary:*** *Kanpa* refers to a movement to encourage the public–in this case soliciting donations for natto in Japan.

8303. *Toyo Shinpo* (*Soyfoods News*). 1985. Kyuto Bussan. Tôfu "Aisukuriimu." Seizô sôchi, "noohau" o kaihatsu. Shôwa Sangyo, Mitsubishi Jûkô ga kyôryoku [Kyuto Bussan Tofu Ice Cream. They have developed the equipment and know-how. Showa Sangyo and Mitsubishi Heavy Industries helped]. July 21. p. 9. [Jap; eng+]
• ***Summary:*** This ice cream is made using soymilk. Kyuto Bussan is inviting large tofu manufacturers to start producing it in Kyushu. Raw materials are provided by Showa Sangyo, equipment by Mitsubishi Juko, marketing by Kyuto Bussan.

8304. *Toyo Shinpo* (*Soyfoods News*). 1985. '85 Ajia "muen Hakko Daizu" Kaigi 7/15-16 oite Tsukuba Kenkyû Gakuen Tosh Kôryû Sentaa [1985 No-Salt Fermented Soybean Conference, July 15-16 at Tsukuba Research Center]. July 21. p. 9. [Jap; eng+]
• ***Summary:*** Representatives from 15 overseas countries attended. Natto and tempeh's "International Symposium" opens. 350 people attended; they had active discussions. Thua-nao (*chuana*) from Thailand was discussed.

8305. *Toyo Shinpo* (*Soyfoods News*). 1985. Nyûjô kyaku 5,000 nin ni apuroochi [Nearly 5,000 people attended]. July 21. p. 8. [Jap; eng+]
• ***Summary:*** About the 1985 No-Salt Fermented Soybean Conference, July 15-16 at Tsukuba Research Center. Natto products were exhibited at a vegetable protein fair. It was sponsored by the Dep. of Agriculture and Forestry (*Nôsuisho*), from Aug. 26 to Sept. 7 at their building. Vegetable protein is a basic part of our daily life. At that time the Japanese Natto Association introduced tempeh, and they took a poll of 140 people. 4.9% of women were aware of tempeh. Mr. Kanasugi introduced tempeh foods to people. Samples of tekka miso, croquettes, fried tempeh, and tempeh burger were served. People like the flavor of these.

8306. *Toyo Shinpo* (*Soyfoods News*). 1985. Tônyû dezaato shin meniyuu ni [Adding soymilk dessert to their new menu]. July 21. p. 53. [Jap; eng+]
• ***Summary:*** The famous Kyoto tofu restaurant Junsei added a soymilk dessert to their menu. There are four flavors (like a custard cup): peppermint, matcha (green tea), ao-ume (green plum), and aka-ume (red plum).

This is a sign of Junsei's internationalization.

8307. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo, Evening ed.*). 1985. "Nattô"–sekai ni shinshutsu ["Natto" is spreading out across the world]. July 24. [Jap]
• ***Summary:*** About the international symposium on non-salted fermented soybean foods held in Tsukuba, Japan. Discusses tempeh as well as natto. Photos show: (1) A man making tempeh in Indonesia. (2) A Japanese woman holding a plate of tempeh snacks. Address: Japan.

8308. *Nihon Keizai Shinbun* (*Japan Economics Newspaper*). 1985. Daizu kara chiizu. Tônyû katameru kôso seisei [Cheese made from soybeans. New enzyme coagulates soymilk]. July 26. [Jap]
Address: Japan.

8309. Asian Symposium on Non-Salted Soybean Fermentation: Tempe, Kinema, Tua-nao, Natto. The roots of biotechnology in monsoon Asia (Abstracts). 1985. Tsukuba, Japan: Tsukuba Center for Institutes. 85 p. Held 15-17 July 1985 at Tsukuba, Japan. 26 cm. [Eng]
• ***Summary:*** For each paper there is a Japanese-language abstract (p. 1-38), and an English-language abstract (p. 43-85). On pages 39-41 are full-page ads for Kume-Natto, Marusan Sukoyaka Tenpe [Tempeh], and Torigoe Tenpe. Address: Japan.

8310. Kawakami, Kozo; Kimura, Eiichi. 1985. Daizu ryôri kotoba no rekishi. Tôfu wa mukashi "tôfu" to kaita [History of soyfoods terminology in Japan. "Tofu" was previously written with different characters]. *Daizu Geppo* (*Soybean Monthly News*). July. p. 34-39. [8 ref. Jap]
• ***Summary:*** A full-page table (p. 39) lists all of the major Japanese soyfoods and gives a citation for the earliest Japanese-language document seen by the authors in which each of their names first appears. Address: 1. Nôgaku Hakase, Shusai, Ryori Genten Kenkyukai; 2. Daizu Geppo Staff.

8311. Kawakami, Kozo; Kimura, Eiichi. 1985. Daizu ryôri kotoba no rekishi [History of soyfoods terminology in Japan: Irimamé (Document part)]. *Daizu Geppo* (*Soybean Monthly News*). July. p. 34-39. See p. 35, 39. [8 ref. Jap]
• ***Summary:*** A full-page table (p. 39) lists all of the major Japanese soyfoods and gives a citation for each of their early names.

Irimamé (dry-roasted soybeans): The earliest document

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seen by the authors that mentions *irimame* is the *Shin Saru Gakki* [New and Funny Lewd Stories], a book published in Japan during the Heian period in about A.D. 1058-1065. *Sarugaku* (*Saru* means "monkey") is a kind of comedy containing some obscene stories that make it especially entertaining; *Sarugaku Kyôgen* is a comedy within a Noh play. It is found in the collected works titled *Gunsho Ruiju no Sarugakki* which states (volume 136, p. 344) "Sakana wa Irimame," which means that irimame is used as a food to serve with saké (*o-tsumami*). The story is about a woman who loved saké.

The second earliest document seen that mentioned *irimame* is the *Sezoku Ritsu Yoshu* published in the *Gunsho Ruiji* (p. 762) during the Kamakura period (1185-1333). Address: 1. Nôgaku Hakase, Shusai, Ryori Genten Kenkyukai; 2. Daizu Geppo Staff.

8312. Kawakami, Kozo; Kimura, Eiichi. 1985. Daizu ryôri kotoba no rekishi: Edamamé [History of soyfoods terminology in Japan: Edamamé (Document part)]. *Daizu Geppo* (*Soybean Monthly News*). July. p. 34-39. [2 ref. Jap]
• ***Summary:*** A full-page table (p. 39) lists all of the major Japanese soyfoods and gives a citation for each of their early names.

Edamamé: The term *Edamamé* is unexpectedly old, dating from at least the Kamakura period (1185-1333). The oldest document seen by the authors is a letter written in the year 1275 by Saint Nichiren (*Nichiren Shônin*). At the time he was living at Mount Minobu (*Minobu-san;* the headquarters of the Nichiren sect). He received many gifts from his followers or devotees. He wrote down the name of each gift and the amount given, the sent a very courteous thank you letter to each of the gift givers. These letters are published in a book titled *Nichiren Shonin Gosho Zenshu* (*The Collected Writings of Saint Nichiren*). In the letter dated 26 July 1275 he wrote to a Mr. Takahashi: "Thank you for the edamamé." This book of Nichren's writings is very hard to find. It might be available from the Sokagakkai. Address: 1. Nôgaku Hakase, Shusai, Ryori Genten Kenkyukai; 2. Daizu Geppo Staff.

8313. Kawakami, Kozo; Kimura, Eiichi. 1985. Daizu ryôri kotoba no rekishi [History of soyfoods terminology in Japan: Tera natto / shiokara natto (fermented black soybeans) (Document part)]. *Daizu Geppo* (*Soybean Monthly News*). July. p. 34-39. [2 ref. Jap]
• ***Summary:*** A full-page table (p. 39) lists all of the major Japanese soyfoods and gives a citation for each of their early names.

Tera Natto: The term *shiokara natto* ("salty natto") appears in the work titled *Gunsho Ruiju* (*Katsuji-hon,* page 344, lower section, line 5). The authors think that this is the earliest document seen that mentions *tera natto* or non-stringy natto [fermented black soybeans]. But after that time, the same food appears to be called *ko no daizu* or *kaori no daizu* ("fragrant soybeans"), and that term first appeared in the *Hôchô Kikigaki,* a cookbook that was published about 1560-1580 and that is part of the *Gunsho Ruiju* (*Katsuji-hon,* page 800, upper section, line 6). The term *ko no daizu* or *kaori no daizu* also appeared in the *Sotan Chakai Kondate Nikki* (*Master Sotan's Tea Ceremony Cookery Menu Diary*), in the morning menu for 19 March 1588. Address: 1. Nôgaku Hakase, Shusai, Ryori Genten Kenkyukai; 2. Daizu Geppo Staff.

8314. Kawakami, Kozo; Kimura, Eiichi. 1985. Daizu ryôri kotoba no rekishi [History of soyfoods terminology in Japan: Itohiki natto (stringy natto) (Document part)]. *Daizu Geppo* (*Soybean Monthly News*). July. p. 34-39. [2 ref. Jap]
• ***Summary:*** A full-page table (p. 39) lists all of the major Japanese soyfoods and gives a citation for each of their early names.

Itohiki natto: What we now call natto (*itohiki-natto*) was written as *itohiki daizu* ("string-pulling soybeans") in the old days. It was written like that in the entry for 19 Dec. 1405 in the *Noritoki-kyo ki* (*Diary of Noritoki Fujiwara*), which is the earliest document seen that mentions natto. The author's name was FUJIWARA Noritoki, but he was usually called Yamashina Noritoki because this nobleman's family, which lived on land they owned in Yamashina near Kyoto, kept their diary for five generations. This Yamashina family was in charge of the supplies department for the Imperial Court (*Chotei*), and all supplies that went to the Court had to pass through this family, which recorded them in detail. Another diary was kept by the family's manager (*banto*), and it is even more detailed, containing all of the prices of the goods ordered, and including wages paid to laborers, carpenters, etc. Therefore it is also a very useful book. In those days people used natto in natto soup (*natto-jiru*), which was quite popular. The earliest document seen that mentions *natto-jiru* is the *Matsuya Hisamasa Chakai-ki* (*Diary of the Hisamasa Matsuya Tea Ceremony Group*); *natto-jiru* was mentioned in the entry for 5 Sept. 1561. Mr. Matsuya was a rich merchant in the Nara area. His family kept their diary for three generations. Address: 1. Nôgaku Hakase, Shusai, Ryori Genten Kenkyukai; 2. Daizu Geppo Staff.

8315. Kawakami, Kozo; Kimura, Eiichi. 1985. Daizu ryôri kotoba no rekishi: Mamenoko and kinako [History of soyfoods terminology in Japan: Roasted whole soy flour (Document part)]. *Daizu Geppo* (*Soybean Monthly News*). July. p. 34-39. [2 ref. Jap]
• ***Summary:*** A full-page table (p. 39) lists all of the major Japanese soyfoods and gives a citation for each of their early names.

Mamenoko appears in the *Onna no shitsukegaki* (ca. 1540). Mameno ko appears again in the *Tamon-in Nikki* (menu of 1 Jan. 1542). Kinako appears in the *Sotan Chakai*

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Kondate Nikki (19 June 1587, morning menu).

Each of these works is cited previously and more details are given there. Address: 1. Nôgaku Hakase, Shusai, Ryori Genten Kenkyukai; 2. Daizu Geppo Staff.

8316. **Product Name:** [Soyette (Soy Ice Cream)].
Foreign Name: Daizuetto Aisukuriimu.
Manufacturer's Name: KBL-sha.
Manufacturer's Address: Main office: Tokyo, Japan.
Date of Introduction: 1985 July.
Ingredients: Incl. Soy protein, safflower oil.
How Stored: Frozen.
New Product–Documentation: Yukan Yomiuri Shinbun. 1985. July 26. This all vegetable product has half the calories of regular ice cream and almost twice as much calcium. In Japanese, "Daizu" means soybean. No address for the manufacturer is given. See also EMUL (1987).

8317. Shurtleff, William. 1985. Re: Computerizing card catalog. Thank you for tempeh materials. Letter to Yasuko Torii, Kamitsuchidana 324, Ayase-shi, Kanagawa-ken 252, Japan, Aug. 1. 1 p. Typed, without signature (carbon copy).
• ***Summary:*** "Dear Torii-san. We are right in the middle of computerizing our Soyfoods Center library card catalog. Already this summer we have keyed in 7,000 cards into the computer. A very talented Stanford student is doing the actual data entry and I am preparing and then proofing every card as it is printed out. It keeps me working 12 hours a day, 7 days a week just to keep up with him. So, this will have to be brief.

"Above all I want to thank you for all of the wonderful things that you have sent me, the letters about the conference, the symposium brochures, the clippings, and your good letters. They are very, very interesting to me. I also look forward to hearing whatever tapes you send. I'll return the *Tofuyo* [Okinawan fermented tofu] video cassette and the tapes to you by the end of September, and write more at that time when I'm a little more free. I'm also sending you $20 to (hopefully) cover expenses (postage, etc.).* You are such a *kichinto-shita hito!* [accurate, precise, punctual, neat and tidy person]. Both Akiko and I greatly appreciate this! Sincerely,...

"* To make it as easy as possible for you (though it doesn't seem as much like a real gift or money), we are deducting the $20 from your invoice. Akiko said if we sent you a $20 bill it would at be *mendokusai* [a nuisance] to go to the bank to cash it. I hope that's okay." Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8318. *Toyo Shinpo* (*Soyfoods News*). 1985. Beikoku no tokkyo o shutoku "tôfu suteeki" seihô. Tôyû Shokuhin [Toyu Foods granted U.S. patent on method for making "tofu steak"]. Aug. 1. p. 1. [1 ref. Jap; eng+]
• ***Summary:*** The company was issued U.S. Patent 4,525,373, which is valid for 17 years.

8319. *Toyo Shinpo* (*Soyfoods News*). 1985. [Using tempeh starter in research and development of new types of foods]. Aug. 11. p. 9. [Jap; eng+]
Address: Tochigi prefecture, Shokuhin Kogyo Shidosho.

8320. *Toyo Shinpo* (*Soyfoods News*). 1985. Daizu kara chiizu. Tsukuba-dai ken guruupu no seika [Cheese from soybeans. Success by Tsukuba University research group]. Aug. 11. p. 9. [Jap; eng+]
• ***Summary:*** Prof. Kazuo Murakami and Prof. Isao Kusakabe have found two special enzymes that works well in coagulating soymilk. Both have a molecular weight of about 24,000 and are proteins. The enzymes were found in soil bacteria on a small island near Shikoku. If you add this enzyme to soymilk heated to 70ºC, it coagulates into a yogurt-like product in about 2 minutes. This yogurt-like curd is mostly protein, does not have any sourness or bitterness, and has a smooth texture and mouthfeel–all of which make it well suited for use as a raw material in food manufacturing. The researchers hope to use the curds to make a fermented non-dairy soy cheese by removing excess water from the curd, adding lactic acid and salt, then letting it ferment.
Address: Tsukuba Univ., Japan.

8321. Nakamuta, Masamichi. 1985. Method and apparatus for manufacturing bean curd. *U.S. Patent* 4,534,283. Aug. 13. 10 p. Application filed 2 May 1983. 20 drawings. Application also filed in Japan on 6 May 1982. [5 ref. Eng]
• ***Summary:*** Soybean slurry is heated with steam in a 2-step process. Detailed descriptions of the equipment are given.
Address: 320, Arii, Shonai-machi, Kaho County, Fukuoka prefecture, Japan.

8322. *Toyo Shinpo* (*Soyfoods News*). 1985. Nisshin Shokuhin (yu) tenpe kôjô oopen. 150 nin ga kengaku, takai kanshin [Nisshin Shokuhin's new tempeh plant opens. 150 visitors attend plant tour with strong interest]. Aug. 21. p. 5. [Jap; eng+]

8323. *Toyo Shinpo* (*Soyfoods News*). 1985. '85 Ajia "muen Hakko Daizu" Kaigi 7/15-16 oite Tsukuba Kenkyû Gakuen Tosh Kôryû Sentaa [1985 No-Salt Fermented Soybean Conference, July 15-16 at Tsukuba Research Center]. Aug. 21. p. 5. [Jap; eng+]
• ***Summary:*** Tempeh made from cowpeas has been introduced into Nigeria; remarks by Robert Djurtoft. Summary of the lecture, Part I.

8324. *Toyo Shinpo* (*Soyfoods News*). 1985. [Mitsubishi's new Mapuron straight]. Aug. 21. p. 1; Nov. 11, p. 1. [Jap; eng+]
• ***Summary:*** This plain ("straight type") soymilk contains no added oil, so it also contains 30% less calories (96 per

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200 ml) and 25% more protein (8 gm per 200 ml) that Mitsubishi's former Mapuron product. And it is specially processed to remove the beany flavor.

8325. Johnson, Dale. 1985. Statistics on production and prices of soy protein products (Interview). *SoyaScan Notes.* Aug. 27. Conducted by Walter J. Wolf of NRRC, Peoria, Illinois.

• ***Summary:*** Dale has just contacted industry experts and compiled the following figures. Estimates of soy protein production and wholesale prices: Defatted soy flour and grits: 150,000 tonnes (metric tons) = 330 million lb at 18-20 cents/kg = 8.2-9.1 cents/lb. Soy protein concentrates: 50,000 tonnes (metric tons) = 110 million lb at 77-132 cents/kg = 35-60 cents/lb. Soy protein isolates: 70,000 tonnes (metric tons) = 154 million lb at 220-243 cents/kg = 100-110 cents/lb. Textured soy flours + concentrates: 75,000 tonnes (metric tons) = 165 million lb. Textured soy flours sell for at 55-66 cents/kg = 25-30 cents/lb. Textured soy protein concentrates sell for at 154-176 cents/kg = 70-80 cents/lb. Spun soy protein fibers (Ralston Purina isolate product) sell for at 330 cents/kg = 150 cents/lb. Soy protein hydrolysates (Gunther product) sell for at 550-600 cents/kg = 250-273 cents/lb.

Exports (U.S. Dept. of Commerce data, 1984): Vegetable flours and grits, defatted: 7,170 tonnes. Vegetable flours and grits, not defatted: 197 tonnes. Concentrates, hydrolysates, textured and spun fibers: 9,545 tonnes. Isolates: 2,300 tonnes.

Johnson will be in Japan to address the Japanese Vegetable Protein Food Association at the end of September. His trip is sponsored by Miss Kojima and American Soybean Association. Address: Food Ingredients (Minnesota), Inc., 2121 Toledo Ave. North, Golden Valley, Minnesota 55422.

8326. Sugisawa, Ko; Matsumura, Y.; Taga, K.; et al. Assignors to House Food Industrial Company Ltd. (Osaka, Japan). 1985. Process for preparing retort tofu. *U.S. Patent* 4,537,789. Aug. 27. 6 p. Application filed 23 Nov. 1983. 1 drawing. Application also filed in Japan on 20 Oct. 1983. [5 ref]

Address: Higashi-Osaka, Japan.

8327. Hesseltine, C.W. 1985. Fungi, people, and soybeans. *Mycologia* 77(4):505-25. July/Aug. [92 ref]

• ***Summary:*** In this Mycological Society of America Annual Lecture, presented on 7 Aug. 1984 at Colorado State University (Fort Collins, Colorado), Dr. Hesseltine gives a nice history of the research conducted by him and others at the Northern Regional Research Center (NRRC) on Asian soybean fermentations, including fermented tofu (Frank Meyer, early USDA plant explorer, in a letter dated 21 Nov. 1916, states: "Parcel No. 125c contains first quality Chinese soybean cheese: please taste a little on the point of a knife; it is extremely appetizing."), sufu, shoyu, miso, tempeh, Chinese black beans (fermented black soybeans), natto, and "the use of lactic acid bacteria to produce a yogurt product from soybeans." He also studied non-fermented tofu.

Dr. Hesseltine pays a nice tribute to the work of Dr. A.K. Smith of the NRRC (p. 506-07). After his trip to East Asia shortly after World War II, Dr. Smith (a protein chemist) made great efforts to promote cooperation between the USDA, particularly the NRRC, and Japan in conducting research to understand how our exported soybeans were used for food. He had the foresight to recognize the importance of studying soybeans used in such huge quantities for processing into human food. Dr. Smith was instrumental in arranging for two Japanese scientists (Dr. Tokuji Watanabe and Dr. Kazuo Shibasaki) to come to the NRRC to do research on tofu and miso. "This really began a new era of research on use of Oriental methods to produce foods from soybeans" (p. 507).

"My first real involvement in fermentation of soybeans was the arrival [in Oct. 1958] of Professor K. Shibasaki of Tohoku University to study the miso fermentation. He was sponsored by the American Soybean Association and USDA's Foreign Agricultural Service. When he arrived, I was told that since I was curator of the mold collection and since the *Aspergillus oryzae* strains used in the miso process were in my charge, I would be the person he would work with. I had no background and no interest in soybean fermentations, but this was a fortuitous happening because it acquainted me with Oriental food fermentations. All my background was in conventional liquid agitated pure culture fermentation. The miso fermentation introduced me to two new concepts in fermentation: (1) solid state fermentation, and (2) use of mixed pure culture inoculum" (p. 510).

"Probably my interest in fermented foods would have abated had it not been for the acceptance of Mr. Ko Swan Djien of Indonesia, who came to us in 1960 for practical training. In my first discussion with him, we talked about the kind of work he would do. Since I knew that a fermentation was conducted in Indonesia using soybeans and reportedly the fermentation organism was a species of *Rhizopus,* I asked him if he was familiar with the product; his answer was yes, that he often ate it, but he knew nothing about how the fermentation was conducted. It was decided that during his 6 months at Peoria this might be an interesting subject to study, especially since he could obtain samples of the tempeh cake from his wife, who was in Java and could tell good tempeh from bad. Dried samples were quickly obtained; from these cakes, four species of *Rhizopus* were isolated" (p. 514-15). Eventually many strains of *Rhizopus* were isolated and investigations showed that *Rhizopus oligosporus* strain NRRL 2710 produced especially good tempeh.

Photos show four famous Japanese scientists who studied fermented foods: (1) Prof. Teizo Takahashi. (2) Ryoji Nakazawa. (3) Kin-ichiro Sakaguchi. (4) Kendo Saito.

Address: NRRC, ARS/USDA, Peoria, Illinois.

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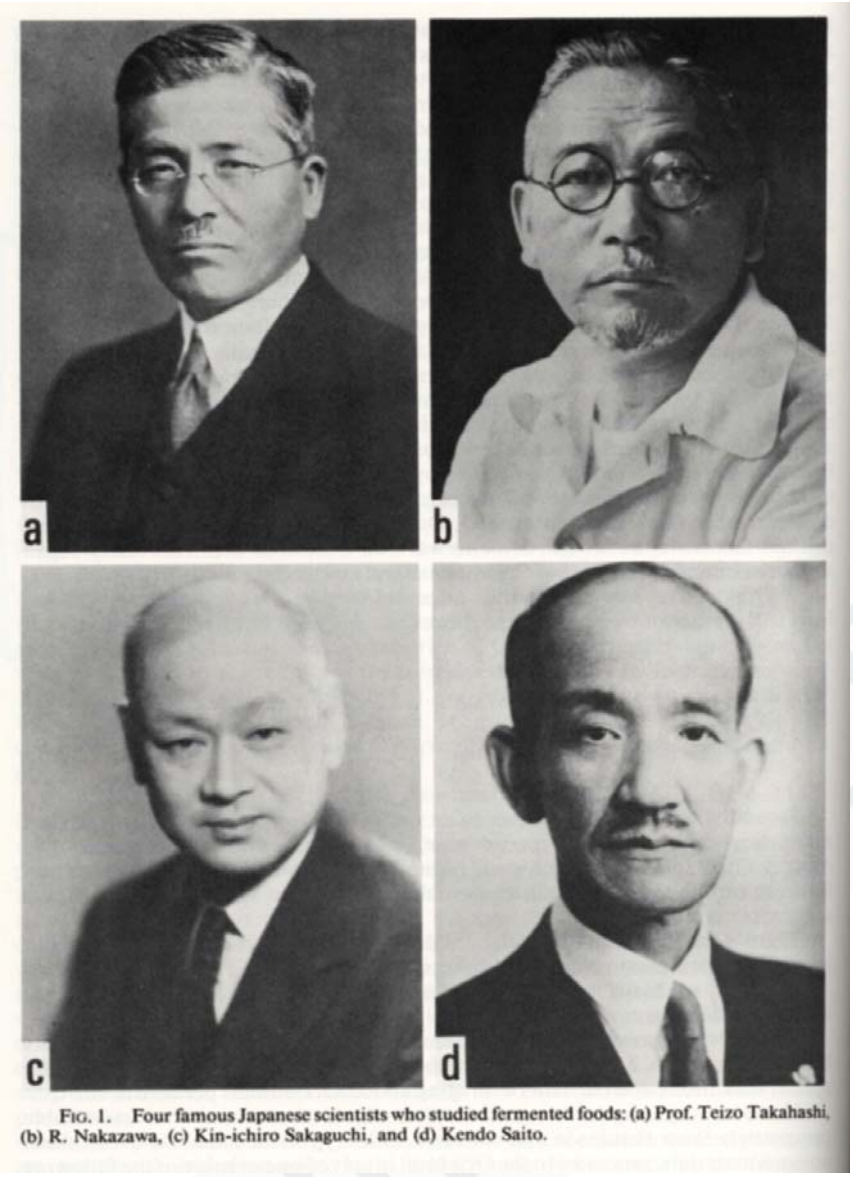

FIG. 1. Four famous Japanese scientists who studied fermented foods: (a) Prof. Teizo Takahashi, (b) R. Nakazawa, (c) Kin-ichiro Sakaguchi, and (d) Kendo Saito.

8328. Ichino, Naoko; Takei, Emiko. 1985. Highashi Ajia no tôfu-zukuri [Tofu-making in East Asia]. In: Ishige Naomichi, ed. 1985. Ronshi Higashi Ajia no Shokuji Bunka [Essays on Food Culture in East Asia]. Tokyo: Heibonsha Ltd. 646 p. See p. 117-47. Illust. No index. 22 cm. [17 ref. Jap]
• ***Summary:*** Includes a discussion (p. 141) of traditional Chinese cold-extraction of soymilk and more modern hot-extraction methods. In cold extraction, the mixture of ground soybeans and water (slurry) is poured into a filter sack, which is pressed in order to extract the cold soymilk. The okara remaining in the sack is often washed with water then pressed again to give a second extraction of soymilk. The two extractions of soymilk are mixed, then cooked in a caldron.

In hot extraction, the slurry is first cooked, then run into a filter sack, which is pressed to extract the hot soymilk. The okara in the sack is usually discarded. Hot extraction takes less time, probably gives soymilk with a less beany flavor (since the lipoxygenase enzymes are inactivated during cooking), and may give a slightly higher yield of soymilk. However the cold extraction probably uses less fuel to heat the soymilk.

Note: Ichino Naoko was born in 1957. Takei Emiko was born in 1955. Both authors are women. Address: Japan.

8329. Murata, Masakazu; Imaizumi, K.; Sugano, M. 1985. Catabolism of newly formed triglyceride-rich lipoproteins and serum high density lipoproteins in rats fed soybean phospholipid and soybean oil. *J. of Nutrition* 115(8):994-1004. Aug. [39 ref] Address: Lab. of Nutrition Chemistry, Kyushu Univ. School of Agriculture 46-09, Fukuoka 812, Japan.

8330. **Product Name:** [Tempeh].
Foreign Name: Tenpe.
Manufacturer's Name: Nisshin Shokuhin, Ltd.
Manufacturer's Address: 1-29-2 Tachibana, Sumida-ku, Tokyo, Japan.
Date of Introduction: 1985 August.
New Product–Documentation: Toyo Shinpo. 1985. Aug. 21. p. 5.

8331. Noguchi, Kazuko. 1985. Tenpe ryôri–Nihonjin no shikô ni awasete [Tempeh cookery–adapted to Japanese tastes]. *Daizu Geppo* (*Soybean Monthly News*). Aug. p. 9-17. [Jap]
• ***Summary:*** Contains numerous Japanese-style tempeh recipes plus some nutritional analyses. Address: Saga Joshi Tanki Daigaku Kyoju.

8332. Ofusa, Tsuyoshi. 1985. Shii bejitaburu: Kenko no tame no kaisô dokuhon [Sea vegetables: A book for health]. Tokyo: Kodansha. 194 p. Aug. 20. Illust. No index. 18 cm. [Jap]
Address: Yamamoto Nori Co., Tokyo, Japan.

8333. Ohsawa-America. 1985. Chico-San sells products line (Ad). *East West Journal* 15(9):33. Aug.
• ***Summary:*** A full-page ad. "Ohsawa-America, a newly formed macrobiotic food company, has recently purchased the Ohsawa-Japan products line from Chico-San, a division of H.J. Heinz, Inc." The ad/letter is signed "... in the spirit of Ohsawa, Herman Aihara, Bob Kennedy, Marty Roth, Joel

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Wollner."

The mail order catalog and price list, printed in tiny letters on this same page, includes 4 types of soy sauce, 5 types of miso, 3 miso condiments, 3 types of koji, and 6 seaweeds.

This ad also appeared in the Sept. 1985 issue (p. 4) of this magazine. Address: P.O. Box 12717, Northgate Station, San Rafael, California 94913-2717. Phone: 415-492-8110.

8334. Sugiyama, Masanori. 1985. "Tenpe" shain shokudô funsen-ki [Tempeh–Report of a hard struggle to introduce tempeh into a company cafeteria]. *Daizu Geppo* (*Soybean Monthly News*). Aug. p. 18-21. [Jap]
Address: Mitsui Bussan (K.K.) Kagaku-hin Sokatsu-bu Kacho.

8335. *Toyo Shinpo* (*Soyfoods News*). 1985. Nigari meekaa mo datsubô. 100% nigari kinugoshi-dôfu. Tôfu ni horete, koko made yattaze Miyaharu Shoten (Gifu) Sakae Haruo shatchô [Silken tofu made with only nigari as a coagulant developed by Haruo SAKAE, president of Miyaharu Shoten in Gifu prefecture]. Sept. 21. p. 6. [Jap; eng+]

8336. *Toyo Shinpo* (*Soyfoods News*). 1985. Nattô girai wa son o suru: Ryôri no barieishon. Nattô mo konna ryôri ni henshin [If somebody doesn't like nattô, too bad for them: Cooking variations. Natto can change into these kinds of recipes]. Sept. 21. p. 9. [Jap]
• ***Summary:*** Three photos show three different dishes, including Natto loaf and Natto ankake.

8337. Martin, Bradley K. 1985. You have to be crazy–or Japanese–to eat natto. *Wall Street Journal*. Sept. 25. p. 35.
• ***Summary:*** One American who thought he could eat anything was not prepared for "his confrontation with *natto*. That fermented soybean product proved to be 'gooey and flesh-colored.' It 'sort of smelled like peanut butter that had been out in the sun for a month.' The appearance was vile, 'just the sort of stuff you imagine when you hear the word "ooze."'

"Worst of all was the taste. The American struggled, vainly, to swallow." Veteran expatriates and Japanese proclaim with near unanimity: "Foreigners can't stand natto.

"Japanese await with smiling anticipation the horrified reaction of a foreigner trying natto for the first time, starting with the first whiff, and then the daunting sight of the whitish, cobweb-like trails that the sticky beans form between bowl and chopsticks."

But now ethnologist Shuji Yoshida of Osaka's national museum has developed a "natto triangle" theory, which says that similar fermented soybean products are eaten inside a triangle having as its corners Japan, Indonesia, and the India-Burma border. *Pe-bout* is eaten in the Shan states of Burma, *akuni* in India's Nagaland, and *kinema* in Eastern Nepal. He theorizes that all of these products trace their roots to a fermented soybean product developed in southern China in ancient times. The folk history of natto in Japan is then discussed.

Note 1. This is the earliest document seen (Dec. 2012) that mentions "akuni," a close relative of Nepalese kinema and Japanese natto.

Note 2. This is the earliest document seen (Jan. 2012) that mentions "Pe-bout" and says that in the Shan states of Burma it is the name for a local food which is a close relative of Japanese natto. The source of his information is Japanese ethnologist Shuji Yoshida.

8338. Puzo, Daniel P. 1985. Food briefs: Getting cotton in. *Los Angeles Times*. Sept. 26. p. H26.
• ***Summary:*** California glandless cottonseed is in demand in Japan "because Japanese researchers are using the unusual ingredient in food products. The work centers on the creation of a cottonseed ice cream, a chocolate and *natto*, a traditional Japanese food, according to *California Farmer* magazine."
Address: Times staff writer.

8339. *Florida Grocer* (*Miami, Florida*). 1985. Morinaga Tofu for U.S. market. Sept. Also in: Food Distributors Magazine (Sept.). Economic World (NY, Nov.).
• ***Summary:*** A photo shows a package of "Mori-Nu Fresh Regular Tofu."

"Morinaga Milk Industry Co., Japan's leading manufacturer of dairy products, has announced the creation of a U.S. subsidiary, Morinaga Nutritional Foods. The new company, headquartered in Los Angeles, will market Mori-Nu brand tofu in the United States."

"Unlike other tofu, Mori-Nu is manufactured by a patented process which assures freshness and long shelf life without the use of preservatives, the parent company says."

"Because Mori-Nu Tofu is actually made inside its hermetically-sealed aseptic package, no hands come in contact with the product. This exclusive packaging process permits the company to offer an unqualified guarantee of freshness to the consumer, Morinaga reports."

"Morinaga plans to introduce a 'regular' firmer style tofu to supplement the Soft Tofu which is currently being sold in limited areas."

"With worldwide sales of $1,300 million, Morinaga today markets tofu in more than 30 countries. The company's move into the U.S. coincides with expanding consumer interest in diet and health, according to Morinaga president, Akira Ohno. 'Our research tells us that there is an increasing trend towards health foods in general and a growing need for non-cholesterol products among U.S. consumers.' Mr. Ohno stated."

"The company's initial sales efforts will be directed to selected markets, beginning with Los Angeles and other West Cost cities, then expanding nationwide. Sales for the U.S. are

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projected at seven million packages in the first year."

"Morinaga sees the launching of Mori-Nu as the beginning of a "long-term involvement" in the U.S."

8340. Fruin, W. Mark. 1985. Soy sauce from A to Z: The beginning and the end of shoyu? *Japan Society Newsletter.* Aug/Sept. p. 5-7.
Address: Prof. of History, California State Univ., Hayward.

8341. Johnson, L.A. 1985. Soy protein: Chemistry, processing and food applications. Presented at the 70th Annual Meeting of the American Assoc. of Cereal Chemists. Held Sept. 22-26, 1985 in Orlando, Florida. *
• ***Summary:*** It is estimated that in the U.S. only about 2.1% of the average daily intake of protein comes from soy, compared to about 13% for the Japanese.

8342. Kikkoman International Inc. 1985. Teriyaki anytime. In almost no time. Kikkoman Teriyaki Baste and Glaze (Ad). *New Age Journal* (*Boston, Massachusetts*). Sept. p. 71.
• ***Summary:*** At the bottom of this full-page color ad is a brush next to a bottle of Kikkoman Teriyaki Baste & Glaze. Above it are four horizontal rows of cooked foods: Steak, fish, meat loaf, and chicken legs.

8343. Kotzsch, Ronald E. 1985. Macrobiotics: Yesterday and today. Tokyo and New York: Japan Publications Inc. 292 p. Sept. Illust. Index. 26 cm. [144* ref]
• ***Summary:*** The best and most objective book available to date (April 2011) on the origins and history of macrobiotics, worldwide. Includes detailed information on central ideas and practices of macrobiotics, its leaders, organizations, applications, and aspirations. Carefully researched and well written.

Contents: 1. Ekken Kaibara: The grandfather of macrobiotics. 2. Sagen Ishizuka: The founder of modern macrobiotics. 3. George Ohsawa: The early years (1893-1929; Yukikazu Sakurazawa, later known as George Ohsawa was born on 18 Oct. 1893 in a western suburb of Kyoto, Japan, the family's eldest child). 4. George Ohsawa: The first sojourn in the west (1929-1936). 5. George Ohsawa: Return to Japan in crisis (1936-1939).

Photographic interlude for *Macrobiotics Yesterday.* Illustration (line drawing) of Ekken Kaibara. Photos of Ishizuka, Nishibata, Ohsawa's parents, George Ohsawa (many from 1901-1966). 6. George Ohsawa: The war years (1940-1945). 7. George Ohsawa: Hope for a new Japan and a new world (1945-1953). 8. George Ohsawa: The world journey of the penniless samurai (1953-1966; George and Lima visited India [Nov. 1953-July 1955]; Africa [Aug. 1955-Feb. 1956, incl. Kenya, and 3½ months with Albert Schweitzer at Lambarene, Gabon]; Paris, France and Brussels, Belgium; New York City, USA [late 1959-Oct. 1961]; France [around 1961 he met Louis Kervran]; Tokyo [most of 1963-64]; Vietnam 1965; Tokyo, where he died on 23 April 1966 [24 April Japan time], probably of filarial parasites contracted in Lambarene, and smoking). 9. George Ohsawa: The man and the legacy. 10. After the master: Part one: America.

Photographic interlude for *Macrobiotics Today.* Photos are given of Toshi Kawaguchi, Michi Ogawa, Hiroshi Maruyama, Kaoru Yoshimi, Francoise Riviere, Cecile Levin, Dr. Kikuo Chishima, Dr. Moriyasu Ushio, Michio and Aveline Kushi, Herman and Cornellia Aihara, the Kushis, Aiharas, and Shizuko Yamamoto, William Dufty, Bill Tara, Aveline Kushi and Wendy Esko, Alex Jack, Dr. Marc van Cauwenberghe, Edward Esko, Murray Snyder, Noboru Muramoto, Jacques and Yvette de Langre [DeLangre], Jerome Carty, Duncan Sim, Lima Ohsawa, Shuzo Okada, Hideo Ohmori, First European Congress of Macrobiotics in London, Nov. 1978, Lenk summer camp, Switzerland, July 1984, Jan Lansloot, Peter Doggen, Rik Vermuyten, Georges Van Wesenbeeck, Roland Keijser, Mayli Lao Shun, Tomio Kikuchi (in Brazil).

11. After the master: Part two: Japan. 12. After the master: Part three: Europe and elsewhere. 13. The gospel according to Kushi. 14. Macrobiotics in western culture. 15. Prospects for the future. Bibliography.

The author, an excellent historian and writer, with a delightful sense of humor and light touch, began his study and practice of macrobiotics under Michio Kushi in Boston in Jan. 1967. A photo of Ronald E. Kotzsch appears on the rear cover. This book is based on his doctoral dissertation titled "Georges Ohsawa and the Japanese Religious Tradition," submitted on 1 April 1981 for a PhD degree in History of Religions from Harvard University. Pages 185-86 discuss briefly the role of the macrobiotic movement in introducing soyfoods (especially miso, shoyu, and tofu) and natural foods to America. Address: PhD, Hanover, New Hampshire; The New North Church, Hingham, Massachusetts (18 Mar 1985).

8344. Kotzsch, Ronald E. 1985. The Morinaga Incident (Document part). In: R.E. Kotzsch. 1985. Macrobiotics: Yesterday and Today. Tokyo and New York: Japan Publications Inc. 292 p. See p. 213. 26 cm. [144* ref]
• ***Summary:*** "In 1953 Japan was shocked by the 'Morinaga Incident.' The Morinaga Milk Company was using arsenic in the production of dried milk, and a batch became lethally contaminated. One hundred and eighty-six infants died of poisoning. A furor arose and the company passed the incident off as a freak occurrence. [George] Ohsawa contacted his long time associate, Keishi Amano, a biologist then working in the research laboratory of the National Fisheries Ministry. He urged Amano to write a book exposing the company and the dangers inherent in its processing techniques. The scientist did so and later published other books on the dangers of food processing and of chemical additives."

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Address: The New North Church, Hingham, Massachusetts (18 Mar 1985).

8345. Kotzsch, Ronald E. 1985. Noboru Muramoto (Document part). In: R.E. Kotzsch. 1985. Macrobiotics: Yesterday and Today. Tokyo and New York: Japan Publications Inc. 292 p. See p. 180-1, 187. 26 cm. [1 ref]
• ***Summary:*** Noboru Muramoto, who has helped to promote macrobiotics on the West Coast of the USA, arrived in California in 1971. An associate of George Ohsawa from Japan and an expert on medicinal herbs, his popular book titled *Healing Ourselves* was published in 1973 by Michel Abehsera's Swan House Press; it introduced many therapeutic uses of food. A student of traditional Japanese food production, Muramoto now lives in southern California, where he produces high quality sea salt, miso, umeboshi, and plum vinegar. Address: The New North Church, Hingham, Massachusetts (18 Mar 1985).

8346. Lippert/Whitehead Inc. 1985. Tofu Time Inc. enters into agreement with largest Japanese retailer [Daiei, Inc.] (News release). 136 East 57th St., New York, NY 10022. 2 p. Sept.
• ***Summary:*** The initial order for export to Japan is for $350,000. Daiei also plans to open three Tofutti Shops in Tokyo within the next 6 months. Daiei owns over 300 ice cream shops. Address: New York. Phone: 212-838-3777.

8347. **Product Name:** [Big Dream Time Powdered Tempeh].
Foreign Name: Taimu Taimu.
Manufacturer's Name: Nakasho Bussan.
Manufacturer's Address: Japan.
Date of Introduction: 1985 September.
Wt/Vol., Packaging, Price: Bottle.
New Product–Documentation: Toyo Shinpo (Soyfoods News). 1985. Sept. 21. p. 8. "New tempeh product announced. Nakasho Bussan to sell it [powdered tempeh]." This new product called Taimu Taimu (Time + Big Dream) was developed by the Japan Natto Assoc. It is their first commercial product. A 450 gm (1 lb) bottle sells for 6,000 yen ($26.67). Use it in miso soup, milk, juices or just mix with hot or cold water.

8348. Tani, Tadato; Katsuki, T.; Kubo, M.; Arichi, S.; Kitagawa, I. 1985. Histochemistry. V. Soyasaponins in soybean. *Chemical and Pharmaceutical Bulletin* 33(9):3829-33. Sept. [12 ref]
• ***Summary:*** Using high-performance liquid chromatography, the authors conducted histochemical analysis to clarify the distribution of "soyasaponins, which are the bioactive constituents of the seeds" of the soybean. Soyasaponin I [later named Saponin A] was found to reside mainly in the plumule, hypocotyl, and radicle of the soybean seed. Note: Saponins, especially soyasaponin I, are responsible for the bitter taste of soymilk. Address: 1-4. The Research Inst. of Oriental Medicine, Kinki Univ.

8349. Tani, Tadato; Katsuki, T.; Kubo, M.; Arichi, S.; Kitagawa, I. 1985. Histochemistry. VI. Tocopherols and isoflavones in soybeans (*Glycine max* Merrill, seeds). *Chemical and Pharmaceutical Bulletin* 33(9):3834-37. Sept. [5 ref]
• ***Summary:*** Tocopherols and isoflavones are bioactive substances. A high concentration of tocopherols was found in the soybean cotyledon, while isoflavones (including daidzin, genistin, and daidzein) were localized mainly in the plumule, hypocotyl, and radicle, which subsequently grow to form the adult plant. Address: 1-4. The Research Inst. of Oriental Medicine, Kinki Univ.

8350. Torii, Yasuko. 1985. Book review: *The Book of Tempeh,* 2nd ed. Revised & updated, by W. Shurtleff & A. Aoyagi. *Hikari.* Aug/Sept. p. 46. [1 ref. Eng]
• ***Summary:*** A substantial, positive review, showing the cover of the book and one recipe. In a box below the review we read:

"Several natural food restaurants in the Tokyo area offer tempeh on their menus. Among them are Healthy Kan (see this month's restaurant review); Alicia, at Daini Suzuki Biru, Kitazawa 2-9-23, Setagaya Ku, tel. 03-485-3681; and Mamenoko at 2-24 Nakamachi, Omiya Shi, Saitama Ken, tel. 0486-44-1323.

"Prepared tempeh is sold at the Aoyama and Kichijoji Natural Houses, and Nihonbashi Mitsukoshi Dept. Store, frozen foods section.

"*The Book of Tempeh* and Tempeh starter is available from Y. Torii, who can answer any questions on availability or manufacture of tempeh. Call her at 0467-76-0811, or contact her at 324 Kamitsu- chidana Ayase, Kanagawa 252."

Note: On page 41 is a review of Healthy-Kan (*Herushi-kan*) natural foods, which was started in Nov. 1984 by Ikuyo Imuta, who says her mother was an excellent cook. "She chose to include tempeh on her menu not only because of its nutritional qualities, but because it's such a versatile protein source which can be used to make anything from cake to curry." Address: Kamitsuchidana 324, Ayase-shi, Kanagawa-ken 252, Japan. Phone: 0467-76-0811.

8351. *Daily Leader* (*Stuttgart, Arkansas*). 1985. Teamwork: Researchers, marketers join forces to make Hartz efforts successful. Oct. 2. p. 4C. Insert.
• ***Summary:*** Genetic research and development of plant varieties today requires teamwork. Dan Lamberth, chief operating officer, says that Hartz is involved in a never-ending quest for excellence. The Plant Variety Protection Act of 1971, which protects a breeder's patent on a new variety for 17 years, set the stage for Hartz's current efforts. Until

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then, a plant breeder had no protection for his work and there was little incentive for private industry to develop research programs. Most plant breeding was done by state and federal government programs.

Since 1971 Hartz has developed nine varieties. "The main emphasis of Hartz Seed Company has been and remains the Southern soybean market... Hartz has also developed a program of food bean production for the Far East, which is an important, but not dominating, percentage of its business. Hartz 936X soybeans, grown in the United States and shipped to Japan and Korea, have been subject to substantial increases in sales during the past six to seven years... Hartz 936X soybeans have captured the best-quality, higher-priced natto market." Hartz is also involved in both farm management and real estate. A photo shows Dan Lamberth seated at his desk.

8352. *Wall Street Journal.* 1985. U.S. company to export tofu dessert to Japan. Oct. 3. p. 34.
• ***Summary:*** "Tofu Time Inc. of Rahway, New Jersey, has agreed to supply Japan's largest retailer, Daiei Inc., with Tofutti, a non-dairy, ice cream-like dessert made from tofu, or bean curd.

"Daiei initially will distribute Tofutti through its existing food-service outlets, but has agreed to open three Tofutti Shops in Tokyo over the next six months. If it catches on, Daiei may begin producing Tofutti in Japan and expand the chain of shops."

This story also ran in Asian Wall Street Journal (Hong Kong). Oct. 4.

8353. S&S Public Relations, Inc. 1985. Miso–Japan's 1,000 year old health and flavor secret now in America (News release). 40 Skokie Blvd., Suite 430, Northbrook, IL 60062. 3 p. + photo. Oct. 6.
• ***Summary:*** About miso, American Natural Foods, and their new line of four products. A black-and-white photo shows a bottle of The Works. An attachment, titled "Cooking with miso–General principles," was developed by Just In Foods [American Miso Co.] in 1984. Note: This news release generated widespread publicity for ANF. Address: Northbrook, Illinois. Phone: 312/291-1616.

8354. Jenkins, Nancy Harmon. 1985. Food notes: A fashion for Japan [Japanese order $350,000 of Tofutti]. *New York Times.* Oct. 9. p. C9.
• ***Summary:*** Taking tofu to Japan is like carrying coals to Newcastle. "The first order is for $350,000 worth of such flavors as vanilla, chocolate, banana pecan, and vanilla almond bark, to be distributed through Daiei, a large retailer."

8355. Yasuda, Masaaki. 1985. Re: Tofuyo, Okinawan fermented tofu. Letter to William Shurtleff at Soyfoods Center, Oct. 9–in reply to inquiry of Sept. 15. 1 p. Typed, with signature on letterhead. [4 ref. Eng]
• ***Summary:*** "I want to help you on this subject heartily. I will answer your questions and send you some good documents."

The earliest written document that I know of is "Gyozen Honso" (1832) by Tsukan Tokashiki Peichin (Tsukan is his given name. Tokashiki is his family name. Peichin is his title, meaning a high-ranking officer).

There are some companies making Tofu-yo in Okinawa. I do not know how many kilograms they make each year because such statistics are not included in *Kogyo Tokei Hyo* (statistics) in Okinawa-ken. Address: PhD, Assoc. Prof. of Agricultural Chemistry, Dep. of Agricultural Chemistry, Univ. of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 903-01, Japan. Phone: 09889-2221.

8356. *Toyo Shinpo* (*Soyfoods News*). 1985. Nattô no peeji: Tenpe no jidai. Tenpe wa ayumi chakujitsu-ni [The natto page: The age of tempeh. Tempeh makes progress very steadily]. Oct. 21. p. 6. [Jap; eng+]
• ***Summary:*** An interview with Goro Kanasugi about tempeh and the Japanese Natto Association. Small photos show: (1) Portrait photo of Mr. Kanasugi. (2) Pieces of tempeh.

8357. Belleme, John. 1985. Shedding light on the miso story. *MacroMuse.* Autumn. p. 29-31.
• ***Summary:*** A discussion of what factors influence the taste, medicinal qualities, and nutritional value of different types of miso. By far the most important influences on all three are the manufacturing methods and the quality of the ingredients. Basically there are three methods of making miso. In descending order of quality they are: traditionally made, naturally aged, and temperature controlled. The author estimates that less than 1% of Japanese miso is traditionally made–that is, using handmade koji in a unheated koji room. "In this uniquely constructed room, heat and humidity naturally generated by the fermenting grain are carefully monitored for 48 hours until the mature koji, covered with a fluffy, white, glistening mycelium, is sweet and loaded with powerful enzymes." Making koji in this way is a labor-intensive process requiring much skill and stamina.

The second type of miso, "naturally aged," is actually commercial miso that was especially developed for the American natural foods market. The process is usually automated and every effort is made to keep out wild microorganisms. The soybeans are rapidly cooked and cooled, while the koji is made automatically in large, stainless steel rooms. Hand labor is kept to a minimum to reduce costs and the need for experienced workers. The finished miso has a "uniform taste, color, and texture and is usually sold pasteurized in one-pound plastic bags which need no refrigeration."

The lowest quality miso, temperature controlled

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commercial miso, accounts for 99% of the miso made in Japan.

With few exceptions, miso can be divided into two large groups based on color and taste. Sweet miso is usually light in color, while salty miso is usually dark in color. "When considering miso quality, some macrobiotic teachers insist on using miso aged at least two years. Miso aged less than this is considered 'unnatural.'" But the author believes that people who say this are unknowingly comparing temperature controlled to naturally aged miso, for "there is no evidence, either traditional or scientific, that sweet, light miso is inferior to dark, salty miso. In fact, miso that is aged too long, regardless of the type, rapidly deteriorates in taste, color, aroma, enzymatic activity, and nutritional value."

"My point is simple: what actually determines the color, taste, and overall quality of miso is not aging but proper aging. And what determines proper aging is recipe and climate." Each type of miso has its own use. "While dark, long-aged miso is excellent for hearty winter cooking, sweet light miso is great in summer soups, dips, sauces, and salad dressings." In short: "When choosing miso, look for organic, traditionally made, unpasteurized miso."

Photos show: (1) Jan Belleme (with baby Justin on her back) and Bob Zullo inoculate steamed barley with *Aspergillus* mold to make barley koji at the American Miso Co. (2) Jan checks the finished barley koji in wooden trays. (3) Bob Zullo prepares to empty 8,000 lb of two-year barley miso from a large wooden vat.

"John Belleme lives with his wife Jan in Rutherfordton, North Carolina, where they have been involved with the American Miso Company." He is president of Just In Foods, producer of miso products. Address: Rutherfordton, North Carolina.

8358. Fuke, Yoko; Sekiguchi, M.; Matsuoka, Hiroatsu. 1985. Nature of stem bromelain treatments on the aggregation and gelation of soybean proteins. *J. of Food Science* 50(5):1283-1288. Sept/Oct. [19 ref]
• ***Summary:*** It is well known that proteolytic enzymes such as chymosin, pepsin, papain, ficin, bromelain, and several proteases produced by microorganisms are able to coagulate cow's milk, and some are widely used in making dairy cheese. Researchers have found that some plant proteolytic enzymes, such as ficin and stem bromelain, can coagulate soymilk. Address: Dep. of Food and Nutrition, Lab. of Food Chemistry, Tachikawa College of Tokyo, Akishima, Tokyo 196, Japan.

8359. Hidaka, Toshio; Tanaka, Y.; Nakamura, K.; Takari, T.; Kirigaya, T.; Kamijo, M.; Suzuki, Y.; Kawamura, T. 1985. Heddo supeesu hô o mochiiru shokuhin-chû no zanryû enso no teiryo [Determination of residual chlorine in foods by head space gas chromatography]. *Shokuhin Eiseigaku Zasshi* (*J. of the Food Hygienic Society of Japan*) 26(5):465-70. Oct. [3 ref. Jap; eng]
• ***Summary:*** Analysis of 67 specimens of vegetables and processed fish and shellfish available in the market revealed 14.0 and 11.6 MY mcg/gm of residual chlorine in 2 soybean sprout samples. No other samples had detectable levels. Address: Yokohama City Inst. of Health, 1-2-17 Takigashira, Isogo-ku, Yokohama, Japan.

8360. Kanno, Akishige; Takamatsu, Haruki; Tsuchihashi, Noboru; Watanabe, Tomoko; Takai, Yuriko. 1985. Nattô no kenkyû. III. Nattô to hikiwari-nattô no seizô oyobi hozon-chû ni okeru tokoferooru ganyûryô no henka [Studies on natto. III. Change in tocopherol contents during manufacturing and storage of "natto" and "hikiwari-natto"]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 32(10):754-58. (Chem. Abst. 104:67760). 15886 [13 ref. Jap; eng]
• ***Summary:*** The tocopherol content of soybeans (on a dry-weight basis) was increased by both soaking and steaming. Address: 1-2. Asahi Shokuhin Co., Ltd., 180-2, Wado, Ushibori-machi, Namekata-gun, Ibaraki 311-24, Japan.

8361. Kitabatake, N.; Megard, D.; Cheftel, J.C. 1985. Continuous gel formation by HTST extrusion-cooking: soy proteins. *J. of Food Science* 50(5):1260-65. Sept/Oct. [15 ref]
Address: Laboratoire de Biochimie et Technologie Alimentaires, Université des Sciences et Techniques du Languedoc, 34060 Montpellier, France. Kitabatake is now with Research Inst. for Food Science, Kyoto Univ., Uji, Kyoto, Japan 611.

8362. Matoba, Teruyoshi; Hidaka, H.; Narita, H.; Kitamura, K.; Kaizuma, Norihiko; Kito, M. 1985. Lipoxygenase-2 isozyme is responsible for generation of *n*-hexanal in soybean homogenate. *J. of Agricultural and Food Chemistry* 33(5):852-55. Sept/Oct. [16 ref]
Address: 1. Dep. of Food Science and Nutrition, Nara Women's Univ., Nara 630, Japan; 2-3&6. Research Inst. for Food Science, Kyoto Univ., Uji, Kyoto 611, Japan; 4-5. Dep. of Agriculture, Faculty of Agriculture, Iwate Univ., Morioka 020, Japan.

8363. Osaki, K.; Okamoto, Y.; Akao, T.; Nagata, S.; Takamatsu, H. 1985. Fermentation of soy sauce with immobilized whole cells. *J. of Food Science* 50(5):1289-92. Sept/Oct. [9 ref]
• ***Summary:*** Soy sauce was produced continuously for 80 days in 280 liter column-type reactors containing immobilized whole cells of *Pediococcus halophilus, Saccharomyces rouxii,* and *Torulopsis versatilis* entrapped in calcium alginate gels. The divided lactic acid and alcohol fermentation by viable cells of three kinds with feed solution obtained from enzymatic hydrolyzate of koji and defatted

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soybean meal proceeded in shorter time than a complex fermentation of moromi (soy sauce mash) in the slurry state. The refined products fermented by this process had good taste and flavor, and were close to the conventional soy sauce with respect to organic acid and aroma components. Address: 1-4. Food Engineering Lab., Kikkoman Corp., 339 Noda, Noda-shi, Chiba 278, Japan; 5. Soy Sauce Research Lab., Kikkoman Corp.

8364. Sasaki, J.; Funakoshi, M.; Arakawa, K. 1985. Effect of soybean crude fiber on the concentrations of serum lipids and apolipoproteins in hyperlipemic subjects. *Annals of Nutrition and Metabolism* 29(5):274-78. Sept/Oct. [26 ref]
• ***Summary:*** After human subjects consumed soybean crude fiber for 2 months, their concentrations of serum triglycerides, VLDL triglycerides, and VLDL cholesterol were decreased significantly. The mechanism by which crude soybean fiber lowers serum triglyceride levels is unknown. There were no significant changes in total cholesterol, LDL cholesterol, HDL cholesterol, apo A-I, apo A-II, apo C-II or apo B levels, nor in body weight before and after administration of the soybean crude fiber. Address: Second Dep. of Internal Medicine, Fukuoka Univ. Hospital, Fukuoka, Japan.

8365. Utsumi, S.; Kinsella, J.E. 1985. Forces involved in soy protein gelation: Effects of various reagents on the formation, hardness and solubility of heat-induced gels made from 7S, 11S, and soy isolate. *J. of Food Science* 50(5):1278-82. Sept/Oct. [31 ref]
• ***Summary:*** The 7S storage protein was found to form harder gels than the 11S protein. Address: Inst. of Food Science, Stocking Hall, Cornell Univ., Ithaca, New York 14853. Utsumi is now at Research Inst. for Food Science, Kyoto Univ., Uji, Kyoto 611, Japan.

8366. Yashiro, Akiko; Oda, S.; Sugano, M. 1985. Hypocholesterolemic effect of soybean protein in rats and mice after peptic digestion. *J. of Nutrition* 115(10):1325-36. Oct. [36 ref]
Address: Lab. of Nutrition Chemistry, Kyushu Univ. School of Agriculture 46-09, Fukuoka 812, Japan.

8367. *Toyo Shinpo* (*Soyfoods News*). 1985. Jûnigatsu kara tôfu aisu o yunyû. Daiei kei kigyô [Daiei Group's Captain Cook to import tofu ice cream starting in December]. Nov. 1. p. 1. [Jap; eng+]
• ***Summary:*** Daiei in Japan has decided to sell Tofutti ice cream in their 14 ice cream stores before Christmas, and they plan to open three Tofutti specialty shops in early 1986. Sixteen flavors will be available, at about 180 to 200 yen per serving.

8368. Levey, Robert. 1985. There's nothing fishy about sushi. *Boston Globe*. Nov. 7. p. 4.
• ***Summary:*** During the past few years a number of excellent Japanese restaurants have opened in the Greater Boston area. Good Japanese restaurants often have a sushi bar. Cafe Sushi, which opened in May on the outskirts of Harvard square, is the closest thing in Boston to a pure sushi restaurant.

"One night there was an appetizer of boiled "edamame," which turned out to be a bowl of whole soybeans cooked in their green skins and then salted. The vegetable looks like a lumpy peapod and you eat it by pulling the pod through your teeth to make the beans pop out. Lovely little finger food."

Note: This is the earliest article seen in the America's Newspapers database that contains the word "edamame." A surprising 2,679 articles in this database now (as of 15 June 2009) contain the word "edamame." Address: Globe staff.

8369. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo*). 1985. Tôfu o-nedan jitsubai risaachi [Research on tofu prices, buying practices, and flavor preferences]. Nov. 7. [Jap]
• ***Summary:*** A taste test showed 42% preferred tofu coagulated with calcium chloride nigari, 35% natural nigari, 19% calcium sulfate, and 4% glucono delta lactone. Total: 100%. So nigari is strongly preferred.

8370. *Toyo Shinpo* (*Soyfoods News*). 1985. Kôbo de shin daizu tanpaku [Using yeasts to make new soy protein]. Nov. 11. p. 1. [Jap]
• ***Summary:*** The Ibaraki Prefectural Industrial Technology Center (*Ibaraki-ken Kogyo Gijutsu Sentaa*) is doing research to develop new soyfood products to use the increasing production of soybeans in the prefecture. They used yeasts (ordinarily used to ferment alcohol) to ferment soymilk, then separated the curds and whey. Then they used the curds to make various soy foods–including a high-protein product with no beany flavor. Address: Japan.

8371. Torii, Yasuko. 1985. Beikoku kenko sangyo saishin joho (5). Tofutti buumu. Ice tojo de tôfu buumu choten ni [Latest news of the U.S. health industry (5). Tofu boom reaches its peak with appearance of Tofutti and other tofu ice creams]. *Shukan Kenko Sangyo Shinbun* (*Weekly Health Industry Newspaper*). Nov. 14. p. 7. [Jap]
• ***Summary:*** A photo shows a pack of hard-pack Tofutti.

8372. MacFall, Kenneth I. 1985. Re: Nippon Oil & Fats Co., Ltd. is interested in INARI's soynut butter. Letter to Mr. Leonard Stuttman, President, Inari Trading Co., Mason, Michigan, Nov. 15. 2 p. Typed, with signature on letterhead (photocopy).
• ***Summary:*** Mr. McFall notes: "I have a gut feeling that soynut butter will find a place in the Japanese market."
Address: Marubeni America Corporation, 200 Park Ave., New York, NY 10166. Phone: (212) 599-3700.

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8373. Shurtleff, William; Aoyagi, Akiko. 1985. History of fermented tofu. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 36 p. Nov. 22. Unpublished typescript. Available online at www.soyinfocenter.com.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction: Two basic types. Part I: History of Chinese-style fermented tofu. Introduction: General description, how it's made. Basic types and varieties of fermented tofu. Etymology. Western mold-ripened dairy cheeses. History of fermented tofu in China. History of fermented tofu in Taiwan. History of fermented tofu in Japan and Okinawa (*tofuyo*), Japan 1912 to the 1980's. History of fermented tofu in East and Southeast Asia. History of fermented tofu in Europe. History of fermented tofu in the United States. Part II: History of fermented tofu cheeses. Cheeses.

Note: As of Aug. 2004 this chapter can be viewed free of charge by going to the Soyinfo Center website (www.soyinfocenter.com) and searching for: History fermented tofu. Address: Lafayette, California. Phone: 415-283-2991.

8374. Sheraton, Mimi. 1985. Let them eat Mézeskalács. *Time.* Nov. 25.
• ***Summary:*** Donald Richie, an authority on Japanese films, "is also a dedicated food buff who studies the fine points of sushi and sashimi, tempura and tofu, as well as other Japanese culinary disciplines."

8375. *Shukan Kenko Sangyo Shinbun* (*Weekly Health Industry Newspaper*). 1985. Kaigai joho: Amerika. Shinseihin aitsugu tôfu desaato [Overseas topics: America. Many new tofu dessert products are being introduced]. Nov. 28. [Jap]
• ***Summary:*** Discusses America's soy ice cream boom and the Soyfoods Association's new tofu standards.

8376. Abe, I.; Okuda, Y.; Iwata, T.; Chachin, K. 1985. Kikkai dakkyo edamame no sendo hoji gijutsu ni kansuru kenkyû [Maintaining freshness in machine-harvested edamame (Abstract)]. *Engei Gakkai Taikai Kenkyu Happyo Yoshi* (*Horticultural Symposium Abstracts*) Fall. S60. p. 495-95. [Jap]*

8377. Bush, Larry C. 1985. Fermented foods: Tasty toner uppers. *Total Health* (*California*). Nev. p. 40-41.
• ***Summary:*** An overview with a large color photo showing packages of: Miso-Cup, Westbrae Natural Shoyu, Westbrae Natural Johsen Double-Brewed Shoyu, Westbrae Natural Traditional Tamari Soy Sauce, Westbrae Natural Instant Miso Soup, Westbrae Natural Mild Soy Sauce, Erewhon Shoyu Tamari, Erewhon Hatcho Miso, Premier Japan Rice Miso, Premier Japan Mugi Miso, Premier Japan Takuan, Premier Japan Umeboshi, and Premier Japan Pickled Ginger.

8378. Hashizume, Kazumoto; Ka, Ginran. 1985. [Difference between tofus coagulated with glucono delta lacton [GDL] and calcium salts]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 150-53. Nov. [11 ref. Jap; eng]
• ***Summary:*** "Kinu-tofu [kinugoshi tofu = silken tofu] coagulated with GDL (glucono delta lacton [lactone]) is harder than that coagulated with calcium sulfate, but it is more fragile."

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 25(7):383-86 (1978). Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8379. Hashizume, Kazumoto; Maeda, Masamichi; Watanabe, Tokuji. 1985. [Relationship of heating and cooling condition to the hardness of tofu]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 154-58. Nov. [7 ref. Jap; eng]
• ***Summary:*** Tofu-gel made from soybean milk which had been heated at 100ºC for a long time was softer than typical preparations. This was due to the oxidation of sulfhydryl groups of soybean protein during the heating.

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 25(7):387-91 (1978). Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8380. Hashizume, Kazumoto; Watanabe, Tokuji. 1985. Influence of heating temperature on conformational changes of soybean proteins. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 159-66. Nov. [18 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 43(4):683-90 (1979). Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2. Kyoritsu Women's Univ., Kanda Hitosubashi-2, Chiyoda-ku, Tokyo.

8381. Hashizume, Kazumoto; Ohara, Tadahiko; Ando, Yoko. 1985. [Identification of vegetable protein in animal protein by urea polyacrylamide gel electrophoresis]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 167-72. Nov. [7 ref. Jap; eng]
• ***Summary:*** Figures show: (1) Disc electrofocusing of soybean, wheat and meat proteins in 7.5% polyacrylamide gels containing 8M urea. (2) Disc electrophoresis of soybean, wheat and meat proteins in 7.5% gels containing 8M urea

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at pH 8.9. (2) Effect of pH of polyacrylamide gels on electrophoretic patterns of soybean, wheat and meat proteins. (11) Urea and SDS electrophoretic patterns of commercial meat products containing TVP.

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 25(11):635-40 (1984). Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2. Nagano State Lab. of Food Technology, Kurita, Nagano-shi; 3. Kyoritsu Women's Univ., Kanda-Hitsubashi, Chiyoda-ku, Tokyo.

8382. Hashizume, Kazumoto; Ikeda, Toru; Saio, Kyoko. 1985. [The effects of air content in soybean milk on expansion of tofu-gels for aburaage-making (Studies on aburaage-making Part 1)]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 218-23. Nov. [6 ref. Jap; eng]

• ***Summary:*** Tofu-gels [slices / kiji] prepared from moderately heated soybean milk, expanded about 3-fold after deep-frying in oil, but one slice made from excessively heated soymilk did not expand. The mechanism of this expansion was investigated: (1) The minimum temperature for Tofu-gel expansion was 85ºC, which is the same temperature for denaturation of 11S protein. (2) The failure of tofu slices to expand was due to the decrease of the air content of soybean milk caused by excess heating of the milk. The air in soybean milk was transferred into tofu slices; it accelerated the vaporizing and resulted in proper expansion. (3) When soybean milk was coagulated at high temperatures, less expansion of tofu slices was observed.

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 31(6):389-94 (1984). Address: 1&3. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2. Central Research Labs., Ajinomoto Co., Inc., Suzuki-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa 210.

8383. Hashizume, Kazumoto; Ikeda, Toru; Saio, Kyoko. 1985. [The relationship of SH and S-S exchange reaction to the expansion of tofu-gels for aburaage-making (Studies on aburaage-making Part 2)]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 224-29. Nov. [14 ref. Jap; eng]

• ***Summary:*** It was found that excess heating of the soymilk used for making aburaage resulted in less expansion of the tofu slices (tofu-gels). Why? (1) The expansion of tofu slices was inhibited by blocking or oxidising reagents for SH groups in soybean proteins, whereas it was accelerated by reducing reagents for S-S bonds. These facts suggests that SH bonds play an important role in the expansion of tofu slices. (2) The tofu slices could not expand significantly when prepared from soybean protein solutions where either SH groups were oxidized into S-S bonds or S-S bonds were reduced into SH groups. However tofu slices prepared by mixing two protein solutions expanded well. This suggests that SH and S-S exchange reactions are certainly involved in the mechanism of the expansion of tofu slices into aburaage. (3) The expansion rate of tofu slices was markedly decreased by heating soybean protein solutions under the conditions where the proteins easily associated or aggregated. On the contrary, the expansion rate was rapidly increased by mercaptoethanol or high urea concentration due to protein dissociation. This suggests that the association or aggregation of proteins by excess heating may prevent tofu slices from expanding when making aburaage.

Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 31(6):395-400 (1984). Address: 1&3. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2. Central Research Labs., Ajinomoto Co., Inc., Suzuki-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa 210.

8384. Hirano, Hisashi; Fukuzawa, Chikafusa; Harada, Kyuka. 1985. Primary structures of the A_4 and A_5 subunits are highly homologous to that of the Reprinted from *FEBS Letters* 191(1):124-28. FEBS is the Federation of A_3 subunit in glycinin seed storage protein of soybean. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 334-39. Nov. [17 ref. Eng; jap]

• ***Summary:*** Legume proteins, such as soy, and pulses belong to the globulin family of seed storage proteins called leguminins (11S) and vicilins (7S), or glycinin and beta-conglycinin in soybeans. A_3 is a subunit of the glycinin seed storage protein of soybean.

Reprinted from *FEBS Letters* 191(1):124-28. FEBS is the Federation of European Biochemical Societies. Address: Dep. of Molecular Biology, National Inst. of Agrobiological Resources, National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8385. Murata, Kiku. 1985. Tenpe kenkyû no konjaku: Kôsanka-sei kara shôhi shikô made [Tempeh research, past and present: From antioxidants to consumers taste preferences]. *Daizu Geppo* (*Soybean Monthly News*). Nov. p. 9-17. [Jap]

Address: Rigaku hakase: Osaka Shi-dai Teikoku Joshi-dai, Meiyo Kyoju. Teikoku Gakuen Kyoiku Kenkyujo Komon.

8386. Nihei, Takao. 1985. Zoku: Hawai ni okeru Nihon-shu no rekishi. Hawai kanyaku imin hyaku-nen ni yosete [A history of Japanese sake in Hawaii. On the hundredth anniversary of Japanese immigration to Hawaii]. *Nippon*

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Jozo Kyokai Zasshi (*J. of the Brewing Society of Japan*) 80(11):786-89. Nov.; 80(12):838-842. Dec. [33 ref. Jap]
• ***Summary:*** In 1868, the first year of the Meiji Period, the first 153 Japanese immigrants arrived in Hawaii on board the three-masted sailing ship Scioto (Saioto-go). They brought with them miso and shoyu. During the 1880s, because of the shortage of laborers to harvest sugar cane, the governments of Japan and Hawaii signed a contract allowing Japanese to immigrate to Hawaii. The first boatload of 944 Japanese arrived on 8 Feb. 1885. These two groups and their descendants introduced sake and soyfoods to Hawaiian culture. A photo shows the "Honolulu Japanese Sake Brewing Co." in 1908.

Note: This document contains the earliest date seen for soybean products (miso and shoyu) in Hawaii (1868); soybeans as such had not yet been reported by that date. Address: Honolulu Shuzo Seihyo Gaisha.

8387. Ochiai-Yanagi, Sonoe; Galeazzi, Maria A.M.; Saio, Kyoko. 1985. Properties of soybean in model storage studies. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 330-33. Nov. [6 ref. Eng; jap]
• ***Summary:*** The following properties were studied during storage of *Glycine max* var Enrei: Moisture content, nitrogen solubility index (NSI), acid value, germination capacity, weight of 100 seeds (Enrei was 35 gm/100 seeds), fat content, and protein content.

Reprinted from *Agricultural and Biological Chemistry* 49(2):525-28 (1985). Address: 1&3. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2. Faculty of Food Engineering and Agriculture, Univ. of Campinas, Cidade Universitaria, Campinas 13100, Brazil.

8388. Okada, Noriyuki; Hariantono, Jimmy; Hadioetomo, Ratna Siri; Nikkuni, S.; Itoh, H. 1985. Survey of vitamin B-12-producing bacteria isolated from Indonesian tempeh. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 49-56. Nov. [9 ref. Eng]
• ***Summary:*** "Identification tests were performed on those bacteria which were isolated from Indonesian tempeh and produced more than 10 nanograms/(cells in 5 ml of culture) of vitamin B-12. Thirteen out of 33 isolates were identified as *Klebsiella pneumoniae.* Two isolates were identified as *K. pneumoniae* subspecies *ozaenae* and *Enterobacter cloacae.* Twelve isolates closely resembled either *K. terrigena* or *K. planticola.* Others included gram-positive rods (4 isolates), Gram-negative, oxidase-positive rod (1 isolate) and Gram-negative, oxidase-negative rod (1 isolate)." This work was sponsored by the Joint Japan-Indonesia Project on the Development of Tropical/Subtropical Microbial Resources, under the direction of the Science and Technology Agency of Japan and BPPT of Indonesia.

Note: A gram-positive bacterium is one that holds the purple dye when stained by Gram's stain. Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8389. Ozora, Colleen. 1985. Of Granum and macrobiotics: A visit with Blake Rankin. *Macrobiotics Today* (*Oroville, California*). Nov. p. 3-7.
• ***Summary:*** In 1969, while a student at UCLA, Blake Rankin came in contact with Erewhon–Los Angeles. After graduation from UCLA he and several friends set up a small health food store in Victoria, BC, Canada. Then he spent 3 months in Boston living in a Kushi study house and working in an Erewhon warehouse. Back in Seattle, he worked at Spiral Foods, an offshoot of Chico-San. Shortly after that he and George Gearhart, the proprietor, closed the store and in 1972 opened a wholesale company, Janus Foods. It was successful. [Note: Miso and shoyu, imported from Japan, were among the company's best-selling products.] After 2 years Rankin left and went to Japan for 6 months, where he traveled with Mitoku and Muso. Mr. Kazama, a friend of Aveline Kushi's brother, had not been in the food business before starting Mitoku. Then he went to Nepal and India on a spiritual search. In late 1973 he returned to Seattle and worked for Janus. Then he returned to Japan where he worked for Mitoku and studied calligraphy. In Japan he met his future wife, Yoko. Returning to Seattle, Rankin started Granum in 1981 as a distributor and importer for Mitoku products from Japan. Now the import company has a small retail store and a 10,000 square foot warehouse. Expected 1985 gross is more than $500,000.

This article contains numerous photos of Blake and Yoko Rankin, and their two children. Address: GOMF, Box 426, Oroville, California 95965.

8390. Park, Yang Won; Kusakabe, H.; Murakami, K. 1985. Production and properties of a soymilk-clotting enzyme system from a microorganism. *Agricultural and Biological Chemistry* 49(11):3215-19. Nov. [11 ref]
• ***Summary:*** Some microorganisms, including some soil bacteria (whose scientific names are not given), were found to secrete an extracellular soymilk-clotting enzyme. Of these, strain No. K-295G-7 showed the highest soymilk clotting activity. Its enzyme system coagulated protein in soymilk, with the curd being formed at pH 5.8 to 6.7 and an optimum temperature of 75ºC (range 55-75ºC). Soymilk was purchased from Kibun Co. Ltd. (Japan). Address: Inst. of Applied Biochemistry, Univ. of Tsukuba, Ibaraki 305, Japan.

8391. Rice, Judy. 1985. Gelled tofu in aseptic cartons: Processor estimates 10-month shelf life in non-refrigerated storage. *Food Processing* (*Chicago*) 46(12):133. Nov.

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• ***Summary:*** About Mori-Nu brand tofu, now sold in regular and soft textures, by Morinaga Nutritional Foods, Inc., Los Angeles, California. The company is a newly formed subsidiary of a leading Japanese dairy products manufacturer, Morinaga Milk Industry Co., Ltd. Morinaga has been making and selling tofu in aseptic cartons to 32 countries for 7 years. Before that time the company had been packaging its product in plastic containers which required refrigeration, that gave the tofu a 3-month shelf life. Morinaga projects first-year sales in the USA at 7 million packs. A photo shows two packages of "Mori-Nu Fresh Tofu." Address: Assoc. editor.

8392. Saio, Kyoko. 1985. [Tofu processing characteristics of Japanese domestic soybeans: Technical report]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 128-49. Nov. [6 ref. Jap; eng]
• ***Summary:*** This technical report is by "Kyoko Saio and the Research Group of Tofu." Japanese domestic soybeans were found to be superior for making both regular and packaged tofu due to the whitish color of the tofu and soymilk they produced, and to the quality of the finished tofu. Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8393. Saio, Kyoko; Kobayakawa, K.; Kito, M. 1985. Protein denaturation during model storage studies of soybeans and meals. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 176-80. Nov. [8 ref. Eng; jap]
• ***Summary:*** Reprinted from *Cereal Chemistry* 59(5):408-12 (1982). Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8394. Saio, Kyoko; Suzuki, H.; Kobayashi, T.; Namikawa, M. 1985. Microstructural changes in winged bean and soybean during fermentation of miso. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 272-79. Nov. [11 ref. Eng; jap]
• ***Summary:*** Winged-bean miso was prepared by substituting winged beans for soybeans. Microstructural changes in both misos at various stages in the manufacturing process were studied using both a light microscope and a transmission electron microscope. Transmission electron microscope (TEM) micrographs soy winged bean miso and soybean miso at high magnification.

Reprinted from *Food Microstructure* (3):65-71 (1984). Address: 1-2. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 3-4. Nagano Miso Co., Ltd., 29-9-3 Tenjin, Ueda, Nagano.

8395. **Product Name:** [Soymilk Yogurt].
Foreign Name: Tônyû yooguruto.
Manufacturer's Name: Sumiyoshi-ya Shokuhin Ltd.
Manufacturer's Address: Yamagata prefecture, Japan.
Date of Introduction: 1985 November.
Ingredients: Incl. soymilk.
How Stored: Refrigerated.
New Product–Documentation: Toyo Shinpo (Soyfoods News). 1985. Sept. 11. p. 5. "Tônyû yooguruto hanbai [Soymilk yogurt on sale]." Sumiyoshi-ya Shokuhin Ltd., the largest tofu maker in Yamagata prefecture, has developed a soymilk yogurt and started selling it this summer. One cup costs 60 yen. They also make a Shojin Ryôri lunch box set to take out. A photo shows 2 cups of the product.

8396. Taira, Harue; Tanaka, Hiromi; Horie, Masaki; Mikoshiba, Kimito. 1985. [Quality of soybean seeds grown in Japan. IX. Varietal differences in seed weight, protein, oil, carbohydrate, ash, potassium, phosphorus, magnesium, and calcium contents of seeds grown in Nagano Chushin Agricultural Experiment Station]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 57-91. Nov. [30 ref. Jap; eng]
Address: 1-2. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 3. National Inst. of Agro-Environmental Science, Yatabe, Ibarkai; 4. Nagano Agricultural Research Center, Suzaka, Nagano.

8397. Taira, Harue; Taira, Hirokadzu; Tanaka, Hiromi; Mikoshiba, Kimito. 1985. [Quality of soybean seeds grown in Japan. X. Varietal differences in total carotenoids content and color of soybean seeds grown in Nagano Chushin Agricultural Experiment Station]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 92-104. Nov. [11 ref. Jap; eng]
Address: 1-3. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 4. Nagano Agricultural Research Center, Suzaka, Nagano.

8398. Yasui, Takeshi. 1985. Dissimilarity of low molecular weight carbohydrate composition of the seeds of cultivated soybean (*Glycine max* (L.) Merrill subsp. *max*) and wild soybean [*Glycine max* subsp. *soja* (Sieb. et Zucc.) Ohashi]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 47. p. 373-78. Nov. [21 ref. Eng; jap]
• ***Summary:*** Reprinted from *Agricultural and Biological Chemistry* 49(4):933-37 (1985). Address: National Food

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Research Inst. (Shokuhin Sogo Kenkyujo), Ministry of Agriculture, Forestry and Fisheries, Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8399. Praskin, Laurie Sythe. 1985. The Farm soy history: An overview. Document part IV. Los Gatos, California. 10 p. Dec. 1. Unpublished manuscript. [Eng]

• ***Summary:*** Continued: "In 1977, Laurie visited her home town in California. She went to visit her favorite Japanese tofu shop and ran into Bill Shurtleff and Akiko Aoyagi outside the closed shop. They were delivering a copy of their *Book of Tofu* to the owner and tofu maker of the shop. Bill took Laurie to the tofu makers' home and helped arrange for Laurie to observe in his shop for one day. Upon returning to the Farm, Laurie immediately set up the Farm's first tofu shop in a small corner of the soy dairy. She set up a very simple shop using one of their cooking kettles and designating it for cooking milk only for tofu. A wash tub was mounted on a stand with a simple lever for pressing out the milk. The tub was lined with a coarsely-woven bag, and a sawed-off whiskey barrel was placed underneath to catch the milk. A finer nylon cloth was stretched over the top to strain out the finer pulp [okara]. Hot milk was bucketed into the press, the bag twisted shut, and a heavy wooden press plate placed on top. The original wooden tofu box was finally in use as well as two additional round stainless boxes made by Michael Lovett. The tofu was pressed with cement blocks or buckets of water. Tofu was made in the whiskey barrel and a 20 gal [gallon] aluminum Hobart bread bowl. The tofu shop's capacity was 200 lb of tofu on a production day. In total, about 600 lb/wk in addition to 800 to 1000 gal/wk of soymilk. Most of the tofu went to people with special dietary needs.

"It seemed very energy inefficient to run a separate tofu and soymilk operation, so technicians started designing a separator that could service both operations. Michael Halpin, one of the Farm's equipment technicians, designed a hydraulic press which cost less than $1500 to build. This was the first large amount of money spent by the dairy for equipment. The inspiration for the money came from the delicious tofu produced in the small shop. Once everyone realized how good it was, the decision to invest community money for improved nutrition followed. The idea of the press was good, but all of the bugs were never worked out. It was supposed to require no bag. The milk was pumped into a stainless cylinder that was drilled with holes and set inside another stainless holding tank. Then with press plate and gasket, the hydraulic ram came down from above, squeezing out the milk. When pressed, there was a trap door at the bottom that was opened, and the pulp pressed right out into a container. The trap door shut, and the press was ready for another batch. The system was supposed to work easily and efficiently. It never did. Gasket failures were a problem, spewing hot soymilk and pulp all over the dairy. In addition, the trap door never worked easily. In an expedient measure to get the dairy back in operation, Laurie removed the cylinder and replaced it with a Japanese pressing sack. The hot soymilk and pulp pumped into the bag which was set down in the stainless holding tank. There was a stainless rack on the bottom to keep the bag off the hole and a stainless plate was set on top of the bag after it was filled. The hydraulic ram came down and pressed the bag. This worked all right, but the bag had to be lifted out by hand, and the position was very awkward and left many sore backs. The milk went directly into a curding barrel or was pumped through the tubular heat exchanger. The capacity jumped to 300 gal of milk and 250 lb of tofu approximately 4 days/wk. At this time, the dairy had concrete floors and was starting to get sheetrocked. Soy yogurt production became unsuccessful because of the close proximity of the cannery, and vegetable contamination was airborne. Tempeh was also in the cannery and experiencing the same difficulties. Ice cream was very popular and being produced in large commercial soft-serve machines. Production of ice cream was varied, but its popularity was unquestionable.

"While the Farm was piecing together its operation, a small settlement of Farm members began in Northern California. In 1976, they opened a small commercial soy deli in California under the management of Robert Dolgin. To supply the deli, a small soy dairy and tempeh shop was set up in the back room. This consisted of Japanese equipment specifically designed for the purpose of making soymilk and tofu. They had a Japanese grinder, 45-gallon pressure cooker, and a small, efficient hydraulic press. It was a nice small kit which they took out a loan to buy. The deli's business was excellent and lasted over one year before it closed and relocated to San Francisco (SF) in order to expand production and market products throughout the health food store industry in California. So with more investment and loans and a warehouse in SF, Farm Foods re-opened. The building was fixed up to meet all the strict California codes, and the equipment was improved for increased output. They continued cooking with the 45-gallon pressure cooker but went for a continuous separator. This was a Brown, an orange juice extractor, and a vibrating screen to remove the finer pulp. They got a plate heat exchanger to cool the milk and a state-of-the-art Mark 25 continuous ice cream maker. They were running an extremely sophisticated operation complete with walk-in coolers and freezers. The Farm management council sent many of the Farm's trained technicians, business managers, and distributors out to SF to operate the business. In total, 60 Farm residents moved to support the growing business, which was under the direction of Robert Tepper and Daniel Lloyd. They started the first commercial soy ice cream company that marketed Soy Ice Bean. Laurie Praskin and her husband were sent to help run the shop and perfect the ice cream recipe. In April 1979, they left to work on the Guatemala soy program and were

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replaced by Michael and Deborah Lovett and Bobby and Michael Bonnickson. Because of the high cost of operating a business in downtown SF and the increased interest of Ice Bean nationwide, Farm Foods decided to move the Ice Bean production to Tennessee. The Farm Soy Dairy purchased the continuous extractor from the SF Soy Dairy and once installed, it immediately increased the production to 1500 lb/day of tofu and 300 gal/day of soymilk–enough for everyone.

"The soy dairy is now under the management of Michael Lee and Ron Maxin and consists of a 400 gallon bean soak tank and a one-and-a-half horse-powered Japanese grinder. Beans are ground with hot water, and the resulting slurry is pumped into one of three 60 gallon stainless kettles. Direct steam injection cooks this milk. When done, it is pumped into the brown extractor. It flows over a second vibrating-screen filter and is gravity-fed to a 45 gal stainless holding tank where it is tapped off into curding barrels or pumped through the same heat exchanger which now has chilled water running through it for more efficient cooling. A chilled water system also provides cold water to cool and store our tofu. When cooled, the tofu is transferred to 40 gal plastic tubs and wheeled into a walk-in cooler where it awaits distribution. (For more information on the Farm Soy Dairy as it is today, contact Ron Maxin or Michael Lee.)" Address: 17969 Oak Dr., Los Gatos, California 95030.

8400. *Asahi Shinbun* (*Asahi Daily News, Tokyo*). 1985. New York saisentan. Tôfu no aisukuriimu [Tofu-based ice creams popular in New York]. Dec. 8. [Jap]
• ***Summary:*** Tofutti is the leader of this popular new rage. Address: Tokyo, Japan.

8401. Yasuda, Masaaki. 1985. Re: History of fermented tofu in China. Letter to William Shurtleff at Soyfoods Center, Dec. 9–in reply to inquiry. 1 p. Typed, with signature on letterhead. [1 ref. Eng]
• ***Summary:*** "I think the origin of fermented tofu in China is very uncertain. I believe the time of origin of *doufu-ru* is later than the *Pen-ts'ao Kang-mu* compiled by Li Shih-chen (1578-1597; Ming dynasty). The *'nyu-fu'* in that book is not fermented tofu, but rather cow's milk protein coagulated with acetic acid. Therefore, I think Yamazaki's Nyu-fu (in the 'Gyoku Hen') is also a dairy product. Yamazaki's Nyu-fu in my article was cited from Ohta's article (*Nippon Jozo Kyokai Zasshi,* 1965, July and August)." Address: Dep. of Agricultural Chemistry, Univ. of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 903-01, Japan. Phone: 09889-2221.

8402. *Asahi Shinbun* (*Evening Ed., Japan*). 1985. Hiekomu tônyû ninki [Popularity of soymilk in Japan cools down]. Dec. 25. p. 10. [Jap]
• ***Summary:*** Soymilk gets no reward for all the efforts made to remove its beany flavor. and now it has fallen behind Japan's beverage industry competition. At one time there were more than 100 companies making soymilk in Japan; now there are about half that many.

Kibun: During the past year Kibun had soymilk sales of about 7,000 million yen. But at its peak in Sept. 1982 its sales were about 11,000 million yen.

8403. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo, Evening ed.*). 1985. Kôkyû = Rich de honmono nanda [High class ice cream is rich and the real thing (Tofutti shop in Tokyo)]. Dec. 25. [Jap]
• ***Summary:*** Contains a large cartoon (see next page) showing Japanese and Santa Claus enjoying Tofutti. Address: Tokyo, Japan.

8404. *SoyaScan Notes.* 1985. Chronology of soybeans, soyfoods and natural foods in the United States 1985 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan. 2. The soybean crushing industry begins a year of major restructuring as the big get bigger and two pioneers drop out. Ralston Purina announces that it has sold six of its soybean crushing plants to Cargill, Inc. A seventh at Memphis was closed. This removed the company from the soybean commodity business. With this transaction Cargill passes ADM to become America's largest soybean crusher.

Jan. 3. "Myth or Miracle: Debunking the Tofutti Fad," by Mark Medoff published in *Whole Life Times.* The first exposé of Tofutti, which contains very little tofu. Jan. 13 Medoff appears on the Gary Null Show, Natural Living, to discuss his findings for 1 hour on prime time radio.

Jan. 12. A.E. Staley Manufacturing Co. announces that it is basically getting out of the soybean crushing business. It has sold five of its six soybean plants (having a combined crushing capacity of some 275,000 bushels daily) to Independent Soy Processors Co., which is closely affiliated with Archer Daniels Midland. Staley was unable to sell its Decatur facility, which ceased operations indefinitely in Jan. 1984. With this transaction ADM has probably regained a slight lead as America's largest soybean crusher.

Jan. 14-26. Soybean Utilization Workshop held at Soyafoods Research Center in Gannoruwa, Peradeniya, Sri Lanka, sponsored by the Sri Lanka Soybean Project and INTSOY. 24 representatives from 12 developing countries participate. The world's first event of its kind (*Soyanews,* Dec. 1985).

Jan. 25-27. Natural Foods Expo at Anaheim. Soy ice creams steal the show. Tofu standards are debated heatedly at Soyfoods Association board of directors meeting on Jan. 28, especially by Ralston Purina attorney. Board decides funds are too limited to try to hire an executive director for SAA. Jan. 31. Paul Obis, founder and editor of *Vegetarian Times,* is seriously considering buying *Soyfoods* magazine from Doug Fiske. He makes a firm offer in late March.

Feb. "Designer Beans," an excellent overview of the

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U.S. soyfoods movement and its gourmet connections by Sandy MacDonald, published in *New Age* magazine.

Jan. American Soybean Association introduces SIS (Soybean Information Service), a computerized database focusing on soybean production and marketing, and oil and meal. The earliest record is 1958.

Feb. 21. *Tofutti and Other Soy Ice Creams: Non-Dairy Frozen Dessert Industry and Market,* by Shurtleff and Aoyagi published by The Soyfoods Center. Two volumes, 352 pages. This is the first study of the rapidly emerging soy ice cream market, and of Tofutti.

Feb. 27. "Tofu Products May Be In, but Its Fans Wonder if There's Tofu in the Products" by Trish Hall published in *The Wall Street Journal.* Second major exposé on so-called "tofu ice creams" (such as Tofutti and Gloria Vanderbilt Glace), which contain only a token amount of tofu, as a marketing gimmick.

March 13-14. The theme of the Feb. 27 *Wall Street Journal* article picked up by the NBC evening news and the Today Show. Very positive coverage for tofu. Gary Barat of Legume, David Mintz of Tofu Time, and Gloria Vanderbilt each speak about tofu.

March 22. *The Book of Tempeh,* extensively revised second edition by Shurtleff and Aoyagi, published by Harper & Row. New bibliography (374 entries), history chapter, and list of tempeh producers.

March 26. Soyfoods Association's Tofu Standards (7th draft) presented to eight senior officials at the U.S. Food and Drug Administration's Center for Food Safety and Applied Nutrition, in Washington, DC, by Tom Timmins (Head of SAA Standards Committee), Gary Barat (President of SAA), Steve McNamara and Tom Donegan (SAA Food & Drug attorneys). The FDA group hears an hour long presentation on tofu, the standards, and the Soyfoods Association of America.

March. Soyarella (later renamed Soy Mozzarella), a tofu-based cheese, is introduced. It becomes an instant hit. Distributed by Neshaminy Valley Natural Foods of Huntingdon Valley, Pennsylvania, it is labeled as "non-dairy," yet it melts, and it tastes like cheese. Shrouded in secrecy, its manufacturer is unknown and the ingredients are questionable. It is sold in large blocks and labeled at individual stores.

March. American Soybean Assoc. launches a campaign among its members to write USAID and encourage them to cancel support for U.S. programs (such as INTSOY) aiding soybean production in Third World nations. The campaign is successful.

April 1. INTSOY signs a new cooperative agreement with USAID. Their work will henceforth focus on soybean utilization. The shift toward utilization began in 1983 and all work on soybean production and varietal development stopped in Aug. 1986.

April. *Tempe: An Annotated Bibliography,* compiled by Siagian and Sofia in Indonesia. Containing 273 references, it is the first bibliography to introduce the extensive Indonesian-language research on tempeh, the majority of which has been published since 1980.

April 15-16. International Symposium on Tempeh held in Jakarta, sponsored by the Indonesian Ministry of Health. 113 people attend.

April. Central Soya buys Griffith Laboratories' line of protein products.

May 31. Barricini Foods acquires Farm Foods, which then becomes a trade name for Barricini's natural / health foods line of non-dairy frozen desserts, including the pioneering product, Ice Bean, and Barricini Tofulite.

May. Morinaga, one of Japan's largest dairy companies, establishes Morinaga Nutritional Foods, Inc., a subsidiary with offices in Los Angeles, to focus on promoting their long-life silken tofu in America.

May. At the 6th Annual Natural Foods Merchandiser Merchandising Awards, soyfoods do well. Miso Mustard by American Natural Foods and Malteds by Westbrae win gold medals. Ah Soy by Great Eastern Sun wins a silver.

May. Soft Tofu Cheese, a non-dairy cream cheese cultured in miso, launched by Simply Natural, Inc.

June. Tofu Topper launched by Worthington Foods.

June. Ralston Purina publishes its 1985 Consumer Attitudes Monitor. Soy Protein in Foods, based on a nationwide survey of 628 adults. Indicates positive attitudes toward soy protein and soyfoods.

July 19. Shamrock Capital, a private company headed by Roy Disney, buys Central Soya, a publicly owned corporation. Agreement to buy was announced April 2.

July. Soy Supreme, spray-dried tofu powder, launched by Oberg Foods Div. of St. Peter Creamery.

July. Asian Symposium on Non-Salted Soybean Fermentation held at Tsukuba, Japan.

July 31. Tofu Time's sales of Tofutti increased more than sevenfold last year to $17,114,886 as compared with $2,361,391 for the previous year. Net income increased nearly 100-fold to $2,006,451.

July. New Gallup survey on vegetarianism of 1,033 Americans shows that millions are eating less meat and tens of millions agree with the move away from meat. 72% disagree with what used to be the standard notion: "The vegetarian diet is just a fad that will pass." A majority (52%) believe that "no one really needs to eat meat more than once or twice a week."

Aug. The DE-VAU-GE soymilk plant in West Germany starts production. Built by STS, with 4,000 liters/hour of soymilk capacity, they make Granose and GranoVita brands of soymilk.

Aug. Lightlife Meatless Tofu Pups (hot dogs) introduced by Tempehworks / Lightlife Foods of Greenfield, Massachusetts. The product sold nearly $250,000 in the next 10 months.

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Sept. Soyfoods Center introduces SOYA, a computerized bibliographic database on soybean utilization, history, nutrition, processing, marketing, and production. Contains 18,500 references from 1100 B.C. to the present.

Sept. 30. Fearn Natural Foods in Illinois sold by Louis Richard to Modern Products, Inc. in Milwaukee.

Sept. 30 to Oct. 4. Tropical Soybean Workshop held at the International Institute of Tropical Agriculture (IITA), Ibadan, Nigeria. Proceedings are published in 1987 as Soybeans for the Tropics. Also this year IITA established a soybean utilization unit.

Sept. Tofulicious, a tofu-based non-dairy ice cream launched by Eastern Food products of Minneapolis. It was developed in conjunction with the University of Minnesota and funded by the Minnesota Soybean Research and Promotion Council. By 1986 it has become the first soyfood product in recent times to be actively promoted by state soybean associations, who sell it at many state and county fairs... where it is a big hit. Through Tofulicious many soybean growers begin to warm up to soyfoods.

Oct. 8th Draft of the Tofu Standards finished, incorporating extensive suggestions from FDA. Compiled by William Shurtleff.

Oct. Mori-Nu brand aseptically packaged tofu introduced by Morinaga Nutritional Foods.

Oct. Cream of the Bean Soygurt, a cultured soymilk yogurt, launched by Cream of the Bean, Inc.

Nov. Kikkoman introduces a long-life tofu in a foil retort pouch, imported from Japan. Poor quality causes the product to be withdrawn. It was re-introduced later.

Dec. Tofu Time starts exporting Tofutti to Japan. The first order by Daiei (a large retailer) of tubs for their parlors, is $350,000. This may be the first major export of a soyfood product (not including ingredients such as soy protein isolates) to Japan.

* The International Institute of Tropical Agriculture (IITA) in Ibadan, Nigeria, starts a program to promote processing and utilization of soybeans in Nigeria and throughout Africa. Continued.

8405. *SoyaScan Notes.* 1985. Chronology of soybeans, soyfoods and natural foods in the United States 1985 (Continued) (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued. 1985 New Trends:

Dramatic Rise of Tofutti and Other Soy Ice Creams. 1985 will go down in the soyfoods history books as the "Year of Tofutti." Never before in history of the United States has any soyfood product achieved such widespread and sudden popularity or notoriety.

During 1985 at least 50 brands of soy ice cream (many with "Tofu" on the label) were on the market worldwide, most in the USA. And many were made by America's biggest dairy companies. An estimated 2.5% of all frozen desserts except novelties (popsicles, bars, etc.) sold in supermarkets were soy-based nondairy. The result of all this was to introduce tofu and isolated soy proteins to millions of people in a very positive context.

But many of the companies that sold so-called "tofu ice creams," while emphasizing tofu in their product names and marketing programs, actually had surprisingly little (if any) tofu in their products. In fact they contain so little that this marketing gimmick might be misbranding and a deliberate deception of the consuming public.

Rise of Soyfoods in Europe. Thanks to the Belgian Office of the American Soybean Association (ASA), and specifically to the efforts of Michael Martin, Europe's growing soyfoods movement is starting to become organized and active. In March 1984 Martin launched Europe's earliest known soyfoods newsletter, *Soya Foods,* and in September organized the First European Soyfoods Workshop, for which bound proceedings were published. This is the first time in recent decades that ASA has promoted soyfoods (other than soy oil) in the Western World. The strong U.S. dollar has led to a recent dramatic decline in imports of soybeans and soybean meal to Europe for feed and oil use (European rapeseed and sunflowerseed are being substituted), so the ASA is exploring new outlets where soy is unique.

The launching of tofu production and marketing by Switzerland's biggest supermarket chain, Migros, and by Galactina, a large and respected maker of dietetic and pharmaceutical products (including soymilk) is a landmark for tofu in Europe. In early January, *Tages Anzeiger,* one of Switzerland's biggest newspapers, had a special report on tofu, followed on Jan. 9 by a 30-minute TV feature on tofu.

The total number of soyfoods companies in Europe continues to show a steady increase. Many of these are being founded by people interested in macrobiotics. By Jan. 1985 there were 1,113 names on The Soyfoods Center's computerized mailing list of people actively involved with soyfoods in Europe.

At the 1984 ASA soyfoods workshop, Martin reported the following estimates of annual European soyfoods consumption: A table with three columns shows: Soyfood name, consumption, percentage of U.S. consumption.

Soy oil–1.7 million metric tons–38%
Modern soy protein products–40 million kg–28%
Soymilk–9 to 10 million liters–7%*
Tofu–5 to 6 million kg–22%
Tempeh–400,000 to 500,000 kg–50%
Miso–250,000 to 300,000 kg–11%

* U.S. figure includes soy based infant formulas. European figure is not clear on this point.

Note that the population of the USA is about 234 million compared with 489 million for all of Europe (not including the USSR), but 237 million for Northern and Western Europe, where most of these products are consumed.

Rapid Growth of Second Generation Soyfoods. In the

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1984 edition of this book, we stated that the three fastest growing soyfoods in the USA (in terms of production increases) were tempeh (33% a year compound annual growth rate), tofu (15%), and soy sauce (14%). But now the picture has changed. In 1984 the fastest growing category was second generation products, ready-to-eat, all-American preparations, especially those based on tofu. The leader in this group is clearly soy ice creams (led by Tofutti), with a production growth rate of roughly 600% a year for the past 1-2 years. Then comes convenience tofu-based entrees such as Legume's products, tofu burgers and tofu burger mixes, and the like. This is the number one way that soyfoods are now entering the mainstream American diet. And the biggest gains are being made by marketing companies, rather than manufacturers. The second fastest growing category may now be imported soymilks, growing at about 40-60% a year.
Major New Capital Influx. The following is a brief summary of new capital influx to the soyfoods industry: A table with four columns shows: Company name, date of offering, $ amount, equity or debt; use.

Legume–Oct. 1982–$100,000 net–Equity. For tofu frozen entrees

Legume–Oct. 1982–$100,000–Debt. For tofu frozen entrees

Legume–Nov. 1983–$400,000 net–*Equity. For tofu frozen entrees

Legume–Nov. 1983–$200,000–Debt. For tofu Frozen entrees

Hinode Tofu–Nov. 1983–$2,500,000–Equity For general expansion

Tofu Time–Dec. 1983 $2,760,000 net–Equity. For soy ice cream

Tempehworks–July 1984–$265,000–Debt. For tempeh expansion

Legume–Feb. 1984–$200,000–Debt. For tofu frozen entrees

Legume–Aug. 1984–$1,248,000 net–Equity. For tofu frozen entrees

Brightsong–Dec. 1984–$500,000–Equity. For tofu products

Legume–April 1985–Expecting lots more. For tofu frozen entrees

White Wave–Expecting.

Note: Equity = Sale of equity ownership in the company via stock in a public offering or in a private placement. Debt = Debt financing by taking out a private loan.

How have these companies fared? Tofu Time has done spectacularly well. The value of the company has increased more than five-fold since Dec. 1983, and profits are excellent. Legume, a marketer of low-calorie, cholesterol-free frozen entrees featuring tofu, has had the hardest sledding. A preliminary prospectus by Huberman Margaretten & Straus dated 5 June 1984 stated that from its inception through 31 March 1984, the company incurred aggregate losses of $709,773, including a loss of $18,465 in 1982, then $225,302 in 1983, increasing again to roughly $486,500 in 1984. Legume's common stock had a negative book value; 1984 sales were "a little less than $1 million." Yet the company has excellent products and in early 1985 landed some foods big chains, which could help its bottom line considerably.

Growing International Interest in Tempeh. During 1983-84 Japan became a major tempeh producer. By May 1984 the world's largest tempeh producing company was Marusan-Ai (of Japan), which made 15,150 lb. a week. New marketing and production techniques were pioneered. The full story was described by Shurtleff and Aoyagi in Tempeh Production (1984).

Three Major International Symposia Featuring Tempeh were held: 15-16 April 1984 in Jakarta, Indonesia; 15-17 July 1984 in Tsukuba, Japan; and May 1986 in Honolulu. A special 13-day group study tour on Japanese Food Fermentations, led by Dr. Keith H. Steinkraus, has been organized by the Japanese-run, New York-based Technology Transfer Institute. Tempeh continues to be one of the fastest-growing soyfoods in the USA.

Growing Interest in Spray-Dried Tofu. Eleven articles were published this year on a product that promises to revolutionize the tofu industry. The first and largest manufacturers (St. Peters Creamery and Clofine) are both dairy companies. Spray dried tofu should appeal to the food industry, since it is easy to ship, store, and process.

Dairy Magazines Publishing Many Positive Articles About Soy-Based Dairylike Products. Traditionally the dairy industry has seen dairy analogs as a threat and fought to oppose them. The decades-long struggle against margarine is a good example of this. But now, many small dairies, struggling to survive, are looking for new products. A number (such as St. Peter Creamery and Clofine) have gained a new lease on life by starting production of soyfoods.

Major Changes in the U.S. Soybean Crushing Industry. Narrow crushing margins, a depressed export market for U.S. soybean meal, and poor profitability have led two of America's biggest soybean crushers, the A.E. Staley Manufacturing Company and Ralston Purina, to decide to get out of the soybean crushing business in Jan. 1985. Clearly they view poor profitability as a long term problem, and plan to diversify away from unpredictable agricultural commodities toward the "value added," retail end of the nation's food supply. Staley, in effect, sold its plants to ADM and Ralston Purina sold its to Cargill. In Nov. 1984 Staley acquired CFS Continental, Inc., the nation's second largest supplier to the foodservice industry. Staley, previously the oldest existing soybean crusher in America (since 1922), now relinquishes that honor to ADM. ADM is now the largest soybean crusher in America, but Cargill (which has many overseas plants) is the biggest in the world. These changes have led to a concentration of control in the U.S.

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soybean crushing industry. Both Staley and Ralston Purina plan to keep their edible soy protein (isolates, concentrates, etc.) operations.

Biotechnology is Emerging as a Major, Promising Factor in future soybean breeding development. Some agricultural experts are predicting that it could usher in the latest agricultural revolution, following the agrichemical revolution of the 1940s and the Green Revolution of the 1960s and 1970s.

The "Calcium Craze" Starts in America, aiding sales of tofu (curded with calcium sulfate), which is one of the best non-dairy sources of calcium.

8406. Hara, T.; Fujio, Y.; Ueda, S. 1985. Bacillus subtilis (natto) plasmid responsible for polyglutamate production encoding gamma-glutamyltranspeptidase. *J. of the Faculty of Agriculture Kyushu University* 30(2/3):95-105. Dec. [Eng]* Address: Kyushu Univ.

8407. Hirohata, Tomio; Shigematsu, T.; Nomura, A.M.Y.; Nomura, Y.; Horie, A.; Hirohata, I. 1985. Occurrence of breast cancer in relation to diet and reproductive history: A case-control study in Fukuoka, Japan. *National Cancer Institute Monograph* No. 69. p. 187-90. Dec. Fourth Symposium on Epidemiology and Cancer Registries in the Pacific Basin. [7 ref]
• ***Summary:*** This study was designed to examine the effects of high-fat, high-protein diets on breast cancer risk. The authors compared dietary intake among 212 women with breast cancer in Japan with equal numbers of hospitalized and neighborhood controls. The found that "overnutrition (a high-fat and high-animal protein diet) was not statistically associated with breast cancer. Older ages at menarche were associated with decreasing risk for the disease.

They also found no association between fat consumption from soyfoods and breast cancer risk. However neither specific information on actual intake or types of "soybean products," nor fat intake from specific soy products was given. Address: 1. Dep. of Public Health, School of Medicine, Univ. of Kurume, Kurume, Japan.

8408. Kitamura, Keisuke; Kumagai, T.; Kikuchi, A. 1985. Inheritance of lipoxygenase-2 and genetic relationships among genes for lipoxygenase-1, -2 and -3 isozymes in soybean seeds. *Ikushugaku Zasshi* (*Japanese J. of Breeding*) 35(4):413-20. Dec. [19 ref. Eng; jap]
Address: Dep. of Agriculture, Faculty of Agriculture, Iwate Univ., Morioka, Japan 020.

8409. Mogi, Yuzaburo. 1985. The conduct of international business: One company's credo–Kikkoman, soy sauce and the US market. *Columbia J. of World Business* 20(4):93-94. 20th Anniv. Issue. Winter, 1985.
• ***Summary:*** In Japan, marketing depends more on personal relations than it does in America. Kikkoman tries to be a good neighbor by localizing its operations. It has a firm commitment to employ as many local people as possible, participate in local activities, avoid the so-called "Japanese village" by advising its people from Japan not to live together but to spread out and live among Americans, to do business with American rather than Japanese companies, and to delegate most authority to local management. Address: Managing Director, Kikkoman Corp., Tokyo.

8410. **Product Name:** [Tofu Gelato (Non-Dairy Soy Ice Cream)].
Foreign Name: Tôfu Geraato.
Manufacturer's Name: Pappy Monro.
Manufacturer's Address: Jiyugaoka, Tokyo, Japan.
Date of Introduction: 1985 December.
How Stored: Frozen.
New Product–Documentation: Asahi Shinbun. 1985. Dec. 5. Tofu gelato, Italian style ice cream, is sold at a specialty store or restaurant named "Pappy Monro" in Jiyugaoka, Tokyo. Flavors are plain, mocha, matcha (green tea), maron (chestnut), and okura. Prices: single scoop of 100 gm is 180 yen, double scoop of 200 gm is 300 yen, and pint takeout is 800 yen. There is a choice of 6 toppings, including almond and chocolate. Color brochure. 1986, undated. "Everyday Gelato. Pappy Monro." The product was developed by an Italian named Maurizio Curati (born 7 Dec. 1953), a color photo of whom is shown. He has restaurants at Jiyugaoka and Shibuya.

8411. Tofu Time, Inc. 1985. Tofutti. Annual report. Rahway, New Jersey. 20 p. Dec.
• ***Summary:*** In fiscal 1985 sales skyrocketed to $17,114,886, up sevenfold over 1984. Net earnings after taxes were $2,006,451. The company moved into a new 30,000 square foot corporate headquarters in Rahway, New Jersey, with state of the art R&D facilities. Tofu is now sold in Japan, Australia, Canada, and Hong Kong.

This artfully designed glossy report includes color photos of Tofutti All Rootie TV ads. Address: 1098 Randolph Ave., Rahway, New Jersey 07065.

8412. Zenkoku Natto Rengokai, Tenpei Fukyukai [Japan National Natto Association, Tempeh Popularization Group]. 1985. 21 seiki no kenko shokuhin wa kore da! [This is the health food of the 21st century (Leaflet)]. Japan: Zenkoku Natto Kyodo Kumiai Rengokai. 3 panels each side. Each panel: 22 x 9 cm. [Jap]
• ***Summary:*** See next 2 pages. A color leaflet. "Tempeh is a distant relative of natto." Contains recipes (with tempeh) for: Curry rice. Gyoza (Pot stickers). Tempeh kabayaki domburi. Tempeh banana donuts. Happosai. Potato croquettes. Seafood salad.

A nice chart compares the nutrients in tempeh and beef.

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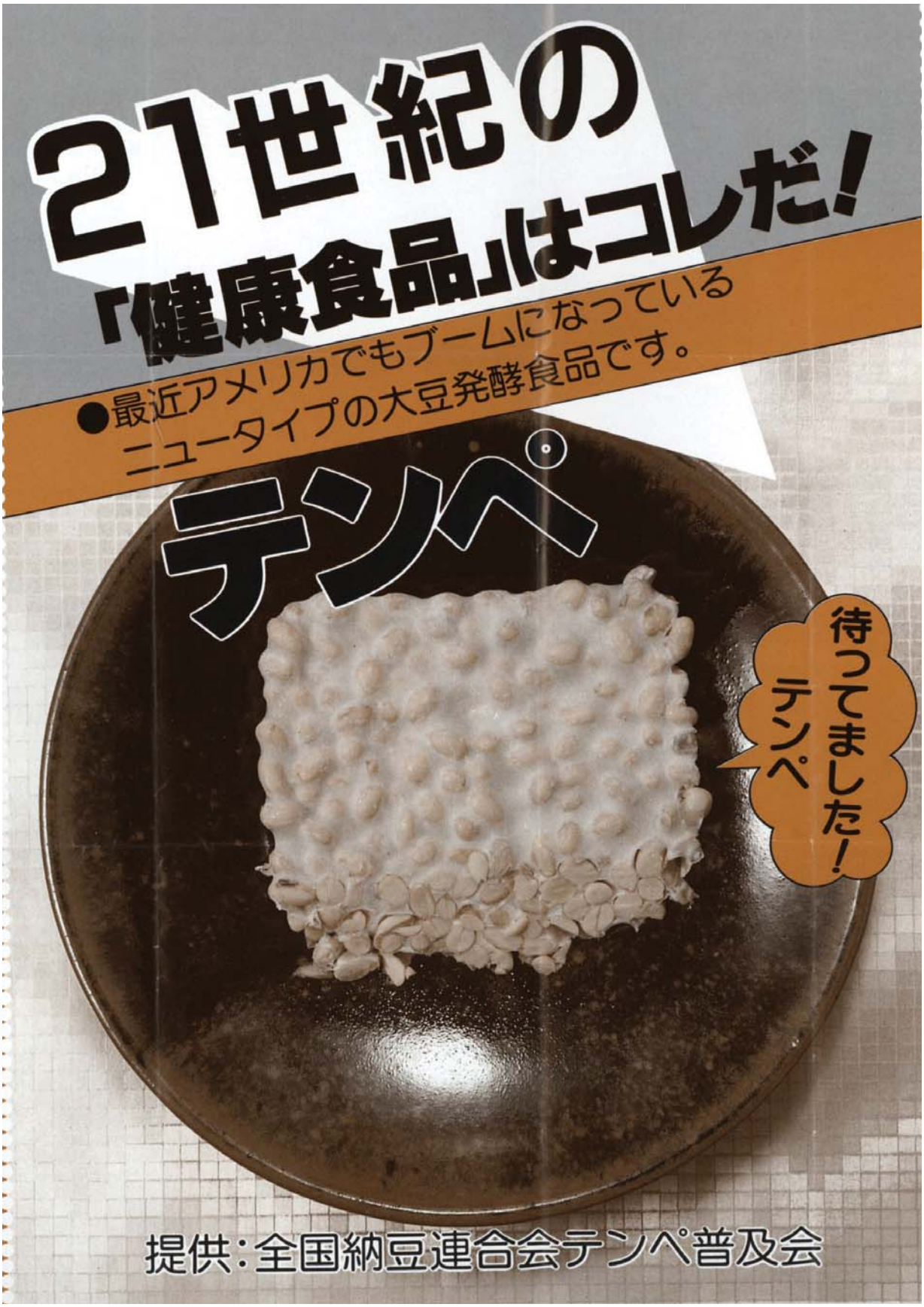

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おいしいテンペ料理いろいろ
テンペの使用法はごくかんたん。

- 揚げても、炊めても、煮てもおいしい
- フライ・カレー・から揚げ・シチュー・テンプラ・スパゲッティ・サラダ・和えもの おつまみ・ケーキ……何でもOK!
- テンペは万能の料理素材なのです。

■ギョウザ（4人分）

〈材料〉
ギョウザの皮…2袋
テンペ…100g ネギ…中1本
キャベツ…100g
A ニラ…80g シイタケ(もどしたもの)…4枚 とろけるチーズ…50g しょうが…1かけ にんにく…1かけ
B 塩…小½ 砂糖…小2 正油…小1 胡麻油…小1 コショウ…少々
サラダ油…焼き油として

〈作り方〉
①Aの材料を全部みじん切りにしてよく手でまぜ合わせ日の調味料を加えて更によくまぜ合わせる。
②①をギョウザの皮でつつみ焼き上げる。

■カレーライス（4人分）

〈材料〉
ご飯…800g テンペ…150g マグロツナ缶詰…1缶
玉ネギ…中2コ にんじん…100g じゃがいも…2コ
しょうが(みじん切り)…1かけ
A カレー粉…大1½ 小麦粉…大2
スープ……3½カップ
B 塩…小½ ハチミツ…小3 ウスターソース、ケチャップ、しょうゆ各大1
バター…大1
サラダ油
植物性生クリーム又はヨーグルト適量

〈作り方〉
①テンペは1.5cm角に切って油で揚げておく。
②にんじんはいちょう切り、じゃが芋は1cm角切り玉ネギは薄切りにしておく。
③厚手鍋にサラダ油2を熱し、しょうが、玉ネギが色づくまで炊め、野菜を加え更に炊め、Aを加える。
④スープを加えて日の調味料を加え煮込む。
⑤最後にバターを入れ、ツナ缶をほぐして③と共に入れ混ぜご飯にかけ、上に生クリームかヨーグルトをかける
(クリームをかけたら、まろやかな味になる)

■テンペ蒲焼丼（4人分）

〈材料〉
テンペ…100g
小麦粉
水……大2
油
正油…大5
砂糖…大4
A （砂糖はできるだけ三温糖を使用）
みりん…大2
水
ダシの素…少々
焼き海苔…少々
木の芽又は粉サンショ
ご飯

〈作り方〉
①テンペは5mmの厚さに切る。
②小麦粉、水で衣を作りフライパンに少し多めの油を入れ、少し焼き色がつくまで焼く。
③鍋にAの調味料を入れ、ほんの少し煮つめ2を入れて、一煮立ちしたらすぐ火をとめる。
④器にご飯を盛りちぎった焼き海苔をかけ、蒲焼テンペをのせ、粉サンショをかける。
★木の芽が手に入ったら、葉を手でたたいて香りを出して上に飾るとよい。

■テンペバナナドーナツ

〈材料〉
A テンペ…(100g・荒みじん切り) 卵…1 ホットケーキの素…½箱(225g) 牛乳又は水 バナナ…2本(つぶしてレモン汁をかけておく)
揚げ油

〈作り方〉
①Aの材料を混ぜる。牛乳又は水を加える量は普通のドーナツより柔かくなる程度入れる。
②中火よりややよわい油(150)でスプーンに油をつけて、①をすくっておとしながら、ゆっくりと色がつくまで揚げる。

企画監修/永山久夫　料理/川嶋則子

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8413. **Product Name:** [Ajipron Soy Flour].
Manufacturer's Name: Ajinomoto Co. Inc.
Manufacturer's Address: Kyobashi 1-5-8, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1985.
New Product–Documentation: Soya Bluebook. 1985. p. 89.

8414. **Product Name:** [Essan Soy Protein].
Manufacturer's Name: Ajinomoto Co. Inc.
Manufacturer's Address: Kyobashi 1-5-8, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1985.
New Product–Documentation: Soya Bluebook. 1985. p. 89.

8415. Beuchat, Larry R.; Nakayama, T.; Phillips, R.D.; Worthington, R.E. 1985. [Comparison of soybeans, peanuts and cowpeas as substrates for preparing natto]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 63:319-24. [Jap]*
Address: 1. Dep. of Food Science, Univ. of Georgia, Agric. Exp. Station, Experiment, GA 30212, USA.

8416. **Product Name:** [Tofu (from Organically Grown Soybeans, or Non-Organic), and Silken Tofu].
Foreign Name: Tofu: Pate de soja, Kinugoshi-dôfu.
Manufacturer's Name: Daizou SARL.
Manufacturer's Address: 883 Rue de Bernau–Z.I., 94500 Champigny sur Marne, France. Phone: 48 82 39 90 or 47.06.33.71.
Date of Introduction: 1985.
Ingredients: Water, yellow soybeans, sea salt. * Some organically grown.
Wt/Vol., Packaging, Price: 360 gm.
How Stored: Refrigerated.
New Product–Documentation: Form filled out by Anthony Marrese based on an interview with Mr. Hirayama. 1989. Nov. Mr. Sakaguchi is the owner of Daizou and Mr. Takatoshi Hirayama is the tofu production manager. Le Bol en Bois started in the 1970s as probably the first macrobiotic restaurant in Paris. They made tofu for their own use and their outside business grew slowly. In 1985 Tama (an importer and distributor of Japanese natural foods) and Daizou (a food manufacturing company) were made separate business divisions of Le Bol en Bois restaurant and health food store. The three companies employ about 50 people, 6-7 in food production. In 1985 the company introduced three types of tofu: Present production amounts are as follows: Non-organic 4,500 kg/month, organic 500 kg/month, and silken 150 kg/month. Also in 1985 the company started making konnyaku and shirataki [thin konnyaku noodles], and in 1987 they launched mochi.

Talk with David de Korsak. 1990. Jan. 31. David, a Frenchman, worked for this company in Sept. 1987. He did an internship with them, setting up a computer system. The manager was Takatoshi Hirayama. Daizou has about 8 employees total. The tofu company was formerly in the basement of Le Bol en Bois in Paris. They moved when they outgrew that space. They sell mostly to Japanese (in water pack tubs), and their main outlet is at Le Bol en Bois. They use 100-125 kg/day of soybeans to make about 300-375 kg of tofu. They also sell some vacuum packed tofu, made with organically grown soybeans, to 1-2 health food shops in Paris.

Letter from Bernard Storup of Société Soy. 1989. March 3. Daizou was founded by Le Bol en Bois (Paris) in 1985. Mr. Sakaguchi was the first to make tofu in France [Actually, Li Yu-ying was probably the first, in 1911].

8417. **Product Name:** [Soy Flour].
Manufacturer's Name: Fuji Oil Co. Ltd.
Manufacturer's Address: Nissei Midosuji Hachiman-cho Building, 6-1 Hachiman-cho, Minami-ku, Osaka 542, Japan.
Date of Introduction: 1985.
New Product–Documentation: Soya Bluebook. 1985. p. 89; 1986. p. 87.

8418. Great Eastern Sun. 1985. All About AhSoy–The Really Soft Drink (Leaflet). Enka, North Carolina. 1 p. Front and rear. 28 cm.
• ***Summary:*** Questions and answers about this soymilk. It is made by San-iku Foods in Japan. "It drinks like a shake–and you can use it to bake." Address: Enka, North Carolina.

8419. Hashiba, H. 1985. [Oxidative browning of soy sauce. II.]. *Nihon Shoyu Kenkyujo Zasshi* (*J. of the Japan Soy Sauce Research Inst.*) 11(5):189-99. [32 ref. Jap]*

8420. Hashiba, H. 1985. [Oxidative browning of soy sauce. I.]. *Nihon Shoyu Kenkyujo Zasshi* (*J. of the Japan Soy Sauce Research Inst.*) 11(4):144-48. [22 ref. Jap]*
• ***Summary:*** A review of the literature.

8421. Ikeda, H.; Tsuno, S. 1985. [The componential changes during the manufacturing process of natto. Part II. On the water-soluble proteins]. *Shokumotsu Gakkaishi* 40:27-37. (Chem. Abst. 104:128586). [Jap]*

8422. Ishimaru, I. 1985. [Removal and analysis of nutrient salts (nitrogen and phosphorus) in waste water from soy sauce factories]. *Nihon Shoyu Kenkyujo Zasshi* (*J. of the Japan Soy Sauce Research Inst.*) 11(5):177-82. [Jap]*

8423. **Product Name:** Onozaki Miso [Red Miso].
Manufacturer's Name: Just In Foods, Inc.
Manufacturer's Address: 92 MacIntosh Rd., Asheville,

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North Carolina 28806.
Date of Introduction: 1985.
Ingredients: Rice koji, soybeans, sea salt, well water.
Wt/Vol., Packaging, Price: 1 lb plastic bag with pressure-release valve.
How Stored: Refrigerated.
New Product–Documentation: This miso is imported in bulk from Onozaki Kojiten in Yaita, Japan. It is packaged by American Miso Co., Rutherfordton, North Carolina. Label sent by John Belleme. 1985. 3 by 3.5 inches. Gold and red on black–very stylish. Pressure sensitive on plastic bag with pressure release valve at top. Front panel text: "Handmade miso. Do not block valve. Non-pasteurized. No preservatives." Back panel text (black letters on white): "Onozaki miso is much more than just a great tasting miso. Its deep, rich flavor and subtle character is a vivid reminder of a vanishing Japanese tradition. And with good reason.

"For like Japan's ancient feudal miso masters, Takamichi Onozaki begins by personally growing, and carefully processing his own organic rice.

"Then, the Onozakis perform each time-proven step of old world miso-making in accordance with their own long family traditions. Finally, long aging in huge seasoned wood vats guarantees the superlative quality of their natural miso.

"Use Mr. Onozaki's wonderfully delicious miso to enhance the flavor and nutrition of soups, spreads, dressings and sauces.

"For more about the unique family and their work, see East West Journal, 'The Miso-Master's Apprentice,' April, 1981."

8424. Kawarai, Kumiko; Kikuchi, Kyoji; Aoki, Sadao. 1985. Tenpe hakkô katei ni okeru seibun no henka [Change in nutrients during tempeh fermentation]. *Tochigi-ken Shokuhin Kogyo Shido-sho Hokoku* (*Tochigi Prefecture Food Industry Leadership Group Report*) p. 1-5. [Jap]*
Address: Tochigi-ken Shokuhin Kogyo Shido-sho.

8425. Kikkoman International Inc. 1985. Kikkoman tofu. Delicious recipes (Leaflet, with 6 recipes). San Francisco, California. 1 p.
Address: P.O. Box 784, San Francisco, California 94101.

8426. Kikkoman International Inc. 1985. The joy of tofu. Great recipes from the Kikkoman kitchens (Leaflet) San Francisco, California. 3 panels on each side. Each panel: 20 x 9 cm.
• ***Summary:*** Contains recipes for: Hi-Protein Smoothie, Creamy Corn Soup, Tuna-Tofu Sandwich Spread, Spice-Nut Coffeecake, Marco Polo Pasta Salad, Simple Skillet Sukiyaki, Hunan Pork & Tofu Stir-Fry, Raspberry Yogurt Fluff Pie. Address: P.O. Box 784, San Francisco, California 94101.

8427. Kikuchi, A.; Kitamura, Keisuke. 1985. Genetic elimination of soybean seed lipoxygenase. 6. Genetic linkage relationship between L-1 and L-2 loci. *Ikushugaku Zasshi* (*Japanese J. of Breeding*) 35(Suppl. 1):300-01. [Eng; jap]*
Address: Dep. of Agriculture, Faculty of Agriculture, Iwate Univ., Morioka, Japan 020.

8428. Kimira, M.; Iwase, Y.; Akaba, M. 1985. [An investigation of salt intake from soy sauce]. *Nihon Shoyu Kenkyujo Zasshi* (*J. of the Japan Soy Sauce Research Inst.*) 11(6):242-46. [7 ref. Jap]*

8429. Matsuhashi, T. 1985. [Development of dried-frozen tofu in Nagano prefecture]. *Report of ASPAC* No. 90. [Jap]*
Address: Nagano State Lab. of Food Technology, Kurita, Nagano-shi, Japan.

8430. **Product Name:** [Sol-P Soy Protein].
Manufacturer's Name: Nisshin Oil Mills, Ltd.
Manufacturer's Address: Shinkawa 1-23-1, Chuo-ku, Tokyo, Japan.
Date of Introduction: 1985.
New Product–Documentation: Soya Bluebook. 1985. p. 89.

8431. Noji, R.; Shindo, Y. 1985. Study on antioxidative activity of miso. I. Application of miso for sardine processing. *Report of Fukuoka Women's Junior College* (*Fukuoka, Japan*) 21:295-301. *
• ***Summary:*** Miso is shown to have antioxidative activity. When sardines are soaked in brine, the levels of peroxide and carbonyl compounds are much higher than when they are soaked in miso.

8432. Shimazaki, K.; Tojo, H.; Sukegawa, K. 1985. [Differentiation of bovine milk proteins and soy proteins by 2-dimensional electrophoresis]. *Rakuno Kagaku Shokuhin no Kenkyu* (*Japanese J. of Dairy and Food Science*) 34(5):A123-28. [13 ref. Jap; eng]*
• ***Summary:*** The soy proteins included soymilk proteins.
Address: Dep. of Animal Science, Obihiro Univ. of Agriculture and Veterinary Medicine, Obihiro, Hokkaido, Japan.

8433. Shinji, E.; Inoue, S. 1985. [Preventing mold in low-salt soy sauce]. *Nihon Shoyu Kenkyujo Zasshi* (*J. of the Japan Soy Sauce Research Inst.*) 11(6):240-41. [3 ref. Jap]*

8434. Tajima, K.; Tominaga, S. 1985. Dietary habits and gastro-intestinal cancers: A comparative case-control study of stomach and large intestinal cancers in Nagoya, Japan. *Japanese J. of Cancer Research* (*Gann*) 76:705-16. *
• ***Summary:*** In this case-control study, the authors noted an increased in rectal cancer risk, but not in colon cancer risk in

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people consuming miso soup (Relative Risk = 2.05, $p < 0.05$). No association was found between tofu consumption and either colon or rectal cancer.

Concerning stomach cancer: Consumption of miso soup or miso was not significantly associated with increased risk of stomach cancer.

8435. Takai Tofu & Soymilk Equipment Co. 1985. Modern soymilk plant: Makes delicious dairylike soymilk with no beany flavor. 1-1 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan. 4 p. 30 cm. [Eng; Jap]
• ***Summary:*** Manufacturer's catalog. The front and rear covers are black letters on light blue. With 5 inserts including excellent fold-out layouts and floor plans, flow chart, and "Information sheet: Your soymilk production plans."

8436. Watanabe, Sugio. 1985. [Manufacturing technique of natto and process of packaging]. *Shokuhin to Kagaku* (*Food and Science*) 20:1-5. [Jap]*

8437. **Product Name:** [Yakult Soymilk (Pineapple, Passion Fruit, Chocolate, and Apple)].
Foreign Name: Tohnyu (Abacaxi, Maracuja, Chocolate, Maca).
Manufacturer's Name: Yakult S/A Ind. e Com.
Manufacturer's Address: Via Anchieta, Km 31–Sao Bernardo do Campo, Sao Paulo, Brazil.
Date of Introduction: 1985.
Ingredients: Chocolate: Extract of soybeans, chocolate powder, corn oil, sugar.
Wt/Vol., Packaging, Price: 200 ml Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Labels. 1988. May. Chocolate is Brown, yellow, orange, and black on white. Abstract illustration of two cocoa beans on front panel. "Natural. Vegetable protein. Tohnyu is a natural liquid food based on an extract of soybeans in various flavors. Contains all the riches of the soybean: Vegetable protein, vitamins, minerals, and linoleic acid. Tohnyu is free of cholesterol. Tohnyu is healthful and delicious. Keep refrigerated." By 1988, this was one of the most successful soyfoods in Brazil, with sales apparently growing rapidly. Total sales of Yakult beverages in Brazil (their fermented cow's milk and soymilk) grew from $13 million in 1984 to $46.2 million in 1987. Profits grew from a large loss in 1984 to 12% on sales net. Color brochure. 1988. Ta Com Tohnyu Ta Com Todo. "You get everything with soymilk."

8438. Yasui, T.; Shikata, H.; Ishigami, Y.; Ishikawa, H. 1985. [Controlling the color of light-colored soy sauce. II. Dark coloration of hydrolysate from wheat under shaking conditions]. *Nihon Shoyu Kenkyujo Zasshi* (*J. of the Japan Soy Sauce Research Inst.*) 11(3):104-08. [7 ref. Jap]*
Address: Higashimaru Shoyu K.K., Japan.

8439. Andoh, Elizabeth. 1985. An American taste of Japan. New York, NY: William Morrow and Co. 334 p. + [8] pages of color plates. Illust. by Susan Blubaugh. Color photos by Aaron Rezny). Index. 25 cm.
• ***Summary:*** This is a beautiful, remarkable book by a perfectionist with an intensely curious mind, a woman who really understands (is indeed an authority on) Japanese foods, cookery, language and culture. The illustrations and photos are likewise exquisite.

Contents: A note on the romanization and pronunciation of Japanese. Acknowledgments. An introduction to cross-cultural cooking (including a brief autobiography). At the market, in the kitchen ("A guide to buying and storing Japanese foodstuffs and equipment, plus an explanation of certain Japanese cooking terms and techniques"). The recipes: Soups, appetizers, sushi (in the lingo of the sushi bar, rice is known as *shari* and soy sauce as *murasaki*– literally "purple"), main dishes, side dishes, desserts. Setting the cross-cultural table. Photography credits. Mail-order and shopping guide.

Soyfoods [and sea vegetables] are so abundantly represented that we will only refer the reader to the glossary plus ("At the market, in the kitchen," p. 19-44) and index. In the glossary: Abura agé (fried bean curd). Ao nori (sea herb flakes). Kanten (agar). Kombu (kelp). Miso (fermented bean paste). Miso shiru (also called *omi-otsuke* [a woman's word]). Neri miso (glossy bean-paste sauce). Nori (laver). Soy sauce (The subtle, full-bodied aroma of soy sauce "does fade after several months. Keep opened bottles tightly capped on a dark shelf in your kitchen"). Tofu (bean curd; kinugoshi, momen, yaki-dofu). Usukuchi shoyu. Yaki-zushi nori.

An American who traveled to Japan in 1966 to study Japanese, Andoh married (in 1969) into the Japanese family she visited there. She enrolled in a class at the Yanagihara School of Classical Japanese Cooking, where she studied for six years.

Each recipe has two titles: (1) A long, descriptive title in English with large, bold typeface and title-style capitalization. (2) Under a hairline, the actual Japanese title, in regular capital letters. The modern Hepburn system of romanization is used throughout the book, so that diacritical marks are used consistently with the appropriate words. Page 52: "Light Bean Soup with Slender White Mushrooms and Bean Curd: Enokidaké no Miso Shiru." Page 183: "Bean Curd Tempura with Spicy Scallion Sauce: Agé Dashi-Dôfu."

Note: Use of the terms "bean curd" and "bean sauce" (instead of the now more widely used "tofu" and "miso") in recipe titles, text, and index makes these parts of the book seem slightly imperfect. Address: Japan.

8440. Bennett, Joan W. 1985. Taxonomy of fungi and

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biology of the aspergilli. In: Arnold D. Demain and Nadine A. Solomon, eds. 1985. Biology of Industrial Microorganisms. Menlo Park, California: Benjamin / Cummings Pub. Co., Advanced Book Program. xviii + 573 p. See p. 359-406. Chap. 12. 25 cm. [232* ref]

• ***Summary:*** This article is so clearly written that even a beginner can understand it.

Contents: Introduction. Some systematics for the nonmycologist: What is systematics? (classification, nomenclature, identification), what is a fungus? (general overview). The genus *Aspergillus:* Morphology, sexual stages (teleomorphs). Genetics: Introduction to *A. nidulans,* the parasexual cycle. Economic aspects: Secondary metabolites, *Aspergillus* metabolites used in food processing, Oriental food fermentations (soy sauce, sake, miso, koji). Conclusion.

Table 12.1 (p. 360) lists "Historical landmarks in mycology and biotechnology involving the genus *Aspergillus."* 1729–P.A. Micheli: Publication of *Nova plantarum genera,* name *Aspergillus* given to group of molds with characteristic spore head. 1827–J. Schilling: First continuous observation of the growth of a fungus from spore to spore, *A. glaucus.* 1854–A. deBary: First association of a perfect state (*Eurotium herbariorum*) and an imperfect state (*A. glaucus*). 1867–P. Van Tiegham: First to establish importance of Aspergilli in biochemical field with identification of *A. niger* in gallic acid fermentation. 1869–J. Raulin: First defined medium for a microorganism *A. niger.* 1894–J. Takamine: First patent for a commercial enzyme form fungus, "Takadiastase" from *A. flavus-oryzae.* 1917–J.N. Currie: Commercial citric acid production from *A. niger* demonstrated as feasible. 1952–J.A. Roper: Parasexual cycle discovered in *A. nidulans.* 1961–Sergeant et al.: Identification of *A. flavus* as mold association with Turkey-X disease; "mycotoxin revolution" begins. The name "aflatoxin" was given in 1962. 1983–Ballance et al.: Transformation system described in *A. nidulans,* the second transformation system elucidated for a mold. Table 12.3 (p. 378-79) is a "Glossary of morphological terms encountered in descriptions of the Aspergilli."

Table 12.6 (p. 392) lists "*Aspergillus*-derived metabolites used in food processing" (after Beuchat 1978, *Food & Beverage Mycology,* see p. 368-96). These fall into three broad categories: Acids, enzymes, and miscellaneous. Acids: Citric acid, from *A. niger,* is used in soft drinks, dairy products, jams, jellies, candies, frozen foods, fats and canned goods. Gluconic acid, from *A. niger,* is used in baking powder, bread mixes, desserts, bottle-washing formulations. Itaconic acid, from *A. itaconicus* or *A. terreus* is used in shortenings, or resin coatings in contact with food. Malic acid, from various *Aspergillus* species is used in beverages, jam, jellies, syrups, candy, and sour dough. Oxalic, from *A. niger,* is used in hydrolysis of starch to glucose. Tartaric acid, from *A. niger* or *A. griseus* is used in carbonated beverages, desserts, jellies.

Enzymes: α-amylase, from *A. oryzae* or *A. niger* is used in corn syrup, dextrose, baking, food dextrins, chocolate syrups. Glucoamylase, from *A. awamori* or *A. niger* is used in dextrose, dextrose syrup, baking. Glucose oxidase or catalase, from *A. niger* is used in powdered egg products, brewing, wines, mayonnaise. Lactase, from *A. niger* is used in dairy products. Naringinase, from *A. niger* is used in debittering grapefruit juice. Pectinase, from *A. niger* is used in clarifying fruit juice and wine. Protease, from *A. oryzae* is used in tenderizing meat, soy sauce, brewing, baking.

Miscellaneous: Mannitol, from *A. candidus* is used as a bulking agent, or humectant.

Illustrations show: (1) "Schematic representation of an *Aspergillus* conidial apparatus" showing metula (primary sterigmata), conidia, vesicule, phialide (secondary sterigmata), conidiophore, and foot cell (p. 377). Address: Prof., Dep. of Biology, Biology, Tulane Univ., New Orleans, Louisiana 70118.

8441. Bhatnagar, P.S. 1985. Soybeans in India–Research and development. In: H.C. Srivastava, et al, eds. 1985. Oilseed Production: Constraints and Opportunities. New Delhi: Oxford & IBH Publishing Co. xix + 700 p. See p. 205-18. [11 ref]

• ***Summary:*** Contents: Introduction. Scope in India. Production potential. Soybean in India. Returns to farmers. Place in cropping systems. Research. Constraints and strategies. Acknowledgements.

Tables show: (1) Increase or decrease in total hectarage, mean yield, and total production of soybean in Asia in 1983 (base year 1974-76). Source: Shanmugasundaram 1984. After each country listed in the table are figures. The 1st is change in hectarage (1,000 ha), the 2nd is change in yield (kg/ha), and the 3rd is change in production (1,000 metric tons). Burma (6, 144, 8). China (900, 153, 2,133), India (610, 235, 623). Indonesia (-25, 64, 24). Iran (-2, 564, 26). Japan (55, 68, 87). Kampuchea [Cambodia] (-3, 0, -3). Korea DPR [north] (19, 227, 90). Korea Rep. [south] (-64, -7, -75). Laos (2, 206, 1). Malaysia (-, 171, -). Philippines (4, 347, 7). Sri Lanka (1, 12, 1). Taiwan (based on 1982 data) (-39, 12, -48). Thailand (22, -76, 13). Turkey (25, 497, 52). Vietnam (65, 526, 88). Asia–total (1,647, 141, 3,080). USA (4,334, -40, 6,659). Brazil (2,342, 125, 4,927). World (11,272, 49, 19,741).

(2) Oil yields of the mail oilseeds as field crops. Source: FAO Production Yearbook (1972). In total yield worldwide in 1,000 tones the ranking is: 1. Soybean 8,749. 2. Groundnut (in hulls) 5,066. 3. Cotton 4,339. 4. Sunflower 3,308. 5. Rapeseed 2,525. 6. Sesame 965. 7. Flax 964. 8. Castor 385. 9. Safflower (N). Yet in terms of oil yield in kg/ha, the top three are: 1. Sunflower 376. 2. Safflower 280. 3. Castor 278. And... 6. Soybean 216.

3. Estimated area potentially available for soybean in

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Madhya Pradesh and Uttar Pradesh. Source: Williams 1974.

4. Targetted and actual cultivation (ha) as well as production (tonnes) in India under the centrally sponsored scheme for soybean development, from 1978-79 to 1983-84. The soybean states are Madhya Pradesh, Uttar Pradesh, Karnataka, Bihar, Himchal Pradesh, Rajasthan, Gujarat.

5. Identified / released varieties of soybean for different agro-climatic zones. The four zones are: Northern hill zone. Northern plain zone. Central zone. Southern zone.

6. The salient production technology of soybean for different agro-climatic zones in India.

7. Performance of some promising advanced breeding lines of soybean developed in India. 8. Composition of defatted soy flour. Address: Project Co-ordinator, All India Co-ordinated Research Project on Soybean (ICAR), G.B. Pant Univ. of Agriculture and Technology, Pantnagar (Nainital), Uttar Pradesh, India.

8442. Bull, S.M.; Yong, F.M.; Wong, H.A. 1985. The production of aroma by *Aspergillus oryzae* during the preparation of soy sauce koji. *Food Chemistry* 17(4):251-64. [14 ref]

• ***Summary:*** The manufacture of most soy sauce involves two fermentation stages–the koji stage and the moromi stage. Koji is a Japanese word that describes the preparation in which select species of mold are grown on cooked cereals and/or soybeans. Koji serves as a source of enzymes that break down or hydrolyze natural plant constituents into simpler compounds. Koji for Chinese soy sauce is made from steamed soybeans enrobed in wheat flour, with strains of *Aspergillus oryzae* or *Aspergillus soyae* used as the koji starter. However koji for Japanese soy sauce is made from a mixture of steamed defatted soybean meal and roasted wheat inoculated with similar but slightly different strains of *Aspergillus.*

Soy sauce koji is dark-green in color, with a pleasant aroma and sweet taste having a slightly bitter note.

A study of the volatiles produced during koji preparation and a comparison with uninoculated soy flour mixture shows that the growth and sporulation of *Aspergillus oryzae* is related to the production of various volatiles. "The volatiles present at the mycelial stage are different from the volatiles of sporulated koji." Capillary GLC (gas-liquid chromatography) was used to analyze extracts. Ten chromatograms are given to show how koji extracts change at various pH values and with time. Volatiles are present at all stages of koji production. Koji has distinctly different aromas at the mycelial and sporulated stages. This difference "supports the practice of soy sauce manufacturers in using well-sporulated koji for the production of soy sauce" (p. 263). Address: Dep. of Biochemistry, National Univ. of Singapore, Lower Kent Ridge, Singapore 0511.

8443. Hirano, Masaaki. 1985. Shôyu miso no bunkashi [A cultural history of shoyu and miso]. Tokyo: Tokyo Shobosha. 346 p. Illust. 22 cm. Series: Shoku no fuzoku minzoku meicho shusei, No. 7. [20+ ref. Jap]*

• ***Summary:*** A history of miso, miso cookery, shoyu, and shoyu cookery. "Tsuketari shoyu miso bunken shiryo shusei" (p. 297-346). Masaaki Hirano was born in 1931. Address: Japan.

8444. Hume, D.J.; Shanmugasundaram, S.; Beversdorf, W.D. 1985. Soyabean (*Glycine max* (L.) Merrill). In: R.J. Summerfield and E.H. Roberts, eds. 1985. Grain Legume Crops. London: Collins. xvi + 859 p. See p. 391-432. Illust. Index. 24 cm. [192 ref]

• ***Summary:*** Contents: Introduction: History, current status and future projections. Principal economic yield and uses of crop products. Principal farming systems. Botanical and agronomic features: Symbiotic nitrogen fixation potential. Principal limitations to production and yield: Developing countries, developed countries. Fertiliser requirements. Quality of seed constituents. Germplasm resources. Principal breeding strategies: Adaptation to new geographic areas, breeding methodology, breeding objectives, seed quality, pest and disease tolerances, current trends in soyabean breeding. Avenues of communication among researchers (INTSOY, AVDRC, IITA, FAO). Prospects for larger and more stable yields.

Tables: (1) Area (1000 ha), yield (kg per ha), and production (1000 tonnes) of soyabeans from 1969-71 to 1982. (2) Maturity durations and productivity potentials of soyabeans in selected countries. (3) *Glycine* species collections around the world. (4) Sources of resistance among soyabeans to selected insect pests. (5) Sources of resistance among soyabeans to selected diseases.

Table 9 shows that there are soybean germplasm collections in 15 countries. This table has 4 columns: Country, location (city), curator, and number of accessions. AVRDC in Taiwan has the largest germplasm collection in one location (10,400 accessions, Tainan), followed by USA (9,648, Illinois and Mississippi), India (4,000, Pantnagar; 1,800 Amravati), Japan (3,541, Tsukuba; 200, Morioka), USSR (3,000, Leningrad), China (3,000 Jilin; 3,000 Hubei; 2,930 Shadong [sic, Shandong {W.-G. Shantung}]; 2,500 Beijing; 960 Heilungjiang [Heilongjiang]). Also: Australia 400, France 500, Nigeria 1,300, Indonesia 600, South Korea 2,833, North Korea 300, South Africa 600, Sweden 1,200, and Thailand 1,686. Address: 1&3. Univ. of Guelph, Dep. of Crop Science, Guelph, Ontario N1G 2W1, Canada; 2. Asian Vegetable Research and Development Centre (AVRDC), PO Box 42, Shanhua, Tainan 741, Taiwan, Republic of China.

8445. Juvik, Gail A.; Bernard, R.L.; Kauffman, H.E. 1985. Directory of germplasm collections. 1. II. Food legumes (Soyabean). Rome, Italy: International Board for Plant Genetic Resources. 53 p. Co-sponsored by INTSOY. [11 ref]

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• ***Summary:*** Soybean germplasm collections worldwide are listed (with address and number of accessions) in the following countries: Argentina, Australia, Austria, Bangladesh, Bolivia, Brazil (2 collections), Bulgaria, Canada, China (14 collections), Taiwan (3), Colombia, Czechoslovakia (2), France (4), Germany (East), Germany (West), Greece, Hungary (2), India (8), Indonesia (3), Italy, Japan (5), Korea (South, 2), Malaysia, Nepal, Nigeria, Papua New Guinea, Paraguay, Philippines, Poland, Portugal, Romania, Spain, Sri Lanka, Thailand (2), Turkey, USSR, United Kingdom, USA (5), Uruguay, Venezuela, Vietnam (2), Yugoslavia, Zambia, Zimbabwe.

The world's largest soybean germplasm collections are as follows: AVRDC, Tainan, Taiwan (12,200 accessions), National Seed Storage Laboratory (NSSL), Fort Collins, Colorado, USA (10,880), Univ. of Illinois, Urbana, IL, USA (8,368), Jilin Academy of Agricultural Sciences, Jilin, China (4,800), N.I. Vavilov All-Union Institute of Plant Industry (VIR), Leningrad, Moscow (4,700), All-India Coordinated Research Project on Soybean, G.B. Pant Univ. of Agriculture and Technology, Pantnagar, India (4,022), Suweon, South Korea (4,020), Tsukuba, Japan (3,741). USDA, Stoneville, Mississippi, USA (3,000).

A world map (p. 9-10) shows (1) The sites of all soybean germplasm collections, (2) the range of ancient cultivation of the soyabean (East and Southeast Asia), (3) range of the wild soybean (Glycine soja; in China and Japan), and (4) range of perennial Glycine (Australia, Papua New Guinea, Philippines, Taiwan, Melanesia, and Micronesia).

This document is "Available free to developing countries, but restricted distribution to developed countries." Address: 1&3. INTSOY, Univ. of Illinois at Urbana-Champaign; 2. USDA-ARS, Dep. of Agronomy.

8446. Kushi, Aveline; Esko, Wendy. 1985. The changing seasons macrobiotic cookbook. Wayne, New Jersey: Avery Publishing Group, Inc. xii + 265 p. Illust. Index. 28 cm. [43 ref]

• ***Summary:*** The recipes are arranged by the four seasons. The index contains 43 entries for miso, 39 for tofu, 35 for tamari, 18 each for seitan and tempeh, 3 for natto, and 1 each for Japanese black [soy] beans, and for soybeans (dry).

Also contains entries for amazake, amazake pudding, azuki beans, brown rice, hiziki [hijiki], kuzu, mochi, and sea vegetables. Address: Brookline, Massachusetts.

8447. Kushi, Aveline; Kushi, Michio. 1985. Macrobiotic diet. Edited by Alex Jack. Tokyo and New York: Japan Publications. 288 p. Illust. Index. 26 cm. [74 ref]

• ***Summary:*** This is perhaps the best, most comprehensive

book seen to date by Aveline and Michio Kushi about the macrobiotic diet. The rear cover states:

"Humanity has been continuously degenerating in spite of scientific and technological achievements. This degeneration is reflected in physical disorders, psychological disorders, and general distrust in human relations. Since diet affects our physical and psychological functions, macrobiotics strives to change our health and behavior through a proper diet in harmony with the environment in which we live.

"This book is a basic and readable presentation of the principles behind the macrobiotic diet. It explains the foodstuffs that comprise the diet, appropriate cooking techniques, proper attitudes toward food and its preparation, and applications of the diet for weight loss, increased energy, relief from and prevention of sickness, and encouragement of psychological health, spiritual development and social stability. Dietary adjustments and modifications are given for men, women, and children, as well as differing climates, levels of activity, and ages."

Macrobiotics, which originated in Japan, has done much to introduce Westerners to soyfoods. This book is an excellent example: The chapter on "Soup" has a long section on miso soup (p. 99-101, 104-05) and the main varieties of miso: Barley miso, soybean miso (Hatcho miso), brown rice miso, light misos, and natto miso (a spicy condiment not usually used in soups).

In the chapter on "Vegetables," the section on "Pickling" has subsections (p. 118-19) on "Tamari soy sauce pickles" and "Miso pickles."

In the chapter on "Beans and bean products" is a long section on "Soybeans" (p. 141-49) which includes an introduction (discusses the "vegetable soybean" vs. "field soybean") and descriptions of miso, natto, okara, soy flour, soy grits, soy milk, soy oil, tamari soy sauce, tempeh, tofu (incl. nigari, oden, Yu-dofu, aburage, inari-zushi), viilia

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(somewhat like soy yogurt from Finland), and yuba.

The subsection on "Soybeans" (for example, p. 147) states: "Yellow soybeans are hard and require thorough cooking. They should be soaked overnight with a strip of kombu and then pressure-cooked for a short time prior to boiling. Properly cooked, yellow soybeans are very soft and delicious and give no problems with gas. A delicious dish called Colorful Soybean Casserole is made from yellow soybeans, kombu, shiitake mushroom, lotus root, dried tofu, daikon, carrot, burdock, and celery. The yellow variety also goes very well served with hijiki sea vegetables. Black soybeans, also known as Japanese black beans, have a strong, delicious taste. They may be prepared plain or cooked with rice. To sweeten black soybeans, a little barley malt, rice syrup, or mirin is often added. Black soybeans are usually cleaned by rubbing with a damp towel to prevent their skins from falling off under water. During cooking, some of the skins from these beans may float to the surface and should be skimmed off. Foam also arises and needs to be discarded. Yellow soybeans are nice seasoned during cooking with a little tamari soy sauce or miso. Black soybeans are usually seasoned with tamari soy sauce."

The chapter on "Snacks and desserts" has a good section on Amazaké (p. 190, 196) and also notes: "In the West, the introduction of tofu has resulted in the creation of many tofu-based desserts such as tofu cheesecake, tofu ice cream, and tofu whip topping. In the Far East, however, tofu is not traditionally combined with barley malt, rice syrup, or other sweetener. It is recognized that tofu's cooling qualities are naturally balanced by a salty taste, not a sweet one. As a result, tofu is customarily cooked and served warm, rather than prepared raw and eaten cold, except in special cases for cooling and refreshment, usually in the hot summer. The macrobiotic diet does not encourage the use of tofu in sweetened desserts except for those in transition from dishes made with dairy food and sugar."

The chapter on "Salt, oil, and other seasonings" includes sections on tamari soy sauce (p. 203-04, 209), miso (p. 204, 210-11), and soybean oil (p. 207).

The chapter on "Dressings, sauces, garnishes, and condiments" includes sections on "Dressings" (p. 215-16, with tamari soy sauce dressings, umeboshi dressings, miso dressings, tofu dressings, sesame dressings), "Condiments" (p. 216-17, with gomashio or sesame salt, sea vegetable powders, tekka, umeboshi plums, miso with scallions or onions, etc.).

The chapter on "Beverages" has sections on amazake and soy milk (if naturally processed, good for those in transition from cow's milk and other dairy foods).

This book also contains a wealth of information (see the index) on such varied foods as azuki beans, barley malt, brown rice, kuzu, sea vegetables (many species), sesame seeds and sesame oil, umeboshi, etc.

Note: The macrobiotic diet is not vegetarian; it allows the inclusion of fish and seafood (see index). Address: Brookline and Becket, Massachusetts.

8448. Lukes, Timothy J.; Okihiro, Gary Y. 1985. Japanese legacy: Farming and community life in California's Santa Clara Valley. Cupertino, California: De Anza College, California History Center Foundation. 156 p. Foreword by Norman Y. Mineta. 22 x 26 cm. 60 photos. Series: Local History Studies Vol. 31. California History Center, Cupertino, California. [175* ref]

• ***Summary:*** A comprehensive work about a Japanese farming community in California from 1895 to 1945. This book was the winner of the Association for Asian American Studies 1987 Book Award "for having made a most significant contribution to the study of the Asian American experience." Pages 23-24 contain a map and legend of San Jose Nihonmachi (Japantown) from 1910 to 1920. Nomitsu Tofu was located on Sixth Street, four doors from Taylor Street.

Japanese farmers first arrived in California's Santa Clara Valley in about 1895. The major theme of this book is their constant struggle. The ideas of inclusion and exclusion, oppression and resistance (the search for self-determination) of this minority group are carefully examined. The inside front cover notes: "Around the turn of the century, clusters of Japanese farms sprang up throughout the Santa Clara Valley, at Alviso, Agnew, Trimble Road, Berryessa, and the West Side (Santa Clara, Saratoga, Los Gatos). Each cluster built a Japanese language school, held picnics and observed Japanese festivals such as New Year's Day, and shared wells, tools, horses, and laborers. Peddlers from Nihonmachi visited those outlying clusters selling Japanese foodstuffs like tofu, miso, and seaweed, and in turn, the farmers took occasional trips to Nihonmachi for entertainment, funerals, and other social gatherings."

Note: A good source of information on farming by Asian-Americans on the Pacific Coast is the periodical *Pacific Rural Press.* Address: 1. Asst. Prof. of Political Science; 2. Director of the Ethnic Studies Program and Assoc. Prof. of History. Both: Univ. of Santa Clara.

8449. Matsuura, M. 1985. [Improvement of chalkiness present in soy milk]. In: Development of New Protein Foods. Yokohama: Tekunoai Press. See p. 315-24. [Jap]*

• ***Summary:*** A bell-shaped graph shows the effect of the pH during soaking on the activities of Beta-glucosidase. The activities are highest at pH 6, and lowest at the extreme pH values of 3.5 and 8.5.

There are two types of Beta-glucosidases in soybeans, and they tend to produce chalky flavors. Beta-glucosidase A is active in the pH range 4-7, has an optimum pH of 5.0, has an optimum temperature of 40-45ºC, and is inactivated by heating at pH 5.0 at 60ºC for 5 minutes.

Beta-glucosidase B is active in the pH range 4-7, has an

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optimum pH of 5.0, has an optimum temperature of 45-50ºC, and is inactivated by heating at pH 5.0 at 60ºC for 5 minutes.

8450. Noh, Chin-hwa. 1985. Traditional Korean cooking: Snacks & basic side dishes. Elizabeth, New Jersey; Seoul Korea: Hollym Corporation. 78 p. Illust. (color). Index (general). Index of Korean recipe titles. 27 cm. [Eng; kor]
• ***Summary:*** This is an excellent cookbook of authentic Korean recipes, each with its Korean name (romanized and in Korean characters). Each recipe is accompanied by numerous useful color photos. The front matter contains an Introduction, Preparation tips, and 2 pages about the healthy Korean diet. Soy related recipes include: Soft bean curd soup (*Sundubutchigae,* p. 10). Seasoned fermented soybean soup (*Ch'onggukchangtchigae,* with 1 cake bean curd and 6-8 tablespoons seasoned fermented soybeans, p. 11 [ch'onggukchang is Korean style natto]). Royal soybean paste soup (*Kungjungdoenjangtchigae,* with 2 tablespoons soybean paste [Korean miso], p. 12). Bean curd casserole (*Tubu Chon-gol,* p. 13). Wrapped bean curd (*Tubussamtchim,* p. 15). Stuffed bean curd (*Tubusobagi,* p. 16). Steamed bean curd (*Tubuson,* p. 16-17). Bean curd in soy sauce (*Tubut'wigimjorim,* p. 18). Salted bean curd and beef (*Tubu Soemgogijorim,* p. 18). Salted beans (*K'ongjorim,* with 1 cup black beans plus soy sauce, sugar, sesame seeds, and sesame oil, p. 19). Cold cooked bean curd (*Tubu Naengch'ae,* p. 22). Bean sprout rice (*K'ongnamulpap,* with 2/3 lb. [soy] bean sprouts, p. 24). Dried radish strips in soy sauce (*Muumallaengijangatchi,* p. 54). Cucumbers in soy sauce (*Oijangatchi,* p. 55). Sesame leaves in soy sauce (*Kkaennipchangatchi,* p. 56). Todok in red sauce (*Todokchangatchi,* with 1 cup soy sauce, p. 56). Fermented soybean lumps (*Meju,* with 18 lb. dried yellow soybeans, p. 62-63). Soy sauce (*Kanjang,* homemade, p. 62-63). Soybean paste (*Toenjang,* homemade, p. 63). Red pepper paste (*Koch'ujang,* homemade, with 2 lb. fermented soybean powder, 6 lb glutinous rice powder, p. 64).

Note 1. This is the earliest English-language document seen (Jan. 2012) that uses the word "ch'onggukchang" to refer to Korean-style natto.

Note 2. This is the earliest English-language document seen (March 2009) that uses the word "Toenjang" to refer to Korean-style soybean paste (miso), or the word "Koch'ujang" to refer to Korean-style fermented red pepper and soybean paste (miso).

The useful Glossary (p. 73-75) contains definitions of: Bean curd (*tubu*). Beans, incl. yellow soybeans (*huink'ong*) which are used to make [soybean] sprouts (*k'ongnamul*), bean curd (*tubu*), soft bean curd (*sundubu*), bean paste (*toenjang*), fermented soybeans for making soy sauce (*meju*), seasoned fermented soybeans (*ch'onggukchang* [*Korean natto*]), soybean flour (*k'ongkaru*), soy sauce (*kanjang*).

Brown soybeans (*pamk'ong*–literally "chestnut beans") are a chestnut brown color and have a smooth chestnut-like texture when cooked.

Black soybeans (*komunk'ong*) are served as a side dish.

Mung beans (*noktu*), used to make mung bean sprouts (*sukchu namul*), etc. Red kidney beans [azuki] (*kangnamk'ong*).

Bean sprouts (*k'ongnamul*) may be grown at home or purchased in the vegetable section of most grocery stores. The large sprouts are from the yellow soybean; the smaller, more delicate sprouts are from the green mung bean.

"Soybean paste (*toenjang*) is a thick brown paste made from a mixture of mashed fermented soybean lumps [soybean koji] (left from making the soy sauce), powdered red pepper seeds and salt. It is used as a thickener for soups and stews and will keep well in the refrigerator.

"Soy sauce (*kanjang*) is a brownish-black salty liquid made by cooking fermented soybean cakes with water and salt. Each household in Korea used to make their own soy sauce in the spring; some still do. These are mild and add good flavor to most any food." Soy sauce is used in cooking and at the table. Japanese "soy sauce is less salty but sweeter than Korean soy sauce.

"Sweet red beans (*p'at*) are small and round and used widely in Korean confections. When cooked and mashed they are sweet and soft textured. This sweet bean puree [Japanese *an*] is used as filling in rice cakes [mochi] and also now in donuts and rolls."

The Glossary also mentions laver (*kim*), a sea vegetable called "nori" in Japan, that is widely used in recipes in this book. No other sea vegetables are mentioned. Address: Munhwa Cooking School.

8451. Odo, Franklin; Sinoto, Kazuko. 1985. Zusetsu Hawai Nihonjin-shi 1885-1924 [A pictorial history of the Japanese in Hawaii, 1885-1924]. Hawaii Immigrant Heritage Preservation Center, Dept. of Anthropology, Bernice Pauahi Bishop Museum, 1525 Bernice St., P.O. Box 19000A, Honolulu, Hawaii 96817-0916. See p. 166. [Jap; Eng]
• ***Summary:*** Commemorating the centennial of the first arrival of government contracted Japanese laborers in Hawaii. Note that both English-language and Japanese-language editions of this book were published. Throughout the English-language edition, the word Hawaii is spelled "Hawai'i."

A photo (p. 166) shows the inside of the Hawaii Shoyu Co. (Hawaii Shoyu Kaisha) on King Street in Palama, Honolulu, taken in about 1914. The caption reads: "The Japanese is Hawaii depended upon shoyu imported from Japan until Nobuyuki Yamashiro started making shoyu in 1904. His company was established as Hawaii Shoyu Co. in 1906. American Shoyu Co. was established in Honolulu in 1912.

The same page shows a 1906 advertisement for Takakuwa Store, Nu'uanu, Honolulu, reprinted from *Hawaii Shinpo,* 1906. The store sells shoyu. Address: Hawaii.

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8452. Okuda, Hiromichi. 1985. Effect of soya saponins and their related substances on gold thioglucose-induced obese mice. In: F. Paltauf and D. Lekim, eds. 1985. Lecithin and Health Care: Proceedings of the Third International Symposium on Soya Lecithin. 285 p. See p. 169-84. [16 ref]

8453. Ontario Soya-Bean Growers' Marketing Board. 1985. Soybeans: Nature's miracle–teaching unit. Chatham, Ontario, Canada: OSGMB. 33 p. Undated. 28 cm.

• ***Summary:*** This interesting portfolio of materials is designed to teach children in Ontario, Canada, about the growth development of a soybean from seed to mature plant, soybean cultivation, soybean processing and products, the importance of soybeans to Ontario's economy, and the Ontario Soya-Bean Growers' Marketing Board.

Contents: Introduction to teacher's unit. 1. From seed to pod: A brief history of soybeans in Canada, biology of the soybean seed, its germination and seedling growth, soybean nodules and rhizobia bacteria, parts of a young soybean plant, reproductive stages from flowering to maturity, corn heat units, tillage, word scramble.

2. Soybeans–Nature's miracle: A brief history of soybean utilization, ways that soybeans are used, soy oil, meal and soyfoods, recipes, word search. 3. Imports and exports: Importance of soybeans to the economy of Canada and Ontario, how soybeans get to market, The Ontario Soya-Bean Growers' Marketing Board.

A table on page 20 shows "Soymeal consumption by Ontario's livestock and poultry." Hogs consume 45% of the total (the total is 503,000 tonnes), poultry 34%, dairy cattle 20%, and beef cattle 1%. Page 22 notes that the bulk of Ontario's soybean exports (77%) are sold to East Asia–especially Japan, Hong Kong, Singapore, Malaysia, Indonesia, and Korea. Soyfoods are listed and discussed in a positive way, with recipes for: Bran muffins (with soy flour and soy oil). Tofamole (tofu guacamole). Tofu fruit pudding. Tofu shake.

Note: This is the earliest English-language document seen (Dec. 2003) that contains the term "Tofu shake."

The three largest farm crops in Ontario in terms of total area are hay (1,050,000 ha), grain corn (902,000 ha), and soybeans (425,000 ha). Address: Chatham, ONT, Canada.

8454. Pelto, Gretel H.; Pelto, Pertti J. 1985. Diet and delocalization: Dietary changes since 1750. In: R.I. Rotberg and T.K. Rabb, eds. 1985. Hunger and History: The Impact of Changing Food Production and Consumption Patterns on Society. New York and London: Cambridge Univ. Press. 336 p. See p. 309-30. [25 ref]

• ***Summary:*** There have been four major changes in food resources and distribution over the past 250 years: First, the increasingly rapid "delocalization" and corresponding internationalization of food production and distribution. There has also been a world-wide dissemination of domesticated plant and animal varieties. These trends lead to a worldwide network of increasing socio-economic and political interdependency. "From the point of view of individuals and families at any one place on the globe, delocalization means that an increasing portion of the daily diet comes from distant places usually through commercial channels. Second, in the industrialized nations, delocalization has been associated with an increase in the diversity of available foods and the quantity of food imports, and, therefore, with improved diets... Third, in the less industrialized countries of the world, the same processes of delocalization have tended to produce opposite effects on dietary quality, except for the elite."

And fourth, the migration of people from rural to urban centers, and from one continent to another, on a hitherto unprecedented scale, with a resulting exchange of culinary and dietary techniques and preferences.

In 1833 in England, based on a large study related to the effects of child labor, working boys aged ten years averaged 121 cm in height compared with 140 cm today (a 15.7% increase); those aged 18 years averaged 160 cm compared with 175 cm today (a 9.4% increase). "The recent trends in Japan from 1950 to 1970 show a nearly 3 cm. increase per decade among seven year olds, and a 5 cm. per decade increase in twelve year olds." The main factor affecting this increased growth seems to be improved nutrition, although improved sanitary conditions have also played a role.

"Age at menarche is another measure frequently cited in connection with the overall improved nutrition levels of Europeans, North Americans, and other industrialized populations. Tanner (1978) has demonstrated that the average age at menarche for girls in Finland, Norway, and Sweden was between sixteen and seventeen years in the middle of the nineteenth century, from which there has been a progressive decline to the present day. Now, the averages hover around thirteen years...

"One of the more obvious, yet infrequently noted, results of the delocalization of food products in the industrialized world is the elimination, except during wartime, of disastrous famines... Famines still occur in isolated parts of India... but mortality from famines was not an important force in slowing India's population growth after 1921. Thus, the forces of delocalization–the spread of transportation systems and food distribution networks, plus governmental communications and food relief systems–have effectively eliminated most (but not all) of the impacts of regional crop failures and other disasters that in the past led to severe periodic famine conditions...

"We suggest that the poorer populations in developing countries, especially in rural areas, have experienced declines in total caloric consumption (per capita) and in dietary diversity as traditional subsistence systems have been severely disrupted by the forces of modernization, especially

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delocalization." Address: 1. Assoc. Prof. of Nutritional Sciences; 2. Prof. of Anthropology and Community Medicine. Both: Univ. of Connecticut.

8455. Richie, Donald. 1985. A taste of Japan: food fact and fable. What the people eat. Customs and etiquette. Tokyo, New York, San Francisco: Kodansha International. 112 p. Illust. (some color photos). Index. 27 cm.
• ***Summary:*** This book contains a nice chapter titled "Tofu" (p. 34-41) in which the different types are described including *momengoshi-dofu* ("cotton" tofu) and *kinugoshi-dofu* ("silk" tofu). It also discusses okara, noting: "Now mainly used as livestock feed, it once also nourished one of Japan's greatest scholars. Arai Hakuseki, who lived during the Edo period (1615-1868), proudly related that in his impoverished student days he lived almost entirely on *okara* and that in gratitude he later, rich and famous, gave large sums of money to his charitable tofu maker."

On pages 38-39 are color photos of: "(1) Atsu-age. (2) Koya-dofu. (3) Ganmodoki. (4) Unohana or okara. In Kyoto, this humble food is rounded into balls and sold. (5) *Yudofu* course in a Kyoto restaurant. The course includes yuba tempura, simmered *hiryozu* (known as ganmodoki in the Kanto [Tokyo] area) and *goma* (sesame) tofu. (6) Aburage (two sizes).

Even today, Chinese and Japanese view tofu in very different ways: "... Chinese cooking tends to regard tofu as an additive, as something which enhances something else. The Japanese, on the other hand, relish the taste of tofu itself..." for example as *Hiyayakko* [chilled tofu; summer] or *Yudôfu* [simmering tofu; winter]. Each is seasoned with soy sauce or a soy-based dipping sauce. The names of various popular Japanese tofu recipes are given (p. 40).

"Freeze-dried tofu" is said to have originated one cold night in a temple at the summit of Mount Koya [*Kôya-san*] when a forgetful acolyte left the tofu offering of the day on the altar. The next morning it was found frozen. It was also found that this tofu had a completely different texture from ordinary tofu and it could be kept for a long dried since it contained very little water. This tofu has at least four different names: (1) Koya-dofu. (2) Misuzu-dofu. (3) Shimi-dofu. (4) Kori-dofu.

Note 1. This is the earliest English-language document seen (April 2013) that uses the term *shimi-dofu* to refer to dried-frozen tofu.

A large illustration (p. 40-41) shows tofu being made from the *Kinsei Shokuhin Zukushi Ekotoba* (1805). The basic process has not changed to this day.

The copyright page notes: "The text of this book is based on a series of articles that appeared in *Winds* magazine, 1981-83." "In this book, all twentieth-century Japanese names appear in Western order, and all earlier names appear in traditional order, surname first."

Note 2. There are also chapters on sushi, sukiyaki, tempura, menrui (noodles), onigiri, mochi, tsukemono (pickles), okashi (Japanese sweets, confections). Saké. Ocha (tea). Address: Japan.

8456. Rotberg, Robert I.; Rabb, Theodore K. eds. 1985. Hunger and history: The impact of changing food production and consumption patterns on society. New York and London: Cambridge University Press. 336 p. No index. 24 cm.
• ***Summary:*** A provocative overview, with chapters by various authors. Some of these are cited separately. In India, the 1942 Bengal famine was devastating. Address: 1. Prof. of Political Science & History, MIT, Cambridge, Massachusetts.

8457. Shurtleff, William; Aoyagi, Akiko. 1985. When major soybean producing nations reached "takeoff" of 10,000 metric tons (Document part). In: Shurtleff and Aoyagi. 1985. Soyfoods Industry and Market: Directory and Databook. 5th ed. Lafayette, CA: Soyfoods Center. 202 p. See p. 168.
• ***Summary:*** Pre-1850 China proper, Manchuria, Korea, Japan, Taiwan, Indonesia. 1912 United States. 1925 USSR. 1942 Canada. 1946 Brazil, Thailand. 1955 Nigeria. 1956 Colombia. 1958 Vietnam (North and South combined). 1959 Yugoslavia. 1961 Argentina. 1962 Mexico. 1963 Paraguay. 1966 Romania. 1968 India. 1969 Turkey. 1971 Bulgaria. 1972 Iran, Nepal, Australia. 1974 South Africa, Hungary, Burma. 1975 Uruguay, Bolivia, Zimbabwe. 1976 Egypt. 1979 France. 1980 Philippines. Address: Lafayette, California. Phone: 415-283-2991.

8458. Shurtleff, William; Aoyagi, Akiko. comps. 1985. Computerized bibliography on soy sauce, shoyu and tamari. Lafayette, California: Soyfoods Center. 67 + 12 p. Unpublished. No index. 28 cm. [749 ref]
• ***Summary:*** The body of this book consists of bibliographic records sorted alphabetically by author, printed on a dot-matrix printer. None of the records has a summary or abstract. The last 12 pages consist of 130 early records (770 B.C. to 1903) sorted chronologically. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

8459. The first macrobiotic cookbook: Formerly *Zen Cookery.* Revised edition. 1985. Oroville, California: George Ohsawa Macrobiotic Foundation. 134 p. Topical index. General index. 22 cm. Copyright 1984, 1985 [11 ref]
• ***Summary:*** Edited by Cornellia and Herman Aihara, this is a revised and expanded edition of *Zen Cookery,* which was first published in 1964 by the Ohsawa Foundation of Chico, California. "Includes 296 recipes updated for the 1980's." Each recipe is numbered and the numbers are almost the same as in the original edition though some of the names have been changed slightly, and ingredients have been adjusted. Much less salt has been used.

There is an interesting preface followed by 4 pages of

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photos titled "Recollections of the early 1960s"–related to Chico-San, Inc. and followers of macrobiotics.

Contents: Preface. Photo recollections. 1. Grains. 2. Noodles. 3. Vegetables. 4. Beans and sea vegetables. 5. Soups. 6. Sauces. 7. Salads and pickles. 8. Special dishes. 9. Miso and soy sauce dishes. 10. Breads and snacks. 11. Desserts. 12. Beverages. Seasonings. Cutting styles. Glossary.

"Soon after George Ohsawa came to the United States as a missionary of macrobiotics in 1959, he published *Zen Macrobiotics* in 1960. This book in its original form included recipes for macrobiotic cooking. Although the number of macrobiotic students increased rapidly because of his interesting lectures and charisma, the much needed editing of the recipes for clearer instructions and measurements was not realized until later.

"In 1961, on Ohsawa's advice, thirteen macrobiotic families, numbering thirty-six [sic, 34] people, left New York City and moved to a small town in Northern California named Chico. The following year, all the adult members of the group started the first macrobiotic food distributing company, Chico-San, Inc.

"Since nobody on the West Coast had heard of macrobiotic foods, one of the first jobs for the Chico-San founders was educating people in the macrobiotic philosophy, diet and cooking. A committee for the teaching of macrobiotic cooking was formed by the women of the group who began by separating the cooking section from *Zen Macrobiotics* and gathering recipes among themselves. Thus, Chico-San, under the name of the Ohsawa Foundation of Chico, published the first macrobiotic cookbook, *Zen Cookery,* in 1964.

"The book sold very well for eleven years. It was out of print from 1975 until 1984, when the George Ohsawa Macrobiotic Foundation published the book under its new title, *The First Macrobiotic Cookbook.* The 1985 edition has been completely revised and corrected; however, the original outline and numbering system have been retained."

The photos have these captions: "(1) Bill Salant, Al Bauman [both standing by a car], and Herman Aihara (not in picture) stop for refreshment on their exploration of the Sacramento Valley area prior to the cross country move. (2) On the road, Cornellia Aihara preparing breakfast for 36 hungry people at a scenic spot near Lincoln, Nebraska, on the way to California. (3) CBS News is on hand to greet the travelers upon their arrival in Chico. Later a 'Welcome to Chico' dinner was sponsored by the town. (4) Joanne Hirsch (left) with Teal Nichols (center), editor of the first edition of *Zen Cookery* [both are seated at a formal dining table with several other people]. (5) Shayne Oles, editor of *The New Zen Cookery,* with husband Lou (left) and Junsei Yamazaki.

"(6) Jacques deLangre, Tommy Nakayama, Lou Oles, and Bob Kennedy relaxing in front of Herman and Cornellia Aihara's home [in Chico]. (7) Herman Aihara rings up a sale at the first 'Chico-San'–the tailgate of his car. (8) Irv Hirsh getting a workout on the first rice cake machine (modified) in the United States. (9) Construction underway on a koji room at the Chico-San facility in Chico. (10) Bob Kennedy (right), president of Chico-San at its sale in 1985, standing in front of a new shipment of organic rice. (11) Meal time at the premier Chico picnic; still held annually at Hooker Oak Park. (12) Herman and Cornellia Aihara, hosting the 1964 New Year's Day celebration." Address: George Ohsawa Macrobiotic Foundation, 1511 Robinson St., Oroville, California 95965.

8460. Toyo Shinpo. 1985. Tôyô Shinpô shikizai nenkan [Toyo Shinpo yearbook of materials and equipment (for tofu)]. Kyoto: Toyo Shinpo K.K. 358 p. [Jap]

8461. Unschuld, Paul U. 1985. Medicine in China. A history of ideas. Berkeley, California: University of California Press. 423 p. [208* ref]
• ***Summary:*** The book contains 60 Chinese primary references, 31 Chinese and Japanese secondary references, and 117 Western secondary references. Address: Prof., Inst. of History of Medicine, Univ. of Munich, West Germany.

8462. Wood, Brian J.B. ed. 1985. Microbiology of fermented foods. 2 vols. Essex, England: Elsevier Science Publishers Ltd. Vol. 1, 371 p. Vol. 2, 304 p. [300+ ref]
• ***Summary:*** Soybeans are discussed extensively. In Vol. 1, in chapter 5, titled "Fermented protein foods in the Orient, with emphasis on shoyu and miso in Japan," by Yokotsuka and Sasaki (p. 197-247) are detailed and historical discussions of chu (koji), chiang, and shi (fermented black soybeans), chiang-yu (soy sauce), miso, shoyu, etc. Address: Dep. of Bioscience and Biotechnology, Univ. of Strathclyde, Glasgow, Scotland, UK.

8463. Yamano, Yoshimasa. 1985. Emulsifying properties of soya phospholipid. In: F. Paltauf and D. Lekim, eds. 1985. Lecithin and Health Care: Proceedings of the Third International Symposium on Soya Lecithin. 285 p. See p. 67-97. [30 ref]
Address: Dep. of Food Science, Kagawa Univ., Ikenobe, Miki-cho, Kagawa 761-07, Japan.

8464. Yokotsuka, Tamotsu. 1985. Fermented protein foods in the Orient, with emphasis on shoyu and miso in Japan. In: B.J.B. Wood, ed. 1985. Microbiology of Fermented Foods. Vol. 1. Essex, England: Elsevier Science Publishing Co. xx + 371 + 14 p. See p. 197-247. [146 ref]
• ***Summary:*** This book chapter is very similar to Yokotsuka (1982), "Industrial application of proteinous fermented foods." However it contains some new, additional, and very interesting information, especially concerning history, on pages 198-209 as follows: Introductory definitions of

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enzymatic hydrolysis, *Aspergillus* molds, miso (whose per capita consumption in Japan is about half that of shoyu by weight), saké, mirin, amasaké. Table 1 shows "Per capita annual consumption of fermented foods prepared from *Aspergillus* moulds in Japan (1981)." Shoyu 10.1 litres. Miso 4.9 kg, sake 12.3 litres, mirin 0.6 litres, shochu 2.2 litres, rice vinegar 0.25 litres, (vinegar) 2.5 litres. Note: Beer 39.5 litres. Whiskey and other foreign alcoholic beverages 3.7 litres. Japanese population 117.85 million on 1 Oct. 1981.

Introduction (p. 197): There is a basic difference between the saccharification process used in Western countries and that of East Asia. In the West, the amylolytic enzymes that break down / hydrolyze starches into sugars are derived from malt, whereas in East Asia *Aspergillus* and *Rhizopus* molds have long been used as the source of these enzymes.

History: History of fermented proteinous foods in China: Chu (koji), chiang, shi or tou-shi [fermented black soybeans], chiang-yu (soysauce), shi-tche (the extracted juice of fermented black soybeans). History of shoyu and miso in Japan: Hishio, sho, soya or soy, miso or misho, tamari, miso-damari, tare-miso and usudare, shoyu, miso of today.

Shu [Qu; koji] was first mentioned in the *Shu-Ching* [pinyin: *Shujing*] written 3,000 years ago during the Chou [Zhou] dynasty (1121-256 BC), which stated that chu is essential for making alcoholic beverages. Two different colors of chu were described: yellow and white. "The most popular one, which had a yellow colour indicating perhaps *Aspergillus oryzae,* was called yellow robe. The white one is presumed to be *Rhizopus* or *Mucor* and was called white robe." Originally, chu was made in granular form and called *san-chu.* But by about AD 947-79 chu was developed in cake form called *ping-chu.*

Page 205: The difference between tamari, miso-damari, tare-miso, and usudare was not always clear, however in early documents they generally refer to the liquid obtained during the fermentation of miso or *sho* [*hishio*]. "Literally, Tamari or Miso-damari, or Tare-miso" means the liquid separated from the top of miso. "or drained off from the bottom of the kegs in which the miso or sho was stored, or filtered into a bamboo cage which is put into miso or sho. But according to such books as the *Honcho-bunsho* (AD 1487), *Shijoryu-hochosho* (AD 1489) and others (AD 1504, 1537), Taremiso or Usudare seems to have been the name for the liquid drained off or press-filtered from the boiled mixture of miso or *sho* [*hishio*] and salt water." But the word *shoyu* (written with the same characters as *chiang-yu* [*jiangyou*] in Chinese) did not appear in any of these books.

Shoyu: The word "shoyu," written with the same Chinese characters with which it is written today [these characters are pronounced chiang-yu / jiangyou, and mean "soy sauce"] in Chinese, first appeared in the *Ekirinbon Setsuyoshu* (AD 1598). The word shoyu literally meant the liquid obtained from *sho / hishio.* However, to confuse matters, the liquid obtained from miso or tamari (soybean koji fermented in salt water) was also called "shoyu" in these early days. Moreover, in the book *Yoshu-fushi* (AD 1686) shoyu was defined as *shi-ju* (*shi-tche* in Chinese), the liquid obtained from salted, fermented black soybeans. In yet another book, shoyu was defined as wheat sho. All these descriptions suggest that the word "shoyu" had a broad meaning in the beginning, and only later acquired the more specific meaning it has today–the liquid obtained from the mash [moromi] in which a moulded mixture of soybeans and wheat or barley was fermented in water in the presence of salt water with a high salt concentration. This gradually became clearly differentiated from tamari or a shi-tche like product made almost entirely from soybeans [plus salt and water].

During Japan's Edo period (1603-1867), great progress was made in the technology of making shoyu, and the scale of its production was enlarged. Many books from this period describe the manufacture of shoyu: *Ryori monogatari yorozu kikigaku* (1643), *Yoshufushi* (1686), *Honcho shokukan* (1692), *Wakan sansaizue* (1715), *Mankin sangyo bukuri* (1731), *Zoshu seiho* (1716), *Sake shoyu denjuki* (1785), and *Koeki Kokusanko* (1844).

The following is a summary of what these books say about how typical Japanese shoyu (*koikuchi shoyu*) was made at that time–about 300 years ago. As basic raw materials use 1 part soybeans and one part wheat kernels or dehulled barley. Gradually it was recognized that wheat gave better quality shoyu than barley. Soak the soybeans, then boil them. Roast the wheat kernels or barley, then crack into pieces. Mix the two main ingredients well, then place them between straw mats or in wooden trays where they will be naturally inoculated and, after 2-3 days, cultured with molds. The mold cultured materials were called *koji,* a word written with the same character as its Chinese counterpart, *chu / qu.* Judge the quality of the finished koji by its color: white, yellow or brown are good, while blue or black are bad. This suggests that *Aspergillus oryzae* or *Aspergillus sojae* were already recognized as the best molds for making shoyu. Set aside a small portion of good koji to use as a starter culture for making the next batch of koji.

To make the moromi mash: Mix the koji made from a mixture of 1 part whole dry soybeans and 1 part wheat kernels with 2.2 parts of water and 1.1 parts of salt. Store this mash for about 70 days in summer or 100 days in winter. Summer was thought to be the best season for making koji and moromi. Amazake was sometimes added to the shoyu mash to add natural sweetness to the salty taste.

The total population of Japan at that time was about 30 million; of these about 1.2 million lived in Edo (today's Tokyo) and these Edo dwellers consumed much more shoyu per person per year than is the case today. One typical wooden keg of shoyu at that time contained 14.4 liters [3.80 gallons or 15.22 quarts] which was said to be enough to

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last one person one year (*Chohoroku* 1856, from *Shoyu-monogatari,* p. 5, written by N. Matsumoto, published by Kikkoman Shoyu Co. Ltd., 1976).

The two main centers of shoyu production in Japan were in Noda city and Choshi city, both of which were not far from Edo / Tokyo. Shoyu manufacture began in Noda and Choshi in 1561 and 1616, respectively. About 1.6 million kegs of shoyu were consumed in Edo, of which 1.5 million kegs were transported from the above two cities and the 0.1 million from places in Japan southwest of Tokyo, mainly Kishu [Wakayama prefecture], Tatsuno [a city in Hyogo prefecture, where light-colored shoyu {usukuchi shoyu} was invented in 1666], and Shodo-shima [an island in Kagawa prefecture in the Inland Sea of Japan]. Address: Kikkoman Corp., Noda-shi, Chiba-ken, Japan.

8465. *Toyo Shinpo* (*Soyfoods News*). 1986. Herushii Shiroyama. Saeki kôjô ga shunkô. Mukashi-fû no tezukuri o ikasu honkaku kôjô tanjô [Healthy Shiroyama. Modern tofu plant in Hiroshima makes traditional tofu, also has tofu restaurant]. Jan. 1. p. 16. [Jap; eng+]
• ***Summary:*** A new combination of the new and old. Contact: Takeo Shiroyama, president. Healthy Shiroyama, Saeki-gun, Hiroshima-ken, Japan.

8466. *Toyo Shinpo* (*Soyfoods News*). 1986. Shizen daizu ni kodawatte, anzen na tôfu-zukuri [Using only organic soybeans to make safe tofu in Yokohama]. Jan. 1. p. 50. [Jap; eng+]
• ***Summary:*** Contact: Yuji TAKADA, owner, Yokohama Mamehiko, Kohoku-ku, Yokohama, Kanagawa-ken, Japan.

8467. *Toyo Shinpo* (*Soyfoods News*). 1986. Yo ni tou. Tôfu Kenshû Gijutsu Sentaa. KK Nagasawa Kikai Seisakusho. Seizô nou hau o kôkai [Nagasawa Equipment Company's Tofu Technology Study Center, open to the public]. Jan. 1. p. 24. [Jap; eng+]
• ***Summary:*** This company risked its future to make this Center and school happen. Even foreigners have graduated and started making tofu in their own countries. Address: K.K. Nihon Shokuhin Seisan Gijutsu Kemkyusho, Aoki 3-15-1, Kawaguchi-shi, Saitama-ken. Phone: 0482-55-6778.

8468. Cook, Anne. 1986. Soybean farms look East for big profits from shrimp. *News-Gazette* (*Champaign, Illinois*). Jan. 11.
• ***Summary:*** Karl Sera, a native of Japan, has managed the American Soybean Association's Tokyo office for 15 years. Japan now imports about 174 million bushels of soybeans, 88% of them from the USA. Ten million cakes of tofu are sold each day in Japan. Sera believes the biggest growth area for soybean use in Japan is in feeding livestock. Japanese poultry and dairy cows are not presently getting the optimum amount of protein; the poultry need the protein from 20 million more bushels of soybeans and the dairy cows from 11 million more bushels. Though fish presently accounts for less than 1% of the feed industry, Sera thinks it has huge potential–especially in feeding shrimp. Dan Akiyama, a native of Hawaii and recent Texas A&M graduate, will soon leave for Singapore to tell industry representatives about a better, faster way to grow shrimp. Akiyama said the high cost of shrimp is linked to 4 main factors: low survival rates in the wild (less than 1%), increasing demand, decreasing supplies, and the expensive diet shrimp farmers now feed their 'livestock.' The current feed now costs $1,000 to $4,000 per ton; with more soy it will cost $400 to $600 a ton. It takes about 100 days for a crop of shrimp to mature for market. Akiyama stresses that raising shrimp is just like any other livestock business, but its under water.

In Asia and South America, where shrimp farming is growing the most rapidly, producers use about 7,500 tonnes/ year of soybean meal for shrimp feed. Akiyama believes that when industry leaders see the advantages of feeding more soy, that market is likely to expand to 375,000 tonnes.

In Japan, it takes longer for new agricultural ideas to be put into practice because they do not have an agricultural extension system as we do in the USA. Address: Staff writer.

8469. Sarda, Patricia T. 1986. Ancient Japanese foodstuff is key to company's new line of products. *Leader Newsmagazine* (*Raleigh, North Carolina*). Jan. 16-23. p. 14-15.
• ***Summary:*** Miso, a product that has little or no recognition in the Triangle area, is the key to the success of American Natural Foods in Chapel Hill. John Troy is president of the fledgling company, Carol Rego is a major shareholder, and Larry Sarling is operations manager. The company's miso based line of natural condiments are now available in over 3,000 specialty food stores and supermarkets across America.

Troy started his company (named Linden's Elfworks) 8 years ago out of his home in the Triangle. He began by marketing a nutritious candy bar. A few years later the company moved to its present quarters at Suite 21, The Courtyard, in Chapel Hill and began developing Wizard Baldour's Hot Stuff. The company now has four products: Miso Mustard, Wizard Baldour's Hot Stuff, The Works, and Smoky Mountain Miso Sauce. Two more are under development: Sea Sauce (a condiment for seafood) and Spark! (a spicy powder condiment). The Miso Mustard is produced in Emeryville, California; the other three are made in Winston-Salem at Mrs. Campbell's Canning company. A photo shows John Troy at his desk talking on the telephone. On the wall behind him is a framed painting of a wizard; on his desk is a bottle of The Works.

8470. Tsuchiya, Kanji. 1986. Re: Address of the soymilk association in Japan. Change in his personal address. Letter to William Shurtleff at Soyfoods Center, Jan. 20. 1 p. Typed,

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with signature.
• ***Summary:*** "The Soymilk Association exists and its address has not changed for several years. When I checked the address in your letter with the one I have, there is one thing missing: the name of the building is Ogura Bldg. Following is the address.

"Mr. Okayama Tadashi Managing director

"Nihon Tonyu Kyokai

"Ogura Bldg. 2F 11-8 2-chome, Shinbashi Minato-ku, Tokyo

"Incidentally my address has changed since last February; would you change your record as follows:

"Kanji Tsuchiya

"1-1 3-chome Kamiogi

"Suginami-ku, Tokyo

"Please note that I can not receive any letter addressed to my old house from this February, as our post office stops transferring service one year after we moved." Address: Kamiogi 3-1-1, Suginami-ku, Tokyo, Japan.

8471. *Asahi Shinbun* (*Asahi Daily News, Tokyo*). 1986. Tônyû to daizu tanpaku aisukuriimu [Soymilk and soy protein ice cream. Tofutti now sold in Dipper Dan Shop in Tokyo]. Jan. 23. [Jap]
• ***Summary:*** Daie (Captain Cook) and Tofu Time have joined forces to sell Tofutti in Japan. 1 pint costs 800 yen. Soft serve is 180 yen. There are three flavors including vanilla, chocolate. Address: Tokyo, Japan.

8472. *Los Angeles Times.* 1986. Tofu can be added to recipes as a low-calorie protein source. Jan. 30. p. J35.
• ***Summary:*** "According to Hinoichi, one of the leading tofu brands in Southern California, tofu is cost effective, low in calories and has no cholesterol."

Three varieties of Hinoichi tofu are available: "soft (Kinugoshi), a custard-like tofu most often pureed into dips and sauces; regular (Japanese), a medium-firm tofu ideal for casseroles, soups and salads, and firm (Chinese), a tofu used for crumbling, stir frying and deep frying."

For free tofu recipes, send self-addressed stamped envelope to Hinoichi Tofu, Department NP, 526 Stanford Ave., Los Angeles, California 90013.

A photo shows tofu lasagne. Address: Los Angeles.

8473. Nagahara, A.; Ohshita, K.; Nasuno, S. 1986. Relation of nitrite concentration to mutagen formation in soy sauce. *Food and Chemical Toxicology* 24(1):13-15. Jan. [14 ref]
Address: Bioscience Research Lab., Kikkoman Corp., 399 Noda, Noda-shi, Chiba-ken 278, Japan.

8474. *Packaging.* 1986. American-style tofu pack [from Kikkoman]. Jan. p. 12.
Address: Des Moines, Illinois.

8475. *Toyo Shinpo* (*Soyfoods News*). 1986. Tokyo Eki chikagai ni Tôfutti kaiten. Tôfu aisu senmon [Tofutti shop opens in Tokyo Station basement shopping center. Specializing in tofu ice cream]. Feb. 21. p. 1. [Jap; eng+]
• ***Summary:*** The first shop of its type in Japan, it is linked to the Daiei Group's Captain Cook.

8476. *Toyo Shinpo* (*Soyfoods News*). 1986. Ryôri no barieeshon: Natta o tsukutta hozonshoku roku-shu [Cooking variations: Six people offer recipes for using natto]. Feb. 21. p. 9. [Jap]
• ***Summary:*** The recipes are: (1) *Soboro nattô.* (2) *Nattô no hachimitsu-zuke.* (3) *Sakaru-zuke.* (4) *Tôzô.* (5) *Nattô-sake.* (6) *Hoshi-natto.* Address: Japan.

8477. Lippert/Whitehead Inc. 1986. First Tofutti shop opens in Japan on January 30 (News release). 136 East 57th St., New York, NY 10022. 1 p. Feb. 25.
• ***Summary:*** The shop was opened in Tokyo by Daiei Company, Inc., Japan's largest retailer, to an overwhelming reception. Address: New York.

8478. *Australian Dairy Foods.* 1986. Soymilk sales decline in Japan. Feb. p. 85.
Address: Australia.

8479. Daiei Company, Inc. and Tofu Time Inc. 1986. Tofutei [Tofutti Flavor List (Menu from Tofutti Shop in Tokyo)]. Shuwa Shiba Park Building, 10th Floor, Shiba Koen 2-4-1, Minato-ku, Tokyo 105, Japan. 1 p. Front and back. Each panel: 21 x 9 cm. [Jap; Eng]
• ***Summary:*** See next page. Printed with black ink on brown paper, this leaflet lists 19 menu items in both Japanese and English. Most are Tofutti flavors.

A separate table sign in Japanese (single sided, 11 x 8 cm) starts with the slogan, "Try New York taste, please." Address: Tokyo, Japan.

8480. *Eiyo to Ryori* (*Nutrition and Food, Tokyo*). 1986. Daizu, daizu seihin: Mijika na tanpakushitsu-gen [Soybeans and soyfoods: A protein source which is close at hand]. Feb. p. 22-34. [Jap]
• ***Summary:*** A collection of recipes, each accompanied by a color photo, using tofu, deep-fried tofu pouches, tofu cutlets, dried-frozen tofu, boiled soybeans, tofu burgers (ganmodoki), okara, and yuba. Address: Japan.

8481. Kaneko, Kayoko; Nishida, K.; Yatsuda, J.; Koike, G. 1986. Effect of methionine supplementation of a soy protein isolate on short-term nitrogen balance in young women. *J. of Nutritional Science and Vitaminology* (*Tokyo*) 32(1):123-30. Feb. [31 ref. Eng]
Address: Kagawa Nutrition College Sakado, Saitama 350-02, Japan.

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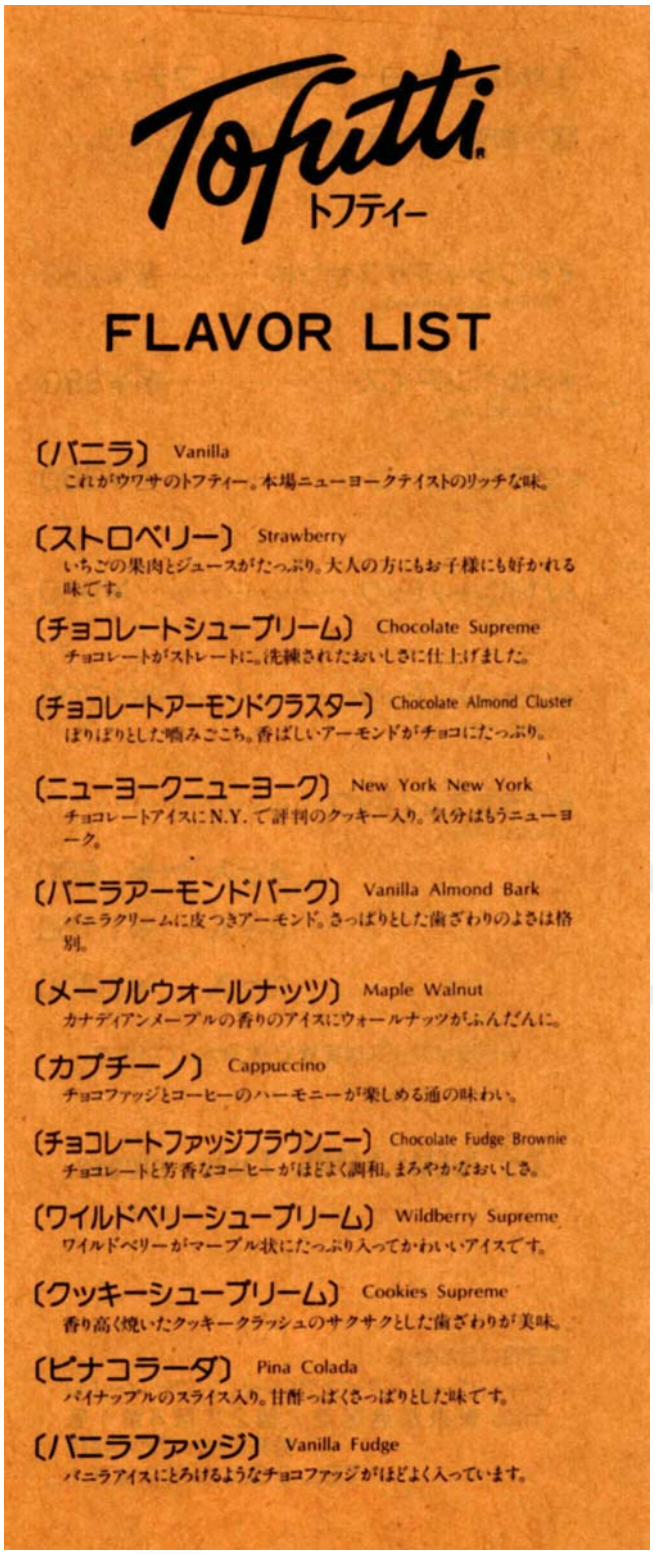

8482. Tsuji, K.; Tsuji, E. 1986. [Effect of natto-feeding on cholesterol level of rats]. *Eiyogaku Zasshi* (*Japanese J. of Nutrition*) 44(1):41-44. Feb. [16 ref. Jap; eng]*

8483. *Watashi no Kenko* (*My Health*). 1986. Neba neba shinai Java nattô, tempeh wa: Shibô no sanka o fusegu seijin-byô yubô saku [Non-sticky natto from Java: Tempeh is a food to prevent geriatric diseases]. Feb. p. 102-04. [Jap]
• ***Summary:*** A general introduction to tempeh. Address: Japan.

8484. Roller, Ron. 1986. New developments with Edensoy, and sales figures (Interview). *SoyaScan Notes.* March 1. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Eden Foods has a joint venture with Marusan (Japan), building a soymilk plant in Saline, Michigan. Some Marusan technicians are now working with them in Saline, building the plant. Its about half done and should be on stream by June or July 1986. They plan a big plant opening. The new Edensoy will be packed in Tetra Pak, which has a lower packaging cost.

In the last 2 months sales of Edensoy have been 40,000 cases of 30 packs per case. This is 600,000 packs/month. Each pack is 6.0 U.S. fluid ounces or 0.1875 quarts. So this is 28,125 gallons/month, or 337,500 gallons/year. Note: This is the first news of this exciting new venture. Edensoy soon became America's leading brand of soymilk and a very famous and profitable soy product. Address: Vice president, Eden Foods Inc., 701 Tecumseh Rd., Clinton, Michigan 49236. Phone: 800-248-0301 or 517-456-7424.

8485. Noble Soya House Limited. 1986. Classified ad: General Sales manager (Bombay). Product manager (Bombay). *Times of India* (*The*) (*Bombay*). March 10. p. 18.
• ***Summary:*** "Noble Soya House is a recently-formed company financially backed by the Godrej and Bhiwandiwalla Groups. The company will produce a wide range of food and health products based on the latest technology in processing and packaging. The company has a technical collaboration with Kibun of Japan, who are leaders in this field. The project will go on stream towards the end of the year.

"The company is presently looking for candidates in two senior positions." For each, "The job" and "The candidate" are described. Address: Box R-431–S, Times of India, Bombay–400 001.

8486. *Toyo Shinpo* (*Soyfoods News*). 1986. Okara kansô ni doramu doraiyaa kôhyô [Drum dryer for drying okara has good reputation]. March 11. p. 7. [Jap; eng+]
• ***Summary:*** A photo shows the okara drum dryer. Address: Johnson Boiler K.K., Noda 915, Kumatori-cho, Sennan-gun, Osaka. Phone: 07245-2-1801.

8487. *Toyo Shinpo* (*Soyfoods News*). 1986. Baio ga tônyû-shu kesu. Ibaraki-ken Kôgyô Gijutsu Sentaa [Biotechnology and fermentation eliminate beany flavor from soymilk. Ibaraki Prefecture Industrial Technology Center]. March 11.

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p. 14. [Jap; eng+]
• ***Summary:*** To soymilk is added glucose/dextrose and 10,000 living organisms of *Saccharomyces cerevisiae* per ml. The milk separates into curds and whey; the curds have no beany flavor, but rather a subtle alcoholic flavor. Details of the study are presented in the journal *Nihon Kogyo Gakkai-shi.*

8488. *Toyo Shinpo* (*Soyfoods News*). 1986. Kubota Kôgyô. Shiboriki no esu, Shiboraa. Botan osu dake no jido tôfu seizô sôchi [Automated tofu system from Kubota Kogyo in Osaka, Japan]. March 11. p. 7. [Jap; eng+]

8489. *Toyo Shinpo* (*Soyfoods News*). 1986. Tôfu wa 90 chô chikaku kônyû. Zenkoku issetai atari nenkanryô 22 nenkan de hobo kawarazu [Nationwide per household consumption of tofu in Japan is about 90 cakes (300 gm each). It hasn't changed much since 1964]. March 11. p. 1. [Jap; eng+]
• ***Summary:*** The high since 1964 was 93.5 cakes (in 1967) and the low was 83.3 cakes in 1974.

8490. Alpine, Lisa. 1986. Tofu business is down to earth. *Fax* (*The*) (*Fairfax, California*). March 18-31. p. 9.
• ***Summary:*** This is an interview with Paul Orbuch and Bill Bramblett, who run Wildwood Natural Foods. Paul and Bill are described as "super business people" who love Fairfax–which is why they have kept their business there, even though it has recently expanded and lower rents can be found in the industrial section of San Rafael. Wildwood, which put Fairfax on the map as the "Tofu capital of the world," has its roots in Fairfax. "Around 1978, the Good Earth health food store on Bolinas Rd. wanted to start selling their own sandwiches. So Paul Duchesne of Fairfax began making them in the Sleeping Lady Cafe kitchen. He created the brown rice and tofu sandwich which was his best seller and is still tops on the Wildwood orders today. As an offshoot to that success, Paul D. expanded his orders to include the other health food stores in the area.

"Bill Bramblett was the breakfast cook at the Lady and sampled many of Paul's sandwiches. He suggested that they join forces and start aggressively selling them in other parts of the Bay Area. Bill wasn't fooling around. He invested money and rented the space at 135 Bolinas Rd. with the idea of also manufacturing Tofu.

"Meanwhile Paul D. went to Boston [Massachusetts] to study macrobiotics with Michio Kushi, and Chris Smith took over his sandwich delivery business. Chris came up with the name Wildwood and Bill looked in the dictionary to see if it fit. Wildwood: 'a wood lane in its natural state.' Everyone decided it worked.

"Chris then went off to Boston to study and Paul D. returned to operate the sandwich making and get the Tofu production off the ground with Bill.

"After reading 'The Book of Tofu,' Bill and Paul D. realized it was no minor venture and in order to buy the equipment they would need more capital. Paul Orbuch and Frank Rosenmayr joined as investors and plans were drawn up to change the building to fit their needs. There was a lot of opposition from the town planning commission and private areas that held things up for four months. The permit complications and the necessary approval of the town planning commission pushed Bill to an impassioned plea in front of the town council that 'making sandwiches is a quiet business and bread is soft and acoustic.'

"During the first six months they lost money and the partners started taking an even more active interest in the business. Paul Duchesne stepped back and Bill took over the books and got a computer. Paul O. focused on production, distribution, product development and the graphics while Frank remodeled the facilities and put his management skills to work. Slowly, through organization, they formed a solid foundation for their business.

"The delivery routes grew and other fresh food companies started using Wildwood for their distribution. Today, outside distribution accounts for a healthy percentage of their business. They deliver to over 200 wholesale customers, three to six times a week. Wildwood has grown tremendously in the seven years since its conception and now includes two manufacturing locations for their wholesale business and a retail deli, all located in Fairfax."

"Why did they expand from a wholesale business to a retail Deli? 'The Deli is the lab where we can find out what is going to be popular in health food,' explained Bill."

"'The Deli gives us a chance to create new products and a way to serve them in other locations,' added Paul."

8491. *Toyo Shinpo* (*Soyfoods News*). 1986. Tenpe no hansoku ni hongoshi. Zenkoku Nattô Rengôkai Tenpe Fukyûkai tairyô na panfu o sakusei [They're putting real effort into promoting tempeh. The Japan Natto Assoc. Tempeh Popularization Group has published many pamphlets]. March 21. p. 10. [Jap; eng+]
• ***Summary:*** Pamphlet title is "This is the health food of the 21st century." Goro Kanasugi is head of the Tempeh Popularization Group. Address: Kyoto, Japan.

8492. *Toyo Shinpo* (*Soyfoods News*). 1986. Tenpe no jidai. Daizu hakkô shokuhin "tenpe" ni tsuite. Jiaru-san e no teikôsei tsuyoshi [The age of tempeh. About this fermented soyfood. It has a strong resistance to thiosulphuric? acid]. March 21. p. 10. [1 ref. Jap; eng+]

8493. Noble Soya House Limited. 1986. Display ad: Soya. In Hong Kong, soya drinks outsell Coca-Cola. *Times of India* (*The*) (*Bombay*). March 23. p. 15.
• ***Summary:*** One of the most interesting, creative, well researched and well designed ads for soya foods ever seen in India. A full page ad interspersed with illustrations and logos.

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The text continues: "In the USA, they put soya into burgers. In the UK, soya foods earn millions every year.

"In Sri Lanka, soya flour has been added to bakery flour. And all over Europe, soya yogurt is already a rage.

"Enter Noble Soya House. A company that is getting into the exciting world of soya foods and beverages. With an investment of Rs. 11.8 crores [118 million rupees]. A company that is managed by some of the most experienced people in the foods industry. And is financially supported by two of the larger business houses in the country. Godrej. And Bhiwandiwalla, of Great Eastern Shipping fame. Both will participate in the equity and have Board representation.

"The other names: Beverage technology for the project is being supplied by Kibun of Japan, acknowledged international leaders in the field.

"Plant and equipment for beverages will be supplied by Alfa-Laval of Sweden, one of the world's largest suppliers of this equipment.

"Equipment and know-how for extruded soya foods will be supplied by Simon Food Engineers of the U.K., a major name in extruded foods.

"Distribution of products will be handled by Godrej Soaps Pvt. Ltd., who reach over 200,000 retail outlets countrywide. And by an established multinational firm that is a major force in specialised healthcare markets.

Engineered food: The technology that Noble House will be using is unlike anything presently available in India... Technology that makes soya possibly the single most versatile food source known to man. A food source that can be engineered into soft drinks, health foods, infant formulations, bakery products, meat analogues, dairy product analogues and more. Much more.

"And what makes all this particularly exciting is the fact that soya is actually a better food source than many of the foods that it is replacing.

"The richest vegetable protein source known: Soya protein is the only known vegetable protein that comes animal protein in quality. But that's not all. he soya bean has an exceptionally high protein content. As high as 40%... And that's why, worldwide, governments and health organizations have backed the development of soya all the way.

"The time has come: Noble Soya House could not have been timed better. Soya bean production in India has just crossed the 1 million tonne mark. By 1990, annual production of the crop is expected to have risen to 2½ million tonnes.

What's more, the processed foods industry of India has finally reached the take-off stage. The growing pace of urbanization, changes in social norms and changes in attitudes towards foods have all combined to create a truly large market for processed foods." "Ad Noble Soya House... looks set to lead the take-off.

"The idea is taking root: Land for the project has already been acquired near Bhopal, the heart of soya country. [Note: The Bhopal gas disaster was on 3 Dec. 1984–only about 15 months earlier]. Civil work has already begun. Plant and equipment have already been ordered, and installation will start by the middle of the year. Products specially formulated by Kibun using Indian raw materials have been tested with consumers in four cities, with a very favourable response.

"Commercial production of the first products will begin before the end of the year... To change forever the face of the processed foods industry." Address: Administrative building: Godrej Soaps Pvt. Ltd., Eastern Express Highway, Vikhroli East, Bombay 400 079.

8494. *Nihon Keizai Shinbun.* 1986. Nattô, Tai ni sato gaeri. Ryûgakuchû no Tai kagakusha keikaku. Seizô puranto no sekkei kanryô [Natto going back to Thailand which is thought to be its native country. Thai scientist who is studying in Japan is planning. Design of natto production plant is completed]. March 28. [Jap]
• ***Summary:*** A photo shows two men at a drafting table, apparently looking at the natto plant design.

8495. American Miso Co. 1986. Hand-crafted organic miso: Made in the USA (Ad). *East West.* March. p. 10.
• ***Summary:*** This one-third page vertical black-and-white ad begins: "Near the Smoky Mountains in the green, rolling country of western North Carolina, the Miso Master continues a centuries-old tradition of hand-crafted miso."

"Containing living cultures, they are truly a living food. Look for Miso Master in the refrigerated section of finer natural foods stores everywhere.

"With its velvety, creamy texture and its superb flavor, Miso Master miso is perfect for soups, dressings, dips, spreads and sauces. For free recipes using Miso Master miso, send a self-addressed, stamped envelope to: Great Eastern Sun, P.O. Box 327, Dept. H, Enka, NC 28728. From our kitchen to yours–traditional Japanese miso, made for you, in the USA."

At the top of the ad is an illustration (line drawing) of a traditional Japanese miso shop, with thatched straw roof and several wooden kegs and barrels outside. Near the bottom of the ad is the Miso Master logo, an illustration showing the head and shoulders of a Japanese miso master, with a knotted headband, in front of a large wooden vat of miso. Below it: "Distributed by Great Eastern Sun, 92 McIntosh Rd., Asheville, North Carolina 28806."

8496. Katoh, Kiyoaki; Ohta, Teruo. 1986. Quality assessment of tempe products–Triglyceride profile of tempe and onchom chips of Indonesia: Notes. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 48. p. 86-90. March. [4 ref. Eng; jap]
• ***Summary:*** "Eight samples of tempe and oncom chips were collected in Java, and the crude fat contents and triglyceride profiles of extracted oil were examined. Tempe chips

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samples included famous souvenir brands of Sri Umbi (No. 1) and Zogor Sari (No. 2) from Bandung, and other three samples purchased in Pasar Bogor (Nos. 6, 7 and 8). Oncom chips tested were Souvenir brands Reno (No. 4) and Gouw (No. 5). Sambel Goreng (No. 3) was a specialty product of mixed fries of tempe and hot chilli." Address: Tsukuba, Japan.

8497. Miyazaki, Shoji; Yagasaki, Kazuhiro; Yasui, Takeshi. 1986. [The rapid determination of starch in soybean seeds with iodine-starch staining]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 48. p. 168-70. March. [9 ref. Jap; eng]
• ***Summary:*** Reprinted from *Proceedings of the Crop Science Society of Japan* (*Nippon Sakumotsu Gakkai Kiji*) 54(2):177-78 (1985). Address: 1-2. National Food Research Inst., Japan; 3. National Food Research Inst., Yatabe, Ibaraki 305, Japan.

8498. Mori, Yutaka; Kiuchi, Kan. 1986. [A method for determination of the basic flavor components of miso]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 48. p. 209-12. March. [12 ref. Jap; eng]
• ***Summary:*** A method for quantitative analysis of the basic flavor compounds contained in miso is proposed. The compounds tested were: pyrazine, 2-methylpyrazine, 2,5-dimethylpyrazine, 2, 6-dimethylpyrazine, trimethylpyrazine, tetramethylpyrazine, N-methylpyrrolidone, benzothiazole, and 2-acetylpyrrole.
Reprinted from *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 80(4):274-77 (1985). Address: National Food Research Inst., 2-1-2 Kannondai, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8499. Mori, Yutaka; Kiuchi, Kan. 1986. [Heterocyclic nitrogen-containing compounds in Hamanatto]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 48. p. 213-15. March. [14 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 80(4):278-80 (1985). Address: National Food Research Inst., 2-1-2 Kannondai, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8500. *Nasoya Newsletter.* 1986. In search of excellence. March. p. 1.
• ***Summary:*** In June 1985 John Paino and Bob Bergwall, the two co-founders of Nasoya, visited Japan to look for tofu making equipment for their new plant. Late that fall, they ordered a system from Sato Shoji Co. of Tokyo. "In February, 7 large trailers arrived with our new equipment, which will be operational by the first week of April, 1986." Four styles of tofu will be exclusively water packed. Address: Leominster, Massachusetts.

8501. Senboku, Toshihiro; Kittipakorn, K.; Kiratiyp-Angul, S.; Srithongchai, W.; Thongmeearkom, P.; Deema, N. 1986. Soybean yellow vein, a new virus disease of soybean. *Tropical Agriculture Research Series* No. 19. p. 101-07. March. [7 ref]
• ***Summary:*** The virus was isolated from soybean plants showing yellow vein symptoms. The plants were grown in central Thailand in 1982. This new soybean virus was designated soybean yellow vein virus (SYVV). Address: 1. Plant Pathologist, Tropical Agricultural Research Center, Ministry of Agriculture, Forestry and Fisheries, Tsukuba Science City, Yatabe, Tsukuba, Ibaraki 305, Japan; 2-6. Plant Virology Group, Div. of Plant Pathology and Microbiology, Dep. of Agriculture, Bangkhen, Bangkok 10900, Thailand.

8502. Suzuki, Hiramitsu; Hayakawa, Seiichi; Tamura, Shinpachiro; Wada, Shun; Wada, Osamu. 1986. [Effect of age {of rats} on the modification of rat plasma lipids by fish and soybean]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 48. p. 221-24. March. [17 ref. Eng; jap]
• ***Summary:*** "Plasma cholesterol and bile acids of aged rats fed on a sardine oils diet decreased to a greater degree than those of young rats. Cholesterol, bile acids and phospholipids of the soybean oil diet group decreased only in aged rats."
Reprinted from *Biochimica et Biophysica Acta* 836:390-93 (1985). Address: 1-3. National Food Research Inst., Japan; 4. Dep. of Food Science and Technology, Tokyo Univ. of Fisheries, Konan, Minato-ku, Tokyo 108.

8503. Taira, Harue; Tanaka, Hiromi; Aoki, Kenichi. 1986. [Quality of soybean seeds grown in Japan. XI. Effect of seeding method, ridging, and side-dressing on chemical composition of the seeds]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 48. p. 28-35. March. [16 ref. Jap; eng]
Address: 1-2. National Food Research Inst., Japan; 3. Fukui Agric. Exp. Station, Ryo-machi, Fukui prefecture.

8504. *Toyo Shinpo* (*Soyfoods News*). 1986. Ima buumu yobu Haiga Tôfu to wa... Taisei Sangyô ga kaihatsu. Eiyô-ka mo amami mo subete baizô. Kongo wa zenkoku tenkai e [What is soy sprout tofu, whose sales are booming? Taisei Sangyo developed it. The nutritional value and sweetness are doubled. They plan to market it nationwide]. April 1. p. 5. [Jap; eng+]
• ***Summary:*** The product, invented by Katsushi Oguchi, President of Taisei Sangyo, of Okayama prefecture, is produced and marketed by three companies now. Taisei makes the sprouting machine. The product is easier to digest than regular tofu.

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8505. *Toyo Shinpo* (*Soyfoods News*). 1986. Iwa Shimizu no aji ga ikiru. Gokayama (Toyama-ken) no tôfu [The taste of firm tofu made with mountain spring water is still alive at Gokayama in Toyama prefecture]. April 1. p. 7. [Jap; eng+]
• ***Summary:*** The tofu from this village, located in an isolated area, is so firm you can carry it by a rice straw rope.

8506. *Toyo Shinpo* (*Soyfoods News*). 1986. In shoppu Kuge ga kaiten. Nichii Fujidera-ten. Fureeku No. 1 tôfu o takaku hyôka. Nakamuta no puranto ga yakudô [New-style tofu shop, using Nakamuta plant, in the Nichii supermarket in Fujidera. It uses Flake No. 1 soy flakes to make tofu, and is selling it freshly fried to customers]. April 1. p. 3. [Jap; eng+]
• ***Summary:*** This new approach is succeeding well.

8507. *Toyo Shinpo* (*Soyfoods News*). 1986. Haigyôsha wa 1800 sha (59 nendo). Shinki san nyûgyôsha 1100 sha mo. Kôseisho chôsa tôfu seizôgyôsha-sû wa 26,032 [In 1984 in Japan 1,797 tofu companies went out of business and 1,067 started business, for a net decrease of 730. Total number of tofu companies is 26,032]. April 1. p. 1. [Jap; eng+]
• ***Summary:*** On average, there was 1 tofu shop for every 4,619 Japanese people. Also, there were 949 natto companies, down 1.86%.

8508. *Toyo Shinpo* (*Soyfoods News*). 1986. Soibiin korokke no hatsubai kaishi. Kannonji Shokuhin. Genryo wa okara. Suritsubushi peesto jô ni [Beginning to sell soybean croquettes. Made by Kannonji Foods in Kannonji city. The raw material is okara, which is ground into a paste form]. April 1. p. 5. [Jap; eng+]
• ***Summary:*** This croquette has a piece of cheese inside, it is frozen and it tastes good. They are applying for a patent. Photos show: (1) Two of the oval patties on a plastic tray. (2) The inventor and maker.

8509. Harrison, Slater. 1986. Re: Work of the Mennonite Central Committee (MCC) with soybeans in Bangladesh. Letter to William Shurtleff at Soyfoods Center, April 3. 1 p. Typed, with signature on MCC letterhead. [1 ref]
• ***Summary:*** George Horlings' book [report] on soybeans in Bangladesh–summarizing his work and that of others on soybean utilization and production–should be published within 2 months.

A Japanese nutritionist, Dr. Yoshimiko Kobayashi (a soyfoods expert), is now helping MCC; she is with a volunteer organization of Japanese doctors.

Bob Burns got 9 large seeded vegetable type soybeans for "edamame." He planted them and got a second generation of quite a few more. Both Bob and Slater make tempeh regularly. Several immigrants from Hong Kong are making tofu in Dhaka. Address: c/o MCC, P.O. Box 5, Maijdi Court, Noakhali, Bangladesh. Phone: 317065 or 316461.

8510. Sturgeon, Bruce. 1986. Great Eastern Sun, soymilk, and St. Peter Creamery (Interview). *SoyaScan Notes*. April 11. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** GES presently imports 3 containers a month of Ah-Soy. There are 3,000 cases/container and 30 packages/case. Each package is 180 ml. So this is 270,000 packages/month or 48,600 liters/month or 12,840 gallons/month or 154,081 gallons/year. Percentage of sales by flavor are vanilla 35%, original 30%, chocolate 18%, carob 17%. Sales have been flat for the last year due to increasing costs due to the poor exchange rate. They will soon make the product in the USA in Tetra Pak, but also continue to import some from Japan.

St. Peter Creamery in Minnesota has bought/licensed the Oberg patent. Their biggest customer is Ice Bean (soy ice cream). They are a dairy company that also makes cheese for Kraft. They have three plants and will soon move to or start a new one in South Dakota. Address: Director of Marketing, Great Eastern Sun, 92 Macintosh Rd., Asheville, North Carolina 28806. Phone: 808-438-4730.

8511. *Toyo Shinpo* (*Soyfoods News*). 1986. Imechen. Tônyû. Yori mairudoni. Kokusan daizu 100%. Dekamame hatsubai [Image change. Milder soymilk. Marusan introduces 1 liter "Dekamame" ("Big Bean") made from 100% Japanese soybeans]. April 11. p. 7. [Jap; eng+]
• ***Summary:*** Grinding the soybeans very finely gives a whiter color.

8512. Noble Soya House Limited. 1986. Display ad: Noble Soya brings together–Godrej, Bhiwandiwalla (Great Eastern Shipping), Kibun of Japan (World's largest producer of soya milk), Alfa Laval of Sweden, Tetra Pak of Switzerland, Simon Foods of U.K... *Times of India* (*The*) (*Bombay*). April 12. p. 10.
• ***Summary:*** Another interesting and creative full page ad from Noble Soya.

"Noble Soya House Limited has been promoted by Dr. A.S. Aiyar, a leading food technologist of international repute.

"Issue opens on 28th April, 1986."

Note: This ad also appeared in the April 16 (p. 12) and April 23 (p. 15) issues of this newspaper. Address: Registered office: E-7/638 Shahpura, Near Campion School, Arera Colony, Bhopal, Madhya Pradesh.

8513. Brodsky, Mark. 1986. Finnsugar Biochemicals and makers of GDL or glucono-delta-lactone (Interview). *SoyaScan Notes*. April 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Four companies make GDL: Finnsugar, Fujisawa in Japan (1,000 to 1,500 tons/year), Pfizer, and

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Roquette in France. In this country, it is all imported from Ireland. ADM uses Finnsugar's GDL. Calcium gluconate will work as a tofu coagulant and add calcium, but it is very expensive. GDL works by hydrolysis. It breaks down into gluconic acid, nothing else. Finnsugar Biochemicals (formerly Fermco Biochemicals) is a subsidiary of the Finnish Sugar Co., Ltd. of Finland. Its GDL is called Glucofin B, sold as white crystals. It also coagulates milk protein. A product specs sheet spells it glucono-delta-lactone, sold in 25 kg bags.

Talk with Louis Hong of Mei Shun Tofu Products Co, in Chicago; he makes tofu using GDL. 1991. Nov. 19. Finnsugar has been sold to Genencor International. Pfizer has been sold to PMP Fermentation, which may be related to DM. Both expect to be out of GDL for the next 3 months. Address: Finnsugar West, 217 W. Alameda Ave., Suite 202, Burbank, California 91502. Phone: 312-640-1112.

8514. *Los Angeles Times.* 1986. New products, convenience foods: Hinoichi offers tofu in three varieties (Advertorial). April 24. p. L23.
• ***Summary:*** In this "Special advertising supplement," this advertorial states: Hinoichi offers three types of tofu, each with a different texture and uses: Soft (kinugoshi), regular (medium-firm Japanese style), and firm (Chinese style).

A recipe for Tofu Mexican vegetable dip is given. A photo shows the dish, ready to eat.

8515. Paterson, Katherine. 1986. The enduring essence of Kyoto: A return visit after nearly 30 years' absence finds the streetcars gone but the city's spirit intact. *New York Times.* April 27. p. XX15.
• ***Summary:*** Kyoto was the only major city in Japan spared Allied bombing. Yet it hasn't changed much since 1957. From Sanzen-in, Katherine and friends walked along a winding road through farmland to Jakkoin nunnery, stopping along the road at a country tea shop "for amazake, a sweet hot sake drink that has the consistency of thin rice gruel."

Kyoto is famous for its tempura, its pickles and its tofu–but the tofu must be tasted when its freshly made.

8516. Belleme, John; Belleme, Jan. 1986. Japanese foods. *Vegetarian Times.* April. p. 40-42, 49, 59.
• ***Summary:*** Adapted with permission from the book *Cooking with Japanese foods: A guide to the traditional natural foods of Japan.* Contains long sections on miso, shoyu, tamari, umeboshi, shiitake, and sea vegetables. Address: Rutherfordton, North Carolina.

8517. Kwon, S.H. 1986. Daizu no hanashi [Talking about soybeans]. *Daizu Geppo* (*Soybean Monthly News*). April. p. 28-32. [11 ref. Jap]
• ***Summary:*** Includes an interesting history of soybean cultivation. Address: Seoul, South Korea.

8518. Maeda, Toshiie. 1986. Miso no furusato [The homeland of miso]. Tokyo: Kokon Shoin. 258 p. April. Illust. 20 cm. [124 ref. Jap]
• ***Summary:*** Contents. 1. The homeland of miso: The birthplace of miso. Cultural factors that gave birth to miso. 2. The paths of dissemination of miso: Southern and northern paths in China. The arrival of miso in Japan and its spread there. History of miso in Japan. 3. The taste and nutritional value of miso: Theories of change in miso. Miso in our lifestyle. 4. Miso as a commercial product: The movement of miso from producer to consumer. The price of miso. Future prospects for miso culture. Present status of changes in miso culture. Explore these new miso products from the principles of changes in miso culture. Proposal for the future of miso culture.

This creative book discusses miso's history, the present status of the Japanese miso industry, the future of miso in the westernized Japanese diet, and the fact that the use of miso mainly in miso soup presents a big problem. The first solution to the problem is to use miso in thick ketchup-like sauces. The second is to return to the non-salted fermented foods such as Japanese natto, Nepalese kinema, Indonesian tempeh, and Chinese fermented black soybeans (shi), which are the ancestors of miso. He emphasizes tempeh, which he feels is a wonderful food that can be used in various ways, and is nutritious and healthy. He explains that tempeh is becoming popular in the USA and Europe, and concludes that tempeh alone can be used to start a food industry. Address: Sozosei Kaihatsu Kenkyusho Shusai.

8519. **Product Name:** [Marusan Tempeh & Shrimp Crackers].
Foreign Name: Marusan Tenpe Ebi Senbei.
Manufacturer's Name: Marusan-Ai Co., Ltd.
Manufacturer's Address: Aza-Arashita, 1 Jungi-cho, Okazaki city, Aichi prefecture 444-21, Japan.
Date of Introduction: 1986 April.
Ingredients: Potato powder, sweet potato powder, tempeh, shrimp, kombu (seaweed), shoyu (soy sauce).
Wt/Vol., Packaging, Price: Poly bag, with window.
How Stored: Shelf stable.
Nutrition: Per 100 gm: Moisture 4.4%, protein 6.5%, fat 0.9%, carbohydrates 83.5%, ash 4.7%, calories 368, calcium 193 mg, iron 2.9 mg.
New Product–Documentation: Label. 1986, undated. 4.5 by 9.5 inches. Red, dark brown, and orange on white. Contains 10 crackers.

8520. **Product Name:** ["Big Bean" (Soymilk)].
Foreign Name: Dekamame.
Manufacturer's Name: Marusan-Ai Co., Ltd.
Manufacturer's Address: 1 Aza Arashita, Niki-cho, Okazaki-shi, Aichi-ken 444-21, Japan.

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Date of Introduction: 1986 April.
Wt/Vol., Packaging, Price: 1 liter Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Shurtleff & Aoyagi. 1986. Soymilk Industry & Market. Update. "Marusan, Japan's second largest soymilk maker, as part of a diversification into health drinks to compensate for decreasing soymilk sales, introduces Dekamame ("big bean"), a soymilk in a liter Tetra Brik carton, made entirely from soybeans grown in Japan." Soya Bluebook. 1987. p. 90.

8521. Medoff, Marc. 1986. A guide to the best tofu "cheesecakes" in New York. *Whole Life.* April. p. 52-61.
• ***Summary:*** "Over the past few years there has literally been a tofu cheesecake revolution going on in New York City's natural foods restaurants, as top local chefs have been working overtime to come up with the perfect tofu cheesecake." Thirteen restaurants now offer them. "In terms of nutritional quality, all are far superior to any real cheesecake, although some are healthier than others. All of the cakes we rated were completely free of animal products. No dairy or eggs at all. None used sugar, white flour or any artificial or highly processed ingredients. The tofu cheesecake rated tops was made by Tokyo-born Keiko Ikeda (a woman; a large photo shows her holding her winner) at *Shojin,* 23 Commerce St. Phone: 989-3530. There wasn't even a close second. Keiko makes five varieties of toppings on one standard tofu cheesecake: strawberry, strawberry grape, strawberry kiwi, blueberry, and raspberry. The pies are baked fresh each day that the restaurant is open and are sold by the slice ($2.75 plain, $3.00 with topping) or by the pie ($17.00, eight slices, orders must be placed one day in advance). Keiko says one key is spending a lot of time squeezing the water out of the tofu before using it. The ingredients are: Tofu (nigari, firm), lemon juice, corn oil, vanilla, maple syrup, sea salt, organic whole wheat flour, organic whole wheat pastry flour, water, cinnamon, fresh fruit.

The second prize went to the two types of tofu cheesecake baked by Ricardo Williams at *Whole Grain* (7 West 19th St. Phone: 206-7518). The plain variety is probably the closest in taste to real cheesecake out of all the ones sampled. Ingredients: Tofu (fresh, firm), lemon juice, vanilla extract, almond extract, agar, maple syrup, toasted almonds, rolled oats, apple juice, blueberry kanten [agar].

Pretty much tied for second was the exceptionally good Tofu Pie made by master chef Alan Hoffman at the downtown *Souen* (pronounced SUE-en; 210 6th Ave. Phone: 807-7421). Ingredients: Tofu (firm, made by The Bridge), maple syrup, rice syrup, tahini, lemon juice, salt, vanilla, whole wheat pastry flour, whole wheat flour, whole fruit, agar, fruit juice. Louis Fellman, now president of Soy Delites (P.O. Box 56, Matawan, New Jersey 07747. Phone: 201-583-8907) developed an early tofu cheesecake at Spruce Tree Bakery. For more than a year Soy Delights "has been producing six varieties of the best commercially available tofu cheesecake we've seen. Fellman's Tofu Cream Pies are sold throughout New York by the slice (about $1.65 for 5 oz.) and by the pie (about $4.50 for 20 oz.) in natural food stores, supermarkets, and many restaurants. Photos show: Fellman with two of his Tofu Cream Pies. Alan Hoffman of Souen with a fresh batch of tofu pies. Margaret Bullard, the tofu cheesecake queen at Country Life. A rare photo shows two men preparing the late great "Tofu Teasecake" at *Angelica Kitchen.*

A half-page sidebar (p. 60) is titled "Tofu Cheesecakes–Gone But Not Forgotten." "The first commercially available (on a large scale) tofu cheesecake sold in the United States was put out by the *Sprucetree Baking Company* of Baltimore, Maryland. Sprucetree began marketing their two varieties of non-dairy tofu cheesecakes (strawberry and blueberry) way back in 1976. The product was sold in stores along the east coast and as far west as West Virginia, and enjoyed a good deal of popularity. Sprucetree founder and current President Howard Grundland recalled that his product was a first, and attracted a faithful following. But in 1983 a number of technical problems arose (including the fact that Sprucetree could not get a dependable supply of kosher tofu) and the company had to suspend its cheesecake production." Grundland says he would like to re-introduce his tofu cheesecake. "Anyone interested in buying into *Sprucetree* or just buying one of their original recipe tofu cheesecakes, can contact: Sprucetree Baking Company, 4200 Mortimer Avenue, Baltimore, Maryland 21215. Phone: (301) 358-8040.

"Another great tofu cheesecake that hasn't been around for a while is the Tofu Teasecake" that use to be a dessert favorite at *Angelica Kitchen* (42 St. Mark's Place. Phone: 228-2909)." Angelica owner Leslie McEachern and her staff stopped making it a couple of years back, feeling that it was too hard to digest and a bad food combination.

"And finally, the recently-gone-out-of-business *Cauldron* [Caldron] had a very good tofu cheesecake with fruit kanten topping..." Address: Editor and Publisher of Whole Life magazine.

8522. **Product Name:** Meridian Shoyu, and Tamari.
Manufacturer's Name: Meridian Foods Ltd. (Importer). Made in Japan.
Manufacturer's Address: Corwen, Clywd, LL21 9RR, Wales, UK. Phone: 0490 3151.
Date of Introduction: 1986 April.
Wt/Vol., Packaging, Price: 500 ml plastic bottles with twist-off lid.
How Stored: Shelf stable.
New Product–Documentation: Simon Bailey. 1988. Natural Choice. Aug. 15. "Soya-Based Products." A photo

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shows the Labels. Each has an illustration on the front panel. The tamari shows Mt. Fuji and the ocean, the teriyaki a soybean plant, and the shoyu some Japanese-style trees. CSP form filled out by Simon Bailey. 1988. Sept. 28. Shoyu & tamari were formerly sold under the Jedwells' brand.

8523. Nagami, Yoichi; Tanaka, Teruo. 1986. Molecular cloning and nucleotide sequence of a DNA fragment from *Bacillus natto* that enhances production of extracellular proteases and levansucrase in *Bacillus subtilis. J. of Bacteriology* 166(1):20-28. April. [60 ref. Eng]
Address: 1. Central Research Laboratories of Mitsubishi Chemical Industries, Kamoshida, Midoriku, Yokohama-shi, Kanagawa 227; 2. Mitsubishi Kasei Inst. of Life Sciences, Minamiooya, Machida-shi, Tokyo 194. Both: Japan.

8524. Shurtleff, William. 1986. Chronology and analysis of the U.S. tofu standards: One viewpoint. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 15 p. April. Unpublished manuscript. [1 ref]
• ***Summary:*** Chronology of key early dates: 1979 Feb. 9– Judith Rubenstein, acting as Institutional Consultant for the New England Soy Dairy, initiates a correspondence with Carol Tucker Foreman, Director of Child Nutrition Programs, USDA, on the subjects of tofu standards and acceptance of tofu in USDA Child Nutrition Programs, including the School Lunch Program. Four letters are exchanged between February and August 1979.

1979 June 29–FDA headquarters personnel draft an internal memorandum in which the agency's views on tofu and its attributes are set forth. Publication of a "pull date" on tofu packages is encouraged.

1979 July 23–Judith Rubenstein (see above) writes the Commissioner of the U.S. Food and Drug Administration (FDA) requesting that the FDA establish a standard of identity for tofu. She notes that Audrey Maretzski, Director of Nutrition and Technical Services for USDA, suggested that FDA give top priority to this issue. Issues of imitation tofu products and bacterial contamination are raised.

1979 July 25–In *Tofu and Soymilk Production,* Shurtleff and Aoyagi, directors of The Soyfoods Center, attempt to define the basic types of tofu and their composition.

1981 Jan. 20–Ronald Reagan is inaugurated as president of the United States. The regulatory climate in Washington, DC, begins to shift toward less federal regulation, and more encouragement for industries to regulate themselves.

1981 April–The USDA decides to establish tofu standards and to publish them in *Federal Register,* but this plan is dropped in September, amid controversy over changes in the school lunch program.

1982 July 19–In *Soyfoods Industry and Market: Directory and Databook,* Shurtleff and Aoyagi include a 5-page section titled "Soyfoods Terminology and Standards," which contains detailed information on tofu.

1983 March 14–The Connecticut Agricultural Experiment Station, in Bulletin No. 810, titled "Quality of Tofu and Other Soy Products," reports high bacterial and coliform counts. A virtual expose revealing the tofu industry's poor quality control and concomitant vulnerability, the report gets widespread media coverage and hurts sales of New England and New York tofu companies.

1983 July 25–Tom Timmins, president of Tomsun Foods Inc., having seen the need for tofu standards in the aftermath of the Connecticut report and as a prerequisite for acceptance of tofu in school lunch programs, speaks to the Soyfoods Association of America's board of directors at Denver, Colorado, about problems with sour and often undated tofu in America. The board asks Timmins to be head of a Soyfoods Association Standards Committee, and to appoint people to work with him in the development of standards.

1983 October 12–Timmins sends a 4-page survey letter concerning soyfoods standards to the 18-person Soyfoods Association Standards Committee that he has appointed.

1983 November–Various members of the Soyfoods Association discover that David Mintz, CEO of Tofu Time, Inc. and maker of Tofutti brand soy ice cream, is using *no tofu* in his product, although he has repeatedly appeared on national TV and radio programs displaying and talking at length about tofu, thus implying that his product uses it as a major ingredient. On Nov. 11 Shurtleff writes Mintz and strongly-worded letter threatening to report the matter to the FDA and the Securities and Exchange Commission (Mintz is about to launch his first public stock offering) if Mintz fails to stop such deceptive practices. Mintz's attorneys quickly notify Shurtleff that Mintz promises to put tofu back into Tofutti. Shurtleff, seeing the need for tofu standards to stop this sort of consumer deception, becomes active in the standards development.

1984 March 2–Based on responses to his October 1983 survey, Timmins drafts preliminary 3-page tofu standards (2 pages of which are microbiological standards), that he circulates to the Soyfoods Standards Committee, inviting comments. March 6, William Shurtleff expands these, keys them into The Soyfoods Center word processor, and returns them promptly to Timmins.

1984 Feb.–Timmins and Shurtleff draw up a ten-step set of procedures and a time line for appointment of a Tofu Standards Committee, development of two drafts of tofu standards, and final approval by the Soyfoods Association Board of Directors in July 1984.

1984 March 29–*First Draft of Tofu Standards,* 15 pages and double spaced, is compiled by Shurtleff on his word processor. As is inevitable with a document of this type, a basic philosophy that shapes the standards has begun to emerge. Essentially it attempts to balance the varied (and often conflicting) commercial interests of the various groups involved with the standards in a way that is as fair as possible to all, considers existing historical precedents

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and FDA laws, and allows tofu to develop and modernize in the way that it has been since the 1930s. One of the major questions that arises at the outset is whether or not the use of isolated soy proteins (isolates) should be allowed in tofu and, if so, under what conditions and with what labeling requirements. Readers of the first draft are polled on this question and the response is 17 to 4 in favor of allowing isolates, as long as each product is appropriately labeled.

In this first draft, the term "second generation" is first applied to soyfoods in the section titled "Naming Second Generation Commercial Food Products Containing Tofu."

By this time, Stephen H. McNamara, a food and drug specialist with the Washington, DC, law firm of Hyman, Phelps & McNamara is actively serving as an advisor on the standards, reviewing each draft, and making many helpful suggestions. Tom Donegan, of the same law firm, is also helping.

Subsequent drafts of the standards: 1984 June 16–Second draft. Nov. 1–Fourth draft. 1985 March 6–Sixth draft. March 20–Seventh draft, which is submitted to the FDA for comments. Then begins a serious inter-industry conflict over the standards which is documented throughout the rest of this document. Initiated by Ron Ishida, an attorney hired by Azumaya, this conflict ended up destroying the standards and preventing their adoption and implementation. 1985 Oct. 3–Eighth draft, incorporating all FDA suggestions.

A 2-page appendix to this document, titled "The Modernization of Tofu in Japan," gives a brief chronology of the many changes in the way of manufacturing "traditional tofu" from the 1930s to the present. It challenges the idea that "traditional tofu" is widely made today. Address: Soyfoods Center, Lafayette, California.

8525. Soppe, Fennie. 1986. Jonathan, Histoire d'un boucher reconverti. Interview de Jos Van De Ponseele [Jonathan. History of a reconverted butcher. Interview with Jos Van De Ponseele]. *Compas* (*Le*) (*France*) No. 26. p. 14-16. March/April. [Fre]

• ***Summary:*** It all started in 1974, when Jos's wife experienced serious health problems. There were suspicions of lung cancer. She went to Switzerland for care, and had a fever of 38-40ºC for 6 months without improvement. One day someone gave them a small book about natural foods. She then began to eat macrobiotically and her fever disappeared after 3 months.

At the beginning, this diet was not at all attractive. The food was very poor, and Jos began to ask himself questions and to read books on the subject. He learned that it wasn't a bad diet at all. Not wanting to have to prepare two types of food, he started to eat the same diet as his wife. His health did not improve much, but he found he had the capacity to work much more, and a need for less sleep. His days started at 6:00 A.M. and ended between 11:00 P.M. and midnight.

Upon seeing the results, he began to think and live differently. In the long run, the work at the butcher shop worried him. He no longer ate meat, but he was still selling it. That wasn't logical. He then decided to sell organic meat products at the butcher shop, and they sold very well. However that was a form of hypocrisy.

You must understand that at that time, macrobiotic people in the area were very fanatical. Meat was considered bad, in fact a poison. A more moderate viewpoint was needed; a bit of meat in itself is not bad, but its consumption in large quantities can present problems.

Jos opened two natural food shops in succession, and they were a success in part because he had experience in running a business. He tried to sell his butcher shop, which was very large. Through his new shops he met people who wanted to stop eating animal proteins, but they knew of no replacement. Back then, you could not find any tofu, or seitan, just beans. When a person decides to change her diet, she cannot fully benefit from the proteins in beans: the process is too slow. This made it hard for a person to change his or her diet.

Jos attended a seminar conducted by Michio Kushi at Drogen (Germany). They talked about these problems. Michio spoke to Jos about miso and tamari, and advised him to come to Boston, Massachusetts, where he could learn and see everything for himself. He did. Indeed miso and tamari were available, but they were made in a foreign country. He was somewhat deceived in the early days. Most of the products came from Japan. At the same time, he worked at the famous macrobiotic restaurant The Seventh Inn. He became friends with a Japanese person and they worked together making seitan. Finally, he started commercial production with two Americans.

Tofu was very well known, but it was made in [Boston's] Chinatown. The Chinese did not want to show others how to make it, but they were allowed to look. This interested him very much.

Upon returning to Belgium, after his studies in Boston, Jos began commercial production of seitan. At the beginning people were very closed. They thought that one should consume only beans. Their fanaticism seemed very natural to them, but that made it very difficult for Jos to survive economically by making only seitan. He started by producing 500 gm a week of seitan for Souen, a macrobiotic restaurant in Gent [Gand]. He urged the restaurant to serve seitan to each customer so that it would become well known. That was successful. After several months, the natural food stores began to order seitan from him; that was his goal. Subsequently he began to make fresh organic tofu. He encountered new opposition when he suggesting sterilizing the tofu, which would cause loss of vitamin C, etc.

People got to know seitan but they were getting tired of it, so now he has the seitan burger between two buns, with onion and lettuce. They are also thinking about introducing seitan brochettes and seitan in sauces. The starch left over

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from making large quantities is used in making soups, spreads for bread, goulash, etc.

How did his customers react initially to all this? They thought he was crazy–in 3 ways. (1) They thought macrobiotics was folly; (2) Who but a fool would sell a butcher shop that was doing so well, employed 16 persons, and was the first to sell organic meat with great success. They thought that America had made him lose his head; (3) They thought artificial meat was absurd and would not sell. But these people have changed their opinions as things have developed.

His best invention is seitan sold sterilized in jars; it is now a very successful product. He is also very proud of his tofu burgers (*les beignets, les ganmos;* made from tofu, sesame seeds, onions, mushrooms, and arrowroot), his sauces, and his mushroom tarts. Neither his soy croquettes nor his carob products sell well. His basic products are seitan, tofu, and mochi (made according to a traditional Japanese recipe). The company will soon focus more on exporting it products, especially to Germany, followed by France (starting in 1987) and Austria. He has created a company in France named Jonathan France (La Comba 24620, Les Eyzies. Phone 53.06.94.68), directed by Frenchmen, because it is very difficult to export to France; he has been trying for 2 years.

Black-and-white photos show: (1) A portrait shows Jonathan, with a large beard, rimless glasses, and thinning hair. (2) Twenty-three of his sterilized products in jars, which have a shelf-life of 2 years. Among these are Sojapastei, Sojaboont Jes, Azukiboont [Azuki bean] Jes, Brown Rice Casserole with Seitan, and Tofu Salade. The company is studying a tempeh spread for bread. The company now has 16 employees, including 3 in stores an a representative. Most of the employees like this food. Not all are macrobiotic but most have changed their diet, usually without fanaticism.

The company's name Jonathan comes from the name of the book *Jonathan Livingston Seagull* (Jonathan Le Goëland), about a seagull who wants to live differently. Jos believes that vegetable proteins can play an important role in world hunger. His dream, which he hopes to realize, is to establish small food companies in Zaire, Rwanda, and all of southern Africa. "For example, a small tofu machine can produce 800 to 1,000 cakes of tofu/day. I would like these people in poor countries to be able to make tofu themselves."

Jos is not a vegetarian. He still likes meat and eats it in small quantities, often fish or organic meat. He has 3 children. Address: Pays-Bas (Netherlands).

8526. **Product Name:** [Soy Sprout Tofu].
Foreign Name: Haiga Tôfu.
Manufacturer's Name: Taisei Sangyo.
Manufacturer's Address: Okayama Prefecture, Japan.
Date of Introduction: 1986 April.
New Product–Documentation: Toyo Shinpo (Soyfoods News). 1986. April 1. p. 5. The product, invented by Katsushi Oguchi, President of Taisei Sangyo, of Okayama prefecture, is produced and marketed by three companies now. Taisei makes the sprouting machine. The product is easier to digest than regular tofu.

8527. Takeyama, Emiko; Fukushima, Masako; Kawarada, Akira; Okamoto, Susumu. 1986. Daizu oyobi daizu kakô shokuhin-chû ni okeru shokubutsu seni ni tsuite [Dietary fiber contents of soybean and soybean foods]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 33(4):263-69. [5 ref. Jap; eng]
• ***Summary:*** The dietary fiber (DF) content of the following soybean foods were determined by the detergent fiber method of Van Soest: kinako, natto, akadashi miso, Hatcho miso, and okara. Pectin, the main indigestible polysaccharide of soluble DF, and crude fiber, were also determined. Okara had the highest total DF value. Miso and natto, both fermented foods, were low in hemicellulose and pectin. Kinako was remarkably high in neutral detergent fiber (NDF). Address: Showa Women's Univ., 1-7, Taishido, Setagaya-ku, Tokyo 154, Japan.

8528. *Toyo Shinpo* (*Soyfoods News*). 1986. Kanai kôgyô de tenpe tsukuri. Nihon no shikô ni tekigô saseru [Making tempeh as a home industry. Making it suitable for Japanese tastes]. May 1. p. 3. [Jap]
• ***Summary:*** Contains three photos. Address: Kyoto, Japan.

8529. Gupta, Rajendra ("Raj") P. 1986. Re: Selling tofu in Kanpur, India, and soymilk equipment to developing countries. Letter to William Shurtleff at Soyfoods Center, May 9. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "It is not even one year since we started selling tofu to consumers in Kanpur [India] and suddenly every one seems to be interested in soyfoods in India.

"There is a great deal of interest here in our process, and it is likely that we would have a tie up with a few companies for the use of our process. APV Crepaco (USA), APV Texmaco (India) and Kurihara (Japan) have begun making soymilk equipment based on our process. Some companies here are also interested in no-beany soymeal. I am hopeful that my extended stay here (up to the end of Aug. 1986) will help move things at a reasonable pace.

"Godrej, a large business house here, is setting up a 4000 liter/hour soymilk plant with know-how from Kibun and equipment from Alfa-Laval. Kalyan Solvent Extraction Limited is expected to setup a similar size plant with process and know-how from us and equipment considering to go into large scale soymilk production. In addition, we have enquiries from 50 companies keenly interested in setting up small scale tofu and soymilk operations similar to ours in Kanpur. Several of them have made deposits with us of up to

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Rs. 5,000 for the purpose." Address: Ph.D., Vice President, ProSoya Foods International Inc., 801-275 Slater St., Ottawa, ONT, K1P 5H9, Canada. Phone: 613-237-5814.

8530. *Toyo Shinpo* (*Soyfoods News*). 1986. Sansanguruto kaihatsu. Aomori. Taishi Shokuhin Kôgyô K.K. Shin tônyû yooguruto shihan e [Sansan-gurt developed by Taishi Foods of Aomori. Marketing a new soymilk yogurt]. May 11. p. 5. [Jap; eng+]
• ***Summary:*** This company is one of the largest soyfoods producers in Japan. Address: Mr. Kazuo KUDO, president. Taishi Shokuhin Kogyo KK., Morita Azaoki-naka 68, Santo-machi, Santo-gun, Aomori-ken, Japan.

8531. Kanasugi, Goro. 1986. Tenpe ryôri jisshû [Tempeh cooking class]. 2 p. May 15. Unpublished manuscript. [Jap]
• ***Summary:*** Ten tempeh recipes were presented in this cooking class which was held at the Omiya Chûbu Public Hall on 15 May 1986 and narrated by Mr. Goro Kanasugi. The class was broadcast by NHK television on 28 May 1986. Address: Japan.

8532. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo*). 1986. Okara [Okara] May 18. [Jap]
• ***Summary:*** Contains a photo and several recipes. Address: Japan.

8533. *Toyo Shinpo* (*Soyfoods News*). 1986. Tenpe ryôri no tokuchô reiji. Torigoe Goorudo. Torigoe Seifun ga PR [They demonstrate the special characteristics of tempeh cookery. Torigoe Flour Milling Co. does PR for its Tempeh Gold, with recipes]. May 21. p. 9. [Jap; eng+]
• ***Summary:*** Recipes include Gojiru, Takikomi Gohan, Tempeh Hamburger, Potato Croquettes, Kakiage, Banana Doughnuts. Address: Kyoto, Japan.

8534. *Toyo Shinpo* (*Soyfoods News*). 1986. Faasuto Fuudo wa tôfu kara. Tomii Cheen. Gyôkai no sakigake mezasu [Fast foods from tofu. The Tomi Chain aims to be a pioneer in the industry]. May 21. p. 3. [Jap; eng+]
• ***Summary:*** Yoshiaki Saruda, president of the Tomi chain in Kyoto, is franchising the concept. He got the idea from McDonald's. His shop sells tofu ice cream, tofu yogurt, tofu hamburgers, tofu pies, Tomi crepes, Tomi pies, etc. These second generation products are all made by machines, produced by Saruda Shoten, which is pioneering such food equipment. Saruda Shoten is owned by Yoshiaki Saruda's father.

8535. *Los Angeles Times.* 1986. Packaging keeps tofu fresh up to 1 year. May 22. p. M26.
• ***Summary:*** Based on a news release. "Morinaga aseptically packaged, preservative-free tofu is being introduced by Morinaga Nutritional Foods Inc."

A black-and-white photo shows Mori-Nu's regular and soft packages. Advertises free recipe booklets, and contains a recipe for creamy tomato and tofu soup.

8536. Farrington, Sharon. 1986. Grilling with an Asian accent: Exotic flavors go beyond barbecue. *Washington Post.* May 25. p. K1.
• ***Summary:*** Many Americans now prefer the word "grill" to the word "barbecue." Teriyaki and Yakitori from Japan are both grilled favorites among many Americans; in Japan they are grilled on the small, efficient hibachi.

A recipe for "Dow see pai quat (Twice-cooked Cantonese spareribs in black bean sauce)" has ingredients that include: "¼ cup soy sauce,... 2 tablespoons fermented black beans, 1 tablespoon ginger root, grated, 1 tablespoon garlic, minced,..." Grill over hot coals.

8537. Abe, I.; Okuda, Y. 1986. Kikkai dakkyo edamame no sendo hoji gijutsu ni kansuru kenkyû [Maintaining freshness in machine-harvested edamame (Abstract)]. *Engei Gakkai Taikai Kenkyu Happyo Yoshi* (*Horticultural Symposium Abstracts*) Spring. S61. p. 466-67. [Jap]*

8538. Katagiri, M.; Shimizu, S.; Kaihara, H. 1986. Miso no esuteru kei shibô-san, yuri shibô-san oyobi yuki-san no chûshutsu to gasukuromatogurafiimiso seibun no kenkyû. I. [Separation and gas chromatography of esterified and free organic acids in miso]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 60(5):385-87. May. [12 ref. Jap; eng]
• ***Summary:*** A method for extraction of lipids from miso and successive detection of ethyl esters, total glycerides and free organic acids was developed. The yield of the first diethyl ether extract obtained by this method was about twice that of the conventional celite filtration method. This procedure is rapid and reliable. Address: Dep. of Home Making, Iida Women's Junior College, Matsuo 610, Iida-shi, Nagano 395, Japan.

8539. Miller, Susan. 1986. Tempted by tempeh: This Indonesian specialty tantalizes Western palates. *East West.* May. p. 18-19. [1 ref]
• ***Summary:*** A good introduction to tempeh. The article starts: "Fragrant, delicious, and versatile, tempeh (pronounced TEM-pay) has become one of the most important protein foods in America's move toward a meatless, natural, and nourishing diet. It joins such notables as camembert, Brie, and Roquefort cheeses, classic Japanese misos, and naturally brewed soy sauce in the panoply of mold-cultured foods that have found acceptance in an evolving American cuisine."

It concludes: "*The Book of Tempeh* contains many recipes, as well as detailed instructions for making tempeh at home and sources of tempeh starter.

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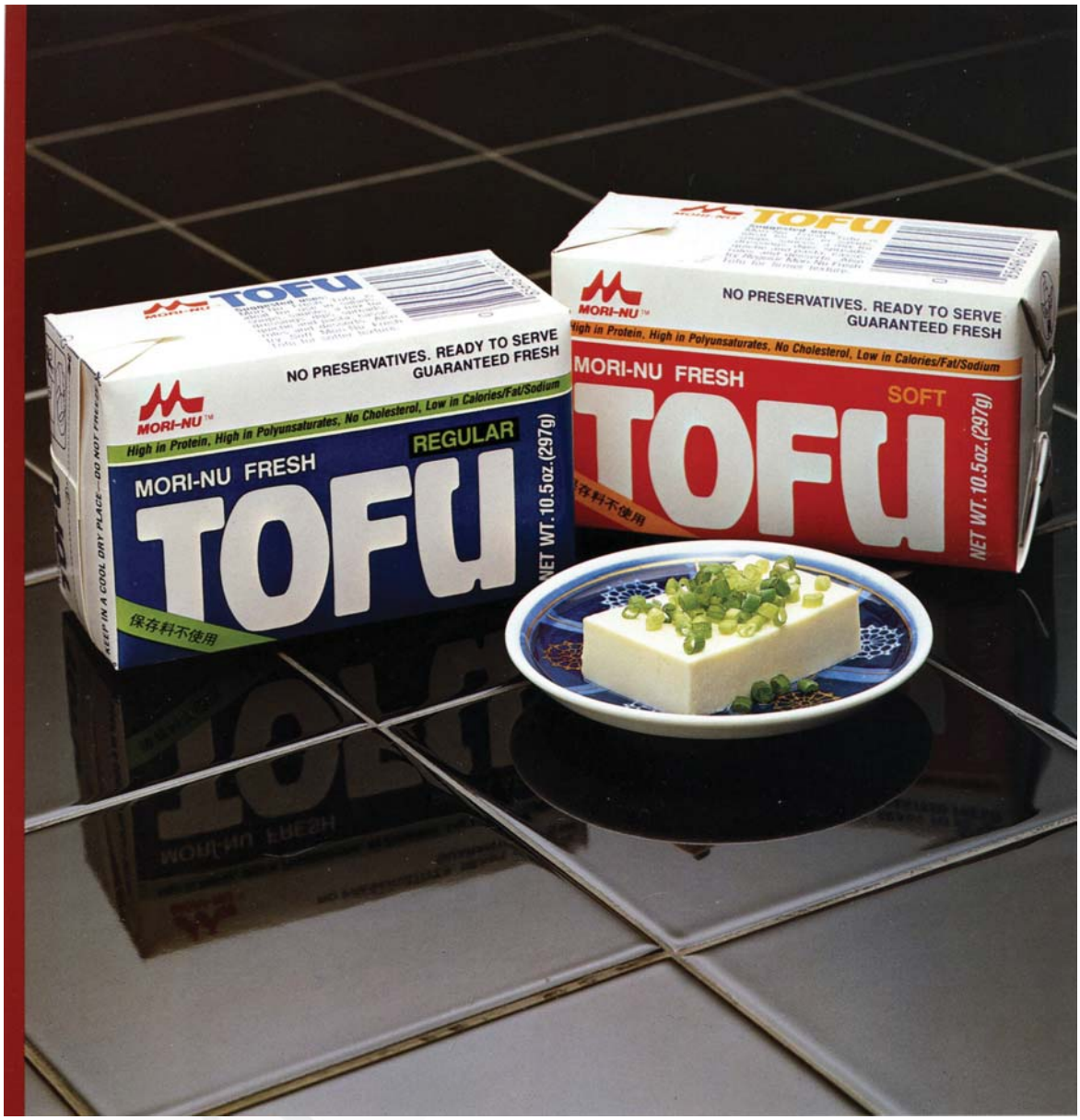

"Whether you make your own or purchase it from a natural foods store, tempeh is sure to become a favorite in your household. As you come to know its qualities of versatility and convenience, you may even begin to find it indispensible." Address: Freelance writer, New York City.

8540. Morinaga Nutritional Foods, Inc. 1986. The freshest tofu you can buy... Guaranteed! (Portfolio). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. Ten inserts. 30 cm.

• ***Summary:*** This glossy color portfolio, which is both a manufacturer's catalog and a press/buyer's kit, contains 10 separate information sheets, most in color. Mori-Nu tofu comes in a newly-redesigned package; the word "silken" no longer appears on the front panel.

The main inserts are: (1) Mori-Nu Fresh Tofu consumer benefits: Freshness, convenience. (2) Merchandising objectives. Location: Next to water-pack tofu in the produce section. Facings: A minimum of 2 facings of regular and 1 facing of soft. (3) Mori-Nu Fresh Tofu trade benefits: More profits, customer satisfaction.

(4) Morinaga Nutritional Foods, Inc. introduces Mori-Nu Fresh Tofu: The only tofu that's guaranteed fresh everytime. (5) What is tofu?

(6) Who makes the freshest tofu you can buy? Morinaga Milk Industry Co, Ltd., located in Tokyo, Japan. Established in 1917, the company is one of the world's largest dairy food manufacturers, with 1984 sales of $1.3 billion.

(7) American tofu market. At the end of 1983 there were: 191 U.S. tofu manufacturers. 54 million pounds of tofu produced (Plus 1.26 million pounds imported). $53 million retail sales–and growing at 15% per year. Address: Los

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Angeles, California. Phone: 213-728-4325.

8541. Nakamura, T.; Utsumi, S.; Mori, T. 1986. Mechanism of heat-induced gelation and gel properties of soybean 7S globulin. *Agricultural and Biological Chemistry* 50(5):1287-93. May. [25 ref]
Address: 1. Hohnen Oil Co. Ltd., 1-2-3 Otemachi, Chiyoda-ku, Tokyo 100, Japan; 2-3. Research Inst. for Food Science, Kyoto Univ., Uji, Kyoto 611, Japan.

8542. Okano, Tadashi. 1986. "Shoku" no tanken ryokô. Otona no tame no esniku ryôri [A trip to explore food and eating. Ethnic cookery for adults]. *Signature* (*Japan*). May. p. 28-32. [Jap]
• ***Summary:*** Tempeh (*Tenpei*) is discussed on p. 32. A photo shows a plate of tempeh chips.

8543. **Product Name:** [Sansan-gurt (Soymilk Yogurt)].
Manufacturer's Name: Taishi Shokuhin Kogyo K.K.
Manufacturer's Address: Kawamorita, Aza Okinaka 68, Santo-machi, Santo-gun, Aomori-ken 039-01, Japan.
Date of Introduction: 1986 May.
New Product–Documentation: Toyo Shinpo (Soyfoods News). 1986. May 11, p. 5. Taishi Shokuhin is a large tofu company and one of the largest soyfoods producers in Japan.

8544. Westbrae Natural Foods. 1986. Q&A. Answers to most-asked questions about WestSoy (Poster). P.O. Box 8711., Emeryville, CA 94662. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center.
• ***Summary:*** Questions and answers about this soymilk. The shelf life is 1-2 years. It is sweetened with barley malt made from sprouted barley. It contains less than 1% added oil. Other soydrinks seasoned with seaweed averaged 144 mg of sodium per serving vs. 125 mg for WestSoy. Address: Emeryville, California.

8545. Forman, Gail. 1986. Where's the beef? Just substitute bean curd skin. *Washington Post.* June 15. p. K1, K6.
• ***Summary:*** Special to the Washington Post: Bean curd has a 2,000 year history [sic] as a dietary staple all over East Asia and recently it has developed a following in the United States. Less well known is a relative of bean curd called "bean curd skins."

Before the coagulant is added to hot soy milk to make bean curd, "a thin skin forms on top, much like the skin that forms when cow's milk or cream is heated... This very thin skin, carefully lifted off and hung up to dry, is called tiem jook [sweet dried yuba] by the Chinese, yuba by the Japanese. In English it goes by the various names of bean curd skin or tofu skin, bean curd sheets and bean curd robes."

Note: This is the earliest English-language document seen (Oct. 2012) that uses the word "robes" or the term "bean curd robes" to refer to yuba.

The thinner the bean curd sheets, the better. Oriental groceries stock them in various dried forms: flat sheets, rolls, folded sticks, strips, circles, and small triangles. They are brittle and break easily, but last almost indefinitely without refrigeration. Some grocery stores now also sell fresh and frozen bean curd skins, which are easier to handle and more flavorful than dried.

Bean curd skins first became widely used millennia ago in Chinese Buddhist vegetarian cuisine, where they were used in place of meat–as in mock Peking duck. They are widely used as wrappers of almost any small packet of tasty ingredients. Steamed bean curd sticks [dried yuba sticks], made of rolled or folded sheets, add substance to a bowl of vegetable broth.

Contains the following recipes, from various restaurants, for using bean curd skins: China Harbor lobster roll (a good way to stretch a small amount of lobster). Meat stuffed bean curd skins (calls for "2½-inch square pressed bean curd"). Yellow birds (vegetarian). Mock Peking duck (vegetarian). Bean stick soup. Steamed fish with bean curd sticks (calls for "2 ounces bean curd sticks, broken into 2-inch sections"). Fukien stuffed shrimp in bean curd skins. Buddha's delight (vegetarian).

Note: This very creative article is the first to mention the word "yuba" in a major American newspaper. Address: Japan.

8546. *Toyo Shinpo* (*Soyfoods News*). 1986. 7 mm kaku no Tsubu Dôfu. Nihon Biinzu kongetsu kara shinhatsubai [Firm tofu in 1/4 inch cubes. Nihon Beans starts to sell it this month]. June 16. p. 1. [Jap; eng+]
• ***Summary:*** This diced, firm lactone silken tofu is packed in a polypropylene container. A convenience food, it can be used in Mabo Tofu, miso soup, etc.

8547. *Toyo Shinpo* (*Soyfoods News*). 1986. Minesota musume ga tôfu shugyô–Kyôto. Tezukuri-ten e shigan. Yume wa kokyo de "tôfu shoppu." [Minnesota woman (Jeri Rasmussen, 29) apprenticing at handmade tofu shop (Hattori Shokuhin) in Kyoto. Her dream is to open a tofu shop in America]. June 16. p. 3. [Jap; eng+]

8548. *Toyo Shinpo* (*Soyfoods News*). 1986. Tôfu aisu ni sannyû Doonaa Cheen [Donner Chain entering the tofu ice cream market in Tokyo]. June 16. p. 1. [Jap; eng+]
• ***Summary:*** This Tokyo-based fast food chain has entered the new tofu ice cream market which is getting more popular in Japan. They are going to start marketing their ice cream in mid-June through restaurants, Denki-ya meat shops, auto dealer stores, hospitals, etc.

8549. *Toyo Shinpo* (*Soyfoods News*). 1986. Tenpe kaihatsu no jigyô. Zen Nôren. Gyôkai no takakuka to kasseika e [Tempeh

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project development report from Japan Natto Association. To make the industry more versatile and active. Second generation products are hoped for]. June 21. p. 9. [Jap; eng+]
• ***Summary:*** The techniques of making tempeh are already well established. The water content and cracking/dehulling the beans are the two key subjects. This report was presented to Japan's Department of Agriculture (*Nosuisho*) in April 1985 by the Japan Natto Assoc. The total budget was 18.1 million yen ($80,000). The project was done at Takashin Shokuhin Ltd. in Tokyo. Members of the research project were Goro KANASUGI and Haruo NITTA (President of Teito Shokuhin KK), Mitsuaki YAMANAKA (Head of Takashin Research Lab.). Head researcher was Makio TAKATO (President, Takashin). Address: Kyoto, Japan.

8550. *Toronto Star* (*Ontario, Canada*). 1986. Try the Kiku platter: Table for Two. June 24. p. H5.
• ***Summary:*** "Table for Two" is the Star's daily restaurant review. This is a review of the Japanese restaurant Kiku located at 1560 Yonge St. (at St. Clair Ave. Phone: 920-9922).

You are the chef at this recently opened restaurant, which is nearly identical to the first Kiku on King St. West. A as barbecue is sunk in the middle of each table.

"The menu offers several entrees that come with miso soup (containing soybean curd with [sic] tofu and green onion), steamed rice, three vegetables or salad, and green tea."

Note: Tofu is the same as soybean curd.

8551. *Los Angeles Times.* 1986. Packaging breakthrough extends life of tofu. June 26. p. L35.
• ***Summary:*** About Mori-Nu Tofu, recently introduced by Morinaga Nutritional Foods Inc. of Los Angeles. A photo shows two tofu packages. Gives a recipe for tofu meat loaves with ground beef. Address: California.

8552. Belleme, Jan; Belleme, John. 1986. Cooking with Japanese foods: A guide to the traditional natural foods of Japan. East West Health Books, 17 Station St., Brookline, MA 02146. xi + 220 p. Illust. Index. 25 cm. [45 ref]
• ***Summary:*** A good study from a macrobiotic viewpoint, with more than 200 macrobiotic recipes. The authors studied in Japan and speak Japanese. Contents: Foreword. Acknowledgements. Introduction. Fermented Foods: miso, shoyu, tamari, brown rice vinegar, sake, mirin, koji, amazake, pickles, umeboshi, ume su, medicinal teas, ume extract, bonito flakes, natto. Noodles: cooking noodles, udon, soba, somen, clear noodles. Grains, incl. rice, mochi, seitan, fu gluten cakes, hato mugi [*hatomugi*] (Job's tears), rice syrup, rice bran. Vegetables: shiitake, daikon, Hokkaido pumpkin, Chinese cabbage, burdock, jinenjo, lotus root. Sea vegetables: kombu, nori, wakame, hijiki and arame, kanten (agar). Beans: azuki beans, black soybeans, tofu. Condiments: kuzu, dark (toasted) sesame oil, goma (sesame seeds), tekka, shiso momiji (shiso leaf condiment), wasabi. Teas. Cooking utensils. Appendix: Composing meals, pronunciation guide, suppliers. Bibliography.

Amazake (p. 39-45). Contains a ½ page description plus good instructions for making basic amazake (thick "pudding" and thinner beverage), both from glutinous ("sweet") rice. Also recipes for Vanilla Amazake Pudding, Amazake Cream Puffs, Neapolitan Parfait, Carob Amazake Brownies, Bob's Coconut Amazake Macaroons, Amazake Bread (yeasted), and Unyeasted Amazake Bread. Perhaps the most lengthy information on amazake available in English up to this time.

Hato mugi ("Job's tears," p. 93) "resembles barley, but it is actually a member of the rice family. An easily digestible whole grain with only the tough outer husk removed, hato mugi contains less vitamin B-1 than brown rice but approximately twice as much protein, iron, vitamin B-2, fat, and slightly more calcium." It has long been used in China and Japan as a medicinal food, "for strengthening the stomach, purifying the blood, and restoring health. Since it is so effective in helping the body to discharge toxins, people who are sick and weak, and women who are pregnant, nursing a baby, or menstruating should eat it sparingly." Address: Rutherfordton, North Carolina.

8553. Davies, C.S.; Nielsen, N.C. 1986. Genetic analysis of a null-allele for lipoxygenase-2 in soybean. *Crop Science* 26(3):460-63. May/June. [11 ref]
Address: 1-2. Post-doctoral associate, of Agronomy, Purdue Univ., West Lafayette, Indiana 47907.

8554. *Grocers J. of California* (*Los Angeles*). 1986. Hinoichi Tofu [New consumer education program]. June.
Address: Los Angeles.

8555. Hara, Toshio; Chetanachit, Charan; Fujio, Y.; Ueda, S. 1986. Distribution of plasmids in polyglutamate-producing *Bacillus* strains isolated from "natto"-like fermented soybeans: "thua nao," in Thailand. *J. of General and Applied Microbiology* (*Tokyo*) 32(3):241-49. June. [25 ref]
• ***Summary:*** "Four polyglutamate (PGA)-producing *Bacillus* strains were isolated from 'thua nao' in Thailand. Three of these did not require biotin for growth. All four produced high activities of gamma-glutamyltranspeptidase (gamma-GTP). Each of these strains carried a single plasmid species."

"Apparently a 'natto' plasmid is distributed widely in PGA-producing *Bacillus."* It may have developed from a common ancestral molecule. "Therefore, the distribution of 'natto' plasmids in PGA-producing *Bacillus* strains may help to distinguish *B. subtilis* from *B. subtilis* (*natto*).

Thua nao is a traditional fermented soyfood in northern Thailand. It is produced by aerobic spore-forming rods, similar to the natto *Bacillus,* growing on steamed soybeans. "It is an adhesive fermented" soyfood with a noticeable

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odor of ammonia, "and so is considered to be the same as Japanese 'natto'" (S. Nakao 1972, *Ryori no Kigen,* p. 121). Address: 1. Dep. of Food Science & Technology, Faculty of Agriculture, Kyushu Univ., Hakozaki, Fukuoka 812, Japan; 2. Dep. of Microbiology, Faculty of Science, Kasetsart Univ., Bangkok 10210, Thailand; 3. Dep. of Applied Microbial Technology, Kumamoto Inst. of Technology, Ikeda, Kumamoto 860, Japan.

8556. Inooka, S.; Uehara, S.; Kimura, M. 1986. The effect of *Bacillus natto* on the T and B lymphocytes from spleens of feeding chickens. *Poultry Science* 65(6):1217-19. June. [6 ref. Eng]
• ***Summary:*** *Bacillus natto* is isolated from the fermented soyfood natto and used in Japan in a preparation that enhances the growth of farm animals; thus it is a kind of nutritional supplement or growth enhancer. Address: 1-2. Dep. of Animal Science, Faculty of Agriculture, Tohoku Univ., 1-1 Amamiyamachi Tsutsumidori, Sendai 980, Japan.

8557. Matsuura, Noboru. 1986. Josha, seikiku, shikomi ikkan sôchi no kaihatsu to mugi miso seizô [Development of industrial miso fermentation equipment for continuous steaming, moulding, and mashing of barley miso]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 81(6):374-77. June. [Jap]
Address: Toyo Kakoki Co., Kumamoto 862, Japan.

8558. Rosoff, Michael; Rosoff, Peggy. 1986. Michio Kushi: The man, the mentor, and his vision. Michio Kushi at 60 years young. *Macromuse.* Summer. No. 25. p. 8-15. June.
• ***Summary:*** An in-depth interview. "The natural foods movement is being degraded with things like tofu ice cream. Why did this happen? We did not guard quality enough." Address: 4905 Del Ray Ave. #400, Bethesda, Maryland 20814. Phone: 301-656-4313.

8559. Sakai, Sonoko. 1986. Tofu: The meat of the fields. *Palate Pleasers of Japan* (*Los Angeles, Calif.*). Spring/ Summer. p. 59-61. [Eng]
• ***Summary:*** Contents: Introduction: The traditional tofu man with his horn and bicycle. What is tofu? Flow chart of the tofu making process. Members of the tofu family (varieties of tofu). How to store tofu. Eating right and staying healthy. Table showing nutritional composition of different types of tofu. History of tofu. Cooking with tofu (six recipes).

Note: This is the earliest document seen with the phrase "The meat of the fields" in the title. Much of the information in this article is taken, with permission, from *The Book of Tofu,* by Shurtleff & Aoyagi. Address: Los Angeles writer.

8560. Westbrae Natural Foods. 1986. Westbrae Natural Malteds. "The Cadillac of Soydrinks" (Poster). P.O. Box 8711., Emeryville, CA 94662. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center.
• ***Summary:*** Questions and answers about these rich and thick soymilk drinks. "What makes Malteds so thick? What makes Malted so sweet? Why do Malteds contain oil? Aren't Malteds high in Calories?" Address: Emeryville, California.

8561. Westbrae Natural Foods. 1986. If all you want to do is save a few pennies on your soy sauce, don't bother reading this [about Johsen Shoyu] (Poster). P.O. Box 8711., Emeryville, CA 94662. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center.
• ***Summary:*** Johsen is made with whole soybeans and aged for two full brewing years. Address: Emeryville, California.

8562. *Toyo Shinpo* (*Soyfoods News*). 1986. Katei de tsukuru tôfu, Hikikko Setto [Make tofu at home using the Hikikko Kit]. July 1. p. 1. [Jap; eng+]
• ***Summary:*** An Osaka-based company, Kansai Toki, makes a machine for grinding dry soybeans to a flour, which can then be used with a tofu kit (hinoki forming box, nigari coagulant, pressing sack, lining cloth; cost 2,500 yen, not including grinder/mill) to make tofu at home. The mill can also be used to grind shiitake mushrooms, niboshi (dry fish), rice, wheat, buckwheat, corn, coffee, konbu seaweed, and herbs.

8563. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo*). 1986. Tôfu no junsui-sa de jinsei-kan kae sai-shuppatsu [Because of the purity of tofu, he changed his outlook on life and started a new career (Michael Horne now makes tofu in Australia)]. July 7. [Jap]
• ***Summary:*** Michael Horne has started to make tofu in Australia at Mt. Coolangbura, Bombala, New South Wales 2632. A photo shows Horne cutting tofu in a forming box with a woman in the background.

Michael went to Japan with his parents in 1971; he stayed for 8 months. After graduating from the university, he attended law school for 3 years. But he disliked being a lawyer, so he gave up that career and dropped out for 5 years until he saw books on tofu production and miso production at his parents' home. He made some tofu successfully at home, then started a tofu shop, while his wife baked bread to sell. Their home in the mountains is located 100 km from their nearest customers. He had a steady tofu business by 1983. Address: Japan.

8564. *Toyo Shinpo* (*Soyfoods News*). 1986. Okara ni tenpe kin [Making okara tempeh. Japan patent application No. 155,358 of 24 August 1983 by Susumu Oshikiri]. July 21. p. 15. [Jap; eng+]
Address: Kyoto, Japan.

8565. *Toyo Shinpo* (*Soyfoods News*). 1986. Tôfu ten no imeeji ga kawaru. Fasshonaburu tenpo [The image of

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tofu shops is changing. A fashionable shop (Okura-ya in Arakawa, Tokyo)]. July 21. p. 10. [Jap; eng+]
• ***Summary:*** This shop started in 1914, but recently the exterior was changed to resemble a sushi parlor, and sales tripled. He sells natural nigari tofu. Now customers buy his tofu and products as gifts (instead of the usual confections). Contact: Tadao ISHIBASHI, President, Okura-ya, Minami Senju 5-36-11, Arakawa-ku, Tokyo-to, Japan. Tel. 03-801-6958.

8566. *Toyo Shinpo* (*Soyfoods News*). 1986. Tônyû ni karushiumu kyôka [Fortification of soymilk with calcium]. July 21. p. 15. [Jap; eng+]
• ***Summary:*** Discussion of Japanese Patent No. 154,778 (applied 1983) by Shuzo Shimoyama and Kazumi Akaike of Kawasaki Kasei Kogyo K.K.

8567. West, Janet. 1986. San Jose firm makes tofu the old fashioned way [Kenny Nozaki of San Jose Tofu Co.]. *San Jose Business Journal* (*California*). July 28. p. 1, 18.
• ***Summary:*** Chester Nozaki, age 29, is waiting anxiously to replace his father, Ken Nozaki, age 53, as the owner of the San Jose Tofu Co. A photo shows Ken Nozaki in the foreground ladling curds in to a tofu pressing box while Chester stands in the background tasting tofu. Ken Nozaki has been running one of the only hand-made tofu operations in the Bay Area for almost 40 years. Last year Nozaki's company sold $80,000 in tofu and Japanese retail food products. Nozaki makes about 420 blocks of tofu a day at $1 a block, while competitor Azumaya makes 24,000 a day for as low as 53 cents a block. A major competitor is Fuji Tofu Co., owned by Mr. Kake, located just one block away. Fuji started out making tofu by hand 25 years ago, but they switched to a four-step automation process when "the manual way became too time consuming." Fuji also sells its tofu for $1 a block. Cheser Nozaki plans to modernize and partially automate the store's equipment and marketing strategy. He also intends to improve his Japanese so he can communicate with the majority of the store's customers.

8568. *Los Angeles Times.* 1986. Tofu maker celebrating first year in United States. July 31. Part 8. p. 38.
• ***Summary:*** About Morinaga Nutritional Foods, maker of Mori-Nu tofu. A photo shows Yasuo Kumoda and Art Mio with the tofu. Address: California.

8569. American Soybean Association. 1986. Soya Bluebook '86. St. Louis, Missouri: American Soybean Assoc. 278 p. July. Index (bold face type indicates advertiser). 22 cm.
• ***Summary:*** Contents: Index of advertisers (p. 4). Soybeans: Your profit opportunity, by Dr. Kenneth L. Bader, CEO, ASA (p. 5). Organizations (by country, within each country alphabetically): For each gives the name, address, contact person, year founded, number of members, objectives and activities, publications. Countries are: USA, Australia, Austria, Bangladesh, Belgium, Brazil, Canada, England, Germany (Federal Republic of), Finland, France, Hungary, India, Indonesia, Italy, Ivory Coast, Japan, Malaysia, Mexico, Netherlands, Norway, Philippines, Portugal, Senegal, Spain, Sweden, Taiwan, Turkey, Yugoslavia, Zaire, Zimbabwe. U.S. agricultural education, research & extension (by state; mainly state agricultural / land-grant colleges), ASA international offices and world regions (colored world map and photo of each country director), government trading agencies.

Soy directory: Oil extraction plants / refineries (alphabetically by state in USA, then by country), soyfoods / edible soy products manufacturers (lecithin, soy flour, soy grits, soy protein concentrates & isolates, textured soy protein, binders, extenders, simulated meat products, soy oil products {margarine, shortening, cooking / salad oil, salad dressings}, soyfoods–beverages [soymilk], frozen desserts, soy sauce, tempeh, tofu, whole soybean snacks {soynuts}, other soy-based foods), within each product by country, producers of soy products for industrial manufacturers (by products, etc.): Industrial lecithin, industrial soy flour / soy protein, industrial soy oil, soy sterols and tocopherols, soybean fatty acids.

Soybean manufacturing support industries: Manufacturing equipment & supplies, soybean processing equipment & supplies, manufacturing services. Marketing and auxiliary services: Brokers, financial services, forwarding agents, marketing consultants, trading companies, transportation, warehousing–export / import.

Soy statistics (tables & graphs): Soya conversions [weights & measures], metric conversions, temperature conversions. U.S. soybean planting and harvesting dates (by state). U.S. soybean acreage, yield and production, 1925–1985 (by year). U.S. soybean planted acreage by state (1970–1985). U.S. soybean harvested acreage by state (1970–1985). U.S. soybean yield by state (1970–1985). U.S. soybean production by state (1970–1985). U.S. soybean production major crops (1920–1985): One graph each for soybeans, corn, wheat, and cotton. U.S. harvested acreage of major crops (1920–1985): One graph each for the big 4. U.S. yield per acre of major crops (1920–1985): One graph each for the big 4. Argentine soybean area, yield and production by province (1975-1986). Brazilian soybean area, yield and production by province (1975-1986). Canadian soybean production: Acreage, yield, production, farm price and value (1950-51–1984-85). Canadian soybean production and utilization (1950-1984, year beginning Aug. 1): Production, imports, supplies, exports of beans, processed for oil and meal, soy oil produced, soybean oilcake produced. World soybean production: Area and production in specified countries and the world total (1980/81–1985/86). Soybean production by major countries (one graph, 1925-1985): U.S., Brazil, PRC [China], Argentina. Share of world soybean

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production [percentage] by major countries (one graph, 1925-1985): Big 4. Soybean acreage by major countries (one graph, 1925-1985): Big 4. Share of world soybean acreage [percentage] by major countries (one graph, 1925-1985): Big 4. U.S. soybeans: Supply, disposition, acreage, yield and price (1970–1986). Soybean usage in the U.S. for crush and exports (one graph, 1925-1985, million bushels). U.S. soybean exports: Percent of total usage (one graph, 1925-1985). Argentine soybeans and products (oil and meal): Supply and disposition (1975/76–1986/87). Brazilian soybeans and products (oil and meal): Supply and disposition (1975/76–1986/87). Prices of U.S. soybeans, No. 1 yellow: Average price per bushel, Illinois country shipping points (by year and month, 1950–1984, dollars). Prices of U.S. soybeans received by farmers: Average price per bushel (by year and month, 1950–1984, dollars). U.S. soybean price support operations (1945-1985, incl. CCC). U.S. soybean crop value: U.S. and major producing states (1925-1985): Illinois, Iowa, Indiana, Ohio, Missouri, Minnesota, Arkansas. Fold-out color map of U.S. soybean acreage by county. U.S. farm marketings of soybeans: Percent of open market farm sales by month (1975/76–1984/85). Map of U.S. soybean processing plants. Value of U.S. soybean products per bushel and crush margin (1950-1984): Soy oil, soybean meal, soybean price (received by farmers, No. 1 yellow Illinois), margin (ditto). U.S. soybean meal: Prices paid by farmers–44% protein, dollars per 100 lbs, by year and month (1950-1984). U.S. soybean meal: Average wholesale price–44% protein, dollars per ton, bulk Decatur, Illinois, by year and month (1950–1984). U.S. soybean meal: Beginning stocks, production, exports and domestic disappearance, by year and month, thousand short tons (1978/79–1984/85). U.S. soybean cake and meals: Supply, disposition and price (1977-1985): Soybean, cottonseed, linseed, peanut. Major world protein meals: Supply and utilization (1981/82–1985/86; Production, exports, imports, consumption, ending stocks): Soybean, cottonseed, rapeseed, sunflowerseed, fish, peanut, copra, linseed, palm kernel. World major oilseeds: Supply and utilization (1981/82–1985/86). World major vegetable and marine oils: Supply and utilization (1981/82–1985/86). Prices of U.S. soybean oil: Soy oil, domestic crude, average cents per pound in tank cars at Midwestern mills, by year and month (1950/51–1984/85). U.S. soybean utilization, by year (1960-1984): Food–Shortening, margarine, cooking and salad oils, other edible, total. Nonfood–Paint and varnish, resins and plastics, fatty acids, other inedible (incl. soap), total. Total domestic utilization. U.S. soybean oil value as percent of total soybean value (1930–1985). Note: Peaked at about 55% in 1930, fell to about 32% in 1980-81. U.S. soybean oil: Supply, disposition and price (1960-1985). U.S. edible fats and oils: Supply and disappearance (1978-1985): Coconut, corn, cottonseed, lard, palm, peanut, soybean, sunflower, tallow (edible). U.S. exports of soybeans, by year and month (1953–1984). U.S. soybean exports by port and country of destination (Sept. 1984–Aug. 1985): Ports are–St. Lawrence Seaway, Lakes, Atlantic, Gulf (by far the largest), Pacific, Interior. U.S. exports: Soybeans–Volume of exports by country of destination (in metric tons) and total value (1981–1985). U.S. exports: Soybean oil–Volume of exports by country of destination (in metric tons) and total value (1981–1985). U.S. exports: Soybean oilseed cake and meal–Volume of exports by country of destination (in metric tons) and total value (1981–1985). Map of U.S. soybean exports by port areas: Sept. 1984–Aug. 1985 (1,000 bushels). U.S. exports of soybean, cottonseed and sunflowerseed oils: U.S. commercial and P.L. 480 exports–Volume of exports by region and country of destination (in metric tons) and total value (1979/80–1984/85; year beginning in October). U.S. exports: Soybean oil–P.L. 480, Title I and III, volume (in metric tons) and value (in $1,000) by country of destination (FY 1981–1985). U.S. exports of soybean and cottonseed oils: U.S. commercial and P.L. 480 exports (1950–1984, million lbs; incl. P.L. 480 as a percentage of the whole). Brazilian exports of soybeans and products to major countries (1,000 metric tons; 1976-1984). Graph of soybean & product exports by major countries (U.S., Brazil, Argentina) (soybean equivalent; 1970-1985). Graph of world share of soybean & product exports by major countries (U.S., Brazil, Argentina) (1970-1985). Note: U.S. share has fallen from 95% in 1970 to about 50% in 1984.

Glossary: General terms, soy protein terms. Standards & specifications: NSPA, Association of American Feed Control Officials (AAFCO), USDA (definitions and grades). Index. Address: P.O. Box 27300, St. Louis, Missouri 63141.

8570. *Grocers J. of California.* 1986. The tofu revolution is sweeping California [Hinoichi Tofu]. July. p. 16. Cover story. Address: California.

8571. Iwashina, Susumu. 1986. Tenpe kakô shokuhin e no kitai [Expectations for second generation tempeh products]. *Daizu Geppo* (*Soybean Monthly News*). July. p. 18-24. [Jap] Address: Nôgaku Hakase, Meiji Seika K.K. Torishimari-yaku Kaihatsu Bucho.

8572. *Japanscan: Food Industry Bulletin.* 1986. Solid state fermentations: Three companies in Japan have jointly developed a bioreactor to produce soy sauce. 4(7):3-4. July. *

8573. *Natural Foods Merchandiser.* 1986. 7th Annual Natural Foods Merchandiser merchandising awards. July. p. 42-43, 45.

• ***Summary:*** Soyfoods won the following awards: Gold: San-J Tamari (wheat-free soy sauce) and Shoyu; Silver: Fantastic Foods' Tofu Scrambler & Tofu Burger, Westbrae Natural miso soups; Honorable mention: Walker & Wilks Tofoods frozen entrees, White Wave boxed tofu. Color

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photos show each.

8574. Okada, Noriyuki. 1986. Tenpe bisei-butsu-gaku no shinpo. I. [Microbiology of tempeh. I.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 81(7):464-69. July. [Jap]
Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8575. *Sunset* (*Menlo Park, California*). 1986. What's the marinade's mystery ingredient? Miso. 177:157-58. July.
• ***Summary:*** Seventh-day Adventists make Marmite, but Vegemite has most of the market. Includes recipes.

8576. *Toyo Shinpo* (*Soyfoods News*). 1986. Hatsu no Beikoku genchi seisan: Marusan-ai no tônyû. Gôben-gaisha Michigan seiritsu [The first American production of Marusan-Ai's soymilk. Joint stock company established in Michigan]. Aug. 1. p. 1. [Jap; eng+]
• ***Summary:*** Japan's second largest soymilk maker, after Kibun, is Marusan-ai K.K. (Head office: Araki 1 banchi, Nikimachi Aza, Okazaki-shi, Aichi-ken, Japan. President: Koji Sato). They have recently established a joint stock company to produce soymilk in Saline, Michigan. Production is scheduled to start at the end of August, 1986.

The new company's name is American Soy Products. The start-up capital is $200,000. There are 4 Japanese companies and one U.S. company involved. Their respective percentage ownerships are: Marusan-Ai (25%, soymilk and miso maker from Okazaki), Kawatetsu Shoji (25%, the New York based company that was previously in charge of exporting soymilk to Eden Foods from Japan), Eden Foods Inc. (25%, natural foods distributor and importer from Clinton, Michigan), Muso Shokuhin (15%, macrobiotic and natural foods exporter from Japan), and Seikensha (10%, soymilk equipment maker from Tokyo).

The chairman of the board is Mr. Michael Potter of Eden Foods Co. and the president is Mr. Hiroyasu Iwatsuki. As before, Eden Foods will continue to distribute the soymilk. The head plant is located in Saline, Michigan (50 km west from Detroit) on a site of 15,000 square meters. The main facilities are 1 Soymilk Line and 2 Tetra packaging lines. The initial run is scheduled to produce 100,000 packages of 250 ml equivalent. They are actually going to make both 250 ml and 1-liter packages. The company's first year sales goal is $5,000,000. Address: Kyoto, Japan.

8577. *Toyo Shinpo* (*Soyfoods News*). 1986. [New uses for okara]. Aug. 1. p. 2. [Jap]

8578. *Toyo Shinpo* (*Soyfoods News*). 1986. Ryôri no barieeshion. Okara de tsukuru reika wa ikaga? Natsu yasumi no kodomo-tachi ni [Cooking variations. How about a cold dessert made from okara? For children during summer vacation]. Aug. 1. p. 2. [Jap]
• ***Summary:*** After a meal containing tofu, you could serve these desserts: cheesecake and sherbet. Recipes are given for 3 okara sherbets (strawberry, papaya, and ogura), and an okara layer cheesecake. Two photos show all four desserts.

8579. James, Leslie. 1986. Two new cafes are the answer for seafood fans. *San Diego Union* (*California*). Aug. 3. p. D-3.
• ***Summary:*** Sushi on the Rock, on Prospect Street in nearby La Jolla, is comfortable and reasonably priced. It brings new verve and an expanded vision to the sushi bar concept. Defying the odds, it has succeeded brilliantly. The meal is a delight–from the "first sip of rich miso soup." "Salted soybeans, called edamame, are also available and are as addicting as potato chips."

8580. Gowland, Hermione. 1986. Wheat gluten bears a remarkable resemblance to real meat. *Guardian* (*England*). Aug. 8. p. 14.
• ***Summary:*** The corner stones of the Buddhist vegetarian cuisine called Shojin Ryori "were beancurd [tofu], beancurd skin [yuba], and wheat gluten" [fu].

8581. Torii, Yasuko. 1986. New developments with tofuyo in Japan (Interview). Conducted by William Shurtleff of Soyfoods Center, Aug. 9. 4 p. transcript.
• ***Summary:*** This interview was conducted during a visit by Mrs. Torii to Soyfoods Center in Lafayette, California. She brings tofuyo made in Okinawa. Dr. Masaaki Yasuda in Okinawa says this is the "real thing," made my a good company that uses awamori. It is very expensive: 2,500 yen for a small container. It does not have a sharp flavor; it reminds Akiko of sea urchin (*uni*). She says it is a "delicacy" (*chinmi*).

The other maker is Urizun, which is also a restaurant; they are bigger and more modern, and they use raw alcohol instead of awamori.

The small number of makers of this traditional food belong to a trade association (*kyodo kumiai*) named *Okinawa Dento Shokuhin Jigyo Kyodo Kumiai,* located in Naha, the capital of Okinawa. It is now widely available via the *yoi shokuhin o tsukuru kai* (the society for making good foods). They are very strict about quality, and starting 5-6 years ago they have had a corner in Matsuzakaya and Sogo department stores.

Tofuyo is eaten a tiny bit at a time on the point of a sort of toothpick (*yôji,* or with chopsticks) while people are drinking saké and eating.

Mrs. Torii's parents were born in Okinawa. Address: Kamitsuchidana 324, Ayase-shi, Kanagawa-ken 252, Japan. Phone: 0467-76-0811.

8582. Katoh, Kiyoaki. 1986. Tenpe no shôraisei wa? Tônyû

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ni tsugu kenkô shokuhin dai-2 dan ni [What is the future of tempeh (in Japan)? The number two health food after soymilk]. *Toyo Shinpo* (*Soyfoods News*). Aug. 21. p. 6. [1 ref. Jap; eng+]
• ***Summary:*** He cannot imagine how tempeh will be accepted by the Japanese. Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8583. *Toyo Shinpo* (*Soyfoods News*). 1986. Ryôri no barieishon: Nattôiri teppanyaki [Cooking variations: Pancakes grilled on a flat iron with natto added]. Aug. 21. [Jap]
• ***Summary:*** The variations are Oyaki, Okonomi-yaki, and Western-style pancakes. A photo shows all of them.

8584. Harizuka, Fujie. 1986. Kôji no kôyô to katei de no tsukurikata, tsukaikata [The benefits of koji, and how to make and use koji at home]. *Tsuchi to Kenko* (*Earth and Health, Tokyo*) No. 168. p. 15-22. Aug. [Jap]
• ***Summary:*** This magazine is published by the Japanese Organic Agriculture Assoc. (Nihon Yûki Nôgyô Kenkyû-kai, Kikan-shi). Address: Japan.

8585. *Kurowassan* (*Tokyo*). 1986. Tôzai tôfu jijô [The tofu situation, east and west]. Summer. p. 4-5, 100-09. Special issue (Bessatsu). [Jap]
• ***Summary:*** This colorful article has 4 parts: 1. High-class tofu in Nagasaki that costs ¥1,000 and is sold in a wooden box. 2. Shônan-mame–Hiko's tofu steak. 3. American tofu cookbooks (four). 4. Favorite tofu recipes from readers. A color photo (p. 5) shows a traditional tofu maker selling tofu from a wooden box on the back of his bicycle. Address: Japan.

8586. Okada, Noriyuki. 1986. Tenpe bisei-butsu-gaku no shinpo. II. [Microbiology of tempeh. II.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 81(8):526-30. Aug. [46 ref. Jap]
Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8587. Potty, V.H.; Shankar, J.V.; Ranganath, K.A.; et al. eds. 1986. Traditional foods: Some products and technologies. Mysore, India: Central Food Technological Research Inst. (CFTRI). 292 p. Aug. Papers presented at the UN University Workshop on "Traditional Food Technologies: Their Development and Integrated Utilisation with Emerging Technologies" held June 1983 at CFTRI, Mysore. 25 cm.
• ***Summary:*** This publication contains 27 papers presented by scientists from countries of Asia, Africa, Europe, and the Americas. Chapters related to soy are cited separately. The traditional foods of the following countries are discussed specifically: Ethiopia, Nigeria*, Sudan, Senegal, Pakistan*, India, Nepal*, Burma*, Thailand*, Malaysia*, Indonesia*, Philippines, Korea*, China*, Japan*, and Mexico*. Countries with foods related to soy are followed by an asterisk (*). Address: Central Food Technological Research Inst. (CFTRI), Mysore–570 013, India.

8588. Saio, Kyoko. 1986. Interactions among traditional and emerging processing technologies observed in Japanese food industries. In: V.H. Potty, et al. eds. 1986. Traditional Foods: Some Products and Technologies. 292 p. See p. 209-15. Aug. Presented at the UN University Workshop on "Traditional Food Technologies: Their Development and Integrated Utilisation with Emerging Technologies." Held June 1983 at CFTRI, Mysore, India.
• ***Summary:*** Contents: Soybean food technologies: Traditional but local products include Rokujo-dofu (made in a small mountainous region of Yamagata prefecture), Hoshi Abura-age or Kanso Abura-age (made in Matsuyama city, Ehime prefecture), Yuba (made fresh mostly in Kyoto), and Shimi-dofu (made in cold, mountainous regions of northern Japan). Emerging soybean food technologies related to traditional foods: Soymilk (tonyu), Daizu-no-Hana (developed by Asahimatsu Shokuhin; marketed with help from Takeda Yakuhin Kogyo; a flowchart is given). Traditional foods prepared from vegetable products: e.g. Tofu derivatives. Address: National Food Research Inst., 2-1-2 Kannondai Yatabe, Tsukuba, Ibaraki 305, Japan.

8589. Tahira, T.; Fujita, Y.; Ochiai, M.; et al. 1986. Mutagenicity of soy sauce treated with a physiologically feasible concentration of nitrite. *Mutation Research* 174(4):255-58. Aug. *

8590. **Product Name:** [University Tofu].
Foreign Name: Daigaku Tôfu.
Manufacturer's Name: Taishi Foods Co. Ltd.
Manufacturer's Address: Furukawa City, Japan.
Date of Introduction: 1986 August.
How Stored: Refrigerated.
New Product–Documentation: C. Tsukamoto, et al. et al. 1991. "A process for the removal of glycosides during tofu production and an evaluation of the marketability of the final product." p. 47-51. This tofu, made by a special process and containing a low level of glycosides, has been sold since Aug. 1986 in Sendai city, Japan. On a taste panel test of 27 consumers living in Sendai city, it received significantly higher scores than both soft and firm tofu for taste, flavor, smoothness, and overall acceptability.

8591. Watanabe, Tokuji. 1986. Traditional foods: Their values, problems and research and development. In: V.H. Potty, et al. eds. 1986. Traditional Foods: Some Products and Technologies. 292 p. See p. 201-08. Aug. Presented

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at the UN University Workshop on "Traditional Food Technologies: Their Development and Integrated Utilisation with Emerging Technologies." Held June 1983 at CFTRI, Mysore, India. [7 ref]
• ***Summary:*** Contents: Introduction (ways of classifying traditional foods). Structural characteristics of traditional food industries in Japan. Traditional food processing technologies. Problems and reevaluation of traditional foods. New food processing technologies applied to traditional foods. Technologies applicable to traditional foods. Assessment in modernization of traditional food production. Some activities related to traditional foods. Conclusion.

Traditional foods can be classified as staple or non-staple, fresh or processed (processing technologies include fermentation [e.g. miso, soy sauce, natto], salting, acidifying, drying after freezing [kori-tofu], sun-drying, fractionation [tofu], fabrication [ganmodoki], simulation of animal foods [soy milk, ganmodoki, su-ho-tai made from yuba in China]), animal or vegetable origin, and region or national production.

In Japan, rice consumption is decreasing year after year. It is thus not surprising that consumption of traditional foods closely associated with rice production are also decreasing. The reevaluation of traditional foods and their advantages and disadvantages are discussed. New food processing and packaging technologies are being applied to traditional foods, including tofu, miso, natto, and koji. Recently a method has been found to extend the shelf life of natto beyond the traditional 1-2 day period. Miso has been freeze-dried.

"Another application of a new process for the traditional foods is the emulsion curd which is a semi-solid mixture with definite proportion of soybean protein, oil and water. It keeps its form without flow. Even the dried or frozen product recovers its original texture by hydration or thawing. Therefore, it is used as a substitute in dried or frozen *Tofu.* Regular *Tofu* cannot recover its texture once it is frozen or dried...

Miso can be enriched with vitamin B-2 and calcium, and its salt content lowered. Since 1980 the Laboratory of Food Science at Kyoritsu Women's University has been conducting a research survey on traditional foods and dishes in Japan in cooperation with the Cooking Research Laboratory. "This project consists of three components: (a) survey of the present status of traditional foods on local basis at respective regions by visiting prefectural research organisations–universities and colleges; (b) sending questionnaires to students for seeking information on the position of the traditional foods in the dietary patterns of individual homes and also to obtain their comments on the future prospects of the local traditional foods; (c) and documentation regarding local traditional foods, followed by classification according to preparation or cooking method for analysis. On the basis of the collected data, the relationship between each local traditional food and its natural, cultural and historical background has been studied and published in the university's journals. More efforts are being made to identify the reasons as to why and how some traditional foods have survived in certain regions, while the others have disappeared or reached the verge of extinction.

"Another related activity is the one carried out by Ajinomoto Company, a major food manufacturer in Japan, which has got the modern audio-visual media, video-tapes and 36 mm-films. Their team has been documenting the processing of some selected traditional foods like *Tofu, Yuba, Fu* and such other foods as demonstrated by professionals by using the old traditional methods and facilities. This would help in the documentation of traditional technologies before they disappear in the event of modernisation of such foods. Such tapes and films have been made available by the company...

"Traditional foods, especially those of plant origin, are prepared by such complex multi-step processes as to be called 'products of human wisdom.' Therefore there is so much to learn from such products if serious attention be paid. Indeed they have great potential for developing new food industries." Address: Kyoritsu Women's Univ., Tokyo, Japan.

8592. *Winds* (*Japan*). 1986. New York: Tôfutti. Tôfu kara aisu kriimu [New York: Tofutti. Ice cream made from tofu]. Aug. p. 53. [Jap]
• ***Summary:*** Color photos show: (1) A hip person wearing shades and eating Tofutti from a plastic dish. (2) A gallon carton of Tofutti parevine frozen dessert mix. (3) A swirl of chocolate Tofutti surrounded by fruits, nuts, and grated coconut. (4) A stylish shop in New York with neon signs in the window advertising frozen yogurt, ice cream, and Tofutti.

8593. Tsuchiya, Kanji. 1986. Plans to visit the USA to attend opening ceremony of American Soy Products soymilk plant in Saline, Michigan (Interview). Conducted by William Shurtleff of Soyfoods Center in Japan, Sept. 1. 1 p. transcript. [Eng]
• ***Summary:*** Mr. Tsuchiya called from Japan to say he plans to attend the opening ceremony Sept. 7-8 in Saline, Michigan. The president of the new company is Mr. Hiroyasu Iwatsuki. He will explain later about 12 soymilk plants he helped to open in China. Address: Tokyo [Technical consultant, Okazaki Marusan, Japan].

8594. Olson, Lise. 1986. Soymilk plant opens: State farmers to reap benefits of new facility [American Soy Products plant at Clinton, Michigan]. *Detroit News.* Sept. 10.
• ***Summary:*** The American Soy Products soymilk plant was dedicated on 9 September 1986. A small package (8.45 oz) of Edensoy sells for $0.59; the larger (33.8 oz) sells for $1.99. Edensoy comes in three flavors: plain (which has a wheat germ flavor), carob, and vanilla. In 1985 privately held Eden

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Foods had sales of about $12 million.

A large photo shows Yasuo Watanabe and Teizo Okada, two Japanese partners in American Soy Products, at the dedication of the new soymilk facility. Address: Michigan.

8595. *Toyo Shinpo* (*Soyfoods News*). 1986. Mukashi no dôgu de, dô dô to... Kurama no otôfuya-san. Tanaka Tôfu-ten [Tanaka Tofu Shop in Kurama, near Kyoto, uses old-fashioned tools to make tofu in the dignified, traditional way]. Sept. 11. p. 4. [Jap; eng+]
• ***Summary:*** The shop's owner, Kazushi Yamamoto, is 28 years old.

8596. *Japan Economic Journal* (*Tokyo*). 1986. Mouthwash rides tide of new garglers after high and dry years on the shelf Sept. 13. [Eng]
• ***Summary:*** "Fall of soy bean milk: While there are markets that explode after years of dormancy, some commodities lose popularity just as quickly, in most cases because of faddish consumers and over-competition.

"Riding on a health food boom, soy bean milk suddenly became an 'in' drink in 1981, doubled sales in the following two years, and created a ¥25-billion market, This year, only half that many soy bean milk packages are likely to be sold.

"The business ballooned to an 80-company industry in a year or so, and the market was severely hurt by low-quality products supplied by me-too makers, says Mitsuru Onozawa, a planning manager at Kibun Health Foods Co., a pioneer in that field.

"'We and other forerunners removed the strong soy flavor from the milk, and thus gained the popularity. The latecomers entered the market without that technology, and many customers found the soy bean milk repelling because of the soy smell.'"

8597. *Contra Costa Times*. 1986. Tofu ice cream hits Japan. Sept. 29.
• ***Summary:*** "Brightsong Light Foods of Petaluma sells a brand of tofu ice cream called Le Tofu. The first order of Le Tofu was shipped to a Tokyo distributor in late July, and is now appearing on the shelves of supermarkets in Tokyo suburbs."

8598. Meduski, J.W. 1986. Morinaga Tofu: Short evaluation of the product and its technology. Los Angeles, California. 9 p. Sept. 29. Unpublished manuscript. [9 ref]
• ***Summary:*** Includes a long discussion and appendix on analysis of glucono delta-lactone from corn starch and crude sugar. Note: According to the Merck Index (9th ed., 1976), "gluconolactone" is an equivalent and legal term for GDL. Address: Los Angeles, California.

8599. Ando, Seiichi. 1986. Kinsei toshi-shi no kenkyû [A study of city history in the Edo Period]. Tokyo: Seibun-do. [Jap]*
• ***Summary:*** Ando's most detailed publication on shoyu is given in the chapter titled "Kishu Yuasa shoyu no seisan to ryutsu [Production and distribution of Yuasa shoyu from Kishu]" (p. 301-12). Address: Osaka Sangyo Daigaku, Osaka, Japan.

8600. Bernd Lehmann International Consultants. comp. 1986. Erste internationale Tofu-Produkt-Praesentation: Tofu 86 [Report of the First International Tofu Products Expo, Seminar, and Buffet: Tofu '86]. Postfach 10 41 07, D-2000 Hamburg 1, West Germany. 17 p. Held on 24 Sept. 1986 at the Sheraton Hotel, Arabellastr. 6, Munich, Germany. [Ger]
• ***Summary:*** Held in Munich with 100 attendees, the conference was sponsored by Bernd Lehmann, International Consultants on the occasion of the IKOFA conference. It featured three speakers, a soy product exhibit (samples were flown in from around the world), and a tofu-based delicatessen buffet at which 24 recipes (12 warm and 12 cold) and were served. Many of these were prepared from Galactina or USA tofu or soy products. The proceedings list all recipe names and ingredients (in German).

The one day program (11:00 AM to 2:30 PM) was as follows: 1. Introduction by Dr. Siegfried Domin. 2. "Tofu: Production, characteristics, and advantages" by Dr. Peter Speck of Galactina. 3. Presentation of products for sampling from the USA, Japan, and Switzerland. 4. Tofu Buffet Lunch. 5. "The most interesting tofu new product developments from America" by Domin. 6. "European tofu products" by Speck. 7. "Development of the tofu market in Switzerland" by Ulrich Bringold of Galactina (see translation). 8. Discussion. Address: Munich, West Germany.

8601. Chandler, William U. 1986. The changing role of the market in national economies. *Worldwatch Paper* No. 72. 57 p. Sept. 22 cm. [71* ref]
• ***Summary:*** Contents: Introduction. Efficiency in Agriculture. Efficiency in energy use. The equity question. Changing reliance on markets. Conclusion.

"From the end of World War II until recently, centralized state-planning served as a model for almost half the world. Newly independent Third World countries faced with the choice between centralized control and market orientation usually chose the former. That their foreign rulers had been capitalists turned them against market systems...

"The world today is poised at a turning point in economic management. The abrupt Chinese shift to market mechanisms is the most dramatic example, not only because of the vast population affected, but because of the reform's spectacular early successes. Many African nations, plagued with agricultural decline, have begun to extend market incentives of agriculture. Latin American nations, plagued with debt, have moved to sell off state-owned companies. The World Bank has helped spur this movement by

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providing technical advice and financial assistance."

In terms of grain productivity, the countries with the highest land productivity are the UK (6.6 tonnes/ha), France (6.0), Hungary (5.4), East Germany (4.5), and the USA (4.4). The countries with the highest labor productivity (in metric tons per worker per year) are the USA (160.3), the UK (57.3), France (34.2), West Germany (29.2), and Hungary (23.6). All of these countries (including Hungary, but excepting East Germany) have market-oriented economies. Countries with a centrally planned agricultural sector generally fall far behind in these two crucial measures. The leaders are East Germany (4.5 / 14.9), Soviet Union (1.4 / 8.5), and Yugoslavia (4.2 / 5.2). "Agricultural productivity has fallen in virtually every centrally planned nation over the last 20 years. Farm productivity continues to increase in market-oriented nations.

"The Hungarian model holds important lessons for the rest of the world, for it shows that market economics can work even in the absence of private land ownership, as long as the producers effectively control their work. It was the Hungarian experiment, moreover, that paved the way for the Chinese reforms."

"Hungary, the most market-oriented country in Eastern Europe, and possibly the most responsive to quality-of-life issues, developed an alternative to central planning called the New Economic Mechanism. Initiated in 1968 by János Kádár, it resembled both in name and substance the New Economic Policy of Lenin who, in frustration with the failure of centralization, introduced some market mechanisms in the Soviet Union just before his death. Stalin later abolished these... three-fourths of Hungarian agricultural land is state- or cooperative-owned... Hungarian farms are run mainly by cooperatives... the cooperatives 'are real cooperatives,' meaning that they are self-managing. The cooperatives, not the central state apparatus, decide what they will grow and how they will grow it."

"The two Germanies make an interesting comparison of market-oriented and centrally planned agriculture... West German land and labor productivity,... exceed East Germany's by 20 percent and 100 percent, respectively."

"Post-Mao China provides a rare and vast laboratory for testing the effect of greater reliance on market mechanisms in agriculture. China before 1978 typified Soviet-style agriculture. But in December 1978, the Chinese decided to switch to market-oriented agriculture. The shift boosted grain output by a third between 1978 and 1985, and provided improvements in per capita consumption that stand in marked contrast to Soviet trends. The shift also doubled oilseed production and raised meat production 80 percent. Significantly, this growth was achieved along with a 4 percent reduction in cultivated area, as highly erosive land was idled, and a decline in water and pesticide use. Shifting to the market spurred a dramatic increase in fertilizer use, a near doubling within the eight-year span. The increases in output and efficiency translated into higher rural incomes, which have grown as much during the eight years since 1978 as in the previous 30 years" (p. 13).

The USA, Japan, and the Common Market countries subsidize agriculture heavily. In the USA taxpayer subsidies are projected to exceed $30 billion in 1986. Japanese farm price policies cost consumers and taxpayers 62% of the value of Japan's agricultural output in 1982. In Japan the price of rice paid to producers is 330% the world price, and wheat is 380%. Subsidies in the EEC aim to preserve the farm sector and its way of life. "But this goal could be equally well served without the damage caused by price distortions if governments substituted agricultural price supports with direct income transfers... When policies such as minimum price supports are provided in order to ensure food security and stabilize markets–that is, when supports are set below international market levels–they can be useful. When supports exceed world market levels, however, they interfere with trade, stimulate environmentally disruptive overproduction, and waste taxpayers' and consumers' money" (p. 16).

In terms of energy efficiency, measured by megajoules of energy per dollar of GNP, the top 8 countries are all market-oriented: France (8.6), Sweden (8.6), Japan (9.7), Spain (11.8), West Germany (11.8), Italy (12.9), UK (17.2), and USA (19.3). Energy consumption per unit of output is highest in centrally planned economies.

In terms of life expectancy (years at birth), in 1983, the top 8 countries were all market oriented: Sweden (77), Japan (77), Spain (76), USA (75), France (75), West Germany (74), UK (74), Italy (74).

Case studies in centrally planned and more market oriented economies are given for China (p. 34-36), Brazil and Mexico (p. 37), Tanzania, Zimbabwe, and Egypt (p. 39).

Markets have at least two advantages over central planning. First, they are largely self-administering. The price mechanism brings demand more or less automatically into equilibrium with supply. Second, prices are meaningful reflecting real scarcity when high. Address: Worldwatch Inst., 1776 Massachusetts Ave., N.W., Washington, DC 20036.

8602. Fukushima, Danji. 1986. New development in the process of traditional soyfoods in Japan. In: F.G. Winarno, ed. 1986. International Soyfoods Symposium. xiv + 403 p. See p. 21-57. Held 16-18 Sept. 1986 in Jogyakarta, Indonesia. [22 ref]

• ***Summary:*** Contents: Abstract. Soy milk. Tofu. Soy sauce. Miso. Natto.

Table 1 (p. 28) shows changes in the size of the soymilk market in Japan from 1979 to 1985. For each year there are statistics for the amount of soymilk sold (in kiloliters), the ratio of that amount to the amount sold during the previous year, the total retail value in yen, the ratio of the retail value

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that year to the value the previous year, and the ratio of the retail value that year to the value in 1979. The amount of soymilk sold in million liters is as follows: 1979–6.5 million liters. 1980–12.0. 1981–25.2. 1982–54.3. 1983–111.5. 1984–84.013. 1986–55.354.

Also contains a detailed analyses of the off-flavors in soymilk. These off flavors are brought about through the hydrolysis of the glycosides by the Beta-glycosidase contained in soybeans. Contains 46 figures, including many photos, flowcharts, and equipment designs. Address: Food Research Inst., Kikkoman Co. Ltd., 339 Noda, Noda City, Chiba prefecture, Japan.

8603. Fukushima, Danji. 1986. Preservation of traditional soy products. In: F.G. Winarno, ed. 1986. International Soyfoods Symposium. xiv + 403 p. See p. 267-93. Held 16-18 Sept. 1986 in Jogyakarta, Indonesia. [25 ref]
• ***Summary:*** Contents: Abstracts. Soy sauce and miso. Soy milk, tofu, and their related products. References. Address: Food Research Inst., Kikkoman Co. Ltd., 339 Noda, Noda City, Chiba prefecture, Japan.

8604. Hara, Toshio; Ishizaki, A.; Ueda, S. 1986. Formation of heteroduplex molecules between plasmids pUH1 and pLS11 in polyglutamate-producing *Bacillus* strains: Note. *Agricultural and Biological Chemistry* 50(9):2391-94. Sept. [15 ref]
• ***Summary:*** The main component in the viscous material on the surface of natto is gamma polyglutamate (gamma-PGA), which contains D- and L-glutamate in varying proportions. "A plausible mechanism for the biosynthetic pathway for PGA has been proposed by Thorne et al." (1955a & b) for another species of *Bacillus.*

Photos show: (1) Agarose Gel Electrophoresis of Digests of pLS11 with Lanes 1-4. (2) Hybridization patterns. (3) Heteroduplex molecules between pUH1 and pLS11.

Illustrations show: (1) A circular restriction map and regions of homology of pLS11. (2) An interpretation of the measurements in photo (3). Address: 1-2. Dep. of Food Science & Technology, Faculty of Agriculture, Kyushu Univ., Hakozaki, Fukuoka 812, Japan; 3. Dep. of Applied Microbial Technology, Kumamoto Inst. of Technology, Ikeda, Kumamoto 860, Japan.

8605. Katagiri, Mitsuaki; Shimizu, Sumio. 1986. Kaku-shu miso-chû no gasu kuromatogurafii ni yoru esuteru gata shibô-san, yuri shibô-san oyobi yûki-san no teiryô [Gas chromatographic determination of esterified and free organic acids in various kinds of miso]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 33(9):667-73. [16 ref. Jap; eng]
• ***Summary:*** Twenty misos were analyzed by gas chromatography. Contents of ethyl esters of fatty acids were about double the values previously reported by the celite method. Approx. 50% of the total fatty acids in the original glycerides were present as their ethyl esters in miso. Address: Dep. of Domestic Science, Iida Women's Junior College, Matsuo 610, Iida-shi, Nagano 395, Japan.

8606. Rice, Judy. 1986. E-B sterilization & new product marketing–Main themes at aseptic conference. *Food Processing* (*Chicago*) 47(9):73-75. Sept.
• ***Summary:*** About the Aseptipak '86 convention in Atlanta, Georgia–the fourth annual aseptic packaging conference.

In the section titled "Aseptic tofu" Art Mio discusses Morinaga Nutritional Foods. It wasn't until 1984 that Morinaga began investigating the possibilities of setting up an office in the USA. Morinaga Nutritional Foods, Inc. was formed as a subsidiary of the Japanese dairy products manufacturer, Morinaga Milk Industry Co., and established a base office in Los Angeles (California) in May 1985. In October 1985 the company began to roll-out its aseptic tofu in the USA. The Produce Marketing Association (PMA) helped Mio to meet face to face with tofu buyers across the nation. He discovered the tofu had reached every corner of the U.S. supermarket industry, but that buyers "all had handling and spoilage problems with the plastic tub, water-packed, poly film-sealed tofu. All indicated an interest in a non-spoilable, refrigeration-not-required tofu. Of course, most couldn't believe it."

Mio concluded by noting that although most of Morinaga's sales are still with their Asian trade, supermarket sales as a percentage of total sales are steadily growing. A photo shows Art Mio.

8607. *Toyo Shinpo* (*Soyfoods News*). 1986. Amerika ni dai-2 kôjô. Kikkôman kokusai-ka ni hakusha [A second soy sauce plant in the USA. Kikkoman spurs on internationalization]. Oct. 1. p. 1. [Jap; eng+]
• ***Summary:*** Note: Talk with Kikkoman. 1988. Aug. 29. Construction on the plant has not yet started.

8608. *Toyo Shinpo* (*Soyfoods News*). 1986. [Tofu hot dogs or frankfurters can be made cold. Nishikawa Shoten suggests new protein binding technique using tofu with meat]. Oct. 11. p. 6. [Jap; eng+]
• ***Summary:*** Product contains 42.2% regular tofu, 22.6% cooked pork, 16.9% fish meat, 7% starch, 3.4% oil, 2.9% sugar, 1.5% egg white, 1.35% natural seasoning, 1.25% salt, 0.9% spices.

8609. *Toyo Shinpo* (*Soyfoods News*). 1986. Tônyû. Naze urenaku natta. Uriage mo meekaa mo gekigen [Soymilk. Why has it stopped selling? Drastic decrease in both sales and number of manufacturers]. Oct. 11. p. 8. [Jap; eng+]

8610. *Toyo Shinpo* (*Soyfoods News*). 1986. Takai seisakusho. Honsha kôjô o kaichiku. Sukurappu ando birudo hoshiki.

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2-3 nen go o medo ni [Takai Tofu & Soymilk Equipment Co. rebuilding its main factory in place using the scrap and build method. It should be finished in 2-3 years]. Oct. 11. p. 1. [Jap; eng+]

8611. *Toyo Shinpo* (*Soyfoods News*). 1986. Zenkoku shuyô toshi no tôfu seihin nenkan kônyû kingaku [Annual amount and value of tofu consumed per household in Japan, by cities]. Oct. 21. p. 1-2. [Jap; eng+]
• ***Summary:*** In 1985 the average household bought 88.5 cakes of tofu costing 7,337 yen. The average price/cake was 79.6 yen. Compared with 1970 the number of cakes rose 0.5%, the amount spent rose 3.05-fold, and the cost of one cake rose 2.88 fold. In 1985, of the total money spent on soyfoods per household (13,435 yen), 58% was spent on regular tofu, 30.2% on fried tofu (pouches and burgers), 12.3% on natto, and 2.8% on other soyfoods. Cities with the highest consumption of tofu per household are Morioka (122.7 cakes), Toyama (115.7), Kagoshima (105.1), Kokushima (105.0), Tottori (102.3). Tokyo is in 29th place with 87.5 cakes.

In 1985, foods with the fastest growing consumption per household compared with 1970 were: coffee and cocoa +116.6%, prepared foods +63.9%, processed meats 47.0%, raw meats 35.4%, foods eaten away from home +34.6% and oils/fats +34.5%. Those decreasing the most rapidly are: rice -34.3%, processed seafoods (e.g. kamaboko) -29.0%, fresh fish and shellfish -21.1%, eggs -13.4%, milk -10%, soyfoods -3.7%.

8612. *Toyo Shinpo* (*Soyfoods News*). 1986. Kenko imeeji-do besuto 20. 6 i ni nattô, 11 i ni tôfu [The 20 Japanese foods with the healthiest image. Natto is 6th and tofu is 11th]. Oct. 21. p. 1-2. [Jap; eng+]
• ***Summary:*** The healthy image ranking, based on a survey of 1,000 households in October 1985. Conducted by Shokuhin Sangyo Center in Tokyo (Toranomon. Tel. 03-591-7451) and titled "Health and Food." 1. Sardines (340 points out of a possible 1,000), 2. Shirasu (the young of sardines, 298), 3. Process cheese (259), 4. Real fruit juice (241), 5. Umeboshi salt plums (227), 6. Natto (227), 7. Natural cheese (225), 8. Brown rice (218), 9. Honey (210), 10. Tofu (204), 11. Wakame (sea vegetable, 197), 12. Soymilk (196), 13. Yogurt (193), 14. Sesame oil (181), 15. Konnyaku (180), 16. Cow's milk (180), etc.

8613. Fujinami, H. 1986. Miso no hinshitsu hyôka to sono yôgo ni tsuite [Quality evaluation of miso and the terminology used therein]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 81(10):711-14. Oct. [Jap]
Address: Chuo Miso Kenkyujo.

8614. Hosokawa, N.; Kato, H.; Nanba, T.; Kito, Y. 1986. Teishoku-en miso no tayô-ka [Diversification of salt-reduced soybean miso]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 81(10):688-92. Oct. [6 ref. Jap]
• ***Summary:*** Several trials were carried out to improve and make new types of salt-reduced miso employing carbohydrate-rich ingredients such as pre-cooked rice, fermented broken rise mash, fruits (including orange, apple paste, strawberry, banana), tomato paste, grape juice, spices (such as ginger and caraway), and yeast. Address: Food Research Inst., Aichi prefecture, Japan.

8615. Ito, Hiroshi. 1986. Tenpe no nihon ni okeru kenkyû no ayumi. I. Tenpe to wa nani ka? [The progress of tempeh research in Japan. I. What is tempeh?]. *Daizu Geppo* (*Soybean Monthly News*). Oct. p. 20-24. [Jap]
Address: Norin Suisan-sho Shokuhin Sogo Kenkyu-jo, Biseibutsu Riyo Kenkyushitsu-cho [Tsukuba, Ibaraki-ken, Japan].

8616. Kotzsch, R.E. 1986. The pioneering spirit of Ohsawa-Japan: Japan's first macrobiotic company puts principles before profits. *East West*. Oct. p. 72, 74-75.
• ***Summary:*** In 1953 George Ohsawa "left Japan to teach the principles of macrobiotics in other lands. Several years later, after sojourns in India, Africa, Europe, and America, he returned to his homeland for a visit. When he saw that it had become almost impossible to procure traditional-quality foods in his own country, he urged some of his followers to become involved in farming and in food processing. He encouraged others to set up a company that would seek out existing producers of high-quality items and market their products in Japan and abroad. Thus was born Ohsawa-Japan, staffed by loyal disciples of Ohsawa and headed by his sister-in-law Flora Tanaka.

"From its inception Ohsawa-Japan was a company rich in ideals and slim in capital. As Yoshi Nanabayashi, its export manager, told me, 'We have always been, above all, a macrobiotic company. So our first concern has been to distribute only the highest-quality food, made according to strict standards. Considerations of cost and profit have always been secondary. Mr. Ohsawa taught that proper food is the key to the health and happiness of humanity. Our main aim has been to promote the health of individuals and of society, not to make a lot of money. And,' he added with a laugh, 'we have been fairly successful.'"

What the Tokyo-based company lacks in professionalism it makes up for in dedication to its ideals. From several score of traditional Japanese food producers (mostly small and family-run) around Japan, it gathers more than 100 products (including miso from Yamaki Miso Co., shoyu, and tamari), packages them, and distributes them to the small but strong network of macrobiotic stores and centers throughout Japan.

For years Ohsawa-Japan's "exclusive North American distributor was Chico-San, the natural foods company located in Chico, California. In 1984 Chico-San, which

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had thrived on its rice cake business, was sold to the H.J. Heinz Corporation. Six months later the import rights to the Ohsawa-Japan products were sold back to Chico-San's original owners, Herman Aihara and Bob Kennedy. At that point a new company, Ohsawa America, was set up to import and distribute the products of Ohsawa-Japan. Today that company, based in Chico, handles about seventy basic Japanese macrobiotic items...

"The main difficulty facing Ohsawa America is the high prices it must ask for its products. The cost of living in Japan is one of the steepest in the world... In addition, the value of the yen has increased dramatically." Lane Seiger is operations manager of Ohsawa America. As Joel Wollner notes, "Like Ohsawa-Japan, Ohsawa America is a philosophy-driven company." Address: Staff.

8617. Lampert, Junko. 1986. The tofu cookbook: Recipes for traditional and modern cooking. Chronicle Books, 1 Hallidie Plaza, Suite 806, San Francisco, CA 94102. 97 p. Illust. Index of recipes. 26 cm. [Eng]
• ***Summary:*** Includes 55 recipes and many color photos. Address: Japan.

8618. Mori, Shôzô; Sasaki, M.; Nonomura, N. 1986. Amerika shijo shôyu no kannô hyôka-taki hinshitsu no tokuchô [Organoleptic quality of soy sauce on the American market]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 81(10):701-06. Oct. [14 ref. Jap] Address: Kikkoman Jôzô Kagaku Kenkyû-jo.

8619. **Product Name:** Shree Akita Miso, Akadashi Miso. Renamed Akita Miso.
Manufacturer's Name: Nepal Soya Industries.
Manufacturer's Address: 9/374 Bhedashing, Jamguthi, Kathmandu, Nepal. Phone: 229130.
Date of Introduction: 1986 October.
Ingredients: Akita miso: Soybean, rice, koji starter, water, salt.
Wt/Vol., Packaging, Price: 1 kg plastic bag.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Letter from Mr. Achutananda Vaidya of Nepal Soya Industries. 1992. Dec. 26. He started making tofu in Kathmandu in 1974. "In 1979-80 I was invited to Japan for 9 months training at the Akita Prefecture Brewing Laboratory. During that time I also learned in detail the processes for making soy sauce, miso, and soyamilk. During that period I also got a chance to read *The Book of Tofu, The Book of Miso, Miso Production,* and *The Book of Tempeh* all of which helped me very much. I still have all those books. In 1985 I was invited by the Rotarians of Akita-Aomori to return to Japan for 1 month to receive further technical training in making tofu, miso, soy sauce, soyamilk, moyashi (sprouts), koji, fruit fermentations for wine, etc. Today I produce tofu, soy sauce, and miso in my small factory in Kathmandu." His business card notes: "Food Technology in Brewing from Japan. Products & Suppliers: Tofu (Vita), Soyamilk (Vitabean milk), Soya Curd, Soya Sauce, & Miso."

Letter from Mr. Achutananda Vaidya of Nepal Soya Industries. 2002. April 12. He started to make this make this miso and to sell it in Japanese hotels and restaurants. It is now named Akita Miso. A label sent in April 2002 is for "Akita-Miso: Naturally fermented..."

8620. Shurtleff, William. 1986. Eden Foods, Edensoy, and American Soy Products: Bold and innovative venture–marketing soymilk in America. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 5 p. [1 ref]
• ***Summary:*** A brief history of Eden Foods and an analysis of the development of American Soy Products, based on interviews and other publications. Address: Lafayette, California.

8621. *SoyaScan Notes.* 1986. What are barley, pearl barley, and Job's tears? (Overview). Nov. 1. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Note: Barley was one of the first grains cultivated to provide food for both humans and animals. Because it has two hard, inedible husks, most barley is milled to some degree to make it more edible. The word "pearling" is used to describe the refining of barley down to the grain's endosperm (starch) layer. After the husks, bran and germ are removed, the remaining grain resembles a pearl. For the highest protein, fiber, vitamins, and mineral content, look for barley kernels that have been pearled enough only to remove the tough outer layers.

Barley comes in many forms and degrees of refinement. Hulled (also called whole) barley, has only the tough outer husks removed; it still contains the nutrient-rich germ and bran. Scotch or pot barley is husked and coarsely ground. Barley grits are husked and ground into medium-coarse pieces. Pearled barley has the husk and bran removed and has been steamed and polished; it comes in coarse, medium (the most commonly packaged), and fine sizes.

A new barley hybrid, high beta-glucan hulless, does not require pearling, contains more soluble fiber, and contains starch that is more stable during freezing and thawing.

Job's tears (*Coix lachryma-jobi*), used as an ingredient in some varieties of soymilk (such as Edensoy) and known as *Hato Mugi* in Japan, are the seed kernels of an annual grass long prized in the Orient for its health giving and nutritional properties. The term *Hato Mugi* is translated in some Japanese dictionaries as "pearl barley," but this is not correct; *hato* means "dove or pigeon" and *mugi* means "barley."

8622. *Toyo Shinpo* (*Soyfoods News*). 1986. Yooroppa de miso buumu. Hatsu gan bôshi ni kôka. Gen hatsu jiko irai kyuzo [Miso boom in Europe after Soviet nuclear accident.

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Effective in preventing cancer]. Nov. 1. p. 1. [Jap; eng+]
• ***Summary:*** Orders from Sendai Miso Shoyu jumped sevenfold after the Chernobyl nuclear accident on 26 April 1986 in the Ukranian SSR.

8623. Yoshinaga, George. 1986. Horse's mouth: Remember tofu. *Kashu Mainichi* (*Los Angeles*). Nov. 3. p. 1. [Eng]
• ***Summary:*** The Hinoichi plant near Little Tokyo was previously owned by Ken Osaki, who sold it to the Yamauchi family from Hawaii, who used their experience from the Hawaii operation in mechanizing the making of tofu. According to a news release just received from Hinoichi, "the one big change in the tofu industry came in the way it was dispensed at the retail level.

"Remember how they used to leave tofu in a large can filled with water and everyone who wanted to buy tofu used to stick their hands into the water to grab the cakes of tofu? There was no facility to wash one's hands before dipping into the can and no other way to grab the tofu without the use of one's hands. I wrote a column about it one day, commenting on how unsanitary it was that a food product which was generally eaten raw could be handled in such a fashion. Somehow the article was read by someone from the city's health department and a new regulation was passed requiring tofu to be packaged in individual containers... I recall the manufacturer of tofu was not too happy with the extra expenses required to not only buy the packaging material but also in setting up machinery to package it." Address: 915 E. First St., Los Angeles, California 90012-4083. Phone: 213-628-4686.

8624. *Toyo Shinpo* (*Soyfoods News*). 1986. Tettai-gumi ga zokushutsu no tônyû [Many major companies withdrawing from soymilk market in Japan]. Nov. 11. p. 6. [Jap; eng+]

8625. Seminar on Traditional Foods and Their Processing in Japan. 1986. Tokyo: NODAI Research Institute, Tokyo Univ. of Agriculture. 4 p. Held on 13-25 Nov. 1986 at Tokyo University of Agriculture, Tokyo, Japan.
• ***Summary:*** This document, which is an announcement of the seminar, contains two parts: (1) The 1-page introductory letter (28 cm), and (2) The 3-page Agenda (26 cm). The proceedings were published in 1987, edited by Fujiharu Yanagida.

The Agenda gives the opening session (Room A): Chairman I. Uritani. 11:00–11:30. Opening address by the chairman of organizing committee, Dr. Izuru Yamamoto, Director, Nodai Research Inst. Welcoming address by Dr. Takao Suzuki, President, Tokyo University of Agriculture. Address by representative of Japan Society for the Promotion of Science. (JSPS). Address by the president of the Society for Agricultural Education–Research Development Abroad (SAEDA), Dr. Jiro Sugi, Emeritus Professor, Tokyo Univ. of Agriculture.

11:30–11:45. Keynote address, Dr. Hiroyasu Fukuba, Professor, Ochanomizu University.

The following soy-related papers, which were published in the 1987 proceedings, are cited separately: Onchom, by Dedi Fardiaz. Miso, by Hisao Yoshii. Tofu, by Tokuji Watanabe. Indigenous fermented foods in Nepal, by Tika Karki. Improvement in traditional soy sauce fermentation, by Sri Hartadi. Address: Tokyo, Japan.

8626. Potter, Michael. 1986. History of Eden Foods and development of American Soy Products joint venture and Edensoy–1971 to 1986 (Interview). *SoyaScan Notes.* Nov. 14. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Michael Potter joined Eden Foods in Oct. 1971, and by Aug. 1973 he and Tim Redmond each owned 50% of the shares. Under their leadership the company grew steadily until 26 Nov. 1979, when a fire destroyed the Eden warehouse and $800,000 inventory. The firm with 100 employees and 2,400 products struggled for its life. After the fire, Redmond sold his stock back to the corporation and resigned. Thereafter the company moved to rural Clinton, Michigan, decreased its size and number of products, while switching its emphasis to manufacturing and marketing carefully selected imports.

A major reason for Eden's recovery after the fire can be traced to support from Muso, Eden's export partner in Japan. In the mid-1970s Muso had about 12 importers in America but by 1979 many of these had gone out of business. Each bankruptcy dealt Muso a painful blow, as had the fact that many of the natural food products that Muso had pioneered in Japan were now being imitated and launched by other, bigger companies in mainstream Japanese markets. Muso was hurting.

In July 1983 Eden Foods surprised the American natural foods industry by launching two designed-for-America long-life soymilks named Edensoy in plain and carob flavors. Made in Okazaki, Japan by Marusan Ai, packaged in stand-up retort pouches, and exported by Muso, the product was the result of a 15-month process involving trips to Japan to visit Marusan and consultations with the U.S. Food and Drug Administration in Washington, DC. [Note: Individual 6-ounce pouches retail for $0.69-79, making Edensoy the most expensive soymilk on the U.S. market, selling for 12.3 cents per ounce, or more than 5 times the price of cow's milk.]

Eden was the first Caucasian-American company to import soymilk, and their gamble paid off; sales skyrocketed sparked by extensive magazine advertising. Between September and December over 1 million 6-ounce packs had been sold. Now a host of competitors rushed to follow Eden's lead, and many of them went to Muso to ask for a similar product made by Marusan. Eden strongly objected. The result was that in January 1984 Eden became Muso's exclusive import agent in the United States, not only for

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soymilk but for all products. Both companies considered the agreement beneficial.

Just as Edensoy was getting into high gear, the product had its first serious encounter with the U.S. Food and Drug Administration, which on 2 March 1984 sent Eden Foods a strongly worded letter citing eleven claims in Eden's pamphlets that the agency considered erroneous. FDA expressed concern about the company's apparent endorsement of Edensoy as an infant formula; FDA asked Eden Foods to stop distributing the pamphlet in which Edensoy was promoted as "Good for Babies." Despite the hassle that followed, Edensoy performed much better that year than Eden had dared to hope: 1984 sales were 11 million units (individual pouches), 70% above target, and Potter began to dream about a Marusan soymilk plant in America.

By 1985 privately owned Eden Foods had about 50 employees and annual national sales of about $12 million. Sales that year were 10.25 million units, down 7% compared with 1984. By 1986 Potter estimated that Eden Foods had 38-40% of the $50 million a year of the soymilk retail consumer market in the US. Edensoy accounted for 20% of Eden Foods' sales, and Edensoy plain was selling better than any other brand in a small-sized carton. But the market was getting crowded. Yuppies were buying Edensoy. The macrobiotic market was only a small segment for Edensoy.

See also interview with Potter (Nov. 1986) on "History of Eden Foods: Building a soymilk plant in America." Address: President, Eden Foods Inc., 701 Tecumseh Rd., Clinton, Michigan 49236. Phone: 800-248-0301 or 517-456-7424.

8627. Tanikawa, Harry. 1986. Recent developments at House Foods and Yamauchi Inc. (Interview). *SoyaScan Notes.* Nov. 15. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Their soymilk was launched in April 1986 in Pure Pak, named Hinoichi Soy Drink, in 4 flavors: Plain, original (with fructose and oil added), mocha, and chocolate. It is sold only in the Los Angeles area in Asian-American food stores. It will never be sold in natural food stores. Pure Pak limits geographical distribution.

House Foods and Mr. Yamauchi now each own 50% of the company. It seems like a happy marriage. Mr. Yamauchi is still very involved in the daily operation of the business. They dropped the parfait before the partnership. Address: Los Angeles, California.

8628. Burum, Linda. 1986. Breakfast in Chinatown and other Asian spots. *Los Angeles Times.* Nov. 16. p. S106.
• ***Summary:*** The section titled "Japanese" begins: "Amid the jangle of downtown traffic, A Thousand Cranes is an oasis of flagging civility." This lovely, calm restaurant, with its own stylized Japanese garden, is in the New Otani Hotel, at 120 S. Los Angeles St., Los Angeles. Dressed in a classical kimono, the waitress brings breakfast on a lacquered tray. On it is a covered bowl of miso soup, plus rice and other delicacies. "One may select from several other *okazu* (the things to eat with rice) such as squares of delectably garnished and very fresh *tofu* or *natto,* a little mound of flavorful fermented bean" [sic, beans].

"A jar of *umeboshi,* the mouth puckering tiny sour plums known as nature's own mouthwash, is placed on each table; one of these cleanses the palate."

The section titled "Chinese" begins with a visit to Yi Mei, a very good traditional Chinese bakery in Monterey Park (near downtown Los Angeles), known for its "Northern-style breakfasts centering on large bowls of soy milk that may be ordered slightly sweetened or seasoned with a dash of sesame oil and salt. Look around and watch everyone dipping *yu t'iao,* long, airy fried buns that resemble unsweetened crullers, into their soy milk." The crullers soak up the soy milk, then everyone noisily (its impossible to do this quietly) eats the crullers.

8629. *Toyo Shinpo* (*Soyfoods News*). 1986. Hyôban no yoi tônyû pan. Mitsubishi Kasei Shokuhin ga hatsubai [Good response to soymilk bread. Mitsubishi Kasei Foods has started to sell it]. Nov. 21. p. 1. [Jap; eng+]
• ***Summary:*** Soymilk has replaced egg, nonfat dry milk, and water in the bread formula.

8630. *Food Technology.* 1986. U.S. & Japanese firms form American Soy Products. 40(11):54, 58. Nov.
• ***Summary:*** Concerns Eden Foods' soymilk plant in Michigan. "Eden Foods will handle product marketing, sales, and distribution, while the Japanese forms of Kawasho International, Marusan, Muso, and Seikensha will supply manufacturing equipment, oversee administration and financing, and be responsible for product production, as well as coordinate international sales of Edensoy." A small photo shows the plant.

8631. Hayashi, Ken-ichi; Sakaguchi, S.; Sakaguchi, G. 1986. Primary multiplication of *Clostridium botulinum* type A in mustard-miso stuffing of 'karashi-renkon' (deep-fried mustard-stuffed lotus root). *International J. of Food Microbiology* 3(6):311-20. Nov. [11 ref. Eng]
• ***Summary:*** In June 1984 a large scale outbreak of type A botulism occurred in 14 prefectures in Japan, involving 36 cases and 11 deaths due to consumption of vacuum packed karashi-renkon. The causative organism may well have been *Clostridium botulinum.* Address: 1. Shiga Prefectural Inst. of Public Health, 13-45 Gotenhama, Ohtsu-shi, Shiga 520; 2-3. College of Agriculture, College of Agriculture, Univ. of Osaka Prefecture, Sakai-shi, Osaka 591, Japan.

8632. Iwane, Atsuko; Yasui, T.; Tsutsumi, C. 1986. Yuba seizô katei ni okeru seisei maku-chû no tôgan-ryô no

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henka [Changes in low molecular weight carbohydrates in yuba (soymilk skin) during yuba-film formation]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 33(11):783-85. Nov. [6 ref. Jap; eng]
• ***Summary:*** Sucrose and stachyose were major sugars in the skins, followed by raffinose. Sucrose, raffinose and stachyose contents of the first and the last formed films were 1.42% and 8.03%, 0.21% and 0.53%, and 1.97% and 7.17% on dry basis, respectively. Results indicated that because of the high solubility of these saccharides, they would be increasingly concentrated in the residual soymilk and their contents in films increased gradually as the film formation process proceeded. Address: 1. Morioka Junior College of Iwate Prefecture, 1-48 Sumiyoshi-cho, Morioka-shi, Iwate 020; 2-3. National Food Research Inst., Ministry of Agriculture, Forestry and Fisheries, 1-2, Kan-nondai 2-chome, Yatabe-machi, Tsukubagun, Ibaraki 305. All: Japan.

8633. *J. of the American Oil Chemists' Society.* 1986. Soymilk facility. 63(11):1406. Nov.
• ***Summary:*** About American Soy Products and the new Edensoy plant in Michigan.

8634. Kawabata, Makoto; Taguchi, Kuniko; Ohtsuki, Kozo. 1986. Okara o shokuryo toshita nattô oyobi tenpe no shokuhin kagaku [Food chemical evaluation of fermented okara products, okara-natto and okara-tempeh]. *Kyoto Furitsu Daigaku Gakujutsu Hokoku* (*The Scientific Reports of the Kyoto Prefectural University* (*Natural Science and Living Science*)) 37(Series B):9-15. Nov. (Chem. Abst. 107:38312). [13 ref. Jap; eng]
• ***Summary:*** Okara, a residue of water-extracted ground soybeans, is produced in large amounts as a by-product of commercial production of tofu and soymilk. Although it contains a large amount of dietary fiber plus 4.8% high quality protein, it has a poor taste and rough texture, and is relatively indigestible.

In this study, natto and tempeh were prepared from okara by fermentation with *Bacillus subtilis* (*natto*) and *Rhizopus oligosporus* (or *R. oryzae*).

Natto is a sticky paste with the characteristic flavor and odor of natto. Okara tempeh has a sausage-like texture, bound together by the fragrant white Rhizopus mycelium, which also covers its surface. Because of its good, bland flavor and because of its high content of dietary fiber, it can be fried in oil and used as a fiber-rich food; powdered or minced tempeh can be used to add fiber to cookies, bread, muffins, etc.

The riboflavin content of both products rose dramatically during fermentation; 33.1 times for okara natto and 32.7 times for okara tempeh. Vitamin B-6 also increased in both foods. Address: Lab. of Food Chemistry, Dep. of Food Science, Kyoto Prefectural Univ. [Japan].

8635. **Product Name:** [Kikkoman Instant Wakame Soup (Seaweed Soup with Miso)].
Manufacturer's Name: Kikkoman Corporation.
Manufacturer's Address: Noda 278, Chiba-ken, Japan.
Date of Introduction: 1986 November.
New Product–Documentation: Spot in Food & Beverage Marketing. 1986. Nov. p. 12, 60.

8636. McMath, Bob. 1986. Hot products: Japanese foods 'stir' up interest. *Food & Beverage Marketing.* Nov. p. 12, 60.
• ***Summary:*** Soyfoods included in the Kikkoman instant soup mix line are Osuimono (Japanese Clear Broth), Aka Miso Soup (Soybean Paste Soup–red), Shiro Miso Soup (Soybean Paste Soup–white), Tofu Miso Soup, and Wakame Soup (Seaweed Soup, a color photo of which is shown). Each packet contains 3-4 individual servings and retails for $1.19 to $1.39.

8637. **Product Name:** [Soymilk Bread].
Foreign Name: Tônyû pan.
Manufacturer's Name: Mitsubishi Chemical (Kasei) Foods Co.
Manufacturer's Address: 5-13-12 Ginza, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1986 November.
Ingredients: Incl. flour and soymilk.
New Product–Documentation: Toyo Shinpo (Soyfoods News). 1986. Nov. 21. p. 1. "Hyoban no yoi tonyu pan. Mitsubishi Kasei Shokuhin ga hatsubai [Good response to soymilk bread. Mitsubishi Kasei Foods has started to sell it]." Soymilk has replaced egg, nonfat dry milk, and water in the bread formula.

8638. Nanba, Kazuyoshi; Nagasawa, Taro. 1986. Tônyû no __ jôteki anteisei ni oyobosu Ca^{2+} tenka no eikyô ni tsuite [Effects of the addition of calcium ion on the colloidal stability of soymilk]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 33(11):745-51. Nov. [16 ref. Jap; eng]
• ***Summary:*** In order to prepare soymilk with a high calcium content equivalent to cow's milk (25mM), the effects of the addition of calcium salts on the colloidal stability of solutions containing 7S or 11S globulins and commercial soymilk were investigated by determining relative viscosity, soluble nitrogen (protein), and pH. When various calcium salts, such as calcium chloride ($CaCl_2$), calcium sulfate ($CaSo_4$), calcium citrate, and calcium phosphate were added to a solution containing 0.1% of 7S or 15S globulins, or to soymilk, calcium chloride affected the stability more than calcium sulfate, calcium citrate, and calcium phosphate, in decreasing order of sensitivity. Colloidal stability of the solutions was increased with an increase in pH in the

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buffer solution. Soymilk containing disodium hydrogen phosphate (20mM) or sodium citrate (20mM) did not show any precipitation, even when 19mM of calcium chloride was added to the soymilk. Stability of soymilk in the presence of calcium salts increased with increasing chain length of the phosphates. Calcium fortified soymilk (19mM Calcium chloride added) containing sodium citrate (20mM), disodium hydrogen phosphate (20mM), sodium pyrophosphate (15mM), or sodium tripolyphosphate (10mM) were highly stable without any signs of precipitation and coagulation at 4ºC for 7 days. Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, Tamagawa Univ., 6-1-1, Tamagawagakuen, Machida-shi, Tokyo 194, Japan.

8639. Swientek, Robert J. 1986. Merging of two technologies produces aseptic soy milk: East meets West. *Food Processing* (*Chicago*) 47(12):128-29. Nov.
• ***Summary:*** In July 1983, Eden Foods introduced Edensoy soymilk into the U.S. market. Made by Marusan Co., Ltd. in Japan, the product is packed in retortable pouches. Today the product is distributed nationwide and sold in about 20 supermarket chains, including Kroger in the Detroit area and Tops in Buffalo. "According to Michael Potter, President of Eden Foods and C.E.O. of American Soy Products, Edensoy holds a 38-40% market share of the $20 million/year soy milk retail consumer market."

Construction of the Edensoy plant began in October 1985 and was completed in August 1986. It was officially dedicated on September 9. Address: Associate Editorial Director.

8640. Taira, Harue; Tanaka, Hiromi; Okano, Hirobumi. 1986. [Quality of soybean seeds grown in Japan. XII. Influence of seeding time and planting density on yield, weight of 100 seeds, and chemical composition of soybean seeds]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 49. p. 29-38. Nov. [13 ref. Jap; eng]
• ***Summary:*** In 1981 three soybean cultivars / varieties were grown at the Ibaraki Experiment Station. Yield, weight of 100 seeds, and chemical composition differed among the varieties by planting time. A high plant density significantly increased the yield and decreased the ash content. Address: 1-2. National Food Research Inst.; 3. Ibaraki Agric. Exp. Station, Mito, Ibaraki. All: Japan.

8641. Tanaka, Yoshikazu; Azuma, Keiko; Hirata, Takashi. 1986. [Studies on quality index of aseptic soymilk on preservation]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 49. p. 135-40. Nov. [20 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 32(7):457-62 (1985). Soymilk prepared commercially using an aseptic packaging system was stored at 5, 25, or 37ºC for 2 months. The quality of this soymilk was then evaluated by determining the microbial count, oxidation-reduction potential (ORP), chemiluminescence, and free amino acid contents. The soymilk was also subjected the a Color Test and organoleptic evaluation.

No microorganisms were detected in the stored soymilk at any temperature, indicating the effectiveness of the process. Organoleptically, however, the soymilk deteriorated during storage, at 25ºC for 2 months or at 37ºC for half a month. The color also changed from yellowish to whitish or faded. The pH of the soymilk decreased [it became more acidic] almost immediately after storage. The ORP decreased and the chemiluminescence increased during storage. No change was observed in the composition or content of free amino acids. However the ammonia content increased during storage and was found to be closely correlated with storage period and temperature. Therefore, ammonia content can be used as a good index of the quality of aseptically packed soymilk. Address: National Food Research Inst., 2-1-2 Kannondai, Yatabe, Ibaraki, Japan.

8642. Potter, Michael. 1986. Re: History of Eden Foods. Letter to William Shurtleff at Soyfoods Center, Dec. 2–in reply to inquiry. 1 p. Typed, with signature on letterhead.
• ***Summary:*** In July 1967 the name "Eden Organic Foods, Inc." started to be used as the name of this company. This was changed to "Eden Foods, Inc." in November of 1969.

In Feb. 1972 Eden Foods began to import foods from Japan, and in June 1972 Muso Shokuhin in Japan became their supplier.

"In Oct. 1971, after providing effective services to Eden Foods, Inc., 13.5% of the common stock of Eden Foods, Inc. was given to Michael Potter by the corporation. At this point the common stock ownership of Eden was: Between William and Judith Bolduc 43.25%, Timothy Redmond 43.25% and Michael Potter 13.5%.

In Feb. 1972 Eden began to import foods from Japan, and in June 1972 Eden began to import foods from Muso Shokuhin.

"In August of 1973 the Bolducs offered to sell their stock in Eden to Michael Potter. Michael Potter accepted this offer and purchased their stock. Because of Tim Redmond's dedication to Eden, Mr. Potter gave enough of this common stock to Mr. Redmond so that the common stock ownership of Eden Foods, Inc. became 50% M. Potter and 50% T. Redmond.

"This situation remained the same until January 1980 when, after a fire destroyed our offices and warehouse, Mr. Redmond sold his stock back to the corporation and resigned, the corporation awarded common stock to its management and Mr. Clifford Adler purchased a significant block of this common stock."

In Jan. 1984 Eden Foods became Muso Shokuhin's

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exclusive American import agent. In June 1985 American Soy Products was founded. Presently the suggested retail price of Edensoy is $0.59 per 250 ml pack and $1.99 per liter pack. They are selling for less in some places, i.e. $0.49 and $1.65, respectively.

11,000,000 individual units (6 fl. oz. = 180 ml retort pouches) of Edensoy were sold in 1984 (Jan.–Dec.) and 10,250,000 were sold in 1985 (Jan.–Dec.). This is equivalent to 515,633 gallons or 1,980,190 liters in 1984, and 480,476 gallons or 1,845,018 liters in 1985. Address: President, Eden Foods Inc., 701 Tecumseh Rd., Clinton, Michigan 49236. Phone: (517) 456-7424 or (313) 973-9400.

8643. Potter, Michael. 1986. History of Eden Foods: Building a soymilk plant in America (Interview). *SoyaScan Notes.* Dec. 12. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** On 1 August 1986 it was announced that a major new joint stock company, named American Soy Products, had been established to produce Edensoy soymilk in Saline, Michigan, 30 miles west of Detroit, at a new state-of-the-art manufacturing and packaging facility. Michael Potter played a major role in conceiving and pulling together this innovative, exciting, and promising new venture. In July 1983 Eden Foods launched their first Edensoy soymilk, made by Marusan Ai in Okazaki, Japan. It soon proved to be a great success. When Potter began to talk with Marusan Ai about building a soymilk plant in the USA, he found that they were wary. In 1982-83 Marusan had had extensive discussions with Hinode Tofu Co. in Los Angeles, California, about a soymilk joint venture, but the talks eventually broke down over small points; Marusan felt they had wasted a lot of time and money to no avail. So Potter focused on Muso. With competition eating into their domestic Japanese health food market, a venture in America looked promising. Yet neither Eden nor Muso had the capital to build a soymilk plant in America. Enter Kawatetsu Shoji, better known as Kawasho International. A big New York based firm with money, influence, power, and experience in international business and joint ventures, they were looking to diversify out of coal, steel, and other commodities, into branded foods. They already knew Eden Foods (they had been financing their growing Edensoy imports and inventories from Japan) and they liked the fact that Eden knew Japan and seemed to have a solid, growing product. Kawasho's endorsement of the project was enough to overcome Marusan's reluctance. And with Marusan came Seikensha, the Tokyo based company that had built Marusan's state-of-the-art soymilk equipment. The historic joint venture package, called American Soy Products, was officially founded in June 1985.

Gross investment in the new company was $10 million. Percentage ownership was Marusan Ai 25%, Kawatetsu Shoji (Kawasho Intl.) 25%, Muso 15%, Seikensha 10%, and Eden Foods Inc. 25%. The chairman of the board was Michael Potter of Eden Foods and the president was Mr. Hiroyasu Iwatsuki, Marusan's soymilk manager, who soon moved to Michigan to go to work.

Each partner had a unique and valuable set of skills to offer. As before, Eden Foods would continue to be responsible for marketing, selling, and distributing all soymilk made by the new company. Kawasho would oversee administration and financing. Marusan would take care of soymilk production. And Muso would coordinate international sales. Seikensha, which has patents on key pieces of soymilk manufacturing equipment, would supply the plant equipment.

Open houses in mid-September were attended by the media and a host of state dignitaries, including the Director of Michigan's Department of Agriculture, who called the new plant "a perfect marriage of high technology and the area's farming." These events, and additional promotion done by a newly-hired, local marketing and advertising firm named Group 243, gave the project extensive, very positive publicity. Widespread color print media advertising, focusing on Edensoy's new larger size package, was also started.

In late October 1986 the sparkling new 22,000 square foot stainless steel plant at Saline (12 miles northeast of Clinton and just south of Ann Arbor, in the southeast corner of Michigan) started test runs, which were carefully monitored by the FDA for 6 weeks. Both the Japanese soymilk equipment and the Swedish low-acid Tetra Brik packaging lines were said to be the most modern of their kind in the world. The company had spared no expense to "do it right." Japanese technicians now living in Saline were training American counterparts.

The factory and land had cost $2.3 million and equipment cost $4.3 million. The company committed $700,000 for startup costs, $1.8 million for marketing funds, and $700,000 for working capital. By November 1986 most of this money had been spent.

The new Edensoy was packaged in both regular (250 ml or 8.45 fl. oz. for $0.59) and large (1 liter for $1.99) Tetra Brik cartons, in plain, carob, and vanilla flavors. The new prices were significantly lower than before. For example, in 1984 (when it was historically least expensive) Edensoy in a 6-ounce retort pouch had retailed for $0.69 to $0.79, or an average of 12.3 cents per ounce. The new 250 ml (8.45 fl. oz.) pack retailed for only 7.0 cents per ounce (down 43%), while the liter size (33.8 fl. oz.) retailed for only 5.9 cents per ounce (less than half the retort pouch, and 16% less than the 250 ml pack). Yet compared with cow's milk at 54 cents per quart (32 fl. oz.) or 1.7 cents per ounce, the Edensoy products are still 3.5 to 4.1 times as expensive per ounce; a much lower ratio than in 1984 but still quite high.

A cornerstone of Eden's food procurement policy since 1973 was the support of local farmers. And Saline was in the heart of Michigan's soybean country. The estimated 85,000 bushels a year of soybeans used to make Edensoy will all be

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grown on contract with individual Michigan farmers located within a 10-mile radius of the plant. Beeson variety soybeans will be used; though low yielding for farmers, they have a low-oil, high-solids composition and give excellent soymilk. Numerous standard grade parameters will also be specified. Growers will typically receive premiums of 15-30% over conventional markets. By mid-1987 American Soy Products (ASP) hopes to start using organically grown soybeans.

One nice by-product of the new ASP plant was the fact that it was the only plant and Tetra Brik line located in that part of the USA especially designed to package low-acid foods; there were only two others in the entire country, both on the West Coast, and used mostly to pack milk. Thus a host of other companies, wishing to have their own low-acid products packed on Tetra Brik machines, started to line up to use ASP's equipment. This sort of contract packing would serve as an important source of income and keep the packaging operation running 24 hours a day.

ASP's initial run is scheduled to produce 100,000 packages of 250 ml equivalent. The company's first year sales goal is $5,000,000 produced on 2 shifts. But the first problem is to fill the 20 truckloads that were back ordered.

In November Eden Foods decided that on 1 Jan. 1987 they will stop serving as a wholesale distributor to retail stores in the Midwest (10% of their total business), drop 150 products, and serve as a master distributor, selling only through other distributors. This will allow additional attention to be paid to American Soy Products. Still big marketing and distribution questions remain: Will ASP use brokers? Go direct? Go through grocery distributors? Who does ASP see as their stiffest soymilk competition? Vitasoy and Sunsoy?

What about future plans? A French label for the Canadian market. Organic soybeans. The use of a grain (such as brown rice, barley, etc.) in the Edensoy formula. A cautious attempt to break into the mass market via super markets, but only after careful test marketing in specific areas. Eventually other similar plants in other parts of the United States.

American Soy Products and the new Edensoy are the most exciting soymilk ventures of 1986, and ones that the industry will be watching closely. Address: President, Eden Foods Inc., Clinton, Michigan.

8644. Hughes Markets. 1986. Merry Christmas! (Ad). *Los Angeles Times.* Dec. 21. p. I20-21.
• ***Summary:*** The section titled "Foods of the Orient holiday specials" includes: Kikkoman soy sauce, gallon can–$4.99. Hinoichi age 1.5 oz pg. 79¢. Misuzu Koya Dofu 3.5 oz. box Wheat cake [sic, Dried frozen tofu]–$1.55. Shirakiku kuro mame, Black [soy] beans–85¢.

Also includes: Frozen Umeya mochi. Fresh gobo. Shirakiku bamboo tips. Ozeki sake. Kokuho rice. Miyako kizami shoga–Sliced pickled ginger. Miyako shiitake–Dried mushrooms Kezuka kampyo [kanpyo]–Dried gourd strip. Shehiro kombu maki–Rolled kelp [konbu].

8645. *Soybean Update.* 1986. China buys U.S. soybeans. Dec. 22.
• ***Summary:*** China has made its' first purchase of U.S. soybeans in this year–an estimated 100,000 tonnes or about 3.7 million bushels. China bought 219,000 tonnes of U.S. beans last year, the first purchase from the U.S. in several years. Export sources say China sells the beans they produce at a premium to Japan for food, while importing less-expensive U.S. beans for their domestic crushing.

8646. Tsuchiya, Kanji. 1986. Re: Soymilk and new soymilk plants in China. The soymilk market in Japan. Letter to William Shurtleff at Soyfoods Center, Dec. 25.–in reply to inquiry. 6 p. Typed, with signature.
• ***Summary:*** All soymilk plants in China are run by provincial governments. Private companies are not allowed to start them. All soymilk made in China is for domestic consumption; none is exported. During the past three years, 14 soymilk plants have been constructed in China under the leadership of Seikensha, with cooperation from Marusan. Seikensha built the plants and Marusan taught the Chinese how to use them to make quality soymilk. Mr. Tsuchiya supervised all aspects. There are no additional orders at present, probably because of the high yen exchange rate, but perhaps because (according to rumors) the Chinese are trying to develop their own soymilk plants.

In terms of the management of Chinese soymilk plants, one person is in charge of construction, one is in charge of running the plant, and then there is always a third person from the Communist party. It is difficult to know who is really responsible, and there is frequent personnel turnover. The Chinese use a lot more sugar in their soymilk than Japanese (often twice as much) and they prefer not to add oil. The soybean solids content is about 6%. Pure/plain soymilk, with nothing added, has a good reputation in China.

I am enclosing the names and addresses of the 13 Chinese soymilk plants that I supervised. They started operation from Aug. 1984 to Aug. 1986. Nine have a capacity of 350 liters/hour, and four have a capacity of 2,000 liters/hour in Beijing, Qingdao (Shandong), Liuzhou (Guangxi), and Jamusi (Heilongjiang). In Feb. 1986 Hong Kong Soya Bean Products Co. Ltd., makers of Vitasoy, bought a dehulling machine, lipoxidase inactivator, and micro-pulverizer from Seikensha. Capacity: 2 tons/hour.

Soymilk production in Japan peaked in 1983, then dropped sharply. Production in tonnes was 17,280 in 1981, 68,245 in 1982, 116,724 in 1983, 84,013 in 1984, 55,356 in 1985, and 44,400 in 1986 (est.). Thus the 1986 level is only 38% of the 1983 peak. As I see it, the main reasons for this drop are: 1. The image of poor flavor (Japanese did not traditionally drink soymilk), or actual poor flavor. 2. The

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three major manufacturers (Kibun, Marusan, Mitsubishi) all position soymilk as a health food or specialty food for the old and sick, keeping it away from mass market soft drinks. 3. Soymilk is a sideline for each of the three major manufacturers. Kibun focuses on seafood products, Marusan on miso, and Mitsubishi Kasei on chemical products. 4. Product managers have taken a short-run profit-oriented approach, rather than building for the future. Address: Kamiogi 3-1-1, Suginami-ku, Tokyo 167, Japan. Phone: 03-312-0775.

8647. *Soybean Update.* 1986. Soyoil equivalent of 5.8 million bushels was sold in Japan as a result of a promotion campaign sponsored by the ASA and Nisshin Oil Mills. Dec. 27.
• ***Summary:*** ... Nisshin used ASA's (American Soybean Assoc.) Soyasign to identify its cooking oil on the label as 100% soyoil, and attached a flier promoting soyoil to each container. More than 2 million consumers bought the soybean cooking oil during the promotion. Based on its success, Nisshin plans to continue aggressively marketing soyoil.

8648. James, Leslie. 1986. Twas a dear year, all stuffed with gustatory glories. *San Diego Union* (*California*). Dec. 28. p. D-3.
• ***Summary:*** These bests of the year's restaurant dishes include: "Upscale junk food:... 'edamame' at Sushi on the Rock." Address: Restaurant reviewer.

8649. Morohoshi, Yozo. Assignor to Hidekatsu Kuroyanagi (Kanagawa, Japan). 1986. Process for manufacturing soymilk products with wheat germs. *U.S. Patent* 4,632,839. Dec. 30. 4 p. Application filed 5 Aug. 1985. See also Japanese Patent 84-239,688 (FSTA 84-11-14). Application also filed in Japan on 3 Sept. 1984. [7 ref]
• ***Summary:*** Nigari or magnesium chloride, a natural coagulant used in the preparation of tofu, gives very rapid coagulation. Other coagulants such as calcium sulfate and glucono-delta lactone give less rapid coagulation, easier mixing, and a softer curd, but have inferior flavor. If soymilk is mixed with a wheat germ dispersion (which has been prepared from fresh wheat germ homogenized at 95ºC) before addition of the nigari or magnesium chloride, the wheat germ slows the speed of the coagulation and allows sufficient time for the curd to mature into a delicious product of even texture. Variations in the ratio of soybean to wheat germ in the suspensions allow different products to be made, e.g., tofu or bean curd, "a dessert pudding" or a "dressing or yogurt substitute." Address: Hiratsuka, Japan.

8650. *SoyaScan Notes.* 1986. Chronology of soybeans, soyfoods and natural foods in the United States 1986 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan. Ron Ishida, an attorney with no previous knowledge of tofu, working for Azumaya Inc. (South San Francisco, California), rewrites the Tofu Standards without authorization. They have already gone through 8 drafts. This creates a crisis.

Jan. Soymage, the first casein-free soy cheese, is introduced by Soyco Foods.

Jan. *Soyfoods: The Journal of the European Soyfoods Association* (*ESFA*) begins publication from Paris. Philippe Vandemoortele of Alpro is president of the association and Guy Coudert is editor of the periodical. The association plans to organize a soyfoods conference every 2 years. But the journal is discontinued after 3 issues.

Jan. Tomsun Foods is reorganized, changing its name (for the fourth time) to Tomsun Foods International. The firm's new chairman is Juan Metzger, founder of Dannon Yogurt. The company produces nearly 3 million lb. of tofu a year.

Jan. First Tofutti Shop opened in Japan by Daiei Co. Inc, Japan's largest retailer. Shop sells non-dairy soy-based ice cream and related snacks.

Feb. 7. Fire destroys Island Spring tofu plant in Vashon, Washington, with an estimated $1 million loss.

Feb. Soya Kaas, an imitation cheese containing soymilk and casein, launched by American Natural Snacks, a marketer. The manufacturer is Swan Gardens of Georgia.

Feb. Jofu, a tofu-based, non-dairy, nonfermented, yogurt-like product, sweetened with fruits, launched by Tomsun Foods International of Greenfield, Massachusetts. The product is a hit, grossing nearly $400,000 in its first 32 weeks on the market.

Feb. Barricini Foods has its first public stock offering. Raises $1.5 million, gross to use in marketing Tofulite and Ice Bean soy ice creams.

Feb. Central Soya purchases Staley's protein line, including Mira-Tex, Procon [soy protein concentrate], and Textured Procon brands.

Feb. ASA hires Jim Guinn as technical director of soybean quality programs. Soybean quality is an area of growing interest, with two parts: 1. The traditional area of soybean condition, concerning grades, damage, foreign material, etc. 2. The newly emerging area of soybean composition and its relation to grades. New measurement technologies make it likely that soybeans may soon be sold based on their composition of oil and protein. Both effect exports and price.

March 5. Pesticide control now tops the Environmental Protection Agency's list of most pressing problems, announces *The New York Times* (and *Soybean Digest,* June/July). Stricter pesticide laws are enacted.

March 7. Richard E. Lyng of California becomes U.S. Secretary of Agriculture, replacing John R. Block. Policies remain unchanged.

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April 18. Wm. Shurtleff, in charge of compiling the original tofu standards, submits a strong criticism of the illegitimate Ishida draft in the form of a detailed chronology of the development of the tofu standards.

April. Tofu cheesecake revolution in New York City profiled by *Whole Life.* Thirteen restaurants now offer them.

May. Tofutti Love Drops (chocolate covered graham cookie drops) launched by Tofutti Brands with much fanfare.

May. Nasoya's new million-dollar automatic tofu-making system, imported from Sato Shoji in Japan, begins operation.

June. Increasing consumer deception by "soy cheese" manufacturers. Whole Life publishes "Whole Frauds in the News: Will the Real Soy Mozzarella Please Stand Up (That is, If There is One)," an exposé of mislabeling involving Soyarella, Tofu Mozzarella, and Soya Kaas (though the latter brand is not at fault). Argues that it is deceptive for health food stores to call a product "non-dairy" if it contains casein (milk protein), even though FDA rules allows such a designation. In Oct. Whole Life shows that "Independent lab tests prove Soyarella hoax; Large quantities of casein [19.6%] found in so-called soy cheese." Soyarella had previously been marketed as casein free.

July. Ralston Purina Co. starts publication of Nutrition Overview, a newsletter focusing on soy protein and fiber.

July. Soyfoods win big in 7th Annual Natural Foods Merchandiser merchandising awards: Gold: San-J tamari and shoyu. Silver: Fantastic Foods' Tofu Scrambler and Tofu Burger, Westbrae Natural miso soups. Honorable mention: Walker & Wilks frozen entrees, White Wave boxed tofu.

July. Vitasoy reintroduces its line of reformulated and repackaged soymilk products, originally launched in 1984. They contain more solids and nutrients, and are sweetened with barley malt instead of maple syrup.

July. A Roper poll in the U.S. finds that tofu is the "most hated" food. 35% of a sample of 2,000 adults checked it on a list of foods said to be disliked, ahead of liver (34%), yogurt (29%), Brussels sprouts (28%), and prunes (24%). Results do not vary significantly by age, but tofu dislike is somewhat less among those with higher incomes. The poll results are very widely publicized, and are even the subject of a question on the TV program Jeopardy (in early 1988)–and its rerun! These findings suggest both a widespread awareness of tofu and a split image: Some like it and others don't.

Aug. Kikkoman's new shoyu plant starts operation in Chitose, Hokkaido, in northern Japan. The first product was shipped on 30 Jan. 1987.

Sept. 9. American Soy Products Inc. plant dedicated in Clinton, Michigan. A $10 million joint venture between Eden Foods and four Japanese companies (Kawasho, Marusan, Muso, Seikensha), construction on the plant began in Oct. 1985. It will make Edensoy soymilk in Tetra Brik cartons. The first products are shipped in November.

Sept. 19. Tofu standards passed by Tofu Standards Committee in San Francisco, after all committee members except Shurtleff agree to start with a blank slate in drafting new standards–thus erasing years of work by hundreds of people. Shurtleff resigns in protest, arguing that this is a violation due process. Shortly thereafter Barricini and Ralston Purina also refuse to give final approval. Tofu standards are stalled indefinitely after many years of hard work.

Sept. 24. First International Tofu Products Expo, Seminar, and Soyfoods Buffet, held in Munich, West Germany. Sponsored by Bernd Lehmann International Consultants. 100 people attend.

Oct. Supersoy brand soymilk introduced to America by Mitoku USA. It is made by Kibun Health Foods Co. in Japan.

Oct. Ralston Purina sells its domestic agricultural products business, Purina Mills. Total sales for 1986 were $5.5 billion.

Nov. Island Spring announces $6.5 million investment from Edward Lynch Co. to finance an expansion plan. Construction of a new 30,000 square foot factory is now underway on Vashon Island.

Dec. 1. White Wave of Boulder, Colorado, acquires Soyfoods Unlimited, a tempeh manufacturer of San Leandro, California. This makes White Wave America's largest tempeh manufacturer.

Dec. 8. Central Soya purchases 7 of 9 Bunge processing plants. ADM is now estimated to control 30% of U.S. crushing capacity followed by Cargill (25%), Central Soya (20%), and other (25%).

Dec. Tomsun Foods International nets about $3.45 million in its first public stock offering. Most of the funds will be used for sales and marketing of Jofu, and to repay $800,000 in debts. Total Tomsun sales in 1986 were about $3.1 million.

Dec. Haagen-Dazs will drop Tofutti and start distributing Barricini Tofulite, a non-dairy frozen dessert.

Dec. Brightsong Foods is named as one of the top ten food innovators for 1986 by Food & Beverage Marketing magazine. In fact, Brightsong is listed first!

Dec. Tofruzen Inc., a soy ice cream marketer from Englewood, Colorado, raises $1.6 million in a public stock offering. Sales of Tofruzen in fiscal 1986 were $91,000, rising to $158,000 in 1987, and $213,000 in the first quarter of 1988.

Dec. Edible Soy Products in Hudson Iowa is sold to Solnuts of Tilburg, The Netherlands, and renamed Solnuts, Inc. The Hudson and Tilburg plants are the only ones in the world that dry roast soybeans to make soynuts.

Dec. More than 60,000 Italian farmers harvested nearly 25,000 hectares (61,700 acres) of soybeans this year. Italy is now Europe's largest soybean producing country, followed by France. Five years ago, Italy produced virtually no soybeans. The Ferruzzi Group is the leading promoter,

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helped by hefty subsidies from the EEC.

1986 New Trends:

So Called Tofu Cheeses. Eight new soy cheeses were launched during 1986, many with the term "Tofu" in the product name. Many have been shrouded in mystery, with the names of the manufacturer and ingredients often not disclosed. There has been much consumer deception, mislabeling, and several attempts to conceal the fact that they usually contain casein, the protein in cow's milk.

Soy Yogurts and Yogurt-Style Products. The leader in this exciting new category is Jofu from Tomsun Foods. The two basic types are fermented soymilk products (e.g. Cream of the Bean, Soy-O), and non-fermented tofu-fruit blends (e.g. Jofu).

Move to Manufacturing Soymilk in America. The rising cost of soymilk imports is making them unprofitable. Domestic production, which obviates shipping U.S. soybeans to Japan, then shipping the beans and water back, will have major, beneficial long-term Edensoy, Ah Soy, and Westbrae Malteds. Still imported are Vitasoy (from Hong Kong, whose exchange rate is tied to the dollar) and Sunsoy (from Belgium).

The declining value of the dollar against the yen starting in late 1985 led to a steady rise in soymilk prices. But the combination of domestic production and larger size packages (see below) has led to a drop in soymilk prices during 1986. For example, Edensoy, selling for 6 times the price of dairy milk per unit volume in early 1984, was selling for only 3.5 to 4.1 times as much in late 1986, a drop of about 37%.

Soymilk Switches to Tetra Brik Cartons and Liters or Quarts. Edensoy, Westsoy, and Ah Soy have all switched to Tetra Brik cartons this year. Lower total manufacturing and shipping cost is the main reason. The liter/quart size was pioneered in the U.S. by Alpro/Vamo Foods/Sunsoy, and followed by Edensoy, Ah Soy, and Vitasoy. These counterparts of dairy milk in quarts suit the needs of regular soymilk users by offering a more economical price per unit volume plus greater convenience. Soymilk may be the first liter-size Tetra Brik product to succeed in America.

INTSOY is doing outstanding, pioneering work with soyfoods and soybean utilization in the Third World and America. Research is focusing on extrusion cooking, extruder-expeller processing for small-scale oil expression, and fresh green soybeans. Since April 1987 the INTSOY Newsletter has become one of the best soy-related publications available.

Morinaga Long-life Silken Tofu becomes a major force in the U.S. tofu market. Traditional manufacturers consider the product a major threat to their markets. Azumaya has hired an attorney who spends considerable time causing troubles for Morinaga.

8651. Aida, Kô; Ueda, Seinosuke; Murata, Kiku; Watanabe, Tadao. eds. 1986. Ajia no muen hakkô daizu shokuhin [Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation]. Japan: Takeshima Shigeru. 319 p. Held July 1985 in Tsukuba, Japan. Illust. (some color). No index. 27 cm. [400 ref. Eng; Jap]
• ***Summary:*** A pioneering symposium featuring tempeh and natto. About 70% of the book is in English and 30% in Japanese. A number of chapters are in Japanese with no English translations. Contains many typographical errors in the English sections.

Those interested in the early history of natto and other East-Asian fermented foods will find the discussion (in Japanese) on pages 174-78 to be very interesting. Address: Tsukuba, Japan.

8652. Asano, Machiko. 1986. Nihonjin no nattô, tenpe ni taisuru shikô chôsa [Survey of Japanese acceptance of natto and tempeh using taste tests]. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 285-90. Held July 1985 at Tsukuba, Japan. English-language summary in Symposium Abstracts, p. 79. [Jap]
• ***Summary:*** Percentage of people in different age groups who say they like natto/tempeh: Students (36.4/4.2), age 20-29 (39.5/15.8), age 30-39 (58.2/32.9), age 40-49 (61.3/38.7), age 50-59 (63.9/33.7), age 60+ (62.5/56.3). Also compares likes and dislikes by region. Address: Teikoku Joshi Daigaku.

8653. Belleme, Jan. 1986. The three flavors of Japanese cuisine: Dashi, shoyu, and mirin are the keys to this ancient culinary tradition. *East West.* Dec. p. 14, 16-21.
• ***Summary:*** With recipes.

8654. *Food & Beverage Marketing.* 1986. The F&BM 10: Leading innovators of 1986 [Brightsong]. Dec. p. 18-19.
• ***Summary:*** Brightsong is listed first! "The California-based firm is staking its claim on the popularity of tofu, considered one of the hot growth categories for 1987... Brightsong is changing the nature of its business from a production-oriented company to a product development firm. While still marketing its own product line, Brightsong is licensing the formulation and production processes of several tofu based products. Through these efforts, Rose explains, he has been able to expand his business on an international basis–adding Japan, Australia, and China to its roster." Address: New York.

8655. Fujii, Hisao. 1986. Nattô no nenshitsu-butsu, nioi, fureebaa to bisei-butsu [Microbial formation of mucilaginous compounds, odor, flavor, and microorganisms in natto]. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 219-33. Held July 1985 at Tsukuba, Japan. English-language summary in Symposium Abstracts, p. 70. [35 ref. Jap]

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• ***Summary:*** Tables and figures in English include: Properties of Bacillus natto Sawamura. Mucilage produced from various beans. Mucilage produced from parts of soybean. Separation of natto mucilage. Analysis of natto mucilage. Effect of nitrogen on the growth and mucilage formation by B. natto. Effect of amino acid on growth and stringy slimy production. Effect of nitrogen source on slime composition. Amino acid composition per 100 gm edible portion of pulses. Hydrolytic products of polyamine derivatives of gamma and alpha linked peptides. Possible scheme for origin of PGA by enzymes found in *B. subtilis.* Effect of optical isomers of glutamine and glutamic acid on transamidase obtained from B. natto. Phage host range against the parental and cured strains, and representative transformants. Levan synthesis by levansucrase of *Aerobacter levanicum.*

Effect of medium composition of viscosity of mucilage. Viscosity of polyglutamate and levan. Soybean carbohydrates. Effect of sucrose on mucilage stability. Detection of phage from natto products. Inhibition of natto mucilage formation by added phage. PGA-digesting activity of phage lysate. Change of nitrogen compounds during fermentation. Liberation percentage of amino acids in raw and steamed soybeans, and products fermented 8 or 16 hours. Distribution of Tetramethylpyrazine (TMP) in Japanese fermented foodstuffs (miso is highest). Address: Fukuoka Joshi Daigaku.

8656. Fukukara, Noriko. 1986. Shûdan kyûshoku ni okeru tenpe no riyô [Use of tempeh in group feeding or institutional foodservice programs]. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 291-97. Held July 1985 at Tsukuba, Japan. English-language summary in Symposium Abstracts, 80. [Jap]
• ***Summary:*** Contains seven tables showing how students and faculty rate the following tempeh dishes on odor/smell, overall appearance, texture, flavor, congeniality with other foods, overall impression: Karinto (sweet), tempeh sandwich, Tatsuda-age (fried), tempeh soup, tempeh dog (like hot dog), tempeh salad, tempeh on noodles (Katsudon-fu). For every dish, the faculty liked it better than the students, which were consistently on the "dislike" side of neutral. The faculty liked the tempeh dog and tempeh sandwich best, but not that much. Address: Teikoku Joshi Daigaku [Japan].

8657. Gauger & Silva, Inc. 1986. San-J International (News release). 129 Hyde St., San Francisco, CA 94102. 2 p. Dec.
• ***Summary:*** San-J, the world's largest brewer of tamari, is implementing a comprehensive new marketing plan under the direction of John Perelman, Marketing Director and National Sales Manager. The products have a new image and look. Natural Foods Merchandiser awarded San-J a gold medal this year for their design. The new packaging is being supported by print advertising, shelf talkers, carton cards, and hangtags. The company will also be making shoyu in America, and introducing Szechuan Sauce. Address: San Francisco, California.

8658. Horii, Masaharu. 1986. Beishoku bunka-ken ni okeru kakô daizu shokuhin no eiyôteki igi [The nutritional significance of soyfoods in rice-eating countries]. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 249-57. Held July 1985 at Tsukuba, Japan. English-language summary in Symposium Abstracts, 73. [Jap]
• ***Summary:*** The percentage of total protein supplied by various food groups in the Japanese diet in the years 1960/1983: All foods of animal origin (33.4/50.5); within that fish and shellfish (24.5/23.7), meats (5.6/15.5), eggs (3.6/6.1), milk and dairy products (1.9/5.2). Rice (32.8/18.1), soybeans and soybean products (10.1/8.3). Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan: Norin Suisan-sho.

8659. Ito, Hiroshi. 1986. Tenpe no nihon ni okeru kenkyû no ayumi. II. Tenpe no seizô-hô to seibun [The progress of tempeh research in Japan. II. The tempeh production process and composition]. *Daizu Geppo* (*Soybean Monthly News*). Dec. p. 31-36. [Jap]
Address: Norin Suisan-sho Shokuhin Sogo Kenkyu-jo, Biseibutsu Riyo Kenkyushitsu-cho [Tsukuba, Ibaraki-ken, Japan].

8660. Kariya, Tetsu; Hanasaki, Akira. 1986. Daizu to nigari [Soybeans and nigari]. *Oishinbo* No. 7. p. 105-30. Dec. [1 ref. Jap]
• ***Summary:*** Adult comic books are very popular in Japan. The title of this 28-issue series, *Oishimbo* (ISBN 4-09-180757-7 CO379 P500E), is a made-up word, which means something like "People who love delicious things." It is a play on the word *Kuishimbo,* which means "glutton." This story is about Henry James Black who comes from Los Angeles, California, to study tofu in Japan. He visits a famous tofu restaurant, which has been in business for 300 years [Sasa-no-yuki], and complains that the tofu they make is not very good. The owner, getting upset, asks "How do you know?" He answers, "I studied tofu in America," then shows the owner a copy of *The Book of Tofu* (p. 116). Later he visits a traditional Japanese tofu shop that makes nigari tofu; here he becomes an apprentice. Details of the traditional process for making nigari tofu are shown in detail in cartoon form.

Note: This appears to be a take-off on the tofu research of William Shurtleff in Japan during the early 1970s. Shurtleff wrote *The Book of Tofu.* Address: Tokyo, Japan.

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8661. Karki, Tika. 1986. Microbiology of kinema. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 39-49. Held July 1985 at Tsukuba, Japan. [Eng; Jap]

• ***Summary:*** The best publication seen on Kinema up to this time. Kinema is a traditional, non-salted fermented soybean food product widely consumed by the Kirat ethnic population of the eastern hills of Nepal, and into Darjeeling and Sikkim. This product, thought to have originated in Nepal, greatly resembles natto of Japan and thua-nao of Thailand. It is usually produced during the winter; dried kinema is used mainly for flavoring purposes. It is consumed in soup along with green vegetables. There is good potential for expanding the production of soybeans in Nepal. In most of the hilly areas, soybeans are grown as a mixed crop with maize, yet it is only in the far eastern part of Nepal that they are used to make kinema. The dominant organism in this fermentation was found to be *Bacillus subtilis.*

To make kinema in the traditional way, soybeans are washed, soaked overnight, boiled until softened, cracked by pounding lightly, and mixed thoroughly by hand with about 0.5% ash. It is then fermented overnight in bamboo baskets covered with banana leaves at about 25ºC. The fresh kinema is then sun dried for about 3 days and stored for 6 months to yield dried kinema. The typical composition is moisture 8.9%, protein 46.2%, fat 18.1%, ash 5.2%. Kinema is less sticky than natto and possesses some acidity.

Tables: (1) Different types of kinema collected from different localities in Nepal. (2) Chemical composition of Kinema.

Figures: (1) An excellent map of Nepal shows the "Kinema producing area of Nepal"–which is in the northeastern part of the country. (2) Flow chart–Traditional process for making kinema. (3) Flow chart–Preparation of kinema starter. (4) Flow chart–Preparation of kinema using selected strains. (5) Bar chart–Distribution of 4 types of bacteria in 4 samples of traditional kinema. (6) Graph–Change in cell propagules, temperature and moisture during the fermentation of kinema. (7) Graph–Change in the growth rate of selected microbes during kinema fermentation.

The paper is followed by 3 pages of discussion, in Japanese. Address: Central Food Research Lab., Babar Mahal, Kathmandu, Nepal.

8662. Kato, Eihachiro. 1986. Nattô no seizô–Dentô to gendai [Production of natto–Traditional and modern]. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 246-48. Held July 1985 at Tsukuba, Japan. English-language summary in Symposium Abstracts, p. 72. [2 ref. Jap]

• ***Summary:*** "In the traditional Natto making, cooked soybeans were wrapped in rice straw and kept in a warm environment until viscous material was formed by fermentation. The rice straw functioned as a natural donor of Natto starter bacterium. The rice straw was not only the donor of the starter responsible for Natto fermentation but it also played an important role in adjusting temperature, humidity and aeration as well as absorbing unpleasant ammoniac odor, which was essential for Natto manufacture using traditional technology. Nevertheless, rice straw was often contaminated with soil-borne microbes, and it was rather difficult to maintain good control of the process in the traditional method of Natto making.

"Dr. Shin Sawamura, in 1905, first isolated Natto Bacillus and characterized the isolates, which opened the way for pure cultures of the starter...

"The fermentation of Natto takes about 18 hours, starting at 40ºC and rising to 50ºC. The temperature in the fermentation chambers was maintained by a charcoal fire, electric heater or steam pipings, carefully watched by experienced technicians overnight." Address: Meiji Daigaku, Japan.

8663. Kato, Takeo; Shiga, I.; Terasawa, K. 1986. Nyûsan hakkô o riyô shita okara no hozon-sei no kaizen [Preservation of okara (soybean residue from soy mash) by lactic acid fermentation]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 33(12):837-38. Dec. [11 ref. Jap; eng]

• ***Summary:*** Lactic acid bacteria were used as starter cultures in order to prevent microbiological deterioration of okara. It was difficult to prevent spoilage of okara in aerobic conditions. In facultatively anaerobic conditions such as packing in a polyethylene film bag or a screw-cap bottle, okara was fermented by lactic acid bacteria, lowering its pH value to less than 4.2 and resulting in inhibition of growth of spoilage bacteria for greater than or equal to 4 days at 37ºC. Address: Food Research Inst., Aichi Prefectural Gov., 2-1, Shinpukuji-cho, Nishi-ku, Nagoya 451, Japan.

8664. Kitada, Yoshimi; Mizobuchi, M.; Ueda, Y.; Yamamoto, M.; Ishikawa, M.; Kawanishi, S. 1986. Miso seizô ni okeru daizu jôsha-eki kara no isofurabon yûdô-tai no kaishû [Recovery of isoflavones from soybean cooking liquid of a miso factory]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 33(12):821-25. Dec. [10 ref. Jap; eng]

• ***Summary:*** Isoflavones such as daidzin, daidzein, genistin, and genistein were recovered using 5 types of adsorbents, of which Diaion HP-20 was the most effective. Address: Nara Prefectural Inst. of Public Health, 58-6 Ohmori-cho, Nara 630, Japan.

8665. Kozaki, Michio. 1986. Monsuun Ajia no hakkô shokuhin [The fermented foods of monsoon Asia]. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium

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on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 5-8. Held July 1985 at Tsukuba, Japan. [Jap]
• ***Summary:*** A general review, including many fermented foods not containing soy. Address: Dep. of Agriculture, Tokyo Univ. of Agriculture.

8666. Moroe, Michio; Sato, Akiyoshi; Yoshida, Toshio. 1986. Tenpe no fureebaa [The flavor of tempeh]. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 210-18. Held July 1985 at Tsukuba, Japan. English-language summary in Symposium Abstracts, p. 69. [12 ref. Jap]
• ***Summary:*** Details from chromatographic analysis of volatile compounds in boiled soybeans, homemade tempeh incubated at 31ºC or 38ºC, commercial tempeh. Address: Takasago Koryo Kogyo K.K.

8667. Murata, Kiku. 1986. Formation of antioxidants and nutrients in tempe. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 186-98. Held July 1985 at Tsukuba, Japan. English summary in conference abstracts. [10 ref. Eng]
• ***Summary:*** Contents: Introduction. Preparation of tempe in our laboratory. Discovery of antioxidants in tempe. Effect of isoflavone Factor 2 in vitro and in vivo. Increase of B vitamins and free amino acids.

Why did Dr. Murata start work on the antihemolytic and antioxidative factors during her study at Dr. P. Gyorgy's laboratory in Philadelphia, Pennsylvania? The United Nations Protein Advisory Group (PAG) and FAO had chosen tempe as one of the best soybean foods for use as a vegetable protein source. When she visited Dr. Gyorgy's laboratory, rat feeding tests on stored tempe and unfermented soybean powder were underway. The tempeh in their laboratory was made using a modification of the pilot plant process described by Steinkraus, Van Buren, Hackler and Hand (1965).

Contains 5 tables and 15 figures (mostly graphs). Most of these appeared in previous publications. Address: Teikoku Gakuen, Moriguchi City, Japan.

8668. Nakao, Sasuke. 1986. Minzokugaku-sha to shite deatta koto domo [An ethnologist's recollections (on fermented soyfoods)]. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 179-83. Held July 1985 at Tsukuba, Japan. English-language summary in Symposium Abstracts, p. 64. [Jap]
• ***Summary:*** In 1962 the author was first introduced to kinema, a non-salted fermented soybean food, in eastern Nepal. Before that time on trips he had noticed that soybeans were commonly planted on the levees of paddy fields in Nepal, Sikkim, and Bhutan. In 1972 he proposed the hypothesis of the "triangular distribution" of non-salted fermented soybean foods, also known as the "natto triangle." Since proposal of the hypothesis, many other examples of non-salted fermented soybean foods in the area have been reported. They are "Soeda" of Bhutan, "Pe-Boutsu" of Burma, "Thua-nao" of northern Thailand and many other examples in China proper (PRC) and in the Miao Tribe of Kweichow (Guizhou) Province of China. "In these examples, the local names are much different and no common word is found. This may suggest that the existence of fermented soybeans is not the result of recent dispersals from a central place of origin, but may have happened in rather ancient times. Then I came to the further assumption that within the triangular area there may have been a complex common human culture from olden times.

"In processing the non-salted fermented soybean, the artificial inoculation of the boiled soybean is sometimes practiced like in tempe. In Bhutan it is reported that the starter for fermentation is the same one which is prepared for the fermentation of alcoholic beverages. The fundamental method of making alcoholic beverages in the Himalaya and southeastern Asia is to inoculate the boiled cereals with the starter and then the main fermentation takes place in solid state, not in water. The process in making the non-salted fermented soybean and the alcoholic beverages can be understood to be a similar one. So they must have originated from the similar culture complex."

Note: This is the earliest document seen (Jan. 2012) concerning "Soeda" of Bhutan, or "Pe-Boutsu" of Burma, both non-salted fermented soyfoods. Address: Professor Emeritus, Osaka Prefectural University.

8669. *Natural Foods Merchandiser.* 1986. A soymilk first: Made in the U.S.A. Dec. p. 4.
• ***Summary:*** A new soymilk plant in Saline, Michigan is a joint venture of 4 companies in Japan plus Eden Foods. It will make Edensoy soymilk.

8670. Noguchi, Kazuko. 1986. Tenpe no chôri–Nihon de no kokoromi [Tempeh cookery–Trials in Japan]. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 274-84. Held July 1985 at Tsukuba, Japan. English-language summary in Symposium Abstracts, p. 78. [Jap]
• ***Summary:*** Gives numerous tempeh recipes suited to Japanese tastes, and a nutritional analysis of each.

8671. Seki, Tatsuji; Oshima, Yasuji. 1986. DNA sôdôsei kara mita kosôkin to ruienkin no bunruigaku-teki kankei [The taxonomic relationship between *Bacillus subtitlis* and related bacteria from the viewpoint of DNA homology]. In: Kô

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Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 70-80. Held July 1985 at Tsukuba, Japan. English-language summary in Symposium Abstracts, p. 53. [54 ref. Jap]
• ***Summary:*** Discusses *Bacillus subtilis,* gives a genetic map, and compares related species. The authors contend that, based on their evidence, strains listed as *B. subtilis* should be classified into two different species, *B. subtilis* and *B. amyloliquefaciencs. B. natto* Sawamura, which includes various strains employed in natto production, is described as a synonym of *B. subtilis* in the 8th edition of Bergey's Manual. Address: Osaka Daigaku, Kôgaku-bu.

8672. Shiroza, Teruaki; Yamane, Kunio. 1986. Kôsokin no amiraaze oyobi puroteaaze [Extracellular α-amylase and proteases of *Bacillus subtilis*]. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 234-43. Held July 1985 at Tsukuba, Japan. English-language summary in Symposium Abstracts, p. 71. [15 ref. Jap]
• ***Summary:*** *Bacillus subtilis,* one of the strains used to make natto, produces many kinds of extracellular enzymes. Address: Tsukuba Daigaku, Seibutsugaku-kei (Inst. of Biological Sciences, Univ. of Tsukuba, Sakura, Ibaraki-ken 305, Japan).

8673. *SoyaScan Notes.* 1986. Japan's largest natto manufacturers (Overview). Dec. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** (1) K.K. Okame Natto Honpo, 15-14 Ogawa, Ogawa-cho, Ibaragi-gun, Ibaragi-ken, Japan.

(2) Asahi Shokuhin K.K., 180-2 Kamido, Ushihori-cho, Gyoho-gun, Ibaragi-ken, Japan. (3) Ugo Shokuhin Kogyo K.K., Noaramachi, Aza Kaido no ue 279, Sennan-mura, Senboku-gun, Akita-ken, Japan.

(4) Taishi Shokuhin Kogyo K.K., Kawamorita, Aza Okinaka 68, Santo-cho / machi, Santo-gun, Aomori-ken 039-01, Japan.

(5) K. K. Azuki Shokuhin, Sekibori 1001, Utsunomiya-shi, Tochigi-ken, Japan.

Note: Each of these large natto makers is located in the northeast prefectures (*Tohoku Chiho*) of Japan.

8674. Takao, Shoichi. 1986. Nattô kenkyû no rekishi-teki kôsatsu [An historical overview of natto research]. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 61-69. Held July 1985 at Tsukuba, Japan. English-language summary in Symposium Abstracts. p. 52. [Jap]
• ***Summary:*** "Natto in Japan generally means Itohiki-Natto, which is a unique product in this country. A very small amount of Shio-Natto derived from China is also manufactured in some limited localities.

"The first description of Natto bacterium was by Dr. Kikuji Yabe in 1894, who isolated three *Micrococci* and one *Bacillus* from Natto, but was unable to determine that those isolates were responsible for Natto fermentation. In 1905, Dr. Shin Sawamura first isolated a bacterium that could produce good Natto by its single inoculation, and named the isolate *Bacillus natto* Sawamura, a novum species. This was the discovery of Natto Bacillus.

"Subsequently, Prof. S. Muramatsu of Morioka Agricultural Academy, and Prof. Jun Hanzawa of Hokkaido University did research and extension / education on natto manufacture with pure starter cultures of Natto Bacillus, and it was Prof. Hanzawa's great contribution that the natto technology which is widely used in the nation today was firmly established and disseminated.

"The traditional manufacture of Natto, namely wrapping of cooked soy in rice straw to ferment the beans, depended on natural inoculum from straw, but that process had problems with sanitation and did not guarantee a consistent quality of products. Prof. Hanzawa introduced not only good starter cultures, but also a new method, to use a container in place of straw. He organized in 1919 an association of natto container improvement, started to publish a journal 'Natto' and was greatly committed to the education of Natto manufacturers. Mr. Jirô Miura, The First President of National Natto Manufacturer's Association (presently National Federation of Natto Manufacturers' Cooperatives) established in 1940, was among those who were directly guided by Prof. Hanzawa.

"The new technology rapidly disseminated in the nation and even in the Japanese communities on the Chinese mainland and Latin America. This fact reflects the excellence of the new technology developed under the guidance of Prof. Hanzawa.

"In microbiological research on Natto Bacillus, a great number of reports were published on taxonomy, nutrient requirements, formation of mucous materials, enzymes, antibiotic activities and phage infection. *Bacillus natto* named by Dr. Sawamura was included in *Bacillus subtilis* in Bergey's Manual of Determinative Bacteriology 6th Edition (1948), and has not been recognized as an independent species since then. However, Natto Bacillus has many different properties from *Bacillus subtilis,* and still maintains its naming at present, especially in the Natto manufacture."

Contains numerous photos, including: 1920 post card from the Society for the Improvement of the Natto Container. Ad for the first pure-culture natto bacteria cultured by Dr. Hanzawa. Dr. Jun Hanzawa. Address: Hokkaido Univ., Nôgaku-bu.

8675. *Tetra Pak Age.* 1986. Edensoy: Born of American and Japanese ideas. 4(4/4):12-13. Fall/Winter.

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• ***Summary:*** Six color photos show Edensoy packages. Describes how the new plant in Michigan was built.

8676. Toyoda, Motoo. 1986. Jiba sangyô to shite no nattô to sono eisei kanri [Natto manufacture as a rural agro-industry and its sanitary management]. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 263-67. Held July 1985 at Tsukuba, Japan. English-language summary in Symposium Abstracts, p. 75. [4 ref. Jap]

• ***Summary:*** "Natto is one of the most efficient nutritious foods and first appeared in food history more than 2,000 years ago. There are two types of Natto, 'Shiokara-natto (salted)' and 'Itohiki-natto (non-salted)'... Ibaraki prefecture is one of the largest producers of 'Itohiki-natto' and the best place to maintain their high quality in Japan. The 'Itohiki-natto' in Ibaraki prefecture is also known as 'Mito-natto' and is one of the major genuine products in Ibaraki prefecture. There are 34,000 tons of 'Mito-natto' produced annually, comprising 20% of all products in Japan (1984).

"There are several reasons why 'Mito-natto' is so popular with consumers. 'Mito-natto' is made from small grain soybeans. Therefore, the taste of 'Mito-natto' is very mild and soft. Due to the Kanto loam, only small grain soybeans can grow in Ibaraki prefecture. From the Tokugawa Era (200 years ago), these small grain soybeans have been harvested before the typhoon season due to their early-ripening character... The small grain soybeans are difficult to use for making Tofu and Miso... Interestingly, *Bacillus natto* can grow better on small grain soybeans than large ones. This feature allows 'Mito-natto' to have unique stickiness with special flavor.

"The container of 'Mito-natto' is quite unique. More than 96% of manufactured 'Mito-natto' is packed in PSP (polystyrene paper) containers. This Natto is distributed widely through grocery stores. The remaining 4% of 'Mito-natto' is packed in a traditional container called 'Tsuto-natto' made of straw. Ibaraki is the only place where 'Tsuto-natto' is permitted to be used as a Natto container. Historically, 'Mito-natto' was first sold at Mito station in 1889. Since then, this type of Natto is mainly sold in souvenir shops, especially Kiosks, located on major JNR (Japan National Railway) stations...

"In 1961, Ibaraki prefecture established the standard methods for inspecting the quality of Natto. In Ibaraki, three organizations, Ibaraki prefectural Institute of Health, Environmental Sanitation Section of Ibaraki Government and Ibaraki Natto Maker's Association, have been working closely to prevent any possible safety problems associated with the manufacturing and marketing of Natto." Address: Technical advisor of Ibaraki prefecture, and Purima Hamu K.K. (Prima Ham).

8677. Tsubaki, K. 1986. Historical survey of the studies on Mucorales in Asia. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 28-30. Held July 1985 at Tsukuba, Japan. [Eng]

• ***Summary:*** This is a survey of the major species of mucorales which are useful in applied microbiology. Taxonomically, they are classified in the sub-division Zygomycotia of the division Eumycota. Names of the genera include *Absidia, Mucor,* and *Rhizopus.* They are included in the Phycomycetes in older textbooks. "So far as I know, the first investigation of Mucorales from Asia was made by a French mycologist, Calmette, who first described an interesting species, *Amylomyces rouxii*, in 1882... His isolates came from the Chinese yeast. This species has been called *Mucor rouxii* in most textbooks so far." Two years later, in 1884, Eijkman considered this fungus to be a species of *Mucor,* but used a trinomial name, *Mucor amylomyces rouxii.* "Then many other important species of *Mucor* have been published including, *M. javanicus, M. praini,* etc. In the case of *Rhizopus,* the first species from Asia is *Rhizopus japonicus* so far which was isolated by Vuillemin in 1902. In Japan, studies of the mucoraceous fungi started by Saito in 1904. After that, Hanzawa reported a taxonomic study of *Rhizopus* in 1912 and 1914 describing twelve species. Hanzawa's work was continued by many mycologists." Address: Dep. of Biological Science, Univ. of Tsukuba, Japan.

8678. Ueda, Seinosuke. 1986. Nattô-kin no "purasumido" kaiseki [Analysis of natto bacillus plasmids]. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 81-91. Held July 1985 at Tsukuba, Japan. English-language summary in Symposium Abstracts. p. 55. [Jap]

• ***Summary:*** "The unique feature of Japanese natto, a traditional fermented food, is the formation of mucous materials by the Bacillus, namely levan-like polysaccharides and gamma-polyglutamic acid, the latter being the chemical principle of mucous appearance of natto. It was discovered that the gene that is responsible for the formation of gamma-polyglutamic acid can be transferred into *Bacillus subtilis* Marburg strains that are incapable of forming gamma-polyglutamic acid, by means of genetic transformation technique at high frequencies...

"The isolation of this small plasmid from more than ten starter strains of natto *Bacillus* was conducted in order to assess the homology of the plasmid isolation... In order to look further into the function of the small plasmid of natto *Bacilli,* many spore-forming aerobic rods that are recognized as natto *Bacillus*-like microorganisms were isolated from Japanese natto-like fermented soybean foods that are popular in the daily diet of East Asia, namely Chinese To-chi, Nepalese Kinema and Thai Thua-nao, and plasmids of each

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isolate were compared. Every isolate tested contained small plasmids of 5.7-9.6 kb [kilobase molecular weight] all of which demonstrated quite a high degree of homology with natto *Bacilli* plasmid pUHl of 5.7 kb, which codes gamma-glutamyl transpeptidase gene controlling the formation of gamma-polyglutamic acid.

"The comparative studies on these plasmids derived from natto *Bacilli* and *Bacilli* from natto-like fermented foods of East Asia may reveal the origin and evolution of natto *Bacillus* plasmid and may ultimately clarify the history of dissemination of such fermentation technologies." Address: Kumamoto Kogyo Daigaku [Kyushu Univ.].

8679. Yasuda, Masaaki. 1986. Preparation of tofuyo (fermented tofu) using *Monascus* fungus. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 312. Poster session. Held July 1985 at Tsukuba, Japan. [Eng]

• ***Summary:*** Tofuyo is a delectable creamy soft fermented tofu product made in Okinawa. "Tofuyo is a cheese-type product from tofu (soybean curd) by the action of microorganisms in Okinawa, Japan. It is a creamy cheese type product which has a mild flavor, suitable elasticity, fine texture and good for tastes. The product using Monascus fungus is unique and highly esteemed for the table. As the method of making Tofuyo has been a secret, there is little knowledge on the preparation of the product. Here the author reports about the preparation of a Tofuyo using *Monascus* fungus.

"Methods: Three steps are involved in making Tofuyo: making koji, preparing tofu and dehydrated tofu, and ripening. Tofuyo was prepared as follows; dehydrated tofu was soaked into a soak containing Beni koji prepared by growing *Monascus* on steamed rice, a small amount of salt and awamori (distilled liquor) and then, it was matured at 25-35ºC for 4.5 months.

"Results: Optimum incubation period of the Beni koji making was from 150 to 160 hr after inoculation of the seed. The highest production of enzymes (protease, alpha, and glucoamylases) activities and pigment of the koji was obtained by employing autoclaved non-glutinous rice. alpha-amylase and glucoamylase of the koji were alcohol tolerant, but protease was not. The best conditions of tofu making for Tofuyo were as follows; the final concentration of calcium sulfate: 20mM, final pressure: 38 gm per cubic centimeter. The curd was characterized as follows; hardness: 10-11 x 10,000 dyne per square centimeter, moisture: about 76%, and texture: suitable elasticity and fine texture. Tofuyo prepared with the dehydrated curd by enforced drying, e.g., by warm wind, in oven or under vacuum, was not good for taste. The best quality of Tofuyo was obtained with the curd (hardness: 2O-3O x 10,000 dyne per square centimeter) which was gradually dehydrated at room temperature, and a hardness of the product was 14-18 x 10,000 dyne per square centimeter.

"Ripening changes in a Tofuyo were also investigated. Crude protein content of the product decreased with ripening period, while that of the soak increased. Decrease of some protein bands of the product was confirmed by the method of disc-gel electrophoresis. Hardness of the product was decreased. Protease activity decreased and the activity depended on the presence of ethyl alcohol concentration of awamori (from 20 to 25%), but alpha or glucoamylase had high activities from early to late in maturing. Reducing sugar (as glucose) of the product increased during ripening period. Chemical compositions of Tofuyo using *Monascus* fungus is as follows; 59.99% of moisture, 31.80% of crude protein, 25.58% of crude fat, 8.50% of crude ash, and 34.12% of nitrogen free extract on a dry basis except moisture." Address: Dep. of Agricultural Chemistry, Univ. of the Ryukyus, Nishihara-cho, Okinawa 903-01, Japan.

8680. Yoshida, Shuji. 1986. Minzokugaku kara mita muen hakkô daizu to sono shûhen [The origin of non-salted fermented soybeans from the viewpoint of ethnology]. In: Kô Aida, et al. eds. 1986. Proceedings of the Asian Symposium on Non-Salted Soybean Fermentation. Japan: Takeshima Shigeru. 319 p. See p. 166-78. Held July 1985 at Tsukuba, Japan. English-language summary in Symposium Abstracts, p. 62-62. [20 ref. Jap]

• ***Summary:*** "Two of the earliest kinds of fermented soybeans were *shì* and *dòu-jiàng.* The former antedates the latter, because *shì* can be traced to the Han Dynasty (206 BC-A.D. 200), whereas *dòu-jiàng* does not emerge until the description in *Qimin Yaoshu* (A.D. 536-550). Good descriptions of *shì* and *dòu-jiàng* are given in *Qimin Yaoshu. Shì* is made as follows: A yellow mold is permitted to grow on boiled beans, which are then washed and wetted, after which they are fermented in a cellar for 10-12 days. *Shì* was eaten as a condiment.

"However, *shì* as a food would have appeared prior to *shì* as a condiment. *Sake* which was made from grain through mold fermentation, was originally not for drinking, but rather for eating. Such a primitive *Sake* is still used in Yúnnán. I suppose that a primitive *shì* also was eaten, and that the place of origin of *shì* was South China, according to the description in *Bencao Gangmu* (*shì* was commonly made in South China), and *Bówùzhì* (*shì* was exotic).

"*Dòu-jiàng,* which may have been first mentioned in *Bencao Gangmu* (1596), was a simple mold bean and was technologically more primitive than *shì,* although the existence of *dòu-jiàng* or a similar substance cannot be traced in the literature before *Qimin Yaoshu.* It seems that the first product of fermented beans would be *dòu-jiàng,* or a similar substance, and that its making would have been influenced by *sake* production. Later, *shì* as a food would have appeared and then *shì* as a condiment was produced, as we see from the *Qimin Yaoshu.*

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"On the other hand, *dòu-jiàng* was developed from *ròu-jiáng,* preserved meat... *Natto, kinema* and *tempeh* would be identified as a substance similar to *dòu-jiàng,* which was a primitive fermented soybean product. Boiled beans became *dòu-jiàng* if they were covered by *Imperata cylindrica* grass, *kinema* if covered by certain leaves, *tempeh* if covered by leaves of *Hibiscus tiliaceus* or banana leaves, and *natto* if covered by ricestraw.

"We know that various kinds of plants are used for making *sake* or mold bran. The species used varies by place. Fermented soybeans occur within the *sake*-making area and only at the margin of the distribution. That means several new fermented soybean products like *shì* and *dòu-jiàng* were made in the center of the fermented soybean distribution, and the area gradually expanded toward the margins. They were accepted in areas close to the center, but the most primitive forms would have remained only in the marginal places, where new ones were not accepted."

A large chart (p. 169) shows the relatives and development of fermented black soybeans (*shi*)*;* it includes the names of various unsalted fermented soyfoods and soy condiments (with their geographical area in parentheses). Relatives (fermented soyfoods made from yellow soybeans): Akuni (Sema Naga, in the Himalayas in northeast India), kinema (Limbu, in eastern Nepal), pe-bout (Shan, in eastern Burma), itohiki natto (Japan), and tempeh (Indonesia). Stage 1. Itohiki natto became Chon Kujjiang [perhaps *chungkuk jang,* Korean-style natto] of the Zhanguo Warring States period (475-221 BC) in China. Stage 2A: Unsalted fermented black soybeans were originally used as a food, rather than as a seasoning. To these unsalted fermented black soybeans, koji was added to create homemade unsalted fermented black soybeans (*doushi,* of China), Stage 2B: Salt was added to the unsalted fermented black soybeans to make various salted foods (each with a firm texture like raisins): Daitokuji natto (Japan; with wheat flour added), *pe-ngapi* (upper Burma), and *seang* (Cambodia). Stage 3. Unsalted fermented black soybeans (*doushi*) developed into closely related danshi. Koji was added to danshi to make *rul-kre* (of Bhutan). Cooked soybeans were shaped into balls and fermented naturally to make miso-dama ("unsalted miso balls" [meju], Korea and Japan). Then salt was added to the miso-dama to make various seasonings (each with a consistency like applesauce or paste / miso): Korean soybean jang (*doen jang*), Korean soy sauce (*kan jang*), or soybean miso (*mamé miso,* Hatcho miso, Japan). Stage 4. Salt was added to unsalted fermented black soybeans (*shi*) to make salted fermented black soybeans, from which developed inyu (a fermented soy sauce made with black soy beans, in Taiwan), *inshi* (meaning unclear, of Taiwan), and taucho (*tauco,* of Indonesia). Stage 5. Koji was added to salted fermented black soybeans to make *shi* for food use, and *doushi* (of Sichuan, China). Stage 6. Flour was added to salted fermented black soybeans to make red pepper jang (*kochu jang,* Korea) and spicy fermented black soybeans (*doubanshi,* China).

Note: This chart may be easier to understand when viewed in chart form, however the logic and some of the products seem a bit unclear. It is also unclear which products are fermented with bacteria (like natto). Soyfoods Center has an English-language translation of this chart. Address: National Museum of Ethnology, Osaka (Kokuritsu Minzokugaku Hakubutsukan).

8681. **Product Name:** [Toniku {Textured Soy Protein}].
Manufacturer's Name: Ajinomoto Co. Inc.
Manufacturer's Address: Kyobashi 1-5-8, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1986.
New Product–Documentation: Soya Bluebook. 1986. p. 92.

8682. Fujiwara, S.; Inoue, K.; Hirota, T.; Kawanishi, G. 1986. [Studies on hydrolysis of soybean phytate by phytase from *Rhizopus sp.* EF-78]. *Reports of Research Laboratory, Snow Brand Milk Products Co.* No. 83. p. 31-41. [25 ref. Jap; eng]*
• ***Summary:*** Optimal conditions for the operation of phytase, isolated from *Rhizopus* species, on phytate from soybeans were determined. The improvement in digestibility of soymilk exposed to this phytase was also quantified. Address: Technical Research Inst., Snow Brank Milk Products Co. Ltd., 1-1-2 Minami-dai, Kawagoe, Saitama 350, Japan.

8683. Hosotani, K.; Mori, M. 1986. [Propionic acid contents in foods]. *Nippon Eiyo Shokuryo Gakkaishi* (*J. of the Japanese Society of Nutrition and Food Science*) 39(3):231-33. [6 ref. Jap; eng]*
• ***Summary:*** *Webster's Dictionary* defines propionic acid (a term first used in 1850) as "a liquid sharp-odored fatty acid $C_3H_6O_2$ found in milk and distillates of wood, coal, and petroleum." It is also produced as a metabolite of microorganisms. The propionic acid content of miso was 2-5 mg/kg and of soy sauce was 2.7-6.0 mg/kg. This compared with 5-9 mg/kg for dairy milk. Address: Dep. of Home Economics, Wakayama Univ., Wakayama 640, Japan.

8684. Ichishima, E.; Takada, Y.; Taira, K.; Takeuchi, M. 1986. Specificities of extracellular and ribosimal serine proteinases from *Bacillus natto,* a food microorganism. *Biochemica & Biophysica Acta* 869:178-84. *

8685. Machida, Yoshiharu. 1986. [Application of powdered soybean protein to oral controlled-release dosage forms]. *Hoshi Yakka Daigaku Kiyo* (*Bulletin of the Hoshi College of Pharmacy*) No. 28. p. 37-40. [Jap]*
• ***Summary:*** A review of the use of soybean protein in controlled-release drugs. Address: Dep. Pharm., Hoshi Univ.,

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Tokyo, Japan, 142.

8686. Matsuhashi, T. eds. 1986. Improvement of community level food processing: The development of 'kori-tofu,' a frozen and dried soybean curd in Japan. In: Jan Bay-Petersen and Norma V. Llemit, eds. 1986. Food Processing by Rural Families: Proceedings of the Seminar on Food Processing by Rural Families, 20-22 May 1985, PCARRD, Los Banos, Laguna, Philippines. Laguna: Philippine Agriculture and Resources Research Foundation, Inc. vi + 242 p. See p. 187-204. [24 ref]*
• ***Summary:*** The co-publisher was the Food & Fertilizer Technology Center for the Asian & Pacific Region, China.

8687. Ministry of Agriculture, Forestry & Fisheries (Japan). 1986. [Japanese agricultural standard for soymilks]. Tokyo. 38 p. [Jap]
• ***Summary:*** This sets standards for soymilk, prepared soymilk, soymilk beverage, and soy protein beverage. It specifies requirements for quality (properties, soy protein content, ingredients, additives, etc.) and labeling for the four products. Address: Tokyo, Japan.

8688. Nakagawa, A.; Murasawa, H. Assignors to Asahi Foods Company Ltd. 1986. Process of manufacturing bean curd and bean milk. *European Patent Application* 170,507 A2. [Eng]*
• ***Summary:*** For soymilk, the soybeans are dried at room temperature, crushed and dehulled. The resulting particles are soaked, ground, then boiled with steam in a closed container. Foam is removed by application of a jet of steam to the surface. The okara is separated from the soymilk. To make tofu, a coagulant (such as glucono lactone, nigari/bittern, or calcium sulfate) is added to the soymilk.

8689. Ogura, M.; Okudaira, T.; Honma, E. 1986. [Use of rice flour for production of candied white miso]. *Kagawa Prefectural Fermentation and Food Experiment Station, Annual Report* No. 79. p. 15-19. [2 ref. Jap]*
Address: Kagawa Prefectural Fermentation and Food Experiment Station, Kagawa, Japan.

8690. Ogura, M.; Okudaira, T.; Honma, E. 1986. [Studies on the use of enzyme preparations for making miso. VII. Changes of pyroglutamic acid contents in yellow-red salty miso made at various temperatures]. *Kagawa Prefectural Fermentation and Food Experiment Station, Annual Report* No. 79. p. 10-14. [1 ref. Jap]*
Address: Kagawa Prefectural Fermentation and Food Experiment Station, Kagawa, Japan.

8691. Ohara, T.; Sakai, T.; Ohinata, H.; Muramatsu, N.; Matsuhashi, T. 1986. [Studies of tofu and dried-frozen tofu (kori-dofu). VIII. Monitoring coagulation of soymilk via electrical conductivity]. *Research Report of the Nagano State Laboratory of Food and Technology* No. 14. p. 91-98. [6 ref. Jap]*
Address: Nagano State Lab. of Food Technology, Kurita, Nagano-shi, Japan.

8692. Ontario Soya-Bean Growers' Marketing Board. 1986. Ontario soybeans in Japan (Color videotape). Chatham, Ontario, Canada. 23½ minutes. Undated.
• ***Summary:*** Shows how Ontario soybeans are used to make tofu, miso and natto in Japan. Includes interviews with end users who make tofu, miso, and natto.

Note: This is the earliest known videotape about soy or tofu owned by Soyfoods Center. Address: Chatham, Ontario, Canada.

8693. **Product Name:** [Soyamil Toasted Soy Flour].
Foreign Name: Soyamil.
Manufacturer's Name: Produtos Alimenticios New Life Ltda.
Manufacturer's Address: Estrada de Itaperica no. 23480, Caixa Postal 5743, Santo Amaro, Sao Paulo, SP, Brazil. Phone: 511.0690.
Date of Introduction: 1986.
Ingredients: Soybeans.
Wt/Vol., Packaging, Price: 300 gm paperboard box.
How Stored: Shelf stable.
New Product–Documentation: Label. 1988. Box is 4.5 by 7 by 1.5 inches. Brown, green, white, and red. Front panel has a color photo of a baked dish (quiche?) in a bed of lettuce. Recipe for Bolo Salgado on the back.

8694. Sasahara, H.; Ando, T. 1986. [Studies on lactic acid bacteria in soy sauce. I. Screening of lactic acid bacteria in soy sauce mash]. *Kagawa Prefectural Fermentation and Food Experiment Station, Annual Report* No. 79. p. 1-6. [18 ref. Jap]*
• ***Summary:*** Pediococci were among the lactic acid bacteria screened. Address: Kagawa Prefectural Fermentation and Food Experiment Station, Kagawa, Japan.

8695. Shinoda, S.; Yoshida, T. 1986. [Phytic acid content of soy-milks and fermented soybean]. *Tachikawa Tandai Kiyo* 19:71-73. (Chem. Abst. 105:151795). [Jap]*

8696. Taguchi, K.; Kawabata, M.; Ohtsuki, K.; Tanaka, Y. 1986. [Changes in dietary fiber of natto and tempeh during fermentation]. *Nihon Eiyo Shokuryo Gakkai-shi* (*J. of the Japanese Society of Nutrition and Food Science*) 39(3):203-08. [15 ref. Jap; eng]*
• ***Summary:*** Total dietary fiber in both natto and tempeh decreased slightly during fermentation. Pectic substances in natto increased 14%, and the relative amounts of the component sugars (arabinose, galactose and galacturonic

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acid) increased during the fermentation, while no significant change was observed in the amount of dietary fiber and the component sugars in the oxalate insoluble residues. The hemicellulose fraction decreased in the tempeh during fermentation, but a marked increase of glucosamine was observed in the oxalate insoluble residues. The increase may reflect the contribution of mycelia polysaccharides to the dietary fiber of tempeh. Address: Dep. of Food Science, Kyoto Prefectural Univ., Kyoto 606, Japan.

8697. Takahashi, T.; Ikawa, F.; Shiga, I. 1986. [Studies on preservation of low salt pickles. III. Reduction of severity of heat sterilization as affecting shoyu pickles]. *Aichi-ken Shokuhin Kogyo Shikenjo Nenpo* (*Annual Reports of the Food Research Institute, Aichi Prefecture*) No. 27. p. 74-77. [Jap]*
Address: Food Research Inst. of Aichi Prefecture Government, Aichi, Japan.

8698. Toho Bussan Kaisha, Ltd. 1986. Company profile. Nihonseimei Shimbashi Building 3 floor, Shimbashi 1-18-16, Minato-ku, Tokyo 105, Japan. 13 p. Manufacturer's catalog. [Eng]
• ***Summary:*** Established in 1947, this trading company employed 147 people in Jan. 1986. One affiliate was Tokyo Tofu Co. Ltd., Chiba, Japan. The soybean and oilseeds dept. trades soybeans and sells a tofu manufacturing plant and its related materials (dried tofu powder). Note: The latter is probably spray-dried soymilk for making tofu. Address: Tokyo, Japan.

8699. Uzawa, H. 1986. Edamame no tosei-bun ni kansuru ideniku shugaku-teki kenkyû [Genetic analysis of the sugar content of green vegetable soybeans]. MSc thesis, Iwate University, Morioka, Japan. [Jap]*
Address: Morioka, Japan.

8700. Anstey, T.H. 1986. One hundred harvests: Research Branch, Agriculture Canada, 1886-1986. *Research Branch, Agriculture Canada, Historical Series* No. 27. xvi + 432 p. See p. 228-30. [6 ref]
• ***Summary:*** "William Saunders first planted soja [sic] bean on the Central Experimental Farm in 1897. Because all available varieties were long-seasoned and would not mature sufficiently to produce ripe seed, the soybean was harvested as hay when pods were about half filled. As recently as the late 1930s no variety was available that would reliably mature seed when grown in Canada...

"The first effort to improve soybean for Canadian conditions was in 1923 when F. Dimmock organized extensive variety trials at Harrow. He transferred to the Forage Crops Division, Ottawa, in 1927 but continued to manage the Harrow soybean trials until C.W. Owen was appointed in 1929. Dimmock inaugurated a selection program within the Manchu variety to find earlier maturing varieties for southwestern Ontario. The first selection, A.K. (Harrow), was released in 1931. It was not until 1943, however, that Harosoy was released from the crossbreeding program started in 1936. The introduction of Harosoy from the Experimental Station, Harrow, marked the beginning of the commercial soybean industry in Canada. By 1959 Harosoy was the most important variety in Canada, occupying about 70,800 ha (75 percent of the soybean) in Ontario and about 1,620,000 ha (15 percent) in the United States.

"Dimmock at Ottawa and Owen at Harrow used germ plasm obtained from Harbin, China, to develop early varieties. They also freely exchanged parental material with the University of Minnesota; consequently the three programs produced similar varieties.

"The objectives of the Harrow and Ottawa programs were to develop varieties that would mature sufficiently early for all seed to ripen before harvest (125-130 days) and to have strong upright branches that held seed pods well above the ground for ease in harvesting...

"The Ottawa program emphasized production of early varieties because the growing season in the northern part of Ontario, Quebec, and Manitoba was about 10 days shorter than at Harrow. In 1961 L.S. Donovan assumed responsibility for the Ottawa soybean (and corn) breeding programs. His objective was to develop varieties of soybean that would mature in the Ottawa River valley of Quebec and Ontario and in southern Manitoba. To achieve this goal he turned to Sweden, which had obtained early maturing, day-neutral varieties from the Sakalin [sic, Sakhalin] Islands of northern Japan. By using this new germ plasm in combination with material from Germany, Donovan widened the genetic base of his breeding program and made outstanding progress... From this program came Maple Arrow (1976), Maple Amber (1981), and Maple Presto (1982). At the time of introduction, Maple Presto was the earliest maturing soybean licensed in Canada...

"Recently H.D. Voldeng of the Ottawa Research Station developed two edible varieties grown specifically for the Japanese market. To obtain the needed small seeds Voldeng turned to wild soybean from China, which has black seeds in small pods...

"In 1978, in cooperation with the Alberta Department of Agriculture, a soybean breeding program was initiated at Lethbridge. H.-H. Mündel was appointed to develop varieties suitable for irrigated lands." Address: Canada.

8701. Bensky, Dan; Gamble, Andrew; Kaptchuk, Ted. comp. and trans. 1986. Chinese herbal medicine: Materia medica. Seattle, Washington: Eastland Press. xiv + 723 p. Illustrations adapted by Lilian Lai Bensky. Index. 29 cm. [1 ref]
• ***Summary:*** The soybean is discussed and illustrated on

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p. 61-62. The illustration shows several clusters of fresh soybean leaves, with flowers and pods. The pharmaceutical name of the preparation is Semen Sojae Preparatum Chinese: *dan dou chi.* Japanese: *tantôshi.* Korean: *tamdugo.* English: Prepared soybean. Properties: sweet, slightly bitter, cold or warm (depending on preparation). Channels entered: Lung, Stomach. Text in which first appeared: *Treasury of Words on the Materia Medica.* The soybean is also listed in "Major combinations" on p. 48 (with scallion or spring onion to treat chills or fever), and on p. 79 (with cape jasmine or gardenia fruit to treat deficiency irritability and insomnia resulting from lingering Heat disturbance in the chest).

Also discusses: Kudzu root–Radix Puerariae–*Pueraria lobata, P. omeiensis, or P. thomsanii* (p. 66-67).

Note: Ted Kaptchuk was born in 1947 and Andrew Gamble in 1946.

8702. Better Home Society. 1986. Tezukuri tôfu, okara ryôri [Homemade tofu and okara recipes]. Beta Homu Kyokai, 1-15-12 Shibuya, Shibuya-ku, Tokyo, Japan. [Jap]*
• ***Summary:*** We can sell this book to tofu makers for only 200 yen. Lots of new okara recipes. Address: Tokyo, Japan.

8703. Chung, Yong-kyu. 1986. The development of multi-cropping systems and soybean production in the Asian-Pacific region. In: S. Shanmugasundaram and E.W. Sulzberger, eds. 1986. Soybean in Tropical and Subtropical Cropping Systems. Shanhua, Taiwan: Asian Vegetable Research and Development Center. xv + 471 p. See p. 409-16. [10 ref]
• ***Summary:*** A major reason for slow production growth is the low net income. In U.S. dollars it was only $65/ha in Taiwan, but minus $100/ha in Japan and minus $200/ha in Korea.

"The need to develop multi-cropping systems for Asian and Pacific countries is widely recognized... Rice is the dominant crop in the region, and there may be a regional surplus by the late 1980s. Japan and Taiwan have already instituted rice reduction programs..."

"A case study in Korea revealed that the income elasticity for soybean demand, including induced demand, was 1.2851, while the value in relation to soybean used for human consumption was 9.8418... This means that a 10% increase in real per capita income will result in a 12.9% increase in aggregate soybean demand and an 8.4% increase in direct consumption."

"World soybean production increased by 5.7% per annum during the last decade... Soybean production in the Asian and Pacific region, however, increased at a rate of only 4.8% during this period. Japan and Korea had small production increases, mainly because of higher yields. Production in Taiwan decreased from 65,000 tonnes in 1970 to 26,000 tonnes in 1980."

"The prospects for soybean production in Taiwan, Japan, and Korea are poor considering recent decreases in production and strong price supports for other crops. The ratio of the farm household sale price to the imported price (1981) in Taiwan, Japan, and Korea was 1.7, 3.7, and 3.1, respectively. This was primarily due to differences in production costs. For example, the production cost for 10 kg of soybean in the USA (1979) was estimated at US $1.34 (Pan 1980) compared with U.S. $3.82 in Taiwan, and US $12.78 in Japan. A dramatic increase in soybean production in the region is therefore unlikely."

"Most governments in the region have already established strong price supports for soybean." Address: Agricultural Economist, Food and Fertilizer Technology Center for the Asian and Pacific Region, 5th Floor, 14 Wenchow St., Taipei, Taiwan.

8704. Colbin, Annemarie. 1986. Food and healing. New York, NY: Ballantine Books. 351 p. Foreword by Robert S. Mendelsohn, M.D. Index. 23 cm. [207* ref]
• ***Summary:*** A very interesting, wholistic look at food trips and philosophies–with a preference for macrobiotics. Discusses miso, natto, tempeh, and tofu. Pages 169-72 discuss beans, including soybeans. Beans are said to be contractive, acid-forming, warming, and a buildup food. "Folklore has it that appreciable quantities of soybeans and their products, especially tofu, can lower, or cool, sexual energy. Research done at the universities of Illinois and Kansas has shown that soybeans may interfere with the absorption of zinc. As zinc is one of the minerals most strongly associated with the healthy functioning of the sex glands, this bit of folk wisdom appears realistic."

Chapter 12, titled "Food as Medicine," discusses healing foods and tells how to prepare them, including miso soup (p. 253; contractive, alkalinizing, warming, breakdown). Miso soup is considered a good food to help cure the common cold, to neutralize the negative effects of excess sugar consumption, and to combat problems of inflammation of the digestive tract (ulcers, colitis, spastic colon, etc.); ulcers are problems of excess acidity.

Chapter 14, titled "The Effects of Food on Sex," notes that "Scientific studies have found that individual foodstuffs have an effect on sexuality via their chemical constituents... soybeans (including tofu) contain traces of antithyroid factors; as the thyroid regulates sexual desire, activity, and fertility, when consumed in large enough quantities these foods could possibly inhibit sexuality by lowering thyroid energy. Oriental folk rumor, which I've been unable to verify, has it that tofu 'cools the sex organs' and is used by monks for the specific purpose of aiding them in maintaining celibacy. In this light, it's interesting to note that the traditional Japanese diet, high in thyroid-depressing soybean products, also contains appreciable amounts of seaweeds, rich in thyroid-stimulating iodine."

In the Foreword, Dr. Mendelsohn writes: "Coming from

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a background of modern medicine, I, as well as hundreds of thousands of other M.D.s, was carefully educated in nutritional ignorance–indeed in disdain for food. The hospital 'dietician' was not–and is not even today–a teacher of physicians. The dietician's traditional purpose in life has always been to serve as a 'referral' for a patient who bothered the physician with too many questions about food. The very title of this book *Food and Healing* represents a joining of two concepts that most doctors regard as unrelated."

A photo (p. 351) shows Annemarie, who was born in Holland and brought up in Argentina on a European vegetarian diet. After her arrival in the United States in 1961, she was introduced to macrobiotics. She lives in New York City with her two daughters, and directs the Natural Gourmet Cookery School there. Address: 365 West End Ave., New York City, NY 10024. Phone: 212-580-7121.

8705. Deming, William Edwards. 1986. Out of the crisis. Cambridge, Massachusetts: MIT Center for Advanced Engineering Study. xiii + 507 p. 22 cm.

• ***Summary:*** Dr. Deming (who is age 90 in 1991), a renowned statistician, was a pioneer in introducing statistical quality control to Japan, starting in 1950. This in turn transformed the image of Japanese products worldwide from shoddy and cheap to superior in quality. The various Japanese national standards, such as the Japanese Agricultural Standard (JAS), grew out of his work. An Appendix to this book, titled "Transformation in Japan," tells how this transformation was made, with details on key Japanese organizations such as JUSE (Union of Japanese Science and Engineering), Japan Management Assoc., Keidan-ren (Federated Economic Societies), quality control circles, etc.

8706. Durston, Diane. 1986. Old Kyoto: a guide to traditional shops, restaurants, and inns. Tokyo, San Francisco: Kodansha International. 240 p. Foreword by Donald Richie. Illust. (photos by Lucy Birmingham). Indexes (by type of shop; alphabetical list of shops). 19 cm. [17 ref]

• ***Summary:*** "A completely revised version of the classic guidebook to Kyoto, with a foreword by Donald Richie. Down the cobbled paths and behind the tranquil noren curtains of Kyoto, the old way of life goes on, nurtured in the restrained furnishings of the traditional inns and in the old shops where fine handmade items still add a touch of quality to life. Since the first edition appeared in 1986, this lovingly written travelogue-cum-guidebook has become de rigueur for knowledgeable travelers seeking to find 'the real Kyoto.' With 51 maps and over 120 photos of the living heart of this ancient capital–and a vanishing way of life. Each shop featured in the book is accompanied by a photo showing its front and a map showing its location" (from the publisher).

Tofu is mentioned on pages 9, 30, 53, 55, 116, 121 (Okutan), 123, 147, 158, 193, 201, 234, 239.

Miso is mentioned on pages 53, 100, 123 (dengaku), 147, 179, 213, and 233.

Yuba is mentioned on pages 30, 59, 61, 147, and 234. Natto is mentioned on pages 49, 183, 233, and 239.

Shôjin ryôri, the vegetarian [actually vegan] food served in Buddhist temples, was also developed in Kyoto from its prototype, fucha ryôri, brought from China by priests. Yuba, uncooked wheat gluten (nama-fu), and tofu are all part of shojin ryori (p. 30).

Fuka (p. 50-52) is a shop that specializes in making wheat gluten, including *nama-fu,* the chewy variety, that is made from half regular wheat gluten and half glutinous rice flour (*mochi-gome*). Wheat gluten is an important part of the vegetarian diet of Zen monks.

Iriyama Tofu (p. 53-55) makes tofu (*momen-dôfu*) in the traditional way, using nigari as a coagulant. The owners (Mr. and Mrs. Iriyama) are 9th generation tofu makers, working in a 120 year old building. Using a charcoal fire they make grilled tofu (yaki-dôfu). They also make deep-fried tofu pouches (*o-age*) and tofu balls (*hiryôzu*).

Note: This is the earliest English-language document seen (April 2013) that contains the term *hiryôzu;* it refers to Kyoto-style deep-fried tofu treasure balls.

Yubahan (p. 59-61) makes yuba in the traditional way using a wood fire and soybeans cooked over an old clay *kamado* stove. "No clocks or timers are involved." Tomizo Asana is the 9th generation yuba maker. "Yubahan started making yuba in 1716, but all family records were destroyed in the huge fire of 1864 that destroyed much of the city."

Takasebune (p. 98-100) specializes in tempura, with a tempura dinner (*tenpura teishoku*) including a "generous bowl of miso soup."

Tamatomi (p. 116-17) offers teppin-age (a fry it yourself tempura meal) and oden stew (with tofu).

Okutan (p. 120-23), inside the north gate of famous Nanzen-ji temple, is famous for its tofu cookery. It has served *yudofu* (fresh tofu simmered in a big ceramic pot over a charcoal fire, with a shoyu dipping sauce) for 12 generations and 300 years. Side dishes include vegetable tempura and tofu dengaku.

Nakamura-ro (p. 136-38) is famous for its tofu dengaku (with miso).

Bunnosuke-jaya (p. 142-44) specializes in amazake.

Ikkyû-an (Ikkyu-an, p. 145-47) serves fucha ryori (Chinese-style vegetarian temple food, including sesame tofu, tofu dengaku. It is named after the famous Zen monk and priest Ikkyû Sôjun {Ikkyu Sojun}).

Takocho (p. 158), 100 years old with 15 seats at the counter, features oden stew with tofu.

Ichiwa (p. 178-80) which makes rice cakes (mochi) and abura mochi (cakes of glutinous rice flour dough that are charcoal grilled on green bamboo skewers then dipped into a

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sweet miso sauce).

Isoda (p. 181-83, 41 Shimomonzen-cho, Murasakino, Kita-ku, southeast of Daitoku-ji. Phone: 075-491-7617) is said to be the best and oldest maker of Daitokuji natto in Kyoto; their fermented black soybeans are sold in a small wooden box. After Daitoku-ji "was destroyed in the Onin Wars (1467-77), an eccentric Zen priest named Ikkyû supervised the reconstruction of the temple and became its 47th (and most celebrated) abbot. According to legend it was Ikkyu who introduced the Chinese Buddhist recipe for this compact, high-protein treat" for mendicant Zen monks. The original recipe, which is still used at Isoda, is described. Because warm weather and natural sunlight are necessary, Daitoku-ji natto can only be made during the summer months, most often in August after the rainy season has abated. Even Sen no Rikyu, the famous Japanese tea master, is said to have been an ardent fan of the salty morsels–which are still served with ceremonial tea. Chûgo Isoda, the present owner, is a 17th generation maker of Daitokuji natto. He and his wife work together during the hot summer making the fermented black soybeans. A full-page photo shows Mr. Isoda mixing a shallow tub of the dark fermenting beans. Daitoku-ji natto are also mentioned on page 49.

Nishiki (p. 197-99) is famous for its kaiseki ryori. "Every month the ingredients are completely changed to match the season." One dish is karashi-dôfu ("mustard tofu").

Sagano (p. 201-02) serves simmering tofu (*yudôfu*) in the bamboo forest just south of Tenryu-ji temple.

The excellent "Glossary" (p. 230-32) includes entries for: Amazake, fu (wheat gluten), kaiseki, miso, mochi, nattô (fermented soybeans), oden, o-hagi, shôjin ryôri, sukiyaki, tofu, yuba, yûdofu. Address: Kyoto, Japan.

8707. Ebine, H. 1986. Miso. In: N.R. Reddy, M.D. Pierson, and D.K. Salunkhe, eds. 1986. Legume-Based Fermented Foods. Boca Raton, FL: CRC Press. [viii] + 254 p. See p. 47-68. Chap. 3. [66 ref]

• ***Summary:*** Contents: Introduction: History, consumption patterns and production. Preparation. Composition: Chemical composition, physical properties, organoleptic qualities, other characteristics. Nutritional quality. Toxicology. Miso-like products: Kinzanji miso, hama-natto (tera-natto), doenjang (soybean paste) and kochujang (red pepper soybean paste), tauco. Conclusions. Address: Central Miso Research Inst., Tokyo, Japan.

8708. Frost, G.M. 1986. Commercial production of enzymes. *Developments in Food Proteins* 4:57-134. Chap. 3. (B.J.F. Hudson, ed. London and Englewood, New Jersey: Applied Science Publishers). [197* ref]

• ***Summary:*** The production of isolated enzymes on an industrial scale began less than 100 years ago. However the action of enzymes (fermentation) for changing and preserving foods has been exploited for thousands of years. Many traditional fermentations involve digestion by extracellular enzymes prior to fermentation by whole organisms. Enzymes are sold mainly to the food, beverage, and detergent industries. The present world market is valued at approximately £200 million. Most applications now involve hydrolytic enzymes, but future growth of other types seems probable. Most commercial enzymes are made by submerged cultivation of highly developed strains of microorganisms using specially optimized processes. Industrial enzymes, though rarely highly purified, are manufactured to exacting microbiological specifications. Enzymes for diagnostic and pharmaceutical use require more sophisticated purification methods.

The first artificial use of an enzyme was probably the addition of calf stomach extract to milk to cause coagulation when making cheese. In the West, the main use of fermentation is in making alcoholic beverages–wine, beer, etc. In East Asia, traditional fermentations are more concerned with improving the nutritional value, flavor, and texture of various foods–such as tempeh.

During the past century Asian and Western applications have been merged. For example, in 1894 Takamine in Japan used *Aspergillus oryzae,* the main organism in the soy sauce fermentation, to make Takadiastase, "an amylolytic enzyme which was first used for human consumption as a digestive aid." Takamine also established a business in the USA and new applications for his enzymes were found. His company still exists (though under a different name) and is still marketing essentially the same enzyme preparations.

Includes a long section on "Enzymes used in food." Address: John & E. Sturge Ltd., Selby, North Yorkshire, UK.

8709. Furuta, Kenji. 1986. Shoyu making in Japan. *Farming Japan* 20(2):58-61. Special issue: Processed foods of soybeans. [Eng]

• ***Summary:*** "From April 1980 to April 1982, I stayed in Nepal as a member of the Japan Overseas Cooperation Volunteers (JOCV). In these months, I was engaged in the study, trial production and diffusion of processed foods at the country's Central Food Research Laboratory, Food Research Section.

"Soon after I arrived at my post, I began studies on shoyu production. In my office at the Laboratory, there was a staffer named Baidya [sic, Achutananda Vaidya]. Mr. Baidya had just returned from Japan, where he received training, chiefly on the production of miso (soybean paste) and shoyu (soy), at the Prefectural Experiment Station of Shoyu and Miso in Akita for about nine months. He was much interested in the processing of soybeans; he had learned the technique of making tofu (bean curd) from my predecessor and operated a business for making and selling tofu. He was very eager to adapt the technique he learned in Japan to the situation in Nepal and to introduce it to his country. I felt

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sympathy with his enthusiasm and decided to cooperated with him.

"There were three types of soybeans, whose appearance differed from one another, found in Nepali markets: white, brown and black and small-grained ones... These soybeans are planted on footpaths between rice and dry fields or on fields alternately with corn. Nepalis eat several kinds of beans, but as to soybeans, they take them roasted with corn only between meals."

In July 1980 the author and Mr. Vaidya began experimental production of soy sauce in Nepal using 4 different methods. The best results were obtained using hand-made koji and whole soybeans. The resulting shoyu was very favorably received. Soon they increased the scale of their experiment so that they could make about 100 liters of shoyu per batch.

They also conducted a survey to try to estimated the demand for shoyu in Nepal. Some of the Japanese and Chinese restaurants in Kathmandu used soy sauce imported from Japan or India. Indian soy sauce tastes entirely different from Japanese shoyu; it is probably unfermented HVP soy sauce. When asked to try Japanese-made shoyu, restaurant owners always preferred it to Indian-made soy sauce. From their survey they estimated that there was a demand for at least 20,000 liters of shoyu per year in Nepal–the actual demand, they felt, might be several times or even many times this amount.

"A Nepali, who heard of our shoyu making experiment, visited us to see the work. This man later wrote a letter to me and said that he began a shoyu making business on a small scale. I helped my Nepali friend making shoyu in Pokra. He owns a hotel there, a tourist resort about 110 kilometers west of Kathmandu. And after one year since then (I had returned home already) Mr. Baidya helped him with the final process of shoyu making in my place." In March 1985 Mr. Vaidya came to Japan, invited by the Rotary Club in Akita and Aomori, to receive further training in soybean processing. The author an Mr. Baidya met in Japan and renewed their friendship. Address: Ex-member of the Japan Overseas Cooperation Volunteers (JOCV).

8710. Hirayama, Takeshi. 1986. A large scale cohort study on cancer risks by diet–with special reference to the risk reducing effects of green-yellow vegetable consumption. In: Yuzo Hayashi, et al., eds. 1986. Diet, Nutrition and Cancer: Proceedings of the 16th International Symposium of the Princess Takamatsu Cancer Research Fund, Tokyo, 1985. Tokyo: Japan Scientific Societies Press; Utrecht, Netherlands: VNU Science Press. xvi + 345 p. See p. 41-53. [13 ref]
• ***Summary:*** Breast cancer: In a prospective study of 142,857 women in Japan followed for 17 years, the author found a significant graded inverse relationship between consumption of miso soup and subsequent risk of breast cancer (p. 48). Note: This is the earliest document seen (June 1999) which suggests that soy might reduce one's risk of prostate cancer.

Stomach cancer: The author found a significant graded inverse association between the consumption of miso and green/leafy vegetables and gastric cancer risk among 122,261 men and 142,857 women followed for 13 years.

Japanese who consumed meat daily had much higher mortality from breast cancer and colon cancer than those who ate little or no meat.

"Daily consumption of green-yellow vegetables (GYV) rich in beta-carotene, vitamin C, calcium, and dietary fiber was observed to lower risks for selected cancers such as lung, stomach, prostate, and cervix. The risk reducing effect appeared more striking in cigarette smokers.

"Risks for cancer of the stomach in males and females and cancer of the breast in females were observed to be lower with the increase in frequency of soybean paste soup consumption which frequently contains GYV." Address: Inst. of Preventive Oncology, Tokyo 162, Japan.

8711. Hoshikawa, Kiyochika. comp. 1986. Shinpen shokuyô sakumotsu [Edible crops]. Tokyo: Yokendo. xviii + 697 p. 6th printing. Index. Illust. 22 cm. [202 soy ref. Jap]
• ***Summary:*** One chapter (p. 416-59) is about soybeans (*daizu*).

8712. Inouye, Jun; Shanmugasundaram, S. 1986. Photoperiod and temperature effects in the growth and reproductive behavior of less photoperiod-sensitive soybeans. In: S. Shanmugasundaram and E.W. Sulzberger, eds. 1986. Soybean in Tropical and Subtropical Cropping Systems. Shanhua, Taiwan: Asian Vegetable Research and Development Center. xv + 471 p. See p. 353-60. [17 ref]
• ***Summary:*** "Soybean... is generally classified as a short-day plant. According to Fukui and Yarimizu (1951, 1952), the crop's blooming to pod ripening period is reduced when soybean is grown under short daylengths and high temperatures. The longer the pod ripening period of a cultivar, the greater the decrease will be in its blooming to pod ripening period. However, some researchers have identified photoperiod-insensitive cultivars." Address: 1. Assoc. Porf., Inst. of Tropical Agriculture, Kyushu Univ., Hakozaki, Fukuoka, Japan; 2. Soybean breeder and Legume Program leader, AVRDC, P.O. Box 32, Shanhua, Tainan, Taiwan.

8713. Kikkoman K.K. 1986. Dai 68 ki hôkoku-sho. Showa 60 nen 1 gatsu 1 nichi–Showa 60 nen 12 gatsu 31 nichi [68th annual financial report. From 1 Jan. 1985 to 31 Dec. 1985]. Tokyo, Japan. 15 p. 19 cm. [Jap]
• ***Summary:*** Written entirely in Japanese with no photos. Address: Tokyo, Japan.

8714. Kondo, Sonoko; Stoumen, Lou. 1986. The poetical

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pursuit of food: Japanese recipes for American cooks. New York, NY: Clarkson N. Potter. 296 p. Illust. by Etienne Delessert. Index. 25 cm.
• ***Summary:*** A very artistic, attractive, and authentic book with superb (imaginative and lyrical) illustrations. The section titled "Staple foods you will need" (p. 17-20) discusses soy sauce, konbu and nori seaweeds, sesame seed paste (*atari-goma;* "Most Americans may be more familiar with the Middle Eastern version called tahini paste... Used in making salad dressings and dips"), miso, and sesame seeds. Soy-related recipes include: Grilled tofu with miso (Dengaku; p. 37). Sesame tofu (p. 38; no soy). Tuna sashimi and green onions with miso (p. 40). Daikon radish with lemon miso (p. 42). Cauliflower florets with miso (p. 42). Basic miso soup (p. 51). Clam miso soup (p. 51). Daikon radish miso soup (p. 52). Vegetable and chicken miso soup (p. 52). Tofu and wakame seaweed suimono (p. 53). Fried rice with tofu and vegetables (p. 89).

Chapter 7, titled "Tofu & egg dishes" includes (p. 103-17): Tofu in Kamakura. Description of different types of tofu: Silken, firm, grilled, pouches, deep-fried, fritters (*ganmodoki*), freeze-dried (*koya-dofu*), how to press tofu. Chilled tofu with ginger sauce. Braised koya-dofu with pea pods. Cold-day tofu. Vegetarian "chicken" tofu (with frozen tofu). Dragon's head (*hiryozu*). Tofu from the sea (*Kenchin-mushi*). Tofu gratinée. Stuffed tofu. Scrambled tofu. Tofu treasure bags. Vegetarian "burger." Egg tofu delight (*tamago-dofu;* no soy).

Beans for breakfast (*natto;* p. 125). Braised konbu seaweed, soybeans, and konnyaku (p. 128). Hijiki seaweed with tofu (p. 129). Stuffed tofu sushi (*Inari-zushi;* p. 157). Snapper tempura with asparagus and miso (p. 174). Marinated cod in miso sauce (p. 179). Seaweed, chicken, and vegetables with creamy miso (p. 185). Steak miso (p. 190). Sukiyaki (p. 206). Shabu shabu (p. 208). Vegetarian nabe (with tofu, p. 211). Sea and mountain (with miso sauce, p. 212-23). Winter nabe (with tofu, p. 214). Udon-suki (with tofu, p. 216). Tofu apple cake (p. 244). Chapter 15 (p. 260-71) is menu plans, by season and time of day.

The glossary (p. 272-82) includes: Agar-agar, azuki beans, konbu seaweed, kuzu, miso paste, nori seaweed, rice cakes (*mochi*), sesame seed oil, sesame seeds, soybeans–fermented (*natto*), soy sauce, tofu, tonkatsu sauce (with dark soy sauce), wakame seaweed. Address: Los Angeles, California.

8715. Kushi, Aveline Tomoko. 1986. Mit miso kochen: Makrobiotik [How to cook with miso: Macrobiotics]. Schaffheim, Germany: Pala-Verlag. 140 p. Illust. Index. 21 cm. [7 ref. Ger]
• ***Summary:*** A German-language edition of her 1978 English-language book. Address: Massachusetts.

8716. Miyashiro, R. 1986. [Bacterial spoilage of foods soaked in condiments]. *Kagawa Prefectural Fermentation and Food Experiment Station, Annual Report* No. 79. p. 39-46. [4 ref. Jap]*
• ***Summary:*** For example, shellfish were soaked in soy sauce. Address: Kagawa Prefectural Fermentation and Food Experiment Station, Kagawa, Japan.

8717. Morinaga Milk Industry Co. Ltd. 1986. Morinaga. Shiba 5-33-1, Minato-ku, Tokyo 108, Japan. 22 p. Undated. 28 cm. [Eng]
• ***Summary:*** This glossy color manufacturer's catalog contains an interesting 2-page chronology of the company titled "Briefing history of Morinaga Milk." The company was founded in 1917. The first commercial product was Morinaga Drymilk–whole milk powder with sucrose. In 1953 the Morinaga Central Research Laboratory was founded–the same year as the "Morinaga Incident" in which 186 infants died after consuming Morinaga infant formula accidentally contaminated with arsenic.

The section titled "Exporting long life tofu–Owing to the technology of aseptic packaging" states: "The first long life tofu was exported in 1978 and in the following year, the Ministry of Science and Technology Prize was awarded to Morinaga's outstanding aseptic manufacturing technology. Since then, long life tofu has been exported to 32 countries and has received a fine reputation. Patents were granted in the U.S., the biggest export market. And in [May] 1985, for the rapidly growing American market, Morinaga Nutritional Foods, Inc. was established in Los Angeles. In 1977, Beech Nut California Corporation, a joint venture with Beech-Nut Foods Corporation was founded.

Note: This is the earliest English-language document seen (April 2013) that uses the term "long life tofu" to refer to aseptically packaged lactone silken tofu. Address: Tokyo, Japan.

8718. Nagao, Minako; Wakabayashi, K.; Fujita, Y.; et al. 1986. Nitrosatable precursors of mutagens in vegetables and soy sauce. In: Yuzo Hayashi, et al., eds. 1986. Diet, Nutrition and Cancer: Proceedings of the 16th International Symposium of the Princess Takamatsu Cancer Research Fund, Tokyo, 1985. Tokyo: Japan Scientific Societies Press; Utrecht, Netherlands: VNU Science Press. xvi + 345 p. See p. 77-86. [44 ref]
• ***Summary:*** "Nitrosatable precursors of mutagens that show mutagenicity to *Salmonella typhimurium* TA100 without S9 mix after treatment with nitrite at pH 3 were found in various foods... The mutagenicity of soy sauce towards *Escherichia coli* WP2 *uvr*A/pKM101 is partly explained by 1-methyl-1,2,3,4-tetrahydro-Beta-carboline-3-carboxylic acid (MTCA) and tyramine reported previously. Oral administration of soy sauce and nitrite to male Fischer 344 rats for 2 years induced basal cell proliferation of the forestomach and intestinal metaplasia of the glandular stomach, but did not

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induce cancers in any organ." Address: Carcinogenesis Div., National Cancer Center Research Inst., Tokyo 104, Japan.

8719. Nagao, M.; Wakabayashi, K.; Fujita, Y.; Tahira, T.; Ochiai, M.; Sugimura, T. 1986. Mutagenic compounds in soy sauce, Chinese cabbage, coffee, and herbal teas. *Progress in Clinical and Biological Research* 206:55-62. [13 ref] Address: Section of Prevention of Carcinogenesis, National Cancer Research Inst., Tsukiji 5-1-1, Chuo-ku, Tokyo 104, Japan.

8720. Needham, Joseph; Lu, Gwei-Djen; Huang, Hsing-Tsung. 1986. Science and civilisation in China. Vol. 6, Biology and biological technology. Part I: Botany. Joseph Needham series. Cambridge, England: Cambridge University Press. xxxii + 718 p. Illust. Index. 25 cm. [2476* ref]
• ***Summary:*** Contents: List of 101 illustrations. List of 22 tables. List of 37 abbreviations. Acknowledgements. Author's note. Introduction. The setting; China's plant geography: Floristic regions, geo-botany *in statu nascendi,* the case of *chü* and *chih.* Botanical linguistics: Plant terminology, plant nomenclature. The literature and its content: Lexicographic and encyclopaedic texts, the pandects of natural history (Pên Ts'ao)–a great tradition, studies on wild (emergency) food plants–the esculentist movement, botanical monographs and tractates, exotic and historical botany. Plants and insects in man's service (by Huang Hsing-Tsung): Natural plant pesticides, biological pest control.

Bibliographies: Abbreviations (mostly of journal names). Chinese and Japanese books before + 1800: 711 references. Chinese and Japanese books and journal articles since + 1800: 415 references. Books and journal articles in Western languages: 1388 references. General index. Table of Chinese dynasties. Romanisation conversion tables (from Needham's modified Wade-Giles to pinyin).

"To the memory of Shih Shen-han, Professor of Botany and Mycology, National North-West Agricultural College, Wukung, Shensi, in gratitude for much inspiration and blythe discourse; and of Wu Su-Hsüan, Director of the Department of Cytology, Institute of Botany, Academia Sinica, Peking, in gratitude for so sympathetic a welcome... this volume is dedicated." Address: 1. F.R.S., F.B.A., East Asian History of Science Library, Gonville & Caius College, Cambridge, England; 2. PhD, Fellow Emeritus of Robinson College, Cambridge; 3. PhD, Program Director, National Science Foundation, Washington, DC.

8721. Nunomura, N.; Sasaki, M. 1986. Soy sauce. In: N.R. Reddy, M.D. Pierson, and D.K. Salunkhe, eds. 1986. Legume-Based Fermented Foods. Boca Raton, FL: CRC Press. [viii] + 254 p. See p. 5-46. Chap. 2. [111 ref]
• ***Summary:*** Contents: Introduction. Types of soy sauce. Preparation of shoyu: Raw materials, preparation (treatment of raw materials, koji making, mash [moromi] production and aging, pressing, refining and pasteurization), production of chemical and semichemical shoyu. Composition: Chemical composition, flavor compounds (Japanese shoyu flavor components, oxidative products of HEMF, flavor components of koji, matured mash, and shoyu oil, quantitative analysis of flavor compounds, change in flavor components during pasteurization, flavor components of various soy sauces in the world), organoleptic quality. Safety: Mycotoxins, long term effects of shoyu consumption, mutagens. Conclusions.

HEMF is 4-hydroxy-2 (or 5)-ethyl-5 (or 2)-methyl-3(2H)-furanone. First isolated in 1976, it possesses a shoyu-like and a strong caramel-like flavor. The addition of 0.1 ppm of HEMF to shoyu makes the taste milder.

Table 5 lists the 271 flavor components that have been found in Japanese shoyu to date. They include 37 hydrocarbons, 30 alcohols, 41 esters, 15 aldehydes, 5 acetals, 17 ketones, 24 acids, 16 furans, 4 lactones, 4 furanones, 5 pyrones, 25 pyrazines, 7 pyridines, 6 miscellaneous nitrogen compounds, 11 sulfur compounds, 3 thiazoles, 3 terpenes, and 2 miscellaneous compounds. Address: Soy Sauce Science Research Lab., Kikkoman Corp., Noda, Chiba, Japan.

8722. Ohta, Teruo. 1986. Natto. In: N.R. Reddy, M.D. Pierson, and D.K. Salunkhe, eds. 1986. Legume-Based Fermented Foods. Boca Raton, FL: CRC Press. [viii] + 254 p. See p. 85-93. Chap. 5. [25 ref]
• ***Summary:*** Contents: Introduction: Types of natto, production and consumption. Method of preparation: raw materials, preparation of itohiki natto (soaking and cooking of soybeans, inoculation and packaging, fermentation, maturation and stabilization), preparation of yukiwari natto and hama-natto, fermentation microorganisms. Composition and physical properties: Chemical composition, physical properties (mucous material, spots on natto, organoleptic properties). Nutritional quality. Toxicology. Conclusions.

The three major types made in Japan are itohiki natto, yukiwari natto, and hama-natto; each has its own method of preparation. Itohiki natto (sticky natto) is made by fermenting whole cooked soybeans with *Bacillus natto;* it is made in large quantities and, in Japan, accounts for more than the total production of the other two types. Yukiwari natto is made by mixing itohiki natto with rice koji and salt, then aging the mixture. Hama-natto is made by inoculating cooked soybeans with the koji mold, *Aspergillus oryzae.* Hama-natto is made in and around only two small parts of Japan: the cities of Hamamatsu and Kyoto, where it is sold as a local souvenir food item.

The earliest document known to have mentioned the word "natto" is the *Shin Sarugaku Shiyu,* written by A. Fujiwara [Fujiwara no Akihira] in 1068; yet no description was given of the method for making this natto. Itohiki natto has long been used as a feed for livestock by village farmers

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and as a food in Buddhist temples during the winter. During its early history, natto was prepared by simply wrapping warm, cooked soybeans in rice-straw bundles, and leaving the wrapped soybeans at ambient temperature. Modern techniques involved the use of starter cultures such as *Bacillus natto* developed after the 1920s.

Production and consumption in Japan: In 1982 the production of itohiki natto was about 170,000 metric tons (tonnes), requiring the use of about 85,000 tonnes of soybeans. [So from 1 kg of soybeans one gets about 2 kg of finished natto]. This amount is nearly a 10% increase over 1980. This large increase, in only two years, which is extraordinary among Japanese traditional fermented foods, may be due to: (1) the growing concern of the Japanese public over the relationship between diet and health, and over the excess intake of animal fats and salt. (2) The fact that natto contains no salt. (3) The high and uniform quality of commercial natto and its long shelf life, which has been extended by the use of refrigerated distribution from natto factories to households.

The majority of natto makers in Japan are small family businesses that make about 300 kg of natto a day. These companies distribute their fresh natto locally. However, there is a growing number of large factories that make more than 3,000 kg per day.

Annual consumption of natto in Japan is 760 gm per person. Until the 1950s, natto was made and consumed mostly in the northeastern region of Japan. This localization has recently changed due to the acceptability of natto in the rest of Japan.

In Japan, natto is eaten with thinly sliced leeks (*negi*), nori (a black, paper-thin sheet made of a sea vegetable), and mustard mixed together with a small amount of soy sauce, as a side dish for a bowl of cooked rice–typically for breakfast and/or dinner. Natto is also used as one ingredient in nori-wrapped sushi and in noodle soup. Address: Director, Applied Microbiology Div., National Food Research Inst., Ministry of Agriculture, Forestry, and Fisheries, Tsukuba, Ibaraki, Japan.

8723. Shanmugasundaram, S.; Sulzberger, E.W. eds. 1986. Soybean in tropical and subtropical cropping systems: Proceedings of a symposium, Tsukuba, Japan, 26 September–1 October 1983. Revised ed. Shanhua, Taiwan: Asian Vegetable Research and Development Center. xv + 471 p. Illust. Index. 26 cm. [500+ ref. Eng]

• ***Summary:*** Note: The first edition, hardcover, published Oct. 1985, was recalled and discarded, due to errors in the text. Contents: Section 1. Cropping systems. 2. Plant breeding. 3. Management. 4. Diseases and insects. 5. Plant nutrition. 6. Physiology. 7. Economics. 8. Related topics. 59 chapters total. Symposium participants. Author index. Subject index.

In the Foreword, G.W. Sellek, Director General of AVRDC, notes that the proceedings of this symposium were published in two sections. The proceedings of the first section, recently published by the Tropical Agricultural Research Center of Japan (TARC), cover country reports and special research projects. These proceedings cover cropping systems. “In the recent past, research was aimed almost exclusively at raising soybean yields rather than developing cropping systems that provide the stability needed to grow soybeans under high-risk conditions. There also seems to be a greater sense of urgency to integrate cropping systems research with disciplines such as plant breeding, crop management, pest control, and plant nutrition.” There is a strong “need to ensure that scientists from a variety of disciplines and backgrounds work together so that their research efforts are well coordinated.” Address: AVRDC, Taiwan.

8724. Takahashi, Kuwako. 1986. The joy of Japanese cooking. Tokyo: Shufunotomo Company, Ltd. 311 p. Illust. (some color photos). Index. 27 cm.

• ***Summary:*** An excellent book with especially good descriptions of Japanese ingredients. Contents: Dedication. Foreword. Introduction. Part I. Japanese ingredients. Seasonings in Japanese cooking. Utensils and equipment. Tableware. Measurements and equivalents. Basic techniques: Making soup stock (*dashi*), cooking rice, preparing fish, boning chicken, cutting vegetables, broiling, poaching, steaming.

Part II. Seafood. Chicken. Eggs. Beef. Pork. *Tofu* (bean curd). Vegetables, dried and manufactured foods.

Part III. Appetizers (*zensai*). Soups. Salads (*aemono*). Casseroles (*nabemono*). Rice. Pickles. Desserts and Japanese sweets.

Part IV. Menu planning. Sample menus with preparation schedules. Part V. Making tea. Serving sake.

A color photo (p. 15) shows six different soyfoods made from soymilk: 1. Deep-fried soybean puffs (*age* or *aburage*). 2. Fried tofu cutlet (*atsu-age* or *nama-age*). 3. Tofu patties (*ganmodoki*). 4. Soymilk film, dried (*yuba*). 5. Bean curd cake (*tofu*). 6. Freeze-dried tofu (*Kôya dofu*).

Note 1. This is the earliest English-language document seen (April 2013) that uses the term *Kôya dofu* to refer to dried-frozen tofu.

The section titled “Japanese ingredients” (a superb glossary, with many entries accompanied by an illustration {line drawing}, p. 17-32) includes: Bean curd cake (*tofu*), incl. regular tofu (*momen dofu*), soft tofu (*kinugoshi dofu*), Ever-Fresh Silken Tofu (aseptically packaged), instant tofu, firm tofu (Chinese style). Tofu products: Deep-fried soybean puffs (*agé* or *aburage*), fried tofu cutlet (*atsu agé* or *name agé*), freeze-dried tofu (*Kôya dofu*), grilled tofu (*yaki dofu*), tofu patties (*ganmodoki*). Beans: Red beans, dried (*azuki*), soybeans, dried (*daizu*), soybeans, fresh (*eda mamé*). Bean pastes: Bean paste, fermented (*miso*), sweet bean paste (*azuki*

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an). Soymilk film, dried (*yuba*). Soy sauce (*shoyu*).

The glossary also discusses: Horseradish, Japanese (*wasabi*), konnyaku, kombu, umeboshi, kabocha, daikon (4 forms), glutinous rice (*mochi gome*), red bean rice (*sekihan*), pounded rice cake (*mochi*), rice wine lees (*sakekasu*), rice wine lees pickles (*narazuke*), perilla (*shiso*), seaweeds (*hijiki, nori, yakinori, small sized nori, wakame, ao nori*), sesame seeds (*goma*), sweet rice wine for cooking (*mirin*), wheat gluten cake (*fu,* incl. *nama fu, yaki fu, and matsutake fu*).

The section titled "Seasonings in Japanese cooking (another superb glossary, p. 33-37) discusses: Soy sauce, incl. Regular soy sauce (*koikuchi shôyu*), light soy sauce (*usukuchi shôyu*), tamari soy sauce (darker and thicker, made from fermented soybean and brine in the Nagoya area. "It is not saltier than regular soy sauce but has a richer flavor, thicker taste, and some people prefer tamari as the dipping sauce for sashimi... Note 2. In the USA the name 'tamari' is mistakenly used for natural soy sauce which is not tamari"), white soy sauce (*shiro shôyu*), milder soy sauce (contains less salt). A table showing the nutritional composition of five different types of Japanese soy sauce is given. Combinations of soy sauce and mirin: Teriyaki. Miso (incl. *kome miso, mugi miso, mame miso,* mixing of miso types).

Use the good index to see how each of the ingredients mentioned above are used in recipes.

A good biography of the author is appears in the Foreword and on the inside rear dust jacket (with portrait photo). The author was also very active in introducing ikebana (Japanese flower arranging) to the Bay Area and the USA. Address: Japan and Berkeley, California.

8725. Tanaka, Kiichi. 1986. Sakugata o ikasu mamerui no tsukurikata: endo, ingen, soramame, edamame [Recipes for preparing beans and peas: peas, string beans, broad beans / fava beans, green vegetable soybeans (edamame)]. Tokyo: No-san Gyoson Bunka Kyokai. 243 p. Illust. 19 cm. [Jap]*
• ***Summary:*** Other titles: "Mamerui no tsukurikata" [How to prepare beans and peas]. Kiichi Tanaka was born in 1930. Address: Japan.

8726. Tanaka, Kiichi. 1986. Endo, ingen, soramame, edamame sonota mame [Peas, string beans, broad beans / fava beans, green vegetable soybeans (edamame) and other beans]. Tokyo: Nôsan Gyoson Bunka Kyôkai. 516 p. 27 cm. Series: Yasai engei daihyakka, No. 8. [Jap]*
Address: Japan.

8727. Tsuji, Shizuo; Hata, Koichiro. 1986. Practical Japanese cooking: Easy and elegant. Tokyo, New York & San Francisco: Kodansha International. 151 p. Illust. (color photos by Yoshikatsu Saeki). Index. 31 cm.
• ***Summary:*** A beautiful, elegant book. M.F.K. Fisher says of this book (rear dust jacket): "The recipes are clear and easy to follow, and the illustrations are especially delightful, truly top high-style Japanese simplicity. Messrs. Tsuji and Hata have given us the best of the old and the new."

The Preface, by Shizuo Tsuji (born in 1948) notes that the many-faceted Japanese "cooking tradition relies heavily on two primary ingredients–delicate bonito stock (*dashi*) and, not unexpectedly, soy sauce. Most, if not all, dishes call for one or both." The recipes generally call for either "dark soy sauce" [koikuchi] or "light soy sauce" [usukuchi].

Soy related: Squid and asparagus with mustard miso sauce (*... karashi su miso ae,* with "5 Tbsps nonsweet white miso paste," p. 19). Tofu, pork, and vegetable soup (*Kenchin jiru,* with "1 block regular {'cotton'} tofu, about 10 oz {300 gm}, p. 24). Pureed corn soup (with "2 Tbsps nonsweet white miso paste," p. 24). Miso soup with pork and vegetables (*Buta jiru,* p. 25). Yellowtail teriyaki (*Buri teriyaki,* p. 35). Simmered mackerel in miso (*Saba miso-ni,* p. 37). Tofu as a possible ingredient (p. 38). Deep-fried trout in vegetable sauce (Tofu can be added to the sauce to give the dish more volume, or tofu can easily be substituted for the trout, p. 39). Stuffed spiny lobster ("In place of egg, softened miso can be used in the filling," p. 40-41). Squid teriyaki (*Ika teriyaki;* the teriyaki sauce includes mirin, sake, dark soy sauce, and tamari soy sauce, p. 44). Shrimp and leeks with mustard-miso sauce (*... karashi-su-miso kake,* p. 48). Grilled beef (with tamari soy sauce in Lemon-soy dipping sauce {Ponzu}, and dark soy sauce in sesame dipping sauce, p. 50-51). Grilled beef with miso (*Gyuniku miso-yaki,* with "4 Tbsps Red Miso Sauce {p. 85}," p. 54). Nagasaki-style braised pork (*Buta kaku-ni,* with "1 cup {250 gm} unpacked okara {tofu pulp} or milk, optional," p. 58).

The section titled "Tofu" includes: Simmered tofu (*Yudofu,* with "2 blocks tofu, about 20 oz {600 gm} total," p. 71). Night-dried tofu with chicken sauce (*Ichiya-dofu tori soboro ankake;* regular tofu is allowed to freeze overnight to give it a different texture, p. 72). Simmered tofu dumplings (*Ganmodoki uma-ni,* p. 73-74). Deep-fried tofu (*Agedashi-dofu,* p. 75). Scrambled tofu (*Iri-dofu,* p. 76). White salad (*Shira-ae,* p. 77). Tofu sandwiches (*Tofu hakata-ni,* p. 78-79). Tofu hamburger steak (with miso, p. 80). Freeze-dried tofu with egg (*Koya-dofu tama-jime,* p. 81).

Grilled eggplant (*Taki-nasu,* with Soy-ginger sauce, p. 84). Deep-fried eggplant with miso sauce (*Nasu dengaku,* with Red Miso Sauce, p. 85). Turnip with ginger-miso sauce (*Furo-fuki kabura,* with 1 cup Red Miso Sauce, p. 88). Chinese cabbage and deep-fried tofu (*Hakusai usuage uma-ni,* with "4 pieces thin deep-fried tofu {*usuage*}, about 3 oz (80 gm) total," p. 90). Deep-fried and simmered acorn squash (*Eikon sukasshu no age-ni,* with "2 blocks thick deep-fried tofu {*atsuage*}, about 5 oz {150 gm} total," p. 93). Simmered soybeans (*Nimame,* with "1 cup {120 gm} dried soybeans;" "The real secret... is to allow the beans a long pre-soak before beginning to cook," p. 94). Vegetables with white sesame dressing (*Goshiki yasai gomashirasu-ae,* with 1 block regular tofu, p. 96). Mixed rice (*Kayaku gohan,*

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has "thin deep-fried tofu" as an alternative ingredient, p. 100). Scattered sushi (*Bara sushi,* with "1 cake freeze-dried tofu {*Koya-dofu*}, about ½ oz {15 gm}," and "2 Tbsp dark soy sauce," p. 106-07). Thick roll sushi (*Futo-maki-zushi,* with "2 cakes freeze-dried tofu {Koya-dofu}, about 1 oz {30 gm} total," p. 113). Inari sushi (*Inari-zushi,* with "10 pieces thin deep-fried tofu {*usuage*}, each about 3 inches {8 cm} square, p. 114-15). Udon noodles with deep-fried tofu (*Kitsune udon,* with 4 pieces thin deep-fried tofu, p. 120). Sukiyaki ("... actually only appeared on the horizon of Japanese cuisine some one hundred years ago," with "½ block regular {'cotton'} tofu," p. 122-23). Oden stew (*Oden nabe,* with "4 blocks thick deep-fried tofu," p. 124-25). Seafood pot (*Yose nabe,* with 1 block regular tofu," p. 126-27). Deep-fried mixed kebabs (*Kushi-katsu,* with 1/3 cup Worcestershire sauce in the Dipping sauce, p. 132-33).

The section titled "Ingredients" (p. 144-49) has a photo and excellent description for each entry, including: Ginger (fresh). Ginger (red vinegared). Ginger (sweet vinegared). Green seaweed flakes (*ao-nori*). Hot yellow mustard (*karashi*). Kelp (*konbu*). Kelp (salted) (*shio-konbu*). Mirin. Miso paste (Sweet white miso, nonsweet white miso, red miso). Nori seaweed. Pickled plums (*umeboshi*). Rice cakes (*mochi*). Rice vinegar. Saké. Sesame seeds (white, black, or brown). Seven-spice pepper. Shiitake mushrooms. Shiso leaves. Soba noodles. Somen noodles. Soybeans (fresh young) (*edamame*). Soy sauce (dark, light, tamari). Tofu (freeze-dried) (*Koya-dofu, kori-dofu, or shimi-dofu*). Tofu (fresh). Tofu (thick deep-fried). Tofu (thin deep-fried). Udon noodles. Wakame seaweed. Wasabi horseradish ("has a tingling hotness that goes straight to the nose").

About the authors (inside rear dust jacket, with small color portrait photos of each): "Shizuo Tsuji is president of the Ecole Technique Hôtelière Tsuji, the largest culinary school in Japan. It comprises three divisions, whose total enrollment currently exceeds three thousand. At the main school, which offers intensive courses in Japanese, French, Italian, and Chinese cooking, aspiring chefs receive the training necessary to become professionals. At the Ecole Supérieure de Pâtisserie Tsuji students may perfect their confectionery techniques. The Centre de Perfectionnement in Liergues, France, accepts those desirous of completing their education with firsthand experience in Europe." All classes are conducted in Japanese. He is author of the classic book *Japanese Cooking: A Simple Art* (1980, in English). Address: Tsuji Professional Culinary Inst., Osaka, Japan.

8728. Woo, Rhung-Jieh. 1986. The effects of economic growth and policy intervention in Japan, Taiwan, and South Korea upon the import demand for soybeans. PhD thesis, Iowa State University. 198 p. Page 1425 in volume 47/04-A of Dissertation Abstracts International. *
Address: Iowa State Univ., Ames, Iowa.

8729. Yokotsuka, Tamotsu. 1986. Soy sauce biochemistry. *Advances in Food Research* 30:195-329. No index. 28 cm. (Edited by C.O. Chichester, E.M. Mrak, and B.S. Schweigert. Academic Press Inc.). [400+ ref]
• ***Summary:*** This extensive review of the subject by one of the world's foremost authorities focuses on the Japanese product, shoyu. Contents: Introduction: Japanese shoyu, the soy sauce produced in other Oriental countries. Manufacture (of the five types of Japanese shoyu): Koikuchi, usukuchi, tamari, shiro, and saishikomi shoyu. Recent research and technological advances in shoyu manufacturing: Comparison between whole and defatted soybeans as raw materials, treatment of raw materials, koji molds, koji making, control of mash (moromi), refining. Color of shoyu: Color compounds of shoyu, measurement of shoyu color, browning mechanism of shoyu. Flavor evaluation of koikuchi shoyu. Volatile flavor ingredients of koikuchi shoyu: Organic acids, alcohols, esters, carbonyls and related compounds, phenolic compounds (incl. 4-Ethylguaiacol (4EG) and *p*-ethylphenol, vanillin, ferulic acid, vanillic acid), lactones (incl. aliphatic lactones, 4-8 kinds of gamma lactones identified in Japanese fermented shoyu), pyrazines, sulfur-containing compounds, terpenes, flavor constituents of the topnote aroma of pasteurized shoyu, methods of quantitative analysis of the volatile flavor constituents of shoyu, contribution of volatile flavor constituents to overall flavor evaluation. Safety problems of shoyu: Nonproductivity of mycotoxins by Japanese industrial molds, fluorescent compounds produced by *Aspergillus* molds with R_f values resembling those of aflatoxins, mycotoxins other than aflatoxins, mutagenic substances in shoyu, bactericidal action of shoyu, biological tests of shoyu. Research needs: Raw materials, koji molds, reduction of fermentation period of mash, application of enzyme preparations, refining and pasteurization, flavor, color. References. Address: Kikkoman Corp., Noda-shi, Chiba-ken 278, Japan.

8730. **Product Name:** [Higeta Soy Sauce].
Foreign Name: Higeta Shôyu.
Manufacturer's Name: Higeta Shoyu Co. Ltd.
Manufacturer's Address: Komai-cho 2-3, Nihonbashi, Chuo-ku, Tokyo 103, Japan.
Date of Introduction: 1986?
New Product–Documentation: Fruin. 1984. History of Five Japanese Shoyu Companies. Soya Bluebook. 1987. p. 94.

8731. Kadocho Mingu-kan. 1986? Shôyu no furusato: Kadochô mingu-kan shokunin-gura [The homeland of shoyu: Kadocho folk tool museum. Craftman's storehouse (Leaflet)]. Wakayama-ken, Japan. 3 panels each side. Each panel: 26 x 12 cm. Undated. [Jap; eng]
• ***Summary:*** Company name with diacritics is: Kadochô Mingu-kan. This company and museum was founded by

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Mr. Chôbei Kanô. Photos in the leaflet show the ancient shoyu equipment including a lever press (*shime-ki*) used to press shoyu from the moromi mash during the Edo period (1600-1868), up until the Meiji period. a wooden ladle (*shoyu kasuri*), a wooden shoyu vat with bamboo hoops, cloth money collecting bags, and a pedal-powered wooden cog-wheel device for cracking wheat. A re-drawn line (the original was from early Meiji period) drawing shows the exterior of a row of shoyu plants along the street in downtown Yuasa. And a photo shows the inside and exterior of the present K.K. Kadocho, where shoyu is still made by traditional methods.

"The history of Yuasa shoyu: Shoyu, the world famous seasoning, was originally produced in Yuasa from Kinzanji-miso or soy bean paste, which was brought from China in the early 13th century by Hotokokushi of Kokokuji Temple of Yura. In those days, Shoyu was only for use at home and not for sale because of poor traffic facilities. But about 400 years ago, in Azuchi-Momoyama era, Shoyu was first shipped to other parts of Japan as a commodity here in Yuasa.

"Since then, Shoyu industry developed a great deal, thanks to the protection of the Lord of Kishu, and it is said that in the Bunka-Bunsei [Bunka (1804)–Bunsei (1818)?] era, there were 92 Shoyu-ya or Shoyu-makers in about one thousand houses of Yuasa.

"In the meantime, people in Yuasa showed how to make Shoyu to the people in some parts of Japan, such as Choshi near Tokyo. Today the Shoyu industry in Yuasa is dwindling, chiefly owing to the promotion of some major Shoyu companies. But we still have the traditional method of making that Yuasa Shoyu once called Yuasa Tamari in Kamakura era."

"The origin of shokunin-gura or shoyu workshop: In Yuasa, the birthplace of Soy Sauce, there still remain some old workshops with very thick and crumbling walls here and there. Some workshops are now converted to the residences. With the disappearance of Shoyu makers, we can no longer see craftsmen who used to toil and moil here, and traditional Shoyu things, the fruits of their wisdom and efforts. (Today we have several museums of folk craft throughout Japan. But I feel responsible, as one of the Shoyu craftsmen, for collecting and preserving these old Shoyu things as well as 'the taste of old days.')

"Kadocho Shokunin-gura, with the size of 80 square meters, was one of the fermenting houses built in Keio era [in Keio 2, 1866]. All these Shoyu things kept here are the tools used for making Shoyu and each of them has sweat and pains in it of the craftsmen of those days. I welcome you to my Shoyu workshops of about 100 years old." Address: K.K. Kadocho, Kitamachi 7, Yuasa-cho, Arita-gun, Wakayama-ken, Japan. Phone: 0737-62-2035.

8732. **Product Name:** [Marukin Shoyu].
Manufacturer's Name: Marukin Shoyu Co. Ltd.
Manufacturer's Address: Shinkawa 1-2-5, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1986?
New Product–Documentation: Fruin. 1984. History of five Japanese shoyu companies. Soya Bluebook. 1987. p. 94.

8733. **Product Name:** [Tamari Shoyu].
Manufacturer's Name: Marusan-Ai Co., Ltd.
Manufacturer's Address: 1 Arashita, Niki-cho (P.O. Box 444-21), Okazaki city, Aichi prefecture 444-21, Japan.
Date of Introduction: 1986?
New Product–Documentation: Soya Bluebook. 1987. p. 94.

8734. **Product Name:** [Soymilk Ice Cream].
Manufacturer's Name: Marusan-Ai Co., Ltd.
Manufacturer's Address: 1 Arashita, Niki-cho (P.O. Box 444-21), Okazaki city, Aichi prefecture 444-21, Japan.
Date of Introduction: 1986?
How Stored: Frozen.
New Product–Documentation: Soya Bluebook. 1987. p. 94.

8735. **Product Name:** [Tamari Shoyu Brand Soy Sauce {Sold in the USA}].
Manufacturer's Name: Yagi Shoyu K.K.
Manufacturer's Address: Tatsuno-shi, Hyogo-ken, Japan.
Date of Introduction: 1986?

8736. *Toyo Shinpo* (*Soyfoods News*). 1987. Gyôkai saidai no nandai okara o kangaeru. Urisaki ga kadai ni [Manufacturers' biggest problem is okara. The problem is where to sell it, dry it, and the expense of doing so]. Jan. 1. p. 7-8. [Jap; eng+]
• ***Summary:*** Is okara waste matter or can it be put to use? If it is useful, can it be used inexpensively? Tofu manufacturers in Japan who deal with okara are trying to use twin screw-extruders to put okara to good use. Dried okara is useful, but drying okara is a very expensive operation. Okara has recently been used in dog, cat, and fish foods, etc. The dairy industry also consumes some.

They are even using it as compost in Aichi-Ken. This has had some good results. They started to use it as fertilizer in July 1986, and they produced nice melons and watermelons. In addition, the okara seemed to ward off insects. Because of results such as these, okara now sells for ¥5,000 a ton. There have been good results in using okara as fertilizer in the production of cucumbers and tomatoes in Hokkaido. In Nagano, they are trying to cultivate shimeji mushrooms using okara.

Okara is also being used in miso for miso pickles (misozuke). This research is still in the preliminary stages however. In Kagawa-ken, a frozen food company is making tofu croquettes using okara. In Fukuoka-ken, they use dried okara for food products, growing mushrooms, and

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as fertilizer. It is also used in croquettes and hamburgers–3 manufacturers are actually making these foods now.

8737. Matsuura, Masaru. Assignor to Kikkoman Corp. 1987. Process for production of sterilized packed tofu. *U.S. Patent* 4,636,398. Jan. 13. 4 p. Application filed 2 Jan. 1985. Application also filed in Japan on 13 Jan. 1984. [5 ref]
• ***Summary:*** Process for production of sterilized packaged tofu. Soymilk is mixed with coagulant, filled into the container, sealed, and heated to simultaneously effect sterilization and coagulation. Address: Noda, Japan.

8738. Probber, Jonathan. 1987. Food and fitness: Soy sauce and diet. *New York Times.* Jan. 21. p. C2.
• ***Summary:*** The Chinese invented soy sauce. The Japanese use a great deal of soy sauce, but theirs is "lighter than Chinese soy sauce." Many households in Korea still prepare their own soy sauce each fall.

There has been a proliferation of soy sauce brands in the USA. Old favorites such as Kikkoman and Ka-me [Kame], which are sold in supermarkets, are now also sold in lower-sodium versions. There is also a brand named Sushi Chef for those who like to make sushi at home.

Regardless of brand, soy sauces contain large amounts of sodium–even the "lite" versions. Kikkoman's "lite," for example, contains 160 milligrams per half teaspoon, which (multiplied by 6) translates into 960 milligrams per tablespoon.

For those on a low-sodium diet–which allows about 1,600 mg of sodium per day–the writer recommends a spray bottle dispenser, with the nozzle adjusted for a fine, misty spray.

8739. Waldbaum's. 1987. Terrific 1/2 (Ad). *New York Times.* Jan. 21. p. C2.
• ***Summary:*** In the middle of this full-page ad, in between the Vlasic Gherkins and Jolly Time popcorn, in small letters is written: "Yamasa Teriyaki sauce. Reg. 99¢. 10 oz. btl. [bottle] 45¢."

Note: This is the earliest Yamasa ad seen on the East Coast.

8740. *Los Angeles Times.* 1987. Newsletter helps cooks add tofu to regular meals [Healthy Times Newsletter from Morinaga]. Jan. 29.
• ***Summary:*** Announcing Morinaga's forthcoming new Healthy Times Newsletter, "a bimonthly publication of nutritional information, recipes and cooking tips designed to help fit tofu into the convenience-oriented American diet... Consumers who wish to receive a year of the Newsletter can do so by enrolling in the Mori-Nu Health for Life Club ($2.00)." Address: California.

8741. Fujinami, Hiroko. 1987. Dai 29 kai zenkoku miso kanhyô kai o oete [Completing the 29th annual Japanese national miso evaluation and grading contest]. *Daizu Geppo* (*Soybean Monthly News*). Jan. p. 36. [Jap]
• ***Summary:*** This contest is sponsored each year by the Central Miso Research Inst., and is widely participated in and the awards highly respected. Address: Chuo Miso Kenkyujo.

8742. Kanematsu, Y. 1987. Hiire shôyu no maku roka ni tsuite [Membrane filtration of pasteurized soy sauce]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 82(1):11-19. Jan. [5 ref. Jap]
Address: Shôda Shôyu KK, Japan.

8743. **Product Name:** [Glace D'or].
Foreign Name: Guraasu dôoru.
Manufacturer's Name: Kinki Reinetsu K.K. Subsidiary of Osaka Gas Co.
Manufacturer's Address: Osaka, Japan.
Date of Introduction: 1987 January.
Ingredients: Incl. soy protein isolate.
How Stored: Frozen.
New Product–Documentation: Talk with Laszlo Somogyi, food technologist at SRI (Stanford Research Inst., California). SRI developed this soy isolate-based non-dairy ice cream for Osaka Gas. It was introduced in early 1987 or late 1986. Osaka Gas has a food division, based on their cryogenics with liquid nitrogen. The product was marketed as low cholesterol, low calorie, and natural. One problem with creating a vanilla flavor is that soy protein absorbs and cancels vanilla flavor. Osaka Gas is now looking to do a joint venture with the product in the USA.

Leaflet sent by Dr. Somogyi. 1989. 7.25 by 10 inches. Color photo shows a scoop of the frozen dessert (chocolate, strawberry & vanilla) with a golden spoon against a blue background. Note the spelling of the product name, not Glace d'Or as it would be in French. "Vegetable ice cream (*shokubutsu-sei aisu*). Refreshing feeling. New feeling. Glace D'or. It's refreshing (*sawayaka*) and therefore it's delicious. The original frozen dessert from Kinrei (Kinki Reinetsu K.K.; a food company that was 100% funded by Osaka Gas). Very little cholesterol. All natural ingredients. Good for health and beauty. A new type of feeling."

8744. *Putnam County Vidette* (*Columbus Grove, Ohio*). 1987. SRM Seeds, Inc. leading "new wave." Local soybeans heading for Japan. Jan.
• ***Summary:*** This company packages and exports identity preserved soybeans to Japan. Mainly Beeson and Keller varieties.

8745. *SoyaScan Notes.* 1987. New Trend: Increase in breeding of soybeans for specialized uses, including special food uses such as tofu, miso, and soy sprouts (Overview).

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Jan. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** This is part of the larger trend toward value added products and toward tailoring soybeans for export to food manufacturers in Japan. The new breeding work is being done by various countries (such as Canada and the USA), and by many universities, agricultural experiment stations, and private seed breeding companies within the USA. U.S. soyfoods companies will definitely benefit for this trend and should keep close track of new developments.

8746. *Successful Farming.* 1987. Tofu-quality beans earn 40¢ premium for Illinois growers. 85(2):18. Jan.
• ***Summary:*** "Tom Pearcy has been paying northern Illinois soybean growers as much as 40¢ a bushel premium over the Chicago Board of Trade soybean price... He's contracting with approximately 300 growers to produce high-quality, identity-preserved beans which he cleans and exports directly to Japan.

"These beans are used to make tofu–and are sold to major manufacturers in Japan." Address: Des Moines, Iowa.

8747. *Toyo Shinpo* (*Soyfoods News*). 1987. 90 byô Nama C M o 13 Kai. Zennôren ichi oku en senden jigyô [The National Natto Association's ¥100,000,000 advertising campaign included thirteen live, 90-second television commercials]. Feb. 1. p. 3. [Jap; eng+]
• ***Summary:*** The Japanese National Natto Association has been conducting a big advertising campaign since August 1986. From October 3 to December 26, 1986, they ran commercials on TV in the mornings showing nutritional value comparisons between soybeans and natto, health and physical fitness benefits, recipes, etc. They have also been distributing 3 booklets: 1. Daisuki Natto (all-color, 16 pages, ¥100, NHK Enterprises K.K.), which contains natto recipes; 2. Natto Man (like Superman) (all-color, 16 pages, ¥15/copy); 3. A picture book for kids. Free, but you have to order 100 or more. Information on natto that had been displayed on the NHK Good Morning Health Special has also been distributed in flyer form.

8748. *Toyo Shinpo* (*Soyfoods News*). 1987. Kôji-kin baiyô okara aji, kaori, shokkan ryôkô. Okara shori ni idomu. Okara hanbaagu tanpaku na aji de katasa yoshi (ryo) [Culturing okara with koji molds. The taste, fragrance, and texture are good. Processing okara by chilling. Okara hamburger–light taste and good firmness]. Feb. 2. p. 2. [Jap; eng+]
• ***Summary:*** In this experiment, raw okara, white rice, bran, and konnyaku powder were cultured with koji molds (*Aspergillus oryzae*), *Rhizopus* molds (*kumonosu kabi*), and one other type. Afterwards, the mixture was used in deep-fried tofu burgers (*ganmo*), croquettes, and hamburgers. The best results occurred when ground pork was mixed in to make a hamburger. The end product had a light taste and a nice firm texture.

8749. Nihon Nogei Kagaku Kai. 1987. Nogei kagaku no 100 nen [Centennial of agricultural chemistry in Japan]. Tokyo. iv + 304 + 50 + [2] p. Feb. 15. [Jap]
• ***Summary:*** A history of this important agricultural subject in Japan, and of the Japanese Society for Agricultural Chemistry. Contains numerous chapters by various Japanese authors; a portrait photo of each appears on the first page of his or her chapter. The first appendix gives a detailed chronology of the Japanese Society for Agricultural Chemistry from its founding on 1924 to 1983.

8750. B.P.; C.R. 1987. L'irrésistible poussée des produits de substitution: Dossier produits laitiers [The irresistible push of substitute products: Dossier on dairy products]. *Marches Agricoles.* Feb. 16. p. 14. [Fre]
• ***Summary:*** Part 1 by B.P. is titled "The debate is launched concerning substitute dairy products." A table lists the following countries: Austria, Belgium, Canada, Denmark, UK, Finland, Japan, Netherlands, Switzerland, and the USA. Column 2 lists substitute products (such as cheese, cream, milk, melorine). Column 3 lists the market share of these products in 1983. And column 4 compares the price of the substitute with the real dairy product. For example, in the USA: imitation cream (non-dairy creamer) has 50% of the market and is less expensive. Imitation cheese has 5% of the market and is 30% less expensive. Flavored milklike drinks have 15% of the market and are 25% less expensive. No imitation products are shown to have a significant market share in Europe.

Part II by C.R. is about CAC in Colmar, its Cacoja subsidiary founded in Jan. 1987, and its Bioforme line of soymilks and soymilk desserts. Address: France.

8751. *Toyo Shinpo* (*Soyfoods News*). 1987. Kikkôman Chitose kôjô kadô [Kikkoman's plant in Chitose, Hokkaido, begins operation]. Feb. 21. p. 2. [Jap; eng+]
• ***Summary:*** The Kikkoman Corporation has built a 4-story, 273,000 square meter plant at Chitose, in Hokkaido. In August 1986, they started fermentation processes there, and on January 30, 1987, the first shoyu produced at the plant was shipped to market. Capital expenditure for the plant was about 700 million yen. The production capacity is 20,000 kl/year, enough to supply the shoyu demand in the Hokkaido region. The plant mainly produces "Kikkoman Shoyu," "Kikkoman Amakuchi Shoyu," and "Kikkoman Menmi." This is the corporation's third plant in Japan; it uses the latest technology and has the highest capacity of production of any of their plants.

8752. Sugisawa, Ko; Matsumura, Y.; Taga, K.; Sengoku, K.; Nagatome, Y. Assignors to House Food Industrial Company Ltd. (Higahsi-Osaka, Japan). 1987. Process for preparing tofu. *U.S. Patent* 4,645,681. Feb. 24. 5 p. Application filed

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27 Feb. 1985. [2 ref]
• ***Summary:*** Example 1. Soymilk containing 10.5% solids was charged into a reserve tank and 0.25% by weight of GDL (glucono delta-lactone) was added as a coagulant after the milk was boiled for 1-2 minutes. The mixture was allowed to stand for 20 minutes to form a curd. A similar type of curd weighing 3 times as much was then added to this tank, and the mixture was agitated to crush it into small pieces. The mixture of the pieces of curd and milk was then charged into heat-resistant plastic containers, sealed, and heated in water at 85ºC for 40 minutes. The resulting tofu resembled Momen Tofu. The process allows for the use of isolated soy protein as an option. Address: 1-2, 4-5. Nara, Japan; 3. Neyagawa, Japan.

8753. Bosshart, R.P.; Uexkull, H.R. von. 1987. Maximum yield research on soybean: A new approach to overcoming yield limiting factors. *CGPRT* No. 10. p. 439-50. Feb. J.W.T. Bottema, F. Dauphin, and G. Gijsbers, eds. Soybean Research and Development in Indonesia. [27 ref]
• ***Summary:*** "In its childhood in North America, Europe, and Japan, newborn in China and the Philippines, and in gestation in Malaysia and Thailand, maximum yield research (MYR) has not yet been conceived in Indonesia. A relatively new approach to agronomic research, MYR aims to maximize crop yield by simultaneously overcoming all factors limiting yield. To be successful, MYR must promote positive multiple interaction among all factors affecting yield. After the maximum yield has been determined, economic analyses must identify the optimum input rates and other practices to produce the maximum economic yields (MEY) which gives farmers the highest net profit per hectare...

"Traditionally, Justis Von Liebig's 'Law of the Minimum,' or single-limiting-factor concept, has guided researchers in increasing crop yield. Using the analogy of the water level in a barrel representing crop yield and the staves of the barrel the limiting factors, the single-limiting factor concept dictates that the water level or yield is controlled by the height of the shortest stave or the level of the most limiting factor. After the limitations caused by one factor, such as N fertilizer rate, are overcome, another factor is studied... Liebig's law, though applicable at the low end of the yield curve, has shortcomings in high-yield agriculture: multiple interaction among nutrients, water, and management practices may not be recognized... The MYR concept attempts both to increase the size of the barrel and to raise the water level to the top of the barrel in one step by increasing the height of all staves simultaneously... To achieve the maximum crop research yield for a given location, an intensive multidisciplinary effort is required to optimize all controllable factors..." Address: Deputy Director and Director, East and Southeast Asia programme of the Potash and Phosphate Inst. and the International Potash Inst., 126 Watte Estate Rd., Singapore 1128.

8754. Goto, Torao. 1987. Joint soybean research project between JICA and CRIFC. *CGPRT* No. 10. p. 113-16. Feb. J.W.T. Bottema, F. Dauphin, and G. Gijsbers, eds. Soybean Research and Development in Indonesia. [3 ref]
• ***Summary:*** The Japan-Indonesian Joint Food Crop Research Programme started on October 23, 1970. The project terminated its activity on October 22, 1978, after the initial 5-year term and 3-year extension. The new project which followed, Strengthening of Legumes in Relation to Cropping Systems Research Project (ATA-218), started on October 23, 1978. In the ATA- 218, the main effort focused on soybean as the most important element in the cropping system. ATA-218, originally planned to last 5 years, was further extended for 2 years, at the request of Central Research Institute for Food Crops (CRIFC). The project terminated successfully on October 22, 1985. During the follow-up period of ATA-218, a request for a new project, Strengthening of Pioneering Research for Palawija Crop Production, was proposed by the Indonesian side. An agreement was reached on the new project after negotiation between Indonesia and Japan.

On April 1, 1986, the new project, Strengthening of Pioneering Research for Palawija Crop Production Project (ATA-378), started. It is scheduled to continue for 5 years, until March 31, 1991. This project is being implemented at the Bogor Institute for Food Crops (under CRIFC). Soybean is the major protein source and the most important palawija crop in Indonesia. Address: Team leader of Japanese experts (ATA-378).

8755. Hayasaka, Chieko. 1987. Chôri-men kara mita misoshiru no tokusei. I. Miso to dashi no kanten ni tsuite [Cooking characteristics of miso soup. I. Relationships between miso and soup stock]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 82(2):99-104. Feb. [Jap]
• ***Summary:*** Sensory relationships are discussed. Address: Joshi Gakuin Tanki Daigaku.

8756. Kijima, Hiromachi. 1987. Tôfu gyôkai no genjô to atarashii ugoki [The Japanese tofu industry and market: Current status and recent trends]. *Daizu Geppo* (*Soybean Monthly News*). Feb. p. 24-30. [Jap]
• ***Summary:*** Nationwide, 28.2% of all tofu sales is from regular (momen) tofu, 22.5% is from deep-fried tofu pouches (aburaage), 19.9% is from lactone silken tofu, 13.8% is from regular silken tofu, 4.7% is from grilled tofu, and 10.9% is from other types (mainly deep-fried tofu cutlets and burgers).

Among large manufacturers, 24.8% of all tofu sales is from regular (momen) tofu, 18.3% is from tofu pouches (aburaage), 24.8% is from lactone silken tofu, 15.1% is from regular silken tofu, 4.1% is from grilled tofu, 7.1% is from tofu cutlets (nama-age), and 5.8% is from other types (mainly deep-fried tofu burgers). Address: Zenkoku Hoso

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Tofu Kyokai, Senmu Riji.

8757. **Product Name:** [Cheese Tofu, Curry Tofu, Peanut Tofu, Sesame Tofu].
Manufacturer's Name: Kobayashi Shokuhin.
Manufacturer's Address: Okubomi 2025, Kitahara-cho, Owari Asahi-shi, Aichi-ken, Japan. Phone: 05615-3-2714.
Date of Introduction: 1987 February.
New Product–Documentation: Toyo Shinpo. 1987. Feb. 11. p. 3. President Masakazu Kobayashi has started test marketing these 4 innovative varieties of tofu.

8758. **Product Name:** [Nigari Filled Silken Tofu Made with Cold-Pressed Soymilk].
Foreign Name: Namashibori Jûten-dôfu.
Manufacturer's Name: Marutsune.
Manufacturer's Address: Urashingiri 2-3, Ushida-cho, Aichi-ken, Japan. Phone: 0566-81-1141.
Date of Introduction: 1987 February.
New Product–Documentation: Toyo Shinpo. 1987. Feb. 11. p. 3. To make this tofu, unsoaked soybeans are ground with water, then the soy slurry is pressed before cooking, while it is still cold, to separate the soymilk from the okara. No defoamer is used in cooking, and the resulting filled silken tofu is coagulated only with nigari. None of the typical GDL is used. The president, Mr. Kondo, went to China to study the cold pressing technique. "The tofu is delicious."

8759. *Monthly New Food Products in Japan.* 1987. Puddings: "Tonyu Pudding" from Taishi Shokuhin Kogyo in Japan is a soymilk based pudding. 12(2):15. Feb. *
• ***Summary:*** Free from soybean odors. Address: Japan.

8760. *Monthly New Food Products in Japan.* 1987. Dessert Mixes. Tofu or soy protein based dessert mixes are new from Morinaga Co. in Japan. 12(2):14. Feb. *
• ***Summary:*** The bean jam mixes yield an azuki bean jelly type dessert after chilling. Address: Japan.

8761. Murata, K.; Kusakabe, I.; Kobayashi, H.; Akaike, M.; Park, Y.W.; Murakami, K. 1987. Studies on the coagulation of soymilk-protein by commercial proteinases. *Agricultural and Biological Chemistry* 51(2):385-89. Feb. [5 ref. Eng]
• ***Summary:*** 17 proteinases from microorganisms, plants, and animals were tested as coagulants for soymilk. Those which did coagulate soymilk were bromelain, papain, trypsin and proteinases from *Bacillus amyloliquefaciens, B. subtilis, B. polymyxa, Streptomyces griseus, S. caespitosus, Aspergillus oryzae, A. sojae, Endothia parasitica, Rhizopus* species, and *Mucor miehei.* Ineffective were rennin, pepsin, and proteinases from *Aspergillus saitoi.* Soymilk clotting activity fell as the pH rose from 5.9 to 6.7. Temperature optima for the enzymes varied from about 50ºC for *Rhizopus sp.* to 85ºC for *Bacillus subtilis* and *B. thermoproteolyticus* and as high as 95ºC for papain. Address: Research Development Sect., Kibun Food Chemifa Co. Ltd., Takinogawa 7-38-15, Kita-ku, Tokyo 114, Japan.

8762. Nakadai, Tadanobu. 1987. Shôyu no saishin gijutsu ni tsuite. I. [Current techniques for soy sauce production. I.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 82(2):95-98. Feb. [9 ref. Jap]
• ***Summary:*** Techniques include electrodialysis, ultrafiltration, reverse osmosis, and extrusion. Address: Kikkoman, Jôzô Kagaku Kenkyû-jo, Japan.

8763. Odani, Shoji; Koide, T.; Ono, T.; Seto, Y.; Tanaka, T. 1987. Soybean hydrophobic protein: Isolation, partial characterization and the complete primary structure. *European J. of Biochemistry* 162(3):485-91. Feb. [32 ref]
• ***Summary:*** Plant seeds contain a large number of proteins of known and unknown physiological function. Those which are very hydrophobic can be extracted by aqueous organic solvents. A 9000-Mr protein isolated from a 60% ethanolic extract of soybean seeds has been characterized and fully sequenced. Address: 1-3. Dep. of Biochemistry, Niigata Univ. School of Medicine, Niigata 951, Japan; 4. Peptide Inst. (the Protein Research Foundation), Minoh, Osaka, Japan; 5. Dep. of Biochemistry, Yamagata Univ. School of Medicine, Yamagata, Japan.

8764. Sakai, K.; Tachiki, T.; Kumagai, H.; Tochikura, T. 1987. Hydrolysis of α-D-galactosyl oligosaccharides in soymilk by α-D-galactosidase of *Bifidobacterium breve* 203. *Agricultural and Biological Chemistry* 51(2):315-22. Feb. [41 ref]
• ***Summary:*** The bacterium *Bifidobacterium breve,* isolated from human feces, grew well on soymilk, assimilating the oligosaccharides stachyose and raffinose in preference to sucrose, and causing the pH to fall to 4.0 resulting in solidification of the soymilk medium. Alpha-D-galactosidase was isolated from *B. breve,* which had pH and temperature optima at 5.5 and 50ºC, respectively and was capable of hydrolyzing all the galactosyl compounds present in soymilk. Address: Dep. of Food Science & Technology, Kyoto Univ., Kyoto 606, Japan.

8765. Sato, Hisayasu. 1987. Hokkaidô no daizu [Hokkaido's soybeans]. *Daizu Geppo* (*Soybean Monthly News*). Feb. p. 16-22. [Jap]
• ***Summary:*** Gives detailed information on production, yield, and varieties from the 1950s to the present. In 1955, Hokkaido produced 20% of Japan's soybeans, rising to 27% in 1975, and about 24% at present. The absolute figure peaked at 108,200 tonnes in 1960. In 1986 it was 51,700 tonnes, or less than half of the peak. Address: Hokkaido Ritsu Chuo Nogyo Shikensho, Inasaku-bu, Shunin Senmon Gijutsu-in.

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8766. *Soybean Digest.* 1987. Japan asks for clean beans. Mid-Feb. p. 26.
• ***Summary:*** Japanese soybean buyers want the U.S. soybean industry to reduce foreign material in soybeans and increase oil and protein content. This year, for the first time, production of rapeseed oil exceeded production of soy oil in Japan. The largest U.S. soybean customer, Japan bought more than 164 million bushels of 1985 crop soybeans.

8767. **Product Name:** [Soymilk Pudding].
Foreign Name: Tônyû Pudingu.
Manufacturer's Name: Taishi Shokuhin Kogyo K.K.
Manufacturer's Address: Kawamorita, Aza Okinaka 68, Santo-machi, Santo-gun, Aomori-ken 039-01, Japan.
Date of Introduction: 1987 February.
New Product–Documentation: Monthly New Food Products from Japan. 1987. 12(2):15. Feb. "Puddings: 'Tonyu Pudding' from Taishi Shokuhin Kogyo in Japan is a soymilk based pudding." The product is free from soybean odors.

8768. *United* (*New York*). 1987. Then came Tofutti: Japan trade balance. Feb. p. 10.
• ***Summary:*** "The Japanese are absolutely crazy over Tofutti," reports David Mintz. "Every month we ship a boatload of one hundred thousand gallons (or 3.2 million 4 oz servings) of it to Japan."

8769. *Toyo Shinpo* (*Soyfoods News*). 1987. Shôwa rokujû nen no gyôshasû. Tôfu gyôsha 25,429 ken. Genshô keikô tsuzuku ga genshôritsu wa teika. Nattô wa 926 gyôsha (zennen hi 2.4% gen) [There were 25,429 tofu manufacturers in Japan in 1985. Although the number of manufacturers continues to decrease, the rate of decrease is slowing. There were 926 natto manufacturers (2.4% less than last year) in 1985]. March 21. p. 3. [Jap; eng+]
• ***Summary:*** The number of tofu manufacturers in Japan dropped in 1985 to 25,429. That is 603 less than last year (2.32% less). But the rate of reduction is also decreasing–from 3% to 2.1%. The number of natto manufacturers in Japan fell to 926. That is 23 less than last year (2.42% less). There were also fewer new tofu makers in the country than in previous years. Graphs in the article compare the number of new manufacturers with those who went out of business.

8770. Kohn, Florrie. 1987. Asian countries emerge as soybean buyers with clout. *Sun* (*Schulyer, Nebraska*). March 26.
• ***Summary:*** China produced 404 million bushels in 1986, but need outpaces production. American Soybean Assoc. encourages domestic consumption especially for animal feed to keep China out of the export market. Japan purchases 95% of its soybeans from the U.S.

8771. *Los Angeles Times.* 1987. Healthy Times newsletter for tofu enthusiasts. March 26.

8772. Eden Foods, Inc. 1987. Traditional Japanese foods. 701 Tecumseh Rd., Clinton, MI 49236. Manufacturer's catalog.
• ***Summary:*** Contains information on the production and use of tamari, shoyu, and miso. The company still uses the terms Hacho [sic, Hatcho] miso, kome miso and mugi miso, and still confuse consumers by calling their shoyu "Tamari-Natural Shoyu." Address: Clinton, Michigan.

8773. Imuda, Ikuyo. 1987. Jidai o sakidori suru tenpe ryôri. Machi no chiisana resutoran kara [Tempeh recipes that are ahead of their time, from Healthy Kan, a small natural foods restaurant in Tokyo]. *Daizu Geppo* (*Soybean Monthly News*). March. p. 39-41. [Jap]
• ***Summary:*** The restaurant is two blocks (3 minutes) from the Ichigaya Station on the Sobu Line in Tokyo. Phone: 263-4023. Tempeh recipes include "Tempeh jiru teishoku" (¥800). Tempeh is a tasty, nutritious soybean food from Indonesia. The menu includes "Brown rice, soup with fried tempeh, side dishes." The restaurant also serves a tofu cheesecake for ¥300. Address: Restaurant owner and nutritionist.

8774. *J. of the American Oil Chemists' Society.* 1987. Oilseeds outlook. Far East soy markets. 64(3):306, 308-09. March.
• ***Summary:*** Mainly a discussion of the outlook in Japan. Last year China exported 280,000 metric tons (MT) of soybeans to Japan. ASA's Beijing office hopes to help China develop ways of using its own soybeans. Yet the USA can expect to continue to be the primary source of soybeans for Japan.

8775. Kiuchi, Kan; Taya, N.; Sulistyo, J.; Funane, K. 1987. Shihan nattô-kin no bunri to dôtei [Isolation and identification of natto bacteria from market-sold natto starters]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 50. p. 18-21. March. [10 ref. Jap; eng]
• ***Summary:*** Seven bacterial strains were isolated from commercial starters made by 3 companies. Six strains were identified as *Bacillus natto*, a variety of *Bacillus subtilis.* One of the strains isolated from the natto starter made by company #2 consisted of *B. subtilis* which did not belong to *Bacillus natto.* Address: 2. Takano Foods Co. Ltd.; 3. National Biological Inst. of Indonesian Inst. of Sciences, Indonesia.

8776. Kondo, Kimio; Sugimoto, Toshio; Saio, Kyoko. 1987. Change in storage protein components of developing

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soybean seeds (*Glycine max* var. Enrei). *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 50. p. 99-106. March. [11 ref. Eng; jap]
• ***Summary:*** During biosynthesis of soybean storage proteins, two subunits of the 7S globulin appeared first, followed successively by the acidic and basic subunits of the 11S globulin and finally by the Beta-subunit of the 7S globulin.

A transmission electro micrograph at high magnification, shows (labeled): S = Starch granule in plastid; P = PLS [protein, lipid, sugar] body. V = Vacuole. Nu = Nucleocentrosome in nuclei. In = Intracellular space. "PLS bodies, which were stained positively with reagents specific for protein, lipid, and sugar, were observed." DAF = "days after flowering."

Reprinted from *Agricultural and Biological Chemistry* 50(3):581-87 (1986). Address: National Food Research Inst.

8777. **Product Name:** [Long Life Tofu].
Foreign Name: LL Tôfu.
Manufacturer's Name: Kyoto Tanpaku K.K.
Manufacturer's Address: Senryo Matsu-cho 200 banchi, Yoko Oji, Fushimi-ku, Kyoto-shi, Japan. Phone: 075-622-3161.
Date of Introduction: 1987 March.
New Product–Documentation: Toyo Shinpo. 1987. March 21. p. 1. *LL Tofu: Gessan 40 man cho o mokuhyo* [Long Life Tofu: Kyoto Tanpaku plans to produce 400,000 cakes a month]. They are distributing the tofu through one of the largest Japanese publishers, a company related to Nihon Shûpan. The tofu sells for ¥100 per 250 gm cake. The tofu can last 6 months without refrigeration, at room temperature, and up to a year with refrigeration. It is aseptically packed so it can be fed to babies and to those who are ill. The tofu has a nice sweet taste and comes in a microwavable container. The company is planning to produce a mini-size cake of tofu (150 gm) and natural nigari tofu in the same long life packages. Shows a black-and-white photo of the front panel of the label.

Talk with Yoshimasa Yamashita, president of Kyoto Food Corp. USA. 1991. Jan. 24. This tofu company was founded in 1966 (Showa 41) in Kyoto by Mr. Yasuo Hachijin (who is still the active owner), but they were doing something with tofu 10-15 years before that. Their main products have always been fresh tofu and agé. They started as a small company making tofu by hand. They grew big by making delicious tofu. Their original address was different from their present one. They have no financial or other connection with Kyoto Food Corp. USA. [Yet note: 1. Interview with Wataru Takai of 9 Oct. 1989. 2. Yasuo Hachijin, founder of Kyoto Tanpaku, is an investor in Kyoto Food Corp. USA].

8778. Marty, Denise. 1987. Les dérivés de soja, un marché pour les Pme [Products derived from soya, a market for the small- and medium-sized companies]. *Agro Industries* No. 26. p. 40-41. March. [Fre]
• ***Summary:*** "At SIAL this year, 5 soyfoods companies will present their products. For a sector this small, this is important, and it indicates that the sector is in full growth." Four companies are Soy, Sojadoc, Daizou, and Lima N.V. Daizou was created in 1985 by the Japanese restaurant Le Bol en Bois, one of the first to sell tofu in France. Daizou makes only 50-100 tonnes/year of specifically Japanese products. The Société Soy, founded in 1980 [sic, actually 1982], is busy transforming tofu into new foods. This year it launched the new tofu yogurt-like dessert Soyeux. Its new plant at St. Chamond (Loire) has a capacity of 7 tonnes/day of tofu, or 1,500 tonnes/year. In June 1986 the society Sojadoc in Albi took the same step, changing from an artisans production of 10 tons/year of tofu to large scale (1,500 tonnes/year) production of tofu and soymilk over the next 3 years from an investment of 12.5 million French francs. Lima-France, affiliate of a Belgian company, is at Lot-et-Garonne. Jan Kerremans is their miso master, making about 70 tonnes a year.

In 1983 about 10 million liters of soymilk were consumed in Europe, compared with 30,000 million liters of dairy milk. Guy Coudert of the European Soyfoods Association estimates that by the year 2000 some 25,000 tonnes/year will be consumed in France. Address: France.

8779. Mikoshiba, Kimito. 1987. Daizu ikushu shiken 30 nen no kaiko. III. Chûgoku Tôhokubu ni okeru daizu no riyô [Soybean breeding experiments. Thirty year retrospective. III. Use of soybeans in the Chugoku and Tohoku regions]. *Daizu Geppo* (*Soybean Monthly News*). March. p. 20-24. [Jap]
• ***Summary:*** Includes a discussion of numerous types of tofu found in these areas. Address: Zen Nagano-ken Nogyo Sogo Shikensho-cho.

8780. Rutherford, B. 1987. World view: Feedstuff needs and resources. Outlook '87: U.S. share to decline. *J. of the American Oil Chemists' Society* 64(3):300-06, 308-09. March. [1 ref]
• ***Summary:*** Compound feed production in the world continues to increase significantly. The average world production over the years 1974-76 was 290 million tonnes. By 1981, this had risen to 377 million tonnes, an annual growth rate of 4.5%. The increase per year was particularly significant in the developing countries, where it averaged 13.4%. Between 1975 and 1981, in the developing countries, compound production more than doubled, from 20 million tonnes to 43 million tonnes. In Indonesia, construction began in 1986 on a 1,000 to 1,500 tonne/day soybean facility, with operation set to begin in late 1987 or early 1988. Thus, the

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outlook for U.S. Soybean exports to Indonesia is bright. However, in the Philippines, a soybean processing plant that opened in August 1983 closed in February 1984, and all soybean imports have virtually ended.

China has displaced the U.S. as the principal soybean supplier to Malaysia's expanding processing industry, with China's share growing from 7% of Malaysia's soybean meal market in 1980/81 to 73% in 1984/85; during the same period, the U.S. share dropped from 52% to zero. Taiwan, the top pork-producing country in East Asia is also expanding soybean consumption. China exported 280,000 tonnes of soybeans to Japan last year. China needs the foreign exchange. Japan's import tariffs are some of the lowest tariffs in the world. However, the mark-up within Japan is very high. Food costs are at least three time, and sometimes as much as seven times, higher than in the U.S. Japan's goals of being 99% self-sufficient in egg production and 96% in broiler production by 1990 offer potential marketing opportunities for soybean meal. Specific American Soybean Assoc. goals in Japan include increasing the crude protein level 1% in layer/broiler feed and replacing 1% of the fish meal with soy meal. Another is to increase dairy crude protein feed levels for a total of 556,000 tonnes of additional soy meal usage.

The European Economic Community (EEC) generally imports about 80% of the Brazilian and Argentine soybean crops plus soybeans from China. During the 1970s, the EEC increased protein in feed rations, helping to expand soybean meal use, but has since limited milk production and cut animal numbers. Address: President, FEFAC (European Assoc. of Animal Feed Manufacturers).

8781. Saio, Kyoko; Suzuki, H.; Kobayashi, T.; Namikawa, M. 1987. Microstructural changes in winged bean and soybean during fermentation of miso. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 50. p. 134-41. March. [11 ref. Eng; jap]
• ***Summary:*** Reprinted from *Food Microstructure* 3:65-71 (1984). Note: This article was also reprinted in the Nov. 1985 issue of this journal (p. 272-79). Address: National Food Research Inst.

8782. Saio, Kyoko; Kondo, K.; Sugimoto, T. 1987. Changes in typical organelles in developing cotyledons of soybean. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 50. p. 142-50. March. [16 ref. Eng; jap]
• ***Summary:*** Reprinted from *Food Microstructure* 4:191-98 (1985). Address: 1&3. National Food Research Inst., 2-1-1 Kwannondai, Yatabe, Tsukuba, Ibaraki, Japan 305; 2. Nagano State Lab. of Food Technology, 205 Nishibana, Kurita, Nagano-shi, Japan.

8783. Taira, Harue; Tanaka, H.; Hirokawa, F.; Miyagawa, T. 1987. Kokusan daizu no hinshitsu. XIII. Dôisseitai-kei daizu hinshu no sakki idô ni yoru ryûjû oyobi kagaku seibun sosei no henka [Quality of soybean seeds grown in Japan. XIII. Effect of seeding time on seed weight and chemical composition of cultivars of the same ecotype]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 50. p. 22-29. March. [19 ref. Jap; eng]
• ***Summary:*** The four planting / seeding times were June 24, July 4, July 14, and July 24. Five soybean varieties / cultivars and one line belonging to the same ecotype (IIIc according to the Fukui classification) were cultivated at the Chugoku Agric. Exp. Station in 1980. The weight of 100 seeds and the yield decreased significantly in the crops planted at the 3rd and 4th dates.

In the seeds planted at the 3rd date, the protein content decreased, while the oil, carbohydrate and ash contents increased. In the seeds planted at the 4th date, the oil content decreased and the protein content increased. While the changes in chemical composition were similar among the different varieties, there were significant differences in the weight of 100 seeds. Address: 1-2. National Food Research Inst.; 3. Chugoku National Agric. Exp. Station, Fukuyama, Hiroshima; 4. Kyushu National Agric. Exp. Station, Chikugo, Fukuoka. All: Japan.

8784. Yanagida, Fujiharu. 1987. Traditional foods and their processing in Asia. Tokyo: NODAI Research Institute, Tokyo Univ. of Agriculture (Tokyo Nogyo Daigaku, Sogo Kenkyugo). vii + 235 p. Illust. No index. 26 cm. [50+ ref]
• ***Summary:*** "This volume was compiled from manuscripts presented at the seminar entitled "Seminar on Traditional Foods and Their Processing in Asia," which was held on November 13-15, 1986 at the Tokyo University of Agriculture, Japan." About 100 scientists from Japan, Indonesia, the Philippines, Thailand, Burma, Korea, Malaysia, Nepal, and Taiwan attended. The seminar was organized by NODAI Research Institute of Tokyo University of Agriculture. Address: Faculty of Agriculture, Gadjah Mada Univ., Indonesia.

8785. Sugimoto, Naotsugu; Torii, K.; Tanahashi, Y.; Morita, H.; Watanabe, Y.; Yamamoto, K.; Kainuma, T. Assignors to Takara Shuzo Company, Ltd. (Kyoto, Japan). 1987. Soybean milk-containing alcoholic beverages. *U.S. Patent* 4,656,044. April 7. 4 p. Application filed 1 Aug. 1985. See also Japanese Patent 84-165741 (FSTA 84-08-09). [7 ref]
• ***Summary:*** These alcoholic beverages may contain fermented soymilk, acid soymilk, or a mixture of the two, plus alcohol and high methoxylpectin. This beverage does not result in the formation of precipitates. Address: 1&7. Kyoto; 2-4. Ootsu; 5. Muko; 6. Osaka. All: Japan.

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8786. Azumaya Inc. 1987. Introducing the yogurt of the future... (its not yogurt) [Stir Fruity] (News release). 1575 Burke Ave., San Francisco, CA 94124. 11 p. April 23. Press kit.
• ***Summary:*** The news release (from Torme & Co.) announcing Stir Fruity is titled: "Next generation yogurt isn't yogurt at all. Nutritious tofu finally breaks through Western taste barriers." 86% of yogurt users who tried the product expressed "high purchase intent" and 65% of non-yogurt users said they would buy Stir Fruity. "Stir Fruity will begin reaching Northern California dairy cases starting April 1987. The company is supporting the Stir Fruity introduction with an ad campaign, "California's Answer to Yogurt," that concentrates on radio in three California markets: San Francisco, Fresno and Sacramento." Stir fruity, after 8 years of testing and tasting, represents a true "flavor breakthrough." It is lower in calories (160 vs. 200-300 for even low-fat yogurts), low in saturated fats, contains no cholesterol, and is an excellent source of calcium. Azumaya, founded in 1937 and now America's "largest producer of tofu and Oriental pastas," with annual sales are over $6 million, has over 80 employees and produces over 30,000 pounds of tofu a day in its modern 40,000 square foot plant. Includes biographies of Bill Mizono (president) and Travis Burgeson (V.P., marketing). Mizono is given credit for the company's rapid growth. Azumaya went national in the 1980s after starting to pasteurize their tofu. Their products are now found in 6 of the 8 largest U.S. supermarket chains, including Safeway, Lucky Stores, Jewel, Kroger, and Stop & Shop. Address: San Francisco, California.

8787. Akiyama, Tetsu; Ishida, J.; Nakagawa, S.; Ogawara, H.; Watanabe, S.I.; Itoh, N.; Shibuya, M.; Fukami, Y. 1987. Genistein, a specific inhibitor of tyrosine-specific protein kinases. *J. of Biological Chemistry* 262(12):5592-95. April 25. [42 ref]
Address: 1. Dep. of Biochemistry, Meiji College of Pharmacy, 1-35-23 Nozawa, Setagaya-ku, Tokyo 154, Japan. Present address: Dep. of Pathology, Inst. for Virus Research, Kyoto Univ., Kawaharamachi, Shogo-in Sakyo-ku, Kyoto 602 Japan.

8788. **Product Name:** [Okara cookie].
Foreign Name: Unohana Kukkii.
Manufacturer's Name: Ikeda Bussan K.K.
Manufacturer's Address: Shinto Building, Marunouchi 3-311, Chiyoda-ku, Tokyo, Japan. Phone: 03-212-8791.
Date of Introduction: 1987 April.
Ingredients: Incl. soy germ, sugar, tofu fiber.
Wt/Vol., Packaging, Price: 120 gm bag for ¥250 or 130 gm bag for ¥300.
How Stored: Shelf stable.
New Product–Documentation: Toyo Shinpo (Soyfoods News). April 21. p. 2. Ikeda Bussan K.K. daikohyo okara cookie [Ikeda Bussan puts out a very good okara cookie]. They use a special type of okara called tofu fiber (*tofu faiba*). It comes in a paste form. It was invented at the Japanese Vegetable Protein Research Assoc. (Zenkoku Shokubutsu Tanpaku Kyokai). The process of making the cookie involves the use of enzymes. These cookies have soy germ, sugar (furakutorigo to), and tofu fiber (okara). The cookies, which taste very good, are called Unohana Cookie (Kukki) and are sold in Kinkado stores in Ikebukuro, Kamio, and Tokorozawa. At ¥250/120g and ¥300/130g, they are about the same price as regular cookies. The manufacturers want to sell these in tofu shops as well, not only in confectionery stores. The people who tasted these cookies agreed that they are tasty.

8789. Kuwahara, M.; Nakano, H. 1987. Soybean in Japan. *Eurosoya* No. 5. p. 5-7. April. [1 ref. Eng]
• ***Summary:*** In 1984 Japan consumed 4,810,000 tons of soybeans. Of the total, 82% is used for oil and meal production, 17% for foods, and the rest (1%) as feed for livestock. 95% of the soybeans used are imported, mainly from the USA (92%) and China (7%). The soybeans from China and Japan, which are higher in protein and lower in oil, are used for traditional foods. Domestic production is small and these soybeans are expensive. They are processed to make tofu (38%), miso (24%), natto (10%), and other foods (11%), while the remaining 17% is used for home cooking.

Soybean breeding started in 1910 in Japan; pure line selection from many local varieties was the main method. After about 1930 cross-breeding became the main method. In 1935 soybean breeding started at the experiment stations of the Ministry of Agriculture, Forestry, and Fisheries (Norinsho). Today there are 5 such stations with a soybean breeding laboratory and 3-5 breeders per lab. From north to south they are Chuo and Tokachi in Hokkaido, Kariwano in Tohoku, Chushin in Nagano, and Kumamoto in Kyushu. Yet from 1950 to 1980 soybean yield increased only slightly, to 1.5 tonnes/ha from 1.3 tonnes. Japan's largest seeded soybean is Tanbaguro; 100 seeds weigh 70 gm. It is preferred for cooking. The smallest is Nattoshoryo; 100 seeds weigh 8-10 gm. It is traded at high prices for natto production.

For decades the Japanese government, for political reasons, has subsidized rice production. But after the late 1970s, when production far exceeded domestic consumption, the government decided to reduce rice acreage and promote the cultivation of other crops, especially soybeans, barley, and wheat in the drained paddy fields (converted upland fields), which accounted for 62% of the soybean cultivated area in 1985, totaling 134,000 ha. Address: Lab. of Soybean Physiology, National Agriculture Research Center, Tsukuba, Ibaraki 305, Japan.

8790. *Mori-Nu Healthy Times* (*Los Angeles*). 1987--. Serial/

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periodical. Morinaga Nutritional Foods, Inc., 5800 S. Eastern Ave. #270, Los Angeles, CA 90040. Bimonthly. Susan Bucher, editor. Vol. 1, No. 1. April, 1987. Published for the members of the Mori-Nu "Health for Life" Club.
• ***Summary:*** Each issue, typically 4 pages, discusses the merits of tofu and Mori-Nu silken tofu. See spot in Grocers Journal of California, April 1987; Talk with Susan Buchér, editor. 1988. Jan. The first issue was April 1987. Circulation is now 5,000. 99% of that is paid ($2.00/year). Most of those polled use tofu in casseroles, stir fries, and shakes.

Talk with Susan Buchér. 1988. Sept. 8. Circulation is now 10,000. The annual subscription rate increased to $3/year from $2/year in about May. In Jan/Feb. 1989 title changed from Healthy Times to Healthy Life. The volume numbering started over again at 1. Format changed to 6 p. from 4 p. Recipes and coupons are now included in the magazine. Address: Los Angeles, California.

8791. Nakadai, Tadanobu. 1987. Shôyu no saishin gijutsu ni tsuite. II. [Latest techniques for soy sauce production. II.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 82(4):236-39. April. [15 ref. Jap]
Address: Kikkoman, Jôzô Kagaku Kenkyû-jo, Japan.

8792. **Product Name:** [Semoa Lactic Acid Soymilk (Regular, or Light/Low Calorie)].
Foreign Name: Semoa Nyûsan Inryô.
Manufacturer's Name: OFCO Oriental Foods. Nagano Miso (K) Group.
Manufacturer's Address: Tenjin 3-9-29, Ueda-shi, Nagano-ken 386, Japan. Phone: 026-824-7771.
Date of Introduction: 1987 April.
Wt/Vol., Packaging, Price: 150 ml for 220 yen.
New Product–Documentation: Toyo Shinpo. 1987. April 21. p. 2. "Daizu seihin no nyûsan inryo Semoa o shuppin" [Lactic acid soy beverage Semoa is exhibited]. The company, whose president is Mr. Hideki Oka, has been exhibiting this product which is made from a soybean extract fermented with *Lactobacillus plantarum.* It has a mild flavor, with very little beany flavor. Mr. Oka also runs a major miso company.

8793. Sekine, Kazuo; Motai, H.; Okuhara, A. 1987. Kôsoku geru roka ni ni yoru shôyu jôzô kôkei-chû no "N sei busshitsu" teiryô-hô [A new assay method for 'N-material' during soysauce manufacturing process using high-speed gel filtration]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 34(4):216-22. April. [9 ref. Jap; eng]
• ***Summary:*** Proposes a new assay method for determination of "N-Material" (a turbid proteinaceous substance appearing when soy sauce is diluted and subsequently heated) during soy sauce manufacture. Address: Soysauce Research Lab., Kikkoman Corp., 399 Noda, Noda City, Chiba prefecture 278, Japan.

8794. *Soya Newsletter* (*Bar Harbor, Maine*). 1987. Morinaga publishes Healthy Times. March/April. p. 5.
• ***Summary:*** The bimonthly newsletter is for members of the Mori-Nu Tofu "Health for Life" Club. The first issue was April, 1987.

8795. *Soyfoods* (*ESFA*). 1987. Using okara in animal feed. 1(2):30. April. [Eng]
• ***Summary:*** "Most of the okara from Japanese and American tofu shops and soy dairies is fed to dairy cattle or hogs." A full page table, extracted from the "Japanese Feed Analyses Tables and Nutrients Requirements for Animals" (1980) gives the following figures for both wet and dried okara: 1. Composition, as fed basis. 2. Nutrient value for cattle: Digestibility (percentage of crude protein, ether extract, nitrogen free extract, or crude fiber), as fed basis (percentage of dry matter, digestible crude protein, total digestible nutrient, digestible energy [Mcal/kg]), and dry matter basis (same). Similar figures are given for the nutrient value for swine.

8796. Ushijima, Shigeomi; Nakadai, Tadanobu. 1987. Breeding by protoplast fusion of *koji* mold, *Aspergillus sojae*. *Agricultural and Biological Chemistry* 51(4):1051-57. April. [35 ref]
• ***Summary:*** This breeding system was studied to develop more desirable koji molds for the production of shoyu, with special attention to their enzyme producing activities. Address: Soy Sauce Research Lab., Kikkoman Corp., Noda 278, Japan.

8797. *Toyo Shinpo* (*Soyfoods News*). 1987. Miete kita tenpe buumu [Tempeh boom becoming more noticeable in Japan]. May 1. p. 7. [Jap; eng+]
• ***Summary:*** In Tokyo, Marusan Ai's tempeh is sold in the Mitsukoshi department store. There has been no tempeh sold in the Kyoto-Osaka (*Kansai*) area before January of this year. After the 1985 Asian Symposium on Non-Salted Soybean Fermentation, professor Murata went to the Mitsukoshi department store in Osaka, which is 314 years old and one of the biggest department stores in Japan. With Murata's strong persuasion, the manager of the Mitsukoshi food department decided to sell tempeh in their freezer case starting in January of 1987. It is currently selling in small numbers, but has attracted some regular customers. The manager said, "Even if we don't sell many of them [tempeh cakes], we would like to carry them just for the few regular customers." He wants the manufacturers to promote tempeh more forcefully. Mitsukoshi sells tempeh for ¥250/250g in a special film-package designed for frozen foods. The Marusan Ai tempeh is made in their main plant and is shipped to the Mitsukoshi store by frozen transportation.

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8798. *Toyo Shinpo* (*Soyfoods News*). 1987. Shitte okitai tenpe no chishiki [Important tempeh information that we should know]. May 1. p. 7. [Jap; eng+]
• ***Summary:*** This article explains what tempeh is, why it is important, its uses, nutritional value, and some information on tempeh use in the U.S. This would be all new to most Japanese readers.

8799. Yan, Huang Y.; Peng, Wang D. Assignors to Taishi Foods Company, Ltd. (Aomori, Japan). 1987. Method of producing lactic-acid fermented soy milk. *U.S. Patent* 4,664,919. May 12. 4 p. Application filed 28 Dec. 1984.
• ***Summary:*** The author has found a new lactic acid bacterium, called *Streptococcus sojalactis,* which grows well in soy milk to give a fermented product very similar to yogurt and free from the characteristic soymilk odor. Its bacteriological properties are described in detail. In classification it falls under Streptococcus, Lactobacillaceae, Eubacteriales. It is quite similar to *Streptococcus cremoris, Streptococcus lactis, and Streptococcus mitis.* But a table shows its basic differences. It gives soy yoghurt with a low pH (4.25) after 16 hours of culture. The curd is very firm, there is almost so soybean odor, there is a strong smell of acetone and diacetyl, and no unpleasant smell. Note: See also U.S. Patent 687,238 (FSTA 84-12-28). Address: Beijing, China.

8800. Aihara, Cornellia. 1987. Vega kitchen condiment series: Miso. *Macrobiotics Today* (*Oroville, California*). May. p. 7-10.
• ***Summary:*** Contains an introduction to miso, recommends barley miso to rice miso, and gives some miso recipes. Address: GOMF, 1511 Robinson St., Oroville, California 95965.

8801. Asano, Mitsuo; Okubo, K.; Igarashi, M.; Yamauchi, F. 1987. Tôfu no hinshitsu ni oyobosu dappaijiku oyobi namashibori no eikyô [Effects of removing the seed coat and hypocotyl, and pressing without heating, on the quality of tofu]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 34(5):298-304. May. [17 ref. Jap; eng]
• ***Summary:*** Soybean glycosides (saponin A group, B group, daizin [daidzin], and genistin), which give an undesirable bitter or astringent taste, are found in the soybean hypocotyl. The effects on the quality of tofu of removing the seed coat and hypocotyl, and pressing the tofu without heating, to remove the glycosides, were studied using texture profile analysis, scanning electron microscopy, transmission electron microscopy, and sensory evaluation. Tofu made only from cotyledons was firmer than that made from whole soybeans. Oil droplets were evenly dispersed in cotyledon tofu, whereas they cohered in whole soybean tofu and seemed to impart an oily taste. The saponin fractions were analysed by thin layer chromatography and high performance liquid chromatography. The most undesirable component (saponin A group) was less in cotyledon tofu than in whole soybean tofu. Cotyledon tofu received a higher sensory evaluation score (based on color, taste, and texture) than whole soybean tofu. Therefore tofu makers should consider removing the soybean hypocotyl before making tofu. Address: Faculty of Agriculture, Tohoku Univ., Amamiya-machi, Tsutsumi-dori, Sendai-shi, Miyagi 980, Japan.

8802. Chikaarashi, Shigeru. 1987. Tônyû seizô ni kôteki na shokuhin no seihô to seizô sôchi [The process and equipment used for making an ideal foodstuff for use in producing tofu]. *Japanese Patent* 61-48900. 1,378,742. 3 p. [Jap]
• ***Summary:*** A patent for making whole (non-defatted) soy flakes, which can then be used in making soymilk or tofu. The last page contains a detailed diagram of the equipment. Address: Shin-Kotoni 6-jô, 2-6-17, Kita-ku, Sapporo, Japan.

8803. Duxbury, Dean D. 1987. Soy sauce: Distinctive fermented ingredient combines sweet, salty, tart flavors. *Food Processing* (*Chicago*) 48(5):70-72. May.
• ***Summary:*** Since the 17th century Kikkoman has continuously been the world's major supplier of soy sauce. The process is still as much an art as a science. Kikkoman's plant at Walworth, Wisconsin, produces 7 million gallons a year in 300,000 square feet with 94 operating employees. The shoyu making process is described; the slow aging of the moromi mash takes 5-6 months, during which time some 20 amino acids and lactic acid, alcohol, and a variety of other flavoring compounds result. Different fermentation cultures are added at various stages in the fermentation process.

Food processors using liquid soy sauce in their formulations can choose from 3 forms of soy sauce or teriyaki sauce: (1) Regular (Traditional) Soy Sauce, which contains sodium benzoate as a preservative and 13.5% sodium chloride (w/w). (2) Lite Soy Sauce, which also contains the preservative but only about one-half the sodium content. (3) Less Salt Soy Sauce, which contains no preservatives. Salt reduction is accomplished using dialysis. Soy sauce is also available in dehydrated form. Regular and reduced salt forms are spray dried onto a dextrin carrier.

Color photos show: (1) A typical Oriental-style stir-fried dish in a wok; the flavor and aroma comes from added soy sauce or teriyaki sauce. (2) A large, rectangular automated koji room. (3) Kikkoman's newly introduced consumer line of high viscosity sauces includes Teriyaki Baste & Glaze, Stir Fry Sauce, Steak Sauce, Sweet & Sour Sauce, and Tonkatsu Sauce. (4) An aerial view of the Kikkoman plant in Walworth. Address: Associate Editor.

8804. Hara, Kazuo. 1987. Sheeto shokuhin [Development of food films and their application]. *Shokuhin Kogyo* (*Food Industry*) 30(10):26-31. May. [Jap]

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• ***Summary:*** The films contain, for example, tofu, soybean oil, rice flour, fish tissues, spinach, or curry powder. Address: Japan.

8805. Hesser, J.M. 1987. Uses and functionality of wheat gluten. In: R. Lásztity and F. Békés, eds. 1987. Proceedings of the 3rd International Workshop on Gluten Proteins. xvi + 618 p. See p. 441-55. [4 ref]

• ***Summary:*** Contents: Introduction. Processing (how commercial wheat gluten, gum gluten, and vital wheat gluten is made and dried). Milling and flour fortification. Bakery products. Breakfast cereals. Meat, fish and poultry products (incl. meatlike products or meat analogs and soy/wheat gluten textured meat extender). Pasta. Cheese analogs and pizza. Nutritional snacks (incl. gluten balls in Europe, vegetarian items in the U.S., Yachi-fu and Yachiyo-fu in Japan, fried gluten items in China, and wafers of 30-45% wheat gluten content in Australia). Breadings, batter mixes, coatings and flavorings (incl. gluten-based HVP). Pet food. Aquaculture. Non-food applications. Modified glutens. Acknowledgement.

"Wheat gluten is the water insoluble complex protein fraction separated from wheat flours. It is, primarily, a mixture of two types of protein from the wheat kernel–glutenin and gliadin. Gliadin is highly extensible, less elastic, soluble in alcohols, low molecular weight (less than 100,000), and has intramolecular bonds. Glutenin is less extensible, highly elastic, insoluble in alcohols, high molecular weight (greater than 100,000), and has intra and intermolecular bonds. These two major protein components of wheat gluten interact in an aqueous system to produce a unique property known as viscoelasticity... The major use of wheat gluten has traditionally been and continues to be in bakery products."

The International Wheat Gluten Association, chartered in 1979, consists of 18 members in 11 countries. The primary objective of the IWGA is to promote the common interests of its members and the general welfare of the international wheat gluten industry. Address: Executive Director, International Wheat Gluten Assoc., 4510 West 89th St., Prairie Village, Kansas 66207. Phone: 913-341-1155.

8806. Jacobs, Barbara; Jacobs, Leonard. 1987. Cooking with seitan: Delicious natural foods from whole grains. New York, NY: Japan Publications. 256 p. Foreword by Aveline Kushi. Index. 26 cm. [16 ref]

• ***Summary:*** "Seitan is cooked and flavored gluten that has been extracted from [high-gluten] wheat flour. It is very rich in protein, while being extremely low in fat and calories... The traditional Japanese way of seasoning seitan is to cook it in a broth using kombu sea vegetable, natural soy sauce, and fresh ginger root. This... is the one taken for granted as the 'standard seitan flavor' by commercial seitan makers and most people who are familiar with seitan. Many other mixtures of seasonings can be added to the basic seitan broth. Several earlier books on wheat gluten have been written, generally by Mormons.

This book offers you the history, nutritional information, a variety of preparation techniques, and hundreds of recipes that will allow you to convert wheat into a delicious and nutritious food. Especially suited for vegetarians who are interested in high-protein substitutes for animal foods.

Contents: Acknowledgments. Introduction: About wheat gluten, gluten, commonly asked questions about seitan. Getting started. Creating seitan from wheat flour (at home in 30-40 minutes). Using the seasonings. Additional methods of cooking. Appetizers. Soups. Main dishes and casseroles. Side dishes. Salads. Sauces, dressings and marinades. Condiments. Sandwiches. Desserts. From the pantry. Sample lunch and dinner menus. Appendix: 1. All about saving and using wheat starch. 2. Storing uncooked seitan. Storing cooked seitan. 4. Commonly encountered problems and some solutions. Nutritional information. Questionnaire for readers. About our ingredients (discusses natural soy sauce, and soymilk). Glossary (includes fu [dried gluten], miso, natural soy sauce or shoyu, soymilk, tamari, tofu). Bibliography.

Recipes containing soyfoods include: Miso soup with fu and wakame (p. 79). Miso-lemon dressing (p. 171). Tangy miso-tahini sauce (p. 180). Tofu spread with variations (p. 181). Seitan-tofu paté (p. 181-82). Tofu "feta cheese" (p. 192-93). Miso-tahini sauce or spread (p. 209).

When Michio and Aveline Kushi started the Seventh Inn Restaurant in Boston in 1971, they introduced seitan, a food that George Ohsawa had popularized in Japan, especially among macrobiotic people. Yumie Kono taught the chefs, one of whom was Lenny Jacobs, how to make seitan (p. 5).

The Introduction (p. 17-18) states: "Seitan is a food with a long history. Although not widely known in the West, it was traditionally eaten in China, Korea, Japan, Russia, the Middle East, and probably many other countries that grew wheat. In America, the Mormons and the Seventh Day Adventists made gluten and used it on a regular basis... The name *seitan* comes to us from the Japanese, who have prepared cooked wheat gluten for hundreds of years... Some natural foods industry insiders think seitan will become the 'tofu of the '80s.'

"Seitan was introduced to the U.S. natural foods industry about sixteen years ago [1970] when a Japanese variety, shrink-wrapped and quite dry and salty, was first imported. There had been several other varieties available from vegetarian groups, primarily the Seventh Day Adventists and the Mormons. Chinese restaurants have also been preparing wheat gluten for many years. The Chinese call it *mien ching,* or *yu mien ching.* Chinese restaurants often refer to it as 'Buddha Food,' claiming that it was developed by Buddhist monks as a meat substitute. There is also a dried wheat gluten available in Oriental food markets called *fu* by the Japanese and *k'ao fu* or *kofu* by the Chinese."

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In the USA, about 130,000 pounds of seitan are made each year. The market is growing rapidly. Current U.S. seitan manufacturers are: 1. Upcountry Seitan in Lenox, Massachusetts, the largest known producer in America, which makes about 600 lb/week and distributes it in 6 states. The company, started about 3½ years ago (counting from Jan. 1987, i.e. founded in about mid-1983) by Win Donovan, is now owned and operated by Wendy Rowe and Sandy Chianfoni. They get a yield of 1.33 (i.e. 90 pounds of flour result in 120 pounds of seitan). 2. Rising Tide Natural Market in Long Island, New York. Michael Vitti has been making seitan for 6 years. About 1/3 of his production is bought by another company for use in making sandwiches. 3. Grain Dance in San Francisco, California. Ron Harris has been making seitan for 8 years and is currently selling 250 lb/week in 8 oz. packages. 4. Creative Kitchens in Miami, Florida. Yaron Yemini has been making seitan for 3 years. and has seen a 5-fold increase during this time. He now makes 120 lb/week. His yield is 0.7. 5. The Bridge in Middletown, Massachusetts. The company was founded in March 1981 by Roberto Marrocchesi and Bill Spear. They were making seitan by Oct. 1982. Steve Lepenta now makes 400 lb of cooked seitan each week and claims that sales have doubled in the past two years. 6. Maritime Foods in Portland, Maine. Rosemary Whittaker makes 50 lb/week of seitan. 7. Real Foods of Towson, Maryland. Sharon Warren has been making seitan for 6 years and now makes 150 lb/week.

Reviewed by Linda Elliot in East West. June 1987, p. 94. Note: Talk with Lenny Jacobs. 1990. Sept. 10. There has been little growth in the U.S. seitan industry since the book was published in May 1987. Problems with price and quality. If seitan is frozen, after defrosting it can become spongy and soggy. Address: Massachusetts. Phone: 617-232-1000.

8807. Kanno, Akishige; Takamatsu, Haruki. 1987. [Studies on natto. IV. Changes in the volatile components of natto during manufacture and storage]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 34(5):330-35. May. (Chem. Abst. 107:114495). [17 ref. Eng; jap]

• ***Summary:*** Acetoin and 2,3-butanediol were found to accumulate and reach a maximum in natto after 12 hours of fermentation, after which time these amounts decreased as a result of the action of microorganisms. Prior to this period, the level of citric acid, the major organic acid of soybeans, and glucose released from sucrose, decreased noticeably. Acetic acid increased gradually during the latter half of fermentation and showed irregular variations during storage. Propionic acid was detected from the middle of fermentation and its increase was affected by storage temperature. 3 branched-chain fatty acids (iso-butyric, 2 methylbutyric, and 3-methylbutyric acids) were detected after 12 hours of fermentation and increased thereafter. During storage at 25 degree C, contents of these acids increased markedly. However no such change was observed during storage at 5 or 15 degree C. Address: Asahi Shokuhin Co. Ltd., 180-2 Wado, Ushibori-machi, Namekata-gun, Ibaraki, 311-24, Japan.

8808. Katagiri, Mitsuaki; Shimizu, S.; Kaihara, H.; Katagiri, C. 1987. [Determination of esterified and free carboxylic acids in the various kinds of natto by gas chromatography]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 34(5):305-08. May. (Chem. Abst. 107:174685). [9 ref. Jap; eng]

• ***Summary:*** Free and esterified fatty and organic acids in various samples of natto (9 types of itohiki-natto and 6 types of tera-natto [fermented black soybeans]) were determined by a modified standard method and compared with those of common miso. Ethyl esters of fatty acids present in large quantities in miso were not detected in itohiki-natto, but found in small quantities in tera-natto. Lactic acid was the dominant organic acid in hama-natto, (470.1 mg/100 gm) and in tera-natto (26.2 mg/100 g) and was not detected in either itohiki- or hoshi-natto. Average contents of the major volatile organic acids in itohiki-natto were (mg/100 gm): acetic acid, 124.7; propionic acid, 28.4; iso-butyric acid, 44.1; and iso-valeric acid, 46.7. The last 2 acids, which gave unfavorable odor at higher concentrations, were found in small amounts in hama-natto and tera-natto. Address: Dep. of Domestic Science, Iida Women's Junior College, Matsuo 610, Iida-shi, Nagano 395, Japan.

8809. Lee, Young Soon; Homma, S.; Aida, K. 1987. Characterization of melanoidin in soy sauce and fish sauce by electrofocusing and high performance gel permeation chromatography. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 34(5):313-19. May. [9 ref. Eng; jap]

• ***Summary:*** Sixteen soy sauce samples and 6 fish sauce samples produced in Asian countries were characterized for melanoidin by electrofocusing on polyacrylamide gels and high performance gel permeation chromatography (HPGPC).

Note: *Webster's Third New International Dictionary* (1963) defines melanoidin as "any of various colored substances formed from proteins or amino acids (as in the presence of glucose)." Address: Dep. of Nutrition & Food Science, Ochanomizu Univ. Ohtsuka 2-1-1, Bunkyo-ku, Tokyo 112, Japan.

8810. Mori, Haruhiko. 1987. Shôwa 61 nendo ni okeru shôyu, miso no kenkyû gyôseki [Review of research reports on soy sauce and miso in 1986]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 82(5):329-51. May. [534 ref. Jap]

Address: Noda Inst. for Scientific Research, Noda, Japan.

8811. Morinaga Nutritional Foods, Inc. 1987. Mori-Nu Tofu recipe cards. 5800 South Eastern Ave., Suite 270, Los

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Angeles, California 90040.
• ***Summary:*** These recipes were developed by Julia Weinberg & Co. Each recipe card is 3 by 5 inches, accordion folded, with five cards printed front and back. The first panel contains a full color recipe photo; on the other nine panels are recipes.

Series 1: Light & Easy Mori-Nu Tofu. Series 2: Mori-Nu's Tempting Tofu Desserts. Series 3: Cool Summer Recipes with Mori-Nu Tofu. Series 4: Hearty Main Dishes from Mori-Nu. Series 5: Mori-Nu Holidays. Note: All but Series 5 are undated. Address: Los Angeles, California.

8812. Smith, Keith J.; Huyser, Wipada. 1987. World distribution and significance of soybean. In: J.R. Wilcox, ed. 1987. Soybeans: Improvement, Production, and Uses. 2nd ed. Madison, Wisconsin: American Society of Agronomy. xxii + 888 p. See p. 1-22. Chap. 1. [13 ref]
• ***Summary:*** Contents. 1. World soybean production: United States, Brazil, Argentina. 2. World trade in soybean. 3. Importance of soybean meal and oil. 4. World production trends.

In the first paragraph of this chapter, the authors state: "Probst and Judd (1973) presented an extensive review of the origin and early history of this crop with highlighted references to soybean in books written over about 4500 years. The early Chinese history is particularly interesting."

Note: This passage, later quoted by other writers, is unfortunate because it perpetuates the myth that the soybean has a documented history dating back 4,500 years. Hymowitz (1970), the first person to do scholarly, critical research on the early history of the soybean in China, has shown that the earliest reference seen to the soybean is in the *Book of Odes,* from roughly the 11th century BC. Thus the soybean has a documented history of about 3,000 years. Address: 1. American Soybean Assoc., St. Louis, Missouri; 2. Development Planning & Research Assocs., Inc., Manhattan, Kansas.

8813. Yaguchi, Keiji. 1987. 1986 nen no daizu no jukyû oyobi kakaku [Soybean supply, demand, imports and prices: 1986]. *Daizu Geppo* (*Soybean Monthly News*). April/May. p. 4-14. [Jap]
• ***Summary:*** A table on p. 14 shows soybean imports to Japan by source country, 1986. USA 4,332,000 tonnes (89.9% of total), China (PRC) 323,000 tonnes (6.7%), Brazil 128,000 tonnes (2.7%), Other 34,000 tonnes (0.7%). Total: 4,817,000 tonnes. Compared with 1985 the percentages increased for USA and China, decreased for Brazil and other. Source: Nihon Boeki Geppo. Address: Daizu Kyokyu Antei Kyokai, Senmu Riji.

8814. Kuwata, Tamotsu; Suginaka, Yutaka; Ohtomo, Hideo. Assignors to Meiji Milk Products Company Ltd. (Tokyo, Japan). 1987. Method of producing calcium-enriched aseptic soy bean curd. *U.S. Patent* 4,673,583. June 16. 7 p. Application filed 21 Feb. 1986.
• ***Summary:*** Note: This is Japanese Patent 85-069105. In this new coagulation system, the coagulant is introduced in the pre-sterilization process and results in a calcium enriched aseptic tofu. The new coagulant is a $Ca(OH)_2$-sucrose addition compound named calcium saccharate. It serves as an alternative to glucono delta lactone (GDL) or bittern (magnesium chloride and magnesium sulfate). It allows aseptic processing of the curd without flavor loss or texture deterioration. In a given sample, 30-100 mg per 100 gm calcium saccharate is added to soymilk, the resulting curd is sterilized and the pH adjusted to 5.7–5.9 with citric or ascorbic acid. The curd is then filled into containers, which are sealed and heated for 20-60 minutes at 75-95ºC. Address: Japan.

8815. Ebine, Hideo. 1987. Re: Can miso prevent or cure cancer? Letter to William Shurtleff at Soyfoods Center, June 29–in reply to inquiry. 2 p. Typed, with signature. [Eng]
• ***Summary:*** Summarizes the research conducted to date. In 1981, early research was conducted separately by Prof. Kimura and Dr. Hirayama. He believes that it is very difficult to conclude that there is solid evidence showing that miso can either prevent or cure cancer. Address: Director, Central Miso Research Inst., Shinkawa 1-26-19, Chuo-ku, Tokyo, Japan.

8816. Ebine, Hideo. 1987. Studies on the effect of miso or miso soup to reduce cancer risk. Tokyo, Japan. 2 p. Unpublished typescript. June 29. [Eng]
• ***Summary:*** "Hirayama first presented a paper to the 40th Annual Meeting, Japan Cancer Association, 1981. Since miso soup is one of the most important foods for Japanese food life, the presentation attracted keen interest of the newspaper, *Asahi Shinbun* and was reported as the top news at the first page of September 27, 1981."

Hirayama pointed out that the observed benefits could come from selected nutrients in the miso. Prof. Kimura and his colleagues found that miso contained some antimutagenic substances such as the ethylester of linolenic acid. Several other studies are now underway.

"As stated by Hirayama, the effect of miso soup is possibly supported by some other substances closely associated with the intake of miso soup such as green-yellow vegetables, Michioka (1985), Akita University, published a paper on the anti-mutagen included in green-yellow vegetables which are often supplied with miso soup in large amount easily." Address: Director, Central Miso Research Inst., Shinkawa 1-26-19, Chuo-ku, Tokyo, Japan.

8817. Kitamura, Keisuke. Assignor to Taishi Foods Company Ltd. (Aomori, Japan). 1987. Process for producing new variety of odorless soybeans. *U.S. Patent* 4,677,247. June 30.

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4 p. Application filed 26 Aug. 1985. [3 ref]
• ***Summary:*** The new soybean has a little or no lipoxygenase, an enzyme which creates the grassy flavor peculiar to soybeans. The normal soybean seed has 3 types of lipoxygenase: L-1, L-2, and L-3. The new variety lacks L-2 and L-3. Address: Tsukamoto + 1991, p. 51.

8818. *Business Japan.* 1987. Japan's oldest biotechnology lays foundation for 21st century. June. p. 116-17.
• ***Summary:*** Yamasa Shoyu Co. was established in 1645 and has over 340 years of tradition in brewing soy sauce. Michio Hamaguchi is the president. Building on its background in the traditional biotechnology used to make shoyu, Yamasa has invented a technique to manufacture two flavor enhancers, Inosine 5'-monophosphate (IMP) and Guanosine 5'-monophosphate (GMP), by breaking down the ribonucleic acid (RNA) with a special microbial enzyme (nuclease P1).

Yamasa also discovered a synergistic action between L-glutamate and the flavor nucleotides (IMP and GMP), which established the new nucleotide industry. Mixing equal amounts of IMP and GMP made by Yamasa, a product registered as Yamasa IG is provided to the rest of the world. It is used as a flavor base for food processing, as an alternative to meat extract.

Yamasa is also working on DNA synthesis, in vitro diagnosis, and immunology. In the latter area, Yamasa began to work seriously on cell fusion technology in 1978. Fusing a mouse spleen cell and myeloma in 1981, Yamasa successfully developed a monoclonal antibody for the first time in Japan.

Photos show: (1) Michio Hamaguchi, President, Yamasa Shoyu Co., Ltd. (2) An aerial view of Yamasa's main shoyu plant in Choshi, Chiba prefecture, Japan. (3) Two views of working on new biotechnology R&D at Yamasa research laboratories. (4) Bottling Yamasa shoyu at the main plant. (5) Computer monitoring of RNA degradation. (6) Part of the central control room at the Choshi plant. (7) Yamasa syclic AMP and GMP assay kits. (8) Bottles of commercial Yamasa monoclonal antibodies.

8819. *Harvard Medical School Health Letter.* 1987. Nitrates and cancer. June. p. 2. [1 ref]
• ***Summary:*** "Since the mid-1970s, nitrate–a relatively common substance in food and water–has been under suspicion as a cause of cancer, especially cancer of the stomach. When nitrate enters the body, or even when it is present in foods left at room temperature, bacteria may convert the compound to nitrite. Nitrite, in turn, can become attached to common organic substances to produce *nitrosamines,* which are carcinogenic...

"The main source of nitrate in contemporary diets is vegetables, which pick it up from fertilizer in the soil. Drinking water may also contain a fair amount of nitrate (much of it, again, originating in fertilizer applied to soil in the run-off-region)...

"In regions of the world where food preservation is inadequate, bacteria contaminating the food supply may generate high levels of nitrosamine, and this may account for the high rates of stomach cancer in less developed parts of the world. Also, certain relatively uncommon foods contain substances favoring formation of nitrosamines. Among them are some types of preserved fish, certain varieties of Japanese soy sauce."

British Medical Journal, February 28, 1987.

8820. Kokke, Robert; Sudo, Narini. 1987. Indonesia no kenko shokuhin, tenpe [Indonesia's health food, tempeh]. *Daizu Geppo* (*Soybean Monthly News*)**.** June. p. 4-18. [50 ref. Jap]
• ***Summary:*** Contains a lengthy and well documented history of tempeh plus an original bibliography of 50 references. Perhaps the best publication on tempeh seen to date in Japanese. Address: 1. United Nations University (Kokusai Rengo Daigaku), Development Programming; 2. Consultant.

8821. **Product Name:** [Tofu Noodles (Chinese, or Japanese Style)].
Foreign Name: Hosonuki Tôfu.
Manufacturer's Name: Machida Shokuhin.
Manufacturer's Address: Hisasawa 46-1, Fuji-shi, Shizuoka-ken, Japan. Phone: 0545-71-3833.
Date of Introduction: 1987 June.
Wt/Vol., Packaging, Price: 188 gm retails for 230 yen.
How Stored: Refrigerated.
New Product–Documentation: Toyo Shinpo. 1987. July 1. p. 6. Mr. Yukio Machida is the company president. The product was launched on 20 June 1987.

8822. **Product Name:** [Neo-Soya Powder {Finely Pulverized Whole Soy Flour from Dehulled Soybeans for Making Tofu}].
Manufacturer's Name: Nihon Soya Bean Powder Co. Ltd.
Manufacturer's Address: Kyoto, Japan.
Date of Introduction: 1987 June.
New Product–Documentation: Soya Newsletter. 1987. 1(3):6-7. This powder is used in the Showa Boeki Mini Tofu Plant.

8823. Okamoto, Ori. 1987. Banguradesshu de no daizu seminaa. Daizu o tôshite, nihonjin to bengarujin ga tomodachi ni nareta [Soybean seminar in Bangladesh. Through soybeans, Japanese and Bengalis became friends]. *Daizu Geppo* (*Soybean Monthly News*)**.** June. p. 19-25. [50 ref. Jap]
• ***Summary:*** The seminar was held at the GUP Training Center on 17 Feb. 1986. Organizers were GUP Tonokai and Dr. Ishikawa. The Mennonite Central Committee was also involved. Address: Reporter for Fujin no Tomo.

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8824. Okubo, Kazuyoshi. 1987. Tôfu no seizô-hô to sono bussei: Fukami seibun kyodô kara [Manufacturing method for and physical properties of tofu: Behavior of unpleasant taste components]. *Nyu Fudo Indasutori* (*New Food Industry*) 29(6):73-83. June. [25 ref. Jap]
• ***Summary:*** Unpleasant taste components include saponins and isoflavonoids. Address: Tôhoku Daigaku Nôgaku-bu (Faculty of Agriculture, Tohoku Univ.).

8825. **Product Name:** Neo-Soya Powder (for making tofu) and Mini Tofu Plant.
Manufacturer's Name: Showa Boeki Co. Ltd.
Manufacturer's Address: 18-27, Edobori 1-chome, Nishi-ku, Osaka 550, Japan.
Date of Introduction: 1987 June.
New Product–Documentation: Manufacturer's Catalog. 1987. 4 p. With 3 p. of inserts. This small, automatic plant uses a patented soya powder that avoids production of okara. The 15-20 minute cycle consists of mixing, boiling, coagulating, cutting the tofu, and cooling. Capacity: 1408 cakes (300 gm each) every 8 hours.

8826. Singh, R.J.; Kollipara, K.P.; Hymowitz, T. 1987. Polyploid complexes of *Glycine tabacina* (Labill.) Benth. and *G. tomentella* Hayata revealed by cytogenetic analysis. *Genome* 29(3):490-97. June. [24 ref]
• ***Summary:*** Glycine species were collected in Australia, Fiji, New Caledonia, Ryukyu Islands (southern Japan), Mariana Islands, Tonga, Taiwan, and Papua New Guinea. Address: Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801.

8827. *Soya Newsletter* (*Bar Harbor, Maine*). 1987. Nasoya Foods' investment in new machinery pays off with increased sales. May/June. p. 8-9.
• ***Summary:*** Nasoya recently acquired a modern 22,500 foot facility and invested over $1 million in new, large-scale automatic tofu making equipment from Sato Shoji Co. in Japan. In June 1985 partners Paino and Bergwall journeyed to Japan in search of a new system. The system arrived in Feb. 1986 and was operational by May. The company's sales of tofu jumped nearly 50% from 1985 to 1986, and first quarter sales in 1987 are 60% higher than for the same period in 1986. Annual tofu production (in pounds): 1980 (600,000 lb), 1981 (625,000), 1982 (950,000), 1983 (1,144,000), 1984 (1,300,000), 1985 (1,560,000), 1986 (2,080,000), 1987 (3,400,000). The latter figure is 65,300 lb/week.

8828. *Soya Newsletter* (*Bar Harbor, Maine*). 1987. Mini tofu plant introduced to U.S. market [by Showa Boeki Co. Ltd. of Osaka, Japan]. May/June. p. 6-7.
• ***Summary:*** It uses a special whole grain soybean powder (called Neo-Soya Powder) in place of whole soybeans. The finely pulverized power yields a silken tofu with no okara.

8829. Yamabe, Shigeo; Kondo, Yasuo. 1987. Shihan fukurozume mugimiso no hozon-chû ni okeru kagaku-teki seibun henka [Changes in the chemical composition of commercial packed barley-koji miso during storage]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 34(6):347-55. June. [24 ref. Jap; eng]
• ***Summary:*** Investigates changes in the composition, oxidative activity, sugar, and lipid components of commercial barley-koji miso during 3 months storage at -10, 4, 20, and 37ºC. Address: Tokyo Dietitian Academy, 2-23-11 Ikejiri, Tokyo 154, Japan.

8830. **Product Name:** [Tofu with Lactic Acid Calcium].
Manufacturer's Name: Yazaki Shokuhin, Ltd.
Manufacturer's Address: Tomioka 1432, Tomiaka-shi, Gunma-ken, Japan. Phone: 02746-2-0009.
Date of Introduction: 1987 June.
New Product–Documentation: Toyo Shinpo. 1987. June 18. p. 11. Tofu containing lactic acid calcium is being targeted at the children's market by Yazaki Shokuhin of Tomioka, Gunma-ken, Japan. Mr. Kazuo Yazaki is the president of Yazaki Shokuhin, Ltd. Includes photos of the packaging and store front.

8831. Torii, Yasuko. 1987. New developments with tempeh in Japan (Interview). Conducted by William Shurtleff of Soyfoods Center, July 1. 2 p. transcript.
• ***Summary:*** Torigoe-Seifun stopped making tempeh in mid-1987. They had a hard time popularizing it. Marusan's tempeh is not selling well. They, too, are thinking of stopping. Mr. Kanasugi and the Natto Assoc. are trying to cooperate with Marusan. They suggest selling "tempeh miso," made as follows: Mix 10 kg tempeh, 10 kg barley koji or rice koji, and 1 kg salt. Grind in a meat grinder and let stand at room temperature in the summer for 1 month. The result is a sort of Finger Lickin' Miso. Barley koji works best, and the resulting tamari is delicious. Mr. Kanasugu hopes some miso maker will make this. Only Mr. Kanasugi is doing tempeh research. He makes this miso in his restaurant daily. He also makes a spread like peanut butter. Mr. Ose is still making tempeh but his business, Udai, is not doing well. No one is left at the Ministry of Agriculture with an interest in tempeh: Mr. Katoh went to work with FAO in Rome and Ohta went to Showa Seiyu.

Why did tempeh fail to catch on in Japan? 1. It was poorly marketed. 2. The ads and Torigoe aimed at the older generation who still know how to deep fry foods. 3. It is not clear whether the attempted tie-in with natto was helpful or harmful. Natto is a convenient fast food. Now tempeh is not even sold at Natural House, the natural foods supermarket. Organic soybeans from Living Farms are now widely used in Japanese miso and natto. Address: Kamitsuchidana 324,

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Ayase-shi, Kanagawa-ken 252, Japan. Phone: 0467-76-0811.

8832. Ishizuka, Waichi; Aoki, Ryochi. Assignors to Taiyo Yushi K.K. (Yokohama, Japan). 1987. Method of producing cheese-like emulsified food. *U.S. Patent* 4,678,676. July 7. 5 p. Application filed 4 Oct. 1984. Application also filed in Japan on 4 Oct. 1983. Corresponds to Japanese Patent 83-185697. [5 ref]
• ***Summary:*** Tofu (3-30%) made from deodorized soymilk is mixed with 5-40% animal/vegetable oils or fats, 0.1-10% of heat coagulable protein (such as egg whites), and 0.1-5% of stabilizer (such as carrageenan, gelatin, guar gum, pectin, locust bean gum, xanthan gum, dextrin, or starch). The mixture is blended and deaerated, then heated for protein gelation and sterilization. The product is an imitation cheese (spread-type soft, semi-hard, or hard) with good body and texture. Address: Yokohama, Japan.

8833. Sugisawa, Ko; Matsumura, Y.; Sengoku, K.; Nagatome, Y. Assignors to House Food Industrial Company Ltd. (Higahsi-Osaka, Japan). 1987. Process for preparing tofu charged into a container. *U.S. Patent* 4,678,677. July 7. 5 p. Application filed 3 June 1985. [4 ref]
• ***Summary:*** Note: This is Japanese patent 84-138481. Soymilk is prepared in the conventional way and a fast-acting coagulant (magnesium chloride) or a slow-acting coagulant (GDL) is added. However, in order to delay coagulation of the soymilk until after it has been charged into containers, a coagulation delaying compound (e.g. sodium pyrophosphate, hexametaphosphate, or polyphosphate) is added and the mixture subjected to high pressure homogenization at 30 kg/sq. cm., between 2 and 30 minutes after addition of coagulant. The homogenized soymilk is subsequently filled into containers and allowed to set. The resulting tofu has a good taste and texture. Address: Nara, Japan.

8834. *Toyo Shinpo* (*Soyfoods News*). 1987. Pari de mitsuketa honmono no tôfu. Munôyaku daizu tsukai parikko ni apiiru [Real tofu made in Paris with organically-grown soybeans and it appeals to the Parisians]. July 31. p. 13. [Jap; eng+]
• ***Summary:*** Mr. Noboru Sakaguchi, age 59, has a tofu shop located in Champaigny–only 20 minutes away from Paris. The shop opened 3 years ago and is called Daizou. The majority of the employees are French. Sakaguchi employs a Japanese plant manager, Mr. Takatashi Hiroyama, age 39. Mr. Sakaguchi also has a health foods store and restaurant, Le Bal en Bois. This is the parent company of Daizou. They produce about 1,000 cakes of tofu (1 cake = 380 gm) a day. Of these, 200 are made with organically grown soybeans and are vacuum packed. The company also uses regular soybeans from Canada and organically grown ones from the U.S. They use nigari in their tofu manufacturing process. They have been experimenting with silken tofu (kinugoshi) and have done market studies with some newly developed soymilk mayonnaise. Their tofu sells for 7 French francs per cake wholesale, and 9-12 francs retail. They sell their organic tofu for the same price as the regular cakes as a method of introducing it into the market. Right now, their big enemy is water that is too alkaline.

8835. American Soybean Association. 1987. Soya Bluebook '87. St. Louis, Missouri: American Soybean Assoc. 270 p. July. Index (bold face type indicates advertiser). 22 cm.
• ***Summary:*** This is the last issue of the *Soya Bluebook* published by the American Soybean Association.

Contents: Organization: International associations, government trading agencies. Soy Directory: Oil extraction plants/refineries, manufacturers of edible grade soy products & soyfoods, manufacturers of industrial grade soy products. Soybean manufacturing support industries: Category listings, product handling equipment & supplies, soybean processing equipment & supplies, manufacturing services, alphabetical company listings. Marketing & auxiliary services: Marketing services, commercial services & suppliers, exporters of soybeans & soybean products, importers of soybeans & soybean products. Soy statistics: Metric conversions, tables, charts, graphs. Glossary. Standards and Specifications. Indexes: Alphabetical company listings, Soya Bluebook sections and categories, advertisers. Maps.

The section titled "Soy statistics (tables, charts, graphs) (p. 185-244) is a rich source of information, worldwide. Contents: Soybean production–Area planted / harvested and yield: U.S. soybean planting and harvesting dates. U.S. soybean acreage, yield, and production. U.S. soybean planted acreage by state. U.S. soybean harvested acreage by state. U.S. soybean yield by state. U.S. soybean production by state.

U.S. production of major crops: Soybeans, corn, wheat, cotton (graph). U.S. harvested acreage of major crops: Soybeans, corn, wheat, cotton (graph). U.S. yield per acre of major crops: Soybeans, corn, wheat, cotton (graph). Argentine soybean area, yield and production by province. Brazilian soybean area, yield and production by state. Canadian soybean production. Canadian soybean production and utilization.

Soybean production by major countries (graph). Share of world soybean production by major countries (graph). World soybean production. Soybean acreage by major countries (graph). Share of world soybean acreage by major countries (graph).

Soybeans and soybean products: Supply and disposition: U.S. soybeans: Supply, disposition, acreage / yield and price. U.S. soybean meal and oil: Supply and disposition. Soybean usage in the U.S. (graph). U.S. soybean exports–percent of total usage (graph). Argentine soybeans: Supply and disposition. Argentine soybean meal and oil: Supply and disposition. Brazilian soybeans: Supply and disposition.

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Brazilian soybean meal and oil: Supply and disposition.

U.S. soybean prices, crop value, farm marketings: Prices of U.S. soybeans: No.1 yellow. Prices of U.S. soybeans: Received by farmers. U.S. soybean price support operations. U.S. soybean crop value. U.S. farm marketings of soybeans.

Soybean processing and products–processing facilities and product value: U.S. soybean processing plants (map). Value of U.S. soybean products and crush margin.

Meal: U.S. soybean meal: Prices paid by farmers. U.S. soybean meal: Average wholesale price, Decatur [Illinois]. U.S. soybean meal: Beginning stocks, production, exports and domestic disappearance. U.S. oilseed cake and meals: Supply, disposition, and price. World major protein meals: Supply and utilization.

Fat and Oils: World major oilseeds: Supply and utilization. World major vegetable and marine oils: Supply and utilization. Prices of U.S. soybean oil. U.S. soybean oil utilization. U.S. soybean oil value as percent of total soybean value (graph). U.S. soybean oil: Supply, disposition, and price. U.S. edible fats and oils: Supply and disappearance.

Exports and imports–U.S. exports of soybeans by month. U.S. soybean exports by port and country of destination. U.S. exports: Soybeans by country of destination. U.S. soybean exports by port areas (map). U.S. exports: Soybean oilseed cake and meal by country of destination. U.S. exports: Soybean oil by country of destination. U.S. exports: Soybean oil, P.L. 480, title I and III by country of destination. U.S. exports: Soybean, cottonseed and sunflowerseed oils by country of destination. U.S. exports: Soybean and cottonseed oils by year. Brazilian exports of soybeans and products to major countries. Soybean and product exports by major countries (graph). World share of soybean and product exports (graph).

Before page 199 are two fold-out color maps (color coded by county): U.S. soybean production 1985, and U.S. soybean acreage 1985. Two other maps are: American Soybean Association international offices / world regions, U.S. soybean processing plants, and U.S. soybean exports by port areas.

A full-page table (p. 235) shows U.S. exports of whole soybeans, 1982-1986–Volume of exports (in metric tons) by country of destination and total value each year. Region and country of destination: North America: Canada, Mexico, other, total. South America: Brazil, Colombia, Ecuador, Peru, Venezuela, other, total. Europe and Russia: Belgium & Luxembourg, Czechoslovakia, Denmark, France, Germany (West), Germany (East), Greece, Ireland, Italy, Netherlands, Norway, Portugal, Romania, Soviet Union, Spain, Switzerland, United Kingdom, Yugoslavia, other, total. Middle East. Africa. Asia: China–PRC, China–Taiwan, India, Indonesia, Japan, Korea (South), Pakistan, other, total. Australia & Oceania. Other unidentified. Grand total. Value of exports–total (million $). Address: P.O. Box 27300, St. Louis, Missouri 63141.

8836. *Corporate Report Wisconsin* (*Milwaukee, Wisconsin*). 1987. Kikkoman brews up super soy sauce. July.
• ***Summary:*** The plant on the Big Foot Prairie, 3 miles northwest of Walworth, is operated by Kikkoman Foods Inc., a unit of Kikkoman Shoyu Co. Ltd. of Japan. Production is now about 8 million gallons a year compared to about 1.7 million gallons in the plant's first year of operation. In 1977 Kikkoman became the leader in the U.S. soy sauce market. Presently U.S. retail market shares are Kikkoman 47%, La Choy 37%, and Chun King a distant third. "Kikkoman is one of the few Japanese companies to succeed in the U.S. with a traditional Japanese product. It has done so in part by promoting its sweet and salty sauce as an all-purpose and all-American product."

8837. Hapgood, Fred. 1987. The prodigious soybean. *National Geographic* 172(1):66-91. July.
• ***Summary:*** Superb photos and an interesting original color painting done by artist James Gurney, in the style of Norman Rockwell, shows more than 60 products containing soybean ingredients (both food and industrial). But, except for the first 2 pages, the text of this far-ranging article is mediocre to embarrassingly erroneous; even the *National Geographic* editors didn't like it, but Hapgood refused to correct his many errors. For example, large bold print at the top of the first page reads: "For centuries Chinese have called the Soybean 'Yellow Jewel' or 'Great Treasure.' Now this prodigious bean is seen by some as a weapon against world hunger." Note: This is the earliest English-language document seen (July 2007) that uses the term "Yellow Jewel" or "Great Treasure" to refer to the soybean.

Superb photos by Chris Johns show: (1) Selling tofu in China. (2) Harvesting soybeans with combines. (3) A tractor suspended high over the hold of a cargo ship loaded with soybeans. (4) Making koji at Kikkoman. (4) 42 different colors and shapes of soybean seeds. (5) Henry Ford on 2 Nov. 1940 wielding an ax against a car trunk lid made from a highly resilient soybean-derived plastic. (6) Yuba drying over pans of soymilk. (7) A Japanese woman with her dried-frozen tofu drying under the farmhouse eaves. (8) Favorite Japanese soyfoods dishes: Dengaku, Simmering tofu, yuba, and miso dumplings. (9) Hatcho miso in vats with stones piled high on each in an earthquake-proof pyramid shape. (10) *Mame-maki* (bean-throwing ceremony) at Setsubun, held each February in Japan; the beans are thrown from small wooden measuring boxes (*masu*). (11) The *hari-kuyo* ceremony for broken needles in Tokyo. (12) A martial arts master and former Shaolin temple monk in China testing his strength by plunging his arm elbow-deep into a soybean-packed barrel. Address: Boston.

8838. Otsuka, Shigeru. 1987. Shôyu sekai e no tabi [A journey into the world of shoyu]. Tokyo: Toyo Keizai

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Shinpo-sha. 230 p. Illust. No index. 20 cm. [22 ref. Jap]
• ***Summary:*** Contents: A pedigree of shoyu (p. 11). The road to shoyu (p. 35). Shoyu and the world (p. 67). A friend of meat cookery (p. 103). Shoyu... make in the USA (p. 115). Shoyu as a forerunner of Japanese culture (p. 129). A visit to the real centers of the Japanese food boom (p. 159). Shoyu recipe contest (p. 209). Mini-science on shoyu (p. 213). Conclusion (p. 219). Postscript (p. 225).

In the section on "Shoyu and the World," subsection "Exports during the Edo Period" (p. 67-79) it is noted that: "In a book-keeping book under the date Man-en 1 (1860), Aug. 16 it is stated that 4 ceramic bottles of Japanese shoyu were shipped to Jakarta (Java), Indonesia. The shoyu that was exported to Europe was sent via Jakarta, Indonesia, to Holland. It was shipped in ceramic bottles each containing a volume of 3 gô (540 ml, or about 1 pint). On each bottle, in roman letters, was written the fact that the bottle contained Japanese shoyu. Terms such as "Japansch Zoya" or "JapanschZoya" or "Jap. Soya" appeared on the bottles.

One photo (p. 76) shows four (another shows three) of these bottles. Below this name, near the base of many bottles was written the brand "CPD" which is thought to have stood for stood for "Comprador." During the Kan-ei period (1624-1630) some rich merchants in Nagasaki established a company named *Konpura-sha.* The merchants who ran it were called Comprador. [Note: They are now (Oct. 2007) generally known in English as the "Comprador Merchant Guild;" Japanese: *Konpura Nakama*].

It is recorded in the *Kôka Nisshi,* the diary of a voyage by Tôsei? Yanakawa in 1860 (Ansei 7) from Japan to the USA by boat, that "after we landed in Washington state, we didn't have any miso or shoyu, so we had nothing but salt with which to season our meals."

In 1765 the French enclycopedist Denis Diderot (lived 1713-1784) wrote a section in his Encyclopedie titled "soui ou soi" about Japanese soy sauce. Note that the first term, pronounced soy, is today's French word for soy sauce. The second term, pronounced "swa" apparently no longer exists.

Two black-and-white photos (p. 47) show the outside and inside of the Goyo-Gura in Noda. Page 93 shows a typical shoyu section in a Japanese supermarket. Address: Toyonaka-shi, Osaka-fu, Japan.

8839. **Product Name:** [Flower-Shaped Tofu (Salt Plum, Beefsteak Leaf, Wakame, Sesame Seed)].
Foreign Name: Hanagata Tôfu (Ume, Shiso, Wakame, Goma).
Manufacturer's Name: Yamaguchi Tofu-Ten.
Manufacturer's Address: Royal Center, Sone-machi 2475-1, Takasago-shi, Hyogo-ken, Japan.
Date of Introduction: 1987 July.
How Stored: Refrigerated.
New Product–Documentation: Toyo Shinpo. 1987. July 1. p. 6. This tofu shop's innovative products are getting popular.

8840. Yamazaki, Junsei. 1987. The Junsei Yamazaki miso and umeboshi story (Brochure). Route 1, Box 1333, Orland, CA 95963. 6 p.
• ***Summary:*** Junsei arrived at Chico-San in May 1963. His wife, Kazuko, came in 1968. Later that year he went to New York to help Michio Kushi with his restaurant. He returned to Chico-San the following spring (1963?) where he started to make traditional miso and soy sauce. He had learned how while growing up on his family's farm in Chiba prefecture. He had attended Tokyo Agricultural University and majored in organic chemistry. Also at Chico-San he made rice syrup, called Yinnies. Now he and Kazuko live on their 5-acre farm in Orland, California. He makes organic miso (brown rice, rice, and barley) and she umeboshi salt plums with shiso. Both farm. Address: Orland, California. Phone: 916-865-5979.

8841. Motai, Hiroshi; Fukushima, Yaichi; Ishiyama, Takashi. Assignors to Kikkoman Corp. 1987. Process for producing seasoning. *U.S. Patent* 4,684,527. Aug. 4. 4 p. Application filed 1 April 1986. [6 ref]
• ***Summary:*** A process is described for producing a seasoning by contacting a hydrolysate of soy sauce koji with an immobilized glutaminase or peptidase in the presence of sodium chloride. Address: 1-2. Noda, Japan; 3. Saitama, Japan.

8842. *Quill* (*Stronghurst, Illinois*). 1987. U.S. farm program

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spending no match for European Community or Japan. Aug. 5.
• ***Summary:*** The Congressional Budget Office recently completed a study requested by U.S. Senator John Danforth. It found that European farm subsidies were the highest of any major trading nation, except Japan. According to AgraEurope, in U.S. dollars, Japan spent $4,928 per hectare, compared with $580 for the EC and $69 for the USA. Thus the EC spent 8.3 times as much per hectare as the U.S.

8843. Crosby, Ann. 1987. Japanese cooking the tofu way [Kobayashi's Tofu in Ontario, Oregon]. *Argus Observer* (*Ontario, Oregon*). Aug. 17.
• ***Summary:*** Kuni and Vickie Kobayashi have been operating this tofu company for 5 years. Formerly J. Kanetomi was the longtime proprietor. Kuni now makes 600-800 lb/week of tofu.

8844. Bernard, Richard L.; Juvik, Gail A.; Nelson, Randall L. 1987. USDA soybean germplasm collection inventory [1898-1944]. Vol. 1. *INTSOY Series* No. 30. vi + 80 p. Aug. [20 ref]
• ***Summary:*** The title page states: "Information on the origins of soybean and wild soybean germplasm including introduced and old United States and Canadian domestic varieties and foreign and domestic strains identified by FC and PI numbers up to PI 150.000 acquired through 1944 and maintained by the United States Department of Agriculture." Note: PI can stand for either "Plant Inventory" or "Plant Introduction."

Contents: Foreword. Curator staff. The USDA soybean germplasm collection: Introduction, history, PI numbers, divisions of the collection, maintenance of the collection, statistical summaries, United States and Canadian varieties, foreign introductions, appendixes, abbreviations (EAS, ARS, ES, INTSOY, USDA, and USRSL).

Statistical tables: 1. Number of strains by maturity group (MG, p. 4). This table is divided vertically into north (MG 000 to IV), south (MG V to X), and wild soybeans. There are columns for: Old domestic varieties (before 1946), FC strains (mostly from USA), PI strains to 150,000, and total. The three maturity groups with the greatest number of strains are III (479), II (436), and IV (376)–all in the north.

2. Number of strains by country of origin (p. 5). This table is divided vertically into old domestic varieties (before 1946), FC strains, PI strains to 150,000, grand total, and wild soybeans to PI 150,000. The countries that have contributed the most strains to the U.S. collection are: China 871, Korea 335, and Japan 288.

3. Number of PI strains by year from 1898 to 1945 (p. 6). Columns show: Year. Plant Inventory volume. Initial PI designation for all crops. Number of soybean PI designations plus number of domestic varieties derived from them. Number of strains in collection each year. Accumulative total. A total of 7,867 PI soybean strains were introduced out of a total 150,209 plant introductions (about 5.2% of the total was soybeans). 413 domestic varieties were derived from these soybean introductions. The most active years for soybean introduction were 1926-1932. In 1954 there were 1,524 soybeans in the collection, or only 19.4% of those introduced with PI numbers. The rest were lost or discarded.

4. Historical summary of soybean introduction, in four time periods (p. 7): 1898-1923 (26 years, 40 strains/year). 1924-1928 (5 years, 375 strains/year). 1929-1932 (4 years, 1,193 strains/year). 1933-1944 (12 years, 14 strains/year).

5. Soybean instructions from major collecting expeditions (p. 7). Frank N. Meyer in China, Korea, and USSR from 1906 to 1917 collected 114 soybean PI strains–including 1 wild soybean in 1913. P.H. Dorsett in China from 1924 to 1927 collected 969 PI strains–including 5 wild soybeans in 1925. P.H. Dorsett and W.J. Morse in China, Korea, and Japan from 1929 to 1932 collected 4,451 PI strains.

6. Source and identification of individual strains: Old domestic varieties (p. 8-19). 7. Source and identification of individual strains: FC [Forage Crop] strains (p. 20-23). 8. Source and identification of individual strains: PI strains (by year, 1907-1944, to PI 150.000; p. 24-59). A sample entry (p. 34) states: Collected in Japan by P.H. Dorsett and W.J. Morse, USDA Agricultural Explorers, in April to June 1929. Obtained at Nishigahara, Tokyo, on April 15. PI 80.466. Maturity Group V. 32 seeds. 'Okura Maru Daizu,' originally from Hokushu, used candied and the product is called 'Mimame' [sic, Nimame]. Note: Right below this is PI 80.468. Tsurunoko Daizu.

Source and identification of individual strains: Wild soybean strains (by year, 1925-1940, to PI 150.000).

Appendixes: 1. PI strains from which old domestic varieties were derived. 2. Old domestic varieties introduced without PI designation. 3. Old domestic varieties of hybrid or unknown origin. 4. FC strains summarized by country and year. 5. PI strains summarized by country and year: 1898 to 1944 (PI 1 to PI 150.000). 6. Chinese location names. 7. Korean location names.

The source, date, maturity group, and other information for the following 191 old domestic varieties (all of which are still in the USDA soybean germplasm collection) is given (p. 8-19): Acadian, Agate, A.K. [FC 30.761], A.K. [Kansas], A.K. (Harrow), Aksarben, Aoda, Arisoy, Arksoy, Arlington, Armredo, Austin, Avoyelles, Bansei, Bansei [Ames], Barchet, Bavender Special A, B, C, Biloxi, Blackeye, Black Eyebrow, Boone, Burwell, Capital, Cayuga, Charlee, Cherokee, Chestnut, Chief, Chusei, Clemson (from Nanjing, China in 1927; released in 1939), Cloud, CNS, Columbia, Creole, Delsoy, Delsta, Dixie, Dunfield, Earlyana, Early White Eyebrow, Easycook, Ebony, Elton, Emperor, Etum, Flambeau, Fuji, Funk Delicious, Funman, Gatan, Georgian, Giant Green, Gibson, Boku, Goldsoy, Granger,

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Green and Black, Guelph (from Japan in 1889 by Prof. W.P. Brooks, Massachusetts AES; called 'Medium Green' from 1903 to 1907), Habaro, Haberlandt, Hahto, Hahto [Michigan], Hakote, Harbinsoy, Harman, Harrel, Hayseed, Hidatsa, Higan, Hokkaido, Hollybrook, Hongkong, Hoosier, Hurrelbrink, Illington, Illini, Ilsoy, Imperial, Improved Pelican, Jefferson, J.E.W. 45, Jogun, Jogun [Ames], Kabott, Kagon, Kanro, Kanum, Kingston, Kingwa, Korean, Kura, Laredo, Lexington, Lincoln, Linman 533, Louisiana Green, Luthy, Macoupin, Magnolia, Mamloxi, Mammoth Yellow, Mamotan 6640, Mamredo, Manchu, Manchu [Lafayette], Manchu [Lafayette] B, Manchu [Madison], Manchu–Hudson, Manchu–Montreal, Manchu 3, Manchu 606, Manchu 2204, Manchukota, Manchuria, Manchuria 13177, Manchuria 20173, Mandarin, Mandarin (Ottawa), Mandarin 507, Mandell, Manitoba Brown, Mansoy, Medium Green, Mendota, Midwest, Miller 67, Mingo, Minsoy, Missoy, Monetta, Morse, Mukden, Nanda, Nansemond, Nela, Norredo, Norsoy, OAC 211, Ogden, Ogemaw, Old Dominion, Ontario, Osaya, Otootan, Pagoda, Palmetto, Pando, Patoka, Patterson, Peking, Peking S, Pennsoy, Pine Dell Perfection, Pluto, Pocahontas, Poland Yellow, Portugal, Ralsoy, Richland, Roanoke, Rokusun, Rose Non Pop, S-100, Sac, Sanga, Sato, Scioto, Seminole, Seneca, Shingto, Shiro, Sioux, Sooty, Sousei, Soysota, Tanner, Tarheel Black, Tastee, Tennessee Non Pop, Toku, Tokyo, Tortoise Egg, Viking, Virginia, Virginia S, Volstate, Waseda, Wea, White Biloxi, Willomi, Willomi B, Wilson, Wilson B, Wilson-Five, Wilson-Five B, Wilson-6, Wing Jet, Wisconsin Black, Wolverine, Woods Yellow, Yellow Marvel, Yelredo.

For each of these 191 varieties, a table gives the following information: Variety name, maturity group, source and other information [such as country of origin and year of introduction to the USA], prior designation [usually a P.I. number], year named or released, developer or sponsor, literature. The last column refers to a list of 20 bibliographic references in chronological order (from 1907 to 1977) on p. 18-19. Address: Univ. of Illinois.

8845. Chon, Deson. 1987. Chôsen daizu ryôri [Korean soyfoods recipes]. *Daizu Geppo* (*Soybean Monthly News*). July/Aug. p. 32-37. [2 ref. Jap]
• ***Summary:*** Gives numerous popular recipes for using whole dry soybeans, soy sprouts, and tofu. Address: Moranbon Aji no Kenkyujo Shocho, Rigaku Hakase.

8846. Honma, Nobuo. 1987. Miso no kôki to kôki seibun ni tsuite. II. [Odor and odor components of miso. II.]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 82(8):547-53. Aug. [56 ref. Jap]
• ***Summary:*** Components include carbonyl compounds and esters. Address: Kenritsu Niigata Joshi Tanki Daigaku.

8847. Ito, Hiroshi. 1987. Tenpe no nihon ni okeru kenkyû no ayumi. III. Tenpe to onchomu no chigai [The progress of tempeh research in Japan. III. Differences between tempeh and onchom]. *Daizu Geppo* (*Soybean Monthly News*). July/Aug. p. 26-30. [2 ref. Jap]
• ***Summary:*** Describes how to make onchom from okara, peanuts, and velvet beans, and discusses its biochemistry and fermentation, cookery, digestion, and nutritional composition. Address: Tokyu Nogyo Daigaku Kyoju, Jozo-ka, Chomi Shokuhin Kenkyushitsu.

8848. Ito, Tetsuo; Sugawara, E.; Sakurai, Y.; Takeyama, S.; Uchizawa, H.; Odagiri, S. 1987. Nattô-kin ni yoru pirajin-rui seisei no baichi sosei ni tsuite [Cultural media for production of pyrazines by a commercial natto bacillus (*B. natto*)]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 61(8):963-65. Aug. [9 ref. Jap; eng]
• ***Summary:*** When natto bacillus was cultured on extracts of cooked soybeans (basal medium), traces of pyrazines were produced, though cell propagation proceeded moderately. A considerable quantity of pyrazines (403 µg/L of alkylpyrazines) was produced on a basal medium containing 1% glucose + 1% sodium glutamate, versus 26 µg/L of pyrazines in media containing only glucose. When 0.5% urea was used as the source of nitrogen, only 51 µg/L of pyrazines were detected in spite of rather high cell propagation levels. Thus urea inhibited pyrazine production. Address: 1&3-6. Dep. of Agricultural Chemistry, Iwate Univ., Ueda; 2. Iwate Prefectural Morioka Junior College, Sumiyoshi. All: Morioka 020, Japan.

8849. *J. of the American Oil Chemists' Society.* 1987. Japan update [oils and fats]. 64(8):1094. Aug.
• ***Summary:*** Fats and oils demand in Japan during 1986 totaled 2,896,000 tons, up 7% from 1985. Of this, vegetable oils totaled 2,020,000 tons while animal fats totaled 876,000 tons. Nisshin Oil Mills Ltd. and Fuji Oil Co. are two Japanese oil companies. Nisshin noted net sales of 121,000 million yen (U.S. $865 million), net income increased by 2,900 million yen (U.S. $20 million). Fuji had net sales of 72,800 million yen (U.S. $520 million) while net income increased by 3,300 million yen (U.S. $23 million).

8850. *J. of the American Oil Chemists' Society.* 1987. World fats & oils report: Higher oil prices predicted. 64(8):1058-59, 1062, 1064, 1066-78, 1080-85. Aug. [1 ref]
• ***Summary:*** Statistics and general information on vegetable oil production, consumption, and trends in the following countries is given: Australia, Austria, Brazil, Canada, China, Czechoslovakia, Egypt, Finland, France, West Germany, East Germany, Hungary, India, Indonesia, Italy, Ivory Coast, Japan, Korea, Malaysia, Mexico, the Netherlands, Nigeria, Norway, Pakistan, Peru, the Philippines, Poland, Soviet Union, Spain, Sweden, Turkey, Uruguay, Venezuela, and Yugoslavia.

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Tables include: 1. World production and consumption of major vegetable and marine oils. 2. Top 10 producers of major vegetable oils (USA, EEC 12 countries, Malaysia, China, Brazil, USSR, Indonesia, East Europe, Argentina, India. The oils: soybean, cottonseed, sunflowerseed, rapeseed, coconut, palm kernel, and palm oil). 3. Top 8 exporters of major edible oils (Malaysia, EEC 12 countries, Argentina, Philippines, USA, Singapore, Brazil, Indonesia). 4. Top 8 importers of major edible oils (EEC 12 countries, Africa, India, USA, Singapore, USSR, China, Pakistan). 5. Margarine, compound fat/shortening, and salad oil production for selected countries (USA, USSR, Japan, India, Pakistan, Netherlands, West Germany, UK, Canada, Poland, Brazil).

8851. Mans, Jack. 1987. Azumaya Inc. Old line soy processor introduces new desserts. This 50-year-old soy processor produces a variety of Oriental products, including a newly introduced soy-based frozen dessert. *Prepared Foods*. Aug. p. 58-60.
• ***Summary:*** Azumaya products are selling in six of the nation's largest supermarket chains. They began to look at a yogurt-like product 12 years ago. The plant has 3 soymilk lines that process about 1,100 lb/hour of soybeans. Stir Fruity is made from silken tofu, which is heated, cooled, blended then pumped into a refrigerated tank in an antiseptic room. Fruit (15% of the product) is filled first, followed by the flavored tofu. Address: Chicago, Illinois.

8852. San-J International, Inc. 1987. Tamari [Tamari (Poster)]. 2880 Sprouse Dr., Richmond, VA 23231. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center. [Jap; Eng]
• ***Summary:*** "On Thursday, September 24th, 1987, San-J International of Richmond, Virginia will become the United States' first brewer of genuine tamari. You are invited to join us for the brewery dedication... Tamari–a premium wheat-free soy sauce had its beginnings in 7th century Japan. The Sato family founded San Jirushi in 1806 and began brewing genuine tamari." A 12-step illustrated description of the tamari-making process says (incorrectly), "The cooked beans are molded into one-inch nuggets. The nuggets, called "koji nuggets," are dusted with a microbiological culture called "koji" (aspergillus oryzae)." Note: This is incorrect. The cooked soybean nuggets are dusted with spores of the mold *Aspergillus oryzae* the resulting fermented product is called "koji." Address: Richmond, Virginia. Phone: 800-446-5500.

8853. Shibazaki, Yoshiyuki. 1987. Soren no yuryô shushi zôsan taisaku [The Soviet program to increase oilseed production]. *Daizu Geppo* (*Soybean Monthly News*). July/Aug. p. 12-15. [Jap]
• ***Summary:*** Production changes from 1971 to 1986 (tonnes). Sunflower: 5,974,000 to 5,260,000. Cottonseed: 4,295,000 to 4,530,000. Soybeans: 471,000 to 703,000. Thus the fastest growth rate has been for soybeans. Soybean production (in million tonnes) was: 1971-1975, 471; 1976-1980, 529; 1981-1985, 504; 1981, 491; 1982, 536; 1983, 560; 1984, 469; 1985, 465; 1986, 703 tonnes. Address: Nogyo Sogo Kenkyujo. Kaigai Bucho.

8854. Shurtleff, William; Aoyagi, Akiko. comps. 1987. Bibliography of soy sauce, shoyu and tamari: 535 A.D. to the 1980s. 1775 references in chronological order, partially annotated with index. Lafayette, California: Soyfoods Center. 155 p. Aug. Index. 28 cm. [1775 ref]
• ***Summary:*** The most comprehensive bibliography on this subject. Note: This is the earliest bibliography seen (Jan. 2014) published by Soyfoods Center. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

8855. **Product Name:** [Soyastern Shoyu].
Foreign Name: Soyastern Shoyu.
Manufacturer's Name: Soyastern Naturkost GmbH (Importer/Distributor). Made in Japan.
Manufacturer's Address: Osteratherstr. 26, 5000 Koeln 60, West Germany.
Date of Introduction: 1987 August.
Ingredients: Pure spring water (Reines Brunnenwasser), soybeans (Soyabohnen), wheat, sea salt (Meersalz).
Wt/Vol., Packaging, Price: 700 ml glass bottle.
How Stored: Shelf stable.
New Product–Documentation: Label. 1987, undated. Black, grey, and yellow on beige. "Traditional Soyasauce, aged 2 years in oak vats. The universal seasoning. In daily cooking and at the table; it rounds off the aroma of your foods and enhances their indwelling flavors–making salt superfluous." Letter from Thomas Karas. 1989. April 21. "Soyastern Shoyu is a Japanese product. We import it from Muso in bulk and fill it in bottles at our company. We started with it in August 1987."

8856. Taguchi, Hiroshi; Yamada, H.; Ishihara, N.; Okumura, K.; Shimabayashi, Y. 1987. Nikochin-san mechirutoransu fueraaze no bunpu to kihon-teki seishitsu [Distribution and fundamental properties of nicotinate methyltransferase]. *Bitamin* (*Vitamins, Kyoto*) 61(8):355-60. Aug. [14 ref. Jap; eng]
• ***Summary:*** High specific activities of this enzyme were found in "soybean young sprout, green soybean and corn (all are edible parts)." Green soybean probably refers to green vegetable soybeans. Address: Dep. of Agricultural Chemistry, Mie Univ., Tsu-shi, Mie 514, Japan.

8857. Utsumi, Shigeru; Nakamura, T.; Harada, K.; Mori, T. 1987. Occurrence of dissociable and undissociable soybean glycinin. *Agricultural and Biological Chemistry* 51(8):2139-

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44. Aug. [18 ref]
• ***Summary:*** Glycinin, 11S globulin, which is one of the main storage proteins in soybean seeds, is composed of 6 acidic and 6 basic subunits. Results show that there are two molecular species of glycinin, one being dissociable and the other undissociable at low ionic strength. Address: Research Inst. for Food Science, Kyoto Univ., Uji, Kyoto 611, Japan; 2. Hohnen Oil Co., Ltd., 1-2-3, Otemachi, Chiyoda-ku, Tokyo 100, Japan; 3. National Inst. of Agrobiological Resources, Yatabe, Tsukuba, Ibaraki 305, Japan.

8858. Roller, Ron. 1987. Job's tears, San-J plant, Edensoy (Interview). *SoyaScan Notes.* Sept. 1. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Edensoy contains Job's tears, the hard, pearly-white to tan seeds of an Asian grass (*Coix lacryma-jobi*), also known as "pearl barley" (easily confused with pearled barley), and called *hatomugi* in Japanese. Note: The large Kenkyusha dictionary (1954) translates *hatomugi* as "pearl barley." A Muso Shokuhin soymilk label gives the scientific name of hatomugi as *Semen coicis.* The grains are about the size of a mung bean but slightly oblong, and with a very prominent sunken tan line running from end to end, as with barley. Eden Foods has tested the growing of Job's tears in the southern USA, and now sells the grain in a 1-lb bag. San-J will be the first company to make natural shoyu in the USA. Eden has been negotiating with them for 4-5 years. Startup costs were $10-15 million. They will make both tamari and shoyu from both defatted soybean meal and whole soybeans. It is an institutional factory, no wooden vats, all stainless steel. Offices will move to the plant site. Edensoy sales are on target. Estimates are that 25-30% of people who go into health food stores have never tasted soymilk. Address: Eden Foods, Clinton, Michigan.

8859. Sakai, Tadaaki. 1987. Method of freezing foods. *U.S. Patent* 4,689,963. Sept. 1. 5 p. Application filed 2 July 1986. 2 drawings. [8 ref]
• ***Summary:*** Describes a relatively simple and inexpensive method for freezing perishable foods such as tofu, so that weight loss and quality deterioration are minimized. A refrigerant passes through pipes in the bottom of a tank, which contains a shallow layer of brine. Articles to be frozen are placed (but not submerged) in the cooled brine, whereupon freezing begins from contact with the cold base of the tank via the brine. The frozen foods do not stick to the base of the tank because of the presence of the brine. Address: 39-8 Yamadanishi 3-chome, Suita-shi, Osaka, Japan.

8860. *Toyo Shinpo* (*Soyfoods News*). 1987. 61 nendo no tôfu shôhi tôkei [Tofu consumption figure in 1986 is 5.29% lower than last year. Natto consumption is up]. Sept. 11. p. 4. [Jap; eng+]
• ***Summary:*** This is the first time in 23 years that tofu consumption per family per year has gone down 2 years in a row. In 1987, the Japanese people bought the least amount of tofu in 10 years. Naha (Okinawa, Japan) was first in the amount of household income spent on tofu, while Morioka was the top in the number of cakes sold per family (118 cho). The top selling location for deep-fried tofu pouches and burgers (*aburage* and *ganmo*) was Fukui while sales dropped in Kobe.

Natto, on the other hand, reached the highest number of packets bought per family in history. In Mito, families spent an average of ¥5700 on natto in 1987–a new record. Included in the article are two graphs giving figures of how much tofu per family per year was bought in the period 1977-1987, and how much tofu was bought per family per month in the period 1985-1987.

8861. *Toyo Shinpo* (*Soyfoods News*). 1987. Zenkoku shuyô toshi issetai atari no nenkan kônyû kingaku oyobi sûryô (1986–Showa 61 nen) [Quantities of soyfoods purchased per household in major Japanese cities in 1986]. Sept. 11. p. 5. [Jap; eng+]
• ***Summary:*** The top ten cities for tofu consumption and the number of cakes (*cho*) sold per household in 1986: 1. Morioka 117.94; Toyama 113.10; Fukushima 109.30; Tokushima 104.82; Tottori 102.93; Matsue 100.36; Yamaguchi 99.26; Aomori 98.87; Kagoshima 98.40; Matsuyama 96.68.

The top ten cities for natto and the amount spent per capita in 1986: Mito, ¥5,705; Fukushima, ¥4,168; Utsunomiya, ¥4,040; Aomori, ¥3,874; Morioka, ¥3,742; Sendai, ¥3,372; Akita, ¥3,335; Maebashi, ¥3,197; Yamagata, ¥2,775; Nagano, ¥2,650.

8862. Aoki, Hiroshi. 1987. Kôri-dôfu to kenkô [Dried-frozen tofu and health]. *Daizu Geppo* (*Soybean Monthly News*). Sept. p. 14-17. [3 ref. Jap]
• ***Summary:*** Gives a brief history of dried-frozen tofu. Discusses tests showing that it lowers serum cholesterol in humans. Address: Nagano-ken Kori-dofu Kogyo Kyodo Kumiai, Senmuriji.

8863. Gauger & Silva, Inc. 1987. Ancient Japanese technology comes to the U.S. (News release). 129 Hyde St., San Francisco, CA 94102. 2 p. Sept.
• ***Summary:*** "After 4 years of research and planning, a technology known in Japan since the 8th century has created a new industry for this country. On September 24th, the first tamari brewery ever built outside Japan will be dedicated by San-J International of Richmond, Virginia... San-J Tamari is the most widely used fermented soy sauce in the U.S. food processing industry. Major food companies, including Campbell's, Hunt Wesson, Stouffer's and General Mills, have discovered the same advantages as consumers–tamari

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tastes better, extends further, is heat stable, reduces sodium, and is a natural product."

Photos show: (1) A front outside view of the new San-J plant in Richmond, Virginia. (2) The presses inside the plant where the tamari (liquid) is pressed from the moromi (mash). Address: San-J: 2880 Sprouse Dr., Richmond, Virginia 23231. Phone: 800-446-5500 or in VA 804-226-8333.

8864. House Foods & Yamauchi Inc. 1987. Hinoichi tofu recipe cards. It happens all the time. 526 Stanford Ave., Los Angeles, CA 90013. 7 recipe cards.
• ***Summary:*** Recipes include: Tofu Mexican Vegetable Dip, Hot-Tofu Spinach Salad, Tofu Pizza, Tofu Broccoli-Corn Casserole, Tofu-Topped Baked Potatoes, Tofu Mexican Casserole, Tofu Tartar Sauce. Address: Los Angeles, California.

8865. Hymowitz, Theodore. 1987. The soybean comes to Illinois. *Illinois Research* 29(2/3):5. Summer/Fall.
• ***Summary:*** Domestication is a process of trial and error and not an event. In the case of the soybean, this process probably took place during the Shang dynasty (ca. 1700-1100 B.C.) or perhaps earlier. Samuel Bowen brought soybeans from China to Greenwich, his residence in Savannah, the Colony of Georgia. The 450 acres of Greenwich became the center of his farming and manufacturing enterprises. On July 1, 1767, Bowen received patent number 878 for his invention of methods to prepare and make sago powder, vermicelli, and soy sauce from plants grown in America. The soy sauce that he made in Georgia was exported to London.

"In 1851, the soybean was introduced to Illinois by Benjamin Franklin Edwards, the youngest brother of the first territorial governor of Illinois, Ninian Edwards... He obtained the seeds from Japanese fishermen who were rescued at sea by the *Aukland,* which was bringing sugar from Hong Kong to San Francisco, California. Edwards gave the seeds to John H. Lea, of Alton [Illinois], who planted them in his garden in the summer of 1851." Address: Prof. of plant genetics, Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801.

8866. *Ie no Hikari.* 1987. Mamenoko osusume no nattô ryôri [Natto dishes recommended by the Mamenoko restaurant]. Sept. p. 68-70. [Jap]
• ***Summary:*** This restaurant, specializing in natto and tempeh cookery, is run by Mr. Goro Kanasugi of the Japan Natto Assoc. The restaurant's cute name means "Child of the Bean."

8867. Kimura, Eiichi. 1987. Gendai gokoku ko. Daizu wa "gokoku no hitotsu" to iwareru ga [Thoughts on China's "Five Grains" today. It is said that soybeans were one of these, but were they?]. *Daizu Geppo* (*Soybean Monthly News*). Sept. p. 34-35. [3 ref. Jap]
• ***Summary:*** Early Chinese works that mention the Gokoku or Five Grains are the Chou li (1122 B.C.?; mentions simply "beans." Note: Most western scholars date this work as 3rd century B.C.); ? (330 B.C.; mentions "beans"); Daihinrei (about 50 B.C.; mentions "shu"); Soko (221 B.C.–220 A.D.; mentions soybeans).

In Japanese works, the soybean is specifically mentioned as being one of China's "Five Grains" in the *Kojiki* (712 A.D.), probably in the *Nihonshoki* (720 A.D.), which said "large and small beans," i.e., soybeans and azuki, and in the *Honcho Shokukan* (1695). Address: Daizu Kyokyu Antei Kyokai.

8868. Mangold, Grant. 1987. As world competition heightens–Can the U.S. win the market marathon. *Soybean Digest.* Aug/Sept. p. 14-17.
• ***Summary:*** A key article explaining why, from 1981 to 1987, the U.S. world market share of soybeans and products fell from 68% to 49%. The key competitors are Brazil and Argentina. "Observers attribute this decline to a strong dollar, weak world economy, enhanced competitiveness of other countries, increased trade agreements and price supports that allow other countries to undersell the U.S." Production costs per bushel for Argentina, Brazil, and the U.S. are $4.05, $5.40, and $6.62, respectively. Landed costs in Tokyo are $5.92, $7.51, and $7.99.

8869. Miyamoto, Taku; Hirata, N.; Nakae, T. 1987. Isolation from soy milk of a growth-stimulating substance for lactic acid bacteria. *Nippon Chikusan Gakkaiho* (*Japanese J. of Zootechnical Science*) 58(9):754-63. Sept. [21 ref. Eng]
• ***Summary:*** The substance, considered to be a peptide with a molecular weight of 1150 daltons, stimulated the growth of *Lactobacillus casei* and *L. acidophilus.* Address: Lab. of Animal Products Technology, Faculty of Agriculture, Okayama Univ., Okayama-shi 700, Japan.

8870. Park, Yang Won; Kobayashi, H.; Kusakabe, I.; Murakami, K. 1987. Purification and characterization of soymilk-clotting enzymes from *Bacillus* sp. K-295G-7. *Agricultural and Biological Chemistry* 51(9):2343-49. Sept. [9 ref]
• ***Summary:*** Enzymes I and II, both serine proteases which have a high soymilk-curding activity, were produced from Bacillus species. When purified, they were found to be homogeneous by polyacrylamide gel electrophoresis (PAGE) at pH 4.3. Both enzymes gave optimum coagulation of soymilk at 65ºC, were stable at 45ºC, and were most active at pH 5.8. Both were more sensitive to calcium ion concentration that to bromelain. Address: Inst. of Applied Biochemistry, Univ. of Tsukuba, Ibaraki 305, Japan.

8871. Saegusa, Kyoko. 1987. Tônyû to amazake de tsukuru hyôka roisu kuriimu [Royce Cream frozen dessert made with soymilk and amazake]. *Gendai Nogyo* (*Modern Agriculture*).

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Sept. p. 106-10. [Jap]
• ***Summary:*** Kyoko and her American husband, who live in Tempe, Arizona, use soymilk, amazake (which they make from Cold Mountain koji), tofu, and various flavorings to make what they call Royce (Rice + Soy + Ice) Cream frozen dessert for use at home. She also makes yuba. One of the longest articles seen up to this time on amazake. Contains three pages with 11 color photos showing how to make amazake and soymilk. Letter from Kyoko Saegusa. 1988. March 21. Her current address: 2040 S. Forest Ave., Tempe, AZ 85282. Phone shown above. Address: 2025 S. Forest Ave. #3, Tempe, Arizona 85282. Phone: 602-966-8397.

8872. Unnevehr, Laurian J.; Gleason, Jane E.; Kauffman, Harold E. 1987. Soybeans in international agriculture. *Illinois Research* 29(2/3):24-26. Summer/Fall.
• ***Summary:*** Soybean cultivation originated in the North China Plain. Today, China is still a major producer of soybean, accounting for about 10% of world production. Other countries in Asia produce only minor quantities. Since 1970, production of soybeans has expanded significantly in four Latin American countries: Argentina, Brazil, Paraguay, and Uruguay. Among the major producers, the U.S. and Argentina have the highest average yields of about 2 tonnes/ha (30 bushels/acre). Lowest average yields, about 1 tonne/ha (15 bushels/acre), are found in China. Over 80% of world soybean production is crushed to provide meal and oil. The soybean is the single largest source of supply in both protein meal and edible oil markets, providing 30% of the world's edible oil and 50% of world supply of protein meal for animal feeds. Its ratio of protein to oil is highest among all oilseeds. The soybean also has high-quality protein compared to other oilseeds.

Because income is a major determinant of soybean meal and oil consumption, it is not surprising that high-income industrial countries are the largest consumers. The European Economic Community (EEC), Japan, and the U.S. account for two-thirds of world soybean meal consumption and one-half of world soybean oil consumption. Recent growth in demand for soybean products has been greatest in less developed countries because incomes are growing most rapidly there. From 1960 to 1980, per capita income in South Korea tripled from $500 to $1,500.

As a result, meat consumption increased from 12 to 40 kilograms per capita. To satisfy increased meat demand, livestock production and feed use also increased rapidly, causing soybean meal consumption to increase from 0 to 300,000 tons in only 20 years. The use of soybeans for food products is a very small part of total use in most countries, but there are some exceptions. For instance, from 1983 to 1985, Indonesia used 92.9% as food; China, 73.8%; and South Korea, 35.9%. Japan protects its domestic soybean processors by confining imports to whole beans. Address: 1. Asst. Prof. of Agricultural Economics; 2. INTSOY agricultural economist; 3. Director, INTSOY, and Prof. of International Agriculture. All: Univ. of Illinois, Urbana, IL 61801.

8873. Gatins, Joseph. 1987. Varina brewing plant typifies foreign firm sought by Baliles [San-J tamari]. *Times-Dispatch* (*Richmond, Virginia*). Oct. 5. p. 1, 13.
• ***Summary:*** The 40,000 square foot soy sauce brewing plant, located on a 9 acre property in the Eastgate Industrial Park in Varina, is run by San-J International, the U.S. subsidiary of 183-year-old San-Jirushi Corp. located near Nagoya, Japan. When the company was founded in 1804, the Shogun still governed Japan and Thomas Jefferson was President of the United States. Nobuyoshi Sato, Chairman of the Board, and Takayoshi Sato, Senior Vice President, are 7th generation heirs of the founding family.

The sauce is fermented in 10,000 gallon tanks for 6-12 months under strict temperature and humidity controls. The company uses Virginia soybeans and meal from the Midwest. The current strength of the yen against the dollar played a big role in the decision to invest in a U.S. plant according to John D. McLaughlin, the retired Army general who is president of San-J, and Takayoshi Sato, the company's senior vice president. The plant will run at peak capacity with only 20 employees. Top management will be American. A photo shows John McLaughlin and Takayoshi Sato with product.

8874. *Rafu Shimpo* (*Los Angeles, California*). 1987. Tofu Festival Oct. 10 [in Los Angeles sponsored by Hinoichi]. Oct. 8.
• ***Summary:*** The Tofu Festival will be held at Japanese Village Plaza in Little Tokyo. Other sponsors include Numano Shoji Ltd. and Yatai Sushi Inc. An improvisation theater group called "Cold Tofu" will present Charlie Chan Blues Band and demonstrate tofu cooking. Los Angeles artists will also demonstrate Hinoichi tofu sculpturing.

8875. *Toyo Shinpo* (*Soyfoods News*). 1987. Ichi nichi 1000 shoku mo deru nattô ryôri. Nattô ryôri senmon ten "Mamenoko" [One thousand natto dishes sold daily. Natto cookery specialty shop–Mamenoko]. Oct. 11. p. 2. [Jap; eng+]
• ***Summary:*** Goro Kanasugi is president of Kanasugi Shokuhin Kogyo Ltd. at Shimomachi 3-6, Omiya-shi, Saitama-ken, Japan. Phone 0486-41-1425. He opened this restaurant, Mamenoko, in 1975. His son is currently running the business. The natto menu consists of natto croquettes, natto gyoza (pot stickers), tororo natto soup, yamaimo no natto age (fried natto with glutinous yam), maguro no natto kake (with tuna) and ika natto (natto with squid). He serves 1,000 of these dishes a day at the restaurant. He also has a health foods shop next to the restaurant and sells second generation tempeh products such as brown rice bread with tempeh, dango, croquettes and kabayaki teishoku. About 10

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of these items are sold daily. His tempeh saka manju, which sells 500-600 (sometimes 1,000) cakes a day, goes for 60 yen per cake. The article includes a photo of the shop.

8876. *Telegraph-Forum* (*Bucyrus, Ohio*). 1987. Tofu trade team from Japan visits. Oct. 13.
• ***Summary:*** The 21 member team representing the Japan Tofu Assoc. was told by ASA that they could ship high-quality Ohio soybeans to Japan in the hundreds of containers that now return to Japan empty after bringing parts to Ohio's Japanese auto makers. The containers would assure high quality soybeans for human food use and assure farmers a premium price for their soybeans.

8877. Sumi, Hiroyuki; Hamada, H.; Tsushima, H.; Mihara, H.; Muraki, H. 1987. A novel fibrinolytic enzyme (nattokinase) in the vegetable cheese Natto: a typical and popular soybean food in the Japanese diet. *Experientia* 43(10):1110-11. Oct. 15. [16 ref. Eng]
• ***Summary:*** A study of protease activity in natto showed that it contained an enzyme that hydrolyzed fibrin, a white insoluble fibrous protein formed from fibrinogen (a globulin produced in the liver) by the action of thrombin, esp. in the clotting of blood. The novel enzyme, extracted by saline solution, was named nattokinase (pronounced not-toe-KAI-nase). The use of natto as a folk remedy for heart and vascular diseases is discussed with reference to the strong fibrinolytic activity it contains, and the potential of nattokinase for oral fibrinolytic therapy is considered.

Note 1. This is the earliest English-language document seen (Jan. 2012) that contains the word "nattokinase" or the word "fibrinolytic." Nattokinase is a strong fibrinolytic enzyme found in natto. Fibrin is a fibrous protein involved in the clotting of blood. It is a fibrillar protein that is polymerised to form a "mesh" that forms a hemostatic plug or clot (in conjunction with platelets) over a wound site (Source: Wikipedia March 2009). According to www.askdrgarland.com (accessed Dec. 2011):

"Nattokinase was discovered in 1980, by Dr Hiroyuki Sumi, who was working at the Chicago University Medical School. He was testing 172 different foods for their ability to promote healthy circulation, and Nattokinase did the job better than any other substance he was testing.

"Since then, additional research has been done on Nattokinase, including 17 published studies in Japan and here in the U.S. The results have been dramatic to say the least.

"But to fully understand the significance of Nattokinase, you need to first understand 'blood clotting.' Blood clotting is a normal and necessary process, it's what stops the bleeding if you cut your finger for instance.

"Our body produces compounds that make blood clots, one of the most important is called 'Fibrin'. Fibrin is made up of sticky protein fibers which look like a tangled spider's web.

"Fibrin's job is to stick to the blood vessel walls and act like a net, form a lump or plug that stops the bleeding. Fibrin is also what determines the viscosity, or thickness of blood throughout our entire circulatory system.

"Normal Fibrin levels will give you normal blood flow.

"There is only one enzyme that breaks down Fibrin–an enzyme called 'Plasmin.'

"Remember, Fibrin is what's forming a 'web' that stops blood from flowing–so by breaking down Fibrin, Plasmin dramatically increases blood flow and thus brings down blood pressure.

"Unfortunately, Plasmin production declines rapidly as we age. If the drug companies could 'bottle' Plasmin, they would have a staggering gold mine in their hands. They can't. But Mother Nature can.

"Nattokinase is 'Mother Nature's Plasmin' and works dramatically to support healthy circulation in two distinct ways.

"First, Nattokinase is identical to Plasmin, so it can break down Fibrin!

"Second, Nattokinase enhances your body's natural production of Plasmin, further helping to break down the Fibrin." Address: Dep. of Physiology, Miyazaki Medical College, Miyazaki 889-16, Japan.

8878. Shurtleff, William. 1987. The transformation of soymilk (Overview). *SoyaScan Notes.* Oct. 20.
• ***Summary:*** Soymilk is a traditional Asian low-tech soyfood / soy beverage that was transformed during the period 1966-86 into a modern high-tech dairy alternative.

The key scientific breakthroughs were made in the USA at Cornell University, but applied in Japan. The key packaging breakthrough was made by Tetra Pak. Address: Soyfoods Center, Lafayette, California 94549.

8879. Lindner, Anders. 1987. The world soymilk market and Soya Technology Systems (STS) (Interview). Conducted by William Shurtleff of Soyfoods Center, Oct. 21. 7 p. transcript.
• ***Summary:*** "On 21 Oct. l987 Anders Lindner, on a trip of the USA, visited the Soyfoods Center (SC). The following interview was conducted by William Shurtleff.

"SC: STS started five years ago, and in that time you have traveled the world, visiting every potential customer, and sold four soymilk plants. What major changes or trends have you seen in the world soymilk market during that time?

"STS: You must look at one region at a time. In the United States there is definitely an increased interest in and awareness of soymilk. Soyfoods are relatively well known. In Europe there has been a big increase in the number of enquiries about soymilk from all countries. The number of larger companies that have contacted us has also increased.

"Africa is still a dark continent as far as soymilk goes,

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with the possible exception of Nigeria, where we have a number of quotations pending, awaiting approval for foreign currency. This could take time.

"Looking at Asia, in India there was almost a frenzy of interest several years ago and we still get enquiries every week. The government gave permission to build many new soybean crushing plants. Soybean production is now over a million tons, and it is still not enough. So the price of soybeans is rising, which raises soymilk prices. But I'm not as optimistic about the future of soymilk in India today as I was 6 months ago. India's first major soymilk plant, established by the Noble Soya House group in Bhopal, has not been as successful as everyone had hoped it would be. Two of India's best known companies, the Great Eastern Shipping Company (also called the Bhiwandiwalla Group) and Godrej, backed the new company, which greatly bolstered public confidence in the project. Each owned 24% of the private limited company and the rest was publicly owned. Great Eastern provided financing and put a number of their very best people in the top management positions. Godrej, which is *the* marketing company in India par excellence, provided distribution and marketing. They specialize in soaps. Alfa-Laval supplied the plant and Kibun sold their technology know how. Production began in January 1987 and it had all the signs of being a very, very good project. Their soymilk, named Noble House Great Shake, comes in four flavors (chocolate, strawberry, mango, and American ice cream flavor, basically a vanilla) in 200 ml Tetra Brik cartons. I have heard it said that the products were not well formulated, the timing was poor, the prices were too high, and the products were marketed as a clearly Western-style of foreign product. The project got lots of big media publicity, but much of it was not favorable, we are sorry to say. Today the plant runs only about 2 hours a day.

"We have sold a plant to Amrit Soya and Protein Foods Ltd., owned by the Amrit Company, an old company. They are in Ghaziabad, Uttar Pradesh, on the outskirts of New Delhi and are expected to start production in mid-l988. This will be India's largest soymilk plant with a capacity of 6,000 liters/hour.

"Back to Asia, when we established STS we located ourselves in Southeast Asia, thinking that with the large consumption of soybean drinks there it would be quite simple to sell plants to make soybean milk as well. But that has not been the case. I find the food processing companies there extremely conservative. Our strategy now is to show the companies in East Asia that our concept works in the USA and Europe.

"China has been a disappointment. They seemed to be more interested in soymilk plants a few years ago.

"So generally speaking, the climate has gotten better, especially in Europe and the United States.

"SC: Has your strategy or basic approach for selling STS soymilk plants changed during this period?

"STS: Yes, it is changing now. We are expanding our product range by offering processes for other soymilk-based foods. Formerly we thought of ourselves as selling primarily liquid soymilk. Now we are offering process lines for tofu, ice cream, dressings, dips, spreads and other dairy analogs, plus what we call 'semi-products.' These are non-consumer, industrial food type products such as concentrated soymilk or curds for use as ingredients by food processors. We are investing in R&D on these. I think we will find new uses for our soymilk base, including new ways of making traditional products, dairy analogs, powdered products, and truly new products.

"SC: Have you made any major technological developments?

"STS: Yes. we are now offering an ultrafiltration system as part of our soymilk system. This is an important technological innovation. It allows you to concentrate soymilk by removing water without adding heat (thus preserving the good flavor of the product) or to remove certain components from the soymilk, such as oligosaccharides or perhaps trypsin inhibitors or lipoxygenase enzymes, using membranes. More important, it can help in automating tofu production. The soymilk base goes into the ultrafiltration plant, where it is concentrated. Coagulant is injected into the line and mixed. Rectangular cakes of tofu are chopped off as they come out the exit end. Luke Lukoskie at Island Spring has been a pioneer in developing these processes using a pilot plant, with an ultrafiltration unit, that we loaned him. This technology seems to have a very promising future for processing soymilk in the West, and for making soya panir (fresh curds) in India. There is not enough cow's milk in India to go around, and most of it is sold in the cities. I think soya panir will undersell dairy panir in India.

"SC: Which company do you feel is your strongest competitor?

"STS: Our main competitor everywhere is Alfa-Laval. After that, but much less, some of the Japanese companies such as Marusan-Seikensha and Mitsubishi. Given that we had just installed the largest soymilk plant in the Western world for De-Vau-Ge in Germany, I was surprised to note that Eden Foods in America chose Marusan-Seikensha without ever contacting us at all. Marusan seems to have only one English speaking person in the entire company, Mr. Tominaga. Mitsubishi competed with us selling systems in India and Nepal. Takai never seems to be in competition with us. Vandemoortele is no longer supplying systems, though the huge plant they built in Ambatolampy, Madagascar (35 million liters/year capacity) is still in operation. The company, Lalasoa SA (Societe Anonym) is run by a woman named Regina.

"SC: Could you tell us a little about the four plants that you have sold?

"STS: Our biggest and most successful plant was sold

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to De-Vau-Ge, a Seventh-day Adventist food company in Lueneburg (near Hamburg), Germany. They started production in August 1985 and make Granose and Granovita brands soymilk, sold mainly in the UK and West Germany, but also in Scandinavia and France. The plant is running at full capacity, which is 3,000 liters per hour of soymilk base (4.7% protein). This is 4,000 liters per hour of finished soymilk (3.5% protein), or 50,000 liters a day. They currently only make two products. Labels for the UK market read Granose Soya Milk (4 flavors) and Granose Soya Dessert (3 flavors of custard puddings gelled with natural carrageenan, a seaweed extract). Both products are packed in half liter or liter aseptic Tetra Brik cartons. The plant is doing very well, selling all it can make. This is the only one of the four that has started operation. we have also sold a plant to Island Spring (Vashon, WA), which may be the next to start production. The capacity is also 3,000 liters/hour of soymilk base. Amrit in India should be in production by mid-1988. Their plant has the same basic capacity as the plant in Germany, but since their soymilk will contain only 2.25% protein, the actual output will be 6,000 liters per hour which is larger than Germany. They will make both beverages and foods, mainly a panir type cheese. The beverages will contain Indian flavorings." (Continued). Address: STS, Singapore.

8880. *SoyaScan Notes.* 1987. Soymilk and dairy milk prices in California, October 1987 (Overview). Oct. 23. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** In Lafayette, California, whole milk sells for $0.55/quart. Soymilk sells for $1.99/liter, which is the equivalent of $1.88/quart. Thus soymilk in a liter pack is 3.42 times as expensive as dairy milk per unit volume. In Dec. 1983 a comparison with pint quantities was made. Cow's milk cost $0.39. The least expensive fluid soymilk was Vitasoy, sold to the Asian market in 8.4 oz pack for $0.35; it was 1.72 times as expensive as cow's milk per pint. The average price of all 6 brands surveyed was 3.53 times as expensive as cow's milk per unit volume. Thus, soymilk prices have dropped only 3.2% in relation to cow's milk prices since Dec. 1983. The main reason that the drop has not been larger lies in the decline in the value of the U.S. dollar from late 1985 on; this led to a steady rise in the price of imported soymilks.

During 1986 two major changes took place in soymilk packaging in the USA. Both helped to reduce costs. (1) Edensoy, Westsoy, and Ah Soy switched to Tetra Brik cartons; Vitasoy had always been in Tetra Brik. (2) Liter and quart Tetra Brik cartons were introduced. This larger size was pioneered by the Alpro/Vamo Foods Sunsoy brand, followed by Edensoy, Ah Soy, Westsoy, and Vitasoy. Soymilk became the first liter-sized Tetra Brik product to succeed in the USA.

8881. *Farm & Country* (*Toronto, ONT, Canada*). 1987. Asians buying plenty: Soy. Oct. 27.
• ***Summary:*** Ontario has captured 66% of Singapore's 41,000-tonne market (soybean). Yet out of Japan's 500,000-tonne annual imports for tofu manufacture, Ontario supplies less than 3,000 tonnes. Canada applies more rigorous grade standards than the U.S., but Canada needs better beans, not just better grading. Buyers believe that American beans are higher in protein. Address: Ontario, Canada.

8882. American Miso Co. 1987. A living art: The American Miso story (Ad). *East West.* Oct. p. 8.
• ***Summary:*** This one-third page vertical black-and-white ad begins: "These days, even in Japan, 99% of the miso is commercially made. Mass production and high technology characterize today's miso. The timeless art of handmade miso is dying.

"However, near the Smoky Mountains in the green, rolling country of western North Carolina, the American Miso Company continues a centuries old tradition of hand-crafted miso." The Miso Master logo shows a Japanese miso master, with a knotted headband, in front of a large wooden vat of miso. Address: Rutherfordton, North Carolina 28139. Phone: 704/287-2940.

8883. Bradner, Norman. 1987. Soybeans for the food market. *Seed World* (*Des Plaines, Illinois*). Oct. p. 44.
• ***Summary:*** Thailand imports nearly 100,000 tonnes/year of soybeans for food use. Japan imports 65,000 to 70,000 tonnes of small beans to make natto. Natto beans can be less than 5 mm in diameter and have a yellow cotyledon and hilum. For tofu, soymilk and miso, importers want high protein, low oil, maximum water soluble proteins, low phytate, high 11S protein fraction, large seed size and high sugar content. But a variety judged good one year can be deemed unsuitable the next. Environmental conditions during seed development play a significant role in determining the final chemical composition. Address: Pulse Breeder, King Agro, Inc., Chatham, Ontario, Canada.

8884. *East West.* 1987. Natural Foods: The best and worst. 2nd annual awards. Oct. p. 32-36.
• ***Summary:*** Only packaged natural foods with nationwide distribution are judged. Best soymilk: Edensoy, but the Tetra Brik package doesn't biodegrade, burn, or recycle. Best sandwich spread: Nasoyanaise by Nasoya Foods. Worst shoyu: Natural shoyu from Erewhon. So heavy it is best dispensed with an eye dropper. Best Tamari: San-J. Worst line of fake meat products: Worthington Foods. Worst beans: Honey Baked Style Vegetarian Beans with Miso from Health Valley. Best Miso: Miso Master Mellow White Miso by American Miso Co. for Great Eastern Sun.

8885. Haumann, Barbara. 1987. Expanding soybean markets,

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uses. *J. of the American Oil Chemists' Society* 64(10):1369, 1372-79. Oct.

• ***Summary:*** Value-added products and soybean varieties tailored to produce specific end products are among the promising developments envisioned to expand markets for U.S. soybeans. Keith Smith, staff vice president of research for the American Soybean Association (ASA) said, "Aquaculture–raising fish such as shrimp, catfish and trout–is a growing industry in the U.S. and abroad." Smith went on to say that the switch from mainly production research to more utilization research occurred eight to nine years ago, and that 60% of ASA's total research money in the past 6 years has gone for utilization research.

Genetic research is working to improve the fatty acid content of soybean oil. Work is also under way to develop a quick, low-cost method to determine oil and protein content. Other work includes trying to lower levels of linolenic acid in the oil. At Purdue Univ. in Indiana, research geneticist Niels Nielsen of the USDA's Agricultural Research Service (ARS) is trying to develop soybean lines free of lipoxygenase enzymes. Soymilk and flours produced from the new seeds are rated significantly better in flavor and aroma. Professor Nielsen and his research group are trying to "improve the nutritional quality of the major soy storage proteins by increasing sulfur amino acid content." He noted that the methodology has resulted in doubling and tripling the methionine content. At the University of Kentucky, David Hildebrand is also working on genetic engineering of soybeans.

Brazil, the second largest producer of soybeans, has evolved as the largest exporter of soybean meal and oil. The other top producers are China, in third place; Argentina, in fourth; and India, which recently made the top five. Indonesia is in 6th. Italy's production has grown substantially in recent years to make it the most important soybean-producing area in Europe. Other European producers include France and Spain. According to Oil World Annual published by ISTA Mielke, West Germany, the top 10 soybean oil producers for 1986/87 (in tonnes) were the following: U.S. 5,430,000; Brazil 2,538,000; Argentina 780,000; Japan 715,000; China 679,000; West Germany 521,000; The Netherlands 488,000; Spain 421,000; Italy 350,000; and Mexico 336,000.

ANPA (American Newspaper Publisher's Association) began seeking alternative sources to petroleum for ink seven years ago due to problems with petroleum supplies. Four years ago, with fluctuations in supplies and price, ANPA began considering the use of soybean oil ink. ANPA has filed a soy ink patent application and has begun licensing major ink manufacturers to make it. The first ink manufacturer to produce the ink, colored and black, is General Printing Ink, a division of Sun Chemical Corp., located in Carlstadt, New Jersey. One advantage of soy oil ink is that it is environmentally nonhazardous, which could reduce waste disposal problems. It also eliminates dependence on petroleum. There is less "ruboff" and the same amount of ink will print more pages. One drawback is that black ink made from soybean oil costs more than traditional black ink. Oil content in newspaper ink averages about 70%.

In the March 4, 1987 *Federal Register,* the U.S. Federal Grain Inspection Service (FGIS) ruled that soybean and other edible oils may be used to control grain dust in elevators. A U.S. Patent, licensed to Industrial Fumigant Co., is held jointly by Harold N. Barham and Harold N. Barham Jr. of Seed Technology of Texas. The patent was filed in 1978. Kinsella, director of the Institute of Food Science at Cornell Univ. said that another research interest was in the area of omega-3 fatty acids. It may desirable to develop soybean cultivars with high omega-3 fatty acid levels. John W. Erdman Jr. of the Univ. of Illinois' Dep. of Food Science and co-worker Angela Poneros want to nail down the factors that lower zinc bioavailability. He said, "We want to find out why this happens and if we can increase it."

Meanwhile, at INTSOY, team member Sing-Wood Yeh and others are working in the field of soybean dairy analogs. Tofulicious, a non-dairy frozen dessert, was developed through research coordinated by University of Minnesota food scientist William Breene and funded by the Minnesota Soybean Research and Promotion Council. Abroad, ASA has been promoting soy-fortified foods. For instance, in Venezuela three years ago, ASA launched an education program for consumer groups and government agencies on the benefits of soy protein. As a result, soy-fortified foods are available in Venezuela's major supermarkets, and demand for soy protein has increased to more than 48,000 pounds per month.

Soybean researchers are also working on standardization of NIR (near-infrared spectroscopy) as a measure of protein and oil content in soybeans. NIR already is successfully used to measure grain and forage composition. If NIR were adopted as a standard by the industry, soybeans eventually could be purchased based on protein and oil content.

8886. Kingma, Sharyn. 1987. San-J International opens first U.S. tamari brewery. *Soya Newsletter* (*Bar Harbor, Maine*). Sept/Oct. p. 9. See also Natural Foods Merchandiser. 1988. Jan. p. 3.

• ***Summary:*** On September 24 San-J opened the doors to its new $10 million tamari brewery in Richmond, Virginia. The 40,000 square foot plant, which has a capacity of 1 million gallons a year, is the first to produce tamari outside of Japan. The plant will produce San-J Tamari, Tamari Lite, Shoyu, and Teriyaki and Szechuan Sauces. San-J tamari was first imported and introduced to the U.S. market in 1979. The plant will employ 20 people. Perelman notes that the U.S. soy sauce market is the second largest in the world (after Japan) having expanded at 24% a year between 1974 and 1984. Manufacturer sales are estimated at $85 million in

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1984 and $91 million in 1985, estimated to grow to $220 million by 1994. With current sales of nearly $100 million, soy sauce is the largest category of soyfoods in the U.S. While Kikkoman has 44% of the U.S. soy sauce market, San-J maintains 75% of the industrial market.

8887. Morinaga Nutritional Foods, Inc. 1987. Mori-Nu Tofu. The "miracle food" in a miracle package (Leaflet). Los Angeles, California. 2 p. Jan. [2 ref]
• ***Summary:*** Contains a large table comparing the amino acid composition (g/100 g amino acid for 18 amino acids) for Mori-Nu Tofu (soft and firm), whole chicken eggs, whole cow milk, beef, tuna, and white bread. Also contains recipes for Strawberry Pudding Fluff (using gelatin) and Honey Lemon Un-Cheesecake. Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040.

8888. Ontario Ministry of Agriculture and Food. 1987. Soybean buyers mission from Japan, Hong Kong, Malaysia, Singapore, October 10-20, 1987. Toronto, Ontario, Canada: Ontario Ministry of Agriculture and Food. 23 p. 30 cm. Saddle stitched. [Eng]
• ***Summary:*** Contents: Mission members (with a photo of each). Itinerary. Japanese market for edible soybeans. General uses of edible soybeans in Hong Kong, Malaysia and Singapore. List of major importers in Asia (by country). Ontario soybean suppliers. Role of the Ontario Soya-Bean Growers Marketing Board (Chatham, Ontario).

This conference, which took place in Toronto, Chatham, and Harrow, Ontario, Canada, was sponsored by OMAF in Toronto. On the mission were 6 buyers from Japan (Takeya Miso Co., Asahi Industries [tofu maker], Takano Foods Co. [natto maker], Dah Cong Hong, Wako Shokuryo Co., and Gomei Shoji Co. [the last 3 is each an importer and wholesaler]), 2 from Hong Kong (Amoy Industries Ltd., and Chung Hing Co.), 3 from Malaysia (Sin Yong Huat Enterprises Sdn. Ltd, Yeo Hiap Seng (Malaysia) Ltd., and Chop Lee Kit Heng), and 2 buyers from Singapore (Eng Huat (S) Ltd. and Chop Hin Leong). Mike Hojo of OMAF/ Tokyo was the mission leader.

The Japanese soybean market is about 5 million tons a year. Of this: Oil crushing 4,036,000 tons. Food 849,000 tons (17% of total), and feed (not crushed) 70,000 tons. From 1982 to 1986 domestic Japanese soybean production has decreased from 168,000 tons to 147,000 tons, while imports have increased from 4,344,000 tons to 4,857,000 tons. Demand for food soybeans has increased from 803,000 tons to 849,000 tons. Tofu, miso, and natto account for more than 94% of the total utilization of edible soybeans, roughly as follows: Tofu 500,000 tons, miso 200,000 tons, natto 100,000 tons.

In 1986 some 89.9% of Japan's soybean imports came from the USA, followed by China (6.7%), and Brazil (2.65%). That year the least expensive soybeans came from Brazil (US$219.86/ton), followed by USA ($221.36), China ($236.06), and Canada ($277.50). Note that Canadian soybeans are 25.3% more expensive than those from the USA. Chinese and Canadian soybeans are most widely used to make foods. Large Chinese soybeans are used to make tofu, medium sized for miso, and small for natto. Of the soybeans imported from the USA, 80-85% are imported from oil crushing because of their high oil content. The remaining 10-15%, or approximately 700,000 tons are food soybeans from Iowa, Ohio, or Michigan. Called "IOM" soybeans, they are used mainly to make tofu. Brazilian soybeans have a high oil content and are used for oil crushing only. The ocean freight cost for a 20-foot container shipped to Tokyo is as follows: USA west coast $1,000. Toronto, Canada $1,800. USA East Coast $2,000. Brazil $2,100. Argentina $2,500. But a large percentage of regular soybeans are loaded directly into ships, and travel at lower freight rates. Exports of food soybeans from Canada to Japan rose from 10,000 tons in 1979 to 26,000 tons in 1986, while those from China rose from 267,000 tons in 1979 to 323,000 tons in 1986.

Very detailed preferred characteristics are given for soybeans to make miso (6 characteristics), natto (5), and tofu (5). Canadian soybeans are recognized as superior to Chinese and American soybeans for food use. This is one reason they command a relatively higher price.

Hong Kong imports 28,100 tons/year of soybeans, and 63% of these come from Canada, followed by China (35%), and the USA (1.8%). Malaysia and Singapore import 124,800 tons/year, and 53% of these come from the USA, followed by Canada (31.7%), and China (8.2%). Most of the food soybeans in Malaysia and Singapore are used to make soymilk and tofu.

Soymilk: Vitasoy dominates the market in Hong Kong, whereas in Malaysia and Singapore the leading manufacturers are Yeo Hiap Seng, Cold Storage, Lam Soon, and Nestle. Soymilk consumption is increasing in these 3 countries, and in neighboring countries. Soymilk makers believe there are four requirements for their products' success: It must taste good, must be priced competitively with soft drinks, must be perceived as a health food, and must be marketed properly.

Bean curd sheets and sticks [yuba] are very common snacks and dishes in Hong Kong, Malaysia, and Singapore. Manufacturers consider only Chinese and Canadian soybeans for these products. Canadian soybeans produce whiter soymilk and thus whiter yuba. However the larger size of Chinese soybeans results in a larger yield. Manufacturers normally blend 60% of Canadian soybeans with 40% of Chinese soybeans to obtain a higher output of whiter sheets.

Major Japanese soybean importers include: Da Chong Hong (Japan) Ltd., Gomei Shoji Co. Ltd., C. Itoh & Co. Ltd., Mitsubishi Corp., Kanematsu-Gosho Ltd., Nichimen Corp., Marubeni Corp., Mitsui & Co. Ltd., Nissho Iwai Corp., Okura & Co. Ltd., Toyo Menka Kaisha Ltd., Wako Shokuryo

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Co. Ltd. Address: Ontario, Canada.

8889. Pandey, R.K.; Sumarno, -; Potan, Nark; Navarro, R.; Dharmasena, C.; Beg, Akhtar. 1987. Asia's shortfall in production of soybeans and the response of national programmes. In: S.R. Singh, K.O. Rachie, and K.E. Dashiell. eds. 1987. Soybeans for the Tropics. New York: John Wiley & Sons. xx + 230 p. See p. 101-09.

• ***Summary:*** Contents: Introduction. Constraints. National research programmes: Varietal improvement, cultural practices. Cooperative research: A new dimension.

Demand for soybeans and products in the region is about twice the regional production. By the year 2000, if current trends continue, Asia's demand for soybeans is projected to be more than three times the amount produced.

The leading soybean producers in Asia, in descending order of tonnes produced in 1983, are China, India, Indonesia, Korea, and Thailand. In Indonesia, soybean production during the past 10 years has been constant at about 700,000 tonnes (metric tons) per year; soybeans are produced mainly in Java.

In 1984 Thailand produced 284,000 tonnes, which was far below its demand of about 350,000 to 450,000 tonnes. A national program set a goal of producing 390,000 tonnes by 1986.

In the Philippines, Mindanao, located in the south, is the leading soybean producer. During the last 10 years, producing has gradually increased, however in 1983 only 8,320 ha were planted to soybeans; that year, imports totaled 261,000 tonnes of soybean meal and 31,000 tonne of whole soybeans.

In Pakistan, commercial soybean production began in 1970 and is concentrated in the North Frontier Province, Sind and Punjab. The area planted to soybeans is small (4,300 ha) but the potential for expansion is very large.

Vietnam produces only about 1% of Asia's soybeans, however the amount is increasing.

The following countries started research programs on soybean breeding and production at an early date: China, Indonesia, Thailand, India, Philippines, Korea, and Sri Lanka; these programs have made great progress during the past few years. China has large and well-run germplasm collections.

Since 1967, the Indian Council of Agricultural Research has had an interdisciplinary team working on soybeans. The project's headquarters are currently at Pantnagar, and a network of 19 centers throughout India tests varieties and production techniques.

In Indonesia, soybean research is coordinated by the Central Research Institute for Food Crops in Bogor, and conducted by five research institutions.

In Thailand, soybean research is coordinated by the Field Crop Research Center at Chiangmai.

In Sri Lanka, in 1973, the government initiated soybean research, with technical assistance from the International Soybean Program (INTSOY), to promote soybean production and utilization in the country.

In 1984 the Asian Soybean Improvement Network (ASIN) was launched in a cooperative effort to extend the resources devoted to research by national programs, IITA, IRRI, AVRDC, INTSOY, the Australian Centre for International Agricultural Research (ACIAR), and the United Nations Economic and Social Council for Asia and the Pacific. The network is coordinated by representatives of AVRDC and IITA.

Figures show: (1) Pie charts–Asia's proportion of world area and production of soybeans. Concerning world production, Asia has about 15.7% of the total, compared with 57.3% for North and Central America, 24.6% for South America, and 2.4% for others. Within Asia, China has 79.1% of Asia's total soybean production, followed by India (5.9%), Indonesia (4.5%), Korea (3.0%), Others (incl. Japan; 7.2%).

(2) Pie charts–Trade in soybeans, soybean meal and oil in Asia and the world. For soybean oil imports, Asia is the leader (37.9% of the world total), followed by Europe (24.5%), Africa (13.9%), South America (12.5%) ad Others (9.2%). For soymeal imports, Europe is the leader (73.0% of the world total), followed by USSR (10.2%), Asia (8.2%), and Others (8.6%). For whole soybean imports, Europe is the leader (58.0% of the world total), followed by Asia (30.6%), North & Central America (6.4%), USSR (5.0%), and Others (0.0%). Within Asia, for soybean oil imports, India is the leader (36.4%), followed by Iran (22.9%), Pakistan (19.3%), Turkey (6.4%), Bangladesh (3.57%), and Others (11.4%). For soymeal imports, Korea is the leader (15.2%), followed by Philippines (14.7%), Iran (12.9%), Japan (12.5%), Thailand (10.0%), Malaysia (8.0%), Others (26.7%). For whole soybean imports, Japan is the leader (61.2%), followed by China (17.5%), Korea (6.6%), Israel (6.6%), Indonesia (2.7%), and Others (3.9%).

(3) Changes in the area planted to soybean over the past 15 years (1965-1983) in selected Asian countries. Graphs of India, Thailand, Indonesia (which have increased, with India's graph increasing dramatically), Asia, China, and Korea (which have decreased somewhat).

(4) Soybean production, consumption, and projected demand in Asia by the year 2000 (Source FAO, 1960-83; IFPRI, 1977). Asia will have to steadily increase its imports of edible oils, since consumption (production + imports) of soybeans is falling behind demand. Address: 1. International Rice Research Inst., Los Baños, Philippines; 2. Central Research Inst. for Agriculture (Lembaga Pusat Penelitian Pertanian), Bogor, Indonesia; 3. Field Crops Research Inst., Dep. of Agriculture, Bangkhen, Bangkok, Thailand. 4. Inst. of Plant Breeding, Univ. of the Philippines, Los Baños, Philippines. 5. Soybean Project, Peradeniya, Sri Lanka. 6. Agricultural Research Council, Islamabad, Pakistan.

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8890. Tsuji, R.F.; Hamano, M.; Koshiyama, I.; Fukushima, D. 1987. Conditioning of meat with raw soy sauce and its proteinases: Their effects on the quality of beef. *J. of Food Science* 52(5):1177-79, 1185. Sept/Oct. [22 ref. Eng]
• ***Summary:*** Raw soy sauce added to beef during tenderization improved its sensory quality. A serine proteinase was most involved in the degradation of both myofibrils and collagen. Address: Food Science Research Lab., Kikkoman Corp., 399 Noda City, Chiba 278, Japan.

8891. Ushijima, Shigeomi; Nakadai, T.; Uchida, K. 1987. Improvement of enzyme productivities through mutation or haploidization of heterozygous diploids obtained by protoplast-fusion of *Aspergillus sojae*. *Agricultural and Biological Chemistry* 51(10):2781-86. Oct. [31 ref. Eng]
• ***Summary:*** A new breeding process for *Aspergillus sojae* involving protoplast fusion was undertaken to obtain desirable koji moulds with better enzyme productivity for soy sauce production. A pair of double marker mutants derived from genealogically unrelated *A. sojae* cultures were fused. Ultraviolet treated and stable heterozygous diploids were obtained. Address: Soy Sauce Research Lab., Kikkoman Corp., Noda 278, Japan.

8892. Thompson, Keith. 1987. Jacob Hartz Seed Co. (Interview). *SoyaScan Notes*. Nov. 4. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Hartz was purchased by Monsanto in April 1983. They have been doing research on soybeans suited for soyfoods for 10 years. The director of research Curtis Williams (formerly at Louisiana State Univ. for 6 years) began in the mid-1970s to develop a very popular natto variety, that was released in 1980. Proprietary varieties for seed were first released in 1984. Univ. of Illinois and Iowa State are also doing food bean research. Soybean production in the South has shrunk 46% in the last 6 years, to 12 million acres from 22 million. A soybean containing no trypsin inhibitor was developed 2-3 years ago but there has not been much interest in it.

There are three lipoxygenase enzymes: L1, L2, and L3. There is a Japanese patented process for removing both L2 and L3, using backcrossing. Hartz has lines that are free of L1 or L2 or L3 or L1 + L3. Lipoxygenase removal seems to offer big promise for improved soymilk and tofu beans. Hartz is the only commercial seed breeder in the U.S. doing work on maturity group IX and X, now that Hinson has closed down his tropical variety development in Florida. Hartz has a global outlook. He is sorry that INTSOY is no longer doing varietal development; they were a great source of information. Daylight insensitive is also called "juvenile characteristic." It takes 1 bushel of seed to plant an acre of soybeans. Address: Food and Export Manager, P.O. Box 946, Stuttgart, Arkansas 72160.

8893. *Toyo Shinpo* (*Soyfoods News*). 1987. Tônyû inryô nado hanbai. Marusan Herusu Saabisu eiyô hojo shokuhin 5 shu o [Selling soymilk etc. Marusan Health Service sells 5 nutritional aids]. Nov. 11. p. 2. [Jap; eng+]
• ***Summary:*** Marusan Herusu Sabisu (health service), the daughter company of the large miso and soymilk producer, Marusan Ai, has started to market 5 nutritional aids collectively called the "Doctor Series". One of these 5 foods is the "Soymilk Doctor Big Beans" (500 ml of soymilk for 200 yen). The other 4 aids are not soyfoods.

8894. *Toyo Shinpo* (*Soyfoods News*). 1987. Shôyu no teien-ka junchô. Kadai wa fûmi no sonshitsu kaizen [The change over to lower salt shoyu is going smoothly. The task is to keep it from losing its flavor]. Nov. 11. p. 13. [Jap; eng+]
• ***Summary:*** In 1984, 1,200,000 kl (kiloliters) of shoyu were produced (0.5% more than in 1983). But in the past 5 years, shoyu production has averaged between 1,180,000 kl and 1,200,000 kl, meaning that production has stabilized. Low salt shoyu (called variously usujio, amajio, or asajio) has 5-8% lower salt content than regular shoyu (about 17%). The production of low salt shoyu in Japan over the last 5 years was as follows: 1980, 4,000 kl; 1981, 11,000 kl; 1982, 14,000 kl; 1983, 15,000 kl; 1984, 17,000 kl. Comparing the 1984 amount per capita with the 1980 one, one finds that shoyu consumption has decreased by 8% (although in 1984, the figure increased 2.4% from 1983). Also, the percentage of the family expenses for seasonings (chomiryo) spent on shoyu decreased from 11.1% in 1980 to 9.5% in 1984.

A comparison study revealed that in 1975 the average salt content of shoyu in Japan was 17.6%. This decreased to 17.1% in 1979 and to 16.6% in 1984. The same study showed that shoyu containing 16% salt held 10% of the market in 1975, increasing its hold to 23% in 1979, and rose to 31% in 1984. Shoyu with 17% salt had 28% of the market in 1975, 35% in 1979, and 34% in 1984. High-salt shoyu (18%) had 41% of the market in 1975 but fell to 26% in 1979, and to 14% in 1984. The reasons for this trend include health concerns and the fact that the Japanese people are eating a lot of instant or prepared foods, meaning that they are eating less home cooked foods and therefore are using less shoyu.

Sales have changed from regular shoyu used in home cooking to the second generation shoyu products like tsuyu & tare. It is a a difficult task to make low-salt shoyu without having the shoyu lose its flavor. If the flavor is lost, people will use shoyu even less than the present rate. The 2 techniques used to remove some salt from the shoyu both have the problem of causing the loss of flavor or balance of flavor.

8895. *Toyo Shinpo* (*Soyfoods News*). 1987. Tônyû aisu o FC tenkai. Nihon Shokuhin Seisan Giken ga chakushu [Nihon Shokuhin Seisan Giken is franchising soymilk ice cream].

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Nov. 11. p. 2. [Jap; eng+]
• ***Summary:*** Nihon Shokuhin Seisan Gijutsu Kenkyusho, which researches and develops various soyfoods, has decided to franchise soymilk ice cream. This company is run by Kiyomatsu Nagasawa of Nagasawa Kikai Seisakujo Kaicho (main office in Kawaguchi-shi). They are going to open one shop in Ikebukuro, Tokyo, and are later planning to franchise 10 a year. They use the Nagasawa system of production so that only 3.3 square meters of space are needed to open a shop.

8896. *Toyo Shinpo* (*Soyfoods News*). 1987. Okara kara jinzô niku tsukuru. Nihon Powder Kankoku de gôben seisan kaishi. Yasukute fûmi batsugun. Gyôkai no chûmoku atsumeru shin shôhin [Making an artificial meat from okara. Nihon Powder starts a joint company in Korea. The meat is inexpensive and tastes great. It is the new food which is getting the attention of the industry]. Nov. 11. p. 2. [Jap; eng+]
• ***Summary:*** Mr. Koichi Yoshida is the president of Nihon Powder, Uchikanda, Chiyoda-ku, Tokyo, Japan. Phone 03-256-7931. Nihon Powder has decided to produce artificial meat made from okara on a large scale in Korea starting in January 1988. They established a joint company with Hoko Shokuhin (a protein food company in Korea). Nihon Powder has ¥36,000,000 invested in the new joint company or 49% of the control. Together they make a product which is better tasting than any artificial meat made from soy. The new product has a better texture and flavor than other such products. They process okara by adding calcium chloride to it and tofu coagulants to make a fresh tofu chunk. The tofu undergoes an ice-cold temperature ripening process, and is then processed using 2 screw-extruders to make a meatlike product. Before this process can be used though, soybean hulls must be removed to produce a good texture soy imitation meat. Fortunately, the manufacturers use an enzyme which breaks down the bean hulls, allowing them to use okara in their processing.

Okara is such a big problem in Japan that the phrase okara pollution (*okara kogai*) was invented. Some of the tofu makers are very concerned about the build-up of this okara waste. The Nihon Powder company has also invested another ¥180,000,000 to make a plant (320 square meters of space) on 16,500 square meters of land which is scheduled for completion in November of 1987.

8897. Cottingham, Mark A. 1987. Soybean group [ASA] works to create foreign markets. *Indiana Agri-News* (*Indianapolis, Indiana*). Nov. 20.
• ***Summary:*** The American Soybean Association supports about 250 projects in 84 countries and operates 11 foreign offices that manage the activities. Japan is expected to import 176 million bu of soybeans this year; 92% will be grown in the USA. In China, ASA's goal is to popularize soybean meal in livestock feeds, first to get China off the export market, and second to create a demand for U.S. soybeans. We lost the Soviet market due to the Afghanistan embargo. Three of the biggest potential markets for U.S. soybeans are the USSR, China, and India. With federal Targeted Export Assistance (TEA) funds totaling up to $17 million ASA has entered a full blown soy oil awareness campaign relying on soy oil identification. It is conducting advertising campaigns in 6 European countries. Resulting from the project, 20 different cooking oil brands in England are now identified as 100% soy oil.

8898. *Toyo Shinpo* (*Soyfoods News*). 1987. Shin gyôkoki ni toiawase tsuzuku. Nigari 100% kinugoshi ni tekiô. Tôyô Plant [Inquiries continue for new coagulating machine which is suited to make silken tofu using 100% nigari]. Nov. 21. p. 7. [Jap; eng+]
• ***Summary:*** Mr. Ikeba is the president of the Toyo Plant (K), Matsue 4-27-6, Edogawa-ku, Tokyo, Japan. Phone 03-655-0111. You can now make 100% nigari silken tofu with the touch of a button! One can also use it to make soft tofu, momen, age-kiji etc. What is it? It is the all-mighty coagulating machine. The company is planning to have demonstration classes because they are getting a lot of enquiries for this machine.

8899. Dunne, Mike. 1987. Japanese delicacies enhanced by warm, intimate atmosphere. *Sacramento Bee* (*California*). Nov. 22. p. EN20.
• ***Summary:*** A review of the Robata Grill & Sushi on Sunrise Boulevard in Sacramento. The idea is inspired by an ancient custom of the Ainu fishermen of Hokkaido, Japan's northernmost island.

"As soon as guests are seated, they are welcomed with hot, wet hand cloths and a small bowl of edamame–steamed, lightly salted fresh soybeans still in the pod, the Japanese equivalent of beer nuts, meant to be eaten casually as guests peruse the menu or sip a cup of sake or glass of beer. Just tear off one end and press or suck out the plump, delicate and wholesome peas [sic, beans]."

The menu also includes Sukiyaki, with tofu. Address: Bee Reviewer.

8900. Granger, Stan; Granger, Lindsey. 1987. Re: Apprenticeship at South River Miso Co. Letter to William Shurtleff at Soyfoods Center, Nov. 29. 3 p. Handwritten, with signature.
• ***Summary:*** Husband and wife, they are students of Michio and Aveline Kushi, and are now studying as apprentices at South River Miso Co. Describes their life and work there. Address: Conway, Massachusetts.

8901. Ajia Protein. 1987. Tokkyo dai 1378742 go ni kansuru: Setsumei shiryô [An explanation of Japanese

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Patent No. 1,378,742 (for making soy flakes)]. Main Office: Miyanomori Palace, Miyanomori 4 jo, 11 chome, Chuo-ku, Sapporo-shi, Japan. 8 p. Unpublished manuscript. [Jap]
• ***Summary:*** A detailed description, in 19 sections, of the patent for making whole (non-defatted) soy flakes, developed by Mr. Chikaarashi. Address: Sapporo, Japan. Phone: (011) 644-1760.

8902. Akiyama, Yoshinobu; Saio, Kyoko; Iwamoto, Matsuo. 1987. Rapid method of analysis of commercial soy milk using near infrared spectroscopy. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 51. p. 76-78. Nov. [3 ref. Eng; jap]
• ***Summary:*** "Near infrared reflectance spectroscopy (NIRS) is a technique which is a technique which is being increasingly used for rapid compositional analysis of foods. The method was developed to replace slow, tedious, conventional methods such as the Kjeldahl method for protein analysis." Address: National Food Research Inst., 2-1-2 Kannondai, Yatabe, Tsukuba, Ibaraki, Japan 305.

8903. **Product Name:** Shoyu Soy Sauce.
Manufacturer's Name: Community Foods Ltd. (Importer). Made in Japan.
Manufacturer's Address: Micross, Brent Terrace, London NW2 1LT, England. Phone: 01-450-9411.
Date of Introduction: 1987 November.
New Product–Documentation: Simon Bailey. 1988. Natural Choice. Aug. 15. "Soya-Based Products." A photo shows the Label.

8904. Eden Foods, Inc. 1987. Product description: Eden Foods quality natural foods. 701 Tecumseh Rd., Clinton, MI 49236. 21 p. Plus 6 pages of inserts. Catalog.
• ***Summary:*** The catalog lists the following soyfoods: Edensoy (Original, Vanilla, Carob; shown on page 1. "Edensoy is the best tasting, best selling, best made natural soymilk on the market"), black soybeans (they "have a hearty yet sweet taste. In Japan, black soybeans are always prepared for the New Year's celebration as they are a symbol of health."), organically grown soybeans (usually Corsoy or Amsoy), Eden tekka ("a hearty, nutritious condiment made from hacho miso, carrots, burdock, ginger root, and unrefined sesame oil; 2.8 oz), dried tofu (actually dried-frozen; 5.8 oz), barley (mugi) miso, brown rice (genmai) miso, buckwheat (soba) miso, light (shiro) miso, rice (kome) miso, hacho (100% soybean) miso, natto miso "Kinzanji," shoyu, organic shoyu, low-sodium shoyu, wheat-free tamari, tamari-roasted nuts and seeds wheat free (pumpkin seeds, sunnies [sunflower seeds], almonds, cashews, mixed nuts), and Lima Tempeh.

Some interesting non-soy foods listed in the catalog include quinoa (16.2% protein), kudzu-kiri, kudzu root starch, adzuki beans, mochi (100% brown rice, with mugwort, or with millet), sea vegetables, organic amazake, barley malt syrup, and Lima seitan.

In the spring of 1986, Eden Foods became General Agent for North America for the Lima Company of Belgium. Lima soyfood products include Lima Tempeh. Note: This catalog was still in use in Jan. 1989. Address: Clinton, Michigan. Phone: 517/456-7424 or 800/248-0301.

8905. Hasegawa, Kiyozo; Mukai, K.; Gotoh, M.; Honjo, S.; Matoba, T. 1987. Determination of the lysinoalanine content in commercial foods by gas chromatography-selected ion monitoring. *Agricultural and Biological Chemistry* 51(11):2889-94. Nov. [21 ref]
• ***Summary:*** Table 1 (p. 2892), titled "Lysinoalanine content in foods," includes values for various soybean products: The lysinoalanine (LAL) content (in mg per 16 gm of nitrogen) was measured by two methods: GC-SIM (gas chromatography–selected ion monitoring) and HPLC (high performance liquid chromatography). The two values for the soy products are: Soy milk A (0/0), soy milk B (6/14), soy milk C (6/18), wet soybean film (fresh / nama yuba) A (0/0), fresh yuba B (13/16), dry yuba (18/11), fried soybean curd (abura-age = tofu pouches) A (8/6), fried soybean curd B (9/trace).

Note: This is the earliest English-language document seen (Oct. 2012) that uses the term "soybean film" or the term "wet soybean film" to refer to yuba.

Of the samples analyzed, the lysinoalanine content was highest in pidan (fermented egg). Wheat flour-based products (Chinese noodles, pretzels and crackers) and milk products (condensed milk and lactic acid beverages) also contained a significant amount of LAL. Cow's milk, soy milk, soy protein isolate and meat products (ham and Hamburg steak) contained a low amount of LAL. Results confirmed that the low-level LAL formation was possible in foods cooked at home without any alkaline treatment.

Note: The three types of soymilk were purchased from retail stores in Nara, Japan. Address: Dep. of Food Science & Nutrition, Nara Women's Univ., Nara 630, Japan.

8906. Iwane, Atsuko; Yasui, Takeshi; Tsutsumi, Chuichi. 1987. [Changes in low molecular weight carbohydrates in yuba (soymilk skin) during yuba-film formation]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 51. p. 115-17. Nov. [6 ref. Jap; eng]
• ***Summary:*** Fourteen yuba films, successively produced by a yuba manufacturer in Kyoto, were purchased and grouped into 8 fractions in order of film formation, from first to last. The carbohydrate composition of each of the 8 fractions was determined by gas-liquid chromatography. Sucrose and stachyose were the major sugars in the skins, followed by raffinose. The sucrose, raffinose, and stachyose contents of the first and last formed films were 1.42% and 8.03% [5.65 times as much], 0.21% and 0.35%, and 1.97% and 7.17%

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on a dry basis, respectively. Because of these high solubility of those sugars, they are increasingly concentrated in the residual soymilk, and their content in the films increased gradually as the film formation process proceeded.

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8907. Johnson, Fred. 1987. Aseptic potentials: A number of products aseptically packaged in other countries could offer sound Canadian opportunities. *Food in Canada* 46(10):24-25. Nov.
• ***Summary:*** Morinaga Nutritional Foods Inc. of Los Angeles, California, reports skyrocketing sales of its tofu products in Tetra Brik cartons. From October 1984 to September 1985 it sold 1.9 million packages. From October 1985 to September 1986, sales almost tripled. Aseptic packaging of soups, sauces, puddings, vegetable oils and dressings, soybean milk, and tofu is detailed. Address: Toronto.

8908. Kiuchi, Kan; Yamamoto, Kazuya; Hunane, Kazumi; Mori, Yutaka. 1987. Nattô-kin no kuen-san riaaze [Citrate-lyase of natto bacteria]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 51. p. 44-47. Nov. [7 ref. Jap; eng]
Address: 1, 3-4. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2. Eishoku Co., Ltd.

8909. Murata, Katsumi; Kusakabe, I.; Kobayashi, H.; Kiuchi, H.; Murakami, K. 1987. Selection of commercial enzymes suitable for making soymilk-curd. *Agricultural and Biological Chemistry* 51(11):2929-33. Nov. [5 ref. Eng]
• ***Summary:*** Soymilk-clotting efficiency was relatively high for proteinases originating from *Bacillus amyloliquefaciens, Bacillus subtilis, Aspergillus oryzae, A. sojae, B. thermoproteolyticus* and bromelain, but low in those of *Endothia parasitica, Rhizopus sp., Mucor miehei,* papain and trypsin. Of the enzymes investigated, proteinases showing high proteolytic activity to soymilk-protein also exhibited high soymilk-clotting efficiency. Such coagulation of soymilk-protein increased with the addition of calcium chloride or magnesium chloride to the soymilk. Address: 1,4-5. Research Development Section, Kibun Food Chemifa Co. Ltd., Takinogawa 7-38-15, Takinogawa 7-chome, Kita-ku, Tokyo 114, Japan; 2-3. Inst. of Applied Biochemistry, Univ. of Tsukuba, Sakura-mura, Niihari-gun, Ibaraki 305, Japan.

8910. Nikkuni, Sayuki; Okada, N.; Itoh, H. 1987. [Studies on soybean protein digestion during miso fermentation. II. Effect of soybean cooking conditions on SDS-PAGE pattern of water-insoluble proteins of miso]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 34(11):731-37. [24 ref. Jap; eng]*
• ***Summary:*** Six miso samples were prepared from soybeans autoclaved under 1 kg/square cm steam pressure for different lengths of time (0, 1, 10, 20 and 60 minutes). There were no significant differences in water-soluble nitrogen contents and in SDS-PAGE (Sodium dodecyl sulphate–Polyacrylamide Gel Electrophoresis) patterns of miso samples prepared from soybeans autoclaved for greater than or equal to 1 minute. However, texture of miso samples prepared from soybeans autoclaved for 1 minute was inferior to that from soybeans autoclaved for greater than or equal to 10 minutes. Address: National Food Research Inst., Ministry of Agriculture, Forestry & Fisheries, Yatabe, Ibaraki 305, Japan.

8911. Ogawa, Ikuo; Saio, Kyoko. 1987. [Processing properties of domestic Japanese soybeans]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 51. p. 15-22. Nov. [6 ref. Jap; eng]
• ***Summary:*** Domestic Japanese soybeans were analyzed for their suitability for making "packed silken tofu," crude protein solubility and yield of acid-precipitated protein from defatted soy flour and reactability with calcium.

The protein content was high in Akishirome and Fukuyutaka varieties. The fat content was high in Tamahomare, Akishirome, and Akiyoshi varieties. And the total sugar content was high in Tsukuizairai, Tamahomare and Akiyoshi varieties.

"For packed silken tofu coagulated with glucono delta lactone, hard gels were obtained with the Fukuyutaka, Okushirome, Akishirome, and Toyosuzu varieties." Crude protein content in soy milk was highly correlated with the hardness of the resulting tofu. Address: 1. Nippon Beans Co., Ltd. Research Lab., 4-18 Shinmachi-1, Hoya-shi, Tokyo 202, Japan; 2. National Food Research Inst.

8912. Omura, Yoshimasu; Akiyama, Yoshinobu; Saio, Kyoko. 1987. [Distribution and varietal differences of lipoxygenase in soybean seeds]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 51. p. 103-08. Nov. [13 ref. Jap; eng]
• ***Summary:*** There are three different types of lipoxygenase: L-1, L-2, L-3. The distribution of lipoxygenase activity in the hypocotyl, cotyledon, seed coat, and whole bean were measure and found to be very uneven. The activities of all 3 types were lowest in the seed coat. Distinct differences in lipoxygenase activity were found in different soybean varieties. The amount of volatile components was greatest in the cotyledon, followed by the hypocotyl, and least in the seed coat. Positive correlations existed between beany flavor and the activities of L-1 and L-2, and also between beany flavor and the amount of *n*-hexanal.

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8913. Saio, Kyoko; Cho, Rae Kwang; Akiyama, Yoshinobu; Iwamoto, Matsuo. 1987. Near-infrared reflectance spectroscopic analysis of protein, oil and moisture in Japanese soybeans. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 51. p. 11-14. Nov. [6 ref. Eng; jap]
• ***Summary:*** A near-infrared reflectance spectroscopic method (NIRS) is evaluated for the determination of protein, oil and moisture contents of Japanese domestic soybeans. NIRS has received much attention because of its rapidity and convenience in determining the chemical composition of seeds. New advances have recently become possible because of major advances in computer technology. Address: 1, 4. National Food Research Inst., 2-1-2 Kannondai, Yatabe, Tsukuba, Ibaraki 305, Japan.

8914. Sumiyoshi, Yasuo. 1987. Miso, shoyu seizô gyôkai no genjô ni tsuite [Present status of the miso and shoyu industries in Japan]. *Daizu Geppo* (*Soybean Monthly News*). Oct/Nov. p. 19-28. [Jap]
• ***Summary:*** For the year 1983, 1,701 miso manufacturers produced 574,000 tonnes of miso, and 2,692 shoyu manufacturers produced 1,194,000 kiloliters of shoyu. Miso production for recent years was: 1980 579,000 tonnes, 1981 576,000 tonnes, 1982 572,000 tonnes, 1983 574,000 tonnes, 1984 581,000 tonnes, 1985 573,000 tonnes, 1986 581,000 tonnes. Most of Japan's miso plants are still small: 1,513 plants (88.5% of all plants) produced 375 tonnes or less a year, but this accounted for only about 12% of all production. Yet eight plants produced 11,251 tonnes or more a year, and this accounted for 26.7% of all production.

Shoyu production for recent years was: 1980 1,189,000 kl, 1981 1,191,000 kl, 1982 1,187,000 kl, 1983, 1,194,000 kl, 1984, 1,200,000 kl, 1985, 1,186,000 kl, and 1986 1,201,000 kl. Address: Shokuryô-chô Kakô Shokuhin-ka, Miso Shôyu Kakari-chô.

8915. Suzuki, Tadanao; Yasui, Akemi; Koizumi, Hideo; Tsutsumi, Chuichi. 1987. [Application of hydrochloric acid extraction procedure to determination of metal elements in soybean, green soybean and roasted soybean flour by atomic absorption spectrophotometry (Hydrochloric acid extraction procedure for determination of inorganic components in food and its related materials part 3)]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 51. p. 140-44. Nov. [7 ref. Jap; eng]
• ***Summary:*** Reprinted from *Nihon Shokuhin Kogyo Gakkai Shi* (*J. of Food Science and Technology*) 34(3):185-89 (1987). Address: National Food Research Inst., MAFF, Kannondai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan.

8916. Taira, Harue; Suzuki, N.; Tsukamoto, C.; Kainuma, Y.; Tanaka, H.; Saito, M. 1987. Kokusan daizu no hinshitsu. XV. Nattô-yô kotsubu daizu no kakô-sei to nattô no hinshitsu [Quality of soybean seeds grown in Japan. XV. Suitability for natto processing of small seeded cultivars and quality of the natto]. *Shokuhin Sogo Kenkyujo Kenkyu Hokoku* (*Report of the National Food Research Institute*) No. 51. p. 48-58. Nov. [23 ref. Jap; eng]
• ***Summary:*** Thirty samples of small seeded soybean varieties "were tested for their chemical composition, suitability for natto processing, and quality of natto produced." Address: 1. National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan; 2-3. Taishi Shokuhin Kogyo Ltd., Towada, Aomori prefecture, Japan.

8917. *Taste* (*Kikkoman, Japan*). 1987. Goyogura: A tale of two families. 1(1):8. Nov.
• ***Summary:*** In these buildings across the scarlet bridge over the moat, Kikkoman makes soy sauce for the imperial family. "Soy sauce for the emperor (which is also available at select stores) is made entirely from wheat and soybeans grown in Japan, and the fermentation process takes place completely naturally, without any temperature control, so that the soy sauce takes almost twice as long to mature. The huge vat room, painted in scarlet from floor to ceiling, contains ten vats, some bubbling softly, others still dormant." Near the entrance is a small museum room filled with artifacts: old sales records, large soy sauce jars shaped like vases, and sepia photographs.

The Goyogura was completed in 1939 to mark the 20th anniversary of the modern company's founding or merging. For it was in 1917 that the soy sauce concerns of the eight branches of two families–Mogi and Takanishi–were united to form Noda Shoyu Company, renamed Kikkoman Corporation in 1980. Noda is 20 miles northeast of Tokyo and the center of Japanese soy sauce production since the mid-seventeenth century.

Photos show: (1) The bridge leading to the Goyo Gura. (2) Moromi fermenting in vats; the orange floor is just below the lip of the vats.

8918. *Whole Foods.* 1987. Tofu used in Everest climb. Nov. p. 24.
• ***Summary:*** A 14-member team, attempting to put the first woman on top of Mt. Everest, is using Mori-Nu Tofu (aseptically packed) as a protein source during the expedition.

8919. *Toyo Shinpo* (*Soyfoods News*). 1987. Seidai ni Pari de kenkô shokuhin ten. Oshu de nobiru tônyû [Successful health food exposition in Paris helps to introduce Europe to soymilk]. Dec. 1. p. 1. [Jap; eng+]
• ***Summary:*** Soymilk, tempeh, and tofu are becoming more popular in Europe thanks to a recent soyfoods exposition in

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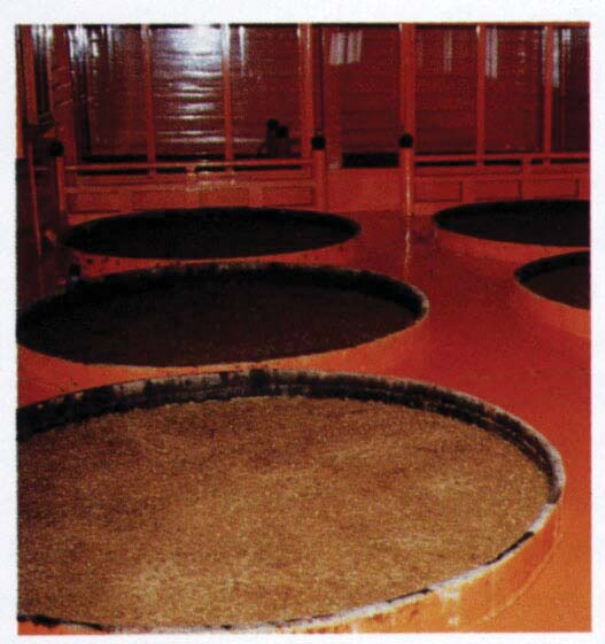
KIKKOMAN CLOSE-UP

Goyogura: A Tale of Two Families



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Paris. There were soymilk desserts, vanilla and chocolate, and Cacoja's soymilk, Soja, received a lot of attention at the event.

8920. *Toyo Shinpo* (*Soyfoods News*). 1987. Ooshû demo tôfu buumu. Pari no kenkô shokuhin ten o mite [After a health foods exposition in Paris, will there be a tofu boom in Europe?]. Dec. 1. p. 5. [Jap; eng+]
• ***Summary:*** The expo was held in Paris from Nov. 7-9. Tofu and second generation tofu products were creating a lot of interest among people who came to the expo. Two French companies producing soymilk are Cacoja and Lima Foods. Their products are labelled Soja and Soya, respectively. Both companies plan to start marketing soymilk ice creams before summer, 1988. Lima Foods is making an effort to produce other soyfoods besides their soymilk such as soy hamburgers, desserts, salads, paté, and terine.

8921. Central Soya Co., Inc. 1987. Central Soya signs feed technology pact (News release). Fort Wayne, Indiana. 2 p. Dec. 4.
• ***Summary:*** Central Soya has signed a five-year technology licensing agreement and technical service agreement with Great Wall Enterprises Co., a leading food and feed manufacturer, in Taiwan. The contract is the third such Central Soya technology agreement reached with an Asian firm in the past 18 months. In early 1986, and agreement was reached with Marubeni Shiryo Company, Ltd., a large Japanese feed manufacturer. And last fall a technology agreement was signed with the Cheil Sugar & Co., Ltd., a large Korean firm engaged in feed manufacturing and oilseed processing. "This is a continuation of our strategy to become a larger part of the Asian market," said Thomas G. Hauenstein, Vice President-International Feed. Address: Fort Wayne, Indiana.

8922. Mio, Art. 1987. Mori-Nu tofu doing well (Interview). *SoyaScan Notes.* Dec. 7. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** More-Nu sales are good. The former package reminded too many people of a bar of soap. The new package is now out and widely advertised. Mori-Nu is now ready to enter the health foods market. The package no longer lists monoglycerides, which are still used but not required since they are a processing aid.

8923. Jacobsen, Ces. 1987. Low in calories [Tofu]. *Lahontan Valley News* (*Fallon, Nevada*). Dec. 9. p. 7. [2 ref]
• ***Summary:*** Suddenly she has been hearing a lot about tofu–serendipity. In *Women of China* she read about a book their staff had compiled titled *200 Recipes for the Tofu Devotee.* She wrote these women and they sent her a copy.

When she returned home from Japan and Korea last July, she read a long article about soybean foods titled "The Prodigious Soybean" in *National Geographic.*

When she returned from Israel, where the Kosher Chinese restaurants use tofu extensively, in her mail was a set of tofu recipes from Azumaya, Inc. She presents one of these–"Tofu with vegetables and sauce."

8924. Tsuchiya, Kanji. 1987. [Re: Lectures on soymilk in China]. Letter to William Shurtleff at Soyfoods Center, Dec. 17. 1 p. [Jap; eng+]
• ***Summary:*** Mr. Tsuchiya went to China at the invitation of the Chinese government for 20 days to give lectures on soymilk production and technology at a convention held by the Chinese Food Industry Assoc. Forty people attended, and they were considered the top people in the field in China, but Mr. Tsuchiya felt that their knowledge of the subject was 20-30 years behind the times. Address: Kamiogi 3-1-1, Suginami-ku, Tokyo 167, Japan. Phone: 03-312-0775.

8925. *Toyo Shinpo* (*Soyfoods News*). 1987. Kenko shokuhin toshite dô kôken suruka. Murata Kiku kyôju o kakonde [How does tempeh contribute as a health food?]. Dec. 21. p. 3. [Jap; eng+]
• ***Summary:*** This article discusses the 5th Japan tempeh conference that was held in Hyogo-ken on December 19, 1987. The following topics were discussed: 1. Tempeh's anti-mutagenic properties (*kohenigen-sei*). Kyoko Ebata gave a lecture on current experiments which focused on tempeh's resistance to the salmonella bacterium; 2. How the Japanese people are accepting tempeh and foods made from it. Lecture given by Goro Kanasugi and Makio Takato; 3. Hyojo High School's experiments on cooking with tempeh, tempeh recipes, and tempeh's acceptance. Lecture by Kojima.

8926. *Toyo Shinpo* (*Soyfoods News*). 1987. Tenpe de "Mura Okoshi" jigyô [Development of a village–using tempeh]. Dec. 21. p. 1. [Jap; eng+]
• ***Summary:*** The 5th tempeh meeting and study group, held in Kasuga-cho, Hyogo-ken on December 19, 1987, drew 40 people, including Dr. Tadao Watanabe and Mr. Goro Kanasugi. The inhabitants of one village are trying to revitalize their village using tempeh. In Kenritsu Hyojo High School (Food Processing Dept.) experiments are being done with various foods made from/with tempeh, including breads, cookies, rice crackers, and jams. This high school was formerly an agricultural high school and they are very interested in making a product that might make their village famous.

8927. *SoyaScan Notes.* 1987. Chronology of soybeans, soyfoods and natural foods in the United States 1987 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan. Westbrae moves the production of Malteds to California from Japan.

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Jan. The Soy Plant, a tofu cooperative in Ann Arbor, Michigan, files for Chapter 7 bankruptcy. It is soon purchased by Bruce Rose of Rosewood Products, Inc.

Feb. *Soya Newsletter,* a 12-page, bimonthly publication costing $96/year, is launched by Soyatech of Bar Harbor, Maine. Publishers are Peter Golbitz and Sharyn Kingma, former owners of Island Tofu Works. The publication quickly proves itself to be the world's best English-language publication on soyfoods. By October, paid circulation tops 900 in 20 countries.

Feb. American Soybean Association petitions the U.S. Food and Drug Administration to require food manufacturers to be more specific in labeling food products that contain highly saturated imported tropical fats (palm, palm kernel, and coconut oils). The petition includes results of a supermarket survey of 1,555 foods containing vegetable oils. 43% of the labels list multiple choice or generic vegetable oil ingredients which hides from the consumer the fact that the products contain highly saturated tropical fats. Imported tropical fats displace the equivalent of oil derived from 171 million bushels of soybeans. Herewith begin the great "Fat Wars" of 1987-88.

Feb. Lite Lite Tofutti introduced by Tofutti Brands, Inc. This non-dairy frozen dessert contains only 90 calories per 4-ounce serving. It soon becomes a big hit.

Feb. Ah Soy in Tetra Brik cartons launched by great Eastern Sun.

Feb. Options trading on futures for soybean oil and meal opened on Chicago Board of Trade.

March 4. The Federal Grain Inspection Service rules that soybean oil may be used to control grain dust in elevators. This voids the Barnham patent and opens up a large potential new market for soy oil, which is in surplus.

March. Great Shake soymilk launched by Noble Soya in India. Sold in Tetra Brik cartons in mango, strawberry, and chocolate favors, it is the country's most heavily promoted soymilk to date, but gets off to a slow start.

March 16-18. First International Congress on Vegetarian Nutrition held in Washington, D.C., sponsored by eight Seventh-day Adventist universities and health care organizations, and three SDA food companies, plus S.E. Rykoff/Sexton.

March. *Vitasoy Vitabrations,* a newsletter, starts being published by Vitasoy USA.

March 31. Hong Kong Soya Bean Products Co. Ltd., makers of Vitasoy, move into a large new plant (370,000 square feet costing $20 million) in the New Territories. Sales of Vitasoy in 1987 is projected to be 126 million packs.

April 1. Tempehworks, Inc., America's first major tempeh producer from Greenfield, Massachusetts, changes its name to Lightlife Foods, Inc. In recent years, Tofu Pups have become the company's bestselling product.

April. Stir Fruity, a non-dairy, nonfermented, soy-based yogurt, is introduced by Azumaya Inc. of San Francisco. Shelf life problems cause the product to be withdrawn, causing Azumaya to set aside plans for an $800,000 radio ad campaign in northern California. The product is soon back on the market, but in limited distribution and with little promotion. Yet during this year, Azumaya probably passed House Foods & Yamauchi to become America's largest tofu producer.

April. *Healthy Times,* a bimonthly newsletter, starts being published by Morinaga Nutritional Foods of Los Angeles, makers of Mori-Nu long-life silken tofu, for members of the Mori-Nu Health for Life Club. By Aug. 1988 circulation is up to 10,000; A subscription costs $3 a year.

May 26. Tofutti Brands Inc. and Coca-Cola launch Cheater's Delite, a major joint promotion featuring a 90-calorie scoop of Lite Lite Tofutti and a 1-calorie glass of Diet Coke, special labeling and couponing on 3 million bottles of Diet Coke, 5 weeks of heavy advertising in New York, New Jersey and Connecticut, and a Caribbean cruise sweepstakes.

June. Dr. Jane Gleason of the University of Illinois goes to Sri Lanka to spend a year studying its soybean and soyfoods industries.

July 1. Ralston Purina Co. of St. Louis, Missouri, establishes Protein Technologies International as a wholly-owned subsidiary to focus on sales of soy protein for food uses. The company's sales of soy protein products were $139.8 million in 1986.

July. Victor Food Products in Toronto, Canada's largest tofu manufacturer, declares bankruptcy. The main cause: Overexpansion, trying to grow too fast.

Aug. The Barat Bar, an upscale chocolate bar containing spray-dried tofu instead of dairy products, is launched by Legume Inc. and extensively promoted. It soon becomes a big hit.

Aug. Brightsong Foods of Petaluma, California, ceases operations. Richard and Sharon Rose resign to found a new company, Rose International, which will be a tofu development, marketing, and consulting company, rather than a manufacturer.

Sept. 24. San-J International of Richmond, Virginia, dedicates the first tamari brewery ever built outside of Japan. The 40,000 square foot facility with a capacity of 1 million gallons a year is located in Varina, Virginia. San-J tamari was first imported to America in 1979.

Sept. 28. Plenty Soya Centre, run by Plenty Canada, opens in Kandy, Sri Lanka. They will sell as many soyfood products as possible at a reasonable cost.

Oct. 6. Anti-cholesterol campaign starts. The U.S. Federal Government and more than 20 health organizations issue the nation's first detailed guidelines for identifying and treating people whose blood cholesterol levels are more than 200 mg per deciliter. The guidelines signal the beginning of a nationwide health promotion campaign designed to reduce blood cholesterol to safer levels. This signals exciting

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new opportunities to market cholesterol-free soy-based alternatives to meat.

Nov. *Kikkoman Taste,* a stylish full-color "quarterly intercultural forum for the exchange of ideas on food," published by Kikkoman Corp. in Tokyo. Its focus is on shoyu in international cuisine.

* During this year of the great vegetable oil wars, the ASA launched an all-out no-holds-barred campaign to educate Americans of the health dangers of tropical fats (palm and coconut oil; which succeeded) and to require such products to be clearly labeled (which failed).

* This year the world's population passed 5 billion. It is increasing by a record 80 million people a year, so that every 3 years the equivalent of one United States' full of people is added to the population of planet Earth. Continued.

8928. *SoyaScan Notes.* 1987. Chronology of soybeans, soyfoods and natural foods in the United States 1987 (Continued) (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued. 1987 New Trends:

Rapid Rise in the Number of New Products in America. During 1987 more than 735 new soyfood products were launched worldwide, including at least 380 in the USA. Many of the most successful products are all-American and fun to eat: Ice creams, burgers, hot dogs, salad dressings, chocolate bars. This is part of the larger trend of the Americanization of soyfoods. Most of the growth has been in the traditional low-tech sector, including tofu, tempeh, soymilk, miso, soy sauce, soynuts, plus modern dairylike products such as soy ice creams, soy yogurts, and soy cheeses, all developed by the soyfoods movement. A growing percentage of these products are second generation products, which could also be called convenience prepared or value added products.

Growth of Consumer Awareness of Soyfoods in America. Ten years ago, perhaps 1% of Americans had heard of tofu, soymilk, tempeh, or miso. Today, probably 50% of Americans are aware of these foods. In 1987, for example, the Soyfoods Assoc. clipping service received a total of 1,587 clips on soyfoods. That is 132 articles a month, way up from 5 years ago.

Increasingly Positive Image of Soyfoods in the Western World. Generally speaking, from about 1945 through the 1960s, soy had a negative image in foods. The became neutral during the early 1970s. During the late 1970s and early 1980s, with the rise of the soyfoods movement and the growing sophistication of modern soy protein products (isolates, concentrates) soyfoods gradually developed a positive image. The Gallup Poll of 1977 was an early indicator of this. By the mid-1980s tofu had become a "hot ingredient." Companies deliberately added it to a product (or at least to the label) to help sell the product. Yet the Roper poll of late 1986, which found tofu to be America's most hated food, may indicate a tarnishing of this image.

Growing Interest of Larger Food Companies in Soyfoods. One indication of this trend is that *Soya Newsletter,* targeted at these companies and selling for $96/year, has over 900 paid subscribers.

Continued Decline of Red Meat. This year consumption of poultry in America passed that of beef for the first time in history. Beef had been king for 3 decades. Before that, pork was king. A pound of chicken has one-fourth as much saturated fat as beef and takes much less grain, water, and energy to produce.

INTSOY Becomes a Major Force Worldwide Developing and Promoting Soyfoods. Working with other international (IITA, AVRDC) and national soybean programs, and doing pioneering research on fresh green soybeans, extrusion cooking, and use of expellers for small-scale oil expression etc., INTSOY has become as effective in its new role (since 1985) of focusing on soybean utilization as it was before that when its major emphasis was on variety development and production.

The Competitive Position of the U.S. Soybean Industry is Slipping. Farmers in Brazil and Argentina can now produce soybeans at much lower cost than their American counterparts. This plus extensive subsidies have led to a dramatic drop in U.S. exports of soybeans and products since their peak in 1981. A major part of the problem is linked to the Latin American debt crisis, which surfaced in the early 1980s and forced debtor nations to export at all costs. This debt crisis (especially by Brazil, Argentina, Mexico, and Venezuela) is now being called the most serious problem facing U.S. agriculture.

Soybean Research Increasingly Shifts from Production to Utilization. Traditionally research focused on increasing production and yields. New efforts are designed to develop new markets instead of larger surpluses.

Big Increase in Breeding Soybeans for Food Uses. This is part of a larger trend toward value added products and toward finding new market niches for American soybeans, especially for foods in Japan.

Revival of Interest in Industrial Uses of Soybeans. The main interest is in new ways to use soy oil, of which there is a large surplus that depresses soybean prices. Promising applications include soy oil for printing inks, dust suppressants, and diesel fuels. The largest interest in industrial uses occurred during 1932-42, when the Chemurgic movement and Henry Ford sought to find industrial uses for all farm crops. Hence, there is a rebirth of interest in Henry Ford's work with soy.

Major Growth of Interest in Soybeans and Soyfoods in Africa. Excellent work by IITA in Nigeria and various national soybean programs (as in Egypt, Zimbabwe, and Zambia) have allowed this relatively new crop to reach the takeoff stage. Decreasing per capita food supplies and growing understanding of the nutritional benefits of soyfoods

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are sparking new interest.

Continued Rise of Soybean Production in Europe. The largest producer, Italy, which produced almost no soybeans as recently as 1983, harvested a record 1.3 million tons in 1987. France is second largest. All production is heavily subsidized.

Omega-3 Fatty Acids Hit the Headlines. Soy oil is a rich vegetable source of these fatty acids which are thought to have a beneficial effect on the cardiovascular system.

Nutritional Spotlight Increasingly Shifted onto Fats, Away from Proteins. During the past few years fats (and especially cholesterol and saturated fats) have come to be seen as the leading problem nutrient, the bad guy, in the American diet. There is a new respect for complex carbohydrates (especially whole grains), which used to be called "starches" and were considered fattening.

New, More Complex View of Oils and Fats Becomes Popular. High cholesterol levels are considered more dangerous than ever, but equally important are the various cholesterol-carrying proteins in the blood. Two kinds (low and very low density lipoproteins) promote cholesterol deposits in the blood, while high density lipoproteins (HDLs) cleanse the blood vessels of fatty deposits. Moreover, saturated fats are considered at least as much of a problem as cholesterol.

So-Called Antinutritional Factors in Soybeans are Increasingly Seen as Having Benefits as Well. Trypsin has been shown to help prevent cancer. Saponins help reduce serum cholesterol. Isoflavones have antioxidant activity that may suppress breast cancer. This indicates that we may need a new term to categorize these substances that offer both benefits and disadvantages.

The Link Between Diet and Health Continues to Grow Stronger, among both scientists and the general public.

Interest in Exercise and Health Still Strong. Several years ago some experts saw this trend waning, but it now seems to be rebounding. For example, there were 21,244 finishers in the New York Marathon (including 3,689 women). Compare this with 12,512 finishers (1,621 women) in 1980 and 55 finishers (no women) in 1970.

Books on Tofu. Since 1974, at least 60 books on tofu (having the term "tofu" in the title) have been published in North America and Europe. Peak publication years were 1981 and 1982. By language, 46 of the books were in English, 7 in French, 4 in German, and 1 each in Italian, Portuguese, and Swedish.

Inactivity of the Soyfoods Association of America now becoming a major constraint on growth of soyfoods in the USA, at a time when interest is at an all-time high. Leadership is needed.

Rise of Canola (Rapeseed) Oil. It looks as if soy oil may have another serious competitor (in addition to palm oil) in future years. Canola contains less saturated fat than any other popular vegetable oil. Only 6%, versus 9% for safflower oil and 15% for soy oil. Lard has 41%, palm oil 51%, and butterfat 66%.

8929. American Miso Co. 1987. A miso primer: The American Miso story (Ad). *Vegetarian Times.* Dec. p. 18.
• ***Summary:*** This one-third page vertical black-and-white ad explains: "Generally, there are three types of miso: Sweet, Mellow, and the darker, Traditional misos. They differ in color, salt content, fermentation time, and the soybean/grain (koji) ratio." The company describes each of the misos it makes as one of these three types. Near the bottom of the ad is the Miso Master logo, an illustration showing the head and shoulders of a Japanese miso master, with a knotted headband, in front of a large wooden vat of miso. Below "Miso Master is produced by the American Miso Co. for Great Eastern Sun."

This ad also appeared in the April 1989 issue (p. 6) of this magazine. Address: Rutherfordton, North Carolina.

8930. Arai, Soichi; Kimura, Hiroko. 1987. Comparative nutritional value for amino acids, oligopeptides and soybean protein. *J. of the American Oil Chemists' Society* 64(12):1692-96. Dec. [25 ref]
• ***Summary:*** "In recent years our view on the absorption of protein digestion products has undergone a radical change. We now believe that intralumen hydrolysis of intake proteins to free amino acids is only partial. It has thus been hypothesized that partial protein hydrolysates or oligopeptide mixtures are nutritionally superior to corresponding amino acid mixtures.

It is now believed that dipeptides and tripeptides formed by intralumen hydrolysis of intake proteins are mostly absorbed prior to further hydrolysis to free amino acids (Adibi 1971, 1973; Matthews 1976, 1977). Presumably, therefore, supplementation of low-quality proteins is more effective when essential amino acids are used as peptides rather than as free amino acids.

These experiments show that the recovery of protein-malnourished rats was significantly more effective when they consumed enzymatically modified proteins containing a peptide-bound methionine at the 3% level. Address: 1. Dep. of Agricultural Chemistry, Univ. of Tokyo, Bunkyo-ku, Tokyo 113, Japan; 2. Kagawa Nutrition College, Toshima-ku, Tokyo 171, Japan.

8931. *ASA Member Letter.* 1987. Soybean buyers confer on quality. Nov/Dec.
• ***Summary:*** Soybean buyers in Japan and Korea are learning about U.S. soybean quality from Jim Guinn, American Soybean Association soybean quality director, at soybean quality outlook conferences in Tokyo and Seoul this week. Last year Japan imported 151 million bu of U.S. soybeans; Korea imported almost 38 million bu.

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8932. Carter, Thomas E., Jr. 1987. Genetic alteration of seed size: Breeding strategies and market potential. In: Dolores Wilkinson, ed. 1987. Proceedings of the 17th Soybean Seed Research Conference 1987. Washington, DC: American Seed Trade Association. vii + 114 p. See p. 33-45. Held 9-10 Dec. 1987 in Chicago, Illinois. [21 ref]
• ***Summary:*** Contents: Introduction. Soyfood market size. Soyfood market trends–short and long range. Premiums and acreage, the breeder's perspective. Breeding special varieties. Future breeding goals. Conclusions.

"The expanding soyfood markets in Japan and the U.S. have generated considerable interest among American soybean producers in recent years. More than 60% of the soybeans used in these markets are grown in the U.S."

Table 1 (p. 34) shows "Soybean consumption as soyfoods in Japan and the U.S." In Japan about 851,000 metric tons of soybeans are used to make soyfoods such as tofu (532,000), miso (180,000), natto (99,000), soymilk (12,000), and soy sauce (5,000 [plus large amounts of defatted soybean meal]). Large-seeded soybeans grow in the U.S. have found acceptance in making tofu and soymilk, capturing 81 and 100% of the raw soybean sales respectively for these products.

"In survey results, 39 of 43 public breeders and 44 or 67 private breeders responded to questions regarding the breeding of specialty varieties. Twenty-four breeders reported that they are maintaining 36 separate projects for large- and small-seeded varieties (Table 3). Public and private breeders are represented equally in this effort with the majority of these projects underway in the Midwest. Eight public and eight private programs are developing varieties specifically for tofu while 13 public and 7 private programs are developing varieties for natto. One public breeder was interested in soy milk varieties but considered varieties for tofu and soymilk as the same. One private and two public breeders are interested in large-seeded garden types for the fresh market in urban areas with large oriental populations. One public and one private breeder expressed interest in small-seeded varieties for sprouts. Soybean sprouts are primarily a Korean soyfood; and, Koreans buy U.S. soybeans for making sprouts in some years." Address: Research Geneticist, USDA-ARS, North Carolina State Univ., Raleigh, NC. Phone: 919-737-2734.

8933. *Dairy Foods.* 1987. Something new from the soybean: Tofu maker [Azumaya] hopes Stir Fruity will be the 'yogurt of the future.' 88(13):27. Dec.
• ***Summary:*** Stir Fruity, a "tofu-based yogurt-like product," is made from a soymilk base in a proprietary process that Azumaya spent 4 years and $500,000 perfecting, explained marketing director Jill Mizono. Azumaya introduced Stir Fruity in February 1987 and quickly gained distribution in Safeway and Lucky supermarkets in northern California. Soon after introduction, however, shelflife problems forced Azumaya to pull the product from both chains. The problem was traced to Azumaya's recently installed clean room, and fixed. The product now is back to a 40-day shelflife. Production was never completely discontinued.

Azumaya is now selling Stir Fruity to foodservice operators in and outside of California and test marketing it at grocery stores throughout the USA. Customers give Stir Fruity high marks for its custard-like texture and non-beany taste; 75% of San Francisco area consumers who sampled Stir Fruity said they would buy it. Most soy-based yogurts, except Stir Fruity and Jofu, are targeted to the health-food market. Photos show Stir Fruity in packages (cups) and a parfait glass, surrounded by fruits. Address: Chicago, Illinois.

8934. Hiyoshi, Hideaki. 1987. Nattô borantia hôkoku. Naijeria de nattô suupu ga kohyô datta [Report of a natto volunteer. In Nigeria, natto soup was popular]. *Daizu Geppo* (*Soybean Monthly News*). Dec. p. 26-29. [4 ref. Jap]
• ***Summary:*** This sophomore man at Rikkyo University went to Nigeria and taught the people about natto. Address: Rikkyo Daigaku, Ninen-sei.

8935. Ikegami, Shoei. 1987. Chugoku ni okeru daizu no seisan dôkô [Trends in Chinese soybean production]. *Daizu Geppo* (*Soybean Monthly News*). Dec. p. 4-10. [4 ref. Jap]
• ***Summary:*** Production (in million tonnes) and yields (in tonnes/ha) by year are: 1978 (7.57/1.06), 1979 (7.46/1.03), 1980 (7.94/1.10), 1981 (9.33/1.16), 1982 (9.03/1.07), 1983 (9.76/1.29), 1984 (9.70/1.33), 1985 (10.50/1.36), 1986 (11.71/1.41). Thus in 1986 China produced 11.71 million tonnes of soybeans; the yield was 1.41 tonnes/ha.

The top ten soybean producing provinces in China in 1986 were: 1. Heilongjiang (3,880,000 tonnes, 33% of total). 2. Shandong (947,000 tonnes). 3. Jilin (837,000). 4. Anhui (819,000). 5. Henan (749,000). 6. Jiangsu (719,000). 7. Liaoning (635,000). 8. Heibei (412,000). 9. Nei Mongol (Inner Mongolia) (410,000). 10. Sichuan (346,000). Production for all other provinces in 1986 and 1985 is also given. Address: Norin Suisan-sho, Nogyo Sogo Kenkyusho.

8936. Kimura, Eiichi. 1987. Gendai gokoku kô. Sankoku, Gokoku, Kyukoku [Thoughts on China's "Five Grains" today. II. The Three Grains, Five Grains, and Nine Grains]. *Daizu Geppo* (*Soybean Monthly News*). Dec. p. 34-35. [1 ref. Jap]
• ***Summary:*** Discusses present production and imports in Japan. Address: Daizu Kyokyu Antei Kyokai.

8937. Morinaga Nutritional Foods, Inc. 1987. Mori-Nu Tofu recipe cards. 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040.
• ***Summary:*** Morinaga has four cards, each 3 by 5 inches, each with one recipe on the front and another on the back.

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They are printed in a color ink on a pastel background, and were found displayed in a small plastic rack near the Yves meat alternatives at Safeway supermarket in Lafayette, California.

The recipes are: BBQ burger kebabs. Mushroom caps. Mexican burritos. Shepherd's pie. Veggie lasagna. Veggie sloppy joes. Address: Los Angeles, California.

8938. Nihei, Takao. 1987. [Barbeque shoyu, a Hawaii creation (Food series, part VI)]. *Kokiku* (*Honolulu, Hawaii*). Dec. p. 29. [Jap; Eng]
• ***Summary:*** Hawaii's barbeque shoyu consists of shoyu, sugar, garlic, ginger, and round onions in which the meat is marinated and broiled over charcoal. The term barbeque shoyu was already known and being sold commercially before World War II. Barbeque shoyu has changed to teriyaki sauce. Teriyaki is now an international term and enjoyed the world over, a sauce which is Hawaii's own creation.

8939. *SoyaScan Notes.* 1987. New Trend: Rebirth of interest in research on industrial utilization of soybeans–based on the early concept of chemurgy (Overview). Dec. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** As early as 980 A.D. the Chinese were using soy oil, mixed with tung oil, for caulking boats. It was widely used as an illuminant in homes and temples lit with wicked oil lamps, until the 1920s, when it was replaced by kerosene. By the 1920s it was widely used in China to make soft soaps (that were known for their ability to give a good lather in hard water), lacquers, paints, printing inks, and waterproof cloths and umbrellas.

By the 1500s, soybean cake began to be widely used in China as a fertilizer, primarily as a source of nitrogen and organic matter, but also for its content of phosphorus and potassium.

The earliest document seen that mentions industrial uses of soybeans in the West appeared in 1880, when L.C. Bryan, an American, noted that soy oil could be used as a substitute for linseed oil in paints, or be burned in lamps. In 1909 soybeans were first imported in significant quantities to Europe; they were purchased solely for their oil, most of which was made into soap. The world's first use of soy oil to make soap was in 1909 in England or Sweden. Manchuria was also soon using large amounts of soy oil in soaps. In 1909 Goessel, a German, developed and patented the first rubber substitute from soy oil. That same year, Henry A. Gardner of the Paint Manufacturers Assoc. of the U.S. began extensive research on the use of soy oil to partially replace linseed oil in paints and varnishes. In 1912 Beltzer, a Frenchman, developed a soy protein plastic, Sojalithe, which he soon produced commercially on a large scale. By 1916 the main use of soy oil in America was in soaps, where it replaced cottonseed oil. In 1917 Satow, a Japanese, published the first of many articles from that country on the use of soybean proteins to make plastics.

The heyday of interest in industrial utilization of soybeans took place in America during the 1930s and Great Depression, spurred largely by the work of Henry Ford (who began focusing on soybean research in Dec. 1931), the Farm Chemurgic Council (founded in 1935), the Chemurgic movement, and the U.S. Regional Soybean Industrial Products Laboratory (founded 1936 at the University of Illinois). The goal was to make industrial products from farm crops to help depressed farmers. The soybean was one of the great success stories of the Chemurgic movement. In 1933, the peak year percentage-wise, a remarkable 70% of all soy oil in the USA went into industrial, non-food uses–primarily paints and varnishes, followed by soaps, linoleum, and oilcloth. Large amounts of soy flour were made into plywood glue, especially by the I.F. Laucks Co. In 1936, the peak year for publications, some 59 publications on industrial uses appeared. In 1935 the Glidden Co. in Chicago built the first small plant for production of industrial grade soy protein isolate, which they called "Alpha" protein.

Active work in this field accelerated during World War II, when soybeans were used to make products that were in short supply. In 1941, after imports of tropical oils from Southeast Asia had been suddenly cut off by the Japanese military, use of soy oil in industrial products skyrocketed to its historical peak in absolute terms; 74.25 million lb were used that year. Of this, 56% was used in paint and varnish, and 33% in soap. But by 1944 industrial uses of soy oil had fallen to only 17 million lb. During the 1950s, a period of huge surpluses for most U.S. farm crops (and of predicted soybean surpluses... which never materialized), research focused on industrial products that could alleviate the surpluses. During the 1960s, as surpluses disappeared, the concern for world hunger and protein shortages grew, and petroleum came to dominate industrial utilization, research switched from utilization to production.

This focus continued until the mid-1980s, when foreign soybean competition, largely from Latin America, and huge surpluses of soy oil led to a rebirth of interest in research on soybean utilization, especially industrial utilization, that could lead to new value-added products for new markets. Promising applications included soy oil for printing inks, dust suppressants, diesel fuels, and the like.

There was little interest, however, in food utilization research (other than soy oil) in the U.S. since the total amount of soybeans used in foods was still quite small, and soybean farmers feared that the resulting products would compete with meat and dairy products, which require the use of more soybeans.

8940. Takahashi, Akira. ed. 1987. Shun no tôfu zukushi [Tofu cookery throughout the four seasons: Encyclopedia of tofu]. Tokyo: CBS Sony. 144 p. Illust. Index. 26 cm. [Jap]*
• ***Summary:*** The author is the president of the Misuzu

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restaurant in Kawasaki City, Japan. Toyo Shinpo (1 May 1988, p. 4) described this as one of the most artistically done cookbooks ever seen. There are many Japanese tofu recipes and some western style. A true work of art in full color!

In part I, 4-5 recipes are given for each of the four seasons. Address: Ogawa-cho 3-3, Kawasaki-ku, Kawasaki-shi, Kanagawa-ken, Japan. Phone: 044-244-6845.

8941. *Tetra Pak Age.* 1987. Mori-Nu gives tofu a new look. Thanks to Morinaga Nutritional Foods Inc., American consumers are taking a second look at tofu. 5(3):6. Fall/Winter.
• ***Summary:*** In October 1985 Mori-Nu tofu was introduced in the Tetra Brik Aseptic carton; it is easy to include in the convenience oriented American diet. A large color photo shows Mori-Nu silken firm and silken soft tofu on a wood table in front of fruits and vegetables. Address: Tetra Pak Inc., 889 Bridgeport Ave., Shelton, Connecticut 06484. Phone: 203-929-3200.

8942. Tsuchiya, Kunio. 1987. Daizu shôhin-ka no genryû o saguru. Manshû daizu hatten shôshi. I. [Searching for the roots of soybean commercialization. A short history of soybean development in Manchuria. I.]. *Daizu Geppo* (*Soybean Monthly News*). Dec. p. 11-25. [4 ref. Jap]
• ***Summary:*** Contains numerous interesting graphs, maps, and tables, plus a 1-page chronology of major political and soybean-related events from 1931 to 1945.

1931 Sept. 18–The Manchurian Incident (*Manshujihen*) started the war between Japan and Manchuria.

1932 March 1–Announcement of the founding of a Japanese state, Manchuoko, in Manchuria.

1933 July–Manchurian immigration plan announced.

1935 July–Manchurian Special Products Central Committee (*Manshu Tokusan Chuokai*) founded.

1936 April–Trade agreements between Manchuria and Germany were inaugurated. Manchuria guaranteed to export soybeans to Germany worth 100 million yen a year.

1937 July–The war between Japan and China started when Japan invaded China.

1941 Aug.–Dissolution of the Manchurian Special Products Central Committee. Establishment of the Manchurian Agricultural Public Product Corporation (*Manshu Nosan Kosha*).

1945 Aug. 15–The emperor of Japan announces Japan's surrender, ending World War II. Address: Daizu Kyokyu Antei Kyokai.

8943. **Product Name:** [Soymilk with Okara Mixed In, Tofu with Okara Mixed In].
Foreign Name: Okara o mazete tônyû, Maiyuki.
Manufacturer's Name: World Foods. Affiliate of Chujitsu-ya.
Manufacturer's Address: Kabuki-cho 2-1-11, Shinjuku-ku, Tokyo, Japan. Phone: 03-209-2121.
Date of Introduction: 1987 December.
New Product–Documentation: Toyo Shinpo (Soyfoods News). Nov. 1. p. 1. Okara o mazeta tonyu [Soymilk with okara mixed in. World Foods, the affiliate company of Chujitsuya, received a patent for their production method in making health foods from raw materials]. Mr. Kichitomo Tagaki is president of Chujitsuya, and Mr. Hatsuo Suki is president of World Foods, Hamura-cho, Tokyo, Japan. The patent is called "Shokubutsu seni shoka tonyu no seizo-ho" (Vegetable fiber enriched soymilk production method). The process works by creating high pressure (400-1000 kg per square cm) to break the soybeans into 50 micron diameter granules. They boil the soybean granules (karyu) to make soymilk. Then 100,000 volts of electricity is used force the protein in the soybeans to coagulate and to whiten the soymilk. Using this process, the manufacturer can get a milder tasting and more stable soymilk. This company already has a product, Maiyuki, which has okara in the tofu.

8944. Chang, Norma. 1987. My students' favorite Chinese recipes: A collection of classroom-tested popular recipes. Wappingers Falls, New York: The Travelling Gourmet. 191 p. Updated edition in 2001. *
• ***Summary:*** The section titled "About tofu" (p. 72) describes how to freeze tofu at home: "Fresh tofu, in any form. can be frozen. Once frozen, fresh tofu changes from white to pale yellow. Thawed, it has a sponge-like texture.

"To freeze tofu: Drain, place in a freezer bag. Label, date and freeze. Allow to freeze at least 24 hours before using. Frozen tofu will keep up to 6 months.

"To thaw frozen tofu: Thaw in the refrigerator or place frozen tofu in a heat-proof container, cover with boiling water. Let stand until thawed, 15 or more minutes depending on the thickness of the frozen tofu. Gently press out the excess water. Use as directed in recipes."

Asian markets sell deep fried tofu, also known as tofu puffs, abura-age or atsu-age. Golden brown in color, they come in various shapes and weights, but are generally very light in weight.

Deep fried tofu is fresh tofu that has been deep fried. During deep-frying, most of the water in the fresh tofu evaporates and the interior become somewhat hollow and porous. Describes how to make deep fried tofu at home.

8945. Ebine, H. 1987. [Enforcement of regulations concerning and problems with the nutritional labeling of miso]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) 35(7):237-49. [Jap]*
Address: National Miso Research Inst., Tokyo, Japan.

8946. **Product Name:** [Takaramame Soy Flour, Fujinik Ace, Fujipur SP, Apex {Simulated Meat Products}, Ganmo {Wild Goose Meat Analog}, and New Soyees {3 Textured

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Soy Flours}].
Manufacturer's Name: Fuji Oil Co. Ltd.
Manufacturer's Address: Nissei Midosuji Hachimancho Building, 6-1 Hachimancho, Minami-ku, Osaka 542, Japan.
Date of Introduction: 1987.
New Product–Documentation: Soya Bluebook. 1987. p. 74, 78.

8947. **Product Name:** [Usuage (Fried, Frozen & Sliced Tofu)].
Manufacturer's Name: Fuji Oil Co. Ltd.
Manufacturer's Address: Nihonseimei Midosuji Hachiman-cho Building, 6-1 Hachiman-cho, Minami-ku, Osaka 542, Japan.
Date of Introduction: 1987.
New Product–Documentation: Soya Bluebook. 1987. p. 96.

8948. Fujii, H.; Shiraishi, A. 1987. [Developments in natto microbiology]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 82:266-72. [Jap]*

8949. Fujii, H. 1987. [Progress in natto microbiology]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 82(4):266-72. [Jap]*

8950. Iijima, M.; Okubo, K.; Yamauchi, F.; Hirono, H.; Yoshikoshi, M. 1987. Effect of glycosides like saponin on vegetable food processing. II. Undesirable taste of glycosides like saponin. In: International Symposium on New Technology of Vegetable Protein, Oils and Starch Processing. Vol. 1. See p. 109-23. Held 16-20 Nov. 1987 at Beijing, China. *
Address: Japan.

8951. Inagawa, Junichi; Kiyosawa, I.; Nagasawa, T. 1987. [Effects of phytic acid on the digestion of casein and soybean protein with trypsin, pancreatin, or pepsin]. *Nippon Eiyo Shokuryo Gakkaishi* (*J. of the Japanese Society of Nutrition and Food Science*) 40(5):367-73. [Jap]*
Address: Faculty Agriculture, Tamagawa Univ., Machinda, Japan 194.

8952. Inoue, F.; Awao, T. 1987. [Control of microorganisms in food (miso and soy sauce) factories]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) 35(11):370-86. [14 ref. Jap]*

8953. Ito, H.; Sakai, H.; Matsumoto, S.; Ebine, H. 1987. [Chemical composition of the water-insoluble residue of miso]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) 35(3):122-27. [23 ref. Jap]*
• ***Summary:*** The composition of lipids and fatty acids was measured. Address: Japan.

8954. **Product Name:** [Emul {Soymilk Ice Cream} (Vanilla, Black currant [Cassis], Pineapple, Orange, Coffee, Chocolate, Kiwi Fruit, Green Tea {Matcha}, Apple, Rum Raisin, Passion Fruit, Coconut)].
Foreign Name: Emuuru.
Manufacturer's Name: K. Biological Science Laboratory Co., Ltd. (KBL).
Manufacturer's Address: 14 Sanno-cho, Shogo-in, Sakyo-ku, Kyoto, Japan. Phone: 075-751-0138.
Date of Introduction: 1987.
Ingredients: Incl. soymilk, safflower oil.
How Stored: Frozen.
Nutrition: Moisture 66.7%, non-fibrous carbohydrate 23.0%, fat 7.0%, protein 3.0%, Ash 0.3%. 160 calories per 100 gm.
New Product–Documentation: See next page. Brochure. 1987. "EMUL rises from the Land of the Rising Sun." 4 p. Full color. "Not an Ice cream, Not a Sherbet. From Kyoto, the Ancient Capital of Japan, The Land of the Rising Sun, EMUL, A healthy dessert made from soya, attracts worldwide attention." The product is made using Takai soymilk equipment. This company also made Daizuetto soy ice cream announced in July 1985.

Soyfoods (ESFA). 1987. April. p. 28. The company was founded by Kyoto restaurateur, Kichizo Kaneda, who has applied for patents in Japan, the USA, and 5 other countries.

8955. Kagawa, Hiroyuki; Yamauchi, F.; Hirano, H. 1987. Soybean basic 7S globulin represents a protein widely distributed in legume species. *FEBS Letters* 226(1):145-49. *
Address: National Inst. Agrobiol. Resour., Yatabe, Japan.

8956. Kayahara, H.; Yasuhira, H. 1987. [Characteristics of the halophile *Pediococcus halophilus* isolated from miso and shoyu-moromi]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) 35(3):117-21. [28 ref. Jap]*
• ***Summary:*** These bacteria are members of the Lactobacillaceae. Address: Japan.

8957. **Product Name:** [Kibun Soy Milk].
Foreign Name: Kibun Tônyû.
Manufacturer's Name: Kibun Food Chemifa Co., Ltd.
Manufacturer's Address: 3-2-5 Shinbashi, Minato-ku, Tokyo 105, Japan.
Date of Introduction: 1987.
New Product–Documentation: Soya Bluebook. 1987. p. 90.

8958. Kiuchi, Kan. 1987. Nattô [Natto]. In: Encyclopedia of Food Materials and Dishes. Tokyo: Gakushu Kenkyusha. See p. 259-62. [Jap]*

8959. **Product Name:** [Nembe (Whole Soybean Snacks;

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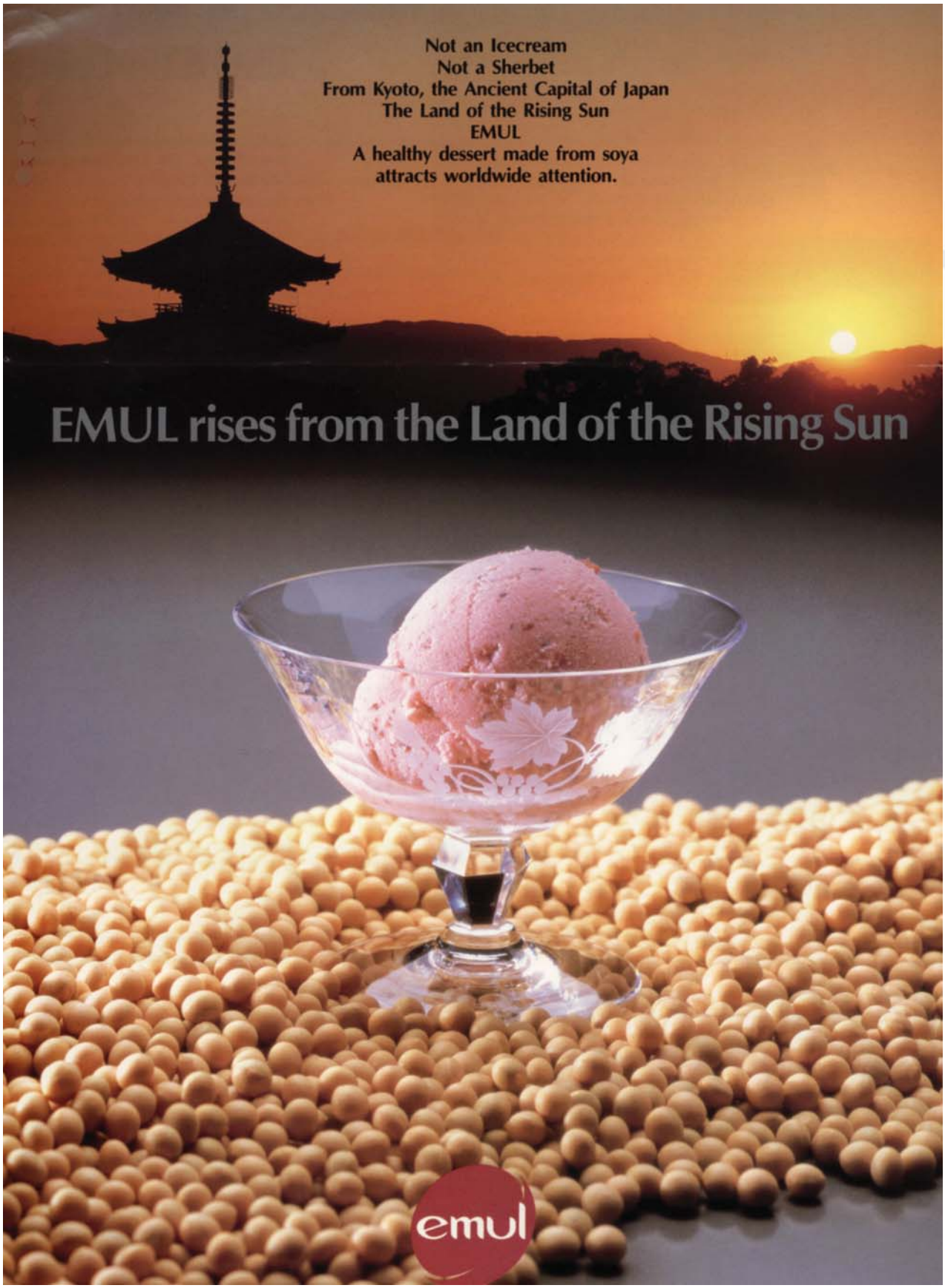

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Soynuts)].
Manufacturer's Name: Marusan-Ai Co., Ltd.
Manufacturer's Address: 1 Arashita, Niki-cho, P.O. Box 444-21, Okazaki city, Aichi prefecture 444-21, Japan.
Date of Introduction: 1987.
New Product–Documentation: Soya Bluebook. 1987. p. 97.

8960. **Product Name:** [Marusan Tofu].
Manufacturer's Name: Marusan-Ai Co., Ltd.
Manufacturer's Address: 1 Arashita Niki-cho, P.O. Box 444-21, Okazaki city, Aichi prefecture 444-21, Japan.
Date of Introduction: 1987.
New Product–Documentation: Soya Bluebook. 1987. p. 96.

8961. Nagano, H. 1987. [Evaluation of okara as a raw material for miso]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) 35(6):228-33. [12 ref. Jap]*
• ***Summary:*** Okara is a by-product of tofu production. Address: Japan.

8962. Nanba, M.; Komaki, M.; Ichikawa, R.; Matsuda, N. 1987. [Growth of heat resistant sporeforming bacteria in soy milk]. *Kanzume Jiho* (*Canners' Journal*) 66(5):88-94. [14 ref. Jap]*
• ***Summary:*** These bacteria included *Bacillus* species and *Clostridium sporogenes.* Address: Japan.

8963. **Product Name:** [Nisshin Sol-P Soy Protein Concentrates, and Isolates].
Manufacturer's Name: Nisshin Oil Mills, Ltd.
Manufacturer's Address: Shinkawa 1-23-1, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1987.
New Product–Documentation: Soya Bluebook. 1987. p. 72.

8964. Ohike, T.; Shimozaki, I.; Kanai, T.; Yoneyama, T.; Itoh, T.; Shinha, Y.; Fukuzawa, M.; Iida, T. 1987. [Quality evaluation of high-yielding rice varieties for rice miso production]. *Research Report of the Nagano State Laboratory of Food and Technology* No. 15. p. 38-42. [2 ref. Jap]*
Address: Nagano State Lab. of Food Technology, Kurita, Nagano-shi, Japan.

8965. Ohike, T.; Itoh, E.; Yoneyama, T.; Itoh, T.; Shinha, Y.; Fukuzawa, M.; Iida, T. 1987. [Studies on fluidizing rice miso]. *Research Report of the Nagano State Laboratory of Food and Technology* No. 15. p. 26.37. [4 ref. Jap]*
Address: Nagano State Lab. of Food Technology, Kurita, Nagano-shi, Japan.

8966. Onozaki, H.; Yamamoto, M.; Isshiki, S.; Esaki, H. 1987. [Levan production by *Bacillus subtilis* isolated from commercially available natto preparations]. *Nihon Eiyo Shokuryo Gakkai-shi* (*J. of the Japanese Society of Nutrition and Food Science*) 40(5):405-09. [11 ref. Jap; eng]*
• ***Summary:*** 33 strains of *B. subtilis* were isolated from commercially available natto preparations. These strains produced significantly different amounts of the viscous material, levan. Levan production reached a maximum after 8 days of cultivation, the optimum temperature ranging from 25-30ºC and the pH from 5 to 8, respectively. Sucrose was the most suitable C source and levan production increased in parallel with the initial sucrose concentrate. Address: Dep. of Food & Nutrition, Sugiyama Jogakuen Univ., Chikusa-ku, Nagoya 464, Japan.

8967. Takao, S.; Nakashima, H.S.; Tokumoto, M.; Saitoh, M.; Watanabe, M. Assignors to Terumo Corp. 1987. Treated soybean with reduced phosphorus and potassium levels, process for preparing the same, and processed soybean foods obtained therewith. *European Patent Application* 0,234,998 A1. Corresponds to Japanese Patent 86-13681. [Eng]*
• ***Summary:*** Soybean products with reduced levels of phosphorus and potassium. Suitable for use in the treatment of renal disease are described. They include soymilk, puffed foods, tofu and cake mix. The phosphorus and potassium components of the soybeans are reduced by soaking the beans in a solution at pH 3.0-6.5, and then washing them at pH 5.0-9.0. Address: Terumo, Tokyo 151, Japan.

8968. Takenawa, S.; Ueda, M.; Takeda, H. Assignors to Fujisawa Pharmaceutical Company Ltd. 1987. A coagulant for a novel yoghurt-like food, and novel yoghurt-like foods manufactured with use of the coagulant. *European Patent Application* 0,244,152 A2. Corresponds to Japanese Patent 86-100142, 28 April 1986. [Eng]*
Address: Fujisawa Pharm., Osaka 541, Japan.

8969. Tanahashi, K.; Takano, K.; Matsumoto, S.; Kamoi, K.; Obara, T. 1987. [Trypsin inhibitor activity of soybean products]. *Nogaku Shuho* (*General Report on Agricultural Science*) 32:206-11. [Jap]*

8970. Togashi, T. 1987. [A balanced high-barrier Saran UB film]. *Fudo Pakkejingu* (*Food Packaging*) 31(2):55-62. [Jap]*
• ***Summary:*** The plastic film was used to package foods such as miso and dried skipjack tuna fish. Address: Japan.

8971. Tomita, M.; Okubo, K.; Yamauchi, F. 1987. [Factors influencing formation of sediment in heated raw soy sauce]. *Hakko Kogaku Zasshi* (*J. of Fermentation Technology*) 65(3):185-89. [11 ref. Jap; eng]*
• ***Summary:*** Raw soy sauce (a filtrate of aged mash) is

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heated at 70-85ºC at the final stage of fermentation to inhibit microbial and enzymic reactions. During heating, sediment is gradually formed, comprising 10% of the volume. The sediment decreases the yield and commercial value of soy sauce. More sediment is formed and it forms faster at 60ºC than at 85ºC, suggesting that raw soy sauce contains a factor or factor that accelerates sediment formation at the lower temperature and/or inhibits it at the higher. Address: Dep. of Food Chemistry, Tohoku Univ., Amamiya-machi, Tsutsumi-dori, Sendai-shi, Miyagi-ken 980, Japan.

8972. Uzawa, H.; Kitamura, Keisuke; Kaizuma, Norihiko. 1987. [Studies on the sugar content of green vegetable soybeans–Characterization and inheritance of high sugar content in *dadacha-mame*]. *Ikushugaku Zasshi* (*Japanese J. of Breeding*) 37(Bessatsu 1):326-27. [Jap]*
Address: Iwate University, Morioka, Japan.

8973. Yamamoto, A.; Matsunaga, A.; Makino, M.; Mizukami, E. 1987. [Analysis of formic and levulinic acids in soy sauce by photometric ion chromatography]. *Annual Report of Toyama Institute of Health* No. 10. p. 144-47. [8 ref. Jap]*

8974. Yoneyama, T.; Ohike, T.; Itoh, T.; Shinha, Y.; Fukuzawa, M.; Shimizu, K.; Nishizawa, N.; Iida, T. 1987. [Quality studies of commercial soy sauce. XIV.]. *Research Report of the Nagano State Laboratory of Food and Technology* No. 15. p. 51-56. [3 ref. Jap]*
Address: Nagano State Lab. of Food Technology, Kurita, Nagano-shi, Japan.

8975. Yoneyama, T.; Ohike, T.; Iida, T. 1987. [Preparation of koji and miso using corn starch. II. Processing of miso using uncooked material]. *Research Report of the Nagano State Laboratory of Food and Technology* No. 15. p. 43-46. [2 ref. Jap]*
Address: Nagano State Lab. of Food Technology, Kurita, Nagano-shi, Japan.

8976. Yoneyama, T.; Ohike, T.; Iida, T. 1987. [Quality evaluation of Japanese soybean varieties for processing in rice miso. III.]. *Research Report of the Nagano State Laboratory of Food and Technology* No. 15. p. 47-50. [2 ref. Jap]*
Address: Nagano State Lab. of Food Technology, Kurita, Nagano-shi, Japan.

8977. Anderson, Margot Holden. 1987. Exchange rate variability and foreign demand for U.S. soybeans. PhD thesis, University of Illinois at Urbana-Champaign. 290 p. Page 121 in volume 49/01-A of Dissertation Abstracts International. *
Address: Univ. of Illinois at Urbana-Champaign.

8978. Bartholomai, Alfred. ed. 1987. Food factories: Processes, equipment, costs. Weinheim, West Germany: VCH Verlagsgesellschaft mbH. xv + 289 p. 24 cm. [Eng]
• ***Summary:*** Includes chapters on tofu plant by Takai Tofu & Soymilk Equipment Co. (Japan) (p. 157-59, Chap 22), surimi plant by K.L. Holmes and C. Riley (p. 207-14), protein recovery plant by J. Lyle (p. 223-27), soybean oil extraction plant by K. Weber (p. 231-35), and soymilk plant by Takai Tofu & Soymilk Equipment Co. (Japan) (p. 279-81, Chap. 41).

Within each chapter are the following sections: Introduction, economic considerations, social impact, plant design basis (capacity), plant layout and floor plan, process description. Takai has recently supplied/sold the following plants: (1) Tofu plants to Natural Inc. (Maryland, USA 30 kg/hour), Tempe Production BV (Netherlands, 30 kg/hour), and Castle Trading (Australia, 60 kg/hour). (2) Soymilk plants to Namyang Company (Korea, 2,000 liters/hour), Seoju Industrial Company (Korea, 1,000 liters/hour), Guilin Sweets and Food Factory (China, 1,000 liters/hour), Jinan Soymilk Factory (China, 1,000 liters/hour). Address: 570 Stanhope Rd., Sparta, New Jersey, 07871.

8979. Beuchat, Larry R. 1987. Food and beverage mycology. 2nd ed. New York, NY: Van Nostrand Reinhold. xiii + 661 p. Illust. Index. 23 cm. [20+ soy ref]
• ***Summary:*** Contents: Contributors. Foreword. Preface. Classification of food and beverage fungi, by E.S. Beneke and K.E. Stevenson. Relationships of water activity to fungal growth, by Janet E.L. Corry. Fruits and fruit products, by D.F. Splittstoesser. Vegetables and related products, by R.E. Brackett. Meats, poultry, and seafoods, by James M. Jay. Dairy products, by Elmer H. Marth. Field and storage fungi, by C.M. Christensen. Bakery products, by J.G. Ponte, Jr. and C.C. Tsen. Traditional fermented food products, by L.R. Beuchat. Alcoholic beverages, by G.G. Stewart. Edible mushrooms, by W.A. Hayes. Poisonous mushrooms, by Donald M. Simons. Fungi as a source of protein, by A.J. Sinskey and C.A. Batt. Fungal enzymes and primary metabolites used in food processing, by R. Bigelis and L.L. Lasure. Mycotoxins, by N.D. Davis and U.L. Diener. Methods for detecting mycotoxins in food and beverages, by L.B. Bullerman. Methods for detecting fungi in foods and beverages, by B. Jarvis and A.P. Williams. Appendix. Regulatory action levels for mold defects in foods.

Chapter 9, "Traditional fermented food products, has a section on koji and a long section on fermented soybean foods that discusses: Shoyu, miso, natto (incl. itohiki-natto, yukiwari-natto, and hama-natto / hamanatto; called tu su by the Chinese and tao-si by the Filipinos), sufu, meitauza, and témpé [tempeh]

Tables show: (9.1) Some fermented foods of fungal origin. For each food is given: Product name, geography,

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substrate, microorganisms, nature of product, and product use. Soy-related products include: Chee fan, Chinese yeast, Hamanatto, kecap, kinema, ketjap, meitauza, meju, miso (incl. chiang, jang, doenjang, tauco, tao chieo), natto, soybean milk, soy sauce (incl. chiang-yu, shoyu, toyo, kanjang, kecap, see-ieu), sufu (tahuri, tao-kaoan, tao-ju-yi), tao-si, taotjo, tauco and témpéh. Address: Dep. of Food Science, Agric. Exp. Station, Univ. of Georgia, Experiment, GA 30212.

8980. Downer, Leslie. 1987. Japanese vegetarian cooking. New York, NY: Pantheon Books. 400 p. 21 cm. *

8981. Drinnon, Richard. 1987. Keeper of concentration camps: Dillon S. Meyer and American racism. Berkeley, California: University of California Press. xxviii + 339 p. Illust. Portraits. 24 cm. [100+* ref]
• ***Summary:*** A well researched, well written, and well documented highly critical account of the Japanese internment camps in the United States during World War II. The single best book on the camps, he says, is *Years of Infamy,* by Michi Nishiura Weglyn.

Contents: Origins. The WRA Story of Human Conservation. Farm Boy. Japanese Americans. Director. Scatterer. Segregator. "Troublemakers." Jailer. Native Americans. Commissioner. "Wily" Indians. "Fomenter of Trouble": Felix S. Cohen. Terminator.

The endnotes, while not numbered, are an good source of bibliographic and archival information, as is the "Abbreviations" section (p. xv-xviii). In 1980 and 1981, the author and his wife visited each of the ten officially listed WRA campsites in the United States–to see what remained.

Note: Dillon S. Meyer was born in 1891. Address: Prof. of History, Bucknell Univ., Lewisburg, Pennsylvania.

8982. Hartadi, Sri; Kabirun, Siti. 1987. Improvement of traditional soy sauce fermentation (mold selection and its application). In: Fujiharu Yanagida, ed. 1987. Traditional Foods and Their Processing in Asia. Tokyo: NODAI Research Institute, Tokyo Univ. of Agriculture. vii + 235 p. See p. 219-33. [15 ref]
• ***Summary:*** Contents: Abstract. Introduction. Materials and methods: Mold selection, soy sauce inoculum preparation (laboratory scale, then commercial scale). Results and discussion. Conclusions.

From a survey of soy sauce manufacturers in Java and laboratory studies the authors conclude that practically none of the soy sauce manufacturers in Java, except for one modern manufacturer in Jakarta, use special inoculum in the soy sauce fermentation process. The source of active microorganisms is mainly the previously used fermentation containers. Most of the soy sauce processing is not carried out in aseptic conditions, so many kinds of molds, yeast, and bacteria can be isolated from the fermented materials. The authors isolated a suitable mold for soy sauce fermentation, and found that the use of 1% of fresh inoculum is adequate for the fermentation of soy sauce. Address: Faculty of Agriculture, Gadjah Mada Univ., Indonesia.

8983. Ito, Kiyoe; Arai, E.; Fuke, S. 1987. Sawara no misozuke ni kansuru kenkyû: Tsukekomi kikan-chû no ganchisso seibun no dôtai ni tsuite [Studies on fillets of Spanish mackerel pickled with soybean miso: Changes of nitrogenous compounds during pickling]. *Kaseigaku Zasshi* (*J. of Home Economics of Japan*) 38(4):267-73. [7 ref. Jap; eng]
• ***Summary:*** Spanish mackerel is *Scomberomorus niphonius.* Pickling time required to obtain the most favorable products were 72 hours for soybean miso and 48 hours for mixed soybean miso. A decrease in trimethylamine in the early stage of pickling suggests that soybean miso decreases the fishy odor. Address: Faculty of Education, Tokyo Gakugei Univ., Koganei, Tokyo 184, Japan.

8984. Karki, Tika. 1987. Indigenous fermented foods in Nepal. In: Fujiharu Yanagida, ed. 1987. Traditional Foods and Their Processing in Asia. Tokyo: NODAI Research Institute, Tokyo Univ. of Agriculture. vii + 235 p. See p. 122-40. [5 ref]
• ***Summary:*** Of Nepal's population of 16 million, 90% are involved in agriculture. A conservative estimate calculates the production of kinema to be 300 tonnes/year. Kinema is a traditional non-salted soybean fermented food product widely and popularly consumed by the Kirat ethnic population of the eastern hills of Nepal, Darjeeling, and Sikkim. This product greatly resembles natto of Japan and thua-nao of Thailand, and is usually produced in the winter season. Kinema is consumed both as a soup, with other green vegetables, and as a curry. A *Bacillus subtilis* strain has been found to be the dominant microflora of kinema fermentation (Karki, 1985). Production figures of kinema are not available, but a conservative estimate would be around 300 tonnes. The obvious reason for the limited kinema production is the virtual ignorance of this product. Even researchers have little knowledge of it. Another plausible explanatory factor is the typical ammonia-like odour which many people living in other parts of the country are not partial to.

Preparation of kinema: Soybeans are washed, soaked overnight, cooked at boiling temperatures till softened and then mashed by light pounding. About 0.5% ash is added and mixed in thoroughly by hand. The mixture is then fermented overnight in a bamboo basket surrounded by banana leaves, at a temperature of around 25ºC. After fermentation, the fresh kinema is dried in the sun for about 3 days and then stored for six months. Reducing sugar is drastically reduced in kinema, compared to natto. A higher ash content in kinema may be due to the addition of ash during processing.

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It is very important to maintain a balance between acid, reducing sugar, the ammonia odour, stickiness, and textural characteristics, in order to improve the kinema processing technology.

Chemical composition of kinema, averages: Moisture (8.9%), protein (46.2%), fat (18.1%), total sugar (21.2%), reducing sugar (2.1%), crude fiber (7.1%), ash (5.2%), acidity (1.52%). Address: Central Food Research Lab., Nepal.

8985. Kato, Hyakuichi. 1987. Nihon no sake, go-sen nen [Japan's sake, 5,000 years]. Tokyo: Gihodo Shuppan. 260 p. [Jap]*
Address: Hokkaido Daigaku, Nôgaku-bu, Japan.

8986. Kauffman, H.E. 1987. Soybean genetic improvement work outside the United States. *ASTA* (*American Seed Trade Association*) 16:14-25. [38 ref]
• ***Summary:*** Contents: Introduction. Perspective–Historical and environmental. Asia (East, Southeast, South), South America, Caribbean Basin, Central America, and Mexico. Sub-Sahara Africa. North Africa and Middle East. Europe and Soviet Union. International Cooperation. Summary and Conclusion. Address: Director, INTSOY, Univ. of Illinois, Urbana.

8987. Kawamura, Yojiro; Kare, Morley R. eds. 1987. Umami–a basic taste: physiology, biochemistry, nutrition, food science. New York, NY: Marcel Dekker. xiv + 649 p. Proceedings of the First International Symposium on Umami, held Oct. 7-10, 1985, Lihue, Kauai, Hawaii. Illust. Illust. Index. 24 cm. [1400* ref]
• ***Summary:*** Contains 28 papers by 48 different authors, quite a few of them from the Ajinomoto Company, Inc. (Kawasaki, Kanagawa prefecture, Japan). The basic message of this book is the same as its title: Umami is a basic taste, just like the traditional four–sweet, sour, salty, and bitter, which were advanced before modern taste physiology had developed. The term "monosodium glutamate (MSG)" appears many times in the index, but the word "Ajinomoto" ("a tradename for a mixture of MSG and ribonucleotides") does not. At the end of each paper are many references.

The taste of MSG is unique: In Japanese it is called "umami" (p. 83). "Glutamic acid (Glu) elicits a unique taste (*umami*) in human sensations..." (p. 3). "Umami" is also found in basic traditional, natural foods widely used in Japanese cookery: *kombu / konbu* (*Laminaria japonica,* a sea vegetable), *katsuobushi* (dried bonito flakes), and *shiitake* mushrooms (p. 86). However MSG is derived naturally from konbu whereas GMP (guanosine 5'-monophosphate) is derived from shiitake. These substances were previously thought to "enhance taste intensity" (p. 35, 256). The "Chinese restaurant syndrome" is discussed on pages 309-14. Although "soy" is not mentioned in the index, it does appear several times in the book: soy sauce (p. 257), soy (p. 265, 267, 268).

Contents (in 8 parts): I: General concepts (3 papers. "Recent progress in the taste receptor mechanism." "Fundamental properties of umami in human taste sensation." "The umami taste concept: Implications for the dogma of the four basic tastes" (sweet, sour, salty, bitter)). II. Developmental aspects (3). III: Receptor mechanisms (5). IV: Psychometric analysis (7). V: Physiology and behavior (3). VI: Brain mechanisms (3). VII: Nutrition and behavior (3). VIII: Overview. Address: 1. Faculty of Nutrition, Koshien Univ., Takarazuko, Japan; 2. Director, Monell Chemical Senses Center and Dep. of Physiology, Univ. of Pennsylvania, Philadelphia, PA.

8988. Kuramochi, Toshiyuki. 1987. The tofu maker. In: Saga, Junichi. 1987. Memories of Silk and Straw: A Self-Portrait of Small-Town Japan. Tokyo, New York: Kodansha International. 258 p. See p. 121-23. Illust. (some color). May. 22 cm.
• ***Summary:*** This chapter appears in section 3, "Shopkeepers and tradesmen." "We kept early hours in my father's day. Now almost everything's done by machine, so even if you don't get up till after five you've still plenty of time to make tofu, but back then we used to get up before two in the morning–more in the middle of the nigh really!

"Let me see if I can remember how ours was made... First we used a treadmill to grind the two sackfuls of soybeans that had been left to [soak and] cool the night before. This job was always done by my uncle, and if he started just before two o'clock, it usually took him until five to grind them up completely. The thick mash that resulted was known as *go.*

"This was tipped into a large cauldron of water, thoroughly boiled, and then poured into the special double bag, four feet long by two feet wide, used for squeezing the soymilk from the bean solids. The double bag full of boiling *go* was extremely hot and heavy, so heavy in fact that the women could barely even lift it off the ground. You heaved this bag up on top of a tub and started wringing it–we didn't have any mechanical presses or anything, it was all done by hand. Several pine boards, tied together with straw rope, were fixed over the tub that was going to catch the liquid. The wringing bag was folded in two and you pressed down hard on it with a heavy wooden pole, about five inches thick and six feet long: one end of the pole was stuck into a hole in a wooden pillar, the middle of it rested on the bag, and you sat on the other end and squeezed the bag down using your whole body weight. But if you just sat on it without moving, the stuff wouldn't be pressed hard enough, so you had to jiggle up and down as vigorously as possible. The liquid would drip down into the tub and the bag would gradually empty. You then had to fold it in four and start squeezing again; eventually all that was left in the sack was the lees.

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"When the bag had been completely squeezed out, you added bittern to the milk in the tub to make it set. Nowadays they use calcium sulphate, but back then we went along regularly to the pickle shop and got the water left at the bottom of barrels of brine-pickled vegetables.

"When the soy milk had set, it was scooped out of the tub with a special ladle known as a *bozu* ["a Buddhist priest"] and put into wooden molds; the molds were made of cypress wood, I remember. From one you could get ten slices of tofu. But you could only make two molds, twenty pieces, at a time. Mind you, the slices used to be much bigger than they are now–they were so big in fact you couldn't have held one on the flat of your hand–about seven and a half inches long and at least three inches deep. And to turn the two sacks of soybeans into tofu, we had to complete the same process again seventeen or eighteen times. But once we'd got started and had the water on the boil, everything went smoothly, with everyone doing their particular jobs, and we'd get all of it done by just after five.

"Once we'd finished making the stuff, we had some breakfast and then went out selling it from two wooden buckets attached to a pole balanced on your shoulder. Each bucket held fifteen pieces so, with a total of thirty, plus a certain amount of water, the pole bent right down on either side with the weight. We also put a box of various types of fried tofu on top of each bucket; it took a fair bit of skill and strength to balance that lot. The buckets weren't round but slightly oval shaped, three feet wide at the longest point and two foot six at the shortest, and maybe about seven inches deep.

"In those days, tofu sellers didn't blow a horn to tell customers they'd arrived as they do now; they walked around ringing a little bell. You had to take the strain of the pole with one hand and ring the bell with the other. What's more, if we'd sold the tofu only in the town we'd never have made much of a profit, so we used to go all the way out to Manabe, and then on to the area around Hojo. Well, people back then had good strong legs–we thought nothing of going as far as Oda or Hojo. I can't see anyone doing that nowadays, eh?

"There used to be tofu shops dotted about all over town and in the surrounding villages. There was a sort of unwritten rule that you couldn't sell your stock in front of, or seven houses either side of, another tofu shop, but you could sell anywhere else.

"Fried tofu cost one sen for as much as a woman could hold in one hand; plain tofu was two and a half sen in 1915, but by the 1920s it had gone up to five sen a piece.

"The men got back at about two or three in the afternoon–dog tired–after carrying their loads twenty-five miles or more with nothing but straw sandals on their feet. My father and the others had a bath as soon as they got in, with a meal straight afterward. And, God, did they eat: one man could easily get through four or five large bowls of rice. There were ten people working in the shop in one day–for breakfast, lunch, and dinner–they put away a good sixty pounds of rice between them."

A small illustration shows a "tofu seller," from the rear, with a pole on his shoulder.

Note: A splendid book, the winner of both awards and high praise. The compiler (Saga) was born in 1941 and the writer (Kuramochi) was born in 1929. A map (p. 8) shows that the small town is Tsuchiura, in Ibaraki prefecture, just northeast of Tokyo. Address: PhD, Japan.

8989. Lin, Bi-Fong; Miyawaki, O.; Torikata, Y.; Yano, T. 1987. Energy saving in the extraction-denaturation stage of kori-tofu production and its optimization. *J. of Food Engineering* (*UK*) 6(5):333-44. [11 ref]

• ***Summary:*** "Production of kori-tofu (freeze-denatured soybean gel) involves 13 unit operations and is highly energy intensive. The previous energy analysis of a kori-tofu manufacturing process (Iibuchi et al. 1982) disclosed that the extraction-denaturation stage of this process consumed twice as much thermal energy as the succeeding drying stage. The key to energy saving in the extraction-denaturation stage was to reduce the amount of water to be heated without reducing the extraction yield. Four methods were investigated for their feasibility as alternatives... The double extraction was the most effective method so far for saving energy." Address: Dep. of Agricultural Chemistry, Faculty of Agriculture, The Univ. of Tokyo, Bunkyo-ku, Tokyo 113, Japan.

8990. Lundblad, Birgitta. 1987. Soy–The world's biggest protein reserve. *Food Focus* (*Alfa-Laval, Sweden*) No. 2. p. 14-15.

• ***Summary:*** Color photos show: (1) Several Tetra Brik cartons of soymilk made in China. (2) The soymilk plant in the Guangdong Cannery in Canton. Up until the 1960s there the major problem with soymilk was its unpleasant "beany" smell and taste. During the 1960s researchers at Cornell University "managed to control the enzyme activation by hot grinding of the beans. Alfa-Laval came up with a commercial solution on the basis of these findings in the 1970s. But it was found that the primary soaking stage was the cause of tangible loss of flavour.

"The next achievement in this field was made at the University of Illinois where they eliminated the presoaking of the beans and instead boiled them directly to kill the enzyme [lipoxygenase].

"The bean flavour was gone alright, but since the fibre residue was not removed, the product resembled porridge in consistency, which the market would never swallow. On the other hand this fibre problem was solved by the Japanese, who included a decanter centrifuge in the process. This was an important step forward which resulted in increased sales of soy milk in Japan by 85% a year for seven years.

"The drawback of this production method was that half of the protein was lost in the process. Evidently, it was not a

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solution that most of the world could afford.

"Combined the advantages: In 1982 Alfa-Laval introduced a soy milk production process that combined all the advantages of earlier achievements. The process has a simple technology and is very economical because of a high extraction efficiency.

"In the process, soybeans are cleaned without the use of water and then ground with hot water to make a slurry. After centrifugal separation of the slurry to remove fibre residue, the clarified soy base that has been extracted is passed on to deactivation of residual enzymes and trypsin inhibitor, followed by deodorization.

"Now the soy base is ready for processing into different kinds of soy products. In the blending section, sugar, fat, flavouring, colouring, etc. can be added to give the product its character and final composition. After UHT treatment, which includes homogenization, the product is finally packaged, ready for distribution. To date Alfa-Laval has signed contracts for more than ten soy base lines in Asia, Europe, Africa and South America. Most of these plants are already in operation or under construction.

"Back where it started–in China: Guangdong Cannery in Guangzhou (Canton) in the Peoples' Republic of China is a big production plant for different kinds of beverages. Their output includes ready-to-drink juices of kiwi, guava, orange and sugar cane concentrate and a chrysanthemum tea...

"Today this plant also produces approx. 20,000 liters per day of high quality, plain and flavoured soy milk. In fact, Guangdong Cannery was the first in the world to install Alfa-Laval's new soy milk line... The soy plant is now working at full speed in two shifts, normally 6 days a week."

8991. Nisshin Oil Mills Co., Ltd. 1987. Nisshin Seiyu 80 nen-shi [Nisshin Oil Mills 80-year history]. Tokyo, Japan. [Jap]*
Address: Japan.

8992. NODAI Research Institute. 1987. Traditional foods and their processing in Asia. Tokyo: NODAI Research Inst. vii + 235 p. Seminar held Nov. 13-15, 1986 at the Tokyo Univ. of Agriculture, Tokyo, Japan.
• ***Summary:*** Contents include: Oncom: Fermented peanut pressed cake, by Dedi Fardiaz. Mochi: Rice Cake, by Akiko Kawabata. Miso: Bean paste, by Hisao Yoshii. Chemistry and technology of tofu and its derived products, by Tokuji Watanabe. Indigenous fermented foods in Nepal, by Tika Karki. Improvement of traditional soy sauce fermentation mold, by Sri Hartadi and Siti Kabirun. Address: Tokyo Univ. of Agriculture, 1-1-1 Sakuragaoka, Setagaya-ku, Tokyo 156, Japan.

8993. Onishi, Reiko; Abe, Keiko; Honma, Seiichi; Aida, Ko. 1987. Nattô no nenshitsu-butsu ni kansuru kenkyû [Studies on a viscous substance of natto]. *Nippon Kasei Gakkai-shi* (*J. of Home Economics of Japan*) 38(10):871-76. (Chem. Abst. 108:73981. 1988). [15 ref. Jap; eng]
Address: 1&3. Faculty of Home Economics, Ochanomizu Univ., Bunkyo-ku, Tokyo 112, Japan.

8994. Passmore, Jacki. 1987. Asia: The beautiful cookbook. Los Angeles, California: Knapp Press. 256 p. Illust. (color). Index. 37 cm.
• ***Summary:*** This is a stunningly beautiful, oversized book–a feast for the eyes, filled with elegant color photos (many full page), authentic recipes and many insights about Asian cookery. Each recipe is accompanied by one or more photos, Contents: Japan: Simplicity and elegance. Korea: Warm and sustaining. China: From the beginning of time. Philippines: East meets West. Thailand: Titillating, tantalizing. Laos and Kampuchea: Unforgettable foods. Vietnam: Herbaceous overtones. Singapore and Malaysia: A blending of cultures. India: Southern fire, northern serenity. Burma: Exotic offerings. Indonesia: Symphony of flavors. Sri Lanka: Gems from an enchanted isle. Glossary. Acknowledgments.

Japan: Yudofu (Simmered bean curd, with 3 cakes tofu {bean curd}, p. 31). Tofu dengaku (Grilled bean curd on skewers, with 2 lb {1 kg} momen tofu and white miso, p. 31). Ton-negu no teriyaki (Teriyaki pork rolls, p. 38). Miso-shiru (Miso-flavored soup with bean curd).

Singapore and Malaysia: Popiah (with ¼ cup (about 2 oz / 60 gm) compressed bean curd cake, shredded, p. 155, 148-49). Tempe lemak (Tempe in coconut milk, p. 166). Hokkien mie (Hokkien style noodles, with 2 cakes compressed bean curd, p. 168). Laksa ayam (Chicken with laksa noodles in coconut sauce, with 2 squares / cakes compressed bean curd, p. 169).

Indonesia: Kecap manis is a sweetish soy and chili sauce (p. 218). Babi kecap (Pork in sweet soy sauce, p. 227).

Glossary (p. 252-54) includes short definitions of: Azuki beans. Bean curd. Bean pastes and sauces. Kecap manis ("based on dark soy sauce, sugar and spices"). Kombu. Nori. Paneer (India). Sesam. Wakame.

8995. Pick, Daniel Hugo. 1987. Macroeconomics and agriculture: The case of soybeans. PhD thesis, University of California, Davis. 153 p. Page 707 in volume 48/03-A of Dissertation Abstracts International.
• ***Summary:*** Contents: Abstract. Acknowledgement. List of tables. List of figures. 1. Introduction. 2. The U.S. soybean crushing industry: General characteristics. 3. Econometric model of the soybean complex: Theory, estimation, results. 4. The macroeconomic model, specification and estimation. 5. Policy scenarios and summaries. 6. Summary and conclusion. References. Appendix A–The almost ideal demand system (AIDS).

Some 50-60% of the soybeans produced in the USA between 1977 and 1982 were exported. The volume of U.S. soybean exports tripled during the last 15 years, while

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the value of exports of soybeans and soybean products increased sevenfold. Soybean production is concentrated in 5 countries: China, Paraguay, USA, Brazil, and Argentina, with the latter 3 countries being the exporters. Until 1979, U.S. soybean production accounted for 75% of the world's production, but due to rising competition from Brazil and Argentina, its share decreased to 50% in the late 1970s. In the same period, Brazil's share rose from 3.6% to about 18%. Similar trends hold for Argentina.

During this time, changes in the world's economy have led to unstable international trade. This was magnified by the collapse of the Bretton-Woods agreement [signed in 1944 in New Hampshire, it created the World Bank]. Address: Univ. of California, Davis.

8996. Shimomura, Michiko; Matsumoto, Juichiro J. 1987. [Changes in proteins of fish meat during cooking and processing. V. Changes in proteins of Spanish mackerel meat cured in miso]. *Nihon Suisan Gakkai shi* (*Bulletin of the Japanese Society of Scientific Fisheries*) 53(4):627-32. [11 ref. Jap; eng]
• ***Summary:*** Misozuke of fish flesh is a traditional processing method whereby fish are cured in miso (fermented soybean paste) in order to preserve the fish and improve its eating quality. The meat becomes more tender and fragile. It becomes harder for the first 7 days, then softer until day 21 due to the enzymes in miso. Address: Dep. of Food Science & Nutrition, Otsuma Women's Univ., Sanbancho 12, Chiyoda, Tokyo 102, Japan.

8997. Shimoura, Michiko; Takahashi, Y.; Yoshimatsu, F.; Matsumoto, J.J. 1987. Kamasu sawara niku no misozuke shori ni okeru tekusuchaa to tanpakushitsu no henka [Changes in texture and proteins of wahoo (*Acanthocybium solanderi*) fish meat cured in miso]. *Kaseigaku Zasshi* (*J. of Home Economics of Japan*) 38(1):13-21. [11 ref. Jap; eng]
• ***Summary:*** Frozen wahoo fillets were cured in miso at 4ºC for 28 days. The meat was very hard after 3 days of curing, but became tender after 21 days. Decomposition was attributed to the proteolytic enzymes of miso acting on the fish meat proteins. Address: 1&3. Faculty of Domestic Sciences, Otsuma Women's Univ., Chiyoda-ku, Tokyo 102, Japan.

8998. Shurtleff, William; Aoyagi, Akiko. 1987. Soymilk industry and market: Updates from 1984 to 1987. Lafayette, California: Soyfoods Center. 17 + 59 p. Index. 28 cm. [165 ref]
• ***Summary:*** This 1987 update to the Soyfood Center's two-volume 1984 *Soymilk Industry and Market* has two parts: (1) Year in Reviewing, describing key events and trends each year from 1984 to 1986. (2) A bibliography of soymilk from January 1987 to late 1987, based on records in the SoyaScan database; at the end is a 10-page index. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

8999. Sonntag, Linda. 1987. The little tofu book. London: Judy Piatkus (Publishers) Ltd. 60 p. Illust. by Trevor Newton and Hanife Hassan. No index. 16 cm.
• ***Summary:*** Contents: What is tofu? Storing tofu. What to do with tofu. Tofu recipes. Dips and spreads. Tofu, the wonder health food. The food for the future. Tofu slimmers. Making your own tofu. The bonuses of making tofu: Go, okara, soya bean milk, yuba, whey. Tofu in Japan. Tofu in Indonesia. Tofu in China. Miso. Other titles in the series. Note: This book draws heavily on *The Book of Tofu* by Shurtleff and Aoyagi. Address: England.

9000. Terajima, Ryôan. comp. 1987. Wakan sansai zue 7 [Collection of Japanese and Chinese diagrams and drawings of all things]. Tokyo: Heibonsha. 442 p. 18 cm. Series: Toyo bunko, no. 471. Toyo Pocket Library series. [Jap]*
• ***Summary:*** See Terajima 1711 (or 1713). This is a translation into modern Japanese, with a title slightly different from that of the original. There have been at least 3 different editions over the centuries, most recently in 1907, 1929, and 1980 on. The set published by Heibonsha was published in 16 volumes from 1980 (vol. 1) to 1990 (vol. 16). This Vol. 7 was chosen at random as one example. We do not know which volume (or volumes) contains the information on soy. Address: Physician.

9001. Toyo Plant. 1987. Tôfurui jidô seizô sôchi [Automatic production system of tofu (bean curd) products]. Toyo Plant Co. Ltd., 4-27-6 Matsue, Edogawa-ku, Tokyo 132, Japan. 4 p. English. 6 p. Japanese. Manufacturer's catalog. [Jap; Eng]
• ***Summary:*** The company was founded in 1967. This manufacturer's catalog describes the production systems for soy milk, momen tofu, abura age, filled silken tofu, silken cut tofu, and egg tofu. Address: Tokyo, Japan. Phone: 03-655-0111.

9002. Wang, Lianzheng. 1987. Soybeans–The miracle bean of China. In: Sylvan Wittwer, Yu Youtai, Sun Han, and Wang Lianzheng, eds. 1987. Feeding a Billion: Frontiers of Chinese Agriculture. East Lansing, Michigan: Michigan State University Press. 462 p. See p. 183-99. Chap. 14. [13 ref]
• ***Summary:*** A good overview of soybeans in Chinese agriculture today, and of early history in China. "World soybean acreage has doubled during the past twenty years. This represents a greater expansion than for any other major crop. Wang Jinling of the Northeastern Agricultural College at Harbin and others have studied the photoperiodic responses of wild soybeans from the northern part of the Heilongjiang Province to the southern part of Hunan Province. They found that, among the wild soybeans of the Yangzi River valley, there are typical short-day types of

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primitive characteristics. It was concluded that the Yangzi River valley of South China was the site of origin for the cultivated soybean. Soybeans with moderate short-day behavior, when moved from that region, were found suitable for North China. But the Yellow River valley also has a large number of wild and semi-wild soybeans of many types and cultivars. Here the cultivated soybeans may have originated from the wild soybeans through selection. Lui Shilin has suggested that the cultivated soybean may have originated from many different places in China.

Soybeans were first called "shu," a word which appears repeatedly in the Shijing [The Book of Songs], which is one of the five Chinese classics dating from 1,100-771 B.C. The Chinese name for the soybean, dadou, first appeared in the book of Shen Nong from the third to fifth centuries B.C. In the "Xiao Ya" section of the Book of Songs it is mentioned that "... in Central China there was the soybean and farmers collected it." Another song, "Guofen" (1,000 B.C.) states that "in October, rice and soybeans are collected." A book by Zuo Zhuan (351 B.C.) reports that "the King of Zhou has a brother who was unable to tell soybeans from wheat." In the Mo Zi (400 B.C.) it is stated that, "relating to farming and forestry, if soybeans and millet were plentiful, the people had enough to eat."

Archaeological findings: In 1959, in Houma County, Shanxi Province, archaeologists unearthed soybean grains now found in the Natural Museum in Beijing. According to carbon-14 determinations, they are 2,300 years old [c.a. 300 B.C.]. The seed coats have a yellow color, and the weight of a hundred grains is about 20 gm. These are the earliest and oldest of archaeological soybean seed relics in the world.

Distribution of the cultivated soybean: During the Zhou Dynasty, the soybean was grown mainly in the Yellow River valley as a main food staple. It was reported that "people eat soybean grain and soybean leaf soup." During the Han Dynasty, in Central China, the people suffered one calamity after another. It was then that large numbers of peasants migrated to the northeast and carried soybeans with them, (see Book of Fan Senzhi, 100 B.C.). At that time, the area for soybean culture was 40% of all crops.

In Shandong, Henan and Hebei provinces, soybeans are used primarily as a staple food. Soybean flour (10-20%) is added to wheat flour and the flour of miscellaneous other crops for noodles, steamed bread and buns. In North China and the Liaoning Province, soybean flour is added to milk to produce a milk powder substitute. Heilongjiang and Jilin provinces are taking the initiative in transforming soybeans into a variety of meat analogs. In northeast and northern China, soybean oil is the most important cooking oil.

Soybeans for industrial uses: The soybean has many industrial uses in China. One of the most important is in the production of high grade industrial enamels. It is also used extensively in the manufacture of varnishes and alkyl resin paints, and in inks and stains, pharmaceuticals, oilcloth, linoleum, and synthetic rubber. Soybean protein is used in adhesives, paper coatings, water-thinned paints, plastics, printing inks, and textile fibers. The soybean is widely used in the production of lecithin, hormones, vitamins, furfural, bakelite, and monosodium glutamate.

Historically, soybeans, tea, and silk have been China's three largest agricultural exports. A moderate percentage (10-20%) of the soybeans produced in China are used directly as human food in the form of sprouts or immature beans in the pod and as many products derived directly from the beans. There has been a surplus of soybeans in recent years in China, and exports to the USSR and Japan have been increasing. Utilization of soybeans in China will vary with the province. In Heilongjiang, the leading producer with 30% of China's soybeans for 1984, 40% were exported to the USSR and Japan, 35% went for human consumption, 10% went for seed purposes, and 15% were exported to other provinces in China. In Jiangsu Province, 80% of the soybeans produced go directly for human consumption.

Note: This document contains the earliest date seen for an archaeological dating of soybeans in China or East Asia or the world.

9003. Watanabe, Tokuji. 1987. Chemistry and technology of tofu and its derived products. In: Fujiharu Yanagida, ed. 1987. Traditional Foods and Their Processing in Asia. Tokyo: NODAI Research Institute, Tokyo Univ. of Agriculture. vii + 235 p. See p. 110-21. [8 ref]
• ***Summary:*** Contents: Introduction. Fresh tofu and its production: Process of tofu making, equipment, kinugoshi tofu, new raw materials for making tofu, new types of tofu. Aburage and other deep-fried tofu. Kori-tofu and its production: Process of making kori-tofu, large-scale production, equipment, distributing the product, utilization of by-products. Local varieties of tofu: Rokujo tofu, tsuto-dofu, tofuyo [fermented tofu]. Conclusion. Address: Faculty of Home Economics, Kyoritsu Women's Univ.

9004. Yamasaki, Yoshio. 1987. Nattô-kin chû no nigami pepuchido [The bitter peptide in natto]. *Nippon Kasei Gakkai-shi* (*J. of Home Economics of Japan*) 38(2):93-97. (Chem. Abst. 107:38308). [9 ref. Jap; eng]
• ***Summary:*** Butanol, the bitter peptide, was extracted from natto and separated into bitter peptide-rich fractions and other fractions. The amino acid composition of the main peptide component was analyzed. Address: Sakuyo Junior College, Tsuyama, Okayama 708, Japan.

9005. Yoshii, Hisao. 1987. Miso: Bean paste. In: Fujiharu Yanagida, ed. 1987. Traditional Foods and Their Processing in Asia. Tokyo: NODAI Research Institute, Tokyo Univ. of Agriculture. vii + 235 p. See p. 74-81. [3 ref]
Address: Faculty of Agriculture, Tokyo Univ. of Agriculture, Tokyo, Japan.

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9006. Takano Foods Co. 1987? Shôhin annai [Catalog of soyfood products]. Ibaragi-ken, Japan. 6 panels. Undated. 30 cm. [Jap]
• ***Summary:*** Takano Fuuzu K.K. makes 43 soyfood products, mostly natto, but also some tofu. On the cover, two black lacquered chopsticks hold a single yellow soybean over a red tray on a red table. Address: Ibaraki-ken, Japan. Phone: 02995-8-232.

9007. Takano Foods Co. 1987? Healthy wave [Healthy wave]. Ibaragi-ken, Japan. 16 p. Undated. 30 cm. Catalog. [Jap]
• ***Summary:*** This catalog introduces Takano Fuuzu K.K. and its soyfood products, mostly Okame natto, but also some tofu. Address: Ibaraki-ken, Japan. Phone: 02995-8-232.

9008. Tanikawa, Harry. 1988. Recent developments at House Foods and Yamauchi Inc. (Interview). *SoyaScan Notes.* Jan. 5. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** HF&Y has never made tempeh. The listing in Soya Bluebook was incorrect. Fuji is a separate company owned by Mr. Shoan Yamauchi. It specializes in sprouts (mung, alfalfa, and "spice" sprouts). Fuji bought Unicorn Village (Arizona), which was mostly an alfalfa sprout producer. Mr. Yamauchi is half owner of HF&Y, which is a partnership. They have had a hard time recently. First, at the end of 1985 and in early 1986 there was a lot of dumping of imported tofu by Morinaga, which had a "buy one, get one free" offer. The FDA made them change their labeling and gave them 3-4 months to deplete their old stocks. This problem is no longer serious. Second, they are now in the 6th week of a strike. The Hispanic workers are the most discontent. The local Chinese tofu makers sell at a pretty low price. HF&Y no longer even tries to compete with them in the Asian-American market; since 1981 they have become a company that sells primarily to supermarkets.

They are unionized and offer their employees a fair wage and benefit package; many smaller competitors are not unionized. HF&Y was unionized in 1981, before House Foods entered in 1983. That led to a big loss of ability to compete. That is why they have had to take such a strong stance during the current strike; what the union was asking for would have priced the company out of the market. House Foods has definitely not taken profits from the company, which raised prices; it all went to labor. Still House is very happy with its partnership. Azumaya may have passed HF&Y as America's largest tofu maker. They have taken a more aggressive attitude (especially outside California), and less red tape. He is not aware of any agreement between Azumaya and HF&Y not to compete in out-of-state markets. For decades, they have not competed inside the state. Address: Sales Manager, House Foods & Yamauchi, Inc., Los Angeles.

9009. Miyazawa, Mitsuo. 1988. [Re: History of Sendai Miso Shoyu Co. Ltd.]. Letter to William Shurtleff at Soyfoods Center, Jan. 14. 2 p. Handwritten. [Jap; eng+]
• ***Summary:*** Although this company was founded in 1919, its roots go back to the late 1500s. In March 1593 (Bunroku 2) 3,000 soldiers of Idate Han (the former feudal domain in northeast Japan where Sendai is now located) went to Korea, led by Daté Masamuné (DAH-tay Mah-sah-MU-nay) in the army of Toyotomi Hideyoshi. It was found during the summer battles that the miso brought by the soldiers from most other Hans started to spoil; only that from Idate Han (Sendai) remained tasty, and it was shared with the other soldiers. From this time the fame of Sendai Miso began to spread throughout Japan.

During the Genroku Period (1688-1703) the miso makers in the Sendai area formed a trade group named Miso Nakama. "Nakama" means "colleague, fellow worker, comrade, or associate." They established rules and made miso under the motto "Examine the quality first." During the Kyoho Period (1716-1735) they started selling shoyu and the group changed its name to Miso Shoyu Nakama." Sasa Ju (Sasaki Jubei) joined this group in the year 1834 (Tempo 5) and worked to protect its quality and tradition. During the Taisho Period (1912-1916) the Japanese economy was strong and demand for miso and shoyu from the Sendai area increased. So in 1919 the members of the Miso Shoyu Nakama formed Sendai Miso Shoyu K.K., headed by a descendant of Sasaki Jubei with the same name. The current president of Sendai Miso Shoyu K.K. is the 8th generation named Sasaki Jubei.

Since the mid-1970s the company has exported quite a bit of its naturally fermented miso and shoyu to macrobiotic and natural foods companies in the USA and Europe. Address: Sendai Miso Shoyu Co. Ltd., Furujiro 1-5-1, Sendai 982, Japan.

9010. Pritchard, Roxanne. 1988. New developments with Azumaya's Stir Fruity non-dairy yogurt (Interview). *SoyaScan Notes.* Jan. 20. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The initial problems were shelf life and wheying off. Now both have been solved. The product has a creamier consistency; it is not chunky when stirred. During the initial launch, the product was sold in the dairy section of supermarkets. But that would have required a long-term commitment to a very expensive advertising program. Now they sell it in the produce section and do in-store demos to promote it. In many cases it is stored in a closed cabinet, which has a lower temperature. Azumaya makes all the tofu they use in their Stir Fruity. Jill Mizono is now sales manager. Address: Azumaya, S. San Francisco, California.

9011. Ebata, Junko. 1988. Tenpe wa hatsugan busshitsu

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ni kiku. Osaka-shi Dai Ebata Jokyôju ga jikken. Tenpe no henigensei to kôhenigensei [Tempeh contains antimutagenic substances that can help prevent cancer. Experiments conducted by Asst. Prof. Ebata of Osaka City University]. *Toyo Shinpo* (*Soyfoods News*). Jan. 21. p. 3. [Jap]
• ***Summary:*** Experiments showed that tempeh controlled the mutagenic activities of AF2, a powerful carcinogen, used during the 1970s in Japan as a tofu preservative. Address: Prof., Faculty of Science of Living, Osaka City Univ. Sugimoto 3-3-138, Sumiyoshi-ku, Osaka 558, Japan. Phone: 06-605-2811.

9012. *Soybean Update.* 1988. Taiwan, the world's third largest importer of U.S. soybeans, is considering raising its duty on soybeans from 3% to 5%. Jan. 25.
• ***Summary:*** In July of last year, the Taiwanese government lowered the duty from 7.5% to 3.5%. The duty was dropped to 3% at the beginning of the year. The money generated from the move would subsidize fruit producers in Taiwan. Taiwan imports 99% of its soybeans from the U.S. Japan is the largest importer of U.S. soybeans.

9013. Kagiyama, Shogo; Aiba, T.; Kadowaki, K.; Mogi, K. 1988. New killer toxins of halophilic *Hansenula anomala.* *Agricultural and Biological Chemistry* 52(1):1-7. Jan. [23 ref]
• ***Summary:*** Two strains of killer yeasts, both identified as *Hansenula anomala,* were isolated from shoyu moromi. Both killer yeasts showed killer activity toward *Zygosaccharomyces rouxii* EA under high NaCl concentration conditions. Both toxins were glycoproteins. The killer activities of both toxins increased with increasing NaCl concentration. The killer activities of these strains were not abolished by cycloheximide treatment or by cultivation at 37ºC. No plasmid was detected in either killer yeast. Address: Research Lab., Higeta Shoyu Co. Ltd., Choshi-shi, Chiba 288, Japan.

9014. Miyao, Shigeo; Yamamoto, Atsuyoshi. 1988. Chômi moyashi no kakô to bisei-butsu [Processing of, and microorganisms in, seasoned soybean sprouts]. *Nyu Fudo Indasutori* (*New Food Industry*) 30(1):27-29. Jan. [Jap]
• ***Summary:*** Focuses on the level of Bacillus in seasoned soy sprouts. In dry soybeans the number of microorganism strains is: Bacillus 19, Micrococcus 13, Coryneforms 7, Molds 3. In soybean sprouts the number of strains is: Pseudomonas 58, Enterobacteriaceae 38, Acinetobacter & Moraxella 23, Flavobacterium 16, Xanthomonas 3, Alcaligenes 3, Micrococcus 3. Address: 1. Tokyô-to Nôgyô Shikenjô (Tokyo Metropolitan Agric. Exp. Station, Tokyo, Japan); 2. Kaneka Shokuhin K.K., Shokuhin Kenkyûshitsu (Food REsearch Lab.).

9015. Ohnishi, K. 1988. Miso jôzô ni okeru α-ka mai no riyô [Utilization of pre-gelatinized rice in the production of rice miso]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 83(1):30-36. Jan. [25 ref. Jap]
Address: Takeya-miso, Suwa, Nagano-ken 392, Japan.

9016. Okada, Noriyuki. 1988. Tenpe–Indonesia no daizu hakkô shokuhin [Tempeh–An Indonesian fermented soyfood]. *Shokuryo: Sono Kagaku to Gijutsu* (*Food: Its Science and Technology*) No. 27. p. 65-93. Jan. [1 ref. Jap]
• ***Summary:*** Contents: Origin of tempeh. Chronology of tempeh (Both taken largely from *History of Tempeh* by Shurtleff and Aoyagi). Methods of making tempeh (with a chronology of their development). Microorganisms that have been isolated from tempeh and its starter. Changes taking place during tempeh fermentation. Protein efficiency. Antioxidants in tempeh. Ways of eating tempeh. Conclusion. Address: Oyo Biseibutsu-bu, Biseibutsu Riyo Dai-ichi Kenkyu-shitsu (Norinsho, Tsukuba, Japan).

9017. *Toyo Shinpo* (*Soyfoods News*). 1988. Mainen niwari-kyô ga tenhaigyô e (tôfu gyôsha). Tsuini 25,000 gyôsha waru [Each year, over 2% of all tofu makers go out of business–the total number of tofu makers in Japan has shrunk to less than 25,000]. Feb. 1. p. 1. [Jap; eng+]
• ***Summary:*** In the end of December, 1986, the number of tofu makers in Japan was 24,821. This was 608 less than 1985 (2.45% less). In the past 10 years, 6,500 tofu companies have gone out of business in Japan. There has been a steady 2% drop each year for the last 10 years.

9018. *Toyo Shinpo* (*Soyfoods News*). 1988. Tôfu no juyôzô ni kitai. Somucho no kakei chôsa natsuba no nobi ga kyô?! [There is hope for increasing demand of tofu says a study from the General Affairs Dept. in Japan]. Feb. 1. p. 1. [Jap; eng+]
• ***Summary:*** In the period Jan.-Oct., 1987, the population consumed 71.93 cakes per household. During the same period in 1986, the number was 70.73 cakes per household. But the amount of money spent on tofu has decreased because of a 5% drop in price over last year.

9019. Abe, Keietsu; Hashiba, Hironaga; Uchida, Kinji. Assignors to Kikkoman Corp. (Noda, Japan). 1988. Novel variant and process for producing light colored soy sauce using such variant. *U.S. Patent* 4,722,846. Feb. 2. 7 p. Application filed 5 April 1985. [5 ref]
• ***Summary:*** The process uses a novel variant, *Pediococcus halophilus* 13-2, obtained by mutating *P. halophilus* X-160. It is capable of utilizing pentose sugars (which cause brown colors in soy sauce), but does not cause fermentation of D-glucose. The variant is added at the koji preparation stage, or in the early stage of brewing of soy sauce moromi. Address: 1-2. Noda, Japan; 3. Nagareyama, Japan.

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9020. Sturgeon, Bruce. 1988. Great Eastern Sun and the U.S. soymilk industry (Interview). *SoyaScan Notes.* Feb. 4. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** "Both Great Eastern Sun and Mitoku still import soymilk from Japan. Barry Evans (president) okayed my releasing our sales in terms of gallons of soymilk. Each of the following is our fiscal year from September 1 to August 31 the next year."

Year Gallons sold Percent Increase
1985-86 100,000 -
1986-87 106,000 6% New quart introduced
1987-88 148,000 40% Based on 5 months, annualized

The big increase in the current year is due almost entirely to the American soymilk. In the first 5 months of this year we've sold as much American-made soymilk as we sold in all of last year. We only make quarts in America. In New England, the low-price area, it retails for $1.59/quart average. A lot is sold in truckload quantities. During some sales, it goes for as little as $1.29/qt. On the West Coast it is typically $1.99 to $2.19. By comparison, the imported 6 oz product retails for $1.09 to $1.19, which is 3.8 times as much per fluid ounce, and this is not even a full margin. The product is made in Minnesota at St. Peter Creamery (which also makes spray-dried soymilk) then shipped in a stainless steel dairy tanker to Borden's in Pennsylvania. If that freight could be eliminated, it would allow significant reduction of the retail price. They are actively talking with St. Peter about getting a Tetra Pak machine there and sharing it. Edensoy's price is also high because of depreciation, and Sunsoy's because of exchange rate. There is considerable pressure on Vitasoy to float their currency. It will be interesting to see what happens to Vitasoy prices if that happens. Vitasoy has low overhead and plenty of excess capacity. Tetra Pak's sales of all products are way below their expectations; the main activity is in juices. Soymilk is doing well for them. Milk has not gotten off the ground, but it could with *Lysteria* scares and deaths. GES holds 1% of their product run for quality control. There are three routes of possible bacterial contamination in Tetra Pak cartons. 1. The spores that are not killed by the temperature/time combination. 2. Bacteria entering through a poorly sealed seam. 3. Bacteria entering through a failed steam seal in the 40-foot pipe from the UHT unit and the packaging machine. The packages explode. Address: Director of Marketing, Great Eastern Sun, 92 Macintosh Rd., Asheville, North Carolina 28806. Phone: 808-438-4730.

9021. Kainuma, Teisuke. 1988. Honolulu Sake Brewery Co. Ltd. (Interview). *SoyaScan Notes.* Feb. 8. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Honolulu Sake Brewery Co. Ltd, 2150 Booth Rd., Honolulu, HI 96813. Phone: 808-537-9069. It was founded about 80 years ago by Mr. Sumida, who is no longer living. His grandson, Mr. Sumida, is retired and lives in Honolulu. The company used to be called Honolulu Sake and Ice Co. It was recently purchased by Takara Sake Co. (Nihon Takara Shuzo Kaisha). They presently make soy sauce, sake, nigori (thick white sake) and mirin. Good contacts are Ron Sumida and Mr. Kimura, an engineer. Mr. Takao Nihei, who is retired in Honolulu, is the best man on the history. Phone: 808-537-1369. He wrote a history of the company and of sake in America, which was published in *Nippon Jozo Kyokai Zasshi* (1978, 1985). He might know if there was any amazake produced commercially in Hawaii. Mr. Kainuma has Mr. Nihei's articles on the history of sake, miso, and shoyu in Hawaii, which he will send. Takara makes sake in America. It contains 16% alcohol, by volume. In 1983 Takara purchased Numano Sake Co., which was founded in 1978 by Mr. Numano at 708 Addison St. in Berkeley, California. Address: V.P., Director of Production, Takara Sake USA Inc., 708 Addison St., Berkeley, California 94710. Phone: 415-540-8250.

9022. Nihei, Takao. 1988. History of amazake, sake, shoyu, and miso in Hawaii (Interview). *SoyaScan Notes.* Feb. 8. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Phone interview followed by a letter dated Feb. 18. He has written a history of sake, miso, and shoyu in Hawaii and America (5 installments), which he will send. Sake was first made in Hawaii in 1908 by Honolulu Shuzo Seizo Gaisha; the brand was Takara Masamune. Mr. Nihei did research on shoyu and miso at the National Fermentation Lab (Jozo Shikenjo) in Japan with Dr. Nakano and knows our work. From there he got into sake. He doesn't know much about amazake but thinks that there are no publications on it and there was never a commercial amazake company in Hawaii. The reason for that is that since long ago everybody there has made amazake from sake lees, perhaps since 1908, and not from koji, though koji was sold before World War II. He moved to Hawaii in 1950 and many people were making amazake from sake lees at that time. They mix the sake lees with hot water, plus sugar and a little grated ginger. His wife's method is his favorite.

Recipe #1, Hawaiian Style Amazake from Glutinous Rice and Sake Lees: Cook 1 cup glutinous rice (incorrectly called "sweet rice" or "mochi rice") with 3 cups water to make a porridge or gruel (*okayu*). Turn off heat and leave in covered pan for 10 minutes. When it is still fairly hot (50-55ºC; 122-131ºF), mix in 1 lb sake lees (sake kasu, which still contain some enzymes). Wrap the pot with towels or a blanket to keep the heat at about 130-140ºF (this is important) and allow to incubate in a warm place for about 2-3 hours. When the mixture becomes soft, add 1 cup sugar and 3 cups hot water, then bring to a boil over low heat. To serve, mix 1 part of this base with 2 parts water; Enjoy hot or cold. Refrigerate leftovers in a sealed glass jar.

Recipe #2, Quick and Easy Hawaiian Style Amazake from Sake Lees (without Glutinous Rice). Mix 3 cups hot

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water with ¼ pound (about 3/4 cup) sake lees. Let it stand for a while until the lees become soft. Heat on low heat, stirring gently until lumps dissolve. Stir in ½ to 3/4 cup sugar and ¼ teaspoon salt. When it comes to a boil, add a little grated ginger juice immediately, and serve. Address: 422 Uhini Place, Honolulu, HI 96813. Phone: 808-537-1369.

9023. *Herald-Journal* (*Clarinda, Iowa*). 1988. Iowa completes Japanese soybean market. Feb. 18. Also in Herald-Patriot (Chariton, IA). Feb. 25. "Goal is Soybean Japanese Prefer."
• ***Summary:*** Iowa farmers are trying to be more competitive in producing special soybeans for the Japanese. The Vinton and Pride soybeans, special varieties used in tofu, are large-seed, high protein. They have a yellow seed coat and a clear hilum. Other types of soybeans known as Prize and Iowasoy L5301 are used in preparing miso. In Iowa, out of 7,000 soybean farmers, only 100 farmers grow the special soybeans. There are no more than 100,000 acres in Iowa for producing special soybeans, which is a small amount. A farmer takes some gamble because these special varieties of soybeans don't yield as much as regular soybeans. However, a farmer receives a premium for high quality special soybeans. The market is changing, becoming more specialized. To sell the special soybeans a farmer has to contract with one of the eight soybean exporters in Iowa. During the 1960s Japan received it's food soybeans from the IOM, which stands for Indiana, Ohio, and Michigan.

9024. Kauffman, Harold. 1988. Possible workshop & conference on small scale soybean processing for developing countries (Interview). *SoyaScan Notes.* Feb. 18 and 26. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The Chinese in Jilin are interested in hosting the conference on 22 Aug. to 3 Sept. 1988 or 1989, but the research center is in a rural village with accommodations for only about 50-60 people. The two key questions are (1) whether to hold it in 1988 or 1989, and (2) sources of funding. Dr. Kauffman has gotten a verbal commitment from USAID, who may want to tie it in with their opening an office in China. Japanese sources (Ministry of Agriculture, National Food Research Inst. at Tsukuba) have shown interest but they cannot act quickly. I suggest (1) Make this the first of an annual or biannual conference, each on a different continent, (2) Have a combination conference and expo, with low-tech equipment, (3) Have multiple tracks in the conference for varying interests (LECs, tofu production, nutrition), (4) Invite Tokuji Watanabe as a speaker on modernization of the tofu industry in Japan, (5) Publish a book titled "Soyfoods Success Stories from Developing Countries."

Note: This workshop was cancelled following the massacre in Tiananmen Square, Beijing, China on 4 June 1989. Address: Director, INTSOY, Univ. of Illinois, Urbana, IL.

9025. Erb, Gene. 1988. Soybean research sprouts products. *Des Moines Register* (*Iowa*). Feb. 21.
• ***Summary:*** Lawrence Johnson is the professor in charge of the Food Crops Processing Research Center at Iowa State University. By the 1930's and 1940's, scientists were earnestly working to find new products and ways to use the soybean. "Utilization research" flourished during those decades. Johnson said, "In this country, we have not aggressively sought export markets for value-added products. We have concentrated on exporting low-value commodities. The major utilization research projects from the 1930's and 1940's ceased in the 1950's because we thought we were headed toward a world food crisis. We shifted to production research and away from utilization. We have to go back to some of the old ideas that have been neglected since the late 1940's. Current research projects at ISU's Food Crops Processing Research Center are directed at improving food and feed processing operations and profitability,"

Several projects are aiming at finding faster, cheaper ways to extract oil from soybeans. The university's Vinton bean is preferred by the Japanese for the production of tofu. Researchers Walter Fehr and Earl Hammond have developed a soybean low in linolenic acid. A small-seeded soybean developed at ISU should be ideal for making soybean sprouts for use in salads. The goal is to develop specialty strains for unique uses.

9026. Belleme, John. 1988. Update on miso in America. How about amazake as a soymilk sweetener? (Interview). *SoyaScan Notes.* Feb. 23. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Mitoku (Mr. Kazama and Chris Dawson) is considering a joint venture with Sendai Miso Shoyu of a miso plant on the West Coast of the USA. This is still very tentative. They are also considering making amazake. But about 2 years ago Miyako Oriental Foods increased their miso production capacity. They can probably make over 1 million pounds a year now. It was about 600,000 lb/year. Fujiwara Brewing Co. in Okayama, which makes equipment for miso and soy sauce companies, supplied the equipment to Miyako. The company San-J finally used to build their tamari plant and supply the equipment was Fujiwara's competitor, Nagata. Steve Earle said this was the same company that had just helped expand the Miyako plant. According to the people at Ohsawa-America, Mr. Kitani, the Japanese man who makes Yamaki Shoyu, and Bob Kennedy, formerly of Chico-San are planning a miso plant in the USA, probably with automatic koji equipment.

John feels that sales of miso in America have slowed down and that if new companies enter the market, it will be oversupplied. At American Miso Co. his maximum capacity was about 400,000 lb/year. The volume hasn't changed

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much in the past few years. Christian Elwell at South River Miso Co. has a capacity for about 60,000 lb/year, which he hasn't reached. Both these are more expensive than Miyako ($4.49 for American Miso white miso, Christian's is more, and Miyako's is about $2.85/lb, or only 63% as much). He suggests: How about amazake as a sweetener for soymilk? It would replace barley malt and give the soymilk more body, kind of like a shake. Then you can put rice on the label. Great idea! Address: Route 5, Box 258, Rutherfordton, North Carolina 28139. Phone: 704-749-9537.

9027. Roller, Ron. 1988. Edensoy and the U.S. soymilk market (Interview). *SoyaScan Notes.* Feb. 23. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Ron estimates the size of the U.S. soymilk market to be about 2.1 million gallons a year (not including infant formulas, or small fresh local manufacturers). The largest companies, in descending order of size, are: American Soy Products (Eden Foods; 55-65% market share), Vitasoy, Sunsoy, Westbrae, and Great Eastern Sun. The trend is definitely up. Vitasoy's aggressiveness in the marketplace from early 1987 slowed down Edensoy's progress. Then Vitasoy had big programs and in the last 4 months they seem to have cooled out quite a bit. A Dun & Bradstreet report shows that they lost $700,000 last year selling soymilk.

All is going very well in the joint venture with the various Japanese companies. The relationships are generally harmonious, and they are on target in terms of their volume goals and expectations. They hope to increase volume to cut down overhead expenses. The plant can make 65-70,000 cases/month. During the last 2 months there have been 15 enquiries for export, some of which will soon be signed agreements with France, New Zealand, Australia, etc. They have approval for 190 Kroger stores and are cautiously optimistic on this. Mr. Iwazuki from Marusan runs the ASP plant. They now have 6 soymilk products which are Eden Foods' top six best-sellers: three flavors (carob, vanilla, original) in two sizes (liter and 250 ml). By volume, the liter outsells the 250 ml by more than 3 to 1. Next: an organic soymilk (They now use non-organic Beeson soybeans. The organic market now seems to be growing rapidly), some new flavors, and some totally new soy products, such as tofu. Eden no longer imports soymilk. Soymilk is pretty price sensitive; whenever they put it on sale, it moves. They just started a case-stack program that Sunsoy has had for years. When they started the plant they stopped wholesaling, and dropped over $1 million of wholesale business. But they made that up this past year, plus some.

Concerning oil in soymilk: The label on their Japanese imported product was not correct. Oil was added in Japan but Eden was not told. It was not listed on the label. When their U.S. product was launched, it contained less than 1% added oil. Eden got so many complaints about this small amount that they now no longer add oil, except to the carob, and that will be discontinued as soon as their present labels are reprinted.

Concerning other grains, they are importing Job's tears, which is now recommended by macro teachers for cancer patients. They brought the price from $8.50 down to $2.00/lb and sell lots. Also involved with quinoa, they used to be the master distributor for Quinoa Corp. but are now importing lots from Andean countries; expect to reduce the retail price by 40%. They are thinking of using quinoa in soymilk. Their present sweetener is "malted cereal sweetener" which is made by mixing sprouted barley with corn grits, the adjunct. Rice is too expensive. You can get a higher sugar content with corn than with barley. Rice is still higher in sugar. Corn converts the fastest; rice is slow. It is specially made by a malting house, and they use almost a tanker load every 10 days. They helped develop the product and intend to come out with a line of malted grain sweeteners using malted barley plus different grains. "There is a lot of funny business in the malting arena." They did not like the use of commercial enzymes by California Natural Products. He thinks most people do not realize how their rice syrup is made. Address: Director of Purchasing, Eden Foods, Clinton, Michigan.

9028. Kushi, Aveline. 1988. Early imported amazake and miso in America (Interview). *SoyaScan Notes.* Feb. 24. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Aveline recalls that she first saw amazake in America in Los Angeles in about 1970. She bought some at the time. It was a white rice amazake imported from Japan, probably in a plastic bag. She came to America in 1951 and by 1952 recalls seeing Hatcho miso being imported to the East Coast from Japan by Japan Foods. Address: Brookline, Massachusetts.

9029. *Los Angeles Times.* 1988. Runners to receive Mori-Nu Tofu. Feb. 25.
• ***Summary:*** An anticipated 15,000 Los Angeles Marathon runners will get something different in their pre-race "goodie bags" this year–tofu.

Samples of recipes made with tofu will be offered to the public as well during the marathon's four day Health and Fitness Expo and race-day Finish Line Festival.

9030. Archer Daniels Midland Co. 1988. Second quarter report to stockholders. Box 1470, Decatur, IL 62525. 8 p.
• ***Summary:*** On 19 Jan. 1988 ADM common stock began trading on the Tokyo Stock Exchange. ADM was the 62nd U.S. company and the 90th foreign company accorded listing privileges by the Tokyo Exchange. Tracing its history to the establishment of the Tokyo Stock Exchange Co., Ltd. in 1878, the Tokyo Stock Exchange in its present form was founded in 1949. It is now one of the most active and influential markets in the financial world.

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ADM is now actively developing degradable plastic bags from corn starch. Address: Decatur, Illinois.

9031. Asanuma, Shuichi. 1988. Naijeria ni okeru daizu no saibai to konryûkin [Cultivation of soybeans and root nodule bacteria in Nigeria]. *Daizu Geppo* (*Soybean Monthly News*). Jan/Feb. p. 4-11. [10 ref. Jap]
Address: Nôgaku Hakase, Nôrin Suisanshô, Hokkaidô Nôgyô Shikenjô, Shunin Kenkyû-kan.

9032. Breene, William M.; Harrigan, Kathleen A. 1988. Sucrose esters: Their impact on soybean oil utilization. In: L. McCann, ed. 1988. Soybean Utilization Alternatives. St. Paul, MN: Univ. of Minnesota Center for Alternative Crops and Products. vi + 429 p. See p. 367-80. [32 ref]
• ***Summary:*** Discusses: Nature of sucrose esters. History of sucrose esters. How sucrose esters are made. Uses and potential uses of sucrose esters. Regulatory status of sucrose esters. The future of olestra. Impact of olestra on soybean utilization. Sucrose polyesters (SPE) are not the newest class of food additives on the market, but they may well prove to be among the most versatile and controversial. The concept of sucrose polyester production in the U.S. was probably initiated in 1952 when Dr. Henry B. Haas, then president of the Sugar Research Foundation, urged Dr. Foster D. Snell to investigate the possibility of "hanging a fat tail" on sucrose to make detergents.

The original patent for "Low Calorie Fat-Containing Food Compositions" was granted to Procter & Gamble Co. in 1971 for products developed in their laboratories by Fred H. Mattson and Robert A. Volpenhein. The patent expires in August of 1988. The company has proposed "olestra" as the generic name for these products. The Japanese market is dominated by Ryoto Co. Ltd. which was formed in 1972 as a result of the joint venture between a Japanese chemical supplier, Mitsubishi Chemical Industry Ltd. (MCI) and the Dainippon Sugar Manufacturing Co. Ltd., licensee of the Snell process since 1958. MCI is the world's largest producer of sucrose esters, with 70% of the world's sales.

The history of SPE approval as a food additive began in Japan in 1959. In 1969, the Joint Food and Agriculture / World Health Organization (FAO/WHO) Expert Committee on Food Additives approved usage. Originally SPE was the product of research to determine which fats might be easily digested by premature infants. The research resulted in an "180 degree turn" when it was discovered that SPE were less, rather than more, digestible than triglycerides. Procter & Gamble has requested that the FDA allow olestra to be used as a replacement for up to 35% of the fat in cooking oils and shortenings used in homes and restaurants, and up to 75% of the oils and shortenings used in the deep-frying of snack foods. The reduction in calories for each of these products was at least 32% and ranged as high as 56%. Address: Dep. of Food Science & Nutrition, Univ. of Minnesota.

9033. *Harvard Medical School Health Letter.* 1988. Follow-up and feedback: Soy sauce and fish (Substances favoring nitrosamine formation). 13:8. Feb. [1 ref]
• ***Summary:*** "Our article on nitrates and cancer (June 1987) mentioned that 'some types of preserved fish and certain varieties of Japanese soy sauce' are among the foodstuffs containing substances that favor formation of nitrosamines. Nitrosamines have been implicated in carcinogenesis, and it has been suggested that a high dietary exposure to them might promote cancer of the stomach (which is increasingly rare in the United States, but very common in Japan). It has also been suggested that their formation from nitrites can be inhibited by the actions of vitamin C and vitamin E.

"Several readers, understandably, wrote to ask *which* soy sauces and fish have this characteristic. In the case of soy sauces, we don't know. The Japanese researchers who reported the finding identified the products they studied only by country and state of origin. Several soy sauces produced in the state of Chiba, Japan, and one from the state of Mie, converted nitrite to nitrosamine at a high rate, and the resulting material had a high score on a laboratory test of bacterial mutation (a version of the Ames test), which is believed to correlate with carcinogenic potential. Soy sauces produced in other Japanese states and Hawaii, and most produced in the United States, yielded less nitrosamine and had much lower scores. One exception, from Wisconsin, was very high on both counts. But it was only identified as 'soy sauce M.'"

9034. *Health Foods Business* (*Elizabeth, New Jersey*). 1988. Mori-Nu joins Soyfoods Association. Feb.
• ***Summary:*** Morinaga announced that it will joins the Soyfoods Association, which was organized in 1984.

9035. Kikkoman International Inc. 1988. Kikkoman stands on ceremony (Ad). *Prepared Foods* 157(2):3. Feb.
• ***Summary:*** This full-page color ad shows two shallow shoyu tasting cups on a tray. "We would consider it an honor to perform Soy Ceremony for you personally. To see, smell and taste the Kikkoman difference contact Kaz Takei, Kikkoman International, Inc.," San Francisco.

"Choose from: Regular Brewed Soy, Reduced Salt Soy, Preservative Free, and dehydrated Soy Sauces. Kikkoman provides technical advice and prompt service from over 20 U.S. distribution centers."

Across bottom of ad: "Since 1630. Kikkoman. Good taste is our business."

9036. Morinaga Nutritional Foods, Inc. 1988. Lessons in tofu (Ad). *Vegetarian Times.* Feb. p. 7.
• ***Summary:*** This striking full-page color ad contains the following sections: Not all tofu are created equal. Eat everything your heart desires. Mori-Nu makes delicious

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Lessons in Tofu.

Not all tofu are created equal.

Mori-Nu Tofu is different. It's the only tofu that's actually made right inside an aseptic package. While most other tofu are made first, then packed in water, losing freshness daily, Mori-Nu's exclusive package locks in the delicious flavor of just-made tofu with every box and protects it until you open it. Guaranteed. No preservatives, no irradiation. Just silken-smooth tofu in a convenient revolutionary package.

Eat everything your heart desires.

Mori-Nu is a cholesterol-free, low-calorie protein source. It is also low in sodium and adapts easily to your favorite recipes, often letting you eliminate milk and eggs entirely. Make everything from drinks, dips and dressings to hearty main courses and desserts. Scramble it, broil it, bake it—even fry it. Or slice it into soups and salads. Just about any meal you prepare can benefit from this simple, natural, healthy and versatile food.

Mori-Nu makes delicious fun.

Blend the sweetness of strawberries into beautiful nutrition. Here's an easy, elegant dessert that everyone will love.

Strawberry Pudding Fluff

1 envelope unflavored gelatin.
1/4 cup boiling water.
1-10.5 oz. package **Mori-Nu Tofu (Silken/Soft),** drained, at room temperature.
3 Tbsp. honey, light color.*
2 cups whole fresh strawberries, if frozen use unsweetened, thaw, and drain.
1/2 cup additional strawberries.

1. Dissolve gelatin in boiling water. Stir until crystals disappear. Allow to cool.
2. In a blender or food processor, combine tofu, honey and gelatin mixture. Add 2 cups strawberries, a cup at a time. Blend on low. Allow some berries to remain in chunks.
3. Place the remaining berries in bottom of each serving glass. Add strawberry tofu mixture. Chill until set and serve cold.

*To sweeten, add more honey as desired.

Makes 4 servings of 6 oz. each. Per serving 126 calories, 5.8g protein, 2.8g fat, 23g carbohydrates, 8mg sodium, 0mg cholesterol.

Healthy Times focuses on today's heart-healthy lifestyles. Meet interesting people, learn about nutrition, and discover exciting, original tofu recipes.

Join the Mori-Nu Health for Life Club.

Learn more about this miracle food. Receive bi-monthly mailings of the **Healthy Times**, Mori-Nu's own newsletter, 15¢ coupons (2 per mailing) and full color tofu recipe series. For a one-year membership, send $2 check or money order to: Morinaga Nutritional Foods, Inc., Box 50, Dept. B 388, Pico Rivera, CA 90665.

Look for Mori-Nu's miracle package.

You'll find Mori-Nu in the Produce, Deli or Oriental food section of your store. Ask for it by name.

Always tastes just made. MORI-NU

© 1988 Morinaga Nutritional Foods, Inc., 5800 S. Eastern Avenue, Suite 270, Los Angeles, CA 90040

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fun. Strawberry Pudding Fluff (recipe, which includes tofu, strawberries, etc. plus 1 envelope unflavored gelatin). Join the Mori-Nu Health for Life Club. Look for Mori-Nu's miracle package. At the bottom of the ad is the slogan: "Always tastes just made." Small color photos show: Tofu spaghetti sauce over pasta on a white plate. A tall stemmed glass of pink Strawberry Pudding Fluff. A stack of pancakes that contain tofu. The cover of Mori-Nu Healthy Times newsletter. A slice of tofu cheesecake. Two packages of Mori-Nu Tofu (firm and soft).

Note: This is Morinaga's first color ad for tofu in the USA. It is also their first full-page color ad.

This ad also appeared in Vegetarian Times (April p. 11), East West (Feb., March p. 54), Delicious, Bestways (Feb. p. 23, March p. 25, April p. 42, May p. 15), New Age Journal (March/April p. 11), etc. Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9037. *Natural Foods Merchandiser.* 1988. Soyfoods import costs rise as dollar declines. Feb. p. 32.
• ***Summary:*** Discusses techniques used by Westbrae, Edward and Sons Trading Co., Eden Foods, and San-J International to try to deal with the falling value of the dollar against the yen. The dollar began its fall in September 1985. In the past 18 months, the dollar has been devalued almost 40% against the yen, making Japanese imports about 40% more expensive. To try to keep consumer prices as low as possible, some companies try to absorb the cost increases themselves, some ask Japanese manufacturers to help, and some (such as Eden Foods, Westbrae, and San-J) start to make products in the USA.

9038. Nomura, Yukihiro; Sugisawa, K.; Adachi, O.; Ameyama, M. 1988. Kotei-ka sakusan-kin o riyô shita ekijô no fukai-shû no teigen hôhô [Reduction of off-flavor in liquid foods using immobilized acetic acid bacteria]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 62(2):143-48. Feb. [6 ref. Jap; eng]
• ***Summary:*** Off-flavors caused by aliphatic aldehydes (e.g. hexanal) in defatted soy milk were reduced by acetic acid bacteria immobilized onto KAPPA–carrageenan. Optimum pH and temperature were 5 and 50ºC, respectively. Address: 1-2. The Research Inst., House Food Industrial Co., Higashi-Osaka 577, Japan; 3-4. Dep. of Agricultural Chemistry, Yamaguchi Univ., Yamaguchi 753, Japan.

9039. Saio, Kyoko. 1988. Chugoku daizu shokuhin tanbô-ki [Report on Chinese soyfoods]. *Daizu Geppo* (*Soybean Monthly News*). Jan/Feb. p. 12-24. [Jap]
Address: National Food Research Inst. (Shokuhin Sogo Kenkyujo), Kannon-dai 2-1-2, Yatabe-machi, Tsukuba-gun, Ibaraki-ken 305, Japan: Shokuhin Rikagaku Bucho.

9040. Shurtleff, William; Aoyagi, Akiko. 1988. Amazake and amazake frozen desserts: Industry and market in North America. 1st ed. Lafayette, California: Soyfoods Center. 10 + 28 + 17 + 17 p. Feb. 21. 28 cm. [82 ref]
• ***Summary:*** Contents: 1. Amazake industry and market analysis: Introduction and overview. History. Market size and growth rate. Comparison with the soymilk market. Largest manufacturers of amazake and amazake products in North America. Market segments (who buys, outlets where sold, geographical). Product types. Prices. Packaging. Imports. Market outlook and forecast. 2. Forty-three commercial amazake products and product/company histories, with index. 3. Bibliography on amazake and amazake frozen desserts (17 references with index). 4. Early documents and labels. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

9041. Sipos, Endre F. 1988. Edible uses of soybean protein. In: L. McCann, ed. 1988. Soybean Utilization Alternatives. St. Paul, MN: Univ. of Minnesota Center for Alternative Crops and Products. vi + 429 p. See p. 57-93. [107 ref]
• ***Summary:*** Discusses: Definitions and methods of preparation. Nutritional and health aspects of soy proteins: Nutritional value of soy protein ingredients, amino acid profile, digestibility, amino acid requirements, nutritional value of soy proteins in food systems, meat, poultry, and fish, dairy products, cereal grains, health and soy protein products. Functionality: General properties, functionality of soy protein ingredients, soy flours/grits (untextured), soy protein concentrates (untextured), soy protein isolates, soy albumens, textured/structured soy protein products, flavor and texture. Uses in food systems: Meat food products, emulsified meats, coarsely-chopped meats, canned meats, whole muscle meats, poultry products, seafood products, analogs, pet foods, dairy-type products, bakery products–cereals–pastas, bread and rolls, specialty breads, cakes and cake mixes, doughnuts, breakfast cereals, pasta products, misc. baking applications, misc. foods. Consumption trends. Future considerations. Summary.

Soy protein concentrates are preferred in milk replacers for baby animals such as calves, lambs, and pigs because of their low soluble carbohydrate content (i.e. less gastrointestinal disturbance problems) and lower immunogenicity. The industry producing edible soy protein products for human consumption has grown enormously since the late 1950's. Yearly world production is estimated to be approximately 1,500,000 tonnes (metric tons or 3,300 million lb; Note: Text figure of 1,500 tonnes is an error) of soy flour, 90,000 tonnes (200 million lb) of soy protein concentrate, and 70,000 tonnes (170 million lb) of soy protein isolate, which amounts to about 3,700 million pounds/year of edible protein for human consumption. Since soy flour is used in many developing countries where statistical records are incomplete, the figure for this

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ingredient could be higher than given here. The demand for soy protein concentrates appears to be growing at the fastest rate.

Note: Dr. Dale Johnson, in a personal communication to Dr. Walter Wolf at the USDA Northern Regional Research Center in Peoria, Illinois, estimated the 1985 production of isolated soy proteins in the USA to be 70,000 tonnes. Sipos here gives that same figure as the world total. Yet isolate production has increased worldwide since 1985 and it is produced outside the USA in Japan, in Belgium (by Ralston Purina), and in China. Address: Sipos & Associates, Inc. Fort Wayne, Indiana.

9042. *Southern Supermarketing* (*Birmingham, Alabama*). 1988. Kikkoman International–After more than 300 years, the success continues. Feb. p. 6-7.
• ***Summary:*** In the last two years, the South has shown the strongest growth record for Kikkoman products as compared to all other regions of the country. The Kikkoman method of production is a six-month process as compared to about a week required for the blended mixture (HVP). Kikkoman is not only the world's oldest brand of naturally-brewed soy sauce–it is also the world's largest selling soy sauce. In Japan, the average person consumes approximately 2.6 gallons of soy sauce a year. Kikkoman's share of this huge market, where there are about 3,000 soy manufacturers, is approximately 30%. In 1957, Tom Yoshinaga pioneered Kikkoman International Inc. in the U.S. and began opening regional offices like stepping stones.

Today, Kikkoman International has five regional offices in San Francisco, Los Angeles, New York, Chicago, and Atlanta. When Kikkoman first entered the U.S. market in the 1950s, the product was very unique in terms of its positioning because it had "All Purpose" printed on the label. Those two words were an important factor contributing to the success of the brand. In 1961, Kikkoman pioneered the bottled teriyaki sauce market in the U.S. Kikkoman introduced Teriyaki Baste & Glaze in 1984. Baste & Glaze is a thick and richly flavored teriyaki sauce. In 1982 Kikkoman developed Lite Soy Sauce with 40% less salt. This product represents about 20+% of Kikkoman's total soy sauce volume. Similarly, in 1986 Kikkoman introduced Stir-Fry Sauce.

9043. Sugawara, Etsuko; Ito, T.; Odagiri, S.; Kubota, K.; Kobayashi, A. 1988. Edamamé kôki seibun no seijuku ni tomonau henka [Changes in aroma components of green soybeans with maturity]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 62(2):149-55. Feb. [3 ref. Jap; eng]
• ***Summary:*** "The characteristic aroma of immature green soybeans (*edamame*) was analyzed by GC (gas chromatography) and GC-MS. The results were compared with those of soybeans. From the aroma concentrates of green soybeans, 28 components were identified, and 19 components were tentatively identified... (Z)-3-Hexenyl acetate, *cis*-jasmone, linalool, and acetophenone that were not identified in ripe soybeans were considered to contribute to the flavor of green soybeans. *cis*-Jasmone was considered one of the key compounds in the flavor of green soybeans, because it was not found in the aroma concentrate of green soybeans harvested at a late stage of immaturity." Address: 1. Faculty of Education, Iwate Univ., Ueda, Morioka 020; 2-3. Dep. of Agricultural Chemistry, Iwate Univ., Ueda, Morioka 020; 4-5. Lab. of Food Chemistry, Ochanomizu Univ., Bunkyo-ku, Tokyo 112. All: Japan.

9044. Takeuchi, T. 1988. Mame miso seizô to hinshitsu tokusei [Manufacture and quality traits of soybean miso]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 83(2):105-11. Feb. [6 ref. Jap]
• ***Summary:*** Quality traits include aroma and flavor. Address: Faculty of Home Economics, Gifu Women's College, Gifu, Japan.

9045. Wood, Rebecca T. 1988. All-American miso. *Bestways.* Feb. p. 27.
• ***Summary:*** Prior to the 1970's, miso was an unknown word–and taste experience–to most Americans. Today this traditional Japanese food, is fast becoming an important staple for the health conscious. Address: Crestone, Colorado 81131.

9046. Earle, Steve. 1988. Re: Answers to questions about the history of San Jirushi. Letter to William Shurtleff at Soyfoods Center, March 7. 3 p. Typed, without signature on letterhead.
• ***Summary:*** No history per se of San-Jirushi has ever been written, however the Sato family has many records of historical interest. The original company, named Minato-ya ("Harbor Company"), was a trading house that traded up and down the rivers that empty into the Bay of Ise at Kuwana. Among the wares traded were salt, miso, and tamari. The miso and tamari were brewed in one of their warehouses (*kura*). Later this became Minato-ya's principal business as the shipping trade moved north to Nagoya.

"There are indications that Minato-ya was already in operation at the beginning of the Edo period (1601), however it is not clear when it began producing miso and tamari as the earliest records were lost when the Minato-ya kuras were burned due to fire bombings in the Second World War...

"The company name was changed in 1909 from 'Minato-ya' to 'Sato Shinnosuke Shoten' and finally to 'San-Jirushi Brewing Corporation' in 1963.

"The original address was Ise-no-kuni, Kuwana-gun, Kuwana-cho Ooaza Senba.

"The original brand/trade name was Yamasan. The name and mark [three horizontal lines with a roof-like mountain

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over the top] symbolized Mount Tado (upriver just northwest of Kuwana) and the three rivers, Kiso, Ibi and Nagara...

"The mountain was dropped from the mark and the name changed to San-Jirushi in 1909. This name was officially registered in 1912.

"The original products were called 'miso' and 'tamari' (not 'tamari-shoyu'). The original ingredients of Minato-ya's miso and tamari were soybeans, water and salt. No wheat was used. There was also originally no *kosen* (roasted barley flour) used with the seed koji. This koji was called 'tomo-koji' and was made by obtaining koji-dama (half-fist sized balls of compressed, cooked soybeans) which were then hung in straw sacks over the rafters in the kura loft to incubate. In these days there were apparently tradesmen, much like the 'toujishi' in sake brewing, who made a circuit of miso and tamari brewers, bringing with them tomo-koji. There is still one employee of San-Jirushi who can recall making koji by this method in the old San-Jirushi kura.

"San-Jirushi began using seed koji [koji starter] in 1933. Koji-ya Sanzaemon, the koji house that still supplies San Jirushi today, has been in operation continuously since the Muromachi period supplying seed koji for sake manufacture, however this technology was not applied to miso and shoyu manufacture until quite late (Kikkoman and the four major shoyu brand makers began using seed koji at about this same time)." Address: UN Park Building, 7th Floor, Ebisu-Nishi 1-19-6, Shibuya-ku, Tokyo 150, Japan. Phone: 03-780-5933.

9047. Shapiro, Margaret. 1988. Japanese outpace the world in life expectancy: Experts credit their low-meat diet. *Washington Post.* March 8. p. HE11.
• ***Summary:*** A table shows that a baby born today in Japan will live 80.9 years (for women) or 75.2 years (for men). In the United States these figures are 77.6 years for women (3.3 years less) and 70.1 years for men (5.1 years less). These Japanese numbers "represent one of the most dramatic increases in life expectancy of any nation since the end of World War II,..." Since the 1970s, the Japanese have been living longer than the Americans, but only in the 1980s did they pass the Swedes. The main reasons for Japan's postwar gains in life expectancy are: (1) Elimination of many deadly diseases, including dysentery and tuberculosis. (2) Major advances in medical care, including a universal system of medical coverage. (3) The lowest infant death rate in the world. (4) A healthy diet that is low in fat and cholesterol, low in total caloric intake, and high in fiber, soybean curd, seaweed, and vegetables. "As a result, the Japanese have one of the lowest levels of cholesterol and heart disease in the world." But Japanese a very high salt intake, which has resulted in one of the world's highest death rates from strokes–blood vessel hemorrhages in the brain. Address: Washington Post Foreign Service.

9048. Ballard, Bob. 1988. History of Great Eastern Sun (Interview). *SoyaScan Notes.* March 10. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The company was founded in March 1982 by Barry Evans (who is now the sole owner and lives in Los Angeles). He may have been joined by Martin Roth and John Belleme. The original purpose was to be a distributor for the miso made by American Miso Company. But it soon decided to import Japanese macrobiotic products from Mitoku (the first order was placed in Jan. 1982) and later became a manufacturer. Address: 92 Macintosh Rd., Asheville, North Carolina 28806. Phone: 808-438-4730 or 704 252-3090.

9049. DeBona, Don. 1988. Re: History of The American Miso Co. Letter to Bob Carr at Cleveland East West Center, March 13. 6 p. Handwritten.
• ***Summary:*** "The American Miso Co. was begun in 1979 by Barry Evans, Sandy Pukel, Joe Carpenter, John Belleme, Michio Kushi, James Kenney, and several other partners. It was arranged for John Belleme and his wife to travel to Japan and study for 7-8 months with the Onozaki family of traditional miso makers. John Belleme returned and began making traditional miso for the then named Oak Feed Miso, Inc., previously called the Erewhon Miso Co., and presently the American Miso Co.

"Meanwhile, Barry Evans began a new company in order to distribute our miso. This company was, and still is, called The Great Eastern Sun Trading Co., located in nearby Asheville, North Carolina. Barry Evans eventually became the sole owner of the American Miso Co. I came to work for Great Eastern Sun in 1983. Prior to this I had worked for several years for Laurelbrook Foods, a large natural foods distributor in Maryland, and then on a Permaculture farm along the Maryland/Virginia border for two years growing organic winter wheat, barley, soybeans and summer produce according to the principles set forth in Masanobu Fukuoka's classic, *The One Straw Revolution*... We still do some farming and quite a bit of gardening on our 100 acres here at American Miso Co., in the foothills of the Blue Ridge Escarpment. I met my wife at a macrobiotic study house in 1980.

"We arrived at American Miso Co. in February 1985 and I took over the position of miso maker after John Belleme's departure in December 1985 [Note: Belleme was fired by Barry Evans.] I was trained to make miso by Akinori Takei, my Japanese teacher and friend, who had also studied with the Onozaki family in Japan. Takei-san remained with me for approximately another year; since then I have been on my own. We are a small enterprise and make approx. 250,000 lb of miso a year with only 3 employees and myself. We make all of our own koji (both barley and rice) by hand in a centuries-old fashion." Address: Route 3, Box 541, Rutherfordton, North Carolina 28139.

9050. *Toyo Shinpo* (*Soyfoods News*). 1988. Takai seisakusho

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honsha, kôjô o kensetsu [Takai is going to rebuild their main offices and production plant]. March 21. p. 1. [Jap; eng+]
• ***Summary:*** The total construction is going to cost ¥300,000,000. They are going to start building at the end of April, 1988. The first floor of the new headquarters will have a laboratory for testing the chemistry of foods. The second floor will be management, and the third floor will be the planning or design area. The company is planning to finish building in the end of July and start moving in at the beginning of August. Address: Tokyo, Japan.

9051. Sugisawa, Ko; Matsumura, Y.; Sengoku, K.; Nagatome, Y. Assignors to House Food Industrial Company Ltd. (Higashi-Osaka, Japan). 1988. Process for preparing tofu charged into a container. *U.S. Patent* 4,732,774. March 22. 5 p. Application filed 3 Feb. 1987. Application also filed in Japan on 4 July 1984. [7 ref]
• ***Summary:*** Soymilk (containing 10-13% solids by weight) is combined and mixed with a polyphosphate and casein or a casein salt, then homogenized under high pressure. "The combination of the addition of said polyphosphate and caseins with said homogenizing treatment synergistically heightens the delayed coagulation effect and results in the production of tofu of excellent quality." The coagulant used in this invention can be of any type including the delayed acting type (GDL) and the rapid acting type (magnesium chloride or calcium sulfate, used alone or with GDL). A fast-acting type should be added to cooled soymilk. The mixture is charged into a package and coagulated by heating after the package is sealed. Thus, this the tofu is made in the container.

Example 1. 2 kg of soybean milk having a dry solids concentration of 11% is prepared. "0.5% of sodium caseinate (relative to the weight of soybean milk; hereinafter the same) was added to the soybean milk after 0.084% of anhydrous sodium pyrophosphate, 0.058% of sodium tripolyphosphate and 0.058% of sodium hexametaphosphate had been added thereto, whereafter, the mixture was mixed and solubilized using high-speed mixer. Said mixture was homogenized under a pressure of 150 kg/square cm by a homogenizer and then cooled below 10ºC, whereafter 0.5% of magnesium chloride was added to and mixed therewith. Thereafter, the mixture was charged into heat-resistant plastic containers in amounts of 300 gm each and sealed. The mixture was then coagulated by heating in hot water at a temperature of 85ºC for 60 minutes, whereby tofu charged into containers was obtained." See also Japanese Patent 84-138,480 (July 1984), and a 1987 patent with the same title by the same company. Address: Nara, Japan.

9052. DeBona, Don. 1988. Developments at American Miso Co. since 1985 (Interview). *SoyaScan Notes.* March 25. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Don left his job as general manager at Great Eastern Sun and began to work at American Miso Co. (AMC) in February 1985. He took over management of the company in December 1985 after John Belleme left. It was a difficult transition, as Belleme and Barry Evans (an absentee owner) did not get along well. Since then, production of miso has roughly doubled, from 9 to 20 large miso vats. His miso teacher, Akinori Takei, stayed until October 1986. Since then Don has run the company. Not much of their miso is used any more in second generation products; they used to sell some mellow white and red miso to Nasoya and Simply Natural. Now 95-98% is sold for kitchen use in plastic tubs. The tubs replaced plastic bags 2 years ago. He also sells in bulk: 35 or 50 lb. He has always used all natural, organic ingredients, which makes his miso about twice as expensive as Cold Mountain. So they lost all their sales to food processors. But total volume has increased due to good sales work. His best-sellers are mellow white miso and traditional country (long-term) barley miso, followed by mellow barley, traditional red rice miso, and sweet white miso. He has ordered his koji starter through Mitoku for the last few years. Now he hopes to buy direct from Kojiya Sansanaemon in Aichi-ken. Don has studied macrobiotics for 12 years. AMC originally had 6 owners; Barry Evans now owns about 95%. Barry originally paid for John Belleme to study miso in Japan. Address: Route 3, Box 541, Rutherfordton, North Carolina 28139. Phone: 704-287-2940.

9053. Nordquist, Ted. 1988. New developments with tofu and soymilk in Sweden. Alfa-Laval in China (Interview). *SoyaScan Notes.* March 26. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** One of Ted's next major projects is a Tetra Pak tofu; Morinaga does not have a patent in Europe. Also, Ted skips two of steps in Morinaga's patent. He intends to flood Europe with an aseptic tofu. His firm tofu will use ultrafiltration instead of isolates to get the firm texture. No that isolates can also be made using ultrafiltration, without hexane solvent. He has used calcium sulfate, which gives a better flavor, but it is difficult because it is not water soluble. This is where the Combibloc carton comes in. He can made Jofu-style soy yogurt with whole berries in it in an aseptic Combibloc carton.

Alfa-Laval is talking with the Chinese about selling them a plant to make continuous process tofu using ultrafiltration. A man who works for Alfa-Laval and works with Ted at Trensums has told him this, in confidence. He was in China for 6 months setting up Alfa-Laval's first plant there. The idea was that when this plant was proved successful, two additional plants would be installed. Ted does not think the latter two have been installed yet. He told Ted about all of the problems that Alfa-Laval has been having there in scaling up pilot plants. This is very confidential. If it is true, it could be grounds for a lawsuit.

Ted's idea for using ultrafiltration to make an aseptic

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tofu is partially Luke's idea. But it also an idea that is tied in with using a bland soy base. For the last 5 years 90% of Ted's research energy has gone into getting a bland soy base. When that is ready he will make an aseptic tofu. Ted could possibly have an aseptic tofu packaged in Combibloc on the market by mid-1989 that would use a combination of GDL and calcium sulfate coagulants, and use ultrafiltration to concentrate it. Address: President, Aros Sojaprodukter, Bergsvagen 1, S-190 63 Orsundsbro, Sweden. Phone: 0171-604 56.

9054. Nordquist, Ted. 1988. Comparing Tetra Pak and Combibloc as aseptic packaging systems. The Morinaga aseptic tofu patent (Interview). *SoyaScan Notes.* March 27. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In the Tetra Pak system, the laminated packaging film that comes on a roll, is run through hydrogen peroxide to sterilize the surface then folded into the shape of a tube around a stainless steel tube filled with UHT sterilized soymilk, inside a sterile chamber. The packaging material is seamed longitudinally. The packaging tube, which is always filled with soymilk, is crimped, sealed and cut below the soymilk level, so that they contain no air.

In the Combibloc system, the laminated packaging material comes in the form of individual flattened sections of a tube. These are fed into an chamber made aseptic by either nitrogen or steam, containing no air. The flat sheets are fed in two at a time and the bottom of each is sealed to form a box. These are then filled with food material, which may contain particles or chunks, such as diced vegetables; Tetra Pak cannot handle such pieces which interfere with sealing of the tube. Finally the top is sealed; some nitrogen gas remains atop the food. A Combibloc machine can be 4 times the size of a Tetra Pak machine, but it can handle various length cartons having the same bottom size (200-500 ml, or 1 liter), whereas Tetra Pak needs one machine for each package size. The Combibloc unit can seal at a much higher temperature than Tetra Pak.

A sterile/aseptic filter, which is very expensive, is used to feed in things (such as volatile flavors) which are heat sensitive and thus should not be run through the UHT unit. The filter eliminates bacteria. Morinaga's 4-step process (1) sterilizes the soymilk with a UHT unit, (2) cools it to 20-25ºC, (3) introduces GDL and calcium chloride coagulants through an aseptic filter, then runs the mixture into Tetra Pak cartons, which are sealed and (4) reheated by immersion in a hot water bath to cause coagulation, which is finally cooled. Morinaga does not have a patent on their Tetra Pak tofu process in Europe. Address: President, Aros Sojaprodukter, Bergsvagen 1, S-190 63 Orsundsbro, Sweden. Phone: 0171-604 56.

9055. Mio, Art. 1988. Update on Morinaga (Interview). *SoyaScan Notes.* March 30. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Morinaga not only has a patent on their aseptic tofu process, they also have proprietary rights to the film. This special film was developed jointly by Morinaga (Japan) and Tetra Pak, and the latter cannot sell it to any other company. This may not be mentioned in the patent.

Concerning promotion in the USA, for the first few years Morinaga targeted their sales to Asian-American consumers. They got little results. Then Art Mio heard that supermarkets were having problems with spoilage, so he changed his focus to supers. Stage 3 has been the recent targeting of the natural and health foods industries. The new package design and absence of monoglycerides on the label have helped sales in this market. Sales could increase 50-100% this year. Headquarters may have decided to build a plant in America. The Japan plant may only be running one shift. Susan Bucher's company (Buchér & Russell, 3801 Wilshire Blvd., Suite 1403, Los Angeles, California 90010. Phone: 213-738-5300; Susan is Japanese-American) has done the recent set of ads.

Tree of life private label tofu sold 5,000 units a week in 1986. Art does not know who makes it. Address: Morinaga Nutritional Foods, Inc., 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9056. Bertrand, Jean-Pierre; et al. 1988. Soja [Soya]. Zurich, Switzerland: Unionsverlag. 130 p.. March. [Ger]*
• ***Summary:*** This book gives a very good overview of the development of the soybean plant in the context of world agriculture.

9057. Demi-Tasse. 1988. March. New soyfoods restaurant or deli. Mishiki-cho 6-7, Okayama-shi, Okayama-ken, Japan.
• ***Summary:*** Toyo Shinpo. 1988. March 11. p. 9. "Restaurant serves tofu dishes with a homestyle feel." The restaurant, Demitasse serves original Japanese and Western tofu dishes–even tofu steak and ice cream!! They are closed on Tuesdays, and open every other day of the week from 11:00 a.m. to 8:00 p.m.

9058. **Product Name:** [Tofu, Tempeh, Natto, Okara Croquettes].
Foreign Name: Tofu, Tempeh, Natto, Croquettes d'Okara.
Manufacturer's Name: Gaïa Enterprise. Officially registered in Jan. 1992.
Manufacturer's Address: Rue Principale, 66130 Corbere, France. Phone: 68.84.86.28.
Date of Introduction: 1988 March.
New Product–Documentation: Form filled out for Anthony Marrese. 1989. Nov. These three products were introduced in March 1988 by Odile Corbel & Dan Ludington. The following amounts are presently produced: Tofu 3 kg/week (sold fresh), tempeh 3 kg/week (non-pasteurized), natto 2 kg/month, and okara croquettes 2 kg/month. Odile started

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making her own tofu for 2 people each week, then for friends. A friend (Pauline Schaft) supplied her with tempeh, natto, and koji for amazake. In 1986 she went to the Kushi Institute in the USA. She returned to France at the end of 1987 with Dan and began her own small production daily.

Letter from Daniel S. Ludington. 1992. Feb. 7. He has been making tofu, tempeh, and miso for sale for 3½ years. He learned to make them using books by Shurtleff and Aoyagi. Now he would like to order their books *Miso Production,* and *Tofu & Soymilk Production.*

Letter from Dan Ludington. 1992. March 3. "Gaïa Enterprise was officially registered with the Chambre de Metiers of the Pyrenees Orientales in Jan. 1992. (She had been unofficially in existence using the same name for nearly four years)." Dan's father was a 20-year career cook in the U.S. submarine service. He died instantly of a heart attack at age 54. Dan is the oldest of 4 boys. He received a degree in chemical engineering from MIT in 1977, then worked for Intel Corp. in their factory making silicon chips for 5 years, then for Toshiba USA for another year. When his father died, he kept a 10-year promise to himself to hitch-hike around America. In or about about Loveland, Iowa, his chemical engineer's eyes saw how chlorinated hydrocarbons enter the food chain; he decided to stop eating meat. About 6 months later he was introduced to macrobiotics. 2½ years later he went to the Kushi Institute in Boston, Massachusetts, to see if he could find a better balance in his diet. There he met Odile Corbel, a French woman with a 12 year-old son named Xavier and 10 years of macrobiotic experience. They were married, and returned to France. 18 months later Dan got a Green Card. While Odile was in the USA, Pauline Schaft had stopped making tempeh, and a weekly, organically grown products market had started in Perpignan. So he and Odile started making tofu, tempeh, and macrobiotic British pasties and selling them at this market. The business has grown until today sales are $400/week. He and Odile are still married with 2 children of their own. Pauline Schaft now goes by her maiden name of Van Marle; she is now more involved with her yoga practice than with making food. The company now sells 12-15 kg/week of tofu, 3-5 kg/week of tempeh, and 4 kg/week of miso, all direct and without the use of labels, marketing, or distribution.

9059. Hara, Kazuo. 1988. Arugin-san geru [Utilization of the properties of stabilizers. Alginic acid gels (used in tofu)]. *Shokuhin Kogyo* (*Food Industry*) 31(6):76-85. March. Tokushû: Zônen anteizai no seishitsu to riyô. [8 ref. Jap]
• ***Summary:*** Alginic acid gels are used in tofu, meat products, fish gels, bread, and fabricated foods.

9060. Hasegawa, Yoshie; Inuta, Toru; Obata, Hitoshi; Tokuyama, Tai. 1988. [Introduction of a high vitamin B-12 productive natto strain through protoplast fusion]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 35(3):154-59. March. [12 ref. Jap]*
• ***Summary:*** To breed a high vitamin B-12 producible natto strain, protoplast fusion was done between *Bacillus natto,* Takahashi No.2 (Arg-mutant), and a vitamin B-12 productive strain, *Bacillus megaterium* IAM 1166 (Try-mutant). Lysozyme of 250 mcg/ml and 500 mcg/ml was adopted for the protoplast preparation of *B. natto* Takahashi No. 2 and *B. megaterium* IAM1166, respectively, with 10% sucrose at 42ºC for 30 minutes. Protoplast fusion was carried out with 40% polyethyleneglycol 6000, and the regeneration was performed on Sucrose Glutamate (SG) minimal medium containing 10% sucrose and 3% polyvinylpyrolidon. Preservation of the stringiness and vitamin B-12 productivity of the protoplast strains were deeply affected by the concentrations of lysozyme and sucrose. Three fusants which were capable of producing stringiness and vitamin B-12 were isolated on SG medium, and the strong stringiness on a steamed soybean by them were also observed in a similar manner as *B. natto.* (From online abstract at http://www.journalarchive.jst.go.jp/english/). Address: 1, 3-4. Faculty of Engineering, Kansai University [near Oksaka, Japan].

9061. Hashizume, Kazumune. 1988. Aburaage [Deep-fried tofu pouches]. *Daizu Geppo* (*Soybean Monthly News*). March. p. 12-17. [4 ref. Jap]
Address: Toyama-ken Shokuhin Kenkyujo.

9062. Hashizume, Kazumoto; Sugimoto, Toshio. 1988. Mechanisms of aburage (fried soy curd) formation. *JARQ* (*Japan Agricultural Research Quarterly*) 21(4):299-303. March. [5 ref]
• ***Summary:*** Describes how and why tofu pouches puff up during deep-frying. Contents: Introduction. Procedure to prepare aburage: Outline of the preparation method, essentials for making aburage. Expansion mechanism of the tofu during frying: Minimum temperature necessary for the expansion, importance of exchange reaction between -SH and S-S in the tofu during the frying, role of the air in the tofu for aburage making. Availability of aburage as a food material and items of aburage. Address: Food Science Div., National Food Research Inst., Tsukuba, Ibaraki, 305 Japan.

9063. Hondo, Satoshi; Yasuhira, Hitomi. 1988. Shuseibun bunseki-hô ni yoru shihan miso no kaiseki [Application of principal component analysis method to the evaluation of miso on the market]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 29. p. 67-73. [6 ref. Jap; eng]
• ***Summary:*** Principal component analysis and multiple regression analysis were applied separately to the evaluation of Japanese light yellow and red miso, sold at retail stores.

9064. Hondo, Satoshi; Yasuhira, Hitomi. 1988. Taipu no

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kotonaru tane kôji-kin ni yoru miso no shijô. III. Tane kôji-kin to miso hinshitsu no kankei [Fermentation of miso using various koji molds. III. Effect of koji mold on the quality of miso]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 29. p. 14-19. [14 ref. Jap; eng]
• ***Summary:*** Koji variants used to produce rice miso, barley miso, soybean miso, sake, shochu, soy sauce, etc. (*Aspergillus oryzae* and *A. Sojae*) were evaluated, as regards such attributes as growth rate, fermentation products, enzymic activity and sensory quality.

9065. Imai, Manabu; Osawa, Y.; Nakamura, M.; Yasuhira, H. 1988. Chakushoku o yokusei-suru koen-sei nyûsan-kin no kensaku. II. [Selection and use of decolorizing strains of *Pediococcus halophilus* (in miso production). II.]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 29. p. 37-41. [3 ref. Jap; eng]

9066. Ito, Kimio; Yasuhira, Hitomi. 1988. Kônôdo shokuen, gurukoosu sonzaika ni okeru *Bacillus subtilis* no dôtai [Behavior of *Bacillus subtilis* at high concentrations of NaCl and/or dextrose (in miso)]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 29. p. 25-32. [16 ref. Jap; eng]
• ***Summary:*** Behavior of *Bacillus subtilis* at high NaCl and/or dextrose concentrate was examined, to evaluate the hygiene of miso. Growth, germination and sporulation were completely inhibited by 20% NaCl alone, 10% NaCl/20% dextrose or 15% NaCl/10% dextrose. Critical water activity for growth was 0.88.

9067. Kakiwara, Kenjiro. 1988. Tônyû gyôkai no genjô [Present status of the soymilk industry in Japan]. *Daizu Geppo* (*Soybean Monthly News*). March. p. 18-24. [Jap]
• ***Summary:*** In Japan, 1977 was the first year that a significant amount of soymilk was produced, according to statistics from the Nosuisho Shokuhin Yushi-ka. Production then rose steadily and rapidly each year to a peak of 116,724 tonnes in 1983. Thereafter it fell for the next three years, dropping to 84,103 tonnes in 1984, 55,354 tonnes in 1985 and 43,392 tonnes in 1986 (only 37% of the peak 1983 figure). About 99% of the products are packed in paper cartons and most are long-life (aseptic).

During the peak years of 1983 about 50 companies made soymilk in Japan; that number has now shrunk to ten. The top three manufacturers (Kibun, Mitsubishi, and Marusan-Ai) had 71% of the market in 1983 and 76% in 1987. The top five companies (including Meiji Nyugyo and Nisshin Seiyu) now have 85% of the market. Production (in 1,000 tonnes) and market shares (in parentheses), estimated by the author, for the top 5 manufacturers in 1983/1987 are as follows: Kibun 41/14 (35%/37%); Mitsubishi Kasei 20/10 (17%/26%); Marusan-Ai 20/5 (17%/13%); Meiji Nyugyo 10/2 (9%/5%); Nisshin Seiyu 7/1 (6%/3%); Other 19/5 (16%/16%).

According to the Japanese Agricultural Standards (JAS) there are 4 types of soymilk. (1) "Soymilk" (*Tonyu*), must be made from whole soybeans, and contain 8% or more solids and 3.8% soy protein; It has a 3% market share. (2) "Adjusted soymilk (*chosei tonyu*), made from whole or defatted soybeans plus added vegetable oil and sweeteners, with 6%+ solids and 3%+ soy protein has a 52% market share. (3) "Soymilk drinks" (*tonyu inryo*), similar to (2) but with 4-6% solids and 1.8%+ soy protein, have a 44% market share. (4) "Soy protein drinks" (*daizu tanpaku inryo*), made with isolated soy proteins, must have 1.8% protein. It has only a 1% market share.

The author then gives three reasons for the boom and bust, shows graphs of who is buying, how often, and at what age. Those over age 40 buy more soymilk that those in their teens. Still, many Japanese have never tried soymilk. Education is necessary to re-popularize it. Address: Mitsubishi Kasei Shokuhin K.K., Tonyu Hanbai Honbu.

9068. Kimura, Eiichi. 1988. Gendai gokoku kô. Kan-dai kunkô no gaku to daizu [Modern thoughts on China's ancient "Five Grains"; Soybeans in the Han dynasty]. *Daizu Geppo* (*Soybean Monthly News*). March. p. 35-36. [2 ref. Jap] Address: Daizu Kyokyu Antei Kyokai.

9069. **Product Name:** [Freeze-dried Natto].
Manufacturer's Name: Koishiya Shokuhin K.K.
Manufacturer's Address: Tochigi-ken, Japan. Phone: 0286-82-2220.
Date of Introduction: 1988 March.
New Product–Documentation: Toyo Shinpo. 1988. March 21. p. 19. "Koishiya Shokuhin, the 'One hundred year old beans of rare taste' company has recently released freeze-dried natto as part of their product line." Mr. Eiichi Koike is president of the company. The firm started to market the new product on March 1. Aluminum packaged, 30 gm of freeze dried natto sells for ¥280 at retail stores. People can use this as a snack–somewhat like peanuts. They are hoping that this type of natto will get people used to the real natto taste.

9070. **Product Name:** [Matcha Tofu (Containing Powdered Green Tea)].
Foreign Name: Matcha Tôfu.
Manufacturer's Name: Matsui Shoten Ltd.
Manufacturer's Address: Myoraku 49, Uji-shi, Kyoto, Japan. Phone: 0774-21-2412.
Date of Introduction: 1988 March.
Ingredients: Incl. Tofu, powdered green tea (matcha).
Wt/Vol., Packaging, Price: A cake sells for 200 yen.
How Stored: Refrigerated.
New Product–Documentation: Toyo Shinpo. 1988. Sept. 1. p. 4. Match Tofu kido ni noru. Koko nara dewa... no kanban-

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zukuri [Matcha Tofu is launched. Trying to make something special in this town]. Matsui SHIN's father died 2 years ago and he took over the family tofu shop. Age 28, he developed green tea (*matcha*) silken tofu and started to sell it in March 1988. Costing 200 yen a cake, it doesn't sell fast. But it has a very smooth texture and a mild green tea flavor. He wants to make this a gift item in this tourist town. There are photos of the tofu label and of Mr. Shin.

9071. Morinaga Nutritional Foods. 1988. Revolutionary tofu (Ad). *Natural Foods Merchandiser.* March. p. 60.
• ***Summary:*** A full-page ad (8 by 11 inches, color). "Long-life aseptic package adds convenience to guaranteed quality and consistent taste." The color photo in the top third of the ad shows two packs of Mori-Nu silken tofu next to an ordinary water-pack: "Made first, then packed in water (Ordinary). Mori-Nu Tofu is actually made right inside our bright new package." Address: Los Angeles, California.

9072. Osawa, Yoshiaki; Ishizawa, Hiroaki; Yasuhira, Hitomi. 1988. Ekusutoruuda shori daizu ni yoru miso no shijô. II. [Miso production from extrusion cooked soybeans. II.]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 29. p. 7-13. [8 ref. Jap; eng]
• ***Summary:*** Soybean flour was cooked by boiling, steaming or twin screw extrusion and used, in conjunction with modified koji or appropriate isolated enzymes, in miso production. The modified koji had enhanced enzyme activity. Miso, koji and cooked soybean nutritional and sensory attributes were evaluated. Address: 1&3. Shinshu-Miso Kenkyusho, 469-6 Nakagosho, Nagano-shi 380, Japan; 2. Nagano Prefectural Research Inst. of Rural Industry.

9073. Osawa, Yoshikai; Yasuhira, Hitomi. 1988. Chakushoku o yokusei-suru koen-sei nyûsan-kin no kensaku. I. [Selection and use of decolorizing strains of *Pediococcus halophilus* (in miso production). I.]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 29. p. 33-36. [2 ref. Jap; eng]
• ***Summary:*** These bacteria belong to the family Lactobacillaceae.

9074. Sakai, Sonoko. 1988. Tofu: Meat of the fields. *Bestways.* March. p. 18, 21, 24, 54, 64. Reprinted from Palate Pleasers of Japan. 1986. Spring/Summer. p. 59-61. [2 ref]
• ***Summary:*** An overview, based largely on material from the works of Shurtleff and Aoyagi. Today the tofu man with his bicycle is an increasingly rare sight in Japan, but Americans do not have the luxury of walking out on the street to buy tofu.

9075. Sato, Masashi; Yasuhira, Hitomi. 1988. Kôon jukusei miso ni tsuite [Studies on miso fermented at high temperature]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 29. p. 20-24. [2 ref. Jap; eng]
• ***Summary:*** Miso containing 50% koji and 0-6% NaCl was fermented at 47, 50 and 53ºC and evaluated for pH, microbial flora, acidity, color, sugar concentrate, free amino acid levels, etc. Higher temperature favoured acidity development due to bacterial action. Color of miso fermented for 3 days at 50ºC was equivalent to that of miso fermented at 30ºC for 30 days, but free amino acid concentrate in the former was lower than that in the latter. Fermenting 3% NaCl miso at 50ºC for 3-5 days, followed by 30ºC for 10-12 days, produced an acceptable miso.

9076. Sode, Akio; Nakamura, M.; Takeda, S.; Ito, K.; Imai, M.; Yasuhira, H. 1988. Kôji no kôso kassei to miso no hinshitsu [The relationship between koji enzymic activity and miso quality]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 29. p. 74-76. [Jap; eng]

9077. *SoyaScan Notes.* 1988. New Trend: "Big Food" enters the U.S. tofu market, but in an unexpected way–Via Japan (Overview). March. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** For the past 5 years or so, U.S. tofu companies and industry watchers have been speculating as to when "Big Food" would jump into the U.S. tofu market. They had in mind big U.S. food companies such as General Foods, Kraft, etc. But at the start of this year, 1988, Morinaga, Japan's third largest manufacturer of dairy products (FY 1982 sales were $1,171 million dollars) began the largest promotional campaign for tofu ever conducted in America, with attractive, full-page color adds for at least 3 months in a row in major natural foods magazines. The product is now showing up in many natural food stores and sales are skyrocketing. And Kikkoman, the world's largest maker of soy sauce and one of Japan's biggest food companies, is now also aggressively selling tofu. Both companies make their tofu in Japan. The big question now is when they will establish U.S. plants.

9078. *Soybean Digest.* 1988. Seed for thought: Salute to farmers. Mid-March. p. 4.
• ***Summary:*** 2.2 million U.S. farmers provide food and fiber for 251 million people here and abroad. One American farmer produces enough food and fiber for 114 people. Compare that with farmers from other countries–11 people in the Soviet Union, 8 in Argentina, 4 in Brazil, 3.5 in China, and 3 in Japan. The average American spends only 14.4% of his after-tax income on food. That's down nearly 20% since the early 1960s. The ag industry employs 21 million people (nearly one in five) and accounts for 17% of the

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nation's gross national product. One hour of farm labor today produces 16 times as much food and other crops as it did from 1919-21. U.S. farmers can produce more than 80% more crop output on an acre of land than did their fathers. Farmers get $0.25 of the consumers' food dollar spent for domestically grown products, down from $0.32 cents in 1968. Americans spend $6,000 million a year on cat and dog food.

9079. *Taste* (*Kikkoman, Japan*). 1988. New frontiers in Hokkaido [Kikkoman's new shoyu plant in Chitose]. 2(1):8. March.
• ***Summary:*** The Kikkoman's third, and newest, domestic soy sauce factory is in Hokkaido. The new plant was finished in early 1987, over half a century after the construction of the second Takasago plant near Osaka. Just as Kikkoman's first plant near Noda City was located amid wheat and soybean fields, the choice of this plant near Chitose was partly influenced by the ready supplies of wheat nearby. (The soybeans are imported from the U.S.) The factory is 27,300-square meters with four stories. Only fifty employees are on hand to man two large control rooms. They have also applied high technology to microorganisms used in the fermentation. The Chitose plant was singled out for a national award by the Nihon Keizai Shinbun last October. Kikkoman, one of Japan's leaders in biotechnology, demonstrated the results of its latest research on bioreactors, designed to reduce the time needed to produce soy sauce. Other companies promoted the versatility of their soybean-related food products, such as cheese-flavored tofu and tofu ice cream.

9080. *Taste* (*Kikkoman, Japan*). 1988. Secrets of sukiyaki. 2(1):6-7. March.
• ***Summary:*** Historically, meat eating in Japan tended to fluctuate with the religious climate of the times. Before the introduction of Buddhism into the country (in A.D. 676) mountain-dwellers hunted for their food just as fishermen relied on fish for their meals. However, the arrival of the new faith soon banished meat from the daily diet. (The nobility, however, continued to consume meat under the guise of medicine.) Today, sukiyaki is prepared in two distinct regional styles; in Kanto (Toko-Yokohama) and in Kansai (Osaka-Kyoto). In Kansai, the ritualistic order of the meal is emphasized.

9081. Tochikura, Tatsurokuro. comp. and ed. 1988. Shôyu no kagaku to gijutsu [The food science and technology of shoyu]. Brewing Society of Japan, Takinogawa 2-6-30, Kita-ku, Tokyo, Japan. 571 p. Illust. Index. 21 cm. [1067 ref. Jap]
• ***Summary:*** The best book of its kind seen up to this time. Contents: 1. Raw materials and their processing. 2. Making koji. 3. Brewing. 4. Microorganisms. 5. Making products and processing. 6. Components. 7. Browning reaction. 8. Preventing infestation and mold. 9. Product quality control. 10. Nutrition and food sanitation. 11. Various types of shoyu. 12. HVP (Amino acid liquid). 13. Seasoning processes. 14. Bottling and packaging. 15. New technology. 16. Waste water treatment and environment preservation. 17. JAS and other laws and regulations. 18. Shoyu around the world. Address: Prof. of Food Science, Kyoto Univ., Japan.

9082. Yokota, Y.; Yasuhira, H. 1988. Miso no kokeibun ryûshi ni tsuite. II. [Studies on solid particles in miso. II.]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 29. p. 42-47. [7 ref. Jap; eng]*
• ***Summary:*** Effects of solid particle size distribution and level in soybean miso on sensory quality of miso soup were examined. Particles less than 170 mesh sieve size had most influence on soup attributes.

9083. Yokota, Yoshiko; Taguchi, T.; Nakamura, M.; et al. 1988. Shihan miso no bunseki kekka ni tsuite [Analytical results of miso on the market]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 29. p. 48-57. [3 ref. Jap; eng]
• ***Summary:*** The 25th study meeting of miso on the market was held. 189 miso samples of various types sold at retail stores were evaluated for sensory quality; 120 of these were analyzed for physicochemical characteristics. Total sugar concentration averaged 17.5%. Rate of protein hydrolysis was related to NaCl and sugar concentration, and affected miso texture. Moisture, nitrogen, pH, acidity and color were also examined.

9084. *High Plains Journal* (*Dodge City, Kansas*). 1988. Farmers in Asia, U.S. gain from soy fish feeds. April 18. Also in Soybean Update. March 21. p. 3.
• ***Summary:*** Dr. Dean Akiyama, who heads up the American Soybean Association's aquaculture programs in Japan, Korea, Taiwan and southern China, says U.S. soybean meal and science could push shrimp production to all-time highs. "Shrimp culture in Southeast Asia is booming," Akiyama said. He also noted that feed trials have shown shrimp feeds can use up to 40% soymeal [mixed with fish meal] with no substantial loss in overall production. In the past, only fish meal has been used to feed shrimp.

"Soymeal is cost effective," Akiyama said, "The basic nutritional principles found in fish meal are also found in soymeal. The only difference is, soymeal is cheaper. We have proven soymeal mixed with fish meal can save a farmer up to 45% on his feeds costs." A shrimp farmer spends about $4 to $8 to raise a pound of shrimp, then sells it for $15 a pound. A typical farm can have up to a tonne of shrimp per acre, per crop. Producing 2.5 tonnes/acre on an average year, the farmer makes $18,000 for every acre farmed.

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9085. *Rocky Mountain News* (*Denver, Colorado*). 1988. Tofu company gets blessing [Denver To-Fu Co.]. April 23.
• ***Summary:*** "The Denver To-Fu Co., in honor of moving from Adams County to new offices in Denver, flew in three Shinto priests from Tokyo for 'blessing of the company' ceremonies yesterday afternoon. The company, owned by Haruhisa Yamamoto, a Tokyo native, manufactures tofu sold in Denver-area grocery stores. To-Fu, now at 3825 Blake St., employs 10 people. Mayor Peña also attended the ceremonies."

9086. Green, Rand. 1988. Packaging keeps Mori-Nu tofu fresher. *Produce News* (*Fort Lee, New Jersey*). April 30.
• ***Summary:*** According to Art Mio, national sales manager for Morinaga Nutritional Foods, there are two basic reasons people are turned off by tofu. First, they don't know what to do with it and may not even by quite sure what it is. The solution is education. Second, many people who have tried it don't like the sour taste. The U.S. Food & Drug Administration recommends that tofu core temperatures be kept below 45 degrees, while the USDA "strongly recommends no higher than 41 degrees." Tom McReynolds is the newly appointed marketing manager at Morinaga Nutritional Foods. Mio mentioned 2 diet books that have been published recently with tofu recipes that specifically recommend Mori-Nu Tofu. *The Calcium Connection* (1988), by Dr. Cedric Garland and Dr. Frank Garland is one such book. *Diet Recipes from Doris' Kitchen,* by Doris Cross is the other.

9087. Mori, Haruhiko. 1988. Re: Noda Industrial Scientific Laboratories / Noda Institute for Scientific Research. Letter to William Shurtleff at Soyfoods Center, April 30. 1 p. Typed, with signature on letterhead.
• ***Summary:*** Noda Industrial Scientific Laboratories (also known as Noda Industrial and Scientific Laboratory, Noda Sangyo Kagaku Kenkyusho) is now generally known as Noda Institute for Scientific Research. It is referred to as NISL in the culture collection list of the Institute of Fermentation, Osaka (IFO).

The institute, which is still active, was founded in 1942 by Kikkoman Corporation, and exists to do basic investigation in the fields of food science and the life sciences, especially microbiology, enzymology, biochemistry, genetic engineering, etc. Address: Noda Inst. for Scientific Research, 399 Noda, Noda-Shi, Chiba-ken 278, Japan. Phone: 0471-23-5568.

9088. Business Trend Analysts, Inc. 1988. The market for salad dressings, sauces and condiments. 2171 Jericho Turnpike, Commack, NY 11725. 260 p. Price: $750.
• ***Summary:*** Sauces include the following table sauces: Ketchup, meat (incl. steak, worcestershire, vegetable, and seafood sauces), barbecue, Mexican (incl. chili, taco, enchilada, etc.), prepared mustard, and soy and teriyaki. Gravies, dips, and dry sauce mixes are not included. Ketchup is the largest segment, about 40% of the total. It has grown at 4.6% annually from 1982-87, but growing faster during the same time are soy and teriyaki sauce (10.3%), barbecue sauce (11.4%), and Mexican sauce (9.2%). In 1977 soy and teriyaki revenues represented 3.1% of total sauce sales, compared to 6.7% in 1987. BTA expects the market to grow at 8.9% annually reaching $280 million in 1997. Kikkoman, the leading producer of soy sauce in the U.S. sells most of its product is the western portion of the country. In 1987 it launched a national ad campaign to expand to the rest of the country.

According to U.S. Dept. of Commerce statistics, sales of soy and teriyaki sauce (in million dollars) and market percentage have grown from $7.7 and 1.8% in 1972, to $25.0 and 3.1% in 1977, to $50.1 and 4.9% in 1980, to $98.1 and 6.0% in 1985, and to an estimated $132.0 and 7.0% in 1988. Other estimated market shares in 1988 were ketchup 39.2%, meat 19.6%, barbecue 14.4%, Mexican 12.1%, and prepared mustard 7.8%. Thus soy and teriyaki have the smallest share.

But the growth rate for soy and teriyaki sales have been slowing, in part due to lower inflation rates. The rate was 26.6% in 1972-77, 24.2% in 1977-82, 10.3% in 1982-87, and a projected 8.9% in 1987-97. In this latter period the growth rate is higher than for any other sauce category.

In 1987 for leading U.S. soy sauce producers, sales and market share were: Kikkoman Foods Inc. $49 million and 41% market share; La Choy Food Products (Subsidiary Beatrice/Hunt-Wesson) $43 million and 36%; Nabisco Brands Inc. (Subsidiary RJR Nabisco), maker of Chun King, $12 million and 10%. All others, $16 million and 13%. Note: Chun King Frozen Foods line was sold to ConAgra, Inc. (Omaha, Nebraska) in 1987. Nabisco still owns the soy sauce and other packaged goods. the U.S. soy and teriyaki market, an estimated 41%., with 1987 sales of $49 million.

According to Department of commerce statistics, U.S. imports of "thin" soy sauce have grown steadily from 13.3 million lb in 1978, to 15.9 in 1980, to 29.6 in 1985, and an estimated 40.0 in 1987. In 1986 roughly 38.9% of this came from Japan, followed by 26.9% from Hong Kong, 12.8% from China, 12.0% from Taiwan, and 9.3% from Others (incl. South Korea, Canada, and Philippines). These imports of 32.5 million lb in 1986 were worth $13.9 million. Between 1980 and 1986 roughly 2,500 lb/year of soy sauce have been exported, a negligible amount. The main destinations were West Germany, Canada, and Mexico. Address: Commack, New York.

9089. DiStasio, Daniel. 1988. Spotlight on David Mintz. *Spotlight on Rockland/Bergen* (*Mamaroneck, New York*). April. p. 72-73.
• ***Summary:*** The quest for the perfect dessert began in 1972. Mintz's career in the food industry had begun in the Catskills

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with a small business called Mintz's Knishes. He attracted help with a sign which read, "Grandmothers Wanted." Thus began the catering business that finally brought him to Manhattan. "I was reading a health food magazine," Mr. Mintz recalls, "when I read that tofu looks like cheese but is not." From 1972 until 1981, Mr. Mintz was like a man possessed. In May 1982, he hand-delivered five gallons of Tofutti ice cream to a Manhattan health-food store.

Even the strict USSR State Committee for Inventions and Discoveries allowed Tofutti to be registered, a coup of sorts in that the Russians usually eschew any "frilly products." The Japanese went crazy: Every month, 100,000 gallons are delivered there, that's 3.2 million four-ounce servings. "Some people call me a kosher ham," quips Mintz. Though his enthusiasm for the spotlight takes up much of his time, workaholic Mintz enjoys his home in Alpine, New Jersey. He is also a talented painter. What's next on the list? Burgers, sausages, hot dogs, more main course foods.

9090. Golbitz, Peter. 1988. Tofu packaging: To water pack or vacuum pack–That is the question. *Soya Newsletter* (*Bar Harbor, Maine*). March/April. p. 1, 3, 6-7, 13.

• ***Summary:*** In traditional countries like Japan, where tofu is consumed daily by a large portion of the population, packaging is used more for the conveyance of the product than it is to preserve it. By far the most popular method in modern times is the water-packed tub, heat sealed with a multi-laminant plastic film. The other popular method is vacuum-packing–placing the tofu in a multi-laminant plastic bag, or in a form-fill-seal machine which makes its own package from the roll stock, drawing off air in the package and heat sealing it.

Water-filled tubs are made of high density polyethylene (HDPE). The sides are fluted to add rigidity. The lidding stock is usually a multi-laminant film composed of a combination of Mylar, Saran, polypropylene or other appropriate material, with at least one layer of polyethylene on the bottom. There are three companies that supply tofu trays to the industry in the U.S. These are: Airtight Container, Inc., Los Angeles, California; Fabri-Kal Corp., Kalamazoo, Michigan; and Gage Containers, Lake Oswego, Oregon. Prices run from around 3.5 cents to 7.0 cents each.

Kawanishi-Shoko, Los Angeles, CA, Bean Machines, San Francisco, CA, and T.R.I. Systems, Rancho Cordova, CA are three leading suppliers of this type of tofu packaging machinery in the U.S. All of these companies import their packaging equipment from Japan.

Most vacuum packing of tofu is done with bags, where the tofu is put in a multi-laminant bag, placed in a vacuum chamber, the lid is closed and the air drawn out. A good operator can pack 720 packages per hour. Vacuum bags can cost from 4 cents to 12 cents per package. Roll stock vacuum machines can run as high as 50 to 200 packages per minute. Popular chamber models are the SuperVac line, sold by Smith Equipment Co. in Clifton, New Jersey, and the Turbovac line sold by Hantover Inc. in Kansas City, Missouri. Roll stock vacuum machines are also available through these companies.

There is a question as to whether or not vacuum packaging can extend the shelf-life of freshly produced tofu. Steve Demos of White Wave, Boulder, CO, reports that "we get a longer shelf-life with our vacuum-packed tofu than we do with our water-packed tofu." White Wave sells vacuum-packed tofu, packaged on a roll stock vacuum machine, both with and without an outer box. "The outer box adds to the cost of the product, but the box can become a vehicle for recipes, cross merchandising, couponing and solicitation for special sales," states Demos.

Ben Lee, company spokesperson for Quong Hop [San Francisco, CA] reports that they get a longer shelf-life with their vacuum-packed tofu as well. Lee said, "One of the major advantages of vacuum packing for us, is the ability to ship the product less expensively. A typical case of water-packed tofu can weigh up to 50% more than a comparable case of vacuum-packed tofu." However, water packing is much quicker and easier.

Swan Gardens, Decatur, Georgia, is a company which uses vacuum packing exclusively. Swan Gardens puts some of their vacuum-packed tofu in a box, similar to White Wave. Swan Garden's tofu is pasteurized and has a 4 to 6 week shelf-life.

Nasoya Foods, Leominster, Massachusetts, uses water packaging exclusively. At one time, the company used a roll stock vacuum machine for packing, but gave it up after years of problems. "On a scale of 1 to 10 for difficulty," says company vice president Bob Bergwall, "vacuum packing was a 10, and water packing is a 1." Nasoya achieves a shelf-life of better than 8 weeks.

Package of the future. Right now, only silken tofu can be packaged aseptically. The biggest improvement in tofu packaging in the near future will not be the result of a new package per se, but rather the result of better attention to in-house sanitation, pasteurization, and the temperature that tofu is being stored and sold at. Address: Soyatech, Bar Harbor, Maine.

9091. Golbitz, Peter. 1988. Long life tofu: Wave of the future? *Soya Newsletter* (*Bar Harbor, Maine*). March/April. p. 7, 12.

• ***Summary:*** Morinaga Nutritional Foods, Inc., Los Angeles, California, and Kikkoman International Inc. of San Francisco, California, are both marketing long-life tofu, produced in Japan exclusively for export to the U.S. and other countries. (A Japanese governmental agency has forbidden the companies to market these products in Japan for fear that they threaten the existence of the fresh tofu industry, which consists of at least 30,000, small and localized, tofu shops.)

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Kikkoman's product, Kikkoman Tofu, is also produced using a patented, though different process, packed in a foil retort pack. The product is produced by Kikkoman Corporation, at their Noda, Japan plant. The principle behind both products is really very simple. Cooled liquid soymilk is mixed with a heat reactive coagulant, packaged in a container, heated to activate the coagulant and then cooled. The major difference between Kikkoman's and Morinaga's product is when and where the sterilization of the package and product occurs.

Morinaga's process consists of: sterilizing the soymilk with UHT processing, cooling, adding coagulants glucono delta-lactone (GDL) and calcium chloride, filling into a sterile Tetra Pak, sealing, heating the package with water just hot enough to activate the GDL, and then cooling.

With the Kikkoman Tofu, the sterilization of the product is achieved after packaging. Coagulants GDL and calcium chloride are added. It is then filled into a retort pack, sealed, and heated at temperatures high enough to activate the coagulant and sterilize the finished product. Both the Kikkoman and the Morinaga tofus tend to be slightly more expensive than regular tofu. Silken (unpressed) tofu is unfamiliar in the U.S., and no company has yet come out with a pressed tofu that doesn't require any refrigeration.

Sales of Mori-Nu are up between 40 and 50% over last year, and unit sales of the product put Morinaga among the top five tofu companies in the U.S. Kikkoman's product has been on the market for more than a year and is also reportedly making healthy sales gains. Morinaga's product is currently being shipped to 36 countries world-wide, with the U.S. being the largest consumer by far. Kikkoman also reports that they are shipping their product to Europe, Australia and Canada, but again, the biggest volume is in the U.S. Address: Soyatech, Bar Harbor, Maine.

9092. Kikkoman International Inc. 1988. Kikkoman. Ahead of its time for 358 years (Ad). *Prepared Foods* 157(4):119. April.
• ***Summary:*** This 8.5 by 11-inch, color photo ad shows a large (20 fl oz) bottle of Kikkoman naturally brewed soy sauce against a black and purple background. Green, computer-graphics circles are superimposed on the bottle. "Since 1630, Kikkoman has produced premium, naturally brewed soy sauce that has yet to be equaled." Available from over 20 distribution centers in the U.S. and Canada.

This ad also appeared in the March 1989 issue (p. 5) of this magazine. Address: P.O. Box 784, San Francisco, California 94101. Phone: 415-956-7750.

9093. Lingle, Rick. 1988. Kikkoman: Painstaking process marks unique operation. Kikkoman knows that 20th century technology can't hasten the centuries old method of making shoyu, or soy sauce. *Prepared Foods* 157(4):62-64. April.
• ***Summary:*** Describes the preparation of shoyu by Kikkoman at Walworth, Wisconsin. The koji is now made in both 100-foot-long koji beds and in a new circular koji room (installed in Feb. 1987), which has the output of 1.5 of the 100-foot units. The 6-month fermentation process is claimed to bring out flavors and aromas involving about 20 amino acids, lactic and acetic acid, and various other flavor compounds. The Kikkoman plant in Walworth, Wisconsin presently produces 7,000,000 gallons of soy sauce a year. Four photos show the inside of the plant.

9094. Matsuda, Norihiko; Komaki, Masaru; Ichikawa, Ryohko. 1988. [Heat resistance of spores of *Clostridium botulinum* types A and B in soy milk]. *Shokuhin Eiseigaku Zasshi* (*J. of the Food Hygienic Society of Japan*) 29(2):151-55. April. [9 ref. Jap]
Address: Research Lab., Japan Canners Assoc., 460 Karibacho, Hodogaya-ku, Yokohama, Japan.

9095. Nikkuni, Sayuki; Okada, N.; Itoh, H. 1988. Effect of soybean cooking temperature on the texture and protein digestibility of miso. *J. of Food Science* 53(2):445-49. March/April. [28 ref. Eng]
Address: National Food Research Inst., Ministry of Agriculture, Forestry & Fisheries, Tsukuba, Ibaraki 305, Japan.

9096. San-J International, Inc. 1988. You don't cook ordinary food. Why use ordinary soy sauce? (Ad). *Vegetarian Times.* April. p. 51.
• ***Summary:*** "More cooks are discovering the extraordinary benefits of tamari–the gourmet's soy sauce. Natural fermentation of whole soybeans gives tamari a rich, full-bodied taste that is smoother and more complex than that of ordinary soy sauce. Tamari is a natural flavor enhancer. It brings out the true flavors of food without overpowering them with the harsh, salty taste often associated with common soy sauce. By using tamari instead of salt you can reduce sodium in your cooking. One teaspoon contains just a pinch of salt, yet has the seasoning strength of a full teaspoon of salt. And unlike ordinary soy sauce, tamari won't burn off in cooking... Write San-J for free recipes." 2/3 page, color.

Talk with John Perelman. 1988. April 4. San-J calls this their "upscale yuppie ad," one of 7 they chose from. The company is divided into retail and industrial sales. John is in charge of retail, which in Jan-Feb. 1988 sold more tamari than in all of 1984. Address: 2880 Sprouse Drive, Richmond, Virginia 23231.

9097. Shurtleff, William; Aoyagi, Akiko. comps. 1988. Bibliography of tempeh, from 1815 to 1988: With 1050+ references. Lafayette, California: Soyfoods Center. 103 p. Subject and country index. Partially annotated. Printed April. 28 cm. [1078 ref]
• ***Summary:*** The most comprehensive bibliography on

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the subject published up to this time. Contains all known commercial products. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

9098. Shurtleff, William; Aoyagi, Akiko. comps. 1988. Bibliography of miso and soybean chiang, from 5th century B.C. to 1988: With 1250+ references. Lafayette, California: Soyfoods Center. 118 p. Subject and country index. Partially annotated. Printed April. 28 cm. [1254 ref]
• ***Summary:*** The most comprehensive bibliography on the subject. Contains all known commercial products. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

9099. *Soya Newsletter* (*Bar Harbor, Maine*). 1988. Japan Tofu Expo held. March/April. p. 10.
• ***Summary:*** Japan Tofu Expo Held. The all-Japan tofu & fried tofu equipment Expo '88 was held at the International Expo Center in Harumi, Tokyo, Japan, March 26 and 27. Attendance at the show was approximately 7-8,000 people, with 56 companies exhibiting tofu equipment. There were 2 new systems for making 100% nigari silken tofu. One involved the use of microwaves to heat the soymilk in the forming tray to coagulate the tofu.

9100. *Soya Newsletter* (*Bar Harbor, Maine*). 1988. Soyfoods Pavilion major attraction at NFE '88 West. March/April. p. 10.
• ***Summary:*** At the recent Natural Foods Expo '88 West, sponsored by Natural Foods Merchandiser, and held at the Anaheim Convention Center, Anaheim, California, April 8-10, the major food attractions were all in one place–the Soyfoods Pavilion.

This year's participants were Galaxy Cheese/Soyco, Golden Soy Foods, Book Publishing, Farm Foods, Legume, Morinaga Nutritional Foods, Tempehworks, Vitasoy USA, and Westbrae Natural Foods. Steve Meyers of Farm Foods remarked, "this is the major eating area of the show." Steve Meyers, Farm Foods/Barricini at 800/431-5030.

9101. Soyfoods Association of America. 1988. May is Soyfoods Month (Ad). *Vegetarian Times*. April. p. 60.
• ***Summary:*** "Discover the convenience and value of soyfoods. Watch for the special soyfoods insert in the May issue of Vegetarian Times and East West Journal." Sponsored by Farm Foods, Legume, Mori-Nu, Nasoya, Simply Natural, Vitasoy, and Westbrae Natural, and the Soyfoods Association.

9102. Sulistyo, Joko; Taya, Nakatoshi; Funane, Kazumi; Kiuchi, Kan. 1988. Production of natto starter. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 35(4):278-83. [12 ref. Eng; jap]
• ***Summary:*** 3 strains of *Bacillus natto* starter were incubated in 3 media, i.e. (1) soybean extract agar, (2) phytone agar, and (3) nutrient agar, to determine effect of media on natto quality. It was concluded that quality of natto produced from 1. and 2. was better than that of 3. Address: 1. National Biological Inst. of Indonesian Inst. of Science, P.O. Box 110, Bogor, Indonesia.

9103. Yeutter, Clayton. 1988. Challenge to world agricultural trade. *International Agriculture Newsletter* (*Univ. of Illinois*). April. No. 119. p. 1-2.
• ***Summary:*** "The emergency situation in agriculture is not a domestic problem, it is an international problem. We should avoid the temptation of trying to solve it with domestic solutions."

"Cutbacks in production did not work even in the 1950's and 1960's when our market was primarily domestic. How can they possibly work in the 1980's when the orientation in agriculture is so much more global?

"The Reagan administration's program for expanding U.S. agricultural trade is based on the realities of the modern world. Its 4 major components are to change economic policies that discourage U.S. exports, use U.S. farm programs to restore our competitiveness, move aggressively against unfair foreign trade practices, and improve international rules governing trade in agriculture.

"In the early 1980's the strength of the dollar made it extremely difficult to export U.S. agricultural products, and our market share declined dramatically. Slow growth in the economies of our trading partners also contributed to the trade imbalance by diminishing foreign demand for U.S. exports."

"During the past 2 years, our policies have led to a significant decline in the value of the dollar against the yen and major European currencies. This decline is making the price of U.S. agricultural products more competitive."

"The 1985 farm bill represents a significant effort to adjust our agricultural programs... A key element of the farm bill is the Export Enhancement Program (EEP). Although we dislike export subsidies, we are now using them in self-defense... As a victim of export subsidies, we are determined to regain markets lost to subsidizers over the past 5 or 6 years and rid the world of all export subsidies."

"The final element of our strategy [is to] strengthen the trade system... GATT rules [are] essentially non-existent for agriculture... We called for a total phase-out by the year 2000 of all policies that distort trade in agriculture. We include all export subsidies, import barriers, and domestic subsidies that affect trade. We exclude bona fide food aid programs and payments to farmers that do not affect pricing or production decisions. Finally, our proposal calls for instituting uniform health regulations for food around the world to make sure that such regulations do not become barriers to agricultural trade."

"U.S. agriculture ought to benefit in a major way from

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the shift to a more free and open trading system. The future of U.S. agriculture lies in exports; there is not much room for expansion in the domestic market. It is essential that we neutralize the government intervention that has so disrupted world agricultural trade."

Ambassador Clayton Yeutter is the United States Trade Representative. Address: U.S. Trade Representative.

9104. *Toyo Shinpo* (*Soyfoods News*). 1988. Ima Taiwan no tôfugyôkai wa? Daizu shohiryô wa nihon no 3 bai nimo [What's happening with the tofu industry in Taiwan? Soybean consumption is 3 times as large as Japan]. May 1. p. 1. [Jap; eng+]

• ***Summary:*** Taiwan's total exports were much larger than her imports this last year. Since the population is small, the per capita ratio of income is high. They produce a lot of second generation tofu products, and some say that Taiwan is producing more tofu products than mainland China. The demand for these foods is always steady. They produce 10,000 tons of soybeans and import 2,000,000 tons of U.S. soybeans. Their per capita consumption of soybeans is 3 times that of Japan.

9105. Pirello, Christina Hayes. 1988. Brief history of Simply Natural, Inc. (Interview). *SoyaScan Notes*. May 11 and June 6. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** In December 1984 Robert Pirello started Simply Natural, a natural foods vegetarian catering company. In 1984 Christina had sold her design company in Florida and moved to Philadelphia, where she worked as a freelance designer. Her mother had died recently and she had been diagnosed as having cancer. She was a vegetarian when she met Robert, a macro, who introduced her to the macrobiotic diet. Christina joined Robert's company while recovering from cancer. She left the advertising field completely to concentrate on getting well and running Simply Natural.

One of the catering company's first products was tofu cheese, made by wrapping a firm cake of tofu in cheesecloth, embedding it in sweet white miso, and allowing it to ferment at a controlled temperature for several days. This product was made using the traditional Japanese process for *Tofu no Misozuké* (Tofu Pickled in Miso), which they learned from *The Book of Tofu* (page 110) by Shurtleff and Aoyagi. These firm little bricks, served as a cheese with crackers, became their showcase item. (Note: A similar product, called Tofurin, had been developed by Nov. 1983 by Manna in the Netherlands). But they also made many other tofu dishes such as various types of stuffed agé (tofu pouches), tofu dips, quiches, stuffed loaves, pates. You name it, they did it. They purchased their tofu from a company named Fresh Tofu in Easton, Pennsylvania.

In December 1984 a group for whom they were planning to cater a Christmas party requested a non-dairy cream cheese dip. Robert tried pureeing their tofu cheese in a blender and discovered a revolutionary new product–A non-dairy tofu-based cream cheese. To this they could add flavors, such as garlic powder, onions & chives, or herbs. This soft tofu cheese, served as a non-dairy party dip, became their second showcase product. In the spring of 1985, Cynthia Schwartz, a friend who owned Center Foods, a leading natural/health food store in Philadelphia, asked if she could try to sell their soft tofu cheese. Bearing the label Simply Natural Soft Tofu Cheese, their first commercial product sold very well. Soon they were selling it in several stores, delivering it out of the back of the car. Within 4 months, they had distributors in Pennsylvania competing with one another to sell the product. Finally in October 1985 they signed an 6-months exclusive distribution agreement with Jerry Schwartz and Earthy Organics, a Delaware Valley natural foods distributor. Sales grew rapidly and by year's end other major East Coast distributors were clamoring for the product. Jerry kindly let go of his exclusive and Soft Tofu Cheese was soon being carried by Cornucopia (Rhode Island, from Dec. 1985), Stow Mills (Vermont, Dec. 1985), and Tree of Life (Florida, Jan. 1986). In January 1986 Jerry Schwartz introduced them to their first West Coast Broker, Roberta Fleischer, of California. Distribution began there in March. Now sales began to skyrocket. Robert and Christina soon realized that they were in the wrong business. In May 1986 they dropped the catering business and transformed it into a tofu product development and marketing company. But problems also began to grow. As the warm weather of spring came, the Soft Tofu Cheese, made by people with a limited knowledge of microbiology and plant sanitation and now sold throughout the East Coast, began to spoil. Sales plummeted. By hiring food specialists took and obtaining help from Dr. H.L. Wang of the USDA Northern Regional Research Center at Peoria, Illinois, they were able, largely by trial and error to finally get the problem under control.

In August 1986 they moved from their plant in Philadelphia into a larger facility in Norma, New Jersey. The plant's owner, Bill Schroeder, wanted to buy into their company. So they incorporated, he let them use the plant rent free, and he invested a little capital, which they used the funds to pay off past debts incurred because of the spoilage problems. The next challenge was to develop and manufacture a line of second-generation tofu products using their Soft Tofu Cheese. Continuing to buy their tofu from Fresh Tofu, they launched Antonio's Simply Natural Tofu Pasta (Oct. 1986, fresh pasta products stuffed with their Soft Tofu Cheese) and a line of Creamy Miso Dressings (Dec. 1986, made with the sweet white miso in which the tofu had been ripened). In October 1986 they started advertising the new line in Vegetarian Times. In October 1987 they were granted a patent on the process for their Soft Tofu Cheese, and in April 1988 a second patent on the end product. Also in October they repositioned and repackaged their product line to cross over into mainstream markets. Soft Tofu

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Cheese was renamed Soft Soyalite and Antonio's Pasta was renamed Pasta Lite. Christina and Robert were married on 31 December 1987.

In mid-1988 Nasoya Foods in Leominster, Massachusetts, began tests on making and pasteurizing Simply Natural's Soft Soyalite. In early 1987 they had discussed the possibility of a merger with Nasoya, but they were not as interested in this as Nasoya was, in part because Nasoya could not solve key pasteurization and product flow problems. They are now negotiating their first real outside financing with Leo Blank, who would like to buy Bill Schroeder's stock, and give them substantial capital. They will soon be closing their plant in Norma, New Jersey. Christina and Robert will be out of manufacturing, able to focus their full attention on marketing and product development. Their pasta products are now made at Mays Landing, south New Jersey and their miso dressings by Alpha-Pak in San Pedro, California (using both Cold Mountain Miso and miso recycled from the Soyalite). The future looks very bright.

Richard Rose. 1988. May 13. Adds: He was told by Wally Rogers and Tim Huang that in the late 1970s The Soy Plant in Ann Arbor, Michigan, developed a "Tofu Cream Cheese," similar to Simply Natural's original firm Tofu Cheese (unblended, in a block) and sold it in their deli. A guy from West Virginia showed them how to make it. Christina confirms this: A tall, thin bearded man [not Steve Fiering] tasted their Soyalite at Anaheim in April 1988. He said that he or someone he knew had sold a similar product in a firm brick form. But he was never able to develop a good flavor and the product never sold well [See 1988 interview with Steve Fiering]. July 28 update: Nasoya appears to have solved the pasteurization and hot-pack problem. Christina enjoys working with Nasoya, a company with very similar principles and beliefs about food.

Update: 1998 Sept. 20. Christina Pirello now has a cooking and food show on PBS-TV. Her latest book is titled "Cooking the Whole Foods Way." Address: P.O. Box 295 (Evelyn & Gershel Aves.), Norma, New Jersey 08347. Phone: 609-691-5866.

9106. Lyen, Donald. 1988. Brief history of Dragon & Phoenix Ltd. (Interview). *SoyaScan Notes.* May 13. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Donald came to England from Hong Kong during the 1950s to study electronics. He founded Dragon & Phoenix Ltd. in London about 22 years ago (in about 1965-66), in order to make tofu, because he liked it and yearned for it. The original location was at [?] Balse Street, Kings Cross, London N1. Later (when?) it was moved to 172 Pentonville Rd., London N1. He also made mung bean sprouts. In both cases, he developed equipment to mechanize the process. He used a liquidizer/blender instead of the traditional stone mill, and a centrifuge to separate the soymilk. He was a pioneer in this area, before Japanese companies did the same thing. At the time there were no other commercial tofu makers in England. However during the mid- to late 1950s there was a small Chinese-run operation in Liverpool (it had no name, and wasn't really a company) that made and sold very small amounts of very hard tofu, probably coagulated with a nigari-type coagulant, not calcium sulfate. It was very expensive, more than 2 shillings sixpence, so it didn't take off. In about 1978 Dragon & Phoenix began making soymilk and selling it mostly to Chinese restaurants. He notes that there is still not much of a market for it, perhaps because the weather in England is not warm enough for it to be served as a refreshing soft drink.

Today, he is sure that Dragon & Phoenix is still the largest tofu manufacturer in England. Yet the market is very small, and he does not advertise or promote his products. He sells only to Chinese restaurants and food stores, not to the health food trade. One reason for the small demand, he feels, is that tofu has so little flavor of its own; you have to know how to cook it to make it tasty. Dragon & Phoenix is only one of Donald Lyen's many businesses. He is still involved with electronics and is the sole agent for a Chinese word processor in the U.K. He is working to convert his tofu plant from a mechanized to an automated one. He was a founder and is presently a member of the European Soyfoods Association. He feels strongly that tofu should not be promoted as a health food but as a basic food for everyone. "Once you classify it as a health food, then you limit your market." Address: 15-18 White Lyon St., London N1 9PD, London, England. Phone: 01-837-0146.

9107. Burgeson, Travis. 1988. Recent developments at Azumaya: Stir Fruity and tofu (Interview). *SoyaScan Notes.* May 19. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In making Stir Fruity, the hot ingredients are homogenized then run into the filler. The product sets up in the cup, but it is basically gelled by gelatin upon cooling; there are small amounts of a calcium coagulant but it plays a secondary role. Travis is upset by the way they treat their employees. They basically fired Travis. He and Ron Ishida left because they saw no future in the company for themselves. Bill brought them in to reorganize the management of the company, i.e. to get Jack under control or to get him to step down as president. Travis was in charge of quality control. Jack was unaware of this and he did not want to step down. Jack was in charge of production, but as president he had final say, largely because he was the older brother. He had little appreciation for marketing, which was Bill's forte. Bill saved the company at the time they expanded into their current building by developing contacts with top Safeway produce people. The key is who you know.

Jack stepped down in late 1985 or early 1986. His son, Bruce, became production manager. Bill's daughter, Jill,

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is in sales and marketing. Bill would be president and Ron CEO. Travis was production manager for the next 6 months, and he installed quality control measures that increased shelf life. But then Bill's wife, Dorothy, the bookkeeper, threatened to leave him if he let the reorganization go through. She was paranoid. This showdown was in Nov-Dec. 1986. The restructuring–reorganization never happened. At that point the top consultant left. Bill brought in a top level consultant and he initiated discussions with Kraft about Kraft's licensing Stir Fruity, but it fell through. All agreed to withdraw Stir Fruity, but they kept making it for the Air Force commissary in Travis Air Force Base and a few other local places. Bill had freaked and gone to Hawaii. They had to cut back. They considered it Travis' fault. So he left in late May or early June 1987, and shortly thereafter Ron Ishida left. That year they didn't lose money, despite Stir Fruity. The ad guy who developed the ads ate $10,000 of production expenses and never got paid for his time. Now they sell quite a bit of Stir Fruity in Hawaii and Massachusetts. They put preservatives in all Stir Fruity now. They may not be listed on the label. Azumaya's biggest accounts are Safeway, Lucky, Kroger, Stop & Shop, and Gemco.

Travis has never heard of cash payoffs to produce people. It may be more subtle, such as gift giving, entry to Olympic Club to play golf, wine and dine them, gifts of wine, entertainment. Azumaya was very scared of Morinaga, since Morinaga was the first company to make inroads into Safeway; their broker sold tofu very cheaply. Connections are everything for brokers. You buy your way onto the shelf; slotting allowances, paid above board to the company. Having a good product is not nearly enough. Bill had such high level contacts that he could get Stir Fruity into the dairy case without paying any slotting allowances. You may be able to do it if you have a very strong advertising and promotional allowance.

Azumaya has never made much money. Maybe 2-3% of sales is profit. They have thought seriously about setting up an East Coast tofu plant, but the company is very short on business/management skills.

Most of the time Travis was there, Hinode (Hinoichi) had higher tofu production volume. Then Hinode started losing lots of business to small Chinese companies. The four Azumaya brothers: George is the oldest. Jack is #2, but he got out some time ago. John is #3. He doesn't do much, makes fresh konnyaku. Bill is the youngest. Dorothy feels that Shurtleff came into the company, learned a lot, then published it in his books. He ripped us off for all this information. Dorothy harbors a grudge. Bill Mizono will always be polite. He will never say something unpleasant directly to a person. Address: Central Health Network. Phone: 415-763-9785 (HM) or 548-6769 (OF).

9108. *Graphic* (*Brooklyn, New York*). 1988. The "scoop" on David Mintz, the father of Tofutti. May 25.

• ***Summary:*** David Mintz, a successful kosher caterer from Brooklyn, never believed tofu could change his life, but it has. In 1972, while searching for a milk substitute for kosher desserts, pastries, pies and sauces, he discovered tofu. In 1981, he introduced Tofutti ice cream to the world. More than 38,000 outlets in all 50 states–including supermarkets, health food stores, groceries, gourmet shops and department stores–carry the product. Tofutti is also available in Canada, Japan, Australia, Korea, Hong Kong, and the U.S. Virgin Islands.

9109. Brandel, Amy Jo. 1988. Minnesota soybeans go to Japan for tofu: Growers eye permanent market for production. *Agri News* (*Rochester, Minnesota*). May 26.
• ***Summary:*** Southwest Trading, Ltd. and other members of the Worthington-based, non-profit agricultural product marketing group are filling Japanese tofu manufacturers needs with a locally grown soybean variety. Last week, 25,000 bushels of southwestern Minnesota and northeastern Iowa soybeans headed for Japan. Farmers received 37½ cents a bushel over May 2 local prices for a total of $6.89 cents a bushel, said Jim Wychor of Southwest Trading, Ltd. The soybeans are imperfect hilums. That means the tiny black dot where seeds and pods attach is nonexistent. The variety also has a high protein content. Once in Japan, the soybeans go to many small tofu manufacturers. Each firm uses only about 300 pounds weekly, but there are over 7,000 such facilities in Tokyo alone. Address: Minnesota.

9110. Belleme, John. 1988. The great Japanese foods face-off: Are natural brands a better buy? *East West.* May. p. 26, 28-35.
• ***Summary:*** Contents: Introduction. Shiitake mushrooms. Wakame (sea vegetable). Udon. Toasted sesame oil. Complex fermented foods: Rice miso, rice vinegar. Sea salt. The Oriental foods industry in the USA dwarfs the Japanese natural foods industry. Annual sales of JFC International Inc. [affiliate of Kikkoman] alone, about $180 million, is about ten times that of the entire Japanese natural foods industry in the United States. Oriental foods sell for about half the price of natural foods. Mitoku's special quality miso is made by Takamichi Onozaki of Yaita, Japan. Eden Foods' miso is made by Toshi Shiroozu of Fukuoka, Japan. Also discusses rice vinegar quality.

Note: This article is a thinly disguised advertorial for Mitoku products.

9111. Cutler, Blayne. 1988. Move over, miso. *American Demographics* 10(5):56. May. *
• ***Summary:*** The youth market and food consumption in Japan.

9112. Haumann, Barbara F.; Baldwin, A.R. 1988. Feature. Update: Fats and oils industry changes. *J. of the American*

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Oil Chemists' Society 65(5):702-04, 706, 708, 710-13. May.
• ***Summary:*** Dramatic changes have occurred in the worlds' fats and oils industry during the past 25 years. U.S. soybeans, the major factor in world fats and oils trade in 1961, have encountered increasing competition from soybeans produced in South America as well as from palm oil, sunflowerseed and rapeseed. U.S. soybean dominance of world oilseed trade during the 1950s and 1960s began to crack in the 1970s. U.S. embargoes on soybean exports in 1973 and 1980 led Europeans, the Soviets and the Japanese to look for alternate sources of supply. They found Brazil and Argentina willing to learn how to grow soybeans for the export market. Ohio State University researcher Norman Rask has estimated total costs of producing a bushel of soybeans at $6.62 in the U.S., $5.39 in Brazil and $4.06 in Argentina.

In the world soybean market, Brazil's share of international trade has grown from 3% in 1981/82 to 14% in 1984/85; in the same time span, Argentina's market share rose from 6% to 13%. Meanwhile, the U.S. share declined from 82% to 65%. In world soybean oil markets, Argentina's share has grown from 3% in 1981/82 to 14% in 1984/85. Brazil's share has increased from 24% to 27%; the U.S. share has fallen from 27% to 20%. U.S. soybean growing area peaked in 1980 at 70 million acres. In recent years, it has declined, with only 56.4 million acres harvested in 1987. U.S. soybean accounted for 65.9% of all world oilseed trade volume in 1979/80. By 1986/87, its share had dropped to 55%. The 1982 Census of Manufactures counted 243 vegetable oil mills operating in the U.S. in 1982. Of these, soybean oil mills had increased to 137 establishments, versus 121 in 1977.

The U.S. Food and Drug Administration (FDA) in 1985 ruled that low erucic acid rapeseed oil could be used in food products in the U.S. The first company to act on this was Procter & Gamble, which in 1986 reformulated its Puritan cooking oil to contain 100% canola oil. The phenomenal increase in corn oil production has been due to enzymatic processes for high fructose corn syrup and a gas tax subsidy on fuel alcohol. Consolidation, mergers, buyouts, and restructurings have led to increasing concentration of capacity in the hands of a few international companies whose operations range from seed cultivation through shipping and export to complete processing. This has led to fewer locations that process larger quantities of oilseeds.

U.S. based soybean processors are expanding their foreign investments in an attempt to escape relatively high U.S. soybean prices as well as to circumvent trade barriers. These include Archer Daniels Midland Co. (ADM), Bunge, Cargill, and Continental Grain. Since 1982, ADM also has held a 45% interest in Alfred C. Toepfer International, a large commodities trading firm with headquarters in Hamburg, West Germany. In 1984, a National Institutes of Health panel recommended that Americans limit their cholesterol intake to less than 300 mg/day, fat intake to 30% of total calories in their diet, saturated fat intake to less than 10% of calories, and polyunsaturated fat intake to a maximum of 10% of calories.

There are a number of possible developments to watch during the next 20 years, including: Soybeans with low or zero linolenic acid; soybeans with higher yields (possibly hybrids) with broader adaptability to increase overall production; increased consolidation of oilseed processing. As world markets for oilseeds and oilseed products increase, market shares for soybeans and soybean products will decline. Address: JAOCS.

9113. Kotzsch, Ronald E. 1988. Soyfoods; A growing industry is revolutionizing the way Americans eat (Special Advertising Supplement). *East West.* May. p. 1A-11A. Also in Vegetarian Times. May. p. 49-59.
• ***Summary:*** A well-done "advertorial" as part of America's first Soyfoods Month. Sponsored by Nasoya, Morinaga, Legume, Simply Natural, Vitasoy USA, Westbrae Natural, and Farm Foods. Each company also ran an ad in this section. Henry Ford played a key role in introducing Americans to soyfoods as with his 16-course meal at the 1934 World's Fair. Interest remained strong through World War II, then dissipated quickly. By the time Ford died in 1947, soyfoods were all but forgotten. Interest was revived and advanced from the mid-1970s on by Shurtleff and Aoyagi of the Soyfoods Center in California. Today through the efforts of many growing companies, the industry is booming.

9114. Morinaga Nutritional Foods, Inc. 1988. Shake off cholesterol: With the prefect blend of Mori-Nu and your favorite fruit (Tear-off recipe pad). 2050 W. 190th St., Suite 110, Torrance, California 90504.
• ***Summary:*** This color tear-off recipe pad (6½ by 4 inches), developed by Susan Bucher of Bucher & Russell in Los Angeles, was introduced in May 1988. On the front is a color photo of a strawberry shake and a package of Mori-Nu Silken Soft Tofu, surrounded by strawberries, a cut pineapple and other fresh fruit. On the back are 2 recipes (Mori-Nu's Wake-Up Shake, Tangy Orange Cinnamon Custard) and "Mori-Nu Tofu Facts." Address: Torrance, California. Phone: 1-800-669-8638.

9115. Murata, K. 1988. Antioxidative stability of tempeh. *J. of the American Oil Chemists' Society* 65(5):799-800. May. [7 ref]
• ***Summary:*** Discusses the antioxidant activities of 6,7,4-trihydroxyisoflavone, an isoflavone isolated from tempeh. Fatty acids liberated from soybeans during the fermentation of tempeh promote rapid decomposition of peroxide. Address: Research Inst. for Education, Teikoku Gakuen, Moriguchi City, Osaka 570, Japan.

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9116. Murata, Katsumi; Kusakabe, I.; Kobayashi, H.; Kiuchi, H.; Murakami, K. 1988. Functional properties of three soymilk curds prepared with an enzyme, calcium salt and acid. *Agricultural and Biological Chemistry* 52(5):1135-39. May. [15 ref. Eng]
• ***Summary:*** Soybean curds prepared with an enzyme showed high emulsion stability over a wide range of pH (2-10) and temperature (20-80ºC) whereas calcium–and acid curds were stable only at pH 4-6, and temperature greater than 40ºC. Though foam stability of each curd was low, the enzyme-curd had higher values than others over wide pH and temperature range. Lyophilised enzyme-curd showed higher solubility in water than others, although its water-holding capacity was lower than the others. No gelation was observed in any of the soymilk curds. These results indicate the high potential enzyme-curd has over the others in application to various kinds of food products. Address: 1&4. Research Development Section, Kibun Food Chemifa Co. Ltd., 2-5 Shinbashi 3-chome, Minato-ku, Tokyo 105; 2,3&5. Inst. of Applied Biochemistry, Univ. of Tsukuba, Tennohdai 1-chome, Tsukuba-shi, Ibakari 305. All: Japan.

9117. Ontario Soya-bean Growers' Marketing Board. 1988. Report on export market development mission of the Ontario soybean industry, March 19th–April 3rd, 1988. Chatham, Ontario, Canada. 23 p. May. 28 cm. Spiral bound. [Eng]
• ***Summary:*** This report was prepared by Owen Dobbyn, John Cunningham, Maurice Waddick, and Fred Brandenburg of OSGMB. Contents: Japan. The Japanese soybean market. Visits: Japan Miso Co-operative Industrial Assoc. (M. Iida, chairman), Japan Packaged Tofu Assoc. (H. Kijima, Exec. Secy.), Federation of Japan Natto Manufacturers Cooperative Society (Mr. Ohse), Takano Foods Co. Ltd. (E. Takano, president, uses 7,000 to 8,000 tonnes of soybeans annually to make natto), Home Foods Co. Ltd (Home Shokuhin, Y. Murai. managing director, has 160 employees and 3 tofu factories that use 300 tonnes of soybeans/month; owned by Wako Shokuryo, the #1 wholesaler of soybeans in Japan), Japan Oilseed Processors Assoc. (JOPA; H. Higashimori, managing director). Japan Oil and Fat Importers & Exporters Assoc. (JOFIEA; I. Shimizu, exec. director), Canadian Embassy, Tokyo.

Hong Kong. Soybean imports. Visits: The Hong Kong Soya-Bean Products Co. Ltd. (makers of Vitasoy soymilk), Amoy Industries (International) Ltd.

Malaysia. Soybean imports 1984, 1985, 1986. Visits: Ace Canning (owned by Lam Soon). Yeo Hiap Seng (Malaysia) Berhad (soymilk), Cheong Chuan (Hup Kee) Sdn. Bhd. (traditional fermented soysauce), Sin Yong Huat Enterprises Sdn. Bhd. (soybean importers), Syarikat Perniagaan Cheon Fatt (tofu manufacturer).

Singapore. Soybean imports (1983-1986). Visits: Sin Seng Lee Trading Co. (Pte.) Ltd. (claims to import 60% of soybeans to Singapore). Conclusions for each country. Recommendations for future action. Future export development missions. Accomplishments. Competition.

In Japan, 842,000 tonnes soybeans are used to make foods, as follows (in tonnes, p. 1): Tofu 456,000, miso 180,000, natto 90,000, dried-frozen tofu 30,000, boiled soybeans 23,000, soybean powder [probably kinako] 10,000, soymilk, 7,000, soysauce 5,000, other 41,000. The suppliers of these edible soybeans are (in tonnes): USA 400,000, China 280,000, Japanese domestic 280,000, Canada 24,000. Total Japanese soybean imports: 5,000,000 tonnes. Of this 4,036,000 tonnes (81%) are used for crushing, 842,000 tonnes for food, and 70,000 tonnes for feed (not crushed). The Japanese market for soybeans is very large for both crushing and food use, but is not growing. The beans for crushing come mostly from the USA and South America.

Preferred characteristics of soybeans for each type of soyfood are given. For example, for miso: Low oil, high protein, high sugar, white hilum. For tofu: High sugars (glucose, sucrose), moisture content 10-12.5%, new crop preferred to old, protein 40%, oil 19-20%, hilum color is not very important but white is preferred, varietal consistency; preferred varieties are Beeson, Amsoy, Corsoy. Natto: Most important is small size, 5.5 mm or less, clean beans free of foreign material, high sugar content (saccharose, stachyose, which bacillus needs to work), less oil, must absorb water well. Soymilk: Good flavor, low moisture (10%), low percentage of splits (too high can cause rancidity), low oil, high protein.

In Japan, vegetable oil consumption has increased 2.5 times in the past 20 years to 45.17 gm/capita/day in 1986. Soyoil and canola oil together account for 85% of production. Canola is replacing soybean oil. If the oil market is strong, the 30 Japanese crushers crush more canola, but if protein is strong they crush more soybeans. U.S. soybeans have too much foreign material; new contracts have a penalty for > 2% FM.

In Hong Kong, 6,000,000 cases of Vitasoy brand soymilk are produced annually. The company uses 2,500 tonnes/year of soybeans, 80% of which are grown in Canada. It uses 100 to 200 tonnes of organic soybeans for Vitasoy exported to U.S. health food stores. Using 15 Tetra Pak machines, production takes place 24 hours/day (3 shifts), 6 days a week. Contacts: Patrick Cheung (marketing manager), and Raymond Yuen (commercial manager).

Amoy Industries, the largest maker of soy sauce in this part of the world, produces 6,000 tonnes/year. The company was established 80 years ago in Amoy, eastern China, moved to Hong Kong in 1949; 50% was purchased by Pillsbury in 1983. Uses 2 containers of soybeans/week, 100% from Ontario for the past 5 years.

Malaysia soybean imports rose from 174,400 tonnes in 1984 to 255,200 tonnes in 1986. The main suppliers in 1986 were China (56.2% of total), Vietnam (15.8%), and Argentina (14.3%). Ace Canning uses ton tonnes/month of

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soybeans (presently all from China) to make soymilk. They have 7 Tetra Pak machines. Yeo Hiap Seng (Malaysia) is the largest soymilk producer in Malaysia, making 25,000 liters/year using 9 Tetra Pak machines. They use 1,250 tonnes of soybeans (80 containers) per year, all Canadian.

In Singapore, soybean imports rose from 28,287 tonnes in 1983 to 41,571 tonnes in 1986. In 1986, some 66% came from Canada, 16.6% from China, and the rest from others.

The major competition for food quality soybeans in these four countries at present comes from China. The Chinese have improved their soybean quality and appear to be actively seeking to increase their market share. In the long run, however, China may choose to reduce its soybean exports in order to increase meat consumption in China. This could lead to new market opportunities for Canada in these four countries. Address: P.O. Box 1199, Chatham, ONT N7M 5L8, Canada. Phone: 519-352-7730.

9118. *Orenji peiji* (*Orange Page*). 1988. Tôfu no okazu. Tegaru de herushii [Recipes for tofu side dishes. Quick and healthy]. May. p. 8-14. [Jap]
• ***Summary:*** Okazu means side dishes to rice, the main dish. Every page is in full color. Address: Japan.

9119. *Seikatsu Benri, Orenji Peji* (*Convenient Life, Orange Page*). 1988. Tôfu no okazu [Tofu side dishes]. May. [Jap]*
• ***Summary:*** According to Toyo Shinpo (1 May 1988, p. 4), the entire May issue (¥200) was devoted to easy and healthy tofu cooking, including both Western and Chinese-style recipes. The magazine is published by Orange Page, Inc.

9120. Shimoda, Keiki. 1988. Naijeria de no nattô shishoku-kai–Osegere-mura, Zonkuwa-mura no rei [Natto tasting meeting in Nigeria. Examples of Osegere village and Zonkuwa village]. *Daizu Geppo* (*Soybean Monthly News*). April/May. p. 32-35. [Jap]
• ***Summary:*** The first natto taste test in Nigeria was in Lagos. 7 women, ages 30-40, at the Department of Agriculture tried plain, unheated natto. They disliked the sticky/slimy texture, saying that it reminded them of rotten food. But the strong smell of natto was not foreign to them, since they knew dawa-dawa.

The next taste test was in the village of Zonkwa, located 50 km southeast of Kaduna. It had 200 inhabitants of which 10 tasted natto, but the village head tasted first and his response may have influenced that of the other villagers. These people know and consume dawa dawa soup, so the natto was used in a similar soup in place of dawa dawa. The result looked like a thick porridge. In this form, the natto was liked very much. A table compares natto and dawa dawa for appearance, smell, texture, and taste–on 5 levels of like and dislike. In each characteristic dawa dawa scored only slightly higher than natto. Natto received the highest score for its taste (very tasty: 8 vs. 9 for dawa dawa) and the lowest for its mouthfeel (4 vs. 9). All tasters said that natto soup was more "sticky" or mucilaginous (*nebatte-iru*) than dawa dawa soup, and that it reminds them of okra soup with corn.

Then at Zonkwa natto was served Japanese-style on white rice (probably seasoned with shoyu and thinly sliced leeks (*negi*)). The "brave young people who ate it said it as very tasty."

The last taste test was in the village of Osegere, located about 20 km east of Ibadan. A tempeh experiment had been conducted there by the Denmark Ministry of Development starting in 1981. This time the local people (who did not speak much English) were asked to make natto soup using freeze-dried natto, plus the usual palm oil, pepe, etc. About 10-12 people tasted it and 90% said they liked it very much; 40% said they found it "sticky." Address: Tsukuba Univ., Shushi Katei Kankyo Kagaku Kenkyu-ka.

9121. Shurtleff, William; Aoyagi, Akiko. comps. 1988. Bibliography of soymilk, from 1500 to 1988: With 2195+ references. Lafayette, California: Soyfoods Center. 209 p. Subject and country index. Partially annotated. Printed May. 28 cm. [2199 ref]
• ***Summary:*** The most comprehensive bibliography on this subject. Includes all known commercial soymilk products. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

9122. Shurtleff, William; Aoyagi, Akiko. comps. 1988. Bibliography of soy sauce, from A.D. 535 to 1988: With 2150+ references. Lafayette, California: Soyfoods Center. 181 p. Subject and country index. Partially annotated. Printed May 30. 28 cm. [2153 ref]
• ***Summary:*** The most comprehensive bibliography on this subject. Includes all known commercial soy sauce products. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

9123. Tsuchiya, Kunio. 1988. Daizu shôhin-ka no genryû o saguru–Manshû daizu hatten shôshi [A study of the origins of soybean commercialization. A small history of soybean development in Manchuria. II.]. *Daizu Geppo* (*Soybean Monthly News*). April/May. p. 21-31. [29 ref. Jap]
Address: Shadan Hojin Daizu Kyokyu Antei Kyokai.

9124. Maeda, Toshiie. 1988. Mura okoshi–Tenpe sonjuku [Revitalizing a village–the tempeh village school. I.]. *Toyo Shinpo* (*Soyfoods News*). June 1. [Jap; eng+]
• ***Summary:*** The author, a representative of the school, wrote a book titled Homeland of Miso (*Miso no Furusato*). He discussed the fact that the use of miso mainly in miso soup presents a big problem. The first solution to the problem is to use miso in thick ketchup-like sauces. The second is to return to the non-salted fermented foods such as Japanese natto, Nepalese kinema, Indonesian tempeh, and Chinese

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fermented black soybeans (shi), which are the ancestors of miso. He emphasized tempeh, which he feels is a wonderful food that can be used in various ways, and is nutritious and healthy. He explained that tempeh is becoming popular in the USA and Europe, and concluded that tempeh alone can be used to start a food industry.

"Because of this book, I received a visit from 2 people from the "Vitalizing Village Committee" of Kasuga-cho, Hyojo-gun, Hyogo-ken. They asked me to give a lecture on tempeh, for they wanted to consider whether tempeh could be used to help vitalize the village. I accepted the offer, but realized I needed more information on the subject. So I contacted Murata sensei, professor emeritus at Osaka Shiritsu Daigaku, who played a key role in organizing the first international Asian Symposium on Non-Salted Soybean Fermentation in Japan. She and others at the university sent me an encouraging letter, four articles on tempeh, and information on tempeh cookery from the university.

"In late August 1987 I used these material to give a 40 minute lecture on tempeh followed by 20 minutes of questions. It was decided to have a follow-up meeting for tempeh tasting. Through Dr. Murata's introduction I received 2 kg of free tempeh from a maker in Aichi-ken. The sampling was a big success and was written up in the newspaper in a big way. The local Hyojo prefecture high school food processing department started to experiment with tempeh, and a women's group, the Kasuga-cho Commerce and Industry Group, began to experiment with tempeh cookery. At the end of Sept. 1987 one of the teachers at the high school succeeded in making tempeh, which made the news. Then they started to make second generation tempeh products, such as confections and breads. At their local school festival in October 1987 he presented the products and gained a good reputation."

9125. *Toyo Shinpo* (*Soyfoods News*). 1988. Hyakkaten deno tôfu jitsuen hanbai hajimaru [Tofu is being made and sold in a department store in Korea]. June 1. p. 11. [Jap; eng+]
• ***Summary:*** In Seoul, Korea, there is a newly built department store, "Lotte World." In it there is a traditional tofu shop which uses a stone grinder to crush their soybeans. They had to get special permission to use a stone grinder, as they are generally considered unsanitary. Their shop is arranged so that shoppers can get a good look at how the tofu is being made, unlike the equivalent store in the Ikebukuro department store in Japan. There is also a counter where customers can eat their tofu. The store does not put the tofu in a water tank. The tofu is very firm.

9126. *Farmers' Advance* (*Camden, Michigan*). 1988. Indiana seeks tofu connection. June 8.
• ***Summary:*** Special soybean varieties for processing Japanese tofu will be developed through a $14,050 value added research grant to the Purdue University Agronomy Department, Lt. Governor John Mutz has announced. "We're also working to develop a special state certification program for exported food soybeans in order to ensure quality and identity," Mutz said. The research project will evaluate production characteristics of seven Japanese soybean varieties.

9127. Fruin, W. Mark. 1988. Kikkoman archives and history (Interview). *SoyaScan Notes.* June 9. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Kikkoman has many documents written before 1900 in the Kikkoman Archives, which are located in a kura on the grounds of the administrative office building at Noda. Before 1980 they used to be in a sales office upstairs in the main building. Many early documents, often in shoji brush script, are very hard to read. There are also said to be many early documents in the personal homes of the families who owned the family businesses that became Noda Shoyu in 1917. They are mostly sales and accounting records. The Takanashi family is said to have many old documents in their mansion near the center of Noda. In Noda Shoyu Keizai Shiryo, Ichiyama Morio has taken some of the older documents and written them in a more easily readable form.

Concerning the relationship between Choshi Shoyu, Kikkoman, and Yamasa. The Choshi and Yamasa founders were two brothers who both came from Wakayama. They split apart during the Tokugawa period. In 1914 the Choshi Shoyu Co. Ltd. was formed from 3 previously independent shoyu brewers from Chôshi in Chiba prefecture. The three were Yoshiuemon Hamaguchi, Yoshibei Fukai, and Genba Tanaka. From the 1860s until this time, the main figure in Choshi Shoyu was Tanaka Genba, owner of the largest brewery there. During Meiji and Taisho periods the Choshi side got into financial trouble and asked Yamasa for help. Yamasa declined so Noda Shoyu (later Kikkoman) Kikkoman stepped in and bought 80% of the Higeta Shoyu Company's stock in 1937. But during the occupation after World War II, Kikkoman was forced to divest Choshi/Higeta Shoyu. However Choshi still does most of its marketing through Kikkoman even though the ownership is separate. Choshi/Higeta uses the Kikkoman fermentation recipe and until recently the Kikkoman sold in Hokkaido was made by Choshi/Higeta Shoyu.

Choshi/Higeta Shoyu and Yamasa have many more early documents than Kikkoman does. Reiko Hayashi is a female professor of economic history (formerly at Tokyo Univ., now retired) who has done extensive research on those records and compiled bibliographies. One of her students, Hiroko Aburai, has also done a lot.

Kikkoman International is a private company in charge of soy sauce in North America. Kikkoman Corporation, the parent company, is publicly owned, but is only traded on the Tokyo stock exchange. It has annual reports. Address: Palo Alto, California.

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9128. Maeda, Toshiie. 1988. Mura okoshi–Tenpe sonjuku: Tenpe zukuri ga hajimaru [Revitalizing a village–the tempeh village school: Tempeh production gets started. II.]. *Toyo Shinpo* (*Soyfoods News*). June 11. [Jap; eng+]
• ***Summary:*** In Nov. 1987 there was serious discussion of having an international tempeh symposium in the town of Kasuga-cho. This was the idea of Prof. Dr. Tadao Watanabe of Kyushu Univ. Though the idea eventually had to be dropped for lack of funding, the Fifth Tempeh Meeting was held in the village of Kasuga-cho on 19 Dec. 1987. Many prominent tempeh experts attended: Dr. T. Watanabe, Dr. Murata, Mr. Kanasugi, and Mr. Takato. The latter two are also involved with natto. After this meeting, some people wanted to start making tempeh in the village. Taking the initiative were Mr. Kenji Takami (a potter), Mr. Kazumasa Takami (a wood sculptor), and later another Mr. Takami (a horticulturist). They wanted to include tempeh in their lunch program. They started to build a tempeh factory on part of T. Takami's pre-school, Meitoku Hoiku-en. Dr. Nishira Hiroshi of Kobe University, Dept. of Agric. Chemistry, advised on how to make tempeh starter. Experiments were conducted at Kyoto Tanki Daigaku (Junior College).

In mid-January 1988 the group started to call itself Tenpe Sonjuku: Kenko Shokuhin Tenpe Kenkyu Sakuru (Tempeh Village School: Health Food Tempeh Study Circle). They bought the best equipment for making tempeh starter. Because of limited capital, they built the plant simply and improvised. For dehulling, they used a tofu shop mill. For separating the hulls by aspiration, a *tomi* developed during the Edo period. For the incubation room, an inexpensive rice sprouting room. For dewatering the beans, a used washing machine centrifuge. For mixing in the tempeh starter, a tofu burger (ganmo) mixer. For incubation trays, used rice sprouting boxes. Address: Kobe Women's Junior College, food processing.

9129. *Toyo Shinpo* (*Soyfoods News*). 1988. Tôfu ga eizu ni kiku! Eizu nimo kôka ga aru tônyû no naka no saponin, Okubo Ichiro hakase ga happyô [Tofu works against AIDS! Dr. Ichiro Okubo's publication shows saponin in soymilk is even effective in treating AIDS]. June 11. p. 11. [1 ref. Jap; eng+]
• ***Summary:*** Dr. Okubo, assistant professor at Tohoku University in Japan, published an article in *Asahi Graph* (3 June 1988) stating that tofu and soymilk work against AIDS. This created a sensation in Japan. There are many types of saponins, but they can be divided into 2 types, A and B. Group, B can control growth of the HIV virus, which is also a cause of leukemia and breast cancer. Group A, which only exists in the soybean hypocotyl (sprout/germ, *haijuku*), is a cause of the soybean's bitter flavor. Thus, removing the hulls and germ from soybeans gives better tasting soymilk and tofu. Address: Asst. Prof., Tohoku Univ., Japan.

9130. *Farmer's Exchange* (*New Paris, Indiana*). 1988. Research to start on soybeans for tofu. June 17.
• ***Summary:*** Special soybean varieties for processing Japanese tofu will be developed through a $14,050 value-added research grant to the Purdue University agronomy department. This project is a key step in our effort to help Hoosier farmers access premium food soybean markets in the Far East. The research project will evaluate production characteristics of seven Japanese soybean varieties and their adaptability to Indiana's climatic conditions and management techniques.

9131. Belleme, John. 1988. Tamari: Reborn in the U.S.A. [San-J International begins production in America]. *East West*. June. p. 14, 16-18.
• ***Summary:*** In 1804, almost half a century before Commodore Perry's ships forced open Japan's ports to American trade, the Sato family's fleet of small boats began ferrying their homemade tamari and other goods up the Kiso, Ibi, and Nagara Rivers. From the port city of Kuwana in the Bay of Ise on the Pacific Coast, the Satos received goods from larger ships and delivered them to communities upriver. Takayoshi Sato is currently the president of San-J International, the remnant company, almost eighty years since the Satos closed their maritime business. Faced with the loss of livelihood, the Satos turned to making tamari and soybean miso on a large scale in 1909.

With the dollar at an all-time low against the Japanese yen, and 100% of all natural shoyu and tamari sold in the U.S. being imported from Japan, the opening of the San-J International tamari plant could not be more timely. American importers of Japanese foods have seen a 50% increase in the price of shoyu and tamari in the past eighteen months. There are just a few companies in Japan still making genuine tamari. San-Jirushi at Kuwana is the largest, producing roughly half of the country's annual production of 6,000 kiloliters (1,500,000 gallons).

William Shurtleff first proposed exporting San-J tamari to the U.S. in 1977. Shurtleff gave a sample of San-J tamari to the president of Mitoku, which supplied Erewhon with Japanese foods. Shortly thereafter, Erewhon began importing San-J tamari in five gallon tins. Next John McLaughlin, a Richmond businessman, tasted San-J tamari and was impressed enough to go to Japan and talk to the Sato brothers. The meeting led to the founding of San-J International in December 1978, a Japanese-American joint venture to market San-J tamari and eventually build the Richmond plant.

Today, industrial giants such as Stouffer's and Campbell's use San-J tamari exclusively in all their frozen food lines. San-J makes the point in their ads: "One teaspoon of tamari–which contains just a pinch of salt–is the seasoning equivalent of a full tablespoon of salt. Tamari seasons with

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protein, not sodium." In the manufacture of tamari, the mixture of koji and brine, called moromi, is left to ferment for about six months. Tamari is pasteurized (2% ethyl alcohol is added to prevent the growth of yeasts and molds). The Richmond plant can make about 1 million gallons of tamari and tamari shoyu (tamari with 20% wheat added) a year, about two times the current annual sales of the imported product.

The Richmond process will differ from that used to make tamari in Kuwana. First, in Japan, San-J tamari is aged for at least 12 months at room temperature. In Richmond, fermentation is accelerated to approximately 6 months by heating the fermentation vats with electric coils. Second, the San-J tamari from Japan is aged in old cedar vats while the Richmond plant is using fiberglass vats lined with epoxy resin. Every major importer of natural Japanese foods has expressed interest in bottling San-J tamari in their private label. However, only Eden Foods Clinton, Michigan, has negotiated a contract with San-J.

9132. Cooper, Jack. 1988. Miso: The mother's touch. *Palate Pleasers of Japan* (*Los Angeles, Calif.*) 6:31-37. June.
• ***Summary:*** The "mountain made" miso commercial turned a small, local miso manufacturer in the Japan Alps, Miyasaka Jozo Co., Ltd., into the second largest miso producer in all of Japan. To Japanese everywhere, the "chop, chop, chop" sounds of mom dicing tofu and scallions in the kitchen, mixed with the savory, pungent fragrance of hot miso broth and the clean, sweet smell of steaming rice are as much a symbol of the dawning of the day as the aroma of fresh coffee and the sizzling sounds of bacon and eggs are to Americans. William Shurtleff and Akiko Aoyagi explain [the bewildering 'vintages' of miso] in their massive volume, *The Book of Miso.* All traditional miso contains salt and soybeans to which a mold culture, or "friendly agent," usually *Aspergillus oryzae,* has been added.

A 1965 study conducted by Dr. Takeshi Hirayama at Japan's prestigious National Cancer Center, people who eat miso soup daily are 32% less likely to develop cancer than those who never eat miso soup. Undiluted, miso contains on average about 12% salt, six times the salt content of cheddar cheese. Most miso sold in America is imported and sold under Japanese brand names like Maruman, Marukome, Shinshu-ichi, Yamabuki, Hanamaruki, etc. One reason for this may be Japan's stringent new laws requiring producers to list all ingredients and additives (mainly MSG, artificial coloring and preservatives), making the natural products more attractive to America's health-conscious consumers.

The Japanese National Miso Association estimates that there are over 2500 miso manufacturers in Japan, many of which are small, family-owned operations. Color photos show: (1) Miko-chan, the little kneeling girl who is the Miyazaka Jozo logo. (2) Three types and colors of miso in white bowls, next to an iris. (3) The historic old Shinshu Ichi miso and shoyu plant. (4) A bowl of white miso soup with crab and tofu. (5) An assortment of traditional miso dishes. (6) The ultra-modern computerized control panel, motorized conveyors, and the modern packaging facility at the Miyazaka Jozo factory (3 small photos). (7) A shop in Japan retailing Japanese miso in traditional small wooden kegs. (8) Five views of the South River Miso Co., Conway, Massachusetts (including an exterior view of the home and miso shop, Christian Elwell at work in the temperature-controlled koji room).

Note: According to *The Book of Miso,* by Shurtleff & Aoyagi (1976, p. 257; based on 1974 statistics) *Mayasaka Jozo* (*Shinshu Ichi*) is Japan's largest miso factory. The company's Tokyo factory produces about 15,000 tons/year; the Nagano and Yamanashi plants produce 9,300 tons and 3,300 tons respectively. All make Shinshu-type light-yellow miso. As of 1983, the Tokyo factory also made freeze-dried miso. Address: Editor, Palate Pleasers.

9133. Fujinuma, Kenji; Saito, K.; Nakazato, M.; Kikuchi, Y.; Ibe, A.; Nishima, T. 1988. Shokuhin-chû no gurichirurichin-san no bunseki-hô [Determination of glycyrrhizic acid in foods]. *Shokuhin Eiseigaku Zasshi* (*J. of the Food Hygienic Society of Japan*) 29(3):210-15. June. [9 ref. Jap; eng]
• ***Summary:*** High performance liquid chromatography was used to determine the glycyrrhizic acid (GA) content of Japanese soy sauce and miso. In a survey of commercial foods, GA was detected at levels of 2 to 224 micrograms/gm in 16 out of 56 samples.

Glycyrrhizin is $C_{42}H_{62}O_{16}$. Glucoside contained in *Glycyrrhiza glabra* L. at the level of 6-14%, with strong sweetness, which is hydrolyzed with acid into glucuronic acid and glycyrrhetinic acid ($C_{30}H_{46}O_4$). Address: Tokyo Metropolitan Research Lab. of Public Health, 3-24-1 Hyakunin-cho, Shinjuku-ku, Osaka, Japan.

9134. **Product Name:** [Soymilk Ice Cream].
Foreign Name: Tônyû Sofuto Kuriimu.
Manufacturer's Name: Iimura Shoji.
Manufacturer's Address: Ebisu Nishi 2-12-13, Shibuya-ku, Tokyo, Japan. Phone: 03-463-1896.
Date of Introduction: 1988 June.
How Stored: Frozen.
New Product–Documentation: Toyo Shinpo. 1988. June 1. p. 6. "Hit product of the summer is the soft-serve soymilk ice cream machine from Iimura Shoji." Iimura Shoji, a company which sells materials for the tofu industry, is trying hard to make this product popular. Ten companies have already bought the soft-serve ice cream machine, and Iimura Shoji anticipates that it will have sold 100 machines by the end of the year. The company has been promoting the product on T.V. just in time for the summer heat. The ice cream comes in two flavors–vanilla and custard. The company is also trying to sell the ice cream machines to local tofu shops.

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9135. Kay, Theodore; Kimura, M.; Nishing, K.; Itokawa, Y. 1988. Soyabean, goitre, and prevention. *J. of Tropical Pediatrics* 34(3):110-113. June. [Eng]
• ***Summary:*** Contents: Introduction. Nutritional value of soya bean Nigerian foods prepared with soya bean paste: Soya bean paste (soaked, ground soybeans without the "husk" removed), kosei (akara ball), panke (puff-puff). Nigerian foods prepared with soya bean milk: how to make the basic milk, wara (milk curd), and alele (moin-moin, made with soya milk residue [okara]). Note: "The above five recipes have been fully accepted in many parts of Nigeria. The taste and the preparation procedure of these traditional Nigerian foods made from soya beans worked out to be almost the same or very similar to the foods traditionally made from cow peas (white beans) for kosei and alele, wheat flour only for panke, and cow milk for wara."

Nigerian foods made with soya bean flour (pre-cooked): How to make the basic flour, protein enriched pap (with akamu), and protein-enriched fu-fu (with gari or cassava flour). Discussion.

"Soya bean is being successfully established in Nigeria, but it has been very difficult to cook in a traditional West African way so it has never become popular in this country. Most soya bean produced in Nigeria has been exported as cash crop except a little for animal consumption."

Kosai, alele, panke, and awara are traditional foods in Northern Nigeria, while akara ball, moin-moin and puff-puff are traditional foods in Southern Nigeria. Discussion: "Why do we need soya bean in Nigeria?" Five reasons are given. The first two are: "(1) It has higher protein content and net protein utilisation (NPU) than cowpeas, groundnut and other legumes. Moreover, soya bean is much cheaper than other legumes in Nigeria. (2) Soya bean flour and soya bean milk have little taste and can therefore be incorporated into traditional foods such as pap and fu-fu without changing the appearance, taste and texture." Address: Dep. of Hygiene, Faculty of Medicine, Kyoto Univ., Kyoto 606, Japan.

9136. Kirazu (Okara Club). 1988. June. New soyfoods restaurant or deli. Imperial Roppongi Forum 2F, Roppongi 5-16-5, Minato-ku, Tokyo, Japan.
• ***Summary:*** Toyo Shinpo. 1988. June 1. p. 9. "The Okara Club, 'Kirazu', helped to open up an okara restaurant in Roppongi. The 60 worldwide dishes are served with wine." The Sapporo Beer Company wanted people to drink a lot of wine. They also wanted to have an outlet restaurant. They came up with the new and unusual idea of having an okara restaurant. It is located in a high class area in Roppongi. They serve okara in 60 different ways, Western and Japanese, and with every meal comes an ample portion of wine. Address: Tokyo, Japan. Phone: 03-582-4469.

9137. **Product Name:** [Maruman Miso].
Foreign Name: Maruman Miso.
Manufacturer's Name: Maruman Jozo Co. Ltd. (Importer). Made in Japan.
Manufacturer's Address: USA
Date of Introduction: 1988 June
Wt/Vol., Packaging, Price: Tubs and plastic bags.
How Stored: Shelf stable.
New Product–Documentation: Ad in Palate Pleasers. 1988. Vol 6. June. p. 33. "Natural Goodness. Miso." The product is distributed in the USA by Oriental Trading Co., South San Francisco, CA 94080; Daiei Trading Co., Inc., Woodside, New York; and Crown Trading Co. Ltd., Kobe, Hyogo prefecture 651, Japan.

9138. **Product Name:** Meridian Teriyaki (Soya Sauce).
Manufacturer's Name: Meridian Foods Ltd. (Importer). Made in Japan.
Manufacturer's Address: Corwen, Clwyd, LL21 9RR, Wales, UK. Phone: 0490 3151.
Date of Introduction: 1988 June.
New Product–Documentation: Simon Bailey. 1988. Natural Choice. Aug. 15. "Soya-Based Products." A photo shows the Labels. Each has an illustration on the front panel. The tamari shows Mt. Fuji and the ocean, the teriyaki a soybean plant, and the shoyu some Japanese-style trees. CSP form filled out by Simon Bailey. 1988. Sept. 28.

9139. Morinaga Nutritional Foods, Inc. 1988. Revolutionary tofu (Ad). *Palate Pleasers of Japan* (*Los Angeles, Calif.*) 6:61. June.
• ***Summary:*** This full-page color ad begins: "Let Mori-Nu technology solve the problem of tofu freshness." "To find out more... Join the Mori-Nu Health For Life Club. Receive newsletters, coupons, and recipes..." A half-page color photo shows aseptic packages of silken firm and soft Mori-Nu tofu on a wooden table in front of fruits and vegetables.

An "advertising supplement" on pages 76-77 of this issue is titled "The miracle food in a miracle package." It contains two recipes: Chinese unchicken salad, and Pumpkin pie (with tofu). Color photos show each of the two recipes, plus the front page of an issue of *Mori-Nu Healthy Times* newsletter (edited by Susan Buchér), and the front of a color recipe pad titled "Light & Easy Mori-Nu-Recipes." Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9140. Nihei, Takao. 1988. [The history of shoyu in Hawaii. (Food series, part XII)]. *Kokiku* (*Honolulu, Hawaii*). June. p. 32. [Jap; Eng]
• ***Summary:*** "Yo o sutete yama ni iru tomo miso, shoyu, sake no kayoiji nakute kanawaji." "Forsaking all worldly things, still, one can't do without these: Miso, shoyu, and sake." As in the ancient waka poem written by Shokusanjin (during the Edo period), no matter where the Japanese went, miso

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and shoyu were necessities of life. Hawaii's first miso and shoyu were recorded in Meiji Gannen (1868), the year of the first Japanese immigrants' arrival. Ikuma Yonekichi, who came on the ship "Scioto" (Saioto-go), noted in his diary, "Yokohama departure. Provisions of rice, miso, shoyu."

In 1887, as the Japanese immigrant population increased, Japanese goods began to be imported, but there were many instances where miso and shoyu were insufficient. In Hawaii, shoyu was manufactured earlier than sake by Shimada Jihachi in 1891, but he gave it up due to financial difficulties. Later, Yamagami Nobuyuki, who came from San Francisco, California, started a shoyu factory which prospered. With the advent of World War II, imported goods from Japan were cut off, which gave rise to the start of miso and shoyu companies here. Barbeque shoyu is Hawaii's own discovery. The locally made miso and shoyu are less salty than the Japanese products.

9141. Shurtleff, William; Aoyagi, Akiko. 1988. Das Tofu-Buch: Herstellung, Verwendung, Ernaehrungswert, Rezepte [The book of tofu: Preparation, uses, nutritional value, recipes]. Munich, West Germany: Goldmann Verlag. 384 p. Illust. by Akiko Aoyagi Shurtleff. Index. 18 cm. [Ger]
• ***Summary:*** A pocket book edition of the original 1981 German edition of *The Book of Tofu.* Contains 300 recipes. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

9142. *Soya Newsletter* (*Bar Harbor, Maine*). 1988. New process for culturing tofu available. May/June. p. 10.
• ***Summary:*** A new process to culture tofu into a yogurt-type food is available for sale or licensing by Steve Rowat of Yofu Development (Canada). The process, which has a Canadian patent and a patent pending in Japan, is titled, "Process Permitting the Culturing of Tofu with Yogurt-Forming Bacteria". Contact: Steve Rowat, Yofu Development (Canada), Box 93, Merricksville, ONT, Canada K0G 1N0. Telephone: 613-269-4483. Address: Yofu Development (Canada), Box 93, Merrickville, ONT, K0G 1N0. Phone: 613-269-4483.

9143. *Soya Newsletter* (*Bar Harbor, Maine*). 1988. Morinaga extends consumer education campaign. May/June. p. 9.
• ***Summary:*** Morinaga Nutritional Foods, Inc., recently announced a multifaceted consumer education program designed to answer the questions "What is tofu?" and "What do you do with it?"

Coordinated by Danielle Lin, talk show host for KFOX Radio, Los Angeles, California, "the campaign will use a variety of mediums, including in-store promotions and media advertising.

"These new consumer education activities are an extension of Morinaga's marketing activities which include their *Health for Life* club and the *Healthy Times* newsletter."

9144. SunShine Tofu House. 1988. June. New soyfoods restaurant or deli. 5091-C Buford Highway, Atlanta, GA 30340.
• ***Summary:*** Atlanta Daily World. 1988. June 21. "New Tofu Restaurant Opens." Mayor Andrew Young joined other dignitaries (incl. Japanese Consul General Takayuki Kimura) and supporters at the formal opening in northeast Atlanta. The proprietor is Seiho Tajiri, a prominent local Japanese businessman. "The restaurant, the first of its kind in the Southeast, will not only provide a full menu of tofu dishes, but also manufactures the tofu and soymilk in the restaurant." Address: Atlanta, Georgia. Phone: 404-451-2054.

9145. Udesky, James. 1988. The book of soba. Tokyo and New York: Kodansha International. 166 p. Foreword by William Shurtleff. Illust. Index. 27 cm. [50* ref]
• ***Summary:*** Contents. Foreword. Introduction. I. Making soba. Homemade soba noodles. Broth. Noodle dishes. Country cooking. Groat cooking. Variations and desserts. Ingredients. II. About soba. Nutrition. Buckwheat: From seed to table. History. III. Appendices. The soba dining experience. Selected soba restaurants in Japan. Oriental, natural, and specialty food stores in the United States and Canada. Bibliography.

Soy-related recipes include: Cold soba noodles with natto and sesame (with "2/3 oz natto," p. 59). "Fox Soba" (*Kitsune soba,* with "4 pieces thin deep-fried tofu {*abura-age* or *usu-age*}, p. 63). Soba noodles in miso stew (*Kenchin soba,* Ibaragi prefecture, with "4-5 tablespoons miso," p. 70). Soy-Soba noodles (with "4 oz soybeans" [whole dry soybeans], p. 71). Broiled soba dumpling with miso sauce (with "3-4 tablespoons sweet white miso," p. 81-82). Soba pasty (with "1½ oz natto, p. 85). Soy sauce is used in many recipes.

The excellent "Ingredients" section (p. 91-98), gives definitions of several soyfoods, including miso, natto, okara, soy sauce, tofu, and tofu–thin deep-fried (abura-age, usu-age).

The definition of "natto" is especially good: "Natto: This rich soybean product with a cheeselike flavor is still underestimated, unappreciated, and misunderstood, mainly because the sticky 'threads' resulting from its special fermentation process are strong and stubborn, making it pretty tricky for beginners to eat. Natto can be made easily at home with soy beans, 'natto spore' (now available at major health-food dealers on both coasts), a pot, and a box... If allowed to sit too long on store shelves, the beans become overripe. Although you cannot check the quality until you open up the package at home, the best natto should have a light, tannish color and still be moist and a little puffy. Too dark a color indicates overripening and a correspondingly bitter taste. To remedy this situation somewhat, stir the

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beans together with chopsticks or a spoon and combine with chopped onions, wasabi horseradish, and soy sauce. Since this food is the result of bacterial action, no preservative can be used. Thus, natto should be eaten as soon as possible."

Mr. Udesky had a chance to prepare homemade soy sauce while living with Mr. Noboru Muramoto (author of *Healing Ourselves*) from 1971 to 1975. In the Appendix titled "Oriental, natural, and specialty food stores" is an entry (p. 153, col. 3.8) for: "Foods for Life, 504 E. Broadway, Glendale, California, 91025." Note: This pioneering natural and organic food store is still in business in 1988.

For a complementary review, see Jean Pearce. 1991. Nov. 10. *Japan Times.*

Letter from James Udesky. 1997. April 21. The hardcover edition of *The Book of Soba* has now sold 12,000 copies in Japan and abroad, and 3,000 copies of a new soft-cover pocketbook edition (246 p.; 18.2 cm) were published by Kodansha International in Dec. 1995. An article on soba titled "The Art of Noodles," by Udesky appeared in *Japan Quarterly* (April-June 1997, p. 32-42; it contains a large color photo of him rolling out soba dough). Udesky is living in Tokyo, has lived in Japan (except for a 3-month break in 1988) since 1988, married a Japanese woman in 1990, for the last 2 years has worked for a medical equipment importer and taught English part-time at Dentsu Inc. to survive financially, has established a company named Udesky Communications, and continues his practice of making traditional Japanese soba. He has plans for a new book titled "Basic Techniques of Udon Making. " Address: Heim R1 #103, Meguro Honcho 6-18-3, Meguro-ku, Tokyo 152, Japan. Or: The Soba Center, P.O. Box 72, Winnetka, Illinois 60093-0072.

9146. Maeda, Toshiie. 1988. Mura okoshi–Tenpe sonjuku: Mura okoshi was kore kara da [Revitalizing a village–the tempeh village school: Now begins the village development. III.]. *Toyo Shinpo* (*Soyfoods News*). July 1. p. 4. [Jap; eng+]
• ***Summary:*** On 31 Jan. 1988 the group held the first formal meeting of its members. In February work on the equipment began, and by Feb. 20 the tempeh starter room were finished. In March, after many failures and trials, good tempeh starter was produced, and from it the first good tempeh. Big success! By mid-April the tempeh plant, with a production capacity of 2 tonnes a month, was completed.

The purposes of the group: 1. To provide real good foods to the household table. 2. Especially to provide nutritious tempeh for the table to change people's food life. And to popularize tempeh as a food to maintain a healthy food life. Therefore they are collecting information on nutrition and trying to develop second generation tempeh products. Mr. Maeda works as a food technology technician. Cooking experiments are done by the wives of the members. They use organically grown soybeans from Mr. Otsuki, a tofu shop owner. Address: Kobe Women's Junior College, food processing.

9147. *Toyo Shinpo* (*Soyfoods News*). 1988. Shinseihin to tônyû no dezain o kairyô, Mausan-Ai [Marusan-Ai comes out with a new product and they are also changing their soymilk packaging]. July 1. p. 3. [Jap; eng+]
• ***Summary:*** The new product is not soymilk, but green tea. However, Marusan-Ai has redesigned parts of their soymilk package so that nutritional information can be clearly read.

9148. *Toyo Shinpo* (*Soyfoods News*). 1988. Kibu, tezukuri tôfu setto. "Kangaeru Kai" to teikei, hatsubai [The Kibun company is producing a kit to make tofu at home in conjunction with Kangaeru Kai ("Thinking Society")]. July 1. p. 3. [Jap; eng+]
• ***Summary:*** The Kibun company, which makes the soymilk for the kit, is located at Ginza 7-14-13, Chuo-ku, Tokyo-to, Japan. The soymilk comes in special long-life, 1 liter bottles that has a 60-day shelf life at room temperature. They use special, domestic Hokkaido beans and water to make this soymilk. They also put natural nigari in the kit. One liter of the soymilk can produce 3 regular size kinugoshi (silken) tofu cakes. The kit, Tofu No Moto, contains 6 liters of the soymilk and costs 8100 yen.

9149. Bulkley, Kate. 1988. Soy products' new flavor spices Denver Tofu. *Denver Business Journal.* July 11.
• ***Summary:*** Denver Tofu Inc. started business in 1925, and by 1973, they were making 150 pieces (one-pound each) a day. "Now," says Denver Tofu Inc. owner and president, Haru Yamamoto, "we make 2,000 to 3,000 pieces a day." In fact, the company's sales doubled annually from 1982 to 1987. The King Soopers grocery store reports that in the 1970s they had tofu in the produce section, but nobody knew what it was. In the early 1980s, they moved it into the dairy case and they "sold an awful lot of it". Denver Tofu makes five different kinds, ranging from extra hard to kinugoshi, or soft, silken tofu. The company also deep-fries some tofu into something called age (pronounced ah-gay). The softer tofu has always been the best seller at the Asian markets. The harder tofu has generally been a better seller in the supermarkets.

Denver Tofu employs 11 people. In the summer, the plant churns out an average of 2,000 pounds of tofu a day. In the winter, production increases to an average 3,000 pounds a day to meet demand. The company also produces 70 gallons of soy milk for sale, as well as many pounds of agé. The production room is filled with about $300,000 worth of big, steel tofu-making machines, all of which are manufactured in Japan. Yamamoto, 49, came to Denver in 1970 from Japan where he had worked in the sales and accounting branch of Dainippon Food Co. He purchased Denver Tofu Inc. in 1973 from its previous owners for an undisclosed amount. In April, 1988, the company doubled its production space

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to 8,500 square feet when it moved to 3825 Blake St. form its former site on Federal Boulevard. The firm had sales of about $500,000 last year, and Yamamoto projected sales to rise to $750,000 this year. Address: Colorado. Phone: 303-295-6848.

9150. Green, Rand. 1988. Mori-Nu takes to the health and fitness circuit. *Produce News* (*Fort Lee, New Jersey*). July 16.
• ***Summary:*** When you have a product that is enthusiastically endorsed by body builders and cardiologists alike, participating in health and fitness events is a sound, sensible way to get the word out. And that is the approach being used by Morinaga. Thomas McReynolds was recently name marketing consultant for Mori-Nu. Tofu is a cholesterol-free protein source, low in sodium, high in calcium, free of saturated fats, and is "darn close to a perfect food," McReynolds stated. People are, for example, participating in the Mr. and Ms. California bodybuilding finals in July and in "all of the health and fitness expos". There is the "Heart Healthy Golf Classic" in Westlake Village, California in September which is being co-sponsored exclusively by Mori-Nu for heart patients who want to lead active lives in spite of their heart disease. And there is a new publication called Heartcorps. McReynolds said that the company is working with the American Heart Association in the development of a brochure called "Holidays a la Heart," which provides heart-healthy recipes.

9151. *Toyo Shinpo* (*Soyfoods News*). 1988. [A study of the amount of money spent on tofu, aburaage, and natto]. July 21. p. 3. [Jap; eng+]
• ***Summary:*** From Jan. to April 1988, a total of 25.99 cakes/household were sold, which is 98.8% of last year's figure over the same amount of time. During the same period, however, natto consumption rose, 8% in January (over last year at the same time), and 15.8% in April. Aburaage consumption was slightly down, only 95.1% of last year's total in January, and 94.3% in April.

9152. *Toyo Shinpo* (*Soyfoods News*). 1988. Okara peesuto de shokupan. Kôso shori de seihin o kaihatsu [The National Vegetable Protein Association is making bread with an okara paste, developed from a specially-treated enzyme]. July 21. p. 3. [Jap; eng+]
• ***Summary:*** Mr. Ryoji Sekiguchi is president of Zenkoku Shokubutsu Tanpaku Kyodo Kumiai located at Sendagi-2-48-8, Bunkyo-ku, Tokyo, Japan. For the past ten years, the National Vegetable Protein Association has been conducting research with okara and has developed an okara paste made by treating regular okara with a special enzyme. This paste can be used in noodles, mayonnaise, miso, ketchup, croquettes, hamburgers, confectionery, tofu, ice cream, etc. One of the products that can be made from this paste is bread. It has 2% less water than a regular loaf and contains 20% okara paste. It stays fresh for twice as long as a regular loaf of bread. The okara paste has the following characteristics: It has no taste or smell, it is low in calories and has some protein, it has an improved texture over plain okara because of the action of the enzyme, it has vegetable fiber, and it is a health food.

9153. *Toyo Shinpo* (*Soyfoods News*). 1988. Tôfu aburaage gyôshasû, zenkoku de 559 ken heru 62 nendo kôseishô shirabe [1987 Public Welfare study shows that there are 559 less tofu and aburaage manufacturers in Japan]. July 21. p. 2. [Jap; eng+]
• ***Summary:*** However, the rate of decrease has slowed a little. In December, 1987, there was a total of 24,262 tofu and aburaage makers. Only Tokyo and Osaka have over 1,000 tofu shops. The rate of decrease has been about 2% a year. The reasons for this steady decline include the fact that it is difficult to find someone to carry on the business and because the price of land is getting so expensive.

9154. *Toyo Shinpo* (*Soyfoods News*). 1988. Heri tsuzukeru nattô seizô shisetsu sû: Tsuini 900 no ôdaiware [The number of natto manufacturers in Japan continues to decrease: It finally dropped below 900]. July 21. p. 35. [Jap; eng+]
• ***Summary:*** There are now less than 900 natto manufacturers in Japan, the lowest it has ever been. In December of 1987, there were 898 natto manufacturers in the country. The number has been steadily dropping by about 2% per year. The problem is that natto manufacturers cannot find anyone interested in taking over the business.

9155. Bubny, Paul. 1988. Venerable soybean sprouts new uses. *Health Foods Business* 34(7):72, 74, 76, 108. July.
• ***Summary:*** Lonnie Stromnes, national sales manager of White Wave Soyfoods in Boulder, Colorado, reports that White Wave recently "upscaled" the packaging on its tempeh products; the new graphics depict tempeh in use, so that customers do not have to bring a thorough knowledge of the food into the store with them. Mitoku-USA, based in Albany, New York, imports some 20 varieties of miso. At least one manufacturer, the Asheville, North Carolina-based Great Eastern Sun, saw its miso sales increase by 20% last year. Bruce Sturgeon, the company's vice president, said Great Eastern Sun's volume on miso alone was $400,000 in 1987. Shoyu and tamari are frequently aimed at the gourmet market as well as the natural foods / specialty foods market. Owner Dale Kamibayshi of Alfalfa's Market in Boulder, Colorado said, "I think many people are still intimidated by (soyfood's) preparation." To help overcome the intimidation factor, Alfalfa's has scheduled a soyfood tasting fair for July 16; the first such fair which the store has devoted to soy.

Gary Barat, chairman of Legume, Inc. said, "I see the natural foods and gourmet markets coming together," said

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Barat. "And the smart marketers are realizing that." People who shop specialty stores have both eyes turned toward quality. Soy companies are increasingly making use of organically grown soybeans. There is also a trend toward using specific soybeans for specific products, a sign of a maturing industry. The trend is more prevalent in the U.S. than in Far East Asia. Westbrae, for example, uses Vinton beans for its Westsoy soy beverage. As the currency in Japan remains strong against the dollar, you're going to see more and more (soy) products produced in America. Also there will be greater growth in so-called "second-generation" soy products–dairy analogs with soymilk, soy cheese, soy ice cream and soy yogurt. Address: Associate Editor.

9156. DeSilver, Drew. 1988. Japanese eat better, but there's a catch. *Vegetarian Times.* July. p. 8-9.
• ***Summary:*** Japanese people have the greatest longevity on the planet. A Japanese boy born in 1987 can expect to live more than 75 years, and a Japanese girl more than 80; the American figures are 70.1 and 77.6, respectively. The traditional Japanese diet–based on rice, tofu, seaweed, vegetables and fish–is assumed to be the reason Japan has one of the lowest levels of cholesterol and heart disease. But with the westernization of the Japanese diet, the average Japanese man's blood cholesterol level has risen from 180 mg% in 1973 to almost 200 mg% today. The Japanese have drastically cut their daily salt consumption–13 grams vs. 10 grams (10 grams of salt = about 2 teaspoons).

9157. **Product Name:** [Okara Doughnuts].
Foreign Name: Okara Doonatsu.
Manufacturer's Name: Ebara Shokuhin.
Manufacturer's Address: Shinta 366-1, Sasakubo, Iwaki-shi, Japan. Phone: 0487-98-1241.
Date of Introduction: 1988 July.
New Product–Documentation: Toyo Shinpo. 1988. July 11. p. 4. "Ebara Shokuhin's okara donuts: Is it a problem that they are selling too many?" They are selling okara donuts like crazy. The donuts have a nice taste and have received good coverage on radio and in newspapers. The message is out that okara is a good fiber source. They receive 200 orders a day for the donuts just from postcards. One package contains 5 donuts for ¥200 (soon to be ¥300). In their Tokyo outlet they sell 200-300 packages a day. They are finding it difficult to keep up with the demand.

9158. **Product Name:** [Dessert Tofu (Yogurt-like Product in a Yogurt Cup)].
Manufacturer's Name: Izumi Shokuhin.
Manufacturer's Address: Akimoto Building, Minamidai 5-27-32, Nakano-ku, Tokyo, Japan. Phone: 03-384-6991.
Date of Introduction: 1988 July.
New Product–Documentation: Toyo Shinpo. 1988. July 21. p. 12. "Izumi Shokuhin Inc. (Tokyo) has a new product, a dessert tofu which is refreshingly sweet." Mr. Aoyama is the president of the firm. His company is selling a yogurt-like tofu dessert in a yogurt cup. It is not a dairy product and it is easy to digest. The name, "Dessert Tofu" is designed to cause no confusion about what the product really is. Everyone will know exactly what it is and what it can be used for.

9159. Kotzsch, Ronald E. 1988. Macrobiotics beyond food: A guide to health and well-being. Tokyo and New York: Japan Publications, Inc. 242 p. Index. 22 cm. [10 ref]
• ***Summary:*** This is a wise, insightful and wonderful book, with much to teach everyone. In the Dedication (p. 8) we learn: Ron's mother is "Martha Koetzsch." He is active in the New North Church in Hingham, Massachusetts. He learned much from his "professors and fellow students at the Center for the Study of World Religions, Harvard University." He thanks his "students and fellow instructors at Outward Bound, where he learned to treasure challenge and the outdoors."

Contents: Foreword. Introduction. 1. The heart of the macrobiotic artichoke. 2. Edible shampoo, organic undershorts, and other necessities. 3. Feasting with the senses. 4. Secrets of the laughing Buddha. 5. Mind does matter. 6. Life is with others. 7. Twinkle, twinkle little star. 8. Into the arms of the infinite. 9. Illness and healing. Conclusion. Bibliography.

Page 48 states that soybeans are an important part of the "standard Macrobiotic diet." A Macrobiotic person who wants to reduce or give up smoking might want to "Reduce consumption of pressure-cooked rice, miso, and other contractive or salty foods."

Please read the "Conclusion" of this book (p. 233+). Address: Ph.D., Hingham, Massachusetts.

9160. Mitoku. 1988. Spotlight on Johsen Shoyu: The world's leading natural soy sauce (Ad). *East West.* July. p. 1-3.
• ***Summary:*** Johsen Shoyu is certified to meet the uncompromising standards of Macrobiotic Quality by Michio and Aveline Kushi. It is bottled under the labels of more than a dozen leading natural food companies on four continents. In February of this year, premium quality Johsen Shoyu was awarded the Japan Ministry of Agriculture's prestigious first place award, "The highest quality soy sauce in Japan." It was selected from over 200 entries by a panel of the world's foremost soy sauce experts. Johsen Shoyu is kept in large cedar aging casks. Johsen Shoyu is aged slowly for more than one and one-half years, protected only from the outside weather by the wood frame building. Over five seasons, including two full summers, the fermentation continues. Johsen is aged over 5 seasons, including 2 summers, for a total of 18-24 months at natural seasonal temperatures. It is aged in well-seasoned cedar casks, and it is packed without additives or preservatives. Address: Tokyo, Japan.

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9161. Morinaga Nutritional Foods Inc. 1988. Mori-Nu's revolutionary tofu (Color videotape). 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. 5 minutes. VHS. July.

• ***Summary:*** This video, targeted at the employees of food stores who buy food, introduces and promotes Mori-Nu Tofu. The presentation is extremely professional, informative, colorful, and 100% American. American tastes have changed to lighter foods. "The tastes of America are changing. Where the foods we desired were once rich and creamy, now they are low in cholesterol, low in saturated fat. Counting calories has become a national pastime. In our quest for better health and a slimmer waistline, must we now say good-bye to flavor? Good-bye to scrumptious? Good-bye to mouth-watering? Not on your life! America, say hello to every delicious dish you see here. Say hello to Mori-Nu Tofu. Who says you can't have it all? A new revolutionary packaging process developed by Morinaga Foods, one of Japan's largest food and dairy concerns, has enabled tofu to become widely accessible, and more compatible with American tastes. Rich in protein, no cholesterol, low in calories, saturated fats and sodium, tofu is a mainstay of the Oriental diet. However it has yet to enjoy a similar popularity in America. There are several reasons for this. It is often not fresh when sold. And the hygienic standards of many tofu manufacturers are questionable at best. Tofu's moist, protein-rich makeup is a perfect medium for rapid bacterial growth, leading to quick deterioration and spoilage. Its traditional packaging of a gelatinous white curd cake floating in water is unappealing to the average American consumer. The subtle taste of tofu is just plain tasteless for American palates used to burgers, pizzas, and Coke. And because it's such a healthy, nutritious food, tofu has wrongly become associated with trendy fad foods fit only for health nuts. But with one revolutionary process, Morinaga Foods has solved all these problems. Using ultra-hygienic state of the art technology, Morinaga has developed a process where soymilk, the prime ingredient of tofu, is pasteurized then immediately put into an aseptic package and hermetically sealed. The soymilk transforms into tofu right in the package. And because that package has locked out all microorganisms, light, and oxygen, there is no deterioration and spoilage. Without refrigeration, without preservatives, without irradiation, Mori-Nu is guaranteed to be first-day fresh for up to 10 months. Because of Mori-Nu, tofu is finally ready for the American market, and the American market, hungry for the perfect high-protein low-calorie food, is more than ready for Mori-Nu. Realizing this, Morinaga Foods is creating a major push to present Mori-Nu properly to Americans."

The modern Morinaga tofu plant in Japan, the production process, and the aseptic packaging are described. The two styles of Mori-Nu Tofu are shown, and their use in many colorful dishes and drinks. Morinaga has published numerous recipes and created the Health for Life Club.

The end shows an address and phone number for buyers to contact in order to order Mori-Nu Tofu.

Note: Talk with Art Mio. 1990. Feb. 16. Although it typically costs $1,000 per minute of final video to produce a good quality video, this one and its 5-minute counterpart, produced by a Salt Lake City, Utah, company, cost more than $50,000 to make. It is a good idea to finish all the basics (scripting, recipe development, etc.) before scheduling the production time. Address: Los Angeles, California. Phone: 213-728-4325.

9162. Morinaga Nutritional Foods Inc. 1988. Mori-Nu's tofu magic (Color videotape). 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. 30 minutes. VHS. July. Price: $9.95.

• ***Summary:*** Step by step advice on cooking with Mori-Nu Tofu. Julia Weinberg and Jonelle Goddard show how to prepare 6 recipes using "the miracle food of our modern times." As each recipe is introduced, the ingredients and instructions are shown in clear white letters against an blue background, accompanied by music. The emphasis is on recipes that are healthful, quick and easy to prepare, stylish and colorful, and free of or low in cholesterol and calories.

The recipes are: (1) Honey Lemon Un-Cheesecake (dairy free) contains no cholesterol and only 260 calories per slice versus 460 for a typical dairy-based cheesecake. Topped with a little Mori-Nu Tofu whipped from a pastry tube, Jonelle concludes: "That is wonderful. You've got to try it." (2) Thick & Creamy Tarragon Salad Dressing. Free of cholesterol and low in calories, it is made with fresh herbs. Place in the fridge for 1 hour to let the herbs and flavors blend. After a description of Mori-Nu Tofu itself, the varieties, packaging, and shelf life we have... (3) Herb Pinwheel Quiche. It uses less eggs and cheese (Swiss and Parmesan) than a regular quiche, replacing them with Mori-Nu Tofu, yet with no sacrifice in taste. After baking for 35 minutes, it is decorates with sliced veggies and rebaked for 10 minutes. (4) Eggless Egg Salad. With no cholesterol and turmeric for color, it is rolled up in a chapati with lettuce and tomato. (5) Creamy Banana Date Shake. Dairy- and cholesterol free, it uses 1 package of soft Mori-Nu Tofu with 1 cup apple juice, 4 dates, and a ripe medium banana–all whipped together. (6) Crunchy Peanut Butter Pops. Tofu, peanut butter, honey, etc. are blended and poured into ice cube trays or popsicle molds. Dip in graham cracker crumbs or chopped peanuts. Kids love 'em.

The cooks conclude that they have barely scratched surface of the possibilities. One could also make pastas, enchiladas, blintzes, burgers, ice creams, etc. The recipes are given in Julia's new Mori-Nu cookbook titled *Tofu Magic.* Viewers are also invited to join the Health for Life Club, to receive 6 issues of the newsletter per year, with 6 series of recipes and coupons.

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The executive producer of the video is Morinaga. Director: John B. Carter. Writer/Director: Michael Bockman. Beautifully done! Address: Los Angeles, California. Phone: 213-728-4325.

9163. Nihei, Takao. 1988. [The history of Japanese sake in Hawaii. (Food series, part XIII)]. *Kokiku* (*Honolulu, Hawaii*). July. p. 32. [Jap; Eng]
• ***Summary:*** The first Japanese immigrants who made a mark in Hawaii were the "Gannenmono" who crossed the ocean on the ship "Scioto" (Saioto-go) in 1868. Miso and shoyu had been loaded on that boat, but there is no record of any sake. Later on, due to a shortage of labor in the sugarcane fields, Hawaii's largest industry, immigrants from Japan were brought in as a result of a contract between the Hawaiian Kingdom and the Japanese Government. On Feb. 8, 1885, the Japanese immigrants arrived in Hawaii on the ship "City of Tokio." On this trip, Japanese sake had been put on board. Ten barrels of sake were offered as a gift to King Kalakaua. Sake began to be imported from 1888 on, increasing in volume each year.

9164. *Watashi no Kenko* (*My Health*). 1988. Atarashii nattô tenpe wa kôshite taberu. Indonesia no kusakunai nattô [Here's how you eat the new natto, tempeh. Indonesia's natto that doesn't smell]. July. p. 147-62. [Jap]
• ***Summary:*** A popular introduction to tempeh containing nutritional information and recipes.

9165. Brush, Christopher. 1988. Tofu gaining popularity in West. Program presented to planning council. *News* (*Wapakoneta, Ohio*). Aug. 6.
• ***Summary:*** Dr. Lun-Shin Wei, who came to the U.S. in 1953 and is now a professor at the University of Illinois, and Dr. Takeichi Kusaka of Shikoku, Japan, presented a special program on tofu prior to Thursday's meeting of the Mid-Western Ohio Joint Planning Council. MWOJPC, for some time, has been selling an ice cream made form tofu at various fairs. Kusaka, a graduate of the Osaka University, Japan, is regarded as "the master tofu manufacturer worldwide." He has devoted the last 42 years to research on improving processes to manufacture tofu from soybeans.

9166. Thiel, Elizabeth. 1988. Soy sauce: Tamari comes to the capital. *Virginian Pilot* (*Norfolk, Virginia*). Aug. 21. p. H1, H4.
• ***Summary:*** Mark Givens, London native and chief officer of a Japanese factory in Richmond, was drawn to American because of tamari, an upscale soy sauce produced by the year-old Virginia company. The young company already produces 40% of the world's tamari, exported to 25 foreign countries and sold to major food processors such as Campbell's Soup Co. The tamari sauce has 30% more protein than soy made under such labels as Kikkoman and La Choy, which add wheat to the mixture to speed up fermentation. Tamari Lite has about 25% less sodium. The catch is the price. A bottle of tamari costs about a dollar more than a bottle of Kikkoman soy sauce. Fermentation takes as long as six months.

In 1979 San-Jirushi incorporated in California to take advantage of the booming Oriental food market in America. The American venture included a warehouse and 4-5 full-time employees. San-J employs 25 in the Richmond plant, and there are three workers at the warehouse in California, compared to 200 in Japan. San-J bottles tamari in 55 and 5 gallon containers for use by restaurants and food processors. "Sales are up 30% this year," Givens says.

Photos show: (1) Yuji Yamamoto, vice president of production at San-J's new tamari plant in Richmond, Virginia. (2) Stephen Earle, vice president of San-J, wearing a hard-hat and protective glasses, with machinery in the background.

Also contains a sidebar with recipes by Regina Schrambling titled "Upscale Oriental sidekick is vegetarian Worcestershire." Tamari is Mollie Katzen's "vegetarian variation on Worcestershire." Address: Staff writer.

9167. Tachihata, Chieko. 1988. Re: Early tofu making in Hawaii. Letter to William Shurtleff at Soyfoods Center, Aug. 22. 1 p.
• ***Summary:*** "In the 'old days' tofu was made locally for just one 'village' or sugar plantation. I know of at least one plantation where a woman made enough for one plantation on a daily basis, and sold the tofu from her home location for the consumption of the Japanese community." Address: Librarian, Special Collections, Thomas Hale Hamilton Library, 255o The Mall, Univ. of Hawaii at Manoa, Honolulu, Hawaii 96822.

9168. *Register-Mail* (*Galesburg, Illinois*). 1988. Breeders aim for vegetable crop from soybeans. Aug. 30.
• ***Summary:*** One of plant geneticist, Richard L. Bernard's newest projects is breeding a soybean variety that is tasty, nutritious and suitable for large-scale commercial vegetable production. "... picked green, the soybean has a nice taste, firm texture and attractive, bright green color–much like English peas. And in my household, soybeans passed the acid test: My children loved them better than anything else. When they were small, we'd have to leave the bowl of soybeans in the kitchen until mid-meal so that they would eat the other foods, too."

In Bernard's home, fresh, green soybean pods are cooked in boiling, salted water. The soybeans are squeezed from the pods before serving. In Japan, he said, green soybeans are served in the pods, and people squeeze the beans out at the table.

Increasing seed size without losing yield potential is one of the first problems to be solved. It may be possible to

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increase protein and also improve the oil by making it more unsaturated. Breeders also will research the desirability of reducing lipoxygenase. They also may attempt to reduce trypsin inhibitor. Taste will be all important in a soybean line intended for human consumption.

9169. *ASA Member Letter.* 1988. Kojima spends 32 years working for U.S. soybeans. Aug. p. 2.
• ***Summary:*** Yoshiko Kojima, who was the associate country director of human nutrition for the American Soybean Association (ASA) in Japan for 32 years, was awarded with ASA's Honorary Life Membership Award at Soybean Expo in Denver, Colorado. Kojima officially left her post March 31, and is now adjusting to retirement.

"'The most gratifying thing about it all is improving the health of the Japanese people,' Kojima explained." "Miss Kojima is a real missionary for soy foods," he said. "Over the years she has developed many key contacts in the Japanese food industry that has helped ASA get its message across." A photo shows Miss Kojima receiving the award, a wooden plaque, from ASA President James Lee Adams, who said he would be missed.

9170. **Product Name:** Clearspring Sendai Genmai Miso, and Hagoromo Mugi Miso.
Manufacturer's Name: Clearspring Natural Grocer (Importer). Made in Japan.
Manufacturer's Address: 196 Old St., London EC1V 9BP, England. Phone: 01-250 1708.
Date of Introduction: 1988 August.
How Stored: Shelf stable.
New Product–Documentation: Simon Bailey. 1988. Natural Choice. Aug. 15. "Soya-Based Products." A photo shows the Label. CSP form filled out by Simon Bailey. 1988. Sept. 28. Gives date of introduction as 1984 under the present label. Formerly sold under the Sunwheel label (1974).

9171. *J. of the American Oil Chemists' Society.* 1988. Soy protein plant. 65(8):1272. Aug.
• ***Summary:*** "Central Soya Co. Inc. will build a soy protein concentrate facility in Europe to meet the expanding protein needs of that market... Fuji Oil Co. of Japan has announced plans to build a facility to produce origo peptide from soy protein, the first such commercial-scale facility in Japan.

"The peptide product will be used for beverages, nutritional foods, cosmetics and as a fermentation enhancer and stabilizer. Production capacity is expected to be 40 to 50 tons per day, with total annual production about 5,000 tons."

9172. Kiri Bue Ro. 1988. August. New soyfoods restaurant or deli. Sonezaki 2-B-4, Kita-ku, Osaka-shi, Japan.
• ***Summary:*** Toyo Shinpo. 1988. Aug. 1. p. 6. "Kiri Bue Ro restaurant captures the romantic theme of the floating Meiji period, serving 30 new and traditional tofu dishes". Mr. Okamoto is the manager of the Kiri Bue Ro restaurant. They are open from 5-12 p.m. every night. They use 100% nigari tofu made from Japanese soybeans. They also play background music by the Beatles.

9173. Kitagawa, Isao; Taniyama, T.; Nagahama, Y.; Okubo, K.; Yamauchi, F.; Yoshikawa, M. 1988. Saponin and sapogenol. XLII. Structures of acetyl-soyasaponins A_1, A_2, and A_3, astringent partially acetylated bisdesmosides of soyasapogenol A, from American Soybean, the seeds of *Glycine max* Merrill. *Chemical and Pharmaceutical Bulletin* 36(8):2819-28. Aug. [17 ref]
• ***Summary:*** "By means of high performance liquid chromatography and other methods, three new partially acetylated soyasponins, named acetyl-soyasaponin A-1 (6a), acetyl-soyasaponin A-2 (7a), and acetyl-soyasaponin A-3 (8a), were isolated from American soybeans." These 3 acetyl-saponins are noteworthy due to their bitter and astringent tastes, even though their parent saponins, soyasaponin A-1 (6), soyasaponin A-2 (7), and soyasaponin A-3 (8), do not show such tastes. Address: Faculty of Pharmaceutical Sciences, Osaka Univ., Japan.

9174. Morinaga Nutritional Foods, Inc. 1988. Shake up profits! (Ad). *Natural Foods Merchandiser.* Aug. p. 65.
• ***Summary:*** This attractive full-page color ad begins: "Interested in building a healthier profit? As one of the fines and most sought-after tofu products on the market today, Mori-Nu delivers a powerful blend of quality products and trade support. A simple recipe to whip up sales. Why is Mori-Nu capturing an increasing share of the tofu market? Stimulates cross-promotional opportunities. Guaranteed quality and taste. Convenient FDA approved long-life package. No preservatives, no irradiation. National advertising program. Consumer education and support. Complete in-store demo program. Free and exciting color P.O.P. [point of purchase materials].

A large color photo shows a pink strawberry tofu & fruit shake in tall glass with two straws, surrounded by a pineapple sliced lengthwise into halves, plus bananas, apricots, a peach and an orange. Small color photos show two packages of Mori-Nu tofu (soft and firm), plus two recipe pads ("Mori-Nu's Tempting Tofu Desserts," "Exotic! Chinese Unchicken Salad"), coupons (15 cents off Mori-Nu Tofu), a video ("Revolutionary Tofu"), and the front page of two issues of "Mori-Nu Healthy Times" newsletter. "Order now. Call Danielle Lin, National Sales Manager, Natural Foods Division at (213) 728-4325."

This ad also appeared in: Natural Foods Merchandiser (Sept. p. 94; 1989. Feb. p. 15), and Whole Foods (Sept. p. 13, Oct. p. 41). Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

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9175. Morinaga Nutritional Foods, Inc. 1988. Shake up your day with Mori-Nu! (Brochure). Los Angeles, California. 4 p. Undated. 28 cm.
• ***Summary:*** On the front page of this four-page color brochure is a blender with pink tofu-strawberry shake sloshing out the top. On the two-page centerfold are three tofu-fruit shakes, with whole and cut fruits and a package of Mori-Nu silken soft tofu. The headline reads: "Whip up delicious nutrition with cholesterol-free Mori-Nu Tofu and your favorite fruit." On the back page is the full-page color ad "Lessons in Tofu" (first published in Feb. 1988). Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9176. **Product Name:** Nikken Fermented Soy Sauce Powders [#5300 standard type, #5301 standard without MSG, #5302 standard without caramel color, #5303 fine mesh type, #5304 roast type].
Manufacturer's Name: Nikken Foods Company Ltd.
Manufacturer's Address: 37-7, 1-chome, Komaba, Meguro-ku, Tokyo 153, Japan.
Date of Introduction: 1988 August.
Wt/Vol., Packaging, Price: 22 lb or 110 lb boxes.
How Stored: Shelf stable.
New Product–Documentation: Soya Newsletter. 1988. July/Aug. p. 8. Imported to the USA by The J.F. Kelly Co., 150 River Road, A-3, Montville, New Jersey 07045. Phone: 201-299-9100. Contact: Mike Kelly. Spot in Food Technology. 1989. Jan. Nikken is now imported and represented by Zonner, Inc. The U.S. distribution center is in St. Louis, Missouri. Talk with Zonner. 1990. Jan. 23. The importer is now G.S. Suppliger in Missouri. Phone: 314-436-5050.

9177. Taniyama, Toshio; Nagahama, Y.; Yoshikawa, M.; Kitagawa, I. 1988. Saponin and sapogenol. XLIII. Acetyl-soyasaponins A_4, A_5, and A_6, new astringent bisdesmosides of soyasapogenol A, from Japanese soybean, the seeds of *Glycine max* Merrill. *Chemical and Pharmaceutical Bulletin* 36(8):2829-39. Aug. [16 ref]
• ***Summary:*** "In addition to soyasaponins I, II, and III, three new bitter and astringent bidesmosides named acetyl-soyasaponin A-4 (2), acetyl-soyasaponin A-5 (3), acetyl-soyasaponin A-6 (4), which are characterized by having a fully acetylated terminal xylosyl moiety, have been isolated from a Japanese species of soybean"–the Tamanishiki strain. The structures of these three have been elucidated. Address: Faculty of Pharmaceutical Sciences, Osaka Univ., Japan.

9178. Sturgeon, Bruce. 1988. Early history of Great Eastern Sun, Oak Feed Miso, Inc., and American Miso Co. (Interview). *SoyaScan Notes*. Sept. 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Bruce is looking at documents from the company archives. Great Eastern Sun was founded in March 1982 by Barry Evans. He was the only principal/owner at the time. American Miso Co. was founded in March 1979 as the Oak Feed Miso, Inc. The principals were Sandy Pukel, John Belleme, and Barry Evans, but it is not clear who owned how much stock. It started doing business in 1981 as the American Miso Co. and officially became The American Miso Co. by law in May 1982. The principals of the American Miso Co. were John Belleme and Barry Evans. Sandy Pukel was somehow bought out and left and joined Oak Feed Co.; It seems to have become his. Barry Evans may have been the original president of Oak Feed Co. It was a store, probably a restaurant, and an import and distribution company. Barry and John went on to do the miso company. Great Eastern Sun was founded as a way to market and distribute the miso. They also became an importer and distributor of Mitoku products at about that same time. Don DeBona was the first or second company president, after Marty Roth. Today Barry owns all the stock of both American Miso and GES. Barry treasures his privacy. Bob Ballard and Bruce run GES. Even they do not know Barry's address or phone number. He checks in about once a quarter to see how things are going.

Ah Soy now has about 5% of the U.S. soymilk market, and is trying desperately to hang onto that. The competition is fierce, but they have many loyal consumers. Their 6 oz size is still their best seller, even after introduction of the quart, and even with a price increase last Feb. to above $1.00. Sales are up compared with last year.

In 1984 Bruce was in Boulder, Colorado as a buyer for Pearl Street Market. They had been buying from GES at that time for about a year. Oak Feed came to Pearl Street Market with imports to sell. Address: 92 Macintosh Rd., Asheville, North Carolina 28806. Phone: 808-438-4730 or 704 252-3090.

9179. Mahoney, Louis. 1988. In the best East-Meets-West style, Japan's oldest soy sauce is about to become Richmond's newest flavor booster. *News-Leader* (*Richmond, Virginia*). Sept. 7. p. 29, 37.
• ***Summary:*** "From a cook's standpoint, the exciting thing about tamari is the versatility, depending on where you're using it," says Judie Cohen. She and chefs at the Butlery Ltd., where she is vice president and director of the catering division, have developed recipes to show home cooks the versatility of this Japanese staple. The first bottles rolled off the production line in eastern Henrico County in August. Tamari is brewed for 6 to 8 months. Since it doesn't have the alcohol that other soy sauces do, the flavor doesn't burn off during cooking. Address: New Leader food editor.

9180. Nagata, Zenji. Assignor to Sanyo Shokuhin Kabushiki Kaisha (Nara, Japan). 1988. Coagulating box for use in making bean curd [from soy milk]. *U.S. Patent* 4,770,319.

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Sept. 13. 4 p. Application filed 1 April 1987. 5 drawings. Application also filed in Japan on 8 July 1986. [5 ref]
• ***Summary:*** See also U.S. Patent 4,771,681, and Japanese Patent JP 86-104629 (July 1986). Address: Yamatotakada, Japan.

9181. Lin, Danielle. 1988. New developments at Morinaga (Interview). *SoyaScan Notes.* Sept. 14. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In the last 6 months, Morinaga has gone from having 3 natural food distributors to having 31 now. They now sell tofu in 36 countries.

Danielle entered the natural foods industry in 1981. She started a company named Laughing Moon, making veggie turnovers containing tofu. She has played an important role in getting Morinaga to enter the natural foods market. She has a natural-foods talk show in Los Angeles. Address: c/o Morinaga Nutritional Foods, 5800 South Eastern Ave. #270, Los Angeles, California 90040. Phone: 213-728-4325.

9182. Fass, Bill. 1988. Brief history of Macrobiotic Wholesale Co. of Asheville, North Carolina (Interview). *SoyaScan Notes.* Sept. 15. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** This company was originally founded by Great Eastern Sun. In 1986 GES sold it to Kurt Schmitz [or Schmidt]; it was then located at 503 Haywood Rd. in Asheville. Schmitz in turn sold it to Bill Fass in August 1986. The company does not import. They distribute only macrobiotic products. Some 90% of the products they sell are imported from Japan, and 90% of these they buy from Great Eastern Sun, the importer. They also buy a few imported products from Eden Foods. Soyfood products they distribute include miso, shoyu, tamari, and koji. Address: 799 Old Leicester Hwy., Asheville, North Carolina 28806. Phone: 800-438-4730 or 704-252-1221.

9183. Nagata, Zenji; Takada, Yamato. Assignor to Sanyo Shokuhin Kabushiki Kaisha (Nara, Japan). 1988. Automatic bean curd manufacturing apparatus. *U.S. Patent* 4,771,681. Sept. 20. 10 p. Application filed 2 July 1987. 6 drawings. Application also filed in Japan on 30 Aug. 1986. [6 ref]
• ***Summary:*** Describes an apparatus for automatically manufacturing bean curd, wherein a hot water tank and a means of water supply keep a coagulated soybean milk continuously covered with hot water to maintain its integrity and to prevent introduction of germs. Address: Japan.

9184. Murata, Kiku. 1988. Re: New Tempeh Study Group planned in Japan. Letter to William Shurtleff at Soyfoods Center, Sept. 24. 1 p. Typed, with signature. [Eng]
• ***Summary:*** "After the Asian Symposium on Non-Salted Soybean in 1985, we had the 4th and 5th Tempeh Conferences (*Danwakai*). We are going to start a Tempeh Study Group (*Kenkyukai*) soon in Japan. At some meetings reports will be presented. Membership is ¥2,000/year. The first meeting of the Study Group will correspond to the 6th Danwakai. We will be sending announcements to about 200 people, and hope that 25-50% will join." Address: 608 Honyakushi, Nara City 630, Japan.

9185. *Japan Times.* 1988. Miso shows promise as treatment for radiation: Researchers say soybeans flush isotopes from rats' organs, muscles. Sept. 27. p. 3. [Eng]
• ***Summary:*** "A team studying atomic bomb radioactivity has found that miso–a traditional Japanese condiment–is effective in helping remove radioactive elements from the body and controlling inflammation of organs caused by radioactivity, it was reported recently."

"This is the first time its effectiveness has been proven scientifically, according to a study team at Hiroshima University's medical research center on atomic bomb radioactivity."

"The experiment was conducted on male and female rats 4 weeks after birth. They were divided into 2 groups, one group fed with feed mixed with dried red miso and the other fed with regular feed. After a week, radioisotopes of iodine-131 and cesium-134 were injected into the stomachs of the rats.

"Both isotopes are secondary radioactive elements, which are produced in such cases as nuclear reactor accidents. The iodine-131 isotope is absorbed in the thyroid gland and mostly remains there. The cesium-134 isotope is accumulated in muscles and the intestines.

"Researchers measured the amounts of the isotopes left in such places as the blood and thyroid gland 3, 6, 12, and 34 hours after the injection. They found there were no differences between the groups of rats in the amount of isotopes in the thyroid gland. But there was only half the amount of iodine-131 in the blood of the group fed with miso compared to the other group, 3 and 6 hours after the experiment. The effect of the miso was also seen in the kidneys, liver, and spleen. Although there was no difference in the amount of cesium in such places as the blood, a high amount of cesium was removed from the muscles of the group fed with miso, the researchers said.

"In another experiment, rats from both groups were exposed to half a lethal dose of radiation to test the effect of miso on victims of a nuclear explosion. Although more than 80% of the rats from both groups died within one week of the exposure, the inflammation of organs usually seen in cases of exposure to radiation was less for the miso-fed rats. This showed that miso stimulates the body's circulatory and metabolic system, the researchers said.

"In a book called 'Food and Predispositions,' Dr. Shinichiro Akizuki of St. Francisco Hospital in Nagasaki says the reason why doctors who attended to atomic bomb victims showed no after effects of the bomb is that they

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drank miso soup with seaweed. After the nuclear reactor accident in Chernobyl [on 26 April 1986 in the Ukranian SSR], a translation of the book was popular in Europe, causing a rush of European countries to import miso from Japan. This prompted a miso research group... to ask Ito's team to study the relationship of miso and radioactivity.

"Akihiro Sawada of Hiroshima University said... the results may also involve the effect of seaweed, which contains iodine, and that further research on how miso helps excretion of radioactive particles is necessary." Address: Tokyo.

9186. *Atencion San Miguel* (*San Miguel de Allende, Gto., Mexico*). 1988. Tofu comes to town. Sept. 30. p. 6. [Eng]
• ***Summary:*** Nicole Black has built a factory which will soon make this inexpensive and nutritious food–tofu–available to all. Already soy "chorizo" (a spicy sausage) is successfully being turned out, made from the fibrous part of the bean. Outside of a small tofu factory in Mexico City which supplies Japanese restaurants and a few special markets, the San Miguel factory is the first in Mexico. Mrs. Black's book containing more than 200 recipes for tofu, many of them designed for the Mexican taste, is soon to be published.

9187. Hoshino, T. 1988. Niigata no edamame [Green vegetable soybeans in Niigata prefecture]. *Daizu Geppo* (*Soybean Monthly News*) No. 153. p. 10-13. [Jap]

9188. Lowes, Robert. 1988. The U.S. foreign aid/trade dilemma. II. Will cutting off cash cut competition? *Soybean Digest.* Aug/Sept. p. 18-21. [1 ref]
• ***Summary:*** Direct U.S. aid for agricultural development overseas amounts to about $1,000 million a year. The U.S. also contributes an average of $1,500 million a year to multilateral development agencies like the World Bank, International Development Assoc., and Asian Development Bank. These agencies lend more than $20,000 million a year to developing countries. Between one-fifth and one-fourth of that amount is targeted for agriculture.

Lowell Grant, chief of the International Trade Commission's (ITC) agricultural crops and products branch, discounts agricultural aid as a major reason for declining U.S. exports. He and other analysts largely lay the blame on factors, such as: A faltering world economy in the early 1980s; a strong U.S. dollar in the early and mid-80s; a foreign debt crisis that forces debtor nations to pay foreign exchange on interest payments, not on imports; surging farm exports from European countries, and a corresponding drop in European farm imports; high prices, which brought more players into the soybean market; U.S. embargoes that shook our customers' confidence.

High world prices arose from price support subsidies in the U.S.–proof, according to some, that our farm economy is as rigged as those we criticize in Latin America and Asia. Indeed, the U.S. spent $26,000 million in subsidizing its own agricultural sector in fiscal 1986. When the U.S. stopped soybean shipments to Japan in 1973, the Japanese signed 15-year contracts with Brazilian producers–and invested $2,000 million in the Brazilian soybean industry in the process. Japanese banks account for the vast majority of investments in soybeans in Brazil.

9189. Morinaga Nutritional Foods, Inc. 1988. Shake off cholesterol (Ad). *Vegetarian Times.* Sept. p. 3.
• ***Summary:*** This full-page color ad shows a strawberry shake in front of various fruits (sliced pineapple, strawberries, apricots, bananas, peach, orange) and next to a pack of Mori-Nu Silken Soft Tofu. Contains a general recipe for "Mori-Nu's wake-up shake." Slogan at bottom right: "Tofu for the American taste."

This classy ad also appeared in this magazine as late as 1992. Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9190. Morooka, Yoshinori; Kosugi, Sho; Mayrowani, Henny. 1988. Socio-economic studies on soybean based farming systems at the village level in Indonesia. *Palawija News* (*Bogor, Indonesia*) 5(3):6-8. Sept.
• ***Summary:*** The study was conducted at a village (*desa*) in Garut, West Java. The objectives were: 1. To identify constraints on the wider adoption of improved technologies by farmers through the analysis of current soybean-based farming systems in an upland area. 2. To analyse and evaluate interactions among the crops involved as well as among the farmers' economic activities in the farming system at the household and village levels. Address: 1. National Agricultural Research Center, Japan; 2. CGPRT Centre, Bogor; 3. Bogor Research Inst. for Food Crops.

9191. Ohsawa America. 1988. Macrobiotic foods catalog [Mail order]. P.O. Box 3608, Chico, CA 95927. 36 p. Sept.
• ***Summary:*** Includes imported (from Japan) soy sauce, miso, miso condiments, koji, and nigari [a tofu coagulant]. Address: Chico, California. Phone: 800-647-2929.

9192. **Product Name:** Soken Vege-Soy Chips.
Manufacturer's Name: Sokensha Co. Ltd.
Manufacturer's Address: 724 Katakura-cho, Kanagawa-ku, Yokohama 221, Japan. Phone: 45-491-1441.
Date of Introduction: 1988 September.
Wt/Vol., Packaging, Price: Plastic bag.
How Stored: Shelf stable.
New Product–Documentation: Ad in Natural Foods Merchandiser. 1988. Sept. p. 82. A label is shown in the color ad. Orange, brown, and yellow.

9193. Sokensha Co., Ltd. 1988. Soken. Its naturally good (Ad). *Natural Foods Merchandiser.* Sept. p. 81.

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• ***Summary:*** "The pioneer of Oriental foods. Soken, the most respected brand from Japan since 1975." Products shown on an island in a stream include soy sauce (no longer labeled tamari), and Vege-Soy Chips. Address: 724 Katakura-cho, Kanagawa-ku, Yokohama 221, Japan. Phone: 45-491-1441.

9194. Tenpe Kenkyushu-kai. 1988. Tenpe Kenkyû-kai kiyaku [Rules of the Tempeh Research Society (Brochure)]. Kobe Park City 2-1110, 6-2-1 Minatojima, Chuo-ku, Kobe 650, Japan. 3 p. [Jap]
• ***Summary:*** The basic membership dues are ¥2,000 per year (April to March). A supporting membership costs ¥10,000 per year. Address: Kobe, Japan. Phone: 078-302-7065.

9195. *Toyo Shinpo* (*Soyfoods News*). 1988. Kankoku tônyû saisei choki e. Nihon no tônyû gyôkai wa teimei [Korean soymilk market starts to grow again. Japanese soymilk industry is in a low state]. Oct. 1. p. 14. [Jap; eng+]
• ***Summary:*** The Korean soymilk market, which rose and then fell like the Japanese soymilk market, is now re-entering a period of growth. According to a recent Korean newspaper, domestic soymilk sales from January to August, 1988 were 42,000 million won, up 20% over last year's figure. Sales are expected to increase during the winter at the end of this year, so total sales for the year are expected to reach 72,000 million won. The won is the Korean unit of currency.

9196. San-J International, Inc. 1988. Ancient Japanese seasoning now brewed in the U.S. (News release). 2880 Sprouse Drive, Richmond, VA 23231. 3 p. Oct. 6.
• ***Summary:*** San-J International announced October 6, 1988 that tamari has been successfully brewed for the first time outside of Japan. The domestic tamari was bottled at the company's new Richmond, Virginia brewery after months of careful aging. "Major food producers, including Campbell, Hunt-Wesson, Stouffer and Heinz, use San-J tamari in their packaged foods because of its purity, stability and superior flavor enhancing properties." San-J sent The Soyfoods Center an individually numbered commemorative bottle of their tamari.

Tamari compared to soy sauce "has 30% more organic protein than conventional soy sauce... The most prevalent amino acid in tamari is glutamic acid, which is the natural counterpart of monosodium glutamate (MSG)" San-J tamari is available in 5, 10 and 20 ounce bottles. Seven recipes are given including: Tamari Coconut Freeze, Tamari Mustard Sauce, Tamari Ginger Vinaigrette, Tamari Brown Sugar Bourbon Glaze, Tamari Hollandaise, Szechuan Sausage Cornbread, and Tamari Macadamia Nut Ice Cream. Address: Richmond, Virginia.

9197. San-J International, Inc. 1988. Facts about San-J's Richmond facility (News release). 2880 Sprouse Drive, Richmond, VA 23231. 1 p. Oct. 6.
• ***Summary:*** (1) San-J's facility in Richmond, Virginia is the only tamari brewery outside of Japan, breaking a 1,200 year old tradition. (2) San-J has the capacity to produce one million gallons/year of tamari. (3) 900,000 pounds of soybeans and 500,000 pounds of soybean meal are purchased per year. (4) Projected sales for 1988 are $3.5 million. Projected sales for 1989 are $5 million. (5) Twenty-five people are employed, four of which are Japanese. (6) The annual payroll is $500,000. (7) Montague Farms is the sole Virginia supplier of soybeans to San-J (William Taliffero). Contact: Mark Givens, Chief Operating Officer; Steve Earle, Senior Vice President. Address: Richmond, Virginia.

9198. Duchesne, Paul. 1988. Development of the Brown Rice & Tofu Sandwich, and early history of Wildwood Natural Foods (Interview). *SoyaScan Notes.* Oct. 8 and Aug. 16, 1989. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Paul Duchesne developed the world's first "Fried Rice & Tofu Sandwich" in Fairfax, California. Duchesne's sandwich was one of America's early second generation tofu products. He deliberately called it a sandwich, even though it was made in a chapati, to make it sound more American. Today there are a surprisingly large number of U.S. companies making a Brown Rice & Tofu Sandwich. Duchesne started 3 of these companies and gave the basic recipe and production methods to the people who started most of the others. All descendants of the original BRTS have also been made in a chapati.

In late October or early November 1977, Duchesne sold the first 200 of them to participants at a macrobiotic seminar led by Michio Kushi in Marin County. Donna Gayle helped him make them. They were very popular; the key secret ingredient was a miso-sesame butter spread which Paul had learned of from George Ohsawa's book *Zen Cookery* (Miso Spread #203).

In Jan. 1978 he started making these sandwiches at the Sleeping Lady Cafe (a co-op started in about 1975 in Fairfax, Marin County) and selling them at the Good Earth Natural Food Store in Fairfax. He bought his tofu, made by Quong Hop & Co. off the shelf at the Good Earth. In Feb. 1978 he began to distribute them to many natural food stores throughout Marin County. Note: Billy Bramblett says (July 1998) that Paul was not licensed to make or sell food and had no business name.

While in California in 1978 Duchesne gave his recipe and production techniques to Roy Steevensz in Los Angeles. Roy was making Fried Rice & Tofu Sandwiches by May 1978 on a big table in his living room. He continued until about 1984. Roy is now claiming that he created the idea. Paul and others were bringing Roy to the Bay Area as a macrobiotic teacher in 1977. Originally Roy was making seitan in Los Angeles.

In September 1978 Paul went to Boston to study

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macrobiotics, so he gave his Fairfax sandwich business (which still had no name) to Chris Smith. A month later, in October 1978, Chris stopped frying the brown rice and renamed the product, coining the now-famous name "Brown Rice & Tofu Sandwich." At the same time he named his business Wildwood Natural Foods. In late 1978 Chris Smith taught Joe Nixdorff, who started the company City Samurai in Berkeley and made the Samurai Hero from 1978-1982. In Boston, Duchesne lived in The Garvey House, a macrobiotic study house. There he started to make his brown rice and tofu sandwiches. The operation soon grew into a business, which he named Rice House. He also taught his process to Marty Roth and Barbara Svenning Garvey Roth, who lived in the Garvey house; several years later Marty and Barbara moved to Santa Fe, New Mexico, where they started a business making the BRTS. Later Barbara made it near Asheville, North Carolina. Marty and Barbara in turn taught the sandwich to Jeff Fairhall, who started Essential Foods in Seattle and built it into a thriving business.

In May 1979 Duchesne and Chris Smith traded places and companies. Thus Chris took over Rice House in Boston, making the transition without missing a day of production and delivery to Brookline, Cambridge, and Boston. He renamed the product Brown Rice & Tofu Sandwich. Chris ran the company until 1981, when he sold it. It is still in operation and named Rice House. Paul left Boston for California, and took over the company he had started originally (now named Wildwood Natural Foods) in Fairfax.

In Oct. 1979 Bill Bramblett (a monied rock musician and part owner of the Sleeping Lady co-op) approached Duchesne and proposed that he invest in the company and expand the sandwich business, including distribution to Sacramento. The company was making only about 100 sandwiches a day at the time. Duchesne declined, saying he wanted to build a traditional, cauldron-style tofu shop around the sandwich operation–an idea that he had conceived while in Boston. Bill said he couldn't afford that so Paul found two more people with money to invest. In May 1980 Duchesne, a sole proprietor, incorporated Wildwood. He gifted shares to Bill Bramblett, Paul Orbuch, and Frank Rosenmayr. Then they invested money so that of the 4 people so that ended up owning 25% of the stock. In Sept. 1980 the company moved out of The Sleeping Lady and down the road to 139 Bolinas Rd. They set up a tofu shop and started to make their own tofu. Duchesne's business plan showed that the operation would open in July. Instead opening was delayed until September 1980, which was the slower rainy season.

In late 1980 Richard Leviton visited Duchesne and Wildwood. In the Winter (Feb.) 1981 issue of *Soyfoods* magazine, in an article titled "Putting tofu in the lunch boxes of America" (p. 61), Leviton gave a detailed description of the shop: "which appears to fulfill the dreams of many soyfoods proprietors by combining both light tofu manufacture with light sandwich production in a clean, efficient, and industrious little shop. Mr. Duchesne designed his shop as a tofu showcase with broad wall-to-wall front windows so that passers-by may glimpse tofu production during the days. Wildwood produces a line of eight packaged vegetarian sandwiches including Brown Rice and Tofu Sandwich (with vegetables in a whole wheat bun), Tofu Vegetable Salad,..."

In late 1980 the business was operating in the red. Bramblett, Orbuch, and Rosenmayr attributed the delay to poor management and in Dec. they, controlling the board of directors, demoted Duchesne (who was working long hours) from general manager to president and sales manager, with a salary cut. There were bad feelings. The board then acted as general manager and met each Tuesday night. There were frequent conflicts between Duchesne and the other three. They wanted to expand faster than did Duchesne. By Feb. 1981 the business was operating at a profit. In Dec. 1981 Duchesne proposed that Wildwood start a distribution company (which he would head) to distribute products made by Wildwood and others. The other three disliked the idea, so a week later Duchesne quit (but kept all his Wildwood stock), bought a big new refrigerated truck, and in January 1982 started his own natural foods distribution company named Cauldron Express; it distributed products made by companies other than Wildwood–such as Brightsong Tofu, Pacific Tempeh, and Grain Dance Seitan. The Wildwood owners felt that Duchesne was competing with them so they repeatedly made life difficult for him, and they were a major factor in his bankruptcy 9 months later in September. (Later, Wildwood got into the business of distributing products made by other companies–with a fervor.) In April 1983 in bankruptcy court, Duchesne signed a covenant not to compete with Wildwood for 5 years and sold all his stock and rights to the other three; he ended up getting $5,000.

In about 1981, at the heyday of the brown rice and tofu sandwich, there were 5 companies in the San Francisco Bay area making 1,000 of them each day. Then the California Health Department began to wake up. When they realized that tofu was a perishable protein food that should be refrigerated, they decreed that all BRTSs be taken off the front counter of stores and sold out of the refrigerator. Sales dropped.

In Oct. 1988, after 5 long years, Duchesne returned to the soyfoods business making a BRTS and doing business as Bert's Place (Best Ever Rice & Tofu Sandwich). Wildwood challenged him for breach of the non-compete clause. The earlier agreement was not clearly written and The judge basically favored Duchesne in the arbitration. He had to rename his company to Paul's Place, which ended up in March 1989 as Paul's Organic Food Works. In early 1989 Duchesne developed a chronology of events relating to Wildwood's history, a chart showing the progeny of the original Fried Rice & Tofu Sandwich, and a collection of labels for these progeny.

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Articles on Wildwood have been published in the *Pacific Sun* (16-22 Jan. 1981, Food & Drink Section by Linda Xiques, pronounced Zirksus), *Independent Journal* (San Rafael; about 1985-87), *The Fax* (Fairfax, Jan. or Feb. 1986, written by Lisa Alpine, who wrote an earlier article about Wildwood in about 1983-84). Duchesne has been married for 24 years to a nurse; they have 2 children. Address: Fairfax, California. Phone: 415-453-2360.

9199. Bolduc, Bill. 1988. The founding of Eden Food Co. (Interview). *SoyaScan Notes.* Oct. 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Bill founded Eden Foods Inc. as a macrobiotic/natural foods retail store in Ann Arbor, Michigan, in Nov. 1969. He was the original incorporator. About 8 months later, a proposal was made to Bolduc by a woman to expand Eden in a new location at 211 South State Street. After that, Bolduc invited Tim Redmond to join him, which he did. Redmond became a 50% owner in 1970, about 9 months after the company was founded. Tim was in Boston at the time, studying with Michio Kushi and working at Sanae. He was interested in the restaurant business. Bill and Tim had been in college together at the Univ. of Michigan. Both later became interested in macrobiotics. Bill wishes now he had not sold his stock.

About 18 months ago, Tim and his wife, Patty, and Bill sat down and talked through the history for the first 2-3 years month by month. They should have tape recorded it. They will try to do it again. His older cousin is David Bolduc.

Tim Redmond is thinking of doing a consumer study on soymilk. He uses Dialog a lot, doing mostly food research now. Address: ELI Research Corp., 660 Northland Blvd., Suite 28, Cincinnati, Ohio 45240. Phone: 513-851-0330 or 751-9090.

9200. Meyer, Amy. 1988. U.S. soy sauce imports (Interview). *SoyaScan Notes.* Oct. 18. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The basic source of information is U.S. General Imports. Schedule A. Commodity by Country. U.S. Dept. of Commerce, Bureau of Census. Monthly statistics are published and totals for each year are given in the December issue. The term "Thin Soy Sauce" refers to typical soy sauce, such as Japanese shoyu. The other thicker Chinese types (black soy sauce, etc.) do not have separate figures kept for them. The SIC code for Edible Foods is #098, and thin soy sauce is 098-0420.

After World War II, U.S. soy sauce imports began in about 1947-50. In 1972 they reached a peak of 23.098 million lb., worth US$3.1 million. They dropped sharply for the next to years after Kikkoman opened its U.S. plant, but by 1981 were back up to 19.613 million lb., worth US$7.444 million. One gallon of soy sauce weighs 9.8 lb; 1,000 lb of soy sauce is 102 gallons.

Talk with Amy Meyer. 1989. Dec. 3. She had wanted to publish her extensive research on the soy sauce market in a scholarly journal, such as the *Journal of International Marketing.* She submitted several proposals but they all found the subject too narrow and boring. So nothing was ever published and probably never will be. All the documents are now filed in a large box. Address: 21 Beacon St. #10A, Boston, Massachusetts 02108. Phone: 617-523-3780.

9201. Sugarman, Carole; Hitchcock, Tyler. 1988. A sense of direction: Finding a place for novel products in the Old Dominion. *Washington Post.* Oct. 19. p. E1.
• ***Summary:*** The section titled "Soy sauce savvy" notes that Takayoshi Sato, the president of San-Jirushi Corp. (the world's largest brewer of tamari soy sauce) has invested $10 million to build the company's first factory outside Japan in Richmond, Virginia; it opened last year. Tamari is made entirely from fermented soybeans. Most Japanese sauces (such as Kikkoman) are made by fermenting both soybeans and wheat. It takes seven months to make tamari, using modern, sanitary equipment and computers. A detailed description of the process is given.

He chose Richmond for several reasons: (1) The cold Virginia winters and humid summers approximate those of Kuwano where Sato and his ancestors have been making tamari for the past 184 years. (2) The supply of pure water from the Appalachian mountains is quite similar to that from the Suzuka Mountains, a range of seven mountains in running through Mie Prefecture in central Japan. (3) A reliable supply of soybeans is available in the USA; they must be imported to Japan. (4) The Virginia location gives San-J better access to the growing American and European markets for tamari.

The San-J plant is will be located in an Industrial park off I-64; it will be clean and scentless. Sato's office shows a blend of American and Japanese cultures. Once a week, American staffers are offered Japanese language classes; Japanese employees takes English classes.

The first batches of tamari are now ready, and have been sold to industrial users only–food makers such as Campbell, Heinz, and Stouffers. Tamari "is more heat stable and has a richer flavor than other soy sauces, so not as much has to be used per portion.

San-J hopes to supply their bottled tamari to retailers by Jan. 1989. Yet many Americans don't know what tamari is. So a program of education will be needed if San-J wants to hit the big time.

9202. Yamauchi, Shoan. 1988. The Los Angeles tofu market (Interview). *SoyaScan Notes.* Oct. 23. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The Los Angeles tofu market has become extremely competitive in recent years. There are at least 9 tofu manufacturers in the greater Los Angeles area, all run

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by Asian-Americans. The Japanese-American companies, ranked in descending order of size are: House Foods & Yamauchi Inc., Aloha Products (Culver City), and Meiji Tofu. The Chinese-American companies, ranked by size, are American Food Co. (Mr. Jackson Wu), Mighty Soy, Soyfoods of America (Ken Lee), Wy Ky, and Visoy. The only Korean company is Obok in Orange County. Address: House Foods & Yamauchi Inc., 526 S. Stanford Ave., Los Angeles, California 90013. Phone: 213-624-3615.

9203. Yamauchi, Shoan. 1988. The origins of packaging tofu in America and Japan (Interview). *SoyaScan Notes.* Oct. 23. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Mr. Yamauchi believes that he was the first person to package tofu in America or Japan... perhaps in the world. In 1958, while his Matsuda Hinode Tofu Co. was located at 4th and Towne Streets, he conceived of the idea of putting individual cakes of tofu each in a plastic bag with water, sealing the bag with a heat sealer, placing the bag in a stiff paper deli carton with a wire handle, then folding over the top. The process was labor intensive. This happened at about the same time that a letter from journalist George Yoshinaga (see Yoshinaga 1986) had led the city to pass a new regulation requiring tofu to be packaged in individual containers.

Shortly after this innovation, later in 1958, Mr. Yamauchi began to sell his packaged tofu at the Boys Market supermarket chain (which had about 12 stores at the time) in Los Angeles. He believes that this was the first time tofu was ever sold in a U.S. supermarket.

In about 1961-62 Mr. Yamauchi became the first to package his tofu in plastic trays/tubs, the type so widely used today. He went to the company that made Sealright trays and asked them to make a waterproof tray for his tofu; none of their trays were waterproof at the time. He gave Sealright the money to make the molds and he retained exclusive rights to buy all trays made from those molds. Sealright was a huge company and this line of plastic trays represented a very small item for them. In about 1969 Yamauchi first met Jack Mizono of Azumaya and helped him to mechanize his tofu plant and package his tofu in Sealright trays. They soon became good friends. In July 1975 Yamauchi, Jack Mizono, Milton Taise, and Chuck Garbor each invested one-fourth to start Airtight Container Inc. (in Los Angeles), which tried to make high density plastic tofu packaging trays (similar to the ones they had formerly bought from Sealright). This was not successful because they had the wrong piece of equipment, so they met Ken Merrill of Merrill's Packaging in Burlingame, and he began to make the trays for Airtight. He also became a shareholder in Airtight.

In Japan, Mr. Yukio Sato developed the first tofu packaging in plastic trays. He had lost his parents when he was very young, but he worked his way through business school, and his first business after he graduated was making simple packaging machines for tofu in plastic trays, starting in 1962 or 1963. Address: Part owner, House Foods & Yamauchi Inc., 526 S. Stanford Ave., Los Angeles, California 90013. Phone: 213-624-3615.

9204. Merrill, Ken. 1988. Early packaging of tofu and Merrill's Packaging (Interview). *SoyaScan Notes.* Oct. 25. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In mid-1976 Ken Merrill met Mr. Yamauchi who, with Jack Mizono (of Azumaya), Milton Taise, and Chuck Garbor already had a company named Airtight Container Inc. Airtight was using its own machine (which it had purchased from the Midwest) at the Airtight plant in Los Angeles to make tofu packaging trays from plastic roll stock. But the operation was not successful because they had the wrong machine for that job. They had purchased it in about mid-1975. So Airtight asked Ken Merrill if his company, which was in the thermo-forming business making plastic containers and trays, could make their tofu trays. In August 1976 Merrill ordered tooling to make the trays on his equipment at Merrill's Packaging in Burlingame, and then became a shareholder in Airtight. He made the trays and sold them to Airtight, which became a marketing and distribution company.

Airtight Container was soon selling tofu trays to tofu manufacturers across America, in competition with Sealright. This took away most of Sealright's business for that line of waterproof containers, so in about 1981-82 Sealright retired it. Their equipment was put up for a closed bid and Airtight bought all of it for two reasons: (1) To get the used extrusion equipment (which ran from pallets of resin, eliminating the need to buy roll stock), and (2) so another company would not buy it and become a competitor. Airtight kept the extruder in Merrill's plant, and cut up the rest and disposed of it.

Merrill thinks Airtight was founded in about 1974, but check with Caroline Taise at Airtight in Los Angeles to be sure [Caroline said mid-1975]. Sealright in Los Angeles agreed to make high-density poly trays. They had long made trays from waterproof materials but the fact that they held in the water in which the tofu was immersed stems from the method that Mr. Yamauchi developed to seal the trays, using a lid stock of a similar material that is heat sealed to the flange of the tray. This was an original idea, in part because few American foods are sold floating in water. Address: President, Merrill's Packaging, 1353 Marston Rd., Burlingame, California 94010. Phone: 415-348-7658.

9205. Peifer, Ray. 1988. Early tofu packaging and Sealright Company Inc. (Interview). *SoyaScan Notes.* Oct. 25. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Ray, who was with Sealright when Mr. Yamauchi first came to them, believes that Sealright started to make trays for packaging tofu in about 1966, and almost

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certainly between 1965 and 1967. Mr. Yamauchi created three early innovations with tray packaging. First, a very deep tray. Sealright made shallow plastic trays at the time, but they had never made a tray nearly as deep a tray as the one Mr. Yamauchi wanted to hold 26-28 ounces. Second, a method for heat sealing a plastic film to the flange of a tray which had cold water flooding over the flange. A faucet in his plant ran cold water directly into each tray. Other companies had heat sealed a film to a tray for a product with liquid inside, but it was never overflowing. Third, he spent a great deal of money (perhaps $45-50,000) to develop and have built high-speed sealing machines to pack and seal the tofu in his plant. Many in the packaging industry "thought he was kind of goofy, but his idea, though radical in its time, turned out to be a pretty good one."

Sealright made Mr. Yamauchi's containers for about 10 years. But they are a volume producer and Mr. Yamauchi was the only user of that sort of package, and he required a relatively small volume of about 20 different custom sizes. So Sealright sold him the tray forming machinery in the mid-1970s. Sealright did co-op ads/stories in trade magazines and newspapers for him nationwide, which led to his first widespread tofu distribution (Buffalo, New York or Charleston, South Carolina). He also sold small quantities (2-3 facings) of tofu in other Caucasian food markets in Los Angeles, such as the Hughes chain and maybe even Dale's. Address: Manager of Sales Administration, Sealright Company Inc., 4209 Noakes St., Los Angeles, California 90023. Phone: 213-269-0151.

9206. Taise, Caroline. 1988. Early tofu packaging and Airtight Container Inc. (Interview). *SoyaScan Notes.* Oct. 25. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Her records show that Airtight Container Inc. started in July 1975. The owners were Shoan Yamauchi, Jack Mizono, Milton Taise, and Varnich Nimsrisakkul (a Thai man). Ken Merrill of Merrill's Packaging in Burlingame joined later. On 22 Nov. 1989 Caroline recalled that Chuck Garbor was also involved. Address: Airtight Container Inc., 519 Gladys Ave., Los Angeles, California 90013. Phone: 2131-624-4349.

9207. Yoshinaga, George. 1988. Early history of tofu packaging in Los Angeles (Interview). *SoyaScan Notes.* Oct. 27. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** As a newspaper editor, he wrote a letter in *Kashu Mainichi* in about 1953 arguing that it was unsanitary to sell tofu in bulk immersed in water. In about 1956-57 a law was passed by the City of Los Angeles prohibiting this means of sale, and requiring individual packaging for all tofu. George got a lot of flack from the local tofu makers, since the new law increased their cost of making tofu. He believes there were only two tofu makers in Los Angeles at that time (he does not recall their names), and he heard from both of them, but he did not hear from Mr. Yamauchi. He thinks Mr. Yamauchi was not making tofu at that time. His newspaper is not indexed, but all back issues do exist. Address: Kashu Mainichi, 915 E. First St., Los Angeles, California 90012-4083. Phone: 213-628-4686.

9208. Ando, Seiichi. 1988. Kishu han no dentô sangyô [The traditional industries of the Kishu han]. In: S. Ando, ed. 1988. Zusetsu: Wakayama-ken no Rekishi [History of Wakayama Prefecture]. Tokyo: Kawade Shobo Shinsha. See p. 171-. [Jap]*
• ***Summary:*** The present Wakayama prefecture is one part of the earlier Kishu Han. The latter place name was used during the Edo period until the start of the Meiji period. In this "Illustrated History of Wakayama Prefecture," in the chapter cited above, there is one section titled "Yuasa–The home of shoyu" (*Shoyu no furusato–Yuasa*). The entire book is 333 p. Address: Osaka Sangyo Daigaku, Osaka, Japan.

9209. Bernard, Richard L.; Juvik, Gail A.; Hartwig, Edgar E.; Edwards, Calton J., Jr. 1988. Origins and pedigrees of public soybean varieties in the United States and Canada. *USDA Technical Bulletin* No. 1746. 68 p. Oct. [20 ref]
• ***Summary:*** Contents: Old domestic varieties. Modern domestic varieties from public institutions. Germplasm resources information network. Tables: 1. Number of U.S. and Canadian soybean varieties by maturity group. 2. Number of U.S. and Canadian soybean varieties by country of origin. 3. Origins and pedigrees of old domestic soybean varieties. 4. Lost old domestic soybean varieties. 5. Literature on old domestic soybean varieties in chronological order. 6. Origins and pedigrees of modern domestic soybean varieties from public institutions. 7. Genetic information on backcross-derived public soybean varieties. 8. Genetic information on backcross-derived soybean parental lines. 9. Public soybean variety registrations and licenses. 10. Corrections to published pedigree information.

Abstract: "In this report are described the origins of the 440 U.S. and Canadian soybean varieties that are maintained in the USDA Germplasm Collection at Urbana, Illinois, and Stoneville, Mississippi. Varieties in commercial use before the mid-1940's were mostly introductions, and this report includes for each the geographic place of origin, the person or institution that provided the seeds, the foreign variety name (if any), as well as information about when it was released and who released it in the United States or Canada. Modern varieties have been developed by hybridization and selection. In this bulletin, the pedigree is specified and where and when each variety was developed and released. This information allows researchers and breeders to trace modern soybean varieties back to their introduced ancestors and facilitates breeding plans and evaluation of the germplasm base of the current commercial soybean crop."

Table 4, titled "Lost old domestic varieties," lists the

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source of each: Acme–PI 14.954 from Shanghai, China, in 1905. Akasoya–From Japan via Indiana. Allison Black–D.T. Allison, Tennessee. Amherst–PI 4.913 (PI 17.275) from Japan in 1900. Arikara–O. Will Company, North Dakota. Arkan–PI 87.050 from Niummen, Keisho Nando, Korea, in 1930. Arksoy 2913–Arkansas Experiment Station, Marianna (similar to 'Arksoy'). Auburn–PI 21.079A from Tieling, Manchuria, China, in 1907. Baird–PI 6.414 (PI 22.333) from Pyongyang [P'yongyang], Korea, in 1901. Biltan–Selection from 'Otootan', South Africa.

Brindle–PI 20.407 from Merkoechofka, Siberia, in 1906. Brooks–PI 16.789 from Hangchow, China, in 1905. Brownie–PI 6.414 (PI 17.256) from Pyongyang, Korea, in 1901. Buckshot–PI 6.334 (PI 17.251) from Tokyo, Japan, in 1901. Burnette–From Farmville, North Carolina. Butterball–PI 8.433 (PI 17.273) from Japan in 1902, via Rhode Island AES [Agricultural Experiment Station] in 1903. Chame–PI 80.473 from Tokyo, Japan, in 1929. Chang–PI 54.610-2 from Changchun, Kirin, China, in 1921. Chernie–PI 18.227 from Khabarovsk, Siberia, in 1906. Chinaton Echo–From Harrow, Ontario, Canada.

Chiquita–PI 27.707 from Hankow, China, in 1910. Chuku–La Choy Company, Ohio. Cibao–From El Salvador. Delnoshat–Delta Station selection 6679, Mississippi. Delredo–From Mississippi. DeSoto–Ohio farmer. Dortchsoy No. 2–Dortch Seed Company, Arkansas (selected from 'Ogden', similar to 'Ogden'). Dortchsoy No. 6–Dortch Seed Company, Arkansas. Dortchsoy No. 7–Dortch See Company, Arkansas. Doxie–Georgia Experiment Station.

Duggar–PI 17.268C, a selection from 'Ito San.' Early Brown–PI 25.130 and PI 25.161 from Tennessee AES and Indiana AES in 1909. Eda–PI 17.257 from Japan in 1890. Edgecombe–R.P. Cocke, Williamsburg, Virginia. Edna–PI 6.312 (PI 17.252C) from Tokyo, Japan, in 1901. Edward–PI 14.953 from Shanghai, China, in 1905. Fairchild–PI 19.184 from Newchwang, Manchuria, China, in 1906. Farnham–PI 22.312 from Shanghai, China, in 1908. Feed All–A.M. Johnson, North Carolina. Flat King–PI 6.312 (PI 17.252) from Tokyo, Japan, in 1901.

Flava–PI 16.789A from Hangchow, China, in 1905. Gala–Georgia Experiment Station. Gem–P.B. Hutchins, Missouri. George Washington–From Virginia. Giant Yellow–PI 22.415 from Naples, Italy, in 1908. Golden–Harrow Experiment Station, Ontario, Canada. Goshen Prolific–Farmer selection, North Carolina. Hamilton–From USDA number 23 by Ohio Experiment Station in 1909. Hankow–PI 6.559 from beyond Chiu Niu, China, in 1901. Hansen–PI 20.409 from Merkoechofka, Siberia, in 1906.

Hay Boy–Farmer selection, North Carolina. Herman–From North Carolina. Hiro–PI 86.038 from Obihiro, Hokkaido, Japan, in 1930. Hope–PI 6.335 (PI 17.267) from Tokyo, Japan, in 1901. Ignotum–E.E. Evans, Michigan. Italian–Canada Experiment Station. Ito San–PI 17.268 from Japan in 1890. Jet–PI 17.861 from Sachon, China, in 1906. Johnsoy–A.E. Johnson, North Carolina. Kentucky A–Kentucky Experiment Station selection.

Kia–Illinois Experiment Station selection. Kungchuling–From Manchuria, China. Looney No. 2–Farmer selection, Tennessee. Lowrie–PI 22.898A from Paotingfu, Chihli, China, in 1908. Loxitan–Delta Experiment Station selection, Mississippi. Ludeke–Farmer selection, North Carolina. LZ–Louisiana Experiment Station selection. Mammoth Brown–Unknown. Manhattan–PI 6.333 (PI 17.277) from Tokyo, Japan, in 1901. Matthews–Farmer selection, Georgia.

Merko–PI 20.412 from Merkoechofka, Siberia, in 1906. Meyer–PI 17.852 from Peking, China, in 1906. Midunk–Funk Brothers Seed Company, Illinois. Mikado–Farmer selection, Indiana. Misstucky–Farmer selection, Kentucky. Morgan–PI 22.633 from Sheklung, Kwongtung [Kwangtung / Guangdong], China, in 1908. Mount Carmel–PI 70.218-2 from Wuchiatzu, Manchuria, China, in 1926. Mukden No. 4–Wisconsin Experiment Station selection. Nanking–PI 71.597 from Nanking, China, in 1927 (see CNS, p. 6). Nanksoy–PI 104.881 from Nanking, China, in 1934.

Nansemond Early–Farmer selection, Virginia. Natsu–PI 19.984 from Yokohama, Japan, in 1907. Nemo–PI 19.985 from Yokohama, Japan, in 1907. Nielsen–PI 22.644B from Hangchow, Chekiang, China, in 1908. Nigra–PI 22.407 from Hong Kong, China, in 1908. Nuttall–PI 6.416 (PI 17.253) from Pyongyang, Korea, in 1901. Okute–PI 19.986 from Yokohama, Japan, in 1907. Oloxi–Coker's Seed Company, South Carolina. Otoxi–From South Africa. Ozark–PI 37.272 from Kogen Province, Korea, in 1914.

Pee Dee–Coker's Seed Company, South Carolina. Pingsu–PI 18.259 from Tschang-ping-tsu, China, in 1906. Preston–Virginia Experiment Station selection. Quillian–Farmer selection, Oklahoma. Rattlesnake–Kentucky Experiment Station selection. Riceland–PI 20.797 from Shanghai, China, in 1907. Rila–Marsh Foundation, Ohio. Sainte Anne–Canada Experiment Station selection. Samarow–PI 17.260 from J.M. Thorburn and Company in 1902. Saskatoon–Farmer selection, Canada.

Sedo–PI 23.229 from Tientsin, Chihli, China, in 1908. Sherwood–PI 17.862 from Tientsin, China, in 1906. Southern Green–PI 62.839 from Nanking, China, in 1925. Southern Prolific–PI 37.250 from Keiki Province, Korea, in 1914. Stuart–PI 22.644 from Hangchow, Chekiang, China, in 1908. Summerland–Canada Experiment Station selection [British Columbia]. Suru–PI 89.128 from Kyojo, Korea, in 1930. Swan–PI 22.379 from Canton, Kwangtung, China, in 1908. Taha–PI 21.999 from Boshan, Shantung, China, in 1907. Tanloxi–Delta Station selection 483, Mississippi.

Tashing–PI 20.854 from Harbin, Manchuria, China, in 1907. Tensas–PI 104.881 from Nanking, China, in 1934 (same as Nanksoy). Texoil–Farmer selection, Texas. Tinzan–From Australia. Trenton–PI 24.610, a selection from 'Mammoth (Yellow)' in Kentucky in 1904. Trinitaria–From El Salvador. U.S.-5–PI 54.563-5 from Jungchiangko,

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Shengking [Liaoning], China, in 1921. Vilnensis–From Poland. Vireo–PI 22.874 from Tokyo, Japan, in 1908. White Eyebrow–PI 30.745 from Wulukai, Kirin, China, in 1911.

Yellow Biloxi–North Carolina Experiment Station selection. Yokotenn–PI 19.981 from Yokohama, Japan, in 1907. Yosho–PI 6.314 (PI 17.262) from Tokyo, Japan, in 1901.

Talk with Dr. Richard Bernard. 1998. July 12. He considers this to be his best publication on this subject, but it is quite similar to *INTSOY Series* No. 30 titled "USDA soybean germplasm collection inventory. Vol. 1," published in August 1987. Address: 1-2. Urbana, Illinois; 3-4. Stoneville, Mississippi.

9210. *East West.* 1988. East West presents: Best & worst awards. 3rd annual. 100% natural. Oct. p. 65-72.
• ***Summary:*** Best Natural Soy Sauce: Lima Nama Shoyu from Ohsawa-Japan, imported by Ohsawa America of Chico, California. Twice brewed, lower in salt, and aged four years. "It is unique among shoyus, with exceptional smoothness and flavor."

Better Than It Sounds Award:" Tofu chocolate? Yes, Barat Bars by Legume Inc. of Montville, New Jersey, use tofu instead of dairy and no hydrogenated or fractionated palm kernel oil. Carob candies move over!"

Best Tasting Flavored Soy Drinks: "The Westbrae Malteds won this contest going away. Creamy, thick, and delicious, they are more of a dessert than a drink. Some devotees eat them frozen."

Least Healthful Line of Soy Drinks: "The Westbrae Malteds. The flip side of their great taste is their almost 400 calories and 15 grams of fat per 8 ounces."

Most Healthful Line of Soy Drinks: Edensoy. They are the only producers making a totally oil-free drink.

Worst Tasting Flavored Soy Drinks: "Vitasoys from San Francisco, Calif., seem to have few fans and finished last in our blind taste test."

Most Questionable Beverage Label Claim: "3 grams of fat per 6 ounces of Carob and Chocolate Ah Soy, by Great Eastern Sun of Enka, North Carolina. These soymilks are rich and creamy, yet 3 grams is a lower fat content than even Edensoys, made without oil. How is that possible guys?"

That's Progress? Award: "Mori-Nu Tofu by Morinaga Nutritional Foods of Los Angeles. Aseptic Tetrapacked tofu that has indefinite shelf life and can be shipped anywhere. Good for backpackers maybe but can't compare to fresh and local."

Best Fake Hot Dog: SoyBoy Tofu Not Dogs by Northern Soy of Rochester, N.Y. "Nice smoky flavor and smooth texture, almost as good as the real thing."

Worst Fake Hot Dog: Tofu Pups of Lightlife Foods of Greenfield, Massachusetts. "Dry and crumbly on the inside, with a lack of distinctive flavor. Won't fool anybody at the neighborhood cookout."

Best Tamari: San-J Traditionally Brewed Tamari from San-J International of Colonial Heights, Virginia. "No one else even came close. Question: Will they be able to retain their appeal when the first U.S.-brewed batch hits the shelves?"

9211. Hymowitz, Theodore. 1988. Soybeans: The success story. In: Jules Janick and James E. Simon, eds. 1988. Advances in New Crops: Proceedings of the First National Symposium New Crops: Research, Development, Economics. Portland, Oregon: Timber Press. xxii + 560 p. See p. 159-63. Held 23-26 Oct. 1988 at Indianapolis, Indiana. [10 ref]
• ***Summary:*** Perhaps the best brief history seen on the origin and dissemination of the soybean, its introduction to America, and the reasons for its success. Contents: Introduction. Paths of dissemination–Old World. Paths of dissemination North America (Early Period [1765-1859]). Paths of dissemination North America (Middle Period [1878-1898]). Paths of dissemination North America (Late Period [1907-1920]). Success [due to the development of new cultivars and the rise of a processing industry]. Summation.

This paper notes that in 1804 soybeans were planted near Dubrovnik, Yugoslavia [Note: Dubrovnic has been in Croatia since 1991]. They were "harvested, cooked, mixed with cereal grain and then fed to chickens for increased egg production."

"In 1878, while in Europe, Dr. George H. Cook and James Neilson of the New Jersey Agricultural Experiment Station obtained soybean seed at the Bavarian Agricultural Experiment Station and at the Vienna Exposition. The seeds were planted at the College Farm in May 1879 and harvested in October. The results were encouraging. This is the first report of soybeans having been tested at a land grant institution in the United States. Within a short time, soybean seeds were introduced from Japan by McBryde (Tennessee), Sturtevant (Cornell Univ., New York), Brooks, (Hatch, Massachusetts), and Georgeson (Kansas)."

The article is dedicated to the memory of the author's friend and colleague Prof. dr. Bogdan Belic [pronounced BEL-itch], Novi Sad, Yugoslavia.

Note: Dr. Hymowitz, in a letter to William Shurtleff of Soyfoods Center dated 22 Dec. 1984, states: "A colleague of mine [Belic], while meandering through a library in a monastery in Yugoslavia, came across an early 1800s citation of soybeans in that area. Apparently the beans were brought to the Zagreb area by a ship captain from China."

Talk with Ted Hymowitz. 1993. April 25. Ted has a copy of the 1804 document by Buconjic that mentions soybeans being planted near Dubrovnik. It was sent to him by his friend and colleague Prof. Dr. Bogdan Belic of Novi Sad, Croatia, Yugoslavia. Dr. Belic, who knew that Ted was interested in the early history of the soybean, photocopied the document and translated that portion which dealt with

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the soybean. Ted does not have an 1826 article by Simic that cites the 1804 document by Buconjic. Address: Dep. of Agronomy, Univ. of Illinois, Urbana, Illinois.

9212. Karta, Susani K. 1988. Market trends in the development of traditional soyfood. Paper presented at the ASEAN Food Conference '88: Food Science and Technology in Industrial Development. 18 p. Held 24-26 Oct. 1988 at Bangkok, Thailand.
• ***Summary:*** Contents: Introduction. Traditional soyfood. Market situation and trends. Indonesia. Singapore. Malaysia. Thailand. Constraints in the market development of soyfood (in each of the above 4 nations). Major trends in the development of traditional soyfoods. Marketing strategy of soyfood. Tables: 1. Traditional non-fermented soyfood products. 2. Nutritional composition of traditional non-fermented soyfoods. 3. Description and uses of traditional fermented soyfood products. 4. Nutritional composition of traditional fermented soyfoods.

5. 1987 estimated consumption of soybeans as foods in the Far East [total and per capita in East Asia]. China, 1,062 million population, 7,325,000 tonnes, 6.9 kg/capita. Japan, 122 million population, 1,141,000 tonnes, 9.3 kg/capita. South Korea, 42.1 million population, 330,000 tonnes, 7.8 kg/capita. Taiwan, 19.6 million population, 260,000 tonnes, 13.3 kg/capita.

6. Southeast Asia soybean consumption for food. From 1983 to 1989 the increase in 1,000 metric tons was: Indonesia 927 to 1,600. Singapore 14 to 26. Malaysia 32 to 70. Thailand 40 to 150. Philippines 9 to 24. Total 1,022 to 1,870 (increase of 82.9% in 7 years).

7. Per capita soybean consumption for food in Southeast Asia. From 1983 to 1989 the increase in kg/person was: Indonesia 6.0 to 8.8. Singapore 5.6 to 10.5. Malaysia 2.1 to 3.7. Thailand 0.8 to 2.6. Philippines 0.2 to 0.5. Average total: 3.8 to 5.9 (increase of 55.3% in 7 years).

8. 1987 estimated consumption of soybeans as foods in Southeast Asia [total and per capita]. Indonesia, 175 million population, 1,575,000 tonnes, 9.0 kg/capita. Thailand, 53.6 million population, 118,000 tonnes, 2.2 kg/capita. Malaysia, 16.1 million population, 55,000 tonnes, 3.4 kg/capita. Singapore, 2.6 million population, 20,000 tonnes, 7.7 kg/capita. Philippines, 61.5 million population, 18,000 tonnes, 0.3 kg/capita.

9. Indonesian soybean production, imports, and consumption as food (in tonnes). From 1983 to 1989, production rose from 536,000 to 1,250,000, imports decreased from 391,000 to 350,000, and the amount consumed as food increased from 927,000 to 1,600,000. About 50% of the soybeans used for foods in Indonesia go to make tempeh, and 40% are used to make tofu.

10. Singapore soybean consumption as food. From 1983 to 1989 the amount increased from 14,000 tonnes to 26,000 tonnes. Most of these soybeans are used to make tofu and soymilk. 11. Malaysia soybean imports and consumption as food (in tonnes). From 1983 to 1989, production rose from 182,000 to 440,000, and the amount consumed as food increased from 32,000 to 70,000. 12. Thailand soybean production, and consumption as food (in tonnes). From 1983 to 1989, production rose from 113,000 to 490,000, and the amount consumed as food increased from 40,000 to 150,000. Only in 1988 were soybeans imported–40,000 tonnes. This growth of soyfood consumption is due partially to the Government of Thailand's interest in promoting the awareness and utilization of soyfood products. The Thailand Agricultural Extension Service program and other institutions have been actively advocating of soyfoods into the food industry and the human diet, especially in rural areas. The government controls soybean imports by issuing licenses.

In summary: The soybeans with the highest per capita soybean consumption for soyfoods are: Taiwan 13.3 kg, Japan 9.3 kg, Indonesia 9.0 kg, Singapore 7.7 kg, South Korea 7.3 kg, and China 6.9 kg. The greatest potential for growth lies in China, where it is very common to find markets running out of soyfoods early in the morning. There is also great potential for growth in Malaysia, Thailand, and the Philippines. Address: American Soybean Assoc., 541 Orchard Rd., #11-03 Liat Towers, Singapore 0923, Republic of Singapore.

9213. **Product Name:** [Tofu Dressing (Plain, Thousand Onion Flavor, and Thousand Tomato Flavor)].
Foreign Name: Otofu Doresshing (Pureen, Sauzan Onion Fûmi, Sauzan Tomato Fûmi).
Manufacturer's Name: Nihon Beans.
Manufacturer's Address: Nakamachi 2-4-5, Musashino-shi, Tokyo, Japan. Phone: 0422-54-4030.
Date of Introduction: 1988 October.
Wt/Vol., Packaging, Price: 160 ml plastic bottle retails for 160 yen.
New Product–Documentation: Toyo Shinpo. 1988. Nov. 11. p. 4. Otofu doresshingu wakai josei no ninki dokusen: Nihon Biinzu [Tofu dressings capture young women's favor: Nihon Beans]. Tofu-based dressings are becoming very popular in Japan. Nihon Beans (president Tetsuya KOFUSE) started to sell 3 varieties in Oct. 1988. Their target is the women's market. They developed their products and design by studying many women's groups. They decided that a product containing 40% and 40% tofu has the best flavor. With more tofu, the flavor is too plain, although the product would be healthier.

9214. Shurtleff, William; Aoyagi, Akiko. 1988. Das Miso-Buch: Hersetllung, Sorten, Kochen mit Miso, Rezepte [The book of miso: Production, varieties, cooking with miso, recipes]. Munich, West Germany: Goldmann Verlag GmbH. 414 p. Oct. Illust. by Akiko Aoyagi Shurtleff. Index. 23 cm.

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Pocket book edition. [Ger]
• ***Summary:*** A pocket book edition of the original 1980 German edition of *The Book of Miso.* Contains 350 recipes.

Contents: Foreword. What is miso? Part I. Varieties, preparation, and production of miso. Part II. Cooking with miso (recipes). Glossary. Acknowledgments. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

9215. Morinaga Nutritional Foods. 1988. Mori-Nu Tofu promotes healthy eating through November (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 2 p. Nov. 4.
• ***Summary:*** This month, Mori-Nu Tofu will participate in 3 special health-related events to educate individuals on the latest advances in healthy eating: (1) The International Dance-Exercise Assoc. (IDEA) Educational Conference Nov. 6-8 in Washington, DC. IDEA consists of 18,000 dance exercise professionals from 50 states and 38 countries. Mori-Nu will distribute recipes and brochures to members of IDWA and serve fresh Mori-Nu strawberry fruit shakes to the expected 1,500 conference attendees. (2) Danielle Lin will serve all-natural strawberry fruit shakes at the Soyfoods Pavilion, Nov. 4-7, at the Natural Foods Expo in Baltimore. (3). Lin will provide delicious low-fat, low-cholesterol, and low-sodium cooking ideas using Mori-Nu Tofu at the First National Cholesterol Conference (sponsored by the National Heart, Lung and Blood Inst.), Nov. 9-11, Crystal City, Virginia. Address: Los Angeles, California. Phone: 213-728-4325.

9216. Bolduc, Bill. 1988. Re: Early history of Eden Foods, Inc. to 1973. Part I. Letter to William Shurtleff at Soyfoods Center, Nov. 5. 2 p. Typed, with signature on letterhead (photocopy).
• ***Summary:*** The following account is based on hours of discussion between Bill Bolduc, the Redmonds, and the Silvers between 1988 and 1991. Bill is not familiar with the details of the history of the food co-op in Ann Arbor prior to 1969. But Ronnie Teeguarden says that in about July 1967 he and Gloria Dunn started a loosely-organized food buying co-op–which had no name–in Ann Arbor, Michigan. Within a few weeks, a number of their friends and acquaintances (a group of eclectic pathfinders, students, graduates, macrobiotics, dropouts, musicians) informally joined the group. These included Tim Redmond, Mark and Nancy Retzloff, Linda Succop, Iona Teeguarden, and Bob Thorson. From time to time, they collectively ordered macrobiotic staples from Erewhon in Boston using the Erewhon catalog. When the foods arrived, the food co-op members got together and divided them up at the Teeguarden-Leabu General Store, located a half flight below street level at 209 South State Street, below the Herb David Guitar Studio in Ann Arbor. Run by Ronnie Teeguarden, with help from Gloria, this store's main business was selling local art, second hand clothes and records, etc.

Bill Bolduc and Judy Succop [Linda Succop's sister], were married in June 1969 in Ann Arbor. They were not yet members of the co-op at that time. A few days later, they went to Berkeley for the summer. When they returned to Ann Arbor at the end of that summer, they lived in Saline, Michigan, 12 miles outside of town with Mark & Nancy Retzloff, Linda Succop, and Tim Redmond. Bill, who wasn't working or going to college, was trying to figure out what to do next. By September 1969, Bill and Judy Bolduc joined the food co-op. They also joined the Zen Macrobiotic Supper Club; all of its members were also members of the food co-op.

In the fall of 1969 the Teeguarden-Leabu second-hand store looked like it was about to close, which would leave the food co-op without a home. The group (especially Ronnie) convinced Bill Bolduc to take charge of the food co-op and find it a permanent home, which he did.

On 4 Nov. 1969 Bill Bolduc incorporated Eden Organic Foods, Inc. as a non-profit corporation in the state of Michigan. The name "Eden," which stood for Environmental Defense Energy Network, was coined at this time by Bob Thorson during a discussion between, Bill Bolduc, and Gloria Dunn at a coffee shop. Thus, the term "Eden" was first used in connection with this co-op or business in Nov. 1969.

Eden was born under a good star. The date Nov. 4 was carefully chosen to be astrologically propitious. At the time, Bill was an intense student of astrology with Michael Erlewine–who is now world famous in the field, and the owner of Circle Books, an astrological publishing company. In 1970 Michael also designed the Eden logo of the 4 sprouts in a circle. Eventually Michael became one of Bill Bolduc's students in macrobiotics.

Bill was president of Eden Organic Foods and his wife Judy (who was working as a secretary at the University of Michigan School of Music) was secretary. Bolduc used $200 of his own money to rent a converted apartment above the bicycle store at 514 East William St. in Ann Arbor, near campus. People from the community loaned $1,500 to help stock the co-op store and buy an 8-inch Meadows stone mill to grind flour.

The question arises: When was Eden Foods established? Bill Bolduc and Tim Redmond believe that the founding should be dated from Nov. 1969, when the company was first named; before Nov. 1969 the food co-op was not even a business. It was dead and had disappeared for about a month until Bill resurrected it by placing an order to Erewhon using his own money.

Eden Organic Foods first began selling soyfoods commercially in November 1969, starting with their first order from Erewhon in Boston. They would buy "tamari" (actually shoyu) and miso (kome = rice, mugi = barley, and

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Hacho varieties) in bulk from Erewhon (which imported them from Japan). At their store, Linda Succop (Bill's wife's sister) would repackage the products, putting the shoyu into bottles and the miso into plastic bags. They were labeled using plain white pressure-sensitive gummed labels with a rubber stamp. One stamp contained the name and ingredients for each product, and another, that was stamped below it, gave the company name and address. They wrote in the weight or volume by hand. Also at William St. a tiny Meadows Mill was used to grind grains and seeds into flour. Continued. Address: ELI Research Corp., 660 Northland Blvd., Suite 28, Cincinnati, Ohio 45240. Phone: 513-851-0330 or 513-751-9090.

9217. Bolduc, Bill. 1988. Re: Early history of Eden Foods, Inc. to 1973. Part II. Letter to William Shurtleff at Soyfoods Center, Nov. 5. 2 p. Revised 4 Dec. 1991 by Bill Bolduc, Ron Teeguarden, and James Silver.

• ***Summary:*** In Sept. 1970 the fledgling company had an offer to move into a newly-redecorated mini-mall [at 211 South State St.] on the main street of campus. New personnel and financing would be needed. Bolduc called Tim Redmond, who had been studying and working at the Sanae macrobiotic restaurant in Boston, to ask for help. Tim returned to Ann Arbor and joined Bolduc in the expansion effort. To raise money for the move, the two approached Tim Redmond's father, who said he would help finance the expansion only if the business was reorganized as a for-profit corporation with Tim having equal ownership. They agreed and in about Oct. 1970 Eden was reorganized as a for-profit corporation with Bolduc and Redmond each owning 50%. At that time the partners shortened the company name to Eden Foods Inc. Bolduc and Redmond then borrowed a 4-figure sum from Tim's dad, had the new store remodeled, and entered the big time. After the new store was opened and running, Redmond returned to Boston and the Sanae restaurant, where he completed his studies. But with this move they fell from the graces of the political co-opers. In November 1970 they did a "Brown rice, seaweed, and dirty hot dog" Bob Dylan commercial on a local radio station; it was a big hit. They bought a 15-inch Meadows Mill and a rotary-drum roaster, then milled flour and baked granola in the back of the store.

In 1970 Bill had located Tom Vreeland, an organic farmer in Ypsilanti, Michigan. An Eden Foods Wholesale Pricelist dated 26 July 1971 shows that the Eden store at 211 South State St. was wholesaling soybeans, soft wheat, corn, and rye, all grown organically in Michigan. Eden was also selling organic flours that they ground from these grains.

In the spring of 1971, after realizing they were the only "natural food" store in the area, and having some other "health food" store owners in Detroit express an interest in carrying more food, they decided to wholesale foods out of the back of their retail store at 211 South State Street. Bill flew to Boston to meet Tim Redmond. They visited Erewhon (they wanted to convince Erewhon to let Eden be their distributor at lower prices), then Bill flew to Arrowhead Mills in Deaf Smith County, Texas, to make arrangements buying in bulk at wholesale prices. In the summer of 1971 they ordered their first 20-foot trailer load of organic foods from Arrowhead Mills, and ran an ad in *East West Journal*. Soon they started to distribute their foods to 4-5 accounts in Detroit. They bought a 1964 16-foot green Dodge van and a dry weight weigher/dumper machine. Their two main brands were Arrowhead Mills and Erewhon, but soon they developed the Eden brand with printed labels, onto which they would rubber-stamp the product name (such as bottled tamari and packaged miso). Soon they added other brands: Celestial Seasonings, After the Fall, Timbercrest, etc.

The wholesale operation quickly outgrew the back of the retail store, so they borrowed more money and rented a 5,000 square foot Quonset hut (resembling an airplane hanger) down on Main Street by the Huron River. Tim Redmond, Mark Retzloff, and Bill Bolduc ran the wholesale operation. Retzloff later co-founded Alfalfa's, a natural foods supermarket chain based in Boulder, Colorado.

In October 1971 Bolduc hired Michael Potter, who was living in Detroit, to run the store. Just before this, Potter had managed a natural foods store named Joyous Revival in nearby Birmingham, Michigan. Prior to this time, the company had been owned by Bill and Judy Bolduc (50%) and by Timothy Redmond (50%). Potter was given 13.5% of the stock and the other principals' share reduced proportionally.

In the late summer or fall of 1973 the Bolducs sold their shares back to the corporation, which then gave a portion of these to Tim Redmond and Michael Potter so that these two men now owned 51% and 49% respectively.

The Bolducs then left Ann Arbor, moving to Cincinnati, then to Illinois, then back to Ann Arbor. Bill is certain that when he left Eden Foods, the company was not importing any products from Japan. He would guess that it was not until about 1975 that Eden started to import a line of foods from Japan. Their first supplier in Japan was Muso Shokuhin, a leading macrobiotic and natural foods exporter in Osaka. Initially, all of their imported products were required to bear the Erewhon brand. Imported soyfoods included miso and shoyu. Sales hit $175,000 in 1973.

Note: Eden was the first of the many macrobiotic distributors based on the Erewhon model to open in America. Others that soon followed included Food for Life in Chicago (1970), Janus in Seattle, Washington (1972 Jan.), Essene in Philadelphia (by 1971 Feb.), Laurelbrook in Maryland (1971 Aug. 23), Ceres in Colorado Springs (by 1973), and The Well in San Jose, California (1973). Address: ELI Research Corp., 660 Northland Blvd., Suite 28, Cincinnati, Ohio 45240. Phone: 513-851-0330 or 513-751-9090.

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9218. Morinaga Nutritional Foods. 1988. Mori-Nu Tofu promotes drug-free bodybuilding at the 1988 Annual Mr./Mrs. International (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 2 p. Nov. 14.
• ***Summary:*** "Mori-Nu Tofu will co-sponsor the 1988 Annual Natural Drug-Free Bodybuilding Contest on Nov. 20 in Redondo Beach, California. Bodybuilders from all over the world will compete for the title of Mr./Ms. Natural, which is only open to men and women who have passed a drug test one week prior to the event.

"Participants are tested by the American Bodybuilders Coordination Committee (A.B.C.C.), the oldest and most widely recognized drug-free association in the country, which utilizes the standard urine test as well as a lie-detector test to determine previous or present use of steroids or other muscle-building drugs...

"Mori-Nu Tofu, which began sponsoring natural bodybuilding contests earlier this year, offers bodybuilders a low-calorie, high-protein addition to their diets." Address: Los Angeles, California.

9219. Harris, Ron. 1988. A history of Grain Dance, one of America's earliest seitan manufacturers (Interview). *SoyaScan Notes.* Nov. 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Ron arrived in San Francisco in about 1975, having studied macrobiotics previously in Ohio from 1974. As far as he knows, he was the first person to make seitan commercially as a real business in America. Before he started, a woman in Marin made seitan at home and sold it at 1-2 stores for a few months. She had no business name. She had learned how to make seitan from Roy Steevensz, a macrobiotic teacher in Los Angeles who also made and sold tempeh. Lima Foods in Belgium started to import a small bottled seitan product long after Ron started. He never had any competition from other seitan makers on the West Coast. When he began, no one had ever heard of seitan. The Kushis and the Aiharas both made and taught others how to make seitan on a home scale.

Ron first learned about and tasted seitan in Key West, Florida, in 1975. A woman named Martha, who was a macrobiotic (originally from Los Gatos, California) was giving a cooking class. His ex-wife Shiwa took the class, then Ron tasted the seitan from the bottom of the pot. He loved it. Shiwa then taught Ron the basic process for making seitan, then he ended up developing some variations on that process and recipe. Shiwa had a small business making pastries (such as date bars) out of her home in San Francisco and selling them at Rising Sun, a macrobiotic food store on Judah St. in San Francisco, owned by Mr. Noboru Muramoto. She suggested that Ron start making seitan to expand the family's line of foods. Ron first began to make seitan out of their home at 187 Downey St. (in the upper Haight-Ashbury district), San Francisco. He sold the first product in bulk at Rising Sun. It was in small dark brown chunks (about 6 pieces/chunks per pound), stored refrigerated in a 5-gallon plastic bucket or earthenware crock. On the bulk container was written the word "seitan" followed by the ingredients. After about a year he started to sell it in individual packages. To the label he added the pronunciation "SAY-tahn" and the phrase "A high-protein food made from wheat." He always sold only one product in one flavor. The ingredients were organic hard red winter whole wheat (always freshly ground), spring water, tamari (actually shoyu), ginger, and onions. He was one of the few seitan makers to use whole wheat; most others used unbleached white flour, which gave a higher seitan yield. Initially he ground the wheat by hand using a French Samap mill that he bought from Jacques DeLangre's son, Tom. Later he bought his wheat from Joe Schwinn of Deaf Smith–Vital Vittles, who milled his own wheat fresh each day.

Originally Ron's seitan company had no name. He coined the company name "Grain Dance" at about the time he began packaging in individual containers–round plastic deli containers with a snap-on lid. First he sold it by the pound, then in 8 oz packs. Later the name was expanded to Grain Dance Natural Foods. The company was never incorporated. From his first address, Ron moved to another home-based kitchen, then in about 1980 he subleted his first legal commercial space mornings in the kitchen of the Real Good Karma Cafe on Dolores St. in the Mission district. Finally in about 1982 he moved into a commercial space at 422 Haight St. between Fillmore and Webster in the lower Haight Ashbury. By 1987 he was selling seitan to about 100 stores in the greater San Francisco Bay Area. They made seitan 3 or 4 days a week, making 80 pounds of finished seitan each day. Grain Dance introduced seitan to thousands of Californians who were looking for an alternative to meat. At fairs he served deep-fried seitan; it was dipped in a spiced wheat-flour batter and breaded with cornmeal. People loved its meaty texture and savory flavor. Ron's personal favorite was freshly cooked seitan, right out of the pot in his unique broth.

Initially Ron distributed the product himself, then Paul Duchesne distributed it after he was pushed out of Wildwood and started his own distribution company, then when he went out of business, Wildwood distributed it; Wildwood also used seitan in some of their sandwiches. Later David "Devo" Knepler came is as a partner (Devo now works with Wildwood Natural Foods). They had one employee.

For ten years Ron made seitan by hand. He really enjoyed the hand kneading, putting handmade energy into the food, and focusing on quality. By 1987 the business was growing, rents in San Francisco were skyrocketing, and he would have to mechanize the shop in order to expand. The business never made much money. "It was a labor of love, and it really enjoyed making seitan and turning people on to good food and helping them in any way I could." So in

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1987 Ron began to phase out the business. He started doing attorney service work (which he is still doing) several days a week, then made seitan on several other days. Initially Wildwood wanted to continue it, so Ron went there and taught a few people how to make seitan. They did it for a while, but found it too labor intensive, and gave it up. There has never been another seitan maker on the West Coast. Address: San Mateo, California. Phone: 415-347-1378.

9220. *Register* (*Whitewater, Wisconsin*). 1988. Noon Kiwanis [U.S. trade and Japan]. Nov. 17.
• ***Summary:*** "In the five years from 1982 to 1987, the United States went from the world's largest creditor nation, owed $150,000 million by the rest of the world, to the world's largest debtor nation, owing $400,000 million to the rest of the world. Our role as the largest creditor nation was inherited by Japan."

9221. Morinaga Nutritional Foods. 1988. Mori-Nu Tofu educates seniors on reducing cholesterol (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 2 p. Nov. 18.
• ***Summary:*** Nov. 18, 1988. "Recently, Mori-Nu participated in the Golden Times Senior Citizen Show in Anaheim, California... Seniors attending the Show received information on the health and nutritional benefits of eating tofu as well as tips on creating delicious recipes using tofu. In addition, seniors got a chance to taste Mori-Nu in all-natural fruit shakes made fresh using strawberries, bananas and Mori-Nu Tofu." Address: Los Angeles, California. Phone: 213-728-4325.

9222. *Packer* (*The*). 1988. Tofu earns Good Housekeeping Seal of Approval. Nov. 19.
• ***Summary:*** Mori-Nu Tofu is the first and only tofu manufacturer in the United States to receive the Good Housekeeping Seal of Approval, according to Tom McReynolds, marketing manager for Morinaga. Based on a news release dated 11 Nov. 1988 and titled "Mori-Nu Tofu receives the Good Housekeeping Seal of Approval." Also in Whole Foods. 1989. Feb. p. 19. Address: Kansas.

9223. Sheraton, Mimi. 1988. Cookbooks to give thanks for: An autumn harvest of American standards, Asian flavors and universal inspiration. *Time.* Nov. 28.
• ***Summary:*** *An Ocean of Flavor* (Morrow, $20.95) is by Elizabeth Andoh, an American who married a Japanese and has spent many years in Japan studying the country's food and culture. This fine guide shows how to enhance the flavor of seafood without destroying it. "Fried soft-shell crabs in a spicy sauce, cold poached tilefish with mustard-miso sauce and fiddlehead ferns, and a careful, simple tempura recipe are among the enticements."

Another new Asian food book is *Asian Ingredients* (Morrow; $22.95) by Bruce Cost. It includes a discussion of the "soy sauces that so many chefs are now using to accent European dishes."

9224. Archer Daniels Midland Co. 1988. First quarter report to shareholders. Box 1470, Decatur, IL 62525. 16 p.
• ***Summary:*** President Randall's Report–stated that the greatest concern of Americans in the 1990s will be the environment. 1. ADM now has in operation eleven large fluid bed boilers for cogeneration of power and process steam. 2. Worldwide technology has been licensed for using a special grade of starch to render disposable plastics degradable. 3. Ethanol is a third contribution to clean environment. Ethanol fuels have a high oxygen content, a major factor in reducing carbon monoxide poisoning of the atmosphere.

"There is a tremendous demand all over the world for soy protein products to replace subsidized milk powder. Our soy protein concentrate plant is completed and is now operational. We will double its size in early 1989 and are making plans to double it again before 1990, in response to the new demand.

"We are also doubling the size of our edible soy protein isolate plant, with plans for further increases in 1989 and beyond. We are constructing a plant for industrial isolates for the paper industry, to be sold in conjunction with our corn starches.

ADM now produces soybean flour, grits, TVP, concentrate and isolate, the most complete line of edible soy products of any producer.

Chairman Andreas' Report–The U.S. Government has more control over what the farmers plan and the prices they receive today than they have ever had in history.

Government imposed embargoes cause massive restructuring of world trade and processing. Examples: Immediately after the 1980 embargo, the following fundamental permanent adjustments in world trade occurred: 1. The EEC, in emergency meetings, alarmed that the U.S. would cut off exports for political reasons, resolved to become self-sufficient, particularly in oilseeds, with the result that they increased production of wheat and have become a large surplus producer of wheat. 2. Japan, equally alarmed, immediately made $1,000 million available to Brazil to expand soybean production 300%. 3. The Soviet Union took its order book to Brazil, Canada, Argentina, Australia, and the EEC, cutting the U.S. from a 75% supplier to a 25% supplier. 4. Canada and Australia responded with 20% increases in production. Address: Decatur, Illinois.

9225. Davet, Philippe. 1988. Classicisme s'abstenir [Classicism abstains]. *Agriculture* (*France*) No. 534. p. 15-17. Nov. [Fre]
• ***Summary:*** At the SIAL 88 food show (Salon des Industries Alimentaires for 1988) the author discovers Emul, a soy ice cream from Japan, for dessert. Rich in protein and free of

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cholesterol, it contains only 160 calories per 100 gm.

9226. Duxbury, Dean D. 1988. Japanese-style tamari furnishes more protein, less sodium, heat stability. *Food Processing* (*Chicago*) 49(11):90, 92. Nov.
• ***Summary:*** About San-J tamari, which contains 30% more fermented vegetable protein than conventional soy sauce. Address: Associate editor.

9227. Maeda, Toshiie. 1988. Atarashii daizu hakkô shokuhin bunka no sai sôzo o mezashite: Mura okoshi "tenpe sonjuku" [Aiming to recreate a new fermented soyfood culture: Revitalizing a village–the tempeh village school]. *Daizu Geppo* (*Soybean Monthly News*). Oct/Nov. [Jap]
Address: Kobe Women's Junior College, food processing.

9228. Masuda, Ryoichi; Hashizume, Kazumoto; Kaneko, Katsuyoshi. 1988. [Effect of holding time before freezing on the constituents and the flavor of frozen green soybeans (edamame)]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 35(11):763-70. [Jap; eng]*

9229. Morinaga Nutritional Foods, Inc. 1988. A healthy market (Ad). *Whole Foods* (*Berkeley, California*). Nov. p. 45.
• ***Summary:*** This full-page color ad states: "Mori-Nu offers you higher profits and increased sales with: Beautiful, full-color advertising in the following magazines: Prevention (regional), Health (regional), 50 Plus (regional), Heart Corps, California Senior Citizens, Delicious (national), Weight Watchers (regional), Vegetarian Times (national), Southern California Senior Life, and more..." Also discusses: Guaranteed quality and taste. Convenient FDA approved long-life packaging. Strong market support (6 items).

Color photos show two packages of Mori-Nu tofu (soft and firm), plus two recipe pads ("Mori-Nu's Tempting Tofu Desserts," "Exotic! Chinese Unchicken Salad"), coupons (15 cents off Mori-Nu Tofu), a video ("Revolutionary Tofu"), and the front page of two issues of "Mori-Nu Healthy Times" newsletter. For more, call now and ask for Danielle Lin, national sales representative, health food industry. (213) 728-4325.

This ad also appeared in *Natural Foods Merchandiser.* 1988. Nov. p. 28, and 1989. April. p. 24. Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9230. Morinaga Nutritional Foods, Inc. 1988. Cholesterol-free holidays are as easy as pie (Ad). *Vegetarian Times.* Nov. p. 29.
• ***Summary:*** This full-page color ad shows a large pumpkin pie on a cloth on a cutting board. Behind it is a package of Mori-Nu Lite Tofu and a cornucopia of vegetables and fruits. A recipe is given for "Mori-Nu's no cholesterol pumpkin pie" using 2 x 10.5 oz. packs of Mori-Nu Tofu Silken/Soft. Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9231. Morinaga Nutritional Foods. 1988. A healthy market (Ad). *Natural Foods Merchandiser.* Nov. p. 28.
• ***Summary:*** A full-page ad (8 by 11 inches, color). "Mori-Nu offers you higher profits and increased sales with: Beautiful, full-color advertising in the following magazines: Prevention (regional), Health (regional), 50 Plus (regional), Heart Corps, California Senior Citizens, Delicious (national), Weight Watchers (regional), Vegetarian Times (national), Southern California Senior Life, and more..."

Color photos show: (1) Healthy Times newsletter. Tofu Magic. At the bottom are packages of Mori-Nu Silken Firm and Mori-Nu Silken Soft Tofu.

This ad also appeared in the April 1989 issue (p. 24). And in Whole Foods. Nov. 1988 (p. 45). Address: Los Angeles, California.

9232. Okura, Akira; Arakawa, H.; Oka, H.; Yoshinari, T.; Monden, Y. 1988. Effect of genistein on topoisomerase activity and on the growth of [Val12]Ha-ras-transformed NIH 3T3 cells. *Biochemical and Biophysical Research Communications* 157(1):183-89. Nov. [20 ref]
Address: Exploratory Research Labs., Banyu Pharmaceutical Co., Ltd.; 2-9-3 Shimomeguru, Meguru-ku, Tokyo, 153 Japan.

9233. *Seed Industry.* 1988. Sigco Sun to produce soybean. Nov. p. 22.
• ***Summary:*** A new (and as yet unnamed) small-seed soybean variety, which is about two-thirds the size of Chico and matures about two weeks later, will be used for the manufacture of natto in Japan. Natto, a fermented food, is often served with rice or sushi.

The new variety was developed by the University of Missouri. "Sigco Sun Products, Breckenridge, Minnesota, has been awarded the exclusive right to produce and market the new" variety.

9234. Shurtleff, William; Aoyagi, Akiko. 1988. Amazake and amazake frozen desserts: Industry and market in North America. 2nd ed. Lafayette, California: Soyfoods Center. 79 + [52] p. 28 cm. 1st ed. Feb. 21, 1988. [82 ref]
• ***Summary:*** Contents: 1. Amazake industry and market analysis: What is amazake? The amazake production process, microbiology, and biochemistry. History of amazake in Japan. History of amazake in North America and Europe. Market size and growth rate. Comparison with the soymilk market. Largest manufacturers in North America. Ranking by size and annual production. Market segments (buyers, retail outlets, geographical). Product types. Prices. Packaging.

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Imports. Market outlook and forecast. Several related forecasts. 2. Commercial amazake products and product/company histories: Subject and country index. Company index. 3. Annotated bibliography (1597-1988): Subject and country index. Author index. 4. Directory. 5. Documents, labels & graphics. About the Soyfoods Center. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

9235. Morinaga Nutritional Foods. 1988. Mori-Nu Tofu is honored by the American Heart Association (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 1 p. Dec. 1.
• ***Summary:*** "Mori-Nu has worked with the American Heart Association on a number of projects over the past year and will continue to promote the healthy heart in years to come." The company was presented with a commemorative medallion in celebration of its philanthropy.

Published in Whole Foods. 1989. Feb. p. 14. And in Health Foods Business. 1989. Feb. Address: Los Angeles, California. Phone: 213-728-4325.

9236. Murata, Kiku. 1988. Re: New developments with tempeh in Japan. Letter to William Shurtleff at Soyfoods Center, Dec. 4. 1 p. Typed, with signature. [Eng]
• ***Summary:*** "Since I wrote you on Sept. 24, I visited a Tempeh Village Group (*Tempeh Sonjuku;* the chief of the group is Mr. T. Maeda) and attended a sampling party at the 'Foods and Green Exhibition,' Hyogo prefecture, Sasayamaguchi."

"After returning from my trip [to Australia] I had tried to start a 'Tempe Study Group.' Since I am now retired from the university and only give a lecture on nutrition once a week, I have no place to do scientific research on tempeh. So I now volunteer my time and money to establish the study group. We now have about 50 members. We plan to have 'The 1st Tempe Research Meeting' in Tokyo, February 1989." Address: 608 Honyakushi, Nara City 630, Japan.

9237. Okonogi, Shigeo; Kuwahara, K.; Oizumi, S.; Mizuguchi, K.; Koide, O.; Shimada, H. Assignors to Morinaga Milk Industry Company, Ltd. (Tokyo, Japan). 1988. Method for manufacturing a packaged aseptic hard soybean curd. *U.S. Patent* 4,789,556. Dec. 6. 5 p. Application filed 24 Feb. 1987. Application also filed in Japan on 24 Feb. 1986. [1 ref]
• ***Summary:*** Produces a kinugoshi-type silken tofu coagulated with GDL (glucono delta-lactone). Address: 1&6. Tokyo; 2. Yokohama; 3. Yokosuka; 4-5. Kawasaki. All: Japan.

9238. Matsuura, Masaru; Obata, A.; Fujii, N.; Nobuhara, A.; Fukushima, D. Assignors to Kikkoman Corp. (Noda, Japan). 1988. Method for grinding soybeans and method for producing tofu. *U.S. Patent* 4,791,001. Dec. 13. 6 p. Application filed 12 Jan. 1987. 1 drawing. Application also filed in Japan on 14 Jan. 1986. [23 ref]
Address: 1-3. Noda; 4. Kasukabe; 5. Omiya. All: Japan.

9239. Kanasugi, Goro. 1988. Re: Update on work with tempeh in Japan. Letter to William Shurtleff at Soyfoods Center, Dec. 26. 3 p. Handwritten, on lined paper. [Jap]
• ***Summary:*** He saw the article in *Daizu Geppo* (Dec. 1988) about the work of Shurtleff and Aoyagi. He is still making and selling tempeh. Each day he makes: 1. Tempeh miso. 2. Vegetable steamed buns (Yasai no manju) with cabbage and tempeh. 3. Steamed bread (Mushi-pan). 4. Tekka miso with tempeh. 5. Sui chikuwa. 6. Onchom–skewered or cylindrical.

In Sept. 1988 he started making and selling a Tempeh bentô (lunchbox); it sells well. He sells about 1,000 tempeh dishes a day at his restaurant and sandwich shop. Address: Shimo-cho 3-6, Omiya-shi, Saitama-ken 330, Japan.

9240. Brown, Judy. 1988. The joy of soy: Nutrition for the '80s. *Body, Mind & Spirit.* Nov/Dec. p. 30-32.
• ***Summary:*** Contents (Soyfoods, nutrition, and a healthy diet). Tofu. Tempeh. Miso. Natto. Okara. Soy cheese & soy yogurt. Soy flour & grits. Soymilk. Soy sauce. Resources: Eden Foods, Fantastic Foods, Inc., Lumen Foods Corp., San-J International. Vitasoy (U.S.A.) Inc., Westbrae Natural Foods (Downey, California). Address: President, In Good Taste, 5923 John Adams Dr., Camp Springs, Maryland 20748.

9241. Harayama, Fuminori; Yasuhira, Hitomi. 1988. *Aspergillus*-zoku to *Rhizopus*-zoku no daizu tanpaku bunkai sayô no hikaku [Comparison of hydrolytic action on soybean protein by the genus *Aspergillus* and *Rhizopus*]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 83(12):828-33. Dec. Reprinted in Shinshu Miso Kenkyusho Kenkyu Hokoku (Report of the Shinshu-Miso Research Inst.). No. 30. p. 94-99. [19 ref. Jap; eng]
• ***Summary:*** Changes in protein during manufacture of miso and fermented soybeans using fungi of the genera Aspergillus and Rhizopus were examined by SDS-polyacrylamide gel electrophoresis. The protease activity, especially of Rhizopus, was largely inactivated by ethanol in salt-free miso containing 5% ethanol. Aspergillus hydrolyzed soybean protein to products of low molecular weight, whereas Rhizopus only slightly hydrolyzed it, leaving mostly middle and high molecular weight substances. Address: The Shinshu-Miso Research Inst., 469-6 Nakagosho, Nagano City, Japan 380.

9242. *J. of the American Oil Chemists' Society.* 1988. China projects. 65(12):1862. Dec.
• ***Summary:*** "Nisshin Oil Mills of Japan is undertaking a joint venture with Dalian Oil and Fat Industry General

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Factory and other firms to establish a soybean-crushing firm at Dalian, China. The new firm–Dalian Nisshin Oil Mills Ltd.–has 12 million dollars in capital supplied by Japanese and Chinese companies.

"Plans have been made to construct a soybean-crushing facility at Dalian Economic and Technical Developing Zone at a projected cost of 5,000 million yen, with start-up targeted for October 1990. Annual crushing capacity is forecast to be 180,000 tons. Heilongjian Province will supply soybeans for the facility."

9243. Kikuchi, S. 1988. [Packaging and cold chain distribution of raw, unpasteurized miso]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 83(12):797-99. Dec. [Jap]*

9244. Morinaga Nutritional Foods, Inc. 1988. Mori-Nu Tofu recipe cards. 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040.
• ***Summary:*** These recipes, developed by Julia Weinberg & Co., were sent free of charge to members of the Mori-Nu Health for Life Club during 1988. Each recipe card is 3 by 5 inches, accordion folded, with five cards printed front and back. The first panel contains a full color recipe photo; on the other nine panels are recipes.

Series 6: Mori-Nu's International Flavors (Feb.). Series 7: Mori-Nu Meal Makers (April). Series 8: Mori-Nu Mornings (June). Series 9: Quick and Cool Recipes from Mori-Nu (Aug.). Series 10: Mori-Nu for Every Reason (Oct.). Series 11: Mori-Nu Holidays (Dec.). Address: Los Angeles, California.

9245. Morinaga Nutritional Foods, Inc. 1988. Tournament assists heart patients. *Whole Foods* (*Berkeley, California*). Dec. p. 20-21.
• ***Summary:*** Morinaga recently sponsored a golf tournament and health fair to assist heart patients and their families. It was called the "Heart Healthy Golf Classic and Health Fair." Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9246. Okubo, Kazuyoshi. 1988. Daizu no DMF (Dry Mouth Feel, aku, fukai-aji) seibun to tôfu nado no shokuhin kakô ni okeru sono kyodô [DMF (Dry Mouth Feel, undesirable) components of soybean and behavior of the components on soybean food processing]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 35(12):866-74. Dec. [40 ref. Jap]
• ***Summary:*** Undesirable sensory properties are found in isoflavin [isoflavones] which has an objectionable, bitter, astringent, and weak phenol-like taste; daidzin and genistin, which have a bitter, astringent taste; and saponins, which have a bitter taste. Group A saponins are found mostly in the soybean hypocotyl, whereas Group B saponins are found in the whole soybean seed. All these are glycosides.

The glycosides with the lowest stimulus thresholds (in ascending order) are soyasapogenol E, soyasapogenol B, genistin, genistein, soyasapogenol A, daidzin, daidzein, saponin B, saponin E, and saponin A. Those with the lowest thresholds are most easily detected by taste panelists. Address: Faculty of Agriculture, Tohoku Univ., Amamiya-machi, Tsutsumi-dori, Sendai-shi, Miyagi 980, Japan.

9247. Tenpe Kenkyu-kai. 1988. Tempe Kenkyû-kai: Kaiin meibo [Tempeh Research Society: Directory of members (Brochure)]. Japan. 3 p. [Jap]
• ***Summary:*** On 31 Dec. 1988 there were 58 members, each with his or her address listed, but no phone numbers. An appended sheet shows that by 10 Feb. 1989 the number of members had increased to 72.

9248. *U.S. Imports for Consumption, Schedule A: Report IM146.* 1988. U.S. imports of soy sauce during 1988. p. 872-74.
• ***Summary:*** Total U.S. imports of soy sauce (called "soy sauce, thin" by the report) during 1988 were 37,971,804 lb. This is almost double the figure of 19,613,000 lb in 1981. The value of this FOB at foreign ports of export was $15,095,348. The duty collected by the U.S. was $315,115. Countries from which more than 1 million lb were imported, ranked in descending order of amount, were: Japan 12,709,008 lb (33.5% of the total), Hong Kong 9,220,737 lb, China 7,760,972 lb, Taiwan 4,806,452 lb, and Thailand 1,423,150 lb. Address: U.S. International Trade Commission, Washington, DC.

9249. Weinberg, Julia. 1988. Tofu magic: Rich 'n' easy cooking with zero cholesterol Mori-Nu Tofu. Cookwrite Publishing, 1015 Gayley Ave., Suite 210, Westwood, California 90024. 68 p. Dec. Illust. No index. 22 cm. Spiral bound.
• ***Summary:*** Contents: Introduction to Mori-Nu. Cooking hints. Recipes–Dips, dressings, sauces, and toppings. Soups, salads, sides. Main dishes. Desserts and drinks. Light gourmet. Table: Nutrients per serving. The front and rear covers and the tabbed divider starting each section are graced quality with a full-page color photo of recipes. All paper is glossy. A very stylish presentation. Below each recipe is a listing of the calories, sodium, and cholesterol. Each recipe calls for Mori-Nu Tofu by name. Some of the recipes contain flesh (Corn 'n' Chicken Chili; Tofu Tuna Burgers; Turkey or Beef Stroganoff).

A Morinaga news release dated 10 Jan. 1989 and titled "Mori-Nu introduces 'Tofu Magic:' New dishes from an ancient food," states that this is a "low-cholesterol gourmet cookbook designed especially for the health conscious... and written by best-selling author Julia Weinberg." A color videotape about cooking with tofu, also titled "Tofu Magic,"

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is also available from Mori-Nu. Address: c/o Morinaga Nutritional Foods, 5800 South Eastern Ave. #270, Los Angeles, California 90040. Phone: 213-728-4325.

9250. *FAO Yearbook–Production.* 1988-2004. Serial/periodical. Rome, Italy: Food and Agricultural Organization of the United Nations. Yearly. ca. 350 p.
• ***Summary:*** See also the earlier FAO Production Yearbook, of which Vol. 12 was 1958.

9251. Ameyama, M.; Adachi, O.; Yasuda, A.; Nomura, Y. 1988. Method of reducing off-flavor in food materials with acetic acid bacteria. *European Patent Application* 255,588 A2. [Eng]*
• ***Summary:*** Medium chain length aldehydes (e.g. n-hexanal, n-heptanal, n-octanal, n-nonanal and n-decanal) can be responsible for causing off-flavors in soy milk. A considerable reduction in these undesirable aldehydes can be achieved using various *Acetobacter* or *Gluconobacter* spp. For liquid foods, bacteria immobilized on alginates or carrageenan can be used. Address: House Food Industrial Co., Higashi-Osaka 577, Japan.

9252. Cook, A.K. 1988. The evolution of Japanese food spending patterns: 1963-1984. *Washington State University IMPACT Center Report* No. 26. *

9253. Ohara, T.; Ohhinata, H.; Muramatsu, N.; Ohike, T. 1988. [Studies on tofu and kori-tofu. IX. Improved sensory and chemical quality of the tofu]. *Research Report of the Nagano State Laboratory of Food and Technology* No. 16. p. 50-58. [9 ref. Jap]*
Address: Nagano State Lab. of Food Technology, Kurita, Nagano-shi, Japan.

9254. Onishi, R.; Abe, K.; Honma, S.; Aida, K. 1988. [A protease in natto inoculated with *Bacillus natto* IAM 1114]. *Nippon Kasei Gakkai-shi* (*J. of Home Economics of Japan*) 39:13-19. (Chem. Abst. 108:220540. 1988). *

9255. Otomo, T. 1988. [An investigation of the possibilities of and developments in extraction of functional compounds: Separation, extraction, and concentration by membrane techniques]. *Shokuhin Kaihatsu* (*Up-to-Date Food Processing*) 23(3):37-42. [8 ref. Jap]*
• ***Summary:*** The membrane techniques or processes of reverse osmosis, ultrafiltration, and microfiltration are applied to soymilk, fruit juice, and saké.

9256. **Product Name:** Tuffy Hi-Protein Soymilk [Malt, Orange, Banana, Mango, Strawberry, or Chocolate].
Manufacturer's Name: Premier Industries (India) Ltd.
Manufacturer's Address: Chetak Centre, R.N.T. Marg, Indore, Madhya Pradesh, India.
Date of Introduction: 1988.
Ingredients: Malt: Soymilk, sugar, malt extract, minerals, edible vegetable oil, vitamin C. Contains permitted colours and flavors.
Wt/Vol., Packaging, Price: 200 ml Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Talk with Mahesh Khaitan. 1989. Aug. 6. This soymilk was introduced in Indore in 1988 in a Tetra Brik carton. Photocopy of Labels for Malt, Orange, and Banana. Sent by Anders Lindner. 1989. "The taste is a knockout. Drink ice cold. In collaboration with Mitsubishi, Japan." An illustration (line drawing) on the front panel shows a Superman-like character with cape flexing his biceps.

Letter from A.K. Bajaj, Managing Director of Amrit Protein Foods Ltd. 1991. June 26. This company has discontinued the production and marketing of its Tuffy brand soyamilk.

9257. Tsutsumi, C.; Ebine, H. 1988. Miso no eiyô seibun bunseki-hô [A method for analyzing the nutrients in miso]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) 36(2):53-75. [9 ref. Jap]*
• ***Summary:*** Discusses a method for analyzing the proximate composition, minerals, vitamins, alcohol, energy content, etc. Address: 1. National Food Research Inst., Tsukuba, Ibaraki-ken, Japan 305; 2. Central Miso Research Institute, Tokyo, Japan.

9258. Watanabe, I.; Nagasawa, T. 1988. [Variation in chemical composition of soybean seeds among genetic resources]. *Tohoku Nogyo Kenkyu* (*Tohoku Agricultural Research*) 41:105-06. [Jap]*

9259. Yoneyama, T.; Itoh, T.; Shinha, Y.; Fukuzawa, M.; Shimizu, K.; Nishizawa, N.; Baba, S. 1988. [Quality studies of commercial soy sauce. XV.]. *Research Report of the Nagano State Laboratory of Food and Technology* No. 16. p. 20-24. [1 ref. Jap]*
Address: Nagano State Lab. of Food Technology, Kurita, Nagano-shi, Japan.

9260. Yoneyama, T.; Baba, S. 1988. [Evaluation of Japanese soybean cultivars for rice-miso production. IV.]. *Research Report of the Nagano State Laboratory of Food and Technology* No. 16. p. 16-19. [3 ref. Jap]*
Address: Nagano State Lab. of Food Technology, Kurita, Nagano-shi, Japan.

9261. Adlercreutz, Herman; Honjo, H.; Higashi, A.; Fotsis, T.; Hämäläinen, E.; Hasegawa, T.; Okada, H. 1988. Lignan and phytoestrogen excretion in Japanese consuming traditional diet. *Scandinavian J. of Clinical and Laboratory*

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Investigation, Supplement 48(Suppl. 190):190.
• ***Summary:*** "Epidemiological studies have revealed low incidence of hormone dependent cancer in Japanese consuming a traditional Japanese diet. One possible mechanism is the low content of fat and the low fat/fiber ratio of the diet, which are known to reduce plasma sex hormone levels. In addition such a diet may be protective with regard to cancer due to its content of lignans and isoflavonic phytoestrogens, which seem to affect estrogen production, metabolism and biological action." Lignans and especially isoflavonic phytoestrogens are excreted in large amounts by Japanese consuming a traditional Japanese diet, mainly due to intake of beans and pulses [soy products]. Address: Dep. of Clinical Chemistry, Univ. of Helsinki, Meilahti Hospital, SF-00290 Helsinki, Finland; and Dep. of Obstetrics and Gynecology, The Kyoto Prefectural Univ. of Medicine, Kawaramachi, Hirokoji, Kamikyo-ku, Kyoto 602, Japan.

9262. Boxer, Charles R. 1988. Dutch merchants and mariners in Asia, 1602-1795. London: Variorum Reprints. 350 p. in various pagings Illust. Maps. 1 portrait. Index. 23 cm. *
• ***Summary:*** Hymowitz (2007/06) wrote: "Boxer points out that the Dutch East India Company exported soy sauce [from Japan] as early as 1673-1674. In 1673, the ship *In Laeren* (p. 333) carried 12 tubs of soy sauce as cargo and in 1674 the ship *In Hasenburg* (p. 334) had an unlisted amount of soy."

Note 1. These two ships loaded their soy sauce at Deshima, Nagasaki, Japan. The ship In Laeren sailed to Batavia. There is no record that either of the ships transported this soy sauce to Holland; they were used in the intra-Asiatic shipping route. Note 2. Charles Ralph Boxer was born in 1904.

9263. Cost, Bruce. 1988. Asian ingredients: Buying and cooking the staple foods of China, Japan and Southwest Asia. New York, NY: William Morrow & Co. 333 p. Illust. Index. 27 cm. [39 ref]
• ***Summary:*** Soy related: Soybean sprouts and recipe (p. 86). Beans, incl. soybeans (p. 146-50). Asian "dairy" (p. 186-87): The soybean and the coconut (incl. bean curd, doufu-nao, fermented bean curd / fu-ru, molded bean curd / chou dou-fu, dried bean curd / dou-fu gan, and bean curd skin [yuba]. Soybean milk.

Soybean sauces, condiments and pastes (p. 195-211): Salted and fermented black beans with recipes for "Roast chicken with black beans stuffed under the skin," and "Soft-shell crabs with ginger, lemon, and black beans" ("Fermented black beans, often flavored with bits of ginger and sometimes orange peel, are usually sold in 8-ounce plastic bags." Acceptable brands: Mee Chun or Koon Chun Sauce Factory. "Earthier and probably more classic are the Yang Jiang Preserved Beans (with ginger) from Kwangtung, China), bean sauce (other names: Yellow bean sauce, brown beans sauce, bean paste, jiang; two types are with the beans whole or ground), hot bean sauce / paste with recipe, hoisin sauce, sweet bean sauce (made with soybeans [probably tian mian jiang, p. 202], Taiwan), soy sauce (Chinese, Japanese, tamari; Highly recommended light soy sauce: Pearl River Bridge. Highly recommended dark: Pearl River Bridge Mushroom Soy, flavored with straw mushrooms), Java's ketjap and other soy sauces miso with recipe, yellow miso (*Shinshu miso*), white miso (*shiro miso, Kyoto shiro miso,* sweet white miso), red miso (*aka miso*), Hatcho miso [soybean miso], barley miso (*mugi miso*), fermented bean curd (white or red; also called preserved bean curd, wet bean curd, bean cheese, dou-fu ru or fu-ru {Mandarin}, fu yu {Cantonese}) with two recipes).

"Red fermented bean curd" is described on pages 210 (also called "red bean cheese"), 211, and 283 (together with "red rice").

Concerning ketjap (p. 206): Tomato ketchup, although it may seem to be of Asian origin, may or may not come from a family of Asian pickled products. But the word "ketchup" is clearly of Asian origin. [Note: The modern Indonesian word for soy sauce is *kecap / ketjap / kechap.*] "It comes from the Malay *kechap,* which apparently derives from the *kôe-chiap* of a southern Chinese dialect (Amoy); both of these refer to the kind of briny liquid preserves that include fish and soy sauces." Throughout most of Southeast Asia, fish sauces are the standard condiment, in Indonesia (incl. Java) soy sauce is more widely used. Sweet Indonesian soy sauce (*ketjap manis*), which is very widely used, is traditionally sweetened with palm syrup and seasoned with garlic, star anise, salam leaves, and galangal.

Also discusses: Seaweed (p. 165-70): Kelp (Laminaria), laver (Porphyra), wakame, dashi, hair vegetable / black moss / hairlike vegetable (China; Gracilaria verrucosa), agar-agar. Monosodium glutamate (p. 247)

Bruce Cost was born in 1945. A photo and brief biography appears on the inside rear dust jacket. Address: [San Francisco, California].

9264. Kawashima, Masao. 1988. Yoi agé o tsukuru tekiô jôken [Suitable conditions for making good quality deep-fried tofu pouches]. In: Yasahii Agé no Kagaku. 1988. Tokyo: Fuudo Jaananru-sha. See p. 39-63. Chap. 2. [Jap] Address: Habutae Tofu K.K., Kanazawa-shi, Ishikawa-ken 921, Japan.

9265. Kikkoman Trading, Europe. 1988. Kochen mit Soja-Sauce... gesund, schmachhaft & raffiniert [Cooking with soy sauce... Healthy, delicious, and artful]. West Germany. 119 p. [Ger]*
Address: West Germany.

9266. Kosan Shoji Co., Ltd. 1988. Catalogue [Catalogue of tofu making equipment]. Main office: Koun-cho 15, Kita-ku,

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Nagoya-shi, Japan. Factory: Honsho-cho 166, Komaki-shi, Aichi-ken, Japan. 14 p. Manufacturer's catalog. [Jap]
• ***Summary:*** A color photo shows each piece of equipment, together with a brief description in Japanese. Address: Nagoya, Japan. Phone: 052-916-2211.

9267. Lautensach, Hermann; Dege, Katherine; Dege, Eckhart. 1988. Korea: A geography based on the author's travels and literature. Translated from the German. Supplemented with a thoroughly revised and expanded index. And edited by Katherine and Eckhart Dege. Berlin, Heidelberg, New York, London, Paris, Tokyo: Springer-Verlag. xvii + 598 p. See p. 20, 160, 174, 180-81, 201, 203, 229, 420-21, 452, 476, 482, 488. Illust. Maps (some color). 26 cm. [936* ref]
• ***Summary:*** "With 42 photographs, 95 diagrams, 46 tables and a [larger color] map." This classic was first published 40 years ago (a few months before the end of World War II) and the field work was done 50 years ago, when Japan still ruled Korea and all place names were Japanese; these names have all been updated.

Vavilov classes soybeans among the plants that originated in the East Asian grain gene pool, and he includes Korea in the gene pool. Thus it is "quite possible" that soybeans were domesticated in Korea itself. Hulbert (1902) includes among the non-Chinese crops black soybeans, two of the three kinds of kaoliang, wild sesame (Perilla), and buckwheat (p. 20).

On page 21 is a very interesting "Chronological table of Korean history. Comparison with Chinese and Japanese history." A major change took place in 680 AD when the Three Hans [Three kingdoms] (Tribal Leagues; Koguryo [Gouryeo, in the north], Paekche [Baekje, in the southwest], and Shilla [Silla, in the central and south east]) merged into one, named Silla. In 918-925 it became Koryô [Kingdom of Goryeo; Wang Dynasty], which in July 1392 became Chosôn [Joseon Dynasty; Yi Dynasty], that lasted until August 1910 when the Japan-Korea Annexation Treaty was enforced by the Empire of Japan.

Chapter 6, titled "The anthropogeographical character of ancient Korea" (p. 149+) contains extensive information about agriculture and food. Page 160: In wealthier sites, the farm buildings enclose a courtyard, to which an entrance gate gives access (Fig. 37c, p. 158). Some enclosures are so complete that a square courtyard results. "In some corner or other of the courtyard stand the huge brown earthenware jars, in which soy sauce (Jap. *shoyu,* Kor. *kanjang*) is prepared and stored."

Nature and traditional culture: Plants found between the subtropical zone and the temperate zone include soybeans, foxtail millet, maize, and hemp. Since ancient times, rice has been Korea's most important cereal crop. The great majority of it is grown in irrigated paddies. Paddy rice (an aquatic plant) has a different name in Korea from upland rice. Hubert (1902, p. 108) mentioned eight varieties of rice grown in traditional Korea, including glutinous rice, whose flour is made into rice cakes by mixing it with water and spicy herbs, then beating the cold mass for a long time with wooden hammers (p. 174).

Page 180: In East Asia, after cereal grains, pulses / legumes are the next most important crop. In Korea, by far the most important is the soybean (Kor. *k'ong*), which makes few demands on the soil. Korea's climate is ideal for soybeans (Tanaka 1931, p. 18); it is even better than Manchuria's climate, because of the large amount of precipitation during the summer. Today, soybeans are an indispensable part of the various dry-field crop rotations. After planting of the paddies has finished, soybeans are planted on the ridges too; there they grow extremely well without being fertilized. Soybeans are grown throughout Korea, but least in the Kaema upland because of the warmth they require. In northern Korea, on dry fields, they are planted between the end of March and beginning of May. Toward the south, planting is delayed until the end of June. They are generally harvested in October, except in Chejudo, where they are not harvested until early November. Soybeans are the crop that is left standing the longest, and they are not harvested until their leaves have turned brown and started to fall.

Soybeans are used as a very nutritious food for both humans and horses. Also, cooked soybeans are used as a fertilizer for the rice paddies. "Above all, though, the hot brown soy sauce, which is never lacking on any Korean or Japanese table, is made of them, using salt and pepper and a process of fermentation. Bean curd (Kor. *tubu,* Jap. *tofu*) and soybean paste (Kor. *toenjang,* Jap. *miso*) are also made of them."

Adzuki beans, cotton and hemp are discussed on p. 181.

The Korean regions: On the forest slopes, which were deforested but the Japanese are energetically reforesting, one can find various lianas [climbing vines] such as *Pueraria hirsuta* [Jap. kudzu]. In the northern part of the coastal fringe, soybeans are grown on the ridges between paddies (p. 200-01).

Namyang is a link in the shortest connection between Tokyo and Harbin, which includes the ship passage between Tsuruga or Niigata and Ch'ongjin. "For this reason, this section has been operated by the South Manchurian Railway since 1 October 1933." The northernmost bays and harbors, especially Unggi, Najin, and Ch'ongjin, and their cities, are developing at an usually rapid rate. "They have become the export harbors for central Manchuria, particularly for soybeans" (p. 203).

In the Kaema upland we find "fire-field farming" and soybean fields in the valley bottoms or basins. "The most important fire-field crops at lower elevations are foxtail and barnyard millet, barley, soybeans, kidney beans, hemp and sesame." "The Japanese forestry commission has taken over

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management of the remaining forests. In the natural forests, wood is cut selectively and only as much as grows back" (p. 229).

Korea as a Japanese possession [colony]: "In southern Korea, barley has replaced rice as the principal staple food under the influence of Japanese economic policy." A large portion of the rice is sold to Japan.

Table 37 (p. 420), titled "Cultivated area, harvested amounts and yields per acre of the most important crops, 1935," includes: Soybeans: 785,000 ha. 7.9 hectoliters of weight. Worth: 60.2 million yen. Yield: 10.1 hectoliters per ha. Adzuki beans: 235,000 ha. 1.7 hectoliters of weight. Worth: 14.3 million yen. Yield: 7.3 hectoliters per ha. The table also includes paddy rice, upland rice, barley, naked barley, wheat, foxtail millet, barnyard millet, broomcorn millet, kaoliang, maize, oats, buckwheat, potatoes, sweet potatoes, mung beans, etc.

"The soybean vies with foxtail for the third place in the order of crops, by cultivated area. Its is a very profitable, undemanding crop that does not fail even in meteorologically abnormal years. Therefore its harvest curve does not have the ups and downs that are characteristic of many other crops, particularly paddy rice (Fig. 84). Acreage and yield per hectare have not increased nearly as much during the Japanese period, however, as for many other crops. Nevertheless, soybeans are the third most important item of agricultural export today, and the quality is supervised by the state. Approximately one-fourth of the harvest is exported. The most important export markets are Unggi, Ch'ongjin, Songjin, Wonsan, Shinuiju, P'yong-yang, Kumch'on and Ch'olsan (T. Tanaka 1931). They are located without exception in the northern half of the country" (p. 421). Note: Since 1948, the northern half of Korea has been a separate nation, North Korea.

"The Korean adzuki bean, particularly that from the northeastern coast, is highly priced in the Japanese market because of its high quality." By acreage it is the sixth most important crop in Korea (p. 421).

The soybean mills that process Manchurian soybeans in to oil and meal lie on the Japan Sea coast of Hamgyongbuk-do (p. 452).

Table 43 (p. 476), titled "Korea's most important import and export goods, 1939," shows that "Beans" were the No. 7 export item to Japan, worth 23 million yen. The leading export was rice (149 million yen) followed by fertilizer (53), copper (52), fish etc. (32). "Of the beans exported to Japan... soybean take first place. Soybean exports to Japan had a weight of 1.3 to 1.9 million q" [1 quintal = 100 kg] in the ears 1934-1938. "In contrast, from the northeastern ports Manchurian beans were shipped to Germany and England." In addition, large amounts of soybeans were imported by Korea itself from Manchuria (0.29 to 1.02 million q). Large amounts of soybean products made in Korea were also shipped to Japan (incl. soybean oil as much as 11.500 q, bean curd [tofu] up to 1.2 million q). Moreover soybean oil (up to 3,210 q) and bean curd (as much as 1.3 million q) were imported from Manchuria (p. 476).

Considerable amounts of dried seaweed and laver [nori] were also exported to Japan (p. 477).

Pages 482-83 try to characterize Korea's significance in 1938 for the economy of Greater Japan (pan-Japan) in general and Japan proper in particular. Pan-Japanese production included that of Korea, Manchuria, and Formosa. "The Korean rice crop in 1938 (44.8 million q) amounted to 23.4% of the pan-Japanese crop and 36.6% of that of Japan proper; 63.2% of Japan's rice imports came from Korea. The soybean crop in 1938 amounted to 6.4% of the pan-Japanese crop, 68.7% of the crop of Japan proper; 17.8% of the soybean imports of Japan proper came from Korea. The relationship was that of a master country to a dominated colony. For example, the Japanese forced the Koreans to eat barley so that the Japanese could import and enjoy the rice grown in Korea.

Soybean production on steep slopes and at high altitudes is mentioned (p. 488).

Hermann Lautensach lived 1886-1971. This book was first published in 1945 in German. Address: Prof., Dr.

9268. McEachern, B. 1988. Sushi–In this most celebrated of Japanese foods, the skill of the chef is as important as the freshness of the fish. *Taste* 2(2):6-7.

• ***Summary:*** When nigiri-zushi, or hand-shaped sushi, first appeared around the 1810s, the fish and shellfish were preserved in vinegar, with the exception of tuna, which was preserved in soy sauce. Soy sauce is the basic seasoning for sushi. Two other soy sauce-based seasonings are nitsume, a thick, sweetish sauce brushed over conger eel, mantis shrimp, and cooked octopus, and nikiri, found today only in the best establishments. Wasabi is the grated root of Japanese horseradish, a native plant that grows in the beds of mountain streams. The biting, yet cleansing taste of wasabi 'unlocks' the subtle flavors of uncooked fish. Pickled ginger (*gari*), which refreshes the palate between mouthfuls, is made by preserving sliced ginger in salt, vinegar, and sugar for about a week. The ginger naturally turns pink during the process.

9269. Morinaga Nutritional Foods, Inc. 1988. Exotic! Chinese Unchicken Salad from Mori-Nu Tofu (Tear-off recipe pad). 2050 W. 190th St., Suite 110, Torrance, California 90504.

• ***Summary:*** This color tear-off recipe pad (6½ by 4 inches), developed by Susan Bucher of Bucher & Russell in Los Angeles, was introduced in 1988. Recipes developed by Julia Weinberg & Company. On the front is a color photo of the prepared salad and a package of Mori-Nu Silken Firm Tofu, surrounded by chopsticks, a red flower, fortune cookies, and a porcelain Chinese dragon. On the back is a recipes for Chinese Unchicken Salad and dressing, plus a free recipe

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offer, Health for Life Club, and "Mori-Nu Facts." Address: Torrance, California. Phone: 1-800-669-8638.

9270. Morinaga Nutritional Foods, Inc. 1988. Healthy! Healthier salads with Mori-Nu Tofu... the cholesterol-free protein (Tear-off recipe pad). 2050 W. 190th St., Suite 110, Torrance, California 90504.
• ***Summary:*** This color tear-off recipe pad (6½ by 4 inches), developed by Susan Bucher of Bucher & Russell in Los Angeles, was introduced in 1988. Recipes developed by Julia Weinberg & Company. On the front is a color photo of colorful salad in a glass bowl and a package of Mori-Nu Silken Firm Tofu, surrounded by fresh carrots, onions, cucumbers, tomatoes, and salad greens. On the back are 2 recipes: Seven Layer Salad with Marinade, and Strawberry Pudding Fluff. Address: Torrance, California. Phone: 1-800-669-8638.

9271. Morinaga Nutritional Foods, Inc. 1988. Mori-Nu mornings (Leaflet, with 9 recipes). Los Angeles, California. 1 p.
• ***Summary:*** These recipes each use one 10.5 oz. of Mori-Nu Silken / Soft Tofu in breakfast dishes. The cover is a color photo showing one such dish on the breakfast table with a table cloth, orange juice, flowers, a bowl of fruits, and a package of Mori-Nu Silken Soft / Tofu. Address: Los Angeles, California.

9272. Moriyama, Yukiko. 1988. A taste of tofu: Mastering the art of tofu cooking. Tokyo: Joie. c/o JP Trading Inc., 300 Industrial Way, Brisbane, CA 94005. 104 p. Illust. Index. 27 cm.
• ***Summary:*** A beautiful book, with the steps and ingredients in every recipe illustrated with color photos. Contents: Introduction. Basic cooking information. Ingredients. Recipes–Appetizers. Soups. Just tofu. Seafood. Poultry. Meats. Vegetables. Salads. Eggs and cheese. Rice and noodles. Desserts. Information. Glossary of ingredients. The author lives in Tokyo. Address: Tokyo, Japan. Phone: JP Trading: 415-468-0775.

9273. Nagayama, Hisao. 1988. Kinako kenkôhô [Be healthy with kinako: Soybeans are very effective foods for preventing cancer and senility]. Tokyo: Futaba-sha (or Sôba-sha). 231 p. 19 cm. [Jap]
• ***Summary:*** Kinako is roasted whole soy flour. The author was born in 1934.

9274. Shinbo, Hiroshi; Hasegawa, Akira. 1988. Shohin seisan ryutsu no dainamikusu [Dynamics of commodity production and distribution]. In: Akira Hayami and Matao Minamoto, eds. 1988. *Keizai Shakai no Seiritsu: 17-18 Seiki* [Establishment of Economic Society: 17-18th Century]. Tokyo: Iwanami Shoten. 324 p. See p. 218-70. [Jap]*

9275. *Taste* (*Kikkoman, Japan*). 1988. New-found food. 2(2):4.
• ***Summary:*** With its mud-and-straw walls, long refectory tables, and wooden flooring, Kirazu, a new restaurant in Tokyo's Roppongi district, combines original food and healthy dining in a relaxed atmosphere. All the dishes on the menu contain okara, the by-product of tofu, as a main ingredient.

9276. Watanabe, Michiko; Arai, Soichi. 1988. The plastein reaction and its applications. *Developments in Food Proteins* 6:179-217. Chap. 5. (B.J.F. Hudson, ed. London and Englewood, New Jersey: Applied Science Publishers). [107 ref]
• ***Summary:*** "It has long been known that when a protein is hydrolyzed with a protease and allowed to stand, it is sometimes transformed into a gel-like product. Surprisingly, this phenomenon was first discovered a century ago (by Danielwski; cited in 1911). The product was then named 'plastein' and was thought to be formed through a reverse reaction catalyzed by the protease. It is now known that the substance 'plastein' does exist. Also, the term 'plastein reaction' is commonly used to refer to a protease-catalyzed process" involving the formation of a gel-like product from an oligopeptide mixture or a partial protein hydrolyzate.

"In recent studies, conducted in order to develop the plastein reaction for various practical purposes, plastein is often defined as a precipitate formed when an entire plastein-reaction product is treated with a typical protein denaturant like trichloracetic acid (TCA)."

Soy protein is often hydrolyzed with proteinases. Table 1 shows "Optimum pH values for hydrolysis of soy protein with proteinases and for plastein synthesis from a peptic hydrolyzate of soy protein with the same proteinases" (From Yamashita et al. 1971). Soy protein was first improved by incorporating methionine ethyl ester (Yamashita et al. 1979), since methionine is the first limiting amino acid of soy protein. However, the current practice of adding methionine leads to two problems: it has an undesirable flavor, and it is chemically unstable. Address: Dep. of Agricultural Chemistry, Univ. of Tokyo, Bunkyo-ku, Tokyo 113, Japan.

9277. Young, Erika. 1988. A touch of Lebanon in Japan. *Taste* (*Kikkoman, Japan*) 2(2):1-3.
• ***Summary:*** Madeline Umekawa, born in Beirut, Lebanon, 30 years ago, married a Japanese man in 1982 and now lives in Osaka, Japan. She has discovered that shoyu works nicely as a seasoning in Lebanese cuisine. A bento is a Japanese boxed lunch. Kikkoman's Recipe Contest for Foreigners is an annual event in Tokyo that was begun in 1982 to encourage new innovative, and creative ways of incorporating soy sauce in the cuisines of other nations. The contest will be held in September. Address: Editor, Taste

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newletter, Kikkoman Corp., International Operations Div., 1-25 Kanda Nishiki-cho, Chiyoda-ku, Tokyo 101, Japan.

9278. *Toyo Shinpo* (*Soyfoods News*). 1989. Zenkoku heikin 102.6 en, tôfu icho no kourine [Japanese national average retail price of a cake of tofu (average weight: 425.8 gm) is 102.6 yen]. Jan. 1. p. 21. [Jap; eng+]
• ***Summary:*** The average wholesale price is 79.2 yen/cake. The average national retail price is 0.238 yen/gram, and the corresponding wholesale price is 0.184 yen/gram. At this time there are about 140 yen/U.S. dollar. So the average price of tofu in Japan is about $0.78/lb. The highest price per gram is in Saitama prefecture. The lowest price is in Tokushima, Toyama, and Mie prefectures.

9279. Willner, Ken. 1989. Hakuhodo is Morinaga's marketing and advertising agency in California and Japan (Interview). *SoyaScan Notes.* Jan. 5. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Hakuhodo has been the agency in Japan for many years. They started with Morinaga in California a little more than 2 years ago. During 1989 they plan to focus on the West Coast market, as with local radio and newspapers. Less national. Address: Los Angeles.

9280. Bechman, Tom. 1989. Tapping the Japanese food market with specialty soybeans. *Indiana Prairie Farmer* (*Lombard, Illinois*). Jan. 17. p. 14-15.
• ***Summary:*** Purdue University agronomist Marvin Swearingin believes the time has come to produce specialized soybeans for the Japanese tofu market, which consumes 37,000,000 bushels a year. Do do this America must: 1. Develop a specialized product which provides traits the Japanese can't get from bulk shipments. 2. Find a company that can ship to the tofu maker in Japan. 3. Find an economical way to ship the beans from elevators to rail shipping points and thence to ports–perhaps using the Japanese freight cars that bring auto parts to the Midwest and return empty to the ports. 4. Find elevators with suitable facilities receive, size, condition to specifications, and bad the specialized soybeans. 5. Get a third party, such as the Indiana Crop Improvement Assoc., to inspect the fields and certify that the beans are what they are supposed to be. 6. Have farmers to grow the beans under contract.

At Indiana, Jim Wilcox and Swearingin are screening varieties and lines to uncover the traits that the Japanese need to produce premium tofu. Funds for the project were provided through the Value-Added Center established by the Indiana legislature in 1988. Generally the Japanese prefer large-seeded (1,500 to 1,700 seeds/lb) varieties with a clear hylum for tofu production.

Also at Purdue, Niels Nielsen, a USDA researcher, heads up a team of researchers who have tried for years to develop soybeans that don't contain lipoxygenase enzymes. They have succeeded in producing soy beans free of the lipoxygenase-2 isozyme.

9281. *Food & Beverage Marketing.* 1989. Tamari comes to the states. Jan. p. 38.
• ***Summary:*** The company is already selling a bulk product, mainly to food processors. The consumer product should hit supermarkets in February. New filtering technologies have given the product a brighter appearance. The U.S. plant will produce tamari from both whole soybeans and defatted soybean meal, whereas the Japan plant uses only whole soybeans. The tamari made from whole soybeans will retail for about $2.39 for a 10 oz bottle bearing a gold label. The tamari made from defatted soybean meal will retail for about $1.99 for the same size bottle and will bear a black label. The latter product is expected to be sold more in supermarkets and the former in natural food stores. The company is focusing on magazine advertising, as in *Bon Appetit* and *Cooking Light,* among others. Address: New York, NY.

9282. *Food Engineering.* 1989. Naturally brewed soybeans yield tamari: With 30% more protein than conventional soy sauces, tamari retains its full flavor when used in processed foods. 61(1):55-56. Jan.
• ***Summary:*** The San-J plant in Richmond, Virginia, which uses 900,000 lb of soybeans and 500,000 lb of defatted soybean meal a year, has the capacity to produce 1,000,000 gallons of tamari a year. The production process is described. In the last step, blended tamari is pasteurized then filtered using ultrafiltration. A color photo shows San-J's brewmaster, Mr. Yamamoto, and tamari vats.

9283. Morinaga Nutritional Foods, Inc. 1989. Exercise your right to eat better with Mori-Nu (Ad). *Vegetarian Times.* Jan. p. 7.
• ***Summary:*** This full-page color ad for Mori-Nu tofu shows a healthy looking, elderly man in a sweat suit on an exercycle. A little girl and her mother are seated on the floor nearby next to a bowl of "Fabulous Strawberry Fluff" (recipe given), topped with strawberries. The little girl is offer the man her spoon. Mori-Nu tofu (2 types are shown) is promoted as having no cholesterol, being low in saturated fats ad calories, and being a versatile source of protein. "Children love the way Mori-Nu blends with favorite foods to make good tasting meals and snacks." The Mori-Nu logo says "Tofu for the American taste." At the bottom of the ad: "Mori-Nu reminds you to 'Dance for Heart'" followed by the American Heart Assoc. logo.

This ad also appeared in the April issue (p. 5) of this magazine. Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9284. San-J International, Inc. 1989. Information on San-J's new U.S. produced tamari (Leaflet). Richmond, Virginia. 3 p.

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28 cm. Jan.
• ***Summary:*** A detailed, step by step description of exactly how San-J makes its new tamari in America. Contents: Raw materials: The soybeans are grown in Virginia. The solar dried sea salt comes from Baja, California [Mexico]. Note: No mention is made of defatted soybean meal. Muro and koji making: Incubation of the nuggets in the climate controlled chamber takes 2 days. Moromi: That made in America uses a higher proportion of brine to koji so that the resulting moromi can be pressed mechanically. Fermentation: The moromi is fermented for 6-7 months in temperature, fiber reinforced plastic tanks, which are more sanitary, less aerobic, and can be made larger than the traditional open wooden vats used in Japan. "One of the reasons that San-J chose Virginia as the site for its U.S. factory is that its climate is probably the most similar of anywhere in the U.S. to that of Virginia."

Press: Here the solids are removed. The resulting liquid is raw tamari. Blending: "The raw tamari is analyzed and blended to yield a consistent protein and salt content. Alcohol is added at this point. Alcohol: San-J adds natural, food grade grain alcohol (made from corn and certified Kosher) to bring the alcohol level up to 2% to inhibit the growth of aerobic yeasts. Pasteurization and filtration: Pasteurization arrests the fermentation and kills bacteria. Filtration removes fine, non-soluble solids. The filtration system used at San-J is a first. Commonly both tamari and shoyu are filtered through cellite (made from diatomaceous earth). The filter we use is a microfilter. This is both more efficient and more effective." Gold Label / Black Label. The Gold Label product is made from soybeans and is wheat free. The Black Label is made with soy grits, which "are made by removing the oil from whole soybeans by a process called hexane extraction. Hexane is a volatile liquid not unlike alcohol [actually it is a petroleum fraction], and is used to facilitate this mechanical [actually chemical] separation." No traces of hexane left in the grits. Address: 2880 Sprouse Dr., Richmond, Virginia 23231. Phone: 804-226-8333. Fax 804-226-8383.

9285. San-J International, Inc. 1989. Family planning (Ad). *Food Distributors Magazine.* Jan. And Feb. p. 80.
• ***Summary:*** This ½-page color ad shows three bottles of San-J soy sauce: Black-label tamari, Tamari Lite (low-sodium), and Szechuan Sauce. It also appeared in Fancy Food (Chicago). March. p. 78. Address: Richmond, Virginia.

9286. Shurtleff, William; Aoyagi, Akiko. comps. 1989. Bibliography of tofu and tofu products: 3,939 references from A.D. 950 to 1989. Lafayette, California: Soyfoods Center. 466 p. Subject/geographical index. Author/company index. Partially annotated. Printed Jan. 26. 28 cm. [3939 ref]
• ***Summary:*** The most comprehensive bibliography on this subject. Includes all known commercial tofu products. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

9287. Shurtleff, William; Aoyagi, Akiko. comps. 1989. Bibliography of industrial utilization of soybeans: 1,078 references from A.D. 980 to 1989. Lafayette, California: Soyfoods Center. 120 p. Subject/geographical index. Author/company index. Partially annotated. Printed Jan. 24. 28 cm. [1078 ref]
• ***Summary:*** The most comprehensive bibliography on this subject. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

9288. Shurtleff, William; Aoyagi, Akiko. comps. 1989. Bibliography of tempeh and tempeh products: 1,416 references from 1815 to 1989. Lafayette, California: Soyfoods Center. 177 p. Subject/geographical index. Author/company index. Partially annotated. Printed Jan. 19. 28 cm. [1416 ref]
• ***Summary:*** The most comprehensive bibliography on the subject. Contains all known commercial products. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

9289. *Toyo Shinpo* (*Soyfoods News*). 1989. Sômu-cho no kakei chôsa ni miru to, tôfu no juyô kotoshi mo bigen-ka [Domestic economy study conducted by the Dept. of General Affairs shows demand for tofu is decreasing slightly in Japan]. Feb. 1. p. 3. [1 ref. Jap; eng+]
• ***Summary:*** From Jan. to Oct. 1988 the average Japanese family spent 5,632 yen to purchase 70.53 cakes of tofu. The corresponding figures for 1987 were 5,758 yen and 71.93 cakes.

9290. Chowning, Larry S. 1989. Soybean marketing efforts in Japan earn state honor for local farming operation. *Southside Sentinel* (*Urbanna, Virginia*). Feb. 2.
• ***Summary:*** Recently, Montague Farms (owned by Bill Taliaferro of Center Cross in Essex County) introduced VANATTO (which stands for Virginia Natto), a brand of Virginia-grown soybeans for the specific purpose of making natto. Because of the firm's efforts to establish a new international market for Virginia soybeans, Montague Farms was recently honored and awarded a plaque by the Virginia Agribusiness Council. For nearly 5 years, the Taliaferros worked to develop the market in Japan, knocking on doors. "Since establishing the market in Japan, the Taliaferros have over 40 growers in Maryland and Virginia growing the small variety of soybean used to make natto. 'It's really a statewide project,' said Taliaferro. 'We weren't able to grow enough ourselves so we went to other growers across the state.'"

9291. Kendall, Charles. 1989. The natto market in the USA is growing fast (Interview). *SoyaScan Notes.* Feb. 6. Conducted by William Shurtleff of Soyfoods Center.

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• ***Summary:*** Charles makes natto and sells about 350 to 400 cases per week–specially to Japanese housewives during the cold months. Each case contains 25 x 7 oz. packages of natto. He sells it only by the case, so the minimum order (which keeps shipping costs down) is 25 packages.

Mountain Ark (in Arkansas) used to have a natto maker who made the natto they sold. Address: Owner, Kendall Food Co., Worthington, Massachusetts 01098-9550.

9292. Inoue, Kojiro; Sugarman, Carole. 1989. I made at least 1,000 pieces of sushi a day. Now I have sushi elbow. *Washington Post.* Feb. 26. p. I22.
• ***Summary:*** The moving and humorous story of Mr. Inoue, age 45, (as skillfully told by Carole Sugarman), who survived the ten-year process of becoming a sushi chef in Japan, then came to America determined to introduce Americans to sushi and raw fish.

After working in sushi restaurants in Japan for 8 years (and getting married) he heard that Japanese restaurants were getting popular in the United States. In 1971 he came to the USA to run a small (5-stool) sushi bar at Sakura Palace in Silver Spring, Maryland. Sushi wasn't yet popular in America and the customers were surprised that anyone would eat raw fish, squid, octopus, eel, etc. They were also scared to try it themselves. Yet ten months later Mr. Inoue asked his wife and young child to join him. He had a hard time finding good quality, fresh fish. Americans told him, "A fish is a fish." Sometimes he brought frozen fish from Japan or California. After 5 years the owner of his restaurant retired and he now wanted to start and own a restaurant for himself. He started as a sandwich shop, then remodeled. It was hard. He had to explain what sushi was and how to eat to potential customers. Many customers asked for a knife and fork; some still do. He also explained about wasabi and soy sauce.

In 1977, the McGovern Report was released. It said that 500,00 Americans died of heart attacks and that Japanese food was low in cholesterol. Because of that, all Japanese restaurants became popular.

Today sushi has become part of American food culture. His customers are now 80% Americans and 20% Japanese. Fresh fish is easy to buy. Mr. Inoue, who was now making 1,000 pieces of sushi day, developed sushi elbow–just like tennis elbow. He had a cast on his elbow for one year.

"Tokyo people love *natto* (fermented soybeans) or miso soup. I eat bread. American bread. Sometimes cereal." Today Americanized sushi is all over Japan. He is still married, but his wife lives in Japan with his three kids. His kids eat American hamburgers, Kentucky Fried Chicken and pizzas in Japan. He operates a sushi restaurant in Washington, DC.

9293. Alvarez Britos, E.R. 1989. La soja en el Paraguay–Retrospectiva y perspectiva [The soybean in Paraguay–Retrospective and perspective]. In: A.J. Pascale, ed. 1989. World Soybean Research Conference IV. Buenos Aires: Continuing Committee. xxviii + 2152 p. See p. 551-63. [6 ref. Spa; eng]
• ***Summary:*** Contents: Introduction. History of soya in Paraguay. Production of soybeans in Paraguay (from 1964-1988, and distribution by state). Soils used for the cultivation of soybeans. Preparation of the soil. Fertilization of the soil. Crop rotation. Soybean varieties. The most important weeds and their control. The most important insect pests and their control. Diseases of soybeans. Cultural practices. Outlook for soybeans in Paraguay.

The soybean was introduced at the beginning of this century, in the National School of Agriculture, in Trinidad, and in the Agronomic Station, situated in Puerto Bertoni, Alto Parana, when the two institutions were under the direction of Dr. Moises S. Bertoni. In 1921, Dr. Pedro N. Ciancio, considered the apostle of soybean cultivation in Paraguay, introduced the varieties Hollybrook, Manouth [Mammoth?], Pekin [Peking], and Shanghai, from Argentina, the USA, and Japan. Paraguayan soybeans originated from mechanical mixes and natural crosses between these varieties; they were cultivated for a long time in the zone of Caazapa.

In 1936, with one of the first immigrations of Japanese to Paraguay, the variety Abura [the term means "oil" in Japanese] was introduced. Its area of cultivation lies in la Colonia la Colmena. In about 1938 the Ministry of Economics, undertook a plan of soybean production through the Agricultural Bank of Paraguay. At the start of 1943, in the National Institute of Agronomy, soybean lines and varieties from different countries were introduced and evaluated. The current Japanese immigrants, who settled in the south of the country in 1958, introduced the variety Lee. Later, in 1961, the enterprise Agro-Soya S.r.l. introduced new lots of seeds of the varieties Lee and Hill. With private initiative and that of the Ministry of Agriculture and Cattle, an expansion of soybean cultivation took place. At the same time new introductions were made by the IAN, the Regional Center for Agricultural Research (CRIA), the Capitan Miranda, and the Campo Experimental de la Cooperacion Publica del Servicio Migratorio del Japon, at Pirapo.

New varieties from Brazil were introduced in 1967, and tested at Faculty of Agronomy and Veterinary, IAN, and CRIA. Again in late 1968, numerous lines were introduced from Brazil. In 1970 the Ministry of Agriculture and Cattle (MAG) initiated the Program of Soybean Research to solve various problems.

Production of soybeans in Paraguay grew from 10,000 tonnes in 1964, to 51,000 tones in 1970, to 220,000 tonnes in 1975, to 540,000 tonnes in 1980, to 1,172,400 tonnes in 1985, and a record 1,417,500 tonnes in 1988. Yields grew from 1.61 tonnes/ha in 1964 to 1.85 in 1988. Soybean product is concentrated in the departments of southeastern Paraguay, especially Alto Parana (40.37% of the total), Itapua (33.5%), and Canindeyu.

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Note 1. This document contains the earliest date seen for soybeans in Paraguay, or the cultivation of soybeans in Paraguay (1921; One of two documents). The source of these soybeans was Argentina, the USA, and Japan.

Note 2. From Alto Parana, most of the exported soybeans are trucked eastward to the port of Paranagua (which was given to Paraguay by Brazil) on the Atlantic Ocean. Some of the soybeans exported from Itapua are shipped southward down the Parana River to the ports of Rosario or Buenos Aires. Address: Instituto Agronomico Nacional, Ruta 2, Km 48, Caacupe, Paraguay.

9294. Ando, Seiichi. 1989. Wakayama no shoku to sono haikei [The foods of Wakayama prefecture and their background]. In: S. Ando, ed. 1989. Kikigaki Wakayama no Shokuji. Tokyo: Nosan Gyosan Bunka Kyokai. See p. 344-53. For shoyu, see p. 345-46. [Jap]*
• ***Summary:*** Discusses the foods of Wakayama prefecture, how they are made and interesting highlights, during the time from the end of the Taisho period to the beginning of the Showa period, thus from about 1920-1930. Address: Osaka, Japan.

9295. Carrao-Panizzi, Mercedes C. 1989. Breeding soybean for human consumption. In: A.J. Pascale, ed. 1989. World Soybean Research Conference IV. Buenos Aires: Continuing Committee. xxviii + 2152 p. See p. 1101-05. [6 ref. Eng]
• ***Summary:*** In 1985 a breeding program was initiated at the National Soybean Research Center of EMBRAPA to improve the flavor of soybeans for human consumption. 'Late Giant,' a vegetable type soybean introduced from Japan, is the source of this quality. It was crossed with other vegetable type soybeans, and used to introduce flavor into high-protein and into small-seeded lines. This program includes teaching Brazilians about the utilization and nutritional value of soybeans. To help make soybeans more acceptable, they were added to traditional Brazilian recipes as a complemental ingredient for improving nutritional value. As a result of this work, a soybean cookbook with 140 recipes was published, and courses on using soybeans are being taught to nutritional leaders. The goal is to increase interest in and consumption of soybeans as food in Brazil. Address: Centro Nacional de Pesquisa de Soja (CNPSo), Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA), Caixa Postal 1061, 86001 Londrina, Parana, Brazil.

9296. Collins, R. 1989. Re: Request for information on traditionally brewed low-salt varieties of shoyu. *East West.* Feb. p. 24. Letter.
• ***Summary:*** Most shoyu contains 16-18% salt. "Since salt is a natural preservative, however, any reduction must be compensated for by the addition of preservatives such as sodium benzoate or ethyl alcohol, as in high-tech varieties, or special handling, as in traditionally-made varieties.

"Traditionally-made lower salt shoyus, such as Ohsawa America Lima Nama Shoyu and Mitoku Macrobiotic Johsen Double Brew Dipping Sauce, are made by a complex process involving two fermentation periods, each lasting eighteen months to two years! First, the usual whole soybean moromi is prepared by mixing koji and a brine solution. After the traditional aging period, the moromi is pressed and the raw shoyu extracted. Next, additional koji and, in some cases, additional brine, is added to the mature raw shoyu and fermented again. The thick, double-brewed moromi is then pressed and the shoyu extracted. The addition of extra koji dilutes the final salt content to 13-14%.

"A few double-brewed shoyu varieties, such as Eden Low Sodium Shoyu and Westbrae Mild Shoyu, have been further diluted with water, reducing the salt content to 8-9% (80-90 mg sodium per half-teaspoon). These lowest salt varieties must be pasteurized, since they have no added preservatives. All low-salt shoyus should be refrigerated after opening."

9297. Eden Foods, Inc. 1989. A soy sauce for all seasoning... (Ad). *Natural Foods Merchandiser.* Feb. p. 14; April. p. 34.
• ***Summary:*** This 5 inch square ad with a color photo shows 5 bottled Eden soy sauces. Four bottles bear the Japanese character for "Hon" or genuine. These four are labeled shoyu soy sauce (including low sodium, and organic) and one is labeled tamari soy sauce (wheat free). "Our Low Sodium Shoyu is double-brewed, requiring three years to mature. Eden certified organically grown crops, aged to perfection, create our Organic Shoyu. Each soy sauce is a masterpiece."

An explanation on page 14 notes that two of these sauces are domestically made [by San-J in Virginia] (naturally brewed shoyu and wheat free tamari). Eden's popular soy sauce line has also been introduced: Traditional Japanese, low-sodium, and organic. "All five items are available in new, convenient sizes–5, 10- and 20 oz glass jars and bulk 4.75- and 55-gallon containers."

Also published in Let's Live. 1989. March. p. 45. And in East West. 1989. April. p. 9. Address: Clinton, Michigan.

9298. Erewhon. 1989. Erewhon... Macrobiotic foods you can recommend with confidence (Ad). *Natural Foods Merchandiser.* Feb. p. 25.
• ***Summary:*** This color ad (7.5 by 13 inches) shows colorful packages of five types of Erewhon products: Misos, seaweeds, ramen, rice crackers, and sweets. In the center is a gold plaque that reads: "Recommended by Michio Kushi. Macrobiotic quality." This same endorsement is in the upper left corner of each package. Erewhon now has four 4 varieties of miso under its brand: Hatcho (note new correct spelling), genmai, kome, and mugi. Note that all still use the esoteric Japanese names. Plastic bag packages are colorful and attractive. Slogan at the bottom of the ad: "Our great taste comes naturally." Address: [Massachusetts].

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9299. *Florida Grocer* (*Miami*). 1989. Kikkoman says–Start the (Chinese) New Year off right! Feb. [1 ref]
• ***Summary:*** Kikkoman has just published a new 96-page cookbook [titled *Kikkoman Oriental Cooking*]. The article outlines Kikkoman's extensive TV and print ad campaign including (1) inserts in leading women's magazines to reach 35 million households, (2) sponsorship of 26 shows in the Yan Can Cook Show series on PBSTV broadcast in 150 markets, (3) sponsorship of Yue Sai-Kan's cable TV series 'Looking East' in Feb.-April, 875 30-second spots featured in a Chinese New Year flight and a fall flight, (4) 72 insertions in 22 magazines to reach 528 million readers, 6 times a year.

Kikkoman soy sauce "has always been made naturally, without any artificial ingredients" [How about preservatives?]. Kikkoman Soy Sauce is the market leader, with over 50% of the market share. With a 25% annual growth rate, Soy Lite is the fastest growing product in the Kikkoman family. Teriyaki Baste & Glaze dominates the category with a 75% market share; Stir-Fry Sauce has over 80% market share. Sweet & Sour Sauce is also doing well.

9300. *Mori-Nu Healthy Life* (*Los Angeles*). 1989--. Serial/periodical. Morinaga Nutritional Foods, Inc., 5800 S. Eastern Ave. #270, Los Angeles, CA 90040. Bimonthly. Susan Bucher, editor. Vol. 1, No. 1. Jan/Feb. 1989. Published for the members of the Mori-Nu "Health for Life" Club.
• ***Summary:*** Formerly titled *Healthy Times*. Each issue, typically 6 pages, discusses the merits of tofu and Mori-Nu silken tofu. Recipes and coupons are now included in the magazine. "Published for members of the Mori-Nu 'Health for Life' Club." Address: Los Angeles, California.

9301. Ontario Soybean Growers' Marketing Board. 1989. 40 years of progress: Fortieth anniversary, 1949-1999. Chatham, Ontario, Canada: OSGMB. 49 p. 22 x 28 cm.
• ***Summary:*** Contents: A message from the Ontario Minister of Agriculture and Food (Jack Riddell). Chairman's message (Ted McGrail). History of soybeans in Ontario (p. 3). Year by year: 1948-1989–One page is devoted to each year. The 3-element / column format is the same for most years and pages, except when there is a photo of the new staff person or a special photo is added: (a) A portrait photo of the chairman for that year. (b) Brief statement of important developments that year (mostly soybean price, production, acreage, yield, support price or deficiency payments). (c) Names of the director(s) from each of the six districts–1. Elgin. 2. Essex. 3. Pelee Island. 4. Kent. 5. Lambton. 6. Middlesex. Page 47 briefly summarizes 40 years of progress.

Four graphs (p. 48-49) show changes related to Ontario soybeans from 1949 to 1989: (1) Soybean acreage grew from 104,000 acres to 1,290,000 acres; the most rapid growth occurred after 1976. Annual average yields and 5-year average yields have increased steadily–the 5-year average from about 18 bushels/acre in 1949 to about 36 bushels in 1989. Soybean production grew from about 3 million bushels in 1949 to a peak of about 45 million bushels in 1987. The soybean crop value (farm cash receipts) grew from almost nothing in 1949 to over $351 million in 1988; rapid growth began after 1971 and 1976.

Chronology of some important events extracted mainly from individual years.

"1949–The Ontario Soya-Bean Growers' Marketing Board was established under the Farm Products Marketing Act. Under the provisions of the new regulations eleven soybean growers were elected as directors to the board. Together they represented some 6,000 soybean producers in six Ontario districts. The first office of the board was located in the office of the Agricultural Representative in Essex, and Angus McKinney was the first secretary. K.A. Standing acted as assistant on a part-time basis. Board operations were financed during the 1949-50 crop year by one half cent per bushel license fee [like the later U.S. checkoff fee].

"1950–The license fee was increased [doubled] from one-half cent to one cent per bushel, the level at which it remained until 1959.

"1951–The first annual convention of soybean growers was held Feb. 15-16, 1951 at the Community Hall, Chatham [County of Kent]. Imports from the U.S. were totalling about 5 million bushels annually.

1952–K.A. Standing became general manager (with portrait photo). The board established its office in Chatham sharing facilities and staff of one secretary with the Ontario Seed Corn Marketing Board on Market Street. The first task was to set up a complete grower records system.

"1953–Expansion of office requirements resulted in a move to new quarters on Fourth Street in Chatham.

1954–The OSGMB organized the first export of Canadian soybeans. The shipment was made from Port Stanley [Ontario] to interests in the United Kingdom. Initiated to generate competition in the domestic market, exports were to continue in every succeeding year. Some 1,492,000 bushels of soybeans were exported during the 1954-55 crop year.

1956–The number of elected directors increased to 14 from 11.

1957–The average price of soybeans paid to growers dropped to $1.95 per bushel–the lowest since World War II. The board pressed for legislation to stabilize returns to growers.

"1958–The board was successful in having soybeans brought under the Agricultural Stabilization Act. The crop was supported at $2.10 per bushel. The average price paid to growers was $1.90, resulting in a deficiency payment of 19.6 cents per bushel for a total of $1,200,000 paid to growers. The office was moved from Fourth Street to Wellington Street West in Chatham. Otis McGregor became assistant

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secretary-manager (with portrait photo).

Note. Letter (e-mail) from Kim Cooper formerly of OSGMB. 2010. Feb. 18. The growers always had to pay a premium to take part in income stabilization programs. So it was not simply a government subsidy. At first, the premiums had to be paid up front, but after a few years, the premiums were deducted from the payout, if there was any payout.

1960–L.R. Addeman became information officer for both the soybean and wheat boards.

1963–The ban on coloured margarine is lifted in Ontario.

"1964–Increased emphasis was put on [soybean] research when federal and provincial programs were brought under a coordinated plan.

"1965–Domestic crushings reached a 16-year high at 20.8 million bushels, as did soybean imports at 16.5 million. There was no price support in 1965 and succeeding crops, the last having been applied to the 1964 crop at $2.15 per bushel."

1970–Canadian soybean production first tops 10 million bushels.

1973–The first shipment of Ontario soybeans (Harsoy variety) was made to Japan. The Ontario Soybean Symposium was held at Ridgetown College of Agricultural Technology, sponsored by the Board, the Ministry of Agriculture, and Food and Agriculture Canada. K.A. Standing became general manager of both the soybean and wheat boards and Otis McGregor was appointed marketing manager of both boards.

1974–D. Sanderson became secretary to the Ontario soybean and wheat boards.

1975–The Soybean Board established its own separate office in a rented building on Kell Drive in Chatham. Otis McGregor became secretary manager of the Soybean Board.

1977–The metric system started to be used in agriculture in Canada; metric ton (tonne) officially replaced bushel. "An Advance Payment Program was established for soybeans under the federal Advance Payments for Crops Act. The program provided interest free loans to producers who stored their soybean crop at harvest for future sale." A record high yield average of 39 bushels per acre was set. Mario Baletto became market information coordinator.

"1979–The Board initiated a program to promote soybeans as a food product and hired home economist Linda Lantz to manage the program. Soybeans were the featured crop at the Royal Agricultural Winter Fair.

"1980–Soybeans began trading duty free between Canada and the United States following the elimination of a 60 cent per bushel tariff, via the General Agreement on Tariffs and Trade" (GATT). Fred Brandenburg became assistant secretary manager.

"1982–The Board participated in a soybean export market development mission to Japan, Hong Kong, Malaysia, Singapore, and Korea; it was organized by the Ontario Ministry of Agriculture and Food. Continued low prices trigger stabilization payments of 38 cents per bushel federally and 37 cents per bushel provincially."

1983–Two new districts were formed, bringing the total to 8. District 7 ran east to the Quebec border reflecting the advance of soybean production to the north and east from its traditional area.

1984–A new office for the Board was erected at 180 Riverside Drive in Chatham. "A two-day conference–the Ontario Soybean Symposium–and an incoming mission of soybean buyers from the Far East [East Asia] and Europe were sponsored jointly" by OSGMB and OMAF. "Prices dropped again making a provincial stabilization payment of 36 cents per bushel necessary." Note: Stabilization support prices are based on an average of market prices for the past five years.

1985–Fred Brandenburg became secretary manager of the board and John Davidse became executive assistant to the board. "Ontario became self-sufficient in soybean production for the first time as the 37,000,000 bushel crop exceeded the 33,165,000 bushel crush. Low prices continued as did stabilization payments–42 cents per bushel from the federal program and 39 cents from the provincial program."

1986–"Ontario's single biggest soybean export sale of 50,000 tonnes was made to the USSR." Low soybean prices paid to producers continued. In addition to federal and provincial stabilization payments, "the Special Canadian Grains Program paid soybean growers on the basis of 18 cents per bushel."

1987–Tino Breuer became marketing specialist. Districts were again redistributed to reflect the average soybean production in each.

1989–The Board celebrates its 40th birthday with a new logo and a change in the spelling of its name from "Soya-Bean" to "Soybean." 15 directors now represent 24,000 growers in 8 districts across the province. 1,280,000 acres of soybeans were grown in 1988–more than 14 times as many as in 1948. Soybeans are Ontario's #1 cash crop, worth over $350 million in farm cash receipts in 1988. Address: P.O. Box 1199, Chatham, Ontario, Canada N7M 5L8. Phone: 519-352-7730.

9302. Shanmugasundaram, S. 1989. Global cooperation for the improvement of soybean research and development. In: A.J. Pascale, ed. 1989. World Soybean Research Conference IV. Buenos Aires: Continuing Committee. xxviii + 2152 p. See p. 1939-47. [17 ref]

• ***Summary:*** "Soybeans became a global crop after its introduction and adoption as an industrial crop in the U.S.A. The collaboration between China and the U.S.A. on soybean germplasm collection marked the beginning of global cooperation for soybean research and development. A number of international agricultural research centers such as AVRDC, UN/ESCAP CGPRT Centre, IBPGR,

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IITA, INTSOY, and IRRI presently conduct worldwide research and development activities on soybean... Their problem-oriented research activities with an interdisciplinary approach should be continued to help improve soybean production, processing, marketing and utilization particularly in the densely populated, developing countries in Asia and Africa. At least 400 to 600 million children in the world's 60 poorest countries suffer from chronic malnutrition and more than one fourth of the world's population suffer from hunger during some part of each year. Soybeans with 40% protein and 20% oil could help alleviate protein and caloric malnutrition. FAO/UNDP, USAID, ACIAR, IDRC, Winrock International and World Bank, among others, are the major funding agencies which encourage and support the research and development activities of soybean. The global cooperation includes regional networking, germplasm exchange, specific research activities, manpower training, workshops, conferences and information exchange. A consolidation of such support for integrating various forces is being proposed to further promote the research and development effort on soybeans...

"INTSOY initiated the International Soybean Variety Experiment (ISVEX trials). From 1973 to 1985, more than 2,000 ISVEX trials were distributed to 132 countries around the world. INTSOY also received a number of breeding lines from cooperators in 34 countries and included them in a preliminary screening program called "The Soybean International Experimental Variety Evaluation (SIEVE) and Soybean Preliminary Observation Trial (SPOT). India, Sri Lanka, Peru, Egypt, Turkey, Ecuador, Costa Rica, Nepal and Guatemala are among the more than 20 countries now commercially growing soybean varieties introduced through INTSOY trials...

"Institutions and agencies involved in soybean: Category I. Production and utilization research: Asian Vegetable Research and Development Center (AVRDC), International Board for Plant Genetic Resources (IBPGR), International Food Policy Research Institute (IFPRI), International Institute of Tropical Agriculture (IITA), International Soybean Program (INTSOY), International Rice Research Institute (IRRI), United Nations Economic Social Commission for Asia and the Pacific's Coarse Grains, Pulses, Root and Tuber Crops Centre (UN ESCAP/CGPRT Centre), European Cooperative Research Network on Soybean (ECNS).

"Category II. Marketing research: American Soybean Associations in various countries, ESCAP CGPRT Centre, Food and Agriculture Organization of the United Nations (FAO), IFPRI, Soyfoods Center.

"Category III. Funding agencies: United Nations Development Programme (UNDP), Food and Agriculture Organization of the United Nations (FAO), United States Agency for International Development (USAID), Australian Centre for International Agricultural Research (ACIAR), International Development Research Centre (IDRC), Canadian International Development Agency (CIDA), Winrock International, World Bank, Asian Development Bank, Japan International Cooperation Agency (JICA), Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres (IRAT), Agency for Technical Cooperation (GTZ).

"The AVRDC commenced its soybean research with the goal of developing stable, high yielding soybeans for the tropics and subtropics. Since 1973, AVRDC has accumulated more than 11,000 accessions of soybean. The Center has provided more than 31,000 breeding lines and varieties to 164 scientists in 56 countries. AVRDC Soybean Evaluation Trial Network (ASET) was initiated in 1980." Address: Asian Vegetable R&D Center, P.O. Box 205, Taipei 10099 Taiwan.

9303. Shanmugasundaram, S.; Tsou, S.C.S.; Cheng, S.H. 1989. Vegetable soybeans in the East. In: A.J. Pascale, ed. 1989. World Soybean Research Conference IV. Buenos Aires: Continuing Committee. xxviii + 2152 p. See p. 1979-86. [12 ref]

• ***Summary:*** "Soybeans harvested and used green, between the R6 and R7 growth stages are termed vegetable soybeans. Japan, Korea, China, Thailand and Nepal currently grow and consume vegetable soybeans... For the Japanese consumer, vegetable soybeans have two or more seeded pods, bright green pod wall after blanching or cooking, large seed, gray pubescence, colorless hilum, specific pod length and width and no more than 175 pods per 500 gm. The outer pod coat should be devoid of any blemishes. After boiling, the taste should be slightly sweet and not oily. A number of seed companies, especially in Japan breed vegetable soybeans. AVRDC is currently developing vegetable soybeans that are adapted to the tropics and subtropics...

"The whole plant is harvested and the leaves are stripped; the stems with pods are bundled and sold in Japan and Thailand. In Taiwan, Nepal, China and Korea, the pods are stripped from the plant and marketed... The majority of the vegetable soybeans in Taiwan are frozen in the pod and exported to Japan...

"In terms of nutrient content, the vegetable soybean can be considered as an excellent source of thiamine, a good source of protein, riboflavin, iron and phosphorus. It has adequate vitamin C; it is fair in calcium, but poor in vitamin A.

"In Japan, the area devoted to vegetable soybean increased from 6,980 hectares in 1967 to 14,000 hectares in 1986 including those planted in vinyl houses... The total vegetable soybean requirement in Japan is about 130,000 to 150,000 tons of green pod per annum. The production in Japan varies from 110,000 to 120,000 tons. To meet the domestic demand, Japan imports about 30,000 to 50,000 tons... The amount of frozen vegetable soybeans exported

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from Taiwan in 1981 was worth US $21 million and reached almost US $63 million in 1987. The domestic Taiwanese consumption of vegetable soybean also steadily increased from 4,700 tons in 1984 to more than 13,000 tons in 1987...

"At present, there are 27 frozen food processing companies in Taiwan which process frozen vegetable soybeans... Five major processors handle 2,713 tons to 11,552 tons per annum...

"In Japan, vegetable soybean varietal development is conducted by the private seed companies. During the past 30 years the seed companies in Japan developed more than 50 new vegetable soybean varieties. Currently, the most popular ones to name a few are: Tsurunoko, Ryokkoh, Kegon, Hatsutaka, Taisho shiroge, Nakate Kaori, Suzumo, Enrei, Fukuda, Raityo, Shirobato, Tamasudare, Hakutyo and Shiratsuyu." Address: 1-2. Asian Vegetable R&D Center, P.O. Box 205, Taipei 10099, Taiwan; 3. Council of Agriculture, 37 Nan-Hai Rd., Taipei 10728, Taiwan.

9304. Shurtleff, William; Aoyagi, Akiko. comps. 1989. Bibliography of soymilk and soymilk products: 2,612 references from A.D. 1500 to 1989. Lafayette, California: Soyfoods Center. 323 p. Subject/geographical index. Author/company index. Extensively annotated. Printed Feb. 6. 28 cm. [2612 ref]

• ***Summary:*** This is the most comprehensive bibliography ever published on soymilk. It is also the single most current and useful source of information on this subject available today, since 64% of all references (and most of the current ones) contain a summary/abstract averaging 80 words in length.

One of more than 40 bibliographies on soybeans and soyfoods being published by the Soyfoods Center, it is based on historical principles, listing all known documents and commercial products in chronological order. Containing 37 different document types (both published and unpublished, including many original interviews and partial translations of Japanese and European works), it is a powerful tool for understanding the development of this subject and related products from its earliest beginnings to the present, worldwide.

Compiled one record at a time over a period of 15 years, each reference in this bibliography features (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English publications together with an English translation, month and issue of publication, and the first author's first name (if given).

It also includes details on 577 commercial soymilk products, including the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as references to and summaries of advertisements, articles, patents, etc.) are also given.

Details on how to use the bibliography, a complete subject and geographical index, an author/company index, and a bibliometric analysis of the composition of the book (by language, document type, year, leading countries, states, and related subjects) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

9305. Tenpe Kenkyushu-kai. 1989. Dai ikkai Tenpe Kenkyû shûkai: Kôen yôshi [Tempeh Research Society: First meeting lecture outline]. Kobe Park City 2-1110, 6-2-1 Minatojima, Chuo-ku, Kobe 650, Japan. 5 p. [Jap]

• ***Summary:*** The first meeting took place on 25 Feb. 1989 at the offices of the Yuki-jirushi (Snow Brand) Milk Co. in Shinjuku, Tokyo. Three talks on tempeh were presented: Yasuko Torii, a natural foods expert, presented "Report on the Natural Foods Expo: Soyfoods in America and Australia," focusing on the Anaheim Expo (April 1988) with its Soyfoods Pavilion and tempeh. Noriyuki Okada of the National Food Research Inst. (Tsukuba) discussed "Searching for the origin of useful genes." And Toshiie Maeda of Hyogo prefecture talked about "Revitalizing a village with a tempeh industry."

The second meeting took place on 24 June 1989 in Osaka. Masahiko Terajima of Fuji Oil Co. Research Dept. spoke on "The present status of soy protein and soy protein foods in Japan." Eihachiro Kato of Meiji Univ. discussed "Low-pressure frying of tempeh." And Nobu Kawabata of Kyoto City Univ. spoke on the "Okara tempeh and its usage." Address: Kobe, Japan. Phone: 078-302-7065.

9306. Wilson, J.C. 1989. The commercial utilization of soybeans, soymilk and soymilk derivatives. In: A.J. Pascale, ed. 1989. World Soybean Research Conference IV. Buenos Aires: Continuing Committee. xxviii + 2152 p. See p. 1750-61.

• ***Summary:*** Abstract. Introduction. Philosophy of preparing soybase: The enzyme lipoxygenase acts as a catalyst, inducing the oxidation of fats to create aldehydes and ketones–"beany" flavour and aroma. The enzyme lipoxygenase can be inactivated in hot water by exposure to temperatures exceeding 80ºC and destroyed by a temperature of 85ºC for two minutes. Excessive heat causes protein insolubility. Ancient method for processing of soymilk.

Dehulling. Cornell hot grind method to control bean flavor: this is the "landmark development of the modern soymilk industry." Blanching (University of Illinois method; steaming dehulled cotyledons before grinding, with no removal of fibre / okara). Problem of "chalky mouth feel [and throat-drying effect]. Removal of fiber (The "Japanese soymilk industry has followed the Illinois method but solved the chalkiness problem by a fibre removal step"). But 2

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new problems: protein insolubility and protein instability in aseptically filled UHT soymilk. From 1978 to 1983 the Japanese soymilk market grew at about 85% a year, however the price of soymilk exceeded that of cow's milk.

Alfa-Laval's soybase extraction line Soyal. Alfa-Laval does no dehulling and double grinding in hot water in an air-free environment. One goal is to inactivate 85% of the trypsin inhibitor (see Fig. 5). Market trends. Future expectations: Soybeans without lipoxygenase, growing acceptance of soymilk and products made from soymilk, strong growth of tofu (especially of aseptically packed tofu with spices), realisation of the importance of quality soy foods in school lunch programs. Address: Alfa-Laval Food & Dairy International AB, Postbox 72, 221 00 Lund, Sweden.

9307. Xu, Bao; Lu, Qinhua; Zhuang, Bingchang. 1989. Analysis of ecotypes and their geographical distribution of wild soybean (G. soja) in the world. In: A.J. Pascale, ed. 1989. World Soybean Research Conference IV. Buenos Aires: Continuing Committee. xxviii + 2152 p. See p. 98-103. [8 ref. Eng]
• ***Summary:*** "The analytical data show 343 germplasm lines (China 292, Japan 32, South Korea 14, and USSR 5), seven ecotypes and their geographical regions and 13 sub-regions were divided... Typical wild soybean is an annual herb, twining around companion plants. Its main stem and branches are almost identical. The leaflets are ovate, oblong or lineolate in shape. The flowers are dark, light or reddish purple. The pods are about 2 cm in length, containing 1-5 seeds. The seeds are black with brown or black bloom. The weight of 100 seeds is about 1-3 gm... Since 1978, about 5,000 accessions of wild soybean have been collected in China. Characters as high protein content, good adaptability are considered superior." Address: Soybean Inst., Jilin Academy of Agricultural Sciences, Gongzhuling, Jilin province, China.

9308. Messinger, Lisa. 1989. Food of the future has rich past. *Antelope Valley Press* (*Palmdale, California*). March 1.
• ***Summary:*** A brief history of tofu. The author is now writing "The Tofu Book" for Avery Publishing Group due out in November. Address: Health/Nutrition Staff Writer.

9309. Kitamura, Yasunori. 1989. Re: Shinshu-Miso Research Institute. Letter to William Shurtleff at Soyfoods Center, March 22–in reply to inquiry. 1 p. [Eng]
• ***Summary:*** The Institute was founded in May 1959. Its annual report, initially titled *Reports of the Shinshu-Miso Research Institute* but now titled *Report of the Shinshu-Miso Research Institute* (*Shinshu-Miso Kenkyusho Kenkyu Hokoku*) was first published in 1960. It is published in March each year, and in 1987 it started to include English abstracts for most of the articles. The 1989 issue is number 30. A 1-year subscription sent by surface mail costs US$8.00. A former director of the Institute, Dr. Tsutomu Mochizuki, retired in 1982. Address: Shinshu Miso Kenkyusho, 469-6 Nakagosho, Nagano-shi 380, Japan. Phone: 0262-28-1221.

9310. Akwarius Almere. 1989. Akwarius prijs en bestelboek: Natuurvoedingsprodukten, Januari-Februari-Maart [Catalog and price list: Natural food products, January-March]. P.O. Box 50070, 1305 AL Almere, The Netherlands. 77 p. [Dut]
• ***Summary:*** For details, see entry for the April-June 1989 catalog. Address: Almere, Netherlands. Phone: 03240-20800.

9311. Daizu Kyokyu Antei Kyokai (Soybean Supply Stabilization Assoc.). 1989. Kaigai genryô kyôkyû dôkô nado kihon chôsa: (Daizu) itaku jigyô hôkoku-sho [A basic survey of the trends in supplying raw materials from overseas: Report on consigned enterprises of soybeans]. #2 Makoto Building 5th Floor, Tora-no-mon 1-4-4, Minato-ku, Tokyo 105, Japan. 327 p. 26 cm. [Jap]
• ***Summary:*** Contents: Trends concerning the demand and supply of oilseeds and oilseed products: 1. Worldwide. 2. In the USA. 3. In Brazil. 4. In China. 5. Various trends in the quality of imported raw materials (soybeans). Address: Tokyo, Japan. Phone: 03-591-3879.

9312. Daizu Kyokyu Antei Kyokai (Soybean Supply Stabilization Assoc.). 1989. Daizu no kakô, ryûtsû nado ni kansuru chôsa hôkoku-sho [Report on a survey of processing and distribution of soybeans]. #2 Makoto Building 5th Floor, Tora-no-mon 1-4-4, Minato-ku, Tokyo 105, Japan. 106 p. March. 26 cm. [Jap]
• ***Summary:*** Contents: 1. General conditions of the productions of domestic soybeans. 2. Trends in the production in the producing districts. 3. Trends in harvesting, drying and processing. 4. Trends in collections of cargo, storing, and shipping. 5. Trends in the promotion of improvement of the commodity and the quality of domestic soybeans. 6. Trends in the promotion of improvement of the collections of cargo, storing and shipping. 7. Some studies on the subject of the stages of harvesting, collections of cargo and shipping for promoting the usage of domestic soybeans. Appendixes: 1. General conditions of inspections. 2. The actual results of the collection cargo by the collection cargo groups. Address: Tokyo, Japan. Phone: 03-591-3879.

9313. Harayama, Fuminori; Yasuhira, Hitomi. 1989. *Aspergillus*-zoku to *Rhizopus*-zoku no kakushu kôso kassei no hikaku [Comparison between several hydrolytic enzyme activities of the genus *Aspergillus* and those of *Rhizopus*]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 100. [Jap]
Address: Shinshu-Miso Research Inst., 469-6 Nakagosho, Nagano-shi, Nagano-ken 380, Japan.

9314. Hondo, Satoshi; Yasuhira, Hitomi. 1989. Miso

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no jukusei ni oyobosu ondo to shokuen nôdo no eikyô [Studies on coloring of miso. I. Effect of temperature and salt concentration on miso fermentation]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 74-81. [19 ref. Jap]
Address: The Shinshu-Miso Research Inst., 469-6 Nakagosho, Nagano City, Japan 380.

9315. Hondo, Satoshi; Yasuhira, Hitomi. 1989. Miso jukusei-chû no chakushoku to seibun no kankei [Studies on coloring of miso. II. Relation between coloring and components during miso fermentation]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 82-85. [8 ref. Jap]
Address: The Shinshu-Miso Research Inst., 469-6 Nakagosho, Nagano City, Japan 380.

9316. Imai, Manabu; Nakamura, Masaaki; Takeda, Shigeru; Ito, Kimio; Sode, Akio; Yasuhira, Hitomi. 1989. Chakushoku o yokusei suru kôen-sei nyûsan-kin no jitsuyôka shiken [Application test of decoloring halophilic Pediococcus]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 18-21. [7 ref. Jap; eng]
Address: Nagano, Japan.

9317. Ito, Kimio; Nakamura, Masaaki; Imai, Manabu; Takeda, Shigeru; Sode, Akio; Yasuhira, Hitomi. 1989. Kokyû kesson kôbo *Zygosaccharomyces rouxii* Y-72 no jitsuyôka shiken [Application test of respiratory deficient yeast, *Zygosaccharomyces rouxii* Y-72 condition of mass culture]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 22-28. [5 ref. Jap; eng]
Address: Nagano, Japan.

9318. Kitamura, Yasunori; Aoki, Y.; Yokota, Y.; et al. 1989. Shihan miso no bunseki kekka ni tsuite [Analytical results of miso on the market]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 43-63. [5 ref. Jap; eng]
• ***Summary:*** The 26th study meeting to evaluate commercial miso was held. 233 samples of miso were studied 131 samples were analyzed for physicochemical characteristics. Salt concentration averaged 11.9% and total sugar 18.0%. Miso with high levels of lactic acid was preferred. Address: Nagano, Japan.

9319. Mangold, Grant. 1989. Are U.S. soybeans losing their luster? Here's what you can do at planting to outshine your competitors. *Soybean Digest.* Mid-March. p. 8-10, 12-13.
• ***Summary:*** "Put this near the top of your 'to-do' list before planting: Check the protein and oil levels of the soybean varieties you plan to plant." The reason? Protein and oil content in U.S. soybeans has been slipping for the past few years, while their levels in South American soybeans has increased. "Hot, dry conditions in the U.S. the past two years had a major effect in lowering protein levels and raising oil content in U.S. soybeans... The market is moving towards paying on the basis of protein and oil composition." Charles Hurburgh, Iowa State Univ. (ISU) ag engineer who has compiled reams of soybean composition data notes that "The U.S. soybeans received by Japan in 1988 had a $0.50 per bushel deficiency in protein and oil compared with the competition. Fifty cents a bushel will lose a lot of customers."

"The U.S. share of Japanese soybean imports peaked at 97.3% in 1978. By 1987 it had dropped to 85.5%, and in 1988 the U.S. share was 80.4%. The decline has been the result of increased imports of good quality soybeans from South America, particularly from Brazil, due to the lowered quality of soybeans from the U.S. in recent years."

In general, soybeans grown in the southern and eastern U.S. contain more protein (36.4%) and less oil (18.7%) than those from the western Corn Belt states (34.9% protein, 19% oil). Beginning on 4 Sept. 1989, the Federal Grain Inspection Service (FGIS) will list protein and oil composition data on domestic and export inspection certificates as requested by the customer.

9320. Nakamura, Masaaki; Imai, M.; Yasuhira, H. 1989. Karubon san bunseki kei ni yoru miso chû no yûkisan bunseki ni tsuite [Analysis of organic acids in miso using carboxylic acid analyzer]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 68-73. [14 ref. Jap; eng]
Address: Nagano, Japan.

9321. Okada, Noriyuki. 1989. Role of microorganisms in tempeh manufacture–Isolation of vitamin B-12 producing bacteria. *JARQ* (*Japan Agricultural Research Quarterly*) 22(4):310-16. March. [12 ref. Eng]
• ***Summary:*** The vitamin B-12 content of tempeh made in Indonesia was found to be 4.6 micrograms (mcg) per 100 gm fresh weight, much higher than any other vegetarian food tested. But this was based on one sample transported slowly from Indonesia to Japan and its smell was no good when the value was measured. A sample brought quickly from Indonesia with good smell contained 0.7 mcg/100 gm. A sample prepared in Japan with tempeh starter from Indonesia contained only 0.05 mcg. And tempeh prepared in Japan with *Rhizopus oligosporus* NRRL 2710 contained 0.03 to 0.06 mcg/100 gm. Other vegetarian foods containing significant amounts of vitamin B-12 were thua-nao (Thailand) 1.5 mcg and fermented tofu (Singapore, also called Sufu) 1.1 mcg. Flesh-based foods with a high B-12 content included Ka-pi shrimp paste (Thailand) 5.3 mcg, fermented shrimp (Thailand) 2.5 mcg, and fish sauce, 3 month fermentation

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(Thailand) 2.4 mcg. The vitamin B-12 in vegetarian foods is produced by the fermentation process and it increases during fermentation. Flesh foods contain their own B-12. The daily requirement of vitamin B-12 for adults is estimated to be 3 mcg.

Bacteria that produced vitamin B-12 in tempeh were isolated and identified. The most prolific producer was *Klebsiella pneumoniae,* which had a maximum relative B-12 productivity of 1350. All prolific producers were members of the genus *Klebsiella* but some *Bacillus* species also produced B-12. The author suggests that intraspecific cell fusion techniques might be used to transfer this ability to *Bacillus natto,* the natto bacterium, which is presently unable to produce vitamin B-12. Address: Dep. of Applied Microbiology, National Food Research Inst., Tsukuba, Ibaraki 305, Japan.

9322. Osawa, Yoshiaki; Yasuhira, Hitomi. 1989. Pentoosu hakkô-sei nyûsan-kin no sentaku [Selection of pentose fermentable halophilic Pediococci]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 14-17. [13 ref. Jap; eng]
Address: Nagano, Japan.

9323. San-J International, Inc. 1989. The gold standard (Ad). *Natural Foods Merchandiser.* March p. 54; April. p. 89.
• ***Summary:*** This full-page color ad refers to "San-J Whole Soybean Tamari: Wheat Free Soy Sauce," and specifically to the new product, which bears a gold label, that is made in America. A large 10-oz. bottle of the tamari is shown against a background of whole soybeans. A small inset of Black Label Tamari and Tamari Lite are also shown. "This extraordinary seasoning establishes a new standard for the other varieties of San-J Tamari. Try our new Black Label soymeal tamari–brewed here for the first time–and Tamari Lite, which offers a 25% sodium reduction. San-J Tamari. Pure soybean. Pure gold."

Also published in Vegetarian Times. 1989. April. p. 3. and May p. 2. And in East West. April. p. 47. Address: Virginia.

9324. Sato, Masashi; Yasuhira, Hitomi. 1989. Kome no seihaku budomari to kôji, miso no hinshitsu [The effect of polishing rate of rice on the quality of koji and miso]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 1-2. [Jap; eng]
• ***Summary:*** Unpolished rice koji had the least amylase activity. Koji from rice polished to 66% had the least protease activity. Miso from 90% polished rice was preferred, whereas that made from 66% polished rice with the hulls/bran added back was disliked.

9325. Sato, Masashi; Yasuhira, Hitomi. 1989. Hasaimai? (Tayôto riyômai henkei kakôhin) no ryûdo to kôji, miso no hinshitsu [The effect of grain/particle size of crushed rice on the quality of koji and miso]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 3-6. [Jap; eng]
• ***Summary:*** The particle size of crushed rice was found to have a negligible effect on the sensory properties of koji and miso.

9326. Sode, Akio; Nakamura, Masaaki; Takeda, Shigeru; Ito, Kimio; Imai, Manabu; Yasuhira, Hitomi. 1989. Miso no burendo kôka [Effects of blending miso]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 7-13. [2 ref. Jap; eng]
• ***Summary:*** Misos made with various levels of koji and sodium chloride (salt) were mixed in varying proportions for several periods of time. The final products were evaluated for sensory quality.

9327. Takeda, Shigeru; Imai, Manabu; Yasuhira, Hitomi. 1989. Candida-zoku kôbo o riyô shita miso no kôki [Flavor of miso fermented by genus *Candida*]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 29-32. [3 ref. Jap; eng]
• ***Summary:*** Miso was produced by 8 strains of *Candida* and by *Zygosaccharomyces rouxii* Y7 (control). Flavor was studied by sensory evaluation. Address: Nagano, Japan.

9328. Takeda, Shigeru; Imai, Manabu; Yasuhira, Hitomi. 1989. Candida-zoku kôbo no bôyû? shiken [Antiswelling of miso fermented by Candida sp.]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 64-67. [5 ref. Jap; eng]
• ***Summary:*** The amount of extra ethanol required to prevent miso swelling (because of gas production) was lower for miso produced by the yeast *Candida etchellsii* S7-1 than for that produced by the yeast *Zygosaccharomyces rouxii.*
Address: Nagano, Japan.

9329. *Whole Foods.* 1989. Bios: U.S. Mills. March. p. 110.
• ***Summary:*** U.S. Mills, established in 1908, specializes in 100% natural products. Our Erewhon cereals, granolas and nut butters are produced in our facility in Omaha, Nebraska. We also import a complete line of macrobiotic products from Japan, including shoyu tamari. In addition, we are the exclusive importer of Kentaur cereals from Switzerland. When the name Erewhon or U.S. Mills appears on the package, be assured your customers are getting the very best. U.S. Mills Inc., 395 Elliot St., Newton Upper Falls, Massachusetts 02164; (617) 969-5400.

9330. Yasuhira, Hitomi. 1989. Atarashii taipu no miso [New types of miso]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 86-93. [28 ref. Jap]

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Address: Nagano, Japan.

9331. Yokota, Yoshiko; Yasuhira, Hitomi. 1989. Miso bunseki e no kinsekigai bunkôhô no riyô [Application of near-infrared reflectance analysis in miso]. *Shinshu Miso Kenkyusho Kenkyu Hokoku* (*Report of the Shinshu-Miso Research Inst.*) No. 30. p. 33-42. [10 ref. Jap; eng]
• ***Summary:*** Near-IR reflectance analysis was applied to the detection of the physicochemical properties of miso. Sample temperature had little effect on the accuracy of the analysis. Moisture, sodium chloride, total nitrogen, lipid, ash, total sugar, and reducing sugar concentration of miso could be adequately measured by this procedure. Address: Nagano, Japan.

9332. Severson, Richard K.; Nomura, A.M.Y.; Grove, J.S.; Stemmermann, G.N. 1989. A prospective study of demographics, diet, and prostate cancer among men of Japanese ancestry in Hawaii. *Cancer Research* 49(7):1857-60. April 1. [34 ref]
• ***Summary:*** This study of 7,999 Japanese Hawaiians, followed for 18-21 years, found that tofu consumption lowered the risk of prostate cancer more than any other dietary factor studied. Men who consumed tofu five or more times per week were 65% less likely to develop prostate cancer compared to men who consumed tofu once per week or less.

Note: This is the earliest document seen indicating that consumption of tofu lowers the risk of prostate cancer. Address: Japan-Hawaii Cancer Study, Kuakini Medical Center, Honolulu, Hawaii 96817.

9333. Chikaarashi, Shigeru. Assignor to Nichii Company, Ltd., Osaka, Japan. 1989. Apparatus for manufacturing a foodstuff suitable for soybean milk production. *U.S. Patent* 4,817,516. April 4. 4 p. Application filed 9 Oct. 1987. [5 ref. Eng]
• ***Summary:*** "The apparatus includes a brushing machine for removing earth matter and earth-born germs deposited on soybean material, a band dryer for adjusting the water content of the soybean material so as to facilitate separation of the material into skin and flesh portions, a skin remover for separating the skin portion from the flesh portion and for dividing the flesh portion of each piece of soybean into four to eight parts, and flat pressing rollers for converting the resulting powdery masses into uniformly distributed flaky masses."

Note: The resulting soy flakes are used by Nichii to make tofu in Japan. The compact tofu plants are located in supermarkets or department stores. Address: Sapporo, Japan.

9334. Thompson, Martha Gifford. 1989. Early work with tofu at Rochester Zen Center (Interview). *SoyaScan Notes.* April 11. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The staff of 30-50 people in the Zen Center kitchen prepared strictly vegetarian meals. Kapleau roshi at that point had a dairy allergy, so very few dairy products were used in the meals. The diet was almost a vegan one. The Toronto Zen Center, was an affiliate group nearby in Canada. In Toronto, which has a large Asian population, were at least three tofu shops: one very small family-run Korean shop on Baldwin Street (which is no longer there), one on Avenue Road (perhaps Chinese run), and a third on Dundas Road. A member of the kitchen staff would make the 2½ hour trip to Toronto, go the shop on Baldwin Street (which had no name) to buy tofu. "The first room was stacked to the ceiling with soybeans. Down in the basement were many people slogging around making tofu. It was quite a scene, and nobody spoke any English. At that point we realized that we could make tofu ourselves. The trip to Toronto was always a hassle. You always got stopped at the border; they always thought you were smuggling something. Jay Thompson took the lead in setting up tofu making facilities. Kapleau roshi was very excited about and supportive of the project, in part because he had practiced for so long in Japan, and in part because he likes projects, right livelihood, and soyfoods. Once the shop was set up in the basement, we also made a lot of soymilk, yuba, and soy yogurt, and served spicy curds; we tried everything! The tofu shop of course never received any financial support from Zen Center." Address: Rochester, New York. Phone: 716-461-5388 Home.

9335. Asano, Mitsuo; Okubo, K.; Yamauchi, F. 1989. Tônyû no hinshitsu ni oyobosu nama shibori ondo no eikyô [Effects of squeezing temperature on the quality of soymilk]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 36(4):318-24. April. [16 ref. Jap; eng]
• ***Summary:*** Traditionally soymilk was pressed from the ground soybean slurry at a low temperature, but today this step is usually eliminated when making tofu. Yet tofu prepared in this traditional way was thought to be preferable to that made in the modern way. "In order to make optimum temperature clear, the effects of squeezing temperature on yield, viscosity, glycoside content, lipoxygenase activity and n-hexanal level of soymilk from the cotyledon and the whole bean were examined. A yield as solid was maximum in soymilk squeezed over 30ºC from the cotyledon and at 60ºC from the whole bean. Viscosity of soymilk significantly decreased with increasing temperature and showed a minimum value at 60ºC. A glycoside content as solid increased in soymilk squeezed above 50ºC and was approximately 2.6 times higher in soymilk at 95ºC than at 20ºC. The lipoxygenase activity, which is the major cause of undesirable flavor of soymilk, decreased in soymilk squeezed over 70ºC. n-Hexanal, which was produced by lipoxygenase,

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was about half in soymilk squeezed at 60ºC as compared with 20ºC. Accordingly, optimum squeezing temperature on soymilk and tofu processing was recommended in range of 50-60ºC." Address: Faculty of Agriculture, Tohoku Univ., Amamiya-machi, Tsutsumi-dori, Sendai-shi, Miyagi 980, Japan.

9336. *Crop Science.* 1989. Theodore Hymowitz: Frank N. Meyer Memorial Award. 29(2):522-23. March/April.
• ***Summary:*** "Theodore Hymowitz was born 16 Feb. 1934 in New York City. His parents Ethel and Bernard emigrated to the USA in their youth from Poland. Theodore graduated from the Crown Heights Yeshivah and Boys High School, Brooklyn, New York, in 1948 and 1951, respectively. As a young boy he often visited nearby Prospect Park, the botanical gardens, zoo and museum and developed a lifelong interest in plants and animals.

"He received the B.S. degree in agriculture from Cornell Univ. in 1955 and M.S. degree in agricultural chemistry and soils from the Univ. of Arizona in 1957. Thereafter he was drafted into the U.S. Army for 2 years. Following basic training at Fort Benning, Georgia, he was stationed at the Quartermaster Research and Engineering Center, Natick, Massachusetts, where he worked as a chemist in a microbiology laboratory.

"Upon discharge from the Army in 1959, he enrolled at Oklahoma State Univ. where he received his Ph.D. in genetics and plant breeding in 1963. At Oklahoma State he was greatly influenced by the potential of plant introductions by his advisor, Dr. Ralph S. Matlock, and by Dr. Jack R. Harlan, a Frank N. Meyer Medalist. As a graduate student he was a Loeb Foundation Scholar and a Fulbright Scholar in India. At the Indian Agricultural Research Institute, New Delhi, in the laboratory of Dr. M.S. Swaminathan, he conducted cytological research on the genus *Cyamopsis* [which includes guar] and under the tutelage of Prof. H.B. Singh, the father of plant introductions in India, he collected guar germplasm. The entire guar collection was sent to the USA and placed in the PI [Plant Introduction] system. The guar research conducted at Oklahoma State Univ. and in India was incorporated into a book coauthored with Dr. R.L. Whistler, published by Purdue Univ. Press in 1979.

"The development of the transdomestication concept was the main feature of Dr. Hymowitz's research on guar. The transdomestication concept is defined as the movement by humans of a wild species from its indigenous area to another region where it subsequently is domesticated. Guar and the tomato are examples of possible transdomesticates.

"From 1964 through 1966, Dr. Hymowitz was employed as an agronomist by the IRI Research Institute, Campinas, Brazil. In Brazil he spent 2 years collecting, identifying and maintaining legumes having potential forage value and sent a collection of about 750 accessions to the USA to be placed in the PI system. Dr. Hymowitz was also a technical advisor to the Brazilian National Soybean Commission.

"Upon joining the faculty at the Univ. of Illinois in early 1967, he was immediately sent to India for 6 months to initiate soybean production experiments at the Uttar Pradesh Agricultural Univ., Pantnagar and J. Nehru Agricultural Univ., Jabalpur. His final report and published research papers become the model for the establishment of the International Soybean Program (INTSOY) at the Univ. of Illinois. In addition he collected soybean in the Kumaon Hills of Uttar Pradesh, a physically demanding expedition since the soybean were collected from fields on mountain terraces from 1100 to 2500 meters above sea level. The soybean collected were incorporated into the PI system.

"Upon his return to the Univ. of Illinois, Dr. Hymowitz initiated a project to investigate the variation in and genetics of antinutritional and biologically active components of soybean seed. Under his direction, his graduate students and colleagues were able to elucidate the mode of inheritance of soybean seed lacking or having very low amounts of the Kunitz trypsin inhibitor, lectin, Beta-amylase, lipoxygenase-1 and urease...

"In 1974, Dr. Hymowitz and colleagues were the first to report the use of a near-infrared light reflectance instrument to estimate simultaneously the oil and protein concentration in corn, soybean, and oat seed...

"From 1972 through 1976, Dr. Hymowitz visited major herbaria in Asia, Africa and Europe in order to examine their *Glycine* specimens. During these years he also worked in the Univ. of Illinois library, examining floras, monographs, maps, historical documents, floral check lists, and plate tectonic and island biogeographical literature in order to determine the most promising exploration sites and time of year to collect wild botanical relatives of the soybean. From January to March, 1977 he made his first of three exploration trips to Australia. Since then, he or his colleagues have made *Glycine* exploration trips to Fiji, Tonga, Vanuatu, New Caledonia, Papua New Guinea, Philippines, Taiwan and the nearby Pescadores Islands, Marianas and Ryukyu Islands, and Japan. Thus far, the genomic relationships of 11 out of 14 currently recognized species in the genus *Glycine* have been elucidated by utilizing cytogenetic, morphological, isozyme and RFLP (Restriction Fragment Length Polymorphisms; see definition below) approaches...

"In 1982, Dr. Hymowitz reported the first successful interspecific hybrid between the soybean and a wild perennial species from Australia, *G. tomentella*... Dr. Hymowitz is the curator of the USDA wild perennial *Glycine* collection at the Univ. of Illinois... Dr. Hymowitz has also taken a keen interest in the history of the soybean and this has led to the discovery of the first introduction of the soybean into North America by Samuel Bowen in 1765. In further historical research he documented that the soybean was first planted in Illinois by John H. Lea in 1851. Subsequently these seeds were disseminated throughout the

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Corn Belt.

"Dr. Hymowitz has advised 11 students for the M.S. degree and eight students for the Ph.D...

"In 1974-1975 he was a visiting professor at the Hebrew Univ. of Jerusalem, Rehovot, Israel. In 1981 he received the outstanding research award from the Land of Lincoln Soybean Assoc. He is the author or coauthor of more than 200 research articles or chapters in books. The research conducted by Dr. Hymowitz is interdisciplinary, spanning the broad areas of chemistry, genetics, taxonomy, cytogenetics, plant breeding, and history of the genus *Glycine* and many other legumes."

9337. Garrett, Lynn J. 1989. Commodity feature: Soybean and soybean meal update for East Asia. *World Oilseed Situation and Market Highlights.* April. p. 40-45.
• ***Summary:*** In this excellent report, the most recent import figures are for crop year 1988-89. Countries discussed are Japan, Taiwan, Republic of Korea, Indonesia, and Philippines. Address: Agricultural Economist, USDA Foreign Agricultural Service (FAS). Phone: 202-720-2852.

9338. Kikkoman Foods. 1989. How to go lite on the salt (Ad). *New Choices for the Best Years* (*New York, NY*). April.
• ***Summary:*** This 2½ by 9½-inch, color photo ad shows a lady's index finger holding up a bottle of Kikkoman Lite Soy Sauce, which contains 40% less salt. "100% Kikkoman taste. But very light in salt. Far lighter than other brands. So now you can add the Kikkoman touch and still go Lite on the salt. Kikkoman Lite. In the oriental section of your favorite market."

9339. Mitoku Co. Ltd. 1989. Food is medicine: Mitoku macrobiotic (Ad). *East West.* April. p. 33.
• ***Summary:*** The top half of this full-page ad contains a large square red seal with four Chinese characters, read *"Ishoku Dogen,* which literally means 'medicine and food (have the) same source.' It is an old traditional saying in Japan, and its not only Oriental philosophy. In the 4th and 5th centuries BC, a Greek physician spoke of letting food be our medicine. Hippocrates taught that the effects of occupation, climate and food, were where much of the cause of illness lay. Today, modern science and medicine have begun to agree with this ancient wisdom."

"Mitoku Macrobiotic products are a selection of some of the highest quality foods in the world; Miso, Tamari and Shoyu, premium seaweeds,... mochi."

USA wholesale distribution: Granum, Seattle, Washington 98105 (206) 525-0051. Spiral Foods Inc., Asheville, North Carolina 28814 (800) 633-2156. Address: CPO Box 780, Tokyo, Japan 100-91.

9340. Morinaga Nutritional Foods Inc. 1989. The importance of packaging (Ad). *Produce News* (*Fort Lee, New Jersey*). April. Insert.
• ***Summary:*** This full-page color ad shows a well-built (well packaged), lovely smiling woman, Marcia Levine, dressed in a chartreuse, two-piece knit workout suit with an open midriff. Her left hand is behind her head, holding her hair, and her right hand is holding a carton of Mori-Nu tofu next to her right temple. The pose and angle emphasize that she has large breasts. Marcia is featured in Gold's Gym Personal Trainer Workout videos, one of which is shown beside her photo with a carton of Mori-Nu tofu. "And now Mori-Nu is proud to sponsor a new two-tape video package for the world famous Gold's Gym. These exercise tapes will give health-conscious people everywhere first-hand instruction on how tofu blends deliciously into a total fitness program.

"Stock up on the tofu that combines trade support, national advertising, consumer education and guaranteed customer satisfaction into one profitable package. Call 1-800-NOW-TOFU for Mori-Nu today."

On the back of this ad is a trade produce ad titled "How does your tofu stack up?" It shows cartons of each of the three types of Mori-Nu Tofu stacked one atop the other. The "stack up" was intended to have 2 meanings. First, can you stack up water packed tofu this neatly. Second, how does it stack up or compare on a number of key points.

According to Art Mio (1990 March 9), the two appeared as an insert in Produce News, and made a big hit. Art notes: "I love the ad myself. We got produce buyers all over the country with the ads tacked up on their bulletin boards." Danielle Lin needed an insert for several of her health food distributors. But when she sent them this back-to-back ad they would not insert it into their monthly flyer–creating a minor scandal. This ad may have also appeared as an insert in *The Packer.* Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9341. Shurtleff, William; Aoyagi, Akiko. comps. 1989. Bibliography of miso and soybean chiang: 1,604 references from A.D. 535 to 1989. Lafayette, California: Soyfoods Center. 227 p. Subject/geographical index. Author/company index. Extensively annotated. Printed April 28. 28 cm. [1604 ref]
• ***Summary:*** This is the most comprehensive bibliography ever published on miso and soybean chiang. It is also the single most current and useful source of information on this subject available today, since 54% of all references (and most of the current ones) contain a summary/abstract.

One of more than 40 bibliographies on soybeans and soyfoods being published by the Soyfoods Center, it is based on historical principles, listing all known documents and commercial products in chronological order. Containing 37 different document types (both published and unpublished, including many original interviews and partial translations of Japanese and European works), it is a powerful tool for understanding the development of this subject from its

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earliest beginnings to the present, worldwide.

Details on how to use the bibliography, a complete subject and geographical index, an author/company index, and a bibliometric analysis of the composition of the book (by language, document type, year, leading countries, states, and related subjects) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

9342. Taguchi, Takeko; Sato, M.; Yasuhira, H.; Sekiguchi, J.I. 1989. Taiensei kokyû kesson kôbo no riyô ni kansuru kenkyû [Studies on utilization of halotolerant respiratory-deficient yeast]. *Nippon Jozo Kyokai Zasshi* (*J. of the Brewing Society of Japan*) 84(4):264-69. April. [7 ref. Jap; eng]

• ***Summary:*** A respiratory-deficient yeast mutant induced from *Zygosaccharomyces rouxii* did not absorb oxygen. It fermented miso with a 13% higher fermentation efficiency and less sugar consumption that its parent strain. In a taste panel test of the two miso types, some recognized no difference and the rest considered the miso made with the mutant to be superior. Address: 1-2. The Shinshu Miso Research Inst., 469-6 Nakagosho, Nagano-shi 380; 3. Dep. of Applied Biology, Shinshu Univ., 3-15-1, Tokida Ueda-shi 386. All: Japan.

9343. Toriano, Peter. 1989. Japanese food firms cook up new strategies for U.S. consumers. *Economic World.* April. p. 22-26.

• ***Summary:*** "Riding the success of tasty, low-priced food products, the Japanese eye a bigger helping of the U.S. grocery mart." Two of the most popular Japanese food products have been soy sauce, ramen noodles, and tofu. "Nissin sold more Cup O'Noodles in the United States last year than McDonald's sold hamburgers nationally... Japanese food companies and food products are slipping under America's door unnoticed... The Japanese start selling their food products in the U.S. to a small, very concentrated ethnic market... While Kikkoman can trace exports of soy sauce to the U.S. as far back as 1869, most Japanese food companies did not export to or manufacture products in the United States in significant quantities until the 1970s...

"American food product companies focus on their competitors, whereas the Japanese tend to focus on what the customer wants...

"Kikkoman, one of Japan's largest food-related companies, is involved with wines and liquors, pharmaceuticals, health foods and a chain of restaurants. In addition to its other products, Kikkoman has introduced a shelf-stable tofu, instant miso soup and a rice wine for use in cooking.

"Kenzaburo Mogi, planning manager of Kikkoman's foreign operations department, says tofu could become as big a market as soy sauce for Kikkoman in the U.S. in the years to come. In the U.S., Kikkoman also owns 80% share of JFC (Japan Food Corp.), a major distributor of oriental food products... Consumption of Kikkoman's soy sauce has increased fivefold since 1972... On average, each Japanese consumes about 2.5 gallons of soy sauce every year; the average American consumes less than 10 oz...

"Almost a quarter of Kikkoman's total business now is outside Japan: two-thirds in the U.S. and most of the rest in Southeast Asia. The company also is targeting production in Europe, Australia and China...

"Ajinomoto Co, Japan's largest food processor, has been selling abroad since 1909, when its first overseas office opened in New York... Until the 1960s, Ajinomoto's main product was MSG (monosodium glutamate). Today, it has a more diversified line-up, with about 41% of sales coming from processed foods, and 26% from seasonings... The predominant products the firm manufactures in the U.S. are amino acids for pharmaceutical use...

"Kibun Products International Inc., a subsidiary of Kibun Company Ltd. Japan, is a major manufacturer of surimi in the U.S... Kibun is a multi-billion-dollar, 50-year-old food products company with worldwide operations totalling $2,000 million annually...

"Morinaga Nutritional Foods Inc., a subsidiary of Morinaga Milk Industry Co. Ltd., the Borden of Japan, is selling its tofu in air-tight containers that prolong freshness, eliminate water changes and is bacteria-free...

"'This could be the food of the future, replacing dairy and meat as major sources of nutrition," says Kent Cooper, spokesman for Hakuhodo Advertising America Inc. in Los Angeles, which handles Morinaga's account...

"Faith Popcorn, chairman of BrainReserve Inc., a marketing consulting company to Fortune 500 companies says America is eating healthier and is more and more concerned with where food products originate and what that does to the Earth, known as the graining/greening of America. 'Vegetarianism is growing like crazy. Americans are changing from flesh food to health food.'"

9344. PTI. 1989. Indian trade tariffs offend U.S. *Times of India* (*The*) (*Bombay*). May 1. p. 20.

• ***Summary:*** "India is described along with Japan, South Korea, Brazil, Canada and the European community as among the 'worst offenders' in putting up unfair trade barriers in a national trade estimate report (NTER) released by Mrs. Carla Hills, the U.S. president's trade representative yesterday." The president is George Bush.

Subsidies by the European community are said to deny $1.5 billion in sales of American soyabeans to Europe.

9345. Doi, Shuji; Ishige, K.; Ishida, N.; Irie, E.; Matsumoto, Y.; Hatabe, Y.; Takahashi, A.; Inoue, N.; Deguchi, N.; Ozaki, H. Assignors to Meiji Seika Kaisha, Ltd. (Tokyo); Kyushu Nyugyo Company, Ltd. (Ohita); Izumi Food Machinery

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Company, Ltd. (Osaka). 1989. Process for the manufacture of packaged aseptic soybean curd. *U.S. Patent* 4,828,869. May 9. 13 p. Application filed 8 May 1987. 4 drawings. Application also filed in Japan on 27 Sept. 1986. [8 ref]
• ***Summary:*** A packaged aseptic tofu is prepared by sterilizing dehulled and hypocotyl-removed soybeans with superheated steam, grinding the soybeans in the presence of heated water to prepare a green slurry, filtering the slurry to separate out the soy milk, heating the soy milk to sterilize it and denature the protein content, aseptically adding a coagulant, filling and sealing in an aseptic container, and then heating to effect coagulation in the container. Address: 1-2. Kawasaki; 3-4. Tokyo; 5-8. Ohita; 9-10. Hyogo. All: Japan.

9346. Demos, Steve. 1989. New developments at White Wave, Inc. (Interview). *SoyaScan Notes.* May 13. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** White Wave has just purchased a meat packing house with 23,000 square feet of processing space, fully refrigerated and built for food production, on 2.2 acres on the eastern outskirts of Boulder, on 61st Street, 7 blocks from their present plant. They are paying only $600,000 for the plant plus land; the land alone is valued at $500,000. They will take possession on May 15 and the deal is expected to close in June. They will retain their current 10,000 square foot plant for making ice cream and some new products. So they will be manufacturing in 2 places. Most offices will be at the new facility. In July, they will install an automated tofu system. During Steve's last 2 trips to Japan he has put it together, mainly from Kawanishi Shoko, which is acting as the broker but with a Masuko cooker and processing system (which do not have a heavy dependence on electronics) and Takai roller extractors. The high cost of Japanese yen prevents importation of a turnkey Japanese plant. Within the last 3 months White Wave built its own conveyorized pasteurizer and is now pasteurizing tofu sent long distance.

White Wave's sales for 1988 were up close to 30% over 1987. After-tax profits were down a little due to extensive product development and expansion. On May 15 White Wave will close on a 504 limited placement equity stock offering for $500,000, which will be used solely for new product introduction and development. The banks loaned an additional $500,000 for equipment and also financed the land and building ($600,000).

The company's new soy cheeses (private labeled TofuRella) are well accepted but have had quality control problems; the shelf life is not good. They are made by another company. White Wave's many new products and the upcoming Meatless Healthy Franks and Links are deluging buyers. White Wave products are also being distributed by Wildwood in California. Steve believes Wildwood will come to a point fairly soon where they will have to choose between being a distributor and a multi-product manufacturer. Its too complex and expensive to try to do both.

White Wave is doing well but the stress is enormous on everyone. Their business strategy is to focus on the mass market in their area, with saturation of in-store demos. They will go through the King Soopers warehouse, with no slotting allowance. He will not pay those. "Its cheaper to get your product pulled onto the market by consumer demand from a big PR campaign, than to pay slotting allowances. I have an ethical problem paying $10,000 per facing of slotting allowances. If the product doesn't move within 60 days you've lost all that money." Address: White Wave, Boulder, Colorado.

9347. Camire, Dennis. 1989. U.S., Japan join hands to put tofu on the table. *Detroit News.* May 21. p. A-7, col. 1.
• ***Summary:*** West Lafayette, Indiana. Purdue University's School of Agriculture, Mitsubishi International Corp. and the USDA are working together to create a soybean variety that will make better tofu. Mitsubishi donated about $350,000 for the study. Niels Nielsen, an agricultural geneticist at Purdue, has worked 12 years to develop a soybean whose protein does not have the characteristic off-flavor. It will be crossed with other varieties to come up with the best taste, texture, and color for tofu production. The new soybean is being developed for the Japanese market–not for Americans. This year, Indiana farmers will grow about 5,000 acres of the experimental variety.

In addition, a small tofu manufacturing plant is being established at Purdue, where production is expected to begin next month. The resulting tofu will be taste-tested by Asian students at school and by Japanese managers from a nearby Subaru-Isuzu auto plant. Address: Gannett News Service.

9348. Rickman, Phyllis C. 1989. Tokyo Rose just wants to have fun. *Washington Post.* May 21. p. M35.
• ***Summary:*** This is a review of the restaurant Tokyo Rose (2427 18th St., NW, Washington, DC). This popular Adams-Morgan Japanese restaurant, a place to have fun, "serves four tofu appetizers, one of them *hasamiage,* which two different waiters said 'tastes scary.'" The reviewer accepted the challenge and was broad-minded enough to like it, although it looked like "blintzes in a tofu wrapper."

"Cold tofu, mashed with avocado and raw quail egg, and grilled tofu with natto turned out to be only weird rather than frightening. Tofu almond fry (which seems to be broiled, rather than fried, almond-crusted bean-curd triangles) is, I'm relieved to say, delicious."

Grilled clams or oysters were served with a "sweetened soy glaze." And "sea trout or seafood brochettes are brushed with sweetened soy and caramelized under the grill so the flesh is moist and crunchy."

9349. Duggan, Patrice. 1989. Jungle road to Tokyo. *Forbes* 143:96. May 29.

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• ***Summary:*** U.S. soybean growers are concerned over the impact that the Brazilian highway BR-364 will have on Brazil's soybean trade with Japan. The highway now runs from Mato Grosso 1,240 miles northwest to Rio Branco. Pushed another 1,000 miles westward, it would reach the Pacific Ocean at Lima, Peru. This could cut the shipping time to Japan by 7 days.

9350. Renner, Michael. 1989. National security: The economic and environmental dimensions. *Worldwatch Paper* No. 89. 78 p. May. No index. 22 cm. [114* ref]
• ***Summary:*** Contents: Introduction. A world at war [the cold war]. The drain of a permanent war economy. Armaments and underdevelopment. Environment and security. From military to environmental alliances. From national to global security. Conclusion. Notes.

"Over the course of history, national security has come to be defined almost exclusively in military terms–the ability to deter or repel outside aggression... It is becoming clear, however, that this growing reliance on force is actually reducing national security... Competitive national security policies have yielded international insecurity.

"The pursuit of military power is undermining the economies of rich and poor countries alike... It can be said that Japan is the true victor in the cold war, partly a result of the fact that since 1945 it has invested a meager 1 percent of its gross national product in the military while the superpowers were engaged in an all-out arms race.

"Perhaps worst, governments preoccupied with security threats of military origin have ignored the perils of environmental degradation. But national security is a meaningless concept if it does not include the preservation of livable conditions within a country–or on the planet as a whole... On a global scale, climate change, ozone depletion, deterioration of the agricultural base, and deforestation are formidable challenges to the safety and well-being of the entire race. Environmental threats with the potential to erode the habitability of the planet from beneath us are forcing humanity to consider national security in far broader terms than that guaranteed solely by force of arms...

"Among industrialized countries, the detrimental effects of maintaining a permanent war economy are most pronounced in the Soviet Union and the United States. Both superpowers have spent enough on their armed forces to undermine their infrastructure, retard civilian research and development, and diminish economic competitiveness...

"The share of public R&D outlays that goes to the military is as high as 70 percent in the United States and an estimated 60 percent in the Soviet Union... Loans acquired for the purchase of military equipment have strongly contributed to Third World indebtedness...

"Ultimately, national security depends on *all* countries becoming part of a global environmental coalition... Reversing environmental degradation confronts the global community with an unprecedented need for stepped-up international cooperation. This monumental task cannot be accomplished without putting an end to the arms race, which claims so much of decision makers' attention and devours so much of the resources needed to halt the danger to the planet...

"The best hope for impartial conflict resolution rests with the United Nations... In many crucial respects, nations are no longer the sole masters of their destinies... Nations have 'outgrown' their borders, but the structures of nation-states remain firmly in place... 'Environmental security' offers a more fruitful basis for cooperation and security among nations than military security because it is both a positive and inclusive concept." Address: Worldwatch Inst., 1776 Massachusetts Ave. N.W., Washington, DC 20036. Phone: 202-452-1999.

9351. Smith, Keith J.; Thompson, James. 1989. History of industrial use of soybeans. In: L.A. Johnson, ed. 1989. New Technologies for Value-Added Products from Protein and Co-Products: Symposium Proceedings. Ames, Iowa: Center for Crops Utilization Research. 312 p. See p. 1-8. Unnumbered.
• ***Summary:*** This history starts in the 1920s and focuses on the USA, with several mentions of Japan. Discusses: Henry Ford (whose soybean suit woven of soy fibers cost an estimated $39,000), soy fiber production in Japan (in 1939 the Japanese produced 900,000 to 1,200,000 lb of it), soybean plastics, Azlon made of soy protein fiber [by The Drackett Co., Cincinnati, Ohio], the Northern Regional Laboratory (at Peoria, Illinois), soy flour adhesives for plywood, soy adhesives used in fiberboard boxes and shotgun shells, soy oil as a drying agent in paints (especially alkyd paints) and linoleum, soy protein paper coating, soy oil in fire fighting foams, as a rubber substitute (Norepol), as an anti-foaming agent, in fuels, printing inks, as a carrier for agricultural chemicals (with probable environmental advantages over petroleum-based carriers), and for control of explosive grain dust (at reasonably cool temperatures, it doesn't readily go rancid).

One of the first major thrusts of the U.S. Regional Soybean Industrial Products Laboratory, established in 1936, was development of soybean plastics. "Isolated soybean plastic was first attempted, then abandoned. The Laboratory had difficulties increasing its water resistance. But the intractable problem was that the protein isolate plastic didn't flow well enough to allow molding in injection dies.

"So they tried plastic made from soy meal instead. But it was even less water resistant than the protein isolate plastics, and had to be expensively treated to remove sugars and salts as well as heat-treated to denature the protein...

Today over 100 million lb of epoxodized soy oil is used as a plasticizer and stabilizer for vinyl plastics. "Soy oil is an anti-foaming agent in the aerated fermentation of

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penicillin, streptomycin and tetracyclines. An added plus is that soy oil provides nutrients to markedly increase the yield of antibiotic... Soy oil is not nearly so good a fuel as it is an anti-foaming agent. For one thing, it is too viscous for good fuel injection. It must be converted to simple alkyl esters." But these form varnish deposits on cylinder walls and fuel inlets.

"Soy oil is coming into its own as a printing ink, relatively cheaper than the soy protein dispersions that proved too expensive in the 1940s. Soybean oil is clear so that pigment shows through better than in petroleum based inks, and soy oil ink doesn't smudge onto your fingers like regular newsprint.

"And the use of soy ink in rural newspapers, and soy oil in agricultural chemicals and grain elevators brings an immeasurable public relations benefit to people who do business with farmers. This public relations benefit frequently offsets any additional cost of using soy oil. For instance, over 1,000 newspapers now print with slightly more expensive soy oil.

"Possibly the major factor in charting the soybean's course was the discovery of vitamin B-12 not long after World War II. No longer was animal protein needed in poultry and swine rations. It could simply be inserted into formulations of only corn and soybean meal. Demand for soybean meal skyrocketed, and became the chief soybean product." Address: American Soybean Assoc., St. Louis, Missouri. Phone: 314-432-1600.

9352. Westbrae Natural Foods. 1989. Distributor catalog: FOB West pricing. Spring 1989. P.O. Box 91-1181, Commerce, CA 90091. [6] + 19 p. 22 x 28 cm.
• ***Summary:*** Has a black on yellow cover. Address: Commerce, California. Phone: (213) 722-1692.

9353. Thornbury, Barbara E. 1989. A feast of tofu in Tokyo and Kyoto. *New York Times.* June 11. p. XX6, XX37. Late edition (East Coast).
• ***Summary:*** Describes three Japanese restaurants that feature tofu, one of the key ingredients in Japanese cooking: (1) Sasanoyuki in Tokyo has a history of more than 300 years. Its name means "snow on bamboo leaves." (2) Goemon in Tokyo. (3) Okutan–best known for its simmering pots of yu-dofu–in Kyoto.

Note: These restaurants are also described in *The Book of Tofu,* by Shurtleff and Aoyagi, however the present description has updated prices. Address: Princeton, New Jersey.

9354. *SoyaScan Notes.* 1989. What are soybean saponins? Can they reduce human blood cholesterol levels? (Overview). June 28. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** *Webster's Dictionary* (1983) defines saponin (derived from the French *saponine,* which is from the Latin *sapon-, sapo* = soap, and first used in 1831) as "any of various mostly toxic glucosides that occur in plants (as soapwort or soapbark) and are characterized by the property of producing a soapy lather; esp: a hygroscopic amorphous saponin mixture used esp. as a foaming and emulsifying agent and detergent."

Thus it may be the saponins (carbohydrates, water soluble sugars) in the whey which is a by-product of the tofu-making process that causes that whey to foam.

Webster's Dictionary defines glucoside (a term first used in 1857) as a glycoside that yields glucose on hydrolysis. A glycoside (first used in 1930) is defined as "any of numerous sugar derivatives that contain a nonsugar group attached through an oxygen or nitrogen bond and that on hydrolysis yield a sugar (as glucose)."

Birk and Peri (1980, p. 161) state: "The saponins are glycosides that occur in a wide variety of plants. They are generally characterized by their bitter taste, foaming in aqueous solutions, and their ability to hemolyze [break down] red blood cells."

The earliest document seen (Jan. 2005) that mentions soybean saponins was published in 1931 by E. Walz in German. In early 1979 a team of Australian researchers (led by Potter, Topping, and Oakenfull) at the CSIRO Division of Human Nutrition in Adelaide found that the cholesterol-lowering effect of soybean products was attributable to the presence of saponins rather than proteins or amino acids. Subsequent research by this group and others seemed to verify this hypothesis. Note that saponins impart an unpleasant, bitter taste to most soyfoods (e.g. tofu or soymilk) in which they are present.

In 1990 Japanese scientists from the Department of Food Chemistry at Tohoku University found that soybean saponins could control reproduction of the HIV virus which is associated with Acquired Immune Deficiency Syndrome or AIDS. These saponins showed inhibitory effects against HIV infection in vitro.

9355. Akwarius Almere. 1989. Akwarius prijs en bestelboek: Natuurvoedingsprodukten [Catalog and price list. April-June]. P.O. Box 50070, 1305 AL Almere, The Netherlands. 77 p. [Dut]
• ***Summary:*** Akwarius is a larger importer and distributor of natural food products. They have worked in this field since 1971, and have a strong interest in macrobiotic and anthroposophical foods. Contents (p. 2). Philosophy and function (p. 3). Beverages (p. 7): Sojamelk naturel and Bonsoy, Provamel Sojadrink (4 flavors in 500 ml and 4 flavors in 1 liter sizes), Provamel Soja dessert (puddings; 5 flavors in 525 gm and 1 flavor in 1050 gm).

Manna sweeteners (p. 12): Amasake drink in 350 and 700 gm sizes, and rice koji. Note that Akwarius imports and distributes large line of Manna-brand macrobiotic products

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from Muso in Japan. Manna vegetable protein products (p. 21): Dried tofu (non-organic). Bonsoy soymilk, Seitan, and three types of dried wheat gluten (fu). Manna Soy Sauces (Sojasausen, p. 21): shoyu (B = biological or organically grown, and NB = not biological, i.e. non-organic), and tamari (non-organic).

Witte Wonder (p. 22): Seitan, Tofu Spread (in paprika, garlic, celery, dill, mushroom, and pepper flavors, 220 gm sizes, all organic), Tofu in Sauces (peanut, curry-pineapple, and tomato flavors, 340 gm, organic), Tofunaise (plain and lemon flavors), Tofu Dressing (Italian, garden herbs, Mexican, and plain flavors).

Yakso (p. 23): Seitan, Tempeh Spreads (in Indonesian poesta and doeloe flavors), Temmo (round tempeh burger, deep fried then marinated, ¼ inch thick, sold 5 in a glass jar), Soyaroma (tempeh spread like butter), Sweet Indonesian-style soy sauce (Ketjap manis), Tofu Spreads (cream cheese consistency, in salsa, dill, green, shallot, and pommodore [apple?] flavors), Tofu Mayonnaise (Sojanaise), Smoked tofu (paprika, mushroom, and celery flavors in 170 gm wide mouth glass jars).

Akwarius soybeans and soybean meal/flour (p. 27-28, 35, organic). Manna Pasta (p. 28): Soya macaroni. Manna black soybeans from Hokkaido (p. 35; 350 gm, non-organic). Manna Tekka Condiment (p. 44), Manna soynuts (*Sojanootjes,* p. 45, 3 flavors). Lima soyadrink (p. 47).

Manna Miso (Sojapasta; p. 48): Brown rice miso (organic and non-organic), young rice miso (non-organic), barley miso (organic and non-organic), natto miso (non-organic), soybean miso (non-organic), instant miso soup (with and without fish, non-organic), instant miso soup with tofu. Manna sea vegetables (p. 49).

Note 1. This is the earliest Dutch-language document seen that mentions soynuts, which it calls *Sojanootjes.*

Note 2. This is the earliest Dutch-language document seen (Sept. 2013) that mentions soy cream cheese. Address: Almere, Netherlands. Phone: 03240-20800.

9356. Hesseltine, C.W. 1989. Tenpe bisei-butsu–Rizoopusu-zoku kin ni tsuite [Tempeh microorganisms–On molds of the genus *Rhizopus*]. *Shokuhin Kogyo* (*Food Industry*) 32(12):34-40. [3 ref. Jap]
Address: NRRC, Peoria, Illinois.

9357. *IITA Research Briefs.* 1989. Osamu Nakayama has joined the Soybean Utilization Unit of the Grain Legume Improvement Program as a food technologist. 9(2):8. June.
• ***Summary:*** Dr. Nakayama has been a food researcher in both the public and private sectors in Japan for some 30 years. Note: During the 1960s, he worked with Dr. Tokuji Watanabe and colleagues on pioneering research on commercial tofu production in Japan. Address: Ibadan, Nigeria.

9358. Kanasugi, Goro. 1989. Zen-Nô-Ren tenpe jigyô-kô [The Japan National Natto Association's thoughts on the tempeh industry]. *Shokuhin Kogyo* (*Food Industry*) 32(12):41-47. [Jap]
Address: Zenkoku Natto Kyodo Kumiai Rengokai, Fuku Kaicho.

9359. Kimura, Eiichi. 1989. Tenpe ni kansuru bunken kaidai–*Daizu Geppo* keisai kiji no shôkai [An introductory bibliography on tempeh–Documents on tempeh published in *Daizu Geppo*]. *Shokuhin Kogyo* (*Food Industry*) 32(12):48-54. [30 ref. Jap]
• ***Summary:*** Those articles are reprinted here. Address: Shadan hojin, Daizu Kyokyu Antei Kyokai Sha, Daizu Geppo, Henshu-nin.

9360. Matsuura, M.; Obata, A.; Fukushima, D. 1989. Objectionable flavor of soy milk developed during the soaking of soybeans and its control. *J. of Food Science* 54(3):602-05. May/June. [23 ref]
• ***Summary:*** Beta-glucosidases, enzymes in soybeans, were found to be responsible for the production of daidzein and genistein from the isoflavone glucosides, daidzine and genistin, respectively, during the process of making soymilk. Address: Research & Development Div. of Kikkoman Corp., 399 Noda, Noda City, Chiba prefecture 278, Japan.

9361. Nanseki, Teruaki; Morooka, Y.; Zakaria, A.K.; Kosugi, S. 1989. Comparative advantage analysis of soybean in an upland area of West Java: A case study of mathematical programming approach. *Palawija News* (*Bogor, Indonesia*) 6(2):3-6. June. [2 ref]
• ***Summary:*** "Economic evaluations on the comparative advantage of selected crops provide a basis for the following analyses: (1) to identify constraints on the adoption of improved and/or new technology by farmers; (2) to identify the most suitable technology for farmers: and (3) to evaluate the effects of both economic and technological change on the farming system in advance. Many research projects on agriculture in developing economies contain these analyses as a core part." Address: 1-2. National Agriculture Research Center, Japan; 3. Bogor Research Inst. for Food Crops; 4. CGPRT Centre, Bogor, Indonesia.

9362. Steinkraus, K.H. 1989. Tenpe no seizô–dentô to kindai [Tempeh production–traditional and modern]. *Shokuhin Kogyo* (*Food Industry*) 32(12):20-28. [3 ref. Jap]
Address: Cornell Univ., New York.

9363. Steinkraus, Keith H. 1989. Tenpe ni okeru bitamin B-12 no seisei [Formation of vitamin B-12 in tempeh]. *Shokuhin Kogyo* (*Food Industry*) 32(12):30-32. June. [3 ref. Jap]
Address: Cornell Univ., New York.

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9364. Ebata, Junko. 1989. History of Japan's Tempeh Discussion Society and Tempeh Research Society (Interview). *SoyaScan Notes.* July 3. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The first meeting of the Tempeh Discussion Society (*Tenpe Danwa-kai*) was held on 30 Jan. 1984 at Kyushu University. The most active founding members in the following years were Dr. Tadao Watanabe and Dr. Kiku Murata.

The purpose of the society was to establish a platform for discussion of matters related to tempeh. The first meeting was held at Kyushu University, the second in Tokyo, the third at Osaka Teikoku Joshi Daigaku, the fourth at Marusan-Ai in Okazaki, and the fifth at *Kasuga-cho Shoko-kai* (Hikami-gun, Kasuga-cho, Kuroi, Hyogo-ken). Most of the group's members were affiliated with a university, a food manufacturing company, or a government research laboratory. In 1988 the group changed its name to Tempeh Research Society (*Tenpe Kenkyu-kai*) in order to establish a more formal, research-oriented feeling and to attract new members. The 16 founding members of the new society were: Goro Kanasugi (Takuma-kai), Makio Takato (Takashin Shokuhin), Yasuko Torii (Shizen Shoku Hyoron-ka), Masaharu Horii (Norinsho Sogo Kenkyujo), Teruo Ohta (Fuji Seiyu K.K.), Eiichi Kimura (Daizu Kyokyu Antei Kyokai), Gyo Nikaido and Mikitoshi Iwatsuki (Marusan-Ai K.K.), Hajime Kashio (Nagoya Eiyo Senmon Gakko), Kiku Murata (Teikoku Gaku-en, Kyoiku-ken, Moriguchi City, Osaka), Toshiie Maeda (Tempeh Sonjuku), Machiko Asano (Teikoku Joshi Daigaku), Teijiro Miyamoto (Osaka Shidai), Tadao Watanabe (Torigoe Seifun and Kyushu Univ.), Kazuko Noguchi (Saga Joshi Tandai), Asao Matsuoka (Kassui? Joshi Tandai), and Naokazu Ohta (Kumamoto Joshi Daigaku).

The first meeting under the new name was held on 25 Feb. 1989 in Tokyo. Talks on tempeh were presented by Yasuko Torii, Nobuyuki Okada, and Toshiie Maeda. On 31 Dec. 1988 the Society had 58 members, increasing to 77 by Feb. 1989. During 1989 meetings are planned on June 24 at Osaka City Univ. and on September 1 at Teikoku Joshi Daigaku (Moriguchi city, Osaka prefecture). The group will attend the Second Asian Non-Salt Fermented Soybean Symposium at Jakarta, Indonesia. Address: Prof., Faculty of Science of Living, Osaka City Univ. Sugimoto 3-3-138, Sumiyoshi-ku, Osaka 558, Japan. Phone: 06-605-2811.

9365. Perez Baez, Oswaldo. 1989. Re: New developments with soyfoods in Venezuela. Letter to William Shurtleff at Soyfoods Center, July 10. 3 p. Typed, with signature on letterhead. [Eng]

• ***Summary:*** "In my last visit to Caracas I contacted: Prof. Makie Kodaira and Prof. Amaury Martinez of the 'Instituto de Ciencia y Tecnología de Alimentos, Facultad de Ciencias, U.C.V.' (Universidad Central de Venezuela) who are very interested in offering a theoretical and practical course about soyfoods, using their pilot plant (the second of importance in Venezuela). Prof. Kodaira studied in Hiroshima, Japan in 1977 and she is a specialist on seafoods. They would like the 'Centro de Alimentos de soya de Venezuela' to organize this course.

"I think this is the time to offer in Venezuela a complete course about soyfoods and I have thought to invite you to come to Venezuela. I am thinking about 2 courses:

"(a) One oriented to Institutional level (Instituto Nacional de Nutrición, Fundación Polar, CIEPE, Universidades, Industry, etc.) for professional people. This course could be in Caracas, Instituto de Ciencia y Tecnología de Alimentos, U.C.V.

"(b) Another one oriented to the general public (not necessarily professional level). This course could be here in La Azulita which is a rural and beautiful place, epicenter of the Venezuelan movement for alternative lifestyles.

"I have thought of the following content for these courses: (1) Soymilk. (2) Tofu. (3) Tofu and soy milk ice cream. (4) Miso. (5) Tempeh. (6) Shoyu.

"I am working on a book about soyfoods, and am enclosing an outline of the contents: I. Introduction. II. Agronomic aspects. III. Soya and food security. IV. The most important soyfoods. V. Industrial potential of the soybean. VI. Bibliography. VII. Index." Address: Ing., Centro de Alimentos de Soya de Venezuela, Granja Tierra Nueva, Aldea San Luis, La Azulita, Estado Merida, C.P. 5102, Venezuela.

9366. Morinaga Nutritional Foods. 1989. Mori-Nu Tofu: The therapeutic health food (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 3 p. July 12.

• ***Summary:*** "Tofu, most often considered a 'weird' California health food, is becoming a 'therapeutic' form of nutrition for cancer and AIDS patients across the country, according to Marsha Brook, clinical dietitian and food service director at Ventura Estates Retirement Home in Agoura Hills, Calif.

"According to Brook, many cancer and AIDS patients are unable to tolerate the foods and prepared supplements they are being served, because of nausea and/or digestion problems. The result is patients aren't getting the proper nutrients they need to become stronger and more healthy. To counteract this problem, Brook, along with many other registered dietitians, has begun incorporating Mori-Nu Tofu into her meal plans.

"She now uses tofu in creamed soups, quiche, enchiladas, lasagna, and other dishes... The patients like tofu because it tastes good, and it's very easy to digest...

"High-protein and low-price, however, are not the only reasons Brook serves tofu to the elderly. She has learned, through her studies, that animal protein high in cholesterol will wear down the kidneys over time. 'Tofu, which is a

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vegetable protein with zero cholesterol, can help extend the use of the kidney, plus it's very gentle on the system,' says Brook.

"According to Carol Kirshenbaum, registered dietitian and manager of clinical nutrition at St. Johns Hospital in Los Angeles, they too are now including tofu dishes on their hospital and cafeteria menus. 'We have found that tofu is particularly good for people that have high-cholesterol and are lactose intolerant,' said Kirshenbaum." Address: Los Angeles, California.

9367. Mio, Art. 1989. Update on Morinaga (Interview). *SoyaScan Notes.* July 19. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Morinaga sales, in terms of number of units sold, increased 30% last year. Presently sales are 60% to Caucasian Americans and 40% to Asian Americans. The main outlet is supermarkets, but about 10% is sold through natural foods stores and Diet Center outlets also sell a lot. In Feb. of 1989 Lucky Stores finally started buying Mori-Nu Tofu, and they have even promoted it with a color ad and $0.79/package price. Safeway started carrying Mori-Nu Tofu about 2 years ago, then they dropped it for a while, but started carrying it again in the fall of 1988. Address: Morinaga Nutritional Foods Inc., 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9368. Welters, Sjon. 1989. Re: Brief history of Manna Natural Foods. Letter to William Shurtleff at Soyfoods Center, July 24. 1 p. With follow-up talk on 2 Dec. 1989.

• ***Summary:*** This company was founded in about 1973 by Adelbert Nelissen and his wife Wieke Nelissen, plus Hugo van Seenus, among others. Adelbert is Sjon's brother in law (his wife's brother). Manna got started in the Rozenstraat in Amsterdam, in an abandoned house that was taken over by so-called "krakers" (counter-culture or hippie squatters). The store called "de Rozemaryn" (Rosemarin) was the first of a chain of stores which, at its peak, contained ten stores total. Hugo now owns and operates Hugo's Market in Washington, DC.

Manna was originally a foundation named Stichting Natuurvoeding Amsterdam. It kept this name until 1982. Manna started the first tofu shop in Europe that was owned and operated by non-Orientals. Opened in Amsterdam in 1977, Manna was a macrobiotic manufacturer, distributor, and retailer run by a non-profit foundation. Soon after opening, Manna was visited by entrepreneurs from Germany, England, Portugal, Denmark, France, Sweden, Austria, and Italy, hoping to learn about making tofu.

In 1975 Manna started importing miso and shoyu from Japan, initially via Muso Foods, and later also via Mitoku. But Muso was always their main supplier.

Manna filed for Chapter 11 bankruptcy or reorganization 2 or 3 times. The first time was a bankruptcy in March 1982. All their property was sold at an auction, but was bought back by a new foundation owned by basically the same people and the same foundation at one-third the value. It was probably at this time that Manna's name was changed from Stichting Natuurvoeding Amsterdam to Manna Natuurvoeding B.V. The company was back on its feet by 1983 but then things didn't work out again. At the last moment before declaring bankruptcy, they got financing. But this time the bank took the Foundation out of the picture, so that the foundation was not giving the collateral for loans. The person behind the foundation, Adelbert Nelissen, became the director/president of the holding company. He probably did not have majority ownership. But at this time (May 1983) Sjon and most of the management left.

In about late 1983 or early 1984 Manna moved all operations from Meeuwenlaan in Amsterdam to Zwanenburg. The former section of Amsterdam was torn down by the city. The third time was in 1987, when the company was disbanded. At that time Adelbert became inactive. The government-appointed curator tried to get as much as possible for the assets. The macrobiotic Manna brand name and the inventory of imported Japanese foods was purchased by Akwarius, which was located in Almere in a building constructed along anthroposophic guidelines (before about 1986 they had been located in the province of Utrecht). The production facility at Zwanenburg and its equipment was purchased (mainly for the bakery) by a conglomerate of 3 natural food companies, including Akwarius and Loverendale (the largest baker of natural yeasted breads in the Netherlands). They made Manna tofu for a year or two, then facing stiff competition, sold off the tofu equipment piecemeal. They ran the Manna sourdough bakery there until 1988, then moved it to Loverendale headquarters, and closed down the Zwanenburg production facility.

Akwarius is a company based on the anthroposophical philosophy of Rudolf Steiner. They were founded in about 1974. In Holland there were 4 types or philosophies of natural foods distributors: (1) Anthroposophical (Akwarius); (2) Macrobiotic and natural foods (Manna); (3) Ecological (Kleine Aarde [Small Earth; inspired by E.F. Schumacher's book *Small is Beautiful*] and De Nieuwe Lelie [The New Lily]); and (4) Reform movement/vegetarian (VNR: Vereniging van Nederlandse Reformhuizen = Union of Dutch Reform Houses, and Scholten [which was also the exclusive importer of Lima products from Belgium]).

Talk with Sjon Welters. 1994. April 4. Manna and Lima sold only vegetarian foods; they did not sell any fish, poultry, or meat. All these early Dutch natural foods companies were this way because no natural food store would sell fish or other flesh products; they were just not acceptable. Some years after they started they used eggs in a few products but they were always vegetarian. The only people who

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ever got involved in flesh foods in the early stages were the Anthroposophic / Biodynamic people because its part of their philosophy, but even in the beginning they didn't sell meat to the stores because customers didn't want it. Address: Craft International Consultants, 21 Wetherbee St., Acton, Massachusetts 01720. Phone: 508-264-4011.

9369. Business Trend Analysts, Inc. 1989. The health and natural food market: A product-by-product marketing analysis and competitor profile. 2171 Jericho Turnpike #342, Commack, NY 11725. 280 p. Price $950.00. *
• ***Summary:*** Section 6 of this report is titled "The Market for Soyfoods" (24 pages). It projects 6.2% growth for the soyfoods industry, and contains the following (much of it provided by Soyatech, Inc. and Soyfoods Center): Analysis and summary. Manufacturers' sales of soyfoods. Manufacturers' sales of soyfoods to major outlets. Manufacturers' sales of soyfoods, by type of outlet. The top six soymilk producers in the U.S. U.S. per capita consumption of soymilk. Retail sales of soyfoods. Retail sales of soyfoods at major outlets. Retail sales of soyfoods, by type of outlet. Graph: Product mix of U.S. soyfood sales. Estimated mix of distribution channels used to market various soyfoods. U.S. soybean production. Characteristics of women's use of soy sauce. Quick Tamari tips. Selected 1988/89 new product introductions: Soyfoods.

Under "Report Highlights and Special Features" we read: "Soyfoods continue to gain popularity with mainstream consumers, as sales are expected to top the $380 million mark, at the wholesale level, by year-end. At the retail level, sales of tofu alone are currently pegged at $77 million, with supermarkets capturing close to 60% of dollar volume."

Overall report Contents: 1. Executive summary. 2. The overall market for health and natural foods (including Soyfoods 1979-1988, with forecast to 1998). 3. The market for health and natural dairy foods. 4. The market for health and natural grocery products. 5. The market for health and natural snack food products. 6. The market for soyfoods. 7. The market for health and natural grains and cereals. 8. The market for health and natural frozen foods. 9. The market for herbal products. 10. Distribution channels. 11. Factors affecting demand. 12. Trends in organic farming. 13. Competitor profiles: Alta-Dena Certified Dairy, Arrowhead Mills, Barbara's Bakery, Celestial Seasonings, Golden Temple, San-J International, Thompson Kitchens. Tivall U.S.A./Garden Gourmet, U.S. Mills (partial list). 14. Directory of more than 200 health and natural food producers. Address: Commack, New York. Phone: 516-462-2410.

9370. Chen, Steve. 1989. Preparation of fluid soymilk. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 341-52. Contains 8 tables and 9 diagrams. [41 ref]
• ***Summary:*** Contents: Development & history of soymilk (based on *Soymilk Industry and Market* by Shurtleff & Aoyagi). Problems of soymilk production: beany flavor, trypsin inhibitors, flatulence factors. Basic steps in soymilk production. Methods of soymilk production. Yields of soymilk: Typically 70-80% of the protein and 55-60% of the solids from soybeans are recovered in the soymilk. Soymilk standards and quality control. Cost and price of soymilk production. Soymilk utilization and types. Nutrition of soymilk. A photo shows Steve Chen. Address: American Soybean Assoc., P.O. Box 3512, Taipei, Taiwan ROC 10099.

9371. Coffey, Rory. 1989. Lupins as an energy-rich protein source for feed and food. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 410-14.
• ***Summary:*** Contents: Abstract. Introduction. Lupin consumption and usage. Dehulled lupin. Human consumption: Lupin concentrate, miso soup, lupin tempeh, lupin flour.

Miso soup: Although about 200,000 tons of soybeans are used each year in Japan to make miso soup, there is a problem with oxidation, which causes discoloring. The Shinshu Research Institute has investigated the use of lupins as a substitute for soybeans in an attempt to solve this problem. Oxidation does not occur with lupins and to date results have been encouraging. Table 8 shows a sensory evaluation of the two types of miso (high score is more favorable): Color–Lupin 12, soy 0; Taste–Lupin 10, soy 2; Aroma–Lupin 7, soy 5; Texture–Lupin 6, soy 6.

Lupin tempeh: In 1986 an Indonesian company began to investigate the feasibility of using lupins as a substitute for soybeans in making tempeh–with the assistance of the Grain Pool of Western Australia and R. Yu of the Victorian Food Research Institute. Despite some problems at the beginning, the efforts by all 3 parties have proved successful and the Indonesian company is now using a significant tonnage of lupins to make tempeh.

Lupin flour: In 1987, the Grain Pool initiated an evaluation of lupin flour in human food products.

Lupins have been grown and used in Western Australia for over 30 years. After extensive genetic engineering, the composition of the present day varieties is far superior to those grown originally. Over 90% of the lupins grown in Western Australia, and all that are available for export, are varieties from the species *Lupinus angustifolius,* a sweet, white, narrow leaf lupin.

In terms of world lupin production in 1985, Australia has the largest area (606,000 ha), followed by the USSR (280,000), and Europe (148,000). In the USSR and Eastern

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Europe much of the lupins are grown for forage or green manure; not much grain is harvested. A photo shows R. Coffey. Address: Grain Pool of Western Australia, Grain Pool Bldg., 172 St. George's Terrace, Perth 6000, Western Australia, Australia.

9372. Dawson, R.J. 1989. Concerns in regulating vegetable food proteins. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 230-33.
• ***Summary:*** "Vegetable food proteins, being nutrients and not additives in most countries are subject to general food legislation, which is based on quality protection, safety, nutritive value and organoleptic criteria. In addition they are subject to regulation for use as food ingredients. There are many countries in the world, e.g., Belgium, Canada, Denmark, Finland, France, Federal Republic of Germany, India, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Peru, Sweden, U.K., U.S.A. and EEC, which have established national and group regulations for the use of vegetable proteins in food.

Contents: Assessment of the present situation. Codex Alimentarius Commission: It was established as an intergovernmental body in 1962 by FAO and WHO to ensure fair practices in international trade and protect the health of the consumer; It has established more than 200 individual commodity standards. Creation of a Codex Committee on Vegetable Proteins (CCVP) in 1978. Activities of the CCVP: Elaboration of international standards for vegetable protein foods. Codex criteria applicable to commodities: Regulation of the use of vegetable proteins in food, use of VPP [vegetable protein products] for their functional properties, use of VPP to increase content of utilizable protein, use of VPP in partial or complete substitution of the animal protein in foods, use of VPP as sole protein source in products with new identities, quantitative methods for the differentiation of vegetable and animal protein. Address: Food and Agriculture Organization of the United Nations, Via Delle Terme di Caracalla, 00100 Rome, Italy.

9373. deKieffer, Donald E. 1989. Government-imposed restrictions on international trade in proteins. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 17-24.
• ***Summary:*** Contents: Abstract. Introduction (Theory of competitive advantage, cartelization, deregulation). The problem: World oversupply of protein products. Government interventions in oilseeds: The European Community (proposed EC consumption tax, European import barriers, EC policy on rapeseed, Spain's domestic consumption quota, Spain's export subsidies, Portugal's domestic consumption quota), Brazil (differential export taxes, preferential export financing, tax exemptions and deductions, minimum price system), Argentina (the Reembolso, the differential export tax system, price support system), Malaysia (differential export duty system), Japan, the United States (the guaranteed loan program, PL-480 and GSM credit programs, tropical oils bill, the drought bill, import barriers), Canada. Government interventions in dairy trade: European Community, United States, Canada. Government interventions in dairy trade. Discussion.

"Japan is a major importer of oilseeds and oilseed products... Imports of U.S. soybeans for crushing alone amounted to $784 million last year." However Japan "maintains a monopolistic import regime that combines high tariffs and nontariff trade barriers designed to protect Japan's processing industries." Japan's government "requires that formula feed contain specific amounts of domestic cornmeal and 2% fish meal for on-farm mixing intended for resale. These requirements limit the incorporation of alternative products in the mixture. The U.S., for example, has been able to export soybeans to Japan, but not soymeal. If Japanese farmers were able to eliminate expensive fish meal from the feed, exporters argue, they could replace it with imported soybean meal."

A photo shows Donald deKieffer. Address: Pillsbury, Madison & Sutro, Suite 1100, 1667 K St. N.W., Washington, DC 20006.

9374. Hanaoka, Toshio. 1989. Miso preparation and new uses. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 369-74. Contains 4 tables and 4 figures. [27 ref]
• ***Summary:*** "The prototype of miso was introduced to Japan from Korea at least 1,300 years ago. Misho (the original type of miso) was first cited in Taihouryou in 701 A.D. Although the production method for misho was not described, it probably resembled soybean miso today. In the northeast district of China, it was called 'misun,' and in Korai (located in north Korea 935 to 1392 A.D.) 'misso' and in south Korea 'mijo.' The process includes pounding and mashing of cooked soybeans, shaping into balls, wrapping in rice straw, hanging the wrapped materials under the eaves and mixing with salt and water and often was seen at farmhouses in prewar Japan... Miso originally was made at Buddhist monasteries for internal and use in aristocratic circles.

"Another route of introduction was from China to Japan by Buddhists and envoys who produced fermented soybean foods such as Kinzanji-miso. The difference of this process from the Korean process was to make koji from cooked whole soybeans with barley or wheat without pounding.

"The industrial production of soybean miso was started in Aichi prefecture in 1625 and that of rice miso in 1645 at

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Sendai as the original of Sendai miso today... Thereafter, the number of miso factories increased gradually in the Tokugawa period (1600-1867) and rapidly up to about 5,000 at the end of World War II. Recently, miso factories introduced many advanced facilities and equipment for economical and hygienic production. The number of miso factories was reduced to about 1,700, amalgamating to large scale factories of which capacity was over 3751 tons in 1984. They produced 353,000 tons equivalent to 59% of total industrial production. Employing 182,000 tons of soybeans, 104,000 tons of rice, 23,000 tons of barley and 72,000 tons of salt, *ca.* 568,000 tons of miso were produced by all factories in 1985. In addition, the amount of home-made miso is roughly estimated as 60,000 tons. The amount of miso supplied per capita was 4.9 kg in 1987...

"Ninety per cent or more of miso is used as an ingredient of soup in Japan... Daily per capita consumption was 28 to 30 g during the years from 1951 to 1959. From that time until 1985, it gradually decreased to the level of 16 g which is enough to prepare one bowl of miso soup." Address: Hanamaruki Inc., 4-22-10 Himonya, Meguro-ku, Tokyo 152, Japan.

9375. Hesser, J.M. 1989. World food uses of vital wheat gluten. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 116-22. Contains 2 pictures and 12 tables. [11 ref]

• ***Summary:*** Contents: Abstract. Introduction: Functional properties: Composition and general properties, Codex Alimentarius International Standard for vital wheat gluten, viscoelasticity, water absorption, pH effects, flavor, nutritional properties, Protein Efficiency Ratio of wheat gluten blended with soy flour in various ratios.

Applications: Milling and flour fortification, bakery products, breakfast cereals, meat, fish and poultry products, pasta, cheese analogs and pizza, nutritional snacks, breadings, batter mixes, coatings and flavorings, pet foods, aquaculture feeds. New applications.

World production, consumption and capacity: Comparison of wheat gluten production by major geographical areas–1980 and 1987, 1987 EEC wheat gluten capacity and production by country, worldwide end uses for wheat gluten in 1980 and 1987. World market: Overview of 1987 supply and trade by major geographical regions, Australian, European and North American wheat gluten consumption by end-use amount (in 1,000 tons) and percent, Argentine wheat gluten demand by end-use, Japanese wheat gluten demand by end-use. Product quality. Acknowledgment. A photo shows J.M. Hesser.

The Protein Efficiency Ratio of wheat gluten is low (only 0.8), compared with 2.0 for soy flour; but a 30:70 blend has a PER of 2.4.

The world's major wheat gluten producing areas in tons (1980 / 1987) are: Europe 29,500 / 132,300 (89% of this is produced in EEC countries), North America (USA, Canada, and Mexico) 30,000 / 54,000, Australia 24,000 / 45,000, South America 2,000 / 7,000, Japan 3,000 / 6,700.

1987 EEC wheat gluten production by country: Netherlands 24,000, United Kingdom 22,500, Germany 22,000, France 20,000, Others 11,800: Total: 118,300.

Changes in worldwide end-use patterns for wheat gluten 1980 / 1987 (percent): Baking 77 / 63, milling (flour fortification) 4 / 14, meats 0 / 5, pet foods 10 / 8, cereals 3 / 2, other 6 / 8.

Overview of 1987 wheat gluten production / net imports / consumption by major geographical regions (tons): Europe (EEC) 118,300 / -20,000 / 98,300, North America 54,000 / 35,600 / 89,600, Australia 45,000 / -26,900 / 18,100, Japan 6,700 / 3,300 / 10,000, South America 7,000 / -2,500 / 4,500. Address: International Wheat Gluten Assoc., 4510 W. 89th St., Prairie Village, Kansas 66207. Phone: 913-341-1155 or 1156.

9376. Johnson, Dale W.; Kikuchi, S. 1989. Process for producing soy protein isolates. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 66-77. Contains 9 figures (diagrams and graphs) and 13 tables. [34 ref]

• ***Summary:*** Contents: Abstract. Introduction. Properties of soy protein isolates. Typical analyses of commercial protein isolates. Comparison of some functional properties of isolates. Discussion of processing conditions: Raw material, water characteristics, extraction conditions, fiber in spent flakes, temperature for processing, curd processing, spray driers, flavor, ultrafiltration studies and phytate removal. Swollen gel technology: Separation efficiency. General comments. A photo shows one of the authors. Address: 1. Food Ingredients (Minnesota) Inc., 2121 Toledo Ave. N., Golden Valley, MN 55422 and Dep. of Chemical Engineering and Material Sciences, Univ. of MN, Minneapols, MN 55455; 2. The System New Life Inc., 1201 2-19-17 Takanawa, Minato-ku, Tokyo 108, Japan.

9377. Jolly, Lindsay; Borrell, B.; Perkins, P. 1989. World trade in vegetable proteins in the 1990's. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 10-16. Contains 6 charts and graphs. [17 ref]

• ***Summary:*** Contents: Abstract. Introduction. The vegetable proteins market: Demand for vegetable proteins, supply of vegetable proteins, historical developments. The future for protein meals: Income and population growth in

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developing countries, changes in policy, European Economic Community, Japan. Discussion.

A photo shows one of the authors. Address: Australian Bureau of Agricultural and Resource Economics, Canberra ACT, Australia 2602.

9378. Karta, Susani K. 1989. Traditional Chinese soyfood. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 382-87. [18 ref]
• ***Summary:*** Contents: Abstract. Introduction. Variables in manufacturing tofu: Soybean variable, processing variable, maceration and extraction (soaking and grinding) stages, filtration and heating stages, coagulation stages, types and concentration of coagulants used in tofu manufacturing. Tofu products.

Tables: (1) Chinese nonfermented soy food products. Five columns show: Food items, Chinese names, organisms used, description, uses. The soy foods are: Fresh green soybeans (*mao-tou*). Toasted soy powder (*tou-fen*) (Description: "Ground toasted dry soybeans, nutty flavor"). Soy sprouts (*huang-tou-ya*). Soy milk (*tou-chiang*). Soy milk film / yuba (*tou-fu-pi*). Soybean curd (*tou-fu*).

(2) Chinese fermented soy food products. Five columns (same as table 1) The soy foods are: Fermented whole soybeans (*tou-shih*). Soy sauce (*chiang-yu*). Soy paste (*chiang*). Fermented tofu (*so-fu* [*sic*]). Actinomucor or Mucor molds are used. Description: Creamy cheese, mild flavor, salty. Uses: Relish, also cooked with meat or vegetable.

(3) 1987 consumption of soybeans as foods in Asian countries. The results are presented here in descending order of per capita consumption: Per capita soybean consumption, country (population), total soybean consumption in 1,000 tonnes. 13.3 kg/capita, Taiwan (19.6 million), 260,000 tonnes. 9.3 kg/capita, Japan (122.2 million), 1,141,000 tonnes. 9.0 kg/capita, Indonesia (175 million), 1,575,000 tonnes. 7.8 kg/capita, South Korea (42.1 million), 330,000 tonnes. 7.7 kg/capita, Singapore (2.6 million), 20,000 tonnes. 6.9 kg/capita, China (1,062 million), 7,325,000 tonnes. 3.4 kg/capita, Malaysia (55 million), 55,000 tonnes. 2.2 kg/capita, Thailand (53.6 million), 118,000 tonnes. 0.3 kg/capita, Philippines (61.5 million), 18,000 tonnes. (4) Nutritional composition of traditional nonfermented foods: Fresh green soybeans, toasted soy powder, soy sprouts–raw, soy milk, soy milk film / yuba, tofu (Source: *Food Composition Table for Use in East Asia,* 1978). (5) Nutritional composition of traditional fermented foods: Fermented soybeans [tou-shih], soy sauce, soy paste [doujiang], fermented tofu (Source *Food Composition Table for Use in East Asia,* 1978).

In China, fried tofu is called Tou-Pok. Address: American Soybean Assoc., 541 Orchard Rd., #11-03 Liat Towers, Singapore 0923, Republic of Singapore.

9379. Kumoda, Yasuo. 1989. Re: Tofu as a potentially hazardous food. Mori-Nu Tofu does not require refrigeration. Letter to Mr. Maurice Guerrette, New York State Dept., Division of Food Inspection Services, One Winners Circle, Albany, NY 12235. 2 p. [1 ref]
• ***Summary:*** This is one of the first letters sent by Morinaga to the department of health in each of the continental 48 states as a result of health inspectors in upstate New York wrongly removing Mori-Nu Tofu from several stores. "We have been informed of recent efforts on the part of health department officials to impact and cite stores that are not conforming to the FDA Model Food Sanitation Code regarding water-packed tofu (soybean curd). We commend this action but seek your advice on the following:

"* The Retail Food Protection Information Manual Interpretations on 'Soy Protein Products Considered to be Potentially Hazardous Food' clearly state that any soy protein products, including tofu, are to be considered potentially hazardous foods and must be maintained at safe food temperatures of at least 45ºF or below.

"* We know of some instances where water-packed tofu was ordered relocated to dairy or deli cases due to the inability of produce department refrigeration units to maintain temperatures within the FDA guidelines."

The letter then explains that aseptically packaged Mori-Nu tofu does not need to be refrigerated, yet that some inspectors, unaware of this, have erroneously ordered it to be moved out of the produce section and into refrigerated dairy or deli cases. It asks if the state would be willing to issue a memorandum concerning Mori-Nu's exemption, or provide Morinaga with a list of local food inspection offices so that Morinaga might contact them directly. Address: General Manager, Morinaga Nutritional Foods, Inc., 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9380. Noguchi, Akinori; Isobe, S. 1989. New food proteins, extrusion processes and products in Japan. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 375-81. Contains 5 tables and 9 figures. [9 ref]
• ***Summary:*** Contents: Abstract. Introduction. Wet extrusion cooking of defatted soy flour: Influence of barrel temperature and pH on the extrudate strength, thermoelasticity of soy protein and application of injection molding, possible model of texturization process of DSF [defatted soy flour] in extruder. Some examples related to TVP [textured vegetable protein] research by the Association of Research and Development on Extrusion Cooking: Preparation of very porous TVP from soy protein concentrate, sterilization and

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granulation of wet okara for making "Tenpei" and culture media for mushroom. A photo shows one of the authors.

Figure 1 shows Japanese production of vegetable protein products (ingredients made from wheat or soy protein) in 1975, and yearly from 1983 to 1987. It increased from 37,000 tonnes in 1975 to 60,000 tonnes in 1987, but growth was static from 1983 to 1987. In 1987 59% of the total was soy protein and 41% was wheat protein.

Figure 2 shows Japanese 1987 production of four types of vegetable protein ingredients: Soy flour 18,000 tonnes, Soy fiber or granules (90% is frozen) 17,000 tonnes; Wheat fiber or granule (2% is frozen) 15,000 tonnes; wheat protein flour 8,000 tonnes. Address: Food Engineering Lab., National Food Research Inst., 2-1-2, Kannondai, Tsukuba, Ibaraki 305 Japan.

9381. Sera, Karl H.G. 1989. Utilization of full-fat soybeans for dairy cattle. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 308-11. Contains 4 graphs. [16 ref]
• ***Summary:*** Contents: Abstract. Introduction. Limitations on concentrate feeding: Protein feeding, body condition scores, nutritional management factors to consider, ideal period for feeding full-fat soybean, factors to consider in feeding rumen non-degradable protein. Summary on utilizing full fat soybean. A photo shows Karl Sera. Address: American Soybean Assoc., Akasaka Tokyu Building, 11th Floor, 2-14-3 Nagata-cho, Chiyoda-ku, Tokyo 100, Japan.

9382. Sera, Karl H. 1989. The use and outlook of full-fat soybean and soybean meal in Japanese commercial feeds. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 408-09. [5 ref]
• ***Summary:*** Contents: Abstract. Introduction: Soybean meal for feed use, soybean meal, a major protein ingredient in feed, full fat soybeans for feed. Future of feed and livestock industry. Future of soybean meal and soybean use for feed.

A shows Karl Sera. Address: American Soybean Assoc., Akasaka Tokyu Bldg., 2-14-3 Nagata-cho, Chiyoda-ku, Tokyo 100, Japan.

9383. Takebe, Takaaki. 1989. World vegetable protein quality concerns. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 28-30. Contains 4 charts and graphs.
• ***Summary:*** Figure 1 shows the protein content of soybeans imported into Japan from 1969 to 1988. The protein content of the soybeans has declined constantly for the three types shown. U.S. I.O.M. soybeans have dropped the most, followed by ordinary U.S. soybeans, then Chinese soybeans. I.O.M. soybeans are still the highest at 36% protein. Japan wants soybeans with a high protein content.

Figure 2, world consumption of agrochemicals, shows that it is rising faster than production of grains and soybeans. Figure 3 shows that the region of greatest agrochemical use is Western Europe, followed by East Asia, and the USA. Agrochemicals account for 7% of the cost of soybeans, higher than any other commodity–followed by cotton, sugar, corn, rice, and wheat. This will "naturally result in higher risks of contamination." A photo shows T. Takebe. Address: Oils and Fats Dep., Mitsubishi Corp., 5-2 Marunouchi 2-chome, Chiyoda-ku, Tokyo 100, Japan.

9384. Taniguchi, Hitoshi. 1989. Novel traditional and manufactured soy foods in Japan. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 444-48.
• ***Summary:*** Contents: Abstract. Introduction. New soy processed materials in soy bean consumption. Contemporary soy food products. Classification of new soy protein products in Japan. Utilization and popularization of new soy protein products: Soy protein isolate, textured soy protein.

"In Japan, the classification of new soy protein products is based on the form of the products; the new soy protein products are classified into three groups, namely, powdered soy protein, granular soy protein and fibrous protein, and it is required that labeling of each product shall bear a protein content statement in 5% steps." Address: Fuji Oil Co. Ltd., 1-sumiyoshi-cho, Izumissano-shi, Osaka FU 590, Japan.

9385. Uchida, Kinji. 1989. Trends in preparation and uses of fermented and acid-hydrolyzed soy sauce. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 78-83. Contains 8 figures (diagrams and graphs) and 5 tables. [18 ref]
• ***Summary:*** Contents: Abstract. Introduction. Production and consumption of soy sauce in Japan: Processes of manufacturing soy sauce, treatment of raw materials, koji-making, moromi-mash fermentation and aging, pressing, refining. Microbiology of soy sauce manufacture: Breeding of hybrid koji-molds by the use of cell-fusion technique, isolation and application of metabolically diverse soy pediococci in the fermentation. A photo shows K. Uchida. Address: Kikkoman Corp., 399, Noda, Noda-shi, Chiba-ken 278, Japan.

9386. Thornbury, B.E. 1989. Global pursuits: Salad doughnuts and other Japanese delicacies. *Washington Post.*

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Aug. 6. p. E1.
• ***Summary:*** She first arrived in Japan 15 years ago, and when she is away, her thoughts begin to dwell on all the treats that she is missing. "But one of the greatest gustatory challenges of Japan comes in the form of beans: the little red [azuki] beans that are boiled, mashed, sugared and turn up with regularity in traditional Japanese sweets; and the soybeans that are fermented until they are slimy and odoriferous and then served–sometimes whipped up with raw egg, mustard and onion–and poured over hot rice. The latter are called *natto.* When you say that you are a devotee of Japanese food, you will invariably be asked, 'But do you like *natto?* Answer honestly. Many Japanese people don't care for *natto* either.'"

9387. *Toyo Shinpo* (*Soyfoods News*). 1989. Tôfu no kakei shôhi was teichô: Natsu no hiyayakko juyô ni kitai [Tofu's domestic consumption is low: Expecting the demand for chilled tofu in summer]. Aug. 11. p. 7. [Jap]
• ***Summary:*** In 1988 Jan. to April, per household national average tofu consumption, ¥2008 (97.5% of the same period in 1987). 24.75 cakes (95.2% of 1987).

Number of cakes of tofu per year per household:
1979 87.02.
1980 86.89. 1981 86.91. 1982 87.54. 1983 90.43. 1984 89.16. 1985 88.48.
1986 85.40. 1987 86.43. 1988 85.07.

9388. Morinaga Nutritional Foods. 1989. Mori-Nu Tofu sponsors internationally-famous Gold's Gym personal workout video (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 2 p. Aug. 14.
• ***Summary:*** "Morinaga Nutritional Foods... has announced that it will officially sponsor the first-ever personal workout video series from the internationally-famous Gold's Gym.

"The Gold's Gym Personal Trainer Series includes one 46-minute beginners exercise video and a 55-minute intermediate tape. The two-tape package features Gold's Gym personal fitness instructors Marcia Levine and Christian Duffy as well as a variety of drop-in guest celebrities, top athletes and physique stars...

"'We thought getting behind Gold's was a natural because fitness without nutrition is self-defeating,' said Arthur Mio, national sales manager for Mori-Nu Tofu. Mori-Nu will feature an instructional commercial spot starring Levine introducing the Mori-Nu Tofu Shake...

"Scheduled for release in early October, the Gold's Gym Personal Trainer Series will be available at a variety of consumer retail outlets nationwide. Suggested retail price is $24.95 including a free two-week membership to Gold's Gym, worth approximately $50." Address: Los Angeles, California. Phone: 213-728-4325.

9389. Welters, Sjon. 1989. Early involvement with soyfoods and Manna in the Netherlands (Interview). *SoyaScan Notes.* Aug. 15. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Sjon was born in 1955. He completed high school plus one year at the National Academy of Fine Arts. Then he dropped out to pursue his interest in the natural foods movement. He got involved with soyfoods when he became a vegetarian in 1973. In Sept. 1975 he started to work for Manna. During 1975-76 he did a lot of experimentation with soyfoods production while working at Manna, and he was involved in selling the shoyu and miso that Manna had been importing from Muso in Japan since 1975. In Sept. 1977 Sjon left Manna and started his non-profit natural foods foundation (Stichting Natuurvoeding Alkmaar) and his own natural foods store, both at Alkmaar (pronounced AL-ek-mayr), the Netherlands, based on the model established by Manna. During 1980-81 Sjon's foundation merged with Manna's foundation and Sjon started to work as director of operations at Manna, and he first became involved with the production of tofu and seitan. During the early 1980s Sjon was an editor of the *Manna Bulletin.* Address: Craft International Consultants, 21 Wetherbee St., Acton, Massachusetts 01720. Phone: 508-264-4011.

9390. Morinaga Nutritional Foods. 1989. Mori-Nu Tofu introduces new in-store display stand (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 2 p. Aug. 17.
• ***Summary:*** "Morinaga Nutritional Foods has introduced a new in-store display unit, which will enable Mori-Nu Tofu to be merchandised in the refrigerated or non-refrigerated section of health food stores nationwide.

"The new stand will allow aseptically packaged Mori-Nu Tofu to be positioned in either the deli or produce section in contrast to water-packed tofu, which must be refrigerated." Address: Los Angeles, California. Phone: 213-728-4325.

9391. Roth, Martin. 1989. Early history of Great Eastern Sun and subsequent work with soyfoods (Interview). *SoyaScan Notes.* Aug. 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Other records describe in detail Martin's pioneering work with commercial production of Brown Rice & Tofu Sandwiches, Sweet White Miso, Amasake, Amasake Shakes, and America's first Amasake Ice Cream. In 1982 he and his very close friend Barbara Svenning Garvey (they were never officially married) moved from Boulder, Colorado, to Miami, Florida, then to North Carolina. Martin met Barry Evens in Florida and Barry commissioned Martin to go to North Carolina and set up a macrobiotic distribution and import company near the American Miso Co., of which Barry was then the principal owner. "The beginning of that company was a wonderful experience. Everybody was

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thrilled. We were the first ones to actually take a full line of Japanese foods and present it to the health food stores in a big way. At that time Erewhon still had a much more limited selection of Japanese imports, such as miso, tamari, soba, etc. We had only imports, 200 to 300 esoteric items that many people never heard. We put together a nationwide sales force and went store to store, introducing the concept of a macrobiotic section. We put that on the map. We had great success, opening hundreds of accounts. I left in about 1984 because I got an opportunity to work for Westbrae as sales and marketing manager, and North Carolina was not my favorite place to live." Martin developed the concept, the name, and the graphics for the Westbrae Malteds and for Mitoku's Supersoy. Address: Berkeley, California. Phone: 415-527-7066.

9392. Ebine, Hideo. 1989. Re: Retirement dates of soyfoods researchers from the National Foods Research Institute, Japan. Letter to William Shurtleff at Soyfoods Center, Aug. 28. 1 p. [Eng]
• ***Summary:*** Masahiro Nakano retired in 1967, Watanabe Tokuji in 1977, and Hideo Ebine in 1982. The National Food Research Institute moved from Tokyo to Tsukuba in Feb. 1989. Address: Central Miso Research Inst., Shinkawa 1-24-19, Chuo-ku, Tokyo 104, Japan. Phone: 03-551-7161.

9393. Morinaga Nutritional Foods, Inc. 1989. Water hazard. Life preserver (Ad). *Supermarket News.* Aug. 28. p. 24.
• ***Summary:*** This controversial ad, the first one in which one tofu manufacturer publicly (but only in trade publications) criticized typical water-packed tofu, infuriated most larger tofu makers in America. It also appeared in *Produce Business* (Aug. p. 16-17) and in *Natural Foods Merchandiser* (Sept. p. 74-75), but by October it was withdrawn.

Color photos show two packages of tofu. On one side, by a typical container of water-packed tofu is the bold text "Water Hazard. Old-style water packed tofu can leak all over and create a mess. Then there's the shrink, with a shelf life of mere days. And once your customer gets it home, the water must be changed daily." Next to a package of Mori-Nu is the bold text "Life Preserver. Mori-Nu Tofu, on the other hand, is aseptically packaged. Airtight. Bacteria tight. And water tight. With a shelf life of 10 months without refrigeration or preservatives. Very safe. Very convenient."

On 8 Sept. 1989 William S. Freeman of the law firm Cooley Godward Castro Huddleson & Tatum in San Francisco wrote a 3-page letter to Morinaga on behalf of their client, Azumaya, citing what they considered to be four malicious and untrue statements in the ad and demanding that Mori-Nu immediately cease running the ads. Freeman argued that (1) not all water pack tofu presents a potential health hazard, (2) water pack tofu that is pasteurized does not have "a shelf life of mere days," (3) water pack tofu is no more likely than Mori-Nu's to "leak all over and create a mess," and (4) the water in water pack tofu does not need to be changed daily while it is refrigerated. Morinaga's legal counsel, Jorge Arciniega of Whitman & Ransom in Los Angeles, responded with a 4-page letter to Freeman on Sept. 22. Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9394. Belleme, John. 1989. Natural soy sauce: A brewing controversy. *Solstice* No. 37. Summer. p. 10-12. [1 ref]
• ***Summary:*** "A San-J placard [shelf talker] sent to thousands of retail stores [about 6 months before this article] says: 'You will notice that all San-J soy sauce has alcohol as an ingredient. As a result of fermentation, there is a small amount of naturally occurring alcohol in all soy sauces. We add a little more alcohol in order to inhibit the growth of naturally occurring aerobic yeast. While the addition of alcohol as a natural preservative is common practice for traditional soy sauce, often it is not listed on the label.'" The author contacted the three major suppliers of traditional imported soy sauce, they were unanimous is denying San-J's accusations. Likewise, the brewmasters of these products denied that any alcohol was added. (Note: Johsen shoyu is bottled under the Tree of Life, Koyo, Mitoku Macrobiotic, Emperor's Kitchen, and Westbrae labels. Marushima Shoyu supplies Eden Traditional Shoyu and Organic Shoyu). However Mansan Brewing Co. of Handa, Japan, adds 4% Mikawa Mirin (rice brandy) to its Mansan Tamari, which is marketed under the Mitoku Macrobiotic label. When Belleme asked San-J vice president Steve Zoller which brands of soy sauce have unlisted alcohol, Zoller could not give any specifics. "The soy sauce San-J imported until their domestic product became available last fall was labeled 'no artificial additives or preservatives.' When we asked Steve Zoller if this shoyu and tamari contained added alcohol and tamari, he replied, 'No comment.'"

Belleme was also concerned that San-J tamari made with hexane-extracted soybean meal using a modern temperature-controlled process would be called "traditionally brewed." Note: Belleme later admitted that the statement in this article about benzene being used by ADM to make food grade ethanol was incorrect. Address: P.O. Box 457, Saluda, North Carolina 28773. Phone: 704-749-9537.

9395. Ebata, Junko. 1989. Antimutagenicity of tempe (Abstract). Abstract of a lecture presented at the 14th International Congress of Nutrition of Nutrition, Seoul, Korea. 1 p. Held 20 Aug. 1989. [1 ref. Eng]
• ***Summary:*** "The antimutagenicity of tempe toward AF2 was examined using the streptomycin-dependent strain SD100 of *Salmonella typhimurium.* Tempe in the process of fermentation was antimutagenic as the number of spontaneously reverted colonies on the tempe-test plate was fewer than that on the tempe-free control plate. The same inhibitory effect was also found in both pan-fried and deep

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fat-fried tempe-samples... The antimutagenic activity... increased with fermenting time and reached a maximum at 20 hours, then decreased."

Note: In July 1989 Prof. Ebata traveled the USA to attend several symposia on Mutagens & Carcinogens in Diet, and on Genetic Toxicology in Developing Countries. She is now preparing a paper on antimutagenetic activity in tempeh to present at the 14th International Congress of Nutrition in Seoul, Korea (20-25 Aug. 1989). Address: Faculty of Science of Living, Osaka City Univ., Osaka, Japan.

9396. **Product Name:** [Miso].
Foreign Name: Miso.
Manufacturer's Name: Gaïa Enterprise. Officially registered in Jan. 1992.
Manufacturer's Address: Rue Principale, 66130 Corbere, France. Phone: 68.84.86.28.
Date of Introduction: 1989 August.
New Product–Documentation: Form filled out for Anthony Marrese. 1989. Nov. This product was introduced in Aug. 1989. Dan makes 100 kg/year of miso aged for a longer time and 5 kg/month of young miso. Both are not pasteurized.

Letter (handwritten) from Daniel S. Ludington. 1992. Feb. 7. He has been making tofu, tempeh, and miso for sale for 3½ years. He learned to make them using books by Shurtleff and Aoyagi. Now he would like to order their books Miso Production, and Tofu & Soymilk Production.

Letter (handwritten) from Dan Ludington. 1992. March 3. "Gaïa Enterprise was officially registered with the Chambre de Metiers of the Pyrenees Orientales in Jan. 1992. (She had been unofficially in existence using the same name for nearly four years)." Dan's father was a 20-year career cook in the U.S. submarine service. He died instantly of a heart attack at age 54. Dan is the oldest of 4 boys. He received a degree in chemical engineering from MIT in 1977, then worked for Intel Corp. in their factory making silicon chips for 5 years, then for Toshiba USA for another year. When his father died, he kept a 10-year promise to himself to hitch-hike around America. In about Loveland, Iowa, his chemical engineer's eyes saw how chlorinated hydrocarbons enter the food chain, and decided to stop eating meat. About 6 months later he was introduced to macrobiotics. 2½ years later he went to the Kushi Institute in Boston, Massachusetts, to see if he could find a better balance in his diet. There he met Odile Corbel, a French woman with a 12 year-old son named Xavier and 10 years of macrobiotic experience. They were married, and returned to France. 18 months later Dan got a Green Card. While Odile was in the USA, Pauline Schaft had stopped making tempeh, and a weekly, organically grown products market had started in Perpignan. So he and Odile started making tofu, tempeh, and macrobiotic pasties and selling them at this market. The business has grown until today sales are $400/week. He and Odile are still married with 2 children of their own. Pauline Schaft now goes by her maiden name of Van Marle; she is now more involved with her yoga practice than with making food. The company now sells 4 kg/week of miso, all direct and without the use of labels, marketing, or distribution.

9397. Golbitz, Peter. 1989. State of Maine bans aseptic packaging: Law will prohibit sales of aseptic soymilk. *Soya Newsletter* (*Bar Harbor, Maine*). July/Aug. p. 1-3. [1 ref]
• ***Summary:*** Maine's new landmark solid waste bill, L.D. 1431, which goes into effect on 1 Sept. 1990, prohibits the sale of all aseptically packaged beverages and of any other beverage container that cannot be recycled. In section 8. MRSA 1868 titled "Prohibition on certain types of containers and holders, the bill states, 'No beverage may be sold or offered for sale to consumers in this State... In a container composed of aseptic packaging composed of aluminum, paper, and plastic in combination, where those materials are for practical reasons inseparable and commonly referred to as a 'brick-pack.'" Exempted from this legislation are "milk and dairy-derived products," whose containers need not be recyclable nor carry a deposit. The bill hopes to reduce Maine's solid waste by 50% by 1994. Many health food stores in Maine reported that aseptically packaged soymilk is one of their ten best-selling products. The only soymilk presently available in the state is aseptically packaged. It is estimated that far less than 1% of all Tetra Pak cartons sold in Maine contain soymilk. Many other states are now in the process of drafting similar bills for reducing solid wastes. If they follow Maine's policies on aseptic packaging, it could be a major blow for soymilk (and Mori-Nu Tofu) in America. "As Maine goes, so goes the nation." Address: Soyatech, Bar Harbor, Maine.

9398. Newman, Jacqueline M. 1989. Tofu comes of age. *Foodtalk* 12(2):7-8. [7 ref]
• ***Summary:*** A brief history of tofu worldwide. Tofu is a culinary chameleon. The early mentions of tofu by John Saris (1613), Friar Domingo [Fernández] Navarrete (1665), and Benjamin Franklin (1779), each referred to Japanese (rather than Chinese) tofu. "In the United States, commercially tofu was first manufactured by the Chinese in 1915 [sic, in 1878 or before]. It was made by the Quong Hop Company, located in San Francisco. This company, founded in 1906, still exists today."

"While bean curd may not be in the culinary mainstream, there is an amazing increase in its use among non-Asians. Its popularity, which recognizes the nutritional qualities of tofu, may be credited in large part to William Shurtleff and his wife, Akiko Aoyagi. Together they helped make the Western world appreciate tofu, thus increasing the use of this inexpensive and versatile protein food. They are the authors of *The Book of Tofu* detailing its history and background and giving several hundred recipes for its use."

After noting the growing popularity of Tofutti and other

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soy ice creams, Newman reflects: "The idea of freezing bean curd, however, is not new. Iced Bean Curd is one of Yuan Mei's recipes from the *Xi Yuan Cookery Book* written near the end of the 18th century. This book by a poet, government official and author, is a very comprehensive volume of over 300 recipes; only some are about tofu. One difference is that the Iced Bean Curd recipe is meant to be served hot, the doufu in it is first frozen then prepared for use." Address: Prof. at Queens College, New York.

9399. Shurtleff, William; Aoyagi, Akiko. comps. 1989. Bibliography of industrial utilization of soybeans: 1,587 references from A.D. 980 to 1989. Lafayette, California: Soyfoods Center. 238 p. Subject/geographical index. Author/company index. Extensively annotated. Printed Aug. 20. 28 cm. [1587 ref]

• ***Summary:*** This is the most comprehensive bibliography ever published on industrial utilization of soybeans. It is also the single most current and useful source of information on this subject available today, since 55% of all references (and most of the current ones) contain a summary/abstract averaging 105 words in length.

One of more than 40 bibliographies on soybeans and soyfoods being published by the Soyfoods Center, it is based on historical principles, listing all known documents and commercial products in chronological order. Containing 37 different document types (both published and unpublished, including many original interviews and partial translations of Japanese and European works), it is a powerful tool for understanding the development of this subject and related products from its earliest beginnings to the present, worldwide.

Details on how to use the bibliography, a complete subject and geographical index, an author/company index, and a bibliometric analysis of the composition of the book (by language, document type, year, leading countries, states, and related subjects) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

9400. Phipps, Bob. 1989. Sun Youth and Calco: Tofu and bean sprout equipment from Taiwan (Interview). *SoyaScan Notes.* Sept. 7. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Sun Youth Machinery Co. Ltd. has been making bean sprout equipment in Taiwan since 1973, and selling tofu equipment since 1979. Bob has been using their all-stainless steel tofu system for about 6 months and it is excellent. The price was 30-40% below Takai's price and their roller extractor was especially low priced. But their support is terrible. The manual that comes with the system is worthless. When he faxed them asking for details on the tofu making process, their response seemed to indicate that they didn't know much about the tofu-making process. Bob could write a 6-page manual on the problems he had getting started. The main one was their thermometer was off by 20ºC, which caused him to burn his soymilk for 2 weeks and it refused to coagulate.

Sun Youth is a very large maker of bean sprout equipment. They have many sprout systems installed in the USA. Bob does not know of any other tofu systems of theirs installed in the USA.

About 10 years ago there was a falling out among makers of bean sprout equipment in Taiwan. At that time the head salesman for Sun Youth, C.P. Wu, left and started Calco, which means "California Company." Kent Wang is head of Calco in the USA and in Houston. He started making bean sprouts in Houston about 10 years ago. He calls *The Book of Tofu* "The Bible." Calco is a large Taiwanese company that makes bean sprout equipment and is in direct competition with Sun Youth. Calco has about 50 installations all over the USA and they are growing fast. Originally they all made bean sprouts. They often sell bean sprouts at one-third the going price. But they have found that tofu is a good product to sell with bean sprouts so now many (10-12) also make tofu. Kent Wang (Phone 713-699-4420) would know these companies but he tends to be secretive about everything. Kent owns and represents a continuous tofu system from Kosan Shoji Co., Ltd. in Japan. It is quite expensive and quite automated. Kosan Shoji has an attractive catalog but it is all in Japanese. Address: Energy Sprouts, 3602 High Point, San Antonio, Texas. Phone: 512-654-3963.

9401. *SoyaScan Notes.* 1989. Sixty-five books on tofu have been published in the Western World since 1970 (Overview). Sept. 17. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Definition: The work must be more than 48 pages long, must have the word "tofu" or its equivalent in the title, and must be written in a non-Asian language. It may be either a popular or a professional/technical work.

By country of publication, 40 of these books (61% of the total) have been published in the USA, 6 in Canada, 5 in Switzerland, 5 in Japan (but written in English for sale primarily outside of Japan), 3 in West Germany, 3 in France (but 2 of these were published simultaneously and primarily in Quebec, Canada), 2 in England, and 1 each in Italy, Sweden, and Brazil. By region of publication: North America 46 (71% of the total), Europe 15, East Asia 5, and Latin America 1.

By language, 49 of these books (75%) have been published in English, 7 in French, 6 in German, and 1 each in Italian, Portuguese, and Swedish.

By year of publication, the first of these books was published in 1974; eleven (17% of the total) were published from 1974 to 1979, forty (62%) from 1980 to 1984, and fourteen (22%) from 1985 to 1989. The peak years of publication were 1981 and 1982, when 12 books on tofu were published each year.

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The best sellers among these books have been *The Book of Tofu* by Shurtleff & Aoyagi (1975, Ballantine Books, Autumn Press, and Ten Speed Press, about 450,000 copies sold in English editions and 9,000 in foreign editions), *Tofu Cookery* by Louis Hagler (1982, The Book Publishing Co., about 175,000 copies sold), *The Tofu Cookbook* by Cathy Bauer and Juel Andersen (1979, Rodale Press, 105,500 copies sold, still in print), *Cook with Tofu* by Christina Clarke (1981, Avon Books, 57,500 copies printed; still in print), and *Tofu, Tempeh, & Other Soy Delights* by Camille Cusumano (1984, Rodale Press, 25,688 copies sold; out of print). These best-sellers have sold a combined total of 822,700 copies, and all tofu books have probably sold over 1 million copies.

9402. Morinaga Nutritional Foods. 1989. Morinaga Nutritional Foods to sponsor the 1989 World Cup of Natural Bodybuilding (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 2 p. Sept. 20.
• ***Summary:*** "Morinaga Nutritional Foods will present the first Mori-Nu Tofu World Cup of Natural Bodybuilding on Nov. 19 at 6 p.m. at Aviation Auditorium, 1935 Manhattan Beach Blvd., Redondo Beach. Top male and female natural athletes from all over the world who have tested steroid-free for one year, will compete for possession of the World Cup.

"The invitational meet... requires participants to take a lie-detector test prior to competing to determine previous or present use of steroids or other muscle-building drugs. The day of the event random urine testing of participants will also take place.

"'Drug-free bodybuilding has been popular for about ten years now,' according to Pete Samra, former Mr. Natural U.S.A. and the promoter of the competition." Address: Los Angeles, California.

9403. Mizono, Bill. 1989. Selling pasteurized tofu in the produce case versus the dairy case (Interview). *SoyaScan Notes.* Sept. 21. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Bill strongly prefers to have Azumaya tofu sold in the produce case as long as the temperature is okay, which it usually is (42-48ºF). Even dairy cases sometimes rise above 45ºF, as on their defrost cycle. Sales are much better in produce. Tofu is an impulse item and there is more impulse buying in the produce section than in the dairy section. It gets lost among the dairy products. Also there is more space and space flexibility of produce, as caused by seasonal vegetables. Produce is a commodity area. A lot of Safeway stores are switching tofu back to the produce case from dairy, since it sells better in produce. But in stores that moved tofu to dairy, it took a year for sales to rebound to their pre-move level. During that time, many customers started going to Lucky supermarkets for their tofu. Lucky sells tofu only in the produce case. Some divisions of Safeway have never moved tofu out of produce. Each store decides its own location. Most produce departments at Safeway sell the Azumaya tofu in a vertical "juice case" which is cooler. They buy it directly from the Richmond produce warehouse.

The FDA is incorrect in saying that tofu is a "hazardous product." That is not true for pasteurized tofu. Azumaya had tests done in 1983 after *Yersinia* was found in tofu in Illinois and the state clamped down on tofu. Azumaya had a laboratory inoculate tofu with the four potentially toxic microorganisms (*Yersinia, Staphylococcus, Salmonella,* and *Clostridium Botulinum*) then pasteurize it like Azumaya does. They found that these organisms start growing only after 6 weeks at 69ºF, and by that time the tofu was too sour and smelled too bad to eat, and the water was very cloudy. These tests showed that *pasteurized* tofu is not potentially hazardous. But the FDA does not distinguish between pasteurized and non-pasteurized tofu.

If health inspectors required all tofu to be moved out of the produce case, the produce buying division of each chain would decide where to relocate it. There are many considerations, and the main one to the produce division accounting department is that they get tofu sales credited to them no matter where it is sold. They have spent more than a decade to build the sales of this product and they are not about to give that up to the dairy department. They will put tofu into a refrigerated case where the temperature is at 45ºF or below. Even when tofu is sold in the dairy case at Safeway, it still has a produce department label on it! Other than the produce case, Bill would like to see the tofu sold right next to the produce case, in a metal juice case. The produce department likes tofu with the vegetables because they feel that when people buy tofu they also tend to buy vegetables; so tofu sells vegetables. So the produce department does not like tofu to be sold in the dairy case. Another problem with an isolated glass case is that the tofu does not get as much attention as it should, and may be allowed to go out of date. But Bill feels it doesn't matter that much where the tofu case is located, as long as the consumer knows where it is. Moreover, Azumaya sells Kikkoman tofu, which can be sold in the produce case.

Azumaya dates their tofu for a 30-day shelf life, but that is very conservative to allow for mishandling. Under typical good conditions it will stay fresh for up to 50 days. But he feels it would be a mistake to date the tofu for 50 days and to use that as a selling tool, as Nasoya does. Azumaya has almost no problems with spoilage, puffing or souring. If there is a problem, the company investigates it. It is generally caused by a refrigeration problem, or letting the product stand for a long time in the back room, unrefrigerated, because people are too busy to get to it. Safeway now sells Azumaya tofu in Hawaii, at far below Hawaii tofu prices. On the East Coast Azumaya undersells Nasoya. Bill is too busy with Stir Fruity (tofu yogurt) to start a tofu plant on the East Coast.

The new Mori-Nu ad about water disaster and life

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preserver is incorrect in saying that water-pack tofu has a shelf life of "mere days."

Azumaya distributes Kikkoman aseptically packed tofu. He strongly prefers the flavor of his own product. Conclusion: FDA should have different temperature standards and "potentially hazardous" definitions for pasteurized and unpasteurized tofu. Azumaya and the Soyfoods Association should take the lead in educating FDA on these points. Address: President, Azumaya Inc., 1575 Burke Ave., San Francisco, California 94124. Phone: 415-285-8500.

9404. Mizono, Bill. 1989. The comeback of Stir Fruity soy yogurt (Interview). *SoyaScan Notes.* Sept. 21. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Bill is too busy with Stir Fruity to start a tofu plant on the East Coast of the USA. First Azumaya did a direct store delivery with Stir Fruity to prove that it was a good product. Lucky stores have just started this week ordering it through their warehouse. It will be in the Safeway system in several weeks. At Safeway it started in the produce section, but now dairy wants it back. Azumaya has their own trucks, which can also take tofu if a store wants it. They get more volume if they go direct, but they cannot service the product in the store because they are not a union shop. Jofu is now in Safeway, but (as Soyfoods Center taste tests also noticed) it is watery, because after it comes off refrigeration and rises above the temperature where it starts to break down, it will not re-set because of the gelatin solidifier it contains. Stir Fruity will re-set. Stir Fruity is dated for a 40-day shelf life, but under typical conditions it will stay fresh for 60 days. It contains potassium sorbate as a preservative. Its future looks very promising. Address: President, Azumaya Inc., 1575 Burke Ave., San Francisco, California 94124. Phone: 415-285-8500.

9405. *Guardian* (*England*). 1989. Nabisco sells off Del Monte to ease its debt burden. Sept. 26. p. 11.
• ***Summary:*** American food giant RJR Nabisco has just sold its worldwide Del Monte processed food operations for $1.5 billion. "Kikkoman will take over some of Del Monte's businesses in the Far East" [East Asia].

Note: RJR Nabisco, Inc., was an American conglomerate formed in 1985 by the merger of Nabisco Brands and R.J. Reynolds Tobacco Company. RJR Nabisco was purchased in 1988 by Kohlberg Kravis Roberts & Co. in the second largest leveraged buyout in history, adjusted for inflation (Source: Wikipedia, Sept. 2008).

9406. Channel 26. 1989. Tofu in Thailand. Television broadcast. Sept. 9. California.
• ***Summary:*** This Japanese documentary on Thailand shows a tribe in northern Thailand coagulating soymilk by simmering a plant or herb (named *yaukane* in the Japanese katakana transliteration) in water then using the resulting liquid as the coagulant. The curds are eaten as such rather than being pressed to make tofu.

9407. Ebine, Hideo. 1989. Miso preparation and use (also hot and sweet pastes). In: E.W. Lusas, D.R. Erickson, and Wai-Kit Nip, eds. 1989. Food Uses of Whole Oil and Protein Seeds. Champaign-Urbana, IL: American Oil Chemists' Society. vii + 401 p. See p. 131-47. Chap. 9. Proceedings of the Short Course on Food Uses of Whole Oil and Protein Seeds held at Makaha, Hawaii, May 11-14, 1986. [24 ref] Address: Central Miso Research Inst., Shinkawa 1-26-19, Chuo-ku, Tokyo, Japan 104.

9408. Griffis, Gil; Wiedermann, Lars. 1989. Marketing food-quality soybeans in Japan. American Soybean Association. Sept. *
• ***Summary:*** This report was published in Jan. 1989, mainly for the American Soybean Association's Tokyo office. Address: 1. American Soybean Assoc., Division Manager; 2. Japan Country Director, American Soybean Assoc.

9409. Lusas, Edmund W.; Erickson, D.R.; Nip, Wai-Kit. eds. 1989. Food uses of whole oil and protein seeds. Champaign-Urbana, Illinois: American Oil Chemists' Society. v + 401 p. Proceedings of the Short Course on Food Uses of Whole Oil and Protein Seeds held at Makaha, Hawaii, May 11-14, 1986. No index. 24 cm. [300+ ref]
• ***Summary:*** Of the 24 chapters, the first 10 are entirely about soybeans and soyfoods, and 5 of the remaining 14 chapters are partly about soya. Many individual chapters are cited separately. Address: 1. Protein R&D Center, Texas Engineering Experiment Station, The Texas A&M.

9410. Morinaga Nutritional Foods, Inc. 1989. How to develop a healthy market (Ad). *Whole Foods* (*Berkeley, California*). Sept. p. 129.
• ***Summary:*** This ad is similar to, but not the same as, one titled "Healthy Market" that appeared in 1988 in this magazine and others. A large photo of pasta and tofu on a black plate, with a silver fork, occupies the top half of the ad. Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9411. Shurtleff, William; Aoyagi, Akiko. comps. 1989. Bibliography of yuba: 161 references from 1587 to 1989, partially annotated. Lafayette, California: Soyfoods Center. 56 p. Subject/geographical index. Author/company index. Printed Sept. 1. 28 cm. [161 ref]
• ***Summary:*** This is the most comprehensive bibliography ever published on yuba. It is also the single most current and useful source of information on this subject available today, since 57% of all references (and most of the current ones) contain a summary/abstract averaging 122 words in length.

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One of more than 40 bibliographies on soybeans and soyfoods being published by the Soyfoods Center, it is based on historical principles, listing all known documents and commercial products in chronological order. Containing 37 different document types (both published and unpublished, including many original interviews and partial translations of Japanese and European works), it is a powerful tool for understanding the development of this subject and related products from its earliest beginnings to the present, worldwide.

Compiled one record at a time over a period of 15 years, each reference in this bibliography features (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English publications together with an English translation, month and issue of publication, and the first author's first name (if given).

Details on how to use the bibliography, a complete subject and geographical index, an author/company index, and a bibliometric analysis of the composition of the book (by language, document type, year, leading countries, states, and related subjects) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

9412. Sugiyama, Shin-ichi. 1989. Production and uses of soybean sauces. In: E.W. Lusas, D.R. Erickson, and Wai-Kit Nip, eds. 1989. Food Uses of Whole Oil and Protein Seeds. Champaign-Urbana, IL: American Oil Chemists' Society. vii + 401 p. See p. 118-30. Chap. 8. Proceedings of the Short Course on Food Uses of Whole Oil and Protein Seeds held at Makaha, Hawaii, May 11-14, 1986. [8 ref]
Address: Kikkoman Foods Inc., P.O. Box 69, Walworth, Wisconsin 53184.

9413. Schwarz, Thomas L. 1989. Memorandum: Mori-Nu brand tofu is not a potentially hazardous food. Letter to Dennis L. Eastin, Regional Food Specialist, HFR-SW16, Oct. 4. 2 p. Typed, with signature on letterhead. [1 ref]
• ***Summary:*** "Your memo of September 27, 1989 sought clarification of FDA's position regarding the storage temperature of Mori-Nu brand tofu." In the model code interpretations for "potentially hazardous food... five exceptions were delineated including: 'Foods that have been adequately commercially processed and remain in their unopened hermetically sealed container.' Mori-Nu brand tofu–soft, regular, and firm–are packaged using the Tetra Pak TBA-3 aseptic packaging system...

"A food Canning Establishment (FCE) number of 07905 has been assigned to the Morinaga Milk Industry Co., Ltd., 33-1, 5 Chome Shiba, Minato-Ku, Tokyo 108, Japan, which produces these products. Intact packages of Mori-Nu brand tofu, like other shelf-stable foods in hermetically sealed containers, are not potentially hazardous and do not require temperature control for safety. We know of no other tofu manufacturer currently using this technology and no other canned food process filing forms have been submitted for moist soy protein products." Address: Asst. Director for Program Development, FDA Center for Food Safety and Applied Nutrition, Retail Food Protection Branch, 200 C St., S.W., HFF-342, Washington, DC 20204. Phone: 202-485-0140.

9414. Lo, K.S. 1989. New developments with Vitasoy and Hong Kong Soya Bean Products Co. Ltd. (Interview). *SoyaScan Notes.* Oct. 6. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The main new development is the company's launch of what it calls the "American Version" of Vitasoy, a new formulation. It is sold throughout the United States.

The company has exported quite a lot of soymilk to China, but it was all made and packaged in Hong Kong. Earlier in 1989 they signed a joint venture project with the Guangming Overseas Chinese Farm, a dairy cooperative with whom they have been doing dairy farming, to build a factory right across the border to serve southeast China. They bought the land, had the ground leveled, and were about to put up the building when the Tiananmen Square massacre took place on 4 June 1989. So they put the project on hold and are waiting to see what happens now in China. If the political and financial environment improves, Lo hopes to have the project back on track within the next 1-2 years.

Also, they have been talking with one party in Beijing that is very interested. A letter of intent has been signed. Lo has visited 2 of the soymilk plants that the Chinese have imported from Japan. Both were sitting idle. Apparently the Chinese have never been taught how to use the equipment to make a proper soybean milk. Address: HKSBPC Ltd., 41 Heung Yip Rd. Aberdeen, Hong Kong. Phone: 5-528211.

9415. Morinaga Nutritional Foods. 1989. Tofu manufacturer contacts health departments nationwide to clarify aseptic packaging dilemma (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 2 p. Oct. 6.
• ***Summary:*** "In an effort to keep supermarkets from inappropriately moving its product from the produce department, Morinaga Nutritional Foods Inc... has released an official statement to all U.S. health departments clarifying the difference between aseptic and water-packed tofu...

"'Most tofu in America is sold in produce 'wet racks' where oftentimes the temperature does not conform with the FDA requirements,' said Art Mio, national sales manager for Mori-Nu. 'We commend the action on the part of the state health department officials for cracking down on inadequately refrigerated water-pack tofu.'...

"Developed by Morinaga Nutritional Foods Inc. in 1972, the aseptic packaging technology of tofu is designed to combat spoilage and eliminate bacterial growth.

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Coincidentally, the concept of aseptic packaging was voted the top food/science innovation of the past 50 years by the Institute of Food Technology in 1989... According to Mio, Morinaga decided to inform all state health departments about the confusion between storage of aseptically packaged Mori-Nu and water-packed tofu after its product was removed from the produce section of Bell's supermarkets in Rochester, New York." Address: Los Angeles, California. Phone: 213-728-4325.

9416. Takai, Wataru. 1989. Re: Kyoto Tanpaku, a large Japanese tofu manufacturer from Osaka, will build a tofu plant in Indiana. Letter to William Shurtleff at Soyfoods Center, Oct. 9. 1 p.
• ***Summary:*** The company will use Takai equipment in the plant. The man in charge at the company is Mr. Hachijin.

Note: Luke Lukoskie has heard that this plant will cost $4.5 million to construct. Address: Takai Tofu & Soymilk Equipment Co., 1-1 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan. Phone: 011-81-0762-48-1355.

9417. Ebner, Guenter. 1989. Re: Brief history of Sojarei Ebner-Prosl. Letter to William Shurtleff at Soyfoods Center, Oct. 17. Followed by two talks in May 1990. 1 p. Typed, with signature on letterhead. [Eng]
• ***Summary:*** "Our company was founded in 1984 in Baden and we started with 6 kinds of products. I had my first contact with tofu in Germany, where I learned the basic work in 1978 from a person named Axel in Frankfurt. The second contact was in Japan during 2 months of Zen training, and then a lot during the years before starting the company by trying all kinds of Tofu-products following your books and ideas.

"We now process 30 tonnes (metric tons) of soybeans (Austrian grown) each year. That is ten times more than we used during our first year, and we plan to increase 5-10 times during the next years... If you are in Austria, we invite you to visit us."

Accompanying this letter was a packet of information about the company including all labels (each with the month and year of introduction), color ads run in two Austrian magazines (Das Gruene Haus, and Natur und Gesundheit No. 8; the slogan reads: "Sojarei Ebner-Prosl, your specialist in fresh soyfoods, brings you fresh tofu daily"), and two catalog/price lists (one for food processors and one for retail stores) for Jan. 1989; products made by the company have been marked by the author with an "S." The retail catalog contains 20 fresh products, 3 books, and 30 non-fresh products. Details of the catalogs are given in a separate record. Address: Augasse 2, A-2500 Baden bei Wien (near Vienna), Austria. Phone: 02252/85101, 45505.

9418. Marrese, Anthony. 1989. Re: Soyfoods in France. Letter to William Shurtleff at Soyfoods Center, Oct. 28. 2 p. Handwritten. [Eng]
• ***Summary:*** The author conducted a soyfoods market study in France for William Shurtleff of Soyfoods Center, sending out forms which were filled out by 12 companies, visiting or interviewing 9 companies, and visiting 5 companies at the Diet Expo '89 held 21-23 Oct. 1989 in Paris. It seems like there are four types of companies working with soya in France:

1. Independents, both large and small, mainly in primary soymilk, tofu, or tempeh production, or in second generation burgers, smoked products, or desserts production, with either organic (biological) or non-organically grown products. Examples: Le Ferme du Jas, Innoval/Sojalpe, Société Soy, Le Bol en Bois / Tama / Daizou, La Maison du Tofu, Les 7 Marches, Boulangerie Artisinale des Maures, Odile Corbel & Dan Ludington [named Gaia Enterprises by Feb. 1992], Communauté de la Lix (United Macrobiotic Company), Tofu Kuehn.

2. Non-Independents owned by large companies or agricultural co-ops: Gerblé, Bonneterre / Triballat, Sojadoc, Cacoja (C.A.C.), Renaitre.

3. Bean or cereal (agricultural) companies: Celnat.

4. Specialty manufacturers for the Asian-European (Japanese, Chinese, Korean, etc.) markets: Yamato.

"I had some very good talks with Bernard Storup of Société Soy, the Bol en Bois people, Celnat, Bonneterre, Gerblé and others. In general the market and usage seem to be going nowhere but up and it is still in the very early stages of 'real consumer' type foods, not just health store specialties. Some French soybeans are used but a lot are imported... Real quantity information is not available since it is changing so fast (mainly in an upward direction and mostly with secondary processed products which use tofu or soya in them)." Address: c/o Terre Nouvelle, Eourres, 26560 Séderon, France. Phone: 92.65.10.95.

9419. Belleme, John. 1989. Natural soy sauce: A brewing controversy. Part II. *Solstice* No. 37. p. 25-26, 28-30. Sept/Oct. [1 ref]
• ***Summary:*** Discusses the differences between HVP unfermented soy sauce (such as La Choy, Chun King, and Kame) and fermented soy sauce, then between modern high-tech fermented soy sauce (such as that made by Kikkoman from hexane defatted soybean meal and fermented for less than 7 months in fiber glass or stainless steel temperature controlled tanks) and "traditionally brewed" soy sauce (such as the macrobiotic brands "made from whole soybeans and aged in wood for at least 4 seasons at the natural temperature of the region"). Manufacturers of modern-high tech soy sauce often refer to their product as naturally brewed to distinguish it from "synthetic" HVP sauces. Now Kikkoman and San-J have succeeded in placing their high-tech products in some natural foods stores. Belleme discusses the objections that can be raised against these

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products: (1) Substitution of hexane defatted soy meal for whole soybeans. "The FDA and solvent extraction industry have set acceptable limits for hexane in soy meal at 25 parts per million (ppm)." San-J and Kikkoman assert that their products test negative for hexane residues. "San-J brewmaster Yuji Yamamoto said that using soy meal rather than whole soy beans is more efficient because fermentation is faster, nitrogen yields are higher, and there is no crude soy oil to dispense with, as in whole soy bean soy sauce." Belleme thinks that this oil can be used for soap. Because of the greater efficiency, soy meal soy sauce can be produced and sold less expensively than whole bean soy sauce.

(2) Heated non-wood vats. "San-J brewmaster Yamamoto says that their closed heated system is easier to clean, more efficient, and produces a clearer, milder, and better balanced soy sauce than the traditional method." Jubei Sasaki of Sendai Shoyu Co. disagrees, arguing that the effect of seasonal changes and the wooden vats improve the shoyu flavor. Wooden vats may also give a product with more vitamin B-12.

"Although whole soybeans are always proudly listed as such, soy meal is usually referred to as 'soybeans.' Ironically, San-J's black label soy meal tamari says 'traditionally brewed,' and makes no mention of defatted soybeans, thus making it difficult for the consumer to make an informed choice." Address: P.O. Box 457, Saluda, North Carolina 28773. Phone: 704-749-9537.

9420. Belleme, John. 1989. Snow-dried tofu: The original convenience food offers flavor an nutrition. *East West.* Oct. p. 30-32.
• ***Summary:*** Each winter, high in the mountains of central Japan, Aki Takagi's small family is busy making snow-dried tofu [dried frozen tofu] for the world's natural foods stores.

Note. This is the earliest English-language document seen (April 2013) that uses the term "snow-dried tofu" to refer to traditionally-made dried-frozen tofu. Address: P.O. Box 457, Saluda, North Carolina 28773. Phone: 704-749-9537.

9421. **Product Name:** Tofu Burgers, Teriyaki Burgers, Miso Burgers, Tofu Nuggets [Plain, or Barbeque].
Manufacturer's Name: La Soyarie.
Manufacturer's Address: 25 rue St. Etienee, Hull, QUE, J8X 1H5, Canada. Phone: 613-235-5356.
Date of Introduction: 1989 October.
Ingredients: Incl. tofu, soy sauce.
How Stored: Refrigerated.
New Product–Documentation: Soya Bluebook. 1989. p. 102-03. Contact: Koichi Watanabe, President.

SoyaCow Newsletter. 1994. July/Sept. Mr. Koichi Watanabe is president of La Soyarie in Hull, Quebec.

9422. Lima N.V. 1989. Lima: Tarif détaillant [Lima Foods catalog and price list]. Edgar Gevaertdreef 10, B-9830 Sint-Martens-Latem, Belgium. 9 p. [Fre]
• ***Summary:*** This macrobiotic food catalog was bound into the back of the Bonneterre catalog at a 1989 food expo in Paris. Lima sells the following soyfoods, each proceeded by its product category: Fresh products: Skewered seitan/tofu, Presto natural tofu, Presto tofu legumes/vegetables, Presto tofu cheese. Legumes: Yellow soybeans. Sprouts: Green soy/mung (500 gm or 5 kg). Flours: Roasted soy flour. Vegetarian preparations: Lima soy sauce (500 ml or 1 liter), tofu, natural tempeh, tempeh with shoyu. Dressings: Salad dressing with soy and tomato, Salad dressing with soya herb. Specialties: Organic miso (1 month), Hatcho miso, Barley miso (organic or regular), Rice miso (organic or regular), Heiwa brand Instant miso soup (regular or red, From Japan), Tamari (250 ml, 1 liter, 18 liters), Mansan Tamari from Japan, Shoyu (250 ml, 1 liter, 18 liters), Sakai shoyu from Japan. They also carry one book titled "Tofu dans le Cuisine Macrobiotique" (Eddie Hara, 1982).

Accompanying the catalog is a packet of individual full-color sheets with of photos of products in a folder titled Lima: Quality is our passion." There are sheets titled "Vegetable products rich in protein," "Tamari and shoyu," "Japanese specialties (incl. Heiwa brand shoyu and tamari), and a brochure titled "Lima: 30 years as a producer of organically grown (biological) foods." It describes the life and work of Edgar Gevaert (poet, artist-painter, ecologist, and a leader of the European peace movement). Address: Sint-Martens-Latem, Belgium.

9423. Mogi, Yuzaburo. 1989. The new yippies. *Look Japan* (*Tokyo*). Oct. p. 14-16.
• ***Summary:*** In this section on "Economy: Overseas investment," Prof. Shôichi Rôyama interviews Yûzaburo Mogi, Executive Managing Director of Kikkoman Corp. Born in 1935, he graduated from Keio University, then rejoined Kikkoman. In 1961 he earned his MBA from Columbia University in New York City. His publications include *How to Make an Overseas Plant* and *Introduction to International Business.* Mogi is an excellent example of a Japanese business leader who thinks big, who sees the big picture, and realizes that the actions of each Japanese company or person overseas can affect all the others. Thus, the need to develop standards of good behavior on various levels.

Mogi is now chairman of the Association of Overseas Organizations of Japan's Committee on the Development of Internationally-Oriented Personnel, and a key figure in the development of the recently released "Frictionless International Strategy." Mogi believes the Japanese corporations with overseas operations need to become internationalized and globally oriented. Employees sent overseas need to learn the local language, become friends and work well with their local colleagues, and make

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contributions to the local community. Returnees and their children should be treated better when they return to Japan–in an effort to minimize international friction.

Corporations should try to localize management and to see themselves "as an integral part of and dependent on the local community. The most important part of localization is having dealings with local corporations. Assuming all other factors are equal, local corporations should be favored over Japanese corporations. And among local corporations, emphasis should be placed on those closest to your plant and the community you are in"–to minimize investment friction. All Japanese companies should work together to minimize international friction trade friction. A photo shows Yûzaburo Mogi.

9424. Nakamura, Hiroshi; Takasawa, M.; Kashara, S.; et al. 1989. Effects of acute protein loads of different sources on renal function of patients with diabetic nephropathy. *Tohoku J. of Experimental Medicine* 159(2):153-62. Oct. [27 ref]
• ***Summary:*** Discusses glomerular filtration rate (GFR), albumin excretion rate (AER), and concentrations of plasma amino acids. "In diabetes with macroalbuminuria, GFR decreased after ingestion of tuna fish meal and did not significantly change after intake of bean curd. In both normal subjects and diabetic patients, urinary AER did not increase after each kind of protein loading. Plasma concentrations of alanine, glycine, and arginine, known to induce glomerular hyperfiltration, increased to a greater degree after ingestion of tuna fish meal than after administration of bean curd." Address: First Dep. of Internal Medicine, Niigata Univ. School of Medicine, Japan.

9425. NHK of Japan. 1989. [Japanese researchers discover that cancer patients have high levels of nitrosamines in their genes]. Television broadcast. Oct. 23. Evening news. [Jap]
• ***Summary:*** Medical researchers from Tokyo University announced experimental results showing that cancer patients have 5 to 10 times as much nitrosamines in their genes as healthy patients. Nitrosamines, known as carcinogens for some time, are thought to cause mutations, which can cause cancer. This may be a key discovery in cancer research.

Note: Four records in the SoyaScan database list nitrosamines, all in connection with soy sauce, and all as known carcinogens.

9426. Levey, Robert. 1989. Japanese restaurant better than ever. *Boston Globe.* Nov. 2. p. 4.
• ***Summary:*** A review of the Japanese restaurant Roka on Massachusetts Ave. near Harvard Square. "You may meander around on the appetizer menu with some satisfying results. Under the 'offbeat category,' consider the edamame, a bowl of Japanese green soy beans blanched in salted water and served cool. You pick up the whole pod, squeeze out the round soy beans and munch them like a party snack."

A salmon entree with teriyaki sauce was also served, as was grilled eel seasoned with a "traditional slightly sweet, thickened soy sauce..." Address: Globe staff.

9427. Robinson, Dick. 1989. Japanese firm seeking site for food plant. *Tribune-Star* (*Terre Haute, Indiana*) 7(173):1. Nov. 4.
• ***Summary:*** Representatives of a specialty food firm (Kyoto Foods, whose name is not mentioned in the article), will be in Terre Haute next week "to start what could be the final negotiations for a new manufacturing plant for Vigo County, a source close to the situation said.

"The company is seeking a site to manufacture tofu, a creamy white food made from soybean flour [sic] and used in Oriental cooking...

"The source said the upcoming negotiations could finalize more than five years of planning that have gone into getting the project to its current status. It has been five years of ups and downs, 'a real roller coaster,' the source said.

"The major principals in the company are Japanese from the area of Tajimi and Kyoto. The relationship between Terre Haute citizens and that part of Japan date back 25 years to the time when the city and Tajimi became sister cities...

"The ties are especially strong between William and Toni Roach of West Terre Haute and Juichi Iida and his wife. Iida is a Japanese businessman.

"When Iida's son came here to study at Indiana University, the Roach family looked after the youth...

"If Vigo County is selected as the plant site, it would become the center for a sales area with a 300-mile radius. The marketing area would include cities such as St. Louis [Missouri], Louisville [Kentucky], Indianapolis [Indiana], Columbus, Ohio, and Chicago [Illinois]."

9428. Reed, M.H. 1989. Sushi and starters featured in Harrison. *New York Times.* Nov. 5. p. WC41.
• ***Summary:*** This is a review of the Japanese restaurant Momiji (261 Halstead Ave., south of the railroad station, Harrison, Westchester County, New York).

Dishes included: "Agedashi-tofu, golden cubes of bean curd moistened by a thin, somewhat sweet dipping sauce sprinkled with green onion.

"Skillfully made, firm tofu-dengaku brought small bars of grilled bean curd on sticks; the intense miso (fermented bean paste) toppings slathered on the bean curd gave the dish the seasoning it needed, but we found the concentrated miso somewhat salty."

9429. Morinaga Nutritional Foods. 1989. Morinaga Nutritional Foods appoints World Variety Produce as its chief distributor for Mori-Nu Tofu (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 2 p. Nov. 8.
• ***Summary:*** "Morinaga Nutritional Foods, makers of the only aseptically packaged tofu, has appointed Los Angeles-

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based World Variety Produce Inc. to coordinate its national distribution.

"World Variety Produce, one of the largest wholesalers of exotic and unusual produce items, are experts in the area of specialty fruits and vegetables...

"'Due to recent health inspector scrutiny of improper refrigeration temperatures for water-pack tofu in produce departments, Mori-Nu has become the tofu of choice for many produce buyers who prefer its convenience and guaranteed quality,' said Joe Hernandez, president of World Variety." Address: Los Angeles, California.

9430. Frey, Harry. 1989. Kyoto Food Corporation, U.S.A. (News release). Administrative Asst., City of Terre Haute, 103 City Hall, 17 Harding Ave., Terre Haute, IN 47807. 1 p. Nov. 10.
• ***Summary:*** This news release was issued by the city of Terre Haute. See published story in Nov. 11 *Star-Tribune* (Terre Haute, Indiana). Address: Terre Haute, Indiana.

9431. Mio, Art. 1989. Recent developments at Morinaga (Interview). *SoyaScan Notes.* Nov. 11. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Zurkoff, a Morinaga food broker in the Milwaukee area, was in communication with the State of Wisconsin Dep. of Agriculture, Trade & Consumer Protection as early as May 1986 concerning the bacterial condition and handling of tofu. Art thinks that there are very few stores in the state of Wisconsin that still carry water-packed tofu in the produce section, but that might have happened 2 years ago. Wisconsin was one of the earlier states to take action on this point, as was Illinois.

Morinaga's "Water Hazard" ad did run for 1-2 months in natural/health food trade magazines starting in about Oct. 1989. It probably ran in *Natural Foods Merchandiser,* and others. Now they have dropped that ad for various reasons: (1) They want to announce their new extra firm tofu; (2) They got a lot of "flack" and ill will from others in the tofu industry, and they didn't want to ruffle any more feathers; (3) Azumaya threatened a lawsuit. Morinaga feels they would win such a suit if it should ever got to court, based on "generalities rather than specifics." Address: Morinaga Nutritional Foods Inc., 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9432. Robinson, Dick. 1989. Japanese firm announces plans for local food plant. *Tribune-Star* (*Terre Haute, Indiana*) 7(180):1. Nov. 11.
• ***Summary:*** "Kyoto Food Corp. USA announced plans Friday to build a production plant in Terre Haute for tofu, a food product made from soybeans. Construction on the $4.5 million plant is slated to begin early in 1990.

"Kyoto Food's five primary investors, Kiyoyaki Hirono, Yoshamasa [Yoshimasa] Yamashita, Yasuo Hatchijin [Hachijin, of Kyoto Tanpaku in Fushimi-ku, Kyoto, Japan] and Wataru Takai of Kyoto, Japan, and Juichi Iida of Tajimi, Japan, announced the planned project at a news conference in the Vigo County Annex and Security Center.

"The 25,000-square-foot plant will be on a 25-acre tract along Johnson Avenue between U.S. 41 and Indiana 63, south of the city. The company will buy the land from Morgan's Honey Creek Commercial Properties.

"The plant, which will be able to produce 2.5 tons of tofu daily, is expected to start with 30 to 50 employees and increase to 100 during the first year.

"The plan is to produce the product in 1-pound packages. The firm's marketing area will be in a 300-mile radius of Terre Haute...

"Plans for the tofu plant are an outgrowth of the 25-year-old sister-city relationship between Terre Haute and Tajimi, said Mayor P. Pete Chalos.

"The company will be an Indiana corporation and not a subsidiary of any other firm. The other four investors are reported to be presidents of medium-size companies in Japan.

"Yamashita will serve as president of the company and move to Terre Haute... After the plant is operating, Yamashita may be the only Japanese employee at the plant. When production begins, the operation is expected to have practically all American personnel...

"The plant is expected each day to use a ton of soybeans provided by area farmers... Tofu is reported to be the world's No. 1 health food."

Note: This is the earliest document seen (March 2013) concerning Kyoto Food Corp. in the USA.

9433. Dickinson, Donald W. 1989. Re: A company named Azumaya cannot be located in San Francisco from 1920 to 1937. Questions answered on Soyfoods Center letterhead (dated 10 Nov. 1989) and returned to SC, Nov. 20. 1 p. Stamped with signature.
• ***Summary:*** On 10 Nov. 1989, after a preliminary call, William Shurtleff wrote the County Clerk requesting that he search San Francisco's fictitious names records for businesses, and the business license records for the years 1920-1923 to try to locate a company named Azumaya, probably owned by a Mr. Teranishi. Shurtleff enclosed the required $18.50 in fees. The clerk searched the indexes of the records from 1920 to 1937 wrote back that he could find no mention of Azumaya.

Attached are: (1) Stamped envelope from County Clerk. (2) Receipt. Address: County Clerk, Superior Court, 400 Van Ness Ave., Room 317, San Francisco, California 94102.

9434. Kikkoman Oriental cooking. 1989. Publications International Ltd., 7373 North Cicero Ave., Lincolnwood, IL 60646. 96 p. Illust. Index. 28 cm.
• ***Summary:*** This full-color cookbook features 125 recipes

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using Kikkoman's full line of Oriental sauces. The book was published in two formats. The first was a small magazine format published in Jan. 1989, for sale at supermarkets during Chinese New Year. The second, published in Nov. 1989, was a larger size (28 cm tall), spiral bound on glossy paper with many color photos, for sale at bookstores. Both were 96 pages. Kikkoman supplied all the recipes.

Contents: Kikkoman brings the Orient home. Appetizers. Beef. Pork. Poultry. Seafood. Side dishes.

A color photo shows the following products, and they are used with their brand names in the recipes: Kikkoman Soy Sauce, Lite Soy Sauce, Teriyaki Sauce, Teriyaki Baste & Glaze, Stir-Fry Sauce, and Sweet & Sour Sauce. Tofu is used in one recipe (p. 46).

9435. Morinaga Nutritional Foods, Inc. 1989. Lessons in tofu (Leaflet). Los Angeles, California. 4 panels each side. Each panel: 22 x 9 cm.

• ***Summary:*** This 8-panel full-color leaflet shows the three types of Mori-Nu tofu stacked one atop the other on the front. It contains 4 lessons about tofu, a $0.15 coupon for the tofu, an order form for a 1-year membership in the Health for Life Club, Tofu Magic Cookbook, and Tofu Magic VHS Video (30 min, 6 recipes). On the back are five recipes: Piña colada. Strawberry banana shake. Zesty cilantro, chili, pea dip. Tofu rice stir fry. Creamy tomato onion soup. Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9436. News Weekly. 1989. [Edible paper made from okara in Japan]. Television broadcast. Channel 26. California. Nov. 3. 4 minutes. [Jap; eng+]

• ***Summary:*** In Japan, according to statistics from the Ministry of Agriculture, Forestry & Fisheries (*Norinsho*), 700,000 tons of okara are produced each year. It has become a major environmental pollutant. Dr. Sakai Mitsuro of the Sakai Rikagaku Kenkyusho (Sakai Physics and Chemistry Research Institute, Imadate-cho, Fukui prefecture, Japan) explains and shows how he has developed an edible paper made from okara. First the okara is mixed with water. Two enzymes are added, one to hydrolyze fat and one for protein. Then "kansho-eki" is added to stabilize the process. The mixture is kept at 40ºC for 5-6 hours, then strained. The resulting fibers are dried, reimmersed in water with a binder (such as glutinous yam, yama-imo), and refiltered. The resultant film is then ironed to form a thin paper-like substance. Its main use will be as the soluble wrapper for the soup stock in cup noodles, replacing the small plastic bag currently used. This saves the consumer the trouble of having to open the bag before eating the noodles, and also saves plastic pollution. When hot water is added to the noodles, the paper dissolves. The okara paper can also be used to make capsules for drugs or nutritional supplements, or in biotechnology applications. The research institute has received 500-600 enquiries from interested people and organizations.

9437. Shurtleff, William; Aoyagi, Akiko. 1989. Tofu as a potentially hazardous food: Crisis or opportunity? Lafayette, California: Soyfoods Center. 67 p. Nov. 16. Index. 28 cm. [54 ref]

• ***Summary:*** Introduction and historical perspective. Major changes loom on the horizon for the tofu industry throughout the Western world. Consider the following facts:

* The U.S. Food and Drug Administration has classified tofu (both fresh and pasteurized tofu) as a "Potentially Hazardous Food."

* Every "Potentially Hazardous Food" must be kept refrigerated at 45ºF (7.2ºC) or below in food stores, restaurants, and vending operations.

* Roughly 90% of the tofu in America is sold in the produce section, where FDA estimates the average temperature to be about 50ºF (10ºC).

* Therefore most of the tofu in America is now sold in violation of federal and state laws governing potentially hazardous foods.

* Attempts to demonstrate to FDA that pasteurized tofu is a safe product with a long shelf life completely miss the point and would be a waste of time and money, according to FDA.

* The FDA person who drafted the original document classifying tofu as a potentially hazardous food thinks "there is a good chance within the next year or two that there will be a crackdown, and that most or all fresh and pasteurized tofu will be moved out of the produce case.

Question 1. Should the removal of tofu from the produce case to a colder location be viewed by the tofu industry as a setback or an opportunity? Question 2. Will the tofu industry be smart enough to turn a short term setback into a long-term gain? Question 3. All things considered, where is the best place for tofu to be sold? (1) In the dairy/deli case between the yogurts and cheeses, and the sliced meats? (2) In a special refrigerated case, built like a dairy case but marked "Tofu" or "Cholesterol-Free Protein Foods"? (3) In a special refrigerated enclosed glass case with other natural foods such as juices? (4) In the meat case next to the hamburger (and perhaps the hamburger / tofu blends, and the meat & tofu hot dogs and sausages)?

Since its invention more than 1,000 years ago, tofu, a moist protein food, has always offered an excellent substrate for multiplication of bacteria.

The earliest document seen (Jan. 2002) reflecting this concern, titled "Ptomaine poisoning from tofu," dates from 1892 in Japan. In 1953 in Japan the first general microbiological study was published, with counts of coli bacteria in winter and summer. And in 1958 the first book on tofu sanitation was published, also in Japan.

In the Western world, the first scientific study on the

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microbiological quality of tofu was published in 1977 at the University of Hawaii. It showed that as tofu spoiled and soured, the optical density (cloudiness) of the surrounding water increased.

Prior to January 1982, all this was of minor interest to the U.S. Food and Drug Administration (FDA), and tofu was still a relatively unknown product. But in that month there was an outbreak of yersiniosis (caused by the bacterium *Yersinia enterocolitica* in tofu) in the state of Washington. About 24 people were affected with diarrhea and severe stomach cramps; half were hospitalized. This was the earliest known outbreak of tofu-caused illness in the USA.

The Seattle branch of the FDA did a careful study of this increasingly popular moist protein foods and on 23 May 1984 classified it (like milk, meat, poultry, fish, etc.) as a "potentially hazardous food" which must be stored at 45ºF or below.

But only a few state health departments or supermarket chains paid much attention, and moved tofu out of the produce case to a colder location. Exceptions were some Safeway divisions on the West Coast, and the states of Wisconsin, Illinois, and eventually New York.

Meanwhile, other scientific studies of the microbiological quality of tofu (e.g. Hankin & Hanna 1983; Rehberger, Wilson & Glatz 1984; van Kooij & de Boer 1985) all showed many brands to have unacceptably high bacterial counts. Some of these (such as Hankin & Hanna, published in Connecticut in March 1983) got widespread negative media coverage, forcing tofu makers to become much more conscious of sanitation. It is interesting that the issue of tofu as a "potentially hazardous food" was not raised in these studies or the ensuing media coverage. In part because of that, most tofu continued to be sold in the produce section; some larger manufacturers responded by starting to pasteurize their tofu. But basically, business continued as usual.

Then in early 1987, health inspectors in Wisconsin pulled Mori-Nu Tofu out of several stores there, saying that it had to be stored at 45ºF or below. In February, Morinaga Nutritional Foods in Los Angeles, the importer and marketer of this aseptically packed tofu, responded with documents showing that their product, because it was aseptically packaged and had an FCE (Food Canning Establishment) number, was exempt from this temperature requirement. During the ensuing exchange of letters with the FDA in Washington, DC, Morinaga first learned (on 3 March 1987) that the FDA had classified tofu as a "potentially hazardous food" which had to be refrigerated at 45ºF or below. The documents show that Morinaga's only concern at that time was to get their product back into the stores. But Morinaga began to realize that, quite by accident, they had stumbled upon a powerful tool for expanding their market share–one of which most of the tofu industry was completely unaware. Yet they decided not to use it for awhile.

During 1988 Morinaga conducted a two-pronged marketing program. On the one hand, they ran the most extensive, positive advertising campaign ever conducted for tofu in America Full-page color ads such as "Lessons in tofu," "Shake up profits!," and "A healthy market" ran all year in numerous national magazines. On the other they began to confront water-packed tofu, promoting their product as having a longer shelf life and less spoilage.

In mid-1989 health inspectors in New York erroneously began to remove Mori-Nu Tofu from produce cases. To try to prevent that from happening nationwide, Morinaga began a campaign in mid-July to write a letter to the health departments in each of the 48 continental states reminding them that tofu had been classified by the FDA as a "potentially hazardous food," and that all water-packed tofu therefore had to be refrigerated at 45ºF or below. Aseptically packaged Mori-Nu Tofu did not require such refrigeration. This part was preemptive. But now Morinaga took the offensive: "We have been informed of recent efforts on the part of the health department officials to inspect and cite stores that are not conforming to the FDA Model Food Sanitation Code regarding water-packed tofu (soybean curd). We commend this action... We know of some instances where water-packed tofu was ordered relocated to dairy or deli cases due to the inability of produce department refrigeration units to maintain temperatures with the FDA guidelines."

Morinaga's campaign of letter writing and phone calls prompted the FDA, and state and local health officials to start enforcing federal and state regulations concerning tofu as a potentially hazardous food, which was required by law to be stored at 45ºF or below.

At the same time, Morinaga appealed to supermarkets and natural/health food stores (using their strongly worded "Water Hazard" ad in trade publications, plus their sales representatives) to carry their aseptic tofu, which could be legally stored in the produce section and which (being pre-dated with a "best used by" date of 10 months) would not cause any problems with souring or spoilage, with returns or "shrink," or with leakage.

A separate campaign of news releases to the popular media attributed the sour, bad-taste image of water-packed tofu to the traditional way of making and packaging it, plus the fact that it was usually stored, inadequately refrigerated, in produce departments.

By late 1989 Morinaga's campaign seemed to be working. In Wisconsin, most (if not all) water packed tofu had been moved out of the produce case; Mori-Nu Tofu had taken its place there. A number of chains nationwide were also relocating their tofu. But where would they put it?

And how should the tofu manufacturers whose tofu was being relocated respond? Should they welcome the change or try to fight it?

This book attempts to study and answer these difficult

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questions, which are crucial ones for the survival and growth of the tofu industry. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 415-283-2991.

9438. *Geschaeftsidee* (*Die*)**.** 1989. Tofu-Herstellung: Unternehmenskonzept Nr. 164 [Tofu production: Enterprise idea no. 164]. 14(6):4, 25-54. Dec. 5. [4 ref. Ger]
• ***Summary:*** An in-depth look at the German tofu industry and the economics of tofu production, encouraging entrepreneurs to start their own tofu shops. According to a study by Dr. Ulrich Hamm from the University of Stuttgart-Hohenheim, use of tofu in West Germany is expected to reach 4,000 tonnes/year by 1992. In 1986 it was only 800 tons. The industry has grown greatly in the past 4 years. There are presently 25 manufacturers (often called Tofureien) in the country and they make 200 to 4,000 kg/week of the healthful food, which they sell for 5-18 DM/kg at natural food stores (Naturkostläden), Reform Houses (*Reformhäuser* and *Bioläden*), vegetarian- and even popular restaurants. Larger business have gross monthly income of 90,000 DM of which 40% may be profit. Minimum startup capital is 2,000 DM, and average is 50,000 DM. A history is given of Ruediger Urban, who started W. Germany's first tofu shop in 1979, cooking with firewood. He now runs a much larger tofu shop in Denning, a suburb of Munich, near the airport.

Klaus Gaiser (with photo and interview), a former student of Sinology and Japanology, started Yamato Tofuhaus in 1983 in Tuebingen, making about 150 kg/week. He learned to make tofu in Japan, where he lived for a year. He now makes 3.5 tonnes/week of tofu (up 35% during the past year) and is West Germany's most successful company.

Albert Hess began to make tofu in 1983, starting with a DM 2,000 investment. He now makes 1.5 tonnes/week of tofu. A brief sketch of numerous other companies, their histories and owners, and their present tofu output is given. Company names are given sporadically, without addresses.

Photos show: (1) Klaus Gaiser. (2) Dr. Ulrich Hamm. (3) A "Vollwert Restaurant / Cafe." (4) Rüdiger Urban. (5) The front of Taifun Tofurei. (6) Lothar Stassen holding a bag of soybeans. Address: Bonn, West Germany.

9439. Oka, Seizo. 1989. Early history of Azumaya (Interview). *SoyaScan Notes***.** Dec. 5. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** According to: Shin Sekai-sha. 1922. *Zaibei Nippon-jin Kan* (*Directory of Japanese in the USA***.** p. 50-51; also called the *New World Directory*) a company named Azumaya Shoten was located at 1636 Post Street in San Francisco. They made Japanese-style pickles, and also sold vegetables and other foodstuffs.

Mr. Oka notes that "Azuma" (written with a different character?) is the old Japanese name for the Kanto area of eastern Japan. According to a legend, the warrior? Yamato Takero no Mikoto went to conquer this wild area. But after a while he got homesick and longed for his wife saying "A tsuma" (Oh, my wife). From this expression the area became known as Azuma.

Mr. Oka and William Shurtleff talked with Mrs. Kazue Teranishi who lives in Hinode Tower, San Francisco (phone: 567-8636). She came to America in 1932 and that same year she married Kôichi Teranishi in 1932. Right after the marriage he took over ownership of Azumaya, a company which had been run by his father, Eijiro Teranishi, and which she believes Eijiro founded in Stockton 5-6 years prior to the marriage, i.e. in about 1926-27. She thinks that Eijiro first made tofu at this company in Stockton, then decided to move the company to San Francisco. She had never heard about Azumaya or Eijiro being located in Oakland–but she is not sure about anything that happened before 1932.

Mr. Oka, whose lifelong work is writing a history of Japanese in America, has not been able to find any reference to Azumaya in Stockton. According to the 1922 Shin Sekai Directory of Japanese in the USA (p. 409) there were two tofu companies in Stockton, Eto Tofu-ten and Yonekura Tofu-ten.

Mr. Teranishi sold Azumaya to Mr. Francis Sueji Sakamaki. Francis was born in Matsumoto-shi, Nagano prefecture, Japan. His name at birth was Sueji Kusama. Just before coming to the USA, Sueji was baptized as a Catholic and given his Christian name, Francis. He was adopted by Kôsa Sakamaki, who was from Tsu-shi, Mie prefecture, Japan. Kôsa had arrived in the USA before 1900 and was well known as the "Alaska Boss," since he recruited Japanese to work in the Alaska salmon cannery. Francis had 4 children: Joseph Koji Sakamaki, Marie Sakamaki, Stephen Motoji Sakamaki, and Timothy Masaji Sakamaki. Francis later took over his father's recruiting business. But since the Alaska salmon canning business was strongly seasonal, Francis wanted another side business. So he bought Azumaya from Kôichi Teranishi in about 1935. However he found that tofu making was tough work so he sold the business in about 1936 or 1937 to Saichi Mizono, who bought it for his son, George.

The 1922 Shin Sekai-sha directory (p. 19?) shows that Mr. Saichi Mizono was a native of Kannon Mura, Saeki-gun, Hiroshima-ken, Japan. He arrived in the USA in 1896. For 5 years he ran a farm. Where? In 1912 (Taisho 1) he started a cleaning and dying company? (*sensen-sho*) in San Francisco? He returned to Japan temporarily, then came back to the USA in 1915. In 1922 his family consisted of his wife, Matsuyo, his first son Akira (George), his second son Kiyoshi (Jack), and his first daughter Shizuko. Address: Head and Founder, History Room, Japanese Cultural and Community Center, 1840 Sutter St. #206, San Francisco, California 94115. Phone: 415-921-1485.

9440. Oka, Seizo. 1989. Early Japanese tofu production in

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America (Interview). *SoyaScan Notes.* Dec. 5. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In the early 1900s, most of the tofu in America was made by the Chinese. The Japanese bought it from them. However when the Japanese started communities in rural areas where there were no Chinese, they started their own tofu companies. Those who did make tofu usually did it as a side business. Thus many early Japanese tofu manufacturers may not have had a company name associated with their activity. The Hayashi and Oye tofu making operations may not have had company names when they started.

It is the Japanese way to refine things, making them more delicate. They did this with Chinese chopsticks and with tofu, making it softer. Some of America's early tofu was probably made by Japanese restaurants. Address: Head and Founder, History Room, Japanese Cultural and Community Center, 1840 Sutter St. #206, San Francisco, California 94115. Phone: 415-921-1485.

9441. Morinaga Nutritional Foods. 1989. Mori-Nu Tofu successfully sponsors the first-ever World Cup of Natural Bodybuilding (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 2 p. Dec. 6.
• ***Summary:*** "Top male and female bodybuilders from across the country recently competed in the first-ever Mori-Nu Tofu World Cup of Natural Bodybuilding, a steroid-free invitational meet held in Redondo Beach, California...

"'These athletes are dedicated to bodybuilding without using anything artificial,' said Art Mio, national sales manager for Mori-Nu Tofu... Mori-Nu Tofu provided free all-natural fruit shakes made with strawberries, bananas and tofu to the event's spectators and participants. According to Mio, tofu is very popular with bodybuilders because it is a rich source of protein, which is very low in saturated fats, sodium and calories with zero cholesterol. He added that tofu is an excellent addition for anyone wanting to eat healthy." Address: Los Angeles, California. Phone: 213-728-4325.

9442. *Tribune-Star* (*Terre Haute, Indiana*). 1989. Morgans sell land for tofu facility. Dec. 10.
• ***Summary:*** "Fred and Jo Ellen Morgan on Wednesday signed a deed transferring ownership of Morgan's Honey Creek Commercial Park, along Johnson Avenue, to Kyoto Food Group of Japan. Kyoto has announced it will construct a tofu manufacturing facility on the property. The company acquired 25 of the 27 acres in the tract, once a commercial tree farm, located between U.S. 41 and Indiana 63, Morgan said. The buyers originally only wanted four acres, but after seeing the great number of trees on the tract the decision was made to purchase all the available land, he said.

"Kyoto did not purchase the two acres belonging to Tim Morgan, which is the site of his feed business. The feed business will continue its operation, Morgan said. The Morgans spent 18 months developing the area for commercial use... The property has numerous evergreens, oak and white birch trees."

9443. Morinaga Nutritional Foods. 1989. TEAMM House drug rehabilitation center receives $10,000 donation from Mori-Nu Tofu (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 2 p. Dec. 13.
• ***Summary:*** "Actor/political activist Martin Sheen recently accepted a $10,000 donation from Los Angeles-based Mori-Nu Tofu on behalf of TEAMM House, a Malibu-California-based non-profit organization dedicated to helping drug and alcohol abusing adolescents free their lives of chemical dependencies.

"Sheen accepted the check at the Mori-Nu Tofu World Cup of Natural Bodybuilding, an invitational drug-free athletic event held in Redondo Beach, Calif." Address: Los Angeles, California. Phone: 213-728-4325.

9444. *Produce News* (*Fort Lee, New Jersey*). 1989. Mori-Nu sponsors competition. Dec. 16.
• ***Summary:*** Mori-Nu has sponsored the World Cup of Natural Bodybuilding. The photo above the article shows a lovely, well-muscled, bosomy lady in a scant two-piece swimsuit flanked by two men in suits humorously flexing their muscles. The caption reads: "Actor Martin Sheen (left) shows his best bodybuilding stance alongside Marcia Levine, star of Gold Gym's Personal Trainer Video Series, and Yasuo Kumoda, executive vice president of Mori-Nu, at the recent Mori-Nu Tofu World Cup of Natural Bodybuilding." For details, see Morinaga news release (12/89).

9445. *Ag Biotechnology News.* 1989. Better soybean planned at new tofu center. Dec.
• ***Summary:*** "Scientists at a new research center at Purdue University are trying to breed a better quality and better tasting soybean in making tofu for the Orient and to make no-cholesterol tofu more palatable for U.S. consumers.

"Researchers will work directly with the Japanese sponsor of the center, Mitsubishi International Corp. Geneticist Niels Nielsen said removal of the beany taste may promote better acceptance of tofu in the U.S. and of U.S. soybeans in the Orient.

"The Purdue Research Foundation holds a patent on a less-beany tasting experimental variety developed by Nielsen. About 5,000 acres of the new bean are being grown this year by Indiana growers under contract with Central Soya Inc." Address: Cedar Falls, Iowa.

9446. Morinaga Nutritional Foods. 1989. Yasuo Kumoda, vice president, general manager (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 1 p. Undated.
• ***Summary:*** "Kumoda supervised the opening Morinaga Nutritional Foods Inc. in Los Angeles in October, 1985, for

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the marketing and distribution of Mori-Nu Tofu. Prior to 1985, Mori-Nu Tofu was distributed by Mutual Trading Co. of Los Angeles with sales targeted to the Asian market. After the opening of Morinaga Nutritional Foods, sales of Mori-Nu Tofu increased from 60,000 to 400,000 cases in less than four years...

"Kumoda has been instrumental in the implementation of Mori-Nu's 10,000 member Health For Life Club as well as Mori-Nu's 'Healthy Life' newsletter."

Note: Talk with Art Mio. 1990. Feb. 6. It now looks like sales of Mori-Nu Tofu for fiscal year 1989-90, which ends in March 1990, will be about 375,000 cases. Each case contains 25 x 10.5 ounce packs of tofu. This represents 5,906,250 lb/year of tofu, or 113,582 lb/week of tofu. This makes Morinaga one of the top four tofu sellers in the USA, along with House Foods and Yamauchi, Azumaya, and Nasoya Foods. Address: Los Angeles, California. Phone: 213-728-4325.

9447. Sakai, Miyoko; Abe, Motoko. 1989. Quick & easy Japanese cooking for everyone. Tokyo: The Japan Times. xvii + 128 p. Illust. (line drawings, photos). No index. 18 cm.
• ***Summary:*** "The purpose of this book is to introduce foreign residents in Japan to the pleasures of Japanese home cooking." Contains 77 typical Japanese recipes, with an English translation of the recipe name plus the Romanized Japanese name and that same name written in Japanese characters.

One chapter (p. 65-77) is titled "Egg and tofu." Soy related recipes include: Miso soup (p. 6). Pork miso soup (*Ton-jiru,* p. 7). Vinegared rice wrapped in thin fried tofu (*Inari-zushi,* p. 11).

Note: This is the earliest English-language document seen (April 2013) that contains the term "thin fried tofu." It refers to deep-fried tofu pouches.

Broiled pork with miso (p. 43). Fresh tofu (Hiya-yakko, p. 72). Tofu salad (p. 73). Tofu with vegetables (p. 74). Tofu steak (p. 76). Fried tofu (Agedashi-dofu, p. 77).

Other soy related recipes: Eggplant with miso (*Nasu no dengaku miso ae,* p. 88). Eggplant and green pepper with miso (*Nasu to piiman no miso itame,* p. 89). Soybeans with vegetables (*Gomoku mame,* p. 92-93). Sukiyaki (with "1 block broiled tofu {*yakidofu*}," p. 96). Address: 1. Teaches Japanese cuisines for foreigners and That dishes for Japanese in Tokyo, Japan.

9448. *Soya Newsletter* (*Bar Harbor, Maine*). 1989. Soy powder plant to be built in Minnesota. Sept/Dec. p. 8.
• ***Summary:*** "The Upper Minnesota Valley Regional Development Commission (UMVRDC) along with PdT, a Minnesota-based specialty soybean supplier, has announced that they will soon be signing an agreement that will result in the building of a soy powder plant sometime in the Spring of 1990. The plant, being built in conjunction with Showa Boeki of Osaka, Japan, will produce Neo Soya Powder (NSP), made through a proprietary dry process. The Minnesota group plans to buy, dismantle and install Showa Boeki's soy powder system in Madison, Minnesota. Showa Boeki will have a five year agreement with the group to buy their NSP. The powder will be shipped to Japan and used in producing tofu and other products."

9449. *Soya Newsletter* (*Bar Harbor, Maine*). 1989. 'Soymilk cheese' to be sold in Japan. Sept/Dec. p. 13.
• ***Summary:*** "Nisshin Biodeveloping Research Laboratory, a subsidiary of Nisshin Confectionery Company of Japan, has announced plans to sell a 'soymilk cheese' made from soymilk. The product will be similar in appearance to margarine and will be sold through department stores."

9450. *Soya Newsletter* (*Bar Harbor, Maine*). 1989. Japanese seek better beans. Sept/Dec. p. 13.
• ***Summary:*** "Fourteen representatives from major Japanese oilseed processing companies met September 22 in Washington, D.C., with top USDA and other government officials to urge the U.S. to produce soybeans with improved oil and protein content. Japan imported approximately 3.66 million tons of soybeans from the U.S. in 1988, compared to 4.65 million tons five years ago. Japanese imports from South America were about 720,000 tons in 1988, compared to 140,000 in 1986. Among Japanese officials participating in the mission were M. Shima of Hohnen and M. Fukawa of Nisshin."

9451. *SoyaScan Notes.* 1989. Major soy-related company acquisitions and mergers worldwide 1970-1989 (Overview). Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1970 March–Miles Laboratories of Elkhart, Indiana (most famous as the maker of Alka-Seltzer) acquires Worthington Foods of Worthington, Ohio (most famous for its Morningstar Farms line of meat alternatives), making it a wholly owned subsidiary.

1973 Jan. 15–ADM acquires 50% of British Arkady Holdings Ltd. and its subsidiary British Arkady Co. Ltd. of Old Trafford, Manchester, England.

1977 (late)–Bayer A.G. of Germany (makers of Aspirin) acquires Miles Laboratories of Elkhart, Indiana; as part of the deal they Worthington Foods, a subsidiary of Miles.

1979–Bunge Corp. acquires Lauhoff Grain Co. of Danville, Illinois.

1982 Oct. 15–Worthington Foods is repurchased from Miles Laboratories by a group of three Seventh-day Adventist investors in a leveraged buyout. During the 12 years under Miles, sales increased five-fold. Sales volume in 1983 was an all-time high. The company employed 250 people.

1983 April 21–Hybritech Seed International, Inc., a wholly-owned subsidiary of Monsanto Company, purchases

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the Jacob Hartz Seed Co. of Stuttgart, Arkansas.

1983–House Food Industrial Co., Ltd. of Japan purchases 50% ownership in Yamauchi Enterprises (formerly Hinode Tofu Co., owned by Mr. Shoan Yamauchi) in Los Angeles. The company is renamed House Foods & Yamauchi, Inc.

1985 May 31–Barricini Foods Inc. acquires Farm Foods (makers of Ice Bean soy ice cream) of Summertown, Tennessee.

1985 March–British Arkady acquires Direct Foods Ltd.

1986 Feb.–British Arkady acquires Vegetarian Feasts Ltd.

1986 Dec. 1–White Wave acquires Soyfoods Unlimited, Inc. of San Leandro, California. It is White Wave's first acquisition.

1987 Aug.–British Arkady acquires Haldane Foods Ltd. and Regular Tofu Co. Ltd. It also acquires Vegetarian Cuisine Ltd. in 1987.

1987 Oct.–The Ferruzzi Group in Ravenna, Italy, acquires Central Soya Co. in Ft. Wayne, Indiana.

1987 Dec. 31–ADM acquires the rest of British Arkady Holdings Ltd. so that it now owned 100%.

1988 Jan.–The British Arkady Group acquires Haldane Foods.

1988 Feb.–Westbrae Natural Foods (of Berkeley, California, maker of soymilk) is merged with and becomes a wholly-owned subsidiary of Vestro Foods, a publicly traded company in City of Commerce, Southern California. Most of Westbrae's top management decides not to stay with the company.

1988 Sept.–Haldane Foods Group acquires Realeat Foods Ltd.

1989 Feb.–Haldane Foods Group acquires Saucemasters Ltd. It also acquires Genice Foods Ltd. in March 1989.

1989 Feb. 16–Edward Lowe of Michigan, the inventor of Kitty Litter, purchases the majority of shares in INARI Ltd. from Len and Irene Stuttman; but they. kept a minority ownership in the company.

1989 April–Huegli Naehrmittel A.G. acquires Yamato Tofuhaus Sojaprodukte of Tuebingen, Hirschau, West Germany. Note: This is the earliest record seen (Feb. 2013) that mentions Huegli in connection with soy.

1989 April 22–Lima Foods of Belgium acquires Jonathan P.V.B.A. of Belgium.

1989 Sept.–Lima Foods of Belgium is purchased from Vibec by Euronature (pronounced as in French, YU-ro na-TYUR), a large international food company headquartered in Paris, France.

9452. Taira, Harue; Tanaka, Hiromi; Saito, M. 1989. [Total sugar, free type of total sugar, and free sugar contents of domestic soybean seeds]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 36(12):968-980. [Jap; eng]*

Address: National Food Research Inst., Ministry of Agriculture, Forestry and Fisheries, 2-1-2 Kannondai, Tsukuba, Ibaraki 305, Japan.

9453. Camacho-C, F. 1989. Caracteristicas y uso potential para frijol de soja verde (*Edamame*) de las variedades de soja nueva y antiquas de la parte central de Japan [Characteristics and potential use of green vegetable soybeans (*Edamame*) from new and old soybean varieties from central Japan]. San Jose, Costa Rica: Centro Para Investigaciones en Granos y Semillas, Universidad de Costa Rica. [Spa]*

9454. Howard, James O.; Harness, Vernon; Minyard, Jimmy D.; Passig, Richard E. 1989. Partners in developing farm markets overseas: A history of the cooperative program between U.S. commodity agricultural organizations and the Foreign Agricultural Service. Washington, DC: U.S. Agricultural Export Development Council. v + 106 p. Illust. 28 cm.

• ***Summary:*** Contents related to soybeans: Soybeans in Spain: Introducing a new product into a hostile market (p. 10-11. "Howard L. Roach, the Soybean Council's new president and Chief Executive, went to Spain in Feb. 1957). Years of reassessment and consolidation, 1963-67: Growth problems emerge (p. 37. A photo shows Howard Roach).

A Congressional committee begins an investigation and drafts a critical report (p. 42-45. Starts in July 1963. Investigation led by Arthur Perlman. Perlman's criticisms. FAS's reply. Program restructuring continues: FAS and cooperators' boards meet to agree on needed changes. Soybean Council of America).

Soybeans (p. 63-64).

Soybeans (p. 88-90).

9455. Ito, A.; Nakagawa, Y.; Watanabe, H. 1989. Effect of orally given miso diet on the incidence of hepatic [liver] tumors in $B_6C_3F_1$ mice exposed to 252Cf. Paper presented at Chugoku Radiation Effect Discussion Meeting. Held 7 July 1989 at Hiroshima. *

9456. Jussaume, R.A. 1989. Food consumption in Seattle, Washington, and Kobe, Japan. *Washington State University IMPACT Center Report* No. 28. *

9457. **Product Name:** [Rice Miso, Barley Miso, and Brown Rice Miso].
Manufacturer's Name: Kanta Kozaki GmbH.
Manufacturer's Address: Dammweg 16, D-7068 Urbach, West Germany. Phone: 07181/87170.
Date of Introduction: 1989.
New Product–Documentation: Letter from Bernd Drosihn of Viana Naturkost. 1990. April 8. A new Japanese miso company, Kanta Kozaki, has started in Germany near Stuttgart. They are producing mugi, genmai, and kome miso.

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Talk with Bernd Drosihn. 1995. Jan. 30. The owners of Kanta Kozaki are Hiroshi Kozaki (Japanese) and Karl Selgmann (German). This company many have started making miso a little earlier than Bernd's company, Viana. The German man conducted a lot of research on miso, and while doing that, he made miso.

Leaflet titled "Kanta Miso und neue Produkte" sent (faxed) by Bernd Drosihn. 1995. Jan. 30. The company's new products include the Kanta Miso Pickles. The first product of this line is Miso Pickled Cucumbers.

9458. Kato, Eihachiro. 1989. [Travels for natto in Africa–For the investigation of the spread of soybeans in West Africa by FAO]. *Daizu Geppo* (*Soybean Monthly News*) 156:18-26. [Jap]*

9459. Kato, K.; Akai, S.; Tominaga, S.; Kato, I. 1989. A case-control study of biliary tract cancer in Niigata Prefecture, Japan. *Japanese J. of Cancer Research* (*Gann*) 80:932-38. *
• ***Summary:*** Consumption of miso soup was inversely related to bile duct cancer, but not gall bladder cancer–although this relationship was not significant after adjustment for other variables.

9460. Kiuchi, Kan. 1989. Nattô [Natto]. In: Sozai to Ryôri [Food Materials and Dishes]. Tokyo: Gakushu Kenkyusha. See p. 194-95. [Jap]*

9461. Kumar, P.S.; Hymowitz, T. 1989. Where are the diploid (2n = 2x = 20) genome donors of Glycine Willd. (Leguminosae, Papilionoideae)? *Euphytica* 40:221-26. [21 ref]
• ***Summary:*** "There are about 16 genera in the subtribe Glycininae, tribe Phaseoleae, family Leguminosae. The overwhelming reason for the economic importance of the subtribe Glycininae is due to the cultivated soybean, Glycine max (L.) Merrill. The soybean, its wild annual counterpart and most of wild perennial members of the genus Glycine carry 2n = 40 chromosomes. It is reasonable to assume that the base number of the genus is x = 10. However Glycine plants carrying 2n = 20 have not been reported. Herein we report on the 2n chromosome situation of the remaining 15 genera in the subtribe Glycininae and two genera (*Galactia, Ophrestia*) once thought to be allied with Glycine. Certain species in *Dumasia, Galactia* and *Ophrestia* were found to carry 2n = 20 chromosomes. All the other genera carry 2n = 22, 28 or 44 chromosomes. The 2n chromosome number of *Teyleria* (44) and *Pseudeminia* (22) is being reported for the first time."

The subgenus *Glycine* contains 12 wild perennial species. Ten of the species are "indigenous to Australia and carry 2n = 40 chromosomes. *Glycine tabacina* (Labell.) Benth. with 2n = 40, 80 chromosomes, has been found in Australia, Taiwan, South Pacific Islands (New Caledonia, Fiji, Tonga, Vanuatu) and West Central Pacific Islands (Mariana, Ryukyu [southern Japan]). All accessions of *G. tabacina* collected outside of Australia are tetraploid (2n = 80) and even within Australia, tetraploids predominate over the diploid forms. *Glycine tomentella* has been found in Australia (2n = 38, 40, 78, 80), Papua New Guinea (2n = 40, 78, 80), Philippines (2n = 80), and Taiwan (2n = 80). Singh et al. (1987) demonstrated that the complexes of *G. tabacina* and *G. tomentella* evolved through allopolyploidization." Address: Dep. of Agronomy, Univ. of Illinois, 1102 S. Goodwin Ave., Urbana, IL 61801.

9462. Masuda, R. 1989. Yasai no reito–edamame [Frozen vegetables–Green vegetable soybeans]. *Reito* (*Refrigeration*) 64:359-76. [Jap]*
Address: Japan.

9463. Nagamine, K. 1989. Tôhoku chihô oishii meibutsu edamame de tsukuru an: Zunda wa san-jippun de dekiagari [Sweet bean paste made from green vegetable soybeans in the northeast provinces: Zunda can be made in 30 minutes]. *Seikatsu Benri* (*Convenient Life*) 6/2. p. 31-33. [Jap]*
Address: Japan.

9464. Nakashima, H.; Okubo, K.; Honda, Y.; Tamura, T.; Matsuda, T.; Yamamoto, N. 1989. Inhibitory effect of glycosides like saponin from soybean on the infectivity of HIV in vitro. *AIDS* 3(10):655-58. *
Address: Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai.

9465. Nihon no nogaku kankei shoshi no shoshi [A bibliography of agricultural bibliographies in Japan]. 1989. Tokyo, Japan: Nihon Nogaku Toshokan Kyogikai [Tokyo Agricultural University]. viii + 225 p. 25 cm. [Jap]*
Address: Tokyo, Japan.

9466. Yoneyama, T.; Itoh, T.; Shinha, Y.; Fukuzawa, M.; Shimizu, K.; Nishizawa, N.; Baba, S. 1989. [Investigations into the quality of commercial soy sauce. XVI.]. *Research Report of the Nagano State Laboratory of Food and Technology* No. 17. p. 16-20. [1 ref. Jap]*
Address: Nagano State Lab. of Food Technology, Kurita, Nagano-shi, Japan.

9467. Belleme, Jan. 1989. Traditional foods of Yaita: Life on a Japanese farm. *Palate Pleasers of Japan* (*Los Angeles, Calif.*) 8:65-70, 72-74.
• ***Summary:*** The story of how John and Jan Belleme learned as apprentices to make miso with the Onozaki family on the outskirts of Yaita, Japan–100 miles north of Tokyo. Photographs by John Belleme. Address: North Carolina.

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9468. Ebine, Hideo. 1989. Industrialization of Japanese miso fermentation. In: K. Steinkraus, ed. 1989. Industrialization of Indigenous Fermented Foods. New York and Basel: Marcel Dekker, Inc. xii + 439 p. See p. 89-126. [60 ref]
• ***Summary:*** Contents: Introduction. The earliest documents seen that mention miso. Raw materials used in ancient times and today. Industrial / Commercial production today. Contrast between indigenous and modern processing. Critical steps in manufacture / fermentation. Major problems in industrialization. Optimal environmental conditions for the microorganisms. Essential microorganisms for fermentation. Microorganisms that cause spoilage. Chemical / Biochemical changes during fermentation. Address: Director, Central Miso Research Inst., Shinkawa 1-26-19, Chuo-ku, Tokyo, Japan 104.

9469. Ebine, Hideo. 1989. Miso shôyu nyûmon [Introduction to miso and shoyu]. Tokyo: Nihon Shokuryo Shinbunsha. Hatsubaimoto Nihon Serufu Saisu Kyokai. 282 p. Illust. 18 cm. Series: Shokuhin Chishiki Mini Bukkusu Shirizu (Knowledge of Foods–Mini-Books Series). [Jap]* Address: Director, Central Miso Research Inst., Shinkawa 1-26-19, Chuo-ku, Tokyo, Japan 104.

9470. Fukushima, Danji. 1989. Industrialization of fermented soy sauce production centering around Japanese shoyu. In: K. Steinkraus, ed. 1989. Industrialization of Indigenous Fermented Foods. New York and Basel: Marcel Dekker, Inc. xii + 439 p. See p. 1-88. [160 ref]
• ***Summary:*** Contents: Introduction. History. Present soy sauce situation. Change of soy sauce manufacturing methods from indigenous to modern processing. Microbiology and biochemistry. Application of new biotechnology for soy sauce manufacture. Forecast. References. Address: Kikkoman Corp., Chiyoda-ku, Tokyo, Japan.

9471. Fukushima, Danji. 1989. Historical development of soy sauce and fermented black soybeans in China (Document part). In: K. Steinkraus, ed. 1989. Industrialization of Indigenous Fermented Foods. New York and Basel: Marcel Dekker, Inc. xii + 439 p. See p. 2-8.
• ***Summary:*** "1. Chiang. In 1979, Kinichiro Sakaguchi proposed a unique hypothesis regarding the origin of soy sauce and miso as a result of historical biochemical investigations, and this hypothesis was later introduced by this author in English (Fukushima, 1985a, 1986b). However, new literature on the origin of soy sauce and miso appeared based on more detailed historical evidence (Pao 1982a, 1982b; 1984a, 1984b). According to these papers, soy sauce was derived from a Chinese food called 'chiang' ('hishio' in Japanese).

"Chiang is a tasty mash product and does not come in a liquid form. Therefore chiang belongs in the category of 'miso' in Japan. The first record of chiang can be found in the book entitled *Chou-li* (*Shurai* in Japanese) by Chou-kung (*Shuko* in Japanese), which was published around 1,000 B.C. in the Chou (*Shu* in Japanese) dynasty (1,222 BC to 249 BC). This book covers the matters on the early years of the Chou dynasty in ancient China (about 3,000 years ago). According to this document, chiang was made by the following procedure. First, yellow aspergilli were grown on millet. (Such mold-grown cereals are called 'koji' in Japanese.) Then the millet koji and the meat of fish, flesh, or fowl and salt were mixed with a good liquor in a bottle and kept for 100 days. Soybeans were not used in this chiang. The first literature in which soybeans appeared as a substitute for meat in chiang was the *Ch'i-min Yao-shu* (*Saimin-Yojutsu* in Japanese) by Chia Ssu-hsieh (Ka Shikyo in Japanese), the world's oldest encyclopedia of agriculture, published in 535 AD in China. This indicates that the chiang in which soybeans was used originated sometime between the Chou and Han dynasties, when the cultivation of soybeans prevailed. The meats in the chiang described in *Chou-li* were gradually replaced by soybeans in the course of time and further cereals such as wheat, barley, and rice came to be used instead of millet, resulting in the production of many types of chiang. In the process of making chiang during these periods, soybeans were not used as a raw material in koji; rather they were added to the harvested koji prepared from the other cereals. The soybeans were digested by the enzymes of the koji. This digestion mixture was the final product, which was in the form of a mash. The liquid products which belong to the category of soy sauce did not appear in the literature before the later Han dynasty (about 25-220 A.D.).

"There is a description of the liquid product which was made by separating the liquid portion from the chiang in *Ssu-ming Yueh-ling* (*Shimin-Getsurei* in Japanese), published by Ts'ui Shih (Sai Shoku in Japanese) in the later Han dynasty. This liquid was called chiang ch'ing which means 'clear chiang.' The manufacturing processes of chiang and chiang ch'ing are shown in Figs. 1 and 2. Chiang ch'ing is a prototype of soy sauce but it differs from 'chiang-yu' which means literally shoyu or soy sauce in the Chinese characters. The first appearance of the name of chiang-yu was in *Shan-chia Ch'ing-kung* (*Sanya-Seikyo* in Japanese) by Lin Hung (Rin Ko in Japanese) in the Sung dynasty (960-1127 AD).

"The first record indicating use of all the raw materials to prepare koji for soybean chiang appeared in the *Nung-sung I-shin Ts'o-yao* (*Noso-Ishoku-Satsuyo* in Japanese) by Lu Ming-Shan (Ro Meizen in Japanese), published in the Yuan (Gen in Japanese) dynasty (1271-1368 AD). The flow sheet of this soybean chiang is shown in Fig. 3." (In this process, soybeans are roasted, dehulled, cooked, then mixed with wheat flour and spontaneously molded to form koji. The koji is dried in the shade, winnowed, and pounded, then mixed with spices and salt water to form a mash. which is insulated and aged to make the soybean chiang.) The chiang-

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yu described in *Pen-ts'ao Kang-mu* (*Honso-Komoku* in Japanese), published in 1590 by Li Shih-chen (Ri Jichin in Japanese) in the Ming (Min in Japanese) dynasty, was also made with koji manufactured by using soybeans and cereals (Fig. 4). (In this process soybeans were cooked in water, mixed with wheat, and spontaneously molded to form koji. Salt water was mixed in with a paddle, then the mash was insulated and aged. Finally it was filtered to make chiang-yu). The ratio of soybeans to wheat in the koji making was 3:2. This ratio is very close to that used in making regular Japanese shoyu, which is made by using equal amounts of soybeans and wheat, as will be described later. The general manufacturing methods of soy sauce in the Ch'ing (Shin in Japanese) dynasty are recorded in *Ch'ing-yuan Lu* (*Seienroku* in Japanese), written by Li Hua-nan (Ri Kanan in Japanese). Cooked soybeans and uncooked wheat were the raw materials used in koji making. The resultant koji was mixed with brine. After aging, the soy sauce was collected by pressing a deep bamboo colander into the aged mash and ladling out the liquid which had accumulated.

"The original chiang was a mash-type product made with a koji that had been prepared from wheat, barley, rice, etc., and not from soybeans. Therefore, the soybean constituents were only changed through the in vitro biochemical reaction by the enzymes from the mold grown on the cereals. Accordingly, the degree of change of the soybean constituents was not very great and most of the soybean proteins were partially hydrolyzed into polypeptides through the in vitro enzyme action. The degree of liquefaction was not very large and the flavor was not as strong. In the case of chiang-yu, however, mold is grown on both the soybeans and cereals and, as a result, the soybean constituents are changed largely through the biochemical reaction both in vivo and in vitro by the mold throughout the entire process of manufacturing. Accordingly, much of the soybean constituents can be liquefied. The soybean proteins are hydrolyzed to single amino acids and, therefore, the flavor is sharp and strong in chiang-yu. Thus, it can be concluded that (a) the progenitor of miso is chiang, originated in China about 3,000 years ago; (b) the progenitor of soy sauce is chiang ch'ing, originated in China about 2,000 years ago; (c) chiang ch'ing had developed into chiang-yu in China and the regular type of shoyu called koikuchi in Japan at least 1,000 years ago.

"It is an amazing fact that the Chinese had utilized the enzyme action of mold in food manufacturing as early as 3,000 years ago. They deliberately selected yellow aspergilli from many types of aspergilli because they best facilitated the manufacture of chiang. If the definition of 'biotechnology' is to make the products necessary for the welfare of humans by using life phenomena, it can be said that people in ancient China had already produced foods by biotechnology as early as several thousand years ago. In this sense, it is not an exaggeration to say that soy sauce was a pioneer of the actual application of biotechnology.

"2. Shih. Shih is a fermentation product of soybeans, the form of which is a tasty nugget with or without salt. Shih is classified into five types by the kind of microorganism used in its manufacture. Those are *Aspergillus* type (called shih in the areas of Pei-ching, Hu-nan sheng, and Taiwan; and called hamanatto in Japan), *Mucor* type (shih in the area of Shan-tung sheng and natto in Japan), *Rhizopus* type (tempeh in Indonesia), *Bacillus* type (shih in the area of Shan-tung sheng and natto in Japan), and *Neurospora* type (oncom in Indonesia). The shih described here is the shih of *Aspergillus* type, which relates to soy sauce.

"The earliest literature in which shih appeared is *Shih-chi* (*Shiki* in Japanese) by Ssu-ma Ch'ien (Shiba Sen in Japanese), which was published in 85 BC. Shih is also described along with chiang in *Shuo-wen Chie-tzu* (*Setsubun-kaiji* in Japanese) by Hsu Shen (Kyoshin in Japanese), the oldest dictionary in China published in 121 AD in the later Han dynasty. The raw material of the shih is soybeans as shown in Fig. 5. (In the process described in the *Shi-ching* by Hsie Feng (which survives only in the *Ch'i-min yao shu*), soybeans are washed, soaked, drained, and steamed. The cooked soybeans are cooled, then spread, furrowed, and piled. The last 3 steps are repeated 3 times a day for 3 days until the beans have become spontaneously molded. The resulting soybean koji is mixed with soybean cooking liquid, barley koji, and salt, put into an earthen pot, sealed, and insulated. It is then dried in the shade, mixed with a mulberry leaf extract, and steamed. The last 3 steps are repeated 3 times, resulting in salted soybean shih. In the second process described in the *Ch'i-min yao-shu,* soybeans are winnowed, cooked, drained, and cooled. They are piled, the temperature is measured, and then they are stirred. The last 3 steps are repeated 3 times until they are spontaneously molded. They are then spread and furrowed to make soybean koji. This is winnowed, washed, drained, dried, moistened, piled, fermented, and dried to give unsalted soybean shih.) Therefore the resultant shih (soybean nugget) contains a high amount of protein. In shih, much of the soybean constituents are present in a liquid state. The soybean proteins are hydrolyzed to single amino acids and, therefore, the flavor is sharp and strong. The flavor constituents of shih can be extracted easily by a salt solution. The original shih was served as nuggets; the brine extract came to be used as a seasoning gradually. In *Chi-min Yao-shu* (535 AD), there is a description of about 70 kinds of cookeries using shih extracts. It should be mentioned that shih and its brine extract developed into today's tamari shoyu in Japan." Address: Managing Director, Kikkoman Corp., Chiyoda-ku, Tokyo, Japan.

9472. Fukushima, Danji. 1989. Introduction of soy sauce to Japan (Document part). In: K. Steinkraus, ed. 1989. Industrialization of Indigenous Fermented Foods. New York

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and Basel: Marcel Dekker, Inc. xii + 439 p. See p. 9-10.
• ***Summary:*** "There is no literature on the exact time chiang and shih (fermented black soybeans) were introduced into Japan. In 702 AD, however, the Hishiotsukasa, the Bureau for the Regulation of Production, Trade and Taxation of Hishio, was established by the Taiho-Ritsuryo, one of Japan's earliest constitutions. This bureau was located at the imperial palace and produced various kinds of hishio (chiang) which was consumed by the imperial household. Among these products, the word 'misho' is found with the words 'chiang' and 'shih.' It should be noted that the word 'misho,' which is very close to the present word 'miso,' is found as one of the products in the bureau. Misho is also found in *Engishiki,* the enforcement regulation of the statutes, which was completed in 927 AD and became effective in 967 Japan. The first appearance of the present word 'miso,' was in *Nihon-Sandai-Jitsuroku,* a Japanese dictionary published in 1597 during the Muromachi period. In the Edo period (1603-1867), several pieces of literature describing miso and shoyu were written, such as *Wakan Sansai Zue* (Narushima, 1712), *Honcho Shokkan* (Hitomi, 1695), *Mankin Sangyotai* (Miake, 1732), *Yoshu Fushi* (Kurokawa, 1682), and the like. The manufacturing processes described in these works are close to the present methods for producing miso and koikuchi-shoyu, thus it is presumed that the basic manufacturing processes of today's Japanese soy sauce had been formed by the early 17th century.

"In the second half of the 17th century, large-scale, industrial production of soy sauce began for consumption in large cities such as Edo (now Tokyo). Surprisingly enough, there are written records that soy sauce had been exported to India, southeast Asia, and Europe as early as the middle of the Edo period [the Edo Period was from 1600 to 1868] (Noda Shoyu Co. 1953). According to documents of the Dutch East India Company stored in the Archives in the Hague, Holland, soy sauce was exported [by Dutch merchants] from Nagasaki in the Kyushu district of Japan to several parts of India: Coromandel in 1668 and 1716, Ceylon in 1670 and 1699, Surat in 1717, Bengal in 1699, and Nagappattinam [Nagapattinam] in 1699. Carl Thunberg, a ship's doctor for the Dutch East India Company who stayed in Japan for a year and a half from 1775 to 1776, published a book of travels in 1796 (Thunberg, 1796). According to his book, a large quantity of soy sauce was shipped to Batavia (the former name for Djakarta [and Dutch capital of the East Indies]), India, and European countries." Address: Managing Director, Kikkoman Corp., Chiyoda-ku, Tokyo, Japan.

9473. Kono, M. 1989. Edamame [Green vegetable soybeans]. In: Nobunkyo, ed. 1989. Encyclopedia of Vegetables and Horticulture. Tokyo: Nosan Gyoson Bunka Kyokai. See p. 413-29. [Jap]*

9474. Maruo, Bunji; Yoshikawa, Hiroshi. eds. 1989. *Bacillus subtilis:* Molecular biology and industrial application. Tokyo: Kodansha; Amsterdam and New York: Elsevier Press. xv + 267 p. Illust. Index. 24 cm. Series: Topics in secondary metabolism 1, [1182 ref]
• ***Summary:*** The nine chapters in this very interesting book are written by 26 different Japanese contributors. Contents: List of contributors. Preface. 1. Introduction. 2. Taxonomic position of *B. subtilis.* 3. Metabolic and cell growth regulation of *B. subtilis.* 4. Sporulation of *B. subtilis.* 5. Plasmid cloning vectors in *B. subtilis.* 6. Phages of *B. subtilis* and their uses in genetic engineering. 7. DNases involved in restriction and recombination in *B. subtilis* and its relatives. 8. Industrial application of *B. subtilis:* Utilization of soybean as natto, a traditional Japanese food, extracellular enzymes of *B. subtilis,* production of primary metabolites, possible use of *B. subtilis* as a host-vector system for production of biologically active molecules such as hormones and antibiotics, insecticidal proteins from *B. thuringiensis.* 9. Use of *B. subtilis* for re-assay of genotoxic substances.

In the Preface, Maruo observes that a novel method of constructing a genetic map by DNA mediated transformation was established by H. Yoshikawa and N. Sueoka. Thereafter, use of this bacterium in molecular genetics has been increasing rapidly and extending into many fields. "The use of *B. subtilis* has contributed greatly to basic research in genetics, biochemistry, and enzymology. *B. subtilis,* unlike *Escherichia coli,* has the remarkable distinction of becoming competent for DNA uptake and of forming spores, a primitive mode of cell differentiation." Address: 1. Nihon Univ., Tokyo, Japan; 2. Osaka Univ., Osaka, Japan.

9475. Morinaga Nutritional Foods. 1989. Morinaga Milk Industry (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 3 p. Undated.
• ***Summary:*** "Morinaga Milk Industry, the parent company of Morinaga Nutritional Foods, is one of the world's largest food manufacturers." It was founded in 1917. Milk products have been the mainstay of Morinaga in Japan. "A significant product for Morinaga has been its infant formula, with a nutritional level equivalent to mother's milk." Other products marketed by Morinaga include tofu, orange juice, tea and baby food.

"In order to diversify its interests, Morinaga has developed affiliations with such international companies as Unilever, Kraft, Beech-Nut, Lipton and Sunkist, thereby bringing many foods from around the world to the Japanese market." Morinaga has also become involved in the pharmaceutical field with the research of anti-tumor agents. Morinaga Nutritional Foods Inc. was established in 1985 in Los Angeles. "The first long-life tofu was exported from Japan to the United States in 1978 and in the following year, Morinaga received the Minister of Science and Technology Agency Prize for its outstanding aseptic manufacturing technology." Address: Los Angeles, California. Phone: 213-

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728-4325.

9476. Nichii Co. Ltd. 1989. Annual report 1989. Awajimachi 2-2-9, Chuo-ku, Osaka 541, Japan. 42 p. [Eng]
• ***Summary:*** Nichii is a major Japanese retailer. In 1989 the company, including its 35 consolidated subsidiaries, had revenues of 1.039 trillion yen (1,039,968 million yen; US$8,200 million), and net income of 13,500 million yen (US$106 million). Headquartered in Osaka, it is Japan's fifth largest publicly held retailing group. The company's gross profit margin in 1989 was 29.3%. One of Nichii's most important retailing strategies is targeting young and "young minded" consumers. In fiscal 1989, Nichii and its subsidiaries became the MYCAL Group. MYCAL is derived from Nichii's "Young-Minded Casual Amenity Life" concept, which reflects the lifestyle that the group helps furnish to its customers. A new concept is the "urban resort," exemplified by the MYCAL Honmoku, which opened in Yokohama in April 1989 and about which a TV program was aired on 19 May 1990, in California on Channel 26 at 9:30 P.M. Mr. Toshimine Kobayashi is President of Nichii. Mr. Shinozaki is President of International Operations, and therefore oversees the soyflake operation in the USA; he is Terry Tanaka's boss. This annual report is beautifully designed. Note: The company is planning to start a plant in Iowa to make soy flakes for use in making tofu.

Update: Talk with Terry Tanaka of Nichii Company of America, Inc. 1992. Nov. 24. In Japan the Nichii name has been used for about 30 years in connection with a supermarket chain. Now the company is trying to phase it out in favor of names like Vivre and Saty. The umbrella group for all of these companies is the MYCAL Group. After Nichii becomes MYCAL Corp., Terry's company will become MYCAL Corp. of America. Address: Osaka, Japan.

9477. Schmidt, Vera. 1989. Die Sieboldiana-Sammlung der Ruhr-Universitaet Bochum, beschrieben von Vera Schmidt [The Siebold collection of the Ruhr University in Bochum, described by Vera Schmidt]. Wiesbaden, Germany: Otto Harrassowitz. xiii + 461 p. Index. 24 cm. Series: Acta Sieboldiana, vol. 3; Veroeffintlichen des Ostasien-Instituts der Ruhr-Universitaet Bochum, vol. 33. [Ger]
• ***Summary:*** This is a catalog of the collection of Philipp Franz von Siebold (lived 1796-1866) at the Ruhr University. Facing the title page is a large oval color portrait of Philipp Franz von Siebold (1848) in a military uniform. Address: Germany.

9478. Simpson, J.A.; Weiner, E.S.C. 1989. The Oxford English dictionary. 2nd ed.: Tofu. Oxford, England: Clarendon Press. [6 ref]
• ***Summary:*** Etymology: From the Japanese word *tôfu,* which is derived from the Chinese word doufu, from dou = beans + fû = rotten. "A curd made in Japan and China from mashed soya beans; bean curd."

The first entry is: Kinch, Edward. 1880. "Contributions to the agricultural chemistry of Japan." *Transactions of the Asiatic Society of Japan* 8(Part 3):369-415. Oct. See p. 399. There are 5 subsequent entries from 1905 to 1981.

Note: No other entries for words meaning "tofu" but with variant spellings (such as dowfu, tahoo, tahu, etc.) appear in this 1989 edition. Address: England.

9479. Steinkraus, Keith H. ed. 1989. Industrialization of indigenous fermented foods. New York, NY: Marcel Dekker. xii + 439 p. 24 cm.
• ***Summary:*** This book contains the following chapters on soyfoods: 1. Industrialization of fermented soy sauce production centering around Japanese shoyu, by Danji Fukushima. 2. Industrialization of Japanese miso fermentation, by Hideo Ebine. It also contains chapters on the industrialization of the production of sake, tapai, African beers, magehu, ogi, and gari. The final chapter is titled "Industrialization of indigenous fermented food processes: Biotechnological aspects."

The book is dedicated "To the memory of Prof. Andre G. van Veen, a pioneer in the study of indigenous fermented foods." Address: Inst. of Food Science, Cornell Univ., Geneva, New York.

9480. The legacy of the Japanese in Hawaii: cuisine. 1989. [Honolulu, Hawaii]: Japanese Cultural Center of Hawaii. 248 p. Illust. (some color). Index. 26 cm.
• ***Summary:*** A spiral bound book. "The simple elegance of Japanese cuisine sets it apart from other ethnic foods of Hawaii." It is a "culinary art."

"The first group of Japanese, the Gannen-Mono, came to Hawaii as laborers in 1868. The S.S. City of Tokio brought a group of 944 contracted laborers, Kanyaku Imin, on February 8, 1885; and by 1924, 220,000 workers had arrived to become residents of these islands. Thus began the legacy of Japanese in Hawaii" (p. 21).

One chapter, titled "Tofu ryori (Bean curd dishes)" (p. 177-92) contains the following recipes: *Hiya yakko* (Cold tofu, with "2 blocks 'kinu' tofu). *Arare tofu* (Fried tofu cubes). *Agedashi tofu* (Deep fried tofu). *Takigawa tofu* (Jellied tofu strips). *Soba dofu* (Buckwheat soybean curd). *Ken chu / Ken cho* (Meatless or shojin food). *Iri dofu* (Sauteed tofu). *Papaya chanpuru* (Tofu stir-fry with vegetables). *Moyashi chanpuru* (Tofu with bean sprouts). *Gan modoki / Hiryozu* (Deep fried tofu balls). Tofu loaf. Tofu patties. *Okara / Unohana iri* (Seasoned soybean lees [okara]). *Shira ae* (Vegetables with tofu dressing). *Yudofu* (Simmered soybean curd).

For kinako (roasted whole soy flour) see: Rice ball with kinako (variation of Ohagi, p. 230). *Kinako mochi* (variation of mochi, p. 232).

Other soy related recipes *Tori dango no teriyaki*

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(Teriyaki chicken dumpling, with shoyu, p. 41). *Ika no su-miso* (Squid with miso dip. p. 42). *Satsuma jiru* (Miso soup with pork and vegetables, p. 68-69). *Miso shiru* (Basic soybean paste soup, p. 70). *Sushi no gu* (Ingredients for sushi, incl. Koya-dofu {Dried bean curd} preparation, p. 93). *Inari zushi* (Cone sushi, with "12 aburage {deep fried tofu or bean curd}," p. 98). *Aburage mochi* (Fried bean curd with mochi, p. 115). *Oden* (Vegetables, seaweed & fishcake simmered in fish broth, with "3 aburage," p. 116). *Sukiyaki* (Meat & vegetables cooked in sauce, with "1 block tofu, cut in 1-inch cubes," p. 117). *Basic teriyaki sauce No. 1 & 2* (p. 127). *Niku no teriyaki* (Meat teriyaki, p. 127). *Shibi no misoyaki* (Tuna broiled with soy bean sauce, p. 132). *Tako no teriyaki* (Barbecue octopus, p. 134). *Tori no misoyaki* (Chicken with soybean paste, p. 137). *Stuffed miniature aburage* (Fried bean curd, p. 147). *Miso no ankake* (Soybean paste sauces, p. 149). *Kuromame* (Black soybeans, p. 151). *Hijiki to aburage no irini* (Stir-fried seaweed & fried bean curd, p. 153). *Butaniku miso ni* (Pork with miso, p. 154). *Aburage namasu* (Fried bean curd salad, p. 201). *Ingen no miso ae* (String beans with miso dressing, p. 202). *Fudanso no shira ae* (Tofu & swiss chard salad, p. 202). *Kyuri no sumiso ae* (Cucumber with vinegar-miso sauce, p. 204). *Tofu salada* (Soybean curd salad, p. 205). *Misozuke* (Vegetables pickled in miso, p. 212). Address: Honolulu, Hawaii.

9481. Ueda, Seinosuke. 1989. Industrial application of *Bacillus subtilis:* Utilization of soybean as natto, a traditional Japanese food. In: Bunji Maruo and Hiroshi Yoshikawa, eds. 1989. *Bacillus subtilis:* Molecular Biology and Industrial Application. Tokyo: Kodansha; Amsterdam and New York: Elsevier Press. xv + 267 p. See p. 143-62. [60 ref]
• ***Summary:*** Contents: Introduction. *B. subtilis* (*natto*)*:* Conditions for growth of *B. subtilis* (*natto*) (temperature, pH, oxygen, biotin), plasmid of *B. subtilis* (*natto*), bacteriophage of natto. Natto manufacturing process: Introduction, outline of the manufacture of natto, soybeans as raw material, soaking, cooking, inoculation, weighing and packing, fermentation. Biochemical aspects of natto: Change of components of soybeans during natto processing, slime of natto, enzymes of *B. subtilis* (*natto*), flavor of natto, nutritional value of natto, effect of natto as medicine (antibiotics, elimination of [pathogenic] microflora in intestine, anticancer activity, effect on blood pressure, vitamin K content in human milk).

In Japan, natto is sometimes *itohiki natto* to distinguish it from salted, fermented whole soybeans made from steamed soybeans and roasted wheat powder using the koji mold, *Aspergillus oryzae.*

There are various theories concerning the origin of *itohiki natto,* however it is clear that natto was made and sold in Japan during the Edo period (1600-1867–about 400 years ago). It originated in the northern part of Honshu, Japan's main island. Modern mass production of natto using pure culture *Bacillus subtilis* started in about 1919.

Today in Japan there are about 700 natto factories using about 95,000 tons of soybeans a year. Natto is most often eaten for breakfast in Japan, with boiled rice, often with soy sauce and mustard.

In 1906 the natto bacterium was first named *Bacillus natto* Sawamura by Sawamura; he considered it a new species. In 1974 *Bergey's Manual of Determinative Bacteriology* (8th ed.) included *Bacillus natto* within *Bacillus subtilis.* "However Amaha et al. (1952) and Kida et al. (1956) reported that *B. subtilis* and *B. natto* can be classified separately based on whether biotin is essential for growth." Biotin is essential for the growth of *B. natto,* but not for the growth of *B. subtilis.* Table 8.1.1 lists the "Properties of *Bacillus subtilis* (*natto*)*."* The optimum temperature for natto growth is about 40ºC. Its spores are heat resistant. Address: Dep. of Applied Microbial Technology, Kumamoto Inst. of Technology, Kumamoto-shi, Kumamoto 860, Japan.

9482. **Product Name:** [CookDo Mabo-dofu Sauce Dry Mix].
Foreign Name: Mabô-dôfu no Moto.
Manufacturer's Name: Ajinomoto Co. Inc.
Manufacturer's Address: Kyobashi 1-5-8, Chuo-ku, Tokyo 104, Japan.
Date of Introduction: 1989?
Wt/Vol., Packaging, Price: Sealed foil pack.
How Stored: Shelf stable.
New Product–Documentation: Television Ad. 1989. Saturday, Sept. 16. 7:10 P.M. California. Channel 26. 30 seconds. Color. Japanese and French language. An intelligent and healthful looking young French couple are talking in Paris at Rue de La Vie, 18eme, apparently a high class part of the city. The wife is holding a cake of tofu in a glass bowl, and explaining in French that she likes tofu, it is not expensive, and she loves Mabo-dofu (a Chinese-style dish with cubed tofu, red pepper sauce, and usually ground pork or beef). She shows how she dices the tofu. The ad notes that "These two are a little particular about Mabo-dofu. They only make the real thing." It closes with a close-up of the colorful package.

9483. *Tribune-Star* (*Terre Haute, Indiana*). 1990. Kyoto [Food Corp. U.S.A.] seeks lot approval. Jan. 3.
• ***Summary:*** "Kyoto Food Corp. U.S.A. is seeking approval of a one-lot commercial subdivision for the $4.5 million tofu plant it plans to build along Johnson Avenue between U.S. 41 and Indiana 63." The company bought 25 acres and wants to subdivide 2.5 acres of that for the production plant. "Negotiations are now under way to get other food-related plants to build on the rest of the 25 acres... The 25,000 square-foot plant, which will be able to produce 2.5 tons of tofu daily, is expected to start with 30 to 50 employees and increase to 100 during the first year. Tofu is a food

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product made from soybeans. Plans for the new plant were announced in November."

9484. *Nikkei Ryutsu* (*Japan*). 1990. Nattô shinpojiumu o hiraku, Shibata Toshihiko-shi (45). Seikatsu-sha no tachiba de gendai shakai minaosu. Shôhi-sha jôhô [Mr. Toshihiko Shibata (45) will open the Nattô Symposium: Rethink the modern world from the consumer's point of view. Consumer information]. Jan. 6. [Jap]

9485. *Mountain Eagle* (*Jasper, Alabama*). 1990. Soybeans may lower breast cancer rate by half, UAB [Univ. of Alabama at Birmingham] study shows. Jan. 14. Also published in the Daily (Decatur, Alabama). Jan. 4.
• ***Summary:*** At University Hospitals in Birmingham, more than 250 rats were injected with a breast cancer-causing agent. The rate of appearance of tumors in those rats that received a diet rich in unprocessed (unheated) soybeans was about 50% slower than the rats that received no soybeans. Head researcher Stephen Barnes (shown in photo) is an associate professor of pharmacology and biochemistry at Univ. of Alabama at Birmingham. He also is a scientist in UAB's Comprehensive Cancer Center and assistant professor of public health. He is convinced that there is something in unprocessed soybeans that offers protection against breast cancer. "We approached this by looking at those countries which have very low rates of breast cancer, like Japan and other Asian nations, and found almost all had one dietary common denominator–soybeans." Barnes noted that soybeans contain a substance that mimics the principal human estrogen called estradiol. "When we looked at the estrogen-like substance in soybeans, we found some remarkable similarities between it and tamoxifen, a drug which is widely used in the successful treatment of hormone-dependent breast cancer in humans," Barnes said. "If we apply our animal findings to women in this country, then we're talking about protecting around 67,000 women against the disease."

9486. Porter, Kelly. 1990. A taste of tofu: Samplers find food different, but delicious. *Tribune-Star* (*Terre Haute, Indiana*). Jan. 21.
• ***Summary:*** "I have to admit I was apprehensive from the start. Curious, but apprehensive. 'You are cordially invited to attend a tofu luncheon.'... The invitation was signed by Mayor P. Pete Chalos. I figured it he was the one doing the asking, the stuff couldn't be all that bad. I was right. Actually, some of the food prepared was downright delicious. Different, but delicious.

"Last week's luncheon was at the Royal Mandarin Restaurant... courtesy of the Alliance for Growth and Progress. Arrangements for the meal at the southside Chinese eatery were made by the Terre Haute Department of Redevelopment...

"'Family Tofu' was my favorite–it was marinated chunks of deep-fried tofu served with rice and all kinds of Chinese vegetables. Tofu tastes a lot like the foods with which it's prepared, but its consistency is difficult to describe. It's a food that's chewy, yet it melts in your mouth at the same time. It's also kind of creamy, but then again it's not.

"The best way to find out is to try it. Kyoto Food Corp. officials are probably hoping you will."

9487. Chikaarashi, Shigeru. Assignor to Nichii Company, Ltd., Osaka, Japan. 1990. Method for manufacturing a foodstuff suitable for soybean milk production. *U.S. Patent* 4,895,730. Jan. 23. 4 p. Application filed 28 Oct. 1988. [2 ref]
• ***Summary:*** "The apparatus includes a brushing machine for removing earth matter and earth-born germs deposited on soybean material, a band dryer for adjusting the water content of the soybean material so as to facilitate separation of the material into skin and flesh portions, a skin remover for separating the skin portion from the flesh portion and for dividing the flesh portion of each piece of soybean into four to eight parts, and flat pressing rollers for converting the resulting powdery masses into uniformly distributed flaky masses."

Note: The resulting soy flakes are used by Nichii to make tofu in Japan. The compact tofu plants are located in supermarkets or department stores. Address: Sapporo, Japan.

9488. *Journal of Commerce & Commercial* (*New York, NY*). 1990. Japan's Nichii plans to build U.S. soy plant. Jan. 23.
• ***Summary:*** "Nichii Co., a major supermarket chain operator, plans to build a 500-million-yen soybean-processing plant in the U.S. to produce flaked soybean, starting in October, company officials said Monday. The project is designed to ensure a stable supply of the flakes, the raw materials for 'tofu' and soybean milk, they said. Nichii is now considering a site for the plant, possibly somewhere in Iowa. The company plans to import [to Japan] half the plant's product for the production of tofu and for direct sale at its stores, the officials said."

9489. Morinaga Nutritional Foods. 1990. Morinaga challenges Soyfoods Association to take stand on FDA temperature requirements for tofu products (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 2 p. Jan. 23. [1 ref]
• ***Summary:*** Morinaga has informed the Association that "it will cancel its membership if this important subject is not addressed. The two-page document, addressed to Gordon Bennett, president of the Soyfoods Association, asks that the organization respond to the May 1984 FDA classification of tofu as 'Potentially Hazardous' food. The FDA's Retail Food Protection Program Information Manual states that

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all potentially hazardous foods must be maintained at temperatures of 45ºF or below, (or over 140ºF). A copy of the letter to Bennett is attached." Address: Los Angeles, California.

9490. Johnson, Lawrence. 1990. New developments at the Center for Crops Utilization Research at Iowa State University (Interview). *SoyaScan Notes.* Jan. 24. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The name of the center was officially changed to this name from Food Crops Processing Research Center in May 1989, and a new booklet was published. The total budget for 1989 is $2.8 million of real spendable money, including $1.4 million in outside contracts from industry and USDA, etc. plus some money from the state–not including allocation of existing faculty salaries. Things are moving fast.

Lester Wilson, Pat Murphy, and an economist went to Japan last summer. They are now finishing their lengthy report, which includes many original translations of Japanese documents by a Japanese student. [Note: As of Oct. 1990, this report was not yet finished.] They are thinking of holding a workshop after that on the status of soyfoods industry in Japan and the potential for identity preserved soybeans from Iowa going into that market. Address: Director, Center for Crops Utilization Research, Iowa State Univ., Dairy Industry Building, Ames, IA 50011. Phone: 515-294-4365.

9491. Perelman, John. 1990. San Jirushi shoyu and tamari (Interview). *SoyaScan Notes.* Jan. 25. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The shoyu made at the Richmond, Virginia, plant (which contains only 20-30% wheat) became available for sale in Jan. 1990. San-J does not promote this product; the company sees its identity as a tamari brewer, where they are the world's biggest company. The gold label and the black label first became available during the 4th week of February 1990. The Szechuan Sauce and Teriyaki Sauce, reformulated using American-made tamari, became available in April 1989. Tamari Lite is still imported from Japan in drums and bottled in Richmond; the company has not yet installed its desalinization equipment in America, and probably won't until at least 1991.

The tamari now brewed in America is much different in character and taste than the one particular tamari that they imported previously from Japan. They make numerous varieties of tamari in Japan, and the one imported to America had a very high solids content and is thus thicker and darker (closer to back than red), and has a much stronger flavor. After the moromi has finished aging, it has to be shoveled out of the vats; it is too thick to be sucked out. When the milder U.S.-made tamari was introduced, some of the many consumers who had been using the thicker imported product were upset. Therefore San-J is re-introducing the imported product under the name "Imported Whole Soybean Tamari: Wheat-free Soy Sauce." It will only be sold in a 20-ounce bottle. It will be a really strange looking bottle and label. The big red dot is not on the label. It will available the third week of March 1990.

San-J is vigilant about keeping their Gold Label out of supermarkets. A little of the Black Label (made with hexane defatted soybean meal) is sold in natural food stores to any store that wants to carry it. Concerning the waste oil from making tamari from whole soybeans, San-J needs a special license to dispose of it.

San-J has gotten three types of feedback on their U.S. made products, though much less feedback than they had expected (maybe one letter every 2 weeks): (1) Some people liked the imported, thicker better than the Gold Label. (2) Some were upset that San-J would make tamari with hexane-defatted soybean meal. (3) Tree of Life now sells a real wheat-free tamari that they are probably buying from Mansan or Marusan. They are promoting it as the "real" thing, rather than a new American-made product. (4) Some are upset that grain alcohol (from corn) is being added to all San-J products as a preservative. Tamari Lite has the most since it contains less salt. The brewmaster, Mr. Yamamoto, has worked in shoyu breweries as well.

The major brands of imported traditional shoyu are Tree of Life, then Westbrae or Eden (Marushima). Address: San Francisco, California. Phone: 415-821-4040.

9492. Belleme, John. 1990. Controversy concerning San-J tamari (Interview). *SoyaScan Notes.* Jan. 26. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** John recently wrote 2 articles about San-J tamari in *Solstice* magazine. After San-J was in operation he visited the plant and wrote a nice story about them. Then San-J came out with a shelf talker accusing most other soy sauce manufacturers of having alcohol in their products. They instigated this debate. They also sent literature to distributors in which they called their product "traditionally fermented," the same term they used on their imported product from Japan. They erased the line about "not made with chemically processed soybean meal." John started to get calls from retailers, so he contacted the other importers and asked them if they added alcohol to their soy sauce; all said they did not. So John published the results of his survey. He feels San-J was not clear about starting to sell tamari made with defatted soybean meal to companies that specialize in macrobiotic products. The ingredient listing on the label says simply "soybeans," which is deceptive. Moreover, when San-J used to import tamari from Japan, it contained added alcohol which was not listed on the label. This is illegal. John respects San-J and their products. Address: P.O. Box 457, Saluda, North Carolina 28773. Phone: 704-749-9537.

9493. Furusawa, Yôko; Okumura, -; Fujii, Sotetsu. 1990.

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I. *Tôfu Hyakuchin* saigen. II. Tôzai tôfu ryôri-ten shôyû [I. A new look at the *Tofu Hyakuchin.* II. In praise of tofu restaurants East and West]. *Asahi Gurafu.* Jan. 26. p. 36-49. [Jap]
• ***Summary:*** The first author introduces and prepares a number of recipes from the *Tofu Hyakuchin,* a famous Japanese cookbook written in 1782 and containing one hundred favorite Japanese tofu recipes. Contains many large color photos of tofu in recipes. A different author wrote each section of the article. Address: Japan.

9494. Korsak, David de. 1990. Work at Daizou SARL and Le Bol en Bois in France, and at Paul's in England (Interview). *SoyaScan Notes.* Jan. 31. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** David, a Frenchman who speaks excellent English, has a degree in Food Technology. He is now taking a 1-year course to earn a Certificate in Business Studies at Cal State, Hayward. From Aug. to Sept. 1987 he worked on weekends for Daizou, located in an industrial zone just southeast of Paris, France. It was his first experience with tofu, but he did not make tofu himself. He did an internship with them, setting up a computer system. The manager was Takatoshi Hirayama. Daizou had about 8 employees total: 2 full-time tofu makers, 2 men frying tofu, 1 manager, 2 drivers who deliver products, and 1 secretary. The tofu company was formerly in the basement of Le Bol en Bois in Paris. They moved when they outgrew that space. They sell mostly to Japanese (in water pack tubs), and their main outlet is at Le Bol en Bois. They use 100-125 kg/day of soybeans to make about 300-375 kg of tofu. They also sell some vacuum packed tofu, made with organically grown soybeans, to 1-2 health food shops in Paris. One of the company's big problems is employee turnover.

After working at Daizou, from Oct. to Dec. 1987, David worked at Paul's Tofu in England. Paul's had recently won a contest that allowed them to move into a small industrial part in Melton Mobray (a city that was looking for employers), Leicestershire, for several years without paying rent. He renamed the company Soyfoods Ltd. The company made tofu only 3 days a week. He was one of the tofu makers. The company used about 5 x 60 lb bags of soybeans a day to make about 2,400 lb/week of tofu. The other days they made second generation products. This company also had big problems with employee turnover, and was unable to grow.

In the future, he wants to work with tofu in France. He will work as an intern at Wildwood Natural Foods in California from Sept-Dec. 1990, then with Société Soy in France selling their products in England. Address: Hayward State Univ., Hayward, California. Phone: 415-886-0867.

9495. Morinaga Nutritional Foods, Inc. 1990. Our new extra-firm tofu creates quite a stir (Ad). *Natural Foods Merchandiser.* Jan. p. 25.
• ***Summary:*** A full-page color ad shows stir-fried tofu and vegetables in a wok. At the lower right is a color photo of a box of Mori-Nu Extra-Firm Silken Tofu. "Mori-Nu: Tofu for the American taste." Address: 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. Phone: 1-800-NOW-TOFU or 310-787-0200.

9496. Shimoyamada, Makoto; Kudo, S.; Okubo, K.; Yamauchi, F.; Harada, K. 1990. Distribution of saponin constituents in some varieties of soybean plant. *Agricultural and Biological Chemistry* 54(1):77-81. Jan. [18 ref. Eng]
• ***Summary:*** Soybean seeds contain many types of glycosides, such as saponins (called soyasaponins) and isoflavonoids. Saponins are bioactive substances with bitter taste. Two types occur only in the seed hypocotyls of soybeans. Address: 1,3-4. Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., 1-1 Tsutsumidori-Amamiyamachi, Aoba-ku, Sendai 981; 2. Kanesa Miso Co., Ltd., 202 Tamagawa Hamada Aomori 030; 5. National Inst. of Agrobiological Resources, 2-1-2 Kannondai, Tsukuba 305. All: Japan.

9497. Smith, Preston. 1990. Agriculture's free trade advocate: How Aussies deal with fewer subsidies. *Soybean Digest.* Jan. p. 28d-e.
• ***Summary:*** "At this Senate confirmation hearing, Secretary of Agriculture Clayton Yeutter, who might consider himself the epitome of free-traders, said, 'We need to break the bonds between government and agriculture.'...

"During his last three years as U.S. Trade Representative, Yeutter headed up the U.S. proposal to the General Agreement on Tariffs and Trade (GATT) to phase out all trade-distorting agricultural subsidies worldwide. But no matter how bold this proposal is, Yeutter has reiterated that the U.S. will not 'unilaterally disarm' its agricultural subsidies until everybody else does.

"If the U.S. were looking for a model of free enterprise and trade–and one that shows a unilateral phase-out of subsidies–it could easily look to Australia. In 1982, the Australian government decided to deregulate its industries, such as banking, shipping and agriculture. In short, Australia has decided not only to speak free trade, but also to phase out farm subsidies, regardless if any other country does...

"A 1987 Economic Research Service study says Australia had one of the lowest producer subsidy equivalents (PSE) in the world. PSE is the portion of farmers' gross income that comes from government assistance... During 1982 to 1986, Japan had an average PSE of 72%, the European Community was at 35%, Canada 31%, the U.S. and New Zealand each 25% and Australia 11%...

"In 1901, Australia gained independence from Britain... Unlike the U.S., where programs date from the 1930s and have grown in the 1980s, the Australian key farm programs started in the late 1950s and faded in the 1970s."

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9498. Nielsen, Niels C. 1990. The Tofu Center at Purdue University and research on food uses of soybeans (Interview). *SoyaScan Notes.* Feb. 8. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Dr. Nielsen, a member of the USDA Agricultural Research Service, is more a molecular biologist than a soybean breeder. He did post-doctoral research and taught in the biochemistry department at the University of California at Davis. The Tofu Center, established in about Feb. 1989, is a corner of the pilot plant in the Food Science Department at Purdue. They have accumulated the equipment they need to make tofu, and they have had people from Taishi Foods (Taishi Shokuhin Kogyo K.K.) a large tofu manufacturer in Aomori prefecture, Japan come to help them make tofu that meets Japanese quality standards. Funding for the Tofu Center and his closely related Soybean Protein Improvement Project comes from Central Soya, Taishi Foods, Mitsubishi, and state grants to support value added research (about $15,000)–plus his USDA/ARS funds. Total funding is still small.

The purpose of the Center is to ask 2 kinds of questions: (1) What is the effect of the way soybeans are stored while being shipped to Japan on the quality for the final tofu? (2) What kind of very small scale tofu preparation techniques can be used in conjunction with soybean breeding programs designed to incorporate into American soybeans traits that will make them more suited for food uses in the USA and abroad. Nothing has been published by the Tofu Center about its goals and activities except for 1-2 news releases from the Purdue Information Office, plus a little video on that was shown at halftime during a recent Purdue basketball game. Suzanne Nielsen (no relation), a food chemist, is also active in the program. The lipoxygenase program is only a very small part of his lab. The major thrust of the whole program is to try to convert the soybean into an edible food, and to make it more acceptable. This will open a whole new market in the West. Most of the effort is aimed at changing the quality characteristics of soy protein by genetic engineering. The major problems they are looking at now are flavor, protein quality, sedimentation value ratios, and flatulence. Concerning flavor, they have made major advances by removing lipoxygenase. Nielsen believes that this is their most important advance to date and that it may have a major effect in improving the acceptability of soybeans for food use. They used backcrossing into Century soybeans (a good-yielding, maturity group 2, field type soybean) to get near isogenic lines. Soybeans missing the L-2 and L-3 lipoxygenase isozymes make a very bland tofu and soymilk, which is much more acceptable to American taste panels. The absence of L-2 alone gives somewhat less bland products. L-1, which has a high pH optimum, plays little role in generating off flavors. Last year about 4,500 acres of soybeans missing the L-2 isozyme were grown in Indiana. The lines lacking lipoxygenase yield the same as Century, but Century no longer yields nearly as well as the best-yielding varieties today. A lot of private and public soybean breeders are now using this germplasm. Concerning protein quality, they have learned how to change the sulfur amino acid content (to increase methionine) and now they are working to get it into a soybean variety.

Being able to change the ratio of 7S to 11S protein sedimentation values (the S stands for Svedberg, who was an early Swedish researcher on the subject) will be important in adjusting the hardness or softness of tofu. But Japanese tofu makers have no clear idea of what ratio they want. Concerning elimination of flatulence factors, that work is just starting.

The Japanese have learned to like soyfoods made from large-seeded vegetable-type (LSVT) soybeans, but American's have not yet learned that. Tofu makers are most concerned about taste and tofu yield, and they prefer LSVT soybeans for their flavor. But they prefer American soybeans for their swelling characteristics during soaking, and this gives a more uniform product. Many Japanese tofu makers plan to have LSVT soybeans grown in America under special contract, but they cannot do that economically due to (1) their poor yield due to problems of shattering during mechanical harvesting, and (2) their thin seedcoat, which leads to more damage during mechanical harvesting. The way the Japanese have traditionally harvested their soybeans, cutting the plants early by hand and hanging them upside down on racks, shattering is an advantage, allowing the beans to be manually threshed from the pods with a minimum of effort. The thin seedcoat, which does not effect shattering, does aid uniform swelling during soaking. Yet he has heard that new-crop LSVT soybeans do not swell as well as year-old ones. Nielsen feels it may not be necessary to start with a vegetable-type soybean to produce the characteristics that they want.

Nielsen believes that the program on food uses of soybeans at Purdue will expand in the coming years. Soybean breeders will be working much more closely than ever before with food scientists. Other key people are Phil Nelson (the department head in the food science department) and Marv Phillips (the department head in agronomy). There have already been 9-10 PhD theses in his soybean protein improvement program. A few of his graduates now doing important work in the area are Nilgen Tumer (from Turkey) at Monsanto (working with cross protection by putting the proteins of a virus into a plant to immunize it against infection) and Paul Staswick at Univ. of Nebraska (working with vegetative storage proteins).

Keith Smith of the American Soybean Assoc. has been very supportive of Nielsen's work. The early work on preparing the low-lipoxygenase lines and modifying the nutritional quality of the soy protein was all funded by ASA. In Dec. 1989, at a meeting at ASA in St. Louis, he first heard

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expressed concern with the quantity of protein in soybeans, for the crushing industry. This seems like a major change of attitude. They are not yet very concerned with the various components of the seed and how those effect quality. At the ASA board meeting, he pointed out that in the coming years, especially because of the development of biotechnology, we will be seeing the developing of niche markets. That will fragment the soybean industry as a commodity crop. A value-added market will emerge, and this will be a major change in the market. So ASA needs to establish better quality standards. He is already working with Central Soya toward component pricing. Indiana has a value-added program with grants to specific projects; it does not have a Center as exists in Iowa and Illinois.

Nielsen's father was a plant breeder at the Univ. of Wisconsin. He was personally more interested in biochemistry and chemistry. So it was very apparent to him due to the environment in which he was raised that there was not enough of a connection between the basic sciences and the applied sciences. The problem was to learn how to establish those bridges. He, who does cutting and splicing of DNA, now has developed close ties with the food science department. The real question will turn out to be whether or not we can find new places to put the improved soy proteins, for example as extenders. Central Soya thinks that these new soybeans will increase the use of isolates and concentrates in foods. Gary Felger (Phone: 219-425-5403) is Nielsen's contact at Central Soya. David Swanson, the CEO, is also very interested in this work. Address: Purdue Univ., West Lafayette, Indiana 47907. Phone: 317-494-8057.

9499. Levey, Robert. 1990. Daring delights at Icarus; Fresh, attractive fare at Cafe Sushi. *Boston Globe.* Feb. 9. p. 71.
• ***Summary:*** This updated review of Cafe Sushi (1105 Massachusetts Ave., Cambridge) states: "There was an appetizer of boiled "edamame," which turned out to be a bowl of whole soybeans cooked in their green skins. The vegetable looks like a lumpy peapod, and you eat it by pulling the pod through your teeth. Lovely little finger food.

"Another offbeat treat was a roasted quail appetizer, a single well-cooked small whole bird served with a few edamame on the side." Address: Globe staff.

9500. Fabricant, Florence. 1990. Food notes: Quick, Hot Sichuan. *New York Times.* Feb. 14. p. C7.
• ***Summary:*** San-J International (the American division of San-Jirushi) has just launched a Sichuan Sauce, which is hot and spicy. San-J specializes in tamari, which it has been making in Virginia for a year. In 1804 the company was founded in Japan.

9501. *Indonesia Times.* 1990. Prospect of non-salted soybean fermentation is good. Feb. 14.
• ***Summary:*** This article is about the Second Asian Symposium on Non-Salted Soybean Fermentation, held 13-15 Feb. 1990 in Jakarta, Indonesia. It covers lectures or papers presented by Prof. Darwin Karyadi (chairman of the symposium), M. Adhyatma (Indonesia's Health Minister), etc.

Moreover: "In Japan, Dr. Kiku Murata, together with a number of scientists and industrialists, have established the Tempeh Club, to encourage research on tempe and to popularize it there."

9502. Smith, Keith J. 1990. American Soybean Association: Recent developments (Interview). *SoyaScan Notes.* Feb. 14. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Dr. Kenneth Bader became ASA's chief executive on 1 Oct. 1976. He worked in Hudson, Iowa, for about 2 years, then he supervised ASA's move to St. Louis from Hudson, Iowa, in Dec. 1978.

ASA now has a research references program. From a database search via Washington University, they obtain and supply to certain researchers and coworkers about 200-250 research references every 3 months, mostly on soybean production.

ASA presently uses these following four terms interchangeably: soybean oil, soy oil, soya oil, and soyoil. Smith thinks that "soy oil" will eventually become the standard; the term "bean" is a negative when used with foods. However "soybean meal" will probably be used in preference to soymeal, primarily because there are soybean meal standards used by the feed trade and NSPA. However, if they eventually propose soybean meal with higher protein content they may call it "soymeal," to distinguish it from 44% meal, since protein is where they have the real advantage.

Concerning component pricing, Smith has spent about a third of his time on this subject during the past year. It is very frustrating. ASA encourages and funds soybean breeders to increase protein and oil levels, and it is almost certain that breeders will be paying increased attention to composition. But whether farmers will ever be officially paid on the basis of protein and oil is highly questionable. Many farmers in the north and northwest will be discounted on the basis of composition today, so they are really being paid on the basis of average component pricing. Smith anticipates that nothing will be done to change soybean trading and marketing rules, but there will be continued pressure on soybean breeders to at least consider composition as they release new varieties. Foreign matter is a major problem in the export markets. USDA's Federal Grain Inspection Service (FGIS) has proposed changing foreign matter requirements over the last several years but U.S. exporters and crushers have effectively opposed this (as well as blending of soybeans), and also oppose component pricing. The Japanese indicate that they are going to start purchasing based on component pricing; this may be a force accelerating pricing. FGIS

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only has to give information on oil and protein levels if the exporter requests it. In the original proposed ruling it was supposed to go from optional to mandatory in 1991, but the latter provision was deleted. ASA has repeatedly supported component pricing, so that soybeans are traded on their inherent quality characteristics, which is their true value. U.S. soybean crushers go out in early fall and analyze the composition of soybeans from counties in many geographical areas. They buy based on this data, and therefore are already doing a form of component pricing, on the average rather than by the individual load. They may not feel it is worth the extra price of getting the data on each load.

There is a lot of interest in value-added products in Washington, DC, nowadays. But ASA's main market is for soybean meal that becomes meat, milk, and eggs. Every state now has a program on breeding specialty soybeans (as for natto or tofu), and most are very optimistic that the program will benefit their state, but the market will soon get saturated. ASA promotes niche markets and encourages breeders to breed soybeans for those markets. The future of low-lipoxygenase soybeans looks good. The main reason ASA has not done much with the soyfoods market is because it is so small. ASA will support the use of soy proteins as meat extenders (a niche market) as long as the red meat industry doesn't complain too much. In the future, this market could be much more important.

A number of state soybean associations such as Minnesota, North Carolina, South Dakota, and Illinois are promoting soyfoods such as soy ice cream and soynuts within the state in order to get growers involved and increase membership. They have found that in order to sell memberships and develop leadership, farmers have to do something. Farmers like to dip ice cream. ASA is supportive of anything that will increase membership and leadership in the states.

Concerning areas of potential cooperation between ASA and the U.S. soyfoods industry / association, ASA is concerned about the perception of soyfoods and would be interested in cooperating in any way possible to give soyfoods a more positive image, and to put them in the mainstream of consumer attitudes and foods. Talk to Gunnar Lynum, who is in domestic promotion.

ASA probably could put together graphs of membership and funding. He suggests that Soyfoods Center write a letter to Ken Bader, Steve Drake, and Marlyn Jorgensen (ASA President) offering to work with ASA in developing a history of ASA. ASA has a history of ASA that was partially done (by Kent Pellett) while they were still in Hudson. It has been dormant for the past 10 years. It is a low priority and will probably never be published, unless I volunteer to write it.

The next World Soybean Research Conference (WSRC) will probably be held in China (PRC), or Brazil (less likely). In recent years there has been a decrease in the number of people working on soybean utilization. So there is not much new to report at the world conferences. The people on the WSRC continuing committee are mostly soybean production people and breeders. Maybe the soyfoods industry and ASA (Gunnar Lynum, who is mainly into soy oil and industrial uses) could cooperative to have the soyfoods industry better represented in these conference speeches.

ASA will put Soyfoods Center on its news release list. Address: Staff Vice President, Research and Utilization, American Soybean Assoc., P.O. Box 27300, St. Louis, Missouri 63141. Phone: 314-432-1600.

9503. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo, English ed.*). 1990. Zambian learns of tricks of tofu trade. Feb. 19. [Eng]

• ***Summary:*** A Zambian man, Stanislas Chisembe, a 38-year-old veterinarian is studying tofu production at a tofu shop owned by Yasuo Tominari in Matsumoto city, Nagano prefecture. He wants to teach the process to his countrymen. In Zambia, where farmers have recently begun to cultivate soybeans, most are exported as cooking oil and feed. He thinks tofu can be mixed with traditional Zambian food, based on cassava and corn, to help relieve protein deficiencies and infant mortality. Chisembe first learned of tofu when he visited Japan 2 years ago. This is the second in a series of articles on an international cultural exchange program called "30 Days in Japan."

"Now he has returned as one of 15 foreigners on a 30-day program in which participants pursue individual projects in Japan. He plans to use his new knowledge about the protein-rich soybean to alleviate malnutrition in Zambia.

"When he returns home, Chisembe will rely on television and other methods to teach tofu-making. The Japan International Cooperation Agency, based in Tokyo, has promised to help him encourage the continued cultivation of soybeans in Zambia...

"At an agricultural center in Toyoshina-machi, Nagano-ken, housewives helped him perfect his technique for making tofu and miso by hand." Address: Tokyo, Japan.

9504. Steinkraus, Keith H. 1990. Re: Current work with fermented foods and biological control/IPM. Letter to William Shurtleff at Soyfoods Center, Feb. 25. 1 p. Typed, with signature.

• ***Summary:*** Dr. Steinkraus retired on 1 July 1989 (not by choice but by law) but is still busy in the area of indigenous fermented foods. He and wife Maxine have 5 children. In Oct. 1988 they moved from Geneva, New York, to Ithaca. Keith moved his laboratory equipment to the Dyce Laboratory at Ithaca, in the Department of Entomology. He has worked on biological control of insects since 1952, so the Department welcomed him. He has also been doing some work on African fermented foods for Nestlé, and will teach this year at Gadjah Mada University in Bogor, Indonesia (which is offering a workshop on Indigenous Fermented

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Foods). Also discusses his activities last year in Japan, Thailand, Wales, and Czechoslovakia. Address: 15 Cornell St., Ithaca, NY 14850; and Cornell Univ., Geneva, New York. Phone: 607-273-6736.

9505. Hesseltine, C.W. 1990. Margaret B. Church, 1889-1976. *Mycologia* 82(1):144-47. Jan/Feb. [20 ref]
• ***Summary:*** "Dr. Margaret Brooks Church was a distinguished mycologist and a charter member of the Mycological Society who has been neglected in the history of mycology. She made several noteworthy contributions to systematic and applied mycology. She, along with Dr. Charles Thom, wrote the first manual on the genus *Aspergillus.* The first authoritative treatment of oriental fermented foods in the West was written by her. It remains an accurate account of these fermentation processes. Dr. Church also conducted laboratory experiments on soy fermentations and collaborated with Japanese workers, especially Professor K. Oshima; Hokkaido Imperial University, Sapporo, Japan...

"Dr. Church was born in Providence, Rhode Island, on March 13, 1899. She received an A.B. in 1912, an A.M. in 1914, and a Ph.D. in 1918, all from Brown University.

"One of her most important contributions was the USDA Department Bulletin 1152 entitled, 'Soy and Related Fermentations,' published in 1923. At that time there was interest in establishing soybean production in the United States because soybeans were being imported into the U.S. from the Orient. This publication had many photographs of the industrial processes of making koji and soy sauce in Japan. Research in soy sauce production began in 1918 and continued for several years. Soy sauce, miso, molded [fermented] tofu, and natto were also described...

"Dr. Church's research dealt extensively with koji, and it is surprising that she knew even then that tane koji (koji inoculum) consisted of several selected mold strains of *Aspergillus oryzae.* The fact that yellow-green *Aspergillus* strains were employed in these fermentations undoubtedly led both Thom and Church to publish the taxonomic relationships of this group of molds in 1921. Her research on koji was a likely catalyst for her study of industrial enzymes...

"In 1938-1939, Dr. Church served as an indexer and abstractor for Biological Abstracts. Upon her retirement, presumably in 1939, she moved to Lyndon, Vermont." A large photo shows Dr. Church. Address: 5407 Isabell, Peoria, Illinois 61614.

9506. Horii, Masaharu; Ide, T.; Kawashima, K.; Yamamoto, T. 1990. Hypocholesterolemic activity of desalted miso in rats fed an atherogenic diet. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 37(2):148-53. Feb. [19 ref. Eng; jap]
• ***Summary:*** "Effect of dietary miso on the cholesterol metabolism was examined in rats fed the diet containing 0.5% cholesterol and 0.15% sodium cholate. The inclusion of 20% desalted miso to the atherogenic diet significantly decreased the concentration of serum cholesterol hepatic lipid concentrations at the time of sacrifice (30 days) were in no way affected by dietary miso. The ingestion of the miso preparation doubled the fecal excretion of acidic steroids, while it increased only slightly that of neutral steroids. The dietary miso appeared to exert the potent hypocholesterolemic activity primarily through the enhancement of the catabolism of cholesterol to bile acids in rats fed an atherogenic diet." Address: 1-2. National Food Research Inst., Ministry of Agriculture, Forestry and Fisheries, 2-1-2 Kannondai, Tsukuba, Ibaraki 305, Japan; 3. Food R&D Center, Japan Tobacco Inc., 6-2, Umegaoka, Midori-ku, Yokohama, Kanagawa 227, Japan; 4. Aomori Field Crops and Horticultural Experiment Station, Rokunohe, Kamikita-gun, Aomori 033, Japan.

9507. Karta, Susani K. 1990. The market prospective for tempe in the year 2000. In: Hermana, Mien K.M.S. Mahmud, and Darwin Karyadi, eds. 1990. Second Asian Symposium on Non-Salted Soybean Fermentation. Bogor, Indonesia: Nutrition Research and Development Centre. vii + 116 p. See p. 94-104. Held 13-15 Feb. 1990 in Jakarta, Indonesia. 23 cm. [11 ref. Eng]
• ***Summary:*** A very interesting paper. Contents: Introduction. Market situation for tempe in Indonesia. Health and nutritional significance of tempe. Tempe for weaning food. Constraints and trends in the market development of tempe. Recommended guidelines and strategies. Ideas for the diversification of tempe utilization (Tempe as a food ingredient, new tempe food opportunities).

Tempe "is a key protein source in the rice-diet of the people of Indonesia. It is consumed by millions of people of various ages and socio-economic status. It has gained popularity in the Netherlands, Japan, Malaysia, Singapore and other areas where Indonesians have settled. It has also slowly been making its way into the American diet, particularly, in the vegetarian, cholesterol-free and low-fat food product markets."

"Indonesia with a population of 177 million people (in 1988) and an annual population growth rate of 2%, is the largest tempe producer in the world and has the largest soyfood market in the region. In 1983, Indonesians consumed about 0.9 million MT [metric tons] of soybeans as food, which increased to about 1.5 million MT in 1988 (Table 1). About 50 percent of the total soybeans consumed was in the form of tempe, 40% as tofu and the remaining 10% was used for making soy sauce and tauco (a fermented whole soybean condiment). In 1988, the estimated soybean consumption for tempe was around 764,000 MT which amounted to an average per capita consumption of 6.45 kg of tempe (equivalent to 4.3 kg soybeans). In the past five years the consumption of soyfood has increased by an average of

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10% annually."

"Acute diarrheal disease is one of the leading causes of childhood mortality and morbidity in developing countries and is a major contributor of malnutrition. Approximately 25% of the growth differential between children in selected developing countries can be explained by diarrhea. The mortality and morbidity data from a total of 193 surveys carried out in 49 countries since 1981 by WHO (1986) indicate that, on average, a child under 5 years of age suffer 3.5 episodes of diarrhea per year and that about one-third of deaths in this age group are diarrhea associated.

"Investigations worldwide have found diarrhea incidence peaking between the ages of 6 months to 3 years."

Tables: (1) Indonesian soybean production, imports, and consumption as food, 1983-1988. Soybean production increased from 536,000 tonnes (metric tons) in 1983 to 1,179,000 tonnes in 1988–more than double. Soybean imports, which were 391,000 tonnes in 1983, rose to a peak of 400,000 tonnes in 1984, then decreased to 350,000 tonnes in 1988. Consumption of soybeans as food increased from 927,000 tonnes in 1983 to 1,528,000 tonnes in 1988. Per-capita consumption figures are not given. Source: ASA estimates and BULOG statistics. (2) Nutritional composition of tempe (100 gm edible portion). (3) The essential amino-acid composition of tempe compared with the FAO/WHO reference pattern (expressed in milligrams per gram of nitrogen). (4) Fatty acids in soy tempe. (5) Global and regional population in 1980 and estimated number (millions) and distribution of diarrheal diseases. (6) Household Health Survey illness data by different age groups in Indonesia. (7) Potential demand for tempe flour in weaning food in the year 2000, Indonesia. (8) Demographic estimates for Asian developing countries. (9) Estimated number (millions) of children under age 5 in Asian developing countries. (10) Projected potential use of tempe flour in weaning food in Asian developing countries in the year 2010. Address: American Soybean Assoc., Singapore.

9508. Kelley, Bill. 1990. Little big men: Good things often come from small packaged good companies. *Food & Beverage Marketing.* Feb. p. 12-13.

• ***Summary:*** This major cover story, with a photo of Morinaga's national sales manager Art Mio against a background of 76 packs of Mori-Nu Tofu, starts its profile of four smaller but successful food companies with a section titled "Bean curd for the masses."

"Art Mio doesn't have an easy job. He has to convince Americans to try tofu. 'It has a tremendous negative image,' says the national sales manager for Morinaga Nutritional Foods, marketer of Mori-Nu tofu. 'People who haven't even tried it think they don't like it.'"... Morinaga does roughly $7 million in sales, says Mio. "Like other tofu marketers, Mori-Nu positions its product as a health food... The only problem is its taste. When fresh, it doesn't have much of one. But, says Mio, it is often bought spoiled and tastes sour. 'Consumers get inconsistent quality. They eat some, it's bad, and they run to the sink and spit it out.' Tofu often spoils because it is improperly refrigerated... While most consumers know tofu as the white, blobby stuff floating in a milky liquid in the supermarket's deli section, Mori-Nu has elevated the oriental bean curd to packaged good status in attractive boxes and displays. Along with offering a longer shelf life, each package contains a recipe for the product. 'Few people eat tofu plain,' says Mio. 'We position it as a healthy ingredient'...

"The package also invites customers to join the company's 'Healthy Life' club... So far, 10,000 people have taken Mori-Nu up on the offer... 'Our strategy is to get people to use tofu as many ways as they can...

"Recently, the company began marketing its tofu through the Diet Center, a chain of weight-loss centers with more than 2,400 stores across the country. 'That has been doing particularly well,' he says. In addition, the company's tofu was mentioned in 40 recipes in a cookbook sold through the centers."

Note: In Sept. 1990, Art Mio told the *Los Angeles Times* that Mori-Nu's sales for last year were $5 million.

9509. Matsuo, Masako. 1990. Development of a high-fiber foodstuff by fermentation with *Rhizopus oligosporus.* In: Hermana, Mien K.M.S. Mahmud, and Darwin Karyadi, eds. 1990. Second Asian Symposium on Non-Salted Soybean Fermentation. Bogor, Indonesia: Nutrition Research and Development Centre. vii + 116 p. See p. 48-56. Held 13-15 Feb. 1990 in Jakarta, Indonesia. 23 cm. [8 ref. Eng]

• ***Summary:*** This article is about the preparation and evaluation of okara tempeh. Figures show: (1) Photograph of okara tempeh, sliced diagonally to show inner surface. (2) Scanning electron micrographs of okara and okara tempeh. (3) Comparison in composition between okara and okara tempeh. (4) Sensory evaluation of okara tempeh powder by a panel of 20 female students, ages 21-22 (four pie charts); it was neither liked nor disliked. (5) Water holding, oil retention and emulsifying capacity of several powders. (6) Antioxidant action of soybean foods. (7) Volume of biscuits containing okara tempeh (OT). (8) Rheolometric parameters and water absorption rate of biscuit containing OT. (9) Antioxidant action of OT in biscuit fat.

A table shows ingredients of the high-fiber biscuit. Address: Gifu Women's Univ., Gifu, Japan.

9510. Morinaga Milk Industry Co., Ltd. 1990. [Human health research for the 21st century]. Tokyo, Japan. 12 p. [Jap; eng]

• ***Summary:*** This attractive booklet, written in both Japanese and English (but with no Japanese title), and containing many color photos, describes Morinaga's new state-of-the-art Research and Information and Research Center, opened in

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late 1989 on the outskirts of Tokyo. It evens contains a gym and tennis courts. The center contains the following sections, each of which is described: Food research and development laboratory, Nutritional science laboratory, Biochemical research laboratory, Analytical research laboratory, Product evaluation center, Management information systems department. In Feb. 1990 Morinaga Nutritional Foods in Los Angeles issued a news release about the new facility. "Mori-Nu Tofu's safety, convenience, and consistent quality are backed by years of Morinaga's food science know-how, and not just words. No other tofu company comes close."

Note: Art Mio (2/90) thinks that it cost about $10 million to build this lab. Address: Tokyo, Japan.

9511. Murata, Kiku; Asano, Machiko; Fukakura, Noriko. 1990. Activities of Tempe Study Group and popularity of tempe in Japan. In: Hermana, Mien K.M.S. Mahmud, and Darwin Karyadi, eds. 1990. Second Asian Symposium on Non-Salted Soybean Fermentation. Bogor, Indonesia: Nutrition Research and Development Centre. vii + 116 p. See p. 1-3. Held 13-15 Feb. 1990 in Jakarta, Indonesia. 23 cm. [13 ref. Eng]

• ***Summary:*** In 1985 the First Asian Symposium on Non-Salted Soybean Fermentation was held in Tsukuba, Japan. In 1988 the Tempe Study Group was started in Japan by various people interested in tempe. "Seventy seven people became regular members (for a membership one has to pay ¥2,000/fiscal year) and 12 supporting members. In 1989 fiscal year there are 85 regular and 10 supporting members (who have to pay at least ¥10,000/fiscal year).

"The Tempe Study Group had the first Tempe Study Meeting at a lecture hall of Yukijirushi Milk Co. Ltd. in Tokyo, Feb. '89. The second Meeting was held at Kenkyu Koryu Center of Osaka City University in Osaka, in June 1989. The third Meeting was held at Teikoku Gakuen, together with the regular meeting of Kansai Cereal Science Study Group in September 1989, having party serving various tempe dishes. Each time there were 70-100 participants from all over Japan who were very active in discussions. The subjects and speakers were as follows:

"For the first meeting, 1. Y. Torii; About her visit to Natural Foods Expo at Los Angeles, California, in April 1988. 2. K. Okada; Studies on Isolation of Specific Gene from Tempe. 3. T. Maeda; Works on Tempe in our Village.

"For the second Meeting, 1. M. Terashima; The Status quo on Soyprotein and its Foods in Japan. 2. E. Katoh; On Frying Tempe in Reduced pressure. 3. S. Kawabata; Tempe made of Tofu Residue [Okara] and Its Utilization. 4. M. Matsuo; High Fiber Biscuit Adding Tempe made of Tofu Residue.

"For the third Meeting, 1. T. Watanabe; Science of Tempe. 2. K. Murata; Chemistry of Tempe and Its Edible Value. 3. M. Iwatsuki; Problem on Production and Selling Tempe on the Market.

"However, according to our survey of 3,000 people in 27 groups on 10% knew tempe. Among them, in 7 groups, 20-25% of the people liked tempe, as shown in Table 1. Therefore, I feel that we need more efforts to let people know tempe and how to handle or eat tempe." A table shows the results of the survey of 3,000 people as described above. In the 7 groups, 50% knew about tempeh, but only 20-25% of the total said they liked it. Address: 1. Research Inst. for Education, Teikoku Gakuen; 2. Teikoku Women's Univ., Moriguchi City. All: Osaka, Japan.

9512. Nomura, Abraham; Grove, J.S.; Stemmermann, G.N.; Severson, R.K. 1990. A prospective study of stomach cancer and its relation to diet, cigarettes, and alcohol consumption. *Cancer Research* 50(3):627-31. Feb. [45 ref]

• ***Summary:*** In this cohort study, the authors did not find a significant association between consumption of miso soup or tofu and gastric cancer risk among 7,990 American men of Japanese ancestry in Hawaii, although a trend toward a protective effect of tofu was present. Address: Japan-Hawaii Cancer Study, Kuakini Medical Center, Honolulu, Hawaii 96817.

9513. Soejono, Irlan; Kagatsume, Masaru. 1990. Shifts and development in trade of various food crops in East Asia, 1960-1984. *CGPRT Working Paper* No. 5. xviii + 168 p. Feb. 28 cm.

• ***Summary:*** For each country discussed, this book gives information on: Production and supply of coarse grains, pulses, and root and tuber crops. Consumption and demand. Trade and trade elasticities. Forecast and policy implications: Prediction on import demand, indication of policy implications.

The countries are: Japan (p. 1-28). People's Republic of China (p. 29-42). Republic of Korea (p. 43-62). Taiwan (p. 63-79). The Territory of Hong Kong (p. 81-92). Appendixes (p. 95-165). References (p. 167-68).

Summary: As people in the East Asia subregion become more affluent and westernized, they consume less food grains directly and more livestock products.

Japan: Japanese rice production peaked in 1963 at 13.42 million tons, but surpluses have continued to grow. The government has tried various schemes to induce farmers to switch from rice other crops, including soybeans. Graphs show: (1-6, p. 6) "Soybean production, area and yield, 1960-1984." Soybean production in Japan dropped from 418,000 tonnes in 1960 to 100,000 tonnes in 1976. Because of the Rice Farming Diversification Policy, soybean production since 1976 has increased, rising to 238,000 tonnes in 1984. The graph also shows harvested area and yield during this period.

(1-13a+b, p. 13, 14) "Total demand for soybeans its components [in Japan], 1960-1984." The total demand has increased steadily from 1.517 million tonnes in 1960 to

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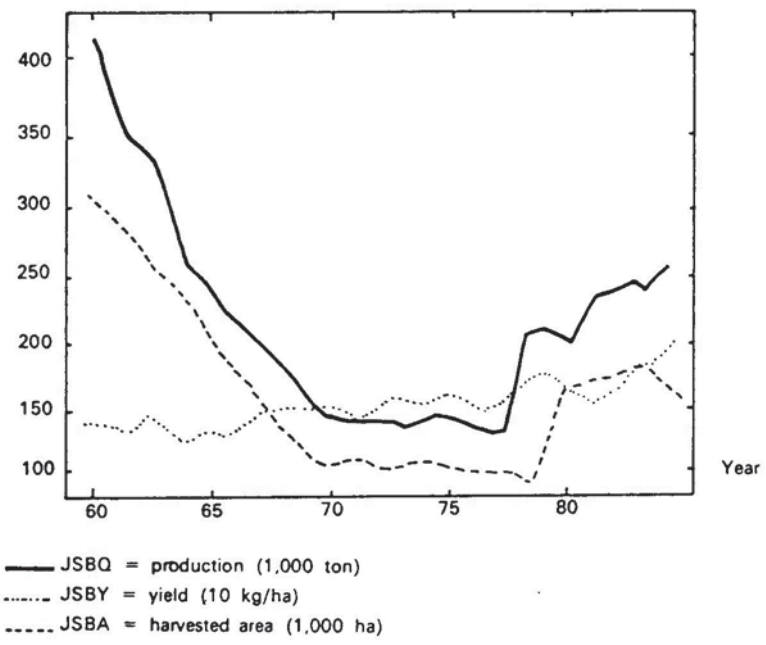

Soybean Production, Area and Yield, 1960-1984

4.814 million tonnes in 1984. About 80% of this demand (3.952 million tonnes in 1984) was for soybeans to be processed. About 90% of these (3.765 million tons in 1984) were crushed into oil and meal. Small and relatively static amounts were processed to make miso (182,000 tonnes) and soy sauce (5,000 tonnes) in 1984. Address: 1. Senior Agricultural Economist, CGPRT Centre, Jl. Merdeka 145, Bogor 16111, Indonesia; 2. National Research Inst. of Agricultural Economics and the Ministry of Agriculture, Forestry and Fisheries of Japan.

9514. Zoller, Stephen; Belleme, John. 1990. Soy sauce: A brewing controversy. *Solstice* No. 39. p. 4-5. Feb. [1 ref]
• ***Summary:*** First Zoller responds to Belleme's two articles about San-J tamari in recent issues of Solstice. Then Belleme responds to Zoller.

Zoller contents that (1) San-J adds food grain alcohol (manufactured by Grain Processing Corp. and certified as kosher) to bring the level up to 2% to inhibit the growth of aerobic yeasts. No benzene is used in the production of this alcohol. (2) San-J's shoyu is made with approximately 80% whole soybeans and 20% whole wheat. No wheat flour is used. (3) Soy grits are of two types: Food grade (which San-J uses) and ordinary (which is used for animal feed). San-J's soy grits are certified as Kosher. (4) Traditionally brewed. The essential parts have not changed.

Belleme responds to each point, then concludes: "San-J cannot have it both ways. When they were marketing only whole soybean tamari in the U.S., their promotional literature referred to soy sauce made with soy grits as 'modern' and 'conventional.' San-J Tamari (black label) and Shoyu (blue label) proudly said, 'traditionally brewed,' 'aged in four seasons,' and 'made with whole soybeans, not chemically treated soy grits.' When San-J began marketing their soy meal product in the U.S., the 'modern' process suddenly became traditional and hexane-extracted soy grits became Kosher. San-J's soy grits may be Kosher, but the confusion they have caused in the natural foods market is not.

"Judging food based on flavor is a matter of personal preference, but natural food shoppers need more accurate labelling to make an educated choice." Address: 1. Vice President and General Manager, San-J International, Richmond, Virginia; 2. Saluda, North Carolina.

9515. *Toyo Shinpo* (*Soyfoods News*). 1990. Chinpin gojutten sorou: Zenkoku tôfu kakô shokuhinten-kai [Fifty second generation tofu products from the Japanese National Processed Tofu Exhibit in Aichi prefecture]. March 1. p. 5-6. No. 1016. [Jap]
Address: Japan.

9516. *SoyaScan Notes.* 1990. The isolation of Japan, trade with Holland, and shoyu (Overview). March 5. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Oda Nobunaga (1534-1582) was the first of the great unifiers of Japan. He eliminated the military power of the Buddhist church, destroying monasteries and killing monks. His bitter opposition to the Buddhists inclined him to favor the Christians, who thrived during his reign. Nobunaga was followed by Hideyoshi (1536-1598), his best general, who completed his work of unifying Japan after 250 years of political disunity. In 1587 Hideyoshi suddenly ordered all Christian missionaries banished from Japan, and he subsequently confiscated their "sub-fief" in Nagasaki. He began persecuting Christians in 1597.

In 1603 Tokugawa Ieyasu (1542-1616) founded the Tokugawa shogunate. He was intensely interested in seeing that his heirs continued his rule–a feat that had eluded Nobunaga and Hideyoshi. He regarded Christianity as a menace, and he stamped it out, though it survived longest in Nagasaki. But he was eager for foreign trade apart from religion. In the second half of the 1500s, trade with Portugal and Holland had thrived. But in 1639 the Portuguese were expelled from Japan for suspected complicity in the Shimabara Revolt. In 1641 the Dutch were moved from Hirado to Nagasaki, where they were kept almost like prisoners on Dejima (also spelled Deshima), a small artificial island in the harbor. All Japanese were prohibited on pain of death from traveling abroad. By these steps Japan succeeded in blocking off most of the channels of foreign contact.

During Japan's 215-year-long period of national

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isolation (1639-1854), the island of Dejima in Nagasaki Bay was the country's only port open to foreign trade.

But Japan's self-imposed isolation was by no means complete. In fact trade increased, though the Japanese were more selective about what they imported. The Dutch had a monopoly on trade between Japan and Europe. One of the items exported by Japan to Europe via Dutch traders was shoyu, is grey pottery jars with blue writing on them. On the jars was written "Jap. Soya" or "Japansch Zoya."

9517. Fehlberg, Eric C. 1990. Thoughts on Loma Linda Foods, its acquisition by Worthington Foods, and the health foods industry in America (Interview). *SoyaScan Notes.* March 7. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Worthington Foods purchased Loma Linda Foods (LLF) from the Seventh-day Adventist Church in Jan. 1990. Loma Linda Foods, unlike most other Seventh-day Adventist companies worldwide, tended historically to target its products to Seventh-day Adventists. Within North America there are very, very few respectable SDA businessmen. That is the problem. "Loma Linda has been working since 1906 with their eyes blindfolded. Too often, instead of using a businessman to head the program, the men in their wisdom have elected to install a broken down minister, and expected him to make a roaring success of it."

A very good businessman, George T. Chapman from Australia, ran LLF from 1938 to 1963. The company did very well financially under his leadership. Since 1963 the company has had a series of managers who lacked business experience; the result was ongoing financial problems. In June 1984 Mr. Fehlberg went from his position at the General Conference to Loma Linda where he turned the company around. Fehlberg ran LLF for about 2 years, during which time it went from a substantial loss to a very profitable company. Mr. Pizzaro was brought in Nov. 1984 and has kept it profitable. He is a very conservative man with a background in banking. He was able to hold LLF together but was not inclined to take the risks to make it really take off.

The church first wanted to sell off the infant formula part of the company because of the high cost of liability insurance. The FDA are really down on infant formula foods. If anything goes wrong, there is no end to the strife. LLF had one small recall due to a small shortage of vitamin A–from dissipation. It was very expensive. Fehlberg understands that but does not understand at all and strongly disagreed with the sale of LLF. "I talked myself hoarse on the committee opposing the sale but I didn't win. I am not happy that it ended up in the hands of Worthington Foods. Their financial report over the past 5 years is not that strong. The last year has not been a healthy year. I hope they can survive. Loma Linda will definitely help them survive by giving them a lot of extra new sales with no extra administration or marketing costs. Now that they have a monopoly, they may relax their standards. I believe that once the 5-year non-compete term expires, you'll get an influx of products into the United States from Adventist companies overseas that will make it very difficult for Worthington to operate–unless they can improve things. Fehlberg prefers the flavor the Australian meat analogs, which are less highly flavored and easier to digest.

Fehlberg feels that the USA is 20 years behind many other countries (Australia, West Germany, Japan) in food processing and storage techniques, largely because of Food and Drug Administration (FDA) restrictions. One area where the USA lags behind is in retorting of food products in plastic film containers. We tend to retort foods too long, and do not have foods retorted in sausage-type pouches (e.g., tofu sausages), which require no refrigeration. The FDA is afraid of botulism in such protein foods, so they require that the foods be frozen. In Australia, West Germany, and Japan these foods are refrigerated, but Adventist tests show they can be stored at room temperature for 6-12 months, or more. If Worthington's frozen meatlike products could put in plastic containers made of this special film (which is available in America) there would be major cost savings in factory storage, transportation, and retail storage. Address: Director, International Health Food Assoc., Seventh-day Adventist General Conference, 12501 Old Columbia Pike, Silver Spring, Maryland 20904. Phone: 301-680-6674.

9518. Mio, Art. 1990. Hinoichi tofu is of excellent quality because it is refrigerated properly (Interview). *SoyaScan Notes.* March 9. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Hinoichi tofu is good quality because it is stored under dairy refrigeration temperatures from the time it is made until it is sold. Southern California is the only area in America that merchandises tofu properly, in the dairy case–even though most people think it sells better in produce. Mr. Yamauchi of Hinoichi insists that any tofu of his sold in Los Angeles be sold in the dairy case. When Hinoichi makes tofu, as for Frieda's Finest, they pack it in a wax coated case and put ice on top of it, so when it gets on the truck going out across America it is in good shape. Address: National Sales Manager, Morinaga Nutritional Foods. Phone: 213-728-4325.

9519. Porter, Kelly. 1990. Kyoto to sink shovels at plant site March 24. *Tribune-Star* (*Terre Haute, Indiana*). March 11.

• ***Summary:*** Describes the proposed ground breaking for the company's new tofu plant at Terre Haute.

9520. *SoyaScan Notes.* 1990. Use of *Bifidobacterium* species in dairylike soymilk products (Overview). March 15. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** A growing number of soy yogurts, dairy milks,

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and cultured milks (such as Yakult) in Europe, Japan, and Canada are being promoted as containing species "Bifido" (pronounced BIF-uh-doe) or "Bifidus" bacteria. Keum et al. (1984) used *Bifidobacterium bifidum* as a starter for soymilk yogurt with good results. Sakai et al. (1987) showed that *Bifidobacterium breve* grown on soymilk assimilates the flatulence-causing oligosaccharides stachyose and raffinose in preference to sucrose, and hydrolyzes galactosyl compounds.

Talk with Brian Quigley of Canada. 1990. March 15. These bacteria are found in the large/lower intestine of newborn infants, but they gradually disappear a few months after birth. If these bacteria are ingested by adults, they supposedly go into the digestive tract, where they survive and kill bad bacteria. By eating a food containing these bacteria, an adult is replenishing his/her digestive tract with a bacteria found there at birth but lost. Some studies ascribe amazing benefits (anti-carcinogen, etc.) to this organism. Chris Hansen's Lab. in Milwaukee, Wisconsin, has done extensive work on this organism in Europe and the USA. They have worked with Yoplait in France and other companies to develop good strains. Products now containing the bacterium are often labeled "BA" or "Bifido Active." In Japan, the bacteria are sold in pill form. Researchers at Laval University in Quebec, Canada, have also done considerable research on these bacteria.

Bergey's Manual of Systematic Bacteriology (1984) lists 32 species of *Bifidobacterium,* including the species *bifidum* and *breve* (p. 1424). "Distinction of two serovars have been made. Serovar A predominates in the feces of human adults, while B predominates in that of neonates (Reuter 1963)."

A search for the term "Bifidobacterium" the MEDLINE database from 1986 to the present lists 78 publications.

9521. Sellars, Bob. 1990. The health benefits *Bifidobacterium* species in dairy products (Interview). *SoyaScan Notes.* March 16. Conducted by William Shurtleff of Soyfoods Center. [1 ref]

• ***Summary:*** Chris Hansen's Lab was founded in Denmark in 1874. Mr. Sellars has been interested in *Lactobacillus acidophilus* and *Bifidobacterium* since 1964, and has done many experiments on himself. His lab has supplied acidophilus to the health food industry since 1962. The single best source of information on *Bifidobacterium* (pronounced BIF-uh-doe-, and called "Bifido" for short) is a 1983 book by Rasic and Kurmann titled *Bifidobacteria and Their Role.* It cites most of the important studies.

The main benefit of Bifido is that it produces some very beneficial enzymes that help to inhibit the formation of pro-carcinogens. But acidophilus also produces an enzyme/compound which reduces or inhibits the azo-reductase and nitro-reductase enzymes in the human body. Those enzymes can produce carcinogens, such nitrosamines (pronounced nai-TROE-suh-meens).

The species of *Bifidobacterium* used by most people are *bifidum, longum, adolscenpis,* and *infantis.* His Lab. makes a mixed culture product named Nu-Trish a/B which contains the longum and the bifidum. The "a" stands for acidophilus, which resides primarily in the small intestine; the B stands for Bifido, which resides primarily in the large intestine. This culture is not used for making yogurt. In the USA the standard for yogurt requires it to contain live *Streptococcus thermophilus* (pronounced ther-MOPH-uh-lus) and *Lactobacillus bulgaricus* organisms. So Nu-Trish a/B (which contains whole cells) is usually added to sweetened pasteurized fluid milk, which is not fermented, but is sold in many supermarkets. In a fermented yogurt, the 3 organisms in Nu-Trish would be antagonistic to the 2 yogurt organisms, so it wouldn't work well. The acidophilus and the bifidum found in newborn infants come primarily from the colostrum in mother's milk, but some may be found in the fetus at birth. Both organisms are found in both intestines of the infant, but (as noted above) acidophilus predominates in the small intestine and *Bifidobacterium infantis* in the large. Infants gradually loose these bacteria as they mature. The Japanese are very interested in these organisms for health reasons because of the Yakult company, and Japanese consume more of these bacteria per capita than any other nation. In Japan, it is legal to promote the health benefits of these organisms, and say that they help cure cancer, that they are good for lactose intolerance (the bacteria produce an enzyme that breaks down lactose in both the milk and in the stomach and small intestine), or that they cure gastroenteritis infections; in the USA, this is illegal. In Europe and Japan extensive clinical research shows the benefits to humans, but in this country the American Medical Assoc. and the Food and Drug Administration have refused to recognize the research done here because the sample size was too small to make it statistically valid. Now Dairy Research Incorporated, the National Dairy Council in Chicago, the National Dairy Research and Promotion Board, the Wisconsin Milk Marketing Board, and the North Carolina Dairy Foundation, Chris Hansen's Lab., and Miles Lab. are all supporting one large scale study in 3 locations. The results, expected in June 1990, if promising will be published in *New England Journal of Medicine* or *Lancet.*

The key to the rapid growth of interest in Bifido was the discovery in Japan a few years ago of the "Bifido factor," i.e. that Bifido need the sugar lactulose for rapid sustained growth. Dairy milk contains small, irregular amounts of this sugar. Hansen's Lab. is interested in dairy milk, and NOT in soymilk.

Al Huggins, president of Huggins International in Chicago has a database on dairy cultures such as acidophilus (Phone: 312-477-0014). Address: Senior V.P. of technology, Chris Hansen's Laboratory, 9015 W. Maple St., Milwaukee, WI 52315. Phone: 414-476-3630.

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9522. Storup, Bernard. 1990. The tofu industry and market in France (Interview). *SoyaScan Notes.* March 26. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The largest tofu manufacturers in France are: (1) Société Soy makes 12,500 kg/week (12.5 tonnes/week) of their basic tofu, much of which is made into second generation products. In fact, regular tofu counts for only about 15% of their tofu sales, whereas Tofu Burgers (*Croque Tofu*) account for 45% and Tofu Sausages (*Tofinelle*) account for 20%. These figures do not include their soymilk, which is more but which is sold as soymilk. They sell to the mainstream market. Société Soy's market for tofu and tofu product has been growing at the rate of about 40% a year over the past few years.

(2) Daizou SARL (related to Le Bol en Bois, in Champigny sur Marne) makes an estimated 500-600 kg/week. They sell tofu from the shop and deliver to several Japanese retail outlets. Their customers are mostly Japanese. Their production seems to have remained static during the past 2-4 years. There are 2-3 small companies that make about 200 kg/week. Innoval (pronounced EEN-oh-val) no longer makes tofu in France. Cacoja (pronounced KA-ko-jah) in the east of France makes what they call their "soy base," to be mixed with meats. It is ultrafiltered, concentrated soymilk with a high solids content but it is quite different from regular tofu. Presently, they may not be selling any tofu in France, and their program to sell the soy base seems weak.

Thus the total size of the tofu market in France is about 14,000 kg/week or 728,000 kg/year. It is growing at about 35% a year.

Update: 12 July 1990. Société Soy has been planning a major export program to the UK. Now they have decided to drop that and export instead to Italy. Address: Founder and Owner, Société Soy, 1 rue du Crêt de la Perdrix, 42400 St.-Chamond, France. Phone: 77.31.23.66 OF.

9523. Ontario Soybean Growers' Marketing Board. 1990. A profile of the Canadian soyfoods market–Characteristics and potential. Box 1199, Chatham, ONT N7M 5L8, Canada. vi + 40 p. March. 28 cm. Spiral bound.

• ***Summary:*** Contents: 1. Introduction: Background, study objectives. 2. Research procedures: Data limitations, data collection (data sources). 3. The soyfood market: Soyfood production and utilization, domestic production, imports and exports (introduction, whole soybeans, soy flours and meals, soy oil, soy sauce, protein substances, cream and other substances, bran & soy hulls, soy meal oil cake), balance, conclusions regarding opportunities.

4. Soybeans for food purposes: Natto beans (background, market characteristics, market potential), whole bean soyfoods (introduction, soynuts, full fatted soy flours, soymilk, tofu, soy sprouts, tempeh, miso, natto, soy sauce), foods from soy ingredients (introduction, defatted soy flakes, soy protein concentrate, soy protein isolates, textured soy protein, consumption and imports). 5. Organic soyfoods: Introduction, organizations (major players, labelling requirements, certification), organic soybeans, organic soyfoods, market opportunities, recommendations.

6. Market estimates: Introduction, conversion rates, market characteristics (introduction, ethnic characteristics, immigration trends, implications), soyfood consumption (production). 7. Soyfood products: Introduction, new products (whole bean products, products from soy components), existing products (products with potential for growth). 8. Marketing strategy: Introduction, respondent requests (background), market opportunities (traditional soyfoods, new products), systems development (system information needs, human resources, production research), institutional needs.

This study was commissioned by the Ontario Soybean Growers' Marketing Board to provide a description of the Ontario soyfood industry. "Production and utilization: In the 1988 crop year, approximately 1.12 million tonnes of soybeans were produced on 1.28 million acres in Ontario. Approximately 86% of the soybeans were sold through the Board, with the remainder being fed or retained on the farms where they were grown. In 1988, 860 thousand tonnes of soybeans were crushed in Canada to produce soybean meal and soy oil, and 272 thousand tonnes were exported.

"Imports and Exports: Canada had a negative balance, a deficit, of almost $190 million in the value of soybeans and soy products traded. This is just over half a million dollars per day. Our largest single area of exports is whole soybeans for human foods. The percentage of these beans going to the major markets in 1988 were: USA, 37%; Pacific Rim Countries, 34%; and Europe and other 29%. Our greatest imbalance in exports and imports is in soybean meal or oil cake. Canadian crushers are unable to maximize their sales of oil cake because of difficulties in selling surplus soybean oil in the US. Soy oil being sold into the US presently faces a tariff of 18% which is decreasing at the rate of 2.25% per year as per the Canada United States Trade Agreement...

"Institutional development: We suggest the Board initiate the establishment of a Soyfood Development Association similar in structure and function to the Canola Council of Canada... There is a need to begin to bring all industry stakeholders together to systematically identify problems, information and research needs; develop data bases; and cooperatively promote the soyfood industry."

Soybeans for food purposes: The total volume of soybeans consumed as soyfoods in Vancouver (BC), Toronto (Ontario), and Montreal (Quebec) was estimated at about 6,000 tonnes, and imports were estimated to be equivalent to 8,000 tonnes of soyfoods.

Miso: One large Vancouver producer and one Toronto producer estimated that the volume of soybeans used to make miso in Canada is only about 35 tonnes/year.

Modern Soy Protein Products: Soy flour, concentrates,

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isolates, and textured soy protein products. Roughly 2,400 tonnes of soybeans are used in Canada for the production of these products, and 5,600 tonnes of soybeans are used to make the imported products (only bakery flour and extruded flour are made in Canada). Almost 1,000 tonnes of soy protein concentrates and isolates, and 400 texture soy proteins were imported, 83% from the USA. Total exports were 800 tonnes, of which 578 tonnes went to the USA. Soy flour (full-fat): The term "flour" generally signifies that the material has been ground finely enough to pass through a 100-mesh screen. Only relatively small volumes of full-fat soy flours are used directly as human foods. Some are used in bread, crackers, and pastry products. 5 companies in Canada make 1,538 tonnes of soy flour worth $495,000.

Natto: Canadians sell roughly 8 to 10 thousand tonnes of natto beans in Japan each year. Natto-type beans are "created by screening out the small beans from among regular food grade soybeans which have white hilums" (p. 15). In Japan about 100,000 tons/year of soybeans are used to make natto. Recently, Canada (via 3 companies–First Line Seeds, W.G. Thompson, and King Grain) has supplied about 10% of this market. Ontario produces about 8,000 to 10,000 tonnes of natto beans. Competition is expected to increase from U.S. seed breeders.

Soymilk: There are presently no large Canadian soymilk manufacturers. A plant is being built by an international trading company near Vancouver (YHS Pacific Fruit Concentrates Ltd., owned by Yeo Hiap Seng). It will supply both the local market and the Western U.S. market when it goes on stream later this year. A high proportion of imported soymilk is organic. Two brands account for 3/4 of all imports: Edensoy and Vitasoy. A high proportion of all soymilk imports are certified organic. This emphasis makes it difficult for Canadian producers to compete because of the shortage of organic soybeans in Canada. Consumption of soymilk is increasing at about 10% a year. Prices range from $1.50 to $2.75 per liter, with the organic product commanding the higher prices. Just under 100 tonnes of soybeans are used to produce soymilk in Canada: Vancouver 42 tonnes, Toronto 30 tonnes, Montreal 25 tonnes, plus imports 240 tonnes. 1 kg of soybeans produces 16.5 kg of soymilk.

Soynuts: The volume of soynuts made in Canada is quite small. One Toronto company [Grove Country Foods Canada, Inc.; they were in business 1-2 years, but were out of business by Jan. 1991], which began operation in Nov. 1988, sells a line of roasted nuts, which are roasted in the USA and chocolate-dipped in Ontario. Production was only a few tonnes in 1989 and is estimated to be about 10 tonnes in 1990.

Soy sauce: In 1986, according to Statistics Canada data, 2,503 tonnes of soy sauce were produced by 6 firms. The value was $2,161 per tonne for a total of $5,411,000. In 1988 Canada imported 5,680 tonnes of soy sauce valued at $4 million, primarily from China, the United States, Hong Kong, and Japan. Exports were 58 tonnes valued at $65,000. The major Canadian producers are China Lily and Sun Fresh in Toronto, Wong Wing and VH in Montreal, and Golden Dragon in Vancouver. The value of Toronto production is currently estimated to be about $5 million.

Soy sprouts: One Toronto manufacturer uses 20-25 tonnes of soybeans per year.

Tofu: About 3,300 tonnes of soybeans are used to produce tofu in Canada, more than any other soyfood. The volume of soybeans used is estimated at 1,400 tonnes in Toronto, 1,200 tonnes in Quebec (when a relatively large operation in Hull [La Soyarie, Inc.], near Ottawa, which exports to Ontario is included), 625-700 tonnes in Vancouver, and 125 tonnes for imported tofu. 1 kg of soybeans produces 2.4 kg of tofu.

Tempeh: Only about 33 tonnes of soybeans are used to make tempeh in Canada, and an estimated 15-20 tonnes in Ontario. Imports are relatively small. 1 kg of soybeans produces 1.6 kg of tempeh. Very few firms produce tempeh in Canada. One producer claims to have over half the Ontario market. A major distributor suggested they sold 4-5 times as much tofu as tempeh.

Soybean crushing: Since 1986 the number of firms crushing soybeans and producing soy oil has decreased from 3 to 2 [Central Soya owns two plants; in 1990 they bought the Canadian Vegetable Oil Processing (CVOP) plant in Hamilton, Ontario, formerly owned by Canada Packers Inc. They purchased Victory Soya Mills in Toronto in early 1985. So now 2 firms own 3 plants]. In 1986 the three plants made 95,108 tonnes of crude soy oil worth $57,271,000. Two firms made deodorized soy oil, but the volume and value were confidential. Less than $2 million of any type of soy oil is imported.

Consumption of soyfoods in Canada is strongly linked to Asian-Canadians. A table (p. 32) shows that according to the 1986 census, there were about 444,000 people of East- and Southeast Asian origin living in three major Canadian cities: Vancouver (155,105 people comprised 11.2% of the city's population), Toronto (234,325 people comprised 6.8%), and Montreal (55,585 people comprised 2.4%). Thus Toronto was by far the largest market, but Vancouver had the highest density of Asian-Canadians. A similar table (p. 33) updates the previous table to 1988. Immigration has increased sharply since then.

Note: This is the earliest document seen (Feb. 2002) that uses the term "food grade" (or "food-grade") in connection with Canadian soybeans (see p. 15). Address: Chatham, ONT, Canada.

9524. Taira, Harue; Tanaka, Hiromi; Saito, Masayoshi; Saito, Masataka. 1990. Daizu no zentô, yûri tôrui ganryô ni oyobosu hinshu, ryûdai saibai nenji no eikyô [Effect of cultivar, seed size and crop year on total and free sugar

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contents of domestic soybeans]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 37(3):203-13. [17 ref. Jap; eng]
• ***Summary:*** As seed size decreases, total sugar, total free sugar, raffinose and stachyose all increase (102-116%), however sucrose decreases slightly.

Table 1-1 shows the relationship, for 13 Japanese varieties, between sugar contents, seed size, and crop year. The varieties (for 1970) are: Kitamishiro, Toyosuzu, Kitamusume, Koganejiro, Tokachinagaha, Isuzu, Oyachi 2, Karikachi, Shinsei, Hokkaihadaka, Okuhara 1, Harosoy, Shika 4. Address: 1-3. National Food Research Inst., Ministry of Agriculture, Forestry and Fisheries, 2-1-2 Kannondai, Tsukuba, Ibaraki 305, Japan.

9525. *SoyaScan Notes.* 1990. U.S. trade deficit with Japan, and changing attitudes and relations between the USA and Japan (Overview). April 6. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** The U.S. trade deficit with Japan was about $5,000 million in 1975. It rose steadily until 1983, then rose dramatically to a peak of $60,000 million in 1987. Thereafter it began to decline, falling to $49,000 million in 1989. A recent poll (*San Francisco Chronicle,* 2 April 1990, p. 1) found that "68 percent of Americans fear the threat from Japan's economy more than the Soviet military... 49 percent of Japanese and 48 percent of Americans believe the United States is in decline as a world power."

9526. Nichols, David. 1990. Re: Asia Protein Co. and their soy flakes. Letter to William Shurtleff at Soyfoods Center, April 8–in reply to inquiry. 2 p. Typed, without signature on letterhead. [1 ref. Eng]
• ***Summary:*** Asia Protein Company was established in 1977, and they began soy flake production in 1980. Their process and product is based on Japanese patent 1,378,742. The average annual output is 2,500 is 2,500 metric tons per year. The company's three main customers for the flakes are Tengu (the largest), Sanyo Shokuhin, and Marufuku Shokuhin manufacturing. Each is a large tofu manufacturer and each uses about 30% of the total production. These companies sell their tofu to large chains such as Daiei and Ito Yokado. Another large customer is the Kuge shops started about 4 years ago inside Nichii department stores, as part of the "Shop within a Shop" retailing concept. Kuge uses 4 tonnes/month of flakes, and has plans to add 7 new shops during 1990. A total of about 50 companies in Japan have switched from using whole soybeans to using soy flakes.

The main reasons these tofu manufacturers have switched to soy flakes are: (1) It takes less time to make tofu using the flakes, and this saves labor costs. (2) The flakes are a high quality product. (3) A company does not need to soak beans overnight and thus can adjust the amount of tofu made during the day with no lead time.

A company named Suehiro makes a push-button tofu making machine that costs about $23,000 and uses the soy flakes. It was designed by Mr. Chikaarashi. Address: Nichii Company of America, Inc., 23440 Hawthorne Blvd., Skypark 2, Suite 140, Torrance, California 90505. Phone: 213-791-0010.

9527. *Jefferson Bee* (*Jefferson, Iowa*). 1990. Nichii Company executives visit Jefferson [Iowa]; seek soyflake plant site. April 17. p. 1, 3.
• ***Summary:*** "The executives were guests of the West Central Cooperative, and were visiting several communities where West Central facilities are located... Pictured during the business meeting are Mr. Shigeru (Sam) Chikaarashi (center), executive vice president for soy flake development with the Nichii Company of America; Mr. Itaru (Terry) Tanaka (right), director and general manager of the Nichii Company of America; and Mr. David Nichols, head of product development of the company. Mr. Chikaarashi developed the process of flaking soybeans that would be used in the new plant... The Nichii Company of America Inc. is headquartered in Torrance, California."

9528. Mio, Art. 1990. In defense of Mori-Nu's negative publicity about tofu, and praise for Hinoichi (Interview). *SoyaScan Notes.* April 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** (1) The industry had the problem of sour tofu, and tofu had developed a bad image long before Morinaga ever began making an issue about it. How many clippings have you read that say, "Tofu needs a good PR agent." (2). Except for rare, accidental slips, the negative publicity and advertising generated by Mori-Nu has been directed only to the food trade (such as supermarket produce and natural foods business publications) and not to consumers. The matte release is the only thing that was voluntarily sent to consumer publications.

It is too bad more tofu manufacturers are not as careful with sanitation as House Foods & Yamauchi, Inc. (Hinoichi). "When I was working at JFK, Hinoichi was packing ice in the case with their tofu. I believe that Hinoichi has the best quality tofu in America. I have confidence in the cleanliness of their manufacturing operation, their refrigeration systems are all state of the art, they ship the tofu to the refrigerated deli warehouse. It goes out on a refrigerated deli truck, and it is sold in Los Angeles stores in the dairy case, which is kept below 45ºF. In Los Angeles, he refuses to let his product be sold anywhere except the dairy or deli cases. He won't sell it in the produce case in Los Angeles." Mr. Yamauchi would like Mori-Nu to private label their tofu for Hinoichi; this would ensure freshness in outlying areas over which he has little control of the storage conditions. Address: Morinaga Nutritional Foods Inc., 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

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9529. Morinaga Nutritional Foods. 1990. Mori-Nu's "Tofu Magic" cookbook is now available nationwide through Baker & Taylor distributors (News release). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 2 p. April 20. Plus photo.
• ***Summary:*** This "low-cholesterol, gourmet cookbook featuring easy-to-make recipes and color photography, is now available through Baker & Taylor... one of the largest book distributors in the United States... This year, Mori-Nu plans to add a new chapter featuring recipes for their new extra firm tofu.

"Julia Weinberg, author of 'Tofu Magic,' is also the best-selling author of two prior cookbooks, 'Gourmet Bouquet' and 'The Big Beautiful Book of Hors d'oeuvres.' Weinberg is a national food stylist based in Los Angeles, where she is director of her own food styling and recipe development company. All recipes in 'Tofu Magic' were developed by Weinberg.

"'Tofu is a miracle food, but the world just doesn't know it yet,' said Weinberg. 'With 'Tofu Magic,' we hope to show people that cooking with tofu is easy and limitless." Address: Los Angeles, California. Phone: 213-728-4325.

9530. Hasshô no chi: Nattô Shinpojiumu in Akita. Nattô was sekai o sukuu!! [The birth place: Natto symposium in Akita. Natto can save the world!!]. 1990. Akita, Japan: Akita-ken Natto Kogyo Kyodo Kumiai. 5 p. [Jap]
• ***Summary:*** On 21-22 April 1990 a natto symposium was held in Akita, a seaport and the capital city of Akita Prefecture in the Tohoku region of Japan (northeastern Japan). It is located on the Japan sea. Specifically, it was held in the Akita-ken Sôgô Saikatsu Bunka Kaikan (a cultural hall).

9531. *Akita Sakigake* (*Akita Pioneer, Japan*). 1990. Nattô de sekai "seiha" o. Inoki-shi ra netsuppoku kataru. Akita-shi de shinpo [Natto conquers the world. Mr. Antonio Inoki and others talked enthusiastically. Symposium (held) in Akita city]. April 22. p. 3. [Jap]
• ***Summary:*** A photo shows four men seated behind a table with the word "Natto Symposium" written in Japanese characters on a banner behind them.

9532. *Mainichi Shinbun* (*Akita Edition, Japan*). 1990. Kôen, ryôri de oishisa jikkan. Akita Atorion, Nattô Shinpo ni 500 nin [Both the lectures and the sampling of foods were delicious. At the Akita Atrion, there were 500 people at the Natto Symposium]. April 22. p. 24. [Jap]
• ***Summary:*** The symposium was held in a building named the Akita Atrion. A photo shows several ladies looking at trays of natto dishes on a table.

9533. *Mainichi Shinbun* (*National Edition, Japan*). 1990. Zakki-chô [Miscellaneous notes]. April 22. p. 27. [Jap]
• ***Summary:*** About the Natto Symposium held in Akita prefecture. A small photo shows a man standing behind a microphone at a podium with the word "Symposium" written in Japanese katakana on a banner behind him.

9534. *Yomiuri Shinbun* (*Akita, Japan*). 1990. Nattô hasshô no chi [The birthplace of natto]. April 22. p. 22. [Jap]
• ***Summary:*** A natto symposium was held in Akita city, Japan.

9535. *Yomiuri Shinbun* (*Akita, Japan*). 1990. Nattô no kokusai-sei kyôchô. Akita de shinpojiumu [The international aspects of natto were emphasized: Symposium in Akita]. April 22. p. 25. [Jap]
• ***Summary:*** A natto symposium was held in Akita city, Japan.

9536. *Yomiuri Shinbun* (*Japan*). 1990. Nattô Shinpo: Kakuchi kara 400 nin tsudoi, nekki. Shokuryô kiki ni tokkôyaku. Seijinbyô e no kôyô mo toku [Nattô Symposium: 400 people gathered from various places, excited and enthusiastic. An effective medicine for the world hunger. They talked about its good effects on adult diseases]. April 22. p. 23. [Jap]
• ***Summary:*** A natto symposium was held in Akita city, Japan.

9537. *Jefferson Bee* (*Jefferson, Iowa*). 1990. Nichii Company will build plant in Jefferson [Iowa]. April 24. p. 1-2.
• ***Summary:*** "Nichii Company of America Inc. will construct a $2 million soyflake processing plant in Jefferson adjacent to the West Central Cooperative (WCC) elevator facility. Governor Terry Branstad made the announcement at his morning press conference at the state capitol in Des Moines...

"The plant will begin production this fall with an output of 1,000 tons of soyflakes per month. The company's plans call for the eventual production of 3,000 tons per month, with three shifts in operation on a round-the-clock basis.

"Employment initially will be about seven people, with the work force expected to rise to more than 15 when all three shifts go into production. When round-the-clock operation is achieved, the Nichii plant will process soybeans at the level of 1.5 million bushels per year...

"Mr. Toshimine Kobayashi, president of Nichii Co. Ltd. of Osaka, Japan, plans to come to Iowa in November to open officially the new plant.

"Mr. Kobayashi explained, 'Due to its topographical characteristics, proximity to a suitable soybean supplier, rail and road access, and the economic incentives offered by the city of Jefferson, this site was judged to best suit Nichii's needs. Representatives of Nichii Co. Ltd. also appreciated the civic spirit and friendliness of the citizens of Jefferson

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which seems to be characteristic of all Iowans.

"Nichii Company hopes to procure eventually for the Jefferson plant 'organically grown or chemical residue free soybeans, which are going to be in larger demand as our society is increasingly concerned with health and a cleaner environment.'

"The new plant in Jefferson will process a flake which allows tofu makers to prepare the product within a few minutes of its purchase, therefore actually making the tofu product in the store. Nichii Company is currently using that process in several of its stores in Japan."

A large photo shows four Nichii executives, incl. Itaru (Terry) Tanaka, David Nichols, Shigetaka Hamai, and Shigeru Chikaarashi.

9538. *Shukan Asahi* (*Japan*). 1990. Nattô wa sekai o sukuu ["Natto saves the world"]. April 27. p. 16. [Jap]
• ***Summary:*** Contains four frames of cartoons. A natto symposium was held in Akita city, Japan.

9539. **Product Name:** Stir-Fry Sauce, Stir Fry Spicy Sauce for Seafood, Chinese BBQ Sauce, and Steak Sauce.
Manufacturer's Name: Merrychef Foods SDN BHD.
Manufacturer's Address: 118A Jalan Burhanuddin Helmi, Taman Tun Dr., Ismail, 6000 Kuala Lumpur, Malaysia. Phone: 03 719-7540.
Date of Introduction: 1990 April.
Wt/Vol., Packaging, Price: 250 gm glass bottles.
How Stored: Shelf stable.
New Product–Documentation: Spot in SoyaFoods. 1991. Spring. p. 4. "Stir fry sauces from Merrychef." "Merrychef Foods produces a whole range of sauces for Western and Oriental cooking, most of which are exported. Their 'Chinese' range of 'stir fry,' 'BBQ,' and steak sauces are mainly based on soya and have been available in the UK for about a year and in Australia, Japan and Germany for a few months. Merrychef hopes to export to the U.S. this year as well as to supply the home market... Varieties include stir fry for meat, vegetables, sea food, Chinese BBQ and steak sauce."

9540. Muso Co. Ltd. 1990. Muso product manual: Foods from Japan. Tanimachi 2-5-5, Chuo-ku, Osaka 540, Japan. 62 p. Catalog. April. 30 cm. [Eng]
• ***Summary:*** This English-language catalog describes Muso's natural-food macrobiotic products that are exported to the West. There are 8 pages of color photos at the front, and many flowcharts and recipes in the body of the catalog. Interesting color photos include: Shoyu fermentation room. Spreading moromi before pressing to make shoyu. Hatcho miso aging room. Drying kombu and cultivating nori on nets. Umeboshi and brown-rice vinegar. Shiitake mushrooms growing on logs and huge kudzu roots.

Contents: Shoyu (organic, low salt), tamari (wheat-free soy sauce), miso (Hatcho, barley, rice, white miso, brown-rice miso, awase miso [mixed miso], buckwheat miso, unpasteurized miso [nama miso]), seaweeds, Japanese pasta, wheat free pasta (incl. kudzu noodles), Japanese tea, other beverages, soymilk, amazake, ume/plum products (incl. umeboshi), Japanese pickles, dried foods (incl. kudzu root starch, shiitake mushrooms, koya tofu, fu [gluten cake]), condiments (incl. tekka miso, *nori no tsukudani,* natto miso [miso condiment]), seasonings, instant foods (incl. brown rice mochi, yomogi mochi, kibi mochi, yaki mochi, abekawa mochi with kinako, cooked brown rice, ramen [Chinese style noodles], instant miso soup), crackers and chips, barley malt syrup and rice malt syrup, food supplements (plum balls, kombu balls), adzuki beans, black soybeans, nigari. Address: Osaka, Japan. Phone: 06-942-0343.

9541. Wolff, David. 1990. The Manchurian soya bean and the development of Northeast Asia, 1899-1922. *Asiatic Society of Japan, Bulletin* (*Tokyo*) No. 4. p. 2-4. April.
• ***Summary:*** The soybean was introduced into Manchuria at the end of the 1800s and by 1899 constituted 79% of the region's total exports. The resulting prosperity made the area a theater of conflict between China, Russia and Japan. "By 1922, almost all bean shipments had been diverted from Vladivostok to Japanese-controlled Dairen, making such 'typically Japanese' foodstuffs as tofu and shoyu generally affordable for the first time... Thus the soya bean played an integral part in the history of Manchuria, bringing first wealth, then strife, and ultimately subjugation." Address: PhD candidate in Russian and Chinese history at the Univ. of California at Berkeley.

9542. *Asahi Shinbun* (*Evening Ed., Japan*). 1990. Sekai ni itohiku? "Nattowaaku." Nattô fan-ra ga kokusai taikai keikaku, 11 gatsu [Natto-work (natto network) stretches and connects its strings to the world. Natto fans are planning to have an international gathering (symposium) in November]. May 2. [Jap]

9543. Igo, Becky. 1990. Kyoto owners, officials agree tofu positive for all. *Tribune-Star* (*Terre Haute, Indiana*). May 6.
• ***Summary:*** Describes the groundbreaking ceremony for Kyoto Food Corp. USA's new tofu plant in Terre Haute. The chairman of the board of Kyoto Food is Kumaharu Shimobo, the president is Yoshimasa Yamashita, and the vice president is Bill Roach. Mr. Roach's wife, Toni, convinced Kyoto Foods to buy the land. Construction of the plant will start in May and full production is expected by November. "Roach said that although Kyoto has purchased 25 acres, the actual plant will sit on only 2.5 acres. The company, he revealed, is looking for other firms to locate at that property." The company hopes to begin by making tofu and later expand into other Japanese health-related food products.

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9544. *Toyo Shinpo* (*Soyfoods News*). 1990. 89 nen shinkoku shotoku rankingu [1989 ranking of tofu, natto, and konnyaku companies in Japan, based on reported income to the tax bureau]. May 21. p. 1. [Jap]

• ***Summary:*** Rank–Company name (Food type)–Prefecture–Reported income in million yen, ranking among all Japanese industries. For food types: T = Tofu, DFT = Dried-frozen Tofu, A = Aburagé (deep-fried tofu pouches), N = Natto, K = Konnyaku:

1. Asahimatsu Shokuhin (DFT, A)–Nagano–843–5,504
2. Takano Foods (N)–Tochigi–445–10,464
3. Asahi Kôgyô (T + other foods)–Tokyo–444–10,490
4. San Shokuhin (T)–Kagoshima–417–11,204
5. Okay Shokuhin Kôgyô (A)–Fukuoka–362–12,867
6. Tajimaya Shokuhin (T, N, A)–Hyôgo–322–14,419
7. Azuma Shokuhin (T)–Tochigi–320–14,516
8. Misuzu Tôfu (DFT, A)–Nagano–307–15,128
9. Fujita Shokuhin (T)–Hyôgo–243–19,082
10. Sekigoe Bussan (K)–Tokyo–189–24,470
11. Tochigi-ken Natto Seisan (N)–Tochigi–174–26,477
12. Santeiri (T)–Aichi–140–32,840
13. Sankô Shokuhin (T, Cow's milk)–Yamagata–136–33,679
14. Saga Tôfu Morika (T)–Kyoto–121–37,484
15. Tengu (T, N, A)–Ibaraki–119–38,342
16. Fuji Kiyo Konnyaku (K)–Kyôto–113–40,160
17. Nihon Tanpaku Kôgyô (T, A)–Tokyo–110–41,156
18. Yashima Shokuhin (T, A)–Kanagawa–107–42,410
19. Yama Shoku (T)–Nara–95–47,272
20. Nagai Sôgo Shokuhin (T, A)–Hyôgo–83–53,659
21. Asahiya Shokuhin (T)–Kanagawa–78–56,956
22. Tsujikane Shokuhin Kôgyô (K, A)–Gifu–77–57,789
23. Marukawa Shokuhin (T)–Hokkaidô–76–58,061
24. Kyôto Tanpaku (T)–Kyôto–71–61,805
25. Niihama Seitô (T)–Ehime–58–73,954
26. Kakumitsu Kudô Shokuhin (T)–Aomori–55–78,339
27. Matsuyama Tanpaku (T)–Ehime–50–84,444
28. Tôkô Shokuhin (T, N)–Tokyo–46–91,698
29. Tokyo Minato (T)–Ibaraki–41–99,618
30. Ebara Shokuhin (T)–Tokyo–40–101,982

Explanation: Number 1, Asahimatsu Shokuhin, makes dried-frozen tofu and aburagé. In 1989 the company reported its income to be 843 million yen. It was the 5,504th largest company in Japan. Note: A number of large manufacturers of dried-frozen tofu, perhaps because of slow sales, are now diversifying into deep-fried tofu pouches.

9545. *Spa!* (*Japan*). 1990. Tsuini "Sekai Nattô taikai" kaisai e! Nattô wa sekai o sukuu ka!? Kessen ni kiku, boke ni, kôketsuatu ni, gan-ni [Zoom up: Finally the opening of the "International Nattô Symposium"! Can nattô save the world? It helps to prevent coronary thrombosis, senility, high blood pressure, and cancer...]. May 23. p. 20-21. [Jap]

• ***Summary:*** Photos show: (1) A person holding chopsticks lifting natto, connected by many strings, up from atop a bowl of rice. (2) A pile of about 15-20 different natto packages.

9546. Andersen, Thomas. 1990. Urtekraemmeren and Urtekram in Denmark (Interview). *SoyaScan Notes.* May 24. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** These two companies were originally one. Urtekram means "herb" in Danish. The original company started in the 1960s, inspired by macrobiotics and natural foods, then it split into two in the 1970s. Both companies now import foods (including soyfoods) from Japan and distribute them in Denmark. Urtekram, located in Mareager, Jutland, is larger and doing a lot better financially than Urtekraemmeren. Urtekraemmeren owns Urten's Tofu and its distribution of imported macrobiotic products is limited mostly to Copenhagen. Address: Urten's Tofu, Hoeje Gladsaxe Torv 2, DK-2860 Soeborg, Denmark. Phone: 31 67 41 90.

9547. Fehlberg, Eric C. 1990. Re: List and activities of Seventh-day Adventist health food companies worldwide. Letter to William Shurtleff at Soyfoods Center, May 24. 6 p. Typed, with signature on letterhead.

• ***Summary:*** For each for the following companies is given the date of founding, date manufacturing started, and the soy products presently manufactured: Granovita, Spain. Nutana, Holland. Nutana, Norway. Nutana name changes. Austrian Food Company. DE-VAU-GE, West Germany. Sahm Yook Foods, Korea. Sanitarium Health Food Company, Australia (3 pages).

Lists (with addresses) the following companies: Sanitarium Health Food Company in Wahroonga, NSW, Australia; DE-VAU-GE Gesundkostwerk GmbH in Lueneburg, West Germany; San-iku Foods in Sodegaura-machi, Kimitsu-gun, Chiba-ken, Japan; Korean Food Factory (Sahm Yook Foods) in Choongchungnam-do, South Korea; Alimentos Integronaturales y Panificadora la Carlota in Montemorelos, N.L., Mexico; Produtos Alimenticios Superbom Industria e Comercio Ltda. in Sao Paulo, Brazil; Alimentos Granix in Florida, Buenos Aires, Argentina; Nutana Health Food Company in Bjaeverskov, Denmark; AB Svenska Nutana in Rimbo, Sweden; Granose Foods Ltd. in Newport Pagnell, Bucks, England; Pur-Aliment Food Factory in Clichy–Cedex, France; PHAG Food Factory in Gland, Switzerland (Note: PHAG is an acronym for Produits Hygièniques Alimentaires Gland); Egypt Food Factory in Heliopolis, Cairo, Egypt; Glaxo India Limited in Bombay, India; Westico Foods Ltd. in Mandeville, Jamaica; Industrias Covac S.A. in Alajuela, Costa Rica; South China Island Union Mission in Hong Kong (3 pages). Address: Director, International Health Food Assoc., Seventh-day Adventist General Conference, 12501 Old Columbia Pike, Silver Spring, Maryland 20904. Phone: 301-680-6674.

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9548. *SoyaFoods* (*ASA, Europe*). 1990. Misleading use of dairy names. 1(1):2. Spring/Summer.
• ***Summary:*** "New UK regulations banning the misleading use of dairy names have been introduced in the UK. The Milk and Milk Products (Protection and Designations) Regulations 1990 implement EC Council Regulation 1898/87/EEC which protects dairy names by prohibiting the use of terms such as 'soyamilk' on labels...

"It will also be an offence to claim or suggest that a product is a dairy product by using dairy imagery in the labelling or advertising of non-dairy products. In countries, like France, where there are even difficulties in using the term 'Soyadrink', alternatives such as the Japanese term 'tonyu' are being considered."

9549. Yasuda, Masaaki. 1990. Okinawa ni okeru tofuyo seizo ni kansuru kenkyu: Seizo hiden no kagakuteki kaiseki to gijutsu tenkai [Studies on the manufacture of Okinawan fermented tofu (*tofuyo*). A scientific analysis of procedures for making tofuyo, and its technical development]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 37(5):403-09. May. [28 ref. Jap]
• ***Summary:*** On page 404 is a flow chart for making tofuyo from whole soybeans. The article contains 3 tables and 4 figures; two of the latter are graphs and one is a photo. Address: Dep. of Agricultural Chemistry, College of Agriculture, Univ. of the Ryukyus, Nishihara-cho, Okinawa-ken 903-01.

9550. Levey, Robert. 1990. Japanese, Spanish treats in Cambridge. *Boston Globe.* June 1. p. 40.
• ***Summary:*** This updated review of the Japanese restaurant Roka states: "You may meander around on the appetizer menu with some satisfying results. Under the 'offbeat' category, consider the edamame, a bowl of Japanese green soybeans blanched in salted water and served cool. You pick up the whole pod, squeeze out the round soybeans and munch them like a party snack." Address: Globe staff.

9551. Oka, Seizo. 1990. Early Japanese immigrants to Hawaii (Interview). *SoyaScan Notes.* June 7. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The first contracted labor immigrants from Japan arrived in Hawaii in 1868 aboard the ship Scioto. They took with them miso and shoyu. Before that time, some Japanese drifted ashore or were shipwrecked on Hawaii. A number of groups were supposed to follow the first group, but there was a dispute in the contract so the program was terminated with the first group.

The ship Scioto (pronounced sai-OH-tuh) was apparently named after a river in Ohio that flows 237 miles southward through Columbus and empties into the Ohio River in Scioto County. It belonged to the Pacific Mail Steamship Co. of the USA. In Japanese the ship's name is usually romanized in katakana as *Saioto-go* (or less commonly as *Shiotto-go*), where "go" (the Japanese character for "number") is a suffix widely used with the names of ships, trains, and other vehicles. "Go" is not a counter for ships–the counter is "seki," such as isseki, niseki.

Robert W. Irwin, an American who became an agent in Yokohama for the Pacific Mail Steamship Co., played a key role in both the 1868 and 1885 contracts. The first group consisted of 148 Japanese. They were under a contract made between the Japanese government and the Hawaiian kingdom. But because of a dispute in the contract, 40 members of the group returned to Japan without fulfilling the contract; 108 remained in Hawaii and fulfilled the contract. Since they left in 1868, the first year of Meiji, they are often referred to as "Gannen mono" which means "Fellows of the first." In 1885 the contracted labor was resumed, and continued on for several years. The second group of contracted labor immigrants was carried from Japan to Hawaii on the ship named City of Tokio. Address: Founder and former Head, History Room, Japanese Cultural and Community Center, 1840 Sutter St. #206, San Francisco, California 94115. Phone: 415-751-5951.

9552. Stachura, Irena. 1990. About the ship Scioto (Interview). *SoyaScan Notes.* June 9. Conducted by William Shurtleff of Soyfoods Center. [1 ref]
• ***Summary:*** In the book titled *Merchant Sail* by William Armstrong Fairburn two vessels named Scioto are listed. The first was built in 1831. Tonnage: 141 tons. Length: 81 feet. Beam/width: 23 feet. Depth: 9 feet. Rigging: Schooner (with triangular sails, pointed at the top). It was probably not built on the West Coast since there is very little information about it in the files of the National Maritime Museum. It was probably built on the East Coast. It is not listed as a Gold Rush vessel.

The second vessel named Scioto was built in the Skolfield yard. It was a ship, with 3 masts or more. For more information contact the Mystic Seaport in Mystic, Connecticut. Address: Research Librarian, National Maritime Museum Library, Bldg. e, Third Floor, Fort Mason Center, San Francisco, California 94123. Phone: 415-556-9870.

9553. Sakaguchi, Noboru. 1990. Early history of making tofu at Le Bol en Bois (Interview). *SoyaScan Notes.* June 14. Conducted by David de Korsak in France.
• ***Summary:*** In 1969 Mr. Sakaguchi made his first trip to Paris from his homeland, Japan. He returned to Paris in March 1974, and became aware of the possibility of buying a macrobiotic restaurant from a friend who at the time was a cook in that restaurant. From April-Aug. 1974 he returned to Japan to finalize a deal with Japanese investors and to study tofu making. While he was in Paris touring vegetarian restaurants, Mr. Sakaguchi had been struck by the lack of

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protein in the foods he saw. Tofu naturally came to his mind as the food that would ideally supplement (and complement) that vegetarian cuisine. "Tofu was missing... I thought of this as my mission."

On 2 Sept. 1974 Mr. Sakaguchi opened Le Bol en Bois. He had expanded it to include a natural foods retail store located directly across the street. In the last quarter of 1975 he began trials making tofu using calcium sulfate as a coagulant. In about Nov. or Dec. 1975 he began commercial production of tofu, using real nigari as a coagulant. He sold this tofu only at Le Bol en Bois natural foods store and served it in his restaurant. An invoice dated 26 Dec. 1975 from Mitoku Company Ltd. in Japan shows that he imported 40 kg of nigari ($17.34), 50 x 150 gm packets of nigari ($33.27), a grinder for making tofu ($562), other pieces of tofu making equipment ($450.35), as well as 1,800 liters of Sakae Tamari-Shoyu, 900 liters of Johsen Tamari-Shoyu, and 200 kg of brown rice miso. Production remained limited (two days a week, 40 cakes per day) until the end of 1976. Mr. Sakaguchi made the tofu himself, helped by some Japanese students. One evening in the winter of 1976 an unusually large number of people came to the store to buy tofu. This corresponded to the end of a conference held by Michio Kushi in Paris. The store became the focus of a lot of interest and activity. Production jumped to roughly 240 cakes per day, two days a week. By the end of 1976 Mr. Sakaguchi had hired his first employee to help him make tofu.

In 1985 the tofu production activity was set up as a separate company named Daizou, located outside of Paris at Champigny sur Marne. At that time production was about 300 cakes per day, two days a week. Mr. Sakaguchi now began to make tofu more than twice a week and to sell this tofu at other retail outlets in addition to his own. Address: 883 Rue de Bernau–Z.I., 94500 Champigny Sur Marne, France. Phone: 48 82 39 90 or 47.06.33.71.

9554. Sakaguchi, Noboru. 1990. Early history of making tofu at Alimentation Japonais and Etablissements Takanami (Interview). *SoyaScan Notes.* June 14. Conducted by David de Korsak in France.
• ***Summary:*** Mr. Mikiyo Yamanaka, a Japanese who came to Paris as a tourist guide, started making tofu at the end of 1968. He made it alone, and not as part of any business, in his bathroom at night using calcium sulfate as a coagulant. He sold the tofu to Japanese embassy personnel. In about 1971-72 he established Alimentation Japonais Osaka, a Japanese restaurant in Paris. He moved his tofu shop into the basement of his restaurant, where it stayed until the end of 1985, when production stopped. A key tofu maker in the early days was Mr. Suzuki, who now owns Ramen Tei Restaurant in Paris (Phone: 1-42 60 64 29). Mr. Yamanaka made quite a bit of money in his business, but he failed to declare it and pay taxes. Instead of facing a lawsuit for this, he decided to return to Japan. His company, now a chain of Japanese restaurants, is presently run by Mr. Nakajima.

Mr. ? Takanami founded Etablissements Takanami in Belgium. But before he set up his company in Belgium, he spent 6-12 months in Paris and during that time he made some tofu, although it is not clear whether or not he did so on a commercial basis. He is now in Brussels (Phone: 2 522 8192). Address: 883 Rue de Bernau–Z.I., 94500 Champigny Sur Marne, France. Phone: 48 82 39 90 or 47.06.33.71.

9555. Kumoda, Yasuo. 1990. Recent developments at Morinaga (Interview). *SoyaScan Notes.* June 19. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The minimum print run for one Tetra Brik product is 300,000 cartons. There are now 15 companies in America that want Morinaga to private label aseptic tofu for them. Mr. Ono in Japan is opposed to private labeling. he wants to build the Mori-Nu brand. Mori-Nu tofu is in 13% of the supermarkets in America but has reached a plateau.

These are the main problems/questions now: 1. Should Morinaga develop a joint venture with Pacific Foods of Oregon to make Mori-Nu Tofu in their low-beany-flavor STS plant, or build their own plant? 2. Should Mori-Nu private label their aseptic tofu for other companies. 3. Should they develop a seasoned/flavored tofu or work on second generation tofu products? 4. Should Morinaga start to make water-packed tofu. 5. What will they do if Tetra Brik cartons are outlawed in many U.S. states and no new acceptable carton is developed by Tetra Pak International? Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9556. Uruma, Masao. 1990. Re: History of San-iku Foods' work with soy in Japan. Please wait. Letter to William Shurtleff at Soyfoods Center, June 22. 1 p. Typed, with signature on letterhead.
• ***Summary:*** He will be gone for several weeks, attending the SDA General Conference in Indianapolis, Indiana, and will return to Japan on July 18. Then he will have time to check through the company's soy product history so that he can provide more accurate information. He has talked with a co-worker who used to associate with Dr. Harry Miller a long time ago. He will also provide historical information. Address: San-iku Foods, Sodegaura Machi, Chiba Ken 299-02, Japan.

9557. Davies, Joy. 1990. Rice bowl rituals: Japanese cooking. *Guardian* (*England*). June 23. p. A19. Illustrated by Nicola Heindl.
• ***Summary:*** The writer, with Atsuko, a private interpreter and guide, sets off into the Tokyo suburbs for a culinary adventure. Their first stop was a "tofu shop where snowy white cakes of fresh bean curd were fished out of a large stainless steel tank [filled with cold water]. Atsuko explained the difference between cotton or 'momen' tofu where the

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curds are drained on a piece of cotton cloth and *kinu-goshi* or silk tofu, which is not drained and so has a far more delicate custard texture... We also bought two flat honey-gold pouches of fried tofu."

9558. Wollner, Joel. 1990. Re: History of early work with amazake, koji, and Rice Dream in America. Letter to Jan Belleme, Saluda, North Carolina, June 23. 3 p. Typed, with signature on letterhead (photocopy).
• ***Summary:*** "Starting in the early 1970s, Erewhon imported scant supplies of a highly perishable, fresh rice koji along with its regular line of Japanese products. Most often, this koji was spoiled or worm-infested by the time it arrived in Boston, Massachusetts. But on those few occasions when a usable amount arrived intact, we had the rare pleasure of attempting to make amazaké at home." One attempt was made on Thanksgiving of 1973. In spring 1977 the Erewhon flagship store on Newbury Street in Boston began to sell Cold Mountain Misos, then Cold Mountain Koji. The misos sold well but not the koji, so Joel and his wife, Wendy, developed a simple method for making amazake at home.

Mona Schwartz in Florida began to order koji from Joel and developed a good recipe for making it into amazake. Joel learned and perfected the process, then described it in detail in the 10-16 April 1978 edition of his newsletter *Erewhon News* (*Newbury Street*) under the title "Overnight Amazake." "You can imagine my surprise–no, shock–when, later that spring Charles Kendall, macrobiotic aficionado, keeper of the Erewhon Company store, and supplier to our store of 'homemade' organic sauerkraut (his own), approached me one day in the store and asked if I would consider selling the refrigerated amazaké drink he had developed." The rest is history.

In about the spring of 1985, Joel and Sjon Welters drove to Moniteau Farm where Robert Nissenbaum and Dave Carlson, calling themselves Imagine Foods, were making a frozen confection from amazaké. "This new incarnation of an old Boston study-house favorite, was actually made from a mixture of amazaké, which they first made from Cold Mountain koji and Chico-San brown rice, combined with Chico-San rice syrup and various natural flavorings, and run through a soft-serve ice cream machine. (A frozen dessert made in several flavors from rice kayu sweetened with rice syrup and/or barley malt syrup was sold at Erewhon Newbury Street in 1977-78.)"

But Imagine Foods was having technical and flavor problems with its product. In Fayetteville, Arkansas, Joel and Sjon had developed a "series of amazaké-like beverages and desserts made by enzyme conversion from whole grains, including brown rice... Of course, our work was top secret, since, at the time, enzyme processing was virtually unknown in the natural food industry, and used for little more than processing corn syrup in the conventional food industry. Robert and Dave had no knowledge of it at all.

"Sjon and I confirmed (to ourselves) the rightness of our enzyme process for use in Rice Dream to make a single brown rice base ingredient for the mix. This development alone would solve the technical and flavor problems to make a commercially feasible product with a broadly appealing taste and texture. We decided to invite Robert and Dave to relocate to Fayetteville and purchase the base ingredient, which would be made in our plant, from us. Months of negotiations would pass before the enzyme process solution was finally revealed to Imagine Foods [by whom?] at the next NNFA show. But then, through a series of twists and turns, Sjon and I lost control, and the enzyme process project was 'diverted' to California Natural Products. More than this, I am not prepared to discuss at this time." Address: 19 Pepper Hollow Drive, Clifton Park, New York 12065. Phone: 518-383-0299.

9559. Brown, Peter J. 1990. Nichii sets its sights on Iowa. *Soya International* (*Bar Harbor, Maine*). April/June. p. 13.
• ***Summary:*** A summary of information already found in previous clippings and news releases.

9560. Esaki, Hideo.; Nohara, Y.; Onozaki, H.; Osawa, T. 1990. [Antioxidative activity of natto]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 37(6):474-77. (Chem. Abst. 114:22641). [Jap]*

9561. Harvey, Carol. 1990. Zenfully delicious: Dessert entrepreneur [Miyoko Nishimoto of Now & Zen]. *City Sports* (*San Francisco, California*). June. p. 66, 68.
• ***Summary:*** The 32-year old woman entrepreneur spends 3 days a week making tofu pound cake. The Now & Zen concept started in Japan in the early 1980s when she had returned from America after attending high school in Mill Valley and majoring in philosophy at a small college in Maryland. In Tokyo she started Madame Miyoko's Bakery making 2 flavors of healthy tofu pound cake. Their placement in the health food section of department stores was virtually a death sentence. She worked at it for 5 years, and turned her energy to running, bodybuilding, and performing as a jazz vocalist. In 1988 she moved back to the Bay Area, and in late 1989 she started Now & Zen. Tofu is a key ingredient in her nutritionally balanced Lemon Almond Mousse Cake, Carob Walnut Torte, and Zesty Orange Cream Cake. "The less-than-glamorous image of tofu is one stumbling block... Sounds like a perfect item for a gourmet vegetarian restaurant, but according to Miyoko, some won't touch the cakes because of the tofu–'they're afraid people will be turned off by it.'"

9562. Hymowitz, T.; Singh, R.J.; Larkin, R.P. 1990. Long distance dispersal: The case for the allopolyploid *Glycine tabacina* (Labill.) Benth. and *G. tomentella* Hayata in the

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West-Central Pacific. *Micronesica* (*Guam*) 23(1):5-13. June. [39 ref]

• ***Summary:*** The subgenus *Glycine* currently contains 15 inbreeding wild perennial relatives of the soybean. These are *Glycine albicans, G. arenaria, G. argyrea, G. canescens, G. clandestina, G. curvata, G. cyrtoloba, G. falcata, G. hirticaulis, G. lactovirens, G. latifolia, G. latrobeana, G. microphylla, G. tabacina,* and *G. tomentella.*

Fourteen of these are diploids (2n = 40) and endemic to the Australian region. However the allopolyploid types (2n = 80) of *G. tabacina* and *G. tomentella* have a wider distribution. *G. tabacina* contains both diploid and tetraploid (2n = 80) members. The diploid forms of *G. tabacina* are found only in Australia, however the tetraploid members of *G. tabacina* have a wider distribution. They are found in the Pescadores Archipelago (Taiwan), the islands of Quemoy and Amoy just off the cost of Fujian Province (China), Ryukyu Islands (Japan), and the Mariana Islands of Tinian and Saipan in the West-Central Pacific. The tetraploid forms of *G. tabacina* are also found in Australia and the South Pacific Islands of New Caledonia, Vanuatu, Fiji, Tonga, and Niue.

G. tomentella is composed of four cytotypes: 2n = 38, 40, 78 and 80. Only the 38-chromosome form is found in Australia. The 40- and 78-chromosomes are found both in Australia and in nearby Papua New Guinea. The tetraploid forms of *G. tomentella* occur in Australia, Papua New Guinea, the Philippines, and Taiwan.

No diploid perennial *Glycine* species have been found outside of Australia. This the questions arises concerning the origin of the allopolyploid forms of both *G. tabacina* and *G. tomentella* in the West-Central Pacific. The seed of wild perennial *Glycine* do not float on water nor do they possess any mechanism for long distance dispersal by air currents. They do not stick to the coats of animals and it is unlikely they were transported by humans because the literature makes no mention of uses of wild perennial *Glycine* species by humans.

"Plate tectonics and biogeography: After the breakup of Pangaea, the universal land mass, Australia, New Zealand and Antarctica were united with South America and with India-Madagascar-Africa, forming Gondawanaland (100 m.y. BP [100 million years before the present]), a Southern Hemisphere land mass. The West-Central Pacific is associated with Laurasia, a Northern Hemisphere land mass.

"New Zealand and New Caledonia separated from Australia and Antarctica about 80 m.y. BP and moved north-eastward reaching their present position about 60 m.y. BP. Australia and Antarctica separated about 49 m.y. BP. As Australia moved northward it entered a zone of reduced precipitation and increased aridity. The Australian plate collided with the Asian plate 10 to 12 m.y. BP. Most probably during this epoch, Miocene, some legumes entered Australia directly from Asia. At that time, Australia was widely separated from South America, India, Madagascar and Africa...

"According to Lackey (1977, p. 85) both 'the subgenus *Glycine* and the subgenus *Soja* are probably derived from *Pueraria*-like ancestors in tropical Asia. From this tropical center, species in the subgenus *Glycine* have successfully invaded Australia and associated areas, and the wild form in the subgenus *Soja* has invaded central and northern Asia.' *Glycine* species (2n = 40) are diploidized polyploids with x = 10."

It has been demonstrated that the allopolyploidization of *Glycine* species (2n = 80) took place only in Australia. "Thus, perennial *Glycine* found a niche in tropical and subtropical Australia. Radiation of *Glycine* species, followed by allopolyploidization of the species, resulted in the *G. tabacina* and *G. tomentella species complexes."*

Long-distance dispersal of *Glycine* seeds from Australia across the equator was probably performed by migratory birds–with shorebirds being the most promising candidates. It has been shown that seeds such as *Glycine* larger than 1 mm and having a hard seedcoat can be retained in the digestive tract of some shorebirds for more than 100 hours then excreted in viable form. With flight speeds of 30-60 miles per hour, the seeds could be transported 3,000 to 6,000 miles per flight. The birds may also pick up small, light seeds in mud adhering to their feet.

For comments on this paper see the March 1995 interview with Prof. Hymowitz titled "Plate tectonics and the dissemination of the soybean." Address: 1-2. Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801; 3. State of Illinois Natural History Survey, Section of Wildlife Research, Urbana, IL 61801.

9563. Morinaga Nutritional Foods, Inc. 1990. Chocolate Pie, au natural! Dairy-free, low-fat pie made with Mori-Nu Lite Tofu (Tear-off recipe pad). 2050 W. 190th St., Suite 110, Torrance, California 90504.

• ***Summary:*** This color tear-off recipe pad (6½ by 4 inches), developed by Susan Bucher of Bucher & Russell in Los Angeles, was introduced in June 1990. On the front is a color photo of a chocolate pie topped with sliced banana rounds. To the upper left are whole bananas, to the upper right is a package of Mori-Nu Lite extra-firm silken tofu (only 1% fat), and to the right is a bowl of almonds.

On the back are recipes for Chocolate Dream Pie/ Pudding, and Fast Lane Low-Fat Tofu Brownies, plus nutritional analyses and an offer for additional Mori-Nu free recipes.

A hole through the pad in the top center, and a horizontal adhesive strip on the back, aids in hanging the recipes in a store. Address: Torrance, California. Phone: 1-800-669-8638.

9564. Shiraiwa, Masakazu; Yamauchi, F.; Harada, K.; Okubo, K. 1990. Inheritance of "group A saponin" in

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soybean seed. *Agricultural and Biological Chemistry* 54(6):1347-52. June. [16 ref. Eng]
• ***Summary:*** Six kinds of saponins have been isolated from soybean seeds and characterized. Two kinds of "group A saponin" are present as the main constituent in soybeans. This type of saponin is absent in some wild soybean lines. Address: 1,2&4. Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., 1-1 Tsutsumidori, Amamiya-machi, Aoba-ku, Sendai, Miyagi 981; 3. National Inst. of Agrobiological Resources, Ministry of Agriculture, Forestry and Fisheries, 2-1-2 Tsukuba, Ibaraki 305. All: Japan.

9565. Tenpe Kenkyushu-kai. 1990. Tenpe Kenkyûshû-kai: Koen yoshi [Tempeh Research Society: Highlights of the year's first meeting]. Kobe Park City 2-1110, 6-2-1 Minatojima, Chuo-ku, Kobe 650, Japan. 18 p. [Jap]
• ***Summary:*** The forth or fifth meeting of this group, and the first in 1990, was held at Meiji University in Tokyo. An insert announces that Mr. Goro Kanasugi, a tempeh pioneer in Japan, died on 5 June 1990. Address: Kobe, Japan. Phone: 078-302-7065.

9566. Muso Shokuhin. 1990. [Pure heart: Muso general catalogue]. Otedori 2-2-7, Chuo-ku, Osaka 540, Japan. 88 p. Printed 1 July 1990. 30 cm. [Jap]
• ***Summary:*** This strikingly beautiful, full-color catalog, pictures and describes Muso's natural-food macrobiotic products in Japanese for the Japanese market–although the title is written only in English. Includes many kinds of miso, shoyu (incl. Marushima Shoyu), black soybeans, yellow soybeans, kinako [roasted soy flour], seitan (in a jar from Marushima, p. 41; the product name is written as "Seitan" in large roman letters, then in smaller letters in katakana), San-Iku Foods canned products (Gluten Burger, Gluten Meat, Linketts, Soyees, Snack Joe; p. 41), yuba, gomoku nimame (cooked whole soybeans), many kinds of sea vegetables and related products, San-Iku Soyalac (8 different products), Marusan soymilk (5 different products; 3 are named mineral tou-jyan; the latter is the Chinese term for soymilk), macrobiotic books. Address: Osaka, Japan. Phone: 06-942-0343.

9567. Tabuchi, Ichiro. 1990. [Re: History of Soyalac soymilk production by San-iku Foods in Japan]. Letter to William Shurtleff at Soyfoods Center, July 4. 1 p. Handwritten, with signature on letterhead. [Jap; eng+]
• ***Summary:*** In 1948 Mr. Tabuchi visited Dr. Harry W. Miller and studied at his soymilk plant in Mt. Vernon, Ohio. During this period, Dr. Miller visited Nihon San-iku Gakuin (a Seventh-day Adventist school located at Chiba prefecture, Sodegaura-cho) almost every year and earnestly advised the people there to make soymilk. In about 1957-58 they started to make soymilk at a tofu plant that was owned by Mr. Ueda. They bottled it in 180 ml dairy milk bottles, which they sold with their tofu. It was a small scale operation and it didn't last long.

In 1959 at the Food Department of Nihon San-iku Gakuin, they set up a tofu manufacturing plant and started to make soymilk in 180 ml milk bottles for the school's lunch program. Several years later they started to make canned soymilk for general consumers. In order to help introduce the soymilk to the school, Dr. Miller lived on the school campus for 2 months. He taught and gave orientation to the students.

In 1970 San-iku Foods became independent from the San-iku Gakuin Food Department and started to make and sell infant formula. Address: San-iku Foods, Japan.

9568. Miller, Bryan. 1990. Restaurants:... Sushisay, basic and raw. *New York Times.* July 6. p. C18.
• ***Summary:*** This is a review of the Japanese restaurant Sushisay (38 East 51st St.), the only American outlet of a 26-restaurant chain in Japan. It specializes in raw and marinated seafood. One of the few cooked items, an appetizer, "is grilled squid legs. Bite-size pieces of crispy squid dipped in soy sauce are as addictive as popcorn." Another of its starters is "maguro natto, tuna in fermented soy beans, which had a texture and highly fermented flavor that was off-putting to some tastes." A soup the reviewer liked was "asari wan, a light miso broth with little-neck clams in the shell,..."

9569. Carver, Nancy. 1990. Ground broken for soybean plant: West Central co-op marks 'landmark day.' *Fort Dodge Messenger* (*Iowa*). July 10. p. 1-2.
• ***Summary:*** "Amid pouring rain, ground was broken for a soy-flaking facility to be constructed by Nichii Company of America...

"This flaking facility is described as "state-of-the-art, push button, high tech"–by Seaman. It will process an estimated 1.5 million bushels of soybeans annually.

"The plant, which will cost an estimated $2 million to build, will initially employ between seven and eight persons, and possibly employ as many as 21 persons when operations expand to several shifts...

"The volume of beans to be used by Nichii will use up most of the 1,800,000 bushels that pass through the Jefferson branch of West Central annually. Tom Feldmann, marketing manager for the co-op, said most of the soybeans will come from Greene County.

"Iowa Secretary of Agriculture Dale Cochran, who said the plant is a step toward developing one of the state's 'most pressing needs'–adding value to raw commodities.

"'I think we are almost on the threshold of an industrial revolution in value–added products...'

"'A few years ago we wouldn't have thought of such a thing as the plant we are now breaking ground for,' Cochran said.

"Another speaker was Dick Timmerman, director of the

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Iowa Department of Economic Development, who said 17 major Japanese companies now have operations in Iowa...

"Jefferson received a $50,000 forgivable Community Economic Betterment Account loan on behalf of Nichii...

"Of the 264 partnerships created last year between companies and communities, the one between Nichii and Jefferson is the strongest, Timmerman said...

"Feldmann and Seaman made a trip to Japan to learn what Nichii was looking for in terms of facilities. Originally the plant was slated to be operational by November. Seaman said there have been delays caused by rain, plant design and the fact that some of the equipment is being shipped from Japan.

"Only one other plant of this type is operational and it is located in the Hokkaido region of Japan. Nichii holds patent rights for the flaking process both in this country and in Japan."

9570. *Jefferson Herald* (*Jefferson, Iowa*). 1990. Ground is broken for new Nichii plant. July 12. p. 1, 7.
• ***Summary:*** The groundbreaking ceremony for the new soyflake production plant took place on Monday, July 9. The plant will Nichii's first overseas production facility. The flake product will be marketed under the trademark "MicroSoy Flakes." The plant will have a capacity of 6 tons of flakes per hour. "Initially, Nichii plans to export 500 tons of soyflakes to Japan per month, and also sell an equal amount in the U.S. market... The process will take whole soybeans from the adjacent West Central elevator, de-hull, crack, and press the beans into flakes."

"Nichii Company of America, a wholly owned subsidiary of Nichii Company Ltd. of Japan, is incorporated in California, with headquarters at Torrance in that state. Its primary business is the export of U.S. products to Japan, including about $6 million per year of Iowa pork. In fiscal year 1989 Nichii Company Ltd. and its subsidiaries [of which there are now 35] became the Mycal Group, with about 300 stores throughout Japan with annual sales of over $8 billion. The Mycal Group is Japan's fifth largest publicly held retailing group.

The event is also a landmark for West Central Cooperative, being its first attempt at both a joint venture and at involvement with production of human foods. Mr. Kobayashi, the president of Nichii Co. and Iowa governor Terry Branstad signed a letter of intent for the plant to be built in Iowa on 20 Jan. 1990. This plant in Greene County will be the 17th major Japanese plant in Iowa.

Note: The plant is expected to be operational by Feb. 1991.

9571. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo, English ed.*). 1990. Miso protects against radiation. July 16. [Eng]
• ***Summary:*** "People who eat miso regularly may be up to five times more resistant to radiation than people not eating miso. This is the conclusion of scientific studies conducted by Kazumitsu Watanabe, professor of cancer and radiation at Hiroshima University's atomic bomb radiation research center."

"Forty-nine-week-old mice were given miso as 10 percent of their food for seven days prior to exposure to radiation. Mice were exposed to full body X-rays 1400 to 2400 times stronger than a regular medical X-ray (7-10 curies). Three days later their cells were examined. The loss of cells was less severe in the miso-eating mice than in regular mice. When 9 curies were administered, the gap between miso-eating and regular mice's loss of cells became greater. Ten curies is a lethal dose for humans. When 10 curies were given to miso-eating mice, 60 percent survived, compared to only 9 percent of the mice which did not eat miso.

"'I don't know specifically what element in miso is effective,' Professor Watanabe told the South Western Japan Conference on the Effects of Radiation. 'The small intestines of mice and humans are quite similar. Therefore this study indicates that miso is a preventive measure against radiation.'" Address: Tokyo, Japan.

9572. Oka, Seizo. 1990. Finding Shinzaburo Mogi and his soy sauce company in Denver (Interview). *SoyaScan Notes.* July 26. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Mr. Oka has made great efforts to collect copies of the early *Directory of Japanese in the USA* (*Zaibei Nippon-jin Kan*). These are vastly better sources of information on Japanese people and businesses in America than early American City Directories published by Caucasians. The first such directory was published in 1905, and Mr. Oka has it. It contains no reference to Shinzaburo Mogi, Kikkoman, or soy sauce in Denver. However Mr. Oka cautions that these directories were published in San Francisco, and information on Japanese outside of California was quite incomplete. The next directory Mr. Oka owns, and the 6th one published, was for 1910. Most, if not all of the directories for the years 1906-1909 were lost in the great San Francisco earthquake of 1909, and later in the internment of West Coast Japanese during World War II. The earthquake shut down the *Nichibei Times* newspaper and caused it to relocate to Oakland, where it was short staffed. Thus, even if Mr. Mogi did start a short-lived shoyu company in Denver in 1907, we will probably never be able to find it in a *Directory of Japanese in the USA.* Better give up looking. Address: Head and Founder, History Room, Japanese Cultural and Community Center, 1840 Sutter St. #206, San Francisco, California 94115. Phone: 415-921-1485.

9573. *SoyaScan Notes.* 1990. Update on Kyoto Food Corp. USA in Terre Haute, Indiana (Interviews with various people). July 26. Conducted by William Shurtleff of Soyfoods Center.

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• ***Summary:*** Kyoto Foods is planning to open a big tofu plant in Terre Haute, Indiana. Ground breaking for the plant was on 3 May 1990. Mr. Yamashita is the person in charge and on July 24 he talked about the plant starting with 15-20 employees. They have 30,000 tsubo of land. Note: 1 tsubo is 6 shaku (1 shaku = 0.995 feet, so 6 shaku = 5.97 feet) on a side or 35.64 square feet. One acre is 43,560 square feet, so there are about 1,222 tsubo/acre. Thus 30,000 tsubo is about 25 acres.

Kyoto Foods plans to make only tofu initially, and they apparently would like to knock off Hinoichi on the East Coast and Midwest. They have support from Marubeni, which makes them potentially very powerful. John Morrell & Co. has done some research using tofu or concentrated soymilk. Kyoto Foods is considering getting this from Pacific Foods of Oregon, then shipping it to Cincinnati, Ohio.

The opening ceremony for the new plant was held on 24 Oct. 1990 in Terre Haute. Local television station covered the event but the print media showed little interest. Wataru Takai came from Japan to attend the ceremony. As of 15 Nov. 1990 the company plans to make water pack firm tofu (not aseptic tofu), but production has not yet begun. They plan to play down the fact that they have a parent company in Japan. They are billing themselves as "the largest tofu company in America." Production is expected to begin in November. The Asian-American population in the Midwest is much larger than most people realize. Some of the tofu will be sold to institutions. Supermarkets seem to be anxiously awaiting the product.

9574. *SoyaScan Notes.* 1990. The Food and Agribusiness Management Program in Illinois (Overview). July 30. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** This program was started in June 1989. It is looking, among other things, at "alternative marketing channels" and "specialty markets" including "specialty export markets" for major crops, such as tofu beans for Japan. James Dunn has a specialty export company. Most farmers think there is a big risk associated with growing specialty soybeans but actually the contract virtually eliminates that risk. One student is studying alternative contracts for specialty crops. Address: Univ. if Illinois.

9575. Yoshikawa, Koichi. 1990. [Re: Yoshikawa's sales of nigari]. Letter to William Shurtleff at Soyfoods Center, July 30. 1 p. Handwritten, with signature on letterhead. [Jap; eng+]
• ***Summary:*** Yoshikawa's current sales of nigari are about 7,000 tonnes (metric tons) per year. Of this, about 3,000 tonnes is used by tofu makers. The latter amount has not changed much during the last 3 years. A small amount of this nigari for tofu use is sold overseas.

The letterhead states that Yoshikawa is the oldest maker of nigari in Japan, established 100 years ago. Brands include Thruzen and Maruzen. The company's factory is on the seashore at Kurashiki, Okayama, Japan. Address: President, Yoshikawa Shoji K.K., Honmachi Wako Bldg. Kita Kyuhoji-cho 2-1-7, Osaka, Higashi-ku, Japan. Phone: 06-261-6767.

9576. *Healthy Talk* (*Japanese Monthly Magazine*)**.** 1990. Nattô wa ningen to chikyû o sukuu! Nattô Shinpojiumu [I love natto. Natto can save human beings and the Earth: Natto symposium]. July. No. 58. p. 17-20. Cover story. [Jap]
• ***Summary:*** Coverage of the Second Asian Symposium on Non-Salted Soybean Fermentation held 13-15 Feb. 1990 in Jakarta, Indonesia.

Photos show: (1-2) Speakers on the platform, with the name of each written in large characters on white paper attached to the front of each table. (3) Natto being sold in a retail store in Japan. (4) A bowl of rice topped with natto. (5-8) prepared natto dishes; the name of each is given. (9) A person standing behind a podium.

A cartoon character of a stylized globe, with longitude and latitude lines, eyes, nose, and mouth, eating natto from a bowl, appears several times. Note: This magazine is published and printed by Tokyo Fuji Seihan Printing Co., Ltd.

9577. Loh, Michael. 1990. An overview of export opportunities in the new markets. In: Ontario Ministry of Agriculture and Food, ed. 1990. Soybean Buyers Mission from New Markets, July 1-7, 1990. Tokyo, Japan: Ontario Ministry of Agriculture and Food. 61 p. July. See p. 10-12. [Eng]
• ***Summary:*** It has been almost 20 years since the first container load of soybeans grown in Ontario was shipped to Japan. By the end of 1989, Ontario was exporting more than $25 million worth of soybeans to Japan, Hong Kong, Malaysia, and Singapore. Now the new markets for Ontario soybeans are Korea, Taiwan, the Philippines, and Indonesia.

In Korea, trade restrictions have eased on soybeans and other agricultural products. With hefty trade surpluses, Korea is under pressure to balance trade. Korea soybean imports jumped from only 428,000 tons in 1979 to 1,100,000 tons in 1989. About 120,000 tons of the imported soybeans are for food use, as follows: Tofu 100,000 tons (83% of the total), soymilk 17,000 tons, and soy sprouts 2,000 tons. Nearly all of Korea's soybean imports come from the USA.

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Taiwan ranks second, after Japan, in terms of best prospects for agricultural exports. The strong Taiwanese currency has made exports less expensive. Burgeoning trade surpluses have led to increasing pressures from trading partners, like the USA, to balance trade. So Taiwan has liberalized imports by lowering tariffs and eliminating non-tariff barriers. "U.S. soybean exporters took advantage of their dominant market position in Taiwan to expand sales. Backed by aggressive trade negotiators, the American soybean industry has enhanced its competitive position by securing a 5-year supply agreement contract with the Government of Taiwan. The agreement calls for the purchase of 5.7 million tons of U.S. soybeans over a five-year period from July 1, 1986 to June 30, 1991. As a result the United States has over 75% of the market share. Taiwan's annual requirements of food soybeans are estimated at 250,000–300,000 tons. With recent market opening measures announced by the Taiwanese government, direct sales of food soybeans to end-users are now permitted."

Philippines: In Feb. 1987 Michael led a mission to the Philippines, and contacted a buyer. Ontario soybeans were first shipped to that country later in 1987. The Philippines import about 10,000 to 15,000 tons/year of soybeans for food use, and this is expected to increase in the near future. Filipro, Inc., which is the Philippines' licensee for Nestle S.A., reported increasing market acceptance of its re-launched powdered soya milk product Vita (chocolate flavor), and a soy-based baby cereal named Ceresoy.

Indonesia: Ontario soybeans (worth $4.2 million) were first sold to Indonesia in 1980 after Canada's first mission there that year. 90% of the 1.7 to 2.0 million tons of soybeans required by Indonesia are used for food. Tempeh is a delicious Indonesian food and Indonesia requires over 750,000 tons/year of soybeans to make tempeh. Address: Senior Representative, Asia/Pacific Region, Ontario Ministry of Agriculture and Food (OMAF), Tokyo, Japan.

9578. Matsumoto, Isao; Imai, Seiichi. 1990. Tenpe seizô n okeru daizu shori [Processing of soybeans for manufacture of *tempe*]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 37(7):497-504. July. 4 fig. 6 tables. [16 ref. Jap; eng]
• ***Summary:*** To obtain the best quality tempeh: Dehull the soybeans, then soak in a 0.2% solution of acetic acid for 3-4 hours to reduce their load of microflora. Drain, then allow to stand and dry (*étuver*) for 3-7 minutes. Address: Food Research Inst., Niigata prefecture, Kamo-shi, Niigata, Japan.

9579. Matsuo, Masako. 1990. Okara tenpe no seishitsu ni oyobosu komenuka no eikyô [Effects of rice bran on properties of "okara tempe"]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 64(7):1237-39. July. [6 ref. Jap; eng]
• ***Summary:*** The addition of 10% rice bran to okara which is then fermented by *Rhizopus oligosporus* modifies the enzymatic activity, the vitamin content, and the physicochemical properties of the resulting product. The emulsifying capacity and the taste of the fermented product are improved. The addition of rice bran also improves the nutritive value of okara tempeh.

Okara tempeh has a texture that is harder and less elastic than that of white bread. The capacity for water retention and the absorbability of oil, and the emulsifying properties are greater than those of wheat flour. The antioxidant activity is equivalent to that of soybean miso. Address: Lab. of Chemistry, Faculty of General Education, Gifu Women's Univ., Taromaru, Gifu 501-25, Japan.

9580. Matsuo, Masako. 1990. Okara tenpe [Suitability of "okara tempe" as a foodstuff]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 64(7):1235-36. July. [2 ref. Jap; eng]
Address: Lab. of Chemistry, Faculty of General Education, Gifu Women's Univ., Taromaru, Gifu 501-25, Japan.

9581. Morinaga Nutritional Foods, Inc. 1990. Inventions that advanced mankind (Ad). *Produce Business.* July. p. 57.
• ***Summary:*** In this full-page color ad, a large photo shows a package of Mori-Nu tofu in the foreground, with a brazier of fire and a huge stone wheel behind it. The text reads: "Fire set the world ablaze. The Wheel turned things around. *And now Mori-Nu Tofu has brought a 2,000-year-old product into the Space Age. Tofu, the perfect food, is now in the perfect package.*

"In its convenient, revolutionary package, Mori-Nu Tofu is guaranteed to maintain its fresh, just-made flavor. Without preservatives or irradiation. And without the need for refrigeration for as long as 10 months.

"Packaged in Tetra Brik Aseptic cartons, Mori-Nu Tofu meets all FDA temperature requirements. So you can display Mori-Nu Tofu anywhere with no shrink. Even in the produce section. For more details or to order Mori-Nu Tofu, call 1-800-NOW-TOFU, today. We're ready to wheel and deal." Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9582. Sugawara, Etsuko; Ito, T.; Yonekura, Y.; Sakurai, Y.; Odagiri, S. 1990. [Effect of amino acids on microbiological pyrazine formation by *B. Natto* in a chemically defined liquid medium]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 37(7):520-23. [9 ref. Jap; eng]*
Address: Dep. of Agricultural Chemistry, Iwate Univ., Ueda, Morioka 020, Japan.

9583. Ushijima, Shigeomi; Nakadai, T.; Uchida, K. 1990. Breeding of new *koji*-molds interspecific hybridization between *Aspergillus oryzae* and *Aspergillus sojae* by

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protoplast fusion. *Agricultural and Biological Chemistry* 54(7):1667-76. July. 6 fig. [34 ref. Eng]
• ***Summary:*** A description of the technique of protoplast fusion between a mutant of each of these two species of molds. The fused mold is stabilized by successive cultures. Address: Soy Sauce Research Lab., Kikkoman Corp., Noda 278, Japan.

9584. Yamauchi, K. 1990. Nozogaku no tabi: Edamame [Travels to study riddles: Green vegetable soybeans]. Television broadcast. July 27. TV Mook, NTV/YTV, Tokyo, Japan. [Jap]*
• ***Summary:*** Note: Lumpkin & Konovsky (1991, p. 121, 140) cite this Japanese television travelogue as a key source on the early history of green vegetable soybeans in Japan. Address: Japan.

9585. *Asahi Shinbun Weekly Magazine.* 1990. "Chikyû ni yasashii" o ure: Kankyô-shoku Nattô ga shinrin o sukuu [Sell "Kind to the Earth": Eco-friendly food, natto saves forests]. Aug. 21. p. 6. [Jap]
• ***Summary:*** A large photo shows a New York chef who cooks with natto.

9586. *East* (*The–Higashi*). 1990. The history of tofu. 26(2):25-31. July/Aug.
• ***Summary:*** This article appears is the section of the magazine titled "The Taste of Japan." Contents: Introduction. The transformation to tofu, The birth of tofu. The popularization of tofu. Transformation of tofu [by further processing]. Tofu dressed up. Tofu coming to Japan from overseas.

Fermented tofu is common in China, but rare in Japan. "Fermented tofu, *furu* in Chinese, can be regarded as a cheese made from tofu." In Japan, fermented tofu is found only "in Okinawa prefecture, which because of its proximity to China, developed a unique culture under Chinese influence. "The Japanese word for fermented tofu is 'tôfuyo' [tofuyo].

Some dishes are made from the byproducts of tofu manufacture. "One byproduct from which dishes are made is okara, the dregs extracted from tônyû" [soymilk].

9587. *Happy Endo* (*Happy End–Japanese Monthly Magazine*). 1990. Indonesia no daidokoro: Dentô-shoku tenpe o tsukuru sato, jawatô soro [The kitchen of Indonesia: The homeland of traditional tempeh making, Solo on the island of Java]. Aug. p. 10-17. [Jap]
• ***Summary:*** Ten photos show traditional Indonesian kitchens and markets, and tempeh making in Indonesia. Five illustrations show traditional Indonesian kitchen tools and utensils.

9588. Morinaga Nutritional Foods, Inc. 1990. We look great on paper... but wait 'til you taste Mori-Nu Tofu (Ad). *J. of the American Dietetic Association* 90(8):1149. Aug.
• ***Summary:*** A table at the top of the ad compares 6 different protein sources, with each portion containing 90 calories. They are: Mori-Nu Extra Firm tofu, cottage cheese, chicken, beef (lean ground), cheddar cheese, and whole milk. Compared with the tofu, all contain a higher percentage of calories from far, more grams of fat, saturated fat, and cholesterol–and less grams of protein.

"Everyone knows tofu is healthy. But too few know about the fresh taste of Mori-Nu Tofu.

"Nutrition: Mori-Nu tofu is much lower in fat and cholesterol than other protein foods. It is also lactose-free and one of the highest sources of vegetable protein.

"Food safety: Mori-Nu's aseptic package locks in fresh flavor and healthy nutrients and also protects against premature spoilage and possible bacterial contamination.

"Easy: With a guaranteed 10-month shelf-life, Mori-Nu is readily available at your fingertips. No special daily rinsing or draining necessary. Easy to blend, cook and serve. Call 1-800 NOWTOFU (669-8638) for more information. Mori-Nu tofu. You never knew nutrition could taste so good." Address: 5800 South Eastern Ave., Suite 270, Los Angeles, California 90040. Phone: 213-728-4325.

9589. Takai Seisaku-sho. 1990. [Takai 1991 systems catalog]. 1-1 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan. 62 p. 30 cm. [Jap]
• ***Summary:*** Photos show the company's many pieces of equipment and systems for manufacturing tofu and soymilk. The catalog is divided into 6 sections: 1. Transportation and soaking systems. 2. Soymilk production systems. 3. Curding and forming systems; Poached tofu systems. 4. Cooling systems; Hot-pack systems. 5. Curding & forming systems. 6. Deep-frying systems.

Letter (fax) from Wataru Takai. 1990. Sept. 29. Two years ago the company rebuilt its factory and installed CAD (Computer Assisted Design) systems. This year they acquired two computer networks: IBM AS/4000 and IBM 5550. Address: Ishikawa-ken, Japan. Phone: 0762-48-1355.

9590. Torii, Yasuko. 1990. [Re: New developments with tempeh and natto in Japan]. Letters to William Shurtleff at Soyfoods Center, Sept. 2 and 23. 2 p. Handwritten and typed, with signature. [Jap; eng+]
• ***Summary:*** In Japan, tempeh has not become popular. Marusan-Ai has stopped making tempeh. What a shame that Mr. Kanasugi, who was so enthusiastic about tempeh, has just passed away. The Tempeh Study Group (Kenkyukai) is still meeting 2-3 times a year and trying to popularize tempeh.

On the other hand, natto is becoming very popular and production is increasing rapidly. Natto groups are sponsoring various events to help popularize natto outside Japan.

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Mrs. Torii traveled to Budapest, Hungary in early September to attend an IFOAM Conference on organic farming, which is spreading in Eastern Europe. There she enjoyed tasty chilled tofu (*Hiya-yakko*) and met a person who knows a lot about tofu. At an international agricultural fair, she found that soyfoods were becoming popular. The booths offering roasted soybean snacks and soya burgers were crowded. She saw an attractive soy cookbook containing color photos, and met a man who is translating *The Book of Tofu* into Hungarian. The Kombinat was doing a lot to develop and popularize soyfoods.

In Feb. she went to Indonesia with other members of the Tempeh Study Group to attend a symposium on soybean fermentation. It was very interesting. Address: Kamitsuchidana 324, Ayase-shi, Kanagawa-ken 252, Japan. Phone: 0467-76-0811.

9591. American Soybean Assoc., China. 1990. Re: The soymilk industry and market in China. Letter to William Shurtleff at Soyfoods Center, Sept. 13. 3 p. [Eng]
• ***Summary:*** There are more than 100 soymilk processing lines in China, of which 34 have been imported from Sweden, Japan, etc. Each year China produces about 100,000 tonnes of soymilk. (Processing capacity is even larger.) Of this total, 60,000 tonnes are produced in the provinces of Guangdong (Kwangtung), Fujian (Fukien), and Guangxi (Kwangsi), all in southern China.

The five largest soymilk manufacturers in China, in descending order of capacity, are: 1. Wuhan Guan Sheng Yuan Foodstuff Factory (20,000 liters/hour capacity); 2. Fuoshan Foodstuff Factory (12,000 liters/hour; Product name: Vita Milk); 3. Guangzhou Cannery (2,000 liters/hour; Product name: Hong Bao; Equipment from Alfa-Laval); 4. Jiangmen Foodstuff Factory (2,000 liters/hour); 5. Jin Jiang Foodstuff Factory (2,000 liters/hour).

All of the soymilk made by large companies in China is sold in bottles; none is sold in aseptic packages, plastic bags, or by street vendors. Most of this soymilk is consumed in China, but 5,000 to 10,000 tonnes (5-10%) is exported to Japan and Southeast Asia each year. A new trend is to develop instant soybean powder [probably powdered soymilk] for the people of northern China, who do not like soymilk. Address: Citic International Building, 25th Floor, Room 4, 19 Jianguomenwai Street, Beijing 100004, China. Phone: 512-7125.

9592. Applegate, Jane. 1990. Tokyo tofu firm's 'bacteria free' sales pitch irks U.S. companies. *Los Angeles Times.* Sept. 17. p. D3. [1 ref]
• ***Summary:*** "The aggressive approach taken by Tokyo-based Morinaga Milk Industry Ltd., one of Japan's largest dairy companies, has angered many U.S. tofu makers...

"'They are hurting the whole industry with their ads,' said Bill Mizono, president of Azumaya, a San Francisco maker. 'There is room for Mori-Nu's product side by side with water-packed tofu...'

"Mori-Nu... offers $5 memberships in its 'Health for Life' club. Members receive a quarterly newsletter featuring recipes, coupons and nutritional information. So far, about 10,000 people have signed up...

"Hinoichi Tofu, a manufacturer in downtown Los Angeles, is working with Jackie Olden, a radio and television personality, to help take some of the mystery out of cooking with tofu.

"Hinoichi's goal is to gain greater trial and repeat purchase of tofu among mainstream American consumers."

9593. McReynolds, Thomas. 1990. Morinaga decides to introduce private labeling and a Fresh Fruit Shakemate (Interview). *SoyaScan Notes.* Sept. 25. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Morinaga will aggressively offer to provide their aseptic tofu, on a private label basis, to other companies in the soy and natural foods industries. To print the package directly, the buyer must commit to ordering at least 500,000 cartons/year, but with affixed pressure-sensitive labels, they can get the minimum down to 25,000 to 50,000 pieces. They will make all three textures available (red = soft, blue = firm, yellow = extra firm). Projected price is about $10/case. Some potential clients are Vitasoy/Nasoya, Frieda's, Eden Foods, Tree of Life.

Next summer, Morinaga will be introducing their first second generation product, called (and trademarked) Fresh Fruit Shakemate. It will be like their soft tofu but with a lower bean profile and perhaps with vanilla added. They will sell/position it in the fruit section of food stores. It will be packaged in a 3-pack, with no printing on individual packages in order to (1) get a bigger face, (2) Put brochures in the back. The theme: Shake up your day 8 days a week. Tom wants to do more second generation products.

There are rumors that Nasoya has secured aseptic packaging equipment from Tetra-Pak (an AB-3 machine for the purpose of manufacturing a 250 ml aseptic tofu) and that Vitasoy in Hong Kong is, or in the near future will be producing an aseptic pack tofu. They may be using a 3-layer laminate to get around the Morinaga 5-layer process with the polyurethane lining. Tom held some kind of an aseptic tofu package in Hong Kong about 18 months ago, but he is not sure who made it. When he talked with Yvonne Lo recently, she hinted that they were developing such a product. But Morinaga has no solid evidence.

Update: Nov. 5. Morinaga will initially offer the private label to only 1 company in each of 3 market categories: Eden in the natural foods market, Vitasoy in the ethnic market, and Frieda's Finest in the national produce market. Address: Marketing Consultant, Morinaga Nutritional Foods, Los Angeles, California 90040. Phone: 213-728-4325.

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9594. Shindler, Merrill. 1990. Affordable feasts: If you knew sushi like they know sushi, you'd try it. *Daily News of Los Angeles* (*California*). Sept. 27. p. L33.
• ***Summary:*** This review of the Japanese sushi bar Miya Sushi in north Hollywood, San Fernando Valley, states: "They also serve plates of edamame ($1.95), boiled salted soy beans, which you squeeze gently, until they pop out of their shells and into your mouth. They're far more addictive than pistachio nuts."

9595. *INTSOY Newsletter* (*Urbana, Illinois*). 1990. Processing and utilization conference sparks interest in soybeans as food. No. 42. p. 1-2. Sept.
• ***Summary:*** The conference, which was co-sponsored by INTSOY, took place in Gongzhuling, Jilin Province, China from June 25 to 29, 1990. The various working sessions and exhibits attracted almost 250 soybean scientist and development officials from 27 countries.

"Besides INTSOY, other sponsors of the conference were the Jilin Academy of Agricultural Sciences; the Chinese Academy of Agricultural Sciences; the Japanese Agriculture, Forestry, and Fisheries Research Council Secretariat; the Scientific Research Institute of Foods and Fermentation Industry; and the International Institute of Tropical Agriculture...

"Some 80 presented papers covered topics ranging from reports on soybean utilization efforts in specific countries to sophisticated medical studies on the health effects of soybean use.

"One especially important paper reported on the potential of soybean components known as saponins to control reproduction of the HIV virus which is associated with Acquired Immune Deficiency Syndrome or AIDS. The report from Japanese scientists in the Department of Food Chemistry at Tohoku University indicated that one class of saponins showed inhibitory effects against HIV infection in vitro.

"Besides attending the working sessions, participants viewed some 37 demonstrations and exhibits from all over China...

"The conference organizers also provided a number of local tours of interest to participants. These included visits to a modern tofu plant, the Soybean Research Institute of the Jilin Academy of Agricultural Sciences, the labs and pilot plant of the Scientific Research Institute of Foods and Fermentation Industries, and the headquarters and gene bank of the Chinese Academy of Agricultural Sciences...

"The general recommendations from the final report called for holding the conference on a regular basis every three or four years. The report suggested Brazil and Africa as potential sites for the next conference."

9596. Vandemoortele, Philippe. 1990. Soymilk, a traditional milk substitute. Paper presented at the Eurosoya Conference. 5 p. Held 5-7 Sept. 1990 at Strasbourg, France.
• ***Summary:*** Contents: Tradition. Milk imitation or substitute? (It is a substitute). New process for making soymilk (giving improved taste and nutritional value). New products (such as dairylike products). Standards (a protein content of at least 3.6% should be guaranteed). Terminology (The terms "soya milk" and "soy-bean milk" have been used in published materials since 1897. Because of the protection of the word "milk," most soymilks in Europe are labeled "soya drink," except in the UK where the term "soymilk" has been legalized). Soymilk imitation (Soymilk made from soy protein isolates, fats, sugar, etc. is neither a natural nor a traditional product). The market. Producers. Future of soya milk. Negative perspectives. Conclusion.

"It is difficult to determine the amount of soymilk produced and consumed in Europe. In 1986-87 a number of enthusiastic reports drastically overestimated the European soymilk market. Some publications, for example, estimated that the market in the UK totalled about 30,000 metric tons (tonnes; i.e. about 30 million liters). The latest reports (1989) however seem to provide more reliable and realistic information. *Agrarwirtschaft* has recently [March 1989, 38(3):74-83] published figures stating that the market grew from 16,000 tonnes in 1986 to a projected 28,500 tonnes in 1992. There is no question however that soymilk consumption has risen substantially in the last 5 years. Yet soymilk remains a marginal market and accounts for less than 0.1% of the total dairy market. The U.S. market on the other hand is estimated at 16,000 tonnes for 1989.

"Today there are more than 14 commercial soymilk producers in Europe, producing and packaging soymilk in more than 200 different packages. Their total capacity is estimated at approximately 60,000 tonnes a year..."

Presently the two main disadvantages with soymilk are its taste, and its high price compared with cow's milk. Address: Managing Director, Alpro N.V., Vlamingstraat 28, B-8560 Wevelgem, Belgium. Phone: (056) 43 22 11.

9597. McReynolds, Thomas. 1990. Mitsubishi grant to Purdue Univ. to develop aseptic tofu (Interview). *SoyaScan Notes.* Oct. 4. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Tom has heard that Mitsubishi (Japan), more than a year ago, made a $300,000 grant to Purdue University to develop aseptically packaged tofu.

Note 1. See long SoyaScan interview with Niels Nielsen (Feb. 1990), who is the key man on this project at Purdue.

Note 2. Talk with Larry Johnson at Iowa State University. 1990. Oct. 4. People from Purdue came to Iowa State Univ. about a year ago and spent a day learning how to make tofu from Lester Wilson. The key man on the project is probably Niels Nielsen. Larry knew that Purdue and Mitsubishi were working together but he did not know that such a large scale amount of money was involved. A

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major component of the work is development of a bland, lipoxygenase-free line of soybeans for use in soyfoods. Address: Marketing Consultant, Morinaga Nutritional Foods, Los Angeles, California 90040. Phone: 213-728-4325.

9598. Shurtleff, William. 1990. America's earliest known tofu manufacturer discovered: Wo Sing & Co. was making tofu in San Francisco in 1878 (News release). Soyfoods Center, P.O. Box 234. Lafayette, CA 94549. 2 p. Oct. 29. [2 ref]

• ***Summary:*** "In Jan. 1848 gold was discovered in California. By 1850 there were still only a few hundred Chinese in California. Then in 1852 the Chinese joined the Gold Rush. They called California the 'Golden Mountain.' By 1852 there were 20-25,000 Chinese in the golden state, and by 1860 there were 30-50,000. The 1880 census found 75,132 Chinese in California, comprising 8.6% of the state's population.

"These Chinese immigrants, mostly young men from Kwangtung province in southern China, and more specifically from the area around Canton, almost certainly brought soybeans with them to America, and they probably made tofu (which they called *daufu, dow-foo, or doufu*) using those soybeans. But, until now, no one has been able to prove the existence of any Chinese manufacturers of tofu or other soyfoods in America before 1899. During this year Walter C. Blasdale, an instructor in chemistry at the University of California, Berkeley, reported in the *USDA Office of Experiment Stations, Bulletin* No. 68 that Chinese in San Francisco were making 'bean cheese,' both fresh and fried, as well as fresh curds.

"After years of searching, William Shurtleff, Director of the Soyfoods Center in Lafayette, California, has discovered a tofu manufacturer in San Francisco, California, in 1878. According to the Wells Fargo and Co. *Directory of Chinese Business Houses,* published in San Francisco in 1878, Wo Sing & Co. was making fermented tofu and regular (non-fermented) tofu at 708½ Dupont St. in San Francisco. The name of the company and its products were written in both Chinese and English. Tofu was translated as 'Bean Cakes.' This was the earliest known tofu shop in the western world (as of Oct. 1990).

"In the same Wells Fargo directory published in 1882, a second Chinese tofu manufacturer appeared. Sam Sing was making fermented and regular tofu at 615 Dupont St., basement, in San Francisco. Wo Sing was still in business at the address given above.

"The earliest known Japanese-run tofu manufacturer in America was Hirata Co. in Sacramento, California. They began making tofu in 1895.

The oldest existing tofu maker in America today is Quong Hop & Co. of South San Francisco. Founded and still run by the same Chinese-American family, they began making tofu in 1906 in San Francisco.

"The two oldest existing Japanese-American tofu companies are probably House Foods & Yamauchi Inc. of Los Angeles and Aala Tofu Co. of Honolulu. Both trace their origins back to 1923 in Hawaii...

"The first five Caucasian-run tofu companies in the western world were all run by Seventh-day Adventists in America. In Nov. 1929, T.A. Van Gundy of La Sierra Industries in Arlington, California (near Riverside), introduced his La Sierra Soya Cheese...

"The sixth Caucasian-run tofu company in America, and the first of the new wave of Caucasian tofu makers, was the Welcome Home Bakery and Tofu Shop in Corvallis, Oregon, founded by Alec Evans. In March 1975 he started making 'Tofu.'

"The earliest document seen (Oct. 1990), written by an American, that mentions tofu appeared in 1770 when the famous Benjamin Franklin wrote a letter on Jan. 11 from London to John Bartram in Philadelphia...

"The Soyfoods Center would like to offer a $100 reward to anyone who can find a tofu manufacturer in North America or Europe before 1878."

Reprinted in Soya International (July/Sept. p. 3). Address: Lafayette, California.

9599. Azumaya, Inc.; et al. 1990. Tofu: Made in the USA... The tradition continues (Ad). *Produce Business.* Oct.

• ***Summary:*** With this anti-Mori-Nu ad, run by "the largest tofu manufacturers and distributors in America," the U.S. tofu wars escalate. The four manufacturers are Azumaya, Hinoichi, Nasoya, and Kikkoman. All make pasteurized tofu. The three distributors are Hanmi Inc. in Seattle, Frieda's Finest in Los Angeles, and Fuji Natural Foods in Ontario, California. "It has come to the attention of produce procurement officers throughout the United States that a foreign (Japan) producer of an aseptically packed tofu has chosen to confuse the trade and general public with claims that their product is superior to traditional water pack tofu. The following addresses the various issues as we see them." These issues are: 1. Water packed tofu has superior taste. Sales of aseptic tofu are virtually nonexistent in Japan. 2. Consumers prefer fresh produce. 3. The assurance of our pasteurization. "An independent study revealed bacterium was unable to grow in pasteurized tofu held at 59 degrees Fahrenheit and below for six weeks." 4. A clear environmental choice. The aseptic package is ecologically unsound, whereas "water packed tofu is packaged in 100% recyclable plastic."

9600. Business Trend Analysts, Inc. 1990. The market for salad dressings, sauces and condiments. 2171 Jericho Turnpike, Commack, NY 11725. 275 p. Price: $895.

• ***Summary:*** This is an update of the 1988 edition. Sauces include the following table sauces: Ketchup, meat (incl. steak, worcestershire, vegetable, and seafood sauces),

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barbecue, Mexican (incl. chili, taco, enchilada, etc.), prepared mustard, and soy and teriyaki. Gravies, dips, and dry sauce mixes are not included. Ketchup is the largest segment. Address: Commack, New York.

9601. MacNeil/Lehrer Newshour. 1990. Infant mortality, worldwide and in the United States. Television broadcast. PBS. Oct. 3. *

• ***Summary:*** On average, 40,000 children under the age of 5 die each day worldwide, mostly from preventable illnesses and diseases, and from malnutrition. In America every year some 40,000 babies die before the age of 1. The main cause is low birth weight, but a major cause is maternal drug abuse, especially cocaine and crack cocaine. 30% of the pregnant women in America do not have adequate access to prenatal care. The USA is 20th from the top on a ranking of countries by infant mortality rate. Japan has the world's lowest (i.e. best) infant mortality rate, followed by Sweden, Finland, Switzerland, Canada, Ireland, Netherlands, France, Denmark, and East Germany. Below the USA are Israel and Greece.

9602. *Vegeta* (*Japanese Monthly Magazine*). 1990. Nattô toraianguru: Tenpe was Indonesia no dentôshoku desu [The natto triangle: Tempeh is a traditional food of Indonesia]. Oct. p. 30-32. [Jap]

• ***Summary:*** A map shows the "natto triangle" in east and southeast Asia. Fifteen photos show various aspects of tempeh in Indonesia, including the finished product wrapped in banana leaves, tempeh being sold by a woman in a traditional market, six steps in the production of tempeh, and six views of cooking with tempeh.

9603. Yu, Angie Elinon Yu. 1990. Re: Cherry Food Industry, APY Food Processing, and promoting tofu in the Philippines. Letter to William and Akiko Shurtleff at Soyfoods Center, Nov. 14. 2 p.

• ***Summary:*** "Sometime in the late 70's, you visited my parents-in-laws Tofu factory, then known as Cherry Food Industry here in the Philippines. I am married to their second, Jerry Joseph.

"The tofu business of my parents-in-law is still active but now registered under a new name, APY Food Processing, but located in the same address (74 Speaker Perez St., Santa Mesa Heights, Metro Manila). The plastic container of the Nippon Tofu (silken tofu), however, still carries the old name."

She and her husband operate a computer services firm. One of their business clients is Shoemart, a big chain of supermarkets, which is selling Nippon Tofu and other tofu products made by APT Food Processing. Shoemart has asked Angie and her husband to operate a portion of their Gourmet Shop (which presently has a salad bar and a Japanese sushi bar) located in the middle of their newest supermarket. They have agreed to do this

"I personally feel that the level of market awareness of what tofu really is, is relatively low. I have always suggested to my in-laws to invest in educating the market about it since five years ago. However not much has been done. By presenting our products in this Gourmet Shop we have found a vehicle to do exactly this."

She asks Shurtleff for ideas on promoting the use of tofu, and for updated materials. And she invites him to visit them any time.

"Our store will start operating on November 28 of this year. All information materials that I release to the public will be based on your Book of Tofu (1979). I bought a copy of it when I was in your country (New York) in 1988. I learned from my husband that you gave his parents an autographed original copy of the same book." Address: Elinon Yu EDP Services, International Corporation, 61 West Capitol Drive Bo, Kapitolyo, Pasig, Metro Manila, Philippines. Phone: 631-9451.

9604. Cohen, Karen J. 1990. Terre Haute firm hopes Americans take a liking to tofu. *Indianapolis Star* (*Indiana*). Nov. 20. p. B-2.

• ***Summary:*** Kyoto Food Corp. expects to begin tofu production at the end of November. "The $4.5 million plant is a joint venture between four Japanese investors and the husband and wife team of William and Setsuko Roach. The 15,000-square-foot factory will be the largest tofu manufacturer in the country, capable of producing 9,800 12-ounce cakes per day, according to Roach.

"The Indiana Department of Commerce awarded a $46,117 grant to the plant for infrastructure needs and $25,000 for employee training. Kyoto Foods employs 19 people.

"'If things go right we hope that will double within a year,' said Roach, who is retired from the construction business and was a Democratic state representative for 12 years...

Mary Beth Thomas, marketing director, said "Kyoto plans to unveil its product in grocery stores, hospitals and universities in and around Terre Haute in the near future. The company doesn't have any contracts yet but Roach said it has had discussions with Kroger Co., Marsh Supermarkets Inc., and Dominick's Finer Foods Inc., a Chicago-based grocery chain." Because the company's marketing director, Thomas, feels that Americans "have a negative image about tofu," the company is developing recipes for sloppy joes, cookies, and tacos, which are taste-tested by employees. Tofu doesn't sell very well in Indianapolis. The Kroger supermarkets sell about 240 packages/week in the central Indiana region. They also sell Tofutti, a soy ice cream. Peter Golbitz of *Soya International* estimates that 5 to 10% of the 69.5 million lb of tofu produced in the USA is used in secondary products. "Americans like the idea of tofu, but they don't like this white cake floating around in a tub of water." Kyoto Foods

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buys its soybeans from outside Indiana. Contains a large photo of the inside of the tofu plant, showing the equipment and employees.

9605. Richardson, Al. 1990. New developments at Nichii (Interview). *SoyaScan Notes.* Nov. 23. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The grand opening for the Nichii soyflake plant is scheduled for 16 April 1990. Mr. Kobayashi, President of Nichii plans to be there. 3,000 lb of flakes will arrive by air next week from Japan. Tests supervised by Mr. Chikaarashi are scheduled to be conducted at House Foods & Yamauchi, Azumaya, Quong Hop, Sacramento Tofu, and Fresno Tofu. Address: Nichii Company of America, Inc., 23440 Hawthorne Blvd., Skypark 2, Suite 140, Torrance, California 90505. Phone: 213-791-0010.

9606. Akimoto, Takashi; Yamada, Susumu.; Matsumoto, Isao. 1990. [Relation between protease and gamma-glutamyltranspeptidase activities and qualities of natto]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 37(11):872-77. [Jap]*

9607. *AURI News* (*Minnesota*). 1990. Minnesota takes a bite out of Japanese snack food market. 1(3):1, 5.
• ***Summary:*** It all started with a call from Rico Westin [Reiko Weston], owner of Fuji-Ya, a former Japanese restaurant in the Twin Cities. She wanted to grow a crop called Edamame rather than paying the costs of importing it. "The same business savvy that enabled her to once carry the titles of U.S. and Minnesota 'Businesswoman of the Year' sparked research in 1987 by the Jameson-Williams Company into the viability of raising this new crop. Unfortunately, Westin died shortly before the first year's crop was harvested."

"Presently the Jameson-Williams is the only commercial producer of Edamame in the U.S. 'We've experimented with hundreds of varieties including vegetable and tofu varieties,' said Jim Lambert, President of the Jameson-Williams Company. 'We produce a smaller pod than Taiwan, but the taste and color of our Edamame is better because we allow only one hour between the time it is harvested and the time it is processed so not as many sugars convert to starches within the soybean."

Bob Luedtke, Senior Consultant to the Edamame Project, calls edamame "the ultimate alternate crop." Yields average 58-62 bushels per acre, compared to regular soybean yields of 45-50 bushels per acre.

"Jameson-Williams contracts with local farmers to grow the Edamame. The company pays for the seed and the harvesting. The contract with local farmers this year was for a net profit of $0.06 per pound or a minimum of $240.00 per acre." The profit from regular soybeans is about $230.00 per acre not including the costs of seed and harvesting. "Generally, farmers producing Edamame net approximately $75.00 more per acre. Quick calculations show a value added agricultural product for Minnesota."

AURI has given the project a lot of expert help in the area of processing. Modification of harvesting equipment reduced field losses to 20%, from 30%. "Jameson-Williams has been steadily increasing their production of Edamame from 7,000 pounds in 1988 to the 350,000 pounds they harvested this year. The product moves directly from the field to the processing facility, Tony Downs Foods in St. James. The Edamame moves over shaker tables, onto a visual inspection line, through a pressure wash, into a continuous blancher, through a hydro-cooler and over a de-watering table. The product then enters an IQF (individual quick freezing) freezer and is finally loaded into tote boxes for temporary storage prior to packaging. Jameson-Williams sells the Edamame in bulk to a trading company who repackages it for the consumer."

The next step for Jameson-Williams is to shell the soybeans to make *mukimame.* The company is currently requesting funding from AURI for expertise to develop the shelling process.

"'The overall objective of our partnership with Jameson-Williams,' says Virgil Smail, AURI Executive Director, 'is to make the crop economically feasible, to provide an alternative crop for farmers with minimal risks, and to promote new uses of soybeans for both domestic and export consumption." Future plans: Use genetic engineering and cross breeding to allow the pod to be more easily removed from the plant, and to increase the size of the pod relative to the size of the beans.

Note: This is the earliest document seen (Oct. 2001) that gives industry or market statistics on green vegetable soybeans for individual companies.

9608. Jack, Alex. 1990. Soviets embrace macrobiotics: Special report from Moscow and Leningrad. *One Peaceful World* (*Becket, Massachusetts*) No. 6. p. 1, 7-10. Autumn/ Winter.
• ***Summary:*** Physicians in the USSR are using miso to try to cure radiation sickness from the Chernobyl nuclear disaster which took place on 26 April 1986 in the Ukranian SSR.

A sidebar on page 7 titled "Miso protects against nuclear radiation" states: "Scientists in Hiroshima reported this summer that in laboratory tests mice fed miso every day were five times more resistant to radiation than those not eating miso. The research, carried out by Prof. Watanabe at Hiroshima University, is the latest data showing that macrobiotic foods can bind and eliminate radioactive material from the body." A photo shows Cary Wolf offering miso soup to people in Moscow. Address: Box 10, Becket, Massachusetts 01223. Phone: (413) 623-5742.

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9609. Kudou, Shigemitsu; Tsuizaki, I.; Shimoyamada, M.; Uchida, T.; Okubo, K. 1990. Screening for microorganisms producing soybean saponin hydrolase. *Agricultural and Biological Chemistry* 54(11):3035-37. Nov. [16 ref]
• ***Summary:*** Soybean saponins in miso and soy sauce are decomposed during fermentation by various species of *Aspergillus* mold. Address: 1&4. Kanesa Miso Co., Ltd., 202 Hamada, Tamagawa, Aomori 030; 2,3&5. Faculty of Agriculture, Tohoku Univ., 1-1 Tsutsumitori, Amamiya-machi, Aoba-ku, Sendai 981. All: Japan.

9610. Takai Seisaku-sho. 1990. Modern soymilk plant: Makes delicious dairylike soymilk with no beany flavor. 1-1 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan. 4 pages. Nov. Catalog. With 1-page color insert. 30 cm. [Eng]
• ***Summary:*** Page 2 is a flow chart of the modern soymilk production process. Page 3 shows modern soymilk plant layouts, floor plans, and specifications. The color insert, which is titled "Modern soymilk plant: Makes delicious dairylike soymilk with off-beany flavor," is printed on both sides. The front shows 3 packaged soymilk products: Ah Soy, Hai-Meeru Soyalac (Made by San-iku Foods in Japan), and Soya Bean Milk (made by Guilin Sweets and Food Factory, Guangxi, China). Companies that make soymilk using Takai equipment include: Chung's Foods and Nam Yang Industries in Korea. Jinan Huifeng Bean Milk Product Factory in China. "One of our plants makes 1,000 liters of 5,000 x 200 ml packs of soymilk; another makes 10,000 or 20,000 packs of soymilk per hour. EMUL is a healthy soy-based frozen dessert. Contact Takai for an EMUL production plant." On the back is a plant layout. Address: Kanazawa, Ishikawa-ken, Japan. Phone: 0762-48-1355.

9611. [Japanese in South America: Nishii Super Shoyu in Peru]. 1990. Television broadcast. Channel 26. California. Nov. 24. 7:00–7:30 P.M. 3 minutes. From Fuji TV channel 8, "Naruhodo da World," in Japan. [Jap]
• ***Summary:*** Nishii Shoyu, located in the Victoria district of Lima, Peru, is owned by Mr. Shinji Kawakami, age 75, the second-generation owner. The outside and inside of his shop, and the process by which he makes 5 tonnes/week of shoyu in the traditional hand-made way, are shown. He also makes miso. A close-up shows the 750 ml bottle and its colorful label, orange, blue, and green on yellow. One bottle costs the equivalent of about 300 yen. Address: Japan.

9612. *SoyaScan Notes.* 1990. Rich Freeze: Central Soya's soy protein isolate-based ice cream mix that was never commercialized (Overview). Dec. 1. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** In *Tofutti & Other Soy Ice Creams* (1985, p. 31), Shurtleff and Aoyagi note: "By 1963 Central Soya had begun development of a soy ice cream based on their Promine-brand isolated soy proteins. A memo dated 21 April 1964 referred to a pilot-plant run to produce dry mix for the product. In 1965 the innovative new non-dairy frozen dessert was granted a registered trademark: Rich Freeze. Research and development work on Rich Freeze continued throughout the late 1960s. In 1966 Central Soya opened an isolate plant with a capacity of 30 million pounds (1,360 metric tons) a year. Central Soya's line of promine isolates was considered the state of the art."

The first publicity for Central Soya's ice cream appeared in 1966. On July 8, *Time* magazine, in an article titled "Commotion in the bean pit" (p. 77-78), reported that "Central Soya has developed an ice cream-like frozen dessert made of soybeans... this month Central Soya will begin mass production of Promine, an isolated soybean protein, at a new Chicago plant."

Then on July 23, *Business Week,* in "Soybeans move up on the menu" (p. 82-87), noted that "Central Soya makes an isolated soy protein binder called Promine... Sales of the binder at $0.35/lb... are so promising that production will be doubled to 2.5 million lb monthly when a new plant opens in Chicago next month... In addition the company this fall hopes to start exporting a frozen soy dessert to tropical countries with no dairy industries."

Shurtleff and Aoyagi (1985, p. 35-36) continue: "In 1970 Central Soya's Rich Freeze, first developed in 1964, began to become well known. The *Soybean Digest* (Aug. 1970) gave this as the year when 'Soy protein isolate replaces milk solids in Central Soya's frozen all-vegetable dessert. Industrial research increases.' The product was initially developed in the form of a dry mix for a company in Japan, a country then facing a shortage of dairy products. The main ingredients were coconut oil, sugar, corn syrup solids, soy protein isolate, and a stabilizer. But many problems arose during the development process. For example, Central Soya had to remove all sugar from the mix to avoid huge import duties. Rich Freeze was a good product, and an outstanding non-dairy ice cream by the standards of the day. But eventually the whole concept fell through before the product was even test marketed in Japan. Yet Central Soya kept the idea alive. In the U.S. they called it an 'all-vegetable frozen dessert,' carefully skirting the term 'non-dairy' which might offend the dairy industry, one of their biggest customers for mixed feeds and feed concentrates. There were negotiations with the navy to use Rich Freeze on ships at sea. In about 1970, using a Taylor soft-serve machine, Central Soya prepared and gave out samples in Japan, at a big international food convention in Washington, DC, at an Institute of Food Technologists's convention on the West Coast, and finally at the huge ANUGA food fair in Europe. There, served spiked with brandy, it was a real hit. Yet Rich Freeze was an idea born before its time; it was never commercialized... not even for the kosher market, which would probably have welcomed it (Rakosky 1985, personal communication)."

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9613. Sanger, David E. 1990. A Japanese innovation: The space antihero. *New York Times.* Dec. 8. p. 1.
• ***Summary:*** Mr. Toyohiro Akiyama, age 48, a Japanese television reporter and the first Japanese (and the first journalist) in space, is now on board the Russian space station Mir. Tokyo Broadcasting System, seeking a large boost in ratings, is reported to have paid the Soviet Union $12 million to have him taken on board–after 18 months of rigorous training with Soviet astronauts. A chain smoker who has admitted having withdrawal problems, Mr. Akiyama mused at dinnertime "'I wish I had brought along some natto,' the smelly fermented soybeans that even many Japanese say they cannot bring themselves to swallow." A photo shows Akiyama as his spacecraft docked with Mir. Address: Tokyo.

9614. Levey, Robert. 1990. Urban treats: Good grazing, pure sushi. *Boston Globe.* Dec. 14. p. 66.
• ***Summary:*** This updated review of the Japanese restaurant Cafe Sushi (1105 Massachusetts Ave., Cambridge) states: "Though the general menu, beyond sushi and sashimi, is limited, there were a couple of diverting specials. There was an appetizer of boiled 'edamame,' which turned out to be a bowl of whole soybeans cooked in their green skins. The vegetable looks like a lumpy peapod, and you eat it by pulling the pod through your teeth. Lovely little finger food.

"Another offbeat treat was a roasted quail appetizer, a single well-cooked small whole bird served with a few edamame on the side." Address: Globe staff.

9615. Kubota, Brad. 1990. A history of tofu in Fresno and surrounding towns (Interview). *SoyaScan Notes.* Nov. 28 and Dec. 4. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The following information is based on Brad's personal recollections and interviews he conducted with various Japanese-American old-timers in Fresno. Brad now owns and runs Fresno Tofu Co. The lineage of his company is as follows:

He has heard from many people that there were two tofu shops in Fresno before World War II, but one went out of business. Also before World War II there was a company in Fresno named Tokubo Tofu, run by a Mr. Tokubo. Mr. Tokubo is said to have brought his company to Fresno from the countryside (from Fowler?) and it is not clear if he was part of the Fresno Tofu Company lineage or to whom he sold the company.

Mr. Sasaki may have owned a tofu company that was an early member of the Fresno Tofu Co. lineage. He sold it to Mr. Fukamoto, who renamed it Fukamoto Tofu.

Mr. Fukamoto sold his shop to Mr. Joe Hashimoto (a nisei or second generation Japanese American, who still lives in Fresno), who renamed the company Hashimoto Tofu in about 1947.

Joe Hashimoto sold his company to a Dr. Wilkinson, a Caucasian/American, who moved it away from Fresno, out into the country. He discontinued production of tofu, but started to make a type of soy cheese and soymilk. Dr. Wilkinson is no longer living.

It was probably Mr. Hashimoto who sold his company in about 1970 to Mr. Tokubo or David Goto, who renamed it Star Tofu Shop. David asked his younger brother, Nagaki, to come to America from Japan to help him make tofu. After a while, Nagaki took over the company. David left the business and started farming. Nagaki Goto renamed the company Goto Bean Factory in 1975.

Nagaki Goto sold his company to Brad Kubota, who renamed it Fresno Tofu Co. in Nov. 1982. Brad started by making the same two tofu products that Mr. Goto had made, medium-firm Japanese-style momen tofu, and agé (deep-fried tofu pouches).

After World War II there were at least two other tofu companies in Fresno: Nagahama Tofu, and Yokota Tofu-ya (which was in business in 1922). Before World War II there were at least two tofu companies in Fowler, California (located about 10 miles southeast of Fresno): Soga Tofu and Harada Tofu. Mr. Hashimoto says that after the war, Mr. Tokubo also used have his tofu shop there in Fowler, whence he moved it to Fresno. In Dinuba (pronounced dai-NU-bah, and located about 30 miles southeast of Fresno) a tofu shop named Nii-Tofu was in business after World War II. Address: Fresno Tofu Co., Fresno, California.

9616. Araki, A.M. 1990. [Re: A brief history of tofu shops in Fresno, California]. Letter to William Shurtleff at Soyfoods Center, Dec. 31. 2 p. Handwritten. Followed by phone interview on 8 Jan. 1991. [Jap; eng+]
• ***Summary:*** "It was difficult for me to collect this information. For some people I talked to it was a sensitive issue, like coming out of the internment camps after World War II back into white society. Since the generations have changed, I had to talk with many people. I came to the USA in Aug. 1920 and settled in Fresno that month. At the time in Fresno there were two tofu shops in Japantown: Yokota Tofu-ten (run by Yuichi Yokota, located on Fargan Alley, which was back-to-back with E Street; Yokota's postal address was on E Street), and Nakaoka Tofu-ten (run by Mr. Nakaoka on Kern St.). He is not sure of the shops were named "Tofu-ten" or "Tofu-ya," but he prefers "Tofu-ten because it has a higher class sound (more *jôhin*).

The owner of Nakaoka Tofu-ten died in about 1922. His wife re-married to Mr. Zenkichi Nagahama, who took over the company, renamed it Nagahama Tofu-ten, and ran it at the same location for about 20 years until 1942, when he was sent to an internment camp. He did not re-start the company after the war; he was too old.

Right after World War II, in about 1945, the first tofu shop in Fresno was started by a man who came from the

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Los Angeles area; although he was a Japanese, he had a big body and blue eyes. But he didn't last for long. After that he company was run consecutively, at the same location, by Joe Hashimoto, Sakae Tôkubo, Dr. Wilkinson (an M.D. and Seventh-day Adventist; he was a very famous surgeon and he made tofu himself at his shop on E Street), and then the two Goto brothers. After the war, the younger Goto brother immigrated to the U.S. from Japan. (Sometimes we call those new first-generation Japanese shin-issei). The same shop on E Street, which has been in business the longest, is now in its third generation, run by Musashi [Brad] Kubota."

He is not sure when the first tofu shops started in Fresno. However his father arrived in Fresno in 1911 and had a shop across the street from the Nagaoka tofu shop on Kern Street. He thinks Yokota was there at the same time, since the house in which Mr. Yokota lived in 1920 (he built it himself) was quite old, dating from about that period. His tofu shop was in the front of his house, facing the street.

There were some Chinese-run tofu shops in Fresno during this period but he does not remember any details concerning them. Address: Nichi Bei Times, Fresno Branch, P.O. Box 11489, Fresno, California 93773. Phone: 209-237-6779.

9617. Bureau of the Census, U.S. Department of Commerce. 1990. The Asian population of the United States in 1990 (Overview). *SoyaScan Notes.* Compiled by William Shurtleff of Soyfoods Center. [1 ref]
• ***Summary:*** According to the 1990 census, the population of the United States was 248.7 million, up 9.8% from 1980. The Asian population is as follows: Total Asian and Pacific Islander 7.273 million (2.9% of the total, up 107.8% from 1980). Total Asian from traditional soy-consuming nations 5.524 million (2.2% of total, up about 100% from 1980!). Chinese 1.645 million (0.7%, up 104.1%). Filipino 1.407 million (0.6%, up 81.6%). Japanese 847,562 (0.3%, up 20.9%). Korean 798,849 (0.3%, up 125.3%). Vietnamese 614,547 (0.2%, up 134.8%). Hawaiian 211,014 (0.1%, up 26.5%).

9618. Hayakawa, K.; Mizutani, J.; Wada, K.; Masai, T.; Yoshihara, Y.; Mitsuoka, T. 1990. Effects of soybean oligosaccharides on human faecal flora. *Microbial Ecology in Health and Disease* 3:293-03.Nov/Dec. [26 ref]
Address: Intestinal Flora Lab., The Calpis Food Industry Co., Ltd., Fuchinobe, Sagaihara, Kanagawa, 229, Japan.

9619. **Product Name:** Easy Barbecue Sauces: Chinese Flavor (Soy Sauce with Wine), Crushed Garlic & Horseradish (in Soy Sauce), Clam Flavored Sauce (Seasoned with Horseradish and Parsley), or Ground Horseradish & Apple (in Soy Sauce with Vinegar).
Manufacturer's Name: Kagome.
Manufacturer's Address: Japan.
Date of Introduction: 1990 December.
Wt/Vol., Packaging, Price: 220 gm bottle. Retails for $1.70.
How Stored: Shelf stable.
New Product–Documentation: Soya International. 1990. July/Sept. p. 5.

9620. Kawanishi Shoko Co., Ltd. 1990. Kenkô ichiban. Yappari tôfu [1991 calendar. Health first. Of course, tofu]. Yokohama, Japan. 6 p. 58 x 39 cm. [Jap]
• ***Summary:*** The top half of the cover and of each page shows a color photo of prepared tofu dishes. On the bottom half is two months of the year. Across the bottom is the company name. Below that: "Tofu & soymilk equipment." And below that the address of the Japanese headquarters and USA branch office, with phone and fax numbers for each. Address: 1. Japan: 340 Kuden-cho, Sakae-ku, Yokohama. 2. USA: 3499 E. Pico Blvd., Los Angeles, California 90023. Phone: (045) 892-5547 (Jap); (213) 780-8166 (USA).

9621. Shurtleff, William; Aoyagi, Akiko. 1990. Tofu & soymilk production. 2nd ed. Lafayette, California: Soyfoods Center. 336 p. Illust. by Akiko Aoyagi Shurtleff. Index. Dec. 11. 28 cm. [223 ref]
• ***Summary:*** Contains many new advertisements, plus changes on the copyright page, on page 14 (Soyfoods Association in now located at Bar Harbor, Maine), and rear cover of both paperback and hardcover editions (new ISBN for each). Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

9622. *SoyaFoods* (*ASA, Europe*). 1990. AFISA changes its name to SOJAXA. 1(2):2. Autumn/Winter.
• ***Summary:*** "The Association Francaise des Industriel du Soja (AFISA) has changed its name to SOJAXA. Representing 7 manufacturers of soyafoods in France (the logo represents a 7 in Japanese) its aims are to standardise, develop and promote soyafoods... The current members of SOJAXA are Innoval S.A. Ligne, S. Formoja, Prolait, Soja Biostar, Sojadoc, Sojasun [Triballat] and [Société] Soy. Their activities this year include a major promotion of soyafoods at motorway restaurants and also a national competition for Chefs to create their own original dishes based on tofu. For further information please contact SOJAXA, 5 Bd de la Mediterrane, 31400 Toulouse, France."

9623. Taira, Harue. 1990. Quality of soybeans for processed foods in Japan. *JARQ* (*Japan Agricultural Research Quarterly*) 24(3):224-30. Dec. [7 ref. Eng]
• ***Summary:*** Contents: Abstract. Introduction. Quality for food processing: Tofu, miso, natto. Variation of bean quality and suitability for processing. Factors inducing variations in the chemical composition and suitabilities for processing.

Figures show: (1) Consumption of soybeans in Japan in

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1988 (1,000 tonnes): Total: 4,663 tonnes. Oil and meal 77%. Food 19%. Other 4%. Food products: 886 tonnes. Tofu and abura-age 57%. Kori-tofu 3%. Miso 20%. Natto: 11%. Other 9%. Individual food products (* An additional 69,000 tonnes are consumed in the form of cooked whole soybeans, yuba, kinako, moyashi {sprouts}, and others). Tofu and abura-age 505 tonnes. IOM and other USA 83%. Japan 11%. China 6%. Kori-tofu 29 tonnes. IOM and other USA 72%. China 28%. Natto 100 tonnes. China 50%. USA and Canada 30%. Japan 20%. Miso 179 tonnes. China 86%. Japan 11%. IOM 3%. Soy sauce: Defatted soybean flakes 183 tonnes (97%) and whole soybeans 5 tonnes (3%).

(2) Frequency distribution of solid matter extractability in soybean milk (105 samples; 60 cultivars and 7 lines)–for varieties Enrei, Fukuyutaka, Akishirome, Akiyoshi, Tamahomare, Fujimijiro, Hyuuga, Shirosenari. Average value of U.S. soybeans. Mode: 79%. Range 70-82%.

(3) Correlation between protein and sucrose content in soybeans. Inversely correlated. The more protein, the less sucrose. (4) Correlation between hardness of steamed seeds and ammonia nitrogen content in natto. Directly correlated. The harder the steamed seeds, the more ammonia nitrogen in the finished natto.

(5) Variation in chemical composition and suitabilities of soybeans for processing: Raw soybeans for processing, soybean milk for tofu, steamed seeds for miso, natto, cooked soybeans.

Tables: (1) Relationship between soybeans and processed foods in raw soybeans, soybean milk, and steamed seeds. (2) Chemical composition and suitability of soybeans from USA, China, and Japan for processing into tofu, miso, natto, cooked soybeans. Varieties: Enrei, Fukuyutaka, IOM (USA; low protein, high oil), Tamahomare, Kitamusume, Miyagishirome (large seeded), Nattoshoryu (small seeded), Chinese (low protein, high carbohydrate). Address: Dep. of Utilization, National Food Research Inst., Ministry of Agriculture & Forestry, Koto-ku, Tokyo.

9624. USDA Foreign Agricultural Service, Information Systems Management Div., Database Administration Branch. 1990. The world's leading soybean crushing countries: Statistics by country, 1964-1990. FAS USDA Oilseeds/ Products, Room 5638 South, 14th and Independence Ave. S.W., Washington, DC 20250-1000. 9 p. 28 x 38 cm computer printout.

• ***Summary:*** A search by Debby Pumphrey of the FACTS (Foreign Agricultural Commodity and Trade Statistics) database, for the amount of soybeans [commodity code: 2222000] crushed for domestic consumption by various countries worldwide, gives the following results, with all countries that crushed more than 500,000 tonnes ranked in descending order of amount of soybeans crushed. All figures are in metric tons (tonnes):

For the year 1990: USA 32,523,000, Brazil 13,700,000, Argentina 7,250,000, China 4,400,000, Japan 3,550,000, Netherlands 2,760,000, Germany, 2,550,000, Spain 2,300,000, Italy 2,025,000, India 1,785,000, Mexico 1,670,000, Taiwan 1,650,000, USSR 1,445,000, Belgium-Luxembourg 1,180,000, Canada 1,100,000, South Korea 840,000, Romania 789,000, Portugal 610,000, and United Kingdom 605,000.

In 1990 a total of 88,515,000 tonnes of soybeans were crushed worldwide. Of this total, the USA crushed 36.7%, Brazil crushed 15.5%, and Argentina crushed 8.2%.

For the year 1964/65: USA 13,036,000, Japan 1,460,000, China 1,304,000, West Germany 1,290,000, Canada 528,000. In 1964/65 a total of 21,357,000 tonnes of soybeans were crushed worldwide. Of this total, the USA crushed 61.0%, Japan crushed 6.8%, China crushed 6.1%, Brazil crushed 1.3%, and Argentina crushed 0.02%.

Note: At the top of the computer report is printed: Global Economic Data Exchange System [GEDES]. CP [Commodity Program] Subsystem–Commodity/Attribute Model. Crushing statistics are given for 175 countries from 1964/65 to 1990. Address: Washington, DC. Phone: 202-382-8232 or 202-447-4989.

9625. Watanabe, Iwao; Nagasawa, Tsugio. 1990. Waga kuni ga shoyû suru daizu iden shigen no gaikan-teki tokusei to kagaku seibun ganyû ritsu. I. Tsubudai, shuhishoku, ? iro oyobi kagaku seibun ganyû ritsu no hindo bunpu to torito-sei jibetsu ni mita tokushoku [Appearance and chemical composition of soybean seeds in germplasm collection of Japan. I. Frequency distribution of grain size, seed coat color, hilum color, and content of chemical components, with special reference to collection site]. *Nippon Sakumotsu Gakkai Kiji* (*Japanese J. of Crop Science*) 59(4):649-60. Dec. [14 ref. Jap; eng]

• ***Summary:*** The soybean seeds in the germplasm collection, which contains about 4,400 samples, were surveyed and analysed by near infrared spectroscopy. The exotic collection from Asia, where soybean has been one of the traditional crops, accounted for only about 18% of all samples, which suggested the need for additional collection.

Seed size was classified based on The Evaluation Standard for Soybean Cultivars; 16% of the seeds were small, 63% medium, and 21% large. In the Asian collection, seed size tended to become smaller as the latitude of the collection site approached the equator (i.e., became lower).

About 26% of the seeds had so-called "coloured" seed coats (green, brown, black, or mottled); the remaining 74% was pale yellow or yellow.

The most frequent hilum color was brown (32%), followed by yellow, black, dark brown, pale brown, pale black and green in descending order.

In the collection from Asia, the protein percentage tended to increase as the latitude of collection site decreased (i.e., moved closer to the equator), while the lipid percentage

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was the opposite.

The protein percentage tended to increase as the seed size got smaller, which the lipid percentage was the opposite. The cultivars with a black seed-coat and extremely small seed size were closest in chemical composition to that of wild soybeans (*Glycine soja* Sieb. & Zucc.).

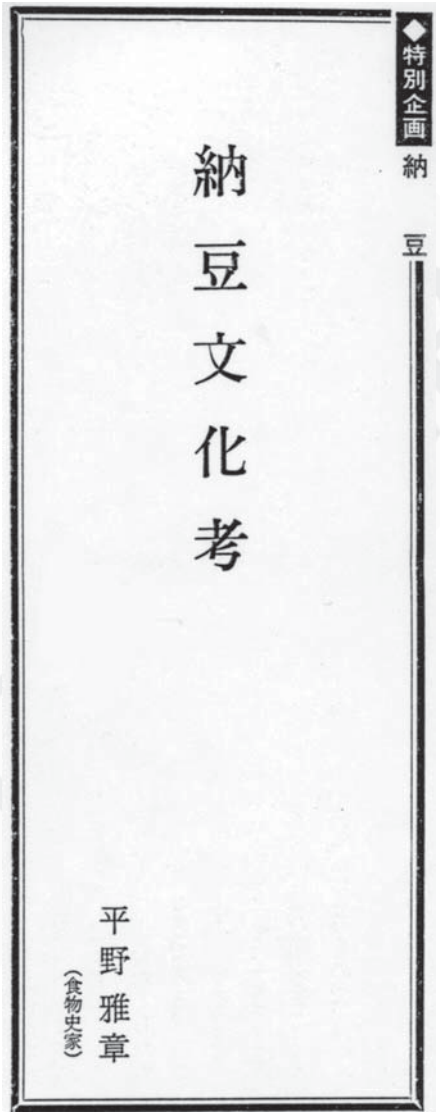
The domestic Japanese collection was characterized as large-seeded, a little lower in both protein and lipid percentage, and higher in carbohydrate percentage. Address: Tohoku National Agricultural Experiment Station, Kariwano, Akita 019-21, Japan.

9626. Watanabe, Iwao; Nagasawa, Tsugio. 1990. Waga kuni ga shoyû suru daizu iden shigen no gaikan-teki tokusei to kagaku seibun ganyû ritsu. II. Tanpakushitsu, shibô, tansui kabutsu ganyû ritsukan no sôkan [Appearance and chemical composition of soybean seeds in germplasm collections in Japan. II. Correlation among protein, lipid, and carbohydrate percentage. Reference to collection site]. *Nippon Sakumotsu Gakkai Kiji* (*Japanese J. of Crop Science*) 59(4):661-66. Dec. [7 ref. Jap; eng]
• ***Summary:*** The chemical composition of about 4,400 soybean seeds in the germplasm collection of Japan was analyzed by near infrared spectroscopy to obtain various correlations among protein, lipid, and carbohydrate percentages. Protein and lipid had a highly negative correlation (r=-0.594). Carbohydrate and lipid also had a highly negative correlation (r=-.561). Carbohydrate and protein had a weak negative correlation (r=-.117). Correlations were different depending on grain/seed size. Protein-lipid correlation was higher in smaller seeded varieties. Carbohydrate-lipid correlation was higher in medium or large seeded varieties and lower in small seeded ones. Address: Tohoku National Agricultural Experiment Station, Kariwano, Akita 019-21, Japan.

9627. *Artery.* 1990. Warfarin antagonism by natto and increase in serum vitamin K by intake of natto. 17:189-201. *

9628. Hirano, Masaaki. 1990. Nattô bunka-kô [Thoughts on the culture and history of natto]. *Shoku no Kagaku* (*Food Science Journal*) No. 144. p. 16-22. [2 ref. Jap]
• ***Summary:*** The author believes that natto (*itohiki nattô*) was first mentioned in the *Shôjin Gyorui Monogatari,* which according to tradition was written by Yoshimoto NIJO (lived 1320-1388) in the mid-Muromachi period. The Muromachi period lasted from 1338 to about 1573, so the middle of it would have been in about 1455, or 67 years after Mr. NIJO died.

Page 22 shows two annotated illustrations from the book titled *Jinrin Kinmôzui* published in 1690 in Kyoto. The top illustration shows a man selling natto in Edo (today's Tokyo). The bottom one shows a man selling tataki-natto in



Kyoto. Address: Japanese food historian, Nikenzuka 2017-19, Futtsu-shi, Chiba-ken 299-12, Japan.

9629. Konovsky, John. 1990. The relationship between consumer preference and the amino acid and sugar content of edamame. *Japanese J. of Breeding* 40(supplement 2):228-29. *

9630. Kudou, Shigemitsu; et al. 1990. Enzymatic hydrolysis of soybean saponins by *Aspergillus oryzae* KO-2. *Agricultural and Biological Chemistry* 54(5):134. [16 ref]* Address: Kanesa Miso Co., Ltd., 202 Hamada, Tamagawa, Aomori 030; 2,3&5. Faculty of Agriculture, Tohoku Univ., 1-1 Tsutsumitori, Amamiya-machi, Aoba-ku, Sendai 981. All: Japan.

9631. **Product Name:** [Nagatani-En Misogura Instant Miso Soup {Fresh Miso Type} (Spinach, or White Miso with Wakame)].

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Foreign Name: Nagatani-En Misogura {Nama-miso taipu} (Hôrenso, Shiromiso).
Manufacturer's Name: Nagatani En.
Manufacturer's Address: Nishi-shinbashi 2-36-1, Minato-ku, Tokyo, Japan.
Date of Introduction: 1990.
Ingredients: Spinach: Packet #1: Fresh seasoned miso [chômi miso] (soybeans, rice, salt, alcohol), kombu extract, alcohol. Packet #2. Natural seasoning powder (monosodium glutamate, bonito powder, etc.), dried spinach, dried [frozen] soybean curd, dried wakame seaweed, dried wheat gluten.
Wt/Vol., Packaging, Price: 2.43 oz: Three 69-gram pairs of packets (3 servings) in a large foil pouch. Retails for $2.25 (1/91, California).
How Stored: Shelf stable.
New Product–Documentation: Product with Label purchased at Diablo Foods, Walnut Creek, California. 1991. Jan. 17. 6 by 8.25 inches. Black, brown, red, blue, and white on light blue. Color photo of a wooden bowl of miso soup on front panel. Color illustration of a traditional Japanese treasure house and a nearby house with overhanging wooden eaves. To prepare, place the contents of each of a pair of foil packets in a soup bowl, add 1¼ cup boiling water, mix well, cover with a lid, and allow to stand for 3-4 minutes. Nagatani-En is an old and very famous Japanese company. Their main business has always been making ochazuke mix.

Soyfoods Center product evaluation. Very nice flavor for an instant miso soup; lots of wakame. Excellent package design. But certain ingredients on the Japanese label are not listed on the English label (e.g. bonito flakes).

9632. Ohno, Y.; Kogawa, K.; Fujii, K. 1990. [Lipids of soybean products and soaked and boiled soybeans]. *Sanyo Gakuen Tanki Daigaku Kenkyu Ronshu* 21:29-38. (Chem. Abst. 115:113205. 1991). [Jap]*

9633. **Product Name:** [Vege Ham {Meatless Ham}].
Foreign Name: Vegehamu.
Manufacturer's Name: San-iku Foods.
Manufacturer's Address: 1-1 Nagaurataku, Sodegaura-machi, Kimizu-gun, Chiba-ken 299-02, Japan.
Date of Introduction: 1990.
New Product–Documentation: Letter from San-iku Foods. 1990. June. This product was introduced in 1990.

9634. Sumi, Hiroyuki. 1990. [Function and application of nattokinase]. *Gekkan Fudo Kemikaru* 6:72-77. [Jap]*

9635. Sumi, Hiroyuki. 1990. [Nattokinase. Properties and recent application for healthy food]. *Bioindustry* 7:724-30. [Jap]*

9636. Sumi, H. 1990. [Physiological function of natto]. *Nippon Jozo Kyokai Zasshi* (*J. of the Society of Brewing, Japan*) 85:518-24 (Chem. Abst. 114:120312. 1991). [Jap]*

9637. Takao, Shoichi. 1990. [Modern history of research on natto bacilli]. *Shoku no Kagaku* (*Food Science Journal*) No. 144. p. 38-44. [Jap]*
Address: Hokkaido Univ., Nôgaku-bu.

9638. Watanabe, Sugio. 1990. Development and functionality of fermented foods and beverages. III. Natto industry, process of its development and present circumstance. In: Proceeding of Symposium on Fermented Foods and Beverages. See p. 9-17. [142 ref]*
Address: Biotechnology Inst. of Natto, Suzuyo Kogyo Co. Ltd. Both: Tokyo, Japan.

9639. Yue Xu (Yiao Hsu). 1990. [Advances in the soy sauce industry in China]. *Hakko Kogaku Zasshi* (*J. of Fermentation and Biotechnology*) 70(6):434-39. [10 ref. Jap; eng]*
Address: Shanghai Brewing Science Research Inst., Shanghai, China.

9640. Asakura, Haruhiko. ed. 1990. Jinrin kinmô zui [Illustrated encyclopedia of life in the Edo period]. Tokyo: Heibonsha. v + 344 p. Illust. Index. 18 cm. Series: Toyo bunko No. 519. [Jap]
• ***Summary:*** This book first appeared in 1690 in Japan. Details are given at the original 1690 edition. Address: Japan.

9641. Hammer, K.; Esquivel, M. 1990. East Asian influences in Cuban agriculture. *Plant Genetic Resources Newsletter* (*FAO/IBPGR*) No. 77. p. 9-16. [15 ref. Eng]
• ***Summary:*** "Virtually the entire aboriginal population of Cuba was wiped out in the first years of the Conquest. The introduction of African slaves supplied the alternative labour needed to develop agriculture in Cuba. Thus by 1861 nearly 60% of the Cuban population was either black or mulatto. By then, slave revolts had become increasingly common, jeopardizing the economic stability of Cuban agriculture. From its founding in 1794, the Junta Real de Fomento, Agricultura y Comercio (Royal Board of Development, Agriculture, and Trade) tried to boost the numbers of non-Africans in Cuba, which led to the traffic in Asiatics in 1847 and Yucatecan Indians in 1849.

"After 1842, large numbers of Chinese were sent to the English colonies of Barbados, Jamaica and Trinidad. The Real Junta de Fomento, noting this, sent a representative to China in 1844 to negotiate the introduction of Chinese settlers into Cuba. A contracting agency for coolies destined for Cuba was set up, operating in Macao, Among, Swataw [Swatow], Hong Kong, and Wompoa. The coolies travelled through Manila in the Philippines. On 1 January 1847, the first lot of 1,073 Chinese immigrants docked in the port of Havana. They consisted, *inter alia*, of farmers, artisans and tradespeople. By 1861, there were already over 60,000

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Chinese from Shanghai and Canton, and it is estimated that between 1853 and 1873 alone, 132,435 Chinese entered Cuba. Basically, these people worked in the agricultural sector. Many tradespeople and artisans remained in Havana, creating a little Chinatown in the Zanja Street neighbourhood, while on the outskirts of Havana, a place known as Cienaga in the Cerro district was settled by farmers who came to grow almost all the vegetables for the capital. A major settlement of Asian vegetable farmers also developed south of Havana, in Batabanó province.

"The Japanese were only a small minority among the Asiatic immigrants to Cuba, concentrated in a few places such as the Isla de la Juventud (formerly Isla de Pinos), where they have played a major role in the development of local fruit and vegetable cultivation. We have no detailed information on their arrival in Cuba, but their presence on the Isla de la Juventud goes back at least three generations, according to our information."

According to Roig (1975), the soybean was introduced to Cuba in 1904 by the EEA (*Estación Experimental Agronómica de Santiago de Las Vegas,* currently INIFAT, the Experimental Agronomical Station) from the USA, but it was possibly already found in the Isla de la Juventud, used by the Japanese to prepare a kind of cheese called 'tofu.' (dau phu in Vietnamese).

Note: This journal is published by the Food and Agricultural Organization of the United Nations / International Board for Plant Genetic Resources. Address: 1. Zentralinstitut fuer Genetik und Kulturpflanzenforschung der Akademie der Wissenschaften der DDR, DDR-4325, GDR; 2. Instituto de Investigaciones Fundamentales en Agricultura Tropical 'Alejandro de Humboldt', INIFAT, Santiago de las Vegas, Havana, Cuba.

9642. Hesseltine, C.W. 1990. UJNR panel on toxic microorganisms. In: Albert E. Pohland, V.R. Dowell, Jr., and J.L. Richard, eds. 1990. Microbial Toxins in Foods and Feeds: Cellular and Molecular Modes of Action. New York: Plenum Press. xvii + 617 p. See p. 1-15. From a Symposium on Cellular and Molecular Mode of Action of Selected Microbial Toxins in Foods and Foods. Held 1988. Illust. 26 cm.
• ***Summary:*** The UJNR (United States–Japan Cooperative Program on Natural Resources) was established in May 1964. There were 7 original panels, one of which was Toxic Microorganisms. The initial emphasis was on botulism, soon followed by aflatoxins. The Panel consisted of 7 Japanese and 7 Americans; they comprised a mix a people who were experts on fungal mycotoxins and bacterial toxins. The Panel conducted many activities including joint panel meetings and study tours, exchange of mutual interest items, publication of 6 books, symposia, development of regulations, and interaction with other societies.

The 1966 study tours in Japan were longer than usual because of the review of 4 projects supported by the USA involving the use of soybeans in foods. These 1966 tours included visits to the following Japanese organizations working with soybeans: (1) Universities: Nagoya Univ. (Mycotoxins and soybean fermentations), Tohoku Univ., Faculty of Agriculture (Miso fermentation), Kyoto Univ. (Fermented soybean foods), and Tokyo Univ. of Education (Soybean cheese). (2) Japanese government laboratories: Noda Institute of Research, Chiba (Shoyu fermentation), Institute for fermentation, Osaka (Culture collection and fermentation in General).

(3) Trade association laboratories (each in Tokyo): Japanese Tofu Assoc., Japanese Shoyu Institute, Central Miso Institute. (4) Companies: Sendai Miso Shoyu Co., Sendai (Miso production), Koji Sanzaemon Roho, Kyoto (Koji starter production), Takeda Chemical Industry, Osaka (Antibiotic & flavor fermentations), Kikkoman Shoyu Co., Chiba (Shoyu production).

Talk with Dr. Walter Wolf of Peoria, Illinois. 2000. Aug. 14. He was on the UJNR Protein Panel, which met for about 10-12 years, on alternating years in Japan and the USA. Thus he went to Japan 5-6 times–the last time being in about 1988. The purpose of the panel was exchange of information about protein. They met with their counterparts at the NFRI (National Food Research Institute, Tsukuba). At a typical meeting there would be formal presentations by members of both teams, followed by a field trip to numerous facilities. Address: NRRC, Peoria, Illinois.

9643. Ishige, Naomichi; Raddle, Keneth. 1990. Gyoshô to narezushi [Fish jiang and fermented rice]. Tokyo: Iwanami Shoten. [8 ref. Jap]*
Address: Japan.

9644. Natto Shikenho Kenkyukai (Society for the Study of Natto); Norin Suisansho Shokuhin Sogo Kenkyujo (National Food Research Institute). 1990. Nattô shikenho [Methods of natto research]. Tokyo: NFRI and Korin Co. Ltd. 99 p. Illust. 21 cm. [Jap]*
• ***Summary:*** This subsection on Methods of natto research is within a larger section on Methods of soybean research. Within the natto subsection is an item titled Measurement of soybean size (p. 1-2).

9645. San-J International, Inc. 1990. In 1804 Napoleon became emperor, Jefferson was reelected, and the Sato family brewed its first tamari (Ad).
• ***Summary:*** The wording of this ad was revised in early 1990. Address: Richmond, Virginia. Phone: 804-226-8333. Fax 804-226-8383.

9646. Senritsu "Takeshi Gundan" no reikai hiwa [Shudder with the Takeshi group: Secret stories of the spirit world]. 1990. Tokyo: Shufu to Seikatsusha. 189 p. Illust. 19 cm.

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[Jap]*
• ***Summary:*** Mr. Takeshi is a Japanese man who has a TV show that features horror stories and scary ghost stories. This book is a Japanese ghost story. The author gives his fictitious name as "Tsumami Edamame," which means "finger foods / snacks + edamame green vegetable soybeans." Address: Japan.

9647. Sumi, Hiroyuki; Hamada, H.; Nakanishi, K.; Hiratani, H. 1990. Enhancement of the fibrinolytic activity in plasma by oral administration of nattokinase. *Acta Haematologica* 84(3):139-43. [26 ref]
• ***Summary:*** Nattokinase can be used in oral fibrinolytic therapy to treat thrombosis. Address: 1. M.D., Dep. of Physiology, Miyazaki Medical College, Miyazaki 889-16, Japan.

9648. Titsingh, Isaac. 1990. The private correspondence of Isaac Titsingh. Vol. 1 (1785-1811). Introduced and edited by Frank Lequin. Amsterdam, Netherlands: J.C. Giebon. Index. 24 cm. Series: Japonica Neerlandica vol. 4. [3 soy ref. Dut; Eng]
• ***Summary:*** Text chiefly in Dutch, with some correspondence in English. Isaac Titsingh was born on 10 Jan. 1745 in Amsterdam, and died on 2 Feb. 1812 in Paris. He was buried in Père-Lachaise cemetery. The inscription on his gravestone, written in French, states: Here lies Isaac Titsingh, formerly a councillor of the Dutch East India Company, Ambassador to China and to Japan. Died at Paris the 2nd of February 1812, aged 68 years.

This book, dedicated warmly to Prof. C.R. Boxer, begins with a 17-page "General introduction," by the author, in English. It discusses: Titsingh's life and work, the nature and content of his correspondence, the manuscripts, and notes on the text. This introduction shows Titsingh as a truly remarkable man, 50-100 years ahead of his time, and a pioneer at the dawn of understanding between Japan and Europe. Titsingh loved Japan, and that love opened doors to him that were closed to mere merchants.

Brief biography (p. xv-xxii): Titsingh was born in 1745 into an affluent, "well-educated patrician family in Amsterdam which counted a number of well-known surgeons among its members. Isaac Titsingh first qualified as a surgeon in Amsterdam, then obtained a doctorate in law at Leiden. In 1765, at age 20, he set sail for Asia as an *Onderkoopman* (Junior Merchant) with the Dutch East India Company (*Verenigde Oostindische Compagnie,* VOC). In Asia, he first worked as an administrator in Batavia (today's Jakarta, head of VOC's Asian operations), then he spent a total of 3½ years in Japan, divided over three separate stays from Aug. 1779 to Nov. 1784, as *Opperhoofd* or *Kapitan,* Director of the VOC trade there. At this time, Holland was the only Western nation allowed to enter or trade with Japan; the VOC was confined to the tiny man-made island of Deshima in the Bay of Nagasaki on the southern Japanese island of Kyushu–where they could be constantly watched and their actions tightly controlled by Japanese authorities. While in Japan, Titsingh paid two official visits to the Shogun's Court at far-away Edo (today's Tokyo). He also visited the Emperor's Court at Kyoto. From 1775 to 1792 he was Director of VOC's trade in Bengal; he resided at Chinsurah, near Calcutta. "In that period he [learned to speak English] and made many good English friends, who later proved a great asset to him." From 1792 to 1793 he returned to Batavia, this time as *Raad-Extraordinaris* (Councillor Extraordinary) of the Indies. From 1794 to 1795 he served as ambassador to the Imperial Court at Peking; he attended the 60th anniversary of the reign of the Qianlong Emperor. In 1796, Titsingh finally returned to Europe after a brilliant stay of 31½ years in Asia. After a brief stay in London, he spent the last years of his life as a largely unknown recluse in Paris.

"Titsingh had a brilliant career, but he was not a typical careerist. He was one of the top VOC officials in the Orient, but he was not a typical VOC employee. He was deeply interested European-Japanese academic and cultural relations. "Titsingh's position was unique." The Enlightenment (ca. 1650-1750) was now well established in Europe and he helped to foster the interests of a number of Japanese pioneers who were interested in learning more about Holland (*Rangakusha*) and about European culture, and in opening up Japan to the outside world. Titsingh took an equally deep interest in learning more about Japan–but in a systematic and objective way, trying to eliminate the many Western prejudices about Japan. "Titsingh taught a number of Japanese to read and write Dutch, and he himself learned Japanese"–he was a prodigy at learning languages. He helped supply Dutch books in the fields of medicine, science, the arts, etc. to the *Rangakusha* and with some of them he became lifelong friends and correspondents. He developed a large collection of Japanese objects; he was granted the rare permission to take these (and a map of Japan) back to Europe. Charles Boxer described Titsingh as "the most learned of all the Hollanders who visited that country [Japan] during the two centuries and a half in which" the VOC was active there. George Sansom, the great Japanologist, described Titsingh as "a man of all-around accomplishment." For much more about Titsingh, read this General Introduction.

Volume I of book contains 215 letters relating to the period 1785-1811. Of these, three mention soy [sauce]. but only in passing. (1) Letter no. 5 of 24 Nov. 1785 (p. 9) ("... *een provisie van sacky, soya en andere Japansche producted toetezended,...*).

(2) Letter no. 16 of 21 June 1786 (p. 27) (*"295 kruyken Zooija. 100 kruyken Zackij..."*).

(3) Letter no. 55 of 19 June 1789 (p. 124) ("*...en kon gen balij zakij or zooija na boord krijgen"*).

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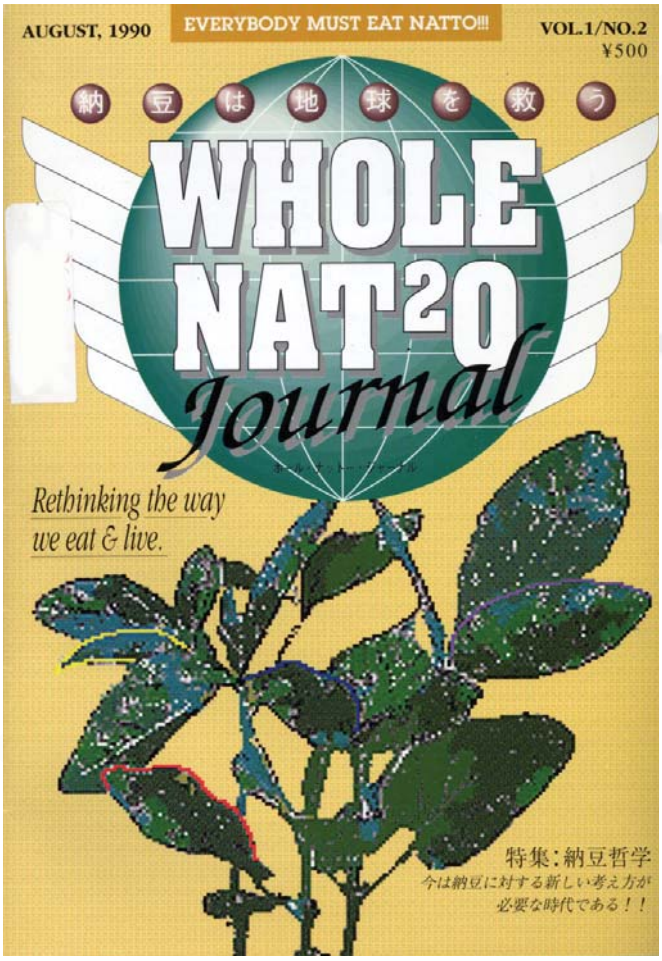
Note: Engelbert Kaempfer (1651-1716) traveled and worked in Japan for two years from Sept. 1690 to Nov. 1692 as chief surgeon to the Dutch East India Co. (VOC). While in Japan, he twice visited Edo and the Shogun Tokugawa Tsunayoshi there. His tact, diplomacy and medical skill overcame the cultural reserve of the Japanese, and enabled him to elicit much valuable information.

9649. Titsingh, Isaac. 1990. The private correspondence of Isaac Titsingh. Vol. 1 (1785-1811). Vol. 2 (1779-1812). Introduced and edited by Frank Lequin. Amsterdam, Netherlands: J.C. Giebon. Index. 24 cm. Series: Japonica Neerlandica vol. 4; Titsingh studies vol. 1. [Eng]*
• ***Summary:*** This is the English-language translation of these two volumes.

9650. *Whole Natto Journal: Rethinking the Way We Eat & Live.* 1990--. Serial/periodical. Japan. Publisher: Club NAT (Division of Shonan Forum 21). Director / Editor-in-Chief: Kohei Kitayama (FossaMagna Inc). Illust. 21 cm. [Jap]



• ***Summary:*** This magazine, except for the title and subtitle, is entirely in Japanese. The description is based on Vol. 1, No. 2 (Aug. 1990), the only issue owned by Soyinfo Center. At the top of the cover, in English (white letters on a gold background) is written "Everybody must eat natto." In this issue is one article about a Frenchman who loves natto (p. 4-6), and another titled "Toward a philosophy of natto," by Yamamoto (p. 8-16); a photo shows Mr. Yamamoto and an illustration shows the "natto triangle." Address: Kabushikigaisha Avan Shônan Fôramu 21 "Kurabu Natto" Jimusho 3-3-25, Katase, Fujisawa-shi, Kanagawa-ken, 251, Japan. Phone: 0466-21-3356.

9651. Japanese American Citizens' League, Seattle Chapter. 1990? Japanese community directory, Greater Seattle and vicinity. Seattle, Washington: Seattle Chapter JACL. 28 cm. [Eng]*
Address: Seattle, Washington.

9652. Japanese American Citizens' League, Seattle Chapter. 1990? Japanese community telephone directory, Greater Seattle and vicinity. Seattle, Washington: Seattle Chapter JACL. 22 cm. [Eng]*
Address: Seattle, Washington.

9653. Kane, Marion. 1991. The cutting edge. *Toronto Star* (*Ontario, Canada*). Jan. 2. p. D8.
• ***Summary:*** In Japan, people are now enjoying foods made from soybeans bred and grown in Canada.

Plant breeders at Agriculture Canada have developed two soybean varieties for specialized markets in East Asia. Harovinton is a large-seeded variety used to make tofu. Nattosan is a small-seeded variety used to make natto, a popular fermented Japanese soy food.

"Let's take a cue from the Japanese and start finding tasty ways to prepare tofu here on home turf. After all, its the perfect protein alternative to meat."

9654. Hellekson, Diane. 1991. Origami turns seafood dishes into an art form. *St. Paul Pioneer Press* (*Minnesota*). Jan. 4. p. 4C.
• ***Summary:*** This is a review of the Japanese-French restaurant Origami, which opened recently on the edge of the Minneapolis Warehouse district (30 First St. N., Minneapolis). "The most miraculous, yet restrained, Japanese seafood preparation is, of course, sushi and sashimi. Origami offers a pleasant bar in the rear of the restaurant, where dexterous chefs cut, roll and arrange the raw fish, rice and vegetables... If you sit at the sushi bar, be sure to ask for a nibble of edamame, young green soy beans cooked in their shells."

The tempura lunch is satisfying: "Cradle the warm bowl of miso soup in your hands, watch the bits of seaweed and silky miso swirl, then think spiritual thoughts as you sip." Address: Staff writer.

9655. *Toyo Shinpo* (*Soyfoods News*). 1991. Bei Nûyôku ni

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tôfu kôjô shinshutsu o kimeru. Kyoto Tanpaku kôkyû tôfu o seizô [Kyoto Tanpaku plans to open a tofu plant in New York to produce high quality tofu]. Jan. 21. p. 3. [Jap]
• ***Summary:*** Kyoto Tanpaku is the largest tofu maker in Kyoto, Japan. The president is Yasuo Hachijin (whose photo is shown). The company's address is 200 Senryômatsu-cho, Yoko-ôji, Fushimi-ku, Kyoto-shi, Japan. Phone: 075-622-3161. The new company, which has already been founded in New York, is named Global Protein Foods. Located in the town of Valley Cottage on the outskirts of New York City about 1 hour from Manhattan, the company plans to produce delicious high-class tofu to meet the needs of the area. They plan to use a new type of tofu package. The tofu plant will be 300 tsubo (10,692 square feet) in size and will use a Takai fully automatic tofu production line with a capacity of 3 hyo (1 hyo = a 60 kg sack, so 180 kg or 396 lb) of dry soybeans per hour. The new company plans to produce nigari tofu, packaged lactone silken tofu (*jûten-dofu*), deep-fried tofu cutlets, deep-fried tofu pouches, and American-style second generation tofu products.

Note: This is the earliest document seen (April 2001) concerning Global Protein Foods in Valley Cottage, New York. As of this date the company is located at 707E Executive Blvd., Valley Cottage, NY 10989. Phone: 914-268-8100. Contact: Anson Wong.

9656. Yamashita, Yoshimasa. 1991. History and future of Kyoto Food Corp. USA (Interview). *SoyaScan Notes.* Jan. 24. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** His company presently has no connection with Kyoto Tanpaku K.K. in Japan. But they learned how to make tofu from Kyoto Tanpaku. Kyoto Food Corp. has the very latest state-of-the art equipment. The parent company of Kyoto Food Corp. USA is a Kyoto supermarket named Kyoto Koseikai; the latter is the major stockholder in Kyoto Food Corp. USA. Kyoto Koseikai's only relationship with Kyoto Tanpaku in Japan is that they buy their tofu to sell in the supermarket.

The reason his company located in the midwest is because Terre Haute and Tajimi city in Gifu prefecture have been sister cities for 25 years. The connection was established when Mr. William Roach contacted his friend Mr. Juichi Iida in Tajimi. Mr. Iida contacted his friend Mr. Yamashita, who worked at the time for Kyoto Koseikai. Kyoto Koseikai decided to join in founding the company, as a major stockholder. Kyoto Food Corp. USA has no connection with any Japanese trading company such as Marubeni or Mitsubishi. They know of the tofu project at Purdue University and are cooperating with it, but have no financial involvement. He feels that they can sell tofu in the Midwest. He feels that the tofu companies who previously tried to sell tofu in the Midwest and failed were too early and too small. The timing is now right. The water he uses is very good and the soybeans are a premium grade, high in protein. He presently has no plans to private label tofu, although there have been four requests for private label brands. The company now has two products: regular tofu, and tofu with a sauce packet. Their next product will be agé. After that they plan to make fresh Japanese noodles (udon) and second generation tofu products (such as meatloaf). Address: President, Kyoto Food Corp. USA, 1050 W. 35th Drive, Terre Haute, Indiana 47802. Phone: 812-235-9505.

9657. Agriculture Canada, Oilseeds Division, Grain Marketing Bureau, Grains and Oilseeds Branch, 1991. Oilseed sector profile. Ottawa, Ontario, Canada. 18 + 1 + 8 p. Jan. 28 cm. Spiral bound. [3 ref]
• ***Summary:*** Contents: Foreword. 1. Introduction. 2. The seed production subsector: Canola, soybeans, flaxseed, sunflower, mustard, composition, subsector performance. 3. The processing subsector: Background, processes, industry structure, production, subsector performance. 4. The marketing subsector: Oilseeds marketing, hedging, processed oilseed products marketing. 5. The marketing environment: Domestic, international markets.

Appendix A: Role of the federal government in the Canadian oilseed industry. Appendix B. Oilseed industry directory.

Table 7 shows that Canada can be divided into three regions: The Maritimes, Central Canada (Ontario, Quebec), and Western Canada.

Table 8 shows soybean exports by major markets. Canada exports more soybeans to the USA by far than to any other country. No. 2 is Japan.

A very important association is the Ontario Oilseed Industry Association, 1185 Eglinton Ave. E, Suite 101, Don Mills, Ontario M3C 3C6. Phone: (416) 429-1073. Address: 930 Carling Ave., Ottawa, ONT K1A 0C5, Canada. Phone: (613) 995-8324.

9658. Fowler Brothers. 1991. Catalog: January 1991. P.O. Box 2324, San Rafael, CA 94912. 79 p. 28 cm.
• ***Summary:*** The company is a "distributor of natural foods." The following makers, distributors, and brands of soyfood products are listed: I. Bulk Products: Miso (American Miso, 8 products), Soy foods (Turtle Island tempeh and Soy Deli tofu burger). Soy Sauce & tamari (San-J domestic shoyu and tamari, Westbrae Johsen shoyu), Tofu (Quong Hop, 6 products).

II. Packaged products: Ah Soy (Westbrae, 7 soy drinks), Eden Foods (Edensoy, 6 soy drinks), Pacific Soyfoods (6 types of soysage), Pacific Tempeh (4 products), Quong Hop (11 soymilk and 4 tofu products), San-J (tamari crackers, 14 soy sauce & tamari products), Soy Deli (Quong Hop, 5 soy foods, 8 vacuum pack tofu), Sweet Earth (3 vegeburgers), Turtle Island (10 tempeh products), Vitasoy (7 soy drinks), Westbrae (2 instant miso soups, 14 soy drinks, 14 types of soy sauce and tamari). Address: San Rafael, California.

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Phone: 415-459-3406.

9659. Gilligan's Restaurant and Islander Bar. 1991. January. New soyfoods restaurant or deli. 3495 Hospital Lane, Terre Haute, Indiana 47802.
• ***Summary:*** Article in Toyo Shinpo. 1991. Talk with Nancy Carter of Kyoto Food Corp. USA. 1991. April 10. The restaurant and bar opened in mid-January. There are now only two tofu recipes on the menu, a tofu soup and a tofu salad. The attendance is excellent. People come for two reasons: for Japanese food and for a typical midwestern steak meal. Address: Terre Haute, Indiana. Phone: 812-235-2356.

9660. Horitsu, Hiroyuki; Wang, M.Y.; Kawai, K. 1991. A modified process for soy sauce fermentation by immobilized yeasts. *Agricultural and Biological Chemistry* 55(1):269-71. Jan. 3 figs. 2 tables. [4 ref]
• ***Summary:*** Ceramic beads were used in a bioreactor to make fermented soy sauce by a continuous process in a short time. Address: Dep. of Bioresources Utilization, Faculty of Agriculture, Gifu Univ., Yanagido 1-1, Gifu 501-11. Japan.

9661. Kudou, Shigemitsu; Tsuizaki, I.; Uchida, T.; Okubo, K. 1991. Purification and some properties of soybean saponin hydrolase from *Aspergillus oryzae* KO-2. *Agricultural and Biological Chemistry* 55(1):31-36. Jan. [51 ref]
• ***Summary:*** Soybean saponins are physiologically active, and also have undesirable bitter and astringent tastes. In a previous paper, the writers screened microorganisms for soybean saponin hydrolase activity and selected *Aspergillus oryzae* KO-2 as highest enzyme activity–for use in breaking down / hydrolyzing saponins. In this paper they describe the purification of this soybean saponin hydrolase enzyme. Address: 1&3. Kanesa Miso Co., Ltd., 202 Hamada, Tamagawa, Aomori 030; 2. Faculty of Agriculture, Tohoku Univ., 1-1- Tsutsumitori Amamiya-machi, Aoba-ku, Sendai 981. All: Japan.

9662. **Product Name:** Tofu (soybean curd) special variety pack. Contains one package each of Mori-Nu Silken Tofu, Soft, Firm, Extra Firm. Seven day menu plan inside.
Manufacturer's Name: Morinaga Nutritional Foods, Inc.
Manufacturer's Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-669-8638.
Date of Introduction: 1991 January.
Ingredients: Water, soybeans, isolated soy protein, gluconolactone, calcium chloride.
Wt/Vol., Packaging, Price: 31.25 oz (884 gm).
How Stored: Refrigerate after opening.
New Product–Documentation: A sampler of three different types of Mori-Nu Tofu in one pack. On the glossy color paperboard cover of the outer pack the word "Tofu" is written in bold white capital letters, each against a black square. Behind the letters are three color photos of Mori-Nu tofu in ready to eat dishes. Net weight 31.25 oz (884 gm).

The dated "Mori-Nu Seven Day Healthy Eating Plan" is in a glossy color 12-page brochure (each page 18.5 x 9.5 cm) featuring 9 delicious Mori-Nu Tofu recipes. The daily meal plan is low in fat, high in fiber.

9663. Nichii Company of America, Inc. Mycal Group. 1991. Are you tired of soaking overnight? (Ad). *Natural Foods Merchandiser.* Jan. p. 64.
• ***Summary:*** This is an ad for "revolutionary new MicroSoy flakes," an alternative to whole soybeans in making tofu or soymilk. They eliminate all washing and rinsing, all soaking water and time, waste water disposal, grinding, and save considerable floor space. You can save up to 2,400 lb of water per ton of soybeans. Call or fax for a free sample.

9664. *Toyo Shinpo* (*Soyfoods News*). 1991. Origotô iri no tôfu Zenshokutan ga juyô kakudai e [Japan Vegetable Protein Assoc. tries to expand the demand for tofu that contains oligosaccharides]. Feb. 1. p. 4. [Jap]
• ***Summary:*** Mr. Sekiguchi Riôji is head of the Association (Zenkoku Shokubutsu Tanpaku Kyôdô Kumiai, Sendagi 2-48-8, Bunkyô-ku, Tokyo. Phone: 03-3828-1040) which got a patent for their tofu that contains oligosaccharides. Oligosaccharides have vegetable fiber and encourage the growth of Bifidus bacteria, which help the intestines. As of Oct. 1989 one chain of restaurants sells tofu pudding that contains oligosaccharides for ¥250. They sell about 3,000 puddings a day total in their 100 shops. Tokyu department stores have also started to sell tofu with oligosaccharides. Address: Japan.

9665. *Toyo Shinpo* (*Soyfoods News*). 1991. Kaihatsu susumu kinôsei shokuhin. Kenko iji ni kônô was aru ka? Yûbô na kinôsei inshi [Developments in foods that aid vital functions. Do they offer benefits in maintaining health? Promising factors]. Feb. 1. p. 4. [Jap]
• ***Summary:*** The functions of oligosaccharides: There are various types of oligosaccharides. They serve as a nutrient that promotes the growth of Bifidus bacteria, which make lactic acid and acetic acid, which in turn kill bad bacteria in the intestines. Oligosaccharides help relieve constipation and diarrhea, they activate the intestines, and reduce the risk of and may help cure cancer of the large intestine. There are various foods which contain oligosaccharides, including drinks and biscuits. Calpis Food Co. has developed a technique for extracting large amounts of oligosaccharides from soybeans, and in Feb. 1990 they started to sell the resulting products, Bifidus Activation Drinks Oligo-Cc (*Bifizu Kassei Inryô Origo Cc;* ¥100).

Meiji Seika started to produce oligosaccharides even earlier. They make a product named Furakuto Oligosaccharides, derived from cane sugar, that as used as a sweetener, as in candies or drinks. Address: Japan.

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9666. Richardson, Al A. 1991. Trip report and market analysis–Europe. Torrance, California: Nichii Company of America. Feb. 4. Unpublished typescript.
• ***Summary:*** This trip report describes visits to various companies. Contents: Unisoy Company, Manchester, England. Dragon & Phoenix, London, England. Cauldron Foods, Manchester, England. Sojinal, Issenheim, France. Alpro, Wevelgem, Belgium. Heuschen-Schrouff, Landgraff, Netherlands. Galactina AG, Belp, Switzerland. Trip and European market summary. Top soyfoods manufacturers in Europe. Address: Director, Marketing & Sales, Nichii Company of America, Inc., 23440 Hawthorne Blvd., Skypark 2, Suite 140, Torrance, California 90505. Phone: (213) 791-0010.

9667. Tetra Pak Inc. 1991. Use of UHT/Aseptic white dairy milk in Europe and other countries, 1989. 889 Bridgeport Ave., Shelton, CT 06489. 2 p. Feb. 5. Unpublished manuscript.
• ***Summary:*** The following statistics are from Tetra Pak Statistics in Lausanne, Switzerland. In western Europe, 27,896 million liters of milk are consumed in total. Of this, 24,108 million liters are consumed in the eleven EEC countries. Countries not in the EEC are Austria, Cyprus, Finland, Iceland, Norway, Sweden, Switzerland, and Turkey. The four countries with the largest total milk consumption are the UK (6,687 million liters), France (3,735), Spain (3,624), and Germany (3,470). Of the all the milk consumed in Europe, 9,660 million liters (35% of the total) is packaged in UHT/Aseptic cartons. Of the all the milk consumed in the EEC, 9,376 million liters (39% of the EEC total) is packaged in UHT/Aseptic cartons. The four countries in which UHT/Aseptic packaging is most widely used are France (3,000 million liters; 80% of all milk in France), Spain (2,125; 59%), Germany (1,578; 45%), and Italy (1,497; 52%).

Outside of Europe, the world's biggest dairy milk consumers are: USA (24,429 million liters; 0.2% UHT/Aseptic), India (5,001; 0.4%), Japan (4,803; 4%), Mexico (2,895; 8%), and Canada (2,504; 0%). Countries with the highest percentage of UHT packaging are Yemen (39 million liters of milk consumed; 95% in UHT), Pakistan (97; 92%), Saudi Arabia (158; 82%), Thailand (34; 70%), Singapore (28; 64%), and Chile (151; 61%). Address: Shelton, Connecticut.

9668. *Toyo Shinpo* (*Soyfoods News*). 1991. Beikoku no ôte ryôhanten ni genchi seizô no tôfu nônyû: Kyôto Kôseikai no genchi kogaisha [Supplying American-made tofu to big supermarket chain: Kyôto Koseikai's subsidiary is on the scene]. Feb. 21. p. 13. [Jap]
• ***Summary:*** Kyoto Koseikai is a company that runs supermarkets in and around Kyoto, Japan. The president is Mr. Kumaji Shimobo. It is located at Nishino Ume-honcho 117-3, Yamashina-ku, Kyoto-shi, Japan. Phone: 075-581-8111. This company established Kyoto Foods Corp. USA, whose president is Mr. Yoshimasa Yamashita, in Terre Haute, Indiana. Kyoto Foods, which has begun production of tofu, has signed a contract with Kroger, a big supermarket chain, which has 117 stores in the Midwest. Kroger has decided to sell Kyoto Foods' tofu in all of their 117 stores. Kyoto Foods' production capacity is presently 10,000 cakes/day of tofu. Mr. Yasushi Yamamoto, the managing director, wants to decide the definite amount of supply and production line expansion.

Kyoto Foods was looking for a large market in which to sell their tofu and Kroger was looking for a company that could provide stable tofu production and supply. The needs of both have been well met. Address: Japan.

9669. *Toyo Shinpo* (*Soyfoods News*). 1991. Beikoku de daizu origo-to. Karupisu, Mitsubishi Shôji to kyôdô [Soybean oligosaccharides in the USA. Calpis and Mitsubishi joint venture with Central Soya]. Feb. 21. p. 13. [Jap]
• ***Summary:*** It has been announced that Calpis Food Co. (Shokuhin Kogyo; maker of a very popular Japanese non-alcoholic beverage) and Mitsubishi Shoji are going to establish a jointly owned company with Central Soya (Indiana) to produce and sell soybean oligosaccharides in 3 of Central Soya's plants in America. Oligosaccharides, which have the ability to condition the intestines, have been produced by several food companies in Japan. But Calpis got safety approval from the U.S. Food and Drug Administration as the first company in Japan. They are planning to sell the product aggressively overseas, to Unilever in Europe, and also in Korea. They are trying to capture the growing awareness of health. They are hoping to reach 5,000 million yen [about $39.3 million] sales during the first three years, selling mainly to confectionery manufacturers as a sweetener. They hope to begin shipping to Unilever this year for use in boosting the nutrition of infant formulas.

In Korea, they plan to supply the largest tofu maker and food manufacturer, Purumuwon in Seoul, with a powdered soy oligosaccharide sweetener, private labeled.

Oligosaccharides promote the growth of Bifidus (Bifidobacterium; beneficial bacteria) in the intestinal tract. In Japan, the market for products that include oligosaccharides is estimated at 150,000 million yen ($1,195 million), growing at about 20% a year due to consumer health awareness. But this concept and the resulting products are not yet popular overseas. There are several types of oligosaccharides. The one Calpis developed from soybeans is widely available in these beans and is getting the most attention. Their product has about 20% of the Japanese market. Calpis established a company named Soya Oligo Japan (president, Mr. Kôkichi Sato) with Mitsubishi in 1989 and has been preparing for overseas expansion.

A shorter, similar, follow-up article was published in

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Toyo Shinpo on 21 March 1991, p. 3. Address: Japan.

9670. Miyazawa, Mitsuo. 1991. [Re: Early shipments of miso and shoyu from Sendai Miso Shoyu Co. Ltd. to Mitoku]. Letter to Chris Dawson of Mitoku, Feb. 22. Based on a request from William Shurtleff at Soyfoods Center. 1 p. Handwritten, with signature. [Jap]

• ***Summary:*** "In Oct. 1970 Jôsen Shôyu was shipped in 18 liter cans, and red (rice) miso was shipped in 20 kg cans.

"In March 1976 brown rice miso was shipped in 20 kg cans. According to our research, these were the earliest dates that each of these products was shipped."

Chris Dawson adds: "I understand that Johsen was the first with brown rice miso, so this must be the first shipment ever of brown rice miso... I am trying to pull together information about the first shipments of miso and shoyu by Mitoku. It is a little difficult since we do not have the records on hand and some of our early customers are no longer in operation."

Note: Chris Dawson was still working for Mitoku in Tokyo on 27 Dec. 1991. Address: Sendai Miso Shoyu Co. Ltd., Furujiro 1-5-1, Sendai 982, Miyagi prefecture, Japan.

9671. Lumpkin, Tom. 1991. Work with edamamé (green vegetable soybeans in the pods) in the state of Washington (Interview). *SoyaScan Notes.* Feb. 27. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** In about 1986 Tom founded the East Asian Crop Development Program at Washington State University (WSU), in Pullman, Washington. He is now full-time head of a team of 12 people in this program, all of whom except himself are working part-time, developing East Asian plants to be grown in Washington state. It is an interdisciplinary team with people from food science and marketing as well as agronomists and himself who is interested (among other things) in documenting the history of various East Asian crops. The program is designed to benefit Washington state farmers. One of these plants is edamamé, or vegetable-type green vegetable soybeans.

Tom has collected about 400 varieties of edamamé as part of his work; the germplasm is maintained at Pullman. He has lived in East Asia and speaks some Japanese and Chinese. His wife is Japanese. He obtained a National Science Foundation grant to study at Kyoto University in Japan, where for 18 months he did extensive research on edamamé at about the same time that his student, John Konovsky, was studying the same crop at Iwate University. Of the many Japanese-language citations in their bibliography on edamamé (most previously uncited in English), John "discovered" about two-thirds and Tom about one-third. Tom ran his program at WSU from Japan and returned to Washington every 3 months to plant crops, check details, etc. Tom is collecting documents on edamamé, and has 60 from China. He has translated the titles of all of them and has translated ten entire documents. In addition he has about 150 Japanese journal articles on edamamé from 1920 to the present; many of the more recent ones have an English abstract. Some translators work with him. These documents are part of a growing library on East Asian crops, housed within Tom's program. He is in the process of finishing a book on edamamé in cooperation with Dr. Sundar Shanmugasundaram and another scientist at AVRDC, which plans to publish it. The book should be ready in about 6 months. It will probably be titled *Edamamé: The vegetable soybean*, and will contain a very lengthy and original bibliography–one of the hallmarks of Tom's work. Tom is also working on a book on the azuki (adzuki) bean, which will be published by CAB in the UK; soybeans are mentioned throughout this book. He is also very interested in wasabi. Tom prefers the term "edamamé" but AVRDC likes "vegetable soybeans." This summer a woman named Hu Jia, who is a librarian at the Chinese Academy of Agricultural Sciences in Beijing, is coming to work on his project for about 1 year. Tom has been very close to her family for 12 years. She collects literature in China for him on all of the basic crops he is working on. He has known her father well for a long time. During the Cultural Revolution, she was sent out to be a barefoot doctor for 10 years. She is age 40, has a degree in library science, and speaks good English, in part because her father, a native Chinese, earned a PhD from a university in Minnesota, and is now a chairman emeritus in the Chinese in the Chinese Academy of Agricultural Sciences. Her father will be sending documents on Chinese crops to Tom's program. She will be in the USA for at least a year, in part to learn more about computers, and in part to help on Tom's project.

Edamamé are now being grown in Washington state. In 1990 two farmers grew 20 acres and in 1991 3-4 farmers are expected to grow about 100 acres. D&K Foods in Walla Walla, Washington, is shelling, freezing and packing the beans. Tom has never met a person who did not like them. The Japanese think they are the best they have ever tasted, probably because they are frozen so quickly after harvest. The seeds are a bit smaller than their Japanese counterparts. Dunn International in Waterloo, Iowa, is also growing edamamé.

One of Tom's graduate students, named John Konovsky, is doing his thesis on edamamé, focusing and breeding and agronomy. They are working with D&K in Walla Walla, Washington on developing mechanical harvesting for edamamé.

Tom presented a paper at the INTSOY soybean conference in China last summer. The focus of the conference was utilization. It was excellent. Address: Head, East Asian Crop Development Program, Dep. of Crops and Soil Sciences, Washington State Univ., Pullman, WA 99164-6420. Phone: 509-335-2726.

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9672. Eden Foods, Inc. 1991. Eden Foods product overview (Leaflet). Clinton, Michigan. 6 panels each side. Each panel: 23 x 10 cm. Feb.

• ***Summary:*** Two panels of this color leaflet contain a brief history of Eden Foods, plus a chronology of key events in the history of Eden Foods: 1967–The first checking account was opened for Eden Foods, a source of macrobiotic and organic foods in Ann Arbor, Michigan. 1968–Eden Foods, Incorporated became a registered business, with food service, retailing and food processing operations. 1970–Eden Organic Certification Standards were implemented. Eden products were distributed in Michigan and Ohio. 1972–Trade relationship began with Muso Company, Ltd. of Osaka, Japan. 1979–Fire at warehouse reduced records, equipment and inventory to rubble. Two weeks later Eden Foods reopened. 1982–Schmidt Noodle Company, maker of Eden organic pasta since 1976, was acquired by Eden Foods. 1983–Edensoy soy beverage introduced; historic new item in natural foods market. 1985–San Francisco, California sales office and warehouse opened to service the West Coast. 1986–American Soy Products opened to produce Edensoy in Michigan; first aseptic soy beverage plant in the United States. 1988–Eden Foods joined OCIA, Organic Crop Improvement Association, for independent certification of crops. 1989–Eden and OCIA established standards for food processing as well as growing crops.

Six panels inside the leaflet describe the company's main product lines and give color photos of leading products from each line: Edensoy soy beverage. Organic durum pasta. Organic tomatoes. Organic grain sweetener (100% barley malt). Oils & vinegars. Beans & grains. Fruit products. Seasonings (Sesame Shake = gomashio). Traditional Japanese pasta. Traditional Japanese miso. Japanese soy sauces. Japanese sea vegetables. Japanese oils & vinegars. Japanese chips & crackers. Japanese pickles. Japanese concentrated foods (plum, garlic, kombu). Japanese teas. Japanese specialty foods (macrobiotic).

The company's trademark is now "Making a tradition of good health." Address: 701 Tecumseh Rd., Clinton, Michigan 49236.

9673. **Product Name:** [Natto].
Foreign Name: Natto.
Manufacturer's Name: Food for Freedom.
Manufacturer's Address: Nylense [Nijlense] Steenweg 72, B-2270 Herenthout, Belgium. Phone: 014 / 51 7237.
Date of Introduction: 1991 February.
Ingredients: Organically grown soybeans, water, natto starter.
Wt/Vol., Packaging, Price: 150 gm.
How Stored: Refrigerated.
New Product–Documentation: Letter, label, and leaflet sent by Lucio de Berti, owner of Food For Freedom. 1992. Jan. 4. This product, called simply "Natto," was introduced in Feb. 1991. The company now makes about 8-9 kg/week of natto. "During a lecture at the Kushi Institute level II in Florence, Italy, I got interested in natto. I liked the strange state, and I started to produce it on a very small scale for my shop in Como, Italy. I grew to appreciate its qualities more and more. When we started our company Food for Freedom in Belgium, we decided to include natto in our products, to complete the line of our soybean products, and (since it was largely unknown) to help people get in contact with it. Our company is meant to be mainly a fresh tempeh producer, since we believe that tempeh is the best way to use soyabeans for mankind. Our second goal is to help spread the use of soya products integrated into a more philosophical lifestyle, based on macrobiotics."

Label. 3 by 4 inches. Black and pink on white. In Dutch and French. "Serve cold with soy sauce and green onions finely diced or daikon radish, or in soups. Peu misoté ou à la friture aux legumes."

Leaflet (in French). "Fresh natto (Le natto frais)." Contents: List of the benefits of natto. What is natto? The importance of eating natto regularly. How natto is made. How to use natto. For more information. Seven natto recipes.

9674. Johnson, Lawrence A. 1991. New horizons in utilizing Iowa's crops: New crops, products and uses. Paper presented at Seed Science Center Workshop. 28 p. Held 26 Feb. 1991 at Scheman Center, Iowa State Univ.

• ***Summary:*** "In this narration to a slide show containing 57 slides the author discusses the increasing price of petroleum relative to agricultural products (such as corn), the Midwest Agribusiness Trade Research and Information Center (MATRIC), the Utilization Center for Agricultural Products (UCAP; previously known as the National Center for Food and Industrial Agricultural Product Development).

Prof. Johnson represents the Center for Crops Utilization Research (CCUR), whose mission is "to expand utilization of crops grown in Iowa and the Midwest by developing new products, processes, and markets.

"The goals of the center are focused on three major areas. We develop technologies for new products and processes to improve competitiveness of American agriculture. We are striving to replace petrochemical-derived products with those derived from renewable agricultural resources. We are channeling the application of biotechnology into utilization of agricultural products.

"We are concerned about the national trend to focus biotechnology primarily on targets that will increase production and that too little biotechnology is being directed towards utilization targets. The danger is that increased production could further exacerbate our surplus situation unless we also enhance end-use value and develop new ways to use crop materials." The next slides show examples for over 40 projects administered through the center, including a number related to soybeans. Also discusses grain amaranth,

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crambe oil, potential for and barriers to exporting value-added soyfoods to Japan, why some soybeans make better soyfoods than others, Henry Ford and soy plastics ("As early as the 1930's, Henry Ford made plastic automobile parts from soy protein and demonstrated their ruggedness. Unfortunately, cheap petroleum caused his effort to be abandoned in the 1950's. We are examining this opportunity using modern techniques and in more favorable economics. Soy plastics may be more environmentally-friendly."), and degradable plastics containing 6% starch. Address: Professor-in-Charge, Center for Crops Utilization Research, Iowa State Univ., Ames, IA 50011.

9675. Okada, Noriyuki; Nikkuni, Sayuki; Manabe, Masaru. 1991. [Cell fusion between Miura strain and Takahashi strain of *Bacillus natto*]*:* Proof of fusion by plate-count method. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 38(2):79-85. [7 ref. Jap; eng]*
Address: 1. Tropical Agriculture Research Center, Ministry of Agriculture, Forestry and Fisheries, Japan.

9676. Shimoyamada, Makoto; Okubo, Kazuyoshi. 1991. Variation in saponin contents in germinating soybean seeds and effect of light irradiation. *Agricultural and Biological Chemistry* 55(2):577-79. Feb. [10 ref]
Address: Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., 1-1 Tsutsumidori-Amamiyamachi, Aoba-ku, Sendai 981, Japan.

9677. Shiraiwa, Masakazu; Harada, K.; Okubo, K. 1991. Composition and content of saponin in soybean seed according to variety, annual cultivation, and harvest time. *Agricultural and Biological Chemistry* 55(2):323-31. Feb. [26 ref]
Address: 1&3. Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., 1-1 Tsutsumidori-Amamiyamachi, Aoba-ku, Sendai, Miyagi 981; 2. National Inst. of Agrobiological Resources, Ministry of Agriculture, Forestry and Fisheries, 2-1-2 Tsukuba, Ibakari 305. All: Japan.

9678. Shiraiwa, Masakazu; Kudou, S.; Shimoyamada, M.; Harada, K.; Okubo, K. 1991. Composition and structure of "group A saponin" in soybean seed. *Agricultural and Biological Chemistry* 55(2):315-22. Feb. [22 ref. Eng]
Address: 1-3&5. Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., 1-1 Tsutsumidori-Amamiyamachi, Aoba-ku, Sendai, Miyagi 981; 4. National Inst. of Agrobiological Resources, Ministry of Agriculture, Forestry and Fisheries, 2-1-2 Tsukuba, Ibakari 305. All: Japan.

9679. Dawson, Chris. 1991. Re: Chronology of early shipments of shoyu and miso from Mitoku to Europe and the USA. Letter (fax) to William Shurtleff at Soyfoods Center, March 8. 1 p.
• ***Summary:*** 1969–First shipment of organic shoyu (Sakae Shoyu brand) from Fukaya Shoten in Shizuoka prefecture, Japan, to Mr. Sakaguchi of Le Bol en Bois in Paris, in 16 liter tins. This shoyu was made with MOA* ingredients.

1970, Oct.–First shipment of Jôhsen Shoyu and red rice miso from Sendai Miso Shoyu Co. Ltd. in Sendai, Miyagi prefecture.

1971–First shipment of Hatcho miso from Hatcho Miso Ltd. in Aichi prefecture to USA.

1976, March–First shipment of brown rice miso from Sendai Miso Shoyu Co. Ltd. in Sendai, Miyagi prefecture. In 20 kg tins.

1980, May–First shipment of Onozaki rice miso from Onozaki Koji-ten in Tochigi prefecture to Oak Feed in Miami, Florida. 84 cartons and 4 kegs.

1980–First shipment of buckwheat miso from Kamegen Jyozo in Nagano prefecture, to Europe. 100 packs of 500 gm each.

1984, Sept.–First shipment of organic tamari from Mansan Shoten in Aichi prefecture to Blake Rankin of Granum in Seattle, Washington. Four x 18 liters.

1984–First shipment of organic soybean miso from Mansan Shoten in Aichi prefecture to Jon Judson of Soy Source, Christchurch, New Zealand.

1987–First shipment of organic young (*waka*) Hatcho miso from Hatcho Miso Ltd. in Aichi prefecture to USA.

1989–First shipment of organic Hatcho miso from Hatcho Miso Ltd. in Aichi prefecture.

* Note: MOA refers to Mokichi Okada International Association, which is a commercial association related to the Japanese religion *Sekai Kyusei Kyo* which means "helping the world religion." Its basic tenet is to "Make heaven on earth," to bring peace on earth and health to all people. There are approximately 700,000 members in Japan. Mokichi Okada lived 1882-1955. The commercial company was formed in 1920 and is now known as MOA Trading Company. Its purpose is to promote natural and organic farming and provide natural products for people. Address: International Sales Manager, Mitoku Co. Ltd., C.P.O. Box 780, Tokyo 100, Japan. Phone: 3-3201-6701.

9680. Barringer, Felicity. 1991. Census shows profound change in racial makeup of the nation: Shift toward minorities since 1980 is the strongest seen this century. *New York Times.* March 11. p. A1, A12.
• ***Summary:*** "This is the dawning of the first universal nation." Of the 249.6 million residents in America, 80.3% are white, 12.1% black, 9% are Hispanic, 2.9% Asian and Pacific Islanders, American Indians are 0.8%. The number of Asians increased 107.8% during the 1980s. There are now 7.3 million Asian-Americans. States with the highest

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concentrations of Asians or Pacific Islanders are: Hawaii (685,236, up 17.5% since 1980, 61.8% of the state's population), California (2,845,659, up 127.0% since 1980, 9.6% of the state's population), Washington (210,958, up 105.7% since 1980, 4.3% of the state's population), New York (693,760, up 123.4% since 1980, 3.9% of the state's population), Alaska (19,728, up 144.9% since 1980, 3.6% of the state's population).

"The change in California, the nation's fastest-growing state, was most striking. In 1980, two-thirds of Californians were whites from European backgrounds. In 1990, the figure was 57 percent, meaning that nearly 13 million of the 29.8 million Californians are from minority backgrounds. California's population includes about 35 percent of the nation's total Hispanic population and 39 percent of the Asians in the United States."

9681. *SoyaScan Notes.* 1991. Yoshiko Uchida (Overview). March 15. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Yoshiko Uchida is a famous and prolific Japanese-American woman author who has written extensively about the lives of Japanese Americans. Her portrait photo appears on a color poster celebrating America's most influential women during women's week.

9682. *Toyo Shinpo* (*Soyfoods News*). 1991. Beikoku de gaishoku tatenka. Genchi no tôfu kôjô o kadô. Nihon-shoku resutoran kaisetsu [Restaurant chain in the USA operating tofu plants nearby. Japanese food restaurant opens]. March 21. p. 2. [Jap]
• ***Summary:*** Kyoto Koseikai has decided to start a chain of Japanese restaurants whose menu is based on American-made tofu and beef. In Japan, regulations governing supermarkets have changed, and competition is becoming more severe. Therefore they have started to move into the USA. The company's first operation, a tofu manufacturing plant, is in Terre Haute, Indiana. Now they have purchased a local restaurant for about 40 million yen [$314,000]. They are calling it Gilligan's Island (*Girigansu Airando*). It has 306 seats. Their goal is 150 million yen [$1.18 million] sales per year. The business is run by Kyoto Foods Corp. whose president is Mr. Yoshimasa Yamashita. Kyoto Foods has very strong connections with local people in the financial community. Address: Japan.

9683. Tsukamoto, Joe. 1991. Soybeans in the Yukon Territory and in Manitoba, Canada (Interview). *SoyaScan Notes.* March 22. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Mr. Tsukamoto was the last director of the Whitehorse Experimental Farm (also called the Agricultural Research Station at Haines Junction, and Mile 10-19 Research Station (on the Alaska Highway); previously called Whitehorse Experimental Substation). This organization no longer exists. He was there for about 13 years, then he left for Manitoba when the Farm was closed by the government in about 1967. In about 1983 the Yukon Territorial Government government had just declared agriculture an industry, and they wanted to become self sufficient in perishable, goods, livestock, etc. So they asked him if he would come back from Manitoba to take charge of agricultural work. Since he had other obligations at the time, he recommended Dick Filteau (from Texas), who had just retired and who had extensive experience in this field. Filteau was hired by the Yukon Territorial Government as an advisor on a contract basis; he arrived there in 1983. Using daylength-insensitive soybean varieties provided by Joe, Filteau conducted soybean variety trials at 4-6 locations in the Yukon Territory for 2-3 years to see if they could be used as a protein supplement in livestock feeds. A summary of the results was tabulated and is probably available from the Director, Department of Agriculture, Yukon Territorial Government, in Whitehorse. Some of the plants grew well, especially in areas like Dawson City away from the ice sheets; near the ice sheets frost was the major problem. He thinks that soybeans are not presently being grown now in the Yukon Territory.

Joe doubts that soybeans have ever been tested by a government organization in the Northwest Territories; agriculture may not be declared an industry there.

Concerning soybeans in Manitoba, he was director of the soybean program in that province. The first daylength-sensitive varieties (Altona, and Portage) were tested in Manitoba in about 1961. These were developed by the pioneer, Dr. Baldur Stefansson, who also started the canola program and became world renowned in the latter field. The first daylength-insensitive varieties, Maple Presto and Maple Ridge, were also developed under this program, and introduced in about 1982 and 1985 respectively. They originated from Finnish varieties [sic, actually Swedish varieties from Dr. Sven Holmberg, especially Fiskeby V, according to Dr. Harvey Voldeng], probably developed by Dr. Harvey Voldeng at Ottawa. He is "the" federal soybean breeder in Canada.

The difference between daylength-sensitive and insensitive is that if you plant the insensitive one early in the spring, it will flower early, whereas the insensitive one, no matter when you plant it, will flower at a certain time of year (determined by the balance of light and dark hours).

In the early 1980s a peak of roughly 16,000 acres of soybeans were grown in south-central Manitoba. The government promoted the crop, then canola was given a premium price and soybean acreage began to decline. Today about 1,000 acres of daylength-insensitive soybean varieties are still grown in Manitoba, mostly for seed that is sold to North Dakota and Minnesota. The seed of these daylength-insensitive varieties is superior to the Maturity Group 0 or I

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varieties grown in the United States.

Joe was formerly an agronomist with the Manitoba Department of Agriculture, Brandon, Manitoba. His mandate was to investigate alternative crops. He retired about 1 month ago. Prior to that he worked for many years to develop about 6 lines of small-seeded natto varieties for export to Japan. He worked with a Japanese merchant and the Japan Natto Association. They are now being tested in Japan for commercial acceptance. Address: 32 19th St., Brandon, MAN, R7B 1K2, Canada. Phone: 204-727-5243.

9684. CSP Foods Ltd.; Central Soya of Canada Ltd. 1991. CSP Foods Ltd. and Central Soya of Canada Ltd. have signed a letter of intent to purchase the edible oils business of Canada Packers Inc. (News release). Canada. 7 p. March 27.

• ***Summary:*** "The purchase includes edible oil refineries in Montreal, Toronto and Wainwright, Alberta, and an oilseed crushing business at Fort Saskatchewan, Alberta, and a seed gathering station at Humboldt, Saskatchewan. A 50% ownership in Prairie Margarine Inc. of Edmonton is also part of the deal... The edible oil business of Canada Packers employs 400 people and generated consolidated sales of approximately $250-million in the fiscal year ended March 31, 1990.

"CSP Foods Ltd. is jointly owned by Saskatchewan Wheat Pool and Manitoba Pool Elevators and is the major processor of canola and sunflower seed in western Canada. It operates crushing and refining facilities at Altona, Manitoba and Nipawin, Saskatchewan. CSP Foods has a crush plant at Harrowby, Manitoba, a refinery at Dundas, Ontario and a 50% ownership in Prairie Margarine Inc. of Edmonton, Alberta.

"CSP Foods is a leading marketer of canola oil and meal products into the North American marketplace. CSP Foods employs 290 people and generated consolidated sales of approximately $200 million in the fiscal year ended March 31, 1991.

"Central Soya of Canada Limited operates a soya/canola crush plant at Hamilton, Ontario and is a subsidiary of Central Soya Company Inc."

"This acquisition will combine three Canadian companies into one. On a North American basis, the new company is estimated to have three percent of the Edible Oils market. This compares to US market shares for ADM, Cargill and Bunge of 33, 20 and 12 percent, respectively...

"Canola is Canada's major oilseed crop, accounting for 65-70 percent of Canadian oilseed production. It is second only to wheat in terms of gross farm revenue, averaging $850-900 million per year. Japan is the predominant export market for canola seed, taking up to 90 percent of total exports and up to 60 percent of canola production. The balance of the crop is sold to the domestic crushing sector, most of which is located in Western Canada."

"Central Soya of Canada Ltd. operates a soy/canola crush plant at Hamilton, Ontario with a soya crush of 365,000 tonnes a year (1,270 tonnes a day) and a canola crush of 227,000 tonnes a year (700 tonnes a day). The crushing canola and soya can take place simultaneously."

Also gives details on: The agreement in principle. Canada Packers Ltd. Assets. CSP Foods Ltd. current operations. Central Soya of Canada Ltd. current operations. New company structure (CSP Foods and Central Soya will each own 50% of the new company and both will provide three Board members or partners to the new company). Rationale for the purchase and merger. The impact on the market place. The impact on producers. Chart of assets of the 3 companies. One map shows the new company's oilseed refineries in Canada, and another map shows its oilseed crushing plants.

9685. *INFORM* (*AOCS*). 1991. Soyfood processing plant to begin operations. 2(3):180. March.

• ***Summary:*** Nichii Co. of America plans to officially open a $7 million soybean processing plant in Jefferson, Iowa, in April 1991. The automated plant is designed to produce 6 tons of soy flakes per hour.

9686. Kudou, Shigemitsu; Shimoyamada, M.; Okubo, K. 1991. A new isoflavone glycoside in soybean seeds (*Glycine max* Merrill), Glycitein 7-O-β -D-(6"-O-acetyl) -glucopyranoside. *Agricultural and Biological Chemistry* 55(3):859-60. March. [6 ref]

• ***Summary:*** Soybeans are known to contain the five isoflavone glycocides (genistin, daidzin, glycitein 7-O-Beta-D-glucoside, 6"-O-acetylgenistin, and 6"-O-acetyldaidzin) and their corresponding aglycones.

Table 1 shows the isoflavone content of nine isoflavone compounds in the hypocotyl, cotyledon and seed coat of soybean variety Suzuyutaka (cultivated in Akita prefecture, Japan in 1988). Address: 1,3-4. Kanesa Miso Co., Ltd., 202 Hamada, Tamagawa, Aomori 303; 2&5. Faculty of Agriculture, Tohoku Univ., 1-1- Tsutsumitori Amamiya-machi, Aoba-ku, Sendai 981. All: Japan.

9687. *Toyo Shinpo* (*Soyfoods News*). 1991. Tôfu Dengaku [Tofu Dengaku: Illustration of a lady in the early 1800s in Japan preparing Dengaku over a grill]. March. 21. p. 4. [1 ref. Jap]

• ***Summary:*** This illustration is from the book titled *Sôsôshi* (1822). It is found in the section titled Shokoku Dôchû Kinwaraji, which is illustrated by Mimaru KITAO. The author of the book is not given.

9688. *Toyo Shinpo* (*Soyfoods News*). 1991. Tataki nattô, yakumi-tsuki. Ichi ninmae 8 mon nari [Pounded natto, with seasonings. One serving costs 8 mon: Ancient natto history]. April 11. p. 4. [2 ref. Jap]

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• ***Summary:*** Two old illustrations of natto sellers are reproduced. One, by Shigemasa KITAO, appeared originally in the book titled *Rakugo Shôfurin* (A Treasury of Witty Stories) published in about 1830-1844. The name of the author is not given. The other, by Morisada Kitagawa, appeared originally in the book titled *Morisada Manko* (Mr. Morisada's Book of Comical Illustrations Without Particular Thoughts), published in about 1848-1854.

9689. *Toyo Shinpo* (*Soyfoods News*). 1991. Okinawa no tôfu. Katakute okii. 1 cho (1 kg) 240 yen [Okinawa tofu. Big and firm. One cake weighs 1 kg and costs 240 yen]. April 21. p. 9. [Jap]
• ***Summary:*** This full-page article contains ten photos, one of them apparently quite old, showing tofu being made in the traditional way (using a hand-turned stone mill) in Okinawa. An inset photo shows the cover of a cookbook titled "Okinawa Tofu Cookery–80 selected recipes" (*Okinawa Tôfu Ryôri–80 sen*) by Masa Kyan, published by Naha Shuppansha in Okinawa.

9690. *Toyo Shinpo* (*Soyfoods News*). 1991. Kawamuki daizu fureeku o tôfu seizô ni. Gyôsha kara mo "oishii" to kôhyôka. Nichii no shyoppu seisaku de Beikoku de seisan kôjô o kensetsu-chû [Dehulled soybean flakes for making tofu. Tofu makers say they produce delicious tofu. With Nichii's shop policy, they are building a plant in the USA]. April 21. p. 7. [Jap]
• ***Summary:*** At their U.S. plant, Nichii (the Nichii Mycal Group) is planning to produce 1,000 tonnes of dehulled soybean flakes the first year, 1,500 tonnes the second year, 2,000 tonnes the third year, and 3,000 tonnes the fourth year. They plan to sell 50% of these flakes in America and export 50% to Japan.

9691. *Jefferson Bee* (*Jefferson, Iowa*). 1991. A plant for the future. April 30. p. 1. Tuesday.
• ***Summary:*** A ceremonial tree planting began the grand opening festivities of the MYCAL Group (Nichii Company of America Inc.) MicroSoy Flake processing plant in Jefferson Monday morning. The planting of a tree symbolizes future growth and prosperity. Taking part in the ceremony were Mr. Toshimine Kobayashi, Iowa Governor Terry Branstad, and Mr. Charles Davis, mayor of Jefferson.

9692. Morinaga Nutritional Foods, Inc. 1991. Dairy-free, low-fat tropical shakes: Made with Mori-Nu and your favorite fruit (Tear-off recipe pad). 2050 W. 190th St., Suite 110, Torrance, California 90504.
• ***Summary:*** This color tear-off recipe pad (6½ by 4 inches), developed by Susan Bucher of Bucher & Russell in Los Angeles, was introduced in April 1991. On the front is a color photo of a strawberry milk shake surrounded by a sliced pineapple, bananas, strawberries, apricots, and other fresh fruits. To the left is a package of Mori-Nu Lite Firm tofu (only 1% fat).

On the back are recipes for: Mori-Nu Hawaiian Smoothie, Mori-Nu Strawberry Banana Shake, and Mango Madness Shake, plus nutritional analyses, Mori-Nu Tofu facts, and an offer for additional free Mori-Nu recipes. Address: Torrance, California. Phone: 1-800-669-8638.

9693. Nichii Company of America, Inc. (MyCal Group). 1991. MicroSoy Flakes: The next millennium (Color videotape). Skypark 2, Suite 140, 23440 Hawthorne Blvd., Torrance, CA 90505. 11.8 minutes.
• ***Summary:*** Tells the story of MicroSoy Flakes and describes their benefits, with emphasis on saving water, energy, and time, increasing tofu yield, and giving good quality tofu. Shows the product being tested inside the Azumaya Inc. tofu factory in San Francisco, and at a small tofu shop in the Pacific Northwest. Lester Wilson at Iowa State Univ. describes tests on the product being conducted there. A very nice presentation. Address: Torrance, California. Phone: 310-791-0010.

9694. Paine, Heather. 1991. Soya and SIAL '90: Editorial. *SoyaFoods* (*ASA, Europe*) 2(1):1. Spring.
• ***Summary:*** "Last year's SIAL (Salon International de L'Alimentaire) was certainly impressive and all the more so because soyafoods and products containing soya had a remarkably good presence... French soyafoods companies were well represented with many new products... In the 'new products' section a soya-oil based margarine from Denmark (Margarines AMA-Dragsbaek Margarine Fabrik S A) won a SIAL D'Or award and a soyamilk from Argentina (AdeS) was highly commended." Address: editor, SoyaFoods, 27a Santos Rd., London SW18 1NT, UK. Phone: 081-874-5059.

9695. Shiraiwa, Masakazu; Harada, K.; Okubo, K. 1991. Composition and structure of "group B saponin" in soybean seed. *Agricultural and Biological Chemistry* 55(4):911-17. April. [21 ref]
• ***Summary:*** Six different kinds of "group B saponin" were detected by HPLC. Saponins have some physiological activity, including hemolytic, goitrogenic, antioxidative, and hypolipidemic properties. Address: 1&3. Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., 1-1-Tsutsumitori Amamiyamachi, Aoba-ku, Sendai, Miyagi 981; 2. National Inst. of Agrobiological Resources, Ministry of Agriculture, Forestry and Fisheries, 2-1-2 Tsukuba, Ibaraki 305. All: Japan.

9696. Tatsumi, Yoshiko. 1991. Kotokoto fukkura–Mame ryôri [Simmer slowly and they expand: Bean cookery]. Tokyo: Zaidan Hôjin Nôsan Gyôson Bunka Kyôkai. 214 p. April 30. [Jap]
• ***Summary:*** The word *kotokoto* in the Japanese title

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describes the sound of bubbles coming up during simmering; it is sometimes translated as "pit pat." This book contains a section of edamame recipes (p. 52-58). After that comes a section on tofu, miso, and shoyu (p. 59+). Address: Cooking teacher, Japan.

9697. *Jefferson Herald* (*Jefferson, Iowa*). 1991. Nichii Co. chairman, Jefferson mayor salute opening of soy flake plant. May 2. p. 9.
• ***Summary:*** Contains the full text of addresses given at the grand opening of the Nichii MicroSoy Flake plant in Jefferson Monday morning by Mr. Toshimine Kobayashi of Osaka, Japan, chief executive officer of the MYCAL Group and chairman of the board of Nichii Company Ltd., and Mr. Charles Davis, mayor of Jefferson. Iowa's governor Terry Branstad and a representative of the secretary of agriculture were present. Mr. Kobayashi notes that this is the first overseas plant built for the MYCAL Group. It is the "largest soybean flake factory in the world, with annual production capacity of 120,000 tons and a total investment of $8 million... Every corporation must have its own culture in order to obtain good employees and contribute to the society. It has been five years since we began our efforts under the corporate philosophy of MYCAL... 'MYCAL' is an acronym for 'Young-Minded Casual Amenity Life,' which I believe is the lifestyle that people all over the world are searching for...

"The MYCAL Group have been importing massive amounts of refrigerated pork from John Morrell & Co. of Sioux City, Iowa, through our U.S. subsidiary, Nichii Company of America, Inc. We have imported high quality beef products through that company, as well. With its unique and excellent meat-processing technique, John Morrell & Co. have been assisting us in the development of several second generation health-conscious food products through the use of the vegetable protein obtained from high-quality soybeans."

9698. *Jefferson Herald* (*Jefferson, Iowa*). 1991. Two-day grand opening held by MYCAL. May 2.
• ***Summary:*** Between 1,500 and 2,000 guests toured the new MicroSoy Flakes plant and sampled foods made from tofu. A photo shows dignitaries crossing a bridge to the plant.

9699. **Product Name:** MicroSoy Flakes.
Manufacturer's Name: MicroSoy Corporation.
Manufacturer's Address: 300 East MicroSoy Drive, Jefferson, IA 50129. Phone: 515-386-2100.
Date of Introduction: 1991 May.
Ingredients: Whole dry soybeans.
How Stored: Shelf stable.
New Product–Documentation: *Jefferson Herald* (Jefferson, Iowa). 1991. May 2. "Two-day grand opening held by MYCAL." Between 1,500 and 2,000 guests toured the new MicroSoy Flakes plant and sampled foods made from tofu. A photo shows dignitaries crossing a bridge to the plant.

9700. Richardson, Al. 1991. New developments at Nichii (Interview). *SoyaScan Notes.* May 16. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The Nichii plant opening in Iowa at the end of April was a great success. The governor of Iowa, Terry Branstad, was there, along with 350 invited guests. An additional 1,500 to 2,000 people showed up to taste tofu dishes and take a tour of the plant. They were responding to a full-page ad in the Jefferson paper that Mr. Chikaarashi had run. They loved the Tofutti [soy ice cream] and Tofu Lasagna that were served, but they didn't seem to care much for plain cubes of tofu seasoned only with soy sauce. Address: Nichii Company of America, Inc., 23440 Hawthorne Blvd., Skypark 2, Suite 140, Torrance, California 90505.

9701. Tanaka, Terry; Richardson, Al. 1991. New developments at Nichii (Interview). *SoyaScan Notes.* May 18. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Nichii is presently selling Microsoy Flakes to only a few small tofu companies in America. They are working with a number of larger companies, but nothing has yet been finalized because those companies need a mixer to process the flakes. Nichii has imported one or more mixers and they are just now clearing customs. They should have imported the mixers a year ago. Most of the flakes made in Iowa are now being sold to Japan. Address: Nichii Company of America, Inc., 23440 Hawthorne Blvd., Skypark 2, Suite 140, Torrance, California 90505.

9702. Messina, Mark J. 1991. Update on soy and cancer prevention research (Interview). *SoyaScan Notes.* May 28. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Aside from Mark's article titled "Commentary: The role of soy products in reducing risk of cancer," published in the *Journal of the National Cancer Institute* 83(8):541-46 (17 April 1991), there will be no other proceedings published. Much of what the participants had to say has already been published. The conference brought the people and ideas together for the first time. Dr. Stephen Barnes was the co-author and chairperson of the workshop, and his work was the motivation for the workshop.

Mark has almost finished writing a new paper which will be a review of all the literature on the role of soy products in reducing the risk of cancer. This review will contain many studies not mentioned in the article cited above, including about 20 animal studies. The initial animal research was very disappointing. K.K. Carroll, for example, in 1975, found no difference between soy protein and casein in protecting against cancer. The epidemiological work is inconclusive, and soy is limited to a minor role in Chinese, Japanese, and some Seventh-day Adventist studies. So, even if soy was

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protective, it would not get much attention in these studies. The literature seems to indicate that soy is most protective against colo-rectal cancer and against breast cancer. One basic problem is that case-control studies are often not very supportive of diet-cancer relationships; they are often done in homogeneous populations with a narrow range of dietary differences. For example, Japanese and Chinese have low fat and high soy consumption, while Europe and the USA are the opposite. This is a big problem for the field because even today much of our understanding of diet-cancer relationships is based on these international variations in cancer compared to the FAO data. We don't have that for soy; we just have a series of case-control studies, though they are generally suggestive of a protective effect. The animal studies show mixed results. Of the 4 studies on soy and mammary cancer, for example, 2 show a protective effect and 2 do not. So we need to look deeper for the cause of these differences. It looks like the isoflavones are the most likely candidates to be the effective protective agents. The protease inhibitors are extremely potent chemopreventive agents; they really work. Whether or not there is enough in soybeans to make a difference is a big question. There may be enough, but it is a difficult question to answer. The isoflavones are absorbed, you can measure them and their effects. They clearly can exert physiological or biological effects. If some of the proposed studies are funded, in the next two years we will learn a great deal about these compounds.

Mark feels that his new review of the literature may launch this as a whole field of serious research, and may stimulate much new investigation in this new field. A new case-control study, titled "Dietary effects on breast-cancer risk in Singapore just published in *The Lancet* (18 May 1991, p. 1197-1200), was so supportive of a protective effect of soy against cancer that it alone will stimulate more thinking about this area. The authors of that study did not set out to look solely at soy, but they noted that not many epidemiological studies have been conducted on soy. Those that have, have been quite supportive in showing a protective effect against cancer.

In about 2 months, NCI will be giving out some money for further study of the isoflavones in soybeans, to see how they are metabolized and their other effects. If things go well, with good results over the next 2 years, they might be in a position to do a human intervention study to look seriously at the effect of soy in preventing or curing cancer. Address: Diet and Cancer Branch, National Cancer Inst., 9000 Rockville Pike, EPN–Room 202, Bethesda, Maryland 20892-6130. Phone: 301-496-8573.

9703. Chang, Yong-Sin. 1991. Welcome address. In: S. Shanmugasundaram, ed. 1991. Vegetable Soybean: Research Needs for Production and Quality Improvement. Taipei, Taiwan: Asian Vegetable Research and Development Center (AVRDC). 151 p. See p. 5. Proceedings of a workshop held at Kenting, Taiwan 29 April–2 May 1991.

• ***Summary:*** "The vegetable soybean industry in Taiwan was an insignificant one in the 1970s. But today there are about 30 frozen food processing factories handling a sizeable volume of vegetable soybean for export–primarily to Japan. The total value of vegetable soybean export to Japan and other countries in 1990 reached an all-time high of about US$75 million. Vegetable soybean constitutes nearly 60% of the total exports of all fruits and vegetables processed in Taiwan. Therefore, we are very much interested in this commodity.

"In the early 1980s, the Council of Agriculture recognized the growing importance of vegetable soybean for export and for the domestic market in Taiwan. In 1985, the Council initiated and supported a vegetable soybean research project at the Kaohsiung District Agricultural improvement Station (DAIS) and the Asian Vegetable Research and Development Center."

New and improved varieties were quickly developed. In 1987, AVRDC's selection AGS 292 was released by Kaohsiung DAIS as Kaohsiung No. 1; it now occupies about 84% of the total area cultivated in vegetable soybean in Taiwan. Address: Council of Agriculture, Taipei, Taiwan.

9704. Cheng, Shui-Ho. 1991. Vegetable soybean area, production, demand, supply, domestic and foreign trade in Taiwan. In: S. Shanmugasundaram, ed. 1991. Vegetable Soybean: Research Needs for Production and Quality Improvement. Taipei, Taiwan: Asian Vegetable Research and Development Center (AVRDC). 151 p. See p. 17-21. Proceedings of a workshop held at Kenting, Taiwan 29 April–2 May 1991. [7 ref]

• ***Summary:*** Contents: Abstract. Introduction. Area, production and yield [in Taiwan]. Foreign and domestic trade. Cultural practices. Research and development. Problems and future needs.

The area planted to and production of vegetable soybeans in Taiwan increased from 7,139 ha and 42,839 tonnes in 1983 to 9,852 ha and 63,163 tonnes in 1990. In 1983 the yield was 5,938 kg/ha rising to 6,411 kg/ha in 1990. Two crops are grown each year, in the spring and fall. Exports of vegetable soybeans from Taiwan increased from 452 tonnes in 1972 to 34,821 tonnes in 1989. About 80% of Taiwan's total production was for export. The export value (FOB) increased from US$47.6 million in 1987 to US$75 million in 1990. The major market for the export of frozen vegetable soybean is Japan, which bought 99% of the total export volume in 1989. A new leading cultivar, KS #1, bred by AVRDC and the Kaohsiung District Agricultural Station (DAIS), was the first official release of a vegetable soybean in Taiwan. Address: Council of Agriculture, 37 Nan-Hai Road, Taipei, Taiwan.

9705. Chiba, Yasuhiro. 1991. Postharvest processing,

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marketing and quality degradation of vegetable soybean in Japan. In: S. Shanmugasundaram, ed. 1991. Vegetable Soybean: Research Needs for Production and Quality Improvement. Taipei, Taiwan: Asian Vegetable Research and Development Center (AVRDC). 151 p. See p. 108-12. Proceedings of a workshop held at Kenting, Taiwan 29 April–2 May 1991. [3 ref]
• ***Summary:*** Contents: Abstract. Postharvest processing and marketing: Utilization, marketing. Period of harvest. Quality degradation. Quality maintenance. Address: Iwate Prefectural Horticultural Experiment Station, 20-1 Narita, Iitoyo-machi, Kitakami-shi, Iwate prefecture 024, Japan.

9706. Hung, A.T.; Cheng, J.H.; Ma, C.H.; Kobayashi, H. 1991. Effect of fertilizer management and rhizobia inoculation on yield and quality of vegetable soybean. In: S. Shanmugasundaram, ed. 1991. Vegetable Soybean: Research Needs for Production and Quality Improvement. Taipei, Taiwan: Asian Vegetable Research and Development Center (AVRDC). 151 p. See p. 73-84. Proceedings of a workshop held at Kenting, Taiwan 29 April–2 May 1991. [3 ref]
• ***Summary:*** Contents: Abstract. Introduction. Materials and methods. Results and discussion: Effects of fertilizer application rate on yield. Effects of fertilizer application time on yield. Effects of different organic fertilizers on yield and graded pod ratio. Effects of different organic fertilizers on quality. Relations of soil properties with quality. Effects of rhizobia and nitrogen on nodule number. Investigations on graded pod yield, fertilizer, and profit increase by rhizobia inoculation. Address: 1-2. Crop Environmental Improvement Div., District Agricultural Improvement Station, Kaohsiung, Taiwan; 3-4. AVRDC, P.O. Box 42, Shanhua, Tainan 74199, Taiwan.

9707. INTSOY. 1991. Highlights of International Conference on Soybean Processing and Utilization. Plus closing statements and recommendations, and a directory of participants. Urbana, Illinois. 3 p. Unpublished manuscript. 28 cm.
• ***Summary:*** Organizers: Jilin Academy of Agricultural Sciences (JAAS), China–host; Chinese Academy of Agricultural Sciences (CAAS), China–co-host; International Soybean Program (INTSOY) at the University of Illinois; Ministry of Agriculture, Forestry, and Fisheries (MAFF), Japan; International Institute of Tropical Agriculture (IITA), Nigeria; Scientific Research Institute of Foods and Fermentation Industries (SRIFFI), China"

Participants: 100 foreign participants from 25 different countries and 150 participants from throughout China. 58 people from developing countries and 40 people from developed countries. Regional distribution of foreign participants: Southeast Asia–25 people from 4 countries. East Asia–23 from 3 countries. North America–17 from 1 country. Africa–13 from 5 countries. South Asia–12 from 5 countries. Europe–5 from 3 countries. Central America–2 from 1 country. Middle East–1 from 1 country.

Program: 80 research/development/policy papers presented. Topics: Research (processing/products): Breeding/germplasm 10, extrusion 9, tofu 8, fermented products 4, nutrition 4, soymilk & ice cream 3, edamame (vegetable) 2, soy protein isolates and concentrates 2, lecithin 2, other 3. Development: Country reports 21 project reports 6. Policy/economic 3.

Demonstrations and exhibitions by 37 companies from throughout China (including soy milk and ice cream).

Local visits: Modern tofu plant. Modern solvent extraction plant. Farms. Local markets/stores. Soybean research institute of Jilin Academy of Agricultural Sciences. Headquarters of the Gene Bank of Chinese Academy of Agricultural Sciences. Labs and pilot plant of Scientific Research Institute of Foods and Fermentation Industries. Address: INTSOY, 113 Mumford Hall, Urbana, Illinois 61801. Phone: 217-333-6422.

9708. Iwamida, Shinji; Ohmi, Hiromu. 1991. Communication links between vegetable soybean producers, processors, trading companies and seed companies in Japan. In: S. Shanmugasundaram, ed. 1991. Vegetable Soybean: Research Needs for Production and Quality Improvement. Taipei, Taiwan: Asian Vegetable Research and Development Center (AVRDC). 151 p. See p. 22-25. Proceedings of a workshop held at Kenting, Taiwan 29 April–2 May 1991.
• ***Summary:*** Contents: Abstract. Distribution of vegetable soybean. Distribution for fresh market. Distribution of seed. Seed production. Future vegetable soybean production.

The total demand for vegetable soybeans in Japan is almost 160,000 tonnes. This figure has remained constant for several years. About 25-30% of the total is sold frozen. Domestic production provided about 116,000 tonnes (72.5% of the total demand), and 43,000 tonnes (27.5%) were imported. Almost all of the frozen product was imported. The prefectures which produced the most vegetable soybeans in Japan in 1987 were Niigata (13,500 tonnes) and Chiba (12,200 tonnes). Address: 1. Hokkaido Research Station; 2. Chiba Research Station. Both: Snow Brand Seed Co. Ltd., Japan.

9709. *Japan Company Handbook* (*Tokyo: Toyo Keizai, Inc. Quarterly*). 1991. Foods. Spring. Second section. [Eng]
• ***Summary:*** In the section on Foods, 1 page of statistics is given on each of the following soy-related companies: Torigoe Flour Milling, Marukin Shoyu (Japan's 5th ranked shoyu maker, based in Shozu island), Yutaka Shoyu (based in Tokai area, also makes miso), Sanbishi (shoyu maker based in Tokai area), Kibun. Address: Tokyo, Japan.

9710. Kamiyama, Yoshinori. 1991. Vegetable soybean seed production technologies in Japan. In: S. Shanmugasundaram,

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ed. 1991. Vegetable Soybean: Research Needs for Production and Quality Improvement. Taipei, Taiwan: Asian Vegetable Research and Development Center (AVRDC). 151 p. See p. 43-44. Proceedings of a workshop held at Kenting, Taiwan 29 April–2 May 1991.
• ***Summary:*** Contents: Abstract. Seed production and supply system. Breeding. Cultivation methods. Future developments.

In Japan, most vegetable soybean seeds are developed and sold by private companies. This paper discusses work in Iwate Prefecture. The Iwate Prefectural Agricultural Experiment Station is concerned with breeding pure lines, plus breeders' and foundation stocks. The Iwate Seed and Plant Center works on seed multiplication. Since most vegetable soybeans are inferior to grain soybeans in their resistance to disease and other damage, it is important to find a variety with strong resistance. Address: Iwate Prefectural Agric. Exp. Station, 737 Sunagome, Takizawa-mura, Iwate gun, Iwate prefecture, Japan 020.

9711. Kang, Il Jun; Matsumura, Yasuki; Mori, Tomohiko. 1991. Characteristics of texture and mechanical properties of heat-induced soy protein gels. *J. of the American Oil Chemists' Society* 68(5):339-45. May. [23 ref]
Address: Research Inst. for Food Science, Kyoto Univ., Uji, Kyoto 611, Japan.

9712. Kokobun, Makie. 1991. Cultural practices and cropping systems for vegetable soybean in Japan. In: S. Shanmugasundaram, ed. 1991. Vegetable Soybean: Research Needs for Production and Quality Improvement. Taipei, Taiwan: Asian Vegetable Research and Development Center (AVRDC). 151 p. See p. 53-60. Proceedings of a workshop held at Kenting, Taiwan 29 April–2 May 1991. [15 ref]
• ***Summary:*** Contents: Abstract. Introduction. Cultural practices–Cropping patterns and cultivars. Raising of seedlings. Planting, fertilizing, irrigation, and temperature control. Control of weeds, insects and diseases. Harvest. Cropping systems: Crop rotation including vegetable soybean, effects of continuous cropping.

Table 1 (adapted from Kohno 1989) shows "Major cultivars used for each cropping pattern of vegetable soybean in Japan" (p. 55). Columns: Cropping type (forcing {in glass house / greenhouse for harvest in February to April} and semiforcing {for harvest from March to June}, early maturity, normal season, late cropping), earliness of cultivars, days from sowing to harvest, cultivars [varieties]. The varieties (from early to late) are: Okubara-wase, Hakuchou, Gokuwaseozaya, Sapporo-midori, Yuki-musume, Hakuchou, Wase-midori, Tamasudare, Wase-shiroge, Mikawajima, Shiratsuya Kegon, Tsurunoko. Note: *Midori* means "green." *Musume* means "daughter or girl." Address: National Agriculture Research Center, MAFF, Kannondai, Tsukuba 305, Japan.

9713. Lumpkin, Thomas A.; Konovsky, John. 1991. A critical analysis of vegetable soybean production, demand, and research in Japan. In: S. Shanmugasundaram, ed. 1991. Vegetable Soybean: Research Needs for Production and Quality Improvement. Taipei, Taiwan: Asian Vegetable Research and Development Center (AVRDC). 151 p. See p. 120-40. Proceedings of a workshop held at Kenting, Taiwan 29 April–2 May 1991. [187 ref]
• ***Summary:*** Contains the best bibliography of Japanese-language documents about edamame seen to date, found and compiled mostly by Konovsky.

Contents: Abstract. Introduction (and history). Trends in production and demand. Trends in research: Agronomy, biochemistry and plant physiology, breeding and germplasm, harvesting and processing, statistics and marketing, plant pathology. Research information. Apparent research needs: Agronomy, biochemistry and plant physiology, breeding and germplasm, harvesting and processing, plant pathology. Conclusion. Acknowledgments.

Early references to immature soybeans (*nama daizu,* later *aomame*) appear in the 8th century A.D., when it is described as one of the sacred food offerings used in *Shinsen,* mentioned in the record book of a royal treasure house called the Shosoin in the capital city of Nara*. *Aomame* is mentioned in the *Engishiki,* a guide to the conduct of government and religious affairs, published in 927 A.D. [Heian period] (Igata 1977). Later, in 1697, cultivation methods for vegetable soybeans were published in the book *Nogaku Zensho* [*A Complete Book of Farming*].

"In Japan, the earliest forms of immature vegetable soybeans were called *eda-nari-mame* (branch-fruiting-bean) or *azemame* (rice-bund bean)* and were probably not well distinguished by the characteristic sweet, savory flavor of current edamame until the Kamakura period (1192-1336) or later, when they became part of Buddhist cuisine. By the middle Edo period, vegetable soybean harvest had advanced from October to August and farmers' wives began selling boiled stems with attached pods on the streets of Edo (early Tokyo), particularly during the Festival of the Dead (*Obon*) in August. At that time, vegetable soybean began being used as it is today, i.e. as a snack food, hors d'oeuvre, or appetizer, usually with alcohol consumption, which explains one of its English nicknames: Beer Bean. (* Source: K. Yamauchi. 1990. "Travels to Study Riddles: Edamame" *Nozogaku no Tabi: Edamame.* July 27. TV Mook, NTV/YTV, Japan. Note: Shinsen is ritual preparation of food to purify the body).

"The dramatic increase in affluence and beer consumption following the Meiji Restoration in 1868 can be partially attributed to a large-scale import of European technology, including German technology for beer production. The culture which centered around drinking and snacking expanded, creating a strong demand for vegetable soybeans. The saltiness of the beans is thought to be the

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perfect complement to beer. The increase in vegetable soybean consumption resulted in it gaining the attention of agricultural and food scientists, and the development of over 400 varieties. Vegetable soybean has now become so distinct from soybeans in the minds of urban consumers that most do not recognize it as the same species as soybeans.

"Demand for vegetable soybean in Japan is thought to have evolved through four phases in society, in addition to its routine use by farm families. The first was a sacred offering to the *Kami* during the Nara period (*Shinsen*), the second as a food for religious purification during the Kamakura period (*Shojin Ryori*), the third as popular street fare among the Samurai during the Edo period, and the fourth, after the Meiji Restoration in 1868, when it became the most popular accompaniment for beer. Figure 1, a graph, shows that the meteoric rise in vegetable soybean consumption closely parallels the increase in beer consumption in Japan because of the complementary nature of the saltiness of the vegetable soybeans and the taste of beer."

"The second major impetus to vegetable soybean production was the spread of refrigeration, first to the commercial sector, especially to bars and beer gardens in the post-war period, and later to the residential sector in the late 1960s and early 1970s when household refrigerators became widely used. The commercial sector currently uses about 65% of frozen vegetable soybean, while the residential sector uses about 35%. The year-round consumption of vegetable soybean has increased in line with the growing popularity of frozen foods in general.

"A current major impetus to the use of frozen vegetable soybean is the changing role of women in Japan. More than half of all Japanese women are now employed outside of the home, and are thus becoming more unwilling and unable to prepare elaborate meals from basic ingredients... Frozen vegetable soybean is thought to have been marketed in Japan after World War II, but large-scale distribution did not begin until 1965, about the same time the Ministry of Agriculture, Forestry, and Fisheries began keeping formal production statistics for vegetable soybean. Production in Taiwan began around 1966, when several large, Japanese trading companies introduced it as an export crop, and exports to Japan began around 1972."

Fig. 2, a bar chart (p. 123), shows vegetable soybean area, production (of pods), and yield in Japan from 1946 to 1988. Total production in Japan gradually increased from 30,100 tonnes in 1946 to a peak of 121,900 tonnes in 1982, after which it declined slowly to 105,000 tonnes in 1988. Yields were highest in 1969, reaching almost 10 tonnes/ha, then steadily dropped, falling to 7.3 tonnes/ha in 1988.

Fig. 3 is a chart titled "Pedigrees of popular vegetable soybean varieties currently grown in Japan" (p. 126). Early ancestors include: Wase-midori, Tsurunoko, Osodefuri [Sodefuri]. Detailed information on each variety is given in the text.

Research needed on harvesting and processing: "The most difficult problem facing growers is knowing when to harvest vegetable soybean... Second, to control production costs, methods of mechanically harvesting vegetable soybean need to be refined. If harvesters can be developed that do not drop, bruise, or break pods, the technology can replace expensive hand labor" (p. 130).

Note: This paper contains the best bibliography seen of Japanese-language publications on edamame. The Acknowledgments section (p. 130) states: "Most of the following bibliography [187 references] was collected and the articles translated while John Konovsky was a Fulbright Fellow at Iwate University in 1990; special thanks go to Dr. N. Kaizuma at Iwate University for his guidance." Address: East Asian Crop Development Program, Dep. of Crop and Soil Sciences, Washington State Univ., Pullman, WA 99164-6420.

9714. Masuda, Ryoichi. 1991. Quality requirement and improvement of vegetable soybean. In: S. Shanmugasundaram, ed. 1991. Vegetable Soybean: Research Needs for Production and Quality Improvement. Taipei, Taiwan: Asian Vegetable Research and Development Center (AVRDC). 151 p. See p. 92-102. Proceedings of a workshop held at Kenting, Taiwan 29 April–2 May 1991. [20 ref]

• ***Summary:*** Contents: Abstract. Introduction. Quality requirements and evaluation. Taste related substances during pre- and postharvest periods. Genetic and physiological research on quality improvement.

Sensory evaluation of stored vegetable soybean showed that the taste of the seeds is determined by sucrose, glutamic acid and alanine. Vegetable soybean is rich in protein, and vitamins A, C, and E. Eating boiled vegetable soybeans as Edamame has a 400-year history in Japan. Edamame is very popular served with beer in restaurants or at home during the summer. Vegetable soybean is processed as "Zunda-mochi," by pounding the seeds to a paste. Zunda-mochi is famous in the northeast prefectures of Japan (*Tohoku Chiho*) but production is limited. Most immature vegetable soybean is consumed in Japan as edamame. Undesirable sensory properties are found in isoflavin [isoflavones] which has an objectionable, bitter, astringent, and weak phenol-like taste; daidzin and genistin, which have a bitter, astringent taste; and saponins, which have a bitter, astringent taste. All these are glycosides. Oligosaccharides have generally been considered undesirable in that they cause flatulence; recently, however, these have been reported to support the growth of bifidobacteria, and to play an important role in health.

Table 1 shows correlations between sensory panel scores (with 8 panelists) and four chemical components of soybeans. The strongest positive correlation is for sucrose content (0.88 overall), followed by glutamic acid (0.82), alanine (0.65), and glucose (0.59).

The volatile flavors (volatiles–as measured by GLC =

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gas liquid chromatography) of boiled vegetable soybeans are highly correlated with quality. "Characteristic, flower-like flavor components of boiled vegetable soybeans are *cis*-jasmone, (Z)-3-hexenyl-acetate, linalool and acetophenone." Address: National Agriculture Research Inst., Ministry of Agriculture, Forestry and Fisheries (MAFF), 2-1-2 Kannondai, Tsukuba 305, Japan.

9715. Nakano, Hiroshi. 1991. Vegetable soybean area, production, demand, supply, domestic and foreign trade in Japan. In: S. Shanmugasundaram, ed. 1991. Vegetable Soybean: Research Needs for Production and Quality Improvement. Taipei, Taiwan: Asian Vegetable Research and Development Center (AVRDC). 151 p. See p. 8-16. Proceedings of a workshop held at Kenting, Taiwan 29 April–2 May 1991. [1 ref]
• ***Summary:*** Contents: Abstract. Demand and production [in Japan]. Regional differences in production and consumption. Seasonal changes in production and demand. Price of vegetable soybean. Distribution of imported vegetable soybeans. Cost and earnings in the production of vegetable soybean. Conclusions. Address: Okinawa Branch, Tropical Agricultural Research Center, Ishigaki, Okinawa 907-01, Japan.

9716. Shanmugasundaram, S.; Cheng, Shi-Tzao; Huang, Ming-Te; Yan, Miao-Rong. 1991. Varietal improvement of vegetable soybean in Taiwan. In: S. Shanmugasundaram, ed. 1991. Vegetable Soybean: Research Needs for Production and Quality Improvement. Taipei, Taiwan: Asian Vegetable Research and Development Center (AVRDC). 151 p. See p. 30-42. Proceedings of a workshop held at Kenting, Taiwan 29 April–2 May 1991. [11 ref]
• ***Summary:*** Contents: Abstract. Introduction. Research up to 1980. Research since 1981. Screening large-seeded germplasm. Breeding strategy. Breeding methods. Vegetable soybean plant type. Research at Kaohsiung DAIS. Future directions.

Varietal improvement of vegetable soybeans in Taiwan began in the early 1950s; the crop was consumed in Taiwan in the form of shelled green beans. From 1950 to 1980, vegetable soybeans were grown primarily in the Pingtung-Kaohsiung area in southern Taiwan during the fall season, and to a lesser extent in the spring and summer. Starting in the early 1970s, a lucrative market for frozen vegetable soybeans emerged in Japan. Varieties introduced from Japan that produced well in southern Taiwan were Tzurunoko (Tsurunoko, known as "205" by farmers), and Ryokkoh (known as "305"). From 1976 to 1980 AVRDC did research on soybeans with large seed size to select those with potential as vegetable soybeans for the Japanese market. Tables 1 and 2 show the results. Vegetable soybeans should have large seeds. Before 1980, a good cultivar was such that 100 seeds weighed 25 gm or more. Today the goal is for 100 seeds to weigh 30 gm or more; a 500 gm frozen pod packet should contain 175 pods or less. Address: 1&4. AVRDC, P.O. Box 42, Shanhua, Tainan 74199, Taiwan; 2-3. Kaohsiung District Agricultural Improvement Station, Min-Sen Road, Pingtung, Taiwan.

9717. Shimoyamada, Makoto; Harada, K.; Okubo, K. 1991. Saponin composition in developing soybean seed (*Glycine max* (L.) Merrill, cv. Mikuriyaao). *Agricultural and Biological Chemistry* 55(5):1403-05. May. [13 ref]
• ***Summary:*** The soybean cultivar named Mikuriyaao in Japan has an unusual saponin composition. It lacks both the Aa and Ab saponins, and instead contains Af (acetyl-soyasaponin A-2) and Ac instead. Address: 1&3. Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., 1-1 Amamiyamachi Tsutsumidori, Aoba-ku, Sendai 981; 2. National Inst. of Agrobiological Resources, 2-1-2 Kannondai, Tsukuba 305. All: Japan.

9718. Takahashi, Nobuo. 1991. Vegetable soybean varietal improvement in Japan–Past, present and future. In: S. Shanmugasundaram, ed. 1991. Vegetable Soybean: Research Needs for Production and Quality Improvement. Taipei, Taiwan: Asian Vegetable Research and Development Center (AVRDC). 151 p. See p. 26-29. Proceedings of a workshop held at Kenting, Taiwan 29 April–2 May 1991.
• ***Summary:*** Contents: Abstract. Introduction. Breeding system. Breeding objectives. Genetic resources. Future prospects.

Vegetable soybeans grown in Japan are consumed late in the summer, mainly in July and August, and therefore very early or early varieties are used. They are ready to harvest about 90 days after the seeds are planted. Those consumed in the winter are imported from Taiwan, Thailand, or New Zealand. The breeding goal is a high yield of 9-10 tonnes/ha. In olden times vegetable soybeans were used as an offering at festivals during O-bon (August 16) and Tsukimi (Sept. 9).

Table 1 titled "Main vegetable soybean varieties" (p. 27) contains the following columns: Variety, breeding system (local variety, pedigree, cross, mutation–radiation), maturity (early to late), pod size, pubescence color, seed coat color, notes (incl. place or name of developer, incl. private seed co.). The following varieties are listed: Datcha, Krosai-chamame, Hiradoko, Tanbaguro, Okuhara 1 gou, Wase Midori, Tokyo Wase, Saporo Midori, Yukimusume, Mosono Green, Kita no Siki [Shiki], Green-75, Echigo Musume, Hatu [Hatsu] Musume, Iwa-mame-kei 1, Experiment Station, Iwa-mame-kei 4. Address: Nagano Chushin Agric. Exp. Station, Nagano, Japan.

9719. Wolff, David. 1991. To the Harbin Station: City building in Russian Manchuria, 1898-1914. PhD thesis, University of California at Berkeley, History Dept. 306 p.
• ***Summary:*** This dissertation is about the early history of

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Harbin, a Russian colony in the heart of Northeast China. Its early population growth, brought about by Russian social and demographic micromanagement, was caused by the needs of competitive colonization against the Chinese. In 1896 Harbin was only a village. It began to grow rapidly with completion in 1898 of the Russian railway connecting it to Port Arthur. It was the Russian administrative headquarters from 1898 to 1905. After Russia's defeat in the Russo-Japanese War (Feb. 1904–1905) Harbin's fortunes began to fall. The Chinese Eastern Railway (CER) almost went bankrupt, the Russians and Southern Manchurians returned home, and the population fell precipitously to around 25,000. Harbin was officially opened to foreign residents on 7 January 1907. Its opening as a treaty port in 1907 aided international trade. "Fortunately, by 1908 the revival of the grain trade under a consortium organized by the Russo-Chinese Bank, together with the debut of soybean exports from Northern Manchuria pulled Harbin out of the doldrums. The economic upswing caused by the explosive growth of soybean exports put an end to hard times for Harbin.

Roman Moiseevich Kabalkin, a Russian Jewish businessman, pioneered the soybean export trade. He was the first person to conceive of the idea of exporting soybeans from Manchuria to Europe–before the Japanese. "Kabalkin, who had already made his name and fortune in European Russia, as a grain trader with no fear of novel methods, served for 14 years as a consultant to the Riazan-Ural'sk Railway. By force of association, this led to an invitation from the newly-appointed chief of the CER Commercial Department, K.P. Lazarev, to help develop freight traffic between Siberia and Manchuria. To this end, Kabalkin founded 'R.M. Kabalkin and Son, Inc.'

"His relationship with the CER and his experience in Siberian trade probably served Kabalkin well during the wartime profiteering. Afterwards, his knowledge of world grain markets made him an early advocate of the soybean. Legend describes Kabalkin wandering in the Harbin Marketplace, pointing out the heaps of beans to his son and calling them the 'gold of Manchuria.' Although Kabalkin had sought Petersburg's permission as early as 1907, European export by his new company 'Natanson and Co.' did not start from Vladivostok until January 1909. Mitsui Bussan's first shipment left Dairen in November 1908. However, Kabalkin's eventual inability to compete with the Japanese resulted less from the head start than from lack of credits from the Russo-Chinese Bank and CER. Both companies, the only major sources of Russian capital in the Far East, were already committed to the grain mills as the keynote of Harbin's industrial future. This would prove to be a fatal miscalculation for Russian trade prospects in Manchuria." (p. 188-90).

This information on soybeans is in Chapter 3–Demography (see the section on Jews), and Chapter 4 about the Russian War Laboratory–the Commercial Bureau of the Chinese Eastern Railway.

9720. Benjamin, Hania; Storkson, J.; Nagahara, A.; Pariza, M.W. 1991. Inhibition of benzo (*a*)pyrene-induced mouse forestomach neoplasia by dietary soy sauce. *Cancer Research* 51(11):2940-42. June 1. [12 ref]
• ***Summary:*** Japanese-style fermented soy sauce (shoyu) was shown to have anticarcinogenic activity in mice fed diets designed to induce cancer. Cancer inhibition was found to be greatest in the mice receiving the most shoyu. Shoyu was also found to contain antioxidant activity which may be related to the observed anticarcinogenic effect. Address: Dep. of Food Microbiology and Toxicology, Univ. of Wisconsin, Madison, WI 53706.

9721. Ohlund, Tim. 1991. Re: Early work with miso and koji in Sweden. Letter to William Shurtleff at Soyfoods Center, June 5–in reply to inquiry. 2 p. Handwritten.
• ***Summary:*** Tim did the pioneering work with miso and koji in Scandinavia. The following dates were carefully extracted from his records in response to a number of questions asked by William Shurtleff.

1973 summer (July)–I was in Japan to study miso and tofu making, etc.

1982 Feb.–I first sold miso in Sweden. That first year I sold about 35 kg of rice miso and barley miso to friends.

1983 Sept.–I first produced an organic miso (from all organically grown ingredients), using oat koji and yellow peas.

1984 April–I started using the name Malvabo (address: 19063 Örsundsbro, Sweden) and first sold miso to a retail food store. The first varieties of miso I made were rice miso, barley miso, and oat miso. I also experimented with using peas instead of soybeans because peas are easier to grow in Sweden.

1985 Sept.–I first sold the organic miso developed in late 1983. Address: Timoteus Kojiprodukter HB, Härvstagård, 19 063 Örsundsbro, Sweden. Phone: 0171-65106.

9722. Raloff, J. 1991. A soy sauce surprise. *Science News* 139(23):357. June 8. [1 ref]
• ***Summary:*** Japanese have an eight-fold higher risk of stomach cancer than Americans. Some Japanese scientists suspect that the difference may be caused by soy sauce, which contains precursors of chemicals that cause mutations in bacteria. But a U.S. research team (Michael W. Pariza and co-workers at the University of Wisconsin–Madison) have observed just the opposite, that Japanese-style fermented soy sauce "exhibited a profound anticarcinogenic effect." They discovered that soy sauce contains compounds with substantial antioxidant activity; many antioxidants are known to inhibit the development of cancer. Their results appeared in the June 1 issue of *Cancer Research.*

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9723. Brummer, Alex. ed. 1991. Notebook: Glow germs. *Guardian* (*England*). June 21. p. 15.
• ***Summary:*** Kikkoman, the Japanese soy sauce maker, "has developed a process that will cause germs in food, in anything from lager to the best sirloin, to glow like fireflies in the night." That could be a problem for restaurants!

9724. *Toyo Shinpo* (*Soyfoods News*). 1991. Kyô-tôfu Amerika e: NHK ga Kyoto Tanpaku o rupo [Kyoto tofu goes to America: NHK television reports on Kyoto Tanpaku]. June 21. p. 3. [Jap]
• ***Summary:*** On 12 June 1991 at 6:00 A.M. NHK television in Japan aired a story about Kyoto Tanpaku, a major Kyoto tofu manufacturer, on their "Morning Wide–Kinki Edition." The company is making fruity tofu, selling hamburger in agé pouches, etc. A photo shows president Yasuo Hachijin. In Japan, the company is located at Kyoto city, Fushimi-ku, Yoko-oji, Senryo Matsu-cho 200. Phone: 075-622-3161. Address: Kyoto, Japan.

9725. Rossant, Colette. 1991. Food: The sound of soba. No chewing please. The correct way to eat soba is to 'froosh,' or slurp, the noodles up with a sustained intake of breath. *New York Times*. June 23. p. SM39-SM40.
• ***Summary:*** Colette first tasted "soba, a nutty-tasting buckwheat noodle, in Tokyo." It was freshly made, and served hot or cold. There was cold soba "in baskets with a dipping sauce [made with soy sauce], soba topped with natto (fermented soy beans) and sprinkled with sesame seeds..."

There is now a soba restaurant in New York City named Honmura An. Contains four soba recipes plus recipes for dashi (basic stock) and tempura. All of the soba recipes call for soy sauce, as does the tempura dipping sauce.

9726. Hara, Toshio; Nagatomo, Shinichiro; Ogata, S.; Ueda, S. 1991. Molecular structure of the replication origin of a *Bacillus subtilis* (*natto*) plasmid, pUH1. *Applied and Environmental Microbiology* 57(6):1838-41. June. [21 ref]
• ***Summary:*** "The structure of a 2.0-kb [kilobase molecular weight] *Bst*EII DNA sequence necessary and sufficient for the replication of a 5.7-kb Natto plasmid, pUH1," has been characterized. This plasmid is responsible for gamma-polyglutamate production by *Bacillus subtilis* (*natto*).

Figures show: (1) Derivation of plasmids used in the present study; each is circular. 2. Structure and replication activity of the modified fragments of the 2.0-kb *ori* fragment. (3) The nucleotide sequence of the 2.0-kb *Bst*EII fragment (this figure fills an entire page). (4) Comparison of the amino acid sequences of *rep* of pUH1, *rep* of pFTB14, *repB* of pIB110, and protein A of pC194. Address: Microbial Genetics Div., Inst. of Genetic Resources, Faculty of Agriculture, Kyushu Univ., Hakozaki, Fukuoka 812, Japan.

9727. Thornbury, Barbara E. 1991. One-pot cooking, the Japanese way. *New York Times*. July 14. p. XX6, XX31.
• ***Summary:*** An excellent in-depth article about *nabemono,* including the many different regional varieties. Chanko-nabe is a favorite of sumo wrestlers in Kyoto and elsewhere. Ishikari-nabe is a specialty of Hokkaido, Japan's northernmost main island; ingredients include tofu and fresh salmon.

Dote-nabe (oyster nabe) is associated with the port city of Hiroshima; ingredients include "grilled bean curd" and an inch-wide ring of miso spread around the inside lip of the pot like a moat.

Hakata, on the island of Kyushu, is known for its mizutake (sometimes called mizu-daki); ingredients include tofu. Other popular types of nabemono are yose-nabe, sukiyaki, shabu-shabu, and chiri-nabe.

9728. *Toyo Shinpo* (*Soyfoods News*). 1991. Nattô no chihô betsu shijô mapu (Heisei 2 nendo): Tsuini 1,000 okuen no ôdai toppa, shôhi no hanbun was kantô ga shimeru [Map of natto's market share by region in 1990: Finally broke 100,000,000,000 yen goal, one half of the consumption was in Kantô (Tokyo-Yokohama) area]. July 21. [Jap]
• ***Summary:*** A stylized map of Japan, from north to south, contains the following information for natto sales by region (listed from north to south):

Hokkaido 7,237 million yen.
Tohoku region 11,222 million yen.
Hokuriku 4,372 million yen.
Kanto region 51,557 million yen.
Tokai region 7,210 million yen.
Kinki region 9,297 million yen.
Chugoku region 2,966 million yen.
Shikoku island 1,275 million yen.
Kyushu island 8,355 million yen.
Okinawa island 396 million yen.
Japan national total 102,745 million yen.

The three largest regions for natto sales (in descending order of sales amount) are:

(1) Kanto region 51,557 million yen.
(2) Tohoku region 11,222 million yen.
(3) Kinki region 9,297 million yen.

Note: The Kantô region of Japan is a is a geographical area of Honshu, the largest island of Japan. The region includes the Greater Tokyo Area and encompasses seven prefectures: Gunma, Tochigi, Ibaraki, Saitama, Tokyo, Chiba, and Kanagawa. Within its boundaries, slightly more than 40 percent of the land area is the Kanto Plain. The name Kanto literally means "East of the Barrier." The name Kanto is nowadays generally considered to mean the region east of the Hakone checkpoint. The official population on 1 Oct. 2010 was 42.6 million.

North of the Kantô region lies the Tôhoku region (northeast prefectures), which is widely considered to be the birthplace of natto. The region, which has a harsh climate

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during the cold half of the year, consists of six prefectures (ken): Akita, Aomori, Fukushima, Iwate, Miyagi and Yamagata (Source: Wikipedia, at Kanto region and Tohoku region, retrieved 21 Dec. 2011).

9729. Kawashima, Masao. 1991. Tôfu, aburage no fuhai henpai no bôshi [Prevention of decomposition / putrefaction and spoilage in tofu and deep-fried tofu pouches]. *Dairii Foodo* (*Daily Foods Science*). p. 40-45. Special summer edition on Soybeans and Technology. [Jap]
Address: Habutae Tofu K.K., Shokuhin Kenkyû-shitsu, Torishimari-yaku–Shitsu-cho, Kanazawa-shi, Ishikawa-ken 921, Japan.

9730. Pringle, W. 1991. Soya protein, past experience & future potential. In: F. Meuser and P. Suckow, eds. 1991. Soja in Lebensmitteln: Vortraege 2. Hamburger Soja-Tagung. Berlin: Technische Universitaet Berlin, Institut fuer Lebensmitteltechnologie und Gaerungstechnologie–Getreidetechnologie. 171 p. See p. 153-59. [4 ref]
• ***Summary:*** Contents: Introduction. Potential uses of soya bean. Past product launches. Soya product as a foodstuff.

A certain Mr. Robert Whymper was probably the first person to show Europeans how the functional character of soya proteins could be exploited. He returned to England in 1923 after a trip to Japan with a suitcase full of soya beans and a head full of ideas. He carried out a series of experiments using soya flour as an ingredient of the dough in the breadmaking process. This work culminated in the granting of a British Patent in 1926. The patent described conditions of unusually vigorous dough mixing which allowed for the maximum inclusion of air. Very substantial improvements in the colour of the bread crumb and the volume and quality of the bread were observed. We now know that this bleaching and improving effect is a direct result of a coupled oxidation reaction involving the lipoxygenase enzyme present in the soya flour. The breadmaking industry of Europe now uses thousands of tonnes of enzyme-active soya flour every year as a bread improver.

"The work of Whymper and his associates continued and in the early 1930's a heat processed full fat soya flour appeared on the market."

Henry Ford, a man of vision, initiated the next phase in the development of soya proteins for human food. In the early 1950's [sic, mid-1930s] he put together a team to work on the isolation of pure protein from soya and the subsequent spinning of this protein into a stable fibre." After his scientific team was disbanded, the expertise was not lost, for the scientists found places in food companies and began to look at the use of isolated soya proteins in the food industry. It is now well established that isolated soya proteins have functional uses for binding and emulsification, and for improving nutritional value. "More controversial and newsworthy was the attempt by the old Ford researchers to produce textured protein products to simulate meat and other traditional protein foods. They did this by two processes: (1) The spinning of isolate into fibres, using technology from the textile industry; (2) The extrusion of soya bean meal under conditions of high temperature and pressure... Branded food products based on these textured soya proteins were launched on the market in the late 1960s and all during the decade 1970-1980."

During the early 1970s the future looked a little bleak due to the world population explosion, the world energy crisis (precipitated by OPEC), and the world food crisis (which was more specifically a protein crisis). The first World Soy Protein Conference, held in Munich in 1973 with over 1,000 delegates, was a very important affair. "The U.S. Secretary of Agriculture, Mr. Earl L. Butz, opened the conference. Senator Hubert Humphrey made a memorable inspirational address... I was there and I can tell you we all thought we could make a big impact on the world's on the world's problems by supplying textured soya protein."

Against this background, many such products were launched in the U.K. in the mid-1970s by major food companies. All but Kesp were based on textured soya flour: 1975 Feb.–Mince Savour by Nestle; 1975 May–Country Meadow by Brooke Bond Oxo; 1976 Jan.–Soya Choice by Cadbury; 1976 April–Economince by Spillers; 1976 Sept.–Kesp by Courtaulds (made from spun soy protein fiber).

"All of the products enjoyed real success for a period of time. In particular Cadbury's Soya Choice sold well for about three years in every area of the U.K. Sad to relate, however, all of them quietly and gradually lost sales and finally disappeared from the market. It is important to know why... People did not want a substitute food; this was a challenge to their security, a threat to the comfortable familiar world." The consumers of today have become more "green." "It is clear to me, the emotional conditioning that sees security in the consumption of traditional animal foods is being replaced by the more logical attitudes of a new generation. The young people of today want to find ways to preserve the environment and they have an increased perception of health problems that may be caused by the consumption of animal products, especially animal fat. These and other factors are making vegetarianism more attractive.

"A recent Gallup poll has shown, in the U.K., that 3% of the total population are vegetarians. A total of 8.5% are either totally vegetarian or avoid red meat, and 9.3% of children are vegetarian. Vegetarianism has moved from being a refuge of cranks to being fashionable."

A new product popular among yuppies is Quorn, a textured fungal protein, marketed by ICI and RHM via Sainsburys and other selected suppliers. Address: The British Arkady Co. Ltd., Manchester, England.

9731. Shurtleff, William; Aoyagi, Akiko. comps. 1991.

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Bibliography of soy sprouts: 655 references from 3rd century A.D. to 1991, extensively annotated. Lafayette, California: Soyfoods Center. 185 p. Subject/geographical index. Author/company index. Language index. Printed July 12. 28 cm. [655 ref]

• ***Summary:*** This is the most comprehensive bibliography ever published on soy sprouts. It is also the single most current and useful source of information on this subject available today, since 71% of all references (and most of the current ones) contain a summary/abstract averaging 172 words in length.

This is one of more than 40 bibliographies on soybeans and soyfoods being compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyfoods Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features: 27 different document types, both published and unpublished, every known foreign language publication on the subject, extensive translations of many Japanese and European works, and many original interviews Thus it is a powerful tool for understanding the development of this subject and related products from its earliest beginnings to the present, worldwide.

Compiled one record at a time over a period of 17 years, each reference in this bibliography features (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English publications together with an English translation, month and issue of publication, and the first author's first name (if given).

It also includes details on 40 commercial soy sprout products, including the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as references to and summaries of advertisements, articles, patents, etc.) are also given.

Details on how to use the bibliography, a complete subject and geographical index, an author/company index, a language index, and a bibliometric analysis of the composition of the book (by decade, document type, language, leading periodicals or patents, leading countries, states, and related subjects, plus a histogram by year) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 510-283-2991.

9732. *Toyo Shinpo* (*Soyfoods News*). 1991. Nattô shôka dangi [Talk about natto in the hot days of summer]. Aug. 1. p. 6. [Jap]

• ***Summary:*** An illustration shows a traditional natto seller, carrying his wares suspended from both ends of a pole balanced on his right shoulder.

9733. *Toyo Shinpo* (*Soyfoods News*). 1991. Kenkô shokuhin to shite no nattô: Nattô no "tare" no genjô [Natto as a health food: The present status of natto's *tare* sauce]. Aug. 1. p. 6. [Jap]

• ***Summary:*** In Japanese, the word *tare* refers to seasoning sauce based on soy sauce.

9734. Egerstrom, Lee. 1991. Bean trade to Japan ripens: When Minnesota Edamame was launched in 1987, not many people knew about one of Japan's favorite food snacks, young soybeans. But this fall the Jackson, Minnesota, company will ship 1 million pounds of the beans to Japan. *St. Paul Pioneer Press* (*Minnesota*). Aug. 5. p. 10-D. Business section.

• ***Summary:*** James Lambert of Minnesota Edamame in Jackson, Minnesota, is growing immature soybeans or green soybeans [green vegetable soybeans] and exporting them to Japan. The Nishimoto Trading Co. of Tokyo liked the taste and look of southern Minnesota soybeans so much that they decided last week to place more than $100,000 worth of their bagging and packaging equipment in the Minnesota Edamame plant. "In September the 4-year-old Minnesota Edamame Co. will start using Nishimoto's equipment to ship 1 million pounds of partially processed immature soybeans to Japan. That's a big jump from the 7,000 pounds shipped in 1988. "Minnesota Edamame has contracts to supply Nishimoto with 3 million pounds of the soybeans from the 1992 Minnesota crop, 6 million pounds in 1993 and 15 million pounds by 1996." Total company sales next year, primarily from the 3 million lb sent to Japan, are expected to reach $1.8 million. The business began in

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1987 when Minneapolis restaurateur Reiko Weston called James Lambert, who owns Jameson-Williams Co., a grain elevator at Huntley, Minnesota, and a farm management company that does business in the Jackson and Fairmont area. "Weston, founder and operator of the Fuji-Ya restaurant in Minneapolis, wanted Lambert to find a small farm for her to buy so she could grow her own soybeans. She served edamame at Fuji-Ya and other Japanese restaurant properties she owned, and it irritated her to import the soybeans into prime soybean-growing country.

"Weston didn't buy a farm, but she joined with Lambert to experiment with growing and processing edamame in Minnesota. She died in 1988, just as the first crop of soybeans was being planted. 'But she had me hooked by then,' recalls Lambert. The first 7,000 pounds were processed and shipped as samples to Japan. In response, Jameson-Williams received orders for 3.5 million pounds for 1989."

"Meanwhile, Lambert teamed up with a few outside investors and risk-taking employees to build the edamame business. They linked up with Nishimoto, received help from edamame researchers at Washington State, Iowa State and the University of Illinois, and secured technical help and a $100,000 loan from Minnesota's Agricultural Utilization and Research Institute [AURI]. Lambert–who remains the principal shareholder–plowed additional investment, including a farm, into the company.

"Bob Luedtke, the project manager, and Dave Hanson, plant manager, retooled a vegetable harvester to combine the green soybeans. As they worked with the processing equipment for the edamame, they accidentally discovered a way to shell unripened soybeans without bruising the delicate beans. Shelled soybeans, called 'mukimame' in Japan and processed slightly differently than edamame, are popular throughout the Pacific countries mixed in salads and other dishes."

"One reason Minnesota Edamame's potential looks good is the jerry-rigged equipment Luedtke and Hanson came up with. Taiwan, which dominates the edible soybean product markets in the Pacific Rim countries, uses field workers to pick the edamame and mukimame beans by hand."

"Meanwhile, contracts the company has signed with seven southern Minnesota soybean farmers will generate a premium of about $40 an acre more than nearby soybean markets. Six other farmers are on a waiting list to grow beans as production increases in each of the next four years. About $30 of the growers' premium comes in cost savings. Minnesota Edamame will harvest the beans for the farmers, saving them that expense, and the company also supplies the special soybean seeds."

Lambert's company, Minnesota Edamame, is at Route 3, Box 3, Fairmont, Minnesota 56031. Phone: 507-238-1675. A large photo shows a close-up of Jim Lambert kneeling on one knee in a field of soybeans.

Note: This is the earliest article seen in the America's Newspapers database with the word "edamame" in the headline / title. A surprising 89 articles in this database now (as of 15 June 2009) contain the word "edamame." Address: Staff writer.

9735. Tara, Bill. 1991. Pioneering macrobiotics and soyfoods in London (Interview). *SoyaScan Notes.* Aug. 18. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Starting in the late 1960s, the pioneering work with soyfoods in London was done by Craig and Greg Sams. They and their parents were Americans, and they had gone to college in America. Their father was employed by the U.S. armed forces as an historian; they spent a lot of their time growing up between America and England. Greg fell out of a tree while going to college in Berkeley in the late 1960s and was paralyzed from the waist down, so he was confined to a wheelchair, but was still very active and innovative. In the late 1960s they set up a macrobiotic natural foods cafe / restaurant on Portobello Road in London, then changed it into Ceres Grain Shop, a natural foods retail store. As volume increased, they began to distribute their products out of the back of their shop, and in about 1971 founded Harmony Foods Ltd. as a distribution company located in a warehouse on Ladbroke [sic, Latimer] Road. The model and evolution was similar to that of Erewhon in Boston. Harmony Foods was the first natural foods distributor in England, and probably the second in Europe after Lima Foods of Belgium. Soon they were importing macrobiotic foods from Japan, and distributing organically grown grains from England and from The Camargue (a marshy island in the delta of the Rhone River in the south of France), etc.

Among their early Japanese imports were bulk miso and "tamari" (actually shoyu), imported from Muso in wooden kegs. They repackaged the miso and shoyu in glass bottles under the Harmony Foods label in London. This was the first Japanese miso and shoyu sold in England. In about 1972, as soon as Erewhon started having miso and shoyu packed in Japan, the Sams had the same thing done with theirs, then they applied their own labels in London. But they continued to import in bulk as well. A Chinese company in London made tofu and [mung] bean sprouts, then sold the tofu to the Sams brothers; they sold it unpackaged in open trays in water. At that time, tofu was not emphasized much in macrobiotic circles so not much was sold; it was considered too yin. The Sams also sold deep-fried Rissoles filled with TVP instead of meat; as early as 1970 the Rissoles were being made by an Israeli guy (name?) who owned a shop (name?) by the Hempstead Heath. Marigold Foods also used TVP in the mid-1970s.

In 1970 Bill Tara, then a vice president at Erewhon in Boston, passed through London on his way to India. One purpose of his trip was to scout out the possibility of Erewhon setting up a distribution point or center in England. Paul Hawken was president of Erewhon at the time, and

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Erewhon was importing miso and tamari from both Muso and Mitoku in Japan. Bill and Paul had been roommates in a warehouse in San Francisco, then they took over the Erewhon food store from Evan Root, Paul starting 2-3 months before Bill. In London, the Sams brothers were just opening a new natural foods restaurant in the Notting Hill area so Bill and Paul Petrofsky spent 2 weeks fixing it up. Paul later started Baldwin Hill Bakery with Hy Lerner. Bill stayed in London 2-3 months during this first visit.

In about 1972 Bill returned to London with Russel Demerais, on the Erewhon payroll, again to start an Erewhon distribution center. But Erewhon went through a cash crisis and Harmony foods had grown dramatically. So Bill and Peter Bradford (an Englishman who had come to American in about 1970 and worked for Erewhon doing organic agriculture at Erewhon Farms near Keene, New Hampshire) began to work for the Sams brothers both at Ceres Grain Shop (the retail store) and Harmony Foods (in the warehouse). Bradford, who now has a very successful natural food store in England named Clearwater Natural Grocer, has been one of the most important promoters of soyfoods in the UK. At this time, Craig Sams set up a bakery. By now, miso and tamari sales had increased; Harmony was still affixing its own label to unlabeled packs.

In 1974 Bill and Peter established Sunwheel as a natural food/macrobiotic distributor. They picked up exotic Japanese imports that Harmony found unprofitable and wanted to drop–so there was little or no competitive feeling with the Sams. By late 1974 Sunwheel Hatcho Miso, Mugi Miso, and Tamari were on the market, imported from Muso (Yuko Okada) in Japan. Sunwheel also made granola and peanut butter. Sunwheel never sold any other soyfood products; they had very limited warehouse space and no refrigeration.

Note: On 17 Aug. 1975 Renée Tara wrote William Shurtleff in California. She was living at 30 B Market St., Bradford-on-Avon, Wilts., England. She is writing a European Macrobiotic Cookbook. She requests information on miso and invites Shurtleff to visit.

In about 1977 Sunwheel acquired a retail store that had been started in and by the Community Health Foundation. By 1979 Sunwheel was very successful, but it needed to be recapitalized or sold. So the partners decided to sell it to a larger health food company; Peter kept the retail store.

In Nov. 1975 Bill established the Self Health Center which by 1976 grew into the Community Health Foundation (CHF). By 1976 CHF was offering classes in soyfoods. Paul Jones was the key man with tofu; he taught classes and started making tofu out of his home in the Highgate area. Paul Jones was definitely the first Caucasian to pioneer tofu in England. Simon Bailey, a baker who was originally with one of the first natural foods stores in England, located in Bath, taught about tempeh. These people were experimenting in the kitchen with soyfoods and taught in a sort of an apprenticeship program. Jon Sandifer, who is still with CHF, learned tempeh from Simon Bailey. CHF sold some tofu and tempeh through its own sit-down restaurant named The Seven Sheaves, then renamed The Natural Snack and changed to a cafeteria. A few people did experiments with miso but it never got to a commercial scale in part because of persistent rumors that Lima Foods was going to start making it.

By the late 1970s soyfoods were growing in popularity in the UK. Two separate groups promoted them; the vegetarians and animal rights people (who liked TVP), and the natural foods and macrobiotic people. Marigold Foods also used TVP in the mid-1970s.

Much of important pioneering commercial work with soyfoods in Europe was done by macrobiotic groups in the Netherlands and Belgium. Bill often went there to teach in 1974-79. Tofu, and later tempeh, were emphasized by groups such as Manna in Amsterdam and De Brandnetel in Antwerp. Macrobiotics was much more active in the Lowlands than in England.

The Sams brothers later started Whole Earth as a marketing company for their jams. They sold it fairly soon. Greg Sams (disabled) is no longer in the food business; he runs The Chaos Shop in London which sells photographic reproductions of computer-generated chaos patterns. Craig started Realeat Co. and now may be with the Haldane Foods Group. Address: Director, Nova Inst., P.O. Box 4648, Estes Park, Colorado 80517. Phone: 303-586-6265.

9736. Stackler, Ben. 1991. Macrobiotics and soyfoods in the Soviet Union (Interview). *SoyaScan Notes.* Aug. 21. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The macrobiotic movement in the West has recently been very active in Eastern Block countries. The leaders there are mostly medical doctors. They are treating Chernobyl radiation patients using macrobiotics. Two areas of greatest activity in the USSR are Leningrad (now named St. Petersburg), and a city in the Ural Mountains (east of Moscow) named Chelyabinsk (also spelled Cheliabinsk; a subdivision of the Russian S.F.S.R.). The St. Petersburg doctors have many ambitious plans. They want to manufacture miso and tempeh on a commercial in cooperative with a brewery in St. Petersburg. A year ago there was a macrobiotic conference in Yugoslavia; 500 people from all over Europe attended and Michio Kushi was the featured speaker. In October 1990 Ben went to Moscow and St. Petersburg with 6 macrobiotic people. He had hundreds of pounds of donated miso sent by airlift to the USSR. The *One Peaceful World* newsletter, published by the Kushi Institute in Massachusetts, did a story on his October trip; it includes the names and addresses of the interested people. He will be making a second trip to the USSR within one week, revisiting people he met before.

Note: The MacNeil/Lehrer Newshour reported on 14 Feb. 1992 that a top-secret Soviet nuclear weapons complex

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is located near the city of Chelyabinsk. It is one of ten which together produced all of the former Soviet Union's nuclear weapons. Address: 1400 Shattuck Ave. #7-2, Berkeley, California 94709. Phone: 415-527-9389.

9737. Sams, Craig. 1991. Pioneering macrobiotics and soyfoods in England, 1967-1979 (Interview). *SoyaScan Notes*. Aug. 24. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Craig and Greg Sams were both born in America. Their mother is from Nebraska and their father from Pittsburgh, Pennsylvania. Greg is 4 years younger than Craig. During the 1950s and 1960s the family went to England periodically, largely because Craig's father worked in England as a historian for the U.S. Air Force. In 1965 Craig took a year off from college, traveled around the Indian subcontinent, and got hepatitis. Upon returning to the Univ. of Pennsylvania in Philadelphia for his final year, he fell in with 3 followers of macrobiotics and got interested in macrobiotics. In about Feb. or March of 1966 he went to the Paradox, a macrobiotic restaurant in New York and decided that he wanted to start a similar restaurant in London. In late 1966 Craig's brother, Greg, fell out of a tree in Berkeley, was paralyzed from the waist down and was confined to a wheel chair–as he still is.

In Feb. 1967 Craig started a restaurant named the Macro at 10-A Airlie Gardens, Holland Park, London. Yoko Ono, John Lennon's wife, was one of the first regulars. She was the first person Craig met in London who was aware of macrobiotics; she had learned about it in Japan. But Craig had to close Macro after 2 months because of zoning problems. In mid-1967 Greg joined Craig in London and in Dec. 1967 they opened a new macrobiotic / natural foods restaurant named Seed at 136a Westbourne Terrace, W.2, London–a few minutes walk from Paddington Station. Soyfoods were a part of the menu. They got Kikkoman shoyu, shiro-miso, and Hatcho miso from a Japanese import company named Mikado-ya, which was run by Japanese in southeast London out of the basement of a house and supplied Japanese embassies in Europe and Africa. At that time Craig thinks there were no Japanese restaurants or retail stores in London. Seed soon started to import Hatcho and barley (mugi) miso from Muso in Japan. Seed never used any of Lima's soyfood products. Seed also used fermented tofu; they mixed it with tahini, spread it on bread, and called it a Rarebit–an alternative Welsh Rarebit, which is cheese on toast. Seed purchased fresh tofu and [mung] bean sprouts from a Chinese company named Lung Kee on Fermoy Road, Paddington, London, right on the banks of the canal. It was run by one Chinese man who employed about 15 West Indian / Jamaican women who made the foods. Bean sprouts accounted for most of Lung Kee's business. Craig has no idea when Lung Kee started making tofu. In addition to its mainstay, brown rice, Seed served the tofu diced in miso soups, or sauteed with vegetables such as nitsuke carrots, etc., or as a dessert with tofu and apple concentrate whipped with fruit to a thick creamy consistency and chilled. The restaurant did well. It was soon famous for its "groovy vibes" and its free meal of brown rice, veggies, and green tea for those who could not afford to pay. Although the Sams brothers were not "proponents of the brown rice and marijuana regimen" (as Kotzsch had implied in 1985, p. 221), Seed was a favorite hangout for a host of '60s counterculture celebrities such as The Beatles, The Rolling Stones, Yoko Ono, and others. Americans such as Bill Tara, Peggy Taylor, Eric Utne, and Paul Petrofsky also worked there. Then people began to ask the Sams if they could buy staple foods from the restaurant. So food was soon packaged and sold over the restaurant counter.

In about March 1969, to meet the growing consumer demand, the Sams brothers opened Ceres, a natural foods / macrobiotic retail store, at 8-A All Saints Road, 2 bocks from and parallel to Portobello Road. Ceres also did extremely well, with Greg and various managers having the main responsibility while Craig focused on the restaurant. Soyfoods retailed by Ceres included Hatcho and mugi miso, tamari, fermented tofu, and fresh tofu sold in trays immersed in water. Eventually Bill Tara and Peter Bradford took over management of Ceres. Soon other people began to open restaurants and natural foods / macrobiotic stores like Ceres in college towns in England: Infinity Foods in Brighton (at Sussex University; Peter Deadman, Robin Bines, Simon Bailey were involved), Arjuna in Cambridge, Harvest in Bath, and On the Eighth Day in Manchester. In 1970 the Sams developed a large mobile tent macrobiotic restaurant and made a lot of money by taking it to various big rock festivals.

In Aug. 1970 Harmony Foods was established as a natural foods / macrobiotic import, product development, and distribution company. The money from the mobile restaurant was used to rent a building at No. 10 St. Luke's Road in London (only about 300 yards from the Ceres shop), and to import enough products to start a line / range of products under the Harmony Brand (the logo was a yin / yang sign). They stored and packed these in basement at Harmony Foods. Starting in 1969, the first imports for the restaurant and for Ceres had came from Muso in Japan, and from a macrobiotic society in Vietnam came red rice and green tea. In 1970 they started to import 4-5 tons of organically-grown brown rice from The Camargue in the south of France. Grown by the same man who grew brown rice for Lima Foods, it became the company's main product. Harmony Foods started out with about 20 customers–16 conventional health food shops and 4 of the new wave of natural foods stores (which the natural foods stores called "grain shops"). Wholefood of Baker Street was the pioneer "organic shop" that started in the 1950s. They were part of the Soil Association, so organic growers used it as an outlet

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for the first organically grown produce retailed in England. They soon became an important outlet for Harmony Foods as well. In addition a man named Ivan Seruya would collect food (mostly produce) from the organic growers and deliver it to restaurants like Seed and Manna in London. One other product that was grown organically was Pimhill Flour. Harmony Foods was a pioneer in developing new organic growers (such as Stewart Patterson who farmed wheat with horses) and in putting organically grown foods into retail outlets.

By Aug. 1970 Harmony Foods was distributing soyfoods, including Hatcho miso, mugi (barley) miso, and tamari from Muso in Japan–imported in wooden kegs and packed in glass jars. These were the first miso and shoyu products available at retail outlets in England.

In Jan. 1971 Harmony Foods outgrew its building on St. Luke's Rd. and moved into a larger warehouse at 191 Latimer Road (Maidenhead), a former cosmetics factory. Just before the move, Bill Tara informed the Sams that he was in London to set up Erewhon Europe to compete with Harmony. The restaurant, Seed, was sold in the spring of 1971 and reopened as The Magic Carpet. In 1971 Ceres was renamed Ceres Grain Shop and relocated at 269 A Portobello Rd.

In mid-1972 the shop next to Ceres closed. The Sams took it over and made it into Ceres Bakery. It transformed large amounts of wheat, organically grown in England, into unique and delicious naturally leavened breads. The enzymes in the freshly-milled flour helped to leaven the bread.

When they closed down Seed, the restaurant on All Saints Road, there was still a demand for simple macrobiotic food, so in about Feb/March 1971 they opened Green Genes, a sort of macrobiotic workingman's café on a much smaller scale. Each person picked up her or her food from a counter; there was no table service. It was open for lunch only whereas Seed had been open only in the evenings.

In 1972 they began to publish a magazine titled *Seed: The Journal of Organic Living.* Bill Tara and Peter Bradford helped with it occasionally. It continued for 6 years. That same year, above Ceres Bakery, started Ceres Bookstore, which only last for 1½ years.

Meanwhile Bill Tara and Peter Bradford had expanded and transformed Ceres Grain Shop, but in a way that led to extensive shoplifting, so it was scaled back to near its original size and finally sold in 1979 to Jack Weller. By that year all efforts and resources were focused on Harmony Foods, the wholesale business. Peanut butter (non-organic), the first product manufactured by Harmony, was now in two of the leading supermarket chains, Safeway and Waitrose. Address: 269 Portobello Road, Notting Hill, London W11 1LR, England. Phone: 071-229 7545.

9738. Weigel, Linda. 1991. Witte Wonder sold by Solnuts B.V. New developments with Solnuts in the USA (Interview). *SoyaScan Notes.* Aug. 28. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In mid-1990 Solnuts B.V. sold Witte Wonder to Appel Frenzel GmbH (Kieschecker Weg 240), D-4000 Dusseldorf, Germany. The transfer of ownership took place on 9 June 1990. Witte Wonder was not sold to Wim Bakker (who had been running it for them since 1986) as planned in early 1990, but Wim is still working at Witte Wonder. Solnuts considered Witte Wonder to be too far away from their core activities, and were glad to be free of it.

Solnuts are now being exported to Japan; Solnuts Inc. in Iowa ships them to Toshoku, a Japanese distributor, which sells them to Snow Brand Foods (Yuki-jirushi), for use in mixes, cereals, and also packaged as a snack item. In the U.S. several cookie and bread companies have started using Solnuts within the last year in place of almonds and more expensive nuts. These products are now on the market, but their names are confidential. The Zero candy bar made by Leaf and a salad topping from McCormick both still contain Solnuts. Address: Sales Manager, Solnuts, Inc., P.O. Box 450, 711 Seventh St., Hudson, Iowa 50643. Phone: 800-648-3503.

9739. Nichii Company of America, Inc. Mycal Group. 1991. Is your tofu the right tofu? Lite is right for the 90's (Leaflet). Torrance, California. 1 p. Front and back.
• ***Summary:*** This red, green, and white leaflet was sent to most or all natural food retail stores in America on 22 August 1991. An illustration (line drawing) shows a large cake of "Natural Foods Store Tofu." The text reads: "Only tofu made from *Microsoy flakes* is right for the 90's. Because only tofu made from *Microsoy* flakes is: Lower in calories. Lower in lipids (fat). Higher in protein. And longer lasting on your shelf... than tofu made from ordinary soybeans. So tofu made from *Microsoy flakes* does indeed offer your health conscious customers substantial benefits, while you can benefit from increased sales, increased store traffic, rapid turnover, and customer satisfaction... How do you get the tofu that's right for the 90's on your shelves? Make sure your supplier is using *Microsoy flakes.*

A footnote states "All results confirmed by independent testing at Iowa State University, Food Science and Human Nutrition Department." Note: America is truly in need of a tofu containing lower calories and lower fat. Address: 23440 Hawthorne Blvd., Suite 140, Torrance, California 90505. Phone: 213-791-0010.

9740. Oshita, Ichiko; Kanamori, H.; Mizuta, M.; Sakamoto, I. 1991. Shôyu-chû no hen'i gen kassei o yûsuru beta-karuborin yûdôtai [A mutagenic β-carboline derivative in soy sauce]. *Shokuhin Eiseigaku Zasshi* (*J. of the Food Hygienic Society of Japan*) 32(4):272-77. Aug. [17 ref. Jap; eng]
• ***Summary:*** "A yellow substance (YS) isolated for the first time from soy sauce by HPLC showed weak mutagenicity

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in *Salmonella* TA 100 without S9 mix. The mutagenicity of the YS increased 7.5 times (His+ revertants /µg/plate) after treatment with sodium nitrite.

"The YS was identified as 1-(5-hydroxymethyl 2-furyl)-9H-pyrido [3, 4-b] indole (1-hydroxymethyl -furyl-Beta-carboline) by MS, ^{1}H-NMR and ^{13}C-NMR. The survey showed that the concentration of YS in Koikuchi soy sauce (regular fermented) was 2.0 µg/ml. The semi-fermented Koikuchi soy sauce and the soy sauce supplemented with amino acid had 0.79 µg/ml and 0.38 µg/ml, respectively. The amount of YS in three kinds of soy sauce increased two fold by heating (120ºC, 20 min). The concentration of YS in soy sauce might serve as a good quality indicator for soy sauce."
Address: 1. Hiroshima Chuo Women's Junior College, 3-1-15, Gion, Asaminami-ku; 2-4. Hiroshima Prefectural Inst. of Public Health, 1-5-70 Ujinkanda, Minami-ku. Both: Hiroshima, Japan.

9741. Yamamoto, Yasusi; Kakegawa, R.; Takahashi, T.; Higashi, K.; Yoshii, H. 1991. Shiro shôyu seizo e no nyûsan-kin no riyô [Studies in the manufacture of shiro-shoyu. I. Utilization of soya lactic bacteria for shiro-shoyu making]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 38(8):663-67. Aug. [4 ref. Jap; eng]
Address: 1-2,4-5. Dep. of Brewing & Fermentation, Tokyo Univ. of Agriculture, Setagaya-ku, Tokyo, Japan; 3. Yamashin Co., Ltd., 3-36 Nishiyama-cho, Hekinan-shi, Aichi 447.

9742. Fujio, Yûsaku. 1991. Tenpe no kaori to kinshu [The flavor of tempeh, and tempeh starter]. *Toyo Shinpo* (*Soyfoods News*). Sept. 1. p. 8. [Jap]
Address: Kyushu Univ., Nôgaku-bu.

9743. *Toyo Shinpo* (*Soyfoods News*). 1991. Jimukyoku ga henkô: Tenpe kenkyû-kai [The Tempeh Study Group has moved to new headquarters]. Sept. 1. p. 1. [Jap]

9744. *Toyo Shinpo* (*Soyfoods News*). 1991. [Investigation of feeding okara to silkworms]. Sept. 1. p. 1. [Jap]
• ***Summary:*** A photo shows the man who is conducting the experiment.

9745. Spear, Bill. 1991. Soyfoods in Yugoslavia (Interview). *SoyaScan Notes.* Sept. 7. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Bill just returned from a 1-week macrobiotic summer camp at Kumrovec, Croatia, Yugoslavia; 75 people plus staff attended–during the current civil war. Last year he attended the same event, along with 600 other people. There are presently an estimated 5,000 to 10,000 macrobiotic people in Croatia. The major activity is in Zagreb. Croatia has most of the money and industrial productivity in Yugoslavia and that is a major reason that Croatians want independence. The Serbians are a relatively poor majority.

There are two commercial and at least three home-based soyfoods manufacturers in former Yugoslavia. The best contact is Ivan Jugovac (about 40 years old), owner of Anyo located at Skolska Ulica 43A, 51215 Kastav (near Rijeka), Croatia, Yugoslavia. Ivan knows the names of the other soyfoods companies in Yugoslavia and is part of a loosely-knit soycrafters network there. Anyo, which started about 2-3 years ago, makes 250-300 kg/week of tofu (100 kg/day in 4 or 5 batches) and 150-200 kg/week of seitan. From the tofu they also make smoked tofu, grilled tofu, deep-fried tofu, and tofu spread (with okara). The tofu is made in a 100-liter steam jacketed kettle and the nigari is imported from Japan. Their soybeans (which are not organically grown) come from Becej (pronounced BECH-ay) in Serbia, Yugoslavia. The business is doing well. Ivan makes natto for his personal use. He wants to start making miso and amazake commercially, and is looking for sources of koji and koji starter.

A second soyfoods shop in Belgrade, Serbia (name, address, and contact person unknown) makes tofu, seitan, and tempeh on about the same scale as Anyo. It probably started at about the same time as Anyo. There are 1-2 small tofu shops in Zagreb, and one in Novi Sad, Serbia; in each, the tofu is made in a home kitchen. In Slovenia, a tofu company that will be the largest in Yugoslavia is nearly ready to begin operation in Slovenia, but the current civil war has delayed their opening. They plan to make 100 kg/day of tofu.

The man who knows the most about soyfoods in Yugoslavia is Zlatko Pejic, a peace activist who is president of the Society for the Improvement of the Quality of Life and head of the macrobiotic community in Zagreb. His wife is a cooking teacher. He invited Bill to Yugoslavia, has been to the USA, and lectures throughout Yugoslavia. He has visited most of the soyfoods companies in Yugoslavia, has a fax, and like Ivan speaks pretty good English.

Basically all of the interest in soyfoods in Yugoslavia grew out of macrobiotics. Several of the people who started companies attended the Kushi Institute in London. Two years ago, others attended the International Macrobiotic Institute in Kiental, Switzerland. In both places there are classes in soyfoods production (miso, tempeh, tofu, etc.) taught by various macrobiotic teachers such as Roberto Marrocchesi. Most companies have some books from Soyfoods Center. Bill is still actively affiliated with The Bridge in Connecticut and is a teacher of macrobiotics. Address: North Road, Bantam, Connecticut 06750. Phone: 203-567-0554.

9746. Koba, Hisayo. 1991. Tenpe no chôri to shikôsei [Tempeh cookery and taste]. *Toyo Shinpo* (*Soyfoods News*). Sept. 11. p. 9. [Jap]
Address: Kassui Joshi Tanki Daigaku, Japan.

9747. Matsuoka, Asao. 1991. Tenpe no kôhen'i gensei ni

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tsuite [On cancer-preventing substances in tempeh]. *Toyo Shinpo* (*Soyfoods News*). Sept. 11. p. 9. [Jap]
Address: Kassui Joshi Tanki Daigaku, Japan.

9748. *Toyo Shinpo* (*Soyfoods News*). 1991. Tenpe kenkyû shukai (Heisei sannendo daiikkai) kôen yôshi [Summary of lectures from the Tempeh Study Group Meeting (First meeting of 1991)]. Sept. 11. p. 9. [Jap]

9749. *Toyo Shinpo* (*Soyfoods News*). 1991. Okara... dekita! [Feeding okara to silkworms]. Sept. 11. p. 11. [Jap]
• ***Summary:*** Photos show trays of juvenile and mature silkworms that have been reared successfully on okara.

9750. *SoyaScan Notes.* 1991. The concepts of alkaline (*arukari-sei*) and acidic (*sansei*) foods in Japan (Overview). Sept. 20. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** It is common knowledge among most typical Japanese that foods can generally be classified along a continuum that ranges from alkaline at one end to neutral (*chusei*) in the middle, to acidic at the other end. Alkaline foods (those with an alkaline ash) are generally considered to promote and protect health. It is widely believed that one should try to keep one's blood a little on the alkaline side of neutral. According to E.C. Grey's *The Food of Japan* (League of Nations, 1928) and *Inshoku Jiten* (*Encyclopedia of food and drink;* Motoyama 1958; see arukari) and to discussions with numerous Japanese, well-known alkaline foods are as follows. Each food is followed by an "alkaline value" in parentheses taken from Grey (1928, p. 56-111; the "alkalinity is due to lime and magnesia"): sea vegetables including kombu (88.9), wakame (55.8), nori (35.3); black soybeans (40.2), yellow soybeans (38.1), soyfoods (and Soyfoods Center) including yuba (25.6), kinako roasted soy flour (25.2), Hamana natto (Hamanatto 24.8), natto (19.3), green soybeans (ao-daizu, dry; 17.8), Misozuke (vegetables preserved in miso, 16.3), shoyu (14.3); red miso (11.5), okara (9.0), white miso (8.1), edamamé (green vegetable soybeans, 5.8), aburage deep-fried tofu pouched (6.7), soymilk (3.8), tofu (1.1), shiitake mushrooms (41.0), azuki beans (27.0), umeboshi salt plums (3.1), dried fruits including dried fig (46.8), dried persimmon (21.3), raisins (15.3), cheese (18.0), most fresh fruits including yuzu (citron, 11.7), buckwheat (7.0), fig (6.3), lemon (5.9), banana (4.6), mikan (mandarin orange, 4.0); root vegetables including potatoes (13.9), tororo imo (11.5), daikon radish (5.0); most green vegetables such as komatsuna cabbage (11.3), or daikon leaves (10.9), pickled vegetables such as takuan (14.6). Alkaline beverages or liquids include tea, coffee, dairy milk (2.6), condensed milk (8.0), powdered milk (26.6), grape wines, and vinegar.

Acidic foods, which the Japanese believe should be used in moderation, include: white sugar (0), mizuame [rice syrup] (0), chocolate (3.0) and other sweet foods, eggs (2.8), flesh foods including chicken (5.2), pork (5.2), beef (5.1), fresh fish (avg. 5.3), alcoholic beverages including amazake (0), beer (0), sake (0); animal fats including butter (1.6), margarine (0.9).

Many Japanese find that acidic foods, when consumed in excess, give them acid indigestion. Neutral foods include rice (0.5-2.9), wheat (3.5-6.6), barley (2.7-4.6), and wheat gluten (1.0).

Note that this classification system is unrelated to the yin-yang continuum used by macrobiotics; most Japanese are unaware of macrobiotics. The latter, for example, considers meat to be yang (alkaline), whereas wines, fruits, and milk are yin (acidic).

9751. Lydon, Sandy. 1991. How to do research on Japanese and Chinese agriculture in California (Interview). *SoyaScan Notes.* Sept. 25. Conducted by William Shurtleff of Soyfoods Center. [5 ref]
• ***Summary:*** Sandy has done extensive research on the Chinese and Japanese in 3 counties in and around Monterey County. He has read every newspaper on the subject since the earliest times and keyed the important information into his bibliographic database. Most Asian immigrants began, in about the 1870s, as field laborers, then became contract workers, then lease holders. In the typical 5-year reclamation lease, they would find a landowner would had land that needed to be cleared, take 4 years to clear it, then farm it the 5th year. The owners never renewed the leases.

The best researcher on Chinese agriculture in California is Sucheng Chan, who is now chair of the Asian-American Studies Dept. at the University of Santa Barbara. She traveled all over California, living out of her car, visiting county seats and examining documents, such as assessors records, lease books, poll taxes, etc. to try to reconstruct a more accurate picture of the early Chinese in California. All is container in her 1986 book *This Bittersweet Soil.*

Another good researcher is Peter C.Y. Leung at the Univ. of California at Davis, Asian-American Studies Dept. His field is the Chinese in the Sacramento Valley. He has written about Locke, near Walnut Grove.

Another group are the archaeologists at the University of Idaho at Moscow, probably in the Archaeology or Anthropology Dept. Most are white and have relatively little knowledge of Asian-American culture. They do digs and produce lots of printed reports, detailing discoveries of things such as shoyu containers. They try to reconstruct the early history in this way. They have an archaeological clearinghouse and museum.

Paul Chace at the Univ. of California at Riverside is interested in this Asian-American archaeology viewpoint, and he knows the researchers well. He is at 1823 Kenora Dr., Escondido, California 92027. Phone: 619-743-8609.

Very important, influential, and wealthy is the Japanese-American National Museum in Japan Town, Los Angeles. They have a scholarly advisory committee and have raised

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about $10 million during the last year. Akemi Kikumura, curator of their whole collection, is a great lady and very knowledgeable. The museum has a great collection of interviews with early Japanese-Americans.

Nearby is the UCLA Japanese-American Collection, which is vast but not well organized. In about the 1970s, they sent people all over California to do interviews with first-generation Japanese immigrants. They have a newsletter and many exhibits. Address: History Dep., Cabrillo College, Aptos, California 95003. Phone: 408-479-6223.

9752. Okihiro, Gary. 1991. Research on early Japanese farming communities in California (Interview). *SoyaScan Notes.* Sept. 25. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Gary is co-author of a book titled *Japanese legacy: Farming and community life in California's Santa Clara Valley.* In researching this book, which covers the period 1895-1945, he does not recall seeing any reference to Japanese growing soybeans in California, but he is almost sure they must have done so. The foremost expert on Japanese agriculture in California is Masakazu Iwata, now Professor Emeritus (retired 5-6 years ago) at Biola University, a small religious college in Los Angeles. He now lives in Montebello, California (phone: 213-723-4389), and he will soon be coming out with a book on Japanese farming in California titled *Planted in Good Soil.* Another very knowledgeable person on this subject is Sucheng Chan who has already published a book on Chinese farming in California and will soon be coming out with one on Japanese farming in California.

Concerning early Japanese farming communities in California, the earliest one he knows of was established in 1865 near Sacramento. It was an agricultural colony named the Wakamatsu Tea and Silk Farm Colony. They came with a feudal lord and tea plants, bamboo shoots, and silk worms. Gary says: "I'll bet they brought over soybeans." They left Japan as disposed people, since they had been on the wrong side (with the Shogun) during the Meiji restoration. Very little has been written about this community, since they did not leave many records. Some mention is made in a book by Bill Hosokawa titled *Nisei: The Quiet Americans* (1969. New York: W. Morrow). In addition, the community was discussed by local Caucasian newspapers. The first Japanese woman to die in California was a member of this community; her grave still exists outside Sacramento. In 1885 there was a Japanese farming community located east of San Francisco Bay. In addition, a Polish traveler to San Francisco described the Chinese gardens surrounding the city. He mentioned a number of crops in his travelogue.

Gary thinks it is more likely that Chinese (rather than Japanese) immigrants first grew soybeans in California. Address: Cornell Univ., Ithaca, New York. Phone: 607-255-6742.

9753. Chan, Sucheng. 1991. Food and agriculture among early Chinese and Japanese in California (Interview). *SoyaScan Notes.* Sept. 27. Conducted by William Shurtleff of Soyfoods Center. [2 ref]

• ***Summary:*** The Chinese in California during the 1800s imported a surprisingly large amount of merchandise and food from China. She would not be surprised if they imported soybeans to make tofu–but they may well have grown the soybeans in California since they did pioneering agricultural research on many new crops. She thinks she recalls seeing a document (probably in account books in the Bancroft library) stating that Chinese imported a kind of dried tofu. When she was researching her book on Chinese in California, titled *This Bittersweet Soil,* she couldn't find any source materials in Chinese, except for account books, which do list beans. But it is never clear what kind of beans they are. And of all the English-language materials she used, there was no reference to soybeans. However in ship's manifests now in the San Francisco customs house, there were many references to bags of beans (see Robert F. Spier).

She does not have any records for Chinese farming in the Imperial Valley, because by the time that irrigation was supplied after 1905 the Chinese had pretty much left agriculture except in a few places where they were already well established.

She could look up her lease records for various counties to see where beans were most widely grown by Chinese. She wrote down beans many times from lease records but does not recall ever writing down soybeans. The Chinese and Japanese farmed mainly in the Delta (of the Sacramento River). She can (and will) very quickly look through her lease records for soybeans, county by county. If she finds a county where there are many records for Chinese or Japanese growing beans, one could then start looking for other sources, such as reports by extension agents or newspapers, to see if soybeans were grown.

Note: Soybeans grow best on sandy or clay loams containing fair amounts of potash, lime, and phosphoric acid. See also: A brief history of soybean cultivation in California (SoyaScan Notes, 28 Sept. 1991).

She has commissioned a lot of detailed translations from books, written in Japanese by Japanese in the USA, that deal with Japanese agricultural and economic activities and crops in California. The period covered in about 1900 to 1940. She has never looked at these carefully to see if soybeans are among them. Her book on Japanese agriculture in California will probably not be ready for at least 5 years because she is too busy with other things. She has a whole room full of material, including many charts. She thinks it is more likely that she will find a document concerning Japanese growing soybeans in California rather than Chinese–because she has almost no Chinese-language sources.

When she was teaching at Cal, Berkeley, she deposited

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photocopies of the originals of about 20 of these books in the Asian-American Studies Library, 101 Wheeler Hall, at the University of California at Berkeley. The originals are at UCLA, at either the East Asian Library or the Asian-American Studies Center. The two best and most detailed books among these are titled *Zaibei Nihon-jin Sangyô Sôren* and *Zaibei Nihon-jin Shi.* Each has a detailed table of contents. Address: Chair, Asian-American Studies Dep., Univ. of California at Santa Barbara, Santa Barbara, CA 94301. Phone: 805-893-8179 or 2371.

9754. *Star-Tribune* (*Minneapolis, Minnesota*). 1991. From Minnesota to Japan, soybeans for sake. Sept. 27.
• ***Summary:*** A large photo shows a number of men in suits and ties using wooden mallets to break open a 50-gallon keg of sake. The caption states that Minnesota's governor Arne Carlson joined Japanese businessmen and others on Thursday, September 26, in a ceremony rarely seen in Minnesota. Known in Japan as *Kagami Biraki,* it is a sake barrel-busting ceremony. It took place from 12:15 to 2:00 P.M. in St. Paul, Minnesota, at the Como Park Conservatory, in the Memorial Japanese Garden, and it marked the signing of a five-year multimillion-dollar soybean contract between the Nishimoto Trading Co. of Tokyo, Japan, and the Jameson-Williams Co. of Fairmont (also located at East County Road 34, Rt. 1 Box 53A, Jackson, Minnesota 56143. Phone: 507-847-3591). Address: Minnesota.

9755. *SoyaScan Notes.* 1991. A brief history of soybean cultivation in California (Overview). Sept. 28. Compiled by William Shurtleff of Soyfoods Center. [5 ref]
• ***Summary:*** The soybean was introduced to California in March 1851, via San Francisco, by Japanese fishermen who had been saved from a ship foundering at sea by the American ship Auckland. But these soybeans were apparently never grown in California; they were taken from San Francisco by Dr. Benjamin Franklin Edwards to Alton, Illinois, where they were grown successfully in the summer of 1851 by Mr. John H. Lea in his garden. Soon they were also grown in Iowa and Ohio (Hymowitz 1987).

In 1899 Walter C. Blasdale, an instructor in chemistry at the University of California, became the earliest known person to grow soybeans in California. He obtained the seeds from a Chinese market in San Francisco, then grew them in Berkeley, Alameda County.

The first soybean variety tests in California were conducted in 1918 at the University farm at Davis, Yolo County. It was found that soybeans did not thrive well in the interior valleys of California (Hendry 1921; Beard et al. 1973). By 1926 soybeans were being grown in the irrigated districts of California, especially in the orange section of southern California (Morse 1926). By 1944 soybeans were found to grow well on the bottom lands of the lower Sacramento River and in the warmer coastal valleys (Madson 1944).

In 1951 soybean trials began in the Imperial Valley of California, and from 1955-57 soybeans were grown with good results throughout the San Joaquin and Sacramento Valleys (Beard et al. 1973). By the 1970s and 1980s most of the soybeans grown in California were grown in the San Joaquin Valley.

9756. Gerner, Bob. 1991. More early history of Westbrae Natural Foods in California, 1972 to 1980 (Interview). *SoyaScan Notes.* Sept. 29 and Oct. 1. And 11 May 1992. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Gordon Bennett arrived in 1972. He started as a customer, then began work as a janitor, then became a partner. At that time Bob Ortiz was asked to leave. The first year in business, Westbrae made only $7,000 profit before any wages were paid to the three partners. Profits were plowed back into the business. Bob lived in the store to save money.

In 1972-73 Westbrae rented a small separate warehouse several blocks away at 1340 San Pablo Ave. They also rented a rat-infested bakery on East 14th St. in Oakland. There they baked granola and bread; Ganesh (Ganesha) was their bread baker and delivery man. In the late fall of 1973, after less than a year on San Pablo Ave., they moved into a much larger warehouse nearby at 1224 10th Street and incorporated the company. At that time Westbrae began importing traditional, natural foods from Japan. They imported soy sauce in bulk and bottled it at their 10th street facility. Also at that time, Bob transferred all his past company records to the corporation. Bob Gerner owned 28% of the stock, Margaret and Kristin (who had now joined) owned 24% each. Three employees owned stock: Gordon Bennett owned 18%, and Jerry Heverly and Rick Lewis each owned 3% each. The company formed an AESOP (accelerated employee stock ownership plan); the goal was for everyone who had worked for the company for a given time to own shares. As soon as Westbrae formed the corporation and the AESOP, there was constant fighting. They spent more time fighting about ownership than running the business. Prior to incorporation, Bob had made most of the decisions himself; afterwards, though president, he ran the company by committee, and felt that the board should make all the major decisions. This was crazy and rendered Bob ineffective, but he felt he no longer owned the company. Also, he didn't realize that Gordon's main goal was to become the head of the company.

From Feb. 28 to March 2, 1974, Bob traveled throughout Japan, with William Shurtleff as his guide, looking at potential suppliers.

At that time Westbrae had financial problems. They hired Stewart Emery to conduct a self-realization seminar for all the employees in the mountains to give more focus. Before the seminar, the owners had a meeting in which they shared frank feelings about one another–who was effective

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and who wasn't, how the company was going, etc. Rick Lewis got voted off the board of directors and Gordon Bennett became general manager, replacing Bob Gerner, who was demoted to chairman and president. Stewart Emery later said that the seminar was his only failure. Rick Lewis was asked to work in the retail store as a clerk; he used that as a base to organize a union. On 22 Dec. 1975 the production employees formed a union, named the Alternative Food Workers Alliance. Westbrae was stuck with a union until Gordon Bennett sold the company to Vestro. At one point they may have joined the teamsters union.

Bob and Gordon had an ongoing struggle. In July 1976 Bob left Westbrae (although he was still president) and bought the retail store (Westbrae Natural Foods) back from the company at a very good price. It had been losing money, the company couldn't sell it (in part because it was unionized), and Gordon wanted to just shut it down. Bob closed it for 3 months, remodeled it, then opened it again in late November as Gilman Street Gourmet: Natural Foods & Delicatessen. Shortly thereafter, Westbrae moved its warehouse from 10th Street in Berkeley to Emeryville because the company needed more space and the rent was much better. Bob was disappointed with the move because the 10th Street warehouse had been just a few blocks from his Gilman Street Gourmet.

In about 1977 Bob, Gordon, Margaret Ortiz and Kristin Brun got together for two sessions at Kristin's house, to discuss and have recorded the early history of Westbrae; a woman whom Kristin found apparently wrote down that history. Kristin now lives in Richmond Annex with Marty Roth, and probably has lots of early Westbrae documents and photos. In July 1977 the Oakland Tribune, then the San Francisco Chronicle each did nice articles about Westbrae. In September 1977, Westbrae Natural Foods moved its warehouse and offices from Berkeley into a much larger building at 4240 Hollis St., Emeryville, California 94608.

Gordon was a good manager, but in 1976, at the time Bob Gerner left, he and Bob were each earning only $800/month. Gordon began to push for higher salaries, so he called in Lloyd Dubroff and Bruce Handler who ran a seminar called POEM (Plan, Organize, Execute, and Manage). Bob hired them as consultants at the retail store, then they served as mediators on a conflict between Gordon and Bob over pay levels. They tripled Gordon's salary to $52,000 a year and he liked them instantly. Gordon hired them as consultants on a continuing basis, then he decided they should be on the board. Kristin Brun got voted off the board and they got voted on. In March or April 1979 Gordon announced at a board meeting that he was going to take a sabbatical starting in 6 months and that he didn't want to run the company any more. The board members said "We think you should leave now," so they voted him off the board–much to Gordon's surprise. The board made Lloyd Dubroff the general manager and chief operating officer, and Bruce Handler became CEO. At that point Bob ceased to be president of Westbrae, but he still owned the controlling share of stock–which he continued to own until 1985.

Dubroff and Handler's first move was to draft a budget and get the financial statements up to date. The financials showed that the company was doing very well. Westbrae had just opened a warehouse in the City of Bell (4841 Eastern Ave.) near Los Angeles (named Westbrae South), so Dubroff and Handler bought Celestial Natural Foods, a wholesale company run by Carter Allen on the docks in Oahu, Hawaii that Gordon had been pursuing and that had been a major customer of Westbrae's. Soon they began to increase inventories to 98% in stock, but they suddenly found that they were unable to pay the bills. The comptroller had made serious errors in the financial records, and Westbrae was almost bankrupt. The companies in Hawaii and Los Angeles were both losing large amounts of money, Bob Gerner returned to the company and began fending off angry suppliers and getting permission to string put payments. It was a very stressful time for Bob as he struggled to keep the company he had founded out of bankruptcy.

In Dec. 1979 or 1 Jan. 1980 the board invited Gordon Bennett back in as general manager. Gordon saved Westbrae. He transformed the company from an importer-distributor to an importer-manufacturer. He closed down the operations in Hawaii and Los Angeles, and sold off Westbrae's distribution rights in northern California–at a pretty good price. He also reduced the number of employees. Westbrae's top money-making products were now imported soy sauce (they imported it in drums and bottled it in Berkeley), and tamari-roasted nuts. Address: Owner, Berkeley Natural Grocery Co., 1336 Gilman St., Berkeley, California 94706. Phone: 415-526-2456.

9757. *Daizu Geppo* (*Soybean Monthly News*). 1991. Kokusan daizu to mamegashi-ya no monogatari [Story of Japanese-grown soybeans and the soy confectionery shop]. Aug/Sept. p. 36-37. [1 ref. Jap]
• ***Summary:*** This article contains long quotations from the Japanese book *Nogyô Zenshô,* plus 9 original illustrations from *Mame Omoshiro Zatsugaku Jiten,* by Byosoma Gyu (Chikuma Shûhansha, 1991). Address: Daizu Kyokyu Antei Kyokai.

9758. Kimura, Eiichi. 1991. Gendai gokoku kô. Kokumotsu no meishô [Thoughts on China's "Five Grains" today. V. Famous book on grains]. *Daizu Geppo* (*Soybean Monthly News*). Aug/Sept. p. 34-35. [2 ref. Jap]
Address: Daizu Kyokyu Antei Kyokai.

9759. Koba, Hisayo. 1991. Tenpe no chôri to shikôsei [Tempeh cookery: Its taste and acceptance]. *Daizu Geppo* (*Soybean Monthly News*). Aug/Sept. p. 24-33. [Jap]
Address: Prof., Ikemizu / Kassui Joshi Tanki Daigaku

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[Women's Junior College].

9760. Kudou, Shigemitsu; Fleury, Y.; Welti, D.; Magnolato, D.; Uchida, T.; Kitamura, K.; Okubo, K. 1991. Malonyl isoflavone glycosides in soybean seeds (*Glycine max* Merrill). *Agricultural and Biological Chemistry* 55(9):2227-33. Sept. [21 ref]
• ***Summary:*** Isoflavone concentration in the soybean hypocotyl is about 5-6 times higher than in the cotyledons. Nine kinds of isoflavone glycosides were isolated from the hypocotyls of soybean seeds. Three kinds were proved to be malonylated soybean isoflavones. The principal conjugated forms of isoflavones in the soybean hypocotyl were 6"-O-malonylglucosides. "All of the isoflavone components produced intensely undesirable taste effects such as bitter, astringent and dry mouth feeling."

A graph (p. 2229) shows "Isoflavone accumulation during maturation of Maple Arrow soybean seeds." The accumulation of daidzin, genistin, glycitin and their corresponding malonylated forms in immature seeds during development began at about 35 days after flowering and increased until about 60 days after flowering. Malonylgenistin and the genistin content increased during the late development of the beans, whereas malonyldaidzin and daidzin accumulated throughout the whole period. Address: 1&5. Kanesa Miso Co., Ltd., 202 Hamada, Tamagawa, Aomori 030, Japan; 2-4. Research Centre, Nestlé Ltd., P.O. Box 44, Vers-Chez-Les-Blanc, CH-1000 Lausanne 26, Switzerland.

9761. **Product Name:** [Emarin Cheese (With Soy Oil and Dairy Milk Protein)].
Foreign Name: Emarin.
Manufacturer's Name: Miyoshi Yushi (K.K.).
Manufacturer's Address: Horikiri 4-66-1, Katsushika-ku, Tokyo-to, Japan. Phone: 03-3634-7141.
Date of Introduction: 1991 September.
New Product–Documentation: Article in Toyo Shinpo (Soyfoods News). 1991. Sept. 1. p. 9. "Daizu umare no chiizu. Miyoshi Yushi no 'Emarin'" [A cheese made from soybeans. Emarin is made by Miyoshi Oil Mill]. This is not a typical soy cheese; rather it is a fermented filled cheese made with soy oil and dairy milk protein. A photo shows the front of the package.

9762. Nishimoto, Miyoko. 1991. The now and Zen epicure: Gourmet cuisine for the enlightened palate. Summertown, Tennessee: The Book Publishing Co. 250 p. Color photos. Index. 24 x 21 cm.
• ***Summary:*** This is a gorgeous, delightful vegan cookbook (though it uses honey), loaded with color photos. Most recipes, designed for entertaining, embody an atmosphere of elegance with a sense of fun, capturing the best of traditional European cuisine, offering gourmet recipes with an element of Japanese style, simplicity, and flavor. Each recipe is accompanied by a nutritional analysis, and most are remarkably low in fat.

The author is founder and owner of the Now & Zen Bakery (1838 Golden Gate Ave., San Francisco, CA 94115) which is well known for its tofu cheesecakes and other delights, and which sells dried okara. She is also a jazz vocalist and vegetarian chef. Born in Japan to a Japanese mother and an American father, she moved to Mill Valley, California, with her parents when she was age 7 and became a vegetarian at age 12. A photo on the rear cover shows Miyoko Nishimoto. She shows great virtuosity in the use of soyfoods–and wheat gluten. The section on ingredients contains excellent, detailed information on miso, nut milks and creams (almond milk and cashew milk, which the author prefers for some uses to soymilk), agar, okara, soy milk and soy cream, soy sauce, soy sour cream, soy yogurt, tamari, tempeh, tofu, frozen tofu, and pressed tofu.

Soy-related recipes include: Tofu "cheese" (p. 32). Tofu "boursin" or herb-garlic cheese ball (p. 33). Tofu "feta" cheese (p. 35). Tofu cream cheese spread with herbs (p. 36). Eggplant and tofu pâté (p. 51). Smoked tofu, mushroom, and garlic canapés (p. 53). Tofu "mornay" sauce (p. 65). Tofu aïoli (p. 82). An introduction to quick and tasty tofu cream soups is given on p. 108. Each of the following cream soups contain tofu. Cream of pumpkin soup (p. 109). Cream of corn soup (p. 110). Cream of green pea soup (p. 111).

Mediterranean eggplant and tofu gratin (p. 115). Tofu burgers suprême (p. 118). Creamy tempeh curry (p. 119). Tempeh mexicali (p. 121). Sweet and sour tofu (p. 122-23). Whole cabbage with hearty tempeh stuffing (p. 124-25). Herbed soybean casserole or stew (p. 132). Savory tempeh and vegetable stew (p. 134-35). Tofu bourguignon (p. 138-39). Homemade tofu pasta (p. 142-43). Ginger tempeh with green peppers (p. 145). Homemade gluten, Tempeh and gluten burgers, and the Great gluten turkey with dressing (p. 150-160). Tempura tofu (p. 163). Marinated tofu (p. 164). Smoky marinated tofu (p. 165). Believable bacon (with tofu, p. 166). Beans and "bacon" casserole (with tofu, p. 167). Orange-soy dressing (p. 177). Tofu sour cream (p. 179). Tofu mayonnaise (p. 180). Tofu thousand island dressing (p. 182). Tropical coconut banana ice cream or sauce (with tofu, p. 212). A different pumpkin ice cream (with tofu, p. 213). Italian cheese-less cake (with tofu, p. 216). Cashew cheesecake (with tofu, p. 217). Tofu crème (p. 218).

For a lengthy and very positive review of this book by Carol Flinders, see *Vegetarian Times* Nov. 1991, p. 86-87. Address: San Francisco, California.

9763. Ono, Tomotada; Choi, Myoeng Rak; Ikeda, Ako; Odagiri, Satoshi. 1991. Changes in the composition and size of soymilk protein particles by heating. *Agricultural and Biological Chemistry* 55(9):2291-97. Sept. [11 ref]*
Address: Gifu Woman's Univ., 80 Taromaru, Gifu 501-25,

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Japan.

9764. Stone, Kathy. 1991. Edamame: Fairmont firm grows and exports this soybean that is a favorite snack in Japanese bars and restaurants. *Minnesota Enterprise.* Sept. p. 12-13.
• ***Summary:*** Last year the Japanese ate 171 million pounds of edamame. The green vegetable soybeans are catching on in the United States and Jameson-Williams, a farm management firm in Fairmont, Minnesota, owned by James Lambert, is at the forefront of this agricultural export. The company employs 10 full time and 50 seasonal employees and had 1990 sales of $2.5 million.

The San Francisco (California) branch office of Japan's Nishimoto Trading Co. is the buyer of Jameson-Williams' edamame. Nishimoto is an importer and wholesaler of processed foods for Japan. Eiji Watanabe is the trading company's general manager.

"Duaine Flanders, technical services manager of the Agriculture Utilization Research Institute (AURI) in Morris, worked with the company to develop the technical expertise needed to process and handle edamame."

"With the help of a $50,000 matching grant from the Mid-America Agri-Trade Council (MIATCO), supported by the federal Foreign Agricultural Service, Jameson-Williams will be able to intensify promotion of its edamame know-how in Japan and Australia."

A photo shows James Lambert with Mike Nishihara (president) and Eiji Watanabe (general manager) of Nishimoto Trading Co.

9765. Takahama, Akihiro; Kuze, Jiro; Okano, Satoko; Akiyama, Kyoko; Nakane, Toshio; Takahashi, Hiroshi; Kobayashi, Takeshi. 1991. [Production of lactosucrose by *Bacillus natto* levansucrase and some properties of the enzyme]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 38(9):789-96. [Jap; eng]
• ***Summary:*** Lactosucrose was produced from the mixture of sucrose and lactose by the enzyme levansucrase, produced by *Bacillus natto.* Address: 1-6. Nagatanien Honpo Co., Ltd.

9766. Kennedy, J. Robert. 1991. History of Chico-San's distribution and import operations (Interview). *SoyaScan Notes.* Oct. 3. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Chico-San never really developed its own distribution company. It used other established distributors, such as Balanced Foods in New Jersey, K&L (Kahan & Lessin) in Los Angeles, Landstrom in San Francisco, and Health Foods Incorporated in Chicago. "We had a tough time getting started in selling macrobiotic foods. Chico-San also sold a lot of macrobiotic foods through its mail-order service because most of the large distributors only wanted the best-selling items such as rice cakes, soy sauce, and sesame salt; they wouldn't take the complete macrobiotic line." In late 1962, shortly after the company was established, Chico-San got a few vans and began a few small routes down to the San Francisco Bay Area and as far north as Redding, distributing 2 types of whole-grain bread (a rice loaf and an unleavened whole-wheat bread) and gluten-nut crackers to the Berkeley Co-op and established (old-line) health food stores. The Berkeley Co-op was one of the first to carry the full line of macrobiotic products. These routes continued until about 1964-65.

Chico-San's first really successful product was rice cakes. They were introduced in 1963 but initially the big distributors showed no interest. That changed starting in about 1964 when a new generation of rice cake machines began to make a better product and a few of the big distributors started to carry them. By 1965 Chico-San's rice cakes and other popular products were being sold at more than 150 California outlets. It was the national popularity of the rice cakes that kept Chico-San from developing its own distribution company, and relying instead on large established distributors–and later brokers.

By about 1966-1967 rice cakes and rice chips (*senbei*) were beginning to cut a wedge into the mass market nationwide, so Chico-San created the Spiral Foods brand for these mainstream products, keeping the Chico-San brand for the health food market.

Concerning imports of miso and soy sauce from Japan, Chico-San first imported directly from George Ohsawa; he located the manufacturer, put the order together, and shipped it himself. Then came Nippon C.I., which was started by George and some of his disciples in Tokyo, but it didn't last very long. In 1966 Chico-San started importing from Muso Shokuhin in Osaka. But after Muso started selling a lot to Erewhon (which became a major competitor for Chico-San), Bob felt that product quality began to decline, so he began to do all his importing from Ohsawa Japan, a company that was developed by George's sister-in-law (Lima Ohsawa's sister), Flora Tanaka, at George's request. Bob felt the quality of products from Ohsawa Japan was better than from Muso, but the prices were higher and the company was not quite as professional in its business dealings.

Concerning the sale of Chico-San to Heinz, Bob is overall not very happy with the outcome. Granted, rice cakes are now much more widely known and sold in supermarkets, but the loss of Chico-San "put a big hole in the process of selling macrobiotic foods." Bob and Herman Aihara bought back the macrobiotic line from Heinz and created Ohsawa America in Chico to try to sell it. Early general managers were Marty Roth, then Lane Seiger (who had previously worked for Bob at Chico-San). But the volume was not there on relatively few products to sustain a company profitably and eventually the company ran up debts of $300,000. At that point Bob basically gave the company to Sierra Natural Foods in Brisbane, California. Sierra had several thousand

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products; they only paid for the inventory. Bob is now working to develop new products from rice–such as a rice-crust pizza and crackers. Address: Chico, California. Phone: 916-891-0970.

9767. Shindler, Merrill. 1991. Affordable feasts: Japanese spots that offer more than just sushi. *Daily News of Los Angeles* (*California*). Oct. 10. p. L13. Valley edition. L.A. Life section.
• ***Summary:*** This review of the Japanese sushi bar Musashi in Northridge states: "As a sort of pre-appetizer appetizer, there's a wonderful little snack called edamame ($2.50), which is nothing more than a big bowl of boiled fresh soybeans, a dish found in every sake bar in Tokyo. You eat them by squeezing the slightly furry shells, until the little green beans inside pop out. They're more addictive, by far, than pistachio nuts."

9768. Rose, Richard. 1991. Highlights of the NFM Natural Foods Expo at Baltimore, Maryland (Interview). *SoyaScan Notes.* Oct. 11. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Sojasun, a soy yogurt made in France [by Triballat], was the best new product at this year's autumn show in Baltimore, held the first week in September. The flavor and texture were superb. Their agent in the USA is looking for an American company to manufacture the product and do a joint venture.

Nichii Co. of America had a huge exhibit, perhaps 4 booths, for their MicroSoy Flakes. Neither Richard nor anyone he has talked to can understand what Nichii is doing, or why anyone would want to buy their product. Yet many people are happy to be working with them since they seem to have a lot of money and they pay promptly. Perhaps they can see something that those who have been in the U.S. tofu and soymilk industry for many years cannot yet see.

Richard's fat-free version of TofuRella (named Heart's D'Lite) will be out by Nov. 1, and the individually wrapped slices by Dec. 1. A 100% casein-free cheese alternative and a soft cream-cheese type product are also in the works.

On Sept. 15 Sharon broker her leg in a freak rambunctious dog vs. owner accident. She is on involuntary sabbatical.

In about May 1991 Richard moved his business out of his home at 9709 St. Helena Rd., Santa Rosa, CA 95404-9623 into larger quarters at 616 Davis St., Santa Rosa, California. Address: P.O. Box 5020 (616 Davis St.), Santa Rosa, California 95402-5020. Phone: 707-963-8628.

9769. Gilbert, Linda C.; Starr, Sara M. 1991. Natural foods companies broaden their horizons: Organic, vegetarian, convenience dominate industry. *Food Business* 4(20):44. Oct. 21.
• ***Summary:*** Discusses these three industry trends, plus San-J International, White Wave, and Lightlife Foods.

San-J will be introducing its OCIA organic certified tamari gold label in November. The 10-ounce product will sell for the same price as its non-organic counterpart. "While the majority of White Wave's $3 million sales still come from tofu, tempeh products reportedly are not far behind. The company says it is growing at about 30 percent annually, and its first and second generation tempeh products are achieving more than 100 percent growth. White Wave's latest offering is a soy yogurt product called Dairyless that is made with live active yogurt cultures, including acidophilus and bifidus. Lightlife Foods, another major soy foods company, has redesigned its logo and added two new products, a vegetarian chili and a sloppy joe mix, both made with tempeh." Address: 1. President; 2. Vice president. Both: HealthFocus Inc., Emmaus, Pennsylvania. Phone: (215) 967-2233.

9770. American Soybean Assoc. 1991. Soybean Association facts: A partnership for progress (Leaflet). St. Louis, Missouri. 1 p. Front and back. 28 cm.
• ***Summary:*** Contents: People and programs. Policy. Domestic promotion. Research. International promotion. Industry information.

"Soybeans represent the third largest cash crop in the United States. Nearly 40 percent of U.S. production goes into the export market, with Japan being the single largest importer... 32,000 farmers are dues-paying members of ASA."

Soybean oil-based inks were first used commercially in 1987. Today one-half of all daily U.S. newspapers have made the switch to soybean oil ink. Address: P.O. Box 41-9200, St. Louis, Missouri 63141-9200. Phone: 1-800-688-7692.

9771. Ebine, Hideo. 1991. Nutritive value and physiological function of miso. In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 89-94. [17 ref]
• ***Summary:*** In 1989, approximately 599,000 tonnes of miso were produced commercially in Japan; of this, 80% as rice miso, 10% barley miso, and 10% soybean miso. In addition, an estimated 40,000 tonnes of miso were made at home. Per capita consumption was 5.2 kg/year. 90% or more of all miso in Japan is used as an ingredient in soups. Table 1 shows the 3 basic varieties of miso (rice, barley, and soybean), the 8 subvarieties based on taste and color, and the principal areas where each subvariety is produced. Discusses the basic process for making miso, the chemical composition, fatty acid composition and vitamin and mineral composition of 5 basic types, plus the amino acid composition of 4 basic types. Research is summarized which indicates that miso consumption reduces gastric cancer mortality (Hirayama 1984), miso contains an antimutagen against benzo(a) pyrene and trp-p-1 (Kitamura 1984), miso reduces hepatic

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[liver] tumors caused by neutron radiation of mice (Ita et al. 1989), a miso component depresses tumor formation by Sarcoma-180 inoculated in mice (Miyazaki 1989), salt-free miso has a cholesterol-lowering effect (Horii et al. 1990), and regular miso has antioxidative activity (H. Kato, 1989). Address: Central Miso Research Inst., Shinkawa 1-26-19, Chuo-ku, Tokyo 104, Japan.

9772. Fukushima, Danji; Motai, Hiroshi. 1991. Antimicrobial activities of soy sauce and manufacturing of preservative-free low-salt soy sauce including productions through bioreactor systems. In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 113-20. [17 ref]
• ***Summary:*** Soy sauce is generally very resistant to the growth of microorganisms because of its high salt content (16.9% w/v for regular koikuchi shoyu). Nevertheless, a special microorganism such as *Zygosaccharomyces rouxii,* can grow atop soy sauce even under these circumstances. Therefore preservatives such as sodium benzoate or n-butyl-p-hydroxybenzoate have been used. However consumers now want soy sauce without preservatives and with reduced salt. Soy sauce containing either 9% or 13% salt is now available.

As the salt content of shoyu increases, the water activity decreases. Most microorganisms cannot grow when the water activity is below 0.9 which corresponds to a 14% salt solution. Soy sauce naturally contains two microbicidal (antimicrobial) substances: Alcohol (typically 2.5%) and organic acids (such as lactic, acetic, and citric acids).

"There are two basic methods for preparing preservative-free low-salt fermented soy which are quite different. One is prepared by removing some quantities of salt from ordinarily made soy sauce (method A). The other is produced by adjusting the salt content by the addition of water to specially made low-salt high-nitrogen soy sauce (method B)."

"Most of the genen-shoyu on the Japanese market are prepared by electrodialysis through ion exchange membranes by the method A described above. The consumption of genen-shoyu is grown steadily on the today's Japanese market and the production is estimated to be about 1% of total soy sauce consumption (Hirose, 1989). Usujio-shoyu is mainly produced by the method B and the total production marked by JAS was 15,345 kl in 1988." Address: Kikkoman Corp., 1-25 Kanda Nishiki-cho, Chiyoda-ku, Tokyo 101, Japan.

9773. Harada, K.; Hossain, K.G. 1991. Genetic variation of protein composition in soybean seeds. In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 85-87. [6 ref]
• ***Summary:*** "Soybean seeds contain between 35 and 45% protein on a dry weight basis, of which about 70% consists of the two major storage proteins, 7S globulin (Beta-conglycinin) and 11S globulin (glycinin). The 7S globulin is a glycoprotein containing mannose and glucosamine... The 11S globulin is a simple protein composed of six intermediary subunits... The 11S globulin contains more sulfur-containing amino acids than the 7S globulin (Fukushima 1968)."

"About a thousand soybean accessions were screened for variation in subunit composition by SDS polyacrylamide gel electrophoresis (SDS-PAGE) and alkaline urea polyacrylamide gel electrophoresis (AU-PAGE)... The 11S/7S ratio ranged from 0.3 to 4.9." Address: National Inst. of Agrobiological Resources, Tsukuba, Ibaraki, Japan.

9774. Kitamura, Keisuke. 1991. Breeding high quality soybeans for food processing in Japan. In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 81-84. [18 ref]
• ***Summary:*** All soybeans grown in Japan are used to make soybean-based foods in Japan. Progress has been made in breeding soybeans to increase the content of sulfur-containing amino acids, as well as improving the food-processing quality by using mutants lacking or with lowered subunits of 7S and 11S globulins, and eliminating the lipoxygenases which are responsible for the for the generation of objectionable beany flavors using 3 types of mutants lacking the isozymes L-1, L-2, and L-3 respectively.

7S and 11S globulins are the two major proteins which amount to about 70% of the total seed proteins... 11S globulin contains 3 to 4 times more methionine and cysteine per unit protein than that of 7S globulin. Furthermore, it was reported that the two globulins have very different functional properties in soy protein foods: the isolated 11S globulin fraction formed a much harder Tofu-gel. These reports suggest that the genetic reduction of the 7S globulin content in the seeds may improve the nutritional and food-processing qualities of soybean."

"Matsuura *et al.* (1989) reported that Beta-glucosidases in soybeans are responsible for the production of daidzein and genistein from the isoflavone glucosides, daidzine and genistin, respectively during the processing of soy milk manufacturing. Because the isoflavone aglucones have more intense astringent and bitter taste than the isoflavone glucosides (Okubo *et al.* 1983), the increase of daidzein and genistein in soy milk by the action of the Beta-glucosidases causes the objectionable aftertaste of soybean products...

"So, if we could develop a new type of soybeans lacking or lowering the Beta-glucosidases in addition to the complete lack of the seed lipoxygenase isozymes, it would be an ideal soybean type for the manufacture of soy milk and related new soybean foods." Address: National Agricultural Research Center, 3-1 Kannondai, Tsukuba, Ibaraki 305,

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Japan.

9775. Matsumura, Yasuki; Kang, I.J.; Mori, Tomohiko. 1991. Instrumental method for evaluation of mechanical/textural properties of soy protein gels. In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 121-26. [11 ref]
Address: Research Inst. for Food Science, Kyoto Univ., Uji, Kyoto 611, Japan.

9776. Matsuura, M.; Obata, A.; Fukushima, D. 1991. Long-life packed tofu in the United States. In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 37-40. [12 ref]
Address: Food Research Lab., Kikkoman Corp., Noda City, Japan.

9777. Mukaiyama, Megumi. 1991. The textured whole soybean product: Its process and properties. In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 69-74. [6 ref]
• ***Summary:*** Asahimatsu's product is called TWSP (Textured Whole Soybean Product). It comes in fibrous, flaked, and granular forms. Address: Supply Section of Asahimatsu Foods Inc., 1008 Dashina, Iida-shi, Nagano 399-25, Japan.

9778. Murasawa, H.; Sakamoto, A.; Sasaki, H.; Harada, K. 1991. The effect of glycinin subunit on tofu-making. In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 53-57. [8 ref]
• ***Summary:*** The presence or absence of an acidic subunit A-4 of glycinin has significant effects on the gelling properties of soymilk and tofu gel hardness. It is easier to make nigari tofu with a smoother and more uniform gel using the soymilk lacking A-4. Address: 1-3. Asahi Industries Co. Ltd., 2-17-8 Mochida, Gyoda, Saitama, Japan; 4. National Inst. of Agrobiological Resources, 2-1-2 Kannondai, Tsukuba, Ibaraki, Japan.

9779. Noguchi, Akinori; Isobe, Seiichiro; Uemura, Kunihiko. 1991. New process of meat analog with twin screw extruder. In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 59-63. [14 ref]
• ***Summary:*** Contents: Introduction. Wet texturization of defatted soy flour. Properties of the protein extrudate. Injection molding. Reactions of Protein. Phase separation and formation of a fibrous structure. Die Opening. Possible model for texturization of high moisture DSF. Address: National Food Research Inst., 2-1-2 Kannondai, Tsukuba, Ibaraki 305, Japan.

9780. Ohara, Tadahiko. 1991. New methods of coagulation process of soy-milk based on computerized measurements of electric conductivity and torque. In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 103-111. [14 ref]
• ***Summary:*** The coagulation step is crucial to make good quality tofu. Powdered calcium sulfate (*sumashi-ko*) is the easiest coagulant to use, but if too much is used, it impairs the tofu flavor. Tofu coagulated with nigari (magnesium chloride) has excellent flavor, but it is difficult to use because the optimum concentration level is very narrow/limited and the coagulation reaction takes place rapidly. Calcium chloride gives the hardest, most condensed tofu, and is used in making dried-frozen tofu and tofu pouches; when a softer texture or smoother taste is desired, magnesium chloride may be partly added.

Industrial production of dried-frozen tofu ("kori-tofu") has developed mostly in Nagano prefecture since 1950. The total value of the annual production of the 9 factories in Nagano prefecture alone exceeds 12,000 million yen, or 80 million U.S. dollars. A single vat ("reaction vessel") in which soymilk is coagulated may contain 500 to 2,000 liters of soymilk.

This study was designed to develop new methods for (1) measuring rapidly the required amount of any coagulant, (2) obtaining information that will affect the optimum concentration of the coagulant used, and (3) establishing an automatic coagulation process that is not dependent on the judgment of a skilled workman.

It was found that by measuring the conductivity and torque of the coagulating soymilk, displaying the results, and stopping addition of coagulant when these values reach a certain level, the process can be automated. Address: Nagano State Lab. of Food Technology, 205-1 Kurita, Nagano city, Nagano-ken 380, Japan.

9781. Okubo, Kazuyoshi. ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. Published by the Japanese Committee. Printed by Sendai Kyodo Printing Co., 2-4-2 Hinode-machi, Miyagino-ku, Sendai 983, Japan. 130 p. Held 25-29 June 1990 at Gongzhuling, Jilin Province, China. Illust. No index. 26 cm. [Jap; eng]
• ***Summary:*** These are only the papers presented by the Japanese participants in this international conference: K. Okubo, K. Kijima, S. Saito, T. Inoue, and T. Watanabe. Each of the papers is in Japanese with an English abstract. It was printed by Sendai Kyodo Printing Co. No publisher is listed. The book can be ordered from the editor.

Pages 1-26 are entirely in Japanese. Pages 27-130 are in English. Pages 27-34 contain the program for the

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5-day conference. Individual English-language papers are cited separately. Address: Prof., Tohoku Univ., Faculty of Agriculture, Dep. of Food Chemistry, Food Biotechnology, 1-1 Tsutsumitori Amamiya-cho, Aoba-ku, Sendai 981, Japan. Phone: 022-272-5321 X-338.

9782. Omura, Yoshimasa; Takechi, Hironori; Hayashi, Katsuo. 1991. Improvement of soymilk flavor for new soymilk products. In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 41-46. [7 ref]
• ***Summary:*** "The method developed consists of the soaking of soybeans in water (15ºC, 18 hours) and the immersion of the soaked soybeans in hot water (70ºC, 5 minutes) before grinding. The treatment with hot water reduced the n-hexanal content in soymilk to about 1% of that in untreated one. It was shown that the reduction of n-hexanal was due to the inactivation of hydroperoxide lyase, not of lipoxygenase."

New products made from this bland tofu are: Tofu coagulated with citrus juice (*sudachi, yuzu*), tofu noodles containing dietary fiber, and fried fish cake containing tofu. Address: Tokushima Prefectural Food Research Inst., 2-41 Akui-cho, Tokushima 770, Japan.

9783. Saio, Kyoko; Watanabe, Tokuji. 1991. Food use of soybeans in Japan. In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 35.
• ***Summary:*** In 1988 some 47,000,000 tons of soybeans were consumed in Japan; 79% of this amount was used to make edible and 19% (8,900,000 tons) was used for foods. In the process of making edible soy oil, more than 3,000,000 tons of defatted soybean meal were produced; 89% of this was used as livestock and poultry feeds, and 12% was used in foods (mostly for soy sauce, but with some for soy protein products and others). There has been a rapid increase in consumption of edible oil and defatted meal in Japan, accompanied by an increase in animal protein in the diet.

In 1988 Japan produced only 290,000 tons of soybeans domestically, and most of this amount was used for foods, especially tofu (60%), miso (24%), natto (9%), and other foods (dried-frozen tofu, yuba, kinako, etc.). The consumption of these foods has risen proportionally to the increase in Japan's population, which means that over all per capita consumption is static.

A recent survey conducted in Japan showed that 82% of Japanese ate soyfoods more than 3 times/week, and that Japanese people had a rather good image of these foods, describing them as healthy, natural, tasty, good for daily use, inexpensive, and delicious.

Japanese enjoy both traditional and modern soyfoods. The technologies for making "Vegetable Protein Products" from soybean meal have been introduced from the USA since 1970, but these have been modified and adapted to suit Japan's tastes and needs. "The importance of soybean foods in Japanese dietary life cannot be too much emphasized. We love them as traditional but also new foods." Address: 1. Research Council Secretariat, MAFF; 2. Tokyo Metropolitan Food Technological Research Center. K. Saio is presently at: National Food Research Inst., MAFF, 2-1-2, Kannondai, Tsukuba 305, Japan.

9784. Shiraiwa, Masakazu; Nakashima, H.; Yamamoto, N.; Tamura, T.; Matsuda, S.; Okubo, K. 1991. Soybean saponin: Structures and physiological properties, especially antiviral activity in HIV *in vitro*. In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 95-101. [20 ref]
• ***Summary:*** The saponins in soybeans are well known to impart an undesirable flavor to some soyfoods. But this report suggests that soybean saponin Bb, the main constituent in the soybean seed, has inhibitory activity against HIV infection. The soybean seed contains about 2% of glycosides, which are composed of several kinds of saponins and isoflavonoids. There are five different kinds of saponins, named soyasaponin A-1, A-2, I, II, and III. Figure 1 shows the structure of each as elucidated by Kitagawa et al. (1974-1985). The authors analyzed the saponin composition of 457 soybean varieties. As a result, six "group A saponins," four "group B saponins," and two "group E saponins" which possess soyasapogenol A, B and E as the aglycone, respectively, have been isolated from the hypocotyl and cotyledons of the soybean seeds, individually named (Aa, Ab, Ba, Bb, etc.), and fully characterized. The chemical structure of soybean saponin is very similar to that of glycyrrhizin, which is known to have a suppressive effect on HIV replication *in vitro*. Address: 1&6. Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., 1-1 Tsutsumitori Amamiya-cho, Aoba-ku, Sendai, Miyagi-ken 981, Japan; 2-3. Dep. of Virology and Parasitology, Yamaguchi Univ. School of Medicine, 1144 Kogushi, Yamaguchi 755, Japan; 4-5. Asahi Chemical Indust. Co. Ltd., 1-1-2 Yuraku-cho, Chiyoda-ku, Tokyo 100, Japan.

9785. Smoky Mountain Natural Foods. 1991. Fall/Winter 1991. Natural foods price list [Mail order catalog]. 15 Aspen Court, Asheville, North Carolina 28806. 23 p. 28 cm.
• ***Summary:*** This is a "Catalogue of natural foods, body care and home products for a healthier, more natural way of life." This mail-order company, which began operation in Jan. 1991, sells products made by other companies; it does not do any manufacturing and does not have its own brand on any products. Their specialty is macrobiotics products, and they buy their Japanese imports from Macrobiotic Wholesale Co. They sell miso (Miso Master American Miso, Mitoku Japanese miso, Traditional Foods domestic miso, and instant miso soups from Edward & Sons), black soybeans and azuki beans (organic are grown in the USA, non-organic

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from Hokkaido), sea vegetables, soy sauce (San-J shoyu and tamari, Mansan tamari, Sakae shoyu, Johsen shoyu), San-J teriyaki sauce and Szechuan sauce, Nasoya dressings and Nayonaise, Natto miso chutney, Sesame miso sprinkle, Tekka condiment (jar or bag), jinenjo tekka, MMB [Mitoku Macrobiotic, a premium brand] organic farmhouse tekka, seitan, MMB traditional dried tofu, Tofu burger, scrambler, and stroganoff, Sweet Cloud sesame miso munchie, Sweet life miso candy.

John Troy is not connected to this company, nor is John Belleme; John is the wizard, and now he makes sauces from the Wizard's Cauldron. He also works with John Belleme at Traditional Foods making seitan. Address: North Carolina. Phone: 1-800-926-0974.

9786. *SoyaFoods* (*ASA, Europe*). 1991. 'Tonyu' launched in France. 2(2):2. Autumn.
• ***Summary:*** The French soyfoods association, SOJAXA, has decided to use the Japanese term, 'tonyu,' which means soymilk, as their official name for products formerly called soyamilk or soyadrink–because of labeling difficulties in France. SOJAXA held a press conference in Paris to launch the name and promote soyfoods in general.

The group also presented the results of the second half of their consumer survey. In 1991 some 41% of those polled reported a knowledge of at least one soya product, up 6% over 1990. Some 21% of respondents had consumed at least one soya product, but only 6% consumed soya products regularly. Soya drinks and desserts (in a variety of flavors) were the most popular, followed by tofu and other products. SOJAXA is located in Toulouse, France.

9787. Tanaka, Haruo. 1991. Effects of defatted soy flour treated by twin-screw extruder on the properties of *surimi.* In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 65-67. [6 ref]
• ***Summary:*** Defatted soy flour treated by a twin-screw extruder was found to be effective in improving the quality of surimi and surimi-based products. Kamaboko (fish meat gel products) prepared from surimi added to these powders became harder and more elastic than that of the control. Address: Food Research & Development Labs. of Ajinomoto Co., Inc., 1-1 Suzuki-cho, Kawasaki 210, Japan.

9788. Tsukamoto, Chigen; Kawasaki, Yoshihiro; Iwasaki, Tsutomu; Okubo, Kazuyoshi. 1991. A process for the removal of glycosides during tofu production and an evaluation of the marketability of the final product. In: K. Okubo, ed. 1991. Japan part of Proceedings of the International Conference on Soybean Processing and Utilization. 130 p. See p. 47-51. [15 ref]
• ***Summary:*** Soybean seeds contain large amounts of glycosides (such as saponins and isoflavonoids), which have undesirable tastes. This is one reason why soybean foods have not received greater worldwide acceptance. An improved method for making tofu has been developed. "This comprises removal of the soybean hypocotyl fraction, the separation of the soymilk before heating, and the introduction of a defoaming step during heating. On the basis of this proposal, Taishi Foods Co., Ltd. has constructed a new factory which can treat 420 kg of soybean per hour, the products have been marketed since Aug. 1986. This new tofu process provides products which are well accepted by Japanese consumers." This tofu, named "Daigaku Tofu" ("University Tofu") has been sold since Aug. 1986 in Sendai City. On a taste panel test of 27 consumers living in Sendai city, it received significantly higher scores than both soft and firm tofu for taste, flavor, smoothness, and overall acceptability.

At the Taishi Foods factory, removal of the seed coat and hypocotyl is performed by a grinder, which brushes down and strips off these fractions at room temperature (not in excess of 40ºC). After an initial washing, the grinding process takes place, conducted first by a line cutter to make small pieces of soybeans (about 3 mm cube). Water at 50ºC is added and the soybean paste is produced in a colloid mill. This paste is separated into soymilk and insoluble matter (okara), below 50ºC, usually in a centrifuge. Water is again added to the okara and the soymilk re-extracted. The soymilk thus obtained is defoamed with a vacuum pump, preheated to 70ºC using a plate type heat exchanger, then heated with a high temperature, short time, steam injector for about 30 seconds to around 115ºC. After such heating, the soymilk is cooled to 65ºC through a vacuum chamber, the concentration adjusted if necessary, and then kept in a holding tank awaiting tofu preparation. Both both soft silken tofu (kinugoshi) and regular (momen) tofu are produced at the Furukawa factory in the early hours of the morning to allow delivery of the goods to market in the early morning. This tofu contains half the glycosides of regular tofu. Address: 1&4. Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., 1-1 Tsutsumitori Amamiya-cho, Aoba-ku, Sendai-shi, Miyagi-ken 981, Japan; 2-3. Taishi Foods Co. Ltd., 68 Okinaka, Kawamorita, Sannohe-machi, Sannohe-gun, Aomori 039-01, Japan.

9789. Takai Seisaku-sho. 1991. [Takai corporate guide]. 1-1 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan. 8 panels. Nov. 1. 30 cm. [Jap; eng]
• ***Summary:*** This color brochure, containing 5 color photos, is written in both Japanese and English. It notes that (as of 1 Nov. 1991) Takai has exported its tofu and soymilk equipment to 140 cities of 30 countries, including Bhutan, Bolivia, Brunei, Burkina Faso, Egypt, Finland, India, North Korea, Mexico, Nepal, Philippines, Spain, Sri Lanka, Sweden, Switzerland, and Thailand.

A chronology of the company states that in July 1917

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Kamejiro Takai, a former president, founded Takai & Brothers Co. It was renamed Takai Sesakusho in Jan. 1946. Address: Kanazawa, Ishikawa-ken, Japan. Phone: 0762-48-1355.

9790. *Toyo Shinpo* (*Soyfoods News*). 1991. Daitokuji nattô-iri wagashi: Kyoto–Murasaki-Take no "Nattô Matsukaze" [Japanese confection contains Daitokuji natto: Natto Matsukaze, made by Moriguchi Kakô Shokuhin in Kyôto]. Nov. 4. p. 3. [Jap]
• ***Summary:*** Name of the confection: Natto Matsukaze. Name of manufacturer: Moriguchi Kakô Shokuhin. Brand: Murasaki-Take. A photo shows the product in a stylish little cloth or paper pouch. Address: Kassui Joshi Tanki Daigaku, Japan.

9791. Pearce, Jean. 1991. Getting things done: Tribute to a miracle. *Japan Times* (*Tokyo*). Nov. 10. [Eng]
• ***Summary:*** "Some time ago I offered to print recipes for natto as a service to those who were disappointed that a natto cookbook was not available in English. There were no responses. Apparently no one has a favorite recipe. Now there is a letter from a reader who says she doesn't like natto but she wants to learn to because of its nutritional value. Please, she says, print some natto recipes.

"I checked my Japanese cookbooks but none listed natto in the index. The basic recipe is, eat it with rice.

"There was one exception, *The Book of Soba,* by James Udesky. His description may explain why it is not listed in other English-language cookbooks." There follows a quotation about natto from Udesky's excellent book–which is much more than a cookbook.

A small portrait photo shows Jean Pearce.

Note: The date of this article may be Nov. 10. Address: Columnist.

9792. Wong, Anson. 1991. Global Protein Foods in Valley Cottage, New York (Interview). *SoyaScan Notes.* Nov. 12. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Global Protein Foods hopes to be ready to start tofu production in about 2 months or less. Mr. Yasuo Hachijin is presently at the plant in Valley Cottage, and some Takai workers (Mr. Tsunoda) are installing a Takai tofu production system. Valley Cottage is in Westchester County, about 45 miles or a little less than 1 hour drive north of Manhattan, across the river from White Plains to the west. They plan to start with a 6-product line: silken tofu, firm tofu, extra firm tofu, fried tofu (thick or thin), and a dessert tofu. They are experimenting with fruit flavored tofu, a yogurt-like product, etc. They will be targeting their products to two markets: the American market and the Japanese market. The brand for the Japanese market will be something like Kyozen-nen (which is established in Japan), and for the American market G.P. Initially, the company will be focusing its marketing efforts on the tri-state area, which consists of New York City, Connecticut, New Jersey, and possibly maybe a little bit of Pennsylvania. This is equivalent to a 50-mile radius from the plant. Their main competitor in the American market is Nasoya, whose tofu is also the most expensive but the taste and quality are very good. There are many competitors in the Japanese market: Mori-Nu, Kikkoman, and Kyoto-Foods (from Terre Haute, Indiana–their tofu is "very good"). Mr. Hachijin is also involved with Kyoto Foods, but he sees them as a competitor.

Anson's background is in the plastics industry; the food industry is new to him. He went to the recent Natural Products Expo in Baltimore, Maryland. Address: Sales Manager, Global Protein Foods, 707 Executive Blvd., Building E., Valley Cottage, New York 10989. Phone: 914-268-8100.

9793. *Coo* (*ku:*). 1991. Tôfu wa idai: Tôfu no miryoku menû 50 [Tofu is great: 50 attractive tofu menus]. Vol. 1. p. 1-164. Nov. 20. [Jap]
• ***Summary:*** This beautiful special first edition of this Japanese magazine, published by K.K. Shôdensha in Tokyo, is packed with hundreds of superb color photos. Devoted entirely to tofu, it shows a multitude of the many facets of tofu in Japanese cuisine and culture.

9794. *Toyo Shinpo* (*Soyfoods News*). 1991. Mame ga fukkura genmaiiri nattô: Takano Fuuzu ga hatsubai [Natto made with the addition of brown rice has a nice soft texture, like that of beans: Takano Foods starts to sell it]. Nov. 21. p. 3. [Jap]

9795. Food and Agriculture Organization of the United Nations (FAO), Statistics Div., Basic Data Unit. 1991. FAO food balance sheets, bilans alimentaires, hojas de balance de alimentos, 1984-1986 average. 00100 Rome, Italy. xx + 384 p. No index. 30 cm. [Eng; Fre; Spa]
• ***Summary:*** This book is written in 3 languages: English, French, and Spanish. Prepared by the Statistics Div. of the Economic and Social Policy Dept. of FAO in Rome, it gives food balance sheets for 3-year periods (e.g. 1961-63, 1964-66, 1986-88, etc.) for 145 countries (including mainland China but not Taiwan). The introduction discusses: Food balance sheets–what they are and how to use them. Accuracy of food balance sheets. Concepts and definitions: Commodity coverage, supply and utilization elements (production, imports, stock changes, exports, processed trade, domestic supply, feed, seed, food manufacture, other uses, waste, food, per caput supply), Population coverage. Units and symbols. Country coverage: Statistics are given for the world, developed countries as a group, developing countries as a group, 34 individual developed countries, and 111 individual developing countries.

Soybeans are included under the heading "oilcrops" (*oléagineux, semillas oleaginosas*), along with 8 other

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individual oilcrops plus "others." Soybean oil is included under the heading "vegetable oils" along with 11 other individual vegetable oils plus "others."

For each country, two tables are given. In the first table, per capita food supply, foods are divided into the following commodity groups: grand total, vegetable products, animal products, cereals (excluding beer), starchy roots, sweeteners, pulses, nuts and oilseeds, vegetables, fruit (excluding wine), meat and offal, eggs, fish and seafood, milk (excluding butter), oils and fats (subdivided into vegetable oils, and animal fats), spices, stimulants, alcoholic beverages, miscellaneous. For each 3-year period the following statistics are given for each commodity group: kilograms/year, calories/day, protein (grams/day), and fats (grams/day). Thus, for the Japan (for example), we can see that grams of protein per day from "nuts and oilseeds" increased from 9.8 in 1961-63 to 10.3 in 1986-88. This is the closest we can get to a figure for soyfoods consumption from this table.

The second table gives average annual domestic supply for the period 1984-86 (broken down into production, imports, stock changes, exports, processed trade, total), domestic utilization (broken down into feed, seed, food manufacture, other uses, waste, food), and per caput supply (broken down into kg/year, grams/day, calories/day, protein [gm/day], and fat [gm/day]), for specific foods within each of the major commodity groups. Thus, for Japan, we see that for soybeans during 1984-86, production was 237,000 tonnes (metric tons), imports 4,747,000 tonnes, stock changes 35,000 tonnes, exports 0, processed trade 2,000 tonnes, total domestic supply 4,947,000 tonnes. For domestic utilization, 67,000 tones were used for feed, 8,000 tonnes for seed, 3,636,000 tonnes for food manufacture, 0 for other uses, 89,000 tonnes for waste, and 1,158,000 tonnes for food. The per capita supply was 9.6 kg/year or 26.3 gm/day. Each day this provided 98 calories, 8.9 gm of protein, and 3.7 gm of fat.

For many countries (including the USA and Brazil) no statistics are given for food use of soybeans or for any parts of per caput supply.

A ranking of the countries (not including Taiwan) with the highest per caput supply of soybeans (kg/year) and soybean protein (gm/day) is as follows: Japan 9.6, 8.9. North Korea 9.0, 8.5. Indonesia 7.2, 6.8. South Korea 6.4, 6.1, Hong Kong 3.9, 3.6. China (Mainland) 3.1, 2.0. Singapore 0.2, 0.1. Address: Rome, Italy.

9796. Fujimoto, Toshio. 1991. Nattô wa onshû o koete: Zen sekai ni nattô o haken shiyô [Natto transcends love and hate: Let's send natto throughout the whole world]. *Daizu Geppo* (*Soybean Monthly News*). Oct/Nov. p. 21-25. [Jap]
• ***Summary:*** Page 25 contains a sidebar announcing the Tempeh Research Society's Fukuyama Forum. Address: Chikyû Nattô Kurabu, Daihyo [World Natto Club, Representative].

9797. Lumpkin, T.A.; Konovsky, J. 1991. The vegetable soybean. In: G. Villanueva, J. Corven, and A. Campos, eds. 1991. Taller Regional Centroamericano y Consulta Sobre Planificacion de Investigacion Horticola, Programa II. AVRDC and IICA. See p. 297-306. Held 5-8 Nov. 1991 at Instituto Interamericano de Cooperation para la Agricultura (IICA), Costa Rica. [52 ref]
• ***Summary:*** Contents: Abstract. Introduction. History: China, Japan, Korea, North America. Quality. Variety selection. Production. Current research. Summary. Address: East Asian Crop Development Program, Dep. of Crop and Soil Sciences, Washington State Univ., Pullman, WA 99164-6420.

9798. Noguchi, Kazuko. 1991. Tenpe was Saga ni netsuku ka? Tsukuba (1985) kara Saga (1991) made [Will tempeh take root in Saga? From Tsukuba in 1985 to Saga in 1991]. *Daizu Geppo* (*Soybean Monthly News*). Oct/Nov. p. 26-31. [Jap]
Address: Prof., Saga Joshi Tanki Daigaku [Saga Women's Junior College].

9799. Silver, Jimmy. 1991. History of work with natural foods, Erewhon, Pure & Simple, and Pure Sales. Part I (Interview). *SoyaScan Notes*. Dec. 9 and 15. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jimmy was born on 21 March 1942 in Philadelphia, Pennsylvania. His father was an officer in the Army Medical Corps. After a brief stay in Baltimore, when Jimmy was in 4th grade, the family moved to Manhasset, Long Island, New York. He grew up there and graduated from high school. He graduated from Oberlin College in Ohio, then did graduate work at the University of Illinois in the Inst. of Labor and Industrial Relations. He finished his course work after 18 months, but did not write his thesis, then went to New York as a labor organizer. After receiving a draft notice during the Vietnam War, he enrolled in the University of Michigan at Ann Arbor studying Medical Care Organization. Again he completed his course work for the doctoral program, but facing the doctoral thesis, he dropped out in 1967 or 1968.

He was briefly introduced to natural foods and macrobiotics in 1967 in Ann Arbor by a friend named Earl Rosner. One day, in the midst of the psychedelic counterculture he had a deep inner realization that Americans were destroying their ecosystem, both within and without. He quit using psychedelics and began to eat only natural foods. He read *You are All Sanpaku* and *The Book of Judgment*, early macrobiotic works. He bought the books and "health foods" at an old-line health food store named Zerbo's, run by Harry Zerbo in nearby Livonia, Michigan. At the Kuwahara trading post in downtown Detroit he bought real Japanese food–such as various sea vegetables, soba, and

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noodles–and Koda Brothers Kokuho Rose brown rice.

At about this time (1967-68) Jimmy got into the music business, and was sort of in business with a poet named John Sinclair, who was a great bear of a man, who the media regarded as the Pharaoh of the Hippies, and who managed a band named the MC-5. Jimmy and John were partners in a production company named Trans-Love Productions–Gets You There on Time. Jimmy managed a rock group named Iggy Pop and the Stooges. After a few months John introduced Jimmy and Susan (his girlfriend of several years and wife to be) to Jim Semark, another poet who was into macrobiotics, Baha'i, and meditation. In mid-1968 Semark invited Jimmy and Susan to a macrobiotic cooking class taught by Michio Kushi at Semark's home in Detroit; then they soon met Michel Abehsera–who they thought was wonderful and very down to earth.

Jimmy and his wife, Susan, were married on 23 Oct. 1968 in Ann Arbor. He and Susan were in Ann Arbor at the time the food co-op changed into Eden Foods but they were never members of the co-op or the Zen Macrobiotic Supper Club–for reasons that he cannot now recall. He and Susan were loners and membership in such groups wasn't their style. Jimmy's parents still lived on Long Island in New York so when he and Susan visited them, they used to go into the city and buy foods from Arnie Greenberg (who owned Greenberg's, a Jewish deli-grocery store at 125 1st Ave., near Ratner's vegetarian delicatessen, in New York City). Arnie carried foods in bulk and packaged natural foods from suppliers such as Infinity. Infinity Foods was a small food warehouse on the 2nd or 3rd floor run by a bunch of Scientologists (including Howard Rower and Jason Hammond [son of John Hammond Sr. of Columbia Records and brother of the white blues guitarist John Hammond Jr. of John Hammond and the Nighthawks]) who were into macrobiotics and natural foods. Jimmy had their catalog and visited their warehouse. Located in downtown New York at 171 Duane St. on the west side near the commercial produce and meat area, Infinity started in the mid-1960s and was the first company to import macrobiotic foods from Japan–before Erewhon. The Erewhon retail store used to carry Infinity's products. Then Infinity fell on hard times and disappeared. Arnie would also ship him macrobiotic staples by Greyhound bus. He recalls Gloria Dunn, who looked like a gypsy, and he recalls Eden Organic Foods which was on the second floor of a building near downtown Ann Arbor. Shortly after Bill Bolduc started Eden, Jimmy and his wife left for Los Angeles with Iggy Pop.

Their first daughter, Rachel was born on 23 Jan. 1969 in Ann Arbor. He went to Los Angeles with his band in the spring of 1970. He played music at night then during the day would hang out at the Erewhon retail store on Beverly Blvd. in Los Angeles with Bruce Macdonald and Paul Hawken. He thinks that Michio Kushi had sent either Bill Tara, Bruce Macdonald, or Paul Hawken from Boston to open a branch of Erewhon in Los Angeles in about the summer of 1969. Years later when the store became a wholesale company, it was given the name Erewhon West, since it had different ownership from Erewhon in Boston. At the end of the summer of 1970, he and his wife moved to Los Angeles to live with Aveline Kushi, who had a house on Franklin Ave. in Hollywood. He wanted to work with Erewhon, not in the retail store on Beverly Blvd., but in the little warehouse that they were just acquiring kitty-corner to across the street from the retail store. In about 1970 it began wholesaling and distribution business. But when Jimmy returned in the fall, Hawken was gone; he had moved to San Francisco and gone to work with Fred Rohe. Hawken had apparently had a falling out with Michio and Aveline Kushi. So Jimmy worked with Bruce Macdonald ("a wild man then, as ever").

Jimmy and his family then moved to Boston, where they lived and worked from Dec. 1970 to 1976. Jimmy had been asked by Michio Kushi to take over the failing restaurants (Sanae and The Seventh Inn) in Boston. Both were owned by Sanae Corporation. Richard Sandler and Warren Durbin had grandiose plans to expand Sanae, so they opened The Seventh Inn on Boylston St. in Boston. It was an immediate failure and they struggled with it for years afterwards–then they just up and left. Paul Hawken at Erewhon had promised to help Jimmy with Sanae.

Then Jimmy worked in Los Angeles with Erewhon West (owned by John Fountain–John Deming was the financial backer) from 1976 to 1980. John Deming's family controls the Murphy Oil Co. in Louisiana and they are extremely wealthy. Erewhon West had financial troubles trying to compete with Nature's Best and K&L–big, established distributors. In 1980 Deming fired Fountain and was going to liquidate the company–just shut it down. So Jimmy and Jeff Hilgert bought the assets from Deming and in June 1980 they transformed Erewhon West into Pure Sales. The company has done various things over the years. Initially it sold natural food consumer products. John Fogg developed the excellent marketing concept for So Tamari in about 1981. When Erewhon went bankrupt in 1981, they voided their contract with Pure Sales to permit the use of their name for a royalty–so within 90 days Pure Sales eliminated the Erewhon name from all of their products; all of the Japanese products became "So'" products (So' Tamari, So' Ramen, etc.), a name Jimmy coined, which meant nothing but sounded Japanese. Continued. Address: President, Pure Sales, P.O. Box 5116, Irvine, California 92716-5116. Phone: 714-540-5455.

9800. Teeguarden, Ron. 1991. Founding and early history of the food co-op (in Ann Arbor, Michigan) that later became Eden Foods (Interview). *SoyaScan Notes.* Dec. 10. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Ron ran a business named the Teeguarden-Leabu General Store located in the basement of Marshall's

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Bookstore (that sold radical and anarchist literature), which was below the Herb David Guitar Studio at 209 South State Street a few blocks off Main Street in Ann Arbor. The store was financed by his partner and best friend Vic Leabu (pronounced luh-BOE then but luh-BUU now; it's Romanian not French), and Gloria Dunn worked there a lot. A very kind black lady named Rose from Marshall's Bookstore rented Ron and Vic the space for $50.00 a month because she liked the creative work they were doing and Marshall's was using the basement. The store sold antique clothing from the 1920s, art from local artists, and records; it was not a thrift store.

In about the summer of 1969 Ron and Gloria Dunn started a small food-buying co-op. The co-op was an eccentric, inventive, creative expression–and food was part of it. Co-ops were very new in those days. Within a few weeks some friends, who were also involved in macrobiotic cooking, joined the circle of people that were buying food together. These included Vic Leabu, Tim Redmond, Mark and Nancy Retzloff, and Bob Thorson. The informal group ordered food from Erewhon roughly 3-5 times; Gloria and Ron put together the orders which were probably pre-paid. When the food arrived, those who had participated in the order divided it up at the Teeguarden-Leabu General Store. Ron Teeguarden brought whole grains and miso into the co-op. Vic Leabu's influence gradually increased, while Gloria's declined. At the maximum, no more than 12 people were ever involved with the food co-op to which Ron belonged. It was never thought of as a business, it had no assets nor board of directors, and it never paid any money for the space that it used occasionally. It was just a bunch of people buying together.

When the co-op first started, there was only one little old-line health food store in Ann Arbor; the room was about 10 feet square and it did not sell natural or macrobiotic foods except very expensive brown rice in little bags.

To go back a bit: In early 1968 Ron felt he was becoming severely debilitated–from smoking pot (as was the fashion in those days) and the incessant pressure of being a varsity tennis player at Michigan on a full athletic scholarship and a pre-med student with a heavy academic load. In retrospect, he felt like he almost had chronic fatigue syndrome from burning the candle at every end. So he wrote a letter to George Ohsawa (not knowing that Ohsawa had died) asking for advice. He got a great letter back from Herman Aihara saying, in effect: "Eat miso soup and tekka every day, use them to help you give up coffee, and if you ever come to California, please come and stay with me." Ron was deeply impressed with Herman's kind and generous offer to a person he didn't even know. So Ron sold his dope to buy an airplane ticket to California, and appeared at Herman's door in long hair and a beard. They took him in and within a week his life changed and has never gone back. "It was a revelation." He became thoroughly macrobiotic, quit drugs, and returned to Ann Arbor; thereafter his memory became clearer and he dropped everything to start what has become a lifelong interest in Oriental medicine and healing. Ron notes: "I am eternally grateful to Herman as a great man." Shortly thereafter Ron and Iona, who had know each other for years but never gotten along well, were married; she then quit drugs, started a macrobiotic diet, joined the co-op, and soon became a fantastic cook. In 1971 she wrote a cookbook titled *Freedom through cooking: The macrobiotic way.*

Jimmy Silver was not a member of the co-op but he was a key influence because he had been macrobiotic for about 2 years, he had an advanced understanding of the philosophy and practice, he had long hair and was very hip, but he did not use drugs–which was very rare at that time. He was so healthy, his wife was very beautiful, and they were both very pure. He managed a rock group named the MC-5 whose motto was "Sex, drugs, and rock and roll." People looked up to him as the leader of the macrobiotic movement in Ann Arbor. Ron doesn't know where Jimmy got his food–he never came into the co-op. Nor does he recall that the co-op ever had a bank account and he does not see why they would have needed one.

But after 2-6 months the local health department wouldn't let them keep grains in the basement of Marshall's Bookstore, so they moved it to an upstairs location at 514 East William Street; that was when Bill Bolduc and Tim Redmond (with important guidance from Jimmy Silver and help from Mark Retzloff) began to organize the co-op and transform it into a company, which was first given a name–Eden Organic Foods. At that same time, Ron greatly decreased his involvement in the food co-op. He shopped at the co-op quite a bit but he does not recall ever working there. He was busy with his own store and he became motivated to try to finish school (he was in school but carrying a light load), then he wanted to move to California, so he and Iona sold their second-hand general store for $300.

The question arises: When was Eden Foods established? Ron Teeguarden believes that the idea for Eden Foods was born in mid-1969 with the establishment of the original unnamed food co-op that ordered macrobiotic foods. "That was when the seed was planted, though it didn't bloom until later that year when the name Eden was coined and a real macrobiotic food company came into existence." Ron is happy to have been connected with this group and to have helped to plant the seed that has become one of America's most successful natural food and macrobiotic food companies–Eden Foods–but he feels that he deserves very little credit for what he did and he certainly does not want to be called "the founder." "Most of the credit for establishing the company goes to Bill Bolduc." He is now deeply involved with Chinese herbs, has just raised close to $1 million, and plans to build an upscale store in Hollywood by late 1992, and eventually take his concept nationwide.

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Follow-up talk with Ron. 1993. March 6. The time from 1967 to 1969 is quite hazy in his mind. It seems like another life and another world. "It's a funny, fuzzy feeling to know that I was part of Eden and part of Erewhon when it first started." Ron also started the Acupressure Center in Berkeley. Ron did not follow developments at Eden Organic Foods after he left Ann Arbor in 1970. He does not recall having ever met Michael Potter, and he still does not recall that the food co-op ever had a bank account or that he ever signed a signature card for that account (yet "We probably did have a bank account; Maybe Vic got it and I might have signed it. Maybe that's where the money went every day.") And he has never been aware that the name "Eden" may have been derived from letters in his last name–but he is not sure that his recollections are correct. His new Herbal Emporium in Hollywood is coming along very nicely. Address: The Tea Garden, 1334 Abbott Kinney Blvd., Venice, California 90291. Phone: 310-450-0188.

9801. Redmond, Tim. 1991. Early work with Eden Foods and macrobiotics. Part II. 1971 to 1979 (Interview). *SoyaScan Notes.* Dec. 11 and 23. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** In the summer of 1971 Tim and Bill Bolduc first met Mike Potter, who had been managing a macrobiotic natural foods store named Joyous Revival in Birmingham, Michigan. Mike was born in about December 1949. There used to be free concerts on Sundays in the park in Ann Arbor. Mike would buy a 50-lb bag of rice from Eden plus a few odds and ends, take it out to the park, cook the rice, and sell it by the bowl to people in the audience.

The growing wholesale business made such large demands on Tim's time that he and Bill began to look for someone to manage the retail store. In the fall of 1971, they hired Mike Potter as manager. For a while Mike worked for little or no wages. In 1972 Bill and Tim offered Mike an ownership position, and gave him about 13% of the total stock in lieu of his service. Bill and Tim now each owned 43.5% of the company's stock. This ownership structure lasted for about one year. In about Nov. 1972 the retail store was moved from 211 State Street into a much larger location at 330 Maynard St. Potter continued to manage the retail store until about 1974.

When Bill Bolduc left the company in the late summer or fall of 1973, he and his wife Judy sold their shares back to the company. Bill left for a variety of reasons, in part because of a little friction that existed at the time. Tim now ended up owning 51% of the company stock and Michael Potter owned 49%. Tim was the president. This arrangement continued for about a year until about the winter of 1974, when Potter convinced Redmond to give up 1% of his stock for a certain amount of money he knew the company needed at the time. Tim and Mike Potter were now 50-50 partners. Potter became the president shortly thereafter.

In 1974 Tim Redmond made initial contacts with Muso, a leading macrobiotic supplier. Mike Potter now traveled to Japan and developed Eden's contacts with Muso. Eden began importing directly from Japan, but Erewhon had an arrangement with Muso which stated that Muso could only sell products to American natural foods companies under the Erewhon brand. Eventually the growing number of natural foods importers, including Eden, protested this policy. There were meetings in Florida and California. Yuko Okada of Muso and Mr. Kazama of Mitoku came to a meeting that was held in Florida, and in about 1975 or 1976 Eden began to do business with Mr. Kazama of Mitoku, importing under the Eden brand. This move by Mitoku broke the Erewhon-Muso monopoly. Today Eden again imports all of its Japanese products from Muso.

In 1973, after about 1½ years of operating out of the rudimentary Quonset hut, Eden was ready for a bigger warehouse. So they found an old building near the middle of Ann Arbor, several streets west of Main Street, down by the railroad tracks. They shared this building and their trucking with Midwest Natural Foods which was run by Hank Bednarz and David Rock. During this period of 1½ to 2, Eden and Midwest became competitors. Eden sold only dry bulk and packaged natural foods; Midwest sold packaged health food lines, vitamins, and frozen or refrigerated goods. Though the two companies proved to be philosophically incompatible, they were the first to act as a full-line "super distributor."

Still growing, Eden moved to larger location on Platt Road in the spring of 1974. The previous 50/50 ownership structure continued until the summer 1979, when they took in Cliff Adler as a junior partner. Cliff purchased 10% of the company stock at a favorable price, leaving Mike and Tim with 45% each. Shortly after the disastrous fire occurred in Nov. 1979 at the warehouse on Platt Road, several key employees were encouraged to stay with the company by awarding them shares of stock. Also one outside person purchased some stock from the company; this provided money that the company greatly needed. The retail store and restaurant were made into an independent company (named The Maynard Street Connection, Inc.) from the Eden Foods wholesale operation.

In May 1980 Tim resigned his position with the company, sold most of his stock back to the corporation (he kept only a few shares), and took over management of the retail store and restaurant, which had been the beginning of the company. There were many personal reasons that Tim left. Since the company's future looked uncertain, he received a relatively low price for his stock. He still owns the stock he did not sell at that time. Tim and a friend operated the retail store and restaurant for about 3 years, then they sold it at the end of 1983. In mid-1984 Tim and Mike Potter had lunch and Mike invited Tim to come into the new soymilk venture, American Soy Products (ASP). Tim

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worked as a consultant for the first 9 months until mid-1985, at which time he became an employee of ASP. Tim is still one of a few people who own shares of stock in Eden Foods; others include Mike Potter and three other people.

Tim is interested in the question: When was Eden Foods founded? He once asked Michael Potter where Michael got that July 1967 date. He recalls that Michael said he had asked the National Bank of Detroit (NBD) in Ann Arbor, which carried Eden's first bank account. It is Tim's guess that the July 1967 date was when Ronnie Teeguarden opened the account for his used clothing store (Teeguarden-Leabu General Store). Tim feels that "Eden Foods did not start in July 1967 by any stretch of the imagination. To say [as a 1991 Eden publication does] that in 1967 'The first checking account was opened for Eden Foods' seems blatantly incorrect." The concept may have started as early as 1967 but the entity and the name did not start until Nov. 1969.

Some people have stated their opinion that the 1979 fire was caused by arson in order to collect insurance money. Tim is sure that these opinions are incorrect. During 1977 and 1978 Eden had been expanding rapidly and had gotten into a tight financial position. Cliff Adler helped the company in this situation. In 1979 they were having the most profitable months they ever had. The business was not in bad financial shape. Moreover the fire cost Eden hundreds of thousands dollars more than they ever recovered from the insurance company. Address: Vice President of Marketing and Sales, American Soy Products, Inc., 1474 N. Woodland Dr., Saline, Michigan 48176. Phone: 313-429-2310.

9802. Silver, Jimmy. 1991. Re: Key contacts concerning the early history of macrobiotics and natural foods in the United States. Letter (fax) to William Shurtleff at Soyfoods Center, Dec. 17. 2 p. Typed, with signature.
• ***Summary:*** Contact information is given for: Roger Hillyard (San Francisco, California). Bruce Macdonald (Vermont). Wendy Calpeno VanGemert (Denver, Colorado). Judy Coates Deming Knepfer (Ross, California). Dora Coates Hawken (Marin, California). Michel Abehsera (Montreal, Canada).

Some notes: "Hy Lerner, a physician who ran the warehouse at Erewhon [Boston] in the early days subsequently started [with Paul Petrofsky] and owns Baldwin Hill Bakery, bakers of the most wonderful whole wheat breads from the Belgian / French sourdough recipe taught to him by Omer Gevaert, one of the members of the family that owns Lima / Belgium. Omer's nephews are Lark and Kerry Lindsey, who started Arden Rice Cakes in North Carolina (with Lima's technical assistance) and subsequently sold the company to Quaker Oats shortly before Bob Kennedy sold Chico-San to H.J. Heinz."

"Eric Utne, presently publisher of *The Utne Reader* (bankrolled by his wife's Rothschild inheritance, according to an interview with Eric) once was manager of the Erewhon retail store on Newbury Street in Boston. As I recall, Michio Kushi put him there for ideological reasons after Roger [Hillyard] put organically grown potatoes on sale in the store and everybody freaked out!" Note: Potatoes, as well as tomatoes and eggplant, are "forbidden foods" in a macrobiotic diet because they are members of the nightshade family.

"Eric was married to Peggy Taylor before that [after working at *East West Journal*] and together they started the *New Age* magazine. When they split up, she kept the magazine, which she later sold. Peggy Taylor was Evan Root's girlfriend when I moved to Boston... Evan later married Barbara Reardon... Barbara was at that time one of the principal students of T.T. Liang, my first t'ai chi teacher, who subsequently moved to Los Angeles and who I see every Saturday morning. He's 91." Address: President, Pure Sales, P.O. Box 5116, Irvine, California 92716-5116. Phone: 714-540-5455.

9803. Fuji Oil Mills. 1991. Fire or explosion in solvent extraction plant. Izumisano (near Osaka), Japan. Dec. 23.
• ***Summary:*** Kingsbaker, C. Louis. 2005. "List of fires and explosions in extraction plants." Atlanta, Georgia. 3 p. Aug. 4. Unpublished manuscript. Note: Izumisano is 22 miles (35 km) southwest of the city of Osaka, facing Osaka Bay. Address: Izumisano (near Osaka), Japan.

9804. Adlercreutz, Herman; Honjo, H.; Higashi, A.; Fotsis, T.; Haemaelaeinen, E.; Hasegawa, T.; Okada, H. 1991. Urinary excretion of lignans and isoflavonoid phytoestrogens in Japanese men and women consuming a traditional Japanese diet. *American J. of Clinical Nutrition* 54(6):1093-1100. Dec. [70 ref]
• ***Summary:*** "Epidemiologic studies revealed low mortality in hormone-dependent cancer in Japanese women and men consuming a traditional diet... The subjects consumed a typical low-fat diet with much rice and soy products, fish, and vegetables... The urinary excretion of lignans was low but that of the isoflavonoids was very high. The excretion of isoflavonoids correlated with soybean-product intake. The low mortality in breast and prostate cancer of Japanese women and men, respectively, may be due to the high intake of soybean products."

The lignans and isoflavonoid phytoestrogens found in mammals are diphenolic compounds with molecular weights similar to those of steroid estrogens. Precursors in plants seem to occur as glycosides; they are converted to lignans and isoflavones in mammals by intestinal microflora.

Thus, the amount of isoflavones in the urine of Japanese is correlated to soy intake. Address: Dep. of Clinical Chemistry, Univ. of Helsinki, Meilahti Hospital, Helsinki, Finland; Depts. of Obstetrics and Gynecology and Preventive Medicine and the Lab. of Gas Chromatography-Mass Spectrometry, Kyoto Prefectural Univ. of Medicine, Kyoto, Japan.

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9805. Conlon, Michael. 1991. Focus on food use could increase soybean sales to Japan. *AgExporter* (*USDA, FAS*). Dec. p. 12-13.
• ***Summary:*** "Japan is the world's largest market for soybeans, importing around 4.68 million metric tons in 1990. While most soybeans are crushed for meal and oil or processed into soy protein and soy sauce, there is another usage–direct food use–that offers potential for growing U.S. sales.

"While the volume of soybean imports for crushing to make meal and oil has stayed relatively unchanged over the past several years, soybean imports for human consumption have increased steadily from 827,000 metric tons in 1980 to 1.2 million tons in 1990, an increase of 45 percent. No other country imports such a large quantity of soybeans for food use."

"The U.S. share of the food-use soybean market is around 75 percent, with exports to Japan increasing 17 percent since 1985.

"Domestic production limited: Despite government programs designed to increase domestic production, soybean area planted in Japan has declined in recent years because growers are interested in more lucrative crops such as vegetables and flowers. As a result, Japan has had to import soybeans in order to meet the demand.

"About three-fourths of Japan's soybean imports, or around $900 million worth, come from the United States, translating into an important and steady market for U.S. soybean growers. Also, there are no tariffs or duties to hinder imports of soybeans, making the market even more attractive.

"... Japan is the world's largest buyer of food-quality soybeans, which are used for a variety of Japanese foods." A brief description is given of tofu (the most popular food in Japan made from soybeans), miso, and natto. "In 1989, 42% of soybeans for food use [in Japan] went into tofu, 14% went into miso, 8% went into natto and 36% went into other soybean products. The demand for soybeans used for direct consumption is increasing approximately 3% per year for tofu and miso and about 7% for natto."

Today about 25% of the soybeans used in Japan go for food use while the rest is crushed for oil and meal.

"According to the American Soybean Association (ASA), the varietal soybeans in demand in Japan have an estimated farm gate value in the United States of $1-3 per bushel above crushing beans. This could represent added returns to U.S. soybean producers of up to $55 million per year."

A graph shows the number of metric tons, from 1980 to 1990, used for crushing soybeans and for food-use soybeans. Address: Oilseeds and Products Div, FAS.

9806. Kamata, Yoshiro; Ohta, Kazutaka; Tamauchi, Fumio; Yamada, Minoru. 1991. Cheese analogs from soybeans or soymilk-curd by limited proteolysis. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 38(12):1143-48. *
• ***Summary:*** Using bromelain, cheese analogs can be prepared from soybean curd.

Note: Bromelain is a proteolytic enzyme extracted from the pineapple plant or from other plants of the family, *Bromeliaceae.*

9807. Nichii Company of America, Inc. Mycal Group. 1991. The best just got better (Ad). *Vegetarian Times.* Dec. p. 29.
• ***Summary:*** Below the large title is an illustration (line drawing) of a package of tofu. The text on the front panel (film lid) reads: "Natural Foods Store. Lite Tofu. Firm. OCIA Organic. New Wt. 16 oz." The text of the ad reads: "MicroSoy flakes has dramatically improved the quality of tofu. We challenge you to see for yourself... Tofu made from MicroSoy flakes is lower in calories, lower in fat, higher in protein, longer lasting on your refrigerator shelf, better for the environment, and is made from organic soy flakes." Small print across the bottom of the ad reads: "MicroSoy flakes use up to 47% less water and as much as 40% less electricity in the manufacture of tofu, so they help preserve our environment and conserve our natural resources. Tofu made from MicroSoy flakes contains 8% more protein and 67% less fat for better health. All results confirmed by independent testing at Iowa State University, Food Science and Human Nutrition Department. Comparison of tofu made from whole soybeans and MicroSoy flakes."

9808. Nichii Company of America, Inc. Mycal Group. 1991. Who makes your tofu? Tell them you want the best tofu. Tell them you want tofu made from MicroSoy flakes (Or we can tell them for you) (Ad). *Natural Foods Merchandiser.* Dec. p. 17.
• ***Summary:*** This full-page red, green, and white ad shows a package of water-packed tofu labeled "Natural Foods Store. Lite Tofu. Firm. OCIA Organic." On both sides of it, with a check-off box in front of, and a question mark after, each are the names of the following American tofu manufacturers: Mori-Nu, Hinoichi, Azumaya, Nasoya, Quong Hop, Calco, Soy Foods of America, White Wave, Sam Sung, Mighty Soy, Mandarin, Northern Soy, Swan Gardens, Other.

Tofu made from MicroSoy flakes is best because it is low in fat and calories, higher in protein, longer lasting on your shelf, better for the environment, made from OCIA-organic soy flakes. "Tofu made from MicroSoy flakes contains 8% more protein and 67% less fat for better health."

This ad also appeared in the Feb. 1992 issue (p. 21) of this magazine. Address: 23440 Hawthorne Blvd., Suite 140, Torrance, California 90505. Phone: 213-791-0010.

9809. Tsuiseki: Iya-dôfu [Chase: Stone-dofu] 1991.

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Television broadcast. Channel 26. California. Dec. 29. Sun. 7-7:30 P.M. [Jap]
• ***Summary:*** In 1185 when the Genji (Minamoto) clan defeated the Heike (Taira) in a famous naval battle on the Inland Sea, some of the Heike survivors fled to mountainous central part of Shikoku island, where their descendants still live today in the remote village of Iya. Shizue Fukushima, a 73-year-old woman, is the village tofu maker. Her Iya-dofu, also called *iwa-dofu* or *ishi-dofu* (meaning "stone tofu"), is much harder than most Japanese tofu. Made by hand, with nigari as a coagulant and without machines, it takes 3 times as long to make as most tofu. The curds are broken into small pieces by vigorous stirring and they are then pressed with a heavy weight for a long time. The finished tofu, dropped onto a stone floor from a height of 1 meter, remains unbroken. A favorite preparation in the village is named *Dekomawashi* derived from the words Dengaku plus *mawasu* (to turn). Slabs of tofu are skewered, and spread with miso. The base of each wooden skewer is then placed nearly upright into the hearth ashes around a fire. Small potatoes are also skewered on separate skewers. When one side is nicely grilled, the tofu is turned so that the other side can also be grilled. Address: Japan.

9810. Wilson, Lester A.; Fenton, A.M.; Wilson, R. 1991. Comparison of whole soybeans to their MicroSoy flakes for tofu production: Steam kettle–hydraulic press system. Ames, Iowa: Iowa State University. 17 p. 28 cm.
• ***Summary:*** Tofu made from Nichii MicroSoy flakes takes much less time (10 minute soak vs. 12 hour soak), 24-48% less water (48% less if process cleanup water is included), 41% less electricity. "The tofu produced from flakes was softer, creamier in color, higher in protein and moisture, but lower in lipid [fat] that bean tofu (24% vs. 40%)." This is to say, on a dry-weight bases, the tofu made from MicroSoy flakes contained (on average) 24% fat, whereas that made with whole soybeans contained 40% fat. This is apparently because more fat remained in the okara when tofu was made from the flakes. No significant differences were found in the yield of firm tofu or in the yield of okara from flakes compared with soybeans.

Concerning sensory or organoleptic qualities, the tofu made from whole soybeans had a significantly firmer texture, which was preferred by the U.S. panelists but would probably not be by Japanese panelists. There were no significant differences in color, beany-flavor intensity, or flavor preference.

Talk with Lester Wilson. 1992. Jan. 31. This undated report was printed on 1 Dec. 1991. One theory as to why the tofu made from MicroSoy flakes contained less fat is that the flakes were made from dehulled soybeans whereas most tofu is made from soybeans with the hulls intact. Perhaps okara which is free of hulls tends to hold more fat. Address: 1. Prof., Dep. of Nutrition, and The Center for Crop Utilization Research; 2-3. Dep. of Food Science and Human Nutrition. All: Iowa State Univ., Ames, Iowa.

9811. Griffis, G.; Wiedermann, L. 1991. Marketing food quality soybeans in Japan. St. Louis, Missouri: American Soybean Association. 24 p. *

9812. Ishizuki, Yoshimochi; Hirooka, Y.; Murata, Y.; Togashi, K. 1991. [The effects on the thyroid gland of soybeans administered experimentally in healthy subjects]. *Nippon Naibunpi Gakkai Zasshi* (*Folia Endocrinologica Japonica*) 67(5):622-629. [12 ref. Jap; eng]
• ***Summary:*** Changes in thyroid function were studied by administering 30 gm of roasted, vinegared soybeans per day to 37 healthy adults, who had never had goiters or serum antithyroid antibodies. After 1 month, no change was detected in the peripheral thyroid levels, but TSH (thyroid stimulating hormone = thyrotropin) was raised slightly. Diffuse goiter and hypothyroiodism appeared in half the subjects after taking soybeans for 3 months, but they decreased, then disappeared after cessation of soybean consumption. The above results indicate that excessive intake of soybeans for a long time might cause the enlargement of the thyroid gland, and slightly suppress thyroid function in healthy people.

Note: This article was translated into English by the Japan Communication Service, Wellington, New Zealand. Address: 1. Ishizuki Thyroid Clinic; 2. The Fourth Dep. of Internal Medicine, Aichi Medical Univ. All: Japan.

9813. **Product Name:** Mitoku Goma-Muso Sesame-Miso Sprinkle.
Manufacturer's Name: Mitoku Co. Ltd. (Distributor). Made in Japan.
Manufacturer's Address: C.P.O. Box 780, Tokyo 100-91, Japan. Phone: 33-201-6701.
Date of Introduction: 1991.
Ingredients: Barley miso (whole soybeans, barley, sea salt), toasted whole sesame seeds.
Wt/Vol., Packaging, Price: 2.8 oz (80 gm) plastic bag. Retails for $2.39 (11/91, USA).
How Stored: Shelf stable.
New Product–Documentation: Product with Label purchased from Smoky Mountain Natural Foods, Asheville, North Carolina. 1991. Nov. 15. 3 by 3.5 inches. Self adhesive, on a 4.5 by 6.5 inch plastic bag. Reddish orange, yellow, and white. "A traditional Japanese condiment... Sprinkle freely on brown rice, vegetables and other favorite dishes to impart extra goodness, flavor and nutritiousness."

9814. **Product Name:** Sweet Life Candies: Miso Drops–Natural Brown Rice Malt Candy.
Manufacturer's Name: Mitoku Co. Ltd. (Distributor). Made in Japan.

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Manufacturer's Address: C.P.O. Box 780, Tokyo 100-91, Japan. Phone: 33-201-6701.
Date of Introduction: 1991.
Ingredients: Traditional rice malt (selected whole brown rice, organic sprouted barley, pure spring water), natural brown rice miso (whole soybeans, whole brown rice, water, sea salt).
Wt/Vol., Packaging, Price: 1.76 oz (50 gm) plastic bag. Retails for $1.19 (11/91, USA).
How Stored: Shelf stable.
New Product–Documentation: Product with Label purchased from Smoky Mountain Natural Foods, Asheville, North Carolina. 1991. Nov. 15. 4.5 by 6 inches. Plastic bag. Gold and white on brown with see-through window. "The original sugar-free sweets from Japan... Sweet Life Candies contain no sugar or any artificial sweetening whatsoever; just the rich goodness of rice malt, with exciting natural flavors. The perfect taste treat for all the family." There are 12 other flavors in this natural candy line. The miso flavor is hard, not chewy.

9815. **Product Name:** Jinenjo Tekka: Tekka Condiment.
Manufacturer's Name: Mitoku Co. Ltd. (Distributor). Made in Japan.
Manufacturer's Address: C.P.O. Box 780, Tokyo 100-91, Japan. Phone: 33-201-6701.
Date of Introduction: 1991.
Ingredients: Hatcho miso (whole soybeans, water, salt), jinenjo (wild mountain yam), lotus root, carrot, burdock, ginger, toasted sesame oil.
Wt/Vol., Packaging, Price: 3.5 oz (100 gm) plastic bag. Retails for $5.99 (11/91, USA).
How Stored: Shelf stable.
New Product–Documentation: Product with Label purchased from Smoky Mountain Natural Foods, Asheville, North Carolina. 1991. Nov. 15. 3.5 by 2.75 inches. Self adhesive, on a 6 by 4.5 inch plastic bag. Blue on white.

9816. **Product Name:** Mitoku Natto Miso Chutney: Barley/Soybean/Vegetable Relish.
Manufacturer's Name: Mitoku Co. Ltd. (Distributor). Made in Japan.
Manufacturer's Address: C.P.O. Box 780, Tokyo 100-91, Japan. Phone: 33-201-6701.
Date of Introduction: 1991.
Ingredients: Barley, whole soybeans, barley malt, kombu, ginger, water, sea salt.
Wt/Vol., Packaging, Price: 10.5 oz (300 gm) plastic crock. Retails for $3.99 (11/91, USA).
How Stored: Shelf stable.
New Product–Documentation: Product with Label purchased from Smoky Mountain Natural Foods, Asheville, North Carolina. 1991. Nov. 15. 3 inch diameter. Self adhesive. Red and yellow on metallic gold.

Soyfoods Center product evaluation. 1991. Dec. 3. Good name! This condiment, which resembles Indian chutney in its chunky consistency, but is a little more salty and less sweet, is actually a type of Finger Lickin' Miso (namé miso). Flavor: Very nice. Label design: Terrible–too hard to read.

9817. **Product Name:** Mitoku Macrobiotic Mansan Organic Tamari: Traditional Wheat Free Soy Sauce.
Manufacturer's Name: Mitoku USA (Importer). Made in Japan.
Manufacturer's Address: Tokyo, Japan.
Date of Introduction: 1991.
Wt/Vol., Packaging, Price: 10 fluid oz bottle.
How Stored: Shelf stable.
New Product–Documentation: Label seen at Open Sesame in Lafayette, California. 1991. Feb. 16.

Mitoku Company Ltd. 1992. "Mansan Organic Tamari: Incomparable Quality and Flavor." *Natural Health.* Feb. p. 126. This ½-page ad has an illustration by Akiko Aoyagi Shurtleff of a man standing on the rim of a huge vat ladling liquid tamari into floating keg. A bold symbol of the character for "tamari" appears in a box to the upper right. "Mansan Organic Tamari is available in North America under the Mitoku Macrobiotic and Emperor's Kitchen label. Exported exclusively by Mitoku Co., Ltd., Tokyo, Japan."

9818. Nanseki, Teruaki; Morooka, Y.; Zakaria, A.K.; Kosugi, S. 1991. Comparative advantage of soybean in an upland area of West Java: Mathematical programming approach. *CGPRT Working Paper.* No. 13. 45 p.
• ***Summary:*** The paper presents a mathematical programming model to identify the comparative advantage of a specified crop in a given farming system. The model was then applied to soybean production in West Java and the implications of this approach were evaluated. The model is stochastic in nature which makes it rather more versatile than commonly used approaches. Address: 1&4. National Agricultural Research Centre, Tsukuba, Japan; 2. Tropical Agricultural Research Centre, Tsukuba, Japan (currently posted in Malaysia); 3. Bogor Inst. of Food Crops (BORIF).

9819. Okuhiro, T.; Kuwano, Y. 1991. [Characteristics and application of konbu minerals]. *Gekkan Fudo Kemikaru* 7:112-17. [Jap]*

9820. Shinoda, S.; Yoshida, T. 1991. [Phytate content in fermented soybean (natto)]. *Tachikawa Tandai Kiyo* 24:103-104. (Chem. Abst. 115:254543). [Jap]*

9821. Shinshu-Miso Research Institute. 1991. *Report of the Shinshu-Miso Research Institute* No. 32. p. 1-130. [Jap; eng] Address: Nakagosho 469-6, Nagano-shi 380, Japan.

9822. Sumi, Hiroyuki. 1991. [Nattokinase and fibrinolysis].

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Kagaku to Seibutsu (*Chemistry and Biology*) 29:119-234 (Chem. Abst. 115:63810. 1991). [Jap]*

9823. Watanabe, Sugio. 1991. [The natto industry: The process of development and its present status]. *Daizu Geppo* (*Soybean Monthly News*) 169:9-19. [Jap]*

9824. Chan, Sucheng. 1991. Asian Americans: An interpretive history. Boston: Twayne Publishers. A Division of G.K. Hall & Co. xviii + 242 + [2] p. Illust. Index. 24 cm. Twayne's Immigrant Heritage of America Series. [200+* ref]
• ***Summary:*** Contents: Foreword. Preface. Terminology and transliterations. Acknowledgments. 1. The international context of Asian emigration. 2. Immigration and livelihood, 1840s to 1930s. 3. Hostility and conflict. 4. The social organization of Asian immigrant communities. 5. Resistance to oppression. 6. Women, families, and the "second-generation dilemma." 7. Changing fortunes, 1941-1965. 8. New immigrants and refugees. 9. Current socioeconomic status, politics, education, and culture. Conclusion. Films about the Asian American experience. Chronology. Notes and references. Bibliographic essay. Address: Univ. of California at Santa Barbara.

9825. Clearspring Ltd. 1991. Traditional Japanese soya sauces (Leaflet). London: Clearspring. 2 panels each side. Each panel: 22 x 15 cm. Illust. *

9826. Davis, Clarence B. 1991. Railway imperialism in China, 1895-1939. In: Clarence B. Davis, Kenneth E. Wilburn, Jr., and Ronald E. Robinson, eds. 1991. Railway Imperialism. New York: Greenwood Press. xix + 225 p. See p. 155-73. Illust. Index. 25 cm. [84 ref]
• ***Summary:*** China was late in entering the railway age. The first railway in China (between Shanghai and nearby Woosung) was built in the 1870s by the British firm of Jardine, Matheson & Co. "The line met with general Chinese disfavor, and when an accident caused the death of a Chinese soldier, the [Manchu] court responded to popular outcry by purchasing the railway." The rails were removed, sent to Taiwan, and eventually dumped into the sea. The complex reasons for this initial reaction are discussed.

China's defeat in the Sino-Japanese War of 1894 lead to a revolution in railway construction. Foreign powers demanded concessions to build railways, on very favorable terms to them, and backed by the implicit threat of force. By late Nov. 1898, Russian, Belgian, French, British, German, and to a lesser extent American contractors had reached preliminary agreements for the construction of 6,520 miles of railways in China. Construction was financed by long-term loans. In 1911 more than 90% of China's railways were managed and controlled by foreign interests, with Britain being the dominant player. By the end of the 1920s, about half of China's debt was devoted to railway loans. However by 1934 Japan, with its extensive involvement in Manchuria, had passed Britain to become the largest holder of railway obligations.

Manchuria had the most extensive railway building in China. By 1949, these three provinces contained about 43% of Chinese railway construction. The Chinese Eastern Railway in Manchuria (from Manchouli [pinyin: Manzhouli] to Suifenhe), built by Russia, was owned by its Russian builder. Address: Keene State College, New Hampshire.

9827. Fukushima, Danji. 1991. Recent progress of soybean protein foods: Chemistry, technology, and nutrition. *Food Reviews International* 7(3):323-51. [29 ref]
• ***Summary:*** Contents: Abstract. Introduction. Chemistry: Chemical composition of soybeans (Soybean globulins composed of four major components–2S, 7S, 11S, 15S), importance of three-dimensional structures of soybean protein molecules in food processing, influence of biologically active substances in soybeans on food processing. Technology: Traditional soybean protein foods and recent progress in their technology (soy milk {remove the hypocotyl and hull to remove off flavors; Soyasaponin A has the strongest off flavor}, tofu, kori-tofu, yuba), fermented soybean protein foods: Application of bioreactor for soy sauce production, nontraditional soybean protein foods and recent progress on their technology, recent progress on new soybean protein foods in which soybean proteins are the key material (modified abura-age, modified ganmodoki, deep fried texturized soy protein nuggets). Nutrition: Recent progress on nutritive values of soybean proteins (Soybean proteins have an amino acid score of 100 for persons more than 2 years old), physiological function of soybean proteins (they lower cholesterol levels when used to replace animal proteins). Future of soybean protein foods (Kikkoman fermented soy sauce is well on its way to becoming a universal seasoning. Tofu and tempeh also seem to have a bright future).

"The most important chemical reactions during the process of soybean protein foods are the intermolecular reactions among the residues exposed on the surface of the protein molecules through the denaturation process. In native soybean protein molecules, most amino acid residues responsible for the reactions-such as cysteine (-SH), cystine (S-S), and hydrophobic amino acid residues-are buried in the inside region of the molecule, inaccessible to water. These residues become reactable with each other through the exposure from the inside by heat denaturation during processing. The unique textures of soybean protein foods, such as tofu, kori-tofu, yuba, and texturized products produced by extruder, etc., are the results of both the intermolecular interchange reaction between the exposed -SH and S-S groups and the intermolecular hydrophobic reaction among the exposed hydrophobic amino acid residues. The exposure of amino acid residues is also important for the

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hydrolysis of soybean proteins by enzymes, through which soy sauce is produced, because the cleavage of the peptide bonds is carried out after binding between the active sites of the enzymes and the enzyme-specific amino acid residues exposed through denaturation." Address: Kikkoman Corp., 1-25 Kanda Nishiki-cho, Chiyoda-ku, Tokyo 101, Japan.

9828. Hesseltine, C.W. 1991. Peoria, an international center of fermentation excellence. *Transactions of the Illinois State Academy of Science* 84(1-2):1-11. [11 ref]
• ***Summary:*** This paper was presented on 28 Sept. 1989 as the after-dinner address for the 50th Anniversary Celebration of the Peoria (Illinois) Branch of the American Chemical Society. Contents: First fermentations. Hiram Walker Co. (1816-1899; for many years they operated the world's largest bourbon whiskey plant in Peoria). Takamine. Northern Regional Research Center. Penicillin & Dr. Andrew Moyer. Penicillin–others (incl. Dr. Kenneth Raper). USDA's Agricultural Research Service (ARS) culture collection (which dates back to 1904). Polysaccharides. Mycotoxins. Fermented foods (especially soyfoods such as miso, shoyu, and tempeh). Fermentation in Peoria today (ADM uses the old Hiram Walker distillery to make fuel alcohol from corn). Honors and awards. References.

"Dr. Jokichi Takamine was the father of commercial enzymology and one of the pioneers of biotechnology. He was born in 1854 in Japan and received his Doctor of Pharmacology and Ph.D. in Engineering. He became very interested in Western concepts that would be useful to the Japanese but he also was interested in Japanese contributions to the West in science, industry and culture. In 1884 he married an American girl whose father helped him financially start the Takamine Ferment Company in Peoria in 1890. This company's business was to produce 'diastase,' a mixture of glucoamylase and α-amylase. This mixture of amylases was produced by the koji molds (*Aspergillus oryzae* and *A. soyae*) and it was here in Peoria that fungal amylase was first introduced to the West. In the production of alcohol from grain it is necessary to break down the starch to sugar, which is then fermented to alcohol. Up to this time the starch conversion step of grain was brought about by the use of malt produced by the germination of grains.

"In the Takamine process the malt was replaced by fungal α-amylase and, therefore, was a process in direct competition with malt utilization. Apparently this new innovation was greeted with apprehension by the malt manufacturers. There was labor agitation and a propaganda campaign against Takamine. In 1894 the distillery where he worked was burned to the ground. Arson was suspected but never proven. The distillery which used fungal amylase was rebuilt, but the company dissolved the Takamine corporation and Takamine left Peoria in 1894. In 1894 Takamine obtained a U.S. patent on his enzyme diastase preparation called Taka-diastase.

"Later Takamine founded the Takamine Laboratories in the East [Clifton, New Jersey] and the Sankyo Pharmaceutical Company of Tokyo. He also isolated crystallized adrenaline at the same time that this was done by J. Abel at Johns Hopkins. Takamine obtained patents on adrenaline. He is also known for arranging for three thousand cherry trees for planting at the Tidal Basin in Washington. Recently a book on Dr. Takamine was prepared and printed by the Miles Company, which some years ago bought the Takamine Laboratories. The book contains his writings translated into English along side the original Japanese."

"The ARS Culture Collection is one of only two large culture collections in the USA, and its primary function is to find and maintain useful or potentially useful microbial and genetic taxonomic material. This collection dates back to 1904 when Charles Thom was hired by the USDA to investigate the mold cheeses. In making these studies, Thom secured several hundred strains of *Penicillium* and *Aspergillus* which became the nucleus of the ARS Culture Collection. At first Thom was at the Connecticut Agricultural Experiment Station, but in 1913 he moved to Washington, DC, taking his cultures with him. The oldest mold culture in the Collection is a strain of *Actinomucor elegans* isolated in 1892. Thom's collection had no formal recognition, and the story is told how Thom worked in the Laboratory on weekends to transfer his collection. In 1940 when the Fermentation Laboratory was established at NRRC, the Thom Collection was moved from Washington, DC, to Peoria and was formally recognized as one of the fermentation groups with Dr. K. Raper in charge. Dr. J. Wickerham joined the group to be curator of the Yeast Collection, and W.C. Haynes was selected to maintain a Bacterial Collection. Since then the number of curators has increased from 3 to 6. Some famous private collections were added in 1940, including the Harvard Collection which had strains isolated before 1900." Address: 5407 Isabell, Peoria, Illinois 61614.

9829. Homma, Gaku. 1991. The folk art of Japanese country cooking: A traditional diet for today's world. Translated by Emily Busch. Berkeley, California: North Atlantic Books. xii + 270 p. Illust. Glossary and index of Japanese words. Recipe index. 26 x 20 cm.
• ***Summary:*** This is a remarkable book by a remarkable man, with many deep insights into both traditional and modern cultures in Japan and the USA; it gives a unique, authentic view of Japanese culture, and makes liberal use of the Japanese names for things, such as foods, utensils, techniques, houses, etc. He uses the Japanese words first, then explains what they mean (in parentheses) in English. Thus the book makes it easy and enjoyable to learn Japanese food-related words.

Moreover, the book is brimming with interesting information about traditional soyfoods in Japan.

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The author was born in 1950 in Akita, capital of Akita prefecture, in northeastern Japan. Starting as a young boy, he studied Aikido with the founder, Morihei Ueshiba (1883-1969), as a live-in student in the small town of Iwama, in Ibaragi [Ibaraki] prefecture. He was curator of the Lake Ogawara Folk Art Museum, in Aomori prefecture, northeastern Japan, where he worked for about 4 years and learned much of the most interesting tradition, history and other information in this book. Since 1977 he has been living in Denver, Colorado.

Contents: Preface. Foreword. 1. Introduction. 2. The background of country cooking–Folk art and custom. 3. The background of Japanese staple foods. 4. The background of country cooking–Basic preparation. 5. Country meals. Closing. Lake Ogawara Folk Art Museum (*Ogawara Minzoku Hakubutsukan*), located in Furumagi, Misawa City, Aomori prefecture. Founded by Mr. Yukio Sugimoto. Officially opened 29 Aug. 1961. Displays over 15,000 pieces of folk arts and crafts.

Edamame (green soybeans, p. 49-50). In and around his home town, Aug. 15 was too early for harvesting fruits, so they celebrated *mame meigetsu* on Sept. 15. The main food offered at this festival was *eda mame* (green soybeans) along with boiled chestnuts, other fruits, and sweet potatoes. The name of the festival is derived from the word *mame*, which means "bean." In other areas the festival might be called *kuri meigetsu* ("chestnut full-moon") or *imo meigetsu* ("sweet potato full-moon")–depending on the main crop produced. All of the various crops harvested were offered to the moon.

Concerning soybean oil (p. 73): The section titled "Abura–Oils" states: In the Lake Ogawara Folk Art Museum an antique wooden tool (*abura shibori*, see photo) used for extracting oil is on display. The seed or food "to be pressed was placed between two pieces of wood and wedges were hammered into place with a big wooden mallet, driving the pieces together.

"In the Lake Ogawara area this method was used to make rapeseed oil, a popular cooking ingredient." Clearly, the oil was produced in small quantities. "The traditional Japanese farmer was never able to produce enough oil for deep-frying foods."

"There are many sources for natural oils in Japan. From sesame seeds we obtain *goma abura,* from Japanese nutmeg we obtain *kaya abura,* from corn we obtain *kimi abura,* from peanuts we obtain *rakkasei abura,* and from soybeans we obtain *daizu abura."*

Concerning yuba: Although very healthful, yuba (dried soymilk film) is not as popular as most other Japanese soy products. "Tofu is made by bringing soybean 'milk' to a boil. As it boils, a thick film forms on the surface. This film is picked up on a cloth and laid out to dry. The resulting food is yuba.

Note 1. This is the earliest English-language document seen (Oct. 2012) that uses the term "dried soymilk film" to refer to yuba.

"I have served yuba to people visiting from Japan and had them ask me what it was." Yuba is popular in China and parts of southern Asia. It can be eaten fresh or dried. "Yuba is available in Oriental markets in the United States, but chemicals have usually been added during production." A photo shows various dried yuba sheets and dried yuba sticks on a shallow, round, woven Japanese tray (p. 92).

Tofu ("soybean cake"), yuba ("soybean film") and natto ("fermented soybeans") are all examples of soybean products (*daizu seihin*) (p. 139).

In the section on *Nimono*–"Poached dishes" is a recipe for yuba and kikurage ("Soak 2 oz. yuba and cut into 1-inch pieces," p. 186).

Concerning *tonyu* (soymilk): It is mentioned only in the recipe for homemade tofu–using "2 cups *daizu* (soybeans) and ½ teaspoon nigari (coagulant)" (p. 142-43).

Note 2. Koji, miso, miso soup, miso-dama, natto, shoyu. tamari, and tofu are each discussed in detail in separate records. Address: Former owner and head chef, Domo restaurant, Denver, Colorado. Founder and chief instructor Nippon Kan Aikido and Cultural Center, Denver, Colorado.

9830. Homma, Gaku. 1991. Miso, miso soup, miso-dama, and tamari (Document part I). In: Gaku Homma. 1991. The Folk Art of Japanese Country Cooking: A Traditional Diet for Today's World. Translated by Emily Busch. Berkeley, California: North Atlantic Books. xii + 270 p.

• ***Summary:*** This is a remarkable book by a remarkable man, with many deep insights into both traditional and modern cultures in Japan and the USA; it gives a unique, authentic view of Japanese culture, and makes liberal use of the Japanese names for things, such as food, utensils, techniques, homes, etc.

Here we will discuss only those parts of the book relating to miso, miso soup, miso-dama, and tamari: The author arrived in Denver, Colorado, in 1977. One day an Aikido student of his took him to a local health food store. In the Japanese section he found hijiki, wakame, nori, miso, and soba. To his surprise, he found that although the foods were expensively priced, each was of "third-rate quality" (p. 5).

He started a Japanese restaurant in Denver, but never advertised it as a health food restaurant. Would anyone serve unhealthy food in a restaurant? Occasionally there would be customers with questions such as, "What kind of miso or shoyu do you use?" He realized that many customers were worried about their diets, rather than being grateful that they had enough food and that they could had the freedom to choose to eat whatever they wanted (p. 11).

He was born in Akita, in northeastern Japan, where the winters are harsh, and traditional people stored foods for winter survival. Some vegetables were buried in miso (soybean paste). Some soybeans were also preserved by making them into miso, which was a *hozonshoku* (preserved

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food) (p. 16, 18).

During the Kamakura period [1185-1333] Zen Buddhism became very popular with the samurai. Since Zen forbade the consumption of any warm-blooded animals, the diet was strongly affected. One popular food was *"kanbutsu* (lightly salted, dried fish) flavored with a mixture of soy sauce and miso called hishio" (p. 26). A photo shows Zen priests, heads shaved, eating in a monastery, Note: Hishio was similar to Chinese soybean jiang, a mash with the consistency of thin congee [rice porridge] or apple sauce; it could be separated by straining or filtering into liquid soy sauce [like tamari], with the solid residue being somewhat like miso, although with less flavor.

During the Muromachi period [1336-1573], Zen Buddhism continued to influence the Japanese diet, which consisted mainly of rice, cooked vegetables, and an early form of miso named *namé miso* ("lick miso" [finger lickin' miso]) (p. 27).

In traditional Japanese farmhouses, fish or fowl were sometimes marinated with salt and miso or tamari (juice from making [soybean] miso), "flash-seared on both sides to seal in juices and flavor, then stuck into the *venkei* (bamboo basket stuffed with rice straw used to store foods above the sunken open-hearth fireplace {*irori*}) to be smoked" (p. 32).

In traditional farmhouses, if there was more meat than could be eaten during lunch and dinner, "the rest was marinated in miso and tamari. The miso would keep the meat from spoiling during the night. The next morning the meats were rinsed lightly, seared, and put in the *venkei"* for the rest the working day. When the family returned for a meal, the meat was ready to eat" (p. 38).

Fishermen would mix their cooked rice with *umezu* (the juice left over after pickling umeboshi salt plums). And they would eat fresh fish with their *umezu* rice balls. First they would split the fish in half from the inside out–without using a knife. Then they would dip the fish in tamari or miso, and eat it uncooked, on the spot. Sometimes the tamari was mixed with wasabi (Japanese green horseradish) as a dip. Wasabi is a sterilizing agent, served with sushi to this day (p. 39).

A dish found in Homma's home town of Akita is called *kayaki* or *kai yaki,* which means "shell bake." "A large scallop shell is placed over the fire and filled with fish, tofu, and seasoned vegetables. Miso, soy sauce, or *shottsuru* (juice from pickling fish) as added for taste" (p. 40).

In the Owu mountain range of northeastern Japan, men whose livelihood depends primarily on hunting are called *Matagi.* "These people also farmed, but they were takers of life." So their lives, like those of the fishermen, were restricted and controlled by religious customs. On long hunting trips, the only food or "flavoring they carried was a dried ball made out of soybean paste called *miso dama.* All they had to do was to add water to make miso or miso soup (p. 42).

After the Tokyo Olympics in 1964, "Japan became a country inspired by consumerism." Japanese wanted to be like Americans. In "modern" families, the husband and wife both began to work outside the home. In the evening, just as the husband walked through the door, the wife would tear open a pouch of instant *misoshiru* (miso soup) and add hot water–"looks so real and tastes so good"–as they chased the American dream (p. 46).

Table manners: "When you are being served a meal, your chopsticks should lay horizontally in front of you at the close edge of the table. Your rice bowl is on your left and your miso soup is on the right..." In Japanese restaurants in the USA, when serving dinner, they usually serve a salad and then *misoshiru* or *osumashi* (clear soup) before the meal (p. 56-57).

When you are a guest in a Japanese home, you "can only ask for *misoshiru* a second time. This is very formal; if it is a casual situation the rules are not as strict, yet manners are important in all situations" (p. 58).

Slightly sour Chinese cabbage mixed with tofu and chopped *negi* (Japanese onion [or leek]), "simmered with water, miso, and *sakekasu* (rice wine lees), makes a delightfully sour dish..." "The first bulbs to appear after the winter snow melted belonged to the *fuki* (butterbur) plant. "These bulbs were seasoned with miso and roasted, or made into *sunomono"* (seasoned with rice vinegar) (p. 66).

"Miso and tamari–soybean by-products: Making miso was traditionally a community effort that began May 21st or 22nd (*haru higan* or the spring equinox)." Soybeans are soaked overnight, boiled, drained, and poured into a large tub. Men wearing rice-straw shoes to protect their feet crush the beans. The women then shape the crushed beans, while they are still warm, into pyramids, squares, or balls, depending on the locality [just like with *meju* in Korea]. After the shapes have cooled, they are tied with rice-straw rope and hung under the eaves of the house (see 2 photos, p. 68). When the naturally occurring fungus [mold] begins to grow on the soybean shapes, it is said that "the flower has opened." When the shapes are covered with a fragrant bloom of mold, they are transferred to the *misodaru* (large cedar miso tub). Just before miso making time this tub is filled with water or weighted with rocks and soaked in a river so that the wooden staves would swell tight. It is then tested for leaks. Salt and water are added and the tub is covered. From time to time the cover is removed and the miso is stirred to enhance the fermentation process. This farmhouse method of making soybean miso is simpler than that which requires the use of koji, and the miso has a saltier taste.

While soybean miso is fermenting, a dark, rich, delicious liquid gathers at both the top and bottom. This is collected and called tamari (or miso-damari), and is used in traditional farm houses like soy sauce. In the countryside, shoyu (soy sauce) was traditionally made "as a cash crop to be sold in the cities. The mountain people and country farmers couldn't

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afford shoyu, so they used tamari or taremiso instead.

As a child, it was Homma's job to crush the boiled soybeans. His family used koji. The traditional farmer keeps a storage shed for the tubs of miso and pickles near his house–but not too near. "City people sometimes use the phrase 'you smell like miso' to mean that you come from" the countryside.

"Sometimes on larger farms, miso was stored for up to eight years. To have old miso in your house meant that you had a large, prosperous family" (p. 67-69). Continued. Address: Former owner and head chef, Domo restaurant, Denver, Colorado. Founder and chief instructor Nippon Kan Aikido ad Cultural Center, Denver, Colorado.

9831. Homma, Gaku. 1991. Miso, miso soup, miso-dama, and tamari (Document part II). In: Gaku Homma. 1991. The Folk Art of Japanese Country Cooking: A Traditional Diet for Today's World. Translated by Emily Busch. Berkeley, California: North Atlantic Books. xii + 270 p.

• ***Summary:*** Continued (p. 72): *Kojikabi* is the koji mold [*Aspergiluus oryzae*]. Koji (made from either steamed rice or barley) and its mold serve as a source of enzymes, which break down [hydrolyze] starches into sugars and proteins into amino acids, in the process of making both miso and shoyu. Koji is also used to make sake, and in farmhouses it was used to make *nigorizake* (unrefined sake, also called *doburoku* or *ohho*) in parts of the northeast prefectures. Nigorizake has been made from *genmai* (brown rice) since the Edo period (1600-1868). (p. 72).

Japan's traditional "seasonings are still undergoing change to suit current tastes [and lifestyles]: witness 'lite' soy sauce and reduced-salt miso!" (p. 74).

A photo shows *miso dama* [which could be called miso koji] and konnyaku dama hanging from the eaves of a traditional farmhouse (p. 83, 85).

There are many ways to preserve fish; one way is to marinate them with miso or tamari (which also add a subtle flavor) and then to dry them. Fish and shellfish (*gyokai-rui*) which have been dried are called *himono* (p. 90).

Homma has childhood memories of morning kitchen sounds. Rice being washed, snapping of kindling to start a fire under the *kama* (rice pot), "the sounds of chopping, as the tofu and scallions were cut for the miso soup" (p. 104).

A whole fish can be used by a single person with no waste. "One section can be eaten fresh that day. The second can be marinated in shoyu or miso for six to seven hours and frozen; this way it is ready to bake and eat at any time" (p. 112).

Breakfast–Setting the table. The simplest breakfast includes *ichihan, ichiju,* and *issai,* which means one bowl of rice, one bowl of soup, and one side dish. This simple breakfast is served during religious training, eaten for four or five days consecutively before a fast, or eaten to change one's diet or to lose weight." "The *ichiju* is either a kombu- or shiitake-based miso soup or a clear soup. The *misoshiru* contains a god balance of tofu and vegetables." The many *issai* include *tsukemono* (a variety of vegetables pickled with miso, salt, shoyu, or *nuka* {rice bran}), and *yakimono* (fish grilled either plain or marinated in shoyu, miso, *sakekasu* {rice wine lees} or nuka) (p. 122).

Okayu is rice porridge. "If you take plain okayu and mix in vegetables, fish, and miso or shoyu, you have *zosui* (p. 125).

"Morning side dishes: Tsukemono–pickles. Originally tsukemono were vegetables pickled in miso. Miso was called 'ko' in earlier times. *Ko no mono* [literally "fragrant things"; *ko* is the Japanese character for "fragrance"] is the old name for pickles." Today miso pickles are still made in Japan, but salted pickles are more popular (p. 126).

Recipe for *miso zuke*–Pickles made with miso (p. 132).

Yakimono–Grilled and broiled dishes (for breakfast): One way to prepare fish for breakfast is to marinate them for 1-3 days in miso, shoyu, or *sakekasu* (saké lees). A recipe for *Kasu zuke yaki*–Fish marinated in rice wine lees is given (p. 144, 146).

Recipes for *Nasu no miso ni*–Japanese eggplant sauteed with miso, Tekkamiso–Soybeans and burdock sauteed with miso (p. 151).

Misoshiru–Miso soup: *Misoshiru* is an integral part of the traditional Japanese breakfast. Japanese farmers started their workday very early. Traditionally they began their day with a large pot (*nabe*) of grains, cereals, vegetables. and miso mixed together to make a porridge like *zosui.* In the last 50 to 60 years the *misoshiru* and rice have been served separately in the traditional Japanese breakfast. There follows a detailed, very interesting 7-page discussion of the art of making and consuming miso soup. Homma has found nothing that evokes as much gratitude and delight from Japanese traveling in the USA as to be served real miso soup. "For myself, if I think of my mother's *misoshiru* I become the most homesick!" "The most important point to consider when making *misoshiru* is timing." The best time to add the miso (which has been mixed with a small amount of dashi to dissolve it) to the soup is just as everyone is sitting down to the table to eat. "As soon as it starts to boil, remove it from the heat and serve." Three recipes are given for making *misoshiru dashijiru:* (1) With kombu and shiitake. (2) With kombu and katsuobushi. (3) With niboshi or yakiboshi (dried sardines or anchovies). Thirteen miso soup recipes are given: (1) Tofu and wakame. (2) Wakame and potato (*jagaimo*). (3) Wakame and shiitake. (4) Sliced tofu and negi leeks. (5) Bits of tofu (*kuzushi tofu*) with spinach. (6) Cabbage with agé (deep-fried tofu puff), (7) Soybean sprouts (*daizu no moyashi*) with agé. (8) Snow peas with agé. (9) Daikon (Japanese white radish) and carrots. (10) Onion and potato. (11) Kabocha (Japanese pumpkin). (12) Sweet potato (*satsuma imo*). (13). Asari or hamaguri (short-neck clam or regular clam). Diagrams (p. 158) show 3 ways (from 3 dishes

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to 6) of setting the breakfast tray (*ozen*).

Aemono recipes: *Shiraae*–Vegetables and tofu flavored with miso. *Kaiso no ume shiraae*–Sea vegetables and tofu flavored with miso and pickled plum. *Burokkori no shiraae*–Broccoli and tofu flavored with miso and pickled plum. *Nanohana no ume shiraae*–Rapeseed leaves and tofu flavored with miso and pickled plum. *Sayaingen no goma misoae*–Green beans flavored with miso and sesame seeds (p. 178-80).

Nabemono (one pot) recipes: *Tsumire nabe*–Fish ball and vegetable casserole flavored with soy sauce [and miso]. Nabemono with miso flavor base: *Butaniku or toriniku nabe*–Pork or chicken and vegetable casserole flavored with miso. *Gyuniku nabe*–Beef and vegetable casserole flavored with miso. *Kaisen nabe*–Seafood casserole flavored with miso (p. 226-28). Address: Former owner and head chef, Domo restaurant, Denver, Colorado. Founder and chief instructor Nippon Kan Aikido ad Cultural Center, Denver, Colorado.

9832. Homma, Gaku. 1991. Natto (Document part I). In: Gaku Homma. 1991. The Folk Art of Japanese Country Cooking: A Traditional Diet for Today's World. Translated by Emily Busch. Berkeley, California: North Atlantic Books. xii + 270 p.

• ***Summary:*** This is a remarkable book by a remarkable man, with many deep insights into both traditional and modern cultures in Japan and the USA; it gives a unique, authentic view of Japanese culture, and makes liberal use of the Japanese names for things, such as food, utensils, techniques, houses, etc. He uses the Japanese words first, then explains what they mean (in parentheses) in English. Thus the book makes it easy and enjoyable to learn Japanese food-related words. Moreover, the book is brimming with interesting information about traditional soyfoods in Japan.

This record will focus on natto, which originated in Japan in the northeastern provinces (*Tohoku Chiho*) where the author lived.

In the index (p. 276), under "Soybean products (*daizu seihin*)," he defines three different types of natto: (1) Fermented soybeans (natto). (2) Slightly crushed natto (*hikiwari natto*). (3) Whole bean natto (*tsubu natto*). He notes that natto is discussed mainly on page 139.

In Chapter 3, "The background of Japanese staple foods," in the section titled "Products used daily" (p. 94-100) is a subsection on "Natto–Fermented soybeans" (p. 97): "*Natto* is a very popular item on the Japanese breakfast table, but either you love it or you hate it; there is no middle ground. *Natto* is boiled soybeans that have been fermented by introducing the natto fungus [sic, natto bacterium, *Bacillus subtilis*]. Open a package of natto and the first thing to hit you is a very strange aroma. If you stir it, it becomes sticky. Someone watching this might say 'yech.' The translator of this book, Emily, is one of these people. Although she has lived in Japan and traveled extensively in Southeast Asia, she says 'Natto is not for me.'

"Like the tofu peddler, the natto peddler came every morning. Now natto is available throughout Japan, but in the past, because of the growing conditions needed to produce it, many people had not eaten natto in southern Japan. Some of the visitors I have had at Nippon Kan, especially the young [Japanese] visitors who lived south of Osaka, had never tasted natto.

"The weather in northern Japan is favorable for the natto fungus [sic]. Traditionally it was common for the farmers to make their own natto at home. I have tasted homemade natto from many different parts of Japan. Like most traditional foods, the taste and texture varies depending on the location and the family recipe.

"The first natto was discovered, it is thought, when soybeans stored for safekeeping became contaminated with water and created the appropriate environment for the natto fungus [sic]. Historically, many Japanese foods were discovered accidentally, such as in the course of storing or preserving foods.

"Since its initial discovery, the process has been isolated and developed in a controlled procedure.

"To eat natto, pour it from its container into a bowl and stir vigorously with chopsticks until it turns sticky. Then add miso or tamari and shoyu or umeboshi (pickled plums) to suit your taste. Spoon it over rice and eat. Although some people may not agree, I find it tasty.

"I met a very old woman in Denver [Colorado, USA] who was a wonderful traditional Japanese cook. She knew all of the techniques for making homemade sake, natto, tofu, umeboshi and tsukemono–everything in her kitchen was homemade. Sometimes this old woman would make natto and bring it to my home. It did not taste like the natto available in grocery stores. She fermented the soybeans in a styrofoam cup using plastic bread wrappers for a cover. She then wrapped the cups in layers of crumpled newspaper as insulation to keep them warm. So you see, traditional Japanese methods can have a place in modern America."

In Chapter 5, "Country meals," the section titled "Breakfast (*Choshoku*)" (p. 120-58) notes (p. 121-22): "The most simple breakfast includes *ichihan, ichiju,* and *issai,* which means one bowl of rice, one bowl of soup, and one side dish. This simple breakfast is served during religious training, eaten for four or five days consecutively before a fast, or eaten to change one's diet or to lose weight.

"Prior to a fast, this meal is served in less and less quantity until the first day of the fast when *okayu* [rice porridge] is served... Traditionally, the *ichihan* or *meshi* (cooking rice) used for the breakfast meal is brown rice or barley or 60% white rice mixed with 40% barley. The *ichiju* is either *kombu*- or *shiitake*-based miso soup or a clear soup. The *misoshiru* (miso soup) contains a good balance of *tofu* and vegetables. There are many *issai* (called *okazu*) but they can be divided into the following basic categories:

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tsukemono (a variety of vegetables pickled with *miso,* salt, *shoyu,* or *nuka* (rice bran)); *ohitashi* (a variety of vegetables boiled quickly and flavored with *shoyu*)*; daizu seihin* (*tofu,* fried *tofu* cutlets, grilled *tofu, natto* and other soybean products); *yakimono* (fish grilled either plain or marinated in *shoyu, miso, sakekasu* {rice wine lees}, or *nuka*)*;* and *jobina* (a variety of dishes prepared and stored in the refrigerator to be eaten anytime).

"One or more side dishes are selected from these categories; you don't eat them all in one meal! Every morning you can arrange a new combination. Interestingly, as you increase the number of side dishes the portions of each decrease, so that you are always serving the same amount of food...

"Long ago Japanese people did not eat sitting around large tables. When sitting around the *irori* [sunken fireplace], a small tray was placed on the right side of each person. On each tray was a small side dish plate... After the meal, warm water was poured into their rice bowl and they used their chopsticks to clean it. After a sip of the water was taken, it was poured into the soup bowl, swirled around, sipped again, poured into the side dish plate, swirled and drunk... No washing required! We can conclude from this that the foods being eaten at the time were not oily, as the dishes could be easily cleaned with hot water." Note: This may well be the origin of the Zen *oryoki* (nested eating bowls and chopsticks wrapped in white cloth) and its ritual.

Also in Chapter 5, under "Breakfast," is a section on "*Daizu seihin*–Soybean products," which includes a subsection on "Natto–Fermented soybeans" (p. 139): *Natto* is a very popular breakfast food made by stuffing boiled white [yellow] soybeans into a *tsuto* (casing made from rice straw) and leaving them to sit in a warm, darkened room. Before they are stored, a natural natto fungus [sic, bacterium] is introduced to start the fermentation process. The result is *natto,* which has a sticky 'gooey' texture and a pungent odor. Most Americans in my experience turn their noses up at the sight (and smell) of *natto.* Continued. Address: Former owner and head chef, Domo restaurant, Denver, Colorado. Founder and chief instructor Nippon Kan Aikido and Cultural Center, Denver, Colorado.

9833. Homma, Gaku. 1991. Natto (Document part II). In: Gaku Homma. 1991. The Folk Art of Japanese Country Cooking: A Traditional Diet for Today's World. Translated by Emily Busch. Berkeley, California: North Atlantic Books. xii + 270 p.

• ***Summary:*** Continued (p. 139). "When making *natto,* the mixing bowl needs to be completely clean and free from any traces of salt. The natto fungus [sic, bacterium] is easily destroyed by salt. Salt is used to preserve most Japanese foods but *natto* is completely opposite.

"There are two kinds of *natto.* The first is called *tsubu* and is made from whole soybeans. The second is called *hikiwari* and is made from slightly crushed soybeans.

"Commercially made *natto* can be found in the frozen section of your local Oriental market for about one dollar. There are many different brands to choose from. Defrost the *natto* to room temperature before eating. Making *natto* from scratch involves a fairly complicated procedure. This book will concentrate on how to enjoy commercially produced *natto.*

A sidebar across the bottom of page 139 is titled "How to eat natto:" "1 package natto (*tsubu* or *hikiwari*).

"Suggested garnishes include chopped scallion, cilantro, parsley, trefoil, seaweed, Japanese hot mustard, seven-taste pepper [*shichimi togarashi*], and ginger.

"A. If frozen, defrost natto at room temperature. Remove from package and put in a bowl. Stir vigorously with chopsticks until sticky. Fold in one or two types of garnishes. 1 teaspoon each, and stir vigorously.

"B. Choose from 1 teaspoon shoyu, 2 or 3 pinches of salt, or 1 teaspoon miso. Add and stir again.

C. If you like it spicy, add Japanese hot mustard, seven-taste pepper, or thin matchstick slivers of ginger to taste. Other garnishes include soaked *sukikombu* [sliced dried Laminaria kelp soaked and dried in thin sheets] and *funori* (floating seaweed; [*Gloiopeltis furcata*]).

"Follow steps A, B, and C just before meal time.

"D. Serve with a bowl or warm white rice. Place about 1 teaspoon of *natto* onto your rice and eat them together. The chopsticks used for serving natto are separate from your own chopsticks because the natto is so sticky. Try not to touch your own chopsticks to the natto; touch the rice only. If your chopsticks do touch the natto they will become slippery and other foods will tend to slip. Another method is to use the *nori* (dried strips of [paper-thin] seaweed) to pick up the natto and rice. Place a 2-inch square of *nori* on top of the natto and with your chopsticks scoop up a bite of natto and rice wrapped in nori. This method is the least sticky."

On page 170 is a recipe for Natto soba, in which 3 oz. of natto, stirred until sticky, is used in place of grated Chinese yam in Tororo soba. *Soba* is the Japanese word for "buckwheat noodles." Address: Former owner and head chef, Domo restaurant, Denver, Colorado. Founder and chief instructor Nippon Kan Aikido and Cultural Center, Denver, Colorado.

9834. Homma, Gaku. 1991. Koji (Document part). In: Gaku Homma. 1991. The Folk Art of Japanese Country Cooking: A Traditional Diet for Today's World. Translated by Emily Busch. Berkeley, California: North Atlantic Books. xii + 270 p.

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houses, etc. He uses the Japanese words first, then explains what they mean (in parentheses) in English. Thus the book makes it easy and enjoyable to learn Japanese food-related words. Moreover, the book is brimming with interesting information about traditional soyfoods in Japan.

This record will focus on koji (p. 72, 73) which originated in China, where it is called qü or ch'u.

Koji is mentioned in the section on making miso and tamari. "To make modern commercial miso, koji is added as a catalyst to start the fermentation process. Koji is malted rice or sometimes barley, although rice koji is the most popular. *Shiro miso* or white miso has a high percentage of koji. *Aka miso* (red miso) has a lower percentage... It was my job as a child to crush the boiled soybeans used to make miso. The crushed beans were then poured into a wooden tub, mixed with koji, covered and left to ferment for an average of six months to a year" (p. 67-68).

In the section on *Shottsuru:* "The end of November and December in my home town of Akita was the season for *hata hata* or sand fish. Thousands and thousands were caught at sea or were washed up on shore in what looked like an invasion." "For many years, *hata hata* was the source of winter protein in Akita and the surrounding areas... A favorite delicacy was *sushizuke,* which was *hata hata* mixed with koji and white rice in large quantities (sometimes 60 gallons). The mixture was left in a large press to pickle. As the koji and white rice fermented, the vinegar produced preserved the fish. The press kept poisons [toxins] from forming by limiting the access to oxygen" (p. 69).

In the section on *Kanmi* (sweets): "Rice or barley (rice being the more popular of the two) is steamed and mixed with *kojikabe* [also called *tané koji*] (a mold that changes starches to dextrose) to make koji. Koji you remember is used as a catalyst to make miso and shoyu.

"Because of the high starch content in rice, if this koji is brewed and distilled, it becomes quite sweet. This unique sweet taste from fermenting koji is the basis for making saké (drinking rice wine) and *mirin* (cooking rice wine).

Today sake is drunk all over the world. In the old days, sake was to expensive for farmers and common people. The farmers drank *nigorizake* [*nigori-zake*], which was homemade sake. This *nigorizake* did not go through the final filtering separation process, so it was not clear like the sake we see today.

"About 60 or 70 years ago, a new government liquor law was instigated to control the production of homemade sake. It became illegal to brew sake. Of course, unlawful brewing continued. In my hometown area the local word for *nigorizake* is *doburoku* or *ohho.* This *doburoku,* brewed in secret under penalty of law, was most delicious. Today it is no longer illegal to produce *nigorizake* to be sold in liquor stores so long as the producers pay an alcohol tax." "*Nigorizake* has been made from *genmai* (brown rice) since the Edo period (p. 72).

"To make *mirin, nigorizake* is filtered to separate the clear sake from the dregs or lees (the later is called *sakekasu*). Distilling this *sakekasu* results in *shochu* (distilled spirits). Mirin is the result of fermenting and straining *shochu,* adding it to steamed sticky rice and koji, and fermenting the lot together. Mirin is the most popular sweetener used in Japanese cooking" (p. 73). Address: Former owner and head chef, Domo restaurant, Denver, Colorado. Founder and chief instructor Nippon Kan Aikido and Cultural Center, Denver, Colorado.

9835. Homma, Gaku. 1991. Shoyu (Document part). In: Gaku Homma. 1991. The Folk Art of Japanese Country Cooking: A Traditional Diet for Today's World. Translated by Emily Busch. Berkeley, California: North Atlantic Books. xii + 270 p.

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This record will focus on shoyu (soy sauce). Pages 68-69: While farmhouse miso is fermenting in a tub, juices leak from the bottom and are collected underneath. This flavorful liquid is called *tamari* or *taremiso;* it is much different from the commercial tamari sold in the United States.

Page 122: Japanese pickles (*tsukemono*) are vegetables pickled with miso, salt, shoyu, or rice bran (*nuka*).

Page 129: A recipe for Pickled Japanese white radish and carrots (*Daikon to ninjin zuke*) calls for 1 tablespoon shoyu as an ingredient.

Pages 136-40: Various recipes, including Ohitashi, Tororo imo, Grated daikon, and steamed Japanese eggplant call for shoyu as an ingredient. Shoyu is also a required seasoning for natto and Chilled tofu.

Pages 146-50: Shoyu is used to season various grilled fish dishes. and pre-prepared side dishes (*Jobina*).

Page 172-74: Shoyu is a standard seasoning for wheat-flour noodles (*udon*), for various *aemono* recipes (p. 180-82), for simmered land and sea vegetables (*nimono*) (p. 186-88), other for tofu dishes as well as chicken, beef, pork, and fish dishes (p. 190-98, 203-06, 208, 218, 222, 226). Address: Former owner and head chef, Domo restaurant, Denver, Colorado. Founder and chief instructor Nippon Kan Aikido and Cultural Center, Denver, Colorado.

9836. Homma, Gaku. 1991. Tofu, grilled tofu, and fried tofu (Document part). In: Gaku Homma. 1991. The Folk Art of Japanese Country Cooking: A Traditional Diet for Today's

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World. Translated by Emily Busch. Berkeley, California: North Atlantic Books. xii + 270 p.

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This record will focus on tofu: "Tofu, soybean cake–also called at the time [14th century] *shira kabe* or white adobe–was introduced by Zen Buddhist priests. Today, nearby most temples are small stands offering tofu handmade by the priests" (p. 27).

"A dish that was found on both this island [located south of Tokyo, 4 hours by boat south of Hachijô-jima] and in my home town [of Akita] was called *kayaki* or *kai yaki***.** *Kayaki* means shell bake. A large scallop shell is placed over the fire and filled with fish, tofu and seasoned vegetables. Miso, soy sauce, or *shottsuru* (juice from pickling fish) are added for taste" (p. 40).

His home town, Akita, is still famous for a dish named *kiritampo;* it is white rice that has been cooked and wrapped around a wooden handle about 16 inches long. The handle is secured in the *irori* [sunken fireplace] next to the fire to sear the outer layer of rice. Then the handle is removed. The Matagi–one tribe of mountain hunters in the Owu range near Akita–packed this same *kiritampo* for their long hunting expeditions. Originally the Matagi added mushrooms added mushrooms they found under the autumn leaves to complete the dish. "Today we add tofu and other ingredients to make a dish that can be found in the finest traditional restaurants" (p. 42-43). Also on page 43 the author explains the origin of sukiyaki; *suki* means spade and *yaki* means barbecue.

In the section on vinegar and pickling: Lightly sour Chinese cabbage mixed with tofu and chopped negi (Japanese onion / leeks), simmered with mater, miso and sakekasu (rice wine lees) makes a delightfully sour dish (p. 66).

"Mame rui–Beans: The most popular product made from soybeans is tofu and I will go into tofu in greater length in the section on products used daily. Here we shall explore how to safe fresh tofu for future use.

"A block of tofu can be cut into half-inch squares and freeze-dried to make *shimidofu***.** Another common name is *koyadofu,* named after Zen monks who lived on Mt. Koya near Kyoto who first discovered this process.

"We don't need to go back this far in history to find *shimidofu***.** It was common practice for farmers to hang tofu under the eaves of the house to dry. Although tofu came from China, the making of *shimidofu* is Japanese.

"The *shimidofu* available in markets today is sometimes processed with ammonia. There is a three-month shelf life for *shimidofu***.** If it is too old it won't soften again when soaked in water. Of course, it also doesn't taste very good.

"If the temperature where you live drops below 32º Fahrenheit for consecutive periods you can make *shimidofu* yourself. You can't make it in the freezer. You need to set it out where strong cold winds blow. Tofu turns yellow when it is freeze dried. Don't worry, this is natural."

Note 1. This is the earliest English-language document seen (April 2013) that uses the term *shimidofu* to refer to dried-frozen tofu.

"Tofu is also preserved through pickling in salt. In Japan, tofu pickled in salt is no longer available. Salt pickling is still popular in China and in other parts of Southeast Asia (p. 92).

The chapter titled "Products used daily" begins: "Tofu–Soybean Curd: Americans frequently ask me what Japanese people eat on a daily basis. Sometime I get disappointed looks when I tell them. I think they expect me to describe some strange, exotic dishes never heard of here in the United States. In the larger cities and towns of Japan today, the younger generation's diet is not so different than here in the U.S. Milk, cheese, and ham are common sights in most young family homes.

"Visiting a home in the country which continues to practice the old customs is a slightly different story. In these homes (almost stubbornly) mostly traditional foods are served. If there is a difference between the traditional households of the past and present, it is in the way the foods are procured, not the foods themselves. Instead of making most everything at home, the people of the countryside visit the grocery store. The flavors therefore are not quite as fresh and good as they used to be.

"When I was a child, the tofu peddler came by early every morning blowing his horn and yelling, 'Tofu, tofu!' in a loud voice. His bicycle was equipped with a metal washtub filled with fresh water and the tofu he had made himself that day. He also carried other products, like *age* (deep-fried soybean puff), *yakidofu* (broiled tofu), *atsu age* (deep-fried tofu cutlet), and konnyaku (devil's tongue yam cake).

"The tofu peddlers made tofu in larger blocks than you buy in the United States. One block was called a *cho***.** You could buy a half or quarter *cho* if you wished.

"The tofu peddler was very familiar with our family and knew how much tofu or *age* we used daily. Knowing how much we needed, he filled the time with pleasantries and friendly conversation as he filled our bowl with the day's supply.

"Traditionally, the old tofu makers used the mineral nigari (bittern), found naturally in fresh sea water, as a solidifier during processing. The tofu found in the supermarkets is made with man-made solidifiers. The nutritional value of mass-produced tofu is rather less than

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tofu made in the traditional fashion. Tofu was brought to Japan by Japanese priests who went to China to study Buddhism. Today, for example, near the old temples of Kyoto there are tofu shops and restaurants that date back many, many generations.

"From its introduction, tofu was eaten by the people of the imperial courts. It was not until the Edo period (1603-1867) that tofu became popular among all classes. Since those earlier times tofu has become a major part of the Japanese diet, one of its daily foods.

"When I was a curator, I spent some time with an old man who made tofu for me in the style that was originally taught to him. I was surprised; his tofu was so hard you could tie blocks of it up with a rope and carry it. Naturally, the solidifier he used was nigari from fresh ocean water.

"Proverbs regarding tofu have been told for generations: something impossible is said to be 'like breaking your teeth eating tofu' or 'like picking up tofu with a pair of tongs.' A spoiled person 'has his tofu peeled.' Remarking that anyone can change: 'even tofu gets tight if cooked long enough.' I heard these proverbs on more than one occasion from my parents!

"The owner of one large tofu company in Denver told me about the first time he took a fresh tofu sample to one of the large local markets. The buyer took one bite and said, 'This is not tofu.' The new tofu maker was surprised and returned home to make another batch, believing in the traditional techniques he knew well. Again the buyer took a bite and said, 'This is not tofu, it is not sour. I have real tofu brought to me from California by truck. This tofu does not taste like the tofu I get from California.' I started laughing before he finished the story. The tofu shipped from California had begun to spoil en route. The buyer, not having anything to compare it to, thought all tofu was supposed to taste sour!

"Fresh tofu is a food high in nutritional value. However, because it has a high water content, it spoils easily. When you are buying tofu, I recommend you buy it at a store that has a good turnover rate, to make sure it is fresh. A bulging plastic cover indicates that gas is being released and the tofu is no longer fresh. After you have opened the package, submerge the tofu completely in fresh water. Tofu absorbs odors easily, so it needs to be covered. If refrigerated, tofu should last for three or four days.

"While I was running my restaurant, young mothers sometimes asked me for raw tofu for their children, but I always boiled it first. Like a sushi chef serving raw fish, it was my responsibility not to serve anything that might have spoiled" (p. 96).

Photos show: (1) Ishiusu–hand-turned stone mill grinding soybeans (p. 94). (2) Tofu products on a woven bamboo tray (1) Yakidofu. (2) Ganmo. (3) Tofu. (4) Atsuage. (5) Koyadofu. (6) Age (p. 96) (Continued). Address: Former owner and head chef, Domo restaurant, Denver, Colorado. Founder and chief instructor Nippon Kan Aikido and Cultural Center, Denver, Colorado.

9837. Homma, Gaku. 1991. Tofu, grilled tofu, and fried tofu (Document part). In: Gaku Homma. 1991. The Folk Art of Japanese Country Cooking: A Traditional Diet for Today's World. Translated by Emily Busch. Berkeley, California: North Atlantic Books. xii + 270 p.

• ***Summary:*** Continued: "Tofu has been promoted here in the United States as a 'new age' food that is very good for you. Please remember that tofu distributed on a large scale and produced with chemical solidifiers may not be quite the same as the traditional product you may have read about. I suggest you boil the tofu just a little bit before serving, especially to children.

"Okara–Soybean mash: If you visit a tofu factory you will notice that the process results in two products. Unohana or okara is the soybean mash by-product. It used to be that the small tofu maker would give okara away. At large tofu factories today it is sold for animal fodder.

"Although the nutritional value of okara is high, it has always had the image of a by-product and was not marketable. This has been a problem for tofu makers. With two products of similar nutritional value, one was in demand with his customers, and one he kept in the back room!

"Today okara has become a popular diet food because it is filling, nutritious, and low-calorie. Larger Japanese markets in the U.S. now carry okara.

"When I was a child, the tofu shop gave okara away, but to use it in cooking you needed to add many other ingredients. Therefore people used to say that okara was free but expensive" (p. 94-97).

Note: In the index (p. 245), okara or unohana is defined as "Bean curd lees." This is the earliest English-language document seen (June 2013) that uses the term "soybean mash" or the term "Bean curd lees" to refer to okara.

When the author he was a child, he remembers the morning sounds of chopping as the tofu and scallions were cut for miso soup (p. 104).

The section on "Breakfast" states: "The most simple breakfast includes *ichihan, ichiju,* and *issai,* which means one bowl of rice, one bowl of soup, and one side dish. This simple meal is given during religious training, eaten for four or five days consecutively before a fast, or eaten to change one's diet or to lose weight." "The *ichiju* is either a kombu- or shiitake-based miso soup or a clear soup. The misoshiru (miso soup) contains a good balance of tofu and vegetables." "There are many *issai* (called *okazu*) but they can be divided into the following basic categories... *daizu seihin* [soy products] (tofu, fried tofu cutlets, grilled tofu, natto, and other soybean products) (p. 121-22).

The section titled *"Daizu seihin*–Soybean products" includes a subsection on "Tofu–Soybean cake" which begins: "Tofu's popularity is increasing rapidly in the United States. It is carried by most major grocery chains." Many different

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tofu products are available. "Occasionally, I still see tofu sold in a container which resembles a Chinese take-out box." "We have offered tofu-making classes at Nippon Kan. In these classes I don't think the end product, which can be purchased at the grocery store for $1 to $1.50, is as important as the time shared together experiencing part of Japanese culture.

"There are many tofu-related parables: trying to talk to someone who won't listen is like trying to hammer a nail into a block of tofu."

Four basic tofu recipes are given: (1) Yakko–Soft tofu served chilled. (2) Yaki dofu–Sauteed tofu. (3) Iri-dofu–Scrambled tofu (p. 139-41).

On pages 142-43 is a detailed, illustrated description of how to make tofu at home, using 2 cups dry soybeans and ½ teaspoon nigari.

In the section on breakfast recipes for *misoshiru* (miso soup) are recipes for: (1) Tofu to wakame. (2) Sogi tofu to negi–sliced tofu and Japanese leeks. (3) Kuzushi tofu to horenso–Mashed tofu with spinach. (4) Kyabetsu to age–Cabbage with deep-fried tofu puff. (5) Moyashi to age–Soybean sprouts with deep-fried tofu puff. (6) Kinusaya to age–Snow peas with deep-fried tofu puff (p. 153-56).

In the section titled "Dinner (Yushoku)" under aemono recipes are recipes for: (1) Shiraae–Vegetables and tofu flavored with miso. (2) Kaiso no ume shiraae–Sea vegetables and tofu flavored with miso and pickled plum. (3) Burokkori no shiraae–Broccoli and tofu flavored with miso and pickled plum (p. 178-79).

In the section on Nimono recipes (Poached dishes) are recipes for: (1) Hijiki or arame (with 1 age puff and 1/3 block had tofu). (2) Okara (soybean mash) sauteed with vegetables. (3) Koyadofu no tamagoni–Freeze-dried tofu with soft scrambled egg. (4) Niyakko tofu–Soft scrambled eggs with tofu, spinach and mushrooms. (5) Age no fukuroni–Stuffed deep-fried tofu puffs. (6) Iridofu–Scrambled tofu flavored with miso (p. 186-90).

In the section on Yakimono (grilled dishes for dinner) are recipes for: (1) Tofu no misozuke yaki–Broiled tofu pickled in miso. (2) Tofu no dengaku–Sauteed tofu with a variety of miso sauces. (3) Gisei dofu–Tofu omelette. (4) Yaki dofu–Fried tofu. (5) Age no hasamiyaki–Grilled tofu puffs (p. 210-12).

In the section on Agemono [deep-fried] recipes is a recipe for: (1) Age dofu–Deep-fried tofu.

In the section on Nabemono [one-pot cookery] recipes are recipes for: (1) Yudofu–Tofu in hot water. Kaisen yudofu–Tofu and seafood casserole. (3) Niku yudofu–Tofu and meat casserole. (4) Sankai yudofu–"Surf and turf" with tofu. (5) Torinabe–Chicken and vegetable casserole flavored with soy sauce. (6) Buta nabe–Sliced pork and vegetable casserole flavored with soy sauce (p. 222-24).

In the section on Sukiyaki nabe–Casseroles cooked with little liquid are recipes for: (1) Gyuniku sukiyaki–Beef sukiyaki (with yakidofu). (2) Butaniku sukiyaki–Pork sukiyaki (with yakidofu) (p. 230-31). Address: Former owner and head chef, Domo restaurant, Denver, Colorado. Founder and chief instructor Nippon Kan Aikido and Cultural Center, Denver, Colorado.

9838. Homma, Gaku. 1991. Kuromame (Black soybeans at New Year's) (Document part). In: Gaku Homma. 1991. The Folk Art of Japanese Country Cooking: A Traditional Diet for Today's World. Translated by Emily Busch. Berkeley, California: North Atlantic Books. xii + 270 p. See p. 51.
• ***Summary:*** "On December 15, the Japanese begin cooking the traditional foods for the New Year's celebration. These are called *osechi...* Black [soy] beans are cooked and sweetened to make *kuromame."* These foods "are not chosen for their nutritional benefits; they are meant for good luck." Address: Former owner and head chef, Domo restaurant, Denver, Colorado. Founder and chief instructor Nippon Kan Aikido and Cultural Center, Denver, Colorado.

9839. Hymowitz, T.; Bernard, R.L. 1991. Origin of the soybean and germplasm introduction and development in North America. In: H.L. Shands and L.E. Wiesner, eds. 1991-1992. Use of Plant Introductions in Cultivar Development: Proceedings of a symposium sponsored by Division C-1 of the Crop Science Society of America in Las Vegas, Nevada, 19 Oct. 1989. 2 vols. Part 1. CSSA Special Publication Number 17. Madison, Wisconsin: Crop Science Society of America (CSSA). 164 p. See p. 147-64. Chap. 9. Crop Science Society of America Special Publication No. 17. [34 ref]
• ***Summary:*** Contents: Introduction. Origin of the genus *glycine.* Origin of the soybean. Introduction of the soybean to North America (by Samuel Bowen in 1765). Experiment stations and technology. Introduced soybean germplasm. Cultivar development. *Glycine soja.* Wild perennial *glycine* species.

"The genus *Glycine* Willd is divided into two subgenera, *Glycine* and *Soja* (Moench) F.J. Herm. The subgenus *Glycine* contains 15 wild perennial species (Singh et al., 1988; Tindale and Craven, 1988). Thirteen of the species [*G. albicans* Tind. and Craven, *G. arenaria* Tind., *G. curvata* Tind., *G. canescens* F.J. Herm., *G. clandestina* Wendl., *G. curvata* Tind., *G. cyrtoloba* Tind., *G. falcata* Benth., *G. hirticaulis* Tind. and Craven, *G. lactovirens* Tind. and Craven, *G. latifolia* (Benth.) Newell and Hymowitz, *G. latrobeana* (Meissn.) Benth. and *G. microphylla* (Benth.) Tind.] are indigenous to Australia. All carry $2n = 40$ chromosomes (diploid) except for *G. hirticaulis* which is tetraploid, $2n = 80$.

"*Glycine tabacina* (Labill.) Benth. with $2n = 40$ or 80 chromosomes, has been found in Australia, Taiwan, south Pacific Islands (New Caledonia, Fiji, Tonga, Vanuatu, Niue) and west central Pacific Islands (Mariana, Ryukyu). All accessions of *G. tabacina* collected outside of Australia are

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tetraploid (2*n* = 80) and even within Australia, tetraploids predominate over diploid forms. *Glycine tomentella* Hayata has been found in Australia (2*n* = 38, 40, 78, or 80), Papua New Guinea (2*n* = 40, 78 or 80), Indonesia (2*n* = 80), Philippines (2*n* = 80), and Taiwan (2*n* = 80). Singh et al. (1987, 1989) demonstrated that the complexes of *G. tabacina* and *G. tomentella* evolved through allopolyploidization in Australia."

"The soybean was first introduced to North America in 1765 by Samuel Bowen, a seaman employed by the East India Company. Bowen brought soybean from China via London to Greenwich, his residence in the province of Georgia. Situated a few kilometers east of Savannah, the 180 ha of Greenwich (now a cemetery) became the center of his farming and manufacturing enterprises.

"By the late 1850s, soybean was evaluated for forage potential by many farmers throughout the USA (Hymowitz, 1987). However, the scientific approach for evaluating the crop had to wait until the emergence of the agricultural experiment stations at land grant institutions during the latter part of the nineteenth century."

Table 9-1 (p. 154-57) shows "Ancestral cultivars and their occurrence in pedigrees of U.S.- Canadian publicly developed grain-type soybean cultivars (excluding backcross-developed isolines covered in Table 3). Part A of this table is a summary by maturity group and part B is a summary by decade of release. Each part is divided into number of descendant cultivars, northern ancestors, southern ancestors, ancestors chosen for pest resistance, other, and number of ancestral cultivars. The ten most important northern ancestors (in descending order of importance with the number of occurrences in pedigrees in parentheses) are: Mandarin (143), Manchu (121), Richland (119), A.K. (108), Dunfield (83), Mukden (73), No. 171 (30), Pakota (27), L37-1355 (25), and Manitoba Brown (14). The 13 most important southern ancestors are: CNS (118), Tokyo (109), PI54610 (108), S-100 (82), Roanoke (42), Haberlandt (40), Arksoy (40), Palmetto (34), Biloxi (9), PI 60406 (7), Otootan (7), Laredo (4), Mammoth Yellow (5).

Table 9-2 (p. 158-59) shows the "Origins of major ancestral cultivars of the 221 cultivars developed at public institutions in the USA and Canada." For each cultivar is given: Descendant cultivars, maturity group, year of introduction, country and locality of origin, and original cultivar name.

Table 9-3 (p. 161) shows "Sources of genes backcrossed into domestic public soybean cultivars." The named varieties are Kanro, Mukden, Arksoy, Higan, Kingwa, and CNS. All 8 of the most important northern cultivars originated in China. Of the 12 most important southern cultivars, 9 originated in China, 2 in Korea, and 2 or 3 in Japan. Address: Univ. of Illinois, Urbana, Illinois.

9840. Kikkoman K.K. 1991. Dai 73 ki jigyô hôkoku-sho. Heisei 2 nen 1 gatsu 1 nichi–Heisei 2 nen 12 gatsu 31 nichi [73rd annual financial report. From 1 Jan. 1990 to 31 Dec. 1990]. Tokyo, Japan. 13 p. 20 cm. [Jap]
• ***Summary:*** Color photos show most of Kikkoman's main products. Address: Tokyo, Japan.

9841. Landwehr, John; Krogt, P.C.J. van der. 1991. VOC: A bibliography of publications relating to the Dutch East India Company, 1602-1800. Utrecht, Netherlands: HES Publishers. xlii + 840 p. + xvi p. of plates. Illust. Facsims. 28 cm. *
• ***Summary:*** In Dutch, VOC is an abbreviation of Vereenigde Ost-Indische Compagnie.

9842. Loewen, Nancy. 1991. Food in Korea. Vero Beach, Florida: Rourke Publications, Inc. 32 p. Illust. (color photos). Index. 26 cm. Series: International Food Library.
• ***Summary:*** Juvenile literature: An introductory book for junior high school students. Text by Nancy Loewen. Recipes compiled by Judith A. Ahlstrom.

Contents: 1. An introduction to Korea. 2. A common heritage. 3. North and South Korea. 4. Agriculture and industry. 5. Holidays in Korea. 6. Food customs in Korea. 7. Korean foods. 8. A festive meal. 9. A red-meat meal. 10. A white-meat meal. 11. An everyday meal. Glossary of cooking terms. Korean cooking.

The Japanese took control of Korea in 1910 and remained in power until 15 Aug. 1945, when the country was liberated by allied forces. That didn't make Korea a free country, however. After 35 years of Japanese rule, Korea's political system was weak and the northern half of Korea was soon occupied by communist forces. The country was divided and in 1948 two new governments–one for the North and one for the South, were established. Then in 1950 North Korea invaded South Korea; the Korean War had begun; it lasted until 1953 with Korea still divided at Panmunjom–as it is today.

Korea still uses two calendars: the Gregorian calendar (used in the USA and in most other countries) and the ancient Chinese lunar calendar. Korea's older holidays are still observed based on the lunar calendar.

Common foods in Korea include rice, soy sauce, tofu, kimchi, and soybean sprouts.

9843. Lumpkin, T.A.; Konovsky, J.C.; Larsen, K.J.; McClary, D. 1991. Potential new specialty crops from Asia: Azuki bean, edamame soybean and *Astragalus.* In: Jules Janick and James E. Simon, eds. 1991. New Crops. New York: John Wiley and Sons. xxi + 710 p. See p. 45-51. Proceedings of the Second National Symposium, New Crops: Exploration, Research, and Commercilization. Indianapolis, Indiana, 6-9 Oct. 1991. [28 ref]
• ***Summary:*** For each of these three crops, the authors discuss the botany, production, and uses.

The astragalus discussed in this paper, *Astragalus*

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adsurgens Pall, is also known as upstanding milkvetch, green great wall astragalus, or *sha da wang* (which means "flourished in sand storms" in Chinese). *Astragalus sinicus* (pronounced us-TRAG-uh-lus SIN-uh-kus), called *renge* [or *genge*] in Japanese and also called Chinese milkvetch, is an annual forage crop grown during the winter.

Note: The Chinese herb known as *huang-qi,* sold in the USA as Astragalus, is *Astragalus membranaceus.* It is considered a superior tonic, used to "invigorate vital energy" or "qi," strengthen the body's resistance, promote tissue regeneration and diuresis, and disperse poisons. In China it is used in conjunction with chemotherapy to treat cancer patients, and to enhance the immune system. Address: 1,3-4. Dep. of Agronomy and Soils, Washington State Univ., Pullman, WA 99164-6420; 2. East-West Seeds, 120 State NE, Suite 1183, Olympia, WA 98501.

9844. Matsumoto, Kosai. 1991. Matsumoto Kôsai no ume de kenkô 365 [Matsumoto Kôsai's healthy 365 with ume plums]. Tokyo: Shufu-no-Tomo-sha. 176 p. Illust. No index. 21 cm. [Jap]

• ***Summary:*** Contains many color photos and black-and-white cartoons. On the front cover we read: Eat umeboshi ever day to be healthy. In *bainiku ekisu* (plum fruit extract) the beneficial effects of the ume plum are concentrated. Its sourness is the key to its way to health (*kenkôhô*). Address: Japan.

9845. Ogawa, Tadashi; Bando, N.; Tsuji, H.; Okajima, H.; Nishikawa, K.; Sasaoka, K. 1991. Investigation of the IgE-binding proteins in soybeans by immunoblotting with the sera of the soybean-sensitive patients with atopic dermatitis. *J. of Nutritional Science and Vitaminology* (*Tokyo*) 37(6):555-65. [24 ref]

• ***Summary:*** This soybean allergenic protein, which is most strongly and frequently recognized by the IgE antibodies in sera of soybean-sensitive patients with atopic dermatitis, has been characterized. The allergen was isolated from the crude 7S-globulin fraction by gel-filtration chromatography. It has a molecular weight of more than 300,000. Address: 1. Dep. of Nutrition, School of Medicine, The Univ. of Tokushima, Kuramoto-cho 3, Tokushima 770, Japan.

9846. Passmore, Jacki. 1991. The encyclopedia of Asian food and cooking. New York, NY: William Morrow. 320 p. Illust. by Jan Smith. Index. 24 cm. [44 ref]

• ***Summary:*** The most complete book of its type seen to date (May 2010), with many helpful cross references (although sometimes flawed). Soyfoods are mentioned throughout. Unfortunately, for Chinese foods, the author does not distinguish between Mandarin and Cantonese, or between pinyin (newer) and Wade-Giles (older) styles of romanization. For some of the "Also known as" it is not clear to which of several previous entries this refers (see "Soybean"). Sometimes she gives standard transliterations (azuki, miso, tofu, yakidofu) yet at other times she writes phonetically (ah meh)–as an aid to correct pronunciation.

Ame (ah meh, Japan): A sweet jelly made from millet.

Azuki bean (*Phaseolus angularis*). Native to China; used in China since the Han Dynasty (206 BC–AD 220): An [or anko] (Japan): A sweetened paste of ground azuki beans available in smooth (koshi-an) and crunchy [chunky] (tsubu-an or tsubushi-an). Sarashi-an: A flour of ground azuki beans. Also known as hong dow (China), dried red beans, red beans [adzuki beans, aduki beans]. See also: Red bean paste, sweet.

Bean curd: Also known as dou-fu, dow foo (China); tahu (Indonesia), momen tofu, tofu (Japan); ta hu, ta hua (Malaysia); tahure ([fermented tofu] Philippines); tauhu kau (Thailand); dau hu, dau hu chung (Vietnam); bean custard, soybean cake.

Note 1. This is the earliest English-language document seen (April 2013) that uses the term *ta hu* to refer to Malaysian-style tofu.

Illustrations of: Fried bean curd, pressed bean curd. Almond bean curd (non-soy). Bean curd "brains": Also known as doufu nao (China); taho (Philippines). "Cotton" bean curd: Also known as momen tofu (Japan). Freeze-dried bean curd [dried-frozen tofu]: Also known as koya tofu (Japan). Fried bean curd: Also known as char doufu, doufu pok (China); agedofu, atsu-age, nama-age (Japan); tauhu tod (Thailand), dau hu chien (Vietnam). Fried bean curd pouches: Also known as aburage, usuage (Japan). Gan modoki. Grilled bean curd: Also known as doufu kan [sic], gone (China); yakidofu (Japan). Instant bean curd. Okara. Pressed bean curd: Also known as doufu kan (China), taukwa, tauhu kuning (pressed yellow bean curd) (Indonesia, Malaysia); tokwa (Philippines); tauhu leong (Thailand); dau hu ki (Vietnam). Silk bean curd: Also know as kinugoshi tofu (Japan), shui doufu (China), taho (Philippines).

Note 2. The author seems to be confused about "Silk bean curd." Japanese kinugoshi is made from relatively thick soymilk, which is "set" using a coagulant but without any separation of curds and whey. Yet on page 26 we read: "In China the name [for silk bean curd] translates as 'water bean curd,' It has a very smooth, delicate texture achieved by straining the coagulated liquid through fine mesh, then allowing the strained curds to settle without pressing." This is not a description of silken tofu, but rather of Japanese regular tofu (*momen-goshi*) made without any pressing weights.

Contains a recipe for homemade "Bean Curd" plus 3 bean curd recipes.

Bean curd by-products: Bean curd skin [yuba], bean curd sticks: Also known as fu jook pin, gee jook (China), yuba (Japan), forng ta ohu [tauhu] (Thailand); rolled bean curd, second bamboo.

Fermented bean curd: Also known as foo yu, fu-ru, narm yu (China), tahoe, tahu (Indonesia, Malaysia), tausi

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(Philippines), bean curd cheese, Chinese cheese, pickled bean curd, red bean curd, soybean cheese.

Moldy bean curd. Bean curd cheese: See bean curd by-products (fermented).

Bean pastes and sauces: Shih and jiang from China: (1) Bean sauce (jiang) also known as taucheo or tau sa (Malaysia, Nonya and Singapore cooking), mien see [mian shi] (China), taoco [Pron. = tao-cho] (Indonesia), tuong ot (Vietnam), bean paste, brown bean sauce, yellow bean sauce. (2) Black bean sauce (a recent addition to the family of Chinese sauces. A major ingredient is puréed fermented black beans with a hint of garlic and star anise. It tastes best when freshly made). (3) Chili bean paste (in addition to chopped dried chilies, it sometimes contains fermented black beans): Also known as lat chu jeung, as lat chu jeung yau (Garlic) (China); kochujang (Korea); bean paste with chili; hot bean paste; Sichuan hot bean paste. (4) Dhwen-Jang (Korea). See also miso. (5) Hoisin sauce (China): A sweet, thick, reddish brown sauce. One ingredient is fermented soybean paste. Not to be confused with the Chinese barbecue sauce called sha cha jang. Also known as hoi sin cheung (China); barbecue sauce. (5) Soybean paste. Also known as mean see jiang (China). (6) Sweet bean paste. In this context it is not the sweet bean paste made from azuki beans, but rather a sweet, thick, dark brown sauce made of ground fermented soybeans and sugar. Its salty-sweet flavor is used in marinades and roast meats. Also known as tim mean jiang (China).

Bean sprout: Mung bean sprouts, silver sprouts (mung bean sprouts with the roots and seed pods removed), soybean sprouts (They "are large, up to 5 inches {12.5 cm} in length, a deep, almost yellow color and strong in flavor..."). Also known as: Daai dau nga choy (soybean sprout), ngunn nga choy (silver sprouts), nga choy, sai dau nga choy (mung bean sprout) (China); tauge (Indonesia); moyashi (Japan); kacang ijo, kacang djong, kacang padi (Malaysia); togue (Philippines); taun gawk (Thailand); gia (Vietnam); bean shoots.

Beijing duck sauce (recipe with ½ cup sweet bean paste). Vietnamese-style Beijing duck sauce (with ½ cup sweet soy sauce–kecap manis).

Black bean: See Fermented black bean. Black bean sauce: See Bean pastes and sauces. Fermented black bean sauce. Black soybean: See soybean.

Broad bean paste. Broad bean sauce: "The best is made in Pixian, a city in Sichuan province, where it is used instead of soybean-based seasoning sauces."

Brown bean sauce: See Bean pastes and sauces.

Che hau sauce (Che how, China): See Bean pastes and sauces (Hoisin). Chick-pea.

China: Has the "oldest and most well-documented cuisine in the world." Chinese cheese: See Bean curd by-products (fermented). Chinese hot bean paste: See Bean pastes and sauces.

Dau hu (Dow hoo, Vietnam): See bean curd. Dau hu chien (Dow hoo chee-ian, Vietnam): See Bean curd, fried. Dau hu chung (Dow hoo chee-ung, Vietnam): See Bean curd. Dau hu ki (Dow hoo kee, Vietnam): See Bean curd, pressed.

Dengaku (plus recipe).

Dhwen-jang (Dwen-jang, Korea). Similar to Chinese soybean paste or Japanese akadashi miso. Also known as Korean bean paste. Doufou Kan [doufu gan], China: Bean curd (grilled, pressed). Dou-fu (Dau-fu, China). See Bean curd. Doufu nao (Daufu-nou, China): See Bean curd "brains." Doufu pok (daufu pork, China). See bean curd, fried. Dow foo (dau fu, China): See Bean curd.

Edamame (e dah ma meh, Japan): See soy bean.

Fermented bean curd: See Bean curd by-products. Fermented bean curd cake. See Bean curd by-products; tempe.

Fermented black beans (Shih, China). With recipe for "Fermented black bean sauce" (p. 106). Also known as dau see (China), black beans, dried black beans, preserved back beans.

Fermented red rice. Flours and thickeners: Kuzu (Japan). Mung bean flour. Soy flour (incl. kinako, which "is used in confections and to make noodles... In China, a thick, nutty-tasting noodle is made from soy flour"). Foo yu (Fu you, China). See Bean curd by-products (fermented). Forng Tao Hu (Fong tao huu, Thailand). See Bean curd by-products, bean curd sticks. Fu jook pin (Fu juk pin, China): See bean-curd by-products, bean curd skin. Fu-ru (Fu yue). Gee Jook (Ji Juk, China): Bean curd sticks.

Gluten: Kau fu, kohana fu, matsutake fu, mein jin pau, nama fu, su tang, yaki fu. Also known as: Kau fu, mianjin, mein jin pau, su tang (China), kohana fu, yaki fu (Japan).

Gochujang (Korea). See also: Chili paste, chili sauce. Korean barbecue sauce.

Grilled bean curd: See Bean curd, grilled.

Hatcho miso: See miso, Hatcho. Hot bean paste. Hot black bean sauce. Inaka miso: See miso.

Japan: "Japanese cooks revel in the artistry of their craft. The Japanese love of nature is a challenge to present each ingredient as reminder of its origins: to bring nature to the table...," Regional cuisines are not of great importance in Japan; cooking methods (incl. Dengaku), salting (incl. Teriyaki), cutting and slicing techniques.

Kecap asin (Ket-chup a-seen, Indonesia): See Soy sauce, sweet and salty. Kecap cair (cha-ear, Malaysia): See soy sauce, light. Kecap hitam (Indonesia): See soy sauce, sweet and salty. Kecap ikan (Indonesia): See Fish sauce. Kecap manis (mah-niece, Indonesia): See Soy sauce, sweet and salty. Kecap petis (pet-is, Indonesia): See fish sauce. Kinugoshi tofu (Japan): See Bean curd, silk.

Kochujang (go-choo jang, Korea): See Bean pastes and sauces; chili pastes.

Koikuchi shoyu (Japan): See soy sauce. Continued. Address: Author of several books on Asian cuisine.

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9847. Passmore, Jacki. 1991. The encyclopedia of East Asian food and cooking (Document part II). New York, NY: William Morrow. 320 p. [44 ref]

• ***Summary:*** Continued from p. 153: Korean bean paste: See Dhwen jang. Koshi-an (Japan): See Azuki beans (an). Koya tofu (Japan): See Bean curd, freeze-dried [sic].

Kuzu (Japan): See Flours and thickeners. Lentil (*Lens esculenta*)*:* Red lentil, Red mung beans.

Light soy sauce: See Soy sauce.

Lu soy (lo shui, China): See soy sauce.

Maltose: Made by fermenting germinated grains of barley. When used to glaze foods, may have soy sauce and red food coloring added. Also known as: Malt sugar, [barley malt syrup].

"Ma-po" dofu [Mabo-dofu]: See beef.

Mean see jiang [mian shi jiang] (min see jiang, China): See Bean pastes and sauces.

Mein jin pau [mien jin pau] (China): See Gluten.

Mianjin (China): Gluten.

Mien see (mien-si [mian shi], China): See Bean pastes and sauces.

Miso (Japan): (1) Hatcho-miso. (2) Inaka miso or Sendai miso. Also known as Red miso. (3) Shinshu miso. (4) Shiro miso.

Mochi. Monosodium glutamate. Also known as: Mei jing (China); aji-no-moto (Japan); servuk perasa (Malaysia); ve tsin (Vietnam), M.S.G., taste essence, taste powder.

Moyashi (Japan): See Bean sprout.

Mung bean. Also known as moong ke dal (India); kacang djong, kacang eedjo [hijau, katjang idjo] (Indonesia); kacang hiau (Malaysia); tau ngok (Thailand); dau xanh (Vietnam); green gram.

Nama-age (nah-mah ah-geh, Japan): See Bean curd, deep fried.

Nama fu (Japan): Raw / uncooked wheat gluten.

Natto (Japan). See soybean.

Noodles: (1) Bean curd noodles (China). Also known as Soy noodles, soy vermicelli.

Oils and fats: Soybean oil. (2) Bean curd skin noodles (China) [yuba noodles].

Peanut (with many foreign names and recipes).

Preserved black beans: See Fermented black beans. Pressed bean curd: See Bean curd (pressed).

Red bean paste, sweet: "An important ingredient in Chinese and Japanese cooking, sweet red bean paste is made by boiling the red azuki bean and mashing it to a paste with lard or oil, then cooking it until it is fairly dry or thick. In Japan, red bean paste is made in two textures: the smooth purée is koshi-an and the chunky version, with the beans only partly crushed, is tsubushi-an. It is a filling for cakes and sweet buns, and is used in several desserts." Also known as hong dow sar (China), an (Japan). Contains a recipe for Sweet red bean paste.

Red rice: See Fermented red rice.

Rice: Many type of glutinous and non-glutinous.

Rolled bean curd: See Bean curd sticks [dried yuba].

Seaweed: Many different types. Seaweed gelatin or Seaweed jelly: See agar agar.

Sendai miso (Japan): See miso.

Sesame seed: Black sesame seed, sesame oil, sesame paste, white sesame seed.

Shinshu miso (Japan). Shui doufu (China): See bean curd (silk). Silk bean curd: See Bean curd (silk).

Soybean (*Glycine max*)*:* (1) Black soybeans. (2) Fresh soybeans [edamame]. (3) Yellow soybeans. Soybean cheese: See Bean curd, fermented [fermented tofu]. Soybean condiment: See Bean pastes and sauces. Soybean milk. Also known as tau cheing, tau ni (China). With homemade soymilk recipe. Soybean noodle: See Noodles, bean curd. Soybean oil: See fats and oils. Soybean paste: See Bean pastes and sauces. Soybean sprout: See bean sprout. Soy flour: See Flours and thickeners.

Soy sauce: "An ancient seasoning, first used in China more than 3,000 years ago. Known in its original form as *shih,* it was a thin salty liquid in which floated fragments of fermented soybeans." "Soy sauce is to Chinese and Japanese cooking what the pungent, salty fish sauce known as nam pla or nuoc mam is to Thailand and Vietnam respectively." (1) Dark soy sauce. Also known as jang yau, see yau (China); koikuchi shoyu, tamari (Japan), kecap pekat (Malaysia); mushroom soy. (2) Light soy sauce: Thinner, saltier, and lighter in color and flavor. It is used in cooking where its light color will not spoil the color of the ingredients. Also known as sang chau, see yau (China), shoyu, usukuchi shoyu (Japan), kecap cair (Malaysia), toyo (Philippines), nam siew (Thailand), xi dau (Vietnam), thin soy sauce. (3) "Lu soy (China) is a 'master sauce' based on soy sauce with sugar, ginger, and five-spice, It is used for simmering poultry and other meats to give a rich flavor and to color the food a deep brown. Also known as lu shui (China)."

Soy sauce, sweet and salty: (1) "Kecap asin (Indonesia) is a thick, salty, dark soy-based sauce used to impart a strong color and flavor. Its sweet counterpart is *kecap manis.* It is similar to, but thicker than, several dark soy sauces used in Chinese cooking." (2) Kecap hitam (Malaysia) is a sweet dark soy sauce. Slightly less spicy than kecap manis. (3) Kecap manis (Indonesia) is a sweet, dark, thick, aromatic soy sauce, especially widely used with satay. "It is similar to, though finer in flavor than, Chinese sweet soy sauce" [tian mian jiang]. Also known as kecap bentang manis (Indonesia); sweet soy sauce. (4) "Sweet soy sauce (China) is a dark, sweet sauce combining soy sauce, sugar, and malt sugar. Its distinctive malt-like taste goes well as a dip for fried snacks, poultry, and seafood." It appears frequently on the table in homes and restaurants in Fukien province, opposite Taiwan on the coast of south-eastern China. For a recipe, see Sweet soy sauce pork (p. 230). Note: This is not

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generally a commercial product. (5) Tim cheong (Malaysia) is a thick, sweet, black soy sauce, similar to that used in China. In Malaysia it is served with poh pia. Its flavor is closer to that of kecap hitam than to kecap manis.

Sprouts, soybean. See Bean sprout, soybean. Sushi (describes many types, with recipes). Sweet bean paste or Sweet bean sauce: See Bean pastes and sauces.

Taho (Philippine bean curd brains). Tahoe (Indonesia or Malaysia, fermented bean curd). Tahu (Malaysia bean curd). Ta hua (Malaysia bean curd). Tahure (Philippine bean curd).

Tamari (Japan): See soy sauce. Taucheo (Malaysia or Singapore, bean pastes and sauces). Tauge (Indonesia bean sprout). Tauhu kao (Thailand bean curd). Tauhu kuning (Indonesia and Malaysia bean curd pressed). Tauhu leong (Thailand bean curd, pressed). Tauhu tod (Thailand bean curd, fried). Taukwa (Indonesia and Malaysia bean curd pressed). Tau sa (Malaysia bean paste and sauces). Tausi (Philippines, bean curd products [sic, fermented black soybeans], fermented).

Tempe (Indonesia, Malaysia): Fermented soybean cake [tempeh]. Oncom [Ontjom]. Tokwa (Philippine bean curd pressed).

Tosa soy sauce (Japan): The classic sashimi accompaniment. Recipe given.

Tsukemono: Takuan, umeboshi.

Usu-age (Japan): See Bean curd (fried) purses.

Winged bean. Yuba (Japan).

Brief biography: "For more than twenty years she has been professionally involved with Asian food as a writer, teacher, publicist, researcher, consultant, and, of course, cook. She has traveled extensively in Asia and lived in Hong Kong for more than ten years, working as a food writer on a number of newspapers and magazines, which led to a career as a food consultant. Her most recent book, *Asia the Beautiful Cookbook* was listed by *Publishers Weekly* as one of the best books of 1987." Address: Author of several books on Asian cuisine.

9848. Shufu-no tomo. 1991. Anzen shokuhin no hon: Munôyaku, mutenka no honmono shokuhin otoriyose gaido [The book of safe foods: A guide for getting real foods without agricultural chemical or additives]. Tokyo: Shufu-no-tomo-sha. 144 p. Illust. 26 cm. Tokubetsu henshû (Special edition). Shufu-no-tomo Seikatsu Series. 26 cm. [Jap]

• ***Summary:*** This beautiful book is about Japanese natural foods, organically grown without agricultural chemicals and processed without chemical additives. It is packed with color photos and descriptions of the products, the people and companies that make them, and the places where they are made. The name, address, and phone number of each company is included. Miso (p. 16-20). Shoyu (p. 21-27). Natto and tofu (p. 76-78).

Amazake (p. 16-17): Koji-ya Saburouemon, Nakamura 2-29-8, Nerima-ku, Tokyo, Japan. Phone: 03-3999-2276. 100 years old, 6th generation.

Miso & Shoyu (p. 18): Sendai Miso Shoyu, Kojo 1-5-1, Wakabayashi-ku, Sendai-shi, Miyagi-ken 982, Japan. Phone: 022-286-3151.

Miso & tamari (p. 19): Nakamura Jozo, Tatsuno-cho 1536, Yokkaichi-shi, Mie-ken 510, Japan. Phone: 0593-26-0456. Started 70 years ago. 3rd generation. About 15 years ago started to make naturally fermented soy products.

Miso (incl. barley miso; p. 20): Shirouza Shoten, Meihama 3-3-27, Nishi-ku, Fukuoka-shi, Fukuoka-ken 819, Japan. Phone: 092-881-0413.

Shoyu made with whole soybeans (p. 21): Kikkogo Shoyu Kondo Shoyu Moto, Yamada 733, Itsukaichi-machi, Nishitama-gun, Tokyo 190-01, Japan. Phone: 0425-95-1212.

Shoyu (p. 22-23): Kadocho, Kita-machi 7, Yuasa-machi, Arita-gun, Wakayama-ken 643, Japan. Phone: 0737-62-2035. 5th generation.

Shoyu (p. 24): Yamaki Shoyu, Kotobuki 3-3-16, Honsho-shi, Saitama-ken 367, Japan. Phone: 0495-24-6161.

Unpasteurized miso, and shoyu (p. 25): Shoku Seikatsu Kenkyu-kai, Miroku-ji 83, Fujisawa-shi, Kanagawa-ken 251, Japan. Phone: 0466-22-0635. Started in about 1970.

Shoyu, amazake base, koji, miso (p. 26): Inoue Shoten (Igeta Shoyu brand), Owari-machi 57, Kitakyo, Nara-shi 630, Japan. Phone: 092-741-5360. 4th generation. Started during the Genji era (1864-65).

Shoyu (p. 27): Jokyu, Daimyo 1-12-15, Chuo-ku, Fukuoka-shi 810, Japan. Phone: 092-741-5360. Started 135 years ago.

Natto (p. 76): Kuroishi Natto, Fukuroi 1-74, Kuroishi-shi, Aomori-ken 036-03, Japan. Phone: 0172-52-3958. Started 60 years ago.

Natto (p. 77): Shojiki Mura, Nishitakao 5-237, Kitamoto-shi, Saitama-ken 364, Japan. Phone: 0120-421351. A relatively new company.

Tofu (p. 78): Kurihara Shoten, Endo 2022, Fujisawa-shi, Kanagawa-ken 252, Japan. Started in about 1977. Address: Tokyo.

9849. Yamauchi, Fumio; Yamagishi, Tatsunori; Iwabuchi, Setsuko. 1991. Molecular understanding of heat-induced phenomena of soybean protein. *Food Reviews International* 7(3):283-322. [116 ref]

• ***Summary:*** "Heating is one of the most important and frequently used methods for denaturing food proteins for processing, preserving, and cooking (1, 2). The functional properties such as gelation, emulsification, foaming and hydration are reflections of the protein structure of the denatured state."

Tanford (1969) stated that "'protein denaturation does not affect amino acid sequence drastically, but does affect native quaternary structure.'" And Hermansson (1978) has said that "'denaturation is not specific and irreversible.'" So a broad definition of denaturation of food protein might

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state that, in it, "an individual protein is physicochemically modified to some extent."

Glycinin corresponds to the 11S protein, and Beta-conglycinin is the principal component of the 7S protein. Address: Dep. of Food Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai-shi, Miyagi prefecture, Japan.

9850. Yokotsuka, Tamotsu. 1991. Nonproteinaceous fermented foods and beverages produced with koji molds. In: Dilip K. Arora; K.G. Mukerji; E.H. Marth, eds. 1991. Handbook of Applied Mycology. Vol. 3: Foods and Feeds. New York, NY: Marcel Dekker, Inc. x + 621 p. See p. 293-328. Chap. 10. [135 ref]

• ***Summary:*** Contents: 1. Introduction (Eight types of traditional fermented foods and beverages, early history of fermented foods, three types of microorganisms used for or found in food fermentations, distribution of fermented foods worldwide, koji in Japan and China, different meanings of the term "koji molds"). 2. Nonproteinaceous, nonalcoholic lactic-acid fermented foods. 3. Alcoholic fermented beverages: A. Made from sugar-containing raw materials. B. Saccharification processes in alcoholic beverage manufacture (malt and koji). C. Mixed culture dough inocula for food and beverage fermentation in Southeast Asia. D. Alcoholic beverages in China and Taiwan (chu / qu is Chinese koji). E. Yakju and Takju in Korea. F. Rhizopus vs. Aspergillus as enzyme producers in alcoholic beverage fermentations... H. Mirin, amasake [amazake], and lao-chao. 4. Vinegar.

Figures show: (1) The course of tropical storms (shown on a map of the world). (2) Classification of microbes (filamentous fungi, yeasts, bacteria) used to make fermented foods or beverages (based on sexual characteristics). Phycomycetes (septate mycelia, sexual spore formation) -> Mucor and Rhizopus (asexual spores are formed on top of sporangiophore which is covered with sporangium). Mycomycetes (nonseptate mycelia, asexual and sexual spore formation) -> Ascomycetes (sporeforming in special sacs or saci) -> Monascus, Saccharomyces and Zygosaccharomyces (spore is formed by budding or conjugation of two cells), Penicillium (no foot cells, no vescicle; penicillium means a brush), Aspergillus (asexual conidiophore are formed by splitting from sterigmata attached to top of conidiophore (vesicle)). Fungi imperfecti (spore nonforming) -> Torulopsis. Schizomycetes -> Eubactriales (bacteria) -> Acetobacter, Micrococcus, Pediococcus, Bacterium, Clostridium. (3) Famous Chinese wine-producing areas: They make Shandong yellow wine, Shaoxing (W.-G. shaohsing) wine, Fujian yellow wine. Note: Kaoliang liquor is a typical distilled wine in China. (4) Flow chart of process for making Shaoxing jiu (from glutinous rice). Address: Research Div., Kikkoman Corp., Noda City, Chiba prefecture, Japan.

9851. Yokotsuka, Tamotsu. 1991. Proteinaceous fermented foods and condiments prepared with koji molds. In: Dilip K. Arora, K.G. Mukerji, and E.H. Marth, eds. 1991. Handbook of Applied Mycology. Vol. 3: Foods and Feeds. New York, NY: Marcel Dekker, Inc. x + 621 p. See p. 329-73. Chap. 11. [118 ref]

• ***Summary:*** Contains a great deal of very interesting information. Contents: 1. Introduction. 2. Fermented soybean foods in East and Southeast Asia: A. Douchi (China), Hama-natto (Japan), and in-yu (Taiwan). B. Shuidouchi (Shandong province, China), thua-nao (Thailand), kinema (Nepal), and natto (itohiki natto) (Japan). C. Tempe [Tempeh] and Oncom [Onchom] (Indonesia) (Making soybean tempe, volatile flavor of tempe, chemical composition and nutritional value of tempe, tempe bongkrek). D. Fermented tou-fu (soybean curd) products: Sufu (China and Taiwan), Tofuyo (Okinawa, Japan).

3. Fermented salty condiments in a slurry or paste made from soybeans and cereals: A. Doujiang (touchiang) (China) and Tauco [taucho] (Southeast Asia). B. Doubanjiang (Toupanchiang). C. Tianmianjiang (Tienmienchiang). D. Gochujiang and Doenjang (Korea). E. Hishio (Japan). F. Miso (Japan) (Production and consumption of miso, making rice miso and barley miso).

4. Fermented salty liquid condiments made from soybeans and cereals: A. Japanese shoyu (Manufacture of koikuchi and usukuchi shoyu, manufacture of tamari shoyu). B. Soy sauce produced in east and southeast Asian countries other than Japan (Korea, Taiwan, Hong Kong, Singapore, Malaysia, Indonesia, Thailand, People's Republic of China {the process, acid hydrolysis, was illegal until recently}, chijhi or whole soybean soy sauce still made in the basins of the Zhujiang {Pearl} River and the Huanghe {Yellow} River).

5. Biochemistry involved in shoyu and miso manufacture: A. Selection of raw materials. B. Contribution of improved cooking methods of raw materials to increase the enzymatic protein digestibility. C. Selection and improvement of koji molds. D. Improvement in koji making. E. Microbial and chemical control of salty mash fermentation. F. Flavor evaluation of koikuchi shoyu. G. Stability of color of pasteurized shoyu. H. Nutritional concern about shoyu and miso (salt content). Safety of koji molds and shoyu (aflatoxins).

6. Conclusion.

Tables show: (1) Chemical composition of kinema, thua-nao, and douchi. (2) Changes in nitrogenous compounds during natto fermentation. (3) Changes of nitrogen compounds in sufu making. (4) Constituents of some types of miso. (5) Chemical composition of various kinds of genuine fermented shoyu in Japan. (6) Effect of cooking conditions of thoroughly moistened defatted soybean grits on the enzymatic digestibility of protein. (7) Differences between *A. oryzae* and *A. sojae* used for shoyu fermentation. (8) Proteinases produced by *Aspergillus sojae.* (9) Enzyme

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composition of koji as influenced by the difference of material. (10) Various metabolic patterns by lactobacilli in shoyu mash. (11) Digestiblilities of protein in shoyu, miso, natto, and tempe fermentations. (12) Results of quantitative analysis of flavor constituents in koikuchi shoyu.

Figures show: (1) Flow sheet of tempe making. (2) Flow diagram of sufu making from 1 kg soybeans (with all quantities of ingredients, temperatures, and times). (3) Flow diagram of rice-miso fermentation from 1,000 kg soybeans and 600 kg milled rice. (4) Flow diagram of koikuchi shoyu fermentation from 330 kg defatted soybean meal (or 400 kg whole soybeans) and 340 kg wheat kernels. (5) Flow diagram of tamari-shoyu fermentation from 800 kg defatted soybeans, 346 kg wheat, 20 kg roasted barley flour, and 439 kg NaCl. (6) Microflora changes in shoyu mash fermentation. (7) Classification of Aspergilli. (8) Fermented foods and condiments made from soybeans mixed with or without cereal grains or flour.

Hama-natto in Japan (p. 332): The Taiho Laws, which took effect in 701, mention an office in Japan's imperial court that dealt with several fermented soyfoods including *"douchi* [2 Chinese characters given] or *kuki* (1 Cc): in Japanese, miso and jiang (1 Cc) or hishio (1 Cc)..." "The method of preparing salted and unsalted *douchi* [fermented black soybeans] is described in the book *Yoshufushi* (1686) and elsewhere. According to the oldest record about douchi in Korea, in 683, the product apparently was not an important food commodity in that country.

Salted douchi [fermented black soybeans, which originated in China] appeared in Central Japan with names such as "Hama-natto, Daitokuji-natto, and others, and in Taiwan as *In-si."*

Concerning *shuidouchi* (*Chinese salted natto with minced ginger. p. 332-35*)*:* This unusual product can be considered an intermediate form between *douchi* (salted fermented soybeans / fermented black soybeans) and the itohiki-natto family of foods; unlike *douchi* it is fermented with a *Bacillus* bacterium rather than with an *Aspergillus* mold, but unlike natto it is a salted product and has ginger added. To make *shuidouchi:* Boiled soybeans are naturally inoculated with *Bacillus subtilis* and incubated at high humidity and at 30-40ºC. This preference for a high temperature may be why the *Chi-min yao-shu* (6th century China) recommended that, when making douchi [fermented black soybeans], the temperature during incubation be kept rather low. In Shandong, China, *shuidouchi* are made as follows: Clean, soak, and boil soybeans until soft. Place in a cloth bag and cover with straw, which is the best natural source of *B. subtilis.* After incubation for 1-2 days at 25-30ºC the soybeans will be covered with viscous substances. Mix the sticky soybeans with minced ginger and salt, then pack tightly into jars, and age for one week. They are now ready to consume (See references 5 and 6). Address: Research Div., Kikkoman Corp., Noda City, Chiba prefecture, Japan.

9852. Hayakawa, Tsuneo. 1992. Re: Hatcho miso company is now building its own miso museum. Letter to William Shurtleff at Soyfoods Center, Jan. 8. 1 p. Typed. [Eng]
• ***Summary:*** The museum is intended to let people know the old way of miso production and to make them more familiar with the company. Using several mannequins, old tools, and some documents owned by the management, the company has almost completed the main part of the museum. Tsuneo, a younger brother of the president, is in charge of collecting historical materials for the museum. He began work on this project 2 years ago; before that he worked for a newspaper company. He intends to make a miso literature corner in the miso museum. Mr. Kaneko, former chief of the general affairs section, retired 10 years ago. Address: Hatcho Miso, 69 Okan-dori, Hatcho-cho, Okazaki-shi, Aichi prefecture 444 Japan.

9853. Hayakawa, Tsuneo. 1992. Re: Building a Hatcho miso museum in Okazaki City, Japan. Letter to William Shurtleff at Soyfoods Center, Jan. 8. 1 p. Typed, with signature. [Eng]
• ***Summary:*** "Hatcho Miso Company (Goshikaisha Hatcho Miso in Okazaki City, Japan) is now building its own Miso Museum to let people know what the old way of miso production was and to make them familiar with the company." He asks for ideas and advice. Shurtleff responds with three specific suggestions. Address: c/o Hatcho Miso, 69 Okandori, Hatcho-cho, Okazaki-shi, Aichi prefecture, Japan.

9854. *Ag Innovation News* (*AURI–Agricultural Utilization Research Inst., Crookston, Minnesota*). 1992. Minnesota producing beans for the Japanese markets. 1(1):4. Jan.
• ***Summary:*** The Jameson-Williams Company, based in Jackson, Minnesota, is the leading U.S. company that is producing and marketing edamame [green vegetable soybeans] on a commercial basis. In a traditional Japanese sake ceremony held on 26 Sept. 1991, Jameson-Williams finalized arrangements with the Nishimoto Trading Company and two huge Japanese distributing companies which will market the Minnesota-grown edamame in Japan. One of the distributors is Asahi Brewery, which has more than $4,500 million annual sales. The other is Japan's largest Coca-Cola distributor.

"AURI invested more than $100,000 in research and technical assistance to refine edamame equipment and techniques... A a result of its partnership with AURI, Jameson-Williams has invested between $40,000 and $500,000 in buildings and equipment in Jackson."

9855. Kudou, Shigemitsu; Tonomura, M.; Tsukamoto, C.; Shimoyamada, M.; Uchida, T.; Okubo, K. 1992. Isolation and structural elucidation of the major genuine soybean saponin. *Bioscience, Biotechnology, and Biochemistry*

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56(1):142-43. Jan. [159 ref]*
Address: Kanesa Co., Aomori, Japan.

9856. Larson, Donald W.; Rask, Norman. 1992. Industry note: Changing competitiveness in world soybean markets. *Agribusiness: An International Journal* 8(1):79-91. Jan. [11 ref]
• ***Summary:*** Contents: Introduction. World soybean production. Soybean and soybean product trade shares. Factors affecting competitiveness and trade: Costs of production, government policy. Conclusions. The GATT negotiations and the New Economic Order are based on the assumption of competitiveness in world markets. The landed cost of soybeans in Japan and at Rotterdam [Netherlands] favors Argentina and Brazil over the USA. The USA has steadily lost export market share for soybeans and soy products, from about 95% in early 1979 to 45% in 1990. During this time the Brazilian share has grown to 30% and the Argentine share to 16%. A fundamental shift from the export of soybeans to the export of more soybean products has occurred largely because of policies favoring product exports from Argentina and Brazil.

Tables show: (1) Soybean area harvested in six major producing countries in five groups of selected years from 1974 to 1990, and the percentage change during this time. The percentage changes are: Argentina +16,333%, Paraguay +10,000%, Brazil +96%, USA +20%, and China -43%. (2) Comparative soybean yields in the USA, Canada, Argentina, Brazil, Australia, and the world in 7 groups of years from 1975 to 1990. Canada usually has the highest yields. (3) Soybean production costs in Argentina ($127/acre), Brazil ($145/acre), and USA ($192/acre). (4) Production and marketing costs for soybeans landed in Rotterdam and Japan for Argentina, Brazil, and USA. In each port, Argentina has the lowest landed costs and USA has the highest.

Bar charts show: (1) Percentage shares of world soybean exports by major exporters (USA, EC-12, Argentina, Brazil, Paraguay, Others) 1980-1990. (2) Percentage shares of world soybean oil exports by major exporters (USA, EC-12, Argentina, Brazil, Others) 1980-1990. (3) Percentage shares of world soybean meal exports by major exporters (USA, EC-12, Argentina, Brazil, Others) 1980-1990. Address: Professors in the Dep. of Agricultural Economics and Rural Sociology, The Ohio State Univ.

9857. Shurtleff, William; Aoyagi, Akiko. comps. 1992. Bibliography of the soybean plant: Nomenclature, physiology, morphology, botany, taxonomy, and wild soybeans, with 1,266 references from 1100 B.C. to 1991, extensively annotated. Lafayette, California: Soyfoods Center. 352 p. Subject/geographical index. Author/company index. Language index. Printed 24 Nov. 1991. 28 cm. [1266 ref]
• ***Summary:*** This is the most comprehensive bibliography on the soybean plant ever published. Its scope includes soybean nomenclature and etymology, physiology, morphology, botany, taxonomy, wild soybeans, and wild glycine species closely related to the soybean. It is also the single most current and useful source of information on this subject available today, since 72% of all references (and most of the current ones) contain a summary/abstract averaging 206 words in length.

This is one of more than 40 bibliographies on soybeans and soyfoods being compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyfoods Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features: 24 different document types, both published and unpublished, every known foreign language publication on the subject, extensive translations of many Japanese and European works, and many original interviews Thus it is a powerful tool for understanding the development of this subject and related products from its earliest beginnings to the present, worldwide.

Compiled one record at a time over a period of 17 years, each reference in this bibliography features (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English publications together with an English translation, month and issue of publication, and the first author's first name (if given).

Details on how to use the bibliography, a complete subject and geographical index, an author/company index, a language index, and a bibliometric analysis of the composition of the book (by decade, document type, language, leading periodicals or patents, leading countries, states, and related subjects, plus a histogram by year) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 510-283-2991.

9858. *Toyo Shinpo* (*Soyfoods News*). 1992. Tenpe ken, Toyama de fooramu Jikkô Iinchô. Tenpe ryôri no shidô mo jimoto TV mo hôei [Tempeh Study Group acted as executive committee for a forum in Toyama. Instructions on tempeh cookery were also broadcast on local TV]. Feb. 1. p. 1. [Jap]
• ***Summary:*** A 2-part article. A photo shows Tomomichi Yanagida.

9859. *Toyo Shinpo* (*Soyfoods News*). 1992. Tenpe kenkyû-kai. Toyama fooramu hiraku. Honba ryôri no shishoku mo. Nana nin no kôshi de moriagaru [Tempeh study group forum held in Toyama. Tasting of real Indonesian dishes with 7 instructors was a hit]. Feb. 1. p. 3. [Jap]
• ***Summary:*** A photo shows many people, standing at tables and cooking, at the active meeting.

9860. *Toyo Shinpo* (*Soyfoods News*). 1992. Nattô mochi ikaga? Kyôto-shi no Kita-bu Kyôkita-machi no meibutsu

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[How would you like some natto mochi? Its a special product of Kitamachi in northern Kyoto]. Feb. 21. p. 3. [Jap]
• ***Summary:*** A small photo shows that the natto is inside a piece of mochi.

9861. DeBona, Don. 1992. The miso market in America and The American Miso Co. (Interview). *SoyaScan Notes.* Feb. 29. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The miso market in America is growing nicely. There are two distinct U.S. miso markets, the Asian-American (Oriental) market and the natural foods (macrobiotic) market. Don can only speak for the latter, and is best able to discuss his company's experience in that market. In the last 3-4 years, his production has grown on average 10-12% a year. He thinks that the causes of this growth are the wider availability of miso, and its greater accessibility to mainstream consumers who increasingly shop at natural food stores and chains such as Whole Foods Market and Bread & Circus. Neither the current recession nor the greater consumer awareness of dietary sodium affect miso sales. Most miso buyers are macrobiotics or vegetarians who are not very concerned about consuming too much sodium. People who buy his lower-sodium misos (sweet white [rice], sweet barley, mellow barley, or chickpea miso), do so not because of their lower sodium content but because they have different applications and flavors. He does not market his low-salt products as "low salt" nor does he see any great potential in making and marketing low-salt misos. Miso buyers generally know a lot about miso and about nutrition. He makes no nutritional claims on his miso products. His main concerns are with the taste and quality of his misos.

From the late 1960s until the very early 1980s, the non-Oriental U.S. miso market was largely a macrobiotic market. But the growth he has seen in the last 3-4 years is mainly to non-macrobiotic customers. He estimates that more than half the people who buy his miso do not think of them selves as macrobiotic, and perhaps a third of them have never even heard the word "macrobiotic." They buy it as a vegetarian natural food product; they like the taste, and see it a new and versatile seasoning. The dark misos provide a meatlike flavor but the sweet and mellow misos do not. People use mellow white miso is soups, salad dressings, or stir fries. Dark misos are used more in soups, whereas sweet misos are not very widely used in soups.

He would categorize the different varieties of miso (both from a production and sales viewpoint) as percentages of his total production as follows: 1. Long-term, traditional darker, 40% (23% barley and 17% rice). 2. Mellow miso (white or barley), 30%. 3. Sweet miso (white or barley), 20%. 4. Other (including non-soy): Chickpea, 10%.

Looking at the same categories for the American natural foods/macrobiotic market as a whole: 1. Long-term, traditional darker, 57% (35% barley, 15% rice, 7% soybean or Hatcho). 2. Mellow miso (rice or barley), 25% (American Miso Co. and Miyako Oriental Foods/Cold Mountain dominate this category). 3. Sweet miso (rice or barley; only American Miso makes or sells a true shiro miso), 10%. 4. Other (including non-soy): Chickpea, finger lickin' miso (a topping), natto miso, buckwheat miso, etc. 8%.

Two Japanese men now live and work at American Miso Co.; one was brought by John Belleme about 8 years ago, and one came about 3 years ago. They are in production. Don also has 2 American workers. They are like part of the family. He has never had soybean or Hatcho miso in his house and has never seen these Japanese eat it. Don does not particularly like the taste; it is dark, lacks sweetness and a complex bouquet due to its lack of grain, and is over-aged. Moreover, he feels it is more difficult to make because soybean koji is hard to make.

Westbrae sells a lot of miso on the West Coast but not much on the East Coast. Miso is said to be Westbrae's third best-selling product category. Don used to sell Westbrae's miso in the 1970s, when he worked for Laurelbrook Foods in 1980-81, shortly after Rod and Margy Coates were bought out.

Companies that make the miso in the USA using organically grown soybeans and grain include American Miso Co. (50% of natural foods market), and South River Miso Co. (10%); Westbrae and Miyako/Cold Mountain only use organic soybeans, but they call their miso "organic." New labeling regulations will soon make that illegal, and will probably cause most of the miso made in America to be made from organically grown soybeans and grains. Many consumers want organic miso.

The three largest makers of miso in America (for both markets), in descending order of production, are Miyako Oriental Foods, American Miso Co., South River, Junsei Yamazaki, and Traditional Foods. The major miso importers, again in approximate descending order, are Eden Foods, Great Eastern Sun (Mitoku Brand), Westbrae, Granum (Mitoku brand), and Tree of Life (Mitoku Brand).

In the U.S. natural foods market, American Miso Co. is the market leader. Don estimates the size of this market to be about 750,000 lb/year, but he would guess that Asian-American market is about twice this large (1,500,000 lb/year). His various misos retail for about $5.95 in 1 pound sizes or $3.95 in 8 oz sizes. When Don travels in America, he studies the shelves, and has been in almost every major natural foods store in the USA. He also regularly visits distributors and food brokers. But he does not try to keep systematic statistics on the market size.

American Miso Co. is growing rapidly, and it is hard to finance this growth from earnings. Don's plant is now too small relative to demand; it is bursting at the seams. He has added more vats and plans to add another building this summer, financing it with a bank loan. The company is owned by only two people: Don and his partner, Barry

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Evans. Barry used to have a lot of money, but he got out of the marijuana business–where he made the money. He is now in jail in Santa Barbara for selling marijuana. In went to jail in Jan. 1992 and expected to be there for about 2½ years. Much of the $500,000 startup capital for America Miso Co. came from Barry, but since then the company has largely had to finance itself. Financially the company is doing very well; they have made a profit every year for the past 3-4 years. Don is wary of bringing in more partners because of bad experiences in the past. Don has had a very good relationship with Barry Evans, and it has greatly benefited both of them and American Miso Co.

Don, whose ancestry is mostly Italian plus a little Irish, greatly enjoys running the company. His role has changed a lot. Up until last year, he made miso every week. How he does that much less, and focuses more on marketing. For the past 2-3 years he has also been president of Great Eastern Sun–a position he held before he came to replace John Belleme at American Miso Co. Most customers identify the company as "Miso Master" rather than "American Miso Co." Address: General Manager, American Miso Co., Route 3, Box 541, Rutherfordton, North Carolina 28139. Phone: 704-287-2940.

9862. Honda, Chiyo; Nanba, Toyohiko; Asaoka, Osamu; Yumoto, Kuniko; Hayashi, Toshio; Ikegami, Sachie; Takai, Yuriko. 1992. [Modification of methods for determination of dietary fiber in raw and processed pulses]. *Shokuhin Eiseigaku Zasshi* (*J. of the Food Hygienic Society of Japan*) 33(1):46-51. Feb. [17 ref. Jap; eng]*
• ***Summary:*** Foods analyzed include white kidney beans, kintoki beans, and soybeans (whole dry raw, boiled, kinako, natto). Address: 1-5. Japan Medical Foods Association, 5-3-11, Maesawa, Higashikurume-shi, Tokyo 203, Japan.

9863. *Illinois Soybean Farmer* (*Bloomington, Illinois*). 1992. Japan eyes landmark U.S. soybean shipment. 3(2):7-9. Feb.
• ***Summary:*** On 17 Sept. 1991 the 100 millionth metric ton of U.S. soybeans arrived in Japan at the port of Yokohama. The Daruma doll (which represents Bodhidharma) observed the event with open eyes. Only one eye of the Daruma doll is painted on when its owner sets a goal; this is to remind the owner to strive to meet the goal. The other eye is painted on after the goal is achieved.

The U.S. began exporting soybeans to Japan in 1946. Ten years later, in 1956, the American Soybean Association opened its first office in Tokyo. Roughly 2 million metric tons (73 million bushels) were exported to Japan during those first 10 years. During 1956 more than half a million metric tons were exported to Japan. Today, Japan is the single largest single-country consumer of U.S. soybeans, importing three million metric tons of soybeans each year. In 1984 the U.S. portion of the Japanese soybean market reached a peak of 93% and then began a slow decline. Today it has fallen to about 70%; the South American soybean share has risen to about 16%. Today about one-third of all soybeans in Japan are used as directly as human food.

9864. Kushi, Michio. 1992. Introduction to *Culinary Treasures of Japan*, by John and Jan Belleme. 16 p. Jan. Unpublished manuscript.
• ***Summary:*** This manuscript, which was published in a condensed form in the actual book, tells the story of Mitoku and their work to export traditional Japanese natural foods to the Western world. Michio Kushi was instrumental in getting Mr. Akiyoshi Kazama involved in this work. Mr. Kushi, who became a World Federalist after World War II, came to the U.S. in Nov. 1949 to study at Columbia University. He continuously sought ways of establishing world peace, and increasingly came to believe that a proper diet is the basis for health, happiness, and peace.

In April 1966 the author's wife, Aveline, opened a small store named Erewhon in Boston. Michio began to search for a Japanese source for foods that Erewhon would sell. He was introduced to Mr. Kazama (who lived in Tokyo) through a Japanese friend, Mr. Obayashi, who resided at that time in New York City. Michio felt that Mr. Kazama understood his desire for foods of high quality. So Mr. Kazama "began his search for food producers and manufacturers who were sincere and willing to supply the kind of quality we requested. I know that for him, at that time, it was a great gamble. It was also a painstaking and slow step-by-step process."

Mr. Kazama was born on 1 Feb. 1930 in Yamanashi prefecture. He graduated from Waseda University in Tokyo, then was selected to study business in the United States. After arriving in Chicago, Illinois, he was drafted by the U.S. government to serve in the American Army in Korea and in Japan from 1956 to 1958. Upon his return to Japan, he settled in Tokyo where he became an import agent for a German company dealing in optics and electronics. After the Kushis contacted him, he became involved in the emerging natural food business. [He founded a company named Mitoku. Mi = Michio. To = Tomoko (Aveline's given name in Japanese). Ku = Kushi].

In 1968 Mr. Kazama made his first shipment of Japanese natural foods to Erewhon; the order was worth $3,000. The Kushis first met Mr. Kazama in Boston in 1970. Over the years, the volume of Mitoku's exports steadily grew, and expanded to Europe, Australia, and the Middle East. Today Mitoku ships its products to about 35 countries. Approximately 40% of Mitoku's exports go to America, 40% to Europe, and 20% to Australia and other regions. Annual sales are about $10 million. Among the major suppliers are Sendai Miso Shoyu Co. Ltd., Hatcho Miso Co. Ltd., Hagoromo Miso, Ltd., Hanamaruki Miso Co. Ltd, San Iku Foods Co. Ltd.

Distributors of Mitoku's products include the following:

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In the USA: Westbrae Natural Foods Inc., Great Eastern Sun Inc., U.S. Mills Inc., Tree of Life Inc., and Shojin Natural Foods (Hawaii). In Canada: Koyo Foods Inc., Flora Distributors Ltd., and Timbuktu. In Costa Rica: Distribuidora de Productos Macrobioticos S.A. In England: Sunwheel Foods Ltd, Clearspring Natural Grocer, Meridian Foods Ltd. In France: Celnat, Tama. In Belgium: Lima N.V. In the United Arab Emirates: Emirates Trading & Marketing Est. In South Africa: Key Health. In Austria: Naturkostladen, Lebenszeichen. In Switzerland: S'lotusbluemli, Terrasana, Futonhaus. In Sweden: Kung Markatta. In Norway: Alternative Import. In Finland: Makro Bios. In Portugal: Armazens Da Matinha. In Spain: Kunga. In Italy: La Finestra Sul Cielo, Probios S.R.L., Dalla Terra al Cielo, Solo Natura. In Israel: Tivoli Ltd. In Australia: Pureharvest. In New Zealand: Enso. In Singapore: Nature's Best. In Yugoslavia: General Export. In Japan: Seibu Department Stores Ltd., Tokyu Department Stores Ltd. Among the countries reached indirectly through trans-shipment are Hungary, reached through Austria, various South American countries reached through the United States, and other countries such as Poland, Czechoslovakia, Iceland, Andorra, Ireland and the Caribbean Islands.

As Mitoku developed its international operations, Mr. Kazama hired many students from Western countries, including Blake Rankin (USA), Ferro Ledvinka (Italy), Christopher Geoffrey Dawson (New Zealand, starting 1979), Robbie Swinnerton (England), Terrie Adams (USA), and Michelle Harbroun (France).

"For the past 10 years, Mitoku has echoed and supported the macrobiotic perspective with its motto 'Isshoku-Dogen.' These words, though they have been forgotten in the last few centuries by the very people in the health care field who should remember them well, mean literally 'medicine and food have the same source,' and can be translated as 'food *is* medicine.' This saying has been used and known as part of the ancestral heritage of wisdom transmitted from generation to generation for several thousand years in Oriental countries such as China, Korea and Japan.

"In an attempt to preserve Japanese traditions, Japan has instituted a 'Living Treasures' program granting official recognition and support to [living masters in] various cultural areas such as theater, music, dance, sculpture, carpentry, weaving... and arts and crafts. Ironically, though, Japan has not granted the same official recognition to its traditional methods of food processing and production in spite of the fact that increasingly large numbers of people throughout the world are now appreciating traditionally processed Japanese food products and have become aware of their important health benefits. The Japanese traditional arts of producing miso, soysauce, tofu, natto, amazake, rice vinegar, sake, mirin, condiments and pickles as well as cooking methods and preparation are unique among the culinary practices of the world... These foods are also works of art... It is my hope and recommendation that official recognition and support be granted by the 'Living Treasures of Japan' to those who have dedicated their life to the traditional art of food production and processing in spite of the hardships and commercial disadvantages they are compelled to face in business competition and present-day economical conditions." Address: 62 Buckminster Rd., Brookline, Massachusetts 02146.

9865. MacNeil/Lehrer Newshour. 1992. Asian-Americans. Television broadcast. PBS. Friday, Feb. 28. *
• ***Summary:*** Asian-Americans are the fastest growing minority group in America. They now number 7.3 million people. 3 million of these live in California. Politically they tend to be Republicans.

9866. Singh, R.J.; Kollipara, K.P.; Ahamd, F.; Hymowitz, T. 1992. Putative diploid ancestors of 80-chromosome *Glycine tabacina. Genome* 35(1):140-46. Feb. [27 ref]
• ***Summary:*** "The objective of this study was to discover the diploid progenitors of 80-chromosome *Glycine tabacina* with adventitious roots (WAR) and no adventitious roots (NAR)...

"*Glycine tabacina* (Labill.) Benth. is 1 of the 15 wild perennial species of the genus *Glycine* Willd. subgenus *Glycine,* which includes both diploid (2n = 2x = 40) and tetraploid (2n = 4x = 80) cytotypes. Diploid G. *tabacina* is indigenous to Australia, while the tetraploid cytotype is found sympatrically with diploids in Australia and in the islands of the south Pacific (New Caledonia, Vanuatu, Fiji, Tonga, Niue) and west central Pacific (Taiwan, Ryukyu [Japan], Marianas)." Address: Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801.

9867. *SoyaFoods* (*ASA, Europe*). 1992. French standards for tonyu [soymilk]. 3(1):2. Winter.
• ***Summary:*** Recently the French soyfoods association, SOJAXA, adopted the term 'tonyu' (the Japanese word for "soymilk") because of labeling restrictions in France and Europe. Now, in cooperation with SOJAXA, The French Standards Institute (AFNOR) has decided to develop standards for soymilk in France.

9868. Whiteman-Jones, Michael. 1992. Soyfoods poised for growth: New mass-market interest, product development and consumer interest are driving sales higher than ever. *Natural Foods Merchandiser.* Feb. p. 18-19.
• ***Summary:*** Last year soyfoods were introduced to mass-market consumers by two of America's corporate giants. (1) Archer Daniels Midland Co. (ADM of Decatur, Illinois) introduced the vegeburger to show that a delicious food product could be made from soy. ADM marketing specialist Lee Lensch says the soy burger is doing very well in test markets in Indiana, Illinois, and Minnesota. Versions of the product are being advertised nationally in corporate

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TV spots and on local TV in test markets. Buyers who gave the products shelf space at chains such as Kroger, SuperValue and Cub Foods now report brisk sales. (2) Protein Technologies International in St. Louis, Missouri, a subsidiary of Ralston Purina, is test marketing a soy-based beverage named First Alternative in Phoenix, Arizona.

Peter Golbitz, president of Soyatech Inc., a consulting company in Bar Harbor, Maine, notes that since the 1980s, Japanese companies (such as Nichii Co.) have invested at least $50 million in soyfoods manufacturing plants in the U.S.

"Retail sales of soyfoods are growing in America by about 5 to 7 percent a year, increasing to about $657 million in 1990, Golbitz says. The most rapid expansion is for soy milk, which is growing at a rate of about 20% a year, and second-generation soyfoods which are growing at a rate of about 15%... Soy milk consumption in Australia, where it is sold in grocery stores like milk, is about 10 times what it is in this country."

Worldwide, consumption of soyfoods now averages about 1.7 kg/person/year, and is expected to rise to 2 kg or more by the year 2000. Taiwan is the world leader with 15.5 kg/capita/year of soy, followed by Japan at 11.1 kg. A world map and table (largely compiled from FAO Food Balance Sheets) shows "Soyfood consumption: Yearly average per capita (Amount of change from 1979 to 1988)." The following countries are listed in descending order of consumption in kg/capita: Korea 17.1 kg (2.4%). Taiwan 13.0 (37.0%). Japan 10.8 (6.7%). Indonesia 6.3 (57.4%). Hong Kong 3.8 (-22.0%). Saudi Arabia 3.6 (342.9%). China 3.4 (-5.6%). Paraguay 2.8 (50.0%). Malaysia 2.3 (102.2%). Thailand 1.6 (162.5%). Zimbabwe 1.6 (22.2%). United States 1.4 (33.3%).

9869. *Toyo Shinpo* (*Soyfoods News*). 1992. Nattô zuihitsu. Kara nattô. Nattô wa nattô demo shioaji no kiita kôji hakkô shokuhin [Natto essay. Salty fermented black soybeans. Even though it's called "natto," it is salty and a fermented food made with koji]. March 1. p. 10. [Jap]
• ***Summary:*** About Daitokuji fermented black soybeans. A photo shows the fermented black soybeans being fermented in wide-mouthed, shallow wooden vats, each bound together with two hoops of braided bamboo. Address: Kassui Joshi Tanki Daigaku, Japan.

9870. Deck, Cecelia. 1992. '60s roots bear fruit: Ann Arbor's Eden Foods takes checkered path to become an industry leader. *Detroit Free Press.* March 2. p. 10F-11F. Cover story.
• ***Summary:*** One of the few food cooperatives and natural food stores that has survived from the 1960s, Eden Foods "has made it through the wacky '70s and the excessive '80s to the health-conscious '90s when, in a surge of reborn interest in natural foods, it has emerged as a for-profit, $20-million-a-year leader among organic food processors.

"Founded by idealists who cared more about getting their message of healthy eating to the public than about bottom lines... the company has never strayed from its mission: to bring organically grown food to the public." Tim Redmond recalls the early days when Eden operated out of an apartment on East William Street upstairs from Campus Bike and Toy. "During the summer, when all of the co-op members had left town or taken jobs elsewhere, former U-M [University of Michigan] football player Bill Bolduc bought out the company. 'No one really seemed to mind,' Redmond says... By 1970 Eden was running the biggest natural food store in the Midwest."

A competitor for 20 years has been the Cooperative People's Warehouse, which has been losing money for the past few years. After the retail store moved to Maynard Street, the company "opened a restaurant which gained fame for its chapati vegetarian sandwiches on Indian flat bread. A colorful mural painted on the alley wall near the store's entrance is still vibrant, though the store and restaurant had closed by the mid-1980s."

Soon the company "started licensing outside manufacturers to pack Eden-brand products such as canned beans, and began importing packaged food from China and Japan. Eden also started doing its own manufacturing–bottling oils, roasting and grinding sesame seeds."

After a fire in 1979 that caused about $800,000 in damage, Eden regrouped and opened its warehouse and manufacturing in an old factory in Clinton. "In 1982, Eden bought Schmidt Noodle Co., a vintage 1923 noodle maker in Detroit, that had been making Eden's organic pasta for about six years under license.

"The next year Eden began exporting organic soybeans to Japan and then importing Japanese-made Edensoy, a milk-like soy beverage that found an immediate market." Tim Redmond recalls that "Eden had never had a success like this in one product." According to Peter Golbitz, soymilk industry sales "zoomed through the 1980s to reach $52 million at retail last year. Edensoy had about a 40 percent share of the market."

"But importing Japanese soy milk and living at the mercy of the yen wasn't good enough, and Potter believed that the burgeoning soy milk market could justify a U.S. plant. So in 1987, Eden opened a soy milk processing plant in Saline in a joint venture with four Japanese companies. With redesigned aseptic packaging, Edensoy sales grew to 4,500 supermarkets nationwide as well as hundreds of natural food stores."

"Eden has had certification programs for its organically grown products since the early 1970s, but in 1988 the company joined the Organic Crop Improvement Association [OCIA], which strictly monitors crops to show that they are grown in soil that is pesticide free for three years and grown to organic standards. An audit trail can trace a can of beans to the field where the beans were grown."

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Color photos show: Timothy Redmond, vice president of marketing at Eden's soy milk processing plant in Saline, standing on the plant floor surrounded by stainless steel equipment. Nancy Potter, on the cover of the tabloid, beside a painting of a huge Eden Foods delivery truck. Address: Free Press business writer.

9871. *Toyo Shinpo* (*Soyfoods News*). 1992. Otishiyori ni mo bôya ni mo yorokobareru "tenpe ryôri." Tenpe ken. Toyama fooramu jisshû yori [Tempeh dishes enjoyed by both the elderly and young children. From cooking classes at Tempeh Study Group meeting]. March 11. p. 11. [Jap]
• ***Summary:*** Five Japanese-style tempeh recipes are given. A photo shows Kazuko Noguchi.

9872. Macdonald, Bruce. 1992. How Erewhon got involved in wholesaling and distributing natural foods (Interview). *SoyaScan Notes.* March 16. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Erewhon went through three phases of selling: (1) Retail. (2) Wholesale, direct to natural food retail stores and restaurants. (3) Wholesale, to natural food distributors (such as Eden Foods). Bruce started phase 2, selling direct to natural food stores and restaurants, primarily in New York.

In the spring of 1969, during Bruce's tenure as general manager, Erewhon got into the wholesale business, running it initially out of their retail store at 342 Newbury Street. Paul Hawken was not involved in the wholesaling to other companies before he left for Japan. Their store was divided into 4 parts: The front half was the retail store, the back half contained the mill (a little 5-inch Meadows Mill later used for grinding whole-grain flours), a walk-in refrigerator, and packing tables (where Bruce recalls working with Jim Docker, packing little 1-5 lb paper bags of grains), an office, and the basement (connected to the ground floor by a dumb waiter), which was the warehouse for storage of commodities.

The wholesale business began in the basement. It started because Erewhon got a good deal on some sesame oil. A company named Sesame Products in Texas had developed the Egyptian salt method of naturally removing the hulls / husks of the sesame seeds. The company apparently went bankrupt, but actually they were a front for some illicit import dealings, such as electronic parts from Mexico. They got caught, and had to sell their high-quality oil. Bruce got the opportunity to buy (for Erewhon) all of their existing sesame oil for 10 cents on the dollar (90% discount). So he bought all the oil, most of which was in amber pint bottles, but the rest of which was in about 5-8 large drums. He trucked it to Erewhon's retail store at 342 Newbury St., and helped to unload it. He and co-workers put Erewhon labels on the amber bottles (Bruce does not remember who designed these labels; Paul Hawken had them designed), bottled the bulk oil manually, labeled that as well, and moved it all to the basement. Erewhon was now ready to jump into the wholesale business, and natural sesame oil was their first wholesale product. Somehow Bruce / Erewhon had to sell 250-300 cases of natural sesame oil. But since he had bought it at a 90% discount, he was able to sell it at a profit below the price of other sesame oils on the market. In the spring of 1969, Bruce put the oil on a truck and drove it to Greenberg's (125 First Ave.) in New York City, Paradox Restaurant, Georgie Abehsera's restaurant, etc. He also took Erewhon's whole line of products, including their new imports from Japan. "Greenberg's took on the entire line of Erewhon products. Suddenly, it just took off. A month or two later Erewhon was sending a van down to New York City ever week."

Next Erewhon expanded its line of mechanically pressed, unrefined oils. Bruce had seen some expeller-pressed corn oil at Paul Keene's Walnut Acres, so he ordered it from Shawnee Milling Co. in Shawnee, Oklahoma. Erewhon considered hexane solvent extraction to be the "big bad method" of removing oils, expeller pressing to be so-so (because the temperature in the worm-screw reached 140-160ºF), and hydraulic pressing to be the best since it kept the product coolest. This golden corn oil foamed upon being heated and tasted like butter in baked goods. Erewhon's third natural oil was a safflower oil. (In 1970 Paul Hawken wrote a pamphlet titled "The New Oil Story").

Next Erewhon added a line of grains. They got non-organic brown rice from Koda Brothers in Dos Palos, California. The company was owned by Japanese-Americans, who were the first to break out of the cooperative marketing scheme, in which all growers mixed their rice together. They had rubber rollers, which did not scratch the grain during dehulling. Their Kokuho-Rose white rice has been the rice of choice for 30 years among Japanese-Americans. Bruce thinks they may have first sold brown rice (in 100 lb peat bags) to Infinity in New York, then to Erewhon.

Then Erewhon added a line of products imported from Japan. These first arrived in about Nov. 1968, just as the Erewhon retail store at 342 Newbury St. was opening. All the Japanese imports came in bulk from Muso Shokuhin in Osaka, rather than individually packaged. Tamari (from Marushima) and miso (including bulk mugi [barley] and Hatcho miso), moromi, etc. came in wooden kegs, loose, rather than in containers, so there was lots of breakage. Most of these imported products were stored in the basement. Erewhon bought some noodles (soba and udon in 5 kg boxes) from Japan Foods, then from Nishimoto Trading Co. and also from Muso. The product line was very simple, consisting of no more than 400 different items. The best-selling wholesale items were the oils, tamari, miso, rice, and imported kuzu, umeboshi (salt plums) and azuki beans. In the retail store there was no produce case or freezer, no vitamins or supplements, no potatoes or dairy products.

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Initially, Erewhon's largest customer was the combined 4-5 macrobiotic study houses in Boston, Massachusetts, accounting for roughly 50% of sales. Erewhon had an old van that delivered the food to the study houses, initially at retail prices; this business kept the retail store afloat. By the late spring of 1969 the wholesale business began to take off, and the macrobiotic study houses were now allowed to buy at wholesale prices. Some additional delivery trucks were acquired.

The macrobiotic products, other than what Erewhon imported, were only available in health food stores, through Chico-San. Because of the high mark-ups at several stages in the process, these products were tremendously expensive for consumers. So Erewhon decided to sell direct to East Coast stores, cutting out the distributors, to keep prices down. Now things started to move very fast, and Erewhon soon achieved national distribution. "It was like introducing products into a vacuum. The whole natural foods industry was starting up, all these little places like Eden Foods in Ann Arbor [Michigan], Tom Swan in Chicago [Illinois], etc.

Bruce traveled to New York and lined up new wholesale customers among macrobiotic restaurants and food stores. Samsara, a macro restaurant in the lower east side run by George ("Georgie") Abehsera, was Erewhon's first customer and its biggest restaurant customer. (Michel Abehsera's younger brother, George later became the baron of the clay and soap business, Three Sheaves, Pierre Cattier, then Nature de France). Right around the corner was Arnie Greenberg, who had a deli on the lower east side, and was one of the first to merchandise macrobiotic foods; he rapidly became Erewhon's best customer. He was very busy selling a mish-mash of foods though he had no particular personal commitment to macrobiotics. Before him, Irma Paule in New York City had run "The Little Cupboard" but had gotten in trouble and was no longer in business at this time. Other good restaurant customers were the Paradox, and the Caldron (Gloria Bremmer at 308 E. 6th St.). The Good Earth, a retail store run by Townley, soon began to order; he was one of the original honest organic produce retailers. The restaurants and the food stores accounted for about equal sales volume for Erewhon. Erewhon shipped all its goods to New York (its sole market) via common carrier; Erewhon owned no delivery trucks of its own. There were no other natural food stores in Boston. One other unique customer was Jimmy Silver, who was macrobiotic, the manager of a rock band named Iggy Pop and the Stooges, and had hair down to his waist. He would drive down from New York with his cute little wife, Susie, and buy $300.00 of food at a time for the whole band. It was the biggest single order that Erewhon ever got in those days. Not long after that, Jimmy dropped out of the music scene and came to Boston.

Then Roger took over from Bruce as general manager in about Oct. 1969, right after Bruce married Maureen, his first wife, and left for Los Angeles to help start the branch of Erewhon there. The Erewhon store in Boston (at 342 Newbury St.) started with sales of about $400 a day. The day of Bruce's wedding, on a Saturday in about Oct. 1969 was the first day that the Erewhon store's sales topped $1,000 a day. It was a milestone day and in those days it seemed like big money. But two years later, Erewhon's sales were $20,000 a day.

In Los Angeles, Bill Tara had opened the doors, and put the bricks and boards up for a new Erewhon store. But Bill was never comfortable doing business; he preferred to teach macrobiotics. So Aveline Kushi encouraged Bruce to come to Los Angeles (where she was living at the time) and to get the West Coast branch of Erewhon started. So Bruce and Maureen moved to Los Angeles.

How did Erewhon finance this growth? At the beginning Erewhon, the trailblazer, was extremely profitable, since they had essentially no competition, and had thriving retail stores in Boston and Los Angeles. The dollar was very strong (from 1967 to 1971 one dollar was worth 355 yen), so Erewhon could buy an item for $1, sell it for $3.50 and still be $2 under any competition (mainly Chico-San). Erewhon invented the concept of a natural food store. Fred Rohe in San Francisco had developed a related idea, perhaps a little before and in parallel with Erewhon. His Sunset Health Foods, later named New Age Foods, was a modified health-food store that sold vitamins, whereas Erewhon was a pure natural foods store, that didn't sell vitamins. In addition, Erewhon had quality standards and a philosophy of foods that no one in the industry had.

After Bruce left, Erewhon moved into its first real warehouse on Farnsworth St. This represented the first real commitment to the wholesale business. A fleet of trucks was acquired. Eventually semis [semitrailers] were delivering all over New England. Address: P.O. Box 100, Cambridgeport, Vermont 05141. Phone: 802-869-2010.

9873. Macdonald, Bruce. 1992. The origin and development of Erewhon's operations in Los Angeles. Part I. 1969 to 1971 (Interview). *SoyaScan Notes.* March 16. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Erewhon started a retail store in Los Angeles because Aveline's youngest son, Hisao, had some form of leg disorder, congenital or from infancy, probably in his knee. Aveline found a Japanese doctor in Los Angeles who she believed (and it turned out that she was right) could cure it. But the doctor had to see Hisao almost daily. So in about August 1969 Aveline moved to California. Bill Tara went with her, while Michio stayed in Boston, Massachusetts. Aveline got a very nice house at 7511 Franklin Ave. in Hollywood. Later she moved into the former Japanese embassy, which was a mansion in a very nice neighborhood, several blocks away on [7357] Franklin Ave. Bruce also lived in this mansion. In Los Angeles, Bill Tara started Erewhon's second retail store, called Erewhon West, in large

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part because Aveline needed good macrobiotic food. Tara rented a very small space at 8003 Beverly Blvd. and called the new store "Erewhon West." Later the name changed several times, but it ended up being just "Erewhon." He got some cinder blocks and boards, ordered a shipment of food worth about $500 from Erewhon-Boston, then he opened the door for business.

Bruce was married on 13 Sept. 1969 to Maureen Traill in Boston. The marriage ceremony took place in the Old South Church, and some 200 people (including Michio Kushi) attended. It was the biggest wedding in the Boston macrobiotic community to date. Maureen had lived in a macrobiotic study house run by Susan Hillyard, and had studied cooking with Aveline Kushi and Susan Hillyard.

About 2 weeks after the wedding, in early October 1969, Bruce and his new wife left Boston. At that time, Roger Hillyard took over as general manager of Erewhon-Boston from Bruce. They drove to Los Angeles, arriving in late Oct. 1969. The first thing Bruce did was to build a walk-in cooler. Bill Tara, who was always more interested in the teaching, philosophical, and scholarly side of macrobiotics, left shortly after Bruce arrived. Bruce was more oriented toward the business side. Bruce became the head of the store, and Jimmy Silver soon came out from Boston to work with him at the store. Initially, sales were very slow: During the first two weeks that Bruce was there, there were *no* sales on eight of the days. Natural food stores were just beginning to open in the U.S. "That was Aveline's store. Wherever Aveline went, she had to have a store–to feed the study house. And it was unbearably hot. But eventually it did work."

Soon shipments of foods began to arrive directly from Japan, sent by Paul Hawken with whom Bruce talked frequently by phone. So in the summer of 1970 Bruce put out a wholesale price list and rented a warehouse (about 2,000 square feet) catty-corner across the street (something like 7990 Beverly Blvd.). One of their first wholesale accounts was Fred Rohe in San Francisco. Soon the first Erewhon products packaged in Japan began to arrive, and because of these retail packs the wholesale business took off. The first seitan came in shrink packs; it later came in jars. Tamari was the best-selling import, followed by miso, then umeboshi. The foods still arrived in small boxes or single kegs; containers did not begin until later. At about this same time Tom DeSilva, a lawyer who became a yoga instructor, applied for a job as a janitor; he just wanted to be around.

Erewhon West soon outgrew its first warehouse, in part due to a deal made with the Lundberg Brothers. Bob Kennedy of Chico-San was the pioneer in contracting with the Lundbergs to grow short-grain brown rice in California. The Lundbergs allotted a certain amount of acreage to organic brown rice and Chico-San agreed (in a contract) to buy all of the organic brown sold on that acreage. Chico-San had exclusive rights to all the organic brown rice produced by the Lundbergs. But Chico-San sold this rice for a high price (much of it in rice cakes or 1-lb bags), which prevented Kennedy from selling the amount he had contracted to buy. Chico-San was always in danger of breaking the agreement and losing his exclusivity. So [in early 1970] a side deal (contract) was made, between Erewhon and the Lundbergs, in which the Lundbergs packaged the unsold rice exclusively for Erewhon and labeled it "unsprayed." Chico-San would not allow it to be labeled "organic." Erewhon never talked with Kennedy or Chico-San about this side deal. "He hated our guts! But we did him a real favor; we sold the rice and we didn't really hurt him, since we were selling into an entirely new market–on the East Coast and in bulk and in boxcars."

With this arrangement, Erewhon got into the rice business in a big way, selling their rice for $11.00 a bag versus about $30.00 for the same product from Chico-San labeled "organic." Brown rice soon became Erewhon's biggest product; they sold it to Eden Foods, Laurelbrook, Tom Swan in Chicago [Illinois; he didn't last long], Tree of Life in Florida, Food for Health in Tucson (Arizona), some distributors in Northern California, Green Mountain Grainery in Boulder (Colorado), etc. It was rice that gave Erewhon nationwide distribution, putting their products in every natural food store in the USA. Bob Kennedy was furious but he was stuck with his 5-year contract. Note: The fire in early Aug. 1972 that burned Chico-San to the ground essentially rendered the contract null and void.

Now Erewhon-West began to catch up with Erewhon-Boston in sales because of two factors: They could get a shipment from Japan 3 weeks faster than Boston, and they were near the source of brown rice.

When Paul Hawken returned from Japan in Dec. 1969 he went direct to Los Angeles, but stayed only several weeks. He then went to San Francisco and worked for several months with Fred Rohe (they had become close friends) on writing educational pamphlets and trying to organize Organic Merchants. After returning briefly to Erewhon West in Los Angeles, he returned to Boston. Paul's direct contribution to starting Erewhon West was insignificant; he wasn't there long enough to do much. Bruce turned it into a real business. "Paul's real contribution was finding new suppliers and products in Japan (he toured Japan with Yuko Okada's father), getting the products labeled in Japan, then arranging for them to be shipped to Los Angeles in containers. Mr. Kazama and Mitoku came later. Erewhon had tried to order Hatcho miso from Muso, but Muso couldn't get it. But Mr. Kazama got it; he is a supreme negotiator! I've never met anyone quite like him.

"One of the secrets to Erewhon's success was always having, as a base, a successful retail store, that had a big mark-up and was generating cash. That was our "calling card." Then the warehouse could grow off of that. The store was also a wonderful place to test and develop new products. "A store is a cash business. With distribution, sooner or later,

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you have to give terms–such as net 30 days. Thus the adage: 'If you're going to grow a business, you need $2 in capital for ever dollar that you grow."

In late 1970, to keep up with the explosive growth, Erewhon rented a second warehouse at 8454 Steller Drive (10,000 square feet). In his "spare time," entrepreneurial Bruce founded two other businesses of his own: Pure & Simple, and The Natural Living Company. Pure & Simple, located in the Steller Drive warehouse, was the first of America's new wave of natural food snack companies. Bruce had talked over the idea with Paul Hawken, who felt that snack foods were not appropriate for Erewhon at that time. The company's first product was Corn Munchies, which was the first natural corn chip. They would make corn tortillas, cut them into wedges, fry them in sesame oil, and season them with tamari. The Corn Munchies soon became very successful. The Natural Living Co. made bodycare products and cosmetics, starting with Sesame Shampoo and Sesame Lotion. Bruce had met a brilliant chemist named Carlos de Villalvilla, a Cuban aristocrat who was head of research for Max Factor. He was a concert pianist with 2-3 PhDs. Bruce asked him to develop a line of cosmetics without preservatives or mineral oil (a vegetable oil should be used instead of a petroleum derivative). Carlos used sesame oil (which is very stable) as the vegetable oil in these first two products.

By early 1971 Erewhon had outgrown the 10,000 foot warehouse and another 20,000 square feet in an old bakery, from which they did all transshipments to distributors. The store expanded twice, taking over the corner fish store (live fish in aquariums), to 8001 Beverly Blvd. Jim Gronemeyer did the remodeling. Tommy DeSilva worked there, and ended up owning the business. Continued. Address: P.O. Box 100, Cambridgeport, Vermont 05141. Phone: 802-869-2010.

9874. Macdonald, Bruce. 1992. The origin and development of Erewhon's operations in Los Angeles. Part II. 1971 to 1991 (Interview). *SoyaScan Notes.* March 16. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** In one of its first issues (the very first was published in Jan. 1971), *East West Journal* published an interview with Bruce while Erewhon–Los Angeles was at the peak of its activity. They arranged for imports of natural foods from Japan to come into Los Angeles. They developed labels for the products with nice stories about each product; Burton Block did the graphics and helped with the text. He later became famous with the Nutragena designs.

In early 1971 Bruce found out that Paul Hawken had somehow obtained some stock and thus ownership in Erewhon and had not mentioned it to Bruce.

So Bruce went back to Boston and discussed the matter with Paul. Paul said, essentially, "That's the way it is." Ultimately Bruce felt that Michio was to blame for the problem, but "when I found out that Paul had some stock, I felt he had broken a blood bond with me and had deliberately deceived me. I felt more disgust than anger towards Paul because I had considered him a very close friend.

"I was not upset at Michio. Basically I have always felt that he was just stupid. He had the greatest opportunity–like the founding of the computer industry and he was Bill Gates–and he couldn't comprehend the American entrepreneurial spirit. Michio's approach was the traditional Japanese one. You come to work for a company, we pat you on top of the head, you have lifetime employment, but don't ever ask to own any of it. But he was in a country that was entrepreneurial to its core. Hey, we don't mind working for nothing–at the beginning. He should have offered the people who conceived and built Erewhon partial ownership in the company to motivate them and to keep them around. Failing to do that was Michio's biggest mistake."

On 21 Jan. 1971 *The Wall Street Journal* ran a front-page feature story on the emerging new natural foods industry. A person from Merrill-Lynch came in and said, "We could package this business and raise millions for you."

Bruce had always thought that Aveline had always owned all the Erewhon stock–from day one to the bitter end. The Kushi's attorney, Morris Kirsner, had put it in her name because they were worried about something happening like had happened to Irma Paule who ran the Ohsawa Foundation in New York. After Beth Ann Simon (a former heroin addict) died in Nov. 1965, the FDA raided the Ohsawa Foundation late one night and found its Nature's Cupboard to be selling food, as well as books, recommending the food as a cure for illness. Charged with "false advertising," the center was closed down, and the focus of macrobiotic teaching shifted to Boston. Michio was always concerned about teaching and being a purveyor of the foods about which he was teaching.

Seeing no future for himself in Erewhon, Bruce left Erewhon forever in May 1971 to attend to his two other thriving businesses. Bruce, who had been president of Erewhon on the West Coast, had been willing to work hard to build the company for a small salary ($150/week), reinvesting all earnings, on the understanding that he would become a part owner later–the entrepreneurial way. That had been his basic approach, and he assumed Paul and Michio were thinking the same way. But it never happened.

Erewhon had more than 99% of the market share on all of the Japanese imports. Bob Kennedy was buying from Tokyo C.I., which was very tiny. They had excellent sources for oils and grains, had built "Erewhon" into the top brand name, and had developed an aura of almost invincibility and quality. In short, they owned the market they had created.

Who got Muso (in Osaka) exporting Japanese natural foods? Probably Michio talking to Mr. Okada. Lima Ohsawa was more closely associated with Tokyo C.I. than with either Muso or Mitoku. Bob Kennedy had a certain allegiance to Lima Ohsawa. Herman and Cornellia Aihara had a little conflict with Michio and Aveline Kushi; "it was never on the

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surface but it sure was underneath." The split began in 1961 when Herman and Cornellia, following Ohsawa's advice, moved to Chico, California, with the group (including Bob Kennedy) that started Chico-San, Inc. in early 1972; Michio and Aveline decided to stay on the East Coast. All four (Michio and Herman, Aveline and Cornellia) were best buddies up until 1961. After than, there was a certain coolness. Bruce remembers, for examples, that when he and others were out in California, they never invited Herman (a sensei) down to lectures or other events. That was unusual. Bruce thinks (but is not sure) that Bob Kennedy (Chico-San) never bought (or never bought much) from Muso.

What happened to Erewhon–Los Angeles? One of the people who financed the early growth of Erewhon was John Deming, whose family were wealthy rice [sic, oil] barons. He married Judy Coates, lived on a trust fund, and invested something like $150,000 to $200,000 in Erewhon. Paul Hawken was close friends with him, in part because Paul gone out with Judy Coates, then later married Judy's sister, Dora. Then (according to hearsay) something happened and John asked for his money back. Erewhon said they couldn't pay him, but offered him Erewhon–Los Angeles instead. "So Deming ended up owning the West Coast" [Erewhon–LA]. [Note: For John Deming's version of this, see Dec. 1994 interview with him].

When Bruce was in Los Angeles, Tom DeSilva had been his "right hand man." In a major policy goof, they put Jim Gronemeyer in charge of the warehouse–which was sort of running the company. That blew up rather quickly. Bruce was long gone, so he does not know the details. Then Tom DeSilva took over, before Deming came in (in 1973-74) and took over Erewhon L.A. Deming owned the company and John Fountain was the manager who ran it. He bought much more than he needed. Someone stole a lot of money; it was a sick scene. They moved the warehouse from Steller Driver down to Vernon; it just declined, although the retail store, run by Tom, did well. Then Tom bought the retail store from John Deming in 1980. It was named Erewhon Natural Foods, and it quickly expanded into neighboring storefronts as they became available, adding a vitamin section, a deli, and then a restaurant named Nowhere Cafe. In 1990 Tom heard a rumor that their landlord would not renew their lease and would, in fact, use the space to open similar businesses. Acting quickly on this news, Tom located a 12,000 square foot space at 7660 Beverly Blvd. next to CBS Television Studios in the street level of a five-story apartment building. The new Erewhon store had to be designed, built, and permitted from an empty shell; this was accomplished within a year. The new store opened in 1991 with annual sales exceeding $9 million.

During much of the early history of Erewhon, Paul Hawken was in Japan. Paul's main reason for going to Japan was so that Erewhon could develop consumer packages and have the products (tamari, miso, noodles, seaweeds, kuzu) packaged in Japan. Hawken didn't return from Japan until the Erewhon store and 2 warehouses in Los Angeles (8554 Steller Drive, plus part of an old gigantic bakery) were up and running at full speed. They could get imports from Japan 2-3 weeks sooner in Long Beach than in Boston. From the West Coast, they shipped the goods as far east as Chicago, Illinois.

Warren Clough of Shiloh Farms was involved with organic farming before Erewhon; Warren was a very early pioneer.

Very little documentation remains on the early history of Erewhon. In about mid-1971 *East West Journal* published an interview with Bruce about Erewhon, conducted by his first wife, Maureen. It contained a photo of Bruce, and a good chronology of developments at Erewhon–Los Angeles. That was the real active time for the West Coast. In Aug. 1973 Paul Hawken wrote a self-serving article in *East West Journal* titled "Erewhon: A biography. The view within," which is full of inaccuracies. Bruce thinks that Patricia Smith (Patti, in Monrovia, California) might have early Erewhon catalogues. She was working for Trader Joe's until several months ago. She now has a new job elsewhere. Address: P.O. Box 100, Cambridgeport, Vermont 05141. Phone: 802-869-2010.

9875. Hayakawa, Tsuneo. 1992. Re: History of Hatcho miso company. Letter to William Shurtleff at Soyfoods Center, March 17. 3 p. Handwritten. [Eng]

• ***Summary:*** There is firm evidence to show that this company was established in 1645. Most documents written during the Meiji period (1868-1912) state that the company was established in that year. "And a death register, which had been kept in the Buddhist temple where my ancestors' tombs stand, supports this view.

"Until about 1600, my ancestors lived in the area across the Yahagi River which runs 80 meters west of our company. Then very favorable social and economic conditions for a Miso company were realized. The stream of the Yahagi River became so broad that ships with heavy load could sail up and down very easily. Next, the Tokaido–Highway was improved...

"Therefore, present location at Hatcho-Miso Company became very suitable for production and sales activity of Miso. Foreseeing the future, one of my ancestors decided to move to Hatcho-cho to start the business. Besides, this place was gifted with good soybeans, pure water of the Yahagi River and excellent salt. Our company has more than one-hundred sales-record notebooks (*Daifukucho*). Some of them were written in the Edo period."

The president and top man at Hatcho-Miso company is now Kyûemon Hayakawa, his elder brother, who was born in 1916. His two sons are in charge of the actual daily business; one is vice-president and the other managing director. Address: Hatcho Miso, 69 Okan-dori, Hatcho-cho, Okazaki-shi, Aichi prefecture 444 Japan.

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9876. Williams, Brian. 1992. Entrepreneur pins his hopes on a budding taste for tofu. *Cincinnati Post.* March 17.
• ***Summary:*** David Kimbel, in partnership with his Japanese wife, Chieko, has launched Chieko Tofu, Inc., a tofu manufacturing company in Cincinnati. He has made health foods for the past 14 years, starting with alfalfa sprouts in his basement, then expanding into bean sprouts [including soy sprouts]. His sprout company is named Sunsprout of Cincinnati. Chieko Tofu hit the stores in late Feb. 1992. The company makes tofu 3 days a week using organically grown soybeans. "Chieko, which has two employees in addition to Kimbel and his wife, produces 300 cases of tofu a week–there are 12 one-pound packages of tofu in a case [i.e. 3,600 lb/week]–and Kimbel sees the potential of reaching 450 cases a week within a month." Address: Post staff reporter, Ohio.

9877. *SoyaScan Notes.* 1992. The advantages and disadvantages of wheat gluten and seitan compared with soyfoods such as tofu and tempeh (Overview). March 19. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Advantages: 1. Wheat gluten and seitan can be made to have more of a meatlike texture and flavor in vegetarian food products using simple technology. 2. They are lower in fat and have a lower percentage of calories for fat.

Disadvantages: 1. Wheat gluten and seitan are much more expensive per unit of weight or unit of protein. 2. The process by which gluten is made is hard on the environment, unless they are made from vital gluten. If made from whole wheat, the wheat starch cause such severe water pollution and clogs up municipal sewage pipes to such an extent that many municipalities will not allow manufacturers to continue operation. 3. The process for making them is very wasteful, since wheat contains only about 14% protein. The rest of the wheat (mostly starch) is wasted–almost as if it were fed to livestock. 4. Gluten is a major allergen; many people are allergic to it. In fact many foods advertise that they are "gluten-free" and many gluten-free cookbooks and other books have been published. 5. Celiac (coeliac) disease and celiac sprue are serious disorders. Most people afflicted with them are advised to follow a gluten-free diet. 6. The quality of their protein is lower.

In summary, in countries such as China and Japan, where both gluten products and soy products have been known and consumed for centuries, soy products pervade the diet and are a significant source of protein, whereas gluten products are used in very small amounts as minor specialty products. In China, they are best known in vegetarian restaurants.

9878. Young, Rich. 1992. Early history of macrobiotics and natural foods in America (Interview). *SoyaScan Notes.* March 28. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** First the names of some good sources: For Infinity Foods and Shadowfax: David Simon, 201-209-1646 (now doing business as Wholesome Brokers, still into scientology, formerly with Erewhon and a macrobiotic). For early Erewhon: Evan Root, 617-566-4783, in Brookline; he is very down to earth and sensible, like Jimmy Silver. For Erewhon–Los Angeles: Tom DeSilva, 213-655-3537. For Essene: Howard and Denny Waxman (brothers who founded Essene, which is still in business in Philadelphia, Pennsylvania). For Laurelbrook: Margy Coates, 301-877-1695, is one of the angels on this planet.

Rich worked for the Kushis for over 13 years. He studied with them at Arlington Street Church before Erewhon existed. Evan and Peggy Taylor, Ronnie Coates and Marty Russell started Sanae; Rich worked there for 18 months, washing dishes and buying. Then he worked at *East West Journal* for 18 months when Robert Hargrove was editor, in advertising and sales. Then for the Seventh Inn for 18 months, shortly after it started and the two guys who founded it quit. It never got off the ground. Evan Root was followed by Ty Smith who was followed by Richard Sandler. Then in 1972 Rich went to work for Tom Chappel of Tom's of Maine (natural toothpaste).

Bruce Macdonald married Maureen Traill, his first wife, in the first "official" macrobiotic wedding in Boston, Massachusetts, at the Old South Church on Copley Square. Then Bruce and Maureen moved to Los Angeles where Bruce played a major role starting Erewhon-Los Angeles. Bruce has had 6 children by four women. Now Bruce runs home-based Right Hand Press which publishes the teachings of Linda Green, an Avatar, dowser, and pendulum-using spiritual teacher from Oklahoma.

Rich thinks that one of the first people to develop a process for putting soy sauce on nuts was Nik Amartseff, who created Nik's Snacks that were sold by Erewhon. Nik started out working with Fred Rohe's New Age Foods in San Francisco. Ask Rich about Erewhon's Hopi Seeds and Nik's Snacks.

Rich began to work at Erewhon in 1974 when Bill Garrison was the president; he continued until the company went bankrupt. When Paul Hawken left Erewhon, Bill Garrison took over. In 1975, under Bill, the company was losing money. Michio brought in Ty Smith on the condition that if Ty could make the company profitable, Michio would give Ty shares in the company. At 33 Farnsworth St., as president Ty (who Rich has great respect for) made the company profitable, but Michio reneged on the deal. So Ty left–he is now in Hawaii running a combination convenience store, deli and gas station. Tom DeSilva knows how to reach him. Then Michio brought in as president Jeff Flasher, who was very close to Ty and thus knew that Michio could not be trusted. One day Jeff went to Michio and said that

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Erewhon could stay at 33 Farnsworth Street and probably stay profitable, but it wouldn't grow as fast due to the limited space. Or Erewhon could move into a much larger warehouse and potentially sell a lot more food, but they would incur significant debt in the process. Jeff left the decision up to Michio and Michio decided to go for the larger warehouse, with the promise that he (Michio) would come through with a certain amount of money by a specified date. Michio was not able to do this.

Jeff Flasher is a wonderful person and his wife, Linda, at the time was extremely intelligent and helpful to Erewhon. Another reason for the downfall was the pressure of the full-line distributors, which led Erewhon to greatly expand its product line and to include many products of marginal quality. It was a choice between being a manufacturer (they made nut butters and granolas) and a brand name (from imports), versus competing with the full-line distributors. Michio chose the latter approach. That was a major reason for Erewhon's downfall. Address: Right Hand Press, Cambridgeport, Vermont.

9879. Morinaga Nutritional Foods, Inc. 1992. Garden variety (Ad). *Natural Foods Merchandiser.* March. p. 49.
• ***Summary:*** This half-page color ad (copyright 1991) shows three different types of Mori-Nu silken tofu (Soft, Extra Firm, and Regular) surrounded by lush fresh fruits and vegetables. The text begins: "The time is ripe for Mori-Nu."

This ad also appeared in *Health Foods Business* (April, p. 53). Address: Los Angeles, California. Phone: 1-800-NOW-TOFU or 310-787-0200.

9880. Yamawaki, Teijirô. 1992. Edo jidai shôyu no kaigai yushutsu [Exports of shoyu from Japan during the Edo Period]. In: 1992. Noda Shishi Kenkyu (Studies of Noda History), Vol. 3. Noda, Japan: Shishi Hensan (Noda City History Editorial Committee). See p. 63-93. March. 30 cm. [50 ref. Jap]
• ***Summary:*** This is one of the best sources known on the subject, which includes much information on the export of shoyu from Japan to other parts of Asia and to the Netherlands by the Dutch East India Company (VOC).

Chronology and basic concepts: Almost all shoyu (soy sauce) exported from Japan during the 1600s and 1700s (and all soy sauce exported officially or legally) was exported from a tiny man-made island named Dejima in Nagasaki Harbor. Most of it was exported by the Dutch East India Company (VOC), which was the only European company allowed to trade with Japan during this period of isolation from 1600 to 1854. The Japanese government classified all soy sauce exported from Deshima into two basic types: (1) Official trade freight (*motokata nimotsu,* also called *compania nimotsu*), and (2) Private trade freight (*waki nimotsu,* also called *yakusha / sojya* {staff / sailor} *nimotsu*). Official trade freight was the kind engaged in by the Dutch East India Co.; this freight was recorded in the Nagasaki Trading Firm Journal. Private trade freight referred to the goods traded privately by Dutch sailors and by the chief and staff working at the Nagasaki Trading Firm.

Note: In about 1600 the Chinese obtained an official trade permit and settled in Nagasaki. At the peak of Chinese activity there, about a century later, as many as 190 Chinese ships a year were visiting Nagasaki, and one-sixth of the town's population hailed from the East Asian mainland.

1609-1641–The Dutch East India Co. (VOC) maintains a trading post at Hirado, a small island off the northwest coast of Kyushu.

1634–Dejima (literally "protruding island," also spelled Deshima), a small artificial island in Nagasaki Harbor is constructed as ordered by shogun Iemitsu; it originally accommodated Portuguese merchants.

1638-1639–The Portuguese (and other Catholic nations) are expelled from Japan for suspected complicity in the Shimabara Revolt of 1637.

1641 May–The Dutch East India Co. is moved from to Hirado to Dejima, where they were kept almost like prisoners on the tiny island. For 200 years, Dutch merchants were generally not allowed to cross the little bridge from Dejima to Nagasaki, and Japanese were likewise banned from entering Dejima. From 1641 to 1853 the Dutch are the only Western nation allowed to trade with or to enter Japan, but solely on Dejima. Chinese and Korean traders are still welcome, but their movements are restricted.

Dutch ship arrivals: From 1641 to 1671 an average of 7 ships per year. From 1671 to 1715 about 5 per year. From 1715, only 2 ships were permitted each year; this was reduced to 1 ship in 1790 and again increased to 2 ships in 1799.

1647–Exporting of shoyu (soy sauce) to Asia from Japan (as official trade freight) began. The first shipment was 10 kegs (*taru / balien*) sent to Amping, on today's Taiwan, by the VOC's Taiwan Trading Firm. From 1647 to 1720, this shoyu was exported from the Nagasaki Trading Firm to each regional trading firm in Asia, including today's Hanoi, Vietnam (1652); Ayuthaya, Thailand (1657), Jakarta, Indonesia (1659), Malaca, Malaysia (about 1660), 250 km northwest of Phnom Penh, Cambodia (1665), Paliacatta, 40 km north of Madras, India (1666), Bengal region. India (1666), Colombo, Sri Lanka (1670), Surat, northwest coast of India (1672), Amboina, Banda, and Ternate, in the Moluccas, Indonesia (1693), Sulawesi Island (Celebes), Indonesia (1693).

Note: This document contains the earliest date seen (May 2010) for soybean products (shoyu) in Cambodia (1665); soybeans as such had not yet been reported by that date.

1685–The Shogunate at Edo limits the amount of "private trade freight" to 400 *kan* (1 kan = about 3.75 kg), or about 1,500 kg or 3,300 lb.

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1669 March 31–20 kegs of shoyu are shipped from Japan to Batavia on a Chinese ship (Source: Diary of Casteel Batavia). This is the earliest document seen showing a Chinese ship exporting shoyu from Japan.

1687–20 kegs of shoyu made in Kyoto (1 keg = about 29.104 liters) is shipped to the Ceylon (today's Sri Lanka) trading headquarters. It is believed to have been made by a sake brewer in Kyoto. At that time, Sakai city, a southern suburb of Osaka city, was located on the edge of Osaka Bay at the mouth of the Yamato River. It is one of the largest and most important seaports in Japan during the Medieval era, and is also famous in the Kyoto/Osaka area (along with Kyoto) for its soy sauce production. During the period 1764-1780 shoyu was made in Sakai by 4 manufacturers, including Shobei Hosoya. Soy sauce made in Sakai was transported by ships along the Inland Sea (north of Shikoku), through the narrow straight between northern Kyushu and Shimonoseki, around the north and west sides of Kyushu, to Nagasaki. These ships from Sakai were called the "Sakai Raw Silk Carrier Boat" or *Sakai Bune.* They had been authorized to ship imported silk from Nagasaki since the Keichô period (1596-1611) of Edo era. The ship was empty going back from Sakai to Nagasaki and the space was used for soy sauce exports. Much of the shoyu exported from Japan to the Netherlands is thought to have been made in the Kyoto / Osaka area. It was probably made mainly in Sakai, while that made in Kyoto was exported in small amounts for special occasions. Extremely low priced shoyu is thought to have been made in Kyushu, and exported to China. None of the shoyu exported during the Edo / Tokugawa period (1600-1867) was made in the Edo / Tokyo (*Kanto*) area.

1711–In the Chinese and Western Freight Log it is recorded that 61 kegs of shoyu (56 large kegs and small kegs) as well as 40 kegs of miso were exported as "official trade freight," whereas 867 kegs were exported as "private trade freight." Thus, the private freight (in this rare year where records exist) was about 8 times as much as the official freight.

1712–Some 999 kegs of shoyu and miso are exported as "private trade freight," Unfortunately we are not told how many of these contained shoyu and how many contained miso.

1721-1792–The VOC exports Japanese shoyu only to its trading headquarters at Batavia (today's Jakarta, Indonesia); from there it is transferred to each regional trading firm.

1737–The VOC first exports Japanese shoyu to the Netherlands, from its Batavia headquarters. Thus, Japanese soy sauce first arrived in the Netherlands (and in Europe) in 1737. All this shoyu was exported as "official trade freight." This export route was used until 1760. During the 24 years from 1737 to 1760, approximately 46,000 liters of soy sauce were exported from Dejima to the Batavia headquarters, and 15,600 liters (about 1/3 of the total) were then shipped from Batavia to the Netherlands. In 1742 and 1743, no shoyu was transshipped from Batavia to the Netherlands. Thus, during the 22 years that shoyu was transshipped from Batavia to the Netherlands as "official trade freight" was about 707 liters/year. The amount exported was calculated based on the capacity of the "large keg" (29.104 liters); the small keg held exactly half this capacity (14.552 liters). In addition, a substantial amount of shoyu was presumably exported from Batavia to the Netherlands as "private trade freight."

Also in 1737 the limit of 400 *kan* on "private trade freight" is abolished, so that any amount can be exported in this way.

1790–Shoyu is first exported from Japan in comprador bottles; these bottles, made of grey / white porcelain, were recorded as "sterilized soy sauce" and 550 of them were used this year to export shoyu.

1795–The book titled *Travels in Europe, Africa, and Asia, Made between the Years 1770 and 1779...,* by Charles Peter Thunberg (a Swede) is published in English. An entry from about the year 1776 (Vol. 4, p. 107), in the chapter on Commerce, reads: The traffic in *Soy* [sauce]... is more considerable [than that of tea. Japanese] soy is much better than that which is brewed in China. For this reason, soy is not only exported to Batavia [Jakarta], in the wooden kegs in which it is made, but likewise sold from thence to Europe and to every part of the East Indies. In some places in Japan too the soy is reckoned still better than in others; but, in order to preserve the very best sort, and prevent its undergoing a fermentation, in consequence of the heat of the climate, and thus being totally spoiled, the Dutch at the Factory [at Desima / Dezima / Dejima] boil it up in iron kettles, and afterwards draw it off into bottles, which are then well corked and sealed [by applying bitumen / coal tar to the stopper]. This mode of treatment renders it stronger and preserves it better, and makes it serviceable for all kinds of sauce.

Note: This early discovery of pasteurization and sealing in porcelain bottles explains how the Dutch were able to keep this soy sauce from spoiling becoming overfermented while it was being shipped from tropical Japan, to Batavia [Jakarta], across the Equator, around the Cape of Good Hope (south of Africa), then all the way to the Netherlands.

1799–The Dutch East India Co. (VOC) is dissolved.

1804-1829–A total of 2,672 kegs of shoyu is exported in Chinese ships during most of these 26 years from Japan. About 153 kegs/year are exported (range: 12 to 322 kegs, but with no exports in 1805, 1816-18, 1824-28).

1854–Japan's policy of self-imposed national isolation is abolished / ended. Shoyu can be exported freely, without limits.

Some 670 liters a year went to Holland. The soy sauce to be sent to Holland was put in a special container with special outside packaging. The shoyu that was exported was made mostly in Kyoto. In 1765 the famous French-language *Encyclopedia,* by Denis Diderot, had a section on soy sauce.

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Brief biography of Teijirô Yamawaki: 1914–Born in Japan. 1950–Graduated from Tokyo University, Dep. of Literature, Faculty of Japanese History. 1954–Awarded his doctorate (PhD) in history from Tokyo Univ. Between 1960 and 2002 he was the author of at least 8 books in Japanese including: (1) *Smuggling* (*Nukeni*) (1965, Nikkei Shinsho). (2) *Trading with Chinese Merchants in Nagasaki* (1964, Yoshikawa-kobunkan). (3) *Nagasaki Trading Firm of Dutch Merchants* (1980, Chiokoron). (4) *Encyclopedia of Silk and Cotton during the Edo Period* (*Jiten Kinu to Momen no Edo Jidai*) (2002, Yoshikawa-kobunkan, Tokyo, 230 p.).

Note: See also the excellent 16-page English-language summary of this report prepared and published by Kikkoman Institute for International Food Culture (KIIFC) in Noda, Japan. Address: Japan.

9881. Yamawaki, Teijirô. 1992. Soy sauce export in the Edo Period–according to the Nagasaki Trading Firm Journal. A translation of *Edo jidai shôyu no kaigai yushutsu.* Noda, Japan: Kikkoman Institute for International Food Culture (KIIFC). 16 panels. 15 x 10.5 cm each. Front and back. Available at http:// kiifc.kikkoman.co.jp/ english/exhibit/ index.html [18 ref. Eng]

• ***Summary:*** This is the best known English-language source on the subject. It is volume 3 of the 14-volume set. Contents: 1. Introduction. 2. Soy sauce export in the Edo Period–according to the Nagasaki Trading Firm Journal. Note: This Firm in Nagasaki was part of the Dutch East India Co, or VOC. 2. Profile of Dr. Teijiro Yamawaki. 3. Official trade freight and private trade freight. Routes of soy sauce exports. 5. Soy sauce export to Asian countries. 6. Soy sauce export to Batavia headquarters. 7. Soy sauce export to the Netherlands. 8. Comprador soy sauce bottle (1). 9 Comprador soy sauce bottle (2). 10. Soy sauce exported as *waki nimotsu* (private trade freight). 11. Soy sauce exported by Chinese ships. 12. Production sites of exported soy sauce. 13. Transportation of Comprador soy sauce bottles. 14. Comprador merchant guild (1) [*Konpura / Kompura Nakama*]. 15. Comprador merchant guild (2). 16. References.

A careful analysis of the records shows that there were two sizes of wooden (cedar) kegs used for exporting soy sauce from Japan. The "large taru" had a capacity of 29.1 liters, whereas the "small taru" had about half that capacity. Note: However during the 20th century, the typical wooden taru used for packaging soy sauce, had a capacity of either 9 *shô* (16.2 liters) or (later) 10 *shô* (18 liters = 4.75 gallons U.S.). Each cedar keg had a wooden lid, was held together with braided bamboo hoops, and tied with packing rope. Address: Lecturer, Tokyo Metropolitan Daisan High School of Business Studies; Dep. of Literature and Graduate School of Hosei Univ., Tokyo, Japan.

9882. Yamawaki, Teijirô. 1992. The Comprador Merchant Guild [*Konpura Nakama*] (1-2). In: Yamawaki, Teijirô. 1992. "Soy Sauce Export in the Edo Period–According to the Nagasaki Trading Firm Journal." A Translation of *Edo jidai shôyu no kaigai yushutsu.* Noda, Japan: Kikkoman Institute for International Food Culture (KIIFC). 16 panels. See panels 14 and 15. [1 ref. Eng]

• ***Summary:*** The "Comprador Merchant Guild" refers to the group of merchants who were authorized to coordinate the trading of commodity goods, exported products and freight between the Dutch staff at the Nagasaki Trading Firm [Dutch East India Company, or VOC] or the Dutch sailors and Japanese merchants.

Comprador is the Portuguese word for "buyer." The Comprador Merchant Guild, an abbreviation of the "Merchant Guild for the Sales of Various Goods at Dejima," was established in 1666 by 16 merchants under the authorization of Michisada Kono, the governor of Nagasaki. (The number of members increased to 17 at one stage.) They were the privileged group of merchants whose marketing rights were assured by the governor of Nagasaki.

The Comprador Merchant Guild was generally thought to have sold goods to Dutch merchants, but actually they worked for the Dutch merchants as their buyer in order to gain margin profits. The name, "Merchant Guild for the Sales of Various Goods at Dejima" refers exactly to this kind of activity.

In Nagasaki, in addition to the Comprador Merchant Guild, there was the Interpreter Guild, a group of interpreters who assisted the transaction of trading private freights. They gained commissions by interpreting and coordinating the trading of *waki nimotsu* ("private trade freight") under the license granted by the governor of Nagasaki in 1670. In the *Nagasaki Public Service Yearbook* written in 1701, 16 comprador guild merchants were counted as part of the 90 guild interpreters. Hence the comprador guild merchants and guild interpreters were treated as having the same social status.

History of the Comprador Merchant Guild: As mentioned in Panel 14, the guild was established in 1666 under the authorization of Michisada Kono, governor of Nagasaki. We now are going to take a closer look at the history of the Guild. (Excerpt from Episodes associated with Comprador Bottles, Masao Ichikawa).

In 1642, when the Hirado Dutch Trading Firm [part of the Dutch East India Co., or VOC] was relocated to Deshima / Dejima, a tiny artificial island in Nagasaki harbor, Heizaemon Koyanagi and Bunzaemon Kujiraya, two merchants engaged in the marketing of Dutch merchant goods in Hirado, accompanied the Dutch merchants and were given permission to continue business operations in Nagasaki. Later, in 1653, when the business became more prosperous, they recruited Rihei Hirayama and three other merchants from Hirado. Hence the merchant guild by this time was organized by six merchants. In 1666, Hikozaemon Murata and another nine merchants joined and

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the 16-member guild was established. Since then the number of the guild merchants has remained the same, except for a certain period when it consisted of 17 merchants.

The number of guild shares was fixed at 16. There were no restrictions concerning exchange of shares, and they were transferred to member's descendents, friends or relatives. In 1858, when a trading treaty with the Netherlands, England, France and Russia became effective, the guild ceased to enjoy its commercial privileges, and the original purpose of the guild disappeared. So in June 1868 the merchant guild branched out into new businesses including the manufacturing and/or distribution of bread. In 1874, however, because of a slump in business, the Comprador Merchant Guild dissolved; the shares and sales office were sold, and the assets divided between the guild merchants.

Besides their regular business operations, the Comprador Guild Merchants were ordered by the Edo Shogunate to accompany the Dutch to Edo in 1844, 1850 and 1855, and to supervise them in the purchase of prohibited goods or to assist them as transaction agents. Address: Lecturer, Tokyo Metropolitan Daisan High School of Business Studies; Dep. of Literature and Graduate School of Hosei Univ., Tokyo, Japan.

9883. Yamawaki, Teijirô. 1992. The Comprador soy sauce bottle (1-2). In: Yamawaki, Teijirô. 1992. "Soy Sauce Export in the Edo Period–According to the Nagasaki Trading Firm Journal." A Translation of *Edo jidai shôyu no kaigai yushutsu.* Noda, Japan: Kikkoman Institute for International Food Culture (KIIFC). 16 panels. See panels 8, 9, and 13. [Eng]

• ***Summary:*** The amount of soy sauce exported from Japan was recorded by the barrel in the Nagasaki Trading Firm Journal. But not all of this soy sauce was actually exported in barrels; some of it was exported in sterilized glass bottles (called "kerder bottles"), which were soon replaced by sterilized grayish white pottery bottles (called "comprador bottles").

The records show that two sizes of barrels were used to export soy sauce. The capacity of the small barrel was about 14.5 liters (3.8 gallons), roughly half of that of the large barrel (approximately 29.104 litres, or 7.78 gallons).

The pottery bottles [many of which still exist and are even sold or displayed on the Web] were made in Imari or Hasami near Nagasaki to cover the shortage of glass kerder bottles. They were then replaced with the pottery bottle similar to the baked bottle currently used as sake bottles (*tokkuri*). [Note: Both types of bottles were ordered, examined, paid for, and supplied by the Comprador Merchant Guild].

The full name of the comprador bottle shaped like a sake bottle is "comprador soy sauce bottle," in order to distinguish it from the comprador sake bottle.

According to Mr. Yamawaki, a comprador bottle

contained about 552 millilitres [a little more than 1 pint or half a quart] and 550 of them were used for the first time in 1790 for soy sauce export. These bottles of soy sauce are recorded in the Journal as "sterilized soy sauce." Soy sauce exported as official trade freight (*motokata nimotsu*) was discontinued in 1793. Eventually in 1799, the Dutch East India Company was dissolved. The Nagasaki Trading Firm subsequently came under the supervision of the East Indian Governor-General in Batavia, and soy sauce exports were resumed. At this time, the bottles were modeled after the ones used in 1790.

It was suggested by the late local historian, Mr. Masao Ichikawa, also a former notary in Amakusa, Nagasaki, that the comprador bottles came in two different styles.

They have the letters (all caps) "JAPANSCHZOYA" or "JAPANSCHSOYA" written on the shoulder. The early comprador bottles have handwritten letters on them and are grey/white porcelain. Two of the three bottles exhibited are the early comprador bottles. One of them, which is of yellowish earth-color, is considered to have been used even earlier than the white porcelain bottle.

Late comprador bottles have "JAPANSCHZOYA" and "CPD" stamped. "CPD" is the monogram that came from "comprador". On the opposite side of the bottle, a circular or oval stamp in Western characters or in Chinese characters, referring to the Nagasaki Comprador Trading Company or the Nagasaki Comprador Store, is seen. According to Mr. Yamawaki, the term, "trading company" came to be used during the Meiji period. This means that the late comprador bottle with the Chinese character stamp was also used during the Meiji period.

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The capacity of comprador bottles differs from bottle to bottle. The capacity of one bottle exhibited in the Noda City Local Museum is 575 millilitres while that of another bottle is 460 millilitres (See: *Comprador soy sauce and soy sauce produced in Tokatsu region,* by Norio Tanaka). Based on the amount of soy sauce and the number of the bottles exported, Mr. Yamawaki assumes that a bottle contained approximately 522 millilitres.

As mentioned in Panel 8, "JAPANSCHZAKY" is seen on the shoulder of the bottles of the same shape used for sake export.

Transportation of Comprador soy sauce bottles: It must have been very difficult for the Dutch to maintain the quality of the soy sauce they shipped all the way to the Netherlands by way of Batavia, right on the equator and around the Cape of Good Hope. How did Dutch merchants prevent the products from spoiling without any of the refrigeration or vacuum packaging technology we have today?

The following is an excerpt from the 1795 book *Travels in Europe, Asia, and Africa, Made between the Years 1770 and 1779,* by C.P. Thunberg, a Swedish doctor and botanist who worked for the Nagasaki Trading Firm as a medical doctor.

"Japanese people produce extremely high-quality soy sauce, much better than the Chinese equivalent. A large amount of soy sauce is shipped to Batavia, India and Europe. The Dutch discovered a reliable method for preventing soy sauce from being degraded or fermented at a high temperature. They boil soy sauce in an iron pot and pack it into bottles applying bitumen (coal tar) to the stopper." (Translated by Tamaki Yamada; Thunberg's 1795 book is in English).

Note: All this took place long before Appert's invention of canning in 1809 and Pasteur's invention of pasteurization in 1862. In fact pasteurization had been practiced in Japan for 200 to 300 years before this time.

In 1790, 550 comprador bottles were used for the first time to export "sterilized soy sauce". This seems to refer to the soy sauce that was boiled and packed into bottles with coal tar-applied stopper, as described by Thunberg.

A photo shows a page that mentions soy sauce from the trading records of the Dutch East India Company (National Central Archive, Hague, the Netherlands). Address: Lecturer, Tokyo Metropolitan Daisan High School of Business Studies; Dep. of Literature and Graduate School of Hosei Univ., Tokyo, Japan.

9884. Macdonald, Bruce. 1992. Introduction to macrobiotics and early work at Erewhon (Interview). *SoyaScan Notes.* April 5. Conducted by William Shurtleff of Soyfoods Center. • ***Summary:*** Bruce was born on 5 Feb. 1946 in New London, Connecticut. In 1964 he entered the University of Connecticut, and essentially majored in LSD. He was an early buyer (for personal use only) of LSD from the Boohoo Church in Florida. This "Church" was the original importer of LSD from Sandoz Labs in Switzerland. Arthur Klets was head; Timothy Leary and Richard Alpert were involved.

At Christmas, 1965, Bruce dropped out of the university because he had a kidney disease that just wouldn't go away. He went to a doctor who gave him, sequentially, 4-6 varieties of antibiotics. Each one worked for several weeks until the microorganisms became resistant. Seeing that he was on a dead-end road at age 18, he freaked. He took a bus to New York and, to his surprise, sitting next to him was Kathy Bellicchi (who is now living in Brookline, Massachusetts). She was from Bruce's home town and he had known her in passing when they were younger, but he hadn't seen her in a while. She said to him, "Just eat brown rice and salt and it will go away. I know somebody that I'd like to introduce you to. He's got a little teeny restaurant in New York City called L'Epicerie [at Second Ave. and 57th St.]. He is Michel Abehsera." Bruce recalls: "Michel is a rather spell-binding personality; also really smart and well-spoken. In 15 minutes he had me absolutely convinced that this was what I needed to do. And he was right. So I rented this apartment for $69 a month on Stanton, down on the Lower East Side" [of Manhattan, New York City]. For the next year, Bruce worked at a boring job for Bennett Brothers (an old, established mail order company in Manhattan selling trinkets–not natural foods) to pay the bills, and he began to study macrobiotics, and yin/yang. Finding a chart which showed buckwheat to be the most yang grain, he decided to start eating buckwheat as his main food. After receiving a call from an old friend, Bort Carleton, in Vershire, Vermont (a good, clean, quiet place for healing) he moved there and began living in a cabin with Bort (a shoe and boot tycoon in Boston), who was also involved with macrobiotics. Later, Bort also sponsored a macrobiotic study house. Soon Bruce was cured–permanently–of his kidney disease. He became a true believer in macrobiotics. He and Bort would drive to Boston to listen to Michio Kushi's lectures in the old church.

In June 1967 Bruce moved to Boston, and began to live in the University Road study house. After four quick affairs with lovely young women ("I was really yang"), Michio called him over to 216 Gardner Road and asked him to "chill out" (calm down) with these girls, since Michio was "involved" with the same young ladies. Michio and Aveline had initially gotten together in a marriage arranged by George Ohsawa, who sent Aveline to America to marry his best student. Michio and Aveline had an "open marriage," and both of them had affairs with younger people of the opposite sex the whole time that Bruce was in Boston. This was well known in the upper echelons of the still small macrobiotic community.

By late 1967 Bruce was working as a carpenter for Michio's landlord (Mr. Fogelman), redoing his house at 216 Gardner Rd. Paul Hawken hired Bruce to be the contractor and carpenter to remodel the new Erewhon retail store at

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342 Newbury St. Bruce did most of the design and contract work, then he assisted Jim Docker (a master carpenter) in the remodeling, getting thick planks from Boston piers for the floors, and constructing the shelves with dowels rather than nails. Erewhon had a little store below street level at 303-B Newbury Street, that later became Tao Books. While the business was at 303-B Newbury, in Aug. 1968 the first imports from Japan started to arrive from Muso Shokuhin. These included tamari (soy sauce) and miso. But Erewhon was unable to get Hatcho miso ("the Emperor's miso") in foil packs, and that was Erewhon's first contact with Mr. Kazama; he was able to get that product for Erewhon in less than boat-load quantities. From then on, Erewhon started to import from both Muso and Kazama / Mitoku. The Erewhon store at 342 Newbury St. opened in November 1968, on Thanksgiving day, and several months later, in March 1969, Paul Hawken went to Japan. Paul asked Bruce to take over as general manager of Erewhon. Roger Hillyard ran the retail store in the front of the building.

What finally happened to Erewhon? Michio always said that Erewhon was a school; he should have said it was a business. Address: Right Hand Press, P.O. Box 100, Cambridgeport, Vermont 05141. Phone: 802-869-2010.

9885. Macdonald, Bruce. 1992. The development of Erewhon: Early financing and suppliers (Interview). *SoyaScan Notes.* April 5. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** How did Erewhon finance its rapid early growth? Initially there was a deal with the State Street Bank in Boston to borrow about $25,000. Bruce was on the West Coast so he didn't really know the details. But State Street said "no," so they switched to New England Merchants bank. Bruce believes that Paul Hawken flew back from Japan to negotiate that loan–in about 1970 or early 1971. They got a slug from New England Merchants–probably in the neighborhood of $100,000. Also, the Japanese companies were giving Erewhon some time to pay; it was Mitoku at the beginning, then Muso later on. Bruce saw some of Erewhon's filings for the bankruptcy. As he recalls, Erewhon owed Muso about $200,000 and Mitoku (Mr. Kazama) about $200,000 to $250,000. That was quite surprising to Bruce. Apparently, right up to the end, Erewhon had been buying in roughly equal quantities from Muso and Mitoku. "Money was always extremely tight. Let's say you double your sales. As you increase your inventory, you also increase your accounts receivable–the money that people owe you. Bruce used to buy commodities from Cornucopia. "I used to order about $8,000 worth a week and he gave me three weeks to pay. So essentially he invested $24,000 in commodities–money that he never saw again. When the 4th week came I paid the 1st week, on the 5th week I paid the 2nd week–but I always owed him $24,000. We did that with all our suppliers, but at the same time we were extending credit to all the people we were selling to. There is a rule of thumb; as your sales explode, you need $3 in capital for every dollar increase in sales. You need a dollar for the extra inventory, a dollar for the extra receivables, and you need a dollar for the extra equipment you need to buy to service it. That could be moving into a new warehouse, buying a new flour mill or new trucks or pallet jacks. But we didn't have those three dollars. So we had to squeeze 'em and it was always very tight."

Who were the early, important organic farmers who grew crops organically for Erewhon. Arrowhead Mills (from Hereford, Deaf Smith County, Texas) was a major supplier of winter wheat, rye, corn, soybeans, pinto beans, etc. for about the first 3 years, before Erewhon had developed any of its own sources; that came later, after Paul Hawken returned from Japan. Paul probably visited Arrowhead Mills in Texas about 50 times; Bruce visited maybe 3 times, but he remembers the long windrows of composted cow manure that were eventually put on the fields. Frank Ford was a real farmer, who believed in working with nature. There was an older fellow, whose name now escapes Bruce, who was the brains behind Arrowhead's farming. He had studied Ehrenfried Pfeiffer's biodynamic method and had developed this method of keeping the soil fertile. "It was the most amazing thing. They were able to grow such good quality wheat and other crops in part because they were enriching their soil like nobody else in that area."

Ted Whitmer, the spring wheat farmer in Montana, was another early supplier. He did not have a contract with Erewhon; he just grew the wheat and sold it (in his bags) to anyone who would buy it. Spring wheat is a high-gluten wheat that is used for bread. Winter wheat, which grew in Texas, is higher in minerals because it is in the ground longer (you plant it in the fall), but it doesn't have much gluten. Lewis B. Cox, an organic farmer from Washington state, grew gorgeous pastry wheat, sold in his bags. Paul Keene at Walnut Acres was a retail mail order operation; Erewhon didn't buy much from him. Shiloh Farms, in those days, was Arrowhead Mills' big distributor. Erewhon didn't buy much from them because they bought from Arrowhead direct.

The contract farming came later. There was a 5-year contract between Bob Kennedy and the Lundbergs. The Lundbergs had been growing rice for decades. When they contracted to grow brown rice for Chico-San, they decided to leave the local rice co-operative (which mingled together all the rice grown by its members); they had to keep their organic rice separate. Leaving the co-op was a big risk for them, in part because they now had to sell all their non-organic rice by themselves–with no help from the co-op. Paul Hawken did all the rice negotiations with the Lundbergs. Even after Erewhon sold all this "unsprayed" rice, they could not buy rice labeled "organic" from Lundberg for a number of years. That was when Paul Hawken went out to contract for organic rice farmers in the South–Carl Garrich in Lone

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Pine, Arkansas, and Willow Farms in Louisiana. That rice was sold in Erewhon's bags and those were some of the first contract farming deals. At that point, Erewhon really began to have an impact on the expansion of organic farming in the United States.

But the person who should be given the credit for contracting organically grown crops, from farmers who had not previously grown organically, is Bob Kennedy of Chico-San. He was the innovator! Paul Keene was another innovator–a decade before Arrowhead Mills [1946-47 vs. 1960]. As far as someone from outside, specifying an organic product and agreeing to buy and market it–that was Bob Kennedy. The Lundbergs had a big family farm when Kennedy first approached them. They were concerned about all the chemicals they were using. But they had to make a rather major investment; they had to install a rubber roller rice mill which they bought from Japan. They also had to break away from the rice co-operative for their organic rice. So for them, it was a huge commitment, and they deserve plenty of credit as well.

Bruce knows nothing about Erewhon's early operations in Canada; that was strictly from the East Coast and must have come later. "The Erewhon branches in Toronto and Milliken, Canada, were related to a guy named something like Fredericks, who was extremely wealthy. He had had been a vegetarian for many years and one day woke up paralyzed. Someone involved with macrobiotics got him on a macrobiotic diet and he had a remission. He set up something but it never amounted to a hill of beans."

Bruce was not involved in Erewhon's exports to places like Sunwheel in the UK. Erewhon never exported much of anything, except to Canada. The Japanese foods were sent directly to Europe. Eden Foods was by far the leader in exporting macrobiotic and natural food products to Europe.

The first soy sauce that Erewhon *sold* was probably purchased from Infinity, a small company in New York. "A $1,000 order would be the largest that they ever got." Infinity was importing soy sauce from Japan before Erewhon. For a short time, Erewhon was by far Infinity's largest customer–before Erewhon began importing from Japan. When Erewhon stopped importing from Infinity, that was one of two reasons for Infinity's decline; the other was that Howard Rower began moving up in the Scientology hierarchy. The first soy sauce that Erewhon *distributed* was probably imported from Japan through Muso and made by Marushima. Address: P.O. Box 100, Cambridgeport, Vermont 05141. Phone: 802-869-2010.

9886. Macdonald, Bruce. 1992. Ceres, Shadowfax, and Erewhon (Interview). *SoyaScan Notes.* April 5. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Frank Calpeno, who was heavily into macrobiotics, started Ceres as a natural food distributor in Colorado Springs, Colorado. "He was a sweetheart of a guy." He was going to be a Green Mountain Granary retail store in Colorado Springs; George Slavin made a deal with him. Whatever the deal was, that ruined the basic idea of the retail store. By the time Bruce arrived (ca. 1972) Frank ran his own natural foods retail store in Colorado Springs; not until years later did he become a distributor. He may have been doing a little distributing before 1980, which is when Bruce left Colorado, but not much. He was not a major player.

Shadowfax was a little natural foods distributor that was established in about 1970-71 by Charlie Smail in Binghamton, in upstate New York. Bruce thinks they were not macrobiotic, but they were strictly natural foods. They started at about the same time as Laurelbrook. They were going great guns for a while and then they petered out. Bruce was on the West Coast so he does not know what happened to them.

Mottell was another small natural foods distributor in New York; he was also going great guns for a while (roughly 1970-1980), but didn't last for long. New York was a tough market for distributors; they came and went.

Essene started as a strict macrobiotic retail store that was one of the original distributors of Erewhon products. "When we first set up all of these distributors down-line from Erewhon, they were one of the first–along with Food for Life in Chicago (Illinois), Eden Foods in Michigan, Green Mountain Granary in Colorado, Westbrae in Emeryville, etc. Most of these people had natural foods stores and Erewhon helped them to expand into being distributors–based on the model of Erewhon. They modeled themselves after Erewhon and bought a large percentage of the products they distributed from Erewhon." Their catalogs were often identical or almost identical to that of Erewhon. This all happened shortly after Bruce left for the West Coast, so in about 1970-71. Essene was run by Denny and Howard Waxman; they still exist. Within the last year or so they moved out of the tiny store they had into a larger, nicer space. The only one Bruce can think of that did not start as a retail store was Laurelbrook.

What does Bruce think was responsible, above all, for creating that Erewhon model? "Paul Hawken and myself. We established the quality standards, the retail store look and environment, the packaging design, the price list and catalog content and design, etc."

Was Bruce ever aware of a power struggle within Erewhon in Boston? No. The chain of authority was always clearly established and respected. In later years things got a little weird with Bill Garrison (who ran the company into the ground), Ty Smith (who rebuilt it). Erewhon made a comeback under Ty, who was the last real live wire to run the place, before it went into its long, slow erosion and decline.

A decisive even was the lawsuit, which had to do with Erewhon's refusal to sell to co-ops. The co-ops sued Erewhon. That was the straw that broke the camel's back. Even though Erewhon won the lawsuit, but they lost because

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the legal fees cost them something like $250,000. There was not enough money to pay these fees and Erewhon never recovered. And Erewhon made other mistakes after that. Trying to become a full-line super-distributor. Doubling the number of items in the catalog. Moving into a huge and expensive warehouse. The labor union strike, etc.

Bruce hired Jeff Flasher out of jail in Los Angeles–where he first worked for Erewhon, L.A. In about 1970 Bruce got a letter from a guy named John Beverage, who was in jail. He said that he could get out if he could prove he had a job. Bruce wrote him back, "You've got a job." John Beverage came to Erewhon West Coast, worked for 3-4 months and was a wonderful, sweet guy. He developed a very successful company making alfalfa sprouts in Boulder, Colorado throughout the 1970s and into the 1980s. Unfortunately he died of a liver disease several years ago.

Anyway his roommate and best friend in jail was Jeff Flasher–who had been caught dealing pot [marijuana]. When John Beverage was working at Erewhon he told Bruce that he had a friend, Jeff Flasher, who was coming up for parole, and he asked Bruce if he would do the same thing for Jeff. Bruce said, "sure." Jeff Flasher became the miller for Erewhon West Coast. Several years later Bruce heard that Jeff was president of the company. "I was astonished."

Bruce believes that by focusing more on one product, Erewhon could have become a dominant force. San-J has built up and now owns the real tamari market, which means the market for natural soy sauce. They have nearly 70% or the market. While Bruce was at Green Mountain Commodities, San-J became the dominant player. They do all the bottling for Eden now. It happened when the dollar collapsed relative to the yen. Remember, in 1987 a dollar would buy 255 yen; it now buys about 130 yen. So, basically, all Japanese imports doubled in price, which enabled San-J–an American manufacturer of tamari and shoyu–to take such a large share of the market; they were $2 a bottle less expensive. Eden Food was a major importer of tamari [natural shoyu] from Japan, as was Westbrae with their Johsen. Tree of Life was a major importer and Arrowhead Mills used to sell quite a bit.

Some big questions: Why didn't Erewhon West Coast move to San Francisco, since 95% their wholesale business was in northern California? It made no sense for Erewhon West Coast to be in Los Angeles–which had a tropical climate. Erewhon West Coast was a major factor in Erewhon's early growth, largely because they could bring containers imported from Japan into the USA through the West Coast. "We began to rival the East Coast in sales for a while." One month, the East Coast did $390,000 a month in sales while the West Coast did $330,000 a month. Why did Michio Kushi fail to grasp America's entrepreneurial spirit? Why was he not honest and straightforward in his offers of stock ownership in Erewhon with Paul Hawken, Ty Smith, and Bruce Hawken? Address: P.O. Box 100, Cambridgeport, Vermont 05141. Phone: 802-869-2010.

9887. Macdonald, Bruce. 1992. Work after leaving Erewhon in May 1971. Part II (Interview). *SoyaScan Notes.* April 5. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Continued: During the time when Jimmy Carter was president and interest rates were at 18% (these were hard economic times), Bruce's flagship retail store, Green Mountain Granary in Boulder (which had been a grocery store for 130 years) was condemned by the City of Boulder. They said the building was in a 100-year floodplain, and they condemned every building from 4th Street at the tip of the mountains all the way to Broadway–but actually they wanted to build their own Justice Center and Library in this area. So instead of invoking "eminent domain," they used this back-handed method. In about 1980 Bruce sold what was left of the company to his manager Seth Feldman.

Bruce then moved from Boulder to Boston. Tony Harnett, of the natural foods retail chain Bread & Circus, called Bruce and asked Bruce to come and work with him. After Erewhon went bankrupt, Tony was in big trouble; he had been getting most of his supplies from Erewhon. There was a little distributor in Connecticut named Earthbound. After Erewhon's demise, all five of Tony's retail stores tried successfully to order from Earthbound. But the next week when they tried to order again, Earthbound said, "Sorry, but we don't have enough capital." So Earthbound promptly went out of business. Consequently, Tony asked Bruce to start him a warehouse so he could supply his five stores. Bruce set it up in Watertown, and before long they had sales of $120,000 a week with three people–a very efficient operation. Then Bruce asked Tony for a share of the company, and Tony said "no."

Then Michelle Abehsera's younger brother, Georgie [George], called Bruce to say that he had just sold Nature de France (clay soaps) and he wanted to start a natural food store. Bruce left Boston in Dec. 1982, went down to New York City, and that was the beginning of Commodities, which they opened in March 1983. It was soon the biggest natural food store in New York City. At he beginning, Bruce and Georgie were equal partners in the company. But he was becoming a very, very orthodox Jew. So every Friday at 3:00 he would sell Bruce his 50% of the company, then he would buy it back Sunday morning. But Friday night and Saturday were the two times the company had its biggest income–about 50% of the weekly total. This was great for Bruce personally. Then a rabbi in Israel told Georgie that this way of doing business was not "Kosher" enough, so Georgie he asked Bruce to buy him out–which Bruce did–but it was hard.

Commodities had signed a 10-year lease in 1982, starting at about $3,000 a month and gradually increasing each year to $7,000 a month. But in the meantime, Robert De Niro and George Lucas had started Tribeca as a state of the

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art film editing facility in New York; in 1989 De Niro bought the old Martinson Coffee factory on Franklin and Greenwich in Tribeca–a 300,000 square foot building a block from the Commodities natural food retail store. They invested millions of dollars in equipment, and before long every celebrity known to man started coming to Tribeca in limos. So, with 3 years to go on the lease, when Bruce eventually went to his landlord to renegotiate his 10-year lease, the landlord said the first year's lease would be $30,000. "You can't run a grocery store paying that kind of rent." So Bruce sold Commodities to his ex-girlfriend and moved up to Vermont and basically retired.

That next summer (1990) he met Linda Green, "a walk-in angel," at an annual dowser's conference in [Danville?] Vermont. In the early 1990s, Bruce studied with Linda from Oklahoma. He actually lived in her monastery in Guthrie, Oklahoma–where she lived. He lived there 3-4 months and practiced spiritual dowsing, but he went there on and off for a year while she was there with the whole group. "We were dowsing these evil ratios and putting them in Solomon's seals (a star inside of a circle) and then in a black box–many tens of thousands of them. For high-level dowsing, we used an Aurameter, a very, very sophisticated and super-sensitive device (no electricity is involved) for sensing energy fields. Its a long story. She had a amazing personal charisma–such a pure spirit. I'd never met anyone like that before–not even remotely close. She just turned my life in a completely new direction. It was a wonderful, wonderful experience. She asked me to start a publishing company. So I went to Vermont and published five of her books (several thousand copies were sold or given away) and organized four different conferences (one in Toronto, Canada; one in Burlington, Vermont) to introduce her and her work to people."

Bruce (and Richard Young) published books at Right Hand Press (which Bruce started) in Cambridgeport, Vermont, about the work and teaching of this angel.

"She died three years later and the group basically disbanded; she predicted her death because she had too many "dreaming bodies"–many more than her body could withstand. Bruce has healed a number of people of chronic illnesses using spiritual dowsing. "You should go to this annual dowsing conference, where the dowsers all meet at this little town in Vermont. Old water dowsers, who come out of the hills, can tell you how deep a source of water is, how many gallons per minute you'll get. They use different dowsing devices. I became proficient using that Aurameter; I can find anything–such as energy blockages in other people–if they are the right soul-type. It's real. You can laugh or not, but I've seen it work again and again." She was an "uneducated nurse." She said there were two people born in the last century who came from a more evolved planet: Rudolf Steiner and Nikola Tesla (1856-1943). Tesla figured out a way to get free electricity.

In 1992, his daughter Crystal's senior year, Bruce was in Boulder, Colorado. He moved to North Carolina in 1993 where he remains in 2011. Bruce has moved 55 times in 40 years.

In 1993 Bruce bought the Macrobiotic Wholesale Company, which had been a division of Great Eastern Sun. Barry Evans, owner of Great Eastern Sun, had sold it to a German guy named Kurt Schmidt, who ran it (with his wife) for about five years, then sold it to Bruce and Yuko Okada, who renamed it Macrobiotic Company of America (MCOA). Since MCOA had been part of Great Eastern Sun, they imported from Mitoku in Japan–not from Muso. In Feb. of 2000 there was a hostile takeover of MCOA by Bruce's partner Yuko Okada of Muso. There were lawsuits back and forth, they settled, and Bruce had to sign a non-compete agreement for a year. In Feb. 2002 Bruce started his present company, Natural Import Company, also in Asheville, North Carolina. Norio Kushi ran MCOA for Yuko. As soon as Bruce left, Mitoku stopped selling to MCOA–but Mitoku had accounts receivable from MCOA. MCOA went bankrupt before Bruce's new company opened. Norio sold down the $400,000 inventory and did not replace it; he was selling his seed corn. Norio started spending money lavishly, and 14 months later he went bankrupt. Address: P.O. Box 100, Cambridgeport, Vermont 05141. Phone: 802-869-2010.

9888. Kushi, Aveline. 1992. The origin of seitan and how it came to America (Interview). *SoyaScan Notes.* April 9. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Aveline thinks George Ohsawa coined the term "seitan," but Aveline is not sure when he coined it. Since he died on 23 April 1966, he probably coined it in the early- to mid-1960s. She first heard the term from George Ohsawa, she thinks in the early 1960s while she and Michio were still living in New York; they moved to Massachusetts in 1963. Shortly after hearing about seitan, she bought some canned gluten-based meatlike products made by Seventh-day Adventist food companies, probably in New York. She does not remember how, where, or when she first learned to make seitan. Beginning shortly after her last son was born in 1964 in Boston, she taught many of her macrobiotic students how to make seitan starting with high-protein wheat flour. She taught seitan-making in almost all of her cooking classes, and she taught how to use the starch like kuzu as a thickener to make creamy soups. Starting in about 1984-85 she started to use the starch, together with rice syrup, to make sweet dumplings for desserts.

The first seitan imported to America was made by Marushima Shoyu Co. on Shodoshima in Japan. George Ohsawa went to visit the company, talked with Mr. Mokutani (who is still the chairman, and a close friend of the Kushis, and a great admirer of Ohsawa), and showed him how to make it. Marushima began to make seitan commercially in the late 1960s. It was imported to America by Muso Shokuhin at about the same time the first miso and shoyu

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were imported. She thinks it came in small jars, and was so salty that she used it as a seasoning in place of soy sauce in stews (such as soybean stews) or cooked it with vegetables; this cooking made it softer. She is not sure which Japanese company (Muso or Mitoku) exported this seitan to America, or which American company imported it, but it probably started to be imported in about 1969.

Concerning wheat gluten, about 15 years ago, the Kushis, through Mr. Kazama, convinced a Japanese manufacturer of dried wheat gluten (*fu*) to make the product from whole wheat flour. Since that time it has been imported to America by various importers of macrobiotic foods.

Follow-up talk with Aveline. 1992. July 8. She has just talked with Lima Ohsawa (age 93) by phone in Japan. Lima has no recollection of ever making seitan in a cooking class in America, or of ever teaching anyone in America how to make it. Initially Aveline thought she might have learned to make seitan from Lima, but after talking with Lima she thinks she may have learned to make it herself by trial and error, after she moved to Boston. Address: 62 Buckminster Rd., Brookline, Massachusetts 02146. Phone: 617-232-6869.

9889. Kushi, Michio. 1992. The main reasons for Erewhon's decline and bankruptcy, and current work with macrobiotics worldwide (Interview). *SoyaScan Notes.* April 9. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Michio has thousands of files in his basement, and some of them probably contain early catalogs and other information about Erewhon. Erewhon definitely started to import from Mitoku first, and then Muso–but they were about the same time. Michio set up all these connections before Paul Hawken went to Japan. Mr. Kazama came to America and they talked about the items Michio wanted to import. Then Muso was approached. Michio thinks Erewhon started importing foods from Japan 1-2 months before Hawken went to Japan. Hawken and Evan Root went to Japan at the same time. The main purpose of Hawken's trip was to study Japanese language and culture, and to set up more good connections for Erewhon and to arrange for products to be packaged individually; previously all were shipped in bulk. Paul didn't find out any new sources, Mr. Kazama did that.

Michio believes that there were two main reasons for Erewhon's decline and bankruptcy: (1) The company tried to expand too much too fast. At the end it was selling 4,000 products; (2) This rapid expansion led to Erewhon having many poor quality products. The company should have concentrated on high quality macrobiotic foods. Management wanted to have a wider selection of products, in part because competitors were offering a wide selection. Also, Erewhon gave up its virtual monopoly on macrobiotic-quality products imported from Japan and revealed many secrets about the Japanese manufacturers and suppliers of those foods and how those foods were made. If he had to do it over again, Michio would concentrate on only the best quality foods, and let the company grow slowly and naturally. For example, the quality of tamari soy sauce began to decline at a very early date. Likewise with the umeboshi plum and sea vegetables. "The quality of every product was declining because of too rapid growth in the company's sales. Moreover the educational activities didn't keep up with the company's growth. Muso and Mitoku have been keeping good quality as best they can but the so-called other natural food buyers, who were not concerned with macrobiotics, also started to go to Japan and buy those products, not only from Muso and Mitoku, but from other suppliers too–especially suppliers of soy sauce and miso with lower quality. These inferior quality products were retailed for a cheaper price at stores in America. The public did not know about the difference in quality, so Erewhon began to face big competition.

Even though Aveline owned Erewhon, neither she nor Michio ever received any salaries or money from the company. They wanted to let the management of Erewhon have a free hand, so they didn't tell them how to run it–to slow growth and concentrate on keeping quality high. "Erewhon was more like an educational place." There were debates over whether or not Erewhon should carry organic cheese and vitamins. Michio and Aveline opposed carrying these products, but let management do as it wished.

At the time Erewhon was growing most rapidly, the company needed money to finance the expansion, but bank interest rates were extremely high–about 15-18%. Inventory control for 4,000 items is very difficult and expensive; it requires a large warehouse and shallow inventories. During the last few years, Erewhon was able to fill only 40-50% of its orders because so many items were out of stock. Also as the company grew, many non-macrobiotic employees had to be hired to drive the delivery trucks, and they created a labor union. Erewhon had to battle with this union for 1½ to 2 years, and that cost a great deal of money. Truck drivers cut prices to stores in order to try to meet the prices of competitors. Financial difficulties piled up starting at the time when interest rates jumped and the union was formed.

Bill asks why Aveline and Michio didn't give talented managers a share of the ownership in Erewhon to motivate them to stay with the company. Michio says that Paul Hawken owned one-third of the Erewhon shares. Evan Root owned shares in Sanae. The Kushis paid all or part of Evan and Paul's travel and living expenses in Japan. Paul got his one-third shares after he returned from Japan and became president. When he resigned, he was definitely paid for the value of his shares. Paul wrote from California that he needed the money and offered to sell back his shares. So Michio and Aveline sent him the money and Paul sent his shares back to them. Only later did Michio learn that Paul needed the money because of his divorce from Dora Coates. Other people (whose names Michio also remembers) also owned some shares. Michio does not feel that giving

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managers ownership would have helped Erewhon. Michio thinks that the people who managed Erewhon during its last 5 years had the necessary business skills necessary to manage a company of that size that was growing rapidly.

Another reason for Erewhon's fall was that Michio did not pay serious enough attention to what was happening at Erewhon. He was too involved in teaching in America and Europe. At the time he noticed what was happening and stepped in, the situation had already become too serious. There was much sloppiness allowed by management, even though their intentions were good. He should have noticed a year before. It was a very sad situation. "Yet Erewhon had meaning as a pioneer company. That spirit still remains. My purpose at present is to continue education all over the world. Macrobiotics is now spreading all over the world, even to the Soviet Union, Thailand, and Japan. In Leningrad some 300 medical doctors are now studying macrobiotics as a group to help find a solution to the health problems of their country. His books are being translated into many Eastern European languages. Also it is very important to reach the scientific, medical, and nutrition professions–as well as governments. Their attitudes are now rapidly changing. Macrobiotics is now growing tremendously. My main concern with natural foods is that the quality be kept very good. My current effort is to elevate the quality of each product. For example, miso should definitely be fermented for 2-3 years. Soybeans and grains should all be organically grown, and only very good sea salt should be used–such as that made by S.I. Salt, an American company in New Mexico, and Lima salt in Europe [from Lima Foods in Belgium]. Michio now goes to Japan twice a year, and there he gives many lectures all over the country, helps to set up chapters of One Peaceful World, and works with food makers on product quality. He also formed the Japan Organic Natural Food Association (*Yûki Nosui Sanbutsu Kyôkai*) in Japan, of which he is president. About 200 companies are members.

On the one hand, Michio is happy with the way his work is going now. "But of course, I am always dissatisfied too. My time and my ability are limited. I can't help as many people as I would like. The demand is so great. So I always feel sad on that point. Whenever you talk with people from Erewhon, please extend my best wishes. And say always that Michio is thinking of them and their happiness. I hope sometime in the future we can get together. Then we can talk more about how to build one peaceful world–and not only food, but more about health, families, government, economics, and spiritual matters, and how to make the many countries more united and harmonious in one world. Let's work together." Address: 62 Buckminster Rd., Brookline, Massachusetts 02146. Phone: 617-232-6869.

9890. Root, Evan. 1992. Recollections of early work with Erewhon and Sanae. Trip to Japan with Paul Hawken (Interview). *SoyaScan Notes.* April 11. Conducted by William Shurtleff of Soyfoods Center. Followed by a letter of April 29.

• ***Summary:*** Evan (his first name rhymes with "heaven") does not have any early Erewhon catalogs, but he thinks Marc van Cauwenberghe might have some in his library on macrobiotics. He does have a letter to the general public announcing the opening of the first Erewhon retail store on 9 April 1966. It was at 303-B Newbury St., below street level. Initially Evan owned (titularly) 100% of the stock in Erewhon, but soon he passed it to Aveline Kushi after legal documents were drawn up. While he was at Erewhon the little retail store sold the following soy products: whole soybeans and probably soy flour (probably from Walnut Acres or a Mennonite community, both in Pennsylvania), soy sauce and miso (probably both obtained from Infinity Foods in New York; Infinity imported these products from Japan). Hamanatto was also sold. No tofu was sold at the store, but firm tofu was available from nearby Chinatown.

The Kushis imported miso, shoyu, condiments, etc. from Japan about twice while Evan was managing the Erewhon retail store. This direct importing was infrequent and the quantities were small due to the lack of cash. It was much easier to buy from Infinity or Chico-San and not tie up the money. In fact it was the norm to stretch out those friendly distributors as long as possible for payment.

Before he left Erewhon, in Oct. 1967, Evan personally hired Paul Hawken, with Aveline's permission, to take his place. Then Evan opened the first macrobiotic restaurant in Boston, named Sanae (meaning "young rice plant" in Japanese); it opened in early 1968 on Newbury St. In late March 1969, Evan and Paul Hawken left Boston and traveled to Japan together. Several months before they left, Evan had been given 50% of the shares of stock in Sanae by the Kushis for the work he had done at Sanae. The Kushi's lawyer, Morris Kirsner, had drafted the agreement to read that if Evan did not return to management of the company within 18 months, he would agree to sell this stock back to the Kushis at an agreed-upon price. Evan thinks that Paul had a similar type of stock arrangement in Erewhon, but he is not sure what it was (Note: See interview with Aveline Kushi, March 1993). Evan went to Japan mainly to study the language and culture. He ended up staying there 3 years and 7 months, largely in Tokyo (Setagaya-ku, Shoin-jinja-mae). He studied Japanese at the Tokyo School of Japanese Language. After 18 months, there was a lad name Hiro Fujieda living with the Kushis in Boston. Rather than Hiro pay rent to the Kushis, Hiro's family would pay Evan monthly in Japan on a monthly basis–until the value of the stock was paid off. Evan used this money to support his studies.

After about a year, in late 1971 or early 1972, Evan went to work for Muso Shokuhin in Osaka. He translated letters that arrived from Europe and America into spoken Japanese, and then answered the correspondence. By the end of his

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stay in Japan, Muso was exporting quite a volume of natural foods and exports were a big part of the company focus. Evan thinks that Ty Smith took his place when Evan left.

Returning to Boston in early Oct. 1972 (along with Mr. Masuda and Michelle Matsuda), Evan became an employee of Sanae after several months, working as maître d'. In 1971, while Evan was in Japan, Sanae had expanded to open another larger branch restaurant in Boston, originally called "Sanae" but informally called "Big Sanae," then later formally named The Seventh Inn (at 269 Boylston St.). When Evan was in Japan, he heard that the restaurants were not doing well, so Yuko Okada (originally of Muso Shokuhin, who was working at Erewhon) took over management of Sanae. Hiroshi Hayashi, a top cook in a lineage, traveled to Boston from Japan, bringing with him his disciple, Chika Abe, to take charge of cooking at Sanae. His disciple, Mr. Yozo Masuda, later joined them. Hayashi is now at a restaurant named Latacarta in Peterborough, New Hampshire (Phone: 603-924-6878).

Evan's recollection is that Paul Hawken's trip to Japan was more to study the language and culture, but he did work on Erewhon business while he was there. Moreover, he returned from Japan after about 9 months to work at Erewhon. Evan feels that few of the people involved in early macrobiotic businesses saw themselves strictly or even mainly as businessmen. "None of us were in it, as I saw it, for the money. For us, the whole thing was a Cultural Revolution with respect to Japan." Evan also identified strongly with the phrase "Biological Revolution."

When Paul Hawken returned from Japan, he built Erewhon into a big natural foods company. Address: 541 Washington St., Brookline, Massachusetts 02146. Phone: 617-566-4783.

9891. *Toyo Shinpo* (*Soyfoods News*). 1992. [Average household expenditures for tofu, aburaage, natto and konnyaku in Japan in 1991 by region]. April 11. p. 2. [Jap]
• ***Summary:*** Average per household expenditures for various soyfoods; yen figures are not adjusted for inflation. The 11 regions (chihô) are: 1. Tokyo-to. 2. Hokkaido. 3. Tohoku Chiho 4. Kanto. 5. Hokuriku. 6. Tôkai. 7. Kinki. 8. Chûgoku. 9. Shikoku. 10. Kyushu. 11. Okinawa.

Average per household expenditures for tofu are highest in Shikoku (9,045 yen, up 22.9% from the previous year). They are 2nd highest in greater Tokyo (8,218 yen, up 3.8%). They are lowest in Hokuriku (6,835 yen, down 2.0%).

Average per household expenditures for aburage and ganmodoki (deep fried tofu pouches and burgers) are highest in Hokuriku (5,772 yen, up 3.7% from the previous year). They are 2nd highest in Kinki (5,170 yen, up 10.5%). They are by far the lowest in Okinawa (701 yen, down 0.7%).

Average per household expenditures for natto are highest in Tohoku Chiho (the northeast prefectures) (4,709 yen, up 20.6% from the previous year). They are 2nd highest in Kanto (4,133 yen, up 13.1%). They are by far the lowest in Okinawa (923 yen, down 13.5%).

9892. DeBona, Don; Callebert, Mark. 1992. Update on Lima Foods and Euronature (Interview). *SoyaScan Notes.* April 19 and 23. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The following is based on a talk that Don had in North Carolina with Mark Callebert, general manager of Lima Foods in Belgium, then a direct interview with Mark in Belgium on April 23, followed by a letter from Mark on June 16 with exact dates. Mark has worked with Lima for about 16 years (since 1 Sept. 1975).

The Gevaert family sold Lima in May 1988 to a company named Vibec in Quebec, Canada. Vibec was a construction company (they were not involved with foods) and the owners spoke French. The contact with Vibec was made via Henry Lucy, a Frenchman who was on the Lima board of directors (and also a shareholder), who was a friend of Michio Kushi (Michio had healed Henry's wife), who had quite a lot of money, and who also had a construction company in Africa. Michio was also on the Lima board for a while. Vibec purchased Lima as a way of getting involved in the new European market without borders which will begin at the end of 1993. However Pierre Gevaert and his son, Daniel (who was production manager at Lima, France), kept their property and mill in the south of France where Lima used to make miso. At that time Lima had a lot of financial problems. Pierre Gevaert owned the majority of the stock in Lima, and his relatives (mostly his brothers and sisters) owned the rest. Mark and Frank Stevens (Pierre Gevaert's son-in-law) played key roles in negotiating the deal, then stayed on to run the company. On 22 April 1989 Lima purchased Jonathan P.V.B.A., which is still a fully owned subsidiary (daughter company) of Lima. But the marriage of Lima (a Belgian natural foods company) and Vibec (a Canadian construction company) was a strange one, and for that reason it didn't last long.

Then in September 1989 Lima was purchased from Vibec by Euronature (pronounced as in French, YU-ro na-TYUR), a large international food company headquartered in Paris, France. Euronature is a holding company that was founded in June 1989; the president of Euronature was able to raise a lot of money from banks and insurance companies to create the holding company. Frank Stevens was killed in an automobile accident in Nov. 1989.

Lima is presently doing well, is financially very solid, and the future looks bright. Lima has sales of about $15 million a year, but the company is not yet profitable. Mark feels that they will become profitable when sales reach about $17 million/year. Their traditional high standards of food quality are completely supported by Euronature. Pierre Gevaert (born 21 July 1928 now in his mid-60s) no longer owns any part of Lima and neither he nor his son have been active with the company since it was purchased by

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Euronature. Pierre lives in the south of France and works on his organic farm there. Lima is still headquartered at Sint-Martens-Latem in Belgium.

Euronature has 4 major divisions: (1) Natural foods division, including Lima Foods, Lima's bakery and muesli factory, and several natural foods distribution companies; (2) Gourmet division; (3) Seafoods division (Euronature's largest), with branches scattered throughout Europe; (4) French specialty foods division.

Lima's largest product lines are their muesli products (which they make at their own plant), their bakery (located 6 km from Sint-Martens-Latem in Belgium), their sesame division (they make tahini and gomashio, and were one of the first to grow sesame seeds organically), and their tomato canning division (located in the south of France, it makes tomato sauces and ratatouille). Lima's leading soyfood products are tamari, shoyu, organic miso, their soymilk products (including regular and Mocha-Soy soymilk, and Soy Desserts, all made by Alpro in Belgium), fresh tofu salads, and tofu in cans and jars. Imports from Japan are now quite small, representing only about 10% of Lima's total sales. Although Lima no longer makes its own miso, it still sells quite a lot of miso–much of it from past batches made by Jan Kerremans in the south of France. Lima is now looking for other sources, including American Miso Co. in North Carolina. Jan now works part time as a consultant for Alpro in Belgium.

Jonathan's main products are now seitan and tofu (both fresh [pasteurized] and in jars), plus many second-generation products made from seitan and tofu, such as fresh tofu spreads, tofu pates, seitan brochettes, etc. Jonathan makes all of the seitan, tofu, and related products sold by Lima. Address: General Manager, American Miso Co., Route 3, Box 541, Rutherfordton, North Carolina 28139. Phone: 704-287-2940.

9893. Wilson, Lester A.; Murphy, Patricia A.; Gallagher, Paul. 1992. Soyfood product markets in Japan: U.S. Export opportunities. Ames, Iowa: MATRIC (Midwest Agribusiness Trade Research and Information Center). x + 64 p. April.
• ***Summary:*** Contents: Figures. Tables. Acknowledgments. Introduction. I. Soybean processing (by Wilson and Murphy). Food from soybeans: Soybean chemical composition, environmental influences on soybean composition. Soyfood manufacture: Soymilk, tofu, momen tofu, kinugoshi tofu, packed tofu, aseptically-packaged tofu, deep-fried tofu, kori tofu. Tofu-related research: Recent studies at Iowa State University, summary, future research. Other nonfermented soyfoods: Yuba, kinako, texturized soy protein foods. Fermented soyfoods: Miso, shoyu, natto, tempeh. Japanese Agricultural Standards (JAS). Identity preservation and transportation. U.S. soybean quality and the Japanese market: Grain quality, judging quality, potential new markets.

II. Japanese soyfood markets (by Gallagher). Demand and growth prospects: Consumption patterns, demand analysis, forecasts. The U.S. share of the food soybean market: Sources and uses, market share analysis, determinants of relative prices, prospects. Trade and trade barriers: Soybeans, processed products. Summary and recommendations.

Appendixes: A. Excerpts from specifications and standards of food additives, etc.–Manufacturing and storage of tofu. B. Excerpts from standards and certification systems in Japan. C. Additional agricultural standards for soybeans. References.

Table 2.1 shows soybean use for soyfood production in Japan; actual (1986) and projected (2000). Soybeans for tofu are expected to increase from 524,000 to 609,700 tonnes. Soybeans for miso are expected to decrease from 156,000 to 101,600 tonnes. Soybeans for natto are expected to increase from 92,000 to 118,600 tonnes. Figures 2.1 to 2.4 show Japanese per capita consumption of tofu, natto, miso, and soy sauce from 1965 to 1988. Tofu: Japanese annual per capita consumption of tofu has risen since 1965, except that it fell during 1973-1977. In 1965 about 3.6 kg/capita of soybeans were used to make tofu, increasing to 4.4 kg/capita in 1988. If 1 kg of soybeans yields 2.8 kg of tofu, then per capita tofu consumption in 1988 was 12.32 kg or 27.1 lb.

Natto: Japanese annual per capita consumption of natto has risen steadily, from a little less than 0.4 kg in 1965 to 0.6 kg in about 1968, to 0.8 kg in 1988.

Miso: Japanese annual per capita consumption of miso fell from 8 kg in 1965 to about 5.4 kg in 1985, then it began to rise to about 5.7 kg in 1986.

Soy sauce: Japanese annual per capita consumption was about 12 liters in 1965. It fell to 11 liters in 1967, rose to 13 liters in 1973, then fell to 9.8 liters in 1985, after which it rose for 1 year. Address: 1-2. Prof. of Food Science and Human Nutrition; 3. Assoc. Prof. of Economics. All: Iowa State Univ. Phone: 515-294-0160.

9894. Creighton, Barry. 1992. Cable Springs Bakery and recollections of Tan Pups in Boston (Interview). *SoyaScan Notes.* May 9. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Barry started baking while he was living in Los Angeles, California, at a macrobiotic study house run by Carolyn Heidenry. Then he moved to Boston and continued selling (out of his apartment) the baked goods he had developed in Los Angeles. He and Cathy were married about a year later on 7 Jan. 1974 then in August 1974 they started Cable Springs Bakery as an incorporated official business.

At that time (Aug. 1974) he is quite sure that a product named Tan Pups (skewered seitan deep-fried in a breaded batter) were on the market. Barry thinks that Tan Pups were probably introduced 6-12 months before his bakery opened, i.e. in early 1974 or late 1973. The Tan Pups may have been

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made by the Queensberry Bakery [actually they were not], which was run by two brothers (whose names Barry does not remember); it was a natural foods- rather than a macrobiotic bakery. Both his Cable Springs Bakery and Queensberry Bakery sold their products at the Erewhon retail store on Newbury Street in Boston. They were sort of competitors, and Barry first saw Tan Pups in that Erewhon store. Barry also recalls that Tan Pups were on the market when his son, David, was born on 3 March 1975. But not long after that, Queensberry Bakery went out of business, and their Tan Pups were therefore no longer available. Barry almost bought Queensberry Bakery, but after a series of negotiations decided not to. Cable Springs Bakery was sold to Bruce Berman in August 1975; Barry had owned the business for a year. Then he and Cathy went to Vermont. Cathy learned about seitan from Michio Kushi during a consultation concerning her daughter, Eliza's, broken leg. She learned how to make seitan from Kathy Bellicchi at the Beacon Hill Study House in Boston, and she learned how to make kofu (raw wheat gluten) from Lima Ohsawa's book *The Art of Just Cooking.* Cathy developed a recipe for Tan Pops in 1975 in Vermont. The best Tan Pops are made by the longer double deep-fry process that Cathy developed for seitan burger parties in Cambridge.

Today at their community in Alaska, they still make Tan Pops on their full-moon night feasts. His daughter makes most of the Tan Pops; she learned from him and Cathy. To made double-fried Tan Pups: Make raw wheat gluten dough and cut it into large chunks (4 by 1½ by 1½ inches). Get 3 pots going on the stove: (1) A pot of oil for deep-frying; (2) A pot of boiling water; (3) A pot of broth containing 12 cups water, 1½ cups tamari, 30 thin slices of ginger, and lots of kombu. Deep-fry the chunks, dip them in the boiling water, then simmer in the broth for 1 hour. Drain and cool. Skewer chunks on chopsticks. Prepare a tempura batter containing 4 cups each corn flour, pastry flour, and unbleached white flour, 2 tablespoons sea salt; add water to mud consistency. Dip skewered chunks in tempura batter and deep-fry again. Address: Foundations Inc., HC2, Box 564-B, Kasilof, Alaska 99610. Phone: 907-262-2824.

9895. Root, Evan. 1992. Cable Springs Bakery in Boston and Tan Pops in Alaska (Interview). *SoyaScan Notes.* May 9. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Barry Creighton started Cable Springs Bakery in Boston. Initially it was run out of his home, but in about late 1974 it became "official." Their main product was a line of about ten varieties of "pies," which were square filled pastries baked in trays with a layer of dough on top and bottom, then cut into squares (they had no dough on the sides). They had Rice-Sea Vegetable Pie (with hijiki), Bean Burrito, then the sweeter ones with fillings of apricots, apples, etc. Kathy Bellicchi worked with them, and later purchased part of the business making cookies. Bruce Berman (who now lives in Chicago, Illinois) finally bought the whole business.

While in Boston, the Creightons must have gotten to know and grown to love Tan Pops. About 5 years ago they moved to Alaska, where they are part of a macrobiotic community of 4 families and 25-30 children living in Kasilof, on the Kenai Peninsula. The community, named Foundations Inc., grows a lot of its own food, and they generally eat quite simply. But on the night of each full moon, they have a feast. To this day, for these full moon dinners, they make about 100 Tan Pops (skewered, deep-fried seitan), which everyone loves–especially the children. They do not sell the Tan Pops commercially. Evan has visited them from time to time. They might know about the origin of Tan Pups in Boston. They have a great love for the food revolution and for kindred spirits who share that interest. Their address is presently HC2, Box 564-B, Kasilof, Alaska 99610. Phone: 907-262-2824. Evan does not know anything about Tan Pups.

Note: As of March 2003 there is a macrobiotic of 5 families named Ionia (website Ionia.org) living on the Kenai Peninsula in Alaska–150 miles south of Anchorage. They make their own tofu and homeschool their children. They try to teach their children traditional values–which do not include reading, writing, or arithmetic. All of the parents studied with Michio Kushi during the 1970s. Address: 8 Ayleston St., Jamaica Plain, Massachusetts 02130. Phone: 617-566-4783.

9896. Bellicchi, Kathy. 1992. Recollections of seitan in Boston from 1970 (Interview). *SoyaScan Notes.* May 10. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In Aug. 1969 Aveline Kushi had moved to Los Angeles where her youngest son, Hisao, had undergone traditional Japanese bone massage therapy. Kathy arrived in Boston in early 1970 when Aveline had just returned briefly from Los Angeles. At that time Aveline gave some cooking classes in Boston which Kathy attended, and Kathy remembers that Aveline taught how to make seitan in these classes. That was the first time Kathy had ever heard of seitan. Before that time, Kathy had lived in New York, had been macrobiotic since 1965, and had cooked with Michel Abehsera and many other macrobiotics in New York; she never heard of seitan while in New York prior to early 1970. But the Ratners chain of restaurants in New York did serve Protose Steak made of wheat gluten.

Kathy recalls that in the early 1970s seitan was considered by macrobiotics to have medicinal properties. For example, when Cathy Creighton arrived in Boston and Eliza had a broken leg, many people suggested that Eliza be fed seitan to help the leg to heal.

To make seitan back in the early days, Kathy would grind a special type of hard Minnesota wheat into flour, knead flour and water together thoroughly to make a dough,

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then let that dough stand under water–often for several hours. She would then further wash the raw wheat gluten, strain the starch water to separate the bran (which settled to the bottom), dry the bran on cookie sheets in an oven, and use it to make bran pickles. The starch water would be used to thicken a seitan stew–so everything was used. Most people made seitan by first deep-frying the wheat gluten, then cooking it in a tamari-ginger broth to make seitan; everyone said it had to be deep-fried first, and Tan Pups probably came from that concept. Kathy thinks that this method may have come from George Ohsawa to Herman Aihara to Aveline Kushi. To make seitan stew, chunks of seitan were simmered with chunks of onions, carrots, and other vegetables; just before it was served, some of the starch water was added to give the stew a nice sheen and little thickness. It turned clear when added.

She remembers that Tan Pups were made by the Queensberry Bakery in Boston. Kathy does not recall the names of the two brothers who ran the Queensberry Bakery. Matthew Chait, an actor who had a cart named the Ricycle at Boston University, worked out of the Queensberry Bakery; he or Vern Verona might know more about Tan Pups. Address: 55 Meadowbrook Rd., Brookline, Massachusetts 02167. Phone: 617-734-1380.

9897. Sinclair, Valerie. 1992. Japanese cuisine is several settings. *New York Times.* May 10. p. NJ 13.
• ***Summary:*** This is a review of the Japanese restaurant Sukeroku (68 Route 23, corner of Pompton Ave., Little Falls, in upstate New York–near Utica, between Albany and Rochester). About four years ago a new owner added a karaoke bar to the sushi bar and tatami rooms. Some dishes illustrate well the contrast in textures so prized in Japan. For example "raw squid rings with chopped fermented [soy] beans (ika natto)."

9898. Adlercreutz, Herman; Hämäläinen, E.; Gorbach, S.; Goldin, B. 1992. Dietary phyto-oestrogens and the menopause in Japan (Letter to the editor). *Lancet* 339(8803):1233. May 16. [7 ref]
• ***Summary:*** The authors of this letter theorize that diet is a possible reason for the differences in menopause symptoms between Japanese and American women. The scientists had studied the phyto-estrogen excretion of a small sample of Japanese women with mean age 50 eating "a traditional Japanese low-fat diet". Phyto-estrogens come from plants; when consumed, they act like endogenous estrogens, the estrogens produced by the body. Menopausal symptoms are associated with a drop in a woman's production of endogenous estrogens.

The Japanese women excreted up to 1,000 times more phyto-estrogens than American women consuming a Western diet. This result was a positive finding for the Japanese subjects; the scientists attributed the high levels with high intake of soyfoods, which are rich in phyto-estrogens.

Although the scientists did not specifically study the effects of phyto-estrogens on menopause, they believe that soyfoods may act like a hormone replacement "pill", closing the gap created when endogenous estrogen levels drop during menopause.

Note: According to Peter Golbitz of Soyatech, Japanese eat an average of 26 pounds of soyfoods per person each year, while Americans eat only about 4 pounds. Address: 1-2. Dep. of Clinical Chemistry, Univ. of Helsinki, SF-00290 Helsinki, Finland; 3-4. Nutrition/Infection Unit, Dep. of Community Health, Tufts Univ. School of Medicine, Boston, Massachusetts.

9899. Chait, Mat. 1992. Early recollections and work with the Ricycle and soyfoods in Boston, 1970-1972 (Interview). *SoyaScan Notes.* May 18. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In the late 1960s Mat had started graduate school in counseling psychology at Hunter College in Manhattan, New York. But under the influence of yoga, Swami Satchitananda, Hinduism, vegetarianism, and macrobiotics, he decided to drop out and to study macrobiotics in Boston with Michio Kushi. He arrived in Boston in about December 1969. Nine months later, Mat started operating the Ricycle at Boston University in September 1970 at Boston University. He recalls: "The design of the Ricycle was absurd. It consisted of a steam table (which without its food weighed 600-700 pounds) welded onto the back of a girls bicycle. To move the Ricycle, he pedaled it (rain or shine; or pushed it up even gradual hills), but it was so heavy and clumsy as to be almost immobile." At night it was kept in the garage of the macrobiotic study house at 6 Ellery Street.

During the first 6 months, Barbara Grace prepared most of the desserts and whole grain breads at the kitchen of a big study house across from the Brookline High School. Marion (who had an Italian last name) prepared the vegetable and grain dishes in another study house. (Note: Marion married Frank Calpeno, who owned Ceres Natural Foods, a fairly big macrobiotic food distribution business in Colorado Springs, Colorado; they moved to Colorado in the early 1970s). Dora Coates (whose parents started Laurelbrook Foods) also cooked for Mat for a while. The business took off quickly, with the help of many magazine and newspaper articles. Mat got a loan, so in early 1971, in the dead of winter when it was too cold to be out on the street, Mat built a kitchen inside the Erewhon warehouse, and it began operation at the end of March 1971. Since Paul Hawken was in California at the time, Mat got permission from the acting president of Erewhon.

Every day the Ricycles would offer a grain dish, whole grain bread, a vegetable dish, a dessert, and often a soup–but there was a different menu every day. A number of popular

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dishes contained soy as an ingredient. A miso-tahini spread was usually available with the bread. Miso soup and Miso Rice were often served. For Miso Rice, miso was mixed with a little water then stirred into a pressure cooker of hot rice that had just been cooked, and allowed to stand for a few minutes. Mat vividly recalls that on days when he had to stand in front of Boston University in the freezing cold for 6 hours without moving, the miso soup would keep him warm. After Mat opened the kitchen at Erewhon, he contracted with David Kailin of Crane's Call Bakery, a macrobiotic bakery, to make most of the desserts and other baked goods for the Ricycle. Sometimes the vegetable dish of the day had tofu in it, or the grain dish had miso in it.

While building the kitchen inside Erewhon, Mat constructed two more Ricycle carts. Mat launched these in the spring of 1971; one served its macrobiotic lunches on weekdays at MIT in Cambridge, and the other in downtown Boston at government center. He was unable to get permit to operate at Harvard Square. The other 2 Ricycles were operated by people that Mat employed; they were paid a percentage of their sales.

One year at the Christmas reunion, Mat did an elaborate impersonation of Michio Kushi (complete with makeup and a built-up nose construction), wrote, sang, and led the audience in a song about miso to the tune of "Get me to the church on time." The words went: "I'm drinking miso in the morning. Hatcho or mugi is sublime. Aveline or my daughter, go heat up the water, and get my miso soup on time. If you use onion, sautee it first, if you use daikon, it satisfies your thirst. For I'm drinking miso in the morning..."

Mat left Boston in about December 1972 to take an acting job in New York. At the time he sold and shipped all 3 Ricycles to an eccentric millionaire's son in Texas. He does not have any recollection of Tan Pups being on the market but he does remember seitan imported by Erewhon from Japan, perhaps by Japan Foods, in the form of little dark salty chunks. Perhaps Robert Hargrove might know more about this. Perhaps Erewhon made the Tan Pups.

Concerning Paul Hawken's departure from Erewhon in late 1973, it has always been Mat's understanding that Aveline Kushi owned the company but that the Kushi's negotiated to pay him $30,000 when he left.

Mat once visited Erewhon's little farm in Keene, New Hampshire. They made sauerkraut there on the top floor of a building; one would jump up and down on the cabbage in a barrel to press it. Address: 8-23rd Ave., Apt. 302, Venice, California 90291. Phone: 213-465-0383 or 213-469-5408.

9900. Kendall, Charles. 1992. Near involvement with tofu in Boston (Interview). *SoyaScan Notes.* May 20. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** In 1975, before *The Book of Tofu* was published, Aveline Kushi encouraged Charles to start a tofu shop in the Boston area. His feeling was "It was too strange. No one's going to buy it–floating in water. No one knew what to do with it." In 1976, after *The Book of Tofu* had been published (Dec. 1975) and after he was married (spring of 1976), Aveline made the suggestion to him again.

At one point Charles was planning to go to Japan to study with a tofu maker for 12-18 months. The East West Foundation or Michio or both had set up the program. Charlie had his visa, work permit–everything but the airline ticket. But when it was found that the tofu maker was very religious and was trying to push his religion on others, Aveline and Michio said that perhaps he should not go. Bill Tims finally ended up going. Charles recalls: "I was very envious of Bill. I wanted to go but at the last minute the Kushis said 'Don't go. Don't go Charley. We found out that this guy is part of some fanatic religious sect.'"

When Tims returned, he told Charles that he had absolutely no desire to make tofu in America. Charles was very surprised to hear this. Tims offered to show Charles how to do make tofu and how to get started. The people who started Nasoya may have learned something from Tims. Address: Owner, Kendall Food Co., 46A Route 112, Worthington, Massachusetts 01098. Phone: 413-238-5928.

9901. Tims, William. 1992. Studying macrobiotics in Boston and tofu making in Otake, Japan (Interview). *SoyaScan Notes.* May 21. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Bill grew up in Oklahoma. In 1969 while attending the University of Oklahoma he developed an interest in Oriental culture, philosophy and religion. He started studying Buddhism and Taoism. One day he came across a little spiral-bound book titled *Zen Macrobiotics* by George Ohsawa. Within several months he quit school and hitch-hiked to Boston, arriving in Jan. 1970.

He lived in a study house with Tom and Mary Hatch, then lived with Michio and Aveline Kushi on Boylston Street, before they moved to 62 Buckminster Rd. First he worked as a carpenter, then starting in early 1972 he worked at the Erewhon warehouse. Paul Hawken was president of Erewhon, but he left Boston, then came back and left again.

In about the spring of 1975, at one of Michio Kushi's "Way of Life" talks, which he gave every Tuesday and Thursday night, Michio said that he had made arrangements for 3 Americans to go to Japan to study traditional food processing. Bill never saw a written announcement of this. Bill signed up for the program along with about 20 other people. Bill had to return to Oklahoma in the summer of 1975, but he returned to Boston in Dec. 1975. He expected that he, Charles Kendall, and one other person would be leaving for Japan in Jan. 1976. He was surprised to find that he was the only one going. Everyone else, for reasons unknown to him, had backed out. He was a bit curious and suspicious as to why no one else wanted to go.

In Jan. 1976 Bill flew to Japan. He spoke no Japanese

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and had almost no money. It was his understanding that if he paid his flight to Japan, in exchange for the work he would do in Japan, he would be provided with a room and board, a small salary, and a flight back to America. Michio and Aveline had never suggested to Bill that he start a tofu shop in America after he returned, and Bill never had a interest in making tofu. He was going to Japan mainly to learn about the country and its culture; the tofu was accidental. In Osaka, Bill met Lima Ohsawa. An older man who was a friend of Lima's became Bill's guide. After several days in Osaka they took a train together to the little village of Otake, about 15 miles south of Hiroshima. They were greeted with great fanfare and met by a man who was the tofu master–who spoke no English. Bill never understood the relationship between the tofu master and Michio Kushi. The tofu master set Bill up in small apartment with a bike, 5 minutes bike ride from the tofu shop. Bill's guide spent 2 days with Bill at the village translating (since no one else in the village spoke English), then he left. Many villagers asked Bill if he was a soldier from a nearby U.S. military base.

Bill worked hard at the tofu shop with 7-8 other employees (mostly older women), not including delivery boys, for the next 7-8 months, until August. The master was very much a traditionalist; he was the only person Bill met in Japan who ate brown rice, but he never mentioned macrobiotics. The master was a hard worker, very stern and yang, but a good, strong, often loving man who treated Bill specially and kindly. Bill has very good memories of him. He made nigari tofu and 13-14 different product (incl. egg tofu, burdock tofu, various deep-fried types), and his dream was to have his style of tofu shop all over the world.

For Bill, the best times were when the master allowed him, twice a week, to take the company truck alone, all day, to deliver okara to dairy farmers in the countryside. Bill was able to do a bit of exploring of temples, shrines, and gardens on these trips. Sometimes the master would be gone for 1-2 days and Bill was responsible for the tofu shop from start to finish. Most of the tofu was delivered to huge supermarkets in Hiroshima. The villagers were amazingly kind to Bill.

But there were difficulties. The master belonged to several different Buddhist sects; Bill was required to go with the master to every religious meeting he attended. Bill hated this because he couldn't speak any Japanese, he had to sit on his knees in seiza for hours at a time, and he was tired from 6 days of hard work at the tofu shop. He desperately wanted some time off from the long hours, both to rest and see more of Japan. At times Bill felt like he was being "used" to work long hours for meager pay, and at other times he realized that this was what a traditional Japanese apprenticeship required. Moreover he was delighted to have this opportunity, difficult though it was.

Returning to America, Bill attended Herman and Cornellia Aihara's annual summer camp in California, then he returned to Boston on about 1 Sept. 1976. Ed Esko and Stephen Uprichard immediately offered him a job at the East West Foundation. He worked there until 1982, eventually becoming vice-president.

Bill was the second American (after William Shurtleff) to study tofu-making in Japan with a traditional Japanese master. Tims and William Shurtleff met in November 1976 at Ken and Ann Burns' house at 16 Warren Street in Boston–shortly after Tims had returned from Japan. Tims was happy to see that Shurtleff and Akiko Aoyagi were doing a nationwide tour to introduce Americans to tofu. Before Bill Tims went to Japan in Jan. 1976 it was difficult to get tofu in Boston; it was considered a luxury. But after he came back, a number of tofu products were being sold commercially–including a tofu cheesecake made by a Boston woman. He also remembers big slabs of seitan (Wheatmeat) sold at Erewhon.

In 1982 Bill moved to Arkansas to start Mountain Ark, along with Frank Head, Joel Wollner, and Tom Monte. Frank was the only one who ever had any financial involvement in Mountain Ark, and he is the only one of the original four left at the company, which is currently for sale and will be liquidated if it is not sold by June 30. Bill never worked at Mountain Ark.

Four or five 5 years ago a news flash came on CNN that there had been a terrible earthquake in Otake, Japan, the little village where he had lived. He watched the destruction on TV with sadness. Several years ago he heard that the old tofu master had died.

Bill now runs his own business, Natural Health Center, which he and his wife Carol started in 1983. He does macrobiotic consultations and sells macrobiotic foods by mail order. Address: Natural Health Center, 45 North Hartman, Fayetteville, Arkansas 72701. Phone: 501-521-9105 (or 9195).

9902. Sandler, Matthew; Sandler, Helen. 1992. Early work with natural foods in Boston. Plans to launch a soymilk product named Luppy (Interview). *SoyaScan Notes.* May 24. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Matthew's brother, Richard Sandler, arrived in the Boston area on 1 Jan. 1968. Matt drove him to 29 University Ave. knowing nothing about macrobiotics except that he ate with Richard once at the Paradox restaurant in New York City. Those were the early days. Nahum Stiskin and Richard Sandler, were already in Boston when Matt arrived in about late 1968. Matt moved to Japan in about 1969; Nahum Stiskin was living in Kyoto, Japan (where he arrived in May 1969), when Matt arrived. Steve Helfer (a student of macrobiotics) had arrived in Japan before Matt. After a while, Matt brought Helen to Japan so they could get married–which they did in about 1971, at the Jewish Community Center. Matt had known Helen when they were in Boston; they lived together a macrobiotic study house.

Helen and a lot of other Americans studying

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macrobiotics in Japan took cooking classes, taught in Japanese, from Lima Ohsawa in Tokyo at Tokyo C.I. (Centre Ignoramus). Matt and Helen left Japan in about 1971-72, returning first to New York, and then to Boston in about 1973. He finally left Boston in 1984.

While in Boston, Matt started a bakery named Matthew's All Natural, located in Woburn, just outside of Boston. It's first products were sweets such as carrot cakes. The discovery of barley malt, a complex carbohydrate sweetener, was a major breakthrough for the company. Helen Sandler developed a line of English Muffins sweetened with barley malt, and then a line of whole-grain breads which were introduced in 1979. The company soon became quite large and successful, and it is still in operation. The bakery did not use soy in any form in its products.

Evan Root started the original Sanae. Matt's brother, Richard Sandler, who arrived in Boston before Matt, started The Seventh Inn (also called Big Sanae). He rented the space and made it into a restaurant with his own hands; his partner was Warren Durbin (originally a film editor from California who came to Boston to study macrobiotics and who now lives in Vermont). Richard is now a photographer living in Greenwich Village (Phone: 212-777-7138).

Barry Creighton invested a lot of money in his Cable Springs Bakery; it was a good idea, but ahead of its time, so it wasn't that successful. When it went bankrupt, Kathy Bellicchi took it over. Helen Sandler (who had her own company) then shared the bakery with Kathy, and baked cakes there starting in about 1975. Helen does not remember any commercial soy products in Boston, except the Tofu Cheesecake sold at Sanae (it was a Sanae special) and 1 or 2 other restaurants in the late 1970s. Matt liked the Tofu Cheesecake; Helen didn't. Matt recalls that the Tofu Cheesecake was sold, pre-sliced, at a number of retail stores, including Erewhon. He thinks it was sold in the first tier of products that Erewhon sold out of the cooler. He thinks it was made by an underground business that made only this product. Helen experimented with "Tofu Cream," made by mixing tofu, vanilla, and maple syrup–but it was never commercialized since it had such a short shelf life and the retail stores had no refrigeration.

Another excellent product in Boston was Tan Pups, made by Nik Amartseff and his wife. It was a natural meatless hot dog made of seitan, deep-fried on a stick. Nik was one of the most creative food product developers in Boston at the time. He also developed the formulations for most or all of the Erewhon cereals, granolas, and snacks, as well as their labels and packaging. "He was a real fertile mind."

Matt is planning to launch a soy dessert named Luppy (in 2 flavors), within the next 6 months. The product will be aseptically packaged in tubs. His company is named Luppy Foods. He remembers Luppy soymilk from Japan as a soymilk sweetened with brown sugar and sold in little bottles.

When Yuko Okada first brought soymilk to the USA, he started by trying to make a deal with Knudsen. That didn't work out and for some reason he had a problem with Eden Foods in Michigan at the beginning. So Yuko called Matt, who at that time was still owner of Matthew's All Natural bakery, and asked Matt if he wanted to distribute the soymilk product over his route which extended from Maine to Philadelphia. Matt also distributed foods frozen and refrigerated as far west as Denver. The product Yuko was offering was quite similar to the Luppy soymilk Matt had enjoyed in Japan. Before Matt could say yes, Yuko had made a deal with Eden Foods to import.

Update on Matt's soymilk dessert. 1992. July 15. It will be a pudding-type product, the soymilk will be supplied by American Soy Products in Michigan, and it should be on the market by about Nov. 1992. Address: P.O. Box 10277, Aspen, Colorado 81612. Phone: 802-869-2010.

9903. Jacobs, Lenny. 1992. Macrobiotic pioneers–where are they now? (Interview). *SoyaScan Notes.* May 27. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Nahum Stiskin is now in New York City in the field of investments. His former wife, Beverly Stiskin, lives in Brookline, and is an Alexander therapist. Nahum has a black cloud and a real bitter feeling regarding his past life. He doesn't like to talk with people. Lenny ran into him 8 years ago at an ABA show and he said to Lenny, "Don't bother me." Mr. Ehud Spurling, the owner of Inner Traditions Press in Rochester, Vermont also knows how to reach Nahum.

Bill Garrison is on the West Coast somewhere. He applied for the job of financial manager of the Kushi Foundation. Anthony "Tony" Harnett is owner of Bread and Circus in Newton, Massachusetts. Jim Ledbetter is in Southern California; the Kushis keep in touch with him. Jim started *Order of the Universe* magazine. Robert Hargrove is in the Brookline area where he owns Robert Hargrove and Associates.

Nik Amartseff got involved with cocaine at some point in about the late 1970s and his life fell apart. But now its back together.

Marcea Newman now lives in Australia; Lenny saw her at Anaheim not long ago and spent a lot of time with her and her husband (who has designed a very interesting Chinese herbal database on a Macintosh computer); its a very expensive diagnostic tool. You can enter your symptoms and it will suggest which herbs to take, or you can key in the name of an herb, and it will tell you all about it.

Eric Utne was the manager of Erewhon in about 1970 or 1971. He came to Boston in the late spring of 1969, at the same time as Lenny's wife to be. Lenny arrived in Boston in the summer of 1969 from Chicago, Illinois. He left Boston for Minneapolis in 1971; then Eric Utne, Lenny, and Peggy

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Taylor (who is now the editor at *New Age Journal*) started a restaurant at the University of Minnesota named Whole Foods. They ran it for 2 years. Then Eric and Peggy returned to Boston, and Eric went to work at the *East West Journal.* Lenny left for Boston in the fall of 1973; he wanted to start a bakery, then he and Bob Phelps (who now runs Redwing Books) planned to start a seaweed harvesting business. The Robert Hargrove, Eric Utne, and several other people (the majority of the staff of East West Journal) asked Michio Kushi to either give them the magazine (free of charge) or they would quit. They did quit and started New Age Journal. Michio Kushi asked Lenny if he would please work for East West for a few months, which he did–though he ended up staying for years until he finally left to work at East West Journal.

The Seventh Inn was a really successful restaurant, but Michio refused to share any of the ownership with the people who ran it and he tried to control it too much. Originally called Sanae, it was started by Richard Sandler (who selected the location and designed the kitchen, but never really worked there after it was in business), Evan Root, and others. Lenny was a cook there. Richard and another guy named Warren Durban quit before the restaurant was finished, and they gave it over to Lenny and Bill Anton (who is still in Japan). Then Yuko Okada and Hiroshi Hayashi started to run it; they changed the name to The Seventh Inn. There were two Sanae Restaurants, one on Newbury St. and the other on Boylston St. Address: New Age, Brighton, Massachusetts. Phone: 617-787-2005.

9904. *Supermarket Business* (*New York*). 1992. Aseptic tofu joins other natural foods enroute to Russia. May.
• ***Summary:*** "Morinaga Nutritional Foods, makers of Mori-Nu Tofu, donated over 100 cases of its aseptic tofu–close to a ton–as part of a hunger-busting effort targeted at the former Soviet Union. In all, some 20 tons of natural food products were sent to St. Petersburg in early April.

"The Hunger relief effort was coordinated by Marlene Wolford, a Corpus Christi, Texas-based organic food promoter, and Dr. Mikhail Zykov, a macrobiotic food advocate. Along with the aseptic tofu, which has a 10-month shelf life without refrigeration, natural foods companies sent brown rice, sea vegetables and other health food products.

"Participating companies included Eden Foods of Clinton, Michigan, which gave away more than 14 tons of products, and Arrowhead Mills, Country Grown Foods, Goldmine Natural Foods, Lifetree Products, Ocean Harvest, Traditional Foods and Pacific Bakery, among others.

"Separately, Morinaga Nutritional Foods' parent company, Morinaga Milk Industry, recently sent thousands of pounds of its infant formula to the former Soviet Union from its headquarters in Japan."

A photo shows Mr. Kumoda, head of Morinaga Nutritional Foods, standing with a co-worker and many cases of tofu in front of a large white banner on which is written: "Mori-Nu Tofu: To Russia with Love"

9905. Ponseele, Jos van de; Verfaillie, Magda. 1992. Re: History of Jonathan P.V.B.A. in Belgium. Letter (fax) to William Shurtleff at Soyfoods Center, June 6–in reply to inquiry. 2 p.
• ***Summary:*** Jonathan was the first company in Europe to make seitan for sale commercially. Jos van de Ponseele, the founder of Jonathan, first learned about seitan during a 9-month stay [with his wife and family] at the Kushi Institute in Boston, Massachusetts, from March to December 1976. There he tasted the seitan prepared by Aveline Kushi. He thought it would be a good meat substitute for the growing group of vegetarians in Europe. [Note: Jos was a butcher with a large meat processing operation before he became a macrobiotic vegetarian]. In Boston, he learned how to make seitan on a home scale from Tamara Uprichard. Then, at the very end of his stay in Boston, he started up medium-scale production of seitan with two Americans; he no longer remembers the name of the company or the names of his American partners. They sold seitan to macrobiotic study houses in Boston and to the Erewhon retail store.

Returning to Belgium, he founded Jonathan. The name "Jonathan" came from a famous book titled *Jonathan Livingston Seagull* [by Richard Bach, 1970. This is a parable about a seagull who loves to fly and practice flight, high and alone, for the joy of flying, while his fellow gulls are busy eating. He is eventually banished from the flock for daring to violate the earth-bound traditions of gull society. Eventually he is taken to a higher world where other gulls, like him, seek perfection and liberation from all limitations. Finally he returns to earth to tutor other outcast gulls in the art of advanced flight.]

Jos hired a man named Ludo Peeters as his first employee and they set up the business in a garage at Holleweg 53, 2180 Ekeren, near Antwerp, Belgium. The company's first product, made entirely by hand, was plain fresh seitan. It was introduced some time in 1977. The product name on the label was simply Seitan, written in 4 languages (Dutch, French, German, and English). It was packaged in 250, 500, and 1000 gm carton dishes with a transparent plastic film lid. With seitan, the big challenge for Jos was to introduce an entirely new and valuable product to the market. Two months after introducing seitan, Jonathan started making tofu and soymilk. Ludo continued to work at Jonathan for many years, eventually becoming managing director.

On 2 Feb. 1979 Jonathan was officially registered as Jonathan P.V.B.A. (the latter abbreviation means something like "Ltd." i.e. a company in which the owner has limited responsibility). Also that year Jonathan introduced a fresh seitan burger, then in Jan. 1980 the company moved to its present location at Antwerpsesteenweg 336, B-2080

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Kapellen, Belgium. At the new location they introduced a number of new seitan products: Seitan Paté (Feb. 1980, sterilized), Seitan Goulash (late 1980, sterilized), and Seitan Schnitzel (1981, fresh). From 1985 on, Jonathan introduced a series of different ready-to-eat meals in which seitan was a major ingredient. Jos sold Jonathan and left on 1 April 1989. Magda started Mycelia P.V.B.A. in 1984 and kept the company small until Jos had sold Jonathan. After that they expanded Mycelia to its present size, producing 5,000 liters of mycelium daily. They are both shareholders in Mycelia. Address: Jean Bethunestraat 9, B-9040 Gent, Belgium. Phone: 91-28-7090.

9906. Stincheum, Amanda Mayer. 1992. Fu and yuba, tasty specialties of Kyoto. *New York Times.* June 7. p. XX6, XX26 (Sunday).
• ***Summary:*** These two foods are "so tied to place, history and freshness that they can really be fully enjoyed only in Kyoto." Fresh wheat gluten (*nama fu*) has a chewy but tender consistency. Fresh yuba (*nama yuba*) comes in "delicate, semi-soft, tissue-thin sheets skimmed from the surface of simmering soy milk." Both are almost never found outside Japan, and rarely outside Kyoto.

Describes how fu is made and served. Fu was brought to Japan from China during the Muromachi period (late 14th to 16th centuries). Rich in protein, it developed as part of the vegetarian cuisine that evolved in Buddhist temples. Because Buddhists refrain from killing sentient beings, all temple foods were (and still are) derived from plants. Kyoto became famous for fu, in part because of its abundance of Buddhist temples, and in part because of the quality of its well water. At the peak of its popularity in the 1800s, fu was made in over 100 specialty shops in the city. The name of one street, Fuyacho, still attests to the former aggregation of fu makers in this area.

Today Fuka, founded 160 years ago and located just west of the Imperial Palace, is one of the very few shops that makes only fu and nothing else. The proprietor, Koboro Shoji, makes all the classic varieties of fu, which are listed and described.

An equally interesting and detailed description of making yuba at Yubahan is also given. Asano Tomizo is the 9th generation of yuba makers who have practiced their craft since 1716. Address: Japan.

9907. Bergh, Barbara. 1992. The Canadian oilseed processing sector: A profile. In: Statistics Canada. 1992. Grain Trade of Canada 1990-91. Ottawa, ONT, Canada: Statistics Canada. See p. 23-32. [Eng; Fre]
• ***Summary:*** Contents: Oilseed situation. Crushing industry. Vegetable oils. Vegetable oilmeals. Economic value of the industry. Policy issues and recommendations by the Canola Marketing Task Force. "The main oilseed crops produced in Canada are [in descending order of the amount produced], canola, soybeans, flaxseed and sunflower seed. There has been an almost continuous increase in the production of oilseeds since 1950, with the largest increase being in canola production which will reach a record 4.3 million tonnes in 1988/89. There was a record 1.3 million tonnes of soybeans produced in 1990/91. A bar chart shows the amount of Canada's four major oilseeds produced every 5 years from 1950 to 1990. "Only small amounts of oilseeds are imported into Canada, but significant amounts are exported. In 1990/91, 99% of canola exports went to Japan, while soybean exports were destined mainly for the U.S., Netherlands, Portugal, Hong Kong, Japan and Singapore."

One of Canada's three soybean crushing plants closed in 1991 causing a drop in soybean crush capacity from 3,700 to 2,500 tonnes per day. Of this, CanAmera Foods in Hamilton, Ontario, has 1,270 tonnes, and ADM Agri-Industries Ltd. [in Windsor, Ontario] has 1,250.

"The two major oilseeds processed in Canada are canola and soybeans, with small amounts of sunflower seed and flaxseed also being crushed. Canola is crushed mainly for its oil as its seed yields about 40% oil and 60% meal. Soybeans are crushed more for the meal since they yield about 78% meal and only 17.5% oil. Sunflower seed yields 42% oil and 35.5% meal, while flaxseed yields 34% oil and 63% meal...

"In 1990/91, 44% of the domestic canola crop was crushed, compared with 72% for soybeans, 70% for sunflower seed and 1% for flaxseed."

"In 1990/91, 0.8 million tons of crude vegetable oils were produced in Canada... Canola oil accounted for 74% of total vegetable oil production in Canada, followed by soybean oil at 21%, sunflower oil at 4% and linseed oil at 1%. In addition, approximately 25.0 thousand tonnes of corn oil are produced annually."

"Soybean meal is the major vegetable oilmeal used in Canada, accounting for 76% of the total oilmeal consumption in 1990/91. Canola meal is next, accounting for 22% of total domestic use, followed by sunflower and linseed meals which accounted for 1% or less." Soybean meal contains 48% protein, whereas canola meal contains only 36-37% protein; it contains more fiber than soybean meal and has less digestible energy.

As of 1 Jan. 1992, Canadian soybeans, crude soybean oil, soybean meal, canola seed, crude and refined canola oil and meal all have tariff-free access to the USA. Refined soybean oil will be duty free as of 1 Jan. 1995. Address: Market Analyst, Canadian Oilseed Processors Assoc., 1010-360 Main St., Winnipeg, Manitoba R3C 3Z3, Canada. Phone: 204-942-3408.

9908. Santiago, Librado A.; Hiramatsu, M.; Mori, A. 1992. Japanese soybean paste miso scavenges free radicals and inhibits lipid peroxidation. *J. of Nutritional Science and Vitaminology* (*Tokyo*) 38(3):297-304. June. [20 ref]
• ***Summary:*** The antioxidative and free radical scavenging

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activity of miso was demonstrated by electron spin resonance spectrometry. Miso may act as an antioxidant by scavenging free radicals.

This article was summarized in *Cereal Foods World* (Jan. 1993, p. 33-34) under the title "Move over vitamin E; Here comes miso." Address: 1&3. Dep. of Neurochemistry, Inst. for Neurobiology, Okayama Univ. Medical School, 2-5-1 Shikata-cho, Okayama 700; 2. Yamagata Technopolis Foundation, Yamagata 900. All: Japan.

9909. Belleme, John. 1992. Santa Fe Organics and seitan (Interview). *SoyaScan Notes.* July 1. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Santa Fe Organics is owned by 3 people: James MacCreight (of Santa Fe, New Mexico) and John each own 45%, and Sandy Pukel (owner of Oak Feed Store in Florida) owns 10%. James got involved because he knew of John's work at American Miso Co., and he was a friend of Barry Evans. Barry was the majority owner of that company but he was sent to jail in early 1992 in California with a 7-year sentence, of which he must serve at least one-third. John got bought out of American Miso Co. in 1986 for two reasons: He had conflicts with Barry, and there were indications that Barry was making his money illegally. He wanted to get out "before the whole thing came down on our heads. My equity in the company might have been confiscated by the federal government." Before Barry went to jail, he made a deal such that his two companies (American Miso Co. and Great Eastern Sun) were not affected. After John left American Miso, he and Sandy Pukel formed a partnership with Blake Rankin and established Granum East. They ran that for 2½ years then sold it to great Eastern Sun in 1988. From that time until 1990 he and his wife, Jan Belleme, did a lot of writing.

James MacCreight, a former Hippie, had made money investing in real estate in Philadelphia, Pennsylvania, where he also founded and owned George's Restaurant (a lovely place named after George Ohsawa). One day in late 1990 he called John and said "I'd like to do something with you. What would you like to do?" They spent a lot of money starting a miso shop adjoining John's home in Saluda, North Carolina, but then John decided it would not be grand enough to meet James' expectations. So they dropped the miso project after 6 months before the equipment even went in. James heard about Seitan Mama's, and they decided to make seitan instead. John had been interested in seitan since 1974, and in Feb. 1978 his wife, Jan, had started an early and very successful seitan company in Coconut Grove, Florida named Seitan Mama's, which see. In early 1991 a huge building became available at an excellent price 10 miles from John's home in Saluda at 906 Locust St. in Columbus, North Carolina. Their first line of 4 retorted seitan products in glass jars was introduced in June 1991. Originally they had planned to be a wholesale company, selling pallets via commercial trucking lines or UPS directly to larger stores (mostly on the East Coast) with a broker; it was hoped that this approach would keep the retail price down. Now they sell only through distributors.

Santa Fe Organics produces its seitan using a huge Japanese-made gluten-making machine (ordered through Mitoku) and an automatic cutter. The company has 3 production workers. To the machine they add flour, water, and salt (or nigari). The salt helps develop a little more gluten, and gives a tighter product with a higher yield. John's machine will process 150 kg (330 lb) of flour per run (which takes 2½ hours). Paddles in the machine knead the flour with water for about 30 minutes to develop the gluten, then the loaf sits undisturbed under water for about an hour, then the dough is rinsed by kneading it under water for about 1 hour; 100 kg of flour yield about 45 kg of fresh gluten. John orders his wheat flour freshly milled once a week from a mill 50 miles away. Fresh milling is very important for good yield and taste. He uses organically grown hard winter wheat. John uses a mixture of whole wheat and unbleached white flours. They key to getting flavors to penetrate to the core of the seitan lies in retorting at 250ºF under pressure (which causes the seitan to expand and become porous allowing flavor penetration) plus the proper mixture of flours. The more whole wheat flour used, the greater the flavor penetration and concentration–but the product is somewhat bready and less dense. The more unbleached white flour used, the greater the density, chewiness, and meatlike texture of the final product. The proportion of flours varies with each product.

John has no problem with starch disposal. The local government looked at the starch and its effects on the local sewage system carefully, and actually encourages Santa Fe Organics to dump it into the sewage system. Eventually John would like to find ways to use the starch, as in stews.

Sales of Santa Fe Organics seitan are large and growing–although the company is still not profitable. A new conflict has arisen in that one owner wants to own a larger percentage of the total shares.

Plans for the future: (1) A new line of 3 Seitan Sloppy Joe products, due out in August; (2) They may have a ravioli maker in Atlanta, Georgia, make Seitan Ravioli using they would ship to Atlanta. They will be sold frozen, 18-22 units in a 13 oz bag, like the Soyboy Ravioli from Northern Soy in Rochester, New York; (3) Sell frozen 6-8 oz chunks or slabs of seitan in bulk (12 lb in a plastic bucket) to restaurants and foodservice institutions, then help them to work out recipes. They hope to have Tree of Life or Cornucopia distribute the product; (4) John's wife, Jan, is now finishing writing a vegetarian cookbook for the Avery Publishing Group. It will contain a whole chapter on seitan. (5) John would like to write a book on miso.

Mitoku has sold two Japanese-made gluten-making machines to the Western world; one was sold to Lima Foods in Belgium. The retort process that both Jonathan and Santa

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Fe Organics use is a very technical process; one must be set up with a license and follow federal regulations. According to Chris Dawson, Lima imported this machine for Jonathan– which made the seitan that Lima sold. The other machine went to the Erewhon warehouse, where it sat for years, until it was sold to the people who started Upcountry. Address: P.O. Box 457, Saluda, North Carolina 28773. Phone: 704-749-9537.

9910. Richardson, Jean. 1992. Sierra Natural Foods is out of business. Ohsawa Japan has stopped exporting (Interview). *SoyaScan Notes.* July 8. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** When Ohsawa America was having problems surviving, Lane Seiger offered their mail order business to Gold Mine Natural Food Co., then offered their import business to Sierra Natural Foods. Gold Mine purchased their Japanese imports from Sierra.

In July 1991, Sierra Natural Foods declared bankruptcy and went out of business. At the time they owed Ohsawa Japan a lot of money, which they never paid. Following this unfortunate experience, Ohsawa Japan stopped exporting products to America. Prior to this, Nama Shoyu (Unpasteurized Shoyu, made by Yamaki Co., run by Mr. Kitani) was the best seller of all the products Sierra imported from Ohsawa Japan. After Sierra's bankruptcy, in March 1992, Gold Mine began importing macrobiotic foods from Muso in Japan. Address: Co-owner, Gold Mine Natural Food Co., 1947 30th St., San Diego, California 92102. Phone: 619-234-9711.

9911. Aihara, Cornellia. 1992. Early recollections of seitan (Interview). *SoyaScan Notes.* July 9. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Cornellia first learned how to make *kofu* (raw wheat gluten) from a Japanese book about *Shojin Ryori* (Buddhist Vegetarian Cookery) that Lima Ohsawa sent her. The book used only white flour to make kofu, but Cornellia substituted whole wheat flour. She does not remember when she first heard the word seitan or from whom she learned the process for making kofu into seitan. Nor does she know who coined the term "seitan." She never saw George or Lima Ohsawa make seitan in America. Cornellia thinks that in earlier times in Japan, seitan was called "shigure."

Cornellia first made seitan in about 1970 in San Francisco. In her *Chico-San Cookbook* (1972), Cornellia first wrote about seitan, giving a recipe for making "Seitan" at home (#516). The ingredients listing called for 10 cups wholewheat flour, 4 cups unbleached white four, 5 cups water, and 2 teaspoons salt. After making the basic plain gluten, pull it into 1-inch pieces and drop these into boiling water. Boil until the pieces rise to the surface of the water. Then: "Sauté 1 tablespoon of fresh minced ginger in 1 tablespoon sesame oil. Add 1 cup of soy sauce and bring to a boil. If you wish to store the Seitan for any length of time use more soy sauce, up to 2 cups, depending on how long it will be kept. Add the cold gluten pieces and simmer, covered, for 3 hours, stirring frequently. Remove the cover and continue cooking until all the liquid is gone. Stored in the refrigerator, it will keep a long time. Cook it with vegetables or use it to season soups and stews."

In her book *The Dô of Cooking* (*Ryorido*)*. Vol. 1* (1972, March) Cornellia gave a similar recipe for seitan (p. 71-72). Part 1 described how to make wheat gluten and part 2 described how to use that wheat gluten to make seitan. After 1970 Cornellia taught many macrobiotic students how to make seitan in her cooking classes. In later years she used only whole wheat flour, omitting the unbleached white flour.

Herman Aihara does not remember when he first heard the world seitan. He is not interested in food from this viewpoint; his interest is in philosophy. Address: Vega Study Center, 1511 Robinson St., Oriville, California 95965. Phone: 916-533-7702.

9912. Yamazaki, Kazuko. 1992. Early recollections of seitan (Interview). *SoyaScan Notes.* July 9. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Kazuko (the wife of Junsei Yamazaki) is sure that George Ohsawa coined the term "seitan" quite a while before he died in April 1966. She first became interested in macrobiotics in Japan in about 1962-63 (Showa 37-38). In about 1965 she may have seen seitan sold at macrobiotic food stores in Japan. Ohsawa Japan also sold seitan, probably by 1962-65; Marushima Shoyu K.K. may have made that seitan. She probably first heard the term "seitan" from Lima Ohsawa, who frequently taught how to make and use kofu (raw wheat gluten) and perhaps seitan in her cooking classes. The first seitan she saw or tasted was sold in little cubes or pieces that were very dark, hard, and salty. In Japan, Chinese people at one store in Aoyama, Minato-ku, Tokyo, made kofu (raw wheat gluten), and she once went there to buy some. She and Lima also tasted a delicious sausage-like product made from soybeans by the Chinese; she does not remember what it was called, but it was not called seitan. Lima Ohsawa often used that kofu in her cooking classes.

After George Ohsawa died, Lima Ohsawa traveled to Taiwan with a group of Japanese and there she met an interesting group of Taoist vegetarians. Some people in that group were very skilled at using wheat gluten in cookery. After returning to Japan, Lima invited that group of Taoist vegetarians to Tokyo. Kazuko met them in Tokyo. At that time they made a product closely resembling seitan. Later they started a business making it in Japan and began selling some to Ohsawa Japan.

One person in Japan who might well know the early history of seitan is Aiko TANAKA. She is now about 65 years year old but she began studying macrobiotics with Lima Ohsawa when she was about 18 years old. She went

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to Taiwan and had a lot of contact with the group of Taoist vegetarians. Address: Route 1, Box 1333, Orland, California 95963. Phone: 916-865-5979.

9913. Troy, John. 1992. Update on Wizard's Cauldron and work with miso (Interview). *SoyaScan Notes.* July 11. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** John makes many lines of products that contain miso. "The Wizard" line, sold through Joel Dee of Edwards & Sons, contains three products: Hot Stuff, Stir Crazy (a stir-fry sauce), and Sweet & Sour Sauce. The Premier Japan line is also exclusive to Edwards and Sons. The Simply Delicious line consists of many salad dressings, such as Lemon Tahini, Ginger Plum (with umeboshi plums), Tofu Poppyseed, and Miso Sesame (the only miso product in this line). His favorite salad dressing (which is also his best-seller) is the Miso Sesame; it is sweetened with rice syrup, and contains both clear shoyu and white miso. "It's really nice."

A fourth line, called "Troy's" is a line of sauces, such as a steak sauce and a poultry sauce. Three of these products contain miso: Miso Magic (a sauce for grains and vegetables), and Cracked Peppercorn Steak Sauce, and Honey Mesquite Barbecue Sauce. John's favorite sauce is his Thai Peanut Sauce. A fifth, called Harbor Lites, is a line of six seafood sauces–all of which contain either soy sauce or miso. The Garlic Grill contains miso. There is also a Ginger Soy in this line.

American Natural Foods (ANF), started in 1984, attracted many local investors who finally got control of the board of directors and encouraged John to do things that went against his beliefs; the company eventually lost about a million dollars, and John lost everything he had. It didn't go bankrupt; it's still alive but John "walked away from it." It's sole product is Miso Mustard, which is made by Morehouse Foods.

At the end of 1985 John was penniless, and had to draw unemployment to buy groceries. "But it was a real blessing in disguise." John started doing some consulting work. In 1986 he started a new company named "Wizard's Caldron," which was initially just a consulting company. John was able to buy the trademark for Hot Stuff away from ANF, then cut a deal with Joel Dee. In Oct. 1987 Edwards and Sons became the exclusive distributor of his Premier Japan line and his Wizard Baldour condiments and sauces, including Hot Stuff. He saved enough money to buy a little plant, then started real small, making food products again. The new company's first product line, the Simply Delicious salad dressings, was launched in 1989. The company has been growing and growing, until now it is a very healthy little company with one million dollars of annual sales. This is the first time John has owned his own plant; previously he always had to use co-packers. "I'm just having a wonderful time with it, but it was a hard lesson to learn." John buys his miso from Don DeBona of American Miso Co. He also uses a lot of clear shoyu, which he buys from San-J; they make it in Japan. He consulted for San-J, and when he visited their plant in 1986 he noticed some stuff dripping from a vat. They said it was clear shoyu which they said they used in sauces, dashi, etc. He brought back a 5-gallon pail to the USA, and eventually made it a featured ingredient in his line of salad dressings. Address: The Wizard's Cauldron, 8411 Hwy. NC 86 N, Cedar Grove, North Carolina 27231. Phone: 919-732-5294.

9914. Mokutani, Kiyoshi. 1992. The invention and development of seitan in Japan (Interview). *SoyaScan Notes.* July 12. Conducted by William Shurtleff of Soyfoods Center. Followed by a letter of July 1992.
• ***Summary:*** In 1959 Mr. Mokutani met Sakurazawa Nyoichi (George Ohsawa) and his wife Lima, and started to study macrobiotics with them, and to eat a macrobiotic diet–after he had undergone two surgical operations for a gastric ulcer and a duodenal ulcer in 1959 and 1960.

In the spring or summer of 1961 he first developed a sample of what is now called *seitan* using only wheat gluten and shoyu as ingredients (no ginger or kombu). He extracted the gluten from wheat flour in his own company. His first goal was to develop a wheat gluten product made from organically grown wheat. He also wanted to make a type of low-fat *tsukudani* made without animal products. Note: *Tsukudani* is a dark and salty Japanese condiment typically prepared from small cubes of shellfish, fish, beef, kombu, or vegetables (gobo [burdock], fuki [butterbur, coltsfoot]) that have been simmered for a long time in soy sauce.

In the fall of 1961 he took a sample of the new product he had invented to George Ohsawa. He took great interest in it and at that point Ohsawa coined the term "seitan" to refer to this product. The term "seitan" had never existed previously in Japan. Ohsawa usually wrote the term "seitan" using the katakana syllabary and characters, however when he occasionally wrote it in Chinese characters, he used the character *sei* (also pronounced "nama" in Japanese) meaning "fresh" or "raw" (since it is made from fresh wheat gluten), plus the character *tan* which is the first character in the Japanese word *tanpaku,* meaning "protein." Ohsawa also gave him instructions for improving the product by mincing the wheat gluten and simmering it in soy sauce. Today on the front of each bottle of seitan is written *"Sakurazawa Nyoichi shido"* (Made with guidance from George Ohsawa).

Initially, in 1961 and early 1962, he had no intention to sell seitan; he sent samples free of charge to macrobiotic people throughout Japan.

In 1962 Mr. Mokutani started to manufacture seitan for commercial production. Marushima Shoyu K.K. (Marushima Shoyu Co., Inc.), of which he was director and head of the technical department, was the first to make seitan in Japan. After production began, most of the seitan made by Marushima Shoyu K.K. was sold (in small glass jars) to the macrobiotic food wholesalers in Japan (such as

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Muso Shokuhin, Ohsawa Japan, and Tsurushima [located in Yamaguchi-ken]) and to the macrobiotic community. The first company to export Marushima's seitan was Ohsawa Japan, Inc. (where Lima Ohsawa's sister was president). It was imported to the USA by Bob Kennedy of Chico-San, located in Chico, California.

A friend of Mr. Mokutani's named Mr. Tsurushima owned a company in Yamaguchi prefecture; it made soba and noodles, and sold many macrobiotic foods. Mr. Mokutani asked Mr. Tsurushima to sell his seitan, which Mr. Tsurushima did.

Mr. Mokutani is currently president of two companies: Marushima Shoyu Co., Inc., and Junsei Shokuhin Marushima Co., Inc. (located at Higashi Onomichi 9-2, Onomichi cit, Hiroshima prefecture). The latter company sells soy sauce as well as more than 800 kinds of natural foods. They also sell freeze-dried gluten product which can be marinated in seasoning then grilled as a fat-free meat substitute, or mixed with meat as a seasoning to reduce the meat's total fat content. Address: Chairman, Junsei Shokuhin Marushima Co., Inc., Higashi-Onomichi 9-2, Onomichi-shi, Hiroshima-ken 722, Japan. Home address: Niihama 1-3-57, Onomichi city, Hiroshima prefecture. Phone: 848-20-2506.

9915. *SoyaScan Notes.* 1992. The remarkable food-related creativity that took place in Boston from the late 1960s until the late 1970s, especially within the macrobiotic community (Overview). July 13. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** A flowering of original food product development took place in Boston during this period. There were a number of reasons for this (1) The meeting of two food cultures, Japanese and American, together with new ideas related to diet and health, as embodied in the macrobiotic teachings of Michio and Aveline Kushi. Just as the meeting of two ocean currents leads to a region at the boundary of great biological activity and development, so does the meeting of two cultures. Young Americans were introduced to a host of new basic foods which they quickly began to use and process in new ways. These included miso, tofu, seitan, amazake, umeboshi salt plums, sea vegetables, rice syrup, rice cakes, azuki beans, mochi, and many more.

To cite but four examples: (A) Seitan: Japanese had used seitan as a salty condiment or seasoning. By late 1972 Americans had transformed it into a succulent meat substitute. (B) Tofu: It had never occurred to Japanese to put tofu in a blender. By the mid-1970s Americans in Boston were combining it with a sweetener to make delectable dairyless tofu cheesecakes and cream pies, or to make low-fat, cholesterol-free salad dressings, dips, and spreads. (C) Amazake: Japanese serve this as a hot beverage like tea, most in teahouses; The only flavoring used is gingerroot. Americans transformed it into delectable ice creams (free of dairy products and sugar), or thick, sweet drinks resembling milk shakes sold refrigerated in plastic bottles. Americans also used amazake as an all-purpose natural sweetener in place of sugar, honey, or maple syrup. They also learned to make a rice milk resembling amazake using commercial purified enzymes instead of koji; at this point, the line separating amazake and rice syrup became somewhat blurred. (D) Rice Syrup: Japanese use *amé* or *mizuamé,* made from koji, as the basis for taffy-like candies or, in very limited ways, as a sweetener. Americans soon began to make rice syrup using commercial enzymes instead of koji and to use it as an all-purpose natural sweetener in place of sugar, honey, or maple syrup.

(2) The closely-knit, almost communal nature of the macrobiotic community in Boston, was one in which many people, mostly young people (including many women), were working closely together with a common vision. New ideas were shared more than guarded or patented. Joel Wollner notes that it was almost like the art community in Paris during the impressionist era of the late 1800s.

(3) The Erewhon retail store (opened in April 1966) provided a ready testing ground for new local products. Many got their start in one or more of these stores. The Erewhon Trading Co. (which started importing Japanese natural and macrobiotic foods in Aug. 1968), and which began wholesaling and distributing in the spring of 1969, greatly helped to expand the market for good products.

(4) The community was fortunate to have a number of exceptionally talented entrepreneurs in the food business, including Paul Hawken, Bruce Macdonald, Roger Hillyard, Bill Tara, and many others. Many of these individuals later left the area to start their own food companies.

(5) It was during this period that the natural foods, macrobiotic foods, organic foods, and vegetarian movements (all closely related, and often based on similar philosophical, ethical, and spiritual values) began to grow in the United States, in part in reaction to the overly-processed, overly chemicalized, unhealthful foods produced by big food companies, and the highly-chemicalized food growing techniques used by American farmers–and in part because of the leadership and inspiration of the community in Boston.

9916. Shurtleff, Akiko Aoyagi; Sandler, Matthew; Okada, Yuko. 1992. Memories of the delectable gluten cutlets served at Tenmi, near Shibuya station in Tokyo, Japan (Interview). *SoyaScan Notes.* July 15. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Yuko Okada thinks that Tenmi first started in about 1968. By the early 1970s, a 10-minute walk from Shibuya station, it was a combination macrobiotic restaurant and food store. The restaurant was named *Tenmi* (Heaven + Flavor) and the store was named *Shizen Shokuhin Senta* (Natural Foods Center). Both were located at Sakuragaoka 4-3, Shibuya-ku 150, Tokyo. Phone: 03-496-7100. Both were still there in 1983.

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The head of the restaurant (and a longtime friend of George Ohsawa), Mrs. Michi Ogawa, made one of the most delicious meatless entrees that we have ever tasted–called *Kôfu Katsu* (Gluten Cutlets). *Kofu* (raw wheat gluten) was simmered in a seasoned broth, then dipped in batter, dusted with Japanese-style bread crumbs (*panko*), and deep-fried. Crisp on the outside, succulent and juicy on the inside, it had a flavor and texture remarkably like that of a pork cutlet. It was served on a bed for thinly-sliced strands of cabbage and topped with one's choice of a natural *tonkatsu* (pork cutlet) sauce (based on soy sauce), or a wedge of lemon.

Such a tasty cholesterol-free menu item could be a hit at almost any restaurant in the Western world–served with either of the above sauces, or with tartar sauce.

From an historical point of view, these Gluten Cutlets, made with seitan, were completely different from the typical Japanese macrobiotic seitan, which was a dark brown salty seasoning or hors d'oeuvre to eat while a person was drinking, as a yang balance for the yin of the alcohol. Address: 1. Soyfoods Center, Lafayette, California 94549; 2. P.O. Box 10277, Aspen, Colorado 81612; 3. Muso Co., Ltd., Kosei Bldg., 2nd Floor, Tanimachi 2-5-5, Chuo-ku, Osaka 540, Japan. Phone: 1. 510-283-2991.

9917. *Toyo Shinpo* (*Soyfoods News*). 1992. Tôfu, aburaagé, nattô, konnyaku noki nami ni fushin: Jisshitsu de zennen dôgetsu hi 0.5% no gensho [Consumption of tofu, aburaage, natto and konnyaku in Japan from 1976 to 1991: Decreased 0.5% from the same month last year]. July 21. p. 2. [Jap]
• ***Summary:*** Per household consumption of various soyfoods; yen figures are not adjusted for inflation. Tofu consumption rose from 85.73 cakes costing 5,020 yen in 1976, to 86.89 costing 6,047 yen in 1980, to a peak of 90.43 costing 6,761 yen in 1983, dropping to 88.48 costing 7,337 yen in 1985, down to 83.42 costing 7,323 in 1990, down to 78.76 costing 7,699 yen in 1991.

Consumption of aburaagé and ganmo (deep-fried tofu pouches and burgers) rose from 2,950 yen in 1976, to 3,472 in 1980, to a local peak of 4,080 in 1984, dropping to 4,057 in 1985, down to 3,898 in 1990, then rising to a recent peak of 4,253 in 1991.

Natto consumption rose from 1,034 yen in 1976, to 1,289 in 1980, to 1,655 in 1985, to 2,532 in 1990, to an all-time peak of 2,532 yen in 1991.

9918. *Toyo Shinpo* (*Soyfoods News*). 1992. Kyôto de Tenpe kenkyû-kai sôkai [General meeting of the Tempeh Study Group in Kyoto]. Aug. 21. p. 1. [Jap]

9919. GEM Cultures. 1992. Catalog [Mail order]. 30301 Sherwood Rd., Fort Bragg, CA 95437. 9 p. Aug. [4 ref]
• ***Summary:*** This catalog celebrates the company's 12th anniversary. The first section is titled "Powdered cultures for soycrafters." On page 1: "Powdered Tempeh Starter, PTS: Tempeh is a delicious Indonesian, cultured soyfood with a chewy texture. Whether your interest is in exotic foods, eating lower on the food chain for health, social or economic reasons, or cutting back on meat, cholesterol, or calorie consumption, tempeh fills the bill. A vegetarian source of Vitamin B-12, this versatile food can be fried in the traditional manner or baked, broiled, steamed, or barbequed. Easily cultured without special equipment, homemade tempeh tastes and smells wonderful, slices better, and costs far less than commercial tempeh.

"The tempeh mold, *Rhizopus oligosporus,* that binds the cooked soybeans together into a sliceable cake, is grown on an entirely vegetable medium. Mature spores are harvested and combined with sterile organic rice flour for easy and accurate measuring on every batch. Complete culture directions and recipes are included. One pound of dry soybeans prepared as directed will make 1 3/4 pounds of tempeh. Preparation time–less than 2 hours. Incubation time–about 24 hours at 85 F (32 C). Kept cool and dry, PTS has at least a 6-month shell life at full potency.

"Kit PTS, 11gm, three 1-pound batches (makes 5+ pounds). $2.50 each.

"Big PTS, 35 gm, ten 1-pound batches (makes 18 pounds). $4.00 each.

"Half Kilo PTS, 500 gm, packaged in bulk. $35.00 each.

"Full Kilo PTS, 1000 gm, packaged in bulk. $65.00 each.

"Powdered Natto Starter: Called *Natto* in Japan and *Thua-nao* in Thailand this cultured soyfood has a strong, somewhat persistent, unique flavor. The bacteria, *Bacillus subtilis* var *natto,* that culture the cooked soybeans make a sticky, viscous polymer during the 6-12 hours of incubation which creates whispy threads evident when the cultured soybeans are pulled apart. A good source of protein, this robust soyfood adds zest to any grain or noodle dish, soup or sandwich. A little goes a long way, so what is not intended for use in a day or two may be easily frozen.

"Natto Starter Kit: This packet contains complete culture directions, recipes, and enough spore to start 3 recipes of natto, each making 5 cups or 1½ pounds.

"Bulk Natto Starter: A concentrated spore preparation, this vial has sufficient spore to start 48 pounds of dry soybeans. Prepared according to the included directions it will therefore make about 86 pounds of natto.

"Natto Starter Kit: Makes 4½ pounds. $2.50.

"Commercial Natto Starter: Makes 86 pounds. $10.00."

Also: Amazake, miso, shoyu, and tamari starters from Japan. Five types of *tane koji* (koji starter) imported from Japan. Commercial miso and shoyu koji spore packets. Organic light rice koji. Natural salts for curding tofu: Natural nigari, Terra Alba calcium sulfate. Self-renewing cultures: Kombucha tea fungus. Fresh sourdough. Seed miso. Fresh fil mjolk, fresh viili, fresh kefir curds. Cookbooks with culture. Sea vegetables from the Mendocino Sea Vegetable

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Co. Kitchen culture items. Address: Fort Bragg, California. Phone: 707-964-2922.

9920. Morinaga Nutritional Foods, Inc. 1992. Dear Mori-Nu: Last Thanksgiving I tried your wonderful pumpkin pie recipe for the first time... (Ad). *Health Foods Business* (*Elizabeth, New Jersey*). Aug. p. 27.
• ***Summary:*** This full-page color ad continues: "I still can't believe that a dessert this good can be cholesterol free and so low in saturated fat (the Bad kind). I hope that you give out the recipe again this year so that everyone... Sincerely Suzanne Newsome, Sherman Oaks, California."

In the center of the ad is a large horizontal photo of the tofu pumpkin pie, surrounded by pumpkins and vegetables and one package of Mori-Nu Silken Firm Tofu. The recipe for "No cholesterol pumpkin pie" is given. Address: 2150 W. 190th St., Suite 110, Torrance, CA 90504.

9921. Takai Seisaku-sho. 1992. [Takai systems catalog '93]. 1-1 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan. 56 p. 30 cm. [Jap]
• ***Summary:*** Black-and-white photos show the company's many pieces of equipment and systems for manufacturing tofu and soymilk. The catalog is divided into 5 sections: 1. Transporting and soaking systems. 2. Soymilk production systems. 3. Curding and forming systems; Poached tofu systems. 4. Cooling systems; Hot-pack systems. 5. Deep frying systems. Address: Kanazawa, Ishikawa-ken, Japan. Phone: 0762-48-1355.

9922. Roach, William. 1992. Re: Kyoto Food Corp. (Terre Haute, Indiana) would like to supply you with tofu. Letter to Richard Rose, Sharon's Finest, P.O. Box 1368, Santa Rosa, CA 95402, Sept. 17. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "The New Orleans Food Ingredients Fair was an exciting event for all those who attended. We at Kyoto Food Corporation are especially excited about the possibilities for Kyoto Tofu to be used in a variety of Products.

"We want you to know that we are ready and willing to assist you in any way we can in the development and inclusion of Kyoto Tofu as a part of your product developments." Address: 1050 West 35th St., Terre Haute, Indiana 47802. Phone: 812-235-9505.

9923. Reid, T.R. 1992. Japan's 'first' star in space: Shuttle crew member fascinates home crowd. *Washington Post.* Sept. 19. p. A1.
• ***Summary:*** "Tokyo–News Flash from Florida: NASA has nixed fermented soybean paste" [natto]. The Japanese have taken a strong interest in Mamoru Mohri, age 44, a Japanese who is now aboard the space shuttle Endeavour, orbiting the Earth. This is a bit surprising since he is not the first Japanese in space; Toyohiro Akiyama rode in a Soviet rocket to the Mir space station in Dec. 1990.

Before takeoff there were some stories about Mohri's efforts to take common Japanese items on board. "Mohri had hoped to bring along some snacks made of *natto,* a stringy, smelly dark paste of fermented soybean. Evidently fearing that loose strands floating weightlessly around the crew quarters might cause international tension, NASA nixed natto. To soften the blow, NASA agreed to let Mohri bring along some *umeboshi,* a spicy pickled plum." Address: Washington Post Foreign Source, Tokyo.

9924. Waxman, Howard. 1992. History of Essene, natural foods retailer and distributor (Interview). *SoyaScan Notes.* Sept. 21. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Essene began in March 1969 as a macrobiotic natural foods retail store named Essene Macrobiotic Supply at 2031 Samson St. in Philadelphia, Pennsylvania. Primarily a juice and snack bar, it was founded by Denny Waxman, Charles Smith (Smitty), and Stanley Petrowski; Stanley left after several months. Howard was not involved with the company at that time. After about a year, the growing retail store moved to 320 South St. (at 3rd) in Philadelphia and changed its name to Essene Traditional Foods.

By Feb. 1971 a distribution company, also named Essene Traditional Foods, was started in the retail store–following the Erewhon model. An ad in *East West Journal* (Feb. 1971, p. 10) shows that "Essene," at 320 South St., was a distributor and wholesaler of natural and traditional foods, including miso, tamari, sea vegetables, and organic grains, vegetables, and beans. They made stone-ground wheat flour on the premises. The distribution company soon outgrew the store and by May 1972 had moved into a small warehouse at 58th & Grays Ave., Philadelphia PA 19143. Then it moved to a larger warehouse in Boyertown, about 1 hour drive outside Philadelphia. The distribution company went out of business in about 1976-78; it had been in business for about 5 years.

In 1981, when Bill Tara returned to the United States to become director of the Kushi Institute of Boston, Massachusetts, Denny Waxman, head of the Philadelphia East West Center, went to London to run the Community Health Foundation and the Kushi Institute. He stayed two years. Denny now lives in Portugal.

The retail store is still in business, owned by Howard. He moved to his present address about 3½ years ago, from 320 South Street, Philadelphia, PA 19147. Address: Owner, Essene Natural Foods, 719 S. 4th St., Philadelphia, Pennsylvania 19147. Phone: 215-922-1146.

9925. Morinaga Nutritional Foods, Inc. 1992. Pure tofu. Perfect package (Ad). *Vegetarian Times.* Sept. p. 24.
• ***Summary:*** This full page color ad shows a burning candle, sunflowers and other flowers, and two packages of Mori-Nu Silken Tofu, one opened, surrounded by nuts, vegetables, and soybeans in a wooden bowl.

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The caption at the bottom reads: "Mori-Nu is silken style tofu in a revolutionary package, which keeps Mori-Nu Tofu fresh and ready to eat for months, without irradiation, preservatives or refrigeration. Mori-Nu's smooth texture and soft, firm and extra-firm varieties make it perfect for any recipe. Write and we'll send you our favorites.

"From appetizers to desserts, Mori-Nu Tofu is part of your lifestyle."

This ad also ran in May 1993 (p. 25). And in Health Foods Business, Sept. 1992 (p. 11). And in Natural Foods Merchandiser, Feb. 1993 (p. 79). Address: 2050 W. 190th St., Suite 110, Torrance, California 90504.

9926. Sambuichi-Rumley, Elize J.; Lai, A.; Hirakawa, T.; Kido, Y.; Shizuka, F.; Kishi, K. 1992. Protein deficiency potentiates lipid peroxidation in growing rats exposed to hyperoxia. *Nutrition Research* 12(9):1101-12. Sept. [28 ref]
• ***Summary:*** Growing male Wistar rats were fed *ad libitum* casein or soy protein isolate (SPI) based diets containing 5 or 20% protein for 3 weeks. Half of the rats were exposed to 95% oxygen (hyperoxia), 12 hours/day, during the last 5 days. The results indicate that hyperoxia, as well as protein deficiency, potentiates *in vivo* lipid peroxidation (which was measured by thiobarbituric acid reactive substances–TBARS).

"In conclusion, it appears that dietary protein may play some important roles in the detoxification of free radicals by the maintenance of scavenger enzyme synthesis as well as antioxidant concentrations." Address: Dep. of Nutrition, School of Medicine, The Univ. of Tokushima, 3-18-15 Kuramoto-cho, Tokushima, 770-Japan.

9927. *Toyo Shinpo* (*Soyfoods News*). 1992. Kyôto de sôkai hiraku. Rainen kaisa-chi (Tôkyô, Meiji-dai) kimeru [Tempeh Study Group's general meeting was held in Kyoto. Next year's general meeting place was decided–Meiji University in Tokyo]. Oct. 1. p. 2. [Jap]

9928. *Toyo Shinpo* (*Soyfoods News*). 1992. Kenkyû seika no happyô mo. Kyôto furitsu-dai de. Tenpe-ken sôkai hiraku [General meeting of the Tempeh Study Group was held at Kyoto University. Research results were reported]. Oct. 1. p. 1. [Jap]

9929. *Toyo Shinpo* (*Soyfoods News*). 1992. Nattô no itohikisei teikazai oyobi kore o mochiiru itohikisei no nai nattô no seizôhô: Tokkyo shutsugan shôroku. Kikkôman (K.K.) ga shutsugan [Making the agent that reduces the sticky properties of natto and making natto that is less sticky: Details of the patent application. Kikkoman was the applicant]. Oct. 1. p. 12. [Jap]

9930. Brownback, Sam. 1992. Re: Biodiesel demonstration in Japan. Letter to six people, Oct. 14. 1 p. Typed, with signature on letterhead.
• ***Summary:*** The six people are: Gil Griffis, American Soybean Association. Steve Howell, Stratco. Bill Ayres, Interchem. Jim Blaauw, Kansas Soybean Assoc., Kenlon Johannes (MSMC). Bill Tallent, USDA.

Thank you all for attending the meeting to discuss the possibility of a biodiesel demonstration project in Japan. We agreed it is best to work initially through Bill Ayres and C. Itoh, the Japanese trading company. Address: Secretary, State Board of Agriculture, Kansas.

9931. Wolff, David. 1992. Early developments with soybeans in Harbin (Interview). *SoyaScan Notes.* Oct. 16. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** David recently finished a PhD in history at the University of California at Berkeley. His thesis was about the Russian thrust into Harbin, focusing on the years 1895 to 1904, but with some history up to 1914. He reads and speaks Russian and did extensive original research in the Imperial Russian Archives (now called the Central Government Historical Archive, which is the central repository for all pre-revolutionary Russian documents) at St. Petersburg (formerly Leningrad). These documents, which were filed before the Russian Revolution, have just become available to outside researchers.

In 1895 Harbin was a small town. His thesis, filed in the UCB history department, does not focus on soybeans or the soybean trade in Harbin, but there is information about soybeans in several places. In Chapter 3, "Demography" see the section on Jews. Russian Jews were given incentives to leave the system which was oppressing them in Russia and to go as a vanguard for the Russians to Harbin and develop the city. There is an anecdote about a man named Kabalkin wandering through the Chinese marketplace in Harbin with his son, looking at all the soybeans, and saying, like a visionary, "Look, this is the future gold of Manchuria." There may be something about soy in Chapter 4 about the Russian War Laboratory–the Commercial Bureau of the Chinese Eastern Railway.

Kabalkin was a Russian Jewish businessman from somewhere in southwestern Russia, near the Ukraine area. He had made his fortune by developing systems for moving grain on the railways, and specifically by developing financial instruments by which he could take out loans against their grain that was being transported on the railways, then pay off the loans after the grain was sold. He did not own any railways but he worked closely with the government-owned railways, increasing their profits by increasing the amount of grains shipped and the tariffs collected. He was the first person to conceive of the idea of exporting soybeans from Manchuria to Europe–before the Japanese. He presented a proposal to this effect in 1903, but then the war broke out [Russo-Japanese War, 1904-05] and obscured his idea. He was closely connected with Count S.Y.

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Vitya, who was the minister of finance and probably the most powerful minister in Russia from about 1891-1903, and who developed all of the Russian railroads and economy. Vitya thought of Harbin, a little colony out in Manchuria, as his own little kingdom within a kingdom.

Kabalkin tried unsuccessfully to work out his ideas for exporting soybeans to Europe with the Russians. In Jan. 1908 Kabalkin exported his first shipment of soybeans from Vladivostok to Europe, but his operations were poorly capitalized. Then in about 1912 he decided to set up a joint venture with British capital. This company, named something like the Anglo-Russian Trading Co., then tried to compete with the Japanese, but the Japanese already had a big head start.

The Anglo-Chinese Trading Company [Kabalkin Oil Mills] was set up at Harbin to crush soybeans into oil and meal; by 1937 the company was owned by Kabalkin's son and was using hydraulic presses, with a capacity of 220 tons/day.

David is now having his thesis published, hopefully as two books. The thrust of the book is Harbin as an unusual kind of Russian city. The first book will examine what is unusual about Harbin from a Russian history perspective. The second book will talk about the interactions between Harbin and the surrounding Manchurian culture, and how a region can be formed out of a conflict. One of the conflicts is over who will control the soybean trade and therefore the wealth of Manchuria. There will be a chapter on the soybean trade. Most of the information in the second book was not in David's thesis.

In 1946 the Tokyo office (the number 2 office after that at Dairen) of the South Manchuria Railway Co. was raided by the U.S. marines. They loaded the entire library onto a boat and shipped it to Washington, DC. Later they also took the whole army archive. Much of it was microfilmed by the Library of Congress. It was the best collection in the world on that subject until the Japanese Diet Library in Tokyo decided to enhance their collection by drawing together everything that was in Japan then microfilming everything that they didn't have that was in Washington, DC. The American government considered the Kantô-gun and the South Manchurian Railway Co. the two agents of Japanese imperialism in Manchuria. Address: Princeton Univ., Dep. of Sociology, Green Hall, Princeton, New Jersey 08544. Phone: 609-258-2851 or 609-683-1844.

9932. Belleme, John; Belleme, Jan. 1992. Culinary Treasures of Japan: The art of making and using traditional Japanese foods. Garden City Park, New York: Avery Publishing Group Inc. xiv + 232 p. Illust. by Akiko Aoyagi. Index. 25 cm.
• ***Summary:*** Contents: Acknowledgments. Foreword. Preface. Map of Japan showing where 21 traditional foods sold by Mitoku are made. 1. Kuzu: The wonder root. 2. Mirin: Sweet rice wine. 3. Miso: A health secret to savor. 4. Mochi: The sweet rice treat. 5. Noodles: Traditional Japanese fare. 6. Rice malt: Heavenly sweet water. 7. Toasted sesame oil: Cooking oil supreme. 8. Shiitake: Miracle mushrooms. 9. Soy sauce: King of condiments. 10. Tea: A national institution. 11. Snow-dried tofu: Protein powerhouse. 12. Umeboshi: Venerable pickled plums. 13. Vegetables of the sea: Underwater harvest. 14. Brown rice vinegar: Japan's liquid treasure. 15. Traditional vessels: Vats, crocks, and barrels. Glossary. Worldwide importers.

Concerning soy sauce, this book discusses Sendai Shoyu and Miso Co., Johsen, tamari, Mansan Brewing Co. founded by Oguri family in 1875, almost destroyed in Sept. 1959 by the fierce Ise-wan typhoon, "discovered" in 1982 by Akiyoshi Kazama of Mitoku. Now a macrobiotic staple.

For details on the uncondensed introduction to this book see Kushi (1992) "Introduction to *Culinary Treasures of Japan.*" Though very interesting, it contains a number of factual errors and statements that leave the wrong impression. Address: Saluda, North Carolina.

9933. Hesser, J.M. 1992. The world wheat gluten market (Interview). *SoyaScan Notes.* Oct. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In March 1981 Matt took over management of the International Wheat Gluten Assoc. (IWGA); it was the first association he managed. At the time, there were 11 members, all manufacturers of dry powdered wheat gluten from Canada, Australia, and American. His first project was to bring European (western and eastern), and Japanese manufacturers into the association. Today the IWGA has 23 members from around the world; all are still manufacturers of dry powdered wheat gluten. The annual output of the individual member companies ranges from about 4,000 tonnes to 35,000 tonnes. Companies that make wet wheat gluten tend to be very small, often cottage industries.

IWGA publishes a quarterly newsletter sent to members and an annual newsletter with a circulation of about 350. Address: International Wheat Gluten Assoc., 4510 W. 89th St., Prairie Village, Kansas 66207. Phone: 913-341-1155 or 1156.

9934. Shurtleff, William; Aoyagi, Akiko. comps. 1992. Bibliography and sourcebook on Seventh-day Adventists' work with soyfoods, vegetarianism, and wheat gluten, 1866-1992: Detailed information on 835 published documents (bibliographic), 602 commercial food products, 207 unpublished archival documents, 158 original interviews (many full text) and overviews. Lafayette, California: Soyfoods Center. 407 p. Subject/geographical index. Author/company index. Language index. Printed Oct. 15. 28 cm. [1606 ref]
• ***Summary:*** This is the most comprehensive book ever published on the work of Seventh-day Adventists (SDAs) with soyfoods, vegetarianism, or wheat gluten. In each of

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these closely-related areas SDAs have been the pioneers and leaders over a period of 70 to 130 years, and they have had the good fortune to be able to watch their visionary ideas gain increasing worldwide acceptance. Moreover, they have founded and successfully run many pioneering food companies that have transformed their ideas into commercial products and made them available to consumers worldwide.

The scope of this book includes all known publications, commercial food products, and archival documents, plus many original interviews, from earliest times to the present, worldwide. Thus it is also the single most current and useful source of information on this subject available today, since 83% of all references (and most of the early and current ones) contain a summary/abstract averaging 131 words in length.

This is one of more than 40 bibliographies on soybeans and soyfoods being compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyfoods Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features: 33 different document types, both published and unpublished; every known foreign language publication on the subject– including 55 in German, 25 in Spanish, 23 in French, etc.; extensive translations of many of the Japanese and European works; 158 original Soyfoods Center interviews and overviews never before published. Thus it is a powerful tool for understanding the development of these subjects and related products from their earliest beginnings to the present, worldwide.

Compiled one record at a time over a period of 17 years, the bibliographic records in this book feature (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English publications together with an English translation, month and issue of publication, and the first author's first name (if given).

It also includes details on 602 commercial food products, including the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as references to and summaries of advertisements, articles, patents, etc.) are also given.

Details on how to use the bibliography, a complete subject and geographical index, an author/company index, a language index, and a bibliometric analysis of the composition of the book (by decade, document type, language, leading periodicals or patents, leading countries, states, and related subjects, plus a histogram by year) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 510-283-2991.

9935. Yasuda, Masaaki; Sakaguchi, M.; Otonari, H.; Okuhama, S.; Kinjyo, S.; Hongo, F.; Toyama, S. 1992. Okinawa ni okeru tôfuyo no seizo ni kansuru kenkyu. VII. Tôfu kanso kotei ni okeru biseibutsu no hatasu yakuwari [Studies on the manufacture of tofuyo in Okinawa. VII. The role of microorganisms during dehydration of tofu cubes]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 39(10):870-77. [17 ref. Jap; eng]

• ***Summary:*** Tofuyo is a unique type of fermented tofu made in Okinawa Prefecture, Japan. It is made from partially dehydrated tofu cubes fermented in moromi (mash) of red rice koji, salt and awamori (distilled liquor). The quality of the finished product is always affected by the quality of the tofu cubes, which are always dehydrated at room temperature. Microorganisms (mainly bacteria) which grow on the surface of the cubes are thought to play an important role in the process. These bacteria were screened to find what species and strains / varieties produced high proteinase enzyme activity. *Bacillus* TYO-67 was found to have by far the greatest enzyme activity. After tofu cubes were inoculated with this strain, changes in the protein and nitrogen composition of the cubes during dehydration at room temperature were measured. Cubes which were uninoculated were used as a control. The pure protein content of the inoculated cubes was lower than that of those which were not inoculated; thus, the former were considered more digested / hydrolyzed than the latter. The values of water soluble nitrogen, 4% trichloracetate soluble nitrogen, and 75% ethyl alcohol soluble nitrogen to total nitrogen and free amino acids of the cubes all increased during dehydration, and the increases in the inoculated cubes were greater than in those which were not inoculated. The ripening time of the inoculated cubes was shorter than that of the cubes which were not inoculated. Therefore, we can say that dehydration of tofu cubes at room temperature is a sort of "prefermentation" by bacteria in the process of making tofuyo.

Tables show: (1) Proteinase activity of various bacteria isolated from the surface of tofu cubes. (2) Changes of free amino acids composition of tofu cubes which were either inoculated or not inoculated with *Bacillus* TYO-67.

Figures (graphs) show: (1) Changes is moisture content and pH of tofu cubes during dehydration for 60 hours. The moisture decreased and the pH increased. (2) Changes in the pure protein content of inoculated and uninoculated tofu cubes during dehydration. Both decreased but that of the inoculated cubes decreased slightly faster. (3) Changes in the content of water soluble nitrogen, 4% trichloro acetic acid soluble nitrogen, and ethyl alcohol soluble nitrogen of inoculated and noninoculated tofu cubes during dehydration. All increased but that of the inoculated cubes increased faster. (4) Changes in the hardness of tofuyo during a ripening period of 150 days. That made from inoculated tofu cubes decreased faster than that made from uninoculated

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cubes. Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, 1, Senbaru, Nishihara-cho, Okinawa 903-01.

9936. Louie, Elaine. 1992. 43 peaceful acres of Japan in Connecticut: A retreat that evokes home. *New York Times.* Nov. 12. p. C8.
• ***Summary:*** On weekends, Isao Aiba, his wife Lisa Sorce, and their two kids live Japanese style on 43 acres in Lime Rock, Connecticut, in the foothills of the Berkshires. And the family shares their retreat with 3-10 Japanese guests each weekend.

"Every two months, Ms. Sorce drives to Yaohan, a Japanese supermarket in Fort Lee, New Jersey, to stock up on raw fish, pickles, tiny dried fish and natto, a natto, a fermented [soy] bean favored in the north and east of Japan."

At home in Connecticut, her breakfasts typically include miso soup.

9937. Griffis, Gil; Wiedermann, Lars. 1992. Marketing food-quality soybeans in Japan: A manual on how to profit from the niche market in Japan for value-added soybeans. 5th ed. St. Louis, Missouri: United Soybean Board. 25 p. Nov. 28 cm.
• ***Summary:*** Contents: Introduction. Japan: Desired soybean characteristics, tofu (procedure for making tofu, desired soybean characteristics, color of hilum, seed size {the larger the better, preferably more than 20 grams/100 beans}, color of cotyledons, hull, composition, special notes, American interpretation), miso (same categories of information as tofu), natto (ditto; seed size: The smaller the better, with a maximum of 5.5 mm diameter. Round shape is preferred to oval in order to limit swelling during the soaking and boiling processes), food quality soybean varieties (name or code-name of 42 varieties, maturity zone, release year, used to make what soyfoods), distribution channels, marketing channels, protocol, pricing, organically-grown soybeans.

Taiwan: Introduction, list of 4 major buyers, users, and trade associations. Korea. Southeast Asia. United States.

Appendix I. Distribution systems for soybeans used for food in Japan: Tofu (23,000 tofu shops of which 13,000 are members of the Tofu Association), natto, miso.

Appendix II. Food soybean imports by country of origin, 1984-1991. USA is the largest supplier (845,000 tonnes in 1991), followed by China (279,000), then Canada (28,000). Total imports, which have stayed about constant during this period, were 1,152,000 tonnes in 1991.

Appendix III. Distribution by usage of soybeans used for food–1991, direct use only in tonnes (metric tons). Tofu: 607,000 tonnes total, of which 562,000 come from the USA and Canada, 25,000 from China, and 40,000 from Japan. Up 2% from 1989.

Miso: 171,000 tonnes total, of which 38,000 come from the USA and Canada, 121,000 from China, and 12,000 from Japan. Up 0.5% from 1989.

Natto: 147,000 tonnes total, of which 87,000 come from the USA and Canada, 50,000 from China, and 10,000 from Japan. Up 9% from 1989.

Other: 39,000 tonnes total, of which 20,000 come from the USA and Canada, none from China, and 19,000 from Japan. Total food use of 964,000 tons is up 2% from 1989. Source: Japanese trade newspapers and trade associations. These figures do not include a estimated 492,000 tonnes of soybeans used indirectly (in the form of defatted soybean meal) for soy sauce, 222,000 tonnes used for soy protein, and 20,000 tonnes for other indirect uses.

Appendix IV. Directory of direct importers of food-quality soybeans for each is given: Home office in Japan. Representative office in the U.S.

Appendix V. Traders of food-quality soybeans (3 companies).

Appendix VI. Soy food organizations in Japan (tofu, miso, soymilk, packaged tofu, natto). Appendix VII. Helpful contacts.

Food quality soybean varieties (with maturity group / zone, and year released; table, p. 5): Chico (00, 1983), Grande (0, 1976), Proto (0, 1989), Minnatto (0, 1989), NattoKing [Nattoking] (I, 1988), Disoy (I, 1967), Vinton (I, 1978), Vinton 81 (I, 1981), King Natto (I, 1985), Kato (I, 1989), Magna (II, 1967), Prize (II, 1967), Marion (II, 1976), LS201 (II, 1989), Provar (II, 1969), Beeson (II, 1969), Kanrich (III, 1956), Kim (III, 1956), LS301 (III, 1989), Verde (III, 1967), IL2 (III, 1989; from Illinois), Hawk (III, ?), Emerald (IV, 1975), Vance (V, 1986), Camp (V, 1989), Hartz 936X (VI, 1981), Hartz 914 (VI, 1989), Hartz 922 (VI 1989), Merrimax (?, 1986).

Note: This report was originally published in Sept. 1989, mainly for use by the American Soybean Association office in Tokyo. Address: 1. Division Director for Asia; 2. Country Director for Japan. Both: American Soybean Assoc.

9938. Lewis, Stephen. 1992. Hitting the tofu trail. *Gourmet* 52:172, 175-76. Nov.
• ***Summary:*** The author and his wife dined at and described many tofu restaurants in Japan, including Sasanoyuki in Tokyo, Gesshotei in Kanazawa, and Okutan in Kyoto. Address: Santa Fe, New Mexico.

9939. Noguchi, Kazuko. 1992. Tenpe ryôri fukyû ni tsutomeru [Making an effort to promote tempeh cookery]. *Toyo Shinpo* (*Soyfoods News*). Dec. 1. p. 13. [Jap]
• ***Summary:*** A photo shows Kazuko Noguchi. Address: Saga Joshi Tanki Daigaku.

9940. *Toyo Shinpo* (*Soyfoods News*). 1992. Nattô no seizôhô. Kikkôman (KK) ga shutsugan. Tokkyo shutsugan shôroku [How to make natto: Kikkoman applied for a patent. Details of the patent application]. Dec. 1. p. 12. [Jap]
• ***Summary:*** A long and detailed article.

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9941. McReynolds, Thomas. 1992. Low-fat and defatted tofu, and other new developments at Morinaga (Interview). *SoyaScan Notes.* Dec. 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Dr. Kenji Mizoguchi (Manager, Product Development Section, Food R&D Lab.) at Morinaga's central research laboratory in Tokyo, Japan, has been able to remove the fat from soymilk in order to make a 1% tofu (it contains 1% fat by weight) or a non-fat tofu. Tom has recently tasted the 1% fat tofu and thought it was excellent. Morinaga is planning to introduce this product in 1993 and Tom feels it will soon become the company's best-selling product.

Currently Mori-Nu firm silken tofu is the company's best-seller, followed by the extra-firm, with the soft in last place.

Tom is just putting the finishing touches on a new book to be titled *Tofu and You.* It was written by a lady who had a long-term weight problem until she married a Chinese man and started eating tofu. It is not a vegetarian book. It comes with a 28-day diet plan, and the book will accompany cases of Mori-Nu tofu. Morinaga hopes to launch the book together with their new low-fat tofu.

The company will also be publishing a newsletter to be sent to dietitians; Mark Messina is working with Tom on this project. The first edition should be out in Jan. 1993 and will be about 4 pages in length. A tentative title is *Soya Nutrition Update.* Tom would like it to be a professional rather than a commercial publication.

Update. Dec. 10. Morinaga's lab in Tokyo can remove the fat from soymilk using a mechanical process, but the process now involves the addition of isolated soy protein. The plant for doing this must remain in Japan. Address: Marketing Consultant, Morinaga Nutritional Foods, 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 213-728-4325.

9942. McCloud, Tina. 1992. Natto: A breakfast dish that's an acquired taste. *Press* (*Newport News, Virginia*). Dec. 7.
• ***Summary:*** "It's the color and consistency of pork and beans, but sticks together like stretched chewing gum." The owner of two Japanese restaurants in Newport News, Mr. K. Nishikawa, notes that "nibbling natto seems a pretty disagreeable way to start the day. Unembellished natto has 'no flavor and smells funny.'" He imports the fermented soybean product frozen from Japan. The key lies in the seasoning. In northern Japan, natto is widely eaten as a breakfast food, served over steamed rice and mixed with mustard and soy sauce. Some people mix in onions and raw egg. The sushi chef at one of Mr. Nishikawa's restaurants serves natto in sushi.

9943. *Toyo Shinpo* (*Soyfoods News*). 1992. Nattô to tenpe wa kyôzon dekiru ka? [Can natto and tempeh coexist?]. Dec. 11. p. 7. [Jap]
• ***Summary:*** The bacterial culture used in the natto fermentation can cause spoilage problems if it gets into tempeh cultures–and it can get in quite easily unless strictly controlled.

9944. Vaidya, Achutananda. 1992. Re: Pioneering and making tofu and other soyfoods in Nepal. Letter to William Shurtleff at Soyfoods Center, Dec. 26. 9 p.
• ***Summary:*** "I started making tofu in 1974. I did not have any connection with my uncle in starting my tofu company, however I did have a chance to see him make tofu at his residence in Kathmandu, and from that time I got the idea in my mind to make tofu myself. I learned the details of the process in Nepal from Mr. Akifumi Nakamura of Kobe, Japan, a member of the Japan Overseas Cooperation Volunteers (JOCV), who worked at the Central Food Research Laboratory in Kathmandu, which was also my office in 1974. I worked together with him as a counterpart for two years learning how to make tofu. During his stay there I learned wholeheartedly the process of making tofu. I learned from him that this food product called "Bhatmas-ko-paneer" in Nepali is known as "tofu" in Japan. Vita-Tofu is the brand-name of my tofu. This tofu is not packaged. It is sold in the form of rectangular cakes out of water-filled cans or bowls because most of the local vegetable shops do not have refrigerators. Even to this day sale of tofu is difficult during the hot summer months because of lack of refrigeration in food retail stores. At the start, for the first 4-5 years, I delivered my tofu from door to door because even at that time the people of Kathmandu did not know about tofu. They did not want to buy it because they did not know how to cook it.

"From July 1979 to March 1980 I was invited to Japan for 9 months training at the Akita Prefecture Brewing Laboratory. During that time I also learned in detail the processes for making soy sauce, miso, and soyamilk. During that period I also got a chance to read *The Book of Tofu, The Book of Miso, Miso Production,* and *The Book of Tempeh* all of which helped me very much. I still have all those books. In 1985 I was invited by the Rotarians of Akita-Aomori to return to Japan for 1 month (Jan/Feb. 1985) to receive further technical training in making tofu, miso, soy sauce, soyamilk, moyashi (sprouts), koji, fruit fermentations for wine, etc. Today I produce tofu, soy sauce, and miso in my small factory in Kathmandu. I currently have an electric wet grinder imported from Kyoto, Japan, in 1976. My other equipment (a basket pressing machine and tofu presses) were all made in Nepal by Nepalese mechanics."

Accompanying this letter are 27 color photos showing the following: Vita Tofu in Nepal. Making koji with his wife in Nepal. Studying and making tofu, miso, and shoyu in Japan in 1980 and 1985. His business card notes: "Food

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Technology in Brewing from Japan. Products & Suppliers: Tofu (Vita), Soyamilk (Vitabean milk), Soya Curd, Soya Sauce, & Miso."

His Curriculum Vitae notes that he was born on 28 Dec. 1947, resides at 9/374 Bhedasingh, Kathmandu, and is married. Address: Founder and owner, Nepal Soya Industries, 9/374 Bhedashing, Jamaguthi, Kathmandu, Nepal.

9945. *Health Foods Business* (*Elizabeth, New Jersey*). 1992. Jan De Lyer, executive director of the Fresh Produce Council, and Yasuo Kumoda, general manager of Morinaga Nutritional Foods, Inc... (Photo with caption). Dec. p. 54.
• ***Summary:*** "... select the grand prize winner of the Hawaiian Vacation Getaway." A photo shows the two, standing on each side of a box on a table. In the background is a large banner that reads: "Mori-Nu Tofu: Cholesterol-Free Protein."

John Prestigiacomo was the winner of the contest. An employee of Woodman's grocery stores in Madison, Wisconsin, he will enjoy airfare and one week accommodations for two in Hawaii.

9946. *Health Foods Business* (*Elizabeth, New Jersey*). 1992. Time honored recipes with Mori-Nu Tofu. Dec. p. 54.
• ***Summary:*** "Morinaga Nutritional Foods, Inc. is offering shipper display units that hold two cases (48 packages) of Mori-Nu aseptically packaged tofu with a full-color Pumpkin Pie header as part of a multi-faceted marketing program featuring Mori-Nu Dairy-Free Pumpkin Pie as its focal point.

"The merchandising effort entitled 'Healthy New Traditions–Without Cholesterol,' is set to reach shoppers who want to enjoy the time-honored recipes but are looking for ways to reduce the amount of cholesterol and animal fat in their diet."

9947. MYCAL Group (Nichii Company of America, Inc.). 1992. If anyone tells you to add water to your soy drink tell them they're all wet (Ad). *Whole Foods*. Dec. p. 13.
• ***Summary:*** "Can you believe it? There are reputable manufacturers going around saying that the best way to make light soy drink is to add water. We don't even want to think about what diluting soy drink with extra water would do to the taste.

"Obviously, they haven't heard about natural dehulled soybean flakes–the most natural way to make light soy drink (and tofu) there is. Without adding any chemicals, preservatives, or anything unnatural, natural dehulled soybean flakes are:

"Made fresh daily. Lower in fats (lipids). Lower in calories. Lower in percentage of calories derived from fat. Higher in protein. Longer-lasting on your shelf. Better for the environment. Ecologically sound." Address: 23440 Hawthorne Blvd., Suite 140, Torrance, California 90505. Phone: 213-791-0010.

9948. Watanabe, Hiromitsu; Okamoto, T.; Takahashi, T.; Ogundigie, P.A.; Ito, A. 1992. The effects of sodium chloride, miso or ethanol on development of intestinal metaplasia after x-irradiation of the rat glandular stomach. *Cancer Science* (*Tokyo*) 83(12):1267-72. Dec. [50 ref]
• ***Summary:*** Rats fed miso eliminate radioactive materials from the body more rapidly that animals no receiving miso. Address: Dep. of Cancer Research, Research Inst. for Nuclear Medicine and Biology, Hiroshima Univ. [Japan].

9949. Hoshiyama, Y.; Sasaba, T. 1992. A case-control study of single and multiple stomach cancers in Saitama Prefecture, Japan. *Japanese J. of Cancer Research* (*Gann*) 83:937-43. *
• ***Summary:*** In this case-control study, consumption of miso soup or miso was associated with increased risk of stomach cancer.

9950. Hoshiyama, Y.; Sasaba, T. 1992. A case-control study of stomach cancer and its relation to diet, cigarettes, and alcohol consumption in Saitama Prefecture, Japan. *Cancer Causes and Control* 3:441-48. *
• ***Summary:*** In this case-control study, consumption of miso soup or miso was associated with increased risk of stomach cancer.

9951. Nagano, Takao; Hirotsuka, Motohiko; Mori, H.; Kohyama, K.; Nishinari, K. 1992. Dynamic viscoelastic study on the gelation of 7S globulin from soybeans *J. of Agricultural and Food Chemistry* 40(6):941-44. *
• ***Summary:*** Soybean proteins consist of two major components: 7S and 11S globulins. 7S globulin was isolated from soybeans using a new method. Address: Tsukuba Research and Development Center, Japan.

9952. Okada, Noriyuki. 1992. [Searching for thua-nao (2). Isolation of vitamin B-12 producing bacteria]. *Daizu Geppo* (*Soybean Monthly News*) 179:21-26. [Jap]*

9953. Asian Vegetable Research and Development Center. 1992. Annotated bibliography of soybean rust (*Phakopsora pachyrizhi* Sydow). Shanhua, Taiwan: AVRDC. 160 p. Author index. Subject index. Geographical index. 26 cm. AVRDC Library Bibliography Series No. 4-1. [480 ref]
• ***Summary:*** This publication supersedes an earlier edition published by AVRDC in 1987. It includes an additional 160 citations covering the period 1985 to May 1991.

Compiled by P.L. Hwang, F.C. Chen, and C.C. Wei, this bibliography contains abstracts of documents about soybean rust which are available in the AVRDC Library. Contents: Explanatory note, general information, pathogen morphology and taxonomy, physiology and biochemistry, epidemiology, pathogenic specialization, etiology, yield loss, and disease

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management (incl. general, chemical control, biological control, host resistance, cultural control).

Countries or continents mentioned in the index at geographical distribution of soybean rust: Africa, Asia, Australia, Brazil, Cambodia, China, Columbia, Costa Rica, Cuba, Guatemala, India, Indonesia, Israel, Japan, Korea, Latin America, Malaysia, Nepal, Papua New Guinea, Philippines, Puerto Rico, Soviet Union, Sri Lanka, St. Thomas, Suriname, Taiwan, Thailand, Togo, United States, West Indies, Venezuela, Vietnam, Zambia. Address: P.O. Box 42, Shanhua, Tainan 74199, Taiwan.

9954. Chainuvati, Chavalvut. 1992. Vegetable soybean production in Thailand. In: AVRDC, ed. 1992. Vegetable Soybean Production: Proceedings of a Training Course, Chiang Mai, Thailand, 18-24 February 1991. Taipei, Taiwan: Asian Vegetable Research and Development Center. 69 p. See p. 8-9. AVRDC Publication No. 92-369. [Eng; Tha]

• ***Summary:*** In 1988 vegetable soybean production was established in Thailand by Japanese and Taiwanese manufacturers. Most of the soybeans are exported to Japan. Major Thai manufacturers include Chareon Pokapan C. Ltd. and Amphol Frozen Food Co. Ltd. In Thailand, soybeans are grown only during certain seasons as an intercrop. Therefore processing plants typically operate only 1-2 months per year due to shortages of vegetable soybeans.

Vegetable soybeans are presently one of the cash crops promoted by the Thai government as a supplementary crop to rice, corn, and cassava. Farmers can earn US$1000 to 1250 per ha growing this new crop. Since growing vegetable soybeans for fresh pods is labor intensive, and farmers have a limited supply of labor, each household can grow only 0.3 ha. Production is concentrated in the central and northern regions of Thailand. Varieties preferred and promoted by the manufacturers are AGS 292, Kaohsiung No. 1, Ryokkoh, and Tsurunoko.

Harvest of the pods begins at 3:00 in the morning. The pods are stored in nylon net bags that facilitate air circulation. The pods are sprayed with water and covered to maintain good quality. They must be transported to the processor within 6 hours to prevent the glucose in the beans from changing to starch. The value of vegetable soybeans depends on their degree of sweetness.

Upon arrival at the processing plant, the pods are cleaned in water. Only grade A and B pods are sorted out for blanching in water at 100ºC for 2½ minutes. The pods are then soaked in ice water, graded, and packaged in 1-kg plastic bags. Address: Rice and Field Crop Promotion Div., Dep. of Agricultural Extension, Thailand.

9955. Chotiyarnwong, Pimporn. 1992. Varieties and varietal development of vegetable soybean. In: AVRDC, ed. 1992. Vegetable Soybean Production: Proceedings of a Training Course, Chiang Mai, Thailand, 18-24 February 1991. Taipei, Taiwan: Asian Vegetable Research and Development Center. 69 p. See p. 13-18. AVRDC Publication No. 92-369. [5 ref. Eng]

• ***Summary:*** Vegetable soybean is called *turag* in Thai. The breeding program at the Chiang Mai Field Crop Research Center in Thailand is working to develop improved vegetable soybean cultivars for local consumption and export. For local consumption, the large-seeded Nakhon Sawan 1 is recommended. For export: About 30 years ago, private companies began breeding vegetable soybeans for export to Japan. They have released more than fifty varieties, among which the following are now widely used: Tzurunoko [Tsurunoko], Ryokkoh, Kegon, Hatsutaka, Taishoshiroge, Nakate Kaori, Suzumo, Enrei, Fukuda, Raityo, Shirobata, Tamasudare, Hakutyo [Hakucho], and Siratsuyu [Shiratsuyu].

Eight tables show varieties, the 100-seed weight, and days to maturity. Vesoy #4, BPI #4, Tzuronoko, and Ryokkoh have performed very well. Vesoy #4 has a 100 seed weight of 56.4 gm. Address: Chiang Mai Field Crop Research Center, Dep. of Agriculture, Thailand.

9956. Constantine, Peter. 1992. Japanese street slang. New York and Tokyo: Tengu Books. xxiv + 190 p. Index. 21 cm. [20 ref]

• ***Summary:*** Contains Romanized Japanese phrases with English translations. The author was born in 1963.

Page 97: "Two cruder street-favorites for testicle are *oinari-san* and *oinaribukuro. Oinari-san* is a type of sushi that originated in Osaka and looks remarkably like balls.

Note. This is the earliest English-language document seen (April 2013) that uses the term "oinari-san" or the term "oinari" to refer to inari-zushi, made from deep-fried tofu pouches. Address: Linguistic researcher, USA and Japan.

9957. Crawford, Gary W. 1992. Prehistoric plant domestication in East Asia. In: C. Wesley Cowan and Patty Jo Watson, eds. 1992. The Origins of Agriculture: An International Perspective. Washington, DC: Smithsonian Institution Press. xvi + 224 p. See p. 7-38. [154* ref]

• ***Summary:*** Contents: Introduction. Environment. Chronology and prehistory: China, Korea, Japan. Initial speculations (Japan). Archaeobotany and recent research. Northeast spread of plant husbandry. The cultigens: Barley (*Hordeum vulgare*), barnyard millet (*Echinochloa utilis*), broomcorn or common millet (*Panicum miliaceum*), foxtail millet (*Setaria italica* ssp. *italica*), rice (*Oryza sativa* [*Oryzae sativa*]), wheat (*Triticum aestivum*), adzuki and mung beans (*Vigna angularis* and *Vigna radiatus*), hemp (*Cannabis sativa*), melon (*Cucumis melo*), (), beefsteak plant and *egoma* (*Perilla frutescens*), other cultigens (incl. buckwheat, soybean, pea). Discussion and directions for future research. Acknowledgments.

The time span covered by this chapter ranges from about

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8500 B.P. to 100 B.P. The origin of agriculture in China can be dated from about 7000 B.P. "The prevailing view is that agriculture began in Korea and Japan in the third millennium B.P. with the initiation of rice-based agrarian societies by both the diffusion of crops and ideas and the migration of people. Evidence is mounting, however, for earlier archaeological origins in these two areas" (p. 7).

In China, any cite with ceramics and no evidence of metallurgy is considered Neolithic. Pottery-bearing sites before 8500 B.P. are termed early Neolithic (p. 13). During the Neolithic, dependence on food production gradually increased.

Illustrations show: (1) Map of 10 vegetation zones of East Asia. (2) Diagram summarizing Northeast Asian chronology in northern China, Korea, southwest Japan, and Northeast Japan, from 8000 B.P. to 500 B.P. Arrow width is roughly proportional to the degree of dependence on food production. (3) Map showing location of 59 East Asian sites [archaeological, in China, Korea, and Japan] mentioned in the text. Address: Assoc. Prof. and Chair of the Dep. of Anthropology, Univ. of Toronto, Canada.

9958. Fruin, W. Mark. 1992. The Japanese enterprise system: Competitive strategies and cooperative structures. Oxford, England: Oxford University Press (At the Clarendon Press). viii + 397 p. Illust. Index. 25 cm. [5 soy ref]

• ***Summary:*** The appendix of this book contains tables (p. 329+) showing the 200 largest industrial firms in Japan in the years 1918 (Kikkoman was 80th, p. 331), 1930 (47th, p. 337), 1954 (126th, p. 346), 1973, and 1987. Kikkoman does not appear in the last two.

Letter (e-mail) from Mark Fruin. 2011. Dec. 20. "Kikkoman falls out of the largest 200 industrial firms in 1973 and 1987. It's not so much that Kikkoman didn't do well in those years as other industries and firms grew a lot faster by comparison. Its revenue base stayed relatively small–soy sauce, other soy foods, and various other endeavors that were not that large relative to the Toshibas, Hitachis, Hondas and Toyotas of the world."

Among the 200 "largest industrial firms in Japan in 1918 and 1930, Noda Shoyu Company represents the only major Japanese corporation that became large on the basis of an indigenous technology [shoyu manufacture] and represents organizational and managerial continuity from the Tokugawa era" (p. 86).

A separate section (p. 108) titled "Noda Shoyu (Kikkoman)" notes that this company was one of the few successful rural enterprises; its manufactured products were packaged and branded at Noda, in rural Chiba prefecture, in the countryside. Although located a day's sail from Tokyo in the late 1800s, Kikkoman evolved rapidly into a dynamic and thriving enterprise as its management created a cluster of related businesses to support its manufacturing activities. In 1900 Kikkoman established its own bank; in 1904 its own research and development laboratory; and in 1911 it helped to build a railroad line from the nearby town of Kashiwa [situated between Noda and Tokyo] through the town of Noda. "As soon as practical, during the 1910s and 1920s, hydraulic presses, steam boilers, conveyor belts, and transfer lines for bottling and canning were installed (p. 108).

Noda Shoyu / Kikkoman is also mentioned or discussed on pages 87 (Kikkoman was subjected to the longest labor strike in pre-World War II Japan {1927-28}; Fruin "posits its outbreak as a clash between traditional methods of labor organization and management and modern requirements for high-volume production and an attendant need for direct management of the production function"), 129, 154-55, 309 (local governments–such as that at Noda–were often unable to "muster adequate resources for social welfare and community benefits." So Kikkoman "financed railroads, grammar schools, cultural centers, water works, fire departments and town halls in Noda for exactly these reasons"), 320, and 324. Address: Palo Alto, California.

9959. Harlan, Jack R. 1992. Crops and man. 2nd ed. Madison, Wisconsin: American Society of Agronomy, Crop Science Society of America. xii + 284 p. Illust. Author index. Subject index. 21 cm. [495* ref]

• ***Summary:*** Contents: Foreword. Preface. 1. Prologue: The Golden Age. 2. Views on agricultural origins. 3. What is a crop? 4. What is a weed? 5. Classification of cultivated plants. 6. The dynamics of domestication. 7. Space, time, and variation. 8. The Near East. 9. Indigenous African agriculture. 10. The Far East. 11. The Americas. 12. Epilogue: Who's in charge here?

A table (p. 57) lists the world's 30 leading food crops in terms of estimated edible dry matter (million metric tons). The top 5 are: Wheat (468), maize (429), rice (330), barley (160), and soybean (88). These top 5 are all annuals.

Page 73 lists crops indigenous to the Chinese region. The pulses include soybean (northeastern China) and adzuki beans (*Vigna angularis,* southern China). Cereals and pseudocereals include Japanese millet (*Echinochloa frumentacea,* eastern China), buckwheat (*Fagopyrum esculentum,* western China) Tartar buckwheat (*F. tataricum,* western China), rice (southern China to India), proso millet or broomcorn millet (*Panicum miliaceum,* northern China), Italian millet or foxtail millet (*Setaria italica,* northern China). Oil crops include tung oil (southern China) and rapeseed (temperate China). More and more people are being fed by fewer and fewer crops. The human species is currently an eater of grass seeds–like canaries.

The section on "The gene pool system: Species" (p. 106-09) notes that in 1971 Harland & de Wet proposed three informal categories: Primary Gene Pool (GP-1), Secondary Gene Pool (GP-2), and Tertiary Gene Pool (GP-3). In the first edition of this book (9175) Harland claimed that soybean had neither GP-2 nor GP-3. Since then, soybeans have been bred

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with their wild perennial relatives, resulting in hybrids.

Tables on pages 152-53 list the major gene banks in the international system. The designated base collections for soybean are USDA (Beltsville, Maryland), and NIAS (National Institute for Agricultural Sciences, Tsukuba, Japan).

Recorded History in East Asia: "Chinese civilization, as distinct from previous cultures, can be said to have begun with the founding of the Shang dynasty sometime before 1500 BC. At about 1300 BC, the Shang capital was established at An-yang and the city was captured by the Chou tribe in 1027 BC... Essentially all of the Shang literature falls between 1300 and 1027 BC and consists of oracle bone inscriptions and writing on cast bronze objects... Among the earliest compilations of Chinese literature is the *Book of Odes* (*Shih Ching*) assembled from bits and fragments from the 11th century to the middle of the 6th century BC. Botanically, it is the most informative of early literatures and mentions about 150 plants as compared to 55 in Egyptian literature, 83 in the Bible, and 63 in Homer (Ho, 1969). In the *Odes, Panicum* millet is mentioned 27 times, the mulberry 20 times, and *Artemisia* is mentioned 19 times with some 10 varieties. The soybean is first mentioned in 664 BC in connection with tribute paid to the Chou by the Shan-Jung (Mountain Jung) tribe... Northern China: The agriculture that evolved in the north China uplands was based on the millets, soybean, and a suite of fruits and vegetables" (p. 198-99).

"Soybean: The wild soybean is a small, slender creeping vine bearing a few small pods with small, black seeds. The plant is widely distributed from southern Siberia, through Manchuria, throughout the eastern coastal plain of China, and Westward to Szechuan. It is rather weedy and is often found in city parks under the shade of trees. Presumably, it was once a woodland or temperate forest plant before the natural vegetation was removed for agriculture. The changes under domestication have been enormous.

"Evolution of bush types from vines is common under domestication. It has happened in American beans, African cowpeas, oriental soybeans, and others. The viny ancestral types are usually retained as well, and trailing forms of soybean are still grown for fodder." Address: Prof. of Plant Genetics, emeritus, Crop Evolution Lab., Dep. of Agronomy, Univ. of Illinois, Urbana, Illinois.

9960. Hayakawa, Isao. ed. 1992. Food processing by ultra high pressure and twin-screw extrusion. Lancaster, Pennsylvania, and Basel, Switzerland: Technomic Publishing Co. xii + 153 p. Illust. Index. 23 cm. *

• ***Summary:*** Contains 13 chapters by Japanese authors on current processing techniques using extrusion cooking (10 chapters) and ultra high pressure technology (3 chapters). Soybeans are discussed extensively. Address: Assoc. Prof. of Food Science and Technology, Kyushu Univ., Japan.

9961. Iwata, Masakazu. 1992. Planted in good soil: A history of the Issei in United States agriculture. 2 vols. New York, NY: Peter Lang Publishing. American University Studies. Series IX. History. Vol. 58. [500* ref]

• ***Summary:*** Soybean production in the USA is not mentioned in this book, but in Vol. 1: Page 124. Saburôji Yoshimura of Ogden, Utah, recalls that for the $6.00 a month that he and others of his work gang paid for food, they received only a limited amount of rice "along with *miso shiru* or soy bean paste soup and *kyabeji no tsukemono* or pickled cabbage."

Page 205. In Vacaville, California, in the early 1900s, "the Issei obtained Japanese products from their fellow countrymen whose shops carried supplies such as rice, soy sauce, and other Oriental items."

Page 297 notes that in California, as in the other Pacific Coast states, "Japanese farmers purchased American clothes almost exclusively, but their food was largely of foreign origin. Soy sauce, *sake* (rice wine) and other delicacies were imported from Japan. In later years many of these items were manufactured here and in Hawaii, but in 1910 it was reported that from 50 to 70 percent of the food consumed by the Japanese farmer was imported."

Volume 1 of this book discusses in detail the Wakamatsu Tea and Silk Farm Colony, which was established in 1865 in Coloma in the Gold Country near Sacramento. They came with the intent of growing bamboo, tea plants, raising fish, etc. The colony lasted for only 12-18 months, then failed. In Vol. 1, the famous pioneering Wakamatsu Colony is mentioned on at least 12 pages including p. 36-43, 60-62, and 64.

In Vol. 2, miso is mentioned on p. 554 (In Washington state "*miso shiru,* or soy bean paste soup," was enjoyed by Issei farmers for breakfast).

In Vol. 2, Chapter 17, titled "The Southwest–Violence in Arizona" includes a discussion of the Tadano family. In 1913, "an unforgettable year," Arizona passed an Alien Land Law which prevented Japanese who were not born in the USA from owning land in Arizona (p. 676). However they could lease land or real property in the state for a period of up to five years. In 1916, Issei Tadeshi Tadano, arrived in Arizona from California's Imperial Valley and grew cantaloupes under paper covers, which hastened their maturation (p. 677). The new method was soon used by other Issei farmers. In 1921 a revised Alien Land Law prevented Issei from both owning and leasing land in Arizona. A crisis took place in 1934 when White farmers took the law into their own hands and tried to drive all Japanese from the lands of the Salt River Valley. "In the early morning hours of September 13, six masked riders armed with machine guns and rifles raided a lettuce ranch operated by Magoichi Inouye, Truma Yamamoto, and Takeshi Tadano. In the Tadano situation, the raiders fired in the direction of Tadashi

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Tadano, the son of the rancher [Takeshi], who had been asleep in the field guarding an irrigation watergate to prevent the repetition of the flooding of the newly planted lettuce field by vandals [on Sept. 9, footnote 68]. At the first shot the son fell to the ground and feigned death. The gang excitedly started for their cars but did not leave the scene until they had pushed the youth's pickup truck into the Grand canal [footnote 69, refers to photo].

"After their departure, the son dashed back to his home and reported the details to his father who placed calls to the sheriff's department and the Japanese community leaders." A week after the Tadano shooting incident, Arizona night riders struck again at another farm in a yet another act of intimidation (p. 696-97). Not much was ever done by the Arizona authorities for the Japanese. Note: Eventually the Tadano family went into the business of making soy sauce.

In Vol. 2, a Glossary (p. 891-95) defines *Miso* shiru (p. 893) as "Soy bean paste soup."

At the end of Vol. 2 (p. 957-60) are three maps (with legend) of Japanese American farming settlements in the United States: (1) Western United States. (2) Central United States. (3) Eastern United States. For example, in Washington state there were communities in Seattle, Yakima, Moses Lake, and Spokane.

Note: This is the earliest English-language document seen (Aug. 2011) that uses the term "soy bean paste soup" to refer to miso soup. Address: 879 N. Vail Ave., Montebello, California 90640. Phone: 213-723-4389.

9962. Kawakami, Kozo. 1992. Tsurezure Nihon shokumotsu-shi. 2 v [Leisurely history of Japanese foods. Vols. 1-2]. Tokyo: Tokyo Bijutsu. Illust. 21 cm. [35+ ref. Jap]
• ***Summary:*** Vol. 1 (vi + 151 p.) contains chapters on: Ryokutô [ryokuto] (bundô, yaenari; p. 74-76, mentions tofu. Note: Kinch 1879 says *Phaseolus radiatus subtriloba* = bundô). Ganmodoki and hiryozu [tofu burgers] (p. 85-89; 9+5 ref.). Yose-dofu (p. 89-99; 13 ref.). Itoko-ni (p. 108-10; 13 ref.; with soybeans, azuki beans and tofu). Gomashio (p. 128-30; 7 ref.).

Vol. 2 (3 + 151 + 5 p.): A color illustration titled (*Nori-zukuri no zu*), by Katsukawa Shunsen (?) on the dust jacket shows women making nori in old Japan. They are chopping freshly collected nori and drying it in sheets. Another old 3-part illustration of making nori is printed on the cover. Contents (centered on foods and treats from the sea) includes: Nori and kawa-nori (from the sea and from rivers. p. 1-5; 35 ref. 1 illust.). Asakusa nori, Kassai nori, Shinagawa nori, and other nori from the Pacific Coast and Inland Sea (*Setonai-kai*) during the Edo Period (p. 8-16, 39 ref. 4 illust.). Nori from the Japan Sea (*Nihonkai*) No. 1: Izumo nori, Uppuri nori, and Kamoji nori. Uppuri is a place near Izumo, and Kamoji is a wig-like hair filler (p. 17-20, 21 ref.). Nori from the Japan Sea (*Nihonkai*) No. 2: Kuro nori, Yuki nori, Noto nori, and Kasashima / Kasajima of Echigo nori (p. 21-24, 21 ref.). The story of river nori, Shiba river nori, Nikko nori, and Kikuchi nori (p. 25-30, 26 ref. 1 illust.). Dried frozen tokoroten (*kôri tokoroten*), made from frozen seaweed (p. 98-102, 3 ref.). Mizukara (a spicy food made from kombu, p. 103-05, 16 ref.). Musubi kombu, musubi kanpyo, and musubi sayori (musubi means "tied up in like a bow in a special way;" p. 106-10, 25 ref. 2 illust.). Musubi yamaimo (mountain glutinous yam) and musubi tofu (both tied up in a special decorative way. p. 111-14, 14 ref.). Also contains other interesting illustrations and chapters. Address: Japan.

9963. Miso no ryôri: Ima minaosareru eiyôka to kenkô kôka. Misoshiru dengaku kara yôgashi made miso no saihakken [Miso cookery: Now being regarded as nutritious and healthy. From miso soup and dengaku to Western-style confections: The rediscovery of miso]. 1992. Tokyo: Chuo Koronsha. 160 p. Illust. (color). 30 cm. Series: Kurashi no Sekkei, no. 208 (1992). [Jap]*
Address: Japan.

9964. Morinaga Nutritional Foods, Inc. 1992. Lessons in tofu (Poster). 5800 South Eastern Ave., Suite 270, Los Angeles, CA 90040. 1 p. 37 x 54 cm. Color. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center.
• ***Summary:*** This large and attractive full-color poster is designed to answer the following questions: Parlez-vous tofu? 1. Just what is tofu? 2. Why is tofu so good for you? 3. Isn't tofu considered a potentially hazardous food by the FDA? 4. How is tofu packaged? 5. Isn't tofu a hassle to keep? 6. What do you do with tofu? (ideas of using the 3 different types of Mori-Nu Tofu). Points 3, 4, and 5 are used to criticize "old fashioned" water-packed tofu in plastic tubs.

Photos show various tasty tofu recipes at the center and the three types of Mori-Nu tofu stacked one atop the other on the front at the lower right. Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center. Address: Los Angeles, California. Phone: 1-800-NOW TOFU.

9965. Okubo, Kazuyoshi. 1992. List of publications: 1965-1992. 11 p. Unpublished manuscript. [159 ref]
• ***Summary:*** Many of these publications are in English, and most are about soy proteins and soy protein products. Address: Prof. of Tohoku Univ., Faculty of Agriculture, Dep. of Food Chemistry, Food Biotechnology, 1-1 Tsutsumitori Amamiya-cho, Sendai 981, Japan. Phone: 022-272-4321 ext. 354.

9966. Okubo, Kazuyoshi; et al. 1992. Components responsible for the undesirable taste of soybean seeds. *Bioscience, Biotechnology, and Biochemistry* 56(1):99. [159 ref]*
Address: Prof. of Tohoku Univ., Faculty of Agriculture, Dep. of Food Chemistry, Food Biotechnology, 1-1 Tsutsumitori

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Amamiya-cho, Sendai 981, Japan. Phone: 022-272-4321 ext. 354.

9967. Shinshu-Miso Research Institute. 1992. *Report of the Shinshu-Miso Research Institute* No. 33. p. 1-125. [Jap; eng] Address: Nakagosho 469-6, Nagano-shi 380, Japan.

9968. Titsingh, Isaac. 1992. The private correspondence of Isaac Titsingh. Vol. 2 (1779-1812). Introduced and edited by Frank Lequin. Amsterdam, Netherlands: J.C. Giebon. Index. 24 cm. Series: Japonica Neerlandica vol. 4. [1 soy ref. Dut; Eng]
• ***Summary:*** Text chiefly in Dutch, with some correspondence in English. Soy [sauce] is mentioned only once in this book, in letter no. 221 of June 1785 (p. 544) (*"Een kast afgekookte soya op kannetjes"*).

9969. Vegetable soybean planting situations: Banhuafuay, Maunglen Subdistrict, Sansai District, Chiang Mai Province [Thailand]. 1992. In: AVRDC, ed. 1992. Vegetable Soybean Production: Proceedings of a Training Course, Chiang Mai, Thailand, 18-24 February 1991. Taipei, Taiwan: Asian Vegetable Research and Development Center. 69 p. See p. 57-62. AVRDC Publication No. 92-369. [Eng]
• ***Summary:*** Contents: General survey. Land preparation. Planting. Fertilizer application. Irrigation. Harvesting (Farmers cut the plants with sickles early in the morning. The plants are then gathered for pod collection). Cost and return. Observation tour of the Vegetable Soybean Demonstration Plot at the Chiang Mai Agronomy Research Center (Sansai District, Chiang Mai Province). Tour of Chiang Mai Frozen Foods Company Ltd. (Sansai subdistrict, Sansai district): The company was established in 1988 as a joint venture between Japan and Taiwan, objectives, operating results, scope of operation, promotion of vegetable soybean cultivation, planting technology, vegetable soybean purchasing (price for various grades), frozen vegetable soybean processing.

9970. Vegetable soybean production, consumption and marketing requirements. 1992. In: AVRDC, ed. 1992. Vegetable Soybean Production: Proceedings of a Training Course, Chiang Mai, Thailand, 18-24 February 1991. Taipei, Taiwan: Asian Vegetable Research and Development Center. 69 p. See p. 47-49. AVRDC Publication No. 92-369. [Eng]
• ***Summary:*** Soybean is an important crop in Thailand. Fresh soybean pods ("Tau Rae") are used as vegetables domestically and are also exported; their export volume has increased rapidly during the past 2 years. Thailand now exports about 5,000 tonnes (metric tons) per year, frozen, to Japan. The main growing area is in northern Thailand. Research is being conducted on variety improvement.

9971. Velde, Paul van der; Bachofner, Rudolf. eds. 1992. The Deshima diaries marginalia, 1700-1740. Tokyo: Japan-Netherlands Institute. xxiii + 595 p. Illust. (some color). 27 cm. Series: Nichi-Ran Gakai gakujutsu sosho, No. 12.
• ***Summary:*** Translation of marginal notes from official diaries kept at the Dutch factory in Nagasaki. Dutch resident merchants lived from 1641 to 1860 on the artificial isle of Deshima in Nagasaki Bay; during this time they were the only European or Western country allowed to trade with Japan. After Japan opened its doors to Western trade in the 1850s, the Dutch lost their trade monopoly.

Soy [sauce] is mentioned only once, but not as an item of export from Japan, in an entry for 29 April 1724 (p. 287).

In the index there are many entries for saké (p. 586, 591) and seaweed (p. 586)–mostly as presents for Dutch officials.

None of the following are mentioned in the index: Beans, mebos, miso, catchup, kecap, ketchup, ketjap, sauce, umeboshi. Address: Netherlands.

9972. Takeya Miso Co., Ltd. 1992? Takeya-Miso: Soy bean paste (Brochure). Nagano, Japan. 4 p. Undated. 26 cm. [Eng]
• ***Summary:*** This attractive color brochure presents Takeya Miso Co. Ltd, "since 1872." Miso–"It comes from nature. It goes with everything. Nature's perfect food–healthy, tasty. Takeya miso!" Contains 6 recipes with photos. Address: 2-3-7, Kogandori, Suwa City, Nagano 392, Japan.

9973. Ochoa, Pamela. 1993. Re: Advertisement in Natural Foods Merchandiser. Letter to William Shurtleff at Soyfoods Center, Jan. 28. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "Dear Mr. Shurtleff: Thank you for responding to our advertisement in the December issue of Natural Foods Merchandiser.

"According to research at Iowa State University, Department of Food Science and Human Nutrition, manufacturers of conventional soy milk and tofu can obtain up to a 32% reduction in fat and no loss in protein, when using our natural dehulled organic soybean flakes.

"White Wave Soy Products, Boulder, Co., is introducing the world's first 'Reduced Fat' tofu at the Natural Products Expo, Anaheim, CA, February 18-21. However, you can take delivery in January. Please contact Jill in Customer Service, (303) 443-3470 for more information.

"See us at the Natural Products Expo, Anaheim, CA, February 18–21, Booth #743A, or call us at the above listed number for more information.

"Very best regards, Soy Products Division." Address: Assistant Manager, Nichii Company of America, Inc., 23440 Hawthorne Blvd., Skypark 2, Suite 140, Torrance, California 90505. Phone: 310-791-0010.

9974. *Agri-Book Magazine* (*Exeter, ONT, Canada*). 1993. Beans in Canada. 19(3):1-23. Jan.
• ***Summary:*** This entire special issue is about soybeans in Canada, with emphasis on soybean production. The magazine is printed with soy ink. Articles include: Top yields

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with no-till. Ten myths about conservation tillage. Ontario Soybean Growers' Marketing Board Newsletter–new format (insert). Ad for symposium "Soybeans in Canada: Beyond 100 Years," organized by the Ontario Soybean Growers' Marketing Board, to be held 28-30 March 1993 in Toronto, Ontario, Canada at the Regal Constellation Hotel; gives names and photos of speakers. Breeding the soybeans of the future. Genetic ingenuity.

In the Newsletter, an article titled "Profile of Larry Miehls, Soybean Board Chairman," notes: "Sixty-five percent of Ontario's soybeans are grown in five counties–Essex, Kent, Lambton, Middlesex, and Elgin... Today the majority of acres goes to two Ontario crushing plants. Twenty percent of the crop is exported and half of that is for human consumption." Therefore breeders need to concentrate on developing soybeans with more sugar, more protein, and less oil. "There is also a trend toward whole roasted beans for animal feed, and I see this as a major area of growth... For food quality soybeans, Japan remains the board's largest export customer.

"Pacific rim customers are interested in buying Ontario soybeans because of their high quality. Canada is also credited with strict grading standards, good processing people–the cleaners and the baggers–and farmers who keep up-to-date. Natto and tofu quality soybeans are popular among the Pacific rim customers. 'The breeders have done a good job of developing beans to meet customer needs...

"'The Harovinton, a tofu bean, was developed at the Harrow Research Station with a lot of board support. It's really starting to take off,' says Larry."

9975. Arifuku, Ichiro; Kakuichi, T.; Kobori, M.; Shinohara, K. 1993. Miso kasu chûshutsu-butsu no in vitro ni okeru seitai bôgyo tantô saibô ni taisuru sayô [Effect of extracts of miso dregs on several cultured biophylactic cell lines]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society of Food Science and Technology*) 40(1):69-74. Jan. [10 ref. Jap; eng]
Address: 1. Food Industrial Research Inst., Tottori prefecture, Sakaiminato, Tottori 684; 2. Fujisawa Pharmaceutical Co. Ltd., 5-2-3 Tokodai, Tsukuba, Ibaraki 300-26; 3-4. National Food Research Inst., The Ministry of Agriculture, Forestry and Fisheries, 2-1-2 Kannondai, Tsukuba, Ibaraki 305. All: Japan.

9976. Ono, Tomotada; Katho, Shoji; Mothizuki [Mochizuki], Kazunori. 1993. Influences of calcium and pH on protein solubility in soybean milk. *Bioscience, Biotechnology, and Biochemistry* 57(1):24-28. Jan. [14 ref]*
Address: Gifu Woman's Univ., 80 Taromaru, Gifu 501-25, Japan.

9977. Potter, Michael. 1993. Re: A brief chronology of Eden Foods. Letter to William Shurtleff at Soyfoods Center, Feb. 14–in reply to inquiry. 2 p.
• ***Summary:*** William Shurtleff sent Michael Potter a chronology of Eden Foods that he (Shurtleff) had compiled from various sources, and asked for Potter's comments, which follow. This letter is a follow-up to a letter written by Potter to Shurtleff on 1 March 1992.

"Eden Foods, Inc. was first incorporated as a non-profit corporation in the winter of 1967/1968, I believe. It was later (Bill Bolduc told me, in a manner that was not consistent with state law) reincorporated (after Ron Teeguarden pulled out) as a regular corporation under the name Eden Organic Foods, Inc. This WAS done by Bill Bolduc in November of 1969.

"Mr. William Shurtleff, traditionally corporations do not define the date they were *founded* as the date they became 'officially' or legally 'incorporated.' Commonly, decades separate these two occurrences, sometimes centuries.

"These thoughts will loosely follow your 2-page 'chronology of key events.' Eden was buying and selling soyfoods, tamari and miso, for more than 2 years prior to Nov. 4, 1969.

"During the spring of 1970 I became a partner of Joyous Revival natural foods in Birmingham, Michigan. I developed a relationship with Bill Bolduc... [the Eden's store's manager], as we were both attempting the same things and respected the quality of the work each other was doing. Frequently Bill B. asked me to move to Ann Arbor.

"After a falling our with my partners in December 1970, I visited Bill and Judy [his wife] in January 1971 and was hired by Bill on the spot, at his home, in his kitchen. My first job was to help a failing new Eden retail outlet in downtown Detroit on the campus of Wayne State University. (I never lived in Detroit at the time. I lived in Walnut Lake 30 minutes north.) By late spring or early summer 1971, after closing this Eden store, my pregnant wife Carol and I moved to Ann Arbor where I assumed responsibility for the Eden Foods store at 211 South State St. It is of interest that Eden Foods' name had already been legally changed back to just Eden Foods, Inc., when I moved to Ann Arbor.

"During the winter of 1971/1972 I was given what amounted to 13.5% of the common stock of Eden Foods, Inc. The share holdings then broke down: Bill Bolduc and Tim Redmond owned the same number of shares, but Judy Bolduc owned a small number of shares so the Bolducs owned the largest block.

Mid-Summer, July 1973, Bill thought the company was going out of business and after I stepped into a near fist fight between Bill and Tim outside the warehouse we were sharing with Mid West Natural Foods; I told them 'that if they'd just quit fighting and leave things alone, all would be well.' Bill immediately offered to sell me all of his stock. I asked Bill how much he wanted for it. After a very brief pause he said "$2,500." I told him that I'd try to get the money. We parted. Bill left and Tim and I went back to work. The next day I

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visited a friend named Ray Suber and asked him to help me purchase the stock. He said he would and to come back the next day. I did and was given $2,500 cash as a 'contribution to the natural foods movement.' With the $2,500 I purchased all of Bill and Judy's Eden Foods, Inc. stock. Neither Bill nor Judy 'sold their stock back to the company.' They sold it to me for cash. They were glad to get out because they were convinced the company couldn't make it."

From a talk on 31 Oct. 1993: There was a 51% Tim Redmond / 49% Michael Potter share holding configuration in Eden Foods, but it lasted for less than a year. When Michael bought all of the Bolduc's stock, he owned the majority of Eden Foods' stock. But he realized that Tim Redmond's father might withdraw his $10,000 if he knew Michael had majority ownership, and if that happened Eden would not be able to survive. So Michael immediately (as part of the transaction with the Bolducs) gave Tim enough of his stock so that Tim owned 51% and Michael owned 49%.

About 3 months later, Michael loaned about $44,000 in cash to Eden Foods. This was money that Michael's father had entrusted to him. But Michael became uncomfortable having no control over something for which he was responsible–both the company and his relationship with his father. Michael discussed his feeling with Tim, and Tim agreed to give Michael equal ownership in exchange for Michael converting his $44,000 loan into an investment in Eden Foods. Now neither partner could make a major decision without the other's agreement–a good situation for Eden Foods.

"In September 1973, at Royce Seeger's home, I received the unanimous recommendation of an employee steering committee and became Bill Bolduc's successor as president of the company. My first goal was to get us away from MidWest Natural Foods for moral and ethical reasons. I located a new facility in the process of being constructed and developed a relationship with the owner/builder, John Sheer. In the spring of 1974 we relocated to that 4601 Platt Road, Ann Arbor warehouse.

"During this period I was building and moving Eden's retail store to 330 Maynard St. in Ann Arbor. The move actually took place in the summer of 1973. It included a large store, a large fast food (chapati sandwiches, etc.) deli, and a natural foods bakery named Sun Bakery, that relocated itself from Kalamazoo, Michigan. These three operations were under one roof in a 6,000 square foot old printing plant at the University of Michigan's campus, leased by Eden Foods, Inc. This operation paid off all Eden's debt and paid for the new warehouse, computer, offices, trucks and equipment. The wholesale operation was carried by the retail until late 1974 after trucks were put out on regular routs throughout the Mid-west.

In October 1974 I made my first of eleven trips to the People's Republic of China (Eden made a total of 13 trips between Oct. 1974 and Nov. 1979) and stopped in Japan on the way back to visit Yuko Okada at the Muso Company. Prior to 1974 Eden Foods imported shipments from Mr. Kazama of the Mitoku Co. in Japan. After my visit to Muso, seeing their educational activities, their macrobiotic center activities, etc., I decided to import Japanese foods exclusively from Muso. Tim Redmond had cultivated the Mitoku connection and initiated our first Japanese imports.

"Spring 1979 Cliff Adler is hired by myself to do sales work for Eden in Chicago. During that summer he lends Eden Foods $100,000, for which he is paid bank interest rates.

"After the Nov. 27, 1979 warehouse fire Cliff converted his $100,000 to stock in February 1980 as Tim Redmond left, certain that Eden was finished. Tim's stock was redeemed with Eden giving him title to our operations at 330 Maynard St. In one transaction Tim was bought out by the company, Cliff and I became 34% shareholders, 10% was sold to Frank Dietrich of Natural Foods, Inc. (Toledo, Ohio) for $100,000 and the following percentages of Eden Foods' common stock were given to Eden managers shortly after we laid off 35 people: Ronnie Roller 5%, Michael Gordon 4%, Mark Cook 4%, Kathy Knor 3%, Bill Swaney 3%, and Bob Duha 3%. This free stock was limited to book value and had to be sold to Eden Foods whenever the person left the company regardless of the reason for leaving. It could not be sold another way.

"In early 1984 when Mike Gordon left Eden his stock was awarded to Michael Potter as a bonus by the Board of Directors... to be continued." Address: Chairman, Eden Foods, Inc., 701 Tecumseh Rd., Clinton, Michigan 49236. Phone: 517-456-7424.

9978. Matsuura, Masaru; Obata, Akio. 1993. β-Glucosidases from soybeans hydrolyze daidzin and genistin. *J. of Food Science* 58(1):144-47. Jan/Feb. [23 ref]
• ***Summary:*** Beta-glucosidases are enzymes in soybeans. Address: Research & Development Div. of Kikkoman Corp., 399 Noda, Noda City, Chiba prefecture 278, Japan.

9979. Morinaga Nutritional Foods, Inc. 1993. A prize in every box (Ad). *Vegetarian Times.* Feb. p. 3.
• ***Summary:*** This full-page color ad shows a stir-fry dish in a wok with cubes of tofu and many sliced veggies plus a few fruits.

The text at the bottom reads: "In every box of Mori-Nu Tofu you'll find a wonderful surprise–fresh-tasting Mori-Nu Tofu. You won't need to worry about soured tofu. Or spoiled tofu. Or any of the problems you may have had with traditional water pack tofu.

"You can rely on Mori-Nu, consistently, to be the same texture and quality, box after long-life box. Choose our Extra-Firm, Firm or Soft variety.

"From the very first taste, you'll see why Mori-Nu Tofu is prized by cooks everywhere, for tempting main dishes,

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rich and creamy desserts, and traditional tofu recipes.

"You can claim your Mori-Nu prize in your supermarket produce section or health food store. Mori-Nu. Pure tofu, perfect package." At the lower right is the red Mori-Nu logo. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504.

9980. Kanazawa, Takemichi; Tanaka, Makoto; Uemura, Tsugumichi; Osanai, T.; Onodera, K.; Okubo, K.; Metoki, H.; Oike, Y. 1993. Anti-atherogenicity of soybean protein. *Annals of the New York Academy of Sciences* 676:202-14. March 15. [18 ref]

• ***Summary:*** "Numerous papers have been published (Sirtori et al. 1977; Descovich et al. 1980) indicating that the proteins isolated from soybeans are effective in preventing the risks of atherosclerosis" [Note: Atherosclerosis is a condition in which fatty material collects along the walls of arteries. This fatty material thickens, hardens (forms calcium deposits), and may eventually block the arteries. Atherosclerosis is a type of arteriosclerosis. The two terms are often used to mean the same thing].

Because the taste of extracts made from *raw* soybeans is unpleasant, it has been difficult to make soy protein drinks without sugar, "which is very injurious to the arterial wall" (Kanazawa et al. 1984; Bunag et al. 1983).

Okubo et al. (1992) and Kudou et al. (1990) have devised a method for removing the undesirable taste from the extracts of raw soybeans.

Soycream was found to reduce the size of low density lipoprotein (LDL) particles and soymilk protected LDL from peroxidation.

Note: This paper is from: The Third International Conference on Nutrition in Cardio-Cerebrovascular Diseases, edited by Kyu Taik-Lee, Yasaburo Oike, and Takemichi Kanazawa. Address: 1-5. Second Dep. of Internal Medicine, Hirosaki Univ. School of Medicine, 5 Zaifu-cho, Hirosaki city, Aomori prefecture, Japan 036.

9981. *SoyaFoods* (*ASA, Europe*). 1993. 20 years of research and publications. 4(1):3. Winter.

• ***Summary:*** "This year William Shurtleff and Akiko Aoyagi Shurtleff are celebrating 20 years of research and publishing on soya foods. In October 1972 they began their research on tofu, starting with an apprenticeship under tofu master Toshio Arai in Japan."

9982. *SoyaScan Notes.* 1993. The world's most active countries with respect to soybeans and soyfoods, as of 1 April 1993 (Overview). April 1. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** A tally by country on the SoyaScan database (which currently contains 42,087 bibliographic references relating to soybeans and soyfoods) shows the following countries to have the largest number of listings relating to soya (over 200): United States of America 21,459, Japan 5,599 Germany 2,053 United Kingdom 1,986, China 1,844, France 1,601, India 1,222, Canada 1,112, Indonesia 993, Brazil 873, Netherlands 809, Manchuria 733, USSR 665, Italy 596, Australia 467, Korea 463, Taiwan 460, Belgium 400, Austria 375, Mexico 371, Switzerland 353, Sri Lanka 341, Philippines 323, Yugoslavia 321, Nigeria 312, Sweden 289, Argentina 244, Israel 240, Czechoslovakia 237, Denmark 225, Bulgaria 219, Malaysia 214, Thailand 214, South Africa 207, Spain 204, Russia 203.

9983. *SoyaScan Notes.* 1993. Journals/periodicals having 75 or more articles related to soya in the SoyaScan database, as of 14 April 1993 (Overview). April 1. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** (1) *Soybean Digest* 2,154. (2) SoyaScan Notes 821. (3) Journal of the American Oil Chemists' Society 664. (4) U.S. Patents 614. (5) Journal of Food Science 240. (6) Nippon Jozo Kyokai Zasshi (Journal of the Brewing Society of Japan) (2 names) 225. (7) Foreign Agriculture 225. (8) Nippon Nogei Kagaku Kaishi (Journal of the Agricultural Chemical Society of Japan) 201 (9) Soybean Update 187. (10) Proceedings of the American Soybean Assoc. 176. (11) INTSOY Series 172. (12) Journal of Nutrition 149. (13) British Patents 149. (14) Soyfoods magazine 149. (15) Jozo Shikensho Hokoku (Report of the Brewing Experiment Station) 147. (16) New York Times 128. (17) Toyo Shinpo (Soyfoods News) 126. (18) Cereal Chemistry 125. (19) Vegetarian Times 122. (20) East West Journal (2 names) 113. (21) Japanese Patents 111. (22) Food Technology 109. (23) Hakko Kogaku Zasshi (Journal of Fermentation Technology) 105. (24) Shokuryo Kenkyujo Kenkyu Hokoku (Report of the Food Research Institute) 104. (25) Agricultural and Biological Chemistry 100. (26) Soya Newsletter 100. (27) Chemurgic Digest 97. (28) Jozogaku Zasshi (Journal of Brewing, Osaka) 84. (29) Food Engineering 82. (30) Bulletin de la Societe d'Acclimatation 80. (31) German Patents 79. (32) Soybean News 76. (33) Journal of Agricultural and Food Chemistry 75.

9984. Roller, Ron. 1993. The Andersons in Maumee, Ohio, and Pioneer Seed Company's "Better Life" label (Interview). *SoyaScan Notes.* April. 3. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The Andersons own a big elevator in Maumee, Ohio. They have specialized in IOM soybeans for many years. They trade with Mitsui (or perhaps Mitsubishi), which sells the soybeans in Japan to food processors (Ron does not know what type of soyfoods were made). When American Soy Products started operations in Michigan, the Andersons were the only people doing anything with Beeson variety soybeans. They had a Beeson program where they were contracting Beesons with growers and paying them a premium of $0.50 per bushel; the soybeans were grown

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"commercially" (i.e. non-organically). Beesons were the only identity preserved soybeans that they handled. Now the Andersons have an organic program and they are starting to contract organic soybeans for the Japanese market.

Ron has had ongoing discussions with Pioneer Seed Co., which is also involved with a number of Japanese trading companies for organic soybeans. Pioneer has a Specialty Crop Division, which handles the "Better Life" label. Soybeans sold under this label are guaranteed to have been grown without pesticides or herbicides–but chemical fertilizers may be used. These beans are sold in Japan. The majority of very large farms (800-1,200 acres) in Ohio and Nebraska grow soybeans organically without the use of animal manure. They use green manure in the form of cover crops, add soil balancing minerals (such as P and K, phosphates and potassium) as needed, and practice crop rotation. Ron has two main objections to the use of chemical fertilizers: (1) They rely on petroleum products for their nitrogen content; (2) They are harder on the environment and ground water. Address: President, American Soy Products, 1474 N. Woodland Dr., Saline, Michigan 48176.

9985. Meyer, Edwin W. 1993. Early research on the structure of soy protein (Interview). *SoyaScan Notes.* April 7. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** At Central Soya, Ed hired a very brilliant and rather independent young protein chemist, Nicholas Catsimpoolas. "He laid wide open the basic structure of soy protein–the soybean storage proteins." Prior to the time that Catsimpoolas started his research, the understanding of the basic structure of soy protein was not clear. It was known that the storage proteins were composed of different types of proteins but he actually showed what the subunit structure was of the various proteins, and the linkages. He could diagram it up to a point. He showed, for example, that glycinin, one of the major storage proteins, was a polymer made up of two units, and each unit was composed of 6 subunits, and they were connected by disulfide bonds and ionic bonds, and the like. "I consider him a pioneer in that area. But I don't want to detract in any way from Dr. Walter Wolf's very significant contributions in the same field at about the same time. Dr. Wolf was working on a little bit different level. Shortly after Catsimpoolas began publishing in about 1969, the Japanese jumped into the field of basic structure research, and they contributed very significantly. Catsimpoolas left Central Soya in 1973 and went to MIT as a professor of nutrition and food science."

Every soybean cell contains a host of soybean proteins. The storage proteins are the nitrogenous materials that nurture the seedling when it starts growing. Examples of non-storage proteins are enzymes plus many others. Address: 1701 N. Sayre Ave., Chicago, Illinois 60635. Phone: 312-637-0936.

9986. *Toyo Shinpo* (*Soyfoods News*). 1993. Tôfu shohi suryo no suii [Changes in tofu consumption in Japan]. April 11. p. 1. [Jap]
• ***Summary:*** Tofu consumption in Japan (in terms of cakes per household) has decreased by 12.4% since 1983. The weight of 1 cake is not given but it is probably 300 gm. The statistics for each year are as follows: 1983–90.43 cakes/household. 1984–89.16 cakes. 1985–88.48 cakes. 1986–85.40 cakes. 1987–86.43 cakes. 1988–85.07 cakes. 1989–81.87 cakes. 1990–83.42 cakes. 1991–78.76 cakes. 1992–79.26 cakes.

9987. Angier, Natalie. 1993. Chemists learn why vegetables are good for you: Certain plant ingredients can inhibit cancers. *New York Times.* April 13. p. C-1, C9. Science section.
• ***Summary:*** An illustration shows a bowl of miso soup. Researchers at Children's University Hospital in Heidelberg, Germany, have isolated a compound named genistein from the urine of those who eat a traditional Japanese diet rich in soy products (like miso soup) and vegetables (especially cruciferous vegetables–those from the cabbage family). Dr. Lothar Schweigerer, his student Theodore Fotsis, and their co-workers discovered that, in test tubes, genistein blocks angiogenesis, the growth of new blood vessels. Their work was published in the current issue of the April issue of the *Proceedings of the American Academy of Sciences.*

An illustration shows genistein blocking the growth of new capillaries that supply blood to some tumors. It also retards proliferation of some cancer cells.

People consuming a traditional Japanese diet were found to have 30 times as much genistein in their urine as typical Westerners. This could explain why Japanese men, who leave their country for several years to work in the USA or Europe, find their rate of prostate cancer rises sharply. Tiny prostate tumors, which have been kept from growing by, say, daily intake of miso soup, would be free to grow on a Western diet.

Dr. Judah Folkmann of Harvard Medical School (Cambridge, Massachusetts), who has pioneered our understanding of how tumors grow, found this to be a "fascinating report." He noted that this is the first time scientists have reported that certain dietary factors, found in the urine, could inhibit the proliferation of blood vessels. Blocking angiogenesis has the potential for providing an ideal type of therapy, since it would attack the tumor while leaving normal tissue intact. Only rarely do new blood vessels grow in the adult body–except to meet the sinister demands of malignant tumors. So any compound that blocked angiogenesis would have few side effects.

At present, only about 5% of the approximately $1.8 billion annual budget of the National Cancer Institute is spent on prevention; most of rest is spent to find high-profile cures, such as gene therapy. Dr. James Duke, an economic botanist

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with USDA, thinks the country would be much better off if we spent $1 billion a year on cancer prevention–including education on diet and cancer.

A large table titled "Potential cancer fighters in foods" (p. C9) includes flavonoids, plant sterols, vitamin E, genistein, (all found in soy products) and fiber. Fiber dilutes cancer-causing compounds in the colon and speeds them through the digestive system. It discourages the growth of harmful bacteria and promotes the growth of healthful ones. And it may foster production of a healthier form of estrogen.

9988. Pinault, Pascal. 1993. Re: Tama–France's best importer of Japanese natural foods. Letter to William Shurtleff at Soyfoods Center, April 27. 5 p.
• ***Summary:*** Tama is located at 883, rue de Bernau, 94500 Champigny / Marne, France. Phone: (1) 49-83-79-94. Fax: (1) 47-06-37-85. Tama traces its origins to the 1960s when it was part of a restaurant, Le Bol en Bois, the first vegetarian place in Paris. This restaurant (at 35, 40 Rue Pascal, 75013, Paris) now specializes in macrobiotic cooking. They added a health food store and a "new age" book shop.

"Tama distributes Mitoku products and excellent miso, soy sauces, amasaké, kuzu, Japanese seaweeds, mochi, etc. They have an excellent list of books concerning natural foods and cooking. They print their own brochures about tofu, seaweeds, and others. Tama has a subsidiary branch named Tofu-Daizou which makes the best tofu in France, as far as I know." Address: "Caplet," 97226 Morne Vert, Martinique, French West Indies 0033. Phone: 596 55-56-57.

9989. Miso [Miso]. 1993. Television broadcast. Channel 18. KTSF. California. April 25. Sun. 7:00-7:30 P.M. [Jap]
• ***Summary:*** This program is part of the series "Tsuiseki" (The Chase). Address: Japan.

9990. Nagayama, Hisao; Tokue, Akihiko. 1993. The naked kitchen: Nattô.*Look Japan* (*Tokyo*) 39(445):24-25. April.
• ***Summary:*** "Natto is formidable fare–fermented soy beans with a sticky, slippery consistency and a pungent odor that lingers long after the last swallow. But once you get used to these deliciously gooey beans, you will likely find yourself hooked... Natto first appeared [in Japan] 1,000 years ago, but it did not catch on until about 700 years later, when it became a favorite among the residents of the capital city at the time, Edo (old Tokyo)." Upper class Kyoto residents used to call natto *"ito"* (thread), "a delicate reference to the minute, sticky threads that cling to the lips of even the most careful natto-eater."

Color photos show: (1) Natto being lifted with chopsticks from a bowl, with its many threads stretching downward. (2) Natto atop a bowl of white rice. (3) Various traditional and modern natto packages, including natto wrapped in rice straw. (4-6) Three steps in eating a package of natto: Simply empty the natto packet into a bowl, add chopped green onions and soy sauce, and stir until sticky strings form.

9991. Nagayama, Hisao; Tokue, Akihiko. 1993. The naked kitchen: Miso. *Look Japan* (*Tokyo*) 38(444):24-25. March.
• ***Summary:*** A nice introduction to miso. Color photos show: (1) A bowl of miso soup. (2) Four different types of miso, each on a wooden spoon. (3) Miso Dengaku.

9992. Yen, Irene. 1993. Roland A. di Centa, the man who introduced tofu to Italy (Interview). *SoyaScan Notes.* May 19. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Irene recently visited with Roland at his home in France near Cannes (Address: Residence Port Azur Apt. B110, 79 Ave. Frìzes Rousians, F-06220 Golfe Juan, France). He told her that he introduced tofu to Italy using *The Book of Tofu* by Shurtleff and Aoyagi. He made tofu in his home kitchen in Italy and sold it commercially. Newspaper articles were written about his work. He was quite involved with macrobiotics and close to the Kushis. He no longer lives in Italy and is no longer involved with making soyfoods.

Roland, who is about age 50, was born in Germany to German parents, but his surname is Italian and his family originates from Italy, from a small village called Centa. He is second or third generation German. He lived in Germany until age 18, then lived in Italy for 10 years and France for 10 years. At one point he was married to a Vietnamese woman, who grew up in France. He was also a fashion photographer for the French fashion magazine *Elle.* A jack of all trades, he currently owns a business named Punshon Ltd. in Lugano, Switzerland, works as a consultant on many subjects, moves around a lot, and is quite affluent. He has a 60-foot sailing boat ported near Nice, France.

Note: Card from Roland. 1993. July 13. His address is now 3, Boulevard d'Aguillon, 06600 Antibes, France. Address: Berkeley, California.

9993. Brink, Susan. 1993. Can tofu stop cancer? As its uses multiply, the soybean looks more like a magic bullet. *U.S. News and World Report* 114:77. May 31.
• ***Summary:*** The magic bullet in soybeans could be genistein, a crystalline substance with almost no nutritive value, which is found almost exclusively in soybeans. "More than 200 scientific papers on genistein's possible role in cancer prevention have been published since 1987. Among the most intriguing is a German study in the April 1993 *Proceedings of the National Academy of Sciences,* which found that, in the test tube, genistein blocks angiogenesis, the process in which new blood vessels grow–and which is needed to nourish malignant tumors.

"The German research feeds speculation that genistein may be one dietary substance that explains the difference in some cancer rates between the United States and Asia. The American breast-cancer rate, for example, is 22.4 per

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100,000, almost four times Japan's rate of 6 per 100,000. The American prostate-cancer rate is 15.7 per 100,000, also roughly four times the Japanese rate of 3.5 per 100,000. A high-fat diet has long been suspected as a cancer-causing culprit. That could be true. But while Americans eat more fat, they also eat fewer plant foods, including soy...

"In the meantime, try making this summer's fruit shakes with soy milk–and see if anyone notices."

Note: This is the earliest document seen (June 1999), with "soy" in the title, and which suggests that soy might reduce one's risk of prostate cancer.

9994. Kohyama, Kaoru; Yoshida, M.; Nishinari, K. 1993. Rheological study on the gelation of soybean 11S protein by glucono-delta-lactone. *J. of Agricultural and Food Chemistry* 40(5):740-44. May. [32 ref]
Address: 1&3. National Food Research Inst., Kannondai, Tsukuba, Ibaraki 305, Japan; 2. Kanagawa Prefectural Inst. of Agriculture, Terdanawa, Hiratsuka, Kanagawa 259-12, Japan.

9995. Nagayama, Hisao; Tokue, Akihiko. 1993. The naked kitchen: Tofu. *Look Japan* (*Tokyo*) 39(446):24-25. May.
• ***Summary:*** Color photos from Fujiya in Tokyo show: A tofu maker cutting a large block of tofu into 60 cakes; Dried-frozen tofu, regular (momen) tofu, and grilled tofu (yaki-dofu); Three types of deep-fried tofu; Yu-dôfu in a *nabe* with kombu. Note: H. Nagayama, born in 1934, is a food historian and Japan's leading authority on the authentic recreation of Japanese period meals.

9996. *Ontario Export Soybeans* (*OSGMB*). 1993. Happenings. 6(2):-2. May.
• ***Summary:*** "March 28-30, 1993 the Ontario Soybean Growers' Marketing Board in conjunction with Agriculture Canada and the Ontario Ministry of Agriculture and Food, staged 'Soybeans in Canada: Beyond 100 Years,' a symposium marking 100 years of soybeans in Canada. Over 350 delegates and 30 exhibitors made the show a tremendous success. A strong list of internationally renowned speakers drew large crowds. Mr. Tetsu Minagawa, of Mitsubishi, Tokyo, spoke on Japan's market for soyfood products. Mr. Michael Loh, Export Development Officer of the Ontario Ministry of Agriculture and Food (OMAF), highlighted the potential for soybeans in the Asia Pacific region as we approach the year 2000.

"In conjunction with the Symposium the Board sent Centennial awards to companies in the Asia/Pacific region, in recognition of their important contributions to expanding the market potential for Canadian soybeans."

Presentations were made in three countries by Michael Loh on behalf of OSGMB. The companies recognized were: In Hong Kong: Dah Chong Hong Ltd., Vitasoy International Holdings Ltd., and Law Man Tung Trading Co. Ltd.

In Singapore: Singapore Sin Seng Lee Trading Co., Asia Corporation, and Yam Thye & Co.

In Malaysia: Yeo Hiap Seng, Chop Lee Kit Heng, Tan Ban Huat, Tung Lieng Trading Co., Thye Huat Chan, and Lun Heng. Address: Chatham, Ontario, Canada.

9997. Yasuda, Masaaki; Matsumoto, T.; Sakaguchi, M.; Kobamoto, N. 1993. Okinawa ni okeru tofuyo no seizo ni kansuru kenkyu. VIII. *Monascus* zoku kin o mochiita tofuyo no jukusei katei ni okeru kagaku seibun no henka [Studies on the manufacture of tofuyo in Okinawa. VIII. Changes in chemical components of tofuyo prepared by *Monascus* fungus during fermentation]. *Nippon Shokuhin Kogyo Gakkaishi* (*J. of the Japanese Society for Food Science and Technology*) 40(5):331-38. [18 ref. Jap; eng]
• ***Summary:*** Tofuyo is an excellent type of fermented tofu made in Okinawa Prefecture, Japan. Crude protein and crude fat contents of tofuyo decreased during ripening, but is reducing sugars increased. The sodium chloride (NaCl) content of the product remained almost constant at about 3%. "Digestion of soybean protein was examined by slab polyacrylamide gel electrophoresis. Some polypeptide bands of soybean globulin, such as α'-, α-, beta-subunits in beta-conglycinin," an acidic subunit in glycinin in the water-insoluble fraction of tofuyo disappeared after 3-months ripening, but that of the basic subunit in glycinin remained. The main constituent of the body of tofuyo was found to be the basic subunit in glycinin and other polypeptides (whose weight in kilodaltons is given).

"The ratio of water soluble nitrogen to total nitrogen (called protein solubility ratio, or ripening ratio) reached" 36.3% after 3 months of ripening. "The ratio of trichloracetic acid soluble nitrogen to total nitrogen reached" 35.0% after 3 months of ripening.

A table shows: Changes in the chemical composition of raw tofu, dehydrated tofu, tofuyo. and *moromi* (mash) prepared by *Monascus* fungus during ripening periods of 0-5 months.

Figures (graphs) show: (1) Changes in ethyl alcohol concentration pH, activities of various enzymes (α-amylase, glucoamylase, proteinase) in the moromi mash during ripening periods of 0-5 months. (2) Changes in pure protein content of tofuyo during ripening periods of 0-5 months; it decreased. (3) (3) Changes in protein solubility ratio of tofuyo during ripening periods of 0-5 months. (6) Changes in the ratio of trichloracetic acid-soluble nitrogen to the total nitrogen during ripening periods of 0-5 months. These nitrogen contents are shown on an oven dried basis. Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 903-01.

9998. Baud, Franck; Pebay-Peyroula, E.; Cohen-Addad, C.; Odani, S.; Lehmann, M.S. 1993. Crystal structure of hydrophobic protein from soybean; a member of a new

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cysteine-rich family. *J. of Molecular Biology* 231(3):877-87. June 5. [29 ref]
Address: 1-3. Institut Laue-Langevin, Avenue des Martyrs, F 38042, Grenoble, France; 4. Dep. of Biology, Faculty of Science, Niigata Univ., Niigata 950-21, Japan.

9999. Carper, Jean. 1993. Colon cancer frighten you? Avoid red meat. Miso power unmasked. *Advance* (*Staten Island, New York*). June 16.
• ***Summary:*** In a new study, researchers at the Columbia University College of Physicians and Surgeons found that women who ate the most saturated fat and red meat were more likely to have polyps–small precancerous growths that can lead to colon cancer years later. This research reinforces warnings from a recent Harvard study which showed that "women who ate a daily main dish of red meat–about five ounces of beef, pork or lamb–upped their risk of colon cancer two and a half times compared with women who ate meat less than once a month."

For more than a decade, Japanese studies have shown that consumption of miso helps prevent cancer. "Researchers from Japan's Okayama University Medical School now believe they have unlocked miso's health-promoting secret. Miso is an anti-oxidant. In experiments, miso neutralized free radicals, rampaging molecules in the body that attack cells and help create a wide array of diseases, including cancer. Miso also helped protect fats in the body from becoming rancid and able to foment disease activity, including artery clogging.

"Miso derives its antioxidant powers from chemicals in soybeans and from substances created by fermentation, researchers say."

10000. Vorih, Susan W. 1993. Re: History of Ralston Purina's and Protein Technologies International's work with industrial soy proteins. Letter to William Shurtleff at Soyfoods Center, June 17 and July 9–in reply to inquiry. 3 p. + 1 p. Typed, with signature on letterhead.
• ***Summary:*** "Ralston Purina became involved with isolated soy proteins through the acquisition of four soybean processing plants from Procter & Gamble (Buckeye Division) in 1958. One P&G plant, located in Louisville, Kentucky, had an industrial soy protein isolate operation built [in about 1946-47] to produce product for their 'Spic and Span' house cleaner. This was not economical for P&G and conversion was made [starting in about 1953] to produce industrial isolated soy proteins for the paper coating industry. This conversion was taking place at the time of the Ralston Purina acquisition, which was finalized on December 10, 1958. At this time, Ralston Purina only had an interest in expanding its soybean solvent extraction processing capacity, but the idle isolate manufacturing facility just acquired became of interest.

"There was no link in this acquisition with Mr. E.F. 'Soybean' Johnson of Soy Products Corp. in Louisville. Johnson, a former Ralston Purina employee, joined Soy Products Corp. in mid-1947.

"Ralston Purina decided to modify the Louisville isolate process for paper coating products; the plant began production on June 13, 1959. A series of hydrolyzed and non-hydrolyzed products under the ProCote brand name was produced and sold successfully to the paper coating industry. Under Protein Technologies International management the facilities have been modified and expanded to become the world's leading producer of Industrial Polymer Isolated Soy Protein products today.

Ralston Purina began research on food-grade isolates starting in late 1959 under the direction of Mr. Bill Brew in St. Louis. Many consultants were paid for information. Pilot plant work was also performed in St. Louis prior to first contacts with Mr. Bob Boyer. Mr. Boyer was a spun protein specialist for products made from the Ralston-Purina developed liquid curd process. Other spray-dried products were developed from curd by the company.

Ralston Purina began more active involvement with food-grade isolated soy proteins in 1960 when the company started food-grade isolated soy protein research and pilot plant work at its headquarters in St. Louis, Missouri. A semi-works plant to produce edible soy proteins was erected in 1961 at Louisville, and both spray-dried and spun fiber proteins began to be produced and sold in October 1962. The spray-dried edible isolates, brand-named Edi-Pro A and Edi-Pro N, were sold to food processors. Mr. Bob Boyer [who began working as a full-time consultant on soy protein for Ralston Purina in early 1960 and joined the company as technical director of protein products sales, working under Donald B. Walker, vice president in charge of Ralston Purina's soybean division] was instrumental in directing soy protein spun fibers and sales.

Mr. Frank Calvert was hired in September 1963 to head up Ralston Purina's R&D work on food-grade isolated soy protein in St. Louis. Calvert received a BS degree in chemistry from the Edison Institute of Technology while working at the Ford Motor Co. in Dearborn, Michigan. In 1965 Calvert was named director of soybean research, and in 1967 director of research of the Protein Division. In 1969 Calvert was promoted to director of research, New Venture Management, and finally in 1971 vice president and research director, New Venture Management. During these years, Calvert developed new soy protein isolation processes, 70 percent soy protein concentrate products, and modified soy protein coating compositions for industrial use. Calvert is considered a visionary in soy protein research and the accomplishments of his career were honored when the Protein Technologies International plant at Memphis was dedicated to him in 1973 in recognition of his years of service and dedication to protein technology."

Ralston Purina first made and sold Supro 610 in Oct.

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1966. Spun soy protein fiber production was discontinued in 1967. The special equipment was dismantled and parts were sold off for scrap metal. Production of other food-grade soy proteins, such as extruded protein, was started commercially at St. Louis and Memphis in 1973. Wet textured edible soy proteins were produced commercially in Memphis and Osaka, Japan (through a joint venture) in 1975.

"In 1970 the 'Protein Project' became part of the New Ventures Group of Ralston Purina with the Protein Project headed by Paul H. Hatfield. Included in this early business development team were Dr. D.H. Waggle, R&D; Mr. Henry T. James, Director of Engineering, now retired; and B.P. Schwartz, Manufacturing. This team, working as a multi-functional and multi-disciplined team, emphasized process reliability, superior quality and performance products, combined with a worldwide perspective of market development.

Ralston Purina "expanded food grade isolate capacity with new facilities at Memphis, Tennessee, beginning production on April 10, 1973; Pryor, Oklahoma, beginning production on December 1, 1976; and Ieper, Belgium, beginning production on August 21, 1979. This expansion easily vaulted the company into the position of world leader in food-grade isolated soy proteins by 1976."

Note 1. Much of the above information was provided to Susan and her assistant, Jane Phelps, by Henry James, a former employee of Ralston Purina working in the area of soy proteins.

Note 2. On 1 July 1987 Ralston Purina Co. established Protein Technologies International as a wholly-owned subsidiary, with 92 researchers. The first official use of the term "Protein Technologies International" began in March 1987.

Note 3. Concerning the Buckeye Cotton Oil Co. In Nov. 1943 it had soybean processing mills in Louisville, Kentucky (large), and Memphis, Tennessee (medium-sized). By 1948 the company's plant in Louisville was making soy flour and soy lecithin. By 1949 (and probably by 1946) the company had become a subsidiary of Procter & Gamble and its headquarters were in Ivorydale, Ohio; O.H. Alderks was involved with soybean processing in Buckeye's technical division. Address: Communications Manager, Protein Technologies International, Checkerboard Square, St. Louis, Missouri 63164. Phone: (314) 982-1983.

10001. Weiner, Michael. 1993. New developments with Amano and Yamashita (Interview). *SoyaScan Notes.* June 18. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Michael works as a consultant for Peter Joe of Sunrise Market Ltd. and with Amano Foods. He used to consult with Mandarin Enterprises in British Columbia. Now his main work is as a broker, representing various U.S. companies such as Vitasoy, Knudsen, Santa Cruz, etc. Amano still makes all of Westbrae's organic miso. Amano is trying to construct a 60,000 square foot plant. They had a joint venture with Yamashita but it fell apart. Now Yamashita is constructing their own 60,000 square foot soy sauce plant in Oregon. The ground breaking will take place in a couple of weeks. Michael does not feel that this will be much of a threat to Amano, which plans to sell a lot of Amano products in supermarkets. The market is big and growing rapidly. Soyfoods now are given large amounts of shelf space (8-16 linear feet) in the produce section of all supermarkets in western Canada (British Columbia, Alberta, and Manitoba). A major reason for this is that Mandarin and Sunrise have an excellent relationship with the people in charge of the produce section in western Canadian supermarkets. Initially Michael helped to establish some of these relationships; these companies got a few facings for their tofu. Then Mandarin added their tofu burgers. Then Sunrise added Yves Wieners and soy cheese. The products sold, which is proof that exposure will work. Michael was involved in trying to make the same thing happen in Ontario with the Loblaws chain, and in Quebec, but they were never allowed to give the program a try–not even in 1-2 stores.

Safeway supermarkets are so sold on soyfoods that they have developed special open-front, vertical, refrigerated "Tofu Products" cases that are placed adjacent to the produce case, but have a lower temperature. They are quite large and contain everything from soy drinks to tofu, soy cheese to meatless hot dogs. Soyfoods are very widely available on Vancouver Island.

Sunrise and Michael jointly import Mori-Nu tofu into Canada from Japan. Also Sunrise distributes some juice products for which Michael is the broker. Mori-Nu does not sell well in supermarkets because it's retail price is too high. Address: President, New Age Marketing, P.O. Box 39590, White Rock, BC, V4A 9P3, Canada. Phone: 604-538-0127.

10002. *Toyo Shinpo* (*Soyfoods News*). 1993. Tôfu gyôsha-su ni-man kendai o iji [The number of tofu shops in Japan is still above 20,000]. June 21. p. 1. [Jap]
• ***Summary:*** As of Dec. 1992 (Heisei 4) there were 20,140 registered tofu shops in Japan, 725 less than 1 year earlier. The number in each prefecture is also given.

10003. Kushi, Michio; Kushi, Aveline; Jack, Alex. 1993. Macrobiotic diet: Revised and enlarged edition. Tokyo and New York: Japan Publications. 400 p. June, Illust. Index. 21 cm. [67 ref]
• ***Summary:*** Edited by Alex Jack, this is the revision of a book with the same title first printed in 1985. The table of contents of this edition is identical to that of the 1985 edition. However, this edition has been "expanded to include information on natural foods that have recently become available; the latest research on cancer and diet; AIDS and diet; the U.S. government's landmark report on Diet and Health, and the China Study; as well as a wealth

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of information on the impact of our dietary choices on the earth's environment" (from the rear cover).

Since the physical dimensions (21.2 cm tall) are smaller, the text is on different pages. For example, Japanese black beans (see below).

The chapter on "Beans and bean products" has the following contents: Daily use. History. Quality. Varieties: Azuki beans, black-eyed peas (sometimes known as yard-long beans), black turtle beans, broad beans, chick-peas, great northern beans, kidney beans, lima beans, lentils, mung beans, navy beans, peas, pinto beans, soybeans (p. 195-99) (introduction, miso, natto, okara, soy flour, soy grits, soy milk, soy oil, shoyu, tempeh, tofu {incl. nigari, fresh tofu, soft tofu, firm tofu, deep-fried tofu, pickled tofu, fermented tofu, frozen tofu, dried tofu}), viilia, soy yogurt, yuba.

For information on cooking soy, see p. 204-07. Note: Natto is not usually made with koji (p. 207). For "Health benefits" and for "Soy foods and cancer research" (p. 208-09).

Black soybeans (also known as "Japanese black beans") are mentioned as follows: "The smaller varieties of azuki beans, lentils, chick-peas, and black soybeans contain less fat and oil and are preferred for daily use" (p. 60). "Bean rice: Besides azuki beans, other beans and legumes such as lentils, chick peas, yellow or black soybeans, and [common] black beans can be cooked together with brown rice in a proportion of 10 to 15 percent beans and 85 to 90 percent rice" (p. 121). The chapter titled "Beans and bean products" (p. 189) begins: "In the standard macrobiotic diet, whole dried beans and bean products are usually eaten daily or several times per week and comprise about 5 to 10 percent of the volume of total food consumed. Beans that are more northerly in origin, smaller in size, and contain less fat and oil than other varieties, such as azuki beans, lentils, chick peas, and black soybeans are eaten most frequently." In the same chapter, the section on "Cooking methods" (p. 200). "In general, chick peas, black soybeans, and other hard beans should be soaked 6 to 8 hours or, preferably overnight, if boiled, and a minimum of 2 hours if pressure cooked." "In order to allow the inside and outside of the beans to cook evenly, beans are usually seasoned toward the end of cooking... In the Far East, a small strip of kombu is traditionally added to the bottom of a pot of beans. The mineral-rich sea vegetable adds flavor to the beans... and improves their digestibility." "Shocking is a traditional method of preparing beans in the Far East." It is described in detail (p. 201). In the section titled "Soybeans" (p. 204) black soybeans are also discussed.

"Natto is a fermented soybean product that resembles baked beans connected by long sticky strands. Its strong odor takes some adjusting to but once appreciated natto is enjoyed regularly as a small side dish or condiment" (p. 196). Address: 1-2. Brookline and Becket, Massachusetts.

10004. Messina, Mark. 1993. Are you ready for the age of the soybean? *Mori-Nu Healthy Life* (*Los Angeles*) 5(2):1. 2nd quarter.

• ***Summary:*** "The food that has been at the center of the Chinese diet for the past 20 centuries is taking the United States by storm. Over the past decade more that 2,000 new soyfoods have entered the market. The soyfoods industry is big and growing. Chances are, many of you are already familiar with some of these products, which range from tofu to soymilk to pizza topped with mozzarella-like soy cheese.

"But soyfoods aren't just hot–they're healthy! Consider the following:" Discusses recent scientific studies showing the health benefits of soy. And getting all of these health benefits is easy.

Note: This 6-page issue (each page 8½ by 11 inches) also contains: (1) Editor's column, by Susan Buchér. (2) Soy research updates. (3) "The exercise diet," by Holly Rudin-Braschi, M.A. Get fresh: Examples of healthy fresh vegetables. (4-5) Recipes and coupons. (6) Reader's forum (letters from readers). Order form for Mori-Nu Tofu or books or videos. Application for membership in the "Health for Life" club, which gets you: 4 issues of Healthy Life. Mori-Nu recipes. 12 Mori-Nu Tofu 15¢-off coupons. Address: PhD.

10005. Morinaga Nutritional Foods, Inc. 1993. The star. The supporting cast (Ad). *Health Foods Business* (*Elizabeth, New Jersey*). May. p. 41.

• ***Summary:*** The left half of this 8½ by 11 inch color ad shows the three different types of Mori-Nu tofu stacked one atop the other. The right half shows the "supporting cast of product brochures, recipe tear-offs, videos, a display merchandiser [that displays 24 packs of tofu] and the new, highly acclaimed, *Tofu and You–A Personal Weight-loss Program and Healthy Eating Plan...* To join the Mori-Nu Fan Club call 1-800-NOW TOFU."

This ad also appeared in *Natural Foods Merchandiser* (June 1993, p. 58). Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 310-787-0200.

10006. Nagayama, Hisao; Tokue, Akihiko. 1993. The naked kitchen: Shôyu. *Look Japan* (*Tokyo*) 39(447):24-25. June.

• ***Summary:*** Color photographs of 4 types of shoyu in shallow plates, each with a pattern on the bottom, show that shiro shoyu is the lightest in color, followed by usukuchi shoyu, koikuchi shoyu, and finally tamari (the darkest). Usukuchi, popular in the Kyoto area, is salty as well as light. "Among the more celebrated local varieties is Nagoya's shiroshôyu, a nearly transparent liquid whose slightly sweet taste sets it apart." No sashimi is complete without shoyu.

10007. Ogawa, Tadashi; Tsuji, H.; Bando, N.; Kitamura, K.; Zhu, Yue-Lin; Hirano, H.; Nishikawa, K. 1993. Identification of the soybean allergenic protein, *Gly m* Bd 30K, with the soybean seed 34-kDa oil-body-associated protein.

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Bioscience, Biotechnology, and Biochemistry 57(6):1030-33. June. [11 ref]
• ***Summary:*** This soybean allergenic protein, which is most strongly and frequently recognized by the IgE antibodies in sera of soybean-sensitive patients with atopic dermatitis, has been characterized. The allergen was isolated from the crude 7S-globulin fraction by gel-filtration chromatography. It has a molecular weight of more than 300,000. Address: 1. Dep. of Nutrition, School of Medicine, The Univ. of Tokushima, Kuramoto-cho 3, Tokushima 770, Japan.

10008. Shurtleff, William; Aoyagi, Akiko. comps. 1993. Tempeh and tempeh products–Bibliography and sourcebook, 1815 to 1993: Detailed information on 616 published documents (extensively annotated bibliography), 423 commercial tempeh products, 216 original interviews (many full text) and overviews, 247 unpublished archival documents. Lafayette, California: Soyfoods Center. 449 p. Subject/geographical index. Author/company index. Language index. Printed June 4. 28 cm. [2078 ref]
• ***Summary:*** This is the most comprehensive book ever published about tempeh and tempeh products. It has been compiled, one record at a time over a period of 18 years, in an attempt to document the history of this subject. Its scope includes all known information about tempeh, worldwide, from 1815 to the present, plus detailed information on each of the following four closely related subjects–the first three of which are popular Indonesian foods:

1. Onchom (125 records; also spelled ontjom or oncom; peanut presscake or okara fermented with *Neurospora*). *Neurospora* is the single most important mold used in genetic and biochemical research; 2. Tempeh bongkrek (49 records; made from grated coconut or coconut presscake). 3. Non-soy relatives of tempeh (54 records, such as winged bean tempeh). 4. Early studies on *Rhizopus* molds in which tempeh is not mentioned (43 records).

This book is also the single most current and useful source of information on each of these five subject, since 79% of all records contain a summary/abstract averaging 125 words in length.

This is one of more than 40 books on soybeans and soyfoods being compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyfoods Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features: 35 different document types, both published and unpublished; every known publication on the subject in every language–including 175 in Japanese, 140 in Indonesian, 96 in German, 68 in Dutch, etc.; 216 original Soyfoods Center interviews and overviews never before published. Thus, it is a powerful tool for understanding the development of tempeh and related products from their earliest beginnings to the present.

The bibliographic records in this book include 616 published documents and 247 unpublished archival documents. Each contains (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English publications together with an English translation of the title, month and issue of publication, and the first author's first name (if given).

It also includes details on 423 commercial tempeh products, including the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as references to and summaries of advertisements, articles, patents, etc.) are also given.

Details on how to make best use of this book, a complete subject and geographical index, an author/company index, a language index, and a bibliometric analysis of the composition of the book (by decade, document type, language, leading periodicals or patents, leading countries, states, and related subjects, plus a histogram by year) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 510-283-2991.

10009. *Toyo Shinpo* (*Soyfoods News*). 1993. Kaigai foto: Chûgoku, Unnanshô ni atta kotsubu nattô [Overseas photo: Natto made from small-seeded soybeans found in Yunnan province, China]. July 11. p. 2. [Jap]
• ***Summary:*** A photo taken in China, at about the time this article was written, shows the soybeans on a circular tray. The article states: In Yunnan province of China, their culture and foods are very much like Japanese–or so we hear. The gate of Tokukôshû, [?] shi, at their open market, their vendors selling nattô among rakkyô pickles and mountain vegetable (*yamana sansai*) pickles. Their natto soybeans are smaller than those of Japan and their natto does not have as much stickiness / stringiness as Japanese natto. But their natto does have that special natto taste spreading in your mouth. They said "Everyone loves natto." I am not surprised since they are part of the same Ye Shulin culture (*Shôyôjurin bunka*) their food culture might also be similar. The price of their natto was 1 gen (about 23 yen) for 1 cup.

Note 1. Yunnan is a large province located in the far southwest of China; the capital is Kunming. The province borders on Burma, Laos, and Vietnam. Ethnic minorities in Yunnan account for about 34% of its total population. Major ethnic groups include Yi, Bai, Hani, Zhuang, Dai and Miao.

Note 2. Since the 1970s, Japanese anthropologists have proposed the theory that Yunnan province, in southern China, is the source of Japan's culture. One early wave of people migrated from there to Japan. In addition to rice cultivation, there are many cultural similarities.

10010. Rich, Robert. 1993. More on Rich Products Corporation's work with soy-based dairy analogs

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(Interview). *SoyaScan Notes.* July 13. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Rich Products does not have any documents in its archives on the various small companies (such as Delsoy Products) that were the first to make soy-based whip toppings starting in about 1944-45. However Bob remembers them well and what they did. Delsoy started with a filled cream named Devonshire Topping which they sold mostly in Detroit, Michigan. Then they came out with a soybean cream that was not frozen. The majority of their early sales were in the filled cream. Delsoy was never sold in Buffalo, New York, and thus was not a competitor to Rich's Whip Topping. Even after Whip Topping was frozen, Delsoy was never much of a competitor. Bob is not sure when Delsoy was launched, but he has the feeling that it was on the market only several months before his Whip Topping.

Concerning the article by F. Olmsted in the 16 April 1945 issue of the *Detroit News,* Bob (who worked for the War Food Administration or WFA) never heard of the WFA issuing an order placing a 19% limit on all fats used in any dairy product. This information was probably supplied to Olmsted by Herbert Marshall Taylor, who Bob remembers as "a wild man." Bob conjectures that maybe the reason Taylor switched to a soy-based topping was to allow him to ship the product across state lines. In those times a company could not sell a filled cream product (which was what he had) across state lines, and there were only 7 states in which filled milk products could be made and sold within the state. In fact the Milnot Company had a plant near Litchfield, Illinois, situated exactly on the state line between Illinois and Indiana. They had a filled milk processing room on each side of the line, i.e. in each state. They never made a soy-based product. At one time, Milnot started shipping its filled milk across a state line either to test the law or because they thought they could get away with it. The government seized their product and took the president to court. He was judged guilty and had to spend the weekend in jail until he could get a bail bond. He was sentenced to a year in jail but he never served time because president Franklin Roosevelt gave him a presidential pardon.

Rich Products was involved in about 40 lawsuits with various states involving its non-dairy products–and the company won them all. But if the lawsuits had taken place a few years earlier, Bob thinks Rich Products could have been beaten. The climate was changing, led by more favorable attitudes toward legalization of margarine–which replaced a dairy product. The first lawsuit against Rich Products took place in California in 1949. The charge was that Whip Topping was an imitation dairy product, and hence illegal. Arguing that the product was a replacement, not an imitation, the company won the case.

Most of the subsequent cases were against Coffee Rich (a non-dairy coffee whitener) starting in 1961. Whip Topping was not much of a threat to the dairy industry. Most milk routes used to take out 6 half pints of heavy cream (38-40% fat; housewives would use it to make whipped cream) in the morning and maybe bring back 8 in the afternoon–due to souring, etc. So heavy cream was not of much interest to milk dealers. But Coffee Rich was a real threat because much more light cream (19-20% fat; for use in coffee) and medium cream (28-30% fat; for use on cereal) was than heavy cream.

Last Wednesday (July 7) Bob celebrated his 80th birthday. He is still chairman of the board of Rich Products Corp., his son Robert Jr. is president, and Herb Kusche is executive vice president. Last year his company did $940 million is sales. Next year, which will be the company's 50th anniversary, they expect to go over $1,000 million. The company has a research department in Buffalo with 75 researchers, plus 6,000 employees and 26 plants worldwide. They have 7 people in their London office, 5 in the Hong Kong office, 6 in Mexico City, 2 in Singapore, 2 in Brisbane (Australia), and 2 in Tokyo–all their own people.

The Freeze Flo process has become very successful, especially in frozen fruits and in their great-tasting product named Bettercreme–which was launched in April 1977 and which keeps fresh without bacterial growth or spoilage at room temperature without preservatives. It is sold as such to foodservice organizations and bakeries, which keep it frozen, then whip it for use on cakes and pies; the latter will go stale before the Bettercreme! It is also used as the filling in Rich's Frozen Chocolate Eclair. Though the company spent a lot of money hoping to find medical applications for the Freeze Flo Process, nothing has yet been commercialized.

Rich Products does not have a good archives with documents from the early years of the company. "In those days we didn't save things, although we have nice displays in our memorabilia room here in our 250,000 square foot building which is called Rich Renaissance Niagara. Our offices and research center are in that building–but it houses no manufacturing operations."

Bob has heard that Edsel Ford died of either ungulate fever or cancer of the intestine. If it were ungulate fever, that could be one more reason why Henry Ford was so interested in promoting the use of soymilk–as at the Henry Ford Hospital. Bob thinks they also served a soy coffee cream (soymilk thickened with propylene glycol) at the hospital.

Note from Ford Bryan, researcher at the Ford Archives, in response to an inquiry from William Shurtleff. 1993. Aug. 9. "I'm fairly certain Henry Ford disliked cows as a boy–long before Edsel's illness. We do not seem to have a copy of Edsel Ford's death certificate. As far as we know, the cause of Edsel's death was cancer of the stomach, perhaps complicated by ungulate fever."

Talk with Herb Kusche, executive vice-president of Rich Products. 1993. July 14. "Bob Rich has a memory like an elephant; its superb." Address: Chairman of the Board, Rich Products Corp., P.O. Box 245 (1150 Niagara St.), Buffalo, New York. Phone: 716-878-8000.

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10011. Katoh, Kiyoaki. 1993. Current status of tempeh in Japan (Interview). *SoyaScan Notes.* July 20. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The Third Asian Symposium on Non-Salted Soybean Fermentation and the International Soybean Food Fair will be held in Akita, Japan, on 4-6 June 1994. There is a legend in Japan that natto originated in Akita, and there is also a large natto manufacturer there. Many countries in Southeast Asia will participate. He is still very involved in tempeh issues in Japan, and maintains a close contact with Indonesian tempeh researchers. The Tempeh Study Group (*Kenkyu-kai*) has its regular meeting twice a year and 60-70 people (including himself) typically attend. A very good and popular restaurant in Shibuya, Tokyo, named Jembatan Mérah (Red Bridge), features many delicious tempeh dishes. They feature ethnic foods, including Thai and Vietnamese cuisines. The chef of the restaurant used to work with Torigoe Seifun. Their tempeh is made by the village cooperative shop in Hyogo prefecture (initiated as part of a local community activation program). This tempeh shop ships their tempeh all over Japan, including to the Indonesian embassy in Tokyo, several Indonesian restaurants in Tokyo, and to individuals who order it. The only other tempeh shop, also part of a village activation program, is led by Prof. Kazuko Noguchi (a woman) of Saga. When Mr. Kanasugi died, the natto people discontinued their interest in tempeh. All the large private companies (Marusan, Torigoe Seifun) also stopped. Address: Tajimaya rice company, International Affairs, Japan.

10012. Katoh, Kiyoaki. 1993. New developments with soyfoods in Africa (Interview). *SoyaScan Notes.* July 20. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Mrs. Yasuko Torii is very involved in efforts to introduce soyfoods to southern Africa and South Africa, especially Capetown. Katoh joined FAO (the Food and Agriculture Organization of the United Nations) in 1987 and was a biotechnology officer there for 2 years and very much committed in Africa. He was active in work with soybeans in Nigeria, Cameroon and other countries. He has written about that work. The crucial question is how to interest African people in using soyfoods. There is now increasing South-South cooperation. For example, Indonesian people are very interested in transferring tempeh technology to Africa. The German government is sponsoring such a program on tempeh and Dr. Darwin Karyadi is leading the Indonesian work; the minister of Science and Technology, Dr. Habibi, is very keen on this. The best man to contact concerning soya in Africa is Dr. Shiv R. Singh (pronounced Sin), who used to work with IITA at Ibadan, Nigeria, and is now Director of the Western Africa Department of the World Bank in Washington, DC. He is the key man with soya in Africa. Address: Tajimaya rice company, International Affairs, Japan.

10013. *Toyo Shinpo* (*Soyfoods News*). 1993. Nattô chûshin ni shinpojiumu: 94 nen 6 gatsu Akita de kokusai Nattô kaigi hiraku [Symposium centered on natto: International Natto Symposium will be held in June 1994 in Akita]. July 21. p. 27. [Jap]

10014. Demos, Steve. 1993. New developments with soyfoods in America (Interview). *SoyaScan Notes.* July 31. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Vitasoy purchased Azumaya Inc. (America's largest tofu manufacturer, and the low-price leader) in May or June 1993 for an estimated $4-$5 million. Azumaya did not sell their building or the land on which their plant is situated. So now Vitasoy owns two large tofu manufacturers on both coasts of the USA: Nasoya in Massachusetts, and Azumaya in California.

Mr. Yamauchi sold the rest of his ownership in House Foods & Yamauchi, Inc. to House Foods of Japan. [Note: Another industry observer states that the sale took place in about April 1993 for about $2 million].

Bill Bolduc is now running a soymilk plant in the Midwest; he now makes Westbrae's soymilk. Steve sees the future of soymilk as being packaged in the new extended shelf life (ESL) gable-top carton and sold as a commodity for a lower price like cow's milk rather than as a specialty flavored beverage.

Anders Lindner told Steve in March that DE-VAU-GE wanted to sell their soymilk plant. He offered to sell the used plant to Steve for a good price in German marks. Steve never responded.

White Wave now makes about 100,000 lb/week of tofu (of all kinds). The company's reduced fat tofu is selling very well. Quong Hop is stating on two red-on-white stickers on their package that (1) their tofu is "The original reduced fat tofu;" and (2) "The original reduced fat–High protein tofu: Serving size 4 oz., Fat per serving 3 gm. Protein per serving 14 gm." Lab tests run by more than one company indicate that Quong Hop's tofu actually contains far more fat.

Steve bought Veggie Life from Leonardo Laudisio much more for the name than for the product (meatless burger) or its formula.

Update: 1993. Nov. 24. Talk with Leonardo Laudisio. On about November 8-10 White Wave secured preferred vendor status from Whole Foods Markets. They now are installing their cold-storage "set" in the individual stores; one is now in the Berkeley store. At the top in large letters is written "White Wave Vegetarian Cuisine" with the oval White Wave logo is bas relief. Address: President, White Wave Inc., 1990 North 57th Court, Boulder, Colorado 80301. Phone: 303-443-3470.

10015. Executive Committee Secretariat. 1993. The Roots

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of Biotechnology in Monsoon Asia: The Third Asian Symposium on Non-Salted Soybean Fermentation and International Soybean Food Fair. Akita Cultural Center, Akita City, Japan: 4-6 June 1994 (Leaflet). Akita, Japan. 2 p. July.
• ***Summary:*** The executive committee for this event is: Chair: Prof. Tadao Watanabe. Vice-Chair: Prof. Fumio Yamauchi. Indonesia Advisor: Dr. Darwin Karyadi. United Nations University (UNU) Food and Nutrition Programme Advisor: Dr. Abraham Besrat.

The symposium hopes to focus on South-South cooperation for technical transfer of soybean technologies (koji, tempe, natto) to Africa in order to alleviate an impending protein crisis beyond the year 2000.

Program outline: Part I: International Soybean Food Fair–Industrial/commercial exhibition and cooking demonstration of ethnic cuisine using soybean products. Part II: Public Symposium–World soybean overview with perspectives for international technical cooperation in Africa. Part III: The Third Asian Symposium on Non-Salted Soybean Fermentation. Session 1. Koji for fermented soybean (Kikkoman, Nagano Miso Institute, China, Korea, Akita). Session 2. Natto in Asia–Microbiology, enzymology, health-medical studies. Kinema of Nepal, Tuanao [Thua-nao] of northern Nepal, Bhutan. Session 3. Tempe (Overview by Dr. Darwin Karyadi, contributions from Indonesia, Germany, USA, Japan and others–on microbiology, biochemistry, nutrition, physiology, medical studies, cooking, and industrial development). Part IV: The Role of Soybeans in Africa–The Perspective beyond 2000 (organized in cooperation with UNU Food and Nutrition Program). Sessions: Agriculture of Sub-Saharan Africa and soybean development (World Bank, IITA, JICA). Tofu technology adapted to West Africa (Dr. Nakayama, IITA). Indigenous fermented legumes in West Africa. Introduction of soy into Sub-Saharan African diet. Achievements of UNU Tempe Training Program (Indonesia/UNU; with Poster presentation of UNU funded research). Proposal on South-South cooperation.

Technical tours will be organized from three participating countries: Indonesia, USA, Germany. Address: c/o Akita International Assoc., Aidex Building 8th floor, 2-1-60 Sanno, Akita City, Japan 010. Phone: 0188-64-1181.

10016. Matsuo, Masako; Hitomi, Eri. 1993. Suppression of plasma cholesterol elevation by okara tempe in rats. *Bioscience, Biotechnology, and Biochemistry* 57(7):1188-90. July. [18 ref]
• ***Summary:*** Okara tempeh is rich in soy fiber and also contains some soy protein. Isolated soy protein and casein contain no fiber. In comparison to casein, cholesterol levels in rats consuming isolated soy protein decreased by approximately 20%, whereas those consuming fermented and non-fermented okara decreased by about 30%. Address: Gifu Woman's Univ., 80 Taromaru, Gifu 501-25, Japan.

10017. Lo, Yvonne. 1993. New developments with Vitasoy (Interview). *SoyaScan Notes***.** Aug. 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** William Shurtleff begins by congratulating Yvonne for the purchase of Azumaya, and for thereby becoming the largest tofu manufacturer in the Western world. Asked if this indicates that K.S. Lo and Vitasoy plan to move from Hong Kong to the USA in 1997 when control of Hong Kong is returned to China, Yvonne says "No," noting that Vitasoy International Holdings Ltd. plans an active program of investment in the food industry in China.

The purchase of Azumaya was finalized on 27 May 1993. Vitasoy only purchased the company; they did not purchase the building or land since Azumaya never owned these. The actual negotiations took a long time; they were conducted by Yvonne and Vitasoy (USA) Inc., which also officially made the acquisition. But this is not a key point since Vitasoy (USA) Inc. is a subsidiary of Vitasoy International Holdings Ltd. (headquartered in Hong Kong). Michael Ho will soon start to run the financial end of Azumaya; Bill Mizono plans to retire at the end of this year. Bob Bergwall, tofu production manager at Nasoya Foods in Massachusetts, was planning to move to California and take over as production manager at Azumaya but, unexpectedly and very tragically, his wife died of an aneurysm. They have a very young baby, which Bob now has to take care of. No articles about the acquisition of Azumaya have yet been published; Vitasoy has been very busy and they are not especially interested in publicizing the acquisition.

Concerning the larger picture of the soyfoods industry, profit margins for manufacturers are shrinking, and a new and more difficult relationship is developing between manufacturers and distributors. Address: President, Vitasoy (USA) Ltd., 99 Park Lane, Brisbane, California 94005. Phone: 415-467-8888.

10018. Mizono, Bill. 1993. More on the history of Azumaya (Interview). *SoyaScan Notes***.** Aug. 5. Conducted by William Shurtleff of Soyfoods Center.
Address: Azumaya Inc., 1575 Burke Ave., San Francisco, California 94124. Phone: 415-285-8500.

10019. Centa, Roland A. di. 1993. Re: Introducing tempeh and tofu to Italy. Letter to William Shurtleff at Soyfoods Center, Aug. 9–in reply to inquiry. 4 p. Typed, with signature. Followed by a letter of Sept. 10 answering questions.
• ***Summary:*** Roland was one of the first people to introduce soyfoods to Italy. He was very interested in macrobiotics and was a close friend of Michio Kushi. "My interest in food was to heal people with food and I had a lot of success using a holistic approach to help people with major diseases. For all these cures I used a lot of miso, tempeh, and tofu. Good miso

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was available. However tempeh and tofu had to be locally produced. I cured people from 1980 until about 1985.

"As I am a businessman I was always business minded in order to produce, make a profit, and be able to realize my ideas–which always cost. I am educated in international law and advise corporations who want to expand abroad.

"Tempeh: There was only tempeh available for Paris, made by a lady there named Anita Dupuy, who delivered and sold it to Le Bol en Bois (a macrobiotic restaurant in Paris) and to some consulates and embassies (such as the Philippines). As I was busy elsewhere I sent Giovanna Mazzieri (of Milan, Italy) to Paris [for 1 week in Feb. 1983] to study the process. She was a very busy lady and a fan of macrobiotics after I healed her husband of a very difficult disease. She was very smart and she produced tempeh in Milan in about 1980 [actually mid-1983]. It was perfect and of very good quality. It was sold in a few health food stores. (Letter from Roland of Sept. 10 says Giovanna's tempeh was never sold commercially in stores; she produced tempeh only non-commercially from Feb. 1983 until today. Roland taught her to make tofu in June 1982; she started to make and sell it shortly thereafter).

"Actually it never took off commercially and eventually was used only for selected people, me and my patients. At that time I was very strict in eating macrobiotic. I was very sensitive to the quality of tempeh: I didn't like the acid taste. On the island of Bali I once ate some tempeh which was very acid. Therefore I used to deep freeze it in order to have it ready when we wanted tempeh with perfectly good taste. Today it is no longer produced, or only in small quantities, for the use of the family of Giovanna and some friends in Italy. As I am no longer living in Italy and I stopped curing people, unfortunately I don't use tempeh any more myself. I was interested to find out whether it worked in curing people. It did! However in order to make a profession and profit-making enterprise, I preferred to do other jobs.

"Tofu: Tofu was produced by myself. I am sure I was the only one who produced it on the basis of your teaching the first time in Italy in 1978. After seeing an ad in the *East West Journal,* I ordered your *Book of Tofu* by mail.

"Tofu already existed in Italy in Chinese restaurants in all the major cities. They called it Tau-Fu. After studying your book, I went to many kitchens in order to observe how it was produced, and with the cooks I ate the okara which was never offered to the clients of the restaurants but was seasoned very hot for themselves. The main restaurant I studied at was "La Muraglia," which means "The Wall" and which still exists.

"I then bought the Tofu Kit [made by Larry Needleman of The Learning Tree] which was advertised in the *East West Journal.* With this kit I started to make my first tofu. It was at once of very good quality.

"I started to make the equipment following the instructions in your book and twice a week produced 10 kg of tofu, which was used by my family, and sold in health food stores and later to my patients. I sold the tofu also in bakery shops where I offered the clients free samples to taste before they eventually bought it. I had a few sales. I produced the tofu in the kitchen of my apartment on Via Maffei in Milan. I got up very early and at 8 A.M. the kitchen was clean–you couldn't see anything left of the production. My wife [who was Vietnamese] didn't want to have a mess in the kitchen when she got up.

"Before I going to work as a consultant in the morning, I delivered the tofu to various shops. I didn't sell as a company because the quantity was too small to justify a commercial set-up yet. After about a year, when the whole business was working well, I transferred everything to a friend of mine who was looking for a job. He did it also in his apartment, but had problems with the neighbors who saw the kettles steaming on his balcony and they wondered what he did in his place. As nobody knew what tofu was, he said he was making some kind of cheese. The neighbors thought he might even have cows in his flat, and they managed to kick him out of his rented apartment after he had been making tofu there for about one year.

"When we heard that a company from Rimini [located 200 miles southeast of Milan and run by Gilberto Bianchini] had also started to produce tofu, we stopped production I didn't get the feedback in profit from this business; I preferred to use my time in other operations and buy the tofu made by Gilberto Bianchini at health food stores in Milan. I am sure I would have had success in Italy if I had continued. But I didn't have the support of my family, even though my wife was Vietnamese, and therefore I oriented myself to other activities. Someone who makes 10 kg of tofu in his kitchen before going to work must be a bit crazy–right?

"Nowadays in France I eat tofu about 2-3 times a week, as does my companion, Barbara, and our 4-year-old Carolina.

"Tofu-Kit: In about 1979 I produced about 100 tofu kits, which I sold for 30,000 lires to friends and other people who were interested in making their own tofu. As it was actually a copy of the American tofu-kit which I bought in the U.S., I wanted to see whether there was a real interest in this product before marketing it in Italy. Since it didn't sell very well, I didn't go ahead with it. Eventually I planned to buy the copyright from the tofu-kit people in the U.S. In 1979 I also published booklets in Italian and French titled "Tau-Fu Kit" and Tofu Kit" respectively. One was sold with each tofu kit; they were not sold separately.

"You have been for me a kind of guru, without knowing each other, because I have a lot of admiration for your approach. You are probably successful because you did only this: Writing about things related to soya." Address: 3, Boulevard d'Aguillon, 06600 Antibes, France. Phone: (33) 07-80-70.

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10020. Gain, Jeff. 1993. The origins and history of the New Uses Movement. Part III (Interview). *SoyaScan Notes.* Aug. 24. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Question: The Reagan and Bush administrations both wanted to make agriculture more subject to market forces and less dependent on government subsidies. How important was that background in creating a climate where the ideas advocated by the New Uses Council were given a fair hearing? Answer: It was quite important. There was a mind-set that said "Let's put agriculture back to work," and the new uses really opened up new market opportunities and relieved pressure from imports.

Who coined the term "New Uses Movement"? "I believe it was the group of us who developed the New Uses Council–Sam Brownback, Paul O'Connell, Allen Tracy, and myself. We talked a lot about this terminology." Jeff would guess the term "New Uses Movement" was first used in about 1987.

David E. Wright (a history professor at Michigan State University, Lansing) is writing a book about the chemurgy movement and he is making every effort to find documents about the movement. "He and I have talked about these matters at length. He's heard me speak and I've had David speak at 2-3 of our meetings."

Where did the term "value-added" come from and when did it originate? [Note: According to *Webster's Dictionary,* the term "value-added tax" was first used in 1967]. "This term goes back a number of years before 1984, though it first started to be used widely in the mid-1980s. I was involved in a lot of discussions about value-added products in the mid-1970s in Illinois and I used the term in speeches and writings from that period. In the Illinois Department of Agriculture, people like Gordon Ropp who was secretary and a state legislator and a farmer near Bloomington, Illinois, used the term at that time. Much of the early discussion came from the meat industry in the 1970s–talking about processed pork and beef–when the Japanese shut out red meat imports and wanted to produce their own. It was one of the reasons for the U.S. Meat Export Federation in the early 1980s. Then there was the big concern over the balance of trade that was a major issue in 1983-85. Talk with Jimmy Minyard about this; he's a walking encyclopedia. He was the Deputy Administrator of the USDA Foreign Agricultural Service (FAS) for about 25 years in the 1960s and 1970s. He helped design the cooperator programs, where the American Soybean Association (ASA) and the Feed Grains Council, the mink breeders, the Diamond Walnut people, and others (67 cooperator groups) have overseas offices to promote agricultural commodities and products. Helen Miller (who would know how to contact Jimmy Minyard) is executive director of the U.S. Cooperator Council; they were in the same offices as ASA until the latter closed their offices recently. To reach her, call the U.S. Feed Grains Council in Washington, DC. Currently he is retired and is now living in the Washington, DC, area."

Jeff and Hal Smedley helped organize the U.S. Cooperator Council in about 1978-79, wrote the contract with FAS, and established an office when he was at the ASA. Helen Miller was the first and only employee. Since Jeff had an office and staff in Washington, DC, he volunteered to provide office space for Helen, whom the Council hired. Helen was partially funded by the FAS because Jimmy Minyard wanted one person who was in charge of working with all of the cooperator groups.

Question: How much of the interest in New Uses was influenced by the fact that, in the case of soybeans, countries such as Brazil and Argentina, were underselling U.S. soybeans and taking away American overseas markets for soybeans and soy products? "This is an interesting question. One of the reasons I was so interested in making this idea of new uses happen this time was just that situation, where I saw our own government undercut our own industry through four soybean and corn embargoes from 1973 to 1980 [they started in June 1973, Oct. 1974, Aug. 1975, and Jan. 1980; the reason for the first 3 was to control domestic prices, whereas the fourth was directed against the USSR for its invasion of Afghanistan] I watched the Germans and the Japanese invest heavily in South America and other areas to strengthen infrastructure and set up our competitors and make them efficient producers. The U.S. was no longer considered a reliable supplier. Long before I went to work for ASA on 1 Aug. 1977, I was concerned that the international markets for all of our agricultural commodities were too unstable because of U.S. State Department and international policy objectives. Thus, in one sense, the New Uses Movement grew out of U.S. government embargoes starting almost 15 years earlier." Update: 1994. Oct. 3. Jeff resigned as head of the Corn Growers Assoc. on 1 Oct. 1994 after holding the post for over 10 years. He now lives in Hardin, Illinois. The new CEO is a woman, Chris Wehrman. She is the first female and also the first registered dietitian to serve as the CEO of a membership-based commodity organization (See *Soybean Digest* Oct. 1994, p. 19).

As of mid-1996, Jeff is with the AARC Corporation (USDA), in Hardin, Illinois. Address: Chairman, New Uses Council, c/o National Corn Growers Assoc., 1000 Executive Parkway #105, St. Louis, Missouri 63141. Phone: 314-275-9915.

10021. Tenuta, Albert. 1993. Soybean cyst nematode. *Ontario Soybean Growers' Marketing Board Newsletter.* Aug. p. 2.
• ***Summary:*** "The soybean cyst nematode (SCN) has been a major pest of soybeans for at least a century and maybe much longer. It was first reported in Japan in 1915 and since has been found in Egypt, Korea, China, Taiwan, Columbia, Argentina, Brazil (unconfirmed), the United States and Canada. In 1954, the nematode was found for

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the first time in North America in Hanover County, North Carolina. This particular area has a history of growing flower bulbs imported from Japan. The first report of soybean cyst nematode in Canada occurred in two fields in Kent County in 1987 and has since been identified in five other counties."

"What is soybean cyst nematode?... It is called a cyst nematode because the swollen, egg-filled adult female (200-600 eggs) is referred to as the 'cyst stage'." Address: Ridgetown College of Agricultural Technology, Ridgetown, ONT, Canada.

10022. Todd, Daniel; Zhang, Lei. 1993. Political and technical factors impinging on port operations: The case of Manchuria. *GeoJournal* 30(4):441-54. Aug. [28 ref]
• ***Summary:*** "Five key events have shaped port-hinterland relations in Manchuria, and accordingly, have dictated the scale and scope of port operations. They are, in chronological order: (1) The Treaty of Tientsin and the attendant opening of Newchang (Yingkou) to foreign trade in 1862. (2) The lease to Russia in 1898 of the tip of the Liaodong peninsula and the founding thereon of the port of Dalny (Dalian). (3) The seizure of Dalian by Japan in 19O5. (4) The closure of Manchuria's ports to foreign trade with the accession of communist rule in China in 1949, and (5) The reversal of that policy in no uncertain terms during the 1980s consequent upon China's conversion to "open port" thinking.

"Scarcely acknowledged because less perceptible, changes in the technology governing the characteristics and employment of ships have been equally critical in regulating port operations in this part of northern China. In particular, the twin driving forces leading to ship enlargement and specialisation have induced fundamental reorganisation of both waterfront and inland transfer facilities."

In 1907, the Japanese opened two ports on the Yalu river: Dandong and its outport of stillborn Tatungkow. Dandong, by far the larger of the two, was designed to take small steamers of 2,000 tons and as a transshipment point for Yalu River junks. Yet it was constrained from the outset by its location 40 km from the mouth of the Yalu. By 1917 it exported mostly [soy] beans and bean cake.

Figures show: (1) Map of contemporary Manchuria with major ports, cities, railroads, provincial boundaries, and mineral-rich areas. (2) Early port trade of Yingkou and Dalian. Dalian trade began in 1907 and passed Yingkou in about 1912. (3) Today's port facilities of Dalian. (4) Port throughput of Dalian and Yingkou after 1952; Dalian has grown rapidly to 49.5 in 1990, compared with 2.37 for Yingkou. (5) Map of hinterlands of Dalian and Yingkou ports. Address: Dep. of Geography, Univ. of Manitoba, R3T 2N2 Winnipeg, Manitoba, Canada.

10023. United Soybean Board. 1993. Value-added soybean summit: Gaining a competitive edge globally (Booklet). Chesterfield, Missouri: USB. 8 panels. 23 x 10 cm.
• ***Summary:*** This booklet describes an educational conference that is being organized and will be held on 20-21 Sept. 1993 at the Hotel Washington in Washington, DC. Contents: Why a summit? Summit objectives. Checkoff at work. Tentative agenda. Who should attend the summit? Benefits of attendance. How to register (cost of conference is $75.00).

The main topics on the agenda are: Adding value: The next frontier in commodity marketing. Heeding the call for improved grain quality. Protein content: Can we do better? Tapping the potential of improved oil characteristics. Molding the market for soy-based plastics. Spinning greener fibers from soybeans. Building new markets by adding value to building materials. Changing industry strategies for value-added future.

Established in 1991, the United Soybean Board (USB) uses checkoff dollars generated by soybean sales to conduct research and promotional activities–such as this summit. A letter dated 13 Aug. 1993 accompanying this booklet bills the conference as a "first-ever event. Secretary of Agriculture Mike Espy and Director of the Japanese Oilseed Processors Association Hiroshi Higashimori are just two of the dynamic speakers who have been invited to address" the conference. Address: 16305 Swingley Ridge Dr., Suite 110, Chesterfield, Missouri 63017. Phone: (314) 530-1777 or 1-800-989-8721.

10024. Sakaguchi, Noboru. 1993. Re: Early history of tempeh in France. Making good nigari tofu in France. Letter to William Shurtleff at Soyfoods Center, Sept. 3–in reply to inquiry. 1 p. Handwritten. [Jap; eng+]
• ***Summary:*** "In 1981 Anita [Dupuy] started making tempeh with a man named Jean-Luc Alonso. Anita was in charge of the commercial aspects of the business and Jean-Luc did the production. The company is no longer in business. I recently talked with Jean-Luc and I think he will be sending you more details. His address is presently "Gaia," 11 rue François Chancel, 31190 Auterive, France. Anita is now in the Netherlands.

Concerning our tofu production, in August 1985 we moved to a suburb of Paris named Champigny and changed the name of our company to Daizou. We have been producing tofu ever since. I am beginning to understand that making good tofu using natural nigari is based on getting good soybeans, so I have become very interested in agricultural issues and have begun to study agriculture. The key question is whether we can grow good soybeans in Europe.

Note: The letterhead and envelope read: Tama–Distribution de Produits Naturels. Address: Tama, 883 rue de Bernaü, Z.I. du Plateau, 94500 Champigny-Sur-Marne, France. Phone: 49 83 79 94.

10025. Nichii Company of America, Inc. Mycal Group. 1993. Reduced fat tofu: Setting the record straight (Ad).

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Natural Foods Merchandiser. Sept. p. 81.
• ***Summary:*** This full-page red, green, and white ad contains questions and answers about reduced fat tofu. Address: 23440 Hawthorne Blvd., Suite 140, Torrance, California 90505. Phone: 213-791-0010.

10026. Shurtleff, William; Aoyagi, Akiko. comps. 1993. Bibliography of koji–grains and/or soybeans cultured with *Aspergillus oryzae:* 535 references from 700 B.C. to 1993, extensively annotated. Lafayette, California: Soyfoods Center. 151 p. Subject/geographical index. Author/company index. Language index. Printed Sept. 5. 28 cm. [535 ref]
• ***Summary:*** Kôji is a Japanese word, now widely used in the Western world in the scientific and popular literature on fermented foods, Japanese foods, and natural foods. In Chinese, koji is called *ch'ü,* and the koji process was developed in China at least seven centuries before the Christian era.

The word koji was first used in an English-language document in 1867 in James C. Hepburn's *A Japanese and English Dictionary.* The earliest English-language scientific article seen in which koji was discussed in detail was R.W. Atkinson's "Brewing in Japan," published in the prestigious journal *Nature* on 12 Sept. 1878. In recent years, interest in koji has increased steadily. This bibliography lists 128 documents published since 1980 which discuss koji; 74% of them are written in English.

When Aspergillus oryzae, a mold, is cultured on cooked grains and/or soybeans in a warm place, the result is koji, which is rich in various types of enzymes. Its fragrant white mycelium, which looks somewhat like the surface of a tennis ball, has a delightful aroma resembling that of mushrooms.

Koji usually serves as the basis for a second fermentation, in which its enzymes help to hydrolyze (break down or digest) carbohydrates, proteins, and lipids (fats). Rice koji, barley koji, and soybean koji are used to make three different types of miso. Wheat and soy koji is used as the basis of the soy sauce fermentation. Rice koji is used to make both Japanese amazaké (non-alcoholic) and saké (rice wine). Soybean koji is used to make soy nuggets (also known as Hamanatto, Daitokuji natto, Douchi, Chinese black beans, etc.).

This is the most comprehensive bibliography ever published about koji. It has been compiled one record at a time over a period of 18 years, in an attempt to document the history of this subject. It is also the single most current and useful source of information on this subject available today, since 59% of all records contain a summary/abstract averaging 185 words in length.

This is one of more than 40 bibliographies on soybeans and soyfoods being compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyfoods Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features: 25 different document types, both published and unpublished; every known publication on the subject in every language–including 242 in Japanese, 226 in English (plus 75 with an English summary), 33 in German, 11 in Chinese, etc.; 16 original Soyfoods Center interviews and overviews never before published. Thus, it is a powerful tool for understanding the development of koji and related products from their earliest beginnings to the present.

The bibliographic records in this book include 478 published documents and 28 unpublished archival documents. Each contains (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English publications together with an English translation of the title, month and issue of publication, and the first author's first name (if given).

The book also includes details on 33 commercial koji products, including the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as references to and summaries of advertisements, articles, patents, etc.) are also given.

Details on how to make best use of this book, a complete subject and geographical index, an author/company index, a language index, and a bibliometric analysis of the composition of the book (by decade, document type, language, leading periodicals or patents, leading countries, states, and related subjects, plus a histogram by year) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 510-283-2991.

10027. *Toyo Shinpo* (*Soyfoods News*). 1993. Atopii ni kiku: Amaransezu nattô [Effective against atopy: Amaranth natto (new product)]. Oct. 1. p. 13. [Jap]
• ***Summary:*** A photo shows the front panel and one side of this new commercial natto product made with soybeans and amaranth.

Note: Atopy includes atopic dermatitis, eczema, etc.

10028. Johannes, Kenlon. 1993. SoyDiesel questions and answers. Jefferson City, Missouri. 6 p. Oct. 8. [Eng; Jap]
• ***Summary:*** Very well done and informative! Three pages are in English, and 3 pages are a Japanese translation of the English pages. The questions are: 1. What is SoyDiesel? 2. How is it made? 3. Why not use ethanol instead of methanol? 4. What is biodiesel? 5. How popular is biodiesel? 6. Why promote SoyDiesel / Biodiesel in the U.S.? 7. Isn't it more expensive [than regular diesel]? 8. Why would anyone use higher priced soybean-based fuel? 9. How much energy is used to produce the fuel? 10. Doesn't SoyDiesel gel in the winter? ("The gel point is slightly higher than #2 diesel, 30ºF, but there are pour point depressants available

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to lower the gel point to -40ºF"). 11. What environmental advantages are there? 12. What projects are taking place now? 13. Where is the fuel being made? (In the U.S., Procter & Gamble is making the fuel in Kansas City and it is being marketed by Interchem Environmental Inc. of Overland Park, Kansas). 14. When will it be available at the pump? 15. How is the [soybean] checkoff involved in this? 16. What can I do? Address: Executive Director, National SoyDiesel Development Board, P.O. Box 104898, 1907 Williams St., Jefferson City, Missouri 65110-4898. Phone: 1-800-841-5849.

10029. Richardson, Al. 1993. Companies using Nichii Soy Flakes, and new developments (Interview). *SoyaScan Notes.* Oct. 14. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The main American user of Nichii's soy flakes is White Wave of Boulder, Colorado, which uses the flakes in only one product–its reduced fat tofu. White Wave also makes a private label reduced fat tofu for Tree of Life in Florida. Other users are: Ashland Soy Works (Ashland, Oregon), which will be introducing a reduced fat tofu, made from 100% soy flakes, this month; Sacramento Tofu uses soy flakes only in their firm-style tofu; Calco of Dallas, Texas, uses flakes in their firm-style tofu. They buy a truckload about every 5 months. They also use whole soybeans; Dorothy Hwang, a PhD chemist, of Michigan Soy Products Co., Inc. (in Royal Oak, Michigan) uses both soy flakes and soybeans. Dr. Les Wilson made the very valuable discovery that soy flakes can be used to make reduced fat tofu.

Quong Hop recently put a sticker on their Nigari Firm Tofu that says "The original reduced fat tofu," which is in violation of FDA regulations. At the new Whole Foods store in Palo Alto, Al recently saw Wildwood's firm tofu with a little sticker on the front that said "Low fat," also a violation. The real problem is that Wildwood's tofu retails for $0.99, Quong Hop's is $1.29, and White Wave's tofu, the only real reduced fat tofu is $1.49.

Nichii has just landed a big agreement with Korea and is now shipping them about 60 tons/month of soy flakes from the plant in Iowa. They are expected to be buying 100 tons/month at the end of this year. Those flakes are being used entirely to make tofu and soymilk. They are buying it for the convenience in dealing with rush orders, and the water and space savings–not for the reduced fat properties.

Nichii's plant in Iowa is now producing a little less than 1,000 tons/month. 95% of this is non-organic soybeans and 5% is organic. There is an increase in demand from Japan for organic flakes. The plant runs a little less than 4 days a week, 10 hours a day.

95% of all soy flakes make in this plant are sold outside America, mainly to Japan and Korea. Al visited Japan earlier this year. All of the flakes in Japan are used for making tofu; none is used in meat products. Nichii/Mycal has about 250 retail stores but just a few of them make fresh tofu in the store using Mr. Chikaarashi's tofu-making machine; yet that number is increasing. 90% of the tofu sold is purchased from outside tofu manufacturers, many of them very large. Nichii sells three types of tofu, each clearly labeled: That made soybeans, that made from a mixture of soybeans and Nichii soy flakes, and that made entirely from Nichii soy flakes. Nichii says "We'll buy your tofu if you use our flakes." None of tofu sold in Japan and made from flakes is promoted for its low fat content. Address: Nichii Company of America, Inc., 23440 Hawthorne Blvd., Skypark 2, Suite 140, Torrance, California 90505. Phone: 310-791-0010.

10030. Redmond, Tim. 1993. New developments at the Soyfoods Association of America (SAA) (Interview). *SoyaScan Notes.* Oct. 29. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Tim has been very active in shepherding SAA during the past year. He is the vice president, on the executive committee, and a director. The original $30,000 grant to SAA from the American Soybean Association increased to about $40,000. SAA will soon be sending 3,000 packets to the media and 5,000 packets to health professionals. Each packet contains fact sheets, a soyfoods brochure, and a brochure announcing the "First International Symposium on the Role of Soy in Preventing and Treating Chronic Disease," which is scheduled to be held on 20-23 Feb. 1994 in Mesa, Arizona. In addition, Tim is now drafting a letter to new and prospective members, including San-J (which has never joined), Worthington Foods, Kikkoman, Ralston Purina, etc. SAA needs more money to promote soyfoods on a broad basis.

Michelle Edwards, Dan Burke's long-time secretary, is now the Executive Director of SAA.

Tetra Pak Inc. has donated $50,000 to SAA over a period of 3 years, primarily to aid in the development of soymilk standards. Note: This is the largest single grant ever received by the Soyfoods Association. As of Jan. 1995, according to Dan Burke (Treasurer of SAA) the funds are being used mainly to pay for legal advice (from Hyman, Phelps & McNamara in Washington, DC) on the standards and to promote soyfoods. Peter Golbitz, who has spent a great deal of time in compiling the standards, has not received any payment for his time. Address: Vice President of Marketing and Sales, American Soy Products, Inc., 1474 N. Woodland Dr., Saline, Michigan 48176. Phone: 313-429-2310.

10031. Seeger, Royce. 1993. Recollections of work with Eden Foods (Interview). *SoyaScan Notes.* Oct. 31. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** At age 18 Royce was introduced to macrobiotics by Jimmy Silver. He was never involved with the food buying co-op before Eden Foods started. He started working for Eden Foods in about the fall of 1970 at the store on State Street. He was married with a child, he needed a

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job, and he was interested in macrobiotics, so the job was a natural. At the time he started work, Bill Bolduc, Mark Retzloff, and Tim Redmond were working at that store. After he had worked there about a year, Michael Potter arrived. Initially he ran the cash register, stocked the shelves, and ran the 8-inch stone flour mill grinding wheat, corn, rye, rice, etc. into flour. Shortly after he started work, he also began to mill soy flour. Tom Vreeland grew the soybeans organically. Royce toasted the soybeans lightly, about half way, so that the flour could be milled more easily and was still yellow. The roasting got rid of the heavy raw taste, but some raw soy flour taste still remained. Initially the soy flour was sold in paper bags, but the bags became very oily, so they switched to packing it in 3 sizes of cello bags which we heat sealed. The bags were considered biodegradable. Eden couldn't buy too large a supply since they became brittle after a while. A printed label was affixed by hand to each cello bag. The flour was also sold in big 25 lb paper flour bags, which were stamped with a rubber stamp to indicate the contents.

Eden also made Kokoh, a macrobiotic baby cereal, which contained roasted soy flour and was also packed in the small cello bags. All the ingredients were roasted together and then ground; soy was one of the ingredients. The soy was roasted longer than it was for the flour.

Eden was also importing miso in kegs from Japan. Employees would pack the miso into 1- and 2-lb bags. Eden still imports its miso in bulk kegs.

In those days the store wasn't making much money; it had just come from being a co-op, so often the only pay employees got was to have their bills paid–such as rent, so they didn't get evicted. They didn't really get a pay check. In about 1973 Royce quit work at Eden to do some construction work for a friend, and then moved to Arizona to be with his wife's parents. After about 10 months he returned to Ann Arbor and went back to work for Eden Foods. This time he stayed until 1978, running the mill and doing packaging. Then he left for a second time; he needed to make more money.

In 1982 Royce returned to work for Eden for a third time. He started working in production at a small bottling line where Eden bottled soy sauces (imported in 55 gallon drums from Japan), vegetable oils, and vinegar. Eden still bottles its soy sauce this way. One person runs the filler, which fills 6 bottles at a time; he slides in 6 bottles, pulls down the lever which fills them, then he puts them on a conveyorized line. The next person on the line puts on caps. Finally, at a labeling machine, one person labels one bottle at a time. Then he went back into running the mill, grinding flours. Royce has been working at Eden, more or less, since 1982. However in 1987 he developed testicular cancer, which had spread throughout his lymph system. His weight dropped to 155 lb and parts of his spine had to be removed. The cancer is now in remission and he feels like he is getting stronger. Royce now serves as Michael Potter's driver, since Michael is not allowed to drive at all by himself. Royce likes working at Eden Foods, even though he is not an official employee, since he is receiving disability payments. Address: 133 S. Clinton, Manchester, Michigan 48158. Phone: 313-428-0973.

10032. Brown, Alan. 1993. Kinmata: Fine dining at a Japanese inn. *Bon Appetit* 38(10):118-22. Oct.
• ***Summary:*** Kinmata Ryokan is a nearly 200-year-old traditional Japanese inn located in Kyoto at 407 Shijo-agaru, Goko-machi, Nakagyo-ku. The owner, Haruji Ukai, who is also the chef, is the seventh generation of his family to run the inn; he greets each new guest in person when they arrive. The food at Kinmata, which is "as delicious as it is beautiful," features *kaiseki* cuisine. There are only seven rooms in two-story Kinmata and no private bathrooms. Contains two miso recipes: Broiled bean curd and eggplant with miso (Kinmata's version of dengaku). White miso soup with shrimp. Address: Free-lance travel writer based in Tokyo.

10033. Morinaga Nutritional Foods, Inc. 1993. Mori-Nu. The lowest fat tofu in the world. The others are just plain tubby (Ad). *Health Food Business.* Oct. p. 37.
• ***Summary:*** A large color photo shows two Tetra Brik cartons of Mori-Nu Lite Silken Tofu. One is Extra Firm and the other is Firm in consistency. On each front panel is written, in large letters: "Only 1% fat." A table shows that the Extra Firm contains only 1 gm of fat and 35 calories, but 6 gm of protein per 3 oz serving. This gives the consumer "The highest protein to fat ration (6:1) and less calories than any other tofu."

This ad also appeared in HFM (Nov., p. 9), and *Natural Foods Merchandiser* (October 1993, p. 79; Oct. 1993, p. 79; July 1994, p. 14).

10034. Morinaga Nutritional Foods, Inc. 1993. Pure tofu. Perfect package. The world's lowest fat tofu. Guaranteed first-day fresh (Tear-off recipe pad). 2050 W. 190th St., Suite 110, Torrance, California 90504.
• ***Summary:*** This color tear-off recipe pad (6½ by 4 inches), developed by Susan Bucher of Bucher & Russell in Los Angeles, was introduced in Oct. 1993. On the back is a recipe for savory spinach dip, a nutritional analysis, and a half-page answer to the question: "How can a protein-rich food like Mori-Nu Tofu retain all of its nutrition for months–without refrigeration?" Address: Torrance, California. Phone: 1-800-669-8638.

10035. Hillyard, Roger. 1993. Work with Erewhon, Arrowhead Mills, and The Well (Interview). *SoyaScan Notes.* Nov. 10. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Fred Rohe started out working for Thom's

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Natural Foods, a retail store in San Francisco. Then Fred bought Sunset Health Foods (a health foods retail store at 1319 Ninth St. in the Haight-Ashbury district of San Francisco) and renamed it New Age Natural Foods–at the same address. Roger thinks it was in about 1965 or 1966, because he was living in San Francisco at that time and had just gotten involved in macrobiotics–in Jan. 1966. He started buying his foods from Marina Health Foods (on Chestnut) but when Fred opened his store, Roger started buying his foods there.

At some point Fred bought a chicken farm, transformed it into a natural chicken farm, and created New Age Resources as the company that owned it.

Then Fred teamed up with Phil Parenti / Parente and they did two big things at about the same time: (1) They opened a second store on California Street in Palo Alto, which was a natural foods supermarket (perhaps the first of its type in the USA). David Mastandrea was the manager and Nik Amartseff may have run the deli. At the time the store opened in Palo Alto, Roger was on the East Coast in Boston with Erewhon. (2) Fred and Phil started a distribution company named New Age Distributing.

Then they got into financial difficulties; they had tried to do too much too fast. The stores reverted to Fred and the distribution company and chicken ranch went to Phil. That's when Phil renamed the distribution company The Well. But legally and corporately, it was still New Age Natural Foods–which was the parent company of The Well. Phil was active from day to day at The Well. Then The Well purchased Pure & Simple from Bruce Macdonald; the products at that time were apple juice, corn chips, and fruit butters. By the time of the natural distributors conference at Pajaro Dunes, California, the line had expanded to other fruit juices and Japanese imports, which were coming from Mr. Kazama of Mitoku–all sold under the Pure & Simple brand and distributed by The Well, which was now a master distributor. Some of these products were sold to other distributors, and all were sold to retail stores.

Irwin Carasso, the founder of Tree of Life, sponsored the natural food distributors conference in St. Augustine, Florida. Roger thinks Irwin was the 2nd or the 3rd person who began importing natural foods directly from Mr. Kazama in Japan–First Erewhon, then Pure & Simple, then Tree of Life. Eden Foods started importing after Tree of Life, and after that St. Augustine conference; but they imported from Muso. Initially Erewhon had insisted that everyone import the Japanese products under the Erewhon brand; they maintained that monopoly for quite a while.

At the time the *Deaf Smith Country Cookbook* was published (1973), Roger and his ex-wife Susan (and 2 kids) were living and working in Hereford, Texas. They spent a year there. While Susan was working on the cookbook, Roger was contracting with local farmers for everything from grains to maple syrup, helping to establish Arrowhead's line of consumer packaged products (graphics, copy, etc.) and (most important) he got Arrowhead's distribution system and network going, selling to other distributors. Roger was employed by Arrowhead. Irwin Carasso was one of the first to be named a wholesaler of Arrowhead Mills' products. Next came Shadowfax. The NNFA convention that year was in Washington, DC.

When they left Texas, after a year, they hopped back in the school bus, drove to Los Angeles and hung out there for a couple of weeks (staying with Bobby Orgo, who worked for Erewhon in Los Angeles), then they drove to Atascadero, but they had no destination. They went to visit Bruce Macdonald (who at that time was living in Santa Cruz, California, and working each day for The Well–Pure & Simple). He sold the Pure & Simple brand than went along with it from Southern to Northern California.

Roger, Susan and their family ended up living in Soquel, California (near the Pacific Ocean and Santa Cruz), in about mid-March 1973; his youngest son was born on March 29, right after they got settled. Jean Allison (from Boston) came out and helped Susan for a while.

The Well went out of business in about 1979. It continued to grow and expand. In very few years, it grew from $3 million to $10 million in sales. The peak year was in about 1978, then it went rapidly downhill. It had the wholesale distribution entity, a small production facility in San Jose where it manufactured fruit butters and bottled tamari and some oils, and also raised alfalfa sprouts. Then (in about 1976-77) it bought out Max Kozek, the organic wholesale supplier from Los Angeles. It also had a project to produce 40 acres of organic carrots in the San Joaquin Delta, and about 10 acres in Borrego Springs (east of San Diego). It also had some acreage of organic apples and peaches (small, real old, so there was not production and it was not of high quality), and substantial crop investments in organic produce via contracts with individual growers, as with John Mason who was a hothouse tomato grower in California. Then it bought a wholesale distribution company [Essene Traditional Foods] in Boyertown, Pennsylvania. With all those ventures, scattered near and far, The Well was (1) undercapitalized, and (2) it lost an incredible amount of money on some of its individual ventures, such as the organic carrots (nematode problems). Phil Parenti owned most of the stock at this time, but he did not have a controlling percentage. The other main stockholder was not a regular participant in the company; Roger does not remember his name. Roger had only stock options. The Well just folded up shop and disappeared; it was not sold to anyone. But the Pure & Sample brand name was sold to Jimmy Silver and John Fountain. Phil Parenti went to Monterey, California, and worked with his father in property development. Roger does not know where he is now. Address: Farley's Coffee Shop, #1315 18th St., Potrero Hill, San Francisco, California 94107. Phone: 415-648-1545.

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10036. Reischauer, Edwin O. general editor. 1993. Japan: An illustrated encyclopedia. 2 vols. Tokyo: Kodansha Ltd. Illust. (color). 29 cm. *
• ***Summary:*** First ed. 12,000 entries. Entry words also in Japanese. Also cited as: *Kodansha Encyclopedia of Japan* (by WorldCat) and *Encyclopedia of Japan* (by JapanKnowledge, which says of it): This work "enjoys a solid reputation for its accurate and elegant English, written by first-class Japanologists chiefly from prestigious Harvard University. In addition to functioning as an ordinary encyclopedia, it can be a great help for explaining Japan or matters relating to Japan in English, or when you wish to express delicate nuances of the Japanese language in English." Release date by JapanKnowledge: Feb. 2002. http://www.japanknowledge.com/contents/intro_e/cont_eoj.html. Address: Japan.

10037. Adlercreutz, Herman; Markkanen, H.; Watanabe, S. 1993. Plasma concentrations of phyto-oestrogens in Japanese men. *Lancet* 342(8881):1209-10. Nov. 13. [10 ref]
• ***Summary:*** Two Finnish and one Japanese scientist teamed up to see if diet could explain why Japanese men have a lower death rate from prostate cancer than Western men, even though both groups have about the same incidence of prostate cancers. The scientists speculated that the Japanese diet may keep small prostate cancers from growing into deadly tumors.

"A low mortality from prostatic cancer is found in Japanese men consuming a low-fat diet with high content of soy products–a rich source of isoflavonoids." Isoflavonoids are the plant version of the female sex hormone estrogen, which has been shown to inhibit cancer cells in the test tube. The researchers therefore investigated the isoflavonoid level in the blood (plasm) of 14 Japanese who ate the typical soy-rich Japanese diet and 14 Finnish men who ate the typical dairy-and-meat diet of Finland. The levels of the estrogen-like isoflavonoids were 7 to 110 times higher in the blood of the Japanese men than in the Finns. Genistein, a tyrosine kinase inhibitor, was the isoflavonoid that occurred in the highest concentration (geometric mean 276 nmol/liter). The authors hypothesize that these high phytoestrogen levels may inhibit the growth of prostate cancer in Japanese men, which may explain the low mortality from prostatic cancer in that country. Address: 1-2. Dep. of Clinical Chemistry, Univ. of Helsinki, Mellahti Hospital, SF-00290 Helsinki, Finland; 3. Epidemiology Div., National Cancer Center Research Inst., Tokyo, Japan.

10038. Reis, Ademar. 1993. History of his work with soyfoods, seitan, and gluten (Interview). *SoyaScan Notes*. Nov. 29. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Ademar, age 46, was born on 2 May 1947 in Santos, Sao Paulo, in Brazil. In the early 1950s when Brazil started growing more soybeans. His mother was a very well educated person and she liked to read; she also had many children and the family was rather poor, so they could not afford to buy meat, milk, or other animal products. Not far from their home was an agricultural department. His mother would send him there, and they would give him free soybeans, which he and his mother would cook or use to make soymilk.

He entered law school in Brazil in the early 1970s, but upon graduation he became an actor and had a theater group. At the time, life in Brazil was very hard and repressive due to the military government. He went against the government and he had to flee the country in June 1973. Since he had several Brazilian friends living in Los Angeles, he went to live with them there. One day while shopping at Erewhon on Beverly Blvd. in Los Angeles he learned about the East West Center.

He moved into the East West Center, a macrobiotic commune on [7357] Franklin Ave. in Hollywood, California 90028. At that point his girlfriend, Iseti, joined him from Brazil; they were married in America in Oct. 1975. First he started working as Roy Steevensz' assistant making foods. Then in late 1973 or early 1974 he started a company named East West Cookery, where he made Soy Burgers, which he sold to many health food stores in and around Los Angeles, including the Erewhon retail store. To make the burgers he would soak whole soybeans, pressure cook them until soft, then cool and mash them for use as a binding agent. He would mix the mashed soybeans with cooked brown rice and fresh onions, parsley, and carrots. He would shape the mixture into patties, which he baked in an oven. He made the burgers in the kitchen of the big East West Center. In terms of logistics, he would wake up at 4:00 in the morning, cook the soybeans and let them cool. Later, after others had finished breakfast in the kitchen, he would shape and bake the burgers. He would put these between buns, with lettuce, tomatoes, etc. and distribute them to stores.

After several years he decided that he wanted to move to Boston to be close to Michio Kushi. He and his wife, Iseti, went to live at the Kushi macrobiotic study house in Newton, Massachusetts. In Newton he tried to support his wife (who was pregnant) and himself by doing some translation of articles from a Brazilian newspaper. After a few months, they realized they could not make a living doing translation, so Ademar decided to move to Somerville, re-activate East West Cookery, and start making Soya Burgers again–just about the same time his son was born (in October). After making the down payment on the apartment, they found themselves out of money. So they went to see Aveline Kushi (who he met when she lectured in California) at her home in Brookline. She gave him $500 to get his business started and she put only one condition on the gift: "Don't put too much garlic in the food." He has kept in touch with her over the years.

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The Seventh Inn made the bread for Ademar's burgers' buns. First he made the burgers out of his home in Somerville, Massachusetts, but he was caught by the Board of Health, so he had to move to a commercial kitchen.

One day a young man named David came from San Diego (where he had been a lifeguard), tasted Ademar's product, and ended up working with the company for a year. Tom was also an artist, and before he left, he drew a logo, wrote "Season's Harvest" in it, and gave it to Ademar as a present. In 1977 decided to rename his company Season's Harvest. Between the late 1970s and the early 1990s Ademar developed a line of about 20 different types of sandwiches (including Solar Burger sandwiches [with Wheatmeat made from Seitan], in 1976), many different burritos (including and a Tofu and Brown Rice Burrito, in about 1978), 20 different types of salads, and carrot juice. In about 1980 Season's Harvest introduced Tuna Salad and Chicken Salad, each containing textured soy protein concentrate; these are the only two products in his line that are not vegetarian.

Until 1987 Season's Harvest did its own distribution throughout the area (Massachusetts, Connecticut, New York, Philadelphia [Pennsylvania], etc.). Then from 1987 to 1990 the company turned over part of its distribution to a natural foods distributor named Country Barn. In 1990 Country Barn went out of business, with large unpaid debts to Season's Harvest. Ademar picked up two distributors in New York: Craig Coester and Ed Wolf.

Looking for a bigger market, in the winter of 1991 Ademar contacted a little company in Massachusetts named Idyllwild Farms, which prepares food and puts food together for major airlines. He made a presentation but nothing developed. One day Continental Airlines contacted Idyllwild saying, "Look, we're having a lot of requests for vegetarian meals, what can you come up with?" Idyllwild spent a great deal of time trying to find meals that were acceptable to Continental's headquarters in Texas, but to no avail. As a last resort, in about December 1992, they went to Ademar. He set to work modifying the Dream Burger. It was an instant hit at Continental–so they asked for more vegetarian products and a dish with mushrooms and onions. Ademar designed the Vegetable Patty. Then they wanted something for breakfast, so he made the Veggie Breakfast Sausage. The first order from Idyllwild arrived in March 1993–the last arrived on 29 July 1993. Idyllwild declared bankruptcy, and Ademar lost $12,000 that Idyllwild owed his company. It was a small disaster. Fortunately, Ademar was able (by great good fortune) to reestablish his contact with Continental and today they are still ordering from him. Idyllwild had hidden the names of its suppliers. Subsequent soy- or gluten-related products included: Dream Burger (1991, June, to be renamed Dreamburger in 1994), Vegetarian Meatball, and Vegetarian Bacon Bits (1992, Feb.), Seitan (1992, June), Cajun Burrito (1992, Nov.), Vegetable Patty (1993, March), and Veggie Breakfast Sausage (1993, March).

Ademar is now looking for a plant or company to make his Veggie Breakfast Sausage. He met Ernie Mucke, who is a fourth-generation sausage maker and who owns a traditional sausage company named Mucke's. Ernie, who is in his late 30s, grew up working in the plant and knows every detail of the machinery. His 4-year-old son has many allergies so his wife started cooking vegetarian meals, which Ernie likes, so now he is very open to vegetarianism. Ernie's wife's brother, who had spiritual powers and lived in Arizona, was Ernie's spiritual guide. Just before he died, this spiritual guide told Ernie that someone would come into his (Ernie's) life and his sausage plant would be transformed, and he would end up making vegetarian foods. Ademar and Ernie are now working out plans together.

In about mid-1992 Sysco, America's largest food distributor, began to carry Ademar's products; he is with their Hallsmith Sysco division. About 6 months ago he also got into J.P. Food Services (Monarch); Harvard University buys his products. The last few months, in working with Protein Technologies International, ADM, and Central Soya, Ademar has learned many new things about food technology and product formulation. So now he is reformulating many of his products. Currently his best-selling products are Bean & Cheese Burrito, Hoomus [Hummus], Tabouleh [Tabbouleh], and Dream Burger–in that order. He now owns the largest natural-food sandwich company in New England–followed by New World.

Ademar has kept good records of his years of pioneering work with natural foods; his files may be able to add more detail and accurate dates and names to this story. He still uses macrobiotic principles in formulating his recipes to balance yin and yang, but he is not as strict as he used to be; he now eats tomatoes and eggplants. Address: Founder and owner, Season's Harvest, 52 Broadway, Somerville, Massachusetts 02145. Phone: 617-628-1182.

10039. Hesseltine, Clifford W.; Kato, Eihachiro. 1993. Natto, a little-known fermented soybean food. Peoria, Illinois. 116 p. Nov. Unpublished typescript. 28 cm. [422 ref]
• ***Summary:*** This is the most complete document seen on natto in English. Written by two eminent microbiologists, it contains a superb bibliography. Contents: Introduction. Microorganisms. Production and process. Industrial production. Enzymes: Proteases, other enzymes, fibrinolytic activity. Vitamins. Nutritive value and use. Antibacterial activity. Mucilage. Lipids. Compounds produced by ***B. natto.*** Plasmids. Phages. Nitrogen fixation. Soybean varieties used. Natto-like foods. Future possible uses of ***B. natto.*** Books containing information on natto. References.

Talk with Dr. Hesseltine. 1994. Aug. 4. This review of the literature is similar to the one he did on miso with Dr. Shibasaki. He has not worked on this book for quite a while, in part because Dr. Kato (whose family is in the natto business) does not answer his letters. He and Dr. Kato

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compiled the bibliography together, mostly from Chem. Abstracts (English) and Nakazawa 1950 (Japanese). Dr. Kato translated about 20 pages of the Japanese documents. Dr. Kato did some work on natto in Peoria with Drs. Hesseltine and Wang; they told him that if he would make a table of their results, they would write the rest of the article; he never replied. Dr. Hesseltine has copies of many of the Chem. Abstracts summaries but not many of the original documents cited.

Note: This book made an important contribution to the book *History of Natto and its Relatives* (*1405-2012*), by William Shurtleff and Akiko Aoyagi published in Feb. 2012 in pdf digital format on Google Books Address: 1. 5407 N. Isabell Ave., Peoria, Illinois 61614; 2. Meiji Univ., Tokyo, Japan.

10040. Morinaga Nutritional Foods, Inc. 1993. Introducing the world's first low-fat tofu. Let's have a holiday (Ad). *Vegetarian Times.* Nov. p. 33.
• ***Summary:*** This full-page color ad shows 2 packs of Mori-Nu Lite Silken Tofu (Firm, and Extra Firm). Contains a recipe for and a photo of a pumpkin pie made with Mori-Nu lite. A table comparing the filling of this pie with a regular pumpkin pie shows the following: Calories 122 vs. 186. Fat 0.9 gm vs. 5.2 gm. Cholesterol 0 mg vs. 67 mg. Sodium 49 mg vs. 72 mg. Protein 4 gm vs. 5 gm. Mori-New Lite contains only 1 gram of fat per serving and has a 6:1 protein to fat ratio. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 310-787-0200.

10041. Richardson, Al. 1993. Re: Nichii headquarters to relocate to Jefferson, Iowa. Letter to William Shurtleff at Soyfoods Center, Dec. 7. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "Effective March 1, 1994, Nichii Company of America, will close the the Torrance, California office, and relocate their headquarters to Jefferson, Iowa."

Mr. Richardson will remain in Southern California, where he will establish his own company. He hopes to find "synergistic products" to compliment his exclusive representation of MicroSoy Flakes, Flour, and Chips in the U.S. Address: Director, Sales & Marketing, Nichii Company of America, Inc., 23440 Hawthorne Blvd., Skypark 2, Suite 140, Torrance, California 90505. Phone: 310-791-0010.

10042. Kawasaki, Junji. 1993. Re: Your Soydiesel fuel development. Letter to Dave Asbridge, Contract Manager, American Soybean Association, 540 Maryville Center Drive, Suite 400, St. Louis, MO 63141, Dec. 20. Dec. 16. 2 p. Typed, on letterhead.
• ***Summary:*** "We are Japanese private Institute funded by private companies but partly sponsored by Japanese government and have close relationship with MITI." They have been asked to study substitutes for petroleum made from vegetable oils. He asks nine questions about soydiesel. Address: Senior Economist, Oil Industry Crops, The Inst. of Energy Economics, Japan (Nippon Enerugi Keizai Kenkyusho), Shuwa Kamiyacho Bldg., 3-13 Toramomon 4-chome, Minato-ku, Tokyo 105, Japan. Phone: 03-5401-4303.

10043. Fujita, Mitsugu; Nomura, K.; Hong, Kyongsu; Ito, Yae; et al. 1993. Purification and characterization of a strong fibrinolytic enzyme (nattokinase) in the vegetable cheese natto, a popular soybean fermented food in Japan. *Biochemical and Biophysical Research Communications* 197(3):1340-47. Dec. 30. [11 ref]
• ***Summary:*** Nattokinase is a strong fibrinolytic enzyme which was purified from natto. It was extracted from natto with a saline solution. Address: Biotechnology Research Laboratories, JCR Pharmaceuticals Co., Ltd., 3-2-61 Takatsukadai, Nishi-ku, Kobe 651-22, Japan.

10044. *Agri-Book Magazine* (*Exeter, ONT, Canada*). 1993. Beans in Canada. 20(2):1-20. Dec.
• ***Summary:*** This entire special issue is about soybeans in Canada, with emphasis on soybean production. The magazine is printed with soy ink. Articles include: Making production profitable. The key to success in soybeans (ad for Pursuit herbicide by Cyanamid). Time savings are considerable [with no till]. Machinery management: Handling high residue. Soybean board activities–An active year: 1993 Ontario soybean marketing agreement, export market development, Japanese soybean mission visits Ontario, Japanese soybeans for food use, Minimum Compensatory rates gone in 1994, board fees reduced to $0.90 per tonne effective 1 Sept. 1993, Canada's centennial symposium, soybean research and variety development. Soybean planters and drill reviewed. Be prepared for control of different weeds.

A table (p. 12) shows the sources of Japan's soybeans used for food in 1993: USA 922,000 tonnes, China 200,000 tonnes, domestic Japanese 170,000 tonnes, Canada 40,000 tonnes.

10045. Protein Technologies International. 1993. Facts–1993 (Leaflet). St. Louis, Missouri. 4 panels each side. Each panel: 22 x 9 cm.
• ***Summary:*** PTI makes the following products: Supro brand isolated soy proteins (a complete range), Fibrim brand soy fiber, Supro Plus isolated soy protein products (combine Supro with carbohydrates, vitamins, and minerals), ProPlus brand isolated soy proteins (fortified to meet the requirements of the School Lunch Program), ProCote soy polymers (functional additives for the coated paper and paperboard markets), Solka-Floc and Keycel brand powdered cellulose.

The company's world headquarters are in St. Louis,

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Missouri; it has food protein plants at Memphis, Tennessee; Pryor, Oklahoma; Ieper, Belgium; and Hannan, Japan. It has an industrial polymer plant at Louisville, Kentucky, and a dairy food systems facility at Hager City, Wisconsin. PTI also has offices in 24 countries outside the USA. Address: Checkerboard Square, St. Louis, Missouri 63164. Phone: 1-800-325-7108.

10046. Okada, Noriyuki. 1993. [Searching for thua-nao (3). Production of thua-nao at a thua-nao mill]. *Daizu Geppo* (*Soybean Monthly News*) 187:16-21. [Jap]*

10047. Okada, Noriyuki. 1993. [Searching for thua-nao (3). Thua-nao cooks in Thailand]. *Daizu Geppo* (*Soybean Monthly News*) 188:15-20. [Jap]*

10048. Bensky, Dan; Gamble, Andrew; Kaptchuk, Ted. comp. and trans. 1993. Chinese herbal medicine–Materia medica. Revised ed. Seattle, Washington: Eastland Press. xxv + 556 p. Illustrations adapted by Lilian Lai Bensky. Index. 29 cm.

• ***Summary:*** The soybean is discussed and illustrated on p. 45-46. The illustration shows several clusters of fresh soybean leaves, with flowers and pods. The pharmaceutical name of the preparation is Semen Sojae Preparatum Chinese: *dan dou chi.* Japanese: *tantôshi.* Korean: *tamdugo.* English: Prepared soybean. Properties: sweet, slightly bitter, cold or warm (depending on preparation). Channels entered: Lung, Stomach. Text in which first appeared: *Treasury of Words on the Materia Medica.*

Note: Ted Kaptchuk was born in 1947 and Andrew Gamble in 1946.

10049. Brar, Gurdip S.; Carter, Thomas E., Jr. 1993. Soybean *Glycine max* (L.) Merrill. In: G. Kalloo and B. Bergh, eds. 1992. Genetic Improvement of Vegetable Crops. Oxford, UK and New York: Pergamon Press. xi + 833 p. Illust. Index. 26 cm. [215 ref]

• ***Summary:*** This very interesting chapter is about breeding soybeans for food uses. Contents: Introduction: Domestication for soyfood use, westward spread. Cytology: Karyotype, aneuploids, chromosome interchanges, interspecific hybridization. Genetics: Linkage maps, restriction fragment length polymorphism and amplification DNA length polymorphism. Breeding objectives: Important soyfoods, heightened Western interest in soyfoods. Germplasm resources. Reproductive biology: Flower biology, cross-pollination, male sterility. Breeding strategies and methods. Genetic traits and soyfood variety development: Seed size, protein and oil content, oil composition, lipoxygenase genes, sugar content, swell ratio, hilum color, protein composition and texture. Biotechnology and its applications: Rapid multiplication of valuable genotypes, somaclonal variation, introgression of valuable traits from perennial species (especially of subgenus *Glycine* into *G. max*), other uses, transformation, criteria of successful germline transformation event, *Agrobacterium*-mediated transformation, protoplast transformation and regeneration, transformation by particle bombardment, cell, protoplast and tissue culture, regeneration from immature / mature cotyledons or immature embryos, regeneration from leaves, protoplast culture and plant regeneration. Future prospects.

Tables: (1) Major producers and consumers of soybean, 1989-90. (2) Soybeans consumed as soyfoods in Japan in 1986. (3) Publicly released US soybean varieties developed for (or utilized in) the soyfoods market. (4) Agronomic and chemical characters of Japanese and US varieties grown at Clayton, North Carolina, USA, in 1988. (5) A partial listing of soybean seed requirements for selected soyfoods consumed in Japan. (6) Selected Japanese soyfoods varieties. (7) Traits genetically engineered into soybeans.

10050. Bud, Robert. 1993. The uses of life: A history of biotechnology. Cambridge, MA; New York, NY: Cambridge University Press. xvii + 299 p. Illust. Index. 24 cm. [557 ref]

• ***Summary:*** Contents: List of illustrations. Foreword by M.F. Cantley (Concertation Unit for Biotechnology in Europe {CUBE}). Acknowledgements. Introduction. 1. The origins of zymotechnology: Introduction, the chemical roots of zymotechnology, from zymotechnology to organic chemistry, the biological alternative, agriculture, brewing, zymotechnics as trademark (zymotechnology, fermentation, the Zymotechnic Institute of Chicago [Illinois]). 2. From zymotechnology to biotechnology. 3. The engineering of nature. 4. Institutional reality. 5. The chemical engineering front. 6. Biotechnology–the green technology. 7. From professional to policy category. 8. The wedding with genetics. 9. The 1980s: between life and commerce. Epilogue. Notes. Sources.

Chapter 1, a fascinating history of the early days of biotechnology, discusses: Emil Christian Hansen, Berlin's *Institut für Gaerungsgewerbe,* Louis Pasteur (p. 6-7), the German father of chemistry and Prussian court physician Georg Ernst Stahl (1659-1734), his interest in phlogiston, zymotechnics and practical teaching of brewing, in 1762 the word *zymotechnie* entered the exclusive dictionary of the Académie Française (p. 8-9), Mary Shelley and her novel *Frankenstein* (published in 1817; Frankenstein's teacher, Professor Walden, admired the results of chemistry), the 1928 synthesis of urea by Friedrich Woehler caused the distinction between natural and chemical products to blur and almost disappear, the implications were explored by his friend, the brilliant chemist, teacher, and publicist Justus Liebig who shared Stahl's faith in practical applications, Liebig came to be increasingly identified with the chemistry of agriculture and physiology, and organic chemistry, his pupils August Hofmann and James Muspratt, Adolf Baeyer

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who was Liebig's successor at Munich created a school based on the study of natural products (p. 10-11), Emil Fischer, Baeyer's greatest pupil, explored the carbohydrates and proteins, competition in Germany between organic chemistry and biochemistry, German Professor Julius Wiesner and his book *Raw Materials of the Plant World* (*Die Rohstoffe des Pflanzenreiches*) (p. 12-13).

"In 1857, Pasteur demonstrated that lactic acid fermentation was the result of the action of live microbes. Through the next decade, he debated increasingly hotly with Liebig who insisted on the purely chemical origins of fermentation phenomena. Pasteur constructed a new scientific discipline based on his understanding of microbes, 'microbiology.' Where chemistry was characterized by the balance, the new science had its own central instrument, the microscope" (p. 14).

The 19th century in Europe saw the rise of major cities such as Paris and London, and the expansion of the industrial revolution in Britain. "Academic leaders argued that they should play their part in helping a development of the society that would avoid the division into a declining agricultural sector and an impoverished industrial proletariat.

"The first German agricultural college was established in the year of Prussia's humiliation at the hands of the French, 1806, by a practical agriculturalist much impressed by British achievements, A.E. Thaer. His academy at Möglin was combined with the newly established University of Berlin in 1810. Largely inspired by Thaer's example, twenty agricultural colleges were founded in German-speaking lands between 1818 and 1858. The development of trades traditionally closely associated with agricultural development would also enable organic change."

"So far the emphasis was on teaching. However, all over Europe research followed.

"In France, Boussingault founded his private agricultural research laboratory at Bechelbronn in 1835, and Lawes and Gilbert established their laboratory at Rothamsted near London in 1842. These initiatives inspired, in Germany, the foundation of a research laboratory at Möckern (Moeckern), in 1851. Two years later, another followed in Chemnitz. By 1863, there were seventeen and, by 1877, fifty-nine so-called research stations in Germany. In the United States, the Morrill Act of 1863 and the Hatch Act of 1887 sustained the development of land grant colleges and associated agricultural research stations [sic, experiment stations] (p. 16-17)."

Brewing was an agricultural industry and increasingly big business in Germany and Britain, the foundation of the world's first major chemical association, the Chemical Society of London in 1841 was driven by the energies of Robert Warington, German leaders were J.J. Steinmann (1799-1833) and Carl Balling–who espoused the term *Zymotechnik* in the 4th volume of his classic text on brewing (*Account of the Progress of the Zymotechnic Arts and Sciences*). "Just as agricultural centres had moved from a purely educational role to a greater influence on research, so this process could be observed in the special case of brewing. The first great centre, established in 1872, was at the school at Weihenstephan near Munich where brewing had been taught for more than twenty years. Its formation was driven by the entrepreneurial pharmaceutical chemist Carl Lintner, who within three years of arriving at Weihenstephan in 1863 had founded his journal, *Bayerische Bierbrauer.* In the first volume, Lintner ran a series of historical articles about the life of Balling, as the first of the founders of zymotechnics 'for future cultural historians' (p. 18-19)."

Emil Christian Hansen and the damaging effects of wild yeasts, Balling identified the role of yeast in brewing before Pasteur, debate over use of the words zymotechnology vs. Pasteur's microbiologie (p. 20-21). Alfred Jorgensen popularized the word "zymotechnics," John Ewald Siebel started a journal titled *Zymotechnic Magazine* in Chicago and in 1901 he founded the Zymotechnic Institute. "Siebel was widely respected and sufficiently renowned to be the focus of a 1933 *History of Brewing in America.*

Chapter 2 (p. 48-49) discusses William J. Hale, Henry Ford, and the rise of Chemurgy in America. "Hale did not distinguish too fastidiously between the boundaries of chemistry and used his word rather as others had employed 'zymotechnology.'" A photo shows "Henry Ford demonstrating the strength of a car body made from soya bean-based plastic in 1941."

Chapter 5 (p. 106-09) discusses Japan as the dominant center of the fermentation industry by the 1960s, and the koji mold. "In Japan, the development of microbiology was closely related to agricultural development and found an institutional home in the Agricultural Chemistry Society established in 1924. So, for all the special features of Japanese culture, the concept of a microbiology harnessed to agriculture closely paralleled chemurgy in the United States. There is a strange irony in this, since the promoters of chemurgy were strongly nationalistic and particularly anti-Japanese.

In 1936, the key appointment of Kin-ichiro Sakaguchi as professor of agricultural chemistry at the University of Tokyo established the reputation of the nation's premier department of industrial microbiology."

The Danish firm of Novo Industri emerged as the world's largest enzyme manufacturer. Not until 1974 did Novo and Gist Brocades in the Netherlands develop cheap and effective methods for using enzymes to convert the glucose in corn to fructose (glucose isomerase). Otto Röhm (Roehm) patented an enzyme preparation for washing in 1913, and his company Röhm & Haas marketed their presoak product 'Burnus' for about 50 years.

The subsection titled "Biogas and gasohol" (p. 132-33) notes that in 1974, a sugar magnate in Brazil, Urbano Stumpf, persuaded the country's president that alcohol made

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from sugar could by itself power all Brazil's cars, replacing petroleum. Brazil committed great resources to this program and by 1980 was seen as a model to the world. America, too, was interested in reviving what Hale had called "agri-crude" and what was coming to be called "gasohol."

The subsection on "single-cell protein" (p. 133) discusses chlorella, tempeh, soya texturized to make an artificial meat, and growing microorganisms on petroleum for food. Max Delbrueck had called yeast an "edible mushroom."

Monsanto and the Plant Variety Protection Act of 1970 (p. 195). Address: The Science Museum, London, U.K.

10051. Chomchalow, Narong; Laosuwan, Paisan. eds. 1993. Soybean in Asia: Proceedings of the planning workshop for the establishment of the Asian Component of a global network on tropical and subtropical soybeans. Bangkok, Thailand: FAO Regional Office for Asia and the Pacific. viii + 218 p. Held 2-7 March 1992 at Chiang Mai, Thailand. RAPA Publication (FAO), No. 1993/6. Illust. No index. 25 cm. [76 ref]

• ***Summary:*** Preface. List of contributors. Acronyms and abbreviations. Part I–Opening session: Welcome address. Remarks, Inaugural address.

Part II–Endorsement and recommendations: Endorsement of network. General recommendation.

Part III–Country reports: Australia, Bangladesh, China, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Republic of Korea, Sri Lanka, Thailand, Vietnam.

Part IV–Institutional Parts: AVRDC, CGPRT Centre, FAO, INTSOY.

Part V–Special Reports: Oilseed crops development project, achievements on soybean research and development. The history of soybean in the Orient. Soybean processing, utilization and marketing in the Philippines. Soybean production, utilization, research and development in Taiwan. Biotechnological research on soybean at Kasetsart University. Address: 1. Regional Plant Production Officer (Industrial Crops); Both: FAO / RAPA (Regional Office for Asia and the Pacific), Bangkok, Thailand.

10052. Chomchalow, Narong; Kueneman, E.A.; Hicks, P.A. 1993. Institutional report 3–FAO. In: N. Chomchalow & P. Narong, eds. 1993. Soybean in Asia: Proceedings of the Planning Workshop for the Establishment of the Asian Component of a Global Network on Tropical and Subtropical Soybeans. Bangkok, Thailand: FAO Regional Office for Asia and the Pacific. viii + 218 p. See p. 164-172. RAPA Publication (FAO), No. 1993/6.

• ***Summary:*** Contents: (1) Introduction. (2) FAO's involvement in soybean research and development in Asia. (3) The FAO-executed projects: National projects (Sri Lanka, Vietnam, Philippines), regional projects. (4) Other FAO-supported activities: Networking (Global Soybean Research Network, Asian Soybean Network), evaluation (Buhler's Full-fat soybean processing technology, Plenty's soymilk production in Sri Lanka, Danish Turnkey Dairies soymilk plant).

Tables: (1) Soybean production, area harvested, and yield in developing and developed countries in Asia: Developing countries: Bhutan, Cambodia, China, DPR Korea (north), India, Indonesia, Iran, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Rep. of Korea (south), Sri Lanka, Thailand, Vietnam. Developed countries: Australia, Japan, New Zealand. (2) Activities involving soybean sponsored by RAS/82/002 (1983-89). (3) Activities involving soybean sponsored by RAS/89/040 (1990-93).

Regional projects RAS/82/002: "During the period of 1983-89, an FAO-executed and UNDP-funded project, RAS/82/002, entitled "Research and development of Food Legumes and Coarse Grains {FLCG} in the Tropics and Sub-Tropics of Asia" was operated. This project involved Bangladesh, Indonesia, Lao PDR, Nepal, Pakistan, the Philippines, Republic of Korea, Sri Lanka, Thailand, and Vietnam. The project was planned in two phases; the duration of Phase I was 2 years, and activities began in September 1983. The proposed UNDP contribution for this phase was US $450,000 and the actual expenditure was US $454,394. Phase II was approved in August 1985 but implemented in July 1987 and concluded in June 1989. Total UNDP contribution for both phases was US $1,331,453.

"The long-term objective of the project was to increase production of FLCG in the participating countries in order to bridge the gap between the demand for protein-rich food for domestic needs and export markets and the actual production. One of the main goals of the project was to establish a network of national institutions, linked with international institutions capable of advancing the relevant development objective of participating countries through coordinated research and extension activities."

RAS/89/040: "A follow-up project of RAS/82/002, entitled 'Regional Cooperative Programme for the Improvement of Food Legumes and Coarse Grains in Asia', funded by UNDP, is being executed by FAO. It became operational in April 1990 and has a termination date of December 1993. Four more countries (China, India, Myanmar, and Malaysia) joined the network in this follow-up phase. The Government of Indonesia continues to provide the Secretariat."

Table 1: Bhutan: Soybean production increased from 900 tonnes (metric tons) in 1981 to 1,300 tonnes in 1991.

Cambodia: Soybean production increased from 1,100 tonnes in 1981 to 16,000 tonnes in 1991–growing at 28.0% a year on average.

North Korea: Soybean production increased from 350,000 tonnes in 1981 to 460,000 tonnes in 1991–growing

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at 2.5% a year.

Iran: Soybean production increased from 62,000 tonnes in 1981 to 105,000 tonnes in 1991–growing at 0.8% a year.

Laos: Soybean production increased from 3,900 tonnes in 1981 to 4,200 tonnes in 1991–growing at 1.3% a year.

Papua New Guinea: Either had no soybean production or no information was available.

New Zealand: Soybean production decreased from 300 tonnes in 1981 to 100 tonnes in 1991–decreasing at -11.0% a year. Address: 1. Regional Plant Production Officer (Industrial Crops), 2. Regional Agricultural Engineering and Agro-Industries Officer: Both: FAO/RAPA, Bangkok, Thailand; 3. Senior Officer, Plant Production and Protection Div., FAO, Rome, Italy.

10053. Fujita, Frank. 1993. Foo, a Japanese-American prisoner of the Rising Sun: the secret prison diary of Frank "Foo" Fujita. Denton, Texas: University of North Texas Press. xviii + 371 p. Foreword and notes by Stanley L. Faulk. Introduction by Robert Wear. Illust. Index. 25 cm. Series: War and the Southwest, No. 1.

• ***Summary:*** Page 148: "As the war progressed and supplies diminished, the carpenters were not permitted to build coffins anymore. Instead *miso* barrels were used. *Miso* is a reddish brown paste made from soy beans and has a very good flavor. The barrels were about thirty inches in diameter and twenty-four inches tall. A dead body would not fit into a barrel that size, so the bones of the corpse were broken in order to cram the body into the barrel... the dead were taken away and cremated."

Page 149-50: The mosquitoes were even worse than the fleas and bed bugs because their bites would itch for a much longer time. "Everyone complained so much that the Japanese decided to let us cover the large cracks between the planks of the walls and the ceiling. They gave us stacks of old Japanese newspapers to be torn into strips... The galley made up a lot of rice or wheat paste, and each room was issued two soy sauce buckets full of paste to stick the newspaper strips up with."

Page 163: He liked to catch little smeltlike fish, from 3-6 inches in length, "then he would have me cook them for him. He liked them cooked whole by dipping them in a soy sauce and sugar mixture and then broiling them over the coals in the hibachi."

Page 293: "Our noon chow was one bread bun per man and nothing else. They were mildewed and almost inedible. There was a very small amount of *miso,* a fermented soybean paste, mixed with some parched soybeans, and we drew lots to see who would share this... Cigarettes were now back down to one per day."

10054. Kataoka, Haruyo. 1993. Japan: A cookbook. Munich, Germany: Mosiak Verlag. 157 p. Index. [Eng]*

• ***Summary:*** This book contains one section (2 pages) that discuss tofu, including how to make tofu at home, followed by 15 tofu recipes. Other dishes using soy appear elsewhere, like Plum Wine with Soya, Milk Jelly, and some dishes that use miso as an ingredient.

Note: This book was originally published by in 1990 Mosiak Verlag in German.

10055. Kitamura, Keisuke. 1993. Country Report 6–Japan. In: N. Chomchalow & P. Narong, eds. 1993. Soybean in Asia: Proceedings of the Planning Workshop for the Establishment of the Asian Component of a Global Network on Tropical and Subtropical Soybeans. Bangkok, Thailand: FAO Regional Office for Asia and the Pacific. viii + 218 p. See p. 64-69. RAPA Publication (FAO), No. 1993/6.

• ***Summary:*** Contents: (1) Production and uses. (2) Research activities. (3) Germplasm.

Germplasm: "Soybeans were introduced from abroad since the old days. Genetic resources of landraces were continuously collected and surveyed since the beginning of this century. In recent years, a number of soybean varieties were introduced from many foreign countries and international institutions, including Korea, China, Nepal, Thailand, USA, AVRDC, etc. Today the total soybean accessions are about 6,000 including wild soybeans. They are conserved and managed in the National Center of Genetic Resources within the National Institute of Agrobiological Resources."

Figures: (1) Scheme of domestic soybean price in Japan. (2) Geographical distribution of soybean varieties according to their ecotypes and location of soybean breeding stations in Japan.

Tables: (1) Planted area, production and yield of soybean in Japan. Total planted area has decreased from 306,000 ha in 1960 to 146,000 ha in 1990. Production has decreased from 418,000 tonnes (metric tons) in 1960 to 220,000 tonnes in 1990. Yield has increased from 1,360 kg/ha in 1960 to a peak of 1,790 kg/ha in 1990. (2) Trends of soybean supply and demand. Japan's imports have increased from 3,244,000 tonnes in 1970 to 4,330,000 tonnes in 1991, when 97.3% of the soybeans used in Japan were imported. Uses of soybeans in 1990: Oil 3,630,000 tonnes–up from 2,505,000 tonnes in 1970. Food 725,00 tonnes–up from 522,000 tonnes in 1970. Fermented products (miso, shoyu, natto) 196,000 tonnes–down from a peak of 208,000 tonnes in 1980. Animal feed 95,000 tonnes–up from 10,000 tonnes in 1970. (3) Trends of soybean price. (4) Trends of seed production. (5) Soybean research activities in Japan. (6) Objectives of the respective breeding stations for soybean. (7) Characteristics of the leading and some unique soybean varieties in Japan. For each of 15 varieties gives: Name, year registered (1928-1991), breeding method (crossing, pure line, mutation, back-crossing), ecotype, weight of 100 seeds, seed color, hilum color, characteristics. Address: National Agricultural Research Centre, Tsukuba City, Japan.

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10056. Lock, Margaret M. 1993. Encounters with aging: Mythologies of menopause in Japan and North America. Berkeley, California: University of California Press. xliv + 439 p. Illust. Index. 24 cm. [552* ref]
• ***Summary:*** This is an extremely interesting, carefully researched, original book. However, soy is not mentioned. Contents: List of illustrations. Acknowledgments. Prologue: Scientific discourse and aging women. Part 1: Japan: Maturity and *kônenki.* 1. The turn of life–Unstable meanings. 2. Probabilities and *kônenki.* 3. Resignation, resistance, satisfaction–Narratives of maturity. 4. The pathology of modernity. 5. Faltering discipline and the ailing family. 6. Illusion of indolence–Ideology and partial truths. 7. Odd women out. 8. Controlled selves and tempered bodies. 9. Peering behind the platitudes–Rituals of resistance. 10. The doctoring of *kônenki.* 10. "Invisible messengers." 11. The making of menopause. 12. Against nature–Menopause as herald of decay. "An act of freedom." Epilogue: The politics of aging. Flashes of immortality. Notes. Bibliography.

Concerning hot flashes and night sweats (p. 29-30): Dr. Mori Ichirô, who works in Kyushu, has spent the greater part of his career doing research on *kônenki.* He thinks that neither its definition not its symptoms coincide with the current Western concept of menopause. Few Japanese accept the idea that *kônenki* is a state that demands medical care–such as hormone replacement therapy. Rather, it is a natural part of the aging process. Herbs can be effective against a wide range of *kônenki* symptoms (p. 296-97).

Concerning osteoporosis in postmenopausal Japanese women: Although the research is limited, there are strong indications that the incidence of osteoporosis among Japanese (and Chinese) women is less than half that of women living in North America–despite the fact that the bone density of East Asian women is less than that of Caucasian women (p. 295).

The life expectancy of Japanese women is the longest in the world. Japanese medicine is oriented toward prevention and primary care.

Some of the early articles advocating estrogen replacement therapy were written by Robert Wilson and his wife as early as 1963. Their research was funded by Wyeth Ayerst, the pharmaceutical company that makes Premarin and has the largest investment in production and sales of estrogen replacement therapy. Advertisements by Ayerst in medical journals of the time urged doctors to "Keep her on Premarin" and used the slogan "When a woman outlives her ovaries..." To keep women free of "senile decay," Wilson advocated not only that declining estrogen be replaced, but also that another crucial ovarian hormone, progesterone, whose principal function was to prepare the lining of the uterus for a fertilized egg, should also be replaced (p. 348-49). This view of menopause as a deficiency disease is increasingly criticized by modern women, who often also consider it demeaning of women and based on propaganda from pharmaceutical companies.

"The Women's Health Network suggests less expensive, safer, and 'more natural' forms of prevention against chronic disease, such as dietary changes, dispensing with cigarettes and excessive alcohol, and environmental improvements..." Dietary changes have significantly reduced the rate of heart disease among men. "Moreover, a diet high in soybeans has recently been linked not only to a reduced incidence of hot flashes but also to lower incidence of breast cancer among premenopausal women (*Lancet,* 1991, p. 1197)" (p. 354-55).

Not all "women with bone fractures have osteoporosis and not all women with osteoporosis have fractures–facts that are often confused. Moreover, there is no simple relation between bone mineral density and incidence of osteoporosis" (p. 355). Address: Medical anthropologist, McGill Univ., Montreal, Canada.

10057. Loewe, Michael. ed. 1993. Early Chinese texts: A bibliographical guide. Berkeley, California: Society for the Study of Early China (SSEC) and Institute of East Asian Studies (IAES), Univ. of California, Berkeley. xiv + 546 p. Index of Chinese, Japanese and Western scholars. 24 cm. Series: Early China Special Monograph Series, No. 2 [31 ref]
• ***Summary:*** This important reference work provides basic information and aids with which to begin the study of an early Chinese text. The 64 texts are arranged in alphabetical order. Chinese names and terms are transliterated using the Wade-Giles system, with minimal hyphenation, and without use of the character *ê.* For each work, a knowledgeable scholar (or sometimes two) discusses most or all of the following: Contents, structure, and established conclusions, sources of the work, authorship and date of composition, transmission / history of the text and early commentaries, newly discovered manuscripts, principal editions, selected studies, translations, Japanese editions, and Indexes. discusses the date of composition, and indicates questions of authorship and authenticity.

Appendix II contains 5 chronological tables: (1) Western Chou kings (1099 to 771 BC), with the name and reign years of each. (2) Eastern Chou kings (770 to 256 BC). (3) Former Han emperors, with the personal name, dynastic title, and reign years of each. (4) Hsin dynasty (the only ruler was Wang Mang, 9 to 23 AD). (5) Later Han emperors, with personal name, dynastic title, and reign years.

"This book is not designed for those who are new to Chinese studies; it is addressed principally to those who are embarking on research after completing some three or four years of a course of basic training and are therefore familiar with the fundamental developments of China's literary and historical traditions."

Note: The Society for the Study of Early China (SSEC) has no physical location. The editor's surname is pronounced LOW-ee. Address: Grantchester.

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10058. Matsumoto, Valerie J. 1993. Farming the home place: A Japanese American community in California, 1919-1982. Ithaca, New York: Cornell University Press. ix + 262 p. Illust. (photos). Index. 24 cm. [100+* ref]
• ***Summary:*** A very interesting look, spanning three generations, at the Cortez Colony, in Cortez, Merced Co., San Joaquin Valley, central California, the last Japanese Christian farming community formed by Kyutaro Abiko in 1919. It is written from a feminist perspective.

In the lean early years at Cortez, "the settlers' diet was limited; meals often consisted of *miso* soup and rice,..." (p. 47).

New Year's was the major holiday of the year. Everyone would partake of carefully prepared traditional Japanese dishes such as chicken *teriyaki, ozoni* (a soup containing mochi, symbolizing prosperity), *mame* ([soy] beans, symbolic of good health), and sushi (vinegared rice "rolled in sheets of toasted seaweed or stuffed into soybean wrappers [deep-fried tofu pouches]) (p. 78).

A glossary of terms (p. 231) includes: an (sweetened red bean paste), azuki (red beans), kinako (soybean flour), mame (beans), miso (fermented soybean paste), nori, shoyu (soy sauce), sushi, teriyaki (broiled meat cooked with soy sauce, wine, and ginger).

Photos show: Abiko family portrait, 1925 (p. 27). Address: UCLA.

10059. Moran, J.F. 1993. The Japanese and the Jesuits: Alessandro Valignano in sixteenth-century Japan. London and New York: Routledge. 242 p. *
• ***Summary:*** Contains many original translations of his work. The arrangement of the material is thematic rather than chronological, and the themes are, for the most part, the same which preoccupied Valignano himself. Address: SJ, Yamaguchi, Japan.

10060. Nagai, Toshirô; Kiuchi, Kan. 1993. [Development of natto starters]. *Daily Foods Science* 13:24-30. [50+ ref. Jap]*

10061. Okubo, Kazuyoshi. 1993. Tôfu, nattô [Tofu and natto]. Tokyo: Nihon Hoso Shuppan Kyokai. 189 + [1] p. Illust. 19 cm. Series: Kenkoshoku, Karada ni Naze ii No?, no. 3. [10+ ref. Jap]*
• ***Summary:*** Kazuyoshi Okubo was born in 1938.

10062. Pitchford, Paul. 1993. Healing with whole foods: Oriental traditions and modern nutrition. Berkeley, California: North Atlantic Books. xxii + 656 p. Illust. Index. 26 cm. 2nd ed. 1996. 3rd ed. 2002 (both by same publisher). [536 ref]
• ***Summary:*** Contents: 1. Origins. Part I: The roots of diagnosis and treatment. 2. Yin-yang and beyond. 3. Qi vitality. The six divisions of yin and yang: 4. Heat/cold–The thermal nature of food and people. 5. Exterior/interior: Building immunity. 6. Excess and deficiency.

Part II: Essentials of nutrition. 7. Dietary transition. 8. Water. 9. Protein and vitamin B-12.

10. Oils and fats. 11. Sweeteners. 12. Salt. 23. Condiments, caffeine, and spices. 14. Vitamins and supplements. 15. Calcium. 16. Green food products. 17. Survival simplified. 18. Enjoyment of food. 19. Food combinations.

20. Fasting and purification. 21. Food and children.

Part III: The five element and organ system. 22. Five elements: Seasonal attunement and the organs in harmony and disease. 23. Therapeutic use of the five flavors. 24. Wood element. 25. Fire element. 26. Earth element. 27. Metal element. 28. Water element.

Part IV: Diseases and their dietary treatment. 29. Blood sugar imbalance [diabetes]. 30. The stomach and intestines. 31. Blood disorders. 32. Cancer and regeneration diets. 33. Other degenerative disorders.

Part V: Recipes and properties of vegetal foods. 34. Vibrational cooking. 35. Grains. 36. Breads. 37. Legumes–Peas, beans, and lentils: Healing properties of legumes, improving the digestibility of legumes, techniques for cooking legumes, miso, tempeh, tofu. 38. Nuts and seeds. 39. Vegetables.

40. Sprouts. 41. Salads. 42. Seaweeds: Agar-agar, dulse, hijiki and arame, kombu and kelp, nori, wakame, Irish moss and Corsican (*Alsidium helminthocorton;* it is sold as a tea and discharges worms. 43. Soups. 44. Sauces. 45. Condiments: Chutneys and relishes. 46. Spreads and patés. 47. Pickles. 48. Grain and seed milks (incl. sesame seed milk, almond milk, almond milk shake, sprouted grain milk {oats, rice, millet, barley}, cooked grain milk). 49. Rejuvelac and yogurt.

50. Fruit. 51. Desserts. Appendixes: Recipe locator. Bibliography (180 references, mostly alternative; Oriental philosophy. Chinese medicine: Theory and foundations. Chinese dietary therapy. Ayurvedic and Tibetan medicine. Western approach to nutrition. Healing the spirit and mind. Chinese herbology. Western herbology. Healing with food. Green foods. Amaranth. Seaweeds. Vegetarian, macrobiotic, vegan. Children. Ecology, politics, and ethics of food. Degenerative diseases and immunity. Toxins and radiation. Cookbooks. Food catalogs, guides, and references. Sources of data for tables, charts, and nutritional statistics). References and notes (356 refs, mostly scientific). Resources index (Incl. Soyfoods Center).

The following are listed in the index (f = most important pages): Acid-forming foods (p. 235f, 240). Aduki [azuki] beans (p. 26, 34, 50, 60, 68, 77, 178, 273, 305, 307, 319, 362, 467f). Amaranth (lots, 419-20f). Amasake (p. 98, 152-53, 155, 160, 163, 275, 287, 592f). Animal products (lots). Aspergillus oryzae (p. 592). Ayurveda (lots). Black sesame seed (lots, 492f). Black soybean (60, 68, 288, 317, 324, 327,

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468). Bran (p. 332) and its role in relieving constipation (345-46). Buckwheat (lots, 422f). Buddha. Calcium (lots). Cancer. Cheese (but no soy cheese). Cholesterol. Cigarette smoking. Coldness, bodily. Dampness, bodily. Deficiency. Digestibility (Improving the digestibility of legumes, p. 471-73). Five elements system. Free radicals. Gerson, Max and cancer therapy (p. 41, 126, 162, 365-66, 381). Goiter. Gomasio (sic, gomashio; sesame salt, p. 272, 566f). Heart / Heart/mind. Heat (lots). Hijiki. Ice cream (p. 291, 305 [no soy]). Job's tears (p. 381, 383). Kasha (buckwheat, p. 422). Kelp. Kloss, Jethro (p. 366, 381). Koji (p. 479). Kudzu (p. 22, 25, 29, 60, 289, 299, 309, 317, 414f). Lecithin (lots, p. 127, 470, 414f). Legumes (lots, p. 466-471, 473f). Macrobiotics (p. 3-4). Marijuana (lots). Menopause (p. 181-82, 362-364f, 441, 468, 497). Microwave cooking (p. 20). Milk). Mind, Chinese Zen concept of. Miso (p. 33-34, 60, 72-74, 78, 81, 90, 92, 98, 101, 105-06, 150, 159, 164, 195, 221-22, 272, 275, 315, 376, 479-82f; natto miso p. 482). Mochi (p. 436-37f). Mother's milk–to increase. Mucus. Nails, dry and brittle (p. 285). Oils (incl. soy oil, p. 138-41) Omega-3 fatty acids. Nori. Protein (lots). Qi [chi, p. 16-17]. Quinoa. Rice syrup. Schweitzer, Albert (365). Sea palm (p. 541). Seaweed (lots, p. 540-55f–see also Agar, alaria, arame, bladderwrack, Corsican, dulse, hijiki, Irish moss, kelp, kombu, nori, ocean ribbon, sea lettuce, sea palm, wakame). Seitan (p. 446-47). Sesame butter (p. 81, 492). Sesame seed (lots, 492f). Soybean (p. 52, 56, 60, 105, 124, 161, 178, 232, 235n, 250, 300, 466, 470f; children and soy products 253-54; soy sprouts p. 22, 34, 122, 291, 470f; see also miso, soy sauce, tempeh, tofu).

The section titled "Soybean" (p. 470) begins: "Cooling thermal nature; sweet flavor; strengthens the spleen-pancreas; influences the colon; moistens conditions of *dryness;* supplements the kidneys; cleanses the blood vessels and heart, improving circulation; helps restore pancreatic functioning (especially in diabetic conditions); promotes clear vision; diuretic; lowers fever; highly alkalizing and eliminates toxins from the body; boosts milk secretion in nursing mothers. Also used as a remedy for dizziness, childhood malnourishment (especially in the form of tempeh and soy milk), skin eruptions, constipation, edema, excessive fluid retention and toxemia during pregnancy, and food poisoning. For the imbalances during pregnancy and for food poisoning, drink soybean juice (prepare as 'aduki juice' above). Soybeans are a natural source of lecithin–a brain food.

"Unless well-cooked, soybeans inhibit the digestive enzyme trypsin, making them [sic] difficult to digest. The fermentation process, such as used in tempeh, tofu, miso, and soy sauce, also eliminates the beans' trypsin-inhibiting effect.

"Soybean sprouts are cooling with a sweet flavor. They are diuretic and used to treat spasms, arthritis, food stagnation, *heat*-type coughs and other heat conditions marked by one or more signs such as yellow tongue coating, yellow mucus, and scanty, dark yellow urine."

Soy sauce (p. 34, 78, 81, 98, 105-06, 150, 159, 164, 195, 222, 272, 277, 315, 414f, 480). Spirulina. Sprouting (p. 232-33). Sprouts (lots, p. 528-30f). Steiner, Rudolf (p. 19-20, 504). Stomach (beneficial foods, stomach/duodenal heat and, strengthening food). Stress. Sugar (lots). Superoxide dismutase (SOD). Sweating–night sweats (p. 24, 117, 441). Sweeteners. Sweet rice (p. 433f). Tahini (sesame, p. 106, 225, 493). Tempeh (p. 22, 34, 56, 60, 96, 99, 105, 124, 216, 221, 242, 250, 290, 307, 310, 482-86f; vitamin B-12 and p. 98). Thirst. Tobacco. Tofu (p. 22, 25, 34, 55-56, 60, 68, 81, 105, 124, 242, 250, 290-91, 300, 303, 307, 310, 317, 327, 486-89f). Tomato. Tongue coating and digestion (p. 399). Umeboshi plums (p. 78, 159, 222, 272, 307, 414, 583f). Umeboshi vinegar (p. 414). Urinary incontinence and deficiency of kidney qi (p. 318-19). Urination, frequent, from kidney qi and yang deficiencies (p. 318). Valerian root. Vegan (p. 5, 95, 137, 261, 389, 502). Vegetarianism (p. 81-82, 95). Vitamin B-12. Vitamin E. Vitamin K. Wakame. Warming foods (p. 18-20, 26-27). Warts. Watermelon. Wind, bodily (foods which quell, 286-89; incl. black soybean, p. 468). Yang. Yin.

Talk with Heartwood Institute. 1997. Nov. 12. This is basically a massage school that also offers retreats. Paul's background is in the martial arts and massage. He graduated from a college after 4 years but the name of the college is not available. He also did 2 years of graduate work at an institution whose name is not available. The Institute sent their catalog/brochure. Address: Director, Heartwood Inst. Wellness Clinic and Oriental Healing Arts Program, 220 Harmony Lane, Garberville, California 95542. Phone: 707-923-5000.

10063. Shimizu, Kay. 1993. Tsukemono: Japanese pickled vegetables. Tokyo: Shufunotomo / Japan Publications. 112 p. Illust. (color). Index. 27 cm. [Eng]

• ***Summary:*** Tsukemomo are Japanese pickled foods, primarily vegetables. Drying and pickling were two of the earliest ways of preserving food. If you've never tried Japanese tsukemono, get ready for a delicious surprise. This excellent book is a good place to start. We would start with takuan and umeboshi (p. 22).

Soy related recipes: Basic *miso-zuke* (p. 36-37). Spicy pickled celery (Celery *miso-garame*) (p. 37). *Koji / miso / kasu* tsukemono base (p. 39). Amazake (p. 40-41). Daikon radish pickled in koji (*Bettara-zuke*) (p. 41). Scallions in shoyu (*Rakkyo shoyu-zuke*) (p. 43). Garlic with soy sauce (p. 64). Garlic with bean paste [miso] (p. 64). Okra and onion pickles (*Okra shoyu-zuke*) (p. 70). Soy-flavored daikon pickle (*Daikon shoyu-zuke*) (p. 82, 84). Asparagus with bean paste (Asparagus *miso-zuke*) (p. 87). Spicy cabbage tsukemono (Cabbage *shoyu-zuke*) (p. 88). Cooked and pickled kelp (*Nori tsukudani*) (p. 97). Soy sauce pickled vegetables (*San-bai-zuke*) (p. 98).

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A 2-page glossary includes: "Age (abura-age)–deep-fried soybean cake (*tofu*). An–sweetened red *azuki* beans prepared as a paste for confections. Amazake–non-alcoholic creamy-thick hot drink prepared from rice fermentation with the addition of rice koji.

"Drop lid. A necessary item for Japanese pickling. A wooden cover which is smaller in diameter than the pot opening, so lid will lay flat on top of food, and weight can be placed on top of lid."

Dou-ban-jiang–spicy Chinese brown bean paste, contains chili. Koji–a yeast-like rice mold that works primarily to convert starches into sugars during a fermentation process.

Mirin–a thick sweet wine made from glutinous rice, used primarily for cooking. Miso–fermented soybean paste. Mochiko–glutinous rice flour. Mochi–glutinous rice that has been pounded until soft and sticky, then formed into cakes. Mochi-gashi–a confection made from glutinous rice.

Natto–fermented soybeans with sticky texture and strong aroma. Nori–edible seaweed, laver. Shoyu–Japanese soy sauce, considerably lighter than Chinese soy sauce, which should not be substituted for shoyu.

Suribachi–Japanese pestle and mortar (earthenware bowl with ridged edges). Tsukudani–food simmered with shoyu, sugar, mirin and water until almost all liquid evaporates.

Ume–Japanese plum; technically a species of apricot, but usually translated as plum. Umeboshi–pickled plum. Wakame–an edible seaweed, thinner and softer than konbu kelp. Wasabi–Japanese green horseradish, most familiar in the west as a mound of pungent green paste served with sushi or sashimi.

Note: Real wasabi is very expensive, and is a completely different plant from horseradish, from a different genus and species. Real wasabi is rarely found outside Japan and is much more potent than its imitation, "western wasabi"–a mixture of horseradish, mustard, and green food coloring. Address: Saratoga, California.

10064. Shinshu-Miso Research Institute. 1993. *Report of the Shinshu-Miso Research Institute* No. 34. p. 1-119. [Jap; eng] Address: Nakagosho 469-6, Nagano-shi 380, Japan.

10065. Tamura, Linda. 1993. The Hood River Issei: An oral history of Japanese settlers in Oregon's Hood River Valley. Urbana and Chicago, Illinois: University of Illinois Press. xli + 337 p. Foreword by Roger Daniels. Illust. Index. 23 cm. [605* endnotes]

• ***Summary:*** A superb book, carefully researched and well. By telling, in depth, the story of one small community of Issei in Hood River, Oregon, from their youth in Japan until their return home after the brutal internment camps, she captures the exquisitely the story of the ordeals faced by the first generation of Japanese (such honest, hard-working people) in racist America. Through her many interviews, the Issei are able to speak for themselves, in their own words, throughout this book.

Soy-related passages: funyu = fermented bean cake = 59! miso = p. 65, 67, 77. Soy sauce = 25, 26, 66, 75, 138. soybean = p. 26.

Page 58: Sekihan (steamed rice mixed with red beans [azuki]). Page 134: O-hagi (sweetened bean jam filled with mashed rice).

Linda Tamura is a native of Hood River and a third-generation Japanese American. Address: Prof. of education and chair of the Education Dep., Pacific Univ., Forest Grove, Oregon.

10066. Taylor, Sandra C. 1993. Jewel of the desert: Japanese American internment at Topaz. Berkeley, Los Angeles, Oxford: University of California Press. xix + 343 p. Plus 8 unnumbered pages of plates. Illust. Maps. Index. 24 cm. [125 + 808 endnotes]

• ***Summary:*** This is "the only in-depth narrative history of both an assembly center and a concentration camp" (Gary Y. Okihiro, rear cover). The camp, Topaz, was in Utah, but the assembly center, Tanforan Racetrack, was in San Bruno, northern California.

Contents: 1. Japanese San Francisco. 2. From Pearl Harbor to evacuation. 3. Life in a racetrack. 4. Welcome to Utah. 5. The jewel of the desert. 6. Dissension, departure, and grim determination. 7. An end and a beginning. 8. Nikkei lives: The Impact of Internment. 9. Coming home, wherever that is. Abbreviations. Notes.

Tofu is mentioned 5 times and miso twice. Address: Prof. of History, Univ. of Utah.

10067. Verreault, Georges. 1993. Journal d'un prisonnier de guerre au Japon, 1941-1945 [Diary of a prisoner of war in Japan, 1941-1945]. Sillery, Quebec, Canada: Septentrion. 313 p. See p. 161. Illust. Portraits. 23 cm. [Fre]

• ***Summary:*** On this day of fish, we had fish prepared in what the Japanese call "sweet Soya sauce."

Note: No French name for this sauce is given. Address: Canada.

10068. Yanagisawa, Y. 1993. Nattô no hon [The book of natto]. Ibaraki, Japan: Asahi Shokuhin. [Jap]*

• ***Summary:*** A chapter titled "The roots of natto," by H. Nagayama, appears on pages 2-3. It discusses the origins of natto, both legendary and documented. Address: Japan.

10069. *SoyaScan Notes.* 1994. Keywords used with more than 1,000 documents in the SoyaScan database, as of 1 January 1994 (Overview). Jan. 1. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** 1. USA 24,636. 2. Commercial soy products 6,565. 3. Japan 5,948. 4. Tofu 5,122. 5. Soymilk 3,884. 6. Illinois 3,642. 7. Soy sauce 3,387. 8. California 3,129. 9.

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Historical (documents published from 1900 to 1923) 3,013. 10. Soy flour 2,822. 11. History 2,730. 12. Soy oil 2,648. 13. Germany 2,447. 14. Miso 2,324. 15. Vegetarianism 2,319. 16. United Kingdom (England, Scotland, Wales, N. Ireland) 2,134. 17. China 1,554. 18. Soybean meal 2,019. 19. Cookery 2,017. 20. Soybean production: Cultural practices and agronomy 1,996. 21. France 1847. 22. Tempeh 1,844 23. Soybean production (General): 1,825. 24. U.S. Department of Agriculture 1,744. 25. New York 1,665. 24. Nutrition (General) 1,471. 25. Historical (documents published before 1900) 1,460. 26. India 1,397. 27. International trade in soybeans, soy oil, and/or soybean meal 1,225. 28. Canada 1,204. 29. Soy protein isolates 1,204. 30. Michigan 1,146. 31. Meatlike commercial products 1,145. 32. USDA state agricultural experiment stations in the USA 1,120. 33. Soybean production: Marketing 1,098. 34. Ohio 1,095. 35. Soybean production: Variety development 1,083. 36. Indonesia 1,063. 37. Tofu used as an ingredient in second generation commercial food products 1,062. 38. Bibliographies and literature reviews 1,049. 39. Massachusetts 1,029. 40. Macrobiotics 1,022. 41. Soy ice cream 1,014.

10070. *Toyo Shinpo* (*Soyfoods News*). 1994. Tôfu, nattô was gan o yôbô suru? Kôka no kaime e ekigaku chôsa susumu [Do tofu and natto prevent cancer? Advancing epidemiologic research to elucidate effects]. Jan. 21. p. 11. [Jap]

10071. O'Brien, Jim. 1994. Can tofu stop cancer? Research shows soy foods cut risk of breast, prostate cancers *Your Health.* Jan. 25. p. 21-22. [1 ref]
• ***Summary:*** Mark Messina, PhD, a nutritionist and former researcher at the National Cancer Institute for 5 years, states that "There's strong evidence to indicate that soy can lower cancer risk, especially of the breast and prostate." Messina says that "soy may contain 'anti-estrogens,' compounds that perform many of the necessary and beneficial functions of real estrogen, but not the harmful stuff (for example estrogen is vital for reproductive health, but researchers believe it may spur growth of many breast cancers).

In Japan, where the diet is rich in soy [and much lower in fat], the breast cancer rate is much lower than in the USA. Every year in Japan roughly 7 women per 100,000 die of breast cancer and 28 per 100,000 are diagnosed with the disease; the corresponding figures for U.S. women are 27 and 105.

Japanese men also have low rates of prostate cancer. 3.5 per 100,000 Japanese men die of this disease every year but it kills 15.7 per 100,000 American men–also nearly a fourfold difference.

10072. Macdonald, Bruce. 1994. Macrobiotic Wholesale Co. is now Macrobiotic Company of America (MCOA) (Interview). *SoyaScan Notes.* Jan. 26. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Bruce (who was one of the early important figures in Erewhon) bought this company from Kurt Schmitz on 15 Sept. 1993. Kurt, who is about age 65, had come to North Carolina from California to retire. He had worked at Hewlett-Packard for more than 20 years. He purchased the company (named Macrobiotic Wholesale Co.) in Aug. 1986 from Great Eastern Sun; Barry Rand negotiated the deal. At the time the company had sales of about $170,000/year; now its sales are well over $1,300,000/year and the last two months have set sales records. Bruce renamed it Macrobiotic Company of America. Bruce used to live in Vermont, but he now lives in North Carolina. Kurt is interested in possibly starting a miso manufacturing company in North Carolina–which has long been considered by macrobiotic teachers to have an ideal climate for making miso (hot summers, cold winters, somewhat humid). The American Miso Company is only 50 miles away. Bruce would like to move the company up to the northeast; he feels it is situated in the wrong place.

Macrobiotic Wholesale Company used to be a division of Great Eastern Sun. Great Eastern Sun sold products to distributors, whereas Macrobiotic Wholesale Company sold directly to retail stores. The distributors got upset with Great Eastern Sun for wearing two hats, so Great Eastern Sun decided to sell Macrobiotic Wholesale Company. Barry Evans still owns Great Eastern Sun.

Note: Half of MCOA is owned by Muso Shokuhin of Japan. When William Shurtleff asked Bruce about this on 4 April 1997, Bruce confirmed that it was true. When the company was purchased from Kurt Schmitz on 15 Sept. 1993, Yuko Okada of Muso put up 95% of the money and Bruce put up 5%–using his own funds. Yuko borrowed all or most of the 95% to make the purchase, and MCOA is paying him back. Bruce agreed to manage the company in exchange for 50% ownership, which he still has. Muso owns the other 50%. He did not tell the true story to Shurtleff in 1994 because Muso wanted to keep this semi-confidential. Address: Owner, Macrobiotic Company of America, 799 Old Leicester Hwy, Asheville, North Carolina 28806. Phone: 704-252-1221.

10073. Nichii Company of America, Inc. 1994. Re: Closing of Torrance office and the relocation of its headquarters to the state of Iowa. Effective March 1, 1994. Letter to customers, suppliers, and financial institutions, Jan. 31. 2 p. Typed, with signature on letterhead. [Eng; jap]
• ***Summary:*** The new address in Iowa will be: Soyflaking Plant, 21 Mycal Drive, Jefferson, Iowa 50129. Telephone: (515) 386-2100. Fax: (515) 386-3237. This announcement comes in the form of a formal printed card in English and Japanese, and a letter from Itaru "Terry" Tanaka, Director and General Manager. After March 1, Al Richardson and Pamela Ochoa will no longer be employed by Nichii Co. However Mr. Richardson will serve as an independent sales

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representative for soy products in the USA. Address: 23440 Hawthorne Blvd., Skypark 2, Suite 140, Torrance, California 90505. Phone: (310) 791-0010.

10074. Agriculture Canada, Oilseeds Division, International Markets Bureau, Markets and Industry Services Branch. 1994. Oilseed sector profile. Ottawa, Ontario, Canada. [iv] + 23 + 1 + 12 p. Jan. 28 cm. Spiral bound. [3 ref]

• ***Summary:*** Contents: Foreword. 1. Introduction. 2. The seed production subsector: Canola, soybeans, flaxseed, sunflower, mustard, safflower, composition.

3. The processing subsector: Background, crushing plants, industry statistics, methods of processing, oilseed crushings, vegetable oils, vegetable oilmeals, economic value of the industry. 4. The marketing subsector: Oilseeds marketing, hedging, processed oilseed products marketing.

5. Organizations: Canola, soybeans, flaxseed, crushers. 6. The environment: Domestic, international.

Appendix A: Role of the federal government in the Canadian oilseeds industry: Research, regulation, marketing. Appendix B. Oilseed industry directory: Industry association, oilseed processing companies, oilseed sector trading companies, research / education institutions, government, others.

Soybeans (p. 3): "Soybeans were introduced into Canada in 1893; however they did not become a commercial oilseed crop until the late 1920's. In that year [sic, about March 1930], the first soybean crushing plant [Milton Oil Refineries, Ltd.] was built in Milton, Ontario. The introduction of modern crushing mills occurred in the late 1930s. Increased demand for vegetable oil and protein meal during the early 1940's firmly established the crop and by 1950, soybeans had become a major cash crop in Ontario. Strong promotional efforts by the crushing industry assisted in continued expansion of the crop. During the 1980s, soybeans were introduced into Québec, the Maritimes and Manitoba as a source of livestock feed... In Québec, whole soybeans have become a viable alternative feed source. In other regions, whole soybeans are only a minor ingredient for livestock."

The soybean growers, like their canola counterparts, have shown a high degree of cohesion and organizational ability. In 1949, the Ontario Soybean Growers' Marketing Board was founded. The Board represents 25,000 producers and negotiates the pricing arrangements for Ontario soybeans. Its functions are discussed in more detail further in this report. The handling, crushing, and exporting of soybeans and soybean products is handled by private companies.

"Canadian soybean production has increased sharply from the late 1970's when up to 60 percent of Canadian soybean requirements had to be imported. In 1987, domestic production reached a level capable of supplying most internal demands for crushing (Table 3). Although some soybeans are still being imported from the U.S., Canada exports a larger volume of high quality white hilum soybeans for food utilization in Asian and European markets.

Domestic crush of these larger crops has made Canada self-sufficient in soyoil production; however, soymeal is still in a deficit position. About 600,000 tonnes representing close to 50 percent of domestic soymeal utilization requirements needs to be imported yearly.

"Up to 1991, the soybean crushing industry was operating below capacity." In that year, Victory Soya Mills in Toronto was closed. "The result is that the crushing capacity now meets the production of soybeans for crushing. Therefore, without an increase in crushing capacity, Canada will remain a net importer of oilmeals. Nevertheless, increasing the crush is economically questionable until a viable market outlet is found to absorb the additional soyoil produced. The 1992 elimination of the U.S. crude soyoil tariff (18%) could ease the situation. The two companies crushing soybeans in Canada are corporately linked to large multinational corporations, with major U.S. operations. Therefore, without tariff, the unrestricted movement of soyoil between the two countries is a possibility."

"Economic value of the industry (p. 12): The oilseed crushing industry makes a large and positive contribution to the Canadian economy. It is a processing industry and as such it provides enhanced strength to the economy through value-added contributions and the financial multiplier effect. In 1992 (table 16) the direct economic benefits were $1,810 million, and the contribution to the Canadian balance of payments was $599 million in total import replacement and $322 million in export earnings for a total contribution of $921 million.

Tables show: (3) Canadian supply and disposition of soybeans, soyoil and soymeal, 1988-1993. (5) Oilseed crushing facilities in Canada. Owners and their soybean crushing plants are: ADM Agri-Industries Ltd. (Windsor, Ontario): 1,250 tonnes capacity per 24 hours. CanAmera Foods (Hamilton, Ontario): 1270 tonnes capacity per 24 hours.

(7) Oilseed crushings in Canada: The soybean crush was #2 largest in Canada after canola and ahead of sunflower seed. The soybean crush was 908,200 tonnes in 1988, then 916,000 tonnes in 1989, then 1,083,500 tonnes in 1990, then 943,600 tonnes in 1991, and 995,200 tonnes in 1992.

(8) Vegetable oil production in Canada. Soybean oil is #2, far behind canola oil and far ahead of sunflower oil. During these 5 years, soybean oil production ranged from a low of 159,000 tonnes in 1988 to a high of 194,800 tonnes in 1990.

(9) Vegetable oil trade. During these 5 years, soybean oil imports to Canada were very small, ranging from a low of 4,000 tonnes in 1989 to a high of 16,000 tonnes in 1990. Soybean oil exports from Canada were even smaller, ranging from a low of 1,000 tonnes in 1989 to a high of 5,300 tonnes

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in 1991. Both soybean crushers also have their own soy oil refineries. The capacity of the ADM Agri-Industries Ltd. refinery (Windsor, Ontario) is 159,000 tonnes per year, whereas that of CanAmera Foods (Toronto) is 147,000 tonnes per year.

(13) Vegetable oilmeal production: Soybean meal is #2, behind canola meal but far ahead of sunflower meal. During these 5 years, soybean meal production ranged from a low of 698,300 tonnes in 1988 to a high of 835,800 tonnes in 1990.

(14) Vegetable oilmeal trade. During these 5 years, soybean oil imports to Canada were large, and vastly larger than any other oilmeal, ranging from a low of 565,400 tonnes in 1990 to a high of 692,100 tonnes in 1988. Soybean meal exports from Canada were very small, ranging from a low of 200 tonnes in 1989 to a high of 33,100 tonnes in 1992. By contrast, large amounts of canola meal (about half of the total amount produced each year) were exported.

(18) Soymeal imports by province. The top 3 in 1988 were: Ontario 326,026 tonnes. Manitoba 169,687 tonnes.

(19) Soybean exports by major markets: The top 8 in 1992 were: USA 69,135 tonnes. Portugal 62,515 tonnes. Netherlands 27,349 tonnes. Former USSR 20,752 tonnes. Hong Kong 19,376 tonnes. Singapore 17,268 tonnes. Japan 11,306 tonnes. Malaysia 10,687 tonnes. Quebec 137,365 tonnes. Total 1992 245,668 tonnes.

(24) EC-12 production of major oilseeds, 1989-193. In 1992-93 the leading oilseeds produced in the European Community were: Rapeseed 6,217,000 tonnes. Sunflowerseed 3,940,000 tonnes. Soybeans 1,294,000 tonnes. Cottonseed 606 tonnes. Linseed 316 tonnes. Address: 930 Carling Ave., Ottawa, ONT K1A 0C5, Canada. Phone: (613) 995-8324.

10075. Gervais, Marc; Theriault, Sylvana; Bernard, Eric. 1994. Oilseed sector profile [Canada]. Ottawa, Ontario, Canada. [iv] + 23 + 1 + 12 p. Jan. 28 cm. Spiral bound.
• ***Summary:*** Contents (each accompanied by tables and charts; each section covers the years 1991-1994): Imports of soya beans for sowing (almost all come from the USA, followed by Chile and Japan). Imports of soya beans for oil extraction (almost all come from the USA). Imports of soya beans, nes [meaning unclear] (almost all come from USA, followed by Taiwan, China, and Japan).

Imports of soya-bean oil crude, whether or not degummed (almost all comes from the USA, followed by France). Imports of soya-bean oil and its fractions, refined but not chemically modified (almost all comes from the USA, followed by Singapore). Imports of veg fats & oils & fractions hydrogenated, inter or re-esterified, refined or not (almost all comes from the USA followed by UK and Netherlands). Imports of animal or veg fats & oils...

Imports of soya bean flour and meals. Imports of soya sauce (main suppliers are: USA, China, Japan, Hong Kong, Taiwan, Philippines, South Korea). Imports of protein concentrates and textured protein substances (almost all comes from USA). Imports of Soya-bean oil-cake and other solid residues, whether or not ground or pellet (almost all comes from USA). Imports of bran, sharps and other residues of leguminous plants, pelleted or not (almost all comes from USA).

Exports of soya beans for sowing (most goes to USA, followed by France, Germany and Austria). Exports of soya beans, for oil extraction (most goes to Netherlands, followed by France, Portugal and Spain). Exports of soya beans, nes (most goes to USA, followed by Hong Kong and Singapore). Exports of soya bean flour and meals (almost all goes to USA). Exports of soya-bean oil crude, whether or not degummed (almost all goes to the USA). Exports of soya-bean oil and its fractions, refined but not chemically modified (almost all goes to Pakistan, followed by USA). Exports of veg fats & oils & fractions hydrogenated, inter or re-esterified, refined or not (almost all goes to the USA). Imports of animal or veg fats & oils... (almost all goes to USA).

Exports of soya sauce (main buyers are UK, Japan, United States, Finland, Cuba).

Exports of protein concentrates and textured protein substances (almost all goes to USA). Exports of Soya-bean oil-cake and other solid residues, whether or not ground or pellet (almost all goes to USA). Exports of bran, sharps and other residues of leguminous plants, pelleted or not (almost all goes to USA). Address: Trade Evaluation and Analysis Div., International Markets Bureau, Markets and Industry Services Branch, Agriculture Canada, Ottawa, Ontario, Canada.

10076. Morinaga Nutritional Foods, Inc. 1994. Our popularity is spreading: New Mori-Nu Lite Tofu (Ad). *Vegetarian Times.* Jan. p. 31.
• ***Summary:*** This full-page color ad shows a pack of Mori-Nu Lite Silken Tofu (Firm) on a wooden table surrounded by cubes and slices of tofu, and Eggless Egg Salad in a bowl and on a sandwich. There is a recipe for this Eggless Egg Salad made with Mori-Nu Lite. A table comparing this Eggless Egg Salad with regular egg salad (½ cup each) shows the following: Calories 57 vs. 181. Fat 1.3 gm vs. 17.3 gm. Cholesterol 0 mg vs. 218 mg. Sodium 131 mg vs. 148 mg. Protein 6.3 gm each. Mori-New Lite silken tofu contains only 1 gm of fat per serving. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 310-787-0200.

10077. Shurtleff, William; Aoyagi, Akiko. comps. 1994. Wheat gluten and seitan–Bibliography and sourcebook, A.D. 535 to 1993: Detailed information on 462 published documents (extensively annotated bibliography), 363 commercial gluten and seitan products, 208 original interviews (many full text) and overviews, 104 unpublished archival documents. Lafayette, California: Soyfoods Center.

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347 p. Subject/geographical index. Author/company index. Language index. Printed 9 Dec. 1993. 28 cm. [922 ref]
• ***Summary:*** This is the first bibliography ever published about wheat gluten or seitan, and the most comprehensive book ever published on this subject. It has been compiled, one record at a time over a period of 18 years, in an attempt to document the history of these two interesting foods and food ingredients. Its scope includes all known information about this subject, worldwide, from A.D. 535 in China to the present.

This book is also the single most current and useful source of information on this subject, since 95% of all records contain a summary/abstract averaging 207 words in length.

This is one of more than 40 bibliographies on vegetable proteins being compiled by William Shurtleff and Akiko Aoyagi. It is based on historical principles, listing all known documents and commercial products in chronological order. It features: 32 different document types, both published and unpublished; every known publication on the subject in every language–including 736 in English, 68 in German, 61 in French, 26 in Chinese, etc.; and 208 original Soyfoods Center interviews and overviews never before published. Thus, it is a powerful tool for understanding the development of gluten, seitan, and related products from their earliest beginnings to the present.

The bibliographic records in this book include 462 published documents and 104 unpublished archival documents. Each contains (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English publications together with an English translation of the title, month and issue of publication, and the first author's first name (if given).

The book also includes details on 363 commercial gluten and seitan products, including the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as references to and summaries of advertisements, articles, patents, etc.) are also given.

Details on how to make best use of this book, a complete subject and geographical index, an author/company index, a language index, and a bibliometric analysis of the composition of the book (by decade, document type, language, leading periodicals or patents, leading countries, states, and related subjects, plus a histogram by year) are also included.

Introduction (p. 7-8): Gluten is a complex protein (composed of gliadin and glutenin) found mainly in wheat, but also in corn, barley and rye. It is best known for its ability to give elasticity and cohesiveness to bread, allowing it to rise. Vital wheat gluten, a cream-colored, free-flowing power, is most widely used to fortify flour and baked goods, but it also finds many other applications. One of the newest and most rapidly growing of these is its use as the main protein source in meatlike products.

Seitan is a Japanese word, coined in 1961 by George Ohsawa (Sakurazawa Nyoichi), a Japanese-born teacher of macrobiotics. He gave this name to a meatlike product developed by one of his students, Mr. Kiyoshi Mokutani. The product was first made commercially in 1962 by Marushima Shoyu K.K. in Japan. It was made by simmering raw wheat gluten in a broth, typically consisting of water, shoyu (soy sauce), kombu (a sea vegetable), and ginger. Seitan was first imported to the Western world in about 1969 by Erewhon, a macrobiotic and natural food company in Boston.

The earliest publication seen that mentions the word seitan is a 34-page macrobiotic cookbook titled Cooking Good Food, published in 1969 by Order of the Universe Publications in Boston. The author, whose name does not appear in the book, is Jim Ledbetter.

Since 1969, interest in and consumption of seitan in the United States and Europe has increased steadily. It continues to be used mostly as an alternative to meat and the macrobiotic community deserves much of the credit for its growing popularity. This book gives details on 104 commercial seitan products that have been developed and launched, mostly in the United States and Europe, and cites 80 published documents (including 40 cookbooks or articles with recipes) in which seitan is discussed. 73% of the published documents are written in English.

The history of gluten can be divided into various periods, a number of which are first documented in this book: Here are a few highlights.

Early History in China: The earliest Chinese reference seen to wheat gluten is in the *Ch'i-min yao-shu,* the world's earliest encyclopedia of agriculture, written by Chia Ssu-hsieh in A.D. 535. It describes *po to,* a type of noodle made largely from freshly-washed wheat gluten. By the Sung dynasty (960-1279) wheat gluten was being called by its present name, mien chin. It was widely used in place of meat, in various forms, by Buddhists in China. The first 17 citations in this bibliography, all published before 1600, come from China, as do 23 of the first 26 citation published before 1803.

Discovery by Scientists in the Western World: The earliest known reference to wheat gluten in the Western world was in 1745 in a Latin treatise titled *De Frumento* (Concerning Wheat), published in Italy. It describes how Beccari, a Professor of Medicine in the Anatomy and Chemistry Institute of Bologna, Italy, prepared a dough from wheat flour, then washed it with water to isolate the gluten. However as early as 1597 the term gluten had been used to refer to "The albuminous element of animal tissues" sometimes called animal gluten. In 1800 William Henry wrote in his book titled An Epitome of Chemistry: "Gluten

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forms the basis of the muscular or fleshy parts of animals." Numerous early observers noted that the gluten in wheat had distinctly meat-like or animal-like properties.

The first two English-language publications to mention wheat gluten appeared in 1803 in London. John Imison, in his *Elements of Science and Art* gave an excellent definition of wheat gluten. European chemists, especially those in France and Germany, took great interest in gluten, in its properties, and in the individual proteins of which it was composed. By 1900 they had issued more than 62 publications on the subject, compared with only 18 in the USA. In America, the first scientific publication on wheat gluten appeared in 1893, by Osborne and Voorhees in Connecticut.

First Use as a Food in the West in Diabetic Diets: In 1836 and 1841, the French scientist A. Bouchardat, while doing research on diabetes, discovered that gluten was good for use in diabetic diets–which were supposed to have little starch. He proposed feeding diabetics with gluten bread that contained only one-sixth the starch of regular wheat bread. His proposal caught on and for the next century gluten came to be widely used in Europe and the United States mainly in diabetic diets. Many commercial diabetic food products were manufactured. 48 records in this book discuss gluten in diabetic diets.

Seventh-day Adventists in America Discover Gluten: The first original publication on wheat gluten in the United States appeared in 1882. It was an advertisement for Sanitarium Foods published in *Good Health* magazine. This company was located in Battle Creek, Michigan, and directed by Dr. John Harvey Kellogg, a famous Seventh-day Adventist physician who headed the Battle Creek Sanitarium. The ad mentions Gluten Wafers, Diabetic Food, and Gluten Food. The Seventh-day Adventists soon became pioneers in introducing gluten-based foods, especially meatlike products, to America. 256 records in this book relate to Adventists, including 174 commercial gluten products. In November 1929 La Sierra Industries in Arlington, California (founded and run by T.A. Van Gundy), introduced the world's first meatlike product based on wheat gluten. It was named La Sierra Soy Gluten. From this small beginning many other Seventh-day Adventist companies launched commercial meatlike products based on gluten: The two leaders were Worthington Foods (Worthington, Ohio; 67 products) and Loma Linda Foods (Riverside, California; 48 products).

Popularization of Seitan in America and Europe: All early seitan products in the Western world were made by members of the macrobiotic community. In America the first two commercial seitan products were introduced in Oct. 1972, made by Nik and Joanne Amartseff in Boston. Tan Pups, consisting of skewered deep-fried seitan in a breaded batter, were so delicious that just their aroma drew passers-by into the store. Piroshki (filled with seitan) were also innovative. America's third seitan product was Wheatmeat, sold as small meatball-like chunks in bulk. Its creator, John Weissman, made many of America's earliest and most innovative seitan products and he still owns the trademark on the term "Wheatmeat."

In Europe, the first three seitan products were all made by Jonathan P.V.B.A., founded and owned by Jos Van De Ponseele, who learned how to make seitan in Boston. They were Seitan (1978), Seitanburger (1979), and Seitan Pâté (1980). Since 1972 at least 62 commercial seitan products have been launched in the USA and 38 in Europe.

The Rise of Gluten Worldwide: Starting in the early 1960s interest in and use of gluten by cooks and food processors began to increase rapidly (see p. 335). The number of records in this book grew from 320 in the 1960s, to 476 in the 1970s, to 749 in the 1980s. In 1974 the first of many gluten cookbooks was published by LeArta Moulton. In 1979 the International Wheat Gluten Association was founded by 11 wheat gluten manufacturers; it now has 23 members worldwide. Today most wheat gluten is sold as vital wheat gluten, and used in baked goods or to fortify flour. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 510-283-2991.

10078. Shurtleff, William; Aoyagi, Akiko. comps. 1994. Soymilk and soymilk products–Bibliography and sourcebook, 1500 to 1993: Detailed information on 3,120 published documents (extensively annotated bibliography), 968 commercial soymilk products, 506 original interviews (many full text) and overviews, 462 unpublished archival documents. Lafayette, California: Soyfoods Center. 1,105 p. Subject/geographical index. Author/company index. Printed 3 Nov. 1993. Published Jan. 1994. 28 cm. [5528 ref]
• ***Summary:*** This is the most comprehensive book ever published about soymilk and soymilk products. It has been compiled, one record at a time over a period of 18 years, in an attempt to document the history of this subject. Its scope includes all known information about soymilk and soymilk products (including soy-based infant formulas, fermented soymilk, and soy-based calf milk replacers) worldwide, from 1500 to the present.

This book is also the single most current and useful source of information on soymilk, since 83.5% of all records contain a summary/abstract averaging 170 words in length.

This is one of more than 40 books on soybeans and soyfoods being compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyfoods Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features: 40 different document types, both published and unpublished; every known publication on the subject in every language–including 296 in French, 270 in Japanese, 190 in German, 105 in Spanish, etc.; 466 original Soyfoods Center interviews and overviews never before published. Thus, it is a powerful

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tool for understanding the development of soymilk and related products from their earliest beginnings to the present.

The bibliographic records in this book include 3,120 published documents and 462 unpublished archival documents. Each contains (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English publications together with an English translation of the title, month and issue of publication, and the first author's first name (if given).

The book also includes details on 968 commercial soymilk products, including the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as references to and summaries of advertisements, articles, patents, etc.) are also given.

Details on how to make best use of this book, a complete subject and geographical index, an author/company index, a language index, and a bibliometric analysis of the composition of the book (by decade, document type, language, leading periodicals or patents, leading countries, states, and related subjects, plus a histogram by year) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 510-283-2991.

10079. Shurtleff, William; Aoyagi, Akiko. comps. 1994. Soyfoods industry and market–Bibliography and sourcebook, 1985 to 1993. Lafayette, California: Soyfoods Center. 361 p. Subject/geographical index. Author/company index. Language index. Printed 11 Jan. 1994. Published Jan. 1995. 28 cm. [985 ref]

• ***Summary:*** This is the second of the two most comprehensive books ever published on the soyfoods industry and market worldwide.

In May 1982 the first study of the burgeoning soyfoods industry in the Western world was compiled by Shurtleff and Aoyagi, and published by Soyfoods Center. In April 1985 the fifth edition of that book, titled *Soyfoods Industry and Market: Directory and Databook* (220 pages), was published. It contained statistics through 1984, the market size and growth rate for each soyfood type, rankings of leading soyfoods manufacturers of each soyfood type and the amount each produced, analyses, trends, and projections. This book is published to update the 1985 market study.

In the decade since 1984 the soyfoods market has continued to grow at a very healthy rate, with some soyfood types (such as soymilk) growing at a truly astonishing sustained rate–in both the USA and western Europe–as the statistics in this book show so vividly. In 1975 only 75 new commercial soyfood products were introduced in the USA, yet that number skyrocketed to 217 in 1979, reaching an amazing 422 new products in 1987.

During the decade from 1984 to 1994, Soyfoods Center has invested most of its time and resources in the production of SoyaScan, the world's largest computerized database on soyfoods, which contains more than 44,500 records as of Jan. 1994. This database also includes a wealth of carefully researched statistics and analyses of the soyfoods market; those from the start of 1985 to the end of 1993 are contained in this book. Its scope includes all known information on this subject, worldwide. Its focus, however, is statistics, analyses, and trends concerning the soyfoods industry and market in the United States and Europe.

In May 1990 Soyfoods Center conducted an in-depth study of the tofu market in Europe (137 pages), and in July 1990 of the soymilk market in Europe (261 pages). All original interviews and published records from both of these market studies, plus a summary of each study, are included in the present book.

The SoyaScan database is composed of individual records. One record might be an original interview with the head of the largest soymilk company in Europe, on the size and growth of the soymilk market in Europe, and new trends in that market, conducted by William Shurtleff of Soyfoods Center. Another might be a published article or an unpublished document concerning the growth of the market for soy yogurts or soy sauce in America.

This book documents the growth of each product category in every country worldwide. The book contains three extensive and easy-to-use indexes: A subject/geographical index, an author/company index, and a language index. These allow you to find the exact information you need on the soyfoods industry and market quickly and easily. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 510-283-2991.

10080. *Toyo Shinpo* (*Soyfoods News*). 1994. Ibaraki no shin meisan-hin. Nattô senbei. Ibaraki-ken Kôgyô Gijutsu Sentaa [New product from Ibaraki prefecture. Natto senbei (crackers) from the The Ibaraki Prefectural Industrial Technology Center]. Feb. 2. p. 7. [Jap]

10081. *Toyo Shinpo* (*Soyfoods News*). 1994. Chiba no shin meisan-hin ni piinattsu iri nattô. Igyôshu kôryû de kaihatsu hanbai. Azuma Shokuhin [Chiba prefecture promoting new natto product that contains peanuts. Two different industries exchanged information to develop and market the product, made by Azuma Foods]. Feb. 2. p. 7. [Jap]

10082. McReynolds, Thomas. 1994. Morinaga's new interest in soymilk (Interview). *SoyaScan Notes.* Feb. 3. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Morinaga has been looking seriously at manufacturing soymilk in America for the last 6 months, and very seriously for the last 4 months. The major reason is the value of the Japanese yen, which has fallen steadily

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against the dollar over the years. From 1964 to 1971 the yen was steady at about 360 yen per dollar. In 1972 it fell below 300, in 1978 it fell below 200, and recently it dipped briefly below 100 yen per dollar; it is now at about 108-109. This makes it expensive to import products from Japan. A second reason is that Morinaga would like to build its own plant in America. But they are looking for a partner in the venture to help minimize the risk. There are two pieces to the formula. The partner must join Morinaga in manufacturing costs, and land and factory development. The partner must also be a potential buyer of the soymilk with an established market, provided the product is made to their quality, volume, and price specifications. Address: Marketing Consultant, Morinaga Nutritional Foods, 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 213-728-4325.

10083. Sanger, David E. 1994. Tokyo's tips for New York. *New York Times.* Feb. 6. p. SM28-SM29.
• ***Summary:*** Japan is the world champion at managing the chaos of urban life. So here are some ideas from Tokyo that America would do well to import. (3) Obasans. Every block in Tokyo has one such lady who sees that everyone on the block packages their garbage correctly. "But our neighbors give us a break, viewing our absence of training in this regard as one of those many cultural handicaps–along with a lack of appreciation for natto, a particularly potent fermented [soy] bean dish–that are beyond our control."

Another idea is gun control; handguns are prohibited in Japan. Tokyo had a grand total of eight gun-related murders in 1992, about as many as New York City has every two days. Japanese can own rifles and shotguns but the licensing and storage requirements are very strict. Address: Tokyo bureau chief of the New York Times.

10084. *Toyo Shinpo* (*Soyfoods News*). 1994. Tô denrai no tôfu-kan. Matsumoto rôho ga dentô o mamoru. Ishiusu de hiki, jigama de taku. Mukashi-nagara no seihô o miru [Tofu-kan transmitted from T'ang dynasty China. The Matsumoto Rôho shop at Uji near Kyoto preserves an ancient tradition, grinding with a stone mill and cooking in a caldron. Here you can see the ancient process]. Feb. 21. p. 5. [Jap]
• ***Summary:*** This full-page article contains 20 photos showing each step in the process of making Chinese-style pressed tofu. During the Edo period (1600-1868) the head priest at Manpuku-ji temple in Uji had a lot of visiting monks from China; he may have learned the process from one of them. Soaked soybeans are ground in a traditional stone mill. The soymilk is cooked in a caldron over a wood fire. Firm curds are ladled into many small cloth-lined forming boxes. The cloths are folded over the curds in each box, and the curds are allowed to drain. Then each little packet is removed from its forming box and 6-8 are put in another forming box, where they are pressed under a wooden pressing lid and two heavy stone weights. For seven generations the Matsumoto family in Uji has been keeping alive this tradition, imported long ago from China. The shop's address: Matsumoto Rôho (Matsumoto Tôfukan-shô), Gokasho Shinkai 2, Uji-shi, Kyoto-fu, Japan. Phone: 0774-31-8604. Note: Rôho means "old shop."

10085. Johannes, Kenlon. 1994. Re: Short answers to your questions on SoyDiesel. Letter to Junji Kawasaki, The Institute of Energy Economics, Japan (Nippon Enerugi Keizai Kenkyusho), Shuwa Kamiyacho Bldg., 3-13 Toramomon 4-chome, Minato-ku, Tokyo 105, Japan, Feb. 23. 2 p. + 9 p. attached articles. Typed, with signature on letterhead. [Eng; Jap]
• ***Summary:*** Good answers to 9 questions in Kawasaki's letter of 20 Dec. 1993. This letter is accompanied by 9 pages of assorted documents on biodiesel in Japan. Address: Executive Director, National SoyDiesel Development Board, P.O. Box 104898, 1907 Williams St., Jefferson City, Missouri 65110-4898. Phone: 1-800-841-5849.

10086. Clifton, Claire. 1994. Flavor of the month: Soy sauce. *Guardian* (*England*). Feb. 26. p. A39.
• ***Summary:*** The writer and Yan-Kit So, the Chinese cookery writer (a woman) tasted more than a dozen soy sauces. They were astonished to find how much the quality varied. Fo Shan Superfine, made in Guangdong, China, was considered the best. The other two brands they liked were Kikkoman (Japanese) and the Kim Ve Wong brand from Taiwan.

Yan-Kit So's latest cookbook is the magnificent *Classic Food of China* (Macmillan).

10087. *Agri-Book Magazine* (*Exeter, ONT, Canada*). 1994. Far East market can double. 20(5):29. Feb.
• ***Summary:*** Canada is selling more and more soybeans for food uses to East Asia. Thailand is the only country in the region that is self-sufficient in soybean production. Japan (population 123 million) imports more than 1 million tonnes per year, Taiwan imports 250,000 tonnes, Indonesia 150,000 tonnes, Korea 120,000 tonnes, and Malaysia 100,000 tonnes. Singapore and Hong Kong import all the soybeans they use.

In 1993 Ontario produced a record 1.7 million tonnes. Only 500,000 tonnes of this (29.4%) was exported, and only a fraction of that was suitable for making soyfoods such as tofu, natto, soymilk, Taiwanese fermented tofu (*foo yee*), etc. A large color photo shows ladies in Taiwan packing fermented tofu in jars.

Ontario has captured 56% of the Hong Kong market, and about 14% of the Malaysian market. But the Asian market is becoming more competitive because exporters from the USA are beginning to offer soybeans in bags as well as bulk shipments. Michael Loh, the OSGMB coordinator for export development, thinks Canada can achieve its goal of doubling soybean exports by the year 2000.

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10088. *Soybean Digest.* 1994. ASA team discusses U.S. soybean quality issues in Japan. Mid-Feb.
• ***Summary:*** Japanese officials and the managing director of the Japanese Oilseed Processors Association (JOPA) said U.S. soybeans are generally one percent higher in foreign Material (FM) and one percent lower in oil content that their competitors from Brazil. Japan challenged the U.S. to eliminate these differences within 10 years. Japan is the single largest consumer of total U.S. soybean exports.

10089. *Tofu Times: Emerging Soyfoods Trends* (*Morinaga, Torrance, California*). 1994--. Serial/periodical. Morinaga Nutritional Foods, Inc., 2050 W. 190th St., Suite 110, Torrance, CA 90504. Bimonthly. Susan Bucher, editor. Vol. 1, No. 1. Jan/Feb. 1989.
• ***Summary:*** Formerly titled *Mori-Nu Healthy Life.* Each issue, typically 6 pages, discusses the merits of tofu and Mori-Nu silken tofu. Recipes and coupons are included. Issues were published in Feb., June, and November/December 1994. Address: Torrance, California.

10090. Lumpkin, Tom. 1994. Update on work with edamamé (green vegetable soybeans) in the state of Washington (Interview). *SoyaScan Notes.* March 1 and April 13-14. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** His program has had several setbacks during the past few years, but it will recover. First, John Konovsky (one of Tom's students who specialized in edamamé) stopped his active involvement in the program about 18-24 months ago. He is still enrolled and he plans to graduate this fall. The book that John Konovsky was writing, which was to be titled *Edamamé: The Vegetable Soybean,* is now on hold and probably won't be published for at least 2 years–unfortunately. Tom has a full-time woman editor working on the various book. John got very excited with the commercial possibilities of edamamé that he decided to start his own business, named East-West Seeds in Olympia, Washington–where John now also resides. His main activity is importing and exporting seed for edamamé; he is also doing a little breeding himself. The book was delayed because John is totally involved in his new business and Tom has so many other projects. For example, he just finished a long review article on wasabi, which was published in the June 1993 issue of *Economic Botany.* Ms. Chadwick, who is in his program, is an expert in wasabi; she is running wasabi farms in Oregon and Washington.

Second, about 3 years ago, Stokely USA (related to Stokely-Van Camp), a major food processor, bought out the local edamamé processor Tom's group was working with. All was going quite well, then Stokely declared Chapter 11 bankruptcy; they are still functioning, but they cut back all their operations except their very core business (such as potatoes and peas). The Japanese and Tom's group begged Stokely to keep processing edamamé, but they were under orders from the head office, so the last crop of edamamé they processed was in 1992. With no processor, local farmers had no incentive to grow the crop. But Tom is confident that he can rebuild the edamamé program. He is a professor with tenure, going up for full professor this fall.

Update of 13-14 April 1994. Tom has just taken a new degree student into his program. Born in Washington state, she speaks and reads both Japanese and Chinese fluently, and has lived in both Japan and China for years. She will help Tom finish the book on edamamé, probably do some translation of documents, and hopefully take responsibility for re-establishing edamamé commercially in Washington state. John Konovsky is currently working as a soil scientist for Soil Conservation in Olympia, while also trying to establish his new company East-West Seeds. Two copies of the full bibliography on edamamé have been made; Tom and John each have one, but the library on which the bibliography is based is housed solely within Tom's program. Address: Head, East Asian Crop Development Program, Dep. of Crops and Soil Sciences, Washington State Univ., Pullman, WA 99164-6420. Phone: 509-335-2726.

10091. *Toyo Shinpo* (*Soyfoods News*). 1994. Urete imasu. Nagai no jun-tôfu. Shufu ni ninki no "Oboro Tôfu" [Nagai's pure Oboro Tofu is selling well. It's popular among housewives]. March 1. p. 7. [Jap]
• ***Summary:*** This product is unpressed tofu curds. A photo shows that tray, similar to a typical water-pack tofu tray, with a sealed film lid.

10092. *Toyo Shinpo* (*Soyfoods News*). 1994. Atarashii fûmi no shokuzai. Tsurumaru Sangyô no 'Chûka Dôfu.' Wadai no shin shôhin [Tsurumaru Industry's "Chinese Tofu" is a new food ingredient with a new flavor: People are talking about it]. March 1. p. 7. [Jap]

10093. Konovsky, John. 1994. Work with edamamé. Part I (Interview). *SoyaScan Notes.* March 3 and 11. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** John grew up on a soybean farm in Indiana. From 1983 to 1985, after graduating from Earlham College in Richmond, Indiana, he felt like traveling outside the USA so he went to Japan on an Earlham College program as a paid English teacher, in a rather isolated area in Iwate prefecture. At that time he had little interest in how the Japanese grew or used soybeans. But in Japan he found that many of the people he knew were growing *edamamé* (green vegetable soybeans) and quite a few grew them on the bunds of rice fields as *azemame.* So he picked up an interest in edamamé from this experience, and he collected some germplasm, which he brought back to America and grew in his garden.

After working for several years in the produce industry in America, he decided to go back to Japan. He entered a

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program at Washington State University (at Pullman, run by Tom Lumpkin) to study Japanese crops–specifically wasabi [*Eutrema wasabi* or Japanese horseradish]. He wanted to introduce this as a new Japanese crop to America, grow it in western Washington state, and sell it to American sushi shops–where it is grated and added to shoyu, then served with sashimi (raw fish) or soba (buckwheat noodles). Tom Lumpkin was already very interested in edamamé, and when he learned that John was growing edamamé, he began trying to convince John to change his interest from wasabi to edamamé. Tom felt edamamé would be a more successful commercial crop than wasabi. Wasabi is very hard to grow–it needs little mountain valleys with plenty of pure water at 10ºC running year round, and it must be harvested by hand. Moreover it is a virtual nightmare to get the necessary environmental permits for growing plants in the water. This requires discharge permits, etc. Finally Tom convinced John to study edamamé; and his program had money that would allow John to travel to Japan to study edamamé.

So after a year at Washington State University, John went back to Japan on a Fulbright fellowship to study edamamé for a little less than 2 years at Iwate University, under the guidance of Dr. N. Kaizuma. Dr. Kaizuma had been a student of Dr. Tadao Nagata, who had spent his life doing very creative research on the dissemination of soybeans to Japan and worldwide. John spent about half of his time in Japan gathering literature and trying to track down and cite every known Japanese-language document on edamamé. He also spent a little time gathering wasabi germplasm. Initially his research advisors told him "There is nothing to find on edamamé." As of 1991 he had what he feels is a complete bibliography of Japanese-language publications. The key man on edamamé in Japan today is R. Masuda, who is at the National Food Research Inst. at Tsukuba. In 1989 he published the only review of the literature on edamamé, in the journal *Reito* (*Refrigeration;* 64:359-76). This is a key article.

John left the edamamé (green vegetable soybean) program at Washington State Univ. (WSU) in 1992 to start his own company. He plans to graduate from WSU with a MSc degree in crop science in the fall of 1994. He is presently breeding edamamé, and has a number of lines. The WSU program conducted large scale edamamé trials in Washington state from 1989 to 1992. Stokely USA invested a lot of money trying to bring edamamé into production, but the Japanese were never quite satisfied with the quality of the crop. John did all the seed procurement and they used top quality Japanese breeding lines, mostly Sapporo-midori and Sayamusume. The edamamé were packed as frozen pods in individual 500 gm plastic bags with labels for retail sale. The Japanese really liked the taste of the edamamé but the appearance of the frozen pods was always borderline. There were three appearance problems: The pods were small, a little too light green in color, and they tended to have bruises on the surface as a result of being mechanically harvested. More than 99% of the edamamé worldwide (basically in Taiwan, Japan, and China) are harvested by hand, not by machine. The Taiwanese are starting to experiment with machine harvesting. Tom feels that each of these 3 appearance problems is basically a technical problem that can be solved. Stokely USA shut down their edamamé operations for various reasons: The Japanese lukewarm reaction to the edamamé produced in Washington state, Stokely's tight financial condition, and orders from the parent company. Continued. Address: East-West Seeds, 728 33rd Lane N.E., Olympia, Washington 98506. Phone: 206-754-2423.

10094. Konovsky, John. 1994. Work with edamamé. Part II (Interview). *SoyaScan Notes.* March 3 and 11. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** A Chinese woman, who is a student in Tom Lumpkin's program, gets a few articles set to her from China every month on edamamé. Her father is the former head of the Chinese Academy of Agricultural Science. She was a librarian in China. Tom is close friends with their family. Getting articles from China in this way is a slow process, but Tom's program probably now has about 100 such articles. Tom will probably include citations for these documents in one of his future publications on edamamé–probably the book titled *Edamamé–The Vegetable Soybean.* John was the sole author of first draft of this book.

Dean McCleary did most of the work on the azuki book and he wrote the final draft, but he will probably not be listed as the main/first author.

John's new company is mostly focused on edamamé variety development, i.e. breeding, then supplying those seeds to local growers. Now he is brokering edamamé seeds, importing them from East Asia. He also has other jobs, related to agriculture but not to soy, which support him financially while he is building his company.

John speaks very highly about the program at WSU; it is a very unique program that offers opportunities not found in any other graduate program in the country. It is still fairly well funded.

For edamamé to succeed in America, some organization (probably a company) will have to be willing to invest considerable money and time in the product. It has great potential and Americans like it, and now that production problems have basically been solved, introducing edamamé to the USA is basically a marketing problem. The subtle appearance problems that Japanese had would probably not be problems for most Americans who have not developed the fine level of discrimination that the Japanese have. John thinks it will take some time to solve the appearance problems for the Japanese.

Concerning the question: How does one say in Japanese–"Large-seeded, vegetable-type soybeans?," John

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does not think there is such a Japanese term. Most soybeans grown today in Japan are large seeded and most of these are used for edamamé or seed production the next year. He did not hear the term *Nihon daizu* ("Japanese soybeans") very often. The introduction of true "field-type" soybeans is relatively recent. Summer-type and autumn-type soybeans refer more to maturity groupings than to seed size. The Japanese have their system, which is more complex than the maturity group system.

While in Japan, John heard the terms *natsu-daizu* (summer type soybeans) and *aki-daizu* (autumn type soybeans) used frequently. This is a fundamental distinction, although there are gradations in between. Summer soybeans correspond to U.S. Maturity Groups 000 through II, from northern latitudes. Maturity Groups V and greater correspond to autumn soybeans. Currently in Japan, almost all green vegetable soybeans (edamamé) are produced using summer type soybeans, because all the farmers want to get to market as early in the year as possible and summer soybeans are a short-season crop. Traditionally in Japan, edamamé were harvested later in the year (September or October) for *mame-meigetsu* (the bright moon of edamamé). Japanese would go outside to view the moon while enjoying freshly harvested edamamé and beer. But nowadays the peak of the edamamé season is in August, around the time of *O-bon.* So there has been a major historical shift toward an earlier harvest.

The Japanese word *dadacha-mame* is a vernacular term from Yamagata prefecture that refers to a specific type of edamamé which, when, mature have a brown seed coat and a much stronger taste (perhaps higher sugar content). It sells for a premium price.

John is still interested in the scholarly side of edamamé but he doesn't have the time for it. He now needs to earn money, which he hopes to do via his new company East-West Seeds. He is tired of school and is no longer very interested in finishing his degree program at Washington State Univ.

Two Chinese scholars who are very interested in the history of the soybean in China are GAI Junyi (of the Soybean Research Institute, Nanjing Agricultural University) and SUN Huan (head of the Soybean Institute, Jilin Academy of Agricultural Sciences, Gongzhuling). Address: East-West Seeds, 728 33rd Lane N.E., Olympia, Washington 98506. Phone: 206-754-2423.

10095. Andoh, Elizabeth. 1994. Tokyo's rich array of regional dining. *New York Times.* March 6. p. XX6, XX19 (Sunday).
• ***Summary:*** Contains excellent reviews of the following Tokyo restaurants: Konomi, Kakiden, Itosho, and Shigeyoshi. The latter served "warabi ferns wrapped in fresh yuba (broad ribbons of bean curd [tofu])" and a "soup, which contained cubes of tofu and strips of fried bean curd... well seasoned with a burnished brown miso."

Note: This brief description of yuba is inaccurate; yuba is made from soymilk, not tofu. Address: Japan.

10096. *Toyo Shinpo* (*Soyfoods News*). 1994. Miso no shukka juncho. Shôyu wa tomoni genshô. 93 nen no seisan shukka [Miso and shoyu production and shipment in Japan for 1993: Miso is increasing but shoyu is decreasing]. March 21. p. 5. [Jap]
• ***Summary:*** In 1993 in Japan 559,238 tonnes (metric tons) of miso were produced and 578,024 tons were shipped. Also in 1993 some 1,163,843 kiloliters of shoyu were produced and 1,189,896 kiloliters were shipped.

10097. *Toyo Shinpo* (*Soyfoods News*). 1994. Tôfu Ryôri Jôkyô-hen. Katei Gahô 4-gatsu gô ["Tofu Cookery–Advanced Level" edition, will be published in the April issue of *Katei Gaho* magazine]. March 21. p. 9. [Jap]
• ***Summary:*** The article contains many photos.

10098. *Toyo Shinpo* (*Soyfoods News*). 1994. Ajia no nattô–sono genryû o saguru. Biruma, Nepaaru nado e kuruma de tôsa. Ajinomoto Shohu (hin) no Bunka Fooramu no josei de. Tenpe-ken Watanabe zen kaichô ra 3 shi. 6 gatsu ni kenkyû seika happyô [Trying to find the roots of natto in Asia. Three researchers went to Burma and Nepal by car in search, helped by Ajinomoto Food Company's Cultural Forum. Among them was Tadao Watanabe, former head of the Tempeh Research Society. They are planning to present their results in June]. March 21. p. 1. [Jap]
• ***Summary:*** Photos show the three researchers who went on the trip: Tadao Watanabe, Yoshiko Yoshida, and Toshiie Maeda.

10099. *Palawija News* (*Bogor, Indonesia*). 1994. International Soyfoods Fair and the Third Asian Symposium on Non-Salted Soybean Fermentation: June 4-6, 1994, Akita City, Japan. 11(1):16. March.
• ***Summary:*** For further information contact: Symposium Executive Committee Director, Seihan Yamada, c/o Akita International Association Aidex Bldg., 8F, 2-1-60 Sanno, Akita, Japan 010.

Note: This symposium took place, but the symposium proceedings were apparently never published.

10100. Toshima, H. 1994. Coronary artery disease trends in Japan. *Japanese Circulation Journal* 58(3):166-72. March. *

10101. Yasuda, Masaaki; Matsumoto, Tetsuya; Sakaguchi, Maki; Kinjyo, Sakie. 1994. Okinawa ni okeru tofuyo no seizo ni kansuru kenkyu. IX. *Aspergillus oryzae* o mochiita tofuyo no jukusei katei ni okeru tanpakushitsu oyobi chisso seibun no henka [Studies on the manufacture of tofuyo in Okinawa. IX. Changes in protein and nitrogen compounds of tofuyo prepared by *Aspergillus oryzae* during fermentation].

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Nippon Shokuhin Kogyo Gakkaishi (*J. of the Japanese Society for Food Science and Technology*) 41(3):184-90. [21 ref. Jap; eng]
• ***Summary:*** Tofuyo is a unique fermented soy protein food made in Okinawa Prefecture, Japan. Crude protein content decreased during ripening. "Digestion of soybean protein was examined by slab polyacrylamide gel electrophoresis. Some polypeptide bands of soybean globulin, such as α'-, α-, beta-subunits in beta-conglycinin," an acidic subunit in glycinin in the water-insoluble fraction of tofuyo disappeared after 3-months ripening, and that of the basic subunit in glycinin still remained. As maturation of tofuyo proceeded, it was found that soybean protein was hydrolyzed by proteases in the moromi (mash). During maturation, the amount of total free amino acids increased, and high levels of glutamic acid, aspartic acid, alanine and proline were found.

Tables show: (1) Changes in chemical composition of tofuyo prepared by *Aspergillus oryzae* during various ripening periods. (2) Changes in the free amino acid composition of tofuyo prepared by *Aspergillus oryzae* during various ripening periods.

Figures (all graphs) show: (1) Changes in ethyl alcohol concentration, pH and activities of various enzymes in the moromi (mash) during ripening periods of 0-5 months. (3) Changes in protein solubility ratio of tofuyo during ripening periods of 0-5 months. (4) Changes in the ratio of trichloracetic acid-soluble nitrogen to the total nitrogen during ripening periods of 0-5 months. Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, 1, Senbaru, Nishihara-cho, Okinawa 903-01.

10102. **Product Name:** Tanpacky Vegetable Sliced Ham.
Manufacturer's Name: YCM Associates Inc. (Marketer-Distributor). Made in Japan.
Manufacturer's Address: 22808 Lockness Ave., Torrance, CA 90501. Phone: (310) 530-8863.
Date of Introduction: 1994 March.
Ingredients: Soybean protein, canola oil, soy sauce (soybeans, wheat, salt), honey, salt, apple cider vinegar, natural smoked flavor, natural seasoning.
Wt/Vol., Packaging, Price: 5.64 oz (160 gm).
How Stored: Refrigerated.
New Product–Documentation: Leaflet (8½ by 11 inch, color) sent by Patricia Smith from Natural Products Expo West (Anaheim, California). 1994. March 10-13. "It's extra low cholesterol. Vegetable sliced ham. You can serve in the raw or cooked. No preservatives. No animal fat."

10103. *Toyo Shinpo* (*Soyfoods News*). 1994. Daizu shokuhin ga migoto ni tappuri. Kyôto eki no shôjin bentô [Abundant, delicious soyfoods in the vegetarian box lunch at Kyoto station]. April 1. p. 13. [Jap]
• ***Summary:*** In this box lunch, which retails for 1,000 yen at the Bullet Train line in Kyoto, there are 7 soyfoods: Seasoned, cooked rice with soybeans. Cooked and seasoned tofu burger (*ganmo*). Fried dried-frozen tofu (dusted with flour). Cooked black soybeans. Tofu shûmai (*shao-mai* steamed dumplings filled with tofu). Fried okara. Fresh yuba. Sesame tofu. An illustration shows the placement of foods in the octagonal box. With the recent boom in healthy foods in Japan, the popularity of this lunch among women has increased sharply.

10104. *Toyo Shinpo* (*Soyfoods News*). 1994. Hinochi suru "Sansai Unohana": Niigata, Ishikawa Shokuhin ga zenkoku hatsubai [Long lasting "mountain vegetable okara": Ishikawa Shokuhin of Niigata started selling nationwide]. April 1. p. 2. [Jap]
• ***Summary:*** A photo shows a pack of dried okara (30 gm), sauce (100 gm), mountain veggies 60 gm (with liquid included 70 gm). Retails for ¥200/pack. 6 packs per carton.

10105. Schmitz, Tom. 1994. Tofu cook believes she nourishes body and soul: Linda Lam, tofu maker. *Mercury News* (*San Jose, California*). April 3. p. 1E, 3E.
• ***Summary:*** A large color photo shows Linda Lam and her husband Thom Tran at their Fuji Fresh Tofu Co. in Japantown, San Jose. They make tofu 6 days a week, as well as tofu pudding, soymilk (in plastic quart jugs), tofu spring rolls, Okinawa tofu, and Peking tofu. Linda Lam learned to make tofu as a girl in Vietnam, where she was taught by the monks at her local Buddhist temple. She stayed at the monastery during school vacations, preparing meals and studying the scriptures. "Three decades later, Lam remains a devout Buddhist. And her faith in tofu is equally strong." She and her family are vegetarian. She uses nigari as a curding agent in making her tofu.

Before leaving Vietnam in 1979, she worked as a high school teacher. Later she ran a catering service.

10106. LaBarr, Connie. 1994. The Nebraska Soybean Program's work with soybeans, edamamé, and other soyfoods (Interview). *SoyaScan Notes.* April 11. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In early 1994 Connie and several other people developed a very original and creative 6-panel leaflet titled "What is Edamamé" for food writers and Nebraska consumers. The Nebraska Soybean Program is now giving away edamamé [green vegetable soybeans] to many people in the state. Dr. Jim Specht, a soybean breeder in the Department of Agronomy at the University of Nebraska (309 Keim Hall), has developed a soybean variety in which all of the pods grow on the stem–and none grow on the branches. This will make it easier to harvest and process the plants for edamamé. The plants are now being grown in Nebraska, and the seed supply is being expanded for commercial production. Dave Lang, at the University of Nebraska's Food Processing Center, is involved with the marketing of

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this new product; he sees Japan as the primary market for the product. Based on what she has heard and seen, Connie feels that there is also a large market here in America. Jim Weyer (pronounced WEER), the director of the Nebraska Soybean Program, is a very forward thinking person. Both he and Connie think there is a big potential market for soyfoods in Nebraska, so they presented a proposal to the United Soybean Board (USB) to market soyfoods (in addition to soy oil) in America. But USB and the American Soybean Association (ASA) don't seem to see that as a valuable market–so the Nebraska proposal was not approved. Nevertheless, the Nebraska program will being doing things to market soyfoods, with focus on things like genistein in cancer prevention and the ability of soy protein to reduce the risk of heart disease. In talking to consumers, Connie finds many people who are interested in soyfoods recipes. She has served tofu cheesecakes and soy cheese to some groups with excellent results.

Besides Nebraska, Minnesota is also doing some work with edamamé. A company there named Minnesota Edamame is selling edamamé to Japan; the pods which do not have the desired number of beans are shelled, frozen, and marketed as "Sweet Beans." The response has been good. Growers in some other states may be growing edamamé under contract with the Japanese.

Note: The Nebraska Soybean Program is the primary contractor for the Nebraska Soybean Board. Address: Director, Consumer Information, Nebraska Soybean Program, 301 Centennial Mall South, Box 95144, Lincoln, Nebraska 68509. Phone: 1-800-852-2326.

10107. *Toyo Shinpo* (*Soyfoods News*). 1994. Kokusai Daizu Shokuhin Fuea. Sanka yobikake (Akita). Posutaa dekiagaru [Poster announces International Soyfoods Fair in Akita Prefecture, Japan]. April 21. p. 3. [Jap]

• ***Summary:*** A large photo shows the poster which explains that there will be an international soyfoods fair in Akita prefecture from June 4 to 6 (3 days). It is being organized by the Asian Symposium on Non-Salted Soybean Fermentation *Ajia Muen Hakkô Daizu Kaigi* and the Japan Organization Committee *Nihon Soshiki Iinkai.*

10108. Shurtleff, William; Aoyagi, Akiko. comps. 1994. Green vegetable soybeans (*Edamamé*) and vegetable-type soybeans–Bibliography and sourcebook, 3rd century A.D. to 1994: Detailed information on 648 published documents (extensively annotated bibliography), 30 commercial green vegetable soybean products, 20 original interviews (many full text) and overviews, 28 unpublished archival documents. Lafayette, California: Soyfoods Center. 265 p. Subject/geographical index. Author/company index. Printed April 13. 28 cm. [718 ref]

• ***Summary:*** This is the most comprehensive book ever published about green vegetable soybeans and vegetable-type soybeans. It has been compiled, one record at a time over a period of 19 years, in an attempt to document the history of these two closely related subject. Its scope includes all known information about green vegetable soybeans and vegetable-type soybeans, worldwide, from the 3rd century A.D. to the present.

This book is also the single most current and useful source of information on green vegetable soybeans and vegetable-type soybeans, since 91% of all records contain a summary/abstract averaging 215 words in length.

This is one of more than 40 books on soybeans and soyfoods being compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyfoods Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features: 30 different document types, both published and unpublished; every known publication on the subject in every language–including 614 in English, 37 in Japanese, 30 in French, 18 in German, etc.; 20 original Soyfoods Center interviews and overviews never before published. Thus, it is a powerful tool for understanding the development of green vegetable soybeans and vegetable-type soybeans from their earliest beginnings to the present.

The bibliographic records in this book include 648 published documents and 28 unpublished archival documents. Each contains (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English publications together with an English translation of the title, month and issue of publication, and the first author's first name (if given).

The book also includes details on 30 commercial green vegetable soybean products, including the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as references to and summaries of advertisements, articles, patents, etc.) are also given.

Details on how to make best use of this book, a complete subject and geographical index, an author/company index, a language index, and a bibliometric analysis of the composition of the book (by decade, document type, language, leading periodicals or patents, leading countries, states, and related subjects, plus a histogram by year) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 510-283-2991.

10109. *Toyo Shinpo* (*Soyfoods News*). 1994. Mikka kakete tsukuru Edo no ippin: Kokyû senro tsuranuku Shibazaki Nattô no Amano-ya [It takes 3 days to make Edo's {Tokyo's} best quality natto: Amano-ya pushes its high class Shibazaki brand natto]. May 1. p. 10. [Jap]

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• ***Summary:*** A large photo shows the outside of the plant. Ten smaller photos show key steps in the process.

10110. *Toyo Shinpo* (*Soyfoods News*). 1994. Okara de oishii doonatsu ga dekiru [How to make delicious doughnuts using okara]. May 1. p. 5. [Jap]
• ***Summary:*** Photos show three steps in the process, including deep-frying the doughnuts.

10111. *Toyo Shinpo* (*Soyfoods News*). 1994. [Cooking with okara]. May 1. p. 15. [Jap]
• ***Summary:*** Three photos show two different prepared dishes plus a portrait of a Japanese woman.

10112. *SoyaScan Notes.* 1994. Foods of East Asian origin that the macrobiotic movement/community has played a leading role in introducing to America, starting in about 1960 (Overview). May 10. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** These include brown rice, rice cakes, miso (many types), shoyu (traditional Japanese-style soy sauce), tamari (Japanese soy sauce containing little or no wheat; prior to about 1980 many practitioners of macrobiotics referred to natural shoyu as "tamari," thus inadvertently popularizing real tamari, which now may be better known in the USA than it is in Japan), natto (fermented soybeans), seitan (wheat gluten seasoned with a soy sauce broth; this word was coined by George Ohsawa), amazake (thick rice beverage), umeboshi salt plums, sea vegetables (kombu, wakame, hijiki, nori, etc), tofu, soymilk, alternatives to dairy products (macrobiotics do not consume dairy products), buckwheat noodles (*soba*), kuzu, rice syrup, barley malt syrup, azuki beans, sesame seeds, sesame salt (*gomashio*), daikon (white radish) and daikon pickles, kabocha (Hokkaido pumpkin), shiitake mushrooms (also known as Chinese black mushrooms, they have a firm "meaty" texture), burdock, jinenjo (glutinous yam).

They have done this by starting and running many natural food companies to import, distribute, manufacture or grow these foods; by writing cookbooks and other books about these foods; by teaching classes (including many cooking classes in which these foods are used); by influencing other people to do all of the above.

The Japanese names of many of these foods have become anglicized and are now the standard English-language names.

The macrobiotic movement also played a major role in introducing "tahini" or sesame butter (a Middle-Eastern food) to America, starting with George Ohsawa's book *Zen Macrobiotics* in 1960. Of the first 20 records in the SoyaScan database that mention "tahini," 14 are associated with macrobiotics. Likewise, 22 of the first 50 records are associated with macrobiotics.

10113. Alonso, Jean-Luc. 1994. Re: History of his pioneering work with tempeh in France. Letter to William Shurtleff at Soyfoods Center, May 16. 4 p. Handwritten. [Fre]
• ***Summary:*** "Mr. Sakaguchi has forwarded to me the letter which you sent him on 15 Aug. 1993. You were asking him for information about the first producers of tempeh in France. You mentioned the existence of a woman. In fact, she and I were associates. Her name at the time was Anita Dupuy. We began producing tempeh in September 1981 in Paris. [Note: Soyfoods Center records indicate that this company did not start production until about May or June of 1982].

Since then Anita was divorced and has remarried to a Dutchman; she lives in Holland, and goes by a different name. I do not know her address. She is teaching French, which is what she was doing before she left France.

A brief history: While staying in the United States for the purpose of studying at the Kushi Institute of Boston [Massachusetts], I came up with the idea of producing tempeh in France. Upon returning to France, I began experimenting with its production and began looking for material and a place to produce it. Mutual friends introduced me to Anita Dupuy who also wanted to make tempeh. Thus we became associates for this adventure. We rented an old butcher shop. The small business was named *Traditions du Grain.* We were producing 100 to 200 cakes of tempeh (each weighing 300 gm) per week. Anita was in charge of the business while I took care of making the tempeh. Except for fried tempeh and sandwiches, we did not make any second generation products. This may explain our lack of success. For two years we did not receive a salary. In addition, understanding between Anita and me went downhill for several reasons.

After two years, I quit the business. Anita continued for a while, then sold the company to another person, who continued for a year or two and then finally stopped.

In 1985, another business in Montpellier named Athanor started producing tempeh, plus a pâté with tempeh and amasake as the main ingredients. This company was not much more successful than Traditions du Grain–It closed its doors in 1987. I do not know the names of the owners of this business.

In 1989, a new attempt was made by the firm named Renaitre (meaning "to be reborn") close to Cahors. Another failure. One year later the business closed its doors.

During that time, in 1987, a company named Soleil de Lalise (meaning "the sun of Lalise"), located near Agen, also began to make tempeh and tofu. These products are still sold by this firm. Their address is: Domaine de Galise, 32260 Tachares, France. Phone: 62.65.35.63.

"As for myself, I produced tempeh at the communal level from 1987 to 1989, within the framework of a macrobiotic center. Then the center closed down. I continued alone for a small local micromarket (friends and acquaintances). In late 1989 and early 1990 I was in contact

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with you. I was planning to make tempeh on a large scale. I almost bought the business Renaitre that I mentioned earlier.

"The most amusing aspect is that while visiting the Renaitre plant, I recognized equipment or material that I had purchased for Traditions du Grain. Renaitre had bought it when Traditions du Grain closed down. In the end, the deal did not go through. In the meantime, my wife [Rachel] and I moved to a new location.

"In October 1992 we began producing Essene bread and other baked goods. This business [Gaia, in Graulhet] is going very well.

"In France, tempeh did not meet with large success because nobody invested energy and money in *information.* For now we are dedicating ourselves to making Essene bread but we have not given up on the idea of producing tempeh. We are just waiting until we have the means to do things seriously." Address: Gaia, 7, rue du Mail, 81300 Graulhet, France. Phone: 63 42 16 03.

10114. *Canadian Export Soybeans* (*OSGMB, Chatham, Ontario, Canada*). 1994. Export market development. 7(2):1. May.

• ***Summary:*** "Ontario's soybean exporters are reaching into new markets in the Asia / Pacific region in an effort to expand sales for food use. Three Ontario companies raveled with representatives of the Ontario Soybean Growers' Marketing Board and Agriculture Canada to Indonesia, Taiwan and Korea, February 27-March 8, 1994.

"Ontario companies have been exporting food quality soybeans to Japan, Hong Kong, Malaysia and Singapore for almost 20 years. Soybean exporters are optimistic about prospects of doing business in the region since the economies of these new markets are booming and showing a willingness to lower trade barriers and thereby improve our access to their markets."

A photo shows OSGMB's Second Vice Chairman Tom Lassaline making a presentation to Canada's ambassador to Indonesia Mr. Larry Dickenson.

10115. Kikkoman great grilled recipes and more. 1994. Lincolnwood, Illinois: Publications International. 95 p. May 17. 21 cm. Series: Favorite Brand Name Recipes, Vol. 5, No. 68.

• ***Summary:*** This color book is saddle stitched, so it looks like a magazine. Contents: Summertime and the grillings is easy with Kikkoman. From the butcher shop. Burgers, ribs & kabobs. Pleasing poultry. From the sea. Magnificent mealtime salads. Savory side dishes.

10116. Clifford, Mark. 1994. Profile: K.S. Lo, Hong Kong. Milk for the millions. Grandson of indentured servant in Malaysia epitomises the Overseas Chinese success story. *Far Eastern Economic Review.* June 9. p. 78.

• ***Summary:*** K.S. Lo is the grandson of an indentured servant who had been sent to work in Malaysia's tin mines. K.S. Lo was born into the poverty of a Hakka family in China's rural Guangdong province, the son of a would-be scholar who moved to Malaysia after failing China's imperial exams. Mr. Lo lived in Malaysia from age 10 to 20. In 1930 the future soy-milk magnate relocated to Hong Kong to attend Hong Kong University, where he studied commerce and law. After graduation, he worked as a secretary to Malaysian-Chinese property magnate Eu Tongseng.

"But a trip to Shanghai in 1937 [sic, 1936], on a mission to wind up a failed business that one of Eu's sons had started, forever changed Lo's life. Shanghai in those days didn't have much of a nightlife for sober sorts like Lo, so he often passed his evenings at the YMCA reading and listening to lectures. One of those lectures, given by an American diplomat from Nanjing, was called 'Soyabean: The Cow of China' and it extolled the role that soya had historically played in the Chinese diet."

Describes the founding and early history of Vitasoy. In 1940 he set up a soy milk factory in Hong Kong's Causeway Bay district. The company got off to a slow start. "It was only when Vitasoy opened a retail store that sales took off.

"War put an end to the business after less than two years. Fortunately, Lo managed to sell the firm's stock of soybeans and sugar before the Japanese commandeered the company headquarters, giving him enough money to survive the nearly four years of war which followed.

"What he did with the proceeds of the sale was typical of Lo's inclination to go against the grain. Rather than investing in gold, the usual Chinese store of value, Lo bought useful products such as telephone wire and tins of anti-malaria medicine."

In 1942, Lo smuggled his family over the border into China, where a tobacco-farming venture flopped. So he returned to doing what he knew best: soy. His wife made cakes and he made soy milk; the business thrived. Vitasoy was first listed on the Hong Kong Stock Exchange earlier this year; now run by his son, Winston, it has annual sales of more than HK$1 billion. The company produces more than one million drinks a day.

"To fully understand Lo, it is necessary to understand his parents. From his mother, Lo imbibed a do-good instinct. From his scholarly father, he acquired a taste for the finer objects in Chinese culture. His teapot collection, which is being readied for a world tour, was born after he stumbled on a collection of Yixing teapots in a Hong Kong antique store. Now, more than 3,000 antique teapots later, Lo is the major benefactor of the Hong Kong Museum of Tea Ware." A photo shows K.S. Lo, smiling.

10117. Kushi, Aveline. 1994. Early work with tempeh (Interview). *SoyaScan Notes.* June 11. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Her first son, Norio, was born on 15 Dec. 1954.

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Her youngest son, Hisao, was born on 8 June 1965. Then she and Michio moved from Wellsley to Boston, Massachusetts, and started Erewhon in April 1966. In Aug. 1969 Aveline moved to Los Angeles (California), where her youngest son, Hisao, underwent traditional Japanese treatment for a bone problem. After about 2 years she and her son returned to the Boston area. At about this time, she and Michio took their first or second trip to Europe. During a visit to Amsterdam, Netherlands, she was with Adelbert Nelissen (who was a student of macrobiotics and is now running a Kushi Institute there), who took her and Michio, after a seminar, to an Indonesian restaurant. There she tasted tempeh for the first time, realized it was made from soybeans, and liked it very much–in fact much better than natto. She also realized that most Americans would like tempeh better than natto–another fermented soyfood. She told Adelbert: "You must learn how to make tempeh." After returning to America, she sent an American man to Amsterdam to learn how to make tempeh. She also brought back tempeh and started to show it to people, and to use it, in her cooking classes in Boston. Everybody liked it. And it was easy to make. Address: 62 Buckminster Rd., Brookline, Massachusetts 02146. Phone: 617-232-6869.

10118. Lipson, Larry. 1994. Makoto Sushi rolls out superb cuisine. *Daily News of Los Angeles* (*California*). June 17. p. L44.

• ***Summary:*** This is a review of the Japanese sushi bar Makoto Sushi at 17930 Ventura Blvd., Encino, California. "Recommended items: Sushi, sashimi, oshinko pickles, edamame soybeans, scallop sashimi, yellowtail collar, baked halibut or barracuda, baby squid [calamari] in miso sauce, soba, special salads."

Note: This is the earliest English-language document seen (July 2009) that contains the term "edamame soybeans." The combination seems to be a way of explaining to customers who are unfamiliar with the word "edamame" that they are basically soybeans. Address: Daily New restaurant critic.

10119. Luedtke, Bob. 1994. Brief history of Jameson-Lambert Co. and Minnesota Edamame (Interview). *SoyaScan Notes.* June 20 and 21. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Bob started working for Jameson-Lambert Co. in 1986, managing farmland for outside investors. Jim Lambert was his boss. At that time Jameson-Lambert was primarily a farm management company that also did some brokerage work. He placed ads in the *Minneapolis Tribune* advertising the company's services. Reiko Weston (that is the correct spelling of her name) contacted him; she wanted to buy land to grow edamamé. He first met with Reiko in the fall of 1987. He talked her out of buying the farmland and got her to contract with local growers and a canning factory. That project started taking a lot of Jameson-Williams' resources. So the company spun off the brokerage firm that it had and some other projects in order to concentrate on the edamamé because the edamamé looked to have a brighter future.

The first commercial edamamé crop in the Western world was planted in mid-1988 (2 acres grown by one farmer near Truman, Minnesota–about 17 miles north of Fairmont) harvested in September 1988. The crop grew well, giving a good yield. But there were problems in harvesting the beans in the pods using a new mechanical picker that required careful adjustment so that it harvested most of the pods without damaging them. 7,000 lb came out of the field–including green beans in the pods (of varying degrees of maturity and quality), foreign material, stems, leaves, everything. Only 2,000 lb was of saleable quality edamamé–the rest went to a cattle feeder. Bob contracted with a local processor (Fairmont Foods of Fairmont, Minnesota) and they washed, blanched, froze, and packed the first crop. In about October 1988, he sold the 2,000 lb to Nishimoto Trading Company in South San Francisco (California). Nishimoto used this product mostly as samples for their distributors.

The product name on the stick-on labels was simply "Edamamé." It was sold frozen in 1-lb plastic bags. Most of the product was sold on the West Coast of the USA, where it was sold mostly in Japanese grocery stores. The company sent samples to Japan but never sent or sold any quantities.

In 1989 the company expanded its acreage dramatically to about 300 acres, rising to 350 acres in 1990. Mr. Lambert owned a grain elevator in Huntley, Minnesota, so all of the growers for these 2 years were located around Huntley. The crop was pre-processed (washed and cooled) in Huntley, then shipped to Tony Downs Foods in St. James, Minnesota for the blanching and freezing. In 1991 Jameson-Williams purchased a building and built their own processing plant in Jackson, Minnesota; they still use this facility. Acreage in 1991 grew to 400 acres. In September, the company signed a 5-year contract with Nishimoto Trading Co. to sell them edamamé. Nishimoto intended to distribute the product mostly in the USA. But two nights into the harvest, on September 18, there were 2 nights of unusually early severe frost, that damaged the crop–even though edamamé are typically harvested about a month earlier than typical dry soybeans. The average first date of frost in that area is October 5–so frost is not usually a big danger. Nishimoto was unwilling to buy any of the 1991 crop–a disaster! Jim Lambert was still president of the company; there were some other things going on at the time that Bob would rather not get into. The company has not dealt with Nishimoto since 1991 and the contract is no longer in effect.

Acreage grew to 450 acres in 1992 and about 500 acres in 1993, but both years the crop suffered from rain–meaning 3 years in a row of weather-related damage. Yields were pretty good but the pods were smaller than ideal. Bob

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considers a good yield to be about 3,200 to 3,300 lb/acre of saleable green beans in the pods. If the beans were allowed to mature, the yield would be about 45 bushels per acre (1 bushel = 60 lb) of dry soybeans per acre (2,700 lb of dry beans without the pods).

In about May of 1992, Jim Lambert, who was the owner of Jameson-Williams Company, sold his company to another man whose name is confidential. At that time Lambert left the company and got out of the edamamé business. One of the reason's Lambert was "let go" had to do with misrepresentations made in Sept. 1991 when the contract was signed with Nishimoto. At that time the company name was changed to Minnesota Edamame. The other man is still part owner; they just finished another joint venture with Minnesota Waxy, Bob is now the manager of Minnesota Edamame. All of the company's operations are now in Jackson, Minnesota.

Essentially all of the edamamé that the company has sold have been sold in the United States, mostly on the east and west coasts. They generally sell the product, private labeled in frozen 1-lb retail packs, to two Japanese-run trading companies: Mutual Trading Co. (Los Angeles) and JFC [Japan Foods Corp., with headquarters in San Francisco and offices across America]. Nishimoto plans to buy edamamé from the 1994 crop. They pack the product under 4-5 different labels. Bob thinks the product ends up mostly in Asian-American grocery stores, with a little sold to restaurants. This year Bob's company has also sold 3 truckloads (90,000 lb) of *mukimamé* (under private label) primarily to a Chinese-American trading company in New York; the generic name on the label is something like edible green frozen soybeans. The company is now in the process of developing its own label. The Japanese are not interested in *mukimame.*

As for the future: The soybeans they are now using have pods that are a little too small for the Japanese market. The edamamé imported to the USA from Taiwan are the second-grade products–not good enough to sell to Japan. The Taiwanese edamamé beans don't grow well in Minnesota. He is working on breeding improved varieties with the University of Minnesota, the University of Illinois (Dr. Richard Bernard), Iowa State University, and some private companies. It is quite easy to develop a large-seeded, good tasting edamamé bean, but it is harder to breed in resistance to phytophthora and other diseases–and the process takes a long time. He is not discouraged and thinks the product has a bright future. One new direction is to develop *mukimame,* shelled green soybeans. They are working with the state of Minnesota and some private individuals to introduce the product as "Sweet Beans" to Caucasian-Americans. His market research shows that there is enough of a stigma associated with the word "soybeans" that they don't want that term to appear prominently on the label.

Bob has been in touch with Pillsbury, but they have dropped their edamamé project–apparently because they don't want to be the first into the market. He is trying to sell to natural and health food stores.

This year Bob's company has planted about 700 acres of edamamé, up from 500 acres last year. Last year's bad rains destroyed about half the crop. He could have sold twice what he harvested. The variety of soybean he grows do not do taste quite as good when grown further south (as in southern Illinois) as they do in Minnesota. This year Richard Bernard (who is partly retired) has 2,500 varieties of soybeans for edamamé growing in his test plot at the University of Illinois. He has grown edamamé for many years, and he has found that the taste of one variety varies depending upon the area where it is planted. The Japanese like the beans best that are grown in southern Minnesota; they like a sweetness. He is looking into breeding in more sweetness. Address: Manager, Minnesota Edamame, Route 1, Box 53A, East County Road 34, Jackson, MN 56143. Phone: 507-847-3591.

10120. Johannes, Kenlon. 1994. Re: Your interest in U.S. biodiesel. Letter to M. Watanabe, Asst. Manager, Machinery and Equipment Dep., Kajima Corp., 2-7, Motoasakusa 1-Chome, Minato-ku, Tokyo 107, Japan, June 28. 1 p. Typed, on letterhead.
• ***Summary:*** "Biodiesel can be purchased from: 'Interchem Environmental, Inc., Midwest Biofuels Division, 9135 Barton, Overland Park, Kansas 66214. Contact: Gary Wilson, Bill Ayres.'" Address: National SoyDiesel Development Board, 1907 Williams St., P.O. Box 104898, Jefferson City, Missouri 65110-4898.

10121. *Health Foods Business.* 1994. San-J brewery expansion. June. p. 55.
• ***Summary:*** San-J International's tamari soy sauce brewery, the world's first outside Japan, has expanded and added fermentation tanks to the facility. This has enabled the company to increase production by 75% as of April.

10122. Morinaga Nutritional Foods, Inc. 1994. "Chocolat Pie, Fantastique!" The Mori-Nu *Lite* Tofu chocolate dream pie–Only 1 g fat (Ad). *Vegetarian Times.* June. p. 65.
• ***Summary:*** This full-page color ad shows a large tofu chocolate creme pie covered with sliced bananas. Above it on a wooden table is a pack of Mori-Nu Lite Silken Tofu (Firm) on a wooden table surrounded by bananas and almonds. There is a recipe for the pie and a coupon for any of 5 types of Mori-Nu Tofu. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 310-787-0200.

10123. Bianchini, Gilberto. 1994. Re: Early history of tofu and seitan in Italy. Letter to William Shurtleff at Soyfoods Center, July 16–in reply to inquiry. 3 p. Typed. [Eng]
• ***Summary:*** "I started to make tofu and sell it officially in October 1979 in Rimini, Italy, at Via Cuoco 9 (Community

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Food). I first learned how to make tofu in London at the Community Health Foundation, Old Street 98, in 1976 or 1977. Then I gained additional experience in making Japanese-style nigari tofu from Centers and individuals in France and Belgium. I first visited the United States in late 1978 and early 1979. On 9 Feb. 1979 I visited you [William Shurtleff and Akiko Aoyagi] at New-Age Foods Study Center in Lafayette, California, having a good impulse in tofu pioneering, to talk about making tofu in Italy.

"In 1980 I visited a friend, Mr. Franco Pagliano, in Milan; that city had many Chinese restaurants. Mr. Pagliano had learned how to make tofu from Mr. Roland di Centa. was supplying these Chinese restaurants with a small quantity of tofu (he made it the Chinese way, with calcium sulfate), but he was soon forced to stop production because he had difficulties producing, unofficially without the proper permits, in his apartment. It was a really good experience for me to get to know Chinese and Japanese people; Franco was very skillful and shared many secrets with me. Then after several months he called me to say that he was going to stop tofu production and that he could introduce me to his clients–which he did, including a Japanese restaurant, Suntory Italia, which had not previously accepted his Chinese-style tofu. I had contacts in Milan and met Mrs. Giovanna Mazzieri at a conference in Milan, where tofu was presented to the public and the press, together with the Italian Chefs' Association. I remember that on that occasion I first had a large number of tofu kits sold through Mrs. Mazzieri.

"I survived financially making tofu for the first couple of years. I sold my tofu to the Chinese restaurants of Milan, driving there once a week from Rimini in my small refrigerated car (280 km each way). I soon got tired of the trip, but actually I was motivated and satisfied and full of curiosity for the Chinese and Japanese atmosphere. Meanwhile, I was stopping to deliver my tofu at all of the macrobiotic and natural food shops and restaurants along the way (in Cesena, Forlì [Forli], Faenza, Bologna, Modena, Reggio Emilia, Parma, etc.). During those years I did promotion for soyfoods, including cooking classes.

"In July 1982 I attended the Soyfoods Conference in Seattle, Washington (we met again) because of my interest in large-scale production and in making a report on soyfoods, together with a lady dietitian from Bologna (I forget her name) supported by the University of Bologna. She continued introducing the many good qualities of soyfoods to those in her field, medical doctors and nutritionists. For more information on this, contact the Sunsoy Food company in Bologna.

"After my 1982 trip to the USA (now having with me color slides, literature, and information), I developed contacts with the largest food distributing company in Italy, Coop Italia, but the people in charge believed that it was too early to distribute tofu widely in Italy–the market was not yet ready... maybe in the future. Even though they were open to innovative ideas, the negative answer was disappointing.

"I remember there was a time in 1983 when I had the luck of meeting a Japanese girl, Fusako Aoki, who was just passing through Rimini–a very rare occasion. She helped me in tofu-making classes for about 3 months, in Rimini and other cities. Meanwhile many people visited me to learn about making and selling tofu (future competitors)!

"I had enough technical skills to develop and build (mostly by myself) a stainless steel continuous open-air steam cooker (not pressurized! a secret for good tofu), a second-hand Weston (from the USA) vibrating screen, a good stainless steel hammer mill. This was really good equipment for those times, the only equipment of its kind in Italy that I knew of.

"I was in charge of everything–production, sale, promotion, and new product development. Unfortunately I was not able to grow from the individual to the team aspect of the work. I exhausted myself, ending production in June 1988. In that year I was supplying centers in cities like Rome, Firenze [Florence], Torino [Turin], Bologna, Treviso, and Ravenna–mostly in northern and central Italy. The demand was growing and it reached the point that in places like Florence, Rome, and Torino people started companies to make soyfoods. At that point, I could survive only by diversifying products, improving packaging, moving into a larger factory at a new location, and expanding the company and the number of employees.

"I could not do this, and after a project of moving in Toscana near Florence, to live and work there, I had to discontinue my activities. The other reason was that my family was growing rapidly; I had 2 children in 1985 and 1987, and I did not want to jeopardize or endanger my family's personal financial situation. Looking back, I think I made the right choice, but I feel good when someone remembers me for my good tofu. I sold my equipment at a low price to a company named Food for All in Verona, then helped them with my knowledge of making and selling tofu. They are connected to the Ananda Marga Society, are supporting activities in India, and are really nice people.

"While in business, I was producing: Tofu (vacuum packaged or in bulk), tofu spreads (various flavors), tofu burgers, tofu mayo (fresh or long-life, in glass jars), seitan, seitan burgers, spreads, soymilk (sometimes, and only fresh), and various tofu desserts (fresh and perishable). I only made small batches of tempeh, for personal use and experimentation (not sold commercially) using cultures from the USA. Near the end of my activities, I produced 400 kg (and up to 600 kg) of tofu (base product); officially I had only one (maximum two) part time workers, with good help from my relatives.

"The only company (apart from the person of Mr. Pagliano) I know that made tofu before I did was the Poporoya company in Rome, which produced and sold it at his branch in Milan, the Poporoya-shop, a Japanese shop.

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"People introducing soyfoods in Italy were the macrobiotic centers: Mr. Ferro Ledvinka from Rome, Mr. Alois Grassany from Bologna, and Mr. Roberto Marocchesi from Torino.

"I still see an opportunity in the future for making and selling tofu and tofu products in Rimini; this would be for me and my friends, but it would work only if it was connected with a larger project of a vegetarian cultural center. Who knows? Now I am a 'natural wood' carpenter." Address: Via Cuoco 9, 47037 Rimini, Italy.

10124. Fellman, Louis. 1994. History of pioneering work with tofu cheesecake, Sprucetree Baking Co., and Soy Delites. Part II (Interview). *SoyaScan Notes.* Aug. 19. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** So in about January 1985 Louis started a company named Soy Delites, Inc. that made nothing but tofu pies. Several friends invested money. "I did what a lot of people do. I took every credit card and maxed it out to the limit, then got on my knees and prayed every night. We went through some trials and tribulations like many companies do." At first he sold only whole pies, but then he realized he needed to sell packaged, individual serving. Eventually he found a company that made little wedge-shaped containers for pie slices. Louis moved his business into a bagel bakery in Matawan, near where he was living. Then Louis started baking the pies in little round 6-ounce tins with a little plastic lid on each. With a nice label and the new size, the product started selling well. He also made 6-inch pies for people who wanted something bigger. Fillings included banana-almond, carob-coconut, and mint carob chip. Toppings included strawberry, blueberry, raspberry. Richard Worth, who started Sorrel Ridge, made very thick batches of his preserves in 3-gallon containers as toppings for his tofu pies. When Richard left the company, it became very difficult to get a good topping that Louis did not have to cook.

Neshaminy Valley distributed the product from the outset, and a Boston distributor back-hauled the tofu pies to Boston, Massachusetts, where they sold well at Bread-and-Circus. But Louis couldn't get his products into supermarkets or mass market stores. He was making a very modest living, but the satisfaction was there. Eventually Louis bought his own shop for Soy Delites at 568 Broadway, Long Branch, New Jersey. Then he started distributing Mediterranean foods (hummus, tabbouleh) made by another company.

In about 1988 Mark Brancato, who had a concession at the Delacorte Theater–free Shakespeare in the Park, approached Louis and they worked together to develop improved Mediterranean foods. Louis made these foods and first sold them to Mark in the summer of 1988. Then he took some samples to some of his customers. "They loved them. They didn't want the brand I was distributing any more." The demand kept increasing. Meanwhile, Louis was having problems getting delivery of tofu from Nasoya. So he started buying his tofu from Jeff Connerton of Fresh Tofu in Easton, Pennsylvania. The quality was inconsistent. Finally he looked at the who situation and realized that the tofu pies were not carrying their own weight. So he let them die. Louis made his last tofu pie in about 1988-89.

The tofu cheesecakes sold well, but there were several problems in making them profitable. First their production required a great deal of labor and therefore were not as profitable as Louis had hoped they would be. Second, the packaging was difficult because each pie was so delicate. He sold them refrigerated, but some stores kept them in the freezer, which hardly changed the quality at all. They were distributed by several distributors–but not by enough of them.

What are they keys to selling tofu cheesecakes profitably? (1) Find a good source of high quality, reasonably priced tofu, ideally one that has kosher certification. Find an acceptable sweetener. Maple syrup makes by far the most delicious tofu cheese, but it is too expensive. So Louis used honey, which he detests, both in terms of flavor and philosophy. Rice syrup is not sweet enough. Rice syrup, brand-named Rice Nectar, is now very readily available on the East Coast, made by T&A Gourmet. Perhaps a mixture of maple syrup and Rice Nectar would make a good sweetener. (2) Use the proper mixer and blade to make the tofu filling very smooth; Louis used a Stefan model made in Germany, not a Hobart VCM. (3) Develop good packaging for the product. (4) Get good distribution for the product, which hinges very much on the packaging, freshness, and shelf life.

In 1992 Louis changed the name of his company to Abraham's Natural Foods, whose main products are Mediterranean-style foods like hummus, tabbouleh, baba ganouj, etc. The market for these latter types of foods was much larger than the market for tofu pies. For a while he made both the tofu pies and the Mediterranean-style foods. Louis' partner from Sprucetree, Howard Grundland, went out of business (he was divorced, and moved), so Louis took over the production of Howard's Sweet Rice Cookies (made with a flour from mochi / glutinous rice). The original recipe, which is macrobiotic, came from Aveline Kushi or Murray Snyder. But the tofu pies were not as profitable as Louis had hoped they would be. So the demand for the hummus and other products basically squeezed out the tofu pies. The Bridge (in Middletown, Connecticut) is now a distributor of Louis' products. Few companies can survive on one product: The companies that make Tabasco Sauce, Pepsi, and Coca-Cola are exceptions.

Louis still pays Howard a small royalty on the Sprucetree Sweet Rice Cookies–which are still selling very well. As of Aug. 1994 Howard Grundland can be reached at 410-239-9791. Murray Snyder (phone: 212-308-3818) is in Manhattan, New York, running a macrobiotic center where he does teaching and consulting. Mark Medoff was planning to go to law school. Louis has been out of the organized

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macrobiotic scene for years. Address: Abraham's Natural Foods, P.O. Box 4201, Long Branch, New Jersey 07740. Phone: 908-229-5799.

10125. Wang, Huei-ju; Murphy, Patricia A. 1994. Isoflavone composition of American and Japanese soybeans in Iowa: Effects of variety, crop year, and location. *J. of Agricultural and Food Chemistry* 42(8):1674-77. Aug. [25 ref]
• ***Summary:*** The amounts of 12 isoflavones were measured in 8 American and 3 Japanese soybean varieties by using C_{18} reverse-phase high-performance liquid chromatography.

The isoflavone content of Vinton 81 soybeans was measured each year from 1989 to 1991; it ranged from 1176 to 3309 micrograms per gram. The isoflavone content of soybeans grown in different locations in 1991 ranged from 1176 to 1749 micrograms per gram. Thus crop year seemed to have a much greater influence on isoflavone content in Vinton 81 than did location. Isoflavone content of the other 7 American varieties ranged from 2053 to 4216 micrograms per gram. The yearly variation in the content of individual isoflavones soybeans can be different by a factor of five, and of total isoflavones by a factor of more than two.

The isoflavone content of the 3 Japanese soybean varieties (Keburi, Kuro daizu [black soybeans], and Raiden) ranged from 2041 to 2343 micrograms per gram. Address: Food Science and Human Nutrition, 2312 Food Sciences Building, Iowa State Univ., Ames, Iowa 50011.

10126. Mio, Art. 1994. Update on Morinaga Nutritional Foods (Interview). *SoyaScan Notes.* Sept. 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Morinaga is now selling about 420,000 cases/year of their different types of Long Life tofu. Sales increased very little last year. The company will have to sell 800,000 cases to break even. During its entire history in America, Morinaga has not had a single year when it made a profit. It continues to lose money every year, but not enough to cause a crisis in Japan or to lead Japanese management to decide to discontinue the product or operations in America.

As the value of the dollar continues to fall against the yen, it becomes increasingly expensive to import tofu from Japan, and thus either the retail price of tofu must rise accordingly or profit margins must drop. It was Mr. Ono's decision to establish Morinaga selling tofu in America, and he is still the person who must make the big decisions about the company. Mr. Kumoda is in charge of Morinaga's operations in America. Many people lose face, each step of the way up the ladder, if they admit that things are not going well. Art has to bend with the wind. Even if he makes a suggestion, it just goes up the ladder.

Bill Shurtleff's observations: Someone needs to look carefully at the total Morinaga situation and make some big decisions, such as to build a plant in America. There is no leadership–the company is just drifting, and losing money every year. No one has a strong belief in the product.

The basic problem is not to find a good slogan to sell Mori-Nu Tofu but to address the fundamental structural questions about the company's future. What is needed is to find a creative way to finance a plant in America. What are the product's unique characteristics? Long Life tofu. Silken tofu. Address: National Sales Manager, Morinaga Nutritional Foods, 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-669-8636.

10127. Grundland, Howard. 1994. Sprucetree Baking Co. and tofu creme pies (Interview). *SoyaScan Notes.* Sept. 11. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Sprucetree conceptually originated in about 1970 or 1971 in Boston, Massachusetts, where Howard was lived in Michael and Gretchen Swain's macrobiotic study house for 3 years (1970-1973). Howard and his roommate, Gary Gaiser, used to visit Crane's Call, a bakery then owned by David and Loretta Kailin. Crane's Call made a fantastic rice bread in loaves–which was naturally leavened (no added yeast), using brown rice and sweet [glutinous] brown rice as a sourdough starter. David and Loretta inspired Sprucetree, which later made a similar bread.

In 1972 Howard traveled down the East Coast from Boston to Key West, including Baltimore (Maryland) and Philadelphia (Pennsylvania). He remembers meeting Murray Snyder in Baltimore a day or two before Murray left for Brazil to study and teach macrobiotics. After Howard returned to Boston, Stanford Lessans, whom he had met in Baltimore, offered to back him in a bakery. Howard had no previous commercial baking or business experience. In mid- to late 1972 David and Loretta had sold Crane's Call to Howard Goldman and the name was changed to the Queensberry Street Bakery. Howard Grundland now began studying baking with Howard Goldman there. Howard bought a small grain mill and began milling flour at the Swain house. With David's and the Goldman brothers allowing him to use their bakery on the weekends, Howard began making a small amount rice bread in late 1972 or early 1973. There was no sense that Howard was a competitor; he sold some bread to Erewhon–as did Queensberry. Early in the summer of 1973 Howard packed up his Volkswagen bus and moved to Baltimore to start his bakery. He lived in a macrobiotic study house run by Miles and Susan Kierson on Park Heights Avenue in Pikesville (in northwest Baltimore) and again met Murray Snyder. Sprucetree Baking Co. started in 1973, and was initially located in the kitchen of the macrobiotic study house. Howard held another job during the day and would bake rice bread 2-3 evenings a week. He would deliver his bread from Baltimore to Washington, DC. In about Sept. 1973 Stanford Lessans bought him a regular commercial "sugar bakery" at 6657 Belair Road in Overlea, a suburb in northeast Baltimore. The company opened its doors in Oct. 1973. During the first year, Howard had no

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paid employees, but from the first day he was assisted by Michael Hare (volunteer) and about 10 other people who were members of the local macrobiotic and "new-age" communities, including Jeffrey Bergen and Murray Snyder (who was also organizing the East West Foundation). Their first product was rice bread. He has an old label which shows that the ingredients were: Organic whole wheat flour, filtered water, organic brown rice, organic sweet brown rice, and sea salt. Note that it contained no added sweetener. His second product was raisin strudel.

Howard is not certain how the recipe for tofu pie [which resembled a cheesecake] originated. He thinks that "Murray Snyder whipped out his old California recipes, and among his recipes was the recipe for tofu pie." Howard does not where in California Murray got this recipe. Murray can be reached in New York City at 212-308-3818. Howard would guess that the tofu pie was launched in about 1974 or early 1975 (about 18 months after the bakery started on Belair Road), and definitely when the bakery was located on Belair Road bakery. By the time the company moved across town to 4105 Aquarium Place at Reisterstown Road, Baltimore, in 1976 or 1977, they no longer made them using a blender. Howard is quite sure that Louis Fellman began to work for Sprucetree when the company was still on Belair Road. [Louis is certain he began to work for Sprucetree in August 1977]. Howard has an article dated 24 Jan. 1980 telling about the company, located at Aquarium Place, and founded in 1973. He also has an undated article titled "Sprucetree Baking Co.: They do things naturally," by Mike Lipske from about 1974 (the article says he was age 25) published in the *Baltimore Sun.* The tofu pies are not mentioned but Sprucetree had just purchased a cookie machine, and Laurelbrook Foods in Bel Air, Maryland was located nearby.

Sprucetree was the first company that Howard knows of that made this kind of product; many companies later copied the product. The product was originally named either Blueberry Tofu Pie or Tofu Blueberry Pie. At times the made either blueberry or strawberry, but the strawberry was usually too costly. "Michio Kushi would shake his head; he couldn't believe that we were blaspheming tofu to such a degree. Aveline Kushi used to eat our tofu pies frequently." Howard does not remember whether tahini and lemon juice were part of the original recipe–but he thinks they were. The tofu pie was not a major income earner for Sprucetree. Breads and cookies made most of the money. "My concept of Sprucetree was to have everything that you could want at a bakery presented in a natural foods form, and as close as possible to macrobiotic quality. We made eclairs (with tahini, apple juice, lemon juice and vanilla filling–no eggs) and doughnuts. We developed many creative, unique products." They also made an apple-tahini pie, seasonal strawberry and pumpkin pies, and a fruitcake for Christmas–all pretty much "macrobiotically correct." The tofu pies were always sweetened only with maple syrup (never with honey), which was expensive, though labor costs were not high. But they were priced to be sell at a profit. Sprucetree made both 8-inch diameter pies (which had the filling on a Graham-cracker type crust made of 2 types of whole-wheat flour, barley malt syrup, safflower oil, and a little salt) and a 3-inch tart (with no crust in a little pie tin), sold refrigerated. The filling was mixed in a 60-quart Hobart VCM, poured into a gallon measuring cup, then poured into the tins. After being baked and cooled, the blueberry topping was put on. The big pies were packaged in pie boxes with a clear window; the individual tarts were initially overwrapped with Saran wrap, later packed in a sealed package. They sold the whole pie, mostly to stores, which generally sliced them and sold them by the slice, either at a juice bar or re-wrapped and refrigerated. Some people would buy whole pies.

The tofu pies were the only product in which Sprucetree used tofu, but they did use soy flour in a 7-grain bread, and they made a sesame-soy bread (based on whole wheat with soy flour, and sesame seeds on top).

By the mid-1980s the natural baking industry had become very competitive. The trend was toward both better quality products and less concern about quality (such as more use of white flour and yeast). Matthew's was becoming very popular and affecting his sales. The company was forced out of its location at Aquarium Place in about 1985-86 and had to move to a shell at 4200 Mortimer Ave. Sprucetree finally went out of business in about Feb. or March of 1988. Address: P.O. Box 13, Hampstead, Maryland 21074. Phone: 410-239-9791.

10128. Belleme, John. 1994. New developments with rice beverages and natto (Interview). *SoyaScan Notes.* Sept. 16. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** At the recent Natural Products Expo on the East Coast there was a big battle of the rice beverages. Westbrae has just launched two new rice beverages in aseptic cartons with spouts; one is regular strength and the other is concentrated. This may be the first natural foods product in an aseptic carton with a spout. Imagine Foods then switched to a carton with a spout. Then Imagine Foods put out a big poster explaining why their Rice Dream is superior to Westbrae's. John prefers the flavor and texture of Rice Dream.

John's main business is now exporting to Mitoku. There is a big demand for organically grown soybeans in Japan. John has a standing order from Mitoku for 1,000 tons of small-seeded organically-grown soybeans to be used in Japan for making natto. Tommy Carter at North Carolina State University in Raleigh is breeding natto-type soybeans. Charles Kendall, a natto manufacturer in Massachusetts, is now testing the soybeans that Carter breeds. It is a nice relationship. Address: P.O. Box 457, Saluda, North Carolina 28773. Phone: 704-749-9537.

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10129. Andoh, Elizabeth. 1994. Where Tokyo's young crowd likes to eat: Choice tables. *New York Times.* Sept. 18. p. 165.
• ***Summary:*** A look at popular restaurants in Tokyo. "One sampler is made up of five rolls of sushi–one each of tuna, omelet, natto (sticky fermented [soy] beans), mentaiko (spicy cod roe) and fresh ama ebi (shrimp).

Also mentions: "chilled cubes of silky bean curd," "miso-thickened broth with wakame, or sea tangle," "fried bean curd," and "sweet adzuki beans."

10130. Snyder, Murray. 1994. Tofu cheesecake, Marcea Newman Weber, and macrobiotics (Interview). *SoyaScan Notes.* Sept. 19. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Murray remembers that Sprucetree Baking Co. made a tofu cheesecake, but he does recall being the source of the recipe. He was the originator of the Sweet Rice Cookie–which Sprucetree also made. When Murray thinks of that cheesecake, he thinks of Marcea Newman (who was married to Dan Weber in December 1982 in Australia, so her name is now Marcea Weber. She and Dan and her children live in Faulconbridge, NSW, Australia). Marcea is a native of New York, but in about 1969-1970 she went to California to study macrobiotics (perhaps with Herman or Cornellia Aihara); she ended up at a macrobiotic study house in San Francisco run by Nan and Dave Schleiger. Murray first met Marcea in California, then she returned to New York.

Murray arrived in Boston on Valentine's day in Feb. 1971. He stayed there studying macrobiotics until Oct. 1972. A little later in 1971 Marcea Newman moved to Boston from New York. He and Marcea got their own apartment and lived together in Boston during 1971 and 1972. At this time Marcea was baking (very carefully testing and converting old family recipes to macrobiotics; her mother was an excellent baker) and she taught Murray how to bake. At the time she did not sell her baked goods. It was from some recipes that she gave Murray that he evolved into the Sweet Rice Cookie, the Babka, etc. Using recipes given or taught to him by Marcea, Murray rented out the kitchen in the Erewhon warehouse and started to do some baking.

In 1974 Marcea's pioneering book titled *The sweet life: Marcea Newman's natural-food dessert book* was published. It contains a recipe for "Cheesecake Tofu Pie" (p. 37), as well as many other innovative desserts and dairylike products that use tofu as a major ingredient. "Marcea was the person who developed the Tofu Cheesecake that Souen, a macrobiotic restaurant in New York City, eventually made and sold. She was very friendly with them and she lived nearby in New York. She also knew the people at The Caldron restaurant."

Murray still has a book of large-scale recipes for baked goods that he made at Erewhon from 1971 and later gave to Howard Grundland. It contains recipes for Sweet rice cookies, Dried fruit square, Babka peanut square, Chestnut bar, Kanten cake, Apple crunch, Apple-tahini juice pie, Rice bread. There are no tofu recipes in that book.

Murray can think of only two ways that he could have been the source of the recipe for tofu pie [cheesecake] made by Sprucetree starting in 1975 or 1976: (1) He suggested that Howard Grundland use the recipe in Marcea Newman's book *The Sweet Life;* (2) He brought Howard a tofu cheesecake made in New York City by either The Caldron or Souen; (3) He could have learned the recipe from his ex-wife, Pam. Note: For more on America's first tofu cheesecake see letter from Marcea Newman Weber, Oct. 1994.

People that Murray remembers living in Boston during 1971 and 1972 were Michael Rosoff, Lenny Jacobs, Jim Ledbetter, Eric Utne and his brother (Tom?), Phil Levy, Paul Hawken, Bruce Gardner, Tom Hatch, and Matt Chait. Matt Chait used the Erewhon kitchen before Murray began baking there. Matt developed the Ricycle, which were bikes with food trays that went out to the colleges. Tony Harnett also worked in that kitchen; he went on to do Bread and Circus. Matt and Murray created Macrojacks–the original caramelized popcorn with barley malt, raisins, and peanuts "which is now made by 2-3 other companies and sold all over the place." In late 1971 or early 1972 they had purchased their heat sealer, boxes, and labels, and they began to make and sell Macrojacks–fairly large quantities. They were all ready to make this into a big business, but circumstances prevented that from happening.

Murray was in Brazil from Oct. 1972 to April 1973. He returned to Baltimore, Maryland, and in 1973-75 he probably made trips up to New York. When he thinks of early tofu desserts, he thinks of the cheesecakes made at Souen (in New York City; it was started and owned by Yama, a Japanese man) and The Caldron (in New York City; it was originally owned by a man named Marty Schloss, plus his wife, Glory, and mother [Seena], who were a good friend of Marcea's). The Caldron had an extensive baking operation, and they may have made a tofu cheesecake even before Souen. Whenever Murray went to New York he would always go to The Caldron to see what innovative new products they had, and he would always bring a number of items back to Baltimore for people to taste test. Marcea would probably remember if The Caldron was known for making a cheesecake, and when and where they got the idea and recipe.

Murray agrees that a remarkably large percentage of macrobiotic students and teachers in the early days were Jewish. He would guess that in 1971-72 roughly 30-35% of the macrobiotic students in Boston were Jewish. "One reason is that many Jewish people of that era were seekers. They were looking for answers; they wanted to know what life was all about and how they could help society. There were unexplained things that were not being talked about in their religion, culture, schools, etc. Historically, there is a strong thread of humanistic ideals within the Jewish culture.

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The macrobiotic movement, as he used to know it, is presently very stagnant. Many old problems have never been resolved. Not everybody wanted to follow a strict, Japanese model–and rightly so. "But I think more people are eating what we would consider to be macrobiotic-type food and loosely following what we consider to be a macrobiotic diet. There is definitely a lot of literature and books being sold under the guise of macrobiotic education. Somewhere down the line, macrobiotics may even become invisible because the basic tenets are going to be integrated a lot of educational and wholistic teachings." Murray is a macrobiotic counselor and teacher, but he is "trying to offer a much broader, more flexible, more embracing way to present macrobiotics without creating a dogma."

Note: Call from Howard Grundland. 1998. Aug. 31. Murray Snyder died recently of throat cancer. Address: Macrobiotic Holistic Health Care, 157 East 61st St., 5th Floor, New York, NY 10021. Phone: 212-308-3818.

10131. Takaboshi, Shinichi. 1994. Re: Natto history book. Letter to William Shurtleff at Soyfoods Center, Sept. 30. 4 p. Handwritten, with signature. [Jap]
• ***Summary:*** The natto history book you asked about is titled *Natto Enkakushi.* It was published on 1 April 1975 and is written entirely in Japanese. Address: Japan Natto Association, 5th Floor Natto Hall, 2-7-10 Motoasakusa, Taito-ku, Tokyo 330, Japan.

10132. *Bluebook Update* (*Bar Harbor, Maine*). 1994. ISU to host soya workshop. 1(3):2. July/Sept.
• ***Summary:*** Iowa State University plans to host a workshop titled "Marketabilty of Soybeans and Soyfoods in Japan and the Pacific Rim" on 28-30 Nov. 1994 at the University in Ames, Iowa. Lester Wilson of the Center for Crops Utilization Research and Paul Gallagher of the ISU Department of Economics are organizing the event. For more information call 515-294-3394.

10133. *Bluebook Update* (*Bar Harbor, Maine*). 1994. Bühler process advances soymilk and soya flour. 1(3):1, 4. July/Sept.
• ***Summary:*** Buehler Ltd. of Uzwil, Switzerland, makes milling equipment that can transform whole soybeans into an ultra-fine soya powder, which can be made directly into soymilk or used as an ingredient in foods or baked goods. In early 1994 Buehler's latest soya flour and soymilk plant began operation in Italy. The company reports it has installed a total of 13 systems in 8 countries including France, Italy, Switzerland, Brazil, Taiwan, Ethiopia, China, and Japan.

10134. Business Trend Analysts, Inc. 1994. The health and natural food market: Past performance, current trends, and opportunities for growth. 2171 Jericho Turnpike #342, Commack, NY 11725. 325 p. Sept. Price $995.00. *
• ***Summary:*** Chapter 3 of this report, the first of seven chapters that discuss individual product categories, is titled "The Market for Soy Foods: An in-depth analysis of historical, current, and projected sales. Trends in the U.S. market for soy foods. Manufacturers' total sales of soy foods. Manufacturers' sales of soy foods, by distribution channel. Total retail sales of soy foods. Retail sales of soy foods, by distribution channel. Retail sales of soy foods, by type: Soy sauce, tofu, second generation, soymilk, miso, soynuts, tempeh. Worldwide soybean production, total and per capita. U.S. production of soybean oil. New product introductions in the market for soy and vegetarian foods, including names of manufacturers, brand names, and product descriptions.

Under "Report Highlights and Special Features" we read that after the 3-year recession, most product categories posted strong gains, but "several segments failed to cash in on the growth bonanza. Manufacturers' sales of soyfoods were up a meager 2½%, while the market for frozen health foods declined slightly... One-third of consumers under the age of 35 feel it is extremely important that the food products they purchase are natural; the percentage is even higher among older consumers. Over 40% of adults believe they will contract heart disease or cancer." Today 68% of adults are overweight, up from only 58% a decade ago.

Overall report Contents: 1. Executive summary. 2. Overall market dynamics (including Soyfoods). 3. The market for soy foods. 4. The market for herbal teas. 5. The market for dairy foods. 6. The market for grains and cereals. 7. The market for frozen foods. 8. The market for snack foods. 9. The market for groceries. 10. The health food consumer. 11. The health/natural food store industry. 12. Competitor profiles. 13. Industry directory. Address: Commack, New York. Phone: 516-462-2410.

10135. *Newsletter of the Soyfoods Association of America* (*San Francisco, California*). 1994. Yamasa builds in America. Sept. p. 1.
• ***Summary:*** "Yamasa Corporation, the world's second largest manufacturer of soy sauce, has constructed a 65,000-square-foot plant in Salem, Oregon, USA. Yamasa has been manufacturing soy sauce in Choshi, Japan, for 350 years. The company decided to build their plant in Oregon because of very high demand for their soy sauce in the U.S., especially on the West Coast." Salem's temperate climate and water quality are also similar to those of Choshi.

In 1992, Yamasa sold 1.3 million gallons of soy sauce in the United States, all of it imported. When fully operational, the new plant will be able to produce 1.7 million gallons per year.

10136. Shindler, Merrill. 1994. Hana-ful: 2 Japanese restaurants offer clear choice in El Segundo. *Daily Breeze* (*Torrance, California*). Oct. 7. p. K41. Entertainment section.
• ***Summary:*** This review of the Japanese sushi bar Hana

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Haru Sushi in El Segundo states: "You can begin your meal with a nice hot bowl of edamame, the absolutely addictive cooked soybeans in their pods that make peanuts seem silly by comparison (and which are nutritionally significantly more satisfying), move through some miso soup (wonderful on chilly evenings), and then tuck into the usual hit parade of sushi items that make so many of us so happy..."

10137. Thompson, Keith. 1994. Breeding soybeans for use in making soy oil or natto at Jacob Hartz Seed Co. (Interview). *SoyaScan Notes.* Oct. 11-12. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Hartz is making more progress in fatty acid modification for the oils industry than they are in Oriental soyfoods, in two areas: (1) Increasing saturated fatty acids to about 30% so that the oil need not be hydrogenated in applications where hydrogenation (which creates *trans* fatty acids) was traditionally used; (2) Reducing saturated fatty acids to the level of canola oil; Hartz already has a "low-saturate soybean" with only 7.5% saturated fatty acids (as opposed to 6% in canola oil) but none of the oil companies are interested. They run strictly on cost and are not willing to pay a premium. Moreover, a specialty oil would require that the beans be "identity preserved" yet even a small solvent extraction plant (such as Riceland Foods in Stuttgart) has a capacity of 50,000 bushels/day. The oil companies say it will cost a lot of money to put a low-saturate soy oil on the shelf and they do not think they can gain market share. Keith hopes that Hartz can pursue this more to find a company interested in a niche market, such as an all-natural oil that is low in saturated fatty acids. The industry seems more interested in (1) than in (2). Monsanto has concluded that it is too costly to make these changes using genetic engineering, but not too costly (and worth doing) using classical breeding.

Hartz has hired a food scientist, Dr. Keshun Liu, who is actively involved in Hartz's mutation breeding program for fatty acids. He does a lot of analysis of the oil content of these soybean mutants, using a gas chromatograph. He also does quite a lot of analysis on natto beans and a little on soybeans for tofu.

In terms of Oriental soyfoods, Hartz has for many years sold a large quantity of specialty soybeans to natto makers in Japan. They have worked closely with natto makers to breed in several characteristics that they require, such as small seed size. Hartz's Japanese partner [Yaichiro Mogi of Asahi Shokuhin] was very scientifically oriented and had good analytical capabilities. They came to Hartz and said "Here's what we want in a natto bean." Hartz bred to their specifications and it worked. Keith thinks that Hartz may have the world's biggest program for breeding soybeans for natto. Hartz's sales of natto beans constitute about 50% of the company's total sales. Hartz's soybean breeders continue to communicate with natto makers (more than does Hart's food scientist) but there doesn't seem to be a lot of change in terms of what they are looking for in a good natto soybean.

Natto makers are willing to pay a good premium for their soybeans because natto beans are inherently lower yielding and have many special characteristics that are difficult to breed and select for. The breeder must get high yield and disease resistance for the farmer plus 3-4 characteristics desired by the natto makers. Address: Food and Export Manager, Jacob Hartz Seed Co., P.O. Box 946, Stuttgart, Arkansas 72160. Phone: 800-932-7333.

10138. Thompson, Keith; Brown, Edward. 1994. Breeding soybeans for use in making tofu at Jacob Hartz Seed Co. Part I (Interview). *SoyaScan Notes.* Oct. 11-12. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** In late 1987 Keith Thompson visited Soyfoods Center and he and William Shurtleff worked together to design a system that Jacob Hartz Seed Co. could use to more effectively breed soybeans for food uses. The purpose of this interview is to find out if that system was implemented, and if so how, and how it is working.

Hartz has hired Dr. Keshun Liu, a PhD in food science. His job is basically trying to interface between soybean breeders, Keith, and the soyfoods industry.

There are three main problems in breeding soybeans for use in making tofu. The first and biggest problem is that most tofu makers never seem to be willing to pay a premium price for their soybeans–unless the soybeans are organically grown, in which case tofu makers will pay huge premiums. The big market for tofu beans is in Japan. Hartz sells about 40,000 bags/year (each 50 lb) to tofu makers in the USA; one tofu maker in Hawaii buys about half of these. From these companies, Hartz is able to get a premium of about $2.50 per bushel over the CBOT (Chicago Board of Trade) price. Until tofu makers are willing to pay a premium for soybeans that give tofu with better yield and quality, they must be willing to accept varieties that are already developed. Tofu beans are pretty much a commodity, since there are a lot of large-seeded, clear hilum beans grown in the Midwest that perform pretty well for tofu. Natto makers are willing to pay a good premium for their soybeans because natto beans are inherently lower yielding and have many special characteristics that are difficult to breed and select for. Because Hartz has limited storage, they breed in the areas where they can get the best premiums. Hartz hedges 100% of its soybean transactions. So it tends to charge a fixed dollar amount (its margin) over the CBOT price.

In growing out new varieties, Hartz contracts with farmers to grow the beans, then buys back 100% of these beans at a pre-determined price, bags them in a Hartz bag, and sells them to soyfoods makers. It does not prefer that farmers sell its beans to soyfoods makers, though farmers have the right to do this. Hartz's 428-acre breeding farm is used solely to produce breeder and foundation seed stock–

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the first 2 generations. The Plant Variety Protection Act of 1972 gives plant breeders some rights over the products they produce in their breeding programs, and prohibits farmers from selling protected seed to other farmers–like a seed company. But farmers can save their own seed and plant it in the future–which means he doesn't have to buy seed from a seed company for a long time. Hartz doesn't like that and he thinks there is a movement to mitigate that. For example, farmer-saved wheat seed was so extensive that Pioneer Hi-Bred withdrew from the market. All Hartz's varieties are plant variety protected.

When Keith entered this business in 1978 there were 8-9 soybean varieties in 3 different maturity groups in the entire southern USA (13 states) that the farmer could choose from; now he has about 150-200 varieties to choose from. Breeders have incrementally increased yield, disease resistance, targeted soil type adaptability, etc.

Soybean farmers generally look carefully at and plant the latest, best yielding varieties since they expect to get better yield, disease resistance, etc.–and save money. Why do soyfoods manufacturers not think the same way. Why would they not be willing to pay more for a new bean that will give them a 10% higher yield? Keith does not know. He thinks these manufacturers get a variety that works well and don't want to change their process. He often cannot even get them to test a new variety; its too much trouble (not surprising). Another problems is that some tofu manufacturers like one variety very much, and others don't like it at all. But the three missing links in this process are (1) research in the breeder's lab to show how the new soybean variety behaves in making tofu (yield, taste, composition, price per pound of tofu, etc.) and (2) comparing the performance of this variety with varieties used by major tofu manufacturers; (3) compiling the results of this research as information that can be easily understood by any soyfoods maker. Breeders now do this for soybean farmers but not for soyfoods makers. Is the tofu market too small for a breeder to make this investment? Not if you include East Asia, Southeast Asia, the USA, and Europe. For many years Singapore and Hong Kong have imported mostly Canadian beans with a pretty low margin. Japan has a tradition of buying IOM beans out of the Midwest, but IOM is no longer a meaningful term because we change varieties so fast. It used to be a large-seeded, clear-hilum mix of several varieties but now it can be almost anything. A portion of the users of Japan's 500,000 metric tons to make tofu is willing to pay a premium for variety soybeans. Hartz exports about 3,000 tons/year to Japanese tofu makers, but they still don't have a good variety. Continued. Address: 1. Food and Export Manager; 2. PhD, Soybean Breeder. Both: Jacob Hartz Seed Co., P.O. Box 946, Stuttgart, Arkansas 72160. Phone: 800-932-7333.

10139. Thompson, Keith; Brown, Edward. 1994. Breeding soybeans for use in making tofu at Jacob Hartz Seed Co. Part II (Interview). *SoyaScan Notes.* Oct. 11-12. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The second problem is that the science of breeding soybeans for tofu is not well understood. We still don't understand the basic theory as to what constitutes a good soybean for making tofu–a good tofu bean. What are the main compositional factors that affect tofu yield, flavor, and consistency (hardness or softness). It is not clear what characteristics breeders should select for when breeding tofu beans–except for the bean's physical appearance. Keith has a very close Japanese contact who is doing excellent work at a lab in a university in Japan, trying to understand what causes one soybean to be better than another for making tofu. He has made a lot more progress than Hartz has, and his work is quite confidential. Hartz has tried to get permission from the Japanese for Dr. Keshun Liu to visit that lab, but they won't even talk about it. Keith's talks about this university researcher with Takashi Matsumoto who is in a large trading company, but he doesn't recall the name of the tofu researcher at the university. The trading company is funding the research and is very forward looking.

The third problem is that the Japanese who buy soybeans that will eventually be used for making tofu have a number of strong preconceptions about the way these soybeans should look–regardless of the amount and quantity of tofu that can be made from them. They want a soybean with very large seed size (less than 2,000 seeds/lb), a clear hilum, and dull-luster–that looks like a typical soybean grown in Japan. If the soybean doesn't look like that, they don't care how good the tofu yield or flavor are. The Japanese seem to prefer what are called "Vinton-type" soybean varieties for making tofu. These include Vinton [a Midwest variety introduced in 1978 by breeder Walt Fehr and Iowa State University] and Harovinton (from Harrow, Ontario, Canada). These are large-seeded clear hilum beans [perhaps traditionally called vegetable-type soybeans]. "Vinton-type" soybeans now sell (cleaned and in bulk) for only about $0.80 to $1.75 over the Chicago Board of Trade (CBOT) price. That is not enough of a premium to attract Hartz. Hartz has developed on soybean that seems to have excellent characteristics for making tofu. But the Japanese don't want this soybean because it doesn't look like what they are used to. It is oblong and not as uniform as usual.

Eddie Brown hasn't given up on tofu beans; he is doing a lot of work and making a lot of crosses. Hartz has 40 acres of a variety it will be harvesting in the next 2-3 weeks and releasing next year that was selected primarily based on seed size, but also protein content. This line is quite large seeded, with 1,400 seeds/lb. Yet agronomically, it is a second or third class variety, so Hartz must charge more for it to counterbalance its lower yield. It is difficult to grow large-seeded soybeans in the south since it is generally true for soybeans that the further you go north and the earlier the maturity group, the larger the seed size and the more

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the percentage of clear hilum varieties. Some of this is genetic and some environmental. Varieties north of Boothill, Missouri are usually indeterminate, whereas those to the south are determinate. Determinate plants grow to a certain height and then start blooming; indeterminate varieties start blooming when the plants are very small and bloom until they reach normal plant height.

Keith thinks that true Vinton is not grown much any more. The new Vinton-types, developed by Midwest breeders, look like a Vinton but the yield is much better for the farmer. These Vinton-types sell for about $0.80 to $1.75 over the CBOT price.

One reason the Japanese may be demanding Vinton-type soybeans having a certain appearance is so that they can blend our $8/bushel beans with their domestic beans [Nihon Daizu], which are much more expensive, then sell the blend as if they were all Japanese-grown soybeans.

Japanese are limiting themselves greatly by demanding large-seeded soybeans. Eddie has only 10-15 breeding lines available to him in large-seeded soybeans compared with 2,000 to 3,000 lines of regular-sized soybeans. Breeders in the Midwest have a much larger germplasm base to work with on large-seeded clear-hilum varieties.

Hartz would like to have more of its soybeans grown organically because they could get a huge premium for those soybeans–no doubt about it. Hartz is already producing some organic natto beans, primarily with one big rice grower who is OCIA certified. His main crop is rice, and he has his own rice mill, rice bagging, and rice marketing system. Most rotations in the South are based on either rice or cotton. It is very difficult to find organic acreage in the South unless you find a rice farmer who is philosophically committed to organic farming [like Carl Garrich of the Lone Pine in Arkansas]. Even if Hartz offers farmers a premium of $4/bushel over the CBOT price they are not interested. It doesn't work well with a rice rotation.

Once a soybean seed company makes the commitment to breed soybeans for tofu, it must develop at least a small bench-top tofu-making system in order to quantify and compare different varieties. You need a program and a systematic way of making tofu and measuring the results. You must be able to prove that one soybean is significantly better than another for making tofu–in terms of yield, or flavor, or fat content, or genistein level, whatever. This becomes the basis of marketing the soybean to tofu makers. Address: 1. Food and Export Manager; 2. PhD, Soybean Breeder. Both: Jacob Hartz Seed Co., P.O. Box 946, Stuttgart, Arkansas 72160. Phone: 800-932-7333.

10140. Roller, Ron. 1994. Breeding soybeans to use for making soymilk in America. Part I (Interview). *SoyaScan Notes.* Oct. 13. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Ron finds that 1 pound of soybeans yields roughly 8.8 pounds of regular non-flavored soymilk and 11.88 pounds of lite soymilk. For regular soymilk, the solids content of flavored soymilk is less than that of "original" or dairylike soymilk. In 1993 an estimated 9.8 million gallons or 81.6 million lb of soymilk were sold in the USA and Canada. Of this, about 80% was regular and the rest was lite. To make this much soymilk required about 8.78 million lb or 146,333 bu or 3,982 metric tons of soybeans. Almost all of these soybeans were organically grown. Soyfoods manufacturers have to pay about 70% more for organically grown soybeans than for non-organic.

Ron knows that most soybean breeders are breeding soybeans for food uses–especially large-seeded food-grade soybeans for the export market. Many of the large-seeded soybeans are selected for high sugar content and processability (cooking with the seedcoat on, dehulling, etc.). Ron has contacted almost all the seed companies and has asked them for "food use clear-hilum soybeans." They say they are working on such products but say they are all sold to Japan. These seed companies are generally working on large-seeded, high-protein, Vinton-type, clear-hilum soybeans. Ron does not think most companies are interested in phytochemicals yet, but Prof. Maurice Bennink at Michigan State is studying the effect of genistein on colon cancer.

Enrei is a very large-seeded Japanese soybean, with a clear hilum, high sugar content, good taste, and seedcoat that is suitable for both harvesting and dehulling during processing. There is an Enrei industry (association and breeding program) in Toyama, Japan. They treat this variety as if each bean was a gold nugget. They hand-cultivate the plants. Ron has had Michigan State working on Enrei soybeans in their breeding program, and he is developing a program to grow it.

When Ron chooses a soybean variety for making soymilk, the most important factor is the taste of the resulting soymilk. For good taste he wants a soybean with high sugar content, high protein, and relatively low fat–but he is not sure what causes a soybean to taste good. A panel of 5-6 experienced people from American Soy Products (ASP) tests the soymilks in a 4-5 sample blind test, always with the same control sample–where the control sample is their basic soybean, that every panelist can distinguish from the other samples every time with no problem whatsoever. Second is the protein and oil content of the soybean: high protein, low fat. Third is availability of the seed. Fourth is the price. They pay a premium of 60-70% above the Chicago Board of Trade (CBOT) price for specialty, organically grown soybeans. In 1994 the price went as high as $18/bushel, but it used to be $8-9. Many people are willing to pay high prices for organically grown Vintons, but Ron is not willing to pay that for Vintons, he doesn't buy them. But there are other soybeans he will pay more for. Other factors: The region in which it will grow. Processability (easily dehulled and does not produce much foam when cooked). Clear hilum. Large

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seed size. Many of these characteristics are interrelated. In terms of the agronomic characteristics: Seed yield, including disease resistance, lodging and shatter resistance, emergence, etc.

Ron contracts directly with farmers for all the soybeans he buys. Some varieties he uses are confidential, others are not. ASP developing varieties that they do not want their competitors to know about. He also buys some varieties bred by Pioneer Hi-Bred: his growers can go to their local elevator and buy that seed. Ron generally tells the farmers with whom he contracts to grow his soybeans what varieties he would like them to grow and where they can go to buy those varieties. Once he tells this to the farmers, the farmers generally tell the industry and ASP's competitors often grow the same varieties. "We are continually testing soybeans to find the best ones for our process and product. It's more selection than breeding. We're taking a number of soybean varieties and storing them in specific bin locations, then blending the varieties to create or maintain a certain, consistent taste and product." Ron generally buy's large-seeded soybeans (but not the biggest), because experience has shown that they taste best, and the sugar content seems to have something to do with the good flavor. But for one variety, the flavor changes from field to field, and from one growing area to another. As ASP's demand for soybeans has grown, so has their growing area, and this requires the use of more varieties of soybeans. Moreover, Ron would not take the risk of growing all their soybeans in one geographical area–since they could then all be destroyed by flood, frost, drought, etc. A good soybean for soymilk must yield well for the farmer and make good soymilk. Continued. Address: President, American Soy Products, 1474 N. Woodland Dr., Saline, Michigan 48176. Phone: 313-429-2310.

10141. Roller, Ron. 1994. Breeding soybeans to use for making soymilk in America. Part II (Interview). *SoyaScan Notes.* Oct. 13. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** How often does Ron change the soybean variety he uses? He has several base varieties, which are kept secret and which he tries to build on. Every year he tries to find new soybean varieties which are like the base varieties but which will grow in other geographic areas. Moreover the acreage for a particular variety must be expanded slowly as it proves itself both agronomically and from a food point of view. When Ron contracts with a farmer he contracts bushels, not acres. That is, guarantees to pay a certain amount per bushel if the farmer plants a certain number of acres, never just a certain amount per acre planted. This way, both sides take a risk: If the farmer has a large yield, then Ron must buy more soybeans than he wants to. ASP has been hurt before by contracting acres, when there was a flood or frost. Each farmer must get certified, which pretty much guarantees that he has grown the soybeans organically. After a while, ASP knows which growers it can trust, and they become part of ASP's steadily expanding grower base or network.

There are probably very few U.S. soyfood manufacturers that have enough volume that they need to contract directly with farmers. But those that are big or have a large need for organic soybeans must contract directly with farmers to assure themselves an adequate supply of the type of soybeans they want.

Ron would be very interested to know more about how the composition of a soybean affects its flavor. He has a good deal of respect for Pioneer Hi-Bred Seed Co. He thinks they have good seeds, a good staff and research department, and a good distribution system. And they have generally been reliable. They have helped Ron find soybeans for certain growing areas that they sell. He likes the fact that they are national, spanning the breadth and width of the U.S. soybean growing area, and selling all maturity groups. However, 3-4 years ago, Pioneer Seed Co. got into the cultivation, cleaning, bagging, and export of organic soybeans–with their Better Life program (no pesticides or herbicides, but they can use chemical fertilizers). So they began to compete with Ron for organic farmers to grow their seeds, and they pay the farmers more than Ron does.

Pioneer has a pretty extensive base of soybean customers in Japan for regular soybeans, Better Life soybeans, natto beans, large-seeded soybeans, and organic soybeans. Their Specialty Crops Division has penetrated the Japanese market in many areas. Their employees travel frequently to Japan, they speak Japanese, they have an office there, and they're plugged in. They study those industries in Japan, find out what they want, then they come back and try to breed that into a soybean. As far as Ron can tell, Pioneer is the leader in breeding soybeans for food uses in terms of both volume and specific varieties.

Another company doing research in this area is Jacob Hartz Seed Co. in Arkansas. They are working on some large-seeded soybeans but they are having a lot of trouble. Ron has a low opinion of the soybeans Hartz breeds for making natto; he studied that market intensively.

There has been a demand from Japan to supply some organic beans, so many of the U.S. companies that supply soybeans to Japan have begun small organic programs (not because they want to–they hate it), just to satisfy their Japanese customers. Even though Mitsui or Mitsubishi or Marubeni don't want a lot of organic soybeans, they want enough in a tight market to drive the price way up. It was because of the Japanese demand plus a small soybean crop that organic soybean prices were so high in 1994. Country Life went out of business, with unpaid debts of $400,000 to $500,000. Some of the farmers formed cooperative marketing groups; they grow varieties desired by the Japanese, and pool their resources in cleaning and bagging, so they can export containers to Japan and eliminate U.S.

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middlemen or soybean brokers. Ron feels the price for organic soybeans will stabilize at about $10-$12 per bushel.

If Ron worked closely with a soybean breeder and seed company, he would want the right for the farmers with whom he contracts to be able to buy the seed from the seed company. His company is unique in having a large number of cooperating organic growers, and that gives ASP the lowest price and highest quality. If Ron contacts the growers early and tells them what ASP will pay per bushel of organic beans, that becomes the standard base contract price for other companies too. Word travels fast. Nichii buys directly from soybean farmers, but Ron thinks Vitasoy buys from a middleman (a soybean broker or trading company such as Pacific Soybean and Grain). Some soyfoods manufacturers buy through soybean brokers–the biggest of which are Pacific Soybean and Grain, American Health and Nutrition, and Purity Foods. Domestic soyfoods manufacturers get deluged with calls from farmers who want to grow soybeans just for them at a premium price and sell direct without a middleman. The middlemen or soybean brokers tend to survive on export business.

This is a very complicated issue–particularly seen from the viewpoint of a seed company that wants to breed better soybeans for food uses. Address: President, American Soy Products, 1474 N. Woodland Dr., Saline, Michigan 48176. Phone: 313-429-2310.

10142. Brown, Lester R.; Kane, Hal; Ayres, Ed. 1994. Vital signs 1994: The trends that are shaping our future. New York, NY: W.W. Norton & Co. 160 p. 24 cm. [200+* endnotes]

• ***Summary:*** Discusses (with graphs) important trends that effect a sustainable society in the following areas: Food, agricultural resources, energy, atmosphere/air, economy, transportation, the environment, society/population/medical, and military.

World soybean production per person (p. 28-29) rose steadily from about 7 kg in 1950 to about 21 kg in 1979. Since then it has been flat, averaging about 20 kg, which was also the estimated figure for 1993. Total world production of soybeans has increased steadily from about 18 million metric tons (tonnes) in 1950 to a record 116 million tons in 1992, falling by 4% to 111 million tonnes in 1993. Heavy rains and flooding in the U.S. Midwest, the world's principal growing region, accounted for the decline. Although the U.S. soybean harvest decreased nearly 16% from the previous year, it still accounted for nearly half of the world harvest. Brazil, with a harvest of 23 million tonnes, remained solidly in second place. Argentina edged out China for third place. Soybean yields in China are about 33% lower than those of the 3 leading western producers (which range between 2 and 2.5 tonnes per hectare). The USA regularly exports one third of its soybean crop as unprocessed beans and enough of the remainder as meal so that about 50% of the crop is exported. By contrast, Argentina and Brazil crush most of their soybeans domestically and export them largely as meal, keeping much of the soy oil for domestic use. China exports a small proportion of its crop as beans, largely for food use in Japan and other Asian countries. The leading importers of soybeans are Japan, Germany, the Netherlands, and Spain.

Population trends (p. 98-99): In 1993, the world added 87 million people to its numbers, down slightly from the 88 million in 1992–thanks largely to a dramatic fertility decline in China, home to more than one-fifth of the world's population. Total world population in late 1993 was an estimated 5.557 billion. 94% of the new people lived in developing countries, home to 78% of the world's population. Africa has the world's fastest growing population. The average annual growth rate in world population peaked in about 1962 at 2.2%. It had fallen to 1.75% in 1986 and was 1.56% in 1993. Yet the slowdown in the world's growth rate is happening much more gradually than was expected just a few years ago. In 1982 the United Nations projected that world population would stabilize in the year 2100 at 10.2 billion–almost twice what it is today. The U.N. now projects that world population will grow until it reaches 11.6 billion sometime after 2200. Address: Worldwatch Inst., 1776 Massachusetts Ave., N.W., Washington, DC 20077-6628.

10143. Morinaga Nutritional Foods, Inc. 1994. Mori-Nu holidays are as easy as pie (Ad). *Vegetarian Times.* Oct. p. 49.

• ***Summary:*** This full-page color ad shows a large pumpkin pie on a cloth on a cutting board. Behind it is a package of Mori-Nu Lite Tofu and a cornucopia of vegetables and fruits. A recipe is given for "Dairy-free, Low-fat Pumpkin Pie" using 1½ packages of Mori-Nu Lite Tofu–Firm. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 310-787-0200.

10144. Ontario Soybean Growers' Marketing Board. 1994. Ontario soybeans. P.O. Box 1199, Chatham, Ontario N7M 5L8, Canada. 7 p. Oct. Unpublished typescript.

• ***Summary:*** This is a compilation of 7 transparencies containing current statistics. 1. History. 2. Ontario soybeans: Production and disposition. Shows the number of tonnes produced, crushed, imported, and exported from 1944 to 1994. Production increase dramatically from 1,200,000 tonnes in 1989 to 2,100,000 tonnes in 1994. In 1989 about 95% of the soybeans produced were crushed, but in 1994 only about 55% were crushed. Exports rose more than 3-fold between 1989 and 1994, while imports decreased.

3. Ontario soybean exports: 1993–by destination. Of the 407,061 tonnes exported, 55.7% went to Europe, 24.4% went to Europe, 5.9% went to Japan, 5.7% to Hong Kong, 3.2% to Singapore, 2.5% to Malaysia, and the rest to Other.

4. Ontario's soybean industry consists of 20,000 soybean

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growers, 300 dealers, 2 crushers, 28 roasters/extruders, and many soyfoods manufacturers.

5. Soybean pricing. OSGMB has no price setting powers. A major U.S. port, Toledo, Ohio, is used as a price reference point for Ontario soybeans. 6. OSGMB Mission Statement. 7. Role of OSGMB. Address: P.O. Box 1199, Chatham, ONT N7M 5L8, Canada. Phone: 519-352-7730.

10145. Tomomatsu, Hideo. 1994. Health effects of oligosaccharides: Ingestion of oligosaccharides increases the bifidobacteria population in the colon, which in turn contributes to human health in many ways. *Food Technology* 48(10):61-65. Oct. [90 ref]

• ***Summary:*** Contents: Introduction. Consequence of toxic fermentation products: Variety and amount of toxic compounds, enzymes participating in toxic compound formation, possible causes of carcinogenesis, possible causes of aging and adult diseases. Benefits of oligosaccharide ingestion: Proliferation of bifidobacteria and reduction of detrimental bacteria, reduction of toxic metabolites and detrimental enzymes, prevention of pathogenic and autogenous diarrhea, prevention of constipation, protection of liver function, reduction of serum cholesterol, reduction of blood pressure, anticancer effect, production of nutrients. Dosages and side effects. Oligosaccharides vs. dietary fiber. Natural Occurrence.

"Oligosaccharides are one of the most popular functional food components in Japan, but they are relatively unknown in the United States. The Japanese produced 40 million lb ($46 million) of nine different types of oligosaccharides in 1990. The number of consumer products containing oligosaccharides reached 450 in 1991 and included soft drinks, cookies, cereals, and candies."

Oligosaccharides are "preferentially consumed by beneficial intestinal bacteria, bifidobacteria, in the colon." Bifidobacteria suppress the activity of putrefactive bacteria and thereby reduce the formation of toxic fermentation products.

Various natural foods are known to contain oligosaccharides. Soybean oligosaccharides [galactooligosaccharides or GOS] are different from fructooligosaccharides [FOS], which are found in many vegetables (such as onion, garlic, burdock, asparagus, etc.).

Note 1. Although bifidobacteria suppress many bad bacteria in the colon / digestive tract, no experimental evidence was given from animal trials that their consumption prolongs the life or improves the health of animals.

Note 2. The early (and later often ridiculed) theories about Elie Metchnikoff and Dr. John Harvey Kellogg concerning bacterial putrefaction in the colon and digestive system may be vindicated by this interesting article and review of the literature. For examples of ridicule see *Nuts Among the Berries,* by Ronald Deutsch. Address: Quaker Fellow, The Quaker Oats Co., John Stuart Research Lab., 617 W. Main St., Barrington, Illinois 60010.

10146. Goh, Francis Nyang Kuang. 1994. Re: Chronology of Unicurd Food Co. (Pte.) Ltd. in Singapore. Letter to William Shurtleff at Soyfoods Center, Nov. 3. 2 p. Typed, with signature on letterhead.

• ***Summary:*** 1978–This company, originally named Unicurd Food Co., is founded as a partnership by two housewives, Mrs. Tan Ai-Wang and Madam Chiang-Kuei Chin. Note: The term "Madam" is used (in writing only) to address a women when it is not clear whether or not she is married; used like "Ms." in American English.

1979 late–The company begins to make and sell tofu, operating on a small scale in a combination 2-story shop and home, with the residence located above the shop. The approximate size was 800 square feet of production space. They produced mainly *juten tofu* (lactone silken tofu), packed in 300 gm trays (known as 2B shape in Japan) and also 250 gm sausage-shaped polyethylene bags (known as sakura tofu in Japan), at the rate of about 150 kg/day. Also this year the company was changed from a partnership to a "private limited company."

1980–The company moved into a factory building at Block 1012, Aljunied Ave. 3, #01-35/37, Singapore 1438. The building, of about 2,400 square feet, was constructed by the Government of Singapore. The company was incorporated as a private limited company with capital of $220,000 Singapore dollars, invested by six shareholders. The company name is changed to Unicurd Food Co. Pte. Ltd. They diversified the product line to include Chinese firm and extra firm tofu. Production increased to 700 kg/day.

1981–The company encountered cash-flow problems and was sold at par value to the present directors, Mr. Francis Goh Nyang Kuang and Mr. Goh Eng Huat, who are cousins, and who were not among the six original shareholders. Prior to this time, the highest annual sales had been S$500,000 (1 US$ = 1.48 S$). Part of the purchase agreement is that Mr. Ma Wen Yi, the managing director of the company, would continue to work for the company for six months to help with the transition. The new owners engaged a young graduate, Mr. Richard Tan, to learn from Mr. Ma. During this time, Mr. Francis Goh visited the company each workday for about 1 hour in the morning and 2 hours in the evening.

1982–Mr. Richard resigned and the owners decide to engage Mrs. Goh (maiden name: Kua Lay-Eng) to run the company. Prior to her appointment, she worked as a Personnel & Administration Executive in a multinational company. Also in 1982 the company purchased an automatic soymilk plant and other machinery from Foodpak Pte Ltd. (a tofu factory in Hong Kong) and from Japan for its new factory, which was built by the government and had an about 3,600 square feet, located at Block 6020, Ang Mo Kio Industrial Park 3, #01-156/160, Singapore, 2056.

1983–Introduced Beancurd Jelly, a new product.

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1984–Introduced Pressed Soft Tofu, a new product. This year Unicurd began to promote tofu in Singapore as a nutritious and healthy food (a pioneering concept) by cooking demonstrations, radio publicity, regular factory tours for visitors (in groups of about 40), and annual participation in a national health promotion campaign organized by the government, using display posters, participation in an exhibition during which the company demonstrated tofu cooking and highlighted its nutritional value, and participation in a program whereby all nutritious foods sold in supermarkets were highlighted with special posters and labels.

1985–The company takes over the adjacent factory (Block 6020 Ang Mo Kio Industrial Park 3, #01-154, Singapore, 2056), increasing its area to 5,000 square feet.

1986–Introduced Tofu Puffs, a new product.

1987 Nov.–Mr. Goh joined the company as a full-time Managing Director; prior to this he usually spent 2 hours at the company each evening and a full day on Saturday.

1988 June–Recruited a Japanese manager to upgrade machinery. Introduced new Japanese tofu and pickles targeted at the Japanese community.

1989–Introduced three new Japanese-style tofu products: *Hiya-Yakko* (Chilled Tofu), *Momen-Dofu* (Traditional Japanese Firm Tofu), and *Nama-Agé* (Deep-Fried Tofu Cutlets).

1993 Nov.–In view of the rapid market growth for silken tofu and other products, the company began to look for a bigger factory. Sales have increased more than six-fold in the past ten years.

1994 Nov. 4–Construction of the new factory starts–floor area of 26,500 square feet on 40,000 square feet of land. It is expected to be completed in about one year. The company plans to invest about $2.5 million Singapore dollars in the new factory and another $1.5 million Singapore dollars (1.01 million U.S. dollars) in the purchase of more automatic equipment.

The company's accomplishments: Tofu in Singapore was traditionally sold in the market without packaging. After purchasing the company, Francis and the other new owners gradually convinced local consumers to accept packaged tofu. Moreover, their continuous promotion of tofu as a nutritious and healthy food (it was viewed as a poor-people's food before) stimulated sales immensely. Singapore consumers have now accepted tofu as a nutritious, healthy food.

Now some recollections and comments from Mr. and Mrs. Goh. Mrs. Goh: "When I joined the company, tofu was still considered a poor-man's food and tofu makers were generally fairly small in scale. The public had a low image of the tofu industry. I decided to resign from working in a reputable company for various reasons: (1) I had full confidence in the potential of the tofu business. Though the growth of the company was slow during the early years, it increased constantly; (2) For the success of small and medium-scale traditional food manufacturers, it is not possible to engage many high-ranking managers, who generally specialize in one field. It is also not easy to engage a person with a diversity of skills who is willing and able to run all aspects of a small traditional food company; (3) We owned the company and Francis did not have sufficient time to manage it. I decided to shoulder the responsibility, particularly after we moved to Ang Mo Kio Industrial Park (1982), when we invested another S$500,000; (4) Before Francis joined the company as full time managing director, my work was very taxing. I had to take charge of practically everything and the working hours were very long. However the work was challenging and the satisfaction was enormous, particularly when the company expanded rapidly." Mrs. Goh is still very active with the company on a day to day basis. She is in charge of Accounts and Sales and Marketing.

Mr. Goh adds: "I am currently in charge of the company overall, and particularly production, quality control, and other external matters (overseas visitors, Government liaison, and overseas purchasing). We have recently employed a local manager and a food technologist (from China). We plan to let them take over all the routine supervisory jobs and the development of new products. This will allow us to reduce our work load so we can invest more time in strategic planning. For example, we may soon take over a small tofu manufacturer and use it to develop a new brand to market similar products of lower value to capture a bigger share of the low-price market. Unicurd will concentrate on existing products and developing new high-value products.

"I would only express regret for joining the company on a full-time basis a bit late. I never realized that the tofu business would be so interesting and challenging. Through the Company, I joined different organizations, such as the Singapore Food Manufacturers Association, and the Association of Small and Medium Enterprises, and played an active role. I made many new friends and learned a lot about the food industry in Singapore, especially about traditional foods such as soysauce, chili sauce, dumplings, noodles, etc. I was also nominated by the Government to join several overseas study missions."

Update: On 24-25 March 1995 a group of six soybean experts from Canada visited Unicurd. Their names and titles are given. On March 24 Mr. Goh arranged for a meeting between them and five tofu makers and 3 council members from the Singapore Food Manufacturers' Association. A copy of the paper Mr. Goh presented during the meeting is attached.

Update: On 30 May 1996 Unicurd Food Co. Pte Ltd. moved to 18, Senoko South Road, Singapore 758089. Phone: +65 759-2855. A photo shows the new factory.

Update: In April 2008 the Vitasoy Group acquired the entire equity of Unicurd Food Co., (Private) Ltd. ("Unicurd"), a leading manufacturer and marketer of

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soyfoods in Singapore. Address: Managing Director, Unicurd Food Co. (Pte.) Ltd., Blk. 6020 Ang Mo Kio Industrial Park 3, #01-154/156/158/160, Singapore 2056. Phone: 482-5454.

10147. Cloud, Jon. 1994. Re: Work with organic farming in Canada. Letters to William Shurtleff at Soyfoods Center, Nov. 14 and Dec. 27–in reply to inquiry. 2 p. and 1 p. Typed, with signature on letterhead.

• ***Summary:*** To the best of John's knowledge, the first soybeans grown organically in Canada (after 1960) were produced in 1974 in Wainfleet, Ontario, under contract with John. They started growing organically because John was willing to "issue them contracts guaranteeing floor prices and ready sales." "Through extensive field work with these and other growers, the quality and field yield of organic soybeans have steadily increased." John now works in a cooperative arrangement with W.G. Thompson & Sons Ltd. in Blenhein, Ontario, Canada. This arrangement "allows us to secure soybeans at harvest, clean them, and store them in facilities that maintain that quality. I'm still training farmers in organic methods."

"I'm no longer at Soy City Foods. I sold my interest there on 1 Jan. 1994 and now I am gratefully involved in taking the industry to its next level of expansion with W.G. Thompson & Sons.

"I began working with Thompson in May 1994. We have a partnership where they are responsible for marketing the complete line of organic commodities. My responsibility is the operational grower / production side of the business. I train farmers in growing techniques so that the organic acreage can be greatly expanded.

"Presently we have about 295 growers on our mailing list. Approximately 50% of these growers produce organic soybeans, and about 40-50 of them produce them in any one year. However many of these growers have limited soybean sales due to their dairy operations and/or position in the 7-year crop rotation. In Ontario there are over 1,500 farmers growing crops organically but mostly on mixed farms [with non-organic crops]. Probably no more than 60-70 of these grow soybeans organically. Due to crop rotations, the acreage in organic soybeans fluctuates dramatically from year to year; anywhere from 1,000 to 2,500 acres of organic soybeans would be under production in any given year. This means that the bulk of their commodities are going for beef and dairy operations. About one fourth of the 1,500 are cash croppers. The number of farmers has not changed appreciably in the past four years but the size of the farms has. The smaller farms have opted for market garden operations while the larger farms are more efficient at cash cropping–things like soybeans, wheat, and spelt.

"At present we market a full line of organic commodities including soybeans which we ship globally. Other organic crops include spelt, soft white winter wheat, hard red spring wheat, rye, buckwheat, barley, corn, and sunflowers. When you take into consideration that soybeans constitute only one of the commodities in the rotation, you can see that the tonnage is greatly expanded by handling all of the commodities. It is our hope that we will be able to move quickly 4,000 to 5,000 acres of soybeans. The vast majority of our current soybeans are high protein for tofu or soymilk.

"Ontario sells few organic soybeans to East Asia because the bulk of our production has historically been shipped to Europe. That has changed this year with Japan receiving its first shipments. Other Pacific Rim countries started receiving minimal amounts of organic soybeans in 1992 and 1993.

"Although I was forced to leave the Ontario Oil Protein Seed Crop Committee because of excessive work load, I still sit as an ad hoc member of that committee in a technical assistance capacity to the plant breeders in designing higher quality soybeans. My two latest projects focus on soluble protein increases and elimination of trypsin inhibitors in soybeans."

John encloses a leaflet titled "Training in organic production techniques: Workshop schedule for the winter of 1994-1995." There are two 4-day workshops each month, one in Blenheim and one in Toronto, Ontario. Each workshop costs $25.

Update: 1995 May 17. Acreage of organic soybeans in Ontario is up about 300% over last year and acreage for all organically grown crops in Ontario is up about 100%. John contracts 75% or more of the organic acreage in Ontario. One crop that is rapidly expanding is spelt. It has a better flavor and protein content than typical wheat, and it lacks one of the glutens to which some people are allergic.

Update: 1999 March 20. Talk with an associate of W.G. Thompson. Jon Cloud now has a very bad reputation with at least one manager at W.G. Thompson. According to this manager, Cloud misrepresented his relationship with the company and did some unscrupulous things, then disappeared leaving some unpaid debts. Address: Cloud Mountain Inc., 342 Indian Rd. Cres., Toronto, ONT M6P 2H1 Canada. Phone: (416) 762-0940.

10148. Kennedy, J. Robert. 1994. How rice syrup and grain syrup came to America from Japan (Interview). *SoyaScan Notes.* Nov. 14. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Chico-San was launched on 6 March 1962 in Chico, California, as a retail store and a wholesale business, capitalized with $10.000. The first Yinnies grain syrup (rice and barley) and Yinnies (rice syrup candies) that Chico-San sold in America were made in Chico-San's food plant at 1262 Humboldt Avenue, in Chico, California, and sold in about 1971. The Yinnies syrup was on the market about 2-3 months before the candy. The candy was made by boiling down the syrup a little more, then pulling it like taffy using a regular taffy-pulling machine (Bob's idea, never conceived

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of in Japan). So already Bob and developed two American innovations: Growing koji on brown rice, and pulling Japanese-style rice candy to give it a texture like taffy. Bob recalls that the demand for the Yinnies syrup (which was used as an all-purpose natural sweetener, especially by macrobiotics) was greater than the demand for the Yinnies confection. These macrobiotic products were made using the traditional Japanese koji process, except that the koji was made from organically-grown brown rice, grown by the Lundberg Brothers at Wehah Farms in Northern California.

Bob used to visit Japan 2-4 times a year in the early 1970s, because Chico-San was importing a large number of Japanese food products and Bob went to visit the farmers and suppliers. During these visits, Lima Ohsawa took him to visit several traditional Japanese shops that made rice syrup (*amé* or *mizuamé*) from koji. Bob observed carefully and took a few notes, which may still be in his diaries (which are in storage). He may have ordered a few samples from Japan, but they were not sold in America.

Bob dabbled and experimented with making rice syrup for at least two years before the product was launched commercially. During this time he learned how to make koji and rice syrup mostly from Mr. Junsei Yamazaki who had emigrated to Chico from Japan in 1963 (sponsored by Bob Kennedy) to make miso and natural shoyu for Chico-San. After graduating from Tokyo Agricultural University, Yamazaki had been a rice farmer in Japan for 17 years. In 1964 he began his first experimental production of miso and shoyu in Chico. His first large batches were made in mid-1970. Since he had to make koji for both miso and shoyu, it was an easy step to make rice koji for amazake. The amazake was cooked, filtered (to removed the fiber), then simmered slowly to yield rice syrup–a slow but relatively simple process. By the late 1960s or early 1970s Yamazaki was making small batches of rice syrup on an experimental basis in the back room at the Humboldt Ave. plant. By 1971 production of rice syrup was in full swing; it was sold in a 12 oz. glass jar and labeled "Yinnies Grain Syrup."

On 14 Sept. 1972 disaster struck. A fire at the Chico-San plant and warehouse at 1262 Humboldt Ave. destroyed 90% of the company's natural food inventory worth approximately $350,000. The company moved to 2244 West First Street in Chico and struggled to get back on its feet. For several months, they continued to make Yinnies syrup from koji in the traditional way in a newly-built koji room. But the demand for this syrup was much greater than the amount that could be made using the traditional koji process. Bob had a friend named Carl Abbott, who worked at a nearby nut plant (Continental Nut Co.) and was also a very bright food chemist. So right after the fire Bob asked Carl if he could do some research to find a way to expand output of rice syrup using natural enzymes with organically grow brown rice to maintain the natural quality and without addition of chemicals–such as caustic chemicals. Carl met with experts at Miles Laboratories (who had never worked with brown rice before), determined the best commercial enzymes, then made adjustments in cooking times and temperatures to fit the needs of the enzymes. Bob is not sure, but he recalls, two enzymes were purchased from Miles: Alpha-amylase to liquefy the rice, and gluco-amylase to break down the rice carbohydrates into sugars (mostly maltose). When Chico-San switched over to using commercial enzymes with brown rice to make rice syrup, they discontinued the use of koji.

In 1971 and 1972 sales of Chico-San's rice cakes began to increase dramatically. After the 1972 fire, it took the company about a year to get back to manufacturing any significant volume of rice cakes. By 1973 the demand for rice cakes was growing like mad. Bob had to build new and better machines that could keep up with the demand. Sales of Yinnies syrup were also growing nicely. Then the company ran out of space at the location on West First Street. So on 1 Jan. 1979 the company moved its Rice Cake machines back to the original address at 1262-1266 Humboldt Ave.–which had been renovated after the fire, and on which Chico-San how had a 10-year lease. Chico-San retained 6,000 square feet of its location on West First Street for the manufacture of Rice Syrup. At about that time Bob met Pat and Cheryl Mitchell, owners of California Natural Products (CNP) in Manteca, California. They were making various syrups, but definitely not from rice.

Note: Robert Nissenbaum of Imagine Foods (23 Nov. 1994) strongly disagrees with this 1979 date. He is certain that in the summer of 1984 he visited the Chico-San plant that was making rice syrup. It was located in Chico, in a sort of garage at the end of an alley. He was buying rice syrup from Chico-San at the time for use as a sweetener in amazake he was making in Missouri, and he wanted to find out why the quality was so inconsistent. He thinks that CNP first began making rice syrup under contract for Chico-San after August 1984.

Bob Kennedy decided to contract with CNP for production of all his Rice Syrup. Bob sold all Chico-San's Yinnies syrup equipment to Pat and Cheryl; this equipment was compatible to whatever they were doing. He also told them all his secrets for making brown rice syrup and had them sign a non-disclosure agreement and a contract which stated that CNP would make rice syrup only for Chico-San. Chico-San guaranteed in writing to buy a specified amount of rice syrup. "Everything went fine until I sold the business to Heinz."

When Heinz bought Chico-San on 16 Nov. 1984, they wanted it all or nothing. If they decided after six months that there were parts of the business they did not want, Bob could buy those parts back. Chico-San carried $100,000 to $150,000 inventory of Japanese food imports. Bob expected to be able to buy back the Yinnies syrup business if Heinz decided not to pursue it, but the contract wording, unfortunately for Bob, allowed Heinz to essentially trade

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the rice syrup business to CNP. Bob lost track of what was happening between Heinz and CNP. He was supposed to work for Heinz as a consultant for about a year, but he didn't like it so he asked to be released from that obligation–which they did after about 3 months. "If I had had a crystal ball at the time, I would have kept the rice syrup business, but at the time I did not think much about it. I was really a little burned out with Chico-San. I was doing 10-12 hours a day for years. It was quite a relief to be free of it."

Bob Kennedy knew about Robert Nissenbaum, who was developing Rice Dream non-dairy ice cream before Chico-San was sold to Heinz. Chico-San was shipping hydrolyzed rice (made by CNP) to Robert Nissenbaum before Nissenbaum was aware of CNP. [Note: Robert Nissenbaum–see interview of Nov. 1994–says he bought only rice syrup from Chico-San, and he became aware of CNP at about the same time as Chico-San, before CNP was processing rice]. Then Chico-San was sold to Heinz in Nov. 1984 and Rice Dream (made with rice beverage from CNP) started to be manufactured in Palo Alto, California, in Jan. 1985. Address: Chico, California. Phone: 916-891-0970.

10149. Ziegler, Jan. 1994. Soybeans show promise in cancer prevention. *J. of the National Cancer Institute* 86(22):1666-67. Nov. 16.

• ***Summary:*** "Epidemiologic evidence indicates that Asian women have a lower incidence of breast and colon cancer, better response to cancer treatment, and fewer problems with menopause than Western women. And among the apparent reasons for this is that Asians, in general, consume more soy products–tofu included–and green tea."

But Daniel Sheehan, PhD, National Center for Toxicology Research, Jefferson, Arkansas, says: "I disagree that soy has been proven safe."

10150. Voldeng, Harvey D. 1994. Dr. Sven Holmberg and breeding short-season soybeans (Interview). *SoyaScan Notes.* Nov. 29. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Dr. Voldeng said in March 1993: "When you look into Dr. Holmberg's work, it was remarkable. He was a very, very good soybean breeder. Nobody in Europe, even up until now, has conducted breeding programs on the scale and with the number of crosses that he did." He got big results on a small budget, with funding coming mostly from a small private seed company and perhaps some from the Swedish government.

Dr. Holmberg's program at Fiskeby was closed down after his death in Nov. 1981 and some of the work was taken up by a young lad in southern Sweden. Dr. Voldeng has quite a bit of correspondence, pedigree lists, and other documents on file from Dr. Holmberg, and he will look there for details and to see if Holmberg's soybeans were tested in other northern European countries, especially Norway, Finland, Denmark, Ireland, or Iceland. [Note: Ireland is located the furthest south of these countries, on about the same latitude as northern Germany, and south of the southern tip of Sweden].

The soybean breeder before Dr. Voldeng was Dr. Lorne Donovan, who was the successor to Dr. Dimmock. In the mid- or early 1960s, Holmberg worked his way over on a cattle ship from Norway one year (he obviously was paying his own way), and spent some time with Dr. Donovan in Canada. Dr. Voldeng met Dr. Holmberg once, in about 1978-1980, when he was still some fairly active. "He went out to the field with me. He had fairly severe arthritis, so he had to walk with a cane. His sister lived with him, and we all drove out to the field. We walked around the plots. He had a very good program, though it was not that large. In Eastern European countries, such as Poland, they had programs and 100 times more financial support than he had, but they made practically no crosses. Holmberg made hundreds of crosses, and that was not easy in the climate and latitude of Fiskeby. He was a remarkably good soybean breeder, there is no question about that." Dr. Voldeng does not know what his academic training was. He heard that before World War II, the Swedish government could see that a problem was coming, that they could be blockaded for vegetable oils. So they paid for his trip to Hokkaido, Japan, and the Kurile Islands to collect soybeans. "He told me, 'When I got to those places I could see birch trees and it looked just like Sweden. So I knew that if I found soybeans there, they could be adapted to Sweden.' He was right, but it took a lot of work to adapt them. He knew exactly what he was looking for.

Dr. Voldeng thinks that. Dr. Holmberg's program is no longer active. "It was more a labor of love that his father had started and he continued. Eventually they were purchased by one of the big plant breeding companies in Scandinavia–probably Hilleshög (which focused on breeding hybrid sugar beets), when Dr. Sven Holmberg was in his later years; he supervised the transfer. Hilleshög was later sold to Volvo, and then to Syngenta AB–so it seems unlikely that any archives or photos survive. He made little or no money from his soybean work though he has contributed immensely to short-season soybeans worldwide.

Note: A letter from the Fiskeby Board AB in June 1994 states that Dr. Holmberg's Institute, which used to be in Fiskeby, Norrköping, Sweden, no longer exists. Address: Agriculture Canada, Central Experimental Farm (CEF), Building #110, Ottawa, ONT K1A 0C6, Canada. Phone: 613-995-3700 x 7653.

10151. Archer Daniels Midland Co. 1994. First quarter report to shareholders, and a report on the 71st Annual Shareholders Meeting. Box 1470, Decatur, IL 62525. 16 p. 20 x 9 cm.

• ***Summary:*** Comments by president James R. Randall. ADM is a growth company that continues to grow in three basic ways. First, by continuing to expand the basic

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businesses: crushing, refining, milling, etc. Second, to grow vertically and upgrade basic products into higher margin items. Central Soya's feed division was purchased along with a worldwide network of premix plants to give ADM excellent distribution of its amino acids and vitamins for animal feeds. By the end of 1995, ADM will be producing all three of the vitamins known as antioxidants. "Our soy protein businesses also continue to grow. Our European concentrate plant is now at full capacity and is being expanded. Our U.S. isolate and concentrate business is well ahead of previous years." Pillsbury's sales of ADM's vegeburgers are "up nearly 900 percent over a year ago. Our third growth area is to grow internationally. There are 94 million new people added to the face of the globe annually and feeding people is our business." These people are being added in "Asia, Africa, Central and South America, places where we have little or no presence, and we need to be there. In the past year we have formed partnerships and have plants in Turkey, Greece, Bulgaria, Hungary, and Czechoslovakia in Eastern Europe. ADM is forming new alliances in Asia.

Comments by Michael Andreas, vice chairman of the board and executive vice president. There is no free trade in today's world. "Twenty years ago soybean farmers in the U.S. couldn't agree on a program for soybeans because the cost to produce them varied so widely from north to south. So they opted for so-called free trade with a low loan rate as a safety net. It all sounded pretty good. Over the last 15 years, however, I observed the following. Ten million acres of soybeans disappeared from the U.S., while areas in Argentina and Brazil increased 14 million acres where land was cheaper and subsidized credits were available. An additional 18.7 million oilseed acres were planted in Canada and Europe, again with heavy subsidies. Twenty-two soybean factories [crushing plants] were closed in our country, while fifty sprung up in South America and Europe. Our share of the world market in soybean products was cut in half. In fact, over 20,000 soybean farmers left the business, and 50,000 jobs were lost at home. And you know we still have the same program today.

"Let's look at Japan. They are truly the masters of managed trade. After the war, Japan put an extremely high tariff on imported vegetable oil but none on raw materials like soybeans and canola, so they could create jobs at home. Factories sprung up in the '50s and '60s like wildfire when they set their systems in place. Canada responded by growing more and more oilseeds and subsidizing exports with cheap freight to the ports. Canada became a colony again. They got no factories, no jobs. Why not?

"Japan had all the factories because they could pay a premium for raw materials (in this case subsidized raw materials), run their factories, and charge the consumers double the market for their products. Taxes on the profits were collected by the government and used to help subsidize automobile exports. Sound complicated? As I said, this was managed trade, and it worked like a charm.

"And don't think for a minute that China hasn't learned from these tricks of the trade. They're putting the same systems in place as fast as they can."

Comments by Dwayne O. Andreas, chairman of the board and chief executive. He discusses the many accomplishments of the Clinton administration, including opening up trade with China. "The second thing he did that is absolutely super for agriculture and ADM is that he got NAFTA through the Congress over the opposition of his labor constituency, one of the greatest achievements for trade of this century. Our exports to Mexico have tripled just since NAFTA, and they are going to triple again." Address: Decatur, Illinois.

10152. *Canadian Export Soybeans* (*OSGMB, Chatham, Ontario, Canada*). 1994. What's new in exports? 7(3):4. Nov.

• ***Summary:*** "The Canadian 1993 crop year saw major export soybean increases in many areas..." A pie chart shows 1993 Canadian exports by destination region and country. In descending order of tonnage, they are: Western Europe 226,733 metric tons (tonnes), USA 99,401, Japan 24,185, Hong Kong 23,286, Singapore 12,930, Malaysia 10,362.

10153. IITA. 1994. Annual report 1993. Ibadan, Nigeria: International Institute of Tropical Agriculture (IITA). 65 p. 28 cm.

• ***Summary:*** Contents: Director General's report. Research perspectives. Resource and crop management. Crop improvement. Plant health management. International cooperation. For the record.

IITA experienced funding cutbacks in 1993 and in 3 of the last 5 years, but in 1993 still had core funding of US$20.8 million and additional Special Project Funding of US$13,267,000, totaling $34,086,000. IITA is actively involved in environmental work, trying to achieve agroecological sustainability, using integrated pest management and other techniques. A color map (p. 9) shows agroecological zones of humid and subhumid tropical Africa. The four main zones are: Arid and semi-arid lands, mid-altitude savanna and woodlands, moist savanna (good for soybeans and other legumes), and humid forest.

In West Africa, for all crops, population-driven agricultural systems occupy 66.5% of the land area, while market-driven systems occupy the other 33.5%. Three countries–Nigeria (40%), Côte d'Ivoire (28%), and Ghana (12%)–together account for 80% of the area in West Africa where the systems are market driven. Kudzu (*Pueraria*) is being tested extensively with good results in fallow systems for sustainable farming. Earthworm cast production is highest under kudzu live mulch.

The section on "Crop Improvement Highlights 1993" (p. 21-24) discusses: Seed of IITA soybean varieties were

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available in the commercial sector, sold by Pioneer Hi-Bred and UAC in their catalogs. The effectiveness of promiscuous nodulation of soybean in farmers' fields was confirmed in 1993. Soybean in Nigeria: As crop's commercial success grows, researchers address linked problems. Ghana and Malawi are promoting soybean production. From 1987 to 1993 the soybean utilization project has been funded by the International Development Research Centre (IDRC) of Canada and the Japan International Cooperation Agency (JICA). In Feb. 1991, the project identified 21 companies in Nigeria which used soybean as an ingredients in their products or projects. By 1993 that number had jumped to 50. "In July 1993, IITA held a workshop of small-scale and industrial soybean processors, which brought together the whole spectrum of producers from the cottage-industry to large-scale levels, as well as soybean growers." Production and marketing information gathered by the IDRC project was reviewed. Producers and processors exchanged views on development of soy-based food products and the associated equipment and machinery for their manufacture." Today the demand for soybeans in Nigeria exceeds the supply.

In 1992 only 4.3% of IITA's core budget went to cowpeas and soybeans, decreasing to 3.1% in 1993. Page 50 shows the 33 main IITA donors in 1993. Those giving more than US$1 million are: USAID ($9,727,000), World Bank ($4,200,000), Japan ($3,584,000), Canada ($1,448,000), and Netherlands ($1,400,000).

During 1993/94 IITA improved soybean germplasm was released in Ghana, Nigeria, and Zaire. Address: PMB 5320, Oyo Road, Ibadan, Nigeria.

10154. Morinaga Nutritional Foods Inc. 1994. Why tofu? Exciting new research indicates tofu is the food of the future (Color videotape). 2050 W. 190th St., Suite 110, Torrance, CA 90504. 10 minutes. VHS. Nov. Price: $4.95.
• ***Summary:*** This 10-minute color video is designed to introduce tofu to dietitians and other health professionals. Contains the latest scientific information showing that consumption of soyfoods reduces one's risk of heart disease and cancer. Morinaga will send out a copy to anyone who requests it, if they pay only the postage and handling.

The video is accompanied by a 2-panel brochure that contains basic information about tofu, 7 tofu recipes, and an order form. Address: Torrance, California. Phone: 1-800-NOW-TOFU.

10155. Morinaga Nutritional Foods, Inc. 1994. The word is out: Tofu is in (Ad). *Vegetarian Times.* Nov. p. 79.
• ***Summary:*** This full-page color ad shows: (1) A carton of Mori-Nu Silken Tofu (Firm) on a wooden cutting board surrounded by cubes of white tofu, green vegetable soybeans, and whole dry soybeans; (2) Cartons of the five types of Mori-Nu Tofu; (3) A tofu-chocolate creme pie topped with sliced bananas.

Five paragraphs compare the conventional wisdom about tofu with the "Word on the street," which is about Mori-Nu Tofu. Examples of the conventional wisdom: "Tofu is a strange, spongy substance found only in exotic Asian dishes." "All tofu is made by hand, cut into blocks and floated in unappetizing plastic tubs filled with water." "Tofu need to be refrigerated, spoils quickly and should be eaten right away." "Tofu is high in fat." "Tofu is a food of the past."

This ad also appeared in the Feb. 1995 issue (p. 51) of this magazine. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 310-787-0200.

10156. Deming, John W., Jr. 1994. Work with Erewhon and the natural foods industry, 1969-1971. Part I (Interview). *SoyaScan Notes.* Dec. 28-29. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** John was born on 27 June 1947 in Tacoma, Washington, where his parents were stationed after World War II, though they came from the South. His mother, who was from Arkansas, was the daughter of the founder of Murphy Oil, and the sister of the man who made it into a Fortune 500 company. So John's family was in petroleum business and quite wealthy. Coincidentally, Murphy Oil is also a major soybean grower. John grew up in Louisiana. He attended Tulane University in New Orleans, Louisiana, until 1967, majoring in English. He spent his junior year in Europe (Wales and Spain), then returned to Tulane. He was active with SDS and psychedelics, then dropped out in early 1969.

Buying an old Volkswagen bus with tuition money from his parents, he drove to Vermont. There he helped to develop one of the first communes in Vermont–named Johnson's Pasture and located 15 miles west of Brattleboro–and played a key role in making it work. There were no "macroids" [followers of macrobiotics] in the commune. In May 1969 Deming met John and Chris Abrams at the commune; they would later introduce him to macrobiotics and become close friends. Realizing he had some money from an inheritance (he began to receive substantial amounts of money from various trusts starting at this time) and tired of the commune, he decided to move to California. "That was where the hippie scene was most intense, and I wanted to do my own thing." So he got in a Volkswagen bus with 9 other people and drove to Mendocino County, California.

There, in Sept. 1969, he used part of his inheritance to purchase (from his great aunt who lived in Berkeley) 55 acres of beautiful land, an old fishing camp on the Noyo River and on the Skunk Railroad Line west of Fort Bragg, California. On the land he started his own commune and lived lightly on the land (which had no electricity) until Aug. 1970. In the summer of 1970 John and Chris Abrams came to California to live with John on his land. (John's father was a well-known heart surgeon and professor at Harvard

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Medical School). Chris developed terrible eczema on her hands soon after they arrived, but she cured it with a 10-day rice diet–based on the macrobiotic teaching of George Ohsawa. She gave John Ohsawa's book *Zen Macrobiotics,* which he read in one or two nights. This was his introduction to macrobiotics. "I was so taken by the book and so impressed by Chris and by the cure of her eczema, that I decided very quickly to dedicate much time and energy to the philosophy and diet of macrobiotics. I got deeply into it. I read everything George Ohsawa wrote and I was just floored. I went for the whole thing hook, line, and sinker. I wanted to save the world and I thought that this was the way to do it. After using pot all summer, I went on a 10-day rice diet. I had never felt better in my entire life." John now had long hair and a big beard. He soon began to visit Herman Aihara about every two weeks and to learn about macrobiotics from him. After a while, John was the only person left on the land, so in late 1970 he decided to give it to Herman Aihara. Herman later cut down all the redwood trees, sold them for cash, and finally sold the land for cash.

John got into the natural foods movement in 1970. New England, New York, and California were hotbeds of this new-age, vegetarian type activity and John wanted to bring it to the South. He hoped to become a leader of this movement. So he drove to Jackson, Mississippi, where he met a Jewish woman named Renée Rosenfeld, about 55 years old from Belgium, who was really into macrobiotics. They started a little macrobiotic restaurant in her house; they typically served 5-6 people lunch that they prepared themselves. After about 2 months, in Nov. 1970, they started a small natural foods store (about 3,000 square feet, paid for by John) named the Singing River Granary. It was successful as a business. At his store John read a short essay by Paul Hawken published as a brochure, which he felt was the best single statement he had seen about why he was interested in macrobiotics and what the philosophy meant to him. John thought, "I've got to meet this guy Paul Hawken. He has a gift with words." One day in early 1971 Roger and Susan Hillyard from Erewhon drove into town to find out who was buying so much macrobiotic food from Erewhon. Roger was going from Boston to Los Angeles to set up Erewhon–Los Angeles. He loved the store and he said "Any time you want to come to work with us, you're welcome." John took a trip to visit Erewhon–Los Angeles, arriving right after the big earthquake struck the San Fernando Valley near Los Angeles on 9 Feb. 1971. He liked what he saw. Aveline was there, living in a big macrobiotic study house with Tom DeSilva and others. Returning to Mississippi, John sold Singing River Granary in Aug. 1971, moved to Los Angeles, and went to work with Erewhon. He began by helping Jim Gronemeyer (a very colorful figure) to expand the Erewhon retail store. John met Paul Hawken when Paul came to Los Angeles and invited all the Erewhon employees down to a beach house he had rented at Carlsbad (about 80 miles southeast of Los Angeles). Dora, Paul's wife, was also there, wearing a bikini on the beach, about 6 months pregnant, and looking lovely.

In mid-Sept. 1971 John flew to his cousin's wedding in Boston, then visited the Erewhon warehouse (at 33 Farnsworth St), where he talked to "Big Bill" Garrison, the manager, who offered John a job. "I realized that here I was in Boston at the center of the center, the heart of the heart of everything. A stoned-out hippie in Tucson, Arizona, once told me that Michio Kushi knows more about the Universe than any other person on the planet. I knew I wanted to study with Michio." Continued. Address: 555 Bryant St. #255, Palo Alto, California 94301. Phone: 415-853-1231.

10157. Yasuda, Masaaki. 1994. Tôfu no bunka: Okinawa no tôfu zukuri to tôfuyo [The culture of tofu: Tofu-making and tofuyo in Okinawa]. In: Yasumoto Hara, ed. 1994. Minzoku no Kokoro o Saguru [Looking for the Folk Mind]. Sakae, Osaka, Japan: Hatsushiba Bunko. See p. 295-337. [35 ref. Jap]*
Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, 1, Senbaru, Nishihara-cho, Okinawa 903-01.

10158. Esaki, H.; Onozaki, H.; Osawa, T. 1994. Antioxidative activity of fermented soybean products. In: M.T. Huang, ed. 1994. Food Phytochemicals for Cancer Prevention I, Fruits and Vegetables. Washington, DC: American Chemical Society. SCS Symposium series 546-547. See p. 353-60. Index. 24 cm. *
• ***Summary:*** "Developed from a symposium sponsored by the Division of Agricultural and Food Chemistry at the 204th National Meeting of the American Chemical Society, Washington, D.C., August 23-28, 1992." Two volumes.

10159. Nomura, G.; Kawabata, T.; Takahisa, H. 1994. β-amylase recovery from soybean whey. *MRC News* No. 13. p. 83-87. *

10160. Okubo, Kazuyoshi; Kudou, Shigemitsu; Uchida, Teiji; et al. 1994. Soybean saponin and isoflavonoids: Structure and antiviral activity against human immunodeficiency virus in vitro. *ACS Symposium Series* 546:330-39. Chap. 26. Food Phytochemicals for Cancer Prevention. *
Address: 1. Dep. of Applied Biological Chemistry, Faculty of Agriculture, Tohoku Univ., 1-1- Tsutsumidori Amamiyamachi, Aoba-ku, Sendai, Miyagi 981.

10161. Shinshu-Miso Research Institute. 1994. *Report of the Shinshu-Miso Research Institute* No. 35. p. 1-100. [Jap; eng]
Address: Nakagosho 469-6, Nagano-shi 380, Japan.

10162. Jacobs, Barbara; Jacobs, Leonard. 1994. Cooking with seitan: The complete vegetarian "wheat-meat" cookbook. 2nd ed. Garden City Park, New York: Avery

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Publishing Group. xi + 185 p. Foreword by Nikki and David Goldbeck. Illust. Index. 26 cm. [20 ref]
• ***Summary:*** Contents: Acknowledgments. Foreword. Preface. Introduction. 1. A Newly discovered ancient food. 2. Making your own seitan. 3. Appetizers and snacks. 4. Sauces and marinades. 5. Soups and stews. 6. Salads and salad dressings. 7. Side dishes. 8. Elegant entrées and hearty casseroles. 9. Desserts. Manufacturers of seitan and seitan products. Mail-order distributors. Bibliography.

In the Introduction, Barbara Jacobs writes (p. 2-3): "In 1970, when we first tasted seitan, it was a tasty but exotic snack food, owing its extremely salty flavor to the fact that it was an imported Japanese specialty food, flavored for the Japanese taste. In addition to being heavily salted, this seitan was hard, chewy, and quite expensive. It was really just a snack food to be eaten while drinking beer. Unfortunately, no one involved in the natural foods movement in this country was familiar with the methods used to make this food.

"In 1971, Leonard became the head chef at the Seventh Inn, one of Boston's first natural foods restaurants. During that time, he and I began our search for different traditional food-preparation techniques and studied with experts in all areas of cooking and baking. In March 1971 a young Japanese woman named Yumie Kono came to work at the Seventh Inn. It was Yumie who taught us how to make seitan. Even macrobiotics leaders Michio and Aveline Kushi–experts in the preparation of healthy Japanese foods–had never actually made seitan."

In 1975 Jonathan's Seitan Shop in Antwerp, Belgium, began to make seitan. In the mid-1970s, a seitan product named Tan Pups had become a very popular snack food. "Created in Boston, tan pups were similar to the country fair specialty of dough-covered hot dogs on a stick. Tan pups were pieces of seitan that had been dipped in flavored batter and deep fried. Boston area natural foods stores carried these healthy snacks as staple items."

The basic recipe for seitan (p. 20-21) involves simmering 2-2½ cups of freshly homemade wheat gluten in a "basic broth" of 4 cups water, ¼ to ½ cup natural soy sauce, a 3-inch piece of kombu (a sea vegetable), 4-6 slices (1/8 inch) of fresh gingerroot (optional), and 1 tablespoon sesame oil (optional). Address: Medfield, Massachusetts.

10163. Konovsky, John; Lumpkin, T.A.; McClary, D.C. 1994. Edamame: The vegetable soybean. In: A. Desmond O'Rourke, ed. 1994. Understanding the Japanese Food and Agrimarket: A Multifaceted Opportunity. Binghampton, New York: Food Products Press. xiii + 217 p. See p. 173-81, 196-99. Illust. Index. 23 cm. [52 ref]
• ***Summary:*** Contents: Introduction. History. Quality. Variety selection. Production. Current research. Summary.

Note: In the superb first draft of this paper: The authors review more than 160 Japanese publications concerning vegetable soybeans, concentrating on the period from 1920 to the present. More than 120 of the articles are in scientific journals dating from 1921 to the present. In general these research articles and publications can be categorized into seven research areas: Agronomy and crop management (37%), biochemistry (15%), breeding and germplasm (12%), harvesting and processing (12%), statistics and marketing (12%), plant physiology (9%), and plant pathology (3%). Address: East Asian Crop Development Program, Dep. of Crop and Soil Sciences, Washington State Univ., Pullman, WA 99164-6420.

10164. Mindell, Earl. 1994. Earl Mindell's food as medicine. New York, NY: Simon & Schuster. 393 p. Index. 22 cm. [97 ref]
• ***Summary:*** Here Mindell, who would write *Earl Mindell's Soy Miracle* in 1995, gives a preview of his growing belief in the health benefits of consuming soy. Phytochemicals (p. 13, 25): Genistein, which is found in the urine of those who eat soy-based foods, appears to block the growth of new capillaries that supply blood to some tumors. Researchers hypothesize that genistein may be responsible for the low incidence of certain forms of cancer among "Japanese, who eat a diet rich in soy foods."

Phytates (p. 28) found in soybeans and cereal grains deactivate steroidal hormones that promote tumors. However excessive intake of phytates is known to interfere with absorption of minerals such as calcium.

Protease inhibitors (p. 29), found in soybeans and soyfoods, can prevent the conversion of normal cells to malignant ones.

Calcium (p. 65): Tofu curded with calcium sulfate is a good source of calcium. Sodium (p. 83-84): Recommends the use of reduced-salt soy sauce.

Breast cancer (p. 215-16): "Soybeans and soy products (soy milk, tofu, etc.) may also provide some protection against breast cancer." Women in East Asia who eat a lot of soy products have 10-15% lower circulating estrogen levels than Caucasian women and must lower rates of breast cancer.

Osteoporosis (p. 242-44): Eat tofu (curded with calcium sulfate), miso, and other traditional soy products.

Menopausal symptoms (p. 261-63): Japanese women seem to have less discomfort. Mindell thinks this may be because the Japanese diet is rich in soy products (tofu, miso, soybeans, etc.). Address: R.Ph, PhD, registered pharmacist and Prof. of Nutrition at Pacific Western Univ. in Los Angeles. He lives in Beverly Hills, California.

10165. Miyako Oriental Foods, Inc. 1994. Cold Mountain Miso: Ethnic versatile seasonings (Portfolio). Baldwin Park, California. Six inserts. 31 cm.
• ***Summary:*** The portfolio jacket was printed in about 1993 or 1994. The six inserts (all leaflets), printed over a period of ten years, include: (1) "Miso: Made from organic soy bean" (March 1995; two sides, color photo of four products

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on front, recipes on the back). (2) "Cold Mountain Miso: A traditional taste of Asia to the modern world" (March 1997; two sides, color photo of four products on front). (3) "Miso: Made from organic soybeans" (1983; two sides, printed brown on light beige). Gives specifications for three types of miso. (4) "Miso: Made from organic soybeans" (1983; two sides, printed brown on tan). Gives specifications for Cold Mountain dehydrated miso. (5) "Fermented black bean paste: Versatile seasoning" (1995; two sides, printed brown on light blue). Gives specifications for Cold Mountain fermented black bean paste. Ingredients: Black soybean, rice, salt, water, *Aspergillus oryzae.* (6) "Dehydrated fermented black bean paste: Versatile seasoning" (1996; two sides, printed brown on light gray). Gives specifications for Cold Mountain dehydrated fermented black bean paste. Address: 4287 Puente Ave., Baldwin Park, California 91706. Phone: 818-962-9633.

10166. Nagano Chushin Agricultural Experiment Station. 1994. Summary of soybean breeding activities in Nagano. Nagano prefecture, Japan. 6 p. [Eng]
• ***Summary:*** Page 3 contains an excellent map titled "Soybean Research Network in Japan." It lists and shows each of the 6 soybean breeding centers, the 7 experiment stations for testing specific characteristics, and the 15 experiment stations for testing local adaptability. Graphs show precipitation and average air temperature year-round at 5 of the main stations. The chief soybean breeder is Nobuo Takahashi. This station has developed and released 16 registered and 6 non-registered soybean varieties between 1962 and 1991; the most famous are Enrei (released in 1971), Tanrei (1978), Tamahomare (1980), Tachinagaha (1986), Ootsuru (1988), Ayahikari (1991).

Breeding objectives: 1. High yielding ability: more than 4.5 tonnes/ha in experimental fields. 2. Late planting adaptability: more than 3.0 tonnes/ha after winter wheat. 3. Suitability for mechanical harvesting: lodging resistance, non-shattering, lowest pod weight. 4. Resistance to diseases and nematodes: Soybean mosaic virus, soybean cyst nematode, black root rot, purple seed stain. 5. Seed quality: large seeds (more than 30 gm per 100 seeds), small seeds for natto (less than 10 gm per 100 seeds), appearance (hilum color, seed coat cracking, etc.), high protein (more than 45%), suitability for food processing. 6. Soybean varieties for special [food] use: Black soybean for kuromame, green soybean for kinako, large and flat soybean for hitashimame. Address: Shiojiri, Nagano prefecture, Japan.

10167. Suzuyo Kogyo Co. Ltd. 1994. [Soybean selection washing, automatic steaming, filling / packaging systems (Leaflet)]. In: Pamphlets on Performance of Factory Automation by Suzuyo's High Quality Steam System. Tokyo: Suzuyo Kogyo Co. Ltd. [Jap]*

10168. Asahi Food Processing Co. 1994? Soybean materials and tofu quality: Soybean use at Asahi. Gyoda-shi, Saitama-ken, Japan. 13 p. 28 cm. Undated. [Eng]
• ***Summary:*** This very interesting report was produced by the Tofu Research Team in the company's Foods Laboratory. It shows how a top Japanese tofu manufacturer evaluates soybeans and processes for making tofu. Each year Asahi uses 4,900 tonnes (metric tons) of soybeans, of which 3,000 tonnes (61.2%) are IOM from the USA and 1,900 tonnes (38.8%) are grown in Japan. Contents: Flow sheet for making soymilk and tofu.

Chemical composition and viscosity of soymilk and hardness of tofu, made using 26 different soybean varieties and 3 coagulants–GDL, calcium sulfate, and magnesium chloride. The main soybeans are Enrei, Toyosuzu, Suzuyutaka, Nanbushirome, Tachinagaha, Yamabe daizu (+ or -), IOM, Vinton, Beeson, Kunitz, Zane, Forrest, 9 experimental Canadian soybeans bred at Harrow [Ontario], Best One (Harrovinton [Harovinton]), plus soybeans from Nepal, Celebes, and Chiang Mai.

Chemical composition of 26 soybean varieties and subunit composition of their protein (11S, 7S, etc.). Composition of other soybeans tested: Vinton organic, Tachiyutaka, Tamahomare, Fukuyutaka, Murayutaka, Raisen, Nakasennari, etc. Variables affecting tofu breakage, and tofu compression. Graph showing effect of A-4 subunit on viscosity change of soymilk after addition of magnesium chloride. Graph showing viscosity curves after addition of magnesium chloride coagulant (0.2%) to soymilk derived from 8 different soybean varieties (Note: Enrei gives the lowest viscosity and Vinton the highest). Dendrogram of cluster analysis on principal component score for Japanese soybean cultivars (Best suited for tofu are Enrei, Toyosuzu, Fukuyutaka, Shirosennari). Note: *Webster's Dictionary* defines dendrogram (a term first used in about 1953) as "a branching diagram representing a hierarchy of categories based on degree of similarity or number of shared characteristics esp. in biological taxonomy."

Three dimension chart of factor loading. Chart (2 pages) of variables affecting tofu quality: Vertical columns: Deliciousness (Color, taste, flavor, texture), nutrition, sanitation, cost. Horizontal columns: Points/characteristics, soybeans, extraction of soymilk, coagulation operation to make tofu, viewpoints (notes), Enrei, IOM. Address: 2-17-8 Mochida, Gyoda-shi, Saitama-ken, Japan.

10169. *Nikkei* (*Tokyo*). 1995. Natto producers relying on health claims, milder varieties to attract converts. Jan. 2. [Eng]

10170. Rower, Howard. 1995. History of The Infinity Company and Infinity Foods. Part I (Interview). *SoyaScan Notes.* Jan. 22. Conducted by William Shurtleff of Soyfoods Center.

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• ***Summary:*** Howard grew up in a Jewish family in Boston, Massachusetts. In about 1964 or 1965 he got interested in macrobiotics. John Hammond, his next door neighbor and a blues singer, was involved in macrobiotics and he told Howard about it one day. So Howard went to the Ohsawa Foundation in New York City, which was run by Irma Paule in those days. He bought some groceries from her and began practicing macrobiotics. George Ohsawa came to New York in 1965 for a summer camp (See Kotzsch 1985, p. 137) and Howard met him. "Ohsawa said he was looking for a guy like me and he wanted me to grow rice in New York state. I found out that was a pretty impossible task so I asked him to pick something easier. He said 'Okay, grow kuzu.' I said, 'Okay, when you get back to Japan, send me some kuzu plants.' And he said, 'Oh no. That's not the Zen way. The Zen way is for you to do it yourself, now.' I spent about 6 months finding out what a kuzu plant was. Finally I got some old agricultural bulletins that described how good kuzu was, then later described how bad it was. I finally managed to find somebody in the South who dug up some kuzu in the winter and sent it to me. I grew it in my garden in New York. The next year when Ohsawa came, I sat him down under this huge kuzu vine, like an arbor, at the back of my house. I said 'There's the kuzu you wanted.' I took some of the kuzu roots and actually extracted kuzu from them and put it in a test tube. I showed it to Ohsawa, told him it was the first kuzu ever extracted in New York, and gave him the test tube. He was astonished and delighted. He said, 'Now we have to begin to work. I knew I was right. You *are* the man I'm looking for. You must begin to import macrobiotic food products from Japan at once. I will ship them to you.' So we started this relationship and in 1965 I began importing foods from Ohsawa in 1965. He used to send me tamari [soy sauce] and miso in beautiful little 18-liter wooden kegs, tied with rope." Howard sold these products to health food stores and to Michio Kushi.

Also during 1965 Howard read a book about grain and he got very interested in freshly-ground flour. A grain of wheat is alive, but as soon as you mill it, it dies. After 5 days the taste and nutritional value have both declined. So people should mill flour, then keep it refrigerated, and use it as soon as possible. So Howard bought a little home flour mill, and set it up in his house. He ground some wheat flour, his wife made some bread, and they really liked the bread. They served the bread to friends who came to dinner, then they wanted fresh flour, so he made flour for them. Pretty soon he was delivering flour to people, then a health food store wanted to sell it, so he had a label made, even though he didn't have a company name at all. So he threw the *I-Ching* to help him choose a name. The hexagram was "Perseverance Furthers." He was going to name the company "Thomas J. Perseverance" so it would sound like a real person. His brother, who was visiting at the time, said "That's a stupid name. You might as well call it Infinity if you're going to have a dumb name." Howard liked the name Infinity, and decided to name his company The Infinity Co. However, later he did have some labels printed on which Perseverance Foods was the company name–just for fun. He once had a lawyer named Bill Pratt, so he sold "William Pratt Old Barrister" brand honey. One of his children pinched his thumb in the flour mill at home and his wife became concerned that a more serious injury could happen. Moreover everything in the house began to dusted with a thin layer of flour.

Howard started The Infinity Company in about 1965 at 188 Duane Street in New York, in the lower Manhattan neighborhood named Tribecca. It distributed, imported, and manufactured natural foods. George Hannides (pronounced HAN-uh-dees) came to work with him, and he later became a minor working partner.

Howard had a friend who practiced karate in a loft at 188 Duane Street, and his landlord gave Howard a small space that had a desk in it on another floor of the same building. So Howard moved in his mill and started doing business as The Infinity Company. Within 2-4 years Howard incorporated the company and changed the name to The Infinity Food Company. Then the health food stores began asking Howard to make other kinds of fresh flour, such as rye flour or corn meal. He did, and soon the product line had expanded to 250 different products. Eventually he had two 30-inch flour mills plus a 24-inch mill and some little 8-inch ones. He had a room full of mills, and milling was a large part of Infinity's manufacturing business. In addition, at one point, the company was getting truckloads of dried fruit and of fruit juices from California, plus jams and jellies made without sugar from the City of Industry, California.

"Michio Kushi was operating out of a house on Harvard Square in Cambridge. He was selling groceries in the hallway. He had started out in New York, then he ran into some kind of terrible financial trouble. He fled to Cambridge to avoid his creditors. His wife, Aveline, ran the business and he was the guru. In the early days, Michio was Erewhon's biggest asset. He used to go around and lecture, then people would say 'Where can we get this food,' and he'd say 'Go to Erewhon.'" Howard is not sure whether or not he ever sold products to Erewhon in the early days. Howard is not sure whether or not he began importing foods before Erewhon. "Erewhon didn't have any kind of an operation going on when I had my warehouse. They became important later. In the beginning, they may have been getting some products from Ohsawa in Japan at the same time I was. Erewhon was located in the Kushi house in Cambridge, where a few of the real loyal macrobiotics lived with the Kushis and helped to pay the rent. They had sort of a grocery display in the hall, and they sold some foods. In the early days, Erewhon bought miso, tamari and other typical macrobiotic products from Infinity." Continued. Address: 84 MacDougal St., New York, NY 10012. Phone: 212-982-3620.

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10171. Silver, Jimmy. 1995. Purchase of the Erewhon and Pure & Simple brand names from John Deming (Interview). *SoyaScan Notes.* Jan. 24. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** From the day that Jimmy began to work for Erewhon–Los Angeles in 1976, he always believed that John Fountain owned the company and that John Deming was only an investor. "For years, John Fountain ran that company into the ground. I have no idea why Deming wasn't paying attention to what was happening. Then Deming showed up and said to me 'Listen, this company really belongs to me, and I need to know what you think about what's happening.' I told him, then he said 'I'm going to get rid of Fountain and I really need to have you stay. It's going to be a great opportunity for you.' But when he found out what was really happening, and there was going to be work involved, he became somewhat dismayed by the whole thing. It was totally bizarre."

So Jimmy stayed on and worked for John Deming, who sacked John Fountain in late 1978 or early 1979. Jimmy then hired Jeffrey Hilgert. In early 1980, Jeffrey negotiated with Shade Foods (a maker of yogurt toppings in Belmont, California) for Erewhon–Los Angeles to buy the Pure & Simple name, plus a few jam products, from Shade. No physical assets were purchased. Payments were made over a period of several years.

Jimmy had recommended to John Fountain that Erewhon–Los Angeles be converted from a wholesale distributor to a master distributor of branded products that were sold nationally. When John Deming came in, he liked the idea and told Jimmy to make the change. So Jimmy arranged for K&L, Nature's Best, and many other distributors to take on the line of products that Erewhon–Los Angeles had formerly distributed for itself. The Erewhon–Los Angeles warehouse and offices were moved from Vernon to Santa Ana, California. The Santa Ana warehouse was much smaller–no more than 8,000 square feet. It housed only the imported Japanese products and Johnson's Spaghetti Sauce.

When Jimmy and Jeff Hilgert bought Erewhon–Los Angeles from John Deming in mid-1980, they basically wanted the right to use two names: Pure & Simple, and Erewhon. Erewhon–Los Angeles was a very small company, with sales of only about $35,000 a month at the time, and there were large debts which Silver and Hilgert agreed to pay off for Deming. "He said, 'I have to have this amount of money'–which was a ridiculous sum. He should have just given us the company and walked away. It wasn't really worth anything, except that it had these two valuable names–if it could control them.

"John presumably had an agreement with Michio Kushi which allowed him to use the name Erewhon in exchange for paying royalties–a percentage of the sales of the business–to Michio. This is what all the subsequent problems hinged on. After Erewhon went bankrupt, they informed John (without our knowing it) that they were going to require us to stop using the Erewhon name–because we had no right to it, because Deming had never executed the appropriate documents with Michio and wasn't paying Michio any royalties. The agreement that John had told us he had with Michio–that he had sold us–did not exist! By the time we discovered this, we had already paid him something like $80,000 to $100,000. I didn't find out until much later that Erewhon notified him that they were going to withdraw the use of the name from him. At that point, John came to us and said 'Look, you still owe me several hundred thousand dollars for the business, but I'd like to accelerate the payments because I really need cash, and in exchange I'll reduce the amount of money you owe me to $250,000.' He wanted us to pay the balance due over 6 months rather than over something like 5 or 10 years. So we began accelerating the payments. He knew that both he and we would be sued by Erewhon, but we didn't know it. After we had paid him $180,000 of the $250,000, Erewhon sued us. We we went to John and asked him to defend us against the Erewhon suit since we still believed he had this agreement with Michio. Even though we had paid him $180,000 and were in the process of paying the rest, he refused to defend us. He told us it was our problem, that he didn't think it was a productive use of money, and that he thought he thought we should just walk away from it. So Jimmy hired a lawyer to defend himself, and asked John to produce a copy of his signed contract with Michio. I guess we neglected to scrutinize his agreement with Michio at the beginning because we trusted him and he had been using the Erewhon name for years. John did show us a copy of a written agreement at the time we made the deal, but the agreement had time frames on it, and it had to be renewed and renegotiated, and he said he was in the process of doing that. I learned a lot from this experience, but the tuition was high.

"In June 1980 we signed the agreement to purchase Erewhon–Los Angeles from John Deming, then we renamed it Pure Sales, which had two major lines of branded products: Erewhon, and Pure & Simple–plus Johnson's Spaghetti Sauce. At the same time we were paying Deming, we were also paying Shade Foods for rights to use the Pure & Simple name. We took Deming's business from $35,000 sales a month to about $350,000 a month within about a year.

Concerning names: Erewhon–Los Angeles had been a natural foods distribution company in Vernon, California, run by John Fountain. There was a time when Jimmy used both the names Erewhon–Los Angeles and Erewhon West, then Erewhon West took precedence as a name when the company became a master distributor of branded products and its products began to be distributed nationwide. The name change took place before Erewhon–Boston declared bankruptcy.

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"After Erewhon refused to allow us to use the Erewhon name, we had to come up with a new name and re-label all our products in 90 days at a cost of something like $50,000 to $90,000. I called the pasta "Johnson's" and the tamari So' Tamari, So' Pasta, etc." John had had his lawyer, Fred Marks, write several very specific sentences into the agreement describing the conditions under which we would not have to pay John. There was a hearing in Boston, Massachusetts, and we had to go before a bankruptcy judge there. When we lost the lawsuit, because there was no valid agreement between Deming and Kushi, our lawyer asked the judge to issue the order in the language that Deming's lawyer had written into our contract. And he did and the judge did. We got a court order losing to Erewhon but it was worded in John's lawyer's language. So we went back to John and said 'We're not going to pay you for the balance due.' We told him we thought he should pay back the $180,000 we had already paid. He refused. After a month or two he sued us for the $50,000. So we counter-sued him for everything that we had paid him plus our costs of relabeling–a total of about $250,000 to $350,000. John came to us and said that he would drop his suit if we would drop ours. We did not pursue our case because we wanted to focus on our booming business and we did not have the resources to prosecute a lawsuit–nor were we willing to go through the emotional energy drain. So we walked away from it. John had lots of money and for him the whole thing was like a monopoly game. Address: President, Pure Sales, P.O. Box 5116, Irvine, California 92716-5116. Phone: 714-540-5455.

10172. Drosihn, Bernd. 1995. The soyfoods market in Germany. New developments at Viana Naturkost (Interview). *SoyaScan Notes.* Jan. 30. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Bernd's company, Viana, is now one of the two largest tofu manufacturers and soyfoods marketers in Germany. The other large company is Life Food in Freiburg. Their brand name is Taifun, and they have been growing rapidly for the last two years.

The tempeh market is very small in Germany. There are only two manufacturers: Hamburger Tofu Manufaktur (Christian Nagel, in Hamburg) and Viana. There is now only one real miso manufacturer in Germany: Kanta Kozaki GmbH in Urbach near Stuttgart. Viana stopped making miso 2 years ago, however Viana sells miso made by Kanta Kozaki in glass jars under the Viana label. A Japanese man (Hiroshi Kozaki) and a German man (Karl Selgmann) run the company together. They have been making miso for 3-4 years. Viana also sometimes makes koji for Kanta Kozaki.

Bernd and Albert Hess are planning to attend the Natural Products Expo West in Anaheim, California, March 10-12, 1995. Address: Founder and president, Viana Naturkost GmbH, Willi Graf Str. 88, 53881 Euskirchen-Kuchenheim, Germany. Phone: 02251-56076.

10173. Brennan, Jennifer. 1995. The emperor's soy sauce. *Gourmet.* Jan. p. 92-93, 135-36.

• ***Summary:*** This noted Anglo-Indian food writer describes her visit to the Goyo-gura in Noda, where Kikkoman still makes soy sauce in the traditional way. A Kikkoman guide tells her that the Goyo-gura is "The home of the imperial soy sauce," which is supplied to the emperor of Japan. Noda, located in northwest Chiba prefecture, is cradled between the Tone and Edo rivers.

The buildings remind her of "old London mews houses." The soybeans are steamed in cast-iron kettles called *shikake-gama.* Wheat is roasted with a wooden paddle in a large shallow iron vessel, resembling an oversized wok, by a master roaster (*mugi-iri*). Unrefined salt is dissolved in fresh well water and the resulting brine is boiled and strained to remove any bitterness or impurities. The koji, made with wheat, soybeans and *Aspergillus oryzae* culture, is stirred twice a day. It is mixed with brine to become moromi, which is allowed to ferment in large cedar vats for one year. The room holding these vats "is a visual explosion." A wall of glass separates the viewers from the vats, which hold batches of moromi in varying stages of maturation and are buried up to their rims in the wooden floor. Every surface–floor, walls, and ceiling–is painted a vivid glossy orange. "If one could walk into the center of a pumpkin, this is what it might be like." The orange color has symbolic connections to Shintoism.

In the old days, after the fermentation was finished, the moromi was poured into cotton sacks, which were stacked in a wooden pressing chamber called a *fune,* or boat. The liquid shoyu was pressed out into a tub, then poured into a vessel to be heated to stop the fermentation; finally it was bottled in ceramic containers. To evaluate the quality of the shoyu for color, aroma, consistency, and flavor, professional tasters use small white dishes called *kikimi-zara.*

A room beyond the tasting chamber serves as a small museum. There are ceramic jugs in which soy sauce was first exported to Europe from Nagasaki in the mid-1600s by the Dutch. A porcelain bottle on display, decorated with the raised Kikkoman logo, held the shoyu that was awarded a special prize at the Vienna International Exposition of 1873. A sepia photograph shows the old *takasebune* flatboats on the Edo River carrying shoyu down to the city of Edo–today's Tokyo. Another photo shows members of the imperial family visiting the Goyogura. (Note: No photos are shown in this article). As she leaves, the author is presented with the "ultimate personal souvenir... It is a scarlet-labeled bottle in a simple beige carton–the emperor's *shoyu."* Her search is complete.

Two small maps show the locations of Noda and Choshi in Japan. Address: Author of several books on Asian cuisine.

10174. Franke, Adrian A.; Custer, L.J.; Cerna, C.M.; Narala,

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K. 1995. Rapid HPLC analysis of dietary phytoestrogens from legumes and from human urine. *Proceedings of the Society for Experimental Biology and Medicine* 208(1):18-26. Jan. [40 ref]
• ***Summary:*** Discusses: Soybeans (dry, U.S., Japan), soybeans (roasted, Japan), soybeans (fresh, raw), soybeans (boiled, U.S., Taiwan), soy flour (U.S.), tofu, black soy beans (raw and boiled), red bean [probably azuki] seeds (dry), daidzein, genistein, coumestrol, formononetin, biochanin-A. Address: Molecular Carcinogenesis Program, Cancer Research Center of Hawaii, Honolulu, Hawaii 96813.

10175. Kitamura, Keisuke. 1995. Genetic improvement of nutritional and food processing quality in soybeans. *JARQ* (*Japan Agricultural Research Quarterly*) 29(1):1-8. Jan. [27 ref]
• ***Summary:*** Concerns changes in 7S and 11S globulins, and three lipoxygenase enzymes. Address: Dep. of Plant Breeding, National Agriculture Research Center, Tsukuba, Ibaraki, 305 Japan.

10176. Shurtleff, William; Aoyagi, Akiko. comps. 1995. Industrial utilization of soybeans (non-food, non-feed)–Bibliography and sourcebook, A.D. 980 to 1994: Detailed information on 2,538 published documents (extensively annotated bibliography), 65 commercial industrial soy products, 78 original interviews (many full text) and overviews, 59 unpublished archival documents. Lafayette, California: Soyfoods Center. 683 p. Subject/geographical index. Author/company index. Language index. Printed 18 Dec. 1994. Published Jan. 1995. 28 cm. [2720 ref]
• ***Summary:*** "A revolution in soybean utilization has been gaining momentum since the late 1980s in the United States. It is described by phrases such as the 'New Uses Movement,' 'value-added soy products,' or 'industrial uses of soybeans.' But few people alive today realize that this is the third–and probably the biggest–wave of a revolution that has taken place at least twice before. The first wave, which had no name, lasted from 1909 until the end of World War I. The second wave, called the farm Chemurgic Movement, began in 1929 (at the start of the Great Depression), reached its peak from 1936 to 1941, and subsided in the late 1940s after World War II.

"Industrial utilization of soybeans refers to uses other than for food and feed. The oil may be used, for example, as an ingredient in printing inks, diesel fuels, paints, resins, soaps, as a dust suppressant, etc. The protein may be used to make adhesives, plastics, artificial wool, paper coatings/sizings, fire fighting foams and a host of other products. Soy oil has always been more widely used in industrial products than soy protein.

"This is the most comprehensive book ever published about industrial utilization of soybeans. It has been compiled, one record at a time, over a period of 19 years, in an attempt to document the history of this subject. Its scope includes all known information about this subject, worldwide, from A.D. 980 to the present.

"This book is also the single most current and useful source of information on this subject, since 81% of all records contain a summary/abstract averaging 181 words in length."

"A Brief History of Industrial Utilization of Soybeans–As early as 980 A.D. the Chinese were using soy oil, a semi-drying oil, mixed with tung oil, for caulking boats. It was widely burned as an illuminant in oil lamps to light homes and temples, until the 1920s, when it was replaced by kerosene. By the 1920s it was also widely used in China to make soft soaps (that were known for their ability to give a good lather in hard water), lacquers, paints, printing inks, and waterproof cloths and umbrellas.

"By the 1500s, soybean cake began to be widely used in China as a fertilizer, primarily as a source of nitrogen and organic matter, but also for its content of phosphorus and potassium.

"The earliest known reference to industrial uses of soybeans in the West was in 1880, when Bryan, an American, noted that soy oil could be used as a substitute for linseed oil in paints, or be burned in lamps.

"The first use of the soybean for industrial purposes in the western world began in about 1909, when the price of linseed and cottonseed oils skyrocketed worldwide. Soy oil began to be used in large quantities in soaps, and experimentally in paints, first in England, then in the United States. Henry A. Gardner of the Paint Manufacturers Assoc. of the U.S. began extensive research on the use of soy oil to partially replace linseed oil in paints and varnishes. By 1916 the main use of soy oil in America was in soaps, where it replaced cottonseed oil. Manchuria also used large amounts of soy oil in soaps.

"In 1909 Goessel, a German, developed and patented the first rubber substitute from soy oil. In 1912 Beltzer, a Frenchman, developed soy protein plastic, Sojalithe, which he soon produced commercially on a large scale. In 1917 Satow, a Japanese, published the first of many articles from that country on the use of soybean proteins to make plastics.

"The heyday of interest in industrial utilization of soybeans took place in America during the 1930s and the Great Depression, spurred largely by the work of Henry Ford, the farm Chemurgic Council (founded in 1935), the Chemurgic movement, and the U.S. Regional Soybean Industrial Products Laboratory (founded in 1936 at the University of Illinois, Urbana). The goal was to make industrial products from farm crops to help depressed farmers. The soybean was one of the great success stories of the Chemurgic movement. In 1933, the peak year percentage-wise, a remarkable 70% of all soy oil in the USA went into industrial, non-food uses–primarily paints and varnishes, followed by soaps, linoleum, and oilcloth.

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Large amounts of soy flour were made into plywood glue, especially by the I.F. Laucks Co. In 1936, the peak year for publications, some 59 publications on industrial uses appeared. In 1935 the Glidden Co. in Chicago built the first small plant for production of industrial grade soy protein isolate, which the called 'Alpha' protein.

"Active work in this field accelerated during World War II, when soybeans were used to make products that were in short supply. In 1941, after imports of tropical oils from Southeast Asia had been suddenly cut off by the Japanese military, use of soy oil in industrial products skyrocketed to its historical peak in absolute terms: 74.25 million lb. were used that year. Of this, 56% was used in paint and varnish, and 33% in soap. But by 1944 industrial uses of soy oil had fallen to only 17 million lb.

"During the 1950s, a period of huge surpluses for most U.S. farm crops (and forecasts of soybean surpluses... which never materialized), research focused on industrial products that could alleviate the surpluses. During the 1960s, as surpluses disappeared, the concern for world hunger and protein shortages grew, and petroleum came to dominate industrial utilization, soybean research switched from utilization to production.

"The mid-1980s in America saw a rebirth of interest in research on soybean utilization, especially industrial utilization. Foreign competition from Brazil and Argentina, and huge surpluses of soy oil drove U.S. farmers, led by the American Soybean Association, to develop new value-added products for new markets.

"Statistics compiled by the U.S. Dept. of Commerce, Bureau of Census, Industry Div. (Reprinted in *Soya Bluebook '94,* p. 234) show that in the year beginning Oct. 1992 (the latest statistics available), the main industrial uses of soy oil were in resins and plastics (95 million lb.), paint and varnish, fatty acids and 'other inedible' (163 million lb.). These nonfood uses totaled 296 million pounds in 1992/93, accounting for 2.5% of total U.S. domestic soy oil utilization. Rapidly growing new uses included printing inks, diesel fuels, and dust suppressants–to mention but a few.

"One of the shining examples of industrial uses of soybean oil in the USA is in soy inks. In 1987 the oil from 9,000 bushels of soybeans went into soy inks, but by 1993 this figure had skyrocketed to 4,000,000 bushels–a 444-fold increase in just 7 years! In 1994 about 10% of all U.S. printing inks, about 44 million pounds, were made from soy oil. About 90-95% of all daily newspapers used soy inks for color and one-fourth of the estimated 50,000 commercial printers regularly used it." Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 510-283-2991.

10177. Yasuda, Masaaki; Matsumoto, Tetsuya; Sakaguchi, Maki; Kinjyo, Sakie. 1995. Okinawa ni okeru tofuyo no seizo ni kansuru kenkyu. X. Beni koji to ki koji no heiyo ni yoru tofuyo no seizo [Studies on the manufacture of tofuyo in Okinawa. X. Production of tofuyo using the combination of red and yellow kojis]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 42(1):38-43. Jan. [15 ref. Jap; eng]

• ***Summary:*** Red koji was prepared by growing molds of the genus *Monascus* on steamed rice. Yellow koji was prepared by growing *Aspergillus oryzae* molds on steamed rice. In this study, tofuyo prepared with either or both of these types of koji was investigated. "The product obtained by using the combination of red and yellow kojis was preferred" to that made by only one koji. The most desirable product was obtained by using the mixed koji of composed 75% yellow koji and 25% red koji.

Crude protein content, hardness, and cohesiveness of tofuyo were found to decrease during the ripening period. Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, 1, Senbaru, Nishihara-cho, Okinawa 903-01.

10178. Ham, P. Marc. 1995. The work of Semences Prograin Inc. (Micronisation Canada Inc.) in Quebec (Interview). *SoyaScan Notes.* Feb. 1. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** This company was established in 1980 and is now a leader in Canada in the field of value added soy products. About two-thirds of their business is making full-fat micronized soybeans for use in animal feeds (mainly dairy cows, plus hogs and poultry), and one-third is in breeding and growing soybean seed (they presently grow about 2,000 acres year for use as soybean seed). They now have two micronizing plants which produce the Micro Flake, the Micro Milled product and the Micro Elite (made from higher protein soybeans, with high bypass). Mark believes that a micronized product makes better feed than that produced on a low cost extrusion cooker. Extrusion may be better for monogastric animals than it is for dairy. They have a research and development program for new soybean varieties. They also contract with a winter nursery in Chile for reproduction during the winter. They buy about 55,000 tonnes/year of soybeans for processing into animal feed and for exporting to the Pacific Rim. They are one of the largest companies in Quebec that buy soybeans and keep them in Quebec. The big trading houses buy soybeans then export them mostly to Rotterdam, Netherlands, to the European crush market. Prograin keeps its Maple Glen varieties identity preserved. They screen soybeans to sort them into 3 sizes. The big beans (18/64 inch and over) are sold to Japan for use as green vegetable soybeans, the medium sized beans (500 tonnes/year) are used in the Chinatown in Quebec to make tofu and soymilk, and the small soybeans are used by 3 companies for making soy sprouts in Quebec. They have a natto program as well. Address: Semences Prograin Inc. (Micronisation Canada Inc.), 145 Bas Riviere Nord, St-Cesaire, Quebec, J0L 1T0, Canada. Phone: (514) 469-5744.

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10179. Weber, Marcea Newman. 1995. Re: Work with natural foods and tofu in England and Australia. Letter to William Shurtleff at Soyfoods Center, Feb. 12–in reply to inquiry. 3 p. Typed, without signature.

• ***Summary:*** Marcea and Daniel Weber met in Boston in about 1972, and both studied macrobiotics. They left Boston in 1974 to live in England because Daniel wanted to study acupuncture in one of the acupuncture schools in Buckinghamshire. They stayed there for 6 months and then moved to London, where they connected with Bill Tara, who was working at starting an East West Centre. Marcea began teaching cooking classes and started a Wholefoods Bakery with an English woman. This continued for 1½ years.

During this time Marcea met Bruce Gyngell, an Australian who met Michio Kushi while he was in London. Michio suggested that Bruce change his diet, so Bruce came to the East West Centre and studied cooking. He was looking for a cook for himself. He was at that time living in England and working for one of the television studies. He was the person responsible for bringing television to Australia, so he was quite influential. He wanted macrobiotics to find its way to Australia, so he invited Marcea and Daniel to visit Australia and bought them each a round-trip ticket. He said they could see if they wanted to stay and start a centre in Australia. So in 1976, after visiting Japan and Oki sensei and his Oki Yoga Dojo in Mishima, Japan, for several weeks, they arrived in Australia, and have lived there ever since. In December 1982 Marcea and Daniel Weber were married in Australia.

"The Soy Bean Factory was established in Dec. 1978, when Michael De Campo, Yoshiko Wright and Marcea Weber started a company devoted to producing traditional Japanese tofu using nigari (a sea water extract) as a coagulating agent. The fresh Japanese-style tofu began to arrive in the health food stores and Japanese supermarkets around April 1979." As far as Marcea knows, theirs was the first Caucasian-run tofu company in Australia. It was her idea to start the company. Shares were issued at the beginning. Marcea initially invested about $5,000 to $7,000, Yoshiko Wright was brought in to invest about $3,000, and Michael De Campo invested about $3,000 or a little less. His main role was making the tofu and working with Marcea on improving product quality.

"The Soy Bean Factory was located just outside Chinatown and in the central district of Sydney, New South Wales, Australia. We concentrated on making a tofu equal in quality to the fresh tofu sold in Japan today. We were able to service people who wanted fresh tofu by selling it straight from the Factory to the public, as well as packaged in a plastic container with a plastic film on top."

The Soy Bean Factory ceased operation in October 1981. Note: On 8 Nov. 1981 Marcea wrote Bill Shurtleff, on a letterhead of the East West Foundation, 363 George St. in Sydney: "Our factory has shut down, and now one of the Chinese producers [Sin Ma Trading Co., 9 Meeks Road, Marrickville (in southwestern Sydney), NSW] is allowing us to use their premises to make our tofu... We are hoping to start another factory with more capitol behind us. Unfortunately, we were grossly undercapitalized, and this was our downfall." While making tofu at Sin Ma Trading Co., The Soy Bean Factory continued to use its original name, since they had lots of packaging and labels, and no need to change names.

"After getting into the swing of making Japanese-style tofu and using the packaging equipment, we decided to find a source of organically grown soybeans that would produce the same quality tofu as the non-organic beans we had been using. In 1983, after several months and many trials, we finally found a bean that would give almost the same quality, though with a small drop in tofu volume [yield].

"As the demand increased up to as much as 600 pieces per week of tofu (each piece weighed 300 gm), we began to look for larger premises, which were found in Leichhardt (about 7 miles southwest of downtown Sydney), so by early 1982 we had re-located to 355 Parramatta Road, Leichhardt, NSW 2040–and had started making tofu. At that time, Yoshiko Wright and Michael De Campo sold their shares to John Fenwick and me, and the name of the company was changed to Soyfoods Australia. Still having a controlling interest in the business, I hired Tony Wondal, a Chinese man, to help operate the business. A year later (in about 1983), after an increase of sales, John decided to sell his shares to Ross Ebert, and we moved to even larger premises at 14/2 Paton Place, Manly Vale (northeast of downtown Sydney), New South Wales. After a year of production and trying to make soymilk without proper soymilk equipment, I decided to sell my share of the company to Ross Ebert. I was expecting my first child in August 1985 and didn't want to be tied down to any business. So I left the tofu business and never looked back! As far as I know, Ross never put any new products out on the market and so the business only sold tofu–and still does today with new owners.

Note: In Sept. 1986 Ross B. Ebert had just spent $100,000 on fairly sophisticated soymilk equipment. He was selling soymilk fresh to Coles supermarkets in plastic bottles. In Nov. 1988 Lindsay Kotzman purchased the business, which was named Great Australian Pty. Ltd. In July 1990 Jennifer Young purchased the business, still located at 14/2 Paton Place. "The Company is Great Australian Tofu Pty. Ltd., trading as Soyfoods Pty. Ltd."

As far as Marcea knows, Sin Ma Trading Co. and Castle Trading Co. were both tofu manufacturers. Address: 56 St. Georges Cres., Faulconbridge 2776 NSW, Australia.

10180. Anderson, Barb. 1995. Whose beans are best? There's more than one way to compete. *Soybean Digest.* Feb. p. 30-32.

• ***Summary:*** Soybeans from Brazil and Argentina are

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generally considered to be better than U.S. beans in terms of overall quality and estimated processed value (EPV). "Overall quality includes more than protein and oil contents and foreign material (FM)." If just oil content and FM are used as criteria, Brazilian soybeans beat U.S. beans almost every time. However if we add free fatty acid levels, moisture, splits, damaged kernels, and test weights to the criteria, the U.S. is able to nearly even the score. Also, the prices used must be those at the destination, not the point of origin. The U.S. could become much more competitive by reducing the FM to less than 2% in its No. 2 soybeans. Most U.S. export customers was less FM.

The U.S. market share in Japan has dropped, averaging less than 81% during the last 4 years because of increased South American imports and quality.

10181. *ASA Today* (*St. Louis, Missouri*). 1995. Customer service to Japan. Part II. 1(4):2. Feb.
• ***Summary:*** "Unfortunately the U.S. share of the Japanese [soybean] market has declined. As recently as 1985, U.S. growers held a 95% share of this market. Over the last four years, the U.S. average market share was only about 80%, with Latin American producers gaining at our expense. A significant part of this loss is directly attributed to quality.

"'Grading of our soybeans on a globally accepted standard is where we need to go now for the future,' stated ASA's [American Soybean Association's] Director for Japan, Kent Nelson... One of the grading criteria that U.S. farmers must continue to improve is foreign material (FM). The Japan Oil Producers Association (JOPA) estimates that the crushing value of Brazilian soybeans is currently $0.20 to $0.25 per bushel higher than American beans, and that up to half of this difference is attributed to FM. The other main differences are the lower levels of oil and protein in U.S. beans, issues which are currently being confronted by researchers."

10182. Hara, Toshio; Saito, Hiroyuki; Iwamoto, Nobuhide; Kaneko, Shinji. 1995. Plasmid analysis in polyglutamate-producing *Bacillus* strain isolated from non-salty fermented soybean food, *kinema,* in Nepal. *J. of General and Applied Microbiology* (*Tokyo*) 41(1):3-9. Feb. [17 ref]
• ***Summary:*** Reports that the plasmid of *Bacillus subtilis* (*natto*) isolated from Japanese natto resembles that of *Bacillus subtilis* isolated from thua nao (of Thailand) and kinema (of eastern Nepal and environs).

Note: This issue is dedicated to the memory of Kin-ichi Sakaguchi (1897-1994); he died on 9 Dec. 1994 at age 97. A memorial appears on pages 1-2; a full-page portrait photo faces page 1. Address: 1-3. Microbial Genetics Div., Inst. of Genetic Resources, Faculty of Agriculture, Kyushu Univ., Higashi-ku, Fukuoka 812, Japan.

10183. Morinaga Nutritional Foods, Inc. 1995. Does your tofu leak or 'puff up' on the shelf? Does it have to be kept below 45 degrees at all times? (Ad). *Produce Business.* Feb. p. 31. *
Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 213-728-4325.

10184. *Ontario Soybean Growers' Marketing Board Newsletter.* 1995. Japanese miso mission visits Ontario. Feb. p. 4.
• ***Summary:*** Five Japanese miso manufacturers, who collectively purchase 180,000 tonnes/year of soybeans for their miso requirements, visited Ontario to see for themselves the excellent quality and appearance of Ontario soybeans. These 5 men represent over 1,600 miso manufacturers in Japan. They also met with OMAFRA Minister Elmer Buchanan. Address: Box 1199, Chatham, ONT, Canada N7M 5L8.

10185. Krizstan, Jan. 1995. Re: Work with seitan and soyfoods in Slovenia. Letter to William Shurtleff at Soyfoods Center, March 1. 2 p. Typed, with signature.
• ***Summary:*** Jan phoned on 6 January 1995, then wrote a long letter dated March 1. His first name is pronounced "Yan." He was born in 1967 in Ljubljana, the capital of Slovenia, where he now lives. He worked for two years on Slovenian television, then in 1992 he quit because of unhealthy working conditions. He had already been a vegetarian for 2 years and he knew that many people are looking for and need healthy food, but they don't know how to get it. So he started a small private company named "Izvor" ("The Source") and in Sept. 1992 started (together with friends) to publish a magazine in Slovenian titled *Bio Novice* ("Bio News") that would connect these people. The main subjects were growing plant foods in accordance with Nature, healthy diets, ecology, alternative medicine, and the culture of peace and non-violence. "It was very difficult, because we started with almost no money, but we published 15 issues of *Bio News.* In December 1994 we had to stop publishing because of big financial problems.

"One of my friends [Vesna Crnivec] translated some paragraphs from *The Book of Tofu* about preparing home made tofu and made an article. We published her translation, a summary of the Introduction, and some of Akiko's illustrations in one of the first issues of *Bio News* (See issue 5/6, letnik 1993, p. 40-44). Some readers (especially women) showed great interest in it! Later I translated some paragraphs from *The Book of Tofu* and published them (together with Akiko's good illustrations) in issues 14 and 15 of *Bio News.* At the end of the article I gave the address of Soyfoods Center for all people interested in ordering your books.

"Last year I was attracted to making seitan and tofu from organic wheat and soybeans. Mr. Mirko Trampus is my very good friend. He has an organic farm in Metlika (1 km

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from the border with Croatia, in southeastern Slovenia). He has been growing wheat, soybeans, and daikon organically for the last 6 years with very good results. We decided to make a kitchen in his house for transforming Mr. Trampus' soybeans, wheat and daikon into tofu, tempeh, natto, soymilk, seitan and pickled daikon.

"A few days before New Year 1995 I visited all Ljubljana's bookshops, because I wanted to find some information about tofu and seitan. What a surprise! There was your *Book of Tofu.* I found it once again and bought a copy. I was so happy. Not far away I found the book *Cooking with Seitan* by Barbara and Leonard Jacobs, with a foreword by Aveline Kushi.

"Now (at the end of February 1995) we are making about 50 kg of seitan per week by hand. We sell it in some 20 healthy food shops all over Slovenia." He would like to start making tofu, soymilk, natto, and tempeh, Later he would like to make miso too. "Our aim is preparing 100% vegetarian foods of the highest possible quality, made from organically grown soybeans, wheat, and daikon. Now we need more information. Presently Mr. Trampus grows about 12,000 kg of wheat and 9,000 kg of soybeans per year. Prof. Spanring is our good friend. He helped Mr. Trampus to choose the best varieties of soybeans for making tofu and the wheat with the highest gluten content for seitan. Now we use hard winter wheat. We mill it into flour in our own mill with stones. From 100 kg of wheat flour we get about 23 kg of very dark brown seitan.

"Up until now, all of the starch has been rinsed by hand, but we have constructed an automatic rinsing machine which will be prepared for use very soon. We presently rinse using only warm water at about 30ºC. We discard all the starch (putting it on compost heaps on the fields), but later we will use it as an ingredient in cooked soymilk puddings."

Jan would like to order *The Book of Tempeh.* He is looking for a source of tempeh starter. Tempeh is largely unknown in Slovenia, but he would like to introduce it because it is a healthy food and tastes very good. Address: Mestni trg 22/1, 68330 Metlika, Republic of Slovenia. Phone: (386) 068 59 481.

10186. Walsh, James. 1995. Suiting foreign tastes: Designer foods being made to fit standards in Japan, world market. *Star Tribune* (*Minneapolis, Minnesota*)**.** March 5.
• ***Summary:*** There is a growing demand for "designer" beans–a "value-added" product. Minnesota researchers (such as those at the University of Minnesota College of Agriculture) have developed, and Minnesota farmers are growing and selling, soybean varieties especially tailored for Asian niche markets. Proto soybeans are large-seeded, and high in protein, excellent for making tofu. They are often grown under contract with Asian companies. Minatto soybeans are a small-seeded variety, sold to the Japanese for making natto. Chico soybeans, also small seeded, are used to make soy sprouts.

According to John McLaughlin, an international trade representative in the Minnesota World Trade Office. One promising and rapidly expanding new U.S. market is for organic foods. U.S. domestic sales of organic foods have risen dramatically from about $178 million in 1980 to almost $2,000 million in 1993, according the *Natural Food Merchandiser* magazine. The Japanese alone pay more than $1,400 million a year for organic food, and that market has grown 80% a year for the past 5 years. Minnesota, which boasts 150,000 acres of organically certified cropland, is working hard to court these buyers.

Jim Orf, a professor and soybean researcher at the Univ. of Minnesota, notes that of the 20 to 30 soybean varieties developed by his university since the late 1970s, seven have been developed specifically for Japanese food use. In addition, private companies in Minnesota contract with Japanese buyers to develop and grow soybean varieties.

SunRich, a company in Hope, Minnesota, that grows soybeans and waxy corn for Japan, "also has developed edamame, the boiled green soybean that Japanese eat as bar snacks. But so far, U.S. versions of that food have not met Japanese taste standards." Allan Routh, a soybean farmer from New Richland, Minnesota, and part-owner of SunRich, grows 20-40% of his crop for export. He must work hard to meet the standards set by Japanese buyers, but the Japanese offer premiums of $0.25 to $1.50 per bushel.

10187. Anand, Karen. 1995. Get fresh at TK's: Good food guide. Bon appetit. *Times of India* (*The*) (*Bombay*)**.** March 7. p. A4.
• ***Summary:*** Top quality ingredients and an informal ambience make it a pleasure to dine at TK's, the Hyatt Regency's new Japanese restaurant. TK's stands for Teppan Yaki Kitchen. Newcomers may wish to wish to choose from one of the four reasonably priced set menus (two are vegetarian), each of which includes 5 courses, such as "Japanese miso soup and dessert." Three sauces comes with grilled dishes; the "soya ginger sauce" is used primarily to season seafood, but it is delicious on many other foods.

10188. Gruenwald, R. Jay. 1995. Update on The Simple Soyman, The Bountiful Bean, Long Life Foods in Minnesota, and Kyoto Food Corp. (Terre Haute, Indiana) (Interview). *SoyaScan Notes***.** March 13. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jay has been with The Simple Soyman for 12 years. On 23 Sept. 1994 The Simple Soyman bought The Bountiful Bean, moved it from Ridgeway to Milwaukee, and merged it into The Simple Soyman. In Dec. 1994 he moved the new larger company to a new address: 3901 North 35th St. (P.O. Box 16677), Milwaukee, Wisconsin 53216. Phone: 414-444-TOFU. Simple Soyman still produces Hummus and Taboolie [both contain tofu], tempeh, and tofu under the

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Bountiful Bean brand. The Simple Soyman will continue to make its Deepockets (Calzone-style [Italian] and Empanada-style [Mexican]; both contain frozen tofu), dips, spreads, etc. Most are made with soy. The company does a lot with frozen tofu, using it in place of TVP, which causes intestinal gas. The business is still struggling, "but hopefully with the addition of The Bountiful Bean business and distribution in Madison, we'll get going. Being in this for 12 years now, we've got to start making a living at it pretty soon. Basic tofu is still not very profitable. We started working out of the Magic Bean's kitchen with one product. When they went bankrupt we basically bought their equipment and moved to 4877 N. Green Bay Ave., Milwaukee, Wisconsin. The building we are in now is 4,500 square feet. The factory is nicely laid out."

R. Jay has heard from a packaging company that a new tofu company named Long Life Foods is scheduled to start in Perham, Minnesota. They are said to be using a special type of package (not water pack) which gives the tofu a very long shelf life.

Kyoto Food Corp. (KFC) in Terre Haute, Indiana, declared bankruptcy in about May or June 1994. He heard that KFC had a verbal agreement from a big chain like Kroger to carry their tofu, then Azumaya, which was the brand Kroger was carrying, lowered their price. So Kroger stayed with Azumaya and that dealt the death blow to KFC [not true; see March 1995 interview with William Roach]. They were trying to sell their building and plant (which they owned and designed to make tofu) for about $1.3 million. He thinks that the company was run by a couple, an American man and a Japanese woman [William and Toni Roach]. Bruce Rose is thinking of buying the company. Address: Owner, The Simple Soyman, 3901 North 35th St. (P.O. Box 16677), Milwaukee, Wisconsin 53216. Phone: 414-444-8638.

10189. Roach, William. 1995. The rise and fall of Kyoto Food Corp. in Terre Haute, Indiana (Interview). *SoyaScan Notes.* March 16. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** In about Dec. 1993 Kyoto Food Corporation (KFC) stopped making tofu and ceased all operations. At that time they were making about 57,000 lb/month of tofu. William estimates that roughly 70% of their customers were Asian Americans. They delivered their tofu using their own delivery vehicles–to ensure freshness and give better access. They did not declare bankruptcy and no bills were left unpaid. Their plant, which was built specifically for making tofu, has been standing idle, with all the equipment in place, for about 18 months.

KFC was one of the first big tofu manufacturers in the Midwest. There were three main causes for the company's failure: First, a severe cash flow problem experience by their Japan-based parent company, Kyoto Koseikai, which owns a supermarket chain in Japan and also owned 90% of KFC. Kyoto Koseikai invested heavily in land in Japan. But during a 2-month period of economic hardship, this land lost one-third of its value on paper. When Japanese banks called in loans from Kyoto Koseikai, they were squeezed. So the ultimate cause was the loss of land value and the banks in Japan. The Kobe earthquake was only peripherally related.

Second, they had made a big mistake in hiring a so-called "marketing expert" named Robert Mattix, and paying him big money. Mattix went to school at Michigan State University in East Lansing, had good-looking credentials, and laid out big plans to reposition the company's products, etc. He turned out to be a con artist, who has pulled this same trick on at least 4 other companies, using the same lawyer to draft his employment contract. Robert gave away a lot of tofu, but sold little. William has learned that it is very difficult to get accurate background information on high-paid executives. Former employers of employees that were unsatisfactory are afraid to talk because of fear of a lawsuit from the employee. When William finally realized what was happening and fired Mattix, Mittix turned around and sued KFC (as was his pattern to do) for breach of contract. This man cost KFC $290,000, but even more important, he cost them one year of lost time. When Mattix left, William took over as sales manager.

Third, the policies of the company were dictated by Japanese who did not understand the American market very well. For example, for the first year, KFC was allowed to make only one product, fresh water-packed tofu. It was sold in a 12-oz size, when 16 oz would have been better. The local Japanese manager, Mr. Yamashita, refused to do any private labeling, which could have greatly expanded sales. Mr. Yamashita left 6 months before the company stopped production.

Since the company stopped production, there have been two serious buyers. Kyoto Koseikai has set the selling price for the plant in Terre Haute at $900,000 and will not negotiate for a lower price. The first potential buyer was a Mr. Park, a Korean-American who own as big tofu company named Obok Foods in Southern California. The second was a group of Chinese who have a joint venture with Bruce Rose of Tofu International Ltd. They already make tofu together in Ann Arbor, Michigan. William feels there is a good chance that the factory in Terre Haute will be sold; he would like to get back in the business if possible. His wife Toni (Setsuko) who is Japanese-American was actively involved in the day to day operations of Kyoto Foods; among other things, she translated most of the Japanese-language correspondence. Address: Terre Haute, Indiana. Phone: 812-533-1400.

10190. Hymowitz, Ted. 1995. Plate tectonics and the dissemination of the soybean (Interview). *SoyaScan Notes.* March 24. Conducted by William Shurtleff of Soyfoods Center.

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• ***Summary:*** Plate tectonics has nothing to do with the cultivated soybean, *Glycine max,* but it helps explain the dissemination of the wild perennial relatives of the soybean. Plate tectonics has to do with the pool of genetic material which ultimately ended up in Australia, versus that pool which we seen in China and Japan today. Ted is interested in the distribution of the genus *Glycine* (pronounced glai-SEE-nee). The question is "Is the distribution of the wild perennials associated with the distribution of the soybean. The answer is "No."

Ted believes that the ancestors of both the wild perennials and the cultivated soybean were in Cambodia, Laos, and Vietnam. This has nothing to do with his contention that the soybean was first domesticated in the eastern half of North China around the 11th century B.C. These ancient ancestors existed something like 4 to 10 million years before the soybean was domesticated, roughly 3,000 years ago. From this pool of genetic material that moved north, *Glycine soja,* the farmers of China domesticated the soybean.

The Australian plate is moving closer and closer all the time to the plate in the southern part of Asia–especially Indonesia and Papua New Guinea. Eventually the two plates hit, and one plate went under the other. At that time there was a golden opportunity for what he believes to be the *Glycine* to move down from Southeast Asia into Australia. The plants that moved south remained perennials. But the plants that went north from this center were annuals; they eventually became the wild annual soybean, *Glycine soja.* Kudzu comes from that same pool. Botanists know that perennials can't survive in the cold north, so when tropical plants move north they often become annuals in order to survive.

Confounding this whole issue of plate tectonics are wild birds. They can move the seeds of wild perennial relatives of the soybean over long distances. Some seeds retain their viability during the time they are eaten by the birds, digested, and excreted. One day while Ted was sitting alone on the Pescadores Islands, he asked himself, "How could the wild soybean have gotten here?" To demonstrate this bird theory of movement, Ted and his colleagues took material that they collected on Taiwan, Pescadores Islands, Okinawa etc. and they crossed it from the material from Australia. The resulting seeds were fertile. That shows that the genetic material had to come from Australia because on the Philippines and Taiwan you only find the polyploids; you don't find diploids. The ancestors of the polyploids, those 16 species, are only found in Australia. But the polyploids, the ones composed of more than one genetic background, are found in Taiwan and elsewhere. Address: Prof. of Plant Genetics, Univ. of Illinois, Urbana, Illinois.

10191. Azevedo, Chris; Gallagher, Paul. 1995. Trends in Japan's soybean market. Paper presented at a conference titled "Producing Soybeans for the Soyfoods Market." 8 p. Held 2 March 1995 at Ames, Iowa. [6 ref]
• ***Summary:*** The pages and most tables in this report are unnumbered. One table shows per capita annual consumption (in lbs) of soybeans in selected Pacific Rim countries in 1974, 1984, and 1994, as follows, in descending order of pounds consumed per capita in 1994: Indonesia: 9.2, 14.0, 23.2. South Korea: 21.4, 18.8, 20.1. Japan 11.0, 15.3, 16.7. North Korea: 11.8, 12.2, 11.2. Malaysia: 2.9, 5.2, 10.3. China: 14.7, 13.0, 9.7. Thailand: 1.2, 3.9, 3.9. Philippines: 0.4, 0.5, 0.8. Sources: (1) USDA; (2) U.S. Bureau of the Census, World Population Profile, 1994 and 1984; (3) Statistical Yearbook, Statistical Office of the United Nations, New York, NY.

Another table shows annual soybean consumption in million metric tons in 1974, 1984, and 1994, as follows, in descending order of amount consumed in 1994: China: 5.237, 6.193, 5.350. Indonesia: 0.546, 1.072, 2.105. Japan: 0.716, 0.830, 0.950. South Korea: 0.328, 0.358, 0.410. North Korea: 0.083, 0.109, 0.117. Thailand: 0.023, 0.092, 0.105. Malaysia: 0.015, 0.036, 0.090. Philippines: 0.007, 0.013, 0.025. Source: USDA.

A final table shows the amount of soybeans used (in thousand metric tons) in Japan, by product and total, each year from 1978 to 1993, as follows: Use of soybeans for tofu rose from 486 in 1978 to a peak of 531 in 1984, falling to 492 in 1993. Use for natto rose from 71 in 1978 to a peak of 109 in 1993. Use for miso rose from 182 in 1978 to a peak of 185 in 1980, falling to 173 in 1993. The total rose from 750 in 1978 to a peak of 927 in 1992, falling to 920 in 1993. Address: Iowa State Univ. Phone: 515-294-0160.

10192. Chen, Hua-Ming; Muramoto, Koji; Yamauchi, Fumio. 1995. Structural analysis of antioxidative peptides from soybean β-conglycinin. *J. of Agricultural and Food Chemistry* 43(3):574-78. March. [18 ref]
• ***Summary:*** Protease hydrolyses of a soybean protein, Beta-conglycinin (7S protein), yielded antioxidative activity against the peroxidation of linoleic acid in an aqueous system at pH 7.0. Address: Dep. of Applied Biological Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai 981, Japan.

10193. Furuhata, Hideki. 1995. Japanese soyfoods markets. Paper presented at a conference titled "Producing Soybeans for the Soyfoods Market." 9 p. Held 2 March 1995 at Ames, Iowa.
• ***Summary:*** This paper consists of nine very interesting statistical tables, one on each page. Table 1 shows the supply and demand for soybeans in Japan from 1984 to 1992 (in tonne = metric tons). The supply of Japanese-grown soybeans decreased from 126,000 tonnes in 1984 to a low of 73,000 tonnes in 1992, and imports increased from 4,401,000 tonnes in 1984 to 4,725,000 tonnes in 1992. The demand for soybeans from crushers has stayed about steady, ranging from a low of 3,428,000 tonnes in 1991 to

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a high of 3,928,000 tonnes in 1985. Demand for food uses has increased from 786,000 tonnes in 1984 to a high of 927,000 tonnes in 1992 (up 18%). Demand for use as feed has increased from 55,000 tonnes in 1984 to 95,000 tonnes in 1992.

Table 2 shows soybean utilization in Japan by type of food product from 1987 to 1994: Use of soybeans for tofu and aburage stayed about steady at 498,000 tonnes, by far the largest food use. Use for miso decreased slightly from 180,000 tonnes in 1987 to 170,000 tonnes in 1994. Use for natto grew strongly from 97,000 tons in 1987 to 110,000 tonnes in 1994. Use for kori-tofu (dried-frozen tofu) grew slightly from 29,000 tonnes in 1987 to 30,000 tonnes in 1994. Use for soy sauce grew strongly from 5,350 tonnes in 1987 to a record 25,300 tonnes in 1992, dropping slightly to 23,000 tonnes in 1994. Use for soymilk decreased slightly from 4,000 tonnes in 1987 to 3,100 tonnes in 9994. Total use of soybeans for food in Japan grew slowly from 875,350 tonnes in 1987 to 930,000 tonnes in 1994 (up 6%).

Table 3 shows Japanese population and per capita consumption of soyfoods from 1982 to 1992. Population grew from 103,720,000 to 124,452,000 during this period, while per capita consumption grew from 6.8 to 7.4 kg/capita (up 8.8%).

Table 4 shows per family expenditures and consumption per year on tofu, natto, miso, and soy sauce from 1982 to 1992. For example, expenditures on tofu increased from 2,535 yen in 1982 to 7,992 yen in 1992, while consumption fell from 87.98 cakes to 79.26 cakes. Thus in 1992 the average Japanese family consumed 1 cake of tofu every 4.6 days.

Table 6 shows imports of soybeans for food from the USA, Canada, and China from 1982 to 1992. Imports from the USA are subdivided into IOM, Beeson, and other identified varieties. In 1992 about 88.7% of food-grade soybeans imported to Japan from the USA were IOM. Moreover, of all these soybeans imported for food use in 1992, about 76.6% came from the USA, 21.5% from China, and 1.85% from Canada.

Table 6 shows the amount spent per capita by people of different 5-year age-groups on four soyfood products. The average person in the age 60-64 year group spent ¥2,976 on tofu, ¥1,539 on miso, ¥1,490 on soy sauce, and ¥1,098 on natto. The average person in the age 30-34 year group spent ¥1,581 on tofu, ¥603 on miso, ¥508 on soy sauce, and ¥708 on natto.

Table 7 shows the source of soybean used to make four soyfood products in 1984, 1990, and 1992. In 1992, of the 498,000 tonnes of soybeans used in tofu and aburage in Japan, 74.8% of the soybeans were IOM from the USA, 6.0% were Beeson (USA), 8.0% were other U.S. varieties, 3.0% were from China, and 8.0% were grown in Japan. Of the 30,000 tonnes use to make dried-frozen tofu, 86.7% were IOM and the rest were from China. Of the 108,000 tonnes used to make natto, 55.5% were from the USA and Canada, 39.8% were from China, and 4.6% were grown in Japan. Of the 176,000 tonnes of soybeans used to make miso, 88.0% were from China, 5.7% were white-hilum beans from the USA, and 6.25% were grown in Japan.

Table 8 shows that production of soybeans in Japan from 1982 to 1994 has decreased sharply. In 1982 some 262,300 tonnes were produced on 147,000 ha with a yield of 1,782 kg/ha. In 1994 some 98,800 tonnes were produced on 26,500 ha with a yield of 1,620 kg/ha.

Table 9 is two charts showing the distribution system for (1) Imported soybeans from suppliers to end users, and (2) Domestic soybeans from farmer to end users. Farmers sell to the Zenno Nokyo or a collector. Address: Mitsui & Co. Phone: 515-294-0160.

10194. Iowa State University. 1995. Producing soybeans for the soyfood market: Conference schedule and registration (Leaflet). Ames, Iowa. 3 panels each side. Each panel: 22 x 9 cm.

• ***Summary:*** On Thursday, 2 March 1995, Iowa State University held a 1-day conference titled "Producing Soybeans for the Soyfoods Market" at the Holiday Inn Gateway Center, Ames Iowa. No proceedings were published. Schedule: Wednesday evening: Tour of Iowa State University's Pilot Plant and Center for Crops Utilization and Research. Soyfoods tasting reception follows at the Holiday Inn Gateway Center for conference registrants. Thursday. Morning session: Markets, trade, and policy. 8:30 a.m.–Welcome and introductions, by Lester A. Wilson. 9:00–Japanese soyfoods markets, by Hideki Furuhata, Mitsui & Co. 9:45–Growth potential for soyfood beans in Asian markets, by Lester A. Wilson. 10:30–Break. 10:45–U.S. participation in soyfoods markets in the Pacific Rim, by Robert Neal, Agri-Grain Marketing. 11:30–Trade policy changes and opportunities, by Paul Gallagher. 12:15–Lunch. Afternoon session: Soybean varietal effects on soyfood quality. 1:30 p.m.–The effect of varietal characteristics on perceived soyfood quality, by Keisuke Kitamura, Chief, Legume Breeding Lab, MAFF [Ministry of Agriculture, Forestry and Fisheries], National Agricultural Research Center, 3-1 Kannondai, Tsukuba, Ibaraki 305, Japan. 2:15–Soybean breeder panel discussion, with Keisuke Kitamura, Walter Fehr (ISU), Dennis Strayer (Strayer Seeds), Tom Brumm (MBS Seeds), Clark Jennings (Pioneer Hi-Bred Intl.), Jerry Lorenzen (FTE Genetics). 2:45–ISU research presentations: (1) Soybean varietal and storage effects on tofu processing–Pilot plant study, by Lester A. Wilson and Patricia Murphy. (2) Rapid quality testing with near-infrared whole grain analyzers, by Charles Hurburgh. 3:30–Break. 3:45–Health benefits of soyfoods, by Mark Messina (American Soybean Association health consultant); Isoflavones in soybeans and soyfoods, by Patricia Murphy (ISU Dep. of Food Science and Human Nutrition). 5:00

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p.m.–Closing comments and questions.

Conference sponsors: Midwest Agribusiness Trade Research and Information Center (MATRIC, Iowa State Univ.). Center for Crops Utilization Research (ISU). Utilization Center for Agricultural Products (UCAP, ISU). Iowa Soybean Promotion Board. MSGA/MSPRC (Minnesota Soybean Growers Assoc. / Minnesota Soybean Research & Promotion Council). Registration fee: $100 before Feb. 15, or $125 thereafter.

A five-page directory of the 74 attendees is attached. Address: Ames, Iowa.

10195. Kanazawa, Takemichi; Osanai, T.; Xiao, S-Z.; et al. 1995. Protective effects of soy protein on the peroxidizability of lipoproteins in cerebrovascular diseases. *J. of Nutrition* 125(3S):639S-646S. Supplement. March. First International Symposium on the Role of Soy in Preventing and Treating Chronic Disease. [30 ref. Eng]

• ***Summary:*** It has been shown that peroxidized low density lipoprotein (LDL) is an important risk factor in the pathogenesis of atherosclerosis. Administration of soycreme suppressed peroxidized lipoprotein. Furthermore, blood cholesterol concentrations were reduced by the administration of soy protein. Therefore soy protein may be useful in the prevention and/or treatment of atherosclerosis. Address: 1. The Second Dep. of Internal Medicine, Hirosaki Univ. School of Medicine, 5 Zaifu-Cho, Hirosaki-City 036, Aomori-Ken, Japan; 3. Beijing Research Center for Immunology, Beijing, China.

10196. Mogi, Yuzaburo. 1995. Re: Selection to become President and Chief Executive Officer of Kikkoman. Letter to William Shurtleff at Soyfoods Center, March 3. 1 p. Printed, with signature.

• ***Summary:*** "On February 6th, the Board of Directors selected me to become President and Chief Executive Officer of Kikkoman Corporation, effective that date."

Note: This printed announcement was sent to friends and shareholders of Kikkoman. Address: Tokyo, Japan.

10197. Murphy, P.A.; Wang, H.-J. 1995. Isoflavone content of selected soybeans and soyfoods (Abstract). *J. of Nutrition* 125(3S):806S. March. Supplement. First International Symposium on the Role of Soy in Preventing and Treating Chronic Disease.

• ***Summary:*** 29 commercial soybean foods were obtained and classified into soy ingredients, traditional soyfoods, and second generation soyfoods. 12 soybean varieties (8 American and 4 Japanese) were also obtained. The concentration and distribution of isoflavones in these was analyzed using HPLC (high performance liquid chromatography) and photodiode array detection. Twelve isomers were quantified: 3 aglycones (daidzein, genistein, and glycetin [sic, glycitein]), as well as 9 glucosides (daidzin, genistin, glycitin; 6"-O-acetyl-daidzin, -genistin, glycitin; 6"-O-malonyl-daidzin, -genistin, glycitin).

Among traditional soyfoods, there were differences between nonfermented and fermented. Higher levels of glucosides were found in nonfermented soyfoods, while higher levels of aglycones were found in fermented soyfoods. Second generation soyfoods contain only 6-20% the isoflavone levels as whole soybeans.

In Vinton 81 soybeans grown during the three years 1989-1991, variation in total isoflavones was threefold, with crop year having a much greater influence than location. Isoflavones in seven other American soybean varieties ranged from 2,053 to 4,216 micrograms per gram. Address: Iowa State Univ., Dep. of Food Science and Human Nutrition, 2312 Food Sciences Building., Ames, IA 50011.

10198. Ontario Soybean Growers' Marketing Board. 1995. Technical soybean mission: Japan, Hong Kong, Malaysia, Singapore. March 10-26, 1995. Chatham, Ontario, Canada. 23 p. 28 cm. [Eng]

• ***Summary:*** Contents: Participating members: Dr. Karen Lapsley, Mr. Ron McDougall, Mr. Michael Loh, Mr. Doug Jessop (food technologist and tofu expert, Harrow Research Station), Mr. Kim Cooper (marketing specialist, OSGMB). Note: This is the first Canadian soybean mission in which a food technologist (Doug Jessop) participated. Background. Mission objectives. Acknowledgements. Mission details–Japan: Canadian embassy.

Japan Miso-Co-op Industrial Association: Japan imports about 250,000 tonnes {metric tons} of soybeans from China each year, and about 150,000 tonnes of that amount is for the miso market. The remaining miso soybeans come from Canada, USA, and Japan. The best soybean for making miso comes from the Hokkaido area of Japan. It is a large, white hilum type, perhaps Toyomasuri. Generally the larger the soybean the better for making miso. Japanese miso makers need two types of soybeans from Canada: (1) Normal SQWH (Special Quality White Hilum); average values for color, taste and texture are acceptable though higher values would be preferable; (2) High Premium Soybeans; they would consider paying a premium for better color, taste, and texture.

Azuma Natto Foods Co. Ltd.: This natto company uses 7,000 tonnes/year of soybeans making them the third largest natto maker in Japan. They use 65% USA, 25% Japanese, and 15% Canadian soybeans. There are four sizes of natto: Small natto < 5.5 mm accounts for 72% of the natto market in Japan; Large natto, 5.5 to 6.2, account for 18%. Extra large natto > 8.5 mm account for 18%. Split seed natto account for 10%. Factors in assessing the suitability of soybeans for natto are: Fat content should be less than 19%. Total sugars–Group 1 contains sucrose, fructose, and glucose, group 2 contains raffinose and stachyose. Calcium affects the hardness or softness of natto. The ideal range is

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180-250 mg/100 gm. Sanwa Company–Tofu manufacturer.

Wed., March 15–Japan Tofu Association: There are over 20,000 tofu makers in Japan, and 53 of these are members of this association, with half of the 53 being in the Tokyo area. Only 185 tofu manufacturers in Japan have 30 or more employees. Tofu makers consider there are two types of organic soybeans: true organic and semi-organic. The association imports about 2,000 tonnes of each type from the USA; they are OCIA certified.

Home Foods Company Ltd. uses 4,000 metric tons of soybeans a year, mostly a blend of 70% Chinese white hilum and 30% U.S. white hilum. The soys from the USA are I.O.M. soybeans, especially the "High Super" variety. For the more premium market they use a blend of 50% Japanese soys and 50% Harovinton soybeans. They have also just started blending 50% Chinese and 50% Canadian white hilum soybeans. The two most important criteria for their soybeans are high protein and high total sugars. Sugar levels of Chinese soybeans (24-25%) are higher than those of Canadian soybeans (23-24%).

Thursday, March 16–Takeya Miso Co.: Ikuo Fujimori, President. Takeya has two plants employing 100 production workers and using 5,000 to 6,000 tonnes of soybeans yearly. 70-80% of their products are sold in supermarkets. For years they have been using the U.S. soybean variety Kanrich.

Nagano Chushin Agricultural Experiment Station: They have been breeding soybeans since 1957 and in that time have developed and released 17 varieties, the most famous being Enrei. The staff of 34 includes 5 soybean breeders. Dr. Nobuo Takahashi has been breeding soybeans for over 18 years. Japan has domestic soybean area of 370,500 acres (150,000 ha); it is decreasing, so imports are increasing.

Nagano Miso Industrial United Co-operatives: This group consists of 8 local co-ops made up of 160 miso manufacturers, who pay a fee to this group based on sales. There was a detailed discussion of the types of sugars in soybeans necessary for good miso.

Friday March 17–National Food Research Institute. Tsukuba is developing into a science research park, now containing over 200 different research institutes. NFRI, originally founded in 1934 as the Rice Institute, moved to Tsukuba from Tokyo in 1973. Thirty years ago, all tofu in Japan was made with Japanese soybeans. Dr. Toshiro Nagai spoke about natto: In 1992 the natto needs of Japan were met by soybeans from China (45%), USA (38%), Canada (17%), and Japanese domestic (8%). Natto consumption has increased by about 10% for each of the last few years. Dr. Sayuki Nikkuni spoke about miso: In 1992 the miso needs of Japan were met by soybeans from China (87%), USA (6%), Japan (6%), and Canada (1%). Dr. Kaoro Koyama spoke about tofu: In 1992 the soybeans for tofu totaled 490,000 tonnes and came from USA (390,000 tonnes; 80%), Canada (50,000; 10%), Japan (20,000; 4.1%), China (20,000; 4.1%), and South America (10,000; 2.0%).

Asahi Food Processing Co. Ltd. This plant, which has 350 employees and operates 365 days/year, was established in 1972 and produces tofu, fried tofu, natto, noodles, and juices. They use 15 tonnes of soybeans daily or 4,900 tonnes/year, of which 38.8% are grown in Japan and the remaining 61.2% are IOM from the USA. Each day they make 120,000 cakes of tofu, 100,000 pieces of fried tofu, and 20,000 packages of natto. Most of the soybeans they use in production are dehulled. They use about 500 tonnes/year of OCIA certified soybeans from the USA and some semi-organic soybeans from Japan. The prices they pay per kg of soybeans are: IOM 30-40 yen; Vinton, identity preserved varieties, and Harrovinton [Harovinton] 100 yen; organic 120-140 yen; Enrei (Japanese) 400 yen.

Saturday, March 18–Hong Kong. Canadian High Commission. Canada Packers (Hong Kong) Ltd.

Monday, March 20. Shenzhen Economic Zone: This area of 30 square km, just outside the Hong Kong border, contains 1 million people or 60% of the provincial population, all of whom require a special permit to work in the area. This economic zone is booming, basically due to spiralling costs in Hong Kong, where many businesses and factories are closing and moving to this area, where land and labor costs are much lower.

Shenzhen Vitasoy (Guang Dong) Foods & Beverage Co. This plant, which is only one year old, produces a major share of the soymilk for Hong Kong. They are able to import soybeans at a low tariff rate because they ship the majority of their finished products back into Hong Kong. The plant uses Canadian SQWH (Special Quality White Hilum) soybeans, but has problems with uneven seed size. They presently receive the soybeans in 45 kg jute bags, but would prefer strong 45 kg poly-lined paper bags. A small percentage of dairy milk is mixed with the soymilk, which is thought to improve its texture and taste.

Tuesday, March 21. Dah Chong Hong, Ltd. This was the first company to import Canadian soybeans for food use in the early 1970s. Dah Chong pointed out that Ontario soybeans were experiencing increasing competition from Quebec soybeans, especially in the past two years. The Quebec soybeans are 5-10% less expensive, due to lower basis levels, lower freight costs, and being more aggressive in a new market. Their quality is similar to Ontario, though the seed coat color is somewhat darker. There are about 50 tofu makers in Hong Kong, 10 larger size and 40 smaller size, although there is not a large difference in size. Consumers believe that packaged tofu is not as fresh as that purchased fresh daily from local markets.

Amoy Food Ltd. (Dr. Alain Butler; This plant makes soy sauce and other sauces used in cooking. They use only Canadian soybeans, the Maple Glen variety from Quebec). Wed., March 22. The group visited Hung Tao Soya Bean Products Pty., a traditional Hong Kong tofu and soybean sprout plant in the New Territories.

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Thursday, March 23–Malaysia. Canadian High Commission. Yeo Hiap Seng (Malaysia) Berhad (Contains excellent details on the company). Chop Lee Kit Heng Sdn. Bhd. (A soybean trader selling to end users in Malaysia).

Friday, March 24–Singapore. Canadian High Commission. Yeo Hiap Seng Ltd. (Singapore). Meeting with nine tofu manufacturers in Singapore. (The name of each company is given. There are 40 tofu makers in Singapore, and the majority now use Canadian soybeans. Tofu growth in the last 5 years has been very rapid and competition is fierce). Asia Corporation Pte. Ltd. (This company accounts for about 70% of the soybeans imported into Singapore and Malaysia. They first brought Canadian soybeans into the area in 1978). Canadec Private Ltd. Sing Yeap Trading Pte. Ltd.

Saturday, March 25–Unicurd Food Company Pte. Ltd. (Mr. Goh gave a tour of his facility and discussed his plans for a new plant in late 1995). Yam Thye & Co. (Warehouse).

Encore Ltd.: Sylvia B. Hollenstein, managing director. This company, based in Switzerland, uses Swiss technology to produce soy yogurts, chocolates, and noodles in Switzerland from Chinese soybeans–mostly for the taste. The products are shipped from Switzerland to the company's 3 retail stores in East Asia; they plan to expand to 10 retail stores by the end of 1995.

Appendixes A through J, issued as a separate document, contain extensive and detailed information and some published documents related to the technical mission. Address: P.O. Box 1199, Chatham, ONT N7M 5L8, Canada. Phone: 519-352-7730.

10199. Suda, Ikuo; Hajika, M.; Nishiba, Y.; Furuta, S.; Igita, K. 1995. Simple and rapid method for the selective detection of individual lipoxygenase isozymes in soybean seeds. *J. of Agricultural and Food Chemistry* 43(3):742-47. March. [23 ref]
Address: Kyushu National Agricultural Exp. Station, Ministry of Agriculture, Forestry and Fisheries, Nishigoshi, Kumamoto 861-11, Japan.

10200. Negru, Matthew. 1995. Tofu and soybeans in Nepal (Interview). *SoyaScan Notes*. April 5. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Matthew lived in Nepal for many years and was married to a Nepalese woman named Laxmi "Latchoo" Lama [now named Mrs. Laxmi Sharma]. They started and owned a woodworking business named Laxmi Wood Craft. In 1987 all foreigners (except those who were married to Nepalese at the time) had to leave the country because the Nepalese government simply stopped renewing visas.

Matthew recalls that when he was in Kathmandu, there were two tofu shops in operation: One was somewhere on the Ring Road and the other was run by a Japanese man and woman; they may not have been married, and they may have had a partner. Matthew first bought tofu in Kathmandu in about 1981-82 and he first met the Japanese tofu makers in about 1985-87; they lived in a house behind the palace, and he thinks they had their tofu shop in Thamel, which is the tourist district of Kathmandu. The tofu was most widely sold at a big market named Asan Tole in Kathmandu. At the end of the market is a sort of square where two streets join; one may be named Bothahiti. There is a line of ships which sell tofu–along with other things. They keep the tofu immersed in water in 5-gallon biscuit tins. The tofu was quite good and tasty. The shops were run by Nepali people, probably the Newari, who are the indigenous tribe of the Kathmandu valley. Most of the tofu in Kathmandu was sold here, but occasionally it was also sold elsewhere.

The Newari own little earth-floored shops, sort of a Nepali saloons, where indigenous whiskey is served–mostly to Nepalese men. There they also serve delicious soybean snacks–such as soybeans fried in mustard oil with special spices. There are thousands of festivals in Nepal–every group has some, and the food served at these festivals is generally delicious. Some of these preparations contain soya. Matthew would like to know if Sherpas, Tibetans, or Thakalis have ever made tofu traditionally. Address: c/o Riverdale Immigrant Women's Centre, 1326 Gerrard St. East, Toronto, ONT M4L 1Z1, Canada.

10201. Kawakami, Kozo. 1995. Tsurezure Nihon shokumotsu-shi: Dai 3 kan [Leisurely history of Japanese foods. Vol. 3]. Tokyo: Tokyo Bijutsu. 195 + 3 p. Illust. Index. 21 cm. [Jap]
• ***Summary:*** As the title implies, the author is writing about 50 foods he finds particularly interesting.

Entries containing an asterisk (*) are about or mention soy. About Mr. Kawakami (sensei) by TANAKA Seiichi. Dengaku tofu * (p. 1+). History of dengaku tofu * (p. 3+). Yuba * (p. 8+). Summary of "History of Tofu" * (p. 13+). Abura-age of tofu (Deep-fried tofu pouches) * (p. 17+). Itohiki natto * (p. 21+). Tororo (Grated tororo imo–glutinous yam–is often served atop dishes such as soba = buckwheat noodles) (p. 24+).

Oroshi daikon (Finely grated juicy raw daikon = Giant Japanese white radish) (p. 30+). Oroshi-gane (Grater) (p. 33+). Mentori daikon (One method of cutting the daikon root to keep the shape during the simmering) (p. 37+). Owari daikon and miyashige daikon (Names of daikon varieties) (p. 39+). Gobo (Burdock root) (p. 43+). Sasagaki gobo (burdock root) and sasagaki daikon (Sasagaki is a special shaving/cutting method. End result: the cut vegetables look like bamboo leaves) (p. 48+). Yatara-zuke (A kind of pickles) * (p. 52+). Kaku-ae (p. 55+). Asa-zuke (pickled asa) (p. 57+). Takuan-zuke (Pickled radish) (p. 62+). Osaka-zuke (p. 67+).

Fu, ki-bu, and shofu / sho-fu (Types of baked wheat gluten) (p. 70+). History of the development of fu (Part 1) (p. 76+). History of the development of fu (Part 2). Kanso-fu (dried) and Kaki-fu (Broiled) (p. 81+). Awase-fu and Yose-fu

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* (p. 86+; tofu is mentioned). Chirimen-fu (p. 88+). Tosa-fu (p. 91+). Shian-fu * (p. 94+; tofu is mentioned). Yamakawa-fu and Chiyo-fu (p. 97+).

Azuki beans and Aka (red) azuki beans (p. 101+). Dainagon azuki (a special variety of azuki beans) (p. 106+). Azuki no suri-jiru (Soup of pureed azuki) (p. 109+).

Hishio–the other name is shoyu no mi (Moromi mash & shoyu presscake) * (p. 115+). Suri-Hishio (ground hishio) * (p. 121+). Ume-bisho and Yubi-hishio * (p. 125+). Hishio and shishi-bishio * (p. 130+) Azuki Kai (Azuki porridge), Aka-kai (Porridge), Uncho-juku (Porridge) (p. 133+) Unzo-kai (Porridge) and Unzo (p. 138+). Kowaii and Seki-han (Rice recipes; Sekihan is red azuki rice) (p. 141+). History of shiso (Shiso leaves are translated as "Beefsteak leaves") (p. 148+).

Asazuki (p. 150+). History of Karashi and Keshi (p. 153+). What is Araragi? ÿ(p. 158+). Tade / Tadé (p. 163+). Itachi hajikami and Inu sansho (p. 167+). History of sansho (Sansho seeds are one type of spice) (p. 170+) Hajikami and Shoga (Ginger) (p. 174+). History of myoga (A Japanese leafy plant with a strong flavor that is often used for a topping for Hiyayakko Tofu) (p. 178+). Myoga-take (p. 181+).

Sai? Seki (Chinese Name) and Niragi * (p. 184+). Kawakami sensei and the Rikagagu Kenkyujo (Note: *Rikagaku* means physics and chemistry), by MATSUSHITA Sachiko, Honorary Professor of Chiba University (p. 190+). 96 Years of my father's life by Kozo Kawakami's eldest son (Tadashi? / Tsutomu?) (p. 192+). My father, Kozo Kawakami,–A view from his 2nd son (p. 194+).

A photo (p. 191) shows the members of the Rikagaku Kenkyujo seated together on tatami mats in a room. A separate outline sketch and legend shows the name of each member.

The section titled "Kawakami sensei and the *Rikagaku Kenkyujo,"* by Prof. Matshita states (p. 190): I was able to receive his guidance for 20 years ever since I became a member of the Ryôrisho Genten Kenkyu Kai, a study group that started in 1994. They met at Keio University's old wooden classroom. These people studied old culinary documents together. I listened to his lecture on the *Ryôri Monogatari.* I could not do my present work that involves Edo period culinary literature without his influence.

I also saw him at the members meeting, visited his home, listened to his talks, and took a look at his sketchbooks on many occasions. On those occasions, he enjoyed talking about his experience at Riken (Rikagaku Kenkyusho) before the war and his teacher Dr. SUZUKI Umetaro. His work on the history of Japanese Food History got started after he retired. His work before his retirement was on agricultural chemistry (*nogei-kagaku*). He worked mostly on Vitamin A at Dr. Umetaro SUZUKI's Lab. in Rikagaku Kenkyusho until he moved to Manshu Kokuritsu Tairiku Gakuin in 1937. He received his PhD in Agriculture.

I first met him at a funeral of the late TSUJI Michiyo sensei in June 1989 held at Enmeiji Temple in Urawa. The late TSUJIMURA Michiyo sensei was in the same lab as Kawakami sensei.

The photo on the next page shows the golden age of Riken group who worked under Dr. Suzuki. I made a copy of one of the 3 photos from late TSUJIMURA Michiyo Sensei's album. He didn't have any photos from our days in Manchuria, so I was very happy and drew the picture below. The man in the center in the dark suit is Kawakami sensei.

Letter (e-mail) from Naomichi Ishige, Japanese food historian. 2008. May 18. KAWAKAMI Kozo, who passed away in 1994, was the foremost philologist on Japanese food culture. Thus, his writing is reliable enough. Continued. Address: Japan.

10202. Kawakami, Kozo. 1995. Tsurezure Nihon shokumotsu-shi: Dai 3 kan [Leisurely history of Japanese foods. Vol. 3]. Tokyo: Tokyo Bijutsu. 195 + 3 p. Illust. Index. 21 cm. [Jap]

• ***Summary:*** The chapter titled natto (*itohiki nattô;* p. 21-23) states: Within the natto family, there are dry types, *shiokara natto* (salty natto) and *itohiki natto* (regular / sticky natto) which can make sticky threads when it is moist, stirred with a pair of chopsticks, and picked up (as with chopsticks). It is thought that shiokara natto appeared in the Heian period because its name appears in the book titled *Shinsarugakuki* in around 1062 as *tsuki shiokara natto* (pounded salty natto) and *shiokara natto* (salty Natto). But for itohiki natto, no clear (definite) document was found, so people thought it appeared in late Edo period. But I don't think in that way. There might be a blank period in the literature, but you cannot say no document was found. There are some documents that mention itohiki natto. I am going to mention them here.

The first is *Shojin Gyorui Monogatari* (1320-1380). It is a story (fictional) of a battle between shojin ryori (Buddhist vegetarian cookery) and gyocho ryori (fish and poultry cooking). It is told that the book's author is called *Nijo Kanpaku* (the word *kanpaku* means a high ranking government officer who assisted the Japanese Emperor politically, or is a nick name for a person who is very powerful) whose real name was Nijo Yoshimoto and was well known for his talent in literature.

This story was written around 1320-1380, near the end of the Kamakura Bakufu and during Nanboku-cho period. (The books called Teikun Orai {1350} and Isei Teikun Orai {1370} were written during the same period.) This story is one of the documents that mentions itohiki natto.

The next document is *Noritoki-kyo-ki* (the diary of Noritoki) written in Ouei 12 nen (in 1405). I was told that there was an entry of December 19; "Rokkaku gifted itohiki natto." So I thought that since I had read this whole book before, I decided to check my notes about this book and

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then I found out that I, too, noted itohiki natto (mentioned) in Ouei 12 nen, Dec. 19. Although I didn't write "Received Itohiki Daizu from Rokkaku (person's name)", it was maybe Itohiki Natto which was given by Mr. Rokkaku. I confirmed this by checking with Mr. Takeshi TOYOTA's *Chusei Shogyo-shi* (History of Middle Age Commerce) and also my old notes.

After that, there are no documents mentioning natto until the *Tamon-in Nikki* (Diary of Tamon-in) in an entry dated Eiroku 11, May 21 (May 21, 1568). In this diary he wrote "Tried drying natto but then it got wet from the humidity of rainy air. So mix salt into *netaru natto* ('slept natto') by roasting salt well and while the salt is very hot, mix it into natto and dry the salted natto again. It won't get moist from the rainy season. *Meizen-bo* (A Zen monk?) said so." *Netaru natto* ("slept natto") means fermented natto and is itohiki natto. But the document just before this was written in 1405, so there is a gap of over 100 years between those two documents; that is the shortcoming of the literature (that mentions itohiki natto).

Then the next document is from late in the early Edo period. "Kefukigusa (Kefukiso?)" in 1645. "Kefukigusa" is a textbook for Haikai (Haiku and Renka). In this book published by Iwanami Buko, Ooyu (?), saliva of a cow, 3 wheels, strings for the puppet. etc. and also natto were listed among the (supportive) words (to make Haiku and Renka). Therefore there must have been natto at that time. To summarize: I checked and confirmed the Noritoki-kyo-ki, and also if there are other documents that can be found on related subjects. The documents on itohiki natto can be traced from the present all the way back to the period of *Natto Taro Itoshige.* But I really think that probably it continuously goes up to the period of Natto Taro Itoshige. Note: This is his guess after checking the documents.

Bibliography:

(1) *Shojin Gyorui Monogatari:* published by the Konnyaku Association in the book called "Konnyaku Kyokai Shi" (History of Konnyaku Association"). This book contains the whole story of the *Shojin Gyorui Monogatari.*

(2) *Tamon-in Nikki:* "Netaru Natto" (was mentioned) in it. Eiroku 11 (1568) May 21

(3) *Kebukiso* (*Kebukigusa?*) 1645. *Tsukeku for itohiki* (adding word for the word Itohiki). Re-published as Iwanami Bunko Bon and it was mentioned in Iwanami Bunko Bon page 109. (Note: He forgot to mention this book's year of publication.)

(4) *Edo Ryori Chu.* 1673. "Nese Natto" Nihon Ryori Taikan, Dai 2 Kan 118-1. (Volume 2, 118-1)

This chapter was written in Heisei 5 nen (1993) Dec. 2.

An illustration (p. 23) includes some writing: On the top container: Kinzanji Misho (Miso?) is written. Note: The Chinese characters are *Mi* as in Miso and the character for *hishio.*

On the bottom container is written "natto."

This illustration came from *Wakan Sansai Zue.* Address: Japan.

10203. *Alternative Fuels Online Today* (*Environmental Information Networks, Inc*). 1995. Japan recycling food oils for biodiesel: International report. April 20.
• ***Summary:*** "The current issue of "Biodiesel Report" (March) notes that efforts are underway in Japan to produce and use biodiesel fuel from waste food oils."

10204. *Canadian Export Soybeans* (*OSGMB, Chatham, Ontario, Canada*). 1995. Technical mission to the Far East. 8(1):3. April.
• ***Summary:*** Five members from the Canadian soybean industry visited Japan, Hong Kong, Malaysia, and Singapore from March 10-25, 1995. Members included Dr. Karen Lapsley (Chairperson of the Centre for Food & Animal Research, Ottawa, Ontario), Mr. Doug Jessop (Food Technologist from the Harrow Research Station, Harrow, Ontario), and Mr. Ron MacDougall, Mr. Michael Loh, and Mr. Kim Cooper (OSGMB, Chatham, Ontario).

10205. FreeLife International. 1995. FreeLife: Experience the incredible benefits of FreeLife's exclusive Soy Miracle products (Leaflet). Milford, Connecticut. 3 panels each side. Each panel: 22 x 9 cm.
• ***Summary:*** This 6-panel color glossy leaflet promotes Dr. Earl Mindell's Soy Miracle (registered trademark) products. On the front panel Dr. Mindell (R.Ph. and PhD) states: "The Soy Miracle Ultimate Body Program is an amazing new breakthrough that makes it simple and easy to have the body you've always wanted in 8 short weeks."

The inside three panels describe the Ultimate Body Program and color photos show four soy products used in the program: Soy Miracle Ultimate Shake (Chocolate Royale, Creamy Vanilla Almond), Soy Miracle Ultimate Body Toner, and Soy Miracle Ultimate Antioxidant. "Dr. Earl Mindell's interest in the nutritional benefits of the soybean began several years ago when he tried to answer the question, 'Why do the Japanese live longer and healthier lives than do Americans?' Dr. Mindell discovered that the key to the longevity of the Japanese is their lifelong consumption of soy foods which are high in isoflavones such as *genistein, daidzein,* and *saponins.* His mission became to bring the miraculous benefits of soy to the American public by developing the ultimate soy-based nutritional program for men, women, and children–a program that could be enjoyed every day!

"Utilizing thirty years of study and nine trips to Japan, Dr. Mindell developed the revolutionary Ultra Soy Complex (trademark) I, II, and III, his *exclusive* blends of the most powerful components of the soybean... The Ultra Soy Complex is Dr. Mindell's most closely guarded secret!"

One back panel describes "How you will benefit from

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the Soy Miracle Ultimate Body Program!" Fat loss/Body sculpting. Vibrant energy. Optimal health. Increased mental alertness. Total body development.

In the middle back panel, a color photo shows Dr. Mindell with his various books and products. "Dr. Earl Mindell is widely considered the world's leading authority on vitamins and nutrition. Earl Mindell's *Vitamin Bible* is the all-time bestselling book on nutrition with over six million copies in print. Translated into twenty-seven languages..."

Talk with Luke Taffuri, Vice-President of Operations, FreeLife International (354 Woodmont Rd. #5, Milford, Connecticut 06460. Phone: 1-800-882-7240). 1995. May 30. To buy these products, you must be sponsored by a distributor. Cost: $61.25 for each of 4 products incl. shipping. Antioxidant is $19.60. Shake is $18.55. Body toner is $18.55. How much genistein is in these products? If each day you take one serving of a shake and two antioxidant pills plus two body toner pills, you will get 20 mg/day of genistein, plus 16-17 mg/day of daidzein. These products were introduced on 1 Feb. 1995, at the same time as Dr. Mindell's book became available. The company, FreeLife, was started in 1995; it has the exclusive 15-year rights to all of Mindell's products. The president of the company, Mr. Ray Faltinsky, happened to be in Los Angeles, California, and he was talking to Dr. Mindell's agent. Ray suggested the idea of this company. He met with Earl Mindell and said that if Dr. Mindell would formulate the products, FreeLife would market them. Address: Milford, Connecticut 06460.

10206. Fujimori, Ikuo. 1995. Canadian soybeans for miso manufacturing in Japan. *Canadian Export Soybeans* (*OSGMB, Chatham, Ontario, Canada*) 8(1):1. April.
• ***Summary:*** "I have been using Canadian soybeans constantly since 1975, which I first tested soybeans from Ontario. I chose the variety 'Harwood' because of its large size, white hilum, and high sugar content... These first soybeans were bagged shipments in containers, and now we receive the soybeans in bulk containers.

"In 1978 I visited soybean growing areas in Ontario. I found a new variety "Harcor" to be one of the better varieties for miso making... The majority of the Ontario soybeans purchased are SQWH (Special Quality White Hilum), namely mixed varieties of white hilum soybeans. At the same time we have bought some 'IP' (Identity Preserved) varieties in limited quantities."

"In the 1980s, I joined with four soybean missions to Canada, sponsored by the governments of Canada and Ontario, and also by the Ontario Soybean Growers' Marketing Board (OSGMB). I gained much information and knowledge about Ontario soybeans. I was impressed by the co-operative system between the OSGMB, the governments of Canada and Ontario, the soybean producers and the industry personnel involved. I was also impressed by the work of keeping quality standards by the Canadian Grain Commission, and by the study of developing new soybean varieties for food use at the Harrow Research Station. Using Canadian soybeans, I found the quality rather stable compared to Chinese soybeans. That is a big advantage for miso manufacturing."

In December 1994 the Japanese Miso Manufacturers Association visited Ontario. As of 1995 "the quality of Chinese soybeans seems unstable and their ability to supply is fluctuating. Therefore many miso makers are now thinking of using Canadian and American white hilum soybeans instead of Chinese soybeans."

A photo shows Mr. Fujimori, Fred Brandenburg of OSGMB, and Elmer Buchanan (Ontario Minister of Agriculture).

Note: This bi-annual newsletter was formerly titled *Ontario Export Soybeans.* Formerly 2 pages, green on yellow, it is now 4 pages, dark green and brown on tan. Address: President, Takeya Miso Co., Nagano, Japan.

10207. McCarthy, Paul. 1995. Dietary phytoestrogens: Scientists stalk potential soy chemopreventives. Research round-up. *Oncology Times* (*New York, NY*). April. p. 19-20.
• ***Summary:*** A good overview and summary, highlighting the work of leading researchers. According to biochemist Kenneth D.R. Setchell, PhD, investigations in this relatively new field began in his laboratory in the early 1980s. Dr. Setchell is Director of the Clinical Mass Spectrometry lab and Professor of Pediatrics at Children's Hospital Medical Center in Cincinnati, Ohio. He found equol, a phytoestrogen metabolite that is structurally similar to estradiol-17B, in human urine. He then determined that eating soy had the greatest effect on equol levels; 40 gm/day of soy protein made equol levels in the blood and urine jump 5,000 times above baseline.

This led him to measure phytoestrogen levels in Asians; he found their levels to be very high. Since weak estrogens have both estrogenic and anti-estrogenic effects, he hypothesized that soy might have properties similar to tamoxifen (a drug which is widely used in the successful treatment of hormone-dependent breast cancer in humans) and that a diet high in soy might explain the lower rates of breast and prostate cancers in Asia. Several key experiments conducted by Setchell, Dr. Stephen Barnes, and others, previously published in scientific journals, are then described.

The results have been provocative, but the mechanism behind the anticancer actions of soy remains unclear. Dr. Setchell is not convinced that it is as simple as his 1984 hypothesis, that the phytoestrogens in soy act like tamoxifen. Since then it has become clear that phytoestrogens also act as antioxidants. Moreover, genistein is a potent inhibitor of protein kinases, the key enzymes involved in the regulation of the phosphorylation of cells.

Herman Adlercreutz, M.D., PhD, of the University

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of Helsinki in Finland, has studied the anticancer role of soy in prostate cancer and is interested in the mechanism. Soy's estrogenic properties might suppress the growth of prostate tumors. This makes sense because prostate cancer is treated with estrogen. Dr. Adlercreutz has shown that genistein is one of the strongest known natural inhibitors of angiogenesis; it helps to cut off the blood supply that tumors need to grow. Alternatively, soy can suppress the production of gonadotropin secretions by the hypothalmus. This may cause a secondary decrease in testosterone production, which may be reflected in the lower levels found in Japanese men. And lifelong lower testosterone levels may postpone the development of prostate cancer.

Dr. Barnes has observed that prostate-specific antigen (PSA) values fall sharply in men with prostate cancer after that start a soy regimen. So he has started a systematic investigation of PSA values and other bio-markers of prostate cancer to determine if they can be favorably altered by soy.

Some researchers believe that soy could substitute for estrogen-replacement therapy (ERT). Barry R. Goldin of Tufts University School of Medicine notes that a Japanese woman on a traditional high soy diet (about 55 gm/day) is getting the daily equivalent of a low dose of Premarin. Already Dr. Adlercreutz and Mark Whalqvist, MD, Chairman of the Department of Medicine at Monash University in Melbourne, Australia, offer a soy alternative to women who are reluctant to take ERT.

Dr. Margo N. Woods at Tufts is now conducting a study on soy and breast cancer in a group of 200 women. She will be studying levels of serum hormones, luteinizing hormones (LH), and follicle-stimulating hormones (FSH), and trying to correlate them with diary recorded hot flashes and night sweats.

No one knows if consuming large amounts of soy could prove harmful to humans; soy researchers typically respond that the Chinese and Japanese have no apparent problems. But fertility specialist Claude L. Hughes, Jr., PhD, MD, raises important questions. Associate Professor of Comparative Medicine and Obstetrics & Gynecology at Bowman-Gray School of Medicine of Wake Forest University (Winston-Salem, North Carolina), Hughes urges researchers to look at both risks and benefits, especially for humans and other animals in their early developmental stages. He "said he wouldn't be comfortable with his pregnant wife eating large amounts of soy. Nor would he want to expose a neonate [an infant less than 4 weeks old] to soy-based formula." Dr. Hughes sees puberty as another opportunity for research. He is feeding soy to peripubertal male and female monkeys to see if it "perturbs the events of puberty from a reproductive/endocrine point of view."

"After puberty, except when a woman is trying to conceive, he said he expects that soy will prove to be a good addition to Western diets and possibly chemopreventive for breast and prostate cancers."

Photos show Dr. Kenneth D.R. Setchell, Dr. Margo N. Woods, and Dr. Claude L. Hughes.

10208. *Ontario Soybean Growers' Marketing Board Newsletter.* 1995. Producing soybeans for the soyfood market. April. p. 3.

• ***Summary:*** In early March, 1995, Iowa State University conducted a seminar titled "Producing Soybeans for the Soyfoods Market." Topics covered included an introduction to soyfoods (complete with tasting at Iowa State's Center for Crops Utilization Research facility), a review of Japan's soyfoods market, trade policy changes and challenges, quality assessment, and the effects of varietal characteristics on soyfood quality.

Speaking on Japan's soyfoods market, Hideki Furuhata of Mitsui & Co. reported that consumption of tofu and natto is increasing slowly in Japan, while miso and soy sauce are decreasing. China has been supplying Japan with 250,000 to 300,000 tonnes/year of soybeans, mainly for making miso and natto. Japan imports between 120,000 and 130,000 tonnes/year of identity preserved soybeans, up from 100,000 tonnes 5 years ago. For example, 50,000 tonnes of Vintons were imported in 1994.

Bradley Hildebrand of Cargill in Minneapolis, Minnesota, reported that the U.S. exports about 130 million bushels/year of soybeans to Japan. About 30 million bushels (23% of the total) are used to make soyfoods. Most of the soybeans used for soyfoods in Japan are "IOM" beans because they are grown in Indiana, Ohio, and Michigan. IOM soybeans are not any specific variety or hilum color, but they are generally higher in protein and better in quality than other U.S. soybeans. They trade at a premium of 10-20 cents per bushel over other U.S. soybeans in Japan. IOM soybeans are traded on the Japanese grain exchange. For shipment to Japan, IOM soybeans are railed to Baltimore (Maryland) or Norfolk (Virginia) for shipment via panamax size vessels. They may also be railed to Mobile (Alabama) or New Orleans (Louisiana) for vessel shipment.

Hildebrand reported that IOM soybeans will keep the largest market share due to their low price, however there is a market for variety soybeans. He said that Vinton is the most popular variety for making tofu in Japan, but it does not yield high enough in the field to make it price competitive. "He suggested that breeders need to develop a high-yielding soybean with Vinton's tofu-making characteristics. However he said the market for variety soybeans is not huge and is easily flooded." Address: Box 1199, Chatham, ONT, Canada N7M 5L8.

10209. Perlmutter, Johanna F. 1995. Book review: *Encounters with Aging: Mythologies of Menopause in Japan and North America,* by Margaret Lock (1993). *J. of the American Medical Association* 273(17):1394. May 3. [1 ref]

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• ***Summary:*** In this pioneering and now famous study, the author interviewed more than 1,000 Japanese women on the subject of menopause (in Japanese, in Japan) over a period of 20 years. The interviews were designed to establish what symptoms these women had experienced after menopause, and how they thought about it. She explains that Japanese women find menopause less traumatic than American women. She compared her findings with the results of a study of 2,000 Canadian women. The Japanese diet, rich in soyfoods, was identified as a major reason because of the natural phytoestrogens found in soyfoods.

Webster's Dictionary defines menopause, a term first used in 1872, as "the period of natural cessation of menstruation occurring usually between the ages of 45 and 50." The author acknowledges several problems with terminology in this study. First, there is no term for menopause in Japanese; therefore a term that is thought to be similar was used. Second, in English the terms "menopause" and "mid-life crisis" are not clearly separated. From the responses quoted in this book, the term used may be closer in meaning to "mid-life crisis" than to "menopause."

Acknowledged cultural problems also exist: Japanese women are polite and want to please. They may give the answer they think the interviewer wants to hear. Because they tend to be shy, they may be embarrassed by the questions being asked and thus may not be completely truthful in their responses. Address: M.D., MPH, Beth Israel Hospital, Boston, Massachusetts.

10210. Shimizu, Teruo. 1995. Recent developments at Miyako Oriental Foods (Interview). *SoyaScan Notes.* May 3. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Miyako's miso business is growing rapidly. They can no longer keep up with demand. This summer Miyako plans to triple its production volume. They hope to buy another plant nearby and make miso in both their current plant and at the new location. Note: As of Feb. 1994 Miyako reported that it was making 2.2 million lb/year of miso.

In 1982 Miyako started importing freeze dried miso and spray dried miso from its parent company in Japan. But the high cost of Japanese imports resulting from the steady decrease in the value of the U.S. dollar has led Miyako to develop its own freeze-dried product in California. They are working with Mercer Processing Inc. in Palo Alto, which does the freeze drying. Later, they plan to use this freeze-dried miso to formulate other products, such as instant miso soups.

In addition, they plan to develop a spray-dried miso (which is lower quality and less expensive, and contains maltodextrins).

Miyako has started getting my enquiries for products from companies in Canada and Mexico because of NAFTA. Address: Vice President, Miyako Oriental Foods Inc., 4287 Puente Ave., Baldwin Park, California 91706. Phone: 818-962-9633.

10211. Allen, Andrea Horwich. 1995. Can isoflavones give soy mainstream acceptance? *Food Product Design.* May. p. 20-21.
• ***Summary:*** Researchers now believe that a family of phytochemicals present in soy, called isoflavones, may actually reduce the risk of atherosclerosis by preventing the formation of plaque on artery walls. One isoflavone, genistein, which is present only in soy, also fights cancer by inhibiting the growth of cancer cells. Genistein appears to mimic the effects of estrogen so that the body produces less of that hormone, thus reducing the risk of estrogen-dependent cancers, especially breast cancer. One study of Japanese men suggests that those who eat a diet high in soy protein have a lower incidence of prostate cancer.

Representatives from Morinaga Nutritional Foods, Westbrae, and Pillsbury Green Giant are trying to take advantage of the new discoveries by educating their customers. The FDA seems unlikely to be ready to approve a soy-related health claim such as "Includes your daily intake of soy." ADM, who makes the Green Giant frozen burgers, is said to retain Mark Messina, PhD, as a consultant. A large photo shows a carton of WestSoy Low Fat Soy Drink (Vanilla). Address: Assoc. Editor.

10212. The memorial service for Dr. Kwee-seong Lo, B.A., LL.D., O.B.E., C.B.E., J.P. 1995. Hong Kong. 6 p. 22 cm.
• ***Summary:*** This service was held at 4:00 p.m. on 11 May 1995 at St. John's Cathedral, Garden Road, Hong Kong. A nice portrait photo (p. 1) shows K.S. Lo, who lived 2 Feb. 1910 to 5 May 1995.

Obituary: "Dr. Kwee-seong Lo was born of Hakka descent in Meixian county in Guangdong province, China, on February 2, 1910. His father, Chin-hing Lo, took the family to live in Malaya when Kwee-seong was still young. Following his graduation from secondary school in 1929, Kwee-seong moved to Hong Kong to study Economics at the University of Hong Kong, from where he graduated [with a BA degree] in 1934.

"As war engulfed East Asia in the 1930's, causing much suffering among the Chinese population, Dr. Lo turned his attention to improving standards of health through the provision of nutritious of food at affordable prices. On a business trip to Shanghai in 1936, he attended a seminar entitled "Soya Bean–the Cow of China" non the nutritional value of the soya bean, which had been a major source of protein for the Chinese for more than 3,000 years. He knew this was the solution he had been looking for and, pooling all resources, he founded Hong Kong Soya Bean Products Company in 1940, the forerunner of today's Vitasoy International Holdings, Ltd."

Discusses the history of the company, and joint ventures with China starting in 1979 with Kwang Ming Dairy Farm in

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Shenzhen. "This signified the first step in fulfilling Dr. Lo's ideal of "Nation Saving by Industry."

Though busy with his business, K.S. Lo made time for an active life of public service. In 1961 he was honoured as a Justice of the Peace (J.P.). In 1971 he was awarded the Officer Order of the British Empire (OBE), and in 1979 the Commander of the British Empire (CBE). In 1982 he was awarded an honorary doctorate of Law by the University of Hong Kong–thus becoming Dr. Lo. In 1994 he retired from the position of Chairman of Vitasoy International.

His many public, business, and personal contributions are then discussed. In 1986 his book titled *The Stonewares of Yixing* was published.

Dr. Lo has his early education in a Methodist School in Malaya where he had his first contact of Christianity. He was baptized in a church located at the Mount of Double Happiness, Lin County, Guangdong, during the period of Japanese occupation of Hong Kong. At that time, he had a very deep religious experience. In the last part of his journey on earth, he experienced the revival of his faith and consequently a renewal of his relationships with God and his family members. He therefore faced his destiny with peace and joy.

"Dr. K.S. Lo passed away peacefully in Queen Mary Hospital on 5th of May, 1995. Although he has now left us to sleep in the arms of God, Dr. Lo will not be forgotten. His achievements and his qualities live on and will be remembered by those whose lives he touched." Address: Hong Kong.

10213. Tsukamoto, Chigen; Shimada, S.; Igita, K.; Kudou, S.; Kokubun, M.; Okubo, K. 1995. Factors affecting isoflavone content in soybean seeds: Changes in isoflavones, saponins, and composition of fatty acids at different temperatures during seed development. *J. of Agricultural and Food Chemistry* 43(5):1184-92. May. [53 ref]
Address: National Agricultural Research Center, Ministry of Agriculture, Forestry and Fisheries (MAFF), Tsukuba, Ibaraki 305, Japan.

10214. Lazzaro, Don. 1995. History and current status of soymilk in Australia (Interview). *SoyaScan Notes.* June 6. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Ceres Natural Foods is their holding company and Pureharvest is their trading name. They made this name change in 1982 since they found the word Ceres was difficult for many people to pronounce. The first soymilk they imported to Australia was made by Saniku in Japan and imported from Mitoku.

Don is interested in macrobiotics. In early 1979 he took over the running of a small macrobiotic and natural foods retail store in Melbourne named Ceres Wholefoods. The only way he could make it viable was to try to buy at better prices, so in April 1979 he started a wholesale and import company, which he named Ceres Natural Foods, also in Melbourne. There was a company named Real Foods (run by Michael Pels) in New South Wales, Australia, that was importing, through Mitoku in Japan, tamari, soy sauce, miso, tofu, etc. Real Foods was the first company in Australia to import foods from Mitoku in Japan.

Don knew Michael from when they both used to live in Sydney in about 1978. Michael purchased some rice cake machines (the same kind used by Chico-san) through Mitoku from Airin Co. These machines were very poorly engineered and constructed. Michael has already sold 168 of these machines to Quaker.

When Don took over the Ceres Wholefoods retail store in 1979, he approached Michael and asked to be the distributor in Victoria of the food products Michael was importing from Japan through Mitoku. Michael said okay, and Don began distributing. Don asked Michael to import some soymilk from Mitoku, which he did in mid-1980. The stick-on label over the Japanese label said Ceres Natural, in Choc-Malt and Natural flavors. But the first soymilk in Australia was imported from Japan in about 1977-78, through Muso by 3-4 health food stores named Russel's; it was made by Marusan in a stand-up plastic pouch. Not much of it was sold. In about 1980-81, Michael decided to get out of the whole import business in order to focus on making rice cakes. So Mitoku Mr. Kazama and Chris Dawson asked Don to become their importer in Australia. Don also ran a 3rd company, a center that provided information and advice on macrobiotics.

Jim Wilson, who was running Spiral Foods in Australia, had been importing from Mitoku. He convinced Mitoku not to sell to Don, his competitor; Mitoku agreed. Mitoku then approached Saniku, and in about 1981 Don began importing soy milk made by Saniku through Mitoku. Don sold it under the same label he had used before. The Muso started to import some soymilk packaged in Tetra Brik cartons through Spiral Foods. Don got the same product from Kibun, and on it began to use the name Pureharvest.

In short: Four companies pioneered in importing soymilk to Australia: Real Foods, Russel's, Spiral Foods, and Ceres Natural Foods. There was also a little relatively beany Chinese soymilk sold in the ethnic Chinese market. Ceres, as a result of its Tetra Brik package, managed to get fairly good distribution into the grocery / supermarket trade, starting in late 1983 or early 1984. By this time Ceres was by far the biggest seller of soymilk in Australia. They were importing five 20-foot containers per month of the Kibun soymilk product. Ceres was actively promoting this soymilk, doing trade shows, etc.

In 1986 Ceres was approached by a small soymilk maker named Australian Natural Foods (ANF) in Sydney; basically they had old machinery and were in trouble. They approached Don asking if they could make a soymilk for him. They worked out an exclusive deal and formula, and

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in Nov. 1986 Ceres launched this as Aussie Soy in its first 1 liter package, in Tetra Brik. Sales shot up. It was trucked in a dairy tanker to Bon Lait in Victoria (almost 1,000 miles away) where it was packaged in a dairy that had a Tetra Brick packaging machine. In about 1990-91 ANF first got its own Tetra Brik packaging machine. That same year ANF launched its own soymilk product, named So Natural, to compete with Sanitarium's So Good. It is made from whole soybeans, and is very similar to the Aussie Soy product they have long made for Don.

As early as 1980 Sanitarium Foods was importing Soyalac in tins / cans. They sold it mostly to Seventh-day Adventists through their own retail stores. Then in April 1987 Sanitarium Foods launched their own So Good soymilk (made from a blend of soy protein isolates, made and packaged by dairy companies) in Australia. They went into it in a big way, with a national campaign. It was the best thing that ever happened to Don and Ceres, because this campaign grew the market dramatically. By April 1987 Ceres was selling 10,000 cartons / month of their Aussie Soy, not including their Japan imports. One year later the figure had skyrocketed to 60,000 cartons / month, increasing to 152,000 on year after that.

Nevertheless, according to the *Australian Grocery Industry Marketing Guide* (1995), Sanitarium has 71% of the dairylike (unflavored) Australian soymilk market, followed by Vitasoy at 7% (they launched in about 1991, and have done a very aggressive marketing campaign), then So Natural (made by ANF) at 5%, Sun Gold at 5%, and Aussie Soy at 4-5%. Of the total Australian soymilk market, flavored soymilks account for only about 5% of the total; the remaining 95% is dairylike; its a milk alternatives market. Each of the three major supermarket chains in Australia (Woolworth's Safeway, Franklin's, and Cole's) has its own soymilk brand. Franklin's has an isolate soymilk made by ANF, starting about a year ago. Sun Gold, made by Associated Dairies of New South Wales, is almost identical to So Good, made by the dairy company that used to mix Sanitarium's product. In about 1990 Sanitarium set up their own soymilk mixing and packaging factory.

Today the soymilk retail market in Australia is $45 million, with a population of only 17 million people. This is huge on a per capita basis. This market has three main segments: (1) Middle class, educated, with some allergies–70%. (2) Age 50 and older, concerned with cholesterol–20%. (3) Natural foods and vegetarian–10%.

In late 1993 and early 1994 Don approached Berrivale Orchard Ltd. (a cooperative of fruit growers, headquarters in Berri, South Australia) to see if they would be interested in making a soymilk product for Ceres / Pureharvest–because Don's relationship with ANF had become intolerable.

In 1979, to get tofu to sell at his retail store, Don used to go to Chinatown in Melbourne twice a week. He bought it from a little Chinese company (whose name he does not remember) located opposite Victoria Market. He would take a couple of buckets and carry it home in bulk, under water. Address: Pureharvest, 15 Ardena Ct., East Bentleigh, Victoria 3166 Melbourne, Australia.

10215. Reuters. 1995. Rotting beans make sweeter feet. *Toronto Star* (*Ontario, Canada*). June 20. p. A16.
• ***Summary:*** A Japanese biotechnology firm named Capital Corp. (president Tsutomu Harada) has launched a product (Niowan 201) using natto bacteria to remedy acute foot odor. Natto, sticky fermented soybeans, are widely eaten with rice for breakfast in the northern half of Japan.

The company, based in Osaka, "combines dormant natto bacteria with sawdust and rice bran into thin packs worn under the feet. The other ingredients preserve the bacteria until they are activated by the heat and humidity of the feet, neutralizing the bad smell."

10216. Roach, William. 1995. Update on Kyoto Food Corp. in Terre Haute, Indiana (Interview). *SoyaScan Notes.* June 22. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Kyoto Food Corp. has still not been sold and prospects for a sale seem to be dimming. One potential buyer was the owner of Obok Foods in Los Angeles. Last week the local health department shut him down for health code violations. His equipment is so old that it is basically useless. He is now trying to sell an island he owns in New York. If and when he succeeds, he may buy Kyoto Food's equipment. In the meantime, his tofu is being made and private labeled by House Foods & Yamauchi Inc. in Los Angeles.

Some overseas Japanese and Chinese buyers seem to be interested in buying the company, but William thinks they do not have much money. U.S. Immigration law states that any foreigner who invests $500,000 or more in a U.S. venture gets a "green card" which guarantees permanent residence.

Update: Talk with JIm Skiff of LongLife Foods. 1996. March 26. Bill Roach has sold all his tofu-making equipment at a low price to some tofu company on the East Coast of the USA. Jim does not know what has become of his factory in Terre Haute. Address: Terre Haute, Indiana. Phone: 812-533-1400.

10217. Wallis, Claudia. 1995. The estrogen dilemma. *Time.* June 26.
• ***Summary:*** "Americas no. 1 drug is an elixir of youth, but women must decide if it's worth the risk of cancer."

"San Francisco nutritionist Linda Ojeda, author of *Menopause Without Medicine,* advocates soybeans, which contain a natural progesterone as well as estrogen. The low rate of menopausal complaints among Japanese women may be due in part to their consumption of tofu, she suggests. To relieve hot flashes, Ojeda recommends 6 oz. of tofu four times a week,..."

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10218. Evans, Barry. 1995. The American Miso story. In: Great Eastern Sun. 1995. Pricelist. Effective June 5, 1995. 37 p. See p. 2-3.

• ***Summary:*** "This spring, as we complete our sixteenth year of operations at the American Miso Company, we are moved to reflect back on the path we have traveled to reach this point. In the spring of 1979, a group of people approached Michio and Aveline Kushi with the idea of forming a new company to produce miso in the United States using traditional methods and only the finest organic ingredients. With the Kushi's enthusiastic support, the Erewhon Miso Company was created to supply Erewhon with miso to distribute throughout the United States. From this distant perspective, it is difficult to remember how powerful a force Erewhon was in the natural foods industry at that time. Dominating the market in the Northeast, Erewhon was the largest distributor of natural food in the United States with strong connections to distributors for its name brands in other regions.

"With Erewhon as our partner, master distributor, and a major investor, we moved ahead confidently with our plans to build a miso factory in the Piedmont Region of North Carolina. The Kushis entreated Akiyoshi Kazama, founder of Mitoku Trading Company, a major supplier then as now of high-quality Japanese natural food to the U.S. market, to put aside any narrow concerns of self interest and find us someone to train our would-be miso makers in the rapidly fading art of traditional miso manufacture. In a selfless spirit of international cooperation, Mr. Kazama searched for someone who still made miso the old-fashioned way, yet was open-minded enough to invite strangers into his home (literally).

"After many false starts amid a lengthy search, Mr. Kazama finally located, in the mountains of Yaita Prefecture north of Tokyo, Takamichi Onozaki, a country miso maker of the old school. Mr. Onozaki, generously opening his home and his heart to *gaijin* [foreign] seekers after knowledge from half a world away, agreed to house and train an American couple, John and Jan Belleme, for an entire miso-making season. From November, 1979, until June, 1980, Mr. Onozaki taught his students all the miso lore he had accumulated from a lifetime of miso making in his small, rural miso factory staffed entirely by local farmwives. This was intermediate technology with a vengeance!

"Upon the Bellemes' return to America, we rapidly constructed our factory building near Rutherfordton, North Carolina, and Mitoku arranged to ship us our new equipment from Japan. By late 1980 we had begun to make our first experimental batches of rice miso. As the miso slowly aged in its huge cypress vats, great events developed hidden from our eyes which were to have a profound effect on the young Erewhon Miso Company. In July, 1981, Michio and Aveline Kushi journeyed to Rutherfordton for the official christening of the miso plant. The beautiful and joyous ceremony left not a dry eye in the gathering; later we discussed Erewhon's ambitious plans to package and market the rapidly ripening miso.

"A glorious road into the future seemed to lay open before us, but Erewhon's financial condition was rapidly deteriorating as too rapid expansion took its toll on a company stretched to the limit by its success. One month later we received the stunning news that Erewhon had filed for bankruptcy. In one of the saddest stories we have ever had the misfortune to be a part of, the Kushis lost control of the company they had nurtured from its birth, and we lost our only customer, a major investor, and our major source of inspiration and guidance.

"At first we were devastated by the blow fate had dealt us, but we had nowhere to go but forward as we had already made a huge financial and emotional investment in our project. Severing our ties to the past, we renamed our enterprise the American Miso Company and began a desperate search for marketers for our product. When we were unable to find anyone to help us, we resolved to set up our own marketing company and do the job ourselves. Thus, out of the direct necessity, Great Eastern Sun was born in December, 1981. Mitoku, itself almost destroyed in the storm of the Erewhon disaster and eager to rebuild, agreed to export Japanese natural food to Great Eastern Sun. GES processed its first order in April, 1982, and sold the first American Miso in September of that same year.

"In the fall of 1981, Mr. Onozaki came to Rutherfordton on an inspection trip to see exactly how well his students had learned their lessons. He stayed and worked in the factory alongside our own crew, patiently reviewing our practices and refining our procedures until he pronounced himself fully satisfied. He had never left Japan before in his life. In the fall [sic, spring] of 1982, Mr. Onozaki dispatched his daughter and son-in-law to America to work for several months in the miso factory just to make absolutely certain that everything remained kosher. In late 1985, John and Jan Belleme turned over the operation of the factory they had built to their successor, Don DeBona, who remains as miso factory manager to this day. Three books and many projects later, the circle comes round again as the Bellemes are now Mitoku's U.S. representatives.

"Although our miso was sold only in bulk for its first two seasons, our familiar tubs with the Miso Master logo soon arrived on the scene and sales slowly but steadily grew. Starting with eight barrels, we added six in 1986, seven in 1989, five in 1991, and fifteen more in 1993 for a total of 41 of these leviathans, each holding over four tons of two-year miso. In order to house our expanding activities, we built a second factory building as big as the first in 1992, and we are already experiencing a shortage of space once again as demand continues to grow. Two years ago we began to export our miso to Europe where it is distributed by Lima throughout the continent. The American Miso Company

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story continues on into the future." Address: Owner, Great Eastern Sun, Asheville, North Carolina 28806. Phone: 704-252-3090.

10219. Great Eastern Sun. 1995. Pricelist. Effective June 5, 1995 [Mail order]. Asheville, North Carolina. 37 p. 28 cm.
• ***Summary:*** Contents: Catalog information. Miso Master organic miso (traditional, mellow, or sweet). Sweet cloud organic sweeteners. Haiku organic Japanese tea. GES organic English tea. Emerald Cove sea vegetables. Emperor's Kitchen condiments (soy sauce, vinegars, ume plum products, toasted sesame oil, mirin, dried vegetables, shiitake mushrooms, beans, seeds, grains, dry condiments, Atlantic sun-dried sea salt). Traditional Japanese macro pasta. Traditional Japanese specialty items (misos, candies, seaweed and ume, organic pasta, liquid condiments, specialty products {snow-dried tofu, HamaNatto, Zenryu fu (round cakes of wheat gluten), shonai fu (flat sheets), organic brown rice koji, organic nuka rice bran, organic brown rice dinner with azukis [azuki beans], or with vegs, mochi (4 types), noodles (some or bifun rice noodles), ume products, teas, pickles (incl. natto miso chutney)}, personal care products, kitchenware, knives). Address: 92 McIntosh Road, Asheville, North Carolina 28806. Phone: 704-252-3090.

10220. Natural lifestyle magazine and mail-order market. 1995. Asheville, North Carolina: Natural Lifestyle Supplies. 55 p. Catalog. 28 cm.
• ***Summary:*** A macrobiotic mail-order catalog with several nice articles, it sells many types of soyfoods and related products, including the full line of Kushi Cuisine, organic soybeans (yellow and black), azuki beans, amazake, Rice Dream soymilk (p. 27), Edensoy soymilk, Westbrae Malteds, Nasoya Vegi-Dressings, Nayonaise, Farmhouse Tekka, organic soy sauce, fresh tofu, snow-dried tofu, kuzu, and miso. Publisher: Tom Athos. Editor and graphic design: Debbie Athos.

On page 5 is a nice ½-page article, "Dr. Spock goes macrobiotic." It begins: "I've been practicing transcendental meditation twice daily since my late seventies. I swim every day, and I try to take short walks after meals. I go to bed at 9 p.m. and get up at 5 or 6 a.m. I do 50 minutes of Yoga stretches each morning. Mary gives me daily massage for my weakened legs. I've been eating a macrobiotic diet for two years. It includes practically no fat, no meat, no sugar and no dairy products. I lost fifty pounds in the first few months and I was eating as much food as I wanted.

"Turning point: Until a few years ago, my health had gradually deteriorated, beginning with a heart arrhythmia at age 65. In 1987 my heart stopped altogether, long enough to drop me face first on the marble floor of the Copley Plaza Hotel in Boston. So they sewed a pacemaker under my skin, with an electric wire into my heart to keep it beating adequately. Three years ago I had a brief stroke-like episode that reduced my talk to gibberish for 15 minutes, and I was put on a blood thinner to prevent a more serious stroke. My legs were gradually getting weaker and less coordinated; the neurologist said it would be progressive. For a year I had repeated attacks of severe bronchitis that required antibiotics; that scared my internist. In 1991, I was introduced to a Belgian-trained physician who had become a macrobiotic counselor. He put Mary and me on a macrobiotic diet." His health improved steadily. "I feel much more alive and alert. After dropping 50 pounds, I lost all my subcutaneous fat, so I get cold easily,... My cholesterol level has gone from over 200 to 123; Mary's was 285 and is now 124. We found that our annual pharmacy bill went from $5,000 to $780."

"Once you decide to take your healing into your own hands, any sense of powerlessness and hopelessness ebbs away." Address: 16 Lookout Drive, Asheville, North Carolina 28804-3330. Phone: 1-800-752-2775.

10221. Chajuss, Daniel. 1995. Concern about phytosterols in soy molasses and other soy products (Interview). *SoyaScan Notes.* July 2. Conducted by William Shurtleff of Soyinfo Center.
• ***Summary:*** The rations for all milk cows in Israel are calculated by computers. Researchers in Israel have found that cows which give lots of milk have fertility problems, and find it more difficult to get pregnant. It was found that this was because they received more soybean meal in their rations. It is now recommended that additional protein (above a certain level) come from non-soy sources.

In 1963 Daniels' company, Hayes Ashdod Ltd., introduced a product named "soy molasses," which is a concentrated extract of soy solubles obtained during the production of soy protein concentrate using aqueous alcohol extraction. This product was used in animal feeds and as a source of oligosugars [oligosaccharides] for elderly people to maintain proper digestive-tract flora and regularity (mainly in Japan). It was later found that soy molasses has a high content of phytoestrogens. If it is fed to animals, the dose must be measured carefully, lest it have harmful effects. In cattle, it increases infertility, making it more difficult for the cattle to get pregnant. In rats it delays the positioning of the fertilized egg in the ovary. It is thought (but not yet 100% clear) that the harm is caused by the phytoestrogens at certain levels. Researchers are now studying the problem. Address: Managing Director, Hayes General Technology Company Ltd., Misgav Dov 19, Mobile Post Emek Sorek, 76867 Israel. Phone: (972) 8 592925.

10222. Smith, Patricia. 1995. Tyler Smith and Erewhon, Los Angeles (Interview). *SoyaScan Notes.* July 8. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Tyler Smith negotiated the sale of Erewhon, Los Angeles, to John Deming and John Fountain. Tyler recently told Patricia that when John Deming and John Fountain took

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over Erewhon, Los Angeles, it was their intent to use it to test the ideas of Andrew Galambos in practice. John Fountain tried to apply the ideas of Galambos among employees in the daily operations of the company. Patricia could feel the changes immediately–even though she didn't find out until much later that John Deming owned the company. "We were all committed to Erewhon as a macrobiotic food company." New words and language started to be used. Patricia eventually took Galambos' basic course.

Tyler first met Michio Kushi through a series of lectures at Stanford University in May 1968; the lectures were organized by William Shurtleff as part of an Esalen at Stanford program, of which he was head. Tyler was a first-year student at Stanford Law School at the time. Address: Radical Food, P.O. Box 952, Mill Valley, California 94942-0952.

10223. Skiff, James. 1995. Experiences with Minnesota Edamame (Interview). *SoyaScan Notes.* July 14. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Two years ago, Jim and his partner, Shichi, at LongLife Foods were in contact with two of the original owners of Minnesota Edamame, which has recently changed its name to SunRich. At one point they had asked Jim and his partner to take over the company. Jim talk with Bob Luedtke at a seminar last week. The man who started the company was Jim Lambert (now at Colorado State Univ. working on an ag program). Skiff first talked with Lambert 2-3 months ago, but he was out of the company before Skiff first met the owners. Minnesota was not using any Japanese soybean varieties–only U.S. field varieties that they grew because they were high in protein. They tried to sell them to the Japanese; it didn't work so the company went broke. Bob Luedtke has been unable to find any Japanese varieties that yield well in Minnesota. The company's new majority partner, Alan Routh, has tried to for the last two years to buy soybean varieties from Skiff and he has refused. Routh has a seed company in southern Minnesota, is a soybean farmer from New Richland, Minnesota, and part-owner of SunRich. Some 18-24 months ago Jim had discussions with Dr. Lyle Joyce, a well-known heart surgeon who orchestrated the exit of James Lambert, who was then owner of the company, and who sold 75% of his interest to SunRich.

Jim has heard both sides of the story about why Lambert was ousted. Lambert says the company directors refused to give him the time needed to develop a program to grow the Japanese soybean varieties that he wanted to grow. The other side says that Lambert was spending too much money and not getting commensurate results. Jim Skiff has known and worked with Minnesota Edamame over numerous years and he is "not at all impressed with the company." Jim's partner, Shichi, told Jim that the company didn't know what they were doing and were using U.S. field-grade soybeans. The first time Jim and Shichi met the owners (Dr. Lyle Joyce and Bob Luedtke), after Lambert's exit, the owners didn't even know how to cook the edamamé; they had to ask Shichi to show them how. Dr. Joyce invited Skiff and his partner to take over the edamame operation if they would move their LongLife Foods tofu plant into the area as well. Jim told Joyce that the quality of the water in southern Minnesota was unacceptable; it didn't even meet drinking water standards. At that time Dave Hansen was in charge of growing the edamame and Luedtke was in charge of the processing plant.

Jim and his partner are now having large-seeded vegetable-type soybeans of Japanese pedigree grown by various farmers near their tofu plant. Address: LongLife Foods, Ltd., Box 180, Perham, Minnesota 56573. Phone: 218-346-6667.

10224. Burton, Thomas M.; Kilman, Scott; Gibson, Richard. 1995. Corn plot. Investigators suspect a global conspiracy in Archer-Daniels case: They see signs of collusion with firms in Europe, Japan on grain products. Let's go to the videotape. *Wall Street Journal.* July 28. p. A1, A5. Friday (West).
• ***Summary:*** It looks like an international conspiracy, complete with videotapes and hundreds of audio tapes of key meetings–thanks in large part to the help of whistle-blower and top ADM executive Mark E. Whitacre, age 38, who headed the fast-growing BioProducts division and reported to Michael Andreas. Since his undercover role was disclosed, Mr. Whitacre has been barred from ADM facilities, but he remains on the company payroll.

Federal investigators are working with a Chicago federal grand jury. The investigation is focusing on: ADM executives–Vice President Michael D. Andreas and Group Vice President Terrance S. Wilson (head of ADM's corn processing division). Andreas, age 46, who runs many of the daily operations of the $12.5 billion-a-year grain processing giant, has long been considered the heir apparent to his father, 77-year-old Dwayne Andreas, chairman and CEO. Although Michael Andreas has a reputation as a super-salesman and has long been groomed for the top post, he has stayed out of the public spotlight.

One key subject of the investigation is lysine, a fermented by-product of corn processing. It is made by feeding corn-derived dextrose to microorganisms. A videotape appears to show collaboration among competitors to limit the supply of lysine in order to keep prices high. Lysine, an amino acid, is added to the feed of hogs and chickens to speed growth of their lean muscle. Other possible evidence of a conspiracy comes from internal company documents obtained by the government during the past 3 years. They show lysine target sales and actual monthly sales of each manufacturer including Ajinomoto Inc. and Kyowa Hakko's BioKyowa unit (both of Japan), and ADM itself. Though not well known, lysine is a big profit-maker and a key ingredient in the feed industry. About 500 lb/year are made and keeping the price high is worth millions of

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dollars to manufacturers. The Japanese were the first to make lysine commercially in the 1960s. ADM, which calls itself "supermarket to the world" has a reputation for entering a new market in a big way. It did that in the case of lysine, constructing what is believed to be the biggest fermentation plant in the world at its sprawling complex at Decatur, Illinois. ADM entered the lysine market in 1991 and today can produce about 250 million lb/year of lysine, about half the world's total output.

ADM's market entry triggered a slide in lysine prices for well over $1 a pound to nearly 60 cents. Then in 1992, for reasons that aren't clear, prices rebounded sharply to about $1 a pound–despite the much larger supply of product. This area is of special interest to investigators. Some lysine users believe their ability to switch to soybean meal, a natural source of lysine, keeps synthetic lysine prices in check. However poultry growers are more dependent on synthetic lysine because birds each much less feed, making soybean meal a less effective source of lysine.

ADM is believed to have spent roughly $1,500 million establishing its BioProducts division, which Mr. Whitacre ran during the 3 years he surreptitiously helped the U.S. government gather information about possible ADM price collusion. Products made by the BioProducts division, in addition to lysine and citric acid, include lactic acid, monosodium glutamate, and xanthan gum. They are believed to generate some of the company's highest profit margins and about 15% of ADM earnings.

Another key subject is citric acid, also derived from corn processing, which is used in the detergent, food, and beverage industries. ADM entered the citric acid market in 1991 when it bought a thriving manufacturing plant from Pfizer Inc.–and today it is the leading U.S. maker of citric acid. ADM is said to have documents showing citric acid sales targets and actual sales for ADM, the Hoffman-LaRoche Inc. U.S. unit of Switzerland's Roche Holdings Ltd. and Germany's Bayer AG (which makes citric acid at its plant in Elkhart, Indiana).

Besides studying lysine and citric acid, federal investigators are also looking at high-fructose corn syrup and possible violations of antitrust laws in connection with its sale. ADM is one of the biggest manufacturers in the $3 billion-a-year worldwide market. 75% of the product is used to sweeten soft drinks.

The federal investigation is now 3 years old. Investigators are still examining documents they seized from ADM headquarters in late June. Other companies are still handing over to the government documents subpoenaed by the grand jury.

10225. Fugh-Berman, Adriane. 1995. Managing menopause: Is hormone replacement therapy the road to take? *Vegetarian Times.* July. p. 72-75.

• ***Summary:*** With so many natural alternatives available, it makes sense to try the drug-free path first. Menopause begins, on average, at about age 50. The hormone estrogen helps reduce hot flashes, night sweats, and vaginal dryness. Hormones may also offer protection against osteoporosis and heart disease. But estrogen can also increase breast cancer rates, and lead to many other unpleasant side effects such as weight gain, bloating, depression, nausea, breast tenderness, breakthrough bleeding, and growth of uterine fibroids.

Some plant foods such as soyfoods, lima beans, fruits, berries and grains contain estrogens known as phytoestrogens that may be helpful for menopausal symptoms. Populations that consume significant amounts of soyfoods, such as Japanese women, don't complain of hot flashes; one theory holds that the high soy intake in Japan may serve as natural hormone replacement therapy. Another important factor may be that in Asia, the elderly are held in high esteem, and aging does not have the negative associations that it does in the USA. Address: M.D., On the board of the National Women's Health Network.

10226. Morrison, E.M. 1995. East Meets West in Perham. *Ag Innovation News* (*AURI–Agricultural Utilization Research Inst., Crookston, Minnesota*) 4(3):1, 4-5. July.

• ***Summary:*** James Skiff and Shichiro Sato teamed up this spring to start LongLife Foods, a tofu manufacturing company, with help from AURI. Skiff, age 47, is an American businessman and former executive with the Foremost Dairy Co. who has extensive experience in dairy processing and international food distribution; he is in charge if marketing and sales. Sato, age 46, is a Japanese who grew up working in tofu shops in Japan and has been involved in agricultural development, commodity trade, vegetable production, ranching, and fisheries; he manages the tofu production. They believe their 10,000 square foot plant in Perham's east industrial park is the Midwest's only tofu manufacturing plant and has the third largest capacity in the country. Their stainless steel tofu equipment was imported from Japan. A major distributor, H. Brooks, began this spring to supply their tofu to grocery chains such as Rainbow Foods and Byerleys.

LongLife Foods claims to be the only U.S. tofu processor using soybeans grown in Japan or Japanese-pedigree soybeans. Says Sato: "There is no question that Japanese soybeans are superior in taste and quality." In Japan, people have spent centuries developing high-protein soybeans for human consumption. By contrast, American varieties were developed mainly for crushing into oil and meal (for livestock feeds). Rather than adapt American soybeans, Sato and Skiff are working to grow Japanese soybeans in Minnesota. In 1993 and 1994 Sato supervised field trials using Japanese seeds to determine the most suitable varieties for local production. LongLife Foods then contracted with 6 Minnesota farmers to grow the selected varieties for making tofu.

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LongLife is working to please two groups of consumers. Asian-Americans already like the flavor of their tofu made with Japanese soybeans. In dozens of taste tests conducted in the region last year, LongLife Tofu won high praise, especially from Asian-Americans. But in the long run, LongLife is aiming to attract the 97% of the market that is non-Asian. "The company's early market research showed that traditional-style tofu in water pack was unattractive to most Americans. It looks strange to them, Skiff says–'like a hunk of Cheese floating in water. There's nothing else like that on the market.'"

In an effort to appeal to both groups, LongLife has decided to make silken tofu. Photos show: Skiff and Sato holding tofu packages in front of tofu processing equipment at their plant. Four cubes of chilled tofu is a dish, with a tulip nearby. A silken tofu and strawberry smoothie in a milk shake glass. Soaked soybeans being run into a kettle. A close-up of a package of their silken tofu. Mr. Sato eating silken tofu with chopsticks from a tofu tub.

Talk with Shichiro Sato. 1995. Aug. 4. He put together his tofu system by buying individual pieces from many equipment makers he visited in Japan. In Japan, he worked at the tofu shop of a friend when he was younger. He is now successfully growing Enrei soybeans in Minnesota; most farmers he talks to want to grow them under contract, so he tests them and chooses those who meet his standards.

10227. Johnson, Duane. 1995. Growing green vegetable soybeans in Colorado (Interview). *SoyaScan Notes.* Aug. 11. Conducted by William Shurtleff of Soyfoods Center. [1 ref]
• ***Summary:*** Dr. Johnson has been growing green vegetable soybeans in Colorado since May 1991. The initial research was funded by the agricultural experiment station, and a paragraph on this work appeared in the annual report for that year. Nothing about this work has appeared in other official publications since all subsequent research has all been privately funded [by Seedex Inc.], and the source of funding asked that they not publish it. But he does have reports with results that he can send out. All of his research is conducted based on Japanese standards. If he uses a mechanical harvester, it results in a 30% loss (by Japanese standards) just from bruised and broken pods. He feels that one obstacle for U.S. consumers is the high price, due to hand harvesting, but this is not a problem for Japanese consumers. Duane's group can deliver 1 pound bags to Los Angeles, California, for about $1.50/lb.

The green vegetable soybeans grown in Colorado are quite sweet, which is considered good; Brix readings (that measure sweetness) are 10½ to 12. Duane believes these soybeans are an excellent food and alternative snack. Some American company has got to market the crop seriously.

Duane knows about the Minnesota crop, but he believes that they are not using a true edamamé soybean. They are using a tofu-type soybean that has some edamamé qualities. He and coworkers have tried the Minnesota product and they feel the flavors is not nearly as good as theirs. He is growing true Japanese varieties, but the varietal names are confidential. All of his edamamé are grown under irrigation. He plants May 22 and harvests Aug. 10, which is 75 days–so it doesn't require much money or time. Address: Dep. of Soil and Crop Sciences, PC118, Colorado State Univ., Fort Collins, CO 80523. Phone: 303-491-6438.

10228. Iwata, Masakazu. 1995. Early history of Japanese farming and agriculture in California (Interview). *SoyaScan Notes.* Aug. 23. Conducted by William Shurtleff of Soyfoods Center. [1 ref]
• ***Summary:*** Gary Okihiro says that Dr. Iwata is the foremost expert on Japanese agriculture in California. He was a professor for many years at Biola University, a small Christian religious college in Los Angeles. He has written a book on Japanese farming in America titled *Planted in Good Soil: A History of the Issei in United States Agriculture.* This is a general work. He has seen no evidence or records that mention Japanese issei growing soybeans in the United States. Their main crop was rice. Soybeans are not even mentioned in his book, but on page 297 he notes that soy sauce was imported from Japan to the USA. In his book he discusses in detail the Wakamatsu Tea and Silk Farm Colony, which was established in 1865 in Coloma in the Gold Country near Sacramento. They came with the intent of growing bamboo, tea plants, raising fish, etc. The colony lasted for only 12-18 months, then failed.

He is aware that there were early tofu manufacturers in California and he thinks it is an interesting question to ask where they got their soybeans.

He has a friend named Fred Wada, who lives near him, and whose parents ran an early tofu shop in Fresno. Address: 879 N. Vail Ave., Montebello, California 90640. Phone: 213-723-4389.

10229. Evans, Barry. 1995. Chronology and history of Oak Feed Miso, Inc. and American Miso Co. of North Carolina. Part I. 1947 to 1979 (Interview). *SoyaScan Notes.* Aug. 25. With follow-up talks on 4 Dec. 1999, and 29 June and 2-7 July 2000. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Barry was born on 25 Feb. 1947 in Reading, Pennsylvania. His father was in the army reserves. He has been an avid reader since he was about age 9. He did very well on his SAT exams, and entered Princeton University in the fall of 1965 on an ROTC scholarship; there he majored in history, a subject in which he is deeply interested to this day. After 3 years he left Princeton (in a squabble over a project) and attended Temple University in Philadelphia for one year. Returning to Princeton for a fifth year in college, he graduated in 1970. He has been a "natural foods enthusiast" since he was in college. He entered the U.S. Army in Feb.

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1971, living off post at Fort Knox (Kentucky), formally applied as a conscientious objector, and was honorably discharged in Aug. 1972 with full veteran's benefits. He returned to Temple Univ., enrolled in a PhD program in history, but left after 3½ semesters. In June 1974 he became a vegetarian–though he regularly eats fish. In 1977, while living in Coconut Grove, Florida, he first heard about macrobiotics and heard Michio Kushi speak in Coconut Grove. He became a devoted follower of macrobiotics, which he still is. Barry heard about the miso venture through Kathy Kashdan, his housekeeper, who was the sister of John Belleme's ex-wife. Sandy Pukel (pronounced pyu-KEL), who owned the Oak Feed Store, was the pasha (local chieftain) of the large macrobiotic community (satrapy) in Coconut Grove. Sandy was also extremely close to Michio, and they were often in touch. Sandy was probably Michio's closest friend among American followers of macrobiotics. The day after Michio's lecture, Barry went to Sandy's Oak Feed Restaurant (where he had previously spent much time) and asked to see John Belleme, the manager of Oak Feed Store, who was seated at a table in the Oak Feed Restaurant with Sandy Pukel, talking with Edmund Benson about the miso company idea. Barry walked over to the table and introduced himself, and said he might like to be involved with the miso company; neither he nor John knew one another, but their paths were soon to become deeply intertwined.

1978 fall–Sandy Pukel, John Belleme, and Michio Kushi start to discuss the idea of a miso manufacturing company in America. John Belleme became interested in this idea in the fall of 1976 in Brookline, Massachusetts.

1978 fall–Various people buy shares in the new miso company. Jim Kenney $5,000. Frank Head intended to buy shares, but never did. At either that time or later Edmund Benson invested about $25,000 of $50,000 that he had formerly pledged.

1978 fall–Pukel and Belleme make a deal through a real estate agent to buy the property in Rutherfordton, North Carolina, on which the American Miso Co. now stands. As Barry recalls, this was the very first concrete move toward starting a miso company other than John taking Japanese Berlitz lessons, which he started at about the same time. They bought something like an option on the property. They put something like $1,000 to $5,000 down as good-faith money and had about 6-12 months to come up with the rest of the down payment of $15,000 to $20,000. John Belleme rode up to North Carolina on his motorcycle to help make the down payment and sign the original land deeds *before* Barry invested any money. Maybe John also rode up again later.

1979 Feb. 28–Oak Feed Miso, Inc. is incorporated. The initial directors and officers are Sanford J. Pukel (President, 3030 Grand Ave., Coconut Grove, Florida 33133) and John Belleme (Secretary-Treasurer, 5490 W. 1 Ct., Hialeah, Florida 33012). It is not clear who owns how much stock at this time. Oak Feed Miso was discussing a joint venture with Erewhon to establish the actual factory, which would then be called the Erewhon Miso Co.

1979 April–Five of the six months have passed. Barry (now age 32) becomes involved as an investor in the miso company, contributing initially $50,000, which more than covers the urgently needed down payment. He thinks Sandy could have found a way to make the next land payment without his money, but perhaps not easily. Barry had not been previously involved in the miso project in any way. Barry believes that by this time Sendai Miso-Shoyu and Mitoku (Mr. Kazama) had very little interest in serious participation in the Erewhon Miso Co. Michio may have wanted them to be involved, but they did almost nothing to demonstrate their interest. At best they may have said "keep us posted." But nothing ever happened.

1979 Oct.–John and Jan Belleme leave for Japan to study miso making. After "camping out" in Mr. Kazama's office for a while, he ends up studying with Mr. Onozaki. Barry's investment helps, but the checks sent to the Bellemes in Japan are written by Sandy Pukel on the Oak Feed Miso account.

1979 Nov. 18–Barry is in a horrific bicycle accident in Pennsylvania. He flies over the handlebars, into a field, breaking 5 vertebrae and 9 ribs. After a 14-hour operation, he spends 6 months flat on his back in the hospital and 1 year in a full-body cast. He was paralyzed from the waist down for quite some time. He did not eat one bite of hospital food; he had all natural-food meals brought in. Continued. Address: Owner, American Miso Co., Inc. and Great Eastern Sun, Asheville, North Carolina 28806. Phone: 704-252-3090.

10230. Evans, Barry. 1995. Chronology and history of Oak Feed Miso, Inc. and American Miso Co. of North Carolina. Part II. 1980 (Interview). *SoyaScan Notes.* Aug. 25. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Continued: 1980 June–John and Jan Belleme return to the USA from Japan. A letter shows that by late summer John had started to order miso-making equipment. Barry is sure that the wooden vats come from Arrow Tank Co. (Buffalo, New York) the only traditional barrel maker left in the United States–a very interesting place. The vats are all traditionally made, from old recycled wine barrels and other old wood. Over the years, the miso company has bought all its vats from Arrow Tank Co. The first 35 vats were cypress, but when those ran out, the next five were fir (they took a long time to season), and last 5-6 were redwood (they worked better).

Concerning Joseph and Patricia Carpenter: Barry never met them and he understands that their being asked to leave when the Bellemes returned was a traumatic, landmark event in their lives. Barry was once in prison for 32 months, and was on probation for three years after that, and was

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awaiting prison for 2 years before he actually went. But when it was over, he let it go and went on with his life. After John returned from Japan, Barry heard about the Carpenters situation from John and Sandy, who said (generally) that they had not done much while they were there, and they did not seem very motivated. But, in all fairness, maybe they didn't have any clear instructions as to what they were supposed to do. For him, their whole role in the miso company was always very hazy. But until Barry took a hand in things, the whole company was very "loosey-goosey." Nobody had any clear instructions as to what was to be done. Only John and Jan Belleme know the details of what actually happened. Sandy is a "conflict avoider" so he would have been ambiguous. John was not a conflict avoider. John, who was never a hippie and was very yang after his stay in Japan, came back to find these two hippie types on the land. "This culture clash may have had a lot to do with it." Also, there was only one house, so the two families would have had to live together.

1980 summer–Each time the company needed more money, they would come to Barry–since he was the only one they knew who had any and was willing to invest it. This summer, when the building had to be constructed, the equipment ordered and paid for, and land payments made, Barry started to invest a lot more money, and to own more and more shares. When he invested his second $50,000 he began to pay more attention to who else owned shares. "As I began to sniff the wind a little more, I sensed that I was surrounded by phantom shareholders, and was the only one actually investing any money." Sandy and Michio didn't want Barry to be on the board of directors, and they wanted his stock to be Class B, which did not enable him to vote–even though he was now the leading investor. Barry confronted Michio on this while on an airplane en route from Boston to Florida; Sandy was also on the plane. Barry made it plain that he would not invest any more money (he was being asked for about $90,000 more) unless he could be on the board of directors, and all the stock (not just his) would be voting stock. Michio and Sandy reluctantly agreed. All this came to a head at an important meeting in Miami in the summer of 1980, shortly after John and Jan returned from Japan.

When the Belleme's returned from Japan, people began to realize that this miso company might really happen. Negotiations had been taking place throughout 1979 and 1980. Three or four versions of an ownership contract / agreement had been presented but never signed; there would be 14-15 more over the next year, and none of those was ever signed either. The negotiations ended with Erewhon's bankruptcy. The discussions were really between the Erewhon group (comprised of Michio, Aveline, Morris Kirsner–their attorney–and Evan Root) and the Oak Feed Miso group (comprised now of Barry, John and Jan Belleme, and David Young–their attorney). Sendai Miso-Shoyu and Mitoku were not even mentioned; they were out of the picture. Mr. Kazama, owner of Mitoku, probably feared and doubted the potential new American miso company. "The issue was: Who would control the company, Erewhon or us? And how many shares would each person or company own?" Each group wanted to own a majority of the shares. This meeting went on for several days at various places, including restaurants, the Oak Feed Store, and the office of David Young–the Oak Feed Miso group's attorney. Note: See also meeting of 27 Sept. 1981.

Barry, who was on crutches, flew in from Reading, Pennsylvania, accompanied by his close friend and confidant, Saul Goodman, a macrobiotic healer and shiatsu practitioner. Barry could not travel by himself, and this was the first trip he had taken after his bike accident. David Young was concerned that the Oak Feed group was being asked to put up almost all of the money yet would not have control; yet he was ambivalent. Sandy Pukel was a member of the Oak Feed Miso group, but he was also ambivalent; he was really on Michio's side. He felt that Erewhon's participation was absolutely vital, and whatever had to be given up to get that participation was appropriate. Everyone should trust in Michio, and Michio would provide.

Sandy was and is one of Michio's closest friends and confidants in the whole world. Sandy and Mona Schwartz were the co-heads of the Florida Macrobiotic Association. An excellent macrobiotic teacher and cook, Mona ran a study house in the Miami area, where Barry ate many of his meals for the first several years that he was practicing macrobiotics. So did Dr. Keith Block. Mona first told Barry how close Michio and Sandy were, and how much each influenced the other's thinking.

Barry recalls that Michio and his attorney, Morris Kirsner, were so demanding and unreasonable in what they wanted that even Sandy hesitated. He wanted to give them more than Barry and John, but he didn't want to give them everything they wanted. Negotiations dragged on and on because they were taking this unrealistic negotiating stance. So it was easy for Barry and John, who saw increasing signs of weakness in Erewhon, to begin to fight a war of attrition and prevent anything from happening.

The Board at that time had five members–including John Belleme, Sandy Pukel, Edmund Benson, Barry, and one other person–which was probably not Michio. Only four other people besides Barry invested money in the miso company: Edmund Benson $20,000, Frank Head (who started Mountain Ark) $5,000, the Japanese cook at the Oak Feed Restaurant (Yozo Masuda) $10,000, and Jim Kenney $5,000. Barry bought out the first two, and Jim died before the company began operations. Sandy Pukel, as one of the company's founders, got a number of "founders shares" for free, which Barry eventually bought back from him.

1980 fall–A document shows that at this time "John and Jan go on Erewhon payroll and start construction of Erewhon

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Miso in Rutherfordton, North Carolina." They begin by leveling the land. They went on the payroll of the Erewhon Trading Co., not the Erewhon Miso Co., since the latter company did not have a payroll and never really existed. Of course, Michio and Aveline owned Erewhon and all or most of its stock. Barry recalls that Erewhon was supposed to put up a certain amount of money for their share of the joint venture, and then provide the additional services of buying all miso made by the new miso company, packaging, and distributing it.

Barry recalls that much of the automatic miso-making equipment came from Japan–some or all of it from the Fujiwara Brewing Co. in Hiroshima. John visited them in 1983 when the miso company was considering adding a soy sauce plant near the miso plant. Continued. Address: Owner, American Miso Co., Inc. and Great Eastern Sun, Asheville, North Carolina 28806. Phone: 704-252-3090.

10231. Evans, Barry. 1995. Chronology and history of Oak Feed Miso, Inc. and American Miso Co. of North Carolina. Part III. 1981 to 1982 (Interview). *SoyaScan Notes*. Aug. 25. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Continued: 1981 Jan. 31–Oak Feed Miso, Inc. IRS tax returns (for the fiscal year ending Jan. 31) show losses of $89,000 for the last year with no sales. Note: The land was purchased on a mortgage, with about $20,000 down payment.

1981 March–The miso building is essentially complete, but some equipment still had to be ordered–from Japan and the USA.

1981 early–Michio and Aveline Kushi can see that Erewhon is heading for bankruptcy. They try urgently to raise money. Sandy Pukel loans the Kushis $100,000–and thereby wins their eternal gratitude and friendship. Sandy never gets the money back. Barry is upset, because he believes that this was money he gave to Sandy as his investment in the miso company. Essentially, Barry then had to give Sandy more money which he finally did invest in the miso company–as follows: Sometime later in 1981, to make things more complicated, Sandy (who is now short of cash) asks Barry if he would be willing to invest in Oak Feed Store and Restaurant with the understanding that Sandy will use the money to buy the shares he had pledged to buy in Oak Feed Miso, Inc. Barry accepts the deal, and Sandy invests the $80,000 to $90,000 in Oak Feed Miso–which makes Barry happy.

1981 July–The opening ceremony for Erewhon Miso Co. is held at Rutherfordton, North Carolina. This was "the crowning moment of the early phase of the miso company. We were all still together at that point, including Michio. We had a big, beautiful sign out on the road in front of the factory, put up for the opening ceremony, that read 'Erewhon Miso Co.'–even though that was never the name of the company. The delegation from Erewhon was Michio, Aveline, and Evan Root. Evan was overwhelmed by the emotion of it all–just crying like a baby. John and Jan Belleme were there, as was a woman from Asheville who did the photography. Sandy Pukel must have also been there, though Barry has no clear recollection of this. Yet tension between Barry and Sandy had been growing. "Without Sandy and Michio, the project never would have happened." By now many people could see that Erewhon was headed for bankruptcy, but "Even at the time of the opening, everyone thought Michio would pull another rabbit out of his hat in the end," to save Erewhon. In late summer and early fall Barry attended several meetings called to discuss Erewhon's perilous financial condition. These meetings were all held in the area of Boston, Massachusetts, sometimes in the office of Morris Kirsner, the Kushi's attorney. Barry was invited largely because they hoped he would help bail out Erewhon.

1981 Aug.–John and Jan Belleme start making miso in North Carolina; the soybeans and grains are contributed by Erewhon Trading Co. But by August or September the Kushis can see that Erewhon's bankruptcy is imminent, so they stop sending John his paycheck and additional raw materials. This creates a crisis; everything must be rethought with Erewhon out of the picture. John may have sent out feelers to Westbrae and Eden to see if they wanted to take over Erewhon's role as distributor of the miso–they didn't.

1981 Sept. 27–At an annual meeting of Oak Feed Miso, Inc. all shares are converted to Class A voting shares. Major shareholders are: Barry Evans 1400 shares. Sandy Pukel 1400 shares. John Belleme 900 shares.

1981 Nov. 18–Erewhon Trading Co. files for bankruptcy protection under Chapter 11 of the federal Bankruptcy Act. For the next several months, "various wolves were circling around, trying to grab hold of the half-dead body. Finally U.S. Mills and Nature Food Centres Inc. grabbed it and dragged it off to its lair." As part of the deal, Michio had to agree that he would only do endorsements through the new owners. So Michio, who had lost control of his own destiny for quite some time, could not be involved with the miso company any more. Barry thinks Sandy realized that and his heart went out of the miso company project at that point. Consequently, all deals between the miso company and Erewhon come to an end. Barry thinks that Erewhon Trading Co. invested a total of about $15,000 in the miso company in the form of payments and miso ingredients. After Erewhon was purchased out of bankruptcy, the new owners, Chuck Verde and Cynthia Davis, never got this investment back. When they called, Barry took the position that the costs and difficulties the miso company had endured because of Erewhon's collapse were much greater than $15,000. Barry added that if they took the matter to court, he would sue them for breach of contract. In fact, the miso company barely survived that collapse.

Over the past four months Barry, who admires Michio as a spiritual leader, has come to realize that he cannot be

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counted on to help establish the new miso company. He has grown tired of all the difficulties with Erewhon and Michio; as a practical businessman, he was "a nightmare."

1981 late–Marty Roth now enters the picture. When John Belleme left his job as manager of Oak Feed Store to study miso in Japan, Jim Kenney took over from him. Jim was an epileptic; while traveling on vacation in East Asia about a year later, he died tragically at about age 27–Barry heard he choked on the seed of an umeboshi salt plum that he was using to try to control an epileptic fit. So in about July or August 1981 Sandy brought in Marty Roth, who had been running the Natural Cafe in Santa Fe, New Mexico. Marty was soon working as manager (or assistant manager) of Oak Feed Store. Marty (a very inventive and creative guy) and Barry (a co-owner of the store) quickly find they get along well and work together effectively. Marty didn't want to stay in Miami, and his job with Sandy wasn't working out. When Marty told this to Barry, Barry said that he was planning to establish his own import company in North Carolina, and that company was also going to take over distribution for the miso factory. It is not crystal clear to what extent Barry lured Marty away from Oak Feed Co. and to what extent Marty would have left anyway.

1981 Dec.–Great Eastern Sun (GES) is organized. The first employee and manager is Barbara Arrow, who arrived in Dec. 1981.

1982–Jan. GES orders its first container of natural foods from Mitoku (Mr. Kazama) in Japan.

1982 Jan. early–Marty Roth moves from Florida to North Carolina to run Great Eastern Sun (GES)

1982 Jan.–Barry makes another investment in the miso company and thereby replaces Sandy Pukel as the largest shareholder. Barry buys out remaining shareholders–except Jim Kenney who is no longer living. Sandy proposes to Barry a deal whereby he would trade Barry all of his stock in the miso company for all of Barry's stock in Oak Feed Store. Barry accepts, but with the added condition that Barry could import goods from Mitoku in Japan.

1982 Jan. 4–Barry Evans sends out a letter on American Miso Co. letterhead to potential customers that begins: "Dear Friends–We at The American Miso Company are proud to announce the opening of our miso shop in Western North Carolina." It ends: "The Lindenself Foundation, doing their business as Linden's Elf Works, located in Piedmont, North Carolina, has been appointed as the sole agent in marketing and distribution of The American Miso Company brand products... Your phone contact is John Troy at... 919/364-2723. Enclosed is the Linden's Elf Works distributor price sheet which includes all the pertinent information for your upcoming Spring catalogue. With kindest regards, Barry Evans, President." When Marty Roth sees this announcement, he argues that GES should distribute AMC's miso; Barry agrees. So John Troy and Elf Works never did distribute any AMC miso.

1982 Jan. 31–Oak Feed Miso has losses of $67,000 for the previous year with no sales. Total loss: $157,000.

1982 Feb. 26–Sandy Pukel and Barry Evans sign an agreement whereby Sandy gets out of Oak Feed Miso and Barry gets out of Oak Feed Store and Oak Feed Restaurant by an exchange / trade of stock. Barry recalls that Sandy left the miso company reluctantly for two reasons. First, because he saw the miso company as "his baby" and he liked to be in control–not so much because he saw it as a company with a bright and profitable future. And second, because Michio wasn't involved any longer, and couldn't be because of what had happened to Erewhon. Barry never asked Sandy (or any of the other shareholders) if he could buy their shares. They all approached him with the idea. First, for example, Edmund Benson wanted to get his money back, so Sandy bought his stock. Yozo Masuda's stock was included in the deal with Sandy.

1982 March 22–Great Eastern Sun is incorporated.

1982 April 19–At the annual meeting of the shareholders of Oak Feed Miso, the name is officially changed to American Miso Co. This change is filed with the state of Florida on 5 May 1982, and signed by Barry Evans and Janet Belleme. The final stamp of filing is 19 May 1982. Barry notes: "In numerology, this date (May 19) is a 44 number, since 5 + 19 + 1 + 9 + 8 + 2 = 44. Forty-four is the number of ultimate business success." Barry did not plan to incorporate the company on this date. "It was just the order of the universe."

1982 May 18–Great Eastern Sun sells its first food products to a natural food store; they were imported from Japan.

1982 mid- to late- The principals of the American Miso Co. are now Barry Evans, John and Jan Belleme, and Mrs. Kenney. Barry started with 1,400 shares, got 1,400 from Sandy, 100 from Yozo, 250 from Edmund, and 200 from Gary Dukeman (a friend of his)–for a total of 3,350. John and Jan had about 850 shares. John had been given about $20,000 worth of shares as a founder of the company, and because he went to Japan to learn how to make miso, and because he had worked for a modest salary (less than $20,000/year) as a miso maker in North Carolina. Mrs. Kenney had 50 shares. On a percentage basis, Barry owned 78.9% of the miso company, John and Jan Belleme owned 20%, and Mrs. Kenney owned the rest. Continued. Address: Owner, American Miso Co., Inc. and Great Eastern Sun, Asheville, North Carolina 28806. Phone: 704-252-3090.

10232. Iwata, Masakazu. 1995. Re: The pioneering work of Gonshiro Harada (died 1943) with koji, tofu, miso, natto, and okara in California. Letter to William Shurtleff at Soyfoods Center, Aug. 25. 1 p. Typed, with signature.

• ***Summary:*** Mr. Iwata is the author of *Planted in Good Soil: A History of the Issei in United States Agriculture* (1992). Yesterday he contacted Fred Harada, "whose father had a

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tofu manufacturing establishment in the Fresno area... He is a good source of information. His father, Gonshiro Harada (died 1943), an Issei (first-generation Japanese immigrant to the USA) from Hiroshima Prefecture, was a master koji-maker who learned his trade in Japan. He opened a store in Fresno in the 1920s but went broke during the depression of 1929; he was a creditor unable to collect from credit customers. Subsequently, in 1939, he relocated in Fowler, about 10 miles southeast of Fresno, where he and his wife and family (nine children) established the Harada Tofu Co. and manufactured such foods as tofu, kamaboko, agé, miso, natto, okara, and other related items, peddling them to the Japanese farmers in a broad area of Central California. Of course the company handled vegetables and other grocery goods on their route consisting of several hundred customers.

"Fred indicates that his father was an innovative entrepreneur who made much of his own tofu-making equipment." Fred believes his father got at least some of his soybeans from rice growers in the Colusa region, who grew soybeans as a sideline. "He mentioned that the Koda rice farms in South Los Baños may have had some acreage in this crop."

Fred Harada can be contacted at 637 North 6th Street, Montebello, CA 90640. Phone: 213-721-8455. Best to contact him after 7:00 p.m. Address: 879 North Vail Ave., Montebello, California 90640. Phone: 213-723-4389.

10233. Iwata, Masakazu. 1995. Re: Early soybean cultivation by Japanese rice growers in central California around the time of World War I. Letter to William Shurtleff at Soyfoods Center, Aug. 25. 1 p. Typed, with signature.

• ***Summary:*** Yesterday Dr. Iwata contacted Fred Harada, "whose father had a tofu manufacturing establishment in the Fresno area... He is a good source of information... My conjecture would have been that much of the soybeans for the tofu came from abroad, but according to Fred, some of the Japanese rice growers, whose heyday in rice farming was around the time of World War I [1914-1918] in the Colusa region, grew soybeans as a sideline. He mentioned that the Koda rice farms in South Los Baños may have had some acreage in this crop.

"I have a section in my book (*Planted in Good Soil: A History of the Issei in United States Agriculture.* New York: Peter Lang Publishing, 1992) on the Koda farms, utilizing information from interviews and the Keisaburo Koda biography in Japanese (*Koda Keisaburo Den,* 1965), but found no mention of soybean production. You might contact Edward Koda (P.O. Box 6, South Dos Palos, California 93665), the son of the founder, about this. I believe the operation is now in the hands of Ross, the third generation heir.

Fred Harada can be contacted at 637 North 6th Street, Montebello, CA 90640. Phone: 213-721-8455. Best to contact him after 7:00 p.m.

Update: Letter from Dr. Iwata. 1996. Dec. 6. "Most likely the Chinese who arrived in California around the time of the Gold Rush of 1849 introduced soybeans from China." Address: PhD, 879 North Vail Ave., Montebello, California 90640. Phone: 213-723-4389.

10234. Blank, Christine. 1995. Organic soy products: Industry remains optimistic. *Organic Food Business News* (*Altamonte Springs, Florida*) 7(8):5-7. Aug.

• ***Summary:*** "Even though Japanese demand for organic soy is falling this year," new studies proclaiming the health benefits of soy products have sparked optimism among manufacturers for higher sales in the near future. Supply of organic soybeans is now greater than demand as the Japanese, who have been willing to pay premiums for organic soybeans during the past two years, have lost interest.

Terry Tanaka, executive director of Nichii Company of America, Inc. (Jefferson, Iowa) exports 95% of its organic soybean flakes to its parent company in Japan. Tanaka had been planning to ship 140 tons/month of flakes to Japan, but is now shipping only 50 tons/month, due to sagging consumer interest. The company sends its flakes by rail to Seattle, Washington, whence they travel by cargo ship to Japan.

David Singsank is co-owner of American Health and Nutrition in Ann Arbor, Michigan. His company is now selling an organic soy protein product named Manna to wholesalers for use in bulk bins in co-ops and natural food stores. It has a chewy texture and will cost wholesalers $0.75 to $0.90/lb.

When prices skyrocketed last year, some soyfood manufacturers had to raise prices or discontinue products. For example, White Wave in Boulder, Colorado, started using commercial (non-organic) soybeans in two of its products that had been organic last season. Now the company is reported to have switched back to organic ingredients when many of its customers complained. White Wave is said to use at least 95% organic ingredients in its soy products, including tofu, soymilk, and tempeh.

New contract prices are about $14/bushel FOB for cleaned clear hilum soybeans and $19/bushel FOB for Vinton. OCIA (president Tom Harding) is the main certifier of organic soybeans; others include Farm Verified Organic (FVO), Oregon Tilth, and Quality Assurance International. Reciprocity is a major issue for soyfoods manufacturers.

Jan Remak, vice president of marketing at Vitasoy (Brisbane, California) says that Vitasoy soymilk is sold in some major supermarket chains, such as Kroger, Fred Meyer, Lucky, and Ralph's. Address: Staff writer.

10235. Muramatsu, Kanako; Kanai, Yukiko; Kimura, Noriko; Miura, N.; Yoshida, K.; Kiuchi, Kan. 1995. [Production of natto with high elastase activity]. *Nippon Shokuhin Kagaku*

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Kogaku Kaishi (*J. of the Japanese Society for Food Science and Technology*) 42(8):575-82. [20 ref. Jap; eng] Address: Kyoritsu Women's Univ., 2-2-1 Hitotsubashi, Chiyoda-ku, Tokyo 101, Japan.

10236. Orthoefer, Frank T.; Liu, Keshun. 1995. Soybeans for food uses. *International Food Marketing & Technology* (*Germany*) 9(4):4-8. Aug. [5 ref]
• ***Summary:*** Contents: Introduction. Traditional soy foods: Soy milk, tofu, toasted whole soybeans and full-fat soy flour ("The toasted flour is often used in rice recipes or for the preparation of flavored bakery snacks. The toasted powder may be mixed with plastic fats and sugar to be used as a filling for confectionery and bakery products"), soybean sprouts, yuba, soy sauce, tempeh, natto, miso. Soy protein ingredients: Soy grits and flour, soy protein concentrates, soy protein isolates. Soy nutrition: Soy protein, fat and calories, phytochemicals. Food bean market. Summary.

Two "different types of soybeans have emerged: oil beans and food beans. This is particularly true in the US soy market..."

Of the fourteen phytochemicals, seven are present in soybeans. These seven are phytates, isoflavones, carotenoids, coumarins, triterpenes, lignans, and phenolic acids. Phytochemicals have been shown to affect human health as much as vitamins and minerals, and many of them have anti-cancer properties. The discovery of phytochemicals may change how the nutritional value of food is assessed.

The world market for soybeans for food use is estimated at about 1 million metric tons (tonnes). In Japan alone about 830,000 tonnes are made into soyfoods as shown in a pie chart as follows: Tofu (552,000 tonnes, 63.4%), miso (180,000 tonnes, 21.5%), natto (90,000 tonnes, 10.7%), soymilk (10,000 tonnes, 1.2%), soy sauce (5,000 tonnes, 0.6%), and others (22,000 tonnes, 2.6%). In the USA the food bean market is estimated at 50,000 tonnes. Other major markets for food beans are in Korea, China, Taiwan, Hong Kong, Singapore, Malaysia, and Thailand. Food-grade soybeans can be sold by the growers at a premium of 5-20% above the base price. The demand for food beans is increasing steadily. Address: 1. Vice President, R&D, Riceland Foods, Stuttgart, Arkansas; 2. Project Leader, Soy Food Lab., Jacob Hartz Seed Co., Stuttgart, Arkansas.

10237. *Soya Bluebook Plus.* 1995-1997. Serial/periodical. Bar Harbor, Maine: Soyatech, Inc. Peter Golbitz, publisher and editor. Frequency: Annual.
• ***Summary:*** Preceded by Soya Bluebook. A directory and information book for the soybean processing and production industries. One of the most valuable sources of worldwide information on soybeans. The first issue (shipped Sept. 1995) is titled "Soya Bluebook Plus: the annual directory of the world oilseed industry." Crops featured on the front cover are "soya, corn, cottonseed, palm, canola, rapeseed, and sunflower." Contents (most sections are marked with a fold-out tab): Organizations and government agencies: White pages, yellow pages. Oilseed product processors and marketers. Equipment supplies and services. Oilseed statistics. Oilseed reference: Oilseed glossary, standards and specifications, oilseed technical charts and tables. Indexes: Comprehensive index, advertiser index.

Concerning the year: The edition published in mid-1994 was titled '94 Soya Bluebook. The edition published in mid-1995 was titled '95-96 Soya Bluebook. The edition published in Sept. 1996 (the 50th edition) was titled '97 Soya Bluebook. The change was made to give the company extra time (16 months) to market the latest edition before the next year arrived. Address: 318 Main St., P.O. Box 84, Bar Harbor, Maine 04609. Phone: 207-288-4969.

10238. Fujita, Mitsugu; Hong, Kyongsu; Ito, Yae; et al. 1995. Transport of nattokinase across the rat intestinal tract. *Biological and Pharmaceutical Bulletin* 18(9):1194-96. Sept. [11 ref]
• ***Summary:*** Nattokinase (NK) is reported to cause the degradation of fibrinogen in the plasma of normal rats. It is absorbed from the rat's intestinal tract. Address: 1-3. Biotechnology Research Laboratories, JCR Pharmaceuticals Co., Ltd., 2-2-10 Murotani, Nishi-ku, Kobe 651-22, Japan.

10239. Messina, Mark. 1995. Isoflavone intakes by Japanese were overestimated (Letter to the editor). *American J. of Clinical Nutrition* 62(3):645. Sept. [8 ref]
• ***Summary:*** Dr. Messina, an expert on soy nutrition, argues that Japanese daily per capita isoflavone is about 50 mg, rather than the figure of 150-200 mg used by Cassidy et al. in 1994. This is a key letter in setting 50 mg/day of isoflavones as the proper dosage. Address: 1543 Lincoln Street, Port Townsend, Washington 98368.

10240. Morinaga Nutritional Foods, Inc. 1995. Made for each other. Introducing new Mori-Nu Mates (Ad). *Natural Foods Merchandiser.* Sept. p. 107.
• ***Summary:*** This full-page color ad shows a packet of Mori-Nu Mates Chocolate Pudding & Pie Mix next to a package of Mori-Nu Lite Silken Tofu. "Dairy free. Low fat. All natural. Quick and easy." Blend one packet of this mix with one package of Mori-Nu Lite Tofu to make a rich and creamy, low fat chocolate mousse.

This ad also appeared in the Dec. 1995 issue (p. 65) and in the Jan. 1996 issue (p. 57) of this magazine.

And in the Feb. 1996 issue (p. 29) and the March 1996 issue (p. 37) of *Vegetarian Times* magazine. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-NOW-TOFU or 310-787-0200.

10241. Shurtleff, William; Aoyagi, Akiko. comps. 1995. Dietary fiber and soy fiber–Bibliography and sourcebook,

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1445 to 1995: Detailed information on 633 published documents (extensively annotated bibliography), 203 commercial soy fiber products, 111 original interviews (many full text) and overviews, 95 unpublished archival documents. Lafayette, California: Soyfoods Center. 315 p. Subject/geographical index. Author/company index. Language index. Printed Sept. 10. 28 cm. [883 ref]

• ***Summary:*** There are three basic types of soy fiber: Okara (soymilk pulp), soy bran (ground soybean hulls / seed coats), and soy cotyledon fiber (soy polysaccharides).

Okara: In the process of making soymilk or tofu, the liquid milk is separated by filtration from the insoluble fiber. This nutritious by-product, called okara (its Japanese name) or soy pulp, has been used for centuries as a source of food, feed, and fertilizer.

Soy bran: Soybean hulls, a by-product of the process of crushing soybeans to make oil and meal, can be ground to a light-colored, high-fiber flour generally known as "soy bran."

Soy cotyledon fiber: In the process of isolating the protein from defatted soybeans (i.e., of making isolated soy protein), the fiber is removed by filtration. We call this fine white powder "soy cotyledon fiber; it differs from okara in five ways: (1) It does not contain soybean hulls; (2) It has been defatted and thus is lower in fat; (3) It has been treated during processing with mild alkali; (4) It has a much finer texture than okara; and (5) It is almost always sold in dry form, whereas okara is rarely dried.

All three of these products are high-quality, inexpensive sources of dietary fiber. This bibliography emphasizes their food uses, and contains all known publications on their nutritional and medicinal value.

This bibliography also contains extensive information, including the most important publications starting in the mid-1970s, on the importance of dietary fiber in human diets. Dietary fiber was the "forgotten nutrient" until physicians working in Africa noticed that Africans who moved from the countryside into the cities, replacing their traditional high-fiber low-fat diets with European-style diets, quickly became afflicted with a host of European-style diseases. The many studies that have tested the "fiber hypothesis" have shown that dietary fiber is a very important part of a balanced, healthful diet, and that it can offer major benefits in helping to prevent and reverse many serious Western diseases.

This is the most comprehensive book ever published about soy fiber. It has been compiled, one record at a time, over a period of 20 years, in an attempt to document the history of this subject. Its scope includes all known information about this subject, worldwide, from A.D. 1445 to the present.

This book is also the single most current and useful source of information on this subjects, since 97% of all records contain a summary/abstract averaging 181 words in length.

This is one of more than 50 books on soybeans and soyfoods being compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyfoods Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features: 34 different document types, both published and unpublished; every known major publication on the subject in every language–including 750 in English, 55 in Japanese, 36 in French, 36 in German, etc.; 111 original Soyfoods Center interviews and overviews never before published. Thus, it is a powerful tool for understanding the development of soy fiber and dietary fiber from their earliest beginnings to the present.

The bibliographic records in this book include 633 published documents and 95 unpublished archival documents. Each contains (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English publications together with an English translation of the title, month and issue of publication, and the first author's first name (if given).

The book also includes details on 203 commercial soy fiber products, including the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as references to and summaries of advertisements, articles, patents, etc.) are also given.

Details on how to make best use of this book, a complete subject and geographical index, an author/company index, a language index, and a bibliometric analysis of the composition of the book (by decade, document type, language, leading periodicals or patents, leading countries, states, and related subjects, plus a histogram by year) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 510-283-2991.

10242. Teranaka, Takeyori; Ezawa, Makoto; Matsuyama, Jun; Ebine, Hideo.; Kiyosawa, I. 1995. Kome miso, mugi miso, oyobi mame miso [Inhibitory effects of extracts from rice-koji miso, barley-koji miso and soybean koji miso on the activity of angiotensin I converting enzyme]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 69(9):1163-69. [14 ref. Jap; eng]

• ***Summary:*** Angiotensin I converting enzyme is abbreviated ACE. Address: 1-3, 5. Dep. of Agriculture, Tamagawa Univ., 6-1-1. Tamagawa-Gakuen, Machida-shi, Tokyo, 194; 4. Central Miso Research Inst., 1-26-19, Sinkawa [Shinkawa], Chuo-ku, Tokyo, 104, Japan.

10243. Wilson, Lester A. 1995. Soy foods. In: D.R. Erickson, ed. 1995. Practical Handbook of Soybean Processing and Utilization. Champaign, Illinois: American Oil Chemists' Society Press; St. Louis, Missouri: United Soybean Board.

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viii + 584 p. See p. 428-59. Chap. 22. [41 ref]
• ***Summary:*** Contents: Introduction. Soybean chemical composition. Unfermented soy foods: Soymilk, tofu (momen, kinugoshi or silken, packed tofu, aseptically packaged tofu, deep-fried tofu, kori tofu or dried-frozen tofu), other nonfermented soy foods (yuba, kinako or roasted whole soybean flour, fresh {edamame} and canned soybeans, texturized soy protein-based foods). Fermented soy foods: Miso, shoyu (soy sauce), natto, tempeh, sufu. Japanese Agricultural Standards. Identity preservation and transportation. Soybean quality characteristics: Overview, judging quality (tofu, miso, natto). Note: This is the earliest English-language document seen (Nov. 2012) that contains the term "roasted whole soybean flour."

Tables: 1. Nonfermented soy food products and common names by country. 2. Fermented soy food products and common names by country. 3. Chemical composition of soy foods. 4. Per capita annual consumption of soybeans (kg) in selected Asian countries (China, Indonesia, Japan, Korea, Malaysia, Philippines, Thailand; for the years 1968, 1978, 1988, 1994).

Figures: 1. Flowchart of refrigerated and shelf-stable soymilk production. 2. JAS seal of approval. 3. Diagram of equipment used in large scale tofu production (each piece of equipment is numbered and labeled). 4. Flowchart of regular tofu production. 5. Graph showing percent transmittance of whey versus coagulant concentration for soymilks at 6% solids made from Weber, Vinton, and Amsoy soybeans. A concentration of 0.023 N was selected as the optimum coagulant concentration, since it gave the most transparent whey. 6. Graph showing percent transmittance of whey versus coagulant concentration for Amsoy soymilk at concentrations of 4, 5, and 8% solids. Concentrations of 0.018N, 0.019N, and 0.035N, respectively, were selected as optimum coagulant concentrations. 7. Flowchart of kinugoshi (silken) tofu production. 8. Flowchart of packaged tofu production. 9. Flowchart of aseptically packaged tofu production. 10. Flowchart of kori (dried-frozen) tofu production. 11. Diagram of equipment used in large scale production of dried-frozen tofu (each piece of equipment is numbered and labeled). 12. Flowchart of miso production. 13. Diagram of the interactive factors producing the characteristic attributes of miso. 14. Flowchart of tempeh production. Address: Iowa State Univ., Ames, Iowa.

10244. Zender, Sandra. 1995. Re: Early Japanese tofu companies in Fowler, California. Letter to William Shurtleff at Soyfoods Center, Oct. 11–in reply to inquiry. 2 p. Handwritten.
• ***Summary:*** "I have been unable to provide you with verification that Fowler had tofu factories in the 1930s. I checked old volumes of yearbooks, newspapers, books on Japanese culture in the area, and local historians. According to local historians and long time residents there were three tofu factories in Fowler. The oldest was Watanabe, the next was Harada, and the most recent was Soga. I contacted a Mr. Honda who is in his mid-80s and says Watanabe was before the 1930s. He believes he was about 10 when Harada was in business. [Note: If Mr. Honda is now age 85, he would have been born in 1910, and would have been age 10 in 1920.] Unfortunately these are only anecdotal sources. I will turn this inquiry over to the county reference and history departments to see if the names of these businesses occur in old city directories dating from that time." Address: Librarian, Fowler Branch Library, 119 E. Merced, Fowler, CA 93625. Phone: 209-834-3114.

10245. Albertson, Ellen. 1995. Super soy: The newest miracle food. *Self.* Oct. p. 148-151, 204. [1 ref]
• ***Summary:*** The subtitle continues: "Okay. One more time. Scientists are telling us they've found the nutritional Holy Grail, a simple food that prevents heart disease and cancer. Do we believe them? Yes!"

"Soy may be so effective that it actually crosses the line from nutritional to medicinal."

This article begins with a summary of the meta-analysis by Dr. James Anderson published in the *New England Journal of Medicine* (3 Aug. 1995). It reported soy in the diet can significantly lower high cholesterol." It also notes that: (1) "Genistein, a powerful natural chemical unique to soy," may stop the growth of cancer cells. (2) The natural estrogens in soybeans may "help alleviate postmenopausal symptoms." In Japan, where soy is typically eaten daily, there is no word for "hot flashes."

Photos and definitions of various soyfood products are given: Tempeh, soy flour, tofu, textured vegetable protein, soy milk. A section titled "15 delicious ways to add soy to your diet," gives serving suggestions for these and other soyfoods at breakfast, lunch, snack, and dinner.

A full-page table on p. 204 rates the best (B) and worst (W) of the following, with nutritional information, taste, texture, and comments: Hot dogs: B–Yves Veggie Cuisine Tofu Wieners. W–Soy Boy Right Dogs. Burgers: B–Boca Burger. W–Green Giant Harvest Burger. Sausage: Lightlife Lean Links Italian Sausage. W–Fantastic Foods Nature's Sausage. Bacon: B–Yves Veggie Cuisine Canadian Veggie Bacon. W–Lightlife Fakin' Bacon. Luncheon Meat: B–Yves Veggie Cuisine Deli Slices. W–Lightlife Smart Deli Thin Slices–Roast Turkey Style. Plain soy milk: B–Westbrae Natural WestSoy 1% fat. W–Edensoy Extra. Soy cheese: B–Sharon's Finest Cheddar Style TofuRella. W–Soymage Cheddar Style Cheese Alternative. Chili: B–Midland Harvest Chili Fixin's. W–Fantastic Foods Vegetarian Chili. Pizza: Nature's Hilights Rice Crust Pizza. W–Farm Foods Pizsoy Cheese Style. Frozen Dinners: B–Amy's Tofu Vegetable Lasagna. W–Hain Pure Foods Pepper Steak. Dessert: B–Living Lightly Chocolate Almond Non Dairy Frozen Dessert. W–White Wave Dairyless Vanilla "Yogurt."

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10246. Barnard, Neal. 1995. Hormone replacement increases cancer risk. *Good Medicine* (*PCRM, Washington, DC*) 4(3):14-15. Fall. [10 ref]
• ***Summary:*** "The *New England Journal of Medicine* of June 15, 1995 [p. 1589-93], reported that hormone replacement therapy increases the risk of breast cancer. This was not news to most doctors. But many have continued to prescribe hormones because they feel that the benefits to the heart and bones outweigh the cancer risk. In the doctor's mind, it is a case of 'choosing your disease.' Will it be heart disease and osteoporosis from too little estrogen, or breast cancer from too much?" But there are other approaches.

"Horse hormones: The most popular estrogen product is Premarin from Wyeth-Ayerst Laboratories. Although doctors sometimes describe it as 'natural' for women, it is actually a horse estrogen. On farms in North Dakota and Canada, 75,000 mares are impregnated and then confined from the fourth month through the end of their eleven-month pregnancy so their urine can be gathered in a collection harness. After they give birth, the mares are reimpregnated. Their foals usually end up as horse meat, and the urine estrogens are packed into pills. The trade name 'Premarin' is simply a condensation of the words 'pregnant mares' urine'–hardly a natural substance for human beings to swallow. While Premarin contains estradiol and estrone, two types of estrogen which are made in humans, it also contains an enormous amount of *equilin,* a horse estrogen that never occurs at all in humans.

"Estrogen supplements can have serious side effects... Women taking estrogen supplements have 30 to 80% more breast cancer risk than other women.

"Why are so many doctors prescribing them? Most of the push relates to osteoporosis and heart disease... About a quarter of white women over sixty have compression fractures of their vertebrae, and many develop hip fractures due to gradual loss of bone." But estrogens rarely arrest bone loss; at best, they simply slow it. Other approaches can be much more effective. Remer & Manz (1994) reported that eliminating animal protein from the diet can cut urinary calcium losses in half. Many other studies show that populations following plant-based diets have enviably low rates of hip fracture. Cutting salt, caffeine, and tobacco smoke intake can further reduce calcium losses. According to J.R. Lee (1990) a different hormone, progesterone, appears to increase bone density. "It is derived from yams or soybeans, has no side effects, and is sold without a prescription as a transdermal cream."

"Of course, it is not just estrogen pills that increase cancer risk. Estrogen production within a woman's body is increased by high-fat diets and overweight. The result is a higher risk of cancer. The National Cancer Institute reports that cutting fat to 20% of calories will reduce a woman's estrogen levels by 17%, which is a good first step in cancer prevention."

"There is no Japanese word for hot flashes: It has long been known that menopause is much easier for Asian women than it is for most Westerners. Hot flashes are reported by only about 10% of Japanese women at menopause." Bones also tend to be stronger in Asia. "Broken hips and spinal fractures are much less common. The most likely explanation is this: Throughout their lives, Western women consume much more meat and about four times as much fat as do women on traditional Asian rice-based diets, and only one-quarter to one-half the fiber. The result is a chronic elevation of estrogen levels. At menopause, the ovaries' production of estrogen comes to a halt, causing a violent drop in estrogen levels. Asian women have lower levels of estrogen both before and after menopause, and the drop appears to be less dramatic. The resulting symptoms are much milder or even non-existent. Those who enter menopause on a low-fat vegetarian diet often breeze right through it." Address: M.D.

10247. Fujita, Mitsugu; Hong, Kyongsu; Ito, Yae; Fujii, R.; Kariya, K.; Nishimuro, S. 1995. Thrombolytic effect of nattokinase on a chemically induced thrombosis model in rat. *Biological and Pharmaceutical Bulletin* 18(10):1387-91. Oct. [28 ref]
• ***Summary:*** "Intravascular thrombosis is one of the main causes of a wide variety of cardiovascular diseases. Platelet aggregation and thrombogenesis play an important role in these diseases." Nattokinase is a fibrinolytic enzyme which cleaves fibrin. Address: 1-3. Biotechnology Research Laboratories, JCR Pharmaceuticals Co., Ltd., 2-2-10 Murotani, Nishi-ku, Kobe 651-22, Japan.

10248. United Soybean Board. 1995. Introducing the soy-a-mid: How soybeans fit into the eating plan described in the USDA's Food Guide Pyramid (Brochure). Chesterfield, Missouri: USB. 6 p. 29 cm.
• ***Summary:*** This food pyramid emphasizes dairy products (the "Milk, Yogurt and Cheese Group") and meats (the "Meat, Fish, Poultry, Dry Beans, Eggs & Nuts Group"), plus products made with soybean oil. "Right now you're probably eating a ½ cup's worth of soybeans every day without even realizing it."

"Plant foods in the Meat Group, such as beans, peas, lentils and nuts, provide protein, but this protein is not 'complete.' Animal protein is 'complete,' that is, it contains all of the eight amino acids required for proper nutrition. Plant proteins–*with the exception of soybeans*–need to be combined with grains or animal proteins to provide all the eight amino acids. Soybeans and soybean products, such as tofu and soybean flours, are one of the few plant protein sources that contain complete protein.

Soybeans belong to "The Pod Squad–legumes," which are not easily classified into one food group. "The soybean is something of a nutritional superstar, even among members of

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the Pod Squad... New medical research suggests that certain non-nutritive components in soybeans may work to reduce the risk of cancer. Many foods that come from soybeans are derived from the various components of the bean... Soy protein is extracted from the bean to be used in a host of manufactured foods form surimi to pancake mixes. Foods derived from whole soybeans, such as tofu and tempeh, are used as a primary protein source in many Asian countries. Tofu is also a good source of calcium in Asian diets where milk and milk products are seldom consumed. In fact, a Food Guide Pyramid in China or Japan would see tofu playing a major role in the third tier of the diagram.

"'Think Soybeans'–Whether you're spreading soybean margarine on your pancakes fortified with soybean flour, or experimenting with tofu in your stir-fry, remember that soybeans are a versatile food that can play an important role in your personal food guide pyramid."

An excellent illustration shows a whole soybean, divided like a pie chart into its major macronutrients. Address: P.O. Box 419200, St. Louis, Missouri 63141-9200.

10249. Kanno, Akishige; Takamatsu, Haruki. 1995. Studies on natto. V. Determination of gamma-polyglutamic acid in natto using cetyltrimethylammonium bromide]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society of Food Science and Technology*) 42(11):878-86. [27 ref. Eng; jap]

• ***Summary:*** A simple and rapid spectrophotometric method has been established for determination of gamma-polyglutamic acid (gamma-PGA) which is the sticky material in fermented soybean food natto. The method is based on the complex formation between gamma-PGA and cetyltrimethylammonium bromide (CET) (from journal@rchive). Address: Asahi Shokuhin Co. Ltd., 180-2 Wado, Ushibori-machi, Namekata-gun, Ibaraki, 311-24, Japan.

10250. Kushi, Michio. 1995. Guide to standard macrobiotic diet: Kushi Macrobiotics Corp. edition. Becket, Massachusetts: One Peaceful World Press. 64 p. Nov. Illust. No index. 22 cm.

• ***Summary:*** Introduction. Part I–Basic principles of standard macrobiotic diet. Part II–Summary of daily dietary recommendations. Part III–Standard macrobiotic dietary practice: Whole grains, soup (incl. miso soup), vegetables, beans (incl. azuki beans, black soybeans, tofu, dried [frozen] tofu, tempeh, natto, okara), sea vegetables, fish and seafood, fruit, pickles, nuts, seeds snacks, condiments, seasonings, garnishes, desserts, beverages, modifications, helpful eating hints. Part IV–Proposed one week meal planner. Macrobiotic resources: The Kushi Institute, The One Peaceful World Society. Kushi Macrobiotics Corp. background (formed in May 1994 to market a line of natural, macrobiotic foods). Michio Kushi: Brief biography (Age 69, he is Chairman of the Board and Director of Research of Kushi Macrobiotics Corp.). On the rear cover is a portrait photo of Michio Kushi with his autograph in both English and Japanese.

Note: This book is designed to promote the Kushi Cuisine line of macrobiotic foods. A half-page black-and-white photo of that line of foods is shown facing the inside rear cover. The slogan is: "Perfect replacements for imperfect foods." Kushi Macrobiotics Corp. is located at Three Stamford Landing, Suite 210, Stamford, Connecticut 06902. Phone: 203-973-2929. Address: Becket, Massachusetts.

10251. Melina, Vesanto; Davis, Brenda; Harrison, Victoria. 1995. Becoming vegetarian: A complete guide to adopting a healthy vegetarian diet. Summertown, Tennessee: The Book Publishing Co. x + 262 p. Foreword by Suzanne Havala. Index. 26 cm. [20 ref]

• ***Summary:*** An excellent vegetarian and vegan sourcebook and cookbook by three registered dietitians. Contents: Acknowledgements. Foreword. Introduction. 1. What is a vegetarian? 2. The evidence is in. 3. Without meat–exploding the myths. 4. Without dairy products. 5. Veganism: More food for thought. 6. Fats and oils: A balancing act. 7. Fiber: The gift from plants. 8. The vegetarian food guide: Putting it all together. 9. Vegetarian nutrition in the growing years. 10. Vegetarian diplomacy. 11. From market to meals. 12. Recipes: Simple treasures. Appendixes: 1. Glossary. 2. Nutrition recommendations.

This book contains a wealth of accurate, positive information about many different types of soyfoods (especially tofu) and related subjects, including tofu, soymilk, tempeh, miso, soy yogurt, soy cheese, soy sauce, tamari, and soy oil (incl. omega-3 fatty acids). Plus wheat gluten, seitan, rice milk, sea vegetables, adzuki beans (p. 66, 162), quinoa, amaranth, macrobiotics, phytochemicals, plant estrogens found in tofu and other soy products (p. 75; they may contribute to positive calcium balance and have a protective effect on the bone health of Chinese and Japanese women), dietary fiber.

Talk with Vesanto Melina. 1996. July 22. This book was originally published in Canada in May 1994 by Macmillan Canada in Toronto. A revised U.S. edition was published in Nov. 1995 by The Book Publishing Co. in Summertown, Tennessee. Address: Canada.

10252. Morinaga Nutritional Foods, Inc. 1995. Made for each other. I want low fat. I want dairy-free. And I want chocolate (Ad). *Vegetarian Times.* Nov. p. 66.

• ***Summary:*** This full-page color ad shows a packet of Mori-Nu Mates Chocolate Pudding & Pie Mix next to a package of Mori-Nu Lite Silken Tofu. On the left side of the ad, standing is a lovely, slim, long-haired Japanese-American lady dressed in a tight black skirt. Her head is thrown slightly back and she half laughs, half smiles, while she eats with a silver spoon from a little glass bowl of Mori-Nu Chocolate Dream Pudding tofu dessert that she holds in her right hand.

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The mix is sweetened with Sucanat. "Indulge your taste for chocolate without guilt."

This ad also appeared in the Jan. 1996 issue (p. 29) of this magazine. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-NOW-TOFU or 310-787-0200.

10253. Nelson, Kent. 1995. Re: Soydiesel. Letter to Kenlon Johannes, National Biodiesel Board (NBB), Missouri, Dec. 13. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "I appreciate your coming to Asia to promote biodiesel and look forward to working closely with you."

"I have been talking with the Vice Chairman of the Nagano Winter Olympic Committee (ex-vegoil crusher who owns 35 gas stations) for a while now about getting them to use soydiesel in the '98 Games. While it's been an uphill battle with no supplies, no testing having been done, no precedents, they have remained open minded and willing to listen The other members of his firm would like to know about biodiesel in Europe. For example, was it used in the French Winter Games in 1990? How much is sold in the EU / Germany? Is it common? Is it expensive compared with other fuels? Does the government give it preferential tax credit? Other subsidies? Is there anything else you know about the EU and biodiesel?"

He has other questions about the USA. Address: American Soybean Assoc., 7th floor, Tameike Tokyu Bldg., 1-1-14 Asakusa, Minato-ku, Tokyo 107, Japan. Phone: (03) 5563-1414.

10254. Ledvinka, Ferro. 1995. Introducing macrobiotics and soyfoods to Italy (Interview). *SoyaScan Notes.* Dec. 24. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Ferro was a pioneer of macrobiotics in Italy. In the process he also helped to introduce soyfoods, especially to Florence. He first learned about macrobiotics when he read a book on macrobiotics in Italy. He started eating a macrobiotic diet. In Rome there was a macrobiotic center founded and run by Marquesa Parvolo, who had been cured of leukemia or a blood disease by George Ohsawa several years before. In 1971 he heard a lecture at this center in Rome by Rob Dobrin, who gave him Michio Kushi's address in Boston, Massachusetts. In the summer of 1972 he traveled to Boston to study macrobiotics, and there he learned how to make tofu and seitan. After leaving the USA, he returned to Italy, living in Rome. From there he worked to spread macrobiotic food and philosophy to all major Italian cities.

In Jan. 1977 Ferro went to Japan to work with Mr. Kazama at Mitoku, exporting macrobiotic foods to Italy and other European countries. The first Italian company to order these foods (including Japanese miso and tamari) was ProBios in Florence. They were followed by two Italian Macrobiotic Centers, located in Rome and Milan. In Oct. Ferro left Japan, returned to Italy, lived in Rome for a while, then moved to Florence, where he established the pioneering Fondazione Est-Ouest at via de Serragli 4, in Florence. This was a combination macrobiotic restaurant and macrobiotic study center. Ferro also worked for a while with ProBios. He taught various people to make tofu, seitan, and tempeh–but none of the restaurant customers would buy or eat these strange new foods. So Ferro decided to fry them and serve them as a snack, free of charge, before each meal. A Tuscan proverb says that "Even a slipper, if fried, tastes good." In this way people in Florence started to eat these new foods. The restaurant made and served these foods from about 1982 to 1985. Then people who were working in the restaurant moved to another place, became independent, and they started a small food factory named Soyalab. The founder of Soyalab, Matteo Iacovelli, is now the chairman of the Kushi Institute in Milan. Another person who helped a lot on the way was Alfredo Ingannamorte. These people learned how to make tofu and tempeh in Boston. Alfredo studied at the Kushi house in Becket. Matteo worked at a macrobiotic restaurant (Open Sesame) in Brookline Village. Address: Via Pellicceria 6, 50123 Firenze (Florence), Italy. Phone: 055-827 274.

10255. Huang, H.T. (Hsing-Tsung). 1995. Early history of soybeans and soyfoods in China (Interview). *SoyaScan Notes.* Dec. 28. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The early *jiang* in China was made from meat or fish. The *jiang* used by Confucius was almost surely made from meat and fish. Many of the ancient books were annotated during the Han dynasty in an attempt to explain the meaning of certain words and passages. A very eminent scholar in the late Han dynasty (about 100 A.D.), talking about events in roughly 500 B.C., said that the *jiang* used by Confucius was made from meat and fish.

The soybean was not an important crop in China until the early Han, say 200 to 300 B.C. The soybean is mentioned in the *Book of Odes,* which is the most ancient and most reliable of Chinese books, not as a crop but as a plant that people gathered from the wild. Then is are a series of books that were traditions of the Chou dynasty; these were codified and gathered by about 300 B.C., but in them there are not many references to the soybean. However by the time of the Western (Former) Han (206 B.C. to 8 A.D.) there were references in the literature to cartloads and big urns of *jiang* [Chinese-style miso]; *shi* (fermented black soybeans) was also mentioned many times in the literature. Both these foods had become commodities.

Soy is also found in the Han Tomb No. 1 at Ma-wang-tui (pronounced "ma-wang-DUI"), a big archaeological find in China. A woman ruler was buried here in about 165 B.C. with all the 5-6 major grains, including wheat, barley, rice, 2 kinds of millet, soybean (*shu*), and hemp. Also found in the tomb were several seasonings including "soy sauce (*jiang*),

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shi ('salted darkened beans'), and leaven (*qu*)."

The earliest reference to pasteurization in China concerns pasteurization of wine, around the 11th century, long before the Japanese were pasteurizing shoyu before shipping it to Holland. He is not aware of any early reference to the Chinese pasteurizing soy sauce, but he will look again. However soy sauce is so highly salted that it does not require pasteurization, whereas wine does. The wine was filled into to earthenware jars with a small mouth, which was covered with cloth or leaves, then sealed with mud.

Dr. Huang will travel to China next month (to Foochow, capital of Fujian province) and he hopes to see some of the existing traditional fermentation processes. Soymilk was not an important traditional food in China, but it was becoming important when he traveled there in the 1940s with Dr. Joseph Needham. When they visited northern China, early in the morning people would have a huge iron wok of hot soymilk, which they sold for breakfast. Joseph liked the soymilk with bits of *youtiao* (deep-fried bread sticks; W.-G. *yu t'iao*).

One of the chapters in Dr. Huang's book deals with nutrition in China. The Chinese diet is said to be lacking in calcium. It is well know that for calcium to be absorbed, you need lactose, and the ability to tolerate lactose. Thus, it would be surprising to find higher bioavailability of the calcium in soymilk or tofu. Before the time of Confucius (551-479 B.C.) the Chinese ate a lot more animal products than they do now, but the agricultural system developed with the emphasis on grains, less emphasis on animal products, and no emphasis on milk–probably because of the lactose intolerance of the Chinese people. Thus, the Chinese never developed a dairy industry. Mongols are not as lactose tolerant as northern Europeans, but they are heavily dependant on animal milks as a source of food. They get around this problem by converting animal milk into yogurt. This fermentation converts the lactose to lactic acid, which both solves the lactose intolerance problem and extends the life of the product by lowering the pH.

Another interesting problem: Europeans are the only ones who make true cheese, using rennet. The Mongolians and all the pastoral people in Asia rely on various animal milks, including horse's milk to make koumiss, and they even make a type of cheese that is sort of like cottage cheese, coagulated by acid. Dr. Huang thinks the discovery of rennet is one of those major, accidental discoveries that is very rare. If you wash an animal stomach carefully before using it to store milk, that will wash all the rennet away. Another such major discovery is the Chinese discovery of *chu* or koji. Address: 309 Yoakum Parkway #403, Alexandria, Virginia 22304.

10256. Johannes, Kenlon. 1995. Re: Shipment of fuel to JOMO. Letter to Kent Nelson, ASA-Japan, Dec. 28. 3 p. Typed.

• ***Summary:*** JOMO refers to the JOMO Technical Research Center, Saitama prefecture, Japan. The fuel [soy biodiesel] supplier is Ag Environmental Products; contact Bill Ayres or Doug Pickering. They will ship it in 5-gallon plastic containers. The cost will be 500,000 yen, paid for by the American Soybean Association, 7th floor, Tameike Tokyu Bldg., 1-1-14 Asakusa, Minato-ku, Tokyo 107, Japan. Attached are 3 letters, two of these from ASA-Japan. Address: Executive Director [National Biodiesel Board, Missouri].

10257. Davis, Susan K. 1995. Bite into the tofu market. *Soybean Digest.* Dec. p. 18j, 18l.

• ***Summary:*** Some U.S. soybean farmers (such as Peter Yoder of London, Ohio) are earning good money by growing food-grade soybeans for the Japanese tofu market. They pay careful attention to harvesting and handling, reduce split, and have no cracked beans. The beans are usually shipped to Japan in containers just used to ship Japanese goods (such as auto parts) to the USA. This is a very difficult market to break into; once you do you must work hard to stay there and build brand equity, according to Gunner [Gunnar] Lynum, head of Strategic Marketing Development in Kankakee, Illinois. Machinery and labor costs are much higher, and you need special handling and/or packaging, plus extra marketing time. Premiums of up to 50% above standard prices are available to farmers who grow soybeans organically for the Japanese organic tofu market, according to Yoshiko Kojima, a consultant to the American Soybean Association.

The top ten tips for growing soybeans for tofu use are: Grow clear hilum beans. Be sure the protein is above 45% on a dry weight basis. Keep the oil low (18%). Keep the sucrose level high. Plant Vinton 81 or Beeson 80, or the new FG1 or FG2. Don't use artificial drying. Have uniform large-size soybeans. Keep these soybeans identity preserved, separate from other soybeans. Ship only soybeans with good eye appeal. Clean the soybeans of dirt and weed stains. Color photos show: A tofu shake with tofu cubes and sliced strawberries. A tofu chocolate cream pie.

10258. Hirose, K.; Tajima, K.; Hamajima, N.; Inoue, M.; Takezaki, T.; Kuroisha, T.; Yoshida, M.; Todudome, S. 1995. A large-scale, hospital-based case-control study of risk factors of breast cancers according to menopausal status. *Japanese J. of Cancer Research* (*Gann*) 86:146. *

• ***Summary:*** This study in Japan found that in premenopausal women (but not postmenopausal women) the consumption of tofu 3 or more times per week was associated with a statistically significant decreased risk of breast cancer (of approximately 20%), in comparison with the consumption of tofu less than three times per week.

10259. Kohyama, Kaoru; Sano, Yoh; Doi, Etsuhiro. 1995. Rheological characteristics and gelation mechanism of tofu

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(Soybean curd). *J. of Agricultural and Food Chemistry* 43(7):1808-12. *

10260. Beversdorf, W.D.; Buzzell, R.I.; Ablett, G.R.; Voldeng, H.D. 1995. Soybean. In: A.E. Slinkard and Douglas R. Knott, eds. 1995. Harvest of Gold: The History of Field Crop Breeding in Canada. Saskatoon, Saskatchewan: University Extension Press, Univ. of Saskatchewan. ix + 367 p. See p. 153-66. Chap. 13. [14 ref]

• ***Summary:*** An outstanding history of soybean breeding and production in Canada. Contents: Introduction. Evolution of the soybean crop in Canada. Early breeding efforts. The emergence of soybean as a significant Canadian crop (1940-70). The modern soybean breeding era [1970 on]. Current breeding objectives and methods.

Before 1930, soybeans were "grown primarily for annual forage production when traditional forage crops failed to survive Ontario winters." The appearance of two short-lived soybean crushing facilities in southwestern Ontario [at Milton in about 1930 and Chatham by April 1933] aided the transition of soybeans from a fodder crop to a grain legume crop.

"Evolution of Canada's soybean crop since 1949 reflects the expertise of soybean producers, dramatic improvement in production technology, improved and earlier maturing cultivars, improved domestic processing capacity and significant export market development."

"Soybean in Canada was born in the vision of C.A. Zavitz, arguably a man 50 years ahead of his time. Zavitz, who was head of the Field Crop Department of the Ontario Agricultural College (OAC) meticulously evaluated and selected soybean introductions for both fodder and grain production for 30 years (Zavitz 1927)."

"In 1893, Zavitz planted the first Canadian soybean crop, probably as a replacement for a field pea that failed to establish that year." Over the years, "Zavitz and two of his colleagues W.J. Squirrel and A.E. Whiteside, evaluated about 100 soybean introductions from the Orient [East Asia] via the United States and Japan for forage and grain production (Zavitz 1927)."

Early soybean breeding in Canada (before 1920) primarily involved the meticulous separation and selection of pure lines from heterogeneous seed introductions. "For example, Zavitz selected and evaluated 34 lines from nearly 10,000 plants from the Habaro cultivar obtained from the" USDA in 1909 (Zavitz 1927).

In 1923 A.E. Matthews and F.W. Dimmock of the Central Experimental Farm (CEF [part of the Dominion Experimental Farms]) conducted a soybean trial at the Harrow Research Station (HRS). "Dimmock continued soybean testing at Harrow until 1929, when Casper Owen took over (Ward 1978)."

The pioneering work of Zavitz (OAC), Dimmock (CEF) and Owen (HRS) to identify and develop soybean varieties adapted to southern Canada created "a base of soybean germplasm and technical knowledge that would support evolution of the soybean crop during and after" World War II.

During and after the war, the main soybean breeders in Canada were C.W. Owen at HRS and F. Dimmock at CEF. Varieties released after 1940 were mainly the result of pollinations among earlier selections from plant introduction and of pedigree selection procedures (Bernard et al. 1988).

The rapid growth in Canadian soybean production in mid-1940s can be attributed to: A large growth in the demand for oil and protein during the war, the appearance of Victory Mills Ltd. in Toronto, improved varieties, promotion and extension efforts by Ivan M. Roberts (of the Field Husbandry Dept. of OAC in 1948 but agronomist for Victory Mills by 1953), and improved inoculant produced by the Microbiology Dept. of OAC. From the 1940s until the late 1970s nearly all of Canada's soybeans were produced in five southwestern Ontario counties: Elgin, Essex (incl. Pelee Island in the middle of Lake Erie; a southernmost point in Canada), Kent, Lambton, and Middlesex (see map near front of book).

Key soybean varieties of the period 1940-1970 are shown in Table 3. One key variety was Harosoy, released by HRS in 1951. Other key soybean breeders were Baldur Stefansson (from 1952) at the University of Manitoba that lead to Portage and Altona. G.E. Jones (from 1953) at OAC that led to Vansoy. John Giesbrecht (from 1959) at Morden (southern Manitoba) that led to Morsoy. A.A. Hildebrand was a pathologist who pioneered early research on phytophthora root rot; he worked with Owen to establish a program of disease resistance breeding at Harrow.

The 1960s: In 1961 Dimmock retired from CEF and was replaced by Lorne Donovan as an adjunct to his corn breeding program. In 1963 Owen retired from HRS and was replaced by R.I. Buzzell. Very early maturing introductions came from Sven Holmberg of Sweden. "Holmberg's material proved to be significant germplasm for Canadian soybeans. He derived it from crosses involving Manchurian and northern Japanese germplasm selected under the cool short-season environments (58º30'N) of Fiskeby, Sweden (Tanner 1973)."

Harosoy 63 dominated Canadian soybean production by the late 1960s. During this decade "two Ontario counties (Essex and Kent) produced nearly two-thirds of the Canadian soybean crop."

In 1974 H. Voldeng took over the soybean breeding program at CEF. In 1976 W. Beversdorf joined the University of Guelph with split responsibilities in soybean and field bean breeding and genetics. In 1982 G. Ablett initiated a soybean breeding program at the Ridgetown College of Agricultural Technology (RCAT). In 1976 CEF released Maple Arrow, a milestone cultivar, with parentage that included a Holmberg line. Maple Arrow, which was

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well adapted to the short-season areas of Ontario, combined with the higher prices of the early 1970s, sparked a soybean expansion northward and eastward.

The last two sections of this chapter are the longest and most detailed.

Figures show: (1) Graph of soybean production in Canada, 1945-1991. (2) Average yield of soybeans in Canada, 1938-1992.

Tables: (1) Early soybean selections and evaluation (OAC No. 211, Mandarin, Habaro No. 20405, Early Yellow). For each is given: Average height (inches), green fodder production (tons / acre). Yield of grain (lbs / acre). Source: Zavitz 1927.

(2) Early Canadian soybean cultivars (OAC 211 {released 1923}, A.K. (Harrow) {1933}, Mandarin (Ottawa) {1934}, Kabott {1937}, Pagoda {1939}, Goldsoy {1938}). For each is given: Source (pedigree, e.g., Habaro). Institution (e.g., OAC). Year licensed or released (1923-1939). (3) Canadian soybean cultivars of 1940-1970 (Harman {released 1943}, Capital {1944}, Manchu (Montreal) {1944}, Harly {1951}, Harosoy {1951}, Acme {1953}, Comet {1953}, Hardome {1953}, Crest {1957}, Merit {1959}, Portage {1964}, Altona {1966}, Harwood {1970}, Vansoy {1970}). For each is given: Pedigree, institution, year.

(3A) Public and private breeding of soybeans, Canada and USA, 1973-1992. The impact of privately funded soybean breeding programs has increased steadily since 1973, when the first privately bred variety was registered in Canada. This "private" variety was bred by N.R. Bradner in the USA and introduced to Canada by St. Clair Grain and Feed (a division of Maple Leaf Mills Ltd.). In 1973 in Canada there were 170 acres of privately bred soybean seed compared with 14,181 acres developed by publicly funded breeders. In 1982 the figures were 6,066 and 27,354 respectively. In 1987 the figures were 28,148 and 29,960 respectively. And in 1992 the figures were 43,004 acres private and 26,727 acres public. In this 20-year period, 120 private soybean varieties and 51 public varieties were registered. 27% of the private varieties and 81% of the public varieties came from U.S. breeding programs.

(4) Typical breeding cycle in the University of Guelph breeding program. Columns: Year and season, activity, location. The typical cycle is about 8 years. (5) Canadian soybean breeding programs (1991): Columns: Organization (public sector and private sector). Breeder (6 + 5 = 11 breeders in both sectors).

The Ontario Soybean Growers' Marketing Board identified export opportunities for both large-seeded yellow hilum cultivars (for tofu and miso) and small-seeded cultivars (natto type) in Pacific Rim markets. "The first natto-type emerged from CEF [Central Experimental Farm, Ottawa] in 1981, six years after D. Durksen of Continental Grain Company reported the potential export opportunity for small-seeded soybean to Japan. King Grain (N.R. Bradner) and CEF (Harvey Voldeng) each released three additional natto-type cultivars (Nattoking 86, Nattoking 87, Nattoking 88, Canatto, Nattosan and TNS) during the 1980s" (p. 8-9). Address: 1. Ciba Seeds, Greensboro, North Carolina; 2. Agriculture and Agri-Food Canada Research Station, Harrow, Ontario; 3. Ridgetown College of Agricultural Technology, Ridgetown, Ontario; 4. Agriculture and Agri-Food Canada Research Station, Ottawa, Ontario.

10261. Inoue, Shôroku. 1995. Kinako dorinku ga kiita! [The kinako drink worked / was effective!]. Tokyo: Makino Shuppan. 72 p. 26 cm. [Jap]
• ***Summary:*** Kinako is roasted whole soy flour. The author was born in 1941.

10262. Kikkoman International, Inc. 1995. Kikkoman industrial products (Brochure). San Francisco, California. 6 p. 28 cm.
• ***Summary:*** On the cover of this glossy color brochure is a 12 oz bottle of Kikkoman all-purpose soy sauce against a textured beige background. "The world's leading soy sauce manufacturer offers two lines of naturally brewed soy sauce for the industrial market: one liquid and one dehydrated. And that means a world of natural flavor solutions for you." For each product is given the product name and code, description, benefits / applications, and ingredients.

The liquid products are: Soy sauce. Preservative-free soy sauce. Lite soy sauce. Less salt soy sauce. Teriyaki sauce. Premium soy sauce–PTN (Higher total nitrogen than regular soy sauce. Ingredients: Water, soybeans, wheat, and salt).

The dehydrated products are: Dehydrated soy sauce–SN-1 (spray dried). Dehydrated soy sauce–KS-32. Dehydrated soy sauce–RS-50. Dehydrated teriyaki sauce. Natural flavor enhancer. Dehydrated soy sauce–HN. Granulated soy sauce.

On the rear cover is a description of naturally brewed soy sauce, and a comparison of it with non-brewed soy sauce (which "is often opaque with a harsh, overpowering flavor and pronounced chemical aroma"). A table lists other industrial products from Kikkoman. Address: P.O. Box 420784, San Francisco, California 94142-0784. Phone: (415) 956-7750.

10263. Kushi, Michio; Jack, Alex. 1995. Das grosse Buch der Makrobiotik: Ein universaler Weg zu Gesundheit, Glueck und Frieden [The big book of macrobiotics: A universal way to health, happiness, and piece]. Munich, Germany: Droemer Verlag. [Ger]*
Address: Boston, Massachusetts.

10264. Masuoka, Hiroshi. 1995. Masuo-san no oishii miso zukuri: wakasa no kenkô no moto [Mr. Masuo's way of making delicious miso: The source of youth and health]. Tokyo: Jakometei Shuppan. 110 p. Illust. (color). 21 cm.

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[Jap]*
Address: Japan.

10265. Nakano, Makiko; Smith, Kazuko. 1995. Makiko's diary: a merchant wife in 1910 Kyoto. Translated with Introduction and Notes by Kazuko Smith. Stanford, California: Stanford University Press. xii + 256 p. With introduction and notes by Kazuko Smith. Illust. Maps. Index. 24 cm. [100+* ref]
• ***Summary:*** This diary was written by Makiko Nakano (1890-1978). A somewhat blurry photo of her (taken ca. 1910) faces the title page. Sample pages from her actual diary are shown occasionally (see p. 56). She is married and her parents also both live in Kyoto. Tofu and miso were a regular part of her family's diet.

Jan. 1 [1910] (p. 57). Jan. 1. New Year's day. Black [soy] beans (*kuromame*) are served for lunch.

Feb. 1 (p. 81): "Because it was a cold night with a howling wind outside, I decided it would be a good chance to make frozen tofu. I took the tofu I bought for this purpose out onto the big roof, poured hot water over it, and left it there overnight. It was bitter cold. I thought my ears were going to freeze." Endnote (p. 82): "5. *Kôya-dôfu* or *shimi-dôfu.* Freezing coarsens the tofu, which then takes on a distinctive flavor when cooked in a mixture of soy sauce and sugar."

"The family custom was to serve the same menu on the first day of each month." That menu was miso soup. salad of grated radish and carrots, and broiled mackerel."

Feb. 2. As soon as she awoke in the morning, she thought about the tofu she had left outside the previous night. She hurried up to the roof in spite of the cold. "It was frozen solid. In fact it was so thoroughly frozen and stuck to the board that pouring hot water over it did not help much to loosen it." She was finally able to dislodge it by pounding it with a hammer for some time. She cooked it with *katsuo-dashi* right away and served it to her husband for breakfast. He complained about it (p. 82).

On Feb. 2 she again put out tofu on the roof to freeze. First thing next morning she rushed up to se it. "It was beautiful! I soaked it in hot water first, then cooked it in soy sauce, *sake,* and sugar. It was perfect and he liked it! My experiment was a success."

Note: This is the earliest English-language document seen (April 2013) that uses the term *shimi-dôfu* to refer to dried-frozen tofu.

Kôya-dôfu is mentioned on page 93. Regular tofu is mentioned on pages 10, 24, 25, 60, 68, 87, 89, 93, 117, 227. Soy sauce is mentioned on pages 82, 83, 225, and 252. Miso is mentioned on about 21 different pages (see index). Address: Kyoto, Japan.

10266. Northrup, Christiane. 1995. Heal your symptoms naturally. Potomac, Maryland: Phillips Publishing Inc. 18 p. 28 cm.
• ***Summary:*** In the section titled "Natural healing for menopause" (p. 1-3) Dr. Northrup advises women to take natural progesterone, since their body stops producing its own progesterone during menopause. This supplement provides relief from both hot flashes and mood swings for many women. "For two weeks out of every month, use a little progesterone cream on the soft areas of your skin, changing sites often... Another form of natural progesterone is plant progesterone. There are many sources. The most common are soy foods and yams (not sweet potatoes)." Also take a safe form of estrogen–estriol. It can be applied as a vaginal cream and may protect against breast cancer. "Natural estrogens such as estriol have been in use for over 50 years, and are considered generic. Although these natural hormones aren't very common in the U.S., estriol is one of the more popular estrogens in Europe." To find a U.S. source call the Women's International Pharmacy at 1-800-279-5708.

"Natural plant hormones with estrogen-like effects are found in soy products, such as soy milk, tofu and miso, in addition to cashews, peanuts, oats, corn, wheat, apples and almonds. Japanese women go through menopause more easily than American women, partly because their diet is so high in the natural estrogens found in soy products. (Note: If you still have your uterus, never take estrogen of any kind without balancing it with progesterone.)"

In the section titled "Natural healing for breast cancer" (p. 6-7) notes that you can lower your risk through diet. "Eat soy products, You can also protect your breasts with tofu. A study published in the September 1994 issue of the *American Journal of Clinical Nutrition* demonstrated that women who ate 60 grams of soy protein per day (about 2 ounces) had changes in the estrogen levels that were similar to the effects of tamoxifen–an antiestrogen drug that is undergoing study as a possible prophylactic agent in women who are at high risk for breast cancer.

"The effects of soy protein on hormonal levels are thought to be from estrogen-like substances in soybeans called isoflavones. These behave like partial estrogen agonists/antagonists, which means they help increase the effects of estrogen in women who have estrogen levels that are too low, while helping to decrease the effects of estrogen in women whose estrogen levels are too high.

"While we're waiting for more research on the subject, I'd recommend adding soy protein to your diet regularly. In addition to tofu, soy protein is found in tempeh, miso and natto. These products are sold in many grocery stores and in almost all health food stores." Address: M.D. (gynecologist), Women to Women, Yarmouth, Maine.

10267. Whitley County Historical Society (Indiana). 1995. Whitley County and its families, 1835-1995. Paducah, Kentucky: Turner Publishing Co. 232 p. See p. 21. Illust. 1 map. 29 cm. *

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• ***Summary:*** The entry for "Shinzo Ohki" (p. 21) states: "Shinzo Ohki died at age 84 just after beginning a game of golf–a game he loved.

"Ohki was born in Japan in 1883, one of nine children. He studied English and went to night school, saving enough money to come to the United States. He became acquainted with Mr. and Mrs. William Distin of Columbia City, Indiana, and was employed in their home." In 1907 he graduated from Columbia City High School, and in 1911 from New York University.

Ohki founded the Oriental Show-You Co., in Columbia City, Indiana, "for the production of oriental sauce [soy sauce] and chop suey. He sold the company in 1962 to Beatrice Food Company of Chicago [Illinois]. During its operation there, the company distributed its products throughout the Midwest and employed many people.

"Ohki was a trustee and elder in the Columbia City Presbyterian Church and was an active Rotarian."

10268. Gorbach, S.; Golden, B.; Adlercreutz, H. Assignors to Tufts University. 1995? Method of treatment for menopausal and pre-menstrual symptoms (Soy isoflavones and menopause). *U.S. Patent* 5,498,631. Application filed April 1992. *

• ***Summary:*** This is a patent for "method of use." It is a method of lessening post-menopausal symptoms through administration of isoflavones. No one else can make this claim. Another company could sell isoflavones, but without the claim that they relieve menopausal symptoms.

This is a short patent, only 2½ columns long. It contains only one example, which is not an example of the invention. It is a paragraph or two from one of their earlier articles, saying that they measured the estrogen content of urine from Japanese women, and they noticed that it was high in isoflavones. Conclusion: The cause is the soy they consume. They are aware of the article by Wilcox.

10269. Yasuda, Masaaki. 1995? Characterization of tofuyo (Fermented tofu) (Web article). http://www.agriqua.doae.go.th/worldfermentedfood/I _12_ Yasuda.pdf. 12 p. Undated. Printed 3 Nov. 2011. [12 ref. Eng]

• ***Summary:*** Contents: Introduction. Process for making tofuyo (3 steps): 1. Process for making tofu and dehydrated tofu. 2. Process for making rice koji (inoculated with *Monascus* mold to make red rice koji). 3. Soaking and ripening. Chemical and physical characterization of tofuyo: 1. Chemical changes during the ripening period. 2. Physical changes of tofuyo during the ripening period. Physiological function of tofuyo. Characterization of tofuyo making ("The major characteristics in tofuyo making are that we do not have a process of molding on tofu-cubes and brining as done for sufu. Red-koji and awamori are used in our process").

Tables: (1) "Effect of steaming methods and varieties of rice on the production of enzymes and pigment of red koji." (2) "Changes in chemical composition of tofuyo prepared by *Monascus* fungus during the ripening period." (3) "Changes in breaking charcteristics of tofuyo during the ripening period" (breaking strain, breaking stress, breaking energy). Flow chart of making tofuyo.

Figures: (2) Graph of "Changes in protein solubility ratio of tofuyo during the ripening period." The ratio steadily increases.

"Tofuyo is very similar to the foods called sufu, tou-fu-ju and furu in China or tau-hu-yee in Thailand and its root is considered as sufu in China. It was brought to Okinawa from Fujian, China and has been introduced since at the period of the Ryukyu dynasty in the 18th century."

"Traditionally, tofuyo is consumed directly as relish with liquor such as awamori or as cakes served with tea Recently it has been used in sushi, cracker-spread, and many kinds of hors-d'oeuvre in the restaurants. Because tofuyo is a cream cheese-type product and has a mild flavor it would be expected to be suitable for use in western countries due to cholesterol free and low salt vegetable food for health" (p. 7). Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, Senbaru, Nishihara-cho, Okinawa 903-0213, Japan.

10270. Johannes, Kenlon. 1996. Re: Video on biodiesel production. Letter to Mr. Wilhelm Hammer, Vogel & Noot, Industrieanlagenbau GMBH, 8055 Graz, Austria, Jan. 11. 13 p. Typed, with signature on letterhead.

• ***Summary:*** Vogel and Noot's video on biodiesel plant production was mailed to Mr. Y. Araki, Muko-shi, Kyoto, Japan. Attached to the cover letter are 12 p. of letters and articles related to biodiesel in Japan. One is a small article (no date or source) which states: "Japanese town builds methyl ester facility. Aito-cho, a town in Shiga Prefecture, Japan, is constructing a facility to produce methyl ester from used household edible oil... the town plans to recycle the spent edible oil for use as a biodiesel fuel."

The NSB letterhead has a new logo in the upper left corner. The word "Biodiesel" (a registered trademark) is written in all capital letters with the first three letters solid blue and the rest with a thin black outline. Above and to the left of the "Bio" is the thin blue outline of a white cloud. Address: Executive Director, National Biodiesel Board, 1907 Williams St., P.O. Box 104898, Jefferson City, Missouri 65110-4898.

10271. Hymowitz, Ted. 1996. Thoughts on growing soybeans in tropical Third World countries such as Cuba: Beware of plant diseases and insects (Interview). *SoyaScan Notes.* Jan. 15. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Tropical countries have no winter, so the diseases and insects continue to accumulate, until they get out of hand. The warmer the country and the closer to the

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equator, the bigger the problem. The main way of combating diseases is by breeding in resistance to specific diseases; this is done in the southern states of the USA. But there are limits to its effectiveness, so farmers tend to spray on more and more agrichemicals to combat both insects and diseases. Diseases have been devastating to soybeans in Indonesia, Taiwan (which now grows mainly green vegetable soybeans for Japan), Malaysia, and they will become devastating to soybeans in new countries like Cuba. In Southeast Asia, the main disease is soybean rust. Note: Havana, Cuba, lies on the Tropic of Cancer, 22.5º north of the equator; Sao Paulo, Brazil, lies on the Tropic of Capricorn, the same distance south of the equator.

In Illinois almost no chemical sprays are used against insects or diseases, but herbicides are widely used at both the preemergence and emergence stages. These herbicides do not end up in the soybeans, whereas the chemicals sprayed on the plants when they are more mature do end up in the seeds. Address: Prof. of Plant Genetics, Univ. of Illinois, Urbana, Illinois.

10272. Kushi Macrobiotics Corp. 1996. Kushi Cuisine order form. Stamford, Connecticut. 2 p. Revision #3. Jan. 19.
• ***Summary:*** This 1-page (back-to-back) photocopied order form lists 26 meals, seasonings, and snacks, which range in price from $4.39 to $0.99. Soy-related items include: Buckwheat noodles (soba style) + soy-ginger sauce (4 servings, $4.39). Quick brown rice + red azuki beans & onions (4 servings, $2.59). Instant miso soup + garden & sea vegetables + shiitake mushrooms (12 servings, $3.99). Instant chicken-free vegetarian noodle soup + tofu & mushrooms (6 servings, $3.99). Traditional premium (shoyu style) soy sauce (10 oz, $2.99). Wheat-free premium (tamari style) soy sauce (10 oz, $3.59). Postage for $0 to $10.00 is $4.95. Address: P.O. Box 1434, Stamford, Connecticut 06904. Phone: 1-800-200-4184.

10273. **Product Name:** [Mansan Tamari Shoyu].
Foreign Name: Tezukuri osashimi tamari.
Manufacturer's Name: Corti Brothers (Marketer-Distributor). Made in Aichi prefecture, Japan, by Mansan Shoten.
Manufacturer's Address: Corti Bros.: 5810 Folsom Blvd., Sacramento, CA 95819. Phone: 916-736-3800.
Date of Introduction: 1996 January.
Ingredients: Whole soybeans, well water, salt, sake [to preserve freshness].
Wt/Vol., Packaging, Price: 300 ml glass bottle. Retails for $7.99 (Jan. 1996).
How Stored: Shelf stable; refrigerate after opening.
Nutrition: Per 1 tablespoon (15 ml): Sodium 890 mg. Calories 10. Protein 1 gm.
New Product–Documentation: Sample (product with Label) sent by Darrell Corti of Corti Brothers in Sacramento. Corti Brothers Newsletter. 1996. Winter. p. 5-6. "The Mansan company has been making shoyu since 1874. Both a sake producer and a shoyu brewer, the plant outside Nagoya is a remarkable amalgam of traditional equipment and technology and modern science." Darrell was the first Westerner to visit the plant. He had to remove his shoes and put on clean slippers so as not to introduce foreign microorganisms. "Seeing the battery of enormous cedar casks packed with stones, the daily ladling process, and the scrupulous cleanliness is an extraordinary experience." The processing of this soy sauce takes up to 18 months. Soybean koji is mixed with water and salt, then placed in enormous cedar casks. "A bamboo bucket is inserted into the mash and large flat river stones are piled on top to keep the mash submerged. The fermenting liquid is ladled out of the bucket which acts like a percolator and is poured over the stones daily to trickle down on the rest of the mash, assisting fermentation and concentrating the liquid. With the daily aeration and the long production cycle, the [tamari] shoyu becomes thick and dense. It turns a rich, dark brown color and has an enticing aroma."

Talk with Darrell Corti. 1996. His company started selling this product in Jan. 1996. He visited the factory in Japan in about 1990-91. The company has an excellent laboratory.

10274. Doidge, Brian. 1996. Canadian soybean export prospects for 1996. *Canadian Export Soybeans* (*OSGMB, Chatham, Ontario, Canada*) 9(1):3-4. Jan.
• ***Summary:*** "The recent formation of the Canadian Soybean Export Association (CSEA), serves to focus attention on this rapidly growing sector of the Canadian soybean industry." The 1994/95 crop set a new record with soybean exports of 524,254 tonnes (19.26 million bushels). Another strong year is projected for 1995/06.

Note: The CSEA is an association of major Canadian soybean exporters; the association does not itself export. One of its major objectives is to lobby the Canadian government for funding and promotional support.

Talk with Michael Loh of Canada. 1996. Jan. 24. Members of CSEA include W.G. Thompson, Maple Leaf Foods, Cargill, etc. Nutrisoya, Inc. will also be a member.

A half-page table (p. 3) shows Ontario soybean supply and demand for 4 years from 1992/93 to 1995/96. Under soybean supply, statistics show: Acres harvested, beginning stocks, production, imports, and total supply. Under soybean supply are: Crush, export, seed, other domestic use, and total use. Plus ending stocks and average price per bushel.

A full-page table (p. 4) lists Ontario soybean exports for 4 years from 1991/92 to 1994/95. Ontario's top four export customers in Asia in 1994/95 were: Japan (25,988 tonnes), Hong Kong (23,311), Singapore (22,502), and Malaysia (16,231). Others are Indonesia, North Korea, Philippines, and Taiwan. The top 4 customers in Western

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Europe in 1994/95 were: Netherlands 73,654 tonnes, Spain 61,134, France 51,119, Belgium 15,428. In Eastern Europe, Poland bough 10,000+ tonnes in 1993/94 and 1994/95 and Uzbekistan bought 7,117 tonnes in 1993/94. Total exports have grown steadily from 238,809 tonnes in 1991/92 to 495,772 tonnes in 1994/95. Address: Education and Business Manager, Ridgetown College of Agricultural Technology.

10275. Ma, C.Y.; Buzzell, R.I.; Jessop, D.B.; Buttery, B.R. 1996. Evaluation of soybeans for tofu processing. *Canadian Soybean Technical Bulletin* (*OSGMB, Chatham, Ontario, Canada*) 1(1):1-2. Jan.

• ***Summary:*** Contents: Introduction. Tofu yields and texture. Flow properties of soymilk. 11S / 7S globulin ratio. Correlation among soymilk and tofu variables. Conclusions.

In this study, eight Ontario, five USA, and two Japanese soybean cultivars covering a wide range of protein content were evaluated for their tofu processing properties, using glucono delta lactone as a coagulant. Table 1, titled "Characteristics of soymilk and tofu prepared from 15 soybean varieties," lists the following varieties (in descending order of soymilk protein; a water to dry matter ratio of 7 was used in making soymilk and tofu): BARC-6, AC Proteus, Proto, Harovinton, Raiden, Enrei, HP202, Secord, TK-89, Kanrich, RCAT Calico, Maple Arrow, RCAT Angora, Grande. This table contains the following vertical columns: Soybean protein (highest was BARC-6 at 53.4% on moisture-free basis), soymilk protein (highest was 6.1% from AC Proteus), soymilk yield (highest was 5.7 kg/kg from Maple Arrow), tofu yield (highest was 4.6 kg/kg from Harovinton and Raiden), tofu firmness (highest was 0.42 N/mm from Enrei), tofu rigidity (highest was 1680 G', Pa from Maple Arrow), soymilk viscosity (highest was 7.73 from BARC-6), and soymilk 11S/7S (highest was 5.44 from Secord; It has been reported that soybeans with a high 11S/7S ratio will produce firmer tofu).

Conclusion: "Results show that Canadian tofu varieties such as Harovinton have excellent tofu processing properties (yields, textures, etc.) comparable to or exceeding those of Enrei, a Japanese tofu variety." Address: 1. Centre for Food & Animal Research, Agriculture & Agri-Food Canada, Ottawa, Ontario, Canada; 2-4. Harrow Research Centre, Agriculture & Agri-Food Canada, Harrow, Ontario.

10276. Chandwani, Umesh. 1996. No need for plant expansion: New issue snapshot. *Times of India* (*The*) (*Bombay*). Feb. 12. p. 19.

• ***Summary:*** The capital market often teaches painful lessons to greedy investors. SUL India Limited (formerly Soya Udyog Limited) may be an example of this. The company is now entering the market with a public issue–which does not seem necessary. Last year the company utilized only 57% of its solvent extraction capacity and 31.9% of its oil refinery capacity.

Note: An interesting bar chart next to this article shows foreign direct investment in India, from 1991 to Nov. 30, 1995–in descending order of each country's investment (in million rupees). The USA is by far the largest foreign investor with 146,498, followed by the UK at 39,051 (only 26% as much as the U.S.), and Japan at 18,190.

10277. Nelson, Kent. 1996. Re: Soydiesel. Letter to Kenlon Johannes, National Biodiesel Board (NBB), Missouri, Feb. 23. 1 p. Typed, on letterhead.

• ***Summary:*** "Spoke with representatives at Apollo Group today. They are still very interested in introducing Soydiesel at the '98 Winter Olympics [to be held at Nagano, Japan]." They would like info on the use of Biodiesel (who, what, when, how much) at the 1992 Summer Olympics in Barcelona, Spain, and an update on the 1996 Summer Olympics in Atlanta, Georgia, USA. "Obviously the more precedents the better for us." Address: American Soybean Assoc., 7th floor, Tameike Tokyu Bldg., 1-1-14 Asakusa, Minato-ku, Tokyo 107, Japan. Phone: (03) 5563-1414.

10278. Ferré, Carl. 1996. The greatest gift of all: In memory of Sensei Muramoto–November 5, 1920–October 9, 1995. *Macrobiotics Today* (*Oroville, California*). Jan/Feb. p. 25-26.

• ***Summary:*** Noboro Muramoto (1920-1995) was a teacher of macrobiotics, born in Japan. He was author of the books *Healing Ourselves* and *Natural Immunity: Insights on diet and AIDS.* Carl attended all of Muramoto's lectures at the 1977 French Meadows camp. Almost a year later Carl began

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to work with Herman and Cornellia Aihara at the Gorge Ohsawa Macrobiotic Foundation in Oroville, California.

The cause of Muramoto's death (at age 75) is not given, but "he died peacefully and without pain... He leaves behind his loving wife, Ida, and older son Yuki, from a previous marriage, and two darling daughters who will perhaps miss him the most."

"Publisher's note from *Natural Immunity:* Herman Aihara.

"Noboru Muramoto was born in Toyama Prefecture, central Japan, in November of 1920 [5 Nov. 1920]. As a young man he wanted to be a doctor of Western medicine, but he studied Oriental medicine, especially Chinese herbal medicine, instead.

After graduating from Tohoku (Imperial) University in economics, he worked in the business field. At that time he had read George Ohsawa's books and studied macrobiotics. However, Ohsawa had left Japan, and he didn't meet him until a few years before Ohsawa's death in 1966. When Ohsawa died, Mr. Muramoto was elected as the head of Nippon C.I. (Centre Ignoramus), the Tokyo macrobiotic center.

"In 1971 we invited Mr. Muramoto to the summer lecture tour held by the George Ohsawa Macrobiotic Foundation in the United States. His lecture at our French Meadow Summer Camp that year was his first English lecture, and it attracted many listeners. One of these people was Michel Abehsera, a New York writer, who later compiled his lecture notes taken from Muramoto's talks and created the book *Healing Ourselves.* This was later published by Avon and has been one of our best macrobiotic books as well as a favorite in the natural self-healing movement.

"After finally emigrating to California in 1976, he established Asunaro, a teaching center, in Sonoma County, where he became one of the first macrobiotic consultants on the West Coast. In 1979 he relocated in southern California, where he continued to teach macrobiotics and to manufacture high quality traditional foods such as miso, umeboshi, and natural salt.

"Mr. Muramoto is an avid reader gifted with a good memory and his lectures always surprise and illuminate the listener, inspiring interest in any subject. In this latest work he introduces his considerable knowledge of Western medicine and history accumulated during his more than forty years of study. However, his writing is not just an accumulation of knowledge but rather the total conclusion of his thinking after four decades of study in sickness, healing, and a macrobiotic approach in diet."

A portrait photo shows Noboru Muramoto.

10279. Quincannon, Jane. 1996. Sensei Muramoto: A gentle man. *Macrobiotics Today* (*Oroville, California*). Jan/Feb. p. 27-28.

• ***Summary:*** "Sensei" is the Japanese word for teacher. The writer studied and worked with Noboru Muramoto. "This scholarly and energetic man was quiet, humble, and one of the least arrogant persons I have ever known. And the hardest working. Sensei was up at dawn each day to write, study history, science or economics, to weigh grams of Chinese herbs for his teas, to clean his sea salt, produce traditionally fermented foods, and tend his vast garden. His vitality and commitment was inspiring.

"At age 15, Noboro Muramoto met George Ohsawa, the founder of the modern macrobiotic movement, after reading the senior teacher's books on healing. As Sensei tells it, 'I had a very bad condition, was overweight, with Vitamin B deficiency, eye trouble, and always tired. I went to the doctor, got treatment, but never got better. I found George Ohsawa's book. It is amazing what kinds of diseases can be cured just by food.'

"'Immediately I decided to try this diet: Brown rice, miso soup, a pickle–very simple food. Soon I got well. Since that time, I never forgot this diet. At George Ohsawa's classes I learned directly from him, a very interesting person. His subjects were almost always philosophy and principles. I had a great interest in the healing power of food. I was his last student, for a short time, but I still received a big influence.'"

Muramoto "Sensei met Herman and Cornellia Aihara shortly after the 1966 death of George Ohsawa. He first met Michio and Aveline Kushi in 1971, when he was invited to lecture in New York City."

"In 1972, Sensei moved to San Francisco to create, with the Aiharas, the Herb Tea Company" [Rising Sun / Herb-T Company].

"In 1983, Sensei Muramoto, with Lino Stanchich, created Great Life Products Company, in order to manufacture and distribute high quality macrobiotic foods made from his special sea salt. Lino and I had the privilege of working with Sensei for three years making varieties of miso and its by-product, tamari, along with barrels of pickled umeboshi plums made with home-grown shiso leaves. Students came to our school, Asunaro, in the hills of Southern California, to study traditional food production and receive Sensei's information and enjoyable teachings... Sensei's dream has been that every macrobiotic household produce such foods as miso, umeboshi, tamari, shoyu, as well as mochi, tofu, tempeh, tekka and other healing, delicious condiments. To that goal he dedicated his life."

"Sensei named his school Asunaro, which is translated from the Japanese to mean 'Tomorrow is perfect.'" "And work he did, up until the last day of this lifetime."

A photo shows Muramoto sensei standing in front of a blackboard, outdoors, at one of the G.O.M.F. French Meadows summer camps. Address: New Jersey.

10280. Holt, Stephen. 1996. New developments with commercialization of soy isoflavones (Interview). *SoyaScan*

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Notes. March 2. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Dr. Holt's first soy product, Genista (pronounced juh-NIS-tuh), is now on the market. It is basically a soy protein isolate that contains about 2 mg/gm of isoflavones; no isoflavones are added to the product. Genista was just presented yesterday to a large meeting of Midwest cardiologists, and there was enormous interest in the product. The soy protein is much better than Mevacor, a drug used to lower cholesterol, that has many undesirable side effects. Combining James Anderson's meta-analysis studies and his own research, Dr. Holt decided that 30 gm of Genista would lower blood cholesterol by 20-30% over a period of 3-6 months as an adjunct to a low-cholesterol diet. His company is trying to be very responsible in the way they market the product, together with lifestyle changes. They market a health plan, so as not to give consumers a false sense of security.

Take Care, sold by Protein Technologies International, contains anywhere from 0.68 to 2.39 mg/gm of isoflavones; no isoflavones are added. But PTI has not come out with a recommended dose in a format that will lower blood cholesterol. Bodybuilders consume up to 6 gm of protein per kg of body mass. Apparently if they take this protein as soy protein it seems to be efficiently handled, which is quite interesting. Protein Technologies International is conducting a study with Romanian athletes; they are measuring urinary mucoproteins, which are some indicator of efficiency of renal handling.

Genista is based on his own research and that of Dr. James Anderson, which says that if you consume 30 gm of a soy protein isolate containing a standardized amount of isoflavone, you will lower your cholesterol. He has quite good early success. He has a joint venture with Charles Day, PhD, of Kentucky who has a developed an agricultural process for making almost pure isoflavones from soybeans. They have just received investment money from Japan to turn this into a large-scale commercial process. The cost of the key piece of equipment is about $6-8 million. They use a proprietary technique and a patented heat-tank solvent extraction process to process partially defatted lightly heat treated soybean meal (usually used for chicken feed) to extract the isoflavones, which are lipophilic. From 4 tons of the meal he can extract 1 kg of isoflavones of 85% purity; they are composed mainly of genistein. As far as he knows, his is the only company in the extracting isoflavones commercially, and enriching products with isoflavones. He has about $6 million of orders on paper for isoflavones from a variety of nutriceutical manufacturers. Why isn't a big company like ADM doing this? "They are looking at it, but they haven't got the science right or the process; we have."

His second product will be Genista-Plus, which will contain 20 mg/gm of isoflavones and will be enriched with isoflavones. Another product, Phyto-Est, will contain 25 mg/gm of isoflavones; it has come out of the joint-venture agreement with Charles Day and the Japanese. It will on the market as soon as they can get a label on it. These products will be sold in double-oh capsules. The capsules of Phyto-Est are already made.

The Italian National Health Service has been giving out soy protein isolate as a free item in their health care preventive approach, mostly to people with kidney (renal) failure who tend to have high cholesterol levels. It has been shown repeatedly in that experience to be quite effective. In addition, soy proteins lower blood pressure, improve renal efficiency and renal handling, and promote calcium retention–which in turns lowers blood pressure.

Dr. Holt says Twin Laboratories is now selling a product named "Twinlab Genistein." In Jan. 1996 Dr. Holt began publication of a new periodical titled *Nutriceutical News International: An information source on natural remedies.* He is Editor in Chief and president of Natus, Inc., New York. His portrait appears on the front page. Stephen Yaskin, M.S., is editorial editor. To subscribe, send $19.95 for 6 issues, payable to Natus, Inc., 200 Clearbrook Rd., Elmsford, NY 10523.

Note: This is the earliest document seen (Sept. 2001) that contains statistics about the soy estrogen industry and market. Address: M.D., Natus Inc., 2388 28th Street, Long Island City, New York 11105. Phone: 718-721-1496.

10281. Macdonald, Bruce. 1996. New developments at Macrobiotic Company of America (MCOA). Acquisition of Mountain Ark Trading Co. in Fayetteville, Arkansas (Interview). *SoyaScan Notes.* March 12. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Bruce's Macrobiotic Company of America (MCOA) used to sell tofu kits to Mountain Ark but then they stopped re-ordering because they planned to sell the company. When Mountain Ark was under the stewardship of Frank Head and others they were macrobiotic oriented. But 3½ years ago Frank sold the company to Ozark Cooperative Warehouse in Fayetteville. "There wasn't a person in that organization that ever had a bowl of miso soup in their life–I don't think. So they began to steer the company away from macrobiotics toward a mainstream natural food company. One of the first things they did was to put in a line of tomato products. So their macrobiotic customers began to run away."

MCOA acquired Mountain Ark on 1 Feb. 1996. Bruce purchased the company name, toll-free phone number, and mailing list of 5,700 customers. He did not purchase any of their inventory. The company is now located at 799 Old Leicester Highway, Asheville, North Carolina 28806–at MCOA. Phone: 1-800-643-8909. Bruce plans to carry the tofu kit on a regular basis–though it sells slowly. The kit is imported from Japan. The cost changes with each container imported. It retails for about $20-25.00. In Oct. 1993,

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Mountain Ark sold the kit for $36.99 + $4.95 shipping.

The innovation of this whole scenario is that, over the last 10 years or so, all of the companies that were involved with macrobiotics either went bankrupt or ran away from it. When Bruce took over MCOA 3 years ago he changed its direction and went headlong into becoming the largest variety supplier of macrobiotic foods on the planet. The company started to grow–even in the big natural foods stores–such as Fresh Fields. Macrobiotic foods is the most misunderstood category in the health food industry. For the big stores he printed up a best-seller list of 200 items that could be put in a "macrobiotics section." Now Bruce is in the process of putting macrobiotic sections in all the Fresh Fields stores. "Because we import direct then distribute direct to retail stores, we are able to offer them prices on these foods that are 25-30% less than a normal distributor. The old way of doing business was, for example, Eden Foods imports it, marks it up 30 or 35%, and sells it to Cornucopia, who marks it up 25-30% and sells it to the store." His wholesale and retail catalogs have a great selection of foods. The only difference is that the retail prices are 10% higher. These low retail markups give a real break to macrobiotic consumers. MCOA also provides information by phone.

Note: MCOA is owned equally by Muso Shokuhin of Japan and by Bruce Macdonald. Address: President, Macrobiotic Company of America, Asheville, North Carolina 28806. Phone: 704-252-1221.

10282. Macdonald, Bruce. 1996. Big problems at Kushi Macrobiotics (Interview). *SoyaScan Notes.* March 12. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Michio and Aveline have big problems on their hands at their new company Kushi Macrobiotics. "Basically, you've got a bunch of high rollers from the commercial food industry thinking that, with slick packaging and cheap ingredients, they can create a product line that is double the price of Fantastic Foods' and not nearly as good in quality... They just don't have a clue of the sophistication of the natural foods shopper. They've got five guys each making $125,000 a year, and they haven't sold a thing yet. Norio Kushi is making $80,000 a year, and he is barely at the level of knowing how to brush his teeth in terms of business experience."

Its just amazing. They raise $1 million privately to start off with. They blew through that with surveys, etc. As Jimmy Silver said aptly, 'Basically what they found out with their million dollars was that people weren't interested in what they were selling.' What they are doing is basically the antithesis of what macrobiotics stands for. Then they proceeded to use no organic ingredients and made it a corporate policy to not use anything from Japan–except brown rice vinegar, of which they are buying a low quality product from Eden Foods. They then raised 6 million with a public offering, and now have less than $4 million left. They are going through money like crazy. They have a 40,000 square foot warehouse in New Jersey, with 10,000 square feet of offices and 3 people in there. None of the distributors that Bruce knows have picked up the Kushi line.

One little disaster got the president fired. They did a line of 4-5 bean dishes. Some jerk didn't realize that you don't add salt to beans when you cook them. So they advertised a 25-minute cooking time on the package; well you could cook this for 25 years and it would never be right. So this guy ordered a production run worth hundreds of thousands of dollars, without checking it with Michio, who is in charge of quality control. It is all garbage.

So 3 weeks ago Aveline called up Bruce in a panic. She thought she was creating another Erewhon. There is a peculiar lack of judgment throughout this whole process. Since Michio is in charge of quality, they do production runs of the whole line and then they send the finished products to Michio. Aveline tried tasting this bean dish and a few others and she was horrified, just beside herself. She says to Bruce, "We want to buy your company." Bruce says, "Okay, $5 million and you can have it." Bruce went to the Kushi's home in Brookline and spent 3 days with them. Aveline looks better and healthier than she has in years. They are now planning to go an acquisition binge; the first company they have their sights on is some cracker company. "I laid out a plan for them, including a major change in the 7-member board of directors. Michio can remain as chairman. You can keep three of the 'financial wizards' on the board, but the other three have got to be Yuko Okada (of Muso Shokuhin), Christopher Dawson, and me. We'll take all the losses at the beginning, then turn the company into a worldwide macrobiotic company."

Bruce's Macrobiotic Company of America is doing very well financially. When he acquired it, sales were less than $900,000 a year. This year he will probably do $3 million. Everyone from Lenny Jacobs on down told Bruce that macrobiotics was dead. True, it has changed, but it alive in new ways. For example, a guy name Horse Schultz is the chairman of the Ritz-Carleton Hotel Chain; he is having his chefs trained at the Kushi institute, and has sent out a memo to all of his hotels worldwide that by a certain date they will be offering macrobiotic quality meals at all hotels in addition to the traditional fare. They are converting one hotel at a time. Bruce is now flying miso down to Cancun. Horse Schultz's cancer is now in remission. Address: President, Macrobiotic Company of America, Asheville, North Carolina 28806. Phone: 704-252-1221.

10283. Mountain Ark Trading Co.; Macrobiotic Company of America. 1996. The "new" Mountain Ark consumer direct catalog–spring 1996 [Mail order]. 799 Old Leicester Hwy., Asheville, NC 28806. 37 p. March 15. 28 cm.
• ***Summary:*** This is a very comprehensive mail order catalog, with an excellent index, for macrobiotic whole

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foods, specialty cookware, cookbooks and books on natural healing, futons, furniture, etc. Soy-related products include: Aduki beans–precooked, amaranth, amazaki concentrate, amazaki [amazake] pickles, arame (sea vegetable), barley malt, black soybeans, brown rice malt, brown rice syrup, cookbooks, dulse (sea vegetable), fu (dried wheat gluten), green nori flakes, hamanatto, hijiki, Hokkaido azuki beans, Hokkaido black soybeans, Japanese plums (*umeboshi*), jinenjo soba, Job's tears, kamut, kanten bars, kelp granules, kinako, kombu cha, kuzu, miso, mochi, natto miso, natto starter spores, nigari, nori, quinoa, sea palm–California, seaweed sesame shake, seaweed cookbook, seitan, shoyu, soy sauce, tamari, tofu making kit, tofu–dried, wakame. Many of these products are imported from Japan.

Bruce Macdonald of Macrobiotic Company of America acquired the company from Frank Head of Fayetteville, Arkansas, on 1 Feb. 1996. The entire catalog can be viewed on the Internet at http://www.mountainark.com. Address: Asheville, North Carolina. Phone: 1-800-643-8909.

10284. Yoshihara, Yasuo. 1996. Update on Shin-Mei-Do Miso Co. (Interview). *SoyaScan Notes.* March 22. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Yasuo speaks with a slight Japanese accent. Shin-Mei-Do Miso Co. is active and growing. They make brown rice miso and barley miso, each sold in 450 gm and 4.5 kg plastic tubs. Lulu does the bookkeeping. The demand for their miso on the west coast of Canada is increasing so they stopped distributing to Eastern Canada. Within the last week a person from eastern Canada called him about starting a miso factory in eastern Canada, and he had a similar enquiry last year. He may be interested in teaching potential miso makers as an apprentice for pay–depending on the conditions. Shin-Mei-Do sells all of its miso to natural foods wholesalers. Amano in Vancouver makes most of the miso sold in Oriental food stores in British Columbia. Moreover, a huge amount of miso (many tons) is imported from Japan. Westbrae packages imported Japanese miso and has nothing to do with Amano–as far as Yasuo knows. Yasuo doubts that Amano ever made miso for Westbrae. Yasuo has never made miso to be sold under another brand. Shin-Mei-Do is basically still a very small operation. Yasuo does not want to become a big company where the miso is made largely by machines. Address: Shin-Mei-Do Miso Co., 5 Wren Road, Denman Island, BC, Canada V0R 1T0. Phone: 604-335-0253.

10285. Skiff, James. 1996. Troubles at LongLife Foods in Perham, Minnesota (Interview). *SoyaScan Notes.* March 25. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** LongLife Foods is in a financial squeeze with an uncertain future. Jim is no longer actively involved with the company, though he is still on the board of directors and still has his money in the company. He is now trying to resign from the board. Jim originally raised all of the money to start the company; Shichi presented himself as an accomplished tofu maker–which, it turns out, he was not. Shichi has taken control of the company and is trying to raise money. The funds he thought he was going to get from Japan never materialized. He does not have the money to buy Jim out. It is a strange situation. Shichi wants to make the best quality Japanese-style (soft) tofu–even if that is not what the market wants. Jim's has stepped back, knowing that his only hope is if the company somehow succeeds.

Jim is looking to start a new company and has been in touch with William Roach of Kyoto Food Corp. in Terre Haute, Indiana. He would like to make firm tofu, plus perhaps egg roll wrappers, wonton skins, and wheat gluten. He has a building (28,000 square feet) in southern Minnesota. Jim formerly worked with Foremost, in their dairy division, specializing in international management. He spent much time out in the Pacific Basin. Address: Perham, Minnesota 56573. Phone: 218-346-5159.

10286. Skiff, James. 1996. New developments with tofu and soybeans in North Dakota (Interview). *SoyaScan Notes.* March 25. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** A very interesting and active man, and an expert on tofu, is Dr. Sam K.C. Chang, Associate Professor in the Food and Nutrition Department, North Dakota State University, Fargo, North Dakota. Sam originally came from Taiwan and he has many strong contacts there. He is doing research on soybean varieties best suited for tofu, has a tofu pilot plant obtained from the Taiwan Tofu Makers Assoc., and has a number of Taiwanese students, including one who has graduated and is now producing tofu at Nasoya. Sam does lots of work for the North Dakota Soybean Association. He also breeds soybeans for food use, and the Sinner Brothers both support his research and grow out the soybeans that he breeds.

Plenty of soybeans are grown in the Red River Valley area of North Dakota, which has red soil–some of the best in the USA. The Sinner Brothers are one of the big growers, with more than 2,000 acres in soybeans. Their soybean variety is Proto, which is not as large as most Japanese varieties but a little larger than typical U.S. varieties. It has a beige hilum, which makes tofu less white than is ideal. The protein level is not as high as desired for tofu. Sam Chang has been experimenting with Proto soybeans in his tofu plant and labs. The 2-3 Sinner brothers are part of a company named Sinner Bros. and Bresnahan (P.O. Box 549, Casselton, ND 58012. Phone: 701-347-4900). Casselton, where they have both their farmland and office, is a small town 15 miles directly west of Fargo. Bob Sinner markets and exports lots of Proto soybeans (along with beef) to Japan, where they are used mostly in foods.

The Sinner family is one of the most important in

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agriculture in North Dakota. Bob's father, George Sinner, was governor of North Dakota for several terms and was recently a nominee for U.S. Secretary of Agriculture. Dan Glickman of Kansas won the job in Feb. 1995 but George Sinner was one of the top 2 or 3 people under consideration.

Update: 1997. Dec. 8. Jim will soon be meeting with Bob Sinner, who does not own a soybean cleaning plant. Jim would like to work with him, to clean his soybeans as part of a larger program of offering non-GMO soybeans. The Sinners now grow soybeans in North Dakota, South Dakota, Minnesota, Michigan, and New York. Next year they will add production in Nebraska and perhaps one other state. Bob apparently has two big customers in Japan; both are large tofu manufacturers. Most of the beans Bob sells are not organic–because organic soybeans are now too expensive and too scarce. Jim will talk to him about marketing his soybeans as GMO-free. Address: Perham, Minnesota 56573. Phone: 218-346-5159.

10287. *Food for Thought* (*Hinoichi Tofu, Los Angeles, California*). 1996. Hinoichi turns 50 in grand style [in 1997]. First edition. p. 1. [Eng]

• ***Summary:*** "Hinoichi just gets better with time. Hinoichi long known for its leadership in bringing tofu to American consumers, first opened its doors in Los Angeles in 1947. Next year, as Hinoichi celebrates its first anniversary in business, it will open a brand new production plant. House Foods of America, marketer of the Hinoichi brand, has announced the new plant will be located in Garden Grove, California, and will feature state-of-the-art equipment. Hinoichi will be ready to meet America's growing tofu needs into the 21st century."

Note: This 4-page newsletter (8½ by 11 inches) also contains the following: Tofu–The joy of soy: Past, present and future. Bring salt intake down by spicing up your diet. Phascinating [sic] phytochemicals. Tofu: The right food for any diet. Two clip and save recipes. Two coupons for Hinoichi Tofu: 25¢ off. On account of your bones. Address: 7351 Orangewood Ave., Garden Grove, CA 92841.

10288. *SoyaScan Notes.* 1996. Interesting new developments at the Natural Products Expo West (Anaheim, California, March 15) (Overview). March. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** The big development was the introduction of two refrigerated, extended shelf life (ESL), gable-top, regional soymilk products. One was Silk, by White Wave, and the other was by Nancy Potter.

Kushi Macrobiotic Corp. is in the process of changing its name to Kushi Natural Foods Corp.

An aseptically packed non-dairy beverage named "Organic Oat Milk" was also introduced (with T-shirts) from Sweden. It tasted good. The U.S. distributor is Nordic Farmers, 4848 South Highland Dr., Suite 211, Salt Lake City, Utah 84117. Phone: 801-272-9759. But as of May 17 they have not yet gotten any product in stock.

Michael Potter was conspicuous by his presence at the show. He had a physical problem (perhaps some type of palsy–not a stroke; one half of his face froze up and it was very noticeable), but it has since gotten much better, though there is some lingering effect. When he was in jail, he had an altercation with someone and his head was smashed against a desk; at the time it injured one of his eyes, which has never been quite the same again. He swiped a shuttle van and was soon in handcuffs. Several weeks after the show, during the week of April 4-8, Michael was in San Francisco (where his son Ki lives) talking with his Japanese partners in American Soy Products (ASP) about investing more money in the company to expand the size of the soymilk plant in Michigan; the plant is apparently running at near full capacity.

10289. Soyfoods Association of America, Standards Committee. 1996. Voluntary standards for the composition and labeling of soymilk in the United States. Accepted by the Soyfoods Association of America, March 1996. Bar Harbor, Maine. 15 p. Unpublished manuscript. 28 cm. [22 footnotes]

• ***Summary:*** Contents: Purpose of voluntary standards. History and terminology: History, existing standards in other countries, terminology. Definition and classification of soymilk products: Soymilk definition, soymilk classification (soymilk, soymilk drink, soymilk powder, soymilk concentrate). Labeling of soymilk products: General, modifiers to the statement of identity, use date labeling, refrigeration information labeling. Microbiological guidelines for soymilk. Standards Committee; Adoption and amendment of standards.

A table (fig. 1, p. 5) titled "Soymilk standards for various countries," lists minimum protein, fat, and soybean solids requirements for various soymilk products. In the following, the minimum protein content is given for various products: Japan (soymilk 3.8%, blended soymilk 3.0%, soymilk beverage 1.8%, soy protein beverage 1.8%), Taiwan (soymilk 2.6%, formulated soymilk 2.0%, soy drink 1.4%), Singapore (soymilk 2.0%, soy drink >2.0%), France (soymilk {tonyu} >3.6%, fortified soymilk {extra tonyu} >3.8%), and Thailand (soymilk 2.0%). Fat content ranges from 0.5% in Taiwan to >1.5% in France; it is not specified in Japan or Singapore.

A table (fig. 2, p. 11) titled "Soymilk composition," defines four different types of soymilk in the USA. The three numbers after each are for minimum percentages of soy protein, soy oil (fat), and total solids: Soymilk 3.0, 1.0, 7.0. Soymilk drink 1.5–2.9, 0.5, 3.9. Soymilk powder 38.0, 13.0, 90.0. Soymilk concentrate 6.0, 2.0, 14.0.

Note 1. These standards, which are very similar to the last draft, were accepted by the Soyfoods Association of America in March 1996. A note on page 2 of a final draft

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circulated in April 1997 states that the Soyfoods Association was formed in 1989; it was actually established in July 1978.

Note 2. In a letter dated 27 June 1996, Peter Golbitz, Standards Committee Chair, notes that the Soyfoods Association of America "is filing a formal 'Citizen's Petition' for a common and usual name for 'soymilk.' Along with this petition, we will be submitting a copy of our standards. We need to have copies of all documents cited in our standards when we make this filing." He asks that Shurtleff send copies of 10 hard-to-find documents located in the Soyfoods Center library. Address: 318 Main St., P.O. Box 84, Bar Harbor, Maine 04609. Phone: 207/288-4969.

10290. Yasuda, Masaaki; Kinjyo, Sakie; Miki, Eizo. 1996. Okinawa ni okeru tofuyo no seizo ni kansuru kenkyu. XI. Tofuyo no jukusei katei ni okeru hadan tokusei, kuripu kyodo oyobi bisaikozo no henka [Studies on the manufacture of tofuyo in Okinawa. XI. Changes in breaking characteristics, creep behavior and microstructure of tofuyo during fermentation]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 43(3):322-27. March. [8 ref. Jap; eng]

• ***Summary:*** Tofuyo has a unique texture like that of cream cheese. Changes in the textures and microstructures of tofuyo made with red koji (genus *Monascus*) and/or yellow koji (genus *Aspergillus*) are investigated. The values of breaking stress and breaking energy for tofuyo decreased during the ripening period. The value of each viscoelasticity coefficient on the creep analysis of tofuyo also decreased during ripening. "An electron microscopic observation revealed that fat molecules seemed to bind with proteins," and that "the structure of soybean protein which formed the body of tofuyo changed from fibriform to small particles which connected each other during fermentation." These phenomena appear to be strongly affected by the degree of degradation [hydrolysis] of soybean protein in the tofu. Address: 1-2. Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, 1, Senbaru, Nishihara-cho, Okinawa 903-01.

10291. Bloch, Hannah; Mondi, L.; Nash, J.M.; Smilgis, M. 1996. The man's cancer: Prostate cancer is reaching epidemic levels in the United States. *Time.* April 1. p. 58-65. *

• ***Summary:*** Both genetics and environment seem to influence prostate cancer. Black Americans have a 37% higher risk of contracting the disease than whites. In countries such as China and Japan, where diets are low in fat and high in vegetables, the incidence of prostate cancer is extremely low. But prostate-cancer rates for first- and second-generation Japanese are considerably higher than in Japan. This suggests an environmental factor, probably the change to a Western diet.

Researchers at Sloan-Kettering have found that tumors grow more rapidly in mice fed a high-fat diet than those on a low-fat diet. And when the mice on high-fat diets are switched to low-fat ones, the growth of their tumors slows.

Dr. Milken, a physician in Santa Monica, California, who works with prostate-cancer patients, serves only non-fat, vegetarian meals, prepared by a private dietitian. A typical lunch might contain a tofu egg-sandwich (the "egg" is actually tofu with mustard and spices), a soy-based drink, and Egg McNothing (a fat-free crumpet with soy cheese, vegetarian bacon, and scrambled egg whites).

"Why all the tofu and soy? Milken points to tests showing that soy products reduce tumors in rats."

10292. *SoyaScan Notes.* 1996. Big changes at Muso (Overview). April 18. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Muso's business has been severely hurt by the yen-dollar exchange rate, and the fact that Japanese exports are becoming much more expensive for foreigners. So Muso is now trying to import organically grown foods and ingredients–such as organically grown soybeans.

10293. Elliott, Julia. 1996. Re: Using soy to treat menopausal symptoms–A summary of personal experience. Letter to William Shurtleff at Soyfoods Center, April 22. 1 p.

• ***Summary:*** This letter is a summary of Julia's 1996 book: "This book pertains to an alternative to traditional hormone replacement therapy. It was brought about due to the side effects that I had experienced while on traditional Premarin and Provira hormone replacement therapy. [Note: Premarin contains conjugated estrogens and Provira contains medroxy progesterone; many women take the two drugs together]. Among the problems that I was experiencing were weight gain, water retention, mood swings and symptoms that likened gall bladder problems. Testing proved that there were no gallbladder problems.

"I was at an age that didn't suggest menopause, 36, thus my doctor at that time prescribed the Premarin / Provira program. I wanted to know more about why and what my options were. I sought literature pertaining to this issue and found that there was very little. I did find that there were some herbal remedies to ease menopausal symptoms, but some of that information sounded pretty profound and quite involved. I wanted to find something that was simple and easy to use. I was interested in retaining an estrogen level that would help protect me from the osteoporosis and heart disease that sometimes occur with menopause. The herbal remedies did not seem to do all of that.

"In a conversation with a friend from Japan, he remarked that women in his country did not seem to suffer menopausal symptoms like American women. I delved into the Japanese culture to find out what the answer was. It seems that the answer was in their diet. Grains, rice, vegetables, and SOY. They ate little or no red meat, and they didn't eat the dairy products that Americans do. In

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my research I found that there are doctors and researchers conducting case studies on menopausal women consuming soy and soy products. They were in the early stages in 1994, and didn't have results at that time.

"I decided to have my own personal case study. I started eating soybeans every day in an effort to raise my estrogen. It worked. My doctor has charted my progress since the first day. He claims 'We educated you about menopause, and you educated us about the soybean.' My estrogen levels today are at the level of a woman only half way to menopause.

"This book tells more about the details involved and includes some recipes to use. This is information that should be available to women in an effort to show them that there are alternatives for those who are not candidates for the traditional HRT. It is written in a personal style that is easy to read and straight to the point. It does not eliminate the doctor; however, it does eliminate the prescribed medication. It is necessary to have a doctor monitor you.

"You do need to replace your estrogen. Many women claim they breeze through this period of their lives, but they are not aware of the hidden damage that can result in the absence of estrogen: osteoporosis, heart disease, deterioration of skin tissues, hair (sometimes it leaves your scalp and ends up on your face), hot flashes, etc. Without proper estrogen balance we can lose our femininity. At this age we really don't want that."

Follow-up talk with Julia. 1996. Sept. 22. She has started doing workshops at a local health food store, sharing her experiences concerning soy and menopause with about 15 women at a time. Address: 10 Guyton St., Kingston, New York 12401. Phone: 914-338-6368.

10294. Saekel, Karola. 1996. Tallying the tofu. *San Francisco Chronicle***.** April 24. Food section. p. 2, col. 5.
• ***Summary:*** This article gives the results of a special taste panel which rated the flavor and texture of ten brands of tofu sold in the San Francisco Bay Area. The article begins: "Thanks to better nutrition information and the availability of good and easy recipes, tofu has escaped from its niche as a strictly ethnic and/or health fanatics' food and found its way into many Western kitchens."

The rankings: 1. Trader Joe's tofu (19 oz, $0.89 = $0.75/lb!). 2. Hinoichi (14 oz, $1.09). 3. Wo Chong (14 oz, $0.79). 4. Global Protein Foods (12 oz, $1.89). 5. Golden Gate (19 oz, $1.63). 6. Soy Deli (made by Quong Hop & Co., 12 oz, $0.99 to $1.39). 7. Mori-Nu (shelf-stable, 10.5 oz, $0.85 to $1.29). 8. Kikkoman (shelf-stable, 10.5 oz, $1.29). 9. Azumaya (14 oz, $0.98 to $1.19). 10. Wildwood Natural Foods (16 oz, $1.39 to $1.59).

Note: This is the earliest (and only) English-language document seen (April 2003) that uses the term "health fanatics" (or "health fanatic"). Address: Chronicle staff writer.

10295. Esposito, Andi. 1996. Nationwide tofu boom has Nasoya Foods working round-the-clock. *Sunday Telegram* (*Worcester, Massachusetts*)**.** April 28. Business section.
• ***Summary:*** Every minute a 36-pound block of tofu slides off the Nasoya production line. It is cut into 1-pound cakes, packed in plastic tubs, bathed with artesian well water, sealed, and pasteurized. The processing lines are now working 24 hours a day, six days a week. The 28,000 square foot factory and its 68 employees are so busy that there is barely room to install the sealing equipment just arrived from Japan. The administrative staff has had to move across the street. It was only 6-7 years ago that Nasoya made tofu on one shift, 3 days a week. But production has risen 20 percent in just the last 12 months, according to Frederick B. Ceconi, plant manager. Today the plant makes 12 million pounds of tofu a year. It is sold at more than 3,000 grocery stores, and more than 60% of the sales are to mainstream supermarkets. The company, which was purchased in 1990 by Hong Kong-based Vitasoy, needs a new building.

The latest tofu boom dates from the publication of an article by Dr. James Anderson in the Aug. 3, 1995 issue of the *New England Journal of Medicine***.** He reported that soy protein can lower serum cholesterol levels, providing protection against heart disease. Address: Business Editor.

10296. Akiyama, Y. 1996. Effects of temperature and osmotic pressure [on] soaking of soybeans. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 138-43. [4 ref]
• ***Summary:*** When making tofu commercially, the greater part of the processing time is the water. Soybean should be soaked for 10 to 18 hours depending on the water temperature and any substances dissolved in the water. Adjustment of the soak time is therefore a key to flexible production management. Soybeans are normally soaked in water at ambient temperature to avoid the fuel costs of heating or cooling the water.

The kinetics of water absorption by soybeans were studied. The rate of water absorption could be expressed by a semi-empirical equation which is analogous to Newton's law of cooling. "The rate of heat loss of a body is proportional to the difference in temperatures between the body and its surroundings." Water uptake is slower if "hard water" is used. Hard water is water that has high mineral content (in contrast with "soft water").

Figure 1 shows the rate of water absorption by soybeans at three temperatures: 20ºC, 30ºC, and 420ºC. Absorption is (of course) fastest at 40ºC. Address: Akita Research Inst. of Food & Brewing, 4-26, Sanuki, Arayamachi, Akitashi Akita

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(010-16), Japan.

10297. Isobe, Seiichiro; Uemura, Kunihiko; Noguchi, Akinori. 1996. Dewatering of soybean residue "okara" by electro-osmosis and screw press. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 523-27. [5 ref]
• ***Summary:*** "The Screw press is used for liquid-solid separation in food processing. To enhance the separation efficiency and the application of dewatering from soybean residue 'Okara,' a twin screw press with ceramic filter was designed and examined. Electro-osmosis also reduce the water in the Okara. The water content was decreased by the screw press treatment from 85% to 74%. The batch test of dewatering from Okara with electro-osmosis also reduced the water up to 40% and the sample was heated by ohmic-heating during treatment (8OV). Electro-osmosis treatment using low frequency (O.5Hz) alternative current (AC) was attractive to reduce the water and heat the sample. Electro-osmosis has the effects of dewatering and pasteurization of Okara. We are trying to combine it into a continuous system (cf. screw press)." Address: Food Engineering Lab., National Food Research Inst., 2-1-2, Kannondai, Tsukuba, Ibaraki 305, Japan.

10298. Isobe, Seiichiro; Uemura, Kunihiko; Noguchi, Akinori. 1996. Recent industrial achievements in extrusion cooking in Japan. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 528-33. [7 ref]
Address: Food Engineering Lab., National Food Research Inst., 2-1-2, Kannondai, Tsukuba, Ibaraki 305, Japan.

10299. Monma, M.; Terao, J.; Ito, M.; Saito, M.; Chikuni, K. 1996. Carotenoid components in soybeans. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 51-57. [15 ref]
• ***Summary:*** Carotenoids are a widespread class of natural pigments that is responsible for the color of many fruits, flowers, insects and marine animals. Lutein was the major carotenoid component in common yellow soybeans. Xanthophylls were found in a variety having a black seedcoat and in several mature soybeans having a green seedcoat. A trace amount of Beta-carotene was found in a Japanese variety of green soybean.

Table 1 shows the lutein and Beta-carotene contents in mature and immature soybean seeds in micrograms/gram. Among four varieties of immature seeds (three Enrei varieties and one Koitozairai) the lutein content ranges from 9.71 to 24.30, and the Beta-carotene content ranges from 4.67 to 45.30. Address: National Food Research Inst., Ministry of Agriculture, Forestry, and Fisheries, Tsukuba, Ibaraki 305 Japan.

10300. Morinaga Nutritional Foods, Inc. 1996. Good things come in threes [Mori-Nu Mates] (Ad). *Natural Foods Merchandiser.* April. p. 33.
• ***Summary:*** This full-page color ad shows 3 packets of Mori-Nu Mates Low-Fat Pudding Mixes in Lemon Creme, Cappuccino, and Chocolate flavors. Bold text proclaims that they are "Low fat. All natural. Dairy-free." Blend one packet of this mix with one package of Mori-Nu Lite Tofu. Two packs of Mori-Nu Lite (Firm and Extra Firm) are shown.

This ad also appeared in the October issue (p. 37). Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-NOW-TOFU or 310-787-0200.

10301. Nakajima, Mitsutoshi; Snape, Jonathan B.; Reddy, K. Kondal; Nabetani, Hiroshi. 1996. Application of membrane technology to soybean processing. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 508-14. [15 ref]
• ***Summary:*** The various types of membrane technology include ultrafiltration (UF), microfiltration (MF), nanofiltration (NF), electrodialysis (ED), and reverse osmosis (RO).

Contents: Abstract. Introduction. Soybean oil processing: Solvent recovery (by reverse osmosis), degumming (UF membranes can be used to remove phospholipids from soybean oil in hexane), lipid separations (separation of tri-, di-, and mono-glycerides and fatty acids from soybean oil by membrane technology), removal of contaminants (such as nickel catalysts from hydrogenated oils), removal of pigments (pigments in soybean oils include chlorophyll, carotenoids, xanthophyll, and their derivatives; use of expensive bleaching earth might be eliminated), wastewater treatment (a typical soybean oil extraction plant {1000 tonnes/day} generates 1,000 cubic meters of waste water each day; each liter contains 100 mg of suspended solids). Soybean protein processing and Beta-amylase production: Soybean saccharides processing, soysauce and

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other seasonings production. Conclusions.

Membrane technology has been widely accepted in many separation processes, including bioseparation. Although only a few industrial membrane processes have been installed for soybean processing, membrane technology has many potential applications in this broad field. One of the main advantages of membrane technology over conventional processing operations is that much lower temperatures can be used. This leads to large saving in energy costs associated with heating, and minimizes the thermal damage to heat-sensitive soybean components. Figure 1 shows how soybean oil might be processed using MF, UF, NF and RO purification near the beginning of the process, and nitrogen with gas separation membrane between the "refined soybean oil" and "packed oil" stages.

Ultrafiltration can be used to remove low molecular substances such as phytic acid. "When soy milk was processed by UF diafiltration, 86% of the oligosaccharides were removed," and the soymilk quality was improved because off-flavors were reduced (Asahi Kogyo Group, 1987). The Kibon [Kibun] Group (1987) has used UF to concentrate soymilk. Soybean has high Beta-amylase activity, and soybean whey has been used for Beta-amylase production. Recently a new industrial plant for Beta-amylase production that uses defatted soybean meal has been installed (Nomura et al. 1994). (p. 512).

Note: This is the earliest document seen (March 2002) that uses the term "nanofiltration" in connection with soy. Address: 1&4. National Food Research Inst., MAFF, Tsukuba, Ibaraki, Japan 305; 2. Nippon Lever B.V., Shibuya, Tokyo, Japan 150; 3. AP Agricultural Univ., Hyderabad, India.

10302. Okabe, Shiro. 1996. The global role of soybean. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 14-19. [6 ref]

• ***Summary:*** Contents: Abstract. Introduction. Soybean production, marketing and consumption, producing countries. Lessons from the soybean development in Thailand: Government policy instruments, intensive and extensive participation of the private sector, agricultural diversification with horizontal, vertical and multi-dimensional forms. Breeding for improvement in nutritional and processing quality and other traits: KTI-free cultivars as a feedstuff (no Kunitz trypsin inhibitor), lipoxygenase-free cultivars as a food source, improvement of high-yielding and pest-resistant cultivars. Conclusions.

In Thailand, during the 6-year period from 1983 to 1989 total soybean production increased more than three-fold, to 617,000 tonnes in 1989. Address: Principal Researcher, Food and Agriculture Policy Research Centre, Tokyo, Japan.

10303. Saio, Kyoko. 1996. Sustainable supply of soybeans as nutritious foods. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 113-17.

• ***Summary:*** Contents: Abstract. Introduction. World soybean production and consumption (In 1994 world oilseed production reached 250,000,000 tonnes, of which 53% was soybean, 13% cottonseed, 11% rapeseed, 10% peanut, etc. World soybean production is localized in the Americas with 50% in the USA, 18% in Brazil, 9% in Argentina, and 2% in Paraguay. In Asia, China produces 12%). Chemical and nutritional components of soybeans. Present soybean utilization in Japan. Short guidelines for soybean storage. Address: Tokyo Metropolitan Food Technology Research Centre, Tokyo 101.

10304. Shanmugasundaram, S. 1996. The evolving global vegetable soybean industry. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 472-78. [6 ref]

• ***Summary:*** Contents: Abstract. Introduction & history. Vegetable soybean–Area, production, supply, demand, domestic and foreign trade: Japan, Taiwan, USA, other countries (Thailand, China, Vietnam, Indonesia, Australia, New Zealand). The role of AVRDC in the evolving scenario of vegetable soybean (Malaysia, Sri Lanka, Granada, Philippines). Address: Plant Breeder, and Director, International Cooperation Program, Asian Vegetable Research and Development Center, P.O. Box 42, Shanhua, Tainan 741, Taiwan.

10305. *Soyafoods* (*ASA, Europe*). 1996. Kikkoman to build European production plant. 7(1):2. Spring.

• ***Summary:*** Kikkoman, the world's largest maker of soy sauce, plans to built its first European plant in Hoogezand, the Netherlands. Work is scheduled to start in July 1996 with a completion date of March 1998. The plant will have a capacity of about 4 million liters/year. Kikkoman currently imports about 20 million bottles of soy sauce to the European market from its plant in Singapore.

But Kikkoman may face some new competition. A Japanese company named Wadakan has announced that it also plans to make soy sauce in the Netherlands, in

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Zoetermeer, starting in Nov. 1996, with initial production of 10 million liters/year.

Kikkoman also has plans to build a second plant in the United States, to complement their existing plant at Walworth, Wisconsin.

10306. *Soyafoods* (*ASA, Europe*). 1996. New soya products at FiE '95. 7(1):6-7. Spring.
• ***Summary:*** "Every year the Food Ingredients Europe Exhibition seems to get bigger and bigger, with more exhibitors and more visitors." Last year's FiE, held 7-9 November 1995 in Frankfurt, Germany, was no exception, and many soy products–especially soy sauces and related seasonings–were on display.

Miwon Co. Ltd. (Seoul, Korea) has developed a range of ingredients under the brand name SoyaDeli. Products include FiberPro, PeptiPro, FlavorPlus, and FlavorBase.

Kikkoman Trading Europe GmbH (Heerdter Lohweg, Germany) introduced FVP Paste, made by enzymatic hydrolysis and concentrated in a vacuum.

Wan Ja Shan International (Middletown, New York) is one of the largest makers of naturally brewed soy sauce and Oriental sauces in the USA. Their products include soy sauce, preservative-free soy sauce, stir-fry sauce, hoisin sauce, teriyaki sauce, tamari soy sauce, dehydrated soy sauce, dehydrated teriyaki sauce, and clear soy sauce.

Ajinomoto Europe Sales GmbH (Hamburg, Germany) was selling San-J Tamari in both liquid and dried forms.

Nikken Foods (Tokyo, Japan) is a large maker of natural food flavors. Exported mainly in powdered form, these include a wide array of soy sauce, natural flavor enhancers, and other fermented products, including white miso powder and red miso powder.

Inproba BV (Baarn, Netherlands) offers a wide selection of about 160 Oriental products, both at retail and to the food industry. These include various soy sauces and other soy products, and they can also develop custom recipes for their customers.

Upcoming FiE exhibition and conferences: 1996 Nov. 12-14 at Paris, France; 1997 at London, UK; 1998 at Frankfurt, Germany.

10307. Tyler, Jim; Neville, Jan. 1996. Wellspring Natural Food Co. Mail order catalog. Amherst, Massachusetts: Wellspring. 32 p. 28 cm.
• ***Summary:*** This is the first issue of this catalog, and Wellspring started in 1996. Soy-related products include: Miso, shoyu, black soybeans (from Hokkaido, Japan), yellow soybeans (organic), azuki beans, snow-dried tofu, kuzu, miso ramen, kinako, natto miso chutney, tekka miso, soymilk, and amasake.

Jim has been a macrobiotic teacher and counselor since 1975-76 and Jennifer was a chef at the Kushi Institute. Main competitors include Gold Mine and other such companies. This catalog is service oriented, easy to use, and more than 80% of the products have lower prices than the competition. Address: P.O. Box 2473, Amherst, Massachusetts 01004. Phone: 1-800-578-5301.

10308. Vinning, Grant. 1996. Wholesale market analysis of green vegetable soybean in Japan and Taiwan. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 488-96. [1 ref]
• ***Summary:*** Contents: Price profiling. Background and table showing names of green vegetable soybeans in English, Chinese (mao dou = "hairy bean"), Indonesian (kedelai, kacang jepu, kacang bulu, dele, dekeman, gadele, kedele), Japanese (eda mame), Malaysia (kacang bulu rimau), Philippines (utau, balatong), Thailand (thua lueang, thua phra lueang, thua rae) and Vietnam (dau nanh rau, day tuong, dau nanh). Production trends in Japan. Wholesale throughput and prices in Japan. Monthly wholesale throughput and price data. Japanese imports of frozen and fresh edamame. Taiwan production, wholesale prices, and export volumes. Conclusion.

Japan is the world's largest importer of edamame and Taiwan is the major supplier. It appears that Japan's domestic production is decreasing but demand is not. Taiwan's production will probably not be able to meet the export demand. The demand-supply gap is estimated at 10,000 tonnes (metric tons) and is widening. While Thailand and China may attempt to fill this gap with frozen products, freshness is a major issue.

Note: This paper contains numerous graphs, however they have no units on the x or y axis, so are almost impossible to interpret. Address: Asian Markets Research, 157 Horizon Drive, Westlake 074, Australia.

10309. Watanabe, Takeshi; Pongmaneerat, Juadee; Viswanath, Kiron; Boonyaratpalin, Mali. 1996. Utilization of soybean meal in aquafeeds. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 408-17. [43 ref]
Address: 1&3. Tokyo Univ. of Fisheries, Konan 4, Minato, Tokyo 108, Japan; 2. National Inst. of Coastal Aquaculture, Muang, Songkhla 90000. Thailand; 4. National Inland Fisheries Inst., Jatujak, Bangkok 10900, Thailand.

10310. Yagasaki, Kazuhiro; Kitamura, Keisuke. 1996.

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Genetic and biochemical characterization of glycinin lacking subunits in soybeans. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 58-63. [10 ref]
Address: National Agriculture Research Centre, Tsukuba, Ibaraki 305, Japan.

10311. Routh, Allan. 1996. SunRich, soymilk, Davisco, St. Peter Creamery, Prosource, and Northern Milk Products in Alexandria, Minnesota (Interview). *SoyaScan Notes.* May 3. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Allan (whose surname rhymes with "south") is CEO and one of the owners of SunRich. His company manufactures both liquid and spray-dried soymilk at a plant in Alexandria, Minnesota. They own this plant as part of a joint venture with Northern Milk Products. The company in Alexandria is named Northern Milk Products, but in the '95-'96 Soya Bluebook Plus the company name is given as Prosource, Inc. (P.O. Box 1058, 601 Third Ave. West, Alexandria, MN 56308. Phone: 612-763-2470). Sales are handled through SunRich.

Question: What happened to St. Peter Creamery, of St. Peter, Minnesota?; they introduced Soy Supreme Spray-Dried Soymilk Powder in Dec. 1984 and Soy Supreme Spray-Dried Tofu Powder in July 1985. Answer: Allan used to be part of the soy process with St. Peter Creamery (located in St. Peter, Minnesota), which was owned by the Davis family and which is no longer in business. The Davis family also owned LeSeur Cheese and Lake Norden Creamery; all these companies (including St. Peter Creamery) are now named Davisco. Stan Davis, the main man, is now retired, but his sons and grandsons are involved. The soy part of the business (the Oberg Division of St. Peter Creamery) was a joint venture between St. Peter and Ed Oberg, and Lou Osterbur. Dr. E.B. Oberg had some patents when he was at Carnation. These patents were only part of the complex, which included "know-how" and process subtleties that made the product taste so good. Like every spray-drier and custom spray-dried in Minnesota and the Midwest, St. Peter was an old dairy plant and a custom processor. This sort of plant used to belong to coops, then individuals would buy them. St. Peter installed its own soymilk. They made soymilk from whole soybeans, then spray-dried it. Soymilk ceased being made at St. Peter in about 1989 because St. Peter decided they wanted to go a different direction and soymilk sales weren't really taking off. The soymilk equipment was partially moved to Northern Milk Products in Alexandria, Minnesota–located about 150 miles northwest of St. Peter. More precisely, they reconstructed a soymilk line in Alexandria that they thought was a little better than what they had at St. Peter. Allan has been with Minnesota Waxy (which started as a corn company) from the early days. Minnesota Waxy purchased the process from Oberg and Osterbur, and Northern Milk owned the physical plant.

Now Allan's joint venture company makes Soy Supreme, which used to be St. Peter Creamery's main soymilk product, made at their plant. But when the general manager at St. Peter, Dennis Anderson, decided to go into business for himself, he bought 3-4 plants–one of which was in Alexandria. So they moved the process to his plant in Alexandria. Basically the same technology that was used to make Soy Supreme (a dry product) is now also being used to make a liquid product, but Allan thinks his company has made significant improvements compared to E.B. Oberg's product.

SunRich is not really company with its own retail products. They sell foods to food manufacturers. They supply Westbrae with soymilk. They have made most of Westbrae's soymilk for a while–a number of tankers each week. They also have other soymilk clients. Most of their spray drying of soymilk is done in the neighboring town of Bertha, but they also have two spray driers in Alexandria. Northern also processes some milk products in Alexandria, and they do some specific separations on oats for customers like Quaker Oats. Zumbro, which is a similar company to Northern Milk in Alexandria, does not spray dry the milk made in Alexandria. Dennis Anderson is still in Alexandria.

Minnesota Waxy (recently renamed SunRich) has always been a specialty grain company. Initially their main product was waxy starch corn, which contains an all amylopectin starch; it has a much larger starch molecule than regular amylose starch or common corn starch. Waxy starch is used in many food applications, such as those that must be freeze-thaw stable, or products that must hold more flavor that is more available. It has many desired functional properties, and can be used to strip cholesterol from eggs. They also grow about 800,000 bushels of specialty, identity preserved soybeans per year, representing about 30% of their total specialty grain business. The soybeans are sold to soyfood manufacturers in both Japan and the USA. All of their corn and soybean production is contracted with farmers. SunRich is a corporation that has about 200 farmer shareholders; it is not a co-op. They have been in business for almost 20 years, and now they contract with a lot of non-shareholder farmers as well all over the Midwest. About 5% of SunRich's business is in organically grown crops, especially soybeans, and they are emphasizing it more and more.

Talk with Allan Routh of SunRich. 1997. April 18. He used to work with Davisco (St. Peter Creamery) making soymilk solids, but that was years ago. They have been out of that business for 5 years or more. Northern Milk Products is now named Northern Food and Dairy; it is owned by Dennis Anderson in Alexandria, Minnesota. Allan now jointly

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processes a lot of soy solids products with them. Prosource is one individual who works out of Northern Foods and Dairy; he does processing up there too. Allan's products are doing well. "Our biggest struggle is just to get big enough to support them." Address: CEO, SunRich Inc., P.O. Box 128, Hope, Minnesota 56046. Phone: 1-800-342-6976 or 507-451-3316.

10312. Routh, Allan. 1996. New developments with Sweet Beans (green vegetable soybeans) at SunRich (Interview). *SoyaScan Notes.* May 3. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Allan (whose surname rhymes with "south") is CEO and one of the owners of SunRich. Minnesota Waxy did quite a bit of work in the early days on *edamamé* (in the pods) for export. They wanted to develop a soybean that could be grown and processed in the USA, that would be acceptable to Japanese consumers, mainly in Japan, but also in the USA. They did some exports for a while, but a great deal of varietal needed to be done before the product would be completely acceptable, and that could take years, so Minnesota Waxy started to work with shelled green soybeans, and that has been where they have focused their efforts in recent years. To this end they registered the trademark Sweet Beans.

Dean Foods will soon start using Sweet Beans in some of their products, first under the Freshlike label, then later probably under the Birds Eye label. The first rollout, which is scheduled for September or October 1996 under the Freshlike label, will be a Baby Broccoli Blend, containing about 40% green vegetable soybeans, 60% broccoli, and perhaps small amounts of other vegetables. Freshlike is a Midwest regional brand, the one they use to do much of their original R&D. Birds Eye takes much more volume than Freshlike. Allan is very optimistic that the product will do well, because it sold very well in Minneapolis / St. Paul in retail grocery stores. He was amazed. It was sold almost exclusively in upscale and premium supermarket chains and grocery stores in Minneapolis/St. Paul, such as Byrelys and Lunds, which have a fresh deli, etc. For a while last winter in a couple of those stores, it was the fastest moving branded vegetable item on its slot in the frozen section.

Dean Foods is a huge and very diversified food company. They used to be in the ingredient and dairy businesses, and they have grown rapidly in recent years so that today they are probably a Fortune 500 company. They bought the Birds Eye company and label from Kraft General Foods about 2 years ago. They own quite a few vegetable companies. Dean's headquarters is in or near Chicago, Illinois, and their vegetable company is located in Green Bay, Wisconsin. Dean Foods Vegetable Company's product manager for Baby Broccoli Blend and Sweet Beans is David Sinkula in Green Bay (Phone: 414-435-5301). He will probably be involved in labeling and terminology decisions.

Allan agrees that green vegetable soybeans may be the easiest way for typical Americans to "get more soy into their diet" as a way of getting the nutritional benefits of soybeans. A key marketing tool in the future will be these benefits–especially the phytochemicals (such as isoflavones) and protein in soybeans. Last year at the various meetings of dietitians sponsored by the American Soybean Association around the country, Sweet Beans got the most attention of any food because all the dietitians could easily identify how they would work them into their menu–as in salads, soups, succotash, etc. Allan is pushing toward the goal of getting Sweet Beans into supermarkets across America. His main problem is that SunRich is not really a retail company with retail products. They sell more to food manufacturers.

Sweet Beans are not grown by farmers who are SunRich shareholders. Now they are moving their Sweet Bean production, so they will be working with all new growers. Mark Rose and Bob Ludtke were in charge of growing; Ludtke, who was very excited about the project, is no longer with SunRich. SunRich has its freezing plant in Jackson, Minnesota, and now it looks like the company will be working with Sno Pac Foods, a small organic vegetable company in Caledonia, Minnesota. They are similar to Cascadian Farms in mission and size. SunRich intends to do all their processing there. Hopefully Sno Pac will put SunRich's entire freezing line into the plant in Caledonia. Every vegetable has its own set of freezing requirements.

Allan agrees that "green vegetable soybeans" is the most descriptive name of this new crop. Dean Foods is now working on the package design for their vegetable blends. They wrote "Sweet Soybeans" across one corner of the front panel. They were going to leave the word "Soy" off, but the FDA told them that since there are people with allergies to soy, they had to include the word "Soy" where people could see it easily. Address: CEO, SunRich Inc., P.O. Box 128, Hope, Minnesota 56046. Phone: 1-800-342-6976 or 507-451-3316.

10313. Akasaka, Yukio. 1996. Effect of soybean methyl ester on fuel quality and exhaust emissions from the latest DI diesel engine in Japan. Toda city, Saitama prefecture, Japan. 16 p. May 6. 28 cm.

• ***Summary:*** Conclusions: (1) Cetane number of the SME (soybean methyl ester) is 46. So, the addition of the SME to commercial diesel fuel will not cause any ignition quality problems. (2) The SME-blended fuel needs to be changed to improve its cold flow properties; its cloud point is 1ºC. (3) Diesel fuel containing 20% SME shows the following changes in emissions: Unburned hydrocarbons (HC): 6% reduction. Carbon monoxide (CO): 3% reduction. Oxides of nitrogen (NOx): 3% increase. Particulate matter (PM): 9% reduction. Soluble organic fraction (SOF) of the particulate matter: 24% increase. (4) Diesel fuel containing 20% SME shows the following changes in performance: Fuel economy:

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1.5% increase. Maximum torque: 1-3% reduction. Address: JOMO Technical Research Center, Niizo-Minami 3-17-5, Toda-shi, Saitama-ken, Japan.

10314. Mio, Art. 1996. Update on Morinaga Nutritional Foods (Interview). *SoyaScan Notes.* May 13. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** During Morinaga's last fiscal year (ended in March 1996), sales of Mori-Nu Tofu rose 20%. One reason for this was the introduction of Mori-Nu Lite tofu to supermarkets. Morinaga has tried to sell the Lite to supers in a shipper, which is a cardboard display that stands on the floor and holds 24 cases. With the shipper, the store must buy one case of Lite Firm and one case of Lite Extra Firm. But most supers don't allow shippers and don't like having to buy two cases.

Morinaga's biggest market is still the Asian-American market, which grew 50% last year. About 4 years ago Morinaga introduced their tofu in a Chinese-language carton; it usually sells well at Chinese New Year. The Chinese label is priced lower to suit the price-conscious Chinese-American consumer. Last year the Chinese label accounted for about 25% of the company's sales.

In supermarkets, Mori-Nu Regular (3 SKUs) accounts for 65% of sales and Lite (2 SKUs) accounts for 35%. In natural food stores Mori-Nu Regular accounts for about 52% of sales and Lite about 48%. Mori-Nu Soft is by far the slowest seller.

Northern California is Morinaga's biggest market and Safeway is Morinaga's best account in America. Mori-Nu tofu is usually sold in the produce section; in the Los Angeles area Hinoichi, the biggest competitor, is sold refrigerated.

Morinaga will add a genistein statement to its new 12 ounce package which will be filled in Oregon. The paper will be made in the USA.

Update from Art Mio. 1996. July 25. Morinaga recently purchased scanner data from Lucky, which is a major account. The data showed that 80% of the tofu sold by Lucky is made by Azumaya and 20% is made by Morinaga. Address: National Sales Manager, Morinaga Nutritional Foods, 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-669-8636.

10315. Mio, Art. 1996. Selling tofu in the produce section of supermarkets (Interview). *SoyaScan Notes.* May 13. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The produce section of a supermarket operates on completely different rules from the rest of the store; there might as well be a brick wall separating produce from the store. In the produce section: (1) There are different margins; (2) There are traditionally no slotting allowances; and (3) There is less rigid allocation of space. The grocery section, by contrast, is characterized by rigid merchandising governed by schematics (schematic diagrams) which specify the exact number of facings, on which shelf each will appear, etc. Art believes that it is largely for the above reasons that most tofu companies have fought so hard to stay in the produce section, even though the temperature is often unsafe, being higher than 4ºC which is required for a "potentially hazardous food."

One of the new trends in the produce section is "pre-cuts," or pre-cut vegetables and fruits, which could change some of the rules. Mori-Nu tofu is usually sold in the produce section; in the Los Angeles area Hinoichi, the biggest competitor, is sold refrigerated. Address: National Sales Manager, Morinaga Nutritional Foods, 2050 W. 190th St., Suite 110, Torrance, California 90504.

10316. Chang, Sam Kow-Ching. 1996. Re: Research on soybeans for making tofu. Letter to William Shurtleff at Soyfoods Center, May 29. 1 p. Handwritten.
• ***Summary:*** During the past 4 years, Dr. Chang's laboratory has been very active in tofu research, particularly in developing methodologies for evaluating which soybean varieties are best suited for making tofu and natto. They have compared tofu making using small (120 gm), medium (500 gm), and large (35 kg) methods. Approximately 10 scientific papers based on this research have been presented at various meetings. Some of them will appear in refereed journals in the near future. Most of their studies are concerned with what physical and chemical factors make a soybean suited for making tofu. They have an automated tofu machine imported from Taiwan for their tofu research. This may be the first such machine in a U.S. university.

During the past 4 years, Dr. Chang has visited more than 20 tofu and natto factories in Taiwan, Japan, China, and the USA. "I am very interested in promoting soyfoods in the United States." Address: Assoc. Prof. and Food Science Coordinator, Dep. of Food and Nutrition, North Dakota State Univ., Fargo, ND 58105. Phone: 701-231-7485.

10317. *Ag Retailer* (*St. Louis, Missouri*). 1996. Roundup Ready soybeans win two key approvals. May.
• ***Summary:*** "Regulatory approval to allow importation of whole Roundup Ready soybeans into Japan has been granted by the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF). That approval says that Roundup Ready soybeans can be imported into as well as cultivated in Japan, based on the safety evaluation by MAFF's Evaluation Expert Committee.

"Meanwhile, the European Commission has confirmed that it officially has cleared the way for Roundup Ready soybeans to be imported and marketed in the 15 member countries of the European Union. The decision, which is binding on all EU countries, says that because Roundup Ready soybeans are as safe as other soybeans, they can be handled without segregation or labeling. The decision covers only imported soybeans. No request was made for planting

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of Roundup Ready soybeans in Europe."

10318. Kotzsch, Ronald E. 1996. Erewhon at thirty: A pioneer and standard-setter in the natural foods industry celebrates an anniversary. Needham, Massachusetts: U.S. Mills. 7 p. May. Illust. 28 cm. [1 ref]
• ***Summary:*** A good, concise history of Erewhon.

"In April 1966 the Kushis opened a retail shop in a tiny basement storefront on Newbury Street in Boston. The store, run by transplanted New York actor Evan Root, was named after the novel *Erewhon* by British writer Samuel Butler. In *Erewhon* (an anagram for the word 'nowhere'), Butler describes an imaginary island in which lawbreakers are put in a hospital and where people who get sick are put in jail. Since the story reflected the Macrobiotic principle that each person was responsible for his or her health, the name seemed appropriate. In the rustic, cramped store, plank shelves resting on cinder blocks were filled with hand-lettered brown paper bags of rice, grains, flour, and beans. During the summer of 1967 when I tended the store, daily receipts averaged about twenty-five dollars."

In the fall of 1967 Paul Hawken and "several other veterans of the San Francisco 'Summer of Love' arrived in Boston to study and work with the Kushis. They took over the running of Erewhon, moved the store to larger, brighter quarters across the street, expanded the product line, and began a mail-order business. Idealistic, smart, energetic, and hard-working, these and other young men and women dedicated themselves to Erewhon as a means to improve the quality of the nation's food and thus to improve the national health and well-being. Over the next decade, Erewhon grew into a large and important retailer, manufacturer, and distributor of natural foods. In 1971, it had sales of about $500,000, and in 1977 it had gross sales of about $10 million. During this period the average age of Erewhon's employees was about twenty-two!"

One interesting illustration shows the front of the Erewhon Trading Co. store on Newbury Street in Boston, Massachusetts. This illustration appeared in the October 1980 issue of *Erewhon Monthly,* the newsletter of the Erewhon distribution company.

There follows a good discussion of Erewhon's contributions to the natural foods industry. Address: Massachusetts.

10319. Second International Symposium on the Role of Soy in Preventing and Treating Chronic Disease: September 15-18, 1996. Brussels Conference Center, Brussels–Belgium. 1996. American Soybean Assoc., Rue du Commerce 20-22 Box 4, 1010 Brussels, Belgium. 23 p. 30 cm.
• ***Summary:*** The cover of this attractive booklet has dark green ink on natural beige paper, with a square photo of soybeans in the middle. Contents: Invitation from the chairperson. The Second International Symposium On the Role of Soy in Preventing and Treating Chronic Disease: agenda. Satellite Symposium: agenda. Important deadlines and addresses. Instructions for abstracts. General information. Introducing Belgium and Brussels. Registration. Hotel accommodation. Social program. Symposium registration form. Hotel accommodation form. Social program form.

This symposium is being organized by Mark Messina, PhD (Chairman, USA), Roger Leysen, PhD (Secretary, Belgium), and Koen Descheemaeker, PhD (Scientific coordinator, Belgium). The international scientific advisory board consists of 12 members: Herman Adlercreutz, M.D. (Finland); Guiseppe D'Amico, M.D. (Italy); Stephen Barnes, PhD (USA); John Erdman, PhD (USA); Bernard Guy-Grand, M.D. (France); Takemichi Kanazawa, M.D. (Japan); Jean-Michel Lecerf, M.D. (France); Erik Muls, M.D. (Belgium); Marcel Roberfroid, PhD (Belgium); Risto Santti, M.D. (Finland); Cesare Sirtori, M.D. (Italy); Kurt Widhalm, M.D. (Austria).

Tentative agenda: Sunday, Sept. 15. Welcome and opening remarks. Overview of diet and cancer. Biotechnology of the soybean. Monday, Sept. 16. Soy and kidney function. Soy and bone health. Soy and heart disease: Hypocholesterolemic effects of soy (basic, mechanisms). Tuesday, Sept. 17. Soy and heart disease: Effects of independent cholesterol reduction. Soy and cancer: Animal studies, soybean anticarcinogens / anticancer mechanisms. Wednesday, Sept. 18. Soy and cancer: Human studies. Hormonal effects of soy.

Satellite symposium: A special satellite symposium will be held on Thursday, September 19, at the Sheraton Hotel, Place Rogier, Brussels; it will focus on two areas. The morning session on "Current understanding of soy and infant health" has been organized to better understand the effects of soy protein formula in infants and soyfoods in infants and young children–with particular emphasis on soybean isoflavones. The afternoon session on "Soybean isoflavones: measurement, levels in foods, and pharmacokinetics," will focus on isoflavone absorption and metabolism, and methodology for quantifying isoflavones in food and biological matrices.

The cost of both symposia, including lunches but hotel accommodations, for a non-student paid before Aug. 1 is about $439.

Sponsors contributing more than $15,000: Alpro natural soyfoods, American Soybean Association, Protein Technologies International, Nebraska Soybean Board, Sojaxa (The French Association for Soyfoods Promotion–Active members: Alpro, Nutrition et Soja, Sojasun, Sojinal), U.S. Foreign Agricultural Service, United Soybean Board, Ohio Soybean Board, Central Soya, ADM, Wyeth Nutrition International, Indiana Soybean Development Council.

Other sponsors: Illinois Soybean Association and Illinois Soybean Program Operating Board, American

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Institute for Cancer Research, Monsanto Company, Ontario Soybean Growers' Marketing Board, Soyfoods Association of America, Minnesota Soybean Research and Promotion Council, Iowa Soybean Promotion Board, Michigan Soybean Promotion Committee, Indiana Soybean Development Council, Morinaga Nutritional Foods, Inc., and Functional Foods for Health Program. Address: Brussels, Belgium.

10320. Demos, Steve. 1996. Recent trip to Europe. What is vegetarianism? Cause marketing (Interview). *SoyaScan Notes.* June 5. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Steve greatly enjoyed meeting Bernard Storup of *Nutrition et Soja* in France, and discussing soyfoods. Steve was especially impressed with his soymilk production and packaging line. Bernard is making some interesting soy/dairy blends. Bernard's long term plan is not to stay with Sandoz. Now Bernard gets a bonus of $100,000 a year in addition to his salary just to stay with Sandoz.

In the UK, Steve met with Graham Keene, head of marketing and sales for the Haldane Group. Haldane makes yogurt under 3 brands, and one of them was the best soy yogurt Steve has ever tasted anywhere. Their yogurt has a pH of 3.8 to 4.0 which gives it a shelf life of 3-4 weeks; there appeared to be no special tricks involved. Steve would soon like to travel to East Asia to take a closer look at Okinawan fermented tofu (*Tofuyo*). Steve spent $100,000 to find out what people mean when they say "I am a vegetarian." They mean: "I avoid red meat."

Cause marketing is where a company puts its advertising dollars into a cause, such as saving the rain forests or promoting vegetarianism.

The largest investor in White Wave has the surname "Demos," and it is not Steve. Address: President, White Wave Inc., 1990 North 57th Court, Boulder, Colorado 80301.

10321. Elliott, Julia. 1996. Re: Proposed table of contents for second edition of her book on soy and menopause. Letter (fax) to William Shurtleff at Soyfoods Center, June 12. 1 p.
• ***Summary:*** The tentative book title is "Beating menopause with soy and its effects 3 years later." Proposed contents: Introduction. Menopause: Explanation–What's happening? Estrogen in the '80s: History and doses. Estrogen in the '90s: What we've learned–case studies, what has changed. Soy for estrogen replacement: Personal results–studies supporting values. Japanese culture & soy: Margaret Lock's book on Encounters with Aging in Japan. Osteoporosis and menopause. Weight management. Alternatives. Genistein & isoflavones from soy: Its role in the cancer programs. Premarin / Progestrin: Natural answer? Recipes. References. Address: 10 Guyton St., Kingston, New York 12401. Phone: 914-338-6368.

10322. Reed, M.H. 1996. In Pleasantville, serenity and sushi. *New York Times.* June 16. p. WC15.
• ***Summary:*** This is a review of the Japanese restaurant Hanada Sushi in Pleasantville, New York. Recommended dishes include: Seaweed salad, agedofu, and seafood teriyaki.

"Outstanding too was agedofu bathed in a gingery sauce, the silken tofu cube fried quickly and topped with broad shavings of bonito."

10323. Kikkoman Corporation. 1996. Annual report 1995. 339 Noda, Noda-shi, Chiba 278, Japan. 24 p. 28 cm. [Eng]
• ***Summary:*** The information in this English-language annual report is current as of April 1996. Contents: Financial highlights. Profile. A message from the president. Management strategy. Financial section. Corporate history. Global network. Board of directors and officers. Corporate data.

Kikkoman is the world's leading producer of soy sauce. The phrase "all-purpose seasoning" has come to be associated with Kikkoman soy sauce worldwide. However this phrase was first used in connection with Kikkoman soy

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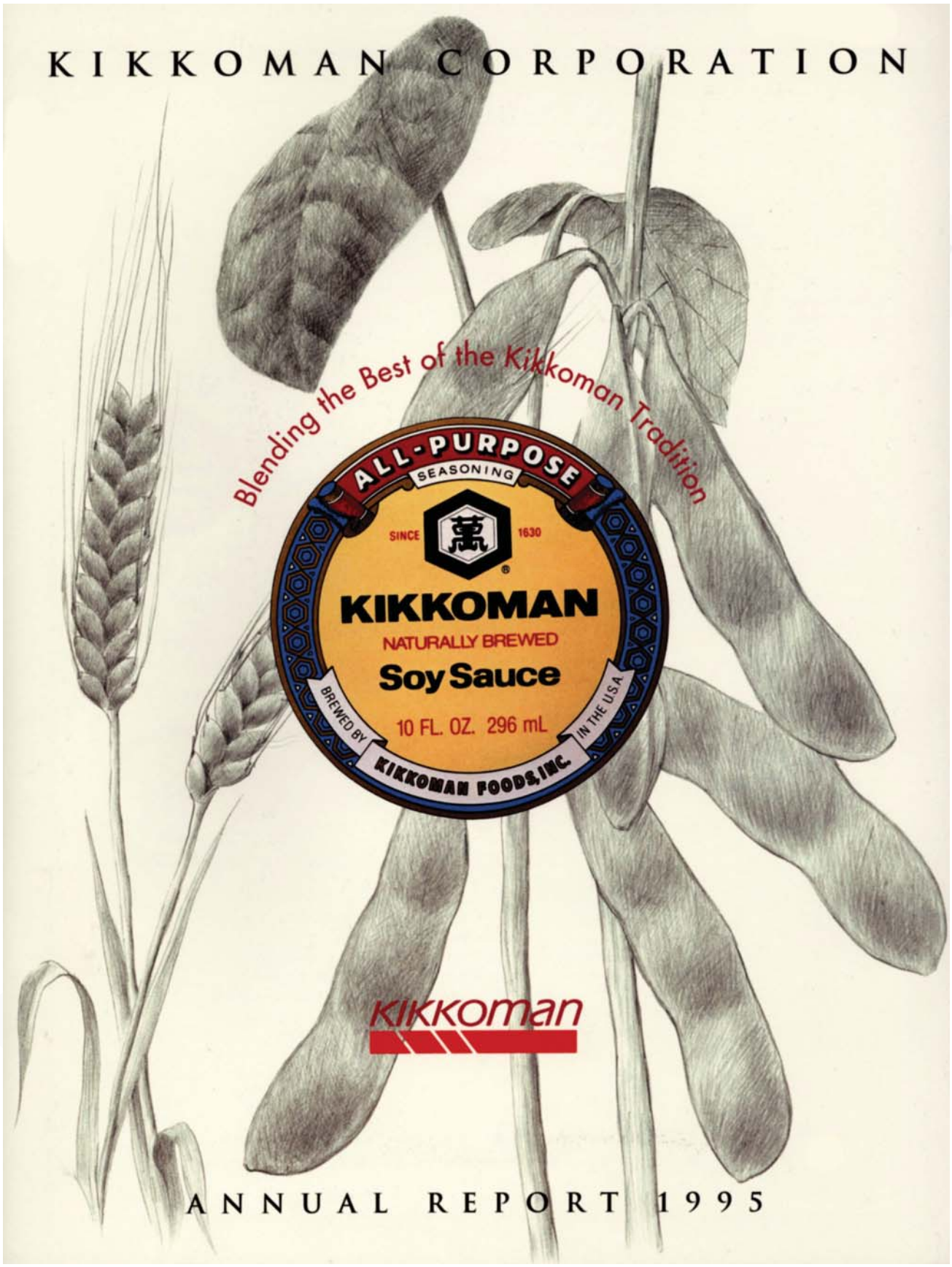

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sauce in 1956 by the *San Francisco Chronicle* [California] when introducing the Japanese product to the American public. It was adopted by Kikkoman the following year.

During 1995, net sales rose 1.1% over the previous fiscal year to 203.3 billion yen, down from a peak of 211.7 billion yen in 1992 (See p. 12). Net income declined 32.8% to 4.4 billion yen, down from a peak of 6.6 billion yen in 1994. In 1993 net income was 4.7 billion, in 1992 it was 4.9 billion, and in 1991 it was 6.2 billion–very volatile. Kikkoman's financial performance was hurt by a very difficult financial for Japan as a whole, including the Great Hanshin Earthquake in Kobe in January. A recent trend in the Japanese food and beverage industry has been the proliferation of low-priced private brands. In response, Kikkoman is hoping that consumers will maintain their brand loyalty and is introducing value-added products such as *Tokusen Marudaizu Shoyu* (Deluxe Shoyu Made from Whole Soybeans), *Tokusen Marudaizu Gen-en Shoyu* (Deluxe Low-Sodium Shoyu Made from Whole Soybeans), Steak Shoyu, and Hon Tsuyu (a new concentrated soy sauce base). Kikkoman is also planning to build a second U.S. plant on the west coast of the United States, and a new plant in the Netherlands.

A bar chart (p. 6) shows that Kikkoman's net sales peaked in 1992 at 148.4 billion yen, dropping steadily to 140.2 billion yen in 1995. Sales of Kikkoman soy sauce have reflected this rise and fall. However overseas sales have grown steadily. A bar chart (p. 7) shows them rising from $330 million in 1991 to a record $434 million in 1995.

Page 22 gives a detailed chronology of Kikkoman from April 1925 to April 1996; it has been consolidated with later events to make a single, up-to-date chronology later in this book.

Letter (fax) from Tsutomu Kishi, Manager, Kikkoman General Affairs Dept. 1996. Sept. 2. This is the first English-language annual report that Kikkoman has ever published. Address: Noda, Japan.

10324. Kuhn, Mary Ellen. 1996. Courting crossover vegetarian consumers: Sales of meat, dairy alternatives skyrocket as companies boost taste appeal. *Food Processing* (*Chicago*) 57(6):26, 31-32. June.

• ***Summary:*** Crossover consumers (also called semi-vegetarians or transitional eaters) are those who are not vegetarians but who are reducing their intake of animal products for a variety of reasons. To reach this market, meat and dairy alternatives must taste good.

A sidebar titled "Bringing macrobiotics to the masses," shows and discusses the Kushi Cuisine line of 25 products. Address: Senior Editor.

10325. *Ontario Soybean Growers' Marketing Board Newsletter.* 1996. Profiles: Maple Leaf Foods, and Maple Leaf Foods International. June. p. 7.

• ***Summary:*** Maple Leaf Foods (MLF) in a 60-year-old, $3 billion-a-year company, perhaps best known to consumers for its Maple Leaf processed meats. However MLF is also a "key buyer of Ontario soybeans, as well as a leading exporter of food-quality soybeans to East Asia, a market that the company pioneered in 1973.

"Maple Leaf Foods is currently evaluating the possibility of manufacturing soybean based products, with an eye toward one day exporting such products to Asia."

In April 1995 the company was acquired and came under aggressive new management. The new chairman is Wallace McCain, who is promising shareholders 5% per year growth in sales, and 11.5% returns on net assets.

"Maple Leaf Foods International is the corporation's international marketing arm, and is Canada's largest food exporter. It does $300 million a year in sales to Japan alone, largely through a network of over 100 partnerships with suppliers, manufacturers and distributors. Ted Bilyea, president of MLFI, says one of the keys to reaching Maple Leaf's export goal will be to make sure Ontario farmers can earn a healthy profit growing food-quality soybeans."

Bilyea adds: "We have always treated soybeans as food, not grain. It's a very important distinction."

"Garth Baxter, trading manager for MLFI's soybean team (whose photo is shown) says, 'In the future, premiums will have less to do with compensation for lower yield, and more to do with the food quality of the variety. We are moving toward a true quality premium.' It's good news for growers, Baxter says."

"Baxter says identity preserved soybeans already make up about 35% of their soybean exports in terms of volume."

"While Bilyea expects Maple Leaf to one day ship processed soyfoods to the Pacific Rim, he says the company also views food-quality soybeans as a value-added export."

"'We have invested very heavily in soybean breeding in the last few years,' Bilyea says. 'These varieties are in the system now, and they're going to be there for growers for years to come.'" Address: Box 1199, Chatham, ONT, Canada N7M 5L8.

10326. Root, Evan. 1996. A macrobiotic quest. *Macrobiotics Today* (*Oroville, California*). May/June. p. 37-39.

• ***Summary:*** A pioneer in the macrobiotic movement in the USA, Evan has focused on "attending to the present moment" since 1981.

10327. Messina, Mark J. 1996. Thoughts on the nutritional value of soybeans (Interview). *SoyaScan Notes.* July 20. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The negative article by Fallon and Enig titled "Soy products for dairy products? Not so fast" has generated a unusually large amount of attention, given how poor the article is and what a minor magazine it was published in. Gary Null wanted Mark to appear on his show just to rebut

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it. The soybean would probably be better nutritionally if it didn't contain phytates and trypsin inhibitors (other than the Bowman-Birk inhibitor). Phytates do inhibit zinc and iron absorption, and this is important; calcium inhibition is not much of a problem. The soybean plant stores much of its phosphorus in the form of phytates. Of the trypsin inhibitors, most of the focus has been on the Bowman-Birk inhibitor (BBI) as having possible anticancer activity. BBI inhibits both trypsin and chymotrypsin. The other trypsin inhibitors (such as the Kunitz) are not hypothesized to have anticancer activity. Dr. Walter Troll and Dr. Ann Kennedy have been the leaders in research in this field. Ann Kennedy, who is now doing most of the work with BBI, will be speaking at the international soy symposium in Brussels this September. Mark thinks that BBI does have anticancer activity, and that it has a lot of potential as a chemopreventive agent. But he wonders if there is enough BBI remaining in typical soyfoods (such as tofu) to exert benefits but not so much as to exert adverse effects. Ann Kennedy is very smart and a very interesting person to talk with. Mark often asks her about the practical significance of her findings concerning BBI. One serving of tofu has something like 10% of the BBI required to reduce cancer risk.

Mark thinks that Steve Barnes unquestionably is the most knowledgeable person in the USA on isoflavones and phytoestrogens. But the many exciting findings is this area must be divided into those of academic interest and those of practical importance. When Mark looks at the epidemiological data, what he finds most exciting is that all these studies showing soy's protective effect, show that one serving of a soy product (usually tofu) is enough. Mark thinks that if there really is a protective effect against cancer, it is either because of isoflavones or some other substance we are not yet aware of. Whatever it is must be very potent and very unique. Mark does not think the effect is due to a combination of substances in tofu, or to a total lifestyle which happens to include tofu. With cancer research, we already have grounds for a hypothesis, some animal data, and plausible biological mechanisms. So the next step is to show that soy actually has a protective effect in humans.

Flatulence factors might seem like a good candidate for removal, but recent research has shown that they might have benefits. They are more a social than a nutritional problem. Japanese animal studies using oligo sugars [oligosaccharides] indicate that they may help reduce colon cancer risk and promote longevity by stimulating the bifidobacteria. A lot of interesting hypotheses concerning these sugars are waiting to be tested. No single food can be all things to all people, and the source of all nutrients.

Mark is not personally excited by the cholesterol-lowering properties of soy protein. It applies only to a small group of people with very high cholesterol levels and one must eat too much soy to experience modest results. In the Framingham study, 50% of the heart attacks occurred in people with serum cholesterol below 240, and 20% had below 200. 150 is very low; Mark's was 177 last time he had it measured, which puts him close to syndrome x. Genetics plays a big role. If we find that soy inhibits cholesterol oxidation, or stimulates vasodilation, or inhibits platelet aggregation, then we are on to something important. This could be very relevant to the 37 million Americans whose cholesterol level is above 240, which is considered high. PTI (Protein Technologies International) sees those 37 million Americans as a huge potential market for its product Take Care. In the Framingham study, the really solid data showing a relationship between blood cholesterol and heart attacks, applies only to a small group of men, ages 35-54. There is no connection in women or in older men. Several years ago, Mark read two long and very well-done reviews on blood cholesterol and heart disease in excellent peer-reviewed journals, he came to think that the cholesterol hypothesis has more holes in it than Swiss cheese. For example, vegetarian women do hot have a decreased risk of heart disease compared to non-vegetarian women. This is probably because estrogen is so strongly protective.

Implicit in the word "phytochemicals" is some beneficial effect–even though most phytochemicals are a two-edged sword, with both benefits and disadvantages. Thus the oligosaccharides in the soybean (which are biologically active and cause flatulence) should probably not be called a type of phytochemical; Mark is not sure whether or not they actually supply calories and are therefore nutritive substances. If they do supply calories, they are not "non-nutritive" as phytochemicals must be. Address: PhD, 1543 Lincoln St., Port Townsend, Washington 98368. Phone: 360-379-9544.

10328. Mio, Art. 1996. Morinaga is sponsoring coverage of the 1996 Summer Olympic Games, held in Atlanta, Georgia, on KNBR radio (Interview). *SoyaScan Notes.* July 25. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Morinaga is one of several sponsors of these radio broadcasts. The radio message states: "This Olympic update is brought to you by Mori-Nu Tofu..." This advertising is connected to a one-month sales promotion with Lucky supermarkets which started at the end of May. Address: National Sales Manager, Morinaga Nutritional Foods, 2050 W. 190th St., Suite 110, Torrance, California 90504.

10329. Chambers, Norm. 1996. Growing and selling low-lipoxygenase soybeans in Iowa for making improved tofu and soymilk (Interview). *SoyaScan Notes.* July 29. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Please begin by reading the July 1996 interview on this subject with Dr. Walt Fehr of Iowa State University. Norman and John Chambers, a father and son team, refer to the soybeans that they grow under license from Iowa State

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University in various ways: "low lipoxygenase soybeans," "low lipo (pronounced LAI-po) beans," "Laura beans," and 2001 beans. They grow these mostly under contract with end users, so each company or person who wants some places a firm order in the spring before planting time and receives the special soybeans in about September. Last year they grew about 50 acres of these special soybeans, with a yield of about 50 metric tons cleaned. Since 1 metric ton = 2,204.6 lb and a bushel of soybeans weighs 60 lb, there are 36.74 bushels in a metric ton, and 50 acres would yield about 1,837 bushels. The price last year was $13.00 per bushel FOB Iowa. They are sold in 30 kg (66 lb) bags. Fairview Farms always grows somewhat more than the amount contracted for; they presently have 107 bags and about 425 bushels unbagged in the bins available for sale.

All of their customers for these special soybeans are overseas. From last year's crop they sent one container to Slovakia (to Alfa Bio), one to Singapore, and one to Japan (*Taishi Shokuhin*). They did not sell any in the USA. Address: Fairview Farms, 2304 150th St., Corwith, Iowa 50430. Phone: 515-583-2198. Fax: 515-583-2192.

10330. Fehr, Walter R. 1996. Commercial sources of and information on soybeans specially bred to be low in lipoxygenase and to give tofu and soymilk with little or no "beany" flavor (Interview). *SoyaScan Notes.* July 29. Conducted by William Shurtleff of Soyfoods Center. [1 ref]
• ***Summary:*** There are 3 lipoxygenase enzymes in soybeans that cause beany flavors. Iowa State has developed several soybean varieties that lack lipoxygenase-2 (L-2), the most active lipoxygenase enzyme. These are now commercially available; Dr. Fehr thinks that the best and most widely tested of these is IA2011. Varieties that lack two, or all three lipoxygenase enzymes are also under development. Dr. Fehr has made tofu and soymilk using the soybean lacking L-2 and found that these products have no detectable beany flavor. To order these varieties, contact any of the suppliers, such as Norman and John Chambers (father & son team), Fairview Farms, 2304 150th St., Corwith, Iowa 50430. Phone: 515-583-2198 (office) or 515-583-2330 (home). Fax: 515-583-2192. They grow these varieties themselves and subcontract the rest out to farmers in the area. Fairview Farms has many Japanese customers; Dr. Fehr does not know if they have any U.S. customers. For a complete list of licensees for the lipoxygenase-free soybean varieties, contact Julie Gustafson at Iowa State University, phone 515-294-9442. This fall Iowa State will be releasing seed of a "triple null" variety with L-1, L-2, and L-3 all missing.

Roughly 6-10 studies have been published (mainly by Nielsen at Purdue Univ. (Indiana), Hymowitz at Univ. of Illinois, and Dr. Kitamura at Tsukuba, Japan) where these soybeans have been used on a laboratory scale to make tofu and soymilk, and the flavor of those products were compared with similar products made from typical soybeans. Japanese consumers do not particularly favor the absence of the lipoxygenase enzyme; they like tofu and soymilk with some (but not a lot of) so-called "beany" flavor. As far as Dr. Fehr knows, no one has ever tested these soybeans lacking lipoxygenase on American consumers–but the information system is very closed and confidential. Dr. Fehr's group has not published anything on lipoxygenase, although they have research underway.

A world leader in this area Dr. Kitamura at the National Agricultural Research Center, 3-1 Kannondai, Tsukuba, Ibaraki 305, Japan. His group developed the genotype (named something like Kyushu) which is absent of any of the 3 known lipoxygenase enzymes, then he shared this variety with U.S. soybean breeders working on this problem. Dr. Kitamura has a series of excellent of papers on this subject, but he has "not found a home for his special soybean in terms of the consumer market." Nor has anyone found any customers for the soybean from Iowa State missing L-2 enzyme. Address: Dep. of Agronomy, Iowa State Univ., Ames, Iowa. Phone: 515-294-6865.

10331. Funaki, Junko; Yano, Midori; Hayabuchi, Hitomi; Arai, Soichi. 1996. Tôfu misozuke no jukusei katei ni okeru tanpakushitsu no bunkai [Studies on tofu-misozuke prepared in Fukuoka prefecture. I. Proteolysis of tofu-misozuke during ripening]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of Japanese Society for Food Science and Technology*) 43(5):546-51. July 30. [20 ref]
• ***Summary:*** Tofu-misozuke, a food indigenous to the Fukuoka district of Japan, develops a cheese-like taste and softness during ripening. These changes are caused by the proteolytic digestion of proteins in the tofu during ripening. Address: 1-3. Faculty of Human Environmental Science, Fukuoka Women's Univ., 1-1-1 Kasumigaoka, Higashi-ku, Fukuoka 813, Japan.

10332. Hymowitz, Theodore. 1996. Evaluation of wild perennial *Glycine* species and crosses for resistance to *Phakopsora. National Soybean Research Laboratory, Publication* No. 1. p. 33-37. J.B. Sinclair and G.L. Hartman, eds. Proceedings of Soybean Rust Workshop, 9-11 Aug. 1995. (College of Agricultural, Consumer and Environmental Science, University of Illinois at Urbana-Champaign). [28 ref]
• ***Summary:*** "The genus *Glycine* Willd. is currently divided into two subgenera, *Glycine* and *Soja* (Moench) F.J. Herm. (Table 1). The subgenus *soja* includes the cultivated soybean, *G. max* (L. Merr.) and the wild soybean, *G. soja* Sieb. and Zucc. Both species are annual, diploid with 2n = 40, and hybridized readily. The soybean grows only under cultivation while *Glycine soja* grows wild in China, Japan, Korea, Taiwan, and Russia. *Glycine max* and *G. soja* form the primary gene pool for the cultivated soybean. Evidence from several sources, including morphology, cytogenetics, seed

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proteins, phytoalexins, restriction endonuclease fragment analysis of mitochondrial DNA, ribosomal RNA, and chloroplast DNA supports the hypothesis that *G. soja* is the wild ancestor of the soybean."

"In 1976 the subgenus *Glycine* contained six wild perennial species, that is, *Glycine canescens, G. clandestina, G. falcata, G. latrobeana, G. tabacina,* and *G. tomentella.* At present the subgenus consists of 16 wild perennial species (Table 1)." Address: Dep. of Crop Sciences, Univ. of Illinois at Urbana-Champaign, Urbana, Illinois.

10333. Mogi, Yuzaburo. 1996. Re: Moving to new headquarters in Tokyo. Letter to friends of Kikkoman, July. 1 p. Typed, without signature on letterhead.
• ***Summary:*** Kikkoman is moving its Tokyo headquarters at Kanka, Nishiki-cho to Nishi-Shinbashi on Saturday, August 10, 1996. They will be open for business on Monday, August 12, with a new address and telephone numbers. The new address: Kikkoman Corporation, 2-1-1, Nishi-Shinbashi, Minato-ku, Tokyo 105, Japan. Phone: 03-5521-5360. Fax: 03-5521-5359. Address: President and Chief Executive Officer, Kikkoman Corp., 1-25 Kanda Nishiki-cho, Chiyoda-ku, Tokyo 101, Japan. Phone: 03-3233-5605.

10334. Natural lifestyle magazine and mail-order market: Spring-summer '96. 1996. Asheville, North Carolina: Natural Lifestyle Supplies. 63 p. Catalog. 28 cm.
• ***Summary:*** A macrobiotic mail-order catalog with several nice articles, it sells many types of soyfoods and related products, including the full line of Kushi Cuisine, organic soybeans (yellow and black), azuki beans, amazake, Rice Dream soymilk, Edensoy soymilk, Westbrae Malteds, Nasoya Vegi-Dressings, Nayonaise, Farmhouse Tekka [miso], organic soy sauce, fresh tofu, snow-dried tofu, kuzu, and miso. Publisher: Tom Athos. Editor and graphic design: Debbie Athos. Address: 16 Lookout Drive, Asheville, North Carolina 28804-3330. Phone: 1-800-752-2775.

10335. Ono, Tomotada; Takeda, Motoyoshi; Guo, Shuntang. 1996. Interaction of protein particles with lipids in soybean milk. *Bioscience, Biotechnology, and Biochemistry* 60(7):1165-69. July. [14 ref]*
Address: 1. Dep. of Agro-Bioscience, Faculty of Agriculture, Iwate Univ. Ueda 3-18-8, Morioka, Japan.

10336. Takai Tofu & Soymilk Equipment Company. 1996. Catalog of small and medium-scale equipment. 1-1 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan. 8 p. 30 cm.
• ***Summary:*** This is a new edition of this catalog, printed with brown ink on glossy white paper. Across the top of the first page is written "The world's leading supplier of tofu & soymilk equipment."

Page 1 states: "During the 1960s and 1970s Takai gained a great deal of experience exporting our equipment to large and small Japanese- and Chinese-run manufacturers of tofu and soymilk in the United States, Europe and Southeast Asia. Then in early 1977, with the rapid growth of interest in soyfood products in the West, we began to work closely with William Shurtleff, author of *The Book of Tofu* and *Tofu & Soymilk Production,* to develop our first- and the world's first–English-language catalog, which appeared in August 1977. Since that time we have become the world's leading supplier of tofu and soymilk equipment. We have sold our equipment to hundreds of new and established companies worldwide, and we are constantly upgrading our equipment materials and quality (as with stainless steel) to meet the highest standards. To give you the widest possible choice of the best equipment available, we also include a number of items produced by other well-known Japanese manufacturers." Address: Ishikawa-ken, Japan. Phone: +81 76 294 1712.

10337. *Rafu Shimpo* (*Los Angeles, California*). 1996. Tofu Festival stirs up delights today and tomorrow. Aug. 9. Page 1. [Eng]
• ***Summary:*** The second annual Tofu Festival, sponsored by the Little Tokyo Service Center, will take place this weekend in Los Angeles. It will be part of the 57th Nisei Week Japanese Festival taking place at the Japanese American Cultural and Community Center Plaza in Little Tokyo. More than 20 restaurants and food providers will be serving their tofu specialties this year. Photos show Patricia Greenberg (author of *The Whole Soy Cookbook,* to be published by Random House in Jan. 1998), and Andy Nakano, owner of Jozu restaurant. A brief bio of each is given.

10338. *Rafu Shimpo* (*Los Angeles, California*). 1996. Taste of Little Tokyo: Tofu makes good at Festival. Aug. 12. [Eng]
• ***Summary:*** More than 10,000 individuals attended this weekend's Nissei Week activities. The inaugural LA Tofu Festival, organized by the Little Tokyo Service Center (LTSC), was a big hit with people of all ages and races. "This year was a beginning. Next year we will see it expanding into a major fundraiser for the LTSC," said Bill Watanabe, executive director of the LTSC. For more information about the LTSC call 213-680-3729. Photos show: Young Japanese-Americans eating tofu dishes. Bill Watanabe and Osamu Torii in front of a Hinoichi Tofu booth. Tofu cookbooks.

10339. *Rafu Shimpo* (*Los Angeles, California*). 1996. Ichi nichi roku-sen cho [In one day, 6,000 cakes of tofu served]. Aug. 12. p. 17. [Jap]
• ***Summary:*** The inaugural LA [Los Angeles] Tofu Festival, organized by the Little Tokyo Service Center (LTSC), was a big hit with people of all ages and races.

10340. Rund, Stan. 1996. Re: Invitation to participate in "Foodbean Day II" in Minnesota. Letter to friends of

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soybeans in Minnesota, Aug. 12. 1 p. Typed, with signature on letterhead (photocopy).
• ***Summary:*** "On behalf of the Minnesota Soybean Growers Association, in cooperation with the Minnesota Research and Promotion Council and the International Marketing Division of the America Soybean Association, I would like to take this opportunity to invite you to participate in "Foodbean Day II" on Thursday, September 12, 1996 in Owatonna, Minnesota. Minnesota hosted its first "Foodbean Day" program in 1994. It met with so much success that plans were made to continue to offer this specialty soybean marketing opportunity to Minnesota producers and companies as often as possible.

"'Foodbean Day II' will bring representatives of 18 to 20 Japanese companies to Minnesota to interact directly with people, such as yourself, to help establish what we hope can be long term buyer/seller relationships in the area of food quality soybeans." If you are interested in participating, please call Mike Youngerberg at the Minnesota Soybean Office by Aug. 20. Address: Industry Information Committee, Minnesota Soybean Growers Assoc., 360 Pierce Ave., Suite 110, No. Mankato, MN 56003. Phone: (507) 388-1635.

10341. Roberts, Paul Craig. 1996. Fear in FBI's arsenal of inquiry. *Washington Times* (*DC*). Aug. 27.
• ***Summary:*** The author argues that the FBI has suffered great damage to its reputation, and become a political arm of the Clinton administration. A case in point is the FBI's three-year investigation of agribusiness giant ADM. In Nov. 1992 ADM notified the FBI of an illicit offer, reported by one of its executives, Mark Whitacre, from an employee of a Japanese firm to sell information to ADM for $10 million. "When ADM's top management informed the FBI, Mr. Whitacre, then head of ADM's BioProducts Division, had a fit of consternation, and objected to being interviewed by the FBI." Mr. Whitacre was later accused by ADM of embezzling millions of dollars from the company. "In retrospect, ADM executives believe the Japanese competitor's offer reported by Mr. Whitacre was in fact one of his own schemes to bilk the company. Mr. Whitacre might have feared that the FBI would find this out...

"His protests notwithstanding, Mr. Whitacre was forced to meet with the FBI. Less than two months later he signed a secret agreement with the U.S. Attorney of the Central District of Illinois 'to act in a covert capacity' as an agent against ADM 'solely at the direction and under the supervision of the FBI and this office.' In exchange, Mr. Whitacre was granted immunity.

"No one but the FBI and Mr. Whitacre knows why his story of the purported Japanese offer resulted in this secret agreement to create evidence against ADM."

"Mr. Whitacre agreed to orchestrate 'price-fixing' meetings that the FBI could secretly videotape. The FBI's case rests on these tapes." Address: Columnist, nationally syndicated.

10342. Gooderham, Melinda J.; Adlercreutz, H.; Ojala, S.T.; Wähälä, K.; Holub, B. 1996. A soy protein isolate rich in genistein and daidzein and its effects on plasma isoflavone concentrations, platelet aggregation, blood lipids and fatty acid composition of plasma phospholipid in normal men. *J. of Nutrition* 126(8):2000-06. Aug. [35 ref]
• ***Summary:*** The effects of consuming a soy protein isolate beverage (60 gm/day for 28 days) vs. a casein supplement was evaluated in 20 males. A dramatic rise in blood plasma isoflavone concentrations was observed in the soy protein group, the levels reaching 907 ± 245 nmol/liter for genistein (a 110-fold increase) and 498 ± 102 nmol/liter for daidzein (a 150-fold increase). These concentrations are higher than previously reported for the blood plasma of Japanese subjects consuming a traditional diet (276 and 107, respectively). It appears that this level of supplementation is not sufficient to counter heart disease risk factors such as high plasma cholesterol and platelet aggregation. Address: 1-2&5. Dep. of Human Biology and Nutritional Sciences, Univ. of Guelph, Guelph, Ontario, Canada N1G 2W1; 3. Dep. of Clinical Chemistry, Univ. of Helsinki, Meilahti Hospital, FIN-00290, Helsinki, Finland; 3. Dep. of Chem., FIN-00014, Univ. of Helsinki, Finland.

10343. IITA. 1996. Annual report 1995. Ibadan, Nigeria: International Institute of Tropical Agriculture (IITA). 55 p. 28 cm.
• ***Summary:*** Postharvest utilization techniques have been developed for soybean, plantain, and banana (p. 5). "An efficient method to quantify nitrogen fixation was developed. The procedure will be integrated into the soybean breeding program in 1996. Computer simulation models were employed to study resource use and nitrogen fixation potentials of early, medium, and late maturing soybean lines (p. 10). Project on application of IPM to legumes (p. 11, 35).

Improving postharvest systems: "Studies confirmed that soybean products were being sold extensively..." (p. 13). CGIAR has initiated an "ecoregional program" which uses "a holistic approach." In the moist savanna zone, the major crops are maize, sorghum, millet, cowpea, cotton, cassava, soybean, and yam" (p. 21). Two pie charts (p. 40) show major resource allocation. In 1994 some 4.1% of the core budget was spent on cowpea and soybean, increasing to 4.6% in 1995. In 1995 IITA received $31.8 million in grants from various organizations and countries and had total revenues of $32.8 million. The leading donors to core funding (in million dollars) were: The World Bank $5.66, USAID $4.02, and Japan $3.59.

A map on the rear cover shows IITA's seven research stations: 1. Ibadan, Nigeria (Headquarters). 2. Onne, Nigeria. 3. Cotonou, Benin. 4. Kano, Nigeria. 5. Mbalmayo,

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Cameroon. 6. Ferkessedougou, Cote d'Ivoire. 7. Namulonge, Uganda. Address: PMB 5320, Oyo Road, Ibadan, Nigeria.

10344. Little Tokyo Service Center. 1996. The four seasons of tofu cookbook. Los Angeles, California. xiii + 82 p. Illust. No index. 14 x 22 cm. Spiral bound.
• ***Summary:*** Contents: Tofu: A 2,000-year-old health food miracle. History of tofu in China, Japan, and the West. Tofu tidbits: Q & A. Glossary (of Japanese ingredients). Spring menu: Appetizers, salads, side dishes, main dishes, desserts (a heart symbol = vegetarian recipe; of the 16 spring recipes, 13 are vegetarian). Summer menu. Autumn menu. Winter menu. On the rear cover is a full-page ad for Hinoichi tofu by House Foods America Corporation. The last page lists the names of companies participating in the 1996 L.A. Tofu Festival, incl. Beverly Soon Tofu Restaurant.

Talk with Margaret Endo. 1997. March 7. This cookbook was compiled for the Los Angeles Tofu Festival in August 1996 by the staff of the Little Tokyo Service Center (LTSC; from recipes they contributed and tested), published in English, and sold at the festival. Proceeds from sale of the cookbook benefit the LTSC's Nikkei Family Counseling Program and Emergency Caregivers Program to help the victims of domestic violence and their children. Address: Little Tokyo Service Center (Resource Development Center), 231 East 3rd St., Los Angeles, California 90013. Phone: 213-473-1600.

10345. Little Tokyo Service Center. 1996. First annual L.A. Tofu Festival. August 10-11, 1996. Los Angeles, California. 22 p. Illust. 28 cm.
• ***Summary:*** This program gives details about tofu and the festival, whose main sponsor was House Foods Corporation (Hinoichi Tofu). Details are given on each of the participating restaurants, incl. Beverly Soon Tofu Restaurant (established in Los Angeles June 1986). Address: Little Tokyo Service Center (Resource Development Center), 231 East 3rd St., Los Angeles, California 90013. Phone: 213-473-1600.

10346. McCord, Holly; Yeykal, Teresa A. 1996. Menopause naturally: Got hot flashes? get soy! *Prevention* (*Emmaus, Pennsylvania*). Aug. p. 65-70. [1 ref]
• ***Summary:*** About 75% of American post-menopausal women experience hot flashes and night sweats, along with sleep disturbances and mood swings. Until now, the only antidote for these unpleasant symptoms has been hormone-replacement therapy (HRT), a prescription medicine the replace the estrogen that women's bodies start making less of. But recently researchers have found that the foods made from the soybean may offer a practical alternative.

"The trail of evidence linking soy with a hot-flash-free menopause starts in Asia." There isn't even a word for hot flash in Japanese. Sherwood Gorbach, M.D., at Tufts University School of Medicine, in Boston, Massachusetts, was one of the first to suggest that the reason for this may lie in the Asian diet, which is rich in soyfoods that contain isoflavones–a natural plant form of estrogen. In one day, a typical Asian woman–who eats about a quarter pound of soyfoods–may be getting 30 to 50 milligrams of isoflavones from her food.

Three clinical studies are now under way to see if and how soy isoflavones work to relieve menopausal symptoms. At Bowman Gray School of Medicine of Wake Forest University (Winston-Salem, North Carolina), Gregory Burke, MD, heads a study of 240 women over age 45 experiencing hot flashes or night sweats. Every day for 2 years the women will drink an 8-ounce soy beverage containing either 1 mg, 34 mg, or 50 mg of isoflavones without knowing which level of isoflavones they're receiving. Researchers will see if more isoflavones relieve their menopausal symptoms or anxiety or mood swings.

Two studies at Tufts University, in Dr. Gorbach's department, are following 60 women with hot flashes. For 3 months, these women will eat either two specially designed almond- or chocolate-flavored soy breakfast bars that each contain 20 mg isoflavones (for a daily total of 40 mg isoflavones) or two placebo bars without isoflavones. Researchers will track the women's reports of hot flashes and night sweats, and their levels of estrogen and other hormones. Though these studies have not been completed, preliminary data look promising says Dr. Gorbach.

A table (p. 67) shows the amount of isoflavones (in mg) in a typical serving of various soyfoods. In descending order: Nutlettes breakfast cereal* (½ cup): 122 mg isoflavones + 140 calories. Beef(Not) textured soy protein granules* (¼ cup dry): 62 mg + 70 calories. Roasted soy nuts (¼ cup): 60 mg + 195 calories. Tempeh (½ cup): 35 mg + 165 calories. Low-fat tofu (½ cup): 35 mg + 54-75 calories. Regular tofu (½ cup): 35 mg + 105-120 calories. Take Care High Protein beverage powder (Protein Technologies International; 2 scoops): 35 mg + 100-130 calories. Regular soymilk (1 cup): 30 mg + 130-150 calories. * = Available from Dixie USA, 1-800-347-3494.

Even if this research doesn't show positive results, other studies show that soy lowers cholesterol and may prevent breast cancer and osteoporosis. "A serving of soy every day could turn out to be a good bet," says Dr. Gorbach. Researchers recommend consuming in the range of 30-50 mg/day of isoflavones. More than 100 mg/day could be harmful, so its is best to get your isoflavones from food instead of pills. Contains two recipes: Creamsicle Cooler (shake with soft tofu; 35 mg of isoflavones). Southwestern Skillet (with Beef(Not); 62 mg of isoflavones).

10347. Obata, Akio; Matsuura, M.; Kitamura, K. 1996. Dehydration of sulfhydryl groups in soymilk by lipoxygenases during soybean grinding. *Bioscience,*

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Biotechnology, and Biochemistry 60(8):1229-32. Aug. [27 ref]
Address: Research & Development Div. of Kikkoman Corp., 399 Noda, Noda City, Chiba prefecture 278, Japan.

10348. Roberts, Paul Craig. 1996. Abetting U.S. competition. *Washington Times* (*DC*). Sept. 5 p. A15.
• ***Summary:*** The author alleges that the FBI has teamed up with ADM's competitors in the market for lysine, a feed additive. "Prior to ADM entering the business in 1990, the market was dominated by Japanese firms, Ajinomoto Co. and Kyowa Hakko Kogyo Co. In 1989 the price per pound was $1.73. ADM discovered a cheaper way to make lysine, and the company's entry into the market resulted in prices falling roughly in half. During the five-year period, 1991-1995, the purchasers of lysine enjoyed cumulative savings of more than $500 million dollars [sic]. ADM gained 40 percent of an expanded market and the big Japanese firms are licking their wounds."

The evidence shows a collapse in lysine prices, to $1.08/b in 1991, down to $0.82 in 1992, up a little to $0.90 in 1993, up to $1.14 in 1994, and down to $1.05 in 1995. "As ADM is the low cost producer, it can undersell its competitors and has nothing to gain from a price-fixing agreement that would limit its market share." Address: Columnist, nationally syndicated.

10349. Sprader, Darci. 1996. Successful use of green vegetable soybeans to treat menopausal symptoms (Interview). *SoyaScan Notes.* Sept. 13. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Darci is a licensed acupuncturist who has had good results helping about ten women who have unpleasant menopausal symptoms by asking them to eat green vegetable soybeans as part of a wholistic treatment using acupuncture and herbs. She suggests that each woman consume about ½ cup 3 times a week. The green soybeans are sold locally at an Oriental food store named Midway Asian Foods. They seem to work better than tofu or other soyfoods. In Chinese medicine, soybeans are neutral to slightly cooling. They probably bring about some hormonal balancing and may enter the kidney channel, where they affect the adrenals. Darci, who is married, began studying acupuncture in about 1990 and has been practicing since 1993.

According to Kikko Matsumoto, a famous Japanese acupuncturist and author who practices in Boston, Japanese researchers have also found that green vegetable soybeans are beneficial in treating menopausal symptoms. She and her colleagues are widely respected for their advanced research and their "connective tissue theory" which attempts to explain how acupuncture works. In addition to her practice, Kikko gives seminars and is the author of two respected books: *Hara Diagnosis* and *Five Stems and Five Branches.* Kikko can be contacted at 8 Center Street, Nantucket, Massachusetts 01760. Phone: 508-651-1975. Or through Dale and Jackie of the Institute for Professional Development at 708-386-8822.

A friend of Darci's attended a workshop at Bastyr University (in Seattle, Washington) which trains naturopaths. The entire group seemed to be aware of the beneficial effects of green vegetable soybeans.

Update: Talk with Darci. 1997. June 6. Darci has now effectively treated about 50 women using green vegetable soybeans, acupuncture, and herbs. She notes that in Chinese medicine, diet is the most important, followed by herbs, and then needles. One good book on the importance of diet in Chinese medicine is *Healing with Acupuncture,* by Paul Pitchford; however he does not mention green vegetable soybeans. Address: Midwest Family Acupuncture Associates, 2423 American Lane, Madison, Wisconsin 53704. Phone: 608-246-8200.

10350. *SoyaScan Notes.* 1996. The top five tofu manufacturers in the USA (Overview). Sept. 17. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** This ranking is based on educated guesses and discussions with industry insiders, but it is not based on solid research data. In descending order of pounds produced per month: 1. Nasoya (Leominster, Massachusetts; Owned by Vitasoy). 2. Azumaya (South San Francisco, California; owned by Vitasoy). 3. House Foods America Corp. (Hinoichi; Los Angeles, California and Japan). 4. Morinaga (Japan and Torrance, California). 5. White Wave (Boulder, Colorado).

10351. *ASA Today* (*St. Louis, Missouri*). 1996. ASA/Japan hosts 40th anniversary celebration. 2(10):1-2. Sept.
• ***Summary:*** An estimated 175 "Soycomplex Leaders" from throughout Japan attended the ASA [American Soybean Association] /Japan 40th Anniversary celebration in Tokyo, according to ASA/Japan Country Director Kent Nelson. In 1946 ASA started activities in Japan as a member of the Japanese American Soybean Institute (JASI), which included the Japan Oilseed Processors Association (JOPA), the Japan Oil and Fat Importers & Exporters Assoc. (JOFIEA), and the Japanese tofu, soy sauce, and miso associations.

A photo shows ASA Executive Officer George M. Strayer and Mrs. Strayer in October 1955 leaving Waterloo, Iowa, enroute to Japan on a trade mission.

One sidebar (p. 2) titled "Meeting Japan's needs now and in the future," states: Japan imports 97% of its soybeans. Nearly 25% of Japan's imported soybeans are used for food. Japan is projected to import its 5 billionth bushel of soybeans from the USA in the second half of the year 2000. "Japan remains the top single country market in the world (soymeal included) and is expected to remain the largest export market for US producers into the year 2000."

A second sidebar (p. 1) titled "ASA/Japan celebrates

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40th anniversary," notes that in 1956, Japan imported 536,000 metric tons of US soybeans. In 1995 Japan imported eight times that amount, over 4 million metric tons. This fall a unified trade team composed of JOPA processors and JOFIEA importers will meet with ASA and United Soybean Board leaders in St. Louis, Missouri, to discuss short, medium, and long-term goals.

10352. Callanan, Bob. 1996. Soya Bluebook: Celebrating 50 years of service to the soybean industry (Ad). *Soya Bluebook Plus* 1997. p. 13-21.
• ***Summary:*** On the top two-thirds of each page is a brief history of the soybean in America from 1900 to the present, with emphasis on the work of the American Soybean Association, which was founded on 3 Sept. 1920 as the National Soybean Growers' Association by more than 1,000 people who attended the first "Cornbelt Soybean Conference" on a farm owned by the three Fouts brothers near Camden, Indiana. It was renamed the American Soybean Association in 1929.

To the left and right of this story on each page are two reproductions of full-page advertisements from existing companies that appeared in the Bluebook. The first four ads are from Anderson International (1947), Archer Daniels Midland Co. (1947), French Oil Mill Machinery Co. (1947), and Ross & Rowe, Inc. (1947, now ADM Lecithin).

The story contains many photos related to the ASA and soybean production and trade. For example: (1) A farmer on a horse-drawn cultivator in a soybean field from the early 1900s. (2) The front of the ASA offices in Hudson, Iowa. (3) Henry Ford in 1940 testing the strength of a soy-based plastic trunk lid on a Ford car by swinging an ax against it. (4) Mr. & Mrs. George Strayer in Oct. 1955 leaving for Japan by air from Waterloo, Iowa. (5) The floor of the Chicago Board of Trade in Oct. 1936 as the new soybean futures market opens. (6) An oceangoing freighter in the 1940s docked next to Central Soya Company's elevators in Chicago. (7) W.L. Burlison and C.M. Woodworth inspecting soybean variety demonstration plots at the University of Illinois.

Accompanying this history, on the bottom one-third of each page is a chronology from 1900 to 1997 that highlights major events of the companies that advertise in the *Soya Bluebook Plus*–even though those events may be of relatively little importance in soybean history. For example: 1905–H.R. Williams Mill Supply Inc., Kansas City, Missouri is founded by Harry Richard Williams. 1914–Universal Oil Products Co. (UOP), Des Plaines, Illinois, is established. Address: Communications Director, American Soybean Assoc. Phone: 314-576-1770.

10353. Chen, Hua-Ming; Muramoto, Koji; Yamauchi, Fukmio; Nokihara, Kiyoshi. 1996. Antioxidant activity of designed peptides based on the antioxidative peptide isolated from digests of a soybean protein. *J. of Agricultural and Food Chemistry* 44(9):2619-23. Sept. [24 ref]
• ***Summary:*** Many hydrolyzed proteins have been shown to have antioxidative activities against the peroxidation of lipids or fatty acids. This paper is about an antioxidative peptide derived from the proteolytic digests of a soybean protein. Address: 1-3. Dep. of Applied Biological Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai 981, Japan; 4. Central Research Lab. and Life Science Center, Shimadzu Corp., Kyoto 604, Japan.

10354. Franklin, Deborah. 1996. The healthiest women in the world [in Okinawa]. *Health.* Sept. p. 56-63.
• ***Summary:*** On average, American men now live to be 72, and American women 79. Not as good as the Japanese, where the ages are 76 and 83 respectively. But women in Okinawa live, on average, to age 84–longer than women in any other country or region of the world. Okinawa was annexed by Japan in 1879 and today it is a full-fledged Japanese state (the equivalent of a U.S. state). What is their secret? Kazuhiko Taira, a gerontologist at the University of the Ryukyus in Okinawa, thinks that much of it has to do with the Okinawan diet. In Okinawa there is a saying that "food is medicine." Traditionally Okinawans have eaten three times more meat (especially pork) than Japanese mainlanders, 50% more tofu, and–very important–40% less salt. In the decades before 1960, mainland Japanese adults typically consumed 6-9 bowls of miso soup each day, plus a few small servings of salty pickled vegetables and/or seaweed–all sources of salt. Yukio Yamori, who (for the last 15 years) has studied links between diet and longevity notes that Okinawans eat quite a bit of tofu and other soy products which are particularly rich in isoflavonoids–estrogen-like compounds that may reduce one's risk of osteoporosis. His "most recent study, of post-menopausal women in Japan and Hawaii, showed that women who consumed the most soy had the densest bones." This might explain why elderly Japanese–and especially Okinawan–women suffer far fewer bone fractures than American women, even though the Japanese consume much less calcium.

Another important key to a long and healthy life in Okinawa is *yuimaru,* a word written with the Japanese characters for "circle" and "connection." It expresses that sense of belonging and connectedness and feeling needed, which makes elderly people look forward to each new day. In Okinawa, the elderly are greatly respected. Address: Staff writer.

10355. Caton, Greg. 1996. New developments at Lumen Foods (Interview). *SoyaScan Notes.* Oct. 8. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Greg is working closely with Dr. Suzanne Paxton, a doctor of pharmacy, of PNC–Preventive Nutrition Consultants. Her late husband, Herb Pierson, worked with

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the National Cancer Institute and is credited with coining the term "Nutraceuticals." He was a pure scientist–not a promoter; he died at age 43, just 6 months ago–probably because of the many cancer-causing substances he was working with. He was especially interested in finding plant-based materials that were effective in curing cancer. On the health and medical benefits of garlic alone, he had something like 20,000 references. Many other people have come in and taken credit for his work. Herb and Suzanne's research *"made* Wakanaga, and their Kyolic garlic supplement." Wakanaga is a $200 million a year garlic company headquartered in Japan.

For Lumen Foods Suzanne has just written a 29-page booklet on the latest developments in soy phytopharmacology. "She was one of the first to publicize the benefits of soy in treating menopausal symptoms. I don't know anybody who knows more about phytopharmacology and the effects of soy and many other different vegetables. She is a world class authority–a very impressive person."

Greg has just run a full-page color ad for Heartline Meatless Meats in the September 16 issue of *Time* magazine, which was mailed to 1 million women. Nine years ago he ran a one-third page ad in the December 1987 issue of *Prevention* magazine that reached 4 million readers. It barely paid for itself.

Greg's business is still small, with sales projected to be about $1 million in 1996. But during his first year in business, in about 1986, the company grossed about $40,000. In the last few years the company's sales have grown for $350,000 to $782,000 last year. Most of his growth in sales is from mail order. Now mail order accounts for about half of his sales; it used to be much smaller.

His low-fat Heartline products (named Heartline Lite) do not sell nearly as well as their regular counterparts; a 2 ounce serving of the latter, reconstituted, contains 83 calories (with 27 calories from fat) and 3 grams of vegetable oil, with no saturated fat or cholesterol. Thus, 32.5% of the calories come from fat. There is a very low rate of repeat sales for the low-fat or nonfat products.

Greg was motivated to start his own business because ADM (with whom he worked from 1981 to 1983) denied that there was any problem with flatulence from their TVP products. This was long before soy protein concentrates became popular. GNC (General Nutrition Corp.) created many dinners using TVP at their plant in Fargo, North Dakota, but after several years they realized that consumers were complaining a lot about the gas; so GNC dropped ADM, who at that time was doing a promotional titled "Uncle Archie's"–which Greg was involved with. So Greg left ADM, did research on new soy products in 1985, then founded the company in 1986.

Greg's fastest growing product now, Stonewall's Jerquee, is a deep-fried product, which has much of the fat subsequently removed by centrifuging. "People who eat a snack want to be wowed. They are looking for an experience. More and more we realize that we are in the experience business. This in the only product we make that is purchased by meat-eaters as well as vegetarians.

Greg now owns five companies; one of these designs and develops Web pages. "If you have to work for a living, your life should be an adventure." Address: President, Lumen Food Corp., 409 Scott St., Lake Charles, Louisiana 70602-0350. Phone: 318-436-6748.

10356. Morinaga Nutritional Foods, Inc. 1996. Finally... a cabinet member you can trust (Ad). *Vegetarian Times.* Oct. p. 25.

• ***Summary:*** This full-page color ad shows 6 cartons of Mori-Nu Tofu and Mori-Nu Mates Chocolate Pudding & Pie Mix on a shelf in a kitchen cabinet or cupboard. "Stock your cupboard with Mori-Nu Silken Tofu–the tofu you can trust to stay "first day fresh" without refrigeration. Our modern aseptic* package guarantees Mori-Nu's freshness without preservatives or irradiation... Finally–a tofu you can trust. Mori-Nu. The low-fat tofu in the long-life package."

* = "aseptic packaging: Voted #1 food science innovation by the Institute of Food Technologists because it increases nutrient retention and flavor while protecting against bacterial contaminations."

Talk with Art Mio of Morinaga. 1996. Nov. 8. Tofu in the pantry shows its lack of need of refrigeration.

This ad also appeared in the Dec. 1996 issue (p. 23) of this magazine. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-NOW-TOFU or 310-787-0200.

10357. Sumi, Hiroyuki; Banba, Takeshi; Kishimoto, Noriaki. 1996. [Strong pro-urokinase activators proved in Japanese soybean cheese natto]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society of Food Science and Technology*) 43(10):1124-27. [9 ref. Eng; jap]
Address: Dep. of Nutrition, Faculty of Health and Welfare Science, Okayama Prefectural Univ., Kuboki 111, Soja-shi, Okayama 719-11, Japan.

10358. *SoyaScan Notes.* 1996. Black soybean varieties in North America: A brief early history (Overview). Nov. 3. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Since the late 1970s, almost all of the soybeans in the USA have had yellow seed coats. Most Americans, including soybean farmers, have never heard of soybeans that were black, green, brown, white, red, bicolored, or mottled. But have yellow soybeans always predominated in America?

"Previous to the numerous introductions by the United States Department of Agriculture beginning in 1898, not more than eight varieties of soy beans were grown in the United States, namely, Ito San, Mammoth, and Butterball,

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with yellow seeds; Buckshot and Kingston, with black seeds; Guelph or Medium Green, with green seeds; and Eda and Ogemaw, with brown seeds." Thus of these eight pre-1898 varieties, 3 varieties (37.5%) had yellow seeds, 2 varieties (25%) had black seeds, 2 varieties (25%) had brown seeds, and 1 variety (12.5%) had green seeds (Source: Piper & Morse 1910, "The soy bean: History, varieties, and field studies," p. 27).

In this same important 84-page report, the authors describe in great detail the 285 soybean varieties that have been introduced into the United States as of 1909. Of these 285 varieties, 152 varieties (53.3%) have yellow (straw-yellow or olive-yellow) seeds, 55 varieties (19.3%) have black seeds, 44 varieties (15.4%) have brown seeds, 24 varieties (8.4%) have green seeds, and 10 varieties (3.5%) are bicolored (p. 37-39).

Thus, as late as 1910, only about half of all soybean varieties in the United States had yellow seeds. But yellow soybeans were already coming to be preferred. Why? "Yellow or green seeds are preferable to darker colors, as the shattered seeds are more easily found by hogs pasturing the field or stubble" (p. 36).

The first black-seeded soybean was probably introduced to the USA from Japan in 1889 by Prof. W.P. Brooks of the Massachusetts Agricultural Experiment Station, who traveled to Japan to collect seeds. He had named this variety "Medium Black" by 1895 and in 1893 it was grown at the Rhode Island Agricultural Experiment Station, from which the U.S. Department of Agriculture received it in 1903 under the name "Japanese No. 15." By 1910 it had been officially named "Kingston" (p. 31).

In 1910 the following named, black-seeded (or partly black) soybeans (listed alphabetically) were being grown in the USA: Arlington, Auburn, Black Beauty, Brindle (brown and black), Buckshot, Chernie, Cloud, Early Black, Ebony, Extra Early Black, Fairchild, Flat King, Hankow (brown banded with black), Hongkong, Jet, Kingston, Large Black, Medium Black, Medium Early Black, Meyer (black and brown), Nigra, Nuttall, Peking, Pingsu, Riceland, Shanghai, Taha (black with olive saddle), Wilson, Wisconsin Black (p. 39-74).

In 1899 Walter Blasdale, Instructor in Chemistry at the University of California, studied the vegetables sold at Chinese markets in San Francisco. He reported that year in USDA OES Bulletin No. 68 that two varieties of soy beans were found, a yellow and a black. "The black is known as 'hak tau,' and is designated by the characters 'black' + 'bean.' Both varieties obtained from the Chinese market in San Francisco grew readily in Berkeley, attaining a height of about 3 feet, and in spite of a very dry season produced an abundant crop of seeds." In this bulletin, Blasdale included a good, full-page photo of "The upper portion of a plant of the black soy bean." He then analyzed the nutritional composition of both the original Chinese soy beans and their progeny grown in Berkeley, and presented his results in tabular form. On a dry-weight basis, the original black soy beans contained, on average, 0.35% more protein (39.62% vs. 39.27%) and 0.72% less fat (18.77% vs. 19.49%) than the yellow soy beans.

On 28 August 1906 the USDA, as part of its major seed and plant introduction, received the first black soybean [SPI #19184] noted for its food use. It came from Newchwang, Manchuria, from Plant Explorer Frank N. Meyer, who wrote: "A large variety of the black soy bean. This is a very rare variety and is used for food: also for making a superior oil."

The first American recipe for using black soybeans was published in May 1917, during World War I, in the *Wisconsin Agricultural College, Extension Circular* No. 79, titled "How to Cook Soy Beans," by the University of Wisconsin Home Economics Department. The one recipe titled "Black soy bean soup" called for "1 pint black soy beans." This same recipe appeared the next month, in the June issue of the *Journal of Home Economics* in an article titled "Soy Bean Cookery," by Nell Beaubien, of the University of Wisconsin Home Economics Department.

In 1960 the first recipe for black soybeans [called "black beans" after the Japanese term *kuro mamé* which means "black soybeans"] appeared in America in a cookbook, *Zen Macrobiotics,* by George Ohsawa. It was recipe No. 118 for Boiled soy beans. But the "black beans" were used only as an alternative ingredient. Most of the recipes for black soybeans in American cookbooks after 1960 were in macrobiotic cookbooks, where they were consistently called "black beans" rather than black soybeans–and one can only wonder if the authors realized that their recipes were really calling for black soybeans. The first macrobiotic recipe calling for "Black soy beans" was published in 1973 by Chico-San in a product catalog which contained many recipes. The first real macrobiotic cookbook to use the term "black soybeans" in a recipe title was *Aveline Kushi's Complete Guide to Macrobiotic Cooking,* published in 1985 by Warner Books (see p. 257-58).

The first packaged black soybeans sold in America for food use appeared in 1959 in New York City. They were imported from Japan by the Oriental Food Shop, and received a write-up in the May 1959 issue of *House Beautiful* magazine.

In 1962 Chico-San Inc., in Chico, California, one of America's first macrobiotic- and natural foods companies, began selling "Black Soybeans," imported from Japan. By January 1970, Erewhon Trading Co. in Boston had followed with a similar product named "Kuromame, a black soy bean import."

In August 1996 Eden Foods introduced America's first canned black soybeans–which were also organically grown in Michigan.

The following is a list of 65+ black soybean varieties introduced before about 1940 to North America, arranged

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alphabetically by name, with the earliest known date of introduction given in parentheses: Arlington (1910), Auburn (1910), Avoyelles (1931), Black (1900), Black Beauty (1910), Black Ebony (1918), Black Eyebrow (1915), Black Ontario (1927), Black Round (1902), Black Sable (1927), Bopp (1927), Buckshot (1907), Cayuga (1933), Chernie (1910), Claud (1914), Cloud (1909), Coker 31-15 (1934), Coker's Black Beauty (1931), Early Black (1902), Early Wilson (1927), Early Wisconsin Black (1927), Ebony (1907), Edna (1914), Essex (1927), Extra Early Black (1902), Extra Early Black Eyebrow (1927), Extra Select Sable (1927), Fairchild (1910), Flat Black (1904), Flat King (1907), Hiro (1936), Honkong / Hong Kong (1909), Jet (1909), Kingston (1907), Kingwa (1935), Kura (1936), Laredo (1920), Large Black (1907), Mammoth Black (1927), Medium Black (1894), Medium Early Black (1897), Medium Late Black (1897), Meyer (1907), Nigra (1910), Norredo (1935), Nuttall (1907), Oloxi (1937), Otootan / O-too-tan (1914), Pee Dee (1937), Peking / Pekin / Peking S (1910), Pekwa (1932), Pine Dell Perfection (1937?), Pingsu (1909), Red Sable (1927), Riceland (1907), Royal (Morse 1918), Sable (1914), Sato (1936), Shanghai (1910), Sooty (1912), Taha (1909), Tarheel / Tar-Heel / Tar Heel (1914), Tarheel Black (1915), Watson Black (1936), Wilson (1909), Wilson-Five (1918), Wing's Extra Select Sable (1911), Wing's Pedigree Sable (1916), Wing's Sable (1910), Wisconsin Early Black (1927), Wisconsin Black (1903), Wisconsin Pedigreed Black (1927).

10359. *Time.* 1996. Health report: The good news. Nov. 25. p. 23. [1 ref]
• ***Summary:*** This short article begins: "Women of a certain age may want to cultivate a taste for tofu." Research shows that hot flashes during menopause are less severe in women who eat soy protein daily. The soybean contains phytoestrogens, which resemble the female hormone estrogen that is widely prescribed symptoms of menopause. In Japan, where diets are rich in soy products, "hot flashes are so rare that there is no common word for them."

10360. Himelstein, Vicky. 1996. Amazing tofu diet to beat hot flashes: And here's how to make 'tasteless' health food really delicious. *Star.* Nov. 26. p. 1, 33.
• ***Summary:*** *Star* is a popular tabloid newspaper, sold at supermarket checkout stands, featuring sensational stories and celebrities. On the cover is a color photo of TV star Roseanne in a large rectangle. The text reads: "Roseanne's holiday diet: Eat what you want and lose weight, plus Tofu diet to beat hot flashes."

This article, based on an Associated Press story, begins: "If you're in the throes of menopause and suffer from uncomfortable hot flashes, take heart. You may be able to beat the heat by simply adding tofu to your diet. Startling new research reveals that tofu, a soybean-rich food, can cool the miseries of menopause fast, which may be the reason Asian women–whose diets are rich in soy–suffer fewer, less severe hot flashes and night sweating than American Women."

The article then summarizes a study by Dr. Gregory Burke, of Bowman Gray School of Medicine in Winston-Salem, North Carolina. Investigating the effects of soy on menopause, his 6-week study involved 43 women, ages 45-55. Tofu contains "phytoestrogen–the plant form of the female hormone estrogen." The Star adds: "Doctors are recommending that women eat tofu–a custard-like extract from soybeans–and drink soy milk. The challenge is now for cooks to make tofu taste good. 'Tofu is a white spongy cube that's very bland when you eat it raw,' says Star nutritionist Ann Newswanger. 'But it's cholesterol free, and absorbs flavor from other ingredients. The possibilities are endless–have it for meals and in desserts." Three recipes are given: Tofu raspberry mousse. Poppy seed dressing. Spicy tofu stir-fry with vegetables.

10361. *ASA Today* (*St. Louis, Missouri*). 1996. European response to genetically modified soybeans: Special update to ASA members. 3(1):3-4. Oct/Nov.
• ***Summary:*** "Special emphasis is placed on the current situation in the European Union, one of our key export markets.

"Background: The first commercially available variety of GMO soybeans, Roundup (R) Ready, have been approved for importation and processing by government regulatory agencies in the United States, Europe, Canada, Mexico, Argentina, and Japan. Regulatory bodies in these countries have declared these soybeans safe and the same as conventional soybeans in composition, nutritional profile and functionality. Because these GMO soybeans have been determined equivalent to conventional soybeans in safety and nutrition, government agencies have not required that they be segregated or labeled, either in the U.S. or abroad.

"Last spring regulatory approval was granted by the European Union allowing the importation and processing of Roundup Ready soybeans into food and feed. However, despite these approvals, consumer acceptance issues regarding biotechnology and GMO soybeans exist in parts of Europe which could affect U.S. soybeans exports to certain European markets. No significant consumer or market acceptance issues regarding GMO soybeans have surfaced outside Europe.

"Present situation: Greenpeace and other activist groups have mounted strident opposition to the introduction of GMO soybeans into Europe." Their efforts have raised concern among consumers and segments of the food industry in several European markets, including Germany, Austria, the United Kingdom, Switzerland and Scandinavia. Based on a consumer 'right to know' platform, these groups are advocating segregation of the GMO soybeans and the labeling of all products containing GMO soybeans. They

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are threatening a possible boycott of all U.S. soybeans and derivative products if their demands for segregation and labeling of GMO soybeans are not met.

"This campaign is particularly strong in Germany. Large-scale consumer research in Germany indicates that a significant percentage of the population currently is uncertain about the application of modern biotechnology. Greenpeace is exploiting this situation and has launched, with a few other organizations, a campaign attacking genetically modified crops in general and GMO soybeans in particular. The German media response has been strong, but even-handed, and German consumers' direct response has yet to be determined.

"As a result of the continued pressure by Greenpeace and other activists, Unilever-Germany, the largest consumer food company in Germany, recently announced that, while it supports biotechnology in general, it will not use soybean oil in their margarine and vegetable oil brands until Unilever-Germany is more confident of positive consumer attitudes. Nestle-Germany has announced a similar position.

"Because of this situation, some European purchasers are looking for supplies of soybeans guaranteed to be GMO free. At the current time, traditional exporters in the U.S. are not guaranteeing shipments of non-GMO soybeans. Greenpeace has identified some small and non-traditional suppliers who are reportedly offering supplies of non-GMO soybeans for export at 'modest' premiums. The grain trade knows little or nothing about these suppliers; it is believed that they could offer only limited supplies, and it is not clear how they would execute shipments.

"ASA actions: The American Soybean Association anticipated this controversy in Germany and, along with the United Soybean Board (USB) and industry stakeholders, has been monitoring and attempting to positively influence the situation since the beginning. ASA staff in Germany and Brussels are involved on a daily basis. We are listening to consumers and are working with industry partners in Germany and other European countries to address questions and help share information. We are also keeping close tabs on the possible spillover of the issue into other European countries.

"Since March, when regulatory approval was announced, ASA has carried out extensive industry educational programs in Germany and the European Union with market development funding provided by the U.S. Department of Agriculture and USB. These programs include the publication and distribution of written materials targeted at the food industry, a visit to Germany by ASA CEO Steve Censky and ASA and USB farmer leaders for discussions on the subject at top industry levels, and the support of videos and consumer magazine inserts developed to explain the safety and benefits of biotechnology and GMO soybeans. ASA is working closely with a coalition of German food processors, oilseed crushers, and others to disseminate factual, science-based information to retailers and consumers.

"In discussions with the trade and the press, ASA has maintained that segregation of GMO soybeans and non-genetically modified varieties is impractical and unnecessary, since they are no different in composition or safety.

"ASA supports modern biotechnology efforts and believes that farmers, consumers, the environment, and the entire ag-industry will benefit from biotechnology. We will continue to work to educate our customers on the benefits and safety of biotechnology.

"As marketers of U.S. soybeans, ASA and our members also must be responsive to our customers. Consumer attitude surveys indicate that German consumers are concerned about the inclusion of genetically modified ingredients in their food products. Whether real or imagined, their concerns are a reality. ASA will continue to work with industry partners to develop strategies and messages that protect the German market (7% of total U.S. soybean exports) and the European Union market at large (over 40% of total U.S. soybean exports)."

10362. Holin, Fae. 1996. Roundup Ready beans stir environmental boycott. *Soybean Digest.* Nov. p. 5.
• ***Summary:*** Jeremy Rifkin, president of the Foundation on Economic Trends, is leading this boycott in the USA and Europe of Monsanto's genetically engineered (transgenic) Roundup Ready soybeans by asking consumers to boycott foods in which these soybeans appear unlabeled–such as Green Giant Harvest Burgers, Similac infant formula, and McDonald's french fries (which may be fried in soybean oil).

Both the European Union and Japan recently approved the use of Roundup Ready soybeans in feed and food. "And one of Europe's largest soybean processors, Oelmuhle Hamburg AG [in Germany], says it will begin importing and processing genetically modified U.S. beans this fall, despite Greenpeace protests."

"Roundup Ready soybeans are being harvested for the first time this year from nearly 1 million acres. That's predicted to increase tenfold next year."

10363. Kikkoman International Inc. 1996. The art of soy sauce: Foodservice recipes, tips, and menu ideas. San Francisco, California. 36 p. Illust. No index. 15 x 22 cm. Spiral bound.
• ***Summary:*** Contents: Introduction–The art of soy sauce. What is soy sauce? Soy sauce and the secrets of flavor enhancement. Kikkoman and the art of soy sauce. Soy sauce infusions (with mushroom, garlic, ginger, shallot, chili). Meet the chefs (with a small portrait photo of each): Tim Cushman, Barbara Tropp, Lawrence Chu, Takayoshi Kawai. The recipes.

Each recipe yields 24 servings and is accompanied by a descriptive quotation from the chef who developed it.

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Many recipes are accompanied by a full-page color photo. The Introduction begins: "Right now, all across America, a new culinary style is evolving. So new, in fact, it has yet to be named. Some call it 'Asian-inspired.' Some call it Pan-Pacific.' Others simply call it brilliantly eclectic. It's a cuisine without boundaries that draws on the flavors of Asia, incorporating them into Western cooking to create fresh flavors and new ideas the world has never seen." The majority of the recipes in this book contain red meat, fish, or poultry. Address: San Francisco, California. Phone: 1-800-944-0600.

10364. Lane, Mick. 1996. New test identifies biotech beans and corn: Company claims. *Soybean Digest.* Nov. p. 19.
• ***Summary:*** The article begins: "A new test that identifies biotech-produced [genetically engineered] crops such as Roundup Ready soybeans could possibly stir up more problems than it solves. That's the concern of many biotech proponents, including farmers, in the U.S."

The European Union and Japan have now given the long-awaited green light to import these transgenic crops for feed and food uses. But antibiotech groups in Europe, especially in Germany, are waging a vigorous campaign "to keep biotech-produced food products out of the food chain."

Until recently, there has been no quick, simple test to show whether or not a sample of seeds contains any that have been genetically modified. But a new company named Genetic ID, in Fairfield, Iowa, has announced that it has developed test that can detect the presence of biotech-introduced genes in grains and foods.

Monsanto spokesperson Karen Marshall expressed concern that the test could not say what percentage of the beans in a ship or bin were actually Roundup Ready. She emphasized that there is no difference in the oil from Roundup Ready soybeans and only a minute difference in the protein.

Jeff Wells, general manager of Genetic Id, said that his company's test takes about 2 days, recognizes foreign DNA in an organism with complete accuracy, and costs about $500 per sample. He believes the test will help U.S. farmers who are willing to contract and market soybeans as not genetically altered.

Richard Godown, senior vice president of the Biotechnology Industry Organization in Washington, DC, is concerned that the test gives no information on the safety or health value of a food being tested. "People just want to know whether a product has been genetically engineered... We are concerned that the test, because it gives incomplete information, could be used by antibiotech groups for a biased purpose, and that is to stigmatize biotech foods."

10365. Pulmuone U.S.A. Inc. 1996. Update on Pulmuone (Brochure). South Gate, California. 3 p. 28 cm.
• ***Summary:*** This 3-page black-and-white brochure was inserted into the color Pulmunoe catalog in June 1997. Contents: Background. Situation analysis. Pulmuone's future. Why Pulmuone tofu for the general market? Sales and trade promotions. Distribution. Media plan. "Background: The success of Pulmuone in Korea stems from the original philosophy of naturally produced foods with respects to mother nature. This corporate culture is prominent in its employees and product line. From delivery personnel to the board of directors, Pulmuone identity is imbedded in the corporate and personal lives of all employees.

"In 1991, Pulmuone's dedication expanded across the Atlantic Ocean to the United States. Pulmuone had a far reaching dream to provide Korean Americans with natural ethnic products they could not find in the U.S. Pulmuone bean paste [miso] and pepper paste were the first products to come into the U.S. and minerals and supplemental foods followed thereafter. Then in June of 1995, Pulmuone opened its first tofu plant in South Gate, California.

"Thus began the history of Pulmuone USA.

"Situation Analysis: Currently, Pulmuone USA holds 70% of Korean tofu market. A market held for over 3 decades by a single Japanese company in the U.S., Pulmuone boldly and aggressively captured the Korean American market within 14 months. Once Pulmuone tofu was introduced to the market, Korean Americans immediately recognized the superior quality of Pulmuone Tofu over other brands.

"Pulmuone has also enjoyed success in the Japanese American market within a short span of time. Pulmuone currently produces private label tofu for Marukai, which is a very popular wholesale type market amongst the Japanese Americans. In the past, they carried two of the most popular brands, Hinoichi and Aloha. However, within a 3 month period, Marukai brand tofu sold both brands by a ratio of 3 to 1.

"We have a state of the art facility with complete automation. Our current production rate is 20,000 pounds of tofu per day running at single shift.

"Pulmuone Tofu's obvious superior qualities are attributed to the following: 1. Use of highest quality pure Vinton 81 soybeans; Vinton 81 soybeans are 30% more expensive than regular soy beans. 2. Quick Chill System for optimum freshness and flavor. 3. Lower pasteurization temperature without compromising taste or shelf stability. 4. Complete Manufacturing Plant Sanitation System on a daily basis."

The company has scheduled advertisements in *Vegetarian Times, Los Angeles Times Magazine* (in Korean), and *Super Market Business* for late 1996 and early 1997.

Letter from John Sim, marketing director of Pulmuone. 1997. June 17. This insert was printed on 17 Nov. 1996. Address: 4585 Firestone Blvd., South Gate, California 90280. Phone: 213-564-3000.

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10366. Hansen, Asger Sommer. 1996. Re: Finally our soymilk business is taking off (Card). Letter to William and Akiko Shurtleff of Soyfoods Center, Dec. 1 p. Handwritten, with signature.
• ***Summary:*** Handwritten on an APV UNICEF Christmas card: "Finally our soymilk business is taking off. Plants sold in 1996: 3 for China. 1 for England. 1 for Japan.

"Kind regards, Asger S. Hansen." Address: APV Soya Sector, Europaplads 2, 8000 Aarhus C, Denmark. Phone: +45 86 12 41 55.

10367. House Foods America Corporation. 1996. Hinoichi products (Leaflet). Los Angeles, California. 1 p. Single sided. 28 cm.
• ***Summary:*** This single-sided leaflet (8½ by 11 inches) shows a photo and gives a brief description of each of the company's products, which fall into four categories: (1) Tofu: Regular tofu, 19 oz, water pack. Shelf life, refrigerated: 34 days. Regular tofu, 14 oz. Soft tofu (kinugoshi), 14 oz. Extra soft tofu, 14 oz. Firm tofu, 19 oz or 14 oz. Yaki tofu (broiled tofu), 9 oz. (Japanese label only)

(2) Age: Agé French fried tofu pouches, 6 pack (1.5 oz each). Oagesan 4-pack tofu pouches (1.1 oz each; Japanese label). Atsuage tofu cutlet (5 oz, Japanese label). Jumbo atsuage tofu cutlet (9 oz, Japanese label). Tofu fritter, large (Ganmodoki, 3 = 2.5 oz.). Tofu fritter, small (Ganmodoki, 8 = 2.5 oz.).

(3) Konnyaku: 6 products, incl. 3 Shirataki yam noodle [thin konnyaku noodles].

Natto: Natto fermented soybeans, 4 oz. Mamekozo natto fermented soybeans, 5.4 oz.

A separate but similar sheet shows foods made in Japan by House Foods and sold by House Foods America Corporation. These include Mabo Tofu Sauce (Medium hot or hot), Wasabi (horse radish paste), *Shichimi togarashi* (red pepper mix), *rayu* (hot sesame oil), *Mugicha* (barley tea), stew mixes (beef or cream), and several curry sauces. Address: 526 Stanford Ave., Los Angeles, California 90013. Phone: (213) 624-3615.

10368. Kluis, Alan. 1996. Global soybean demand continues to increase: A price rebound likely in 1997. *Soybean Digest.* Dec. p. 54.
• ***Summary:*** A table shows U.S. soybean exports to leading nations and regions from 1990/91 to 1995/96, with Northstar estimates for 1996/97. China began importing U.S. soybeans in 1995/96 with 12 million bushels, projected to rise to 26 million in 1996/97.

Europe is the largest market: European imports of U.S. soybeans rose from 212 million bu in 1990/91 to 339 million in 1995/96.

Japan is the 2nd largest market. Japan's imports of U.S. soybeans rose from 131 million bu in 1990/91 to 149 million in 1995/96.

Taiwan is the 3rd largest market. Taiwan's imports of U.S. soybeans rose from 69 million bu in 1990/91 to 96 million in 1995/96.

Mexico is the 4th largest market. Mexico's imports of U.S. soybeans rose from 59 million bu in 1990/91 to 95 million in 1995/96.

South Korea is the 5th largest market. South Korea's imports of U.S. soybeans rose from 32 million bu in 1990/91 to 51 million in 1995/96.

Indonesia's imports of U.S. soybeans rose from 3 million bu in 1990/91 to 25 million in 1995/96.

Israel's imports of U.S. soybeans rose from 15 million bu in 1990/91 to 16 million in 1995/96.

Total imports of U.S. soybeans rose from 557 million bu in 1990/91 to 845 million in 1995/96. Address: President, NorthStar Commodity Co.

10369. *Ontario Soybean Growers' Marketing Board Newsletter.* 1996. Canadian soybean exports and imports. Dec. p. 2.
• ***Summary:*** Gives comparative soybean statistics in metric tons (tonnes) for crop year 1994/95 and 1995/96.

Total soy [soybean] imports: Increased 12% from 62,539 to 69,900.

Exports to East Asia: Increased 11% from 110,251 to 122,176. The leading importers, in descending order of thousand tonnes imported in 1995/96, are: Japan (36.5), Hong Kong (31.2), Malaysia (21.3), Singapore (19.7), Indonesia (3.6), South Korea (2.5).

Exports to Europe: Increased 27% from 262,163 to 333,412. The leading importers, in descending order of thousand tonnes imported in 1995/96, are: Spain (100.7), Netherlands (88.2), Portugal (48.2), Belgium (44.0), Norway (28.3).

Exports to USA: Decreased 16% from 150,757 to 136,903.

Total soybean exports: Increased 11% from 528,102 to 586,621 tonnes.

Source: Statistics Canada. Address: Box 1199, Chatham, ONT, Canada N7M 5L8.

10370. *Ontario Soybean Growers' Marketing Board Newsletter.* 1996. Japan Tofu Association. Dec. p. 3.
• ***Summary:*** "In October, Ontario hosted a group of processors from Japan who were interested in buying Ontario soybeans for use in tofu production.

"The visiting delegation toured the Eastern Cereal & Oilseed Research Centre (Ottawa), where Dr. Harvey Voldeng and his colleagues are working on short season tofu varieties. The group also visited a grain facility in Quebec, the Greenhouse & Processing Crops Research Centre (Harrow), where Dr. Dick Buzzell and his colleagues are producing tofu in the lab, looking at tofu texture, firmness and carbohydrates. The Japanese group also observed the

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processing and cleaning of soybeans at several Ontario grain elevators.

"In Chatham, over forty people gathered to meet with this very important delegation. The Honourable Noble Villeneuve, Minister of Ontario Agriculture, Food & Rural Affairs, spoke to the group on the value of the Japanese tofu market. Having visited Japan last April, he knows first-hand the huge potential for Ontario soybeans in Japan." Address: Box 1199, Chatham, ONT, Canada N7M 5L8.

10371. *Ontario Soybean Growers' Marketing Board Newsletter.* 1996. Profile: Gord Pryde of Hensall District Co-operative (Ontario, Canada). Dec. p. 7.
• ***Summary:*** "Ontario's newest soybean exporter is planning to expand contract production of white hilum soybeans northward through Huron and Perth Counties.

"Hensall Co-op contracted with over 100 growers in 1996 to produce 10,000 tonnes of food quality soybeans, mainly for export to Japan and Hong Kong. For 1997, the cooperative will offer contracts for 150 farmers as it makes more inroads into the Pacific Rim market. "'Quality is the key,' says Gord Pryde, marketing manager for the cooperative, which has invested $4.5 million in processing equipment at its Hensall site within the last three years. Pryde says that in 1990, the cooperative faced a pivotal choice. Either it had to undertake a major upgrade in facilities to ship high-quality edible beans, or it had to quit that business.

"Very early in the discussions, directors saw the potential to enhance the return on their investments in equipment and human resources by expanding into soybeans. Now, the cooperative has world class receiving, cleaning and drying equipment, matched with a flexible high-quality storage network that lets it segregate beans and soybeans for distinct markets. Pryde says the equipment achieves precise size, colour and cleanliness standards, and allows them to ship soybeans in bulk or in poly or jute bags.

"Hensall Co-op has total sales over $100 million a year, with nine locations from Ilderton in Middlesex County to Londesborough in north Huron County. The cooperative markets farm inputs such as seed, fertilizer and feed, together with fuels and hardware. Hensall Co-op operates five elevators at Hensall, Seaforth, Exeter, Ilderton and Londesborough. The cooperative is a prominent player in Ontario's white bean industry, and also contracts a dozen kinds of edible beans, ranging from familiar kidney beans to two kinds that most Ontario consumers have probably never seen. These are otebo [*Phaseolus vulgaris* L.] and kintoki [azuki] beans, grown especially for Japan, and they're another reason that Hensall Co-op believes that it can sell food quality soybeans in the Pacific Rim.

"'We've already established a presence as a high quality niche market supplier in the region,' Pryde explains.

"Pryde says Hensall Co-op is building on the efforts of pioneers including John Thompson of W.G. Thompson & Sons, and Nap and Paul King of King Grain, and more recently Peter Hannam of First Line Seeds.

"'They have established a reputation for quality,' Pryde says. 'We don't see ourselves as competitors. We think we can complement their efforts by identifying our own niches.' He adds, 'We believe we are expanding Ontario's share of overseas markets.'

"Pryde says the co-op expects steady growth in contract production, especially with identity-preserved varieties. For its 1996 contracts signed last winter, the co-op offered a 20 cent at-harvest premium for white hilums, and 30 cents for identity preserved, rising to 60 cents for January delivery.

"Most current growers are in north Middlesex county, but Pryde sees potential for growth throughout its trading area as growers gain experience. Hensall Co-op lays out a production program, including weed control. Quality at the receiving platform, however, is heavily influenced by critical harvest decisions, including combine settings and harvest timing.

"'We see our involvement in soybeans five years from now to be completely different than today,' Pryde says. 'We're always going to have a base of regular white hilum soybeans, but the future is to source customers who have unique requirements that demand a niche approach.' That means more identity-preserved production. In fact, Pryde foresees the growth of unique niche marketing becoming so precise, buyers who live half a world away will want to know they're receiving beans grown by specific producers.

"'We built our edible bean business on niche marketing,' Pryde says. 'We will use the same approach in soybeans. We're definitely in this market for the long term.'"

A photo shows Gord Pryde of Hensall District Co-operative standing next to a large truck. Address: Box 1199, Chatham, ONT, Canada N7M 5L8.

10372. Fukutake, M.; Takahashi, M.; Ishida, K.; Kawamura, H.; Sugimura, T.; Wakabayashi, K. 1996. Quantification of genistein and genistin in soybeans and soybean products. *Food and Chemical Toxicology* 34(5):457-461.
• ***Summary:*** Discusses: Soybeans, soy nuts, soy powder, soymilk, tofu, miso, natto, soy sauce, genistein. Address: 1-3,5-6. Biochemistry Div., National Cancer Center Research Inst., 1-1 Tsukiji, 5-chome, Chuo-ku, Tokyo 104; 1,4. Tsumura & Co., 3586 Yoshiwara, Ami-cho, Inashiki-gun, Ibaraki 300-11. All: Japan.

10373. Ito, H.; Tong, J.; Li, Y.; Li, Y. 1996. [Chinese douchi. I. From itohiki-natto to particle miso]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) 44:216-21. [Jap]*
• ***Summary:*** Tamang (2010, p. 264) gives the title in English as: "Chinese dauchi, from itohiki natto to nonmashed miso." And he gives the pages as 224-50, in the same volume.

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10374. Ito, H.; Tong, J.; Li, Y. 1996. [Chinese douchi. II. From itohiki-natto to nonmashed miso]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) 44:224-50. [Jap]*

10375. Katsura, M. 1996. Tofuyo [Tofuyo]. *Nihon Chori Kagakukai-Shi* (*Journal of Cookery Science of Japan*) 29:314-22. [Jap]*

10376. **Product Name:** [Tsumami Dry Natto for Snacks].
Foreign Name: Tsumami Nattô.
Manufacturer's Name: Koishiya Shokuhin K.K. KF. Japan Airlines (Marketer).
Manufacturer's Address: Ujike 2664, Ujike-machi, Shioya-gun, Tochigi prefecture, Japan. Phone: 0286-82-2220.
Date of Introduction: 1996.
Ingredients: Natto, kombu.
Wt/Vol., Packaging, Price: 80 gm.
How Stored: Shelf stable, 90-day shelf life.

New Product–Documentation: Product with Label sent from Japan by Jean Pearce, writer for the Japan Times. 1997. March. Sold in a cylindrical plastic tub, 3½ inches diameter by 1½ inches deep. Label on the top is self-adhesive, brown and red on yellow. "A natural food. Enriched with vitamin E. Kombu added."

This natto is in a dry from that can be used as either a snack or a topping. A *tsumami* is literally "a pinch,"–as of salt. *Beeru no tsumami* means a "side dish for beer."

10377. Li, Y.; Chun, M.; Zhou, W.; Gang, S.; Ito, H. 1996. [Chinese douche. II. From itohiki-natto to particle miso]. *Miso no Kagaku to Gijutsu* (*Miso Science and Technology*) 44:244-50. [Jap]*

10378. Nikkuni, Sayuki; Karki, Tika B.; Terao, T.; Suzuki, T. 1996. Microflora of *mana,* a Nepalese rice koji. *J. of Fermentation and Bioengineering* (*Osaka, Japan*) 81(2):168-70. *

10379. Wu, Anna H.; Ziegler, R.G.; Horn-Ross, P.L.; et al. 1996. Tofu and risk of breast cancer in Asian-Americans. *Cancer Epidemiology, Biomarkers, and Prevention* 5:901-06. *
• ***Summary:*** Study group and area: Asian-Americans (Chinese-, Japanese-, and Filipino Americans) residing in the San Francisco-Oakland metropolitan statistical area, Los Angeles County, and Oahu, Hawaii. Time period: 1983-87. Number of case subjects: 597 (169 in SF, 215 in LA, and 213 in Hawaii). Number of control subjects: 966 (310 in SF, 273 in LA, and 378 in Hawaii). Address: 1. Dep. of Epidemiology, Univ. of California at San Francisco (UCSF).

10380. Chichibu no Miya, Setsuko; Britton, Dorothy Guyver. 1996. The silver drum: a Japanese imperial memoir. Translated from the Japanese *Gin no bonbonieru* by Dorothy Britton. Folkestone, Kent: Global Oriental. xxvii + 210 p. Plus 8 unnumbered pages of plates. See p. 10. Illust. 23 cm.
• ***Summary:*** When I was about 9 years old, my nanny, Taka, severely scolded me for leaving one or two grains of rice in my lunch box after school.

"'Do you realize that the Aizu clan members in virtual exile on the Tonami Peninsula, and their wives and children, had to live on weeds and grass seeds and the tofu lees [okara] and leftover rice, usually fed to horses and oxen, which they were given by the local farmers...'" (p. 10).

"This is the story of a Japanese princess. It is the first autobiography by a member of the Japanese Imperial Family to be published in English. Her name was Setsuko, Princess Chichibu, who was born in Walton-on-Thames, England, in 1909, was educated at the Peeresses' School for Girls, Tokyo, and the Friends School, Washington, and was then invited to marry Prince Chichibu, younger brother of Emperor Hirohito and therefore next in line to the throne. She accepted... The marriage duly took place in September 1928. She died at the age of 85 in August 1995... Both the Prince (who spent some time studying in London and Oxford) and Princess had especially close links with England and the United States. When Japan entered the Second World War they both had to endure the unendurable: their mother country having declared war on their adopted countries. It was an appalling nightmare for them both. In the post-war years, the Princess made numerous trips to Europe in an attempt to rebuild old friendships. She was greatly loved and admired. There were no children" (from the publisher's description). Address: Japan.

10381. Hasse, Geraldo; Bueno, Fernando. 1996. O Brasil da Soja: Abrindo fronteiras, semeando cidades [The Brazil of

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soy: Opening frontiers, sowing cities]. Porto Alegre, Brazil: L&PM Editores S.A. 256 p. Illust. (some color). 32 x 28 cm. [Por; Eng]

• ***Summary:*** This spectacular and original book contains the best history of the soybean in Brazil seen to date. It was published to celebrate the 25th anniversary of Ceval Alimentos S.A. (best known as "Ceval"), a soybean crushing and processing company in Brazil. Founded on 4 April 1972 as *Cerais do Vale Ltda.* ("Valley Cereals") by the Hering Co. to benefit from tax incentives offered by the government of Santa Catarina, it began regular operations in Oct. 1972–but quickly transcended its origin and original name. In 1996 the company had nine soybean crushing plants throughout Brazil; three of these also contained soy oil refining capabilities.

The first half of this book is written in Portuguese, the second half in English. Issued in a case, it contains almost 100 pages of full-color photos plus 24 historical black-and-white photos (from the early 1900s to the present, each with a detailed caption) and excellent illustrations. Hasse, an expert in rural matters, conducted more than 150 interviews in the process of writing this book.

Contents: A Brazilian saga (how the book was created), by the publishers. The soy revolution (introduction), by Ivo Hering and Vilmar Schürmann of Ceval Alimentos. Before the fields, the school: Introduction, in the baggage of the Japanese, the reflection of North America, whole grain bread, the role of World War II, local industry. The foreign thrust (p. 202): Introduction, Communist help, the pool of exporters, "Zé Sojinha" (nickname of agronomist José Gomes da Silva, who continues the research of pioneer Neme Abdo Neme at the IAC), frost in coffee plantations (1955 in Parana), the weight of industry (Samrig in 1953, Bunge & Born, Antonio Mafuz, first Samrig crushing plant in 1956 at Porto Alegre, Institute for Soy Development of Rio Grande do Sul once had 42 members), planting news (Samrig, Nestle), butter vs. margarine (Primor soy oil and margarine), table showing soybean production in Brazil and four states, every five years from 1950 to 1970. The wheat lever: Introduction, a civic mission, the import addiction, the circle of mold, the technological package, paper wheat, the powerful CTRIN, swapping roles. The cooperative branch (p. 212): Introduction, the original sin (*Fecotrigo,* Oct. 1958), in the shadow of Banco do Brasil, victims of a giant, grass roots education, a summit decision, big shot, the charter flight to Chicago, the crisis of 1982, loss of credibility, the lessons of soy. The Chicago fever: Introduction, "It was impossible to compare," "Exceptional," kings and beggars (the price fever of 1973), the export model, state incentive, the theory of plenty. The conquest of the West (p. 222): Introduction, expanding frontiers, under the weight of the ax, from the other bank of the river, family subsistence, chronological duality, the march to the west, sowing cities, family memories, once upon a time, the transportation bottle-neck (building the Madeira river waterway). The agribusiness axis: Introduction, the role of the government, plenty of credit, the oil industry, the "poking" method, the boom of Santa Catarina, the dynamism of the Central-West region, the new paradigm, the revolution in transportation, the effect of the strike, grain trucks, machinery industry, the progressive Carazinho, Lodgemann–the land surveyor, Streich–the carpenter. A tropical adventure (p. 236): Introduction, a multinational legion, the metamorphosis, technical leadership, Santa Rosa, in the Mogiana region, the Campinas-Pelotas pioneers, Santa Maria, trailing behind producers, the queen of the cerrados, technical polarization, no frontiers, stories from the hinterland, Londrina–technical capital, the Nobel Prize, the retirement of the plow, farewell to one-crop farming, poor man's food (ITAL). A symbol of health: Introduction, the paradox of Esteio, forced diet, for the pigs and the poor, food and medicine, nutritious soft drink (soymilk, *leite de soja*), a secondary ingredient, flavor barrier (Ital {a public organization}, Vital soymilk {1977}, Sojal soymilk, Gestal soymilk, Roberto Moretti from 1977), the Mechanical Cow (Moretti's "cow" was awarded the "greatest Brazilian invention" prize by the governor of Sao Paulo; this started the cow on an outstanding public career), drops in the ocean, a standing taboo, in search of health, Oriental wisdom, anti-nutritional factors, therapeutic powers. The lessons of a revolution (p. 255): Conclusion. Chronology of the history of soy in Brazil.

On the two pages after the table of contents are full-page color maps which show: (1) Satellite photo of the Planalto Central (High Central Plains) region of Brazil. The city of Brasilia is at the center, and concentrated on the right are areas of soy plantations. The small circles between the plantations are "pivot" planted areas. (2) Map of Brazil showing the historical growth of the soybean crop, places of historical interest, and important cities and ports. There are five special symbols: (a) A brown soybean pod = Introduction of soybean cultivation, e.g., 1882 Bahia, 1980 Barreiras, 1989 Balsas. (b) A blue ship by an elevator = Ports that are outlets for soybean production. (c) Three silver elevators = Centers of cooperative wheat growing. (d) A red retort and a white book = Centers of education, training, and research. (e) A yellow factory with smokestack = Crushing or processing plants. Generally, the soybean has expanded into the northern and northwest parts of Brazil. The captions explain: 1882–Bahia–First cultivation of soybeans in Brazil. 1908–Japanese immigrants import soybeans to Brazil in their personal baggage. 1920–Santa Rosa, Rio Grande do Sul–Soybean seeds distributed to European colonists. They become the first regular cultivators of soy in the southern Brazil. 1923–Sao Simao, Sao Paulo–Henrique Lobbe starts to test American soybean varieties. 1938–Porto Alegre–The first exportation of soybeans from Brazil to Germany. 1958–Esteio–Brazil's first soy oil plant, started by Samrig. 1971–Rio Grande–Grain terminal starts operating. 1972–Gaspar,

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Santa Catararina–Ceval Alimentos begins operations. Dourados–Bridge of entry of soybeans into Mato Grosso do Sul. Territory of Brasiguaios–Planters of soya and wheat. Port cities (from south to north): Rio Grande, Sao Francisco, Paranagua, Santos, Vitoria, Ilheus, Ponta de Madeira: They play an important role in the exports of seeds and industrialized products.

Talk with Ted Hymowitz, Prof. of Plant Genetics, Univ. of Illinois. 2000. July 3. From 1964 through 1966, Dr. Hymowitz was employed as an agronomist by the IRI Research Institute, Campinas, Brazil–working with soybeans–as part of the Alliance for Progress. He was also a technical advisor to the Brazilian National Soybean Commission. When he read this book, he was struck by the fact that it did not mention the important U.S. role in the development of the soybean industry in Brazil in the 1960s. Address: 1. Journalist; 2. Photographer. Both: Brazil.

10382. Hasse, Geraldo; Bueno, Fernando. 1996. Captions of 24 historical photos of the soybean in Brazil (Document part). In: G. Hasse and F. Bueno. 1996. O Brasil da Soja: Abrindo Fronteiras, Semeando Cidades [The Brazil of Soy: Opening Frontiers, Sowing Cities]. Porto Alegre, Brazil: L&PM Editores S.A. 256 p. See p. 187-92. Illust. 32 x 28 cm. [Por; Eng]

• ***Summary:*** These historical photos and English-language captions appear on pages 187-92: 1. In the region of Santa Rosa, the center of soy in the first decades of the 20th century, German settlers gather at a celebration. 2. European immigrants established wood as the pioneer activity of the agricultural civilization in northern Rio Grande do Sul. 3. Beginning in 1908, Japanese immigrants arrive in Santos carrying the seeds of a new crop to be developed in South America in their luggage. 4. In the planting fields run by *Instituto Agronômico* of Campinas in the interior of Sao Paulo in 1920, soy plants were practically as tall as a man.

5. For almost a century, the *Instituto Agronômico* of Campinas, founded in 1887, was the main technical reference center on soy in Brazil. 6. The pioneer of soy cultivation in the South was the *Escola de Agronomia Eliseu Maciel* (Agronomy School), once called *Liceu Agricola Rio-Grandense,* in Pelotas. 7. *Sorol,* which began operation in the early 1950s in the harbor area of Pelotas, was one of the first oil factories of Brazil. 8. At the factory in Horizontina, farmer Carlos Sapiezinski removes the first threshing machine manufactured in the region of soy.

9. In the 1960s, before extensive mechanization, the fields previously dominated by the queen-of-the-meadow grass in *Planalto* region of Rio Grande do Sul were cultivated with a hoe. 10. In Sao Paulo, a technical meeting on soy. From right to left: Shiro Miyasaka, José Drummond Gonçalves, and José Gomes da Silva ("Zé Sojinha"). 11. Studies of soy adaptation to *cerrados* climate of Central Brazil began at the Federal University of Viçosa. 12. While gathering a sample of soybean plants before harvest, a worried farmer from Paraná evaluates the quality of beans.

13. In the 1970s, the boom of soy in the state of Paraná is shown through the lines of trucks in the harbor of Paranguá. 14. Taking advantage of the soy wave, *Olvebra,* a fusion of four small factories of the interior of Rio Grande, entered the stock market fever in 1972. 15. The settlement of Mato Grosso followed the same method used in the southern states for felling forests by offering official incentives. 16. The first SLC harvester [combine] was created in 1965 in the center of soy, based on a *John Deere* reaper-thresher, which had been imported 10 years earlier. Note: SLC is the name of a harvester manufacturer based in Horizontina.

17. At first, the super-harbor of Rio Grande was a wheat and soy terminal given to *Cotrijuí* by the government. 18. Since 1974, following the soy boom, serial manufacturing of trailers for bulk transport in Caxias do Sul was developed by *Randon.* 19. When *Ceval* was built in Gaspar during the first half of the 1970s to take advantage of tax incentives due to the *Hering* company, nobody imagined that it would become the largest company of Santa Catarina in the 90s, thanks to soy. 20. In Brazilian kitchens, soy oil slowly replaced peanut and cotton oils. After 30 years, it was a necessity in Brazilian kitchens.

21. Olacyr de Moraes, a pioneer in exploring virgin lands in Ponta Pora, was named the "king of soy" because of his extensive plantations in both states of Mato Grosso. 22. Since the 70s, the *Centro Nacional de Pesquisa da Soja* [CNPSo, National Soy Research Center] in Londrina has been the main agricultural reference on *Glycine max* in Brazil. 23. The *Centro Nacional de Pesquisa do Trigo* (Wheat Research National Center) in Passo Fundo. Soy helped the wheat crop in the 60s, just as wheat helped the soy crop in the 90s. 24. The no-tillage method, the latest stage of agriculture mechanization, is a planting technique which causes no erosion and preserves soil fertility. Address: 1. Journalist; 2. Photographer. Both: Brazil.

10383. Hasse, Geraldo; Bueno, Fernando. 1996. Chronology of the soybean in Brazil (Document part). In: G. Hasse and F. Bueno. 1996. O Brasil da Soja: Abrindo Fronteiras, Semeando Cidades [The Brazil of Soy: Opening Frontiers, Sowing Cities]. Porto Alegre, Brazil: L&PM Editores S.A. 256 p. See p. 198-99, 255-56. Illust. 32 x 28 cm. [Por; Eng]

• ***Summary:*** An excellent chronology: 1882–The earliest known planting of soybeans in Brazil, at Bahia. 1889–The first technical article on soybeans is published in *Instituto Agronômico* (Campinas, Sao Paulo). 1900–Experimental soybean plantations in Rio Grande do Sul. 1908–Japanese immigrants cultivate soybeans at home in the interior of Sao Paulo. 1914–In Porto Alegre, E.C. Craig teaches about soy. 1921–Seed is distributed to settlers of Santa Rosa, Rio Grande do Sul, by priest Albert Lehnbauer. 1923–Henrique Lobbe begins the testing of American varieties in Sao Simao,

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Sao Paulo.

1930–Planting and cooking in northeastern Rio Grande do Sul is taught by Czeslaw Biezanko. 1934–Seeds are brought from China to Minister Fernando Costa by actress Patrícia Galvao. 1935–Neme Abdo Neme begins his experiments in *Agronômico* from Campinas. 1938–The first shipment from Rio Grande do Sul to Germany is exported by Frederico Ortmann.

1941–Soy first enters agricultural statistical data of Rio Grande do Sul. 1945–Soy first enters agricultural statistical data of Sao Paulo. 1948–In order to add soy to *Patroa* cotton oil, Swift encourages planting in the interior of Sao Paulo.

1950–José Gomes da Silva begins the Soy Campaign in Sao Paulo, introducing new American varieties. 1951–Francisco de Jesus Vernetti begins to research soy at *Iapas,* Pelotas, Rio Grande do Sul; *Incobrasa* inaugurates its factory in Gravataí, Rio Grande do Sul, and launches the *Santa Rosa* oil, with technology brought by the Chinese who fled Mao Zhe Dong's revolution. 1952–*Sorol* produces soybean oil in Pelotas. 1955–Chinese entrepreneurs establish *Igol* in Santa Rosa and soy is planted to recover frosted coffee plantations in Paraná. 1957–In Porto Alegre, *Merlin* launches canned oil. 1958–*Samrig* inaugurates a factory in Esteio, Rio Grande do Sul, and launches the *Primor* oil and margarine; Shiro Miyasaka discovers a soybean variety that is less sensitive to the photoperiod in the Paraíba river valley; foundations of the *Federaçao das Cooperativas Tritícolas do Sul* (Southern Wheat Cooperatives Federation) (Fecotrigo).

1962–In Giruá, Rio Grande do Sul, Sadi Pilau establishes a factory. 1963–The Federal University of Viçosa, Minas Gerais, begins to study varieties adapted to the *cerrados.*

1966–Santa Rosa, the first great Brazilian variety, resulting from crosses of American strains, is launched at the First National Soy Festival. 1967–Operation Armadillo, in the interior of Rio Grande do Sul, a milestone of the couple wheat-soy, is financed by *Banco da Brasil*; first Soy Festival in Sao Joaquim da Barra, Sao Paulo. 1968–Romeu Kiihl returns from the U.S. after studying soy's ability to adapt to different latitudes. 1969–*Mineira* and *Viçoja* varieties launched by UFV.

1970–Soy begins to be planted in Mato Grosso (do Sul) and penetrates the *cerrados* of Goiás. 1971–*Olvebra* begins operation after the fusion of four factories from Rio Grande do Sul; the National Commission on Soy Research is established in the Ministry of Agriculture, which is responsible for launching BR seed varieties. 1972 April 4–*Ceval* is founded by the Hering company. Oct.–Begins regular operations in Gaspar, Santa Catarina. 1973–*Anderson Clayton, Cargill* and *Irmaos Pereira* factories are inaugurated in Ponta Grossa, Paraná. 1973–Soy prices boom in the international market. 1974–Settlers from Rio Grande do Sul visit the Chicago Stock Market.

1976–The National Center for Soy Research, of Embrapa, begins operation in Londrina, Paraná. The *Sadai* group, the biggest consumer of soybean meal, begins processing soy in a factory in Toledo, Paraná; *Perdigao* establishes a factory in Videira, Santa Catarina.

1980–Soy broadens the agricultural frontier to the *cerrados* in Bahia. 1981–*FT-Cristalina* variety is launched, suitable for the *cerrados.* 1982–The "Centralsul Scandal" exposes the crisis of the southern agriculture cooperatives; international credit to Brazil is cut by the International Monetary Fund. 1985–Beginning of the transference process of the soybean crushing industries to the Central-West.

1990–Soybean penetrates Maranhao and Piauí. 1994–National production record, consisting of more than 25 million tons.

1995–The established capacity of the soybean processing industry reaches 116,000 tons per day; soy businesses represent U.S. $7.5 billion–more than 1% of GNP. 1996–The federal government invests in waterways and railways to consolidate the agricultural frontiers of the Central-West. Address: 1. Journalist; 2. Photographer. Both: Brazil.

10384. Hosking, Richard. 1996. A dictionary of Japanese food: Ingredients & culture. Boston, Rutland, Vermont, Tokyo: Tuttle Publishing. 239 p. Illust. by Richard C. Parker. Index. 21 cm. [16 ref]

• ***Summary:*** This appears to be the same as the original 1972 edition. An excellent, accurate book. The basic entry for each word is given under its Japanese name (thus *daizu* rather than soybeans). Each entry includes the Japanese term in kana (usually hiragana) and (usually) kanji (Chinese characters). One hundred small illustrations are very helpful.

Here is a short example: "dengaku (hiragana, kanji) a preparation in which food such as eggplant, taro, konnyaku, or tofu are dressed with a sweetened miso topping and grilled on skewers. Fish *dengaku* is called *gyoden."*

An example of a longer entry is "yuba (hiragana, kanji) soy-milk skin. A specialty of Kyoto, this skin that is formed when soy milk (tônyû, 2 Chinese characters) is heated is not only delicious, but highly nutritious, being the richest source of protein known (over 52%). It is also high in natural sugars (12%) and polyunsaturated fats (24%) and therefore very high in energy. It is eaten both fresh and dried, being added to soups and used as a skin to roll up such things as cucumber and burdock. Nearly all yuba is made in Kyoto and it is fairly expensive. Much use is made of yuba in shojin ryôri."

Seventeen appendices (p. 197-235) give detailed discussions of the following important Japanese foods and related items: Chopsticks. Katsuobushi. The kitchen and its utensils. Kombu. The meal. Miso. Saké. Salt. Sansai. Soy sauce. Sushi. Tea. The tea ceremony. Umami and flavor (incl. MSG). Vegetarianism (incl. Buddhism, shôjin ryôri, and fucha ryôri). Wasabi. Wasanbon sugar.

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The author has lived in Japan since 1973. He holds an M.A. degree from Cambridge Univ. Address: Prof. of Sociology and English, Hiroshima Shudo Univ., Japan.

10385. Kikkoman K.K. 1996. Dai 78 ki jigyô hôkoku-sho. Heisei 7 nen 1 gatsu 1 nichi–Heisei 7 nen 12 gatsu 31 nichi [78th annual financial report. From 1 Jan. 1995 to 31 Dec. 1995]. Tokyo, Japan. 13 p. [Jap]
• ***Summary:*** Color photos show most of Kikkoman's main products. Address: Tokyo, Japan.

10386. Kleiner, Art. 1996. The age of heretics: Heroes, outlaws, and the forerunners of corporate change. New York, NY: Currency Doubleday. xii + 414 p. See p. 273-89. Illust. Index. 24 cm.
• ***Summary:*** From the rear cover: "Art Kleiner has uncovered a kind of secret history that links the medieval monastic orders, the counterculture of the sixties, and the key agents of corporate change in the modern world. I think its a landmark for people both inside and outside the most influential institution of the modern age–the corporation"–by Howard Rheingold, author of *Virtual Reality, Virtual Communities and Tools for Thought.*

Chapter 8, titled "Millenarians," begins with a history of Erewhon Trading Company (p. 273-89), which makes it appear that Paul Hawken was the only important person in the company. Nevertheless, the history is full of interesting insights, many related to Erewhon's role as a pioneer in the countercultural natural foods industry and (for a while) the largest distributor of natural foods and macrobiotic foods in the United States. Kleiner is a engaging and insightful writer. Erewhon was started by Michio and Aveline Kushi who, in the 1950s, had met at La Maison Ignoramus [literally, The House of Ignorance], a macrobiotic institute founded by renegade philosopher George Ohsawa outside Tokyo. Ohsawa claimed to have cured himself of tuberculosis by eating a diet of brown rice, miso soup, and cooked vegetables (from both land and sea). Ohsawa came to believe that a good (macrobiotic) diet is the foundation of both personal and societal health. The first step is to change your own diet, then to help others change theirs. Ohsawa was a Japanese writer, had lived in Paris in the 1920s, and was deeply interested in world government–as well as in Zen. Ohsawa recruited the Kushis to go abroad (Michio was the first to leave Maison Ignoramus and to do so) to promote world government. Michio and Aveline fell in love in the United States and were married. They eventually started teaching young Americans in Cambridge, Massachusetts. Before long they were prosecuted for practicing acupuncture without a medical license–but they prevailed and stayed. In the mid-1960 macrobiotic diets called for staples that were rarely found in East Coast food stores: brown rice, miso, tamari, etc. The Kushis started to sell food and books out of their home in Cambridge. Then [in April 1966] they moved the little store out of their home into a basement retail space at 303-B Newbury Street–and named the fledgling company Erewhon. "... one of their students, Paul Hawken, took over as clerk"–or at least so says this book. Hawken was only eighteen, a lean young man from California. The rest of the story is how Hawken (apparently single-handedly) built Erewhon and the early natural foods movement.

From the publisher's description: "The author explores the nature of effective leadership in times of change and defines its importance to the corporation of the future. He describes a heretic as a visionary who creates change in large-scale companies, balancing the contrary truths they can't deny against their loyalty to their organizations. This book reveals how managers can get stuck in counterproductive ways of doing things and shows why it takes a heretical point of view to get past the deadlock and move forward." Address: Former editor of *The Whole Earth Catalog* and freelance business reporter during the 1980s, Oxford, Ohio.

10387. Palmer, R.G.; Hymowitz, T.; Nelson, R.L. 1996. Germplasm diversity within soybean. In: D.P.S. Verma and R.C. Shoemaker, eds. 1996. Soybean: Genetics, Molecular Biology, and Biotechnology. Wallingford, England: CAB International (Commonwealth Agricultural Bureaux). x + 270 p. See p. 1-36. Chap. 1. [234 ref]
• ***Summary:*** Contents: Introduction. Germplasm–Subgenus *Soja.* Germplasm–Subgenus *Glycine.* Germplasm–Characterization of diversity: Soybean breeding and loss of diversity, diversity for 'yield' traits within *G. max,* diversity for value-added traits within *G. max,* diversity for pest resistance/tolerance within *G. max,* diversity for physiological traits within *G. max,* soybean breeding and use of *G. soya,* diversity for cytogenetic and molecular traits within *G. max* and *G. soja.* Conclusions.

The introduction states: "There are more than 100,000 *Glycine max* accessions, probably less than 100,000 *Glycine soja* accessions, and approximately 3,500 accessions of perennial *Glycine* species in germplasm collections throughout the world. Inasmuch as the only worldwide survey of soybean collections is a decade old (Juvik et al., 1985), the exact numbers are unknown. Major *Glycine* collections exist in Australia, Brazil, China, Germany, India, Indonesia, Japan, Russia, South Korea, and the United States. Many other smaller but important collections exist throughout Asia and Europe."

Tables show: (1.1) List of species in the genus *Glycine* Willd., three-letter code, 2n, standard (PI), genome symbols and distribution. (1.2) Origin and number of accessions of *Glycine soja* in the USDA Soybean Germplasm Collection from China. (1.3) Origin and number of accessions of *Glycine soja* in the USDA Soybean Germplasm Collection from Japan. (1.4) Origin and number of accessions of *Glycine soja* in the USDA Soybean Germplasm Collection

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from South Korea. (1.5) Origin and number of accessions of *Glycine soja* in the USDA Soybean Germplasm Collection by country and maturity group. (1.6) Origin and number of accessions of *Glycine max* in the USDA Soybean Germplasm Collection. (1.7) Number of accessions of *Glycine max* in the USDA Soybean Germplasm Collection by maturity group. (1.8) Representative examples of plant introductions and their descendants used in pest reaction studies in soybean (19 references from 1951-1992). (1.9) Representative examples of plant introductions and their descendants used in qualitative genetic studies in soybean (34 references from 1918-1992). (1.10) Representative examples of plant introductions and their descendants used in protein and isozyme studies in soybean (13 references from 1977-1992).

Figures show: (1.1) Summary of genomic relationships based on cytogenetics and seed protein profiles among 11 of the 16 wild perennial species of the subgenus *Glycine.* Address: 1. United States Dep. of Agriculture, Agricultural Research Service, FCR and Dep. of Agronomy and Zoology/ Genetics, Iowa State Univ., Ames, IA 50011; 2. Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801; 3. USDA-ARS and Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801.

10388. Spahn, Mark; Hadamitzky, Wolfgang; Fujie-Winter, Kimiko. 1996. Kanji jukugo jiten The Kanji dictionary. Rutland, Vermont; Tokyo, Japan: Charles E. Tuttle. xviii + 1748 p. See p. 666, 667, 787, 1391. 24 cm. [Eng; Jap]

• ***Summary:*** On page 666, under the character *tô* or *zu,* meaning bean or pea or (as prefix) miniature, are the following (with diacritics) related to soybeans: tônyû–soybean milk.

"mame(no)ko–soybean flour [*kinako* or "roasted soy flour"].

"tôfu–tofu, bean curd.

"mamema(ki)–bean-scattering ceremony [using soybeans].

"daizu–soybean.

"kôridôfu–frozen tofu.

"yakkodôfu–tofu cut into cubes.

"edamame–green soybeans.

"i(ri)mame–parched / popped beans.

"nattô–fermented soybeans.

"kuromame–black soybean.

"yudôfu–boiled tofu.

"ya(ki)dôfu–broiled tofu.

"nimame–boiled beans [usually soybeans].

"i(ri)dôfu–bean curd boiled dry and seasoned.

"shiomame–salted beans.

"mitsumame–boiled beans with molasses.

kôyadôfu–frozen tofu.

Also: "amanattô–adzuki-bean candy.

"nankinmame–peanuts.

On page 667, under the character *mi* or *aji,* meaning taste or flavor, are miso–miso (fermented soybean paste).

miso shiru–miso soup.

On page 787, under the character *kô, ô, ki* or *ko,* meaning yellow is: ki(na)ko–soybean flour.

On page 1391, under the character for *fun, kona,* or *ko* meaning flour or powder are: "mame(no)ko–soybean flour.

"ki(na)ko–soybean flour.

On the cover: "Over 47,000 Japanese character compounds." "Find any compound using any of its component characters."

A brief biography of the three authors, with photos of Spahn and Hadamitzky, appears on [unnumbered] p. 1750.

10389. Steinkraus, Keith H. ed. 1996. Handbook of indigenous fermented foods. 2nd ed., revised and expanded. New York, Basel, and Hong Kong: Marcel Dekker, Inc. xii + 776 p. Illust. Index. 26 cm. Food Science and Technology Series, Vol. 73. Index. 26 cm. [350 + soy ref]

• ***Summary:*** This 2nd edition is about 108 pages longer than the original 1983 edition. Contents: Introduction to indigenous fermented foods. (1) Indonesian tempe and related fermentations: Protein-rich vegetarian meat substitutes. (2) Indigenous fermented foods involving an acid fermentation: Preserving and enhancing organoleptic and nutritional qualities of fresh foods. (3) Indigenous fermented foods involving an alkaline fermentation. (4) Indigenous fermented foods in which ethanol is a major product: Type and nutritional significance of primitive wines and beers and related alcoholic foods (incl. Chinese koji (big *qu* {bricklike in shape and made from barley or wheat and soybeans, inoculated with *Aspergillus*} molds), and small *qu* ({spherical, plate-circular or rectangular in shape and made from rice or rice bran with various herbs, inoculated with *Mucor* and/or *Rhizopus* molds}, p. 449), Japanese amazake (p. 480-81).

(5) Indigenous amino acid / peptide sauces and pastes with meatlike flavors (p. 509-654): Introduction.

(A) Soy sauces: Japanese shoyu: Koikuchi, usukuchi, and tamari; Chinese chiang-yu, by Tamotsu Yokotsuka (p. 511-17). Biochemistry of *Saccharomyces* (*Zygosaccharomyces*) *rouxii,* by Steinkraus, Franta, and Ayres (p. 517-24). Umami flavor, by Kawamura and Kare (p. 524-28). Chinese fermented products related to soy sauce (big *qu,* small *qu,* and jiang, by Chen & Ho, p. 528). Taiwanese soy sauce, by Liu (p. 528-33). Malaysian soy sauce: Kicap, by Ong, Mercian, Poesponegoro and Tanuwidja (p. 531-39). Indonesian soy sauce: Kecap, by Saono, Poesponegoro and Tanuwidja (p. 539-43). Korean soy sauce, by Chang (incl. homemade kanjang and meju, p. 543-44). Taiwanese black bean sauce: Inyu, by Jan et al. (p. 544). Philippine taosi, by Steinkraus (p. 544-45).

(B) Fermented soybean pastes: Japanese miso, by Ebine, Shurtleff and Aoyagi (p. 545-56). Indonesian tauco, by Saono et al. and Winarno (p. 556-59). Korean Doenjang and

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kochujang, by Chang, Shurtleff and Aoyagi (p. 559-64).

(C) Fermented fish-shrimp sauces and pastes (p. 565-606).

(D) Fish-soy sauce and fish-soy paste, by Ismail, p. 607-11).

(E) Miscellaneous Oriental fermentations. Japanese natto (itohiki natto), by Hayashi and Ota (p. 611-24). Japanese Hama-natto (hamanatto) and related products (incl. yukiwari natto, p. 624-26). Chinese red rice: Anka (Ang-kah), by Lin, Su and Wang, Sooksan and Gongsakdi, and Pichyangkura (p. 626-33). Chinese sufu, by Su and L.-P. Lin (p. 633-41). Preserved duck eggs / Century eggs, Chinese pidan (p. 641-42). Pidan are made by a chemical process, not by fermentation. Note: Chapter 5 contains about 240 references. Much of the text in this chapter is similar to that in the original 1983 edition, although this chapter is 7 pages longer and contains 3-4 new sections.

(6) Mushrooms: Producing single-cell (microbial) protein on lignocellulosic or other food and agricultural wastes.

(7) General papers related to indigenous fermented foods. Address: Inst. of Food Science, Cornell Univ., Geneva, New York.

10390. Tetsudo Unyukyoku. 1996. Shio sato shôyu miso ni kansuru chôsa [Survey concerning salt, sugar, shoyu, and miso]. Tokyo: Yushodo Shuppan. 23 cm. Series: Juyo Kamotsu Jokyo, no. 9. [Jap]*
Address: Japan.

10391. Verreault, Georges. 1996. Diary of prisoner of war in Japan, 1941-1945. Rimouski, Quebec, Canada: Vero. 288 p. See p. 157. Illust. Portraits. 23 cm. *
• ***Summary:*** "Yes we really had fish, cooked the traditional Japanese way, in sweet soya sauce. The three meals of the 6th day of the 10th month of the nineteen hundred and forty-fourth year, are over. Let's forget them!"

Note: The first French edition was published by Les éditions du Septentrion (in Quebec) in 1993. This is a translation of: *Journal d'un prisonnier de guerre au Japon, 1941-1945.* Georges Verreault lived 1920-1966; he died at about age 46.

10392. Hymowitz, Ted. 1997. Siebold & Co. in Leyden, Netherlands: A very early soybean seed dealer. Early European-language documents on the soybean in China from the years 1254, 1330, and 1346 (Interview). *SoyaScan Notes.* Jan. 1. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Bill Shurtleff called Ted Hymowitz on New Year's Eve to wish him a happy New Year and to tell Ted that he had just received from France a copy of the earliest Vilmorin seed catalog that listed the soybean; it was published in 1864. Bill asked Ted if he knew of any earlier record of soybean seeds being sold commercially. Ted said he would look.

After a few minutes, Ted called back and read the text of an 1856 article by J.J. Smith, titled "New and Valuable Trees and Fruits," published in the American journal *Horticulturist, and Journal of Rural Art and Rural Taste* (Albany, New York). It stated: "One of the most remarkable catalogs ever published has just appeared in Leyden [Netherlands]. It contains a price list of the Japanese plants actually cultivated in the nursery of Siebold and Co. of that place [Leyden]. He also offers seeds of the *Soja japonica,* the real plant from which the sauce called 'soy' is prepared." Note: In the mid-1840s, Philipp Franz von Siebold and Joseph G. Zuccarini first gave the soybean its present genus name, Glycine. They gave the wild soybean its present scientific name *Glycine soja.*

How did Ted find this document so fast? It was not in his computer. But he knows the contents of his collection and all of his early history documents are filed chronologically in file cabinets.

Ted then announces that his earliest European-language document on the soybean is from the year 1254, followed by 1330, then 1346. The first two are in Italian, and the third is unclear because Ted has only the translation. He also has one from the year 1583 titled "Summary of the Things of Japan" by Valignano (Tokyo, Sophia University, *Monumenta Nipponica* Monograph No. 9). It states: "The padre Alexandro Valignano of the Society of Jesus [Jesuit] visited Japan three times, 1590-1592, 1598, and 1603." Address: Prof. of Plant Genetics, Univ. of Illinois, Urbana, Illinois.

10393. Pearce, Jean. 1997. Getting things done: Starting out on soy. *Japan Times* (*Tokyo*). Jan. 12. p. 17. Wednesday. [Eng]
• ***Summary:*** "Last week's columns reported on recent research pointing to the dietary benefits of soybean products in relieving complaints associated with menopause." Discusses isoflavones and the isoflavone content (in micrograms per gram) of kinako (roasted soy flour, 2,589), roasted soybeans (1,625), edamame (1,354), natto (1,273), regular tofu (509), fried tofu (695), soy milk (357), miso (373), shoyu (16).

Gives several tofu recipes and recommends *The Book of Tofu* by Shurtleff & Aoyagi.

"And finally, kudos to Japan Airlines for creating natto in a palatable form, freeze-dried and flavored... It has been tremendously successful. In two years, total sales amounted to ¥56 million. Just think of all those isoflavones." A photo shows Jean Pearce.

Note: This article may have been published on 12 Feb. 1997 rather than 12 Jan. 1997. Address: Columnist.

10394. Hartz, Chris. 1997. The early history of Jacob Hartz Seed Co. (Interview). *SoyaScan Notes.* Jan. 13. Conducted by William Shurtleff of Soyfoods Center.

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• ***Summary:*** Chris' father is Jake Hartz, Jr. His grandfather, Jacob Hartz, Sr., founded the Jacob Hartz Seed Co. (JHSC), which Monsanto purchased on 21 April 1983. Chris had a 3-year contract, so he stopped working for the company in April 1986. He now runs a wholesale nursery, and does a little seed brokering.

When Jake, Jr., left the company, he left all his files and company history documents at the company; he took nothing with him. Chris did likewise. Chris called Keith Thompson and he said he would be glad to help in any way he could to get early historical documents. Keith said that Terry Hicks in the accounting department is the keeper of the early files. Terry is now in Kalamazoo involved with the Asgrow purchase. When the company was sold to Monsanto in 1983, the biggest story would have been in the *Arkansas Gazette* in Little Rock; it has since merged with the *Arkansas Democrat* to become the *Arkansas Democrat-Gazette***.** One interesting historical document was published by Monsanto on the 50th anniversary, probably in 1992. Chris has never seen any early seed catalogs. Chris and his father now share the same building, but Jake is seldom in the office.

When did JHSC first start to sell soybeans? Chris does not know. But if Jacob Hartz, Sr. first brought in 25 bushels of Laredo soybeans in 1926, it would probably have taken the company several years to develop enough seed stock to be able to sell some and keep the rest for seed multiplication.

Chris was responsible for focusing the company on breeding soybeans for food uses, starting in the late 1970s. It all started in about 1975-77 when a Japanese natto manufacturer, Mr. Yaichiro Mogi of Asahi Shokuhin, contacted JHSC and explained that he needed a soybean that was uniform in size and quality to run through his automated factory (that made only natto) to give a uniform product that he could sell as premium natto. He was getting soybeans from China, IOM, and Canada and he couldn't set up his cookers and fermenters to accommodate all the different soybeans he was getting. He was one of two automated natto manufacturers in Japan at the time. He gave Chris specifications for the natto beans he wanted. Chris happened to have 9 pounds of small-seeded soybeans with a brown hilum that Dr. Hartwig had sent him free of charge. It was a plant introduction with a PI number. The diameter was 5 mm or less. Hartz crossed that small-seeded soybean with Pickett to get rid of the high rate of shattering. They registered the resulting variety as Hartz 936–their first natto soybean. Hartz's breeding program got into high gear in 1976, when they hired Dr. Curtis Williams; that year they put in their first greenhouse. Prior to that one of Hartz's field reps, an agronomist named Jimmy Johnson, was doing the crossing; he now works for Stratton Seed Co. Chris hired Keith Thompson in about 1980 as a salesman. When Chris left in 1986, Keith took over the food side of the business.

Chris was never able to get used to Monsanto's way of making decisions. "Decisions took months instead of minutes, as they did in the family-run business. It was very frustrating." Dan Lamberth was the general manager after Monsanto took over; he and Chris did not get along well.

Concerning Roundup Ready soybeans: Chris has heard a number of farmers say that they are very good on fields where there is a weed problem, but if you don't have a weed problem it is very difficult to accept Monsanto's value-added pricing. Chris uses a huge amount of Roundup on his seed nursery. "It is a standby for us. We like it because it kills virtually all weeds but does not harm most of the plants he wants to raise. Our workers are careful with it, as with any chemical, but it is relatively problem-free." In Chris' opinion, from a human health viewpoint of his employees using herbicides on the nursery, there is less to worry about with Roundup than probably any other herbicide. "In addition, we can spray it on our woody ornamentals and it doesn't hurt them–as long as there is no new growth. But it does hurt the redwood and cypress plants.

As far as Chris knows, Hartz never operated a soybean crushing plant to make soybean oil and meal.

In June 1942 the company named Hartz-Thorell split up. Jacob Hartz took the seed side of the company and named it Jacob Hartz Seed Co.; Mr. Thorell took the implement side and named it Thorell Implement. After Mr. Thorell died, his implement company was sold to White Implement–headquartered in Houston, Texas. They handle McCormick-Deering farm machinery. It is now more a wholesale outlet than retail. Address: Stuttgart, Arkansas. Phone: 501-673-2242.

10395. Roller, Ron. 1997. New developments with organically grown soybeans in America (Interview). *SoyaScan Notes.* Jan. 16. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The demand for organic soybeans in America is rising rapidly. Ron thinks this has nothing to do with concerns over genetically engineered (transgenic) soybeans such as Monsanto's Roundup Ready soybeans. "Soybeans have become, hands down, the main cash crop (the one that makes the most money) for organic farmers, at least those in the Midwest. Organic growers in the Dakotas and Montana still rely on wheat as their main cash crop, but the corn, wheat, and soybean growers everywhere else rely on soybeans." The demand for organic soybeans is growing faster than the supply–even though the supply is rising. Increasing prices have attracted more and more farmers to growing soybeans organically. The biggest demand is still from Japan, as it has been for the past 4-5 years. As interest in organic foods has grown in Japan, bigger food manufacturers (primarily of tofu and natto) have started to use organic soybeans. The American food companies that use organic soybeans are still relatively small and few. Ron's company (if you add the organic soybeans Ron exports) may be the single biggest.

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The demand for organic natto soybeans from Japan appeared suddenly and is now very large. Acreage that was used to grow organic soybeans for tofu or soymilk suddenly got switched to growing small-seeded organic natto soybeans. Because of that, the acreage used to grow organic soybeans for tofu and soymilk has decreased. Last year the organic soybean crop in the Midwest (especially Michigan and Ohio) was smaller than expected. So the combination of the export demand (mainly to Japan but also to Europe), the loss of acreage to natto beans, the bad crop, and the lack of new growers, has made the price of organic soybeans rise–by about 10%. But remember that the price of organic soybeans were already more than double, very often triple, that of non-organic beans. The highest prices are paid for Vintons and natto beans. It is these premium prices that are so attractive to the organic farmers. "This trend is of great concern to me, and especially the effect it could have on the price of soyfoods. In a free market economy, with lots of farmers looking for value-added crops, you would think that many more of them would start growing organic soybeans. But it is a difficult chasm to cross. A farmer must learn a whole new way of farming, and, he must wait for 3 years before that land can grow organic crops. That 3-year lead time is the big stumbling block; many farmers actually lose money on that land during those 3 years. Some big farmers are now starting to grow organic soybeans, but they getting involved on a gradual basis, adding 50 to 100 acres a year. Those large commercial growers, who have recently switched to growing soybeans organically, are sitting in the catbird seat, and doing extremely well."

In Ron's market, there have been very few questions from consumers about genetically engineered (transgenic) soybeans. "It hasn't become a problem at all for ASP; I think it will be an asset for us–because we don't use them and we can prove that we don't. However a lot of growers want to grow transgenic soybeans." Address: President, American Soy Products, 1474 N. Woodland Dr., Saline, Michigan 48176. Phone: 313-429-2310.

10396. Thompson, Keith. 1997. History of breeding soybeans for use in making natto at Jacob Hartz Seed Co. (Interview). *SoyaScan Notes.* Jan. 20. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Hartz got involved with natto and with food soybeans in 1975 when Yaichiro Mogi, founder and president of Asahi Shokuhin, a major Japanese natto manufacturer, contacted Continental Grain in Vancouver, BC, Canada. Bud Currie (phone: 604-684-7292) of Continental was there at the time and he knows the whole story in detail. Continental Grain then contacted Jacob Hartz Seed Co. in 1975 on behalf of Mr. Mogi. It was probably not until about 1979 or 1980 that Hartz's program to breed natto soybeans began to yield some results. The first natto soybean they bred successfully was their H-24. The small seeded soybeans they had before that shattered so badly (the seeds popped out of the pods before harvest) that after farmers grew it once, they refused to grow it again. Now Hartz has 6 natto varieties. Hartz was one of the first American seed companies to breed soybeans for food use. Hartz is still dealing with Mr. Mogi, as they did more than 20 years ago. He is buying more soybeans direct than anyone else in the business, because he does not go through all the multiple steps of purchasing (importer, then wholesaler) as is typical in Japan. In the early 1980s Hartz added a second customer for natto beans, as they started working with Mitsubishi. Today Mitsubishi and Continental sell natto soybeans bred by Hartz to other natto makers in Japan.

At a rather early date, Mr. Mogi decided that what made a soybean variety good for use in natto could be determined by scientific research. So, long ago, he established a research lab, and they started comparing soybean varieties, looking at several other characteristics (especially the chemical composition) in addition to seed size and hilum color. He communicated is research findings to Hartz, and they started screening based on the criteria that he desired. They started with small seed size and light hilum color, then tried to add more characteristics (such as high sucrose content) into the mix. Of course, Hartz would also like to get a high yield, but they have never been able to get good natto beans that yield well. So they end up sacrificing yield to get the other desired characteristics. "We think we've got the best natto breeding program in the world–by a long shot." Keith doesn't know of any other private company breeding natto soybeans and only a few universities (in Nebraska, Virginia, Minnesota, and South Dakota) are "tinkering around with natto beans." One major problem is that you must start with a very small germplasm pool–typically a southern pool because it is small seed size to begin with. There are some Midwestern and some Canadian natto varieties, yet at least 75% of all natto soybeans exported to Japan are grown in the South–by Hartz, James Dunn, and 2-3 others. Hartz is the largest supplier. Historically, Mr. Mogi has said that a particular soybean variety is good for making natto, many other natto makers start buying that variety. Once a natto manufacturer finds a variety he likes, he would prefer not to change it. Hartz has developed a natto variety that yields better, but Mr. Mogi has refused to accept it, so it probably will die. Hartz's competition (Asgrow, Pioneer, Northrup-King, smaller companies, etc.) are constantly trying to get better yield. The name of the game is to keep the desired natto characteristics but to constantly improve the yield.

Hartz sells two types of soybeans–food and commercial: 50% of its soybeans are sold to food manufactures and the remaining 50% (commercial) are sold to Southern farmers for planting and eventual use as oil and meal. The amount of soybeans sold for food use will continue to increase, but its percentage of the total will drop, because Hartz plans to rapidly expand its production of Monsanto's Roundup Ready

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soybeans, which are very profitable.

When Keith started in the soybean seed business in 1978, there were less than 10 soybean varieties in the southern United States–in 3 maturity groups. All of these were public varieties, bred at southern universities. Keith came to work for Hartz in 1983. Hartz introduced its first proprietary (private) commercial varieties (for planting by farmers) in 1984. The farmer is interested *only* in yield. Hartz is now looking to South America as an important new market. Address: Food and Export Manager, Hartz Seed, P.O. Box 946, Stuttgart, Arkansas 72160. Phone: 800-932-7333.

10397. Brown, Lester R.; Flavin, C.; French, H.; et al. 1997. State of the world 1997: A Worldwatch Institute report on progress toward a sustainable society. New York, NY: W.W. Norton & Co. xiii + 229 p. Index. 24 cm. [300* ref]
• ***Summary:*** This 14th edition takes a realistic look at our progress toward sustainable development since the 1992 Rio Earth Summit. It shows how pervasive resource loss is at the root of the "new world disorder" and argues that if unsustainable trends continue, "the pressure on the earth's natural limits will undermine food security–now already evident in the decline of marine fisheries and the shrinking grain harvest per person. Indeed, food scarcity may be the first major manifestation of our environmentally unsustainable global economy.

"To reverse this situation, *State of the World 1997* calls for us to take urgent measures to build an environmentally sustainable economy, slow population growth, value the nonmonetary services nature provides, adopt the best of simpler and less consumptive lifestyles, and abandon taxpayer subsidies that encourage the consumption of natural resources such as water and fossil fuels."

Contents: A special tribute. Acknowledgments. List of tables and figures. Foreword. 1. The legacy of Rio, by Christopher Flavin: The road from Rio, eight environmental heavyweights, stabilizing the climate, conserving biological wealth, limiting human numbers and consumption, Rio plus five... and counting. 2. Facing the prospect of food scarcity, by Lester Brown: Food security trends, land and water scarcity, the fertilizer factor, the carrying capacity question, food security–the next generation, responding to the challenge. Graphs show: World grain production, 1950-96. World grain production per person, 1950-96 (it peaked in 1984 at 346 kg). World grain carryover stocks as days of consumption, 1961-96 (they have fallen from a peak of about 100 days in the mid-1980s to about 50 days consumption). World irrigated area, 1950-93. World fertilizer use, 1950-95 (after 1989 it began to decline). World grain harvested area and fertilizer use per person, 1950-95. World grain yield per hectare (it has grown steadily at about 2.3% a year, from 1.06 tons in 1950 to 2.54 tons in 1990).

3. Preserving global cropland, by Gary Gardner: Trends–from surplus to scarcity, expanding cities, degrading our future, import dependence–the case of Asia, a land-scarce world, land for the next generation. A graph shows: Grain harvested area per person and imports as a share of consumption in Japan, South Korea, and Taiwan, 1960-95. Imports now account for about 75% of consumption in these 3 countries! 4. Preventing chronic disease in developing countries. A graph shows Total dietary oils per capita in selected regions, 1965-95. North America is the highest, rising from 11 to 28. South Asia is the lowest, rising from 3 to 8. 5. Tracking the ecology of climate change. 6. Valuing nature's services. 7. Transforming security. 8. Reforming subsidies. 9. Learning from the ozone experience. Address: Worldwatch Inst., 1776 Massachusetts Ave., N.W., Washington DC 20036-1904. Phone: 202-452-1999.

10398. Nguyen, Q.V. 1997. Production of vegetable green soybean for the domestic market and trial shipments to Japan. Barton, ACT, Australia: Rural Industries Research and Development Corporation. ii + 43 p. Jan. Illust. 30 cm. Series: RIRDC Research Paper No. 97/8. *
• ***Summary:*** A report for the Rural Industries Research and Development Corporation by the Horticultural Research and Advisory Station, NSW Agriculture, principal investigator, Q.V. Nguyen. Address: Barton, ACT, Australia.

10399. Pearce, Jean. 1997. Getting things done: Tofu *now.* *Japan Times* (*Tokyo*)**.** Feb. 5. [Eng]
• ***Summary:*** "This column may be beneficial to your health. First, the conclusion. Increase your consumption of soy products today. Now I will tell you why." Address: Columnist.

10400. Mio, Art. 1997. Re: Pacific Nutritional Foods, Inc. Tualatin, Oregon, will be shipping its first orders of U.S.-made aseptically packed Mori-Nu Tofu on February 18, 1997. Letter (fax) to William Shurtleff at Soyfoods Center, Feb. 11. 1 p. Typed, with signature on letterhead.
• ***Summary:*** The first sales will go to the health food industry; other sales channels will be filtered in over the next few months. During this transition period, Morinaga Nutritional Foods will be selling both Tokyo-made 10.5 oz. Mori-Nu as well as the new 12.3 oz. U.S. product.

The Grand (internal) opening will be held at the plant on 4 March 1997, starting at 1:00. Note: Only about 200 "insiders" will be invited for a luncheon; no local or state government people will be present. Address: National Sales Manager, Morinaga Nutritional Foods, Inc., 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-669-8638.

10401. Dawkins, William. 1997. Poisoning scare hits Kikkoman. *Financial Times* (*London*)**.** Feb. 25. p. 28.
• ***Summary:*** Kikkoman, the world's largest maker of soy sauce, has 30% of the Japanese market. This year a summer

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epidemic cause many Japanese to temporarily stop eating in restaurants and to avoid fast food. Soy sauce was not itself implicated in the food poisoning, yet Kikkoman suffered a 22.1% decline in unconsolidated recurring profits. Address: Tokyo.

10402. House Foods America Corporation. 1997. Changing the way America eats–Hinoichi (Brochure). Garden Grove, California. 6 p. 28 cm.
• ***Summary:*** This is a stylish, glossy, 6-panel full-color brochure, with a white on red cover. Contents: The freshest ideas for healthy appetites: An ingredient full of innovation, two billion people can't be wrong, eating, feeling, and looking better, doctors and chefs now agree, making change so natural. The House behind the brand.

Photos show: A full-page shot of tofu in 4 dishes as part of an elegant dinner. Small shots of tofu in various dishes. The label of 3 types of Hinoichi tofu (regular, firm, and soft–kinugoshi). The outside of the company's new plant in Garden Grove. Rows of stainless steel pressing boxes inside the new plant. Address: 7351 Orangewood Ave., Garden Grove, California 92841. Phone: (714) 901-4350.

10403. House Foods America Corporation. 1997. House Foods America Corporation. Garden Grove, California. 12 p. 28 cm.
• ***Summary:*** This color booklet is written in 4 languages: English, Japanese, Korean, and Chinese. Thus four blocks of text, each with the same message, appear on each 2-page spread. Contents: Introduction. House Foods products. Tofu & tofu products. Restaurant–Curry House. Factory.

"House Foods Corporation is the biggest spice manufacturer in Japan, selling processed foodstuffs such as curry mix and stew mix products. In 1981, we established the Los Angeles office to introduce Japanese style curry... In 1983 we opened a curry restaurant in Little Tokyo, where our customers enjoy cuisine created with a Japanese sensibility. We also [in 1983] started manufacturing tofu, the healthy food low in fat and high in protein. Tofu has become increasingly popular in the United States and most grocery stores carry it. In 1997, we established House Foods America Corporation by merging the three enterprises: House Foods Los Angeles Office, which is in charge of the sales of House Foods' products from Japan, Curry House Restaurant, and Hinoichi Tofu manufacturing. The new entity allows us to provide better quality products to our customers. House Foods America Corporation aims to bring the rich Japanese food culture to the United States by providing high quality food products to American customers."

The new factory in Garden Grove makes 3 types of tofu, natto, fried bean curd, and konnyaku. "This factory features state-of-the-art equipment which can produce 150,000 packages of tofu per day." As of March 1997 there are five Curry House restaurants in the Los Angeles area.

Contains many color photos including: Two views of the outside of the new tofu factory in Garden Grove, California. Curry and Chinese Mabo Tofu Sauce packages. Packages of 3 types of Hinoichi Tofu (regular, firm, and soft kinugoshi) plus natto. The inside of a Curry House restaurant. Five views of the equipment in the new tofu factory, including an overview of the production area. Address: 7351 Orangewood Ave., Garden Grove, California 92841. Phone: (714) 901-4350.

10404. Kourebanas, Maria. 1997. Less is more: Dining on the light side–International bean soups. *Gourmet* 57(2):112, 143-45. Feb.
• ***Summary:*** Contains a recipe (p. 145) for Adzuki bean miso soup (from Japan), using ¼ cup white miso.

10405. Messina, Mark. 1997. Summary of findings: Heart disease. *Soy Connection* (*The*) (*Jefferson City, Missouri*) 5(1):3. Winter. Special edition: Highlights of the *Second International Symposium on the Role of Soy in Preventing and Treating Chronic Disease.* [4 ref]
• ***Summary:*** One obstacle to greater use of soy protein to lower blood cholesterol is the failure of scientists to understand the mechanism which causes this lowering–although there is no shortage of hypotheses. Dr. Cesare Sirtori, of the University of Milan, Italy, (a veteran researcher in this field and one of the keynote speakers) presented data showing that cholesterol reduction is due to enhanced LDL cholesterol degradation stimulated by peptides formed from the hydrolysis of the 7S globulin (a soy protein) by the liver. Dr. Shigeru Yamamoto and colleagues from the University of the Ryukyus in Japan, suggest it is the undigested peptides from soybean protein that lower cholesterol.

However, work by Ms. Mary Anthony and colleagues, from Bowman Gray Medical School in North Carolina, suggest that isoflavones, not protein, are the key. "Dr. Sirtori indicated that much of his clinical work demonstrating cholesterol reduction involved the feeding of soy products that contained minimal amounts of isoflavones, although his assertion met with some surprise."

"Elegant work presented by Dr. William Wong from the USDA's Agricultural Research Service (ARS) suggests that soy lowers cholesterol by enhancing cholesterol excretion through bile acid production, specifically via the chenodeoxycholic pathway.

"One of the most exciting findings of the symposium was the observation that soy increases HDL cholesterol. Relatively few dietary approaches have been shown to raise HDL cholesterol. Three human studies, by Susan Potter and colleagues from the University of Illinois [USA], Dr. Elzbieta Kurowska and colleagues from the University of Western Ontario [Canada], and Drs. Karin Nilausen and Hans Minertz from the University of Copenhagen [Denmark], indicated that HDL increases in response to

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soy consumption. In some individuals the results are quite dramatic with HDL increasing as much as 50 percent, although typical increases are more in the range of 5-10 percent. It appears that the lower the initial starting HDL cholesterol level, the greater the response to soy. The combined effect of a decreased LDL and an increased HDL strongly support the use of soy for reducing heart disease risk." Address: PhD, Symposium Chairperson, Port Townsend, Washington.

10406. Messina, Mark. 1997. Summary of findings: Menopause relief. *Soy Connection* (*The*) (*Jefferson City, Missouri*) 5(1):3. Winter. Special edition: Highlights of the *Second International Symposium on the Role of Soy in Preventing and Treating Chronic Disease.* [4 ref]
• ***Summary:*** "One hypothesis that appears with increasing frequency in the media is that soy foods may be useful in relieving menopause symptoms such as the inability to regulate body temperature which often manifests as night sweats and hot flashes. In support of such speculation is the reported low incidence of symptoms among Japanese women and the estrogenic effects of isoflavones. Much of the data presented at the symposium were preliminary and inconsistent.

"Research presented by Dr. Margo Woods and colleagues from Tufts University, and Dr. Fabian Dalais and colleagues from the Monash Medical Center in Australia suggest that, at best, soy has relatively little effect on the frequency of hot flashes. In contrast Dr. Claudia Harding, from the University Hospital of South Manchester, United Kingdom, indicated that the consumption of soyfoods providing 80 mg of isoflavones per day reduced the frequency of hot flashes ($P < 0.03$).

"Work presented by Dr. Gregory Burke and colleagues, from Bowman Gray Medical School [North Carolina], indicated that soy modestly reduced the severity of menopausal symptoms although frequency was not affected. (This research was highly publicized after it was also presented at the American Heart Association meeting on Nov. 9 [1996]).

"Upon the basis of the existing data, it is difficult to reach any definitive conclusions about the effects of soy intake on menopause symptoms. Several studies addressing this issue are currently underway. Soon it should be possible to make more definitive conclusions about the effects of soy on hot flashes." Address: PhD, Symposium Chairperson, Port Townsend, Washington.

10407. Pacific Nutritional Foods, Inc. 1997. Re: Invitation to open house (Folded card). Tualatin, Oregon. 4 panels.
• ***Summary:*** On the cover of this printed, folded invitation card (each panel is 6¼ by 4½ inches) is written "Pacific Nutritional Foods Incorporated." Above these words are two green waves. On the inside is written: "Pacific Nutritional Foods, Inc. cordially invites you to attend our Open House. 11:00 a.m. to 4:00 p.m. Tuesday, March 4, 1997, at our facility located in Tualatin. 9960 S.W. Potano. Dedication ceremony at 1:00 p.m.

Note: This new company and factory, Pacific Nutritional Foods, Inc., is a joint venture between Morinaga Nutritional Foods, Inc. and Pacific Foods of Oregon, Inc. It will make Mori-Nu Tofu. Address: Tualatin, Oregon.

10408. Pearce, Jean. 1997. Re: Japan Airlines (JAL) has created a good-tasting freeze-dried and flavored natto. Letter to William Shurtleff at Soyfoods Center, March 1. 1 p. Typed, with signature.
• ***Summary:*** Jean recently wrote an article about Japan Airlines creating natto a new type of natto–freeze-dried and flavored–which has been very successful. "When your letter arrived today, I had copies of the columns for you and the JAL natto. I also wanted to get the kind that is available at stores. You will have the package soon."

Note: The commercial product was, indeed, tasty and not sticky or stringy like regular stringy natto (itohiki natto). Address: Columnist for the Japan Times, Tokyo.

10409. Tsurata, Shizuka. 1997. From Mother Earth kitchen: Sifting through soybeans for a taste of tofu. *Japan Times* (*Tokyo*)**.** March 6. [Eng]
• ***Summary:*** "Tofu has now become a staple food in the West,..." Address: Columnist.

10410. Endo, Margaret. 1997. The Los Angeles Tofu Festival (Interview). *SoyaScan Notes***.** March 7. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** This festival was held on 10-11 August 1996 in Los Angeles, in collaboration with the annual Nissei Week–which has been celebrated for more than 50 years. Nissei Week in Los Angeles resembles the week-long Cherry Blossom Festival in San Francisco. The goal is to draw outside people into Little Tokyo and to expose them to Japanese culture, businesses, etc. 10,000 people attended–6,000 the first day and 4,000 the second day. The idea came from Bill Watanabe, executive director of the Little Tokyo Service Center (LTSC), which is a non-profit community organization which provides a variety of social services for the Little Tokyo community. The staff of LTSC is mostly Japanese-American. The main sponsor to step forward was Hinoichi Tofu Co. Tofu recipes were served at restaurants and one tofu cookbook, titled *The Four Seasons of Tofu Cookbook*, was compiled in 1996 for the festival by the staff of the LTSC (from recipes they contributed and tested), published in English, and sold at the festival. Note: Patricia Greenberg of Los Angeles, head of The Fitness Gourmet, who is writing a soyfoods cookbook, visited this festival in 1996.

The second Tofu Festival will be held this year on

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August 9-10, the first weekend of Nissei Week. A Japanese-language edition of *The Four Seasons of Tofu,* will also be published. Address: Little Tokyo Service Center (Resource Development Center), 231 East 3rd St., Los Angeles, California 90013. Phone: 213-473-1600.

10411. Apodaca, Patrice. 1997. Curd is the word: Tofu–Nation's largest factory open in Garden Grove [southern California]. *Los Angeles Times.* March 13. p. D1, D5. Business section. [1 ref]
• ***Summary:*** Osaka-based House Foods opened America's largest tofu factory on Wednesday. A Shinto minister, the Rev. Alfred Y. Tsuyuki of Konko Church, Los Angeles, stood before a shrine and conducted the ceremony of blessing–as traditional to Japanese opening a new business as christening a ship is to Westerners. Rev. Konko has blessed Japanese buildings across America. "These plants have made millions off me," he quipped.

The fully automated, state-of-the-art, 130,000 square foot plant cost $21 million, and will more than double the company's tofu production capacity to 150,000 pounds/day. The old factory has been operating a full capacity for years. The new one will have 150 workers by the time it is fully operational next month. The new plant even has a test kitchen, where a resident home economist will test recipes and consult with dietitians. The firm's sales are currently about $10 million a year. House Foods is best known in this country as a maker of snack foods and curry powder.

House Foods is hoping that its U.S. expansion will help it withstand growing pressures at home. With about $1.7 billion in total sales, it has had among the highest profit margins in the Japanese food industry, according to Patricia Horvath, an analyst at UBS Std. in Tokyo. But House Foods' profits have decreased in the past few years due to increased competition, the Japanese recession, and a weaker yen which increases the cost of imported materials. In 1983 House Foods bought an interest in the Hinoichi tofu plant in Little Tokyo, Los Angeles, then purchased the rest of the company in 1993.

After the Shinto ceremony, before the guests were ushered away to a lunch of traditional fare and tofu lasagna, the company–leaving nothing to chance–finished with a typical American opening symbol. They cut a ribbon.

In America tofu has been championed by vegetarians as a meat substitute. "They've fought to overcome the typical American impression of tofu as soggy and tasteless by promoting its chameleon-like" versatility. Contains a quote from *The Book of Tofu* by Shurtleff & Aoyagi about how a traditional craftsman makes tofu.

Color photos show: Yellow soybeans. Soymilk being curded in a carousel curding machine with about 24 cylindrical vats. Rev. Tsuyuki in Shinto cap holding a bowl. Address: Times Staff Writer.

10412. Koda, Carole. 1997. Re: Soybeans, tofu and Japanese-Americans in the Central Valley of California. Letter to William Shurtleff at Soyfoods Center, March 17–in reply to inquiry. 2 p. Handwritten, with signature.
• ***Summary:*** Carole is writing an oral history on the maternal side of her family. Her mother, who married into the Koda family after World War II, doesn't think that the Kodas grew soybeans. She also asked her uncle, who has farmed in Livingston, California, all his life. He wasn't aware of any Japanese or Japanese-Americans who grew soybeans.

But Carole has a memory of tofu. "When I was a child visiting aunts and uncles in Livingston & Cressey, the tofu truck used to come to the houses delivering fresh tofu and various Japanese foods."

Note: Livingston is in the California's Central Valley between Modesto and Merced on Highway 99. Address: Kitkitdizze, 18442 Macnab Cypress Road, Nevada City, California 95959.

10413. DeBona, Don; Chaplin, Paul. 1997. Update on miso in Europe (Interview). *SoyaScan Notes.* March 20. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Don attended Biofach in Germany this month; this is the forth time he has attended. He has had two students who came from Europe to study miso-making with him at American Miso Co. in North Carolina. Jan (pronounced *Yon*) Kerremans, who worked at Lima Andiran in southern France, studied with Don for 2 months, Oct. 1984 to Nov. 1984. Jan was a minority partner with Pierre Gevaert. Jan now still works for Lima, but not as a miso maker; originally Flemish, he married a French woman, lives in Paris, and is Lima's sales rep.

Paul Chaplin from Wales studied with Jan Kerremans at Lima in France during May and June 1984, then with Don for 2 months, in October and November 1985. His miso manufacturing business in Wales is still tiny, but it is growing well. Total turnover (income) in fiscal 1996 (Nov. 1995 to Nov. 1996) was £28,000 (=$44,800). Paul's new address is: Source Foods (Organic Priority) 9 Cwm, Business Centre, Marine Street, Cwm, Ebbw vale, NP3 6TB, Wales, UK.

For both Jan and Paul, Don provided miso-making instruction, as well as room and board, free of charge. Barry Evans did not like Don to be teaching other people to make miso.

Pierre Gevaert was the founder of Lima. His son is named Daniel, and Daniel's wife is Valérie. Daniel studied miso-making with Jan Kerremans in southern France. In early 1990, after Pierre Gevaert died, Daniel and his wife took over Lima's miso company at Andiran in southern France. They changed the company name to Danival from Lima-Andiran. The two of them now make two types of miso, and they also sell shoyu and tamari–but it is not known if they make the latter two products or not. Lima and Danival

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are no longer in contact with one another because there are bad feelings between them; Lima purchases their miso from American Miso Co.–much to Danival's chagrin.

Other new miso companies in Europe: Noka, run by Karl Selgmann, in Alzey, Germany. Karl used to be with Mr. Hiroshi Kozaki of Kanta Kozaki in Urbach; that company started in 1990. Paul Chaplin has visited Noka.

Two new miso makers in Yugoslavia are Sladjan Randjelovic and his wife, Vladimirka, of Lion Health Food Co. (Zagorska 12/9, YU-11080 Zemun, Belgrade, Serbia / Yugoslavia). Their business card says: "Belgrade, London, and Beijing." Vladimirka is actively involved in the business. They are both very macrobiotic. They already make *mizuamé* (rice syrup or rice malt). Their miso was of fairly good quality. They also made an interesting miso with added shiitake and kombu.

Hans Weisseneder is making miso for Sojvita in Lichtenwoerth, Austria. He had photos of his vats which are in a wine cellar outside of Vienna.

In Europe, imports of miso from Japan are almost certainly larger than total European miso production. Address: General Manager, American Miso Co., Route 3, Box 541, Rutherfordton, North Carolina 28139. Phone: 704-287-2940.

10414. Hanamaruki K.K. 1997. Hanamaruki [Hanamaruki]. Nagano Prefecture, Japan. 21 p. 30 cm. [Jap]
• ***Summary:*** The first 13 pages of this color brochure are about the company, the next four pages are about the top management, and the last 3 pages show the company's miso products. Inserted into the back, and dated April 1999, is a chronology of the company from its founding in 1918. Address: Hirade 1560, Tatsuno-cho, Kamiina-gun, Nagano-ken 399-0422 Japan. Phone: 0266-41-1321.

10415. Macdonald, Bruce. 1997. The complex relationships between Eden Foods, Muso Shokuhin, Macrobiotic Company of America, Gold Mine Natural Food Co., Sierra Natural Foods, and Ohsawa Japan (Interview). *SoyaScan Notes.* April 4. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In Oct. 1974, Michael Potter visited Yuko Okada at the Muso Company in Osaka, Japan, then decided to import Japanese food products exclusively from Muso. Then in Jan. 1984 (following major losses from the bankruptcy of Erewhon (in Nov. 1981) and other American natural foods distributors–including Shadowfax, Laurelbrook, and Good Food Company), the Muso Company of Japan appointed Eden Foods its General Agent for North America. But in subsequent years, as the value of the dollar continued to fall against the yen, making Japanese imports more expensive, Eden began to buy less expensive grades of some products (especially seaweeds and umeboshi) from Muso. In this way, Eden avoided price increases. But strains grew in the relationship. Muso did not like being dependent on one wholesaler in America and Eden wanted the freedom to shop around. So in the mid-1990s there was an above-board agreement that Muso no longer had to sell its products in the USA exclusively to Eden. But even before that, Yuko had been selling to other companies such as Republic of Tea, Smith & Hawken (Japanese tools), and Gold Mine Natural Food Co.

Jean Richardson of Gold Mine trademarked the name "Ohsawa," much to the chagrin of Ohsawa Japan. When Bruce working at MCOA, he thought of challenging this trademark, and he feels he could have done so successfully, but at a cost of at least $30,000 in legal fees. This is even more ironic because MCOA is the exclusive importer of products from Ohsawa Japan. So the trademark borders on misrepresentation. The Ohsawa Japan story goes back to Bob Kennedy, who had been dealing with Ohsawa Japan since the beginning. When Michio Kushi began importing, he did so from Muso–not from Ohsawa Japan. Several years later he also began to import from Mitoku; today Michio recommends only Mitoku products. When Bob Kennedy stopped importing foods from Japan, he sold his business (after Heinz returned the rights to him) to what had been the warehouse of Rainbow Foods. Rainbow started as a store in San Francisco, California, then they grew a wholesale business. A religious group ended up buying that wholesale business from them, and they renamed it Sierra Natural Foods. Sierra bought the rights to import from Ohsawa Japan from Bob Kennedy, then started importing containers. They had also gotten the Soken distributorship, and they started expanding so fast that they couldn't finance the rapid growth; this (and perhaps some mismanagement) soon led to their bankruptcy. At the time they owed Ohsawa Japan about $200,000. Ohsawa Japan decided to stop selling foods to America. So they asked Mitoku to be their sub-distributor for America. So even today Bruce buys his Ohsawa Japan products through Mitoku. But Gold Mine can't buy from Mitoku because Mitoku won't give out any more distributorships. Mitoku's main distributors now are U.S. Mills (Erewhon brand), Great Eastern Sun, Granum, and MCOA. Address: President, Macrobiotic Company of America, Asheville, North Carolina 28806. Phone: 704-252-1221.

10416. Andoh, Elizabeth. 1997. In Tokyo's ryotei, the art of service [omotenashi]. *New York Times.* April 20. p. XX6, XX24 (Sunday).
• ***Summary:*** Contains excellent reviews of five of Tokyo's fine, traditional (and often expensive) restaurants: Tatsumura, Tsukiji Tamura, Bon, Kocho, and Saryo Arai.

Bon serves a type of vegetarian cuisine called fucha, which traces its origins to the Buddhist temple food of China. Bon serves "ivory-colored spirals of nama yuba (silky, fresh soybean curd sheets)" and uses kudzu in some

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dishes. Address: Japan.

10417. Labbé, Max. 1997. Ces étonnants aliments végétaux fermentés et lacto-fermentés [Those astonishing fermented and lactic-fermented vegetable foods]. Auvers sur Oise, France: Published by the author. 116 p. Preface by Richard Hwei-Ming Bau. Illust. No index. 21 cm. [Fre]
• ***Summary:*** Part III of this popular book, titled "Asiatic Specialties," contains the following sections and subsections (p. 77-103): Chinese and Japanese fermented foods: Shoyu and tamari, miso, umeboshi, nuka pickles, natto, sufu. Characteristics and way of tempeh: Definition, preparation, arrangement of grains before inoculation. Indonesian tempeh: Preparation of the cakes, preparation of the inoculum. Javanese tapé (tapeh) and its culture. American-style tempeh. A color photo on the rear cover shows Max Labbé. Address: 3 rue Emile Level, F- 75017, Paris.

10418. Morinaga Nutritional Foods, Inc. 1997. The wonders of nature–in a perfect package (Ad). *Natural Foods Merchandiser.* April. 4-page insert glued in after page 18.
• ***Summary:*** This is an elegant 4-page color ad (8½ by 11 inches). On page 1 is the new package of Mori-Nu silken tofu (made in the USA) against a waterfall splashing down over rocks. Across the next 2 pages in large, soft-blue letters is written "tualatin, oregon. state of the art packaging." Page 2, titled "Pure tofu," begins: "Mori-Nu Tofu now arrives fresh from the Pacific Northwest, where the cool, clean currents of the Columbia meet the pure, sweet waters of the Willamette. Because quality tofu depends on quality water, Mori-Nu has found a new home in the little town of Tualatin, Oregon." Page 3, titled "perfect package," describes the new and larger 12.3 ounce "airtight package." "In fact, this state-of-the-art packaging was voted the "#1 food science innovation of the last fifty years" by the prestigious Institute of Food Technologists. Photos on these two pages show: Tofu dishes. Majestic Mt. Hood. An aseptic packaging line. Five different Mori-Nu tofu packages.

Across the top of page 4 is a collage of many magazine and newspaper headlines such as: "Tofu is healthy." "The one food that could save your life." "Foods that fight breast cancer. "Tofu seems to decrease breast cancer, hot flashes." "Tofu is a good source of protein in your diet." The text begins: "Low in saturated fat with no cholesterol, tofu is the primary source of protein for over one billion people every day. As more Americans recognize the benefits of eating soy, tofu is gaining popularity–and with good reason.

"Soybeans contain high levels of a unique type of *phytoestrogen* (a plant chemical) called *isoflavones;* researchers suggest *genistein,* the main isoflavone found in soyfoods, helps to inhibit the growth of cancer cells and to reduce the risk of osteoporosis. In fact, current studies suggest that soyfoods may play a significant role in lowering cholesterol levels; preventing many forms of cancer, heart disease and osteoporosis; and controlling diabetes. Recent research also indicates that soyfoods, like tofu, help to minimize the unpleasant hot flashes of menopause."

Visit the Mori-Nu website at http://www.morinu.com. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-NOW-TOFU or 310-787-0200.

10419. Muramatsu, Kanako; Muraoka, Yasuhiko; Yasui, Akemi; Suzuki, Tadano; Kiuchi, Kan. 1997. *Bacillus subtilis* (*natto*) KFP 419 ni yoru erasutaaze no seisan [Study on the deterioration of itohiki natto (Formation of struvite)]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 44(4):285-89. [20 ref. Jap; eng]
• ***Summary:*** When itohiki-natto becomes old, white crystals develop on its surface and its quality as a food greatly deteriorates. The crystal, sold commercially as "struvite," is composed of magnesium, phosphorus, and ammonia. Address: 1. Kyoritsu Women's Univ., 2-2-1 Hitotsubashi, Chiyoda-ku, Tokyo 101, Japan.

10420. Gevaert, Valérie. 1997. Re: Brief history of Danival and current activities. Letter to William Shurtleff at Soyfoods Center, May 13–in reply to inquiry. 2 p. Typed, with signature. [Eng]
• ***Summary:*** "Daniel Gevaert purchased the Lima Andiran site in early 1990–but not the Lima trademark–and established Danival the same year in June. Our miso and shoyu, as well as our fruit and vegetable preserves are prepared with certified organic ingredients, and we also package unrefined Atlantic sea-salt. Our company name is indeed Danival." The address and phone and fax numbers are shown below.

"My full name is Valérie Fenech Saint Genieys. Daniel and I have been married for 15 years, and we have two sons, Benoît age 14 and Martin age 10.

"We began producing miso as soon as we bought the site, and put it on the market for the first time in 1992, after completing the first 18 month production cycle. Our shoyu products were launched the following year. All Danival's products are prepared on site. We buy 90% of our raw material in France (soya, vegetables, fruits and cereals), giving priority to local producers in our region in the south-west.

"Daniel's skills in preparing miso came to him from his father, who was in charge of miso production for Lima. At the time, Jan Kerremans was an employee whose task was to work on the miso recipe. Daniel himself has had the great privilege of receiving the teaching and guidance of the master-craftsman who is personally responsible for miso preparation within the imperial court of Japan, and who has imported his traditional skills and knowledge to Daniel while visiting Danival or during Daniel's frequent trips to Japan. We are both familiar with your publications and find them of

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great value."

Note 1. Near the top of the letterhead, below and to the left of the logo and company name, is written "Fabricant de père en fils." In the center of the stationary, in a light half-tone, is a line drawing of a traditional shoyu seller (which also appears in *The Book of Miso,* 2nd ed., by Shurtleff & Aoyagi, p. 262). A printed seal in the lower left corner shows that the company won special mention for the *Prix Écoproduit* 1992, in the "Enterprise and Environment" competition organized by the French Ministry of the Environment.

Note 2. Enclosed with the letter are five brochures and booklets, some of which are cited separately. Address: Moulin d'Andiran, 47170 Mézin, France. Phone: +33 5 5397 0023. Fax 5 5397 0010.

10421. Osho, Sidi M. 1997. Work with soyfoods in Nigeria (Interview). *SoyaScan Notes.* May 22. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Sidi Osho was born on 19 Aug. 1959 at Ibadan, Western Nigeria; ethnically she is Yoruba. The family spoke mostly Yoruba (but some English) at home; in Nigerian schools only English was spoken. Her first name, Sidi, means "Truth" in Yoruba. Her second name, Modupe, means "I thank God." She was the second child (and the first girl) in the family of 3 boys and 3 girls. Her father (born on 22 May 1927) was a civil engineer, educated in Lagos, Nigeria, at Yaba College of Technology; he has been in the construction business since 1959. Both of her parents believed strongly in the importance of education. They spent all of their money to educate their children, sending four of them to the United States for college and higher education. Sidi received no scholarships to help in her higher education. Today, with the change exchange rate between the U.S. dollar and the Nigerian naira, it is even more expensive for a Nigerian to get an education in America. "After we receive this education, he always reminds us–'Any education you have, if you don't apply it and offer other people opportunities, then it has been a waste of time.'" So Sidi decided to return to Nigeria after she earned her MSc degree at Ohio State University, and to look for work oriented toward development.

In Jan. 1983 she entered Nigeria's National Youth Service Corps (NYSC) as a volunteer. She was assigned to work at IITA (International Institute of Tropical Agriculture) at Ibadan as a biochemist in the root and tuber improvement program. Then from Jan. 1984 to Aug. 1985 she was employed as a Field Work Specialist with women's groups in Nigeria. She first got interested in soybeans in 1987. Many of the people with whom Sidi worked at IITA were not enthusiastic about her work to teach Africans food uses of soybeans. She always felt under pressure. "They believed that soybeans should be fed to animals. That was one of the reasons my contract was not reviewed. Now IITA is not doing anything on soybeans. Whatever you see in annual reports is descriptions of work they have done before that is just being repeated. The problem is not so much IITA as an organization as specific individuals within the organization; some of these are Americans.

Concerning the proceedings of the Second International Soybean Processing and Utilization Conference: The proceedings have not yet been published–but they probably will be soon. The editor is Alex Buchanan of Australia. The proceedings for the First such conference, held in China, were apparently never published. The second conference was better organized than the first.

Sidi is very interested in both tofu and tempeh. She and a Japanese researcher found a new coagulant to transform soymilk into tofu–the leaves of the *Calotropis proceara,* a bush which has long been used as a coagulant of animal milks to make cheese. This was a major discovery since calcium sulfate and nigari are not available in Nigeria, especially in the rural areas.

Sidi has set up a soybean processing center in a market in Ibadan. She would like to use this as a model and set it up in every market in Nigeria.

Chicken is now more expensive than red meat in Nigeria. Address: Forest Hill Estate, G.P.O. Box 38619, Ibadan, Nigeria. Phone: 234-2-241-3993.

10422. Ott, Katherine. 1997. The National Museum of American History (NMAH), at the Smithsonian Institution, has just approved the acquisition of materials related to macrobiotics, and especially the work of Michio and Aveline Kushi (Interview). *SoyaScan Notes.* May 23. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The Smithsonian in Washington, DC, is the most prestigious and famous repository of documents and artifacts in America. Having this collection in the Smithsonian's museum and archives will allow scholars, researchers and writers to study the origins and development of macrobiotics and related food businesses for generations, probably centuries to come.

The approval was given on May 20 by the Collections Committee. The only objection or question was: "Will the food objects attract pests." Katherine is very excited about acquiring this collection; she has taken the initiative in developing interest and overcoming opposition. Craig Orr is the archivist who went to the Kushi's home in Brookline to examine the collection; he plans to go there again in early August to ship the materials.

The archival materials (documents) will be stored in the Archives Center. The three dimensional objects will be stored in her Division of Science, Medicine and Society at NMAH. Such objects may include packages of macrobiotic foods, eating utensils, etc. In the Collections Committee report, Katherine put macrobiotics in the 20th century context of "foodways" and the American diet, and showed

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its significance to the America experience. At the NMAH the broad subject of food and diet in America is often referred to as "foodways," which is sort of an anthropological term. It has to do with the preparation of food, the rituals, folklore and stories that go with it, family use of foods, and how food conveys identity–a much broader meaning than just nutrition and diet. The subject headings for the collection may be: Macrobiotics. Medicine and Health. Business and entrepreneurship (because it documents grass-roots activism and the networks of businesses that have grown up around macrobiotics. It reflects the wave of the future, showing how ideas spread internationally).

Note from Patricia Smith of Mill Valley, California, and a long-time friend of Michio and Aveline Kushi. 2003. Sept. 8. "Talked with Katherine Ott today by telephone. The Smithsonian is moving the Kushi family collection: location unknown." Address: PhD, Div. of Science, Medicine and Society, National Museum of American History, MRC 627, Smithsonian Institution, Washington, DC 20560. Phone: 202-357-2413.

10423. Liu, KeShun. 1997. Soybeans: Chemistry, technology, and utilization. Florence, Kentucky: Chapman & Hall. xxvi + 532 p. Illust. Index. 24 cm. [1255 ref]
• ***Summary:*** This is an excellent, original book, packed with useful information, plus 1,255 references, 138 figures (including 20 photos), and 66 tables. It is carefully researched, thoroughly documented and indexed, and well written. Unlike the few earlier comprehensive books of this type, it gives complete, balanced and accurate information about soyfoods–both traditional Asian and modern Western. If you want to buy just one book on this broad subject, buy this book!

Contents: Preface. Contributing authors (4). Reviewers (13). Abbreviations. 1. Agronomic characteristics, production, and marketing. 2. Chemistry and nutritional value of soybean components. 3. Biological and compositional changes during soybean maturation, storage, and germination. 4. Nonfermented oriental soyfoods. 5. Fermented oriental soyfoods. 6. Soybean oil extraction and processing. 7. Properties and edible applications of soybean oil. 8. Soybean protein products. 9. The second generation of soyfoods. 10. Soyfoods: their role in disease prevention and treatment. 11. Soybean improvements through plant breeding and genetic engineering.

Each chapter contains its own list of references at the end. Dr. Liu wrote 8 of the 11 chapters in this book. The remaining three chapters were written by experts (each with a PhD degree) in their respective fields: Dr. Mark Messina (Chap. 10), Andrew Proctor (6), and Navam Hettiarachchy and Uruthira Kalapathy (8). Each chapter was reviewed by 1 or 2 experts in the field and the reviewer's names and addresses are listed near the front of the book. Each chapter is cited separately and its contents and number of references is given. This book is favorably reviewed by Dr. Malcolm Bourne in *Food Technology* (Dec. 1997, p. 83).

About the author (autobiographical): Talk with, then letter from, Dr. KeShun Liu. 1998. March 17. Dr. Liu was born on 26 December 1958 in a rural village, Feixi county, Anhui province, eastern central China. His father was a farmer with 3 years of primary school education; his mother was illiterate. The family was very poor, with five children at that time. The third of five children, he was lucky to get any education; his two elder sisters had little chance to enter any school and they are basically illiterate. In 1965 he entered a primary school in the village, while continuing to care for the cattle on the commune to help earn family income. In 1966, when he was age 8, the Cultural Revolution began in China; his education was heavily interrupted–and remained interrupted for the next 10-12 years. After 5 years he managed to finish primary school, then entered a middle school (located 1½ miles from his village), where he boarded 5 days a week; the school featured a work-study program, the income from which allowed him to pay his school expenses. Three years later he was one of only 15% of his graduating classmates who made it into high school. In 1976, after two years, he graduated from high school with high honors. His health was very poor at the time due to severe malnutrition (he weighed only 93 lb at age 17). He returned to his village and worked as a farmer on the commune. He had no hope of entering college, since admission was based on family connections and power–not merit. However the next year, in 1977, Deng Xiaoping (Teng Hsiao-p'ing) returned to power and began to change the system of college entrance, basing admission on national examinations. KeShun decided to take this exam. He failed the first time (due to lack of preparation and intense competition) but succeeded the second time.

So in 1978 (at age 19) he entered Anhui Agricultural University, located in Hefei, the provincial capital (about 250 miles west of Shanghai, and 35 miles east of his village). During his first year he began to study English; the first word he learned was "flag," as instruction still had political overtones. In the Department of Horticulture, he studied pomology (fruit cultivation). After four years he graduated with very high honors and a BSc degree in pomology. In an English-language competition, he tied for first place out of about 500 students in the college. Immediately after graduation, in 1982, he took the National Graduate Entrance Examinations. Passing with high grades, he won a Chinese Ministry of Education scholarship to study in the United States. Entering the South China Agricultural University, in Guangzhou (Canton) he received 4 months of intensive English language training, and was given a year to take some science courses while applying to graduate schools in the USA.

In 1984 he entered the graduate school at Michigan State University. After two years, he received his MSc degree in food science, and after 3 more years (in 1989) he earned

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his PhD degree in the same field from the same university. Both his MSc and PhD research programs were related to soybean chemistry. His MSc research dealt with the effects of maturation and processing on certain antinutritional factors in soybeans. For his PhD program he worked on improvements in methods for measuring the activities of soybean trypsin inhibitors and chymotrypsin inhibitor, and discovered a link between limited protein hydrolysis and the order in which reagents were mixed during the assay for proteinase inhibitors. Six publications resulted from his MSc and PhD work.

After graduation, he went for a one-year internship at the Coca Cola Co. in Atlanta, Georgia. Then for 2½ years he worked at the University of Georgia Experimental Station (Griffin, Georgia), where he did postdoctoral research with five faculty members on a centuries-old problem: how and why do the seeds of certain legume species (they studied mainly cowpeas), after being stored for a certain length of time, become resistant to softening during cooking? This is known as the storage-induced hard-to-cook phenomenon or defect. His research discovered two new mechanisms that point to the involvement of both denaturation of intracellular storage proteins and beta-elimination of cell-wall pectin. Ten publications resulted from this work, including an invited review article on the subject.

In Sept. 1992 Dr. Liu began to work for Hartz Seed, a Unit of Monsanto Co. since 1983, in Stuttgart, Arkansas, first as a food chemist and then as a project leader. He currently oversees the company's Soyfoods Laboratory. Details of his major responsibilities in this lab are given elsewhere (see Liu, March 1998).

In Feb. 1998 he traveled to Japan where he visited many soyfoods companies as well as soy research labs in universities and research institutions. On the same trip, he also visited China, the third time back to his home town since he came to the U.S. in 1984. He taught about soyfoods at Anhui Agricultural University (where he had received his BSc degree in 1982).

Dr. Liu has been very involved in professional activities. He has organized three symposia and given more than 20 presentations at professional meetings. He has authored or co-authored more than 27 peer-reviewed papers in the area of legume chemistry, including one book chapter and one book review–prior to the publication of this book.

With his influence and help, KeShun's two younger brothers have entered colleges in China and come to the USA for graduate studies. One is a mechanical engineer working in Portland, Oregon; the other is a medical doctor doing research in Little Rock, Arkansas.

KeShun is married to Yan Li, who has a chemical engineering degree. They have a daughter, Sonya, age 5 and a son, Hans, age 2. Address: PhD, Soyfood Lab., Hartz Seed, a Unit of Monsanto, P.O. Box 946, Stuttgart, Arkansas 72160-0946. Phone: 870-673-8565.

10424. Liu, KeShun. 1997. Nonfermented Oriental soyfoods. In: KeShun Liu. 1997. Soybeans: Chemistry, Technology, and Utilization. Florence, Kentucky: Chapman & Hall. xxvi + 532 p. See p. 137-217. Chap. 4. Index. [125 ref]
• ***Summary:*** Contents: Introduction. Soymilk: Traditional soymilk preparation methods, chemistry of beany flavors, modern soymilk preparation methods (Cornell method, Illinois method, rapid hydration hydrothermal cooking, methods using defatted soy material, deodorization techniques, commercial methods, novel approaches), basic steps and principles of soymilk preparation (starting material, water incorporation, grinding, soymilk extraction, heat treatment, formulation and fortification, final processing and packaging, additional processing), other constraints (objectionable aftertaste, chalkiness, yields), standardization of soymilk.

Tofu: Tofu preparation methods (traditional methods, variations in tofu preparation methods), tofu varieties, quality and quantity attributes of tofu, factors affecting tofu making (soybean varieties and compositions, temperature of grinding soybeans, concentration of soymilk, heat processing of soymilk and tofu gelation mechanism, types of coagulants, concentration of coagulants, coagulation temperature, mode of adding coagulants, coagulation time, molding conditions, other factors, tofu made from full-fat soy flakes, novel treatments), microbiological safety.

Yuba: Preparation, chemical composition, varieties, utilization, mechanism of film formation, conditions for film formation and their optimization.

Other nonfermented soyfoods: Soybean sprouts, okara, roasted soybeans, soynuts, and soy flour (roasted soy flour, known in China as *dou fen* and in Japan as *kinako.* "In China, roasted soy flour may be mixed with lard and sugar and used as a filling or coating material for pastry... In Indonesia, the flour is mixed with spices, such as garlic and chili powders, and served with *longtong,* which is boiled rice wrapped in banana leaf"), cooked whole soybeans, immature soybeans [green vegetable soybeans]. Address: PhD, Soyfood Lab., Hartz Seed, a Unit of Monsanto, P.O. Box 946, Stuttgart, Arkansas 72160-0946. Phone: 870-673-8565.

10425. Liu, KeShun. 1997. Fermented Oriental soyfoods. In: KeShun Liu. 1997. Soybeans: Chemistry, Technology, and Utilization. Florence, Kentucky: Chapman & Hall. xxvi + 532 p. See p. 218-96. Chap. 5. Index. [127 ref]
• ***Summary:*** Contents: Introduction. Fermented soy paste (*jiang* and miso): Varieties of miso and jiang, koji and microorganisms involved, koji starter and its preparation, Chinese jiang preparation (traditional household method, pure culture method, enzymatic method), Japanese miso preparation (rice koji preparation, treatment of soybeans, mixing and mashing, fermentation, pasteurization and packaging), principles of jiang and miso preparation,

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major factors in jiang and miso making (raw materials, cooking temperature and time, conditions during koji preparation, proportions of ingredients, fermentation conditions, novel processing for special products). Soy sauce (*jiangyou* or shoyu): Varieties of soy sauce, soy sauce processing (traditional Chinese household method, modern Chinese method, processing of Japanese shoyu, comparison of soy sauce and *jiang* or miso preparations), principles of making soy sauce (action of koji enzymes, fermentation by lactic bacteria and yeasts, color and flavor formation, glutaminase and glutamic acid), chemical soy sauce, progress in soy sauce preparation (use of defatted soy grits or flakes, improvements in treating soybeans, development of an automatic koji-making system, application of microorganisms with specific activities, techniques to shorten production time, improvements in soy sauce clarification), chemical composition, quality attributes and standardization, mycotoxins. Tempeh: Varieties of tempeh, preparation (traditional method, pilot plant method, petri dish method), microorganisms involved, factors affecting tempeh fermentation (starter, dehulling and aeration, moisture, temperatures, acidity, losses of solids), changes during fermentation (general changes, protein, lipid, carbohydrates and other constituents), production of vitamins, storage, nutritional value. Natto: Preparation, microorganisms involved, factors affecting natto quality (raw material, soybean cooking conditions, storage), changes during fermentation, trends in research on natto and *B. natto* (development of novel strains of *B. subtilis,* purification and characterization of key enzymes, studies into genes encoding key enzymes of *B. subtilis,* studies of possible physiological roles of natto). Fermented black soybeans (douchi or hamanatto). Sufu: Preparation, types of sufu, microorganisms involved, effect of mold growth, effect of brine aging.

Figures show: (1) Photo of Chinese chiang, and Japanese red and white miso, each on one of three spoons in a shallow white bowl. (2) Flow chart of a Chinese method for making koji starter from whole soybeans and wheat bran. Adapted from Shi and Ren (1993). (3) Flow chart of a pure-culture method for making Chinese jiang from whole soybeans (65%) and wheat flour (35%). Adapted from Shi and Ren (1993). (4) Flow chart of an enzymatic method for making Chinese jiang from whole soybeans (65%) and wheat flour (35%). Adapted from Shi and Ren (1993). (5) Flow chart of the manufacturing process for Japanese rice miso [red miso]. Adapted from Fukushima (1981). (6) Diagram of the interactions of basic miso components during miso fermentation. From Shurtleff and Aoyagi (1983) who adapted it from Shibasaki and Hesseltine (1962). (7) Graph of trichloracetic acid (TCA)-soluble nitrogen (N) contents of miso samples prepared with soybeans cooked at different temperatures for 10 minutes, followed by 0 days or 25 days of fermentation. Adapted from Nikkuni et al. (1988). (8) Graph of temperature and time control curves for different types of Japanese miso during fermentation. Adapted from Shurtleff and Aoyagi (1983). (9) Photo of soy sauce in three different containers: dispenser, small Yamasa bottle, and large Chinese can (Soy, Superior Sauce). (10) Flow chart of a typical manufacturing process for koikuchi shoyu, the most widely used type of Japanese soy sauce. Adapted from Fukushima (1981). (11) Graph (salt content % vs. temperature) Of safety zone for enzymatic digestion of shoyu koji. Protein digestibility and amino acid content in Zone A are better than those in Zone B. From Yokotsuka (1986). (12) Graph of lactic acid fermentation of shoyu mash as a function of time. Adapted from Jose et al. (1976). (13) Flow chart of role of the proteolytic enzymes of koji mold in liberation of amino acids from proteins. Adapted from Fukushima (1985). (14) Chromatogram of organic acids in fermented and chemical [HVP] soy sauce manufactured in the United States. Optical densities vs. retention time. From Fukushima (1979a). (15) Flow chart of traditional Indonesian method for making tempeh from whole soybeans. Adapted from Winarno (1989). (16) Four superimposed graphs of change in pH and organic acids as a function of incubation time during accelerated acidification of soybeans at 30ºC. Shows acetic acid, lactic acid, citric acid, and pH. Adapted from de Reu et al. (1995a). (17) Graph of water soluble nitrogen content in the fermentation of soybeans with *Rhizopus oligosporus* during the traditional tempeh process at 25, 30, and 37ºC, and with the rotating drum reactor at 36ºC. (18) Photo of two chopsticks lifting some Japanese natto from a bowl full of natto; the thin strings connecting the natto above and below are clearly visible. (19) Flow chart of typical method for making Japanese natto from whole soybeans. (20) Photo of Chinese fermented black soybeans (*douchi*) on a white plate. (21) Flow chart of typical method for making Chinese fermented black soybeans from whole soybeans. (22) Photo of cubes of sufu (Chinese cheese) in a shallow white bowl. (23) Flow chart for making Chinese sufu from firm tofu.

Tables: (1) Proximate composition of some traditional soyfoods (both fermented and nonfermented). (2) Classification of major types of Japanese miso and their chemical composition. Adapted from Fukushima (1979a). (3) Types of soy sauce recognized by the Japanese government and their chemical composition. (4) Comparison between fermented soy sauce and protein chemical hydrolysate [HVP soy sauce]. Source: Yokotsuka (1986). (5) Relationship between cooking soybeans and nitrogen composition and yield of resultant soy sauce. Source: Fukushima (1979b). (6) Detailed composition of fermented Japanese soy sauce (Koikuchi shoyu). Source: Yokotsuka (1986). Includes inorganic components (minerals), organic components, amino acids, organic acids, sugars, solids, etc. (7) Selected enzymatic activities, soluble nitrogen content, and stringiness of natto samples prepared with soybeans cooked under a pressure of 1.5 kg per square cm for various periods.

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Adapted from Matsumoto et al. 1995. (8) Major responsible microorganisms isolated from sufu made in different parts of China. Column 1 is the genus and species. Column 2 is areas where the sufu is made, including Taiwan and Hong Kong. Adapted from Shi and Ren (1993). Address: PhD, Soyfood Lab., Hartz Seed, a Unit of Monsanto, P.O. Box 946, Stuttgart, Arkansas 72160-0946. Phone: 870-673-8565.

10426. Messina, Mark J. 1997. Soyfoods: Their role in disease prevention and treatment. In: KeShun Liu. 1997. Soybeans: Chemistry, Technology, and Utilization. Florence, Kentucky: Chapman & Hall. xxvi + 532 p. See p. 442-77. Chap. 10. Index. [185 ref]
• ***Summary:*** Contents: Introduction. Diet, health and soyfoods. Macronutrients in soybeans: Protein, fat. Soy isoflavones: Isomer structure and occurrences, absorption and metabolism, estrogenic/antiestrogenic activity. Soy intake and cancer risk: Genistein as an anticarcinogen, breast cancer, prostate cancer, cancer treatment. Soy intake and osteoporosis: Protein, soy protein and bone health, isoflavones and bone health. Soy intake and kidney disease. Soy intake and heart disease: Serum cholesterol-lowering effect, role of isoflavones. Soy intake and menopause. Potential concerns related to soy consumption: oligosaccharides, phytate, saponins, trypsin inhibitors, isoflavones. Summary. References.

Breast cancer: Starting in the early 1990s, interest in the idea that increased soy intake might reduce cancer risk focused mainly on breast cancer. This hypothesis was based primarily on three observations: (1) The relatively low death rates from breast cancer in Asian countries where soy is traditionally consumed. In Japan, for example, the rate is ¼ the U.S. rate. (2) The potential antiestrogenic effect of isoflavones (Folman & Pope 1966), including soybean isoflavones (Mäkelä et al. 1995). (3) The relatively high blood isoflavone levels in Asian people (Adlercreutz et al. 1993).

Barnes et al. (1990, 1994) reported that rates fed diets containing soy developed fewer mammary tumors induced by 7,12-dimethylbenz(a)anthracene than those fed a control diet without soy or a diet containing soy from which the isoflavones had been chemically removed. Then in 1991 Lee et al. reported a case control study conducted in Singapore that found regular consumption of soyfoods was associated with a marked decrease in risk of breast cancer in premenopausal but not in postmenopausal women. These two studies did much to draw attention to the soy-breast cancer hypothesis. Overall, however, findings on the relationship between soy intake and breast cancer risk are equivocal. Three studies (Lee 1991, Yuan et al. 1995, and Hirose et al. 1995) are cited to show that there is some evidence indicating that soy consumption can decrease premenopausal breast cancer risk, but little if any suggesting soy consumption reduces risk of breast cancer in postmenopausal women. These findings are consistent with the notion that soybean isoflavones can function as antiestrogens when placed in the high estrogen environment found premenopausally, though genistein has been found to inhibit the growth of both estrogen-dependent and estrogen-independent cancer cells. Address: PhD, Nutrition Matters, Inc., 1543 Lincoln Street, Port Townsend, Washington 98368.

10427. Morinaga Nutritional Foods, Inc. 1997. Perfect food: Perfect package (Leaflet). Torrance, California. 4 panels each side. Each panel: 22 x 9 cm.
• ***Summary:*** This color leaflet contains 6 color photos. Contents: Cover. Perfect food. Perfect package. Perfect for everyone. Learn more about Mori-Nu tofu. Coupon and order form. Mori-Nu quick tips. Five recipes.

"In our factory in the town of Tualatin, Oregon, we blend wholesome soybeans with pure Cascadian water and a tiny amount of gluconolactone (Footnote: a non-dairy coagulant derived from food starch). Each package is hermetically sealed and gently heated, transforming the rich soymilk into creamy tofu."

A table shows the nutritional composition of 5 types of Mori-Nu Tofu.

Note: An updated version of this leaflet appeared in Sept. 2000. It had 5 panels on each side (instead of 4) and contained new information about: (1) Mori-Nu Tofu Hero–four seasoning mixes for making Eggless Salad, Italian Herb Medley, Garden Scrambler, and Shanghai Stir-Fry. (2) Mori-Nu Mates–mixes for puddings or pies in vanilla, lemon-creme, or chocolate flavors. (3) Mori-Nu Tofu is now made using only non-GMO soybeans. (4) Mori-Nu tofu and the FDA heart health claim. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 310-787-0200.

10428. [Shoyu and Holland]. 1997. Noda, Japan: Kikkoman International Institute for Food Culture. 14 p. May. Unpublished manuscript.
Address: Noda, Japan.

10429. Kikkoman Corporation. 1997. Annual report 1996. 339 Noda, Noda-shi, Chiba 278, Japan. 24 p. 28 cm. [Eng]
• ***Summary:*** The information in this English-language annual report is current as of April 1997. Contents: Financial highlights. Profile. A message from the president: The year in review, an emphasis on growth, principal management issues, looking ahead. Overseas operations–A world brand: The Americas, Europe, Asia and Oceania. Financial section. Corporate history. Global network (directory of Kikkoman names, addresses, and phone numbers worldwide). Board of directors and officers. Corporate data.

During fiscal 1996, ended 31 December 1996, consolidated net sales worldwide rose 1.3% over the previous fiscal year to 206.0 billion yen, down from a peak

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of 211.7 billion yen in 1992. Net income surged 63.8% to a record 7.3 billion yen, up from 4.4 billion yen in 1995. In 1993 net income was 4.7 billion, in 1992 it was 4.9 billion, and in 1991 it was 6.2 billion–very volatile.

Overseas sales jumped 21.8% in 1996 to 54.4 billion yen, and accounted for 26.4% of consolidated net sales, up 4.4 percentage points from fiscal 1995. "Although the declining value of the yen helped boost overseas sales, this impressive result mainly reflects the excellent performance of the company's subsidiaries in the United States." In Japan, difficult conditions resulted in a 4.4% decrease in sales.

During the past year: Kikkoman increased efforts to boost sales of its premium-quality *Marudaizu* Soy Sauce (made from whole soybeans rather than defatted soybean meal). July 1996–Kikkoman starts construction of its first soy sauce manufacturing plant in Europe, located in the city of Hoogezand-Sappemeer, in the northern Netherlands. Aug. 1996–Relocated its Tokyo Head Office to Nishi-Shinbashi in central Tokyo, in a move to expand the role of this office–and introduced E-mail. Feb. 1997 began constructing its second U.S. soy sauce manufacturing plant in Folsom, California, on a 52-acre site; the ground-breaking ceremony took place in March 1997. Feb. 1997–Launched a new *Yakiniku no Tare* (Steak Dipping Sauce) in *Akadare* (Red Label) and *Kurodare* (Black Label) flavors.

"The Americas." Kikkoman's new plant in Folsom, California, is scheduled to come on stream in autumn 1998 with an initial production capacity of 10,000 kiloliters per year (about 2.64 million gallons per year). The plant will be operated by Kikkoman Foods, Inc., the company's wholly-owned Wisconsin-based subsidiary, and approximately 25 local employees will be hired. The plant will supply Kikkoman *Koikuchi Shoyu* (regular soy sauce) to customers in the western United States and Canada. Kikkoman's first shoyu plant outside Japan began operation in Wisconsin in 1973. Kikkoman has increased the production capacity of that plant 10-fold to meet expanding demand. [Note: Since the initial capacity was about 10,000 kiloliters/year, the current capacity must be about 100,000 kiloliters/year or 26.4 million gallons/year.] Over the years, Kikkoman has captured approximately 50% of the market for soy sauce and soy sauce-related seasonings in the USA. A bar chart shows the relative production volume growth at the Wisconsin plant. It has increased 2.4 fold since 1986. In addition to its plant in Wisconsin, Kikkoman has four subsidiaries in the USA: (1) Kikkoman International Inc. (San Francisco, California), which markets a broad range of Japanese and Asian foodstuffs, primarily soy sauce, teriyaki sauce, noodle sauce, and tempura sauce. (2) JFC International Inc. (San Francisco), North America's largest importer and distributor of Japanese and other Asian foodstuffs. (3) Japan Food (Hawaii), Inc., which wholesales soy sauce plus other Japanese and Asian foodstuffs in Hawaii. (4) Japan Food Canada Inc., which wholesales soy sauce plus other Japanese and Asian foodstuffs in Canada.

In Europe, Kikkoman's plant in the Netherlands is expected to start deliveries of soy sauce in Oct. 1997. It has an initial production capacity of approximately 4,000 kiloliters per year. "Kikkoman currently supplies the European market with soy sauce produced at its Singapore plant. When operations commence at the Dutch plant, this volume will be available to meet the burgeoning demand for soy sauce in Asia and Oceania."

In Asia and Oceania: Kikkoman has two production plants, in Singapore (est. 1983) and Tainan, Taiwan (President Kikkoman Inc., which makes a sweet soy sauce developed for local tastes; it was established in Feb. 1990 as a joint venture company). "Marketing activities in Asia are performed by Kikkoman Trading (S) Pte. Ltd. of Singapore, and JFC Hong Kong Limited, while in the competitive markets of Australia and New Zealand, Kikkoman Australia Pty. Limited is enhancing the Kikkoman name. The latest addition to Kikkoman's Asian marketing network is Shanghai Kikkoman Trading Co. Ltd., which was established in December 1995" [in China]. Address: Noda, Japan.

10430. Marking, Syl. 1997. Bean growers build 'exciting' export markets: ASA's directors give progress reports. *Soybean Digest.* May/June. p. 28-29.

• ***Summary:*** Joseph Zack, the American Soybean Association's regional director in Belgium, discusses the controversy over Roundup Ready soybeans after the European Union improved their import. Opposition, led by consumer activist organizations such as Greenpeace, peaked in about mid-1996, and appears to be subsiding. "The campaign was fed by emotion and lacked scientific fact said Zack."

"Phillip Laney, ASA's country director in Beijing, China, described events in the world's most highly populated country as 'revolutionary.'

"'In a period of about three years, China has shifted from being a major exporter of soybeans, soy meal and soy oil to now being a major importer,' Laney said.

"'This past calendar year, there has been a dramatic occurrence,' he continued. 'China has imported 1.1. million metric tons of soybeans. And the U.S. industry got a very good 78% market share of those sales, plus a small share of soy meal sales. In this current marketing year, and we're only five months into it, we've already shipped 1.4 million metric tons of soybeans, 600,000 metric tons of meal and 300,000 of oil. The totals keep going up week by week.'"

Virgil Miedema, ASA's country director in India, noted that India has a huge population but soybean consumption is very low. ASA is focusing on the poultry industry, "which is growing about 15% a year. There is a huge and growing demand for meat and protein... The inclusion rate (the amount used in rations) for soybean meal is up to about 8%." "For now, ASA's educational efforts focus on increasing the

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inclusion rate for soybean meal and soon on the human food aspect."

Kent Nelson, ASA's country director in Japan, noted that for the USA, this is the oldest and largest soybean market. ASA opened its Tokyo office in 1956. Last year the U.S. exported about 150 million bushels of soybeans to Japan worth $1.2 billion. New opportunities? Replacing fish meal in rations. In biodiesel in the Tokyo metropolitan bus system. A newspaper in Kobe, with circulation of over 1 million, recently switched to using soy ink. A photo shows Phillip Laney (ASA, China).

10431. Morinaga Nutritional Foods, Inc. 1997. The wonders of nature–in a perfect package (Ad). *Vegetarian Times.* June. p. 5.

• ***Summary:*** This attractive full-page color ad is a condensed version of its 4-page counterpart that appeared 2 months earlier. Near the top is a large photo of a waterfall splashing down over rocks. To the left of that, and vertically, are five packages of Mori-Nu Tofu; the top 3 have a new design with a photo of a prepared tofu dish at the top of the front panel. At the bottom is a photo of a purple smoothie.

The text reads: "Quality tofu depends on quality water. From our new home in the little town of Tualatin, Oregon, we blend the finest soybeans with the pristine water of the Pacific Northwest to create the creamy, smooth texture and 'just made' taste of Mori-Nu Tofu." The logo is a red script M. Below it is written "Mori-Nu. Pure tofu. Perfect package." Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-NOW-TOFU or 310-787-0200.

10432. Nagai, Toshirou; Koguchi, K.; Itoh, Y. 1997. Chemical analysis of poly-gamma-glutamic acid produced by plasmid-free *Bacillus subtilis* (*natto*)*:* Evidence that plasmids are not involved in poly-gamma-glutamic acid production. *J. of General and Applied Microbiology* (*Tokyo*) 43(3):139-43. June. [31 ref]

• ***Summary:*** A key discovery concerning the role of plasmids in the natto fermentation. "It has been postulated that the *psf* gene on a small plasmid, pUH1 (5.8 kb) regulates positively the synthesis of capsular poly-gamma-glutamic acid (gamma PGA) in *Bacillus subtilis* (*natto*) Asahikawa."

Note: In 1982 there were three known strains of *Bacillus subtilis* (*natto*)*:* Asahikawa, F, and M. Address: Div. of Applied Microbiology, National Food Research Inst. (NFRI), MAFF, Tsukuba 305, Japan.

10433. *SoyaScan Notes.* 1997. The soy protein isolate industry and market worldwide (Overview). July 14. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** The following statistics were compiled, with permission, from one or more very reliable sources, which have asked to remain anonymous.

Protein Technologies International (PTI) in the USA–70,000 tonnes/year.

PTI in Belgium–15,000 tonnes.

ADM–15,000-20,000 tonnes.

Fuji-PTI in Japan–10,000 tonnes.

Sanbra in Brazil–8,000 tonnes.

Others worldwide: 6,000 tonnes.

Total worldwide: 124,000 to 129,000 tonnes/year.

The soy protein isolate market worldwide is pretty stagnant–growing quite slowly. By contrast, the soy protein concentrate market is growing very rapidly, and is expected to double in the next 4-5 years.

10434. Andoh, Elizabeth. 1997. Tea and temple fare in Kamakura. *New York Times.* July 20. p. XX6, XX18 (Sunday).

• ***Summary:*** Contains reviews of restaurants in Kamakura. Saami serves dishes that include wheat gluten, and "soy foods," and a sweet tofu-based pâté known as gizei-dofu [gisei-dofu], plus "goma-dofu, creamy sesame pudding drizzled with soy sauce and topped with a dab of fiery wasabi horseradish."

Kintame uses traditional pickling mediums including "miso paste." Their "house soup is ozoni, a creamy, pale, a miso-thickened broth.

Fushiki An offers shojin ryori, temple-style vegetarian cuisine including goma-dofu and a "clear broth with cubes of silken bean curd..." The chirashi-zushi contained "soy-simmered koya-dofu bean curd..." Address: Tokyo, Japan.

10435. Buzzell, R.I.; Poysa, V. 1997. Two food quality soybean cultivars released by GPCRC. *Canadian Soybean Technical Bulletin* (*OSGMB, Chatham, Ontario, Canada*) 3(2):1. July.

• ***Summary:*** GPCRC is the Greenhouse and Processing Crops Research Centre (formerly Harrow Research Station). "These two cultivars, AC Onrei and OX756, have been introduced to complement Harovinton expand the export of Ontario soybeans into the premium Asian soyfood market. Harovinton, a tofu-type soybean cultivar developed at Harrow, has established Canadian soyfood soybeans as a premium quality product in Asia, where it is called 'Orient Pearl.'

"AC Onrei is a selection from the cross Vinton X Enrei. Enrei is a premium quality Japanese tofu cultivar which lacks the a4 protein sub-unit of the 11S glycinin (gy4/gy4). Enrei's superior tofu quality, especially the ability to make premium tofu using the 'nigari' (magnesium chloride) coagulant, is due to the lack of this a4 protein sub-unit. Vinton is Gy4/Gy4 and has the a4 protein sub-unit."

"OX756 was developed from the backcross of L2 X Harovinton. L2 is a backcross derived lx2/lx2 line of Century which lacks the L2 lipoxygenase isoenzyme... Harovinton is Lx2/Lx2 and has the L2 lipoxygenase isoenzyme."

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"OX756 is a low lipoxygenase (lx2/lx2), yellow hilum cultivar similar in yield but earlier maturing than Harovinton, the recurrent parent. The lack of the lx2 lipoxygenase enzyme should reduce the 'beany' flavours in tofu, soymilk, and other soyfood products made with OX756, thus promoting wider acceptance of soybeans as food ingredients. It was released to W.G. Thompson and Sons, Ltd."

A table shows agronomic performance and seed quality for these two new food varieties compared with Harovinton during 8-9 years. For each variety are given: Yield, plant height, lodging score, days to maturity, weight of 100 seeds, protein %, and oil %. Address: AAFC, GPCRC, Harrow, Ontario, Canada.

10436. Kikkoman International Inc. 1997. Build a better burger with Kikkoman: Foodservice menu ideas (Brochure). San Francisco, California. 4 p. 15 x 22 cm.
• ***Summary:*** Five burger recipes that use Kikkoman soy sauce. The Kikkoman slogan is now: "The true taste of soy sauce." Address: San Francisco, California. Phone: 1-800-944-0600.

10437. *Soyafoods* (*ASA, Europe*). 1997. Japanese soy sauce sales hit by food poisoning scare. 8(2):2. Summer.
• ***Summary:*** Kikkoman, the world's larger maker of soy sauce with 30% of the Japanese soy sauce market, suffered a 22.1% decline in unconsolidated recurring profits–in part because of an outbreak last summer of food poisoning (caused by *E. coli*) in Japan. Just over half of Kikkoman's total sales come from soy sauce. Soy sauce was not implicated in the poisoning, but its sales fell when many Japanese temporarily stopped eating in restaurants and avoided fast food.

10438. Tobar, Hector. 1997. A world of surprises at Tofu Festival: Little Tokyo event includes twists on dishes from burgers to chocolate mousse that belie the food's bland image. *Los Angeles Times.* Aug. 10. p. B3, B7. Metro News section.
• ***Summary:*** The article begins: "To the uninitiated, tofu is synonymous with bland. It comes in funny white blocks that float in water. All by itself, it doesn't taste like much. But the people attending the Tofu Festival in Little Tokyo this weekend know better. They'll tell you what with some imagination and expertise–and a lot of spices–tofu is a culinary delight." More than 20,000 people were expected at the event, on Saturday and Sunday. Twenty-six restaurants served up a variety of tofu dishes. One favorite dish was the tofu cheesecake offered by Ryo Sato, the chef *de cuisine* and owner of Chez Sateau restaurant in Arcadia. The exact recipe is secret but the ingredients include tofu (50% of total), cream cheese, sour cream, egg, and lemon juice.

Talk with Margaret Endo of Little Tokyo Service Center. 1997. Sept. 10. This year's Tofu Festival was much bigger and better than the first one last year. Close to 20,000 people attended; roughly 70% of these were Asian Americans (with the majority of those being Japanese-Americans, but with also many Chinese- and Korean-Americans), and the remaining 30% were Caucasian-Americans. Pat Greenberg was very involved. A new edition of *The Four Seasons of Tofu* cookbook was prepared for the festival, and about 1,000 copies were sold. Address: Times Staff Writer.

10439. Brody, Jane E. 1997. Diet may be one reason complaints about menopause are rare in Asia. *New York Times.* Aug. 27. p. B10. Health section (Natl).
• ***Summary:*** A table (from the scientific journal *Obstetrics and Gynecology*) shows the content of phytoestrogens (in milligrams) in various soyfoods: Roasted soybeans 165.2. Textured vegetable protein 138.2. Green soybeans 135.4. Soy flour 112.4. Tempeh 62.5. Tofu 33.7. Tofu yogurt 16.4. Soy hot dog 15.0. Soy noodles (dry) 8.5.

10440. Kushi, Michio; Kushi, Aveline. 1997. Re: Letter of congratulations to the Lima Team. Lima celebrates its 40th anniversary! Letter to the Lima Team in Maldegem, Belgium, Aug. 30. 5 p. Typed, with signature on letterhead.
• ***Summary:*** "We extend happy congratulations from our hearts to the Lima team on its 40th Anniversary.

"The Lima team has truly been a European pioneer in organic agriculture and distribution of organic food. Not only many of Europe's people, but also people who are in organic food production, distribution and consumption all around the world, are extending their gratitude to the Lima team which has shown such dedication to the health and well-being of humanity.

"As we well remember, Lima began in 1957. George Ohsawa and Lima Ohsawa visited France and Belgium, and stayed with the Gevaert family. As are we, they all were advocating the cause of world peace, especially the pursuit of the realization of a world federal government. The father of Pierre Gevaert was one of the prominent European leaders in this peace movement, as well as a well known artist / painter. The Gevaert family, after suffering during World War II, settled, and began organic agriculture. Pierre Gevaert led his brothers and sisters in the cause of natural health as the base for a peaceful society. George and Lima Ohsawa encouraged their cause and called for four young Japanese students who were experts in their respective fields of food production. With their participation and intensive labor contribution under the leadership of Pierre and other Gevaert family members, together with the spiritual and philosophical guidance from George and Lima Ohsawa, the company–using the name 'Lima' from the name of Mrs. Ohsawa–had begun!

"Though the four Japanese left after their initial contribution, the Lima company continued to encourage organic agriculture in Belgium, France and other areas.

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It produced bread, miso, and other macrobiotic products as well as importing–mainly from Japan through Mitoku Company, Ltd., and others–the best quality of soy sauce and other organic products which were processed through the most authentic methods.

"While many other companies arose in France, Spain, Italy, Portugal, Germany and other areas of Europe, under the influence of macrobiotic education and rising interest in organic natural food, as well as people's concern for better health through better eating, Lima has steadfastly remained one of the companies which are most conscientious and thoughtful of the health and well-being of humanity.

"We fondly recall visiting the Lima facilities many times, giving advice on several occasions on the qualities of food. We also remember giving lectures, talks, and discussions at the company on several occasions when we visited Europe.

"In addition to the operation of food production and distribution, Pierre Gevaert and other members of the Gevaert family, as well as macrobiotic and natural foods-related friends, made great contributions towards educating people in society and promoting natural health by holding conferences, forums, seminars, lectures and meetings on many occasions and in many cities.

"We sincerely extend our heartfelt thanks to all these founders, contributors, workers and participants in the operation of Lima.

"After the company was bought and its ownership changed, the spirit of its founders continued to remain. Marc Callebert, who continuously stayed until recently, had also carried forward its original spirit. We all know that though the ownership has changed, the spirit of Lima has never wavered, and shall continuously develop towards further realization of the endless dream of humankind: health and peace of the world. We sincerely trust the current owners and management, together with all Lima workers, are sharing the same spirit: to keep the company a symbolic leader in Europe of authentic, organic, natural and macrobiotic Food producers and distributors.

"While, with many friends' companies, the Lima team is spreading its contribution to maintain and develop human health in Europe, America has also been changing widely towards organic, natural and macrobiotic food production, distribution and consumption. There are many huge-scale natural food supermarkets which have been set up in every major city in America. The nutritional and eating pattern has greatly turned into one incorporating more whole grains, organic vegetables, beans and fruits, in addition to authentic macrobiotic products such as miso, soy sauce, tempeh, tofu, sea salt, umeboshi, sea vegetables, sourdough bread and many others.

"Food revolution has definitely begun, and we all know that will change the eating pattern throughout the entire world within a few decades.

"For the past five years, we have been pouring our energies into changing Japan and other Far Eastern countries. Although they are several years behind America and Europe, they are quickly awakening, and a large trend of organic, natural, macrobiotic food has been spreading through the participation of hotels, restaurants, food producers, farmers and consumers. This trend will spread to other Asian countries, and eventually towards the Middle East and Africa, and will enable the world to become a more healthy and peaceful society in the near future.

"We further wish to comment that this movement towards healthy food in general is closely associated with and has been inspiring alternative approaches to health care. Many areas of alternative medicine are dealing with healthy dietary practice, largely including a macrobiotic way of eating. Nutritional science has also been changing towards the reduction of animal food and increase of grains, vegetables, beans and other foods which we have been promoting.

"All of you are part of this wonderful positive movement in the world, and so, together with many friends, we again extend our congratulations to you on your 40th anniversary, and we pray from our hearts for your continuous contribution and success in the development of human health and well-being through the best quality of food. To the many people who have put their efforts into developing Lima as a symbolic existence in the industry: Thank you very much!

"In peace and love, Michio Kushi, Aveline Kushi, with many American macrobiotic, natural food friends."

Note: Lima NV is now located at Industrielaan 11A, B-9990, Maldegem, Belgium. Phone: +32 50 71 05 64. Address: 62 Buckminster Rd., Brookline, Massachusetts 02146. Phone: 617-232-6876.

10441. American Soybean Association. 1997. ASA foreign offices–August 28, 1997–Directory (Leaflet). St. Louis, Missouri. 1 p. 28 cm.
• ***Summary:*** Contains details on ASA's 13 overseas offices in Japan, Taiwan, Korea, Singapore, Austria, Belgium, Venezuela, China, Mexico, Russia, Cyprus, Germany, and India. For each entry: Name of director, address, phone and fax numbers, e-mail address. Address: Missouri. Phone: -.

10442. Funaki, Junko; Yano, Midori; Misaka, T.; Abe, K.; Arai, S. 1997. Purification and characterization of a neutral protease that contributes to the unique flavor and texture of tofu-misozuke. *J. of Food Biochemistry* 21(3):191-202. Aug. [14 ref. Eng]
• ***Summary:*** Tofu-misozuke, a food indigenous to the Fukuoka district of Japan, is a type of tofu fermented in miso; it has a unique cheese-like taste and soft texture. The changes in the tofu are caused by protease enzymes originating in the koji, which is one of the raw materials of miso. The key enzyme, a protease [that digests protein]

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was purified and identified. Address: 1-2. Faculty of Human Environmental Science, Fukuoka Women's Univ., 1-1-1 Kasumigaoka, Higashi-ku, Fukuoka 813, Japan.

10443. Kamimura, Yasuko. 1997. Sushi: Making at home. Tokyo, Japan: Graph-sha Ltd. Overseas distributor: Japan Publications Trading Co., Ltd. 64 p. Aug. Illust. (color photos). No index. 26 cm.
• ***Summary:*** The section titled "Inari-zushi (Sushi rice in fried tofu bags) states (p. 32): The shape, size and fillings vary according to regions and families, which are proud of their own *oinari-san* (*inari-zushi*)*."*

Common "to all is the use of well-seasoned abura-age (fried tofu)." The recipe and a color photo follow. Address: Cooking teacher, Japan.

10444. Little Tokyo Service Center. 1997. The four seasons of tofu. 2nd ed. Los Angeles, California. 152 p. Illust. 22 cm. Spiral bound.
• ***Summary:*** This is a greatly expanded and improved version compared with last year's. Contents: Little Tokyo Service Center. Nikkei Family Counseling Program. Emergency Caregivers Program. Domestic violence. Tofu: A 2,000-year-old health food miracle, compiled by William Shurtleff of Soyfoods Center. Tofu tidbits: Q & A. Glossary of Japanese cooking terms. How to drain water from tofu. Contributors to cook book. Spring menu: Appetizers, salads, side dishes, main dishes, desserts (a heart symbol = vegetarian recipe; of the 16 spring recipes, 13 are vegetarian). Summer menu. Autumn menu. Winter menu. Address: Little Tokyo Service Center (Resource Development Center), 231 East 3rd St., Los Angeles, California 90013. Phone: 213-473-1600.

10445. Little Tokyo Service Center. 1997. L.A. Tofu Festival, August 9-10. Los Angeles, California. 22 p. Illust. 26 cm. Saddle stitched (stapled).
• ***Summary:*** Contents: 1997 LA [Los Angeles] Tofu Festival committees and volunteers. Schedule of events, Aug. 9-10. Map of events. Letter from Little Tokyo Service Center, with thanks to House Foods / Hinoichi Tofu as the Title Sponsor. List of sponsors by rank. Honorary chairpersons: Sandy Gooch and Rob Fukuzaki. Health education and health benefits of tofu. Tofu: A 2,000 year old health food miracle, compiled by William Shurtleff of Soyfoods Center. 1997 LA Tofu Festival restaurant profiles (20 restaurants, p. 7-9): Aloha Food Factory (Alhambra, CA, started Oct. 1990–Tofu specialty dish: Tofu with cha-shu on stir fried vegetables). Berth 55 (Long Beach, 1988–Tofu poke dish). Buk Chang Dong Soon Du Bu (LA, April 1996–Spicy tofu casserole with oyster, shrimp & clams). Chez Sateau (Arcadia, 1981–Tofu cheesecake, Tofu Caesar Salad. Chef Sato was "Chef of the Year of Los Angeles" and 1980 Chef of the Year of southern California." He was also a member of the 1980 U.S. Team for the Cooking Competition in the Culinary Olympics). Curry House (Beverly Hills, Aug. 1996–Tofu steak {marinated in soy sauce}, Tofu cheesecake). Furaibo (LA, Aug. 1994–Tofu salad with original ginger). Indo Cafe (Los Angeles, 1993–Stuffed tofu cake {tofu filled with ground chicken and shrimp}, Fried tofu {marinated in turmeric and candlenut}). Jozu Restaurant (LA, Dec. 1, 1996–Fried tofu with marinated porkchops). Little Tokyo Lion's Club (LA, 1974–Tofu miso soup, Futomaki sushi). Mr. Ramen (LA, Oct. 1993–Vegetarian {with tofu} ramen). Ocean Seafood Restaurant (LA, 1990–Mabo tofu, Tofu with mixed vegetables, Tofu in clay pot). Papa Jon's Cafe (Long Beach, 1990–Greek tofu salad, Tofu lentil salad, Potato-tofu salad, Sesame tofu salad, Tofu spinach, Lasagna, Tofu broccoli stir-fry, Spaghetti and tofu balls, Tofu/lettuce/tomato {TLT} sandwich, Tofu scramble {breakfast}, Tofu dessert pies, Tofu frosting {on cake}, Tomato basil w/tofu, Teriyaki tofu, and Spinach mushroom pasta w/tofu). Pat Greenberg, "Fitness Gourmet" (Beverly Hills, Renowned instructor of the "Joy of Soy" cooking classes). Southern California Cuisine (LA, 1994–Tofu ravioli served with Curry sauce or traditional marinara sauce). Suehiro Cafe (LA, 1972–Stir-fried eggplant, Bell peppers with tofu braised in miso sauce, Deep-fried tofu with sauce). Three Brothers Restaurant & Catering (Harbor City, 1983–Chinese tofu salad, Tofu seafood salad). Tofutti Brands Inc. (Cranford, New Jersey, 1982–Non-dairy frozen desserts, Tofutti tortellini, Mini ravioli, Tofutti cookies). Unique Catering (Chino Hills, 1995–Tofu patty with shiitake sauce, String beans with tofu dressing, Inari-sushi). Vegetarian Delight (San Gabriel, 1991–Veggie fish in hot braised sauce). Wild Oats Community Market (Santa Monica, 1984–Tofu tempeh deli salad).

Advertisements (p. 10-21), including ads for Tofutti, Patricia Greenberg "The Joy of Soy" cooking classes, JFC International Inc., House Foods America Corporation (full page, inside rear cover). Address: Little Tokyo Service Center (Resource Development Center), 231 East 3rd St., Los Angeles, California 90013. Phone: 213-473-1600.

10446. *SoyaScan Notes.* 1997. Periodicals/journals having 90 or more articles related to soya in the SoyaScan database, as of 1 Sept. 1997 (Overview). Sept. 1. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** (1) *Soybean Digest* 2,605. (2) SoyaScan Notes 1,408. (3) Journal of the American Oil Chemists' Society / Oil and Soap (2 names–674 + 61) 735. (4) U.S. Patents 644. (5) Journal of Food Science 256. (6) Nippon Nogei Kagaku Kaishi (Journal of the Agricultural Chemical Society of Japan) 230. (7) Foreign Agriculture 229. (8) Nippon Jozo Kyokai Zasshi (Journal of the Society of Brewing / Brewing Society of Japan) (2 names–203 + 23) 226. (9) Journal of Nutrition 215. (10) Vegetarian Times 208.

(11) Proceedings of the American Soybean Assoc. 191 (12) Soybean Update 188. (13) Agronomy Journal / J. of the

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American Society of Agronomy (2 names–111 + 75) 186 (14) INTSOY Series 175. (15) Soyfoods magazine 158. (16) Toyo Shinpo (Soyfoods News) 156. (17) New York Times 154. (18) British Patents 150. (19) Jozo Shikensho Hokoku (Report of the Brewing Experiment Station) 146. (20) Cereal Chemistry 140.

(21) Hakko Kogaku Zasshi (Journal of Fermentation Technology) 134. (22) East West Journal / East West (2 names–79 + 36) 115. (23) Japanese Patents 114. (24) Agricultural and Biological Chemistry 110. (25) Chemurgic Digest 106. (26) Food Technology 106. (27) Crop Science 105. (28) Shokuryo Kenkyujo Kenkyu Hokoku (Report of the Food Research Institute) 105. (29) Natural Foods Merchandiser 103. (30) Soya Newsletter (Bar Harbor, Maine) 101.

(31) Journal of Agricultural and Food Chemistry 100. (32) American J. of Clinical Nutrition 97. (33) Bulletin de la Societe d'Acclimatation 93. (34) Food Engineering 93. (35) Wall Street Journal 92. (36) Jozogaku Zasshi (Journal of Brewing, Osaka) 91.

10447. Hesser, Amanda. 1997. Miso goes beyond Japanese cooking. *New York Times.* Sept. 3. p. C1, C8 (NY City ed.); p. B1, B8 (Natl). Living Arts section. [1 ref]

• ***Summary:*** An excellent, long article. The version in the New York City edition (described below) is considerably longer than that in the national edition. Nina Simonds believes that miso is no longer an exotic food as it one was; it has now become much more mainstream. Many varieties of miso are now sold in America. William Shurtleff, co-author of *The Book of Miso,* notes that "It brings a savory flavor to vegetarian meals that is very hard to find. Miso provides a bridge between a steak and a vegetarian diet."

Katagiri & Company, on the Upper East Side of New York City, sells more than 20 varieties. In Japan, miso soup maintains a reputation as a cure-all, much like chicken soup is to westerners.

Contains three miso recipes. One sidebar, titled "The package says a lot," gives the name, address and phone number of six different sources for misos: The Health Nuts, Integral Yoga Natural Foods, Katagiri & Company, Whole Foods Market (all 4 in New York City), South River Miso Co. (Conway, Massachusetts), and Natural Lifestyle Supplies (Asheville, North Carolina–Sells Miso Master, Onozaki, Mitoku, and South River misos).

Photos show: Nine different brands of packaged miso. A bowl of miso soup, with chopsticks.

10448. Sandler, Richard. 1997. Recollections of early tofu cheesecakes in Boston and New York #2. The place of cheesecakes in Jewish culture (Interview). *SoyaScan Notes.* Sept. 16. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Concerning the first tofu cheesecake in Boston, Richard's brother, Matthew Sandler, stated today: "The original recipe for the tofu cheesecake probably came from Connie Frank Sandler, the first wife of Matt's brother, Richard. Connie and Richard made a tofu cheesecake at Sanai restaurant in about 1966-67." But Richard says he has no recollection of any cheesecake in Boston. He suggests calling Connie Sandler (now Hanna Frank, who lives in Mexico). The recipe he best remembers developing with Connie was Rice Kayu Bread–which she invented.

"My first recollection of tofu cheesecake (or tofu pie) was 1969 in New York. The Caldron restaurant was started by Marty Schloss, his wife Glory, and his mother, Seena. I was the first cook at The Caldron; I set up the kitchen, the menu, the bookkeeping, etc. The Caldron first opened for business on 18 April 1969." About a month of two after The Caldron opened, its three founders started a natural-food grocery story and bakery right next door to the Caldron; it was named The Caldron's Well. Marty's mother, Seena, became the baker at The Caldron's Well roughly 6 months after April 1969. I think she invented and developed the tofu cheesecake that soon became very popular at The Caldron. A fellow named Danny Mount (who arrived after Richard and probably working with Seena) also made tofu cheesecakes at The Caldron. Before working at The Caldron, Danny had worked at the Good Karma Cafe in San Francisco, California. "I don't think Seena had any precedent for her discovery. My personal opinion is that, as in all great historical discoveries, there are often two or three people independently working on the same thing. It speaks to that fact that it is Nature that is producing this, speaking to a few minds. I firmly believe that.

"This is definitely my first recollection of seeing or tasting a tofu cheesecake anywhere. I lived in the Kushi's house in Boston and Aveline never made a tofu cheesecake. I was the cook at Sanae and neither I nor Evan Root, the first cook there, ever made it. I made desserts at Sanae every single day, but I definitely never made a tofu cheesecake. I moved to Boston on 1 Jan. 1968 and immediately went to work helping out with the construction of Sanae–which was already about 80% done. Sanae opened in about January or February 1968."

"In 1968 in Boston, the only tofu that even existed in this strict macrobiotic community was tofu from Chinatown. Tofu was always a suspect food. But cheesecake was something that always appealed to Jewish macrobiotics, trying to adapt the food to their traditions. Cheesecake is a very Jewish dessert–at least among secular Jews in the USA in the 1950s and 1960s. It is not quite as Jewish as lox and bagels, but it was definitely indicative of wealth in the Jewish community, or of a Jewish person climbing the ladder of success. It was like 'Oy–You got so much cheese you can make a cake! I can't believe it.'"

The laws of Kosher say that if you eat meat, you must wait about 4 hours before you eat dairy. Until about 50

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years ago, almost all Jews kept Kosher, but by the 1950s the majority of Jews probably were not Kosher. Yet many Jews who gave up Kosher laws, still kept meat and milk apart. There are two kinds of Kosher restaurants in New York City–Meat restaurants and dairy restaurants. The meat restaurants sold no dairy products and the dairy restaurants sold no meat products; the dairy restaurants sold dairy products but no meat. The Kosher dairy restaurants sold delicious cheesecakes.

Other people who might remember more about early tofu cheesecakes: (1) Hanna Frank (formerly Connie Sandler), Richard's first wife. She now lives in Mexico. (2) Wally Gorell, who lives in the Bay Area and has an encyclopedic memory and mind. He was in Boston for a short time in the early days, then soon left to go to Japan. Wally was seen as a prodigy in terms of cooking, and was greatly admired by everyone for his light touch and great creativity. In 1968 there were only two macrobiotic study houses in Brookline (Boston): The one that Michio and Aveline lived in, on Gardner Road, and the second one which was on University Road. Wally and Richard and Matt Sandler lived in the house on University Road. When Nahum and Beverly Stiskin moved out of the University Road House, Richard took their room. Later Connie, Richard and Wally moved into Michio's house on Gardner Road.

(3) Beverly Sky (formerly Stiskin; she is now single and lives in Boston). (4) Nahum Stiskin in New York City (he's involved in computer software and the financial world).

(5) Michelle = Maier Abehsera, who is now an Orthodox Jew and lives in Brooklyn with his wife Claude. His phone number is listed. He and his wife had a great, great macrobiotic restaurant in New York named *l'Épicerie.*

Note: For a previous interview with Richard Sandler on this subject, see SoyaScan Notes, 26 May 1992. Address: 251 East 10th St., Apt. 7 [East Village], New York, New York 10009. Phone: 212-777-7138.

10449. Bates, Caroline. 1997. California–Los Angeles area: *Spécialitiés de la maison. Gourmet* 57(9):32, 34. Sept.
• ***Summary:*** One of the three restaurants featured in this article is Jozu, a Japanese restaurant at 8360 Melrose Ave. in Los Angeles (phone: 213-655-5600), owned and run by Andy Nakano. One of the writer's favorite recipes is the fragrant Japanese eggplant in miso sauce. A photo shows the prepared dish.

10450. Fujii, T.; Nakamura, H. 1997. Method for producing solidified tofu lees and combustion of okara as fuel. *Fuel and Energy Abstracts* 38(5):326. Sept. *
• ***Summary:*** "Okara waste from tofu manufacture is mixed (100 parts) with urethane resin (5-70 parts by weight) at 5-50ºC in order to produce solidified okara. Water contained in the okara is exuded during the process, and the heating value grows."

10451. Ontario Soybean Growers' Marketing Board (OSGMB). 1997. Overview of the Canadian soyfoods market. Chatham, Ontario, Canada: OSGMB. 44 p. 28 cm.
• ***Summary:*** This excellent, complete, and accurate market study was compiled by the Collège d'Alfred of the University of Guelph, under contract with the Ontario Soybean Growers' Marketing Board (OSGMB). The project leaders were Suzanne Lavoie, Charles Goubau, and Ian Walker. The field research was conducted between Jan. 15 and Aug. 31, 1997. The first study of the Canadian soyfoods market was published in March 1990 (vi + 40 pages).

Contents: Acknowledgments. Summary. Introduction. Research procedures: Methodology, limitations (of the 100 companies in this study, over 75% were visited, interviews were conducted in person, and product samples were collected). The Canadian soyfoods market: History, structure of the Canadian soyfood industry, market highlights by region (The Maritimes, Quebec, Ontario, the Prairies {Manitoba, Saskatchewan, and Alberta}, British Columbia), factors influencing the soyfoods market (A closer look at Canadian demographic trends, a closer look at Canadian immigration trends, a closer look at vegetarianism and family food expenditure trends, research on soyfoods and their health benefits, the American influence). Supply and demand of soybeans for use in soyfoods: Soybean production in Ontario, imports and exports of soybeans, imports and exports of soy products, the soybean crushing industry in Ontario, consumption of whole soybeans by soyfood processors. Opportunities in the Canadian soyfoods market. Soyfood processors and their needs. Market opportunities for food-grade soybeans. Summary comments. Bibliography.

Tables show: (1) Major soyfood companies established in the province of Quebec (p. 13). (2) Major soyfood companies established in the province of Ontario (p. 16). (3) Major soyfood companies established in the province of British Columbia (p. 19).

(4) Percentage of change in units and sales of soyfoods by product in grocery stores in Canada between 1994 and 1996 (soy sauce, soy flour, soy oil, soymilk, tofu and meat analogs). (p. 21). (5) Percentage distribution of population in Canada by province (p. 22. In 1996, 37.5% lived in Ontario and 24.6% in Quebec). (6) Percentage distribution of age groups–Canada (p. 22; In the 15-24 age group, 19% did not eat meat in 1992, down from 23% in 1986).

(7) Percentage of population who do not eat meat & share of budget spent on meat, Canada 1986 and 1992 (p. 28). (8) Canadian soybean: Supply and disposition (September–August crop year)–in metric tons (p. 31). (9) Canadian soybean exports by country of destination (p. 32. In 1997-98 some 325,000 tonnes went to the European Union, 145,000 to the USA, 85,000 to Japan, 40,000 to Hong Kong, 75,000 to other Asia, and 15,000 to other places).

(10) Imports and exports–All countries, dollar values (p.

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33. The leading imports are soybean meal $202.7 million, crude soybean oil $16.75 million, and whole soybeans for oil extraction $12.59 million. The leading exports are protein concentrates and textured protein substances $9.1 million, soybean meal 6.5 million, and brans, sharps and other residues $4.3 million).

(11) Soybean crushing facilities in Canada (p. 34. All are located in Ontario province; ADM Agri-Industries Ltd., Windsor. Capacity: 3,600 tonnes/day of raw soybeans. CanAmera Foods, Hamilton, 3,000. Helin Oil Packers, Whitby, 250. Started crushing in 1997. Cold Springs Farm Ltd., Thamesford, 100. Started 1995. Sunfield Oil Seeds, Wingham, 100. Started 1994. Dennis Jackson Seeds Services Ltd., Dresden, 40. Started 1994. Tri County Protein Corporation, Iroquois, 100. Not in operation yet).

(12) Estimated quantities of soybean utilized by soyfood processors–1996–metric tons (p. 35. Total volume of whole soybeans consumed: 9,650 tonnes, of which 4,780 are for soymilk, 4,775 are for tofu, and 95 are for other soyfood products). Total volume of whole soybeans consumed by province (by soyfood processors): British Columbia 3,825 tonnes, Ontario 3,050 (excluding crushing plants), the Maritimes and Quebec 2,535, and the Prairies 240.

(13) Major foreign companies in the Canadian soyfood market (p. 37. Soy cheese: Soyco Foods, Sharon's Finest, Cemac Foods Corp. {Nu-Tofu}. Frozen desserts: Tofutti Brands Inc. Tempeh: Turtle Island Foods Inc. Tetra Pak packaged soymilk: Westbrae Natural Foods, Cenat, Pacific Select, Vitasoy USA Inc., Eden Food Inc. Tofu: Mori-Nu, Vitasoy USA Inc. Prepared dishes: Amy's, Sharon's Finest. Meat analogs: Fantastic Food Inc. MGM Brands, Northern Soy, Soy Boy, Turtle Island Foods Inc. Salad dressing: Nasoya Foods. Soy sauce: Eden Foods Inc., Kikkoman Foods Inc.).

The Prairie Provinces (Manitoba, Saskatchewan, and Alberta) contained about 16.6% of Canada's population (4.5 million persons) in 1995. "The province of Alberta [Capital = Edmonton] is different from the other two Prairie provinces, due mainly to its larger population base, its growing Oriental population and its proximity to Vancouver. Calgary [a large city in Alberta province] and Edmonton have their own Chinatowns, including small Oriental-owned tofu and soymilk production facilities." Note: According to the Canadian Soyfoods Directory (1997, p. 14), there are 7 soyfoods companies in Alberta province, 2 in Manitoba, and none in Saskatchewan. Address: OSGMB, 180 Riverview Dr., P.O. Box 1199, Chatham, ON N7M 5L8, Canada. Phone: 519-352-7730.

10452. Fitzpatrick, Michael. 1997. Soy far, so good. *Guardian* (*England*). Oct. 25. p. B57.
• ***Summary:*** This article is mostly about soy sauce. "As for promoting longer life, reports of the Japanese press have declared soya beans to be anti-carcinogenic, especially the revolting fermented soya-bean concoction called natto."

American consumers already use vast amounts of soy sauce, but to promote it in Europe, Kikkoman sponsors an annual competition in the UK and Germany named "Kikkoman Masters." Kikkoman asks chefs in these two countries to make their own favorite recipes using Kikkoman soy sauce.

In the UK, Japanese soy sauces are definitely more expensive than their Chinese counterparts, and there are more varieties of Chinese soy sauce on the market to choose from. Yet there are an estimated 7,000 soy sauce makers in Japan–although many of the smaller ones sell only locally or regionally.

The Yamasa company makes and sells three types of soy sauce: regular, table number one with reduced salt, and one made especially for raw fish [sashimi]. Two other brands [owned by other companies] are Higashimaru (from Osaka) and Kurashi-more (declaring itself top grade and expensive).

10453. Golbitz, Peter. 1997. Soyfoods Expo '97 in Mexico City, 21-23 Oct. 1997 (Interview). *SoyaScan Notes.* Oct. 31. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The American Soybean Association (ASA) sponsored this expo and hired Peter and Soyatech to recruit American companies to participate. 824 people attended (many more than the last soyfoods expo in Mexico in 1994) and 28 companies exhibited at the U.S. Trade Center in Mexico City. The event started Tuesday, October 21, with a briefing by the Trade Center on how to import products into Mexico. Tuesday evening there was an opening VIP cocktail, attended by about 300 people. The booths were all set up; it and ended Thursday Oct. 23. One Wednesday and Thursday the Expo hall was open from 12:00 noon until 8:00 p.m. each day. The U.S. Trade Center arranged appointments for people, from 9-12 o'clock each morning, linking potential buyers and sellers. A great deal of business was conducted. In addition there were five seminars each day, from 12:30 to 6:00 p.m., with the speakers being mostly Americans, talking about new technologies, marketing, soymilk standards, products, etc. There was one seminar about current developments with soy in Guatemala. ASA put together a beautiful little color catalog as part of a big packet on the Expo, with all the seminars, speakers, attendees, etc. Peter will send a 5-page faxed recruitment packet announcing the event.

Cuba has exported an excellent soymilk plant to Mexico; the company, Biotek, owned by Dr. Javier Sandoval Pierres, is now in operation at: Km. 9 Carreterra Celaya, San Miquel Allende, Guanajuato state (GTO, south of Mexico City), Mexico. Phone: +91 415 5-0347 or 0348. Fax: 4-0349. The soymilk is delicious. The company is beginning to work with the Mexican government to get this soymilk into schools.

Mexico is now the third largest importer of U.S. soybeans after the Netherlands (#1) and Japan (#2; see *Soya*

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Bluebook, p. 348). This is largely attributed to NAFTA, the proximity of Mexico to the USA, and the fact that as imports from the USA have increased, Mexican soybean production has decreased. In addition, China is now exporting good quality food soybeans to importing nations in Asia.

ASA Mexico now produces a quarterly Spanish-language magazine titled *Soya.* For more information contact Adela Perez and Viki Braverman at ASA Mexico.

Note: A photo in *Bluebook Update* (March 1998, p. 6) shows U.S. participants in the Expo: Matt Renkoski of Optimum Quality Grains; Deb Wycoff of Devansoy; Rick Eluk of Clofine Food & Dairy; Teresa Isakson of SunRich; Lorne Broten of International ProSoya; Alberto Pico of ADM; and Peter Golbitz of Soyatech, Inc. Also shown are Adela Perez of ASA (Mexico) and some of her staff. Address: Soyatech, P.O. Box 84, Bar Harbor, Maine 04609. Phone: 207-288-4969.

10454. Evans, D.E.; Tsukamoto, C.; Nielsen, N.C. 1997. A small scale method for production of tofu and silken tofu. *Crop Science* 37(5):1463-71. Sept/Oct. *

• ***Summary:*** 80 gm of ground soybean is used to make silken tofu. Glucono-delta-lactone is used as the coagulant. To evaluate the method, soymilk and tofu were made from 182 experimental, public, and private soybean cultivars grown in Indiana in 1990. Address: 1. Dep. of Plant Science, Univ. of Adelaide, Waite Campus, Glen Osmond, SA 5064, Australia; ; 2. Taishi Food Co., 68 Okinaka, Sannohe-Machi, Sonnohe-gun, Aomori, Japan 039-01; 3. USDA-ARS, Dep. of Agronomy, Purdue Univ., W. Lafayette, Indiana 47907-1150.

10455. Olson, Joan. 1997. Soy ink makes Asian news. *Ag Innovation News* (*AURI–Agricultural Utilization Research Inst., Waseca, Minnesota*) 6(4):14. Oct.

• ***Summary:*** "Leading printers and newspapers are switching to soy ink. Korea's two largest daily newspapers have made the switch; their combined readership is 4.7 million. Japan and Taiwan are also beginning to switch to soy ink. 'There is a tremendous opportunity for market growth,' says Jo Patterson, coordinator of the National Soy Ink Information Center, Des Moines, Iowa. American Soybean Association seminars in Asia have sparked overseas use of soy ink."

Source: Illinois Soybean Checkoff Board, Claudine Wargel, (309) 663-7692.

10456. Gonzalez-Watanabe, Yvonne; Watanabe, Joji. 1997. Introducing tofu to Hispanics. Visit to the House Foods America Corp. tofu factory in Garden Grove near Los Angeles (Interview). *SoyaScan Notes.* Nov. 9. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Yvonne and her husband Joji (who first contacted Soyfoods Center on 12 Sept. 1997) are interested in translating *The Book of Tofu* into Spanish and introducing tofu to the Hispanic community, starting in Los Angeles. Yvonne, age 24 was born in the USA, where her parents (who are both from Costa Rica) lived for 30-35 years; her father was a pharmacist. She learned to speak some Spanish at home. Her parents have returned to Costa Rica. Yvonne (who was raised a Catholic) now works in a real estate office and teaches vegan cooking classes at the Kanzeonji Non-Sectarian Buddhist Temple and Shiva Ashram Yoga Center at Mt. Washington in Los Angeles; there both she and Joji practice Zen meditation and yoga. Rev. Ryugen Watanabe, Joji's uncle, is a Soto Zen master, yoga teacher, and the head of this temple. Both Yvonne and Joji are vegetarians, and she is a vegan. Her sister is an editor for El International, a big Spanish language magazine located in Miami, Florida.

Yvonne got interested in vegetarianism and soyfoods through Rev. Watanabe. She had had severe migraine chronic headaches for many years. After trying every possible remedy to no avail, she told her uncle, Rev. Watanabe, about her problem. He said simply but forcefully, "It's your diet." She thought: "He's crazy. I have a great diet." In 1994, although she had been eating meat for 30 years, she tried the vegetarian diet he recommended and got quick relief. Following his advice, she began by giving up red meat and pork, then phased out chicken and fish until after 8-9 months she was consuming a vegan diet. As Yvonne began educating herself about vegetarian nutrition, she was looking for alternatives to meats as a source of protein. Rev. Watanabe told her about tofu, and even taught her how to make it at home from whole soybeans. Now Yvonne teaches other people how to make tofu at home.

Yvonne has great admiration for Rev. Watanabe. "He's really great. He's been teaching Zen and yoga for more than 20 years and he still charges the same, low prices–$2.00 for a yoga class. If you can pay, you pay. If you can't, how about rolling some incense. It's wonderful. I've never seen someone so committed to people."

Yvonne has been a vegan ever since and has not had a headache in almost five years. A friend of Yvonne's had migraine headaches that were so bad, she had to give herself shots. Yvonne suggested that she try switching to a vegetarian diet. She hasn't had a headache in a year. Over the years many of Yvonne's female relatives (her mother, sister, cousin, etc.) have become vegan–largely because they want to lose weight.

Joji, age 36, was born in Tokyo but has lived in the USA since age 6. He speaks Japanese and English and is a financial consultant. Joji graduated from USC, and now works in a corporate environment in real estate financing. His grandmother, Masa Miyai, lives with them. Four years ago they shut down their business selling medical supplies to Latin America. Now they are developing a project to introduce tofu to Hispanics.

On Oct. 18-19 Yvonne and Joji visited Soyfoods Center, where they talked with Bill Shurtleff about their project and book publishing. They photocopied many Spanish-language

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documents and recipes related to tofu. Upon returning to Los Angeles, they developed a one-page Spanish language brochure on tofu, visited with Margaret Endo in order to arrange for a booth in next summer's Tofu Festival, and began to do research.

Their first research project was a visit to the House Foods America Corp. tofu plant in Garden Grove, Southern California. After a brief meeting with employee Miyuki Nagano, she took them on a walking tour of the plant, so they were able to observe the entire tofu-making process. It is completely automated, except when a worker smooths the curds in the pressing trays before they are pressed. The company employs about 120 people at this facility. Of the 78 workers in the factory (including shipping and receiving), 98% are Hispanic men, but the office workers are all Japanese. The company has its own delivery trucks; its marketing is focused on California, in part because of increased competition from companies outside the state–as in Massachusetts [Nasoya Foods]. The company invites the Hispanic workers to take home tofu, but they don't–probably because they don't know what to do with it. The company has a full test kitchen and laboratory, and Miyuki is interested in developing tofu recipes that Hispanics will like. The company also makes natto at this plant.

Update: Talk with Yvonne. 1997. Nov. 23. Her cousin, Alejandra Jimenez, from Costa Rica has just arrived in Los Angeles to work with her on the tofu project. Alejandra's native language is Spanish but she also speaks perfect English and has a master's degree in English. Another cousin from Costa Rica is part of an all-male rock band, whose members are ages 30-37; all were born and raised in Costa Rica. She served them 3 tofu recipes–which they liked very much: (1) Tofu cubed in miso soup; (2) Chilled tofu, cubed with sesame oil, rice vinegar, and soy sauce; and (3) Crisp freshly deep-fried tofu cubes, with soy sauce. They are interested in using tofu as part of a weight-loss program.

They all went to a Chinese vegetarian restaurant in nearby San Gabriel named Vegetarian Delights. Run by a Chinese-American lady, it served a delicious dish named Roasted Black Bean Fish, that tasted remarkably like fish–but used tofu instead of fish. Yvonne made friends with the owner. Address: 6029 LaPrada St., Los Angeles, California 90042. Phone: 213-254-1712.

10457. Schorow, Stephanie. 1997. Books–*Golden 'Geisha':* Brookline author's 'Memoirs' explores mysterious world of Japanese courtesans. *Boston Herald.* Nov. 12.
• ***Summary:*** *Memoirs of a Geisha,* by Arthur Golden has become a bestseller. "The Japanese call themselves a 'natto' society. A natto is a fermented bean that if you pick one up, they stick together so much, they won't separate."

"'Memoirs' explores this 'natto' world from the perspective of a girl raised" to be a geisha. Address: Massachusetts.

10458. Huang, H.T. (Hsing-Tsung). 1997. Early history of the concept of heating and cooling foods in China. Books on nutrition and medicine in Joseph Needham's *Science and Civilization in China.* (Interview). *SoyaScan Notes.* Nov. 13. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Dr. Huang will not deal with the question of "heating and cooling foods" in his forthcoming volume in Joseph Needham's *Science and Civilization in China* series. That part was cut out because there was not enough room for it; he would have to devote more time to that subject in order to deal with it adequately. The tradition is ancient in China, but the concept seems to have been first written down in two sources from about the same time: First, in the *Yellow Emperor's Classic of Internal Medicine,* which contains material from before the Christian era, probably from the Warring States period (221-403 B.C.). Second, in the first Chinese pharmacopoeia, the *Shen Nung Pên Ts'ao Ching,* which defined drugs as heating and cooling, and also discussed their toxicity. Quite a lot of this latter book remains. For a long time it was considered lost, but it has been reconstituted, in part because fragments are preserved in the later pharmacopoeias. Most of the material is in the *Pen-Ts'ao Kang-Mu,* compiled by Li Shih-chen (1578-1597). It was copied and printed during the Sung dynasty. The Japanese have an almost complete copy; it was discovered during the early years of this century then brought back to China, where it created a great deal of interest and scholarship. Now there is a very nice edition of it in Chinese–but no single book in English.

Note concerning book burning in early China: In *East Asia: The Great Tradition,* Reischauer and Fairbank (1960, p. 87-88) explain that during the brief Ch'in dynasty, just after the Warring States and before the Former Han, China was first unified under the first emperor–*Ch'in Ssu Huang Ti.* In his attempt to control people's thought and get rid of outmoded or subversive books, he commanded his prime minister Li Ssu, in 213 B.C., to set about destroying "undesirable" books in a literary inquisition that has come to be known as the "Burning of the Books." The only books spared were utilitarian ones, such as works on medicine, divination and agriculture, and the historical records of the Ch'in itself. "For this desecration of the written word, Li Ssu has earned the undying hatred of Chinese historians. Unquestionably his effort to blot out dangerous doctrines did help to put an end to the golden age of Chinese thought. Other factors were the burning of the Ch'in imperial library when the dynasty fell..."

Dr. Huang continues: Many of the books were lost, but some were saved by people who hid them, and they were supposedly "rediscovered" during the Han dynasty.

There will be a small nutrition section in Dr. Huang's book. In it he deals almost exclusively with the Chinese treatment of nutritional deficiency diseases. That part is

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rather scientific. The earliest such treatment was for goiter, using seaweeds, described in the *Pen-Ts'ao Kang-Mu* (1578-1597)–long before Dr. James Lind in the West. Note: In 1747 James Lind proved that citrus fruits cure scurvy in the first controlled human dietary experiment. But it was not until 1796 (50 years later) that lemon juice was officially introduced into the British Navy to prevent scurvy.

In the Needham series, the subject of heating and cooling foods (and herbs/drugs) will probably be dealt with in the volume on *Materia Medica,* but the progress of that volume is now sort of bogged down. Joseph Needham wrote an entire volume focusing on the early history of medicine in China, which should be available in 1-2 years. An entire volume on acupuncture was published by Cambridge University Press in 1980; titled *The Celestial Lancets: A History and Rationale of Acupuncture and Moxa,* by Lu Gwei-Djen and Joseph Needham, it was originally intended to be part of the *Science and Civilization in China* series, and is probably still in print. To order (or for the latest catalog of Cambridge University Press in the USA), call 1-800-872-7423.

Dr. Huang has so much interesting material which he was unable to include in his *Science and Civilization* volume, that he is thinking of writing a popular book on the history and origin of food, nutrition, and food culture in China, from the technological viewpoint. It will probably include information on heating and cooling foods. The "hot-cold" principle is applied to foods even in Mexico. The old Western idea of the bodily humors is also related in that foods were related to these humors. This idea was popular at the time of the Thirteen Colonies and until the 19th century. Address: 309 Yoakum Parkway #403, Alexandria, Virginia 22304.

10459. Eden Foods, Inc. 1997. Eden soy sauces: Traditionally brewed shoyu & tamari (Ad). *Vegetarian Times.* Nov. p. 71.
• ***Summary:*** This 1/3-page color ad shows bottles of the following: Eden organic tamari (soy sauce; Purple label is "Naturally brewed" in the USA for about 6 months; Green label is "Traditionally brewed" for up to 2 years and imported from Japan). Eden organic shoyu. Eden selected shoyu (2 sizes). "Eden Soy Sauces are created just as they have been for centuries by master brewers who are truly artisan craftsmen. They are aged and tended for over two years, creating rare and versatile soy sauces." Address: Clinton, Michigan 49236. Phone: 1-800-248-0320.

10460. Lee, Jill. 1997. New soybeans fill tofu niche. *Agricultural Research* 45(11):13. Nov.
• ***Summary:*** Thomas E. "Tommy" Carter, at the USDA-ARS Soybean and Nitrogen Fixation Lab. (Raleigh, North Carolina) breeds special varieties of soybeans for use in making tofu. Although they have lower yields and demand extra care, they bring extra profits to farmers. "Tofu is gaining in popularity." USDA's Economic Research Service estimates that Japan uses about 20 million bushels each year for making a tofu; most of these are imported from China and the United States. But tofu is also made in the USA, where there are about 100 tofu makers, whose tofu has a retail value of about $130 to $150 million / year. All this tofu is made from soybeans grown in America.

"U.S. shoppers are doubling their consumption of tofu about every 3 to 4 years, according to the Soyfoods Center of Lafayette, California, which monitors such trends." Address: ARS.

10461. Lowenstein, Melissa. 1997. Natural alternatives for menopausal women: A panel discussion with the experts. *Vegetarian Times.* Nov. p. 86-90, 92.
• ***Summary:*** Several of these experts recommend the use of soyfoods. Tori Hudson, N.D., director of A Woman's Time Clinic in Portland, Oregon, was asked: "What foods do you suggest for women with menopausal symptoms?" Answer: "The best foods are those that contain high amounts of phytoestrogens, or plant estrogens. The very best sources of phytoestrogens are soy products and flaxseeds Ä not flax oil but the whole seed. A handful of roasted soy nuts, a cup of soymilk or a half-cup of tofu will give you 35 to 50 milligrams (mg.) of isoflavones, the phytoestrogen found in soy. I recommend at least 45 mg. a day, but the more, the better. Soy foods also decrease the 'bad' kind of cholesterol and increase the 'good' kind and can dramatically reduce breast cancer risk. Japanese women, who eat enough soy to get 100 mg. of isoflavones a day, are four to six times less likely to have breast cancer." Address: Santa Barbara, California.

10462. Morinaga Nutritional Foods, Inc. 1997. Perfect food. Perfect package (Ad). *Vegetarian Times.* Nov. p. 24.
• ***Summary:*** This attractive color ad (8½ by 11 inches) shows two aseptic packages of Mori-Nu tofu (Extra Form and Firm) on a wooden cutting board surrounded by fruits and vegetables–green beans, cherry tomatoes, tofu cubes, strawberries, cauliflower, raspberries, mushrooms, carrots, and leeks.

At the bottom of the latter ad, the reader is invited to order: "*The Art of Tofu,* featuring international recipes, by Akasha Richmond, a celebrated chef who has cooked for stars like Barbara Streisand and Michael Jackson." Call 1-800-793-9161. For more visit www.morinu.com.

This ad also appeared in the December issue (p. 24), and in the January 1998 issue (p. 47) of this magazine.

And in the Jan/Feb. 1998 (p. 79) and May/June (p. 85) issues of *Natural Health* magazine. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-NOW-TOFU or 310-787-0200.

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10463. Morinaga Nutritional Foods, Inc. 1997. New! Mori-Nu Mates pudding and pie mix now available in vanilla (Ad). *Natural Foods Merchandiser.* Nov. p. 51.
• ***Summary:*** This full-page color ad shows a large packet of Mori-Nu Mates Low-Fat Pudding Mix in vanilla flavor against a white background. Below it are packets in Lemon Creme and Chocolate flavors. Bold text across the bottom of each package proclaims that they are "All natural. Dairy-free. No refined sugar" Blend one packet of this mix with one package of Mori-Nu Lite Silken Tofu. For more: www.morinu.com. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-NOW-TOFU or 310-787-0200.

10464. Muramatsu, Kanako; Nagai, Toshiro; Sato, Shizuko; Ochiai, Yuko; Kiuchi, Kan. 1997. [Stimulative effect of phytone on the production of sticky materials in *Bacillus subtilis* (*natto*)]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 44(11):812-15. [20 ref. Jap; eng]
• ***Summary:*** "The quality of natto depends on the quantity of sticky materials (SM) which are produced by the starter, *Bacillus subtilis* (*natto*) strain. In this study, we found that phytone, papain-digested soy protein, significantly enhanced the SM production by *B. subtilis* (*natto*). L-Glutamate was also found to exhibit the same effect" (from journal@rchive). Address: 1. Dep. of Food Science and Nutrition, Kyoritsu Women's Univ., 2-2-1 Hitotsubashi, Chiyoda-ku, Tokyo 101, Japan.

10465. Saio, Kyoko. 1997. Global soybean processing and utilization for the 21st century. In: Sudarmadji, Suparmo and Raharjo, eds. 1997. Reinventing the Hidden Miracle of Tempe: Proceedings, International Tempe Symposium, July 13-15, 1997, Bali, Indonesia. Jakarta, Indonesia: Indonesian Tempe Foundation. xi + 280 p. See p. 22-27.
• ***Summary:*** Contents: Abstract. Introduction. From traditional to the future via modern: Development of food industry, key words for the 21st century. Conclusion.

The processing and marketing of soybeans in the modern world involves modernization and mechanization, larger scale, the mass market, sped, hygiene and novelty. "However in the 21st century the key words such as healthy, safety, and environment will be much more important..." (p. 22). She believes that our "priority for the 21st century is not always technology-oriented progress like the 20th century." People may prefer to have a more comfortable and peaceful life as human beings (p. 26-27). Note: This embodies the "Small is beautiful" idea of Schumacher and satisfying or fulfilling work. Address: Tokyo Metropolitan Food Technology Research Center, 9-1 Kanda-Sakuma-cho, Chiyoda-ku, Tokyo 101.

10466. Macdonald, Bruce. 1997. Macrobiotic Company of America is thriving and macrobiotics is making a making a comeback in America (Interview). *SoyaScan Notes.* Dec. 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Bruce's company focuses on high quality, macrobiotic foods. Company sales and number of accounts are growing rapidly. When he bought the company in Sept. 1993, they had about 900 accounts; this grew to about 2,500 in 1997 and 5,000 at present. The number of individual/personal accounts is growing the most rapidly. The main individual buyers seem to be aging baby boomers–those from the same generation as the people who founded the movement 30 years ago in the late 1960s and 1970s. Why are they buying? First, macrobiotics has been Americanized and de-mystified. Many of the teachers are now Americans and the heavy Japanese emphasis is disappearing. Second, the baby-boomers are realizing that they had better start eating well or they will soon pay the price in poor health and shorter longevity.

Bruce's best-selling macrobiotic products are kuzu, nori and wasabi powder (for people to make sushi at home), 4-year soy sauce (*nama shoyu*), and Johsen organic shoyu (in quarts or 10 oz bottles). He gets 100-200 catalog requests each week and does no advertising. Lenny Jacobs likes to say that macrobiotics is on the decline, but he doesn't know what he's talking about. Address: President, Macrobiotic Company of America, Asheville, North Carolina 28806. Phone: 704-252-1221.

10467. *SoyaScan Notes.* 1997. What is amé?–A traditional Japanese sweet or candy (Overview). Dec. 4. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** A good Japanese dictionary defines *amé* as: (1) *Mochigomé nado no denpun o bakuga de tôka saseta shokuhin.* (*2*) *Amae.* (*3*) *Amami.* Translated, this means: (1) A sweet food made by saccharifying the starch of glutinous rice or other grains using malt. (2) Sweet. (3) Sweetness.

The Modern Reader's Japanese-English Character Dictionary, by Andrew N. Nelson (1966) states (p. 966, #5160). *I* (Chinese reading) or *Ame* = rice jelly, candy. *amedama* = taffies, toffies. *ame-iro* = light-brown, amber. *ameuri* = candy vendor, candy store. *ameya* = candy vendor, candy store. *amembô* = stick of candy.

10468. Kamego, Marco. 1997. Re: History and present status of Kikko Corporation S.A., manufacturer of soy sauce and miso in Peru. Letter to William Shurtleff at Soyfoods Center, Dec. 29. 3 p. [Eng]
• ***Summary:*** Mr. Kamego filled out a 3-page company history form sent by Soyfoods Center. This company was founded in April 1957 in Peru by Mr. Manuel Toshihiko Kamego (Marco's father) and Mr. Alejandro Kioyasu Kamego (Manuel's brother). In 1957 the company, named Fabrica de Siyau Kikko Sociedad de Responsibilidad Limitada, was located at Av. Colombia 171, Pueblo Libre,

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Lima, Peru. Phone: 32-3754. The company's first two products, Kikko Siyau ("soy" sauce–but made with Peruvian common beans, *Phaseolus vulgaris,* instead of soybeans because the latter were not available) and Miso Kikko (both *shiro miso* {sweet white miso made with rice} and *aka miso* {red miso made with barley}) were both introduced in 1957. These products may have been the world's first shoyu and miso made with common beans instead of soybeans. In 1960 the company first began to use soybeans in its products; they were grown in Tumbes, on the northern coast of Peru.

From the beginning, the company was dedicated to the traditional, nearly hand-made production of sauces and foods to supply the restaurants and homes of Peruvians of Asian origin through the home delivery system. Marco writes: "We are the pioneers of soy sauce manufacturing in Peru. It is through our product that the Peruvian native people have come to know soy sauce, its use and quality. Our company has succeeded because of tenaciousness, as well as adaptation to the requirements of the Peruvian market." The Kamego family originated in Japan. The two Chinese characters (*kanji*) with which the family name are written, can also be pronounced "Kikko" and mean "turtle's shell." This explains the origin of the Kikko brand and emblem/logo. Note: The name and logo is very similar to that of Kikkoman, the world's leading manufacturer of soy sauce.

In 1964 the company introduced its third soy product, Mensi Kikko (in Chinese *mien shih* = sweet wheat-flour fermented black soybeans), obtained from fermentation of whole soybeans; it is known as *mianchi* (*mien shih*) in China and *doenjang* in Korea. In 1979 Ajinomoto, the world's leading manufacturer of seasonings and of MSG, began to produce soy sauce in Peru in competition with Fabrica de Siyau Kikko, but as of 1997 Kikko is still the leader in the Peruvian market, ahead of Ajinomoto.

In July 1994 the company moved its factory and offices to a new location, which is the present address: Jr. Alexander Fleming 432, Ate, Lima 03, Peru.

In 1995 the company was reorganized as Kikko Corporation Sociedad Anonima (S.A.). This new company was formed from the merger of the original company with Sazonadores S.R.L. Note: *Sazonadores* means "seasonings" in Spanish. At this time the company launched three new products: Kikko Shoyu: Salsa de Soya, Salsa Mensi (mensi / *mien shih* seasoned with spices), and Ajoikion (soy sauce seasoned with ginger and garlic; in Peruvian, *kión* means ginger–the Spanish word is *jengibre;* in Spanish, *ajo* means garlic).

Present status: The company now makes each week: 25,000 liters of soy sauce, 2,000 liters of Salsa Mensi, and 2,000 liters of Ajoikion. Their second best-selling product is sweet and sour sauce, but it contains no soy. They still make *shiro miso* (sweet white miso) fermented for 5 months, but have discontinued red miso. The company employs 51 people, including 5 in management, 36 production workers, and 10 office and others. The current owners are Manuel Kamego, Marco Kamego, and Alejando Kamego's heirs. Net sales last year were $1,500,000. The net worth of the business is about $115,000. The company's sales have grown, on average, at about 2% each year over the past 2-3 years. The building is 2,000 square meters in size: 1,800 for production and 200 for office space. As af late 1997 the factory is located at Robert Fulton 115, Lima 3, Peru. Most of the soybeans now used by the company come from Bolivia

Marco encloses attractive full-color labels for four products: Kikko Shoyu, Salsa Mensi, Ajoikion, and Kikko Siyau. Address: Jr. Alexander Fleming 432, Ate, Lima 03, Peru. Phone: +511 326-0870 or 1200.

10469. *SoyaScan Notes.* 1997. Chronology of major soy-related events and trends during 1997 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan. 1–Novartis Seeds (headquartered in Golden Valley, Minnesota) is formed through the blockbuster merger of Ciba Seeds and Northrup King Co. That merger was possible because of the mid-1996 merger of pharmaceutical giants Sandoz and Ciba-Geigy. Novartis Seeds is now America's second largest seed company after Pioneer Hi-Bred International.

Feb. 3–Monsanto completes its acquisition of Asgrow Seed Co. of Kalamazoo, Michigan, for $240 million. From May 1968 to 1994 Asgrow had been owned by The Upjohn Co., which built the company into one of America's largest soybean seed companies. When Monsanto bought Asgrow it was called the Asgrow Agronomics business of Seminis Inc., a subsidiary of Empresas La Moderna, S.A. (ELM), a multi-national agricultural company based out of Monterey, Mexico. of Mexico.

March 4–Morinaga Nutritional Foods' new tofu plant in Tualatin, Oregon holds its official grand opening. Mori-Nu Tofu, previously made in Japan, starts to be made in America for the first time. The plant, 65,000 square feet worth about $15 million, is on the same property as Pacific Foods of Oregon, but in a separate building.

March 12–House Foods America Corporation holds the opening ceremony for America's largest tofu factory, in Garden Grove, California; the company closes its tofu plant in central Los Angeles. The new fully automated, state-of-the-art, 130,000 square foot plant cost $21 million, and will more than double the company's tofu production capacity to 150,000 pounds/day, from 70,000 in the old plant. The old factory has been operating a full capacity for years. The new plant will have three tofu production lines, and is located on 5 acres of land–which gives plenty of room for expansion.

Sept. Nasoya Foods (owned by Vitasoy) finishes moving into a much larger, state-of-the-art $13.5 million plant (125,00 square feet) in Ayer, Massachusetts, from its former location in Leominster. The first Vitasoy brand soymilk ever

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made in America starts to be shipped from the plant in mid-September. Nasoya's offices have now been moved to Ayer from Leominster, but tofu is still being made at the plant in Leominster.

Oct. 14–The Hain Food Group acquires Westbrae Natural, Inc. Westbrae's new name becomes Hain Food Group–Westbrae. Westbrae will continue to be headquartered in Carson, California. Dec. 1–Phytoestrogens / isoflavones extracted from soybeans by ADM start to be sold commercially in the USA in pill form by supplement companies. ADM's name for the product is Mega Soy.

Dec. 3–DuPont purchases Protein Technologies International (PTI–the world's leading manufacturer of soy protein isolates), a wholly-owned subsidiary of the Ralston Purina Co. DuPont signed a letter of intent to acquire PTI on Aug. 24. PTI, which has offices worldwide, will continue to be headquartered in St. Louis, Missouri.

"How can I get more soy into my diet?" is the question most frequently asked by callers to Soyfoods Center. Soy appears to have a bright future.

10470. *Canadian Soybean Technical Bulletin* (*OSGMB, Chatham, Ontario, Canada*). 1997. Japan technical mission–September, 1997. 3(3):1-2. Dec.
• ***Summary:*** Tofu: Before the team of three professionals (representing industry, university, and government) left Canada, a series of questions concerning the different techniques and methods used in making tofu in Japan were submitted to the Science and Technology Section of the Canadian Embassy in Tokyo. These were sent to as many tofu manufacturers and researchers as possible in the hope of arriving at a consensus of opinion on the best way to make tofu. This Bulletin discusses times and temperatures for soaking the soybeans, water uptake, desired characteristics of the soymilk used to make tofu (percent solids, protein, fat, and sugar content, nitrogen, pH, and color), coagulants, times and temperatures in the coagulation process.

A sidebar titled "The GMO question" (p. 2) states: "If a common concern was established at all points of contact on the mission, it was the one concerning transgenics or Genetically Modified Organisms (GMO). The Japanese concern over this issue is one of the greatest to face the food production industry." According to Dr. Yukio Kawamura, a major reason for this aversion arises from the fact that "because Japan was the only nation to suffer from an atomic bomb, the people fear the effects of mutation from non-natural sources... Even though several departments of the Japanese government have OK'd the use of GMO in the food supply, there is a strong resistance to them... Mr. Ozawa, President of Fujishoji [Fuji Shoji], said that being able to label products as GMO-free will be as popular as those products who currently advertise that only organically grown beans are used in their manufacture. Wherever the team visited, this was the foremost topic of conversation. The Japanese are currently seeking a written documentation to accompany shipments stating that they are GMO free. Even though acceptance may be forthcoming in the future, this is a unique opportunity to protect and possibly increase market share in Japan."

10471. Honda, Kyoko. 1997. Tofu & soybean cooking: The Japanese healthy way. Translated by Kazuhiko Nagai. Tokyo: Graph-sha Ltd. 64 p. Dec. Illust. 26 cm. [Eng]
• ***Summary:*** This full-color Japanese-style cookbook is loaded with color photos showing both steps in the process of preparing recipes and the finished dishes. Contents: Basic preparations: Parboiling soybeans, draining tofu, reconstituting Koori-dofu ([Kôri-dofu], freeze-dried tofu), removing oil from abura-age (thin deep-fried tofu), toasting okara. 1. Soybean cooking (daizu = soybeans, aodaizu = green soybeans, edamame = young soybeans in pods, kuromame = black soybeans), abura-age, soybean sprouts. 2. Tofu & natto dishes (Koori-doofu, kouya-dofu, shimi-dofu, okara, yu-dofu = simmered tofu). Let's make momen-dofu (homemade tofu). Tofu dishes from Okinawa (Goya champuru, Ukarairichi, Ujira-tofu).

3. Other dishes from soybeans (Atsu-age, Chinese cheese–Furu [Fermented tofu], miso, soy milk, yuba, daizu moyashi = soybean sprouts, kinako). Articles (summary of four articles).

Note. This is the earliest English-language document seen (April 2013) that uses the term *Koori-dofu* or the term *kouya-dofu* to refer to dried-frozen tofu. Address: Sc.D. (Doctor of Science), nutritionist, and lecturer at Women's Junior College of Nippon College of Physical Education.

10472. Kim, H-R; Muramatsu, Kanako; Kanai, Y.; Tanaka, T.; Takeyasu, M.; Kiuchi, K. 1997. Manufacture of chungkuk-jang with elastase activity. *Food Science and Technology, International* (*Tokyo*) 3:251-56. *

10473. Kim, H-R; Muramatsu, Kanako; Kanai, Y.; Tanaka, T.; Takeyasu, M.; Kiuchi, K. 1997. Development of a new soy protein food employing chungkuk-jang. *Food Science and Technology, International* (*Tokyo*) 3:310-16. *

10474. Nikkuni, Sayuki. 1997. Natto, kinema and thua-nao: Traditional non-salted fermented soybean foods in Asia. *Farming Japan* 31(4):27-36. Special issue on soybeans and fermented foods worldwide. [Eng]*

10475. Asia Foods Group. 1997. Product profile. Hong Kong. 12 p. 29 cm. [Eng; Jap; Chi]
• ***Summary:*** This company grows a wide variety of vegetables in Taiwan and China. These include green vegetable soybeans, sold in the pods or shelled (without the pod). About six vegetable products are listed on each page. Below each color photo is a description of the product,

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its origin and varieties, written in English, Japanese, and Chinese.

The last page, titled "Organic Vegetables," states: "The company has been test growing organic vegetables in Taian and Weifang city of Shandong Province, Northern China." They are running into the 4th year in Taian and 2nd year in Weifang. "As of March 1997, the vegetables could be sold under the following label guided by Japan Ministry of Health and Welfare: 1. Organic vegetables (transition stage). 2. Low pesticide vegetables. 3. Low level chemical fertilizer vegetables. Farming land area: Taian city: 66,000 square meters. Weifang city: 66,000 square meters. Six organic products are currently available, incl. soy bean. The company has two organic certification organizations in China: One each in Beijing and Nanjing. They are applying for certification by "OFDC which is under the supervision of America's OCIA authority, and follows their standards and approval procedure." The inside rear cover states: "Instant freezing for lasting freshness, texture, and flavor."

Headquartered in Hong Kong (Asia Foods (H.K.) Ltd.), the company has three other regional offices: (1) Taiwan: Asia Frozen Food Corp, Kaohsiung, Taiwan. (2) Central and South China: Asia Foods (LongHai) Co., Ltd., LongHai City, Fujian, China. (3) North China: Asia Foods (H.K.) Ltd., Qingdao Rep Office, Qingdao, China.

Note: In May 1995 two inspectors from OCIA (Organic Crop Improvement Association) International (Krista Kennedy and Jodi Snyder of Lincoln, Nebraska) visited the Zhou Chanzhong Beicun Farm at Wanjiawhang, East of Wanguan Rd., Xujialou Township, Taishan District, Taian Municipality, Shandong Province, China. They issued organic certification for seven vegetable crops, including "Young Soybean" for Crop Year 06-10-99–06/10/2000. Member No. 14739. Certificate No. 14739-99. One certificate is written in English, the other in Chinese. Address: Suite 1508 Dominion Centre, No. 43-59 Queens Road East, Hong Kong. Phone: (852) 2865-3216.

10476. Cho, Sungsoo; DeVries, Jonathan W.; Prosky, Leon. 1997. Dietary fiber analysis and applications. Gaithersburg, Maryland: AOAC International. xv + 202 p. Illust. No index. 26 cm. [500+* ref]

• ***Summary:*** Contents: Preface. 1. The definition of dietary fiber. 2. The structure and chemistry of dietary fiber. 3. An overview of dietary fiber analytical methodology. 4. AOAC International approved dietary fiber methods. 5. The physico-chemical properties of dietary fiber. 6. Analytical methods for measuring the physico-chemical properties of dietary fiber. 7. Future needs for analytical methods for dietary fiber. 8. Dietary fiber content of foods.

In Chapter 8, table 8.4, "Dietary fiber data on foods of Japan, contains a section titled "Grain products" (p. 158-59) which gives values for TDF % (total dietary fiber), SDF % (soluble dietary fiber), and ISF % (insoluble dietary fiber) for the following foods: Miso, barley-koji. Miso, rice-koji, dark yellow type. Miso, rice-koji, light yellow type. Miso, rice-koji, sweet type. Miso, soybean-koji. Natto, Hikiwari, fermented soybean. Natto, Itohiki, fermented soybean. Okara. Tofu, Kinugoshi, soybean curd. Tofu, Kori-dofu, soybean curd. Tofu, Momen, soybean curd. Yuba, dried.

The three values for okara are 9.8%, 0.3%, 9.5%. Thus, most of the dietary fiber in okara is insoluble. Address: 1. Kellogg Co., 235 Porter St., Battle Creek, Michigan.

10477. Elovson, Rune. 1997. Algot Holmberg & Söner AB [Algot Holmberg & Sons Inc.]. In: Gösta Olsson, ed. 1997. *Den svenska växtförädlingens historia. Jordbruksväxternas utveckling sedan 1880-talet.* Stockholm: Kungl. Skogs- och lantbruksakad. 320 p. See p. 81-84. Illust. 25 cm. [5 ref. Swe]

• ***Summary:*** This history of plant breeding in Sweden contains a chapter about the work of Sven Holmberg and his father, Algot Holmberg, founder of the company Algot Holmberg & Söner AB.

The seed company Algot Holmberg and Sons at Fiskeby in Norrköping was by far one of Sweden's oldest in its category, and its roots go back as far as 1822 when Per Holmberg established a small country store in Norrköping. Eventually, it was taken over by his son P.J.A. Holmberg. However, it was his grandson Algot Holmberg from which the company got its name who upon his return from studies abroad gave the company its modern direction. From 1891, the company specialized entirely on producing and selling seeds and, in the beginning, the preservation and cultivation of local varieties and stocks from Östergötland and other parts of central Sweden, especially forage roots and leguminous plants. Eventually, the cultivation of potatoes and oil- and protein- yielding plants such as mustard, flax seed, sweet 'lupine' and above all soybeans was incorporated. Fairly soon the breeding of grains was also added.

After the death of Algot Holmberg in 1927 his work was continued by his sons Pehr A. and Sven A. Holmberg and the company's name was changed to Algot Holmberg and Sons Inc. Pehr A. Holmberg was the head of the company while Sven A. Holmberg was responsible for the breeding business.

In 1925 a close cooperation was initiated with the Danish breeding company Pajbjergfonden which would continue to exist for more than 40 years (Seed, 1965). The purpose of the breeding business at Fiskeby was primarily to produce varieties that were satisfactory to central Sweden's demands for gestation and cultivation dependability. The varieties from Pajbjergfonden would then render the business access also to varieties that suited the breeding demands of southern Sweden. The cooperation also meant that crossings performed at Holmberg's or Pajbjergfonden became the subject of choice at both of these breeding stations. At that time, the breeding expert at Pajbjergfonden, Henrik Bogh,

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periodically stayed at Fiskeby for this purpose.

During a period of time Professor Heribert-Nilsson was linked to the breeding business at Algot Holmberg and Sons, primarily for working with rye.

The demand for increased rationalization and to meet the mounting costs of breeding resulted in the sale of Algot Holmberg and Sons Seed and Breeding Company, including all the breeding material to W. Weibull and Company in 1966 (Weibullsholm, 1970). The buildings with the warehouses at Fiskeby outside of Norrköping, well known to all railroad travelers between Malmö and Stockholm, were sold to Fiskeby Bruk. The breeding of soybeans, however, continued under the administration of Weibull in the same place in localities rented by Fiskeby Bruk until 1984 at which time the lease expired (the warehouses were to be demolished), and the soybean breeding moved to Landskrona.

Breeding Results: In the beginning the greatest success was achieved in the root category and the first result was the 'Göta Turnip' which has its origin in the 'Östgöta Turnip', already grown in gardens for many years. Among other things it had good resistance against club root of cabbages disease. Thereafter, the focus was more on fodder beets and above all fodder sugar beets which were represented primarily by the varieties Svea Barres and Milka, respectively. The focus was especially aimed at raising the proportion of the total solids in the beets.

Of the leguminous plant Götaklöver is worth mentioning. It is a late common purple clover and one of the first bred clover families that has been released in Sweden (commissioned by the agricultural scientist Gösta Eriksson who during one period worked for the Holmberg company). Furthermore, the intermediate common purple clover Monark and the common white clover Milka from Pajbjergfonden were also introduced.

The work with potatoes resulted in a local varieties for Östergötland, Östergyllend which was commonly liked as potatoes for human consumption ("A few words about Algot Holmbergs Seed Breeding").

In the grain category one can largely depend on the varieties from Pajbjergfonden. The primary varieties were the spring barley varieties Kungs and Kron and the oats varieties Rex. The barley varieties were among other things known for their resistance to nematode. Certain success can be shown regarding Holmberg's wheat breeding which among other things was crossed with Finish material with the intention of developing early varieties with good resilience and resistance against spike germination. The spring wheat varieties 'Algot' was approved and incorporated into the Swedish list of varieties in 1969. It was a very early and on the whole a well balanced spring wheat varieties. But it was soon exceeded in yield by newer varieties and therefore never marketed. By and large the wheat material was taken over by and incorporated into Weibulls.

The breeding of soybeans: Since 1939 the operation at Holmberg's in Norrköping has largely consisted of the soybean breeding, and without doubt this operation has made the name Holmberg known, especially internationally. It was Sven Holmberg who initially got the idea of adapting the soybean to the Swedish climate. After having made several attempts with varieties mainly from Canada and Germany with poor results, in 1939-40 he made a journey for sample collections to northern Japan and Sakhalin in Eastern Siberia. These places have a summer climate similar to that of Sweden, and a long tradition of breeding soybeans. The basics for this type of soybeans which was developed by Sven Holmberg (Holmberg, 1946, 1973) consisted of crossings between early, hardy and low growing varieties from these parts, and more higher growing varieties, mainly from Germany (with its origin from Manchuria).

There are primarily three characteristics that distinguish the soybean varieties from Holmberg's breeding and that are entirely essential to the adaptation to the Swedish climate: (1) Adaptation to long-day-climate. (2) Tolerance against low summer temperatures. (3) Early ripening. Three varieties of soybeans from Sven Holmberg's breeding are or have been incorporated into the Swedish list of varieties, Fiskeby V, Bråvalla and Träff. Fiskeby V is the highest yielding and the tallest. It is also the most well known varieties, viewed internationally. Bråvalla and Träff are short and extremely early varieties. They ripen 8 and 12 days, respectively, earlier than Fiskeby V. / In spite of the breeding success, the soybean never attained common cultivation in Sweden, primarily because its yield was low and uncertain in comparison with other crops. Even if the breeding efforts in this respect seemed to have failed, they have probably, on a global scale, attained great value considering the invested resources. The soybean varieties from Fiskeby are well known among soybean growers all over the world, consisting of a source for early gestation and tolerance against low temperatures in breeding programs, wherever these characteristics were needed.

The soybean breeding has now been discontinued and the breeding material is stored at Nodiska Genbanken (The Nordic Gene Bank).

For his achievements in plant breeding, Sven Holmberg was given several awards, among other things A. W. Bergsten's Award and a silver plaque from the Royal Academy of Forestry and Agriculture.

An illustration (portrait) shows: (1) Algot Holmberg (1856-1927), founder of the seed company.

Photos show: (1) Holmberg's Seed Cleaning Establishment and Warehouse next to the railroad tracks in Norrköping, Sweden.

(2) Sven Holmberg, Doctor of Agricultural Science, holding out a bundle of soybean plants. He made significant contributions as breeder of soybeans through producing extremely early varieties. (3) Three soybean plants, shown with a playing card to indicate their size, against a white

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background. The short plant to the right is a primitive but early country variety (Aojiro Gokuwase) of soybean from Hokkaido, Japan. The tall plants to the left have been chosen from one of the first crossings (St. K7 / 38 x Aojiro Gokuwase) at Fiskeby.

The last three references are:

(3) Some words about Algot Holmberg's Seed Breeding. Publication by Algot Holmberg och Söner AB (Undated).

(4) Seed. 1965, Cooperation Holmberg-Pajbjerg 40 years. Algot Holmberg's Yearbook 1965, 3-4.

(5) Weibull, J. 1970. Weibullsholm 1870-1970. I: Weibullsholm 1870-1970. Anniversary Publication by Jörgen Weibull. Landskrona, p. 7-49.

Note: The photos of figures 1, 2 and 3 were supplied by Kerstin Wellving, Svalöv. Address: Sweden.

10478. Food and Agricultural Organization of the United Nations. 1997. Soybeans: Area harvested, yield, and production. *FAO Yearbook–Production* (*Rome, Italy*) 51:102-03.

• ***Summary:*** The 1997 Production Yearbook, under "Soybeans" (p. 102-03, in English, French, and Spanish) gives area harvested (1,000 ha), yield (kg/ha), and production (1,000 MT), each for the years 1989-91, 1995, 1996, 1997, for the following places: World. Africa: Benin, Burkina Faso, Burundi, Congo–Democratic Republic, Cote d'Ivoire, Egypt, Ethiopia PDR, Ethiopia, Gabon, Liberia, Morocco, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.

North and Central America: Canada, El Salvador, Guatemala, Honduras, Nicaragua, USA.

South America: Argentina, Bolivia, Brazil, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela.

Asia (fmr = former). Asia: Azerbaijan, Bhutan, Cambodia, China, India, Indonesia, Iran, Iraq, Japan, Kazakhstan, Korea–Democratic People's Republic of (north), Korea–Republic of (south), Laos, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Syria, Thailand, Turkey, Viet Nam (Vietnam).

Europe (former). Europe. Albania, Austria, Bosnia Herzegovina, Bulgaria, Croatia, Czechoslovakia, Czech Republic, France, Germany, Greece, Hungary, Italy, Latvia, Moldova Republic, Romania, Russian Federation, Slovakia, Spain, Switzerland, Ukraine, Yugoslav SFR, Yugoslavia.

Oceania. Australia.

USSR.

10479. Grace, Eric S. 1997. Biotechnology unzipped: Promises and realities. Washington, DC: Joseph Henry Press. 248 p. Illust. Index. 22 cm. [31 ref]

• ***Summary:*** This is a well-written, fair and balanced treatment of a complex and controversial subject. Chapter 1 contains a good history of the development of biotechnology. Contents: Preface. 1. How biotechnology came about: What is biotechnology?, in the beginning, the voyager and the monk (a striking coincidence–Alfred Russel Wallace and Charles Darwin), colored bodies (fruit flies in the lab), let there be DNA, unraveling the double helix, how does DNA store information?, a copy in every cell, what do genes do?, protein primer (examples of proteins, proteins are us, the amino acids, genes, proteins, and your eyes), the genetic code (nature the expert packer), how genes make proteins, daring nucleotide adventures.

2. Tools in the genetic engineering workshop: Why bacteria?, hijackers and molecule snippers, first catch your DNA, making recombinant DNA, putting new genes into cells, gene expression, cloning plants, animals, and cells, monoclonal antibodies, DNA probes, DNA "fingerprinting", polymerase chain reaction.

3. Biotechnology and the body: new parts for old, it's all in the genes, the beginnings of gene therapy, the human genome project, the continuing story of gene therapy, the human genome project, the continuing story of gene therapy, microbes in medicine, medicines from plants, the interferon story, genes and vaccines, nature's magic bullets, designer drugs, a case study: tryptophan, closing thoughts.

4. Biotechnology on the farm: Milking it for all it's worth, let us spray, developing regulations, great expectations, pests and diseases, a versatile bacterium, weather and soil, farmer-ceuticals?, closing thoughts.

5. Biotechnology and the environment: Microbes clean up, microbes as monitors, finding the right microbes for the job, a quick reading, microbes and mines, golden harvest, a new angle to landscaping, fighting chemicals with chemicals, making new fuels, closing thoughts.

6. Biotechnology in seas and trees: An ocean of opportunity, foul is fair, underwater drugs, a cornucopia of chemicals, research and development, fuels from the sea, farming the seas, diseases and pollutions, frozen fish, the forest and the trees, a harvest of wood, building better trees, forests of the future, closing thoughts.

7. Ethical issues: Making opinions, life, patenting people, problems with patents, profiting from the poor, protecting consumers, health dilemmas, gene therapy revisited, pros and cons of gene therapy, Prometheus revisited.

Postscript. Glossary. Further reading. Internet resources. Photo credits & sources.

Biotechnology is the transplanting of genes from one species into another.

Subjects discussed include: Deaths from tryptophan made in Japan by Showa Denko (p. 88-90). Monsanto Co. (p. 97, 102, 107). IPM (Integrated Pest Management, p. 108, 120-21). Dr. John Fagan (molecular biologist at Maharishi University in Iowa and author of the book: *Genetic engineering: the hazards, Vedic engineering: the solutions.* He is opposed to much of biotechnology). Address: Victoria, British Columbia, Canada.

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10480. Hicks, P.A. 1997. Soybean industry applications in Asia. In: Napompeth, Banpot, ed. 1997. World Soybean Research Conference V: Proceedings. Soybean Feeds the World. Bangkok, Thailand: Kasetsart University Press. xxiv + 581 p. See p. 437-40. Held at Chiang Mai, Thailand, 21-27 Feb. 1994.

• ***Summary:*** RAPA stands for "Regional Office for Asia and the Pacific."

Table 2 (p. 438) shows the area of soybeans harvested (in 1,000 ha) in 27 developing and 3 developed Asian countries, in the following years: 1982, 1989, 1990, 1991, and 1991. The last columns shows the average annual growth rate in soybean area from 1982 to 1992. The countries, their 1992 area, and their growth rates are (NL = no values listed; F = FAO estimate):

Developing countries (Bangladesh NL. Bhutan 2.0F, -5.4%. Cambodia, 8.8, 20.1%. China 7,203.5, -0.8%. Cook Islands NL. North Korea 310.07, 0.5%. Fiji NL. India 2,500.0, 12.8%. Indonesia 1,667.0, 9.4%. Iran 60.0F, 1.5%. Laos 6.1, 1.5%. Malaysia NL. Maldives NL. Mongolia NL. Myanmar 34.8, 2.7%. Nepal 22.0F, 9.4%. Pakistan 1.4F, -11.4%. Papua New Guinea NL. Philippines 10.0F, -1.7%. Rep. of Korea 120.0, 3.9%. Samoa, Western NL. Solomon Islands NL. Sri Lanka 1.4, -20.8%. Thailand 380.0, 14.4%. Tonga NL. Vanuatu NL. Vietnam 113.0F, 1.5%. Sub-total 12,440.0, 2.2%).

Developed countries (Australia 30.0, -2.2%. Japan 141.0, 0.3%. New Zealand NL. Sub-total 171.0, -0.2%).

Asia-Pacific Total 12,611.0, 2.2%.

Rest of world 41,979.7, 0.6%.

World 54590.7, 0.9%. Address: FAO Regional Agricultural Engineering and Agro-Industries Officer, FAO, RAPA, Bangkok, Thailand.

10481. Horii, M. 1997. Soybean and fermented food culture in the world. *Farming Japan* 31(4):10-12. [Eng]*

10482. Hosking, Richard. 1997. A dictionary of Japanese food: Ingredients & culture. Boston, Massachusetts: Charles E. Tuttle. 239 p. Illust. 19 cm. *

• ***Summary:*** This is the 1st reprint of the 1996 edition. A 2nd reprint appeared in 2001.

10483. House Foods America Corp. 1997. Tofu temptations (Recipe booklet). Garden Grove, California. 24 p. Each page: 7.8 x 12.8 cm. [Eng]

• ***Summary:*** This small, dated, glossy color booklet has a subtitle on the first page: "Discover all the wonderful ways you can enjoy tofu, from sensational salads to hearty main dishes to delicious desserts." A photo shows half of a creamy tofu pie.

Contents: What is tofu? Know your tofu: Hinoichi soft, regular, firm, or extra firm. Recipes (each recipe takes 2 pages and is accompanied by a color photo): Tropical smoothie (nondairy, with Hinoichi Soft Tofu). Fruit with creamy strawberry sauce. Omelet de España. Spinach mushroom quiche. Santa Fe stir-fry. Tuna dijon pasta salad. BBQ kebabs. Cappuccino pie. Lemon raspberry parfait. Creamy mandarin orange pie.

On the rear page are photos of the four different types of Hinoichi tofu. Address: 7351 Orangewood Ave., Garden Grove, CA 92841.

10484. Kanazawa, Takemichi; Osanai, T.; Uemura, T.; Kamada, T.; Onodera, K.; Metoki, H.; Oike, Y. 1997. Role of soy food forms in prevention of human vascular disease. In: Paul A. Lachance, ed. 1997. Nutraceuticals: Designer Foods III–Garlic, Soy, and Licorice. Trumbull, Connecticut: Food & Nutrition Press, Inc. xx + 375 p. See p. 219-36. Chap. 23. [26 ref]

• ***Summary:*** Soy protein appears to provide protection against injury to blood vessels, and this to reduce the risk of cardiovascular disease. Three mechanisms are proposed. Address: 1-5. The Second Dep. of Internal Medicine, Hirosaki Univ. School of Medicine, 5 Zaifu-cho, Hirosaki, Aomori, Japan 036; 6-7. Reimeikyo Rehabilitation Hospital, 30 Ikarigaseki-mura, Aomori, Japan 038-01.

10485. Kikkoman International Inc. 1997. Kikkoman foodservice: Soy sauce is just the beginning (Brochure). San Francisco, California. 4 p. 28 cm.

• ***Summary:*** The inside 2 pages of this color brochure describe and show (in color photos) ten Kikkoman foodservice products, many in half-gallon bottles: Soy sauce. Teriyaki sauce. Teriyaki baste & glaze with honey & pineapple. Stir-fry sauce. Tempura batter mix. Lite soy sauce. Teriyaki glaze. Roasted garlic teriyaki marinade and sauce. Sweet & sour sauce. Panko Japanese style bread crumbs (toasted or untoasted).

On the back page are two tables: Product specifications, and usage guide. Address: San Francisco, California. Phone: 1-800-944-0600.

10486. Kitamura, Keisuke. 1997. Genetic improvement of nutritional and food processing quality in soybean. In: Napompeth, Banpot, ed. 1997. World Soybean Research Conference V: Proceedings. Soybean Feeds the World. Bangkok, Thailand: Kasetsart University Press. xxiv + 581 p. See p. 441-46. Held at Chiang Mai, Thailand, 21-27 Feb. 1994. [17 ref]

• ***Summary:*** Discusses manipulation of the 7S globulin (Beta-conglycinin) and 11S globulin (glycinin), the two major soy protein components, accounting for about 70% of the total seed protein. Newly developed Japanese varieties lacking lipoxygenase are: Suzuyutaka, Yumeyutaka (1992, lacks L-2 and L-3), and Kyushu 111 (lacks all 3 lipoxygenase isozymes). Address: National Agriculture Research Center,

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Tsukuba, Japan.

10487. Kittler, Pamela Goyan; Sucher, Kathryn P. 1997. Food and culture in America: a nutrition handbook. Belmont, California: West/Wadsworth. xiv + 535 p. Illust. (photos). Index. 26 cm. [100+* ref]
• ***Summary:*** What is American food anyway? Does it include sushi, soy sauce, miso soup, or tofu? How about Peking duck or pot stickers? How about enchiladas, chile rellenos, or tacos?

This excellent and original work is arranged in chapters by cultural groups or subcultures living in the USA.

The chapter on "Latinos" states under "Foreign influence" (p. 286) that the "demand for Asian ingredients by later immigrants resulted in the introduction of soybean products,..." Under "Regional variations" (p. 290) that Cubans like a chicken dish marinated in lime juice and soy sauce. Under "Meal composition and cycle" (p. 290) that West-African fritters are made from the meal of soybeans..."

The chapter on "Asians," under "Chinese," notes (p. 328-30) that "Soybeans are transformed into an amazing array of food products that are indispensible to Chinese cooking," including soy sauce, soy milk, bean curd or tofu, black beans ("made with cooked fermented soybeans preserved with salt and ginger. Black beans are usually added as a flavoring in dishes"), hoisin sauce, and oyster sauce. Soy oil is also used in Chinese cooking. The Hakkas enjoy tofu stuffed with meat (p. 332). Every Chinese meal aims for a good balance of *fan* (grain foods, such as rice or wheat) and *tsai* (side dishes). "The Chinese believe that a good diet is critical for physical and emotional harmony and necessary to strengthen the body against disease" (p. 334). During pregnancy, soy sauce may be avoided to prevent dark skin (p. 335). Chinese who avoid fresh dairy products because of lactose intolerance, may consume soybean curd and soy milk (if fortified with calcium) as alternatives.

Under "Japanese," soy sauce is a traditional food of Japan (photo, p. 341). Soybean products (p. 350) are an important part of the Japanese diet; they include tofu, shoyu (soy sauce), miso, and teriyaki sauce–to name just a few. Second-generation Japanese use more soy sauce than non-Asians (p. 354) but as their diet becomes Americanized, they fall prey to more diseases of affluence. The response to dairy products and lactose intolerance is similar to that of Chinese, with the use of tofu and soy milk.

Under "Koreans" (p. 363, 366) Soybean products are in important part of the diet; they include soy sauce, soy paste, and soybean curd or tobu [sic, *tubu*] (tofu).

Under "Southeast Asians and Pacific islanders." Adobo is a popular Filipino stew, seasoned with soy sauce (p. 389). Soy products include soy milk and tempeh (p. 399, 402, 404, 421-22).

The "Glossary of ethnic ingredients" mentions many soy products including (p. 490): "Black beans, fermented: Black soybeans salted and fermented to produce a piquant condiment. Used in Chinese cooking as a seasoning or combined with garlic, ginger, rice wine, and other ingredients to make black bean sauce." Address: 1. M.S., Food and nutrition education consultant; 2. Dep. of Food and Nutrition, San Jose State Univ., California.

10488. Kiyama, Yoshihiro. 1997. Nanikato nattô bukku: oru zattô nattô dokuhon [The book of natto]. Tokyo: Keibunsha. 124 p. 21 cm. [Jap]*

10489. Machida, Shinobu. 1997. Nattô taizen! [The big and complete book of natto!]. Tokyo: Shogakukan. 223 p. Illust. [Jap]*
Address: Japan.

10490. Nguyen, Vong. 1997. Development of green soybean vegetable for the domestic and Japanese markets. Gordon, NSW, Australia: Horticultural Research & Development Corporation. 122 p. 30 cm. Series: Final report / Horticultural Research & Development Corporation (HRDC), No. VG130. *
Address: New South Wales, Australia.

10491. Oishii miso ga tabetai: herushii na miso de tsukuru shiki no ryôrishû [I want to eat delicious miso: Healthy seasonal miso cookbook]. 1997. Tokyo: Zesuto. 95 p. 26 cm. [Jap]*
Address: Japan.

10492. Rombauer, Irma S.; Becker, Marion Rombauer; Becker, Ethan. 1997. The joy of cooking. New York, NY: Simon & Schuster / Scribner. xiv + 1136 p. Illust. Index. 24 cm.
• ***Summary:*** Soy-related subjects include (* = recipe): Soy sauce butter* (p. 77). Asian black bean sauce* (with "3 tablespoons preserved black beans" [fermented black soybeans], p. 83). Japanese wasabi soy sauce* (p. 83-84). Ginger soy sauce* (p. 84). Soy and sherry marinade* (p. 85). Description of miso soups and their role in the Japanese diet (p. 107-08). Light-colored miso soup with simmered vegetables and dark-colored miso soup with sautéed vegetables and Mongolian Hot Pot–a miso soup based dish* (p. 108). Ginger soy vinaigrette* (p. 238).

One long chapter is titled "Beans and Tofu" (p. 270-294). Lentils with spinach and soy sauce* (p. 280). The section titled "soybeans" (p. 287) discusses their nutritional value, health benefits ("They contain substances thought to help prevent breast and other cancers, as well as Omega-3 fatty acids, which reduce the risks of heart disease"), how to cook yellow and black soybeans, how to dry-roast [to make soynuts], many ways of processing, soy milk, okara, fermented black beans, soy sauce, tamari, miso, soy cream cheese, soy sour cream, and soy cheese. There are also

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substantial subsections describing the following soyfoods: (1) Soy milk, including a recipe for making it at home (p. 287-88). (2) Tofu, including silken tofu, cottage tofu, frozen tofu, sauteed or fried tofu, and smoked tofu (p. 288-89). Recipes containing tofu include: Szechuan spiced tofu, Southeast Asian curried vegetable stew, Smoked tofu burgers, and Brown rice tofu salad with orange sesame dressing (p. 289-90; the latter recipe calls for toasted sesame oil and adzuki beans, with smoked tofu being optional). (3) Tempeh, including recipes for Moo shu tempeh and Szechuan-style "hacked" tempeh. (4) About soy protein, describing textured vegetable protein and textured soy concentrate, with recipes for Dinner loaf Tex-Mex style and Lion's head (p. 292). This is followed by a subsection describing seitan and with recipes for Root vegetable and seitan stew, and Seitan kibbe (p. 293-94).

Asparagus with mustard miso* (p. 343-44). Baby bok choi with soy ginger sauce* (p. 349). Steamed scallops or shrimp with soy sauce* (p. 513). Grilled or broiled whole red snapper with ginger soy vinaigrette* (p. 548-49). Small fish, fillets, or steaks poached in soy sauce* (p. 555-56). Chinese soy-braised chicken* (p. 601-02). The chapter titled "Know your ingredients" (1059-87) includes short descriptions of bean sauce, Hoisin sauce, miso, nori, salted and fermented black beans, sesame oil, sesame paste, soy sauce, tamari, tonkatsu sosu (dark spicy sauce based on soy), wakame, wasabi, vinegars from fruit and grains, margarines (mentions trans fatty acids, but not soy), and shortenings (p. 1065-69).

Subjects related to vegetarianism include: Discussion of vegetarian diets (positive and accurate, in Chapter 1, p. 3). List of vegetarian side-dishes and main courses in this edition (27 recipes, p. 20). Vegetarian chili* (p. 283). Dairy-free chocolate cake* (vegan, p. 932). Ultra-orange cake* (vegan, p. 932-33).

Irma Rombauer (the grandmother of Ethan Becker) first wrote the *Joy of Cooking* in 1931, "when domestic help was fast becoming a thing of the past and women all over the country were once again heading to the kitchen."

Note: This cookbook was written by a committee of experts, put together by Maria Guarnaschelli. Many controversies and clashes of opinion arose out of this arrangement. Address: 3. Cockaign, Cincinnati, Ohio.

10493. Saio, K. 1997. Soybean foods: Nutritionally and industrially valuable. In: Napompeth, Banpot, ed. 1997. World Soybean Research Conference V: Proceedings. Soybean Feeds the World. Bangkok, Thailand: Kasetsart University Press. xxiv + 581 p. See p. 521-26. Held at Chiang Mai, Thailand, 21-27 Feb. 1994. [10 ref]
• ***Summary:*** Contents: Abstract. Introduction. Localization of the components seeds and foods. Roles and behavior of the components in soybean food. Physical functionalities of the components. Nutrition and physiological functionalities of the components. Conclusion.

Contains 4 figures (incl. 11 photos and 1 graph) and 4 tables. Table 3, "Chemical composition of main soybean foods (in 100 gm)" includes tofu (regular), abura-age, kori-tofu, yuba, kinako, soybean sprouts, natto, miso (dark yellow), soy sauce (common), TVP [textured soy flour], soy protein isolate, soybeans (Japanese). Address: National Agricultural Research Center, 1-1-3 Kannondai, Tsukuba, Ibaraki, Japan 305.

10494. Shanmugasundaram, S.; Tsou, S.C.S.; Hong, T.L. 1997. Vegetable soybeans production and research. In: Napompeth, Banpot, ed. 1997. World Soybean Research Conference V: Proceedings. Soybean Feeds the World. Bangkok, Thailand: Kasetsart University Press. xxiv + 581 p. See p. 529-32. Held at Chiang Mai, Thailand, 21-27 Feb. 1994. [21 ref]
• ***Summary:*** Contents: Introduction. Production. Emerging vegetable soybean producers. Vegetable soybean and sustainable agriculture. Quality of vegetable soybean. Diversified products from Vegetable soybean. Future research issues.

Vegetable soybeans are specialty soybeans harvested between the R6 and R7 growth stages (Fehr 1971) and used green. Japan has long been and still is the major producer and consumer of vegetable soybean; since 1980 the area planted has remained at about 140,000 ha. The Tohoku and Kanto districts are the major producing areas. The annual demand is about 150,000 tonnes (metric tons). Of this, about 42,000 tonnes (27%) is supplied by Taiwan. During the past 5 years, China, Thailand, the Philippines, and Indonesia have been exploring the potential of vegetable soybeans for export and for the domestic market. The crop is also grown and consumed in Nepal. Address: Asian Vegetable Research and Development Center (AVRDC), P.O. Box 42, Shanhua, Tainan 741, Taiwan, Republic of China.

10495. Sumi, Hiroyuki. 1997. Nattô wa kore hodo kiku: seijin-byô kara genhatsu made [This is how effective natto is: From the illnesses of the elderly to childhood diseases]. Tokyo: Dainamikku Serazu Shuppan. 273 p. Illust. Maps. 19 cm. [Jap]*

10496. Tajimaya Shokuhin K.K. 1997. [Progressive Tajimaya]. Hyogo prefecture, Japan. 22 p. 30 cm. [Jap; eng]
• ***Summary:*** This elegant color catalog, with striking graphic design and many photos, written entirely in Japanese (except for the cover and the page tabs and headings) describes the company and its products. It was picked up at FoodEx (a major food exposition in Japan) on 12 March 1997 and sent to Soyfoods Center, On the cover is a naked Japanese mother holding a naked baby in her arms to cover her breasts; over one arm is draped a white towel. The subtitle reads (in English): "We create new diet and value through our high-proteins & low-calorie soy processed foods, by positively

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and steadily pursuing the future of various possibilities."

Contents: What's new–The soybean story. Low calorie & high protein. Production. Distribution. Product branch. Research & development. Challenging spirits. For the next one. A note from the president. Company profile and chronology. Sales from 1987 (27.2–units not given) to 1996 (50.4).

Accompanying this main catalog are the following smaller (but equally elegant) full-color brochures and leaflets: (1) Progressive Tajimaya. 8-panel brochure. Shows color photos of all the company's soy products in packages on 4 pages: Agé (22 types). Tofu (22 types, including those fortified with vitamin E, beta-carotene, or yuzu, plus organic tofu, nigari tofu, grilled tofu, Hiya-yakko tofu). Okara (*unohana*). Tachikawa tofu (plain or with green tea added, in the form of noodles; The word "Tachikawa" is composed of two characters meaning waterfall + river). Tofurich.

(2) Frozen Tofu (4-page brochure). Includes color photos of the inside of the company's factory, and prepared tofu dishes. (3) Single-sided color leaflets, each with a large color photo and the following titles: Frozen momen. Frozen yaki-tofu (Grilled tofu). Tachikawa-dofu. Tezukuri-age. Warabi mochi-fu tofu shokuhin. Tofu pudding. Tofu bread. Address: Ikejiri 7-139, Itami-shi, Hyogo prefecture, Japan. Phone: (0727)-77-3939.

10497. Vavilov, Nicolay Ivanovich. 1997. Five continents. Translated from the Russian by Doris Löve. Rome, Italy: International Plant Genetic Resources Inst. xliii + 198 p. Illust. No index. 24 cm. [10 ref. Eng]

• ***Summary:*** This book, about the life and work of N.I. Vavilov (1887-1943), was published long after his death as a political prisoner. Unfortunately, the book has no index. The excellent introductory chapter titled "The Russian scientist Nicolay Vavilov," by Seymon Reznik and Yuri Vavilov (p. xvii-xxix) is a frank biography, including details of his conflict with arch-enemy Trofim Lysenko, his fall into disgrace by 1935, his arrest by the KGB on 7 Aug. 1940, and his death in prison in 1943.

In "The basic principle behind the expeditions" (p. 1-4) Vavilov notes that the seven basic geographical centers of origin, which cover only about 7% of the world's land area, are: (1) The tropical centre, in tropical India, IndoChina, and southern China. (2) The East Asiatic Centre, includes the central and western parts of China, Korea, Japan. and the major portion of Taiwan. (3) The Southwest Asiatic Centre. (4) The Mediterranean Centre, along the coast of the Mediterranean. (5) The Abyssinian Centre. (6) The Central American Centre, and (7) The Andean Centre. Maps show Vavilov's travels in each center. These centers were first outlined in his book *Centres of Origin of Cultivated Plants* (1926, Leningrad).

In the chapter titled "Expedition to Japan" (p. 58-61) he expresses his surprise at "the endless variety of plant types" including the "various preparations of soya beans and 'adzuki' beans (*Vigna angularis* [Willd. Ohwi & H. Obashi])." "There is perhaps no other country where the love of trees and flowers is so strongly expressed as in Japan. The care of flowers and plants has become a national characteristic of this country." "There is not a single weed in the fields or in vegetable gardens." In Japan he found "a multitude of dishes made of soyabeans (substituting for fat and including a cheese called 'tofu,' a soya product)..." He was impressed by the work of Ekiken Kaihara [Kaibara; 1630-1714]. A philosopher, man of letters, physician, geographer, historian, agronomist and naturalist, he wrote 270 volumes on 60 different themes, including a 5-volume work on garden plants and a 3-volume work on vegetable plants. In 1638 two gardens of pharmaceutical plants were established in Edo (Tokyo) and in 1720 another one in Komada.

In the chapter titled "Expedition in Korea" (p. 69-71) he again mentioned soyabeans and 'adzuki beans,' and noted: "Dozens of different foods are made from soyabeans, including the special cheese, tofu. Sprouts of soyabeans are rich in vitamins and are available in large amounts in all markets in Japan. Soya is used for seasoning meat and rice and of course, it produces an excellent oil, used for making margarine and for technical purposes. Although it is a crop exceptionally well suited to a monsoon climate, the soyabean has become the most important technical crop worldwide during the last couple of decades. Owing to the effect of European and American demands an enormous area has become planted to soyabeans. During the past two decades the plantations of soya in Manchuria have reached 7 million hectares and the world-wide area has exceeded 15 million hectares. It is difficult to imagine a more flexible plant in respect of the variation of both biological and other characteristics. The varieties of soyabeans can be counted by the thousands. The present American industry has introduced even more variety."

In Seoul, Vavilov unexpectedly met two colleagues, P.H. Dorsett and William Morse, known to him from Washington, DC. "Dr. Morse is the co-author of a well-known monograph on soyabeans, written by him and Dr. Charles Piper, another plant introducer from Vancouver, Canada. Morse was fanatically devoted to soyabeans throughout his life. In the course of some years, Piper studied in China, Korea, Manchuria and Japan on behalf of the U.S. Department of Agriculture, investigating crops of soyabeans, collecting seed material and forwarding it to the USA." Also discusses the agricultural explorations of Frank Meyer and Mark Carleton. Swingle "organized an extensive utilization of Chinese research, including the building up of a valuable library of Chinese literature and a whole staff of translators, who revealed the treasures of ancient Chinese agronomical science. The results of this endeavour have become obvious during the past couple of years. The similarity between the

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conditions of extensive parts of the territories of the USA and China make possible a wide utilization of soyabean crops, which during the last couple of years have amounted to as much as 1.5 million hectares."

"Quietly and modestly, Morse, who traveled with his family, wife and daughter, went from one city to another while staying in the best hotels."

Note: Soyfoods Center has a copy of the "Translator's Foreword" (p. xxx-xxxvi) which was typeset but later deleted from the book. Only the last two paragraphs were used. It tells the real story of Vavilov's work, his downfall at the hands of Trofim Denisovich Lysenko, several moving petitions by Vavilov asking that he be able to finish writing unfinished books, and details of his case history and death. Address: Head, All-Union Inst. of Plant Industry (VIR), Russian SSR.

10498. Kristof, Nicholas D. 1998. A lure for athletes and pilgrims: Nagano City, host of the Olympic Winter Games, is home to one of Japan's greatest temples. *New York Times.* Jan. 4. p. TR13.
• ***Summary:*** "Americans sometimes are put off by Japanese foods such as natto, fermented soy beans, or basashi, raw horsemeat, but it is difficult to find someone who does not like soba" [buckwheat noodles].

10499. Mukherjee, Anjali; Singh, Kanaka. 1998. Add years to your life–starting 1998. *Times of India* (*The*) (*Bombay*). Jan. 8. p. A4.
• ***Summary:*** Studies show that vegetarians are healthier and live longer than meat eaters; they have lower blood pressure and cholesterol levels, plus lower rates of heart attacks and cancer.

Eat more foods made from soybeans. That may be why the Japanese outlive the Americans. The soybean contains an arsenal of antidisease agents such as antioxidants, lecithin, phenols, genistein and phytates. Genistein has anti-cancer activity. "Soya foods boost the 'good' cholesterol and improve the HDL / LDL ratio." Soya foods and soya milk are also good sources of calcium. To derive the full benefit of soyabeans, it is best to eat "soya foods" every day. To incorporate them into your daily diet: (1) When making chappatis [chapatis], mix wheat flour with soya flour in a 2:1 proportion. This will ensure a steady intake of soya. (2) Use tofu in place of paneer whenever possible. Tofu has more antioxidant punch than casein, the protein in milk. Animal studies have shown that those fed soyabeans had a life span 10-15% longer than those fed casein. (3) Used roasted soyabeans [soynuts] as a tasty snack food. (4) Use textured soya protein products like Nutrinuggets or Nutrella, which come in granule or chunk form, together with mushrooms or green peas to vegetarian chilies or vegetable pulao

pilaf. (5) Whole dry soybeans can be cooked like other pulses to make rajhma / rajma [a north Indian vegetarian dish consisting of red kidney beans in a thick curry and lots of Indian whole spices] or channa / chana masala; serve with rice or chappatis [chapatis].

10500. Kikkoman International Inc. 1998. Talk about a signature sauce! The true taste of soy sauce (Ad). *Nation's Restaurant News* 32(3):47. Jan. 19.
• ***Summary:*** This full-page color ad, targeted at restaurateurs, shows the words "Kikkoman Soy Sauce" on a fish fillet. The text reads: "Don't use just any soy sauce. Start with Kikkoman. Because among leading brands, only Kikkoman is naturally brewed and aged for full flavor. *Your* flavor. Whether that fish dish is Asian or fresh from the American mainstream. Catch our latest recipe ideas. Call 1-800-944-0600."

"The true taste of soy sauce" is a registered trademark, printed in white letters on a red background.

10501. Early soyfoods in Japan–Chronological (SoyaScan database search report). 1998. 36 p. incl. index. Jan. 23. Unpublished manuscript. [20 ref]
• ***Summary:*** This carefully customized database search was conducted for Mark Messina to document the fact that soyfoods have been widely consumed for a long time in Japan. Among the 47 records are the earliest Japanese-language and English-language documents that mention or discuss soyfoods in Japan, with emphasis on tofu (27 records), soy sauce (26 records), miso (20 records), and soymilk (8 records). Also includes the earliest English-language records that give significant industry or market statistics on tofu, miso, or soy sauce in Japan.

10502. Schillinger, John A. 1998. History of Asgrow Seed Co. and of his work with the company: 1994 to present (Interview). *SoyaScan Notes.* Jan. 26. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In 1994 Upjohn decided to sell Asgrow Seed Company to Empresas La Moderna (ELM), a multi-national agricultural company based out of Monterey, Mexico.

In 1995 the fault-line between the vegetable and agronomic sides of Asgrow, which had been growing ever wider since 1968, finally split, as ELM divided Asgrow into two separate divisions. The vegetable division, which was still larger in terms of total sales than the agronomic division, was merged with Petoseed and Ball Seed in 1995 to form Seminis Vegetable Seeds (still owned by ELM). The agronomic division of Asgrow was sold to Monsanto, the deal being finalized on 3 Feb. 1997.

Question: A recent survey conducted by Doane Marketing Service contains a ranking of U.S. soybean seed companies by quantity of seed sold (not value/dollars) The top two companies are: (1) Pioneer Hi-Bred, which has a little over 19% of the total market share, and (2) Asgrow (not including Hartz), which has just under 12% of the

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total market share. Do these figures seem accurate and fair? Schillinger: Hartz is a part of Asgrow, with offices in the same building in Des Moines, Iowa. If Hartz's numbers were included, Asgrow's total would be significantly higher. These figures also do not include seed saved by the farmer (saveseed), and Asgrow's surveys show that farmers save more Asgrow soybean seed than any other variety. So if saveseed was included, Asgrow's total would be even larger. There is a big difference between planted acres and newly purchased seed. If you look at planted acres, Asgrow has about 19.4% of the total. While this may still be somewhat less than Pioneer's total, the gap is smaller.

During the last 3 years, Asgrow's sales have skyrocketed. In the year just passed (calendar year 1997), Asgrow sold almost four times as many Roundup Ready soybean seeds as the previous year. Before January 1, 1998, Asgrow had already sold all of its soybean seed for the coming 1998 crop year. John thinks that this year, Asgrow's volume of sold-seed will exceed Pioneer's for the first time.

Question: Do you believe that profitably will be the main determinant of what type or variety of soybeans farmers plant in the future? Schillinger: Yes. Question: Do you have figures showing that Asgrow's Roundup Ready soybeans are more profitable to farmers now than non-Roundup Ready soybeans? Schillinger: Yes, we do have data and our researchers and our sales staff could provide it. There are two sets of data. When Roundup Ready soybeans are planted using our system with Roundup herbicide, there is a definite profit advantage to the Roundup Ready soybeans. But if you treat the Roundup Ready soybean as if it were an ordinary soybeans, the advantage is not nearly as great–but it is still there. Our research shows that there is long-term stunting of soybean plants from other popular herbicides such as Pursuit, but none from Roundup. When you spray soybean plants, even during stressful times, there is no effect on the plant growth and development. If our Roundup Ready soybeans were not the most profitable, why are farmers buying them faster than we can supply them? "Our biggest challenge right now is to tell our customers that we are very sorry we did not have enough supply for them. The orders came in so fast that we sold and oversold, particularly in areas like Illinois and Indiana. It was embarrassing. So were are instituting programs like going back to the farmers and saying 'You order right now what you want for next year, and we'll guarantee delivery.' The market clearly seems to be saying that there is a very high regard for Asgrow's Roundup Ready soybeans.

"Asgrow has an advantage and a lead because we were the first company to get the gene that protects soybeans from Roundup herbicide. That's because we worked with Monsanto in a collaborative project. In 1989-90 we were first able to shoot Roundup gene into our soybean variety 5403; in 1991 we began testing and growing out. So we were able to use a different protocol from other companies that did not get this gene until 2 or 3 years later. We just went through the normal variety development process. We didn't backcross into old varieties that would be outdated by the time they went to market. Rather, we proceeded with what we call 'forward crossing' which is crossing into other elite material and then selecting for yield and performance. Our first commercial soybean seed product containing the Roundup gene was on the market in 1996.

Question: In food uses, Roundup Ready soybeans contain no consumer health benefits. Some consumers are reluctant to consume these soybeans in foods. What is the main obstacle that needs to be overcome before these soybeans will be accepted. Schillinger: "I think we need to develop a strong message, based on science, that consumers and advocate groups can understand. We have to develop an education and communication system that will reveal the truth of what these product have and don't have. We need to answer questions about possible threats to humans as well as to the environment. I have four grandchildren that I love dearly. People ask me, 'Would you feed your grandchildren these soybeans?' I have no qualms at all; I would not hesitate to do that. I've eaten them since 1991. But still we have to communicate. I think that Greenpeace and others have communicated through psychological warfare some misunderstandings that are going to be difficult to overcome. But that's one of the key things we need to do. One consumer benefit is that we can produce soybeans cheaper. Our company supplies a major share of the tofu soybeans for Japan–roughly a million bushels a year to Japan just for making tofu. We grow the identity preserved soybeans containing the Roundup gene under contract, then clean them and sell them to Japan–not to farms but directly into the food system.

Roundup Ready soybeans have already played a major role in protecting the environment by enabling farmers to move to conservation tillage practices. These soybeans plus Roundup give them the tools they have needed to produce soybeans with a lot of crop residue on their land; this holds the soil and water, leads to less runoff. Roundup is probably the safest herbicide, because as soon as it hits the soil, it breaks down (decomposes) instantly into some very safe and naturally occurring compounds; it doesn't even get into the soil. "You could even drink it and it wouldn't hurt you. I wouldn't recommend it, but you can." The plant (weed) enzyme which the product binds to is not even present in any humans or animals.

Two years ago, Asgrow started to introduce consumer nutritional / health benefits into Roundup Ready soybeans–such high oleic acid. These soybeans should be on the market in 4-5 years. Address: Co-President, Asgrow Seed Co., 4140 114th St., Des Moines, Iowa 50322. Phone: 515-331-7111.

10503. Ota, Eileen. 1998. Update on Ota Family Tofu in Portland, Oregon (Interview). *SoyaScan Notes.* Jan. 28.

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Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Ota Family Tofu has tofu making equipment that Eileen would like to sell; it has hardly been used. In about 1981 the company moved to a new location, 812 S.E. Stark St.; it had more than twice as many square feet as their previous location. When they moved Ko went to a soy conference and met Eddie Okita, who was selling tofu manufacturing equipment. Ko decided to buy new equipment. Eileen objected at the time, suggesting that he try it before he buys it–to be sure you get the product that you want. Ko said "No." He just wanted to buy it. Coincidentally, at the same time, a competitor (Dae Han Tofu) began making tofu in Portland. Before that, there was a small tofu maker in Salem that didn't last very long. Dae Han was planning to deliver their tofu, which Ota had never had to do before. So Ota lost a large portion of the Portland tofu market to Dae Han.

Ko used the new equipment for a while, but then it became apparent that the tofu and the agé were not coming out the same. He had less control over the more automated equipment. Their customers noticed the difference and did not like the change. Moreover, Ota no longer had the volume to support the new equipment. So they went back to their old machines.

One of the early tofu-makers was Saizo Ohta (not Seizo), but he was not one of the founders. Two brothers apparently started the company. At the time of the "Spanish flu" epidemic in 1918-19, one or both of them became ill and the business went to Saizo Ota, Matsuno Ota's father. Matsuno was an only child, and in those days there was the tradition of sending Japanese children in America back to Japan for education. So when she was 4-5 years old she went to Japan. She did not return to America until after World War II. During the war her father, Saizo, had died. Matsuno returned to the USA in the early 1950s. The Grandmother, Shina, had a stroke after they arrived in Portland. At that point, in about 1956-57, Ko's father (Matsuno's husband) took over the tofu business. Ko's father was trained as a medical technician in Japan, but he couldn't get a job in the USA because his certification didn't transfer. So he worked for a while as a janitor and then spent a lot of time helping the grandmother, Shina.

After Ota Tofu moved to its present location, there was a huge influx of Vietnamese people who wanted soymilk, so the company started making it.

Shurtleff tells Eileen of an early listing for Ota Tofu in Portland in a 1922 Japanese-language directory of Japanese in the United States.

10504. Smith, Sieglinda. 1998. Looking for the Ota family in the Polk's Portland city directories (Interview). *SoyaScan Notes.* Jan. 28. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In the 1915 city directory she finds: Ota Roy, student in dentistry and pharmacology. Also an Ohta F baths at 86½ 5th St. North. In 1916 the student appears again. In 1917 there is Ohta E restaurant at 67 6th North 6th North (which is today's 217 NW 6th St., between Davis and Everett on 6th). Also in 1917 there is "Ota Saijo (Shina) lndy [laundry] 266 Davis." In the 1918 city directory she finds: Ota E restaurant, 67 6th St. North. She called the city archives, but they have only a 6 year retention rate for business licenses. Then she called the Business Bureau which had a record for the Ota Family Tofu Co., founded in 1972. However in 1971 the city directory had Ota Soybean Cake Co. at the same address where they are now, on Stark.

The addresses in Portland changed in 1930. For example Ota baths at 86½ 5th North, which is now 322 NW 5th.

In the book *Issei,* by Kazuo Ito (1973) is an undated business map of oldtown Portland, 1915-1941. Below the map is handwritten: "90 Japanese business, 1935." On that Map Ohta Manufacturing appears on 5th between Everett and Flanders–which is where the family places it.

Siegfried just noticed that the name is spelled Ohta and she has been checking in the Polk's city directories under Ota. So she looks again: Nothing for Ohta in 1918. In the 1935 city directory there is an Oha Saizo baker wholesale 322 NW 5th Ave. Address: Reference Librarian, Oregon History Center, 1200 SW Park Ave., Portland, Oregon. Phone: 503-306-5240.

10505. Chen, Hua-Ming; Muramoto, K.; Yamauchi, F.; Fujimoto, K.; Nokihara, K. 1998. Antioxidative properties of histidine-containing peptides designed from peptide fragments found in the digests of a soybean protein. *J. of Agricultural and Food Chemistry* 46(1):49-53. Jan. [16 ref]
• ***Summary:*** Many hydrolyzed proteins have been shown to have antioxidative activities against the peroxidation of lipids or fatty acids. This paper is about the properties of 2 synthetic peptides containing histidine, which were designed on the basis of an antioxidative peptide derived from the proteolytic digests of a soybean protein. Address: 1-4. Dep. of Applied Biological Chemistry, Faculty of Agriculture, Tohoku Univ., Sendai 981, Japan; 5. Shimadzu Scientific Research Inc., Tokyo 101, Japan.

10506. Godfrey-June, Jean. 1998. Soy is unbelievably, fabulously healthy. *Elle* (*New York City*) 13(5):108. Jan.
• ***Summary:*** *Elle* is a woman's magazine. This short article begins: "Women who eat lots of it appear to be less likely to get breast cancer; it may also protect against heart disease."

"The actual food–the soybean–was unearthed by an *Elle* operative at an otherwise nondescript Japanese restaurant. It turns out that boiled, lightly salted soybeans are available at many Japanese restaurants, but are rarely on the menu. Fabulously called 'edamame' (they sound as if they'll be brought to the table by a jazz legend), they taste like fava beans and are addictive in much the way sunflower seeds are:

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You suck the beans out of the pods."

A color photo shows green vegetable soybeans in the pods. Address: Beauty Editor, Elle magazine.

10507. Kluis, Alan. 1998. Currency woes threaten ag exports: Devaluations have hurt some of our best customers. *Soybean Digest.* Jan. p. 108-09.
• ***Summary:*** The USA now grows about 50% of the world's soybeans. One graph shows the world's top soybean producing nations and states (in hundred million bushels): USA (280), Brazil (110), Argentina (55), Iowa (50), Illinois (40), Minnesota (28). A second graph shows U.S. soybean exports by country (in million bushels): Japan (145), Netherlands (125), Mexico (122), Taiwan (75), China (68), Brazil (62), Korea (55), Spain (55), and Germany (43). Address: President, NorthStar Commodity Investment Co.

10508. Lehnert, Dick. 1998. Specialty soybean varieties bring premiums for a price: Markets for food-grade varieties are growing. *Soybean Digest.* Jan. p. 64-65, 68.
• ***Summary:*** About 120,000 tons of specialty soybeans are now shipped from the USA to Japan each year–about 10% of the food-grade soybeans the Japanese buy. The soybeans must always be kept separate–"identity preserved." Growers typically get more dollars per bushel, but sometimes get fewer bushels per acre. The soybeans are made into foods such as tofu, tempeh, natto, or miso.

Kim Nill, deputy director for international marketing at the American Soybean Association, keeps tabs on the growing opportunities for specialty soybeans. He says seed companies are finding niche markets for food-grade soybeans.

Last year, DuPont introduced a variety that produces oil high in oleic acid (naturally lower in saturated fats and more heat stable without hydrogenation). DuPont is now working on a low stachyose bean. Pioneer Hi-Bred International grew 7,000 acres of low-linolenic oil beans for a market similar to that of high-oleic acid beans.

A photo shows a combine harvesting specialty soybeans that will be made into tofu.

10509. Morinaga Nutritional Foods, Inc. 1998. Mori-Nu Tofu and the dinner bell (Tear-off recipe pad). 2050 W. 190th St., Suite 110, Torrance, California 90504.
• ***Summary:*** This color tear-off recipe pad (6½ by 4 inches), developed by Susan Bucher of Bucher & Russell in Los Angeles, were introduced in Jan. 1998. On the front is a color photo of three green peppers stuffed with tofu and vegetables, in a tomato sauce in a tureen–which is surrounded by uncut vegetables. In the background is a pack of Mori-Nu Firm Tofu. On a diagonal yellow band (snipe) in the lower right corner is written in black: "Delicious vegetarian recipe on back".

On the back is a recipe for Stuffed Cajun Bells, plus a nutritional analysis, facts about Mori-NU Tofu, and an offer for additional free recipes. Address: Torrance, California. Phone: 1-800-669-8638.

10510. Frey, Jennifer. 1998. Temple opens 1,400 years of tradition to visitors: Winter Olympics–Nagano 1998. *Washington Post.* Feb. 4. p. C4.
• ***Summary:*** Zenkoji, a 1,400-year old wooden Buddhist temple, is the cultural center of Nagano. "Today is 'Setsubun' in Japan, an annual festival that marks what the Japanese consider the eve of the first day of spring. The Buddhist monks and priests–as well as Japanese dignitaries–toss toasted soybeans at the crowd in a ritual that is supposed to drive away evil and usher in a year of good luck." A small photo shows Zenkoji, designated a Japanese national treasure.

10511. Jones, Jacob. 1998. Thoughts on seed and plant introduction (Interview). *SoyaScan Notes.* Feb. 11. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The archival records of the Bureau of Plant Industry (Record Group 54) are now located at the second National Archives building in College Park, Maryland; they were moved there recently from the National Archives main building in Washington, DC.

During the late 1800s and early 1900s, when plant explorers scoured the globe for new or valuable species, it is quite remarkable that they were generally given whatever they asked for. One of Russia's biggest crops was durum wheat, used to make pasta. Yet Russia gave away these precious varieties to American explorers, enabling America to eventually pass Russia as the world leader in hard wheats.

Why were the Manchurians and Japanese so willing to give Dorsett and Morse all the soybeans they asked for? Were they short-sighted? Were they not afraid that the Americans would take over their soybean export business? In fact, they sometimes asked Dorsett and Morse about this. They key is to remember that at that time in the USA soybeans were grown largely as a forage crop–not for their seeds. It was not until 1941 that the acreage of soybeans harvested for beans (seeds; 5.889 million acres) surpassed the total of that harvested for hay (forage; 3.546 million acres) or grazed or plowed under (for green manure; 1.910 million acres). Moreover, since the Americans were not collecting germplasm in their own colonies, they cannot fairly be accused of imperialistic plant collecting. Nor were they involved in germplasm theft, since they were given what they requested.

The Division of Foreign Seed and Plant Introduction sent out something like fifty plant exploration expeditions, but they did not start keeping official trip reports until fairly late in the process. Jacob is not sure why. Maybe a politician demanded to know how the taxpayers' funds were being spent. Or maybe it took a long time for leaders of the

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Division to fully understand the importance of what they were doing and the need to document it fully.

David Fairchild continued to be a student of Barbour Lathrop's throughout their relationship. At the Fairchild archives in Miami, Florida, Jacob found several pocket notebooks that Fairchild kept for 60 years. One whole notebook is filled with detailed instructions that he wrote for himself, based on Lathrop's teachings, of how he should act under different circumstances in various countries around the world. For example: If you (Fairchild) are with a South American gentleman who is superior to you in age and rank, you should stand up, bow slightly when he is ready to leave, pick up his gloves and cane, present them graciously to him,... etc. Address: Graduate student, Purdue Univ., P.O. Box 132, Lafayette, Indiana. Phone: 765-742-8530.

10512. Marking, Syl. 1998. The checkoff-supported new-uses pay off begins: First products hit the market. *Soybean Digest.* Mid-Feb. p. 10-11.

• ***Summary:*** The United Soybean Board (USB) has set a goal to have 300 million bushels of soybeans incorporated into new-uses products by 2005. USB is presently funding/supporting a total of 48 research and commercialization projects.

Oct. 1997–The first product to hit the market was soy-based wood adhesives used to glue finger-jointed lumber at Willamina Lumber Co. in Oregon. This high-quality jointed lumber is then exported to Japan.

1997 Nov.–CytoSol, a proprietary formula based on soy methyl esters, dissolves crude oil or petroleum products from sand, rocks, and plant life on shorelines. Earlier in 1997 the CytoSol process was approved by EPA as an oilspill cleanup material for shoreline uses. In June the state of California issues a license for its use. In early November the West Coast Regional Response Team approved use of the CytoCulture bioremediation process to clean up a small oil spill in Humboldt Bay, northern California.

Also in 1997, concrete form release oil, used to prevent concrete from sticking to construction forms, saw its first commercial use. Color photos show: (1) Two pieces of finger-jointed lumber being glued. (2) A wooden floor, apparently glued with soy-based adhesive.

10513. Messina, Mark. 1998. Estrogen, phytoestrogens and cognitive function: November 1-2, 1998, Four Seasons Olympic Seattle–Council Room, Seattle, Washington (Portfolio). Seattle, Washington: United Soybean Board. Four inserts.

• ***Summary:*** The four documents enclosed in this portfolio (which has no cover) are: (1) Conference program, including reception on Sunday evening, breakfast on Monday morning, opening remarks and introductions, seven papers, plus discussion and research recommendations. For each paper is given: Title, author, author's address, and presentation time (2 pages). (2) Contact information: Speakers and attendees (1 p. 12 people). (3) Speaker biographies (3 p.) (4) Speaker abstracts (5 p.).

The following seven papers were presented: Soybean phytoestrogens: An overview of health effects, by Mark Messina. Estrogen replacement therapy and cognition, by Madeline Murguia Rice. Estrogen, tofu consumption, and cognitive change in older Japanese American women: the kame project, by Madeline Murguia Rice. Tofu consumption and brain atrophy, by Lon White. Phytoestrogens in brain: analytical and cognitive studies, by Timothy J. Maher. Of rats and monkeys, the cognitive effects of soy phytoestrogens, by Jay R. Kaplan. Modulation of Alzheimer's disease markers by dietary soy phytoestrogens, by Helen Kim.

The key paper in this symposium, and the one which caused it to be convened, was by Lon White and colleagues. In the speaker abstracts it appears as follows: "Brain aging and midlife tofu consumption, by Lon White, Helen Petrovich, G. Webster Ross, Kamal Masaki, John Hardman, Daron Davis, James Nelson, and William Marksberv. In a population-based study of aging Japanese men in Hawaii, midlife tofu consumption was associated with cognitive impairment assessed two decades later, and with low brain weight at autopsy. An increasing prevalence of cognitive impairment with increasing tofu intake was consistently observed in each age stratum. An increased prevalence of low brain weight with greater midlife tofu intake was apparent in men both below and above mean body mass index. The associations remained statistically significant in multivariant regression models after controlling for internal skull diameter, age at death, midlife blood pressure, and midlife tofu intake. The findings may reflect long-standing sub-optimal plasticity and accelerated brain aging due to repeated exposure during midlife to soy isoflavone phytoestrogens, and to lower levels of endogenous estrogen generated in adipose tissue in leaner men. This interpretation implies that estrogen-dependent plasticity mechanisms may ameliorate the erosive effects of aging in men as well as in women."

Lon White has MD and MPH degrees. His biography reads: "Lon White completed his medical education at the University of Washington in 1963, his pediatric residency at the University of Washington affiliated hospitals in 1969, and his MPH in epidemiology at the Johns Hopkins University School of Hygiene and Public Health in 1980. From 1964 to 1997 he served in the United States Public Health Service as a researcher with the National Institutes of Health, initially at the National Institute for Child Health and Human Development, later at the National Institute for Neurological Diseases, and, since 1981, at the National Institute of Aging. Prior to 1981 he conducted virologic, immunologic, and biochemical research related to persistent virus infections in animals and man, and to neurological diseases of uncertain cause (as Guamanian P-D and ALS) in the

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laboratory of G. Carleton Gajdusek, NINCDS. At the NIA he initiated a series of epidemiological studies of cognitive functioning and dementia, including the East Boston study, the Framingham dementia study, and the Honolulu-Asia Aging Study (HAAS). He designed and served as the on site Scientific Director of the HAAS from its beginning in 1991 until his retirement from federal service in August, 1998. He is currently a member of the faculties of the Schools of Medicine and Nursing at the University of Hawaii, research consultant to the Honolulu, VA [Veterans Administration], and the Senior Neuroepidemiologist for both the HAAS and the allied Neurotoxins and Neurodegenerative Disorders Project, based at the Pacific Health Research Institute in Honolulu. His current research is focused on brain aging and the pathogenesis of Alzheimer's disease, vascular dementia, Parkinsonism, cerebrovascular disease, and aging-related cerebral atrophy."

10514. Morinaga Nutritional Foods, Inc. 1998. Celebrity tofu (Ad). *Vegetarian Times.* Feb. p. 51.
• ***Summary:*** This full-page color ad shows a package of Mori-Nu Firm Lite Tofu next to a round white bowl of Australian-Pumpkin Soup and a square glass bowl of creamy Asparagus Bisque, surrounded by squash, pumpkins and asparagus.

At the bottom of this ad, the reader is invited to order: *"The Art of Tofu,* by Akasha Richmond. She is "the Health Food Chef to the Stars." The book is filled with delicious vegetarian gourmet recipes from around the world. "Every recipe is made with Mori-Nu Tofu, the prefect tofu in the perfect package."

This ad also appeared in the Feb. (p. 51), March (p. 29) and April (p. 49) issues of this magazine.

Note: On page 50 (the left hand page facing this page) is a 1/3 page ad for *The Art of Tofu,* by Akasha Richmond. Containing 50 gourmet recipes, it is on sale at $9.95 for *Vegetarian Times* readers. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504.

10515. Nagata, Chisato; Takatsuka, N.; Kurisu, Y.; Shimizu, H. 1998. Decreased serum total cholesterol concentration is associated with high intake of soy products in Japanese men and women. *J. of Nutrition* 128(2):209-13. Feb. [24 ref] Address: Dep. of Public Health, Gifu Univ. School of Medicine, Gifu 500, Japan.

10516. Yasuda, Masaaki; Sakaguchi, Maki. 1998. Degradation of soybean protein by an acid protease from *Monascus anka:* Note. *Food Science and Technology International* (*Tokyo*) 4(1):6-8. Feb. [12 ref. Eng]
• ***Summary:*** The role of the enzyme in the process of ripening tofuyo was investigated. "It was found that the digestion of soybean protein progressed as follows: initially, α'-, α-, and beta-subunits in beta-conglycin, and then, the acidic subunit in glycinin were degraded. However, the basic subunit of glycinin still remained, and some polypeptic bands (around 10 kDa [kilodaltons, a unit of molecular weight]) were formed during the enzyme reaction." The concentration of ethyl alcohol in the reaction mixtures affected the degradation rate of soybean protein by this enzyme. Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, 1, Senbaru, Nishihara-cho, Okinawa 903-0213, Japan.

10517. Kikkoman International Inc. 1998. Asian noodles are surfacing everywhere (Ad). *Nation's Restaurant News.* March 2. p. 29.
• ***Summary:*** This full-page color ad, targeted at restaurateurs, shows a bowl of noodle soup. "They're profitable, they're different, and they're surprisingly easy to add to the menu. All it takes is a few good recipes and one essential seasoning: Kikkoman Soy Sauce. Some soy sauces are harsh and overpowering. But Kikkoman is naturally brewed and aged for full flavor, so it complements and balances all kinds of noodles from Pad Thai to Pasta Primavera and anything in between. For 21 unexpected recipes call 1-800-944-0600."

"The true taste of soy sauce" is a registered trademark, printed in white letters on a red background.

10518. *Los Angeles Times.* 1998. Obituaries: Herman Aihara–Pioneer in macrobiotic health programs. March 6. *
• ***Summary:*** Herman Aihara died on 25 Feb. 1998.

10519. Gonzalez-Watanabe, Yvonne; Watanabe, Joji. 1998. Update on introducing tofu to Hispanics in the Los Angeles area (Interview). *SoyaScan Notes.* Feb. 24. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** This summer the Little Tokyo Service Center will be organizing their third annual tofu festival in Los Angeles. Yvonne and Joji have reserved a double booth, where they will give away samples of food made with tofu, give lectures once an hour in Spanish on the nutritional benefits of tofu, and conduct cooking classes in Spanish at a demo area. Yvonne will talk in English and José will translate into Spanish. They have put together a pamphlet of tofu recipes including a coupon. They have gotten to know Pat Greenberg, who is on a festival committee.

Presently Yvonne is conducting tofu workshops (*tofu tajellar*), like cooking classes in Spanish at a community recreating center in Pasadena; only Spanish-speaking people attend, and they generally want to learn Asian-style (rather than traditional Hispanic) recipes. About 90% of the participants are women–of all ages, from 20 to 80. They come for health reasons–high blood pressure, elevated cholesterol levels, or overweight. An average class has about 12 people (range 4 to 30 people). Yvonne teaches them how to make tofu at home from whole soybeans, uses that tofu to prepare a number of Hispanic recipes, then gives them

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basic nutritional information. Miyuki, who is their contact at House Foods America Corp., plans to attend their next class. Yvonne greatly enjoys her work, but she needs some income and is planning to approach House Foods to ask for sponsorship of her workshops. Address: 6029 LaPrada St., Los Angeles, California 90042. Phone: 213-254-1712.

10520. Kikkoman International Inc. 1998. Want to build a better burger? The true taste of soy sauce (Ad). *Nation's Restaurant News.* April 27. p. 48.

10521. Muramatsu, Kanako; Yamawake, Norio; Kiuchi, Kan. 1998. *Bacillus subtilis* (*natto*) KFP 419 ni yoru erasutaaze no seisan [Production of elastase by *Bacillus subtilis* (*natto*) KFP 419]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 45(8):494-98. [24 ref. Jap; eng]
• ***Summary:*** "Production of elastase by *Bacillus subtilis* (*natto*) KFP 419 was investigated to obtain enough enzyme for studying on physiological functionality of itohiki-natto... The maximum elastase activity was obtained at pH 7.0 after 24 hour fermentation" (from journal@rchive). Address: Kyoritsu Women's Univ., 2-2-1 Hitotsubashi, Chiyoda-ku, Tokyo 101, Japan.

10522. *Ontario Soybean Growers' Marketing Board Newsletter.* 1998. Profiles: Ikuo Fujimori, President of Takeya Miso Company Limited in Nagano, Japan. April. p. 7.
• ***Summary:*** In Feb. 1998, at the Nagano Winter Olympics, the Nagano Miso Cooperative Association fed miso soup to over 2,000 athletes and 1 million visitors from all over the world.

"Mr. Fujimori is President of the Takeya Miso Company Limited, located in Nagano, Japan. He is also the Chairman of the Nagano Miso Manufacturers Association and Vice Chairman of the Japan Miso Manufacturers Association. Takeya Miso is a family business with a long and rich heritage. The Fujimori family has been making miso commercially since 1872... Presently Takeya Miso employs over 100 people in two plants, producing over 50 different miso products."

"His company has been purchasing Ontario soybeans for over 23 years." A photo shows Ikuo Fujimori and Tom Lassaline examining some Takeya miso products. Address: Box 1199, Chatham, ONT, Canada N7M 5L8.

10523. Soyfoods Association of America. 1998. Soyfoods once a day for life! (Special advertising section). *Vegetarian Times.* April. 12-page color insert after p. 58.
• ***Summary:*** Contains large color ads by Nasoya (tofu and TofuMate), Morningstar Farms (Chik Nuggets), Eden Foods (organic black soy beans) Vitasoy (creamy original natural soy drink), Westbrae (Westsoy soymilks), Westbrae (Vigoraid nutritional drink), Sno Pac (frozen Sweet Beans–organic green vegetable soybeans), and GeniSoy (soy protein bars). On the rear cover are additional small ads (each with a logo) for Lightlife Foods, Lisanatti, Monsanto, Soyco Foods–Div. of Galaxy Foods Co., Soyfoods Association of North America, and United Soybean Board.

Interspersed with the ads is advertorial text and "Soy facts." The text on page 1 begins: "Miracle food. Health insurance in a pod. Nutritional powerhouse. The bean supreme. Nutritionists, physicians, researchers, chefs, and food experts of all kinds are raving about the healthfulness and great taste of soyfoods, and it's no wonder; soy truly is a nutritional and culinary gift from nature.

"Soyfoods are delicious, convenient, and versatile. At breakfast, soy can make an appearance in the form of soymilk, scrambled tofu 'eggs,' or soy 'sausages.' A soy shake or veggie burger makes a great lunch. Try a tempeh stir-fry, or perhaps a creamy tofu dessert.

"So dig in... with the huge variety of soyfoods available at your local natural foods store, it's easy to get your daily intake of soy, and reap the many benefits of the bean supreme."

The inner contents: Food as medicine. Heart health. Fighting cancer. Menopause? What menopause? Strawberry smoothie. Protein punch.

Soy cooking tips (p. 4): Easy ways to incorporate soy into your baking: Use soy flour in your baking. Be aware that soy flour contains no gluten, and therefore yeast breads will not rise without the addition of some gluten-containing flour. About ¼ cup of soy flour per cup of unbleached white flour is recommended for breads, pastas, and pastries. In place of olive oil, try adding a few ounces of Nasoya Silken Tofu and a dash of lemon juice to mashed potatoes. Try mashing miso into your root vegetables in place of butter. When adding miso to dishes, add roughly 1 tablespoon per four servings. Add GeniSoy Natural Vanilla Soy Powder to your baked goods such as muffins or pancakes. Buy Eden Organic Soybeans in a can and use them the same way you would any other canned bean: over rice, with pasta, in stir-frys, etc.

It's not only what you eat; its also what you don't eat. Making healthy eating taste great. Soy fact: soybeans were traditionally considered one of five sacred crops in China.

No time to cook? Try these quick ways of getting soy in your diet.

Strong bones... a matter of calcium retention. Miso.

Soy fact: there is no word for "hot flash" in Japan. Soy beverage.

Miraculous tofu. So soy convenient. Soy fact: Western culture discovered tempeh through the Dutch colonization of Indonesia. Soy fact: tofu was unknown to most people in the United States until Chinese immigrants came to this country in the 1800's. Tofu.

Tempeh. By the handful. Soy fact: miso was developed in China about 2,500 years ago. Where to find it. Address:

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Washington, DC.

10524. Gonzalez-Watanabe, Yvonne. 1998. Introducing tofu and soymilk to Costa Rica. Update on soyfoods work in the Los Angeles area (Interview). *SoyaScan Notes.* May 4. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Yvonne just returned from a month (March 29 to April 24) in her native country of Costa Rica, where she was teaching about and studying tofu and soymilk. She gave 8 classes in people's homes, where she taught them how to make and use soymilk and tofu; about 30-40 people attended, and about half the people attended more than one class. During these classes she developed a recipe for tofu seviché (pronounced say-VEE-chay), which is traditionally made with marinated raw fish but occasionally with green plantain or avocadoes substituted for the fish. Yvonne used tofu in place of the fish, and it was a big hit.

Vegetarianism is now quite popular in San Jose, the capital of Costa Rica, but it goes under the name of macrobiotics. There are a number of "macrobiotic" restaurants in the capital; all serve only vegetarian food.

When Yvonne tried to interview the one existing Chinese-run tofu company, they were very uncooperative. It seemed like they might be going out of business because tofu is now being made on a small scale in many other places. Yohan, the big chain of Japanese-run food stores, now makes fresh tofu each day in the store. Many small Chinese food markets and restaurants also make their own tofu. Kikkoman Tofu, sold in aseptic packages, is fairly widely available.

Yvonne's booth and tofu recipe brochure for the LA Tofu Festival are progressing nicely. Margaret Endo has found advertisers for the booklet, which will enable Yvonne to expand its size. She has also found a Costa Rican celebrity to be the host at her booth–Lily Melgar, a well-known actress and friend of her cousin. Yvonne went to Lily's home and prepared her favorite tofu recipes, which Lily liked very much.

Update: Talk with Yvonne. 1998. July 8. The Southern California Gas Co. will be sponsoring Yvonne's booth at the LA Tofu Fair–which is now set for Saturday and Sunday, August 15-16. They will pay for all the bands, the music, and a Spanish-language flyer–largely because they are interested in reaching the Hispanic population in the Los Angeles area. Yvonne has been meeting a large number of people who are interested in tofu–some of them local celebrities. One Puerto Rican lady who is a musician, goes by the name "La India." Ricky Martin from Mexico is a pop music star. Yvonne has cooked Hispanic vegan tofu recipes for both of them.

Update: Talk with Yvonne. 1998 Dec. 10. She is now the guest chef on a TV show in Los Angeles (KCET–Channel 52) twice a month teaching cooking–vegetarian and soyfoods. She receives no pay for this, but it is very interesting and good exposure. Address: 6029 LaPrada St., Los Angeles, California 90042. Phone: 213-254-1712.

10525. Cohen, Misha Ruth. 1998. Tofu as seen by traditional Chinese medicine (Interview). *SoyaScan Notes.* May 12. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** From the viewpoint of traditional Chinese medicine (TCM), tofu is a *yin* food with three main healing properties: It is a cooling food, it moistens dry conditions (increases fluids), and it is a *yin* tonic. To say that tofu is simply a *yin* food (as some followers of macrobiotics do) is an oversimplification in the view of TCM. A *yin* food such as tofu is good/healing for some people but not good for others, depending on the person's constitution and particular health condition or problems.

Yin is more the water element, as opposed to yang which is more the fire element. A yin tonic increases the yin effect on or aspects of the body–including coolness and fluid; likewise, a ch'i tonic increases the amount of energy in the body. A person might need a yin tonic if they had dryness, hot flashes, and night sweats or afternoon sweats. TCM uses yin (and tofu) to treat perimenopausal symptoms.

A healthy body has yin and yang in balance. At this point it is important to distinguish four states of yin/yang imbalance: Yin deficiency, yang excess, yang deficiency, and yin excess. The latter condition (yin excess) is rare, except in dampness, as manifested by a "slippery pulse" and too much fluid in the body. A person (such as one with liver fire) could have a large yang excess plus some yin deficiency, which in TCM is called "yin deficient–yang excess." Such a person might have dry skin and the tip of their tongue might be red. Tofu would be a good food for this person to eat.

Seen from the Western viewpoint, tofu contains phytoestrogens. That means it is a "yin tonic" because estrogens are yin substances, which create the female (yin) character. As people get older, they gradually lose all of their hormones. As a yin tonic, tofu is good for older people, both men and women.

Concerning heating and cooling foods: If a woman comes to Misha with menopausal symptoms, such as hot flashes and night sweats, she would first look at her digestion. People who have very poor digestion find it hard to eat tofu–because it is too cooling. Americans typically have "cold digestion"–which is not true of most Japanese. Children usually have hot digestion, and their diarrhea is "hot diarrhea." Older people are generally constipated–they have yin deficiency; they don't tend to get loose stools. People who have loose stools and cold stomach conditions should not, generally, eat plain tofu. As Paul Pitchford says: "Its yin cooling quality needs to be altered by thorough cooking; adding warming spices such as ginger is particularly helpful for "cold persons." A person can have heat in many areas of the body (such as the spleen or liver) and still have a cold center and cold digestion. So the cooling properties of tofu can be changed by heating it. "I see a lot of women who are eating a lot of tofu and other soyfoods, and

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they are having problems with their digestion, including a lot of gas. So I tell them how to cook it, with ginger or garlic or things that are more warming, and all of a sudden they can enjoy the tofu without the digestive problems. But if a person is very hot and has good digestion, they can make a tofu shake." Note that in Japan and Hawaii, chilled tofu is very popular during the summer–when the weather is quite warm (*yang*). So a practitioner of TCM must look at many things (tongue, pulse, environment, etc.) before recommending a specific food and method of preparing it.

Question: The concept of heating and cooling foods goes back to the T'ang dynasty in China (A.D. 618-906) and is widely understood by typical people throughout Asia. Do you think that this must be explainable in terms of Western biochemistry and medicine, or is it possible that this is a concept that Western science has overlooked? Most post-menopausal women in the USA and Europe who have hot flashes and night sweats never think about using a cooling food (such as tofu, watermelon, wild chrysanthemum tea, or cucumbers) to help relieve the problem.

Answer: Misha is not sure, but she does think that if perimenopausal women were aware of and consumed cooling foods and yin tonics in an intelligent way, it could save them much suffering. These foods are described in Misha's book titled *The Chinese Way to Healing: Many Paths to Wholeness* (1996, Berkeley Publishing Group/ Perigee). Visiting an acupuncturist is a good way to deal with difficult menopausal problems (such as hot flashes and night sweats); the combination of acupuncture, herbs, and dietary recommendations often give surprisingly quick results. Hot flashes are usually a combination of yin deficiency and yang excess, but Misha has seen many kinds; some are more liver-heat hot flashes and others are more yin-deficient hot flashes. But tofu is one food that is almost always good for hot flashes because it tonifies yin, is cooling, and increases fluids. Historically, the Chinese have been extremely good at dealing with gynecological problems; women's health a major part of Chinese medicine. Address: O.M.D. (Doctor of Oriental Medicine), LAc, Chicken Soup Chinese Medicine, San Francisco. Phone: 415-861-1101.

10526. Messina, Mark J.; Messina, Virginia. 1998. Does consumption of soy increase or decrease a woman's risk of breast cancer (Interview). *SoyaScan Notes.* May 18. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Mark: In the area of possible adverse effects of soy (especially soy isoflavones), Mark's greatest concern is with soy and breast cancer. "It still bothers me tremendously." There have been 3-4 animal studies in which soybeans or isoflavones have been fed to animals and then they have been given a breast carcinogen. In none of these studies have scientists found an increase in the number of tumors or in the incidence of breast cancer. Several of the studies show "modest protective effects" from soy. So this is good news. The epidemiologic studies are not that supportive of the hypothesis that soy reduces the risk of breast cancer, but none of them have suggested that soy increases breast cancer risk. There were one or two studies showing that fried tofu increased risk of breast cancer, but that nonfried tofu did not. So within an individual study, one soyfood might pop up as being problematic. "But overall, you would not look at those kinds of studies and conclude that soy is risk factor for breast cancer." The fact that Japanese women have about one-fourth the incidence and mortality of breast cancer compared with American women is worth noting. Several basic facts about soy must be kept in mind. (1) It is clearly estrogenic, containing phytoestrogens. (2) When you add genistein to cancer cells that are estrogen receptor positive, it will stimulate their growth over the typical physiologic concentration, but at higher levels it will inhibit their growth. In the range at which it stimulates growth, this is probably due to an estrogenic effect, but at the higher range, genistein is probably inhibiting one of the enzymes that cause the cancer sells to stop growing. At least ten scientific papers have raised the question of what is happening with these isoflavones, and they sound a little cautionary note. The criticism of these studies, where a little genistein is added to cells growing in a petri dish, is that there is absolutely no estrogen in the medium, and that even in post-menopausal women estrogen is present. So some people would say the petri dish does not represent a physiologic condition–you need to add some estrogen. Mark has heard that a researcher in Minnesota has added estrogen to the medium and she still gets a 20% increase in breast cancer cell growth. So genistein may still be an estrogen in that situation. One animal study showed that if you implant estrogen receptor positive cancer cells into rats who don't have ovaries, then you give them a significant amount of genistein, it will stimulate the growth of those cancer cells (tumors). But one criticism of this design is that there is very little estrogen in these rats and fairly high doses of genistein were used.

It is the three human studies (two of which have been published) which are troubling, and cannot be ignored. One is "Stimulatory Influence of Soy Protein," by Nicholas Petrakis at UCSF (1996) in *Cancer Epidemiology, Biomarkers, and Prevention* (5:785). A second is an abstract from the 1997 Brussels symposium by McMichael Phillips. Third, McMichael Phillips told Mark about a study in England that was 4 months in duration. They looked at nipple aspirate fluid and also got an increase in estrogen-regulated gene products. Mark has not seen the actual study and it is a long way from being published. These studies are troubling not because they are scary, but because they do not make sense. Malcolm Pike, from UCLA, a leading endocrinologist, said after studying McMichael Phillips' actual paper (not the abstract), that his must be a short-term effect, because that kind of stimulus would cause an increase in breast cancer, as (for example) in the Japanese population.

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Given that the other epidemiology does not suggest that soy increases risk, and given that the animal studies don't either, and given that the Japanese have a low breast cancer mortality rate, there is probably something else that could explain this phenomenon. Again, it could be a short-term effect that is actually preventive in the long run. But if it was a short-term effect, it still might be possible that soy should not be given to a person who already had estrogen-receptor positive cancer. So Mark is very reluctant to think that soy could increase risk of breast cancer risk; for one thing, it is very hard to identify any kind of food that increases or decreases breast cancer risk. And it is so unlikely that such a food would be soy, because there is very little supporting evidence. Nevertheless, Mark has about 25 scientific studies at the end of which the authors have expressed a cautionary note. The latter range from "Wow! These soy isoflavones are stimulatory; we've got to find out what is going on here," to "It's clear that we need to understand more about the estrogenic / antiestrogenic effects of these compounds before we recommend them to the public."

Mark does not differentiate between soyfoods such as tofu and isoflavone pills in terms of toxicity. He asks: "Would anyone use the above studies to recommend that people stop consuming tofu? No! When you look at the data collectively, it's hard to conclude that soy would increase the risk of breast cancer–especially for normal women. On the other hand, if it weren't for the low breast cancer mortality rate in Japan, and we just had the animal studies and the individual case control studies (neither of which show that soy increases breast cancer risk) plus the human studies, there would be more of a movement to look into this." When Nick Petrakis' study was published, it didn't get much attention; Mark thinks there is a built-in bias to assume that soy is either beneficial or (at the worst) has no effect. It will be interesting to see what the response will be when McMichael Phillips' paper is published as a full paper as part of the proceedings of the Brussels symposium (in Sept. in a supplement to the *American J. of Clinical Nutrition*). It is quite powerful; they actually took biopsies and found an increase in DNA synthesis.

Virginia: Ginny is well aware of the research showing possible adverse effects of soy (especially soy isoflavones) on breast cancer. She definitely thinks about this in planning her diet–in part because she has a fairly high risk for breast cancer; she has had two biopsies. "This is uppermost in my mind almost every day." Ginny wasn't eating a lot of soy products before this new research was published (she probably ate them 3-4 times a week), so she has not reduced her consumption based on the new information. Because of the concern with soy and breast cancer, Ginny would not eat soy products 2 or 3 times a day. "I certainly still eat soy products and I do not feel that I need to avoid them."

Ginny eats soyfoods because she is a vegetarian, because she likes them, they are easy to include in the diet, and they are generally good, healthy foods. Ginny has never calculated how may milligrams of isoflavones she is consuming per day. "I'm really into food, into good, healthy, whole food, with lots of fruits and vegetables, and whole grains. I don't think about things like isoflavones, vitamin C. I just figure I eat a really good diet." Address: 1. PhD; 2. MPH, RD. Both: Nutrition Matters, 1543 Lincoln St., Port Townsend, Washington 98368. Phone: 360-379-9544.

10527. Messina, Mark J. 1998. Soy phytoestrogens–Update (Interview). *SoyaScan Notes.* May 18. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The hottest area of current estrogen research is "selective estrogen receptor modulators" (SERMs). A selective estrogen can have an estrogenic effect on one site in the body and an antiestrogenic effect on another site. One key question is: Are isoflavones selective?

It has been known for several years that soy isoflavones inhibit angiogenesis. But this raises many interesting questions. Do they therefore inhibit nose bleeding? Josh Korzenik at Yale Univ. School of Medicine [in Connecticut] is conducting a study on patients who have a hereditary disease that causes their noses to bleed. They have a genetic defect which causes abnormal blood vessels to form. In this ongoing unpublished study, results to date on about 8 patients show that about 40-50% of those who take soy isoflavones experience a reduction in their nosebleeds. He found some benefit on gastrointestinal bleeding and a major benefit on migraine headaches. This confirms the finding that in petri dishes, genistein also inhibits blood vessel growth.

Do these isoflavones affect fertility? Mark thinks that fertility has more to do with ovulation. How about slowing wound healing? The key point seems to be that if soy isoflavones are potent enough to exert beneficial effects, why aren't they potent enough to exert adverse effects? For example, they may slow wound healing, but only by a few days. But if they chronically prevent angiogenesis in tumors, that would be an acceptable trade-off.

Many people who cite Japanese intake of isoflavones do not realize that the average Japanese level of isoflavone intake (about 30 mg/day) is far below the level needed to get benefits. The daily intake to get benefits in the area of bone health and reduced osteoporosis seems to be about 90 mg/day.

Concerning the exciting studies involving Raloxifene and prevention of osteoporosis and cancer announced this week: Mark uses Raloxifene in his demonstrations because it is antiestrogenic for the breast, and doesn't cause estrogenic effects on the endometrial tissue. But Raloxifene may cause "hot flashes" or make them worse, and it is probably not as effective for reducing risk of heart disease as estrogen is. "But that is an extremely beneficial trade-off; you can work on heart disease in many different ways, and weak bones are much more difficult to fix. As you know, I am a strong

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believer in the importance of food, nutrition, and prevention, but I think our greater understanding of molecular biochemistry and what on goes at the cellular level, and our ability to design drugs to specifically get estrogenic effects in some tissues and antiestrogenic effects in other ones–I think all that research is incredibly promising. They are using the isoflavones as a model and then designing better drugs from them, maximizing benefits and decreasing disadvantages." Mark believes that soy isoflavones will not be as potent as estrogen for bone health or heart disease–but the beauty of isoflavones is that there has never been any concern whatsoever about their safety. That is why it is so critically important to figure out some of the unexplained findings concerning soy and breast cancer. In addition, we must do the studies to see if soy isoflavones promote cognitive function (or delay impairment of it)–like estrogen probably does. If they do not, they won't be nearly as popular–because that is going to be such a big issue with an aging population.

Will people who raise concerns about adverse effects of soy isoflavones be invited to speak at the Third International Symposium? Mark thinks they will definitely be invited to participate, in part because he has chosen a large advisory board. However they may end up doing a poster session rather than a major speech–unless their data look extremely important. The politics of soy and isoflavones is still real and pervasive.

As an almost comic example of this, Mark heard of a man who is an M.D. and PhD in nutrition who was holding a small meeting about soy. He had been studying soy for 2 weeks. When Mark called him and asked if he could attend the meeting, the man yelled at him on the phone (quite arrogantly) for 10 minutes. He objected to some statements that Mark had made on possible adverse effects of soy. Mark said he would be happy to discuss the subject. The man said Mark could come to the meeting if he promised not to bring up that subject. Apparently he wants to make a name for himself in the field of soy. Address: PhD, 1543 Lincoln St., Port Townsend, Washington 98368. Phone: 360-379-9544.

10528. Gotoh, T.; Yamada, K.; Yin, H.; Ito, A.; Kataoka, T.; Dohi, K. 1998. Chemoprevention of N-nitroso N-methylurea-induced rat mammary carcinogenesis by miso and tamoxifen, alone and in combination. *Japanese J. of Cancer Research* (*Gann*) 89(5):487-95. May. *
• ***Summary:*** Diets containing either 10% soybeans or 10% miso reduced mammary tumor numbers (tumors/rat) by roughly 50%, although there was little effect on tumor incidence (percentage of rats in each treatment group developing tumors).

The combination of miso and tamoxifen strongly inhibited tumor development–more than either agent alone. Moreover, when treatment was delayed until mammary tumors were already established, the combination of miso and tamoxifen inhibited tumor growth by about 50%, whereas tamoxifen by itself was ineffective. Miso by itself was not studied.

10529. Sugawara, Etsuko; Yonekura, Yuichi. 1998. Comparison of aroma components in five types of miso. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 45(5):323-29. [13 ref. Jap]*
• ***Summary:*** The compositions of aroma components were compared in three types of rice miso, red salty rice miso (*sekishoku karakuchikei komemiso*), thin-colored salty rice miso (*tanshoku karakuchikei komemiso*), and weak-salty rice miso (*komeamamiso*) which were produced from soybeans and rice, barley miso (*mugimiso*) produced from soybeans and barley, and soybean miso (*mamemiso*) produced from soybeans only. Address: 1. Faculty of Education, Iwate Univ.; 2. Iwate Industrial Research Inst. Both: Iwate prefecture, Japan.

10530. *Rafu Shimpo* (*Los Angeles, California*). 1998. TV host Huell Howser named Tofu Festival celebrity chair. June 30. [Eng]
• ***Summary:*** The L.A. Tofu Festival will kick off the 58th annual Nisei Week celebration. "No longer just an Asian mainstay, tofu is fast becoming a cross-cultural 'super' food, packed with antioxidants, protein and calcium. Made of soybean curd, tofu is finding it's way into enchiladas, chocolate cheesecakes and *ceviche / seviche*–some of which will be offered at the weekend festival." A photo shows Huell Howser enjoying a tofu dish at Jozu restaurant.

10531. Anderson, Barb Baylor. 1998. A new-uses promotion of Olympic proportions: ASA project targets restaurants throughout Japan. *Soybean Digest.* May/June. p. 12.
• ***Summary:*** "Biodiesel is produced from the oil after being used in french fry vats or tempura shops. This can be used to power buses and trucks, generate electricity, and run heating and air conditioning units."

During the Winter Olympics in Nagano, a KFC [Kentucky Fried Chicken] franchise in Olympic Village was used by the American Soybean Association's Japan director Kent Nelson to launch "ECO 2000," a project to promote the idea of using biodiesel to generate electricity to run heating and air conditioning units at the KFC store and other locations. The goal is "to have at least one new corn or soy-based product in use at more than 2,000 restaurants in Japan by the year 2000."

10532. **Product Name:** [Momen Tofu (Nigari), Okara, Oboro Tofu, Atsuagé (Deep Fried), Yaki Dofu (Grilled), Fresh Yuba].
Foreign Name: Momen Tofu (Nigari), Okara, Oboro-dofu, Atsuagé, Yaki Dofu, Fresh Yuba.
Manufacturer's Name: Awayuki.

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Manufacturer's Address: Boerhaaveplein 2hs, 1091 AS Amsterdam, Netherlands. Phone: +31 (20) 468-5617.
Date of Introduction: 1998 June.
Nutrition: Tofu; SS-VA; USA; CSP; FibeOkIgûTofu; SS-VA; USA; CSP; FibeOkIg
New Product–Documentation: Letter from Mitsuo and Atsuko Kamada. 1998. Jan. 16. They plan to start a tofu shop making Japanese style momen tofu, yose-dofu, yaki-dofu, and atsuage. Present address: Gerrit van der Veenstraat 145/4, 1077 DZ Amsterdam. Company name: Awayuki–Japans Tofu en Delicatessen Produceren.

Letter from and form filled out by Mitsuo and Atsuko, husband and wife, founders and partners in Awayuki. 1999. Jan. 20. On 1 Jan. 1998 in Amsterdam they established a production and wholesale company named Awayuki. They began tofu production in June 1998. Their production is completely Japanese traditional style like Sangen-ya and uses nigari from Yoshikawa for curding. Equipment: Japanese stone mill, stainless steel cauldron 60 cm in diameter with gas cooking stove, Japanese hand press machine, and a deep forming box. They bought some equipment and special tools from Japan. All their products are now made from organic soybeans, which they buy from a Dutch company. Two books by Shurtleff & Aoyagi (*The Book of Tofu,* and *Tofu & Soymilk Production*) were very helpful to them. Everything they know they learned from these books, because now in Japan it is difficult to find traditional tofu production. They now make the following amounts of the following soy products: Nigari momen tofu, started June 1998, about 2,500 packs/month (each pack weighs 370 gm). Atsuagé (Deep Fried), started Sept. 1998, about 300 packs/month. Yaki Dofu (Grilled), started Nov. 1998, about 100 packs/month. Fresh Yuba, started Nov. 1998, by special order only. A letter to Akiko in Japanese says that her many detailed illustrations in the above books were very helpful. Everyone in Amsterdam says their tofu is the tastiest available.

Photos sent by Mitsuo and Atsuko. 1999. April 5. Eleven color photos show how they make traditional tofu in their shop in Amsterdam.

10533. Chajuss, Daniel. 1998. Soy protein concentrate: Current status. *Oils & Fats International* 14(3):35-36. June.
• ***Summary:*** The three main commercial soy products are (1) Full fat and defatted soya flours and textured soya flour–current world production and sales about 80,000 tonnes (metric tons). (2) Soya protein isolates–current world production and sales about 130,000 tonnes. (3) Soya protein concentrates–current world production and sales about 284,000 tonnes, and growing at about 15% a year. More than 75% of all concentrates are now used for human consumption, the rest being used in pet and animal feeds. In human foods, concentrates are used mainly in meat alternatives or extenders. In animal feed they are used in formulations for calves and piglets as a milk replacer, in pet foods and in special feedstuffs such as 'fish-flavour-free' bland fish seeds, and for mink and other animal feeds. Concentrates are devoid of the antigenic protein components present in most other soya products.

Production of soy protein concentrates worldwide is presently concentrated in the hands of two companies: ADM and Eridania Béghin-Say (Central Soya). About 95% of all soy protein concentrates worldwide are now made by the counter-current aqueous alcohol was system, originally developed in the late 1950s by the Hayes Company of Israel. A table shows estimates of world production (in metric tons) by company and country in 1998:

ADM, Netherlands 70,000 AAW (Aqueous alcohol wash).
ADM, USA 60,000 AAW.
Central Soya, USA (several factories) 60,000 AAW.
Central Soya, Aarhus, Denmark 50,000 AAW.
Sogip (Central Soya group), France 15,000 AAW.
Solbar Hatzor (formerly named Hayes Ashdod) (with Soya Mainz, an ADM subsidiary), Israel 15,000 AAW.
Sopropech, France 6,000 AWL (Acid/water leach).
Sanbra (Bunge), Brazil 5,000 Acid wash.
ADM, USA 3,000 Acid wash.
Lucas Ingredients, UK 2,000 (unconfirmed, Acid wash).
Total worldwide 284,000 metric tons.

The margins on soy protein concentrates are much more attractive than those from crushing soybeans into oil and meal–which in recent years have been either small or negative. The cost of making a tonne of concentrates ranges from US$459 to $600. For food applications, the sales price obtained by manufacturers for powder and small grits forms ranges from $1,200 to $1,600 per tonne, but for textured or functional forms this increases to $1,500 to $3,000 per tonne. The sales price for the pet food, milk replacer, and special feed industries ranges from $1,000 to $1,200.

Another high-value product, a potential source of additional income, is soya molasses, a by-product of making soy protein concentrates. It is a rich source of soya phytochemicals and soya oligosaccharides.

A second table shows estimates of world production (in metric tons) of soy protein isolates, with estimates for 1997 and forecasts for 1998.

Protein Technologies International (PTI, USA) 60,000 in 1997, 70,000 in 1998.
ADM, USA 15,000, 25,000.
PTI Belgium 15,000, 15,000.
Fuji-PTI Japan 10,000, 10,000.
Sanbra (Bunge) Brazil 5,000, 10,000.
Others worldwide 6,000, 8,000. Total worldwide 110,000, 138,000. Address: Managing Director, Hayes General Technology Co. Ltd., Misgav Dov 19, Mobile Post, Emek Sorek, 76867 Israel. Phone: +972-8-8592925.

10534. Dateline. 1998. Healthline: The joy of soy. Television

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broadcast. NBC. June 9.
• ***Summary:*** The announcer from Studio 3B in New York is Stone Phillips. He has four guests: Chief medical correspondent Dr. Bob Arnot, Bob McKeown, Keith Morrison, and chief consumer correspondent Lea Thompson. Mr. Phillips begins: "Most Americans don't know beans about soy, but that may soon change. The humble soybean is sprouting into the hottest new health food trend since oat bran, and for good reason. Scientists are learning that soy may help lower the risk of an amazing range of diseases."

Mr. Arnot then asks John Glaspy: "Which of these diseases could soy play a very positive preventive role? Heart disease?" Answer: Probably. Osteoporosis? Almost certainly. Menopause? Almost certainly. Breast cancer? Almost certainly.

Mr. Glaspy is most interested in breast cancer. He says that changing the way Americans eat could stop this killer. He believes that diet "could be a huge risk factor and could explain up to... 80 percent of breast cancer in the world."

Arnot adds that the first hint that soy may be a dietary factor begins in Japan. "Japanese women have one of the lowest breast cancer rates on earth. But when they move to Hawaii, leaving behind their native diet, their risk doubles. Doctors think the difference is soy."

Arnot says that "Debbie McCurdy is betting her future on soy. Diagnosed with breast cancer 2½ years ago, she has gone through surgery, chemotherapy, a bone marrow transplant and radiation. Now she's part of Dr. Glaspy's study to see if soy can protect her from a recurrence."

"Here's how doctors think soy works. In order for a breast cell to turn cancerous, it needs to be fed by strong hormones, like estroGen. But soy has what are called 'weak estrogens' that float through the blood and attach themselves to breast cells. That means, the strong, potentially harmful hormones have no place to attach to, and no way to turn a normal cell into a cancer cell."

"For the study, Debbie drank soy shakes three times a day and doctors took tissue samples to look for changes that might indicate the soy is working, but Debbie's not waiting for the results. Her family's menu has changed for good. They now eat lots of fruits and vegetables, as well as soy beans, miso soup, even tofu added to chili. And they seem to like it!"

10535. Japan Tariff Assoc. 1998. Exports of soy sauce (shoyu): No. 2103.10-000. *Japan Exports and Imports: Commodity by Country.* June. No. 618. p. 83. [Eng; jap]
• ***Summary:*** For each country, gives the quantity and value for the current month, and for the cumulative year to date. Address: 4-7-8, Kohji-machi, Chiyoda-ku, Tokyo 102-0083, Japan. Phone: 81-3-3263-7221.

10536. Japan Tariff Assoc. 1998. Exports of miso (bean paste): No. 2103.90-000. *Japan Exports and Imports: Commodity by Country.* June. No. 618. p. 83. [Eng; jap]
• ***Summary:*** For each country, gives the quantity and value for the current month, and for the cumulative year to date. Countries to which Japan exports large quantities of miso are (year to date in kg): USA 1,127,052. Taiwan 168,941. Hong Kong 156,221. South Korea 104,743. Total exported this year: 2,235,149 kg. Address: 4-7-8, Kohji-machi, Chiyoda-ku, Tokyo 102-0083, Japan. Phone: 81-3-3263-7221.

10537. Kikkoman Corporation. 1998. Annual report 1997. 339 Noda, Noda-shi, Chiba 278, Japan. 26 p. 28 cm. [Eng]
• ***Summary:*** The information in this English-language annual report is current as of April 1998. Contents: Financial highlights. Profile. A message from the president (Yuzaburo Mogi): The year in review, foundation, growth, and opportunity, serving a global market, toward the new century. A strong global operating presence: The Americas, Europe, Asia and Oceania, Japan. Operational review. Financial review. Financial section: Consolidated balance sheets, etc. Corporate history (chronology from April 1925 to October 1997). Global network (directory of Kikkoman names, addresses, and phone numbers worldwide). Board of directors and officers. Corporate data.

During fiscal 1997, ended 31 December 1997, consolidated net sales worldwide rose 4.0% over the previous fiscal year to 214.3 billion yen, breaking the record of 211.7 billion yen set in 1992. Yet income decreased by 21.6% to 5.711 billion yen.

Overseas sales expanded 10.6% in 1997 to 60.1 billion yen, and accounted for 28.0% of consolidated net sales.

The Americas: "In June 1998, Kikkoman Foods, Inc., the centerpiece of Kikkoman's expansion in North America, will celebrate 25 years of operations. The number of items produced at the plant has risen to more than 100, and the plant's production has expanded more than 10-fold."

"On April 17, 1998, Kikkoman commenced operations at its second U.S. plant, in Folsom, California. Built at a cost of US $46 million, the plant covers an area of approximately 210,000 square meters and has an initial annual production capacity of 10,000 kiloliters of soy sauce. In autumn 1998, the Company will begin delivering soy sauce produced at its second U.S. plant, in Folsom, California."

"Kikkoman's English-language Internet home page, opened in April 1997, receives approximately 100,000 hits a month, mainly from people in the United States. In particular, the recipes listed on the home page have attracted a great deal of interest, with site visitors frequently requesting further recipe information."

Europe: In Oct. 1997 Kikkoman Foods Europe B.V. began operation of its plant in the Netherlands.

Letter from Keiji Yamazaki of Kikkoman, San Francisco. 1998. Aug. 7. Kikkoman's annual reports are published in mid-June each year. Address: Noda, Japan.

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10538. Shimbo-Beitchman, Hiroko. 1998. Magical miso. *Saveur* (*New York, NY*) No. 27. May/June. p. 100-08, 110, 112.

• ***Summary:*** A beautiful article, loaded with glossy color photographs (by Christopher Hirsheimer and Tom Wagner) and recipes. Photos show: (1) Shiromiso in a stylish bowl. (2) A Japanese worker, in clothing with traditional designs, stands on the rim of a miso vat and shovels what will become miso at Yamaki Jôzô, a miso brewery built in 1902 by the Kitani family, in Kamiizumi-mura, Honjô city, Saitama prefecture, 75 miles northwest of Tokyo, Japan (full page). *Yama* means "mountain, *ki* stands for Kitani, and *jôzô* means "brewery. Kazuhiko Morita is the brewery's director. The company has been making three basic types of miso, plus shoyu and tofu, since 1902. Yamaki partially automated in the mid-1980s and today makes about 400 tons of a miso a year; it is not pasteurized and no alcohol is added in packaging as a preservative. (3) Looking down into a bowl of miso soup with tofu and wakame (full page). (4) The exterior of Yamaki Jôzô; a tree bearing bright orange persimmons stands in front of several traditional wooden buildings. (4) Hiroko Shimbo-Beitchman. (5) Mr. Morita, in traditional clothing, smelling the koji in a large, automated, stainless-steel koji incubation room. (6) The man shoveling the finished koji out of the incubation room onto a conveyor belt. (7) Eggplant Dengaku (with red and white miso, full page). (8) Walnuts being ground to a paste in a suribachi. (9) Steaming the soybeans at Yamaki Jôzô; 5,300 pounds of whole soybeans are steamed at a time. The company has two giant steel pressure cookers. For akamiso, the beans are cooked for about 7 hours until soft and yellow. (10) Cooling the cooked soybean on a conveyor belt. Most of the miso's flavor comes from the beans; the aroma and sweetness come from the kôji. (11) Mixing the cooked soybeans and koji, with salt and a little spring water. Then the mixture is forced through a machine like a meat grinder to produce a smooth paste, which will ferment more easily than a chunky one. (12) Putting the ingredients for akamiso into 100-year-old cedar vats, which are covered with plastic sheeting then weighted. After several months it is moved to another set of barrels, then again a few months later. It can age for up to two years. (13) Three packages of commercial Japanese miso: akamiso, akadashi-miso, and shiro miso.

Recipes: Miso soup with tofu and wakame. Eggplant dengaku with two miso sauces. Green beans with miso dressing. Broiled miso-marinated black cod. Panfried miso-marinated beef. Steamed pork with mamemiso. A sidebar describes the different types of miso, with details on akamiso, mamemiso, and shiro miso. The company also makes brown rice miso (unpasteurized), and a kit (with koji and instructions) for making your own miso at home.

Traditionally miso made at home was the source of great family pride. *"Temae miso desu ga,"* one would say–meaning "I don't want to boast about my miso, *but..."* Today Japan's 50 largest miso manufacturers control about 90 percent of the market. But miso connoisseurs prefer miso made by smaller companies in the traditional way; these are painstakingly preserving old-fashioned techniques and regional miso styles. Address: Teacher of Japanese cooking, Hiroko's Kitchen, London, England. Phone: Fax: 44-171-289-0855.

10539. Tamang, J.P. 1998. Role of microorganisms in traditional fermented foods. *Indian Food Industry* (*Mysore, India*) 17(3):162-67. May/June. [32 ref]

• ***Summary:*** This article is mainly about the benefits of fermentation and fermented foods. Contents: Introduction (main microorganisms are filamentous fungi, yeasts and bacteria, especially LAB = lactic acid bacteria). Biopreservation. Bioenrichment. Microorganisms that produce enzymes. Microorganisms that destroy undesirable components. Enrichment of the diet. Mixed starter culture. Traditional fermented foods of medicinal value (koumiss, kvass). Conclusion.

The following fermented soyfoods are mentioned: Kinema, hawaijar, miso, natto, shoyu, tauco, and tempe [tempeh]. Koji is also mentioned.

"Fermented foods are defined as foods that have been subjected to the action of selected microorganisms by which a biochemically and organoleptically modified substrate is produced, resulting in an acceptable product for human consumption." Address: Microbiology Research Lab., Dep. of Botany, Sikkim Government College, Gangtok, Sikkim–737 102, India.

10540. **Product Name:** Certified Organic Soymilk (Sold in Quart Pure-Pak / Gable Top Cartons) [Regular, and Chocolate].
Manufacturer's Name: Wildwood Natural Foods (Marketer-Distributor).
Manufacturer's Address: 1560 Mansfield Ave., Suite D, Santa Cruz, CA 95062. Phone: 408-476-4448.
Date of Introduction: 1998 June.
Ingredients: Filtered water, whole non-genetically modified, certified organic soybeans*, certified organic brown rice syrup*, naturally occurring calcium carbonate, sea salt, carrageenan, xanthan gum, vitamin A palmitate, vitamin D-2, vitamin B-2 (riboflavin), vitamin B-12. * = Grown and processed without synthetically compounded herbicides or pesticides in accordance with the California Organic Foods Act of 1990.
Wt/Vol., Packaging, Price: 32 fl. oz (1 quart). Pure Pak carton. Retails for $2.29 (1998/07 California).
How Stored: Refrigerated.
New Product–Documentation: Talk with Billy Bramblett of Wildwood Natural Foods. 1998. June 24. Wildwood recently introduced a new fresh soymilk, sold in gable-top quart cartons. The flavor is excellent. Two packages with

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Labels sent by Billy Bramblett. Green, red, blue, and orange on white. The front panel states: "1% of sales donated to the Breast Cancer Fund. Low fat. Non-dairy drink. Calcium and vitamin enriched. Naturally lactose free." One side panel states: "A diet rich in soy contains a variety of beneficial phytonutrients including*: Isoflavones. Genistein. Phytoestrogens. * = Consult your physician concerning the role soy may play in effecting specific chronic diseases. Trusted purity since 1980: Naturally antibiotic and hormone free. Vegan–No animal products. Enjoy other Wildwood soy foods: Organic tofu. Wild Dogs. Vegie Burgers. Meltables. Talk to us at 1-800-499-Tofu." A second side panel, titled "The fresh approach to healthy eating," states that "1% of sales of this product goes to researching environmental causes of breast cancer."

Talk with Bill Bramblett. 1998. June 9. The original Wildwood soymilk was named Yo Soy! Ted Nordquist and his company TAN Industries, Inc. have played a major role in developing and making this soymilk. Jeremiah and Ted have been friends for many years, and recently they have been working together very closely on this soymilk. They used to call it the "Ted and Wally Show." Jeremiah went to Ted 4-5 years ago; Ted had a new technology for making non-beany soy base. Jeremiah and Ted came up with a formulation for the final product made from Ted's soy base. They had dreams of building a plant together, where Wildwood would do the tofu side and Ted would do the milk side. But in the end, Wildwood didn't have the funds or energy to go that direction, so Ted went to White Wave and told them about his great soymilk. Then White Wave came up with their own formulation (which was different from Wildwood's formulation), resulting in Silk. Ted makes his soymilk at a plant in southern California [Soyfoods of America], then another California company [Morningstar, formerly called Avoset] finishes and packages the product for Wildwood. Ted is in the process of developing a new yogurt, which is not yet on the market. He would like to make it for Wildwood, but Billy doesn't think it is ready. Also Ted wants the yogurt package to bear the words "Made with TAN soy base."

Talk with Jeremiah Ridenour of Wildwood. 1998. Oct. 20. This product was first sold in June 1998. It may be the first soymilk in America to have the word "Soymilk" in the product name–to test the FDA. Wildwood has nothing to do with the manufacture of packaging of the product; It is made at one place and packaged in another. White Wave's Silk is this product's main competitor. Jeremiah believes that Wildwood's formula is better. See also Oct. 1998 interview with Jeremiah on the early history of this product. This product states in the ingredient listing that it is GMO free, but Jeremiah thinks that the term "organic" is still more important to consumers than "GMO free."

Leaflet (single sided, 8½ by 11 inch, color) sent by Patricia Smith from Natural Products Expo West. 1999. March. "Introducing Wildwood Natural Foods Organic Soymilk. Low fat. Delicious non-dairy drink. Calcium & vitamin enriched. Naturally lactose free. 1% of sales donated to the Breast Cancer Fund. Available in Regular and Chocolate flavors."

Product (chocolate, quart) with Label purchased at Safeway supermarket in Lafayette, California. 2001. April 1. Both real vanilla and chocolate quarts are sold refrigerated in the Odwalla cooler in gable-top cartons for $1.99/quart. One side panel reads: "Wildwood has been making soymilk for over 20 years. As a pioneer in American soyfoods Wildwood has learned to make great tasting nutritious soymilks." The certified organic chocolate is produced from beans grown in a bio-diversity preserve in Costa Rica and Panama.

The back panel states: "Wildwood Natural Foods. Affecting dietary and agricultural change. Wildwood owners Jeremiah Ridenour and Billy Bramblett both grew up in Michigan, then migrated to California and became evangelists for soy. Jeremiah comes from a soybean farming family. While he was studying tofu production in Japan, his future partner Billy was concocting tofu delectables at the legendary Sleeping Lady Cafe in Fairfax, California. Wildwood Natural Foods started producing organic Soymilk and Tofu in 1980. Today these two lead their company's production of thirty-five delicious, premium, organic soy products. More organic choice means less chemicals in your environment..."

10541. Yates, Ronald E. 1998. Shinzaburo Mogi in America: Making shoyu in Denver, Colorado, and Toronto, Canada. Work with and investment in the Oriental Show-You Co. in Columbia City, Indiana. In: Ronald E. Yates. 1998. The Kikkoman Chronicles. New York, San Francisco & Washington, DC: McGraw-Hill. xviii + 206 p. See p. 125-32.
• ***Summary:*** "Somewhere in Denver, Colorado, are the remains of what is most likely the first Japanese-built and managed soy sauce plant in the continental United States." It is fairly certain that Shinzaburo Mogi went to Denver in 1892. He was barely 20 years old and had a bold idea–to produce shoyu in the USA (p. 125). "As the fifth son of the Kashiwa branch of the Mogi family, he did not join the family business in Japan. His older brother, Shichirouemon Mogi, became the first president of the Noda Shoyu Co." (p. 129).

Kenzaburo "Ken" Mogi (not to be confused with Yuzaburo Mogi's younger brother, also named Kenzaburo) traveled to Denver in the early 1980s in search of info about his great-granduncle. "Kenzaburo, the son of Katsumi Mogi, who served as Kikkoman's president from 1980 to 1985, had heard the stories of this little-known member of the Mogi clan for years–some of them from Keizaburo Mogi, who served as president of Kikkoman from 1962 to 1974, when he became chairman of the board. Ken Mogi managed to learn that "Shinzaburo Mogi had indeed managed a soy

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sauce plant in Denver in 1907. Unfortunately the operation was not successful, Kenzaburo learned after meeting with a man who apparently worked with Shinzaburo Mogi at the plant... But failure in Denver didn't stop Shinzaburo Mogi from pursuing his dream of making soy sauce in North America" (p. 130). After Denver, he apparently helped manage a soy sauce plant in Toronto, Canada. Eventually, he settled in Chicago where he was involved in the trading business–including the importing of Japanese (most likely Kikkoman) shoyu to the United States" (p. 130-31).

Note: As of Nov. 2004 Soyfoods Center is aware of very little evidence indicating that Shinzaburo Mogi ever started a plant making fermented soy sauce in Denver, Colorado, or anywhere in the United States. We believe that Kikkoman has spread this unfounded rumor. On 7 Feb. 2005 Kenzaburo Mogi IV, the first person from Kikkoman who tried to find evidence of these existence of this soy sauce plant in Denver, replied to a letter from William Shurtleff asking whether Ken thought the Denver soy sauce plant was a theory or a fact: "I also think it is unfortunate that the theory is told as a fact." Address: Head, Journalism Department, Univ. of Illinois (Urbana).

10542. Yates, Ronald E. 1998. The story of the origins of Kikkoman in a woman named Shige Maki (Document part). In: Ronald E. Yates. 1998. The Kikkoman Chronicles: A Global Company with a Japanese Soul. New York, San Francisco & Washington, DC: McGraw-Hill. xviii + 206 p. See p. x-xi, 13-19, 62.

• ***Summary:*** Before we recount this story, we would like to say that we question its authenticity. Why was Shige Maki not mentioned in Mark Fruin's classic 1983 history of Kikkoman titled *Kikkoman: Company, Clan and Community,* published by Harvard University Press? William Shurtleff asked Dr. Fruin in late 1998 if he had ever heard of Shige Maki and he replied "No." Why has Soyfoods Center never heard this story before? Why does Mr. Yates provide no documentation to support this story–or the story that Kikkoman traces its origins back to 1630–for which we have never seen any credible evidence. We find this all very suspicious.

According to Mr. Yates, Kikkoman now traces its origins back to a woman named Shige Maki, who in 1615 was living in the Shadow of Osaka Castle, where her husband, Yorinori, was a samurai warrior (retainer) serving the warlord Hideyori Toyotomi. Hideyori (1593-1615), whose archrival was Ieyasu Tokugawa, was the son of Hideyoshi Toyotomi, one of Japan's greatest warlords and a man credited with uniting Japan in 1590 by subjugating the five western provinces of Japan's main island, Honshu. In 1586 Hideyoshi built the magnificent Osaka Castle–the largest and most impressive castle in Japan. For the next 5 years, Hideyoshi continued to consolidate his power via a series of battles and castle sieges. In 1591 he issued an edict establishing four distinct classes of people. At the top were samurai, followed by farmers, artisans, and merchants. That rigid social order lasted until 1868, when Japan's emperor Meiji ended feudalism and ushered in the nation's modern era. In 1597 Hideyoshi invaded Korea; he died there in 1598 during the campaign. His Japanese forces withdrew and in 1600 Ieyasu Tokugawa, a senior general in Hideyoshi's army, seized power following the battle of Sekigahara when he defeated an army of Hideyoshi's former vassals and retainers. This move was viewed as betrayal by many of Hideyoshi's men. In 1603 Ieyasu was awarded the titled of shogun by the emperor; he was the first of Japan's powerful line of Tokugawa shoguns that would rule Japan virtually unchallenged until the mid-1800s when Commodore Matthew Perry of the United States and his squadron of black ships forced Japan to open its doors to global politics and commerce.

The Toyotomi family, now led by 19-year old Hideyori, vowed revenge on Ieyasu Tokugawa. Shige Maki and her husband, Yorinori, supported Hideyori. But in June 1615 Hideyori was defeated at Osaka Castle. Yorinori committed suicide; Shige Maki and her young son, Heizaburo, escaped from the castle and fled. For 15 years the two were on the run. "Eventually, Shige Maki and Heizaburo settled in the small farming community of Noda, about 30 miles north of Edo (now Tokyo). In the interim they had changed their name from Maki to Mogi, with Heizaburo altering his first name to Shichizaemon. No descriptions of Shige Maki exist, but she must have been one tough and resourceful lady. Not only did she survive the bloody battle of Osaka Castle and outwit the shogun's henchmen, but she spent years working in the rice fields of Noda" (p. 13-17).

On pages x-xi the author tells the end of this story somewhat differently: Because Shige Maki and "all others who had supported Toyotomi were on Tokugawa Ieyasu's death list, she changed her name to Mogi and blended in with the rice farmers in the area [of Noda]. For 15 years, she and her son cultivated rice and in the process learned the craft of brewing *shoyu*–the Japanese word for soy sauce... Using her new name of Mogi, the resourceful woman... made some refinements in the production process and more than 300 years ago began making the product that the world today knows as Kikkoman."

Continuing on p. 19: "Among the earliest recorded shoyu producers in Noda were Hyozaemon Takanashi and Shichizaemon Mogi [Shige Maki's son]. Local records show that Takanashi was producing fermented shoyu in 1661, while the Mogis were making miso [by 1662].

"A year later, on August 22, 1662, some 47 years after she had escaped from the ruins of Osaka Castle, Shige Maki died. There is no doubt that if Shige Maki had not been as intrepid and resourceful as she was, there would be no Kikkoman Corporation today."

On page 62 Yates tells this story with still another twist: "When Shige Mogi (nee Maki) and her son Schiroemon [sic,

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Heizaburo] began making miso and shoyu in Noda in the 1600s, it was still very much a farmhouse industry."

Note 1. Soyfoods Center believes, based on three detailed histories of Kikkoman published in Japanese, plus the excellent research of Mark Fruin and others, that Kikkoman cannot trace its connections with soy sauce back farther than 1661, when Hyozaemon Takanashi started to make shoyu in Noda. We want to emphasize that there was no connection between the Takanashi and Mogi families until 1768 (more than 110 years after Hyozaemon Takanashi started to make shoyu in 1661). Mr. Yates presents no evidence that Shige Maki or her son ever made soy sauce (shoyu).

Mr. Yates continues (p. 19-20): In 1768 the eldest son of the Hyozaemon Takanashi clan married the "daughter of the fifth generation of the Shiroemon [sic, Shichizaemon] Mogi line. This was to be only the first of a series of alliances between the Mogi and Takanashi families."

Note 2. According to Fruin (1983, p. 16) Shichizaemon Mogi started to make miso in Noda in 1662. This was the Mogi family's earliest connection with foods or condiments made from soybeans. Address: Head, Journalism Department, Univ. of Illinois (Urbana).

10543. Yates, Ronald E. 1998. History of Oriental Show-You Co. in Columbia City, Indiana (Document part). In: Ronald E. Yates. 1998. The Kikkoman Chronicles. New York, San Francisco & Washington, DC: McGraw-Hill. xviii + 206 p. See p. 131-32.

• ***Summary:*** Oriental Show-You Co. was founded by Shinzo Ohki. He was born in 1884 in Kamakura, Japan, the son of a shoemaker and one of eight children. As a boy, Ohki served an apprenticeship in his uncle's saké (rice wine) warehouse. In 1901, barely 17 years of age, he used the money he had saved to emigrate to the United States. He made his way to the Midwest, where he settled in Columbia City, Indiana. There he graduated from high school, later graduating from New York University.

From New York, he moved to Detroit, Michigan, where he established a business importing tea and bulk shoyu [Japanese-style soy sauce] from Japan. He bottled the soy sauce and sold it with his tea. Before long he discovered a large demand for soy sauce from the Asian community in that area.

Returning to Columbia City, Indiana, Ohki recruited a partner, established the Oriental Show-You Company, Inc., and went into business bottling his imported soy sauce in an old canning plant. As demand for his soy sauce continued to grow, Ohki realized he would be more successful if he learned how to make the product himself.

So in 1917 he returned to Japan, learned how to make shoyu, obtained a formula for the naturally fermented product, and (with a wife) returned to Columbia City, where he began to make shoyu.

He received some help from the U.S. Department of Agriculture in obtaining and culturing the necessary microorganisms needed to produce the koji required for traditional, natural shoyu. Soon his shoyu was sold in most Asian grocery stores in the area.

In the 1920s Shinzaburo Mogi (a descendant of Kikkoman's Mogi line), who was now working for the Yamato Trading Co. in Chicago, discovered Oriental Show-You in one such store. Intrigued by the idea of making traditional Japanese shoyu in America, "Mogi traveled to Columbia City to see the operation for himself." He found that Oriental Show-You Co. used a natural aging process that took about 24 months from start to finish. Impressed with Mr. Ohki and his shoyu operation, Mogi invested in the company and became a major stockholder, continuing as such until the start of "World War II when his property (as was the case with all Japanese immigrants) was seized by the U.S. government under the 'Alien Property Custodian Act' [sic].

"Mogi returned to Japan shortly before the beginning of World War II." He showed his daughter, Katsuko, the stock certificates she still owned from the Oriental Show-You Co. "They're worthless now," he said, and tore them up. Shinzaburo Mogi died in 1946 in Japan.

Oriental Show-You Co. continued to make shoyu until 1961, when it was acquired by Beatrice Foods, Inc. and became part of La Choy Food Products. The plant was eventually moved out of Columbia City and the fermentation process was discontinued in favor of the faster and less labor intensive HVP soy sauce process. Today the only evidence of the Oriental Show-You Co. in Columbia City is a few crumbling remnants of the factory's foundation.

At its peak, the Oriental Show-You Co. was making about 30,000 gallons per year of soy sauce. It was "perhaps the first successful Japanese shoyu operation on America's mainland" [sic].

Note: Early Japanese shoyu manufacturing companies were started on the West Coast of the USA in San Jose, California (1897 and 1907), Melrose, California (1908), Fruitvale, California (1908), Los Angeles, California (1908), Portland, Oregon (1909), Oakland, California (1909, two companies), and Stockton, California (1910). Source: Japanese-American Yearbooks.

Shinzaburo Mogi never worked for Noda Shoyu Co., Kikkoman's predecessor, and his efforts on behalf of shoyu in the United States were never sanctioned by Noda Shoyu Co.; his innovative activities abroad were completely independent. Address: Head, Journalism Department, Univ. of Illinois (Urbana).

10544. Cook, Anne. 1998. Kikkoman knows taste of success: Faculty member at UI writes book on soy sauce firm. *News-Gazette* (*Champaign, Illinois*). July 4. p. A3. [1 ref]

• ***Summary:*** Ron Yates, who is now head of the journalism

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department at the University of Illinois (Urbana) has recently written a book titled *Kikkoman Chronicles,* a history of the world's largest maker of soy sauce, published by McGraw Hill. For ten years, during the 1970s and 1980s, Ron Yates was the business correspondent for the *Chicago Tribune* in Japan. He speaks Japanese. Kikkoman's history started in 1630. This article states (incorrectly) that (1) shoyu had been brewed in Japan since the 6th century; (2) the founder of Kikkoman's plant in Walworth, Wisconsin, Yuzaburo Mogi, came to the United States in the early 1970s as a Columbia University student; he came to the U.S. even though he didn't speak English. The handwriting was on the wall in the 1960s in Japan. The market was saturated. Mogi said he needed to learn about America. A photo shows Ron Yates. Address: Staff writer.

10545. Bernard, Richard L. 1998. Thoughts on naming soybeans introduced from abroad (Interview). *SoyaScan Notes.* July 14. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Most of the important early soybean varieties grown in the USA were not developed here; they were introduced from abroad, then tested, and those that performed well were given a name. In talking about when an early soybean variety was first named, it is important to remember that most of these varieties already had names in the country from which they were imported to the USA. In some cases we kept that name (Eda Mame, Kanro) and in some cases we modified it only slightly (or renamed it), usually to make it shorter (Wase Eda Mame -> Waseda; Chusei O Saya Eda Mame (from Imperial Seed Co., Tokyo) -> Osaya; Chusei O Saya Eda Mame {from Yamato Seed Co., Tokyo} -> Chusei; Higan Mame -> Higan; Sousei O Saya Eda Mame -> Sousei; Shing Toa -> Shingto) (See Bernard, Juvik & Nelson 1987, p. 64-69).

If we do refer to a "year named," we should qualify that with a footnote such as: "The year that a soybean variety first appeared with this name in a U.S. publication." It might also be noted that a variety may be released commercially before or after it is first named in the USA.

Once a Japanese soybean breeder was being criticized by his boss who asked, "Why can't you develop high-protein soybean varieties like that Sioux variety that the Americans have developed?" It turns out that Sioux was a Japanese variety ('Aoshiro Eda Mame' introduced to the USA from Sapporo, Hokkaido, Japan, in 1929; PI 81.021); Dr. Bernard has heard that it was even developed in Japan at his station. When we send soybean varieties developed in the USA to foreign countries, we hope and expect that they will not rename them. Yet many soybean breeders write articles about newly discovered traits (such as resistance to a particular disease) in journals like *Crop Science* without even mentioning that soybean's country of origin, or when it was introduced, or its foreign name (if known). "That is criminal. We give them no credit at all. If people in other countries did that without our soybean varieties, we would be highly indignant. A breeder, who was here from Pakistan a few years ago, said the leading soybean variety there was Williams. They call it Williams–as they should. We should do the same." Address: USDA/ARS Soybean Germplasm Collection, Room 229 EASB, 1101 W. Peabody Drive, Univ. of Illinois, Urbana, IL 61801.

10546. Miles, Carol A. 1998. Re: Vegetable soybeans. Letter (e-mail) to Dana Jacobi in New York City, July 14. 1 p. [2 ref]

• ***Summary:*** Dana Jacobi sent Carol the rough draft of an article she is writing on green vegetable soybeans. Carol responded that she has been conducting vegetable soybean variety trials in southwest Washington state for the past 3 years. She has also been developing new vegetable soybean varieties which should be ready for release in several years. She has been working with Mark Musik [the farm advisor for the Pike Place Market] and Hmong farmers [rhymes with "mung." They are hill people from Laos] for the past year, and it looks like their work together next year will be ever better.

"I think it is important to state clearly that vegetable soybeans, although the same genus and species as field soybeans (*Glycine max*), are special varieties and they differ biochemically from field soybeans. Vegetable soybeans have different biochemical components which allow them to be eaten after boiling for only 5 minutes. If a person were to harvest field soybeans at the green stage and boil them for 5 minutes and eat them, they would get stomach cramps due to the indigestibility of the beans."

She has heard the SunRich did not pay close enough attention to this point and used field soybeans when developing their Sweet Beans. The company later got lots of complaints about the indigestibility of Sweet Beans.

Carol has a web page at http://agsyst.wsu.edu on which are several research-type papers that she has written about edamame. The information about biochemical differences between edamame and field soybeans is in these papers.

Talk with Carol Miles, PhD. 1998. Aug. 26. She got her PhD from Cornell University (Ithaca, New York) in vegetable crops, with a minor and dissertation in breeding sweet corn. Now she is working on edamame with Tom Lumpkin, who is at Washington State Univ. She has been there growing edamame for 4 years. She and her co-workers like edamame very much, as do her two young kids. Her information on biochemical differences between vegetable-type soybeans and field soybeans comes from a paper by Tom Lumpkin. They have a lower content of trypsin inhibitors and of indigestible oligosaccharides, and more vitamins. She has written some research reports on edamame, but no refereed journal articles. The Pike Place Market is the largest farmers' market in the Pacific

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Northwest. It is located in downtown Seattle on Pike Street. A farmer's market, by definition (largely for insurance purposes), is one in which at least 50% of the products must be produce sold by the people/farmers who grew it. The other 50% can be crafts, produce sold by people who did not grow it, etc. There is not yet a measurable acreage of green vegetable soybeans in Washington state; this is a new crop that is still in the development stage. Carol has a variety testing program in western Washington and down into Oregon where the climate is mild and the precipitation high. Most of this seed is imported from Japan and costs about $17/pound, which is prohibitive. So there is a big need for her program to have its own seed production and its own varieties. Therefore, she also has a variety development program, where she is plant breeder using conventional methods. Tom is trying to develop pod-shatter resistance. The major constraint to developing varieties is pod shatter during harvesting. Dr. Sundar Shanmugasundaram at AVRDC in Taiwan has found that pod-shattering is linked to one of the soybean's oils. He is trying to isolate these oils in vegetable-type soybeans. Carol was in Taiwan working with him in November and December of 1997. Another constraint is lack of good harvesting equipment; she has been trying for several years to get the vegetable processing industry interested in this problem since they have the equipment. She is aware that work has been done on this in Illinois and Colorado; Taiwan uses an FMC green bean harvester.

Carol believes that edamame must be adapted to American culture by serving it as a good, wholesome green vegetable, served on the table like green peas or used as an ingredient in other dishes such as a stir-fry–rather than as a snack food with beer as it is served in Japan. So she would sell edamame shelled, rather than in the pods. She heard a rumor that last year SunRich did not use vegetable-type soybeans for their Sweet Beans; they used field-type soybeans and they had some major consumer problems, as with indigestion.

The Hmong farmers comprise the largest single group of farmers selling through the Pike Place Market. Traditionally a roaming tribal, patriarchal group from Laos, they collaborated with the USA as "jungle guides" during the Vietnam war and so our country brought them here as refugees after the war about 15 years ago. A large community of Hmongs lives in the Seattle area. Few of the adults speak English, but the children are being raised in the American system. They traditionally grew green vegetable soybeans in Laos, but their seed, which was suited to a tropical climate, would not flower in the Seattle area, which has a cooler climate and a longer day-length. Carol has supplied the Hmong farmers with seed. She works mostly with seed companies from Japan, but she knows of two U.S. seed companies that sell vegetable-type soybeans: Johnny's Selected Seeds in Maine and Nichols Garden Nursery in Oregon. Nichols (located at 1190 North Pacific Highway, Albany, OR 97321-4580. Phone: 541-928-9280) started in 1997 to sell Buker's Favorite Soybean–a breeding line Carol has worked on. Dr. Robert J. Buker is a plant breeder who worked in Illinois, then overseas for 20 years. Now he works in Vancouver, Washington, which is just across the river from Portland, Oregon. He received his material from AVRDC several years before Carol got hers. Address: PhD, Washington State Univ., Extension Agricultural Systems, 360 NW North Street, Chehalis, Washington 98532. Phone: 360-740-1295.

10547. Doerge, Daniel R. 1998. Antithyroid factors in soybeans that can cause thyroid problems or goiter (Interview). *SoyaScan Notes.* July 21. Conducted by William Shurtleff of Soyfoods Center. [1 ref]

• ***Summary:*** Dan (whose surname is pronounced DOR-gee; rhymes with Porgy) and coworkers have done research showing that the isoflavones genistein and daidzein are the antithyroid principles in soybeans. They fractionated the soybean extract and showed that the genistein and daidzein peaks had essentially all of the antithyroid activity that was present in the extract. Then they did mass spectrometry to characterize substances. This is very interesting because isoflavones are not inactivated or destroyed by heat; they are not heat labile. Yet most of the literature shows that heating soy products destroys their anti-thyroid principles. Dan does not know how to explain this. He believes he is starting to understand the mechanisms and becoming able to make predictions in terms of thyroid status, iodine status, and potential for hazards in humans.

People are now promoting soy because of its health benefits and chemotherapeutic properties (which may be based on genistein and daidzein), and it may have some of these excellent properties, but it could also cause problems for people who are "thyroid compromised." A surprisingly large number of Americans have hypothyroidism or a thyroid problem, or are on the borderline of having a thyroid problem (clinically euthyroid), and they should not be consuming large amounts of genistein or daidzein–especially in the form of supplements. About 10% of American women over the age of 60 are hypothyroid (have low thyroid levels); this happens with a gradual reduction of autoimmune function.

Some data from soy-based infant formula makers show that 20-25% of American babies, infants and children are raised on soy formula. Research by Ken Setchell has shown that these kids have higher blood levels of genistein and daidzein than women who take soy/estrogen supplements. There is no direct evidence that there is a problem in kids–but this is the most important potential risk that should be addressed with further research.

In addition, there is evidence in the literature that kids on soy formula are more likely to go on autoimmune thyroiditis in their later lives. (See Fort, P., et all. 1990.

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"Breast and soy formula feeding in early infancy and the prevalence of autoimmune thyroid disease in children." *Journal of the American College of Nutrition* 9:164-67). "But let's be clear about this. I think there is a big difference between people eating soybeans or soybean products, and people taking genistein or isoflavone supplements. The level of estrogen of intake is much higher with the supplements, and that makes a great deal of difference."

Ishikawa and coworkers in Japan have done some good work on soy and thyroid function in about the 1970s or 1980s. Address: PhD., Dep. of Health and Human Services, Food and Drug Administration, National Center for Toxicological Research, Div. of Reproductive and Developmental Toxicology, Jefferson, Arkansas 72079-9502, and Dep. of Biochemistry, Univ. of Arkansas for Medical Sciences, Little Rock, AR 72205. Phone: 870-543-7000.

10548. *Rafu Shimpo* (*Los Angeles, California*). 1998. Tofu festival celebrates multicultural diversity. July 21. p. 1, 3. [Eng]

• ***Summary:*** A good preview of the festival, to be held Aug. 15-16. General Food tickets will be available for $1 each. Preferred seating will also be available for $25 per person. More than 30 Southern California restaurants will showcase an array of international cuisine ranging from tofu enchiladas and chocolate tofu cheesecakes to tofu ceviche / seviche. The new Children's Pavilion play area will offer face-painting, balloon-making, story-telling, break-dancing, puppet shows, arts and crafts, and many more activities.

"Proceeds from the L.A. Tofu Festival will benefit the Little Tokyo Service Center and the Japanese American Cultural and Community Center, two community-based nonprofit organizations." A photo shows participants in last year's Tofu Eating Contest.

10549. American Soy products. 1998. Official celebration guide: Invitation. Saline, Michigan. 12 p. 13 cm.

• ***Summary:*** This attractive passport-sized booklet states: "American Soy Products presents the opening of the largest soymilk processing facility in North America. Official opening ceremony: Wednesday, Sept. 9, 1998. Your invitation–VIP guest No. 01325024. Registration time: 11:15 to 11:30. Official ceremony: 12:00 noon to 12:45 p.m. Followed by light refreshments and hors d'oeuvres. Lunch: 2:00 to 3:00. Tours and demonstrations: 1:00 p.m., 2:00 p.m., 3:00 p.m., 4:00 p.m. RSVP by August 12.

"The event will honor the achievements of a unique joint venture partnership formed to produce Edensoy for the North American marketplace."

"Factory facts: Square footage by Aug. 1998–65,000 square feet. Expected annual output–4,000,000 + cases. Number of quality control checks–245 (4000 per day). Soymilk lines–(2) 8800 pounds per hour and 13,200 pounds per hour.

"Celebrate with us 'History in the making' as four international corporations send you their personal invitation to salute cooperation and unity at work."

The CEO of American Soy Products is Mr. Hiroyasu Iwatsuki. "Joint venture partners: Eden Foods, Inc., Clinton, Michigan, USA. Mr. Michael Potter, Chairman/ President. Kawasho International (USA) Inc., San Francisco, California, USA, Mr. Akio Ono, President. Marusan-Ai Company Ltd., Okazaki-City, Aichi-Prefecture, Japan, Mr. Hatsuji Shimomura, President. Muso Company Ltd., Osaka, Japan, Mr. Yuko Okada, President." Address: 1474 North Woodland Dr., Saline, Michigan 48176. Phone: 734-429-2310.

10550. Bramblett, Billy. 1998. Company history: Wildwood Natural Foods. Fairfax, California. 10 p. Unpublished typescript.

• ***Summary:*** Contents: The beginning (1978-1981). The evolution (1982 to 1998). \"The beginnings of Wildwood Natural Foods, Inc. evolved over 2 years starting in 1978 [or maybe 1977] and culminating with incorporation in April of 1980 and actual operations in August of 1980. "In 1978, Paul Duchesne was an employee of the Good Earth Natural Food Store in Fairfax, California. Among his duties were the squeezing and bottling of fresh beet and carrot juice and the making of fresh sandwiches, all of which would be sold in the store each day. During a routine inspection of the Good Earth by the Marin County Health Department inspectors, it was determined that this practice was illegal, since the Good Earth did not have a health department approved kitchen and, therefore, no license to produce these products on the premises. Mr. Duchesne approached the cooperative ownership of a neighboring vegetarian restaurant, The Sleeping Lady Cafe, to determine if space might be rented at their kitchen during the very early morning for the production of sandwiches and juices. The co-op agreed and soon Mr. Duchesne was producing these products each morning and then transporting them to the Good Earth for sale.

"After a few months, Mr. Duchesne started producing a sandwich of his own invention, the brown rice and tofu sandwich (BRT), at the Sleeping Lady, on his own and selling those sandwiches to the Good Earth and a few other local health food stores. By the late summer of 1978, Mr. Duchesne was producing hundreds of the sandwiches weekly and delivering them to seven locations in central Marin county.

"At that point Mr. Duchesne decided that he wanted to move to Boston, Massachusetts, to study macrobiotics with Michio Kushi and so he gave his fledgling, as yet unnamed, business to a fellow named Paul Watson [sic, Chris Smith]. This enterprising man expanded the business and was soon delivering to over fifteen locations in central and southern Marin County. During a routine inspection of

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one of the southern Marin locations, the health department inspector noticed that the labels on these sandwiches were in violation of the State of California's labeling laws and contacted Mr. Watson. One of the violations was that there was no company name on the label. Mr. Watson [sic, Chris Smith] came up with the name Wildwood Natural Foods. He asked the advice of Bill Bramblett, the founder and general manager of the Sleeping Lady, on the choice of that name. Mr. Bramblett looked up 'wildwood' in the dictionary and discovered the meaning to be 'natural or wild wood or forestland in its natural state.' Since this described the Fairfax area fairly accurately, Mr. Bramblett agreed that this was a good choice for Mr. Watson's company."

Note: Talk with Billy Bramblett. 1998. Oct. 14. Billy now agrees (after talking with several old-timers, and reading some old articles) that it was Chris Smith, not Paul Watson who took over the company when Paul Duchesne left for Boston and who coined the name Wildwood. Billy cannot recall what Chris Smith looked like. He clearly remembers Paul Watson, who made and/or delivered Wildwood sandwiches after Duchesne left for Boston.

"Sleeping Lady Cafe began in 1972 and served all kinds of food, including meat, for the first three years. In 1975 we stopped serving meat, but did serve eggs and dairy. We also went non-smoking at that time. This was in the days before "vegan." We made our own yogurt, and got the cleanest foods we could find back in those days.

"Our credo was good food from the best sources we could find at reasonable prices, a wide variety of music and performing arts each night (and sometimes during the daytime as well) and rotating local art on the walls. We made our own furniture, built everything ourselves. We were hippies having fun. We were able to last over 12 years because we paid cash for everything and paid ourselves last. An amazing adventure.

"By the spring of 1979, Mr. Duchesne had started his own version of the brown rice and tofu sandwich company in Boston, but had had a difficult winter and was weary of the East Coast. Mr. Watson longed to travel east and study macrobiotics with Mr. Kushi, and so the two traded places, Mr. Duchesne returning to Fairfax and Mr. Watson going to Boston. Since Mr. Duchesne had given Mr. Watson his business, Mr. Watson gave it right back to Mr. Duchesne. Suddenly Mr. Duchesne was an entrepreneur and was making 400 to 500 sandwiches each week and delivering them all over Marin County. He did most of the work himself, with his wife and children helping out on occasion. Each morning as Mr. Duchesne departed on his route, he would give a BRT sandwich to Mr. Bramblett, who was the breakfast cook at the Sleeping Lady. Mr. Bramblett loved these sandwiches and realized what a great potential there would be in the greater San Francisco Bay are for this product. One morning Mr. B mentioned to Mr. D that an investment of about $10K could likely put this product Bay Area wide. He outlined his plan for such a move, which included building a new kitchen somewhere else in Fairfax, hiring a few employees and getting another vehicle to use for the expanded delivery.

"Mr. D was astounded, He told Mr. B. that he had been chanting for just that amount, $10K, and that he had similar notions. After work, several days per week, Mr. B and Mr. D would smoke marijuana and plan for their business venture. They would be equal partners. Mr. B. would put in the $10K and Mr. D would put in his existing business. Then they decided if they were going to make brown rice and tofu sandwiches, why not make the tofu as well? So they got the *Book of Tofu, Volume II,* by Bill Shurtleff, and started making calculations. They figured they would need more like $30K to pull that one off, so Mr. D approached a couple of his macro-psychotic friends, Frank Rosenmayr, a developer, and Paul Orbuch, a photographer. Mr. B. approved of these two fellows and soon the four were talking to lawyers about incorporation. In the meanwhile a location in Fairfax had been found. While the partners went through the permit process with the town of Fairfax, the incorporation process ensued. In the meanwhile Mr. D continued to operate his sandwich business out of the Sleeping Lady.

"On August 8, 1980, Wildwood Natural Foods, Inc. officially began business at 135 Bolinas Road, Fairfax, California 94930, (415) 459-3919. Mr. B was the Tofu manager, Mr. D was the general manager, Mr. R had supervised and done most of the renovation of the property, and Mr. O was in charge of graphics and label art.

"During the first six months, several people were hired to make sandwiches, work in the kitchen during the daytime doing preparation work for the next night's sandwich shift as well as developing and producing various other products. Four other people also made tofu and there were three drivers/delivery person. But, alas, after six months this new little enterprise had lost over $16,000.00 and the owners were troubled. Each of the three money dudes kicked in an additional $2500 to keep things afloat and the Board of directors became the functional general manager. It was decided that the enormity of the job was too much for Mr. D and so the board go involved with all the day to day stuff. Mr. D remained in charge of the production and delivery, but was not happy about his demotion. It was soon clear that a divorce was in the air. One of the things that was being considered was the expansion of the business to deliver other small manufacturers products to help pay for the expense of delivery. At a BOD meeting in October of 1981, which was specifically called for the purpose of discussing this concept, Mr. D announced that he was leaving Wildwood and starting his own delivery service, called Cauldron Express. By early December, 1981, Mr. D was gone, as was his wife, the bookkeeper. Mr. B and Mr. O dropped what they were doing and jumped in, feet first to salvage the company." Continued. Address: Wildwood Natural Foods, 135 Bolinas Rd., Fairfax

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California 94930. Phone: 415-485-3940 X-47.

10551. Leading Edge Group. 1998. The U.S. health and natural food market: Past performance, current trends, and strategies for the future. 2171 Jericho Turnpike, Suite 200, Commack, NY 11725. 330 p. July. Price $1,995.00. Illust. 29 cm. *
• ***Summary:*** Three past editions of this report have been published by Business Trends Analysts, Inc. (BTA), which is located at the same address as The Leading Edge Group. BTA is the parent company. Since it was founded 20 years ago, it had published reports under two brand names, each of which has a different style. Business Trends Analysts Reports tend to contain mostly secondary research, with an abundance of charts and graphs, and less text and analysis. Leading Edge Reports are conducted by a person with a specialty in that area. The report contains much more primary research and in-depth analysis, and is roughly twice as expensive. This report was conducted by Melina Laverty.

Chapter 5 of this report is titled "Soyfoods and alternative meat products: Market dynamics.

Overall report–Contents: 1. Executive summary. 2. Overall market dynamics (including Soyfoods). 3. The market for soy foods. 4. The market for herbal teas. 5. The market for dairy foods. 6. The market for grains and cereals. 7. The market for frozen foods. 8. The market for snack foods. 9. The market for groceries. 10. The health food consumer. 11. The health/natural food store industry. 12. Competitor profiles. 13. Industry directory. Address: Commack, New York. Phone: 516-462-2410.

10552. Morinaga Nutritional Foods, Inc. 1998. Surprise. It's Mori-Nu tofu (Tear-off recipe pad). 2050 W. 190th St., Suite 110, Torrance, California 90504.
Address: Torrance, California. Phone: 1-800-669-8638.

10553. *Rafu Shimpo* (*Los Angeles, California*). 1998. King's Hawaiian serves up Tofu Smoothie. Aug. 3. p. 5. [Eng]
• ***Summary:*** This is a profile of King's Hawaiian Bakery and Restaurant in Torrance, California–in conjunction with the L.A. Tofu Festival. The business has been in the Taira family for about 50 years. "Robert Taira began Robert's bakery in Hilo, Hawaii, where the Portuguese sweet bread became a local favorite. The business relocated to King Street in Honolulu and expanded to include a restaurant.

"In 1977, Taira made the bold move to bring his family to Torrance and brought his bakery and restaurant with him.

"Look for King's Hawaiian Tofu Smoothie at the L.A. Tofu Festival." A photo shows Robert Taira in front of his deli case.

10554. Little Tokyo Service Center. 1998. Presents the Third Annual 1998 LA Tofu Festival (Ad). *Rafu Shimpo* (*Los Angeles, California*). Aug. 7 and 12. p. 3. [Eng]
• ***Summary:*** "Tofu salads. Tofu desserts. Tofu main dishes. Title sponsor: House Foods America Corp. (Hinoichi Tofu). Gold sponsor: Sparkletts. Festival patrons: AT&T, Farmers Insurance Group, Inc., Pacific Bell. Festival supporters: The Gas Company, Vitasoy USA, Inc., Whole Foods Market, Yuasa, Inc. Official festival airline: Northwest Airlines. Celebrity co-chairs: Huell Howser of "California's Gold" and Lilly Melgar, International Actress. Media partner: KSCI–Channel 18.

"Saturday, August 15: 11 to 6. Sunday, August 16: 11 to 4. Plus: Entertainment, music, taiko, & children's performances. Health and information screening (free immunization for children on Saturday. Must present immunization card). New recipes and tofu samplers. Promotional and giveaway items. Cooking demonstrations. Drawing–(grand prize, trip for 2 to Japan). Children's pavilion with games and crafts. Cultural events of the 58th Nisei Week Festival, the Street Arts Festival and Grand Parade on Sunday. Come and experience an array of international tofu dishes prepared by top chefs in southern California."

Note: Other ads show: "Participating food providers include: Al Mercato, Aloha Food Factory, Bali Place, BCD Tofu, Berth55, Boxer, Cafe La Boheme, Chez Sateau, Citrus, Classic Catering, Coma Tofu, Curry House, Empress Pavilion, Feast from the East, Flowering Tree, Furaibo, Gadsby's, Galaxy Tea Corp., House Foods America Corporation, Hyatt Regency L.A., Pavan Pacifico, Indo Cafe, Inn of the Seventh Ray, Japan California Products, JFC / Tama Nishiki Rice, Jozu Restaurant, King's Hawaiian, Marina Mago Restaurant, Melissa's, Mother Earth, Papa Jon's Cafe, Southern California Cuisine, Suehiro Cafe, Tofu Cabin, Tofutti Brands, Trader Joe's, Union Center Cafe, Unique Catering, Vege-D'Lite, Vitasoy USA Inc., Whole Foods Market, Yujean Kang's, Zen Grill."

10555. Kikkoman International Inc. 1998. Holy guacamole! (Ad). *Nation's Restaurant News*. Aug. 10. p. 76.
• ***Summary:*** A large color photo shows a tortilla wrapped around a mixture of meat and vegetables on a plate. On the tortilla is branded: "Kikkoman naturally brewed soy sauce." The text reads: "Kikkoman keeps turning up in the most unexpected places. At one major Mexican chain, they've discovered that nothing brings out the flavor of their fajitas like a marinade of Kikkoman and pineapple juice. That's because unlike some soy sauces, Kikkoman is naturally brewed and aged for full flavor. Your flavor." Address: San Francisco, California. Phone: 415-956-7750.

10556. Liu, Jeff; Tokumura, Megumi. 1998. Tofu geddon: When Stephen Fong, reigning bean-curd eating champion, licks his chops, watch out. It's over. *Rafu Shimpo* (*Los Angeles, California*). Aug. 11. p. 2. [Eng]
• ***Summary:*** A dialogue with Stephen Fong, age 14, a

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freshman at Schurr High School; he won one of two tofu-eating competitions last year, and hopes to win again this year. Contestants can't use their hands when eating the tofu; hands must be behind the back. The tofu is placed, unseasoned, in a dish on the table. Three photos show Stephen eating a cake of tofu.

10557. *SoyaScan Notes.* 1998. Chronology of Frank N. Meyer (1875-1918), USDA plant explorer in Asia. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** 1875 Nov. 29–Frans Meyer is born in Amsterdam, Netherlands. 1889–Meyer, age 14 becomes a gardener's helper, later a gardener at the Amsterdam Botanical Garden, and assistant to Prof. Hugo de Vries, the eminent Dutch botanist and geneticist, in his special experimental garden. Note: In 1900 de Vries was one of three scientists who, at a conference in London, England, "rediscovered" the work of Gregor Mendel, introducing modern genetics.

1901 Oct. 20–Meyer first arrives in the USA, in Washington, DC, with a letter of introduction from de Vries to Erwin F. Smith, one of the five plant pathologists who were working with Beverly T. Galloway at the USDA in 1889. Smith found Meyer a modest job as a gardener in the USDA greenhouses on the Mall at Washington, DC.; here Meyer worked from 23 Oct. 1901 to 31 Aug. 1902. He resigned 1 Sept. 1902. On 15 Sept. 1902 re-entered USDA service at the Plant Improvement Garden at Santa Ana, California. Resigned after 7 months on 1 April 1903 and became head gardener at a little nursery in Montecito, California.

1904 Jan. to March–In St. Louis, Missouri, attending the World's Fair and working at Armstrong's nursery. 1904 March to August–Made journeys of study in California (visited Luther Burbank in Santa Rosa), Mexico (took a steamer in March from San Francisco to San Blas, Mexico; walked across Mexico from San Blas to Guadalajara to Mexico City, then to Vera Cruz on the Gulf of Mexico), and Cuba. From Havana he took a ship to New Orleans, Louisiana, then on to St. Louis. 1904 Aug. 1–Began work at the Missouri Botanical Garden [called the Shaw Botanical Garden locally] in St. Louis. Was a member of the jury on Forestry at the World's Fair of 1904. Resigned Shaw Garden on 1 July 1905.

1905–In about early March, Adrian J. Pieters, a fellow Dutchman who had come to know and admire Meyer, tells Fairchild about Meyer's love of walking and deep interest in plants. On March 10 Fairchild asks Pieters to telegram Meyer to ask whether he would be interested in going to China as an agricultural explorer (Fairchild 1938, p. 315; Cunningham 1984, p. 21). The dream of Meyer's youth had come true. But 3 months passed before Meyer left St. Louis.

1905 July–Fairchild and Meyer first meet and instantly become mutual friends. For a detailed description of their first meeting see Fairchild 1938 (p. 314-16). On 10 July 1905 Meyer re-enters USDA service for the third time, now as an agricultural explorer in the Bureau of Plant Industry.

1905-1908–First expedition; mainly to China, but also to Japan, Korea, Manchuria, and Eastern Siberia. He collected nearly 2,000 plants and seeds. He left Washington, DC, on 27 July 1905 and returned on 7 July 1908.

1906 Feb. 23–Meyer's first soybean introduction, SPI 17852 from Peking was received in the USA; it was later named Peking.

1908 July 21–Meyer submits a Petition for Naturalization (now located at the U.S. Immigration and Naturalization Service, Dep. of Justice, Washington, DC).

1909-1912–Second Expedition.

1912-1915–Third Expedition.

1916-1918–Fourth Expedition.

1918 June 4–Telegram arrives in Washington at 4:00 p.m. from the Consul at Nanking "Frank Meyer, Department Agriculture, disappeared from steamer in this consular district en route Hankow to Shanghai, June 2nd." His death occurred at night. His body was recovered from the Yangtze River on June 5, about 30 miles above the little town of Wuhu, and buried on June 12 at the Bubbling Well Protestant Cemetery in Shanghai. His death remains a mystery to his friends; it is not known whether he died from accident or suicide. It was well known among his friends, and clearly indicated in his letters to David Fairchild, that he had been very much depressed by the wars in both Europe and China and by his long confinement in the city of Ichang.

In 1907 the U.S. only had 23 varieties of soybeans, whereas in 1919 the U.S. had 629 varieties; most of the new ones were introduced by the Office of Foreign Seed and Plant Introduction (OFSPI), many by Meyer. Named varieties introduced by Meyer (or selected directly from introduced by Meyer), in order of PI Number are: Meyer (PI 17852), Peking (17852 B, selected from the Meyer variety), Lexington (PI 17862), Wilson (PI 19183), Morse (PI 19186), Virginia (PI 19186 D, selected from Morse in 1909), Habaro (PI 20405), Chestnut (PI 20405 B, selected from Habaro), Duggar (PI 20798), and O.A.C. 211 (OAC 211, selected from Habaro), Biloxi (PI 23211, named by Dec. 1916), and Laredo (PI 40658, named by June 1920). Of these varieties Meyer introduced, Peking, introduced in 1906, proved to be the most important commercially in America.

10558. *SoyaScan Notes.* 1998. Chronology of David Fairchild (1869-1954), organizer and head of the USDA Section of Foreign Seed and Plant Introduction (FSPI). Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** 1869 April 7–David Fairchild is born at Michigan State College, one of five children, in a family deeply interested in ideas. 1879–When David was age 10, his father, George T. Fairchild, accepts the presidency of fledgling Kansas State College of Agriculture–a position

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he held until 1897. Thus David grew up on agricultural college campuses. He later attended that college and took a strong interest in the new science of plant pathology. 1888–Graduated from Kansas State College of Agriculture. 1889–Goes to Washington, DC, to work for the USDA in Dr. Beverly Galloway's new "Section of Vegetable Pathology.

1893–Resigns his position at the USDA to continue his studies in Europe. On this trip he meets Mr. Barbour Lathrop. Lathrop offers to pay Fairchild's way to Java to continue his studies. Later, the two men discussed a broad plan for systematic plant introduction under the auspices of the USDA.

1897 fall–The Section of Foreign Seed and Plant Introduction (FSPI) is organized within the Seed Division of USDA in Washington, DC, with Fairchild in charge. Fairchild detests the inclusion of the superfluous words "Seed and" in the name of the organization.

1898 March 22–Congress allocates $20,000 for the collection, purchase, testing, and preparation of foreign seeds, plants, bulbs, shrubs, and trees. Fairchild serves as "Explorer in Charge" for the next 27 years. He spends much of his time from 1898 to 1903 travelling in search of new plants. He temporarily resigned from Oct. 1898–Aug. 1900, and in the position of "Special Agent" plant explorer he made a "quick reconnaissance of the world."

1900–Bureau of Plant Industry is organized within the USDA. 1901 July 1–The Bureau of Plant Industry is formally established; it includes the former Division of Seed and Plant Introduction. It was the first official agricultural organization of its kind devoted exclusively to plant introduction. 1901 March 1–The Section of FSPI is placed under the Bureau of Plant Industry; it was referred to successively as the Office of Foreign Seed and Plant Introduction and then the Office of Foreign Plant Introduction. 1904 June to Oct.–Grand tour of the USA visiting experiment stations and people testing plants being introduced by the USDA, including Charles Sprague Sargent, director of Harvard's famous Arnold Arboretum [Cambridge, Massachusetts], and P.H. Dorsett at the new USDA plant introduction garden in Chico, California. Adrian J. Pieters directed the Foreign Seed and Plant Introduction Office during the last months of Fairchild's travels. 1904 Nov.–Fairchild meets Marian Bell, daughter of Alexander Graham Bell, whose sister had married into the Grosvenor family of *National Geographic* fame. He quickly falls in love. 1905 March–Fairchild learns of Frank N. Meyer from fellow Dutchman Adrian Pieters and coworker Erwin F. Smith. Soon thereafter, on March 10 Fairchild asks Pieters to telegram Meyer in St. Louis, Missouri, to ask whether he would be interested in going to China as an agricultural explorer (Fairchild 1938, p. 315; Cunningham 1984, p. 21). The dream of Meyer's youth had come true. But 3 months would pass before Meyer left St. Louis for Washington, DC.

1905 April 25–Fairchild and Marion Bell are married at Twin Oaks in Maryland. Grosvenor becomes Fairchild's brother-in-law. Wanting to live as far out in the country as possible, they bought (that summer) a 40-acre tract of land in the woods near Kensington, Maryland, through which Rock Creek flowed. Beyond the suburbs of Maryland, it was 10 miles northwest Washington, DC, and a mile beyond the end of the Chevy Chase. They soon build a home and plant many Japanese cherry trees and a garden; Barbour Lathrop named the place "In the Woods."

1905 July–Fairchild and Meyer first meet in Washington, DC, and instantly become mutual friends.

1916–David and Marian Fairchild purchase a piece of property located in Coconut Grove on Biscayne Bay, Florida; they name it The Kampong. On the property were many fine old tropical trees.

1934 Feb. 9–The Division of Plant Exploration and Introduction is established by the merging of the former Division of Foreign Plant Introduction and the former Division of Botany. 1935–Fairchild retires from active service, and spends and increasing amount of time at The Kampong in Florida. 1954 Aug. 5–Fairchild dies of a cerebral hemorrhage in Miami, Florida.

10559. Albano, Leilani. 1998. Nisei Week kicks off in Little Tokyo. *Daily News* (*Los Angeles, California*). Aug. 17. p. 4.
• ***Summary:*** "Second generation Japanese-Americans began Nisei Week in 1935 as a way to honor the issei, or first-generation Japanese immigrants to the United States.

"The festival was suspended for seven years when Japanese-Americans were interned in camps during World War II, and the celebrations resumed in 1949.

"'The festival is in honor of what the issei had gone through,' said Wendy Fujihara Anderson, a spokeswoman for the festival.

"Soybean lovers got a taste of their favorite cuisine Saturday and Sunday at the Nisei Week tofu festival, part of the overall event.

"Thirty Southland restaurants participated in the two-day celebration that became a blend of the old and the new, with traditional Japanese tofu plates served alongside contemporary dishes that included tofu enchiladas, tofu cheesecake and tofu seviche."

A photo shows vendors in tents serving tofu dishes along the street side in Little Tokyo (Los Angeles). Note: Nisei Week opened with a taiko drum festival, by the Daion Taiko drummers of Anaheim.

10560. Liu, Jeff. 1998. Third Annual Tofu Festival dazzles: Thousands of tofu enthusiasts attend Nisei Week tribute to soy bean cake product at JACCC. *Rafu Shimpo* (*Los Angeles, California*). Aug. 18. p. 1, 5. [Eng]
• ***Summary:*** This is the best overview seen of the 1998 L.A. Tofu Festival. An "estimated crowd of between 40,000-50,000 hungry people streamed into Little Tokyo this past

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weekend for a tribute to all things tofu." Over 40 restaurants and food providers offered tofu dishes. This year's festival was the biggest ever, spilling from the Japanese American Cultural and Community Center (JACCC) Plaza into South San Pedro Street. Popular recipes included: Fried tofu with garlic (by Empress Pavilion). Tofu cheese mousse. Tofu cheesecake (Inn of the Seventh Ray), Iced mocha cappuccino with soy milk. Halo-halo and soy snowcones. Tofu coffee dessert (Jello-like). Tofutti Cuties. Hawaiian orange passion mango banana tofu smoothie (from King's Hawaiian; "a remarkable and refreshing fruit-soy shake that is a wonderment to the sense..."). Tofu curry. Smoked eel with tofu and soba. Tofu tuna poke salad. Mabo tofu. Tofu avocado seviche (by Coma Tofu, an outreach to the Latino community organized by Yvonne Gonzalez; "a potent blend of minced onions, chopped cilantro and lime in an all-vegetarian version that substitutes crumbled tofu for fish"). A photo shows an aerial view of one street, lined with tent-like booths and jammed with people. Address: Rafu staff writer.

10561. Endo, Margaret. 1998. The LA Tofu Festival of August 1998 (Interview). *SoyaScan Notes.* Aug. 27. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** This year's Tofu Festival was the biggest and most successful yet. Since there is no admission fee to the Tofu Festival, the Little Tokyo Service Center raises its money by selling food scrip tickets. Each ticket costs $1.00 and can be used at any of the booths, for food, drinks, or novelty items. This year sales of those tickets was $69,000, almost double the $37,000 dollar figure last year. Saturday they sold $33,000 in tickets compared with $16,000 last year. Sunday they sold $36,00 in tickets compared with $20,000 last year. There were 40 food booths and 3 drink booths, including one selling soymilk snow cones. Most of the food booths were run by restaurants that served tofu dishes. One restaurant sold chilled edamamé. There was one tofu boutique selling t-shirts, polo shirts, shorts, etc. and on each was written LA Tofu Festival. This year there was a children's pavilion with really cute tofu-related games, soy coloring books sent by the United Soybean Board, and 300 soy-based crayons sent by Dixon-Ticonderoga. They also raise money by having corporate sponsors, and selling their tofu cookbook (which was only slightly changed from last year). There was also a program booklet, that contained a history of tofu.

Rafu Shimpo did lots of good English-language articles this year, including highlights of each restaurant that participated. The LA Times did nothing. The crowd was more racially diverse than last year, with a larger percentage of non-Japanese Americans and non-Asian-Americans, including a lot more Chinese-Americans, and Hispanics.

They did a lot of work with Yvonne Dreyfus of the Latino Outreach. She was on KBEA–the Latino station. It worked out pretty well but it was a little bit difficult for Yvonne. Because she wasn't a restaurant, she had much fewer resources as an individual, so LTSC had to help a lot with things like ordering the food products. A little more maintenance was required–but it was well worth it because of the outreach and exposure to the Latino community. Margaret is hoping she will stay involved next year. People liked her Tofu Seviche.

In Los Angeles there is a program on PBS (KCET-TV–channel 28) titled "Visiting... with Huell Howser." This coming Saturday at 6:00 p.m. and Sunday at 7:00 p.m. in Los Angeles (channel 28) a 1-hour documentary he filmed on Saturday about the Tofu Festival–All You Wanted to Know about Tofu will air on this channel. He first visited a tofu factory (American Foods) to show how tofu is made, then shot footage at the festival. The program will not be aired outside the Los Angeles area. The phone number of Huell Howser Productions is 213-953-5380. Note: They sent Soyfoods Center a free copy of the 1-hour video. A PR company volunteers their time each year and puts together a media packet of all the articles etc. about the Festival. Margaret will ask them to send one packet to Soyfoods Center. Address: Little Tokyo Service Center (Resource Development Center), 231 East 3rd St., Los Angeles, California 90013. Phone: 213-473-1613.

10562. Fujimori, Ikuo. 1998. Japan's position on genetically enhanced soybeans. *Canadian Soybean Technical Bulletin* (*OSGMB, Chatham, Ontario, Canada*) 4(1):3. Aug.
• ***Summary:*** Japan needs more time and information to discusses this matter seriously. Some consumers and consumer groups are now very nervous regarding the use of these soybeans. Address: President, Takeya Miso Co. Ltd., Nagano, Japan.

10563. Jessop, Doug. 1998. Update on tofu testing procedures. *Canadian Soybean Technical Bulletin* (*OSGMB, Chatham, Ontario, Canada*) 4(1):4. Aug.
• ***Summary:*** "As a result of the latest technical mission to Japan in September 1997, the Food Processing Lab at the Greenhouse and Processing Crops Research Centre (GPCRC) has made several changes in its tofu evaluation procedure." These three include temperature and time of soaking, use of the coagulant calcium sulphate dihydrate, and use of an 8 mm penetrometer to measure texture. Address: Food Processing Technologist, Harrow Research Centre, Harrow, Ontario, Canada.

10564. Johnnes, Daniel. 1998. Flavors of Japan: Small dishes form the essence of a summer meal. *Gourmet* 58(8):90-95, 119. Aug. See p. 93-94. [Eng]*
• ***Summary:*** Includes a description and photo of, and a recipe for edamame. The title of the recipe is "Edamame: Soybeans in the pod." The headnote for the recipe states: "Sweet delicious young soybeans, which appear fresh in markets in

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Japan throughout the summer (they're available frozen in the U.S.) make great hors d'oeuvres. They're packed with protein and fun to eat. The slightly fuzzy green pods tickle your lips as you gently suck the beans into your mouth. Provide bowls for the empty pods." The only ingredients are: 1 pound bag of frozen edamame. Coarse salt to taste. Instructions: Fill a 5-quart kettle three quarters full with water. Bring to a boil. Have ready a bowl of icy cold water. Cook the frozen edamame until bright green–2-3 minutes. Transfer them to the ice water. Drain well. May be prepared 4 hours ahead and kept in a bowl, covered with a towel and plastic wrap at cool room temperature. Just before serving, toss with salt to taste. Note: Dropping the hot edamame into ice water helps to keep the green color as bright as possible.

Letter (fax) from Dana Jacobi of New York, who discovered this article. 1998. Aug. 22. "As I am teaching, I have dubbed edamame and Sweet Beans 'the Kiwi of the '90s'... a currently exotic item that will become common in supermarkets over a 5-10 year period, which is what it took kiwis to become a staple."

10565. Little Tokyo Service Center. 1998. The Third Annual L.A. Tofu Festival, August 15-16. Los Angeles, California. 26 p. Illust. 26 cm. Saddle stitched (stapled).
• ***Summary:*** Contents: 1999 LA [Los Angeles] Tofu Festival committee. About Little Tokyo Service Center. Festival sponsors, by rank. Celebrity Co-chairs: Huell Howser and Lilly Melgar. Festival health providers. Schedule of events (orange insert). Map of events (pink insert). *Coma Tofu: El que y porque!* (Eat tofu: The what and why!) in Spanish, with 2 recipes by Yvonne Gonzalez. Tofu: A 2,000 year old health food miracle, compiled by William Shurtleff of Soyfoods Center. Tofu Q&A. 1997 LA Tofu Festival participant profiles (39 restaurants, p. 7-9). Advertisements (p. 13-26), including ads for Vitasoy (incl. Nasoya & Azumaya), Whole Foods Market (incl. White Wave–Vegetarian Cuisine), Yuasa, Inc., Patricia Greenberg and her *Whole Soy Cookbook,* the Indiana Soybean Council and Prang Fun Pro Soybean Crayons, House Foods America Corporation and its Hinoichi tofu (full page, inside rear cover). Address: Little Tokyo Service Center (Resource Development Center), 231 East 3rd St., Los Angeles, California 90013. Phone: 213-473-1600.

10566. Muramatsu, Kanako; Yamawake, Noriko; Kiuchi, Kan. 1998. *Bacillus subtilis* (*natto*) KFP 419 ni yoru erasutaaze no seisan [Production of elastase by *Bacillus subtilis* (*natto*) KFP 419]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 45(8):494-98. [24 ref. Jap; eng]
Address: Kyoritsu Women's Univ., Japan.

10567. Ndungi Khoto, Aubry. 1998. Contribution a l'avant-projet d'une usine de production de *lait de soja* en poudre a Lubumbashi [Contribution to the rough draft for a factory for the production of soymilk at Lubumbashi, Congo]. Civil Engineer thesis, University of Lubumbashi, Polytechnic Faculty, Dep. of Industrial Chemistry. v + 154 + 16 p. Illust. 30 cm. [73 ref. Fre]
• ***Summary:*** Preface and dedication. Introduction. Part I: Review of the literature. 1. General information about soya and proteins: 1.1. The soybean (Botanical, origin and history, soybean production and commerce worldwide, soya in the Democratic Republic Republic of the Congo {Congo, formerly Zaire}, structure and composition of soybean seeds, utilization of soybeans {with diagram}, food uses of soybeans {oil and meal, soy flour (4 types), soy concentrates and isolates, textured soy proteins {TVP, thermoplastic extrusion, spun fibers}, soymilk, tofu, other uses (shoyu, miso, tempeh, yuba)}, industrial uses of soybeans {linoleum, plastics, paints, varnishes, etc.}). 1.2. Proteins (in the human body, in foods), the structure of proteins (amino acids, ionization and acid-base properties of amino acids), protein bonds, denaturation. 1.3. Soya proteins (glycinin or globulin 11S, globulin 7S, hemagglutinins or lectins, protein inhibitors and other antinutritional factors, amino acid composition of soy protein). 1.4 Factors affecting the food value of soya: Acceptability problem (food value of raw soybeans), intolerance to soy proteins, off-flavors in soya and their source, inactivation of lipoxygenase, other treatments affecting the food value of soya: Alkalis.

2. Preparation and properties of soymilk. 2.1. Properties. 2.2. Advantages and disadvantages of soymilk compared with cow's milk. 2.3. Preparation. 2.4. Commercial / industrial production using the Alfa-Laval process.

3. Reminder of certain operations required for the preparation of soymilk powder: 3.1. Homogenization. 3.2. pasteurization and sterilization. 3.3. Concentration by evaporation. 3.4. Drying by atomization. 3.5. economies of energy in dewatering operations.

4. Some ideas on the methods of sensory evaluation: 4.1. The different methods. 4.2. Results and interpretations.

5. Important ideas in the study of the market, in determining the capacity of production, and in the economic evaluation of a project: 5.1. Study of the market. 5.2. Determining the capacity of production. 5.3. Economic evaluation of a project, incl. estimating fixed capital by adding capital costs.

Part II: Experimental, industrial calculations, economic calculations. Introduction. 6. Origin and characterization of the raw materials, trials for inactivation of lipoxygenase. 7. Determination of the optimal conditions for the preparation of soymilk. 8. Results of pilot plant trials. 9. Market study and determination of the capacity of production. 10. Description and calculations for the installation. 11. Economic evaluation of the project. General conclusion.

Tables show: (1) Number of people that can be supported for 1 year by the production from one acre

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devoted to certain crops and animals. Fewest: Beef 190. Pork 319. Poultry 457. Most: Potatoes 5,329. Split peas 6,901. Soybeans 9,075. Algae 43,200–154,000. Yeast 3,275,000. (1.1) Leading soya producing countries in 1985 (worldwide, with area, production, and yield; USA, Brazil, China, Argentina, India). (1.2) Leading soya producing continents in 1985 (North and Central America, South America, Asia, USSR, Europe, Africa, Oceania). (1.3) Leading soya trading countries in 1985. Importers: Japan, Netherlands, R.F.A. (Republique Federal Allemagne = Germany), Spain, Italy. Exporters: USA, Brazil, Argentina, China, Paraguay. (1.4) Production of soya in the Congo, by province 1970-1978 (the leading producer by far in 1978 was Western Kasai). (1.5) Production of soya in Katanga [formerly Shaba, before that Elisabethville] (1990-1994; by far the leading producer is Tanganyka). 1.6 Total production of soya in the Congo (1,000 metric tons) from 1970-1995 (increased from 1.7 in 1970-74 to 18 in 1995). (1.7) Average composition of different parts of the soybean seed. (1.8) Physico-chemical composition of soybean seed (ranges and average). (1.9). Mineral content of soybeans. (1.10). Vitamin content of mature soybean seeds and soybean meal. (1.11) Fatty acid composition of soybean oil. (1.11A) Enzymes in the soybean: Lipoxidase, urease, lipases, beta-amylase. (1.12) Properties and characteristics of the water-soluble fractions of soybean seeds. (1.12A) Variations in the solubility of proteins from defatted soy flour at various pH levels. (1.12B) Amino acid composition of soybean protein. Address: Lubumbashi, Katanga Province, Congo.

10568. Powell, Douglas. 1998. Genetically engineered soya. *Canadian Soybean Technical Bulletin* (*OSGMB, Chatham, Ontario, Canada*) 4(1):1-2. Aug.
• ***Summary:*** The article begins: "Genetically-engineered Roundup Ready soybeans must be considered the most successful product of agricultural biotechnology to date–if farmer acceptance is the measure.

"Monsanto estimates that more than 20 million acres of the transgenic soybeans were planted in the U.S. this year, up from 10 million in 1997 and 1 million in 1996. Next year, the number could easily double again to 40 million, out of a total of some 70 million U.S. acres. Similar ratios of genetically engineered soya are being planted in Canada.

"The rapid acceptance of herbicide-resistant Roundup Ready soybeans is linked to cost savings for farmers who can use fewer chemicals to keep weeds out of fields."

"But what if the measure is consumer support?... Around the globe consumers are asking the same questions: Why are you messing with nature? Why don't you label everything? Can you guarantee there won't be any long-term risks? Why are you playing God?

"One way to glimpse the public discussion of agriculture biotechnology is through the many public opinion surveys of biotechnology that has been conducted internationally over the past 20 years." Discusses approaches to and problems with labeling.

"Are there known health risks? Yes, in one instance, an allergen was transferred from one crop to another. Once discovered, the company acted responsibly and halted work at an experimental stage."

"In 1989 there was an outbreak in the U.S. of a new fatal blood disease, eosinophiliamyalgia syndrome (EMS). The outbreak killed at least 27 and sickened another 1,500. The cause was traced to certain batches of the amino acid, L-tryptophan, manufactured in Japan by Showa Denko and widely available in the U.S." Subsequent investigations by U.S. health authorities found that in 1989 the company had begun using a strain of *Bacillus amyloliquefaciens,* which had been genetically engineered to produce larger amounts of L-tryptophan. Address: Asst. Prof., Dep. of Plant Agriculture, Univ. of Guelph, Ontario, Canada.

10569. Sato, Satoru. 1998. Chef Sato's all-natural desserts: Delicious cakes, pies, pastries, and other irresistible sweets. Becket, Massachusetts: One Peaceful World Press. 96 p. Foreword by Aveline Kushi. Recipe index. 22 cm.
• ***Summary:*** This innovative little book contains "42 delicious, sugar-free, dairy free desserts." Soymilk is widely used in place of dairy milk (as in fillings), and tofu is used in many frostings. Maple syrup is used as the sweetener. Address: Great Barrington, Massachusetts.

10570. Eden Foods, Inc. 1998. Eden–The highest quality natural food (Catalog). Clinton, Michigan. 12 p. 28 cm.
• ***Summary:*** This 8-page color catalog, with four pages of inserts, introduces Eden Foods, its products, philosophy, and history. A timeline running across the bottom of each page lists 23 milestones in the company's history, which is said to have started in 1968. Note: The founders of this company all agree that it was not founded in any form until Nov. 1969.

Contents: Eden Foods–Thirty years of dedication: Macrobiotic understanding, tribute to Herman Aihara, Old World pasta–goodness of grain, maturing as an organic manufacturer, organic pioneers of the audit trail, Eden today (supporting 200 family farms with over 20,000 acres of organic land). Eden Foods–A dedicated network: Color maps show the source of products in the USA, Japan, and Europe. Intuitive imported foods, the Eden brand–fulfilling a promise, organic pest management, our GEO (genetically engineered organisms) policy (since 1993), preserving organic integrity. Edensoy creates a new food category. Eden in the next 30 years? Company goals (rear cover).

The first insert, dated Sept. 1998, is written and signed by Michael J. Potter, "leading Eden Foods for twenty-seven years" (i.e. since 1971). The second insert lists all or most of Eden's products. The third is a mailer inviting comments. Address: 701 Tecumseh Road, Clinton, Michigan 49236. Phone: 517-456-7424.

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10571. Hayashida, Yasuo; Nishimura, K.; Slaughter, J.C. 1998. The importance of the furanones HDMF and HEMF in the flavour profile of Japanese barley miso and their production during fermentation. *J. of the Science of Food and Agriculture* (*London*) 78(1):88-94. Sept. [15 ref]
• ***Summary:*** "All 13 samples of Japanese barley miso accepted for the Kumamoto Prefecture Miso Competition of 1995 were assessed by tasting and by GC [Gas Chromatography] analysis using FID, SIM..."

On Kyushu, Japan's main southernmost island, barley miso is more widely produced and consumed than rice, miso. The salt-tolerant yeast *Zygosaccharomyces rouxii* is added and the mash is allowed to ferment for 3-6 months at room temperature. Address: 1-2. Kumamoto Industrial Research Inst., 3-11-38 Higashi, Kumamoto City, Kumamoto-ken 862, Japan.

10572. Morinaga Nutritional Foods, Inc. 1998. "You don't have to be a vegetarian to love Mori-Nu Tofu" (Ad). *Vegetarian Times.* Sept. p. 27.
• ***Summary:*** This full-page color ad shows a lovely red-haired lady dressed in a chef's uniform, with her right elbow resting on a huge whisk. Below the photo we read: "Alex Hilebronner, Reel Foods Productions, Los Angeles, California / Chef, Caterer, Part-Time Vegetarian."

The text reads: "I'm a caterer. My company does parties, business luncheons, film crew feeds, and custom meals. I've been cooking with tofu for 10 years and every day I get requests for tofu dishes. Maybe my clients eat tofu to stay trim. Or they've hears about the benefits of tofu–like fighting cancer, heart disease, high cholesterol, and even reducing the hot flashes of menopause. Whatever the reason, healthy, good tasting food is always important. That's why I choose creamy smooth Mori-Nu Tofu. It purées, marinates, and grills like no other tofu to create delicious low-fat dishes like tomato soup, pad thai, or chocolate pie. The airtight package keeps Mori-Nu fresh and ready to use without refrigeration... But don't just take my word for it. Visit www.morinu.com and try one of the recipes yourself."

A color photo in the lower right corner shows two packages of Mori-Nu Tofu (from and extra firm) on a small wooden cutting board, surrounded by fresh vegetables. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-NOW-TOFU or 310-787-0200.

10573. Morinaga Nutritional Foods, Inc. 1998. Surprise. It's Mori-Nu Tofu (Ad). *Natural Foods Merchandiser.* Sept. p. 62.
• ***Summary:*** This full-page color ad shows a package of Mori-Nu Silken Style tofu on a wooden cutting board surrounded by strawberries, raspberries, tofu cubes, carrots, and mushrooms. At the top right is a bowl of Creamy pumpkin soup. At the top left a plate of Fiesta burritos. Top center: Chinese un-chicken salad. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-669-8638.

10574. Nakatomi & Associates. 1998. L.A. Tofu Festival media clips (Portfolio). Santa Monica, California. 53 inserts. 28 cm.
• ***Summary:*** This is a portfolio of 53 newspaper clippings, advertisements, news briefs, and articles related to the L.A. Tofu Festival, which took place in Los Angeles on 15-16 August 1998 (Saturday and Sunday). The dates range from August 7 to 21. The most popular source was *Rafu Shimpo* (an English-language newspaper for Japanese Americans) with 21 clips, followed by the Los Angeles Times (Food section, calendar section), with 6 clips, and the Daily News (incl. L.A. Life Weekend, 4). But clips from many other newspapers, spanning many ethnic groups, also appear: *Asian Journal, Chi-Am Daily News* (*3*), *Chinese Daily News, Downtown News, Gardena Valley News, KoreAm Journal, Korean Journal, La Opinion* (*Spanish*), *Lighthouse* (*2*), *Los Angeles Magazine* (*2*), *New Times Los Angeles, Pacific Asian Current, Pacific Citizen, Sing Tao Daily* (*Chinese*), *Vecinos del Valle* (*Spanish*), *and Viet Bao Kinhte* (*Vietnamese*).

These clips show how the Festival was promoted through and covered by the media in the greater Los Angeles area. Clearly the great success of this year's festival was due, in part, to the excellent public relations work of Nakatomi & Associates. A number of the clips in *Rafu Shimpo* featured individual restaurants that would be serving their favorite tofu dishes at the festival. This concept, starting on July 31, spotlighted 12 restaurants. Address: 1301 Montana Ave., Santa Monica, California 90403. Phone: 310-656-1616.

10575. *Soya & Oilseed Bluebook.* 1998--. Serial/periodical. Bar Harbor, Maine: Soyatech, Inc. Peter Golbitz, publisher and editor. Frequency: Annual.
• ***Summary:*** Preceded by Soya Bluebook Plus. A directory and information book for the soybean processing and production industries. The first issue (shipped Sept. 1998) is subtitled "The annual directory of the world oilseed industry." On the cover, below a map of the world is printed the date "1999" in large letters, followed by "A Soyatech Publication." Crops featured on the front cover and inside are "soya, corn, cottonseed, canola, rapeseed, sunflowerseed, palm kernel, palm, coconut, and peanut."

Contents (the four main sections are marked with a fold-out tab): Translations of oilseed terminology (English, German, French, Spanish, and Portuguese). Organizations and government agencies: Complete listings by country. Oilseeds and oilseed products: White pages (Index, individual crops), catalog pages, yellow pages (complete company listing by country). Equipment supplies and services. Oilseed statistics. Oilseed reference: Oilseed glossary, standards and specifications, oilseed technical

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charts and tables. Indexes: Comprehensive index, internet address index, brand name index, advertiser index.

Soy-related terms appearing in the translation section (p. 9-15) are: (1) Oilseeds and products: dairy analogs, lecithin–edible, lecithin industrial, meat analogs, miso, organic soy products, soy distillate, soy fiber, soy flakes–defatted–edible, soy flakes–full fat, soy flour–defatted, soy flour–enzyme active, soy flour–full fat, soy flour–low fat, soy flour–roasted, soy flour–textured, soy grits, soy isoflavones, soy livestock feed, soy oil margarine, soy oil shortening, soy oil–crude, soy oil–edible, soy oil–hydrogenated, soy oil–industrial, soy oil–refined, soy oil-based fuel, soy protein concentrate, soy protein isolate, soy protein–hydrolyzed, soy protein–industrial, soy sauce, soy sterols & tocopherols, soy-based foods–other, soybean fatty acids, soybean hulls, soybean meal, soybean meal–full fat, soybean seed breeder, soybean seed (for planting), soybean soapstock, soybeans–food grade, soybeans genetically modified, soybeans–green vegetable, soybeans–identity preserved, soybeans–non-gmo, soybeans–organic, soybeans, whole dry, soymilk beverages, soymilk powder, soynuts, tempeh, tempeh starter cultures, textured vegetable protein, tofu & tofu products, tofu powder. (2) Equipment & services: Coagulants for tofu, soymilk & tofu processing equipment, sprouting equipment. Address: 318 Main St., P.O. Box 84, Bar Harbor, Maine 04609. Phone: 207-288-4969.

10576. Culbertson, Ewell. 1998. Growing edamamé (green vegetable soybeans) at Pachamama Organic Farm in Longmont, Colorado (Interview). *SoyaScan Notes.* Oct. 5. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Ewell and his wife, Lauren, began farming about five years ago. Before that he was in sales. They bought this Pachamama Organic Farm (a 38-acre farm in Longmont, Colorado) two years ago. The couple began growing edamamé (he uses that name) on their farm in 1997. That first year they tested six varieties (100 row feet of each variety) on a small plot of about one-tenth of an acre total. The experiment was suggested to him by Dwayne Johnson, a professor at Colorado State University and the "New Crops Specialist" in the Department of Soil and Crop Sciences. Dwayne's job is to introduce, develop, and sometimes breed new crops for Colorado. Ewell has known Dwayne for 5-6 years and has tested many new crops (such as vegetable quinoa) for him previously. Dwayne got these six varieties from Seedex, a Japanese seed company in Colorado; their main business is sugar beet seeds, but they are looking at edamamé as a possible new seed product. The varieties grew well, and they were well accepted by customers at local farmers' markets and natural food stores. The Culbertsons like several varieties in particular (Ewell does not know the varietal names), so over the winter they imported 60-70 lb of those varieties from Seedex.

This year they grew about 1¼ acres, starting their planting in May, then planting a new batch about every five days so that they would have a steady supply at harvest time about 100 days later from mid-August into late September. They planted nine different successions. "The harvest is very tricky. You have only a few days before the pods turn yellow and the seeds become starchy. Then they are no good." Ewell harvests when the seeds have their maximum solids content, and just as the green pods start to turn light green but before they start to turn yellow. The first year they lost some because they waited too long before harvest. When there were some they couldn't sell, they let the plants dry in the field and saved the seed–which is very expensive to buy. Next year they plan to expand again to about 2-3 acres, and to plant their entire crop from hand-harvested saved seed–of which they about 500 pounds. This year they did a lot of demos with their edamamé. Each Friday night before a farmers' market they would cook about 20 lb of edamamé to serve as samples. The flavor is best if they sell them cooled, the next morning (Saturday) at the farmers' market. "They are so sweet when served very fresh. I compare they to sweet corn." People find that his freshly cooked edamamé taste much better that those which have been frozen.

They cut off the soybean plants just above the ground with a pair of flower scissors, then bundle the plants–typically 2-3 plants per bundle (which weighs at least one pound, or a little more). One fresh bundle retails for $5.00 at the farmers' market or $5.99 at natural food stores. They attach a little hang tag to each bundle. It says "Pachamama Farm–Edamamé" on the front. On the back is an explanation of what they are, plus cooking instructions.

Dwayne Johnson has found that the temperature differential during the growing season between the hot days and cool or cold nights in Colorado causes the edamamé to sweeten. Dwayne has measured the sugar level in Brix and found it to be unusually high. Japanese customers who know this food say they have never tasted such sweet and delicious edamamé. In an area like the Midwest where the nights are warm, the plant continues to transpire and releases sugars. So where the plants are grown is as important to good flavor as what varieties are grown.

Ewell believes that edamamé will grow into a huge market in the United States. It should eventually surpass the broccoli market. People like edamamé much better than broccoli. "All you do is boil 'em up in a little salt water, then enjoy 'em with a beer. People flip over them. People are beating my doors down to buy these beans."

Another expert on edamamé is Prof. David Lang, a retired professor from the University of Nebraska (home phone: 402-796-2479). He did intensive and very promising research (about 3 years ago) for several years on edamamé in Nebraska, speaks some Japanese, and formerly had a student named Mr. Okada who did research on marketing edamamé. Okada still works for Daiei supermarkets in Japan. Address: Pachamama Organic Farm, 10771 North 49th St., Longmont,

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Colorado 80503. Phone: 303-776-1924.

10577. Lang, David L. 1998. Work with edamamé at the University of Nebraska (Interview). *SoyaScan Notes.* Oct. 5. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** David used to work with the University of Nebraska, Food Processing Center, HC Filley Hall, Lincoln, Nebraska 68588. He was involved with the marketing of this new product, and he saw Japan as the primary market. Before he retired from the University several years ago, he worked with organic farming and with new crops. He lived in Japan for about 4 years working in communications, and he still speaks a little Japanese. It was only after he joined the University that he got farm experience. He really got interested in edamamé. His group actually grew about 40 acres of commercial edamamé about 3 years ago. With financial help from a Japanese company, they sent one container to Japan for comparison and testing. There was very little difference between the American-grown edamamé and others consumed in Japan except the Americans did have the capability to put it in the kind of pretty package the Japanese wanted. But the flavor and appearance were excellent. David's group bought 1,000 pounds of seed one year from Daiei, who bought it from a Japanese seed company; they also used vegetable-type soybean seed that researchers at the University of Nebraska had developed. He has the varietal names in papers he wrote while at the university.

Mr. Okada had been a major marketer for Daiei corporation for 20 years or so before he came to America. He did work with edamamé in Thailand and Taiwan. A specialist in edamamé, he could look at and taste new varieties grown in new places and tell whether or not they could be sold in Japan. After he enrolled at the University of Nebraska, he was assigned to David's department to assist Nebraska companies in marketing their products in Japan. He is a very good friend of David's, and even stayed at David's house many times. David saw him in Japan last February. He's a wonderful guy.

David has written quite a bit about edamamé, and he sent much of that to Ewell Culbertson, who grows edamamé in Colorado. David wanted to visit him this year so he might work with him during the next growing season.

David believes edamamé have a very bright future in America. In part because of this, the whole experience in Nebraska was quite frustrating. His group was unable to find a processor who could handle the actual blanching and freezing process–without taking down a line of some company that was processing some other food. No company was willing to invest enough money to build even a small plant that could have made the product successful. David had no trouble selling the edamamé–"Everybody loved 'em. About three years ago we took edamamé to bars and taverns, county fairs and state fairs, everywhere. People thought they were just wonderful." He went to a small town north of Lincoln, Nebraska, and got together with several businesses that pitched in about $20,000 to David's project on about 3 farms outside their area. They wanted to do this very much, but they couldn't get together enough money to make it work.

Another group of soybean growers in southeast Iowa (not Iowa State University) has marketed 10-12 containers each season. He has names and addresses in his files. Address: 331 Hudkins, Malcolm, Nebraska 68402.

10578. Stromnes, John. 1998. Zen among us: Former Seattle teacher finds a peaceful existence in western Montana. *Missoulian* (*Missoula, Montana*). Oct. 5. p. A1, A8.
• ***Summary:*** Genki Takabayashi, age 66, a Zen master born in Japan, is teaching authentic Rinzai Zen Buddhist meditation at a temple located in a rented farmhouse near Ronan, Montana. He is one of only three native Japanese teachers of the Rinzai Zen school in America. He is married to an American named Leslie Gannon. Genki Roshi likes to make his own tofu, using a primitive, 300 year old hand-turned stone mill. As part of his daily practice, he grinds ten pounds of dried soybeans (which have been soaked) at a time. Large color photos show: (1) Roshi grinding soybeans–with Montana scenery in the background. The stone mill is inside a large, shallow galvanized metal bucket. (2) Roshi dressed in his formal brown robes, sitting zazen near his home altar.

Also included with this newspaper article: (1) A letter from Leslie Gannon, dated 15 Oct. 1999. She hopes to start a small commercial tofu shop as a source of income. (2) The Newsletter of Zen No Ji Farm (March 1999, Vol. 2, Issue 1). (3) A color photo of Roshi standing in his robes. (4) The June/July 1999 issue of Inspiring Times (Helena, Montana), which contains an article about Genki Roshi titled "Mountain Clay," by Bill Halinan (p. 6, 10). Roshi was born in 1933 in Japan, and entered the monastery at age 11. He has practiced Rinzai Zen for 55 years, many at Daitokuji in Kyoto, but the most recent 20 years were with the Seattle Monastery in Seattle, Washington. He and his new wife Leslie moved from Seattle to the Flathead Valley in the summer of 1997, drawn by the mountains and rural farm setting. Photos show: (1) The roshi making tofu. (2) Leslie Gannon and Genki Roshi in robes. Address: Staff reporter.

10579. Wannamaker, Luther B.; Wannamaker, Mary Joe. 1998. Memories of John E. Wannamaker, soybean developer and farmer from South Carolina (Interview). *SoyaScan Notes.* Oct. 15. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** John E. Wannamaker (pronounced WAN-uh-may-kur) was a minor seedsman and farmer from St. Matthews, South Carolina. He had a deep, lifelong interest in the soybean, and is best known for developing the soybean

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varieties named J.E.W., after his initials. John was a very far-sighted man, especially when it came to the potential and future of soybeans.

Luther's father and John Wannamaker were cousins. Mary Joe, who has a PhD degree, is Luther's daughter. Luther knew John Wannamaker quite well.

John had a nephew who died about 3 years ago. He lived as a hermit at the end of the woods. When his will was probated, it was discovered to everyone surprise, that he left all of his land to a land trust, that would set it aside for conservation and not develop it. His uncle, John, would have liked that!

Luther returned to the business in 1966 to work with his father. John E. had begun to sell soybean varieties by that time, and Luther continued this practice. Bragg was one of the varieties sold. Unfortunately the family no longer has any seed catalogs from that time period.

Luther grows mostly cottonseed, but for the last ten years he has grown a black soybean (*kuromamé*) variety named Tamba, as a specialty crop. It has a higher sugar content than most soybeans. He ships most of his black soybeans (mature/dry) to Japan, where they are boiled with sugar and served on New Year's Day (January 1). Now that the Japanese have discontinued their old rice-growing quotas, they are growing more soybeans in Japan. These compete with Luther's black soybeans, so he would like to try to sell his black soybeans to Asian Americans–especially on the West Coast.

This year, for the first time, Luther is growing (experimentally) a black natto soybean. The Japanese think that black means sweet. He is also considering harvesting his Tamba at the green vegetable stage (the seed is still green) to sell as edamamé. He thinks they would grow well since his latitude is similar to that where edamamé are grown in Japan. Moreover, he has a patented soybean picking machine. However he does not have a freezer or a cooker. Address: L.B. Wannamaker Seed Co., P.O. Box 497, St. Matthews, South Carolina, 29135. Phone: 803-874-3011.

10580. Lerner, Jane. 1998. Global Protein may be shut down: Valley Cottage tofu packager out of second chances, official says. *Journal News* (*The*) (*Valley Cottage, New York*). Oct. 25. p. 12A-13A.

• ***Summary:*** The article begins: "A Valley Cottage tofu-making company has one of the worst food safety and sanitation records in New York and could be shut down by the state any day because of its repeated failure to clean up.

"Global Protein Foods, which processes and packages tofu, bean sprouts and soy beans, has been charged with more violations–for roaches, rat droppings, dirty equipment–than any other establishment in Rockland, Westchester or Putnam counties.

"The company, which has been ordered to pay nearly $7,000 in fines since 1996, is among the worst offenders in the state, said Peter Gregg, spokesman for the state Department of Agriculture and Markets."

Records show that the company has failed 21 of 29 inspections by the Department since 1993. The company failed 8 of its last 10 inspections, the most recent of which took place on Oct. 14. "'Our file on them is as thick as the telephone book,' he said. 'This place continues and continues to ignore our laws and regulations.'"

Located at 707 Executive Blvd., in an otherwise spotless corporate park, the entrance to Global Protein Foods is heaped with garbage. The business has been in Valley Cottage for 7 years. Company president Haruhisa Tsuchitani, now on a business trip in Japan, was unavailable for comment.

10581. Archer Daniels Midland Co. 1998. Annual report: The nature of our business. P.O. Box 1470, Decatur, IL 62525. 40 p. Oct.

• ***Summary:*** Net sales and other operating income for 1998 (year ended June 30) were $16,109 million, up 16.3% from 1997. Net earnings for 1998 were $403.6 million, up 7.0% from 1997, but far below the recent peak of $796 million in 1995. Shareholders' equity (net worth) is $6,505 million, up 7.5% from 1997. Net earnings per common share: $0.68, up 7.9% from 1997. Number of shareholders: 32,539.

"We have moved rapidly toward a borderless world... Globalization of trade has changed the face of agriculture. The central focus for agriculture today is the emergence of consumer power. Consumer demand drives the entire food and fiber system" (p. 1).

One half-page color photo (p. 2) shows the factory where ADM makes isoflavones at Decatur, Illinois. High on one side is the huge green and black logo: "Novasoy–The power of soy." This is the world's first commercial isoflavone plant. A larger photo (p. 3) shows a bottle of Novasoy Soy isoflavones–a co-branded ingredient found in leading nutritional supplement products. "ADM is meeting the needs of health-conscious consumers by offering a wide range of health and nutrition products, including nutraceuticals, also known as functional foods.

"Among our nutraceutical products are soy-derived isoflavones, which have been shown in initial studies to stimulate bone formation (thus boosting the body's natural defenses against osteoporosis), to inhibit the growth of cancer cells, and to contribute to lower cholesterol levels. In addition, isoflavones are thought to play a role in alleviating the symptoms of menopause. ADM produces Novasoy isoflavones in the world's first commercial isoflavones plant."

ADM now has a major presence in the South American soybean market, with five crushing plants (that crush 5,600 tonnes/day), two Atlantic coast export facilities (incl. a new one at Tubarao, southern Santa Catarina state, Brazil), and nearly two million metric tons of storage capacity (p. 5).

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A world map (p. 6-7) titled "ADM's global network" shows ADM processing plants, partnerships, grain elevators, and A.C. Toepfer trading offices. The company owns 800 trucks, 13,000 railcars, and 2,250 river barges (p. 11).

"ADM Lecithin: Early in 1998, the Food and Nutrition Board of the Institute of Medicine established for the first time a Dietary Reference Intake (DRI) for choline, the principal component of lecithin. Ultralec, a deoiled lecithin made from an innovative ultrafiltration technology exclusive to ADM, is an excellent source of dietary choline. This plant has been completed in Decatur, Illinois. Acquisitions brought significant increases to production capacities in the past year. In the U.S. the acquisition of Moorman Manufacturing Co. included their lecithin production facilities at Quincy, Illinois and Helena, Arkansas. Production capacity was gained in Mainz, Germany through the acquisition of Soya Mainz GmbH" (p. 16). Note: Moorman Manufacturing Co. bought the Quincy Soybean Processing Co. (Quincy, Illinois) from Irving Rosen in 1961.

"ADM Research: Nutraceuticals (or 'functional foods') now in production include vitamin E, vitamin C, isoflavones, granular lecithin, and sterols (from vitamin E). Among ADM's forthcoming health and nutrition products are the antioxidants beta-carotene, oligosaccharides, and tocotrienols. Already in use in Japan, oligosaccharides are complex sugars that belong to the nutritional category of prebiotics that have been proven to decrease the risk of colon cancer and perhaps increase life expectancy" (p. 16).

Haldane Foods has four factories in England that make a variety of "meat and dairy alternatives... New products include meatless slices, including chicken, ham, and 'Vege-Bacon." Haldane also makes an outstanding dairy-free ice cream (p. 17).

Color photos show: (1) Dwayne Andreas shaking hands with Shimon Perez (facing p. 1). (2) A white plastic bottle of NovaSoy Soy Isoflavones (p. 3). (3) ADM's dock and export facility in the Atlantic port city of Tubarao, Brazil (p. 5).

Accompanying the annual report is a "Notice of Annual Meeting of Stockholders." Address: Decatur, Illinois.

10582. Shurtleff, William; Aoyagi, Akiko. 1998. The book of tofu. 2nd ed. Revised. Berkeley, California: Ten Speed Press. 336 p. Oct. Illust. by Akiko Aoyagi Shurtleff. Index. 28 cm. [321 ref]

• ***Summary:*** This edition contains a completely new "Appendix B–Directory of Tofu Makers" (p. 313-316, updated to 1 Aug. 1998). The page "About the Authors" (autobiographical) has been updated, and the original photograph has been replaced with two more recent ones–reflecting the fact that Bill and Akiko separated in Nov. 1993 and their marriage ended in May 1995.

After the first printing in Oct. 1998, the Preface was quite extensively revised (but not updated) to include more about how this book came into being (early dates and names), including the important contributions on Jeffrey and Gretchen Broadbent, and of Nahum and Beverly Stiskin. These Preface changes first appeared in the second printing of May 1999.

On page 336 is "The Best of Vegetarian Cooking from Ten Speed Press" (descriptions of eight cookbooks, with price and ISBN).

The inside rear cover has been updated, and now includes current information about SoyaScan, the unique computerized database produced by Soyfoods Center. This database now contains more than 55,000 records from 1100 B.C. to the present, and more than 73% of all records have a summary / abstract averaging 128 words in length. A description of the four different types of records (published documents, commercial soy products, original interviews and overviews, and unpublished archival documents), and the number of each type, is given.

The front and rear covers, title page, table of contents, and the first page of each section have been redesigned to give the book a much more contemporary look. Still contains 500 vegetarian recipes–both Western and Eastern style.

Ten Speed Press gave this book a new ISBN: 1-58009-013-8. Yet despite the many changes described above, the authors preferred not to have this called a "new edition" or "revised edition." Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

10583. Noon, Ed. 1998. Importing frozen edamamé from China for Safeway (Interview). *SoyaScan Notes.* Nov. 18. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Ed (who is a Caucasian American) runs a company (Noon International) that imports and exports frozen vegetables. He deals a lot with the Asian community and he travels frequently to East Asia, especially China, Taiwan and Japan. Wants to import frozen edamamé in the pods from China for Safeway, to package under their Select label. He is working with Janet Olson, who is in charge of Quality Assurance at Safeway. He has been interested in edamamé for years, but during the past 12-18 months he has noticed a big increase in awareness of this product in America, especially among Americans who eat at Japanese restaurants. There, edamamé are often given away as an hors d'oeuvre free of charge, in the pods, in little dishes or baskets, usually served cold–but sometimes warm. He has liked the product for years, and has brought in samples for his family and staff. They have all enjoyed it. Several years ago he visited SunRich, in Minnesota; they were growing edamamé. Ed has even tried growing edamamé in Honduras and Mexico–for the first time 2½ to 3 years ago, and most recently about 1½ years ago. He now sells some frozen shelled edamamé to a company named Logan–a big marketing company like the Birdseye of Australia; Logan sells them shelled under the name Green Soybeans.

Shelled edamamé is also a good product, but it has

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one big problem; it looks too much like a lima bean or green pea, and compared with those two foods, edamamé are much more expensive. Ideally, Ed would like to market this product to bars; they could sell it–as is done in Japan–as an hors d'oeuvre like peanuts–with beer or other alcoholic beverages. But the problem is that edamamé require considerably more care than peanuts–especially refrigeration–and there will be losses from spoiled products that are held too long.

Ed hasn't imported foods from Japan for about ten years, because of the appreciation of the Taiwan dollar vs. the American dollar. He imports many products from China, but since the Chinese have not devalued their currency, their price is not as low as in most other Asian countries. Address: Noon International, 3840 Blackhawk Road, Suite 100, Danville, California 94506. Phone: 925-736-6696.

10584. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*). 1998. Nattô kin to nattô no ito [*Bacillus subtilis* (*natto*) and natto's strings]. 45(11):710. [3 ref. Jap]

10585. Culbertson, Ewell. 1998. The work of Seedex Inc. in Longmont, Colorado, and its president Akio Suzuki Colorado (Interview). *SoyaScan Notes.* Dec. 16. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Seedex is a Japanese seed company in Longmont, Colorado. Akio Suzuki, who is about age 60, was born and raised in Japan, but has a PhD in agriculture from North Carolina State University, is the company president. Seedex's main business is sugar beet seeds, but they are looking at edamamé as a possible new seed product. Seedex has a relationship with two seed companies in Japan that breed edamamé and are working on about 20 varieties. Seedex has also worked closely with Dwayne Johnson for the last 4-5 years in developing new varieties of edamamé. Last August (4 months ago) Seedex paid for Dwayne to go to Japan to study seed harvesting equipment for mature dry soybeans.

When a grower, such as Ewell, buys good quality edamamé seed from Japan it costs $12-$26 per pound. When seeded at the rate of 80 lb/acre this comes to $960 to $2,080 per acre just for the seed! Seedex now has excess edamamé seed that they would like to sell.

Ewell believes that edamamé has a bright future in America since consumption is now growing rapidly in various parts of the country. Mr. Suzuki seems to have a much less optimistic view of the crop and its future; therefore, Ewell feels, the pace of the Seedex development program is slow and somewhat half-hearted. Address: Pachamama Organic Farm, 10771 North 49th St., Longmont, Colorado 80503. Phone: 303-776-1924.

10586. Takai, Wataru. 1998. Re: Several manufacturers of tofu equipment have gone bankrupt in Japan during 1998. Letter (fax) to William Shurtleff at Soyfoods Center, Dec. 18. 1 p.
• ***Summary:*** These include: (1) Touffer Co., formerly named Takahashi Shoten (Nagoya). (2) Nakamuta Seisakujo (Kyushu). (3) Hoshitaka Co. The Japanese economy has been struggling for the past 8 years or so. Address: Takai Tofu & Soymilk Equipment Co., 1-1 Inari, Nonoichi-machi, Ishikawa-ken 921, Japan. Phone: 011-81-0762-48-1355.

10587. *GMF–Genetically Modified Foods Market Intelligence* (*Genetic ID, Fairfield, Iowa*). 1998. Labeling news. No. 27. Dec. 23. p. 3-6.
• ***Summary:*** Contains three articles: Japanese want labels. New Zealand claims pressure. U.S. chefs campaign for labels.

10588. Adlercreutz, Herman; Wähalä, K.; Rasku, S.; Salakka, S.; Watanabe, S. 1998. Soybean isoflavones: analysis, amounts in foods and biological matrices, and pharmacokinetics–Metabolism of isoflavinoids in Japanese men (Abstract). *American J. of Clinical Nutrition* 68(6S):1536S. Dec. Supplement.
Address: 1-2. Dep. of Clinical Chemistry; 3-4. Dep. of Chemistry. 1-4. Univ. of Helsinki, Helsinki, Finland; 5. Dep. of Nutrition and Epidemiology, Faculty of Nutritional Science, Tokyo Univ. of Agriculture, Tokyo, Japan.

10589. Akihiro, Ito; Goto, T.; Yamanda, K.; Fujimoto, N.; Watanabe, H. 1998. Soy and cancer–Animal studies: Primary prevention of cancers by miso, soybean, and biochanin A on rodent tumors (Abstract). *American J. of Clinical Nutrition* 68(6S):1525S. Dec. Supplement.
Address: Dep. of Cancer Research, Research Inst. for Radiation Biology and Medicine, Hiroshima Univ., Kasumi 1-2-3, Hiroshima 734, Japan.

10590. Kahara, Yoshiki Y.; Iida, T.; Okubu, K.; Kanazawa, T. 1998. Soy and cancer–Soybean anticarcinogens and anticancer mechanisms: Chemical structure and radical scavenging activity of soybean glycosides (Abstract). *American J. of Clinical Nutrition* 68(6S):1528S. Dec. Supplement.
• ***Summary:*** Soybeans contain about 2% glycosides. The composition and structure of "group B saponins" in Japanese soybean seeds were investigated. Five kinds of soyasaponins were isolated. The structures were found to have a DDMP group attached, and this group showed an activity like that of superoxide dismutase. Moreover, the DDMP saponins has DPPH radical scavenging activity. Address: Dep. of Environmental Bioremediation, Graduate School of Agriculture; Tohoku Univ., Aobaku, Sendai, Japan 981; 2nd Dep. of Internal Medicine, Hirosaki Univ. School of Medicine, Hirosaki, Zaifucho, Hirosaki, Aomori, Japan 036.

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10591. Kanazawa, Takemichi; Osanai, Tomohiro. 1998. Soy and heart disease–Effects independent of cholesterol reduction: Effects of soy protein on peroxidizability, antiplatelet aggregability, and enlargement of molecular size of low-density lipoprotein (Abstract). *American J. of Clinical Nutrition* 68(6S):1523S. Dec. Supplement.
Address: Second Dep. of Internal Medicine, Hirosaki Univ. School of Medicine, Hirosaki, Japan.

10592. Kitamura, Keisuke. 1998. Miscellaneous–Genetic modification of seed storage protein in soybean (Abstract). *American J. of Clinical Nutrition* 68(6S):1541S. Dec. Supplement.
Address: Dep. of Plant Breeding, National Agriculture Research Center, Japan.

10593. Komatsu, Tatsushi; Komatsu, K.; Yamamoto, T.; et al. 1998. Soy and heart disease–Hypocholesterolemic effects of soy–Potential mechanisms: Soybean protein hydrolysates reduce serum cholesterol concentration and induce thermogenesis (Abstract). *American J. of Clinical Nutrition* 68(6S):1520S-21S. Dec. Supplement.
Address: 1. Univ. of Occupational and Environmental Health, Fukuoka, Japan; 2. Fukuoka Prefectural Univ., Fukuoka, Japan; 3. Applied Research Inst., Fuji Oil Co., Osaka, Japan.

10594. *Palawija News* (*Bogor, Indonesia*). 1998. The Third International Soybean Processing and Utilization Conference (ISPUC-III): Tsukuba, Ibaraki, Japan. October 15-20, 2000. 15(4):17. Dec.
• ***Summary:*** The first such conference was held in the People's Republic of China in 1990, and the second in Thailand in 1996. For further information, contact: Secretariat for ISPUC-III. c/o Congress Corporation. 7th Akiyama Bldg., 5-3 Kojimachi, Chiyoda-ku. Tokyo 102-0083, Japan. Telephone: 03-3263-5896. Fax: 03-3263-4032. E-mail: ispuc3@congre.co.jp. URL: http://www.nfri.affrc.go.jp/gyoji/soybean.html.

10595. Secretariat for The Third International Soybean Processing and Utilization Conference (ISPUC-III). 1998. First announcement–The Third International Soybean Processing and Utilization Conference (ISPUC-III): 2000–Dawn of the innovative era for soybeans. October 15-20, 2000, Tsukuba, Ibaraki, Japan (Leaflet). Tokyo, Japan. 3 panels each side. Each panel: 22 x 11 cm.
• ***Summary:*** This leaflet is printed black and green on yellow paper. The scientific program has 3 keynote sessions and 8 scientific sessions. There will also be exhibitions and study tours. Proceedings will be published after the conference. Dr. Keiji Kainuma is president of this third conference. For further information: Fax: 03-3263-4032. E-mail: ispuc3@congre.co.jp. URL: http://www.nfri.affrc.go.jp/gyoji/soybean.html. Address: c/o Congress Corporation. 7th Akiyama Bldg., 5-3 Kojimachi, Chiyoda-ku. Tokyo 102-0083, Japan. Phone: 03-3263-4032.

10596. Wu, Anna H.; Ziegler, R.G.; Nomura, A.M.; West, D.W.; Kolonel, L.N.; Horn-Ross, P.L.; Hoover, R.N.; Pike, M.C. 1998. Soy intake and risk of breast cancer in Asians and Asian Americans. *American J. of Clinical Nutrition* 68(6S):1437S-43S. Supplement. Dec. [46 ref]
• ***Summary:*** The risk of breast cancer varies significantly throughout the world. Rates are highest among whites in the USA and Europe, and lowest among native Japanese and Chinese and other Asians in their homelands. The risk among the first group (whites) has historically been about 6 times as high as that of the risk among Asians. Migration studies have proved that this large difference in risk is not caused by genetic differences. Evidence from case-control studies suggests, but not entirely consistently, that soy intake may protect against breast cancer.

Two of three epidemiologic studies published before the 1990s suggested that intake of soy may protect against breast cancer (See: Nomura et al. 1978; Hirayama 1986). Since 1990, four case-control studies have evaluated the association between self-reported soy intake and breast cancer: See Lee et al. 1991, and 1992 (Conducted among Chinese in Singapore); Yuan et al. 1995 (Chinese in Shanghai and Tianjin, China); Hirose et al. 1995 (Japanese in Nagoya, Japan); Wu et al. 1996 (Asian-Americans {Chinese-, Japanese-, and Filipino Americans} residing in the San Francisco-Oakland metropolitan statistical area, Los Angeles County, and Oahu, Hawaii). This article compares those studies very carefully.

In groups consuming similar amounts of tofu, the tofu was more protective in Asians who migrated to the USA, than to Asians born in the USA. Address: Dep. of Preventive Medicine, Univ. of Southern California, Los Angeles; Environmental Epidemiology Branch, Div. of Cancer Etiology, National Cancer Inst., Bethesda, Maryland; Epidemiology Program, Cancer Research Center of Hawaii, Univ. of Hawaii, Honolulu; Northern California Cancer Center, Union City.

10597. Yamamoto, T.; Aoyama, T; Fukui, K.; Takamatsu, K.; Hashimoto, Y. 1998. Growth and hormonal effects of soy–Soy protein and its hydrolysate reduce body fat of dietary obese rats (Abstract). *American J. of Clinical Nutrition* 68(6S):1540S. Dec. Supplement.
Address: Dep. of Nutrition and Health, Applied Research Inst., Fuji Oil Co., Ltd., Sumiyoshi-cho, Izumisano-shi, Osaka 598, Japan.

10598. Gotoh, T.; Yamada, K.; Yin, H.; Ito, A.; Kataoka, T.; Dohi, K. 1998. Chemoprevention of N-nitroso

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N-methylurea-induced rat mammary carcinogenesis by soy foods or biochanin A. *Japanese J. of Cancer Research* (*Gann*) 89:137-142. *
• ***Summary:*** Diets containing either 10% soybeans or 10% miso reduced mammary tumor numbers (tumors/rat) by roughly 50%, although there was little effect on tumor incidence (percentage of rats in each treatment group developing tumors).

10599. Muramatsu, K.; Kanai, Y.; Tanaka, T.; Kiuchi, K. 1998. Comparison of Korean chungkuk-jang with itohiki-natto on development of new fermented soybean food. *Bulletin of the Center for Interdisciplinary Studies, Science Culture Kyoritsu Women's Univ.* 4:22-25. *

10600. Nikkan Keizai Tsûshin-sha (Nikkan Keizai News Agency). 1998. Miso no shuyô-meka [Japan's largest miso manufacturing companies]. Tokyo, Japan. 1 p. [1 ref. Jap]
• ***Summary:*** This table ranks Japan's top fifty miso manufacturers in descending order of volume produced. For each company it gives the company name, prefecture where the company is located, and tonnes (metric tons) of miso produced in 1993, 1994, 1995, 1996, and 1997.

The top ten companies (with their output in tonnes) for 1997 and 1998 are: (1) Marukome 77,000 / 81,500 (they do not export any). (2) Hanamaruki 38,800 39,200 (they export to Westbrae, Canada). (3) Kanesa 27,300 / 27,800. (4) Marusan-ai 26,230 / 26,800 (they export to Eden Foods). (5) Miyasaka Jozo 19,080 / 18,900. (6) Hikari Miso 14,700 / 16,000. (7) Yamajirushi 15,200 / 15,100 (they export to San-J). (8) Fundôkin Shoyu 13,900 / 14,100. (9) Ichibiki 13,100 / 13,000. (10) Takeya 12,000 / 11,500.

Also: (11) Marudai 11,300 / 11,400. (13) Nagano Miso 9,500 / 9,450. (16) San Jirushi Jozo 8,750 / 1,700. (25) Sendai Miso Shoyu 4,900 / ? (they export to Westbrae).

The total amount of miso produced in Japan by all companies was as follows by year (in tonnes): 1993–561,259. 1994–540,390. 1995–539,427. 1996–542,077. 1997–542,238. 1998–548,750. Address: Japan.

10601. Onozawa, M.; Fukuda, K.; Ohtani, M.; Akaza, H.; Sugimura, T.; Wakabayashi, K. 1998. Effects of soybean isoflavones on cell growth and apoptosis of the human prostatic cancer cell line LNCaP. *Japanese J. Clinical Oncology* 28:360-63. *

10602. **Product Name:** [Tofu-yo fermented tofu].
Foreign Name: Awa Beni Dôfu.
Manufacturer's Name: Otsuka Foods Co., Ltd.
Manufacturer's Address: Osaka, Japan.
Date of Introduction: 1998.
Ingredients: Tofu (non-genetically engineered), ethyl alcohol, rice koji, red rice koji (*beni-koji*), salt, tofu solidifier (no specifics are given), spices, enzymes.
Wt/Vol., Packaging, Price: Glass jar.
How Stored: Refrigerated.
New Product–Documentation: See next page. Product with Label and outside paperboard box brought to Soyinfo Center. 2011. Dec. 14. by Taro Mikuriya of Otsuka Pharmaceutical Co., Nutrition & Sante Group. The outer, nearly-cubic box is 3 by 3 by 3¼ inches high (7.5 x 7.5 x 8.5 cm). Red and black on beige. The front panel, which appears on 3 sides of the box, shows a square of tofu-yo on a small white dish. The characters "Beni-dofu" appear large and bright red against the tan background. The product description appears on one panel. Contents: 6 pieces (no weight is given).

The fermented tofu itself comes in a glass jar, immersed in alcohol thickened by red rice koji. Atop the jar, inside the outer box is a small brochure, full color on glossy paper; with 4 panels on each side. Each panel is 6.5 cm square. The inside 4 panels describe different ways of serving the product. One outside panel gives a brief history of tofu-yo from Okinawa. Taro says (e-mail of 21 Dec. 2011) that the product was launched in 1998 by Otsuka Foods Co., Ltd.

Soyinfo Center taste test: Taste and texture: Delicious, almost like Okinawan tofu-yo. However use of the word "awa" in the product name, a possible hint at the word "awamori" (an expensive and traditional Okinawan alcoholic beverage) when there is none in the product, seems deceptive.

10603. Sugiyama, Hideko; Kagawa, Sachiko; Kamiya, Hidehiro; Horio, Masayuki. 1998. Chlorine behavior in fluidized bed incineration of refuse-derived fuels. *Environmental Engineering Science* 15(1):97-105. *
• ***Summary:*** "The synthetic RDFs were made of newspaper and Tofu-lees or newspaper, Tofu-lees, and Polyvinylchloride (PVC) with and without calcium additives."

10604. Baba, Teiji. 1998. Jibun de tsukutte nattô ku: zukai [Eat the natto you have made yourself: Illustrated]. Tokyo: Hato Shuppan. 123 p. 21 cm. Series: Omoshiro Sensho, no. 19. [Jap]*

10605. Beta homu kyokai [Better Homes Association]. 1998. Kantan tezukuri miso tekisuto [Easy homemade miso handbook]. Tokyo: Beta homu kyokai. 48 p. 21 cm. [Jap]* Address: Japan.

10606. Ling, Kong Foong. 1998. Food of Asia: authentic recipes from China, India, Indonesia, Japan, Singapore, Malaysia, Thailand and Vietnam. Singapore: Periplus. 160 p. Illust (color). Index. 31 cm.
• ***Summary:*** A very attractive book printed on glossy paper with at least one color photo on almost every page. The introduction and essays are by Kong Foong Ling. The index, which is poor, makes the book hard to use if you are looking for particular foods found throughout Asia such as soybeans,

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soy sauce, miso, salted / fermented black beans, yuba [bean curd skin], etc.

Contents: The flavors of Asia. Ingredients. The Asian kitchen. China. India. Indonesia. Japan. Malaysia & Singapore. Thailand. Vietnam. Appendix.

The "Ingredients" section includes: Bean curd (incl. cotton or momen tofu, silken bean curd, deep-fried bean curd or aburage, grilled bean curd or yakidofu, fermented bean curd or nam yee). Bean curd skin [yuba]. Black beans, salted (and fermented). Hoisin sauce ("A sweet sauce made of soy beans, with spicy and garlicky overtones"). Miso (incl. red miso and white miso). Salted soy beans (incl. "yellow bean sauce"). Soy sauce (incl. light soy sauce, black soy sauce, red soy sauce, Kikkoman, tamari, thick sweet soy sauce (kecap manis–Indonesian)). Tempeh. Also: Red beans (dried azuki). Seaweed (incl. dried kelp, golden kelp, mozuku, salted dried kelp, laver or nori, wakame). Sesame (black and white seeds, tahina {tahini}). Sesame oil. Sesame rice crackers.

Beancurd or bean curd is mentioned on pages 12, 29-30, 34, 36, 88, 94, 101, 155.

Fermented bean curd: p. 25.

10607. Lotong, Napha. 1998. Koji. In: Brian J.B. Wood, ed. 1998. Microbiology of Fermented Foods. 2nd ed. Vol. 2. London: Blackie Academic & Professional / Thompson Science. An imprint of Chapman & Hall. xx + p. 441-852 + I1-I17. See p. 658-95. Illust. Index. 24 cm. [165 ref]
• ***Summary:*** Contents: Definition and scope. Soybean koji: Raw materials (soybean wheat), koji preparation (Japanese soy sauce koji, miso-dama, koji produced by natural inoculation, preparation procedures, microorganisms involved, koji enzymes), application of soybean koji (soy sauce fermentation, soybean paste fermentation, sufu fermentation, fish sauce fermentation). Rice koji and similar products: Mould enzymes used in the fermentation of alcoholic foods and beverages (saké rice koji, preparation of rice koji, roles of rice koji in saké brewing, saccharolytic enzymes obtained by using starter cakes as inocula, and their applications, saccharolytic enzymes used in distilling industries in Thailand), ang-kak, miso rice koji. Seed inocula: Tane koji, production of seed inocula for soybean koji in Southeast Asia, preparation of flask-like plastic culture bags, types of seed koji, factory stock cultures, production of seed culture in other South East Asian countries, dry starter cakes (raw materials and method of preparation), spore mass produced on rice adhering to inside surface of flasks. Conclusion. Address: Dep. of Microbiology, Faculty of Science, Kasetsart Univ., 50 Paholyothin Rd., Jatujak, Bangkok 10900, Thailand.

10608. Miso fûmi no okazu: kono kaori ga tamaranai [Side dishes flavored with miso: Their fragrance never ends]. 1998. Tokyo: Shufunotomo-sha. 95 p. 26 cm. [Jap]*
Address: Japan.

10609. Ruiz, Hipólito. 1998. The journals of Hipólito Ruiz: Spanish botanist in Peru and Chile 1777–1788. Translated by Richard Evans Schultes and María José Nemry von Thenen de Jaramillo-Arango. Transcribed from the original manuscripts by Jaime Jaramillo-Arango. Portland, Oregon: Timber Press. 357 p. See p. 192. Illust. Index. 27 cm. [Eng]
• ***Summary:*** In Chapter 31, titled "Description of the village of Sayán," states that the valley of Huara stretches from Huara to Sayán. (Note: A modern map of Peru shows that Huara is a town on the seacoast about 80 miles northeast of Lima (the capital) and Callao, and just north of the seaport city of Huacho; Huara is about 30 miles inland, directly east.) In about Sept. 1781, the Spanish botanists and artists traveled a little southward along the coast to the province of Chancay. Note: Today the town of Chancay is on the coast about midway between Huara and Callao/Lima. In this province they collected and dried many plant specimens. For each, the author gives the scientific name (genus and species), local Spanish name; the translator adds the English name (if known). One of the plants collected (p. 192) is "*Dolichos soja?*, frijolillos (little beans); the seeds are eaten cooked and are very tasty. It is a cultivated plant. I have never seen it growing wild." Note 1. The question mark after "soja" probably means that Ruiz was unsure of the plant's identity. Note that two other plants mentioned on p. 192 also have a question mark after their scientific names. This question mark also appears after *Dolichos soja* in the index of this book (see p. 347). Why did the translator not give the English name?

Note 2. If Ruiz correctly identified *Dolichos soja,* an early scientific name for the soybean, this would be by far the earliest document seen concerning soybeans in Peru or South America or all of Latin America. And this document would contain the earliest date seen for soybeans in Peru, or South America, or South America.

Talk with Juan del Campo, historian at the Peruvian Embassy in Washington, DC. 2000. March 16. In 1777 Peru was a colony of Spain ruled by a Viceroy who represented the king of Spain–so more precisely it was the viceroyalty of Peru–which was established by Spain in 1542. But the phrase "Kingdoms of Peru and Chile" was widely used by the Spanish at the time.

During the 1600s and 1700s, Peru and Mexico were the two main Spanish dominions in the New World. Up until the 18th century, the viceroyalty of Peru included Panama and all of Spanish South America except Venezuela. The region now corresponding approximately to Bolivia was named "Upper Peru." In 1717 New Granada (now Colombia), and in 1776 Buenos Aires (La Plata; now Argentina) were made separate viceroyalties.

There was a very large seaport at Callao. Founded in 1537 and incorporated as a town in 1671, it is presently the chief port of Peru, on Callao Bay, 8 miles (13 km) west

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of Lima. The Spanish even built a large fort at Callao to fight against the English pirates Francis Drake (1543-1596) and John Hawkins (1532-1595). The Manila Galleons that went from the Philippines to Acapulco, Mexico, usually went next to Callao to trade. At the time, the Philippines (called Capitania General) was ruled by Spain from Mexico. During its peak of trade with Asia, for more than a century from about 1650 to 1760, Callao was the biggest port of the Spanish dominions in the Americas–much bigger even than Acapulco in its volume of trade. So anything (such as soybeans plants or seeds) that went on a Manila Galleon to Acapulco might very well have also gone to Callao.

The first Asian immigrants to Peru came from China in the early 1850s to work in agriculture and on the railroads. They continued to arrive until the 1880s. The first wave of Japanese immigration to Peru started in the late 1890s. In the Quechua language, the language of the indigenous Peruvians, several similarities have been found between Quechua words and Japanese words–which is amazing, and of great interest to linguistic researchers. One theory says there was trade with East Asia during the Incan empire, which ruled Peru from ca. 1230-1533, when it was conquered by Spanish explorer Francisco and fellow Spanish soldier Diego de Almagro.

Talk with Prof. Ted Hymowitz, Prof. of Plant Genetics, Univ. of Illinois. 2000. March 28. Richard Schultes started the field of ethnobotany; he is now approximately in his 80s. Ted thinks the plant that Ruiz was describing was probably the lima bean. Linnaeus first gave the name *Dolichos soja* to the soybean in 1753 (*Species plantarum.* Vol. II., p. 727). Ruiz had probably never seen a soybean but he may have had Linnaeus' manuscript or book with him.

Contains numerous interesting and early color maps, including one of Lima, Peru, and the coast, including Callao (facing p. 176) based on a survey conducted in May 1771. Address: Spain.

10610. Sinclair, Charles Gordon. comp. 1998. International dictionary of food and cooking. Chicago: Fitzroy Dearborn. 594 p. See p. 234. 24 cm. *

• ***Summary:*** Vietnamese: dau hu: Bean curd. dau hu chien: Fried bean curd. dau hu chung: Bean curd. dau hu ki: Dried [sic, pressed] bean curd (p. 161).

fu jook pin (Chinese): Bean curd sticks [dried yuba sticks] (p. 219).

"*gochujang* (Korean): A chilli paste similar to sambal olek" (p. 234).

Indonesian: Kecap asin is thick, salty, dark colored soy sauce used for coloring and flavor. Kecap bentang manis: See kecap manis. Kecap manis: A sweet, thick, dark colored aromatic soy sauce used as a seasoning and condiment, and for satay. "Also called ketjap sauce, kecap bentang manis, sweet soya sauce" (p. 292).

Ketjap (Ho [Holland, Dutch]) Ketchup. Ketjap sauce. See kecap manis.

The word "soya" appears on 100 pages in this book. For example: Aburage (Japanese): Soya bean pouches made by deep-frying slices of pressed bean curd.

For "soy bean" see "soya bean." For "soy bean oil" see "soya bean oil." For "soy sauce" see "soya sauce."

"Sweet bean paste. A thick brown sauce made from ground fermented soya beans mixed with sugar and brine. Popular in Taiwan as a condiment or seasoning" (p. 530).

10611. Solomon, Charmaine; Solomon, Nina. 1998. Charmaine Solomon's encyclopedia of Asian food. Boston, Massachusetts: Periplus Editions. xiv + 480 p. Color illust. ([28] p. of plates). 29 cm. [67* ref]

• ***Summary:*** An outstanding book; the color illustrations of many ingredients are spectacular and very informative. The author has an insatiable curiosity.

Contents: List of illustrations. Introduction. How to use the *Encyclopedia of Asian Food.* Acknowledgements. A-Z of Asian Food. Bibliography. Illustrated index of selective ingredients. Index of recipes. Index of alternative words and main entries.

Soy related entries: Bean curd (p. 26-28, incl. all the different types, yuba, deep-fried tofu types, fermented tofu incl. ch'ou doufu [chou doufu]: "Despite its overpowering aroma, slimy texture, unappetizing color and the unfortunate odor it leaves on the breath, those brave enough to partake of it consider it a delicacy").

Bean paste, sweet (p. 29. The three colors and types are red {from adzuki beans}, yellow {from mung beans, husked and split}, or black {from black soy beans}. "The pastes are usually available ready-made sweetened in cans. It is possible to make your own, starting out with dried beans." Name in Chinese: dow sa, tau sa {sweet bean paste}).

Bean paste, yellow (p. 29. Despite what the label says, this thick, salty condiment is brown, not yellow, in color).

Bean sauces (p. 29. "Made from fermented soy beans," they range in color from yellow to brown to black [sweet black bean paste]. Their consistency is more like pastes that must be spooned from the jar than pourable tomato ketchup).

Beans, salted yellow (p. 31. Canned yellow soybeans which have been salted and fermented).

Beef (p. 31-37 incl. Teriyaki steak, Sukiyaki, Beef with black bean sauce, incl. "2 tablespoons canned salted black beans [fermented black soybeans]").

Black bean (p. 43-44. Black soy beans which are fermented and salted. "Some are sold in cans in a salty liquid, others in plastic bags, covered with salt crystals." Also called "preserved black beans").

Flours & starches (p. 157-61). Incl. soy flour. "A high protein, low starch flour... used mostly in Japan [where it is called kinako] and China. In Korea roasted soy bean flour and fermented soy bean flour are used to make a variety of bean pastes."

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Note. This is the earliest English-language document seen (Nov. 2012) that uses the term "roasted soy bean flour" to refer to kinako.

Legumes & pulses (p. 206-18). A long and interesting section. All entries have a scientific name. Many have an illustration. Those found in many Asian countries (e.g., green bean, green pea) have the name in each country. Includes: Introduction, adzuki bean, asparagus bean (see winged bean), asparagus pea, black-eyed pea (a variety of cowpea), black gram, blue pea, broad bean, butter bean (see lima bean), chick pea, cowpea (see yard-long bean), fenugreek, green bean, green pea, hyacinth bean (see lablab bean), lablab bean, lentil, lima bean, long bean (see yard-long bean), moong bean (see mung bean), moth bean, mung bean, parkia, peanut, pigeon pea, red bean (see adzuki bean), red kidney bean, rice bean, sataw bean (see parkia), snow pea, soy bean (short entry), sugar snap pea, tamarind, white gram (see black gram), winged bean (China: su-ling dou; India: Goa bean; Indonesia: kecipir; Japan: shikakumame; Malaysia: kacang botor; Philippines: sigarilyas; Sri Lanka: dara-dhambala. Thailand: thua pu). Yard-long bean (this is the fresh bean known by a host of names). Recipes: Adzuki bean soup.

Master sauce (p. 232). "Also known as 'flavour pot' or 'lu,' this sauce has a base of soy sauce, water, sugar and Chinese wine or sherry, with a few variable additions..." Cooking with it is similar to 'red-cooking.'

Miso (see soy bean products). Mushrooms & fungi (p. 237-40, incl. recipe for Braised bean curd, cloud ear and vegetables, and Braised soy mushrooms). Natto (see soy bean products).

Oils (p. 258-59, incl. coconut oil, gingelly oil [sesame oil], mustard oil, palm oil, palm kernel oil, peanut oil, perilla oil, sesame oil). Note: Soy oil is not mentioned here! Okara (see soy bean products). Salads, incl. recipe for Indonesian vegetable salad (gado-gado), that calls for 4 oz. fried bean curd. Shoyu (see soy sauce).

Soy bean, dried (349). China: da dau, wong dau, hak dau, tai dau. Indonesia: kacang kedelai. Japan: daizu. Korea: jaa jang. Malaysia: kedelai. Philippines: utaw. Thailand: thua lueang.

Soy bean, fresh. China: mao dau. Indonesia: kacang soja. Japan: edamame. Malaysia: kacang soja. Recipe: Fresh soy beans with bean curd.

Soy bean products (p. 350): Miso (incl. recipe for miso soup). Natto. Soy bean paste (go). Soy milk (including okara). Tahuri (Philippine fermented tofu). Tokwa (tokwan; very firm square tofu).

Soy bean sprouts, with recipe for soy bean sprout salad. China: dai dau nga choi. India: bhat. Indonesia: kacang kedele, taugeh. Japan: daizu no moyashi. Korea: Kong namul. Malaysia: kacang soja, taugeh. Philippines: utaw. Thailand: thua-lueang.

Soy sauce (p. 351-52). Chinese soy sauce: Dark soy sauce. Light soy sauce ("Usually labeled 'superior soy'"). Mushroom soy sauce (Dark soy sauce that has been flavored with straw mushrooms). Japanese soy sauces: Koikuchi (regular shoyu), tamari, usukuchi. Korean soy sauce ("About the same colour as Chinese light soy sauce, but not as fiercely salty and with a sweet malted aroma"). Thick and flavoured soy sauces: Kecap asin ("A dark, salty soy sauce, from Indonesia, a little thicker than the dark soy of China"). Kecap manis (A thick, sweet soy sauce from Java, Indonesia). Kicap cair: "The Malaysian equivalent of light soy sauce." Kicap pekat: "The Malaysian equivalent of dark soy sauce, though thicker than the Chinese version, but not as thick as kecap manis." Ponzu shoyu. Toyo mansi (p. 352): "A soy sauce used in the Philippines soured with kalamansi juice."

Note: This is the earliest document seen (April 2012) that uses the term "Kicap cair" or the term "Kicap pekat" to refer to light and dark Malaysian soy sauces, respectively.

Tempeh (p. 386). Incl. recipes for Savoury Tempeh and Thai style tempeh. Tofu (see bean curd).

Also discusses: Adzuki bean, agar-agar (incl. almond bean curd, awayuki), almond, amaranth, cowpea, crab in black bean sauce (recipe at crab), daikon, millet, monosodium glutamate ("I would strongly recommend omitting it"), Nonya (pronounced 'Nyonya.' The unique cookery found in Malaysia and Singapore resulting from the fusion of Malay and Chinese cuisine during the last century), peanut, peanut sauce, sago (this palm flowers only once in its life, at about age 15. Just before flowering, it builds up a large reserve of starch in the pith. The tree is felled, the pith scooped out, ground and washed to make sago starch), seaweed (incl. agar-agar, hijiki, kombu / konbu, mozuku, nori / laver, wakame), sesame paste, sesame seed, vegetarian meals ("By far the most important vegetarian food in the Far East... is bean curd"). Address: Australia.

10612. Stacey, Jenny; Keller, Maureen. 1998. The soy sauce cookbook: Explore the flavor-enhancing power of Asia's magic ingredient. New York, Tokyo and London: Kodansha International. 80 p. Illust. Index. 29 x 15 cm.

• ***Summary:*** This stylish, vertically rectangular book, contains many excellent color photos on glossy paper–of both recipes and scenes related to soy sauce. Contents: Introduction–Soy sauce: Light and dark soy sauce, what is soy sauce?, the history of soy sauce, how soy sauce is produced (koji, non-brewed or HVP, Chinese-style), soy sauce today. Savory snacks. Poultry with pizzazz. Sizzling seafood. Rice, pasta, and noodles. Main meat dishes. Sensational salads. Vegetable variations.

Interesting color photos in the Introduction include: (1) A traditional soy sauce ceramic jar with the "Kikkoman" logo and the Chinese characters for "shoyu" on it. (2) A glass bowl of dark soy sauce. (3) Kikkoman's *Goyo-gura*, Noda, Japan. (4) Ancient Japanese illustration showing soy sauce

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production. (5) A glass bowl of light soy sauce. (6) Another ancient Japanese illustration showing soy sauce production. (7) Shoyu fermenting in vats inside the *Goyu-gura.* (8) Three small, modern soy sauce containers, two glass bottles and one glass dispenser. Note 1. Photos 1, 6 and 7 were courtesy of Kikkoman Corp.

Note 2. The recipes call for "light soy sauce," "dark soy sauce"–terminology that we find confusing. The book contains numerous other factual errors. Address: 1. U.K.; 2. Colorado.

10613. Tohata, Asako. 1998. Tohata Asako no karada ni oishii miso no hon: misoshiru kara wafû no miso ryôri made miso no kenkô itadakimasu! [Tohata Asako's book of miso that is tasty for the body: From miso soup to Japanese-style miso cookery. Let's have good health with miso!]. Tokyo: Makino Shuppan. 79 p. Illust (color). 26 cm. Series: Makino Mukku Ryori Shirizu. [10+ ref. Jap]*
Address: Japan.

10614. Tokushû 1 Takikomi gohan. Tokushû 2 Tôfu yuba [Special edition 1. Rice cooked with other ingredients. Special edition 2. Tofu and yuba]. 1998. Tokyo: Shibata Shoten. 176 p. 26 cm. [Jap]*
Address: Aomori, Japan.

10615. Watanabe, S. Assignor to Suzuyo Kogyo Co. Ltd. 1998. [Fermentation room with a horizontal flow type of air conditioner. Fermentation room for natto]. *Japanese Patent* No. 0289668. [Jap]*

10616. Watanabe, S. Assignor to Suzuyo Kogyo Co. Ltd. 1998. [Continuous fermentation system and fermentation room. Applicant]. *Japanese Patent* No. 2760380. [Jap]*

10617. Wise, Victoria. 1998. The vegetarian table: Japan. San Francisco: Chronicle Books; London: Hi Marketing. 156 p. Illust. (color photos by Deborah Jones). 22 x 21 cm. Series: The Vegetarian Table.
• ***Summary:*** Contents: Introduction. Basic ingredients and seasonings for the Japanese table. 1. Appetizers and condiments. 2. Soups. 3. Rice. 4. Noodles. 5. Vegetables. 6. Sweets. Table of equivalents.

Ingredients include: Soybeans, soy sauce, tofu (incl. silken tofu, tofu puffs, grilled tofu), miso (red, white, yellow, brown, barley), fresh soybeans, dried soybeans (incl. black soybeans), soybean sprouts, freeze-dried tofu, soybean milk skin (yuba), and soybean curd pulp [okara]. Azuki beans, sea greens [sea vegetables incl. agar, kombu, nori, wakame], sesame seeds, umeboshi (pickled plums), wasabi, saké.

Contains too many soy-related recipes to list them all. The color photos and food styling are superb–perhaps the most beautiful we have ever seen in a cookbook.

Note: Other books in this series (all published by Chronicle Books) are: France, India, Italy, Mexico, and North Africa. Address: Oakland, California.

10618. Yokotsuka, Tamotsu; Sasaki, Masaoki. 1998. Fermented protein foods in the Orient: shoyu and miso in Japan. In: Brian J.B. Wood, ed. 1998. Microbiology of Fermented Foods. 2nd ed. Vol. 1. London: Blackie Academic & Professional / Thompson Science. An imprint of Chapman & Hall. xx + 440 + 17 p. Illust. Index. 24 cm. [197 ref]
• ***Summary:*** Contents: Introduction. History: The history of fermented proteinaceous foods in China (chu / koji, chiang / jiang, shi [fermented black soybeans], chiang-yu / soy sauce / tou-yu, shi-tche [the juice or extract of shi]).

Note: "This section was based on material drawn from *Thirty-five Years History of Noda-Shoyu Company* (1955), *The History of Kikkoman* (1970), Sakaguchi (1979) and Wang & Fuang (1981)," the history of shoyu and miso in Japan (hishio or sho or soya or soy, miso or misho, tamari, miso-damari, tare-miso and usudare, shoyu, miso and shoyu of today). Fermented soybean foods in the Orient: shoyu, miso, tempeh and natto: Japanese shoyu (establishment of the Japanese Agricultural Standard {JAS} for shoyu in 1963, production methods, types and grades of shoyu by JAS, quality standard of shoyu exported from Japan, production [statistics], technological contributions by the Japanese government to the shoyu industry, soy sauce produced in Oriental countries other than Japan [Korea, Taiwan, Singapore, Malaysia, Indonesia], miso). Manufacture: Koikuchi shoyu (treatment of raw materials, koji making, mash-making and ageing, pressing of mash, refining), tamari shoyu, miso. Recent progress in shoyu and miso production in Japan: Soybeans and wheat as raw materials (soybeans, wheat), treatment of raw materials (soybeans, wheat), koji moulds, koji-making, mash fermentation (microbes in the mash, chemical changes in shoyu-mash fermentation, temperature of the mash, period of mash fermentation), refining (pressing of the mash, pasteurization), material balance in shoyu manufacture, product (color and clarity of koikuchi shoyu, flavour components of shoyu {HEMF, HDMF, HMMF, phenolic compounds, flavour constituents of the top note aroma of pasteurized shoyu}, formation of flavour components during heating for pasteurization, flavour components of shoyu worldwide, relationship between organoleptic evaluation of shoyu and its chemical constituents, nutritional concern about excessive salt intake, safety of fermented shoyu [aflatoxins], microbial stability of shoyu). Discussion.

In the *Ben-Chao-Gong Mu* [*Bencao gangmu,* The great pharmacopoeia, 1596] many types of shi are discussed. In more recent times these have apparently been classified into three types depending on the microorganism used in the fermentation: (1) *Aspergillus oryzae* type. (2) *Mucor* type, usually made in Szechwan. (3) *Bacillus* type. Soak and cook soybeans, then place them in a cloth bag. Cover with straw

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and ferment for 1-2 days at 25-30ºC. "When the beans are covered with viscous substances, Shui-tou-shi is prepared." Mix the sticky beans with ginger and salt, then pack tightly into jars; age for one week. The product [a sort of salted natto with ginger] is now ready to eat. "The organisms responsible for this fermentation have been identified as *Bacillus* species" (p. 356). Address: Research and Development Div., Kikkoman Co. Ltd., 339 Noda, Noda-shi, Chiba-ken, 278 Japan.

10619. Yonzan, H.; Tamang, J.P. 1998. Consumption pattern of traditional fermented foods in the Sikkim Himalaya. *J. of Hill Research* (*Sikkim*) 11(1):112-15. [6 ref]
• ***Summary:*** During 1996-97 a survey was conducted using a questionnaire in 270 randomly selected houses in three hill sub-divisions of the Darjeeling Hills of West Bengal and 315 houses in four districts of Sikkim representing the ethnic communities of the Nepalis, the Bhutia and the Lepcha. The amount of fermented foods consumed at every meal by each person was weighed directly using a portable balance and daily per capita consumption (in gm per day) was estimated. The frequency of eating fermented foods by each family (as a percentage) was also recorded. Annual home production of each fermented food was calculated on the basis of population based on Indian census records. A database was developed from the field data.

For kinema, the average consumption rate in the Darjeeling Hills was 80.6%, whereas it was 78.9% in Sikkim. Kinema was one of three foods that was not eaten daily; it was typically consumed 2-4 times a week as a source of plant protein. The survey showed that, in the Darjeeling Hills, 45.3% of the people prepared the fermented foods at home and only 28.3% purchased them from local markets, while in Sikkim 53.7% of the people prepared the fermented foods at home and only 18.8% purchased them from local markets.

Table 1 shows per capita consumption (gm per day) and annual home production (tons per year) of the various fermented foods. For kinema the figures show: In the Darjeeling Hills, the average per capita consumption was 3.3 gm/day (range 2.3 to 4.7) and the annual production for the entire area was 829 tonnes. In Sikkim, the average per capita consumption was 2.2 gm/day (range 0.7 to 3.7) and the annual production for the entire area was 327 tonnes. Address: Microbiology Research Lab., Dep. of Botany, Sikkim Government College, Tadong (near Gangtok), Sikkim 737 102, India.

10620. Miso Health Building Committee. 1998? What's miso? (Leaflet). Tokyo, Japan. 3 panels each side. Each panel: 21 x 10 cm. [Eng]
• ***Summary:*** Contents: Types and classification of miso. How miso is made. Small color photos of 13 types of rice miso, one type of soybean miso (*Tokai mame miso*), and 3 types of barley miso. Miso's value as a health food: Lowers blood pressure, increases survival rate of mucous membrane interstitial cells after X-rays. Miso in Japan. Recipes for using miso. Address: White Building 603, 1-4-8 Tsukiji, Chuo-ku, Tokyo 104, Japan. Phone: 03-5565-6461-62.

10621. Miyasaka Brewery Co., Ltd. 1998? A guide to Shinsyuichi Miso (Brochure). Tokyo, Japan. 4 p. 30 cm. [Eng; Jap]
• ***Summary:*** A color brochure describing, in English and Japanese, the company's main varieties of miso and instant miso-soup. Color photos show: (1) A red lacquerware bowl of miso soup. (2) Miso Dengaku. (3) Grilled salmon with miso. (4) Miso stew. (5) All 10 products. Address: 2-4-5 Nogata, Nakano-ku, Tokyo, Japan. Phone: 03-3385-2121.

10622. Taiwan Regional Association of Frozen Vegetable & Fruit Manufacturers. 1998? Effectiveness of green soybean (Brochure). Taiwan. 4 p. Undated. 26 cm. [1 ref. Eng; Jap; Chi]
• ***Summary:*** On the cover of this full-color brochure is one green soybean and full green pod against a purple marbled background. An article titled "The effectiveness of edamame," by Goaki Noriharu, Professor at Girls Nutrition University (from Economic News (Evening News), Japan, 15 Dec. 1997) is quoted on p. 2 in Japanese, p. 3 in Chinese, and the rear cover in English. It discusses the health benefits of edamame. On each page are large color photos of edamame in different forms: (1) Four Japanese-style dishes containing shelled green soybeans (*muki-mi*). (2) A gelled dessert made with pureed edamame and agar / kanten. (3) Edamame in five Chinese-style dishes, plus a drink, ice cream, and popsicles containing edamame. (4) A soybean plant loaded with many lush green pods. (5) A white bowl of edamame (in the pods) on a table next to two cups of tea and a tea pitcher. (6) A dish of edamame (half shelled, half in the pods) on a table next to two clear mugs of beer. (7) Edamame in a blender with water, behind a tall glass of a green drink made from edamame. Address: Taiwan.

10623. Jorgensen, Carl. 1999. Update on Genetic ID and the testing of genetically engineered foods (Interview). *SoyaScan Notes.* Jan. 4. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Genetic ID had its first profitable quarter during the first quarter of 1998. When Carl arrived it was a start-up company. He was hired to perform a specific service (research, publish, and distribute their fax newsletter) and not to get deeply involved with company management. But as the company entered its most difficult, Carl ended up basically running the company–which was definitely not his plan. Jeff Wells, who had previously run the company, couldn't afford to work without pay, whereas Carl could. So Jeff left in the autumn of 1997. Carl hung in there and

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basically brought the company "over the hump" and through the painful transition period when it was ahead of the market and growing but not making money. Carl left in June 1998 (after Issue No. 21 of the Newsletter had been published) after Genetic ID was "over the hump" and able to hire new people to manage the company; an entrepreneur (he has started a number of companies) rather than a day-to-day manager, he had accomplished his objectives. Now the company is on solid ground and growing. During 1999 it is projected to grow from 9 to about 17 people. The company has about 40 paying customers mostly in the USA, Europe, and Japan. Most of the samples originate in North America.

Carl believes Genetic ID will be "hugely" successful–at least in the near future. Bill Witherspoon is the CEO who runs the company from day to day; Julia Wong is his administrative assistant. Genetic ID has decided to try to move worldwide very quickly. There was a need to bring in lots of new funds (which is happening) and new people. John Fagan is chairman of the company but does not do day-to-day management. He oversees the science and top-level decisions. He does not believe it is important it is important to keep a neutral philosophy on the goodness or badness of GMO. Carl believes strongly it is important to keep a neutral philosophy in order to maintain objectivity. If you are two strongly anti-GMO, your objectivity becomes suspect–even if it is unjustly suspect. John is by far the top scientist worldwide in the field if GMO detection. But he is also a man with a mission; he believes very, very strongly that agriculture is going down the wrong road with GMOs–and he's not afraid to say it. The big ongoing debate within Genetic ID is how closely the company should identify itself with an anti-GMO position. In the long run, strangely enough, foreign companies (in Europe and Japan) appreciated John's stand because they knew where the company stood on the basic issues. However the U.S. companies were uncomfortable with this close identification. The company was able to prove that the people who do the analysis (in a separate lab down the street) have no idea about the origin of the sample they are required to test.

Genetic ID has competitors in various countries, but Carl believes that Genetic ID has the best, most accurate and most reliable approach in terms of both sampling and detection. One key to accuracy is to use a large sample–a large number of soybeans taken from many different places in the lot. This costs more money.

Carl believes that genetic engineering of crop plants was one of the biggest stories of last year and of the late 20th century–but most Americans don't know what is going on and the American media isn't covering it. The little seed dealers Carl knows in Iowa know all about it and they think the Europeans and Japanese are crazy for not buying genetically engineered soybeans–or even being concerned about it.

Carl is the founder and owner of a company named Purely Organic Ltd. He is extremely busy importing organic foods from Italy, then selling them to natural foods stores and restaurants. Soon they will start selling them direct to consumers via a website on the Internet–where they can pay by credit card. That won't be up and running before the end of January.

Carl was the former editor of Genetic ID's outstanding newsletter. Another person who is a very skilled writer and researcher in this field is Susan Marcus; she contributed to the Mothers For Natural Law Newsletter–though she is no longer doing that. She knows the issue inside and out, but she does not understand how to send a newsletter to 500 people at once via e-mail or fax. Address: Owner, Purely Organic Ltd., P.O. Box 847, Fairfield, Iowa 52556. Phone: 515-472-7873.

10624. Poysa, Vaino. 1999. Food-grade soybeans in Canada (Interview). *SoyaScan Notes.* Jan. 5. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Dr. Poysa is a public soybean breeder, who was hired in 1996-97 to replace Dr. Richard Buzzell at the Harrow station. Like his predecessor, he specializes in breeding food-grade soybeans.

Canadians use the term "food-grade soybeans" for what Americans call "large-seeded vegetable-type soybeans." The term "food grade" implies both large-seeded and clear hilum. The corresponding term for the rest of the soybeans, which are typically crushed to make soybean oil and meal, is "commodity soybeans." By far the most widely used food-grade soybean in Canada, and by overseas customers of Canadian exporters, is Harovinton. It was developed by the Agriculture Canada Research Station at Harrow (mainly by Dr. Buzzell) and released in 1989 to Maple Leaf Foods. In Canada, the exclusive rights to grow and sell a particular food-grade soybean variety that is publicly developed are sold to one and only one private company.

Virtually all of the soybeans sold by Canadian companies to overseas food manufacturers are food grade and identity preserved (IP). Because they are IP, the Canadian companies can guarantee that they are also not genetically engineered, i.e. GMO-free.

Two newly released food-grade soybeans are AC-756 and AC-Onrei [derived from the Japanese variety Enrei]. The former was released to W.G. Thompson & Sons Ltd. and the latter was released to Maple Leaf Foods at the end of 1997. Neither of these two varieties have been registered. In fact most food-grade soybeans are no longer registered! Why? For basically two reasons: (1) Since they are developed mainly for their food properties, it is not considered important to give details about their agronomic properties. (2) The private seed breeders are applying pressure to stop registration of food-grade soybeans.

Note: This is the earliest English-language document seen (June 2009) that contains the term "commodity

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soybeans," which is used in contrast to "food-grade soybeans." Address: Soybean breeder, Agriculture Canada Research Station, Harrow, ON N0R 1G0, Canada.

10625. Broadbent, Gretchen Priest. 1999. Pioneering work with tofu in the USA and Japan, 1946 to Aug. 1971. Part I (Interview). *SoyaScan Notes.* Jan. 6. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Gretchen Priest was born on 29 Oct. 1946 in Boston, Massachusetts. She grew up in Marblehead, Massachusetts–which is located on the Atlantic Ocean 15 miles northeast of Boston. While in high school there she decided (entirely on her own, for reasons she no longer remembers) to become a vegetarian–even though she had never heard the word "vegetarian." She also began a lifelong interest in art. In Sept. 1964 she started to attended Goddard College (in Plainfield, Vermont) for one semester and was almost immediately introduced to the teachings of Kirpal Singh, an Indian Sikh master. "I went through a spiritual revolution, along with many friends." She was very sensitive and began to have spiritual experiences. At Goddard she met her husband to be, Jeffrey Broadbent, in an art class. Art is Gretchen's passion. They both found the first day of class boring, so separately they snuck out. Gretchen found the paints in the back of the room and, before they had met or spoken to each other, they ended up painting each other faces. When the teacher saw them after the class he exclaimed, "Now that's art!" At that point, Jeffrey and Gretchen introduced themselves to one another.

After the 3 months, Goddard had a work term. Gretchen went to California and experimented with psychedelics. Now all she wanted was to live a spiritual life.

Returning to Vermont in the early summer of 1965, she entered the Kirpal Ashram in Calais (pronounced KAL-us), Vermont. Only one person was living and meditating there at the time, Nina Gitana, age 37, the caretaker. The ashram was part of land and a trust that had been donated to Kirpal Singh for use as a retreat for his practices and teaching. Vegetarianism was a very important part of Kirpal Singh's teachings, so Nina was a vegetarian. But she did not know much about preparing vegetarian foods; a diet of fruits and juices was not giving her the strength she needed. The day Gretchen arrived, Nina left to go to Boston, where she met Michio Kushi (and maybe George Ohsawa) and began to study macrobiotics. When she returned to the ashram, she taught Gretchen what she had learned and they both began to follow a vegetarian macrobiotic diet. It felt good, and Nina's strength returned. Gretchen soon became the cook. She did not use any macrobiotic recipe books, though she did study a book of macrobiotic principles. Their first basic foods included brown rice and miso, but Gretchen also prepared lots of chapatis and brown rice croquettes (regular or deep-fried). During the cold months she cooked for the two of them (and often a neighbor), but during the summer she cooked and cared for 15-20 people. It was very difficult to get macrobiotic or natural foods in those days, so they would periodically make the 5-hour drive to buy food in Boston. They would buy most of their foods at Michio's house (where they were stored in little bags on plain wooden shelves), and in this way Gretchen came to know Michio and Aveline. But they would go to Boston's Chinatown to buy tofu; it was considered a very special treat at the ashram, served only 3-4 times a year. Considered an excellent source of protein and easy to digest, it quickly disappeared–in part since it was very perishable, but also because it balanced the very *yang* daily diet. One winter Gretchen moved to Boston to earn money (odd jobs, including work at a hospital) and study macrobiotics while Nina stayed at the freezing cold ashram. Michio Kushi gave a special series of Sunday classes to teach macrobiotic philosophy to Anne Lynn, her husband, one other person, and Gretchen; these were not cooking classes. Michio and Aveline visited the ashram for a day several times. On one visit, Michio brought his father and mother.

In 1971, after 6 years at Kirpal Ashram, Gretchen left to marry Jeffrey Broadbent. Jeffrey had been practicing Zen meditation for several years as a disciple of Suzuki roshi at Tassajara Zen Mountain Center, deep in the Santa Lucia Mountains south of Carmel Valley, California. One of Jeffrey's close friends and roommate at Tassajara was William Shurtleff, who was also a disciple of Suzuki Roshi. While he was at Tassajara, Katagiri roshi encouraged Jeffrey to go back to college and finish his education. So he enrolled at the University of California at Berkeley, where he studied Chinese language. At some point he switched from Chinese to Japanese at Suzuki roshi's recommendation. Then Jeffrey applied for U.C. Berkeley's Junior Year Abroad program in Japan. Right after he was accepted, he wrote Gretchen at the Vermont ashram: "I'm going to Japan. Please marry me and let's go together." She accepted. Jeffrey and Gretchen stayed together for a month and a half at the Berkeley Zendo, then were married on 13 June 1971 at the San Francisco Zen Center by Shunryu Suzuki roshi in a large ceremony.

Ten days after the marriage ceremony, Jeffrey and Gretchen arrived in Japan. He had been enrolled in the intensive Japanese language coarse for foreigners at International Christian University (ICU) in Mitaka, just east of Tokyo. Before the school year started, they participated in the ICU summer program, where all the new students traveled to the Kumano-Nachi shrine and Nachi waterfall at the southeastern tip of the Wakayama peninsula. The program was designed to introduce the foreigners to Japanese language and culture.

Soon after arriving at Nachi, they wrote William Shurtleff, who was now taking an intensive Japanese language course at the *Nihongo Gakko* (Japanese Language School) in Kyoto and living in the home of one of his Japanese teachers. They invited him to visit them for a

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week at Nachi when his school semester was finished. On 1 August 1971 Shurtleff hitchhiked south and they had a nice reunion, practicing meditation together and enjoying the beautiful mountain scenery for about a week. Then Jeffrey and Gretchen went to ICU near Tokyo and Shurtleff returned to Kyoto.

At ICU, Jeffrey and Gretchen rented a small and austere Japanese-style apartment located just off campus, about 10 minutes walk away, c/o Yoda Yoshiko, Koganei-shi, Higashi-cho 1-25-13, Tokyo, 184. The two-room apartment consisted of a small kitchen (with two table-top propane burners and a sink, but no refrigerator), a minuscule toilet chamber, and a combination living room / bedroom (6-8 tatami mats in size). Outside the sliding window was a tiny porch for airing bedding and drying clothes. Jeffrey recalls that there was one small kerosene heater in the apartment; it was used only on very cold days–to save money. But Gretchen recalls that there was no heater at all. Continued. Address: RFD 1, Box 100, East Calais, Vermont 05650. Phone: 802-456-7091.

10626. Broadbent, Gretchen Priest. 1999. Pioneering work with tofu in the USA and Japan, Aug. 1971 to Dec. 1972. Part II (Interview). *SoyaScan Notes.* Jan. 6. Followed by a letter from Gretchen dated Jan. 13. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued: In the fall of 1971 the Broadbents invited Shurtleff to be a guest at their apartment at ICU if he wanted to continue his Japanese studies at the university level. Shurtleff's year-long language course at *Nihongo Gakko* finished in early December 1971. He immediately packed all his meager belongings and caught an all-night car ride to Tokyo where, on December 4, he joined the Broadbents at ICU, and moved into their small apartment. Note: That same day (there was a full moon), Bill and Jeffrey's teacher, Suzuki roshi, died of cancer in San Francisco, California.

Together Bill and Jeffrey took the intensive course in written and spoken Japanese, five days a week with five 70-minute periods a day. They led a very simple, rather monastic life, rising early, meditating twice each day (first thing in the morning and just before bedtime), and studying Japanese intensively. During the day, Gretchen taught English in and around Tokyo to earn money, studied Japanese language by herself while riding on trains and buses (using books and tapes), and did the laundry (by hand at home in the kitchen sink), food shopping, and cooking.

The man who made tofu in the local shop sold his tofu throughout the neighborhood on a bicycle. He blew a little horn to announce his presence. When he came in front of our apartment, we would run down and buy various kinds of tofu; it was a regular part of our diet. Shurtleff, who liked tofu very much and had eaten it almost daily while in Kyoto, continued this practice in Tokyo. Gretchen was especially fond of the deep-fried tofu, and because we had no refrigerator, she would often deep-fry left-over regular tofu during the warm months to preserve it and/or freshen it.

In about February or March 1972 Shurtleff moved out of the Broadbents' apartment and went to live for a while in a large house with Steve and Marty Caldwell on the ICU campus. Not long thereafter, Gretchen grew so interested in tofu that she sought out and began to visit the local tofu shop. She has always had a deep interest in traditional crafts and in making food. She visited the shop about six times, walking there alone in the early morning, when it was still dark. She took notes in a little notebook. The tofu maker explained quantities and times for making regular (*momen*) and silken (*kinugoshi*) tofu, and Gretchen recorded this information in her notebook. Eventually she had enough information to make tofu. The tofu maker gave her some nigari (traditional tofu coagulant) and two nylon straining bags (one for regular and one for silken tofu), which she later took back to America; she still uses the bags in Vermont to make crab apple jelly. Jeffrey Broadbent, her husband at the time, vaguely recalls visiting a very small local tofu shop–but he is not sure he ever went there.

After watching the tofu master at work Gretchen felt that there was a great need to introduce tofu and tofu shops to America. In mid-April Shurtleff returned to live with the Broadbents. Not long after that Gretchen recalls discussing her growing interest in tofu with Shurtleff and invited him to join her in a visit to the local tofu shop. At this time, Gretchen was much more interested in and knowledgeable about tofu than Shurtleff was. She recalls (Jan. 1999): "When you returned to our apartment, you were excited that I was studying tofu. We had lively conversations and I explained what I was doing. I had a notebook which I showed you. You wanted to go too. I thought we went together, but I don't have an absolute picture that I can rely on." Shurtleff likewise does not have a clear memory of going to a local tofu shop at this time, nor did he mention any such visit in his journals, yet he acknowledges that he might have gone with Gretchen and simply forgotten it. But Gretchen remembers clearly that she planted the seeds of Shurtleff's interest in tofu, which later resulted in his writing (with Akiko Aoyagi) *The Book of Tofu.*

On 22 March 1999, after thinking about these past events for more than two months, Gretchen wrote Shurtleff the following: "I have an ongoing persistent focused memory of being together at the tofu shop on one occasion. You were carrying a notebook. The tofu maker was busy with his daily work. You asked many questions and were writing down the new vocabulary. I was concerned that the questions were interfering with his work..." Continued. Address: RFD 1, Box 100, East Calais, Vermont 05650. Phone: 802-456-7091.

10627. Broadbent, Gretchen Priest. 1999. Pioneering work with tofu in the USA and Japan, Aug. 1971 to Dec. 1972. Part III (Interview). *SoyaScan Notes.* Jan. 6. Followed by a

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letter from Gretchen dated Jan. 13. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued:

On 25 December 1971 (Christmas eve) Shurtleff had met Kazuko Aoyagi, who was a student at ICU, through their mutual friend Travis Venters. Venters, an American from North Carolina, taught English at ICU and was Kazuko's English teacher. The next day Kazuko introduced Shurtleff to her sister, Akiko Aoyagi, and they soon became close friends. Kazuko likewise became very close to Travis, and soon they were engaged to be married.

Bill and Jeffrey's course in Japanese at ICU ended in June 1972. On June 11 Kazuko and Travis were married; their wedding ceremony was held at a hall on the ICU campus. Gretchen, a very creative cook interested in natural foods, volunteered to make all the food for the wedding party. The centerpiece of her creations, which everyone remembers clearly to this day (25 years later) was the wedding cake. It was a sensation. The icing / frosting was made of tofu! No one had ever seen anything like it. It was a round layered cake, with each layer being a fruitcake that was slightly smaller than the one below it. Made entirely of natural foods, it contained whole-wheat flour instead of white flour and honey or fruits instead of sugar. Thus, it was rather heavy. Gretchen made the icing / frosting–her own invention–by whipping firmly pressed tofu in a blender with honey. The cake even had a theme–evolution. Gretchen formed many small creatures out of dough, then deep-fried them. There were little crabs and starfish on the bottom layer, then little animals on the second layer, and finally on the top–guess what–human beings. Because Gretchen did not have an oven in her apartment, she baked the cake on the ICU campus in an oven at the home of Steve and Marty Caldwell. She recalls: "I was really into that cake!"

After the wedding, Shurtleff and Aoyagi left Tokyo and traveled around Japan, visiting Zen masters at their temples and practicing meditation. Jeffrey and Gretchen went to practice Zen at the temple of Noiri roshi in central Japan. Gretchen was asked to stay at Suzuki roshi's temple not far away, but it didn't work out. In August 1972 Gretchen left to study with the Indian boy Guru Maraji at Yamaguni north of Kyoto (Shurtleff and Akiko Aoyagi were also there), and then with a sculptor named Fushigi Nangoku near Lake Biwa.

On 22 Oct. 1972 Shurtleff and Aoyagi visited tofu master Toshio Arai at this shop named Sangen-ya in Nerima-ku, several hundred yards from the Aoyagi's home. Mr. Arai later became Shurtleff's teacher. This is the first clear memory Shurtleff has of going inside a tofu shop and studying the process. Then on Oct. 28 Shurtleff & Aoyagi went to study Zen meditation at the temple of Noiri roshi where Broadbent was already studying. This did not work out, since Noiri roshi suddenly became very ill, so they returned to Tokyo and lived at Travis and Kazuko's apartment (while they were in America) in Pine Lodge at ICU.

In early December Shurtleff began to write a booklet on tofu for Americans; he probably realized that Nahum and Beverly Stiskin, who he had known in Tokyo and who had founded Autumn Press in Japan, might well be interested in publishing it. On 22 Dec. 22 Shurtleff and Jeffrey Broadbent were talking by phone. Shurtleff mentioned that he was writing a booklet on tofu, and Broadbent mentioned that he and Gretchen had recently visited the Stiskins. He gave Shurtleff the Stiskins' new address and phone number in Hayama, south of Tokyo. Shurtleff called Nahum Stiskin, who said he was very interested in discussing the book proposal, and invited Shurtleff and Aoyagi to his home to discuss the matter. A meeting was arranged for 13 Jan. 1973.

The visit went very well. Nahum was deeply interested in foods and Japanese culture, and was looking for books about Japan to publish; he and Beverly liked tofu and he liked Shurtleff's book idea. After Stiskin looked at the proposed table of contents and a brief introductory chapter, they signed a formal book contract. There was no negotiation of terms and no advance.

Gretchen is not certain how she and Jeffrey met the Stiskins. She recalled in January 1999 that she and Beverly Stiskin had met first; the initial connection was probably related to food and macrobiotics. She may have met Beverly at one of Lima Ohsawa's cooking classes in Tokyo. Then the Stiskins invited Jeffrey and Gretchen Broadbent to dinner at their attractive home in Hayama, south of Tokyo. After that Jeffrey Broadbent got the inspiration to introduce Bill Shurtleff to Nahum Stiskin. Jeffrey may have called Nahum to check out the idea before suggesting such a meeting to Shurtleff. Address: RFD 1, Box 100, East Calais, Vermont 05650. Phone: 802-456-7091.

10628. Suzuki, Akio. 1999. The work of Seedex Inc. in Longmont, Colorado (Interview). *SoyaScan Notes.* Jan. 6. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Seedex is a Japanese seed company in Longmont, Colorado. Akio, the company founder and president, earned his PhD from North Carolina State University in 1968; his thesis concerned his basic research on tobacco genetics. Upon graduation he went to work for the Great Western Sugar Co. headquartered in Denver (owned by the Hunt brothers–the famous Texas speculators), where he worked for 17 years. In April 1985 he left Great Western (which he could see was on the verge of bankruptcy) and started to work for Mitsui Co., the Japanese trading company and conglomerate; Great Western went bankrupt 2 or 3 months later. His first job with Mitsui was to develop and establish a seed company in Colorado that focused on breeding sugar beets. He founded Seedex in 1987, with financial help from Mitsui which became the majority stockholder; Akio became and still is a minority stockholder.

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Mitsui is now the parent company of Seedex.

Akio believes that it would be difficult to export edamamé (even if they were of superior quality) from Colorado to Japan because Japan now buys most of their edamamé from China, and prices from China are currently very depressed (low). However Japanese are becoming increasingly interested in organically grown foods, so there may eventually be an opportunity to export organic edamamé to Japan.

Edamamé is listed as a typical garden vegetable (just like tomatoes or cucumbers) in most seed catalogs in Japan. The seed that is used has been specially bred over many centuries to produce delicious edamamé. Address: PhD, Founder and President, Seedex, Subsidiary of Mitsui & Co. (USA) Inc., 1350 Kansas Ave., Longmont, Colorado 80501. Phone: 303-678-7333.

10629. Johnson, Duane. 1999. Update on work with *edamamé* (green vegetable soybeans) in Colorado (Interview). *SoyaScan Notes.* Jan. 8. Conducted by William Shurtleff of Soyfoods Center. [1 ref]

• ***Summary:*** Duane considers there to be two basic types of large-seeded vegetable-type soybeans: Tofu-type beans and edamamé-type beans. Any good taste panel can tell the difference. Duane has never done any analyses of the composition of these two types, or of food-grade soybeans vs. commodity soybeans, but he had read that edamamé-type beans often contain only 6-7% oil vs. 16-17% oil in commodity-type soybeans. He would guess that there is also a difference in the composition of the sugars (edamamé-type beans taste sweeter) and of the volatiles–which contribute to subtle differences of flavor. Duane has seen many studies of volatiles in soy sauce but never a study on volatiles in edamamé. Tom Lumpkin in Washington state might know more about these questions of composition. Duane has applied to the United Soybean Board for funding to do more research on edamamé but they consider them to be a vegetable rather than a soybean!

Duane is aware of two programs to breed soybeans for edamamé run by state soybean boards, in Nebraska and Minnesota; unfortunately in both places they have used tofu-type beans rather than edamamé-type beans.

There are basically two types of harvesters used to pick edamamé in East Asia. In China, where labor is cheap, they use a single-plant harvester and thresher. In Japan they use a machine that harvests one row at a time, similar to the Pixall one-row green-bean picker. The Pixall is made by Oxbo, a U.S. company based in Wisconsin, with offices in various states. Duane has used a Pixall with pretty good results, but he must discard about 20% of the pods for use as shelled edamamé.

The best edamamé Duane has ever tasted are those grown by Ewell Culbertson at Pachamama Organic Farm in Longmont, Colorado. The farm is located at an altitude of about 5,500 feet, which is the upper limit for growing soybeans. The combination of cool or cold nights and warm days leads to an unusually high sugar content, which makes Ewell's edamamé taste delicious. Address: Dep. of Soil and Crop Sciences, PC118, Colorado State Univ., Fort Collins, CO 80523. Phone: 970-491-6438.

10630. Cooper, Kim. 1999. New developments with soybeans in Canada (Interview). *SoyaScan Notes.* Jan. 18. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The term "food-grade soybeans" is increasingly widely used by Canadian soybean exporters and their Asian customers to refer to all soybeans developed specifically for food use. Many are large seeded, but some are also small seeded–developed for sprouting (to have high germination) or natto. All have a white hilum. The biggest problem with this term is that all soybeans can be used for human food. About 5-10% of the soybeans exported from Canada are "food-grade."

Most overseas buyers of Canadian food-grade soybeans want them to be GMO-free. In addition, some overseas crushers now also want soybeans that are GMO-free, though they need not be food grade.

The genetically engineered soybeans grown in Canada are generally handled in two different ways. The great majority, which are used by Canada's two major soybean crushers (owned by the American companies ADM and Central Soya) are given no special treatment; they are simply sold by farmers to their local elevator, where they get mixed with other soybeans in "the stream." These two crushers have made it very clear that they do not want these GMO soybeans to be segregated or given any special treatment. However the genetically engineered soybeans purchased by soybean exporters are handled like any other identity preserved (IP) crop, primarily so that buyers in foreign countries who want GMO-free can be guaranteed what they want. For the past ten years, the Canadian soybean trade has been developing its system of IP varieties, especially to serve Japanese customers–who usually like specific varieties. Exporters would contract with farmers to grow these special varieties, then at harvest they would be stored in their own elevator, silo, tank, etc. and shipped with their identity preserved. Organically grown soybeans are handled in a quite similar way. So when GMO soybeans arrived, the export trade decided to handle them just like IP varieties–actually more like organic soybeans than like IP. Setting up such an IP system has that added benefit that if and when, in the future, consumer benefits are genetically engineered into soybeans, their identity will have to be preserved. An increasing percentage of the soybeans grown in Canada are grown under contract–perhaps about 10% at present.

Shurtleff notes: The U.S. soybean distribution system is based on bulk shipments; its ability to handle IP shipments is much less advanced than the Canadian system. For

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this reason, the U.S. exports of soybeans to Europe have decreased dramatically over the past year. In America, GMO soybeans simply took over the main soybean distribution system; they did so with hardly any discussion and probably based on the assumption that hardly anyone would care. It is the latter assumption that is highly questionable.

Kim: U.S. soybean exporters went to Europe several years ago and told their customers: "We have these genetically modified soybeans and we're going to be shipping them to you starting this fall." The European buyers explained that European consumers are different from American consumers, and may want to think about and discuss this new matter. The American's said, "Sorry, we can't wait. The soybeans are coming." The Europeans felt upset, like the Americans were trying to shove something down their throats.

In Canada, the problem is far from resolved. Consumers in Canada are starting to become aware of this issue, and they are just starting to sound the alarm. But more and more genetically modified products are coming onto store shelves, so Kim believes consumers will gradually develop confidence in them–but not in the next 1-2 years. Kim believes that there is essentially no chance that most consumers will reject genetically modified foods in the long run.

The international conference in Canada last September was attended by about 200 people; there would have been more but for an airline strike in Canada. Peter Golbitz presented an excellent keynote address. His paper and some others are posted on the OSGMB website. Address: Marketing Specialist, OSGMB, Chatham, Ontario, Canada N7M 5L8. Phone: (519) 352-7730.

10631. Lacina, Tom. 1999. Starting a tofu manufacturing company on his farm in Iowa, and making the tofu from soybeans he grows (Interview). *SoyaScan Notes.* Jan. 24. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Tom is the founder and owner of Midwest Harvest Corp. He began making and selling tofu this month. His company currently makes only one product, firm tofu. His distributor to the health food market is Blooming Prairie. He is both a lawyer and a farmer (he started as a lawyer then became a farmer) so he grows many of the soybeans used to make the tofu on his own farm–without chemicals. He grew up on this farm, and both his father and grandfather farmed this land.

He has been growing identity-preserved soybeans for the Japanese market for about 7 years. He started with the Pioneer Better-Life program (no chemicals were allowed), then that company was bought out by North Country Seeds in Ormsby, Minnesota. The varieties he grew were LS301, then HP204 (HP stands for "high protein"). Now he sub-contracts out the organic soybeans, which he also uses in making tofu, to small organic farmers in the area. He is considering growing organic soybeans himself in the future.

When selecting a soybean variety to grow organically or without the use of chemicals, its agronomic properties are much more important than its characteristics that effect the final tofu flavor, texture, or yield of tofu. Tom basically looks for a soybean variety that will form a canopy quickly to block growth of weeds; this becomes the key determinant of soybean yield. His taste tests show that the effect of different food-grade soybeans on the tofu flavor is very subtle.

Organic certification in Iowa is presently a mess; growers are having great difficulty get the certifications conducted. OCIA is having big problems; they are notorious for not getting out to the fields on time and not getting their paperwork done. It is very confusing. OCIA split with the central certification organization. The good news is that demand for organic soybeans is very strong.

Yet organic does not necessarily mean value added; remember that soybeans are part of a 3-year or 5-year rotation, and some of that time the fields are planted to cover crops that create little or no income. Moreover, most organic growers get 40 bu/acre compared with about 60 bu/acre for most regular commercial growers.

Tom's packaging is unique–a paperboard sleeve over a plastic tub. On the sleeve is the story of how the soybeans are grown and the tofu is made. He uses a Takai system, that was ordered and installed for him by Bar N.A.; he did not want to deal with the problems of importing equipment, and he wanted some expertise to come with it. He watched tofu being made at both INTSOY in Illinois and on the self-contained Takai system at Iowa State University. He was been in contact with Walt Fehr, a soybean breeder, and Dr. Lester Wilson, who is "Doctor Tofu"–both at Iowa State. Dr. Wilson has visited his tofu plant on his farm. "Quite a few people in the state of Iowa are fascinated by the idea of a farmer doing this kind of value-added agriculture." His wife and sister, who are called the "soy sisters" work at the end of the tofu production line, doing the curding and controlling the quality at that end; they are also developing tofu recipes for the Midwest. Tom's brother-in-law is the operations manager.

Tom continues to work as a lawyer (partly to pay the bills), and he works in the tofu factory several days a week. Tom has no doubt that his business will survive; the big questions are (1) How much do they want to grow; from day one they have not been able to keep up with demand. (2) What will they do if ConAgra decides to set up a big tofu plant in Iowa.

Update: Talk with company representative. 2000. May 22. The company is doing "extremely well." They are looking for a source of organic calcium sulfate. Address: Midwest Harvest Corp., 3635 Hwy 146, Grinnell, Iowa 50112. Phone: 515-236-5170.

10632. Sky, Beverly Stiskin. 1999. Recollections of early

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work with macrobiotics in Boston. Part I (Interview). *SoyaScan Notes.* Jan. 31. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Beverly Siewerski was born on 15 Nov. 1947 in Austria; her family's roots were in Poland. Her mother was a Holocaust survivor. She came to the United States at age 10 and grew up in New York state. She has been friends with Richard Sandler since they were both young.

Beverly first went to Boston to study macrobiotics in 1967. At the time she was living in Philadelphia, Pennsylvania, age 19, and cooking at an early natural foods restaurant named The Commons; the early one in New York was The Paradox. At The Commons, they aspired to macrobiotics. Although nobody there had ever studied about it with a teacher, they cooked from the little *Zen Cookery* book. Several articles were written about the new restaurant, and in one of them Beverly talked about how they considered themselves a macrobiotic restaurant. About a week later, Beverly got a letter from Jim Ledbetter, a student of Michio and Aveline Kushi in Boston, inviting her to come to Boston to learn how to cook properly–before you call yourselves macrobiotic. The restaurant sent Beverly, who went for 10 days in the spring of 1967. She got very sick within the first 3 days that she was there–like many of her friends she was still smoking a good deal of pot and at the time Aveline was cooking extremely salty food; the combination of her being so yin and the yang diet made her so sick she had to stay in bed for most of the time. The Kushis were worried. At the time, Nahum Stiskin (born in 1945) was going to Brandeis University (in Waltham, Massachusetts). He moved in with the Kushis at their home on Gardner Road right after he graduated.

After 10 days of studying with Aveline, Beverly returned to Philadelphia and continued cooking at the restaurant. But now she realized that there was so much more to learn about macrobiotics in Boston, and to continue cooking in a community where everyone was still smoking pot, and dropping acid [using LSD] from time to time, just didn't feel like a healthy lifestyle. Beverly called Boston and asked if she could come there to study for a longer time. Fine. "So Nahum drove down to Philadelphia (I think because he liked me), picked me up, and by June, 1967, I was living at the Kushi house on Gardner Road. I arrived right after the 6-day war in Israel–which started on 5 June 1967. The five Kushi children were also living there." There were no study houses yet. Michio and Aveline had ten original disciples; Beverly and Nahum Stiskin were among the ten. Other students living at the Kushi's home were Jim Ledbetter, Evan Root, Peggy Taylor, Connie Frank (Richard Sandler's first wife–Beverly introduced Richard to Connie), Paul Hawken, Ty Smith, Peggy Winter (who is no longer living), and Rebecca Dubowsky. There was also a sizeable peripheral community also, including Joe Leis (rhymes with "lease"). Continued. Address: Boston, Massachusetts. Phone: 617-776-8749.

10633. Sky, Beverly Stiskin. 1999. Recollections of years in Japan from June 1969, starting Autumn Press in Kyoto, and meeting William Shurtleff in Kyoto. Part II (Interview). *SoyaScan Notes.* Jan. 31. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The Stiskins arrived in Tokyo, Japan in June, 1969. Beverly, who was five months pregnant with her first child, Reuben, almost had a miscarriage from the airplane flight. They stayed for about a month in Tokyo and met Gary Peacock (who was a musician), and David and Cecile Levin–all of whom were interested in macrobiotics. Through David Levin, Nahum made a connection with the Takeda family in Kyoto. The Takedas allowed the Stiskins to live in their three-building compound, the *Higashiyama Sanso,* in eastern Kyoto, behind *Kiyomizu-dera.* They moved in in July, and Reuben was born in August. In September 1969 they both began to attend the *Nihongo Gakko* (Japanese language school) and Nahum began to study Shinto; he began to study with an esoteric Shinto sect that had preserved many old and beautiful rituals–and they were connected to Judaism. He also got involved with Japan-Israel Society whose aim was to teach Hebrew to Japanese.

After a year they moved to a small Japanese house in Uzumasa (near *Kitano-jinja*–Kitano Shrine), west of Kyoto. Ty Smith lived with the Stiskins for a while. Wally Gorell also lived in that part of Kyoto, but further west near Arashiyama.

Note: William Shurtleff arrived in Japan on 16 Jan. 1971, went straight to Kyoto and enrolled in the Japanese language school, the same one the Stiskins were already attending.

Beverly recalls that she and Nahum first met William Shurtleff at the *Nihongo Gakko.* Nahum and Beverly lived in Kyoto for 2 years. One night the Stiskins hosted an evening get-together and talk by Helen and Scott Nearing at their home near *Kitano-jinja.* Shurtleff was there, his first visit to their home. Beverly tells Shurtleff: "I remember you distinctly in Kyoto, and this will verify that that was where we met. First, we were macrobiotic and strictly vegetarian, so we were interested in tofu. You told us that you were very interested in tofu and you had just started or were about to start doing research on tofu–finding all the different ways that it is prepared, etc.

"You told us this because Nahum and I had already started Autumn Press in Kyoto. The Autumn Press logo, a sheaf of harvested brown rice, was symbolic of our mission which was to publish books to feed the mind and spirit. Erewhon was food for the body. Autumn Press was conceived of as harvesting the knowledge of Asian and American cultures to nourish the challenges of the new age. Our first book was Nahum's book, *The Looking-Glass God: Shinto, Ying-Yang, and a Cosmology for Today.* We published it ourselves because nobody else would. We borrowed

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$2,000 as 'seed money' from both our families (both sets of parents), did an initial printing in Japan of about 500 copies in 1971, and warehoused the books in our home west of Kyoto. Then we discovered that this book did not have copyright protection in the USA so in 1972 we published a much nicer hardcover edition with Weatherhill (New York and Tokyo). By 1972 we knew what we wanted to do in life–publish books. We had tapped into a very interesting resource for information–although none of the other publishing companies thought it was interesting. Who wants to know about Shinto? Brown rice? Forget it! Tofu? Are you crazy?

"You had a shaved head and a shoulder bag (for carrying books to school) that was made out of a big burlap bag and had the words "Kokomo Rice" [probably Kokuho Rose–a brand of short grain brown rice grown by Koda Bros. in Dos Palos, California] prominently on the side. I remember thinking that you were a unique character. I knew a little bit about you–that your family was fairly well off, but here you were living like a strict Buddhist monk, an itinerant monk from California. You wore very simple clothing, plus that rice bag–which I thought was the ultimate in humility. I think you were in Nahum's classes at the language school; you weren't in any of my classes.

"But the main point is this: Nahum and I had a publishing company and we were both interested in tofu–and potentially in a book about tofu. You knew this clearly when we were all in Kyoto in 1971, and we knew you were thinking about doing research and writing something about tofu. You might have first put pen a year or so later after you had moved to Tokyo, but the idea was already brewing while you were in Kyoto."

The Stiskins then left Kyoto and moved to Tokyo, where Nahum worked with a marketing company, turning their Japlish marketing studies into good English. Shurtleff left Kyoto on 4 Dec. 1971 to continue his Japanese language studies at International Christian University (ICU) on the outskirts of Tokyo. At ICU he stayed with Jeffrey and Gretchen Broadbent. Jeffrey and Bill took the same intensive Japanese language course. Gretchen was very interested in tofu, and by April 1972 was even studying tofu-making with a local tofu maker.

Beverly has no recollection of ever meeting Jeffrey or Gretchen Broadbent. "The Broadbents may have given you our new phone number in Hayama, south of Tokyo, but the important connection had already been established 6-9 months earlier in Kyoto."

"I remember the day you called Nahum, and I remember him getting off the phone and saying 'Guess who I just talked to.' We both remembered you from Kyoto, and I remember the call because we both liked the idea of a book on tofu very much. That was a turning point for us and Autumn Press."

Shurtleff then recalls that first meeting on 13 Jan. 1973 at the Stiskins' attractive home by the ocean in Hayama (2113 Isshiki, Hayama-shi, Kanagawa-ken, Japan 240-01). "I explained to Nahum that I thought a book about tofu would be interest to many people in America. He liked the idea immediately. I was astonished that anyone else shared my idea. He quickly looked over the table of contents and a few pages I had written by hand on the subject, then pulled a publishing contract out of his desk drawer and said 'please sign here.' I didn't even read the contract. There was no discussion of terms or of an advance–I didn't even know what an advance was. I signed, he signed it, we each took a copy and that was it. Before we left, Nahum showed me comments he had received from a professional cookbook editor who he had hired to edit the macrobiotic cookbook he was writing with Lima Ohsawa. I was very impressed that he would take such a professional approach. I remember him emphasizing that in a good cookbook, in the list of ingredients, the words 'teaspoon' and 'tablespoon' are always written out, never abbreviated as 't.' and 'T.' I found it remarkable that we had a meeting of the minds and signed a book contract in 1 or 2 hours."

This would be the sixth book that Autumn Press would publish: (1) *The Looking-Glass God,* by Nahum Stiskin (published in 1971 in Kyoto, revised ed. 1972). About Shinto–Japan's oldest religion. (2) *The Art of Just Cooking,* by Lima Ohsawa with Nahum Stiskin (1974, in Hayama, Kanagawa-ken, Japan). A macrobiotic cookbook. (3) *The Gayatri Mantra: Yoga for Beginners,* by Satyavan [S.K. Roy] (1974). A tiny, 50-page book. (4) *Cry of the People and Other Poems,* by Kim Chi-ha (1974). A translation into English of poems written from jail by a South Korean dissident poet, criticizing the country's dictator. (5) *Island of Dreams: Environmental Crisis in Japan,* by Norie Huddle, Michael Reich, and Nahum Stiskin (1975). A book about pollution in Japan. The Foreword was by Paul Ehrlich, and the Afterword by Ralph Nader.

Beverly continues: One of these books, *Cry of the People,* would later have a profound effect on both Autumn Press and *The Book of Tofu.* Bob Bernstein at Random House was well acquainted with Kim Chi-ha, his protest poetry and the fact the he was now in jail. Bob wanted to try to help him. When he heard that Kim's poems had been published, Bob said "I want to meet the publisher." When Nahum showed him Autumn Press' various books, Bob decided to include Autumn Press in Random House's small publishers distribution program. That quickly led to Ballantine Books (a Random House subsidiary) buying the mass market paperback rights to *The Book of Tofu* in 1978.

"Nahum was perfectionist–and so were you. This led to some problems and difficult compromises along the way, but in the end it led to a quality book... I remember one of the first times we met at Hayama, you showed up with Akiko and this box full of papers–which was supposed to be 'the manuscript.' It was very disorganized, with recipes and text all mixed up together. Nahum and I both remember

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that clearly and still laugh about it." Address: Boston, Massachusetts. Phone: 617-776-8749.

10634. Jones, Catherine. 1999. Shining examples: At East, the sushi sparkles. If only the service and everything else did. *New York Times.* Feb. 28. p. NJ14.
• ***Summary:*** This is a review of East Japanese Restaurant (1405 Teaneck Rd., Teaneck, New Jersey–a suburb of the New York metropolitan area, just west of Manhattan island, New York City). The mood was relaxing and the sushi was very good. "Finally the natto roll both surprised and perplexed my group. I love soybeans but have never tried them mixed with scallion in a roll; they are gummy, bland, salty, satisfying and curious all at the same time."

10635. Jack, Alex. 1999. Let food be thy medicine: 750 scientific studies, holistic reports, and personal accounts showing the physical, mental, and environmental benefits of whole foods. 3rd ed. Becket, Massachusetts: One Peaceful World Press. 304 p. Index. 23 cm. [8 ref]
• ***Summary:*** This book, organized alphabetically by subject, is a very original and creative source of information, with hundreds of interesting bibliographic references. The author believes in a natural, whole-foods diet. Includes the following subjects: Alternative medicine, amasake (amazake), Asia Diet Pyramid, azuki beans, bovine growth hormone, cancer, cholesterol, coffee, complex carbohydrates, dairy food, estrogen, evolution, exercise and fitness, fats, fiber, genetically engineered food, genetic model of health and disease, genistein, global warming, heart disease, hiziki, hunza diet, isoflavones, Japanese diet, kombu, kuzu, lignans, longevity, macrobiotics, Mad Cow Disease, meat, menopause, microwave cooking, miso, mochi, natto, nori, osteoporosis, Paleolithic diet, phytochemicals, phytoestrogens, polyps, potatoes, Price–Weston, prostate cancer, protein, rice, Schweitzer–Dr. Albert, sea vegetables, seitan, sesame, shoyu, soy foods, tempeh, tofu, umeboshi plum, vegans, vegetarians, wakame, wartime restricted (diets, incl. World War I and II), whole grains. Resources. About the author. Address: Box 10, Becket, Massachusetts 01223. Phone: (413) 623-5742.

10636. Morinaga Nutritional Foods, Inc. 1999. Help! Help! My tofu needs help! Never fear–New Tofu Helper is here! (Ad). *Natural Foods Merchandiser.* Feb. p. 19.
• ***Summary:*** This full-page color ad shows (at lower left) packages of four new varieties of Mori-Nu Tofu Helper: Italian Herb Medley, Shanghai Stir Fry, Eggless Salad, and Garden Scrambler. Across the very top of the ad is written: "Location: Expo West–Booth 755. A desperate cry is heard from the crowd. There's a blinding flash. And suddenly..." A Superman-type figure, with red cape, red-gloved right hand held out, and green uniform, is flying through the air over a fair maid who is crying for help. Below the packages is written: "Able to create great meals in a single pan. Faster than a hungry family. Defender of great taste everywhere. Introducing new Tofu Helper from Mori-Nu. All natural. Dairy-free. Vegan. For more info about new Tofu Helper call 1-800 Now Tofu." Website: www.morinu.com.

Note: The first product of this type with the name Tofu Helper was introduced by Larry Needleman in about 1980–but it was never commercialized.

This ad also appeared in *Vegetarian Times* (March, p. 41 and June, p. 65). Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-669-8638 (NOW TOFU).

10637. Nagai, Toshirou. 1999. [Breeding and genetic manipulation of *Bacillus subtilis* (*natto*)]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 46(2):39-44. [39 ref. Jap] Address: Genetic Resources Center, National Institute of Agrobiological Resources, Ministry of Agriculture, Forestry and Fisheries, Tsukuba-shi, Ibaraki prefecture 305-8602, Japan.

10638. Daniels, Nahum Stiskin. 1999. Recollections of publishing *The Book of Tofu* (Interview). *SoyaScan Notes.* March 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** "*The Book of Tofu* was one of those very special projects–almost timeless indeed. We did what we all set out to do, which was to communicate a very tangible idea to the West. It's very rare when people can get together and actually pull that off. It was a very exciting and very worthwhile project–something I'm always very proud of being involved in."

Nahum has always imagined [not true] that I [Shurtleff] went to speak to Weatherhill and Tuttle before coming to Autumn Press. "I thought you came to me as a last resort, after they rejected your idea... I remember the day that I took a phone call from you. We were living in Hayama. I remember picking up the phone and hearing your voice at the other end–much like to tonight. You said, "Hi Nahum, this is Bill Shurtleff." Yeah. "I'm thinking of doing a book on tofu" something like that. "I said to myself–it was just an instinctive 'Great!' I think I said 'I think that's a great idea.'" It triggered something–like a light bulb went on in my mind. "As soon as I heard it, I thought it was a fabulous idea." We were struggling to get our own little publishing company going.

Bill recalls: I remember that phone call too. And I remember thinking 'Amazing–There's somebody else in the world who thinks this is a good idea."

Nahum continues: "I had an image of you as this waiflike creature who had been in my peripheral vision in Kyoto. You were a free spirit, doing interesting and bizarre things. I didn't know you, but I had an instinct that when you

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set your mind to something, you were going to do it. Only much later did learn about your family; I still remember that your grandfather had his own railroad car."

The Book of Tofu was the sixth book that Autumn Press published, but we had never done anything of its magnitude before. Lima Ohsawa's book was very helpful in preparing me to do *The Book of Tofu.* Through one of the editors at Weatherhill I was introduced to a woman cookbook editor in America. She taught me the high style in cookbook editing.

"I remember just before *The Book of Tofu* was published, that your mom, may she rest in peace, loaned Autumn Press some money–about $5,000–to help pay for the first printing. This loan was very important and helpful to Autumn Press, to get us over the hump."

Kim Chi Ha and *The Book of Tofu:* In 1974 Autumn Press published *Cry of the People,* by Kim Chi Ha–Poems written from jail by a South Korean dissident poet. Some years later Robert L. "Bob" Bernstein, the President and CEO of Random House, was in Japan. He had a strong personal interest in free speech, and he spoke up for oppressed writers around the world. He knew of Kim Chi Ha, and knew he was in a dungeon in South Korea because he wrote and spoke publicly against the country's dictator and tyrant. In Japan, Bernstein's translator, who was a friend of the Stiskins, gave him a copy of *Cry of the People.* He said that he wanted to meet the people who had published this book. Bernstein called Nahum just as Nahum was preparing to leave Japan after seven years. Nahum didn't know who Bernstein was and said he was sorry but he was too busy to meet with him. Back in the states, after realizing the opportunity he had missed, Nahum called Bernstein and accepted an invitation to visit his office in New York City. He took copies of each of Autumn Press' books, including *The Book of Tofu,* which had just been published. They talked about publishing and Bernstein was very interested to see what kind of books Autumn Press was publishing. Before they parted Bernstein said that Random House would like to distribute Autumn Press' books. This was a huge break for Autumn Press. Random House soon noted that *The Book of Tofu* was selling very well. Several years later at a sales conference, Dick Krinsley, in charge of Ballantine Books, approached Nahum and said he would like to buy the paperback rights to *The Book of Tofu.* Thank you Kim Chi Ha.

In 1978 Autumn Press published *Nuclear Madness: What You Can Do,* by Helen Caldicott, a physician and anti-nuclear activist from Australia. The book sold very well and was eventually very influential. However it led to the downfall of Autumn Press, in a process filled with conflict, in which Helen eventually sued Autumn Press. Address: Stanford, Connecticut.

10639. Mukherjee, Anjali. 1999. Natural chemical stew. *Times of India* (*The*) (*Bombay*). March 4. p. A7.

• ***Summary:*** Scientists are rapidly learning about the nutritional and medical benefits of phytochemicals ("plant chemicals"). Foods which are brimming with phytochemicals include soyabeans.

The Japanese consume more "Soya foods" than any other population on earth; and they have a longer life expectancy than almost any other population. Compelling evidence suggests that something in Soya foods protects cells in the human body from free radicals and carcinogens. Scientific research has shown that Soya foods are an exceptionally rich source of phytochemicals with tongue twisting names like isoflavones, phytic acid, saponins, coumarins, genistein, etc. Genistein, for example, is known to thwart cancer at almost every stage of its development. People consuming as little as 50 gms of Soya foods every day can benefit from their cholesterol lowering properties.

A portrait photo shows Anjali Mukherjee. An illustration shows a sack of whole soybeans labeled "Soya food."

10640. Mahy, Dixie. 1999. Work at Now & Zen Bakery (Interview). *SoyaScan Notes.* March 10. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** For 25 years Dixie Mahy was head of the San Francisco and a teacher in the San Francisco school system. She has long eaten a vegan diet. When she retired, she invested much of her retirement funds in Now & Zen, a company founded and run by Japanese-American Miyoko Schinner which had a vegan restaurant and a bakery that made delectable vegan cakes, cookies and other desserts. One of their best-selling products in recent years (also made at their factory) has been their UnTurkey, a meatless turkey based on seitan, with a yuba skin. New products may include a Barbecue UnRibs, and a breast of UnChicken. She is now on the company's board of directors, and she is learning a lot about business and money. The company started on a shoestring and they are still running on a shoestring. Unfortunately, last year, in June 1998, they had to close the Now & Zen restaurant, because they could not keep both the restaurant and factory running at the same time. Part of the reason is that Miyoko now has two little girls.

Now & Zen supplies various vegan products (including chocolate chip cookies and cinnamon rolls) to United Airlines. Address: Now & Zen, Inc., 665 22nd St., San Francisco, California 94107. Phone: 415-695-2805.

10641. Efron, Sonni. 1999. Japanese choke on American biofood: Genetically altered produce reaps opposition. But moves to label it threaten $11 billion U.S. sales. *Los Angeles Times.* March 14. p. A1, A8.

• ***Summary:*** Japan is one of several nations that have proposed labeling "bioengineered food to give consumers the freedom to reject it." American trade groups say the Japanese are being protectionist. Address: Staff writer.

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10642. Guo, Shun-Tang; Ono, Tomotada; Mikami, Masayuki. 1999. Incorporation of soy milk lipid into protein coagulum by addition of calcium chloride. *J. of Agricultural and Food Chemistry* 47(3):901-05. March. [20 ref]*

10643. House Foods America Corporation. 1999. Hinoichi Tofu (Leaflet). [Garden Grove, California]. 1 p. Front and back. 28 cm. [Eng; Jap]
• ***Summary:*** Printed with black ink on light green paper. On the front is a half-page introduction to tofu in English (top half) and Japanese (bottom half). On the rear is a recipe (in English) for Stir-fry tofu and vegetable (with "2 {14 oz.} pkgs. Hinoichi Regular Tofu"). Address: [7351 Orangewood Ave., Garden Grove, CA 92841].

10644. House Foods America Corporation. 1999. Tofu: The joy of soy (Leaflet). Garden Grove, California. 1 p. Single sided. 28 cm.
• ***Summary:*** See next page. Glossy color. Shows photos of the front of the package of four different types of Hinoichi-brand tofu (Soft, regular, firm, and extra-firm) and four different types of House-brand tofu (Organic soft, organic regular, organic firm, and organic extra-firm). For all types: "65 days of freshness guaranteed." Address: 7351 Orangewood Ave., Garden Grove, CA 92841.

10645. Kushi Institute. 1999. Kushi Institute store: Food, books, kitchenware, bodycare, video, audio. Spring/summer 1999 (Mail-order catalog). Becket, Massachusetts. 40 p. 28 cm. [8 ref]
• ***Summary:*** A good new source of macrobiotic supplies. Includes: Amazake (from Kendall Food Co.), arame (sea vegetable), azuki beans (from Hokkaido {Japan} and organic), barley malt, black soybeans (from Hokkaido and USA), dulse, fu (dried wheat gluten), hato mugi [hatomugi], hijiki, kanten flakes, koji, kombu, kuzu, mirin, miso, mochi (organic, Kendall), natto (organic, Kendall), natto miso, nori, rice syrup, sea palm, sea vegetable kit (8 varieties), shoyu, suribachi, tamari, tekka, tofu–dried, tofu kit, umeboshi, umeboshi concentrate, wakame, yuba. Address: P.O. Box 500, Becket, Massachusetts 01223-0500. Phone: 1-800-645-8744.

10646. Liu, KeShun. 1999. Oriental soyfoods. In: C.Y.W. Ang, K. Liu, and Y-W. Huang, eds. 1999. Asian Foods: Science & Technology. Lancaster, Pennsylvania: Technomic Publishing Co., Inc. 546 p. See p. 139-99. Chap. 6. March. [60 ref]
• ***Summary:*** Contents: Introduction: Soybeans as a crop, composition and nutritional quality of soybeans, soyfoods–from the east to the west, soyfood classification.

Soymilk: Introduction, traditional soymilk, modern soymilk (techniques for reducing beany flavors, commercial methods, formulation and fortification, homogenization, thermal processing, and packaging), concentrated and powdered soymilk, fermented soymilk (with lactic acid bacteria), soymilk composition and standardization.

Tofu: Introduction, methods of tofu preparation, factors involved in tofu making (soybean varieties, concentration of soymilk, heat process of soymilk, types of coagulants, concentration of coagulants, coagulation temperature, coagulation time, process automation, packaging), varieties of tofu (silken tofu, regular and firm tofu, Chinese semidry tofu {*doufu gan*}, Chinese tofu sheets and tofu noodles, lactone tofu), varieties of tofu products (deep-fried tofu, Japanese grilled tofu, frozen tofu {"Made almost exclusively in rural farmhouses and temples by putting tofu outdoors in the cold weather, frozen tofu was never sold as a commodity in the past"}, Japanese dried-frozen tofu, Chinese savory tofu {"In China there are many specially made tofu varieties known as savory tofu"}, fermented tofu {Sufu or Chinese cheese, varieties of sufu, preparation methods, preparation principle}).

Soymilk film (yuba). Soybean sprouts. Green vegetable soybeans. Other non-fermented soyfoods: Okara, roasted soy powder. Concerning okara: In some parts of China, okara is salted and spiced and used as a pickle. Or it can be simply added to a dish with meat and vegetables. In other parts of China it is made into okara tempeh [called *mei-dou-zha* or meitauza].

Fermented soy paste (Jiang and miso): Koji, koji starter, and inoculum (koji, koji starter, inoculum), Chinese jiang (traditional household method, pure culture method, enzymatic method), Japanese miso (preparing rice koji, treating soybeans, mixing and mashing, fermenting, pasteurizing and packaging), principles of making jiang or miso.

Soy sauce (Jiangyou or shoyu): Chinese jiangyou (traditional household method, modern methods), Japanese shoyu (treatment of raw materials, koji making, brine fermentation, pressing, refining), principles of making soy sauce, chemical soy sauce (made by acid hydrolysis; heat with 18% hydrochloric acid for 8-12 hours, then neutralize with sodium carbonate and filter to remove insoluble materials), proximate composition of soy sauce, quality attributes and grades.

Japanese natto: Methods of preparation, principles of preparation.

Indonesian tempeh: Traditional method, pilot plant method, principles of tempeh preparation. Fermented black soybeans (Douchi or Hamanatto): Chinese douchi, Japanese Hamanatto.

Tables: (1) Names (English, Chinese, Japanese, Korean, Indonesian, Malay, Filipino) general description, and utilization of nonfermented Oriental soyfoods.

Soy sprouts: Chinese: Huang dou ya, Da dou ya. Japanese: Daizu no moyashi. Korean: Kong no mool.

Yuba: Chinese: Dou fu pi, Fu zhu. Japanese: Yuba.

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Korean: Kong kook. Filipino: Fu chok.

Yuba (Soy pulp): Chinese: Dou zha / doufu zha. Japanese: Okara. Korean: Bejee. General: "Insoluble residue after filtration of soy slurry into soymilk."

Roasted soybeans (Soynuts): Chinese: Chao da dou. Japanese: Iri-mame. Korean: no name. Indonesian: no name

Roasted soy powder: Chinese: Chao dou fen, dou fen. Japanese: Kinako. Korean: Kong ka au. Indonesian: Bubuk kedelai. (2) Names (English, Chinese, Japanese, Korean, Indonesian, Malay, Filipino) general description, and utilization of fermented Oriental soyfoods. (3) Proximate composition (gm per 100 gm fresh weight) of some fermented soyfoods.

Figures show: (1) Flowchart: Traditional Chinese method for making soymilk and tofu (from whole soybeans). (2) A commercial processing method (Alfa-Laval) for making soybase and a subsequent product–soymilk. (3) Photo of homemade firm tofu. (4) Photo of a dish of tofu and mushrooms. (5) Photo of cubes of sufu (Chinese cheese) on a white plate. (6) Flowchart for making sufu from firm tofu. (7) Photo of two packages of dried yuba sticks (Chinese). (8) Photo of a bowl of soy sprouts. (9) Photo of Chinese chiang, and Japanese red and white miso, each on one of three spoons in a shallow white bowl. (10) Flowchart of a common method for making Japanese rice miso [red miso]. (11) Photo of soy sauce in three different containers: dispenser, small bottle, and large Chinese can. (12) Flowchart of a common method for making Japanese koikuchi shoyu (soy sauce). (13) Photo of two chopsticks lifting some Japanese natto from a bowl full of natto; the thin strings connecting the natto above and below are clearly visible. (14) Flowchart of a common method for making Japanese natto from whole soybeans. (15) Photo of tempeh made in the USA in perforated plastic bags (Courtesy of Mr. Seth Tibbott, Turtle Island Foods, Inc., Hood River, Oregon). (16) Flowchart of traditional Indonesian method for making tempeh from whole soybeans. (17) Photo of Chinese *douchi* (fermented black soybeans) on a white plate.

Note: For a biography of KeShun Liu PhD see p. 544. Address: PhD, Soyfoods Lab., Hartz Seed, A Unit of Monsanto, Stuttgart, Arkansas.

10647. Newman, Jacqueline M. 1999. Cultural aspects of Asian dietary habits. In: C.Y.W. Ang, K. Liu, and Y-W. Huang, eds. 1999. Asian Foods: Science & Technology. Lancaster, Pennsylvania: Technomic Publishing Co., Inc. 546 p. See p. 453-85. Chap. 15. [104 ref]

• ***Summary:*** Contents: Introduction. Foods of Bangladesh. Cambodian foods. Chinese foods: Food selection, eating behaviors, intracultural differences, feasts, holidays and special foods. Indian foods. Indonesian foods. Japanese foods. Korean foods. Laotian foods. Malaysian foods. Nepalese foods. Foods of Pakistan. Philippine foods. Thai foods. Vietnamese foods.

In each country and culture, the role and practice of vegetarianism is discussed.

Soyfoods are mentioned as follows: China (p. 458): "For breakfast, Northerners prefer warm soymilk and fried wheat-dough crullers." Vegetarians from both north and south get an important part of their protein "from a sophisticated cuisine based upon considerable use of gluten and tofu," made to look and taste like animal products.

Indonesia (p. 463): "... foods are preferred sweet; even the local soy sauce, kecap manis, is fermented sweetened."

Japan (p. 465): Mentions shoyu and tofu.

Korea (p. 468-69): Mentions tofu.

Malaysia (p. 472): Discusses Chinese who married Malay women (called Nonyas); "their families are called Peranakan or Straits Chinese and their cooking is called Nonya Cuisine. Straits Chinese live mostly in Penang, Malacca, and Singapore; practice Buddhism; and cook their Chinese food with a Malay influence. Their Nonya cuisine is eaten communally; all dishes are served at once,..."

Nepal (p. 473): "During Janai Purnima, a soup called *quantee* is essential; it is made from sprouted soy, chick pea, black beans,..."

Pakistan (p. 476): Pad Thai, a popular lunch dish, is made with tofu. Note: Pad Thai, based on rice noodles, is one of Thailand's national dishes. Address: PhD, R.D., Prof., the Dep. of Family, Nutrition and Exercise Sciences, Queens College-CUNY, Flushing, New York.

10648. **Product Name:** Nichimo Frozen Tofu [Dice Cutting, Stick Type, For Deep-Frying].
Manufacturer's Name: Nichimo (Importer Marketer). Made in Tanaba, Wakayama, Japan 646, by Tendre Co., Ltd.
Manufacturer's Address: USA: 1420 Princeton St., Santa Monica, CA 90404. Japan: Tokyo. Phone: 1-877-654-8638 (TOFU).
Date of Introduction: 1999 March.
Ingredients: Soy bean, water, gelatine, potato starch, calcium chloride.
Wt/Vol., Packaging, Price: 16 oz. foil Ziploc bag.
How Stored: Frozen.
New Product–Documentation: Talk with Mike Misawa of Nichimo. 1999. April 12. This new frozen tofu was introduced in March 1999. It comes in three forms, and each is individually quick frozen (IQF) and sold in a plastic bag. The dice cut comes in 300 gm or 450 gm, and the stick type in 80 gm. The third type is ready for deep frying. It was first sold at Trader Joe's. It is made by Tendre, a subsidiary of Nichimo, in Wakayama, Japan.

Label and leaflet sent by Mike Misawa. 1998. April 13. 11.5 by 7 inches. On the front is a color photo printed on the foil pouch, which shows a bowl of tofu & egg-flower consomme soup in front of a baguette. "Very handy. The tasty bite size frozen tofu." The logo is a bear holding a globe sitting atop the world. On the back are six small color

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photos showing serving suggestions: Tofu hamburger. Tofu consomme soup. Tofu steak. Tofu pizza. Tofu scrambled egg. Tofu Italian salad.

Leaflet: "Tendre frozen tofu is a product like no other." Two sided, color. Shows many of the same photos as on the label. On the back: "Give us a chance to increase your business profit." Photocopy brochure. "Frozen tofu: Revolutionary product developed by Nichimo Co." 5 p. Nichimo Corporate Overview. 1998/04. "Towards a boundless future: Being a company which contributes to an affluent life." 12 p. For 80 years Nichimo has been a fisheries business. Website: www.nichimo.co.jp. Address in Japan: 10th Floor Nippon Building, 6-3 Otemachi, 2-chome, Chiyoda-ku, Tokyo 100-0004, Japan.

10649. Santacruz, Cecilia; Santacruz, Nestor. 1999. Tofu and other soyfoods in Colombia (Interview). *SoyaScan Notes.* April 1. Conducted by William Shurtleff of Soyfoods Center. [1 ref]

• ***Summary:*** In June 1998 Cecilia and Nestor started the earliest known non-Asian tofu shop in Colombia that focused on traditional, hand-made tofu and made delicious products from tofu. Named Delisoya, it is located in a residential part of Bogota (the country's capital) high in the Andes mountains of Colombia at 8,500 feet altitude. They visited Soyfoods Center from Salinas, California, after being given an excellent tour of the Wildwood Natural Foods soyfoods plant in Santa Cruz. The main things they learned at Wildwood: (1) They can make a large amount of very tasty tofu using an open-top, stem-injection system (without pressure). Nestor would like to get this same kind of system. (3) Their many creative tofu products are delicious; the baked (not fried) tofu burgers were especially interesting. (3) The shop was very clean and sanitary.

Ceci speaks good English, since she lived for a year in Tennessee (with "Ami") during her high school years. This is the third time they have been to the USA.

Ceci and Nestor were both born in Colombia–Ceci on 3 December 1949 and Nestor on 28 Aug. 1955. They both attended the Colombian National University (*Universidad Nacional de Colombia*) where they studied chemistry and graduated in 1982. They were married that same year, shortly after graduation. Nestor got a job in Bogota with Canta Claro, a company that operates soybean crushing plant. They made animal nutrition products from the soybean meal and various foods from the soy oil. Ceci also worked for Canta Claro for 2-3 years in quality control, then she left and worked with her family who owns a small hotel about 150 km (93 miles, 4 hours by car) outside of Bogota. She also spent more time cooking and doing things she enjoyed, alone and with her mother (who has her own foundation and is a very civic-minded person). In 1992 Nestor and Ceci met a macrobiotic group named *Escuela de Educación Vitalicia* (The Life and Vitality Education School) run by students of Tomio Kikuchi, a well-known teacher of macrobiotics who lives mostly in Brazil; this group had been in Bogota since 1985. Later in 1992 Nestor left his job at the soybean crushing plant and began to work as an administrator in Ceci's family hotel. Slowly their lives began to change. In June 1993 they traveled to Brazil to attended the annual winter seminar by Tomio Kikuchi. They found him to be an excellent teacher and, at age 70, a man of remarkable vitality. Bernadette Kikuchi is Tomio's wife. Through her cooking lessons in Colombia and Brazil, in their school, they first made contact with Oriental cooking and foods. Through them they came to know about brown rice and tofu for the first time, 7 years ago. "They are remarkable human beings who left a deep impression on us."

In early 1996 Nestor and Ceci bought some tofu from a Chinese man in Bogota; it was quite hard and the flavor was not very good, so they started to make their own tofu. In late 1996 Nestor and Ceci began to pursue their interest in soyfoods more actively. They saw an article somewhere about Peter Golbitz of Soyatech in Maine, so they wrote him and he sent them a free copy of the 1996 *Soya Bluebook.* In that book they saw a Takai advertisement for tofu and soymilk equipment. Takai sent them a catalog and there they saw the address of Soyfoods Center–from which they ordered several books, including *The Book of Tofu* and *Tofu & Soymilk Production.*

They found that there were already two companies in Bogota that made tofu and other products. Named Hosanna and Sabyi, they each opened in about 1996-97, and were run by Colombians (non-Asians), but their focus was on products such as sausages made with tofu and soy flour, or pimento-flavored tofu, their tofu was not hand-made, and both Nestor and Ceci found the tofu to be very hard and not tasty. So in June 1998 Nestor and Ceci opened Delisoya. There they made traditional handmade tofu and soymilk, plus several tasty second generation soy products such as cheesecake, soy mayonnaise, and soy burgers. The interior is very attractive with a large deli case stretching across the room, and a list of products and prices written by hand on a blackboard on the wall. They gave Soyfoods Center three color slides showing the above views. This is a business with a philosophy and a social mission. They want to teach local people about the goodness of soyfoods and how to use them (including the okara), and they want the shop to eventually serve as a school where other Colombians can learn to make tofu, soymilk, and other soyfoods. Recently the International Monetary Fund (IMF) has demanded that Colombia quickly open its economy to foreign goods. The influx of cheap products has had a drastic effect, creating very high unemployment and widespread suffering. Nestor and Ceci are working to alleviate this crisis.

The soybeans used to make tofu at Delisoya are all grown in Colombia, at Cali, the capital of Valle de Cauca department at 3,327 ft, in western Colombia, bisected by

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the Cauca River. "Valle" is pronounced "Balle" in Spanish. There is a big Japanese community living in Cali, the area where the first Japanese settled in Colombia many years ago. Another center of soybean production in Colombia is Palmira, a city at altitude 3,000 feet, in Valle de Cauca department, in western Colombia, near the Cauca River. It is about 15 minutes by car from Cali, but 8 hours by car from Bogota.

Nestor now makes a little more 100 lb of tofu per week; more precisely, he makes about 100 cakes, each weighing 500 gm. He and Ceci are looking for a larger plant near their home in Bogota. He knows a lot about machines and mechanic, so he will make some of the equipment. At the plant they will hire people they know–who are simple and nice.

Ceci and Nestor are interested in translating *The Book of Tofu* into Spanish. They are trying to gain support for the project from Japanese cultural organizations in Colombia, such as JAICA (Japan International Cooperation Agency), and JETRO (Japan External Trade Organization). JAICA is Japanese governmental organization which assists developing countries, including financial support for some projects requested by local people. They send experts in various fields (such as agriculture, earthquakes, etc.) and also send local people to Japan for training. Ceci has a friend, Mrs. Tanaka, who is the wife of the president of JETRO in Bogota.

During the last presidential campaign in Colombia, soybeans were featured by the candidate who won (in June 1998), Pres. Andres Pastrana. In about Sept. 1997 his political campaign published a booklet titled "El Cambio" which means "Change!" It is said that the president's wife, Nohra Puyana de Pastrana, took the idea from people working with soyfoods in Caldas–a department in west central Colombia. Currently, soyfoods are promoted by the *Instituto Colombiano de Bienestar Familiar* (Columbian Institute for Family Well-Being). This institute, which has its headquarters in Bogota but branches in many Colombian cities, now offers free soyfoods cooking classes and printed information (incl. recipes and nutritional facts).

The Colombian government has been studying soyfoods for at least 20 years. The first major organization to do this was the *Instituto de Investigaciones Tecnologicas* (IIT–Institute for Technological Investigations). It existed 20 years ago but ceased operations about 10 years ago. Their purpose was to help industry develop and market new products. Their first soy product was Incaparina [production began in 1963], followed by Bienestarina [first manufactured in Jan. 1976]. IIT made soymilk and targeted local people.

One soy pioneer in Colombia was a man named Joaquin Molano, who was a chemist, is now age 90, and who founded Fundacion del Rio Magdalena. Address: Founders and owners of Delisoya, Calle 78 No. 12-03, Santafe de Bogota, Colombia. Phone: 346-2178.

10650. Smith, Patricia J. 1999. The Natural Products Expo at Anaheim and a macrobiotic award (Interview). *SoyaScan Notes.* April 19. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The Expo at Anaheim this year was the biggest ever, attracting some 30,000 people. It was so crowded, one could barely walk down the aisles. "The soyfoods category has just exploded. Everyone was excited; you could feel the buzz." Patricia collected lots of printed information for Soyfoods Center.

Patricia also organized the first "In the Spirit of Macrobiotics" award, which was presented to Tom DeSilva of Los Angeles, who was a pioneer with Erewhon, Los Angeles, and has continued to run a very successful natural foods retail store. Forty people came to honor him at drinks, and 16 stayed for dinner–including Chuck Verde of Erewhon, Lenny Jacobs, and Michael Potter. The award focuses on the business side of macrobiotics.

Update: 1999. Nov. 19. Patricia just received an e-mail from Norio Kushi saying that Lima Ohsawa died this month in Japan.

Update: 2000 May 2. There was a continuing explosion of soy products at the Natural Products Expo at Anaheim. She saw former macrobiotic friends, Rus Postel and Francis Pintel (who ran the Erewhon warehouse in Los Angeles). Jacques DeLangre has died, and his charming wife Yvette remarried to a childhood sweetheart and now lives in Louisiana, where she still runs the Grain and Salt Society. Patricia wishes that Trader Joe's would take a stand on genetically engineered foods. Address: Radical Food, P.O. Box 952, Mill Valley, California 94942-0952.

10651. Conquergood, George. 1999. History of work with soyfoods and vegetarianism. Part I. 1976 to 1994 (Interview). *SoyaScan Notes.* April 21. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** George was born on 1 Dec. 1946 in Toronto, Ontario, Canada. He went to high school in Toronto but did not graduate, and he never attended college. "I attended the school of hard knocks." He dropped out of high school at age 15 he began to work full-time. At age 17 he went to work for a textile firm until he was age 20. Then he started his own business in the fields of textiles and clothing. In 1967 he married Wendy Lynn Richardson–who was born on 27 Sept. 1948. In 1973 he received knowledge from Guru Maraji (via Guru Charanan) in Toronto, became his disciple, traveled throughout the United States and (in 1973) to the Houston Astrodome [in Texas] with Guru Charanan, and started a vegetarian diet and vegetarian restaurant. In 1977 he was one of the founding partners of Jolly Green Garden, a vegetarian restaurant in Toronto. He called it "Guru Maraji's restaurant" because many of the employees and customers were disciples of Guru Maraji. There he first got involved

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with soyfoods. He bought tofu and used it to make various products, such as patties, dressings, etc., which were served in the restaurant. George has been involved with soyfoods for more than 20 years, starting in Toronto.

In early 1979 George and his family moved to southern Alberta. He went to work for the Canadian federal government helping a group of native Blackfeet people there. He set up a company named Pe-Kun-nee Garments that manufactured textiles (garments), put 300 women through a training program, and ran it (with the title of General Manager) for about 4 years. George still has the full-beaded outfit and feathers that he got from the Blackfeet people he helped.

In 1984 George and his family moved to Saskatoon, Saskatchewan, where he started a computerized embroidery business. His wife and three children still run this as a family business. Today his company is one of the top software development firms in North America for computerized embroidery. He worked for a company named Jeffrey E. McPherson, headquartered in Nottingham, England, with North American offices in Greensboro, North Carolina and in Canada; George worked for the North Carolina company. They held the worldwide distribution rights for an embroidery machine made by a Japanese company named Barudan (pronounced buh-ROO-dun) who pioneered the electronic embroidery machine from Japan. The ancient Jacquard looms, which were programmed with punch cards, originated in Switzerland [sic]–which is why we refer to "Swiss embroidery." [Note: The French inventor, Joseph-Marie Jacquard (lived 1752-1834) invented the Jacquard loom at Lyons, France, in 1801 and was awarded a patent and medal by Napoleon in 1804]. The Japanese copied these looms. George was a salesman for their equipment, and he developed a collection of baseball caps because he was one of the first people to sell caps–whether it be importers of blank caps or embroiders of finished caps. George even called himself Captain Capman. He went around and set up embroidery companies to whom he sold his embroidery equipment (from Barudan in Japan) all over western Canada. George was one of the first people to embroider a baseball team insignia direct onto the blank hat–replacing the old crest that was stuck on the hat. It was much classier, and now its the only way they do it.

In 1992 he started another gourmet vegetarian (actually vegan) restaurant, this time named Sweet Carrot Café, located at 702 14th St. East, Saskatoon, Saskatchewan S7N 0P7. Actually, George bought the building for his embroidery business, then opened up a corner of one building on the corner as a lunchroom for his staff. It was an historical building, with three buildings in one. George bought an espresso machine for his lunchroom. Passersby thought it should be a coffee shop. George lined the walls of his lunchroom with his collection of embroidered baseball caps. He soon converted the lunchroom into a coffee bar, which he named it Caps Coffee Bar. A popular menu item was Cappuccino! There was a grand piano in the dining room. It was probably the only vegetarian or vegan restaurant ever to be written up in *Where to Eat in Canada*–two years in a row. In those days most people thought of vegetarian restaurants as places where hippies with beards and long hair sat on picnic benches and ate granola bars. Most people were afraid to eat in such places, so George made his restaurant into a fine dining room. One of the main focuses of George's life since the 1970s has been vegetarianism; his wife is a vegan and teaches tai-chi. In the restaurant George made his own tofu, soymilk, and related products, such as spreads, dressings, etc. In the early days, he made these products in the old fashioned way. The firm nigari tofu was very good tasting but the soymilk had a pronounced beany flavor. He was so busy, and making all these foods was such a chore, that he began looking for other technologies to expand his production. One day in early 1992, at about the time Raj Gupta started publishing his *SoyaCow Newsletter,* a young lady from the United Way in Ottawa came into the restaurant and commented on his organic tofu sandwich. She also tried his soymilk and told him about a soymilk making machine named the SoyaCow, developed by a company named ProSoya in Ontario. George asked for more information and the lady sent him a copy of the newsletter. George immediately phoned Raj Gupta, the inventor of the machine, and was on the next airplane to Ottawa. He ended up buying the only small SoyaCow (SC-20) Raj had. Articles about George, his stylish restaurant, and his new SoyaCow appeared in two early issues of the *SoyaCow Newsletter* (Jan/March and April/June 1993–Vol. 2, Nos. 1 and 2). He used the SoyaCow to make soymilk, which he sold at his restaurant–starting in early 1993. This was the first commercial soymilk ever produced by a SoyaCow. He sold the soymilk in 1 liter glass bottles, with the SoyaCow logo printed directly on the glass on each bottle. He and Frank Daller developed the bottle. So the name of the soymilk was "SoyaCow" and it was sold in seven flavors–including maple, chocolate, vanilla, original, chocolate-peanut butter, and nog (a delicious eggnog alternative made only at Christmas). Dusty Cunningham and Lorne Broten were both patrons of George's vegetarian restaurant in Saskatoon. A romance soon developed and they were called the "love birds." George was thinking about opening a winery in his restaurant. Since Lorne was an accountant, George started working with him on a business plan for the winery in about 1994. George liked Lorne and hired him as his bookkeeper and accountant for his two businesses–embroidery and vegetarian restaurant.

Soon, within his restaurant (which consisted of three buildings in one), George converted his Caps Coffee Bar into the SoyaCow Health Bar Deli, where he sold at least five soy products, both as part of the menu and for takeout: Soymilk (in six flavors), soy ice cream (many flavors, always

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changing), soy yogurt (several flavors), tofu, and Soyanaise. He also carried Yves Veggie Cuisine. He used his car to deliver some of the soymilk he made to three local stores; he never delivered his other soy products from the restaurant. He carried the glass bottles in milk crates. Continued. Address: Vice-president Operations, International ProSoya Corp., 312-19292 60th Ave., Surrey (Vancouver), BC, V3S 8E5 Canada. Phone: 604-541-8633.

10652. Santacruz, Cecilia; Santacruz, Nestor. 1999. Re: Searching for the roots of soya in Colombia. New developments at Delisoya. Letter to William Shurtleff at Soyfoods Center, April. 2 p. Typed, with signature. [1 ref]
• ***Summary:*** In searching for the earliest documents about the soybean in Colombia, Cecilia and Nestor have had the opportunity to talk with some interesting people, such as Victor Manuel Patiño (age 87) who wrote several early Bulletins, among them No. 4, titled *Plantas Introducidas* (Introduced Plants), which tells the complete story of how the soybean, and different varieties, were introduced to Colombia. It is being sent to them from Cali. Victor says that the *Estación Agrícola Experimental de Palmira* (Palmira Agricultural Experiment Station) still exists, and he will ask a friend who lives in Cali to search for the Bulletin No. 1, which mentions soybeans. The station started in 1929, and that same year the first 18 Japanese arrived in Colombia. They included agricultural mechanics and experts in the handling of tractors, etc. They started to plant soybeans and Victor, who was a student at the time, kept the seeds for future trials since no one wanted them besides the Japanese. Soybean production started on a fairly large scale in the 1940s with the manufacture of vegetable oil by Grasas SA.

ASEJA (*Asociación de Exbecarios del Japon*) is an association of Colombians to whom the Japanese government has given a scholarship or supported in some way. Ceci and Nestor know several members including Camilo Ruiz, who is Ceci's teacher of Japanese language. He also assists Japanese missions that come to Colombia through JICA (Japan International Cooperation Agency). Camilo belongs to ASEJA and next week is taking a course at JICA on how to structure a project proposal and project. He thinks that translation of *The Book of Tofu* into Spanish is a good idea and may interest JICA.

At her Japanese class, Ceci saw a nice poster celebrating the 70th anniversary of the arrival of the first Japanese emigrants to Colombia (1929-1999). It contained old photos of the early pioneers. Ceci hopes to be able to get information from the Japanese themselves through Camilo Ruiz who is going to Cali.

On April 27 Ceci and Nestor were on Colombian television for 3-5 minutes with all their products nicely displayed on a table. The program is called "En Vivo" with Adriano and Darío. Nestor spoke very well and many people saw it. Address: Founders and owners of Delisoya, Calle 78 No. 12-03, Santafe de Bogota, Colombia. Phone: 346-2178.

10653. Yasuda, Masaaki; Aoyama, M.; Sakaguchi, M.; Nakachi, K.; Kobamoto, N. 1999. Purification and characterization of a soybean milk coagulating enzyme from *Bacillus pumilus* TYO-67. *Applied Microbiology and Biotechnology* 51(4):474-79. April. [25 ref. Eng]
• ***Summary:*** *Bacillus pumilus* TYO-67 has been isolated from tofuyo, a traditional fermented food made from soybean milk in Okinawa, Japan. This bacterium secretes a soybean-milk-coagulating enzyme (SMCE), which is essential for making tofuyo, however reports on this microbial enzyme are very limited, and its properties have not been sufficiently characterized.

This bacterium was found to be the best producer of SMCE, induced by the addition of soy protein to the growth medium. The enzyme was found to be a monomer with a molecular mass of about 30 kDa [kilodaltons] and an isoelectric point at 9.75. The optimum pH for the enzyme was 6.0 to 6.1 and the optimum temperature was 65ºC. The enzyme was significantly activated by the addition of various ions and its thermal stability was significantly increased by the addition of a Ca (2+) ion.

This enzyme can be applied for the production of various processed foods from soy milk, and may also be widely applicable to other food processing. Address: Dep. of Bioscience and Biotechnology, Univ. of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 903-213 Japan.

10654. Inobe, Dean. 1999. Okara is becoming a bigger and bigger nuisance in Japan (Interview). *SoyaScan Notes.* May 13. Conducted by William Shurtleff of Soyfoods Center. [1 ref. Eng]
• ***Summary:*** An article about okara appeared in the March 13, 1999 issue of the *Nihon Ryûtsû Keizai Shinbun* (in Japanese) stating that the Japanese Supreme Court declared tofu to be a public nuisance. The defendant was a tofu manufacturer from Osaka, who was accused of dumping okara without a permit. The court noted that the entire tofu Japanese industry was struggling with the problem of okara disposal.

Miki is a Japanese prune company, but Mr. Inobe is working with an American company that has developed a powder which can be used, instead of whole soybeans, to make tofu which has no okara as a by-product. This product is not yet on the market. It contains some additives and the soymilk must be homogenized before it is made into tofu. Address: Managing Director, Miki USA, 1333 N. California St., Room 570, Walnut Creek, California 94596. Phone: 925-932-3994.

10655. Boismenue, Clyde. 1999. New type of textured soy protein isolate made in Taiwan using extrusion (Interview). *SoyaScan Notes.* May 27. Conducted by William Shurtleff of

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Soyfoods Center.
• ***Summary:*** Making this product is now a boom industry in Taiwan. Japanese companies have solid patents on the process, yet that does not seem to defer at least three Taiwanese manufacturers. The product, made by extruding soy protein isolates and starch, is much less expensive than spun soy protein isolates. The starch melts away when fresh, leaving a fibrous texture. The result represents a major advance. Address: Basic Foods Co., P.O. Box 240070, Los Angeles, California 90024. Phone: 310-473-0719.

10656. Hijiya-Kirschnereit, Irmela. 1999. A cradle of Japan scholarship: The German Institute for Japanese Studies was founded just a decade ago, but already it has established itself as an international center of Japan-related scholarship. *Look Japan* (*Tokyo*). May. p. 26-28.
• ***Summary:*** The German Institute for Japanese Studies (DIJ) in Tokyo was founded in Dec. 1988 on the approval of Germany's Federal Ministry of Research and Technology. "The foundation itself, which is named after the German Japanologist Philipp Franz von Siebold (1796-1866), is financed by the federal government, but it maintains independence in all its research activities according to private law." Contains a color painting of Siebold by Kawahara Keiga ca. 1829. Address: Director, DIJ, Tokyo.

10657. Iijima, Akihiko; Sasaki, Hitoshi; Wakamatsu, Hiroyuki; Watanabe, Sugio; Maeda, Yoshimi. 1999. [Microcalorimetric analysis of fermentation of natto, a traditional Japanese food]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 46(5):279-84. [13 ref. Jap; eng]
Address: 1-3, 5. Iwaki Meisei Univ., 5-5-1 Chuohdai-iino, Iwaki-shi, Fukushima 970-8551.

10658. Matsumoto, Isao; Akimoto, Takashi; Imai, Seiichi. 1999. [Effect of soybean cooking condition on the quality of natto]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 46(5):338-43. [19 ref. Jap; eng]
• ***Summary:*** Natto was prepared from soybeans cooked under a steam pressure of 1.5 kg per square cm. for various time periods ranging from 1 to 60 minutes, and sensory evaluation, hardness, enzyme activities, components and stringiness of viscous substances of natto samples were investigated. From the results of sensory evaluation of natto samples, it was concluded that the optimum cooking time under this condition was 30-40 minutes. Address: Niigata Food Research Institute, 2-25 Shinei-cho, Kamo-shi, Niigata 959-13, Japan.

10659. Schinner, Miyoko Nishimoto. 1999. Japanese cooking: Contemporary & traditional–Simple, delicious, and vegan. Summertown, Tennessee: Book Publishing Co. 176 p. Illust. Index. 21 cm.
• ***Summary:*** Contents: Introduction (incl. Japanese attitudes towards nutrition, vegetarianism and animal rights, the recipes, the Japanese meal). Sample menus (by season). Glossary: Ingredients, kitchen concepts, and tools. Rice dishes. Soups and stews. Cooking with tofu. Fried dishes. Salads and cold vegetables. Noodles. Meals in a pot. Stewed and braised dishes. Meals in a bowl. Everyday favorites. Nouvelle Japanese cuisine.

Terms in the Glossary include: Abura-age, agar agar, atsu-age, azuki, fu (made from wheat gluten), goma (sesame seeds), goma-dofu (a tofu-like cake made from sesame butter), hijiki, Inari-zushi (sushi), kanten, konbu, kuzu & kuzu-ko, miso, mochi, natto, nori, okara, sesame oil (goma abura), shoyu, soba, soy sauce, tofu ("Perhaps the most misunderstood food in Japan... Americans might call it bland; the Japanese prefer to think of it as delicate in flavor"), umeboshi, wakame, yaki-dofu, yuba.

This vegan cookbook is filled with many soy-related recipes, both traditional and new. Examples of new: "Fishy Tempura Tempeh. Crispy Fried Tempeh (Kara-Age).

"Trying to dine out in a strictly vegan fashion in Japan can present challenges. Although dairy products are not found in traditional Japanese cuisine, fish-based stocks appear in a range of dishes from appetizers to soups to entrees... My advice to vegan or vegetarian visitors to Japan: find a temple or restaurant that serves traditional *kaiseki*-style *shojin-ryori* (Buddhist vegetarian cooking)–and splurge big time. You won't regret it" (p. 10).

On the rear cover is a biographical sketch of Miyoko. "She was born in Yokohama, Japan, and graduated from St. John's college in Maryland. Her bilingual bicultural background has endowed her with the creativity and originality of the West and the aesthetic sense of the East." She has been a vegetarian since age 12. Address: Owner, Now and Zen Bakery and Vegetarian Restaurant, San Francisco.

10660. Gorman, Christine. 1999. The joy of soy: Worried about high cholesterol? This versatile bean may be just what the doctor ordered. *Time.* June 7. p. 68-69.
• ***Summary:*** Begins with the story of a woman, age 67, who volunteered for a study to determine whether or not drinking a soy protein shake could lower blood cholesterol. She was delighted when her cholesterol level fell from 245 mg/dl to 205 mg/dl, and her LDL or "bad cholesterol" level fell from 170 mg/dl to 130 mg/dl. Now that the study is over, she still sprinkled soy protein on her breakfast and continues to see results–as more than 25 scientific studies have shown. Every little bit counts; a 1% drop in total cholesterol leads to a 2% drop in the risk of developing heart disease. For best results consume soy in minimally processed forms. Many Americans find boiled soybeans (edamame) to be delicious. Tofu is good if you find the right seasoning. Soy milk is nice

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on cereal but will ruin a cup of coffee. Miso soup contains quite a bit of salt. Soy powders (soy protein isolates) can be added to shakes or sprinkled on cereal. Soy isoflavone supplements are best avoided.

Many Americans are discovering that soybeans aren't just for vegetarians and livestock anymore. They may be able to fight cancer and build healthy bones. Later this summer or fall the FDA is expected to put soy on its short list of foods (like whole grains, and fiber-containing fruits and vegetables) that may actually reduce one's risk of heart disease.

Scientists are still not sure why soy lowers cholesterol levels. It may be the isoflavones or the soy protein or a combination of both.

In Japan, the incidence of breast cancer is much lower than in the USA [about one-sixth] and other industrialized countries. One reason may be the soy in the Japanese diet; the isoflavones in soy may act as antihormones, like the drug tamoxifen. Yet this is not yet clear. In the worst case, soy might even negate the protective effects of tamoxifen.

Photos show: Two large pods of edamame. A cake of tofu which is "a great source of nutrients." Japanese consume more than 50 lb of tofu per person per year.

10661. Murphy, Patricia A. 1999. A new database on the isoflavone levels in foods, commercial ingredients, and soybeans (Interview). *SoyaScan Notes.* June 24. Conducted by William Shurtleff of Soyfoods Center. [1 ref]
• ***Summary:*** In April 1999 a new database became available on the Internet at www.NAL.USDA.gov/FNIC/FoodComp / Data/Isoflav/Isolfav.html. There are several files which are downloadable. Data are given for 160 foods, most of which are soy-related. Many individual branded products are included, such as Gimme Lean! or Lightlife Lean Links or Mead Johnson's Prosobee (infant formula). Soy oil is also included–just to show that it contains no isoflavones.

For each food, data may be given for daidzein, genistein, glycitein (pronounced gly-SEE-tun; if available), and total isoflavones. For each of these four information may be given on: Average, mean, and maximum, standard error, sample size, confidence code (A=best, C=least). of all published data. Finally a list of the numbers of all the references used to get this data. So there might be 7 references used to generate the mean value for tofu.

Soybeans themselves are also included, with data given for food-type soybeans, commodity-type soybeans, plus reports from Japan, Korea, Taiwan, etc. But there is no data on individual soybean varieties. Supplements are not included. For each food, some data is given on the isoflavone content The information in the database comes from published scientific studies and from work at Iowa State University's project on national sampling of foods. The food composition lab people will be updating the data as it is collected. There is also a separate file for items which are more typical of clover and alfalfa, which have different isoflavones.

The person in charge of the project is Gary Beecher, in the USDA Beltsville Lab. [Maryland], food composition group. David Haytowitz is the statistician. The funding came from the U.S. Army, Medical Branch, Breast Cancer Research Initiative. This year Congress, "in its wisdom," couldn't give any more money to HHS (the U.S. Department of Health and Human Services), so they gave a large amount of money to the Defense Department for work that would typically be done by NIH (National Institutes of Health). But the army has run this huge program very well–perhaps better than some NIH programs.

Note: NIH is under the Public Health Service, within HHS. Address: 2312 Food Sciences Building, Food Sciences and Human Nutrition Dep., Iowa State Univ., Ames, IA 50011.

10662. Oka, Tadashi. 1999. An American island in a Japanese sea: At home, it was miso soup. *Christian Science Monitor.* June 24. p. 22 (The Home Forum). *

10663. *ASA Today* (*St. Louis, Missouri*). 1999. Non-GMO niche markets may offer premium opportunities. 5(8):4. June.
• ***Summary:*** Since 1997, Brazilian suppliers have received a premium of up to 50% for non-GMO soybeans. Countries importing non-GMO soybeans include Norway, Korea, and Japan. Last year ADM and other processors paid fairly substantial premiums for non-GMO beans. Farmers who want these premiums and plant both GMO and non-GMO beans must clean their combines and bins.

10664. *Canadian Soybean Bulletin* (*OSG, Chatham, Ontario, Canada*). 1999. Services of the Canadian Grain Commission–Export soybeans. 13(1):1-3. June.
• ***Summary:*** Contents: Introduction to the CGC. Inspection services: Vessel shipments, truck, rail and container shipments. Special analyses. Oil and protein content. Monitoring services. Entomology services (insects). Verification/audit services. Genetic testing. Weighing services.

Concerning genetic testing: "The Chatham office is in the process of implementing test procedures aimed at the identification and certification of GMO/non-GMO (Roundup Ready) soybean shipments. Initially, testing will involve an ELIZA based method which, after internal evaluation is known to provide reliable detection at levels above 0.3%. In the longer term, the CGC will explore and move to alternative methods that will enhance its abilities in this area."

A photo shows Jim Lowe of the CGC as he shows samples of Canadian soybeans to members of the Japanese Tofu Association.

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10665. *Canadian Soybean Bulletin* (*OSGMB, Chatham, Ontario, Canada*). 1999. Canadian soybean exports. 13(1):4. June.
• ***Summary:*** A large table shows statistics on tonnes (metric tons) of soybeans exported to various countries, and regions, each year from 1994/95 to 1997/98. The countries are: In Asia–China, Hong Kong, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, and Thailand. In Western Europe–Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Portugal, and Spain. By continent–Africa, Central America, Eastern Europe, Middle East, Oceania, South America, and United States.

In 1997/98 the countries to which the largest amount of Canadian soybean exports went were (in tonnes): Norway 159,000, United States 134,706, Japan 62,931, Portugal 58,465, Spain 34,759, Hong Kong 23,210, Belgium 20,687, and Malaysia 20,539.

10666. Hanamaruki K.K. 1999. Gyômu-yo seihin no go-annai [Introduction to our products for commercial use (Brochure)]. Nagano Prefecture, Japan. 8 p. 30 cm. [Jap]
• ***Summary:*** On the cover of this color brochure is a photo showing yellow soybeans, white rice, and salt. The inner 6 pages contain brief information in Japanese and a color photo showing each of the company's products–most of which are miso or miso-based. The information includes product name, ingredients, bar code, unit price, case size, and product description. On the rear cover is the address, phone number, and fax number of the company's headquarters, two miso factories (in Nagano and Gunma prefectures), research lab, and many sales offices. The website is hanamaruki.co.jp. Address: Hirade 1560, Tatsuno-cho, Kamiina-gun, Nagano-ken 399-0422 Japan. Phone: 0266-41-1321.

10667. Hanamaruki K.K. 1999. Seihin no go-annai [Introduction to our products]. Nagano Prefecture, Japan. 12 p. 30 cm. [Jap]
• ***Summary:*** This color brochure contains brief information in Japanese and a color photo showing each of the company's products–most of which are miso or miso-based. The information includes product name, ingredients, bar code, unit price, case size, and product description. Address: Hirade 1560, Tatsuno-cho, Kamiina-gun, Nagano-ken 399-0422 Japan. Phone: 0266-41-1321.

10668. Kikkoman Corporation. 1999. Annual report 1998. 339 Noda, Noda-shi, Chiba 278, Japan. 30 p. 28 cm. [Eng]
• ***Summary:*** The information in this English-language annual report is current as of April 1999. Contents: Financial highlights. A message from the president (Yuzaburo Mogi): The year in review, dining pleasure and convenience, serving a global market, a source of variety, seeking new growth opportunities, promoting food culture. Global operations: The Americas, Europe, Asia and Oceania, Japan. Review of operations: Soy sauce, soy sauce derivative products, Del Monte, sake and wine. Research & development. Financial section: Consolidated balance sheets, etc. Corporate history (chronology from April 1925 to October 1998). Global network (directory of Kikkoman names, addresses, and phone numbers worldwide). Board of directors and officers. Corporate data.

Net sales were up slightly (7.1%), but net income was down for the second year in a row. Overseas sales (excluding exports from Japan) grew 15.8%, and have grown dramatically each year since 1994 (p. 16). In 1994 overseas sales accounted for about 15% of consolidated net sales; in 1998 about 28%. And operating income generated overseas accounted for 51% of Kikkoman's consolidated operating income.

In 1998 Kikkoman released *Akadare-to-Kurodare,* a steak dipping sauce based on a blend of their popular Akadare (miso based) and Kurodare (soy sauce based) dipping sauces.

"Serving a global market: In June 1998, Kikkoman Foods, Inc., our first overseas plant, celebrated 25 years of operation, thus marking a major milestone for our international activities. Over the past quarter century, the production capacity of the Kikkoman Foods plant–located in Wisconsin–has expanded more than tenfold. To further augment capacity, in October we commenced operations at our second plant in the United States, in Folsom, California, which is conveniently located near large markets on the West Coast. Similarly, in Europe, we raised the annual production capacity of our plant in the Netherlands to 5,000 kiloliters. Following these additions, total production of soy sauce and its derivative products at our overseas plants surpassed 100,000 kiloliters in 1998. This is approximately the same as the production capacity of the second largest soy sauce manufacturer in Japan."

Kikkoman's share of the soy sauce market in Japan is almost 3 times as large as that of its nearest competitor.

The Americas: On 6 Oct. 1998 Kikkoman had the formal opening of its second U.S. soy sauce manufacturing plant in Folsom, California. The 210,000 square meter facility was built at a cost of US$46 million and has an initial soy sauce production capacity of 10,000 liters per year. The plant began operating in April 1998 and shipments of soy sauce started in October. The Kikkoman plant in Walworth, Wisconsin, is now approaching its annual soy sauce production capacity of 80,000 kiloliters.

Color photos show: Yuzaburo Mogi (president and CEO). The opening ceremony and an outside view of the plant in Folsom, California. Most of the company's products (p. 8-13). Address: Noda, Japan.

10669. Morinaga Nutritional Foods, Inc. 1999. Input Mori-Nu :) (Ad). *Natural Foods Merchandiser.* June. p. 72.
• ***Summary:*** This full-page color ad shows many packages

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of Mori-Nu Tofu arranged to spell out "Y2K" against a large white background. The text reads: "Mori-Nu is the 'Perfect Tofu in the Perfect Package'–even for life's unexpected moments. With Y2K, your customers will be looking for convenient foods they can store in their cupboard. Mori-Nu is the answer." Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-669-8638 (NOW TOFU).

10670. U.S. Postal Service. 1999. We have more than 33,000 post offices to serve you (Postcard). Washington, DC. 1 p.
• ***Summary:*** This 4¼ by 6-inch card is printed blue on white. We cite it here to note that the number of tofu shops in Japan is approximately equal to the number of post offices in the USA. Address: Washington, DC.

10671. Nadeau, Daniel A. 1999. Oligosaccharides play important health role. *Soy Connection* (*The*) (*Jefferson City, Missouri*) 7(3):1, 3. Summer. [29 ref]
• ***Summary:*** The colon and the flora that inhabit it have a critical role to play in overall health. Many Americans are familiar with probiotics, a concept that was introduced in the early 1900s; live bacteria from products such as yogurt might offer health benefits. But Americans are generally less familiar with "prebiotics," a concept that originated in Japan in the mid-1970s; it states that non-digestible food ingredients (such as oligosaccharides) offer health benefits to the host by selectively stimulating the growth and/or activity of beneficial microflora in the intestines. Address: M.S., M.D., practicing endocrinologist.

10672. Bittman, Mark. 1999. Authentic Asian fare in L.A. [Los Angeles], with or without Formica. *New York Times.* Aug. 15. p. TR6.
• ***Summary:*** At Takao, a Japanese restaurant, he was served "dreamy tofu made with sesame paste" [often called "sesame tofu," or in Japanese, *goma-dofu*]. For a higher price, the sesame tofu was served with a sauce of sea urchin roe. Also: A raw spring roll of noodles, miso, shiso, crab, and vegetables. A dark miso soup that put the standard dish to shame.

At the Thai restaurant Talésai he enjoyed a plate of eggplant with black bean sauce, and fried tofu with a peanut dipping sauce.

The Chinese Islamic Restaurant served a tofu dish.

At the Empress Pavilion, a Chinese restaurant, he enjoyed "braised bean curd."

10673. Belleme, John. 1999. The story of how the Oak Feed Miso, Inc. was established, and its relationship to the Erewhon Miso Co. Part I. 1943 to 1978 (Interview). *SoyaScan Notes.* Aug. 22. Conducted by William Shurtleff of Soyfoods Center. With updates in Nov. 1999.
• ***Summary:*** Without John Belleme's perseverance and determination, the American Miso Co. would almost certainly never have come to be.

John was born on 3 Jan. 1943 in Union City, New Jersey–right across the Hudson River from the Empire State Building. His father died when he was young, so he and his brothers and sisters were raised by their mother. Years later John found that he was dyslexic–but in school this undiagnosed dyslexia caused him many problems and great frustration. He failed first, second, and third grades, so he was much older than his classmates. The frustration sent him to reform school at age 13½ and at age 14 he was "kicked out of New Jersey." His mother moved the family to Miami, Florida. He was old enough to drive a full-sized motor cycle to the sixth grade. He managed to graduate from high school (just short of age 21) in Miami, went to junior college in Miami for two years, then won a scholarship to the University of Miami. He had liked biology, science, and research since age nine, so once he settled down he became a good student–though because of dyslexia he could barely read or write when he started college. In the mid-1970s he graduated from the University of Miami after two years with high grades in science, and got a job at the Veteran's Administration (VA) hospital in downtown Miami. He was put on one of the first teams in the United States that used and did research using a Phillips electron microscope. Soon they were doing pioneering research. Soon John was quickly promoted to the position of research biologist, a title usually reserved for those with a PhD degree. Soon the team's research was being published in scientific journals. "It was very exciting." This job, which paid very good money, was mostly a photography job and the hospital had a huge, state-of-the-art darkroom. John worked with an amazing older man from Germany, who required him to carry a camera everywhere he went and to shoot and print his photos as a way of developing his photographic skills. Before long John was a very skilled photographer–and electron microscopist.

But after a while he was transferred to a chemotherapy, a job which he disliked. So he started graduate school to be a school psychologist–and first realized that he had dyslexia.

Sandy Pukel (pronounced pyu-KEL) was the center of a small but growing community of people interested in macrobiotics and natural foods in Coconut Grove, a suburb of Miami. Sandy had a tiny food store. John was with a girl who asked him to buy her some foods at this store. Before long, he was a regular shopper. Then he started to get interested in macrobiotics, and before long he found himself doing volunteer work at the little store on weekends. Sandy suggested that, to study macrobiotics in depth, he should go to Boston and study with Michio Kushi. After attending a few of Sandy's macrobiotic classes in Coconut Grove, John quit his VA job and left for Boston.

1976 July 4–John arrives in Boston and starts to live at the macrobiotic study house of Ken and Anne Burns. John wrote in 1987 that he "stayed for what was to be one of

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the most exciting years of my life." Ken is an exceptional teacher, and the house has a *dojo* atmosphere–like that of a martial arts practice place or Zen monastery. The temperature is kept at 40ºF during the winter, and life is spare but rich and deep. Through Ken, John and Jan got very interested in wild foods, and planned to publish a book on the subject. By the fall of 1976 John is interested in miso. He had read *The Book of Miso* by Shurtleff and Aoyagi and on Nov. 17 he attends an afternoon miso class and workshop they conduct at the Burnses' house. John is intrigued by the romance of going to Japan to learn how to do something. After the workshop he decides that he wants to travel to Japan, learn all he can about making miso in the traditional way, then come back to America and help to start a miso factory. John recalls: "I wanted to go to Japan and bring something back. I was going to do this or die."

After a year in Boston, John worked at Harvard Medical School for a while. Then he and Frank and Phyllis Head drove to Mexico in Frank's van with the idea of teaching the Mexican people about macrobiotics–with whole grain tortillas, etc. Living in a little village in rural Mexico in a house with no electricity and no running water, they managed to tough it out for one summer. Then multiple scorpion bites and general hardship drove them back to America. From Frank's father's estate in Texas, John phoned Sandy, who offered him a job.

1978–John had heard Michio Kushi talk about starting a shoyu factory in America. Michio hoped to involve Sendai Miso Shoyu Co., Erewhon, and some Oak Feed people such as Sandy Pukel and some of Sandy's investor friends. One day John–who was still a pretty small man on the totem pole–he said to Sandy, "Let's start a miso factory in America–rather than a shoyu factory." He then explained his idea about studying miso in Japan. Sandy's response was "Good! Michio and I have been wanting to do that for a long time too." John then started to take Japanese language lessons from Berlitz. Sandy established an Oak Feed Miso account on which John could write checks to pay for these lessons, for his travels related to miso in the USA, and for legal fees to form a corporation, etc. Sandy's main concern was running the Oak Feed Restaurant next to the store.

1978 Aug. 6–William Shurtleff is in Miami, Florida, visiting Robert Brooks and Mary Pung of Swan Foods, a soyfoods manufacturer. He presents a slide show (2-3 blocks from Oak Feed Store) on miso at which John Belleme, Sandy Pukel and one other person are present.

1978–Various groups come together in an attempt to start a miso company in America. The "Oak Feed group" initially consists of Sandy Pukel of Oak Feed Co., John and Jan Belleme, and a few other investors. The "Erewhon group" was composed of Michio and Aveline Kushi, Mitoku, Sendai Miso-Shoyu Co., and a few people from Erewhon. Michio communicated with the Japanese members of the "Erewhon group" (Mitoku, Sendai) by phone; they never attended meetings.

1978 Dec.–The Oak Feed and Erewhon groups meet shortly before Christmas at Michio and Aveline's home on 62 Buckminster Rd., Brookline (Boston), Massachusetts. Those present were Michio Kushi, Sandy Pukel, and John Belleme. They begin discussions about starting the "Erewhon Miso Co." Everybody agreed on that company name. John recalls: "It couldn't have been called anything else."

What was the need for a miso company in America? First, they wanted to have unpasteurized miso. All the miso being imported by Erewhon from Japan was pasteurized in sealed plastic bags. Cold Mountain miso, made near Los Angeles, California, was sold unpasteurized in 14 oz plastic tubs. So the people interested in the new company began to criticize this product as being made with machines, non-organic, etc. Where would the factory be located? What might it be called? How big might it be? Who might be involved from Japan?

Sandy, Michio, and John all deserve some credit for the original idea of starting a miso factory in America. During 1978 and 1979 every time that Sandy or John went to Boston, they would talk with Michio about the miso company idea. Continued. Address: Honto Press, P.O. Box 457, Saluda, North Carolina 28773. Phone: 704-749-9537.

10674. Belleme, John. 1999. The story of how the Oak Feed Miso, Inc. was established, and its relationship to the Erewhon Miso Co. Part II. 1979 to 1980 (Interview). *SoyaScan Notes.* Aug. 22. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued: 1979 Jan.–John Belleme in Coconut Grove, Florida, writes Bill Shurtleff in California on Oak Feed letterhead that he and Sandy are starting to look for land for the miso company. "Bill, If you were going to make miso in the U.S., based on climate, what state would you choose?" 1979 Feb.–Oak Feed Miso, Inc. is incorporated. Sandy Pukel and John Belleme are the principals.

1979 April–Barry Evans of Coconut Grove, Florida invests money and becomes an important shareholder in the new corporation and a member of the "Oak Feed group."

1979 spring–Members of the Oak Feed and Erewhon groups meet in North Carolina in the first attempt to locate a site for the miso plant. In attendance are Michio and Aveline Kushi, Sandy Pukel, John Belleme, Frank Head, and Junsei Yamazaki and his wife (both from California). Michio thought the Yamazakis should be there, so the group paid for their transportation. Junsei was tasting the soil, tasting the water–it was bizarre. Then Aveline insisted that they all rent a car and drive to Atlanta, Georgia, since she thought the miso factory should be near some big city like Atlanta. Every now and then Junsei would sniff the air or get out of the car and taste the soil. John recalls that this trip was disorganized, unsuccessful, and very frustrating.

Why were they looking for land in North Carolina?

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They knew some people who lived in North Carolina, and they knew a real estate man in North Carolina. But after the trip with Junsei Yamazaki, John began to think that it didn't really matter where they located the company. Sandy, who is from Coconut Grove (a suburb just south of Miami), Florida, does not like cold weather–not even as cold as North Carolina. John is also from Miami. Moreover, the miso factory was supposed to be a small part of the whole project, which was to be called the Oak Feed Land Project. That was Sandy's idea, and it was supposed to be an educational center, summer camp, Kushi Institute–similar to what ended up being at Becket. The Kushi's Ashburnham project had failed by this time. There is actually still a 4-by-8-foot sign on the property that says "Oak Feed Land Project." Sandy and John wanted a "land project" in a warmer climate that was closer to Miami. They learned that there is an isothermal belt in North Carolina, an unexplained warm stretch of land that runs through the Piedmont below the mountains in western North Carolina; this happens to be an excellent place to make miso because the warm climate brings the miso to maturity faster.

In mid-1979 Sandy Pukel, armed with this new information about the isothermal belt, went up to western North Carolina and bought one of the first pieces of land he was shown–129 acres. The land cost about $120,000 and the down payment was probably about $10,000 to $15,000. Rutherfordton, North Carolina, turned out to be the perfect location. "What would be a 2-year miso in Massachusetts using Mr. Onozaki's basic formula, was a 1-year miso in North Carolina." Moreover, Great Eastern Sun and the Macrobiotic Wholesale Company, and a large community of macrobiotic people in Asheville are in North Carolina because of this sequence of 'accidental' events born largely of ignorance.

After the land had been purchased, John and Jan rode to North Carolina from Miami on John's motorcycle and saw the land for the first time. They took $20,000 cash, which belonged to the new Oak Feed Miso, Inc., and deposited it in a safe-deposit box at the BB&T Bank near Rutherfordton; John kept the key. Sandy flew up to North Carolina while John was there. John and Jan, and Sandy and Jackie (his wife) all went together to the First Citizen's Bank in Tryon, North Carolina; after signing something, they returned to Miami. John purchased two round trip tickets to Japan, and set aside $5,000 for living expenses which he would take to Japan–using corporation funds from the safe-deposit box.

1979 Oct.–John and Jan Belleme (who have just been married) leave Florida to travel to Japan. On the way they visit Thom Leonard at his new Ohio Miso Co.; he has already made several thousand pounds of miso. Arriving in Japan in late October, they spend several weeks in Tokyo with Mr. Kazama "hanging around his office." The plan had been for the Bellemes to study miso making at Sendai Miso Shoyu, but basically John refused because he knew they had a big factory and he wanted to learn the more traditional way that he planned to use when he returned to America. After John handcuffs himself to Mr. Kazama's desk, he arranges for the Bellemes to study miso-making with the Onozaki family 10 miles north of Yaita city, in Tochigi prefecture, northern Japan–even though Mr. Kazama had not previously known the Onozaki family. Finally Mr. Kazama drives the Bellemes northward to visit Sendai Miso Shoyu Co. On the way back he drops them off in a country village outside Yaita at the home of the Onozaki family, who run a traditional koji and miso factory. Imagine their surprise when, out of the blue, two Americans appear intent on learning the traditional Japanese art of making miso!

In November John and Jan begin to study miso making at the *Onozaki Kôji-ten,* while living with the Onozaki family. They paid the family a certain monthly fee for room and board, and an additional fee for the teaching and training. He and Jan also received a small monthly wage. At one point John requested an additional $5,000 from the corporation. The Onozaki family made and sold both miso and koji. About half the koji was sold, mostly 1-2 pound bags to individuals who used it at home, mostly to make amazake. When John was there, the Onozaki family made much more miso than koji. The Bellemes' study and training continue until the next summer. While in Japan, John wrote many letters back to macrobiotic friends in America as part of campaign to (1) try to prevent Sandy from giving away the miso company to the "Japanese group," (2) show that he was learning how to make the real traditional Japanese miso, and (3) argue that much of the so-called "traditional" miso being imported from Japan was actually made in modern factories.

1980 April–A letter from John Belleme, titled "Making miso in Japan" is published in *GOMF News* (Oroville, California). It is the first published account of his experiences with the Onozaki family. 1980 May–According to Mitoku's records, the first shipment of Onozaki rice miso from Onozaki Koji-ten in Tochigi prefecture is sent by Mitoku to Oak Feed Store in Miami, Florida; 84 cartons and 4 kegs. John Belleme contacted Mr. Kazama and arranged this shipment. At the time, Oak Feed Store was importing Japanese products from Mitoku and distributing to stores across the USA. Michio Kushi set up the connection and it was all done with his blessing.

1980 May–After their apprenticeship with Mr. Onozaki, John and Jan spend 3-4 weeks at Sendai Miso Shoyu–at Michio's request. Mr. Kazama drove them to Sendai. John studied the process and took lots of photographs.

1980 June–John and Jan Belleme return from Japan. The Oak Feed and Erewhon groups meet at Oak Feed Co. in Florida to determine ownership of Erewhon Miso Co. There were various contracts. In one, for example, said that Sendai Miso Shoyu and Mitoku would each own 15% of the company–even though it was not clear what they would

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contribute to the venture. It is finally decided that each of the two groups would own 50%.

1980 summer–John starts to locate and order the miso equipment he needs, which falls into three categories: (1) Purchased from USA: He orders wooden vats from the Arrow Tank Co. in Buffalo, New York. The pressure cookers (for soybeans) and boiler also came from the USA–mostly New Jersey. (2) Purchased from Japan: Two steamers for rice and barley, a rice milling machine, an automatic koji inoculating machine ["rice rocket"] (which they never used until many years later; John did all inoculating by hand), soybean washing machine, soybean crusher (to grind and crush the cooked soybeans), miso mixer (to mix the crushed soybeans with the koji and salt), the foot-activated piston filling machine, which originally filled bulk tubs, and later filled coffee bags and small plastic tubs. (3) Designed by John and fabricated locally: The tilting cooling table to cool hot soybeans then dump them into the soybean crusher, the conveyor that transports raw miso from the miso mixer up into the tall wooden vats, the clam that would come down from the ceiling and lift 400-500 lb of finished miso out of the vats; John also used it to mix miso from one vat to another in mid-season. Everywhere (except in the koji-making process) that Japanese miso makers used intense labor, John tried to use machines.

1980 fall–John and Jan Belleme go on the Erewhon payroll at $400/week, break ground, and start construction of the miso plant in Rutherfordton, North Carolina. On Sept. 29 the land for the new factory is being leveled. John pays initial expenses using funds in the BB&T safe deposit box.

1980 late–John starts to make small, experimental batches of miso in his house, in the sauna room. In his spare time, John starts to grow shiitake mushrooms, behind the main house, up on the hill. He and Jan had brought shiitake plugs from Japan. They used a chain saw to cut oak trees into logs for growing. He sold small amounts to Great Eastern Sun, but he was too busy with other things for shiitake to become a business, as he had once hoped. Continued. Address: Honto Press, P.O. Box 457, Saluda, North Carolina 28773. Phone: 704-749-9537.

10675. Belleme, John. 1999. The story of how the Oak Feed Miso, Inc. was established, and its relationship to the Erewhon Miso Co. Part III. 1981 (Interview). *SoyaScan Notes.* Aug. 22. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued: 1981 Jan.–When it comes time to buy equipment and build buildings, the new company finds it has little or no money. It needs about $40,000. The person constructing the building, Doug Ashley, threatens to put a padlock on the building because John is unable to pay him. He also threatens to sue John. The project comes to a complete standstill for months as Barry and Sandy are trying to settle their conflict in Miami. During this time, when John has nothing else to do, he starts to write articles about his miso apprenticeship in Japan. And Jan corrects her dyslexic husband's multitude of misspelled words and prepares the stories for publication. Eventually he and Jan wrote over 100 published articles about Japan, Japanese foods, and miso. They contain some 400 of John's photographs.

During the conflict between Sandy and Barry, John finds himself in a very difficult position–in the middle and torn. At one point Sandy, who had been John's longtime close friend and macrobiotic mentor, decides that he no longer wants to be involved with Barry Evans and the miso company. Michio Kushi and Mr. Kazama of Mitoku go along with Sandy, dropping their crucial support for the project. John barely knows Barry, but now he finds himself trying to convince Barry not to abandon the miso project. Barry asked John: "If I'm going to trade my ownership in Oak Feed Store for the miso factory, what value does that factory have? It's a piece of land and part of a building, but can you make miso? How are we going to sell it? Is it a business with potential?" John has to answer all questions with a convincing "yes!" even though he has not yet made miso by himself and has no idea what the market was. But by building up the value of the miso and downplaying the value of Oak Feed Store, John strains his relationship with Sandy. If Barry had abandoned the miso project, all of John's work in Japan might have been in vain. Moreover it would have left the land and the new building unpaid for–a total mess.

Soon John finds that his role had changed from potential miso maker to miso promoter and educator. His articles must put the wind in the sails of a ship that has stalled in the doldrums. "Every one of those stories had all kinds of intricate purposes to it." And each is written for various audiences with different goals. John has to convince: (1) All his readers that he is an expert on miso and that his miso would be unique–the best available. (2) Potential macrobiotic customers that the lighter, sweeter misos are good tasting and good for health. He could never build a company solely on long-term salty miso. (3) Michio Kushi, and macrobiotic counselors and teachers, not to say bad things about his miso. "I kept putting pressure on them until some were afraid of me–the miso mafia." (4) Barry Evans that the company would succeed and be a good investment. John sent Barry a copy of everything he wrote. John was not sure that Barry was completely committed until about 1984.

1981 Jan.–John Belleme's first article about his miso studies in Japan, titled "The Master of Hoops," is published in *East West Journal.*

1981 April–John Belleme's second article, titled "The Miso Master's Apprentice," is published in *East West Journal.*

1981 July–John Belleme's third article, titled "The Miso Master with a Big Heart: Making Miso in a Japanese Village," is published in *Soyfoods* magazine.

1981 early spring–Increasingly, the much-needed money

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starts to arrive from Barry. At about this time, and perhaps again earlier, "Barry Evans' money saved the company–there is no doubt about it."

1981 May–All of the miso-making equipment has arrived in North Carolina.

1981 July–The two groups meet at the newly constructed Erewhon Miso Co. plant to have an opening ceremony and celebration. About 25 people are present. The Shinto ceremony is conducted by Michio, with salt, daikon, azuki beans, etc. He goes from door to door, putting Japanese symbols on each door. Evan Root, who was there, was deeply moved by this ceremony. The Kushi's stay on the land for 3-4 days. John remembers that there was a lot of stress during this time. Barry and Sandy were in the middle of resolving their problem.

1981 Aug.–John and Jan start full-time, large-scale production of Erewhon Miso. They have not made any miso on a large scale for more than a year. Erewhon Trading Co. contributed the soybeans, grains, and Lima seasalt (from Belgium); they probably arrived a month or two earlier. Money is still in short supply.

1981 Nov. 10–Michio Kushi files a petition for Erewhon for protection under Chapter 11 of the Bankruptcy Act at the federal in court Boston. This is a disaster for the new miso company. The Bellemes' paychecks and the miso ingredients stop arriving from Erewhon. The miso company's name is soon changed to Oak Feed Miso Inc., but the company now has no means of packaging or marketing its products. None of the Belleme's miso is ever sold under the Erewhon labels or the Oak Feed label. Address: Honto Press, P.O. Box 457, Saluda, North Carolina 28773. Phone: 704-749-9537.

10676. Belleme, John. 1999. The story of how the Oak Feed Miso, Inc. was established, and its relationship to the Erewhon Miso Co. Part IV. 1982 to present (Interview). *SoyaScan Notes.* Aug. 22. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued: 1982 Jan. 4–Barry changes the name of the company to American Miso Co. and announces that it is open for business.

1982 Jan. 31–Sandy Pukel and Barry Evans agree to an exchange of stock whereby Sandy gets out of Oak Feed Miso and Barry gets out of Oak Feed Store and Oak Feed Restaurant. They finalize the deal on Feb. 26, but it is retroactive to Jan. 31.

Barry starts The American Trading Co. (soon renamed Great Eastern Sun) to distribute their miso which would soon be ready for sale. For a while, Barry Evans and Sandy Pukel had been in a partnership in that import and distributing company. When Barry and Sandy split up, and Barry started Great Eastern Sun, Mr. Onozaki's miso started going to both companies. Marty Roth soon begins running GES.

1982 Jan.–At about the same time, during the first season, after John has made quite a bit of miso Mr. Onozaki visits the American Miso Co. in North Carolina for about 2-3 weeks at the Bellemes' invitation. They are interested in his comments on their miso plant and process, and they pay his way as a consultant and friend. He works with them making miso and gives them some very valuable suggestions (both big and subtle) for improvements–mainly in making the koji. Formal dinner is held in his honor.

1982 April–Mr. Onozaki's eldest daughter, Kaoru, and her husband, Haruo (Mr. Onozaki's adopted son), visit the miso factory and work for 3 months, living under the same roof as the Bellemes. Jan is pregnant when they arrive and the Belleme's son, Justin, is born on 24 May 1982 in North Carolina.

1982 April 24–Richard Leviton, editor and publisher of *Soyfoods* magazine, visits the American Miso Co. in Rutherfordton, North Carolina, and writes an in-depth cover story about the miso-making process, equipment, and company, published in the summer (July) 1982 edition of his magazine. The best, most detailed coverage to date. The color cover photo (taken by Leviton) shows John, Kaoru, and Haruo making miso.

1982 fall–The Bellemes' first miso is ready for sale. It is a red miso made, Onozaki style, with approximately equal parts soybeans and rice. It is sold only in bulk. The logo is two crossed sheaves of grain in a circle–drawn by an artist friend of John Troy's. This miso is shipped to Great Eastern Sun and sold in bulk under the American Miso label.

Prior to about 1983-1984 all of the company's miso was sold in bulk through Great Eastern Sun to stores. Over the years, John had been working on selling miso refrigerated in one-pound plastic bags, each having a pressure-release valve. The unique bag was designed for coffee and made in Italy. Finally, at a food show in Atlanta, Georgia, two big refrigerated distributors–Cornucopia and Tree of Life–decided to carry the new products. Soon refrigerated distribution trucks began stopping by the miso factory in North Carolina to pick up 7 varieties of miso in 1-pound bags. It was a breakthrough. Demand increased dramatically.

1983 Oct. 1–At John and Janet's request, Barry Evans buys all their shares (900 shares, 35-45% of the ownership) in the American Miso Company. John agrees to work as a consultant for 6 months and to train a person to take his place. John Fogg has been handling the marketing account for Great Eastern Sun. John Belleme asks him to design a retail marketing program, logo, and label for American Miso. He comes up with the idea of "Miso Master." John cringes, because it implies that he is a miso master, whereas he still considers himself a beginner, and he is developing many new types of sweet miso that he has definitely not yet "mastered." Peter Harris draws the Miso Master logo, an illustration showing the head and shoulders of a Japanese miso master, with a knotted headband, in front of a large wooden vat of miso.

1984 Feb.–At the time he sells his stock to Barry, John

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establishes a new marketing company named Just In Foods, Inc. (John's son is named Justin) for his miso and miso products. It is owned by John and Jan and Barry Evans. John is training Don DeBona to take his place at American Miso Co. His new responsibility will be to work as a marketing person between the miso factory and Great Eastern Sun (a distributor).

1985–John creates another entity named Institute of Fermented Foods (it was never registered or official) as part of his ongoing struggle with Barry Evans. The name appears on the label of many creative miso products Chick Peaso (Chick Pea Miso) and Mellow Ebony Miso (with Black Soybeans).

1985 Dec.–John and Jan leave the American Miso Co. due to ongoing conflicts with Barry Evans. Over the years, John had negotiated with Barry to give him more and more ownership in the company–because he was doing all the work. He eventually owned about 30% of the shares, which Barry bought back from him a year or two before he left–at John's request.

1985–John (who has nothing to do), with Sandy and Blake Rankin form a company named Granum East, based on Sandy's wholesale company in Florida. They plan to sell macrobiotic foods to distributors. It was nothing more than a telephone in John's home office. John would call up Great Eastern Sun (GES) customers and offer them a 10% larger discount than they could get from GES. Within 18 months the company had $700,000 worth of GES' business. Barry was forced to buy the company from them.

John reflects on Sandy's financial role in the company: Sandy has an incredible money karma; he lets it go out and come in without holding onto it, without any attachment. John was later in a seitan business with Sandy; it failed and lost about $300,000. When Sandy found out about these losses, he hardly batted an eyelash–and he's not a rich person. He helped people out all over Miami, and not only with money. He'd give them food, or whatever they needed. It was just amazing to see. Then all of a sudden a large amount of money or good fortune would just drop in his lap. Address: Honto Press, P.O. Box 457, Saluda, North Carolina 28773. Phone: 704-749-9537.

10677. Carmack, Robert. 1999. Soy sauce. *Australian Gourmet Traveller.* Aug. p. 78-83.

• ***Summary:*** Gives brief descriptions of the following types of soy sauce: Thick soy sauce, dark soy sauce, light or thin soy sauce, low-salt soy sauce, koikuchi, usukuchi, saishikomi, marudaizu, shiroshoyu [shiro shoyu], tamari. Most recipes contain meat. Address: Australia.

10678. IITA. 1999. Annual report 1998. Ibadan, Nigeria: International Institute of Tropical Agriculture (IITA). 94 p. 28 cm.

• ***Summary:*** A color photo (p. 3) shows Lucas Brader, Director General of IITA; he writes the introduction. A color outline map of Africa shows the three main agroecological zones in tropical Africa: Humid forest, moist savannah, and midaltitude. The very interesting section titled "IITA and Japan bring tofu to sub-Saharan Africa" (p. 8-10) states that "Tofu... is on its way to becoming an indigenous food in Nigeria, Africa's most populous country. The soy cheese is replacing the traditional dairy product, *wara,* made from cow's milk, which has become increasingly costly, making it out of reach of many consumers... Tofu is inexpensive, nutritious, and versatile in use. Because of its bland taste and porous texture, it can be used with virtually any food."

"Before IITA's Soybean Utilization Research Project initiating research on tofu, there was little information on tofu making and use in Nigeria. *Wara,* which is similar, was produced by housewives in the northern states and in some southwestern states. *Wara* is a simple, soft, white, unripened cheese made by coagulating unpasteurized cow's milk with the juice from sodom apple leaves. The food is popular in the diets of the poor and low-income groups. With the rise in cost of fresh cow's milk–a major source of protein–IITA realized that intervention was required.

"IITA turned to the Japanese International Cooperation Agency (JICA) for assistance and funding. Dr. O. Nakayama, a food technologist and tofu expert, was sent to IITA by JICA to work on tofu. He began by developing a method to make tofu using local food processing technologies; specifically, finding an inexpensive coagulant. In Asia, tofu is traditionally made with calcium sulphate or magnesium chloride. These chemicals are expensive and not readily available in Nigeria; especially in rural areas.

"Nakayama developed a procedure for making tofu using the same local coagulant (juice extract from sodom apple leaves) that housewives were using for making *wara.* He also found that other coagulants can be used, such as lime/lemon juice. Having been exposed to the tofu making process through their ingenuity, Nigerian tofu makers discovered that the fermenting liquor from cereal (maize, millet, and sorghum) wet processing, formed when preparing a fermented gruel, could be used as a coagulant, tamarind extract, was also being used.

"These coagulants have become very popular and are regularly used in Nigeria for making tofu. Nakayama later helped to improve on the yield of tofu based on these new coagulants and developed an alternative procedure–hot milk extraction. Now an emerging market is developing side by side with *wara.* Today, tofu consumption has increased in many parts of Nigeria. Tofu making has become an income generator for many housewives. It is fried and hawked on the streets and consumed as a snack or as a meat substitute in stews and soups.

"IITA provides training in production of tofu in many villages. It is envisaged that tofu making will develop into a cottage industry in Nigeria. With the scarcity and high

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cost of dairy products in Nigeria, consumption will likely diversify and displace the traditional *wara.* The future of tofu in Nigeria is bright."

Color photos show: (1) A Nigerian woman in Kano State, in tradition dress, slicing tofu with a knife. "Tofu making has become an income generator for many housewives. IITA provides training in its production in many villages." (2) A woman and her child seated in an outdoor market selling fried tofu. (3) The home page of IITA's website: www.cgiar.org/iita (p. 11).

On p. 94 is a list of acronyms appearing in this report. Address: PMB 5320, Oyo Road, Ibadan, Nigeria.

10679. Little Tokyo Service Center. 1999. Fourth Annual Tofu Festival–1999 (T-shirt). 231 East 3rd St., Los Angeles, CA 90013.

• ***Summary:*** This blue-green large T-shirt is 100% heavyweight cotton. On the front, over the left breast, is written "Tofu: Little Tokyo Service Center" next to the Center's logo. Above and to the right of the word "Tofu" are three stylized cakes of tofu, one chartreuse, one orange, and one purple.

On the back is written in much larger black letters: "Fourth Annual Tofu Festival–1999." The same three colorful cakes of tofu appear inside a vertical black rectangle. On the right sleeve is written "House Foods," a major Festival sponsor. Address: Los Angeles, California. Phone: 213-473-1602.

10680. *Vending Times* (*New York City*). 1999. House Foods tofu meets demands of vegetarians. Aug.

• ***Summary:*** Garden Grove, California–House Foods America Corp. provides tofu for the foodservice market in an array of patron-pleasing varieties.

"The company's tofu is available in extra-soft, soft, regular, firm and extra-firm varieties. Also available to add a special touch to vegetarian dishes are Tofu Cutlets and Tofu Fritters."

A photo shows Frank Hsu and Mariko Shibata, who prepared recipes using House Foods' many tofu varieties at the JFC International booth during the Fancy Food Show.

10681. Hesser, Amanda. 1999. Bet you can't eat just one soybean. *New York Times.* Sept. 8. p. F3. [1 ref]

• ***Summary:*** An excellent article on edamame (green vegetable soybeans), which are now becoming more popular in America. Trader Joes has been selling frozen green soybeans for 10 months. Sales at SunRich in Hope, Minnesota, have risen 25% in each of the last two years. Allan Routh, president, says he sells as many as he can grow. Recently SunRich began distributing the beans, grown mainly in Iowa and Minnesota, to mainstream grocery stores.

"Now that soy is being heralded for healthfulness," soybeans are seen as remarkable. But health is not the sole driving force behind the new interest in edamame. "Next to a bag of chips, soybeans in the pod happen to be the world's easiest hors d'ouevre." In Japan they are served in practically every bar. "In New York, edamame appears on the menus of most Japanese restaurants, usually among the appetizers. It also shows up on Korean and Chinese menus, as well as on ones that are not Asian"–such as Avenue [85th St. and Columbus Ave.] and Gourmet Garage [7th Ave. at 10th St.].

Most cooks and connoisseurs agree that fresh green soybeans are better than frozen. They have a sweeter and cleaner taste, and more snap when you bite into them. Frozen ones lack this sweetness and have a starchier, almost glutinous texture. The owner of two Chinese restaurants in New York City refuses to serve them frozen because freezing "ruins the texture."

Discusses which Asian-American restaurants in New York City serve green vegetable soybeans, and how they are served. Contains two recipes: Soybeans in the pod. Rice with edamame (*Mame gohan*). Color photos show: (1) A man picking green soybeans in a field; (2) A close-up of edamame pods.

10682. White, Nadia. 1999. Edamame memory: Boiled soybeans eaten like popcorn in Japan. *Daily Camera* (*Boulder, Colorado*). Sept. 8.

• ***Summary:*** During a year living with a Japanese family in Chogo, near Tokyo, she enjoyed many a bowl of edamame. Address: Camera staff writer.

10683. Iverson, Ron. 1999. Re: Signature Ingredients, LLC is a new company that plans to develop and market a good tasting, nutritious soy milk. Letter (fax) to William Shurtleff at Soyfoods Center, Sept. 16. 24 p. Typed, with signature on letterhead.

• ***Summary:*** "Enclosed is information on FSPGold, a powder that they claim makes good soy milk." FSP stands for "Fine Soy Powder" which is actually fine-mesh whole soy flour.

"Company profile–Start: Soy Protein Technologies (USA), LLC is a continuation of Toshoku Co., Ltd. established in Kyoto, Japan over 20 years ago by FSP inventor Zentaro Iwamoto. FSP has been produced and sold in Japan for over 15 years; however, due to the need to import soybeans and the economic infeasibility of production and infrastructure in Japan, the decision was made to transfer the business to the United States.

"In April of 1999, a partnership was established between newly established Iowa company Soy Protein Technologies (USA), LLC and World Food Processing, LLC to begin construction on a 58 acre site located in Oskaloosa, Iowa–aptly named World Food Park.

"Construction of the FSP plants is scheduled to be completed around April of the year 2000. The initial production capacity is approximately 6000 metric tons per year. The Oskaloosa site will have the capacity to grow as

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the level of business increases.

"Principals:

"The principals of Soy Protein Technologies (USA), LLC are as follows:

"Zentaro Iwamoto–President, Manager

"Harrison Copper–Vice President, Member

"Yoshinori Iwamoto–Vice President of Operations, Member

"The principals of World Food Processing, LLC are as follows:

"Jerry Lorenzen–President, Manager

"Duane Bushman–Vice President, Manager

"http://www.fspgold.com/prome/index.html.

"Infrastructure

"Soy Protein Technologies (USA), LLC will be located within World Food Park site in Oskaloosa, Iowa. The production facility will be adjacently located next to World Food Processing which is a large, super-sophisticated soybean cleaning facility equipped with chilled storage for soybeans. The proximity of the soybean cleaning and storage as well as the availability of state of the art equipment will enable Soy Protein Technologies (USA), LLC to always be readily supplied with soybeans which are handled well beyond the requirements of the most stringent grain handling / food safety laws.

"The production facility is located on a railroad spur which connects to a ramp in Newton, IA. Rail access will enable us to conveniently and economically ship to all regions in the United States as well as all major ports which facilitate export shipments.

"A highway is also being installed which connects to this facility and will greatly facilitate freight traffic efficiency to the production site."

Company goals: "... We intend to produce FSP with non-GMO varieties of soybeans, which may be grown organically, on a chemical free program, and commercially grown. By doing so we intend to create markets for soybeans grown in the midwest [sic. Midwest].

"Marketing: Soy Protein Technologies (USA), LLC has special ties with The North American Marketing Corp., which is a company designed for the sales and marketing of FSP in the North American market (USA, Canada, Mexico)..."

"Meet the inventor of FSP: Zentaro Iwamoto of Kyoto, Japan is the inventor of FSP Gold. In his facility at Yagi, he has produced and experimented with FSP for over 15 years. His initial inspiration to produce soy powder was the fact that soy food production was inefficient and that many nutrients were lost in the traditional methods of producing tofu and soy milk. This fact was especially significant for Zentaro Iwamoto because he experienced life in post-war Japan where food shortages were a major problem.

"Starting the end of 1999, Mr. Iwamoto will relocate to Oskaloosa, IA with his son Yoshinori Iwamoto to begin construction of the FSP facility. Mr. Iwamoto will hereafter be a resident in the United States..." Address: Chairman, 693 Ponce de Leon Dr., Tierra Verde, Florida 33715. Phone: (727) 865-1833.

10684. Tamura, Yoshiyuki; Takenaka, Tetsuo. 1999. [Antioxidative activity of water soluble extracts from okara fermented with *Bacillus natto* and *Rhizopus oligosporus*]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 46(9):561-69. [23 ref. Jap; eng]

• ***Summary:*** "Water-soluble materials (WSM) were prepared from okara unfermented (OK) and fermented with *Bacillus natto* (ON) or *Rhizopus oligosporus* (OT). The properties of antioxidative activity, hydrogen peroxide decomposition and iron-binding in WSMs were observed. The contents of phytic acid, saponin A, isoflavones, and amino acids associated with antioxidative activity were also determined...

"The fermentation of okara with *Bacillus natto* resulted in an increase in the yield of WSM and the contents of crude protein and amino acid in ON-WSM, but that with *Rhizopus oligosporus* provided only an increase in the amino acid content" (from journal@rchive). Address: Faculty of Agriculture, Tamagawa Univ., 6-1-1, Tamagawa Gakuen, Machida-shi, Tokyo 194-8610, Japan.

10685. **Product Name:** Frozen Tofu Cubes.
Manufacturer's Name: Tendore.
Manufacturer's Address: Wakayama prefecture, Japan.
Date of Introduction: 1999 September.
How Stored: Frozen.
New Product–Documentation: Talk with Christine, co-worker with Michio Kushi. 2000. Oct. 20. Tendore makes frozen tofu. They add starch, which enables it to stay soft when added to hot miso soup. Then they flash-freeze it for about 20 minutes. Trader Joe's has carried the product.

Talk with manager of Trader Joe's in Lafayette, California. 2000. Oct. 20. This product, imported from Japan, was sold on a one-time trial basis by Trader Joe's. They discontinued the product in about April 2000 because it did not sell very well.

10686. Iino, Ryoichi. 1999. The history of shoyu (Soy sauce) 1. *Food Culture* (*Kikkoman Inst. for International Food Culture, Noda, Japan*) No. 1. p. 12-15. Oct. 19. http://kiifc.kikkoman.co.jp. [14 ref]

• ***Summary:*** Contents: Shoyu (Soy sauce): The worldwide seasoning. Sho from China. The sho in *Qi Min Yao Shu.* Production of sho in Japan. Japanese sho, made from soybeans. Liquid or mash (moromi)? Sho for making pickles. Mash-style sho. Notes (14).

Note: "Born in Tokyo in 1938, Ryoichi Iino graduated from the department of English literature at Waseda University. He is also a graduate of the History-Geography

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program at Meiji University." Address: Food historian, and teacher of food history, Hattori Nutrition College, Japan.

10687. Riccardi, Victoria Abbott. 1999. Enjoying soy: You know it's good for you. Now learn to like it. *Boston Globe.* Oct. 20.

• ***Summary:*** When people hear the word "soy," different images come to mind. "For devotees of sushi, it might be emerald green soybeans. For the Woodstock generation, it could be custardy blocks of tofu. And for juice bar addicts, it might be soy milk for smoothies." But whoever you are, soy has "likely crossed your radar screen. And pretty soon its going to be on every channel."

Peter Golbitz, president of Soyatech Inc. (Bar Harbor, Maine) has just completed a market study. In 1998 total soyfoods sales were $1.78 billion, up 18% from 1997. They are projected to be $2.6 billion by the year 2000.

Gives a good profile of two local mom-and-pop companies: Health-Trip Foods Inc. of Concord, owned by Eileen Moriarty and Dan Sanford, makes soynut butter. 21st Century Foods Inc. of Jamaica Plain, owned by Rudy and Lovin Canale, makes 800 lb/day of tofu. Before coming to the USA, Rudy ran a health food restaurant in Italy. He came here in 1977 to study macrobiotics at the Kushi Institute in Becket, Massachusetts. In 1981 he and an Italian friend started making tempeh in Brookline. Soon they added tofu products, using tofu made by another company. When the cost of the tofu became prohibitive, they started making their own. Now he and his wife, Lovin, do all the work and delivery. Last year they had $175,000 sales, and even with no advertising they make a profit.

10688. Fallon, Sally; Enig, Mary G. 1999. Nourishing traditions: The cookbook that challenges politically correct nutrition and the diet dictocrats. 2nd ed. Washington, DC: New Trends Publishing Inc. xvi + 668 p. Illust. by Marion Dearth. Subject index. Recipe index. Menu index. 26 cm. [200* ref]

• ***Summary:*** Contains over 700 recipes. Contents: Preface. Introduction: Politically correct nutrition, fats, carbohydrates, proteins, milk & milk products, vitamins, minerals, enzymes, salt, spices & additives, beverages, about food allergies and special diets, parting words, guide to food selection (nourishing traditional foods, compromise foods {such as tofu}, newfangled foods {such as soy protein isolates and commercial soy milk}), a word on equipment, kitchen tips & hints, references (188). Mastering the basics. Great beginnings. The main course. A catalog of vegetables. Luncheon and supper foods. Grains & legumes. Snacks and finger foods. Desserts. Beverages. Feeding babies. Tonics and superfoods. Appendixes (A-F). About the authors.

Some of the basic recommendations in this book fly in the face of modern nutritional science: Eat more meat. Eat dairy products made from raw milk; pasteurization harms the milk. The worst fats are *trans* fatty acids, produced by hydrogenation; cholesterol and saturated fats do not cause heart disease. Consume plenty of enzymes. Meat should be eaten raw, rare, or braised in stock. Moreover, the authors propose a conspiracy in which doctors, researchers, nutritionists, and spokesmen of various government agencies are giving bad nutritional advice to the American public (p. 2). The authors wish, sentimentally, for the return of the small American farm. Moreover, they do not examine some the non-dietary issues related to a diet based on meat and dairy products: What is its impact on the environment? How would it affect the ability of the Earth to feed more than 6 billion people? What right do humans have to kill animals?

However the authors also make a number of recommendations that many people would agree with: Eat more natural, traditional, fresh, and unrefined foods instead of refined and processed foods. Avoid sugar and hydrogenated fats. This book is strongly influenced by the observations of Dr. Weston Price, a dentist, whose important book *Nutrition and physical degeneration: A comparison of primitive and modern diets and their effects,* was published in 1939.

Concerning soyfoods, the authors favor the use of small amounts of fermented soyfoods (such as traditionally fermented soy sauce and miso) but are strongly opposed to the use of non-fermented soyfoods such as tofu and soymilk.

Soy-related recipes and information: Commercial soy formulas are low in saturated fats and devoid of cholesterol (p. 6). Today most of the fats in the American diet are polyunsaturated and derived from vegetable oils such as soy (p. 10). The cheapest oils, such as soy oil, are often hydrogenated; this creates *trans* fatty acids (p. 14-15). Cows lose valuable Activator X when fed high-protein soy-based feeds. Lecithin is found in butter (soy, the main source of lecithin worldwide, is not mentioned). Mother's milk is high in cholesterol because it is essential for growth and development (p. 16-17).

Omega-6 (bad) and omega-3 (good) fatty acids in soybean oil (p. 19). Fermented soy foods contain compounds that resemble vitamin B-12 but they are not absorbed by humans (p. 28). Isolated protein powders made from soy are usually obtained by a high-temperature process that over-denatures the proteins to such an extent that they become essentially useless, while increasing nitrates and other carcinogens. These isolated soy proteins can cause osteoporosis (p. 29).

Beef should not be fed soy meal for protein, but rather animal parts (p. 31). Avoid farm raised fish [aquaculture] that have been fed soy meal (p. 32). Cultured soybean products from Asia, such as natto and miso, are a good source of food enzymes if they are eaten unheated (p. 47). The natural glutamic acid in soy sauce and miso gives these foods their rich, meat-like taste (p. 49). Many processed foods contain MSG or hydrolyzed protein, "especially soy-based

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concoctions" (p. 50).

Heavily yeasted foods, such as soy sauce and Worcestershire sauce, often exacerbate the symptoms of chronic yeast [candida] infection (p. 56). Beans cause digestive problems because they contain two complex sugars, farrinose [sic, raffinose] and stachyose (p. 60). The macrobiotic diet and soybeans: Use only as fermented products like miso, natto, and tempeh. Problems with tofu, soy milk, and phytoestrogens in soy (p. 62). The sickening effect of soy on ruminants (p. 87). In Japan, a typical meal contains miso, soy sauce, and pickles, all fermented products. In Indonesia, they eat tempeh (p. 94).

Ode to naturally brewed tamari soy sauce and teriyaki sauce (p. 147). Soy products increase the body's need for vitamin B-12 (p. 164). Soy in Chinese history. Miso soup. Tofu in fish stock and soy sauce broth (p. 201). Macrobiotic diets (p. 343). Soy foods block zinc absorption (p. 348). Eat natural salmon; farm-raised salmon are fed inappropriate soy meal (p. 418). Problems with soy flour and modern soy products: phytates, antinutrients, omega-3 fatty acids, disagreeable taste, phytoestrogens, phytic acid, enzyme inhibitors (p. 477, 495).

Soybeans are low in two essential amino acids (p. 496). Textured soy protein contains three antinutrients: Phytic acid, trypsin inhibitors, and isoflavones (p. 502). Person fed soybean milk as an infant had a spleen filled with ceroid (p. 546). Infants should not be fed soy-based formulas which contain phytic acid and estrogen compounds (p. 599, 603-04).

Note: The first edition was apparently published in 1995 by ProMotion Publishing (San Diego, California). Address: California. Phone: (877) 707-1776.

10689. **Product Name:** SoyAct (Soy Isoflavones).
Manufacturer's Name: Kikkoman Corporation, Biochemicals Div.
Manufacturer's Address: 1204 Allanson Rd., Mundelein, IL 60060. Phone: 847-247-9319.
Date of Introduction: 1999 October.
Ingredients: Soy isoflavone aglycones (40%) and glucosides (60%).
Wt/Vol., Packaging, Price: Bulk.
How Stored: Shelf stable.
New Product–Documentation: Nutrition Business Journal. 1999. Oct/Nov. p. 5. Earlier in 1999 the Biochemicals Division of Kikkoman Corp. (Mundelein, Illinois) launched SoyAct, an isoflavone aglycone that contains genistein and daidzein. Kikkoman claims that its unique form of aglycone is more easily absorbed than the glucoside form of those isoflavones and has a higher antioxidant activity. SoyAct joins Novasoy (made by ADM) in competing for sales to the supplement and functional foods markets. Talk with Kikkoman Biochemicals Div. in Mundelein, Illinois. 1999. Dec. 8. This product was introduced in Oct. 1999. It is a white powder, packaged in bulk according to the customer's order. It contains 40% aglycones. It was developed in Japan, and is manufactured there.

10690. Kuda, Takashi; Tanaka, Chieko; Yano, Toshihiro. 1999. [Fermentation of autoclaved beans by *Bacillus subtilis* (*natto*)]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 46(10):669-71. [6 ref. Jap; eng]
• ***Summary:*** "We investigated the fermentation of six autoclaved (121ºC, 20 min) beans–soybeans (yellow and black), kidney beans (*taisho-kintoki* and *uzura-mame*), peas, azuki beans, and lotus seeds by *Bacillus natto* strain TF 1. During the fermentation, colony numbers of TF 1, the sticky material, called *itohiki* in Japan, ammonia and L-glutamic acid increased clearly in soybeans, particularly yellow soybeans. The increase in *itohiki* and ammonia concentration was observed in kidney beans, pea and lotus seeds, but not shown in azuki beans" (from journal@rchive). Address: Ishikawa Agricultural College, 1-308, Suematsu, Nonoichi-machi, Ishikawa 921-8836, Japan.

10691. Great Eastern Sun. 1999. Pricelist. Effective November 15, 1999 [Mail order]. Asheville, North Carolina. 24 + 6 p. 28 cm.
• ***Summary:*** Contents: Catalog information: I Ching reading (hexagram #43), ordering, billing, shipping. Miso Master organic misos (traditional, mellow, sweet, miso tamari). Sweet cloud organic sweeteners. Haiku organic Japanese teas. One world organic classic teas. Mandala organic herbal teas. Organic planet pasta. Emerald Cove sea vegetables. Emperor's Kitchen condiments (Organic Oriental sauces, condiments in bottles, condiments in jars, condiments in bags, Japanese kitchenware). GES variety packs. Also sells coarse nigari in 44 lb or 440 lb lots. Address: 92 McIntosh Road, Asheville, North Carolina 28806. Phone: 704-252-3090.

10692. Kawata, Ayumi. 1999. The LA Tofu Festival on 14-15 August 1999 (Interview). *SoyaScan Notes.* Nov. 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** This year's Tofu Festival was the biggest and most successful yet. More than 26,000 people came. The Little Tokyo Festival was part of the 59th Nisei Week Japanese Festival, the longest-running Japanese festival in the USA. Nisei Week began in 1934 during the Great Depression, when the Nisei (second-generation Japanese-American) community established the first festival to create goodwill in the local community and attract businesses to Little Tokyo. The festival continued until 1941, when West Coast Japanese were relocated to internment camps. Even though the Japanese community returned to the area in 1945, the festival didn't start again until 1949. It is now one of the leading ethnic festivals in the United States.

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This year they created a lovely Tofu t-shirt. Ayumi will send the official program booklet and a packet of press clippings. Address: Little Tokyo Service Center (Resource Development Center), 231 East 3rd St., Los Angeles, California 90013. Phone: 213-473-1602.

10693. Creamer, Beverly. 1999. Tofu linked to dementia, study says: 2 servings a week may be harmful. *Honolulu Advertiser.* Nov. 20. p. A1, A5. [1 ref]
• ***Summary:*** "Eating tofu more than twice a week in midlife may diminish brain function in old age, and lead to Alzheimer's disease, according to ground-breaking research by Hawaii scientists." Alzheimer's affects 2% of America's 65-year-olds and up to 16% of 80-year-olds; this is the first time scientists believe they have found a risk factor for the disease.

The team, led by Dr. Lon White, draws its findings from a database of long-term information (starting in 1965)–that of the 3,734 Japanese-American men in the Honolulu Heart Program. White, who was invited to speak, presented his findings at a recent conference in Washington, DC, sponsored by the nation's soy industry. With funds from the National Institute on Aging, White has been working on the tofu connection for several years as part of the Honolulu-Asia Aging Study and the Honolulu Heart Program.

White compared the dietary habits of 3,734 Japanese-American men whose tofu consumption ranged from zero to many servings a week. He found that those who ate the most scored lower than those who ate little on a standard cognitive function test for determining dementia.

Moreover, autopsies conducted on the brains of 300 members of the study who have died showed that the brains of those who consumed two or more servings of tofu a week weighed less than those who consumed fewer than two servings.

These cause of the problem is not yet known. Dr. Helen Petrovich, a co-investigator, theorizes that tofu might be slowing down production of estrogen in the brain, or interfering with its natural binding in the brain. Yet moderate amounts of tofu are still thought to bring health benefits.

Note: White has submitted his research to various scientific journals, but none have accepted or published it. The journals *Nature* and *Science* turned it down. Address: Dr., Pacific Health Research Inst., Kusinki Medical Center, Hawaii.

10694. Pukel, Sandy. 1999. History of interest in macrobiotics and miso. Part I. 1945-1974 (Interview). *SoyaScan Notes.* Nov. 20. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Sandy was born on 10 Sept. 1945 in Queens, New York City. In 1967 he graduated from the University of Wisconsin, majoring in political science, then went to law school at the University of Tulsa in Oklahoma. After two years he realized he did not want to be a lawyer, and dropped out–at a time when many other young Americans were also dropping out of college or "straight" jobs. For the next two years he passed his leisure time like many other young Americans. In August 1969 he was at Woodstock and appears in the movie–naked. Knowing he wanted to be an entrepreneur, he worked on Wall Street for a while.

In April 1970 a childhood friend from Queens, Willy Rosenfeld, introduced Sandy to macrobiotics. Willy had gone to Harper College (SUNY) at Binghamton, New York, where he met Michel Abehsera. Sandy went to a lecture in New York City by Rebecca Dubawsky. "From that night on I became macrobiotic; I went 'cold turkey.'" He stopped using psychedelics and quickly got interested in the philosophy of macrobiotics; he wanted to "turn the world on" and saw this as one way to do it. That summer he went to a macrobiotic summer camp / retreat at Awosting in upstate New York with 30-50 other people. There he first met Michio Kushi, who was in short pants and knee-sox. This deepened his interest.

In August 1970 Sandy and five of his closest friends decided move to the island of Jamaica, where they would live a simple life and practice macrobiotics–in paradise. They stopped by Greenberg's Natural Foods at 125 1st Ave. in New York City. Located on the lower east side of Manhattan, it probably had the largest selection of macrobiotic foods in America. There they bought provisions for the trip: a 100-lb sack of brown rice, a keg of Hatcho miso, aduki beans, and soba noodles. They got non-tourist visas, and settled down in a lovely rural spot. The dentists in the group had hoped to open a clinic. But it didn't work out; the local people saw them as white hippies so they kept trying (unsuccessfully) to sell them drugs. The local people just wouldn't let them alone, so after about 6 months, one by one, they returned to the United States. Sandy was the last to leave. He went to Coconut Grove to stay with one of his roommates in law school, Roger Schindler, who happened to live there. But there was no place to eat or to buy macrobiotic foods. So in Nov. 1970 Sandy and two of his close friends started Oak Feed Store. One partner was Leon Matsil, a dentist and Sandy's boyhood friend from Queens; the other was Joel Magazine, an attorney and public defender in Miami, who also went to law school with Sandy in Oklahoma and who Sandy turned on to macrobiotics. They just wanted to have food available. They did not go into it thinking it would be a business–Sandy's father lent them $4,000 to start the store. It was named Oak Feed Store because the law library was on Oak Avenue. The word "Feed" was used because the purpose of the store was "to feed the people the good food." They name came spontaneously; no one person thought of it. This was the first of many enterprises that Sandy would help to finance. It was located on the second floor walk-up of the law library of the lawyer of one of his friends. The room was about 10 by 15 feet. This was the first macrobiotic food store or organization in the greater Miami area. They

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ordered their foods via common carrier (truck) from Akin, a distributor in Jacksonville, Florida. Akin distributed many Erewhon products. They also ordered quite a bit of food via mail order direct. They carried relatively few foods: Bulk brown rice, almonds, miso, noodles, noodles, apple juice, plus one cosmetic (Oregene shampoo). "It was really a strict, strict macro kind of place." There was a commune in Coconut Grove named the Maya House, and its members were regular workers at Oak Feed Store. Sandy also worked there regularly.

Also in about 1970 Sandy and his two friends started another communal affiliation that they called LJZ Enterprises–Leon, Joel, and Zuni; Sandy's nickname was Zuni. Everything went into one pool and they shared everything 100%–totally. All money from Joel's law salary, all money from Leon's dental practice and investments, all money Sandy earned from the store went into this pool, and each person took whatever they needed. This included purchases of houses, cars, clothing–everything. This lasted for the next 7 years and worked very well. To this day, they are all still close friends.

Oak Feed Co. became increasingly popular. After about one year they moved to a street-level retail store in the same building. Then in late 1971 or early 1972 they moved around the corner to a bigger store at 3030 Grand Avenue–where they stayed for the next 20 years. By this time they were running a real business–in spite of themselves.

Sandy recalls: "Once I got into macrobiotics I was a zealot about it–preaching, teaching, everything." In 1972 he began to give the first macrobiotic cooking classes in the area out of a rented home in Coral Gables, where he and Leon lived. A macrobiotic community began to evolve, with Sandy at its center. Sandy got to know Neal Loeb, who had studied macrobiotics in Boston, Massachusetts, and was Michio Kushi's driver. He was planning to bring Michio to Florida for a seminar, but he "flaked out" and couldn't get it together, so in about 1973-74 Sandy organized the weekend seminar. Michio's students in Boston sent Sandy detailed information about how Michio was to be treated, where he was to stay (hotel or motel only), what he was to eat, his detailed schedule, etc. "They were incredibly protective." The seminar was very successful, with a good turnout at a local church or private school auditorium. Michio stayed at Sandy's house and did individual consultations. Sandy and Michio got along very well, and Sandy gave Michio all they money they collected–in part because he didn't care about the money. Soon he and Michio became lifelong very close friends, and Michio started to give seminars in the Miami area on a regular basis.

In about 1973 LJZ bought a very nice house, communally, in Pinecrest a very nice neighborhood of Miami; there the three friends continued living together for a year. Macrobiotic visitors and friends stayed in the guest house on the property. In 1974 Sandy bought his own house (with a lake in his back yard) on 63rd Avenue in Miami, about 4 miles from Oak Feed Store.

In about 1974 Sandy started the Macrobiotic Foundation of Florida. Its purpose was to spread macrobiotics. Edmund Benson was on the board of directors. The cooking classes continued at Sandy's house in Coral Gables. Anyone passing through Florida who knew macrobiotic cooking was invited to be a guest teacher at the cooking class. Tim Redmond taught the first class on macrobiotic desserts–featuring apple pie. Sandy's repertoire didn't include desserts, except perhaps those made from agar or kuzu. Jay Pinsky, from Philadelphia, Pennsylvania, asked if Sandy had any apple butter, peanut butter, or sesame butter; he didn't. "We still ate basically rice, vegetables, miso soup, and aduki beans. We were as close to a Number 7 diet as you can imagine." Continued. Address: Owner, Oak Feed Store and Restaurant, 4500 S.W. 63 Ave., Miami, Florida 33133. Phone: 305-446-9036.

10695. Pukel, Sandy. 1999. History of interest in macrobiotics, miso, and the Oak Feed Miso Co. Part II. 1975 to Aug. 1979 (Interview). *SoyaScan Notes.* Nov. 20. Conducted by William Shurtleff of Soyfoods Center. • ***Summary:*** Continued: Over the years Michio Kushi had talked about having a factory that made shoyu (natural Japanese-style soy sauce) in the United States. In about 1975, Sandy decided to do something about Michio's dream. He was increasingly an entrepreneur, but only in the sense that he liked to help make things happen. He still did not see himself as a businessman, in that he had little interest in money except insofar as it was important for making things happen. Oak Feed Co. was now a thriving enterprise. But why? "Because we didn't do it to make money, and because nobody took any money out of the company. So all the earnings were put back into the business. My job was to keep the philosophy going." Sandy's living expenses came from other investments. In the early 1970s, most young people Sandy knew who were interested in macrobiotics were dropouts with no money. He lived in a very nice house in Pinecrest (near Miami) and had the money he needed. In 1976 he began looking at the idea of a shoyu factory more seriously, but he soon realized that the complex equipment and buildings would make it too expensive.

Then John Belleme started coming to the macrobiotic cooking classes and other events at Sandy's house on 63rd Avenue. Though he came on his motorcycle, John had a "straight" job in electron microscopy at the Veterans Administration Hospital in Miami. Soon he was deeply interested in macrobiotics and wanted to learn more and more. So Sandy suggested that John go to Boston to study macrobiotics with Michio. John did that, moving into a Ken Burns' study house. He stayed for about a year, then went to Mexico with Frank Head, and finally returned to Miami.

He asked Sandy for a job at the Oak Feed Store, and

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Sandy said "Fine." He was a responsible and knowledgeable person. John soon became the store manager, while also taking macrobiotic cooking classes at Sandy's house, but he did not see his future in a retail food store, thus he wasn't very happy with the job–though he was a very good worker. John was more a creator than a manager, and he and Jan had become sweethearts–great people and good workers. Jan used to make delicious seitan there. One day in about late 1977 John went to Sandy and suggested they do some kind of a project together. One of the ideas that came out of their brainstorming session was starting a miso factory in America.

A new idea was born, and Sandy responded by making John a deal. If John would work in the Oak Feed Store, in retail, for a total of three years (1976-79), Sandy would take care of the money necessary for making a miso factory happen and he would pay John's expenses related to starting the factory, pay for John's trip to Japan to study traditional miso making, and pay for John's share of ownership in the new miso company–$25,000 in shares. John would be responsible for doing the research, learning how to make miso in Japan, etc. John accepted and began to manage the store.

In the fall of 1978 Sandy and John visited Michio in Boston to discuss the idea; Michio was very supportive, but he wanted the miso company to be in Massachusetts–perhaps on land at Becket or Ashburnham. Sandy didn't like the idea of Massachusetts–too much macrobiotic politics and the weather was too cold. Sandy put money from the Oak Feed Store into a separate account that John used to pay his miso-related expenses. Soon he began taking Japanese language lessons.

In 1977 Sandy started the Oak Feed Restaurant, and at about the same time Leon got married. These two events led to the three partners dividing up the properties of the communal LJZ Enterprises. Sandy ended up as the sole owner of the Oak Feed Store and his friends ended up with other businesses. Sandy took in partners in the restaurant; Michael Henry (a friend), and Wayne Neal and his wife. They invested and owned shares in the restaurant. Sandy got Yozo Masuda to be the chef at the restaurant. For many years Yozo had been the right-hand man of Hiroshi Hayashi at Sanae, an early macrobiotic restaurant in Boston. Sandy brought him and his whole family from Japan, and got him a green card so he could cook at the Oak Feed Restaurant.

1979 (early)–At some point, Sandy began looking for land for the miso company–using specifications related to the climate and temperature that John Belleme had given him. But he was also looking for land for another reason–the Oak Feed Land Project. This was Sandy's dream of a macrobiotic educational center where various people would build homes and apprentice with John at the miso plant, and where various macrobiotic retreats and workshops and a summer camp with classes could be held on the land. Sandy spent about two months looking at catalogs, talking to realtors, etc.

1979 Feb.–Oak Feed Miso, Inc. is incorporated. By this time two groups have formed and begun to discuss their potential ownership of shares in the miso company: The Oak Feed group and the Erewhon group. It was agreed that the company would be named the Erewhon Miso Company. In the Erewhon group were Michio and Aveline Kushi, Sendai Miso-Shoyu, and maybe Mr. Kazama of Mitoku. In the Oak feed group were Sandy and John Belleme. It was expected that the Japanese would play a very important role in this company; they would assist the Americans in making miso in the United States. Sandy recalls meeting only once with some representative of Sendai Miso-Shoyu, probably at some natural foods trade show. Michio had most of the contact with them. At about this time the first of many of drafts concerning ownership of shares was placed on the table. None of the drafts was ever signed.

1979 April–Barry Evans becomes a major investor in the miso company.

1979 summer–After extensive research, Sandy flies up to North Carolina (Asheville) alone, looks at several pieces of property that a real estate agent has suggested, finds exactly the piece of land and house he had been looking for, makes a deposit or down payment of $10,000 to $15,000, agrees to assume the mortgage of the previous owners at the Tryon National Bank, North Carolina, and flies home alone the same evening. The roughly 90-95 acres of land in Rutherfordton cost about $100,000 to $120,000. The mortgage payments were $500/month for 30 years. It was a lovely but very rural piece of property with rolling green hills. The Sears-style prefab 5-bedroom house on the property was basically thrown in free of charge. The land had become available because someone had died recently. With the new land and house, Sandy's Macrobiotic Foundation could do things that were impossible in metropolitan Florida.

1979 Aug. 7–Sandy closes / finalizes the purchase of the land for Oak Feed Miso in Rutherfordton, North Carolina. He and John Belleme both sign the closing documents. Now the new miso company would have to find the money to make the monthly mortgage payments, plus additional monthly payments to two officers of the bank totalling $23,000. Barry Evans' money was important in making these payments but it was not essential. The miso company definitely would have been able to pay for the land in Rutherfordton and send John and Jan to Japan without the money Barry invested at this time. The investments Barry made after construction of the factory began in mid-1980 and after Erewhon filed for bankruptcy were more important to the company's survival. Sandy put in the first money; Barry's came later. Sandy told John that if John took care of all the technical matters, Sandy would take care of all the financial matters to make the new company happen. Continued. Address: Owner, Oak Feed Store and Restaurant, 4500 S.W. 63 Ave., Miami, Florida 33133. Phone: 305-446-9036.

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10696. Pukel, Sandy. 1999. History of interest in macrobiotics, miso, and the Oak Feed Miso Co. Part III. Aug. 1979 to 1982 (Interview). *SoyaScan Notes.* Nov. 20. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Continued: 1979 Aug. 16–A "subscribers consent" agreement is signed at a meeting in Miami. The following people, all or most of whom were present, subscribe to buy shares in Oak Feed Miso, Inc. Sandy Pukel, John Belleme (he invested sweat equity, not money; Sandy put up John's share of the money), Barry Evans, Yozo Masuda (chef in the Oak Feed Restaurant), Edmund Benson (a friend of Sandy's involved in macrobiotics), and Jim Kenney (manager of the Oak Feed Store). All these people knew each other, and all but Barry lived near Coconut Grove. John signed as the secretary. Sandy also has the original by-laws of Oak Feed Miso–more than 10 pages of typewritten boilerplate-type language. They are not dated or signed, but they were almost certainly drafted in 1979. No names or shares are given. Frank Head was never a shareholder as long as Sandy was involved.

1979 Aug. (late)–After the land deal was closed, Joseph and Patricia Carpenter (married, with children, macrobiotic friends of Sandy's from his neighborhood) moved into the main house on the miso company land at Rutherfordton, North Carolina, and lived there, rent free and getting money, throughout the time the Belleme's were in Japan. Joseph was a carpenter and fix-it guy, and he was expected to make improvements to the house and land before the Belleme's returned. Joseph was also hired to be John's assistant and head worker in running the miso company. Joseph "seemed like a hard-working guy" and Patricia was "a sweetheart lady." Joseph now lives in California and Patricia (who now uses her maiden name, Roberts) lives in Boca Raton, Florida, where she owns an antique store. Her parents live in Lighthouse Point, Florida, and her brother, Brendon Roberts, lives in Boulder, Colorado. Things did not end up on nice terms between them and John. Because they didn't do the work that John had expected of them, he either fired them or kicked them off the land. Sandy doesn't know what they were supposed to do; John would know. The Carpenters then bought land nearby.

1979 Oct.–John Belleme (and his new wife, Jan) leave for Japan. All their expenses are paid from the Oak Feed account Sandy had established–not from the new corporation.

Michio was supposed to arrange for John's welcome in Japan and find a place for him to learn how to be a miso maker. But the people at Sendai Miso-Shoyu didn't want to share their secrets with John, so John ended up studying with the Onozaki family–kind of by accident. It turned out to be a blessing, because Sendai was too automated for John to learn traditional miso-making there. Moreover, Sendai Miso-Shoyu wanted to send one of their people to the USA to run the new Erewhon miso factory; John would have been his assistant.

1980 June–John and Jan Belleme return from Japan. Not long afterwards, there was an important meeting at Sandy's house in Miami. Now that it was becoming clear that a miso company was actually going to happen, people began to get serious about issues of ownership and money. At the meeting were Michio and Aveline Kushi, Sandy, John Belleme, and Joseph and Patricia Carpenter. Joe Carpenter had no money; he was a handyman who was going to be a worker. Sandy recalls it as a "pretty testy" meeting. Michio looked upon the miso company as "his baby." His contributions would be "in kind" rather than in money. He would supply the company name: Erewhon Miso Company. Moreover, since he owned Erewhon Trading Co., he stated that the Trading Company would buy all the miso, package it, and distribute it under the Erewhon brand. Barry Evans was not there. In short, Erewhon planned to play an essential role in the new miso company.

After John and Jan returned from Japan, they went right to work building the factory and purchasing equipment. John is a very talented photographer. He took many superb photographs of miso making in Japan then documented the rise of the new miso company on the land in North Carolina.

1981 Sept. 27–Sandy has the "Minutes of an Annual Stockholders Meeting of Oak Feed Miso" (3 pages). It is signed by directors John Belleme, Sanford Pukel, and Barry Evans, all of whom, of course, were in attendance. It refers to the Subscribers Consent Agreement of 16 Aug. 1979 and tells exactly who owns how many shares in the company. With the help of an attorney, Barry got his stock converted to Class A, which enabled him to vote for the first time; he also got on the board of directors. Barry and John together now own the majority of shares. Sandy was, alas, no longer in control. The company needed Barry's money, and his demands were reasonable. The changes seemed inevitable–but it hurt.

In 1981, when it became clear to Michio and Aveline that Erewhon Trading Company was in a financial crisis and needed cash quickly, they appealed to many of their close friends for help. Sandy responded by sending them $100,000. Nevertheless, on 19 Nov. 1981 Erewhon filed for bankruptcy protection under Chapter 11 of the Federal Bankruptcy Act. That left Sandy in need of money. Barry Evans invested a considerable sum in Oak Feed Store as part of a complex agreement. For Sandy, the Erewhon bankruptcy couldn't have come at a worse time.

1982 Feb. 26–Sandy Pukel and Barry Evans sign an agreement whereby Sandy gets out of Oak Feed Miso and Barry gets out of Oak Feed Store and Oak Feed Restaurant by an exchange of stock. Barry's financial strength won over, but this left Sandy upset and bitter at Barry. Sandy believes that there was no connection between this event and his lending $100,000 to Michio. John was torn–caught in the

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middle. On the one hand, he felt great loyalty and affection for Sandy, and hated to see him out of the new company. On the other hand, he had invested years in the miso company and wanted to see it through to the end. So John continued to work with Barry, and Barry made him an offer he couldn't resist. This conflict strained Sandy and John's relationship for years afterward. About 8-10 years later, Sandy received a beautiful present in the mail of a wooden keg of special miso. It was from John (who had made the miso), accompanied by a nice note as a peace offering, with the hope that the two could renew their friendship.

The idea of the Oak Feed Land Project disappeared when Barry Evans bought out Sandy's interest in the miso company. Sandy basically held a proxy for most of the other investors; when he left, they also left, selling their shares to Barry Evans.

One sidelight: In about 1993-94 Sandy formed a non-profit organization, an offshoot of the Macrobiotic Foundation of Florida, named The Ignoramus Club. Most of the members are people who have been involved with macrobiotics for many years. It had several hundred members who paid $100 each, including Michio, Herman Aihara, etc. No one had any authority over anyone else. At the meetings, some of which drew 50-100 people to Miami, everyone talked freely about macrobiotics. Resentment and criticisms, as well as gratitude came out. "A lot of people owe a lot to macrobiotics." The Club is no longer active. Address: Owner, Oak Feed Store and Restaurant, 4500 S.W. 63 Ave., Miami, Florida 33133. Phone: 305-446-9036.

10697. Coleman, Joseph. 1999. A sauce fit for the emperor. *Times of India* (*The*) (*Bombay*). Nov. 24. p. 13.
• ***Summary:*** Describes the way Kikkoman makes soy sauce for the emperor at the Goyogura in Noda, Japan. Noda, a hamlet 35 km north of Tokyo, "has served as the center of Japanese soy sauce production for centuries." Address: Associated Press.

10698. Oihankesni, Anpetu. 1999. Life story and work with the South River Miso Co. (Interview). *SoyaScan Notes.* Nov. 29. Followed by a 4-page handwritten letter of Nov. 29. Conducted by William Shurtleff of Soyfoods Center. [1 ref]
• ***Summary:*** Anpetu (whose name was originally Jeffrey Zellich) was born into a Russian Jewish family and grew up in Philadelphia, Pennsylvania, but later in life, while living with the Lakota Sioux, he was given the name he now uses. He has been involved with macrobiotics since 1973. Before that, in 1971-72, he lived alone in a cabin in the woods in New Brunswick, Canada, gardening and using wild plants. He also lived in a tepee in northern Maine.

In 1973 he went to Boston to study macrobiotics. He lived for a while with Jack Garvey and Jack's first wife. He left to go to Mexico, where he lived for a while with indigenous people (Indians), then in 1974 returned to Boston, where he lived in Jamaica Plain. About 40% of the macrobiotic students in the Boston area at the time were Jewish. He met Hannah Bond through a mutual interest (shared also with Ken Burns) in wild plants. Hannah was older, and came from a Quaker background. She made pickles for Erewhon and was considered to be the best pickle-maker in Boston. He found her to be "the most intellectual woman I had ever met–wonderful." She had formerly been married to a professor of Greek. They went to his cabin in New Brunswick, Canada, she proposed to him, and they were married in 1982–the ceremony took place at the Elwell's land in Conway, Massachusetts. Christian and Gaella had both previously worked at East West Journal, she as an editor and he as an artist, who also illustrated several of Michio Kushi's earlier books. They had also both worked with Alan Chadwick, the legendary teacher of French intensive, biodynamic gardening at the University of California at Santa Cruz.

Anpetu was at the South River Miso Co. in about Oct. 1982 when Thom Leonard came for a month (on contract) to teach the Elwell's how to make miso and use the equipment. Christian and Gaella were married, had a daughter, and owned 64 acres of beautiful land on both sides of the South River. Christian was able to fund the company's start-up with his inheritance; he came from an affluent family and his father had died. He and his brother, Will, initially planned to start the miso company together, but later Will left. At one point the Elwell's approached Michio Kushi to see if he wanted to buy the company. Anpetu and Hannah lived in nearby Conway for 2 years, then on the Elwell's land in a trailer across the river. Another couple, Don and Martha Wheeler, lived upstairs in the miso shop after it was completed. Don and Martha loaned $10,000 to Christian for the miso company. Anpetu also loaned $10,000 to the miso company (though no papers were signed), and worked there making miso for 6-9 months; Hannah was not involved with making miso. During that time they published a flyer on miso (dated spring 1983) which Anpetu still has; he designed the logo showing 3 waves in a circle. The waves symbolized South River and the three stood for the three families who were joining together to create the miso company. He also took quite a few color photos, which he still has. Don and Martha decided to leave first. Then Anpetu's enthusiasm waned and he and Hannah decided to leave.

Anpetu recalls that many big problems took place after this decision. Christian wanted Anpetu and Hannah to leave promptly, and when they would not set a deadline for leaving, Christian took them to court to try to get them evicted. The case went before a local judge in Greenfield; he suggested they work the matter out among themselves, but said that Christian had the basic rights as a landowner. Anpetu and Hannah left one month later, in the fall of 1983. Christian paid him back the $10,000 without interest over the next ten years. Anpetu and Hannah separated after being

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married for 7 years.

Today Anpetu lives a very simple life in Hotchkiss/Cedaredge, Colorado, where he runs an heirloom seed company named Sourcepoint Organic Seeds and practices Vipassana meditation. His teacher is Goenka, of Burma.

Note: Anpetu contacted Soyfoods Center today to request a review copy of *The Book of Miso* as announced in the latest edition of *River Currents: News from South River Miso Company* (*Conway, Massachusetts*). Address: Founder and owner, Sourcepoint Organic Seeds, 1349 2900 Road, Hotchkiss, Colorado 81419. Phone: 970-872-4971.

10699. Morinaga Nutritional Foods, Inc. 1999. Lite'n your holidays with Mori-Nu Tofu (Ad). *Vegetarian Times.* Nov. p. 29.

• ***Summary:*** The top half of the ad is a color photo of the tofu pumpkin pie, surrounded by pumpkins and vegetables and one package of Mori-Nu Silken Firm Tofu.

The recipe for "Dairy-free, low-fat pumpkin pie" is given in the lower right quarter of the ad. In the lower left quarter is a color photo of 5 different packages of Mori-Nu Tofu. Plus an invitation to: "Create delicious, low-fat, dairy-free holiday dishes with Mori-Nu Lite Tofu. Creamy-smooth Mori-Nu Lite has only 1 gram of fat per serving, 50% less calories than regular tofu and it's an excellent source of cholesterol-free protein." Address: 2150 W. 190th St., Suite 110, Torrance, CA 90504.

10700. *Nutrition Business Journal* (*San Diego, California*). 1999. Sales of soy protein isolate set to grow. 4(10/11):21-22. Oct/Nov.

• ***Summary:*** The market for soy protein isolate is dominated by two manufacturers: Protein Technologies International Inc. (PTI, St. Louis, Missouri, a business of DuPont) and Archer Daniels Midland. PTI claims to have sales of $500 million in 1999 and to have captured about 75% of the soy protein isolates market. By extrapolation, this implies a U.S. market of $700 million/year.

About 40% of PTI's isolate sales are to meat and fish processors, 16% to nutritional and sports beverages, 10% to infant formulas, 9% to the paper industry, 5% to young animal feed (milk replacers), and 20% to "developing opportunities."

Other manufacturers of soy protein isolates are Santista of Brazil, and Fuji Oil of Japan.

A new PTI product is Supro XG, an isolate enriched with genistein. Top customers include Ross Laboratories (Ensure), Nestle, SlimFast, and Weider.

The second half of the article discusses ADM's efforts to educate mainstream consumers–in part is using the umbrella brand, Nutrisoy. This tradename will start appearing on supermarket shelves during the first quarter of 2000. Del Cahill, North American manager for ADM's specialty proteins, sees a new trend. The mainstream food industry, recognizing that the U.S. has an aging population, believes that the easiest way to prevent long-term chronic disease is through diet. These companies are now trying to develop and market better food choices.

10701. *Nutrition Business Journal* (*San Diego, California*). 1999. SunRich acquired by NASDAQ company [Stake Technology Ltd. of Ontario, Canada]. 4(10/11):22-23. Oct/Nov.

• ***Summary:*** In July 1999 Stake Technology Ltd. (Norval, Ontario, Canada) acquired SunRich Inc. in a stock-for-stock deal. Stake is an environmental company with technical expertise in steam explosion pulping, cleaning of metals, and recycling. In 1998 it had revenues of $14 million. SunRich, a $35 million niche producer, makes various soy products and contracts with 700 growers in the Midwest. Soy products comprise approximately 60% of SunRich's sales, and soymilk contributes approximately 20%, according to Allan Routh, president and CEO. SunRich makes three basic categories of soymilk: a standard [dried] product used as an ingredient in second generation products; several soy beverages; and soymilk with various protein and fat contents.

SunRich was founded [as Minnesota Waxy Corn Growers Export Inc.] in 1978, and changed its name to SunRich in 1994. Some 30-40% of SunRich's revenue's are international, primarily from Japan, reflecting its roots as an exporter. Less than a year ago, SunRich launched its own retail division, Hearty & Natural.

Note: Talk with Allan Routh of SunRich. 2001. Nov. 6. The acquisition was finalized on 1 Sept. 1999.

10702. Sumi, Hiroyuki; Yoshikawa, Misako; Baba, Tomoko; Matsuda, Kiminori; Kubota, Hidefumi. 1999. [Elastase activity in natto, and its relation to nattokinase]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 73(11):1187-90. Nov. [19 ref. Jap; eng] Address: 1. Dep. of Physiological Chemistry, Kurashiki University of Science and the Arts, 2640 Tsurajima-cho, Kurashiki, Okayama prefecture 712-8505, Japan.

10703. Elwell, Christian. 1999. Chronology of South River Miso Co. Part I. 1946-1979 (Interview). *SoyaScan Notes.* Dec. 16. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** 1946 Dec. 29–Christian is born at Martha's Vineyard, Massachusetts. His father is a vegetable farmer. When Christian is in grade school, he moves with his family to the Boston area and instead of vegetable farming his father opens a florist and nursery business.

1949 Aug. 3–Gaella (pronounced GAY-luh) is born Margaret B. Jett in Richmond, Virginia. Her family lives in Reedville, Virginia, on the Chesapeake Bay–where she grew up. Her father died when Gaella was 3 years old. Her mother, a school teacher in home economics, remarried to Jennings

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Butler, a professional fisherman with the menhaden fishing fleet of Reedville.

1969 June–Christian graduates from Cornell University (Ithaca, New York) in landscape architecture.

1969 July–Christian enters Peace Corps training in Morrison, Colorado. His group arrives in Teheran [Tehran], Iran, in Sept. 1969. He serves as a park designer for the municipal office of the Province of Esfahan, the 17th century capital of Persia. During this time, Christian's father dies of pancreatic cancer at age 51. This event, coupled with his immersion in the traditional aesthetic and religious culture of Iran, precipitated a shift in the main stream of his life. He had graduated from Cornell with ambitions of becoming a landscape architect; he was accepted to enroll at the Harvard graduate school of design upon his return from Iran. But he finished his two years of Peace Corps service in Iran "with an altogether new orientation, burning with questions about the meaning and purpose of life."

1973 spring–Christian returns to the United States for a year. He travels (to the French island of Saint-Barthelemy in the Caribbean for several months, then to California in a Volkswagen bus), studies with a portrait artist in Boston for several months, then studies the teachings of Sri Aurobindu at a center in the Catskill Mountains.

1974 spring–Christian travels to India, where he lives in Pondicherry in association with the Sri Aurobindu ashram and Auroville. After becoming ill with hepatitis, he begins to study alternative health care and healing. After a year in Auroville, he then travels west to Scotland.

1974 May-Sept.–While at the Findhorn community in northern Scotland, Christian meets former students of Michio Kushi (teacher of macrobiotics in Boston), reads the book *Healing Ourselves* by Noboru Muramoto (teacher of macrobiotics in California) and puts its teachings to use–successfully.

1974 Dec. 29–Christian (on his 28th birthday) first attends a lecture by Michio Kushi in Boston. The subject: Right Life. He settles into the macrobiotic community in nearby Brookline and starts to work with the East West Foundation (doing everything from chauffeuring Michio around to helping with their magazine layout and design), while starting Whole Life Arts, a company to distribute French flour mills in the USA.

1976 fall–Gaella arrives in Brookline to study macrobiotics. Works at *East West Journal* as secretary to editor Sherman Goldman.

1976 Nov. to 1977 April–Christian and Gaella first meet at a massage class given by Shizuko Yamamoto. They first talk about making miso for a livelihood at an Irish pub in Brookline Village. While living in Ken and Anne Burns' macrobiotic study house (at the same time as John Belleme; they were good friends) in Brookline, they attend a miso-making workshop by Bill Shurtleff and Akiko Aoyagi. Christian wanted to farm and it seemed that making miso in the traditional way (as he had read about it in *The Book of Miso* by Shurtleff & Aoyagi) would fit into the New England farm cycle as a source of work and income during the cold months. In early 1977 they moved from the Burns' study house to the home of Michio and Aveline Kushi across the street.

1977 late summer–Christian and Gaella go to Covelo, California and work with Alan Chadwick, the legendary teacher of French intensive, biodynamic gardening. He had already left the University of Santa Cruz and set up what he called "The Garden Project" in Covelo. Christian becomes an "apprentice gardener" (later poultry manager) and Gaella is the head cook. They stay for about 6 months, until late 1977. Chadwick "blew up one day–just lost it completely." After that the Project fell apart.

1978 Jan.–Christian and Gaella leave Chadwick's garden and go to study with Noboru Muramoto at the Asunaro Institute in Glen Ellen, California. He is offering a one week "Fermented Foods Workshop" with an emphasis on miso-making. They ended up staying until April, making miso with him. That spring they make 1,000 lb of miso and write an article about it titled "Making miso in America," published in *East West Journal* in Sept. 1978. There they first met Thom Leonard, who comes to visit. Thom had already made some miso and tofu in Arkansas. Though they were together for only 2-3 days, they greatly enjoyed talking about their many mutual interests. "It was a really good connection."

1978 Feb.–Article titled "Learn natural architecture: Conversation at Cornerstones" (with Charlie Wing), by Christian (with photos by William Elwell), published in *East West Journal.* The interview took place in the fall of 1977.

1978 April or May–Christian and Gaella return to western Massachusetts, and with Christian's brother, Will, look for land in the Pioneer Valley region–within the larger Connecticut Valley.

1978 July–Review (by Christian) of five books by Rudolf Steiner published in *East West Journal.*

1978 Aug.–With financial help from their mother, Christian and Will purchase 64 acres of undeveloped land in Conway, Massachusetts, for $50,000 cash. They name the place South River Farm; South River (20-40 feet wide) runs through the property. They buy the land with the intention of homesteading, that is building their own home, farming, leading a life that is as self-sufficient as possible. While living in a small apartment in the village of Conway, they first build a barn and several cabins, and get a pair of draft horses.

1978 Sept. 9–Christian and Gaella are married at the Old Brick Church in Old Deerfield, Mass. They learn that one of Christian's direct maternal ancestors, John Williams, was the first minister of that church in the early 1700s.

1979 March 15–Thom Leonard and Dick Kluding ladle the first batch of miso into their one-ton wooden vats at

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the Ohio Miso Co. in Monroeville, Ohio. They had begun construction of the shop the previous October.

1979 May 15–The Elwell's first child, Anna Deerfield Elwell ("Anni," a girl), is born. They are still living in their apartment in Conway.

1979 fall–The Elwells move onto the land from their apartment. They live in a 24-foot-long pink and white trailer. Will is already living on the land in a cabin they built next to the barn. Continued. Address: Founder and Owner, South River Miso Co., South River Farm, Conway, Massachusetts 01341. Phone: (413) 369-4057.

10704. Elwell, Christian. 1999. Chronology of South River Miso Co. Part II. 1980-1982 (Interview). *SoyaScan Notes.* Dec. 16. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued: 1980 Jan.–The Elwells receive a letter from Thom Leonard informing them that the Ohio Miso Co. is for sale.

1980 spring–The Elwells get a $3,000 grant from the U.S. Department of Energy, Appropriate Technology small grants program–to build a rammed earth house on their property. Fred Hubbard, originally from Cape Cod, hears about this building project through his sister, who was a relative of Christian's, and offers to participate. Unmarried, he arrives in the early summer of 1980 and lives in a tent on the Elwell's land.

1980 May–The Elwells purchase the Ohio Miso Co. for $10,000 cash from Richard Kluding.

1980 summer and fall–Christian tries to "back out of the miso business." He feels overwhelmed by all the work that would be required. His brother, Will, who had just met his wife to be, is not sure he wants to be involved in the "miso making adventure." He decided that he would move off the land in the summer of 1981. Christian approaches Michio Kushi, who owned Erewhon, and talks about Erewhon buying the Ohio Miso company. Michio shows a sincere interest in buying the company and in going to Ohio to look at the equipment and miso–but that never happened. A year later, in Nov. 1981, Erewhon filed for Chapter 11 bankruptcy.

1980 Nov.–With the walls of the rammed earth building finished, Christian and Fred Hubbard drive to Monroeville, Ohio, where they "stuffed the entire Ohio Miso company, all the equipment and 13 tons of miso, into the back of a huge semi truck trailer which a trucking company had delivered." Each vat contains about 2,400 lb of miso. They empty all of the miso into 5-gallon buckets, then put the in-tact wooden vats into the truck, then put the 5-gallon buckets (still filled with miso) into the vats. It took 10-14 days to fill the truck. Christian and Fred drive back to South River Farm and a week later the trucking company delivers the trailer one day before a light snow storm. Christian and Fred, with help from neighbor Don Herzig and his tractor, unload the entire contents and store it in their barn–which was across the river.

1980 Dec.–Christian sends a form letter to Ohio Miso Company's former customers that begins: "Dear Friends, old and new: The Ohio Miso Company has changed ownership. As of November, 1980, the Elwell family has purchased and moved the equipment and present stock of miso to South River Farm in Conway, Massachusetts... Eventually we want to follow a full cycle by growing the grains and beans on our own farmland... We plan to have our new shop ready for the fall season of 1981..."

1981 winter (Feb/March)–Christian sells Ohio Miso out of the barn, loading it onto a horse-drawn sled, pulling it over a logging road through the woods (the river was impassable) to the road and then on to a UPS terminal in Springfield. One of their best customers is Western Mass. Co-ops–which later became Northeast Cooperatives.

1981 June–The Elwells and partners lay the foundation of their new miso shop–1,220 square feet–and begin building a timber frame (post-and-beam) miso shop on their land. The frame is made of big, heavy timbers which are joined together with wooden pegs–no nails. This is an old English and New England method of construction. Christian had planned to construct a less expensive cinder-block building until he met master timber framer Jerry Sawma, who lives in Conway. Christian and Fred work with Jerry all that summer and fall, helping him frame the building and put the shingles on the roof. Fred and Christian take over from there, putting on the walls, etc. They had not finish by winter, so they covered it with plastic sheeting to keep out the snow.

1981 Nov. 29–Christian writes an "Historical sketch" of the South River Miso Co. on its handsome new letterhead: "There, a new shop of traditional timber-frame construction, featuring a wood-fired masonry cooking stove was completed in 1981. Production capacity is 40,000 to 120,000 pounds of miso per year. Barley miso is the standard variety offered. Others include Brown Rice, Corn, and Black Soybean miso."

1982 Jan. 1–South River Miso Co. is incorporated.

1982 Feb. to spring–Christian was now thinking of running the miso company with two other families on a community basis; they would contribute money, labor, and community/social spirit. Christian's brother, Will, had left in the summer of 1981. Christian invites the other families to come and live on the land and work in the miso company. One couple, from the macrobiotic community in Boston, was Anpetu Oihankeshni and Hannah Bond; they were not married when they arrived but they had a wedding ceremony on the land. The other couple was Don and Marcia Wheeler, who were from families that had lived nearby in the Pioneer Valley for generations. These two couples invest $30,000 to finish the miso shop and get the company running.

1982 spring–Christian and Fred finish building the miso shop, assisted by Don Wheeler and Anpetu. The total cost of the building was about $80,000, including Jerry's labor expenses but not including Christian's and Fred's time. Jim

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Sadler later drew a nice illustration of the 5-part building from a photograph. The main center part, which has two stories, is where the miso is made; a living space is in the loft upstairs. The koji room protrudes out toward the front. To the right of the main part is the entryway to the shop where the shipping is now done. To the right of the entryway is a 36-foot-long storage building, where the miso vats are stored. Each vat, made of recycled virgin cypress, holds about 7,500 lb of miso. To the left of the main building, under a roof that slopes downward, is more of the miso shop plus storage for smaller miso barrels. To the far left is a firewood storage shed.

1982 Oct. 25–With the miso shop just finished Christian, Gaella, Don Wheeler, and Thom Leonard hold a dedication ceremony then begin to make the first miso (actually barley koji for a 2-year barley miso) at South River Miso Co.–according to the "Production Log" which still exists. Thom arrived (from Baldwin Hill Bakery, which is a 45-minute drive away in Phillipston, Mass.) about a week before this day and stayed for about 3 weeks afterward. Part of the agreement in the purchase of Ohio Miso was that Thom would come to Conway to help them get started and teach them as much as he could about miso-making. It was a friendly and informal arrangement. Christian had to keep telling Thom to wait because it took longer than expected to finish building the miso shop; he was very patient and understanding. The organic barley and soybeans used in the first batches of miso were from Living Farms in Tracy, Minnesota. From 1980-82 Thom had taught miso-making classes in Boston. Earlier in 1982 Christian attended one of Thom's classes at Baldwin Hill Bakery. As of December 1999 Thom has a very nice bakery in Salinas, Kansas, and he is very happy–part of a nice community. The first miso at South River is put into recycled oak whiskey barrels, purchased from Ohio Miso Co. Muramoto also used such barrels and Thom may have gotten the idea from him. The barrels had been burned on the inside so the charcoal would improve the flavor of the whiskey as it aged; the charcoal had to be scraped off before the barrels could be used for miso. Small batches went into the smaller whiskey barrels; larger batches went into cypress wood vats. Christian recalled in 1999: "Thom told me during the first week, as we were washing and soaking soybeans, 'Miso making is about creating order. That is the main thing to keep in mind here in the shop: to create and maintain order.' This was his way, in the spirit of Zen food craft, of breaking through the glamour and mystique of miso making."

Gradually the men used the two horses and cart to move the miso barrels and vats from the barn, across the river, and into the new storage building that was part of the miso shop. By that time Christian had sold most of the miso made in Ohio.

1982 winter–Anpetu and Hannah live above the shop that winter; the Elwells live across the river–before there was a bridge over it. Christian would walk through the ice cold water early each morning (until the river froze) to get the fires started each morning. Continued. Address: Founder and Owner, South River Miso Co., South River Farm, Conway, Massachusetts 01341. Phone: (413) 369-4057.

10705. Elwell, Christian. 1999. Chronology of South River Miso Co. Part III. 1983-1999 (Interview). *SoyaScan Notes.* Dec. 16. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued: 1983 spring–The miso company sends out a very interesting and poetic hand-lettered, dated leaflet and price list. The front panel, with a logo of three waves in a circle, announces the availability of three kinds of miso: Mellow Barley (6 weeks), Mellow Brown Rice (6 weeks), and Mellow Flint Corn (8 weeks). "South River Farm is the coming together of three families seeking common livelihood." A pie chart shows the company's costs.

1983 summer–The first in-depth story about the miso company, with five good photos, appears in *Soyfoods* magazine. The article states that the company (whose name is incorrectly given as "South River Farm Miso Company") is owned by three families, and the names of the six owners are given. Actually, however, Christian and Gaella were (and have always been) the company's only legal owners.

1983 fall–The community idea fails after one miso season (1982-83). The Wheelers leave first. Anpetu and Hannah leave in the fall of 1983; Anpetu writes a sad poem about falling leaves as they part. It takes the Elwells 10 years to repay the money the other two families had invested.

1983 Sept.–Christian goes to Charlie Kendall, who lives nearby, and asks if he can supply Charlie with rice koji for the amazake he makes. Charlie had been buying all his rice koji, dried and in bulk, from Miyako Oriental Foods in California. Christian offered to match Miyako's price and make the koji from organic rice. Christian was already making rice koji for his red miso and he needed more customers. After making many trial batches and building a koji dryer, Christian begins supplying Charlie with 900 pounds (three 300-lb batches) of koji at a time. Also that second miso season (1983-84) the first apprentice, Sonia Schloeman, works at the miso shop; Christian needs help and Sonia needs a place to stay. He pays her a salary and she stays in the loft above the shop. After Sonia leaves, the Elwells move into the loft above the shop. The second intern was Dan Hornack, who came all the way from Aspen, Colorado. From then on the arrangement was room (in the cabins across the river) and board plus a small stipend in exchange for the apprenticeship. Other apprentices who worked in the shop over the years have included (in chronological order) Rich Sweitzer and Susan Gribbon (later to marry), Michelle Gemme (Montreal, Canada), Don Phillips, Michael Dessen, Tim Langdon, John and Mary Granger, Caroline Wurts, Maggie Smith, Andrew Goodman,

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Tolly Gibbons (New Zealand), Anne Walsh Sullivan, Bobby (age 18 and white, from South Africa), Sean LePoutre, Maria Low, Kamil Bersky (a medical doctor from the Czech Republic), and Stephen Jannetta. Stephen worked at the shop for two seasons (Oct. 1990 to May 1991, and Sept. 1993 to May 1994), then helped others (Soyalab, and La Fonte della Vita) to start commercial miso production in Italy. His brother, Phil Jannetta, worked for Mitoku in Tokyo. Most apprentices stayed for one full miso season. Gaella cooked for everyone.

1983 Oct. 17–Isaiah, the Elwell's second child is born.

1983 Nov.–The company runs its first ad (1/3 page vertical) in *East West Journal*. The theme: "Wisely given miso gives its own wisdom." An illustration at the bottom shows the miso shop buildings. A logo at the top shows three waves in a circle.

1985–Starting this year, a group of students from the Kushi Institute at Becket, Massachusetts (which is about 1½ hours drive away) comes to visit to miso shop–even though Christian has had no personal connection with the macrobiotic movement for many years. Over the years, the number of groups has increased to 3-4 a year. In the early years, Christian would give a slide show and talk on miso-making. Now they usually come on a weekend and take a tour of the shop when it is not in production, and Christian will share with them what he has learned about miso.

1989-90–The Elwells, with the help of Fred Hubbard, design and begin building a timber-frame home located behind the miso shop–about 12 feet away from it. For the previous 5 years they had lived in the loft above the miso shop. Fred eventually built his own home in Conway, where he now resides as a carpenter and builder.

1991-92–The Elwells stop taking apprentices and start with paid workers. There was a difficult period of transition as Christian began to tire of working in the shop. Workers include Larry Glanz, a former student who worked with Muramoto-sensei and Stephen Jannetta.

1995 Aug.–Christian seriously considers selling his miso company to Barry Evans, owner of American Miso Co. and Great Eastern Sun in North Carolina. He had taken training to become a Waldorf School teacher. But this would require the Elwells to give up their land, and although it was quite isolated, they did not want to leave it.

1995 fall–Yukio Doyama begins to work at the miso company, a happy, hard-working man who enjoys making miso. At the same time, Steve Freiman comes to live above the miso shop and work with Yukio. Christian was now freed up for an extended time from day to day production and packing work; he began taking a more supervisory role and handled most of the office work and shipping. Andy Mathey followed in Steve Freiman's position, working with Yukio.

1996-97–This fiscal year the miso business is computerized. In late 1997 Christian decides not to sell the miso company, and to invest much more energy, time and resources in it–"to make it come alive again" after a period of hibernation. "When we clear up things inwardly, this is reflected by outward things." Quickly, all sorts of good new things begin to happen.

1998 Feb.–The first issue of *River Currents: News from South River Miso Company* is published. This attractive newsletter contains a catalog and order form, plus news about miso and the company.

1997-98 fall and winter–Three young people come to live at South River Farm to cultivate the land–and to work on forming a community. Arthur Lerner comes first, then his partner, Emily Kellert, and soon after, David Fisher. That winter these three also work part time in the miso shop. Robin Cole, a friend of many years, arrives in early spring of 1998 and creates the position of office manager/ administrative assistant.

June 1998–The Elwells and coworkers finalize a mission statement for the miso company after three months of weekly meetings. It is published in the winter (Dec.) 1998 issue of *River Currents*.

1999 Sept.–The apprenticeship program is reinstated; Maria Rossi is the first to fill the position.

1999 Dec. 16–Christian says that the miso company, about to enter its 21st year or adulthood, is taking on a life of its own. Gaella was never a regular miso maker in the shop. In the early years she was a full-time mother and cooked hundreds of meals for builders and then miso apprentices. Her role has always been one of moral support. This year she does work in the shop two afternoons a week on the packing crew. The many new people are contributing to the growth of the miso company as a "learning organization" (see *Fifth Discipline,* by Peter Senge).

South River Farm is now moving in the direction of being home to self-sustaining farmstead–"as the place in which South River Miso is planted." David Fisher has built a pole barn, gotten draft horses, pays a modest lease, and sells his organic produce. Address: Founder and Owner, South River Miso Co., South River Farm, Conway, Massachusetts 01341. Phone: (413) 369-4057.

10706. Yoshihara, Lulu. 1999. Re: Update on Shin-Mei-Do Miso Company. Letter to William Shurtleff at Soyfoods Center, Dec. 17. 1 p. Handwritten, with signature.

• ***Summary:*** Last May, Lulu and Yoshi went to visit their miso mentors at Maruman Miso Company in Iida City, Nagano prefecture, Japan. Their factory was completely rebuilt. They also have a very attractive booklet describing research on the health benefits of miso–all in Japanese. Lulu is now in her third year of studies at the University of Victoria, working towards a degree in Pacific and Asian studies, with a concentration in Japanese. Their eldest son, Hikari, is at the University of California at San Francisco doing a PhD in molecular biology.

Yoshi continues to make miso the way he always has,

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slow and steady. Gradually Shin-Mei-Do has more Japanese customers seeking out their miso, but the health food stores are their mainstay. The company's new website is Shinmeidomiso.com.

Their friend Jerry Lewycky is "getting into miso in a big way. He should be very successful. Sincerely, Susan Marie (aka Lulu) Yoshihara."

Talk with Yasuo (nickname "Yoshi") Yoshihara. 2000. Jan. 13. Lulu's maiden name is Susan Marie Pritt. Jerry Lewycky (pronounced le-WIK-ee) used to run a wholesale company in Toronto that used to distribute Yasuo's miso. He sold his company, studied miso making with Yasuo for about a week, then started to make miso last summer in Claremont (near Toronto), Ontario. He wants to run a small company that makes miso in the traditional way. Yasuo does not consider Jerry a competitor. Address: Shin-Mei-Do Miso Co., 3906 Wren Rd., Denman Island, BC, Canada, V0R 1T0. Phone: 250-335-0253.

10707. Skiff, James. 1999. New Japanese law concerning labeling of foods made with genetically engineered ingredients (Interview). *SoyaScan Notes.* Dec. 22. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jim is aware of this Japanese law, which was passed in Oct. 1999 but does not take effect until 1 April 2001. Jim Echle, head of the American Soybean Association office in Tokyo, told Jim about the law; Echle is extremely receptive to the needs of his Japanese customers, such as tofu makers. ASA is also getting more involved with issues involving identity preserved (IP) soybeans; they are organizing an IP conference on Jan. 17 in St. Louis, Missouri.

Skiff then faxes Shurtleff a provisional translation of the labeling guidelines, in the form of a 1-page table. The translation was done by ASA-Tokyo and sent to Skiff by Jim Echle. There are three columns: (1) Classification of food: A. Not equivalent to conventional foods with regard to composition, nutrients, or intended use. B. Equivalent to conventional foods, but modified DNA or protein produced therefrom remains after the manufacturing process. C. Equivalent to conventional foods, but modified DNA or protein produced therefrom is removed or decomposed and no longer exists in the in the final food. (2) Examples of the three types of foods: A. High oleic acid soybean oil. B. Tofu and tofu products, soybean sprouts, natto, soymilk, miso, soybean flour, roasted soybeans, corn, popcorn, potatoes, etc. C. Soy sauce, soybean oil, high fructose corn syrup. (3) Method of labeling: "Soybean (genetically modified),..." Address: US Soy, 2808 Thomason Dr., Mattoon, Illinois 61938. Phone: 217-235-1020.

10708. *ASA Today* (*St. Louis, Missouri*). 1999. ASA supports growers' penchant for biotechnology. 6(2):2. Dec.
• ***Summary:*** Marc Curtis, president of the American Soybean Assoc., presented to the U.S. Senate Agriculture Committee a list of suggestions of what the federal government can do to "strengthen the commercial environment for biotechnology [genetically engineered] crops and products." U.S. soybean growers have lost sales in Europe this year.

"In Japan, a labeling law approved this year could affect up to 700,000 metric tons of soybeans shipped in bulk to the tofu market." Curtis believes it is "good news" that Japanese buyers are lining up Identity Preserved (IP) contracts with U.S. farmers.

Six suggestions are given. A video of Curtis' testimony is available at www.oilseeds.org.asa.video/.

Note: See interview with Jim Skiff, president of US Soy. Dec. 22.

10709. Fisher, Kate. 1999. Varieties yield big business: Food-grade soybeans fuel new enterprises. *Soybean Digest.* Dec. p. 16-17.
• ***Summary:*** About soybean breeder Jerry Lorenzen of Oskaloosa, Iowa. He started researching and breeding food-grade soybeans after he graduated from Iowa State University fifteen years ago.

Earlier this year Lorenzen, now president of FTE Genetics, joined with growers and processors in several new projects, which include a processing plant to make fine soy powder (FSP). FTE is looking for about 100,000 acres of soybeans, according to John Pape, director of specialty operations.

Lorenzen and FTE partnered with Japanese businessman Zentaro Iwamoto and a small group of investors to create a 56-acre industrial park near Oskaloosa named the World Food Park. It will be home to a $4 million state-of-the art soybean conditioning and processing facility named World Food Processing. Two separate facilities will take up about 23 acres of the site.

Some of the beans from the WFP conditioning facility will be made into tofu by Midwest Harvest at Grinnell, Iowa. The tofu will be used in Bratos, a tofu-pork bratwurst developed and marketed by FTE Genetics and Midland Genetics Group (Ottawa, Kansas). Bratos, which are said to be healthier than regular bratwurst, "will be served in 400 schools in Iowa."

Midland officials say that Bratos have some big advantages over regular bratwurst. "They have 50% less fat, 35% fewer calories, 24% less sodium, 17% more protein, and no MSG. And they're fully cooked.

"Bratos are also available in some of the larger chain grocery stores–primarily in Iowa for now."

Talk with soybean industry insider. 1999. Dec. 13. This looks to him like a scam. FTE says they can make a 1,000 mesh soy flour which is impossible. There is no way to sell soy flour from 100,000 acres of soybeans. FTE seems to have gotten some money from Iowa Economic Development.

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10710. Key, T.J.; Sharp, G.B.; Appleby, P.N.; Beral, V.; Goodman, M.T.; Soda, M.; Mabuchi, K. 1999. Soya foods and breast cancer risk: a prospective study in Hiroshima and Nagasaki, Japan. *British J. of Cancer* 81(7):1248-56. Dec. [35 ref]

• ***Summary:*** The association between soya foods and breast cancer risk was investigated in a prospective study of 34,759 women in Hiroshima and Nagasaki, Japan. Women completed dietary questionnaires in 1969-1970 and/or in 1979-1981 and were followed for incident breast cancer until 1993. For miso soup, relative risks were 1.03 (0.81-1.31) for consumption two to four times per week and 0.87 (0.68-1.12) for consumption five or more times per week, relative to consumption once a week or less. Thus, women who consumed miso soup five or more times a week were 13% less likely to get breast cancer than those who consumed it once a week or less. The reason for this protective effect is not known. Address: 1. Imperial Cancer Research Fund Cancer Epidemiology Unit, Gibson Building, Radcliffe Informary, Oxford, OX2 6HE, UK.

10711. *River Currents: News from South River Miso Company* (*Conway, Massachusetts*)**.** 1999. Meet Yukio Doyama. Winter. p. 2. Dec.

• ***Summary:*** Yukio was born in Tokyo, Japan, in 1949. This fall marks his fifth consecutive season as a miso maker at South River. "This kind and energetic man has brought a great deal of stability and continuity to our company. If you are grateful for its existence, you can be sure he has a lot to do with it." A photo shows Yukio. A sidebar shows a small photo of Maria Rossi, who is now an apprentice at the company.

Other photos in this issue show: (1) The miso shop and the Elwell's house in the winter, decked with snow at evening. (2) Six steps in the miso-making process. (4) Six jars of different types of miso.

10712. *SoyaScan Notes.* 1999. Major soy-related company acquisitions and mergers worldwide 1990-1999 (Overview). Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** 1990 Jan.–Worthington Foods acquires La Loma Foods of Riverside, California (formerly Loma Linda Foods, owned by the Seventh-day Adventist Church).

1990 (early)–Daniel Gevaert purchases the Lima Andiran site at Andiran (near Mezin) in southern France from Lima Foods–but not the Lima trademark. In June 1990 Daniel and his wife, Valerie, established Danival.

1990 Aug. 3–Hong Kong Soya Bean Products Co. Ltd. (makers of Vitasoy soymilk) acquires Nasoya Foods of Leominster, Massachusetts.

1990 Dec. 21–The Haldane Foods Group (a subsidiary of British Arkady Ltd., which is in turn owned by ADM) acquires Unisoy Milk 'n' By-Products Ltd. of Cheshire, England.

1991 Jan. 1–The Haldane Foods Group acquires Granose Foods Ltd. of Watford, Hertfordshire, England (formerly owned by the Seventh-day Adventist Church).

1991 Jan. 28–Tetra Pak International acquires Alfa-Laval AB.

1991 April–Huegli Naehrmittel A.G. acquires Soyastern Naturkost GmbH / Dorstener Tofu Produktions GmbH.

1991 Dec.–Specialty Food Ingredients (SFI) Europe BV acquires Solnuts BV (Netherlands) and Solnuts Inc. (Hudson, Iowa).

1992 Oct.–Central Soya Co. acquires the Protein Division of Aarhus Oliefabrik in Denmark.

1993 June–Vitasoy purchases Azumaya Inc. (America's largest tofu manufacturer, and the low-price leader) in California, for an estimated $4-$5 million. Vitasoy is now in the tofu business.

1993 June–21st Century Foods acquires Farm Foods from Barricini Foods.

1993–House Foods of Japan purchases the remaining 50% of House Foods & Yamauchi, Inc. from Mr. Shoan Yamauchi. The new company is named House Foods American Corporation.

1993 July–Nutrition et Santé (part of the Sandoz Group) acquires Société Soy of Saint-Chamond, France. The latter company was renamed Nutrition et Soja, and on 15 Oct. 1994 it moved into a new factory at Revel (near Toulouse), France.

1993 (mid)–B & K Holdings of Switzerland acquires Sojinal of Issenheim, France.

1993?–Kineret (pronounced kuh-NAIR-et) Acquisition Group acquires Farm Foods from 21st Century Foods, then in Nov. 1993 the Hain Food Group acquires Kineret plus some assets of Barricini Foods Inc.

1996 April 22–Alpro (Belgium) purchases Sojinal (France).

1995 April 21–Irene and Len Stuttman buy back control of their company, INARI Ltd. (dba. Sycamore Creek) from J. Charles Follett (former CEO) and Peter L. Pairitz (accountant).

1995 April–Quest International, a unit of Unilever, acquires A.E. Staley's Gunther Products Division.

1997 Feb. 3–Monsanto purchases Asgrow Seed Co. from Seminis Inc., a subsidiary of Empresas La Moderna, S.A. (ELM).

1997 Aug. 24–DuPont signs a letter of intent to acquire Protein Technologies International, a wholly-owned subsidiary of Ralston Purina Co.

1997 Oct. 14–The Hain Food Group acquires Westbrae Natural, Inc., makers of soymilk. Westbrae's new name becomes Hain Food Group–Westbrae. 1997 Dec. 3–DuPont finalizes its purchase of Protein Technologies International (PTI–the world's leading manufacturer of soy protein isolates).

1998 Oct. 16–Worthington Foods purchases the Harvest

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Burger product line from ADM; by agreement, ADM will continue to make the Harvest Burgers at its Illinois plant.

1998 Dec. 31–DE-VAU-GE acquires Bruno Fischer GmbH, which sells bottled soymilk; both companies are located in Germany.

1999 Jan. 4–W.G. Thompson & Sons Ltd. of Blenheim, Ontario, Canada, purchases Sycamore Creek Co., a maker of soynuts and soynut butter (located in Mason, Michigan).

1999 Oct. 4–The Kellogg Co. (famous maker of breakfast cereals, Battle Creek, Michigan) buys Worthington Foods Inc., America's leading maker of meat alternatives.

10713. Sumi, Hiroyuki; Ohosugi, Tadanori. 1999. [Antibacterial component dipicolinic acid measured in natto and natto bacilli]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 73(12):1289-91. Dec. [15 ref. Jap; eng]

• ***Summary:*** "In commercially obtained natto and experimentally-prepared natto preparations, relatively high concentrations of dipicolinic acid, 20.55 ± 13.67 mg/100g natto (0.006-0.048%, wet weight) were detected, using a simple method combined with ion-exchange column and colorimetric assay procedures. These values were less than that of the previous data (0.06-0.20%, wet weight) reported 60 years ago. Dipicolinic acid was thought to be an intracellular component of natto bacilli and could be extracted in the water-soluble fraction by heat-treatment of the sample for 30 min at 120ºC. Furthermore, the partially purified material from natto bacilli caused very strong inhibition of the growth of sake yeasts (Kyokai 7 and Kyokai 9 mutant)" (from journal@rchive).

Note: The title of this journal is romanized (on p. 1289) as *Nippon Nogeikagaku Kaishi*. Address: Dep. of Physiological Chemistry, Kurashiki University of Science and the Arts, 2640 Tsurajima-cho, Kurashiki, Okayama prefecture 712-8505, Japan.

10714. Nikkan Keizai Shinbunsha Co. Ltd. (Nikkan Keizai Newspaper Co. Ltd.). 1999. [Output of natto]. *Monthly Statist. Beverages Foods* p. 40-45. [Jap]*
Address: Japan.

10715. Wolff, David. 1999. To the Harbin Station: The liberal alternative to Russian Manchuria, 1898-1914. Stanford, California: Stanford University Press. 276 p. Foreword by Nicholas V. Riasanovsky. Illust. Index. *

• ***Summary:*** This is the author's PhD thesis transformed into a book. From the publisher: "In 1898, near the projected intersection of the Chinese Eastern Railroad (the last leg of the Trans-Siberian) and China's Sungari River, Russian engineers founded the city of Harbin. Between the survey of the site and the profound dislocations of the 1917 revolution, Harbin grew into a bustling multiethnic urban center with over 100,000 inhabitants. In this area of great natural wealth, Russian, Chinese, Japanese, Korean, and American ambitions competed and converged, and sometimes precipitated vicious hostilities.

"Drawing on the archives, both central and local, of seven countries, this history of Harbin presents multiple perspectives on Imperial Russia's only colony. The Russian authorities at Harbin and their superiors in St. Petersburg intentionally created an urban environment that was tolerant not only toward their Chinese host, but also toward different kinds of 'Russians.' For example, in no other city of the Russian Empire were Jews and Poles, who were numerous in Harbin, encouraged to participate in municipal government. The book reveals how this liberal Russian policy changed the face and fate of Harbin."

"As the history of Harbin unfolds, the narrative covers a wide range of historiographic concerns from several national histories. These include: the role of the Russian finance minister Witte, the building of the Trans-Siberian Railroad, the origins of Stolypin's reforms, the development of Siberia and the Russian Far East, the 1905 Revolution, the use of ethnicity as a tool of empire, civil-military conflict, strategic area studies, Chinese nationalism, the Japanese decision for war against the Russians, Korean nationalism in exile, and the rise of the soybean as an international commodity. In all these concerns, Harbin was a vibrant source of creative, unorthodox policy and turbulent economic and political claims."

10716. Balough, Linda; Bartley, Betty. 1999. A pictorial history of Hendricks County, Indiana. Virginia Beach, Virginia: The Donning Co. 192 p. Illust. Index. 28 cm.

• ***Summary:*** Chapter 8, titled "Agriculture: Crops" contains a description (p. 132) of how Adrian A. Parsons was the first to grow soybeans in Hendricks County in 1886. He imported "soja" seed from Japan to grow on his farm as a feed for livestock. By 1900, Parsons and his sons were growing hundreds of acres of soybeans. A black-and-white photo shows Adrian Parsons with his son, Chet (born 1887), a veteran of World War I, in his uniform, just after he returned from the war.

Note: The first author's surname is pronounced BAY-low. Betty Bartley is the Hendricks County historian. The information in this entry is based on farm newspaper articles from 1930 and 1931, and the family history contributed by Lee Parsons to the 1976 Hendricks County history. Address: 2. Danville, Hendricks Co., Indiana.

10717. Bashô, Matsuo. 1999. The essential Bashô. Translated from the Japanese by Sam Hamill. Boston, Massachusetts, and London: Shambhala. xxiii + 184 p. See p. 94. Maps. 24 cm.

• ***Summary:*** The poem (in Romanization) reads as follows (p. 94):

"Niawashi ya.

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"Mamenoko meshi ni.

"Sakura gari."

Hamill's translation: "It's altogether / Fitting–bean-floured rice balls / while blossom hunting.

Note: "Mamenoko" is the early Japanese word for *kinako,* which is roasted whole soy flour, that is–a flour or powder made by grinding whole roasted soybeans.

10718. Bladholm, Linda. 1999. The Asian grocery store demystified: A food lover's guide to all the best ingredients. Los Angeles, California: Renaissance Books. 234 p. Foreword by Jonathan Eismann. Illust. Index. 23 x 13 cm. Series: A Take it With You Guide.

• ***Summary:*** An original, well-researched and well-written book–though some of the terminology (such as "beancurd") is outdated. Soyfood products include: Beancurd noodles (p. 38). Kinako (p. 47. "A Japanese soybean flour, that is a light tan powder made by roasting and grinding soybeans. This flour is mixed with sugar and used to coat mochi (pounded rice cakes), ohagi (rice balls), and wagashi (a type of confection [Japanese confections]). Look for the Shirakiku brand and Assi roasted soybean flour, both in 1-pound bags"). Soy sauce, mushroom soy sauce, kecap manis (p. 53). Hoisin sauce (p. 54).

Chapter 10, titled "Soybean products" (p. 93-99) includes: Black bean sauce, dried soybeans, tempeh, beancurd (pressed beancurd, deep-fried beancurd, savory grilled beancurd {yaki-tofu}, freeze-dried beancurd [sic] {koyadofu}, bean curd sheets {fu pei, yuba, fu jook; the latter are "rolled-up, long, rumpled, cream-colored sticks of bean curd skin, bent in two"}), fermented beans (preserved black beans {fermented black beans, tau see}, bean sauce, toen-jang, chili/hot bean sauce, fermented beancurd), okara, edamame, soybean sprouts, soy milk.

Note: This is the earliest English-language document seen (March 2009) that uses the word "toen-jang" (or "toen jang") to refer to Korean-style soybean jang (miso).

Concerning preserved black beans: "Also called salted or fermented black beans or 'tau see,' this is made by steaming small black soybeans, then fermenting them with salt and spices. Used in a variety of dishes to add a pleasant rich aroma and salty taste... Crush or mash beans slightly to release more flavor or mix with garlic, fresh ginger, or chilies. Available in small glass jars, cans, and plastic bags. They should feel soft and not be dried out... Look for Pearl River Bridge brand labeled 'Yang Jiang Preserved Beans' in a 1-pound yellow canister, and Koon Chun Sauce Factory, Double Parrot, and Zu Miao Trademark brands all in 8-ounce bags." Note: This is the earliest English-language document seen (Nov. 2011) that uses the term "tau see" to refer to Chinese-style fermented black soybeans (preserved black beans).

Concerning bean sauce: "Varieties of this Asian staple include yellow bean sauce, brown bean sauce, bean paste (tau jeong), or sweet bean condiment. All are made from yellow or black soybeans, fermented with salt and in the sweet Northern Chinese type, with sugar-sweetened crushed yellow [soy] beans. Two forms are found: whole beans in a thick sauce and bean paste, which is mashed, ground or pureed beans. The whole bean type has a rounder flavor and adds texture, while the pastes are very salty and should be used sparingly... The yellow bean paste is tau cheo... Sold in glass jars and cans. Look for Koon Chun Sauce Factory, Kon Yick Wah Kee bean sauce, Amoy, or Yeo's.

Chapter 18, titled "Japanese food products" (p. 168-81) includes: Tsukemono (pickled in miso), miso paste, shiromiso, akamiso, mamemiso, natto, miso soup, noodle dipping sauce base (memmi), tamari sauce, teriyaki sauce, tonkatsu sauce.

Interesting non-soy products include: Sesame paste (p. 57). Satay sauce (with peanuts), gado-gado-dressing (p. 58). Peanut oil (p. 64). Sesame oil (p. 65). Amaranth (vegetable, p. 72). Winged beans (p. 76). Pickled wheat gluten (p. 108). Sesame seeds, peanuts, roasted peanuts (p. 118). Red/azuki beans, agar-agar (p. 121). Wheat gluten (p. 127). Sesame candy, peanut roll (p. 136). Sesame seed and peanut cookies (p. 137). Sweet red bean paste (azuki *an,* p. 139). Coix seed (Job's tears, p. 165). Japanese seaweed and kelp (p. 169-70). Umeboshi (p. 171). Fu (dried wheat gluten cakes), mochi (p. 177).

Note: Although angkak / ang-kak is not mentioned by name, under "red yeast rice" part of the description is "Did you ever admire those glowing red ducks and spare ribs in Chinese restaurants? The red color comes from powdered red yeast rice which is an ingredient in the marinade and barbecue sauce." Since this product is made with a mold (*Monascus purpureus*) and not a yeast, we prefer the term "red rice koji" in English. Address: Writer, designer, illustrator and photographer, Miami Beach, Florida.

10719. Davidson, Alan. 1999. The Oxford companion to food. New York, NY and Oxford, England: Oxford University Press. xviii + 892 p. Illust. by Soun Vannithone. Index. 29 cm. [1500+* ref]

• ***Summary:*** The 2,650 alphabetical entries in this excellent encyclopedia and cornucopia represent 20 years of Davidson's work. The 175 illustrations by Laotian artist Soun Vannithone are superb. There are 39 longer entries about staple foods such as rice, noodles, and apples. A comprehensive bibliography provides access to further information. The book does not contain recipes.

Soy-related entries include: Bean sprouts (p. 64). Black beans, fermented (*chi,* p. 79). Kecap (Indonesian soy sauce, made "basically from soya beans and palm sugar only." "The word 'kecap' has passed into the English language as catchup or catsup and then as Ketchup, which now means something quite different." p. 429). Ketchup ("probably via the Malay word *kechap,* now spelled *kecap,* which means soy sauce.

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The word was brought back to Europe by Dutch traders who also brought the oriental sauce itself. The sauce has changed far more than has the word, although the name has appeared in a large number of variations such as catchup and catsup."

Tomato ketchup is now the best known and widely used–in fact almost the only ketchup left. Whereas tomato ketchup contains much sugar and vinegar, mushroom ketchup contains neither, and is basically a salted mushroom extract with a liquid, transparent consistency. The British food historian, C. Anne Wilson (1973), believes that mushroom ketchup was the first kind of ketchup in Britain; she argues that people used to pickle mushrooms, intending to use the mushrooms, but then started using the pickle too, and finally began using the pickle by itself.

"Oysters, mussels, walnuts, and many other ingredients have been used to make ketchup, and cold be blended with spices, garlic or onions, wines and spirits to vary the flavour" p. 430-31). Koji (p. 435). Lecithin (p. 447). Miso (p. 509). Natto (p. 530). Soybean (p. 739). Soy milk (p. 739-40). Soy sauce (p. 740). Tempe (or tempeh, p. 788). Tofu (p. 798-99), including plain tofu (doufu in Chinese), pressed tofu (*doufu-kan,* sic, *doufu-gan*)*, wu-hsiang kan,* cotton tofu or momendofu, kinugoshi or silk tofu, sui-doufu, freeze-dried tofu [dried frozen tofu], smoked tofu. Cooked forms of tofu: Deep-fried tofu, doufu pok, cha-dofu, abura agé or deep-fried thin slices which can be opened to make Inari-zushi, ganmodoki or deep-fried tofu balls, yaki-dofu or tofu which has been grilled. Fermented tofu: The generic term is doufu-ru. The most popular type is white doufu-ru, and there is red doufu-ru, tsao-doufu, ch'ou doufu [chou doufu], chiang doufu. In the Philippines fermented tofu is called tausi [sic, tahuri, tahuli; tausi is fermented black soybeans]. Miscellaneous: A specialty of Japan is *umesutsuke,* "tofu pickled in plum vinegar with a purple exterior." Note: As of Oct. 2011 not one hit / result for umesutsuke can be found on Google. Nor have we ever heard of such a Japanese tofu product.

Dofu nao (literally "bean brain") or smooth curds, yuba or "bean curd skin" or "tofu skin," okara or "presscake" (pulped skins of soya beans) (p. 798-99). Yuba (p. 860-61).

Also discusses: Alfalfa (p. 10). Almond (p. 12-13, incl. "almond milk"). Amaranth (p. 13). American cookbooks, history (p. 15-17). Azuki beans (p. 44-45). Barley, barley breads, and barley sugar (p. 58-60). Beef–BSE (mad cow disease, p. 68). Chia (p. 166). Cowpea (p. 230-31). Chufa (p. 185). English cookery books, history (p. 276-80). Five grains of China (p. 305). Gluten (p. 341). Groundnuts (or peanuts, p. 356-57). Hemp (p. 377-78). Hydrogenation (p. 391). Japanese culinary terms (p. 415-17). Kudzu (p. 437). Linseed (p. 454-55). Lupin (p. 463). Margarine (p. 478-79). Mung bean (p. 518). Nori (p. 534). Noodles of China (p. 537, incl. "Gan si {soya bean noodles}" and "Fen si {also fen-szu} {mung bean vermicelli})." Oncom (p. 553-54). Quark (p. 644). Quinoa (p. 645). Seaweeds (incl. hijiki, kombu/konbu, nori, wakame, etc., p. 712). Sesame (p. 713). Shortening (p. 721-22). Sprouts (no listing). Tahini (p. 779). Toast (p. 797, incl. Melba toast). Ume and umeboshi (p. 817). Winged bean (p. 849).

The entry for "Fermentation" states that the two main reasons for subjecting a food to fermentation are: (1) To "convert it from a form that will not keep, such a milk, to one which will, such as cheese." (2) To "make foods which are indigestible in their original state, such as wheat or soya beans, digestible by turning them into products such as bread or tempe." Other benefits include improvements in flavour. Many do not realize that fermentation is part of the process of making coffee, cocoa, vanilla, and many kinds of sausage. A brief biography and nice portrait photo of Alan Davidson, a man of extraordinary knowledge in the world of food, appear on the rear dust jacket.

Note: The paperback edition of this book (2002) is titled *The Penguin companion to food.* Address: World's End, Chelsea, London, England.

10720. Hanamaruki Foods Inc. 1999. International cooking with miso (Leaflet). Nagano Prefecture, Japan. 1 p. Front and back. 30 cm. [Jap]

• ***Summary:*** The front of this color brochure is in English and the back is in Japanese. On each side are four recipes: Miso soup with nameko mushrooms and tofu bean curd. Tonjiru. Eggplant and pork fried in miso. Miso-flavored bouillabaisse. Address: Hirade 1560, Tatsuno-cho, Kamiina-gun, Nagano-ken 399-0422 Japan. Phone: 0266-41-1321.

10721. House Foods America Corp. 1999. Hinoichi Tofu: America's favorite tofu recipes. 4 vols. (Recipe cards). Garden Grove, California. 3 panels each side. Each panel: 7.6 x 12.6 cm. [Eng]

• ***Summary:*** These dated, glossy color cards each contain 3 recipes. The front three panels of each set are approximately the same: (1) Cover: "Hinoichi Tofu: California's number one tofu." (2) Our family of tofu varieties (7 SKUs): Organic soft. Organic regular. Organic firm. Organic extra firm. Soft. Regular. Firm. Extra firm. Tofu cutlets. (3) Hinoichi is California's number one tofu.

The recipes in Vol. 3 are: Soy-sational guacamole. Spicy tofu burritos. Peach sunshine smoothie (nondairy, with Hinoichi Soft Tofu).

The recipes in Vol. 4 are: Picante bean dip. Spinach fettucine alfredo. Tropical fruit pudding.

To the left of each recipe is a color photo of the ready-to-eat dish and nutritional information per serving. Address: 7351 Orangewood Ave., Garden Grove, CA 92841.

10722. Jue, Joyce. 1999. Asian flavors. Alexandria, Virginia: Time-Life Books; Menlo Park, California: Oxmoor House. 111 p. Illust. (photos by Richard Eskite, some color). 26 x 23 cm. Series: Williams-Sonoma Lifestyles.

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• ***Summary:*** An attractive, glossy color book with a full-page color photo facing every recipe. The "Welcome," by Chuck Williams (p. 7) begins: "Not so long ago, 'Asian food' meant Chinese food, more specifically the Cantonese-style cooking many Westerners grew up enjoying when they went out to eat."

Soy related recipes: Miso soup with tofu and mushrooms (p. 27). Sizzling rice cake soup with crab (with "½ lb {225 gm} firm tofu, finely diced," p. 35). Miso-glazed sea bass (p. 97).

The Glossary (p. 108-11) includes: Bonito flakes, dried. Red bean curd (also known as fermented bean curd or fermented tofu). Rice, sticky. Sesame oil, Asian (always made from toasted sesame seeds, almost always used as a seasoning). Soy sauces ("Soy sauces from Japan tend to have milder, sweeter, less salty flavors than Chinese products"). Tofu ("Chinese bean curd tends to have a firmer consistency than the Japanese variety").

Joyce Jue, who created the recipes, was born in 1947. Address: Native of San Francisco's Chinatown, and an internationally recognized authority on Chinese and Southeast Asian Cooking.

10723. Jûyô dôko chôsa hôkokusho: Shiyokuse–1998–Misosei [Research report on consumption trends: Saltiness characteristics–1998–Essence of miso]. 1999. Tokyo: Chushô Kigyô Jigyôdan Chôsa Kokusai-bu Chôsa-ka. 277 p. 30 cm. [Jap]*
Address: Japan.

10724. Kamachi, Noriko. 1999. Culture and customs of Japan. Westport, Connecticut: Greenwood Press. xxxii + 187 p. Illust. Maps. 25 cm. Series: Culture and customs of Asia. [65+* ref]
• ***Summary:*** Chapter 6, "Cuisine," focuses on typical Japanese meals today. Most urban Japanese today have a Western-style breakfast, which can be prepared more quickly. "The traditional breakfast requires cooking rice, making miso soup, drilling dried fish, and slicing pickled vegetables." Natto (fermented soybeans) was often served with raw egg. Also popular was raw egg seasoned with soy sauce poured over a bowl of steaming hot white rice.

In chapter 9, "Holidays, festivals, and annual events" is a section about "Setsubun (Celebration of new season)" (p. 142-43). In ancient times at Japan's imperial court, rituals to commemorate passage of the four seasons were observed. During the Heian period (794-1185), these were very serious concerns for the court nobles and aristocrats. The most important ritual, celebration of the beginning of spring, had spread among the commoners by the Edo / Tokugawa period (1600-1867) and was observed nationwide. However Setsubun is not designated as a national holiday and the custom is no longer observed in most households. However it is practiced in a big way in some Buddhist temples, where many people gather to participate in the ceremonies.

On the evening of *risshun* (the first day of spring, which falls on Feb. 3 or 4), a ritual took place in ancient times in the imperial court to chase out evil spirits. Long afterward, ordinary people adopted the ritual of scattering beans inside their house while shouting "Devils out, Good fortune in!" It is fun for children to scatter soybeans while wearing homemade masks of the devil or the goddess of fortune. During the period immediately after World War II when treats were scarce, eating roasted soybeans made this ritual doubly enjoyable. Address: Prof. of History, Univ. of Michigan, Dearborn.

10725. McEwen, Freeman; Morrison, Douglas; Rennie, Clare; Tanner, Jack. 1999. 125 years of achievements: OAC–A proud tradition, an exciting future, 1874-1999. Guelph, Ontario, Canada: University of Guelph. 132 p. Illust. 22 x 28 cm.
• ***Summary:*** Contents: 1. New beginnings. 2. Administration and co-ordination. 3. Teaching. 4. Research. 5. Extension and service. Within these are 125 achievements, each covered on one page; the page number is the same as the number of the achievement. Thus, achievement no. 56 appears on p. 56. The soybean is the subject of or mentioned in five of these achievements, all within Chapter 4, "Research" (p. 56-109) as follows:

OAC 211 soybean (p. 56): This is the first achievement described under "Research." A photo shows Charles Zavitz (seated at his desk), the pioneer in bringing soybeans to Canada. Zavitz graduated in OAC's the first degree class in 1888 and was hired by the College as an assistant experimentalist in charge of field plots. In 1893, the same year he was put in charge of all field research at OAC, Zavitz obtained five soybean varieties from Dr. C. Georgeson of Kansas State Univ. In 1898, after five years of trial, he reported that Early Yellow was the highest yielder. Over the next few years Zavitz introduced approximately 100 new soybean lines from Asia, and in 1901, through the Experimental Union, soybean seed was sent to farmers for evaluation. Like most plant introductions, these soybean lines were not pure lines, but contained some "off types," so Zavitz made pure-line selections from some of these lines. Initially Zavitz selected OAC 111 from Early Yellow. Then in 1918, he made 34 selections from 10,000 plants of the introduction, Harbaro [sic, Habaro] No. 10405. The progeny of 22 of these lines were tested under uniform conditions. The line that produced the highest yields was placed in regular variety trials in 1921; it beat all other varieties in grain yield and was second in fodder production. Designated OAC 211, it became the first soybean variety registered in Canada–on 26 Aug. 1925. During the years when Zavitz was evaluating soybean varieties, he was also researching soybean management techniques. The first commercial production of soybeans in Ontario took place in 1925 in

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Essex and Kent counties. By 1932 production in the province was almost 8,000 acres; by 1940 it was 10,000 to 11,000 acres, and by 1997 it had skyrocketed to 2.3 million acres, "the largest of any crop in Ontario. Zavitz would have been proud!"

Early OAC forage varieties (p. 57). About the work of Prof. O.M. McConkey, with a portrait photo. He joined the Field Husbandry Dept. in 1923.

Soybean expansion in Ontario (p. 65): Three men were pioneers in trying to expand soybean production in Ontario. Prof. George Jones, who joined the department in 1952, believed soybean production could be greatly expanded from the 200,000 acres then being grown. Prof. Jack Tanner joined the department in 1963, and Prof. David Hume arrived in 1966. But many problems stymied their efforts. Two events changed the environment for soybean expansion. First, as the corn crop expanded, it paved the way for soybeans (see p. 69). "Second, Dr. Harvey Voldeng, soybean breeder at the Central Experimental Farm in Ottawa, released the varieties Maple Arrow and Maple Glen." "These new varieties provided the final piece of the 'production package' which included varieties with a good yield potential, improved techniques for inoculating seed and improved herbicides for selective control of weeds. Confident that the production package was complete, Prof. Hume and his cohorts moved aggressively to promote it directly to farmers through farm meetings, field demonstrations, and FactSheets and indirectly through extension personnel and industry specialists. In 1997, approximately 2.3 million acres of soybeans were planted between Windsor and the Ottawa Valley and more land was planted in soybeans than in any other cash crop." A photo shows Prof. Hume discussing soybean varieties and management practices at a growers' meeting.

Zoning for crop variety recommendations (p. 72): Discusses the Crop Heat Unit System and shows two maps where climate zones are delineated by heat units. This heat unit system, used for hybrid corn recommendations since 1964, was now applied to soybean varieties.

Improved soybean varieties (p. 73): From 1980 to 1997 Ontario's soybean acreage increased fourfold. Improved varieties were developed by the OAC Department of Crop Science. Most important, they were higher yielding, but also more resistant to lodging, to *Phytophthora* root rot and to other diseases. Prior to 1983, only 3 soybean varieties had been released from OAC. Since then 44 have been registered. This highly effective soybean breeding program was started by Prof. Wally Beversdorf, then successively led by Profs. Jack Tanner and Bruce Luzzi. The best variety to date has been OAC Bayfield, which out-yielded existing varieties by 15%. In 1998 it was grown on 400,000 acres in Ontario–the biggest soybean acreage for a soybean variety in Ontario. Other important varieties have been OAC Eric and OAC Millennium. In 1997 the soybean crop in Ontario was worth $800 million. A photo shows Wally Beversdorf inspecting soybean plants.

Accommodating to Canada's cold climate (p. 83): In the late 1960s, Prof. J.W. Tanner began to study cold tolerance in soybeans. Prof. D.J. Hume researched the physiological basis for cold tolerance exhibited by some of the soybean varieties–developed by Dr. Harvey Voldeng of Agriculture Canada, Ottawa–which had the Swedish variety Fiskeby V as a parent. The gene for chilling tolerance had come from a soybean variety from Hokkaido, Japan, in the 1940s.

An improved soybean rhizobium: 532C (p. 93): Some Rhizobium strains are more effective that others in fixing atmospheric nitrogen. In the early 1980s Prof. David Hume, Dep. of Crop Science, began to screen for more effective strains of soybean rhizobia. He obtained a number of strains from Dr. Joe Burton of the Nitragin Company in Milwaukee, Wisconsin, and by 1988 found that one strain, 532C, supported better yields (7% higher) and higher protein contents than other strains tested. It was promoted to commercial inoculant companies in North America. By 1990, all the soybean inoculants sold in Canada contained 532C. It is estimated that 532C occupies about 30% of the soybean-growing soils in Ontario and most of Quebec. Address: Univ. of Guelph, Guelph, Ontario, Canada.

10726. Miso [Miso]. 1999. Tokyo: Shibata Shoten. 109 p. Illust. (some color). 24 cm. Series: Shibata Books. [10+ ref. Jap]*
Address: Japan.

10727. Miyoshi, Motoharu. 1999. Kore de wakaru honmono mizu shio miso shôyu: mô damasarenai nani ga honmono nanoka sono kijun o zubari to shimeshita [This books enables you to understand real water, salt, miso and shoyu: No more being fooled. What is the real thing? This book shows the nature of real things very directly and truthfully]. Tokyo: Tsukiji Shokan. 122 p. 19 cm. [Jap]*
Address: Japan.

10728. Mowe, Rosalind. ed. 1999. Southeast Asian specialties: A culinary journey through Singapore, Malaysia, and Indonesia. Cologne, Germany: Culinaria Koenemann. 319 p. Illust. (color photos by Günter Beer). Index. 26 x 22 cm.
• ***Summary:*** Translated from the German. Includes headings in Chinese. This book is a feast for the eyes, printed on glossy paper with informative color photos on almost ever page. The structure and content are also creative and very interesting; it has caught the heart and spirit and nuances of the culture. On some pages, however, the type is too small to read. The name of most recipes and ingredients is given in their native language. A 2-page map of Southeast Asia appears near the front. The basic structure: Singapore (p. 12-109). Malaysia (p. 110-215). Indonesia (p. 216-301). Glossary (p. 302-04). Introduction to Chinese nutritional

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theory, by Andrea Fülling (p. 305-06): Introduction, yin and yang, the three warmers, the warming effect of foods (the five energy states are hot, warm, neutral, refreshing, and cold), the five elements. Acknowledgements. Photo credits. Index.

The contents includes: Healing herbs (p. 26-29). Soup as medicine (p. 30-33). Soybean (in Singapore, p. 40-47): Introduction (familiar forms are sprouts, soy sauce, beancurd, tempeh; new disguises are "vegetable protein," emulsifier," "lecithin," "vegetable oil" which are found in dairy products, canned fish, candies, desserts, and much more), in the West soybeans are "often grown as monocultures, with the disadvantages that this entails, such as the use of chemical fertilizers and pesticides," and genetically engineered soybeans, great nutritional value yet rarely used as whole dry soybeans, most of the harvest in SE Asia is processed into beancurd and tempeh, importance of fermentation, soy milk resembles cow's milk and is an excellent substitute, soy sauce is used throughout this cuisine. Photo of green soybean plants with green pods.

Soybean sprouts: "Black soybeans are imported from Thailand and Myanmar (Burma)." After washing, the beans are spread out in deep baskets and kept in the dark for 6 days. "Before the baskets of sprouts can be sold, the top layer if green leaves is trimmed off. They are used as feed for chickens and ducks. One basket yields 154 lb (70 kg) and the output of a medium-sized business is 60 baskets a day." Soybean "sprouts should never be eaten raw, nor should they be cooked for too long." Mung bean sprouts are better known than soy sprouts, but both can be bought fresh.

Dou ban jiang ("Salted soya bean sauce." Photo of jar and Sinsin label). Dou chi ("Black bean sauce." Photo of jar and Sinsin label). Note 1. Typically Dou chi are named "Salted black beans." Photo of five glasses showing how dry soybeans are transformed into soymilk, then curds.

Tofu: Meat from the fields (p. 42-44). The best tofu is made from special types of soybeans that are different from those that are crushed to make oil and meal. Most of the tofu in Singapore is made from soybeans imported from Canada. Describes the basic process for making commercial pressed tofu or soft tofu, with 7 photos showing the steps. Implies that making yuba is part of the process for making tofu; it "is eventually sold as dried beancurd sticks (*fu chok*).

Soy milk products: Fu pei–dried tofu skin [yuba]. Fu chok–dried tofu sticks [dried yuba sticks]. Tim chok–sweet tofu pieces [sic, sweet dried yuba / ama-yuba].

Note 2. This is the earliest English-language document seen (Feb. 2012) that uses the term "Tim chok" to refer to sweet dried yuba, or that uses the term "dried tofu sticks" to refer to dried yuba sticks.

Tofu fa–soft tofu as a dessert [tofu curds]; a little tapioca flour may be added. "Served warm or cold with a syrup flavored with almond extract." Color photo shows yellow yuba atop hot soymilk, and a woman removing a slab pressed tofu from its mold.

Tofu recipes for every taste (p. 44-45): "Tofu on its own is rather bland in taste, but this is precisely its strength, since when it is combined with different ingredients and condiments it tastes new and different every time. Recipes: Niang dou fu (Fried beancurd pockets). Xia ren dou fu (Stir-fried beancurd with jumbo shrimp). Hong shao dou fu (Braised beancurd). Sui rou zheng dou fu (Steamed soft beancurd with ground pork). Dou hua (Sweet beancurd dessert). Zha fu pi juan (fried beancurd skin [yuba] roll). Color photos show the 2nd and last recipes.

Soy sauce (p. 46-47): A naturally fermented product made with mold cultures of *Aspergillus oryzae.* Describes the process for both light and dark soy sauce; the koji is made in shallow round trays, ready after 4 days. It is "then transferred into fiberglass tanks [or earthenware jars], covered with brine, and left to ferment for 3 months," after which the 1st extraction of crude soy sauce takes place [but not through pressure]. More brine is added and a second extraction takes place 1 month later; this process is repeated for the third extraction. "At this point, the paths of the different soy sauces diverge." The saltier, light-colored soy sauce is mixed with a preservative, pasteurized, "and stored in tanks to clarify before bottling." The dark soy sauce is mixed with both a preservative and caramel coloring, is allowed to mature for an additional 4 weeks, then is pasteurized and bottled. Note 3. What happens to the 2nd and third extractions? Color photos show five steps in the process, but a traditional earthenware vat is shown instead of the fiberglass tanks. Dark soy sauce is thicker than light. Recipes: Jiang you ji (Chicken in soy sauce, with marinade). Hong shao niu nan (Braised shoulder of beef).

Oyster sauce (contains no soy). Sesame oil (p. 49, with 7 photos).

Condiments (p. 50-51): Color photos show the front and label of 15 separate jars and bottles with a substantial description under each. Those containing soy are: Hoisin sauce. Dou chi (Fermented bean dried). Dou ban jiang (Tou cheong). Fu ru (Beancurd preserved). Jang qing (light soy sauce). Hei jiang you (Dark soy sauce). Tian jiang (Sweet sauce).

Peking duck (p. 62-65; soybean paste {no Chinese name is given} and Hoisin sauce are ingredients in the sauce). One key is the crisp skin. It is served in thin Mandarin pancakes.

Suckling pig (p. 86-87): Piglets are bred in Hunan province. Slaughtered at the age of 3-4 months. After a dead piglet has been patted dry, it is brushed with soy sauce, then coated with a marinade that includes fermented red bean curd and light soy sauce. As with Peking Duck, suckling pig is prized for its crisp, tasty skin. Six photos show the skewered baby pig.

Symbolic foods (p. 98-101): One of these is Moon Cakes from the mid-autumn festival (15th day of the 8th lunar month). "Traditional fillings include sweet black bean

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or lotus paste." Is the sweet black bean filling made from soy beans?

Instant cup noodles [instant ramen] (p. 48): Note 4. Wikipedia says at Momofuku Ando: ORS [Order of the Rising Sun], (lived March 5, 1910–Jan. 5, 2007) was the Taiwanese-Japanese businessman who founded Nissin Food Products Co., Ltd. He is famed as the inventor of instant noodles and cup noodles, which he launched on 25 Aug. 1958 (at age 48) under the name Chikin Ramen–after months of trial and error experimentation to perfect his flash-frying method. On 18 Sept. 1981 he launched his most famous product, Cup Noodle.

Beansprouts (p. 154-57): With a long introduction, a description of the process, beautiful photos, and recipes: Taugeh goreng kucai (Fried beansprouts with chives). Taugeh masak kerang (Fried beansprouts with baby clams). Tahu goreng (Fried tofu with beansprouts). Bihun goreng (Fried rice noodles). Urap taugeh (Fried beansprouts with grated coconut).

Nasi tumpeng (rice cone) (p. 220). Served with sambal goreng tempe (crisp-fried marinated strips of tempeh). Gudeg (rice with green jackfruit cooked in a sweet sauce, p. 221) is served with a side dish of tahu goreng bacem (tofu cooked with spices, then fried).

Tempeh (p. 228-29), soybeans fermented with *Rhizopus oligosporus* mold. Indonesians consume more tempeh than tofu. The process is described, with 4 color photos: Recipe: Tempe goreng (fried tempeh).

Glossary (p. 302-04) includes: Fermentation. Soy sauce ("Probably the best-known Asian seasoning agent,..."). Sticky rice (also known as glutinous rice). Tahu (Indonesian; tofu). Tempeh. Tofu (beancurd, incl. hard, soft, and smoked).

10729. Murakami, Ryû. 1999. Miso soup [Miso soup. Translated from the Japanese by Corinne Atlan]. Arles, France: Editions Philippe Picquier. 237 p. 21 cm. [Fre]*
• ***Summary:*** A novel. The author was born in 1952.

10730. Nattô [Natto]. 1999. Tokyo: Asupekuto. 135 p. 20 cm. Series: Shihô no Dentoshoku (The Most Valuable Traditional Foods), no. 1. [Jap]*

10731. Okura Boeki-cho (Ministry of Finance, Division of Trade). 1999. Miso yûshutsu tsûkan jisseki–Heisei 10 nen [Japan miso exports worldwide in 1998]. Tokyo, Japan. 1 p. [1 ref. Jap]
• ***Summary:*** This 1-page table, written in Japanese, gives the exports of miso to various countries, in calendar year 1998, by region. We will list them here in descending order of volume by region–in kilograms. Asia: Taiwan 349,591. Hong Kong 332,325. Korea 232,115. Singapore 120,681. Thailand 100,459. Philippines 44,605. Malaysia 40,129. Indonesia 26,585. China 23,024.

Middle East: United Arab Emirates (*Arabu*) 9,895. Israel 4,887. Kuwait 1,256.

Europe (Western and Eastern): Netherlands 115,703. Germany 102,724. England 74,231. France 45,971 Sweden 40,170. Italy 20,283. Belgium 17,932. Austria 13,370. Spain 6,118. Denmark 4,090. Canary Islands (Spain) 2,000. Russia 1,715. Finland 1,310. Switzerland 450.

North America: United States: 2,297,893. Canada 242,240.

Latin America: Argentina 12,589. Brazil 12,338. Costa Rica 400.

Africa: South Africa 2,678.

Oceania: Australia 164,601. Guam 31,553. New Zealand 27,621. Mariana Islands 6,578 (of which the largest is Guam). Palau Islands 650.

Note: This is the earliest document seen (March 2010) concerning soybean products (miso) in Palau; soybeans as such have not yet been reported.

Total exports. 4,531,300 kg. Total amount of miso made in Japan in 1998: 548,750,000 kg. Percent of miso made that is exported: 0.82%. Address: Japan.

10732. Onajimi nattô de odoroki recipe (101 recipe): Gakken hit mook [Using natto to make 101 recipes that will surprise you: Available from Usenet]. 1999. Tokyo: Preschool. 73 p. 26 cm. [Jap]*

10733. Sumi, Hiroyuki; Naoe, Katsushi. 1999. Nattô no susume: Shintai to kakei o tasukeru soshoku no ôsama [Recommending natto: The king of humble foods that helps body and home budget (economy)]. Tokyo: Pieichipi Kenkyujo (P.H.P. Research Lab). 210 p. 18 cm. Series: PHP Business Library; New Life. [Jap]*

10734. Togano, Meijiro. 1999. Saishin shôyu jôzô-ron [Principles of modern shoyu brewing. 3 vols.]. Tokyo: Ryûkei Shosha. Illust. 22 cm. Series: Meiji Kôki Sangyô Hattatsushi Shiryô, Nos. 459-461. [Jap]*
• ***Summary:*** This is a modern edition of his classic, first published in 1913 and 1914.

10735. Tsumami edamame no ima dakara hanaseru boku no kyôfu namataiken [My horrible experiences using edamame as a finger food, which I can finally talk about]. 1999. Tokyo: Takeshobo. 201 p. 15 cm. [Jap]*
• ***Summary:*** The author gives his or her fictitious name as "Tsumami Edamame," which means "Finger food / snacks + edamame green vegetable soybeans." This is a book about "mind and spirit research"–not a recipe book. Address: Japan.

10736. Wakai, Kenji; Ohno, Yoshiyuki; Genka, Keiichiro; et al. 1999. Risk modification in lung cancer by a dietary intake of preserved foods and soyfoods: findings from a case-control study in Okinawa, Japan. *Lung Cancer* (*Amsterdam,*

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Netherlands) 25:147-59. AsEaJapa [32 ref]
• ***Summary:*** Data were analyzed from 1988 to 1991 based on 333 cases and 666 age-, sex- and residence matched controls. Findings: The greater the intake of miso soup, the higher the risk (test for trend: P = 0.001 for males; = 0.043 for females).

Frequent consumption of soybeans was associated with a decreased risk in men (adjusted odds ratio {OR} 0.63, 95% CI [confidence interval]: 0.40-0.98 for once or twice a week or more, relative to less than once a month). Daily consumers of tofu were at a reduced risk, particularly for squamous cell carcinoma [a type of nonmelanoma skin cancer]; the OR (95% CI) is 0.55 (0.34 to 0.89) in males and 0.14 in females. These findings suggest deleterious effects of preserved foods and protective effects of soyfoods rich in isoflavones.

Isoflavones could well be another relevant dietary factor. They have been considered to exert anti-estrogenic effects in premenopausal women and estrogenic effects in postmenopausal women and in men. Thereby, they reduce the risk of some hormone-related cancers such as those of the breast and prostate.

Yet isoflavones also have non-estrogenic biological activities that may inhibit carcinogenesis. These include inhibition of tyrosine protein kinases, DNA topoisomerases and ribosomal S6 kinase activity, inhibition of angiogenesis, antioxidative properties and induction of malignant cell differentiation. Therefore it seems reasonable to hypothesize that isoflavones could be protective against not only hormone-related cancers, but also a wider ranger of malignancies including lung cancer. Address: 1. Dep. of Preventive Medicine, Nagoya Univ. School of Medicine, 65 Tsuramai-cho, Showa-ku, Nagoya 466-8550, Japan.

10737. Wakai, Kenji; Egami, Isuzu; Kato, Kumiko; et al. 1999. Dietary intake and sources of isoflavones among Japanese. *Nutrition and Cancer* 33(2):139-45. [35 ref]
• ***Summary:*** The dietary intake and sources of isoflavones (daidzein and genistein) among Japanese subjects were examined based on dietary records (DRs). The subjects comprised two groups: 1,232 who completed one-day DRs (Group 1) and 88 men and women who kept four four-day (16-day) DRs. For quantitative data on the level of daidzein and genistein in soy foods, the literature was thoroughly examined, particularly for Japanese soy foods, and adopted the median value for each food. The median intake of daidzein was 12.1 and 9.5 mg/day among Groups 1 and 2, respectively, while the corresponding values for genistein were 19.6 and 14.9 mg/day. About 90% of the daidzein and genistein in the Japanese diet comes from 3 soyfoods–tofu (including fried tofu), miso, and natto.

Table 2, titled "Estimated total daidzein and genistein contents of soy foods: Median values among results of food" lists these foods: Soybeans, dry. Soybeans, green [edamame]. Soybeans, boiled. Kinako (roasted and ground soybeans). Soybean sprouts. Tofu. Tofu, freeze dried ("kohri tofu"). Fried tofu, thin ("abura-age," deep-fried). Fried tofu, thick ("nama-age," fried briefly). Fried tofu and minced vegetables / seaweed ("ganmodoki"). Soy milk. Okara (tofu lees). Yuba (dried soy milk skim). Natto (fermented soybeans). Miso. Soy sauce. Address: Dep. of Preventive Medicine, Nagoya Univ. School of Medicine, 65 Tsuramai-cho, Showa-ku, Nagoya 466-8550, Japan.

10738. Zenkoku Miso Kogyo Kyodo Kumiai Rengokai (Japanese National Miso Association). 1999. Okazu miso gokuraku zukan [Illustrated heavenly miso side dishes]. Tokyo: Shoshinsha. 115 p. 21 cm. Series: Cooking & Home Made; Asobitsutuski. [Jap]*
Address: Japan.

10739. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo*). 2000. Masani sekai ryôri no shukuzu: "Edamame" ga bureiku [New York–Its exactly a miniature of world cookery: Edamame is the breakthrough]. Jan. 1. p. 8. [Jap]
• ***Summary:*** This is an article about New York-style cooking. If you want to understand American-style cooking, go to New York City–where all the different regional styles can be found and epitomized. Americans are becoming more health conscious–led by the people of New York City. This as led to an explosion of interest in Japanese food–a Japanese food boom! Americans now realize that soy is good for one's health. In 1999 the *New York Times* (Sept. 8., p. F3) introduced edamame and gave a recipe.

Note: The article was "Bet you can't eat just one," by Amanda Hesser. Address: Tokyo, Japan.

10740. Wright, Allison. 2000. FDA health claim about soy will grow tofu category, says Mori-Nu's Mio. *Produce News* (*Fort Lee, New Jersey*). Jan. 10.
• ***Summary:*** "Recent approval by the Food & Drug Administration of a health claim linking consumption of soy protein to a reduced risk of heart disease will being increased awareness to the health benefits of tofu and will grow the category, according to Art Mio, national sales manager for Morinaga Nutritional Foods Inc. of Japan.

"The FDA health claim is permitted on foods that contain at least 6.25 grams of soy protein per serving." Mori-Nu Extra Firm Tofu contains enough soy protein to carry the new health claim. Several other Mori-Nu tofu products contain 6 grams of soy protein per serving, just barely missing the 6.25 gram mark set by the agency.

10741. Schultz, Kevin. 2000. Soybean research may lead to a better tofu. *Land* (*The*) (*Mankato, Minnesota*). Jan. 21.
• ***Summary:*** Galena Genetics is a joint venture between Pioneer Hi-Bred Japan and North Country Seed (Ormsby, Minnesota; President, Joel Rabbe). Research director Steven Schnebly says the goal is to breed better soybeans for making tofu. Address: Land editor.

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10742. Burros, Marian. 2000. Eating well: Doubts cloud rosy news about soy. *New York Times.* Jan. 26. p. F1, F11.
• ***Summary:*** Sales of soyfoods have been skyrocketing recently because preliminary research suggests that soy has many health benefits, from reducing loss of bone density to easing some menopausal symptoms. In October the FDA "put its imprimatur on soy" when it granted food companies the right to claim that soy protein reduces cholesterol and the risk of heart disease. Although other claims are unproven, soy is strongly promoted by its marketers as a panacea, and the U.S. media has been "almost unanimous in praising its safety and efficacy."

"Against the backdrop of widespread praise, however, there is growing suspicion that soy–despite its undisputed benefits, may pose some health hazards. The scientific world is still divided over many of the claims for efficacy [is it really effective] and over some safety issues." There is agreement on two points: (1) Soy can reduce cholesterol, and (2) There may be an increased risk of cancer when consuming soy isoflavones in pill form–especially for post-menopausal women; and for these women there may also be hazards in adding soyfoods to their diets. The two main isoflavones, genistein and daidzein, are phytoestrogens, or weak plant estrogens. They act in much the same way as regular estrogens in that they can both inhibit and stimulate the growth of certain cells.

"Not one of the 18 scientists interviewed for this column was willing to say that taking isoflavones was risk free." There is a big difference between consuming soyfoods and components of the soybeans, like isoflavone supplements.

During the 12 months ending October 1999, sales of soyfoods in supermarket chains were $420 million, up 45% from the previous year, according to SPINS scanner data. The biggest increase was in soy isoflavone pills, whose sales were up 246% during the same 12-month period. These supplements, which can contain more than 85 mg of isoflavones in a single pill, have much higher levels of isoflavones than occur naturally in foods. And some makers advise taking two pills a day. Some soy protein concentrate powders have up to 160 mg of isoflavones per serving. Scientists are concerned that typical consumers don't distinguish isoflavones from soy protein, and that they will overdose on the isoflavones. For this reason, Dr. Daniel Sheehan of the FDA's National Center for Toxicological Research (in Jefferson, Arkansas) opposed the FDA's soy health claim. No one knows what the maximum safe dosage of isoflavones is, because no human studies have been conducted. However, if people consume soyfoods instead of supplements, they will not overdose on isoflavones. In Japan, for example [where women's breast cancer rates are one-forth to one-sixth of those in the USA] the typical daily consumption of isoflavones is 25-50 mg, and most people consume soyfoods throughout their lives.

Dr. William Helfreich, associate professor of nutrition at the University of Illinois who specializes in diet and breast cancer, is concerned about the risk of soy isoflavones for post-menopausal women with estrogen-dependent breast cancer. Given early in life, he notes, they will prevent, but given late they may promote. Unfortunately the research in this area is very limited and the results are unclear and far from definitive. Fortunately, a number of studies that answer these questions are now being underwritten by the National Cancer Institute.

Many large companies are developing new soy products in response to the growing soy demand: Kellogg's, General Mills, Campbell's Soup, and ConAgra.

This article was reprinted, under the title "Rush to embrace soy products raises warnings about downside," in the *Oregonian* (Portland, Oregon; Feb. 8, p. FD10). On the same page was a recipe for a "creamy, dreamy" Tofu Cheesecake.

10743. **Product Name:** Senbei (Rice Crackers) [Soy, Original (Lightly Salted), and Sun Dried Tomato].
Manufacturer's Name: Masuya Naturally (Importer). Made in Japan.
Manufacturer's Address: 730-999 Canada Place, Vancouver, BC, V6C 3E1. Phone: (604) 844-1913.
Date of Introduction: 2000 January.
Ingredients: Incl. glutinous rice flour and soy sauce.
How Stored: Shelf stable.
New Product–Documentation: Card sent by Patricia Smith from Natural Products Expo, Anaheim. 2000. March 27. This postcard advertises Masuya's senbei. On the front is a color illustration of the Buddhist monk Kobo Daishi (St. Kobo) kneeling by a long rectangular hibachi (*naga-hibachi*) and baking rice senbei using the ancient Japanese method. The back notes that Masuya sells three varieties of senbei and gives the company's address, phone, and website.

Talk with Brian R. Elliot at Masuya in Canada. 2000. March 31. This product was introduced in North America in Jan. 2000. It is made in Mie prefecture, Japan and packed in 4 oz foil bags for freshness. The company plans to switch from shoyu to tamari so that the product is free of wheat and gluten.

10744. *Hawaii Hoichi* (*Honolulu*). 2000. Wakayama a health-food hotbed. Feb. 1.
• ***Summary:*** Hiroaki Iwamoto is president of Tendre Corp., Tanabe City, Wakayama prefecture. He obtained a patent on his frozen tofu in 1995. Tendre now makes about 2,500 tons/year of frozen tofu, worth 700 million yen.

10745. Lewycky, Jerry. 2000. Starting a new miso company in Canada (Interview). *SoyaScan Notes.* Feb. 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jerry (whose last name is pronounced luh-WIK-

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ee) learned how to make miso from Yasuo Yoshihara. He started making miso in April 1999 and now has about 20,000 lb "brewing" in vats, each of which contains about 7,000 lb of raw miso. He has two vats full of 2-year barley miso and one vat full of 2-year brown rice miso. These will be ready for sale in the fall of 2000. He would also like to make a short-term white miso. He has not yet decided the name of his company, but he is considering "Miso Tradition." Jerry also has another miso teacher–Don DeBona. He visited Don several times in North Carolina–after he was no longer employed by American Miso Co.–and Don visited Jerry once in Claremont, Canada; he has been very helpful. Don still lives in his house right beside the miso factory in Rutherfordton, and is now working as a forest ranger for the Forest Service in North Carolina, but he has expressed an interest in making miso again, perhaps with Jerry. Jerry has traveled to Japan several times when he was co-owner of Timbuktu Natural Foods. He sold the company for a good price to a guy who bought it hoping to make a lot of money; he ruined the company. Jerry plans to sell his miso in glass jars. He believes he can take over much of the Canadian miso market now owned by South River Miso Co., because their miso is very expensive in Canada. Address: R.R. #4-2090, Claremont, ON L1Y 1A1, Canada. Phone: 905-649-1988.

10746. Associated Press (AP). 2000. Iowa joint venture says soy's time is here: Japanese working with Americans. *Iowa Farmer Today* (*Cedar Rapids, Iowa*). Feb. 5. Weekly.
• ***Summary:*** Oskaloosa, Iowa–Two men who live far apart have become partners in a $22 million venture whose goal is to make foods containing soy more appetizing.

The factory to be built by Jerry Lorenzen, a soybean geneticist from Fremont, Iowa, and Zentaro Iwamoto, a Japanese entrepreneur, will grind soybeans to make a powder (called Fine Soy Powder, or FSP) that is five times finer than any now available. FSP is more easily mixed with liquids or other foods to make it more palatable.

Lorenzen has named the new Oskaloosa factory "The World Food Park." The 54,000 square foot plant, which is expected to be producing FSP by the end of spring, has the capacity to process up to 5 million bushels of soybeans a year.

"The project was made possible by a financial package that included $750,000 in state aid and nearly $1 million from local businesses and economic development groups. The rest comes from loans or investors who share Lorenzen's dream.

Lorenzen graduated with an agricultural degree from Iowa State University.

Note: In 1994 he started a company named Bee-Lor Inc. to make and sell pork & tofu sausages.

10747. Mueller, Ray. 2000. 'Food grade' soybeans earn premiums for grower group. *Wisconsin State Farmer* (*Waupaca, Wisconsin*). Feb. 11.
• ***Summary:*** In 1999 the roughly 150 members of the Rock County Grain Co. shared the $2.4 million worth of premiums from the "identity preserved" or "food grade" soybeans they grew and sold largely to overseas buyers in Japan, Germany, Italy, and some other Asian countries. These soybeans are used to make foods like tofu.

10748. Jessop, Doug; Mullin, John. 2000. How their Canadian miso won a prize in the Japanese miso contest (Interview). *SoyaScan Notes*. Feb. 28. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Canada has been working for many years to develop food-grade soybeans that are especially well suited for making Japanese soyfoods, such as miso. This year Doug and John entered their miso in the Japanese national contest and won two Special Participation awards. Dough explains: They started by making miso using three Canadian soybean varieties: Harovinton (released in 1989), AC Onrei (released in 1997; "AC" stands for Agriculture Canada), and AC 756 (a double lipoxygenase null variety). They made miso from each of these three soybean varieties and sent it for evaluation to the Nagano Research Institute. NRI said that, of these three, the miso made from the AC Onrei variety was the best, so they concentrated on making miso from that soybean for competition. AC Onrei is a very large-seeded, long-season, white hilum, buff colored soybean, one of whose parents is Enrei–a large-seeded Japanese variety. Most of the miso they entered was red miso; some of it was rough (unground) and some was finished/fine (smooth/ground). They entered their miso in two different contests: The All-Japan content and the Nagano contest, and they won an award for each. This was surprising because AC Onrei was not bred as a miso-type soybean; it has a high protein content and was originally developed as a soymilk and tofu bean. For miso soybeans, the Japanese always look for high sucrose–over 7%; AC Onrei has 6.8%. They also look for total free sugars, of which AC Onrei contains about 10.5-11% (about average). Even though about half the sugars are probably bound up in pectins or cellulose and have no effect on the miso flavor, they still like to know the total sugar content.

Entering and winning this contest was a new step forward for the Canadian soybean folks. "It's really something special." Doug has been taking Japanese language lessons. The miso group of which John is the project leader is now starting to log in soybean variables on a database, which has fields for sucrose, total free sugars, color, etc. For miso soybeans (including red miso or long-term soybean miso), the Japanese prefer a yellow color to a whiter color–which the tofu and soymilk makers look for.

John explains that he is a food scientist, not a soybean breeder. We talked about 6 years ago when he was starting to work on miso, and he ordered a search on miso from the

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SoyaScan database. The breeders are the key to the process; at Harrow they breed mostly food-type or food-grade soybeans rather than commodity-type or oilseed-types–which are bred mostly at Ottawa and Guelph.

John's miso group at Harrow has developed a close working relationship with the Food Research Institute in Nagano; they now work directly with one another. About two years ago, Mr. Fujimori, a miso maker with whom they have developed strong ties over the years, was in Canada on one of his trips. John gave him (for the first time) some homemade miso that his group had produced. He sniffed it and looked at it and said "This isn't too bad." He took it back to Japan, where it was evaluated and the results were sent to John–with Mr. Fujimori's interpretation. The conclusion was: "It's okay but... don't give up your day job." John wrote back asking how his group could improve the miso. That was they key! Mr. Fujimori came to Harrow again with another person, gave John's group a lot of technical information, suggested that he use that information to make more miso–and to enter the miso in the annual Japanese miso contest! Mr. Fujimori provided the koji and John got a microbiologist involved. John's group now made miso from three different soybeans (see above) and the scientists and judges at the FRI in Japan "were quite surprised." They said "This isn't bad." They chose the best one. So John's group made larger batches and sent them to Japan in October 1999 for entry in the annual contest. In November John went to Japan to be present at the contest–although nobody can observe the judging. He learned that this was the first miso ever entered by foreigners in the Japanese contest. He also learned that the Canadian miso was not being judged with or against the Japanese miso. They were judging it separately in a special category–of which it was the only entry. Both awards for an "E" for effort and for reaching a high standard. "Miso is kind of a religion in Japan and it for an upstart like us to come in might not go down too well. But we found it interesting that they used our presence there for publicity–in a big way." John also discovered that the koji in all miso entries *must* be made from Japanese rice–even though a lot of Thai rice is used in making commercial miso in Japan. "Our real mission there was to raise the profile of Canadian-grown soybeans and to increase exports of Canadian soybeans. We want to breed soybeans that are very well suited for making miso in Japan. We are not interested in making miso to sell to Japan. However there is a good possibility of developing a domestic market for miso in Canada."

John is also deeply involved in trying to understand "stone seeds" or hard-seeded soybeans that do not absorb water well. Part of the problem seems to be related to weather/environmental conditions during the growing season. John hopes to try to understand the problem at the genetic level. "We now have a very heavy experimental stone-seed line."

John enjoys miso at home and he has served miso soup at the research station on several occasions. Last week he had it served at the Rotary Club. In each case, everybody liked it. "Fermented foods add such a variety of textures and flavors that people enjoy." Address: 1. Food Processing Technologist; 2. Food Scientist: Both: Agriculture and Agri-Food Canada, Greenhouse and Processing Crops Research Centre (GPCRC), Highway 18 East, Harrow, ON N0R 1G0, Canada. Phone: 519-738-2251.

10749. Jaret, Peter. 2000. The joy of soy: Hailed as the king of all health foods, the mighty soybean has been touted as a weapon against heart disease and cancer. *Harper's Bazaar.* Feb. p. 152, 156.

• ***Summary:*** "Wonder foods come and go... But the new superfood of the moment promises to be different. Eventually it's going to get everyone's attention, because the health claims being made for it are just too big to ignore." "A stream of scientific papers have shown evidence that it can fight heart disease and cancer." Even those who hate tofu are finding that soy can taste pretty good. Many like edamame–those slightly furry green pods served at Japanese restaurants. You run them through your lips and suck out the smooth, slightly salty soybeans inside. "Edamame have become so popular, they're being sold in bulk stores from New York to California." At Trader Joe's, a nationwide retail chain, sales of frozen edamame now rival those of frozen corn and broccoli. Even soymilk is poised to go mainstream. A key reason for the health benefits of soybeans is that they are rich in isoflavones–substances that resemble the natural hormone estrogen. Isoflavones are also powerful antioxidants.

Color photos show: (1) Two large red chopsticks holding one cooked yellow soybean. The caption: "The soybean, Asian staple, may be a big reason why cancers of the breast and prostate are uncommon in Japan and China." (2) Edamame in the pods, topped with a sprinkling of coarse white salt, on a square bamboo tray. The caption: "Edamame, the salty finger food served at sushi bars, is so popular, specialty food markets are beginning to sell it by the pound."

10750. *Ontario Soybean Growers Newsletter.* 2000. Japanese miso awards presented. Feb. p. 3.

• ***Summary:*** "Agriculture and Agri-Food Canada scientists at the Greenhouse and Processing Crops Research Centre (GPCRC) in Harrow recently received two Special Participation Awards for the first foreign entries in miso competitions in Nagano and Tokyo, Japan... Japan requires approximately 160,000 tonnes of soybeans annually to produce miso, some of which comes from Canada.

"The miso production test program at the federal research centre at Harrow began in March 1998 to support the centre's soybean breeding program and to evaluate the suitability of Canadian soybeans for making miso."

"Dr. John Mullin, the miso project leader, said it was

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a great honour to receive the awards, which recognize the effort and progress that the Canadian researchers have made in making miso. Dr. Mullin traveled to Japan to submit the miso for competition and was on hand to accept the awards.

"The soybean breeding program at the GPCRC is known throughout the world for its research on food-grade soybeans. Harovinton was the first food-grade soybean variety developed in Canada for the Japanese tofu industry, and helped pave the way in establishing Canadian food-grade soybeans as a premium quality product in Asia."

A photo shows Dr. Jonn Mullin and Food Processing Technologist Doug Jessop, each holding a framed plaque (written in Japanese). On a table in front of them are samples of their award-winning miso. Address: Box 1199, Chatham, ONT, Canada N7M 5L8.

10751. Shurtleff, William; Aoyagi, Akiko. comps. 2000. Soy sprouts–Bibliography and sourcebook, 2nd century A.D. to 1999: Detailed information on 957 published documents (extensively annotated bibliography), 62 commercial soy sprout products, 59 original interviews (many full text) and overviews, 48 unpublished archival documents. Lafayette, California: Soyfoods Center. 408 p. Subject/geographical index. Author/company index. Language index. Printed 25 Oct. 1999. 28 cm. [1065 ref]

• ***Summary:*** This is the most comprehensive bibliography ever published on soy sprouts. It is also the single most current and useful source of information on this subject available today, since 88% of all references (and most of the current ones) contain a summary/abstract averaging 247 words in length.

This is one of more than 40 bibliographies on soybeans and soyfoods being compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyfoods Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features: 37 different document types, both published and unpublished, every known foreign language publication on the subject, extensive translations of many Japanese and European works, and many original interviews. Thus it is a powerful tool for understanding the development of this subject and related products from its earliest beginnings to the present, worldwide.

Compiled one record at a time over a period of 24 years, each reference in this bibliography features (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English publications together with an English translation, month and issue of publication, and the first author's first name (if given).

It also includes details on 60 commercial soy sprout products, including the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as references to and summaries of advertisements, articles, patents, etc.) are also given.

Details on how to use the bibliography, a complete subject and geographical index, an author/company index, a language index, and a bibliometric analysis of the composition of the book (by decade, document type, language, leading periodicals or patents, leading countries, states, and related subjects, plus a histogram by year) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

10752. *SoyaScan Notes.* 2000. Chronology of soy sprouts worldwide. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** 100 A.D.–Soy sprouts are first mentioned in China in the *Shen-nung Pen-tsao Ching* [Classical pharmacopoeia of Shen Nung, the Heavenly Husbandman]. Four Chinese characters [yellow + curls + big + bean] are used to refer to soy sprouts, whose use is mentioned only as a medicine, not as a food. The use of soy sprouts as a food in China did not become popular until the Sung dynasty (A.D. 960-1127). This pharmacopoeia was compiled starting in the Early/Western Han Dynasty [206 B.C. to A.D. 8] from material that had existed long before. Today it is considered by Chinese authorities as a genuine work.

1767–Soy sprouts are first mentioned in an English-language publication or in the American colonies by Henry Yonge of Savannah, Georgia. Yonge got his information from Samuel Bowen, for whom he grew the first soybeans [called Chinese vetches] ever cultivated in North America in 1765. Bowen got his soybeans while traveling in China. Yonge writes:

"They put about two quarts of the vetches into a coarse bag, or hair-cloth bag, that will hold about a peck [2 gallons], and after keeping them in it a little time in warm water, they lay the bag on [a] flat grating, or a wooden lattice, placed about half way down a tub; then every four hours they pour water on them, and in about 36 or 40 hours they will have sprouted about three inches in length; they are then taken out and dressed with oil and vinegar, or boiled as other vegetables..." Mr. *Flint* and Mr. *Bowen* having found them an excellent antiscorbutic prepared in this manner, was a principal reason for his introducing them in *America,* as it would be a most valuable remedy to prevent or cure the scurvy amongst the seamen on board his majesty's ships." Note that in America, as in China, soy sprouts are first recommended for use as a medicine; It is their vitamin C that prevents or cures scurvy.

1830–Soy sprouts are first mentioned in Europe by Philipp Franz von Siebold, an early traveler in Japan, in his book on the economic plants of Japan. In a large fold-out table, he states that soybeans (*Sooja Japonica,* Sieb.) can

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be artificially germinated to make "Mogasi" [sic, Moyashi]. He includes the word *moyashi* written in both katakana and Chinese characters.

1871–Frederick Porter Smith, a medical missionary from England living in China, states in his book *Contributions toward the Materia Medica and Natural History of China,* that soy bean sprouts (*Tau-ya*) are "artificially raised in large quantities for food in the winter" when green vegetables are scarce in China. This is the second earliest English-language publication that mentions soy sprouts.

1905-06–Soy sprouts are first produced commercially in the United States by two Chinese food companies in California: Wing Chung Long in Los Angeles, and Quong Hop & Co. in San Francisco.

1911–Soy sprouts are first produced commercially in Europe by Li Yu-ying, a Chinese scholar and soybean expert, at his plant *Usine de la Caseo-Sojaine* at Valles, Colombes, northwest of Paris, France.

1914–D. Bois in France publishes the earliest illustration seen of a soy bean sprout.

1917-1918–During World War I, interest in soy sprouts in the United States grows. Yamei Kin, a Chinese-American woman with an M.D. degree from an American college, is sent to China in June 1917 to study and report back on soyfoods–including soy sprouts, which she says can be used in a nutritious salad with fermented tofu.

Writing in *Country Gentleman* (28 Sept. 1918), Sam Jordan of Missouri states: "Another dish which tastes as good as it looks or sounds is soy-bean sprouts. The smaller beans, of some yellow or green variety, are usually used." They are excellent because of "their use in the winter, acting as a green vegetable, and the fact that the vegetable can be had whenever wanted."

William Morse, the USDA's soybean expert, writes in the *Yearbook of the U.S. Department of Agriculture* (1918) in a special section titled "Soy-bean sprouts" that in China soy beans are widely used for sprouting. "Bean sprouts can be used as a home winter vegetable, for the dried beans are sprouted easily in a short time under proper conditions of heat and moisture. It is quite possible that sprouted soy beans utilized in various vegetable dishes would appeal to the American taste." A full-page photo shows a large basket of sprouted soy beans. Taken by Frank N. Meyer, it is the first photo of soy sprouts ever published.

1921–Dr. John Harvey Kellogg, in his book *The New Dietetics,* has a special section titled "Soy bean sprouts" in which he is the first to use the word "vitamins" in describing the nutritional benefits of soy sprouts, and the first to note that "Sprouted soy beans is one of the constituents of the famous chop suey."

1941-45–During World War II, awareness of soy sprouts again increases. Their champion is Prof. Clive McCay of Cornell University. His first brochure on the subject (April 1943) begins: "Our daily paper would surprise us if it carried an ad: 'WANTED: a vegetable that will grow in any climate, rivals meat in nutritive value, matures in 3 to 5 days, may be planted any day in the year, requires neither soil nor sunshine, rivals in vitamin C, has no waste (in preparation), can be cooked with as little fuel and as quickly as pork chop.' The Chinese discovered this vegetable centuries ago in sprouted soy beans."

Prof. McCay and his wife, Jeanette, worked closely with the New York State Emergency Food Commission, to publicize soy sprouts and other soyfoods during the war years. Governor Thomas E. Dewey hosted a famous "soy bean lunch" at the governor's mansion in Albany, New York, to demonstrate the value of mean substitutes. Soy sprouts were in two of the dishes served to the 67 media representatives.

1960s-2000–Soy sprouts benefit from the rapid growth of interest in all kinds of sprouts in the USA and Europe, and from the growing number of Asian-Americans.

10753. *To Your Health* (*Dr. John McDougall's Newsletter, Baltimore, Maryland*). 2000. Is the doctor in... Can soy make you sick? Feb. p. 6.

• ***Summary:*** This article begins with a question, apparently from a reader: "I read recently that studies have found a link between soy products and dementia. I thought tofu and other soy products were good for me. What's going on?" The response (from the unknown writer) discusses an article in the *Honolulu Advertiser* (Hawaii) on 26 Nov. 1999 (p. A1) discussing the work of Dr. Lon White of the Pacific Health Research Institute. While studying 3,734 Japanese-American men in the Honolulu Heart Study, he found that those age 45 or older were more likely to suffer cognitive loss if they ate tofu more than twice a week. White's study has not yet been published in a scientific journal.

White theorizes that the phytoestrogens in tofu may be interfering with the brain's ability to use human estrogen. Typically, human estrogen binds to brain cells. Estrogen has long been thought to improve brain function. White suggests that phytoestrogens may be clogging the brain's receptor sites, preventing human estrogen from attaching.

The writer adds that another possible reason for the association is the high aluminum content of soybeans. "Aluminum is the only known controllable source of Alzheimer's disease." Aluminum from the soil attaches to substances in the soybean, such as phytates, to make unabsorbable complexes. "However, the heating and processing of soybeans to make tofu may free up the aluminum so that it can be readily absorbed."

Readers are advised to go easy on soy products and use them only as condiments. One reason is that "tofu is 45 percent fat." Note: The writer intended to say that 54% of the calories in tofu come from fat. Tofu actually contains 4.3 to 5.3% fat, depending on the firmness. Thus, a 100 gm serving of tofu contains 4.3 to 5.3 gm of fat; this fat is vegetable oil,

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which is largely unsaturated.

10754. Wolff, David. 2000. Bean there: Toward a soy-based history of Northeast Asia. *South Atlantic Quarterly* (*Durham, North Carolina*) 99(1):241+. Winter. [26 footnotes]
• ***Summary:*** The rise of the soybean as an international commodity transformed Manchuria from China's least-developed province into an area of armed conflict between China, Japan, and Russia, and a province of great wealth and industrial innovation. Address: Visiting Asst. Prof. of East Asian History, Univ. of Chicago.

10755. Essoyan, Susan. 2000. Trouble for titan tofu: A study in Hawaii finds that the health food favorite may accelerate aging of the brain. But critics note that the research creates more questions than answers, and no causal connection has been made. *Los Angeles Times.* March 23. p. B2. Metro section.
• ***Summary:*** Results from the Honolulu-Asia Aging Study, some of which were presented by chief investigator Dr. Lon White (of the Pacific Health Research Inst.) at a symposium in Washington, DC, in Nov. 1999, are scheduled for publication in the April issue of the *Journal of the American College of Nutrition.*

The vice president of medical and scientific affairs for the National Alzheimer's Assn. in Chicago (Illinois), Bill Theis, "considers the findings too preliminary to support any conclusions."

A clinical trial is underway to examine the connection between estrogen and Alzheimer's; it follows a survey which showed that women who took hormone replacement therapy after menopause were at lower risk for getting Alzheimer's. Dr. Kenneth Setchell, prof. of pediatrics at the Univ. of Cincinnati's Children's Hospital Medical Center (Ohio), disputed White's conclusions. His research shows that isoflavones have a positive effect on the brain. He asked: If soy is so bad, why are there not high rates of Alzheimer's disease in Japan and China? And why is there no association with any other soyfood? And why don't vegetarians, who typically consume plenty of tofu, get Alzheimer's?

"In stark contrast to White's findings, a 1993 study of 272 Californians enrolled in the Adventist Health Study, matched for age, sex and ZIP Code, found that those who ate meat were more than twice as likely to become demented as their vegetarian counterparts."

This article concludes with some market statistics from a study titled "The U.S. Soyfoods Industry," by Soyatech Inc. and Senechal, Jorgensen & Hale Co. U.S. tofu sales have grown from $108 million in 1992 to $238 million (forecast) in 1999. U.S. sales of all types of soyfoods have grown from $852 million in 1992 to $2,140 million (forecast) in 1999. Address: Special to Times.

10756. Tokyo Abura Tonya Ichiba [Tokyo Oils & Fats Wholesalers Cooperative Union]. 2000. Tokyo Abura Tonya Shi: Abura sho no rutsu on tazuneru [History of the Tokyo Oils and Fats Wholesalers: Searching for the roots of the merchants of oils and fats]. Tokyo: Tokyo Oils & Fats Wholesalers Cooperative Union. vi + 158 p. Illust. (some color). No index. 26 cm. [5 ref. Jap]
• ***Summary:*** Contents: Part I: The oil and fats business–an account of its history (p. 11). Note that the members of this union market both vegetable oils and animal fats (lard from pigs and tallow from cattle). 1. Roots (origin) of oil (p. 13): Origin of oil (p. 14), merchants of middle ages (p. 23), commerce of the middle ages (p. 29).

2. Edo period–Thriving wholesale oil dealers (p. 34): Economy of the Edo period (p. 35), sea transportation during the Edo period (p. 41), innovations in pressing out oil (p. 47), establishment of a fellow trader of stocks (p. 50), policy of the military government of the Edo period for wholesale dealers (p. 62).

Part II: 100 year history of the Tokyo wholesale oil dealers market (p. 95). 1. The beginning of the Tokyo wholesale oil dealers market (p. 97). 2. Tribulations of the Taishô period (p. 116). 3. Talking about wholesale oil dealers–memories / stories (p. 124). 4. Leaping wholesale oil dealers of the Shôwa period (p. 129). 5. History (steps) of wholesale oil dealers after World War II (p. 137).

Photos show: (1) First color photo–Cover of both volumes of a Japanese-language book titled *Seiyuroku* [Records of making oils and fats / Records of the crushing industry], issued in the 19th century. It describes the history of crushing in Japan. The illustrations on page 22 are from this book.

(2) The 2nd page of color photos titled *Edo-jidai no Seiyu Dogu* [Instruments used for crushing in the Edo period {mostly in the 1800s}] contains 4 separate photos Top left is a receptacle for grinding seeds. Top right is an air blower like a bellows below the pan to steam the ground seeds. Bottom left is a wooden bucket and a furnace for steaming ground seeds. Bottom right is a wedge press named a *shimegi* in Japanese.

The 3rd page of color photos shows the cover of two books issued after World War II. The left one, titled *Kogane no Hana,* describes the history of rapeseed in Japan. *Kogane* means "golden" and *hana* means "blossoms." The book on the right is titled *Rikyu Hachimangu,* referring to a shrine in Kyoto. It is said that a priest from this shrine developed the first crushing instrument named *Chogi* in 859.

The 4th page of color photos shows two illustrations of famous places in Edo (the old name for Tokyo) in 1800s. The top one shows the Nihonbashi area where a long and famous bridge crosses the river crosses the Nihonbashi River. The bottom one shows Isemachi-Kashi Dori; the buildings were the warehouses of goods and the market place.

On page 1-5 are the names of five Japanese who are important figures in this book: (1) Mr. Tatsuaki Kaneda, the

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President of Tokyo Oils & Fats Wholesalers Cooperative Union in 2000.

(2) Mr. Keishiro Fukushima, Director General, Foods Policy Planning Bureau, Ministry of Agriculture, Forestry and Fisheries. Describes his congratulatory remarks for 100 Year Jubilee of the Union.

(3) Mr. Masaji Shima, the President of Japan Oilseed Processors Association (JOPA) in 2000. His congratulatory remarks are also described.

(4) Mr. Yukio Sakaguchi. He is the Honored Chairman of Council for *Sukei-kai,* which is the Adoration Group for *Yamazaki Rikyu Hachimangu.* He passed away in 2002 when he was 101 years old.

(5) Kinzaburo Shiraishi, the President of Japan Oils & Fats Wholesalers Association in 2000.

Page 22 shows 4 line drawings from the book *Seiyuroku,* mentioned above. The two on the left show the wedge press. The top right shows several instruments used for crushing. The bottom right shows instruments used for refining, or (more precisely) filtration.

Two books on page 76 also describe the history of the crushing industry in Japan. The left one, issued in 1810, describes the origin and history of crushing industry. The right one, issued in 1716, describes the history of mainly wholesalers of vegetable oils.

Note from Y. Komura, who sent this book as a gift to Soyinfo Center: The editor of this book is Mr. Takayoshi Shimada, the CEO of the wholesale cooperative union, and the writer is Mr. Takahashi Shirashi, a professor emeritus of Keio University and scholar of Japanese history. In the old days, merchants of oils & fats used to work as seed crushers, refiners, wholesalers and retailers. However, the current meaning of *abura tonya* is mainly a wholesaler. Therefore I express it as "Wholesale Business" in the title. The book was published in celebration of the 100th anniversary of the Tokyo Oils & Fats Wholesalers Cooperative Union though, the Union has no formal title of the book in English. Therefore I myself translate the title of the book into English. As you know, the center of policy, business and culture of Japan used to be Kyoto and Nara in the old days. At that time Tokyo was the countryside with no industrial development. It is said that the crushing industry originated in Kyoto in 859. The priest of Yamazaki Rikyu Hachimangu, a shrine, developed a crushing instrument named a *Chogi.* This indicates that the other businesses concerning with seed crushing also developed in or around these areas. Merchants of oils and fats initially developed in Kyoto and expanded throughout Japan. It is said that rapeseed was introduced into Japan from China or Korea in the 16th century when the Tokugawa era [1600-1867] started–or perhaps somewhat earlier. Since then crushing rapeseed became popular even in the Tokyo area. Compared with a long history of the oilseed crushing industry in Japan, Tokyo has a very short history of this industry. Address: Tokyo, Japan.

10757. Edward & Sons. 2000. A new look and a new variety! Organic vegan. Premier Japan (Sell sheet). Carpenteria, California. 1 p. Single sided.

• ***Summary:*** Shows the front label of four organic bottled sauces: Garlic Tamari, Ginger Tamari, Wasabi Tamari, and Thai Soynut. The first three are 5 oz, the last is 10 oz. On each is a vegan logo. Address: P.O. Box 1326, Carpinteria, California 93014. Phone: 805-684-8500.

10758. *Food Trade Journal U.S.A.* (*Ikegawa Food Specialists*). 2000. FDA as well as media help Japanese food industry: Soy products and green tea are highlighted. 10(2):1, 3-4. March. [Eng; Jap]

• ***Summary:*** Each article in this newspaper is published in both English and Japanese. Last October, the FDA gave its approval for U.S. companies to begin using a health claim on foods containing at least 6.25 gm of protein per serving. Except for traditional soy products (such as tofu), each serving must contain no more than 3 gm of fat, 20 mg of cholesterol, and 480 mg of sodium. The FDA believes that adults who consume 25 gm/day of soy protein could experience a decrease in their blood cholesterol, which reduces their risk of heart disease. The mainstream soyfoods that benefited from this announcement are veggie burgers, soymilk, tofu, and soy cheese. But now edamame has emerged as a big seller at supermarkets since a few years ago. A Japanese-style cartoon shows two blonde girls seated at a table. A boy, who is standing, says "I show you how to eat Edamame." Holding a pod of edamame in his right hand, he is popping the beans into his mouth. A circular inset, showing how his fingers hold the pod, is titled "Squeeze." Another cartoon shows Takuji Kimura [Mr. edamame in America], drawn by his son.

The article gives lengthy excerpts from two recent American articles: (1) Hesser, Amanda. 1999. "Bet you can't eat just one soybean." *New York Times.* Sept. 8. p. F3. (2) Deane, Donna. 2000. "Get more soy in your life." *Los Angeles Times.* Jan. 12. p. H1, H3. Food section.

According to Shigeru Shirasaka, president of House Foods (a leading U.S. tofu maker), his company shipped 29 million pieces of tofu in 1999, which is a 70% increase over 1995.

The last page of this article is about edamame, by Takuji Kimura, America's leading edamame broker, Concord, California. Japanese restaurants have been the showrooms for edamame, and they are part of the reason for its growing popularity. Tak Kimura started trying to sell edamame in 1994 at several natural food stores, but nobody seemed interested. He contacted the produce manager of Whole Foods in Berkeley–a woman–without an appointment. When he asked her to try his edamame, she said that she knew what it was–an appetizer at sushi bars! She liked it very much and had tried to find a source, but the restaurants

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would not disclose their sources. During his first demo day at Whole Foods he sold only 8 packs in 8 hours. But after 2 weeks sales started to increase. Then he got permission to sell edamame at other Whole Foods Markets, and then at the Wild Oats chain of natural food stores. In 1998 sales started to increase rapidly. Now the FDA is supporting edamame and major newspapers are doing stories, so sales continue to grown.

10759. Skiff, James. 2000. A co-op in North Dakota is working to become a maker of roasted soynuts. US Soy is developing oil-roasted soynuts (Interview). *SoyaScan Notes.* March 27. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Jim and Howard Weiner met these people at the Anaheim show. Their co-op is located north of Fargo, North Dakota, in the area that has been hard-hit by floods during the past few years. They are growing soybeans organically and are thinking of roasting them to make soynuts. The market for soynuts seems to have exploded during the past year. Jim's company is developing oil-roasted soynuts. At one time, Jim and Howard seriously considered buying the Sycamore Creek Co. from Len and Irene Stuttman. Soynuts are not a traditional soyfood in Japan and are largely unknown to this day. In February, Jim took oil-roasted soynuts to FoodEx, the food expo in Tokyo. He has talked with Kirin Brewing Co. (owned by Mitsubishi) about supplying them with his oil-roasted soynuts for use as a snack, and both Kirin and Mitsubishi seem very interested.

We also discuss use of the term GEO (genetically engineered organisms) in place of GMO (genetically modified organism). Address: US Soy, 2808 Thomason Dr., Mattoon, Illinois 61938. Phone: 217-235-1020.

10760. Jonas, Steven; Gordon, Sandra J. 2000. 30 secrets of the world's healthiest cuisines: Global eating tips and recipes from China, France, Japan, the Mediterranean, Africa, and Scandinavia. New York, Chichester, Weinheim, Brisbane, Singapore, Toronto: John Wiley & Sons, Inc. ix + 261 p. Index. 24 cm. [80* ref]

• ***Summary:*** This book contains numerous recipes for beef, pork, lamb, chicken, shrimp, salmon, and other meats. Soy-related recipes and topics include: Isoflavones (p. 77, 85-86). Miso (p. 83-84, 86, 186). Soy sauce (p. 36, 51-52, 85, 138). Soyfoods (p. 37, 77, 103, 137). Soyfoods in Japan (p. 83-86). Tofu (p. 83-86, 137). Tofu recipes (150, 173, 182, 185, 188). Vegetarian eating (p. 44-45, 106), Vegetarian recipes (p. 181-97).

Dr. Steven Jonas is a veteran triathlete, a certified professional ski instructor, and a longtime author of books on healthy eating and exercise (he has written 8 books of his own). Address: 1. Prof. of Preventive Medicine, State Univ. of New York, Stony Brook; 2. Freelance health and nutrition writer, Weston, Connecticut.

10761. Morinaga Nutritional Foods, Inc. 2000. Anecdote. Antidote (Ad). *Vegetarian Times.* April. p. 35.

• ***Summary:*** Below the big bold word "Antidote" is a photo of a shiny red apple. Below that, and below the equally large word "Antidote" is a package of Mori-Nu Extra-Firm Silken Tofu (Non-GMO).

The text across the bottom reads: "Update the 'apple-a-day' anecdote to 'a box of Mori-Nu Tofu a day keeps the doctor away.'

"The FDA agrees–'diets low in saturated fat and cholesterol that include 25 grams of soy protein a day may reduce the risk of heart disease...' One box of Mori-Nu Extra-Firm Tofu contains exactly 25 grams of soy protein. Cholesterol free Mori-Nu has only 1.5 grams of fat per serving. And now, Mori-Nu is made with Non-GMO soybeans. The aseptic package * means Mori-Nu doesn't need refrigeration until opened. All of which is why Mori-Nu Tofu may just be the antidote for heart disease, menopause and even cancer. Visit www.morinu.com for the latest information about the healthy benefits of Mori-Nu Tofu.

"For recipe suggestions, visit www.morinu.com or send a SASE to Mori-Nu, 2050 W. 190th St. #110, Torrance, CA 90504.

"Tetra Pak * In 1996, received the Presidential Award for Sustainable Development, the White House's highest environmental prize, Also named 'the most significant food science innovation of the last 50 years' by the prestigious Institute of Food Technologists (IFT) for increasing nutrient retention and flavor while ensuring safety. For more information, visit www.tetrapak.com."

This ad also appeared in *Natural Health,* in April 2000. Address: 2150 W. 190th St., Suite 110, Torrance, CA 90504.

10762. Tezuka, Masanori; Taira, Hideharu; Igarashi, Yasuo; Yagasaki, Kazuhiro; Ono, Tomotada. 2000. Properties of tofus and soymilks prepared from soybeans having different subunits of glycinin. *J. of Agricultural and Food Chemistry* 48(4):1111-17. April. [20 ref]*

10763. White, Lon R.; Petrovich, Helen; Ross, Webster; et al. 2000. Brain aging and midlife tofu consumption. *J. of the American College of Nutrition* 19(2):242-55. April. [56 ref]

• ***Summary:*** This study of Japanese men living in Hawaii found that those who ate tofu 2-4 times per week when they were around 45-65 years old had higher rates of mental deterioration (low brain weight, Alzheimer's disease, poorer cognitive function) in their later years when compared with men who ate less tofu. The authors speculate that isoflavones were responsible for the apparent adverse effect of tofu consumption.

Note 1. The statistical association or correlation found in this study does not prove cause and effect. In other words, this epidemiological study shows no causal

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relationship between soy and cognitive function, only a positive association or correlation. Even the director of the Alzheimer's Association (Chicago) was quoted as saying that the study does not warrant dietary changes. It is possible that other unknown factors affected brain function and that tofu consumption was associated with those factors and was not itself the risk factor.

Note 2. Lon White's study was rejected by two major journals before being published here. White was formerly employed by the National Institute on Aging, part of the National Institutes of Health. For more balance and perspective, see the editorial by Grodstein et al. published in this same issue. Address: 1-2. Pacific Health Research Inst., Hawaii.

10764. Pukel, Sandy. 2000. Why were Patricia and Joseph Carpenter kicked off the miso company land in Rutherfordton, North Carolina, and denied their share of ownership in the company? (Interview). *SoyaScan Notes.* May 20. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Sandy has just finished talking with John Belleme on the phone to compare their memories of this unpleasant incident. Their memories were exactly the same. "John remembered even more things that the Carpenters didn't do than I remembered." "If they were upset or felt they were owned money, why did they wait 20 years to tell me about it? That's pretty bizarre."

It was very clear to everyone else why they were kicked off the land. The miso company bought the land. Joseph was hired as a carpenter-handy man and paid a salary to build the factory there and to oversee things. They had their kid in private school, and they lived rent-free. "We paid for everything. John got back and nothing was done. They lived the life of Riley [a carefree, comfortable way of living] for a year."

Sandy says that his job was not at all to tell them what to do. Before he left for Japan, John gave them specific instructions for specific projects. It was very clear, and John is very meticulous. Anything he didn't tell them before he left, he certainly would have communicated to them from Japan. "When John got home, he totally freaked out. He absolutely had a heart attack. He couldn't believe it. They had done nothing. They knew very clearly what they were supposed to do and they didn't do it. No ifs, and, or buts about it." This put the miso company 6-12 months behind schedule. Moreover, "they got paid a serious salary to do it–and they lived rent-free, in a beautiful set-up there."

Question: "Why do you think Joseph didn't do the required work?" Sandy's answer: "I guess he wasn't motivated or he wasn't capable. I don't really know why. I haven't seen him in many, many years. He's a nice guy but I think he needed more direction." Patricia wanted to be part of the miso company more than Joseph did. "She's very outgoing and aggressive, and maybe she oversold him. He was more of a laid back hippie carpenter." Sandy made John Belleme a deal that if he went to Japan, learned how to make miso in the traditional way, then came back and made miso for the new company, Sandy would give him $25,000 in stock. He did what was expected, and got what he was promised. Actually John got his $25,000 in stock even before he left for Japan, because there was no question that he was going to do what he said he would do. Address: Owner, Oak Feed Store and Restaurant, 4500 S.W. 63 Ave., Miami, Florida 33133. Phone: 305-446-9036.

10765. Roberts, Patricia. 2000. History of interest in macrobiotics. Living on the Oak Feed Miso Co. land in Rutherfordton, North Carolina from 1979 to 1980. Part I (Interview). *SoyaScan Notes.* May 20. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** 1972–Patricia meets Joseph Carpenter (a native of California) in Oregon on a farm where she went to do yoga; she was very involved with yoga and meditation. Joseph is a very friendly and personable fellow, and he has an "incredible memory. Most people are in awe of his brain." They went together to Tucson, Arizona, to pick oranges. She was living on oranges and bananas, had lost much of her memory, and was very spaced out and emotional. They went into a place named The Granary, where they met Jack Garvey, who brought them into the macrobiotic community. She first met Michio Kushi in Tucson, when he came there to lecture.

1973 Sept. 15–Patricia and Joseph Carpenter are married in Arkansas. They were invited to Arkansas to do a little farming by some friends who had some property there. Their friends were deeply involved with Stephen Gaskin and The Farm in Summertown, Tennessee. They arrived with all of their macrobiotic "judgments" and that led to conflicts. They built a little house on the land in Arkansas, and Thom Leonard came to visit them there in 1973. He took care of their house for the winter when the Carpenters went to visit Patricia's parents in Florida.

1973 Nov. 11–Their first child, Yana, a girl, is born in Arkansas. They leave to go to "Snowflake," the first macrobiotic conference in Arizona. It was held on property near a Hopi reservation that a group of people in the macrobiotic community, including Michio, purchased.

1974–Patricia goes to a macrobiotic conference in Miami and meets Sandy Pukel for the first time. She becomes friends with Sandy and his wife, and saw Michio for the second time.

1975 fall–Patricia arrives (with her daughter, Yana) in Brookline, Massachusetts, and lives in the macrobiotic study house run by Ken and Ann Burns. After about 3 months she moves to another study house. Joseph arrives later, in about 1976, and lives in the study house run by Jack and Barbara Garvey, on the same street as the Burns' house.

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Joseph Carpenter was very close to Jack Garvey. They both have a close relationship with Michio and Aveline Kushi. For Patricia, who had a Catholic upbringing, Michio was a spiritual teacher. John Belleme arrived in Brookline about mid-1976 and lived in the Burns' study house; it was at about this time that Patricia first met John–though they never lived in the same study house. Joseph designed and built an addition to the Kushi's home at 62 Buckminster Road; it was for Aveline–the bathroom of her dreams on the second floor. One day Aveline came to see Patricia in her apartment. She liked a chopping block table that Joseph had built for Patricia. Joseph is an excellent carpenter. He did much of the finish carpentry on the original Erewhon retail store on Newbury St. in Brookline, including the wooden bins for grains and beans.

1977 Christmas–Patricia and Joseph go to Florida for Christmas, one of many trips they took there. Patricia's parents and many of her friends live in Florida; she loves to visit. In early 1978 Joseph worked as a carpenter for several months in Sandy Pukel's Oak Feed Restaurant in Coconut Grove, Florida. He had gotten to known Sandy because Patricia and Sandy were close friends. During this time Sandy came to realize that Joseph was a skilled carpenter.

1979 Feb. 12–Patricia's second child, Benjamin, is born in Brookline. At about this time Patricia's sister, Christine, moved up to Boston to be near Patricia. In the spring of 1979 Patricia went to Florida to visit her parents and show them her new baby. Sandy flew Joseph down to talk business. Sandy had now decided that he wanted the Carpenters to become part owners of the company–so he offered them a deal, which, as near as Patricia can remember, was as follows. He asked them to live on the land the miso company planned to purchase while the Bellemes were in Japan learning how to make miso. If they would live and work the land, become a presence in the community, and then become owners of and workers for the company, Sandy offered to pay their expenses and give them $25,000 worth of company shares for each year they stayed and worked on the land–including the first year, of course. But this agreement was verbal; nothing was put in writing. Back in those days, Patricia, recalls, people were less businesslike than they are today.

Looking back, Patricia believes that she and Joseph failed in their negotiation of this deal. Joseph is an artist, and he is much better at self expression than at negotiating agreements. Sandy is very good at negotiating.

1979 May–On Memorial Day weekend, at the end of May, after four years in Brookline (near Boston), the Carpenters leave and move to Florida for the summer, to be near Sandy, to work out the details of beginning the miso company. In leaving Boston, they were giving up a lot, including many friends ("We were very plugged in. My sister, Christine, was quite upset that we were leaving") and Joseph's good carpentry job. But they believed that Sandy's deal made the move worthwhile.

Patricia flew to Florida with her two young children. At Sandy's request, Joseph drove their van so that he could go to Hendersonville to meet with several real estate agents. The miso company property had not yet been decided on or purchased. The realtors took Joseph to visit several areas on the isothermal belt, but they didn't find the property at that time. The isothermal belt means "never too hot, never too cold." But it freezes and snows a little during the winter.

Patricia recalls that they bought the property from Bob Deakin. Joseph knew Bob Deakin. Bob was driving with his wife and daughter at about that time, on a holiday, to chimney rock. A truck was coming toward Bob's car and suddenly a bee flew into the cab of the truck. When the truck driver started to swat the bee, his truck swerved across the road and killed Bob Deakin's daughter. Bob kindly refrained from suing the truck driver or truck company, and somehow, because of the accident (or perhaps because of big hospital bills) he lost his property–which the miso company later purchased.

In Florida, Patricia and Joseph rented a place for the summer on Highland Beach near Boca Raton. They had visits with Sandy and learned more about his plans for the miso company. That summer, Michio came down and did a seminar, which they attended. Michio wanted the land to be used as a summer camp and a place to garden; he also wanted to build a dam and lake. John and Jan Belleme were preparing to go to Japan. Continued. Address: Grass Valley, California.

10766. Roberts, Patricia. 2000. History of interest in macrobiotics. Living on the Oak Feed Miso Co. land in Rutherfordton, North Carolina from 1979 to 1980. Part II (Interview). *SoyaScan Notes.* May 20. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued: 1979 Aug. 1–A special election is held on alcoholic beverage control in the town of Rutherfordton, North Carolina. Called the ABC Referendum, it would decide whether alcoholic beverages in containers could be sold in special "ABC Stores" and whether off-premises sales of malt liquor (mostly beer) would be permitted. Note: Before that election, a person had to go to South Carolina to buy such beverages. To this day, all cities in Rutherford County except Rutherfordton and Lake Lure are "dry"–one cannot buy alcoholic beverages there. Throughout the county one cannot buy any alcoholic beverages (except wine) by the drink or glass. No sales of any alcoholic beverages are allowed on Sundays.

1979 Aug. (late)–The Carpenters and their two children arrive (in separate vehicles) in Rutherfordton from Florida and move onto the miso company land. Patricia remembers the date clearly because people in town were buying beer to celebrate the implementation of the ABC Referendum. The Carpenters were the first people to live on the land after it

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had been purchased by Oak Feed Miso.

Two months later, in Oct. 1979 John and Jan Belleme leave for Japan. Patricia recalls that the Bellemes stopped by the land briefly on their way to Japan and left some things in the house. Patricia recalls that there was no discussion at this time about the work that Joseph was supposed to do during the coming year. There was no list of things Joseph was supposed to do. John never asked: "Is everything clear? Do you have any questions?" "We were all in our twenties and we all had a dream. Nobody knew exactly how it was going to happen, but we had a very nice relationship with John at the time. We were close friends." It is also important to remember that Sandy was in charge of the miso company, not John.

During the time Patricia and Joseph lived on the land, they were very happy. Patricia recalls: "It was a wonderful time for us." Joseph worked hard every day, out on the land, while they were there. He cut down trees and cleared lots of land, for the miso factory and warehouse, for planting the soybeans, and for their own home. Then he spent days rototilling and planted many acres of soybeans on the land he had prepared. He worked with local soil and agricultural departments in preparation for a dam that was to be built on the property. He also worked with the Farm Bureau and the water department–to get the basic groundwork done for the miso company. But he didn't do any carpentry at all when he was on the land, because he was waiting for John Belleme to send the plans, measurements, kinds of wood, where to build, the orientation of the buildings (*Feng-shui*), etc. Patricia recalls no communication with the Bellemes after they were in Japan. Joseph was in regular communication with Sandy Pukel in Florida. Sandy would say "Hang on" but never sent the needed information.

In exchange for their work, the Carpenters got use of the house for free of charge plus the electricity and food expenses. Patricia taught cooking weekly classes to local people, and about 40 typical Americans came to class after class. Michio and Aveline Kushi came once to visit while the Carpenters were there; Patricia remembers his black suits, his cigarettes, and the fact that he liked her rice.

"Joseph is a very laid-back guy. He's an incredible artist. He's not threatening. He always follows through with things. He has a very unique constitution and spirit. He doesn't talk about other people; he's not a schmoozer."

1980 June–John and Jan Belleme return from Japan. Patricia recalls that "When John and Jan came back from Japan, they were very, very different people." John had been rigid in Boston, but now he was much more rigid. After several weeks of sharing their house with the Bellemes, the Carpenters are told to leave the land. Patricia thinks it was John Belleme who actually told them this, but she is quite sure that it was Sandy who made the decision. She recalls that Sandy phoned Joseph several times after the Bellemes returned to discuss problems. For example, the Carpenters had a new truck that was owned by the miso company but that was registered in Joseph's name. Patricia recalls that a settlement deal was made: "When you turn over all the legal papers, then we'll give you the money we promised you. They gave us $1,000, then they promised us an immediate $8,000 more upon receipt of the truck title." Patricia is sure that the amount promised was $8,000 but she does not know how that number was arrived at.

To this day, neither Patricia nor Joseph know why they were told to leave. She and Joseph were left in Rutherfordton without anything to do, and with two young children. Patricia was pregnant with their third child. They borrowed money from Patricia's father and bought a beautiful 50-acre farm in Rutherfordton. They had lived (uncomfortably) in the same house with the Bellemes for more than a month. Patricia recalls: "Losing the miso company was a disaster for Joseph. He never wanted to talk about it again. I think he never really got over it."

Not long thereafter, Jan Belleme come to visit Patricia and Joseph. She brought a basket of vegetables that the Carpenters had planted in the garden on the miso company land. As she arrived, Patricia clearly remembers thinking that she was bringing the money they were owed. "It was always expected."

1980 Nov. 23–The Carpenters' third child, Patrick, was born at that farm. After the birth, Patricia was thin and weak. Jack Garvey came to visit and directed her to eat differently. "It saved my life."

Patricia has nothing but good memories of the time she and Joseph lived on the miso company land. "Joseph was a very happy, healthy, and active man, with a lot of good energy, while we were living on that land." But she has bad memories from the time they were kicked off the land and not paid the money they were owed. Joseph also has very bad feelings and memories about the latter events. Joseph has an incredible memory for facts and details. Patricia notes that she doesn't hold onto things, but there was something about the way their agreement with the miso company ended that has been the only thing in her life that she has sadness about. She has tried to work it out, but she still feels badly about it. She still does not understand why John Belleme asked Joseph to leave the land. Continued. Address: Grass Valley, California.

10767. Elwell, Christian. 2000. Using barley to make miso (Interview). *SoyaScan Notes.* May 29. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Naked barley (called *hadaka mugi* in Japanese) is like wheat in that the outermost husk can be easily removed, whereas this husk tends to adhere to the bran layer of regular barley. However naked barley has a rubbery skin around the endosperm which the koji cannot penetrate. Of course, the consistency of this skin is different among varieties, yet none of the ones that Christian has tested have

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made good koji. Apparently naked barley was the more primitive and typical grain in some indigenous cultures. Tibetans grow naked barley and grind it to make their *tsampa* or barley cereal.

Before it can be used to make koji for barley miso, regular barley must be pearled; naked barley need not be pearled before it is eaten. Barley is sold after having been pearled to different degrees, meaning that different amounts of the bran layer have been removed. Pot barley (also called "hulled barley"), which Christian uses to make barley miso, has most or all of the outer husk removed but it is hardly pearled at all, so all or most of the bran layers remain around the endosperm.

Mugi-cha (Japanese barley tea) is made from barley from which the husk has not been removed. Address: Founder and Owner, South River Miso Co., South River Farm, Conway, Massachusetts 01341. Phone: (413) 369-4057.

10768. Fallon, Sally W.; Enig, Mary G. 2000. Tragedy and hype: The Third International Soy Symposium. *Nexus* (*New Zealand*). April/May. p. 15-20, 69.
• ***Summary:*** Contents: Introduction. Marketing the 'perfect food.' Cinderella's dark side. Soy protein isolate: Not so friendly. FDA health claim challenged. Soy consumption and cancer. Phytoestrogens: Panacea or poison? Birth control pills for babies. Dissension in the ranks (Dr. Lon White of Hawaii on soy and Alzheimer's). Questions over GRAS status. The next asbestos?

The authors are highly critical of soyfoods. This 4-day [actually 2-day] symposium took place in Washington, DC, in Nov. 1999 [Nov. 12-13]. Several weeks earlier, on Oct. 25, the U.S. Food and Drug Administration announced a health claim for soy products which were low in saturated fat and cholesterol and 6.25 gm of soy protein per serving. Among the surprising statements in this article: Isolated soy protein is made from what was once considered a waste product–the defatted, high protein soy chips–which look and smell terrible. "Flavourings, preservatives, sweeteners, emulsifiers and synthetic nutrients have turned soy protein isolate, the food processors' ugly duckling, into a New Age Cinderella" (p. 15).

"The propaganda that has created the soy sales miracle is all the more remarkable because, only a few decades ago, the soybean was considered unfit to eat–even in Asia." Note: This is a preposterous and completely false statement. Read any Japanese or Chinese cookbook and you will find many tofu recipes. In the 1970s there were approximately 30,000 tofu manufacturers in Japan alone, plus many more in China, Korea, and Indonesia. In 1976 in Indonesia there were 41,201 tempeh manufacturers and 10,986 tofu manufacturers in Indonesia (Winarno 1976).

Note: No references appear with the printed version of this article, but 72 references are found with the article on the authors' website. Address: 1. M.A.; 2. PhD. Phone: 619-574-7763.

10769. Kato, Hiroko. 2000. How to eat at a Japanese restaurant the vegan way. *Vegetarian Journal* (*Baltimore, Maryland*). May/June. p. 20-23.
• ***Summary:*** Describes how to avoid fish and bonito extract and flakes. Traditional Japanese vegan cuisine, called *shojin ryori,* was created by Zen Buddhists; it is very easy to enjoy beautiful and delicious Japanese vegan dishes at such restaurants. Sushi can include *natto maki, yuba maki,* or *inari-zushi* (rice wrapped in season aburage). Tofu dishes may include *yu-dofu, hiya yakko, tofu dengaku, agedashi-dofu,* and *goma-dofu* (made of sesame seeds; no soy). Other dishes: Edamame, miso soup, vegetable tempura, or *gyoza.*

10770. Carpenter, Joseph. 2000. Living in Boston and on the Oak Feed Miso Co. land in Rutherfordton, North Carolina from 1979 to 1980. Part I (Interview). *SoyaScan Notes.* June 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Joseph was born on 5 Aug. 1948 in Oakland, California, at Providence Hospital. He lived with his family in Berkeley until he was age 10; his father, who was a carpenter by trade, died in 1954, when he was still a boy. He and his mother then moved to nearby El Sobrante (by the back gate of De Anza High School–where he graduated from high school). He attended Contra Costa Junior College for two years, moved up to Sonoma State for a year, then dropped out. At age 19-20 (1967-68), he took off to see the world. As a young man, he became a skilled carpenter, learning by doing. Several of the men he worked with were good teachers.

A hippie during the 1960s, he met Patricia Roberts who was born in March 1947 in Queens, New York, and grew up in Rockaway Beach in Queens. Her father was a New York City police officer and detective for 20-25 years. Her parents retired to Florida in the late 1960s or early 1970s. When the kids were at home, they lived in a nice big home at Whitehouse Point; after the kids were gone, they moved to Deerfield Beach. Soon after meeting Patricia, Joseph stopped using psychedelics drugs and alcohol. They picked apples together in Hood River, Oregon, and lived in an old picker's camp. Having been overweight, he lost about 80 pounds in less than 6 months–and felt great. He and Patricia and a girl friend of hers migrated to Tucson, Arizona, where they were planning to pick oranges for the winter. While looking for a place to stay, they came across a macrobiotic bakery, The Granary, run by Jack Garvey. That was their first introduction to macrobiotics. Because of their largely raw food diet, they were somewhat resistant at first, but soon became friends and students of Jack's. In 1973 Joseph and Patricia were married in Arkansas.

1977 Feb.–Joseph arrives in Boston from Northern California; he is very sure of this date. He met Charlie

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Kendall (a maker of traditional natto, amazake, and mochi), who had just bought a house in Brookline by the railroad tracks; Joseph helped him extensively remodel that building. Charlie's wife, Yoko, was Aveline's sister. Joseph soon became friends with Bill Painter, who was a house painter by trade and also had a small shop in the basement of the Kushi's house. Before long Joseph was working as a carpenter with Bill Eggloff, building a handsome grain bin for Erewhon's retail store on Newbury Street. Using red oak and Plexiglas, they worked on it in the basement, which had a garage door that opened onto the alley behind the store. Bill, who lived on Cape Cod, stopped working for Erewhon when the bin was finished. But the store needed more fixtures, so Joseph made a bid, signed a contract, then installed new check-out stands, new shelves, and units to hold the crocks of bulk tamari, barley malt, etc. Joseph had a family to support, and carpentry was his livelihood, so he was paid for all work he did in the Boston area. Later, over 4-day weekend, he worked to tear out old bathrooms and office spaces to open up the cramped front of the Erewhon store. He also did some work on a new Erewhon store in Brookline. After Erewhon moved out of their old 4-story brick warehouse, he worked on the huge modern warehouse that Erewhon moved into. The Kushi's house on 62 Buckminster Road had been the headmaster's house for a private school. Upstairs there was an institutional bathroom. Aveline asked Joseph to remodel it to make a private bathroom–with lots of tile. After about a year of working for the macrobiotic community (always for pay), Joseph got "burned out" and went to work for a regular contractor unconnected to macrobiotics.

1977 Christmas–Joseph and Patricia go to Florida for Christmas, one of many trips they took there. In early 1978 Joseph worked as a carpenter for several months in Sandy Pukel's Oak Feed Restaurant in Coconut Grove, Florida. He had gotten to known Sandy because his wife, Patricia, and Sandy were close friends; they had first met when they both went to a seminar Michio Kushi gave in Coconut Grove. After the restaurant opened, in about May 1978, Joseph and Patricia took a vacation to Jamaica. During the summer and fall of 1978 Sandy came to Boston several times. Each time he and Patricia and Joseph went out to dinner together. Sandy mentioned that he was thinking of starting a miso company and asked if they might be interested in getting involved. They expressed interest, but no definite plans or offers were made.

1979 Feb.–Joseph's second child, Benjamin, is born in Boston to his wife Patricia. The Carpenters took many trips to Florida, especially during the winter, to visit Patricia's parents. In about March 1979, over a long weekend, when Patricia and their two children were vacationing in Florida (visiting her parents), Sandy Pukel paid for Joseph to fly from Boston to South Florida for a meeting to discuss the part that the Carpenters might have in the development of the new miso company. Sandy knew Joseph's skills as a carpenter. Joseph recalls that the meeting was at Edmund Benson's house. Sandy said that he wanted Patricia and Joseph to become part of the miso company. In exchange for their labor, they would be given a share of the business ownership worth $25,000. Joseph does not recall whether they would receive the $25,000 once or each year that they worked–but he definitely recalls the $25,000 offer. Joseph recalls that the talk at this first meeting was very general in terms of what kind of carpentry or construction work he would do for the company.

1979 May (late)–Joseph leaves Boston in his van, headed for North Carolina–after handing over their house to the next renters. On the way, following Sandy's instructions, he stops in Hendersonville, North Carolina, for about a week to check out some real estate. With real estate agents that Sandy Pukel and/or Edmund Benson had found, Joseph looks at property the agents thought might be appropriate for the miso company in the Asheville area and in Rutherford County. As far as he knows, Joseph was the first person to actively look for land for the miso company. They found several properties that Joseph considered borderline, so Sandy (and probably John Belleme and Edmund) flew up from Florida and they all visited these sites together. Finding nothing that was suitable, they left. Joseph continued on to Florida in his van to be with Patricia and their children. Sandy continued to work with local realtors until he found a suitable piece of property. Joseph is quite sure that just before they finally purchased the land in Rutherfordton, Sandy, Michio and he (and perhaps a few other people) all went to see the property at the same time. They walked over the roughly 100 acres of land and through the beautiful house.

During the summer of 1979 Joseph and Patricia met with Sandy and Edmund several times to discuss their living on the miso company land while John and Jan Belleme were away studying miso-making in Japan. Though nothing was put into writing, Joseph and Patricia both recall clearly that their daily expenses would be taken care of, they would work on the land, and, at the end, they would own a part of this new business. They were not given any specific list of tasks or duties they were expected to accomplish. Continued. Address: 10655 Lakeshore Dr., Clear Lake, California 95422. Phone: 707-994-3218.

10771. Gonzales, Greg. 2000. Making miso and koji for American Miso Co. Inc. Part I (Interview). *SoyaScan Notes.* June 20-21. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Greg was born in July 1959 in Torrance, near Los Angeles, California, in a middle-class Mexican-American Catholic family. Both his parents were born in the Los Angeles area and Greg grew up in that area. After graduating from high school at age 18-19 he became a

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professional dancer. In 1987 he went to Japan for 6 months to work as a dancer at a tourist hotel in a small, isolated Japanese town. He liked Japanese culture very much. During this time he wrote short stories, and decided it was time for a change of careers. After returning to the USA, he lived in Los Angeles, found several easy jobs, and went to L.A. Community College for a year to pursue his interest in writing. At that time, in 1989, he met Barry Evans who was living to Los Angeles. They met through a mutual friend, spent a lot of time together during the next year, and became good friends. Barry took a federal holiday and Greg moved to Sonoma County in northern California. There he met a woman named Manon Fancher who became his partner; she already had a child named Keith Fancher. Together they moved to a small lumber town in Plumas County, in the Sierra Nevada mountains, about 70 miles north of Lake Tahoe. Greg worked for the U.S. Forest Service on a timber salvage marketing crew and taught dance on the side. On 12 Aug. 1992 they had a baby boy named Devin.

One day, in 1995, after they had lived in mountains for about two years, Barry Evans called, said he lived and owned several businesses in and around Asheville, North Carolina, and offered Greg a job working at the miso factory; Don DeBona would be his boss. Greg said he would like to think about it, discuss it with Manon, and visit the company before making a final decision. He had enjoyed miso previously, but did not know how it was made. He liked Japanese food and culture, knew nothing about macrobiotics, and was not sure how he would like living in rural North Carolina. So Barry flew him out to North Carolina. Before his interview with Don DeBona, Greg read *The Book of Miso* to better prepare himself. He accepted the offer. He and Manon tied up loose ends in Plumas County, then drove with their kids across the country to North Carolina.

Arriving in Feb. 1995, Greg worked at Great Eastern Sun for about 8 weeks, then went to work with Don DeBona at American Miso Co. (AMC). Don had had trouble keeping workers; they were attracted by the romance of miso and making macrobiotic foods, but couldn't take the hard work or the rural environment.

Greg worked for Don for about 2½ years. When Don left the company, Greg had plenty of experience making miso but he had never made koji by himself. Greg recalls: "I suddenly found himself with the reigns in my hands. There was a lot of responsibility, and I felt tense at first." He had steamed and inoculated the rice, dug it, put it in the trays, put the trays in the koji room, etc., but he had never stayed with the koji during the night or had to make decisions about adjusting its temperature. Making koji is an art, based on being sensitive to the properties of the koji; it cannot be learned from a book. It takes a long time to "learn how to make koji happy. Newcomers always want to go by what the thermometer says, but it doesn't work that way."

About a month after Greg took over, Barry hired John Belleme, one day a week, to look carefully at the koji Greg had made the day before, and to give him tips on how to improve. John is still active in this role, which is working out very nicely for both John and Greg. "John loves this place."

Greg makes koji at least once a week; Wednesday is koji night, so Greg will be with the koji until midnight. He will check its progress every 60 to 90 minutes, depending on the season and outdoor temperature. A little after midnight, he goes to his cabin on the miso company land and sleeps until a little before 4:00 the next morning. Then he returns to the miso plant, checks the koji again, and starts cooking the soybeans. Because of the fermentation process, koji generates its own heat, and it creates increasingly more heat as it matures, and its mycelium expands and binds the rice into a cake. Each time Greg makes koji it is different, and different types of adjustments must be made. There are no thermostats in the koji room. All temperature adjustments are made by either opening or closing the koji room door or the vents in the ceiling. If the ceiling vents are opened too much, the heat will rise out but so will the humidity. Thus, the balance of opening the door vs. the ceiling vents is important in adjusting the koji room humidity. To add humidity, Greg may wet the floor of the room and close the room. He never uses a heater to heat the koji room, in part because it dries out the air. When inoculating the rice, Greg will use less inoculant in the summer than in the winter.

This koji is really made in the traditional way–all natural, nothing artificial. Most companies automate their process as their volume expands, but AMC has decided not to do that. Yuko Okada of Muso and Mr. Kazama of Mitoku (both Japanese natural food companies) told Barry Evans that they thought AMC was the largest maker of traditional koji in the world. The company makes about 300,000 lb/year of miso. Don DeBona increased the number of miso vats from 10 to about 45. Continued. Address: 4225 Maple Creek Rd., Rutherfordton, North Carolina 28139. Phone: 828-287-2940.

10772. *SoyaScan Notes.* 2000. One disaster after another leads to success: Brief history of American Miso Company (Overview). June 20. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** This story, with its many strange twists and turns, might be called "One disaster or failure after another leads to success" or "The perfection of imperfection."

1977 Aug. 2–It was a disaster for Bob and Karen Deakin of Rutherfordton, North Carolina, when a bee flew into the cabin of a big truck near their home. As the driver tried to swat it, his truck swerved across the road and smashed into a car driven by Bob Deakin, killing Bob's daughter (age 12½) and severely injuring Bob and his young son.

1979 Jan. 26–It was a second disaster for Bob and Karen Deakin when they were forced to give up the home they had built and the 92 acres of land they dearly loved in

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Rutherfordton because they could not make the mortgage payments. With Bob still injured from the car crash, the family had no steady income. The land was sold to Oak Feed Miso Co. on 7 Aug. 1979.

1979 Oct.–It was a disaster for John Belleme when he arrived in Japan to study miso and nobody knew who he was or why he was there. The arrangements that were supposed to have been made were never made.

1979 Oct.–It was a small disaster for Mr. Kazama of Mitoku when John Belleme handcuffed himself to Mr. Kazama's desk and said he would not leave until Mr. Kazama had located a miso master with whom John could learn the traditional art of making Japanese miso.

1979 Oct.–It was a disaster for miso master Takamichi Onozaki, of Yaita, Japan, when two foreigners arrived, without invitation, saying they wanted him to teach them how to make miso. He told them he was sorry, but they could not stay. They stayed in his house, under the same roof, for 6-8 months as they worked hard and learned how to make miso.

1979 Nov. 18–Barry Evans is in a disastrous bicycle accident, breaking 5 vertebrae and 9 ribs. After a 14-hour operation, he spends 6 months on his back in the hospital and 1 year in a full-body cast.

1980 June–It was a disaster for Joseph and Patricia Carpenter, who had lived on the miso company land for the past ten months and expected to be owners of the miso company, when they were told to leave and, in their opinion, not told why.

1981 Nov. 10–It was a disaster for Michio and Aveline Kushi when their company, Erewhon, is forced to file for Chapter 11 bankruptcy protection because of debts totaling $4.3 million. The Kushis also had to give up their dream of starting a miso company (named Erewhon Miso Co.) in America. It was also a disaster for the miso company which could no longer count on Erewhon to distribute its products.

1982 Jan. 31–It was a disaster for Sandy Pukel when he has to give up his stake in Oak Feed Miso, Inc. It was his "baby" and he, more than anyone else, was responsible for bringing it to this stage. Equally sad was the fact that his good relationship with John Belleme was strained for the rest of the 1980s; they didn't talk for years after this event.

1982 Jan.–It was a small disaster for Mr. Onozaki when John Belleme begged him to come to America from Japan to check John's koji-making. He didn't want to go. He spoke no English, had never been outside of Japan, and had a business to run at home. Yet he went to help a friend in need.

1983 Oct. 1–It was a disaster when John and Jan Belleme feel they must sell all of their ownership in the American Miso Co. (900 shares) to Barry Evans. They had devoted most of the last 4-5 years working to create and build this company.

1992 Jan.–It was a disaster for Barry Evans when he is forced to take a "federal vacation" in Santa Barbara, California, for 2½ years.

2000 July 4–American Miso Co. is the largest and most successful Caucasian-run miso manufacturer in the Western world. Who is and was responsible for this success? Most of the people named above.

Note: Some of the most interesting (juiciest) stories about this company remain untold, for reasons that cannot be disclosed at this time.

10773. Schaller, Lorenz K. 2000. Husked or covered barley vs. naked or hull-less barley (Interview). *SoyaScan Notes.* June 23. Preceded by a letter dated June 20. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** The following is based on an article that Lorenz wrote in *The Cerealist,* Issue No. 1 (1989, p. 10-11, published by Kusa Research Foundation). All the different types of barley belong to the species *Hordeum vulgare.* This species is divided into two major groups: (1) Husked or covered barley, and (2) naked or hull-less barley. These two groups are not indicated as part of the scientific name, just as winter and spring wheat are not. However, if a scientist wants to indicate the naked form, he can write... var. *nudum.* Husked or covered barley, which has a husk "cemented" to the seed, is common in the West, where it is used for brewing and livestock feed. Naked or hull-less barley, of which the husk is easily removed (like the husk of wheat or rice) is more common in Asia (in Japan it is called *hadaka mugi; hadaka* = naked), especially in countries where barley is used as a food. Naked barley is the type generally used to make miso. "Naked barley closely resembles the free-threshing wheats, the naked grain sitting loosely in the spikelet between the lemma and palea, which show no adherence to the grain" (M.P. Charles. 1984. "Introductory remarks on the cereals." p. 29).

A mature barley plant bears a head or spike composed of individual spikelets. Each spikelet has glumes which completely enclose the seed in an envelope of fibrous husks.

The removal of the outer skins of the kernel is called "pearling." "Pearl barley" refers to barley that has been polished to remove the husk and outer bran layers. It is a word like "white rice." Husked or covered barley is more often pearled than naked barley. More than 99% of the barley available for food in modern developed countries is pearl barley. Scientists have found that naked barley is rich in beta glucones, phytochemicals that reduce "bad" cholesterol.

"Barley is the cereal most frequently mentioned in early Sanskrit records. It was introduced into India in ancient times and was probably the principal food grain during the Vedic Period (1600 B.C.–6000 B.C.)." "Barley, a sister crop of wheat, is the staple food of much of India's poor. In India, barley has been a poor man's crop, chiefly grown by small and marginal farmers in economically distressed areas." In the early 1980s, greatly improved hulless barley cultivars were developed by a brilliant Indian barley breeder, Dr.

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Mahabal Ram.

"Caryopsis" is a morphological term, correctly applied only to the dried seeds of grasses. It's meaning is identical to "seed" or "grain."

The sunken black line running the length of a seed / kernel of barley (called *fundoshi* or "loincloth" in Japanese) is called the "crease" or, more precisely the "ventral groove" or "ventral crease" in English. "These terms are of immense utility to paleobotanists, persons who specialize in identifying ancient botanical remains, as they are sifting through archaeological debris and making attempts to identify plant part remains."

When Americans eat barley, they do so mainly in soups and stews. Address: Founder & Director, The Kusa Seed Research Foundation, P.O. Box 761, Ojai, California 93024. Phone: 805-646-0772.

10774. Troy, John. 2000. Update on Wizard's Cauldron and work with miso (Interview). *SoyaScan Notes.* June 26. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** John's original organization was the Lindenself Foundation, a nonprofit organization involved with Eastern spirituality. The linden tree symbolized the heart. Out of this grew Linden's Elfworks, then Elf Works, Ltd., whose first product was a candy bar named Wizard Baldour's Power Pac introduced in 1976, and containing ginseng. Elf Works, Ltd. was created outside of the nonprofit corporation, and it existed only briefly (1981-1984).

In about 1980, John was first introduced to miso by Joel Dee of Edward & Sons who was introducing his Miso Cup, a dehydrated miso soup. Troy's next product was Wizard Baldour's Hot Stuff (in Regular or Blazing intensities); it was the company's first big success. It contained miso from the day it was launched. Troy first bought this miso from Erewhon (a fairly dark salty rice/red miso), but when Erewhon filed for Chapter 11 bankruptcy in Nov. 1981, Troy started buying his miso from Barry Evans of American Miso Co. It was John Belleme and Barry Evans who really got Troy interested in and involved with miso–before American Miso Co. had any miso for sale, but after their miso plant had been constructed. Troy can't remember how, where, or when he met Barry Evans. Belleme told him about going to Japan and apprenticing with Mr. Onozaki. Later Barry Evans introduced Troy to John Fogg in Charlotte. Troy later worked closely with Fogg; "at first I thought he was arrogant and fussy, but he ended up being a tremendous influence in my life, and taught me so much about marketing... To this day I still draw on the wisdom of John Fogg."

Troy now makes almost 100 different products for the natural food trade. Most of these contain miso and/or soy sauce. All of his business is private labeling, so he develops and manufactures products, which other companies market. Across the street from his office is a modern, high speed blending, bottling, labeling plant, with plenty of cold storage. He manufactures and bottles every product he develops. His company, The Wizard's Cauldron, Ltd., run small by a small team of leaders, now does about $2 million a year in annual sales. His products are now almost totally organic–200 ingredients. John has just a handful of customers. The biggest is Whole Foods Markets; he makes all the salad dressings and sauces sold under the Whole Foods label. Second biggest is Joel Dee of Edward & Sons. Troy makes four brands for Joel Dee: Premier Japan, The Wizard's, Troy's, and Rain Forest Organic. Joel's company owns the "Wizard" brand, which Troy gave him in 1987 as part of his "recovery plan" after American Natural Foods went down the tubes. Joel said, "You make it, I'll sell it." At about the same time, they also both developed the Premier Japan brand and line, which is still doing extremely well. In about July 1989 John developed "The Wizard's Worcestershire Sauce," a vegetarian sauce, for Joel Dee. It is now selling better than Hot Stuff. Ponzu is the Japanese equivalent of Worcestershire sauce; they use bonito instead of anchovies. But ponzu originated first, so "Worcestershire sauce is a Western 'knock-off' of ponzu." The Ginger Tamari is still a wonderful product that is doing very well.

Troy's third largest customer is Albert's Organics, America's largest organic produce distributor, for whom he makes a line of fresh, refrigerated organic dressings. Albert's Organics recently merged with UNFI (United Natural Foods, Inc., the collection of distributors that was Stow Mills, Cornucopia, Rainbow, Mountain People's Warehouse, etc.). UNFI is now a big publicly-owned company. Troy's favorite product developed for Albert's is Mellie's Miso Mustard Dressing, launched in 1998 with a mild miso from American Miso Co. Albert's daughter is named Mellie.

John is now developing a line of dressings under the Moosewood Restaurant brand for the people who own that restaurant. John's favorite is the Miso Ginger Salad Dressing. A few days ago he closed a deal with Robert Tepper (formerly of The Farm, in Summertown, Tennessee) to market his Simply Delicious brand of dressings. Robert now has his own company named Sunrise Management, which is a brand management company; Simply Delicious will be the first brand he owns. Robert worked for Natural Nectar, then Blue Sky, then Annie's (which he left in early 2000 to start his own company).

John's main work is still developing new products and naming his creations–the work he enjoys most of all things. "It's really fun." Blessed are those who find a way to do what they love most in life. Address: The Wizard's Cauldron, 8411 Hwy. NC 86 N, Cedar Grove, North Carolina 27231. Phone: 919-732-5294.

10775. Troy, John. 2000. Update on the Macrobiotic Company of America and Bruce Macdonald (Interview). *SoyaScan Notes.* June 26. Conducted by William Shurtleff of Soyfoods Center.

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• ***Summary:*** Bruce was recently kicked out of the company (MCOA), Norio Kushi is now running it, but Muso owns most of it. Bruce has filed a lawsuit against MCOA. Barry Evans and Norio are trying to work together, since Barry would like to slowly get out of the distribution business (he owns Great Eastern Sun) and move towards building branded products.

A few days ago John heard that Mr. Kazama had decided not to sell any more of his Mitoku products to MCOA. Rather, he will help Bruce start a new company in Asheville, and Mitoku will sell to Bruce.

John heard from Norio a few days ago that MCOA wants to come out with a line brandnamed "Kushi Organic" to take the place of Mitoku. They want John to develop a line of miso-based sauces, dressings, etc. for them. "Kushi" is now a registered trademark, owned by Michio Kushi, who is willing to assign it to his son, Norio. Address: The Wizard's Cauldron, 8411 Hwy. NC 86 N, Cedar Grove, North Carolina 27231. Phone: 919-732-5294.

10776. Shimatsu, Yuki. 2000. The National Institute of Informatics (NII) in Japan and their excellent website (Interview). *SoyaScan Notes.* June 28. Conducted by William Shurtleff of Soyfoods Center. [1 ref]
• ***Summary:*** The Japanese name of this organization is *Kokuritsu Jôhôgaku Kenkyû-jo.* Their website is www.nii.ac.jp. Their database is named NACSIS Webcat. Address: Reference Librarian, East Asiatic Library, Univ. of California, Berkeley.

10777. Evans, Barry. 2000. A visit with Mr. Onozaki in Japan: The story of the guests who decided to stay (Interview). *SoyaScan Notes.* June 29. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In 1984 Barry and John Belleme both traveled to Japan where they visited Mr. Takamichi Onozaki, with whom John and Jan Belleme had spent seven strenuous months studying miso-making in late 1979 and early 1980. Barry visited Mr. Onozaki again last month in Japan. At about age 70, he was still his same energetic self, very active and healthy and full of vitality, and his daughter and son-in-law were still there living 10 feet away (in Japanese fashion) and working hard making miso. Barry recalls: "He is a wonderful person. When we pulled up, got out of the car, and I saw him there, I broke down and started weeping. I hadn't seen him in 15 years. I think of him as the father of our miso company and I feel the same great affection and respect toward him that I do to my own father. It was very special." Mr. Onozaki then told Barry a story he had never heard before.

When the Belleme's showed up at his house, unannounced, in 1979, it was a disaster for him. He didn't want them to stay at all. He went out for a while, but when he came back he found to his dismay that they had moved all their baggage into the room of his daughter who was away at college, and made themselves at home. They begged him to let them stay overnight, so he relented and said okay, but only for one night. The next day they persuaded him to let them stay for one more night. The whole time they were there, he tried to get rid of them, over and over again–but they bamboozled him at every turn. They talked him into letting them stay for one week, then for one month, then for one more month, then for three months, then for two months more. At every juncture, they had to fight their way to stay the extra time. They would cry and moan. Of course, by end of their stay, television crews were coming up to cover the amazing story of Americans who had come to Japan to learn how to make miso.

But as he told the story it was clear that he was now quite proud of the fact that his disciples had started what is today the largest Caucasian-run miso factory in the Western world.

He then told Barry about how John seemed to have lost some confidence in his koji-making ability during the first season. John asked Mr. Onozaki if he would come to the United States and check that he was making the koji correctly. Mr. Onozaki said that he refused to come the first 3-4 times that John asked him. He had never been outside Japan before, and he has never left it since. He didn't want to go–at all. He didn't speak any English. How would he find his way? He had an active business to run at home. But John just kept insisting that he had to come. Mr. Onozaki said that eventually he remembered an old Japanese saying: "When a friend says he really needs your help, you've got to try to help!" So he felt that he just had to go, though he did so "kicking and screaming." Several months later, he sent his daughter and son-in-law in his place.

On the 1984 trip to Japan, after visiting Mr. Onozaki in northern Japan, John and Barry visited the Muso Company (*Muso Shokuhin*) in Osaka (south-central Japan), then the Fujiwara Brewing Company in Hiroshima (a manufacturer of equipment for making beer, soy sauce, miso, etc.; Barry was considering making shoyu in North Carolina), then the company that makes sweet white miso for Muso in Fukuoka (on Kyushu, Japan's southernmost island).

On a 1983 trip with Robbie Swinnerton of Mitoku (John Belleme was not along) Barry visited Sendai Miso-Shoyu Co. in northern Japan. Address: Owner, American Miso Co., Inc. and Great Eastern Sun, Asheville, North Carolina 28806. Phone: 704-252-3090.

10778. Kikkoman Corporation. 2000. Annual report 1999. 339 Noda, Noda-shi, Chiba 278, Japan. 33 p. 28 cm. [Eng]
• ***Summary:*** The information in this English-language annual report is current as of April 2000. Contents: Financial highlights. A message from the president (Yuzaburo Mogi): Overview of the fiscal year, principal developments, summary of business policy (business principles, medium-

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term business strategy, business organization, basic policy on distribution of profits, looking to the future, tasks for the coming years, in closing). Global operations: The Americas, Europe, Asia and Oceania, Japan. Review of operations: Soy sauce, soy sauce derivative products, Del Monte, sake and wine. Research & development. Financial section: Consolidated balance sheets, etc. Corporate history (chronology from April 1925 to Nov. 1999). Global network (directory of Kikkoman names, addresses, and phone numbers worldwide). Board of directors and officers. Corporate data.

Consolidated net sales fell 3.4%, but net income rose 1.3%. In 1999 overseas operations (excluding exports from Japan) accounted for about 27% of consolidated net sales and 49% of Kikkoman's consolidated operating income.

The Americas: Today more than 100 items are manufactured at Kikkoman's plant in Walworth, Wisconsin. The plant's annual soy sauce production capacity is 80,000 kiloliters. The new Folsom plant had an initial annual soy sauce production capacity of 10,000 kiloliters. There is room to expand this capacity fourfold. In the year 2000 production capacity is expected to reach 15,000 kiloliters. Annual per capita soy sauce consumption in the USA has increased to 700 milliliters, which is less than 8% of the estimated 9,000 milliliters per capita in Japan. U.S. consumption is expected to double within the next ten years.

Color photos show: Yuzaburo Mogi, Kikkoman's new headquarters in Noda, all company products. Address: Noda, Japan.

10779. Kono, Makoto. 2000. Life after the "Liefde": Dutch influence in Japan. *Look Japan* (*Tokyo*) 46(531):35-37. June.
• ***Summary:*** In 1600, the Dutch ship *Liefde* drifted ashore in Usuki Bay in Bungo Province (now Oita prefecture). Of the original 110 crew members, only 24 were still alive, and only six of these could walk ashore unassisted. The arrival of this ship marked the beginning of relations between Japan and the Netherlands, and the 400th anniversary of this key event is being celebrated in Japan this year. Two of the surviving crew were to earn important places in Japanese history: William Adams and Jan Joosten.

Adams, an Englishman, became Tokugawa Ieyasu's advisor on diplomacy and trade. He adopted the Japanese name Miura Anjin, married a Japanese woman, Oyuki, and was given the social rank of samurai. Two monuments and a festival commemorate the site of his residence in Tokyo and the grave of his wife. Jan Joosten became Ieyasu's advisor on military affairs. He, too was given a Japanese name, Yaôsu, and that name survives today in a slightly modified form as Yaesu, a district on the eastern side of Tokyo Station.

In 1633 the Tokugawa shogunate adopted a policy of national isolation which continued for 221 years until 1854 when the American Commodore Perry forced the country to open its doors to Western trade. During this time Japan maintained contact with only three nations: China, Korea, and the Netherlands. The Dutch were restricted to an artificial island named Dejima [Deshima], built by the shogunate in Nagasaki Harbor. This was the sole source of "Western Learning" which was more commonly called "Dutch Learning" (*rangaku*). The first area of interest to Japanese scholars was Western medicine, starting with anatomy. In 1774 a 5-volume anatomy was translated into Japanese by a team headed by Gempaku Sugita.

At the Dutch trading post in Dejima, three doctors were employed; each had a strong impact on the relationship between Japan and the West. Engelbert Kaempfer, a German, came to Japan early in the Edo period (1603-1867). Philipp Franz von Siebold, also a German, came in the middle years of the Edo period, and Carl Peter Thunberg, a Swede, came near the end. Besides medicine, all three taught natural history, focusing on the flora and fauna of Japan, and all three became well known in Europe for disseminating their knowledge of Japan.

10780. Ross, Brain; Allyn, Richard D. 2000. 20/20–Soy: The untold story. Television broadcast. Friday, June 9. Channel 7. 10:00 p.m. ABC (American Broadcasting Co.). (California). 10:00 p.m.
• ***Summary:*** This program segment was divided into several parts, all on the theme that soy may not be great for everyone: (1) FDA scientists Daniel Doerge and Daniel Sheehan have stepped forward to criticize their own agency's heart health claim. Their long, well documented letter is available on the 20/20 website. The two explain that while soy may be beneficial to the heart, excess consumption could be harmful to people with thyroid disorders, or women who are at risk for breast cancer, or babies consuming infant formula (they are concerned that phytoestrogens in soy could interfere with normal human sexual development).

(2) Debate over phytoestrogen levels in soy-based infant formulas: Dr. Claude Hughes, director of the Women's Health Center at Cedars-Sinai Medical Center in Los Angeles, recommends that mothers who don't breast feed, should use as milk-based formula, and chose soy as a last resort. But Dr. Kenneth Setchell, a pediatrics professor at Children's Hospital in Cincinnati, Ohio, contends that hundreds of thousands of infants have been raised on soy infant formula and many are now adults, yet few problems have been observed. (3) Soy and breast cancer: Dr. Hughes notes that some studies show soy protects against breast cancer. But other studies indicated that, for certain women, the phytoestrogens found in soy may enhance a widely-found kind of estrogen-feeding breast cancer. It can speed up division of those estrogen-dependent cells that are already cancer cells.

(3) Lon White's study on tofu and brain aging and shrinking among elderly Japanese-American men in Hawaii. The soy industry counters that White's study shows only an

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association between tofu consumption and brain aging, does not prove that tofu causes this aging, and is in conflict with other studies on Asian populations and animals.

The report concludes: "While the scientific research on soy is still emerging and is often contradictory, there are now some serious questions being raised about this miracle food, and some of its staunchest defenders acknowledge that these questions need to be answered."

10781. Stewart, Martha. 2000. Edamamé. Television broadcast. Tuesday, June 13. Martha Stewart's Living program.

• ***Summary:*** The first segment of this TV program is titled "Edamamé" (3 minutes, 20 seconds). Martha Stewart, one of the most famous women in America today and a leading authority on entertaining and cooking, begins by holding a package of Trader Joe's precooked, frozen edamamé and saying: "If you see edamamé in the freezer section of your grocery story, buy a package and try it. It's really fantastic. I'm always looking for healthy, easy-to-prepare snacks that are also nutritious–and these are just the answer." Inside the fuzzy green pods are soybeans. Soy sauce, miso, and tofu are among the many other yummy foods made from soybeans.

Martha demonstrates how to cook the soybeans, following the instructions on the package, by boiling them in heavily salted water for about 5 minutes. Have a bowl of iced water nearby in the sink. "Soybeans like this are packed full of vitamins, nutrients, and unsaturated fats–the kinds of fats that break down cholesterol in your body. As such, I suggest that you try 'em as a snack." Lift the edamamé out with a strainer, then lower the strainer into the iced water. Leave until cool, but not too long, lest they become soggy. Drain in the strainer, then while they are still a little bit damp, sprinkle them generously with natural sea salt–the kind with irregular crystals. Then they are ready to eat. "You just squeeze on the pod, and the little soybean pops out. Mmmm. Really good." "Keep a supply of this edamamé in your freezer, and the next time guests stop by or your children come home from school, you'll be prepared with a really healthy and delicious snack."

Talk with Tak Kimura. 2000. July 11. To prepare precooked, frozen edamamé: After the green pods are picked from the soybean plants, they are rushed to the packaging plant, blasted with steam (to clean the surface of the pods), immediately blanched in boiling water for 4-5 minutes (to help them keep their bright green color and good flavor and texture), then quickly frozen and packaged. A large percentage of the edamamé consumed in Japan today are sold frozen like this, so that they can be enjoyed year-round. This new frozen trend started in about 1990; before that Japanese enjoyed edamamé as a seasonal food, fresh during the summer only. Nowadays quite a few companies even freeze the fresh edamamé during the summer, because they find that dealing with fresh foods is a nuisance.

Note: Martha Stewart has been able to turn her own lifestyle into a major industry. A successful model during the late 1950s and early 1960s, she was even more successful as a Wall Street stockbroker, and again very successful in a catering business she started. In 1982 she wrote a best-selling book titled *Entertaining.* Her ideas about gracious living have had a major influence. Address: Westport, Connecticut.

10782. Wollner, Joel. 2000. Mr. Kitani of Yamaki Co. in Japan has a huge new shoyu and miso factory that uses 100% organically grown ingredients (Interview). *SoyaScan Notes.* July 2. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** In June 2000, on a trip to Japan and China, Joel (together with translator and guide Yoshi Nanabayashi) visited Mr. Tomio Kitani, owner of Yamaki Jôzô K.K. in Saitama prefecture, Japan. He is about age 60 and very healthy and vital. Several years ago he moved from the nearby town into the mountains, where he built a huge new factory where he makes miso, shoyu, tofu (fresh and instant), and pickles. The company's address is (written Japanese-style): Saitama prefecture, Kodama-gun, Kamiizumi Mura, Oaza Shimo, Akuhara 955. Phone: 0274-52-7000. Fax: 0274-52-7001. Plant manager: Morikawa Kazuhiko. The nearest railroad stop is Kodama station.

The company has about 80 huge shoyu vats filled with moromi. Most of his miso is short-term–1 to 3 months. His koji rooms are fully automated. Yamaki Co. is extremely important in the world of organic miso and shoyu in Japan. Joel thinks they make more of these products than Sendai Miso Shoyu, and may be the biggest such manufacturer in Japan. He also bottles and sells water from a spring he owns. His company is flourishing, and growing very rapidly. Some 90-95% of his market is in Japan; the rest is miso and shoyu exported to the USA. He is the 4th of 5th generation owner, and he hopes his son will take over from him within the next ten years or so. The main ingredient he uses is soybeans, but all of his ingredients are organically grown in Japan by MOA (Mokichi Okada International Association), a quasi-religious, quasi-cooperative organic farmers organization and movement. MOA is one of the pioneering and most important organic organizations in Japan.

Joel first visited Yamaki in 1985 when he, Bob Kennedy, and Herman Aihara were setting up Ohsawa America (after Kennedy had sold Chico-San to Heinz). Joel later brought in Martin Roth–who is now married, lives in Berkeley, and is head of a marketing company with Kristin Brun (who lives in El Cerrito). Ohsawa America, which traded with Ohsawa Japan, no longer exists. Address: 76 Florida Ave., Berkeley, California 94707. Phone: 510-524-4420.

10783. *SoyaScan Notes.* 2000. Chronology of Erewhon Miso Co., Oak Feed Miso, Inc. and American Miso Company (Overview). July 6. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** These three companies are actually the same

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company whose name changed. This chronology is based largely on dated documents. Undocumented dates are usually followed by question mark. Notice the many unusual twists and turns in the story.

1977 Aug. 2–A bee flies into the cabin of a big truck near Rutherfordton, North Carolina. As the driver tries to swat it, his truck swerves across the road, smashing into a car driven by Bob Deakin, killing Bob's daughter (age 12½) and severely injuring Bob and his young son.

1978 Dec.–Sandy Pukel, Michio Kushi, and John Belleme get together in Boston to discuss the miso factory. They agree on quite a few points. All three are deeply interested in macrobiotics.

1979 Jan. 26–The bank (Tryon Federal Savings and Loan) forecloses on Bob and Karen Deakin's mortgage. Still injured from the car accident, he is unable to make his land payments. The land goes on the market.

1979 Feb. 28–Oak Feed Miso, Inc. is incorporated in Florida. The initial directors and officers are Sandy Pukel and John Belleme. 1979 Feb?–A contract is drafted by David Young (though never signed) showing what percentage of the proposed Erewhon Miso Co. will be owned by the Erewhon group (comprised of Sendai Miso-Shoyu Co., Michio and Aveline Kushi, and maybe Mitoku / Mr. Kazama) and by the Oak Feed Group (comprised of Sandy Pukel and John Belleme). The Erewhon group was to have the majority ownership, and Japanese companies and individuals were expected to play a major role in the new company.

1979 March–Joseph Carpenter looks for land in Rutherford County, North Carolina. Talks with several insurance agents.

1979 spring–Members of the Oak Feed and Erewhon groups meet in North Carolina in the first attempt to locate a site for the miso plant. In attendance are Michio and Aveline Kushi, Sandy Pukel, John Belleme, Frank Head, and Junsei Yamazaki and his wife (both from California).

1979 April–Barry Evans makes his first investment in the miso company, $50,000.

1979 June?–Sandy Pukel travels to North Carolina and makes the down-payment on a piece of land in Rutherfordton. The roughly 92 acres cost about $110,000 to $120,000.

1979 Aug. 7–Oak Feed Miso, Inc. finalizes the purchase on the 92 acres of land by assuming the second mortgage and paying an additional $11,500 each to Lawrence L. Bridges and E. Milton Singletary. Sandy Pukel (president) and John Belleme (secretary) sign the land deed and deed of trust.

1979 Aug. 16–Subscribers Consent Agreement executed.

1979 Aug. (late)–Joseph and Patricia Carpenter arrive in Rutherfordton from Florida to live and work on the miso company land.

1979 Oct.–John and Jan Belleme leave for Japan to begin an apprenticeship with a miso master. They stop by the land in North Carolina to visit briefly with the Carpenters, then also visit Thom Leonard at Ohio Miso Co. Arriving in Japan in late October, they visit Mr. Kazama in Tokyo then travel north with him to Yaita, where they study miso-making with the Onozaki family–which makes only dark rice miso. A good, long letter from Jan describing their experiences is published in 1980 in the book *Macrobiotic Cooking for Everyone,* by Edward and Wendy Esko.

1979 Nov. 18–Barry Evans is in a very serious bicycle accident.

1980 April–A detailed letter by John, about his miso apprenticeship with the Onozaki family in Yaita, Japan, is published in *GOMF News,* a small macrobiotic magazine from Oroville, California.

1980 June–John and Jan Belleme return to the USA from Japan. That summer John located the remaining miso equipment in New Jersey and ordered wooden vats from the Arrow Tank Co. in Buffalo, New York.

1980 fall–John and Jan go on the Erewhon payroll.

1980 Sept. 29–Work has just begun at Rutherfordton in leveling the site for miso factory, which is going to be a metal Butler building. By late 1980 John and Jan begin to make their first experimental batches of one-year rice miso, at their home, in the sauna.

1981 early–The project stalls for lack of funds. John starts writing articles about his trip to Japan. One goal is to convince Barry not to abandon the project.

1981 Jan.–"The Master of Hoops," John's first article, is published in *East West Journal.*

1981 March 9–John Belleme is deeded 7.5 acres of land by American Miso Co. in the northwest corner of the AMC property; later he starts to build a house there.

1981 April–"The Miso Master's Apprentice," John's second article, is published in *East West Journal.*

1981 July–"The Miso Master With a Big Heart: Making Miso in a Japanese Village," John's third article, published in *Soyfoods* magazine. Contains many good photos of miso making in Japan.

1981 July–The beautiful and joyous opening ceremony for the Erewhon Miso Co. is held at Rutherfordton, North Carolina. Those present include Michio and Aveline Kushi, John and Jan Belleme, Sandy Pukel, Barry Evans. It is a moving experience for all. But behind the scenes, Erewhon's financial is rapidly deteriorating–due largely to too rapid expansion.

1981 Aug.–John and Jan Belleme begin full-time large-scale production of one-year Onozaki-style red (rice) miso at their plant in Rutherfordton.

1981 Sept. 27–The annual meeting of the Oak Feed Miso Co. is held at Rutherfordton, North Carolina. Barry Evans is appointed acting chairman. Shares in company are owned as follows: Barry Evans 1,400, Sandy Pukel 1,400, John Belleme 900, Yozo Masuda 100, Edmund Benson 100, and James Kenney 50. All stock is converted to one kind, Class A, which is voting stock. Thus, for the first time, Barry

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gets the right to vote and becomes a member of the board of directors.

1981 Aug.–John and Jan Belleme begin fulltime, large-scale production of miso and koji at their new plant in Rutherfordton, North Carolina. Fourteen months have passed since they returned from Japan. Twelve more months must pass before this miso is ready to sell.

1981 Nov. 10–Erewhon files for bankruptcy protection under Chapter 11 of the Federal Bankruptcy Act because of debts totaling $4.3 million. At this time, Aveline Kushi is the sole owner of Erewhon. Thus, the miso company can no longer count on Erewhon to distribute its products. Apparent disaster!

1981 Dec.–Barry Evans establishes Great Eastern Sun (GES) in Asheville, North Carolina, in part to package and market the miso made by AMC. Mitoku, almost destroyed by Erewhon's collapse, and eager to rebuild, agrees to export Japanese natural foods to GES.

1982 Jan. 4–Barry Evans sends out a letter announcing the opening of The American Miso Company in North Carolina. The company now has a new name (it was officially changed on 5 May 1982). Barry also announces that Linden's Elf Works (Rougemont, North Carolina), run by John Troy, has been appointed as AMC's sole marketing and distribution agent. Note: This arrangement was very short-lived; Elf Works never distributed any of AMC's miso. Great Eastern Sun did all the distribution.

1982 Jan.–Mr. Takamichi Onozaki comes to America from Japan to see how well his students had learned his lessons. He stays and helps make koji and miso for 2-3 weeks, until he is fully satisfied that all is well.

1982 Jan. 31–Barry Evans and Sandy Pukel agree to a swap of stock, such that Barry gets all of Sandy's stock in the miso company and Sandy gets all of Barry's stock in Oak Feed Store and Restaurant. After this, Sandy is no longer involved with the miso company. Barry and John Belleme now own all the company's shares, and Barry owns a large majority.

1982 April–Great Eastern Sun make's its first sale, of products imported from Mitoku in Japan to a natural foods store in the USA.

1982 April–Mr. Onozaki's his adopted son, Haruo, and eldest daughter, Kaoru (Haruo's wife), arrive in Rutherfordton and spend 3 months sharing the Belleme's home, helping Jan who is pregnant, and helping to make miso. The Bellemes' son, Justin, is born on May 24.

1982 July–The first detailed article about American Miso Co. and its method of making miso (with many fine photos) is published in *Soyfoods* magazine: "American Miso makes a Big Move Down South," by Richard Leviton, who visited the company in April. The company "has struck a careful balance between the traditional approach (as in making koji, which requires skill and personal attention) and labor-saving mechanization (as with bean washing, soaking, cooking, mixing, and moving)."

1982 Sept.–The first miso made by AMC is sold by Great Eastern Sun. It is one-year, Onozaki-style red miso, sold in bulk only in 4 lb, 15 lb, and 40 lb tubs.

1983 Oct. 1–John and Jan Belleme sell all their ownership in the American Miso Co. (900 shares) to Barry Evans for $30,000. However, John continues to work making miso for AMC. Throughout the past year he has been experimenting with making mellow white and mellow barley misos. Great Eastern Sun is now selling about 50,000 lb/year of white miso from other sources.

1984 fall–AMC miso first starts to be sold in one-pound plastic coffee bags (each with a pressure release valve), refrigerated. A full-page ad showing the bag appears in the Jan. 1985 issue of *East West Journal.* Previously, all their miso had been sold in bulk.

1985 Feb.–Don DeBona leaves his job as general manager at Great Eastern Sun and begins to work at American Miso Co., learning the process from John Belleme.

1985 April?–AMC introduces three varieties of relatively sweet, light-colored, short-term misos: Mellow White Miso, Mellow Barley Miso, and Amakuchi Mugi Miso–a shock to traditional macrobiotic followers. These light misos were sold in the plastic bags. As of July 2000, half the company's sales come of such short-term types of light miso.

1985 Dec.–Don DeBona takes over management of the company. John Belleme leaves. It was a difficult transition.

1985 Dec. 31–AMC has its first profitable year, earning $22,000 in calendar year 1985.

1986 early–AMC miso starts to be sold in one-pound plastic cups/tubs, refrigerated. The plastic bags are phased out.

1987 fall–AMC miso starts to be sold in 8-oz plastic cups.

1988 Feb.?–New koji room designed and built by Don DeBona. Constructed at floor level with a large door and high ceiling, it enables the koji crib and racks of koji trays to be wheeled in and out. Before, all the koji had to be carried in and out by hand.

1992 Jan.–Barry Evans is required to take a "federal vacation" in Santa Barbara, California, for 2½ years. He hands the management of American Miso Co. and Great Eastern Sun over to Don DeBona.

1992–American Miso Co. builds a second factory as large as the first.

1993–American Miso Co, now has 41 huge wooden (mostly cedar) miso vats, each of which holds over 4 tons of miso. Starting with only eight vats, they added six in 1986, seven in 1989, five in 1991, and fifteen more in 1993. Also in 1993 AMC begins to export its miso to Europe, where it is distributed by Lima throughout the continent.

1995 April–Greg Gonzales starts work at American Miso Co. learning the process from Don DeBona.

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1995–AMC uses up the last of tax loss carryforwards; total past financial losses go to zero.

1997 March–Greg Gonzales takes over management of the company after Don DeBona leaves.

10784. Santacruz, Cecilia; Santacruz, Nestor. 2000. Re: More searching for the roots of soya in Colombia. New developments at Delisoya. Letter to William Shurtleff at Soyfoods Center, July 19. 2 p. Typed, with signature. [1 ref]
• ***Summary:*** Cecilia traveled to Corpoica but was unable to obtain the 1930 Boletin by Durán Castro: Molina Garcés. All records of the Granja Experimental de Palmira were sent to ICA, and the ICA can't find them.

"Our small business demands a lot of time and we are not integrated; we make and sell the tofu in different places. We started a new activity (see the yellow paper) in Delisoya–making lunches. Gloria, my new partner, a young girl and I. Nestor keeps making tofu and soymilk."

Accompanying the letter is Deli Soya's daily lunch menu (black on yellow background) which includes: Brown rice mixed with tofu. Whole-grain lasagna with Italian tomato sauce, tofu and spinach.

In a handwritten note at the end, Cecilia says that she is studying Japanese, and has been invited to stay at the home of Japanese friends. Address: Founders and owners of Delisoya, Calle 78 No. 12-03, Santafe de Bogota, Colombia. Phone: 346-2178.

10785. Belleme, Jan. 2000. Work with American Miso Co. (Interview). *SoyaScan Notes*. July 23. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** After she and John had been living at the Onozaki's home in Japan for about a month, a letter came from Mr. Kazama (of Mitoku) saying that Mr. Onozaki did not want to teach them any more about making koji–so they would have to leave any day now. This was disastrous news for them. Then, without an explanation, Mr. Onozaki changed his mind, and they ended up staying for 7 months.

After John and Jan returned from their apprenticeship with Mr. Onozaki in Japan, Jan worked side by side with John making koji and miso. In 1981, when she was pregnant, she had to increasingly take it easy. She worked up until the 7th month of her pregnancy; their son, Justin, was born on 24 May 1982. Address: P.O. Box 457, Saluda, North Carolina 28773.

10786. Asia Foods Group. 2000. Company profile. Hong Kong. 30 p. 30 cm.
• ***Summary:*** This brochure, written in English and Japanese, contains many color photos. Contents: Introduction. Company profile. Company history (chronology: Dec. 1976 to July 2000). Organization structure. Directors and management. Quality assurance and environment protection. Edamame power. Office & factory profile. Organic farming: History and background, farming fields control and management, compost production facility and management, quality control and factory management, GMO (genetically modified organism), pesticide residue control and management.

For ongoing basic information, see the 1998 edition. The page titled "Edamame power" states: "Edamame has been Asia Foods' main product since its establishment and today the Company is both the leader in Edamame processing and one of the largest exporters to Japan and the USA market." Nine benefits of eating edamame are discussed.

In March 1994, Asia Foods began organic farming in China (Taian, Shandong province).

In the long section titled "Products," the page on "Beans" (*mamérui*) shows (with a color photo and text, in English and Japanese, for each product) that Asia Foods sells three types of edamame: (1) Edamame and Edamame without pod (*muki edamame*). (2) Chamame and Chamame without pod (*muki chamame*). (3) Kuromame [black soybean] and Kuromame without pod (*muki kuromame*). Address: Suite 1508 Dominion Centre, No. 43-59 Queens Road East, Hong Kong. Phone: (852) 2865-3216.

10787. Fallon, Sally W.; Enig, Mary G. 2000. Tragedy and hype: The Third International Soy Symposium. Parts I & II. *Nexus* (*New Zealand*). July. p. 66-71; Aug/Sept. p. 56-58. [72 ref]
• ***Summary:*** Note: This article, which is extremely critical of soy and the soy industry, is identical to that by the same authors that appeared in *Nexus* (New Zealand) in April/May 2000 except that: (1) The word "Hype" was accidentally written "Hope" in Part I of this article; (2) The references are included with the article. Address: 1. M.A.; 2. PhD. Phone: 619-574-7763.

10788. House Foods America Corporation. 2000. Hinoichi and House Foods products: Tofu, age, konnyaku, natto (Leaflet). Garden Grove, California. 1 p. Front and back. 28 cm.
• ***Summary:*** Glossy color and dated. Appears to show a photo of the front of the package of all the different types of Hinoichi-brand and House-brand soy products made at this time.

(1) Tofu. Hinoichi brand: Soft tofu 14 oz, regular tofu 14 oz, firm tofu 14 oz, and extra-firm tofu 14 oz. Soft tofu 19 oz, regular tofu 19 oz, firm tofu 19 oz, and extra-firm tofu 19 oz. House brand: Tokusen kinugoshi tofu (Soft tofu) 10 oz, Sukui tofu (Extra soft tofu) 12 oz, Spoon tofu (Extra soft tofu) 12 oz.

(2) Organic tofu: House brand: Organic tofu soft 14 oz, organic tofu regular 14 oz, organic tofu firm 14 oz, and organic tofu extra-firm 14 oz.

(3) Flavored tofu. House brand: Chef tofu original 19 oz, Chef tofu herb & garlic 19 oz, Chef tofu chili & vegie 19 oz.

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(4) Tofu dessert. House brand: Shao mi tofu dessert (mango) 10 oz, Shao mi tofu dessert (lychee) 10 oz, Shao mi tofu dessert (tangerine) 10 oz.

(5) Age. Hinoichi brand: Agé (tofu pouches) 6 pieces = 1.5 oz total, Oagesan (tofu pouches) 2 pieces, Oagesan (tofu pouches) 4 pieces, Oagesan (tofu pouches) 100 pieces (institutional), Atsu-agé (tofu cutlets) 5 oz, jumbo atsu-agé (tofu cutlets) 9 oz, ganmodoki large (tofu fritters) 3 pieces = 5.4 oz total, ganmodoki small (tofu fritters) 8 pieces = 4.3 oz total.

(6) Konnyaku. Hinoichi brand: White ita konnyaku (yam cake) 10.5 oz, black ita konnyaku (yam cake) 10.5 oz, white shirataki bag (yam noodle) 8 oz, black shirataki bag (yam noodle) 8 oz, konnyaku (yam cake) 11 oz, shirataki (yam noodle) 9 oz.

(7) Natto. Hinoichi brand: Mamekozo natto (fermented soybeans) 5.4 oz, natto (fermented soybeans) 4 oz. Address: 7351 Orangewood Ave., Garden Grove, CA 92841.

10789. Shurtleff, William; Aoyagi, Akiko. comps. 2000. Miso and soybean chiang–Bibliography and sourcebook, first century B.C. to 2000: Detailed information on 2,619 published documents (extensively annotated bibliography), 343 commercial miso products, 304 original interviews (many full text) and overviews, 372 unpublished archival documents. Lafayette, California: Soyfoods Center. 1026 p. Subject/geographical index. Author/company index. Extensively annotated. Printed July 10. 28 cm. [3198 ref]
• ***Summary:*** Miso, or "fermented soybean paste," is one of East Asia's most important soyfoods. Miso is an all-purpose high-protein seasoning, which has no counterpart among Western food or seasonings. Made from soybeans, rice or barley, and salt, its smooth or chunky texture resembles that of soft peanut butter. It comes in a wide range of warm, earthy colors ranging from light yellows to rusty reds, rich chocolate browns, or loamy blacks. Each miso has its own distinctive flavor and aroma, which for the darker, more traditional varieties is savory, and sometimes almost meaty, while for the lighter-colored types is subtly sweet and delicately refreshing. Miso's range of flavors and colors, textures and aromas, is at least as varied as that of the world's fine wines or cheeses.

Today miso is made by a small number of companies in the United States, Canada, Europe, and (as miso or miso products) is widely available at supermarkets, natural- and health food stores, and Asian stores.

This book contains the first detailed history of each of America's pioneer miso manufacturers.

This is the most comprehensive book ever published about miso and/or soybean chiang. It has been compiled one record at a time, over a period of 25 years, in an attempt to document the history of this subject. Its scope includes all known information about these two seasonings, worldwide, from the first century B.C. to the present. It is also the single most current and useful source of information on this subject available today, since 86% of all references (and most of the current ones) contain a summary/abstract averaging 229 words in length.

This is one of more than 40 bibliographies on soybeans and soyfoods being compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyfoods Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features: 63 different document types, both published and unpublished, every known publication on the subject in every language–including 2,368 in English, 618 in Japanese, 120 in German, 105 in French, etc. Extensive translations of many of the Japanese and European works. 304 original Soyfood Center interviews and overviews never before published. Thus, it is a powerful tool for understanding the development of this subject from its earliest beginnings to the present, worldwide.

The bibliographic references in this book include 2,169 published documents and 372 unpublished archival documents. Each contains (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English language publications together with an English translation of the title, month and issue of publication, and the first author's first name (if given).

This book also includes details on 343 commercial miso products, including the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as advertisements, articles, patents, etc.) are also given.

Details on how to make best use of this book, a complete subject/geographical index, an author/company index, a language index, and a bibliometric analysis of the composition of the book (by decade, document type, language, leading periodicals or patents, leading countries, states, and related subjects, plus a histogram by year) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

10790. Cooper, Kim. 2000. Growing identity preserved (IP) soybeans in Canada (Interview). *SoyaScan Notes.* Aug. 21. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Canada has been "IPing" (growing identity preserved soybeans) for about 15 years (i.e., since about 1985). The pioneers in growing IP soybeans were Paul King (age 50-55) and his father (who founded King Grain, and who is now in his 90s) and W.G. Thompson & Sons Limited (Blenheim, Ontario). Kim worked for King Grain for about 9 years. During his travels, Paul saw the need for consistent soybeans. He realized there was no way that Canada could

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compete with the USA for bulk shipments, so he proposed that Canada start to develop niche markets. He got very interested in soyfoods, because he believed there was a real opportunity for Canada to supply tofu makers with soybeans of consistently high quality year after year. Today Canada has the largest and most sophisticated IP system for soybeans of any country in the world.

When genetically engineered soybeans started to be sold, the Ontario Soybean Growers (OSG) got chastised by the American Soybean Association for growing non-GMO soybeans and for not helping the advancement of GMO soybeans. When the ASA suggested that Canada stop this, they responded that they were simply trying to fill a need in the market.

When customers started asking for non-GMO soybeans, they simply became another of Canada's IP products; the infrastructure was in place. OSG is basically selling a process, which they show to their customers–from seed to grower to elevator. The customers are quite satisfied that they will get the soybeans they want, whether it is 0.1% non-GMO or 1% non-GMO or whatever. For customers in Japan and the UK, non-GMO is very important; for those in Hong Kong, only about 50% want non-GMO. Ontario's IP production and exports have been increasing. This growth is hard to measure because the acreage is grown by individual companies. Kim has been doing some informal surveys, which show that 30-35% of the larger farmers are growing IP soybeans, which are also a value-added crop. Throughout Ontario province, Kim would estimate that IP acreage accounts for about 20-25% of total soybean acreage, compared with less than 5% of America's total soybean acreage. So Canada is way ahead of the USA in growing IP soybeans. Address: Marketing Specialist, OSGMB, Chatham, Ontario, Canada N7M 5L8. Phone: (519) 352-7730.

10791. Korth, Laura. 2000. Looking for those 'green things'–Edamame beans: Hard to recall the name but finally going to market. *Times–Call* (*Longmont, Colorado*)**.** Aug. 23.
• ***Summary:*** In Colorado, where edamame have been grown for about 4 years, they are just starting to arrive in markets this year. The author, who has become a fan, tells how to cook and eat them. Laura Culbertson, of Panchamama Farms in Longmont, went with her husband Ewell, to Japan to learn more about growing edamame. When eating their meals in farmers' homes, they were pleasantly surprised to see a bowl of cooked edamame set on the table at every meal–even breakfast.

10792. Skiff, James. 2000. Seminars on identity preserved (IP) soybeans and non-GE soybeans organized by the American Soybean Association in Tokyo, Japan (Interview). *SoyaScan Notes.* Aug. 25. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** A Japanese law requiring selective labeling of genetically engineered (GE) soybean ingredients was passed in Oct. 1999 but does not take effect until 1 April 2001. Jim Echle, head of the ASA office in Tokyo, is extremely receptive to the needs of his Japanese customers, such as tofu makers.

The first conference on this subject was held in April 1999 in Tokyo; it was Jim Echle's idea. In about Jan. 1999 Echle visited Jim Skiff's non-GE soybean facility in Mattoon, Illinois. He told Skiff that he was thinking about having a seminar on Identity Preserved and non-GE soybeans in Tokyo and asked Skiff if he would be willing to participate; Skiff said he would like to. He did not yet have a date or place, but he had the idea before he visited with Skiff, because he had been approached in Japan by trade associations and manufacturers who were interested in obtaining non-GE soybeans. Skiff then suggested that Echle talk with Dr. Dennis Thompson of the Illinois Crop Improvement Association, who Jim relied on to test for and verify non-GE soybeans. Skiff took Echle to meet Thompson. Echle subsequently scheduled Thompson to be the keynote speaker at the seminar in Tokyo. It was held in April 1999 in the afternoon in a university auditorium near the ASA offices. Several Japanese also spoke. An interpreter was present. The ASA went out of its way to make the subject of the seminar Identity Preserved (IP) soybeans and seed certification rather than non-GE soybeans, since ASA has pushed so hard to try to make GE soybeans acceptable. In fact, Echle told Skiff not to mention non-GE soybeans and not to have any signs that mentioned them. About 150-200 people attended the seminar, which lasted approximately 4 hours.

After the seminar, the attendees went to a larger meeting room down one story in the same building where there was a two-hour informal expo and social hour with snacks. About 7-8 American companies, such as Jim's, had tables or booths. Most were selling specific IP soybean varieties. Only Skiff was focused on non-GE soybeans. Peter Shortridge from Northland Organic had a both next to Skiff's. Sandra, the USDA Officer in Tokyo, gave a little introductory talk, followed by the president of the Japanese Tofu Association. Because of his position with the ASA, Echle had to downplay non-GE soybeans but he also knew genetic engineering was a big issue in Japan. Skiff feels that he has developed a good relationship with Jim Echle.

The second such seminar was held in early June of this year (2000) in Tokyo. Dan Burke of Pacific Grain and Soy was the keynote speaker. Jim was unable to attend because he had to be at a show in Europe; he is not aware of a third seminar. Jim thinks that the Tokyo office of ASA has been the most responsive of all ASA offices worldwide to the needs of its customers for non-GE soybeans. In Europe, ASA has lost many customers. The last ASA director in ASA's Brussels office lasted less than a year.

ASA has done a great disservice to soybean growers

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by presenting a one-sided and slanted view, and by not keeping them informed of anti-GE sentiments and legislation worldwide. With better information, more American farmers would have started growing IP or non-GE soybeans–and probably profited thereby. The Ontario Soybean Growers in Canada have done a much better job of following a two-track policy. ASA still argues that there are only a few nuts like Greenpeace who oppose GE soybeans for no good reason, and that all rational people believe genetic engineering is a boon to soybean farmers and the inevitable wave of the future. But how about the Japanese and their law requiring labeling of GE ingredients? ASA should have followed a two-track, customer oriented policy. You want non-GE soybeans? Buy 'em from us. You don't care if the soybeans are genetically engineered? Buy 'em from us. Address: US Soy, 2808 Thomason Dr., Mattoon, Illinois 61938. Phone: 217-235-1020.

10793. Asimov, Eric. 2000. $25 and under: Going beyond sushi, on an unlikely street. *New York Times.* Aug. 30. p. F9.
• ***Summary:*** This is a review of the Japanese restaurant Miyagi (220 West 13th St., Greenwich Village–a largely residential area on the west side of downtown {southern} Manhattan in New York City). One of the writer's favorite dishes was "greens tossed with delicate soy milk skins [yuba] in a mustard-and-miso dressing ($4.25). The dish is so bright and winning that only on closer examination can you tell that the greens are broccoli rape."

10794. *ASA Today* (*St. Louis, Missouri*). 2000. Food grade soybeans in Japan: The market for high quality, non-biotech soybeans. 6(9):4-page insert after p. 4. July/Aug.
• ***Summary:*** Across the top of each page this insert: "Demand for identity preserved soybeans grows in Japan." In a colored box on the lower right corner: "A special guide to profit opportunities, from the American Soybean Association, August, 2000." A color photo in the lower left corner shows a huge soybean with the words "non GMO" branded on it in brown, against a blue sky with white clouds. The caption (in both English and Japanese): "The Tokyo Grain Exchange launched the world's first Non-GMO soybean contract on May 18, 2000." Across the bottom of page one: "This publication is sponsored by Bayer Corporation."

The article begins: "Japan, the single largest customer for U.S. soybeans, and the world's largest importer of food grade soybeans, has passed a biotech food labeling law that will affect foods containing soy protein. Beginning April 1, 2001, foods containing biotech ingredients will be required to display a label informing consumers that the product includes genetically modified materials.

"Rather than marketing a consumer product with a GMO ingredient label, Japanese importers are already sourcing from the United States Identity Preserved (IP), non-biotech soybeans for use in tofu, and other soy foods, in anticipation of the new labeling law."

A sidebar on p. 2 titled "Market size" states: "ASA estimates that demand for identity preserved non-biotech soybeans for the tofu market in 2000 will equal about 500,000-700,000 metric tons (18-26 million bushels)–around 15-20 percent of total U.S. exports to Japan. This does not include about 300,000 metric tons (MT) of organic and premium grade soybeans, which have been grown for the Japanese market under high-value IP systems by U.S. farmers for many years."

A color photo on page 3 shows seven people standing together at "ASA's 3rd Annual Food Soybean Conference" which was held in Tokyo on June 13. One of the seven is Dan Burke of Pacific Soybean and Grain (San Francisco, California).

Note: Throughout this article the term "food grade soybeans" is used.

10795. KTV Kansai Fuji Television. 2000. "Excavation"–Aru aru daijiten #174 "Edamame" [Digging into our big, big dictionary #174–"Edamame"] (Color videotape). Tokyo, Japan: Fuji Television. 50 minutes. Aired Aug. 6. [Jap]
• ***Summary:*** This color video discusses the history of edamame in Japan, the nutritional value of edamame, and how to best prepare edamame (in the pods) at home.

The strongest "team" is beer and edamame–natural products of Japan's summer. But what is edamame? Edamame are soybeans that are harvested three months before mature, dry soybeans, while they are still young and green. Eating premature soybeans is part of Japan's original food culture, according to Nagayama Hisao, food culture historian and commentator. Countries that currently enjoy edamame are China, Taiwan, Thailand, Vietnam, and a few other Asian countries. But the habit of eating edamame originated in Japan.

Edamame became part of Japanese food culture during the Edo period (1600-1868). According to documents from that time, edamame vendors, carrying edamame in pack on their back, entered various towns during the summer season. People were attracted as they called out "Edamame," according to one written record. Since the edamame were precooked, they were a ready-to-eat food–a snack that you could eat while walking–even though was considered bad manners at the time. In short, edamame was Japan's "original fast food." And during the Edo period that began to be eaten as a snack with beer.

There are several theories as to why Japanese started, long ago, to eat premature soybeans. One theory, based on documents in the National Diet Library, says that during the Nara Period (A.D. 710-784), when there were repeated famines, Japanese began to eat edamame as an emergency famine food. Note: Unfortunately, no reference is given for these ancient documents, nor are we told what the food was called at the time. A second theory, also based on

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documents in the National Diet Library, says that during the Heian period (794-1185), edamame was consumed by the aristocracy as a high-valued food that was only available for a short time during the summer months.

Now is the prime season to enjoy edamame's "hidden health power" to counterattack summer fatigue, overdrinking, and overworking. Both fresh and frozen edamame are available. There are now more than 30 different brands of frozen edamame according to the Japanese Frozen Food Association.

The program closes with tips for preparing the most delicious edamame at home.

Talk with Tak Kimura of Concord, California–who gave a copy of this video to Soyfoods Center. 2001. Aug. 3. This is the best video he has seen on edamame. Address: Tokyo Japan.

10796. DiMartino, Christina. 2000. Mori-Nu seeks to educate consumers about the benefits of tofu. *Produce News* (*Fort Lee, New Jersey*). Sept. 11.
• ***Summary:*** The article begins: "One sure way to take advantage of what interests consumers today is for a company to focus on the health benefits of its products." Morinaga Nutritional Foods is doing just that.

A photo shows 4 types of Mori-Nu organic tofu "packaged in aseptic boxes," which assures consumers that the tofu will be fresh.

10797. *SoyaScan Notes.* 2000. Monsanto has no plans to develop biotech soybeans with consumer benefits (Overview). Sept. 12. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Monsanto and other biotech advocates have been saying, in response to growing consumer opposition to genetically engineered (GE) foods, that their next step will be to develop GE foods with consumer benefits–such as soybeans with more protein or isoflavones (such as genistein) or vitamin E, etc. Actually, however, Monsanto is reducing (by firing) most or all of their researchers developing such GE foods, for two reasons: (1) The market for soyfoods is too small to justify the investment in food development and plant breeding; (2) The risk is too great that consumers won't want GE foods even if they have such benefits.

Instead Monsanto is focusing its efforts on breeding soybeans with benefits for animal feeds, since the market is much bigger and there is much less risk of complaints from customers.

With this strategy, however, Monsanto faces a basic contradiction and fundamental problem. Without products having consumer benefits, consumer opposition to genetic engineering is likely to grow. Japan has already passed a law requiring all GE foods to be so labeled; the USA and Europe are likely to follow Japan's lead since polls show that most consumers believe that have a right to know what is in their foods. But labeling laws will require that GE and non-GE foods must be harvested, cleaned, transported, and stored separately. As the debate expands, and as new unforeseen consequences multiply (which seems likely), citizens may put pressure on legislators to sharply limit all genetic engineering. This may well become one of the big issues and debates of the early 21st century.

Talk with Jim Skiff of US Soy. 2000. Sept. 13. The trend in Europe is away from genetically engineered animal feeds. Some countries, such as Austria, won't allow any GE seeds to cross their borders. In both the USA and Europe the market for organically grown feeds is expanding. Given these trends, Monsanto may run into opposition to its GE feeds.

10798. Iino, Ryoichi. 2000. The history of shoyu (Soy sauce) 2. *Food Culture* (*Kikkoman Inst. for International Food Culture, Noda, Japan*) No. 2. p. 20-23. Sept. http://kiifc.kikkoman.co.jp. [11 ref]
• ***Summary:*** Contents: Introduction. Abolition of the *Hishio no Tsukasa* (Jan. 808 AD); Establishment of the *Sho-in* (somewhere between 835 and 882). *Sho* section and the manufacture of *sho* (*sho* soybeans were the major ingredient in *sho*). *Sho* and *sai-sho* (*sho* which still contains the dregs). What is *sai-sho?* The decline of liquid *sho.* Notes (11). Address: Food historian, and teacher of food history, Hattori Nutrition College, Japan.

10799. Morinaga Nutritional Foods, Inc. 2000. Made with non-GMO soybeans: Mori-Nu Tofu, the perfect tofu in the perfect package is made with perfect soybeans (Ad). *Natural Foods Merchandiser* 21(9):2. Sept.
• ***Summary:*** This full-page color ad shows a large circular logo that reads "Made with Non-GMO Soybeans against a background of soybeans in green pods. Below the titled is printed: "See Mori-Nu at Expo East Booth 1208-1210. The text at the bottom of the ad reads: "Mori-Nu uses only Non-GMO soybeans in its great tasting tofu. We think that what is natural and good should be left that way. Mori-Nu Tofu is made without preservatives and never irradiated. Mori-Nu tastes "first day fresh" from its long-life aseptic * package.

Below the ad are small color photos of five Mori-Nu Tofu products, each with the "Non-GMO" logo near the upper right corner. Below that is a Tetra Pak logo, after which we read: "* In 1996 [the aseptic package] received the Presidential Award for Sustainable Development, the White House's highest environmental prize..."For more information visit www.tetrapak.com and www.morinu.com. Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-669-8638 (NOW TOFU).

10800. Secretariat for The Third International Soybean Processing and Utilization Conference (ISPUC-III). 2000. Program and other information: The Third International

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Soybean Processing and Utilization Conference (ISPUC-III). 2000–Dawn of the innovative era for soybeans. October 15-20, 2000, Tsukuba, Ibaraki, Japan. Tokyo, Japan. 40 p. 30 cm.
• ***Summary:*** Announces details of the upcoming conference, with the title and speaker for each of the oral and poster presentations. Proceedings will be published after the conference. Kyoko Saio is chairperson of the executive and program committees, and continuing committee for ISPUC-III. For further information: Fax: 03-3263-4032. E-mail: ispuc3@congre.co.jp. URL: http://www.nfri.affrc.go.jp/gyoji/soybean.html. Address: c/o Congress Corporation. 7th Akiyama Bldg., 5-3 Kojimachi, Chiyoda-ku. Tokyo 102-0083, Japan. Phone: +81 3-3263-5896.

10801. Efron, Sonni. 2000. Japanese company tries making tofu trendy. *Daily Journal* (*Orem, Utah*). Oct. 11.
• ***Summary:*** Kyo Tofu Fujino, a famous Kyoto tofu shop, is trying to survive by reinventing itself as an upscale, designer chain selling European-style tofu confections. Seiji Fujino, the company's second-generation president, says he wants to teach kids, who are growing up on McDonald's and Mr. Donut, how to eat tofu. The company already has outlets in fancy department stores in Kyoto, Osaka, and Tokyo, plus its own specialty stores and a tofu restaurant. It opened the latter, Tofu Kaho, in April at Fujino, a quiet neighborhood of northern Kyoto. Its offerings: Tofu doughnuts, chocolate peach soy-cream layer cake, tofu cream fig shortcake, or a pastry filled with whipped soy cream and purple sweet potato. In addition to many types of cakes and puddings made with tofu, the sweet shop also offers four flavors of tofu ice cream–ginger, white sesame, vanilla, and black bean coffee. And it bakes cookies using the left-over okara. Then there are traditional dishes: Oboro-dofu (served cold), tofu flavored with yuzu (a citrus-like lime), sesame tofu, black bean tofu, and deep-fried tofu with lotus root.

Recently, some 500-600 neighborhood tofu shops across Japan have gone bankrupt each year, although there are still some 16,500 shops in Japan–according to the Japan Tofu Association. In 1967 the average Japanese household consumed 72 pounds of tofu; by 1999 that figure had fallen to 59 pounds–an 18% decline in 32 years. During the same period, consumption of rice and fish also fell, which meat consumption rose sharply.

Fujino tofu, like many other brands, carries a label stating that it contains no genetically modified soybeans. Address: Los Angeles Times.

10802. Rose, Bruce. 2000. How Bruce got involved with natural foods, soyfoods, Rosewood Products, Inc. and Tofu International Ltd. (Interview). *SoyaScan Notes.* Oct. 15. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In 1967, while enrolled at Wayne State University in Detroit, Michigan, Bruce got involved with macrobiotics. His main education came from "street school." He would drive to Ann Arbor for the fun of it, and there he discovered Eden Foods, a little upstairs co-op that was the first he found that sold brown rice. He would buy foods, and take them back to the little center which was in Detroit. Michio Kushi visited their center several times and gave lectures.

One of his childhood friends was Tim Redmond, whom he later met during his college years and then at Eden Foods. Redmond's dad invested money in Eden Foods on the condition that they cease to be a co-op. Michael Potter later contributed money "from spurious sources in tune with the times." Potter's attitude has long been "It's Mike against the world."

Many of the food co-ops were started by potheads; most were in university towns and part of the counterculture–a mix of politics and natural foods.

From time to time, usually when some problem or opportunity arose, Eden Foods would run out of money and call on Bruce. He loaned them money (once $12,000) and they paid it back each time. In 1978 Bruce started to work for Eden Foods at their warehouse on Platt Road in Ann Arbor. They were already a fairly big food distribution company with large semi trucks [semitrailers]. Soon Bruce learned about the Soy Plant, which was a co-operative on Ann Street in Ann Arbor. He started to visit their deli. In 1979, Bruce and his family moved to a town about 20 miles north of Ann Arbor–before the fire.

Then in Nov. 1979 the Eden warehouse at 4601 Platt Road was destroyed by a large fire. Bruce was a manager at the time. He is quite sure that the fire was *not* caused by arson. If it was arson, it certainly was not done by the owners. They definitely didn't burn down the company to collect on the insurance. The main reason is that Eden was greatly underinsured; they lost a lot more than they got back or than could ever have gotten back. In the best case, insurance pays you 80% of what you're insured for. To this day, nobody knows for sure what caused the fire. The fire almost put Eden out of business; they lost a lot of money. They were able to stay in business because of the help of their friends. Before the fire, the insurance companies were always trying to get Eden to buy more insurance coverage–but they never did.

The fire was devastating for Bruce as well. He had been working on some automatic packaging equipment for Eden; it all melted. So after the fire, he decided to leave the company. They owed him $15-30,000 at the time. He sat down with Potter and his good friend Redmond and made them an offer. You can forget the debt if you will give me just 15% of the stock in Eden Foods. Potter said "Yes" and Redmond said "No."

Cliff Adler, who had joined the company before the fire, had a profound effect on its recovery. After the fire, he converted a $100,000 loan into stock so that in 1980

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he owned 34% of the company. "Cliff was great. He was an upper management mover and shaker and eased the company's debt burden. He moved the company forward."

At one point Bruce considered starting a company to make tofu, but he didn't want to compete with the Soy Plant. Then he happened to meet Ben Wenzel who was delivering (by contract) the Soy Plant's tofu out of the Ann Arbor area and outside of Michigan. "He was delivering cider and tofu in his old hippie van." So Bruce decided to go into the raw milk cheese business. He got into it by accident by misunderstanding the difference between markup and profit margin. "Had I known the difference, I never would have gone into the business." So in Aug. 1980 he started a distribution company named Rosewood Products, Inc. After about a year, he started to distribute the Soy Plant's products along with his cheese. Then the Soy Plant got into trouble financially. Bruce tried to help them. He said: "I had a long history with the Soy Plant and this looked easy. Making tofu sounds exciting. East meets West type products was the reason I went in. I never dreamed I'd be packing tofu for 20 years. You never know what life has to offer you."

Bruce ran the Soy Plant for 3 months before they went bankrupt. Then he bid on the company when they were in bankruptcy, and won the bid. He tried to keep all the employees but they came from a co-op background. "I was a pretty traditional business guy. I wasn't smoking dope any more, had short hair, hard working. A lot of the co-opers wouldn't work for me. I found the best workers were good old meat-eaters. The idealists would do great for three months, and then peter out."

For years after he took over the company, people who had loaned the Soy Plant $100 or so, came to Bruce and said they wanted their money back. He tried to explain that the Soy Plant had declared bankruptcy and their debts were not his. But that didn't satisfy most of them. Bruce estimates that The Soy Plant paid back about half of the roughly $10,000 they borrowed from members of the community.

In the end, Bruce merged the Soy Plant, a pioneer soy company, into his Rosewood Products, then later renamed it Tofu International Inc.

Update: Letter (fax) from Bruce Rose. 2001. May 22. Bruce says Rosewood Products no longer makes tempeh. They bought from White Wave from 1990-1998, but now buy their tempeh from Lightlife. They sell mostly bulk tempeh burgers. The Soy Plant started making tempeh in 1977. Rosewood started in 1987, stopped about 1995. Address: Founder and President, Rosewood Products, Inc., 738 Airport Blvd., Suite 6, Ann Arbor, Michigan 48108. Phone: 734-665-2222.

10803. Kimura, Takuji "Tak." 2000. Mechanical harvesting of edamamé (green vegetable soybeans) (Interview). *SoyaScan Notes.* Oct. 17. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** In Taiwan, Tak saw a huge machine specially designed to harvest edamamé and separate the green pods from the stems and leaves. Thus, it might be called an "edamamé combine." It is about 13 feet long, 13 feet high, and 10 feet wide, and looks like a cotton-picker, a large pea-picker. Two large and adjacent horizontal brushes sweep the pods off the plants and up into the machine, then (inside the machine) separates the pods from the leaves and any accidental stems. It puts the pods gently in a huge container in the machine, and discharges the leaves and chaff back onto the field, where it serves as organic matter. When this container is full, the edamamé are dumped into a similar container in a truck alongside the harvester; this dumping inevitably causes some bruising of the edamamé.

The Taiwan Edamamé Association, located in central Taiwan, owns about 32 of these harvesters. The harvesting of edamamé in China and elsewhere in East Asia is done by hand. Of the edamamé grown in Taiwan, about 80% are sold to Japan, 10% to the USA, and 10% to Europe. The soil in Taiwan used to be quite polluted, but they have greatly improved it as by bringing in peat moss.

The pods are rushed to the packing plant, where most are dropped into lightly salted boiling water in a continuous process. After the water returns to a boil, they are boiled for about 6 minutes before being frozen. For customers (mostly in the USA) who want shelled green beans, the tender green beans are removed from the pods by hand–using human labor; they have a machine to do this but it doesn't work very well.

The growing of edamamé is now spreading rapidly to Vietnam and Thailand, which are located in Southeast Asia, south of the southernmost part of China; there they can get four harvests a year. In Taiwan and southern China they can get only two harvests a year.

SunRich in Minnesota has a harvesting machine and a separate machine that carefully removes the tender beans from the pods. These may be similar to the machines that harvest and shell green peas. But Tak thinks that green peas are much easier to squeeze out of their pods than green soybeans.

Photocopies of color photos show a huge edamamé harvester at work in Taiwan: (1) Distant front view of harvester at work in a field of green soybeans. (2) Close-up view harvester, showing driver in clear-walled cabin at front left. A sign shows that this machine was made by FMC corporation; it may be an FMC green-bean harvester. (3) Rear view of harvester. (4) Close-up view of a row of soybean plants that have been harvested. Many stems are still standing upright and many leaves are lying on the ground. (5-6) Dumping a container of pods from the harvester into a truck waiting beside it. (7) Close-up view of the raised harvesting mechanism at the front of the harvester; the two adjacent cylindrical brushes are each about 14 inches in diameter and as wide as the harvester (10 feet). Beneath them

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is a sort of comb. Address: 3616 Delancey Lane, Concord, California 94519-2357. Phone: (925) 687-2422.

10804. Cleland, Nora T. 2000. Couple takes unique approach to farming. *Farm Talk* (*Parsons, Kansas*). Oct. 18.
• ***Summary:*** Innovation is the watchword for Lee and Cindy Quaintance who farm near Edgerton, Kansas, close to Olathe.

Their main crop is organic soybeans, especially those varieties made into tofu. This year they are trying another variety named "Nato" [for making natto], which is smaller than most soybeans. Whereas the count of typical soybeans is about 3,500 per pound, "the little Nato beans run about 6,500 beans per pound."

They have found a company in Garden City, Missouri, which will buy the Nato beans and export them directly to Japan. They expect to be paid about $15 a bushel, but that isn't quite as lucrative as it sounds because Nato yields only about 35 bushels per acre.

When growing soybeans organically, they have found that it is easier when they are planted in rows 36 inches apart rather than 30 inches. The beans rapidly grow and shade a 10-inch space on both sides of the row–which eliminates the need for herbicides. Still he cultivates the area between the rows once each season to eliminate weeds.

10805. Akiyama, Yoshinobu; Kawamura, Y.; Yoshiki, Y.; Okubo, K. 2000. Rice-tofu, its reactive oxygen scavenging activity and the making system. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 183-184. [1 ref]
Address: 1-2. Akita Research Inst. of Food and Brewing; 1, 3-4. Graduate School of Agricultural Science, Tohoku Univ.

10806. Bordignon, J.R.; Tsushida, T.; Yamaki, K.; Nepomuceno, A.L.; Farias, J.R.; Neumaier, N. 2000. Effect of water deficiency in the isoflavone contents in Brazilian soybean cultivars. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 99-100. [3 ref]
Address: 1, 4-6. National Soybean Research Center, Embrapa, P.O. Box 231, Londrina, Parana, 86001-0970, Brazil; 2-3. NSRI [sic, NFRI], Ministry of Agriculture, Forestry and Fishries, 2-1-2 Kannondai, Tsukuba, Ibaraki 305-862 Japan.

10807. Bordignon, J.R.; Tsushida, T.; Yamaki, T.; Carrao-Panizzi, M.C.; Neumaier, N. 2000. Isoflavone content in some soybean cultivars obtained from different Brazilian regions. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 101-102. [2 ref]
Address: 1, 4-6. National Soybean Research Center, Embrapa, P.O. Box 231, Londrina, Parana, 86001-0970, Brazil; 2-3. NSRI [sic, NFRI], Ministry of Agriculture, Forestry and Fishries, 2-1-2 Kannondai, Tsukuba, Ibaraki 305-862 Japan.

10808. Cheng, Yongqiang; Shimizu, N.; Kimura, T. 2000. Improvement of tofu production in China–texture evaluation of different tofu (soybean curd). In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 148-149. [4 ref]
• ***Summary:*** Generally speaking, Chinese prefer hard tofu. Today in China, tofu is considered to be a promising food for solving the problem of inadequate protein intake. Tofu made from soy protein isolates (made by Fuji Oil Co. Ltd., Osaka, Japan) and coagulated with GDL (glucono delta-lactone) are investigated. Address: Inst. of Agricultural and Forestry Engineering, Univ. of Tsukuba.

10809. Dong, Chunping; Thao, B.T.; Hirata, Y. 2000. Change of storage protein in soybean during storage for long time. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 159-160.
Address: Graduate School of Tokyo Univ. of Agriculture & Technology.

10810. Fukushima, Danji. 2000. Recent progress in research and technology for processing and utilization of soybeans. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 11-16. [30 ref]
• ***Summary:*** Contents: Abstract. Keywords: soybean soy food, soy protein, glycinin, beta-conglycinin, three-dimensional structure, saponin, isoflavone, osteoporosis, hypocholesterolemic, breeding, lipoxygenase-free soybean, allergen-less soybean. Introduction. Nutritional and physiological effects of soybean storage proteins and soybean minor constituents: Reevaluation of nutritive value of soybean storage proteins, physiological function of soybean storage proteins. Physicochemical functionalities of soybean storage proteins: Basic structures of beta-conglycinin and glycinin molecules, three-dimensional structures and physicochemical functionalities. Quality improvement of soyfood products: Off flavors and allergenic proteins in soybeans, genetic improvement of soybean qualities. Conclusion. Address: Kikkoman Corp. [Japan].

10811. Hikino, Isao. 2000. Super premium soybean variety "Tanbaguro". In: Kyoko Saio, ed. 2000. Proceedings–

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Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 35-36.
• ***Summary:*** Tanbaguro is a soybean variety having a black seed-coat in which the seed size can reach 80 gm per 100 seeds under suitable cultivating condition. The seed size has doubled in the last 50 years from 40 gm to 80 gm by selection and improvement of cultivation practices. Tanbaguro is highly valued because of its large seed size, softness and the good taste of the boiled beans. Consequently the price is about ten times that of ordinary varieties in Japan. Moreover Tanbaguro has received high evaluation as a vegetable soybean of unique quality in recent years.

However, Tanbaguro also has many demerits in cultural traits, such as susceptibility to certain diseases, low lodging resistance, and low yield.

Tanbaguro (or Tanbakuro) has a long history; it originated in Hyogo and Kyoto prefectures in central Japan. The earliest known literature about it dates back to 1797 in Sasayama city. The name "Tanbaguro" first appeared in 1934. Address: Hyogo Prefectural Hokubu Agricultural Inst. [Japan].

10812. Hirota, Akira; Taki, S.; Abe, N.; Yano, M.; Kawaii, S. 2000. Antioxidative activity and antiproliferative activity toward cancer cell lines of 8-hydroxyisoflavones from soybean miso. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 218-219. [4 ref]
Address: 1-3. School of Food and Nutritional Science, Univ. of Shizuoka, 52-1 Yada, Shizuoka 422-8526, Japan; 4-5. National Inst. of Fruit Tree Science, Okitsu-naka, Shimizu 424-0204, Japan.

10813. Ishigami, Takashi. 2000. Contract grow and IP [identity preserved] handling systems for the Japanese food soybean market. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 117-120.
• ***Summary:*** Japan is the world's largest soybean importer. Of the 4.9 million tonnes (metric tons) imported, about one million tons (actually 960,000 tonnes or 19.6%, called "food soybeans") are used for making tofu, miso, natto, soysauce, etc. The rest are crushed to make soybean oil and meal.

A table (p. 118) shows the quantity of soybeans obtained from various sources to make each of the major Japanese soyfoods in 1998, 1999, and 2000. In the year 2000, some 512,000 tonnes were used to make tofu, 168,000 tonnes for miso, 125,000 tonnes for natto, 40,000 tonnes to make soy protein and products, 30,000 tonnes to make soysauce (from whole soybeans), 6,000 tons to make soymilk, and 79,000 tons to make other products. Grand total 960,000 tonnes.
Address: Marubeni Corp., Japan.

10814. Kanda, Tomo; Sagara, M.; Hirao, S.; Liu, L.; Negishi, H.; Akazawa, T.; Yoshida, H.; Honda, K.; Ikeda, K.; Yamori, Y. 2000. Soy bean diets decrease cardiovascular risk factors in Japanese immigrants living in Hawaii. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 199-200.
• ***Summary:*** Daily intake of soy products containing more than 25 gm of soy protein with the isoflavones naturally occurring in those products is shown to be effective for the prevention of cardio-vascular disease (CVD) in middle-aged Japanese immigrants living in Hawaii. Address: 1-5, 9-10. Graduate School of Human and Environmental Studies, Kyoto Univ., Kyoto, Japan; 6. Japan Cell Foods Co. Ltd.; 7-8. Fujicco Co. Ltd.

10815. Kikuchi, Akio; Sakai, T.; Shimada, H.; Mandarino-Gontijo, J.-M.; Bordingnon, J.-R.; Takada, Y.; Adachi, T.; Tabuchi, K.; Carrao-Panizzi, M.-C.; Shimada, S. 2000. Genetic diversity and inheritance of isoflavone contents in soybean seeds. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 59-60. [11 ref]
Address: 1-3. Tohoku National Agric. Exp. Station, Nishisenboku, Akita 019-2112, Japan.

10816. Mandarino, José Marcos Gontijo; Carrao-Panizzi, M.C.; Masuda, R. 2000. Composition content of sugars in soybean seeds of Brazilian cultivars and genotypes of EMBRAPA's germplasm collection. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 77-78. [6 ref]
Address: 1-2. National Soybean Research Center–EMBRAPA, Londrina, PR–Brazil; 3. National Food Research Inst., Tsukuba, Japan.

10817. Masuda, Ryoichi; Kyuya, Harada. 2000. Carbohydrate accumulation in developing soybeans seeds sucrose and starch levels in 30 cultivars for soyfoods. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 67-68. [6 ref]
Address: 1. National Food Research Inst., Tsukuba, Japan; 2. Faculty of Horticulture, Chiba Univ., Matsudo, Chiba, Japan.

10818. McVey, Marty P.; Baumel, Phil; Wisner, Bob. 2000. Brazilian soybeans–What is the potential? *Ag Decision Maker: A Business Newsletter for Agriculture.* Oct. See: www.extension.iastate.edu/agdm/articles/others/McVOct00.

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html.

• ***Summary:*** "Soybeans have been produced in Brazil since 1882. By 1960, soybean production reached 0.2 million metric tons, all of it processed domestically. The oil was used in domestic foods and the meal was used to support a growing poultry industry. At this point, Brazil was not a competitor in world soybean markets.

"That began to change in the early 1970s when the following chain of events propelled Brazil into the world soybean market. In 1971, the U.S. devalued the dollar causing the export price of U.S. corn, wheat, and soybeans to fall sharply relative to the rest of the world. During that time, the USSR generated large supplies of foreign currency by increasing its petroleum production. Using this foreign currency, the USSR financed large quantities of imported U.S. wheat and then later, large quantities of U.S. corn and soybeans.

"Simultaneously, adverse worldwide weather conditions reduced world grain production. Later, in 1972-73, an exceptionally harsh El Nino greatly reduced the supply of Peruvian fishmeal at that time, a major source of protein in animal feed rations. As a result, foreign demand for U.S. soybeans increased dramatically, causing soybean supplies to dwindle. Soybean prices skyrocketed to an all time record of $12.00 per bushel. This drew loud complaints from U.S. consumers who feared that the U.S. would run out of soybeans.

"Responding to political pressures in June 1973, President Nixon imposed an embargo on soybean and soybean meal exports. The soy embargoes and the Peruvian fish meal shortage combined, created a worldwide impression that the U.S. and Peru were unreliable suppliers of animal feed protein. Major soy importers–Japan and Europe–began seeking alternative sources of animal feed protein. Attempting to encourage the growth of soybeans in Brazil, Japanese investors bought land in Brazil for soybean production. Since then, soybean production has increased from 5 million metric tons in 1973 to about 32.5 million metric tons in 2000. Today, Brazil is the world's second largest soybean exporting country." Address: Professors of economics, Iowa State Univ.

10819. Mogi, Katsumi. 2000. Makasete, makasazu [Entrust, but keep an eye on it]. Japan: 133 p. Oct. No index. 21 cm. [Jap]

• ***Summary:*** Katsumi was the former vice-president and president of Kikkoman Corp. Address: Former president, Kikkoman Corporation, Japan.

10820. Muramatsu, Kanako; Katsumata, Rie; Watanabe, Sugio; Tanaka, Tadayoshi; Kiuchi, Kan. 2000. Improvement of itohiki-natto manufacturing process employing commercial natto starters. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 333-34. [1 ref]

• ***Summary:*** In order to improve the quality of natto in Japan, changes in the incubation temperature program and of the amount of oxygen consumed within the natto packages were measured as a function of time. Four programs of temperature regulation were devised. In the one considered best (No. 4): The temperature was initially set at 40ºC, then raised to 47ºC between the 12th and 17th hour–at which point the temperature in the package rose as high as 52ºC. After the 20th hour, the temperature was cooled to 4ºC.

Three commercial natto starters (A, B and C) made by three different companies were used. Five large-seeded soybean varieties used to make tofu and four small-seeded varieties used to make natto were studied; all were harvested in 1999.

Natto made by temperature regulation program No. 4 was twice as viscous that made by program No. 1. The natto made by Starter C was especially viscous. Natto made from Suzuyutaka soybeans had the best flavor. Although it is generally said that small-seeded soybean varieties make better natto than large-seeded ones, the latter were found to be as good as the former for making natto in this study. Address: Faculty of Home Economics, Kyoritsu Women's Univ., Hitotsubashi, Chiyoda-ku, Tokyo 101-8433, Tokyo.

10821. Muramatsu, Kanako; Katsumata, Rie; Watanabe, Sugio; Tanaka, Tadayoshi; Kiuchi, Kan. 2000. Natto manufacturing methods employing natto bacilli with high elastase activity and its mutants. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 335-36. [1 ref]

• ***Summary:*** This process begins by forcing bacteria to mutate by irradiating them with ultraviolet (UV) radiation. Elastase is an enzyme which, when obtained from a pig's pancreas, is sold as a medicine. The goal of the mutation was to create and isolate one strain of elastase-producing natto bacilli, plus a second strain that did not require leucine, an essential amino acid (also called α-amino acid).

But natto made from the mutants was not viscous. So a new program of temperature regulation was devised. When the temperature was initially set at 42ºC, then raised to 47ºC after 8 hours, held there for three hours, then reduced to 42ºC after 24 hours [which does not add up!], the natto made from the mutant strains was viscous.

Note: How far are you willing to go to make your natto taste a little better? Address: Faculty of Home Economics, Kyoritsu Women's Univ., Hitotsubashi, Chiyoda-ku, Tokyo 101-8433, Tokyo.

10822. Nagaoka, Satoshi; Ishikawa, H.; Shibayama, F; Hori, G.; Hara, T.; Yamamoto, K.; Kamiya, T. 2000. Comparative studies on the improving effects of cholesterol metabolism

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induced by soyprotein sumizyme hydrolysate with bound phospholipids or chitosan. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 207-208. [8 ref]
• ***Summary:*** Soy protein, a vegetable protein, is well known to reduce serum cholesterol, in comparison with casein, an animal protein. This study on rats found that the cholesterol lowering activity of soyprotein peptic hydrolysate with bound phospholipids (SPHP) was stronger than that of soyprotein peptic hydrolysate (SPH) or soy protein alone. Chitosan, a dietary fiber, also lowers both serum cholesterol and body weight gain in rats. Address: 1-3. Dep. of Food Science, Faculty of Agriculture, Gifu Univ., Gifu 501-1193, Japan; 4-7. Tsukuba Research Laboratories, Kyowa Hakko Kogyo Co., Ltd., Ibaraki 305-0841, Japan.

10823. Nakagawa, Yoshihisa. 2000. Effect of storage temperature on tofu-processing property and phytic acid in soybean. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 142-143. [7 ref]
Address: Toyama Prefectural Food Research Inst.

10824. Nguyen, van Chuyen; Konagai, C.; Oshite, H. 2000. Antioxidative activity and desmutagenicity of soybeans after heating. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 189-190. [6 ref]
• ***Summary:*** The antioxidative activity and radical scavenging activity of soybeans were increased by heating to 150-190ºC. Aqueous and methanol extracts of heated soybeans showed strong desmutagenic [antimutagenic] activity (43-92%) against heterocyclic amines. These extracts included the isoflavones daidzin, genistin, daidzein, and genistein. Address: Dep. of Food and Nutrition, Japan Women's Univ., Tokyo, Japan.

10825. *Nikkei Shinbun* (*Tokyo*). 2000. Bei ni reitô tôfu kôjô: Genchi meekaa baishu mo suishin. Tendore [Frozen tofu factory in America: Also push to buy local tofu makers. Tendre]. [Jap]
• ***Summary:*** The American Soy & Tofu Co. has been incorporated in Massachusetts by Michio Kushi. They hope to raise $15 million and are now raising venture capital. They plan to purchase 18 local tofu makers. The four prospective partners are: American farmers $2.6 million. East West Foundation (Kushi) $2.0 million. Tendre, a maker of frozen tofu from Wakayama prefecture, Japan $1.0 million. Michio Kushi $1.0 million. The company is planning to build a factory in Macon, Georgia, and to make tofu, margarine, and cheese.

Talk with Christine Akbar, who works with Michio Kushi at his home. 2000. Nov. 20. Macon, Georgia is the center for Japanese cherry trees in America; some 200,000 to 300,000 cherry trees now grow there. Mr. Kato who is head of the International Cherry Park Commission in Japan wants to disseminate Japanese cherry trees all over the world. His dream is to buy several hundred acres of land in Macon, Georgia, and to plant cherry trees in the form of a huge American flag: Red blossoms for the red stripes, white blossoms for the white stripes, and a 40-acre reflecting pond for the field of blue, with sprinklers coming out for the 50 stars. Each tree will have a donor/sponsor, whose name will appear on a plaque on or by the tree. Mr. Kato is from Wakayama, and he established a connection with the Tendre company which makes frozen tofu there. On the part of this land not used for cherry trees, Mr. Kato and Michio Kushi would like to build a factory to make soy products for the company he has started–American Soy and Tofu Co. Mr. Kato discovered Tendre; they could make frozen tofu in the factory. Aveline discovered the Okinawan fermented tofu named *Tofuyo,* which she loves; she would like to learn how to make it at the factory. Fred Sternau, who lives and works in New York state, (phone: 914-763-3662) is an old friend of Michio's, and has a background in the investment banking business with Dean-Witter, is working now to raise the money from venture capitalists in America for the new corporation, and to develop a business plan. Christine thinks that someone else is working to raise money in Japan. Christine thinks that some money has been committed but she does not think that any of it has been "transferred." "We should know more in one month. It's just getting started."

Note: Hiroaki Iwamoto is president of Tendre, Tanabe City, Wakayama prefecture. He holds a patent on his frozen tofu.

10826. Ogawa, Tadashi; Samoto, M.; Takahashi, K. 2000. Development of hypoallergenic soybean products–strategy for the reduction of allergenicity of soybean. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 165-168. [7 ref]
• ***Summary:*** "Three major soybean allergens were identified and characterized. The reduction of soybean allergenicity was achieved using the combined techniques of breeding, physico-chemical treatments of soy protein isolate (SPI), and an enzymatic digestion of whole grains." Tohoku 124 is a new soybean line. Address: 1. Dep. of Food Design and Utilization, Research Inst. for Food Science, Kyoto Univ., Uji, Kyoto 611-0011, Japan; 2. Protein Dev. R&D Div., Fuji Oil Co., Ltd. Sumiyoshi-cho, Izumisano, Osaka, 598-8540, Japan.

10827. Omura, Yoshimasa; Ozaki, Masahiro. 2000. Simple

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evaluation of soybeans for processing tofu. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 151-152. [4 ref]
Address: 1. Tokushima Prefectural Industrial Technology Center, Tokushima 7700-8021, Japan; 2. Shikoku Kakoki Co., Ltd., Tokushima 772-0035, Japan.

10828. Onishi, Yoshihisa. 2000. Adapting HACCP to Japanese traditional soybean food. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 138-141.
• ***Summary:*** In 1996 Japan was hit by a series of intestinal hemorrhagic E. coli O157 cases nationwide. The Japanese are working to adopt HACCP (Hazard Analysis and Critical Control Points) to the soy sauce, miso, and tofu industries. Each food has its unique CCP. Address: Japan Food Industry Centre.

10829. Ono, Tomotada. 2000. The mechanisms of curd formation from soybean milk to make a stable lipid food. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 51-52. [6 ref]
• ***Summary:*** The lipids / fats in tofu are stable and no subject to oxidation. During the curd formation, first protein particles (80 nm = nanometers in size) combine with an oil globule (300 nm) because of the addition of magnesium or calcium ions [in the coagulant]. Then the bound globules aggregate with one another to hold water. The curd is formed as soluble proteins are combined with a decrease in the pH. The oil is packed in triple layers of protein, that is oleosin (oil body protein), protein particles, and soluble proteins.

Figures show: (1) Scanning electron micrograph of the floating fraction of soymilk. (2) Formation of tofu-curd from soymilk (speculation). Address: Dep. of Agro-Bioscience, Faculty of Agriculture, Iwate Univ. Ueda 3-18-8, Morioka, Japan.

10830. Saio, Kyoko. ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference: Dawn of the innovative era for soybeans. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. Held 15-20 Oct. 2000, Tsukuba, Ibaraki, Japan. Illust. Author index. 30 cm. [Eng]
• ***Summary:*** The first international conference of this type was held in Jilin, China, in 1990. The second was held in January 1996 in Bangkok, Thailand. Foreword. Program committee for ISPUC-III. Contents: Keynote session (3 papers). Session 1: Production for processing and utilization (20 oral presentations/papers, 22 poster presentations). Session 2: Quality control (13 oral, 7 poster). Session 3: Nutrition and physiological functionality (23 oral, 25 poster). Session 4: Traditional products (23 oral, 19 poster). Session 5: Modern processing and utilization of foods (32 oral, 20 poster). Session 6: Edible oil and feeds (9 oral, 5 poster). Session 7: Innovative non-food uses (10 oral, 4 poster). Session 8: Strategies for dissemination (18 oral, 4 poster). Satellite session: Monodisperse microspheres and microchannel technologies (12 oral, 15 poster). Public symposium: The miracle of Asia–Marvelous fermented soyfoods (6 oral presentations/papers). Author index. Sponsors: Organizations/companies (55), individuals (33), others (8). Within each category, listed in order of date contributed. Exhibitors (29; an exhibition was held with the Conference). Advertisers (6 companies purchased full-page black-and-white ads). Address: Chair of the Program Committee, ISPUC-III, Tsukuba, Japan.

10831. Sato, Tetsuo; Takahashi, M.; Hajika, M.; Matsunaga, R. 2000. Near infrared spectral patterns of soybean and fatty acid composition. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 136-137. [8 ref]
Address: Dep. of Crop Breeding, Kyushu National Agric. Exp. Station, MAFF.

10832. Suehara, Ken-ichiro; Shimizu, S.; Toshimori, D.; Koda, M.; Nakano, Y.; Yano, T. 2000. Quality evaluation of soybean with germination percentage and protein content of soybean for tofu production. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 144-145.
Address: Dep. of Information Machines and Interfaces, Faculty of Information Sciences, Hiroshima City Univ., Ohzukahigashi, 3-4-1, Asaminami-ku, Hiroshima 731-3194, Japan.

10833. Sugano, Michihiro; Koba, Kazunori. 2000. Possible physiological significance of soybean protein as a regulator of polyunsaturated fatty acid metabolism. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 211-213. [1 ref]
Address: 1. Prefectural Univ. of Kumamoto, Kumamoto 862-8502; 2. Siebold Univ. of Nagasaki, Nagasaki 851-2195, Japan.

10834. Sugimoto, Toshio; Masuda, R.; Shiraishi, N.; Oji, Y. 2000. Effects of soil fertility and nitrogen fixation on seed composition of soybean seeds. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and

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Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 81-82. [6 ref]
Address: 1, 3-4. Faculty of Agriculture, Kobe Univ., Nada, Kobe, Japan; 2. National Food Research Inst., Tsukuba, Japan.

10835. Takahashi, Koji; Sakai, T.; Takada, Y.; Shimada, H.; Shimada, S. 2000. High glycinin and low allergen soybean developed by gamma-ray irradiation. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 43-44. [8 ref]
• ***Summary:*** The authors have developed high glycinin (11S) and low allergen soybeans, named Tohoku 124 and Tohoku 139. "These lines are lacking the α' subunit and two of the three major allergenic proteins, the α subunit and *Gly m* Bd 28K of B- conglycinin (7S). Deficiency of these three proteins were controlled by recessive independent alleles." Address: 1. National Agriculture Research Center; 2-5. Tohoku National Agriculture Experiment Station [Japan].

10836. Takahashi, Masakazu; Hajika, M.; Matsunaga, R.; Komatsu, K.; Obata, A.; Kanegae, R. 2000. Breeding of soybean variety lacking β-conglycinin by the introduction of *Seg* gene from wild soybean. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 45-46. [5 ref]
• ***Summary:*** The authors have been using genetics to improve the nutritional quality of soy protein using a wild soybean line that lacks beta-conglycinin in the seed proteins. Kyu-kei 305 was successfully bred with the traits of lacking beta-conglycinin and good field performance. This variety can be used for hypoallergenic soyfood materials, because it lacks some major allergens which are alpha- and beta-subunits of beta-conglycinin, and *Gly m* Bd 28K. This variety was found in a collection of wild soybeans from Kyushu, Japan's southernmost main island. Address: Kyushu National Agricultural Experimental Station (KNAE); 2. Agriculture, Forestry and Fisheries Research Council; 5-6. Allergen Free Technology Lab. (Kikkoman Corp. at present).

10837. Takemura, Hiroshi; Ando, Noriko; Tsukamoto, Yoshinori. 2000. [Breeding natto bacteria that do not produce branched short-chain fatty acids and their application to production of natto without a strong smell]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 47(10):773-79. [23 ref. Jap; eng]
• ***Summary:*** "Natto contains branched short-chain fatty acids (BCFAS), such as isobutyric acid, isovaleric acid, and 2-methylbutyric acid. These BCFAS have an unpleasant smell. To produce light-smelling natto, we tried to develop BCFAS non-producing natto bacteria."
"The natto fermented by B2 strain was valued highly as a light-smelling natto by sensory evaluation. Finally, we obtained the LDH-defective mutants by chemical mutagenesis to utilize in commercial production of natto. The mutants produced little BCFAS like B2, and the natto fermented by the mutants had lighter smells" (from journal@rchive). Address: Mistukan Group Corporation, 2-6, Nakamura-cho, Handa-shi, Aichi prefecture 475-8585, Japan.

10838. Thanh, V.C.; Thao, T.B.; Ky, H.; Hirata, Y. 2000. Variation of seed storage proteins in Vietnamese soybean genetic resources. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 161-162. [1 ref]
Address: 1,3. College of Agriculture, Cantho Univ., Vietnam; 2,4. Dep. of International Environmental and Agricultural Science, Graduate School of Agriculture, TUAT, Japan.

10839. Thao, Troung Ba; Thanh, V.C.; Hirata, Y. 2000. Variation of tropical soybean storage protein in Vietnam. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 121-122.
• ***Summary:*** "Abstract: 114 accessions were analyzed to find out genetic variations in soybean storage proteins such as lipoxygenase 7S and 11S." "The results showed that 5 introduced accessions [from Cantho University in Vietnam] lacked the A3B4 subunit, 22 local accessions lacked the A4B3 subunit, and one lacked the beta subunit." Address: 1-2. College of Agriculture, Cantho University, Vietnam; 3. Graduate School of International & Environmental Science, Tokyo University of Agriculture and Technology, Fechu, Tokyo 183-8509, Japan.

10840. Watanabe, Shaw; Uesugi, S.; Zhuo, X. G.; Uehara, M.; Takamatsu, K. 2000. Effects of soy rich diet and isoflavone supplement on healthy women. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 203-206. [8 ref]
• ***Summary:*** Japanese consume 20-30 mg/day of isoflavones on average. This isoflavone intake is mostly attributable to tofu, natto, and miso. Address: 1-4. Dep. of Nutritional Science, Tokyo Univ. of Agriculture, Tokyo 156-8502, Japan; 5. Research Inst. of New Materials, Fuji Oil Company.

10841. Yamori, Yukio. 2000. Soy beans for health in the world–lessons from Okinawan diets and healthy longevity by WHO-Cardiac and immigrants studies. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing

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Co., Ltd. [xxiv] + 728 + 8 p. See p. 195-198.
• ***Summary:*** Okinawan women now enjoy the longest life expectancy (85.08 years) in Japan, and thus in the world. Moreover, Okinawans have the highest soy product consumption in Japan. Two graphs show that the greater a person's urinary excretion of isoflavonoids, the lower their risk of ischemic heart disease (p. 196) and of breast cancer (p. 197).

Conclusion: The WHO Cardiac study indicates that "increased soybean consumption would reduce not only cardio-vascular disease (CVD) mortality, but also prostate cancer, breast cancer, and all other cancer mortalities." Address: WHO-Cardiac Study Group, WHO Collaborating Center for Research on Primary Prevention of Cardiovascular Disease, Graduate School of Human and Environmental Studies, Kyoto Univ.

10842. Yano, Takuo; Koda, M.; Shimizu, S.; Suehara, K.; Nakano, Y. 2000. Estimation of the final germination percentage of soybean with a logistic curve and the germination percentage observed in the early stage of the germination test. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 123-124.
Address: Dep. of Information Machines and Interfaces, Faculty of Information Sciences, Hiroshima City Univ., 3-4-1 Ohzukahigashi, Asaminami-ku, Hirosima 731-3194, Japan.

10843. Yoshida, H.; Teramoto, T.; Ikeda, K.; Yamori, Y. 2000. Suppressive effect of isoflavones on proliferation of breast cancer cells induced by nonylphenol and bisphenol A. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 177-178. [1 ref]
• ***Summary:*** The chemicals used in manufacturing plastics and detergents have been found to be estrogenic. Two of these, nonylphenol and bisphenol A are endocrine disrupters and can enhance growth in estrogen receptor-positive MCF-7 human breast cancer cells. Isoflavones (such as genistein, daidzein, and glycitein) inhibited the endocrine disrupter-reduced cell proliferation of MCF-7 human breast cancer cells. In general, isoflavones decrease the effect of endocrine disrupters. Address: 1-2. Fujicco Co.; 3-4. Graduate School of Human and Environmental Studies, Univ. of Kyoto.

10844. Yoshida, Shuji. 2000. The origins of fermented soybeans and their distribution. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 697-700. [8 ref]
• ***Summary:*** The origins of two types of fermented soybeans will be discussed: (1) *Jiang* is used in preserving meat. (2) *Dou-chi* is used in brewing.

Jiang existed in the lower Huang-He [Yellow River] area before the Yin dynasty, ca. 1500 BC. Doujiang, jiang made of soybean, seems to have been invented much later, during the Han dynasty, around 300 B.C.

However *dou-chi* was already known in the middle and lower reaches of the Chang Jiang River [Yangtze River, which enters the ocean {East China Sea} near Shanghai, in southern China] before the Han dynasty. *Dou-chi* [fermented black soybeans] spread northward to the northeastern part of China, westward to Nepal, southward to Indonesia, and eastward to Japan.

1. Dou-chi and dou-jiang. Dou-chi is the oldest type of fermented soybean made by fermenting soybeans with species of *Aspergillus* mold. "'Dou-chi with ginger' was found in the ancient Ma Wang Dui Tomb no. 1 which was probably built in BC 186. Thus, dou-chi appeared in the Han Dynasty and was supposedly invented before the Qin dynasty (Bo 1984)."

The idea of culturing a "koji" mold on cooked soybeans was probably derived from the brewing process. Thus, instead of fermenting a cereal grain (such as rice for saké) they attempted to ferment soybeans. But as often happens, the final product was different from what had been expected. The result was a soybean covered with a mycelium of yellowish mold (*dou-huang,* where dou = soybean + huang = yellow). "Dou-chi is a sophisticated form of dou-huang; douchi is soaked in a little water and fermented for more than one month."

"Jiang, on the other hand, is probably derived from meat preservation. In the early days, meat was preserved simply by adding salt. Later, koji mold was employed for preservation and koji was produced. Jiang existed in the northern part of China during the Yin dynasty, about 1500 BC. Soybean jiang (*dou-jiang*), however was a relatively new product. It never existed before about the 3rd century B.C., during the early Han dynasty (Ishige & Raddle 1990)."

Dou-chi and dou-jiang each are connected with brewing. "I am not concerned here with the history of brewing in China but I will briefly introduce the hypothesis on koji mold development. There are two types of koji, the grain type and the cake type." The grain type was first introduced in the Chang Jiang [Yangtze] River area of southern China; from there it migrated to northern China. The cake type of koji, however, was invented in northern China (Yoshida 1993a).

Following this hypothesis, dou-chi was derived from the grain-type of koji, not from the cake type. "Therefore I assume that dou-chi originated in the Chang Jiang [Yangtze] River area of southern China, where the grain type was invented and is still popular. In practice, dou-chi is preferred in southern China." The dou-chi method of culturing mold on cooked soybeans was practiced before dou-jiang was invented. When the molded soybean method was introduced to northeastern China via northern China, it became common

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to produce dou-chi using the local soybeans produced in that area I assume that northeast China is the second center of dou-chi production; from there it spread to Korea and Japan. In Japan, dou-chi is known as "miso" [sic]. Address: National Museum of Ethnology, Osaka (Kokuritsu Minzokugaku Hakubutsukan), Japan.

10845. Yoshikawa, Massaki; Tsuruki, T.; Takahashi, M. 2000. Soymetide, a multifunctional bioactive peptide derived from soybean protein. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 173-174. [2 ref]
Address: 1. Research Inst. of Food Science, Kyoto Univ.; 2. Faculty of Agriculture, Okayama Univ.

10846. Yoshiki, Y.; Kikuchi, T.; Okubo, K.; Otomo, K. 2000. Identification of reactive oxygen scavenger from soy sauce using photon-HPLC analysis. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 169-170. [3 ref]
Address: 1-3. Dep. of Environmental Bioremediation, Graduate School of Agricultural Science, Tohoku Univ., 1-1 Tsutsumidori Amamiyamachi, Aoba-ku, Sendai 981-8555, Japan.

10847. Chiang, Cecilia Sun Yun. 2000. Maodou (green vegetable soybeans) in Chinese food culture (Interview). *SoyaScan Notes.* Nov. 6. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** *Maodou* (characters: hair + beans) are widely used in two types of Chinese cooking: (1) As a seasonal vegetable in the cooking of Jiangsu province (Wade-Giles: Kiangsu; southeastern China), whose major culinary cities are Shanghai (now an independent municipality), Nanjing (Nanking), Wuxi (Wu-hsi), and Changzhou; (2) Chinese Buddhist vegetarian cookery (*su-tsai*). *Maodou* is rarely used in northern Chinese cooking, where the people eat a lot of flours. In Shanghai they eat a lot of beans, including *maodou.* Yet *maodou* is almost never found in the cookery of neighboring Guangdong province or in the famous cookery of its capital, Canton.

Cecilia was born in Wu-hsi near Shanghai, one of 13 children in a family of great wealth. Her father was a high government official. When she was age 4, she moved with her family to Peking, where she was raised in luxury (their famous house had been an old palace) and educated from grammar school to university graduate. Her mother cooked only on special occasions. Among the 14 servants and maids, her family had two chefs; one cooked northern Chinese food and the other cooked Shanghai food. Cecilia learned nothing from these two cooks, since she was not allowed to go into the kitchen! In 1943, when the Japanese marched on Beijing (Peking), her family fled south to Chongqing (Chungking / Ch'ung-ch'ing; capital of "Free China" from 1937-1945); there she was married. It was not until 1945, V-J Day, that she first saw the remains of her parents' house at Wuxi. It had been destroyed by Japanese bombings. She and her husband (plus a cook and a few servants) lived near Shanghai for four years, then in April 1949 they fled to Japan when the Communists arrived, eager to confiscate the property of the wealthy. They lived in Japan for 8 years, until 1957, during the hard, lean years after World War II. Then they came to America. Cecilia learned to cook after she came to America.

In the Shanghai area during the summer months *maodou* are as widely found as edamamé in Japan. They are used in many different dishes. For example, shelled, they are cooked with shrimp, or with shrimp, pickled vegetables, and *pai-yeh* (sliced, pressed tofu sheets). A very large number of Buddhist vegetarian dishes contain *maodou*–such as "Vegetable Delight" which Cecilia used to serve at The Mandarin restaurant. When served in the pods, the pods are first boiled in unsalted water, then sesame oil and soy sauce are sprinkled on the pods, and the *maodou* are served in the pods.

Because they are available fresh for only about two months each year, *maodou* are very expensive. Thus, they are certainly not a poor-man's food. Some people (such as her mother) would dry *maodou* during the summer for use as a vegetable during the snowy winter when vegetables are scarce. The dried *maodou* are washed, soaked, then cooked–often with meat.

Cecilia is aware that edamamé are now starting to become quite popular in the USA. She thinks "the Japanese did something very good. Many Japanese restaurants give you a little edamamé to start with."

Cecilia knows nothing about the history of *maodou,* but she is quite sure these characters have been used in Chinese cooking for at least several hundred years.

Today, lots of edamamé are grown in Taiwan but Cecilia thinks this is not a result of the Japanese occupation of Formosa. Rather, the Japanese used Formosa mainly to grow sugar cane and pineapples. Address: Former owner, The Mandarin restaurant, Ghirardelli Square, San Francisco, California.

10848. *Rafu Shimpo* (*Los Angeles, California*). 2000. House Foods introduces new Chef Tofu. Nov. 6. [Eng]
• ***Summary:*** This new product helps consumers save time but costs a little more. Chef Tofu is firm textured and comes in three flavors–Original, Herb & Garlic, and Chili & Vege. Already sliced into four pieces, it is easy to prepare.

"House Foods America Corporation is based in Japan, where it was founded in 1913 under the name of House Foods Corporation." The largest spice processor in Japan, it is also one of the largest food conglomerates.

"In 1981, the Los Angeles office was established to

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introduce through importing, Yoshoku–Japanese style western food–to the United States, Canada, and Mexico. In 1983, the Curry House Restaurant chain was opened in Little Tokyo [Los Angeles]. There are now four Curry House Restaurants in Los Angeles County (Beverly Hills, Gardena, Little Tokyo, Torrance), and two in Orange County (Cypress and Irvine.)

"The U.S. Company also started manufacturing tofu in the early 1980s. Shortly after this, House Foods merged with the Hinoichi Tofu Company. Hinoichi is an over 50-year-old firm with long-established ties in the Los Angeles market. Today, House Foods America Corporation not only sells various Japanese style flavored mixes but such traditional Japanese food products, Some of their better-known brands are Hinoichi Tofu, House Foods Organic Tofu and Shao Mi Mi Tofu dessert.

"In 1997, all three divisions were combined to become House Foods America Corporation."

10849. Ito-Peterson, Yoko. 2000. House Foods betting on spiced-up tofu. *Orange County Business Journal* (*Newport Beach, California*) 23(46):1-2. Nov. 13.
• ***Summary:*** The House Foods tofu plant in Garden Grove, California, opened in 1997, replacing an old plant in downtown Los Angeles that began making tofu in 1981. A unit of Japan's House Foods Corp., the Garden Grove plant is believed to be the largest in the USA, making more than 100,000 packages of tofu a day, and is 128,700 square feet–compared to the 120,000 square foot East Coast Nasoya plant owned by rival Vitasoy USA. The California plant employs about 140 workers, mostly Hispanic.

In May House Foods added two new production lines, bringing their total to five, and their capacity to 220,000 packages per day. Yet Toshifumi Nomura, the company's marketing manager, says Americans have "tofu-phobia."

The U.S. tofu market was estimated at $238 million last year by Peter Golbitz of Soyatech Inc. Southern California is the largest U.S. center of soyfoods production according to William Shurtleff of Soyfoods Center (Lafayette, California). A photo shows Kazumi Kuniyasu, the business administration manager of House Foods America.

10850. Ito-Peterson, Yoko. 2000. Protein play: House Foods betting on spiced-up tofu. *Orange County Business Journal* 23(46):1, 73. Nov. 13-19.
• ***Summary:*** House Foods America Corp. is a unit of House Foods Corp. of Japan. Kazumi Kuniyasu, the company's business administration manager, says that his modern tofu plant, located in an industrial corner of Garden Grove, California, is the biggest one in America; it is 128,700 square feet, whereas the next largest plant (owned by Nasoya in Massachusetts) is only 120,000 square feet. His 140 workers, mostly Hispanic, produce more than 100,000 packs of tofu a day from about 15 tons of soybeans. Last year House Foods America sold $17 million worth of tofu and other soy products, up 15% over 1999. In May the company added two new tofu production lines, bringing their total to five and more than doubling the plant's capacity–to 220,000 packages per day.

In 1997, when the Garden Grove plant opened, it replaced an older factory in downtown Los Angeles that had been set up in 1981. The 1997 move enable the company to double production.

Last year the U.S. tofu market was estimated at $238 million by Peter Golbitz of Bar Harbor, Maine–up 15% over 1998. The largest single company is Vitasoy USA, which claims to make about half of all tofu sold in U.S. supermarkets at their two large plants in California (Azumaya) and Massachusetts (Nasoya). The Osaka-based parent company, House Foods, doesn't make tofu in Japan. To protect small tofu shops, a Japanese law prevents big corporations for entering the tofu manufacturing industry. House is Japan's largest spice manufacturer, selling curry powder and snack foods. In Southern California, the company also operates five Curry House restaurants.

A large color photo shows Kazumi Kuniyasu, wearing a sanitary hair net, standing next to two soybean washing machines in his plant. Five small black-and-white photos show: Three shots of the conveyorized packaging line, curding vats and tofu forming boxes, various packaged tofu products.

10851. Associated Press (AP). 2000. Iowa soybean market about to take off. *Sioux City Journal* (*Iowa*). Nov. 21. p. A5.
• ***Summary:*** Des Moines–Iowa Governor Tom Vilsack predicted Monday that sales of organic soybeans to Japan could increase 50% during the next year because of Iowa's labeling efforts and trips to Japan to cement relationships.

10852. Lumpkin, Tom. 2000. Update on work with edamamé (green vegetable soybeans) in the state of Washington (Interview). *SoyaScan Notes.* Nov. 22. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** One of the earliest Chinese-language references Tom has seen to soybeans (though he is not sure they are green vegetable soybeans) is in a poem about boiling immature soybeans with the branches of the plant. The poem is told from the viewpoint of the pods, which lament "Why are my brothers, the branches, boiling us?"

Tom has a videotape made in Japan that contains several early Japanese references to edamamé.

The proceedings of the edamamé conference, to be held on 10-12 Aug. 2001 at Washington State University, will be published before the conference. Tom asks Shurtleff to write a worldwide chronology of green vegetable soybeans and edamamé, which Shurtleff agrees to write; Tom will present it at the conference and publish it.

For the past five years, Tom's program has been

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developing ten non-shattering varieties of edamamé; they are at the F-6 stage. The key to breeding edamamé for America is making them machine harvestable. One Japanese and one Thai graduate student are helping him on the project. The varieties do not yet have names, only numbers. The main variables are non-shattering, structure of the plant, seed size, and flavor. Tom's program is also running "microsatellite fingerprinting" and "AFLP fingerprinting" on 150 edamamé varieties. Note: AFLP, which stands for "amplified fragment length polymorphism," is the registered trademark of a Dutch company. Most of the varieties are Chinese, with some Japanese and including their own ten. These new techniques, which give genetic fingerprints of each variety, enable them to: (1) Give precise descriptions of varietal differences; (2) See how much diversity exists among popular varieties; (3) Protect the lines and varieties they are developing; and (4) See who has been stealing varieties from whom. They have already constructed a pedigree, which will appear in an article, probably in *Crop Science* and in the conference proceedings. To get a broad range of offspring, a breeder wants to ideally select parents that are quite different.

Americans find the image of green soybean pods very attractive. Tom is well aware that edamamé are not simply any soybeans harvested at the green stage. He likes to say: "What sweet corn is to field corn, edamamé is to soybeans." They must also be processed in the same way to keep the sugars from changing into starches.

Tom has heard the word *azunda* used to refer to a soup containing edamamé; it is also used in some sweets, and his group has made a nice guacamole containing edamamé.

Tom believes that China will become the world's major grower of edamamé in the near future. Tom is working with Small Planet Foods (formerly Cascadian Farms) in the state of Washington–doing varietal development. Small Planet sells edamamé both in the pods and shelled. Tom also expects that precooked, flavored edamamé (in wasabi, teriyaki, etc. flavors) will become a big item in the near future.

Tom has been department chair at WSU for five years. His administrative duties (with 40 faculty and 70 staff people) make it harder for him to find time to do his own research and write. Just before he accepted this position, he had been accepted to go to the Needham Research Institute (which includes the East Asian History of Science Library) at Cambridge University in England. He would like to do that when he steps down from his current position, and maybe do a book on edamamé at that time. Address: Head, East Asian Crop Development Program, Dep. of Crops and Soil Sciences, Washington State Univ., Pullman, WA 99164-6420. Phone: 509-335-2726.

10853. *Canadian Soybean Bulletin* (*OSG, Chatham, Ontario, Canada*). 2000. Canadian soybean exports. 14(2):3. Nov.
• ***Summary:*** A large table shows statistics in tonnes (metric tons) of soybeans exported to various countries, and regions, each year from 1996/97 to 1999/2000. The countries are: In Asia–China, Hong Kong, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, and Thailand. In Western Europe–Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Portugal, and Spain. By continent–Africa, Central America, Eastern Europe, Middle East, Oceania, South America, and United States.

In 1999/2000 the countries to which the largest amount of Canadian soybean exports went were (in tonnes): Japan 179,708, United States 121,860, Malaysia 99,919, Indonesia 64,426, Denmark 47,444, Germany 43,410, and Netherlands 36,392.

10854. *Canadian Soybean Bulletin* (*OSG, Chatham, Ontario, Canada*). 2000. Incoming Japan soybean mission. 14(2):1. Nov.
• ***Summary:*** Japan imports 5 million tonnes (metric tons) or 184 million bushels soybeans each year. Of that, about 1 million tonnes (20%, or 37 million bushels) are used to make soyfoods such as tofu, miso, natto, soy sauce, etc. Of the 1 million tons, 500,000 tonnes (50%) are for tofu, 160,000 tonnes (16%) are for miso, and 130,000 tonnes for natto.

Exports of Canadian soybeans have been increasing rapidly, from 36,000 tonnes in 1995, to 75,000 tonnes in 1998, to 175,000 tonnes in 2000.

In Sept. 2000, the Canadian Soybean Export Association and the Ontario Soybean Growers hosted ten Japanese from the soyfoods industry and showed them the Canadian soybean industry. These Japanese were most appreciative "of our efforts to segregate GMO and non-GMO varieties of soybeans using our Identity-Preserved, or IP program."

10855. **Product Name:** UniCell soybeans.
Manufacturer's Name: Japan Cellfoods, Co., Ltd.
Manufacturer's Address: 5-45-1001, Mukogawa-cho, Takarazuka City, Hyogo Pref., Japan.
Date of Introduction: 2000 November.
Ingredients: Whole soybeans.
How Stored: Shelf stable.
New Product–Documentation: Portfolio (with 5 inserts) sent by Japan Cellfoods, received 21 July 2001. The inserts are: (1) Background information: Japan Cellfoods, Co., Ltd. Address, phone and fax. "Japan Cellfoods Co., Ltd., was formed in 1991 by Mr. Toru Akazawa, who is the company's president. After establishing the company, Mr. Akazawa spent most of the 1990s refining his proprietary soy processing technology. He applied for an international patent for the technology in August of 1999, and in February 2001 the patent was made public. Last year, Japan Cellfoods established UniCell Co., Ltd., a joint-venture with KSK Co., Ltd., of Osaka. UniCell began commercial distribution of the soy product in November of last year. At present, the product is mainly used as an ingredient in bread produced by

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such companies as Dai-Ichi Seipan, Saint-Germain Co., Ltd., Ryoyu Seipan, and Hankyu Department Store, as well as KSK Co. UniCell soybeans are currently being produced at two plants, one in Okayama and one in Hokkaido. In Japan, the company is now developing new uses for its product in nutritional beverages, curry, hamburgers, and other foods.

"UniCell soybeans: Using its proprietary technology, Japan Cellfoods produces UniCell soybeans, which are soybeans that have been broken down into individual soybean cells. The process involves an enzymatic treatment to produce a pectinase that dissolves the substance binding the cells together. Since the entire soybean is used in this process, all of the nutrients are retained. Moreover, because most of the individual cell membranes are not ruptured in this process, UniCell soybeans have almost none of the 'beany' taste of regular soybeans that is produced when an enzyme [lipoxygenase] in the soybeans oxidizes the bean's unsaturated fat. Keeping the individual cell membranes intact prevents this oxidation process and thereby minimizes the distinctive taste. As a result, UniCell soybeans can be added to a variety of food products–including bread, sauces, soups, hamburgers, and beverages-without compromising their taste."

(2) Media Advisory: Contact: Mr. Michael Solomon at Michael Solomon Associates Tel: (212) 764-4760 E-mail: solomon@msapr.com

Japan Cellfoods To Announce Breakthrough in Soy Processing–New Product Offers Soy's Nutritional Benefits Plus Palatability.

Time: Wednesday, July 11th–11:45 a.m. to 1:15 p.m.

Place: Hilton Hotel, Gibson Suite, 1335 Avenue of the Americas at 53rd Street. Gives a half-page summary of the new food and the innovative processing technology.

(3) Japan CellFoods press conference. A program featuring 11 speakers, sample tasting, Q&A session, and presentation and sampling of dishes that utilize UniCell soybeans by Ms. Misao Shirai, Chef/Food Expert.

(4) Participant profiles: Brief resumés of 5 Japanese and 3 Americans who participated in the news conference. (5) News release: Japan Cellfoods Announces Breakthrough in Soy Processing–New Product Offers Soy's Nutritional Benefits Plus Palatability. A 1-page summary of the news conference. "Journalists and representatives of the food processing industry attending today's press conference had an opportunity to confirm the palatability and versatility of UniCell soy powder by sampling it in a variety of foods and beverages. The samples included nutritionally enhanced bread developed in cooperation with the American Institute of Baking. Also featured were representatives of Henningsen Foods of Rye Brook, New York, which produced the spray-dried UniCell soy used in preparing food samples, and researchers from Iowa State University and Indiana Crop Improvement Association, who are working on food applications for the new soy product and allergy testing, respectively. Dr. Yukio Yamori, Emeritus Professor of Kyoto University, who has used the Japan Cellfoods soy product in his World Health Organization-supported research, spoke on the health benefits of a soy-rich diet.

"In addition to supplying the consumer and institutional markets (including school lunch programs) in the U.S., Japan Cellfoods intends to cooperate with U.S. firms to produce UniCell soy in this country for export to Japan and elsewhere."

(6) Translation of remarks by Mr. Toru Akazawa, President, Japan Cellfoods Co., Ltd., July 11, 2001. Two pages, typewritten, single spaced.

Note: This is a new product. It does not fit easily into either of our categories: Product Category, or Soyfood Type. We will watch with interest the future of this product.

10856. Sumi, Hiroyuki; Sasaki, Tomohiro; Yatagai, Chieko; Kozaki, Yasutaka. 2000. [Determination and properties of the fibrinolysis accelerating substance (FAS) in Japanese fermented soybean "Natto"]. *Nippon Nogeikagaku Kaishi* (*J. of the Agricultural Chemical Society of Japan*) 74(11):1259-64. Nov. [17 ref. Jap; eng]
Address: 1. Dep. of Physiological Chemistry, Kurashiki University of Science and the Arts, 2640 Tsurajima-cho, Kurashiki, Okayama prefecture 712-8505, Japan.

10857. Huang, H.T. (Hsing-Tsung). 2000. Science and civilisation in China. Vol. 6, Biology and biological technology. Part V: Fermentations and food science. Joseph Needham series. Cambridge, England: Cambridge University Press. xxviii + 741 p. Illust. Index. 26 cm. [200+ soy ref]
• ***Summary:*** This is the most important book on soyfoods in China ever written, and it is especially good on their origins and early history in China. It is also one of the best books seen on food in Chinese culture and history.

The section titled "Soybean processing and fermentation" (p. 292-378) comprises 14.3% of the book's text, and has the following contents: Introduction. Soybean sprouts. Soybean curd and related products: The origin of bean curd, transmission of *tou fu* to Japan, products associated with *tou fu* (soymilk {*tou fu chiang*}, tofu curds

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{*tou fu hua* or *tou fu nao*}, pressed tofu sheets {*ch'ien chang* or *pai yeh*}, yuba {*tou fu i* or *tou fu p'i*}, deep-fried tofu {*yu tou fu* or *tou fu p'ao*}, pressed tofu {*tou fu kan*}, five-spice pressed tofu {*wu hsiang tou fu kan*}, plain dried tofu [pressed tofu] {*pai tou fu gan*}, smoked tofu {*hsün tou fu*}, dried tofu soaked in brine and fermented {*ch'ou tou fu kan*}, frozen tofu {*tung tou fu*}), making fermented tofu {*fu ju*}, comparison of *tou fu* and cheese, addendum. Fermented soybeans, soy paste, and soy sauce: *Ferments* for food processing, fermented soybeans–*shih,* fermented soy paste–*chiang,* fermented soy sauce–*chiang yu,* soy fermentations in China and Japan.

There are also long sections on the history koji (*qu*) and of red rice koji (*hong qu*) in China (p. 192-203).

Note: This is the earliest English-language document seen (April 2013) that uses the term "hsün tou fu" [pinyin: *xun doufu*] to refer to smoked tofu. Soy is also discussed in other parts of the book. Address: Alexandria, Virginia.

10858. Huang, H.T. (Hsing-Tsung). 2000. Soybean curd and related products: Transmission of *tou fu* to Japan (Document part). In: H.T. Huang. 2000. Science and Civilisation in China. Vol. 6, Biology and Biological Technology. Part V: Fermentations and Food Science. Joseph Needham series. Cambridge, England: Cambridge University Press. xxviii + 741 p. See p. 317-19. [10 ref]

• ***Summary:*** There is general agreement that tofu originated in China, but considerable uncertainty as to when and how it arrived in Japan. In recent years, the subject has attracted much interest among food historians in China; they hoped that an answer to these questions might help answer questions about the origin of tofu in China.

Two theories about the transmission of tofu to Japan have been proposed. The first follows the popular Japanese tradition which says that tofu was brought from China by a delegation of Buddhist monks headed by the master Kanshin (Jian Zhen; W.-G. Chien Chên) in A.D. 754. The second holds that tofu came to Japan with the Zen master Ingen (Yin Yuan; W.-G. Yin Yüan) in A.D. 1654. Both theories are probably unfounded.

When Ingen arrived in Japan, tofu was already a common food, and he was surprised to see varieties that were different from those he knew from China. After he established the well-known Mampuku-ji temple south of Kyoto, he taught the monks and local tofu masters how to make Chinese-style pressed tofu. According to *The Book of Tofu,* by Shurtleff and Aoyagi, "although this very firm variety became quite popular in Japan in the next century, it is now made by only one tofu shop in Japan and is featured in Zen Temple Cuisine only in restaurants near Mampuku-ji" (p. 115). Address: Alexandria, Virginia.

10859. Shurtleff, William; Aoyagi, Akiko. 2000. Tofu & soymilk production. 3rd ed. Lafayette, California: Soyfoods Center. 336 p. Illust. by Akiko Aoyagi Shurtleff. Index. Dec. 28 cm. [223 ref]

• ***Summary:*** Contains many new advertisements, plus changes on the title page, copyright page, and rear cover of both paperback and hardcover editions (new ISBN for each). Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

10860. Kanai, Y.; Kimura, M.; Kiuchi, K.; Muramatsu, K.; Yamawake, N.; Yoshimi, T. 2000. [Purification and crystallization of a new *Bacillus subtilis* elastase]. *Kaseigaku Zasshi* (*J. of Home Economics of Japan*) 51:1127-35. *

10861. Toda, T.; Sakamoto, A.; Takayanagi, T.; Yokotsuka, K. 2000. Changes in isoflavone compositions of soybean foods during cooking process. *Food Science and Technology Research* 6:314-19. *

10862. Watanabe, Sugio. 2000. [Growth market: International industrialization of fermented beans production]. *Research J. of Food and Agriculture* (*Tokyo*) 23:28-33. [142 ref]*

Address: Biotechnology Inst. of Natto, Suzuyo Kogyo Co. Ltd. Both: Tokyo, Japan.

10863. Bakken, Henry H. 2000. Encyclopedia Americana: Futures trading. Danbury, Connecticut: Grolier Inc. 30 volumes. See Vol. 12, p. 208. [3 ref]

• ***Summary:*** Contents: Introduction. Function. Development of trading. Ever since humans discovered the benefits of trading, market procedures have gradually evolved. This development can be divided into at least five stages: Gift giving, barter, cash market, contracts "to arrive" or "to deliver," and futures trading. A futures trade in soybeans, for example, is an agreement between two parties to transfer legal rights to the beans for delivery and acceptance in the future. It is contracts that are bought and sold; the soybeans are never brought to the trading floor. A futures market serves different purposes from those of a cash market. One function is to shift risks through hedging.

The limitations of cash markets became apparent in the 1800s at major trading centers such as Tokyo, Liverpool, and Chicago (Illinois). In Chicago, for example, port facilities for storage were limited, so in 1851 grain dealers there began making agreements that were soon known as "to arrive" and "to deliver" contracts. Grain would be delivered in the future for cash, on dates when ships would be available for transport on the Great Lakes.

This system was better than earlier trading methods, so grain dealers experimented further with time contracts. In 1867 the earliest known instance of futures trading in the USA took place at the Chicago Board of Trade. However futures trading began in Japan in 1730 (rice) and in England in 1826 (nutmegs). Address: Univ. of Wisconsin.

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10864. Corum, Ann Kondo. 2000. Ethnic foods of Hawai'i. Revised ed. Honolulu, Hawai'i: The Bess Press. vi + 234 p. See p. 53-54, 74, 88. Illust. Recipe index by category. Recipe index by ethnic group. 23 cm. 1st ed. 1984. [73 ref]
• ***Summary:*** The semi-Japanese recipe for Microwave azuki mochi (p. 74) concludes: "Roll in katakuriko (potato starch) or kinako (soybean flour)."

The Okinawan recipe for "Nantu: Steamed Okinawan mochi" (p. 88) calls for "kinako (soybean flour) as an ingredient.

The ethnic groups whose recipes are represented in this collection are (listed alphabetically): Chinese, Filipino, Hawaiian, Japanese, Korean, Okinawan, Portuguese, Puerto Rican, Samoan, Thai, and Vietnamese.

The section titled "Soybean and bean products" (p. 53-54) discusses miso, tofu, and shoyu, sukiyaki, aburage, okara, miso soup, teriyaki, and kuromame (black soybeans).

About the author: On the rear cover, with a portrait photo, we read: "Ann Condo Corum was born in Honolulu and graduated from Punahou School. She has a degree in English from California State University at Long Beach and a Master of Science degree from the University of Southern California." Address: Author.

10865. Cost, Bruce. 2000. Asian ingredients: A guide to foodstuffs of China, Japan, Korea, Thailand, and Vietnam. New York, NY: HarperCollins. xiv + 322 p. Illust. 24 cm. *
• ***Summary:*** The contents of this book is almost identical to that of the original 1988 edition. This is not a new edition.

10866. Fukuyama, Hideko. 2000. Okazu tokidoki-zakana, goma miso su [Side dishes from time to time with drinks, sesame, miso and vinegar]. Tokyo: Bunka Shuppankyoku. 95 p. Illust. (mainly color). 23 cm. [Jap]*
Address: Japan.

10867. Hosking, Richard. 2000. At the Japanese table. New York: Oxford University Press. x + 70 p. Illust. (some color). Index. 20 cm. Series: Images of Asia. [19 ref]
• ***Summary:*** Contents: Acknowledgements (thanks to Dr. Naomichi Ishige). The Japanese and food. Food: the raw and the cooked. Seasonal foods and drinks. Appearance, texture, and flavour. The dining room and kitchen. Meals and menus.

Briefly mentions: Soy sauce (p. 2, 12, 20), bean curd (2), tamari (p. 20), Japanese Worcester sauce (p. 20), other soy bean products (p. 20-21), tofu (p. 21, 25), yuba (p. 21, 36), deep-fried tofu–aburaage, agedofu (p. 21), miso (p. 21), green vegetable soybeans (p. 21), teriyaki sauce (p. 28), miso soup (p. 35).

10868. Koizumi, Takeo. 2000. Nattô no kairaku [The pleasures of natto]. Tokyo: Kodansha. 221 p. 20 cm. Series: New Fifties. [Jap]*

10869. Kouwenhoven, Arlette; Forrer, Matthi. 2000. Siebold and Japan: His life and work. Leiden, Netherlands: Hotei Publishing. 111 p. Illust. (Incl. color). No index. 27 cm. [40* ref. Eng]
• ***Summary:*** An excellent biography of Philipp Franz von Siebold (1796-1866), a German physician and naturalist who was one of the first Europeans to live in Japan. In 1823 Siebold wrote a letter to the Governor of Batavia requesting professional help at Deshima. In 1825 two men were finally dispatched: (1) Dr. Heinrich Bürger (1804-1858), a scholar, who worked as a pharmacist in Batavia, and who was to assist with scientific research, chemistry and mineralogy; and (2) Carel Hubert von Villeneuve, an auditor and artist.

On 15 Feb. 1826, Siebold departed from Deshima, accompanying the court journey to Edo (today's Tokyo) of *Opperhoofd* Johan Willem de Sturler; Siebold was joined by Dr. Bürger in the role of secretary, although Bürger's true purpose was to assist Siebold in his scientific research. These were the only three Dutchmen allowed to make the long journey. Siebold and Bürger were well prepared for the trip; they had gathered all sorts of equipment to take with them, including barometers, thermometers, hygrometers, sextants, chronometers, microscopes, crockery, furniture, silver, fine glassware, and even a piano. Some of these items were intended as gifts. En route, the inquisitive Siebold observed and wrote about practically everything. They arrived in Edo on 10 April 1826, about 2 months after leaving Nagasaki, a trip of about 1,400 km. On 1 May 1826 the three Dutchmen had an audience with the shogun. The delegation finally left Edo on 18 May 1826 and arrived at Deshima on July 7. Note: It was almost certainly on this trip that Siebold and Bürger observed soybeans and recorded their observations in the trip's log.

A 3-page chronology of Siebold (p. 100-02) includes: 1796 Feb. 17. Philipp Franz von Siebold born in Würzburg [in today's Germany]. 1815–Starts study of medicine at the University of Würzburg; subjects include chemistry, botany, and physics. 1820–Completes his studies in medicine, surgery, and anatomy, obtains his doctorate, and establishes himself as a physician in Heidingsfeld. 1822 June 21–Appointed Surgeon-Major in the Dutch East-Indies Army. 1823 Feb. 13–Arrives in Batavia. On April 18 he is appointed to the post of physician at the trading post on Deshima, near Nagasaki, Japan. He also receives instructions to conduct research into Japanese natural history, laws, and politics.

1823 Aug. 12. Arrives on Deshima and starts teaching almost immediately. That same year he "married" Kusumoto Sonogi, also known as Otaki (1807-1865); she is 11-12 years younger than he. 1824. Starts a botanical garden on Deshima at the request of the government in Batavia. Opens his school in Narutaki, just outside Nagasaki. 1825. Dr. Heinrich Bürger arrives from Batavia to help Siebold with his geological

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research, accompanied by C.H. Villeneuve, the illustrator.

1826 Feb. 15 to July 7. He accompanies *Opperhoofd* De Sturler on the court journey to Edo. Bürger, Keiga and several of his Japanese students join the delegation. 1827. The government in Batavia requests his return there, with the possibility that he may have to return to Holland. Also in 1827 Von Siebold's daughter, Oine (1827-1903) is born.

1828 Sept. 18. A severe storm causes the ship, with 89 crates containing Siebold's collection, to run aground on the coast at Nagasaki. The discovery of forbidden objects leads to the detainment of Siebold, Takahashi, and many others. Siebold is placed under house arrest.

1829 Oct. 22. After being subjected to lengthy cross-examination, Siebold is banished from Japan. On Dec. 30 he leaves Japan.

1830 Jan. 18. Arrives in Batavia, then travels to Holland where he arrives on July 7. In Antwerp he meets Dr. Hoffmann, who is later to become the first professor at Leiden University.

Note: 1830. Siebold's first publication on Japanese plants appears (largely in Latin, but with many Japanese characters) in *Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen* 12:1-74. See p. 54-57, plus first table at end. He mentions two species of soybeans: *Sooja Japonica,* the cultivated soybean, and *Sooja nomame,* the wild soybean; he says he has seen a living plant specimen of the latter. Soybeans are used to make shoyu, miso, and tofu. A note at the end of table I states that he drafted it at Deshima in November 1827.

1831 April 20. King Willem I agrees to buy Siebold's ethnographic collection and to pay an advance of 12,000 guilders. 1832. Hires a house at 19 Rapenburg in Leiden, Netherlands, where he organises his collection and opens it to the public. He maintains contact with Bürger, who still lives on Deshima. Travels to Germany in the autumn. 1833. Returns to The Netherlands in the summer. Presents the first copy of his opus *Nippon* to the Society of Dutch Letters on 26 Nov.

1835. Travels in Germany and Austria. Meets Zuccarini and others. 1836 Aug. 22. Buys the house at 19 Rapenburg. 1839. From now on he spends winters in Germany, where he meets his future wife, Helene von Gagern.

1840. Buys a piece of land at Leiderdorp, where he builds the villa, 'Nippon' and starts a nursery. 1842. Establishes the plant and seed company, Siebold & Co. with Blume and Rodbard. 1845 July 10. He marries the Lady Helene von Gagern (1820-1877) in Berlin; she is 24 years younger than he. Soon four children are born. 1859. Returns to Japan. Arrives in Nagasaki on Aug. 4. 1861 Oct. He is banished from Edo, and Japan itself. 1866 Oct. 18. Von Siebold dies in Munich, Germany; he is buried in the Alten Südlichen graveyard on the Thalkirchner Strasse.

10870. Krasno, Rena. 2000. Floating lanterns and golden shrines: celebrating Japanese festivals. Berkeley, California: Pacific View Press. 49 p. Illust. (color, by Toru Sugita). Map. Index. 29 cm.

• ***Summary:*** Describes a year of special celebrations in Japan, with historical and cultural information, including recipes, crafts, and legends.

One of the celebrations is "Setsubun: Bean-throwing festival" (p. 9). The Chinese calendar was adopted by Japan in about 500 A.D. The date of Setsubun (Feb. 3 or 4) is determine by that old lunar calendar, which has 4 seasons and 24 divisions. "Setsubun" means the end of a season, as it passes on to the next one. The most celebrated of the four setsubuns is the one at the end of winter, which marks the end of one year and the beginning of a new year. This is the time for bean-throwing (*mamemaki*).

In the house people shout *Oni wa soto!* (Devils out!). Handfuls of roasted soybeans (*mame*) fly out the front door.

Then the people go outside the house and shout *Fuku wa uchi!* ("Good luck into the house"). This time more soybeans are thrown through the door into the house.

Mamemaki is such fun. Kids are running around with excitement. Some are making scary faces as they pretend to be evil goblins. Other are wearing devil (*oni*) masks that came with the package of soybeans. They scream out loud as other kids chase them and pelt them with roasted soybeans.

The next day will be Risshun, the first day of spring. Do you want to be lucky? Eat one bean for each year of your life, plus one more for the coming year.

What smells so bad? The family has grilled sardines and hung their heads outside the front door to keep devils away– by using the stinking smell.

Tomorrow, on risshun, will offer a chance to see famous athletes, movie stars and local heroes who visit Buddhist temples and Shinto shrines, where they will fling handfuls of roasted soybeans to the crowd waiting below and shouting "Good luck! Good luck."

Hundreds of eager hands are stretched out as they try to catch at least one bean–a lucky charm. "I got two! I got two!" a little girl shouts with excitement.

Note: A Japanese devil has a body shaped like a person. It has red skin, two horns, curly hair, a big mouth with two fangs among its upper teeth, angry-looking eyes and long black eyebrows.

10871. Kulp, Karel; Ponte, Joseph G., Jr. eds. 2000. Handbook of cereal science and technology. 2nd ed., revised and expanded. New York, NY: Marcel Dekker. ix + 790 p. Illust. Index. 29 cm. Series: Food Science and Technology, No. 99.

• ***Summary:*** Chapter 26, "Fermentation and microbiological processes in cereal foods," by Pierre Gélinas and Carole McKinnon (of Food Research and Development Centre, Agriculture and Agri-Food Canada, St. Hyacinthe, Quebec, Canada) (39 refs) (p. 741-54) contains a long table (p. 742-

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46) titled "List of foods prepared from fermented cereals." The four columns are: (1) Food name (synonym or related food). (2) Food type (characteristics). (3) Area (country or continent). (4) Main microorganisms.

Under "Soybeans" the following foods are listed: Chee-fan. Chinese yeast. Hama-natto. Kenima. Ketjap. Meitauza. Meju. Miso (chiang, doenjang, kochujang, tauco). Natto. Soy sauce (kanjang, kecap, kicap, shoyu, taosi [sic]). Sufu (tahuri, taokoan tao-hu-yi). Tairu (taire–fermented soybean milk, like yogurt, from Malaysia). Taotjo. Tempe (tempeh).

"Chee-fan" is described as "Curd-like" [fermented tofu] from China. Main microorganisms: *Mucor* spp., *Aspergillus glaucus.*

Note 1. Taokoan (listed under Sufu, above) is not a fermented food. It is the Filipino equivalent of Chinese *doufu-gan* or "pressed tofu." Filipino fermented tofu is *tahuri* (also spelled *tahuli*).

Table 2, "List of representative microorganisms associated with fermented cereal foods" (p. 74-48) contains two columns: (1) Type of microorganism (and within type, genus and species, listed alphabetically by genus). (2) Food produced.

Under "Bacteria" are: *Bacillus natto*–Hama-natto [sic], natto. *Lactobacillus delbrueckii*–Miso, soy sauce. *Pediococcus* spp.–Hamanatto. *Pediococcus halophilus*–Soy sauce. *Streptococcus* spp.–Hama-natto.

Under "Bacteria" are: *Actinomucor elegans*–Meitauza, sufu. *Aspergillus glaucus*–Chee-fan. *Aspergillus oryzae*–Hama-natto, ketjap, meju, miso, saké, soy sauce. *Monascus purpureus*–Anka (ang-kak, beni-koji, red rice), hong-ru (lao-hong). *Mucor* spp.–Chee-fan, ruhi, sufu. *Mucor hiemalis*–Sufu. *Rhizopus oligosporus*–Tempe.

Under "Yeasts" are: *Candida* spp.–Soy sauce. *Zygosaccharomyces rouxii*–Miso, soy sauce.

The section on "Major commercial fermentation processes" includes (p. 752-53) soy sauce (from wheat and soybeans) and miso (from rice and soybeans).

Note 2. Koji, the basis of soy sauce, miso, and saké fermentations, is not mentioned in either of the first two tables. However it is mentioned by name on p. 753. Address: 1. American Inst. of Baking; 2. Prof. Emeritus, Kansas State Univ. Both: Manhattan, Kansas.

10872. Kurlovich, B.S.; Rep'ev, S.I.; Petrova, M.V.; Buravtseva, T.V.; Kartuzova, L.T.; Voluzneva, T.A. 2000. The significance of Vavilov's scientific expeditions and ideas for development and use of legume genetic resources. *Plant Genetic Resources Newsletter* No. 124. p. 23-32. [78 ref. Eng; fre; spa]

• ***Summary:*** This article is a summary of Vavilov's principal expeditions and their significance for scientific research and practice. "Nikolai I. Vavilov (1887-1943) is recognized as the foremost plant geographer, botanist, and geneticist of contemporary times." He "was the first to recognize the necessity for intensive plant collecting and preservation." He was very interested in the sites of ancient agricultural civilizations and of mountainous regions. In 1929 he organized an expedition to China, Japan, and Korea. After these expeditions, wild and cultivated soybean species were added to his collection. However the principal legumes he collected were mung beans, chickpeas, lentils, peas, and lupins.

His main contributions to the theory of plant introduction were: Centers of origin and diversity, law of homologous series, differential systematic- geographical methods, and geographical and ecological differentiation. The latter concept has enabled scientists from VIR (N.I. Vavilov Inst. of Plant Industry–St. Petersburg, Russia) to develop interspecific classifications for almost all leguminous crops, including soya bean (Korsakov 1971; Teplyakova 1997). Korsakov has also clarified the centers of origin of various soya bean species.

Presently the VIR germplasm collection has 43,000 accessions belonging to 15 genera and 160 species of the Fabaceae including soya beans.

A photo shows: (1) N.I. Vavilov and his wife, E.I. Barulina, in 1926, before the expedition to the Mediterranean. Address: N.I. Vavilov Inst. of Plant Industry (VIR), B. Morskaya str. 44, St. Petersburg 190000, Russia.

10873. Michio and Aveline Kushi macrobiotics collection (Archival collection and finding aid). 2000. Washington, DC: Smithsonian Institution, Archives Center. 48 boxes.

• ***Summary:*** This is collection AC 619 consisting of 48 boxes (28 cubic feet). The finding aid to the collection is 12 pages. Kathy Keen did the processing. Most of the materials document the 1970s and 1980s. There are five series in the collection: (1) Publications of the East West Foundation and Kushi Institute (the largest series): In boxes 1-7 are issues of *East West Journal* (EWJ) from April/May 1977 through Dec. 1989. In box 9 are volumes 1(1971) and 2(1972) of EWJ. In boxes 10-12 are volumes 2(1972) through 6(1976) of EWJ. In boxes 13-26 are various volumes and issues of macrobiotic periodicals including *Order of the Universe* (from Vol. 1, 1967), Michio Kushi Seminar Reports (from Nov. 1974), *Macrobiotic Monthly* (from July 1965), *Yin Yang* (from Sept. 1962), *Macrobiotic News* (from May 1960), *One Peaceful World* (from No. 27), *The Macrobiotic* (from Vol. 9) *Macrobiotics Today* (from 1984), *Musubi* newsletter (1971), *Macromuse* (from 1982). In box 29 are Erewhon product catalogs (13 catalogs from 8 Dec. 1972 to summer 1977; other catalogs include 19 Feb. 1973, 6 April 1973, 29 May 1973, 20 Aug. 1973, Nov. 1973, June 1974, spring 1975, summer 1975, Feb. 1976, and spring 1977).

(2) Audio tapes (box 40). (3) Video cassettes of lectures by Michio Kushi on macrobiotic subjects from 1981 to 1991 (boxes 34-40). (4) Books on macrobiotic subjects (99 in English and 8 in foreign languages) (boxes 30-33). (5)

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Photographs (box 41).

Contents of the 12-page finding aid: History of macrobiotics and Michio and Aveline Kushi. Provenance (the collection was donated in Aug. 1997, with additional materials in May 1999). Scope and content. Related materials. Container list.

There is also a 2-page cataloging record for the collection. Address: Washington, DC. Phone: 202-357-3270.

10874. Miso Kenkozukuri Iinkai. 2000. What's miso. Tokyo: Miso Health Building Committee. 6 panels. 1 folded sheet. Illust. (color). 21 x 10 cm. [Eng]*
Address: Japan.

10875. Shimbo, Hiroko. 2000. The Japanese kitchen: 250 recipes in a traditional spirit. Boston, Massachusetts: Harvard Common Press. xiii + 512 p. Foreword by Ming Tsai. Illust. (by Rodica Prato). Index. 23 cm.
• ***Summary:*** An excellent book with exquisite illustrations. The index contains 46 entries for miso, 20 for tofu, 12 for shoyu, 10 for teriyaki, 7 for edamame, 6 for natto (fermented soybeans), 6 for soybeans, 5 for koji ("a fermentation starter"), 3 for koyadofu (freeze-dried tofu), 2 for soy milk, soy sauce dressing, soybean lover's soybean rice, soybean miso, soybean pulp, 1 each for kinu dofu, moyashi (incl. soybean sprouts; "Until recently, moyashi used for cooking in Japan were predominantly soybean sprouts," p. 42), nama-age, nama-miso, nama-shoyu, okara (soybean pulp), saikyo miso, and tamari.

In the section on *Daizu* "(Dried soybeans)" (p. 96-97) both roasted soybean flour and *kinako* are mentioned. Dried green soybeans, are toasted then ground to a flour (*kinako*) which "is mixed with sugar and used to coat moist or sticky Japanese sweets." During the summertime, edamame (fresh green soybeans) are boiled and served in the pods.

The section on "Koyadofu" recounts the story of its origin: "The dried form of tofu, koyadofu, was invented by accident around the twelfth century, when, it is said, a priest at Mt. Koya Temple left freshly made tofu as an offering on the altar one snowy night. The next morning the tofu was frozen, so he threw it away in the back garden." After several sunny days of melting and evaporation, the tofu was found completely dried. It was found that this dried form can be kept for a long time.

The section on *Tofu seihin*–"Cooked tofu products" (p. 139-41) includes *Abura-age*–"Fried thin tofu." "One type of *abura-age,* called *sushi-age,* is sold specially for the preparation of *inarizushi,* a small barrel-shaped brown sushi, *Sushi-age* comes slit to make a pocket into which sushi rice can be stuffed."

Note: This is the earliest English-language document seen (April 2013) that uses the term *Sushi-age* to refer deep-fried tofu pouches used to make inari-zushi.

Atsuage–"Fried tofu." *Ganmodoki*–"Fried tofu dumplings." *Yakidofu*–"Lightly broiled tofu." *Yuba*–"Soy milk sheet."

The latter section states nicely: "Because freshly collected yuba is soft and fragile, many sheets may be piled together and rolled into a 1-inch-thick stick. The stick is chilled, cut into bite-sized pieces, and eaten with a little shoyu (soy sauce) and grated wasabi. Fresh yuba has a wonderful creamy texture and a sweet, nutty taste."

"Because fresh yuba is perishable, most yuba found in stores is in the form of a dried sheet." It must be reconstituted in water, but after it has regained its flexibility it makes an excellent wrapper for other foods in fried or simmered dishes.

Shimbo-Beitchman is a knowledgeable and talented Japanese cooking teacher who ran a cooking school in Tokyo for eight years and in London for two; she now teaches in New York City. Address: Teacher of Japanese cooking, Hiroko's Kitchen, London, England. Phone: Fax: 44-171-289-0855.

10876. Tokushû 1: Ageru! Tokushû 2: Miso [Special issue 1: Deep-frying! Special issue 2: Miso]. 2000. Tokyo: Shibata Shoten. 175 p. 28 cm. Series: Ryori Hakka, no. 48; Shibata Shoten Mukku. [Jap]*
• ***Summary:*** These are two special issues of a cooking magazine. Address: Japan.

10877. Wilkinson, Endymion Porter. comp. 2000. Chinese history: A manual. Revised and enlarged. Cambridge, Massachusetts: Harvard University Press / Harvard Yenching Institute. xxiv + 1181 p. Index. 23 cm. Harvard Yenching Institute Monograph Series, 52. 1st ed. 1998. [500+* ref]
• ***Summary:*** A remarkable and extremely valuable book. Partial contents: Introduction: Recent historiographical trends, center and periphery, periodization, the dynasties.
I: Basics. 1. Language. 2. Dictionaries. 3. People. 4. Geography. 5. Chronology. 6. Telling the time. 7. Statistics: Numbers and order of magnitude, population, weights and measures, money, prices. 8. Guides and encyclopedias. 9. Locating books. 10. Locating secondary sources. 11. Libraries.

II: Pre-Qin sources. 12. Archaeology. 13. Pre-Qin archaeology. 14. Prehistoric signs and symbols. 15. Oracle bone inscriptions. 16. The characters: Evolution and structure. 17. Epigraphy. 18. From bamboo strips to printed books. 19. Excavated and transmitted texts.

III: Historical genres. 20. Primary and secondary sources. 21. Annals. 22. Standard histories. 23. Topically arranged histories. 24. Miscellaneous histories. 25. Government institutions. 26. Official communications. 27. Law. 28. War.

IV: Other primary sources... 35. Agriculture, food and the environment. 36. Medicine. 37. Technology and science... 42. Foreign accounts of China.

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V: Primary sources by period.

In the chapter titled "Agriculture, food and the environment," section 35.2.2 on "Pre-Qin foodstuffs and cooking" (the Qin dynasty, 221-206 B.C., came just before the Han) states that the staple dishes, cooked mainly by boiling or steaming, were typically "accompanied by a savory paste (*jiang, miso* in Japanese) made from hydrolyzed (fermented) meat, fish, crustaceans, or, most important of all, soybeans" (Footnote 8). "The soybean is indigenous to northeast China. Its cultivation began in the Zhou period. It was a major source of protein, especially for peasants and laborers. Starting in the Yangzi valley, it was brined and hydrolyzed into the characteristic Chinese flavoring, soy sauce (*jiangyou*) (9). By the Han, a new process had been discovered; if the production was interrupted half way and the beans dried, they became blackened and delicious. Along with savory pastes (*jiang*) and pickles (*zu*), these fermented soybeans (*chi*) were immensely popular (10)."

Footnote 8: See *Zhongguo shiqian yinshishi* (A history of Chinese prehistoric food and drink), Wang Renxiang, ed. in chief, Qingdao, 1997.

Footnote 9 (p. 638): "The origin of 'soya' in European and other languages is from either *xiyao* [fermented black soybean sauce] or *shôyu* (the Cantonese and Japanese for *jiangyou* [soy sauce] respectively). The early generic word was *shu* (*Glycine max*), later *dou,* and later still *dadou* to distinguish it from post-Han imported pulses."

Footnote 10: "*Chi* used to be pronounced *shi.* Other names for *chi* were *douchi, daku,* and *nadou* (*nattô* in Japanese)."

Section 35.2.3 on "New foodstuffs and cooking" covers the period from the beginning of the Han dynasty in 202 B.C. Noodles (*bing*) were introduced. Soybeans (in the forms of jiang and fermented black soybeans {*chi*}) remained an important source of protein. Alfalfa (*musu* or *mushu*), peas (*hudou,* modern *wandou*), and sesame (*huma,* modern *zhima* or *mazi*) are said to have been introduced by Zhang Qian, the emissary from the Former / Western Han dynasty. By the Tang "bitter fermented blackened soy beans" (*huchi*) had been introduced; *hu* means "barbarian." Tofu (*doufu*) is first mentioned in the early Song dynasty. It was imported into Japan and first appeared there in a document dated 1183. "It was used as a substitute for meat and fish in Buddhist vegetarian cooking." New World crops which made their way into China from the 16th century include peanuts (*fandou,* modern *huasheng*), chili, corn, sweet potatoes, and tomato (p. 643).

Note: The author was educated in England. Address: Head of Delegation and Ambassador to China for the European Commission.

10878. Yûmeiten no ryôrinin go oshieru miso o tanoshimu ryôri hachijippin [Chefs from famous restaurants teach 80 recipes for enjoying miso]. 2000. Tokyo: Seibido Shuppan. 129 p. 29 cm. Series: Seibido Mook. [Jap]*
Address: Japan.

10879. G.T.B. Group of Japan, Inc. 2001. Questionnaire [concerning edamame]. Denver, Colorado. 6 p. Jan. 31. Unpublished typescript.
• ***Summary:*** This research was conducted over a 2 month period from 1 Dec. 1999 to 31 Jan. 2000. The questionnaire was administered by an in-store demonstrator. The GTB is the edamame vender for Whole Foods, Wild Oats, and King Sooper. The questionnaire consists of 11 questions, with about 4-5 choices after each question. The number of respondents to each question varies from 59 to 132.

1. How long have you known about Edamame? More than 1 year: 49%. First time: 22%.

2. How often do you purchase Edamame? 1-2 times per month: 44%. Once every 2 weeks: 22%.

3. How often do you eat soy products? (Tofu, Dried soybeans, Soymilk etc.). 1-2 times per week: 51%. 2-3 times per week: 22%. 1-2 times per month: 18%. 2-3 times per month: 9%.

4. Reasons for purchasing our Edamame. Good Taste: 37%. Great health benefit: 33%.

5. Price. Reasonable: 59%. Expensive: 38%.

6. How do you like the flavor of our Edamame? Just Right: 88%. Do not need any salt at all: 7%. Not Enough Salt: 4%. Too Salty: 1%.

7. How do you eat Edamame? By Itself: 81%. Put them into salad: 13%. Put them into stir fry: 5%.

8. How do you feel about the person doing the demonstration? Very friendly: 59%. Provides great information: 23%. Answers customers' questions clearly: 17%.

9. How did you find out about Edamame? By shopping grocery: 53%. At restaurant: 26%.

10. What are other food products you would prefer to eat as snack or quick-preparation meal? Sushi: 37%. Miso soup: 29%. Noodle soup: 28%.

11. If you have any other comments or suggestions, please feel free to give us anything! Address: Denver, Colorado.

10880. Ibe, Sachie; Kumada, Kaoru; Yoshibe, Mineko; Onga, Tsutomu. 2001. [Production of natto which contains a high level of isoflavone aglycons]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 48(1):27-34. [13 ref. Jap; eng]
• ***Summary:*** "To our knowledge, this is the first report to indicate that *B. subtilis* (*natto*) possesses beta-glucosidase [an enzyme] with the ability to hydrolyze isoflavone glycoside." Address: 1, 3-4. Ohyamatofu Co., Ltd., 575, Shirone, Isehara-shi, Kanagawa-ken 259-1147, Japan.

10881. Okamura, Ao. 2001. Korede wakatta Mito nattô no

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nazo: Shizen shokuhin [Now I've understood the mystery of Mito nattô: Its a natural food]. Tokyo: Tokyo Shinbun Shuppan Kyoku. 159 p. 19 cm. [Jap]*
Address: Japan.

10882. *Mainichi Daily News* (*Japan*). 2001. Poor seaweed crop [nori in Kyushu, Japan]: Editorial. Feb. 5.
• ***Summary:*** About 40% of all the nori (seaweed) produced in Japan comes from the Ariake Sea off the western coast of Kyushu. This is the biggest stretch of tidewater in Japan and is also the nation's biggest center of nori production. This winter the nori crop was devastated by an unseasonal outbreak of red tide. The nori has been unable to get enough nutrients because of the massive proliferation of plankton, which turned the sea red, and caused the nori off the coast of four Kyushu prefectures to turn yellow–instead of the normal black.

Local nori growers blame this on a land reclamation project in Ishaya Bay off Nagasaki prefecture. In April 1997 some 3,500 hectares of the bay were closed off to create 1,500 hectares of farmland. Nori growers believe this destroyed the natural purifying capability of the sea and coastlands. Another likely culprit behind the abnormal plankton levels is the release of untreated water from a large reservoir created by the project during low tide.

10883. Kashihara, Keiko; Nio, Noriki; Kobota, Kouji. 2001. [Purification and characterization of a protease in commercial natto]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 48(2):134-37. [13 ref. Jap; eng]
Address: Ajinomoto Co., Inc., Food Research & Development Labs, 1-1, Suzuki-cho, Kawasaki-ku, Kawasaki-shi, Kanagawa prefecture 210-0861, Japan.

10884. *SoyaScan Notes.* 2001. Early sources of funding for the American Soybean Association (ASA) (Overview). March 11. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1920-1925. From Sept. 1920, when the forerunner of the ASA (named the National Soybean Growers' Association) was founded on the Fouts Brothers' farm in Indiana, until Sept. 1925 when the Association was reorganized and renamed, the ASA has no source of income. Its only activities were to organize an annual summer field meeting and a winter business meeting. At the fifth annual business meeting in Chicago, Illinois: "The matter of a membership fee was discussed by W.A. Ostrander and C.L. Meharry. It was moved that a committee be appointed by Mr. Morse to consider the feasibility of a regular membership with a fee attached and report at the next field meeting."

1925 Dec.–The first constitution and by-laws are drafted and approved at the sixth annual business meeting in Chicago. The provision for dues states that membership is $1.00 a year. This remains ASA's main source of income for more that 15 years–during the Great Depression.

1930–In volume II of the *Proceedings of the American Soybean Association* (published in 1930 for the years 1928 and 1929) the first advertisements appear. The 10 pages of ads (from soybean crushers, and sellers of soybean seed, inoculant, farm equipment, bags, etc.) help pay the cost of publishing and mailing the 110-page proceedings.

1940 Nov.–George Strayer begins publishing *Soybean Digest,* an excellent monthly magazine, in his hometown of Hudson, Iowa. "The coupon on the rear cover and your check for $1.50 will entitle you to a membership in the American Soybean Association and to a year's subscription to 'The Soybean Digest' if mailed immediately." So dues are up by 50% but with them comes a major new benefit of membership. Advertisements in *Soybean Digest* help to pay for the costs of editing, publishing, printing, and mailing the magazine.

1941 Jan.–The "Seed Directory" section in *Soybean Digest* enables ASA members, for $1.00, to list up to three soybean varieties that they sell.

1956 April–The ASA signs an agreement with USDA's Foreign Agricultural Service for a market development project for soybeans in Japan. Up to $75,000 in Japanese yen may be used for the project. For ASA, this is a huge amount of money.

1956 May–The Soybean Council of America, Inc. is organized by the American Soybean Association and the National Soybean Processors Association. Its basic purpose is to expand the market for soybeans in the USA and abroad. "The program will be financed by voluntary contributions of 10¢ per 100 bushels ($1.50 per carlot) at the point of sale. Collections start Sept. 1 on all 1956-crop soybeans sold on or after July 15."

1966 Sept. 9–The landmark date in the history of ASA funding! North Carolina soybean producers vote to pay a half cent per bushel checkoff on all soybeans sold, starting with the 1966 crop. This is the first statewide checkoff ever put into effect on soybeans. About 75% of the 11,000 soybean producers voting favored the checkoff.

1968 Sept.–"Phase 1, ASA's plan of contribution by growers and agribusiness to launch a program of worldwide market development, begins.

1969 Nov. Phase II, ASA's voluntary ½ cent per bushel checkoff on soybeans at the first point of sale, begins in several states. Funds collected from this program will go for market development in Japan, Germany, and Iran.

10885. Smith, Patricia. 2001. The Natural Products Expo at Anaheim and the natural foods industry (Interview). *SoyaScan Notes.* March 23. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The Expo at Anaheim this year was the biggest ever, attracting more than 30,000 people. She walked past

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every booth and almost every one was offering some kind of soy product. The interest in soyfoods just keeps growing.

At the show there was talk about illegal genetically-engineered StarLink corn in Kellogg's Morningstar Farms products such as Corn Dogs, Mini Dogs, and maybe other products. Some company are pulling these products from their shelves.

Before the first Natural Foods Merchandiser (NFM) trade show was held in 1981, at Anaheim, California, the pioneering natural foods companies such as Erewhon, Eden, Westbrae, Sunburst, and Chico-San all (reluctantly) attended the annual NNFA show in Las Vegas, Nevada. There would always be a big party one evening in someone's hotel suite–with lots of fun. But from 1981 on, these and other natural foods companies found their real home at the NFM trade shows.

Patricia saw Yuko Okada at this year's show. His Macrobiotic Company of American now sells only Muso Shokuhin products. Norio Kushi is running the company. Yuko kicked out Bruce Macdonald over alleged financial improprieties. A lawsuit that Bruce filed has apparently been settled.

Michael Potter bought the Herb-T Company from Cecile Levin in southern California. Mr. Muramoto started the company many years ago.

Patricia has now worked for Trader Joe's for 16 years. Address: Radical Food, P.O. Box 952, Mill Valley, California 94942-0952.

10886. Morinaga Nutritional Foods, Inc. 2001. Organic beauty. Aahh! The wonder of nature. 100% pure. Unadulterated (Ad). *Natural Foods Merchandiser.* March. p. 57.

• ***Summary:*** This full-page color ad is divided into equal-size quarters, each with a title (see above). In each square is the front of a package of a different type of Mori-Nu Silken Tofu "Made with organic soybeans." The four types are soft, extra firm, extra firm lite, and firm.

Note: This is NOT "Mori-Nu organic tofu." But rather "Mori-Nu 'Made with Organic soybeans' tofu." What's the difference? Each type of Mori-Nu tofu contains isolated soy protein, which is not presently available as an organic ingredient. Address: 2050 West 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-669-8638 (NOW TOFU).

10887. Andoh, Elizabeth. 2001. Sampling seasonal delicacies, at reasonable prices, in Osaka. *New York Times.* April 1. p. TR6, TR18 (Sunday).

• ***Summary:*** Contains reviews of restaurants in Osaka. Yoshino Sushi offers "plump vegetable rolls stuffed with broth- and soy-simmered koya-dofu (dried tofu).

Shiru Yoshi offers "one tofu kaiseki; each menu is $100 a person. Throughout Japan tofu is not synonymous with vegetarian cuisine. At Shiru Yoshi, it means two of the many courses that feature silky bean curd [kinugoshi; silken tofu]: in the winter a hot pot of tofu and mushrooms with a soy-based dip... and agedashi, a deep-fried block of tofu..." A "succulent chunk of miso-marinated fish was also served" to those who ordered the kobachi kaiseki dinner (literally "feast of small dishes"). Address: Tokyo, Japan.

10888. Kaneki, M.; Hodges, S.J.; Hosoi, T.; Fujiwara, S.; et al. 2001. Japanese fermented soybean food as the major determinant of the large geographic difference in circulating levels of vitamin K2: possible implications for hip-fracture risk. *Nutrition* 17(4):315-21. April. [Eng]

• ***Summary:*** "Increasing evidence indicates a significant role for vitamin K in bone metabolism and osteoporosis. In this study, we found a large geographic difference in serum vitamin K2 (menaquinone-7; MK-7) levels in postmenopausal women.

"Serum MK-7 concentrations were 5.26 +/- 6.13 ng/mL (mean +/- SD) in Japanese women in Tokyo, 1.22 +/- 1.85 in Japanese women in Hiroshima, and 0.37 +/- 0.20 in British women. We investigated the effect of Japanese fermented soybean food, natto, on serum vitamin K levels. Natto contains a large amount of MK-7 and is eaten frequently in eastern (Tokyo) but seldom in western (Hiroshima) Japan. Serum concentrations of MK-7 were significantly higher in frequent natto eaters, and natto intake resulted in a marked, sustained increase in serum MK-7 concentration.

"We analyzed the relation between the regional difference in natto intake and fracture incidence. A statistically significant inverse correlation was found between incidence of hip fractures in women and natto consumption in each prefecture throughout Japan. These findings indicate that the large geographic difference in MK-7 levels may be ascribed, at least in part, to natto intake and suggest the possibility that higher MK-7 level resulting from natto consumption may contribute to the relatively lower fracture risk in Japanese women."

Note 1. There are two K vitamins: K1 and K2. K1 has been much more widely studied than K2. The most concentrated sources of K1 are fruits and vegetables (in micrograms per 100 gm): Kale 817. Spinach 387. Broccoli 156. Green peas 36. Natto 34.7.

Note 2. This is the earliest document seen (Jan. 2012) that focuses on the nutritional significance of the high concentration of vitamin K in natto. Address: Dep. of Geriatric Medicine, Univ. of Tokyo Graduate School of Medicine, Tokyo, Japan.

10889. Muramatsu, Kanako; Katsumata, R.; Watanabe, S.; Tanaka, T.; Kiuchi, K. 2001. Itohiki nattô seisan-hô no kairyô [Improvements in the process for manufacturing itohiki natto]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*)

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48(4):277-86. [23 ref. Jap; eng]
Address: 1-2. Faculty of Home Economics, Kyoritsu Women's Univ., 2-2-1 Hitotsubashi, Chiyoda-ku, Tokyo 101-8433, Japan.

10890. Muramatsu, Kanako; Katsumata, Rie; Watanabe, Sugio; Tanaka, Tadayoshi; Kiuchi, K. 2001. [Development of a low-flavored natto manufactured with leucine requiring mutants of elastase-producing natto *Bacillus*]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 48(4):287-98. [26 ref. Jap; eng]
Address: 1-2. Faculty of Home Economics, Kyoritsu Women's Univ., 2-2-1 Hitotsubashi, Chiyoda-ku, Tokyo 101-8433, Japan.

10891. Sumi, Hiroyuki. 2001. Shinkin kôsoku, nôkôsoku, boke ni genkiteki ni kiku nattôkinaze: nattô ga umidasu kyôi no kessen yôkai pawaa [Nattokinase works dramatically for heart attack, stroke, and senility: Amazing thrombus-solving power has been produced by natto]. Tokyo: Yuraku Shuppansha. 190 p. 19 cm. [Jap]
Address: Japan.

10892. *Nikkei Marketing Journal* (*Tokyo*). 2001. Shun akinai. Ikebukuro Seibu no natsu yasai: jieratto, juusu [First thing of the season–business. Seibu Department Store in Ikebukuro summer vegetables: gelato and juice. Appealing and refreshing things for extremely hot summer days]. May 14. [Jap]
• ***Summary:*** One of the most popular items at Seibu is edamame gelato, which sells for 280 yen each (US$1.00 = 124 yen, so 280 yen = $2.25). Each serving (ice cream cone) weighs 100 grams. Only 20 cones a day are sold at Seibu since everything is hand-made. These edamame ice cream cones are sold out almost every day. A color photo shows the blackboard menu, including the edamame gelato, and a girl serving a cone to a customer.

10893. FutureHarvest. 2001. Research gives birth to Nigerian soybean industry: Tofu becomes a hunger fighter and cash earner for women farmers and entrepreneurs (Web printout). *www.scienceinafrica.co.za/may/tofu.htm.* May. Printed 27 Aug. 2009.
• ***Summary:*** The article begins: "Ask any farmer in central Nigeria which local food crop is good for her children, puts cash in her pocket, and enriches the soil, and she'll probably say 'soybean.' Then ask her how she prepares it, and she'll likely say 'as tofu.'

In just over two decades, Nigeria–the continent's most populous country (est. 148 million in 2007)–has become Africa's largest producer of soybeans and soy products. In the year 2000 Nigeria harvested about 500,000 tons of soybeans, a 20-fold increase in just over 20 years. That crop, which was valued at US$85 million, "was used to produce a variety of traditional dishes, as well as processed foods such as soymilk and specially formulated foods to help malnourished infants and children."

"A near-perfect crop: 'Soybeans are a near-perfect crop for a country like Nigeria,' says Lukas Brader, director general of the International Institute of Tropical Agriculture, IITA, one of the 16 Future Harvest centers. 'Nutritionally, they carry twice the protein of meat or poultry and contain all eight essential amino acids needed for childhood development. Soybeans are also good for the environment,' Brader says. 'Because they evolved in Asia, they are far less vulnerable to local insects than African bean crops and require fewer insecticide sprays. They also fix atmospheric nitrogen, which reduces the need for farmers to purchase fertilizer.'

"Best of all, they are affordable. In Nigerian markets, soybeans cost about one-fifth as much as other forms of protein, including dairy and fish, and are easier to store and transport. "'Those are big advantages for a crop,' Brader says. 'But to get to that stage, our researchers had to produce an entirely new plant type that could cope with high disease pressure, compete with parasitic weeds, and grow in African soils.'

"'Basically, our plant breeders had to redesign the crop,' he says. IITA soybeans, he notes, are two to three times more productive under Nigerian conditions than U.S. and Asian varieties.

"Funding for the research, some US$20 million, was provided by the members of the Consultative Group on International Agricultural Research (CGIAR), building on seed money provided by Canada's International Development Research Centre (IDRC)."

"My Second Husband: 'Soybean has been a godsend for Nigeria,' says Professor Dele Fakorede, an agricultural expert based at Nigeria's Obafemi Awolowo University. 'Our farmers are earning good money, our small industries are prospering, and our children and young mothers are benefiting from a locally-made, protein-rich food.'

"Nigerian women would seem to agree. In Benue State, a major soybean producing area in the central part of the country, women farmers often describe the crop as their 'second husband' because it helps to pay school fees and medical bills.

"'Soybeans are making it possible for a lot of women to earn their own way and achieve a greater degree of independence than ever before,' says Fakorede.

"While the new plant types have made it possible to expand soybean farming across large parts of the country, most observers agree that what sparked production was the development of soy-based food products, including a West African version of tofu. It was a Japanese researcher, Osamu Nakayama, who got the idea to use tofu as a substitute for *wara,* a traditional but expensive kind of local cheese, says

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Brader. 'And, of course, there were skeptics.'

"'A lot of people had doubts that we would succeed or that tofu would ever be accepted by Nigerian consumers,' Nakayama says, 'but eventually we succeeded in making a good *wara* substitute using soymilk and local plant extracts.' Nakayama worked at IITA as part of a scientific exchange program sponsored by the Japan International Cooperation Agency (JICA).

"The idea, Nakayama says, came from watching what local village women did to prepare food for their families. 'We learned a lot through simple observation and by asking questions about traditional methods, he says.' Nakayama's 'wara-tofu' is similar in appearance to farmers' cheese or firm yogurt and has a taste and texture that's only slightly different than Asian-style tofu. Local cooks say that it is easily incorporated into traditional recipes and costs about a third as much as wara made from cow's milk.

"Today, the demand for tofu and other processed soy foods is growing at an annual rate of 20 percent, fueling a major cottage industry in rural Nigeria. A follow-up report by researchers at Nigeria's University of Ibadan points out that children who grow up in soybean-producing communities are generally healthier and suffer less malnutrition than the average Nigerian child. Improved nutrition, researchers believe, also helps to limit the spread of HIV/AIDS.

"In the places where soybeans are grown, roughly 40 percent of the income earned by women is thought to be derived from soybean production or processing. Thus far, nearly 100,000 Nigerians, three-fifths of them women, have been trained in soybean production and in the preparation of soy products by local NGOs, hospitals, and church groups working in cooperation with IITA and various government agencies.

"Currently, about 140 soy-based food products have been developed for use in Nigeria."

A color photo shows a Nigerian woman, in traditional dress, holding a plate filled with pieces of fried "wara-tofu."

10894. Iino, Ryoichi. 2001. The history of shoyu (Soy sauce) 3. *Food Culture* (*Kikkoman Inst. for International Food Culture, Noda, Japan*) No. 3. p. 20-23. May. http://kiifc.kikkoman.co.jp. [8 ref. Eng]
• ***Summary:*** Contents: *Sho* in the Kamakura period. The development of *nimono.* The appearance of *tare-miso.* Cooking with *tare-miso. Tou-miso* in the *Tamonin-nikki.* The appearance of the term *shoyu.* Soy sauce and tamari.

This article begins: "Sho in the Kamakura Period: In the previous issue of *Food Culture,* I noted that both liquid *sho* [pronounced *jiang* in Chinese] and unrefined *sho* [which probably had a consistency like applesauce] were manufactured during the Heian period (794-1185); that the term *sho* was generally used to refer to unrefined *sho;* and that the use of liquid *sho* gradually declined. In this continuation of my article, I would like to discuss the situation in the subsequent period; that is, during the medieval age, up until the appearance of soy sauce."

"*Tare-miso* is a liquid seasoning made by adding water to miso, boiling it down, and then straining the mixture by suspending it in a cloth bag. A method for making *tare-miso* can be found in the *Ryori Monogatari,* compiled in 1643... The same book contains a different recipe for *nama-dare,* which is a form of *tare-miso* prepared without cooking." Yet *tare-miso* is mentioned as early as 1432. Address: Food historian, and teacher of food history, Hattori Nutrition College, Japan.

10895. JICA (Japanese International Cooperation Agency). 2001. Tofu production in Nigeria. *Japan Close-Up.* May. *
• ***Summary:*** Describes how Osamu Nakayama (a Japanese) in Nigeria learned how to use the process for making *wara* (unripened Nigerian dairy cheese) to make alternative cheese from tofu.

10896. Maeda, Hiroshi; Mizutani, Osamu; Yamagata, Y.; Ichishima, E.; Nakajima, T. 2001. Alkaline-resistance model of subtilisin ALP I, a novel alkaline subtilisin. *J. of Biochemistry* (*Tokyo*) 129(5):675-82. May. [39 ref]
• ***Summary:*** The alkaline-resistance mechanism of the various alkaline-stable enzymes is not yet known. To clarify the mechanism of alkaline-resistance of alkaline subtilisin, structural changes of two typical subtilisins, subtilisin ALP I (ALP I) and subtilisin Sendai (Sendai), were studied by means of physicochemical methods. Conclusion: Alkaline resistance is closely related to the surface structure of the enzyme molecule. Address: Lab. of Molecular Enzymology, Div. of Life Science, Graduate School of Agricultural Science, Tohoku Univ., Tsutsumidori Amamiyamachi, Aoba-ku, Sendai 981-8555, Japan.

10897. Shurtleff, William; Aoyagi, Akiko. 2001. The book of tofu. 2nd ed. Revised. Berkeley, California: Ten Speed Press. 336 p. May. Illust. by Akiko Aoyagi Shurtleff. Index. 28 cm. [321 ref]
• ***Summary:*** The spine has a new look, with dark brown letters on a beige background. At the base of the spine is the Ten Speed Press logo in orange.

This edition contains an updated "Appendix B– Directory of Tofu Makers" (p. 313-316, updated to 22 Feb. 2001). The copyright page and inside rear cover have also been updated; the SoyaScan database now contains 62,000 records. The preface has been expanded. Numerous other small changes have been made throughout the book. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

10898. Torassa, Ulysses. 2001. Living long and prospering: Doctor thinks Japan's Okinawans have discovered the secret. *San Francisco Chronicle.* June 3. p. B3-B4. Living / Health

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& Fitness section.
• ***Summary:*** A new book titled *The Okinawa Program,* by Dr. Bradley Wilcox (a Harvard physician), Craig Wilcox, and Makoto Suzuki, analyzes why the people of Okinawa, Japan's southernmost prefecture, live such long, vigorous, and happy lives. Unlike America, with its fast pace, consumerism, love of junk food, and emphasis on individualism, Okinawans do the opposite. They live longer than anyone else on earth (81.2 years vs. 76.8 for Americans). There are six times as many centenarians per 100,000 people in Okinawa than in the USA. Rates of heart disease and breast and prostate cancer in Okinawa are less than a quarter of what they are in the USA. Wilcox says they are the happiest people he has ever seen, yet Okinawa is Japan's poorest region–the gross domestic product is just 60% what it is elsewhere in Japan.

What are the secrets? For starters, according to Wilcox, "it's a diet rich in soy, fish and vegetables, and low in fat, red meat and dairy foods." Soy is rich in flavonoids. Address: Staff writer.

10899. Kanai, Atsuko. 2001. Working with Fuji Seiyu to introduce new Japanese-style frozen tofu products to the USA (Interview). *SoyaScan Notes.* June 11. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Fuji Seiyu is a Japanese oil milling company that got interested in soy protein products in the 1970s. They have strong research on soy protein and on developing soy protein products, but they do not have strong marketing or distribution in the USA; that is Mutual Trading Company's forte. So Mutual began working with Fuji Seiyu to bring their ready-to-eat frozen tofu products to the USA, introducing them first to Japanese restaurants in Dec. 2000. Her concept was to sell "authentically Japanese" tofu products that were not easily replicated by American manufacturers. Fuji Seiyu has dozens of such products; Mutual is test marketing only a few. This is one of Mutual's priority food lines in 2001. Eventually Atsuko would like to get one or more of those items into large natural foods retailers.

Atsuko sends two leaflets which describe eleven products in this "Miyako Tofu Course Series." For each is given: A photo of the finished product, the item number, pack size, product name and description in English and in Japanese (*hiragana*), and price per case, pack, and serving. The following products are sold: (1) Fukkura Ogon Tofu: Golden fried tofu puff. (2) Veggie-Fish Tsutsumi: Tofu stuffed squares patty. (3) Gomoku Inari: Vegetable medley squares patty. (4) Yuba to Yasai no Cabbage Tsutsumi: Yuba and tofu stuffed cabbage. (5) Ajitsuke Inari: Inari sushi pocket. (6) Yawaraka Ganmo: Tofu vegetable patty. (7) Yuba Shumai: Yuba and tofu shumai. (8) Vegetable Kinchaku: Tofu vegetable pouch. (9) Koimo Kinchaku: Tofu taro pouch. (10) Shrimp Yubamaki: Tofu shrimp roll. (11) Vegetable Yubamaki: Tofu vegetable roll. Address: Mutual Trading Co., Inc., 431 Crocker St., Los Angeles, California 90013. Phone: (213) 626-9458.

10900. Revkin, Andrew C. 2001. U.S. losing status as a world leader in climate science: Relying on foreign help. Long-term research is lagging even as consensus builds about global warming. *New York Times.* June 11. p. A1, A11 (Natl).
• ***Summary:*** The U.S., in little more than a decade, has fallen significantly behind other countries in its ability to predict and simulate long-term shifts in climate. Problems include: Fragmentation of research efforts among many government agencies; lack of super computers; lack of funding. Global warming "could become the biggest environmental problem of the next 100 years." Britain and Japan have poured millions of dollars into computer centers focusing on long-range climate research. Japan is poised to leapfrog past everyone; over the past 3 years it has spent more than $400 million building its "Earth Simulator" in Yokohama, which will have a linked array of the world's best supercomputers. In the USA, budgets for science are curtailed everywhere.

10901. Fetters, Luke. 2001. Sovereign foundations and educational antecedents to the Hong Kong Conference, Church of the United Brethren in Christ. Paper presented at the second annual meeting of the United Bretheren Historical Society. 31 p. Held 29 June 2001 in Huntington, Indiana. [34 ref]
• ***Summary:*** "In this paper I will present a historical overview of the United Brethren outreach to the Chinese prior to 1950, focusing on the work of three key figures who shaped a United Brethren missiological strategy for reaching the Chinese: Moy Ling, Chiu Yan Tze, and Wan Kwai Chin. All three were Chinese. All three were educators. All three were related by marriage. All three were highly entrepreneurial. And most impressive, all three displayed remarkable resilience in the face of numerous setbacks."

Chiu Yan Tze is an important figure in the history of soymilk in China and the USA. Therefore we will focus on his life, and that of his wife, Wan Kwai Ching. Here is a brief chronology: 1890 April 14–Y.T. Chiu born in Canton, China, the eldest of 9 children, into a devout Christian family with a strong Baptist heritage. His grandfather on his mother's side was the first Baptist preacher in Canton. His uncle (Mrs. Moy Ling's father) was at one time pastor of the Canton Baptist Church. His father came to Portland, Oregon, in 1855, and while studying in one of the mission schools in Portland, became a Christian; before his death he became one of the elders of the Baptist Church in Hong Kong. His mother was a teacher in the Canton Baptist School before she was married. Therefore Y.T. Chiu was a 3rd generation Christian. 1893–Chiu's father moves his family to Hong Kong, and the son studies in private schools

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there from 1895 to 1903. 1895 ca.–Wan born in Hong Kong. 1905–At age 15, Chiu baptized in Baptist Church in Hong Kong. 1908–Chiu leaves Hong Kong to study science and education at the University of California at Berkeley. While in school, he was an active Christian leader. He served as teacher and assistant principal of evening school in Berkeley. 1913–Chiu receives his B.S. degree in Chemistry from U.C. Berkeley. 1914–He moves to New York City to attend Columbia University. 1915–Chiu receives his MS degree in chemistry from Columbia. 1915–Chiu returns to Canton to serve as prof. of chemistry and chair of Religious World Committee at Lingnan University (then known as Canton Christian College, Baptist). 1916–Chiu and Wan are married. Her mother died when she was 12 years old. She was the eldest of 3 living children. She graduated from teacher's college at age 16. Upon graduation, she founded Ming To school for poor children in Hong Kong and served as principal for 2 years. She resigned to marry Chiu; the marriage was arranged by their families. 1927–Chiu receives his PhD degree in chemistry at Cornell University (Ithaca, New York). 1937 Aug. 31–Japanese start bombing Canton. 1938 Oct. 12–35,000 Japanese troops occupy Canton; Chiu is in Hong Kong. 1941 Dec. 8–Japanese bombing of Hong Kong begins, followed soon by occupation. Wan evacuates to Hong Kong, where she works in education, evangelism, and refugee relief. 1942-46–Chius flee Hong Kong with family, staff and students. They travel in the Chinese interior, providing education and relief work. 1946–Chius return to Canton to find demolished homes and school buildings. Their person effects are gone. They repaired, rebuilt, and started over. 1947 summer–Chiu returns to USA to teach at Huntington College, Indiana, as a guest professor. Wan supervises work in China. 1949–Communist revolution in China. In Oct. Chiu moves to Hong Kong because of his extensive ties to America. 1949 Oct. 14–Communists take control of Canton. Wan remains in Hong Kong to supervise work. 1957 March 30–Wan is permitted to leave China for Hong Kong. 1959–Chiu serves as director of Hong Kong conference until 1967, at which time the Chius retired to California. 1981–Wan dies. 1987–Chiu dies.

Includes a timeline of Dr. Chiu's life. Note: Both K.S. Lo and Y.T. Chiu lived in the village of Linshan during the war. His name: Chiu Yan-Tsz (Cantonese; he wrote it like this on all his papers) or Chao En-tz'u (Mandarin); Zhao Enzi (pinyin). She says Yan = Grace and Tsz = Given. He was a Rev and PhD; in 1927 he wrote his PhD thesis on soymilk at Cornell Univ. Address: Asst. Prof. of Educational Ministries, Huntington College, 2303 College Ave., Huntington, Indiana 46750.

10902. Hiroyuki, Fujita; Tomohide, Y.; Kazunori, O. 2001. Efficacy and safety of Touchi extract, an alpha-glucosidase inhibitor derived from fermented soybeans, in non-insulin-dependent diabetic mellitus. *J. of Nutritional Biochemistry* 12(6):351-56. June. *

• ***Summary:*** Eighteen type-2 diabetic patients ingested touchi extracts (0.3 gm) three times daily before every meal (0.9 gm/day) for a 6-month period. Blood glucose levels and HbA(1c) levels were monitored at 0 (pre-ingestion), 1, 3, and 6 months post-ingestion. Blood glucose levels dropped from 9.25 to 7.6 mmol/liter. HbA(1c) levels dropped from 10.5% to 9.0%.

Indexes for serum lipids and total cholesterol level revealed moderate decreases with a slight increase in the high-density lipoprotein (HDL) level after touchi extract (TE) ingestion. However, triglyceride (TG) levels significantly decreased at 3 ($p < 0.05$) and 6 mo ($p < 0.01$) post-ingestion of touchi extract. In this study, other biochemical parameters were not affected in any of the patients, and no one complained of any side-effects or abdominal distension. TE, exhibiting alpha-glucosidase inhibitory activity, demonstrated an anti-hyperglycemic effect and may prove useful for improving glycemic control in patients suffering from non-insulin-dependent diabetic mellitus. Address: Research and Development Dep., Nippon Supplement Inc., Kita-ku, 531-0076, Osaka, Japan.

10903. Kikkoman Corporation. 2001. Annual report 2000. 250 Noda, Noda-shi, Chiba 278-8601, Japan. 39 p. 28 cm. [Eng]

• ***Summary:*** The information in this English-language annual report is current as of April 2001. Contents: Financial highlights. Introduction. Message from the president (Yuzaburo Mogi): Fiscal year in review, operating results, strengthening the competitive business, summary of business policy (business principles {based on consumer satisfaction}, medium-term business strategy, business organization, basic policy on distribution of profits, tasks for the coming years, in closing). Global operations: United States, Europe, Asia, Japan. Topics: Commemorative events held to mark milestones at Singapore and Taiwan plants, Kikkoman takes part in Dutch water resource preservation project. Research and development. Financial review: Operating results. Consolidated balance sheets, etc. Corporate history (chronology from April 1925 to Aug. 2000). Global network (directory of Kikkoman names, addresses, and phone numbers worldwide). Board of directors and officers. Corporate data. Overall, sales and profits remained approximately unchanged from 1999.

Overseas, Kikkoman is benefitting from the growing popularity of soy sauce. Statistics demonstrate this. Over the last 26 years, overseas of Kikkoman soy sauce have grown by an average of more than 10% a year. Last year, overseas sales of soy sauce topped 120 million liters for the first time. Overseas sales (excluding exports from Japan) accounted for about 30% of consolidated net sales and 50% of Kikkoman's consolidated operating income–excluding the Coca-Cola Business. Sales volume in the USA, the company's largest

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overseas market, rose to 95 million liters, grew steadily, and accounted for 80% of Kikkoman's total overseas sales of soy sauce. Last year, Kikkoman's share of the U.S. home-use market hit an all-time high of 55%. In Europe, production capacity at the plant in the Netherlands is presently being raised to 7 million liters, from 6 million liters, to meet rising demand. In China, Kikkoman is constructing a soy sauce plant; shipments are slated to start in the spring of 2002. The China plant will be the company's third in Asia outside Japan, joining plants in Singapore and Taiwan.

Effective from fiscal 2000, the results of the Tone Coca-Cola Bottling Co., Ltd. and two other companies accounted for by the equity method have been included in the consolidated results, following the introduction of new accounting standards based on the Securities and Exchange Law of Japan. However tables on p. 22 make it easy to compare Kikkoman's 2000 financial performance with that of the year before. Excluding Tone: Sales were down 1.4% but net income (profit) was up 39.6%.

Photos (p. 3 and 7) show Yuzaburo Mogi. Address: Noda, Japan.

10904. Ragone, Diane; Lorence, David H.; Flynn, Timothy. 2001. History of plant introductions to Pohnpei, Micronesia and the role of the Pohnpei Agriculture Station. *Economic Botany* 55(2):290-324. April/June. [30 ref. Eng; pol]
• ***Summary:*** Pohnpei (formerly Ponape) is located in the eastern Caroline Islands, approximately 4,800 km southwest of Honolulu. A high volcanic island with a land area of only 344 square km, it is the third largest in Micronesia (after Guam and Babeldoab) and the largest in the Caroline group. It is presently a member state and capital of the sovereign nation of the Federated States of Micronesia (FSM). The population is about 35,000, one-third of whom live in the island's main town, Kolonia.

History: Pohnpei was formerly colonized by Spain, Germany, and Japan. After World War II, the island was administered by the United Nations as a UN trusteeship (Trust Territories of the Pacific Islands). During the Japanese period (1914-1945), the Japanese Tropical Research Industries Institute was established. It became very active largely through the efforts of one man, the distinguished agronomist Moritaro Hoshino, who came to the island in 1927 and set about making Ponape the center of Japanese agricultural research in Micronesia. In the 1930s the Pohnpei station was one of the world's foremost centers for the study of tropical agriculture.

Appendix I of this article, titled "Plants documented as introduced to the Island of Pohnpei, including all plants tested or cultivated at the Pohnpei agricultural station" (p. 304+) states (p. 313) that the soybean was introduced during the Japanese period for use as a vegetable.

Note: This is the second earliest document seen (July 2002) concerning the cultivation of soybeans in Micronesia. This document contains the earliest date seen for soybeans in Micronesia, or the cultivation of soybeans in Micronesia (1945 or before). The source of these soybeans was probably Japan. Address: National Tropical Botanical Garden, 3530 Papalina Road, Kalaheo, Hawaii 96741.

10905. *SoyaScan Notes.* 2001. On the English-language etymology of "green vegetable soybeans," "edamamé," "vegetable-type soybeans," and "food-grade soybeans": A chronology of terminology (Overview). July 6. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** No other soyfood has had so much difficulty in finding a single, standardized name. To this day, soybeans picked when still fresh and green in the pods, boiled or steamed, and served like a vegetable, are called by a bewildering variety of names: *edamamé* (pronounced ay-duh-MAH-may, the Japanese name), fresh green soybeans, vegetable soybeans, green soybeans, edible green soybeans, green vegetable soybeans, immature green soybeans, green immature soybeans, immature soybeans, garden soybeans, garden-type soybeans, garden soys, branch-beans, etc. The short names are all ambiguous and the precise names are all too long. Fortunately, since the late 1990s, the media have increasingly used one name: edamamé.

The first attempt to describe green vegetable soybeans appeared on 12 April 1855 when T.V.P. [T.V. Peticolas] of Mount Carmel, Ohio, writing in the *Country Gentleman* said: "They are inconvenient to use green, being so difficult to hull." For the next few decades other writers followed this pattern of describing rather than naming the tender green beans.

In Dec. 1890 C.C. Georgeson, writing in the *Kansas Agric. Exp. Station Bulletin* first used the term "Edamamé" in an English-language publication to describe his seeds imported from Japan; but he was using the word as the name of a soybean variety, rather than as the name of a food type.

It wasn't until Jan. 1915 that a real name for these tender fresh beans first appeared–in the *USDA Bureau of Plant Industry, Inventory* No. 33. Referring to Plant Introduction No. 34702, from Shantung Province, China, Dr. William R. Faries of Coachella, California, wrote that he had received the seeds in December 1912. They "grow well here. They are fine for green shelled beans."

On 19 May 1917 Anna R. Van Meter, writing in the *Ohio Farmer,* called them "Green Soybeans." The only problem was that dry soybeans with green seed-coats are called by the same name.

In July 1918 William J. Morse, wrote in the *USDA Farmers' Bulletin* No. 973 about this "green-vegetable bean."

The name we prefer was coined by William Morse while studying soybeans in Japan. In July 1929 he first called them "Vegetable soybeans," then in Jan. 1931 he started using the term "Green vegetable soybean," and finally in March 1932

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"green vegetable soybeans" (our preference). Morse made a major effort to introduce both the new varieties and the new way of eating them to America.

During the 1930s, six new terms were introduced: "green shelled soybeans" (USDA Bureau of Home Economics, 1933), "fresh green soybeans" (Carey Miller of Hawaii, 1933), "green immature soybeans" (Carey Miller and Ruth Robbins, 1934), "shell soy beans" (Dr. John Harvey Kellogg, letter of 9 Dec. 1935 to William Morse), "immature green soybeans" (Dr. A.A. Horvath 1938), and "immature garden soy beans" (Helen Parsons, Abby Marlatt, and George M. Briggs, 1939).

The name "Green vegetable soybeans" first appeared in the title of a publication in 1935; it was an article by Morse in the *Proceedings of the American Soybean Association* (p. 44-45). In the same article he began to search for terms to describe the new *type* of large-seeded Japanese soybeans from which the best edamamé are grown: Being unaware of the word edamamé, he coined the terms "vegetable types" and "green vegetable types." In 1938 he began to call them "edible soybeans."

But the name that stuck was first appeared in March 1939 in a famous bulletin titled "Eighteen varieties of edible soybeans," by J.W. Lloyd and W.L. Burlison of the Illinois Agricultural Experiment Station. They called them "vegetable-type soybeans" and distinguished then from typical "field-type soybeans."

Other terms used to refer to regular soybeans include "grain type" (Deodhar et al., 1973), "oil beans" (Liu et al., 1995), and "commodity soybeans" (Poysa, 1999).

During the 1930s and 1940s William Morse did more than any other person to try to introduce green vegetable soybeans and "edible- or vegetable-type" soybeans to America as a new food and to popularize their use. He wrote and lectured widely about them, and therefore he thought a great deal about what name would best describe them. He was in a unique position to see the big picture in terms of soybean terminology, and by the 1940s he had clearly settled on the terms "green vegetable soybeans" and "edible types" as those he preferred.

After 1940 only a few new names appeared: "Garden soys" (Edward Dies, 1942), "garden-type soybeans" (Allan K. Smith, 1959), and "branch-beans" (a literal English translation of the Japanese name *edamamé*) (*Organic Gardening and Farming*, July 1977).

Then in the late 1990s a new name burst upon the scene: "edamamé," the Japanese word for green vegetable soybeans cooked and served in the pods. This name was first used in an English-language document, as far as we can tell, in 1991, by the Jameson-Williams Co. of Fairmont, Michigan. The company issued a 2-page leaflet titled "What is edamamé?" By the late 1990s and early 21st century, food writers and manufacturers were using the word "edamamé" for all kinds of green vegetable soybeans, including shelled ones that would never be called "edamamé" in Japan.

Today, most people using the term "edamamé" don't realize that they are using it to mean "green vegetable soybeans" and that the word "edamamé" has long been used to refer to a subcategory of green vegetable soybeans–namely those that are cooked and served in the pods. Moreover, many do not understand the important connection between "vegetable-type soybeans" and "green vegetable soybeans." This is unfortunate.

After studying these terminology questions for more than 25 years, Soyfoods Center would like to see the following terms adopted: (1) Green vegetable soybeans: Vegetable-type soybeans picked green and cooked until tender. They may be served either in the pods (as edamamé) or shelled. This term has a 50-year history of use in the professional literature. (2) Edamamé: Green vegetable soybeans sold, cooked, and served in the pods. For shelled green vegetable soybeans we favor the term "shelled edamamé." In Japan, the latter are just starting to become available in the produce section of grocery stores, sold refrigerated (not frozen), typically in rigid containers with clear plastic tops and called either *mukimi edamamé* or *edamamé no mukimi* or *mukimamé. Mukimi* means "shelled" and *mukimamé* means "shelled beans." (3) Vegetable-type soybeans: Certain varieties of large-seeded soybeans (most with Japanese pedigrees and clear hilums) recognized for their good flavor and texture when used as food–either as green vegetable soybeans or tofu, soymilk, etc. This term has a 50-year history of use in the professional literature. In Japan, such seeds are called *edamamé no tane* ("edamamé seeds"). They are widely available in Japan in the spring in typical paper seed packets at grocery stores next to the produce department or the cut-flower department.

An alternative, simpler approach (now used by the American media) would be to call both (1) and (2) above "edamamé" then to call the shelled ones "shelled edamamé."

Unfortunately each of these three approaches and terms has its disadvantages. (1) Green vegetable soybeans is a very descriptive term, but it is quite long and unfamiliar to most Americans. Since "shelled green vegetable soybeans" is much too long, "shelled edamamé" (a term now starting to be used in Japan) or "green shelled soybeans" might be better. (2) Edamamé is nice and short, and widely used in the American press since the late 1990s. But it is difficult for English speakers pronounce correctly if there is no accent on the last letter, yet no English words have accents, and the keyboard character (é) only exists in special foreign-language character sets, which are a nuisance to use frequently. (3) The term "vegetable-type soybeans" is easy to confuse with "green vegetable soybeans." Moreover, the term sounds strange when used to describe large-seeded (often clear hilum) soybean varieties preferred for making tofu or soymilk. In addition, most American's have never heard of "vegetable-type soybeans." The term "food-grade

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soybeans," widely used in Canada since the 1980s, has its own problems. First, it is often used to refer to all soybean varieties utilized to make foods, including small-seed varieties used to make natto and soy sprouts. Second, all soybeans can be considered "food grade."

10906. Urano, Tetsumei; Hayato, I.; Umemura, K.; Suzuki, Y.; Oike, M.; Akita, S.; Tsukamoto, Y.; Suzuki, I.; Takada, A. 2001. The profibrinolytic enzyme subtilisin NAT purified by *Bacillus subtilis* cleaves and inactivates plasminogen activator inhibitor Type 1. *J. of Biological Chemistry* 276(27):24690-96. July 6. [43 ref]
• ***Summary:*** Subtilisin NAT (formerly designated BSP, or nattokinase) is a profibrinolytic serine proteinase from *Bacillus subtilis,* the bacterium used in the natto fermentation. Address: 1-2. Dep. of Physiology, Hamamatsu Univ. School of Medicine, 3600, Handa-cho, Hamamatsu, 431-3192, Japan.

10907. Miso Soups (by Aveline Kushi) (Website printout). 2001. www.orientalfood.com/culture/literature/misosoups.shtml 3 p. Printed July 31.
• ***Summary:*** Describes miso and how to make delicious miso soups.

10908. Fushimi, Tsutomu; Masuda, Ryoichi. 2001. 2-acetyl-1-pyrroline concentration of the aromatic vegetable soybean "Dadacha-mame." In: T. Lumpkin, ed. 2001. Second International Vegetable Soybean Conference. Pullman, Washington: Washington State University. 202 p. See p. 39. [1 ref]
• ***Summary:*** "Dadacha-mame" varieties of vegetable soybean have a high market value due to their excellent flavor. It was found that the aromatic compound 2-acetyl-1-pyrroline (AP) is largely responsible for this good flavor. The concentration of this compound in soybeans changes as the seeds mature, reaching its maximum concentration during the edible period for edamame, then decreasing.

Note: This is the earliest English-language document seen (Sept. 2006) with the word "mame" in the title. Address: 1. National Food Research Inst., Kannondai 2-1-12, Tsukuba, Ibaraki 305-8642, Japan. E-mail: fufufu@nfri.affrc.go.jp.

10909. Hiroyuki, Fujita; Yamagami, T.; Oshima, K. 2001. Long-term ingestion of a fermented soybean derived Touchi-extract with α-glucosidase inhibitory activity is safe and effective in humans with borderline and mild type-2 diabetes. *J. of Nutrition* 131(8):2105-08. Aug. [31 ref]
• ***Summary:*** How interesting that the word "touchi" should be considered the modern scientific name of fermented black soybeans (pinyin: *douchi, doushi*).

"Touchi extract (TE) is a fermented soybean product prepared by first steaming and then fermenting soybeans with koji (*Aspergillus* sp.)" molds. It has been found to counteract hyperglycemia in rats and humans. "It may be a useful tool for improving glycemic control in people with borderline type-2 diabetes mellitus." Address: Research and Development Dep., Nippon Supplement Inc., Kita-ku, Osaka, Japan.

10910. Kitamura, Keisuke. 2001. Recent edamame production information and research advances in Japan. In: T. Lumpkin, ed. 2001. Second International Vegetable Soybean Conference. Pullman, Washington: Washington State University. 202 p. See p. 71-74. [5 ref]
• ***Summary:*** Contents: Introduction. Production and consumption. Varietal improvement. Determinant components and factors of eating quality: Changes in the concentrations of free amino acids, changes in the concentration of free sugars. For increasing edamame production and consumption. Address: National Inst. of Crop Science, NARO, Kannondai, Tsukuba, 305-8518 Japan.

10911. Lin, Chang-Chi. 2001. Frozen edamame: global market conditions. In: T. Lumpkin, ed. 2001. Second International Vegetable Soybean Conference. Pullman, Washington: Washington State University. 202 p. See p. 93-96.
• ***Summary:*** Contents: Introduction. Market overview–global supply: Taiwan, China, Thailand, Indonesia, Vietnam, other supply. Market Overview–global demand: Japan, the United States. Asia foods. Address: CEO, Asia Foods Group of Companies & Chairman, Taiwan Frozen Vegetables & Fruits Manufacturers' Assoc., No. 1 Wen-Hua West Road, Fengshan, Kaohsiung 830, Taiwan, ROC, Email: seika@asiafd.com.

10912. Lin, Fu-Hsiung; Cheng, Shi-Tzao. 2001. Vegetable soybean development for export [from Taiwan] to Japan: A historical and technical perspective. In: T. Lumpkin, ed. 2001. Second International Vegetable Soybean Conference. Pullman, Washington: Washington State University. 202 p. See p. 87-91. [7 ref]
• ***Summary:*** Contents: Introduction. Soybean breeding in Kaohsiung DAIS from 1950-1970. Varietal improvement for vegetable soybean from 1970 to 1980. Varietal improvement after 1980. Breeding vegetable soybean for fresh market. Breeding vegetable soybean for fall and spring. Future direction. Acknowledgement.

Customarily vegetable soybeans are shelled from the pod and marketed as fresh beans for use with other vegetables. Address: 1. Director General; 2. Researcher. Both: Kaohsiung District Agricultural Improvement Station (DAIS), No. 1, Nong-Shih Lane, Min-Shen Road, Ruey-Guan Li, Pingtung 900, ROC. Email: alex3605@ms61.url.com.tw.

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10913. Masuda, Ryoichi; Harada, Kyuya. 2001. Enhancement of sweet components in vegetable soybean seeds: Starch degradation during cooking enhance flavor of immature seeds. In: T. Lumpkin, ed. 2001. Second International Vegetable Soybean Conference. Pullman, Washington: Washington State University. 202 p. See p. 105-108. [6 ref]
• ***Summary:*** Contents: Introduction. Methods: Cultivation and sampling, component determination. Results: Explore of high sucrose or starch immature seeds among domestic varieties in Japan, alternative way of enhancement of sweet components. Discussion. Conclusions. Address: 1. National Food Research Inst., MAFF, Tsukuba 305-8642 Japan. Present address; National Inst. of Crop Science, NARO, Tsukuba 305-8518 Japan. E-mail: masuda@affrc.go.jp.

10914. Ohmi, Hiromu. 2001. Breeding, seed production and marketing of vegetable soybean in Japan by Snow Brand Seed Co, Ltd. In: T. Lumpkin, ed. 2001. Second International Vegetable Soybean Conference. Pullman, Washington: Washington State University. 202 p. See p. 139-141.
• ***Summary:*** Contents: Introduction. Breeding. Seed production and quality control. Marketing. Address: Vegetable Breeding Section, Chiba Research Station, Snow Brand Seed Co., Ltd., 634 Naganumahara-cho, Inage-ku, Chiba City, Chiba prefecture, Japan. E-mail: Hiromu.Omi@snowseed.co.jp.

10915. *Ontario Soybean Growers Newsletter.* 2001. Market scan [Total soybean imports and total foods soybean imports to selected Asian countries]. Aug. p. 12.
• ***Summary:*** A table shows total soybean imports / total foods soybean imports to selected Asian countries. All figures are in tonnes (metric tons):

Japan 4,800,000 / 980,000.
Hong Kong 35,000 / 35,000.
Singapore 26,000 / 26,000.
Malaysia 200,000 / 70,000.
Taiwan 2,400,000 / 350,000.
Indonesia 600,000 / 350,000.
South Korea 1,200,000 / 200,000.
Philippines: 100,000 / 28,000.
Thailand 900,000 / 100,000.
Total for these countries: 10,261,000 / 2,139,000.

"Canada has been exporting soybeans to Asia for 30 years."

Source: Statistics Canada, Cereal and Oilseeds Review Series.

Note: Statistics for China and Vietnam are not available. Address: Chatham, ONT, Canada N7M 5L8.

10916. Shurtleff, William; Aoyagi, Akiko. comps. 2001. Green vegetable soybeans, edamamé, and vegetable-type soybeans–Bibliography and sourcebook, 1275 A.D. to 2001: Detailed information on 1,032 published documents (extensively annotated bibliography), 77 commercial green vegetable soybean products, 133 original interviews (many full text) and overviews, 72 unpublished archival documents. Lafayette, California: Soyfoods Center. 514 p. Subject/geographical index. Author/company index. Printed Aug. 4. 28 cm. [1245 ref]
• ***Summary:*** This is the most comprehensive book ever published about green vegetable soybeans and vegetable-type soybeans. It has been compiled, one record at a time over a period of 26 years, in an attempt to document the history of these two closely related subjects. Its scope includes all known information about green vegetable soybeans and vegetable-type soybeans, worldwide, from earliest times to the present.

This book is also the single most current and useful source of information on green vegetable soybeans and vegetable-type soybeans, since 95% of all records contain a summary/abstract averaging 248 words in length.

This is one of more than 45 books on soybeans and soyfoods being compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyfoods Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features: 49 different document types, both published and unpublished; every known publication on the subject in every language–including 1,102 in English, 61 in Japanese, 44 in French, 25 in German, etc.; 69 original Soyfoods Center interviews and overviews never before published. Thus, it is a powerful tool for understanding the development of green vegetable soybeans and vegetable-type soybeans from their earliest beginnings to the present.

The bibliographic records in this book include 1,032 published documents and 72 unpublished archival documents. Each contains (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English publications together with an English translation of the title, month and issue of publication, and the first author's first name (if given).

The book also includes details on 77 commercial green vegetable soybean products, including the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as references to and summaries of advertisements, articles, patents, etc.) are also given.

Details on how to make best use of this book, a complete subject and geographical index, an author/company index, a language index, and a bibliometric analysis of the composition of the book (by decade, document type, language, leading periodicals or patents, leading countries,

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states, and related subjects, plus a histogram by year) are also included. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

10917. Shurtleff, William; Aoyagi, Akiko. 2001. The book of tempeh: A cultured soyfood. 2nd ed. Revised. Berkeley, California: Ten Speed Press. 176 p. Aug. Illust. by Akiko Aoyagi Shurtleff. Index. 28 cm. [374 ref]
• ***Summary:*** This revision has completely new front and rear covers, designed and illustrated by Akiko. It contains a completely new "Appendix B–Directory of Tempeh Makers" (p. 157-58, updated to 16 June 2001). The page "About the Authors" (autobiographical) has been updated, and the original photographs have been replaced with more recent ones–reflecting the fact that Bill and Akiko separated in Nov. 1993 and their marriage ended in May 1995.

The last page, "Soyfoods Center," has been updated.

On page 176 is "The Best of Vegetarian Cooking from Ten Speed Press" (descriptions of eight cookbooks, with price and ISBN).

The inside rear cover has been updated, and now includes current information about: (1) *Tempeh Production,* a book published by Soyfoods Center about how to start and run a company making tempeh on any of four scales and budgets in North America, and on either of two scales in tropical developing countries. (2) *Tempeh and Tempeh Products: Bibliography and Sourcebook,* published by Soyfoods Center. (3) SoyaScan, the unique computerized database produced by Soyfoods Center. This database now contains more than 62,000 records from 1100 B.C. to the present, and more than 76% of all records have a summary / abstract averaging 146 words in length. A description of the four different types of records (published documents, commercial soy products, original interviews and overviews, and unpublished archival documents), and the number of each type, is given.

The title page, copyright page, and table of contents have been redesigned and updated to give the book a much more contemporary look. Other small changes have been made throughout the book. Still contains 130 vegetarian recipes–both western and Indonesian.

Ten Speed Press gave this book a new ISBN: 1-58008-335-8. Yet despite the many changes described above, the authors preferred not to have this called a "new edition" or "revised edition." Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

10918. Shurtleff, William; Lumpkin, Thomas A. 2001. Chronology of green vegetable soybeans and vegetable-type soybeans. In: T. Lumpkin, ed. 2001. Second International Vegetable Soybean Conference. Pullman, Washington: Washington State University. 202 p. See p. 97-103. [12 ref]
• ***Summary:*** Contents: Introduction. Chronology. Address: 1. Director, Soyfoods Center, Lafayette, California; 2. Chairman, Dep. of Crop and Soil Sciences, Washington State Univ., P.O. Box 646420, Pullman, WA 99164-6420. lumpkin@wsu.edu.

10919. Shurtleff, William. 2001. On the English-language etymology of "green vegetable soybeans," "edamamé," "vegetable-type soybeans," and "food-grade soybeans". In: T. Lumpkin, ed. 2001. Second International Vegetable Soybean Conference. Pullman, Washington: Washington State University. 202 p. See p. 179-181.
• ***Summary:*** "After studying these terminology questions for more than 25 years, Soyfoods Center would like to see the following terms adopted: (1) Green vegetable soybeans: Vegetable-type soybeans picked green and cooked until tender. They may be served either in the pods (as edamamé) or shelled. This term has a 50-year history of use in the professional literature. (2) Edamamé: Green vegetable soybeans sold, cooked, and served in the pods. For shelled green vegetable soybeans we favor the term 'shelled edamamé.' In Japan, the latter are just starting to become available in the produce section of grocery stores, sold refrigerated (not frozen), typically in rigid containers with clear plastic tops and called either *mukimi edamamé* or *edamamé no mukimi* or *mukimame. Mukimi* means 'shelled' and *mukimame* means 'shelled beans.' (3) Vegetable-type soybeans: Certain varieties of large-seeded soybeans (most with Japanese pedigrees and clear hilums) recognized for their good flavor and texture when used as food–either as green vegetable soybeans or tofu, soymilk, etc. This term has a 50-year history of use in the professional literature. In Japan, such seeds are called *edamamé no tane* ('edamame seeds'). They are widely available in Japan in the spring in typical paper seed packets at grocery stores next to the produce department or the cut-flower department.

"An alternative, simpler approach (now used by the American media) would be to call both (1) and (2) above 'edamame' then to call the shelled ones 'shelled edamame.'

"Unfortunately each of these three approaches and terms has its disadvantages. (1) Green vegetable soybeans is a very descriptive term, but it is quite long and unfamiliar to most Americans. Since 'shelled green vegetable soybeans' is much too long, 'shelled edamame' (a term now starting to be used in Japan) or 'green shelled soybeans' might be better. (2) Edamame is nice and short, and widely used in the American press since the late 1990s. But it is difficult for English speakers to pronounce correctly if there is no accent on the last letter, yet no English words have accents, and the keyboard character (é) only exists in special foreign-language character sets, which are a nuisance to use frequently. (3) The term 'vegetable-type soybeans' is easy to confuse with 'green vegetable soybeans.' Moreover, the term sounds strange when used to describe large-seeded (often clear hilum) soybean varieties preferred for making tofu or soymilk. In addition, most Americans have never

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heard of 'vegetable-type soybeans.' The term 'food-grade soybeans,' widely used in Canada since the 1980s, has its own problems. First, it is often used to refer to all soybean varieties used to make foods, including small-seeded varieties used to make natto and soy sprouts. Second, all soybeans can be considered 'food grade.'" Address: Soyfoods Center, Lafayette, California, USA.

10920. Shurtleff, William; Aoyagi, Akiko. 2001. The book of miso: Savory, high-protein seasoning. 2nd ed. Revised. Berkeley, California: Ten Speed Press. 278 p. Illust. by Akiko Aoyagi Shurtleff. Index. Aug. 28 cm. [223 ref]
• ***Summary:*** This revision has completely new front and rear covers, designed and illustrated by Akiko. It contains a completely new "Appendix D–Miso Manufacturers in the West" (p. 255, updated to 10 May 2001). The page "About the Authors" (autobiographical) has been updated, and the original photographs have been replaced with more recent ones–reflecting the fact that Bill and Akiko separated in Nov. 1993 and their marriage ended in May 1995.

The last page, "Soyfoods Center," has been updated.

The inside rear cover has been updated, and now includes current information about: (1) *Miso Production,* a book published by Soyfoods Center about how to start and run a company making miso on any of various scales and budgets. (2) *Miso and Soybean Chiang: Bibliography and Sourcebook,* published by Soyfoods Center. (3) SoyaScan, the unique computerized database produced by Soyfoods Center. This database now contains more than 62,000 records from 1100 B.C. to the present, and more than 76% of all records have a summary / abstract averaging 146 words in length. A description of the four different types of records (published documents, commercial soy products, original interviews and overviews, and unpublished archival documents), and the number of each type, is given.

The title page, copyright page, and table of contents have been redesigned and updated to give the book a much more contemporary look. Other small changes have been made throughout the book. Still contains 130 vegetarian recipes–both western and Indonesian.

Ten Speed Press gave this book a new ISBN: 1-58008-336-6. Yet despite the many changes described above, the authors preferred not to have this called a "new edition" or "revised edition." Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

10921. Srisombon, S.; Shanmugasundaram, S.; Sophanodora, D. 2001. The history of vegetable soybean development, current status and future development in Thailand. In: T. Lumpkin, ed. 2001. Second International Vegetable Soybean Conference. Pullman, Washington: Washington State University. 202 p. See p. 183-186. [7 ref]
• ***Summary:*** Contents: Introduction. Vegetable soybean development: Production and market promotion, research, yield constraints. Future prospects. Conclusion.

"From the time the soybean was introduced from China to the northern part of Thailand the vegetable soybean was consumed for more than a hundred years in Thailand." Soybeans with medium size seeds (15-20 gm per 100 seeds), used for food and oil extraction, have also been used traditionally as green vegetable soybeans (called *tua rae* in Thai). "Green pods attached to the stems are commonly boiled and sold countrywide in the local markets."

In the late 1980s, the development of vegetable soybeans for export began with the establishment in Thailand vegetable factory as a joint venture between Thais and Japanese. In 1990 the first small exports of vegetable soybeans from Thailand to Japan began. In 1999 the export volume increased dramatically to about 9,000 tonnes, making Thailand the 3rd largest exporter of vegetable soybeans to Japan–after China and Taiwan. Address: 1. Senior Research Scientist, Field Crops Research Inst., Dep. of Agriculture, Paholyothin Road, Chatuchak, Bangkok 10900, Thailand, Email: kssssb@yahoo.com 2. sundar@netra.avrdc.org.tw 3. fcri@doa.go.th.

10922. Brooks, Patricia. 2001. A Japanese cuisine with style & spark. *New York Times.* Oct. 28. p. CT16.
• ***Summary:*** A restaurant review of Yooki Yama ("snow-capped mountain"), 1018 Main St., Branford, Connecticut. The "silk tofu casserole, a Korean dish whose contents were steamy hot and included "custard-soft bean curd cakes" which "floated in a batch of red-hot pepper sauce that made our eyes smart. The tofu was like a sponge, absorbing all the fire of the peppery broth. Wow!" Yooki Yama's owner is Japanese Korean, which explains the spicy hot dishes on the menu.

One of the "recommended dishes" is "Age-dashi tofu" [age-dashi-dofu]–"deep-fried soy bean cakes [tofu] served with a perky ginger scallion dip."

Note: Branford is a seaside town with many lively restaurants just east of New Haven, Connecticut, midway between New York City and Providence, Rhode Island.

10923. Bennett, Ken; Stoneman, Don. 2001. Japanese soybean investment helps Ontario farmers access good Identity Preserved markets. *Better Farming* (*Ontario, Canada*) 3(9):20-29. Nov.
• ***Summary:*** Ontario farmers are moving from growing commodity soybeans for crushing to growing identity preserved (IP) soybeans for specialty uses, as for the Japanese market. This year's drought and small soybean crop may actually speed the transition. Growth of Ontario soybean sales overseas continues to grow.

Eric Bosveld "is president of the new Agromart Processing Company Incorporated, located at Belton in western Ontario, between St. Marys and London." Agromart is a new food-grade soybean processing plant; it is also

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"the missing piece of equipment that has kept the Agromart Group from accessing good Identity Preserved (IP) markets for farmers.

"The plant also represents a significant investment by three Japanese companies who are paying half of the total cost, which is in excess of $1 million." The three, Marubeni Corp., Nisshin Oil Mills, and Nisshin Logistics, have made a substantial commitment to the Ontario soybean industry. This gives Ontario soybean growers and Agromart Processing to their markets. With this investment, the Japanese companies are no longer just a buyer; they are now a partner and investor, directly involved with the new processing company.

The other half of the costs has been paid by 12 Agromarts. This should make Ontario soybean farmers more profitable.

"That business model has already been proven by the success of Agromart Terminals Incorporated, which also operates at Belton and is 50 per cent owned by 14 of the Agromart joint ventures."

Peter Hannam, president of First Line Seeds Limited in Guelph, Ontario, "is considered by many to by many to be the guru of the Ontario soybean industry. He found the cold-tolerant soybean variety named Now. The story begins in 1962, when Hannam saw some soybeans "growing outside the crop science building at the University of Guelph, where he was about to receive an agricultural degree." At the time soybeans were considered to be a warm season crop, better suited to the climate of a few of Ontario's southwest counties. When a professor told Hannam that soybeans would not grow in cold climates, he took it as a challenge. In 1963 he began experimenting with a small plot of soybeans on the outskirts of Guelph. It took him 8 years of planting 5 or 10 acres of soybeans before he found a way that was profitable. "He worked closely with the University of Guelph to find a cold-tolerant bean, searching as far away as Sweden."

"In the early 1980s, he was involved with the Canadian Seed Growers Association and met a dozen other seed growers across Ontario who shared his vision. In 1982, they joined forces and First Line Seeds was born" in Guelph. Hannam wants to get out of "the commodity cycle" by developing proprietary soybean varieties and finding proprietary IP markets. He believes this will benefit farmers.

"In 1993 it was not legal to breed the Roundup Ready (R) gene into soybeans in Canada. "Nobody else in Ontario was interested in doing that." First Line was the first company to incorporate the Roundup Ready gene. "That innovation gave them a huge lead in the Roundup Ready market, enabling them to offer the first [genetically engineered soybean] varieties in Canada in 1997. It also made them an attractive partner for a large crop technology company, and in 1998 Monsanto bought a majority stake in First Line." The active minority shareholders make First Line "the most unusual seed company in the world." Hannam sees "a very strong future for the bio economy, growing specialized crops for specialized purposes." There will be many new uses. There is "a long way to go in utilizing the protein of soybeans to its fullest extent," says Hannam.

John Cowan is manager of the Hyland Seed Division of W.G. Thompson and Sons Ltd. He notes that "Hyland was the original IP crop producer in Ontario, producing corn for the Kellogg plant in London," Ontario, Canada, as early as 1977–the same year Hyland began its soybean breeding program.

In the crop year ending September 2000, Ontario soybean growers sold 2.34 million tonnes of soybeans. "Exports were more than 400,000 tonnes. While the definition of IP remains vague," Kim Cooper, marketing manager of the Ontario Soybean Board, says that, "strictly speaking, IP soybeans represent about 40 per cent" of the exports. Peter Hannam, president of First Line Seeds, thinks that about 75% of this year's crop will be "sold by variety."

10924. Morinaga Nutritional Foods, Inc. 2001. Get rich. Quick (With Mori-Nu Creamy Soups made with organic soy) (Ad). *Natural Foods Merchandiser.* Nov. p. 13.
• ***Summary:*** This full-page color ad shows a four flavors of Mori-Nu soups (butternut squash, corn, tomato, garden pea) in two sizes (1 quart and 11 oz). "Just heat and serve for 4 to 6 grams of soy protein per serving."

This ad also appeared in the Jan. 2002 (p. 21) issue. Address: 2050 West 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-669-8638 (NOW TOFU).

10925. Ashiuchi, M.; Kamei, T.; Baek, D.H.; Shin, S.Y.; Sung, M.H.; Soda, K.; Yagi, T.; Misono, H. 2001. Isolation of *Bacillus subtilis* (chungkookjang), a poly-gamma-glutamate producer with high genetic competence. *Applied Microbiology and Biotechnology* 57(5-6):764-69. Dec. [Eng]*
• ***Summary:*** Chungkookjang (also spelled chung-kook-jang) is a traditional Korean seasoning, fermented with *Bacillus subtilus* [the natto bacterium]. A bacterium with high poly-gamma-glutamate (PGA) productivity was isolated from this fermented food. Address: Dep. of Bioresources Science, Kochi Univ., Nankoku, Japan.

10926. *Canadian Soybean Bulletin* (*CSEA, Chatham, Ontario, Canada*). 2001. New food grade soybean cultivars developed at Harrow. Fall. p. 2.
• ***Summary:*** New varieties developed at the GPCRC (Greenhouse and Processing Crops Research Centre) include AC Hime, AC Vin-Pro, AC X790P. Canada's exports of food grade soybeans to Japan have increased dramatically from 36,000 tonnes in 1995 to 75,000 tonnes in 1998, to 175,000 tonnes in 2000. Address: Canadian Soybean Export Assoc., P.O. Box 1199, Chatham, Ontario, Canada N7M 5L8. Phone: 519-352-7730.

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10927. Ohara, M.; Lu, H.; Shiraki, K.; Ishimura, Y.; Uesaka, T.; Katoh, O.; Watanabe, H. 2001. Radioprotective effects of miso (fermented soy bean paste) against radiation in B6C3F1 mice: increased small intestinal crypt survival, crypt lengths and prolongation of average time to death. *Hiroshima J. of Medical Sciences* 50(4):83-86. Dec. *

• ***Summary:*** Miso at three different stages of fermentation (short, medium, and long-term) was mixed in a modified-fat diet (MF diet) into biscuits at 10% and was fed to the rats 1 week before irradiation. Survival of rats fed the long-term fermented miso was significantly longer compared with rats fed the short-term fermented miso and MF cases after a specified dose (8 gray) of gamma ray radiation at the rate of 2 gray per minute. Rats in all three miso groups lived significantly longer. At doses of 10-12 gray and a dose rate that was twice as high (4 gray per minute), the treatment with the long-term fermented miso significantly increased crypt survival. Also the protective influence against irradiation in terms of crypt lengths in the long-term fermented miso group was significantly greater than in the short-term or medium-term fermented miso and MF diet groups. Thus, prolonged fermentation appears to be very important for protection against radiation effects.

Note: Michio Kushi, a macrobiotic teacher in Boston, Massachusetts, has often said that long-fermented miso has more healing power than short-term miso.

10928. Halpern, Jack. 2001. The Kodansha kanji learner's dictionary. Tokyo, New York: Kodansha International. *

10929. Kiuchi, Kan. 2001. Miso and natto. *Food Culture* (*Kikkoman Inst. for International Food Culture, Noda, Japan*) No. 3. p. 7-10. http://kiifc.kikkoman.co.jp. [6 ref. Eng]

• ***Summary:*** This article makes several statements that, to us, seem very surprising: (1) "Both *miso* (soybean paste) and *natto* (fermented soybeans) are said to have originated in China, but once introduced into Japan they inspired the development of a variety of unique local soybean based products" (p. 7).

Note 1. We believe that *itohiki-natto,* whose main fermentation organism is *Bacillus subtilis* and which is unsalted, originated in Japan, and that *douchi* (fermented black soybeans), whose main fermentation organism is a mold and which is salted, originated in China, long before *itohiki-natto* is thought to have originated in Japan.

(2) "Whole soybeans are used to make *natto,* and because only a single variety of *natto* mold is used in the fermentation process, the beans retain the original shape" (p. 7).

Note 2. Natto (i.e., *itohiki-natto*) is not made with a mold; it is made with a bacterium.

(3) *Natto* is thought to have originated in China's Yunnan province, although legend has it that *itohiki-natto* (hereinafter simply called "natto") was invented by accident in Japan's Tohoku region in the eleventh century when boiled beans that were going bad were eaten and found to be rather tasty.

"The two main varieties of *natto* are *itohiki-natto* and *shiokara-natto,* which is also known as *tera-natto* and includes *daitokuji-natto* from Kyoto and *hama-natto* from Hamamatsu. A bean koji is made using koji mold" (p. 9).

Note 3. We believe that the statement *"Natto* is thought to have originated in China's Yunnan province,..." is very confusing, and that confusion is based on the fact that in Japanese, two completely different and unrelated fermented soyfoods are both referred to as "natto." We would say instead: Natto (i.e., *itohiki-natto*) originated in Japan and *douchi* (called *shiokara-natto in Japan*) originated in China. Address: Ph.D., Prof., Dep. of Food Science and Nutrition, Kyoritsu Women's Univ., Japan.

10930. **Product Name:** San-J Tamari Sesame Dressing, Tamari Peanut Dressing.
Manufacturer's Name: San-J International, Inc.
Manufacturer's Address: 2880 Sprouse Dr., Richmond, VA 23231. Phone: 804-226-8333.
Date of Introduction: 2001.
Ingredients: Tamari Sesame: Water, tamari soy sauce (water, soybeans, salt, alcohol), rice vinegar, organic sugar, onion juice (onion juice, salt, natural flavors), sesame oil, ground sesame, arrowroot, whole sesame, white pepper. This product is made in a plant inspected by the Gluten-Free Certification Organization (www.gfco.org).
Wt/Vol., Packaging, Price: 8 fl. oz. (237 ml) glass bottle.
How Stored: Refrigerate after opening.
New Product–Documentation: Digital color image of front and back labels for both dressings sent by Misako Binford of San-J. 2012. May 11. In an attached e-mail she says that these products were first sold in 2001 in a "milk jug type" bottle (which looked like it was designed for sauces) rather than the present "banjo-type" bottle. However the copyright on the back of each label is 2009–indicating that the label design was updated.

10931. Ishige, Naomichi. 2001. The history and culture of Japanese food. London, New York, Bahrain: Kegan Paul. x + 273 p. Illust. Maps. No index. 24 cm. [59 ref. Eng]

• ***Summary:*** This book is crippled by the lack of an index. Moreover, the sources of most of the interesting material in the text are not cited. Otherwise it is very well researched and well written.

Contents: Introduction–The historical framework. Part I: The dietary history of Japan. 1. The prehistoric era: The Paleolithic age, the advent of earthenware, Jômon society and dietary culture. 2. Establishment of a rice-growing society: A crop held in special regard, the dissemination

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and development of rice, rice cooking, sake brewing, fermented fish and flavourings. 3. The formative period of Japanese dietary culture: Historical setting, the taboo on meat eating, the lack of a dairy industry, annual observances and rites of passage, place settings and table settings, cooking and banquet styles, the roles of the monasteries, the popularization of noodles.

4. The age of change: Historical setting, the diffusion of tea, the impact of the 'Southern Barbarians' (*nanban;* first came the Portuguese and Spaniards, Catholics from Iberia, then the Dutch and English, Protestants from northwest Europe called *kômôjin* {"redheads"} to distinguish them from the Iberians, Saint Francis Xavier, introduction of meat eating {beef} by Catholics by 1557 in the town of Oita in northwest Kyushu, expansion of meat eating by non-Christians in Nagasaki and Hirado island {northeast Kyushu}, in 1612 Christianity and meat eating are prohibited by the Tokugawa shogunate but the Chinese colony in Nagasaki is exempted, Dutch traders are the only Europeans allowed to remain in Japan after the country is closed but they are isolated on a tiny island in Nagasaki harbor and barred from contact with ordinary citizens, dishes with nanban influence include fried tofu patties {called *ganmodoki* in the east of Japan, or *hirôsu* or *hiryôzu* in the west}, tempura, nanban confectionary {such as *kasutera*} is especially popular, introduction of new crops by Europeans {incl. sweet potato, two types of pumpkin squash, cayenne pepper, kidney beans, peanuts}), formation of a new style (banquet-style meals {*honzen ryôri*}, *kaiseki*), change in the frequency of meals (from two to three).

Note 1. This is the earliest (and only) English-language document seen (April 2013) that contains the word *hirôso;* it refers to Kyoto-style deep-fried tofu balls.

5. The maturing of traditional Japanese cuisine: Historical setting town and country, the spread of soy sauce, the emergence of the restaurant, snack shops, books on cooking and restaurants, the Ainu, the Ryukyu Islanders. 6. Changes in the modern age: Historical setting, the resumption of meat eating, milk and dairy products, entry of foreign foods, zenith and nadir, new meal patterns, integration of foreign foods–a model.

Part II: The dietary culture of the Japanese. 7. At the table: Gohan–framework of the meal, the rise of the table, the tabletop as landscape, chopsticks and table manners, etiquette–as you like it. 8. In the kitchen: The secularization of fire and water, from wood fire to electric rice cooker, the knife–a sword in the kitchen, restaurants–the public kitchen. 9. On the menu: Soup and umami flavouring. Sashimi–Cuisine that isn't cooked, Sushi–from preserved food to fast food, sukiyaki and nabemono, tofu and nattô–meat for vegetarians, vegetarian temple food, tempura and oil, noodles and regional tastes, pickled and preserved seafood, mochi, confectionery and tea, the dynamics of sake and tea.

Teriyaki developed during the Edo / Tokugawa period (1600-1867) (p. 116; However no citation for the source of this information is given).

During the Edo period, most commoners living in Japan's cities ate plain and repetitive meals. In Edo (later Tokyo) most had a breakfast of rice, miso soup, and pickles; for lunch and dinner they ate approximately the same thing "with the addition of one dish of simmered vegetables or tofu, or simmered or grilled fish" (p. 113). Address: National Museum of Ethnology, Osaka, Japan.

10932. Ishige, Naomichi. 2001. The spread of soy sauce [and miso]. In: N. Ishige. 2001. The History and Culture of Japanese Food. London, New York, Bahrain: Kegan Paul. x + 273 p. See p. 113-17. [59 ref. Eng]

• ***Summary:*** Soy sauce and miso are both made by mixing soybeans and miso with a fermenting agent named koji (see Section 2.4, p. 32-35). Prototypes of these fermented soyfoods were probably developed in China during the Han dynasty (c. 200 BCE to CE 200). The earliest record of their use in Japan appears in the Taihô Code of 701. The fermented soyfoods mentioned in those laws are: (1) Miso. (2) *Kuki,* which was similar to today's Daitokuji Natto and Hamanatto, in which the beans retain their shape and solidity in the final product. (3) *Hishio,* "a semi-liquid paste or gruel fermented from a mixture of soybean, grains, and sake."

At least 90% of the miso consumed in Japanese households today is used in miso soup, which most people consume once a day. Miso soup is known to have existed as early as the 10th century, when it was mentioned in the *Engi Shiki.* However "during medieval times it was not part of the meals of the common people. This may have been because miso was considered a luxury and hence not made in quantities sufficient for daily cooking. Instead small amounts were typically consumed by eating a side dish of miso or of vegetables pickled with miso." Small amounts were also used as a flavoring. Regional varieties began to develop. In order to improve the appearance of food or to impart a lighter flavor, "miso and water (or a cooked mixture of miso and water) would be placed in a cloth bag and the liquid that trickled out would be collected. This refined miso solution was used in preparing elegant meals for the upper class, and later was replaced by soy sauce."

As noted above, the prototype of soy sauce was *hishio,* a semi-liquid flavoring, which was probably used in Japan as early as the 8th century (Fukuo 1979). Yet it "was probably too expensive to come into general use, for it is harder to make than miso and has a more refined flavour."

Soy sauce (shoyu) is mentioned in several 16th century documents. By the 2nd half of this century shoyu factories had been established in the Osaka-Kyoto (Kansai) area, "and some trading ships were used exclusively to distribute the product to other regions. It was as a factory-made product that soy sauce became popular, initially coming into use at daily meals among the townspeople whose lives

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depended upon the commodity economy." As Edo (today's Tokyo) grew into a major city, its residents consumed large quantities of soy sauce made in the Osaka-Kyoto (Kansai) area.

Then in the late 1600s, "soy sauce aimed at the Edo market began to be made locally, in the districts that are now called Chôshi and Noda in Chiba Prefecture." In contrast to the lighter-colored and saltier Kansai product (*usukuchi*), the plants around Edo / Tokyo used a larger proportion of wheat to make a rich, fragrant soy sauce called *koikuchi.* This suited the townspeople of Edo well and by the late 1700s, it had taken over the metropolitan market.

In the cities, by the 1700s, "soy sauce had become the principal seasoning for food and miso had come to be used almost exclusively for soup. But in remote rural districts, miso remained in use as a seasoning for daily meals until the early 20th century, while soy sauce, purchased in small quantities from local factories, was eaten [consumed] only at festival meals or when serving special guests. Many farm families made their own miso until the 1950s, whereas those families that made only soy sauce were always a rarity.

"Nothing is wasted in making miso, because all of the ingredients are turned into the paste which is eaten. Making soy sauce not only involves more work but also leaves a substantial amount of inedible lees after the liquid is strained [and the lees pressed]. The lower rate of yield from the raw materials made soy sauce a luxury item which the peasantry could not easily produce at home, and so miso remained the everyday seasoning among the rural population. What soy sauce was used was factory made. Besides the local sake brewery, every area had a small soy sauce brewery until the early 20th century, when major firms with large factories and national distribution networks created an oligopoly market for soy sauce and it came into regular use even in poor rural households. Thus the main flavouring of Japanese cooking shifted from miso to soy sauce over a period of more than two centuries, as urban taste gradually diffused through the countryside."

"Direct use of salt is much less common in Japan than in the West, for much salt is ingested indirectly from soy sauce and miso. A 1980 survey by the Ministry of Health and Welfare determined that soy sauce and miso supplied 27% and 16% respectively of the average daily salt intake, while salt sprinkled on food in the kitchen or at the table accounted for only 13%. In addition to saltiness, of course, soy sauce and miso add other flavour and fragrance to food. Their tastiness results notably from their high content of glutamic acid (discussed in Chapter 2) and their complex flavour structures contain tart and sweet elements as well as alcohol."

"Soy sauce, being a liquid, is easier to use than miso." Its greater convenience and wider range of use are key factors in its growth in popularity, which was "also connected with a change in the style of easting raw fish" (*namasu* or *sashimi*). "Sashimi now means fish that has been sliced and arranged on a plate and served with a smaller plate of soy sauce,... With this style, skill at cutting and arranging the slices in a pleasing becomes a point of pride with the chef. Besides *sashimi,* such popular and internationally known dishes as sushi (*nigiri-zushi*), tempura and teriyaki, which all developed during the Edo period [1600-1867], are also meant to be eaten with soy sauce."

The "cooks of the Edo period were not very eager to develop new tastes. Their culinary ideal was... rather to present the natural taste of the food itself in as pure a way as possible." Soy sauce helped them fulfill this ideal. "Cooking which concentrates on avoiding creativity and complexity in taste, and which seeks to select the finest ingredients and to slice and serve them with the most beautiful technique, is what developed among the chefs of the high-class restaurants during the Edo period." Address: National Museum of Ethnology, Osaka, Japan.

10933. Ishige, Naomichi. 2001. Books on cooking and restaurants. In: N. Ishige. 2001. The History and Culture of Japanese Food. London, New York, Bahrain: Kegan Paul. x + 273 p. See p. 124-28. [59 ref. Eng]

• ***Summary:*** "Japan had the highest rate of literacy in the world during the Edo period [1600-1867]. Many common people could read and write, and a print culture flourished as great numbers of books were printed by woodblock. Cookbooks were among them, and for the first time it became common for cooking techniques to spread by means other than word of mouth and actual example. Thus knowledge about refined cooking could spread beyond a particular region or class, and travel quickly to the countryside and the population at large. More than 120 different block-printed cookbooks from the Edo period, and more than twice that number of hand-copied cookbooks are extant [Hirata 1985: 537].

"A hand-copied work from the end of the thirteenth century, the *Chûji ruiki* (Kitchenry Cyclopedia), is the oldest known Japanese document recording practical cooking techniques. The ten or so chief surviving examples of cookbooks written between then and the seventeenth century detail the foods, serving etiquette and table manners of ceremonial banquets for the nobility and samurai. Their authors were either members or associates of the schools of cooks who served the court and the Muromachi shoguns, and the works are evidently intended for those who were qualified to attend such banquets and those who cooked for them. In short, the cookbooks of the medieval age had extremely limited circulation.

"The first modern cookbook was titled *Ryôri monogatari* (Accounts of Cooking), and went through many editions. The oldest surviving specimen was printed in 1643, but it is very likely that it was originally published about 1600. Its unknown author wrote from an independent standpoint

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that was not allied with any particular cooking school. Eschewing the authoritarian, formalistic descriptions of trivial and antiquated procedures that had characterized previous cookbooks, the *Ryôri monogatari* presents practical knowledge in a thoroughly pragmatic spirit. It contains 20 sections which fall into two main parts, the first containing the names of many different dishes listed by ingredient, and the second providing general descriptions of the techniques for preparing stewed foods, grilled foods etc. along with recipes for typical dishes. Under that arrangement there are many dishes that are mentioned by name without instructions for their preparation, indicating that the book was not written with amateurs in mind, but rather for those with a fair degree of cooking knowledge, mainly professional cooks [Harada 1989: 17-29].

"From the seventeenth century, books of practical explanations of cooking were published one after another. They are organized in various ways, by ingredient with lists of recipes; or by cooking technique with lists of ingredients; or by menu with instructions for preparing each item. What most of them have in common is that they are not mere collections of recipes, but attempts to explain cooking techniques in a systematic fashion.

"In addition to cookbooks, various scholarly works concerning foodstuffs were published. These were written mainly by specialists in the field of traditional Oriental natural science (*honzôgaku*), in which Chinese medicine and pharmacology played strong roles. They were concerned with the effects of different foods on the body and with the choice of foods for maintaining health and healing illness. The outstanding work of this genre is the *Honchô shokkan*, written by Hitomi Hitsudai and published posthumously in 1697. It is a 12-volume, illustrated encyclopaedia of a tremendous number of animal and plant substances, with explanations of processing methods, cooking techniques, pharmacological characteristics, and folklore.

"The number of printed cookbooks increased from the 1760s, the same time that restaurants began to proliferate in the cities. Previous cookbooks had strong colouration as insider's manuals, written by cooks and aimed at readers who were cooks. From the latter part of the eighteenth century many works appeared which were aimed at a general audience, and a significant number were written not by specialists but by intellectuals with literary skill. This new genre went beyond the bounds of practical manuals. Conceived primarily as interesting reading matter, the books tended to be in literary prose style with quotations from other books or descriptions of strange foods, and were lavishly illustrated [Harada 1989: 104-31]. These `fun-to-read cookbooks' may well have circulated among the common folk via the lending libraries which developed during the period.

"An influential example is *Tôfu hyakuchin* (A Hundred Tofu Curiosities), originally published in Osaka in 1782. It presents a hundred ways to prepare tofu along with illustrations, sketches of popular restaurants specializing in tofu cooking, relevant excerpts from Chinese and Japanese literary works, and citations concerning the history of tofu. The population was quite familiar with tofu, and this book allowed everyone to satisfy any intellectual interest they may have had in the food. The pseudonymous author is suspected to be a sinologist who was active in Osaka at the time. The book won enormous popularity and within the year a second volume presenting another hundred ways of preparing tofu was published and both volumes were available in Kyoto and Edo bookshops as well. This success promptly motivated a bookseller in Kyoto to issue a series of `hundred recipes` books on such foods as eggs and porgy (in landlocked Kyoto, freshwater carp was long rated the tastiest fish, but saltwater porgy [sea bream] displaced it during the Edo period). This cookbooks came to be designed by publishers as potential bestsellers.

"Restaurant guides constituted another category of food-related publications. With the proliferation of restaurants in the three main cities, the need arose for information to help in selecting a place to eat... Many of them were broadsheets..." and they appeared "in Japan a century before the first *Guide Michelin* was published in France." Address: National Museum of Ethnology, Osaka, Japan.

10934. Kang, In-hui. 2001. Kankoku shoku bunkashi: genshi kara gendai made [History of Korean food culture: from the past to the present]. Tokyo: Fujiwara Shoten. [Jap]*

10935. Khatau, Asha. 2001. The best of epicure's vegetarian cuisines of the world. Mumbai (Bombay), India: Zaika. 292 p. Illust. (color). 26 cm. *

10936. Kiuchi, Kan. 2001. [Natto industry and technical innovation]. In: Food System and Food Processing (Food System Series, Vol. 15). Tokyo: Society of Agricultural Statistics. See p. 139-50. [Jap]*

10937. Kizawa, Hans; Goto-Nance, Rina. 2001. Japanese home cooking. New York, NY: Hippocrene Books, Inc. 131 p. *

10938. Masuoka, Hiroshi. 2001. Masuosan no misozukuri shinan: tsukurô tabeyô temae miso [Mr. Masuo teaches how to make miso: Let's make and eat our own homemade miso]. Tokyo: Ie no Hikari Kyokai. 87 p. 21 cm. [Jap]* Address: Japan.

10939. Matsumoto, Miwa. 2001. Tôfu, nattô [Tofu and natto]. Tokyo: Kin no Hoshi Sha. 47 p. Illust. (color). Index. 30 cm. Series: "Shoko" de Sogo Gakushu Minna de Shirabete Tsukette Tabeyo, no. 4. [Jap]*
• ***Summary:*** A children's book. Address: Japan.

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10940. Miso Kenkozukuri Iinkai (Making Healthy Miso Committee). 2001. Miso bunkashi [History of miso culture]. Tokyo: Zenkoku Miso Kogyo Kyodo Kumiai Rengokai (Japanese National Miso Association). 590 p. 23 cm. [Jap]* Address: Japan.

10941. Nagayama, Hisao; Shimizu, Shinko. 2001. Miso washoku [Miso in Japanese-style recipes]. Tokyo: Ie no Hikari Kyokai. 127 p. 21 cm. [Jap]*
• ***Summary:*** Hisao Nagayama was born in 1934. Address: Japan.

10942. Nakamura, Shigeko. 2001. Wagaya no aji kantan tezukuri miso: wandei tezukuri shirizu [My home taste of easy homemade miso: One day homemade series]. Tokyo: Esuesu Komyunikeshonzu (S.S. Communications). 50 p. 20 cm. Series: Esuesu Shi Mukku; Retasu Kurabu (S.S. Company's Mukku; Lettuce Club). [Jap]*
• ***Summary:*** A children's book. Address: Japan.

10943. Nakamura, Yumiko; Kaihara, A.; Yoshii, K.; Tsumura, Y.; Ishimitsu, S.; Tonogai, Y. 2001. Content and composition of isoflavonoids in mature or immature beans and bean sprouts consumed in Japan. *J. of Health Science* (*Japan*) 47(4):394-406. [26 ref]
• ***Summary:*** Isoflavones comprise a class of organic compounds, often naturally occurring, related to the isoflavonoids. [1] Many act as phytoestrogens in mammals. Some are termed antioxidants because of their ability to trap singlet oxygen. [2] Some isoflavones, in particular soy isoflavones, when studied in populations eating soy protein, have indicated that there is a lower incidence of breast cancer and other common cancers because of its role in influencing sex hormone metabolism and biological activity through intracellular enzymes, protein synthesis, growth factor actions, malignant cell proliferations, differentiation and angiogenesis. [2] Isoflavones are produced almost exclusively by the members of the Fabaceae (i.e., *Leguminosae,* or bean) family. (Source: Wikipedia, at isoflavones, Jan. 2013).

Thirty four samples of mature legumes, 7 samples of immature legumes and 5 of legume sprouts, obtained in Japan, were analysed by HPLC (high-performance liquid chromatography) for contents of total isoflavonoids and 9 individual isoflavonoids.

Mature legumes tested included yellow soybeans, black soybeans, green soybeans, kidney beans, scarlet runner beans, lima beans, butter beans, saltapia beans, peas, adzuki beans, black mappe [*Vigna mungo*], green gram, chick peas, broad beans and peanuts.

Immature legumes included soybeans (edamamé), black soybeans, broad beans, green peas, green pea pods and kidney bean pods. Sprouts were from soybeans, green peas, black mappe and green gram.

Individual isoflavonoids [isoflavones] tested were daidzein, glycitein, genistein, formononetin, biochanin A, coumestrol, daidzin, glycitin and genistin.

Content and composition of isoflavonoids varied greatly between soybean sprouts, immature soybeans and mature beans of the same type but from a different source. Isoflavonoid content was highest in mature soybeans, but the relative proportions of isoflavonoids present varied at each stage of growth. In samples other than soybeans, highest isoflavonoid content was found in mature chick peas, but this value was much lower than that in mature soybeans. It was concluded that the contribution of legumes other than soybeans to daily intake of isoflavonoids in a typical Japanese diet is negligible.

Table 5 gives the "Compositions of isoflavonoids" and the total. For whole dry mature soybeans of various colors and from various countries (11 samples), the total content ranges from 1.3 to 13.0.

For immature soybeans (2 samples), the total ranges from10.3 to 12.0.

For soybean sprouts (2 samples) the total ranges from 16.2 to 34.3, compared with 27.6 for black mappe sprout (1 sample) and 27.7 for green gram sprout. Address: Div. of Food Chemistry, National Inst. of Health Sciences, 1 -1-43 Hoenzaka, Chuo-ku, Osaka 540-0006, Japan.

10944. Natsume, Michiko. 2001. Tôfu, nattô, aburage no okazu: Shunka shûtô teiban menyuu [Side dishes made from tofu, natto, and deep-fried tofu pouches: spring, summer, fall, winter, a standard / definitive menu]. Tokyo: Ikeda Shoten. 143 p. 21 cm. [Jap]
Address: Japan.

10945. Snow Brand Seed Co., Ltd. (Yuki-jirushi). 2001. Vegetable seeds (Catalog). Japan. 57 p. See p. 1, 4-10. [Jap; eng]
• ***Summary:*** Seeds for edamame are one of the company's specialties. Snow Brand varieties offered include: Harunomai, Sapporomidori, Yukimusume, Sayamusume, Sayakomachi, Sayanishiki, Kitanosuzu, and Misono Green. Address: Snow Brand Seed Co., Ltd., 634 Naganumahara-cho, Inage-ku, Chiba City, Chiba prefecture, Japan. E-mail: Hiromu.Omi@snowseed.co.jp.

10946. Willcox, Bradley J.; Willcox, D. Craig; Suzuki, Makoto. 2001. The Okinawa Program: How the world's longest-lived people achieve everlasting health–and how you can too. New York, NY: Clarkson Potter. x + 484 p. Index. 24 cm. Foreword by Andrew Weil, M.D. [41 + 474 endnotes]
• ***Summary:*** A remarkable book! Written by a team of internationally renowned experts, it is based on the landmark, scientifically documented 25-year Okinawa Centenarian Study. Okinawans have the world's longest

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disability-free life expectancy. Their occurrence of heart disease is only one fifth that of Americans. Their rate of breast, ovarian, and prostate cancer is less than one quarter of American levels. And the number of centenarians per 100,000 is six times that of the USA. This is a book with plenty of solid, practical scientific advice.

If you have ever questioned the healthfulness of traditional soyfoods, read Chapter 4, "Eating the Okinawa way" (p. 114-45). A table (p. 116) lists "The top fifteen Okinawan healing foods." No. 1 is "Okinawan tofu." Its main active components are saponins and flavonoids (mostly isoflavones). No. 2 is Miso, which has the same active ingredients.

Step 3 in eating the Okinawan way is to "Eat three calcium foods daily." Calcium-fortified tofu is given as the single best source (p. 122)–containing 46% more usable calcium than the same volume of calcium-fortified orange juice! Calcium fortified soy milk is the 3rd best source. "Dairy products are also excellent sources of calcium, but they are best consumed in moderation–there is little support from interventional studies that they actually help reduce risk for osteoporosis [8]. In fact, osteoporosis rates are lower in societies where people eat few, if any, dairy products. This may be because they are high-protein foods, and *too much protein tends to leach calcium out of bones.* For every gram of protein that you eat, you lose 1 to 2 mg of calcium in your urine [9]. For postmenopausal women your protein to calcium ratio (how much protein you eat versus how much calcium) is actually a stronger predictor of your risk for bone fracture than your calcium. intake alone [10]. If you maintain a high-protein diet for an extended period with marginal calcium intake, you could be increasing your risk for osteoporotic fracture.

"The type of saturated fat in dairy products is also the worst offender for making cholesterol in the body."

Step 4 in eating the Okinawan way is to "Eat three flavonoid foods daily. Flavonoids–ubiquitous plant compounds found in large quantities in soy products and some other legumes (beans), and to a lesser extent in tea, onions, and apples–are powerful antioxidants. They provide a weak form of estrogen where the body needs it and block the body's own estrogen in locations where estrogen may induce cancer... two plants–soybeans and flaxseed–have pharmacological levels of these compounds, levels that exceed those in other plants by as much as 1,000 times [14]." "Soy has just been allowed the unprecedented honor of an official U.S. Food and Drug Administration (FDA) health claim [20]... Our prediction is that as the evidence mounts for soy consumption reducing the risks for breast cancer, prostate cancer, and possibly other cancers such as colon cancer, other USDA-approved health claims will follow."

"Tips for increasing your flavonoid intake: Learn about soy products." On pages 126-28 are substantial, accurate descriptions of the following soy products: Tofu, silken tofu, tempeh, miso, soy milk, soy flour, textured soy protein (TSP) or texturized vegetable protein (TVP), edamame, soy nuts.

The praise for soyfoods continues in the next chapter, "Okinawa's healing herbs and foods." There are two pages about Okinawa firm tofu (p. 158-59). Address: 1. M.D., Div. of Aging, Harvard Medical School; 2. PhD, medical anthropologist and gerontologist, Asst. Prof., Okinawa Prefectural Univ.–College of Nursing; 3. M.D., PhD, cardiologist and geriatrician, Prof. Emeritus of Community Medicine, Univ. of the Ryukyus, and Prof. and Chair, Dep. of Gerontology, Okinawa International Univ.

10947. Yamashita, Yoshiyuki; Hakozaki, Miyoshi; Naito, Tadao. 2001. Kagaku hiryo 3 yoso no renzoku shiyo ga rensaku edamame no seiiku oyobi shuryo ni oyobosu eikyo [Effects of continuous yearly use of three major nutrients of chemical fertilizer on growth and yield of sequentially cultivated green soybean]. Kawasaki: Kenkyusho. See p. 19-26. Series: Meiji Daigaku Kagaku Gijutsu Kenkyusho-kiyo, No. 40,3. [Jap; jap; eng]*
Address: Meiji Daigaku, Japan.

10948. Kuzmic, Vlatka. 2002. Re: Brief history of Annapurna, and work with tofu and seitan in Croatia. Letter (fax) to William Shurtleff at Soyfoods Center, Jan. 11. Followed by letter (e-mail) of 11 July 2006. 1 p. Typed, on letterhead. Followed by a brief interview later the same day. • ***Summary:*** 1997 March–Vlatka and Miroslav "Miro" Kuzmic (later her husband) started cooking and delivering vegetarian meals to some friends and acquaintances. In order to improve the quality of the meals, they became interested in macrobiotics and tofu.

1998 Feb.–They tried to make tofu, for the first time, from soy flour as described in the book *Super Soy,* by Ruth Winter. They were not successful. So they started reading *The Great Macrobiotic Cookbook,* by Aveline Kushi (in Croatian) and studying a recipe for tofu in that book. At about the same time they asked Suzana Ciceli, a macrobiotic friend, to help them improve their tofu-making process. She gave them her recipe, but after trying it a few times, they made big changes. Suzana suggested that they grind the soybeans, cook the slurry, then press the hot soymilk from the okara. But they decided to do it in the traditional Chinese way, grinding the soybeans, pressing the cold soymilk from the okara, then cooking only the soymilk. The results–firm, Chinese-style tofu–were excellent. At first the tofu was flat and round. They discussed their achievements with their friend Gordana Sibila. She supported them and convinced them to sell tofu and seitan to their friends.

At that time Maca, and his vegetarian restaurant *Vegeterra,* became interested in tofu. But of course they wanted nice square tofu. At first they had a tofu forming box made from a plastic box that could contain about 500 gm of tofu. But this wasn't a very good idea, so their fathers came

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to help them. Their next forming box was made of stainless steel; it had three compartments that each held about 0.8 kg of tofu, and it had removable sides so that when the tofu was ready they would just remove the sides and have nice squares. They made a mechanical screw press (rather than using a weight) to press the tofu.

They could produce about 5 kg/day of tofu in their small kitchen located at Poljanicki Prilaz 12, 10000 Zagreb, Croatia.

1998 May–They started selling their tofu and seitan to their friends, then to their friends' friends, and soon to many other people they didn't even know. At the same time they began using the business name "Annapurna" with the tag line *"zdrava hrana.* Annapurna is the name of the second highest peak in the Himalayas–but unlike the others, which are covered with snow, it is covered with greenery and flowers. Annapurna is also an Indian goddess of food and wealth (*anna* means "food" and *purna* means "wealth"); *"zdrava hrana* means "healthy food." Their first three products, each introduced in May 1998, were Fresh Tofu, Marinated Tofu, and Fresh Seitan. Marinated Seitan was introduced a month later, and Smoked Tofu in Sept. 1998. The ingredients in their first commercial tofu were soybeans (non-organic, grown in Croatia near the city of Kutina) and refined nigari (in small flakes; they bought it in Croatia at a shop named Biovega).

At the start, they bought a new vacuum packaging machine from Multivac, the best European manufacturer. It packs two bags at a time; you just have to close the lid. After the bag is sealed, the lid opens automatically. Eventually they stopped cooking meals and devoted themselves totally to making tofu and seitan–but still in their small home kitchen. They developed some Croatian-language flyers which they used to help sell their tofu.

1999 April–They start making smoked tofu.

1999 Dec.–They decided to start their tofu and seitan making business officially.

2000 Jan.–They introduced Tofu Mayonnaise.

2000 May–They rented a workplace at Petrinjska 2, bought the necessary equipment, and moved out of their home kitchen. Now their business became serious and really started to grow.

2001 Jan.–They moved their business into a larger space at Zumberacka 42.

2001 Feb.–They began to sell their tofu in health food stores.

2001 Feb. 12–Vlatka and Miroslav are married. She writes: "I think Miroslav deserves most of the credit for our business. Most of the ideas were his. It was his idea that we should start making tofu in the first place, and he has always been very enthusiastic about making tofu."

2001 March–They start using natural (unrefined) nigari to coagulate their tofu; they buy it from Austria.

2001 Sept.–They introduce Tofu with Vegetables, Tofu Spread with Garlic, and Tofu Spread with Sweet Dry Red Peppers.

2001 Oct.–They start using organically grown, non-GE (not genetically engineered) soybeans, which are now grown near Pozega, a small town in eastern Croatia, by Zeljko Mavrovic, a very famous Croatian ex-boxer and world champion.

2001 Dec.–They move their business into a larger rented space at Nehajska 42, 10000 Zagreb, Croatia. On Dec. 18 they sold the first tofu made at that location.

2002 Jan.–Today they make about 700 kg/month of tofu, including Fresh Tofu, Marinated Tofu, Smoked Tofu, Tofu with Vegetables, Tofu Mayonnaise, and Tofu Spread (With Garlic and Parsley, or With Red Peppers). They use organically-grown, GMO free soybeans.

But the demand for tofu in Croatia is much larger than they expected. Their equipment is too slow to keep up with the demand, which is increasing every day. Their biggest problems are grinding the beans and draining the okara. Address: Nehajska 42, 10000 Zagreb, Croatia. Phone: +385 1-3639-092.

10949. Carter, Jeffrey. 2002. More research dollars needed to breed export soybeans: There's less focus on producing new lines of foodgrade soybeans than on herbicide resistant beans. *Ontario Farmer* (*Canada*) 34(47):16. Jan. 15.
• ***Summary:*** This was the message of soybean exporter Michael Loh to farmers at the Southwest Agricultural Conference at Ridgetown. Loh emphasized that the Ontario soybean industry must respond to the needs of its customers. "My vision for southwestern Ontario and Canada is for us to have the image as being the place to go for the best foodgrade soybeans."

Roundup Ready varieties tend to produce a smaller sized bean, yet many Japanese customers want larger-seeded varieties–according to Morris Sagriff, a Lambton County farmer. A photo shows Michael Loh.

10950. Nihon Kokugo Daijiten [Shogakukan Unabridged Dictionary of the Japanese Language. 2nd ed. 14 vols.]. 2002. Tokyo: Shogakukan, Inc. Illust. 26 cm. [Jap]*
• ***Summary:*** The English title (above) is that given by JapanKnowledge, which says of it: This work "has been edited over a period of four decades, with the cooperation of over 3,000 authorities in fields such as history, Buddhism, Chinese writing, folklore, economics, law, zoology and botany." In Japanese, it is abbreviated as Nikkoku. The 1st edition was published in 1972.

Like the *Oxford English Dictionary,* this work is based on historical principles, and each entry word contains a citation for the earliest know document containing that word. Address: Japan.

10951. Huang, H.T. (Hsing-Tsung). 2002. Takamine Jokichi

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and the transmission of ancient Chinese enzyme technology to the West. In: Alan K.L. Chan, Gregory K. Clancey and Hui-Chieh Loy, eds. 2002. Historical Perspectives on East Asian Science, Technology and Medicine. Singapore: World Scientific Publishing Co. See p. 525-32.

• ***Summary:*** "When we talk of technology transfer in the last hundred years, we tend to think of the traffic as flowing entirely from West to East. Actually, even in the 20th century significant bits of Chinese or East Asian technology were also being transmitted to America and Europe. Of these the most influential and yet least appreciated is the use of microbial enzymes in food processing and related industries."

Most of the enzymes used today are derived from 3 genera of moulds, namely *Aspergillus, Rhizopus* and *Mucor.* In the early 1950s Dr. Huang gained a working knowledge of the enzyme industry in the U.S. when he worked as a research chemist at the Enzyme Research Department of Rohm and Haas Co. (Philadelphia, Pennsylvania).

Table 1 (p. 526) shows microbial enzymes used in food processing in 2002, and Table 2 (p. 527) shows those used in food processing in 1951. Takamine Laboratories (Clifton, New Jersey) made and marketed Takadiastase, a digestive aid. Wallerstein & Co. (New York) produced the enzyme papain for chillproofing of beer. Rohm & Haas pioneered the application of pancreatic enzymes for the bating of hides. All 3 companies were founded at about the turn of the 19th to 20th centuries.

Jokichi Takamine's innovation was based on koji (Chinese: *qu* [pronounced ch'ü]; the Japanese word is written with the ancient Chinese character), which has been used in Japan for centuries to make saké (and other alcoholic drinks), soy sauce, and miso (both soy condiments). "Modern microbiological studies show that the principal organisms in *qu* are grain molds of the genera *Aspergillus, Rhizopus,* and *Mucor.*

"The origin of *qu* is obscure. It was a known entity in the early Zhou (1000 B.C.), but it could have been in existence much earlier, perhaps even before the legendary Xia dynasty (2000 B.C.). According to the *Jiu Gao* (Wine Edict), c. 300 A.D., by Jiang Tong, *qu* was first obtained when steamed rice was inadvertently left in the open and became mouldy [endnote 3 gives the exact Chinese characters]. This view is supported by two pieces of evidence. First, rice was already cultivated extensively and pottery steamers were known around 6000 B.C. in the Hemudu culture near Hangzhou [W.-G. Hang-chou, or Hang-chow, capital of Zhejiang province in eastern China]. Second, this is precisely the way a rudimentary *qu* was prepared and used in making wine in the 1950s by the aborigines in Taiwan. Thus the earliest *qu* probably had rice as the growth substrate. Rice is still the principal substrate in South China today. But during the Zhou [1045-256 B.C.], as barley and wheat (which were considered inferior grains) grew in importance as cultivated crops in North China, they were adopted as the preferred substrates for making *qu.* Endnote 4. For further details on the origin of *qu,* see H.T. Huang's book titled *Fermentations and Food Science* in the *Science and Civilization in China* series.

"The art of using *qu* or koji to make fermented drinks, i.e. *sake,* was brought to Japan from South China, probably towards the end of the Han dynasty (Shinoda Osamu 1967, p. 551-74). Their employment in the making of fermented soy condiments, such as *Jiang,* arrived later during the Tang (618-907 A.D.), accompanied by the famous agricultural treatise *Qimin Yaoshu* (Important Arts of the People's Welfare) of 544 A.D. But the Japanese soon developed their own versions of soy condiments such as miso which is quite unlike the fermented *jiang* (soy paste) of China." Modern microbiology has shown that the principal mould in koji is *Aspergillus oryzae.*

"The technology of *qu* was also transmitted, presumably by Chinese immigrants in more recent centuries, to Indonesia. It is called *raggi* [*ragi*] by the natives or *peh-khak* ('white qu') by the Chinese settlers. In the 1890s Dutch scientists determined that the fungi in *raggi* were species of *Mucor* and *Rhizopus.* They tried to exploit the amylolytic activity of these fungi for converting grains to alcohol commercially in Seclan [Seclin], France, and Antwerp, Belgium, but their attempts were unsuccessful."

These early ventures might have remained forgotten were it not for the work Jokichi Takamine in the USA. There follows a summary of Takamine's life to 1890. In his travels in the U.S. Takamine learned how the brewers and distillers there "used malt to hydrolyze grains into sugar so they could be fermented into alcohol. He realized that Japanese *koji* was much more active than malt for the hydrolysis of grains. He studied the production of 'diastase' (amylolytic [starch splitting] enzymes) by the *koji* mold *Aspergillus oryzae* when he returned to Japan. The results convinced him that replacing malt with *koji* enzymes would be a great improvement in the manufacture of whiskey." In 1890, with the help of his wife's parents, Takamine made the fateful decision to move his family to the USA and to start the Takamine Ferment Company in Peoria, Illinois, to produce diastase for a local distillery company. The initial results were very promising.

"However, Takamine's apparent success presented an unwelcome threat to the malt producers in Peoria. They incited local xenophobia [fear and hatred of strangers or foreigners or of anything that is strange or foreign]. One night in 1894 the distillery in which his experiments were being conducted was burned down." Note 1. There is no evidence that he ever sold any of his purified enzymes in Peoria. [Three years later] "He moved his family to Chicago, where he continued to promote his diastase preparation. Fortunately, by this time, he had obtained a patent (U.S. 525,820) on the use of his diastase as a cure for dyspepsia."

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Parke, Davis & Co. (Michigan) agreed to make and market the product under the brand name Takadiastase. In 1897 he moved his family and research laboratory to New York City. Address: Goodwin House, 4800 Fillmore Ave., Alexandria, Virginia 22311.

10952. Kikkoman International Inc. 2002. Se habla soy sauce! (Ad). *Food Product Design* 11(10):77. Jan.
• ***Summary:*** A large color photo shows a tortilla wrapped around a mixture of meat and vegetables on a plate. On the tortilla is branded: "Kikkoman naturally brewed soy sauce." The text reads: "There's big news in flavor enhancement, amigo. From fajitas to fish sticks, manufacturers are discovering a surprising natural flavor enhancement solution: Kikkoman Soy Sauce. That's because Kikkoman's naturally occurring amino acids actually intensify the flavors of other ingredients. Naturally brewed and aged for full flavor, Kikkoman is available in every form for every function, from liquid to dry, reduced sodium to preservative free and even clear–the widest selection of any company in the world. So when you think soy sauce, don't just think Asian. Because no matter what cuisine you're working on, Kikkoman speaks your language. Naturally." Address: San Francisco, California. Phone: 415-956-7750.

10953. Grimes, William. 2002. Diner's journal. *New York Times.* March 15. p. E43.
• ***Summary:*** This is a review of the Japanese restaurant Kai (822 Madison Ave., at 69th St.). The name refers to kaiseki, the elegant tea ceremony cuisine. "The two main courses include tilefish wrapped in yuba, or soy-milk skin, and accented with mitsuba, a chervil-like herb. The sauce is a seafood broth..."

10954. MicroSoy Corporation. 2002. MicroSoy Flakes. Exceeding expectations (Leaflet). Jefferson, Iowa. 8 panels. Each panel 28 x 21 cm.
• ***Summary:*** See next 2 pages. Leaflet sent by Patricia Smith from Natural Products Expo West at Anaheim. 2002. March. Contents: The key benefits of MicroSoy Flakes. Microsoy Flakes product types. Microsoy Flakes unique fat reduction capabilities. Controlling lipoxygenase and "beany" flavor in soy foods and beverages. Verification of Microsoy Flakes quality and safety. Microsoy Flakes: What you should know about processing. The top ten features of Microsoy Flakes. About our company.

"MicroSoy Corporation, formerly known as MYCAL Corporation of America, was formed in 1984. MYCAL Corporation of America was a wholly owned subsidiary of the MYCAL Group based in Osaka, Japan. The company was acquired in March 2002 by a group of U.S. investors led by Itaru (Terry) Tanaka former General Manager of MYCAL Corporation of America.

"MicroSoy Corporation produces MicroSoy Flakes within the heart of the largest and finest soybean-producing region of the world, Jefferson, Iowa. The company has been producing its proprietary MicroSoy Flakes in Jefferson since 1991, providing the unique soy ingredient for nutritious, wholesome and great-tasting food products to millions of people, primarily in Japan. With the growing popularity of soymilk, soy beverages, tofu, soy yogurt, soy cheeses, soy frozen desserts (ice creams) and other soy foods in the western hemisphere, MicroSoy is focusing on servicing and growing with the expanding global demand." Address: 300 East MicroSoy Drive, Jefferson, Iowa 50129. Phone: 515-386-2100.

10955. Asimov, Eric. 2002. $25 and under: Japanese noodles make you forget sushi. *New York Times.* April 10. p. F10.
• ***Summary:*** This is a review of the Japanese restaurant Onyi (330 Avenue of the Americas, near West Forth St., Greenwich Village–in downtown {southern} Manhattan in New York City). Menchanko means foods mixed together in one huge bowl. "The oyster Menchanko ($12.50), a miso broth with ramen noodles, is thick with fat, tender oysters, chunks of tofu, vegetables and billowy sheets of soy-milk skin [yuba] that look like handkerchiefs but are soft as bean curd."

"The already spicy miso Menchanko ($9.75) is... crammed with shrimp. chicken and balls of salmon along with tofu, soy-milk skin and vegetables."

After 5 p.m. you can supplement noodle dishes with "simple edamame ($3.75), boiled green soybeans that are the Japanese equivalent of salted peanuts, to complex yuba chakin ($6.75), crisp tofu [sic, yuba] purses stuffed with vegetables and crab meat."

Note: The word "Oni" means devil in Japanese.

10956. Vaidya, Achutananda. 2002. Re: Answers to questions on soyfoods in Nepal. Letter to William Shurtleff at Soyfoods Center, April 12. 3 p.
• ***Summary:*** On 19 Jan. 1993 William Shurtleff, founder of Soyfoods Center, wrote Mr. Vaidya a series of questions based Mr. Vaidya's last letter. Mr. Vaidya and his uncle seem to be the first people to make tofu in Nepal, so details of their work are very interesting from an historical point of view.

"First, questions about the work of your uncle, Raghubir Baidya. (1) Did he ever sell any of his tofu? Even a few cakes? He Must have sold a few cakes if he tried for several months?" Answer: "First he made Tofu for his own consumption only." He did not sell that tofu. At that time none of the Nepali people understood what tofu was, so he had no idea of selling it.

(2) "At what address did he make his tofu at his residence in Kathmandu?" Ans: The address of his residence in Kathmandu was Tripureswar, Kathmandu, Nepal. Now his family address has changed.

(3) "Did your uncle ever mention that tofu was made

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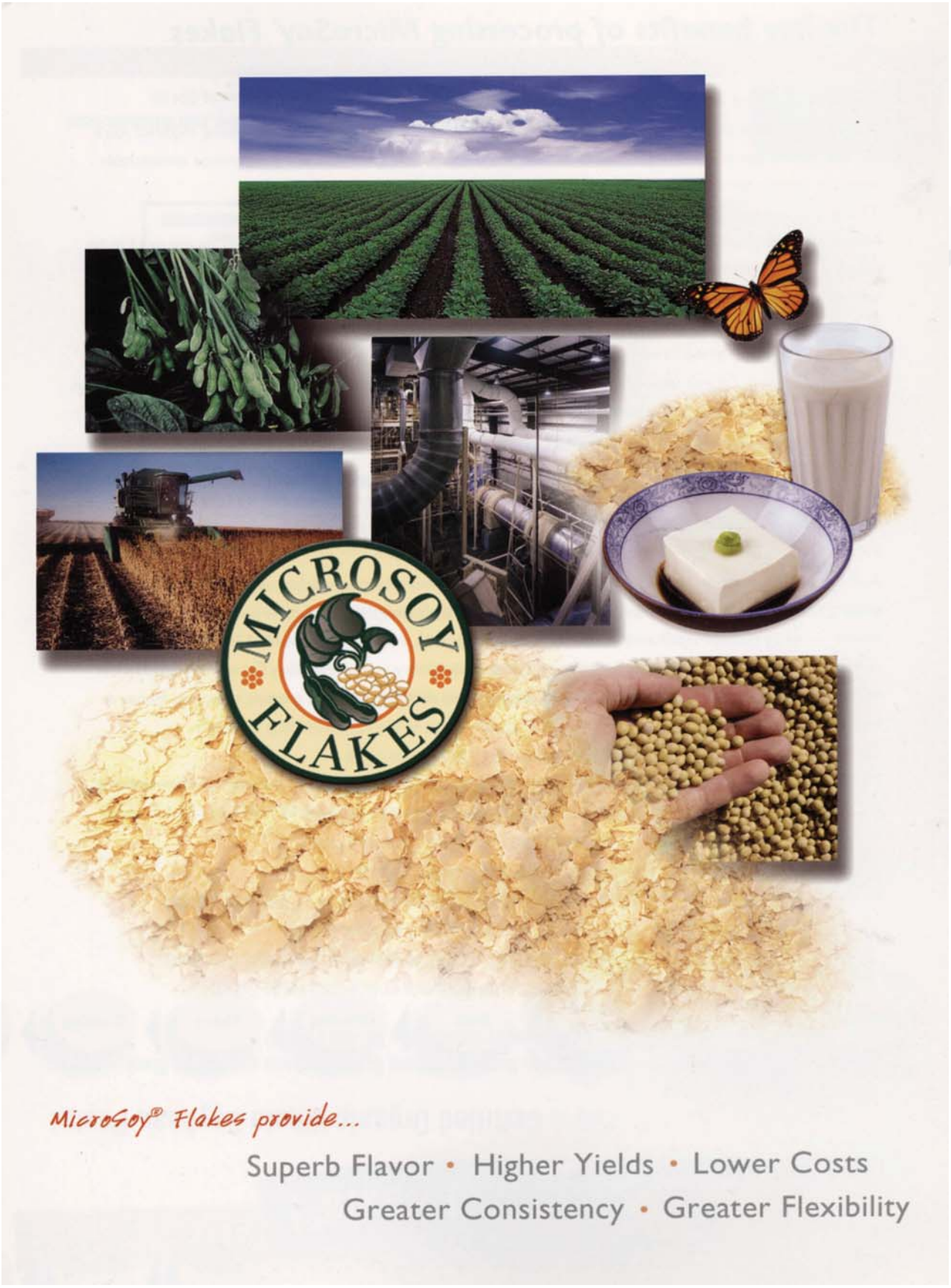

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commercially (= for sale) in Tibet? Have you ever heard that it is?" Ans: "No I never heard my uncle mentioning that Tofu was made commercially in Tibet. He had no idea about it." I heard he had only one Tibetan friend.

(4) "You said he started making tofu for 'domestic consumption.' Does that mean he made it, free of charge (of course) for members of his immediate family? How did they cook and serve it (what kind of recipes?). Did he also give it to members of his extended family such as brothers, nephews? Did you ever taste it? What did you think of it? How was it prepared when you tasted it?" Ans: Yes, at first when he started making Tofu he made it free of charge for members of his family. At first Tofu is fried in oil. And then it is used with vegetables as a delicious food," like pickles etc. "Yes he gave it to his extended family members. Yes, I've tasted it. I think Tofu is an excellent food for helping to solve world food crisis because it is a high quality nutrition food and the cost is very low. I tested it; I thought it was like a vegetable." I studied your book, *The Book of Tofu.*

(4a). "How often did you watch your uncle making tofu?" Ans: "Sometimes I watched him making tofu."

(5) "Did he do a special demonstration just for you to teach you the process or did you just watch him while he was making tofu as usual?" Ans: "He never did a special demonstration to teach me but I learned by watching him as usual."

"My uncle was not interested in Tofu because the Nepalese people were not interested because it was a new product for them." The Nepalese concept of the soybean is that it is very cheap and used only by low-class people. "But I was very interested because it was of high quality nutrition and the cost was very low.

"At first no one knew that Tofu was soybean cakes. My uncle's family also didn't know it. They just called it using the Nepali words *Bhatamass Ko Paneer."* But when my friend Mr. Akifumi Nakamura came to Nepal from Kobe, Japan, in 1972, he suggested to me that I call this product Tofu. "Mr. Nakamura was the one who saw my interest in Tofu and taught me to make tofu. He came to Nepal in 1972" to work with Japan Overseas Cooperation Volunteers (JOCV) for two years. He worked at the Central Food Research Laboratory in Kathmandu. During this time he taught me to make Tofu during his after office hours. Then I learned how to make tofu. I started making tofu commercially in Dec. 1974, first at my own residence to keep my expenses low. I started by selling it to small shops and many other places. Then I developed recipes and sold it to even more people. And slowly the people of my country came to understand it as well. At times Mr. Nakamura would help me and we imported some machines from Japan. Then I started commercially.

"Now I want to ask about your company, Nepal Soya Industries. I think you were a pioneer in Nepal not only with tofu, but also with other soyfoods! (7) In what month and year did you start to SELL each of the following soyfoods commercially in Nepal. And approximately what percentage of your total sales does each account for now? Ans: (7a) Shree Akita Miso = Akadashi Miso. Started Oct. 1986. I made miso and sold it in Japanese hotels and restaurants. Even now no Nepalese people know about miso. It accounted for 15% of total sales. Now it is named Akita Miso.

(7b) Soya sauce. Started in March 1982. When I started to make soy sauce nobody knew what it was. Nowadays some people in the cities know about it. And also some local restaurants used soya sauce. It accounted for about 25% of total sales.

(7c) Dry Tofu. I tried making it but never sold it commercially because there was no interest.

(7d) Soya Milk. At first the Nepalese people had not heard of soya milk, but after a few years one International company started it. They named it Indreni Soyamilk. But after some years they stopped selling it. (7e) Soya Curd. I started making it in 1985. It is a part of Yogurt we used. It is sold commercially. But now lots of dairy companies make it commercially, so I stopped producing it. During the period 1985-1990 it accounted for about 10% of sales.

(7f) Vita Tofu. It started making it Dec. 1974. I stopped making it during 1983-185 because at that time I went to Japan and could not manage my factory. My children could not do the work for me. From 1986 to 2000 we again made Vita Tofu, but last year our country had a crisis–the Royal Family accident. Nowadays Maoists are attacking most parts of our country. And now the Nepalese Government has issued an Emergency. Because of this, tourists have stopped visiting Nepal. My business fully depends on tourists. So last year I had to stop making tofu. It once accounted for 40%. "I am interested in working with soyfoods in any country. If

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you will arrange it I am always ready for it."

(8) "Please circle each product for which you were the first person in Nepal to make that product commercially." Ans: He is not sure, so he circles only Tofu in 1974.

(9) "Are you making all these products commercially now? Are you making any others? Is making soyfoods your main source of income now?" Ans: Nowadays I produce it on a very small scale and this is my main source of income. But now I am retired from my job also [on 15 March 2001 at the Central Food Research Laboratory in Kathmandu and as a food inspector].

(13) "You said that in Japan you learned to make moyashi. Were these soybean sprouts or sprouts from other kinds of seeds?" Ans: They were not soybean sprouts but rather sprouts from some kind of black seeds [probably black mappe].

Mr. Vaidya attaches his business card and a 2-page curriculum vitae with a portrait photo attached. He was born on 28 Dec. 1947. Address: Founder and owner, Nepal Soya Industries, 9/374 Bhedashing, Jamaguthi, Kathmandu, Nepal.

10957. Greendale, Gail A.; FitzGerald, Gordon; Huang, M.H.; Sternfeld, B.; Gold, E.; Seeman, T.; Sherman, S.; Sowers, M. 2002. Dietary soy isoflavones and bone mineral density: results from the study of women's health across the nation. *American J. of Epidemiology* 155(8):746-54. April 15. [39 ref]

• ***Summary:*** "Japanese and Chinese women are about half as likely as Caucasian women to experience a hip fracture." Understanding the reasons for this striking difference could lead to new strategies for treating or preventing this condition.

"Isoflavones are naturally occurring selective estrogen receptor modulators, with potential bone protective effects. To study the relation between soy isoflavone intake and bone mineral density (BMD), the authors analyzed baseline data from the Study of Women's Health Across the Nation, a US community-based cohort study of women aged 42-52 years. Their 1996-1997 analysis included African-American (n = 497), Caucasian (n = 1,003), Chinese (n = 200), and Japanese (n = 227) participants." Address: 1. Div. of Geriatrics, School of Medicine, Univ. of California, Los Angeles, CA.

10958. Smith, Patricia J. 2002. Macrobiotic Company of America (MCOA, Asheville, North Carolina) is no longer in business. Bruce Macdonald is importing all of Mitoku's products to the USA (Interview). *SoyaScan Notes.* April 19. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Patricia has heard from reliable sources that after MCOA ceased its operations, Norio Kushi left the company. Bruce Macdonald and his daughter, Crystal, both live in Asheville and run Bruce's company.

Patricia recently visited South River Miso Company where she visited with Christian Elwell, Robin Cole, Megan Calogeras, and Charles Kendall–who is still making natto, amazake, and mochi. Address: Radical Food, P.O. Box 952, Mill Valley, California 94942-0952.

10959. Grimes, William. 2002. Restaurants: A Japanese-French hybrid, in little bites. *New York Times.* April 24. p. F8.

• ***Summary:*** This is a review of the Japanese restaurant Kai (822 Madison Ave., at 69th St.). "Kai is short for kaiseki, the traditional meal of refined little bites [*deai*] that grew up around the tea ceremony." At Kai, the food is modernized kaiseki, and the commitment to presentation and style is total. It is a feast for the eyes–and a bold experiment.

The executive chef, Hitoshi Kagawa, has grafted French ideas onto kaiseki cuisine with an elegant hand. "In a Japanese response to cooking en papillote [using edible oiled paper], he has wrapped tilefish in a soy-milk skin [yuba] that, miraculously, quivers but does not break."

10960. Steinkraus, Keith H. 2002. Fermentations in world food processing. *Comprehensive Reviews in World Food Science and Food Safety* 1(1):23-32. April. [96 ref]

• ***Summary:*** The section titled "Alkaline fermentations" (p. 28) states that highly alkaline fermentations are generally safe. These include *dawadawa* in Nigeria, *soumbara* in the Ivory Coast, and *iru* in West Africa–each made by fermentation of the soaked and cooked seeds of the African locust bean tree (*Parkia biglobosa*). This is a bacterial fermentation; the bacteria belong to the genus *Bacillus,* typically *Bacillus subtilis.* No inoculum is used.

Soybeans can be substituted for the locust beans.

Protein-rich alkaline fermentations also include several based traditionally on soybeans; natto from Japan, thua-nao from northern Thailand, and kinema from Nepal and environs. In each food, the essential microorganism is *Bacillus subtilis* and related bacilli. The enzymes produced are highly proteolytic; the proteins in the substrate are hydrolyzed to peptides and amino acids. Ammonia is released and the pH rapidly rises to 8.0 or higher. The combination of high pH and free ammonia plus the rapid growth of the essential microorganisms at relatively high temperatures (above 40ºC) make it difficult for spoilage microorganisms to grow. Therefore the products are quite stable and well-preserved. They are safe to eat even when made in an unhygienic environment.

The section titled "High salt savory flavored amino / peptide sauces and pastes" (p. 28) discusses sauces and pastes including Chinese soy sauce, Japanese shoyu and miso, Indonesian kecap, Korean kanjang, Taiwanese inyu, and Filipino taosi.

"The ancient discovery of how to transform bland vegetable protein into meat-flavored amino acid / peptide sauces and pastes was an outstanding human accomplishment." Address: Prof. Emeritus, Microbiology

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and Food Science, Cornell Univ., Ithaca, New York 14853.

10961. **Product Name:** [Summertime Edamamé Snack (Chips)].
Foreign Name: Natsu no Edamamé Sunakku.
Manufacturer's Name: Kameda Seika K.K.
Manufacturer's Address: Danchi 3-1-1, Kameda-Kogyo, Kameda-cho, Nakaurahara-gun, Niigata-ken, Japan 950-0198. Phone: 025-382-8880.
Date of Introduction: 2002 May.
Ingredients: Wheat flour, edamamé (soybeans), vegetable oil, green peas powder, salt, chicken extract powder, etc.
Wt/Vol., Packaging, Price: 55 gm foil pouch.
How Stored: Shelf stable.
New Product–Documentation: Product with Label brought from Japan by Tak Kimura. 2002. June 14. 7 by 9 inch foil pouch. Green, red, white, blue and tan on white. On the front panel are two color photos. On the top half is a shallow bamboo basket filled with bright green edamamé (in the pods). On the bottom half are the many light-green rectangular chips sold in the bag. Soyfoods Center taste test. 2002. July 15. Excellent texture and flavor. A creative product.

10962. Willems, Nadine. 2002. Tofu: The taste of a hundred things. *Winds* (*JAL Group–Japan Airlines*) 22(12):19-25. May. [1 ref]
• ***Summary:*** "As versatile as eggs or potatoes, but far better for you, tofu–or bean curd–left the specialist health stores in the West long ago and is now a familiar sight on the menus of fashionable restaurants." Starts with a description of making tofu at 5:00 a.m. one morning at Futaba tofu shop in Tokyo's downtown Ningyocho area. A one-page sidebar discusses the *Tofu Hyakuchin* (One Hundred Tofu Delicacies), published in Osaka in 1782 during "The Golden Age of Tofu."

Superb color photos show: (1) A Yokohama tofu maker at work early one morning. (2) Soymilk being poured into a wooden forming box to make silken tofu. (3) Dried yellow soybeans with a wooden measuring box (*masu*). (4) Freshly made silken tofu being cut away from the sides of a forming box. (5) Large block of tofu, held with one hand, being sliced into cakes under cold water. (6) Deep-fried tofu (Ganmodoki and aburage) draining on a bamboo mat (*sudare*). (7) Many tofu dishes served at Ume no Hana chain restaurant. (8) Tofu dengaku. (9) A cake of tofu being held out in one hand.

10963. Corcoran, David. 2002. Restaurants: The sushi belt. A Japanese restaurant is reborn as it installs automated service. *New York Times.* June 9. p. NJ20.
• ***Summary:*** This is another review of East Japanese Restaurant (1405 Teaneck Rd., Teaneck, New Jersey). East has installed a kaiten-zushi revolving conveyor belt that carries pieces of sushi around the sushi bar. On it the "chefs continually place little plates of fresh sushi, to which the diners help themselves. The color of the plate indicates the price; at the end of the meal the waiter adds it all up."

The idea was invented in Osaka in the late 1950s; it has transformed this sushi bar from a calm, relaxed, mediocre place to one that "throbs with hyperkinetic urban intensity" and an "impulse-buying spirit."

"That bean-and-scallion roll on the white dish, driving up on the left? Go for it! It's only a dollar. It turns out to be a natto roll: sticky soybeans that leave a viscous trail when you pick them up; they are bland, chewy and faintly bittersweet.

"In truth, I'd place natto roll in the 'interesting' category. I'm glad I tried it, but I didn't feel I needed to finish it." As the carousel turns.

10964. *Bluebook Update* (*Bar Harbor, Maine*). 2002. Soymilk plant opens in Guatemala: MicroSoy Flakes fuel new project. 9(2):1, 7. April/June.
• ***Summary:*** Leyenda, S.A., a new plant making soymilk and soyfoods in Villa Nueva, Guatemala, now makes Soy! Soyaleche, according the president Alejandro Barrios. The plant opened in Nov. 2001. With the capacity to produce 40,000 liters/day, Leyenda uses processing equipment from Perfecta Curitiba of Brazil and non-GMO MicroSoy Flakes from MicroSoy Corporation of Jefferson, Iowa. A photo shows Barrios holding two large glass beakers of his soymilk; That made from MicroSoy Flakes is whiter than that made from whole soybeans.

10965. Miyazaki, Koji; Hanamizu, Tomoko; Iizuka, R.; Chiba, K. 2002. Genistein and daidzein stimulate hyaluronic acid production in transformed human keratinocyte culture and hairless mouse skin. *Skin Pharmacology and Applied Skin Physiology* 15(3):175-83. May/June. *
Address: Yakult Central Inst. for Microbiological Research, Kunitachi, Tokyo, Japan.

10966. Ohara, M.; Lu, H.; Shiraki, K.; Ishimura, Y.; Uesaka, T.; Katoh, O.; Watanabe, H. 2002. Inhibition by long-term fermented miso of induction of gastric tumors by N-methyl-N'-nitro-N-nitrosoguanidine in CD (SD) rats. *Oncology Reports* 9(3):613-16.May/June. *
• ***Summary:*** Can consumption of miso affect gastric tumors. N-methyl- N'-nitro- N-nitrosoguanidine is abbreviated MNNG. A total of 120 rats, 6 weeks of age, were divided into 6 groups and given MNNG (100 ppm) in the drinking water for 16 weeks. Starting 1 week before the carcinogen treatment the rats were fed a normal control modified-fat (MF) solid diet, or the same diet containing 10% long-term fermented, medium- or short-term fermented miso, or 1% NaCl until the end of the MNNG exposure period. They were then maintained on the MF control diet and normal tap water until the autopsy time point at 52 weeks. The long-term fermented miso significantly reduced the size of the gastric

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tumors as compared with the other groups. The present results thus indicate that dietary supplementation with long-term fermented miso could act as a chemopreventive agent for gastric carcinogenesis.

10967. *Yomiuri Shinbun* (*Yomiuri Daily News, Tokyo*). 2002. [Edamame: From growers direct to consumers]. July 22. p. 14. [Jap]
• ***Summary:*** Three color photos show farmers harvesting edamame, first in August, then September, and finally October. A fourth shows the emerald green edamame ready to eat on a bamboo basket. These edamame can be ordered through the newspaper at http://shop.yomiuri.co.jp. 1 kg fresh sells for about $32.50.

10968. Friedrich, Kristin. 2002. Soy you like tofu? Little Tokyo festival celebrates the miracle bean. *L.A. Downtown News* (*Los Angeles*). Aug. 5. p. 16.
• ***Summary:*** The festival, part of Nisei Week festivities, will be held on San Pedro between Second and Third Streets in Little Tokyo. General admission is $2, and food prices range for $1-$4 per serving. See www.tofufest.org or www.niseiweek.org.

10969. Severson, Kim. 2002. Global food fight? Why, soytainly! Battle brews over sauce labeling. *San Francisco Chronicle*. Aug. 25. p. 1, A21.
• ***Summary:*** The debate concerns classification of soy sauces made by different methods under the rules of the Codex Alimentarius Commission, the powerful regulator of international food trade, which was created in 1962 by two organizations of the United Nations. The Commission sets standards for foods that are imported and exported. Starting September 23, the Codex committee in charge of soy sauce will meet in San Antonio, Texas.

The debate began several years ago when Japanese officials proposed that only "naturally brewed" [fermented] products be allowed to use the term "soy sauce" in international trade. Products made using the quicker hydrolyzed vegetable protein nonbrewed method would have to use another name. The International Hydrolyzed Vegetable Protein Council dislikes the proposal; they believe the standard is discriminatory. *Food Chemical News,* a trade publication, has strong views on the subject. The stakes are high since Americans consume almost 3 cups of soy sauce a year.

Leaders of Slow Food, an international organization with 60,000 members dedicated to preservation of natural food products and methods, say the debate is about consumer rights. They believe only brewed soy sauce should have the right to use that name.

However, 30 years ago nonbrewed soy sauce was America's favorite, led by the La Choy and Chun King brands. Then in 1973 Kikkoman entered the picture with a brewed soy sauce. Today La Choy and Chun King are owned by ConAgra Foods, and are much less popular than Kikkoman.

A sidebar titled "Tasters find brewed is best" explains how the Chronicle's food staff compared the taste of Chun King (nonbrewed) and Kikkoman (brewed). Kikkoman won. Address: Staff writer.

10970. Aoki, Hisa; Otaka, Y.; Igarashi, K.; Takenaka, A. 2002. Soy protein reduces paraquat-induced oxidative stress in rats. *J. of Nutrition* 132(8):2258-62. Aug. [32 ref] Address: Dep. of Bioresource Engineering, Faculty of Agriculture, Yamagata Univ., Yamagata, Japan.

10971. Kikkoman Corporation. 2002. Annual report 2002. Year ended March 31, 2002. 250 Noda, Noda-shi, Chiba 278-8601, Japan. 30 p. 28 cm. [Eng]
• ***Summary:*** Kikkoman has changed its fiscal year end from Dec. 21 to March 31. April 2001. It is disappointing that so little information about the company's performance and activities is given compared with previous years. Sales and profits were about the same as for the year ended 31 Dec. 2000. As in previous years, growth in overseas sales and profits was much larger than their Japanese counterparts. Address: Noda, Japan.

10972. Golbitz, Peter. 2002. Japanese soyfoods: Looking back to the future. *Bluebook Update* (*Bar Harbor, Maine*) 9(3):4-5. July/Sept.
• ***Summary:*** A photo shows Peter Golbitz.

10973. *Iowa Soybean Review* (*Iowa Soybean Association, Urbandale, Iowa*). 2002. ISU keeps consumer in mind when developing food-grade soybeans. 13(8):17. Summer.
• ***Summary:*** Dr. Walter Fehr, distinguished professor of agriculture at Iowa State University (ISU) and head of the university's breeding program, has as his motto: "The consumer is always right." The university's involvement in breeding soybean varieties for food uses has been driven by the Asian market. In 1978 ISU developed a variety named Vinton; after 20 years it remains the standard of quality in the Japanese tofu industry.

In 1979 Fehr took his first trip to Japan to understand that market. Since that time he has worked closely with Asian food manufacturers and buyers. ISU has also developed large-seeded soybeans tailor-made for miso, vegetable soybeans (edamame), lipoxygenase-free soybeans with no "beany flavor," soybeans with reduced saturated fat content to eliminate the need for partial hydrogenation, varieties that are low in phytate to reduce the amount of phosphorus in animal waste.

10974. Morinaga Nutritional Foods, Inc. 2002. Powered by soy (Ad). *Vegetarian Times.* Oct. p. 31.

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• ***Summary:*** A full-page color ad. In the top half of the ad, a large photo shows two young women walking briskly for exercise. Below that is the ad title. The ad is for Mori-Nu Creamy Soy Soup, which is available in three flavors (tomato, butternut squash, and corn) and two sizes (1 quart and 11 oz). The text concludes: "Rev up your day with a kick of soy." Address: 2150 W. 190th St., Suite 110, Torrance, CA 90504.

10975. *SoyaScan Notes.* 2002. Growth habit of the soybean: Viny vs. erect, the wild annual soybean, and its wild perennial ancestors (Overview). Nov. 18. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** The ancestors of the cultivated soybean (all wild perennial *Glycine* species) were all very viny, twining, and procumbent in growth habit (having stems that trail along the ground), with very small black seeds. The wild soybean (*Glycine soja*), which is an annual, is also viny, twining and procumbent with small black seeds that shatter terribly; it is intermediate between the wild perennial soybeans and the domesticated soybean (*Glycine max*). Because of this ancestry, most of the world's early domesticated soybeans were of viny growth habit and had black seeds. Thus, it would not be surprising to find a viny soybean in a farmer's garden in Ming dynasty, China. If it were a wild soybean (*Glycine soja*), it would probably reseed itself each year; the farmer would simply tend it. If it were a domesticated soybean (*Glycine max*), it would probably have larger seeds than its wild relative and might be erect, since farmers over many generations selected for large seed size and erectness; however, the growth habit might still be viny.

A small percentage of the early soybean varieties grown in the United States were viny–like cowpeas. The vines were either cut and used as forage for livestock, or left uncut and used as pasture (including hogging off). These viny soybeans, when interplanted with corn, would often climb up the corn plant to the top. Soybean varieties adapted to Southern U.S. daylengths but grown in the north, would continue to grow–in a viny way–until they were killed by the cold.

In 1910 Piper & Morse (in "The soy bean: History, varieties, and field studies." *USDA Bureau of Plant Industry, Bulletin* No. 197) classified all 285 soybean varieties introduced to the USA to date. The major grouping (p. 37-39) was by habit of growth: (1) Plants bushy, the branches without tendency to twine, the terminals rarely elongated: 202 introductions or 71% of the total. (2) Plants more or less twining, especially the long slender terminals: 83 introductions or 29% of the total. Of this latter twining group there were two subgroups: (2a) Plants erect or suberect, slender, the internodes long; pods medium to small: 76 or 26.7% of the total. (2b) Plants procumbent, rather coarse; pods small; very late: 7 varieties or 2.4% of the total. Of these 7 varieties, none had a name. Four were from India, and one each from Soochow (southeast China), Taihoku (Formosa), and Tokyo (Japan; a wild soybean from the Botanical Garden).

Thus by 1910 Asian farmers had been quite successful in selecting for erect habit of growth (and large seed size).

In 1923 Piper and Morse (in their classic book *The Soybean,* p. 162-70) described the main characteristics of the 43 varieties "that have been found agriculturally the most valuable under American conditions up to 1922." A tabulation of the growth habit of the plants shows the following: Erect and stout (and usually bushy): 34

Erect and slender: 7 (Laredo, Minsoy, Otootan, Peking, Virginia, Wilson, and Wilson-Five).

Semi-erect with twining terminals: 1 (Chiquita). Rather inclined to lodge (fall over) in rich soil: 1 (Barchet).

In summary: 80% were bushy and stout (like most modern varieties), and 95% were erect. None were described as "viny," "vining," "twining," or "procumbent."

The advent of the use of the combine (combined harvester-thresher) to harvest soybean seeds in about 1924 created a new incentive for breeders to develop plants with upright, stout, and bushy growth habit.

However in the USA most soybeans continued to be used as forage, until 1941 when the number of acres planted for seed first surpassed the number of acres planted for forage. Address: Prof. of Plant Genetics, Dep. of Crop Sciences, Univ. of Illinois, Urbana, Illinois.

10976. Kadokura, Tania. 2002. Sumo stew: Japan's famed wrestlers have been bulking up on chanko-nabe, a hearty, protein-rich one-pot meal, for more than a century. *Saveur* (*New York, NY*) No. 62. p. 68-75. Nov.
• ***Summary:*** Ingredients include tofu and miso. Contains recipes and color photos of sumo wrestlers and chanko-nabe. Address: Tokyo-based cooking teacher.

10977. Kadokura, Tania. 2002. In the *Saveur* kitchen: The beef behind sukiyaki. *Saveur* (*New York, NY*) No. 62. p. 89. Nov.
• ***Summary:*** Sukiyaki is thin slices of meat or seafood with tofu and vegetables, simmered in a sweetened soy sauce base; it is Japan's best-known nabe. Contains a recipe and color photo. Address: Tokyo-based cooking teacher.

10978. *SoyaScan Notes.* 2002. Chronology of major soy-related events and trends during 2002 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan. 1–The Kerry Group (of Wisconsin and Iowa) creates Nutriant as its new nutritional division; into Nutriant it merges Solnuts and Iowa Soy Specialties, LLC.

March–Proceedings of the Fourth International Symposium on the Role of Soy in Preventing and Treating Chronic Disease held at San Diego, California, published as a supplement to the *Journal of Nutrition,* 132(3):545S-619S.

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General chairpersons and Supplement editors: Stephen Barnes and Mark Messina.

March–A new tofu plant owned by Sunrise Soya Foods of Vancouver, starts operation in Toronto, Canada. This is the company's first plant in eastern Canada.

March 15–Minnesota becomes the first U.S. state to pass legislation requiring diesel fuels sold in their state to contain a 2% blend of biodiesel (B2). By 1 July 2002 nearly every gallon of diesel fuel sold in Minnesota must contain a 2% blend of biodiesel.

May 8–Dean Foods announces that it has signed a definitive agreement to acquire the 64% equity interest in White Wave, Inc. it does not currently own. The price of this 64% was approximately $189 million, bringing Dean's total investment to approximately $204 million. White Wave had total sales of approximately $125 million during the 12 months ending 31 March 2002.

May (late)–Central Soya Co. acquires CanAmera, Canada's largest producer of edible oil products. Central Soya had owned 50% of CanAmera since it was established in 1992.

July 22–Bunge Ltd., North America's leading soybean processor, announces an agreement to acquire a majority stake in Cereol S.A., the Paris-based parent of Central Soya Co., headquartered in Fort Wayne, Indiana.

Aug. 13. Pharmacia spins-off Monsanto; as a result, Pharmacia no longer owns any equity interest in Monsanto. During fiscal 2002 Monsanto suffered huge financial losses. Net income showed a *loss* of $1,693 million–down dramatically from +$295 million in 2001.

Oct. 1–Bunge acquires Cereol S.A. (based in Paris), which includes Central Soya (a U.S. soybean processing pioneer and leading manufacturer of soy protein concentrates and soy lecithins) and CanAmera Foods (in Canada).

Oct. 4–Mr. Shoan Yamauchi, the most important tofu pioneer in the United States and Hawaii, dies in Torrance, California. He began making tofu in Hawaii in 1939 at a company that was started in 1923. In 1947 he and his wife came to Los Angeles, where in late 1947 they purchased the Hinode Tofu Co. at 6th St. and Towne Ave. This company, which is now named House Foods America Corporation (still in Los Angeles), is the oldest existing Japanese-American tofu manufacturer in the United States.

Oct. 21–The National Organic Standards take effect.

Sept. (late)–U.S. Food & Agribusiness Exhibition in Havana, Cuba. Some 290 U.S. companies take the rare opportunity to present their products to over 16,000 visitors.

Nov. 14–Biodegradable hydraulic fluid made from soy oil is first used in the elevator inside the Statue of Liberty. Its advantages over the petroleum-based oils previously used are its environmental friendliness and improved safety–says the National Park Service and USDA.

Dec.–Hain-Celestial buys Imagine Foods (maker of Soy Dream and Rice Dream) for $52 million. Imagine has annual sales of about $70 million.

10979. Belleme, John. 2002. Mitoku–Japan's natural foods pioneer. *Macrobiotics Today* (*Oroville, California*) 42(6):22-25. Nov/Dec.
• ***Summary:*** A good history of Akiyoshi Kazama and the company he founded, Mitoku. With photos. Address: Saluda, North Carolina.

10980. *Canadian Soybean Bulletin* (*OSG, Chatham, Ontario, Canada*). 2002. Canadian soybean exports. Winter. p. 2.
• ***Summary:*** A large table shows statistics in tonnes (metric tons) of soybeans exported to various countries, and regions, each year from 1998/99 to 2001/2002. The countries are: In Asia–China, Hong Kong, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, and Thailand. In Western Europe–Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Portugal, and Spain. By continent–Africa, Central America, Eastern Europe, Middle East, Oceania, South America, and United States.

In 2001/2002 the countries to which the largest amount of Canadian soybean exports went were (in tonnes): Japan 126,619, Malaysia 101,698, United States 60,244 Germany 29,377, Indonesia 26,836, Hong Kong 22,800.

Total soybean exports have declined dramatically during the past two years, from a peak of 946,360 in 1999/2000, to 746,241 in 2000/2001, down to 471,492 in 2001/2002.

10981. Sebastian, Anthony; Frassetto, L.A.; Sellmeyer, D.E.; Merriam, R.L.; Morris, R.C., Jr. 2002. Estimation of the net acid load of the diet of ancestral preagricultural *Homo sapiens* and their hominid ancestors. *American J. of Clinical Nutrition* 76(6):1308-16. Dec. [61 ref]
• ***Summary:*** Paleolithic diets produced a slightly alkaline condition in the human body; even though animal foods caused an acidic condition, this was more than buffered by plants in the diet. However when cereal grains displaced some fruits and vegetables, the balance tended to shift to a net acid condition. Sebastian believes this is a "profound transition" and has inevitable maladaptations–which may be the cause of many of our modern diseases.

Note: The basic problems with this theory are that: (1) Most human diets throughout the past 10,000 years have been based on cereal grains; (2) The healthiest populations in the world today (Okinawa, Japan, China) eat a grain-based diet. Address: Dep. of Medicine and General Clinical Research Center, Univ. of California, San Francisco.

10982. Yamori, Yukio; Moriguchi, Emilio H.; Teramoto, Takanori; et al. 2002. Soybean isoflavones reduce postmenopausal bone resorption in female Japanese immigrants in Brazil: A ten week study. *J. of the American College of Nutrition* 21(6):560-63. Dec. [20 ref]
• ***Summary:*** Brazilian researchers gave 20 Japanese

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postmenopausal female immigrants either a placebo or 37 mg of isoflavones isolated from the hypocotyl portion of the soybean. The hypocotyl portion of the soybean is high in the isoflavones glycitein and daidzein and is low in genistein. After 10 weeks, the urinary excretion of bone resorption markers in the isoflavone group was significantly decreased, whereas there was no change in the placebo group. Thus, this study suggests isoflavones inhibit bone breakdown. Address: 1. WHO Collaborating Center for Research on Primary Prevention of Cardiovascular Diseases.

10983. Shimizu, A. 2002. [The structural change in the food system of "natto" (fermented soybeans) and correspondence of natto manufacturers]. *J. of Food System Research* (*Tokyo*) 8:13-24. [142 ref]*
Address: Biotechnology Inst. of Natto, Suzuyo Kogyo Co. Ltd. Both: Tokyo, Japan.

10984. Emi, Kazuko. 2002. Japanese cooking: The traditions, techniques, ingredients and recipes. London and New York: Hermes House. 256 p. Illust. (color). Index. 31 cm.
• ***Summary:*** A beautiful book, with many old color woodblock prints and creative color photos. With recipes by Yasuko Fukuoka. Contents: Introduction. The development of Japanese cuisine. Foreign influences. The impact of isolation. Sushi: a national favourite. The tea ceremony. Traditions and festivals. Seasonal and regional foods. Cooking and eating. Equipment and utensils. Utensils for cooking with rice. Cooking at the table. Crockery and cutlery. Drinking vessels. The Japanese kitchen: Rice and rice products,... dried beans (incl. soya beans, boiled soya beans, dried yellow beans, dried green beans, black soya bean, soya bean products, kinako, natto), fresh beans (incl. eda-mame), tofu and tofu products (incl. fresh tofu, okara, silken tofu, koya-dofu, yuba, fried tofu, abura-age, atsu-age, ganmodoki, home-made ganmodoki), gluten products, mushrooms, seaweeds, fish, shellfish, fish roes, fish products, fish pastes, meat and chicken, sauces for flavouring and dipping, ready made sauces,... Japanese cooking (recipes). Glossary. Acknowledgements. Shopping information.

The index mentions: Abura-age (tofu), atsu-age (tofu), azuki beans (incl. *an* {sweet bean paste}), eda-mame, gammodoki, kinako (yellow soya bean flour), koya-dofu, miso, miso soup, shoyu (soy sauce), soya beans, silken tofu, sukiyaki (with tofu), tofu, yuba, vegetarian tempura.

Concerning kinako [roasted whole soy flour]: A photo (p. 65) shows kinako made from soybeans with three different color seedcoats: black, yellow, and green. The kinako made from the black soybeans is the darkest of the three–a medium brown–but not at all black. The kinako made from the yellow soybeans is the lightest of the three–yellowish brown. The kinako made from the green-coated soybeans is intermediate between the other two in darkness–light brown–but with no trace of green in its color. When kinako is mixed with an equal volume of sugar and a pinch of salt, it is rolled in lightly-boiled, soft mochi cakes which make tasty confection. Kinako, which is also used to make *wagashi* (Japanese cakes / confections), is sold at most Japanese grocery stores or supermarkets. Address: Japan.

10985. Hamauchi, Chinami; Sumi, Hiroyuki. 2002. Ketsueki sarasara nattô no soko jikara: kusuri yori kiku oishii nattô ryôri yonjûippin [Helping your blood to flow smoothly: Natto's deep potential power. 41 natto recipes that work better than any medicines]. Tokyo: Takara Jimasha. 96 p. 26 cm. [Jap]*

10986. Imai, Seiichi. 2002. Miso: iro aji ni bure o dasanai gijutsu to hanbai [Miso: The methods of making and selling which control color and taste]. Tokyo: Nosan Gyoson Bunka Kyokai (Agricultural and Fishing Village Cultural Organization). 151 p. 21 cm. Series: Shokuhin Kako Shiirizu, no. 6. [Jap]*
• ***Summary:*** How to make good-quality miso on a commercial scale, and how to market it. Address: Japan.

10987. Kyoto–Kyôtôfu kyôyuba kyômiso: Kyôto de tabeyô. Herushi Kyôto [Kyoto–Kyoto yuba and kyoto miso: Let's eat in Kyoto. Healthy Kyoto]. 2002. Kyoto: Kyoto Shinbun Shuppan Senta. 80 p. 26 cm. [Jap]*
Address: Japan.

10988. Kyô-tôfu kyô-yuba kyô-miso: Kyôto de tabeyô herushii Kyôto [Kyoto's tofu, yuba and miso: Let's eat Kyoto's healthy foods]. 2002. Kyoto: Kyoto Shinbun Shupan Senta. 80 p. 26 cm. [Jap]*
• ***Summary:*** A book promoting soyfoods made in Kyoto. Address: Japan.

10989. Lee, Cherl-Ho; Lee, Sang Sun. 2002. Cereal fermentation by fungi. In: George G. Khachatourians and Dilip K. Arora, eds. 2002. Applied Mycology and Biotechnology. Vol. 2. Agriculture and Food Production. Amsterdam, New York: Elsevier. 428 p. See p. 151-70. [50 ref]
• ***Summary:*** Contents: Summary. Introduction. Fermentation starters: History of solid state fermentation starters in northeast Asia, cereal alcoholic fermentation starters, soybean fermentation starters. Fungal fermented foods: Cereal alcoholic products (rice wine, rice beer, alcoholic rice paste, alcoholic rice seasoning), fermented soybean products (Korean kanjang and doenjang, Japanese shoyu and miso, tempe, Chinese sufu), other fermented products (Chinese red rice {Anka}, enzyme foods). Hygienic aspects of fungal fermented foods: Mycotoxins in fermentation raw materials, mycotoxin formed during fermentation. Conclusion.

Page 162: "... soybean sauce, *kanjang*, and soybean paste, *doenjang*, have been used in Korea for more than 2000

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years and formed the characteristic flavor of Korean cuisine. The term "Shi" [fermented black soybeans], the Chinese letter indicating *meju,* first appears in *Jijiupian* written in the Han period (206 B.C. to 208 A.D.) of China. *Bowuzhi* of Jin (265-420 A.D.) of China describes that *Shi* [fermented black soybeans] originated in a foreign country, and the letter is a dialect. *Xintangshu* of the Tang period (618-807 A.D.) in China names Shi as a special product of Balhai or Bohai (688-826 A.D.), a nation founded by the refugees from defeated Kokuryo (37 B.C. to 668 A.D.).

"It is generally recognized that Koreans were the first to experiment with soybean fermentation, sparking the beginning of the soy sauce culture of the Orient (Lee 2001). Their traditional fermentation technology was so advanced that they taught their techniques to neighboring countries."

Page 162-63: "*Meju* [soybean koji], the fermentation starter for Korean soysauce, *kanjang,* is made from soybean... The ripening of *kanjang* mash in the brine is ended in 1-2 months."

Figures: (12) A combination diagram and flowsheet showing the process of making Korean kanjang and doenjang. Address: 1. Graduate School of Biotechnology, CAFST, Korea Univ., Seoul, 136-701, Korea; 2. Dep. of Biology, Korea National Univ. of Education, Chungbuk, 363-791.

10990. Ling, Kong Foong. 2002. Food of Asia: authentic recipes from China, India, Indonesia, Japan, Singapore, Malaysia, Thailand and Vietnam. Singapore: Periplus. 192 p. Illust. (color photos). Index. 31 cm.
• ***Summary:*** This oversized paperback book, loaded with glossy color photos, is an expanded version of the original 1998 edition. The introduction and essays are by Kong Foong Ling. The index, which is poor, makes the book hard to use if you are looking for particular foods found throughout Asia such as soybeans, soy sauce, miso, salted / fermented black beans, yuba [bean curd skin], etc.

Contents: The flavors of Asia. Ingredients. The Asian kitchen. Burma. China. India. Indonesia. Japan. Korea. Malaysia & Singapore. The Philippines. Sri Lanka. Thailand. Vietnam. Appendix.

The "Ingredients" section (p. 10-17) includes: Bean curd (incl. cotton or momen tofu, silken bean curd, deep-fried bean curd or aburage, grilled bean curd or yakidofu, fermented bean curd or nam yee). Bean curd skin [yuba]. Black beans, salted (and fermented). Hoisin sauce ("A sweet sauce made of soy beans, with spicy and garlicky overtones"). Miso (incl. red miso and white miso). Salted soy beans (incl. "yellow bean sauce"). Soy sauce (incl. light soy sauce, black soy sauce, red soy sauce, Kikkoman, tamari, thick sweet soy sauce (kecap manis–Indonesian)). Tempeh. Also: Red beans (dried azuki). Seaweed (incl. dried kelp, golden kelp, mozuku, salted dried kelp, laver or nori, wakame). Sesame (black and white seeds, tahina {tahini}). Sesame oil. Sesame rice crackers.

Korea (p. 109+). Page 110: There are also many fermented pastes and sauces for dipping, called *chang.* Every restaurant and home has its own formula for making chang. Based on a fermented mash of soy beans, the three most common varieties are *kan chang* (dark and liquid), *daen chang* (thick and pungent), and *gochu chang* (fiery and hot).

Soybean is mentioned on pages 8, 11, 68, 89.

Beancurd or bean curd is mentioned on pages 8, 10, 11, 26, 32, 33, 35, 36, 40-42, 68, 70-71, 74, 89, 90, 92, 93, 94, 96, 100, 102, 104, 107, 111, 112, 113, 119, 120, 127, 133, 158, 172, 175, 185, 189, 190, 191, 192.

Bean curd skin [yuba] is mentioned on pages 11, 35, 36.

Bean paste and bean paste sauces, p. 8, 32.

Fragrant soy sauce is mentioned on page 128.

Also: Red bean paste, p. 46 (canned, azuki).

10991. Machida, Shinobu. 2002. Nattô taizen: aisubeki dentô shokuhin no nazo o toku [The big and complete book of natto: Solve the mystery of the beloved traditional food–natto]. Tokyo: Kadokawa shoten. Illust. [Jap]*
Address: Japan.

10992. Milton, Giles. 2002. Samurai William: The Englishman who opened Japan. London: Hodder & Stoughton. 352 p. Illust. Index. 20 cm. [100+* ref]
• ***Summary:*** In April 1600 William Adams became the first Englishman to set foot in Japan. He was captain of the Dutch ship, the *Liefde,* which had a harrowing 19-month journey westward from Rotterdam (port of departure on 24 June 1598), to the Cape Verde Islands (Praya Island), down the west coast of Africa to Cape Lopez and Annabon, across the Atlantic, through the terrifying Magellan Straits (where they meet winter storms and are attacked by savages), to Mocha (in today's Chile, where many men are slaughtered), westward across the uncharted Pacific Ocean to Hawaii (probably), where 8 men jump ship, to the Bonin Islands (only 24 men are left alive), and finally in desperation to Bungo on the northwest coast of Kyushu at the mouth of the Oita River. Address: England.

10993. Nattô ga deatta aji hito furusato: nattôzuki niwa kotaerarenai jimoto no aji o ikashita nattô reshipi-shû [Natto met taste, people, and homeland: A natto recipe collection that makes good use of local taste, which natto lovers couldn't resist]. 2002. Tokyo: Gakken. 89 p. 26 cm. [Jap]*
Address: Japan.

10994. Sakamoto, Hiroko; Sakamoto, Kana. 2002. Nattô ryôri de genki hyakubai [Our energy and health becomes 100 times stronger with natto cookery]. Tokyo: Soshinsha. 101 p. 21 cm. [Jap]*
Address: Japan.

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10995. Sasaki, Sanmi. 2002. Chado: the way of tea. A Japanese tea master's almanac. Translated from the Japanese *Saijiki* by Shaun McCabe and Iwasaki Satoko. Boston, Massachusetts: Tuttle Publishing, an imprint of Periplus Editions (HK). xli + 742 p. Foreword by Sen Sôshitsu XV. Illust. Index. 24 cm. [Eng; jap]
• ***Summary:*** This book, published originally in 1960 in Japanese, is widely regarded as a classic. And this is a superb translation.

Text in English with captions and quotations in Japanese. One page 78, footnote 14, referring to *kitsune-zushi* states: "Also called *inari-zushi. Kitsune-zushi* is sushi in *abura-age* (deep-fried tôfu) pouches. *Abura-age* is considered to be the favorite food of the fox (*kitsune*)**.**

Tofu is mentioned on 10 pages: In the glossary: Dengaku is tofu coated with sweetened miso and grilled on skewers (p. xxii).

Tofu (soybean curd): The two main types are *momen-dôfu* (cotton-like) and *kinugoshi-dôfu* (silk-like) (p. xxxvii).

In the month of February: Footnote explaining *kitsune-zushi* (p. 78). Koori-dôfu (dried-frozen) is an ingredient in one course (p. 92).

For the month of April: Tofu dengaku (p. 171, 207– served as part of *Kaiseki,* meals for tea / tea ceremony meals). A section titled "Tofu dengaku" (p. 212) explains that this dish is "one of the symbols of spring." Gives details on how to prepare it using skewers of green bamboo and a coating of *ki no me miso.* Kenzan, Oribe and other tea masters have designed containers made exclusively for dengaku. However a lacquer or plain wood container is fine. "Nakamura-rô at Gion, Kyoto, is famous for its dengaku."

For the month of May: kinugoshi-dôfu is an ingredient in a course (p. 262).

For the month of August: Shin-tofu ("New tofu") is made from the first soybeans of the year. A poem by Kikaku states: "Just as we were admiring the fine points of the pottery, *shin-dôfu* was served" (p. 427).

Daizu (soybeans) are a major ingredient for making miso, soy sauce, yuba, tofu, natto, and *mame-ko* (roasted soy flour). "A behind-the-scenes contributor for *kaiseki* (p. 431).

For the month of September: The section on "Ochiayu" explains that *ayu* holds the first place among all the fish for summer. Ochi-ayu, those caught in the autumn, taste good when cooked with tofu, but may not be a good choice for kaiseki (p. 469).

For the month of October: Yu-miso (p. 494), also called *yuzu-miso,* is the subject of a section (p. 524). Yuzu is a green Japanese citrus fruit. The top is cut off, the inside is hollowed out, it is packed with a mixture of miso and sugar then grilled. Only the miso is eaten–filled with the fragrance of yuzu. "It is suitable for vegetarian *mukô.* A second way of making yu-miso is described which can be used for dengaku in April. A poem that mentions yu-miso is included.

For the month of November, broiled tofu and kuro-mame (black soybeans) are mentioned (p. 552).

Kuro-mame [black soybeans] are mentioned on 2 pages (p. 42, 552), miso on 33 pages, soy [sauce] on 35 pages, soybean or roasted soybean flour on 6 pages (Uguisu-mochi, p. 87; warabi-mochi, p. 134; hagi no mochi, p. 460), soybeans on 8 pages. Yuba (p. 621). Natto (p. 71, 621-22). Eda-mame (green soybean, p. 701).

Vegetarian: "During the week of the spring equinox a vegetarian meal in vermillion utensils is expected" (p. 139). *Shôjin* means vegetarian (p. 655). Address: Tea master, Japan.

10996. Smith, Lawrence. 2002. Japanese prints during the allied occupation, 1945-1952: Onchi Kôshirô, Ernst Hacker and the First Thursday Society. Chicago, Illinois: Art Media Resources. 128 p. See p. 20. Illust. (some color). 29 cm. [120* ref]
• ***Summary:*** A book (p. 20) of prints published in 1942 in Japan was titled *Mamenoko Butai.* The word "mamenoko" usually means *kinako* or "roasted soy flour." However it is translated (probably correctly) on page 20 as "The Baby Peas' Detachment."

Note: Chapter 1 (p. 8-12) is "Japan June 1857-1952: A fast track history." Very interesting and creative. Address: Former Keeper of Japanese Antiquities in The British Museum.

10997. Sugimoto, Keiko; Takamizawa, Etsuko. 2002. Ikiiki bijin no nattô reshipi: ketsueki sarasara ohada tsurusuru hone genki [Natto recipes for the beautiful woman: your blood flows smoothly, skin is glowing, and bones are healthy]. Tokyo: Sobokusha. [Jap]*
Address: Japan.

10998. Sugimoto, Takashi; Iwatate, Marcia. 2002. Shunju: new Japanese cuisine. Sensational recipes from Tokyo's most famous restaurant. Singapore: Periplus Editions. 271 p. Foreword by Charlie Trotter. Illust. (chiefly color, by Masano Kawana). Index. 26 x 23 cm.
• ***Summary:*** Contents: Foreword. The Shunju way: The Shunju philosophy (history, architecture, bar, lighting, *zashiki* {dining room floor}, *chashitsu* {tea room}, hospitality {*motenashi*}). The seasonal kitchen. Spring. Summer. Autumn. Winter. Appendixes: Step by step preparation techniques (incl. Fresh soymilk, Green bean soymilk yuba {*Ryokuto nama yuba*}). Chefs (profile of head chef at each restaurant). Glossary of ingredients. Mail-order sources of ingredients. Acknowledgments.

"The history of Shunju began in 1986 in Mishuku, Tokyo." Today, Shunju has five different outlets in Tokyo– Mishuki, Hiroo, Torizaka, Bunkamura Dori, and Tameiki Sanno (p. 14).

"The most important element in Shunju's cuisine is to be able to truly appreciate the four seasons and the abundant

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blessings which mother nature has bestowed upon us...–Marcia Iwatate" (p. 24).

At the recipe for Green and lavender tofu squares (*Masu-dofu*) we read (p. 53): Tofu is undoubtedly one of the most representative dishes of Shunju. Our tofu is made daily–soymilk is curdled with *nigari* (bittern)–in different ware unique to each of our five restaurants; in this case in *masu* (traditional square, wooden measuring boxes)." To make green soymilk, see p. 255.

The glossary of ingredients (p. 258+) includes azuki (*koshi an, ogura an*), edamame, miso (many types), okara, sake (incl. koji {molded steamed rice}), shoyu (incl. koikuchi shoyu, usukuchi shoyu, shiro shoyu, tamari shoyu), tofu, ume, umeboshi, wasabi, yuba (famous as a Kyoto delicacy).

Tamari is mentioned on 98 pages of this book, miso on 67 pages, soy sauce on 54 pages, shoyu on 51 pages (incl. "koikuchi shoyu" on 34 pages, "usukuchi shoyu" on 13 pages and "shiro shoyu" and "tamari shoyu" on 2 pages each), tofu on 18 pages, soymilk on 14 pages, yuba on 7 pages, koji on 5 pages, nigari and edamame on 4 pages each, black soybeans on 2 pages (p. 53 and 84).

Natto and kinako are not mentioned. Address: Creators and founders, Shunju restaurants, Japan.

10999. Sumi, Hiroyuki. 2002. Shinkin kôsoku, nôkôsoku boke tônyôbyô o fusegu naosu: nattôkin iri fukugô aojiru no sugoi pawaa [Cure heart disease (myocardial infarction), stroke (cerebral infarction), senility, and diabetes: Extreme power of Green Juice which contains natto bacteria]. Tokyo: Bunsei Shuppan. 206 p. 19 cm. [Jap]
Address: Japan.

11000. Takemae, Eiji. 2002. Inside GHQ: The allied occupation of Japan and its legacy. Translated and adapted from the Japanese by Robert Ricketts and Sebastian Swann. London: Continuum International Publishing Group. xlv + 751 p. Index. 24 cm. *

11001. Tamang, J.P.; Thapa, S.; Dewan, S.; Jojima, Y.; Fudou, R.; Yamanaka, S. 2002. Phylogenetic analysis of *Bacillus* strains isolated from fermented soybean foods of Asia: kinema, chungkokjang, and natto. *J. of Hill Research* (*Sikkim*) 15(2):56-62. [22 ref]
• ***Summary:*** A total of 38 strains of dominant endospore forming and rod shaped bacteria were isolated from kinema, chungkokjang, and natto (three closely related fermented soyfoods), and studied phenotypically. All endospore forming rods were identified as *Bacillus subtilis.* The average load of endospore forming bacteria of the samples was about 100 million colony forming units (CFU) per gm.

Fig. 1 (p. 60) is a "Phylogenetic tree [also called a horizontal cladogram] showing the relationships of *Bacillus subtilis* strains to other strains of the genus *Bacillus* and related genera based on partial sequence of 16S rRNA gene."

This suggests that *B. subtilis* strains responsible for the fermentation of sticky Asian soyfoods might have originated from the same stock. Address: 1-3. Food Microbiology Lab., Dep. of Botany, Sikkim Government College, Gangtok, Sikkim 737 102, India.

11002. Watanabe, Sugio. 2002. Nattô: genryô daizu no erabikata kara hanbai senryaku made [Natto: From choosing the whole soybeans (as a raw material) to sales strategy]. Tokyo: Nô-san-gyoson Bunka Kyôkai. 120 p. Illust. 21 cm. [Jap]
Address: Japan.

11003. **Product Name:** [Organic Shoyu].
Foreign Name: Salsa de Soja (Shoyu) Organico.
Manufacturer's Name: M.O.A. Internacional.
Manufacturer's Address: Argentina.
Date of Introduction: 2002?
Ingredients: Soybeans, wheat, salt, water.
Wt/Vol., Packaging, Price: 900 cc bottle.
How Stored: Shelf stable.
New Product–Documentation: Visit with Carlos Planes at Soyinfo Center in Lafayette, California. 2012. Feb. 23. He brought this label in a scrapbook. Red, black and yellow on green. 2.75 by 4.5 inches. Carlos says MOA is a well-known company in Argentina, owned by Japanese, located on a little farm near Buenos Aires. He does not know when MOA started to make and sell Japanese-style soy sauce (shoyu) but he obtained this label from the product in Argentina in about 2002. MOA also made (and probably still makes) Japanese-style tofu.

11004. Mescher, Kelly. 2003. Japanese expand minds and menus to new soyfoods: The Japanese are known for observing tradition. *Iowa Soybean Review* (*Iowa Soybean Association, Urbandale, Iowa*) 14(4):6. Jan.
• ***Summary:*** Discusses the "Japan Food Soybean Mission, in which the Iowa Soybean Promotion Board (ISPB) staff, board members, and Iowa food grade soybean exporters traveled to meet with soybean processors in Japan and to talk with them about market opportunities."

"The soyfoods seminar provided cooking demonstrations for professional chefs, manufacturers, and food media in Japan." An American chef, Michael Foley, prepared various dishes (whose names are given) using soy ingredients. "They ate everything. There was not a morsel left, and they wanted the recipes," said Linda Funk, executive director of the Soyfoods Council. The Japanese are already fans of soy in its traditional forms, says Foley, "but these recipes were outside the box for them. To finish soups with soymilk, soy yogurt, and soy sauce is new to them... They were surprised at how good it tasted."

One of the highlights was the first Soyfoods Foodservice

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Seminar. A color photo shows Linda Funk and Jim Stillman (ISPB director) in a downtown market in Tokyo.

11005. Russnogle, John. 2003. Old market, new possibilities: Non-GMO is now part of life in Japan. *Soybean Digest.* Jan. p. 24.
• ***Summary:*** Japan was for many years the world's No. 1 buyer of American soybeans until 1999, when it was surpassed by China and Mexico. In 1993 Japan bought 980,000 tonnes (metric tons) of U.S. food-grade soybeans, or 75.6% of that country's total soybean imports. But by 2002 that figure dropped by one-third to an estimated 659,000 tons–just 57.9% of Japan's imports. During that time, Canada's soybean exports to Japan increased 2.6 fold, from 57,600 tonnes to 150,000 tonnes (from 4.4% in 1993 to 13.2% of Japan's total imports in 2002). And Japan has almost tripled its own production of food-grade soybeans from 68,000 tonnes to 200,000 tonnes. Japan's increased production is partly the result of a government program that gives growers big financial incentives to convert rice acres to soybeans. Japan grows more rice than it can consume, but produces only 5% of its total soybean needs. Japanese like Brazilian soybeans, which tend to be higher in protein and oil than their U.S. counterparts.

11006. Iino, Ryoichi. 2003. The history of shoyu (Soy sauce) 4. *Food Culture* (*Kikkoman Inst. for International Food Culture, Noda, Japan*) No. 5. p. 8-10. Feb. 20. http://kiifc.kikkoman.co.jp. [5 ref]
• ***Summary:*** Contents: Edo period–The production and diffusion of shoyu (soy sauce). The manufacture of soy sauce. From barley to wheat. Heating and *niban shoyu* (second soy sauce). Kijoyu (raw soy sauce) and the addition of dilutors. The center of production moves to Kanto (Tokyo area). Exports to Holland. Another name for soy sauce (*oshidashi*). Soy sauce with cooked dishes and soups. Grilled foods and soy sauce. Sashimi (raw fish) and soy sauce.

Another name: "We know that soy sauce became a standard seasoning relatively early in Japan by the fact that it is also began to be called *oshidashi.* The word *oshidashi* is written using the Chinese characters meaning foundation or base. The term was used during the Muromachi Era (1338-1573) to indicate soup stock or broth, which was the basic ingredient for flavoring foods. *Oshidashi* was used in the same way to later refer to soy sauce. There are several written examples of the use of the term *oshidashi* to indicate soy sauce including *Onna Chouhou-ki* (1692), the three-volume *Ukiyo Burou* (1811), *Tokaidouchuu Hizakurige* (1814) and *Kouto Gosui* (1850)." Address: Food historian, and teacher of food history, Hattori Nutrition College, Japan.

11007. American Soybean Assoc. 2003. Bean beat: ASA reports U.S. soybean quality survey results. *Soybean Digest.* Feb. p. 56.
• ***Summary:*** The results of ASA's 17th U.S. Soybean Crop Quality Survey were presented in Dec. 2002 during a 2-week international mission to Korea, Japan, China, and Taiwan. The survey contained information about the protein (35.4%), oil (19.4%), and amino acids content of this year's U.S. soybean crop.

This was the first year that the survey gathered information about amino acids, according to author Tom Brumm of the Agricultural and Biosystems Engineering Dep. at Iowa State University. Livestock producers use amino acid content to determine the value of soybean meal. The report is based on a survey of 1,400 randomly selected ASA farmer-members across the USA; each submitted samples of their crop. For details see www.asasoya.org under "Current News & Events."

11008. *Ontario Soybean Growers Newsletter.* 2003. OSG promotes Canadian soybeans on mission to Asia. Feb. p. 2.
• ***Summary:*** "The Canadian soybean industry travelled to Asia in November 2002 to conduct eight seminars in eight Asian cities. The seminars were held in Japan (Tokyo, Nagoya, Osaka, Fukuoka), Malaysia (Penang, Kuala Lumpur), Singapore and Hong Kong.

"Liam McCreery and Kim Cooper from the Ontario Soybean Growers participated in this trip, along with 12 other members of the Canadian Soybean Export Association, representing exporters, researchers and government.

"The objectives of this trip to Asia were:

"To meet with soyfood associations and various buyers and give them presentations on the Canadian soybean industry and the IP [identity preserved] soybean standard that was developed by the Canadian Soybean Export Association last year.

"To demonstrate how both the Canadian and Ontario governments are working in partnership with the Canadian soybean industry to develop, market and ensure the highest quality of food-grade soybeans to meet export customers' needs.

"To gather information on customers' markets, needs and suppliers (market intelligence) in order to better provide a quality and competitive product.

"To provide information to export customers on the 2002 soybean crop in terms of yield, quality and grade. To emphasize Canada's commitment to further develop research and marketing programs in response to buyer's needs.

"This trip was very successful in attaining its objectives. All mission members and our overseas buyers felt these seminar presentations were very informative and needed if we are to further expand our market base around the world."

A large photo shows OSG past chair, Lam McCreery. Address: Chatham, ONT, Canada N7M 5L8.

11009. Takenaka, Asako; Annaka, H.; Kimura, Y.; Aoki, H.; Igarahi, K. 2003. Reduction of paraquat-induced

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oxidative stress in rats by dietary soy peptide. *Bioscience, Biotechnology, and Biochemistry* 67(2):278-83. Feb. [19 ref]
• ***Summary:*** A soy peptide was found to have antioxidative activity. The effect of a dietary soy protein isolate (SPI), soy peptide (PEP) and the amino acids in soy protein on oxidative stress was investigated in rats. Address: 1-3, 4. Dep. of Bioresource Engineering, Faculty of Agriculture, Yamagata Univ., Tsuruoka, Yamagata 997-8555, Japan.

11010. Zhou, J.R.; Yu, L.; Zhong, Y.; Blackburn, G.L. 2003. Soy phytochemicals and tea bioactive components synergistically inhibit androgen-sensitive human prostate tumors in mice. *J. of Nutrition* 133(2):516-21. Feb. [38 ref]
• ***Summary:*** Japanese prostate cancer rates are only about one-eighth of those in the USA. In this animal study, soy phytochemical concentrate (SPC) was given to mice implanted with cancer cells that were sensitive to the tumor-promoting effects of testosterone. SPC, which is rich in isoflavones, reduced tumorigenicity (% of animals with tumors) by about 50% compared to animals fed the control diet. Furthermore, black tea also inhibited tumorigenicity by about 40%. SPC combined with black tea reduced tumorigenicity by nearly 80%. Thus soy inhibits prostate tumor growth in mice. Address: Nutrition / Metabolism Lab., Dep. of Surgery, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, Massachusetts.

11011. Hill, Amelia. 2003. The day the earth died. *Observer* (*London*). March 2. p. 213.
• ***Summary:*** On 7 Aug. 1942 Japanese planes dropped anthrax on a town in China. Yalin Zhou recalls that it was beautiful as it floated down, like willow pollen or flowers, flowing with the wind.

But at midnight on that same day, "in the village of Tangjia in Zhejiang, CaiQiu Tang woke up screaming. Her pillow was wet with blood... The skin on my face had rotted and turned black, and my flesh was all pulpy like fermented tofu. All the teeth on one side of my face had fallen out..."

This is the story of Japan's secret Unit 731 of the Japanese Kwantung Army in Manchuria, organized in 1936, that conducted experiments on people living in China and Manchuria in order to try to perfect germ warfare (biological warfare). It is one of the largest and yet least known of the crimes against mankind.

11012. Bittman, Mark. 2003. The minimalist: Move over vinaigrette. *New York Times.* March 26. p. F3.
• ***Summary:*** As always, it is worth buying good soy sauce. "The standard brands (Kikkoman, Yamasa, San-J and so on) are fine, as is any soy sauce that lists as its ingredients only soy [beans], wheat, salt, and 'culture,' the yeast that makes the mixture ferment.

"Homemade ponzu will keep for several days with no loss in quality."

11013. *ASA Today* (*St. Louis, Missouri*). 2003. FAS is 50. 9(5):1. March.
• ***Summary:*** The Foreign Agricultural Service (FAS), an agency of the USDA, was established on 10 March 1953. FAS, which is celebrating its 50th anniversary this month, works to improve access to foreign markets for U.S. products and "operates programs designed to build new markets and improve the competitive position of U.S. agriculture in the global marketplace.

"The very first FAS Foreign Service National (FSN) cooperator was from the American Soybean Association's Japan office." Over the years, ASA has worked closely with FAS to develop and grow international markets for U.S. soybeans and soy products. FAS has a network of agricultural counselors, attachés, and trade officers stationed abroad as well as analysts, marketing specialists, negotiators, and related specialists in Washington, DC.

"FAS bears the primary responsibility for USDA's overseas activities–market development, international trade agreements and negotiations, and the collection and analysis of statistics and market information. It also administers USDA's export credit guarantee and food aid programs."

11014. *Bluebook Update* (*Bar Harbor, Maine*). 2003. Soybeans used as food will grow by 72% this decade: Soyatech releases new study. 10(1):2. Jan/March.
• ***Summary:*** "Whole Soybeans as Food Ingredient," a new study published [in January] by Soyatech, Inc., focuses on the market for soybeans for food.

Over the past 30 years, soybean production globally has grown over 400%. The production in 2002 was about 184 million metric tons, with the combined products of Argentina and Brazil looking like they might overtake the United States, the largest producer. The lower cost of production factors like land and labor in South America and the high value of the dollar are contributing factors.

Annually, 85% of soybeans are crushed into meal and 9% are processed into human food, 95% of which is consumed in Asia. China, Japan, Korea, Indonesia, and Taiwan are the main consumers.

A small percentage of the beans crushed into meal are processed into soy protein ingredients for food. Examples include soy protein concentrates, soy flour, and isolated soy proteins. 3.2% of the crushed beans are used in this manner; however, use of crushed soybeans is food is expanding at 6 times the rate of the use of whole soybeans.

The use of soybeans for food will expand by 72% between the years of 2000 and 2010, requiring that additional soy protein plants be constructed. Distribution channels will also require expansion.

Although only 0.2% of the U.S. soybean crop is processed into human food domestically, 8.8% are when global exports are included. 6.3 million acres of soy beans

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therefore ultimately are used for food.

A pie chart titled "Soybean usage: 1996-2001" shows: Soybean crush 84.4%. Direct food use 8.6%. Feed/seed/residual 5.7%. Change in stocks. 1.4%.

11015. Nagata, Chisato; Shimizu, H.; Takami, R.; et al. 2003. Soy product intake is inversely associated with serum homocysteine level in premenopausal Japanese women. *J. of Nutrition* 133(3):797-800. March. [32 ref]
• ***Summary:*** Soy is shown to reduce levels of homocysteine in the blood. Address: Dep. of Public Health, Gifu Univ. School of Medicine, Gifu, Japan.

11016. Shiraki, K.; Une, K.; Yano, R.; Otani, S.; Mimeoka, A.; Watanabe, H. 2003. Inhibition by long-term fermented miso of induction of pulmonary adenocarcinoma by diisopropanolnitrosamine in Wistar rats. *Hiroshima J. of Medical Sciences* 52(1):9-13. March. *
• ***Summary:*** Can miso help reduce lung tumors? Diisopropanolnitrosamine is abbreviated BHP. A total of 63 Slc:Wistar rats, 6 weeks of age, were divided into 4 groups and given BHP (2000 ppm) in their drinking water for 10 weeks. After the carcinogen treatment the rats were fed a normal control modified-fat (MF) solid diet, or the same diet containing 10% long-term or short-term fermented miso for 12 weeks. The long-term fermented miso significantly reduced the number of lung tumors, adenocarcinomas and PCNA strongly positive tumors as compared with the short-term fermented miso.

These results indicate that dietary supplementation with long-term fermented miso could exert chemopreventive effects on lung carcinogenesis. Address: Dep. of Cellular Biology, Research Institute for Radiation Biology and Medicine, Hiroshima Univ., Kasumi 1-2-3, Minami-ku, Hiroshima, 734-8553, Japan.

11017. Shiraki, K.; Une, K.; Yano, R.; Otani, S.; Mimeoka, A.; Watanabe, H. 2003. Inhibition by long-term fermented miso of induction of pulmonary adenocarcinoma by diisopropanolnitrosamine in Wistar rats. *Hiroshima J. of Medical Sciences* 52(1):9-13. March. *
• ***Summary:*** Diisopropanolnitrosamine is abbreviated BHP. Address: Dep. of Cellular Biology, Research Institute for Radiation Biology and Medicine, Hiroshima Univ., Kasumi 1-2-3, Minami-ku, Hiroshima, 734-8553, Japan.

11018. Suzuki, Y.; Kondo, K.; Ichise, H.; Tsukamoto, Y.; Urano, T.; Umemura, K. 2003. Dietary supplementation with fermented soybeans suppresses intimal thickening. *Nutrition* (*Burbank, California*) 19(3):261-64. March. *
• ***Summary:*** Although soyfoods have been consumed in East Asia for more than 1,000 years, it is only during the past 20 years that they have made inroads into Western diets. We investigated the effect of dietary supplementation with natto extracts produced from fermented soybeans on intimal thickening of arteries after vessel endothelial denudation. Natto extracts include nattokinase, a potent fibrinolytic enzyme having four times greater fibrinolytic activity than plasmin. Address: Dep. of Pharmacology, Hamamatsu Univ. School of Medicine, Shizuoka, Japan.

11019. **Product Name:** [Nattoesse: Essence of Natto Food].
Foreign Name: Nattoesse.
Manufacturer's Name: Ventrep Sante, Inc. (Importer/Marketer). Made in Japan by Gudo Shusei Co., Ltd. (Tokyo).
Manufacturer's Address: 3-3-26-201 Jingu-mae, Shibuya-ku, Tokyo 150-0001, Japan. Phone: +81 3 3401 8360.
Date of Introduction: 2003 March.
Ingredients: Natto.
How Stored: Shelf stable.
New Product–Documentation: Leaflet (8½ by 11 inch, color) sent by Patricia Smith from Natural Products Expo West (Anaheim, California). 2003. March. "Nattoesse: Essence of Natto Food. Soy beans naturally fermented by Bacillus (NattoVR 501) living in rice straws." Contents: A functional food from traditional Japanese diet. Research reports. A brief story [history] of natto food and nattokinase.

11020. Kasahara, Takaoki; Kato, Tadafumi. 2003. A new redox-cofactor vitamin for mammals. *Nature* (*London*) 422(6934):832. April 24. [10 ref]
• ***Summary:*** A Japanese research team confirmed that PQQ (pyrroloquinoline quinone), a substance discovered in 1979, can be classified as a vitamin. More specifically, it is a new B vitamin, joining niacin / nicotinic acid (vitamin B3) and riboflavin (vitamin B2)–first new vitamin in 55 years. The most concentrated known source of PQQ is natto, a type of soybeans fermented by *Bacillus natto* bacteria. The new vitamin plays an important role in the fertility of mice and may have a similar function in humans.

Note 1. This is the earliest document seen (Jan. 2012) that mentions PQQ in connection with natto.

Note 2. A Google search of natto + pqq (July 2009) gets 2,480 hits. Natto is an excellent source of PQQ, a critical nutrient for skin health. PQQ is essential to the mammalian diet, meaning it can only be obtained from food sources. Address: Lab. for Molecular Dynamics of Mental Disorders, Brain Science Inst., RIKEN, Wako-shi, Saitama 351-0198, Japan.

11021. Colbin, Annemarie. 2003. Interview with Irma Paule: February 9, 2002. *Macrobiotics Today* (*Oroville, California*). March/April. p. 10-13.
• ***Summary:*** A biography of Irma Paule, a pioneer in organizing macrobiotics in New York City, starting in about 1959-60, when Alcan Yamaguchi saved her life–free of charge. At the time, she was a young actress and a coffee addict, drinking 30 cups a day. Because she speaks French,

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she served as George Ohsawa's translator when he spoke in America. Yamaguchi and Herman Aihara had founded the Ohsawa Foundation in New York City. When they left for Chico, California, it fell into Irma's hands willy-nilly. She called it by various names, including the Ohsawa Foundation and the Macrobiotic Foundation. She gave lectures and advised people, but never charged for her services. She rented a small professional apartment at 217 Second Ave. where they had some Ohsawa books and sold organic brown rice, etc.

There was a swank Japanese restaurant named Musubi on West 56th Street, between 5th and 6th avenues. The Sato brothers invested money in that restaurant and Alcan Yamaguchi ran it like a macrobiotic restaurant. There she first saw a machine for making rice cakes. Describes the death of Beth Ann Simon from Irma's recollections. Beth drank "three-fourths of a bottle of tamari soy sauce" shortly before she died. A photo shows Irma Paule. Address: PhD, Founder, Natural Gourmet Cookery School and Inst. for Food and Health, New York City.

11022. Morinaga Nutritional Foods, Inc. 2003. Mori-Nu. The tofu created for royalty. Now available for your table (Ad). *Vegetarian Times.* April.
• ***Summary:*** This attractive color ad (8½ by 11 inches) shows a large black-and-white photo of a former emperor of Japan and his wife. In front of it is a large color package of Mori-Nu Extra Firm Silken Lite Tofu–with a new label design. Across the bottom are small photos of the six types of Mori-Nu tofu–each with a new label design. The tofu that is "Made with Organic Soybeans" also has new ingredients–it no longer contains isolated soy protein. All should be available in stores by late April.

This ad also appeared in *Natural Foods Merchandiser* (March 2003, p. 15). Address: 2050 W. 190th St., Suite 110, Torrance, California 90504. Phone: 1-800-NOW-TOFU or 310-787-0200.

11023. Aoyagi, Akiko. 2003. McDonalds in Japan plans to launch a fried tofu burger (Interview). *SoyaScan Notes.* May 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Akiko recently saw a program on Japanese TV stating that McDonalds Holdings Co. (Japan) Ltd., the American burger giant, is experiencing lagging sales and decreasing profits for the first time in 29 years in Japan. In response they have decided to start selling a fried tofu burger as a healthy alternative in their Japanese restaurants, and to make other healthy additions to its Japanese menu. The new tofu burger will come with a ginger-flavored soy sauce and sell for $1.91. McDonalds' problems include youth savvy competition from the Freshness Burger chain and fears about Bovine Spongiform Encephalopathy (BSE).

Note: An article in *Bluebook Update* (May 2003, p. 1) stated that On April 23, McDonalds Holdings Co. (Japan) Ltd., a mainstream foodservice company, is adding "tofu hamburgers" to its menu. Address: Walnut Creek, California.

11024. *Ontario Soybean Growers Newsletter.* 2003. Canadian Soybean Export Association holds annual meeting. May. p. 6.
• ***Summary:*** "The Canadian Soybean Export Association (CSEA) held their 8th annual business meeting recently in Guelph. The following members were elected to lead the association in 2003-2004:

Chair: Brad Richmond, Maple Leaf Foods International
Vice-Chair: Marty Huzevka, Hensall District Co-operative
Past-Chair: Martin Vanderloo, Huron Commodities Inc.
Executive Member: Jim Gowland, OSG
Secretary / Treasurer: Kim Cooper, OSG

"CSEA is a voluntary association of members of the Canadian soybean industry, working to promote exports of Canadian soybeans and soya products into world markets. This year's activities included hosting a group of soybean industry members from Japan, Taiwan and Western Europe, participating in a technical mission to Japan, Taiwan, South Korea and Singapore, and the development of two resources to promote the Canadian soybean industry." Address: Chatham, ONT, Canada N7M 5L8.

11025. Yamamoto, Seiichiro; Sobue, T.; Kobayashi, M.; Sasaki, S.; Tsugane, S. 2003. Soy, isoflavones, and breast cancer risk in Japan. *J. of the National Cancer Institute* 95(12):906-13. June 18. [44 ref]
• ***Summary:*** Breast cancer risk was reduced by one half in Japanese women who ate three or more bowls of miso soup on an almost daily basis. The report monitored 21,852 women from 1990 to 2000. Post-menopausal women showed the greatest reduction of risk.

"In Japan, soy is consumed in various forms, including dried or green soybeans, tofu (soybean curd), natto (fermented soybeans), miso (fermented soybean paste), okara (tofu lees), soybean sprouts, soymilk, yuba (soy milk skin), kinako (soy flour), and soy sauce." Address: Cancer Information and Epidemiology Div., National Cancer Center Research Institute, Tokyo, Japan.

11026. Belleme, Jan. 2003. New developments with Mitoku and with miso (Interview). *SoyaScan Notes.* June 23. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** At the end of March 2003, Mr. Kazama closed Mitoku's office in the USA which John and his wife, Jan, ran as a home business. So John is looking for other sources of income.

Rudy Shur plans to publish John's new book on miso in October or November of this year; the title will probably be *The Miso Book.* The book is a wholistic look at miso with emphasis on health benefits.

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Vern Verona, a long-time macrobiotic, wrote a book titled *Cancer Preventing Food,* published in 1994 by Prentice-Hall. Vern is now writing a book about miso. John is involved in a miso-marketing venture. He and Sandy Pukel are organizing a 7-day "wholistic health" cruise to the western Caribbean.

Update: 2009. Jan 27. In the spring of 2005 Sandy Pukel and his partner, John Belleme, launched Holistic Holiday at Sea, a fun filled cruise vacation with gourmet vegan fare and extraordinary educational opportunities. The Taste of Health and Holistic Holiday cruise (as it has come to be known) has become a full-time and very successful business, with revenue of more than $1 million a year. They do only one cruise a year–in the summer. Last year more than 1,000 people went on the cruise. This coming summer will be the 6th cruise. It is organized entirely by John and Jan Belleme and Sandy Pukel. On a typical day, John and Jan work 12 hours a day. The cruise rates per person range from $1,195 to $3,000.

Chris Dawson, who now owns Clearspring in London, has built it into a thriving $10-12 million dollar a year import and distribution business. He imports from Japan and China and also distributes many natural foods made in Europe. John wrote a book for him titled *The Real Taste of Japan,* published by Cross Media. Address: P.O. Box 457, Saluda, North Carolina 28773.

11027. Kuba, Megumi; Tanaka, K.; Tawata, S.; Takeda, Y.; Yasuda, M. 2003. Angiotensin I-converting enzyme inhibitory peptides isolated from tofuyo fermented soybean food. *Bioscience, Biotechnology, and Biochemistry* 67(6):1278-83. June. [27 ref. Eng]
• ***Summary:*** Angiotensin I-converting enzyme (ACE) inhibitory activity was observed in a tofuyo (fermented soybean food) extract. Address: 1-3, 5. Dep. of Bioscience and Biotechnology, Faculty of Agriculture, Univ. of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 902-0213, Japan.

11028. Suganama, Kiyoshi; Sumi, Hiroyuki. 2003. Kono fukugô aojiru de shinkin kôsoku nôkôsoku boke tônynô-byô kara dasshutsu shita: nattô-kin nattôkinaze to ryokuyô yasai juisshurui fukugô [I escaped from heart attack, stroke, senile psychosis, and diabetes using this compounded green juice: Natto bacteria, nattokinase, and 11 green leafy vegetables combined]. Tokyo: Gendaishorin. 197 p. 19 cm. [Jap]*

11029. Tanaka, Tadayoshi; Yamauchi, Tomoko; Katsumata, Rie; Kiuchi, Kan. 2003. [Comparison of volatile components in commercial itohiki-natto by solid-phase microextraction and gas chromatography]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 50(6):278-85. [23 ref. Jap; eng]
• ***Summary:*** "The volatile component in commercial itohiki-natto was extracted with divinylbenzene / carboxen / polydimethylsiloxane solid-phase microextraction fiber at 50ºC for 60 minutes, and injected by gas chromatograph (GC) or gas chromatograph mass spectrometer (column: DB-WAX (0.25mm ID, 30m long, 0.25µm film thickness)). Each peak was identified by comparing the mass spectrum and the retention indices with the mass spectrum databases and the retention indices of authentic compounds, respectively. Twelve alcohols, 20 ketones, 12 fatty acids, 12 nitrogen compounds, 10 hydrocarbons, 8 esters, 3 phenols, 2 frans, 1 aldehyde, 1 pyrane, 1 oxazole, and ammonia = a total of 83 compounds were identified" (from journal@rchive). Address: 1. Dep. of the Science of Living; 2. Faculty of Home Economics. All: Kyoritsu Women's Univ., 2-2-1, Hitotsubashi, Chiyoda-ku, Tokyo 101-8433, Japan.

11030. Wood, Marcia. 2003. USDA plant collectors' exotic expedition captured in historical photo albums. *Agricultural Research.* June. p. 18-19.
• ***Summary:*** Seven albums, containing more than 1,000 photographs from the Dorsett-Morse Expedition to East Asia, are now owned by Special Collections, National Agricultural Library at Beltsville, Maryland. The collection is officially named the "Palemon Howard Dorsett Collection." Researchers visiting the library can, by appointment, view the albums. Each print is pasted on heavy green paper, typical of that used for photograph albums of the early 1900s; below each is a handwritten caption in black ink which generally includes the date, location where the photo was taken, and the name of the plant or object shown–notes Susan H. Fugate, head of the library's special collections. For example: "Soja ussuriensis, Wild soy bean. View [of] the wild soy bean plants growing along road side on [the] outskirts of Heijo [today's Pyongyang / P'yongyang, the capital of North Korea]... These plants appear different from wild soy bean found in Manchuria and Japan. The leaves are larger and somewhat different [in] shape."

A selection of nearly 50 prints can be viewed on the Web at www.nal.usda.gov /speccoll/findaids /dorsett.

The major focus of this expedition was soybeans. "Today soybeans are the second largest U.S. farm crop, worth more than $14 billion in 2002." Food uses that Dorsett and Morse envisioned are part of that market. "What's more, studies are revealing the new benefits of soy compounds such as isoflavones."

"Some of the credit for this current success can be attributed to the Dorsett-Morse expedition. The team brought back about 4,500 soybean specimens as well as another 4,500 specimens of interest. Some of the soybean plants had prized traits, such as resistance to harmful microbes that could otherwise devastate the crop.

"Dorsett, born in Illinois in 1862 and educated at the University of Missouri, joined USDA in 1891. After more than a decade, he left the department to start his own

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business, then rejoined as a plant explorer in Washington, D.C., in 1909.

"The Dorsett-Morse Oriental Exploration Expedition was an unqualified success and further enhanced Dorsett's reputation as a premier plant explorer. In 1936, he won the Frank N. Meyer Medal from the Council of the American Genetic Association for his outstanding work. The award was named in honor of another USDA plant explorer, who died under what some claim were mysterious circumstances while on a collecting expedition in China.

"But that's another story."

A photo shows P.H. Dorsett (second from right) and his Chinese interpreter Peter Liu on the trail. No date is given. Address: USDA ARS.

11031. Elegant, Simon. 2003. Long lives well lived. *Time.* July 16.
• ***Summary:*** "Okinawa's national dish is a stir-fry called chample." "The exact recipe varies from house to house but the basic ingredients are always there: tofu, soya beans and goya [a local variety of bitter gourd]. Those three are all very high in flavonoids as well as other compounds like isoflavones, saponins and vitamins B and C that provide protection against free radicals." Address: Okinawa.

11032. Toscano, Dawn. 2003. Work with tofu in Japan and Spain (Interview). *SoyaScan Notes.* July 16. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Dawn has been living in Spain since 1988–for the last 15 years. Now she wants to start making tofu in Valencia, Spain, where it is available only at high prices, vacuum packed in plastic, at trendy herb stores or via Chinese distributors.

She knew Nahum & Bev Stiskin, whose fledgling publishing company, Autumn Press, published *The Book of Tofu* in late 1975. In March 1974, when she went to Japan (because she could not find a job in USA), she lived in Minami-ku, Yokohama, and worked at the YMCA. Then, during her yearly gynecological visit, she met a gynecologist at the Yamate Hospital who was a Lt. Commander in the U.S. Navy. He lived on the navy base in Yokohama. Later in 1974 she moved to Hayama and got into paper-making then into weaving. Beverly Stiskin was selling one of her looms, but Bev needed to see a gynecologist, so Dawn took Bev to the Yamate Hospital and Dawn's boyfriend helped her, free of charge. Dawn ended up not buying the loom. But she did talk to Nahum and showed him a newspaper article she had about tofu. He was interested. She may have given Shurtleff's phone number to Nahum or she may suggested to Shurtleff that he call Nahum.

In the 1970s she called Shurtleff at least 3 times in Japan and once in ca. 1980-81 from a phone box in Lafayette, California; her future ex-husband lived in Walnut Creek. In Japan she sent Shurtleff a draft of an article she wrote about tofu and wanted to submit to *Mother Earth News.* Shurtleff suggested some corrections, but it was never published. She used to make tofu all the time at home in Japan, and she has continued since she arrived in Spain. She bought a first edition of *The Book of Tofu,* then wrote a letter to *Mother Earth News* and urged them to review the book. They wrote back saying "no, the timing is not right," because they had never heard of tofu. She still has both letters *Mother Earth News* wrote to her. The second says "Thanks so much for bringing this book to our attention." She was a *Mother Earth News* lifetime subscriber ("Lifer," for $250) #447 or #449. Address: Calle Uruguay 59, pta 13, 46007 Valencia, Spain. Phone: +34 96 380 2129.

11033. Suzuki, Y.; Kondo, K.; Matsumoto, Y.; Zhao, B.Q.; Otsuguro, K.; Maeda, T.; Tsukamoto, Y.; Urano, T.; Umemura, K. 2003. Dietary supplementation of fermented soybean, natto, suppresses intimal thickening and modulates the lysis of mural thrombi after endothelial injury in rat femoral artery. *Life Sciences* (*Netherlands*) 73(10):1289-98. July 25. *
Address: Dep. of Pharmacology, Hamamatsu Univ. School of Medicine, 1-20-1 Handayama, Hamamatsu City, Shizuoka 431-3192, Japan.

11034. Nagata, C.; Takatsuka, N.; Kawakami, N.; Shimizu, H. 2003. A prospective cohort study of soy product intake and stomach cancer death. *British J. of Cancer* 87(1):31-36. July. [27 ref]
Address: Dep. of Public Health, Gifu Univ. School of Medicine, 40 Tsukasa-machi, Gifu 500-8705, Japan.

11035. Kikkoman Corporation. 2003. Annual report 2003. Year ended March 31, 2003. 250 Noda, Noda-shi, Chiba 278-8601, Japan. 30 p. 28 cm. [Eng]
• ***Summary:*** Consolidated net sales rose 1.7% to $2.854 billion and operating income climbed 19.8% to $69 million. Address: Noda, Japan.

11036. Kikkoman. 2003. Soymilk for the purist (Ad). *Vegetarian Times.* Sept. p. 11.
• ***Summary:*** See next page. This 8½ by 11 inch color ad shows five varieties of "Kikkoman Pearl" organic soymilk in 1 quart Aseptic cartons against a pearl-colored background. In the foreground is a glass of soymilk. The organic flavors are Original, Creamy Vanilla, and Green Tea. The Tropical Delight (With 7 Juices) is made with organic soybeans.

11037. Inagaki, Shyuichiro; Domon, Eiji; Saito, Akira; Akutagawa, Hiroshi. 2003. [Discrimination of *Bacillus subtilis* natto "strain KA-145" using insertion sequence, *IS4Bsu1*]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 50(10):483-87. [18 ref. Jap; eng]

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• ***Summary:*** "We established a simple method for identifying *Bacillus subtilis* natto strain KA-145 by PCR [polymerase chain reaction]. *B. subtilis* natto is indispensable as a starter strain for fermenting the traditional Japanese food natto. *B. subtilis* natto strain KA-145 is a recent isolate with high nattokinase activity compared to the normal strain. Discrimination of the bacterial strains is important in controlling contamination of the strains" (from journal@ rchive).

Note: An insertion sequence (also known as an IS, an insertion sequence element, or an IS element) is a short DNA sequence that acts as a simple transposable element. Insertion sequences have two major characteristics: they are small relative to other transposable elements (generally around 700 to 2500 bp in length) and only code for proteins implicated in the transposition activity (they are thus different from other transposons, which also carry accessory genes such as antibiotic resistance genes). (Source: Wikipedia, Feb. 2012). Address: 1-3. National Agricultural Research Center for Kyushu Okinawa Region, Suya 2421, Nishigoushi, Kikuchi, Kumamoto-ken 861-1192, Japan.

11038. *Iowa Soybean Review* (*Iowa Soybean Association, Urbandale, Iowa*). 2003. Top U.S. customers received assistance. 15(1):15. Oct.
• ***Summary:*** Every one of the top ten U.S. soybean customers was once a recipient of some type of U.S. foreign assistance. "Today these nations are powerful U.S. trade partners. A table shows export value in millions of U.S. dollars."

Whole soybeans: European Union $1,167 million. China $1,012. Mexico $755. Japan $724. Taiwan $385. Indonesia $245. Korea $226. Canada $130. Thailand $115. Israel $95.

Soybean meal: Canada $200 million. Indonesia $167. Philippines $138. Dominican Republic $71. Turkey $62. Saudi Arabia $59. Japan $59. Mexico $50. Egypt $49. Thailand $44. Source: U.S. Department of Commerce.

11039. *NSRL Bulletin* (*National Soybean Research Laboratory, Urbana, Illinois*). 2003. New soybean varieties developed for use as garden vegetable. 10(3):5. Oct.
• ***Summary:*** "Soybean breeder Richard Bernard at the Univ. of Illinois has developed 13 varieties of soybeans called Gardensoy, specifically bred to be eaten as a vegetable on the dinner plate alongside peas, carrots, and corn, but with the added nutritional punch of protein found in soybeans.

"Cary Howrey has been farming for about 15 years and was a guinea pig for Bernard's Gardensoy soybeans when he was first developing the varieties. Howrey grew many of the varieties on her farm in Illinois and sells them at a Saturday morning farmer's market at Lincoln Square in Urbana at her stand under the name 'Garden of Eatin'.'

"'When I first started selling edible soybeans, they were a hard sell to American women.' Howrey says. 'They thought soybeans were just for animals. Then when soybeans were in the news saying that soy products were good for women's health, they started trying my fresh soybeans more. My Asian customers have always loved them.'

"Farmers in Japan have been growing soybeans to be eaten as a table vegetable for centuries, but their varieties don't thrive in the climate and diseases in the United States. 'I started the hybrid process using Japanese soybean varieties and crossed them with our own high-yielding varieties,' Bernard says."

In 2000 Bernard released his first six Gardensoy varieties. In 2002 he released 7 additional varieties and is still working on more than 100 varieties.

"He will provide 30 to 50 seed packets free of charge to anyone who wants to try them. Larger quantities can be ordered through Rupp Seeds in Ohio at (800) 700-1199."

11040. Morinaga Nutritional Foods, Inc. 2003. This is not merely a cookie (Ad). *Natural Foods Merchandiser.* Nov.
• ***Summary:*** This full-page color ad shows a huge cookie, then pieces of another nearby. "This is a dairy-free, eggless, guilt-free, cholesterol-free, made with made with Mori-Nu Silken Tofu surprise. This is a 'let's mix up a batch for the kids' treat. This is a fresh, hot from the oven, 'betcha can't eat just one' reward. This is a Mori-Nu Silken Tofu great idea."

This ad also appeared in Vegetarian Times, April 2004 (p. 26). Address: 2441 West 250th St., Suite C-102, Torrance, California 90501. Phone: 1-800-669-8638 (NOW TOFU).

11041. *Acres U.S.A.* 2003. A rush to judgment: Fraud in Roundup Ready soybean assessment. 33(12):10, 12. Dec. [1 ref]
• ***Summary:*** Japan's Ministry of Health (MOH) reviewed the evidence, presented by Monsanto, for the safety of Roundup Ready soybeans. MOH found that Monsanto repeatedly falsified the evidence–which is deeply disturbing.

11042. Wang, L.J.; Saito, M.; Tatsumi, E.; Li, L.T. 2003. Antioxidative and angiotensin I-converting enzyme inhibitory activity of sufu (fermented tofu) extracts from various regions of China. *JARQ* (*Japan Agricultural Research Quarterly*) 37:129-32. [Eng]*

11043. Azusawa, Kaname. 2003. Edamame, soramame: 2 [Edamame and broad beans: 2]. Tokyo: Kodansha. 335 p. 20 cm. [Jap]*
Address: Japan.

11044. Chan, Sucheng. 2003. Remapping Asian American history. Walnut Creek, California: AltaMira Press. xii + 277 p. Illust. 24 cm. *
• ***Summary:*** Contents: Introduction: Unexplored topics, emerging frameworks, by Sucheng Chan. Part I: Unexplored

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topics... 2. Revisiting New York's Chinatown, 1900-1930, by Xiaolan Bao. 3. Forgotten families: The development of the Chinese American community in San Francisco, 1860-1880, by George Anthony Pfeffer. 4. Testing assumptions: IQ, Japanese Americans, and the model minority myth in the 1920s and 1930s, by David K. Yoo. 5. "A finer set of hopes and dreams": The Japanese American Citizens League and the ethnic community in Cincinnati, Ohio, 1942-1950, by Allan W. Austin. 6. "Wrong face, wrong name": the return of Japanese American veterans to Hood River, Oregon, after World War II, by Linda Tamura. 7. Return to the wars: Jimmie Omura's 1947 crusade against the Japanese American Citizen's League, by Arthur A. Hansen.

Part II: Emerging frameworks. Address: Univ. of California at Santa Cruz.

11045. Du Bois, Christine Madeline; Mintz, Sidney Wilfred. 2003. Soy. In: Solomon H. Katz, editor in chief. 2003. Encyclopedia of Food and Culture. 3 vols. New York, NY: Charles Scribner's Sons, Thomson Gale. See Vol. 3, p. 322-26. [13 ref]

• ***Summary:*** Contents: Introduction. Physical characteristics of the soy plant. Origins, domestication, and diffusion of soy. Developments in soy agriculture–Demand and supply. Modern trade in soy. Processing soy for different cuisines: Processing whole soy, processing soy oil, processing defatted soy protein. National differences in amounts of soy protein consumed. Research on soy's health benefits. Future directions for soy.

See also: China. Dairy products. Genetic engineering. Japan: Traditional Japanese cuisine. Vegetarianism.

Of this excellent 3-volume set: Vol. 1: Acceptance to Food politics. Vol. 2: Food production to Nuts. Vol. 3. Obesity to Zoroastrianism. Index. Address: 1. Lansdowne, Pennsylvania; 2. Prof. of Anthropology, Johns Hopkins Univ., Baltimore, Maryland.

11046. Egami, Eiko. 2003. Miso de tsukuru genkishoku: uchi no awasewaza kenkô ando biyô no reshipi hyakujô Kyôi no miso pawaa o mainichi no shokutaku ni [Healthy foods using miso: 110 recipes from my home which bring you both health and beauty. The amazing power of miso for your table every day]. Tokyo: Seibundo Shinko-sha. 125 p. 21 cm. [Jap]*

Address: Japan.

11047. Food and Agricultural Organization of the United Nations. 2003. Soybeans: Area harvested, yield, and production. *FAO Yearbook–Production* (*Rome, Italy*) 57:115-16.

• ***Summary:*** The 2003 Production Yearbook, under "Soybeans" (p. 115-16, in English, French, and Spanish) gives area harvested (1,000 ha), yield (kg/ha), and production (1,000 metric tons), each for the years 1989-91, 1995, 1996, 1997, for the following places: World. Africa: Benin, Burkina Faso, Burundi, Congo–Democratic Republic, Cote d'Ivoire, Egypt, Ethiopia PDR, Ethiopia, Gabon, Liberia, Madagascar, Morocco, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.

North and Central America: Belize, Canada, El Salvador, Guatemala, Honduras, Nicaragua, Panama, USA.

South America: Argentina, Bolivia, Brazil, Colombia, Ecuador, Paraguay, Peru, Suriname, Uruguay, Venezuela.

Asia (fmr = former). Asia: Azerbaijan, Bhutan, Cambodia, China, East Timor (1,000 MT), Georgia, India, Indonesia, Iran, Iraq, Japan, Kazakhstan, Korea–Democratic People's Republic of (north), Korea–Republic of (south), Laos, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Syria, Tajikistan, Thailand, Turkey, Viet Nam (Vietnam).

Europe (former). Europe. Albania, Austria, Bosnia Herzegovina, Bulgaria, Croatia, Czechoslovakia, Czech Republic, France, Germany, Greece, Hungary, Italy, Moldova Republic, Romania, Russian Federation, Serbia-Montenegro, Slovakia, Slovenia, Spain, Switzerland, Ukraine. Note: Serbia-Montenegro appears for the first time. Harvested 112,000 ha (yield = 2,099F kg/ha) in 1999-2001, 87,000 (yield = 2,369F) in 2001, 100,000 (yield = 2442F) in 2002, and 131,000 (yield = 1,720F) in 2003. Produced 224,000 metric tons in 1999-2001, 207,000 MT in 201, 244,000 MT in 2002, and 226,000 MT in 2003.

Oceania. Australia.

Note: In this 2003 Yearbook the USSR was not listed for the first time in the history of the publication.

11048. Fujita, Masako. 2003. Itsumo no gohan ni nattô sae areba [If I only had natto with my ordinary meals]. Tokyo: Takahashi Shoten. 111 p. 26 cm. [Jap]*

11049. Fukuoka, Yasuko. 2003. Sushi!: 55 authentic and innovative recipes for nigiri, nori-maki, chirashi and more! Philadelphia: Courage Books. London: Salamander Books. 96 p. Illust. (color photos by Paul David Ellis). Index. 29 cm.

• ***Summary:*** Contents: Introduction. Nigiri. Maki-mono. Chirashi. Oshi-zushi. Other sushi.

The ingredients section includes entries for Abura-age (p. 9): "This is thin tofu fried in oil and essential for 'shojin ryori,' vegetarian cooking developed from the diet of Buddhist monks. It is also used opened as a bag to be stuffed with sumeshi rice (see inari, page 89)." Miso paste. Shoyu ("This is the Japanese variety of soy sauce and has quite a different flavor from the Chinese type"). Seaweed (ao-nori, konbu seaweed, nori dried seaweed, tororo or oboro konbu).

Soy-related recipes:

Futo-maki (p. 33) calls for "1 pack pre-seasoned abura-age (thin fried tofu: use 3 or 4 pieces, layered and cut into ½ inch wide strips)."

Shojin oshi (Beets and tofu sushi, with "1 pack {10 ounces} tofu," p. 75).

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Inari (Sushi in fried tofu bags, with "10 abura-age {fried thin tofu}," p. 89).

Note: This is the earliest English-language document seen (April 2013) that contains the term "fried thin tofu." It refers to deep-fried tofu pouches. Address: Musician, composer, food writer, England.

11050. Hamauchi, Chinami. 2003. Miso ryôri: karada to kokoro ni shimiwataru [Miso cookery: It goes deep into your body and soul]. Tokyo: Jitsugyo no Nihon-sha. 125 p. 21 cm. [Jap]*
Address: Japan.

11051. Hamauchi, Chinami. 2003. Mainichi nattô: karada ni yasahii kara [Everyday natto: because it's good for your body]. Tokyo: Jitsugyo Nonihonsha. 125 p. 21 cm. [Jap]*

11052. Hirahara, Naomi. 2003. Distinguished Asian American business leaders. Westport, Connecticut: Greenwood Press. viii + 242 p. See p. 216-19. Illust. (portraits). Index. 26 cm. [3 ref]
• ***Summary:*** One of these leaders is Tsuru Yamauchi, mother of Shoan Yamauchi, whose story is told on pages 216-19. Born on 25 Dec. 1890, in Shuri, Okinawa, Japan, her full name at birth was Tsuru Kamigawa. She died in 1900 in Hawaii. She was cofounder of the Aala Tofu Co., Honolulu, Hawaii (1940-1958). A "picture bride from Okinawa, she helped her husband, Shokin, establish Aala Tofu Co. in Honolulu, Hawaii, in 1940. This tofu manufacturing company, which traces its roots back to 1923, eventually made its way to Los Angeles, California, where it became Hinode Tofu Co. It eventually merged with a Japanese Spice manufacturer, House Foods, to create Hinoichi Tofu." Address: Independent writer and editor.

11053. Hoshikawa, Hiroko; Hoshikawa, Haruo; Koizumi, Takeo. 2003. Shôta to nattô [Shôta and natto]. Tokyo: Popurasha. Unpaginated. Illust. (color). 21 x 27 cm. [Jap]*
• ***Summary:*** For a juvenile audience. Shôta is a Japanese boy. His grandfather teaches him that natto is a magical food. Starting from growing soybeans to making natto, the whole process of making fermented soyfoods is introduced.

11054. Hosoi, Tomohiro; Kiuchi, Kan. 2003. Natto–A food made by fermenting cooked soybeans with *Bacillus subtilis* (*natto*). In: Edward R. Farnworth. 2003. Handbook of Fermented Functional Foods. Boca Raton, Florida: CRC Press. 390 p. See p. 227-50. [111 ref]
• ***Summary:*** Contents: Fermented soybean foods in Asia. Ingredients of natto: *Bacillus subtilis* (*natto*) spores, soybeans (color, size, protein content, sugar content, washing and storage methods). Natto processing: Washing and soaking of soybeans, steaming of soybeans, inoculation with *Bacillus subtilis* (*natto*) spores, packaging, fermentation, packing for shipment, changes in packages. Assessment of quality: Chemical composition, sensory tests (8 criteria), changes in consumers' preferences (growing preference for larger soybeans and natto with markedly weaker odors and strings). Health benefits: *Bacillus subtilis* (*natto*) cells (effects on intestinal microflora and feed efficiency, effects on the immune system, anti-allergy effect of subtilisin, fibrinolytic activity of subtilisin, role of vitamin K-2 (menaquinoe-7) in the prevention of osteoporosis), phytoestrogens–effects on cancer and osteoporosis. Conclusions.

Natto and related foods are all made by fermentation with the bacterium *Bacillus subtilis* (*natto*). These include sweet dou chi (*xian doushi*) in China (where it is used as a seasoning for Beijing duck [Peking duck]), kinema in Nepal and Myanmar, *tua nao* in Thailand, and *chungkuk-jang* in Korea.

In the year 2000 a total of 10.1 million metric tons of soybeans in Japan were converted directly into foods; more than 80% of these soybeans were imported. Between 1991 and 2000 there was a 13% increase in soybean consumption for natto products.

Natto makers prefer to use certain soybean varieties such as Suzuhime and Suzumaru which are grown in Hokkaido, Kosuzu in Iwate, Miyagi, and Akita Prefectures, and Natto-Shoryo in Ibaraki Prefecture.

Natto makers generally desire the following qualities in soybeans: 1. Extra small or small size (for consumers from Tokyo northward). 2. Easily washable. 3. Yellow surfaces and hila. 4. A suitable degree of stickiness when made into natto. 5. Relatively sweet taste. 5. Minimal changes in constituents and appearance during storage.

In Japan, soybeans are classified by diameter into four groups: (1) Extra small is less than 5.5 mm diameter. (2) Small is 5.5 mm to 7.3 mm. (3) Medium is 7.3 mm to 7.9 mm. (4) Large is greater than 7.9 mm in diameter.

Japan's leading natto trade association is called the "Federation of Japan Natto Manufacturers Cooperative Society."

A soybean allergen has been identified as *Gly m* d 28K. This allergen is found in high concentrations in various nonfermented soybean products such as soy protein isolate, tofu, dried frozen tofu, and yuba. However fermented soybean products such as natto, soy sauce and miso do not contain this allergen. "*Bacillus subtilis* (*natto*) produces a serine protease [proteolytic enzyme] of subtilisin NAT during its growth. Subtilisin NAT appears to degrade *Gly m* d 28K."

"Circulating platelets and blood-derived proteins (fibrin) are essential for the formation of blood clots, which prevent bleeding long enough for healing to occur. However, excess coagulation prevents normal physiologic blood flow, which causes thrombotic disorders Thrombolytic therapy is the most direct means of restoring blood flow. *Bacillus* spp. produce serine proteases called subtilisins, which are known

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to have fibrinolytic activity" [8 references cited]. Address: 1. PhD, Tokyo Metropolitan Food Research Centre; 2. PhD, Dep. of Food Science and Nutrition, Kyoritsu Women's Univ. Both: Tokyo, Japan.

11055. Kakure nôkôsoku ni nattô kinaze ga kiku: dekite shimatta kessen to kasu yuiitsu no kôso [Nattokinase helps for an undetected stroke: the only enzyme that dissolves an already developed blood clot / thrombus]. 2003. Tokyo: Shufunotomo Infosujohosha. 96 p. 26 cm. [Jap]*

11056. Marquard, Walfgang. 2003. Kochen mit Soja-Sauce: die wuerze fuer jede Kueche [Cooking with soy sauce: the seasoning for every kitchen]. Cologne, Germany: DuMont-Monte Verlag; Kikkoman Trading Co., Europe GmbH. 140 p. Illust. 23 cm. [Ger]*
Address: West Germany.

11057. Minamiyama, Yukiko; Okada, Shigeru. 2003. Miso: Production, properties and benefits to health. In: Edward R. Farnworth. 2003. Handbook of Fermented Functional Foods. Boca Raton, Florida: CRC Press. 390 p. See p. 277-86. [45 ref]
• ***Summary:*** Contents: Introduction. Miso: The history of miso, manufacturing miso, home production of miso, effects of miso on health (gastrointestinal diseases, cancer prevention, elimination of radioactive materials, effect on cholesterol levels and aging, harmful effects of tobacco). Conclusions. Acknowledgments.

Total commercial production of miso in Japan is presently about 600,00 tonnes (metric tons) per year, produced by over 1,500 miso factories and plants (p. 278).

History: At some time between 200 B.C. and 300 A.D. the soybean was probably introduced to Japan, most likely from northern China, through Korea. The earliest known book about miso is "thought to be the *Taiho-ritsyryo* compiled in A.D. 702, but by that time a type of miso was already known in Japan." The technique for preparing miso was introduced from either Korea or China. One theory is that miso developed from Chinese jan [sic, jiang]. In about 550 to 600 A.D., Japanese came to know about jiang, however at this time jiang was being made in Buddhist temples in China. It is believed that in 753, a Chinese Buddhist named Ganjin (688-763) came to Japan to promote Buddhism and at the same time brought jiang to Japan.

Elimination of radioactive materials: Miso exports to European countries increased after the April 1986 accident at the Chernobyl nuclear power plant in Northern Ukraine, because it was believed that miso consumption could ameliorate the harmful effects of exposure to atomic radiation. Researchers studying the activities of microorganisms have shown that miso consumption helps to eliminate radioactive substances from the body. Address: 1. PhD, First Dep. of Pathology, Okayama Univ. Medical School; 2. Dep. of Pathological Research, Graduate School of Medicine and Dentistry, Okayama Univ. Both: Okayama, Japan.

11058. Miso, tôfu, nattô [Miso, tofu and natto]. 2003. Tokyo: Nosan Gyoson Bunka Kyokai (Agricultural and Fishing Village Cultural Organization). 249 p. 22 cm. Series: Kikigaki Furusato no Katei Ryori (Written as Heard Home Cooking of the Homeland), no. 16. [Jap]*
Address: Japan.

11059. Oshima, Akira; Faas, Patrick; Cwiertka, Katarzyna J. 2003. Yamazato: The Kaiseki cuisine–Hotel Okura Amsterdam. Oostkamp, Netherlands: Stichting Kunstboek. 191 p. Illust. (photos by Bart Can Leuven). 27 p. [Eng]*
Address: 3. Researcher, Centre for Japanese and Korean Studies, Leiden Univ.

11060. Saito, Shigeta. 2003. Nattô shugi no ikikata [The way of living based on natto principles]. Tokyo: Soshinsha. 155 p. 19 cm. [Jap]*

11061. Sukenari, Futaba. 2003. Mainichi dakara yappari misoshiru [Every day, therefore, as we've always known, miso soup]. Kyoto: Natsume-sha. 103 p. 24 cm. [Jap]*
Address: Japan.

11062. Sumi, Hiroyuki. 2003. Kono aojiru o nomeba shinkin kôsoku, nôkôsoku, boke, tônynô-byô wa kowakunai; nattô-kin nattôinaze to ryôkuyô yasai juisshurui fukugô [If you drink this green soup, you need not be afraid of heart attack, stroke, senile psychosis, or diabetes: Natto bacteria, nattokinase, and 11 green leafy vegetables combined]. Tokyo: Gendai Shorin. 198 p. 19 cm. [Jap]*

11063. Uchi no nattô ga ichiban oishii: ryôri ni karada ni ii. Shiranakatta nattô reshipi no kotsu no kotsu [My natto recipes are the most delicious: Natto is good for both cooking and for your health. Tricks and secrets for natto recipes you've never heard of]. 2003. Tokyo: Gakushu Kenkyusha (Gakken). 81 p. 26 cm. [Jap]*

11064. Watanabe, Junko. 2003. Nattô ryôku: taberu kusuri [Natto power: Edible medicine]. Tokyo: Kodansha. 63 p. 26 cm. [Jap]*

11065. Yamori, Yukio; Zhou, Sufen; Cheng, Anqi. 2003. Chang shou yang ceng wei zeng tang [To live longer, healthier: Miso soup. Translated from Japanese]. Taipei, Taiwan: Ju zi chu ban you xian gong si (Juzi Publishing Co., Ltd.). 111 p. Illust. (some color). 26 cm. Series: Shi Jie Mei Shi (Delicious Street Food), no. 1. [Jap]*

11066. Evans, Barry. 2004. Failure of nori crop in

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Kyushu, Japan. Sea vegetables imported to America today (Interview). *SoyaScan Notes.* Jan. 12. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** About 40% of all the nori produced in Japan comes from the Ariake Sea off the western coast of Kyushu, where it has been cultivated on nets for more than 25 years. This bay was ringed by wetlands, which were gradually filled in by developers. In early 2001 the entire nori crop in that bay failed because of an unseasonal outbreak of red tide–which had several causes, including a land reclamation project which destroyed wetlands that are no longer able to purify the sea water. The Japanese believe that nori will never be grown in that bay again–a huge disaster for thousands of nori farmers! This had led to more of the sea vegetables imported to the USA coming from China and Korea. Barry thinks that 80-90% of all the sea vegetables now consumed in Japan comes from China.

It is generally believed in Japan that, of the various sea vegetables, the kombu crop is the cleanest and most free of heavy metals such as lead, mercury, and arsenic. That is because most of the kombu harvested in Japan comes from the area around Hokkaido, Japan's northernmost large island, where the cold, clear current flows down from the north. Japan has made a big effort, over the past 10-20 years, to clean up its environment and coastal waters.

China, on the other hand, has little pollution contral. Its main goal is to be the low-cost producer of any product that consumers desire–worldwide. It produces a growing percentage of the world's sea vegetables–but heavy metal content is an issue.

Eden Foods, which is the leading seller of sea vegetables in the USA, buys all of its sea vegetables from Japan and pays more for them than if it bought them from China or Korea. In recent years, Great Eastern Sun (GES) has built its seaweed business on having less expensive products, imported from China. The only sea vegetable GES imports from Japan (Mitoku) is arame, which is not available from China. Address: Owner, American Miso Co., Inc. and Great Eastern Sun, Asheville, North Carolina 28806. Phone: 704-252-3090.

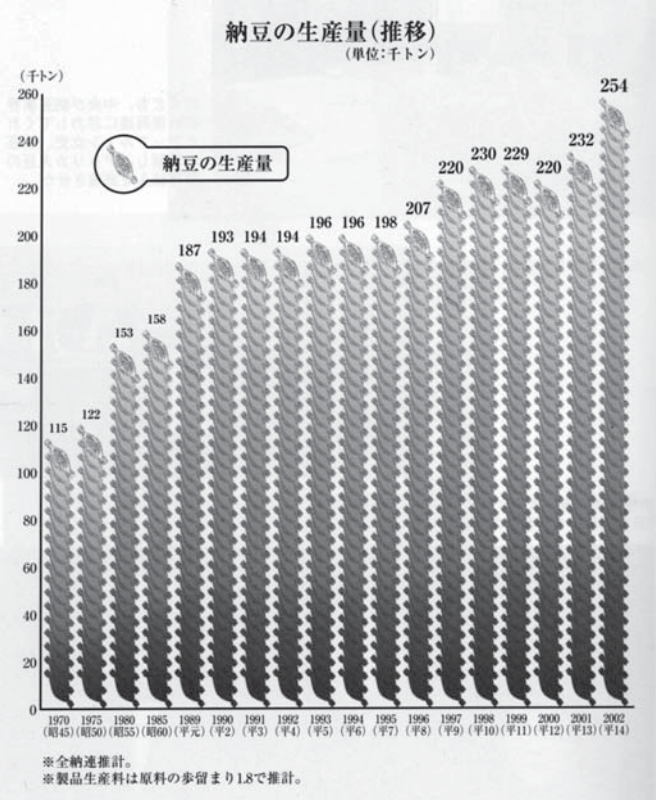
11067. Takayama, Hideko. 2004. The latest homegrown diet craze. *Newsweek International.* Jan. 26. p. 48. *
• ***Summary:*** About the Okinawan diet.

11068. Alexander, Melissa. 2004. Focus on Brazil: Soybean sector surges ahead on investments by multinationals, domestic companies. *World Grain* 22(1):22, 24, 26-27.
• ***Summary:*** Worldwide, Brazil ranks first in exports of coffee, orange juice and soybean meal, second in exports of soybeans and tobacco, and third in exports of beef and poultry. Brazil's main export markets are the U.S., Argentina, Japan, and the Netherlands.

A valuable sidebar titled "Key facts," gives basic information about: Capital city, demography, geography, government, official agricultural agencies, economy, G.D.P. per capita, currency, exports, imports, major crops / agricultural products, wheat, soybeans, maize, transportation, internet. A half-page section discusses oilseeds (mainly soybeans) in Brazil. Underlying Brazil's spectacular rise as a world soybean producer is "a whole new system of oilseed inputs, outputs, and infrastructure led by multinationals, such as Cargill, Inc. and Bunge Limited, and large domestic companies." On the one had, these companies have made seed, fertilizer, herbicides, and credit available to farmers, while on the other hand they are offered purchasing, crushing, transport and export facilities to complete the cycle. Many new soy-related projects are under construction or being planned.

A graph (1994-95 to 2003-04) shows Brazil's soybean production and soybean exports, and U.S. soybean exports.

11069. Zenkoku Natto Kyodo Kumiai Rengokai (Japanese National Natto Assoc.). ed. 2004. Nattô kindai gojû nenshi [Natto's recent history: 50 years]. Tokyo: Zenkoku Natto Kyodo Kumiai Rengokai. 439 + 31 p. Plus 8 unnumbered pages of plates at front. Illust. No index. 20 cm. [1 ref. Jap]



• ***Summary:*** Name of organization with diacritics is: Zenkoku Nattô Kyôdô Kumiai Rengokai. Contents: Graph of natto production (in 1,000 metric tons {tonnes}) in Japan from 1970 to 2002. Production increased from 115,000 in 1970 to 187,000 in 1989 to 230,000 in 1998 to 254,000 in

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2002. 31 unnumbered pages of glossy photos, mostly of people connected with the Natto Association. 1. History of natto (before World War II). 2. History of natto (after World War II). 3. From soybeans to natto: History of natto containers. 4. History and usage of mustard for natto: History of sauce (*taré*). 5. Comments from the researchers: Suggestions / proposals.

6. Big and complete book about the nutritional value of natto–How wonderful natto is! [*Nattô Taizen,* by Shinobu Machida, published in 1997]. 7. Longevity with native / local natto foods and cookery: The Japanese chain of islands, natto cuisine is traveling. 8. Study of spices / condiments (*yakumi*). 9. Natto cooking a la carte. 10. Activities, directions, and work details of the Japanese National Natto Association. 11. Timeline / chronology of Japanese National Natto Assoc. 12. Meetings / gatherings for judging samples of natto. 13. How this book was published: Regarding the use of questionnaires. Address: Tokyo, Japan.

11070. Hinners, John. 2004. Sizing up the competition. *Iowa Soybean Review* (*Iowa Soybean Association, Urbandale, Iowa*) 15(5):16-17. Feb.

• ***Summary:*** Brazil is poised to become the world's largest exporter of beef in 2004. In 1999 Brazil exported 464,000 tons of beef; in 2004 the country is projected to export 1.4 million tons–an "explosive increase." It is likely that pork production and exports will follow the same pattern. In 2003 pork exports from Brazil rose 99% (almost double).

A pie chart titled "U.S. soybean use by livestock" shows: Poultry 50%, swine 25%, beef 13%, dairy 6%, petfood 3%, and other 3%.

Mexico and Japan are the two largest consumers of U.S. red meats. Tables show that in 2001, the U.S. exported to Japan 513,174 tons of beef and beef variety meats worth $1,245.8 million. Also in 2001 the U.S. exported to Mexico 311,404 tons of beef and beef variety meats worth $546.2 million.

More than 33 million bushels of U.S. soybeans are used to produce U.S. red meat exports. For more: www.usmef.org. Address: Director: Industry Relations, U.S. Meat Export Federation.

11071. Shida, Yasuyo. 2004. Soymilk desserts: Quick & easy. Tokyo: Joie, Inc. 92 p. Feb. Illust. (color). No index. 26 cm.

• ***Summary:*** A handsome book loaded with glossy color photos. Contents: About the author. Baked desserts. Steamed / fried desserts. Fruit desserts. Chilled desserts. Drinks & shakes. Nutrition and health benefits of soybean products. Kitchen utensils for making sweets. Glossary: Meringue, mousse, okara, parchment, puree, sesame seeds, sieve, skimmed milk, souffle, syrup, tofu, *tonyu* (the Japanese word for soymilk), whisk, *yuzu* (a sour and fragrant citrus fruit from Japan).

The author has studied confectionary art at both L'Ecole Lenotre in Paris, France, and at Richmond Bakery School in Luzern (Lucerne), Switzerland. A portrait photo shows the author.

11072. Shurtleff, William. 2004. Why do we in the USA use the Japanese word "tofu" rather than the Chinese word "doufu" to refer to this soyfood product? (Editorial). *SoyaScan Notes.* March 4.

• ***Summary:*** Several important trends would favor the use of the Chinese term "doufu": (1) During the period 1920 to 1960, Chinese cooking was much better known in the USA than Japanese cooking. There were many more Chinese restaurants, Chinese cookbooks, and Chinese recipes in American cookbooks (See *Cooking with a Foreign Accent,* 1952; *Helen Brown's West Coast Cook Book,* 1952, etc.). (2) In 1975, there were also more Chinese-American tofu manufacturers. See list in *The Book of Tofu,* by Shurtleff and Aoyagi–although no list is complete because many were small and sold their products mostly to the local Chinese community. (3) Americans generally prefer Chinese-style firm tofu to Japanese-style soft tofu.

But: (1) The influence of confusing Chinese terminology and spelling due to dialects and lack of standard system of romanization. For example, Cantonese is the main dialect of Chinese spoken in the United States, whereas Mandarin is the standard in China.

(2) Influence of Japanese macrobiotic movement: 1. In the 1950s, George Ohsawa, a Japanese teacher, started the macrobiotic movement in the United States. He and his teachers (Michio and Aveline Kushi; Herman and Cornellia Aihara) developed a great popular interest in Japanese foods. 2. Tofu used as an ingredient in many macrobiotic cookbooks. 3. The macrobiotic movement played a major role in starting the natural foods industry in America, especially with the pioneer company Erewhon–started by Aveline and Michio Kushi, Japanese teachers of macrobiotics. The first Erewhon retail store opened in Boston, Massachusetts, in April 1966. Soon Erewhon became the most important distributor of natural foods in the USA. Tofu was sold at most natural food stores, where it was almost always called "tofu."

(3) Influence of William Shurtleff: He became interested in both macrobiotics and Japanese culture in the mid-1960s. 1967 spring–He took a course in Japanese Art, taught by Michael Sullivan, at Stanford University; that summer he lived in Kyoto, Japan, studying art and architecture and practicing Zen meditation. 1968 May–the Esalen at Stanford program (of which he was director), hosted Michio Kushi, a Japanese teacher of macrobiotics, in a 1-week workshop. At about this time Shurtleff and the members of the commune in which he lived near Stanford University decided to stop eating meat and become vegetarians. 1968 June 10–Shurtleff entered Tassajara Zen Mountain Center south of Carmel,

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California, where he practiced meditation as a student of Japanese Zen master Shunryu Suzuki, roshi for 2½ years. The delicious vegetarian diet included tofu, miso, and whole soybeans. 1969 Dec.–A photocopied book titled *The Tassajara Food Trip,* which he wrote, was distributed to friends at Christmas. It contained many Japanese and macrobiotic recipes served at Tassajara–including 4 recipes calling for "tofu"–the word that was used by everybody at Tassajara to refer to this food. 1971 Jan. 16–Shurtleff arrives in Japan to study Japanese language and culture, and Zen meditation. He becomes increasingly interested in Japanese foods and especially tofu. 1971 Dec. 26–He meets Akiko Aoyagi in Tokyo. She is an excellent cook and artist, and begins to serve him many Japanese-style vegetarian recipes–often including tofu. 1972 Dec.–He begins to write a booklet about tofu, for friends. But after meeting Nahum and Beverly Stiskin, founders of Autumn Press, the booklet is transformed into a book project. In Dec. 1975 *The Book of Tofu,* by Shurtleff and Aoyagi, was published in Japan by Autumn Press. It was the first popular book about tofu in the Western world, and it quickly became a best-seller–selling more than 500,000 copies by the year 2002. The Preface to the 2001 editions gives details about how the book was written.

(4) Influence of Library of Congress. In the USA the Library of Congress has long been the organization that decides which terms will be used to describe important subjects. The results are published in the well-known Library of Congress Subject Headings (LCSH), which is updated each year as new terms are added or outdated terms change. On 6 June 1977 the term "Bean Curd" was approved by the Library of Congress Subject Headings committee. On the same day they approved "Bean Curd, Dried" and "Cookery (Bean Curd)." So starting at this time, "bean curd" became the official, authoritative name for tofu. According to Tom Yee of the Library of Congress, these headings were probably established as a result of cataloging *The Book of Tofu,* by Shurtleff & Aoyagi. Any books about tofu published in the USA would thereafter be given the subject heading "bean curd" by the Library of Congress and libraries across America in their cataloging and card catalogs. New editions of *The Book of Tofu* published after June 1977 were given the subject heading "bean curd." In May 1985 Shurtleff wrote the Library of Congress, Cataloging in Publication Div., recommending that its subject heading be changed from "bean curd" to "tofu." He gave three carefully researched reasons for recommending the change. The Library of Congress made the change from "bean curd" to "tofu" in their subject headings. Address: Lafayette, California.

11073. Drosihn, Bernd. 2004. Update on soyfoods in Europe. Part II (Interview). *SoyaScan Notes.* March 15. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Soymilk: A major new soymilk maker in Europe is named Wild (www.wild.de), an old German food company that specializes in fruits and ingredients; their retail soymilk is named Soy and Joy. Their most famous brand is Caprisun, a non-soy drink in a foil pouch, well known in the USA. They and So Good, the Australian soymilk now made with Solae, are both strong competitors of Alpro.

Several weeks ago Hain-Celestial of New York purchased two German soymilk makers, both owned by Bruno Fischer, Jr.: Natumi and Gut Honneroth. He sold both companies at a low price–probably because he had to. Bruno had gotten his soymilk into Aldi, the mother company of Trader Joe's and the No. 1 discounter in Germany–and maybe in all of Europe, and he developed a large soymilk business with Aldi–perhaps so large he could no longer handle it himself. Bruno also made a lot of private label soymilk. With Hain, Bruno found a large German dairy to make soymilk for Aldi under a new Aldi brand. The new European CEO of Hain-Celestial is Philippe Woitrin, who was CEO of Lima Foods when Hain acquired it.

Triballat makes the best soy yogurts (Sojasun brand) in the world–in Bernd's opinion. They have a new brand, Sojadé, which are delicious creamy yogurt drinks–maybe organic. The Japanese Yakult concept of drinking live beneficial probiotic bacteria each morning has now caught on in a big way in Europe. Yakult is one of the best entries into the European food market in years. Bernd just saw White Wave's Silk Alive [the name was soon changed; it was sold commercially only under the name "Silk Live"], a similar product, at the Anaheim Natural Products Expo. But he liked the Wildwood smoothie even better, and the WholeSoy fermented soymilk best of all American products.

In France a small company named Sojami (pronounced so-zha-MEE), which started about 10 years ago, makes very creative, unique, and interesting soy cheeses and cultured soy yogurts. The founder has a university research background and is a very nice guy.

Tofu: Tofu consumption in Europe has expanded steadily over the past 5-7 years, but it is still a very small product. The largest maker of the tofu and tofu products sold in Germany is Life Food GmbH / Taifun Produkte, run by Wolfgang Heck and Guenter Klein. Heuschen-Schrouff B.V. (Landgraaf, Netherlands) and Viana are tied for second place. About 10 years ago, Heuschen-Schrouff started selling their tofu under the organic So Fine brand (www.sofine.nl). An Indian-run company in Kerkrade, Netherlands, run by the brothers Singh (both Sikhs), makes tofu mostly for the Asian (Indonesian) market. In 2001 Viana started selling its tofu to the mainstream market under the Veggie Life brand; this English-language brand name communicates well to people speaking many different languages throughout the EU (European Union)–though distribution is still limited to Germany and Austria. Soto Tofu, formerly run by Rolf Barthof has been sold to a very large dairy company, Algäuland. Viana's main products are tofu and tofu

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products–such as meat and cheese alternatives. Viana is #1 in Germany in meat alternatives. Germans buy soyfoods for three main reasons: They are good for one's health, they taste good, and good for the environment. Bernd is a vegan, but about 90% of Viana's products are sold to non-vegetarians.

Early tofu companies still active in Europe include Sojafarm (founded and still run by Lothar Stassen), Albert's Tofuhaus (Albert Hess; exports lots of his products to France). A basic problem with the smaller, early tofumakers in Germany is that they didn't have the creativity or power to put a brand on the market. So both these companies produce a lot of tofu under private labels. Lothar bought the Svadesha brand (Svadesha was the first German tofu company) and produces tofu under the Svadesha brand. About 2-3 years ago he also purchased the Nagel's Tofu brand from Christian Nagel, who now markets the tofu under his former brand. So Lothar makes tofu under 3 brands. Berief Feinkost (in Beckum, northern Germany), started 10-15 years ago, tries to cover the mainstream tofu market, but not very successfully. Kassel Tofu Kato (started by Gyoergy / Yuri Debrecini, who was at Soyastern). Thomas Karas is no longer involved with soyfoods; he tried to enter the computer business but Bernd does not know what he is doing now. In Spain, the market leader is Natursoy near Barcelona. Nearby is Salvador Sala of Vegetalia. In Spain, there is a lot of interest in and rapid growth of soyfoods and organic foods. In Italy the Ki Group (Schenker) owns a tofu company–fairly old but not very creative.

In the United States, Pulmuone now has three U.S. factories; their first one in Southgate, southern California, a new one at Fullerton, California, and a 3rd one in New York. The Fullerton factory is the most modern Bernd has ever seen. There they make Gourmet Tofu, introduced in about Jan. 2004, which is presliced and marinated, in 4 flavors / styles: Baked, Sliced, and Marinated.

Meat alternatives: Nestle now owns Osem which owns Tivall, the Israeli maker of meat alternatives. Since all of Tivall's products are held together by eggs or egg whites, none of them are vegan–and none are organic. Quorn, which also contains lots of egg protein, is owned by AstraZeneca [Marlow Foods]–which wants to sell the company because growth and profits have been lower than expected. DE-VAU-GE in Germany is a very big company, they make large amounts of meat alternatives (incl. burgers), and they do a lot of business with Aldi in breakfast cereals–not in soyfoods. Bernd thinks they are good, and very economical manufacturers, but they are not very creative and they have no USP (unique sales point); moreover, many of their products contain egg protein, but their quality is lower than that of Tivall. Bernd believes his meat alternatives are as good as Tivall's, but more expensive, in part because of organic ingredients. Tivall makes its raw materials in Israel, then exports these to Europe for cutting and flavoring.

Klaus Gaiser owns Topas which sells Viti brand meat alternatives based on wheat gluten, with no soy; he owns the brand and markets the products, but he has meat companies manufacture them. However, when his typically 3-year contract with the manufacturer expires, he has to find a new manufacturer, but the previous one keeps making his products under their own brand. In the USA: At Turtle Island Foods (Hood River, Oregon), Bernd met Hans Wrobel, a German who does product development. Note: Hans and Rhonda Wrobel of The Higher Taste developed Tofurky in Portland, Oregon. Bernd makes Pizzarella, a tofu-based cheese alternative. Address: Founder and president, Viana Naturkost GmbH, 54578 Wiesbaum / Vulkaneifel, Germany. Phone: +49 06593-99670.

11074. Morinaga Nutritional Foods, Inc. 2004. Mori-Nu–Refreshing new package design: Tantalizing new recipes (Leaflet). Torrance, California. 1 p. Front and back. 28 cm.
• ***Summary:*** This color leaflet (sent by Patricia Smith from Natural Products Expo West, March 2004) contains a color photo of each of the six different types and textures of Mori-Nu Silken Tofu: Soft, Firm (Made with organic soybeans), Firm, Lite Firm, Extra Firm, Lite Extra Firm. The writing and graphics are now in "landscape" mode, with the package horizontally rather than vertically. "The same great Mori-Nu Silken Tofu now in a new package."

On the rear is detailed information about each product, including ingredients. The coagulant in each is "gluconolactone" plus either calcium sulfate or calcium chloride. Address: 2050 West 190th St., Suite 110, Torrance, California 90504.

11075. Okazaki, Tetsuki. 2004. The role of the merchant coalition in pre-modern Japanese development: An historical institutional analysis. CIRJE-F-284. www.e.u-tokyo.ac.jp/cirje/research/dp/2004/2004cf284.pdf. 20 + [8] p. March. [59 ref]
• ***Summary:*** Shinbo and Hasegawa (1988, p. 262-63) pointed out that in 1780 a *kabu nakama* [merchant coalition] of merchants trading soy sauce from other regions was established in Kyoto; it formed a distribution system for soy sauce from the other regions and brought about soy sauce production in Tatsuno. This is an example of how a merchant coalition can contribute to forming a distribution network (p. 12).

Commodities whose prices are known during the period 1800 to 1840 in Edo (Tokyo) and Osaka are unpolished rice, polished rice, barley, soybeans, raw cotton, wax, muscovado, miso, soy sauce, and saké (p. 12-13). Note: Muscovado (also "muscavado") is unrefined or raw sugar obtained from the juice of the sugarcane by evaporation and draining off the molasses. Address: Faculty of Economics, Univ. of Tokyo.

11076. **Product Name:** Soy Natto–Natto Boy Snack Nuts [Plain, or Sea Salt & White Soy Sauce].

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Manufacturer's Name: Soy Natto Food Co. (Importer-Distributor). Made in Japan.
Manufacturer's Address: 1015 East Howard Ct., Visalia, CA 93292. Phone: 559-679-9699.
Date of Introduction: 2004 March.
Ingredients: Sea Salt: Soybeans, Subtilis natto, White soy sauce, sea salt.
Wt/Vol., Packaging, Price: 1.06 oz (30 gm) plastic pouch.
How Stored: Shelf stable.
New Product–Documentation: Sell sheet (8½ by 11 inch, color) sent by Patricia Smith from Natural Products Expo West (Anaheim, California). 2004. March. "New generation soy food: Soy natto." "Healthy and happy snack from kids to seniors. Easy to crunch, enjoyable for snacking." Also press release dated March 5, 2004. "Soy Natto Food Company is proud to unveil its new products, 'Soy Natto Snack Nuts'... into North America and Europe Markets at Natural Products Expo West at Anaheim, California on March 5, 2004. Soy Natto is a dried food product derived from fermented soy beans. Fermented soy beans, known as 'Natto,' have received positive attention for the natural enzyme, Nattokinase, and ability to help maintain a healthy circulatory system in addition to diversified beneficial functions." Natto has a long history in Japan, going back many centuries. Contact: www.soynatto.com or info@soynatto.com.

Product with Label sent by Mike Masuyama, PhD, of Visalia. 2006. June. 4 by 6 inches plastic pouch. Two flavors. On the front panel is a color cartoon of Natto Boy, a soybean, with a smiling mouth, eyes, 2 hands, and 2 feet, On the sea salt flavor he is wearing a flat-brimmed yellow hat with a red flower in it. Nutrition facts and barcode are also on the front panel; there is no printing on the back of the package. The natto inside have been dried until crunchy, quite like soynuts. Soyfoods Center taste test. The salted ones have a good flavor and texture. The unsalted are quite bland.

Note: K. Mike Masuyama, PhD (Executive Vice President) and Christopher K. Maruyama (Marketing Manager) both sell "Spirit of the Sea" High Mineral Sea Salt. A leaflet (8½ by 11 inches, 3 panels each side) gives details.

11077. **Product Name:** Soy Natto–Salad Toppers (Fermented Soy & Veggie Salad Topping). Renamed Natto Boy: Natto & Veggie Toppers by June 2006.
Manufacturer's Name: Soy Natto Food Co. (Importer-Distributor). Made in Japan.
Manufacturer's Address: 1015 East Howard Ct., Visalia, CA 93292. Phone: 559-679-9699.
Date of Introduction: 2004 March.
Ingredients: Fermented soy (soybeans, Subtilis natto), sesame, carrots, cabbage, rice, wakame sea vegetable.
Wt/Vol., Packaging, Price: 1.06 oz (30 gm) plastic pouch with self-seal top (like Ziploc).
How Stored: Shelf stable.
New Product–Documentation: Sell sheet (8½ by 11 inch,

color) sent by Patricia Smith from Natural Products Expo West (Anaheim, California). 2004. March. "New generation soy food: Soy natto." "Healthier salad topping than bacon bits or analogues. Applicable before serving over pizza, pasta, baked potato, anything for additional seasoning and health benefit" Also press release dated March 5, 2004. "Soy Natto Food Company is proud to unveil its new products, 'Soy Natto Salad Toppers'... into North America and Europe Markets at Natural Products Expo West at Anaheim, California on March 5, 2004..." Contact: www.soynatto.com or info@soynatto.com.

Product with Label sent by Mike Masuyama, PhD, of Visalia. 2006. June. 4½ by 7½ inches plastic pouch. On the front panel is a color cartoon of Natto Boy, a soybean, with a smiling mouth, eyes, 2 hands, and 2 feet. The tagline now reads: "Natto Boy Natto & Veggie Toppers." Nutrition facts and barcode are also on the front panel; there is no printing on the back of the package. The natto pieces inside have been dried until crunchy, quite like pieces of soynuts. Soyfoods Center taste test: Fair flavor (quite bland) and texture. The only salt comes from the wakame.

11078. Yasuda, Masaaki. 2004. Tofuyo no jukusei to beni

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koji kin no purotease [The ripening of tofuyo and proteases from genus *Monascus*]. In: Inouye, K., ed. 2004. Fuudo Puroteomikus: Shokuhin Koso no Oyô Riyo Gijyutsu [Food Enzyme Chemistry]. Tokyo, Japan: CMC Shuppan [CMC Publisher]. March. See p. 123-33. [31 ref. Jap]*
Address: Dep. of Bioscience and Biotechnology, Faculty of Agriculture, Univ. of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 903-0213, Japan.

11079. Ness, Carol. 2004. Kikkoman voted top vanilla soy milk: Taster's choice. *San Francisco Chronicle.* April 28. p. F2. Food section.
• ***Summary:*** Five brands of organic soymilk were tasted and rated in descending order of preference as follows: 1. Kikkoman Pearl (73 points, $2.29/qt at Rainbow). 2. Silk fresh (70 points, $1.99/qt). 3. Pacific Select Low Fat (68, $1.89/qt). 4. Vitasoy Smooth (66, $2.09/qt). 5. Vitasoy Vanilla Delight (58 points, $2.09/qt).

"Also tasted but unranked were Safeway Select Organic, WestSoy Plus, Soy Dream, Silk (boxed), Clover Stornetta, Trader Joe's, Pacific Ultra, Wildwood, 8th Continent, Edensoy, and 365." Address: Staff writer.

11080. Schettler, Renee. 2004. Miso goes mainstream: The jewel of Japanese cooking has found its way into vinaigrette, barbecue sauce and even a peanut butter sandwich. *Washington Post.* April 28. p. F1, F4-F5.
• ***Summary:*** Includes 8 recipes.

11081. Frederick, Jim. 2004. Japan's terror threat. *Time* (*Asia*). May 31.
• ***Summary:*** Tsuneo Taya, a tofu-shop owner in Japan, often saw a well-dressed al-Queda suspect on the street talking on his cell phone.

11082. Davis, Brenda. 2004. Is soy safe? *EarthSave* Spring. p. 1, 11. www.earthsave.org/pdf/spring2004.pdf [1 ref]
• ***Summary:*** An excellent overview and resounding "yes." Address: Founder and Board Chair Emeritus, EarthSave International.

11083. Wilcox, James R. 2004. World distribution and trade of soybean. In: H. Roger Boerma and James E. Specht, eds. 2004. Soybeans: Improvement, Production, and Uses. 3rd ed. Madison, Wisconsin: American Society of Agronomy. xxv + 1144 p. See p. 1-14. Chap. 1. [14 ref]
• ***Summary:*** Contents: Introduction. 1. World soybean production: USA, Brazil, Argentina, China, India. 2. World trade in soybean, soybean oil, and soybean meal. 3. World production trends. 4. Potential changes in seed yields. 5. Summary. Address: Prof. Emeritus, Dep. of Agronomy, Purdue Univ., West Lafayette, Indiana 47907-1150.

11084. Kikkoman. 2004. Kikkoman: The original teriyaki. *Gourmet.* June. p. 74-75.
• ***Summary:*** The unique ad (full page, color) consists of three tear-out recipes printed front and back on cardstock paper. On the front, each shows a bottle of a different type of Kikkoman teriyaki sauce with a slogan: Roasted garlic–"Respect the chicken." Marinade & sauce–"Respect the halibut." Toasted sesame–"Respect the tenderloin." On the back of each is the recipe with a color photo of the finished meat.

11085. Nagayama, Hisao. 2004. Nattô banzai [Cheers to natto]. Tokyo: Hifumi Shobo. 229 + 4 p. 19 cm. [Jap]*
• ***Summary:*** Mr. Hisao Nagayama was born in 1932.

11086. Williams, David. 2004. The clot-busting miracle that unclogs arteries, reverses heart disease. *Alternatives–For the Health Conscious Individual* (*Rockville, Maryland*) 9(28):1, 3-5. [2 ref]
• ***Summary:*** In Japan, heart disease is practically unknown. In 1980 a young doctor named Hiroyuki Sumi set out to discover why. New research indicated that a major culprit in causing heart disease and strokes might be blood clots that lodge in the arteries and cut off the oxygen supply to the heart and brain. After carefully testing 173 common Japanese foods, he found that the most powerful clot-buster was natto, a fermented food.

After additional research, he found that that natto contained a potent enzyme named nattokinase (pronounced nah-to-KAI-nase), which had the ability to prevent blood clots from already forming, but also to dissolve blood clots that had already formed.

Since 1980 at least 17 studies on natto and its enzymes have been published in Japan and the USA.

Blood clots, which are composed of sticky protein strands called fibrin that accumulate in blood vessels, have two functions: First, they enable the blood to quickly form clots to prevent loss of blood in the case of a cut or major wound. But their second function causes major problems. If these clots occur within the vessels of the heart, the heart muscle is starved of needed oxygen and quickly begins to die; the result is either angina or a heart attack. When clots occur in blood vessels supplying the brain, nerve cells die, resulting in a stroke and/or senility.

11087. Takahama, Motohide; Shiraishi, Atsushi. 2004. Mudage o nakusu tônyû rooshon. Bihada o tsukuru nattô rooshon [Soymilk lotion that helps to get rid of unwanted body hair. Natto lotion that makes beautiful skin]. Tokyo: Besto Serazu. 207 p. 15 cm. [Jap]*

11088. Corliss, Richard; Lemonick, Michael D. 2004. How to live to be 100: New research suggests that a long life is no accident. So what are the secrets of the world's centenarians? *Time.* Aug. 30.

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• ***Summary:*** Okinawans live long and healthy lives. Take Seiryu Toguchi, age 103. He wakes at 6 a.m. For breakfast, he enjoys whole-grain rice [brown rice] and miso soup with vegetables. Then he works for 2 hours weeding his fields. For lunch, he has "goya stir-fry with egg and tofu," then naps for an hour or so and spends several hours in the field.

11089. Iowa Soybean Promotion Board. 2004. SoyInk: Soy ink touches people across the globe. *Iowa Soybean Review* (*Iowa Soybean Association, Urbandale, Iowa*) 15(8):12e-12f of 12-page insert after p. 12. Summer.
• ***Summary:*** Soy ink is made from soybeans grown in the USA. Soy ink made its world debut in 1987 when *The Gazette* in Cedar Rapids, Iowa, was the first newspaper to use soy ink. Today, more than 90% of America's 1,500 daily newspapers use it in their printing. In addition, 50,000 commercial U.S. printers use now soy ink for magazines, government and commercial documents, and packaging. Recently a soy-based toner (dry ink) for photocopy machines has been developed. Outside the United States, use of soy ink is increasing worldwide. For example, in Japan, 47% of all newspaper ink is soy ink. In addition, soy ink accounts for 77% of all heat-set ink and 28% of all sheet-fed ink. At the end of April 2004, there were 4,000 SoySeal registrations in Japan.

One sidebar is titled "Ten-year anniversary of the Vegetable Ink Printing Act: U.S. Representative Jim Leach (R-IA) was one of the Members of Congress who championed passage of the Vegetable Ink Printing Act. Signed into law on October 6, 1994, this Act prohibits any Federal agency from performing or procuring lithographic printing if the ink contains less than a specified percentage of vegetable oil (40 percent for news ink; 20 percent for sheet-fed ink and forms ink and 10 percent for heat-set ink)."

Another sidebar is titled "Soy ink users." There are 85 U.S. ink manufacturers offering soy ink. "Nearly 20,000 subscribe to the Soy Ink Newsletter published by the Soy Ink Information Center and there are nearly 3,300 SoySeal trademark users in the U.S."

Contains many color photos.

11090. Kikkoman Corporation. 2004. Annual report 2004. Year ended March 31, 2004. 250 Noda, Noda-shi, Chiba 278-8601, Japan. 33 p. 28 cm. [Eng]
• ***Summary:*** This year's annual report is unfortunately a minimal and rather uninteresting version with almost no information about activities in the USA and Japan, and little financial information in dollars–only yen.

Consolidated net sales fell 2.4% to ¥334.656 trillion, operating income fell 4.8% to ¥69 trillion, but net income rose 11.7% to ¥9.287 trillion. Cash dividends per share were up 25%, to ¥10 from ¥8.

Message from the CEO (Yuzaburo Mogi, with color photo): "Summary of business policy. Business principles: The activities of the Kikkoman Group are shaped by three core principles: To pursue the fundamental principle 'consumer oriented.' To provide high-quality products and services and to promote the international exchange of food culture. To become a company whose existence is meaningful to the global society.

"The future performance and prosperity of a company are the direct result of customer satisfaction. Indeed, optimizing satisfaction is the key to future growth and earnings. Accordingly, the Kikkoman Group continues to develop products imbued with value that mirror the ever-changing needs of consumers and that provide opportunities for new culinary experiences."

"In order to earn recognition as a socially responsible company whose existence is meaningful to society, Kikkoman is committed to deepening its involvement in social activities while working to assure that its operations co-exist in harmony with the environment."

"Business strategy: Overseas we are making progress ramping up production capacity at our plants in Wisconsin, U.S.A., the Netherlands and in Singapore. Shipments are also increasing steadily from our plant in China. With these developments, we are creating a foundation to enable us to meet new demand for, and stimulate greater consumption of, soy sauce in markets around the world."

The section titled "Soy sauce division" (p. 7) states: "In Japan the home-use sector, *Tokusen Marudaizu Shoyu* (premium soy sauce), *Gen-en Shoyu* (light soy sauce), *Tokusen Yuki Shoyu* (organic soy sauce) and other products generated strong sales. However, sales in the home-use sector were down year on year due to lower sales of 1-liter bottles of mainstay *Koikuchi Shoyu* (regular soy sauce)."

"From June 2003, Kikkoman progressively switched to using non-genetically modified soybeans for its soy sauce in response to customer calls for safe and reliable products that are free of any concerns surrounding genetically modified ingredients.

"Overseas, in the U.S. and Asia outside Japan, sales were sluggish in the first half of the year due to the Iraq war and fallout from SARS, but results improved in the second half on the back of a recovering economic picture. Sales continued to grow steadily in European soy sauce markets."

Small color photos across the bottom of pages 6-7 show bottles of various Kikkoman soy sauce products.

Note: SARS stands for "severe acute respiratory syndrome," a viral disease in humans. There was a near pandemic between Nov. 2002 (it began in south China) and July 2003, with 8,096 infected cases and 774 deaths. Address: Noda, Japan.

11091. Robbins, John. 2004. Soy: What's the whole story? (Letter to the editor). *EarthSave* Summer. p. 4. www.earthsave.org/pdf/summer2004.pdf [1 ref]
• ***Summary:*** This excellent rebuttal is to an article titled

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"The Whole Soy Story: The Dark Side of America's Favorite Health Food," by Kaayla Daniel, published in *Mothering* magazine (May/June 2004). It is by far the best rebuttal seen.

"It is difficult in a short letter to respond to seven pages of biased material, particularly when each page is crowded with half-truths, statements taken out of context, and conclusions drawn inappropriately from data." Contains a good discussion of the case of Okinawa. "The elder population of Okinawa (a prefecture of Japan) have the best health and greatest longevity on the planet. This is important because the highest soy consumption in the world is in Okinawa." In the *Okinawa Centenarian Study,* which includes an extremely thorough analysis of food consumption in the prefecture, the principle investigators and authors of the study (Makoto Suzuki, M.D., Bradley J. Willcox, M.D., and D. Craig Willcox, Ph.D.) state: "Okinawan elders eat an average of two servings of flavonoid-rich soy products per day."

"This is about 10 times more than the amount of soy Kaayla Daniels claims 'Asians really eat.' When she says 'there is no historical precedent for eating the large amounts of soy food now being consumed,' she is incorrect. Soy makes up twelve percent of the diet of Okinawan elders." The authors of the study "conclude that high soy consumption is one of the main reasons that Okinawans are at extremely low risk for hormone-dependent cancers, including cancers of the breast, prostate, ovaries, and colon. Compared with North Americans, they have a staggering 80 percent less breast cancer and prostate cancer, and less than half the ovarian cancer and colon cancer." Address: Founder and Board Chair Emeritus, EarthSave International.

11092. Bryant, Anne. 2004. New developments with HVP soy sauce (Interview). *SoyaScan Notes.* Sept. 15. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** New regulations require that the terms "HVP" and "hydrolyzed vegetable protein(s)" be made more specific; for example: "hydrolyzed soy protein" or "hydrolyzed wheat protein." This is related in part to a new allergy bill.

Concerning the international Codex Alimentarius, ConAgra wants its La Choy brand HVP soy sauce to be able to be sold as "soy sauce" worldwide. The U.S. government is attending international meetings in support of ConAgra's position. The Japanese position is that only fermented soy sauce should be able to bear the label "soy sauce." Address: Center for Science in the Public Interest, Washington, DC.

11093. Skrzycki, Cindy. 2004. Feud ferments between soy sauce makers: The regulators. *Washington Post.* Sept. 21. p. E1, F4-F5.
• ***Summary:*** The dispute, which began several years ago, involves setting an international standard, under the auspices of the United Nations' food standards program (Codex Alimentarius Commission), that would govern the manufacture and labeling of soy sauce. In 1998, the Japanese asked the Commission to define soy sauce as being fermented ("naturally brewed") and aged.

But the proposal was not well received by the International Hydrolyzed Protein Council; some of its members make HVP soy sauce. The U.S. delegation wants both fermented and HVP soy sauce to be able to bear the label soy sauce. The issue has not yet been finalized.

11094. Zhuo, Xing G.; Melby, M.K.; Watanabe, S. 2004. Soy isoflavone intake lowers serum LDL cholesterol: A meta-analysis of 8 randomized controlled trials in humans. *J. of Nutrition* 134(9):2395-2400 Sept. [53 ref]
Address: Dep. of Nutrition Science, Faculty of Applied Bioscience, Tokyo Univ. of Agriculture, Tokyo, Japan.

11095. Cui, Zhanglin; James, A.T.; Miyazaki, Shoji; Wilson, Richard F.; Carter, Thomas E., Jr. 2004. Breeding specialty soybeans for traditional and new soyfoods. In: KeShun Liu, ed. 2004. Soybeans as Functional Foods and Ingredients. Champaign, Illinois: AOCS Press. xii + 331 p. See p. 264-322. [217 ref]
• ***Summary:*** Contents: Introduction. Soybean and soyfoods in China: Domestication of soybean, ancient utilization and processing, traditional soyfoods cultivars, current soyfoods markets, modern soyfoods cultivars (cultivars for bean curd {tofu} and soymilk, cultivars for small-seeded soybeans {sprouts, natto}, cultivars for vegetable soybeans {*maodou*}, cultivars for soy sauce, *doujiang, douchi,* and medicine, cultivars with improved seed composition).

Soybean and soyfoods in North America: Introduction of soybean, current soyfoods markets, modern soyfoods cultivars, genetic base and diversity of soyfoods cultivars. Soybean and soyfoods in Japan: Introduction of soybean to Japan, traditional soyfoods in Japan, current soyfoods markets, modern soyfoods cultivars (cultivars for tofu {bean curd} and soymilk, cultivars for *miso* {soybean paste}, cultivars for natto {fermented soybean; Japanese cultivars registered with the Ministry of Agriculture, Forestry and Fisheries (MAFF) include Suzumaru, Kosuzu, Natto-shoryu = Natto-Kotsubu}, cultivars for *nimame* {boiled soybean}, cultivars with low allergenic properties).

Soybean and soyfoods in Australia: Current soyfoods markets, modern soyfoods cultivars. Breeding for the soyfoods market: Tofu (environmental influences on tofu yield and solubility of seed dry matter, genotypic effects on tofu yield, seed protein and gelling properties of tofu, seed color, sugar content, undesirable flavors in tofu), natto, *edamame* or *maodou,* soymilk. Designing future soyfoods cultivars: Increasing protein and oil concentration, soybean protein composition (potential for altering protein composition, mutations in 7S storage-protein genes, mutations in 11S storage protein genes, influence of nutrition

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on storage protein gene expression, association with protein functionality), soybean carbohydrate composition (genetic regulation of oligosaccharide content), soybean fatty acid composition (genetic modification to reduce saturated fatty acid composition, genetic modification to alter unsaturated fatty acid composition, influence of multiple gene combinations on oil composition), Tocopherols and isoflavones in soybean seed (tocopherols, isoflavones). Summary. Acknowledgments.

Figures: (1) Diagram of two-dimensional representation of genetic relationships among 89 soyfood cultivars derived from a two-dimensional multidimensional scaling (MDS) analysis based on coefficient of parentage. (2) Bar chart of distribution of protein concentration among accessions of the USDA soybean germplasm collection. (3) Bar chart of distribution of oil concentration among accessions of the USDA soybean germplasm collection. (4) Diagram of the stachyose and phytic acid synthetic pathways in soybean. (5) Graph of relation of tocopherol concentrations to C18:3 concentration in mature seed of soybean germplasm with altered linolenic acid concentration, based on germplasm from the population N93-194 x N85-2176. (6) Graph of relation of total isoflavone and protein concentration among soybean cultivars.

Tables: (1) Distribution of releases of 193 public soyfood cultivars developed in China from 1923 to 1995. (2) Origin and description of 193 soyfood cultivars released in China from 1923 to 1995. (3) Distribution of releases of 123 public soyfood cultivars developed in North America from 1956 to 2000. (4) Origin and description of 123 public soyfood cultivars released in North America from 1956 to 2000. (5) Ancestors of North American soybean that contribute to soyfood cultivars but do not contribute significantly to commodity cultivars. (6) Distribution of release of 97 specialty-use public soyfoods cultivars developed in Japan from 1950 to 1995. (7) Origin and description of 97 public soyfood cultivars developed and released in Japan from 1950 to 1995. (8) Cultivars used for soyfood purposes in Australia. (9) Cultivars of Asian origin currently being employed in soyfood breeding in Australia. (10) Desired breeding traits for traditional soyfood cultivars. (11) Ratio of 11S to 7S proteins in seeds of soybean cultivars. (12) Genetic manipulation of soluble carbohydrate concentration in soybeans. Address: 1. North Carolina State Univ., Crop Science Dep., 3127 Ligon St., Raleigh, North Carolina, 27607, USA.

11096. Ginsburg, Lynn; Oliver, Hillary; Uhland, Vicky. 2004. 25 people who influenced the organics industry. *Natural Foods Merchandiser.* Oct. p. 74, 76-78, 80, 82, 84, 86, 88, 90.

• ***Summary:*** To mark its 25th anniversary, *Natural Foods Merchandiser* pays homage to the following visionaries (with a color portrait photo of most), listed alphabetically by last name. They built the organics industry into the $10.8 billion business that it is today. Roger Blobaum, Bena Burda, Amigo Cantisano and Kalita Todd, Lynn Coody and Yvonne Frost, Michael Crooke, Katherine DiMatteo (director of OTA since 1990), Sam Farr, Jonathan and Katarina Frey, Drew and Myra Goodman, Lewis Grant, Gary Hirshberg, Barclay Hope, Eckhart Kiesel, Senator Patrick Leahy (D-VT), The Lundberg brothers (Lundberg Family Farms, 35 years in the industry), Marty Mesh, Nell Newman, Steve Pavich, Anthony Rodale, Craig Sams (37 years in the industry), Bob Scaman, Bob Scowcroft, George Slemon, Michael Sligh, Zea Sonnabend.

Note: Unfortunately omitted: Paul Hawken and Michio Kushi (Erewhon), Jerome I. Rodale and Robert Rodale (Rodale Press), Michael Potter (Eden Foods).

11097. Liu, KeShun. 2004. Soy sauce as a natural seasoning. In: KeShun Liu, ed. 2004. Soybeans as Functional Foods and Ingredients. Champaign, Illinois: AOCS Press. xii + 331 p. See p. 248-263. [33 ref]

• ***Summary:*** Contents: Introduction. Types of Soy Sauce. Production of fermented soy sauce: Treatment of raw materials, koji making, brine fermentation, pressing, refining. Principles of making fermented soy sauce: Action of koji enzymes, fermentation of lactic bacteria and yeasts, color and flavor formation, formation of sugars and alcohols, formation of amino acids, function of salt. Enzymatic method–an alternative to traditional fermentation. Chemical and semichemical soy sauce. Proximate composition, quality attributes, and grades. Application of soy sauce.

Figures: (1) Outline of typical preparation process for koikuchi shoyu, the most common Japanese type of soy sauce.

Tables: (1) Differences in chemical components between brewed (fermented) and nonbrewed (chemical) soy sauces. (2) Applications of soy sauce on various types of food. Address: Univ. of Missouri, Columbia, Missouri.

11098. Mohamed, Ali; Mentreddy, Rao S. 2004. Vegetable soybeans as a functional food. In: KeShun Liu, ed. 2004. Soybeans as Functional Foods and Ingredients. Champaign, Illinois: AOCS Press. xii + 331 p. See p. 209-238. [118 ref]

• ***Summary:*** Contents: Introduction. Brief history. Global market: Taiwan, mainland China, Japan, Thailand, Indonesia, Vietnam and other countries, the United States. Quality characteristics of marketable vegetable soybean: Chemical composition and nutritional quality of vegetable soybean (moisture content, protein and oil accumulations, fatty acid composition, amino acid composition, carbohydrates, vitamins), biologically active compounds (trypsin inhibitor, phytate, isoflavones, saponins, phytosterols), nutritional quality, organoleptic features of vegetable soybeans (pod and seed appearance, texture, flavor and taste), factors affecting quality attributes (genotypes, growing location and

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season, preharvest, period of harvest, harvesting, postharvest handling, effect of processing). Agronomic performance in the United States. Constraints and future research needs.

Figures: (1) Photo of vegetable soybean in the Japanese market. (2) Photo of frozen vegetable soybean in the U.S. market. (3) Photo of vegetable soybean in processed food.

Tables: (1) Nutritional content of some vegetable soybean and pea products. (2) Quality characteristics and associated chemical compounds of vegetable soybeans. Address: 1. Dep. of Biology, Virginia State Univ., Petersburg, Virginia, 23806, USA.

11099. **Product Name:** Soy Natto: Tropical Flavor Baked Energy Bar.
Manufacturer's Name: Soy Natto Food Co. (Importer-Distributor). Made in Japan.
Manufacturer's Address: 1015 East Howard Ct., Visalia, CA 93292. Phone: 559-679-9699.
Date of Introduction: 2004 October.
Ingredients: Brown rice syrup, Energy Smart (fruit juice, natural grain dextrin), rolled oats, baby rolled oats, natto, rice flour, raisin paste, dried apples, barley malt, brown crisp rice, dried apricots, dried pineapple, natural flavors, banana puree, sea salt.
Wt/Vol., Packaging, Price: 2 oz (56 gm) in foil pouch. Retails for $2.79.
How Stored: Shelf stable.
New Product–Documentation: Product with Label sent by Mike Masuyama, PhD, of Visalia. 2006. June. 6 by 2 inches foil pouch. On the front panel is a color cartoon of Natto Boy, a soybean, with a smiling mouth, eyes, glasses, 2 hands, and 2 feet. A pink Hawaiian lei hangs around his "neck" (held up by the back of his glasses). Also: Two sell-sheets: (1) "Natto up-date." 2005. Jan. (2) "New generation soy food–Natto Boy products." "The world's first Natto energy bar." "Natto has a distinct fermented smell and sticky texture. The characteristic smell is similar to that seen with bacterial surface aging cheeses such as Limburger from Belgium, Liederkranz, Brick, or Monterey from the US, St. Paulin or Brie from France, Muenster from Germany and Bel Paese from Italy." In 1980 Dr. H. Sumi at the University of Chicago discovered that the sticky portion of natto "contains functional properties such as antigens and Nattokinase."

Soyfoods Center taste test: Delicious flavor, excellent texture and appearance.

11100. Bruni, Frank. 2004. Restaurants: A paean to tofu in a Japanese pub. *New York Times.* Nov. 24. p. F8.
• ***Summary:*** This is a review of En Japanese Brasserie, a restaurant in Greenwich Village, New York City, which features artisanal tofu–as well as "its dynamic cousin yuba, which is the skimmed skin of heated soy milk, omelet-esque in texture. Yuba arguably has more character than plain tofu..." It also serves house-made miso pastes. Address: Japan.

11101. Bittman, Mark. 2004. Japan's liquid gold [shoyu]. *Travel & Leisure.* Nov. *
• ***Summary:*** The writer travels to Kyoto, Japan, where he visit's Denkichi Matsuno's shoyu factory. He describes how traditional shoyu is made (including koji and moromi) and discusses possible origins and early history of shoyu and its place in Japanese culture. Regular shoyu (*koikuchi*) is fermented for 18 months and double-fermented (*saishikomi*) is fermented for 2 years. Matsuno's family has been making shoyu since 1805; he is the 6th generation to run the business. He makes 26,000 gallons of shoyu a year whereas the big Kikkoman factory in Noda turns out more than 90,000 gallons a day! Today about 1,600 companies make at least 12 different varieties of shoyu in Japan and Kikkoman is the largest.

Bittman then visits Tsukiji, the bustling central fish market in Tokyo, and has sushi (with shoyu) for breakfast. Every piece of fish is glazed with a light sauce of shoyu and mirin just before being served. "This mixture, on which the best chefs pride themselves, is added to daily, often making the base years and years old. My dining companion whispered, 'If there's ever a fire, the shoyu base is the first thing the chef will grab.'"

For dinner, after a hot public bath, he enjoys freshly made soba (buckwheat noodles) served with *soba tsuyu,* a dipping sauce made of shoyu, mirin, and dashi. His friend orders mixed tempura, served with shoyu (of course) followed by *soba yu* the water in which the soba noodles were cooked. They mixed it with leftover *soba tsuyu,* spiked it with chili and shoyu, then drank it like tea–a great tradition. Conclusion: "Shoyu makes everything taste good."

A photo shows a Japanese man pouring fresh koji from a wooden scoop into a wooden koji tray.

11102. Lanki, Colleen; Tsuneda, Keiko; Sadakari, Lei. 2004. Moral: A play by Kisaragi Koharu. *Asian Theatre Journal* (*ATJ*) 21(2):119-76. Autumn. See p. 174.
• ***Summary:*** This is a long translation and review of the play *Moral.* Introduction by Colleen Lanki; script translated by Tsuneda Keiko and Colleen Lanki; original director's notes translated by Colleen Lanki and Lei Sadakari. Kisagari Koharu is a Tokyo woman playwright.

In the "Notes" section at the end of the translation, note 14 (p. 174) states: *"Inari-zushi* is a small ball of rice covered by *aburage,* a thin fried tofu skin soaked in a sweet vinegar sauce."

Note: This is the earliest document seen (April 2013) that contains the term "thin fried tofu skin."

11103. Iowa Soybean Promotion Board. 2004. Simply soy: Recipes celebrating nature's perfect bean. Urbandale, Iowa: Iowa Soybean Promotion Board. 151 p. Illust. Index. 23 cm.

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• ***Summary:*** A gorgeous book, filled with elegant, mouth-watering full-page color photos of prepared recipes. Contents: Introduction, by Linda Funk, Executive Director, The Soyfoods Council. 1. The magical bean: Soy to the world, soy and health, the soyfoods pantry (glossary incl. soybean oil, soymilk, tofu, tempeh, edamame, soynuts, soy flour, textured soy protein, canned soybeans, miso, soy protein powder {soy protein isolates}, dried soy flakes {MicroSoy}, soy yogurt and smoothies, soy pasta {ADM}). Soyfood nutrient chart. 2. Start it up with soy: Appetizers and nibbles. 3. On the sidelines: Sides and salads. 4. Spoon fed: Comforting soups and stews. 5. Vegetarian anyone? 6. Teamwork: Pork, beef, chicken, seafood and soy. 7. The bread box: Breads and muffins. 8. Desserts: Soy and spice and everything nice. 9. Cooking with kids. Resources (Directory of members of The Soyfoods Council and their soy products; Directory of state and national soybean boards).

A smoothie (p. 133) is made at home by combining 1 cup soymilk (plain or vanilla), ½ medium banana (may be frozen, if desired), and optional nondairy ingredients, such as chocolate syrup, peanut butter, fruit juice concentrate, or frozen fruits (alone or in combinations–pineapple, orange, cranberry, raspberry, etc.). "Many of the soy smoothies and soy yogurts on the market today are probiotic, meaning they contain active, live cultures that are beneficial to intestinal health." Address: 4554 N.W. 114th Street, Urbandale, Iowa 50322-5410. Phone: 866-431-9814.

11104. Takahashi, Hideki; Ohara, Masahiro. 2004. Biodiversity and biogeography of the Kuril Islands and Sakhalin. 3 vols. Sapporo, Japan: Hokkaido University Museum. Illust. Maps. 30 cm. *
• ***Summary:*** Also cataloged as Bulletin of the Hokkaido University Museum.

11105. Wang, L.J.; Li, L.T.; Fang, J.F.; Saito, M.; Tatsumi, E. 2004. Antioxidative and angiotensin I-converting enzyme inhibitory activity of sufu (fermented tofu) extracts from various regions of China. *JARQ* (*Japan Agricultural Research Quarterly*) 10:324-27. [Eng]*

11106. Bashô, Matsuo; Barnhill, David Landis. 2004. Bashô's haiku; Selected poems by Matsuo Bashô. Translated by, annotated and with an introduction by David Landis Barnhill. Albany, New York: State University of New York Press. xiii + 331 p. Index. 22 cm.
• ***Summary:*** No. 476 (p. 110). The poem (in Romanization) reads as follows:

"Niawashi ya.

"Mame no komeshi ni.

"Sakuragari."

Barnhill's translation: "So fitting–/ Bean-flour rice balls / while blossom hunting.

Comments on this poem on page 232: It was written in the spring of 1690. "The simplicity of rice balls sprinkled with flour fits with flower viewing more than the common picnics with fancy food and large quantities of sake. 'Blossom hunting' was another name for blossom viewing."

Note: "Mame no ko" is the early Japanese word for *kinako,* which is roasted whole soy flour, that is–a flour or powder made by grinding whole roasted soybeans. Address: 1. Japan..

11107. Belleme, John; Belleme, Jan; Spevack, Ysanne. 2004. The real taste of Japan: Using the finest ingredients. London: Cross Media Ltd. 155 p. Illust. 19 cm. *
• ***Summary:*** Written and published for Clearspring, a natural foods importer and distributor in London. Address: 1-2. Saluda, North Carolina.

11108. Blussé, Leonard; Viallé, Cynthia; Remmelink, Willem; Daalen, Isabel van. eds. 2004. The Deshima diaries marginalia, 1740-1800. Tokyo: Japan-Netherlands Institute. xl + 898 p. Illust. Maps (some color). Index of ship's names. Index of geographical names. Index of non-Japanese names. Index of Japanese names. Subject index. 27 cm. Series: Scientific Publications of the Japan-Netherlands Institute No. 2. [99 ref]
• ***Summary:*** "The basis for the present text are the Deshima [Japan] *dagregisters..."* of the Nederlandsche Oost-Indische Compagnie. Comptoir, Nagasaki.

Contents: Fold-out color Japanese map of Nagasaki in the 1700s, with numbers and accompany legend inserted for key places by the editors. Three other fold-out color illustrations. Map of the route to and from the Shogun's court in Edo (today's Tokyo), with a circle giving the name of each overnight place. The route to Edo goes across Kyushu then along the southern coast of Japan's main island (Honshu). The route back is largely by boat through the Inland Sea to Shimonoseki, than back across Kyushu. List of illustrations. Contents. Foreword. Editorial note. Introduction. Diary kept for one year (starting in about mid-November or early December) by each *Opperhoofd* (Chief of the Dutch factory on Deshima with the rank of Senior merchant). Appendixes (4; secret diaries and private notes). Sources (with NFJ numbers at the Dutch National Archives, The Hague). Glossary.

The legend to the color fold-old map of Nagasaki Bay and city includes: (6) Dutch ship at harbor. (7) Deshima. (9) Government house. (10) Chinese island (about the same size as Deshima, but just to the south of Deshima). (11) Chinese garden. (12) Junk from Nanjing. (13) Boats of the Shogunal guard. (14) Shogunal guard at Tomachi. (15) Tow boats. (16) Dutch ship arrives. (17) Shogunal guard from Nishidomari. (18) Junk from Fuzhou arrives.

In the index there are many entries under: Chinese–Island. And under Seaweed.

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Note: Soy sauce is not mentioned in the Index under "Chinese–Island." Very little has been written in English about the activities of the Chinese traders who lived on this artificial island in Nagasaki harbor–very near the island of Deshima, where the Dutch traders were confined. The Chinese traders at Nagasaki were confined to a walled compound, and their activities, though less strictly controlled than the Dutch, were closely monitored and scrutinized by the Governor of Nagasaki. Many questions arise: What is this island called? What kind of Chinese organization(s) occupied the island? Was it a single private company like the Dutch East India Co., or was it a collection of independent Chinese merchants, or something else? When did the Chinese island compound start to be used as a trading post? When did it cease to be used? Did the Chinese export or import any soy products? If yes, which ones, how much of each per year, from when to when. Where were these products sold? Inside China or outside? Address: Netherlands.

11109. Ebine, Hideo. 2004. Industrialization of Japanese miso fermentation. In: Keith H. Steinkraus, ed. 2004. Industrialization of Indigenous Fermented Foods. 2nd ed. Revised and Expanded. New York, NY & Basel, Switzerland: Marcel Dekker. xix + 796 p. See p. 99-147. Chap. 2. [87 ref]

• ***Summary:*** Contents: Introduction. History and earliest known references to miso. Indigenous process: Raw materials used in ancient times. Industrial / Commercial production today. Contrast between indigenous and modern processing. Critical steps in manufacture / fermentation. Major problems in industrialization. Optimal environmental conditions for microorganisms. Essential microorganisms for fermentation. Possible spoilage microorganisms. Chemical / Biochemical changes in miso during fermentation. Changes in physiological functions during fermentation. Forecast of the role of miso in the future.

Foods similar to miso are made in other parts of East- and Southeast Asia. They are referred to as "jiang" in China, "doenjang" in Korea, "taucho" in Indonesia, and "tao-si" in the Philippines.

Note: In the Philippines, the word "tao-si" (also spelled "tausi" or "taosi") refers to fermented black soybeans, not to a kind of miso. Address: Professional Engineer, Shishitsuka, Tsuchiura, Ibaraki-ken, Japan.

11110. Fukuda, Yoshiko. 2004. Genki ga deru nebaneba pawa reshipi [Sticky power recipes to bring forth your energy and health]. Tokyo: Ie no Hikari Kyokai. 95 p. 21 cm. [Jap]*

11111. Fukushima, Danji. 2004. Industrialization of fermented soy sauce production centering around Japanese shoyu. In: Keith H. Steinkraus, ed. 2004. Industrialization of Indigenous Fermented Foods. 2nd ed. Revised and Expanded. New York, NY & Basel, Switzerland: Marcel Dekker. xix + 796 p. See p. 1-98. Chap. 1. [179 ref]

• ***Summary:*** Contents: Introduction. History: Historical development of soy sauce in China (Chiang, shih), introduction of soy sauce in Japan, origin of fermented soy sauce in the United States. Present soy sauce situation: Japan (types of soy sauce, manufacturing, flavor components and quality evaluation), China, Southeast Asia, United States. Change of soy sauce manufacturing methods from indigenous to modern processing: Treatment of soybeans and wheat as materials, koji fermentation, brine fermentation, pressing, pasteurization, refining and bottling. Microbiology and biochemistry: Role of koji as an enzyme source (unique source of enzymes, peptidases in koji, role of proteinases in koji during protein digestion, role of glutaminase in koji in formation of glutamic acid during protein digestion) effect of heat treatment of soybean proteins on their digestibility and nutritive value (enzyme digestibility and yield of soy sauce, enzyme digestibility and nutritive value of protein), microorganisms during brine fermentation in soy sauce (change of microflora during brine fermentation, properties of *Tetragenococcus halophilus,* properties of *Zygosaccharomyces rouxii,* properties of *Candida species*), safety of soy sauce and physiological functional properties (Studies of mycotoxins and safety of soy sauce, studies of mutagens and safety of soy sauce, long-term animal tests and anticarcinogenicity of soy sauce, other physiologically functional properties of soy sauce). Application of new technology for soy sauce manufacture: Manufacture of soy sauce through fermentation by bioreactor with immobilized whole cells, enzymatically hydrolyzed vegetable protein, breeding of koji mold through protoplast fusion. Forecast.

Contains 68 figures and 23 tables.

The section titled "Origin of fermented soy sauce in the United States" states (p. 10) that in 1907 a plant manufacturing fermented soy sauce was opened in the United States by Shinzaburo Mogi–a relative of the Mogi family of Kikkoman fame. Note: The author does not say where this plant was, nor does he cite any evidence to support his claim. As of Jan. 2005, Soyfoods Center has been unable to find any firm evidence that such a plant was opened.

"After that, another soy sauce company named Oriental Show-You Company was promoted in 1917 in Columbia City, Indiana." Shinzaburo Mogi was one of the stockholders in this company. Shinzo Ohki, a Japanese man living in the USA, began to make regular (koikuchi) shoyu in the traditional Japanese way, and at one time was making 30,000 gallons/year. In 1961 the Oriental Show-You Co. was sold to Beatrice Foods, Inc. and subsequently became part of La Choy Food Products which was also owned by Beatrice.

Figure 12 (p. 28) shows imports of soy sauce to the USA from 1947 to 1981. This graph was taken, without citing the source, from: Shurtleff & Aoyagi. 1985. *Soyfoods Industry*

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and Market, 5th ed. p. 103.

Concerning the soy sauce market in the United States (p. 28-31): In 1973 Kikkoman opened its first plant to make fermented soy sauce at Walworth, Wisconsin. In 1998 Kikkoman opened a 2nd such plant in California. In 2001 these two Kikkoman plants made 85,000 kiloliters and 20,000 kiloliters (kL) of soy sauce respectively, for a total of 105,000 kL. To take advantage of the rapidly growing American market for soy sauce, several other foreign manufactures also opened plants making fermented soy sauce. In about 1980, Wan Ja Shan (Taiwan) opened a plant making regular Japanese-style soy sauce (koikuchi). In 1991 San-J (San Jirushi, Japan) opened a plant making tamari soy sauce. In 1994 Yamasa (Japan) opened a plant making shoyu in Salem, Oregon. In 2001 the total annual production of these 3 plants was estimated at about 20,000 kL. In addition, HVP soy sauce (unfermented) is made and sold in the USA under brands such as La Choy, Chun King, and Aloha–with total production in 2001 estimated at 15,000 kL. Thus in 2001 total soy sauce production in the USA was estimated at 140,000 kL with the following market shares: Kikkoman 75%, 3 other makers of fermented soy sauce 14.2%, and HVP 10.7%. Figure 14 shows total U.S. consumption of soy sauce from 1950 to 2001, including total domestic production, total Kikkoman U.S. production. and total imports. Address: Noda Inst. for Scientific Research, Noda-shi, Japan.

11112. Kiuchi, Kan; Watanabe, Sugio. 2004. Industrialization of Japanese natto. In: Keith H. Steinkraus, ed. 2004. Industrialization of Indigenous Fermented Foods. 2nd ed. Revised and Expanded. New York, NY & Basel, Switzerland: Marcel Dekker. xix + 796 p. See p. 193-246. Chap. 4. [142 ref]

• ***Summary:*** Contents: Introduction–Description and history of natto: Raw materials, natto in East Asia (History of natto, natto in China {*douche*} [*doushi / douchi*], natto in Japan {itohiki-natto, cracked natto, yukiwari-natto, barley natto, salted natto, dried natto, soboro-natto, how natto is used in foods}, tua'nao [thua-nao, tua nao] {incl. pe-pok in Myanmar and tau'si in Laos}, kinema, chongkuk-jung, dawadawa [the starters for these products are *Bacillus subtilis*], making of natto in the home).

Production and consumption. The fermentation process. Materials used for traditional and modern natto production. Modern manufacturing methods: Storage of raw soybeans and purification process, processes of washing and soaking, steaming and inoculation processes, natto-filling process, fermentation process, refrigeration and aging process, second packaging and shipping processes.

Change from traditional process to modern manufacturing process: Cultivation and storage of raw soybeans (traditional, modern), selection. washing and soaking, steaming and inoculation, filling, fermentation, first refrigeration, packaging, second refrigeration. Critical steps in the manufacture and fermentation of natto. Important problems in the industrialization of natto: Soaking, steaming, filling, fermentation Optimum conditions for fermentation: Initial stage of fermentation (lag phase), middle stage of fermentation (log to stationary phases), latter stage of fermentation (death phase). Microbiology and biotechnology: Determinative or systematic characteristics of natto bacilli, difference between natto bacilli and other *B. subtilis* as natto starters, enzymes and other materials produced by natto bacilli. Other aspects of the microbiology of natto: Phages of natto bacilli, plasmids of natto bacilli. Chemical and biochemical changes during fermentation: Soybean characteristics on steaming, relationship between the components of natto and those of soybeans, changes in soybean constituents during fermentation (carbohydrates, fatty acids, organic acids and other volatile components), size of soybeans, steaming condition. Starter cultures: Marketed starters, development of new starters. Contains 26 figures.

In 1999 in Japan, about 130,000 metric tons per year of soybeans are used to make about 260,000 tons of natto or 5.20 billion 50-gm packages worth 160.5 billion yen. Approximately 500 companies make natto in Japan, but the 10 largest companies account for 85% of total production.

Concerning hikiwari natto (cracked natto) (p. 195): Parch soybeans than crack them into 3-4 pieces for use as a raw material, instead of whole soybeans, for making natto (*itohiki nattô*). Cracking reduces the soaking time to 3-4 hours.

Concerning yukiwari natto (p. 195): It is one of the trade names of "Barrel natto" and a special product of Yamagata prefecture, located in northeastern Japan. To make it at home or on a small commercial scale, mix 18 kg cracked natto, 9 kg of rice koji, and an appropriate amount of salt in a large wooden barrel. Allow it to ferment until ripe.

Note 2. This is the earliest English-language document seen (Jan. 2012) that uses the term "tua-nao" to refer to thua-nao. Address: 1. Kyoritsu Women's Univ.; 2. Biotechnology Inst. of Natto, Suzuyo Kogyo Co. Ltd. Both: Tokyo, Japan.

11113. Kozaki, Michio. 2004. Tempe production in Japan. In: Keith H. Steinkraus, ed. 2004. Industrialization of Indigenous Fermented Foods. 2nd ed. Revised and Expanded. New York, NY & Basel, Switzerland: Marcel Dekker. xix + 796 p. See p. 637-45. Chap. 12. [12 ref]

• ***Summary:*** Contents: Circumstances and background of tempe. Starters for tempe production. Tempe *Rhizopus* is derived from hibiscus. Production of tempe. Nutrition and secondary processing of tempe. Future of tempe in Japan.

Before 1998, the origin of the Rhizopus mold used to make tempe in Indonesia was unknown. Research on the subject by K. Tsubaki, S. Tokumasu, and H. Konno, based on investigation of the percentage of mold genera isolated from

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fresh *usar* and wild hibiscus leaves in Indonesia and Japan, showed that *Rhizopus* was by far the predominant genus. Their results, shown in tables 1 and 2, were published in 1998 in the *Journal of the Japanese Tempeh Society* (vol. 3, no. 1).

Commercial tempeh production in Japan began in the 1980s. However it has gradually decreased until today it has stopped. However total annual production of about 30 tons is now continued in agricultural communities in Okayama and Saga. Address: Tokyo Univ. of Agriculture, Tokyo, Japan.

11114. Kuswanto, Kapti Rahayu. 2004. Industrialization of tempe fermentation. In: Keith H. Steinkraus, ed. 2004. Industrialization of Indigenous Fermented Foods. 2nd ed. Revised and Expanded. New York, NY & Basel, Switzerland: Marcel Dekker. xix + 796 p. See p. 587-635. Chap. 11. [88 ref]

• ***Summary:*** Contents: Introduction. Production and consumption. History of tempe. Outline of essential steps in fermentation: Cleaning the beans, soaking and hydration, boiling, dehulling and washing, steaming or boiling, inoculation, packaging, incubation or fermentation. Indigenous processes: Raw materials used in ancient times and today. Modern industrial and commercial processing methods. Changes from indigenous to modern processing methods: Treatment of raw material, starter culture, packaging and incubation, sanitation and waste management. Major problems in industrialization. Microbiology and biochemistry of fermentation. Optimum fermentation conditions. Biochemical changes during fermentation. Starter culture. Effect of processing on nutritive value. Forecast for future fermentation.

Contains 30 figures and 8 tables. Photos (unless otherwise stated) show: (1) Screening of soybeans to remove foreign matter (at Tempe Murni in Yogyakarta). (2) Whole soybeans, hulls, and dried dehulled beans. (3) Velvet beans and their tempe product (*tempe benguk*). (4) Winged beans and their tempe product (*tempe kecipir*). (5) *Phaseolus lunatus* and their tempe product (*tempe koro*). (6) Soy curd (tofu) solid waste [okara] and its tempe product (*tempe gembus*). (7) Tempe bongkrek from Purwokerto. (8) Hand dehuller machine. (9) Usar starter culture for tempe. (10) Tempe wrapped in banana leaves. (11) Flow sheet: traditional small scale Indonesian tempeh production method. (12) Flowsheet: modern large scale tempeh production process (Marusan Ai Company, Japan). (13) Flowsheet: small scale tempe production (The Farm, Summertown, Tennessee). (14) Flowsheet: large scale tempe production (The Farm, Summertown, Tennessee). (15) Soaking whole soybeans before boiling in the traditional way. (16) Soaking soybean cotyledons after dry dehulling. (17) The first boiling of cotyledons, after the first soaking. (18) The second boiling of cotyledons, after the second soaking. (19) Transferring the boiled cotyledons [in sacks using a pulley]. (20) Draining and cooling tray. (21) Package of Raprima inoculum from Bandung, Indonesia. (22) Inoculation of boiled beans with "ragi tempe." Note electric fan. (23) Inoculation with spore solution. (24) Wrapping the cotyledons in banana leaves at village level. (25) Packing in perforated plastic bags. (26) Packing in plastic trays covered with perforated plastic. (27) Incubating in bamboo baskets. (28) Incubating tempe on bamboo racks. A package of Tempe Murni in a perforated plastic bag. (29) Tempe wrapped in plastic bags. (30) Flowsheet: tempeh processing at Tempe Murni, Yogyakarta, Oct. 2002.

Note: The source of much of the information on the history of tempeh is incorrectly cited. Address: Gadjah Mada Univ., Yogyakarta, Indonesia.

11115. Nattô de yarikuri reshipi: aidea mansai. Zenreshipi nedan o hyôji [Budget recipes using natto: Full of ideas. All recipes include prices]. 2004. Tokyo: Gakken. 81 p. 26 cm. [Jap]*

11116. Nattô rooshon ando nattô sekken [Natto lotion and natto soap]. 2004. Tokyo: Shufu no Tomo-sha. 66 p. 26 cm. [Jap]*

11117. Ogawa, Seiko. 2004. Gôyâ okura tômorokoshi edamame no okazu: Yasai pawâ no kenkô ryôri kyakuhappin [Recipes for side dishes using bitter melon, okra, corn, and edamame: 108 healthy recipes with "vegetable power"]. Tokyo: Gurafusha. 64 p. 26 cm. Series: Mai raifu shiriizu tokushû-ban. [Jap]*

• ***Summary:*** In the Okinawan dialect, bitter melon (*Momordica charantia; Jap. nagauri*) is called *gôya.* Address: Japan.

11118. Seo, Yukiko. 2004. Ketteiban tôfu, nattô aburaage [Definitive recipes for tofu, natto, deep-fried tofu pouches]. Tokyo: Shufu no Tomosha. 207 p. Illust. (color). 24 cm. [Jap]*

11119. Shiraishi, Atsushi. 2004. Hada ga uruô nattô rôshon [Moisturizing skin, natto lotion]. Tokyo: Makino Shuppan. 79 p. 29 cm. [Jap]*

11120. Steinkraus, Keith H. ed. 2004. Industrialization of indigenous fermented foods. 2nd ed. Revised and expanded. New York, NY & Basel, Switzerland: Marcel Dekker. xix + 796 p. Illust. Pseudo-Index. 24 cm. Series: Food Science and Technology No. 136. [508 soy ref]

• ***Summary:*** This book contains the following chapters on soyfoods: 1. Industrialization of fermented soy sauce production centering around Japanese shoyu, by Danji Fukushima. 2. Industrialization of Japanese miso fermentation, by Hideo Ebine. 4. Industrialization of Japanese natto, by Kan Kiuchi and Sugio Watanabe (incl.

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yukiwari-natto, a special product of Yamagata prefecture, p. 196). 11. Industrialization of tempeh fermentation, by Kapti Rahayu Kuswanto. 12. Tempe production in Japan, by Michio Kozaki. It also contains chapters on the industrialization of the production of sake, tapai, African beers, magehu, ogi, gari, Mexican pulque, Thai fish sauce (nam pla), Thai fermented fish and related products, and Myanmar fish paste and sauce.

The final chapter is titled "Industrialization of indigenous fermented food processes: Biotechnological aspects."

Soy-related chapters are also cited separately.

Note: Cornell Prof. Emeritus Keith H. Steinkraus died on 13 Nov. 2007 at age 89. He was a specialist in indigenous fermented foods and food microbiology. Address: Inst. of Food Science, Cornell Univ., Geneva, New York.

11121. Takagi, Junko. 2004. The best of tofu. Translated from the Japanese by Kazuko Nagai and Karen Sandness. Tokyo: Japan Publications Trading. Distributed by Kodansha America through Oxford University Press. 112 p. Illust. (color). Index. 26 cm.
• ***Summary:*** Contents: Cooking regular tofu (Simmered tofu. Chilled tofu. Mapo tofu). Hiya-yakko and salad-yakko. Homemade tofu. Okara recipes. Tofu as a main dish. Varieties of tofu (momen tofu, soft tofu, juten tofu, yose tofu, oboro tofu, zaru tofu, silken tofu). A brief history of tofu. The nutritional value of tofu. Homemade aburage and atsuage. Simple accompaniments to drinks. Preserved tofu. Draining tofu. Preserving tofu. Cutting techniques. Homemade frozen tofu. Soup and one-pot dishes. Homemade yuba. Desserts (incl. soymilk pudding).

The section titled "Preserved tofu" includes: Tofu preserved in soy sauce with garlic (p. 82). Tofu preserved in miso (p. 82). Tofu preserved in herb oil (p. 83). Tofu preserved in kochujang (p. 82).

A small portrait photo shows Junko Takagi. Address: Japan.

11122. Watanabe, Aya. 2004. Nattô bôya [Natto boy]. Tokyo: Gakushu Kenkyujo. Unpaginated. Illust. (color). 25 x 22 cm. [Jap]*
• ***Summary:*** Juvenile fiction. Natto boys are singing and dancing. This is the story of delicious, enjoyable natto–a fermented soyfood. Address: Japan.

11123. Yuki, Goro; Takabe, Haruichi. 2004. Nattô [Natto]. Tokyo: Kadokawa Haruki Jimusho. Unpaginated. Illust. (color). 23 cm. [Jap]*
• ***Summary:*** Juvenile fiction. A woman who sells natto passes by our house at about the same time every day. But one day I noticed that the tone of her voice had dropped. Address: Japan.

11124. Zenkoku Miso Kogyo Kyodo Kumiai Rengokai (Japanese National Miso Association). 2004. Mukashi to ima no miso reshipi nihyaku [200 miso recipes, both old and new]. Tokyo: Shokugakukan Ssukuuea (Shoaku-kan Square). 103 p. 26 cm. [Jap]*
Address: Japan.

11125. Huang, H.T. (Hsing-Tsung). 2005. Re: Natto in China and Japan. Letter (e-mail) to William Shurtleff at Soyinfo Center, Jan. 29. 1 p.
• ***Summary:*** Dr. Huang prefers to define natto as "the product of the fermentation of soybeans with bacillus natto." "As I see it, natto is probably a Japanese invention, unless you can show that it came to Japan by transfusion from SE Asia."

"There is no record of a soybean-Bacillus fermentation in the classical or modern records in China." Address: PhD, Alexandria, Virginia.

11126. *Los Angeles Magazine.* 2005. Small bites. Jan. p. 128.
• ***Summary:*** "Umenohana, a Japanese import, has opened on Canon Drive in Beverly Hills and is serving tofu and yuba (soy milk skin) *kaiseki* style."

Note: Umenohana is apparently a Japanese-style restaurant.

11127. **Product Name:** Soy Natto: Natto Boy Powder.
Manufacturer's Name: Soy Natto Food Co. (Importer-Distributor). Made in Japan.
Manufacturer's Address: 1015 East Howard Ct., Visalia, CA 93292. Phone: 559-679-9699.
Date of Introduction: 2005 January.
Ingredients: Soybeans, *Subtilis natto* [sic, *Bacillus subtilis natto*].
Wt/Vol., Packaging, Price: 8.8 oz (250 gm) in cylindrical plastic bottle.
How Stored: Shelf stable.
New Product–Documentation: Product with Label sent by Mike Masuyama, PhD, of Visalia. 2006. June. 3.75 inches high by 3.75 inches in diameter. On the front panel is a color cartoon of Natto Boy, a soybean, with a smiling mouth, eyes, 2 hands, and 2 feet. He is wearing a baseball cap; in his left hand he holds a baseball bat. Also: Two sell-sheets: (1) "Natto up-date." 2005. Jan. (2) "New generation soy food–Natto Boy products." This product is "All powder: All high-quality natto properties retained. Use for mixing into shakes or for sprinkling over foods. 1 tablespoon (10 gm) per serving." Contains a one-month supply.

11128. Morinaga Nutritional Foods, Inc. 2005. Changing tofu attitudes. One chocolatey slice at a time (Ad). *Vegetarian Times.* Feb. p. 15.
• ***Summary:*** A full-page color ad. Below the title is a large color photo of a slice of "Chocolate Dream Dessert." Below

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the photo is the recipe which calls for "2 pkgs. Mori-Nu Silken Lite Extra Firm Tofu." "Mmmm, Chocolate Dream Pie. Quick and easy, cholesterol-free, guilt free. Made rich and creamy with Mori-Nu Silken Tofu... This slice of heaven will change your attitude about heaven." Across the bottom of the ad are photos of each of six types of Mori-Nu Silken Tofu. Address: 2441 W. 205th St., Suite C-102, Torrance, CA 90501.

11129. Hikari Miso Co., Ltd. 2005. Shinshu miso: Hikari Miso (Brochure). 4848-1, Shimosuwa-machi, Suwa-gun, Nagano-ken 393-0041, Japan. 4 p. 30 cm.
• ***Summary:*** This handsome color brochure has a photo of a bowl of miso soup with tofu and snow peas on the cover. Contents: About the company and its location. Types and classification of miso. How miso is made. Miso's value as a health food.

Hikari Miso was founded in 1932. Their organic miso was introduced in 1988. The Shinshu area is currently known as Nagano prefecture. The company makes light miso (Shinshu miso), dark red miso, and kome-koji miso.

Photos show: (1) The 3 types of miso made by the company. (2) Inside of the automatic koji-making machine. (3) Multi-level automated warehouse. (4) The head office and the Iijima Green Plant. An outline map shows the location of Nagano Prefecture in Japan. Address: Shimosuwa-machi, Suwa-gun, Nagano-ken, Japan. Phone: +81 266-27-8848.

11130. Nippon Supplement, Inc. 2005. Touchi extract: A functional food with anti-diabetic activity (Website printout–part). www.nippon-sapuri.com/english/touchi.html 10 p. Printed April 14.
• ***Summary:*** Contents: 1. Screening natural foods for an ingredient gentle to human body. What is Touchi. 2. Touchi extract inhibits the digestion of carbohydrates, thereby lowering the blood glucose level (Fig. 1. A diagram shows the mechanism; it inhibits of the activity of the enzyme alpha-glucosidase. In a clinical trial, Touchi extract was found to keep the blood sugar level of diabetic patients low). Fig. 2. A graph–Touchi extract showed anti-glycemic effect in rats. Touchi extract showed anti-glycemic effect in a clinical trial on borderline diabetic subjects. Fig. 3. Graph of anti-glycemic effect of touchi extract in humans. Fasting blood pressure of over 60% of diabetic patients decreases. Fig. 4. Anti-glycemic effect of Touchi-extract. Fig. 5. Anti-lipidemic effect of Touchi extract. Address: Japan. Phone: 1-800-VITASOY.

11131. Sweets, Laura E.; Wrather, J. Allen; Wright, Simeon. 2005. Soybean rust. http:muextension.missouri.edu/explore/agguides/crops/g04442.htm. 2 p.
• ***Summary:*** "Asian soybean rust is a serious foliage disease that has the potential to cause significant soybean losses. Although Asian soybean rust was identified on soybean plants in Hawaii in 1994, the disease was not reported in the continental United States until the fall of 2004. The USDA released an official notice of the confirmation of soybean rust on soybean leaf samples collected in Louisiana on Nov. 10, 2004. Over the next few weeks the fungus was detected on plants from a number of additional states, including Missouri."

"History: Soybean rust was first reported in the Eastern Hemisphere [Asia] in the early 1900s. It is now accepted that there are two different fungal species, *Phakopsora pachyrhizi* and *Phakopsora meibomiae,* that cause soybean rust. *Phakopsora meibomiae,* referred to as the New World type, is a much weaker pathogen and is the pathogen that has been found in limited areas in the Western Hemisphere (primarily the Caribbean).

"*Phakopsora pachyrhizi,* referred to as the Asian or Australasian soybean rust, is the more aggressive pathogen. It was first reported in Japan in 1902 and was initially limited to tropical and subtropical areas of Asia and Australia. Unfortunately, it is *Phakopsora pachyrhizi* that has been spreading through the soybean-producing regions of the world. *Phakopsora pachyrhizi* was reported from Hawaii in 1994, Zimbabwe in 1998 and Paraguay in 2001. In Africa this aggressive soybean rust has spread to Uganda, Zambia, Rwanda, Nigeria, West Africa, Mozambique, South Africa and Cameroon. In South America, *Phakopsora pachyrhizi* has been found in most of the soybean-producing regions of Brazil as well as Argentina, Bolivia and Colombia." Address: 1. Dep. of Plant Microbiology and Commercial Agriculture Program; 2. Dep. of Plant Microbiology and Pathology, Delta Research Center; 3. Plant Diagnostic Clinic. All: Univ. of Missouri.

11132. Camps, Lisa. 2005. Re: History of work with soyfoods in Goa, India. Letter (e-mail) to William Shurtleff at Soyfoods Center, May 15. 2 p.
• ***Summary:*** 1984–Lisa came to Goa to nurse a friend back to health; he was a vegetarian. While in India she discovered so many alternative styles of life, so many people from all over the world with a similar consciousness related to healthy body, mind, and spirituality. All "seemed to care about the planet, nature, peace, yoga, natural healing, vegetarianism, etc. India is a whole country of vegetarians, but in Goa, a former Portuguese colony, the inhabitants are mostly Christians who eat meat." That year, Lisa became a vegetarian.

She returned to America, only to yearn to come back to India. So she spent 7-8 years coming and going, whenever finances permitted. When in the USA, she worked with food, in restaurants, hotels, night clubs, made good money, then left again. She took many courses in the health and nutrition at community colleges. She had seen many unhealthy vegetarians and wanted to learn how to be a healthy,

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vigorous vegetarian. Having helped to deliver 4 children by natural child birth in Goa, she was interested vegetarian diets for children and natural healing.

1982–While in Goa, Lisa met an Australian woman, Diane [Froggatt], who was making her own tofu, because it was not available, and all were tired of Dal (lentils). "I asked her to teach me, and she did... I happily made it for myself to fill the protein gap. Along with Tofu also comes Soy Milk and Okara! A bonus! Made soysausage, soya burgers, etc., but only at home at that time."

1986-87–Lisa attended a Michio Kushi Institute in Switzerland; she learned macrobiotics and shiatsu, which she practiced for about a year, then decided that macrobiotics was "excellent for healing purposes, but not for daily life, simply because any diet so extreme and tasteless is doomed to opposite extremes." She observed that most people who regularly ate a macrobiotic diet "craved massive amounts of Chocolate, or some other form of 'naughtiness.'"

1989-90. Lisa decided to settle in Goa. It had really become her home and it was too expensive to fly back and forth. But how to make money in India? Her many Indian women friends adored lingerie. So she did all the necessary paperwork and started a business named Ooh-La-La-Lingerie Pvt. Ltd., importing undergarments from Europe and traveling all over India to sell them to major department stores. The business went well for 2-3 years until the suppliers and buyers connected–leaving her out.

At the same time, Lisa was selling soya burgers, hummus brown bread, and 4 flavors of soy milk in the Flea market [in Anjuna], where she had a food stall; she made these in her home kitchen. "Then a few people started asking me if I could make them some Tofu! So, I thought why not, since I'm doing it for myself anyway." "All our production started in a small room (in my house), which I converted into a special tofu room, with ventilation above a false ceiling, a sink, stainless steel tables, and extreme hygiene. It was about 3 meters on a side with white tiles. We used (and still use) Aqua Guard water filter systems for all production and packing. So I started by making 2-3 kg at a time, squeezing the milk through a cloth by hand, actually burning my hands on a regular basis, until I decided to build a press. Made some wooden tofu boxes, and did the grinding on a grinding stone. Ouch, too much time and labor! We were selling only to shops and Five-Star hotels.

"As time passed and orders got bigger, my friend and now partner, Richard Chabin, helped me get some machinery, Then, I wanted to learn about Tempeh, and how to make it. There was an American fellow named Joseph Papa who had a book and an interest, so I traded him my shiatsu massages for the method on how to make Tempeh. My interest in Tempeh was the vitamin B's only found in Tempeh. Important if you don't eat beef liver.

"So now I knew many soy foods, and was happily cooking for many friends daily. I enjoy cooking, and they enjoyed eating.

"Then I tried to market the tofu to the local market and restaurants, but as they were not familiar with it, they were afraid, even after I gave them many recipes" and even showed them how to prepare it Indian style–like paneer. "That's when I decided to open a small sandwich shop."

1999–The sandwich shop, named Bean Me Up, Soya Station, Salad Bar, was a "raging success from the beginning." It became too big for the original premises, and there were long lines at peak season. Note: The restaurant name derives from a famous catchphrase from the movie *Star Trek,* "Beam Me Up, Scotty!"

2004 Oct. 31–Lisa took on large premises with 14 rooms to rent and a small health food shop and restaurant. The commercial foods (tofu, tempeh, soymilk, etc.) are made in a separate building (a small factory) on the compound. It opened on Halloween with a costume party. The "real point is the restaurant" (which kept the same name); it is a unit of Ooh-La-La Ling. When people discover that they can get fresh safe salads, Tofu, Tempeh, Seitan, soya ice cream, Tofunaise, etc. after traveling in India, they are so Appreciative. That is a reward in itself! I truly believe that to introduce people to a more healthy diet, and to given up meat, the alternative must taste good, or why would they consider changing? Hence, our theme is 'The Tasty Alternative.' Lisa, now an established businesswoman, has a new source of income from her 14-room hotel!

Two months later, on 24 Dec. 2004 (Christmas eve), a mob of 150 people, escorted by two policemen (for the mob's protection!) went to the Anjuna-Chopra beach belt and rudely demanded that certain restaurants and shops close down. Why? Because their owners were of foreign origin. No matter that Lisa, of American origin with an Indian passport, had lived in Goa for 23 years and had all the legal papers required to run her business. The agitation was probably initiated by indigenous restaurant / shop owners who resented the foreigners' success and had the blessings of local politicians–a familiar theme worldwide. Fortunately, Lisa had some friends with the National Press, *Times of India,* so she and her fellow foreigners showed no fear, followed the procedures, and made a big noise; the actions of the mob were clearly illegal. Her restaurant was never shut down and the problem appears to have gone away.

Lisa is a member of the Vegetarian Society of India, and occasionally they call on her to give seminars for the members.

Note: Diane Frogatt died a few years ago from cancer.

Photos sent by Ratan Sharma in 2010 and taken by him in Jan. 2005 show the entrance to and the inside of this remarkable soy restaurant and salad bar. They serve only soy-based recipes. They also have a branch in Hyderabad. Note: Lisa does not own a SoyaCow. Address: Owner, Bean Me Up, 1629 Deulvaddo, Anjuna / Vagator, Goa, India 403-509. Phone: 0091-(0)832-227349.

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11133. House Foods America Corporation. 2005. House Foods: Tofu and other soy products (Leaflet). Garden Grove, California. 2 panels each side. Each panel: 28 x 21.5 cm. Dated May 2005.
• ***Summary:*** Glossy color and dated. Appears to show a photo of the front of the package of all the different types of House-brand soy products made at this time.

(1) Tofu: 12 types / SKUs. (2) Organic tofu: 4 types. (3) Seasoned tofu (tofu steak): 2 types. (4) Soy snack (Tofulicious [soy ice cream]): 3 types. (5) Soy milk: 6 types. (6) Age [Fried tofu]: 11 types. (7) Natto: 3 types. (8) Konnyaku (8 types, 2 of which contain tofu). Address: 7351 Orangewood Ave., Garden Grove, CA 92841.

11134. *Ontario Soybean Growers Soybean Report.* 2005. CAFTA campaign stresses importance of international markets. June. p. 1.
• ***Summary:*** "OSG Director and Bruce County farmer Jim Gowland is among the six Canadians to be featured with his family in the 'My Future is Global' campaign from the Canadian Agri-Food Trade Alliance (CAFTA).

"The 'My Future is Global' campaign is designed to highlight the importance of international markets to Canada's agriculture and agrifood sector. Canada is the world's third largest exporter of agriculture and food products. More than 90% of Canada's farmers, representing 80% of farm cash receipts, rely on international markets. And more than a million Canadian jobs depend on trade.

"Yet the sector continues to be forced to compete in a market that is severely distorted by subsidies and access barriers."

"'We are really happy to be telling the positive story of trade to Canada's decision makers,' says CAFTA President Liam McCreery. 'We want Canada's decision makers and negotiators to understand how important trade is to the Canadian agriculture and food sector, and how innovative and competitive our industry is. But we also want them to understand that this very vibrant industry is relying on them to negotiate aggressively at the World Trade Organization to remove market distortions. Our future is global, and it's in their hands.'"

A photo shows Jim Gowland and his family. "Jim's specialty soybeans are found in tofu in Japan. They are also considered special health foods in Europe." Address: Guelph, ONT, Canada.

11135. Kikkoman Corporation. 2005. Annual report 2005. Year ended March 31, 2005. 250 Noda, Noda-shi, Chiba 278-8601, Japan. 35 p. 28 cm. [Eng]
• ***Summary:*** Consolidated net sales rose 3.0% to $3.220 billion, operating income climbed 4.6% to $166 million, and net income rose 2.2% to $88.6 million.

"In March 2005, the Kikkoman Group established Country Life, LLC with Consac Industries, Inc. to manufacture and sell in the U.S. nutritional supplements, health foods, sports foods, personal care and other products." Address: Noda, Japan.

11136. Lemke, Dan. 2005. Cosmetic beans. *Ag Innovation News* (*AURI–Agricultural Utilization Research Inst., Waseca, Minnesota*) 14(3):11. July/Sept.
• ***Summary:*** A moisture-rich substance from okara–the fiber left over from making soymilk or tofu–is now being used to tone and soften the skin of Japanese women. Bernet International teamed up with Osaka Prefectural University to design the technology used to extract the substance named "soyfun." Used as an ingredient in cosmetics and soaps in Japan, it has been registered with the U.S. Food and Drug Administration. Source: Soyatech.com, 29 March 2005.

11137. *SoyaScan Notes.* 2005. Etymology and definition of the word "seitan" (Overview). Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Etymology: From Japanese *sei-* fresh or raw + *tan* (in tanpaku(shitsu) protein); usually written in the Japanese katakana syllabary to deemphasize the meaning of the Chinese characters, however < Middle Chinese.

The word was coined in 1961 by the founder of macrobiotics, Nyoichi (or Nyoti) Sakurazawa, known in the West as George(s) Ohsawa (1893-1966).

Definition: "A condiment or meat alternative made by simmering fresh wheat gluten in soy sauce, sesame oil, ginger, and kombu."

The word seitan was clearly coined by George Ohsawa in 1961–see authoritative account (interview) of the word's origin by the man (Mr. Kiyoshi Mokutani) who developed and first commercialized seitan in Japan and was with Ohsawa when he coined the term, writing it in the Japanese katakana. This is a key point; he wanted it to be a Japanese word, not a Chinese loan word.

Seitan was first made commercially in Japan in 1962, and was first imported to the Western world (USA) in about 1969 by two macrobiotic trading companies. For most of the first 10 years of its history it was used as a condiment, mainly by those eating a macrobiotic diet; it was much too salty for typical Americans, and was not widely available.

The basic taste and texture of seitan underwent a gradual transformation over its first 10 years in the USA. It started as a very salty, black, rather hard or tough (like jerky) condiment, then evolved into a much less salty, more tender, brownish product that might be called a meat alternative. I have never heard anyone–except OED–refer to it as a "textured vegetable protein." The latter term is generally used to refer to products that have been texturized by a machine named an extrusion cooker or extruder. I strongly prefer the term "meat alternative," but only for seitan's later incarnation. The term "meat substitute" has largely

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been replaced in the USA over the past 10 years "meat alternative"–which has a more neutral connotation.

11138. Kingsbaker, C. Louis. 2005. Fires and explosions at soybean processing plants (Interview). *SoyaScan Notes.* Aug. 2. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** There has long been an important relationship between the Safety Committee of the National Soybean Processors Association (NSPA, now named NOPA) and the National Fire Protection Association (NFPA); the latter organization has developed NFPA-36, which is the standard for Class 1B flammable liquids. The first NFPA-36 standard was written in 1957 and adopted by NFPA in 1959. It has been incorporated into the OSHA law / standards. When Lou joined the NFPA-36 committee in 1970, there were only two engineers (Lou and John Howeman) and no members of oilseed processing companies. Everyone else on the committee represented insurances; they were out to protect their own interests. "NFPA-36 pretty well eliminates soybean dust as a cause of explosions, because soybean dust is not an explosive due to its high oil content." Lou plans to give a speech in Buenos Aires, Argentina, in Nov. this year; his subject will be fires and explosions, and what changes have been made in NFPA-36 to prevent them from happening. The number of explosions has decreased as better safety practices have been implemented and enforced.

Lou has a list (not computerized) of more than 50 [59 to be exact] fires and explosions from 1948 on at oilseed processing plants worldwide; these are mostly soybean plants. He would be willing to share it with Soyfoods Center if we credit him as the source. He has been involved in 12 or 13 of these accidents, either while the fire was still burning or coming in afterwards to see what caused it.

In 1948 Lou started to work for Blaw-Knox and has been involved in starting up plants since 1949. In most of these cases, he was working for Blaw-Knox (which was later acquired by Dravo). Some of the explosions were in Blaw-Knox plants, some were not–but Blaw-Knox saw this as an opportunity for new business.

Lou was involved with the Louisville sewer explosion. In Friday, 13 Feb. 1981 Ralston Purina dumped about 25,000 gallons of hexane into the Louisville, Kentucky, sewage system, and blew up (and destroyed) about 20 miles of sewage pipes in the system. Miraculously, nobody was killed, and only one person was injured. Manhole covers were blown into the air, and flames shot out of the manholes. Ralston Purina was trying to get rid of the hexane and they thought they could get away with it. This was Lou's first job as a consultant; he was hired by the Louisville municipal sewer system.

Lou presented a paper about the Louisville sewer explosion in Denver, Colorado, for the international oil millers superintendents association. "This was the first time anyone had talked about what happened in this explosion." Ralston Purina sent a lawyer. Lou said that as long as the lawyer was in the room, he wouldn't give his paper. The group asked the lawyer to please leave, which he did. George Willhite of AOCS attended the meeting mainly to hear Lou's paper.

Lou turned the paper into an article, then submitted it to George Willhite for publication. The higher-ups at AOCS wouldn't allow the article to be published; somebody from Cargill stopped it. AOCS may publish it in 2005 to mark the 25th anniversary of the disaster.

Dick Farmer is now checking to see if Cargill (which bought 7-8 of the Ralston Purina soybean crushing plants) will allow Lou to give the talk at an AOCS meeting next spring. Lou and Dick Farmer are good friends and have worked together since the 1960s.

Cargill bought most or all of the Ralston Purina plants after the explosion. The explosion was probably the main reason that Ralston Purina got out of the soybean processing business! They were very embarrassed by this incident. The deposition of Hal Dean and William Stiritz was taken in their board room. Lou has most of the newspaper articles and many photos about the explosion in his files. It was the biggest event in the history of the solvent extraction industry in the USA. One reason for the Louisville explosion was very bad management at Ralston's plant; there was an ongoing argument between the man running the plant and headquarters in St. Louis, Missouri. Lou walked and inspected the sewers, and took many photos. More than 100,000 people were without sewage for a very long time. Sewage could not flow through the old pipes until they were replaced. One hole in the street was 20 by 30 feet. Ralston took out a $100 million insurance policy with Lloyd's of London 1-2 days after the explosion; they were afraid of pestilence if there were rain. People could get ill and die. In the end, Lou thinks it cost the company about $80 to $90 million out of pocket. There was a federal trial in Louisville. Lou, who was on the side of the prosecution, was in the witness stand for 4 straight days. After the prosecution presented its case, Ralston caved in and settled–with the sewer district, the city of Louisville, the state, and all the merchants who had to shut down their businesses because they couldn't get sewage service.

He also has photos of Quincy Soybean Co. when they had an explosion in Sept. 1966. And of Oelmuehle Hamburg in Germany where there was a tremendous explosion in about 1983; he was hired by them as a consultant. Central Soya had an explosion in 1994 in Indianapolis, Indiana; they were not allowed to rebuild the plant. They were cited by OSHA and fined something like $600,000 to $700,000. The story made all the Indianapolis newspapers. If somebody gets killed or goes to the hospital, OSHA comes right in and it becomes an open book. At Union Oil Mill, a cottonseed processor in Jackson, Mississippi, two men were killed.

In Germany, there have been a lot of explosions related

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to solvent extraction. Oelmuehle Hamburg had 3 solvent plants; 2½ of them were blown apart. At one plant in Germany, Lou was there when it was on fire. Another was Fuji Oil Co. in Japan in about 1990, where about 8 people were killed. Then the Japanese government stepped in, shut down the company and wouldn't let them re-open the plant. Lou, who was a consultant by then, was hired by the Japanese Oilseed Processors Association to fly to Japan, meet with the company, and see if they could develop a program to get government approval.

Blaw-Knox replaced the German plants owned by ADM and by Glidden (Indianapolis). Blaw-Knox copied some of the German designs, but then they developed a completely new extractor (Rotocel), and desolventizer. Lou "cut his teeth" working with the Rotocel at Blaw-Knox. Address: Atlanta, Georgia. Phone: 770-396-1413.

11139. Beech, Hannah. 2005. The wasted asset: Japan's gender crisis. *Time* (*Asia*). Aug. 22.
• ***Summary:*** Cover story: "Japanese society... venerates the winner dog, the housewife who waits at home with a vat of miso soup for her husband and kids." It still doesn't have much respect for women who are single, childless, happy, affluent, and independent.

11140. Squires, Sally. 2005. The argument over soy: The FDA is weighing its health benefits, even as some experts caution that too much could pose a risk for children. Lean plate. *Los Angeles Times.* Aug. 22. p. F3.
• ***Summary:*** Are Americans getting too much of a good thing–soy? Some FDA administrators are asking this question as they consider a "petition to give soy products a new boost: a qualified health claim for possible prevention of breast, colon and prostate cancer. This type of claim, unlike full-fledged health claims, is based on emerging research that points to, but does not prove, health benefits.

In recent years, qualified claims have been given to nuts, olive oil, and omega-3 fatty acids. Soy protein received its first full-fledged FDA health claim in [Oct.] 1999. Since then, consumption of soy protein has more than doubled in the USA, so it is now 2.2 gm per person per day from all sources. This is about one-fourth the amount consumed daily in Japan.

Soy is a rich source of high-quality protein, with many other good nutrients. "But its the isoflavones in soy that may be of greatest benefit and concern." They have some of the same properties as the female hormone estrogen.

Mark Messina, PhD, an expert on soy nutrition, says that most of the safety issues pertain to infants and children. "With adults, its hard to find any cause for concern," he adds. In July 2005, the Israeli Ministry of Health announced plans to recommend that young children limit soy products to one a day and advised that infants avoid them altogether. The French government recently advised that soy products not be given to children younger than age 3.

"But a recent review at the National Institute of Environmental Health Sciences in Research Triangle Park, North Carolina, reached a different conclusion. Though the researchers found that soy-fed infants are exposed to enough compounds that are pharmacologically active, they concluded that 'there is no indication of such action in the 50 years the formulas have been used.'"

A little goes a long way. Dr. Mark Messina advises adults to aim for 15 to 25 grams of soy per day–about the amount found in one-half to one cup of tofu or several cups of soy milk. "If you've got high blood cholesterol, 'shoot for 25 grams per day,' he said, noting 'the limitation is not based on any safety concerns, but the dietetic principle of eating a varied diet.'"

A large color photo shows an overhead view of edamamé (green vegetable soybeans in the pods) in a round blue bowl. Address: Special to The Times.

11141. Thurman, Judith. 2005. Night kitchens: Where making bean curd is an ancient art. *New Yorker.* Sept. 5. p. 66, 68-70, 73-74.
• ***Summary:*** One of the most insightful articles about tofu ever seen. An American goes in search of the heart of tofu in Japan, and the place of tofu in the Japanese diet and psyche; in the process, she finds the heart and soul of Japan. At Daisen-in, a Zen temple in Kyoto, she discovers "workshops where tofu is handmade by artisans faithful to the old tradition." Tofu was imported to Japan from China and Korea, along with Buddhism; it has been a mainstay of the monastic diet in Japan for about 1,000 years. But it "has never lost the soulful, exalted aura of its provenance."

At Okutan, the oldest tofu restaurant in Japan (established about 400 years ago within the walls of Nanzenji temple) she enjoys tofu at its best. She meets Mr. Ishii, whose tofu kitchens and private museum of beans are housed beneath the restaurant; he gives her a detailed history and gastronomy of the soybean. The shop where Okutan's tofu is made uses only traditional equipment–much of it made of cedar. Nigari is made here, dripped from sea salt. Shima-dofu is made with pure seawater–not with nigari–gathered off the tiny island of Hateruma.

She spends the night at a lovely old traditional Japanese Inn (*ryokan*) named Yoyokaku, near the beach in Karatsu, Saga Prefecture, on the west coast of Kyushu, about 4 hours by train south of Kyoto. Biking to a tiny nearby restaurant named Kyomachi, she finds that "its cuisine consists almost entirely of artisanal tofu made nightly, on the premises, by Yoshimasa Kawashima... whose family has been making tofu in Karatsu for nine generations." Age 58, he has created a unique new product named *zaru-dofu,* curded with nigari and eaten as curds. He also serves the okara as a dish in its own right.

Finally she visits Kashiwajima, an rocky island off

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the coast of Karatsu, where she experiences–and learns the history of–its legendary *ishiwari-dofu* ("stone-breaking tofu"), which is pressed until it is quite hard. Address: Correspondent, Japan.

11142. Downey, Tom. 2005. A two-day tour of Tokyo, stretching $500 worth of yen. *New York Times.* Sept. 11. p. D11.
• ***Summary:*** Foreigners seem to think Tokyo is so expensive, but it's not–of you know were to go and what to avoid. The writer enjoyed dinner at the Milk Wonton, in Yurakucho; it "serves some challenging fare for the Western eater–things like grilled eel fin twirled on a stick, natto (fermented, stinky soybeans) and sticky yam–but these foods are well worth sampling."

11143. Nakao, Sasuke. 2005. Ryôri no kigen to shokubunka [The origin of cooking and food culture]. Sapporo, Japan: Hokkaido Daigaku Tosho Kankokai. xxii + 839 + 22 p. Sept. 25. Illust. (some color). Maps. Index. 22 cm. [Jap]
• ***Summary:*** Sasake Nakao was born in 1916. Address: Professor Emeritus, Osaka Prefectural University.

11144. House Foods America Corporation. 2005. House Foods America Corporation (Brochure). 7351 Orangewood Ave., Garden Grove, California 92841. 12 p. 28 cm. [Eng; Kor; Jap; Chi]
• ***Summary:*** Brochure (glossy color, written in 4 languages on each 2-page spread: English, Korean, Japanese, Chinese) sent by Patricia Smith from Natural Products Expo (Baltimore, Maryland). 2005. Sept. Contents: Introduction. Tofu & tofu products (In 2004 House Foods American Corporation building its second tofu factory in Franklin Township, Somerset County, New Jersey). House Foods products. Restaurant Curry House. Tofu factory (Garden Grove, four photos). Other photos of the company's products are scattered throughout the brochure. Address: Garden Grove, California. Phone: (714) 901-4350.

11145. Shurtleff, William; Aoyagi, Akiko. 2005. Doufu zhi shu [The book of tofu]. Taipei, Taiwan: Persimmon Cultural Enterprise Co., Ltd. viii + 270 p. Sept. 1. Illust. by Akiko Aoyagi. No index. 26 cm. [Chi]
• ***Summary:*** A very attractive, complex character, Chinese-language edition of *The Book of Tofu* (2nd ed. Ten Speed Press). A slightly revised edition (different color cover) was published in mid-2012. Address: 1. Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

11146. Toyama, Michiko. 2005. Nobu: Japan's celebrity chef to the stars. *Time* (*Asia*). Oct. 3.
• ***Summary:*** This is part of a cover story titled "Asia's heroes." Nobu, a humble sushi chef from Saitama, has become one of the biggest names in the restaurant world. Of course it helps that Nobu's business partner is Robert De Niro, whose favorite recipe (made by Nobu) is "black cod with miso."

11147. Hirayama, Tadao. 2005. Shôyu hattatsu shoshi: Sho kara shôyu e [Brief history of shoyu development: From *sho* to shoyu]. Tokyo: Printed by Hokazu Hachibori. 66 p. 26 cm. [47 ref. Jap]
• ***Summary:*** This excellent history, with many illustrations, is available from the Kikkoman International Institute for Food Culture (KIIFC), Noda, Japan.

Contents: Preface I. Chinese jiang: 1. Jiang was called different names by the raw materials which were used to make various types (p. 1). 2. How to make doujiang ("bean jiang") (p. 2). 3. Doujiang might have been a side dish and had a consistency like moromi (p. 4).

II. Japanese sho (hishio?): 1. From the "fish jiang" (*gyosho*) period to the "grain jiang (*kokusho*) period (p. 5). 2. *Sho* and *misho* were differentiated in the very early period (p. 5). 3. *Sho* was used having a consistency like moromi [quite like applesauce]. (p. 7).

III. The birth of shoyu: 1. Various types of *sho* and *misho* as seasonings (p. 9). 2. Characters used to write the word *shoyu* in Chinese documents (p. 10). 3. Kinzanji miso and shoyu (p. 11). 4. Popularization of Zen Buddhism and Tea Ceremony culture (p. 12). 5. *Tare miso* and *To Miso* (p. 13) 6. The birth of shoyu (p. 15).

IV. The path / road to becoming true shoyu: 1. Shoyu and tamari (p. 17). 2. The making of shoyu at Tatsuno: The birth of *sumi shoyu* (p. 18). 3. The process for becoming true shoyu (p. 20). 4. San koji (Scattered means not clustered Koji) and *mochi koji* (p. 21). 5. The birth of the true shoyu after the mid-17th century (p. 22).

V. Shi (kuki) or sho: 1. Shi (kuki) to shoyu (p. 24). 2. Fermentation in solid form and fermentation in liquid form (p. 25). 3. Research in recent years (p. 27 4). From simplicity to complexity; from only one to more varieties (p. 28). 5. Purpose of the production of sho (hishio) (p. 30). 6. Arrival of new technology made sho into Shoyu (p. 31).

VI. Production of shoyu in Edo period: 1. Production methods of shoyu from mid- to late 17th century (p. 33). *Ryori Monogatari* (Cooking Story) (p. 33). *Yoshu Fushi* (p. 34). *Honcho Shokkan* (*Honcho Shokukan*) (p. 34). 2. Things we cannot afford not to have in the kitchen *Wakan Sansai Zukan* (p. 35). 3. The best way is; Prepare (*shikomi*) shoyu in summer (during Doyo) and finish (harvest) in fall Bankin Sangyotai (Mankin sangyo bukuro) (p. 37). 4. Shoyu making at home Koekikokusanko (Translator's guess at meaning: Wide profit domestic products ideas?) (p. 39).

VII. Kudari shoyu and Kanto Jimawari Shoyu: 1. Kudari shoyu (p. 41). 2. Ama's (Nuns') namaage shoyu (p. 43). 3. Favorite flavor of people of Edo (p. 44). 4. Kamigata's (Kyoto Kansai area) Dashi (stock) and Edo's Dashi (stock) (p. 47). 5. Edo's Honkobushi (Honkare bushi? Honkosetsu?)

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(p. 47). 6. Kanto's jimawari shoyu (p. 48). 7. The method in Shinsen Hochotei (Shinsen Hocho Hashigo) (means Newly Selected Knife Ladder) (p. 51). 8. Making shoyu into a commercial product (p. 53).

VIII. Shoyu production in Kansai area: 1. Shoyu production on Shodoshima Island (p. 55). 2. Shoyu production in Tatsuno (p. 56). 3. Adding amazake to moromi to create Tatsuno shoyu's unique flavor (p. 57). 4. In Tatsuno they strongly believed in using Kohamaen (Kohama salt) (p. 59). 5. To make large production of shoyu, they used Ako's Saen (salt) (p. 61).

Conclusions (Summary). Main sources (Bibliography). Address: Japan.

11148. Shurtleff, William; Aoyagi, Akiko. 2005. Wei ceng zhi shu [The book of miso]. Taipei, Taiwan: Persimmon Cultural Enterprise Co., Ltd. 280 p. Nov. 14. Illust. by Akiko Aoyagi. No index. 26 cm. [Chi]
• ***Summary:*** A very attractive, complex character, Chinese-language edition of *The Book of Miso.* A slightly revised edition (different color cover) was published in mid-2012. Address: 1. Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

11149. *New York Times.* 2005. Dried vaccines. Dec. 6. p. F6.
• ***Summary:*** Aktiv-Dry, a Colorado company that turns liquids into superfine powders, is developing a measles vaccine that can be stored dry and inhaled. It is very difficult to keep vaccines cold in Third World villages without refrigeration. Yet each year, "23 million children in Africa and Asia get measles, and 1 million die of it." The chosen vehicle for the vaccine is *Bacillus subtilis,* which is found in dirt all over the world. Safety is not an issue, since many Japanese eat it daily for breakfast. "The bacteria are used to ferment soybeans for a dish called natto." Illustrations show the inhalator and how it works.

11150. *SoyaScan Notes.* 2005. Chronology of major soy-related events and trends during 2005 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan.–Monsanto acquires Seminis for $1.4 billion. This gives Monsanto a commanding position in the fast-growing and very profitable vegetable seed market–a segment in which Monsanto previously had no presence. Jan.–*EarthSave News* stops being printed on paper and migrates to the Internet.

Feb. *The Whole Soy Story: The Dark Side of America's Favorite Health Food,* by Kaayla T. Daniel published by New Trends Publishing Inc. (Washington, DC). This is the first entirely anti-soy book.

March 14–Steve Demos, founder of White Wave, Inc., is terminated without cause (forced out) by Dean Foods.

July 7–Galaxy Nutritional Foods announces it will sell its manufacturing assets to Schreiber Foods, Inc. of Green Bay, Wisconsin, a major manufacturer of cheese products. Galaxy has recently suffered large financial losses.

July–Israeli Ministry of Health announces plans to recommend that young children limit soy products to one a day and advised that infants avoid them altogether. The French government recently advised that soy products not be given to children younger than age 3.

Oct. 17–Gardenburger Inc., the company credited with taking veggie burgers into the mainstream, files for Chapter 11 bankruptcy. The company will stay in business but become privately held; the name of the new owner is not yet known. The value of all Gardenburger shares is now zero.

Nov.–Yamasa Corporation purchases San Jirushi Corp. (Kuwana, Japan). San-J plans to build a new tamari plant next to their original plant (which has reached full capacity) in Richmond, Virginia.

During 2004-05 world production of palm oil reached 33.88 million metric tons to pass soybean oil (32.31) for the first time in history and to become the world's leading vegetable oil. Projections show this lead continuing to grow during the next two years (Source: *2007 Soya & Oilseed Bluebook,* p. 348).

11151. Lyddon, Chris. 2005. Global grain trade review. *World Grain* 23(12):34-38, 40-41. Dec.
• ***Summary:*** For soybeans in 2004-05, the top exporters (in 1,000 tonnes [metric tons]) are: 1. USA 29,801. 2. Brazil 20,538. 3. Argentina 9,600. 4. Paraguay 2,600. And Canada 1,025. Total world exports: 65,034.

Top importers: 1. China 25,700. 2. E.U.-25 16,000. 3. Japan 4,300. 4. Mexico 3,500. 5. Taiwan 2,300.

Statistics are also given for soybean meal.

The five leading U.S. seaports for imports and exports of all grains are (in million tonnes): 1. South Louisiana 44.169. 2. Houston, Texas 5.273. 3. Portland, Oregon 3.548. 4. Duluth, Minnesota 2.573. 5. Corpus Christi, Texas 1.687. Address: World Grain's European Editor, chris.lyddon@ntlworld.com.

11152. Nakajima, Nobuyoshi; Nozaki, N.; Ishihara, K.; Ishikawa, A.; Tsuji, H. 2005. Analysis of isoflavone content in tempeh, a fermented soybean, and preparation of a new isoflavone-enriched tempeh. *J. of Bioscience and Bioengineering* (*Japan*) 100(6):685-87. Dec. *
• ***Summary:*** By adding soybean germ (hypocotyl) that contained a large amount of isoflavone, the writers prepared a new isoflavone-enriched tempeh in the form of a granular fermented soybean-based food, which can serve as a nutritious supplement, e.g. for the elderly.

Gives levels of daidzein, genistein, and glycitein in tempeh–made from yellow soybeans, black soybeans, and defatted yellow soybean germ, plus isoflavone-enriched tempeh. Address: 1. Graduate School of Health and Welfare Science, Okayama Prefectural Univ., Kuboki, Soja, Japan.

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11153. **Product Name:** [Organic Shiro-shoyu (clear soy sauce)].
Foreign Name: Shiro shôyu.
Manufacturer's Name: Hichifuku Brewing Co., Ltd.
Manufacturer's Address: 2-7 Yamagami, Hekinan, Aichi 447-0869 Japan. Phone: +81 566-92-5213.
Date of Introduction: 2005.
Ingredients: Wheat, soybeans, salt, culture.
How Stored: Shelf stable.
New Product–Documentation: The website www.pref.aichi.jp lists this company at Certification No. 225. "Japan's only specialized manufacturer of *shiro-shoyu* soy sauce, in Hekinan City, the home of this special ingredient. Executive director: Atsunori Inuzuka. Company outline: Hichifuku [Shichifuku] Brewing is the only company in Japan whose *shiro-shoyu* soy sauce plant is organic–JAS certified. Wheat accounts for 90% of the raw material used to produce this soy sauce. The amber-colored product keeps intact the colors of the other ingredients as they cook. Hichifuku Brewing also manufactures *shiro-dashi* (a combination of shiro-shoyu soy sauce and dashi broth of carefully selected dried bonito, kombu, and shiitake mushrooms)."

11154. Andoh, Elizabeth. 2005. Washoku: Recipes from the Japanese home kitchen. Berkeley, California: Ten Speed Press. vii + 320 p. Illust. (many color). Index. 25 x 25 cm.
• ***Summary:*** A beautiful book. Contains a section titled "Tofu and eggs" (p. 268-93), plus many recipes that use miso, shoyu, edamame, kinako ("toasted soy flour"), and amazake. Address: Japan.

11155. Fujii, Mari. 2005. The enlightened kitchen: fresh vegetable dishes from the temples of Japan. Translated by Richard Jeffrey. Tokyo, New York, London: Kodansha International. 107 p. Illust. (photos by Tae Hamamura). Index. 26 cm.
• ***Summary:*** This is a lovely Japanese vegan (and vegetarian) cookbook filled with the spirit of kindness and of Zen–and with color photos on almost every page. It discusses and describes the ancient tradition of *shojin ryori,* the plant-based diet which originated in Japan's Buddhist temples. The author, who is the wife of a Buddhist monk, has taught temple cuisine for over 20 years. Her husband, Sotetsu, lived as a monk for ten years in various Buddhist temples; he also trained as the tenzo (head cook).

In this book she presents 60 beautiful, delicious, health-giving, and heart-warming recipes, many adapted to Western kitchens but all true to their roots. A majority of the recipes contain soyfoods in one form or another.

The helpful glossary includes descriptions of edamame beans, hijiki, karashi mustard, konbu, Koyadofu ("freeze-dried tofu"), miso, natto, nori seaweed, pickled plum paste, saké, sesame paste, sesame seeds, shiso (perilla), soy sauce, soybeans, sukikonbu, tofu, umeboshi pickled plum, usu-age tofu, wakame seaweed, wasabi, yuba, yuzu.

The index contains 20 entries for miso, 15 for tofu (p. 15, 24, 29, 32, 39, 41, 42, 48, 51, 53, 56, 62, 71, 100, 104), 6 for soymilk (p. 17, 45, 47, 94, 99, 104) 4 for edamame (p. 16, 35, 68, 99), 3 for deep-fried tofu (p. 32, 42, 71, 104), 3 for natto (p. 44, 50, 100), 2 for teriyaki (p. 48, 62), 2 for Koyadofu (p. 48, 100), 2 for usa-age (thin slices of deep-fried tofu; p. 32, 104). 2 for yuba (p. 47, 104). A small color photo on the inside rear dust jacket shows Mari Fujii. Address: Cooking teacher, Kamakura, Japan.

11156. Heldstab, Celeste Rayne. 2005. The kitchen grimoire. 2 vols. Published by the author. 724 p. See Vol. 2. p. 450. *
• ***Summary:*** The recipe for "Kinako mochi" calls for kinako as an ingredient.

11157. Hu, Shiu-ying. 2005. Food plants of China. Hong Kong: Chinese University Press. xvi + 844 p. Illust. Index. 26 cm. [350+ ref]
• ***Summary:*** This is a truly remarkable book–the most original and comprehensive book seen to date on the food plants, plant foods, and the economic botany of China. It is the author's supremely valuable life's work.

Contents: Foreword by Richard Evans Schultes (Director, Botanical Museum of Harvard University, Emeritus). Foreword by George W. Staples, III (Bernice P. Bishop Museum, Honolulu, Hawaii). Introduction: Why the book and to whom is it addressed. Illustrations (numbered but on unnumbered pages).

Part I: Cultural aspects of Chinese foods. 1. The sources and nature of information. 2. The production and preparation of Chinese plant food. 3. Selected Chinese food plants with instruction for preparation. 4. Spices and flavoring materials. 5. Health food (*bupin*) and herbal tea (*liangcha*).

Part II: Botanical aspects of Chinese food plants. 6. Nonvascular plants. 7. Vascular plants (incl. spermatophytes {seed-bearing plants} and angiospermae {flowering plants}, incl. monocotyledons and dicotyledons). Bibliography. Latin name index. Chinese name index. English name index.

On the inside front cover and facing right-hand page is a large map of China, with each province shown, and the localities of Shiu-Ying Hu's botanical activities in China clearly show in symbols: white triangle = before and white circle = after 1950. A black triangle or circle = staying 8 or more years. In each triangle or circle is a number, keyed to a list of the names of 65 localities. She did more research in southern China than in northern.

There is no country in the world today "where the value of useful plants is more thoroughly appreciated than in contemporary China" (p. vii, Foreword 1).

Dr. Hu is an expert taxonomist and economic botanist. She "draws on the fields of plant taxonomy, morphology, economic botany, pharmacognosy, and phytochemistry to

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name a few, yet the text is far from a dry recitation of facts and statistics. What brings the work to life are the numerous anecdotes and personal experiences she shares. Indeed, this latter element gives the book the aspect of a personal memoir." "The major divisions... are taxonomic and within each division the plants are arranged alphabetically by scientific name. Also provided are the names in Chinese characters, the transliteration in English of both the Putonghua and Cantonese pronunciations for the Chinese names, common names in English, and a brief commentary" (p. ix-x, Foreword 2).

"The food plants of an area provide the material basis for the survival of its population" and furnish inspiration for its cultural development. "In China, 1,156 species and 274 varieties and/or cultivars of food plants have been recorded and are used" by the people. The preparation of this work began in 1957 and a compilation was distributed at the Ninth Pacific Science Congress. Born in 1908, the author entered a boarding school in Xuzhou, Mary Stevens Girls' High School, run by Presbyterian missionaries. In like manner she went to Ginling College, a small liberal college of arts and sciences in Nanjing. After college she entered Lingnan University (formerly Canton Christian College) in Guangzhou, from which she graduated with the master of science degree in June 1937–a month before the Marco Polo Bridge Incident on July 7, 1937, when the Sino-Japanese War broke out in Beijing. She fled to Chengdu, Sichuan, where in Jan. 1938 she accepted a teaching position in the Department of Biology, West China Union University–also a missionary college. In the late 1930s and early 1940s, Hu had botanized in western Sichuan at a time when only a few men (notably Armand David, Joseph Rock, and E. Wilson) had explored that region. During summer vacations, she took students to botanize around Muping. At West China Union University, Hu continued her field studies, taught courses in botany, and was elected president of the International Women's Club. The vice president of the club, who was a Radcliffe graduate, applied to Radcliffe for a fellowship for Hu.

She left China on 2 Aug. 1946 for graduate work at Radcliffe College; it was like a metamorphosis–the United States was a completely new world. In 1946 she was offered a graduate fellowship for a doctorate (PhD) program at Radcliffe College under Prof. E.D. Merrill, then Director of the Arnold Arboretum (Harvard Univ.) from 1935-1946. Her doctoral dissertation on the genus *Ilex* (Aquifoliaceae) was carried out at the Arnold Arboretum under the direction of E.D. Merrill. After completing the requirements and finishing the dissertation for a doctorate degree at Harvard, in April 1949, she became the herbarium assistant at the Arnold Arboretum. From 1953 to 1957 she worked on the Flora of China Project at Arnold Arboretum. Among other things, she became famous for her Chinese dinners with staff and students alike. She officially retired from the Arnold Arboretum on 30 June 1976.

Dr. Hu returned to China in July 1975, after 29 years abroad. Since the normalization of diplomatic relations between the USA and China in 1978, she has made many trips to China, and travelled studied extensively (p. xi-xii, 12-14). As of Aug. 2011 Dr. Hu resides in Hong Kong and is closely associated with the Chinese University of Hong Kong.

A photo (Fig. 1) shows the author in 1941 as a young lady in Tibetan attire; she spent summers in the area formerly called "Eastern Tibet."

Fig. 34, an illustration composed of seven superb line drawings (each with a scale) showing the soybean plant, a flowering branch, the front view of a flower, a lateral (side) view of the same, a fruit (pod with 2 seeds) with one side of the pericarp (outer pod) removed–showing the seeds, a soybean seed showing the acentric hilum, the micropyle and the hypocotyl ridge, soybean sprouts from a market showing the smooth fleshy cotyledons, the hypocotyl and the very small plumule.

Fig. 35. Four black and white photos showing: (1) Two round trays of koji, made of cooked soybeans, roasted wheat flour, and fungal spores, in shelves, to be used for making soy sauce. (2) Large earthen jars with convenient hat-like covers, containing the koji, salt and water, placed in the yard of the *jiang-yuan* (2 Cc = Chinese characters given) ("jiang garden"), exposed to the sun during the day and dew at night, covered only when it rains and stirred occasionally. (3) A man stirring hot soymilk in a large shallow cauldron before adding pulverized calcium sulfate for precipitation of the soybean protein, used to make tofu. (4) A wooden frame [curding box], lined with cloth for filtering the coagulated protein and solidifying the mass (under small pressure) to make bean curd.

Soybeans (*Huang-dou,* 2 Cc). Before World War II, the United States was a net importer of soybeans; now she is a net exporter. "Although soybean products have entered American supermarkets, several Chinese uses of soybean can introduce more variety and tastier food into many homes (Figure 35). Included... are: green immature soybean, soybean curd, soybean sheets [pressed tofu sheets], firm bean curd squares [pressed tofu], soybean skin [yuba], and soybean sprouts." With the exception of soybean sheets, all these items are available in Chinese American grocery stores. "The Food Plants Research Institute, Amherst, Massachusetts, is in the process of introducing soybean sheets (3 Cc) to American markets (p. 118-19).

Hordeum vulgare L. var. *vulgare*–Barley *Da-mai* (W.-G. *Ta-mai*) (2 Cc, 'big grain'). "... also ground with sorghum and soybean for a coarse, healthy, fiber bread flour."

Glycine max (L.) Merrill–Soybean. *Da-dou* (W.-G.: *Ta-tou*). (2 Cc) ('giant bean'). *Huang-dou* (W.-G.: *Huang-tou*). (2 Cc) ('yellow bean'). "Seed mixed with *gao-liang* (kaoliang) and barley, ground together for flour, used to be

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the staple of the rural population in the Yellow River Region; soaked, cooked with salt, served as tidbits in northern China; used as source for all the following forms of Chinese food" (p. 474).

Dou-you (W.-G.: *Tou-yu*). (2 Cc) ('soybean oil'). Cooking oil extracted from the soybean. (p. 474). Address: Botanist, Arnold Arboretum, Harvard Univ.; Honorary Prof. of Chinese Medicine, The Chinese Univ. of Hong Kong.

11158. Ikezawa, Yasushi. 2005. America Nihonshoku wozu: Sushi, tôfu, edamame, Nihonshu. Ima Amerika de wa Nihonshoku ga daibumu. Bijinesu ni, kanko ni, shitte oku to zettai yakudatsu "Beishoku gaishoku saishin jijo" [Japanese food wars in America: Sushi, tofu, edamame, saké. There is now a big boom of Japanese foods in the USA! The newest guide book to eating out in America is very useful for your business and sightseeing trips]. Tokyo: Asahi Shuppan. 253 p. Illust. Maps. 21 cm. [Jap]*
Address: Japan.

11159. Ishige, Naomichi; Otsuka, Shigeru; Asakura, Toshio. 2005. Kankoku [Korea]. Tokyo: Nô-san Gyoson Bunka Kyôkai. Series: Sekai no Shokubunka, No. 1. [Jap]*

11160. Ito, Etsuo; Chinen, Michiko. 2005. Kantan yakuzen miso no tsukurikata: gan ni naranai Okinawa gohan [How to make easy medicinal foods using miso: Okinawan dishes prevent cancer]. Tokyo: Gendai Shorin. 102 p. 21 cm. [Jap]*
Address: Japan.

11161. Koerbitz, Werner. 2005. Status of biodiesel in Asia, the Americas, Australia, and South Africa. In: G. Knothe, J. Van Gerpen and J. Krahl, eds. 2005. *The Biodiesel Handbook.* Champaign, Illinois: AOCS Press. ix + 302 p. See p. 211-18. [7 ref]
• ***Summary:*** Contents: Introduction. The Americas: Argentina, Brazil, Canada, Nicaragua. South Africa. Australia. Asia: China, India, Japan, Malaysia, Philippines, South Korea, Thailand. Address: Austrian Biofuels Inst., Vienna, Austria.

11162. Lowry, Dave. 2005. The connoisseur's guide to sushi: everything you need to know about sushi varieties and accompaniments, etiquette and dining tips and more. Boston, Massachusetts: Harvard Common Press. xxii + 297 p. Index. 27 cm.
• ***Summary:*** The section titled "Inari Sushi" states (p. 20): "Inari; usually pictured as a old man with a pair of sacks and accompanied by a pair of foxes, is the god of rice in Japan. Because pockets of abura-age, or fried tofu, stuffed with *sushi-meshi* look like the rice bags carried by Inari, they're called *inari sushi.* They are also known as *age sushi* (*age* means "fried," referring to tofu pouches), *o-inari sushi* or *o-inaribukuro* (inari stuffed in a sack) or *kitsune sushi* (fox sushi)."

Popular with Japanese children, inari sushi makes a fine snack or light lunch, but it isn't common in sushi-ya [sushi shops]. They are most widely found in prepackaged lunch-box type sushi.

Note 1. This is the earliest English-language document seen (April 2013) that uses the term *age sushi* or the term *kitsune sushi* or the term *o-inari sushi* to refer to inari sushi, made with deep-fried tofu pouches.

Almost all of the sushi terms in this book are presented and used in their original Japanese; they are not translated into English. Thus, this book contains a wealth of real sushi terminology and vocabulary. The writing style mixes both humor and serious admiration. Address: Restaurant critic for *St. Louis* magazine, Missouri.

11163. Moriyama, Naomi; Doyle, William. 2005. Japanese women don't get old or fat: Secrets of my mother's Tokyo kitchen. New York, NY: Delacorte Press. 274 p. Illust. Index. 22 cm. [50+ ref]
• ***Summary:*** From the publisher's description: "Japanese-born Moriyama reveals the key to the enduring health and beauty of Japanese women. The Japanese eat one of the most delicious, nutritious, and naturally satisfying cuisines in the world without denial, without guilt, and, yes, without getting fat or looking old. If you think you've eaten Japanese food, you haven't tasted anything yet. Japanese home-style cooking isn't just about sushi and raw fish but good, old-fashioned everyday-Japanese-mom's cooking that's stood the test of time–and waistlines–for decades. Reflected in this are the age-old traditional values of family and the abiding Japanese love of simplicity, nature, and good health. It's the food that millions of Japanese women eat every day to stay healthy, slim, and youthful. Even better, it's fast and easy. If you're tired of counting calories, counting carbs, and counting on diets that don't work and don't satisfy, it's time to discover this."

Traditional Japanese soyfoods are mentioned throughout this book, always in a very positive way and in recipes. Japanese generally eat soyfoods in their more natural and less processed forms such as tofu, miso, natto, and edamame–and rarely in the forms of soy supplements, soy shakes, soy burgers, soy energy bars, etc. that are so popular in the West.

Chapter 5, "The seven pillars of Japanese home cooking," states (p. 122) that they are: "fish, vegetables, rice, soy, noodles, tea and fruit." Soy, "The fourth pillar," is discussed very nicely on pages 181+.

Here is the number of pages on which various foods are mentioned: Tofu 56 (incl. silken tofu {kinugoshi}, cotton tofu {momen, regular}, atsu-age {deep-fried tofu cutlets}, usu-age {deep-fried tofu pouches}, yakidofu or broiled tofu). Miso 50 (incl. p. 91-92. 99-100). Soy sauce 50. Edamame 12. Shoyu 3 (p. 75, 114, 121). Natto 2 (p. 184, 188). Okara

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1 (p. 184). Yuba 1 (p. 184). Also many reference to sea vegetables (hijiki, kombu, nori). A photo on the inside rear dust jacket shows the authors; she was born in Tokyo, and he is an American who has written or cowritten five books.

Note: The paperback edition of this book (only) mentions "The Japanese Skincare Revolution: How to Have the Most Beautiful Skin" in connection with tofu. Address: Wife and husband live in New York City.

11164. Mullin, W.J. 2005. Miso as a functional food. In: John Shi, C.-T. Ho, and F. Shahidi. 2005. Asian Functional Foods. Boca Raton, Florida: CRC Press. xxi + 647 p. See p. 537-53. Chap. 19. [34 ref]
• ***Summary:*** Contents: Introduction. Raw materials: Soybeans (preferred qualities), rice, barley, salt, water, [yeast and] bacterial cultures (halophilic yeasts: *Zygosaccharomyces rouxii, Candida versalitis;* lactic-acid producing bacteria: *Tetragenococcus halophilus*), koji starter (*tane-koji*). Processing technology: Organoleptic properties. Nutritional properties. Standards and regulations.

Of the macronutrients in soybeans, the carbohydrate content is the most important, particularly the level of oligosaccharides.

Page 242: Traditionally, making miso was a family operation that took place after the fall harvest; the food was preserved in times of plenty, which were followed by times of uncertainty in the food supply.

Miso cooperatives: The system of miso cooperatives is very well organized. Local cooperatives throughout Japan are organized into 51 unions, and these are grouped into eight national blocs based on geographical location. The blocs have joined to form a national organization called the Japan Federation of Miso Manufacturers Cooperatives (JFMMC) [*Zenkoku Miso Kogyo Kyodo Kumiai Rengokai*], with headquarters in Tokyo. JFMMC represents about 1,400 miso manufacturers of all sizes. All miso makers are eligible to become members of the local organization, and the vast majority take advantage of the membership, which can provide many benefits. "The JFMMC operates the Central Miso Research Institute, which conducts basic research, tests new domestic and imported varieties, troubleshoots processing problems, and prepares and distributes cultures for fermentation." The JFMMC is very active in public relations and publicity; it also sponsors research into the health benefits and nutritional value of miso. It publishes an annual report which includes detailed statistics on miso production in Japan, as well as discoveries based on new miso research.

Annual miso competitions are held at the local and national level to keep miso in the spotlight; they do much to maintain and improve the quality of miso. Most take place in the fall, with the national JFMMC competition held last of all in early November in Tokyo–a climax of the miso production year. "The competitions are keenly contested with several hundred entries and are widely reported in the national and local media." "Winning a class can be of great promotional benefit to the winner." New uses for miso are also on display with leading chefs preparing dishes that are offered to members of the JFMMC, competition participants, and to the media. Address: Agriculture and Agri-Food Canada, Ottawa, Ontario, Canada.

11165. Nagata, Juzo. 2005. Daredemo dekiru tezukuri miso: hajimete demo dekiru gokujô no aji [Handmade miso that anyone can make at home: You can make the very best flavor even if its your first try]. Tokyo: Nosan Gyoson Bunka Kyokai. 142 p. 21 cm. [Jap]*
Address: Japan.

11166. Nattô ando tenpe shokudô honjitsu kaiten: wagaya no shokutaku niwa itsumo nattô ga aru [Opening the Today Natto and Tempeh restaurant: Natto is always on our dining table]. 2005. Tokyo: Gakken. 81 p. 26 cm. [Jap]*

11167. Nattô ryôri: omoigakenai nattô no tabekata o shokai. Nebaneba pawaa de motto kenkô ni [Natto cookery: Introducing some unusual ways of eating natto. Becoming healthier by sticky power]. 2005. Tokyo: Butikkusha. 48 p. 19 cm. [Jap]*

11168. Park, Kun-Young; Jung, Keun-Ok. 2005. Fermented soybean products as functional foods: Functional properties of doenjang (fermented soybean paste). In: John Shi, C.-T. Ho, and F. Shahidi. 2005. Asian Functional Foods. Boca Raton, Florida: CRC Press. xxi + 647 p. See p. 555-96. Chap. 20. [121 ref]
• ***Summary:*** Contents: Introduction. History of Korean soybean fermented foods. Manufacturing methods and characteristics of doenjang fermentation. Functional properties of doenjang: Nutritional and functional components in soybean and doenjang, safety of doenjang, antimutagenic activity of doenjang. Anticancer effect of doenjang. Increased chemopreventive effect of doenjang: Antioxidant effects, reduced cardiovascular diseases (fibrinolytic effect {as in chungkookjang and natto which secrete strong fibrinolytic enzymes}, antihypertensive effects, reduced serum cholesterol level), other possible functions of doenjang. Conclusion.

Doenjang is "Korean fermented soy paste" and kanjang is Korean-style fermented soy sauce that is obtained by filtering off the liquid from doenjang. "Historically soybeans and processed soybean foods have been the main protein sources in the Korean diet" (p. 555). "The medicinal functions of doenjang were first described in the *Dongeuibogam* [*Dongui Bogam* (*RR*), *Tongui Pogam* (*MR*)] (1613 A.D.), which was a popular traditional Korean medical text" [no citation given].

The section titled "History of Korean soybean fermented

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foods" contains what promises to be a number of references to early and possibly very interesting documents that mention soybeans and soyfoods in Korea. Yet the authors fail to cite any of them properly, so for the time being, we must accept their account of what the documents say. The problems are: (1) None of these documents (except one, Ref. #46) is cited in the long list of references at the end of the chapter. (2) The title of all these documents is given only in Korean, even though at least two should have Chinese titles; one of those two (described as "The Chinese agricultural technology book, *Jeminyosul* {A.D. 530 to 550} written by a governor, Maeeunsa,...") is actually the famous *Qimin Yaoshu,* by Jia Sixie. (3) We are never told in what language the original document referred to is written. (4) The page number(s) on which the ancient, important information appears is not given for any of these documents. (5) For some documents no date is given, whereas for others no author is given. (6) It is not clear what names were used to refer to each of the various soyfoods in the original documents. (7) The authors never tell us whether they examined the original document, or read a contemporary version, or simply got the information from a secondary source.

For example (all dates are A.D.): 99–It has been reported [by what document?] that soybeans were cultivated–Where were they cultivated?

530-550–The *Jeminyosul* [*Quimin Yaoshu*] states (in Chinese) that shi [fermented black soybeans], soybeans fermented with bacteria, in Korea were disseminated to China and Japan.

683 Feb.–An article [no title given] by King Sinmoon, that appeared in the 3rd year of his reign (during the Silla dynasty), mentioned the words *jang* (mold-fermented soybeans) and *shi* (bacteria-fermented soybeans).

701–*Daeboyulryong* mentioned the words jang, shi, and maljang, which referred to soybean products.

739–*Jungchang Wonmooseu* also mentioned the word maljang.

Donga (no date given), which was written by Shinjungbaesuk (is that the writer's real name?) in Japan, "indicated that maljang was imported from Korye (the old name of Korea);" it was renamed "miso" (Source: Ref. #46–35th Chronicle of Korea Soy Sauce Industrial Cooperative. 1997. Seoul. p. 27-32). Korean jang is said to have developed into traditional Japanese miso using meju made of soybeans and rice instead of maljang, which was made from soybeans only.

918-1392–During the Korye [Goryeo] dynasty, [in Korea] the name "maljang" changed to "maejyo" and then to "meju" [meaning soybean koji in the shape of balls or cones]; it was soaked in brine in a clay pot and ripened [then filtered]. The liquid was called *kanjang* (soy sauce) and the solid sediment was called *doenjang* (soy paste).

1613–*Donguebogam* [see above], written by Hurjun, described how to make medicinal doenjang using soybeans and how to fix soured doenjang.

1760–*Jungbosan Limkyunge,* written by Yojungim, "introduced 45 different processing methods for soybean foods, describing how many days fermentation for jang, selection of water, salt quality, how to handle the pottery, fixing jang with an off-taste, etc."

1790 ca–*Kyuhap Chongseo,* written by Madam Lee (lived 1759-1824) described the proper methods for making the various types of jang in great detail.

1930 ca.–Commercial production of fermented soybean products ("jang" in Korean) started in Japanese-built jang factories in Korea during the occupation (1909-1945) to supply soybean products for the Japanese in Japan.

1945–After gaining independence from Japan, Koreans took over the factories. Since the Korean war (1950-1953) military personnel and people living in large cities have mostly consumed commercial fermented soybean products, whereas families living in rural areas still prepare their own. Address: Pusan National Univ., Busan, Korea.

11169. Shi, John; Ho, Chi-Tang; Shahidi, Fereidoon. 2005. Asian functional foods. Boca Raton, Florida: CRC Press. xxi + 647 p. Illust. Index. 24 cm. Series: Nutraceutical Science and Technology.

• ***Summary:*** Contents: Preface. About the editors. Series introduction. Contributors. Table of contents. 1. Functional foods and their impact on nutrition and health: Opportunities in the Asia Pacific... Contains two chapters on fermented soyfoods (Chap. 19, Miso, and Chap. 20, Doenjang) which are cited separately.

The Preface begins (p. v): "Health and 'healing' foods have a long history in Asian cultures." Asians such as the Chinese and Indians have long known that food and medicine come from the same source; they can treat illnesses and build a healthy life. Since ancient times, Chinese have compiled a remarkable amount of information about the materia medica, the use of natural substances–plants, animals, and chemical–to treat illness.

Kudzu (*Pueraria lobata, ge geng*), one of the earliest medicinal plants used in traditional Chinese herbal medicine, is discussed on pages 83-86.

In chapter 7 titled "Traditional Functional Foods in Korea," the section on "Fermented soybean foods" (p. 165-66) states that typical daily per capita consumption of these foods are: Soy sauce 20 ml, soy paste 20 gm, and hot soy paste 10 gm. In recent years there has been a decrease in soy intake due to increased use of Western seasonings such as mayonnaise, tomato ketchup, meat sauces, etc.

In Chapter 8, titled "Evolution of Korean dietary culture and health food concepts," the section on "Food as medicine" begins (p. 210): In traditional Korean culture, food was regarded as the basic source of health. It was believed that all diseases could be cured by foods. Korean knowledge of the medicinal effects of foods came, not

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through the sciences of nutrition, medicine, chemistry, or physiology, but through long human experience. Moreover, a key practice and discipline has long been to eat only when hungry, and not to overeat. The enormous size of the health food market in Korea today reflects the country's long tradition of 'food as medicine.'"

Page 229: "Micronutrients." Asian fish sauces are good sources of vitamin B-12 (cobalamine) because they are made from animal protein. Fish sauce from Thailand contains 1.91 mcg (micrograms) per 100 ml. This amount protects the Thai population from megaloblastic anemia caused by vitamin B-12 deficiency. The estimated average requirement for vitamin B-12 is only 2 mcg per day. However fermented soybean sauce contains very little (0.14 mcg per 100 ml); the small amount present is attributed to microbial synthesis.

Page 230: "The high salt problem." Japanese men rank highest in daily per capita sodium intake at 5.4 gm; the United States, Thailand, and New Zealand each average about 3.9 gm.–72% as much, or 28% less. Some cultures consume as little as 0.69 gm / day.

Pages 248-49: "Future potential for fish sauce." It is unclear whether fish sauce was first developed in Asia or Europe. But while it has vanished in Europe, it has become a thriving industry in Southeast Asia–perhaps because the extensive use of bland-tasting rice requires a salty and tasty protein-rich seasoning. Several species of anchovy are the preferred raw material for fish sauce. Some say that soy sauce was first developed in Japan. Address: 1. Research Scientist, Federal Dep. of Agriculture and Agri-Food Canada, Ottawa, Ontario, Canada; 2. Rutgers Univ., Rutgers, New Jersey; 3. Memorial Univ. of Newfoundland, St. John's, Newfoundland, Canada.

11170. Smith, Andrew F. 2006. Soy [sauce] and ketchup / catsup (Interview). *SoyaScan Notes.* Jan. 12. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** William Shurtleff called Smith, who had written a book on the history of ketchup (*Pure Ketchup*), to ask why there were recipes in early American cookbooks titled "Tomato Soy" (Randolph 1838, p. 163) and "Soy" (Beecher 1850, p. 72) which did not call for soy [sauce] as an ingredient and did not even mention "soy" in the body of the recipe.

Smith: The price of the soy sauce imported to America from Asia in the late 1700s and 1800s would have been very high. Importers may have adulterated this soy sauce to obtain more and reduce the price. Andrew thinks that the "soy" called for in early American cookbooks would probably not have been real soy sauce; that is, it may not have been made with soybeans–you don't know for sure. Soy is a generic concept; it's like the term "ketchup," which is also a generic term. "Ketchup" and "soy" were used interchangeably. There were probably only a handful of people in 19th century America who knew was "soy" really was, and most of those did not realize that soy sauce was made from soybeans. And soy was certainly not a major part of the American diet or cookery. Mary Randolph could use the word "soy" in place of ketchup and not even give it a second thought. Ketchup is a sauce that is made from a single food product (such as mushrooms) with added spices. Soy was the same. It wasn't necessarily made from soybeans.

Once a term is adopted, like ketchup in England, it becomes an "in" word, and people then use the word to mean other things. These words are not yet clearly defined. In the United States, Noah Webster's *American Dictionary of the English Language* did not appear until 1828. It states: "Catchup or Catsup: A liquor extracted from mushrooms, used as a sauce." "Catsup: *see* Catchup, Ketchup." "Ketchup: A sauce. *See* Catchup." "Soy: A kind of sauce used in Japan."

Mary Randolph ran a boarding house. If someone came in with a "Tomato soy" recipe, she would probably have said "Okay, fine."

If a cook goes somewhere and samples or buys a little real soy [sauce], and finds it to be tasty, her / his goal is to go home and try to develop a kitchen recipe for it–just as with ketchup. Ketchup was originally a fermented sauce from Indonesia which included soybeans. When it arrived in England, people tried to duplicate it. Recipes are interesting in that they first show us that people were using the word "soy" to refer to sauce that contained no real soy sauce. People did not feel the need for clear definitions in the area of recipes, and especially with the terms "ketchup" and "soy." It really isn't until sauces become commercialized that clear definitions become necessary.

Concerning terms like "India soy" and "Indian soy," Shurtleff notes: Japan was closed to foreign trade until about 1868. The one exception was the Dutch trading post on the tiny island of Deshima in Nagasaki Bay in southern Japan. From there, Dutch trading ships would transport Japanese shoyu to their own network of trading posts in Southeast Asia, and to the southern tip of India, where they would sell it to the British East India Company. But, of course, they would not tell the British where it was made. So the British began calling it "India Soy" or "Indian Soy," even though (as far as we know) no soy sauce was made in India. Smith adds: The Dutch probably also traded Indonesian ketchup (kécap; Indonesian-style soy sauce, made in Indonesia) with the British, but there is less evidence of this.

In 1684, the British established a settlement on Sumatra named Bencoulin [Benkulen, Bengkulu] (alternatively spelled Bencoelen, Benkulen, Benkoelen). "It served as a center of the British pepper and spice trade during the late 17th and early 18th centuries. At the time of its founding, Bencoulin was the only British settlement in Southeast Asia." In 1825 the settlement was handed over to Dutch control in exchange for the Dutch colony of Malacca on the Malay Peninsula [in today's West Malaysia on the Strait of Malacca].

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"Only one ketchup recipe known to have originated in Southeast Asia has survived. It was published by Richard Bradley in the 1732 edition of his *Country Gentleman and Farmer's Monthly Director.* The recipe was titled "Ketchup in Paste" (see Part 2, p. 150) and its main ingredient was kidney beans–which almost certainly referred to soybeans. Rich in spices, it contained no salt or sugar, so it could not have lasted for any length of time. "It appears to have had no influence on subsequent cookery writers." In short, the British first discovered ketchup–and began using the word–on the southwest coast of Sumatra, in today's Indonesia, in Bengkulu, on the Indian Ocean. That ketchup was probably Indonesian-style soy sauce. They tried to duplicate it when they returned to England, but since they didn't have soybeans, and didn't even know it contained soybeans, they developed a host of alternative recipes–based on mushrooms, walnuts, anchovies, etc.

Isn't it strange, that soy sauce was never adopted or became popular in the Netherlands, as it did in England. This raises one real question. Also: Why are there so few early records concerning soy sauce in today's Indonesia? Another question is whether the terms "India soy" and "Indian soy" refer to today's India or to the Dutch East Indies. Address: 135 Eastern Parkway, #11a, Brooklyn, New York 11238.

11171. Shurtleff, William. 2006. Thoughts and questions concerning Dutch traders, the Dutch East India Co. (VOC), soy sauce in the Dutch East Indies and the Netherlands, and the words "catchup," "catsup," "ketchup" and "ketjap" (Editorial). *SoyaScan Notes.* Jan. 15.

• ***Summary:*** During the 1600s and 1700s, traders and merchants of the Dutch East India Co. in Asia greatly preferred Japanese shoyu [soy sauce] to Indonesian kecap / ketchap [soy sauce]. In the 1640s, the Dutch replaced the Portuguese as the only nation allowed by Japan's ruling shoguns to trade with Japan. Dutch traders purchased Japanese shoyu from their trading post at Deshima, then filled orders for it from their many trading posts in the Dutch Indies (today's Indonesia and parts of India), where it was used to season foods. Dutch traders also sold it in India to British East India Co. traders, who shipped it back to England and on to the United States; in both these places it became quite popular–much more popular than it ever became in the Netherlands. The British had no access to Japan; the only way they could obtain Japanese soy sauce was to buy it from the Dutch East India Co. In short, the Dutch were the first foreigners to buy, sell, and use Japanese soy sauce.

It seems very surprising that, during this period, there is almost no evidence that these Dutch traders were importing any kind of soy sauce to the Netherlands.

Soy sauce was in England by 1679, when it was reported by John Locke in his journal. This is also the earliest date seen for soy sauce in Europe. It was not reported in the Netherlands until 1727; that year the German physician and traveler Engelbert Kaempfer wrote: "This *Soeju* [shoyu, or soy sauce] is exported by the Dutch, and brought even into *Holland."*

From 1641 to 1858 there was a Dutch East India Co. trading post on Deshima, an artificial an island in Nagasaki harbor, Kyushu. The earliest date seen for a shipment of shoyu from Deshima by Dutch traders is 1651.

About 20 years earlier, in 1619, the Dutch built Batavia [today's Jakarta] and established a settlement on Java [part of today's Indonesia].

When the British started buying "Ketchup" from the Dutch: (1) What type of Ketchup was it? Sweet or salty. Perhaps we could find the answer by doing a careful analysis of its early imitations–mushroom, walnut, and oyster ketchup. Were they basically sweet and thick like the more modern kecap manis, or were they thinner and salty–like ketjap asin or like Japanese or Chinese soy sauce? (2) Where in the Dutch East Indies was it made? (3) At which trading post did the Dutch East India Co. sell it to the British East India Co. (4) When did the earliest known sale take place and where is it recorded? (5) In what type of containers was it packaged and shipped?

If only one VOC ship a year was allowed to export Japanese goods (including soy sauce) from Deshima, the VOC would plant that shipment very carefully to maximize profits. Why would they want to sell the soy sauce at wholesale prices to the British East India Co.

The best way to understand what early ketchup was, is to study it together with soy sauce–not by itself, alone.

Did the VOC or the Dutch ever import soy sauce from the Dutch East Indies to the Netherlands? If so, starting when? What did they call it? Did they import different types?

When did soy sauce first appear in Holland / The Netherlands?

What were the characteristics of earliest homemade ketchup recipes in English–make a table of ingredients with date down left column. Did they tend to be sweet or salty? When salty, how was the salty flavor obtained? The savory flavor? Were any early ones fermented? Or just aged? Address: Founder and owner, Soyfoods Center, Lafayette, California. Phone: 925-283-2991.

11172. Global Industry Analysts, Inc. (GIA). 2006. Soy foods–Global strategic business report. 5645 Silver Creek Valley Rd., San Jose, California. 302 p. Jan. *

• ***Summary:*** Publisher description: This report analyzes the worldwide markets for Soy Foods in millions of US$. The specific product segments analyzed are Soy Ingredients, and Soy Oil. The report provides separate comprehensive analytics for the US, Canada, Japan, Europe, Asia-Pacific (excluding Japan), Latin America, and Rest of World. Annual forecasts are provided for each region for the period of 2000 through 2010. The report profiles 151 companies

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including many key and niche players worldwide such as Archer Daniels Midland Company, Dean Foods Company, White Wave, Eden Foods, Inc., Galaxy Nutritional Foods, Inc., Gardenburger, General Mills, Glenn Foods, Greet Spot (Thailand), Griffith Laboratories (UK), H.J. Heinz Co. Hain Celestial Group, Hartz International (Australia), Hazlewood Grocery (UK), Heartland Fields (USA), Hermans Foods (Australia), High Mark Foods (New Zealand), Imagine Foods, Inc., Kerry Group PLC (Ireland), Kerry Ingredients (Australia), Kikkoman (Japan, Australia, USA, Singapore), Kimlan Foods Co. (Taiwan), Kuhne Nederland BV (Netherlands), SoyaWorld, Inc., Turtle Island Foods, Inc., and Vitasoy USA, Inc.

Price: Electronic or hard copy 3,496 euros. Please note: Reports are sold as single-site single-user licenses. The delivery time for hard copies is between 3-5 business days, as each hard copy is custom printed for the organization ordering it. Electronic versions require 24-48 hours as each copy is customized to the client with digital controls and custom watermarks. Address: San Jose, California. Phone: 408-528-9966.

11173. *SoyaScan Notes.* 2006. Chronology of the Dutch East India Company (VOC), 1602-1799 (Overview). Feb. 6. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Throughout the 16th century (1500s), Portugal became fabulously wealthy from its monopoly of the spice trade in the East Indies. Like many commercial advantages of the time, this was achieved by control of sea routes, especially domination of the route to the East Indies via the Cape of Good Hope (at the southern tip of Africa).

A well-organized Protestant church movement developed in the Netherlands, and the dissatisfaction with Catholic Spain coincided with the Protestant revolt against the Roman Catholic Church.

1566–Anti-Catholic riots spread across the Spanish Netherlands. Philip II of Spain sends his troops whose harsh actions result in open revolt.

1568–The 80-year war of independence by the Dutch against Spain begins (ended 1648).

1579–Signing of the Union / Treaty of Utrecht with Spain marks the foundation of the United Provinces. These are the 7 northern Protestant provinces of Holland, Zeeland, Utrecht, Gelderland, Groningen, Friesland, and Overijssel. The 7 provinces that joined the union would eventually become the Netherlands; the 10 southern Catholic provinces that did not would become Belgium.

1581–The Union of Utrecht (United Provinces) declare independence from Spain.

1596–Dutch merchants begin trading with Jayakarta (today's Jakarta).

1600–The Dutch ship *Liefde* is stranded in Usuki Bay, Japan; the first Dutch contact with Japan.

1600–The Honourable East India Company is established in London, Europe's first such international trading company. The Tokugawa shogunate begins in Japan.

1602 March 20–The Dutch East India Company (*Verenigde Oostindische Compagnie, VOC*–literally "United East Indies Company") is established by Dutch merchants, when the Estates-General of the Netherlands granted it a monopoly to conduct trade, business and colonial activities in Asia. It was the world's first company to issue stocks and the first multinational corporation. The VOC eventually became the world's largest company, in existence for over 200 years. It built over 1,600 ships called East Indiamen.

The VOC consisted of 6 Chambers (*Kamers*) in Amsterdam (with 8 delegates), Middelburg (for Zeeland; 4 delegates), plus Enkhuizen, Delft, Hoorn, and Rotterdam (1 delegate each). Delegates of these chambers convened as the *Heeren XVII* (the Lords Seventeen). Because of its majority 8 delegates, the Amsterdam bloc basically decided policy. The start-up capital was 6.4 million Gulden, raised by the 8 chambers, of which 27% came from Amsterdam. This capital was raised by selling VOC stock to 1,143 subscribers.

1603 Dec. 18–The first VOC fleet of 12 ships sails under the command of Steven vander Hagen.

1605–VOC first lands in Asia. Armed Dutch merchantmen capture the Portuguese fort at Ambon (Amboyna / Amboina, a town and island in the Moluccas, in today's eastern Indonesia) and take control of the island which was the most important of the Moluccas (Spice Islands) at this time. The Portuguese had established a factory here in 1521; it was the source of their clove monopoly. This fort is developed in the VOC's first secure fort. Ambon was the headquarters of the VOC from 1610 to 1619 until the founding of Batavia (now Jakarta) by the Dutch.

1609–VOC factory (comptoir, trading post) established on site of Jacatra / Jakatra (today's Jakarta) by Dutch merchant Jan Pieterszoon Coen. Located at the far western end of the island of Java, it becomes the headquarters of the Dutch East India Company, which gradually extends control over neighboring sultanates and principalities.

1609–First VOC factory (trading post) in Japan established on the island of Hirado (Por. Firando), off Japan's southernmost island of Kyushu (northwest of Nagasaki).

1609–Twelve Years' Truce, signed in Antwerp, calls a halt to hostilities between Spain and the Seventeen Provinces.

1610–Small walled town of Paliacatta (also spelled Paliacatte; today's Pulicat) established on the east coast of southern India. It soon becomes the chief Dutch settlement and headquarters of the VOC factories on the Coromandel Coast. At its center is Fort Geldria, with its permanent garrison of Dutch soldiers, its cannon and armory to protect the various Company trading posts along the Coromandel Coast.

1612–Fort established on Ceylon (today's Sri Lanka).

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1613–As early as this year, VOC leaders recognize the importance of direct trade with China. However attempts to establish a settlement on the Chinese coast in the early 1600s are not successful.

1615–Powerful Dutch merchant Isaac Le Maire tries to break the VOC monopoly on trade routes to the Indies by sailing westward through dangerous and uncharted waters around Cape Horn, the southernmost tip of South America and into the Pacific Ocean, avoiding the VOC-controlled Straits of Magellan. The ship arrived in Jakarta in Oct. 1616, to the amazement of Governor-General Jan Coen.

1616–Danish East India Company founded.

1619–The Dutch attack and destroy Jayakarta (Jakarta, Jacatra). East of the ruins they build a new coastal town, which Coen names Batavia (essentially he renamed Jayakarta). Batavia becomes the headquarters of the VOC and of Dutch colonial power in Asia for almost 350 years.

1621–Banda Islands (in today's south central Moluccas, Indonesia) conquered by the VOC, which establishes its monopoly over nutmeg and mace there.

1621–Dutch West India Company founded. In 1624 this Dutch West India company establishes a settlement in New Amsterdam (now Manhattan, New York).

1622–VOC attack on the Portuguese in Macao / Macau fails.

1624–Chinese armies drive the VOC from the Pescadores Islands. A fortified settlement on Formosa (Taiwan) becomes VOC's base for trade with China until 1662.

1633–St. Helena island in the South Atlantic Ocean becomes a supply station.

1635–The Portuguese blockade Malacca (until 1640).

1638–Goa (capital of Portuguese India) blockaded by Dutch fleets (until 1644).

1638–Beginning of VOC's conquest of the coast of Ceylon near Kandy.

1639–The Portuguese are expelled from Japan by the shogun.

1641–The Dutch put a blockade on Melaca / Malacca (the city in today's Malaysia that controls the crucial Straits of Malacca) then seize the city from the Portuguese after 6 months. They keep this hold on Melaka for the next 150 years.

1641–The VOC trading post on Hirado (closed in 1640 by the shogun) is moved to the tiny artificial island of Deshima in Nagasaki Bay, where the men are kept as virtual prisoners (with more severe restrictions than before Shimabara Revolt and the seclusion {*sakoku*} of Japan in 1641) and allowed only one trading ship a year. The Dutch are the only Europeans allowed to trade with Japan for the next 200 years–until 1853.

1648–Treaty of Muenster ends the 80-years' war; Spain recognizes the sovereignty of the Dutch Republic, which is now the foremost commercial and maritime power in Europe, and Amsterdam is the financial center of the continent.

1651–Repeat of the war with Portugal in the Indies–in Ceylon and on the Malabar Coast of southwest India.

1652–Jan van Riebeeck establishes a supply station at Table Bay, the first European settlement near the Cape of Good Hope (on the southern tip of today's South Africa). This post later became a full-fledged Dutch colony, the Cape Colony.

1652-54–First English-Dutch sea war.

1658–Dutch replace Portuguese in Sinhalese kingdom (Ceylon) as the occupying power.

1661–Beginning of the definitive campaign (completed in 1663) to drive the Portuguese out of the Malabar Coast and to control their production of pepper.

During the 1600s (17th century), British and Dutch traders became bitter rivals in international commerce.

1662–VOC is driven out of Formosa / Taiwan by Ming Chinese troops under the command of Cheng Ch'eng-Kung, known to Europeans as Koxinga. In 1684 Manchu troops occupy Formosa.

1664–French East India Company founded.

1665-67–Second English-Dutch sea war.

1667–Dutch seize town of Macassar (Ujung Pandung) and develop trade monopoly in Makassar Strait (in today's Indonesia between East Borneo and West Sulawesi).

1667–VOC takes trading post at Achem (Aceh), the native kingdom of Sumatra.

1669–The VOC is now the richest private company the world has ever seen, with over 150 merchant ships, 40 warships, 50,000 employees, a private army of 10,000 soldiers, and a dividend payment of 40%. By now, the company is in almost constant conflict with the English. Moreover, the VOC has now grown to become a state within a state.

1682–Dutch seize Bantam in West Java. VOC outposts were also established in Persia (today's Iran), Bengal (now Bangladesh), Siam (now Thailand), and mainland China (Canton).

Dutch policy encourages monoculture of the fine spices they controlled: Amboyna for cloves, Timor for sandalwood, the Banda Islands for mace and nutmeg, and Ceylon for cinnamon.

During the 17th century, the VOC was the most important European company in the Asia trade, and Amsterdam became Europe's most important market. It took a Dutch ship 3 to 6 months to travel from Holland to Batavia. The trip was risky, in part because of the inherent dangers of bad weather and uncertain navigation, but also because no reliable method of determining longitude was discovered until the 1770s (by John Harrison in England) and measures to prevent scurvy (carrying fresh fruit, vegetables, and sauerkraut) were not put in place until the period 1772-1795.

The 17th century has been called the Dutch Golden Age,

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in which Dutch trade, science, and art were among the most acclaimed in the world. This Golden Age was caused by wealth, tolerance, and a new national consciousness.

1731–The Swedish East India Company founded.

1780-1784–Fourth war between the United Provinces and England; England wins, capturing many VOC ships and imposing peace terms that enabled it to trade without hindrance from the VOC and to take over key VOC settlements in Asia. After this war, the VOC is in deep financial trouble.

1795 Jan 19–The seven provinces which have comprised the Republic of the Seven United Netherlands proclaim the *Bataafse Republiek* (Batavian Republic), rendering the Netherlands a unitary state–one country. From 1795 to 1806, the Batavian Republic designated the Netherlands as a republic modelled after the French Republic.

1799 Dec. 31–The bankrupt Dutch East India Company is nationalized, dissolved and liquidated; its huge debt of 219 million Dutch guilders and all of its property are taken over by the Dutch government.

From 1806 to 1810, the *Koninkrijk Holland* (Kingdom of Holland) is set up by Napoleon Bonaparte as a puppet kingdom governed by his brother Louis Bonaparte in order to control the Netherlands more effectively. The name of the leading province, Holland, was used for the whole country. French domination lasted until 1815 when the "United Kingdom of the Netherlands" was formed by the Congress of Vienna at the end of the Napoleonic Wars.

11174. Nihon Keizai Shinbun. 2006. Honda Trading to launch diet supplement business on natto-based product (News release). Japan. 1 p. March 1.
• ***Summary:*** Honda Trading Corp. "said Tuesday it was launching a dietary supplement business based on nattokinase, an enzyme synthesized by the bacteria used to make natto, a fermented soybean food.

"Studies have shown that nattokinase has the effect of dissolving blood clots that might otherwise lead to heart attack or stroke.

"Honda Trading has been working with the discoverer of nattokinase, Hiroyuki Sumi, a professor at the Kurashiki University of Science and the Arts, to develop a way to refine nattokinase" so that it has high purity.

The company plans to sell the refined nattokinase in powdered form as a supplement to makers of food and medicine starting this spring.

Two pills a day would provide the same amount of nattokinase as eating a typical 50-gram package of natto. Address: Japan.

11175. Manley, Charles H. 2006. History of hydrolyzed vegetable proteins (HVP) (Interview). *SoyaScan Notes.* March 7. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Discusses: Justus Liebig (developed basic chemistry), Julius Maggi (commercialized the product in Switzerland with many products), Nestle (acquired Maggi in the 1930s), Unilever, World War II (Maggi built HVP plant at New Milford, Connecticut in USA), wheat, corn and soybeans, Aji-no-moto and Suzuki, monosodium glutamate, Japanese fermentation process, Huron, process flavors (started in late 1960s with Dr. May, a Brit who worked for Unilever). Address: PhD, Vice President, Science and Technology, Takasago International Corp. (USA), 4 Volvo Dr., Rockleigh, New Jersey 07647. Phone: 201-784-7305.

11176. Shurtleff, William; Aoyagi, Akiko. comps. 2006. History of Erewhon–Natural foods pioneer in the United States: Extensively annotated bibliography and sourcebook. Lafayette, California: Soyfoods Center. 220 p. Subject/geographical index. Author/company index. Printed April 18. 28 cm. [306 ref]
• ***Summary:*** A comprehensive history of Erewhon, with a Preface by James Silver. Includes 100 original interviews with Erewhon's founders, early directors, and others close to the company. Also includes 19 copies of key Erewhon documents from Feb. 1967 to May 1981, including all of one early Erewhon catalog. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

11177. McNatt, Linda. 2006. These soybeans smell rotten, taste cheesy and sell like crazy. *Virginian Pilot* (*Norfolk, Virginia*). May 18.
• ***Summary:*** "Isle of Wight County–If Americans ever develop a hankering for specialty soybeans that smell slightly rotten and taste like strong cheese, Bill Taliaferro and his brothers at Montague Farms Inc. will be overwhelmed.

"As it is, the family farm operation in Essex County on the Middle Peninsula [of Virginia], has more than it can handle supplying the Japanese market with the specialty bean called natto. The Japanese eat them for breakfast, in a sandwich spread and in soups.

"The company shipped more than 10,000 tons of the beans last year, so Montague Farms is expanding its operation into Isle of Wight County."

"Researchers at Virginia Tech have developed a new variety of the natto bean that grows particularly well in the mid-Atlantic region, from Maryland to North Carolina. They call it the vanatto." "On the existing market, farmers get $2.25 a bushel more for the food-grade soybeans than regular soybeans, used for oil and animal food, said Rachel Morris, rural economic development manager in Isle of Wight."

11178. Aihara, Cornellia. 2006. The secret of cooking, from *The Do of Cooking. Macrobiotics Today* (*Oroville, California*) 46(3):22-27. May/June.
• ***Summary:*** Contents: Eat locally grown foods in season. Do not waste. The yin yang game / principle in selection

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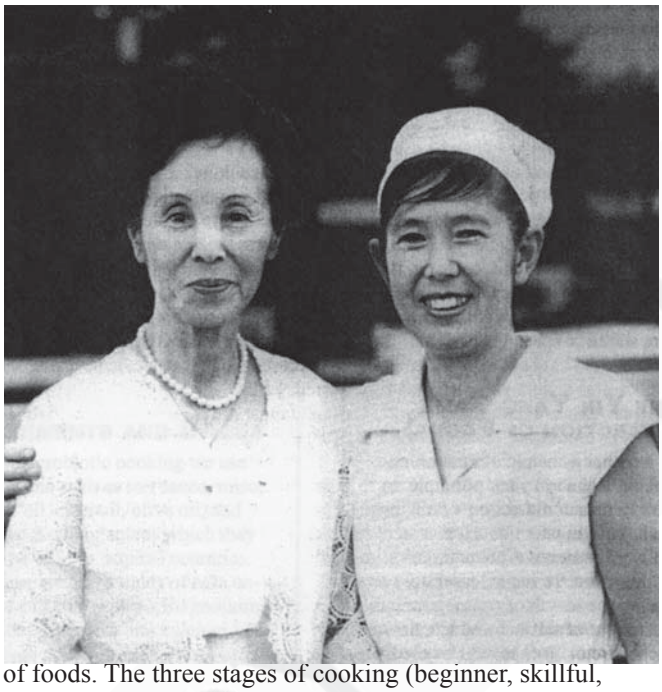

of foods. The three stages of cooking (beginner, skillful, master). Don't hurry. Basic suggestions (Main foods should be whole grains. For seasonings use traditional, naturally fermented miso and soy sauce. Tekka, gomashio, hiziki [hijiki], shio kombu). Condiments and spices (incl. soy sauce and miso). Food combination (based on yin and yang). Lunchbox and other tips. Kitchen hints.

Photos show: (1) Portrait of Cornellia. (2) Lima Ohsawa and Cornellia standing together. (3) Cornellia teaching foot massage to David Hammon.

11179. Ikeda, Yukihiro; Iki, M.; Morita, A.; Kajita, E.; Kagamimori, S.; Kagawa, Y.; Yoneshima, H. 2006. Intake of fermented soybeans, natto, is associated with reduced bone loss in postmenopausal women: Japanese Population-Based Osteoporosis (JPOS) Study. *J. of Nutrition* 136(5):1323-28. [35 ref]

• ***Summary:*** Japanese fermented soybeans (natto), which contain a large amount of menaquinone-7, may help prevent the development of postmenopausal osteoporosis. Bioavailable isoflavones may also contribute to the effect. "The incidence of hip fracture in Japan is lower than in European countries and the United States. The reasons for this difference are unknown," but they are thought to be due to differences in dietary and lifestyle factors. Address: JPOS Study Group, Dep. of Public Health, Kinki Univ. School of Medicine, 377-2 Oono-Higashi, Osaka-Sayama, Osaka, Japan.

11180. Masuyama, Mike K. 2006. Re: Shiro (white) soy sauce. Letter (e-mail) to William Shurtleff at Soyfoods Center, July 3–in reply to inquiry. 1 p.

• ***Summary:*** Hello Bill: I would like to share the info that Mr. Ninagawa has sent me. 1. Ninagawa does not know the exact first name of Mr. Endo, guessing probably "Yoshinao".

2. There is an association of white soy sauce manufacturers, Tokai Shiro Shoyu Association" (1-16-7 Sakae, Naka-ku, Nagoya, 400-0008, Japan, Phone 011-81-52-221-9501, No e-mail address listed). This organization is not a trade organization but one with volunteer memberships. It holds 2-3 friendly meetings a year for traditional greeting or some news exchanges. It does not represent the whole white soy sauce industry and does not do any publication of statistics or government-public relation activities.

3. According to Ninagawa, there are 9 manufacturers of white soy sauce in Aichi-Mie prefecture area: Yamashin, Nitto Jyozo, Ohtaya (under the brand name of Morita), Shichifuku, Hatoya, Sato, Yamadai, Nakari, Isekura.

There are four manufacturers outside Aichi-Mie prefecture area. Kinoene (under Kikkoman, Chiba), Shoda (Gunma), Chiba (Chiba), Honmurasaki (Hiroshima).

4. The Shoyu Information Center www.soysauce.or.jp is the only one organization to provide info to public. According to Ninagawa, there are no statistics on white soy sauce there.

I pay respect to your comment on our business. I will answer you technical questions as follows:

1. Since white soy sauce darkens through photo-chemical reaction, we use amber or green bottles to minimize darkening. Yamashin appears not to be concerned with the natural reaction in clear bottles. There is no safety issue there but appearance and taste concerns.

2. A very small amount of alcohol may be produced in white soy sauce fermentation process. The alcohol listed as an ingredient is alcohol originating from another fermentation that is added for preservation and flavor stabilization.

"I hope you will make contacts with the Tokai Shiro Shoyu Association or Shoyu Information Center for further

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inquiries. Happy 4th of July. Mike Masuyama." Address: Visalia, California.

11181. Gilbert, Marc Jason. 2006. Paper trails–Deshima Island: A stepping stone between civilizations. *World History Connected* 3(3):1-27. July. Retrieved 10 Nov. 2008. <http://www.historycooperative.org/journals/whc/3.3/gilbert.html>.
• ***Summary:*** "Deshima, known as Dejima in Japanese, was a small artificial island in Nagasaki Bay (approximately 150 feet by 500 feet)... From 1641 to 1845, Deshima served as the sole conduit of trade between Europe and Japan..." (p. 1).

Will Adams, pilot of the *Liefde* was the first European to win the confidence of Tokugawa Ieyasu. "Adams relations with the Tokugawa were immortalized, if also highly fictionalized, by the late James Cavell in his popular novel, *Shogun* (1975).

One of the best contemporary accounts of the Dutch factory and of Japan was by Isaac Titsing [Titsingh] (1740?-1812) who went to Japan as the Durch Envoy in 1778 and served as director of the factory at Deshima for three periods between 1779 and 1784. Recently his correspondence has been published in English in two volumes. His work also provides insight into the Chinese factory at Deshima.

Illustrations show: (1) The Dutch factory on the Island of Deshima (overhead view). (2) Will Adams. (3-4) Will Adams' memorials at Hirado, Japan, and Gillingham, England (his birthplace). (5) Two views of the bay of Nagasaki and the island of Deshima in 1832 (top) and 1850 (bottom). Aerial view of the procession of the Dutch factors from Deshima to the Tokugawa court in Edo. (6) The Chinese factory on an island near Deshima. Address: North Georgia College and State Univ.

11182. Patterson, Daniel. 2006. The way we eat: I can't believe its tofu. *New York Times Magazine.* Aug. 6. Sunday.
• ***Summary:*** The writer never thought he could love a soy product. He could probably muster admiration, certainly respect, but never infatuation. So he was quite surprised when dining at Kappo Sakamoto in Kyoto, Japan, that he swooned over a dish of yuba. It was served in a handmade box, simmering in water over a piece of glowing charcoal. He lifted the opaque sheets from the bubbling water, dipped them into a sauce (made from soy sauce, dashi, mirin, and fresh wasabi) and wow! A mildly sweet flavor and tender texture he had never experienced before. Here was tofu's "sexy and elegant cousin." He returned to the USA in search of yuba.

By good fortune, Ryuta Sakamoto, the son of Kappo Sakamoto's chef, was a partner in a San Francisco restaurant name "Medicine," that served (among other things) yuba! He explained that "yuba is one of the purest expressions of Kyoto cuisine. It is exquisitely simple, so its magic lies in the quality of the ingredients and the skill with which they are handled." Just as a film forms atop milk when it is heated, so yuba forms atop soymilk. Each batch of soymilk will yield about 7-8 layers of yuba. The first 4-5 are the best quality; the last 2-3 sheets are generally dried. "Yuba is best just after it is made" and will keep for only about 5 days.

Can you make yuba at home? Yes, but not with commercial soymilk. The protein content is too low.

Then Sakamoto directed the writer to Minh Tsai, the owner of Hodo Soy Beanery, a Bay Area company that makes soyfoods using only organic ingredients that are not genetically engineered. Tsai sells his yuba and other soy products at farmer's markets around the Bay Area and will also ship yuba in the U.S. The writer bought some and rushed back to his restaurant to try it. Modest success. But when he deep fried the yuba it was pure bliss.

11183. Kendall, Charles. 2006. Making natto in America (Interview). *SoyaScan Notes.* Aug. 7. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Charles first made and sold natto in the fall of 1978. He didn't make that much in the early years. He no longer has the original labels but he thinks they were rectangular. The next label was circular.

His main business now is making and selling natto–mostly via UPS. Most of his customers are Japanese-Americans, who love his natto and are very loyal. He just stopped making amazake (he almost never drank it himself) and is selling his last cases–largely because he has so much demand for natto. Also amazake and its bottles take a lot of room and a lot of equipment.

Discusses how to make the best quality natto. He has always tried to make the best quality of each food. Of course he starts with organically grown ingredients–soybeans in the case of natto. He does not use any variety of "small seeded soybeans," but rather uses the cut of small soybeans that result from screening. His natto soybeans are 5.5 to 6.0 mm in size. Some soybean varieties have average seed weights that are smaller than others, yet they still produce many individual soybeans that are too large for natto and must be screened out and used for other purposes. As soon as his natto has finished its basic fermentation, he refrigerates it to 35ºF and ships it out. Natto is best 3-4 days after the end of its incubation, when it should be refrigerated. It gets stickier and better. It should never be eaten right away, but it will keep refrigerated for 20-30 days.

He and his wife Yoko (Aveline Kushi's sister) live in eastern Massachusetts, out in the country. His business is very small; he has the capacity to make 650 containers of natto/day, each weighing 5 ounces. People in the New England area eat much more soybeans during the winter than during the summer–when it is hot, humid, and muggy. He makes natto and mochi, mostly during the cold half of the year, which is when the demand is greatest. He plans to take about 1½ months in the summer to do other things–and to not make foods then. He enjoys making foods, but not all the

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time. He and his wife are nearing retirement; she is near 70. His two main hobbies are playing golf and gardening.

He and his wife traveled to Mito, Japan, last year and visited a natto maker who still wraps and ferments his natto in straw. He has a machine that does the wrapping and binding. They have to steam the straw first to kill all the undesirable bacteria; the natto bacteria survive the steaming. Humidification is also important. They learned the history of natto there, but nothing new about making natto. Address: Owner, Kendall Food Co., 448 Huntington Rd., Worthington, Massachusetts 01098-9550. Phone: 413-238-5928.

11184. Kunishi, Alvin. 2006. Early history of Sacramento Tofu Co. (Interview). *SoyaScan Notes.* Aug. 10. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Alvin's mother, Michiko Kunishi, who is still alive and whose husband (Hiroshi "Tom" Kunishi) founded the Sacramento Tofu Co., has always told Alvin that the company was started in 1947 in Sacramento. She helped her husband with the company as much as she was able to while raising a family. Four men founded the company: (1) Hiroshi, Alvin's father. (2) Takeo Hiroshige, a friend of Hiroshi's who is still alive. (3) George Shimada, Alvin's uncle (his mother's brother), and (4) Mr. Tsumura, who taught Hiroshi Kunishi how to make tofu. Alvin thinks that Mr. Tsumura may have owned a tofu company before World War II began. Alvin thinks there were 2-3 tofu manufacturers in Sacramento before the war. All four men worked at the company from day to day for about the first 1-2 years. Takeo Hiroshige told Alvin several times that the company was founded in 1947. Other than this, Alvin has no written or documentary proof of the date the company was founded.

Sacramento State College collects materials on the history of Japanese Americans in Sacramento.

Note: Japanese American Directories show that at least 19 different tofu manufacturers existed in Sacramento from about 1895 to 1941. Address: Owner, Sacramento Tofu Mfg. Co., 8300 Belvedere Ave., Sacramento, California 95826.

11185. Kamimura, Yasuko. 2006. Nattô no reshipi 93: nebaneba pawaa de karada bijin [Ninety-three natto recipes: The sticky power way to a beautiful body]. Tokyo: Nitto Shoin Honsha. 127 p. Illust. (color). 21 cm. [Jap]*

11186. Kikkoman Corporation. 2006. Annual report 2006. Year ended March 31, 2006. 250 Noda, Noda-shi, Chiba 278-8601, Japan. 37 p. 28 cm. [Eng]
• ***Summary:*** Consolidated net sales rose 4.4% to $3.076 billion, operating income climbed 4.0% to $158 million, and net income rose 6.7% to $86.5 million. Note: Some dollar values actually fell due to changing foreign exchange rates.

"In terms of capital and business alliances, we are collaborating with Higeta Shoyu Co., Ltd. on jointly purchasing raw ingredients and effectively sharing each other's manufacturing facilities, while fostering closer cooperation in the foodservice- and industrial-use markets... We are also reinforcing our alliance with the Kibun Foods Group." In April 2006 Kikkoman "transferred" [sold?] its *shochu* [a clear alcoholic beverage] business. A nice photo shows Yuzaburo Mogi (Chairman of the Board and CEO) and Takashi Ushiku (President and COO). Address: Noda, Japan.

11187. Lee, Joseph. 2006. The sky burns red. Los Angeles, California: Published by the author. 331 p. www.theskyburnsred.com.
• ***Summary:*** This is a work of fiction. Page 128: "The deal smelled as bad as 'Nattoh,' Japanese fermented soybean paste [sic, fermented soybeans] that his friends had made him eat as a dare. He finally ate it, but had to guzzle two bottles of Asahi Super Dry to clear his mouth of the aftertaste."

Page 330: Japanese words and their translation: "Nattoh: Fermented soy beans."

On the rear cover is a portrait photo of the author and a brief biography.

Note: This is the earliest English-language document seen (Dec. 2011) that uses the word "nattoh" to refer to natto. Address: International business consultant, Los Angeles, California.

11188. McNatt, Linda. 2006. Japanese demand for natto beans gives Virginia farm all the business it can handle. *Non-GMO Report* (*The*) (*Fairfield, Iowa*) 6(8):3-4. Aug.
• ***Summary:*** From the *Virginian-Pilot.* Natto is fermented whole soybeans that "smell slightly rotten and taste like strong cheese." Natto soybeans are grown by Bill Taliafero and his brothers at Montague Farms, Inc. in Essex County, Virginia. The company shipped more than 10,000 tons of the natto beans last year. "Researchers at Virginia Tech have developed a new variety of the natto bean that grows particularly well in the mid-Atlantic region from Maryland to North Carolina. They call it the Vanatto." Natto soybeans are smaller than typical soybeans and are bright golden in color. Farmers get $2.25 a bushel more for the food-grade natto beans than for regular soybeans used for oil and animal feed.

11189. Hymowitz, Ted. 2006. Why did the West (Europe and the Middle East) know so little about China in the 12th and 13th centuries? (Interview). *SoyaScan Notes.* Sept. 1. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Because the Arabs blocked most European travel over the Silk Road / Route from about the 7th century until the 12th or 13th century. The Arab conquest blocked the overland route, in part to control the trade. There were actually two phases in the history of the Silk Road. The first phase ended in about the 6th or 7th century, before the origin of Islam.

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Note: Both of these "Silk Roads" was actually a series of interconnected routes that ran from about Xian (Chang'an) in eastern China, along the northern part of China, branching into today's Central Asia, south of the Caspian Sea, through today's Turkmenistan, Iran (formerly Persia), and Iraq, to Damascus (today's Syria) and Antioch (in today's Turkey). The first famous and documented Chinese traveler, Zhang Qian (W.-G. Chang Ch'ien) led two expeditions to the Western Regions in the 2nd century BC, during the Former / Western Han dynasty.

As early as the 1st century AD, there were already some oceanic routes that were part of the "Silk Road." They hugged the coast from central China, around India, into the Persian Gulf and the Red Sea, then on to Italy!

This Arab blockade was one of the reasons for the search for a water route to China. The blockade began to fail as sea routes were developed. For example, in May 1498, Vasco da Gama was the first European to discover a sea route to India.

Another reason it took so long for information about the soybean to reach Europe from China was that the soybean is unlike rice, wheat, and maize / corn, where the product of the crop is associated very closely with what is growing in the field; everyone knows what rice, wheat and corn look like because they are so widely consumed as food. The main products of the soybean, especially those in commerce (such as soy sauce), bear no resemblance to the seed or plant from which they are made. It took a long time before Europeans realized that soy sauce (for example), which was known in Europe by the late 1600s, was made from the soybean–which did not arrive in Europe until the late 1730s. Even in Asia, the various names of the soybean were very different from the names of its major products. For example in China: Soybean is *dadou* or *huangdou,* soy sauce is *jiangyou,* tofu is *doufu,* and soymilk is *dounai* or *doujiang.* In Japan: Soybean is *daizu,* soy sauce is shoyu, tofu is tofu, soymilk is *tonyu,* miso is miso, natto is natto, and green vegetable soybeans are edamamé. In Indonesia, tempé is tempeh. Even in the Western World today, many of these traditional foods and condiments do not have "soy" as part of their name. Moreover, the foods look totally different from the seed / bean from which they are made.

The first European to understand the connection between the soybean and its products was Engelbert Kaempfer; he made this clear in his book *Amoenitatum exoticarum...* vol. 5. Yet most Westerners did not understand this connection until more than a century later, and quite a few even today don't realize that tofu (for example) is made from soybeans.

Ted is convinced that Marco Polo and the various early Western missionaries who traveled to China probably tasted soyfoods over and over again–but they didn't realize they were made from soybeans. A good example is milk. The early Western travelers in China often mentioned that Chinese drank milk; in some cases they were probably drinking soymilk. Address: Prof. of Plant Genetics (retired), Dep. of Crop Sciences, Univ. of Illinois, Urbana, Illinois.

11190. Inatsu, Y.; Nakamura, N.; Yuriko, Y.; Fushimi, T.; Watanasiritum, L.; Kawamoto, S. 2006. Characterization of *Bacillus subtilis* strains in Thua nao, a traditional fermented soybean food in northern Thailand. *Letters in Applied Microbiology* 43(3):237-42. Sept.

• ***Summary:*** The purpose of this research was to determine the diversity of *Bacillus subtilis* strains in Thua nao that produce high concentrations of products useful in food manufacturing and in health-promoting compounds.

"Production of amylase, protease, subtilisin NAT (nattokinase), and gamma-polyglutamic acid (PGA) by the Bacillus subtilis strains in Thua nao was measured... Molecular diversity of isolated strains was analysed via randomly amplified polymorphic DNA-PCR fingerprinting. The strains were divided into 19 types, including a type with the same pattern as a Japanese natto-producing strain."

Conclusion: Thua nao could be a good source of the desired enzymes. Address: National Food Research Institute, Tsukuba, Japan. inatu@affrc.go.jp.

11191. Fruin, W. Mark. 2006. Thoughts on the early history of soy sauce and kecap / ketjap (Interview). *SoyaScan Notes.* Oct. 6. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Mark knows a woman professor Tashiro in Japan who is doing research on the early history of soy sauce (e-mail shiro@flet.kweio.ac.jp). She and others she knows are interested in the "leaky sieve" theory which basically says "Yes, we had this very controlled system during the Tokugawa / Edo period, but lots of things were going on that were not official–such as exporting outside of Deshima. You could call them pirates or extra-legal exports. Many of these exports went to places like Korea, or the Korean islands between the Korean mainland and Japan, all of which were near Japan. Mark suggests I write her and mention his name.

Remember that there is a difference between Kansai shoyu (lighter in color and saltier, *usukuchi*) and Kanto shoyu (darker in color, *koikuchi*). Whatever they shipped out of Deshima and Nagasaki was more likely to be Kansai shoyu than Kanto shoyu.

Also remember that soy sauce was widely made locally by small makers. One of the bigger castle towns (*jôka-machi;* "castle + under") or commercial towns (*shukuba-machi*) of Kyushu or southern Japan probably provided the early shoyu exported by the Dutch East India Co. (VOC). These were the two types of cities in Tokugawa Japan; there had to be one castle per fiefdom (*han*). Address: Palo Alto, California.

11192. Rowe, Simon. 2006. A heavenly night's rest. *Time* (*Europe and Asia*). Oct. 10 and 16.

• ***Summary:*** Rengejo-in is a beautiful temple located atop Mount Koya, famous among Buddhists in Japan. "... a cable-

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car ascent. The 48-room *shukubo* is famous for its tofu and lavish temple altar." Meditation is offered twice daily.

11193. *SoyaScan Notes.* 2006. Another dimension of the macrobiotic and natural foods movements: Preserving traditional ways of making foods (Overview). Oct. 10. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** George Ohsawa, and the founders of Nippon C.I. and Muso Shokuhin–both Japanese-run companies based in Japan–were the first to seek out these Japanese makers of traditional foods. Soon Mr. Akiyoshi Kazama, founder of Mitoku Trading Co., joined them in the search.

In the mid-1960s, Paul Hawken of Erewhon went to Japan to find and place orders from companies and craftspeople who made foods in the traditional, natural way. Many of these companies were facing financial difficulties as modernization was sweeping Japan, and this new business and new market gave them a new lease on life.

Phase 2 began when companies in the USA and Europe started making Japanese foods (such as miso) and European foods (such as whole wheat bread) in the traditional, natural way.

11194. Hymowitz, Ted. 2006. Re: Note on "India Soy" and "Indian Soy" as early names for soy sauce. Letter (e-mail) to William Shurtleff at Soyfoods Center, Oct. 31. 2 p.
• ***Summary:*** "Looking through gobs of historical documents it is obvious that certain cities in Asia were centers of trade within and between Asian countries and with the west.

"For example, when the Spanish started trade with the Philippines in 1560 they recorded what was brought back to Mexico. I was amazed at the stuff that came from China, Japan, etc.

"I was puzzled by the diversity of items in the Spanish trade. However, when I visited the Pescadores Islands a little snooping about solved my Manila problem. During the day the fishing boats were out fishing. However, at night they were also gone. Aha, the boats were loaded with electronics for trade with Mainland China. The fishing boats would meet with boats from mainland China somewhere mid-point between the Islands and China and exchange goods. Probably exchanges were made by family contacts.

"Manila was a trading city as was Calcutta and places in Indonesia. Thus India soy was the name given to soy that arrived from Calcutta. Obviously it was not made in Calcutta but rather was brought there via local trading ships. Thus soy sauce was shipped to Calcutta and from there transported to England. Now the Dutch had their own contacts in India, Japan and Indonesia. Thus soy sauce reached the Netherlands via the Dutch ships who transported the sauce via the Dutch East India ships. The Dutch were the main importers of ketchup since it was made in the Malaysia Area where they had extensive contacts.

"Was soy sauce made in China? In 1711 Lockyer says so. But I suspect most of the stuff in international trade came from Japan via the Dutch.

"The first English factory in India was in Surat. Could very well be that Surat was or had been the transshipping point of soy sauce to England."

Note: This e-mail was a reply to one that Shurtleff had written Hymowitz the day before:

Not much soy sauce was made in China in the 1600s and 1700s, and several travelers in Asia from that period say that Chinese "soy" was not nearly as good as Japanese soy. The reasons were simple:

(1) The Chinese saw making soy sauce as wasteful; what were they going to do with all that residue, except feed it to pigs. So they spent little effort in trying to improve the process and the product.

(2) Chinese soy sauce, to this day, is usually made with soybeans only, and little or no grain; it is basically the same as Japanese tamari–a product with a tiny niche market in Japan and worldwide. The standard Japanese formula calls for equal parts soybeans and roasted wheat. The wheat is hydrolyzed by the koji enzymes into alcohol and many fragrant and volatile compounds, such as esters, giving Japanese shoyu a real "bouquet."

So I ask again, where do you think the Chinese got the soy sauce that they shipped to India? China? The Dutch East Indies (they had a small base there)? Address: Prof. of Plant Genetics (retired), Dep. of Crop Sciences, Univ. of Illinois, Urbana, Illinois.

11195. Budra, Beth. 2006. Magic miso: A guide to Japanese soybean pastes and how to use them. *San Francisco Chronicle.* Nov. 1. p. F1, F6.
• ***Summary:*** "In my quest to make the most of miso, I turned to Ayaki [sic, Ayako] Iino, who teaches Japanese cooking classes in the East Bay" (www.ayakoiino.com). The title of p. F6 is "Discovering the secrets of miso." Gives the names of some miso varieties and their uses. Contains recipes for: Orange almond miso vinaigrette. Miso-broiled black cod. Sesame-miso dipping sauce (with Japanese sesame paste, tahini, or natural peanut butter, and sweet white miso).

11196. Itoi, Lydia. 2006. A Zen palette. *Time* (*Europe and Asia*). Nov. 20 and 27.
• ***Summary:*** Umu is London's most ambitious kaiseki restaurant. Executive chef Ichiro Kubota goes to great lengths to bring the refined taste of Kyoto to the land of fish and chips. "Dishes like sesame tofu are nods to Kyoto's Buddhist vegetarian cuisine. At the end comes the spiritual heart of the meal: rice, pickles and the best miso soup around."

11197. Endô, Orie. 2006. A cultural history of Japanese women's language. *Michigan Monograph Series in Japanese Studies.* No. 57. vii + 129 p. Nov. See p. 38. [415+* ref]

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• ***Summary:*** In the section titled "Women's language in the Kamakura [1185-1333] and Muromachi [1336-1573] periods" we learn (p. 37) that *mushi* is the women's word (*nyôbô-kotoba*) for miso; it appears in *Senjimono* (The Decoction).

The word "mame no ko" (meaning *kinako* or "roasted soy flour") appears on page 38–in the very interesting context of women's words created during the Edo period. We read: "Some expressions came into use among the men of the samurai class as well, a fact lamented in *Kagomimi* [a book published during the Edo period, 1600-1867]. 'It is unpleasant to hear samurai, tradesmen, and artisans use words that are women's. Examples such as... *okawa* for *kawamesha,* 'glutinous steamed rice for red beans,' *akanomeshi* for *sekihan,* 'festive red rice, *kinako* for *mame no ko,* 'soybean flour,' are all too frequently used.' There are also examples of men using words such as *murasaki, himojii,* and *okabe* in a collection of popular common stories called *Seisuishô* (1623).

Note: This series is published by the Center for Japanese Studies, University of Michigan, Ann Arbor, Michigan. Address: Dep. of Cultural Linguistics, Koshigaya campus, Bunkyô University, Japan.

11198. Lyddon, Chris. 2006. Global grain trade review: IGC [International Grains Council] predicts sharp drawdown in grain stocks, particularly wheat, in 2006-07. *World Grain* 24(11):32-36, 38-39, 42. Nov.

• ***Summary:*** A table titled "Global grain trade activity (in 1,000 tonnes)" gives the following statistics for soybeans: 2005-06 Top exporters: 1. Brazil 26,750. 2. U.S. 25,719. 3. Argentina 7,300. 4. Paraguay 2,600. 5. Canada 1,267. World total 65,195 (unchanged).

Top soybean importers: China 27,700. E.U.-25 14,100. 3. Japan 4,050. 4. Mexico 3,725. 5. Taiwan 2,300.

Also gives the top 5 importers and exporters of soybean meal for 2005-06. Exporters include: 4. India 3,500. 5. Bolivia 870. Total 51,062 (+9%). Address: European editor; chris.lyddon@ntlworld.com.

11199. Mutual Trading Co., Inc. 2006. Kyôdô Bôeki K.K. 80 nenshi: Nihon no aji o sekai no hitobito ni [Mutual Trading Company, Inc.–80 years of age. Taking the flavor of Japan to people around the world]. Los Angeles, California. 56 p. 28 cm. [Eng; Jap]

• ***Summary:*** This excellent history of Mutual Trading Co. (MTC) is divided into two parts, each written in both Japanese and English on facing pages. Part I is the general company history (p. 1-27). Part II is the very interesting "Chronology" (p. 28-56), which starts in 1635 (the year of Japan's self-imposed national isolation and ban on Japanese traveling abroad), contains numerous photos, and gives a chronology of the company in the context of major world events, with an "Economic overview" for each year from 1996 to 2006. On page 56 are two large bar charts related to Mutual Trading Co. Group: (1) Annual sales from 1950 to 2005. (2) No. of employees in 5-year periods from 1950 to 2005. The inside rear cover give the contact information for MTC's 9 offices in the USA (6), Hawaii (1), and Japan (2).

Located in Los Angeles, Mutual was a pioneer in bringing Japanese foods to America. See also the company's 70th anniversary history. Address: 431 Crocker St., Los Angeles, California 90013. Phone: 213-626-9458.

11200. Cwiertka, Katarzyna J. 2006. The soy sauce industry in Korea: Scrutinising the legacy of Japanese colonialism. *Asian Studies Review* 30(4):389-410. Dec. [81 + 27 endnotes. Eng]

• ***Summary:*** Excellent; very original, carefully researched, well documented, and well written! Contents: Introduction. Fermented soyfoods in Korea. The soy sauce industry in Japan. The Japanese soy industry in colonial Korea. The soy sauce industry in South Korea. The hidden legacy of Japanese colonialism. Address: Centre for Japanese and Korean Studies, Leiden Univ., P.O. Box 9515, 2300 RA Leiden, The Netherlands. Phone: +31 71 527 2599.

11201. Cwiertka, Katarzyna Joanna. 2006. Modern Japanese cuisine: Food, power and national identity. London: Reaktion Books. 240 p. Illust. Index. 22 cm. [525* ref. Eng]

• ***Summary:*** The author is a recognized expert on the subject of Japanese cuisine and its modern history. This book is the result of more than a decade of research. Since 1950, the popularity of Japanese food in the West has greatly increased, contributing to the continuing diversification of Western eating patterns. This book examines the origins of Japanese cuisine as we know it today, exploring the transformations and developments food culture in Japan has undergone since the late 19th century. "Among the key factors in the shift in Japanese eating habits were the dietary effects of imperialism, reforms in military catering and home cooking, wartime food management and the rise of urban gastronomy. Japan's patchwork of diverse regional cuisines became homogenized over time and was replaced by a set of foods and practices with which the majority of Japanese today ardently identify. This book demonstrates that Japanese cuisine as it is currently understood and valued, in spite of certain inevitable historical influences, is primarily a modern invention concocted in the midst of the turbulent events of the late 19th and the 20th centuries."

Miso, miso soup, tofu, tofu lees [okara] and "simmered thin-sliced deep-fried tofu" are mentioned on pages 104-05–suggestions for dishes to be served in 1915 and July 1920. Address: Researcher, Centre for Japanese and Korean Studies, Leiden Univ.

11202. **Product Name:** Miso-Cup: Japanese Restaurant Style Natural Instant Soup (Soft-Pack Miso Soup).

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Manufacturer's Name: Edward & Sons Trading Co., Inc. (Importer). Made in Japan.
Manufacturer's Address: P.O. Box 1326, Carpinteria, CA 93014.
Date of Introduction: 2006 December.
Ingredients: Soft-Pack: Organic miso (Organic soybeans, cultured organic rice, sea salt, yeast), water, kombu seaweed extract, salt, shiitake mushroom extract, onion powder, yeast extract, alcohol. Tofu and vegetable packet. Freeze dried tofu (water, soybeans, calcium sulfate, rice starch), wakame seaweed, freeze-dried green onions.
Wt/Vol., Packaging, Price: Three 8-oz. servings.
How Stored: Shelf stable.
New Product–Documentation: Product with Label sent by Joel Dee of Edward and sons. 2006. Dec. 8. Gusseted plastic stand-up pack 6 by 7.75 inches. Green, yellow and white on red and black. A color photo on the front shows a bowl of miso soup. A small illustration to right of bowl shows a Japanese lady serving miso soup. Text on front panel: "Made with organic miso. 3 individual servings. Convenience without compromise. 60 calories per serving. No MSG. Vegan logo. Gluten-free logo. Delicious miso soup–To go. Just add hot water. Back panel text. The story of miso cup. Directions. Source: The Book of Miso by Shurtleff & Aoyagi, Ten Speed Press. Ingredients. Copyright Edward & Sons Trading Co., Inc. a vegetarian company." Nutrition facts. Special offer for Miso-Cup Travel Mug.

11203. Kikkoman Inst. for International Food Culture. 2006. Identifying the true character of Kansai soy sauce: Report on our "Edo Soy Sauce" revival project. *Food Culture* (*Kikkoman Inst. for International Food Culture, Noda, Japan*) No. 11. p. 10-13. http://kiifc.kikkoman.co.jp. [5 ref]
• ***Summary:*** Contents: Kansai soy sauce. Examination of "Edo Soy Sauce" and Kansai Soy Sauce. Contains many color photos.

11204. Tanaka, Norihito; Taylor, Marilyn L.; Claterbos, Joyce A. 2006. Case 17–Kikkoman Corporation in the mid-1990s: Market maturity, diversification, and globalization. In: R. Duane Ireland, Robert E. Hoskisson, and Michael A. Hitt, eds. 2006. Understanding Business Strategy: Concepts and Cases. Mason, Ohio: Thomson Higher Education. 576 p. See p. 171-89. Name index. Company index. Subject index. *
• ***Summary:*** The larger book contains a glossary at the end. Address: 1. Kanagawa Univ., Japan; 2. Univ. of Missouri at Kansas City.; Univ. of Kansas.

11205. Beebe, Lewis; Beebe, John M. 2006. Prisoner of the rising sun: the lost diary of Brig. Gen. Lewis Beebe (Internet resource). College Station, Texas: Texas A&M University Press. xii + 253 p. Introduction by Stanley Falk. Series: Texas A&M Military History No. 103. *
• ***Summary:*** This book shows the treatment accorded officers and shows how the prisoners in Corregidor (Philippines) fared as World War II progressed.

Page 162: "Incidentally, this Japanese canned meat ration is something new to me and very good. It appeared to be beef, cut in small slices, and cooked in a gravy made of soya sauce, sugar, and salt added to the natural meat juice."

Page 184: "The issue of rice is holding up very well and most of us are getting about all the rice we can eat. We have miso in the soup almost every morning and that is a help. I may be putting on a little weight..."

Page 185: "The regular issue of rice dropped to the point where we barely averaged a teacup level full for each meal, and on several occasions there was less than a cupful. The soup also fell off in quality, as we are not receiving as much miso, cooking oil, etc. There was no meat in the soup today (Sunday) as there usually is."

Page 215: "There is frequently nothing in the morning soup except miso–no vegetables."

Note: The diary was written by Lewis Beebe (1891-1951). This book was edited by John M. Beebe.

11206. Fujita, Yoshiaki; Araki, Yuko. 2006. Longevity and age-related disease. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 139-153. [51 ref]
• ***Summary:*** Contents: Introduction. Longevity: Changes in dietary habits and disease structure, prolonged life expectancy, food preferences in the elderly, activities of daily living in the elderly. Exercise: Benefits of light exercise, interaction of nutrition and exercise. Age-related diseases in humans: osteoporosis, cardiovascular disease, diabetes mellitus, interaction of nutrition and drugs. Animal studies: Dietary restriction and longevity, kidney function and dietary protein, dietary restriction and proteinuria, protein sources and proteinuria, amino acids and proteinuria.

Tables: (1) Food preferences of elderly Japanese.

Figures: (1) Bar chart of effects of long-term, light exercise under restricted feeding on body compositions at 900 d of age in male Wistar rats. (2) Graphs of differences in the age of appearance and severity of proteinuria in male Wistar rats fed on different commercial stock diets. (3) Bar chart of effects of dietary protein levels and sources on urinary protein excretion in adult rats. Address: Dep. of Clinical Nutrition, Kawasaki Univ. of Medical Welfare, Kurashiki, Japan.

11207. Funahashi, Tohru; Matsuzawa, Yuji. 2006. Adipocytokines. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 73-85. [38 ref]
• ***Summary:*** Contents: Introduction. Visceral obesity and metabolic syndrome. Molecular aspects of adipose tissue and adipocytokines. Discovery of adiponectin. Effects of adiponectin on atherosclerosis and diabetes. Genetic

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hypoadiponectinemia. Soy protein and adipocytokines.

Figures: (1) Bar chart of high frequency of genes for secretory proteins in adipose tissue. (2) Structure and adipose tissue-specific expression of adiponectin gene. (3) Diagram of molecular mechanism of antiatherogenic functions of adiponectin. (4) Diagram of concept of metabolic syndrome. Importance of visceral fat accumulation and hypoadiponectinemia. (5) Bar chart of effect of soy protein diet on the expression and plasma concentration of adiponectin. Address: 1. Dep. of Internal Medicine and Molecular Science, Osaka Univ., Suita, Japan.

11208. Golbitz, Peter; Jordan, Joe. 2006. Soyfoods: Market and products. In: Mian A. Riaz, ed. 2006. Soy Applications in Food. Boca Raton, Florida, London, New York: CRC Press (Taylor & Francis Group). [x] + 288 p. See p. 1-21.
• ***Summary:*** Contents: History of soyfoods: Growth and development in the Western world, soybean industry blossoms in the United States, soybeans grow around the world. Soybean production and utilization for food: Soyfoods in Asia, soyfoods in Europe, soyfoods in Africa, soyfoods in the United States: Development of the U.S. soyfoods industry, Americanization of soyfoods. Soybean nutritional components: Soy protein, soy oil, carbohydrates and fiber, vitamins and minerals, isoflavones. Soyfoods and protein ingredients: Whole dry soybeans, tofu, soymilk, tempeh, soymilk yogurt, miso, soy sauce, okara, natto, soynuts, meat alternatives, cheese alternatives, nondairy frozen desserts, green vegetable soybeans (edamame), soy sprouts, full-fat soy flour, defatted soy flour, textured soy flour, soy protein concentrate, soy protein isolate. Conclusions.

Tables: (1) World soybean production by major producers. (2) Annual per capita consumption (2001) of soybeans for direct food. (3) U.S. soyfoods market (1996 to 2005).

This chapter suffers from a lack of references, and contains several basic errors concerning the early history of the soybean. Contrary to what Mr. Golbitz says: (1) The Chinese have not considered the soybean a basic source of nutrition for almost 5000 years (see Hymowitz 1970, "On the domestication of the soybean"). For "a little more than 3000 years" would be much more accurate. (2) The first reference to soybeans in Chinese literature does not date back to 2853 B.C. (see Hymowitz 1970, and Hymowitz and Shurtleff 2005, "Debunking soybean myths and legends in the historical and popular literature"). It dates back to about 1100 B.C. (3) Natto was not developed at least 3000 years ago in Japan (the earliest known document that mentions natto dates from 1450 CE–or about 560 years ago). Address: Soyatech, Inc., Bar Harbor, Maine.

11209. Ikeda, Ikuo. 2006. Soy sterols. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 199-205. [9 ref]
• ***Summary:*** Contents: Introduction. Physiological functions of soy sterols. Mechanisms of the cholesterol-lowering activity of plant sterols. Mechanisms of inhibition of cholesterol absorption by plant sterols. Hypocholesterolemic effect of soybean-germ oil. Conclusions.

Tables: (1) Examples of composition of plant sterols in soybeans and soybean-germ oils.

Figures: (1) Chemical structures of major plant sterols in soybean oil and soybean-germ oil. (2) Bar chart of effect of dietary sitosterol and cholesterol on the micellar solubility of sterols in rats. (3) Bar chart of effect of sitosterol on incorporation of ^{14}C-cholesterol into rat intestinal mucosa. (4) Graph of effect of sitosterol on lymphatic recovery of ^{14}C-cholesterol in rats cannulated in the thoracic duct. Address: Graduate School of Agriculture, Tohoku Univ., Sendai, Japan.

11210. Imaizumi, Katsumi. 2006. Role of soy lecithin in lipid metabolism. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 173-198. [90 ref]
• ***Summary:*** Contents: Introduction. Hypocholesterolemic action of soy lecithin: Chemical composition of soy lecithin, chemical composition of mesenteric lymph lipoproteins, chemical composition of bile and fecal lipids, serum lipids and lipoprotein profiles, hepatic secretion of lipids and lipoproteins, catabolism of serum lipoproteins (catabolism of CM, catabolism of VLDL, catabolism of HDL). An active component of soy lecithin that lowers serum cholesterol concentrations: Effect of dietary phospholipids and their constituent bases on serum lipids and apolipoproteins, contrasting effect of dietary PE and PC on serum and liver lipids. Absorption and transport of PE and PC: Intestinal absorption of phospholipid bases, transport of PE and PE in blood serum and thoracic duct lymph, effect of dietary PE on tissue ethanolamine and phosphoethanolamine concentrations. Hypocholesterolemic action of ethanolamine-containing phospholipids: Hypocholesterolemic action in diet-induced hypercholesterolemia, hypocholesterolemic action in exogenously hypercholesterolemic rats. Role of ethanolamine-containing phospholipids on fatty acid metabolism: *In vivo* experiment, metabolism of linoleic acid in cultured hepatocytes, metabolism of glycerol by cultured hepatocytes. Consumption of phospholipids. Applications.

Tables: (1) Fatty acid composition of phospholipids in lymph CM in rats fed soy lecithin and soy oil. (2) Concentration of serum lipids and apolipoproteins in rats fed soy lecithin and soy oil. (3) Concentration of lipids and apo B in serum $d < 1.063$ g/ml lipoproteins at 20 h after Triton injection in rats fed soy lecithin and soy oil. (4) Chemical composition of lymph CM in rats fed soy lecithin and soy oil. (5) Metabolic parameters of [^{125}I] HDL in serum from rats fed soy lecithin and soy oil. (6) Excretion of sterols into

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feces in rats fed different types of purified phospholipids. (7) Fatty acid composition of PC in serum HDL and liver in rats fed PC- or PE-containing diets. (8) Distribution of ethanolamine-labeled PE and choline-labeled PC in the lipids and water soluble fractions of jejunal mucosa and jejunal contents. (9) Distribution of ethanolamine-labeled PE and choline-labeled PC in the lipids and water-soluble fractions of liver. (10) Desaturation, esterification, and oxidation of [^{14}C] linoleic acid by cultured rat hepatocytes in medium containing ethanolamine. Address: Graduate School of Agriculture, Kyushu Univ., Fukuoka, Japan.

11211. Kennedy, Ann R. 2006. The status of human trials utilizing Bowman-Birk inhibitor concentrate from soybeans. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 207-223. [47 ref]
• ***Summary:*** Contents: Introduction. Details of the four completed human BBIC trials: Oral leukoplakia, benign prostatic hyperplasia, ulcerative colitis, prostate cancer, summary of human BBIC trials performed to date. Acknowledgments.

Tables: (1) Known biological effects of BBI. (2) History of BBI and BBIC from the bench to the clinic. (3) BBIC clinical trials. (4) Status of BBI and BBIC for use as human drug product. (5) BBI and BBIC dosing information. (6) BBI pharmacokinetic studies.

Figures: (1) Photo of example of the response of a patient with oral leukoplakia to BBIC treatment. (2) Graph of clinical response of oral leukoplakia in relation to the dose of BBIC administered. (3) Graphs of effects of BBIC (400 C.I. units per day) and placebo medication on the serum PSA concentration in patients with BPH. (4) Graphs of effects of 100 C.I. units of BBIC per day in a patient with BPH. (5) Bar chart and graphs of effects of 6 months of BBIC (800 C.I. units per day) treatment on serum PSA levels in a patient with metastatic prostate cancer. Address: Div. of Oncological Research, Univ. of Pennsylvania School of Medicine, Philadelphia, Pennsylvania.

11212. Kritchevksy, David. 2006. Soy in health and disease: Perspectives. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 289-297. [40 ref]
• ***Summary:*** Contents: Background. Present status. Future studies.

Tables: (1) Influence of fish protein, casein, or whole milk protein on atherosclerosis in rabbits (effect of lysine to arginine ratio). (2) Influence of addition of a single amino acid on experimental atherosclerosis in rabbits (average of three experiments). (3) Fecal steroid excretion in rabbits fed casein, soy, casein + arginine, or soy + lysine (1 week collection). (4) Interaction of protein and fiber in rabbits fed semipurified diets. Address: Wistar Institute, Philadelphia, Pennsylvania.

11213. Kumoda, Yasuo. 2006. Tôfu baka sekai ni idomu [They call me "Mr. Tofu"]. Tokyo: Kôbunsha. 285 p. Illust. 19 cm. [Jap]*
• ***Summary:*** Yasuo Kumoda, born in 1941, was the head of Morinaga Nutritional Foods in the USA.

11214. Ministry of Agriculture, Forestry and Fisheries [MAFF], Japan. 2006. Tofu, nattô no genjô [The present status of tofu and natto in Japan]. Tokyo: MAFF, Government of Japan [Jap]*
• ***Summary:*** Natto: In 2004 in Japan, total production of natto was about 250,000 metric tons (tonnes), requiring the use of 139,000 tonnes of soybeans. The retail value of this natto was 111.4 billion yen. Address: Japan.

11215. Murakami, Sachiko. 2006. Murakami Sachiko-ryû nebatoru kenkô reshipi [Sachiko Murakami-style sticky-gooey healthy recipes]. Tokyo: Ienohikari Kyokai. 95 p. 21 cm. [Jap]*

11216. Ogawa, Tadashi. 2006. Soy allergy. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 123-137. [56 ref]
• ***Summary:*** Contents: Introduction. Soybean allergy: Prevalence, symptoms, and threshold of soybean allergy, soybean allergens (Gly m Bd 30K, Gly m Bd 28K, Gly m Bd 60K (α subunit of Beta-conglycinin), other allergenic proteins, carbohydrate determinants as a common cross-reactive antigenic site). Development of hypoallergenic soybean and soybean products: Determination of allergenicity, molecular breeding, reduction of Gly m Bd 30K by genetic modification, physiochemical reduction of Gly m Bd 30K, enzymatic digestion of allergens, chemical modification of allergens, extrusion cooking, evaluation of hypoallergenicity.

Figures: (1) Amino acid sequence alignment between Gly m Bd 30K and Der p 1 and their IgE epitopes. (2) Amino acid sequence alignment between Gly m 4 and Bet v 1. (3) Structure of asparagine-N-linked glycan moiety of Gly m Bd 28K and 30K. Address: Faculty of Health Science for Welfare, Kansai Univ. of Welfare Science, Kashihara, Japan.

11217. Oishiku tabete kirei ni naru reshipi: daizu no chikara o shinjinasai. Nattô, tenpe, chongutchan [Delicious recipes that make you beautiful: Believe in the power of soybeans: Natto, tempeh, Korean-style natto]. 2006. Tokyo: Gakushû Kenkyûsha. 81 p. Illust. (Color). 26 cm. Series: Gakken mook. [Jap]*
Address: Japan.

11218. Orcutt, M.W.; McMindes, M.K.; Chu, H.; Mueller,

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I.N.; Bater, B.; Orcutt, A.L. 2006. Textured soy protein utilization in meat and meat analog products. In: Mian A. Riaz, ed. 2006. Soy Applications in Food. Boca Raton, Florida, London, New York: CRC Press (Taylor & Francis Group). [x] + 288 p. See p. 155-84. [11 ref]

• ***Summary:*** Contents: Introduction. Textured soy protein products. Soy grits. Textured soy flour. Textured soy protein concentrates. Textured isolated protein products. Textured vegetable protein blends. Meat coatings. Regulations governing the use and labeling of products containing textured vegetable protein products: United States, People's Republic of China, Canada, Japan, European Union. Meat product formulations containing textured soy protein ingredients: Preparation procedure for raw frozen beef patties, preparation procedure for precooked beef patties, preparation procedure for chicken patties, preparation procedure for beef meat loaf, preparation procedure for beef chili, preparation procedure for reduced-fat pepperoni. Meat analog food products: Meat analog product formulations (preparation procedure for vegetarian patty nugget, preparation procedure for vegetarian chili). Summary.

Tables: (1) Water-holding capacities and cooked texture of textured soy protein concentrate flake, crumble, and granule particles. (2) Texture comparison of different treatments. (3) Characteristics of textured soy protein products. (4) Characteristics of beef patty formulated to contain various levels of hydrated textured soy protein concentrate. (5) Minimum meat content requirements for selected meat and poultry products produced and sold in the United States. (6) Summary of use of textured vegetable protein meat products having a standard of identity. (7) Minimum meat requirements for selected Canadian standardized meat products. (8) Minimum meat requirements for Japanese agricultural standards. (9) Contents of raw frozen beef patties (U.S. formulation). (10) Contents of precooked beef patties (U.S. formulation). (11) Contents of chicken patties (U.S. premium formulation). (12) Contents of U.S. beef meat loaf. (13) Contents of beef chili. (14) Contents of reduced-fat pepperoni. (15) Contents of chicken-flavored vegetarian patty nugget. (16) Contents of vegetarian chili. Address: All: The Solae Company LLC, St. Louis, Missouri.

11219. Planck, Nina. 2006. Real food: What to eat and why. New York and London: Bloomsbury Publishing. [viii] + 343 p. Index. 22 cm. [30+ ref]

• ***Summary:*** This book is carefully researched and very well, thoughtfully and fairly written; the author has written for *Time* magazine and comes with very good credentials for this book. Born in 1971 in Buffalo, New York. "She was a speechwriter to the U.S. ambassador to Britain when she opened the first farmers' market in London on June 6, 1999. Six months later she quit her job to open ten more markets, write *The Farmers' Market Cookbook,* and host a British television series on local food. In 2003 Nina created the Mount Pleasant Local Food Market in Washington, D.C. In New York City she ran Greenmarket, the largest network of farmers' markets in the United States. Nina's new company, Real Food, runs markets for farmers and purveyors of regional and traditional foods" ("About the author," p. 344).

The author advocates the following: (1) Eat real, traditional foods rather than more modern "industrial foods." These real foods include plenty of meat, fish, poultry, eggs, and dairy products made from whole raw (unpasteurized) milk from cows grazed outdoors on grass (rather than corn and soybeans, which cows were not designed to eat by nature) without synthetic hormones–plus real, organically grown fruits, vegetables, whole grains and legumes (including traditional soy foods), real salt, and dark chocolate.

(2) Eat real fats–including butter, beef fat, coconut oil, lard, and extra-virgin olive oil, including saturated fats and cholesterol. Avoid industrial fats–such as margarine, polyunsaturated vegetable oils (including soybean, corn, and sunflower oil), and shortening. (3) Go beyond and disregard the cholesterol myth; the evidence supporting it is weak. (4) Stop eating a vegetarian diet, and especially a vegan diet (which no traditional society has ever practiced).

To start with the section on soy foods: In the Chapter 8, titled "Other real foods," the section on soy foods is titled "Traditional and industrial soy are different" (p. 225-34). Traditional soy foods are those that have a long history in the diet, and are still made in pretty much the way they used to be. Her information on the early history of the soybean and soy foods (p. 225-26) contains many errors, as well as some interesting observations. Some of the earliest soyfoods were fermented (starting with fermented black soybeans and jiang in China). She lists five health benefits of fermentation. Fermentation (along with cooking) helps to reduce the phytic acid in soybeans. Soy foods do not contain reliable vitamin B-12. The author states several times that soy protein is not complete protein. Most nutritionists for the past 50 years have correctly avoided this "is" vs. "is not" labeling and instead have listed all foods along a continuum from high quality to low quality. By the latest measures of protein quality, soy protein (by itself, without supplementation by cereal grains) has about the same quality as beef, but lower than that of eggs or milk. While noting that about 85% of all soybeans are genetically engineered, she fails to mention that most traditional soyfoods in the USA are made from organic, non-GE soybeans. She discusses the important part that soy plays in the Okinawan diet, where the people have the highest longevity in the world. Yet soy "should be viewed as part of a diverse diet, not as a nutritional silver bullet." We heartily agree. She lists the many traditional soyfoods (p. 231-32), made in basically the traditional way, including: Bean sauce (jiang), miso, natto, soy milk (non-industrial), soy sauce. sufu (fermented tofu, incl. Filipino tahuri), tofuyo

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(fermented tofu from Okinawa), tamari (liquid left after miso is made), tempeh, tofu, and edamame. She recommends that we avoid modern soy protein products made from defatted soybean meal (typically extracted with hexane solvent), including soy protein isolate, "industrial soy milk," soy based infant formula, and soy sauce which uses defatted soybean meal instead of whole soybeans. But what would she do with all the oil left over after using whole soybeans?

Concerning a diet rich in fish, meat, and poultry. She partly ignores the ethical issues involved in killing billions of those animals each year and the environmental issues involved in raising them. These are both huge issues. Several complex issues that she addresses head-on and in a fair, interesting way: (1) Is milk good for humans (p. 39-86).

One of the basic hopes / agendas behind this book is that people will start to leave cities, buy a piece of land (as the author's own family did when she was age 2), grow their own food and raise their own animals for milk, meat, and eggs. There is a steadily growing number of books advocating this traditional way of life.

The Glossary (p. 306-15) contains many good definitions that most people will be able to understand. The bibliography (p. 316-21) is substantial, and there are also endnotes (p. 290-303) but the book would be better if more of its controversial or historical statements cited authoritative sources. Address: USA.

11220. Rowney, Kim. 2006. Cooking Japanese. Murdoch Books. 192 p. *

11221. Sirtori, Cesare R.; Johnson, Stuart K. 2006. Soy proteins, cholesterolemia, and atherosclerosis. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 17-41. [101 ref]

• ***Summary:*** Contents: Introduction. Epidemiological evidence of cardiovascular protective effects of soy. The hypocholesterolemic effects of soy: Early observations, the early clinical studies, current consensus, studies in normolipidemic and mildly hypercholesterolemic subjects, use of soy protein-induced hypocholesterolemia under special clinical conditions (pediatric hypercholesterolemia, patients not responding to statins, kidney disease), mechanisms of action of soy protein-mediated hypocholesterolemia (soy protein components responsible for hypocholesterolemic effects, evidence from clinical studies, role of soy polypeptides), evidence of hypocholesterolemic activity of isoflavones. Antiatherosclerotic effects of soy protein preparations: Role of protein in the antiatherogenic effects of soy preparations, role of isoflavones in the antiatherogenic effects of soy protein preparations, alternative legumes for cardiovascular disease risk reduction, conclusions.

Tables: (1) Correlation between plasma cholesterol and soy protein intake in a Japanese population (The Takayama Study). (2) Normalized isoflavone content of soy flour and of two batches of the soy protein product used in the Italian clinical studies. (3) Effects on cholesterolemia, stool weight, and fecal steroid output of an oat bran diet and of a similar diet with pinto and navy beans.

Figures: (1) Graphs of changes in (a) total and (b) low-density lipoprotein (LDL) cholesterol levels (mg/dl) during a randomized crossover investigation of 20 inpatients with severe hypercholesterolemia. (2) Graphs of changes in low-density lipoprotein (LDL) cholesterol levels in Type II hypercholesterolemic patients given a soy protein diet for 8 weeks. (3) Bar chart of plasma cholesterol changes vs. baseline levels in the meta-analysis from 38 clinical studies of soy proteins in subjects with widely different cholesterolemias. (4) Graph of first U.S. study of a soy protein diet in subjects with a wide range of cholesterolemia, given an additional 25 g/d of dietary soy protein. (5) Bar chart of degradation of I-LDL by freshly isolated mononuclear cells from type II hypercholesterolemic patients, before and after dietary treatment with a low lipid diet or with a soy protein diet, with an identical cholesterol content. (6) Bar charts of plasma total cholesterol and triglyceride levels in hyperlipidemic rats given a high-cholesterol diet (HC) plus isolated soy 7S globulin, the 7S α' subunit, or a lipid-lowering drug at a standard rat dose for 28d. Address: Dep. of Pharmacological Sciences, Univ. of Milan, Italy.

11222. Sugano, Michihiro. 2006. Nutritional implications of soy. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 1-16. [10 ref]

• ***Summary:*** Contents: Introduction. Structure of soybean. Components of soybean: Proteins, oil, carbohydrates, minerals, vitamins. Composition of soy products. Nutritional aspects of soy products: Protein, peptide, oil, oligosaccharide, vitamins, other components. From "A Meat in the Field" to "A Treasure Box of Functionality."

Tables: (1) Major soybean components and their health effects. Two columns: Components and functions. (2) Nutrient contents of dried soybean (incl. minerals and vitamins). (3) Nutrient contents of soybean products (gm per 100 gm): Kinako (parched soybean flour, full-fat). Tofu (bean curd). Abura-age (fried bean curd). Kori-tofu (frozen bean curd). Natto (fermented soybean). Okara (Tofu refuse). Tonyu (soymilk). Yuba (Soymilk skin). Tempe. Miso (bean paste). Shoyu (soy sauce). Soy protein isolate. (4) Mineral contents of soybean products (sodium, potassium, calcium, magnesium, phosphorus, iron, zinc, copper, manganese; same products as in Table 3). (5) Vitamin contents of soybean products (retinol, carotene, D, E, K, B-1, B-2, niacin, B-6, B-12, folic, pantothenic, C; same products as in Table 3). (6) Amino acid and protein composition

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of Japanese soybean products. (7) Proposed patterns for essential amino acid requirements and composition of soybean proteins (soy protein concentrates and isolates). (8) Fatty acid composition of soybean oils (% of total fatty acids) (Products: Refined soybean oil, genetically modified oils, low linolenic, high oleic, low palmitic, low saturated fatty acid, high palmitic, high stearic).

Figures: (1) Pie chart of intake of soybean and its products in Japan (gm per day of tofu {38.2 gm}, fried tofu {7.9 gm}, natto {6.9 gm}, whole soybeans {2.0 gm}, other {2.3 gm}; Total 57.3 gm per day). (2) Bar chart: Amino acid score of dietary proteins in humans (casein 1.0, egg white 1.0, soy protein concentrate 9.9, soy protein isolate 9.5, beef 9.5). (3) Graph and bar chart: Soybean protein lowers liver delta-6 desaturase activity and liver phospholipid delta-6 desaturation index in rats–relative to casein. Address: Director, Fuji Foundation for Protein Research, Japan; Prof. Emeritus Kyushu Univer. and President, Prefectural Univ. of Kumamoto, Japan.

11223. Sumi, Hiroyuki; Yatagai, Chieko. 2006. Fermented soybean components and disease prevention. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 251-278. [76 ref]

• ***Summary:*** Contents: Introduction. Natto: Antibacterial activity of natto and natto bacillus, fibrinolytic enzyme substances contained in natto, depressor effects, carcinostatic effects, and dissipation of the effects of alcoholic drinks, preventive effects for osteoporosis. Tempeh: Strong antibacterial activity and effectiveness against intestinal disorders, antioxidant, antiallergic, and beauty care effects, starters for tempeh and high nutritional value. Shoyu (soy sauce): Antibacterial, antioxidation, and depressor effect, antitumor effects. Miso (soybean paste): Effectiveness of soybean paste for cancer prevention, depressor effects, antioxidation and antiradioactivity effects. Tofuyo.

Tables: (1) Dipicolic acid in natto and *Bacillus subtilis* natto. (2) Fibrinolytic activity in human plasma after the intake of natto. (3) Expired gas and intestinal gas after intake of tempeh. (4) Isoflavone content in tempeh. (5) Antioxidation activity of the aromatic components of shoyu (soy sauce). (6) Functional effects of melanoidine contained in shoyu (soy sauce) and miso (soybean paste).

Figures: (1) Graph of the effects on *O-157* as a result of the addition of natto bacillus. (2) Graph of the effects on *H. pylori* (Sydney strain) resulting from the addition of natto extracts. (3) Photo of fibrinolytic activity of natto. A piece of natto commonly sold on the market was placed in a petri dish with artificial thrombus. (4) The molecular structure of nattokinase. (5) Photo of fibrinolytic activity of nattokinase. (6) 3 graphs of changes in the fibrinolytic parameters in the blood after oral administration of nattokinase to human volunteers. (7) Graph of the effects of natto extracts on blood pressure. (8) Graph of the inhibitor activity of platelet aggregation. (9) 2 graphs of the concentration of vitamin K_2 in human blood after the intake of natto. (10) Bar chart of change in the concentration of menaquinone-7 in plasma after ingestion of natto. (11) Graph of the effects of the tempeh bacteria on aflatoxin-producing bacteria. (12) Diagrams of the aromatic components of shoyu (soy sauce). (13) Bar chart of the effects of the concentration of nitrous acid on the antitumor activity of shoyu (soy sauce). (14) Chart of the carcinogenesis inhibitor effects of HEMF against proventriculus tumors induced by benzo[a]pyrene. (15) Bar chart of standardized mortality from stomach cancer relative to the level of frequency of eating miso soup. (16) Graph of changes in blood pressure by oral administration of miso (soybean paste) extracts. (17) Graph of reaction between coloring degree of miso and its antioxidative activity. Address: Dep. of Physiological Chemistry, Kurashiki Univ. of Science and the Arts, Kurashiki, Japan.

11224. Takamatsu, Kiyoharu. 2006. Soy peptides as functional food material. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 235-249. [53 ref]

• ***Summary:*** Contents: Introduction. Soy peptide manufacturing. History of dietary peptides in nutrition. Soy peptides as functional foods: Soy peptides for sports fatigue and stress, obesity and proteins and peptides, allergens and peptides, hypotensive effect. Recent topics in stress and brain function. Conclusions.

Tables: (1) Characteristics of commercial soy peptides. (2) Amino acid composition of soy peptide products (g/100 g). (3) Clinical studies of soy peptides. (4) Antiobesity effects observed in animals fed soy peptides.

Figures: (1) Diagram of protein peptides and amino acids. (2) Flow chart of soy peptide manufacturing. Address: Food Science Research Institute, Fuji Oil Co., Ltd., Izumisano, Japan.

11225. Tsukamoto, Chigen; Yoshiki, Yumiko. 2006. Soy saponin. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 155-172. [50 ref]

• ***Summary:*** Contents: Introduction. Saponin components in whole soybeans. The genetics of soybean saponins. Functionality of soybean saponins: Biotransformation, anticancer effects, antiviral effects, hemolytic effects, inhibitory effects on liver disorders, antioxidative effects. Conclusions. Acknowledgments.

Tables: (1) Composition and nomenclature of saponins found in soybean seeds according to the carbohydrate sequences at the C-3 and the compounds at the C-22 positions of soyasapogenols, A, B, and E. (2) Saponin components detected in the cotyledon and the hypocotyl of soybean seeds with respective genotypes. (3) Physiological

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properties of soybean saponin.

Figures: (1) Chemical structures of representative saponins found in soybean seeds. (2) Relationship between chemical structure and physiological properties of saponin. (3) Antioxidative activity of DDMP saponin; includes chemical structure and spin density. Address: 1. Faculty of Agriculture, Iwate Univ., Morioka, Japan.

11226. Watanabe, Shaw; Zhuo, Xing-Gang; Melby, Melissa K.; Ishiwata, Naoko; Kimira, Mituru. 2006. Systematic review of intervention studies using isoflavone supplements and proposal for future studies. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 87-106. [48 ref]

• ***Summary:*** Contents: Introduction. Materials and methods. Results: Study designs and different sources of isoflavones, health outcomes (breast cancer, prostate cancer, cardiovascular disease, bone metabolism, effects on lipids, antioxidant status, symptoms of menopause, menstrual cycle and hypothalamo-pituitary-gonadal (HPG) hormone, reproductive health in normal males, cognitive function, insulin resistance). Discussion: Subject selection and characteristics (equol producer status), IF source (dietary sources of IFs [isoflavones]), IF dose and form, blood or urinary levels of IFs, intervention duration, end points (clinical symptoms, biomarkers). Summary and Recommendations.

Tables: (1) Characteristics of the 22 intervention studies using pure isoflavones in humans. (2) Supplementation with constituents of pure isoflavones in 22 intervention studies. (3) Minimum requirements for future research design and reporting of results.

Figures: (1) Basic molecular structure of the isoflavone family. (2) Molecular structure of isoflavones in the soybean. Address: 1. National Inst. of Health and Nutrition, Tokyo, Japan.

11227. Yamamoto, Eric K.; Ebesugawa, Liann. 2006. Report on redress: The Japanese American internment. In: Pablo De Greiff, ed. 2006. The Handbook of Reparations. Oxford, England; New York, NY: Oxford University Press. xxxiii + 1020 p. See p. 257-83. Chap. 7. Index. 26 cm. [123 ref]

• ***Summary:*** This book is a project of the International Center for Transitional Justice. Chapter 7 is balanced and insightful.

Contents: Introduction. 1. Origin of the Japanese American internment and reparations: Before Pearl Harbor, after Pearl Harbor, the internment: Military, congressional and executive actions, legal challenges. 2. History of 1988 Civil Liberties Act: Judicial action, executive action, congressional action (under presidents Gerald Ford, Ronald Reagan, and George H.W. Bush). 3. Implementation of the 1988 Civil Liberties Act: Office of Redress Administration, eligibility requirements and payments, form of delivery, Civil Liberties Public Education Fund, relationship to civil suits, economic impact ($20,000 per surviving internee). 4. Conclusion.

Was there any factual basis for American fears before the internment? "Heightening military anxieties between December 17 and December 23, Japanese submarines sank two tankers and damaged one freighter along the West Coast. General DeWitt feared (inaccurately) that Japanese Americans were aiding the submarines by signaling them from shore" (p. 260)

Note: There was another submarine incident in southern California. On 23 Feb. 1942 the lone Japanese submarine I-25, under captain Nishino Kozo, surfaced near an oil field pier just north of Goleta, a suburb of Santa Barbara, California. The submarine shelled the pier, damaging it, and also shelled the area around the Ellwood Oil field, but no damage was done there. On 1 March 1942, the headlines of the Santa Barbara newspaper and the *San Francisco Chronicle* announced the attack. News of the shelling triggered an invasion scare along the West Coast. "Frightened residents put their homes up for sale and made plans to flee." This was the first shelling of the U.S. mainland during World War II. California citizens along the West Coast were on edge.

After midnight, on Feb. 25, 1942, there seemed to be a Japanese air raid over Los Angeles. The city was put on red alert, with air raid alarms, blackouts, and radio silence. Anti-aircraft guns were manned and searchlights turned on. "Anti-aircraft guns from the IV Interceptor Command opened fire at 3:16 a.m., fired steadily until 3:36, stopped, then resumed at 4:05 for another 10 minutes. During their 30-minute fusillade, the command's guns hurled 1,440 rounds of 3-inch and 37mm ammunition into the night sky above Los Angeles. Not counting unofficial shots, 48 shells were fired per minute. And almost 10 tons of expended ammunition fell somewhere on the city during the supposed raid."

"While it is easy to look back and laugh at the excitability of Los Angeles' defenders, their reaction to the possibility of an enemy air attack reflects the anxiety that gripped much of the West Coast in the months after Pearl Harbor" (Young 2003).

Sources: (1) *History of California, 4th ed.,* by Andrew Rolle (1991, p. 445). (2) *In Defense of Internment,* by Michelle Malkin (2004). (3) "Phantom Japanese Raid on Los Angeles During World War II," by Donald J. Young. *World War II* magazine (Sept. 2003). For a broader discussion of Japanese attacks on the the USA and Canada see "Japanese operations" under American Theater (1939-1945) on Wikipedia.

"Several high-ranking government officials, including Attorney General Francis Biddle, opposed the exclusion of Japanese Americans. On February 19 [1942], President Roosevelt nevertheless signed Executive Order 9066

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granting the military the power to exclude persons from specific areas. On its face, the order made no mention of persons of Japanese ancestry. Race was implied." The full text of the Order is given (p. 262).

"The Civil Liberties Act became law on August 10, 1988, when Ronald Reagan signed Public Law 100-383. Before signing the bill President Reagan remarked that 'we gather here today to right a grave wrong... More than forty years ago... 120,000 persons of Japanese ancestry living in the United States were forcibly removed from their homes and placed in makeshift internment camps. This action was taken without trial, without jury. It was based solely on race.'

"The President captured the essence of the bill by stating: 'No payment can make up for those lost years. So what is most important in this bill has less to do with property than with honor. For here we admit a wrong; here we affirm our commitment as a nation to equal justice under the law... the ideal of liberty and justice for all–that is still the American way" (p. 270).

"The apology mandated by the Civil Liberties Act. of 1988 was ultimately made through a letter from President George [H.W.] Bush to each person eligible for reparations, The reparations check accompanied the letter, both of which were sent by registered mail" (p. 274).

Conclusion: "The Japanese American redress process was arduous. Many Japanese Americans contributed, and their communities overwhelmingly considered reparations a great victory... A measure of dignity was restored. Former internees could finally talk about internment. Feelings, long repressed, surfaced..." Address: 1. Prof. of Law, William S. Richardson School of Law at the Univ. of Hawaii.

11228. Yamamoto, Seiichiro; Johnson, Stuart K. 2006. Soy and breast cancer prevention. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 43-72. [132 ref]

• ***Summary:*** Contents: Introduction. Soy and isoflavone: Estrogenic activity of isoflavone. *In vitro* studies: Physiological environment, cell growth inhibition by genistein, summary. Animal studies: Overall results, early exposure, *in vivo* studies in humans. Epidemiological studies: Level of evidence in epidemiological studies, population-level studies of soybean intake and breast cancer, randomized controlled trials. Summary. Acknowledgments.

Tables: (1) Comparison of isoflavone intake, concentration in blood, and urine excretion of isoflavone in various populations. (2) Experimental studies of isoflavone in rodents. (3) Evidence level and epidemiological study design. (4) Summary of epidemiological studies investigating dietary soybean products and breast cancer.

Figures: (1) Bar chart of cumulative incidence of breast cancer in the world. (2) Graphs of age-adjusted mortality rates by prefecture and year in Japan. (3) Molecular structure of estrogens and isoflavones. (4) Graph of time series analysis of soy intake and breast cancer in Japan. (5) Graph of soy bean consumption and breast cancer mortality by prefectures in Japan. (6) Graph of soy bean consumption and breast cancer mortality be prefectures in Japan and selected Western countries. (7) Graphs of age-specific breast cancer incidence throughout the world. (8) Relative risk of soy product in breast cancer in epidemiological studies by design and publication this year. (9) Relative risk of soy product in breast cancer in case-control studies by ethnicity, menopausal status, and publication year. (10) Relative risk of soy product in breast cancer in cohort studies by ethnicity and publication year. Address: National Cancer Center, Tokyo, Japan.

11229. Yamamoto, Takashi. 2006. Soybean Components and Food for Specified Health Uses (FOSHU). In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 279-288.

• ***Summary:*** Contents: The effectiveness of the soybean. Food for Specified Health Uses (FOSHU). FOSHU products with soybean components: Cholesterol lowering, regulating intestinal function, bone health. Conclusions.

Tables: (1) Physiological functions of soybean compounds. (2) Clinical trials in Japan on effects on cholesterol lowering. (3) Classification of Japanese health function foods (effective April 2001). (4) Specific health uses and major food components with health claims. (5) Selected FOSHU products containing soybean components.

Figures: (1) Pie cart of composition of soybean. (2) Bar chart of articles on food for specified health uses. Address: Faculty of Health Management, Nagasaki International Univ., Sasebo, Japan.

11230. Yamori, Yukio. 2006. Soy for "Health for All": Message from WHO CARDIAC study and dietary intervention studies. and proposal for future studies. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 107-121. [34 ref]

• ***Summary:*** Contents: Introduction. Experimental evidence for CVD prevention by soy intakes. Major CVD risk factors and gender differences. Women's health and soy isoflavones with estrogenic activity. Soy diets and CVD risks in immigrants studies and life-style-related diseases. Nutritional intervention by soy protein and isoflavones. Conclusions.

Figures: (1) Map of study sites of the WHO CARDIAC study. The first surveys were carried out in 1985-1995. (2) Graphs of gender difference in the association between age-adjusted mortality rates from stroke and 24-hr urinary sodium (Na) excretion. Men are most salt-sensitive than women. (3) Graphs of gender difference in the association between coronary heart diseases (CHD) and serum total

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cholesterol. Men are more vulnerable to CHD than women even when serum cholesterol levels are similar. (4) Bar chart of menopausal changes in systolic blood pressure (SBP) or CARDIAC Study population where soy food is common (+) or not (-). (5) Pie chart of food sources of isoflavones and the average daily isoflavone intake of the Japanese (1992) and chemical structure of isoflavones compared with estrogen. The Japanese get about 18 mg of isoflavones per day on average from bean curd, fermented soy bean, soy bean paste, etc. (6) Bar chart of twenty-four-hour urinary isoflavone excretion in relation to the frequency of soy product intake in the Japanese. (7) Graph of association between age-adjusted coronary heart disease (CHD) mortality and 24-h urinary excretion of isoflavones. The CHD mortality rates are low in Japan and China, where soybean products are commonly eaten and urinary isoflavone excretion exceeds 10 μ mol/d. (8) Bar chart of effect of daily intake of DHA (2 g) and soy protein (25 g) in breads on atherogenic index (AI). AI is calculated as the ratio of non-HDL cholesterol (total cholesterol–HDL cholesterol) divided by HDL cholesterol, high in men, reduced down to the lower women's level after an 8-week intervention. Address: WHO Collaborating Center for Research on Primary Prevention of Cardiovascular Diseases, Kyoto, Japan.

11231. Yan, Like. 2006. Shelf life of toasted soyflakes and their application in breadmaking, tofu: Color prediction from the soybeans and soyflakes color. Thesis (M.S.), Iowa State University. 95 leaves. Illust. 29 cm. *
• ***Summary:*** Used MicroSoy toasted soyflakes. Address: Iowa State Univ., Ames, Iowa.

11232. Yoshikawa, Masaaki; Tsuruki, Takahiro. 2006. Bioactive peptides derived from soy protein. from soybeans. In: Michihiro Sugano, ed. 2006. Soy in Health and Disease Prevention. Boca Raton, Florida: Taylor & Francis. [xii] + 313 p. See p. 225-233. [34 ref]
• ***Summary:*** Contents: Introduction. Hypocholesterolemic peptides. Hypotriglyceridemic protein. Peptides regulating food intake. Hypotensive peptides. Anticancer proteins and peptides. Immunomodulating peptides. Antioxidative peptides.

Tables: (1) Affinities of soymetide-13 and its derivatives for fMLP receptor. (2) Immunostimulating properties of soymetide-4, -9, and -13.

Figures: (1) Graph of effect of lunacin on DMBA-initiated, TPA-promoted skin tumorigenesis in female SENCAR mice. (2) (A) Bar chart of activation of phagocytosis by soymetides with C-terminal deletions. (B) Graph of concentration-dependent activation of phagocytosis by soymetide-4, -9, and -13 (n=2). (C) Bar chart of effect of fMLP antagonist Boc-MLP (100 μ*M*) on phagocytosis activated by soymetides (n=4). (3) Photo of protective effects of soymetide-4 against etoposide-induced alopecia. Etoposide was injected at a dose of 1.0 mg/kg intraperitonealy for 3 consecutive days to 11-d-old rats. (4) Light micrographs of hematoxylin-eosin-stained dorsal skin sections from neonatal rats treated with saline, etoposide, or etoposide + soymetide. Address: Kyoto Univ., Kyoto, Japan.

11233. Ishige, Naomichi. 2007. Re: Early history of the word "teriyaki." Letter (e-mail) to William Shurtleff at Soyinfo Center, Jan. 5. 1 p. [Eng]
• ***Summary:*** "The following is my answer to your question of teriyaki.

"As far as I know, the first appearance of the word 'teriyaki' was in 1813, when *Shijûhachi Kuse* [48 habits], written by Shikitei Sanba, was published. The word appeared in the second volume of the novel as 'shrimp teriyaki'. The original text was a block book, so the page number was unknown. However, according to the reprinted edition, the details are as follows: *Ukiyodoko: Shijûhachi Kuse* in *Shincho Nippon Kotenshusei 52*, Honda Yasuo (corrections and notes), Tokyo: Shincho-sha, 1982, p. 237.

It is assumed that teriyaki's recipe already existed in the Edo period before the word of teriyaki appeared in a book. For instance, the way to cook *unagi no kabayaki* ("charcoal broiled eel"), which went around from the middle of the Edo period onward, is the same as teriyaki; its sauce is the mixture of soy sauce and mirin or sake. Eel is covered by the sauce and baked. In the 19th century, the use of mirin in the sauce became more popular than the use of sake, because it gave good gloss (*teri*) to the eel when it was cooked. As a result, I suppose, 'teriyaki' became a generic term for the style of cooking that fish was grilled with soy sauce and mirin.

A Happy New Year! Best wishes, Naomichi Ishige.

Note: In his book *The History and Culture of Japanese Food* (Kegan Paul, 2001, p. 116), Ishige says that teriyaki developed during the Edo / Tokugawa period (1600-1867), however no citation for the source of this information is given. Address: National Museum of Ethnology, Osaka, Japan.

11234. *SoyaScan Notes.* 2007. Award and plaque presented to William Shurtleff and Akiko Aoyagi Shurtleff by JETRO Los Angeles (Overview). Feb. 13. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** The imitation stone plague, which is about 5½ by 8 inches, mounted on a cherry wood background (7½ by 10 inches) reads: "Presented to William Shurtleff, Akiko Aoyagi, in honor of your pioneering achievements in the promotion of Japanese foods. JETRO Los Angeles, Chief Executive Director, Keizo Tsuchiya. February 13th, 2007."

The plaque, a $1,000 award, and a nice letter from Atsuko Kanai (on Mutual Trading Co. letterhead) were presented to Akiko who flew to L.A. for the ceremony (William was unable to attend) at a luncheon at the home

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of the Japanese consulate in L.A. The main event was the "Press Event for Sake Festival in L.A." As part of that was a 10-minute "ceremony of Appreciation." Awards were presented to Mr. John Gauntner (sake expert) and Akiko. Mr. Gauntner then gave a 1-hour lecture on sake.

The person who initiated the award to Shurtleff and Aoyagi was Mr. Noritoshi Kanai, president of Mutual Trading Co. Two pages of information about the work of Shurtleff and Aoyagi, written by Atsuko Kanai from materials supplied by Soyinfo Center, were distributed representatives of the media who were present.

11235. Vialle, Cynthia. 2007. Re: In 1637 the Dutch exported ten barrels of *moersackij* (shoyu) from Japan. Letter (e-mail) to William Shurtleff at Soyinfo Center, Feb. 19. 1 p.
• ***Summary:*** "About soy. Do you know that soy was also called murasaki? Sakijmoer or moersakij in the Dutch records. I have a reference of 1637 that ten barrels of moersakij were shipped from Japan to Siam or Batavia. Two Japanese historians told me that moersakij is murasaki, soy. It's nothing to do with the history of the word, but I thought it might be of some interest to you."

On March 28 Cynthia sent the following citation: "10 vaten moersackij" = 10 barrels of murasaki [soy sauce]. "Hirado, 27 Nov. 1637. Shipped in the *Aeckersloot* sailing from Hirado to Siam and Batavia.

Source of document: "Nationaal Archief, The Hague, Archive of the Dutch Factory in Japan, record number 837." Address: Leiden Univ., Netherlands.

11236. Japanese American Service Committee Legacy Center. 2007. Other repositories with collections documenting Japanese Americans. Chicago, Illinois: JASC Legacy Center. 3 p. Unpublished typescript. 28 cm.
• ***Summary:*** The following are listed in alphabetical order:

(1) Brethren Historical Library and Archives, 1451 Dundee Ave., Elgin, IL 60120.

(2) Chicago History Museum [formerly Chicago Historical Society], Research Center, 1601 North Clark Street, Chicago, IL 60614.

(3) Chicago Japanese American Historical Society, 745 Beaver Road, Glenview, IL 60025.

(4) Japanese American Citizens League, Chicago Chapter, 5415 North Clark Street, Chicago, IL 60640.

(5) Japanese American National Museum, National Resource Center, 369 East First Street, Los Angeles, CA 90012.

(6) Northeastern Illinois University, 5500 N. St. Louis Avenue, Chicago, IL 60625.

(7) Northwestern University, Special Collections, 1935 Sheridan Road, Evanston, IL 60208.

(8) Southern Illinois University, University Archives, Carbondale, IL 62091.

(9) University of California at Berkeley, Bancroft Library, Berkeley, CA 94720.

University of Chicago, Regenstein Library, 1100 E. 57th Street, Chicago, IL 60637. Address: 4427 North Clark St., Chicago, Illinois 60640. Phone: (773) 275-0097 X-224 or archives@jasc-chicago.org.

11237. Ness, Carol. 2007. Top tamari balances sweet and salty: Taster's choice. *San Francisco Chronicle.* March 28. p. F2. Food section.
• ***Summary:*** Seven brands of tamari sold in San Francisco were tasted and rated in descending order of preference as follows: 1. Eden (organic, imported green label) (69 points; $5.69 for 10 oz at Rainbow). 2. Mitoku imported (60 points, $7.99 for 10 oz at Rainbow). 3. Eden (55 points, organic, plum-colored label, not imported. $4.19 for 10 oz at Whole Foods). 4. Kikkoman (53 points, made in Japan, $3.89 for 10 oz). 5. San-J (45 points, black label, $2.59 for 10 oz at Rainbow). (6) Ohsawa (35 points). (7). San-J gold label 14 points.

Tamari is a Japanese-style soy sauce "made mainly from soy beans with little or no wheat, which gives it a richer taste than regular soy sauce." Tasters commented mainly about the color, saltines, sweetness, and (above all) the balance of saltiness and sweetness. "The panel looked for a smooth, rich flavor balanced by the right amount of salt. Common problems were harsh or sweet notes, or too much salt." Address: Staff writer.

11238. **Product Name:** Better Bites: Sweet Soy Treats.
Manufacturer's Name: Microsoy Corp.
Manufacturer's Address: 300 East Microsoy Dr., Jefferson, IA 50129. Phone: (515) 386-2100.
Date of Introduction: 2007 March.
Ingredients: Non-GMO soybean flakes, Florentine mix (glucose syrup {wheat starch}, sugar, vegetable oil, dextrose, whole milk powder, soy lecithin).
How Stored: Shelf stable.
New Product–Documentation: Glossy color leaflet (single sided, 21.4 cm) sent by Patricia Smith from Natural Products Expo West. 2007. March.

11239. Yoshiba Restaurant. 2007. Best food of champions. *Time.* April 24.
• ***Summary:*** For centuries, for sumo wrestlers, the main course "has been *chankonabe,* a protein-rich stew containing beef, chicken, pork, seafood, tofu, vegetables and just about anything else the stable master can find." Traditionally sumo wrestlers abstained from meat such as beef or pork that came from four-legged animals. Address: Tokyo, Japan.

11240. Wexler, Geoffrey. 2007. Re: Documenting the early history of Ota Tofu Co. (Portland, Oregon). Letter to Roy Yotsuuye, 16003 N.E. 25th Ave., Ridgefield, Washington 98642, June 1. 1 p. Typed, on letterhead. [8 ref]

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• ***Summary:*** "To answer your first question, the two addresses (226 [sic] Davis Street and 96 N. 5th St.) were not the same location. The [first] major street renaming took place around 1892, when the 'alphabet' streets (A, B, C, etc.) were given the names of Portland pioneers (Ankeny, Burnside, Couch, Davis, etc.). The next major change was between 1931 and 1933, when all the house numbers in the city were changed and many street names were altered too. At that time North Fifth Street became Northwest Fifth Avenue, and Davis Street became Northwest Davis Street.

"As to the founding of the Ota Tofu Company, the city directories do not help with this. I spot checked the directories from 1908 through 1934 and found no listing at all for Ota (or Ohta) Tofu. However, I did find the following:

1910: Charles Ota listed as a "cook" with residence at 352 Oak Street.

S. Ota listed as "baths" with business and residence at 86½ 5th Street North.

1913: E. Ota listed as "cook."

1915: S. Ota listed as "baths," same addresses as 1912.

1921-1922: H. Ohta listed as "baker."

1924: H. Ota listed as "restaurant" with address at 86½ 5th Street North.

1933: Saizo Ohta listed as "wholesale baker" at 86½ 5th Street North.

1934: Same as 1933.

"Of course, the directories are not always accurate, especially for the Japanese and Chinese communities in the area that is now called Old Town / Chinatown in downtown Portland (where the above addresses were located).

"There may be more detailed information here at OHS, perhaps in census records or books on the Japanese community. It may be worth a trip here to our research library to conduct further research." Address: Senior Archivist, The Oregon Historical Society, 1200 SW Park Ave., Portland, Oregon 97205. Phone: 503.222.1741.

11241. Okazaki, Noriko Ota. 2007. Re: Ota family history. Letter (e-mail) to Eileen Ota, Ota Tofu, Portland, Oregon, June 3. 1 p.

• ***Summary:*** "Hi Eileen: Hope everything is going well for you and the Tofu shop.

"I've been trying to answer your e-mail regarding the history of the Ota Tofu Shop and this is what I think I know:

"Saizo and Shina's last name was OHTA and whoever reported Matsuno's birth certificate made a mistake on her last name and was recorded as OTA. The Japanese character is the same.

"I don't know how many brothers and sisters Saizo had. At least one brother was here in the United States. I have no idea when he arrived in United States. I know for sure one brother was here because he married Mits' grandmother at one time. (she was married to Okazaki and had a son, Shizuo, in Japan before she was remarried to Saizo's brother).

"Saizo may have had a brother (I guess could be a sister also) in Japan since my mother talked about her cousin (no idea how many). Had tuberculosis and died.

"Like I had told you earlier, I don't know or have not met one single person with a name of Ota in Japan when I was growing up.

"The oldest relative who might know anything would be Matsuno's cousin, Matasuda since she grew up with them but he is at least 10 years younger and the time I saw him last year, he was not in any condition to remember anything.

"I think Grandma Shina was a picture bride and she moved into Ota family in Japan prior to coming U.S. No idea how long or what year. I don't think she had any occupation, just to a training to be a bride.

"Ohta family (I think) lived in Shiraishi, Okayama but no idea of their occupation. I don't think they were any way connected to the Tofu business. (this is my guess)

"There may be sources in Japan to help or the temple Ohta family belong to may help but I have no idea where to start. It is also possible everything was destroyed during the war when Okayama was bombed; no idea how extensive damages were.

"This is all I can think of now. If I get any more information, I will let you know.

"Take care and say hello to everybody, Noriko." Address: Japan.

11242. Walsh, Bryan. 2007. Lamenting the decline of the home-cooked meal in Japan. *Time.* June 6.

• ***Summary:*** About Etsuko Shiobu teaching at her home in Tokyo: "As commuter trains rumble outside the window of Shinobu's crowded kitchen, we prepare tuna sushi cake, tofu, a carrot and radish soup and a vinaigrette salad."

11243. *SoyaScan Notes.* 2007. Early Dutch exports of soy sauce from Japan, and early documents that mention soy sauce in Europe (Overview). June 10. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** 1647–Documents show that the Dutch East India Co. (VOC) began exporting soy sauce from Japan, from their tiny artificial harbor in Nagasaki harbor, and exported some almost every year from 1751 on. Most of this soy sauce was sent and used at to their trading posts in Southeast Asia.

Concerning early documents that mention soy sauce in Europe:

1679–John Locke (England) mentions "saio" in his journal.

1688–William Dampier (England) mentions "Soy" in his journal.

1690–E.B. (England). The canting crew. "Catchup, a high East-India Sauce."

1696–Ovington, Suratt (England). "Bambou and

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Mangoe Achar [pickle], Souy the choicest of all Sawces, are always ready to whet the Appetite."

1705–Samuel Dale (England). "3. Soia *Offic.* [probably Officinarum] Phaseolus Japonicus ex quo Japonesium Soia, qui intinctus species est, conficitur *Herm.* Species Phaseoli parvi albi, è Japonia allata, è qua conficiunt condimentum *Ketchup* dictum, duum generum, liquidum nimirum & solidum.

1736–The first Dutch soy sauce, exported from Japan via Batavia in the Dutch East Indies, arrives in Holland.

1750–Soy sauce first arrives in the Unites States (actually the British colonies of North America) in New York City. It is imported from Europe and advertised as being on sale in a retail store.

11244. Shurtleff, William. 2007. Thoughts and questions concerning Chinese traders in Nagasaki, Japan. Could they have exported soy sauce? Could they have sold that soy sauce to British East India Co. merchants? *SoyaScan Notes.* July 15. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** In about 1600 the Chinese obtained an official trade permit and settled in Nagasaki. At the peak of Chinese activity there, about a century later, as many as 190 Chinese ships a year were visiting Nagasaki, and one-sixth of the town's population hailed from the East Asian mainland. Address: Founder and owner, Soyfoods Center, Lafayette, California. Phone: 925-283-2991.

11245. Yu, Jonathan; Yu, Beth. 2007. Re: History of Cherry Food Industry / APY Food Processing in Quezon City, Philippines. Letter (e-mail) to William Shurtleff at Soyinfo Center, Aug. 24. 1 p.
• ***Summary:*** Cherry Food Industry operated as a soy processing company in 1976. In January 1985 the company was registered as APY Food Processing. APY signifies the initials of Mrs. Adelaida Pua Yu, the owner, who had the first factory running at # 74 Speaker Perez St., Barangay Lourdes, Quezon City with 10 employees. From its initial operations until January 1995, Mrs. Yu successfully maintained the factory. In 1993, Jonathan Yu and wife Beth participated in the family business operations. Since the other siblings of Jonathan were engaged in other concerns, the management and operations of the company was transferred to the youngest Jonathan Pua Yu in 1995.

The company now makes the following soy products: Nippon Tofu. Toho. Tokwa. Taohue. Soymilk. Address: Quezon City, Philippines. Phone: (632) 365-0835.

11246. Kikkoman Corporation. 2007. Annual report 2007. Year ended March 31, 2007. 250 Noda, Noda-shi, Chiba 278-8601, Japan. 37 p. 28 cm. [Eng]
• ***Summary:*** Consolidated net sales rose 9.1% year on year to $3.327 billion, operating income climbed 16.6% to $183 million, and net income rose 16.6% to $91.1 million. All three were record figures for Kikkoman. Note: Some dollar values actually fell due to changing foreign exchange rates.

Page 1, titled "A golden heritage: Kikkoman's 50th anniversary in America," begins: "In 2007 we celebrate the 50th anniversary of our full-scale entry into the U.S. market. Over the ensuing 50 years, we have aimed to make soy sauce a more integral part of the American food culture... Sales volume of soy sauce overseas during fiscal 2007 grew to some 157,000 kiloliters." A map shows North American production and sales bases. A bar chart shows "Overseas sales volume," which has grown from about 10,000 kl in 1974 to 35,000 kl in 1986 to 92,000 kl in 1996 to 158 kl in 2006; it has increased dramatically and exponentially. Kikkoman's two soy sauce factories in the USA, at Walworth, Wisconsin, and Folsom, California (northeast of Sacramento, California, near Folsom Lake) "now ship over 110,000 kiloliters of soy sauce throughout North America."

A photo (p. 2) shows Yuzaburo Mogi (Chairman of the Board and CEO) and Takashi Ushiku (President and COO). Address: Noda, Japan.

11247. Monden, Eiji. 2007. What is natto? Natto to save the earth! Presented Sept. 16 at 2007 Midwest Specialty Grains Conference & Trade Show. 29 p. Held Sept. 16-18 in Fargo, North Dakota.
• ***Summary:*** A PowerPoint presentation with 29 slides containing color photos and graphics. (2) Table of contents. (3) About Federation of Japan Natto Manufacturers' Cooperative Society. Phone: 03-3832-0709. President: Takashi Sasanuma. Established: April 1954. Members: 251 natto manufacturers. Objective: To work cooperatively among members to conduct natto promotion activities and improve natto makers' economic status. Qualifications: Must be a natto manufacturer that owns an office in Japan. History: 1939–Prefectural natto cooperatives were organized, 1941–Established Japan Natto Industry Cooperative Association. 1953 [after World War II]–Re-organized to Federation of Japan Natto Manufacturers' Cooperative Society.

(4-5) Activities: National natto contest. Natto symposium. Natto queen ceremony. (6) What is natto? With photos of soybeans, container of natto, natto mixed with rice being lifted out of a bowl with chopsticks. (7) Natto making: The 3-day process. (8-10) Health benefits of natto. Medical uses: Reduces likelihood of blood clotting. Contains large amounts of vitamin K. Contains large amounts of enzyme called nattokinase which may also reduce blood clotting. (11-12) Types of Natto. Sticky natto and Dried Natto. Whole soybean natto, hikiwari natto (from cracked soybeans) and goto natto (hikiwari natto and malted rice [rice koji]) are all types of sticky natto, while Tera Natto (Temple Natto) is the only dried natto. It is black and salty, and was introduced to Japan by priests who studied in China. Photos show Itohiki Natto (Sticky natto), Goto Natto, Tera Natto, and Cracked Bean Natto. (13) How to eat Natto. Photos show

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a package of natto, the package open to show its contents, with the natto, a packet of sauce, and a packet of mustard, and the natto served in a bowl on top of rice. (14) History of Natto. *Bacillus natto* are naturally found on straw; in the Taisho period (1912-1926), researchers found a way to cultivate the bacillus without straw. This made the natto easier to produce and more reliable. (15-16) Natto Market. Graph shows Natto Consumption per household per year and volume of natto market. 130,000 MT [metric tons] of soybean are used annually to produce 4.7 billion packages (50 g natto/package) of natto. (17) Reasons for purchasing Natto. (18) How did you learn the health benefits? Graph shows how people learned about the benefits of natto. (19-21) Natto Variety. Graph shows soybean use for Natto by country of origin, 2007 Food soybean use by usage. In 2007, 956,000 MT of soybeans were used for food; 135,000 of which went to produce Natto. Graph shows price trends for a bushel of soybeans. (23) World Average Life Span Rankings. Table shows that Japan ranks first, with an age of 82 years. The United States is 26th at age 78. (24) Future Market: Further research on new natto health benefits, new menu development of natto, further natto market expansion domestically and globally. (25) Expectations of the U.S. IP [identity preserved] soy industry: To strengthen more direct communication for new variety development with natto manufacturers at an early stage, to continue growing food soybeans, continuing demands and market potential for U.S. Non-GMO soybeans exist in Japan, the possibility of launching a natto market similar to the soysauce market in the United States. Address: Federation of Japan Natto Manufacturers' Cooperative Society (Zenkoku Natto Kyodo Kumiai Rengokai), 4th Floor, Natto Kaikan 2-7-10 Moto-Asakusa, Taito-ku, Tokyo 111-0441 JAPAN.

11248. Kikkoman Corp. 2007. Kikkoman–A golden heritage: Kikkoman's 50th anniversary in America. *Arigato, America* (Ad). *New York Times.* Sept. 19. p. A13.

• ***Summary:*** A full-page color ad. The top half is a message from Mr. Yuzaburo Mogi, Chairman and CEO, Kikkoman Corporation. It begins: "Thank you, America, for 50 great years.

"Thank you for making Kikkoman one of America's best-loved food brands. We are honored and humbled by the generous welcome you have extended to us since we started marketing our soy sauce in America 50 years ago.

"A lot has changed since then, but one thing remains the same. Our core product, naturally brewed soy sauce, is still made just as it was more than 300 years ago–slowly fermented and aged for full flavor like a fine wine." Below the message is Mr. Mogi's signature. In the bottom half of the ad is a large color photo of Mr. Mogi, a bottle of Kikkoman soy sauce, and the logo of Kikkoman's 50th anniversary in America (1957-2007). In smaller red letters we read: "A member of the family that founded the company more than three centuries ago, Mr. Yuzaburo Mogi has helped make Kikkoman one of the world's leading food brands."

At the bottom of the ad is an announcement of Kikkoman's 50th anniversary sweepstakes, which ends Sept. 30, and includes a trip to Japan. To enter and for official rules go to www.kikkoman50.com.

11249. Nisshin OilliO Group Co., Ltd. 2007. Nisshin Oirio Gurûpu 100 nen-shi [Nisshin OilliO Group Co. Ltd. 100-year history]. Tokyo, Japan. 351 p. Illust. No index. 31 cm. [100+ ref. Jap]

• ***Summary:*** Mr. Y. Komura, who sent this citation and scans of many pages, notes: "In 2004, Nisshin Seiyu Co. merged with 2 oil milling companies and started its new stage by changing its name as Nisshin OilliO.

"The president of Nisshin then told me he thought the staffs of new the company had to recognize that the new company must based on "Oil"

"The new name is formed by combining "Oil" and "Oil." Thus, OilliO is a palindrome, which reads the same backward or forward. Address: Japan.

11250. Taguma, Kenji G. 2007. History of the *Nichibei Shinbunsha-sha* (Japanese-American Times Co.), Kyutaro Abe, Tsuda Yonako (his wife) and Tsuda Umeko (Yonako's sister) (Interview). *SoyaScan Notes.* Oct. 19. Conducted by William Shurtleff of Soyinfo Center.

• ***Summary:*** The *Nichibei Shinbun* began publication in 1899 as the merger of two earlier Japanese newspapers in the USA. It was published from 1899 to 1942–when it was closed by the Internment of World War II.

It was founded and published by Kyutaro Abiko (1865-1936), perhaps the most prominent *Issei* pioneer in America. In 1909 he married Tsuda Yonako (1880-1944), and they worked together closely in publishing the newspaper. Address: Vice President and English Edition Editor, Nichi Bei Times, 2211 Bush St., San Francisco, California 94115.

11251. Dorff, Erik. 2007. The soybean, agriculture's jack-of-all-trades, is gaining ground across Canada (Web article). http://www.statcan.gc.ca/ pub/ 96-325-x/ 2007000/ article/10369-eng.pdf. 14 p. Oct. 26. Printed 28 Jan. 2010. [7 ref]

• ***Summary:*** An outstanding overview and description of the current status of soybeans in Canada.

Contents: Introduction. Development of the soybean sector in Canada. Growth in soybean area across the country. The soybean–an international super-crop. Soybean dollars make sense to farmers. One crop, many uses. Food for human consumption. Animal feed. Industrial products. Soybean not a "has-bean" crop in Canada. The gift of the bean (a brief early history of the soybean in the USA and Canada).

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Figures: (1) Gains in soybean area reflect crop development efforts (1951-2006; 000 hectares). (2) One crop many uses. Diagram showing uses as: Food for human consumption, animal feed, industrial products. (3) Bred in Canada: soybeans of prominence. AC Proteus, Toki (for tofu), Nattawa (for natto), Maple Arrow (expanded soybean range out of southern Ontario), Maple Presto (the fastest maturing soybean). (4) Traditional soy foods: a brief guide (with a description of each). Edamame, miso, natto, soy sauce, soy milk, tempeh, tofu.

Tables: (1) Census of agriculture tracks growth in soybean area. Gives the area planted in Canada, Prince Edward Island, Nova Scotia, New Brunswick, Quebec, Ontario, Manitoba, Saskatchewan, and Alberta in the census years of 1976, 1981, 1986, 1991, 1996, 2001, and 2006. Soybeans were planted in each of these provinces in the three most recent census years. (2) Top 10 soybean producing nations (Average 2000 to 2005): After the USA, Brazil, and Argentina, China is 4th, India 5th, Paraguay 6th, Canada 7th, Bolivia 8th, Indonesia 9th. and Italy 10th. (3) Average soybean composition. Columns: Characteristic, oil, feed and meal beans, soy milk / tofu soybeans. For the latter: 100 seeds should weigh more than 20 gm. Colour very light with clear hilum, oil content 17-19%, protein content 44-47%, soluble sugar content 11-13%, insoluble sugar content 21-25%, minerals 5%. (4) Nutritional comparisons: Tofu and soy milk with ground beef and cow's milk.

Maps: (1) Soybeans in Canada (3 maps on one page). Map A shows that quite a bit of Quebec's soybean acreage lies south of the Saint Lawrence River, in the region named "Southern Quebec" (which includes the Eastern Townships at its southernmost area–its south-western end).

"Until the mid-1970s, soybeans were restricted by climate primarily to southern Ontario. Intensive breeding programs have since opened up more widespread growing possibilities across Canada for this incredibly versatile crop: The 1.2 million hectares of soybeans reported on the Census of Agriculture in 2006 marked a near eightfold increase in area since 1976, the year the ground-breaking varieties that perform well in Canada's shorter growing season were introduced" (p. 1).

"For years, soybeans were being grown in Canada but it wasn't until the Second World War that Statistics Canada began to collect data showing the significance of the soybean crop, with 4,400 hectares being reported in 1941. In fact, one year later the area had jumped nearly fourfold, to 17,000 hectares. In 1943 a program aimed at actively breeding soybeans suitable for southern Ontario was initiated.

"During the Second World War, North American manufacturers used oil from soybeans not only as a food but also to produce a wide number of industrial products including glycerine for the manufacture of nitroglycerine used for explosives and ammunition.

"By 1951, 62,967 hectares had been planted with soybeans (Figure 1), but they were still mostly confined to southern Ontario, the region with the longest and warmest growing season in Canada" (p. 2).

"It wasn't until varieties with earlier maturity and improved tolerance of cooler climates were successfully developed–the 'Maple' series of soybean cultivars–that significant soybean production was pushed beyond southern Ontario. The 1976 release of the Maple Arrow variety in particular is credited with expanding the range of soybean production into eastern Ontario (Table 1)."

The "growth between 2001 and 2006 was particularly notable in the Prairie provinces, with Manitoba's soybean area increasing sevenfold to over 141,869 hectares and its more western neighbours, Saskatchewan and Alberta, beginning to actively pursue soybean production. These gains in area were the payoff from research aimed at finding and breeding soybean varieties suited to the Prairies as well as from crop promotion and market development" (p. 5).

"In the 2006 calendar year, farm cash receipts from soybeans amounted to $680 million in Canada, making it the fifth most valuable field crop, trailing canola ($2.5 billion), wheat ($1.8 billion excluding durum), potatoes ($899 million) and corn ($753 million). In Ontario, where it was also the most planted crop, it was the top crop in terms of farm cash receipts, at $547 million, eclipsing the receipts from corn ($449 million) and wheat ($275 million)" (p. 6).

"International trade contributed to the value of soybean receipts. Preliminary figures place soybean exports at over 40% (1.5 million tonnes) of the soybeans grown in Canada in the 2006 crop year (3.5 million tonnes).

"Of the four top buyers in 2006, Japan led the list, importing $138 million in Canadian soybeans, followed by Malaysia ($52 million), the Netherlands ($49 million) and Iran ($43 million). At the same time, Canada imported about 302,000 tonnes of soybeans valued at approximately $81 million, 99% of which came from the United States" (p. 7). Address: Statistics Canada.

11252. Willcox, Bradley J.; Willcox, D. Craig; Todoriki, H.; et al. 2007. Caloric restriction, the traditional Okinawan diet and healthy aging: the diet of the world's longest-lived people and its potential impact on morbidity and lifespan. *Annals of the New York Academy of Sciences* 1114:434-55. Oct. [70 ref]

• ***Summary:*** Table 1 (p. 443) shows the Okinawa's whole-population dietary intake for the year 1949. Notable is the high intake of vegetables, particularly sweet potatos and soy, as a principal protein.

Okinawans also had higher consumption of flavonoids–as in soy foods and Okinawan sweet potatoes.

Summary: Caloric restriction in humans, as in other animals, promotes healthy aging. Caloric restriction (CR) is the most robust and reproducible means of reducing age-related diseases and extending life span in short-lived

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animals such as rats, dogs, etc. This study shows the same is true of humans. Address: 1-2. Pacific Health Research Inst., 846 South Hotel Street, Suite 301, Honolulu, Hawaii 96813.

11253. *SoyaScan Notes.* 2007. Seattle's 2nd oldest Japanese newspaper: *Hokubei Jiji* (*The North American Times,* 1902-1942), and *Hokubei Hochi* (*The North American Post,* 1946-present [2007]) (Overview). Dec. 22. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** *Hokubei Jiji* (*The North American Times*) was founded in 1902. From no later than 1906 until it was forced to close in 1942, the newspaper's office was located at 215 5th Avenue South, in the future International District of Seattle. This paper was forced to close when Seattle's Japanese American community was forced away into internment camps during World War II. The last issue was published on 12 March 1942.

After a four-year suspension, on 5 June 1946, a Japanese newspaper was again published in Seattle. *Hokubei Hochi* (*The North American Post*) started as a weekly at 217 5th Avenue South. As of Dec. 2007 the *Hokubei Hochi* is published at 662½ S. Jackson St. in Seattle. Phone: 206-623-0100.

11254. Belleme, John; Belleme, Jan. 2007. Japanese foods that heal: Using traditional ingredients to promote health, longevity, and well-being. Tokyo, Rutland, Vermont, Singapore: Tuttle Publishing. 224 p. Illust. Index. 26 cm.
• ***Summary:*** On the dedication page is a portrait photo of Takamichi Onozaki. Contents: Pronunciation guide. Foreword, by Christina Pirela. Preface, by John and Jan Belleme. Introduction: Food is medicine. 1. Miso: A health secret to savor. 2. Toasted sesame oil: The cooking oil supreme. 3. Shoyu: King of condiments. 4. Tamari: Wheat-free soy sauce. 5. Amazake: Sweet ambrosia. 6. Kuzu: The wonder root. 7. Brown rice vinegar. 8. Shiitake: Miracle mushroom. 9. Brown rice malt syrup: Heavenly sweet water. 10. Umeboshi: Venerable pickled plumbs. 11. Mochi: Sweet rice cakes. 12. Noodles. 13. Tofu: The square egg. 14. Seitan: The vegetarian alternative. 15. Sea vegetables: Underwater harvest. 16. Mirin: Sweet rice wine. 17. Maitake: The king of mushrooms. 18. Japanese tea: A healthy tonic. Acknowledgments. Shopping resources. Glossary. Recipe index.

Note: Tuttle Publishing is an imprint of Periplus Editions (HK) Ltd., with editorial offices at 364 Innovation Dr., North Clarendon, Vermont, 05759. Address: P.O. Box 457, Saluda, North Carolina 28773.

11255. Meerak, Jomkhwan; Iida, H.; Watanabe, Y.; Miyashita, M.; Sato, H.; Nakagawa, Y.; Tahara, Y. 2007. Phylogeny of gamma-polyglutamic acid producing *Bacillus* strains isolated from fermented soybean foods manufactured in Asian countries. *J. of General and Applied Microbiology* (*Tokyo*) 53(6):315-23. Dec. [23 ref]
• ***Summary:*** Natto and closely related fermented soyfoods are made and consumed in many Asian countries. In this study, 34 *Bacillus* strains capable of producing gamma-polyglutamic acid (PGA) were isolated from natto and its relatives in mountainous areas of South Asia and Southeast Asia and from soils in Japan. This phylogenetic analysis shows the similarity among strains of *Bacillus subtilis* isolated from various sticky fermented soyfoods of Asia. This suggests that *B. subtilis* strains responsible for the fermentation of sticky Asian soyfoods might have originated from the same stock.

The foods examined include: Kinema from Darjeeling (West Bengal, India) and Dhankuta (Nepal). Thua-nao from Maehongsorn and Chiangmai, Thailand. Tan-douchi from Ruili, Yunnan province (near the border with Myanmar). Chungkuk jang from Taegu, Korea. Also, soil was examined from Hokkaido, Iwate, Nagano, and Yamagata, Japan. Address: 1-3, 7. Dep. of Applied Biological Chemistry, Faculty of Agriculture, Shizuoka Univ., Shizuoka 422-8529, Japan.

11256. **Product Name:** San-J Tamari Ginger Dressing.
Manufacturer's Name: San-J International, Inc.
Manufacturer's Address: 2880 Sprouse Dr., Richmond, VA 23231. Phone: 804-226-8333.
Date of Introduction: 2007.
Ingredients: Tamari Sesame: Water, tamari soy sauce (water, soybeans, salt, alcohol), rice vinegar, organic sugar, onion juice (onion juice, salt, natural flavors), sesame oil, ground sesame, arrowroot, whole sesame, white pepper. This product is made in a plant inspected by the Gluten-Free Certification Organization (www.gfco.org).
Wt/Vol., Packaging, Price: 8 fl. oz. (237 ml) glass bottle.
How Stored: Refrigerate after opening.
New Product–Documentation: Front and back label sent by Misako Binford of San-J. 2012. May 11. In an attached e-mail she says that this product was first sold in 2007. However the copyright on the back of each label is 2009– indicating that the label design was updated.

11257. Gill, Robin D. 2007. Cherry blossom epiphany: The poetry and philosophy of a flowering tree. Key Biscayne, Florida: Paraverse Press. 719 p. See p. 47. Index. 25 cm.
• ***Summary:*** The poem (p. 47 in Romanization) reads as follows:

"Niawashi ya.
"Mamenoko meshi ni.
"Sakura-gari."

Gill's translation: "Bean-flour rice / The perfect food for / Cherry hunting."

Gill's commentary: "The 'bean-flour' is *kinako,* roasted soybean flour with a slightly malty taste. Balls of rice (common picnic fare) may be dusted with it and some salty

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or sweet condiment. While rice is, by definition, fine food, this is a rustic way to eat it–compared to the fancy box lunches of the wealthy–suitable to the country Bashô was visiting and the sandy gold color of the flour would look good with pinkish petals."

11258. Kurihara, Harumi. 2007. Harumi's Japanese home cooking. 1st American ed. New York, NY: Home Books. A division of the Penguin Group (USA) Inc. 160 p. Illust. (color). No index. 26 cm.
• ***Summary:*** A translation of *Kurihara Harumi no japaniizu hoomu kukkingu.* One chapter is titled "Soup, eggs & tofu." The book (which is crippled by the lack of an index) contains 7 recipes for miso, 5 for tofu, 2 for teriyaki sauce, and 1 for edamame. Soy sauce is used as an ingredient in many recipes such as Chicken with soy and balsamic dressing. The short glossary mentions Kochujan (Korean miso).

Harumi Kurihara, a housewife, is Japan's most popular cooking expert. Her first book in English, *Harumi's Japanese Cooking* won the Gourmand World Cookbook award in 2004. Address: Japan.

11259. **Product Name:** Liquid nigari (Bittern).
Manufacturer's Name: Natural Import Co. (Importer). From Japan.
Manufacturer's Address: 9 Reed Street, Biltmore Village, NC 28803. Phone: 828-277-8870 or 1-800-324-1878.
Date of Introduction: 2008 February.
Ingredients: Seawater.
Wt/Vol., Packaging, Price: 5 oz plastic bottle or ½-gallon container.
How Stored: Shelf stable.
New Product–Documentation: Talk with Bruce Macdonald. 2008. July 1. His company began selling this product in Feb. 2008. They import it from Ishigaki Island, located 430 km southeast of Okinawa, Japan. The entire island, surrounded by pristine coral reefs, is a natural sanctuary and protected from development. It is registered for a "Ramsar Convention on Wetlands"–signed in Ramsar, Iran in 1971 for the conservation and wise use of wetlands. The company started making natural seasalt in 1996 with 5 staff members. They now have a staff of 20 people, all professional salt-masters. They pipe up the sea water in bamboo pipes from 20 meters depth in the midst of the coral reefs. Then they boil it slowly for 3 days until the density is 28%, which Ishigaki Seasalt starts to appear. During the drying process, which is patented, the temperature never exceeds 90ºC (below boiling). No refined salt or chemicals are added. From this the liquid nigari (called bittern) is made–but Bruce is not sure how. They are a environmental activist company. Long ago Bruce visited Robert Salazar, who made Muramoto seasalt; he put natural salt in a sack and let the nigari drip off.

A diagram from the company shows that the following steps are used in making sea salt and nigari: Sea water > filter > concentration > separation > natural sea salt goes off. Check density of liquid > Filter 100 mesh > weighing > packing in bottles. Note: This process could be reverse osmosis or ultrafiltration.

11260. Shurtleff, William; Aoyagi, Akiko. 2008. Le livre du tofu: La source de protéines de l'avenir–dès maintenant! [The book of tofu: Protein source of the future–now! Translated from the English by Nathalie Tremblay]. Varennes, Quebec, Canada: Éditions AdA Inc. 430 p. Illust. by Akiko Aoyagi. Index. Feb. 28 cm. [53 ref. Fre]
• ***Summary:*** Contents: Preface. Acknowledgements. Part I. Tofu: Food for mankind. 1. Protein East and West. 2. Tofu as a food. 3. Getting started. Our favorite tofu recipes (lists about 80 recipe names for each of the different types of tofu, plus soymilk, yuba, whole soybeans, gô, okara, and curds; very favorites that are also quick and easy to prepare are preceded by an asterisk).

Part II. Cooking with tofu: Recipes from East and West (500 recipes). 4. Soybeans: History, cooking with whole dry soybeans, roasted soybeans (*iri-mame*), fresh green soybeans (*edamame*), kinako (roasted full-fat soy flour), soybean sprouts (*daizu no moyashi*), natto (sticky fermented whole soybeans, with "gossamer threads"), tempeh (fermented soybean cakes), Hamanatto and Daitokuji natto (raisin-like natto), modern western soybean foods (natural soy flour [full-fat], soy granules, defatted soy flour and grits, soy protein concentrates, soy protein isolates, spun protein fibers, textured vegetable protein (TVP), soy oil products). 5. Gô (*purée de fèves de soya fraîches;* a thick white puree of well-soaked uncooked soybeans). 6. Okara or Unohana. 7. Curds and whey (*Caillé et petit-lait*). 8. Tofu (includes history, and preparatory techniques: Parboiling, draining, pressing {towel and fridge method, slanting press method, sliced tofu method}, squeezing, scrambling, reshaping, crumbling, grinding).

9. Deep-fried tofu (*Tofu frit*)*:* Thick agé or nama agé (*Agé épais {côtelettes de tofu frit}*), ganmo or ganmodoki (*burgers de tofu frit;* incl. *hiryozu / hirosu*), agé or aburagé (*pochettes de tofu frit;* incl. "Smoked tofu," p. 197). 10. Soymilk (*Lait de soya*). 11. Silken tofu (Kinugoshi ou tofu soyeux) ("*Kinu* means 'silk'; *kosu* means 'to strain'; well named, kinugoshi tofu has a texture so smooth that it seems to have been strained through silk"). 12. Grilled tofu (*Tofu grillé*). 13. Frozen and dried-frozen tofu (*Tofu surgelé et tofu surgelé séche*). 14. Yuba (incl. many meat alternatives such as Yuba mock broiled eels, Buddha's chicken, Buddha's ham, sausage). 15. Tofu and yuba in China, Taiwan, and Korea (incl. Savory tofu {*wu-hsiang kan*}*;* see p. 258 for illustrations of many meat alternatives, incl. Buddha's fish, chicken, drumsticks, and duck, plus vegetarian liver and tripe, molded pig's head, and molded ham). 16. Special tofu (*Tofu particuliers*).

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Part III–Japanese farmhouse tofu: Making tofu for more and more people. 17. The quest. 18. Making community tofu. 19. The traditional craftsman. 20. Making tofu in the traditional way. Appendices: A. Tofu restaurants in Japan (many are vegetarian). B. Tofu shops in the West (Directory of 43 shops in the USA, 3 in Europe {Germany, Austria, Belgium, Denmark, Finland, France, Ireland, Italy, Netherlands, Portugal, Spain, Switzerland, UK, Wales}, and 3 in Latin America {Brazil, Colombia, El Salvador, Guatemala, Mexico}). C. People and institutions connected with tofu. D. Table of equivalents. Bibliography. Glossary. Index. About the authors (autobiographical sketches; a photo shows Shurtleff and Aoyagi, and gives their address as New-Age Foods Study Center, 278-28 Higashi Oizumi, Nerima-ku, Tokyo, Japan 177). Sending tofu in the four directions.

Pudding recipes include: Rice pudding with gô and apple (p. 76, incl. 2 cups soymilk). Tofu chawan-mushi (p. 147; Steamed egg-vegetable custard with tofu). Tofu fruit whips (p. 148). Tofu rice pudding (p. 150, incl. 1 cup soymilk). Tofu custard pudding (p. 152). Soymilk custard pudding (p. 208). Brown rice pudding (p. 208, with 2 cups soymilk). Soymilk chawan-mushi (p. 209). Chawan-mushi with yuba (p. 249).

Dessert recipes include: Tofu whipped cream or yogurt (p. 148; resembles a pudding or parfait). Tofu ice cream (p. 149, with chilled tofu, honey, vanilla extract and salt). Banana-tofu milkshake (p. 149). Tofu cream cheese dessert balls (p. 149). Tofu icing (for cake, p. 149). Tofu cheesecake (p. 150). Tofu-pineapple sherbet (p. 151). Also: Soymilk yogurt (cultured, p. 205). Healthy banana milkshake (p. 206). On p. 160 is a recipe for "Mock tuna salad with deep fried tofu."

Note. This is the earliest French-language document seen (Sept. 2013) that mentions soy cream cheese (p. 125), which it calls *Fromage à la crème au tofu.* Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549 USA. Phone: 925-283-2991.

11261. Moskin, Julia. 2008. Yes, MSG: Monosodium glutamate never shook off its image problems, but these days its the secret behind spicy tuna rolls and Thai noodles. *New York Times.* March 5. p. D1, D5. Food section.

• ***Summary:*** The "Chinese restaurant syndrome" started in 1968 when a Chinese-American physician wrote a rather light-hearted letter to the *New England Journal of Medicine.* "He had experienced numbness, palpitations and weakness after eating in Chinese restaurants in the United States, and wondered whether the monosodium glutamate used by cooks here (and then rarely used by cooks in China) might be to blame.

"The consequences for the restaurant business, the food industry and American consumers were immediate and enormous. MSG, a common flavor enhancer and preservative used since the 1950s, was tagged as a toxin, removed from commercial baby food and generally driven underground by a new movement toward natural, whole foods."

In September 2008 the University of Tokyo will host the "centenary celebrations honoring Prof. Kikunae Ikeda's 1908 discovery of glutamate flavor"–umami. Ajinomoto, a Japanese company, transformed that flavor into a crystalline powder and patented it in 1909.

Contains two recipes that use MSG as an ingredient and a photo of many commercial products that contain MSG.

11262. Ishige, Naomichi. 2008. Re: Early history of tataki natto, itohiki natto, and natto-jiro in Edo city, Japan. Letter (e-mail) to William Shurtleff at Soyinfo Center, March 16. 2 p. [Eng]

• ***Summary:*** "Tataki natto is minced itohiki natto, chopped with a cooking knife.

"In about the 1830s, eating granulated [regular] itohiki natto started to become popular in central Edo city (today's Tokyo). When people had granulated itohiki natto, they stirred it and put it on hot rice with soy sauce. Before that period, itohiki natto was commonly eaten as natto-jiru, which was a kind of miso soup with tataki natto, greens, and tofu. Because of this eating style, peddlers started to sell tataki natto with greens and tofu so that people could make their own natto jiru more easily and inexpensively.

Note: This is the earliest English-language document seen (Jan. 2012) that mentions or describes "Tataki natto."

"Natto-jiru was the soup for the winter season. Starting in about the 1830s in Edo city, granulated [regular] itohiki natto began to be sold instead of tataki natto. Once people got familiar with eating granulated itohiki natto with soy sauce, peddlers started to sell itohiki natto even in the summer.

"In the well-known book *Morisada Mankô,* the author, KITAGAWA Morisada, compared the way of life in Edo, Kyoto, and Osaka in the late Edo period. He wrote that natto sellers disappeared from Kyoto and Osaka in the late Edo period. Thus, people who wanted to eat natto in the region needed to make it by themselves. Even now, although natto is popular in Kanto region, which developed around Edo city, people in Kansai region, to which Kyoto and Osaka belong, do not eat natto so much.

"I do not know any record by which the origin of tataki natto can be traced. However, it is thought that tataki natto was made from olden times as one of the basic ways of eating natto.

"Today, natto-jiru is not popular for Japanese, so tataki natto is usually not sold. If you want to have natto-jiru, you need to mince natto by yourself." Address: National Museum of Ethnology, Osaka, Japan.

11263. *SoyaScan Notes.* 2008. Dates of earliest documents seen that mention non-fermented soyfoods used as human food (Overview). March 17. Compiled by William Shurtleff

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of Soyinfo Center.

• ***Summary:*** Whole dry soybeans, ground or mashed to a paste after boiling, or ground raw with water to a fresh puree or slurry (Including Japanese *gô*)*:* 636 BCE–China.

Whole Dry Soybeans (Boiled): 360 BCE, China.
Soy sprouts: 100 CE (AD) China.
Tofu: 965 CE China.
Green vegetable soybeans or edamame: 1275 Japan.
Roasted soy flour: 1301 China.
Soymilk: 1866 France.

11264. Kikkoman International Inc. 2008. Kikkoman: Purely authentic. San Francisco, California. 4 panels each side. Front and back. Each panel: 28 x 21.6 cm

• ***Summary:*** On the cover is a color photo showing the following products: (1) Kikkoman Bread Crumbs (Panko). (2) Kikkoman Organic Soy Sauce and Tamari Soy Sauce. (3) Kikkoman Teriyaki (Original, or Spicy Miso; Takumi Collection). (4) Kikkoman Pearl Soymilk (Aseptic quarts; Organic Original, Organic Creamy Vanilla, Organic Green Tea, Organic Unsweetened, Organic Chocolate, and Nonorganic Tropical Delight–with 7 Juices). (5) Kikkoman Pearl Soymilk (Tetra Prisma Aseptic grab-n-go 8.25 oz packs; Organic Chocolate, Organic Green Tea, Organic Creamy Vanilla). (6) Kikkoman Black Bean Sauce, Hoisin Sauce, Thai Style Chili Sauce. Plum Sauce.

On the inside two pages are details about each of these products. On the rear panel is detailed information about the six flavors and two packages of Kikkoman Pearl Soymilk. Address: P.O. Box 420784, San Francisco, California 94142-0784. Phone: (415) 956-7750.

11265. Lee, Jennifer 8. 2008. The fortune cookie chronicles: Adventures in the world of Chinese food. New York, NY: Twelve (Hachette Book Group USA). x + 307 p. 24 cm. [75+ endnotes]

• ***Summary:*** Contents: Prologue. 1. American-born Chinese. 2. The menu wars. 3. A cookie wrapped in mystery inside an enigma. 4. The biggest culinary joke played by one culture on another. 5. The long march of General Tso. 6. The bean sprout people are in the same boat we are. 7. Why chow mein is the chosen food of the chosen people, or, The kosher duck scandal of 1989. 8. The Golden Venture: restaurant workers to go. 9. Take-out takeaways. 10. The oldest surviving fortune cookies in the world? 11. The mystery of the missing Chinese deliveryman. 12. The soy sauce trade dispute. 13. Waizhou, U.S.A. 14. The greatest Chinese restaurant in the world. 15. American stir-fry. 16. Tsujiura Senbei. 17. Open-source Chinese restaurants. 18. So what did Confucius really say?

The basic history: Fortune cookies were invented in Japan by the 1870s (they were called *Tsujira senbei*), then brought to California by Japanese immigrants. Before World War II they were called *senbei* and the fortunes were usually written in Japanese. Makoto Fujiwara served these senbei in 1894 in San Francisco at the Japanese Tea Garden (of which he was superintendent); it was built as part of the World's Fair, the Midwinter International Exposition. In San Francisco, there was a 9-fot fortune cookie manufacturing machine in the basement of Benkyodo, a Japanese sweets and food store still in operation.

Starting in early 1942, and during World War II, when basically all 110,000 West Coast Japanese were sent to internment camps, Chinese living in America took over the business of manufacturing fortune cookies (in Los Angeles and San Francisco)–in part because Chinese restaurants needed them. "By the 1940s English-language fortune cookies were already commonplace in Chinese restaurants in San Francisco and southern California. Historically, Chinese have never baked and are not known in the West for their desserts–which use little sugar and fat, but plenty of red [azuki] beans, lotus, peanuts, sesame seeds, soybeans and almonds. The Chinese built automated factories and when the Japanese were freed from the camps after the war, they were unable to get back into the industry. Today, the major fortune cookie manufacturing companies in the USA are owned and run by Chinese Americans.

Chapter 12 is about a company named Kari-Out, located in the quasi-industrial town of Totowa, New Jersey. Kari-Out–which was founded in the late 1960s by Howard Epstein, a Bronx-born businessman with a "passion for what he called 'small-unit packaging'"–makes the millions of tiny transparent packets of brown-black liquid that are distributed every year for free in Asian take-out meals and products (like ramen noodles). It is called "soy sauce" but its main ingredients are water, hydrolyzed vegetable protein, caramel coloring, and corn syrup. So, where's the soy? Asian manufacturers of traditional fermented soy sauce, in which soybeans are one of the main ingredients, have begun a global campaign to prevent products like that made by Kari-Out from being classified as "soy sauce." Through the government of Japan, they have submitted a proposal to the Codex Alimentarius Commission, the "forum for international food-definition battles." The Asian makers of soy sauce wanted to have soy sauce classified into four types: long-term brewed, short-term brewed, nonbrewed, and mixed. But the debate has heated up because La Choy, founded in America, also makes this same kind of HVP soy sauce. Suddenly the International Hydrolyzed Protein Council and the USDA were defending La Choy's HVP soy sauce. In the end, the Americans wrestled the definition of "soy sauce" away from the Asian makers. In 2005 the Japanese government quietly withdrew its proposal.

Note 1. From the publisher's description of this book: "If you think McDonald's is the most ubiquitous restaurant experience in America, consider that there are more Chinese restaurants in America than McDonalds, Burger Kings, and Wendy's combined. *New York Times* reporter and Chinese-

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American (or American-born Chinese). In her search, Jennifer 8. Lee traces the history of Chinese-American experience through the lens of the food. In a compelling blend of sociology and history, Jenny Lee exposes the indentured servitude Chinese restaurants expect from illegal immigrant chefs, investigates the relationship between Jews and Chinese food, and weaves a personal narrative about her own relationship with Chinese food. The Fortune Cookie Chronicles speaks to the immigrant experience as a whole, and the way it has shaped our country."

Note 2. The author was born in 1976. "Jennifer 8. Lee, the daughter of Chinese immigrants and a fluent speaker of Mandarin Chinese herself, grew up eating her mother's authentic Chinese food in her family's New York City kitchen before graduating from Harvard in 1999 with a degree in Applied Mathematics and economics and studying at Beijing University. At the age of 24, she was hired by the *New York Times,* where she is a metro reporter and has written a variety of stories on culture, poverty, and technology." A color photo on the rear dusk jacket shows Jennifer 8. Lee. Address: Harlem, Manhattan, New York City, New York.

11266. U.S. Soybean Export Council (USSEC). 2008. Members: As of May 1, 2008 (Web printout). http://www.asaim.org.tw/Membership.pdf. 3 p.
• ***Summary:*** Website: www.ussoyexports.org. Contents: Exporter class: Bartlett Grain Co. (Kansas City, MO [Missouri]). Blue Grass Farms of Ohio (Jeffersonville, OH). Brushvale Seed, Inc. (Breckenridge, MN [Minnesota]). CHS, Inc. Soy Flour Division (Mankato, MN). DeBruce Grain, Inc. (Kansas City, MO). The DeLong Company, Inc. (Clinton, WI [Wisconsin]). Grain Millers Specialty Products (Eden Prairie, MN). Jeneil Biotech, Inc. (Saukville, WI). Knewtson Soy Products LLP (Good Thunder, MN). Lansing Trade Group, LLC (Newark, OH). Latham Farms, LLC (Alexander, Iowa). Microsoy Corporation (Jefferson, IA). Midamar Corp. (Cedar Rapids, IA). Missouri Food & Fiber, Inc. (Harrisonville, MO). Northland Organic Food Corporation (St. Paul, MN). NeCo Seeds (Garden City, MO). Owensboro Grain Company (Owensboro, Kentucky). Perdue Agri Business, Grains & Oilseed Division LLC (Salisbury, Maryland). SB & B Foods, Inc. (Casselton, North Dakota). SunOpta Company (Sandusky, Michigan). The Scoular Company (Minneapolis, MN). The Seed Company (Lynnville, IA). SK Food International, Inc. (Fargo, North Dakota). Unity Seed Company (Casselton, ND). Address: 12125 Woodcrest Executive Drive, Suite 140 St. Louis, Missouri 63141. Phone: 314-985-0988 or 1-800-408-4993.

11267. Liu, KeShun. 2008. Food use of whole soybeans. In: Lawrence A. Johnson et al. eds. 2008. Soybeans: Chemistry, Production, Processing, and Utilization. Urbana, Illinois: AOCS Press. viii + 842 p. See p. 441-481. Chap. 14. [85 ref]
• ***Summary:*** Contents: Introduction. Non-fermented soyfoods: Soymilk (traditional soymilk, modern soymilk {techniques to reduce beany flavors, formulation and fortification, homogenization, thermal processing, and packaging}), tofu (preparation methods, factors involved in tofu-making {soybean varieties, storage and pretreatment, solids concentration, heating, type of coagulants, coagulant concentration, coagulation temperature, coagulation time, process automation, packaging}, varieties of tofu {silken tofu, regular and firm tofus, varieties of tofu products}), green vegetable soybeans, soybean sprouts, yuba, okara, roasted or cooked (boiled whole) soybeans.

Fermented soyfoods: Terms (Koji {fermentation, koji starter, inoculum}), fermented soy paste (preparation method {preparing rice koji, treating soybeans, mixing and mashing, fermenting, pasteurizing and packaging}, processing principles), soy sauce (preparation method {treating raw materials, koji making, brine fermentation, pressing, refining}, processing principles, chemical soy sauce), Japanese natto (preparation method, processing principles), Indonesia tempeh (processing method, processing principles), fermented soymilk, fermented tofu (preparation method, processing principles), fermented black soybeans (Chinese douchi, Japanese hamanatto). Conclusion.

Figures show: (1) Flowchart of a traditional Chinese method for making soymilk and tofu. (2) Photo of savory tofu dices. (3) Photo of soy sprouts. (4) Photo of yuba (soymilk film). (5) Photo of Chinese jiang and Japanese white and red miso. (6) Flow chart of a common method for making Japanese rice miso. (7) Photo of Japanese natto. (8) Flow chart of a traditional Indonesian method for making tempeh. (9) Photo of Chinese douchi (fermented black soybeans or fermented whole soybeans). Address: Research Chemist, U.S. Dep. of Agriculture, Agricultural Research Service, Grain Chemistry and Utilization Lab., Aberdeen, Idaho 83210.

11268. Ota, Eileen. 2008. Update on history of Ota Family Tofu in Portland, Oregon (Interview). *SoyaScan Notes.* June 30. Conducted by William Shurtleff of Soyinfo Center.
• ***Summary:*** Koichi "Ko" Ota is still the head tofu maker at Ota Family Tofu. He and Eileen were married in 1976, which is how Eileen got involved with and became an owner of this business, but later divorced. Ko's sister, who goes to Japan fairly often and keeps in touch with her father's part of the family (Isoshima), is interested in the history of Ota Tofu Co. She said that they never kept in contact with half of the family; that was the Ota family. She thought that maybe there was some kind of a stigma attached to them; maybe they had tuberculosis. She recalled to Eileen that after her mother (Matsuno) and father (Sokichi) came to the United States in the early 1950s, she remembers her parents in Japan renting an automobile and driving around to say farewell to everybody. The children got out everywhere except at the

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Ota residence; the children at that stop were made to stay in the car. She thought it may have been because they had tuberculosis.

Elsewhere Eileen has heard the story about someone connected with Ota Tofu dying or getting sick, one of the brothers went back to Japan.

Matsuno Ota was sent back to Japan for her education; she ended up getting a college education there. She married Sokichi Isoshima, who changed his name to Ota, in order to carry on the family name.

Who were the Ota brothers and when did they start to work at or own the tofu shop? In the *Hokubei Nenkan–North American Yearbook* (1913, p. 43) the names of the Ota brothers, Saizô and Heiji, are written in Japanese characters. No address is given, but the entry says they came from Okayama. A census record shows that Saizô came to the USA in 1905 from Okayama. It is clear from an ad dated 1 Jan. 1915 in *Oshû Nippô* (*The Oregon News*) (Portland, Oregon) that the Ota brothers owned the tofu shop at this time. But Eileen does not know when or why they left. It is also not clear who Saizo's parents were.

At some point Saizô and his wife, Shina, began to own and operate Ota Tofu Co.

Eileen's maiden name was Nishimoto. She was born in Portland after World War II, in 1949. She avoided the internment but her parents and elder brother did not. She finished college at the University of Oregon, majoring in Japanese language. However today she cannot read Japanese.

When Bill Shurtleff first contacted Eileen many years ago, he sent her three genealogy charts to fill out. At that point Eileen went to Ko's sister; they were unable to fill out all three charts, which stopped (going backwards) with Saizo's parents and with the two brothers who either started or owned the Ota Tofu Co.

The two places most interested in the history of Ota Tofu Co. are The Oregon Historical Society and the Oregon Nikkei Legacy Center. The legacy center may have interviewed Ko's mother, Matsuno Ota.

11269. Ito, Eiichi. 2008. Re: Looking for the Ota family Portland, Oregon, directories at the Library of Congress. Letter (e-mail) to William Shurtleff at Soyinfo Center, July 11. 1 p.

• ***Summary:*** Shurtleff asked Mr. Ito if he would look for the names Ota, Oha, and Nagoro in the *Japanese American Yearbook* (*Nichibei Nenkan*) and *Japanese American Directory* (*Nichibei Jushoroku*) in the section on Portland, Oregon, residential listings, for the years 1919, 1926, 1932, 1936, and 1941.

Mr. Ito writes that there are residential listings in Portland, Oregon, in all five editions (1919-1941) requested. However he did not find entries for Ota or Nagoro in any of these.

In addition, The Library of Congress' collection of the *Japanese American Yearbook* (*Nichibei Nenkan*) includes 1909-1910, and 1912-1916.

11270. Ota, Eileen. 2008. Re: More history of Ota Family Tofu in Portland, Oregon. Letter (e-mail) to William Shurtleff at Soyinfo Center, July 11. 1 p.

• ***Summary:*** "In answer to the question of the marriage of Saizo and Shina, Noriko Ota Okazaki, seemed quite certain that Saizo and Shina were married in Japan, as she recalled that Shina went to live with the Ohta family in Japan for a period of time. Perhaps Shina was not a "picture bride" as I would define it, but went through the traditional Japanese match-making process. Shina Ota and Saizo Ota are listed on a passenger list sailing from Yokohama, Japan on June 11, 1913. Her name is no longer Masuda, but Ota. From this, I would guess that Saizo may have returned to Japan to marry, and then returned to the US with his bride."

I do not know if the ONLC [Oregon Nikkei Legacy Center, in Portland] has Polk's [Portland directory], but they also sent me a page of the 1928 Census of the Japanese Population in Oregon. Please let me know if you are interested in receiving any of the pages the ONLC sent to me.

Amy Peterson works at the ONLC and is a subscriber to Ancestry.com. Amy, who provided the documents from Ancestry.com, said that Saizo and Shina may or may not have been married at the time of the 1913 ship's listing. According to her, in some cases women changed their names prior to boarding ships to come to the US. Amy also said that it was a common practice for marriages to take place in Seattle. So we are not yet sure where or when the marriage of Saizo and Shina took place.

11271. Yoshihara, Susan-Marie ["Lulu"]; Yoshihara, Yasuo ["Yoshi"]. 2008. Re: History of Shin-Mei-Do Miso Company. Letter to William Shurtleff at Soyinfo Center, Aug. 12. 3 p. Typed, with signature.

• ***Summary:*** "Dear Bill, In 1977 I met you and Akiko in Tokyo. Our miso making journey began a year before when I found "The Book of Miso" in Uwajima-ya department store in Seattle [Washington]. Your book, "The Book of Tofu," was already my favourite cookbook and I was looking forward to new culinary adventures. It may sound trite but what I found in the "The Book of Miso" literally changed my life.

"Inside the book was not only a wealth of miso lore and recipes, complete and detailed instructions for making miso at home and on a commercial scale were there in the back of the book, too. With this information I knew that our family could set up our own miso business.

"In 1976 we had just moved to rural Denman Island but still had no idea of how we would make our living. My husband, Yoshi, was from a Japanese farm family and he remembered how his family had made miso at home every

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fall. But he was only a child then and knew only some of the details involved. Nevertheless, we were interested and in the fall of 1977, accompanied by our 4 year old son, I went to Japan.

"Thanks to an amazing bit of luck I received an introduction to Yaeko Nakata, sister of the president of Maruman Miso Company in Nagano prefecture. Ms. Nakata was in charge of the hand-made division of the company. She and miso maker Chisato Kobayashi allowed me to observe and participate in the koji making process. Because I was able to experience the making of koji, so crucial to the making of good miso, I felt that Yoshi and I would be able to succeed in miso making.

Note: Susan-Marie arrived in Japan in Oct. 1977 and was there until the end of February 1978–about 5 months. Thus, she was the first Caucasian and the first Westerner to travel to Japan with the specific goal of making miso commercially in the North America or Europe. She got very little support from anyone in the beginning. The trip was funded in part by money she had earned from planting trees for two weeks on Vancouver Island. "Most folks in Japan and Canada probably thought I was out of my mind to try to make miso in Canada." Yet without her struggle and her hands-on experience, the miso business in Canada could never have existed. On this trip she was accompanied by the now famous Japanese photographer, Mr. Ryuji Miyamoto.

"With very little capital but with youth and enthusiasm on our side we started work. It was 1979 and we had a 5 year old and a new baby boy. We made our first few batches in a woodshed. Our beans and grains were steamed in ½ whiskey barrels over a wood fire in a maple syrup cooker that we found in an antiques store. The upper part of our 10 acre property had been clear-cut some years before we bought it, so Yoshi used the logging slash to stoke the fires.

"That summer we built a new building. About once a month Yoshi drove our little red Datsun pickup truck to Vancouver where he bought sea salt and organically grown rice and soybeans. He also bought large oak barrels from Sweeney Cooperage in Vancouver. Two of the barrels could just squeeze into the back of the pickup and the bags of salt and grains and soybeans fit inside the barrels.

"We had no machines–no grinder, no mixer. Using a ½ barrel and a special pair of clean new gum boots, Yoshi and I took turns smashing cooked soybeans while the other poured in the salted koji and turned the miso-to-be with an extra large rice paddle that Yoshi carved from Douglas fir. Often one of us was carrying the baby on our back. Our elder son played in the shop while we worked. Over about 3 years we made 22 tons of miso that way.

"Did I tell you that Yoshi's first carpentry project ever was to build the koji incubation room in the woodshed? Our neighbours made the koji boxes from red alder wood and those boxes are still in good condition, nearly 30 years later.

"It is amazing what you can do when you are young, healthy, idealistic and ignorant! Even so, we realized soon enough that we'd have to have mechanical help to make a living. In 1982 we built an addition to the building and added 8 large wooden tanks from Arrow Tank Company of Buffalo, New York. By that time Sweeney Cooperage had already been torn down for Expo 86 in Vancouver. We also imported a miso mixing machine from Japan and bought a used grinder. A neighbour helped us set up a low pressure steam boiler by adapting a wood-fired house furnace. Used stainless steel steam kettles completed the production equipment.

"Every summer Yoshi bucked, split and stacked firewood for the boiler. He made an extra long wooden spoon to harvest the finished miso from the large tanks. He packed the miso by hand no matter how hot or cold the weather was. Only the koji incubation room was heated, yet even in mid-winter Yoshi stood there at the packaging table for hours in the freezing cold. Yoshi is very strong and fit for a man his age.

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"In September of 2006 Yoshi broke his collarbone in a bicycle accident. It never healed properly. In the meantime the cost of doing business had gone up incredibly. Ferry fares to the islands more than doubled. In 2008 we decided to retire and shut down our business after producing 220 tons of miso in nearly 30 years of business.

"If you would like to know more about how we made miso please don't hesitate to contact us. We are enclosing newspaper articles, 9 photographs and captions that explain them. Please keep these copies as we have backup copies of them.

"Sincerely,..." "

Photos (mostly black and white) accompanying this letter show: (1) Susan-Marie learning koji making at Maruman Miso in Iida, City, Nagano prefecture, Japan. Feb. 1978. Photo by Mori Akiko of Sankei Shinbun.

(2) Susan-Marie helping Mr. Chisato Kobayashi carry grain to the steamer. Same date, place, and photographer as No. 1.

(3) Susan-Marie crushing cooked soybeans underfoot to make miso, 1979, Denman Island, at Shin-Mei-Do Miso Co. Photo by Yasuo Yoshihara.

(4) Steaming soybeans using an old cast-iron, wood-fired, maple-syrup boiler, April 1979. Photo by Yasuo.

(5) Yasuo and baby Tomoe by the steamer, April 1970. Photo by Susan-Marie.

(6) Yasuo and Susan-Marie in the new miso shop, on their same property, 1983, Denman Island.

(7) The new miso shop and new equipment, 1983.

(8) Miso license plate, 1984, Denman Island.

(9) Yasuo and Susan-Marie with Arrow Tanks, 1986, Denman Island (color).

(10) Yasuo moving a large stone. Address: Shin-Mei-Do Miso Co., 3906 Wren Rd., Denman Island, BC, Canada, V0R 1T0. Phone: 250-335-0253.

11272. Chie no Kai. ed. 2008. Kyô no rekishi, bungaku o aruku [Walking through the history and literature of Kyoto]. Tokyo Japan: Bensei Shuppan. 314 p. See p. 61. [Jap]*
• ***Summary:*** Page 61: Early books about natto are *Shinsaru gakuki,* written by Fujiwara no Akihira in the middle of Heian period, *Oojorôu onna no koto,* written in the end of Muromachi period, and *Oyudono no ue no Nikki.*

Note: The Heian period in Japan lasted from AD 794 to 1185. The Muromachi period lasted from 1336 to 1573. The capital was Kyoto and the ruler was a shogun. Address: Japan.

11273. Kikkoman Corporation. 2008. Annual report 2008. Year ended March 31, 2008. 250 Noda, Noda-shi, Chiba 278-8601, Japan. 41 p. 28 cm. [Eng]
• ***Summary:*** Consolidated net sales rose 5.4% to $4.139 billion, operating income climbed 10.2% to $238.5 million, and net income rose 6.6% to $114.4 million. "Sales growth was hampered, however, by lackluster performance from Kibun Food Chemifa's soy milk drinks." Note: Dollar values may have changed at different percentage rates due to changing foreign exchange rates.

Page 1 is titled "Kikkoman Group global launch of new corporate brand logo and slogan. Written in orange, it is: "kikkoman: season your life." Above and to the right of the word "kikkoman" is the old hexagonal Kikkoman logo with the Japanese character meaning "man = 10,000" inside. "Kikkoman introduced its previous corporate logo in the Japanese market in 1987. In the two decades since then, Kikkoman has steadily globalized its operations and generates half of its operating profit in markets outside Japan." The new corporate brand logo represents the Group's "determination to harness both tradition and innovation in its business activities."

A photo (p. 7) shows Yuzaburo Mogi (Chairman of the Board and CEO) and Mitsuo Someya (President and COO).

Pages 8-9 show color photos of Japanese soy sauce products including *Tokusen Marudaizu Shoyu* (Premium shoyu made from whole soybeans–rather than the usual defatted soybean meal) and *Tokusen Yuki Shoyu* (Premium organic shoyu, certified by Japanese Agricultural Standards, JAS). Address: Noda, Japan.

11274. Kaplan, Lawrence. 2008. Legumes in the history of human nutrition. In: Christine M. Du Bois, C.-B. Tan, and S.W. Mintz, eds. 2008. Urbana, Illinois: University of Illinois Press. viii + 337 p. See p. 27-44. [40 ref]
• ***Summary:*** Contents: Introduction. Legumes in early prehistoric nutrition. Food grain legumes native to the Americas: Radiocarbon dating, beans in American archaeology, history and protein structure. The Near Eastern pulses: The classical texts, the broad bean (*Vicia faba*), lentil, pea, chickpea. The Asiatic and African pulses: Cowpea (*Vigna unguiculata* subspecies *unguiculata*), yard-long or asparagus bean (*Vigna unguiculata* subspecies *sesquipedalis*), mung bean or green gram (*Vigna radiata*), black gram (*Vigna mungo*), adzuki bean black gram (*Vigna angularis*). Note.

Throughout the world and throughout history legumes accompany cereal grains as primary components of human diets. "So pervasive is the combination of the combination of these complimentary food resources that they are often assumed to have been combined since the very beginnings of agriculture." In developing countries, "the proportion of protein derived from pulses appears to be in steady decline."

"Soy consumption is highest in industrialized, technologically developed Japan and the Republic of Korea [South Korea] (supply per capita per year of 7.53 kg and 8.10 kg, respectively) because of its central role in the traditional diet of these countries." Address: Emeritus Prof. of Biology, Univ. of Massachusetts, and former editor of the journal *Economic Botany*.

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11275. *Organic and Non-GMO Report* (*The*) (*Fairfield, Iowa*). 2008. Monsanto sale of rBGH called a major milestone. 8(8):4-5. Sept.
• ***Summary:*** Monsanto announced that it has agreed to sell Posilac, its bovine growth hormone, to Eli Lilly and Co. for $300 million. The drug has failed to be approved in Canada, the European Union, Japan, Australia, and New Zealand. Milk "from cows injected with rBGH contains high levels of insulin growth factor-1 (IGF-1), a hormone that is linked to prostate and colon cancer."

11276. Osborn, Donald Z. 2008. Soybeans and soybean products in West Africa: Adoption by farmers and adaptation to foodways. In: Christine M. Du Bois, C.-B. Tan, and S.W. Mintz, eds. 2008. Urbana, Illinois: University of Illinois Press. viii + 337 p. See p. 276-297. [48 ref]
• ***Summary:*** Contents: Introduction. History. Growing soybeans in Africa. Soybeans as food. Soybeans for *Daddawa.* Bean curd. Soybeans and bean curd in Niger. Other local uses. Conclusion. Notes.

A table (p. 277) shows the earliest documentation of soyfoods in West African countries. For each country is given the year first noted and the source. The countries (listed alphabetically) are: Benin, Burkina Faso (former Upper Volta), Cameroon, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo. Note: Most of these dates and sources are identical to those published earlier in: Shurtleff, W.; Aoyagi, A. 1997. *Soy in Africa: Bibliography and Sourcebook, 1857-1997.* Lafayette, California. Soyfoods Center.

The section on "daddawa" is very interesting and well annotated. "One relatively early and by now fairly common adaptation of soybeans to local foodways in West Africa has been its use as a substitute for seeds of the *nèrè,* or African locust bean tree (*Parkia biglobosa*)." The resulting condiment is known as daddawa (or dawa-dawa) in Hausa, *sumbala* in the Mande languages, and *iru* in Yoruba. The physical form of daddawa may appear as a small ball, a patty, or a cluster of ripened beans, "but it is always black in color and has a very pungent odor." The product is traded widely from the areas of production. For example, some of the daddawa sold in markets in Niger was made in Nigeria. Making daddawa is traditionally a woman's work; it is relatively labor intensive and consumes significant amounts firewood [which in many areas is increasingly scarce].

The section titled "Bean curd" notes that a milestone in the effort to introduce tofu to West Africa took place when Osamu Nakayama, a soyfoods expert, was brought to Nigeria by the Japanese International Cooperation Agency (JICA) in 1989-91 to work with IITA in Ibadan. Working with local people, he saw the potential for making *wagashi* (also called *wara* in Yoruba [or *warangashi* in northern Benin]) the West African name of a soft unripened dairy cheese, from soybeans, curded with the traditional coagulant–the sap of the giant milkweed or Sodom apple tree (*Calotropis procera*). It took Nakayama six months of research to figure out how best to use the traditional African coagulant with soymilk. The resulting product is said to resemble the West African dairy cheese more than Asian tofu, yet it readily found its place as a substitute for the former. "It compared well with the cheese in flavor and texture, but had the important advantage of being much less expensive to produce."

In the decade that followed, the making of African-style tofu spread largely on its own through the north of Nigeria and across the border into Niger, becoming an important new source of income for many women. As it spread, new soymilk coagulants "were identified by local producers, notably water in which tamarind fruit had been left to soak and water from rinsing pounded pearl millet, left overnight" to sour.

The section titled "Soybeans and bean curd in Niger" begins: "Soybeans have been subject to a limited amount of agronomic research in Niger and are not produced in any significant amount." Note: This implies that soybeans have been cultivated in Niger, although in small amounts. Endnote 14 states that there have been some ongoing soybean trials in the southern part of the Dosso region.

According to American Peace Corps volunteers, tofu started to be made in about the year 2000 in the southern parts of the Zinder and Maradi regions. Since that time, tofu has been made and marketed in Niger using soybeans brought in from Nigeria, in many villages, towns, and markets, mainly in the Hausa-speaking north-central part of Niger. In 2001 it was possible to find tofu in the weekly markets of local villages in these areas, fried and sold with hot red pepper spice. "By 2002 it was more ready available in the cities of Zinder and Maradi and was produced in Birnin'Konni in the Tahoua region. By 2003 it was available in Gaya, and by midyear it was also available in Dosso town in the Dosso region."

Like the soybean used, tofu making clearly spread along the Hausa networks that cross the border. It seems significant that the Hausa names for tofu differ between Zinder and Maradi [in south central Niger] on the one hand, where a loanword from Yoruba–*awara*–is used, and Birnin'Konni [in southwestern Niger] on the other hand, where the term used is *kwai-da-kwai,* suggesting a comparison with the texture of eggs. This suggests that different networks within the larger Hausaphone area were involved the transmitting the process for making tofu.

In Niger, making tofu is a small home-scale activity. The women who make it usually do so to coincide with weekly rural markets or, if in larger towns, several times a week or even daily to fill the demand. Three curding agents are used. Four photos show tofu being made by an African woman

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in the village Guiddan Iddar, Niger, West Africa. Address: Former assoc. director for agriculture with the Peace Corps in Niger.

11277. Ozeki, Erino. 2008. Fermented soybean products and Japanese standard taste. In: Christine M. Du Bois, C.-B. Tan, and S.W. Mintz, eds. 2008. Urbana, Illinois: University of Illinois Press. viii + 337 p. See p. 144-160. [26 ref]
• ***Summary:*** Contents: Standard taste as a cultural model. Standard taste–the Japanese case. Origin of the components. The persistent nature of the standard taste. Ongoing and prospective changes. Address: Osaka International Univ., Japan, Assoc. Prof. of Anthropology.

11278. McMullen, Michelle. 2008. Needed: Consistent non-GM soybean supply from Canada. *Ontario Soybean Growers' Update.* Oct. p. 1.
• ***Summary:*** "The Canadian Soybean Council's (CSC) 2008 incoming mission of Japanese buyers emphasized the importance of Canada's continued commitment to producing quality non-GM soybeans. Tsuento Sasaki, Trade Commissioner from the Canadian Embassy in Tokyo, joined the mission. Japan is Canada's largest market for food-grade soybeans.

"The group unanimously said that Japan's consumers will continue to demand non-GM food products. This presents a tremendous opportunity for Canada to increase its share of the Japanese market, as other non-GM soybean producing countries are unable to meet the demand.

"'The Japanese market is confident in Canada's ability to produce a quality, segregated non-GM soybean product,' says Jim Gowland, CSC Chair. 'Japanese soyfood manufacturers are now looking to Canada to be a consistent supplier of non-GM soybeans.'

"Japan continues to be Canada's largest importer of IP (identity preserved) non-GM soybeans. Nearly 100% of Canada's exports are non-GM for the food market. In 2007, Japan's total soybean imports totaled 4.16 million tonnes (metric tons), and Canada accounted for 7% of that amount. Of that 2007 total, approximately 1 million tonnes were for food uses.

"'Companies from across Japan are concerned about their ability to source non-GM soybeans in the future and are offering attractive premiums to producers for the extra work associated with growing IP soybeans,' says Gowland. 'Skilled, innovative Canadian soybean producers are needed to help meet the demand of markets such as Japan.'"

A photo shows a team of about five Japanese soy food manufacturers examining Ontario soybeans growing on a farm in September. "Ontario soybeans are the basis for Japan's highest quality tofu and miso products." Address: Canadian Soybean Council Manager.

11279. *Organic and Non-GMO Report* (*The*) (*Fairfield, Iowa*). 2008. Japanese company to triple non-GMO soy production in Canada: Market news. 8(9):9. Oct.
• ***Summary:*** In a few years, Kanematsu Corporation (Japan) plans to triple planting of non-GMO (not genetically engineered) soybeans for food use on 50,000 acres on Prince Edward Island, Canada.

Next year, PEI's soybean production is expected to be 15,000 metric tons grown on 15,000 acres–all for shipment to Japan. PEI farmers are shifting to growing organic soybeans from potatoes, which require high pesticide use and are less profitable due to falling demand.

Japanese makers of tofu, soy sauce, and other food processors use about 1 million tons a year of non-GE soybeans from overseas in addition to domestic organic soybeans. Kanematsu provides about 10% of those non-GE imports.

11280. *Nichi Bei Times* (*Japanese American News*). 2008. Nattô kigyô ga kitaka ni shinshutsu: "Tezukuri Nattô." Sonoma-gun, Sebasutopooru: Shinsensa o "uri" ni jimichi na katsudô o [A natto business has recently started in Northern California: "Handmade Natto." Sonoma County, Sebastopol: Selling freshness through slow and steady hard work]. Nov. 22. No. 16,705. p. 10. [Jap]
• ***Summary:*** This is coverage of an event held by Japan Traditional Foods (makers of Tezukuri Natto) at De Loach Vineyard, Santa Rosa, California, on 15 Nov. 2008. Photos show: (1) Close-up of two packages of Tezukuri Natto ["Handmade Natto"]. (2) Small mounds of Tezukuri Natto on a tray for tasting with a small wooden "food pick" stuck in each. Address: California.

11281. *BaySpo: The Japanese Weekly Entertainment Paper* (*San Francisco Bay Area*). 2008. Sendo batsugun no "Tezukuri Nattô" hanbai kaishi: Japan Traditional Foods ["Handmade Natto," with superb freshness, starts to be sold: Japan Traditional Foods]. Nov. 28. No. 1047. [Jap]
• ***Summary:*** This is coverage of an event held by Japan Traditional Foods (makers of Tezukuri Natto) at De Loach Vineyard, Santa Rosa, California, on 15 Nov. 2008. Photos show: (1) Packages of Tezukuri Natto. (2) Dishes containing natto on a table. Address: California.

11282. *Hokubei Mainichi News* (*San Francisco, California*). 2008. Sebastoporu de seisan kodawari no nattô: JTF–"Hontô no mono ajiwatte" [Made in Sebastopol, California, natto with attention to details: JTF–"Let's enjoy the taste of the real thing"]. Nov. 28. p. 2. [Jap]
• ***Summary:*** This is coverage of an event held by Japan Traditional Foods (makers of Tezukuri Natto) at De Loach Vineyard, Santa Rosa, California, on 15 Nov. 2008. Photos show: (1) Close-up of two packages of Tezukuri Natto ["Handmade Natto"]. (2) JTF's president Minami Satoh standing beside JTF's vice-president Shun Takahashi. Both

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are dressed in traditional Japan clothing.

11283. *Sports J* (*San Francisco Bay Area*). 2008. Amerika de honmono no nattô o: Japan Toradishonaru Fûzu no "Nattô Preview Party" [Real natto is now made in America: Japan Traditional Foods "Natto Preview Party"]. Nov. 28. No. 548. p. 13. [Jap]
• ***Summary:*** In the section titled "Bayarea Restaurant Guide" is coverage of an event held by Japan Traditional Foods (makers of Tezukuri Natto) at De Loach Vineyard, Santa Rosa, California, on 15 Nov. 2008. Three photos. One shows Minami Satoh standing. Address: California.

11284. Lyddon, Chris. 2008. Global grain trade review: Volatility the dominant factor in the 'wildest 12 month history of the grain market.' *World Grain* 26(11):26-33. Nov.
• ***Summary:*** A table titled "Global grain trade activity (in 1,000 tonnes)" gives the following statistics for soybeans: 2007-08 Top exporters: 1. United States 31,434. 2. Brazil 25,500. 3. Argentina 13,500. 4. Paraguay 5,080. 5. Canada 1,825. World total 78,968 (+15% over last year).

Top soybean importers: China 36,500. E.U.-27 15,400. 3. Japan 4,050. 4. Mexico 3,750. 5. Argentina 2,950.

Also gives the top 5 importers and exporters of soybean meal for 2007-08. Exporters include: 4. India 4,850. 5. Paraguay 1,112. World total 56,2062 (+6%). Top importers: 1. E.U.-27 23,900. 2. Indonesia 2,400. 3. Vietnam 2,400. 4. Thailand 1,950. 5. Korea 1,835.

Various factors have been cited as the cause of this volatility: (1) Energy policy–using maize, rapeseed, and soybeans to make biofuels. (2) Commodity speculators–who can make prices rise faster than they would otherwise. (3) Hedge fund position limits. (4) Government intervention by embargoes and export taxes. (5) The low value of the U.S. dollar. (6) The long term trend (spanning about 15 years) of declining wheat acres. (7) Fundamentally tight stocks. (8) Disruption of supply by things like floods. Address: European editor; chris.lyddon@ntlworld.com.

11285. Sosland, Morton I. 2008. Consequences from growing wheat in foreign countries. *World Grain* 26(11):6. Nov.
• ***Summary:*** In 1973, when Richard Nixon was president of the U.S., soaring grain and soybean prices "prompted him to impose an embargo on U.S. soybean shipments. This controversial move led Japan, as a major importer of U.S. soybeans, to foster production of this crop in Argentina and Brazil."

This was an early example of "contract production," which is now looming as one of the more controversial issues facing the global grain industry. Saudi Arabia, for example, trying to secure its food supply, is seeking to purchase cropland in lots no smaller than 250,000 acres in countries like Sudan, Ethiopia, Kazakhstan, and Libya. Some have decried this as "Neo-colonialism," since the land will be used to grow crops for export, regardless of the food supply in the area where the crops are grown. Address: Editor-in-chief.

11286. Sudiarno, Tarko. 2008. Rustono: King of tempeh in Kyoto. *Jakarta Post* (*The*) (*Indonesia*). Dec. 1. www.thejakartapost.com /news/2008/12/01 /rustono-king- tempeh-kyoto.html.
• ***Summary:*** A color photo shows Rustono looking very happy and standing next to a tempeh making machine that he ordered from Bantul, Yogyakarta. Rustono, age 40 was born in Purwodadi, Central Java, Indonesia. He now lives in a Japanese village about an hour's drive from, Kyoto, Japan, with his wife and their two children. He likes living there, and finds the people friendly, just like villagers in Java.

Previously a bellboy for a star-rated hotel in Yogyakarta, he now has about 350 tempeh customers in Japan. One winter, in the snow, he and his wife built their own tempeh factory, 4 by 8 meters. Some 60% of his customers are Japanese. Address: Staff writer, Japan.

11287. Welters, Sjon. 2008. Re: History of work with amazake. Letter (e-mail) to William Shurtleff at Soyinfo Center, Dec. 17–in reply to specific questions. 4 p. 28 cm.
• ***Summary:*** "When I started to study macrobiotics in 1973 in The Netherlands I became aware of a product called amazake. It was not for sale at the time in The Netherlands. I learned how to make it, using koji, from cooking classes at the [macrobiotic] East West Center in Amsterdam. We always used Cold Mountain Koji, made and sold by Miyako Oriental Foods (owned by Mutual Trading Co.) in Los Angeles. We made a few gallons of amazake a week initially. I did not do much with it, aside from teaching how to make it during cooking classes I gave all over the Netherlands from 1977-1983. When I went to the USA in 1980 I saw the Mitoku pouch pack amazake from Japan."

Q: When and where and why did you start making and selling amazake? Ans: "In Alkmaar [a city in The Netherlands in the province of Noord Holland] we had a natural food store and restaurant between 1977 and 1983, and made amazake from koji imported from Japan. We made desserts with it and experimented with making our own sake and miso with the koji. It was just a fascinating sweetener and food that I loved from the first day I tasted it.

"In late 1982 I started to experiment with making my own domestic kind of amazake. But I did not use koji because it was expensive, foreign, and hard to get. So I used sprouted wheat and barley at first, but did not like the aftertaste the hulls of the grains gave. I then started to work with pure enzymes that I got from a European enzyme company; bacterial and fungal amylase and other enzymes, that worked well. I continued to make it off and on, with koji or enzymes, for home use but did not sell the koji-made

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amazake commercially until many years later.

"I took this knowledge and the enzymes to the USA when we emigrated to Fayetteville, Arkansas, in October of 1983, where I continued to experiment using enzymes from American companies. I told Joel Wollner, an old friend of mine and the reason we ended up in Arkansas, about my work with amazake and enzymes. During the winter of 1983-84 we came up with a plan to start a company that would produce (among other things) seitan, of which we would use its by-product, the starch, as the raw ingredient for an amazake-like product. Bob Kennedy, owner of the Chico-San rice cake company, who's company was also making rice syrup using enzymes at the time, was approached as a possible financier. He came to Fayetteville to talk and I eventually ended up at his rice syrup plant looking at ways to improve the process and see if we could work together. Nothing came of this however, as Chico-San got sold to Heinz shortly thereafter and I moved to Massachusetts and became a partner in Nasoya [a company that made tofu].

"(Note on the side: Joel took Bob to a facility of the University of Arkansas where they were shown UA's work on a "pounded sweet glutinous rice food," they, according to Joel, being totally oblivious to the fact that such a product already existed in Japan.)

"However, during our time in Arkansas, the founders of Rice Dream (Robert Nissenbaum and Ken Becker) were running experiments while they were living at an intentional community [Moniteau Farm] north of us in Jamestown, Missouri, trying to figure out how to make amazake ice cream. They were stuck with koji as being an ineffective and expensive way of turning this big kettle full of cooked brown rice into a sweet base for their rice ice cream. Joel and I visited them there and saw what they were doing. Afterward Joel continued his contact with Chico-San and spoke to Peter Milbury (who after Chico-San's sale, started to to work for Lundberg Farms) there about my experiments with enzymes. The word was out and no sooner Robert and Ken started to experiment with enzymes, too. They eventually developed what we now know as Rice Dream, the non dairy ice cream, and Rice Dream the drink, both amazake-inspired products widely available in the US.

"In about 1993, while working in Aveline Kushi's sushi restaurant in Stockbridge, Massachusetts, I learned that Mutual Trading Company had a branch in New York, and that they sold Cold Mountain koji–although I think it was still made in California.

"In 1997 we started our restaurant in the back of State Street Market at 20 State Street, Montpelier, Vermont. It was named 'The Wrap' until April 2002, when the name was changed to 'Rhapsody,' the present name. We started making and selling amazake at the same time we opened the restaurant. Although this amazake was unflavored it was naturally fortified with kombu–just like Eden soymilk. It was sold in 12 fl. oz. plastic bottles in the natural food store cooler, without a label on the bottle; the label or sign was on the shelf just below the bottles.

On 3 May 2002 we expanded into our own restaurant at 28 Main Street in Montpelier, and changed our name to "Rhapsody" from "The Wrap." In early 2003 we introduced three flavors of amazake in larger (16 fl. oz.) plastic bottles and discontinued the original amazake fortified with kombu. These had nice color labels and were sold in our cooler.

"Currently one of our people at Rhapsody makes about 80 pints per week in our restaurant kitchen, but the demand is much higher. We are just not set up yet to produce more. We cook the amazake and bottle it hot and freeze it to give it its shelf life of one year (at least). Refrigerated it lasts about 3 weeks. Hopefully somewhere in 2009 we will be able to produce at least enough for the New England market.

"Our restaurant, Rhapsody, is self-serve. Therefore, our amazake is not on our menu (we have no menu) and we do not serve it (hot or cold) in cups to people as they are dining. Rather, we sell it as a drink from our beverage cooler (three flavors: I will send you the labels) for $3.50 per pint, and to stores in Central Vermont. Recently Associated Buyers of Barrington, New Hampshire, has started to distribute the products, too. It is a special, yet exclusive product that deserves wider acceptance, which will come over time as people will start to embrace a more natural diet. I'd be happy to assist the regional development of amazake production.

"The Bridge of Connecticut sells their original amazake in Whole Foods in the Boston area. Charlie Kendall stopped making it as far as I know quite a while ago."

Note: Sjon has never learned how to make koji starter, so he has always had to buy ready-made koji for his amazake. Address: Founder and owner, Rhapsody, 28 Main St., Montpelier, Vermont 05062. Phone: 802-229-6112.

11288. Keene, Donald. 2008. Chronicles of my life: an American in the heart of Japan. New York, NY: Columbia University Press. 196 p. Illust. (by Akira Yamaguchi, some color). 22 cm.

• ***Summary:*** Japanese, even taxi drivers, often start a conversation by asking me which Japanese foods I dislike. They seem disappointed when I say I like sashimi. "But they persist, asking next about *natto* (fermented soybeans), and if I say I eat *natto*, they ask in desperation if I eat *shiokara* (salted fish guts)..." (p. 11).

"Miso soup" is mentioned on pages 178 ("I enjoy a bowl of miso soup once in a while...") and 180.

A large photo (facing the title page) shows Donald Kenne at the grave of Matsuo Basho (1644-1694), the great Japanese haiku poet, at the Temple at Otsu, Shiga, Japan. Address: Japan.

11289. Kitahara, Aiko. 2008. The budding tree: six stories of love in Edo. Translated from the Japanese by Ian MacDonald. Champaign, Illinois: Dalkey Archive Press. 170

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p. See p. 17. 24 cm.
• ***Summary:*** In the first chapter, titled "Love's chill wind," we learn about Hagino, a young unmarried woman (p. 17): "She had at last reached the point where her little school was growing. In the past, when she'd had fewer students by the year, she's had to dip into the meager savings that her father had left her in order to pay the rent. When the savings had run out, she's staved off hunger for a while by eating tofu lees [okara]. Yet she had refused to close the school..."

This is a novel, originally published in Japanese as *Koiwasuregusa* by Bungei Shunju, Tokyo. "In the latter half of the Edo period [Tokugawa period], the warrior caste was finding itself pushed out of the top echelons of Japanese society & repeated famines swept the countryside. Against this backdrop, a small number of women built themselves independent lives. The stories in this book recount the conditions in which these women lived" (Publisher's description).

11290. Kiuchi, Kan; Nagai, Toshirô; Kimura, Keitarô. eds. 2008. Nattô no kagaku: Saishin jôhô ni yoru sôgôteki kôsatsu [The science of natto: A comprehensive examination of the latest information]. Tokyo: Kenpakusha. viii + 285 p. Index. 22 cm. [50+ ref. Jap]*

11291. Kleiner, Art. 2008. The age of heretics: A history of radical thinkers who reinvented corporate management. San Francisco, California: Jossey-Bass. ix + 391 p. + [16] p. of plates. See p. 323-37. Illust. Index. 24 cm.
• ***Summary:*** This is the second edition of a book first published in 1996. The material about Erewhon appears to be identical, but it is now on pages 232-37.

11292. Kojima, Keisuke. 2008. Itsudatte edamame! Biiru no otsumame dake ja mottainai [Edamame any time: What a waste to serve them only as a snack with beer!]. Tokyo: Seishun Shuppansha. 95 p. 18 cm. [Jap]*
• ***Summary:*** Edamame are green vegetable soybeans served in the pods, Japanese style. Address: Japan.

11293. Murai, Ringo. 2008. Oishii tsukemono to tezukuri miso: shokutaku ni mainichi nosetai kantan rokujûsan reshipi teibanzuke kihon no miso kara aidea arenji made [Delicious pickles and homemade miso: 63 easy recipes you will want to serve every day from basic pickle recipes, basic miso, and some creative ones]. Tokyo: Seibido Shuppan. 127 p. 24 cm. [Jap]*
Address: Japan.

11294. Pettid, Michael J. 2008. Korean cuisine: An illustrated history. Korean-style soy sauce, miso, and red pepper sauce (Document part). London: Reaktion Books. 223 p. [118 + 110 endnotes]
• ***Summary:*** This is the best book seen to date on this subject. There are many records of the early Korean kingdoms using soy products; for example a record of 683 CE states Korean-style jang (*toenjang*) and soy sauce (*kanjang*) were among the presents exchanged in a royal wedding (p. 40, endnote 15. See: Kim Pusik, *Samguk sagi* {"History of the Three Kingdoms"} translated into modern Korean, Yi Pyongdo {Seoul, 1996}, Vol. 1, p. 201).

The section on "Condiments and seasonings" (p. 42) begins: An old Korean proverb states, "Food is only as good as the *jang"* (sauces based on soybeans).

Korean cookery has a wide range of flavors which include the stronger flavors of soybean paste stew (*toenjang tchigae*) and *kimch'i.* Moreover, even among the soy sauces (*kanjang*) and Korean-style misos (*toenchang*) there is a tremendous range of varieties and regional specialties, with many distinctive flavors.

A work titled *Chungbo sallim kyonje* (Farm management, supplemented and enlarged), written in the early 1800s points out the importance of *jang.*

"Jang is the source of all flavors. If the taste of a house's *jang* is not good, even if there are good vegetables or flavorful meats, one cannot prepare good food. The household head must always keep in mind the fermentation of *jang,* and through this will be able to have well-aged and good *jang."*

Likewise, Yi Pinghogak (1759-1824) in her *Kyuhap ch'ongso* ("Encyclopedia for Women's Daily Life") discusses the best days to make *jang* and also the importance of having the *changdoktae,* the terrace upon which earthenware jars of soy sauce and other *jang* are kept, face in an auspicious direction, as determined by the yearly calendar.

The three main types of *jang* are *toenjang, kanjang* and *koch'ujang.* The suffix *-jang* refers to a fermented sauce based on soybeans; *toenjang* means 'thick' soybean sauce and *kanjang* means 'salty' liquid soybean sauce.

The basic ingredient used to make both these sauces is soybean koji (*meju*) which was traditionally made in the late autumn and allowed to ferment until past the lunar New Year, about 3 months in all. The blocks of *meju* were then soaked in large earthenware pots of brine to make *jang* and *toenjang.*

In Korea, there are three basic types of soy sauce (*kanjang*)*:* (1) a strong-flavored sauce with a dark color (*chin kanjang*), (2) a medium-flavored sauce with a light-brown color (*chung kanjang*), and (3) a weak-flavored sauce with a light, clear color (*mulgun kanjang*). Type (1) requires at least five years of fermentation, and because of its sweet flavor and dark color it is used for boiling, fermenting, or as a seasoning in medicinal rice (*yak pap*). Type (2) was traditionally used as a seasoning for vegetables or stews, whereas type (3) which was fermented for 1-2 years used mainly as a seasoning for soups.

Given the importance of soy sauce in Korea, it us no surprise that recipe books of the Choson

Joseon period (1392-1910) offer dozens of variations

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on the basic recipe. For example, *Sallim kyongje* ("Farm management") alone offers some 25 variations.

In each household, soy sauce was prepared with great care, and each step in the process was carefully followed according to the family tradition. If a daughter-in-law failed to match the preferred taste of the soy sauce in her husband's household, it was seen as a bad omen for the family. Many families even made small ritual offerings to the household gods when making soy sauce in order to ensure success. Other customs such as hanging gold-colored thread, red chili peppers, or traditional socks–all believed to repel malevolent spirits–around the earthenware pots of soy sauce were done to keep away malicious spirits.

During the period 1910-1945, when Korea was a colony of Japan, Japanese-style shoyu was introduced to Korea and mass-produced in factories. However the flavor of this new soy sauce did not match the tastes of the Korean people, so despite the rationing of crops for the military, Koreans continued to make their traditional soy sauce, thereby preserving this important element of Korean food culture.

A detailed discussion of Korean-style miso (*toenjang*) is given next, followed by a shorter discussion of *koch'ujang* which is made by mixing *meju* powder, glutinous rice or regular boiled rice, and red chilli pepper powder–and then fermenting the entire mixture. Address: Asst. Prof. of Korean, Dep. of German, Russian, and East Asian Languages, Binghampton Univ., England.

11295. Rayner, Jay. 2008. The man who ate the world: In search of the perfect dinner. New York, NY: Henry Holt and Co. 273 p. See p. 125. No index. 24 cm.
• ***Summary:*** Chapter 4, "Tokyo," states (p. 125): "I am served some greaseless tempura, and a refreshing salad of mushrooms and greens and a steaming bowl of soup with silky bean curd [silken tofu?] and the sudden, nose-tickling hit of horseradish." Address: A judge on the TV show Top Chef Masters; Restaurant critic for the *London Observer*.

11296. Ryôri kenkyû-ka Hamauchi Chinami san totteoki nattô pawaa hyaku nijippaasento katsuyo reshipi hachijûgo [Cooking specialist Chinami Hamauchi's specially reserved natto power 120%: 85 practical recipes]. 2008. Tokyo: Nikkeibipisha. 95 p. 28 cm. [Jap]*

11297. Yonemura, Mayumi. 2008. Chitcha na Santa wa edamame ni notte [A tiny Santa Claus is riding on a pod full of green vegetable soybeans]. Tokyo: Shufu to Seikatsu-sha. 125 p. 19 cm. Series: Watashi no mamegoma nikki, No. 4. [Jap]*
Address: Japan.

11298. Japan's Otsuka Pharmaceutical to grow nutraceutical business in Europe with acquisition of France's Nutrition & Sante (Web article). 2009. http://www.flex-news-food.com/pages/ 21267/ France/ Functional/ Japan/ Nutraceutical/ japans-otsuka- pharmaceutical-grow- nutraceutical-business-europe-acquisition- frances-nutrition- sante.html. 1 p. Jan. 7. Printed Dec. 28.
• ***Summary:*** Didier Suberbielle is CEO of Nutrition & Santé, which is headquartered in Revel, France, and "is a leader in the European dietary foods market through activities in functional foods (Gerblé and Céréal), slimming products (Gerlinéa, Pesoforma and Milical), sports nutrition (Isostar), and other nutritional specialties.

"The firm's 2007 turnover increased 10% to 260 million euro. The company has a workforce of 950."

In Nov. 2005 ABN AMRO Capital France acquired Nutrition & Santé from Novartis for 220 million euro.

11299. Conlon, Michael. 2009. The history of U.S. soybean exports to Japan. *GAIN Report* (*Global Agriculture Information Network*) No. JA9502. 14 p. Jan. 20. [42 ref]
• ***Summary:*** An excellent, very readable historical summary. Contents: Introduction: The amazing soybean. The Auckland. Perry and the black ships. William Morse: USDA's plant explorer in Japan and the father of soybeans in America. U.S. Market development efforts in Japan. Recent activities in market development. End notes.

"The 1973 U.S. soybean embargo, unfortunately, caused some anxiety in the strong relationship between the United States and Japan. Soybeans were in short supply in the middle of 1973, and as an inflation-fighting measure, on June 27, the U.S. Secretary of Commerce imposed an export embargo on soybeans, cottonseed, and various meal and oil products from these commodities. Less than a week later, on July 2, the embargo was lifted. The embargo actually did not affect the volume of soybean exports to Japan as the country imported a record volume from the United States in 1973. However, since Japan relied on the United States for this food staple (in 1973 the United States accounted for over 88 percent of Japan soybean imports) the embargo sent shock waves through the Japanese government and food sector.

"USDA took quick action to relieve Japan's feeling of vulnerability. In early 1974, Secretary of Agriculture Earl Butz took a trip to Asia and Japan to assure the Japanese that "we made a mistake" and that the United States would never embargo food products again and that we were a reliable supplier. Secretary Butz and the Japanese Minister of Agriculture Abe met in Washington, DC on August 12, 1975. The Butz-Abe Understanding grew out of this meeting, where the United States agreed to supply Japan with certain minimum levels of grains and soybeans that were discussed in the August 12th meeting. The annual amounts were 3 million tons of wheat, 3 million tons of soybeans and 8 million tons for feeding. In all three years of the Understanding (1976-78) the minimum levels were exceeded.

"Every year since 1985, ASA Japan has hosted a

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Soybean Quality Conference to discuss customer concerns, provide the latest information on the quality of the new U.S. crop, and get the Japanese industry's insights and estimates of future needs. Around 200 participants, from crushers and traders to food manufacturers and the media, attend each year. The Conference in Japan has proved so successful that ASA now holds them in South Korea, China and Taiwan."

Figures show: (1) Bar chart of U.S. soybean exports to Japan (1,000 metric tons). They grew from 3.4 in 1946, to 572 in 1955, to 1,021 in 1960, to 2,001 in 1968, to 3,126 in 1972 to a peak of 4,646 in 1983, falling to 3,325 in 2007.

Photos show: (1) A farmer on a treadmill in a canal causing water to be lifted from the canal to irrigate a field of crops (Source: The Dorsett-Morse Expedition, at USDA National Agricultural Library). (2) A horse pulling a plow in a wet field as two farmers work with it. (3) George Strayer and his wife en route to Japan in 1955. (4) ASA Kitchen on wheels in Japan. (5) U.S. Soybean Seminar at the U.S. Trade Center in Tokyo.

A table shows the names ASA Japan country directors and the years each served. 1956-69 Shizuka Hayashi. 1972-73 Scott Sawyers. 1973-74 Howard Ackers. 1974-78 Lloyd Reed. 1978-83 Gil Griffis. 1983-87 Gunnar Lynum. 1987-93 Lars Wiederman. 1994-98 Kent Nelson. 1998-01 James Echle. 2001-02 Keiichi Ohara. 2002-08 Takehiko Nishio. 2008 Oct. 24-present LaVerne Brabant; he was named by the U.S. Soybean Export Council. Address: Agricultural Trade Officer, FAS, Japan.

11300. Clearspring, Ltd. 2009. Clearspring (Website printout–part). www.clearspring.co.uk Printed Jan. 28.
• ***Summary:*** Contents: Home page. About us. Awards. Glossary. FAQ. News. Books. Links. Stocklists. Trade. Contact. Food quality. Producers. Health. Recipes. Where to buy.

"Introducing the chairman: Christopher Dawson was born 19 September 1953, at New Plymouth Hospital, New Zealand and grew up in Opunake, a rural town in New Zealand. He is the third son of William Geoffrey and Joan Dawson.

"Education: He did his primary, secondary and tertiary education in New Zealand. He first started independently studying vegetarianism and organic agriculture at the age of 18. In 1974 he came to London to further his studies of organic agriculture, both at the Henry Doubleday Horticulture and Nutrition Research Centre in Braintree and the Bio Dynamic Agriculture section at the Rudolf Steiner Emerson College, Sussex.

"Beginning Organic Food Distribution: In 1977, he opened and managed the East West Natural Foods Store at the Community Health Foundation, Old Street, London. He developed this shop into a distribution centre for traditional natural / macrobiotic foods, sourced from both local organic farms and from abroad, especially from Japan.

"From August 1978 through to January 1980 he traveled extensively throughout Europe, America, Australia and Asia, investigating the traditional dietary practices and food-processing techniques. He studied at the East West Foundation in Boston, Massachusetts, U.S.A. about Far Eastern philosophical principles and traditions and studied the distribution network of the natural foods movement in both America & Europe, as well as Australia and New Zealand.

"Eighteen Years in Japan: Christopher made his first trip to Japan in July 1979, visiting natural food enterprises throughout Japan with Mr. A. Kazama, president of Mitoku Co. Ltd. He returned to Japan in January 1980 and began extensive studies into the daily life and cultural and dietary practices of the Japanese people.

"At the end of 1980 he commenced full-time employment at Mitoku Co. Ltd., the major exporter of traditional, natural Japanese foods. During the eighteen years he spent with the company Christopher studied Japanese Foods & production, worked with the producers to develop products to suit the needs of customers abroad and help the producers become compliant with EU organic certification. He also travelled extensively to introduce the foods to markets worldwide, with the intention to see if Japanese foods could really become international foods.

"Building Clearspring in the UK, Europe and the Middle East: In September 1993, Christopher bought the Clearspring Ltd. company, which was then a London based wholesaler with one shop, the very shop that Christopher started in 1977! By 1998, he felt he had sufficient knowledge of traditional, top quality Japanese food and decided it was the right time to come back to UK and to focus on marketing organic and authentic Japanese foods under the Clearspring brand.

"Recognition from the Japanese government: On 25 May 2007, Christopher received the Award for Overseas Promotion of Japanese Food 2007 from the Ministry of Agriculture, Forestry and Fisheries of Japan, for his distinguished contribution to the promotion of Japanese organic food worldwide."

Down the right side of this page are the following photos: (1) Christopher seated at a desk, writing in a notebook, looking very happy, at an early age (about 6), already a promoter of the written word. (2) Christopher at the East West Natural Foods Store in 1977. (3) Christopher with his mother at home in New Zealand. (4) Christopher at Mitoku in Japan (with Mr. Kazama and staff) in the late 1980s. (5) Photo taken 11 Oct. 1990 with Lima Ohsawa, then 91, the wife of macrobiotic teacher George Ohsawa, and Aveline Kushi, then 67, the wife of macrobiotic teacher Michio Kushi. (6) Christopher with his young family (Japanese wife and 3 children) in Japan in the early 1990s. (7) Christopher, with his wife and two sons in Spain in 2006. (8) Christopher now regularly visits Clearspring's

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suppliers in Japan, here with team of Sendai Miso Shoyu Company and Mr. Yoshida from Mitoku. (9) Christopher in Japan with Onozaki san, miso producer. (10) Christopher at the Organic & Natural Products Show, London 2007. (11) Special vegetarian foods prepared at the Dawson household, to celebrate the New Year. Address: 19A Acton Park Estate, London W3 7QE, UK. Phone: +44 (0)20 8749 1781.

11301. Yoshihara, Akino. 2009. The temptations of tempeh. *Daily Yomiuri Online* (*Japan*)**.** Feb. 19. www.yomiuri.co.jp / dy/features/culture /20090219TDY16002.htm.
• ***Summary:*** Tempeh was introduced to Japan about 30 years ago, but it has not become widely popular since there are now few tempeh manufacturers in Japan. Yet tempeh is made in Shiroishicho in Saga prefecture, Tokyo, Nagano prefecture and Okayama prefecture (located in southwestern Japan, just north of Shikoku Island). In Okayama prefecture about 20 firms make tempeh and 2nd generation tempeh products such as ramen noodles with tempeh or miso with tempeh. Moreover, many tempeh-related events have been organized, including cooking classes.

In 1987 the Japanese Society of Tempe was organized. Today it is headed by Masaharu Horii, professor in the Graduate School of Human Life Sciences, Notre Dame Seishin University, Okayama. The society promotes tempeh "to both the food industry and individual consumers through an annual conference featuring expert lectures and a cooking workshop."

"The society is trying to popularize consumption of tempeh as part of people's daily diet. We plan to publish a book containing useful information for consumers, such as the health benefits and a buyer's guide."

In Indonesia, long popular among the working classes, tempeh has recently become popular among the upper classes because of its many health benefits.

Note: Masaharu Horii, born in March 1939 and a researcher in the field of eating habits and food science, can be contacted at: Notre Dame Seishin University, Graduate School of Human Life Sciences, 2-16-9 Ifukucho, Okayama-shi, Okayama 700-8516 Japan. Fax: +81-86-252-5042. Address: Staff writer, Japan.

11302. Yoshihara, Akino. 2009. A life's dream sprouted from soybeans. *Daily Yomiuri Online* (*Japan*)**.** Feb. 19. www. yomiuri.co.jp /dy/features/culture /20090219TDY16001.htm.
• ***Summary:*** Rustono, a man born in Indonesia, lives with his Japanese wife, Tsuruko Kazumoto and two daughters in a house adjacent to their tempeh shop in Otsu, Japan. Otsu, the capital of Shiga prefecture, is located at the southwest end of Lake Biwa in Central Japan, just east of Kyoto.

The two met in 1995, when Tsuruko took a trip to Indonesia, at a hotel in Yogyakarta where Rustono worked. "After maintaining a long-distance relationship, Rustono came to Japan in October 1997, and the couple married and started living in Uji, Kyoto Prefecture." Rustono, who was interested in food and Japanese culture, first worked at a confectionery shop in Uji, where he carefully observed the Japanese quality control and inspection techniques. He later worked at a food factory, where he chopped vegetables for two years. It was at about this time that Rustono got the idea of making tempeh in Japan.

Using a recipe his mother got from a neighbor, Rustono and his wife made 40 packages of tempeh a day. After about four months, however, they ran into difficulties. The quality of the tempeh bean to decrease [probably due to a decrease in the quality of the starter culture].

So Rustono returned to Indonesia for several months; there he visited about 60 tempeh makers, and vastly increased his knowledge of how to make tempeh.

Returning to Japan with renewed commitment, he also decided to change his sales strategy by focus on Indonesians throughout Japan, starting with his Indonesian friends. Before long, "his tempeh's reputation [and sales] began to grow among foreigners and Japanese by word of mouth."

In 2000 the couple moved their family and business from Uji to Otsu, where they lived in a house belonging to Tsuruko's father. They chose Otsu, in part, because of its clear water. By themselves, they built a tempeh shop during a snowy winter, "carrying sand from the bottom of the river to mix with concrete." They dug a well to reach the clear water. Good water is important in making good tempeh. They also created a new brand: Rusto's Tempeh.

They now make large batches of tempeh about 2-3 times a month, then freeze it. They ship their tempeh to about 300 locations from one end of Japan to the other.

The business is growing. Recently the couple purchased property just a few minutes walk from their home on which to build a new house and larger tempeh shop. Address: Staff writer, Japan.

11303. Yang, Gong; Shu, Xiao-Ou; Li, Honglan; et al. 2009. Prospective cohort study of soy food intake and colorectal cancer risk in women. *American J. of Clinical Nutrition* 89(2):577-83. Feb. [64 ref]
• ***Summary:*** New research suggests that women, especially over-50s who consume a lot of soy can significantly cut their risk of developing bowel cancer. Researchers studied the diet and health of 68,412 women aged 40-70 in Shanghai, China. After adjustment for age, birth calendar year and total energy intake, consumption of soy foods was significantly associated with a decreased risk of colorectal cancer and the risk of colorectal cancer decreased with increasing soy food intake, primarily among postmenopausal women. According to the authors, the risk decreased more than 30% among women who were in the top third of soy food intake compared with women in the bottom third.

The authors believe that the findings may help explain why fewer people in countries such as China and Japan,

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where soy is a staple part of the diet, develop bowel cancer compared with western countries, where soy consumption is low. They suggest that the study should be repeated in non-Asian women with different genetic backgrounds and lifestyles from those in this study before public health advice based on the new research can be given. Address: 1-2. Dep. of Medicine, Vanderbilt Epidemiology Center and Vanderbilt-Ingram Cancer Center, Vanderbilt Univ. School of Medicine, Nashville, Tennessee 37203.

11304. Smith, Patricia J. 2009. Re: The Natural Products Expo at Anaheim (Color postcard). Letter to William Shurtleff at Soyinfo Center, March 7. 1 p. Handwritten.
• ***Summary:*** A Mickey Mouse postcard, with Goofy, Mickey and Minnie Mouse, Donald and Daisy Duck, etc. On the front: "Hello! from California."

Patricia writes: "Well, the Japanese have made an impression at the expo–along with soyfoods and probiotics. There are 1,600 booths and 50,000 people. the aisles are jammed. The atmospheric is electric." Address: Mill Valley, California. Phone: (617) 354-2001.

11305. House Foods America Corporation (HFAC). 2009. House Foods America Corporation (Website printout–part). www.house-foods.com Printed April 15.
• ***Summary:*** Contents: Welcome to House Foods America (dynamic banner): We are engaged in three operations: Curry & More, Tofu & More, Curry Restaurant. If you click tofu: Dynamic page & video of products–Taste & Comfort. Contents: About us. All about tofu. Products. Recipes. Production process. FAQ. What's new.

At "About us" is a brief corporate chronology / history: 1981–House Foods, Japan opens a sales office in Los Angeles. 1983–Acquires a fifty percent stake in the Hinode Tofu manufacturing company, one of the most respected brands in the country and enters into the Tofu business. 1983–The first Curry House restaurant opens in Little Tokyo (Los Angeles), introducing local Californians to Japanese cuisine with a contemporary atmosphere. 1997–A new state-of-the-art Tofu manufacturing facility opens in Garden Grove, California. All HFAC operations are consolidated at the facility. 2000–To expand business on the East Coast, HFAC opens New York office. 2006–HFAC opens its second plant, a new state-of-the-art tofu manufacturing facility in Franklin Township, Somerset, New Jersey. 2007-2008–With two major plants servicing the country, House Foods America Corporation becomes nationwide. Address: Garden City, California.

11306. Benanti, John. 2009. Re: Growing and using soybeans in Petaluma, California. Letter (e-mail) to William Shurtleff at Soyinfo Center, April 20. 1 p.
• ***Summary:*** "One final tidbit. A colleague found a clipping in our "Agriculture" file which I did not see. An ad from the newspaper of May 12, 1917 for the "Hay, Grain and Feed Market" lists, among other things, Soyo Bean Meal selling for $2.75. The paper is the Petaluma Argus. We think, rather than an ad for a specific market (store) the list is a list of market prices for a wide variety of agricultural foodstuffs including chickens, ducks, turkeys and butter. The list does not indicate the quantity of meal available for the $2.75 price.

"I will mail you a copy of the May 12, 1917 list, and one from December 31, 1912 and one from July 5, 1917. Thanks to erroneously pulling out the 'Architecture' file instead of the 'Agriculture' file to make you a copy of May 12 I found two other lists which mention soy beans misfiled in Architecture. I will send you copies of all three. I did go through the rest of the agriculture and architecture files and found no other lists. Our filing system, done by volunteers, is not the perfect system a researcher might like it to be.

"I will also send you a copy of a page from the 1919 Sanborn fire insurance map for Petaluma which shows the Soy Bean Co. mill at a time it was located on Weller St., a few blocks from Wilson. I have gone over the 1923 Sanborn map and do not find the mill anywhere on it. I can not explain why it is not there when the directory says it was on Wilson Street in 1923.

"We do not have the old newspapers on microfilm here at the museum. I will go to the local library tomorrow and search their microfilms to get the page numbers, if I can, for the three lists I am sending you.

"Petaluma was a huge poultry center in the 1920s; both eggs and chicks were shipped down the river [the Petaluma River into San Pablo Bay, adjoining San Francisco Bay] in great numbers. I think the ads were meant to tell local farmers and ranchers what prices they could expect for their goods. They 1912 list gives Poehlmann & Co. prices for meat, Drees prices for poultry and eggs, and McNear prices for grains. Poehlmann was the largest meat wholesaler, Drees the biggest poultry dealer and McNear the biggest grain dealer. McNear was known locally as the king of Petaluma, a powerful and influential businessman." Address: Researcher, Research Library, Petaluma Museum, Petaluma, California.

11307. *SoyaScan Notes.* 2009. Soybean germplasm collections on the IPGRI website (Overview). May 6. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** These four spreadsheet databases were sent to Soyinfo Center by Dr. Randall Nelson, curator, USDA Soybean Germplasm Collection, Urbana, Illinois. He created the databases (which reside only on his computer) using information found at the FAO website for germplasm collections: http://www.bioversityinternational.org / Information_Sources /Germplasm_Data bases /Germplasm_ Collection_Directory /index.asp. At the "Biodiversity Directory of Germplasm Collections Query Form," after "Taxon" enter "Glycine max" then click "Search" at bottom

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of page. Wait for several minutes for results to be displayed.

(1) The 40 largest global *Glycine max* [domesticated soybean] germplasm collections–in descending order of no. of accessions in collection. (1) Institute of Crop Germplasm Resources (CAAS), China, 23,578 accessions. (2) Soybean Germplasm Collection, USDA, USA, 18,046. (3) Asian Vegetable Research and Development Centre (AVRDC), Taiwan, 12,508. (4) Nanjing Agricultural University, China, 10,000. (5) Institute of Agroecology and Biotechnology, Ukraine, 7,000. (6) N.I. Vavilov Research Institute of Plant Industry, Russia, 6,126. (7) Centro Nacional de Pesquisa de Recursos Geneticos e Biotec. (CENARGEN), Brazil, 4,693. (8) Soybean Research Institute Jilin Academy of Agric. Sciences, China, 4,200. (9) All India Coordinated Research Project on Soybean, Govind Bal. Pant Univ., India, 4,015. (10) Centro Nacional de Pesquisa de Soja (CNPSO), EMBRAPA, Brazil, 4,000.

(11) Department of Genetic Resources I Nation. Inst. of Agrobiol. Resour. Japan, 3,741. (12) Crop Experiment Station Upland Crops Research Division, Korea, Republic of, 3,678. (13) Australian Tropical Crops Genetic Research Centre, Australia, 3,144. (14) Genebank, Inst. for Plant Genetics and Crop Plant Research (IPK), Germany, 3,063. (15) Regional Station, National Bureau of Plant Genetic Resources (NBPGR), India, 2,808. (16) Taiwan Agricultural Research Institute (TARI), Taiwan, 2,699. (17) National Research Centre for Soybean, India, 2,500. (18) Crop Breeding Institute DR & SS, Zimbabwe, 2,236. (19) Sukamandi Research Institute for Food Crops (SURIF), Indonesia 2,194. All the 2,194 *Glycine max* (cultivated soybean) accessions in this collection are from Australia, China (including Taiwan), Japan, and USA. None are apparently indigenous to Indonesia. Why? (20) Nanjing Agricultural University, China, 2,168.

(21) Instituto Agronomico de Campinas (I.A.C.), Brazil, 2,000. (22) National Plant Genetic Resources Laboratory, IPB/UPLB, Philippines, 1,764. (23) CSIRO Division of Tropical Crops and Pastures, Australia, 1,600. (24) Genetic Resources Dep.–Research Inst. for Cereals and Ind. Crops, Romania, 1,600. (25) G.I.E. Amelioration Fourragere, France, 1,582. (26) Soyabean Research Institute, Heilongjian Academy of Agric. Sc., China, 1,558. (27) Institute of Oil Crops Research CAAS, China, 1,529. (28) Institute of Plant Breeding, College of Agriculture UPLB, Philippines, 1,508. (29) Instituto Nacional de Investig. Agricolas, Station de Iguala, Mexico, 1,500. (30) Station de Genetique et Amelioration des Plantes, INRA C.R. Montpellier, France, 1,404.

(31) Kariwano Laboratory, Tohoku Nat. Agricultural Experiment Station, Japan, 1,400. (32) Int. Institute of Tropical Agric. (IITA), Nigeria, 1,358. (33) Centro de Investigacion La Selva, (CORPOICA), Colombia, 1,219. (34) Institute of Crop Breeding and Cultivation, CAAS, China, (1,200). (35) Institute for Field and Vegetable Crops, Yugoslavia, 1,200. (36) Institute of Industrial Crops Jiangsu Academy of Agric. Sciences, China, 1,199. (37) Corporacion Colombiana de Investigacion Agropecuaria, CORPOICA, Colombia, 1,170. (38) Genebank Cereal & Oil Crops Inst. Hebei Academy of Agric. Sciences, China, 1,154. (39) Instituto Nacional de Investigaciones Forestales, Agricolas y Pecuarias (INIFAP), Mexico, 1,124. (40) Maharashtra Association for the Cultivation of Science, India, 1,081.

(2) Germplasm collections (105) that have *G. max, G. soja,* advanced cultivars, breeding and inbred lines, cultivars, genetic stocks, introgressed forms, landrace or traditional cultivar, mutants, wild / weedy species, or unknown. Listed alphabetically by country: Albania 1 collection. Argentina 3. Australia 3. Bolivia 1. Brazil 5. Bulgaria 1. Canada 1. Chile 1. China 15. Colombia 2. Cuba 1. Czech Republic 1. Ecuador 1. France 6. Germany 1. Hungary 2. India 8. Indonesia 3. Japan 5. Korea, Rep 1. Madagascar 1. Mexico 2. Nepal 2. Nigeria 1. Papua New 1. Paraguay 1. Peru 1. Philippines 2. Poland 1. Romania 2. Rwanda 1. Slovakia 1. South Africa 1. Spain 1. Sri Lanka 1. Sweden 1. Switzerland 1. Taiwan 3. Thailand 4. Ukraine 4. Uruguay 1. Venezuela 1. Vietnam 4. Yugoslavia 1. Zambia 1. Zimbabwe 1.

(3) The 23 largest global *Glycine soja* [wild annual soybean] germplasm collections–in descending order of no. of accessions in collection. (1) Institute of Crop Germplasm Resources (CAAS), China, 6,172 accessions. (2) Soybean Germplasm Collection, USDA, USA, 1,114. (3) Soybean Research Institute Jilin Academy of Agric. Sciences, China, 600. (4) Soyabean Research Institute, Heilongjiang Academy of Agric. Sc., China, 400. (5) Crop Experiment Station Upland Crops Research Division, Korea, Republic of, 342. (6) Asian Vegetable Research and Development Centre (AVRDC), 339. (7) N.I. Vavilov Research Institute of Plant Industry, Russia, 310. (8) Breeding Laboratory, Faculty of Agriculture, Iwate University, Japan, 151. (9) CSIRO Division of Tropical Crops and Pastures, Australia, 60. (10) Taiwan Agricultural Research Institute (TARI) Taiwan, 46. (11) Hunan Academy of Agriculture Sciences, China, 45. (12) Tieling District Agricultural Research Institute, China, 29. (13) Department of Agronomy National Chung Hsing University, Taiwan, 20. (14) Eastern Cereal & Oilseed Research Centre, Saskatoon Research Centre, Saskatchewan, Canada, 18. (15) Soyabean Breeding Laboratory, Tokachi Agric. Exp. Station, Nemuro, Hokkaido, Japan, 15. (16) Instituto Nacional de Investigaciones Forestales, Agricolas y Pecuarias (INIFAP), Mexico, 9. (17) All India Coordinated Res. Project on Soybean, Govind Bal. Plant Univ., India, 7. (18) Maharashtra Association for the Cultivation of Science, India, 6. (19) Sukamandi Research Institute for Food Crops (SURIF), Indonesia, 4. (20) Research Institute for Food Crops Biotechnology–RIFCB, Indonesia, 4. (21) Kariwano Laboratory, Tohoku Nat. Agricultural Experiment Station, Japan, 3. (22) Genebank, Inst. for Plant Genetics and Crop Plant Research (IPK), Germany, 2. (23) S.K. University of

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Agriculture and Technology, India, 1.

(4) Germplasm collections that have at least one wild perennial relative of the soybean (*Glycine* species, such as *Glycine clandestina*), in descending order of total number of accessions: (1) CSIRO Division of Plant Industry, Australia, 2,102. (2) USDA Soybean Germplasm Collection, USA, 919. (3) Plant Genetic Resources Unit, Agricultural Research Council, South Africa, 281. (4) CSIRO Division of Tropical Crops and Pastures, Australia, 87. (5) Asian Vegetable Research and Development Centre (AVDRC), Taiwan, 69. (6) N.I. Vavilov Research Institute of Plant Industry, Russia, 31. (7) Breeding Laboratory, Faculty of Agriculture, Iwate University, Japan, 23. (8) National Dept. of Agriculture, Dir. of Plant and Quality Control, South Africa, 23. (9) Seed Bank, Seed Conservation Sect. Royal Botanic Gardens, Kew, UK, 1.

11308. *Soyfoods Canada Newsletter.* 2009. Canadian soybeans–a sustainable crop. Spring. p. 4.
• ***Summary:*** "Canada accounts for almost 2% of the world's soybean production. In 2007, approximately 2,700,000 tonnes [metric tons] were produced in Canada, on 2,870,657 acres (1,161,755 hectares). Soybeans are grown in three provinces: 215,006 acres in Manitoba, 434,715 acres in Quebec, and 2,224,936 acres in Ontario.

"Canadian soybean producers are known for innovative and sustainable production practices... Canada's soybean industry is known for its superior ability to segregate and trace soybean crops from seed through to end user, referred to as Identity Preservation (IP).

"Over 40%, or about 1.7 million tonnes of Canadian-grown soybeans are exported to markets such as Japan, Malaysia, Singapore, Hong Kong and Taiwan. They are used to make Asian food staples such as tofu, miso, natto, and soymilk. Japan only produces about 12% of its own country's food grade soybean requirements, and their consumers demand non-genetically modified product. Japanese buyers value Canadian soybeans because of our industry's IP ability.

"Growing soybeans leaves a relatively small carbon footprint. As a legume, the soybean plant's ability to 'fix' its own nitrogen virtually eliminates the need for petroleum-based nitrogen fertilizer. The wide canopy of leaves formed by soybean plants helps to minimize the need for herbicide sprays."

11309. Soyafarm USA Inc. 2009. Soyafarm (Website printout–part). www.soyafarmusa.com Printed June 28.
• ***Summary:*** Contents: Home page. Retail (Soyafarm Bistro Burger {meatless}, Edamame Shumai, Gourmet Tofu Delights). Food service (Soyafarm Edamame Yuba Shumai, Edamame Yuba Sticks {available since Nov. 2004}), Tofu & Yuba Patties, Baked Tofu, Tofu Nuggets, Soya-Up R CSP (fine white powder, water-soluble soy polysaccharides, made from okara). Profile (Soyafarm USA is a division of Japan's Fuji Oil Group. "Fuji Oil Group has been a world leader in the creation of innovative and delicious soy foods for over 50 years. With headquarters in Japan, where delicious, healthy soy foods are a honored tradition, Fuji Oil Group operates in Asia, Europe, South America and USA"). Contact us. Links. Address: 20675 S. Western Ave., Suite #210, Torrance, California 90501. Phone: Fax: 310-781-9293.

11310. Febrina, Anissa S. 2009. The making of a staple food. *Jakarta Post* (*The*) (*Indonesia*). July 27. www.thejakartapost.com /news/2009/07/27/ the-making-a- staple-food.htm
• ***Summary:*** Production of tempeh has long been the domain of cottage or home industries. At one kampung (village; or neighborhood, or district in a city) in Tegal Parang, South Jakarta, you can see how tempeh is made at home. About 90% of the 300-plus inhabitants of Tegal Parang ("city of soy") make tempeh and/or tofu for a living. For more than 30 years, Muhammad Bintoro, age 56, has been living in this kampung and making tempeh. His tempeh shop is in his kitchen plus living room inside his home of 20 square meters that he has called home for the past 15 years.

Each day Muhammad buys 40 kg of soybeans, which his son washes and soaks overnight. The next morning Muhammad pours the softened soybeans into a machine that he built himself. He used to tread the soaked beans underfoot to remove the hulls, but now he simply runs them through this machine. The process for making tempeh is then described. Tempeh that is started on Thursday will be ready to sell on Sunday.

A color photo shows soaked soybeans being poured (with their soak water) into a square wooden box atop a soybean dehuller. Address: Staff writer, Japan.

11311. **Product Name:** Chamame (Edamame Frozen in the Pods).
Foreign Name: Wel-Pac Chamame.
Manufacturer's Name: Marukai. Imported by JFC International. Product of Taiwan.
Manufacturer's Address: Cupertino, California.
Date of Introduction: 2009 July.
Ingredients: Soybeans (in the pods).
Wt/Vol., Packaging, Price: 14.1 oz (400 gm) plastic bag. Retails for $1.68 at Marukai (2009/07, Cupertino, California).
How Stored: Frozen
New Product–Documentation: Product with Label purchased at Marukai in Cupertino, California by Tak Kimura and wife. 2009. July 14. Pre-printed plastic bag is 9½ by 6½ inches. Filling front of bag is color photo of bright green edamame in the pods on a *zaru* (circular woven bamboo tray), atop a *sudare* (bamboo mat). Text is mostly in Japanese, but in the upper left corner is written in roman letters: "Wel-Pac. Chamame. Specially selected soybeans in

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pod." On back of bag are nutrition facts in both English and Japanese. The text is in two columns, each 3 inches wide, one in English and the other in Japanese. The top of each explains what chamame are and the bottom gives cooking directions. "Chamame Soybeans in Pod uses a special kind of Japanese soybean called Chamame." It "has been produced only in some areas of Japan for centuries but lately has gained popularity among food connoisseurs, as it has an exquisite sweetness and a distinctive aroma." Directions: Bring 6 quarts of water to boil in a large saucepan. Add contents of package and ½ teaspoon of salt (optional). "Return to a boil. Boil 5 to 6 minutes. Drain. Rinse with cold water to cool. Drain well. Serve as an appetizer or snack. Open pod; eat the beans inside and discard pod. If desired, add cooled, shelled beans to tossed green, bean, or pasta salads."

11312. Shurtleff, William. 2009. Re: Research on soy sauce in the archives of the Dutch East India in the Hague, Netherlands. Letter (e-mail) to Dana Jacobi, food writer, New York City, Aug. 1. 1 p.
• ***Summary:*** "Did I tell you that I hired an expert in Dutch archival research for two years to send me documents showing how the Dutch brought 'soy' [sauce] from the Dutch East Indies to Amsterdam–when they were sent and sold everywhere by Dutch and British merchants with ships.

"Soy sauce was being sold in retail shops in New York City by 1750–the first form of soy to arrive in the British North America, even before the soybean itself. Of course nobody but Samuel Bowen realized that 'soy' was made from soybeans. Bowen was the first to actually make commercial soy sauce in the British North America.

"He had worked at the archives of the Dutch East India Co. for years and could read the handwritten Old Dutch that appears in the letters, logs, manifests, etc. He sent me both photocopies of the originals and his translations into English of the relevant parts.

"He made a breakthrough when we realized that by 1637 the Japanese were using the ancient word for soy sauce–Murasaki–which means 'deep purple.'

"The only Japanese food item that the Dutch loved more than soy was–guess what–sake! The more things change, the more they stay the same. The Dutch also ordered lots of miso, umeboshi, and pickled vegetables for their personal tables at Dutch trading posts in the East Indies

"That story, now ready to be published, is filled with interesting and unexpected twists and turns. I hope to have a it published as part of the History of Soy Sauce on our website within the next 12 months." Address: Founder and Director, Soyinfo Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

11313. Kikkoman Corporation. 2009. Annual report 2009. Year ended March 31, 2009. 250 Noda, Noda-shi, Chiba 278-8601, Japan. 41 p. 28 cm. [Eng]
• ***Summary:*** Largely as a result of the global financial crisis, starting in the fall of 2008: Consolidated net sales decreased 0.3% to $4.210 billion, operating income fell 14.6% to $207.8 million, and net income declined by 76.0% to $28.0 million. Note: Dollar values may have changed at different percentage rates due to changing foreign exchange rates.

Page 1 is titled "Kikkoman Corporation shifts to a holding company structure." The shift will be effective 1 Oct. 2009. "The transition will entail the creation of several new spin-offs to operate the Group's existing businesses. A chart shows the holding company structure after 1 Oct. 2009. Under Kikkoman Corporation (the holding company) are eight divisions: 1. Kikkoman Business Services Company (new). 2. Overseas business. 3. Other domestic businesses. 4. Fodchemifa Co., Ltd. 5. Manns Wine Co., Ltd. 6. Nippon Del Monte Corporation. 7. Kikkoman Beverage Company (new). 8. Kikkoman Food Products Company (new).

"We have revised our business principles based on the following three principles. (1) To pursue the fundamental principle 'consumer oriented.' (2) To promote the international exchange of food culture. (3) To become a company whose existence is meaningful to the global society."

A photo (p. 7) shows Yuzaburo Mogi (Chairman of the Board and CEO) and Mitsuo Someya (President and COO).

Pages 8-9 show color photos of Japanese and overseas soy sauce products including *Tokusen Marudaizu Shoyu* (Premium shoyu made from whole soybeans–rather than the usual defatted soybean meal) and *Tokusen Yuki Shoyu* (Premium organic shoyu, certified by Japanese Agricultural Standards, JAS). Overseas: Less Sodium Soy Sauce (North America). Teriyaki Sauce (3 types) (North America). Sweetened Soy Sauce (Europe) (*Sauce Soja Sucrée*). Herbal Soy Sauce (Asia; made in Singapore with a fragrant blend of sweetness and herbs). Address: Noda, Japan.

11314. Willcox, D.C.; Willcox, Bradley J.; Todoriki, Hidemi; Suzuki, Makoto. 2009. The Okinawan diet: health implications of a low-calorie, nutrient-dense, antioxidant-rich dietary pattern low in glycemic load. *J. of the American College of Nutrition* 28(4):500S-516S. Supplement. Aug. [113 ref]
Address: Dep. of Human Welfare, Okinawa International University, 2-6-1 Ginowan, Ginowan City, Okinawa, Japan.

11315. Fernstrom, J.D. ed. 2009. 100th anniversary symposium of umami discovery: The roles of glutamate in taste, gastrointestinal function, metabolism, and physiology. *American J. of Clinical Nutrition* 90(3S):705S-881S. Supplement. Sept. *
• ***Summary:*** Umami is a taste sensation that is savory or meaty and is produced by several amino acids (such as glutamic acid) and nucleotides. Umami is increasingly

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considered a fifth basic taste ("savoriness"), alongside sweet, sour, salty, and bitter. Umami is found in natural foods such as *konbu / kombu* (a sea vegetable; *Saccharina japonica / Laminaria japonica*) and *shiitake* mushrooms.

Contents: Program participants (directory). Symposium keynote address. Historical perspectives (4 papers). Receptors, transduction, perception: session I (6). Receptors, transduction, perception: session I (6). Gastrointestinal tract (6). Absorptive and postabsorptive handling (6).

11316. Pharmavite / Soyjoy. 2009. During the Dust Bowl, soybeans did more than just revive the earth. They helped revive America (Ad). *Martha Stewart Living* (*magazine*). Sept. p. 44.

• ***Summary:*** A full-page color ad. On the vertical left two-thirds of this ad are a color illustration of a soybean plant with deep roots, color photos of a compass, a small red stock transfer certificate, and a green soybean pod with two green soybeans, and black and white photos of a farm and the inside of a farmhouse during the Dust Bowl days. On the right one-third is a column of text with a color photo of a Soyjoy bar at the bottom. The text begins:

"The 1930s, The Great Depression turned the land of opportunity into a land of despair." Unwise farming practices, overgrazing and drought created the Dust Bowl.

"Enter the soybean. Packed with soil-replenishing nitrogen, it gave back to the land what crops like corn and wheat stripped away. Planted in large quantities and utilized in crop rotation practices first developed in China, soybeans helped suppress erosion and hold the ground together.

"With the stabilization of the land helping to stabilize the economy, America was slowly pulled out of the Great Depression. Thanks in part to the amazing soybean–for over 5,000 years an integral part of cultures and diets.

"Today, it is the same historic soybean that we take, mix with fruit, and bake to make Soyjoy.

"Packed with soy. Baked in history." soyjoy.com.

This ad also appeared in *Redbook* magazine, Sept. 2009 (p. 8). Address: Mission Hills, California.

11317. Lyddon, Chris. 2009. Global grain trade review: Despite soaring demand, record grain production puts surplus at highest point ever. *World Grain* 27(11):28-32, 34-36. Nov.

• ***Summary:*** A table titled "Global grain trade activity: Marketing years as indicated (in 1,000 tonnes)" gives the following statistics for soybeans: 2008-09 Top exporters: 1. United States 34,836. 2. Brazil 29,350. 3. Argentina 5,965. 4. Paraguay 2,300. 5. Canada 1,975. World total 76,324 (-4% from last year).

Top soybean importers: China 39,800. E.U.-27 12,800. 3. Japan 3,450. 4. Mexico 3,100. 5. Taiwan 1,830.

Top soybean meal exporters: 1. Argentina 25,000. Brazil 12,772. 3. United States 7,983. 4. India 3,150. 5. Paraguay 1,167. World total 52,988 (-5%). Top soybean meal importers: 1. E.U.-27 22,150. 2. Indonesia 2,450. 3. Vietnam 2,300. 4. Thailand 2,100. 5. South Korea 1,850.

A two-page color spread shows (for major importing countries or regions, for *all* grains) "Grain imports and exports by major seaports" (in tonnes, calendar year 2008) (plus the increase or decrease compared with last year). A world map shows where each port is located. The tables of exporting ports have a blue background whereas the tables of importing ports gave a green background.

The main exporting ports in the USA are (in descending order of volume, 1,000 tonnes): 1. South Louisiana 22,828,781. 2. Tacoma, Washington 6,785,247. 3. Corpus Christi, Texas 5,423,867. 4. Houston, Texas 5,194,172. 5. Portland, Oregon 4,410,476. 6. Brunswick, Georgia 819,790. 7. Duluth, Minnesota 612,149. No importing ports are shown for the USA.

The main exporting ports for Brazil are: 1. Santos 10,101,975. 2. Parana 4,172,447. The main importing port for Brazil is: Santos 1,339,593.

The main exporting ports for Argentina are: 1. San Martin / San Lorenzo 34,636,170. 2. Rosario 14,847,183. 3. Bahia Blanca 7,350,005. 4. Quequen 3,202,964. 5. Ramallo 1,172,462. 6. Lima (Argentina; just northwest of Buenos Aires) 814,746.

The main importing ports for Europe (E.U.-27, which does NOT include Norway, Switzerland, Russia; Candidate countries are Croatia, Macedonia, Turkey) are: 1. Rouen, France 6,349,742. 2. Hamburg, Germany 3,690,955. 3. Rotterdam, Netherlands 2,457,000. 4. Rostok, Germany 2,361,000. 5. Amsterdam, Netherlands 1,393,000. 6. Ghent, Belgium 671,929. 7. Antwerp, Belgium 506,185.

Note: The main importing port for Russia is Novorossiysk 6,317,000, located on the Black Sea in southern Russia in Krasnodar Krai. To get there a ship must pass through the Mediterranean Sea, the Bosporus, then the entire Black Sea. Address: European editor; chris.lyddon@ntlworld.com.

11318. Brunk, Conrad G.; Coward, Harold. eds. 2009. Acceptable genes?: religious traditions and genetically modified foods. Albany, New York: State University of New York. vi + 272 p. Index. 23 cm. [200* ref]

• ***Summary:*** Contents: Introduction, by Conrad G. Brunk and Harold Coward. 1. Genetics and genetically modified organisms, by Samuel Abraham. 2. Ethical perspectives on food biotechnology, by Paul B. Thompson. 3. Does vegetarianism preclude eating GM foods?, by Lyne Létourneau. 4. "When You Plow the Field Your Torah Is with You": Genetic modification and GM food in the Jewish Tradition(s), by Laurie Zoloth. 5. Some Christian reflections on GM food, by Donald Bruce. 6. Genetically modified foods and Muslim ethics, by Ebrahim Moosa. 7. A Hundred Autumns to Flourish: Hindu attitudes to genetically modified

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food, by Vasudha Narayanan. 8. The karma of genetically modified food: A Buddhist perspective, by David R. Loy. 9. "So That You May Have It with No Harm": Changing attitudes toward food in late imperial China, by Hsiung Ping-chen. 10. Born from bears and corn: Why indigenous knowledge systems and beliefs matter in the debate on GM foods, by Shiri Pasternak, Lorenzo Mazgul, and Nancy J. Turner. 11. Regulatory and innovation implications of religious and ethical sensitivities concerning GM food, by Conrad G. Brunk, Nola M. Ries, and Leslie C. Rodgers. Contributors.

An excellent book written from many different points of view. Unfortunately the book fails to identify the difference between "genetically modified" (all plants and animals have been genetically modified since ancient times using selection or traditional selective breeding techniques) and "genetically engineered" (transgenic technology, involving the unnatural insertion of a gene from one species into the genome / genes of another species).

A lively debate about genetically modified has followed the introduction of these foods since their introduction into the food supply in the last two decades of the 20th century. The debate has been especially intense in Europe, Japan, and parts of Africa.

"This debate has been uncharacteristically subdued in North America, where these products were first grown for commercial use and sent to markets for consumption... One reason for this may have been that government regulators in Canada and the United States approved these products for the market with no public announcement that they were doing so and certainly without any prior public consultation, in contrast to the practice in most European countries. Indeed most people in North America have been, until recently completely unaware that much of the food they are purchasing is from genetically modified corn, canola, soybeans, and other crops, and that genetically or cloned food animals have been developed and applications for their market approval submitted to their regulators.

"One concern, however, is not low–that of the desire for labeling these products in order to give consumers a choice whether or not to purchase them" (p. 1).

Ethical vegetarians have broader concerns than health vegetarians. "Ethical vegetarians worry that the genetic modification of food will lead to a loss of genetic diversity; that it will widen the gap between developing and industrialized countries; that it will reinforce the concentration of power in the hands of industry; and it will create unknown risks for human health." Not to mention herbicide-resistant weeds. Address: 1. Prof. of Philosophy and former Director of the Centre for Studies in Religion and Society at the Univ. of Victoria; Prof. Emeritus of History and Founding Director of the Centre for Studies in Religion and Society at the Univ. of Victoria. Both: British Columbia, Canada.

11319. Hatori, Yukio. 2009. Atama no yoi kodomo o sodateru miso reshipi hyakurokujûroku [166 miso recipes which help you to raise a smart child / children]. Tokyo: Jingukan. 96 p. 26 cm. [Jap]*
Address: Japan.

11320. Ishimura, Shin'ichi; Ishimura, Yumiko. 2009. Jikase miso no susume: Nihon no shobunka saisei ni mukete [Recommending homemade miso: For revitalizing Japanese food culture]. Tokyo: Yuzankaku. 310 + 4 p. 21 cm. [Jap]*
Address: Japan.

11321. Lewis, Lynn. ed. 2009. The food of Asia: a journey for food lovers through China, India, Japan & Thailand. Sydney, Australia: Murdoch Books Pty Ltd. 504 p. Illust. (color). Index. 30 cm.
• ***Summary:*** A gorgeous, artistically designed book, printed on glossy paper, with spectacular color photos on every page.

Contents: The food of Asia: China, India, Japan, Thailand. Snacks. Starters and salads. Soups. Seafood. Poultry. Meat. Tofu, legumes & vegetables. Noodles & rice. Accompaniments & side dishes. Desserts. Breads, rice & basics. Glossary.

"China has one of the great cuisines of the world." Japan: "... combines delicate, subtle tastes ands textures, always prepared with a light hand and sublimely presented to appeal to the eye as well as the tastebuds."

Soy-related: Inari sushi (p. 22-23). Tofu rolls (from China, with firm tofu and tofu skins [yuba], p. 76-77). Chilled tofu with ginger and spring onion (from Japan, with "600 gm block silken firm tofu," p. 78-79). Tofu dengaku (from Japan, with "700 gm firm {cotton} tofu" and "100 gm red or white miso paste," p. 94-95). Tofu and spinach soup (from China, with "120 gm soft tofu, drained," p. 100-01). Stuffed tofu soup with prawns (from Thailand, p. 102-03). Ramen noodles with soy broth (from Japan, p. 104-05). Agedashi tofu (from Japan, p. 110-11). Fragrant tofu and tomato soup (from Thailand, p. 124-25). Ten-treasure soup (from China, with 450 gm firm tofu, p, 126-27). Salmon and tofu balls (from Japan, p. 150-51). Steamed mussels with black bean sauce (from China, with "1 tablespoon salted, fermented black beans, rinsed and mashed," p. 178-79). Clams in yellow bean sauce (from China, with "2 tablespoons yellow bean sauce," p, 178-79). Soy chicken (from China, with dark soy sauce and light soy sauce, p. 214-15). Shanghai soy duck (with light and dark soy sauce, p. 236-37). Shabu shabu (from Japan, with "150 gm firm {cotton} tofu," p. 258-59).

Tofu, legumes & vegetables: Ma Po tofu (from China, "A quintessential Sichuan dish... Soft tofu is traditionally used," p. 298-99). Braised tofu with Chinese mushrooms (from China, p. 304-05). Fermented tofu with Asian greens (from China, with "3 tablespoons fermented white tofu," p.

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304-05). Mushrooms with tofu (from Thailand, p. 308-09). Miso tofu sticks with cucumber and wakame salad (from Japan, with "500 gm silken firm tofu, well drained" and "3 tablespoons white miso paste," p. 310-11). Stuffed tofu (from China, p. 314-15). Stir-fried tofu in yellow bean sauce (from China, p. 314-15). Buddha's delight (from China, with "50 gm tofu puffs {deep-fried cubes of tofu}," p. 322-23). Soft tofu with chilli and spring onion (from China, p. 328-29). Braised tofu (from China, p. 328-29). Mock duck (from China, with homemade wheat gluten, p. 338-39). Beans with sesame miso dressing (from Japan, p. 392-93). Shiitake simmered in soy [sauce] (from Japan, p. 408-09). Three ways with sauces (from Japan, Ponzu, Sesame seed sauce, and Tempura dipping sauce, with soy sauce, p. 484-85). Three sauces (from China, Soy and vinegar dipping sauce, Soy, vinegar and chilli dipping sauce, Soy, chilli and sesame dipping sauce, with soy sauce, p. 487-88).

Glossary of Asian food and cooking (p. 492+): Aburage, dal (dhal), edamame, fermented tofu ("It is sometimes called preserved tofu or tofu cheese and is used as a condiment or flavouring"), hoisin sauce, inari abura-age (used to make inarizushi), Japanese mustard, Japanese soy sauce (shoyu), ketchap manis ([kecap manis] "A thick, sweet soy sauce used as a flavouring"), kuzu, mirin, miso, nori, paneer, ponzu, red bean paste ("Made from crushed adzuki beans and sugar..."), salted, fermented black beans (soya beans), sesame paste, sesame seeds, Shaoxing rice wine, soya beans, tofu, wakame, yellow bean sauce.

11322. Messina, Mark; Watanabe, Shaw; Setchell, Kenneth D.R. 2009. Report on the 8th International Symposium on the Role of Soy in Health Promotion and Chronic Disease Prevention and Treatment. *J. of Nutrition* 139:796S-802S. Supplement. Held 9-12 Nov. 2008 in Tokyo, Japan. [69 ref]
• ***Summary:*** Contents: Abstract. Introduction. Research highlights: Breast cancer. Reproductive and hormonal effects in men. Bone health. Menopausal symptoms. Cholesterol lowering effects of soy protein. Mineral status. The equol hypothesis examined. Conclusions. Authors and presentation titles. Address: 1. Nutrition Matters, Port Townsend, Washington 98368 and Dep. of Nutrition, School of Public Health, Loma Linda Univ., Loma Linda, California 92350; 2. National Inst. of Health and Nutrition, 1-23-1, Toyama, Shinjuku-Ku, Tokyo 162-8636, Japan.

11323. Nguyen, Andrea Quynhgiao. 2009. Asian dumplings: Mastering gyôza, spring rolls, samosas, and more. Berkeley, California: Ten Speed Press. 234 p. Illust. (color photos by Penny De Los Santos). Index. 28 x 19 cm. [38 ref]
• ***Summary:*** Another very attractive book and well-written book by Andrea Nguyen. In the Introduction, the section titled "Ingredients" (p. 8+) discusses soy sauce (p. 16) and tofu (p. 16-17).

Soy related recipes include: Steamed vegetable dumplings [vegetarian] (Zhengjiao, Chinese, with 3 oz. brown pressed tofu filling, and light (regular) soy sauce, p. 35-36). Kimchi dumplings (Kimchi mandu, Korean, with 10 oz firm tofu, p. 44-45). Korean meat and vegetable dumplings (Gun mandu, with 6 oz firm tofu, p. 46-47). Steamed filled buns (Zheng bao, Chinese, with Vegetable and tofu bun filling {p. 101}, p. 95-96). Baked filled buns (Ju bao, or Guk bao in Cantonese, Chinese, with Vegetable and tofu bun filling {p. 101}, p. 97-99). Vegetable and tofu bun filling (Cai bao, Chinese, p. 101).

Chapter 9, "Sauces, Seasonings,..." contains several soy dipping sauces: Tangy soy dipping sauce (great with Chinese jiaozi or Japanese gyôza, p. 215). Korean dipping sauce (for Korean Mandu, p. 215). Sweet soy sauce (good with Cantonese steamed rice rolls {p. 156-60}, p. 217). Address: Food writer, Santa Cruz, California.

11324. Yagihashi, Takashi; Salat, Harris. 2009. Takashi's noodles. Berkeley, California: Ten Speed Press. An imprint of Crown Publishing Group, a division of Random House. vii + 168 p. Illust. (photos by Tyllie Barbosa). Index. 25 cm.
• ***Summary:*** A very original, beautifully designed book. "A collection of 75 recipes from James Beard Award-winning chef Takashi Yagihashi for both traditional and inventive hot and cold Japanese noodle dishes" (from the publisher).

Contents: Acknowledgments. Introduction. 1. Ramen. 2. Soba. 3. Udon. 4, Somen. 5. Asian noodles. 6. Pasta. 7. Appetizers. Ingredients glossary.

The cover photo shows a photo of "Natto soba." The headnotes to the recipe for "Natto soba" (p. 46-47) state: "My hometown of Mito is known throughout Japan as 'Natto City' in recognition of our devotion to these fermented soybeans. Natto has a wonderful nutty flavor and aroma, and I've loved it since I was a kid. Serving it with soba is a terrific introduction to this nutritious and ancient naturally preserved ingredient. When you open a packet of natto, the beans will be sticky and thready, but don't let that put you off. This dish makes a beautiful presentation when it's served. Just make sure you mix together all the ingredients very well before you eat to combine the flavors." On the facing page is a full-page color photo of the dish with cold soba broth being poured over the top.

The brief Glossary (p. 161-63) includes: Abura-age, goma paste, hoisin sauce, kombu, mirin, miso (red, white, or brown), natto, nori, soy sauce, sunchang kochujang, tobanjan, tofu, umeboshi, wakame, wasabi, yamaimo, and yuzu.

The word "soy" appears on 51 pages in this book, "soy sauce" on 43 pages, "Japanese soy sauce" on 39 pages, "miso" on 15 pages, "tofu" on 14 pages, "abura-age" on 7 pages, "natto" on 6 pages, "soybeans" on 2 pages, and "soybean" on 1 page. "Japanese soy sauce" is called for in dashi, in all other noodle broths, and in most recipes. Meat, poultry, fish, shellfish, and eggs are used throughout the

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book.

Several portrait photos show youthful, handsome Takashi. Harris Salat writes about food and culture. Address: USA.

11325. *BaySpo: The Japanese Weekly Entertainment Paper* (*San Francisco Bay Area*). 2010. Gurume jiji tankenka: Fuyu no ichidai ibent. Fanshii Fuudo Shoo ni itte kita zoi no maki [Gourmet old-guy explorer: The biggest winter gourmet event. This article is: "I went to the fancy food show"]. Jan. 29. No. 1106. p. 15. [Jap]

• ***Summary:*** Over 80,000 items were exhibited. There were familiar goods too. Showed the possibilities of Japanese foods. Photos show: (1) The Kikkoman booth. (2) Marukome miso. (3) A tea both. (4) Minami Satoh standing, in traditional Japanese clothes, discussing and demonstrating his natto. (6) A Caucasian blonde girl. "A lot of Americans who attended said they liked the taste of natto." (7) Members of a miso company and a plastic container of their miso. Address: California.

11326. Shurtleff, William. 2010. Thoughts about George Ohsawa. *SoyaScan Notes.* Feb. 5. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** There are six things I greatly admire about George Ohsawa: (1) He had a tremendous sense of gratitude for life itself and for all things. (2) He emphasized the oneness of all things (nonduality) and showed that the pairs of opposites are more deeply one. (3) He had a marvelous love of life and sense of humor. People remember him as a deeply happy and charismatic man. (4) He had a very original and creative mind–especially for a Japanese man of his time. (5) He introduced many fine Japanese foods into Western diets that Caucasians now actually eat on a regular basis–miso, tofu, shoyu / tamari, umeboshi, kuzu, sea vegetables, seitan, natto, and many more–and in doing so played a major role in starting the natural foods movement in America. (6) He played a leading role in introducing brown rice into American food culture, starting in the 1960s. Address: Founder and owner, Soyinfo Center, Lafayette, California. Phone: 925-283-2991.

11327. Nagata, Chisato. 2010. Factors to consider in the association between soy isoflavone intake and breast cancer risk. *J. of Epidemiology* (*Japan*) 20(2):83-89. Epub. 2010 Feb. 20. [80 ref]

Address: Dep. of Epidemiology & Preventive Medicine, Gifu University Graduate School of Medicine, Yanagido, Gifu, Japan.

11328. Vollmann, Johann. 2010. Re: Exhibition at the Ethnology Museum in Vienna, Austria, includes various small paper bags labeled (in Japanese) "kuro mame." Letter (e-mail) to William Shurtleff at Soyinfo Center, March 2. 1 p. [Eng]

• ***Summary:*** "At present, there is an exhibition taking place at the Ethnology Museum in Vienna, Austria, on the occasion of the 140th anniversary (2009) of the setting up of diplomatic relations between Japan and Austria in 1869. This was an issue of the opening of Japan to the Western world after the end of the Edo period. And a couple of years later, Japan participated in the Vienna expo of 1873 and again thereafter the Haberlandt experiments had started."

"In that present exhibition, a wooden box containing bags with Japanese food, 'beans,' tobacco, rice, medicals is presented. Mr. Takashi Sato, a Japanese PhD student of mine in Vienna has identified a bag entitled 'kuro mame' which means black beans. There is a possibility that these 'beans' are soybeans, perhaps the ones Haberlandt had seen during the expo in 1873 and of which he received his first seed samples (before ordering other early maturity samples). I contacted the curator of the exhibit. She believes that the signs on the bags read like black beans, but she does not know whether this means soybeans or not. (And we do not yet know what is inside!).

"I have copied a few color photographs for you onto my web site, where you could see the box and bags from the exhibition.

"I would be happy to hear your opinion on the 'black beans' bag. Could this be a soybean?

"Kind regards. Johann."

Shurtleff replied: "Dear Johann.

What treasures! It never occurred to me that such objects might be saved. I lived in Japan for 6 and a half years and still speak quite good Japanese, especially on subjects related to soy.

"In Japanese 'kuro mame' does indeed mean literally 'black beans.' However this term is used in Japanese *only* to refer to black soybeans, and should be translated 'black soybeans.' Mr. Sato will surely be aware of the widespread use of this term at the time of the Japanese New Year when *kuro mame* are one of the standard / required dishes.

"In his article 'Der Anbau der rauhhaaringen Sojabohne' (1877, table p. 261) Haberlandt states (referring to soybeans): 'Black from China (one original, one progeny), black from Mongolia (original), and black from Japan (original).' The paper bag confirms his black soybeans from Japan.

"In photo #5517 the right bag is labeled 'kuro mame.' The left bag is labeled 'maru kuro mame' ('round / whole black soybeans') and the middle bag bears the name of Siebold, referring to Philipp Franz von Siebold (1796-1866), the famous German physician and naturalist who wrote extensively about Japan and brought back a botanical garden and museum full of Japanese material, especially seeds and plants.

"Siebold's main trip to Japan lasted from Aug. 1823 to mid-1830–8 years. This was 50 years before the Wiener

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Ausstellung. Siebold was the first Westerner to sell soybean seeds in a seed catalog (his own), published in 1856 in Leyden (Netherlands) and Bonn. It would not be at all surprising or unusual if Haberlandt obtained that bag of soybeans from Siebold's organization.

"In photo No. 5524, a bag on the right is labeled 'kuro hira mame' which means literally 'black flat soybeans.'

"I think the probability that those carefully-labled bags contain black soybeans is greater than 95%. What else could be in them? The only other possibility (very unlikely) is black azuki beans." Address: PhD, Inst. of Agronomy & Plant Breeding, BOKU–Univ. of Natural Resources and Applied Life Sciences Vienna, Gregor Mendel Str. 33, A-1180 Vienna, Austria.

11329. Vollmann, Johann. 2010. Re: Heinrich von Siebold and soybeans in Austria and Europe. Letter (e-mail) to William Shurtleff at Soyinfo Center, March 2. 1 p. [Eng]
• ***Summary:*** "Let me tell you more precisely my understanding of the whole story which plays out *after* the end of the Edo period, i.e., after 1868.

It is not possible that Haberlandt had received soybeans from Philipp F. von Siebold, as Philipp von Siebold died in 1866. Our university was founded in 1872, before that time Haberlandt was a teacher in Hungary. Haberlandt came to Vienna in 1872 as the first agronomy professor, he learned about soybean only in 1873 during the Vienna World Exposition (*Wiener Weltausstellung*).

According to what I learned from the present exhibition, the name 'Siebold' on the seed bags refers to Heinrich von Siebold (1852-1908) who was the second son of Philipp F. von Siebold. Heinrich von Siebold came to Japan in 1869, shortly after the Meiji restoration. He served as an interpreter and diplomat at the Austrian-Hungarian embassy in Tokyo for 30 years. In January 1873 he accompanied the Japanese delegation as an interpreter on their journey to the Vienna World Exposition. Like his father, Heinrich von Siebold was a collector of Japanese items of all kind. After the end of the Vienna expo he bought some of the items on display during the expo.

"Later (in 1889), Heinrich von Siebold donated over 5,000 items out of his collection to the Vienna Natural History Museum (now in the Vienna Ethnology Museum). This explains why the name 'Siebold' is on those bags; it has nothing to do with Phillip Franz von Siebold in my understanding."

"It seems that Heinrich von Siebold advised the Japanese delegation on what to present during the Vienna World Expo of 1873. He undoubtedly was one of the few people to be competent enough do so, as he knew both Japanese and European 'worlds.' So, he could have been the one who decided to bring soybeans to Europe where Haberlandt picked them up."

Dr. Vollmann attaches a detailed German-language biography of Heinrich Frh. von Siebold, diplomat and collector. Born: Boppard, Prusses (Germany) 21 July 1852; Died: Schloss Freudestein bei Bozen, Tiron (Bolzano / Bozen in Italian) on 11 Aug. 1908. It was published in an Austrian Biographical Lexicon and contains a good bibliography.

The full citation is: Körner, H.; Walravens, H. Österreichisches Biographisches Lexikon 1815-1950, Vol. XII, p. 230. Volume editor: Österreichischen Akademie der Wissenschaften Publisher: Verlag der Österreichischen Akademie der Wissenschaften, Wien, Österreich. It is available online at www.oeaw. ac.at/oebl/. Address: PhD, Inst. of Agronomy & Plant Breeding, BOKU–Univ. of Natural Resources and Applied Life Sciences Vienna, Gregor Mendel Str. 33, A-1180 Vienna, Austria.

11330. Carr, Stephen. 2010. Patience a virtue in miso making: Englishman Tony Flenley sticks with tradition, keeps 105-year-old Osaka business alive. *Japan Times.* April 3. [Eng]
• ***Summary:*** Flenley is the managing director of Osaka Miso Jozo in central Osaka. He has run the company for 20 years–since April 1990. Flenley first came to Japan in 1977 after graduating from the University of Swansea, South Wales. He worked as an English teacher and married a local Japanese girl whose father had been running a well-established miso business since several years after World War II.

Consumption of miso has been decreasing in Japan and the quality has been going down as large manufacturers (and consumers) focus on low-price products. "Flenley believes that 'the insistence on cheap prices by supermarkets' is killing Japanese food culture. 'It's not just miso. If food producers are continually forced to keep prices down, they can survive only by making inferior products. The Japanese are getting used to the taste of cheap food.'

"Another example, he says, is natto fermented soybeans, which are only half fermented when you buy them in a supermarket. If you eat it a couple of weeks after the sell-by date, it will be properly fermented!"

"Domestic consumption is down, with 1,300 miso manufacturing plants nationwide compared with 1,600 a decade ago. Production is 520,000 tons, as against 560,000 tons at the beginning of the decade. But miso exports today stand at 6,200 tons, more than double the 3,000 at the turn of the century."

Photos show: (1) Flenley, with arms folded, standing in front of 50-year-old wooden barrels where red miso is aged for two years. (2) Flenley works with an employee at the 105-year-old miso company. Address: Tokyo.

11331. *SoyaScan Notes.* 2010. The life and work of Minami Satoh, natto maker in Sebastopol, California (Overview). April 11. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** 1957 April 2–Minami Satoh was born in Japan to father Fumio Satoh and mother Hisae Okazaki. Fumio

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Satoh, was founder and President of Satoh Steel Pipe Co. Ltd, a wholesaler of steel pipes and tubes.

1981 March–Minami graduated from Keio University, Law department in Tokyo, Japan, with a Bachelor of Arts degree. Minami had an interest in becoming an international business person. So in late March, 1981, while awaiting admission to American Graduate School of International Management, (Thunderbird), in Glendale, Arizona, he arrived in the USA and began to attended the Economic Institute in Boulder, Colorado; he took English classes, which helped to prepare him to study business.

1981 Sept.–Minami officially began studies at Thunderbird.

1983 Jan.–He graduated from Thunderbird. Minami lived in the U.S. for one and a half years earning his degree, Master's International Management.

1983-1988–Minami worked for DuPont in Japan, as a marketing representative, marketing Corian (artificial marble).

1989-2006–He worked for his father's company Satoh Steel Pipe Co., Ltd. wholesaling steel pipes and tubes. While successful, this work was not of much interest to him, thus he pursued diversifying the company.

2003–during this research phase, he met a Japanese American who was planning to import natto snacks to the U.S. at a trade show in Tokyo, Japan. Minami had interest in a business that had multi-cultural dynamics. However this particular project did not succeed financially.

2005–Minami then had the opportunity to purchase majority shares of a small natto-making company named Yaguchi Natto Manufacturing Company, now Yaguchi Foods Co., Ltd. in Japan. Shortly after this time, the owner died; and his relatives sold the company to Minami.

The company address is 1-30-29 Numakage, Nimai-ku, Saitama City, Saitama prefecture, Japan. Yaguchi Foods makes only natto, however they sell other soybean related foods such as tofu. The company has 35 people on the payroll including part-time employees.

Minami believed fresh and hand-made natto would have the opportunity to sell in the U.S. with its milder aroma and taste compared to frozen imported natto–and that it could become popular like other soyfoods such as tofu, edamame, miso, soy sauce, soymilk and tempeh.

2005–Minami came to the United States to meet Malcolm Clark (The great grandson of Dr. William Smith Clark {graduated Amherst College, 1848}, who was the first chairman of the agricultural college in Hokkaido, Japan, and is still quite famous.)

Malcolm Clark, founder of Gourmet Mushrooms, Inc. has since retired. While studying in Japan, he was chosen to be one of two principal students of Dr. T. Yoshii, the innovator of the use of sawdust as a substrate for growing mushrooms. With this knowledge, Malcolm returned to North America and collaborated with a group of Japanese-Canadians to start the cultivation of shiitake mushrooms. During this period, he met David Law and in 1976 the idea of Gourmet Mushrooms, Inc. was hatched.

In 1977, he and David (now CEO) founded Gourmet Mushrooms Inc. and began building their dream of commercial cultivation of exotic mushrooms in Sebastopol, Sonoma County, California.

Malcolm Clark now lives in Occidental, California.

Minami hoped that Malcolm Clark would give him some good advice about how to market natto in the USA. When he met Mr. Clark, the latter was thinking of retiring.

Minami chose to buy some shares of Gourmet Mushrooms, to share resources and create synergies between his Natto company and Gourmet Mushrooms.

2006 Feb. 24–Minami founded Japan Traditional Foods, as a corporation in Sebastopol, California for the production and sale of foods, namely natto.

2008 June–Minami moves to the United States from Tokyo, Japan to manage Japan Traditional Foods. The company presently has two employees, Minami Satoh and Dallas Akimoto. In the beginning Shun Takahashi, joined him from his natto company in Japan. Shun made the natto and Minami was in charge of running the company and marketing the natto until 2009, November.

2008 Nov.–Japan Traditional Foods starts selling its first natto product, Tezukuri Natto (Tezukuri means "hand made" in Japanese), through a Japanese distributor in Los Angeles. The first important retail outlet was Nijiya Japanese Grocery Market.

2008 Nov. 15–Natto Preview Party held at Deloache Vineyard in Santa Rosa.

2009 June 27-28–Tezukuri Natto Demonstration at Mitsuwa Market Place in San Jose, California.

2009 Aug. 8-9–Tezukuri Natto Demonstration at Mitsuwa Market Place in Costa Mesa, California.

2009 May 12–Seth Roberts, in his Wellsphere blog, writes a good history of Minami Satoh's work to date.

2010 Jan. 18–Japan Traditional Foods introduces organic Megumi Natto at Fancy Food Show in San Francisco, California.

2010 April 20–Launch celebration event for organic Megumi Natto at Ozumo Restaurant in San Francisco, California.

Note: Mr. Satoh lives in Santa Rosa, California, with his wife and daughter and travels regularly to Japan. As owner of Yaguchi Foods, he continues to oversee production and sales of natto in Japan.

11332. Nishito, Yukari; Osana, Yasunori; Hachiya, Tsuyoshi; Popendorf, K.; et al. 2010. Whole genome assembly of a natto production strain *Bacillus subtilis* natto from very short read data. *BMC Genomics* 11:243+. April 16. [40 ref]
• ***Summary:*** This is an open access article: Abstract: *Bacillus subtilis* natto is closely related to the laboratory standard

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strain *B. subtilis* Marburg 168, and functions as a starter for the production of the traditional Japanese food "natto" made from soybeans. Although re-sequencing whole genomes of several laboratory domesticated *B. subtilis* 168 derivatives has already been attempted using short read sequencing data, the assembly of the whole genome sequence of a closely related strain, *B. subtilis* natto, from very short read data is more challenging, particularly with our aim to assemble one fully connected scaffold from short reads around 35 bp in length.

"Results: We applied a comparative genome assembly method, which combines *de novo* [new] assembly and reference guided assembly, to one of the *B. subtilis* natto strains. We successfully assembled 28 scaffolds and managed to avoid substantial fragmentation. Completion of the assembly through long PCR experiments resulted in one connected scaffold for *B. subtilis* natto."

Conclusions: The determination of the whole genome sequence of *Bacillus subtilis* natto provided detailed analyses of a set of genes related to natto production, demonstrating the number and locations of insertion sequences that *B. subtilis* natto harbors but *B. subtilis* 168 lacks. Multiple genome-level comparisons among five closely related *Bacillus species* were also carried out. The determined genome sequence of *B. subtilis* natto and gene annotations are available from the Natto genome browser http://natto-genome.org/. Address: 1. Dep. of Biosciences and Informatics, Keio Univ., Hiyoshi, Kohoku-ku, Yokohama, Japan.

11333. Chen, Y.; Ono, T. 2010. The mechanisms for yuba formation and its stable lipid. *J. of Agricultural and Food Chemistry* 58(10):6845-49. May 26. *
Address: The United Graduate School of Agricultural Sciences, Iwate University, Ueda 3, Morioka, Iwate 020-8550, Japan.

11334. Yasuda, Masaaki. 2010. Daizu hakko shokuhin [tofuyo] ni kansuru shokuhin kagakuteki kenkyu [Scientific aspects of the fermented soybean food, tofuyo]. *Nippon Shokuhin Kagaku Kogaku Kaishi* (*J. of the Japanese Society for Food Science and Technology*) 57(5):181-90. May. [56 ref. Jap; eng]
• ***Summary:*** The subtitle of this article reads (in Japanese): (*Heisei 21 nendo Nippon Shokuhin Kagaku Kogakukai Sho*). This means that in 2009 this article won an award from the Japanese Society for Food Science and Technology.

Tofuyo is a type of low-salt fermented tofu. This study describes the chemical characteristics of tofuyo and the role of molds of the genus *Monascus* in its production.

The tofuyo fermentation process is unique in that its soybean proteins undergo limited hydrolysis by proteinases [enzymes that break down protein] in the presence of ethyl alcohol which originates from *awamori.*

Note: *Awamori* is Okinawan distilled liquor; it is made from Thai-style long-grained Indica rice and black koji mold, indigenous to Okinawa; after distillation it is often aged like whiskey.

The main constituents of tofuyo are basic subunits of glycinin and polypeptides. During maturation, the soy proteins in tofuyo are digested into peptides and amino acids. The amount of free glutamic acid and aspartic acid are strongly correlated to the good taste (*umami*-taste) of tofuyo. Address: Dep. of Bioscience and Biotechnology, Faculty of Agriculture, Univ. of the Ryukyus, 1 Senbaru, Nishihara-cho, Okinawa 903-0213, Japan.

11335. Demetriou, Danielle. 2010. Grain of wisdom: Madonna's former personal chef (Web article). *http://www.thenational.ae/lifestyle/house-home/grain-of-wisdom-madonnas-former-personal-chef.* June 16.
• ***Summary:*** Mayumi Nishimura of Tokyo (age 53), a world-famous practitioner of macrobiotic cookery, was Madonna's personal chef for 7 years, cooking for the singer and her family, as well as providing most meals during four of Madonna's world tours. Madonna (who is not a vegetarian) also avoids dairy products, enjoys tofu, miso and soymilk, is adept at using chopsticks, and speaks pretty good Japanese.

While in high school, Mayumi began to see clearly the connection between her diet and her health and spiritual wellbeing. She changed her diet and became a vegetarian and began to eat brown rice. At age 21 Mayumi was introduced to the writings of George Ohsawa. So she packed her bags and went to study at the Kushi Institute in Boston, Massachusetts. It worked very well for her and she ended up running a branch of the Kushi Institute in Beckett, Massachusetts.

Then 9 years ago she was asked if she wanted to try out as Madonna's personal chef. She got the job and became part of Madonna's extended family. Madonna later wrote her in the book *Mayumi's Kitchen:* "Not only are you the best chef in the world, you are part of our family... In the seven years you lived with us and cooked for us, your amazing food helped me to be a happier, healthier person, balanced in body and mind. I feel better than I did 20 years ago. I am very grateful to you for this."

Note: As of April 2011, Madonna lives in New York City, in the fashionable Upper East Side at 152 East 81st St. She lives in a gated community, said to be worth $32 million.

11336. *SoyaScan Notes.* 2010. The first and second natural food movements in the United States: Differences and similarities (Overview). Aug. 19. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** The first natural foods movement, which started in 1953, had its headquarters in Atlanta, Texas. They published an excellent monthly magazine titled *Natural Food and Farming* from April 1954 until Aug. 1995 (Vol.

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41, No. 2). Each issue was 8½ by 11 inches, and in 1957 a typical issue was 22 pages long.

The movement was based on an organization named "Natural Food Associates" (NFA) (founded in 1953), which had a large membership from the mid-1950s on, and had many nationwide chapters–such as the "Connecticut Natural Food Associates." Their basic missions were to raise awareness that our food system, soil, water, and bodies were being poisoned by a host of new agricultural chemicals (such as DDT), fluoridation, etc., and to provide an alternative for those who were concerned about their health and/or the environment: "natural foods grown on fertile soil eaten fresh and poison free" (April 1958, p. 6).

They encouraged people nationwide to start a vegetable and grow their own food using compost and without using chemical fertilizers or toxic pesticides. They were independent of but closely allied with and active in promoting the fledgling organic gardening and farming movement and the biodynamic farming movement (especially Ehrenfried Pfeiffer). As they watched with alarm as the fertility of the soil was being destroyed by large-scale chemical farming methods, they were especially active in linking the health of the body to the health of the soil.

They worked very hard, for example, to ban DDT and fluoridation and many of their leading members (PhDs and university professors) testified against it.

The founder, president and sparkplug of NFA was Joe D. Nichols, M.D., from 1954 until his death on 27 May 1992. Most of the officers and leaders of this movement were adults, and a large percentage were physicians (M.D.s), dentists, or in academia. They had annual nationwide conventions, and before long, regional and state chapters and conventions. They were very active and well funded–nationwide.

Note: In 1962 *Silent Spring* was published. In 1972 DDT was banned in the USA.

The second natural foods movement in the U.S. began as a macrobiotic foods movement. It was started by Erewhon Natural Foods in April 1966 in a small natural foods retail store at 303-B Newbury Street (below street level) in Boston, Massachusetts. Aveline and Michio Kushi (teachers of macrobiotics) were the founders, but Aveline was the sole owner. Evan Root was the first retail store manager. The origin of the natural foods industry and movement in America can be traced to this date. Erewhon was the first store of its kind in America and it soon served as a model for many other similar natural food stores across the United States. So the 2nd natural foods movement actually began as a macrobiotic foods movement.

The 2nd natural foods movement was largely vegetarian in addition to eschewing refined foods–and specially white sugar. The 1st natural foods movement advocated the eating of meat, poultry, and fish as good sources of protein.

Soyfoods were a major part of the 2nd natural foods movement, but a very minor part of the 1st. Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549.

11337. Kikkoman Corporation. 2010. Annual report 2010. Year ended March 31, 2010. 250 Noda, Noda-shi, Chiba 278-8601, Japan. 41 p. 28 cm. [Eng]

• ***Summary:*** Consolidated net sales decreased 30.8% to $3.071 billion, operating income rose 3.9%% to $226.7 million, and net income increased 213.2% to $92.49 million. Note: Dollar values may have changed at different percentage rates due to changing foreign exchange rates.

Page 2 is titled "Kikkoman exhibits at Japan industry pavilion, Expo 2010, Shanghai, China." A *ryôtei* is a Japanese restaurant that serves *kaiseki-ryori,* an ultimate form of Japanese cuisine. Kikkoman's booth was named Ryôtei Murasaki.

A photo (p. 3) shows Yuzaburo Mogi (Chairman of the Board and CEO) and Mitsuo Someya (President and COO). Address: Noda, Japan.

11338. Boswell, April. 2010. Re: Work at the Erewhon retail store on Newbury Street in Boston. Letter (e-mail) to William Shurtleff at Soyinfo Center, Oct. 13 and 24. 1 p.

• ***Summary:*** "On a whim yesterday I googled Erewhon, the natural foods store on Ellery St. in Boston for whom I worked a few months in early 1971. As I scanned through what came across, memories began slipping back. So I thought I'd send on to you what I remember although you probably have plenty of information, and my memories are not very clear. Nevertheless...

"As a 20 year-old (my name was April Deborah Van Outrive in those days) I moved from California to Cambridge, Massachusetts in January 1971, and into a third-floor walk-up apartment with my boyfriend at the time Rory Ingalls (he might have been working at Tao Books), and two other roommates, a South American fellow, Manuel Manga (who was obsessed with geodesic domes) and Fern Weiner. They were all eating and living macrobiotically and I was learning from them. Fern did all the cooking for the house. She taught me how to make an authentic Japanese futon and some basics of macrobiotic cooking.

"After only a month or so for reasons I don't recall, we moved again into a lovely old macrobiotic house on Ellery St., around the corner from the Orson Wells theater and down the street from Harvard Square. There were eighteen to twenty people living in this house which was run by Bruce and Melinda Gardner. Melinda was pregnant and subsequently had her baby, David, that spring or summer. The house was three stories and had been built in the early eighteen hundreds. I remember Melinda making tofu from scratch in the big kitchen there with a number of us women. My memories of Bruce and Melinda are that they were both calm, gentle people. Melinda called their baby 'Davie-cha.'

"I went to work for Erewhon on Newbury St. and rode

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the bus from Cambridge, past MIT and over the bridge into Boston. Russell Desmarais (spelling?) was managing the store as I recall. We had large open barrels of grains, seeds and nuts as well as nut butter grinders, and I recall estimating amounts when helping customers with their grains. One time the famous singer Odetta came in and I waited on her. I didn't know who she was at the time. I also recall a young man who worked at Erewhon, he played the flute and would sit outside the back door on a ledge or a stairway during his breaks; I was charmed by his haunting tunes.

"Some of us Erewhon employees took a bus one weekend up to Vermont, to donate our time to work on a farm there. We worked in the fields digging stones out of the soil. The stones were as numerous as potatoes in the ground but less satisfying to unearth. I recall wondering if they just continued to rise to the surface over time. Another memory of that weekend is that along the way there, we stopped and swam in the bend of a clear cold river. The idyllic nature of that swim and that time remains with me today.

"On another occasion there was a big party at what may have been the Kushi's house that we all attended. I recall it as being a gracious home. It might have been Aveline or Michio Kushi's birthday celebration.

"We attended lectures given by Michio Kushi in Boston, I think this was downtown at a church, close to the Boston Commons.

"Bruce and Melinda were offered the opportunity to run a big house and farm in the countryside outside of Boston, where we had also visited as a group. I think they did leave the Ellery St. house to do that.

"In June or July of 1971, I decided to catch a ride back home and put up a sign to that effect on the bulletin board at Erewhon. A girl name Dulcie answered my ad; she was heading to California in her little VW and could use a traveling companion. She arrived bright and early one fine summer day, I packed my things in her car and off we went. Life made its usual twists and turns and I did not return to Boston.

"I was the girl on the cover one month of the little publication put out by Erewhon, might have been the East-West Journal. I think I was holding a big basket of fresh produce.

"So that's my little story! Thanks for allowing me to reminisce." Address: Clayton, California.

11339. Cappuccino, Bonnie; Cappuccino, Fred. 2010. Child Haven International, a herd of SoyaCows, and soymilk on the Indian Subcontinent. Part II (Interview). *SoyaScan Notes.* Oct. 25. Conducted by William Shurtleff of Soyinfo Center. • ***Summary:*** Continued: Child Haven has a number of volunteers, Westerners who go for 6-12 months to help at one of the homes in Asia. Before going, they are given a 1-2 day orientation in Ontario. Fred notes: "One of things we tell them is that anything they can do to encourage the use of the SoyaCow machines would be beneficial–such as praising and encouraging the staff who are making the soymilk. Most of the Westerners really do like the SoyaCow program and most of them enjoy that hot cup of soymilk early in the morning." Bonnie adds: "I really enjoy and appreciate that hot morning soymilk. For me, it has a better flavor than cold soymilk. I guess its just what you get used to." Because of the dark-skinned children Bonnie adopted, Fred was kicked out of one Methodist church and invited to another, where he served for four years. "During the time we were there the congregation changed from almost totally white to almost totally black." Then they moved out to the country where Fred served as minister to three churches; 9:00, 10:00, and 11:00–Fred made the circuit every Sunday. "It was fun. After that we were able to make the transfer to a Unitarian congregation." Fred has always been a Unitarian at heart.

Frank Daller was living in Toronto, in what he called "the rat race," when he heard about Child Haven and about Bonnie and Fred. He learned that Bonnie had adopted a lot of kids and that Fred was an anxious spectator. Frank was in the music business, but he was not a musician. He might have been a promoter or a manager. On the wall of his office in Toronto he had a "Juno Award." These are presented annually to Canadian musical artists and bands to acknowledge their artistic and technical achievements. Frank wanted to get out of that "rat race" life, so he and his wife moved from Toronto to be near where Fred and Bonnie lived in Maxville. Frank had skills as a carpenter, so he earned his living doing carpentry and he also worked at ProSoya. Frank and his wife had one child born to them; they then adopted a kid from Mexico.

In early 1993 CHI ordered six more SoyaCows. One of these went to their largest home, in Kaliyampoondi (near Madras, in Tamil Nadu state of southwestern India). The others went elsewhere in India–perhaps to early SoyaCow entrepreneurs.

Importing anything into India at this time was a huge hassle and extremely difficult. Getting those six SoyaCows through customs was fraught with problems–mostly bureaucratic. They didn't assume Child Haven was a charity; they took it to be a money making venture. How would they monitor how much money was made from these six machines, and are the taxes properly paid, etc.

In 1993 CIDA sent a man [Dan Thakur, PhD] to India to evaluate the SoyaCow project. This was the first program he had evaluated a program for CIDA. CIDA does not give funding for children's homes, so CIDA had no interest and no involvement in the main program of Child Haven–the children's homes. His evaluation of the SoyaCow program was totally negative. For example, CHI had hired a woman named Sandiya Rani to be in charge of the SoyaCow program. She was never a caregiver. They hired a woman because CIDA wanted to help women gain employment. She didn't work out very well. She did not

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know how to fix equipment that was not working properly and she was prohibited (as an unmarried woman, probably by her family) from traveling unless accompanied by a male relative or chaperone–as to other SoyaCow sites. This lack over supervision was an example of a criticism. The main criticism was that Child Haven was not able, at that time, to get the SoyaCow out into the Indian community with people who wanted to use it to make a living. The 53-page report was submitted on 24 Sept. 1993, after CHI owned at least six SoyaCows. After this evaluation, Child Haven received no more funding from CIDA (except for on-site funding for a school building in Nepal). Child Haven had to raise all future funds for the soya program–almost entirely from donors in Canada.

At about the same time as the negative CIDA report was issued Child Haven hired Dr. Ratan Sharma (his PhD is in soy and dairy paneer) full time to be in charge of the SoyaCow program (replacing the woman) and to monitor the roughly six SoyaCows. He was paid a fixed annual salary, to promote soyfoods and SoyaCows, teach new potential entrepreneurs how to use the SoyaCow and start a business with it, and to maintain existing SoyaCows if they develop problems. Child Haven found Ratan through Raj Gupta and they think Ratan is an outstanding person who is doing a very good job.

Shortly after hiring Dr. Sharma, Child Haven opened the SoyaCow Centre. Here Child Haven also pays the rent on his home and office. At Centre there is no SoyaCow and no space for training people. Ratan has to go to an existing site to train people.

Dr. Sharma is still employed full time by Child Haven, which is not able to pay him as much as he could earn elsewhere with his PhD degree. But he also is paid for part-time consulting with the American Soybean Association, with ProSoya, with Malnutrition Matters, and with some Indian government programs.

At least once or twice, Frank Daller traveled to India with Bonnie. On a trip in early 1995, Daller went to India to see if the herd of SoyaCows were being used properly. When he found that many were not, basic changes in the program were made.

"Part of our reason for developing the SoyaCow was not just for our children's homes but the idea of getting across the whole possibility of low-cost, high-protein food for a society that is basically vegetarian and is gradually losing one important traditional source of protein–dal. But it takes a long time to introduce a new food to a traditional culture, unless you start with the children. The SoyaCow is going out to new places in India and I think Ratan is largely responsible for that. He is still an employee of Child Haven, paid from money that is donated to Child Haven.

After Child Haven got paid staff at the office of its headquarters in Maxville, they became much better about keeping and organizing all important documents so they could be quickly and easily located. Two people presently work at the office in Maxville.

"For Child Haven, over the years, The SoyaCow program has meant much better health for the children and better teeth. Occasionally doctors from other countries offer to come in and do a dental clinic or health check. They usually say that our children have much better health and much better teeth than other children in that area or than children at other children's homes that don't have a SoyaCow. Also the whole idea of trying to spread the concept of this basically very good food for a society that needs a good source of protein because they are largely vegetarian. The SoyaCow provides a good-tasting soymilk. Using soybeans in the form of soymilk or tofu is much better than trying to use them as dal. Ratan has done good work in India, Bangladesh and Nepal to help small entrepreneurs start a new business based on soymilk and tofu made by the SoyaCow. Child Haven has a SoyaCow at its home in Nepal (where electricity is a problem) and at Chittagong, the 2nd largest city in Bangladesh.

"Raj Gupta has been a good supporter over the years of the basic program at Child Haven. Certainly the whole idea of this Soya Cow would never have started without him. Its a mutual admiration society between Raj and Rashmi and the two of us. We admire him and his wife so much for what they have been doing. We saw them often during the early years of the SoyaCow program and the committee that worked to get funding from CIDA. We still see them 2-4 times a year and they have helped us with the Indian High Commissioner to Canada (like an ambassador who lives in Canada) to get visas for our volunteers going to India from Canada. They come to our annual fundraising dinners in Ottawa. We have annual fundraising dinners across Canada at about 18 different places. Child Haven's annual budget from donors in Canada (plus a little from the U.S.) is about $1.5 million.

Question: How would you describe what you have done since you started Child Haven? Ans: "I don't know. I don't try to analyse it. We just do what seems to make sense and hope it works. I calculated one time that 75% of what Bonnie and I have tried to do in terms of new projects, etc. was a total flop. And then something clicks. Child Haven is one thing that clicked. I don't know that it means that we have any special talents or skills."

Fred adds: "When I was in Japan I had the Methodist missionary mindset. But instead of converting people, I accidentally got converted, and came to feel that the Japanese are all right the way they are. That's pretty much my story. I'm a Unitarian minister now. We don't convert people. I tell the congregation that I was 36% Buddhist, until I heard the Dalai Lama. Then I became 48% Buddhist. I'm 81% Unitarian. There's overlapping there" [Laughter]. Address: Founders, Child Haven International.

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11340. *SoyaScan Notes.* 2010. Did the Chinese or Japanese or Koreans traditionally feed soymilk to infants or to recently-weaned children? No! (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** A personal view by William Shurtleff:

I have lived in Japan with a Japanese family for 6½ years, spoke fluent Japanese, traveled all over China, and read huge amounts of literature about soy in China and Japan.

I would say that the Japanese and Chinese do NOT feed soymilk to infants or even to weaned infants. Rather they DO feed tofu as one of the earliest weaning foods. They mash it with rice gruel, so both are very soft. Remember that traditional Asian soymilk causes infants intestinal gas which tofu generally does not, or at least much, much less.

Of course it depends partly on what age you mean by "infants." At what age does an infant cease to be an infant? Wikipedia says of "infant": "It is typically applied to children between the ages of 1 month and 12 months; however, definitions vary between birth and 3 years of age."

I have never seen or heard of soymilk used as an infant food or a weaning food, except in a few early French-language articles such as: Labbé 1911, and Beltzer 1911–and maybe a few other articles.

The statements in these two articles that soymilk is fed to infants are rare exceptions. I imagine that Beltzer learned it from Labbé and that Labbe did not know much about the subject.

Read the writings of Dr. Harry Miller (M.D., on our website, www. soyinfocenter.com) who established the first soy dairy in China in 1936, who lived in China as a missionary in China for many decades, and who introduced soymilk for infants (Soyalac) to the United States. He wrote a great deal and a biography has been written about him, yet I do not recall that he ever said that Chinese feed soymilk to infants. Address: Soyinfo Center.

11341. Gorell, Wallace. 2010. Re: Brief memoir–Interest in and involvement with macrobiotics (Continued–Part II). Letter (e-mail) to William Shurtleff at Soyinfo Center, 27 Dec. 2010 and 6 March 2011. 5 p. [1 ref]

• ***Summary:*** Continued: "Here is an extract from my 1967 journal, describing my arrival in Boston. (It was written without capital letters):

"now i am at 29 university road, brookline. i was greeted by beverly (renée's friend) who said 'welcome, you can put your things in the basement till we see if you will stay.' on the way out to the car i met rebecca [Dubowsky], the housekeeper. she asked mike and jan to come only at night [because they looked like hippies–they had even longer hair than I did then]. as i went to bed she was having beverly make her short hair shorter. i wonder about my hair. is my desire to keep it only natural or is it materialistic?

"just being here has made me very high. they are wonderful. i have so much to learn.

"today i have met the kushis. both he and she are amazing. very young-seeming, full of energy. i have spoken to jim ledbetter who is more like i imagined than the kushis. he is thoughtful. they are. their children are happy and active. already i feel love for them all. tomorrow perhaps mom and dad will arrive. "they arrived on the 11:00 shuttle from new york. they like the house and the people. at dinner last night they even liked the seaweed. they spoke with mr. kushi who gave them a brief run down of their ills by looking at them and trying a few pressure points. he ordered two bags full of macrobiotic staples which might be difficult to get in pennsylvania. martin brought the foodstuffs back from the store and i packed them in a picnic basket for their return trip. most everyone here at the house has told me how lucky i am to have such friendly, aware, and open-minded parents.

"now they have left. mother sounds as if she may take mr. kushi's advice and come here to live for a week or so to learn to cook and to have consultation and massage therapy. i have a slight headache and a beginning cold. michael has come by to find out what to do about jan who is sick. i unpack.

"Because I wouldn't cut my hair or beard, I was not included as part of the public face of the macrobiotic community. But I quickly made myself at home on University Road, doing a lot of the cooking for our 'study house,' and I co-edited 'The Order of the Universe' with Jim. I also intently studied macrobiotic theory, trying to make sense of the yin-yang system. I sat with Michio for hours working on a relative ranking of foods. [Note: This was no simple matter given the number of factors to consider. Yin food characteristics: large, wet, fragrant, sweet, sour or spicy, oily, seeds on the outside, native to a warm climate, coloration toward the violet end of the spectrum. Yang food characteristics: compact, dry, odor-free, salty or bitter, seeds on the inside, native to a cold climate, coloration toward the red end of the spectrum. Flesh is more yang than vegetables. Roots are more yang than fruits, stems more yang than leaves, etc., etc.]. 'Which is more yin,' I would ask, 'Cucumber or eggplant? Eggplant or banana? Banana or onion?'

"Another journal entry from that time:

"michio says that 'macrobiotics' will no longer be nonsense in ten years. perhaps that means that in ten years everything will be so nonsensical that no one will notice that macrobiotics still is.

"I returned to San Francisco for the summer of 1968 to share what I had learned–the theory still didn't make much sense, but the diet did. I served as Bobby Weir's macrobiotic advisor (Bobby was one of the founding members of the Grateful Dead). I taught a beginning cooking class weekly in the Haight Ashbury, and an advanced class in North Beach. Then after another year in Boston I went off to Japan, in August of 1969, to study acupuncture (which was still

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thought of as some medieval barbarism in the West, if it was known at all). Michio said he would arrange everything for me, that his parents would meet me at the airport and that I would stay with them while I was studying. Luckily Evan Root, a friend from Boston, met my plane, because I never saw or heard from Michio's parents during the subsequent year and a half I was in Japan.

"Why Michio told me those things, I have never understood. I tried to construe the whole thing as a trial he had contrived for me, guru-like, but it didn't make me think better of him. On my own, I never found an acupuncture teacher I wanted to study with, but I did study cooking with Darbin Yamaguchi [the wife of Alcan Yamaguchi] in Kyoto; I did work with the Katsuragis on their farm in southwestern Japan [Okayama] for a year, where I studied traditional methods of food preservation [the family made its own miso and *takuan* pickles]; and I did study shiatsu massage with the generous Miyamoto family in Hokkaido.

"After returning to the States, I worked for a year at my father's window business near Pittsburgh before returning to Boston. Here is another journal entry from that time:

"9/71 it seems i just can never write in here when the action's fast. weeks again have gone by and much has happened. now i'm in the hartford airport on my way to pennsylvania to gather up my things so i can return to boston to work with paul and bill and everyone at the erewhon trading company on filthy farnsworth street. who could have guessed it? it wasn't even on my list of options. i didn't even try. and already i've produced a whole new line of bags for them (us?) and i'm living at garner road. why this year i may even pay taxes.

"now [I'm being paid at erewhon] dollars five hundred sixty [$560] for each calendar month. paul tells me i'll be getting seven hundred by december (probably november), but he doesn't seem to want to be precise. stories of michio shafting various people monetarily make me uneasy in arranging money business here.

"'what effects did the trip to japan have on your thinking?' michio asks, and my mind whirls. what a question. 'about macrobiotics,' he says. well then. and we talk for over an hour.

"paul hawken seeks to form a new corporation in texas. he says the miller wants to give us (erewhon) nine million dollars.

"There are many unsavory stories I could tell about Paul. He named his son after Frank Ford of Arrowhead Mills in Texas–the miller mentioned above–in order to clinch an Erewhon-Arrowhead merger, then changed the boy's name when the merger fell through. He had an avid companion in his bed every night his wife Dora was in the hospital bearing him that son. (To get to his room at the Gardner Road house one had to pass by mine.) He routinely dissed Erewhon's idealistic workers. His secretiveness and duplicity made it difficult for his co-workers, many of whom had once thought of themselves as his friends, to do their jobs. One day when I couldn't take it any more, I went into Paul's office to challenge him on his behavior. Screaming, he told me he had no intention of treating anyone any differently, so I resigned. When I returned to my desk, several people at the desks around me whispered, 'What was *that* about?' 'I quit,' I said. Just then he stormed out of his office, loudly accused me of being incompetent and told me he was firing me. 'I already told them I quit,' I replied. He flushed crimson, and screamed at me to get out.

"Precisely because their president was only twenty-three–who can be surprised that he lacked maturity?–many of Erewhon's employees thought they were working in the ranks of a new world order. They gave up better-paying jobs in order to take part in the great healing. We had an M.D. working in our shipping department. But at the management level I was perhaps the only one who didn't need to curry favor with Paul. The others had no previous corporate experience–no CV that could land them a similar position anywhere else. I could easily return to a job with my father's business or, as it happened, return to school (to study Japanese)." Continued. Address: Berkeley, California, and Flinders Island, Tasmania.

11342. Gorell, Wallace. 2010. Re: Brief memoir–Interest in and involvement with macrobiotics (Continued–Part III). Letter (e-mail) to William Shurtleff at Soyinfo Center, 27 Dec. 2010 and 6 March 2011. 5 p.

• ***Summary:*** "Michio and Aveline Kushi saw business, saw Erewhon, as a way of advancing the macrobiotic campaign (and/or their own ends). They asked us, the troops in that campaign, to help make Erewhon successful. We tried, telling ourselves we were creating a new business paradigm, although, week after week, the discord Paul created made it harder to swallow that line. Would Erewhon have been peachy without Paul? It seemed so to me at the time, but perhaps that was more youthful naiveté. Bill Tara, Jean Allison, Beverly Sky, Roger Hillyard, Judy Coates, Nancy Lesourd and I–others too, perhaps even Paul–were artists who, trying to change ourselves, trying to change the world, found our way to Boston to study a new technique. We were counter-culturists, mostly strangers to the world of business. The way things were at Erewhon, it was a very uncomfortable world to spend time in. Ill at ease there, disenchanted, some of us migrated away from the scene–although not necessarily away from macrobiotics–trying to find a personal path, to further a personal vision, to walk peacefully forward. Some have been kind of successful, some–not so much. But no doubt all, like me, have found it an interesting passage."

Note: After reading an earlier draft of this memoir, Shurtleff asked Gorell several specific questions, whose answers are given below. Please excuse any of this information that is now repetitive.

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Although the Grateful Dead and The Quicksilver Messenger Service never played at The Firehouse, Wally assumes they did play at the dance his group organized at California Hall.

Wally says he hardly knew Paul Hawken in San Francisco. When asked: "How did Paul, Jean, Bill Tara, etc. support themselves for 2-3 years in San Francisco? How did they pay for food, rent, psychedelics, etc." Wally replies: "I have no recollection. I worked at the post office for a while and then after the Firehouse / Calliope Company folded I worked as an actor with the New Shakespeare Company which has become today's Shakespeare in the Park."

"I don't believe I ever knew Erewhon to have a head other than Paul Hawken when I was in Boston. I was there for three different stays. Searching back through my journals I find that... I first arrived in Boston in mid-September of 1967. I remained there for the academic year, studying with Michio and Aveline, co-editing 'The Order of the Universe' and cooking for the University Road study house. In June of 1968 I returned to San Francisco to share what I had learned.

"In late summer of 1968, I went back to Boston to continue my studies with Michio and Aveline, to continue to work with Jim Ledbetter on editing 'The Order of the Universe' and to try to rationalize the yin-yang classification system for foodstuffs, and again I cooked for our study house on University Road.

"In August of 1969 I traveled to Japan for the first time. I expected I would have enough trouble getting along there without the problems created by having long hair at that time, so I cut it off short before I left.

"I returned to the USA in early 1971, worked for my father in Pennsylvania for about nine months, and then was offered the position of Director of Imports with Erewhon. To be perfectly frank, I can't recall ever having performed any of the duties that title would suggest, although I suppose I must have. I developed recipes for our packaged line of foods, designed the labels, illustrated (I think) and hand-lettered them. In my free time, I edited some of the recipes for a cookbook Aveline was producing, I painted the signs for Sanae restaurant."

"I first studied cooking with Aveline and helped her when I could, particularly after returning from Japan when I was living on Gardner Road. In Japan I studied with Lima Ohsawa a few times and took regular weekly classes from Darbin Yamaguchi during the latter part of 1969. I also learned a lot from teaching cooking classes which I began to do in 1968 and continued for some time as a way of repaying the obligation I felt toward my teachers.

"Names [of people studying macrobiotics in Boston during Wally's first year]: Connie Frank, Beverly Sewerski, Nahum Stiskin, Paul Hawken, Martin Russell (ran the retail store), Rebecca Dubowsky, Anne Harkless, Georgeanne Coffee, Richard Sandler, Bill Tara, Renée Gremore (that's her name now, can't recall her name then), Jean Allison, Evan Root, Jim Ledbetter, Joe Leis, Nancy Lesourd, Judy Coates, Dora Coates, Peggy __ (she became a Druid nun)...

"I'm afraid I can't tell you who came first and who came later. Just don't remember except for Jimmy and Susan Silver who I believe came in my second year."

When asked if he remembered an early tofu "cheesecake" developed in the macrobiotic community in Boston: "There was a lot of experimentation attempting to make foods that people missed–tofu 'cheesecake,' seitan 'chicken,' etc. I was never much interested in those efforts. I liked food that could be appreciated for what it was and cuisine that presented that food as simply and honestly as possible. But then I didn't have wild cravings for 'forbidden' foods the way many of my fellow macros did. Brown rice was (and continues to be) one of my favorite foods. There were times in those days when I seemed to be the only person I knew–including Michio–who was actually *following* a sensible macrobiotic diet. Everyone else seemed to lurch between bingeing and making penance. This tendency was, I felt, instigated by Ohsawa's extremism. Japanese macrobiotic adherents paid little or no attention to his edicts about drinking as little as possible, avoiding yin foods entirely, never picking up your child except for feeding, etc.; while many of his American adherents, to their detriment, strictly followed his advice."

When asked when and where he learned to write formal Japanese (*keigo*)*:* "After all three stints in Boston, and not really knowing what I was getting myself into, I decided to go back to school to study Japanese formally. (I had done a seven week crash course at Harvard before going to Japan for the first time, but had not, otherwise, done any formal coursework.) I didn't want to study in a big city so The Monterey Institute of Foreign Studies (as it was then called) was the only place to go. I spent a year there, then transferred to U.C. Berkeley where I completed my B.A. degree. I then went off to study for a year at the Inter-University Center for Japanese Language Studies in Tokyo, where they put us through a *lot* of *keigo* paces. And then I did three more years of graduate study in the rhetoric department at UCB, working on rhetorical analyses of Japanese language materials, mostly the poems of a 20th century symbolist poet by the name of Nishiwaki Junzaburo–six years of formal study in all.

"Sad to say, my reading skills are now back to the level of decoding and my writing skills are next to non-existent, but I can still carry on everyday conversation fairly well and I understand most of what it is said at my tea ceremony lessons."

Martin ran the Erewhon retail store most of the time Wally was around. He was a "key figure who, as I recall, ran the retail store pretty much by himself for some years. He had a limp from childhood malady and always seemed to feel a bit one down because of it, but was a really good man and quite capable." Address: Berkeley, California, and Flinders

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Island, Tasmania.

11343. Andoh, Elizabeth. 2010. Kansha: Celebrating Japan's vegan and vegetarian traditions. Berkeley, California: Ten Speed Press. vii + 296 p. Illust. (color photos by Leigh Beisch). Index. 25 x 25 cm.
• ***Summary:*** A beautiful book, and a major contribution toward understanding Japanese cuisine, culture, and the pervasive spirit of gratitude / appreciation. In Japanese, *kansha* means appreciation or gratitude. Contents: Acknowledgments. Introduction: A historical perspective on kansha (*shojin ryori* is vegan), recent developments, putting theory into practice, practicing kansha, meal planning, some final thoughts, a note about language. Rice. Noodles. Stocks and soups. Fresh from the market. The well-stocked pantry. Mostly soy. Tuskémono [pickles]. Desserts. A guide to the kansha kitchen. A catalog of tools and techniques. A catalog of ingredients [glossary]–with entries that include the following: daikon, edamame, flours (kinako), kudzu, herbs, spices and seasonings (ao nori, sansho, shiso, togarashi, wasabi), kabocha, dried beans (adzuki [sic], daizu {dried soybeans–the most important legumes in the Japanese pantry}), dried soy foods [sic] (hoshi yuba {dried yuba}, koya-dofu / kori-dofu). Dried vegetables from the land (dried shiitake mushrooms). Dried vegetables from the sea (arame, hijiki, kanten, kombu [konbu]). Dried wheat gluten. Kasu (sake dregs). Konnyaku and shirataki. Matcha. Miso (red miso, white miso, genmai miso). Mushrooms. Natto. Nigari. Nuka. Okara. Pickles. Rice. Roots and tubers. Saké. Salt. Sesame (seeds, sesame paste, sesame oil). Soy milk. Soy sauce. Sweeteners (ama-zaké, kuro-zato, mirin, mizu amé). Tofu (firm tofu, silken tofu, grilled tofu, thin fried tofu {abura agé}, thick fried tofu {atsu agé}).

Tsukemono (pickles). Umeboshi (pickled plums). Vinegar. Yuzu. Yuba.

Note: This is the earliest English-language document seen (April 2013) that uses the term "thick fried tofu" to refer to atsu agé / deep-fried tofu cutlets.

Contains many recipes that use tofu, miso, soy sauce, edamame, natto, etc. Address: Japan.

11344. Nutrition & Nature. 2010. Nutrition & Nature: Nourrir par nature. Soy. Céréalpes. Variez, équilibrez [Nutrition & Nature: Be nourished by nature. Soy. Céréalpes. Variety, and in balance (Catalog)]. Revel, France: N&N. 20 p. 30 cm. Full color [Eng]
• ***Summary:*** A stylish product catalog (without prices) for Soy and Céréalpes [Cerealpes], loaded with color photos of product labels. Contents: Introduction, by Bernard Storup, founder and General Director of Soy. Organic solidarity: No genetically engineered soybeans. 100% of soybeans used grown in southwest France. To be engaged in the development of organic agriculture. To work give growers a written contract with just prices.

Fresh line of products. UHT line. Long life line. Marketing. Shelf layout. Address: Chemin de l'Horte, F 31250 Revel (near Toulouse), France. Phone: 05 62 18 72 85.

11345. Hughes, Holly. ed. 2010. Best food writing 2010. Cambridge, Massachusetts: Da Capo; London: Perseus Running (Distributor). xii + 352 p. Recipe index. 21 cm.
• ***Summary:*** One story (p. 76-80) is titled "Kyoto's tofu obsession," by Adam Sachs–from *Bon Appetit* magazine. The writer strives to understand the heart of fresh tofu. Did he use *The Book of Tofu* as his guide?

Fresh tofu restaurants in New York City: EN Japanese Brasserie. In Kyoto: Kinki. Tousuiro (also serves okara, yuba, oboro-dofu, and soy-milk ice cream). Okutan. Kichisen (*yu-dofu*). A tofu maker is Morioka. A yuba maker is Yuba-han.

11346. Japanese Canadian Cultural Centre, Heritage Committee. 2010. Just add shoyu: a culinary journey of Japanese Canadian cooking. Toronto, ONT, Canada: Japanese Canadian Cultural Centre. [Eng]*
Address: Canada.

11347. Kikkoman. 2010. The word "murasaki" and soy sauce (Web article). http://www.kikkoman.com/news/2010news/01.shtml. 1 p. Printed 2 Oct. 2012.
• ***Summary:*** "In Japan, the word *murasaki,* meaning 'purple,' is sometimes used to refer to soy sauce. It was first used by restaurants during the Meiji period (1868-1912) in reference to the clear reddish-purple color of soy sauce, and thereafter came to be used widely."

11348. Kiuchi, Kan; Nagai, Toshiro; Kimura, Keitaro; Kodaka, Kaname; Muramatsu, Kanako; Watanabe, Sugio. 2010. Nattô no kenkyû-hô [How to conduct research on natto]. Tokyo: Koseisha Koseikaku. 207 p. 22 cm. [Jap]*
Address: Japan.

11349. Koizumi, Takeo. 2010. Nippon zenkoku nattô daihakurankai. [The great nationwide Japanese natto exhibition]. Tokyo: Tokyo Shoseki. 125 p. 16 cm. [Jap]*
Address: Japan.

11350. Miyamoto, Tsuneichi. 2010. The forgotten Japanese: Encounters with rural life and folklore. Translated by Jeffrey Irish. Berkeley, California: Stone Bridge Press. 315 p. Illust. Maps. 23 cm.
• ***Summary:*** "Described by translator Jeffrey S. Irish as a man of 'rare energy and practical insight,' Miyamoto Tsuneichi [1907-1981] was a leading Japanese folklorist of the mid-twentieth century. In this lifetime he walked 100,000 miles along the backroads and throughout the hill and island villages of Japan, conducting interviews, taking photographs, and capturing a vanishing way of life.

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Miyamoto's descriptions of these meetings are presented here–in the villagers' own words, in narratives, and in vignettes. The collection is as revealing as it is poignant (from the publisher).

Page 167: "Many in Takihata had learned to make Kôya tofu at Mt. Koya, and a lot of these people were originally from Tajima." "When I got well, because my family was also making Kôya tofu, I went to Awa to buy soybeans, from which tofu is made."

"Meanwhile, people said there was no profit to be made in Kôya tofu and they left" (p. 176).

Concerning the village of Kawame, Aomori prefecture (p. 248): Millet was planted in the first year of a 3-year crop rotation, soybeans in the second year, and daikon radish in the third. "Millet was the staple food, soybeans were used to make miso, and daikon radish was pickled."

Miso is mentioned on pages 50, 65, 66, 187, 248, and 315.

Soy sauce is mentioned on pages 43, 65, and 315. Address: Ethnologist, Japan.

11351. Nagai, Toushirou; Tamang, Jyoti Prakash. 2010. Fermented legumes: Soybean and non-soybean products. In: Jyoti P. Tamang and K. Kailasapathy, eds. 2010. Fermented Foods and Beverages of the World. Boca Raton, Florida: CRC Press / Taylor & Francis. xii + 448 p. See p. 191-224. [125 ref]

• ***Summary:*** An ethnic fermented food is one used by a certain ethnic group. Contents: Introduction. Fermented soybean foods: Bacilli-fermented, sticky and nonsalty soybean foods (natto, kinema, thua nao, chungkokjang, hawaijar, tungrymbai, aakhone, bekang, peruyaan, pepok, sieng), mold-fermented soybean foods (tempe, douchi, sufu, doenjang, miso, shoyu / soy sauce, tauco).

Fermented non-soybean legume foods: Dawadawa (preparation and culinary, microbiology), ugba (preparation and culinary, microbiology), maseura (preparation and culinary, microbiology), wari (preparation and culinary, microbiology), oncom (preparation and culinary, microbiology), dhokla and khaman (preparation and culinary, microbiology). Conclusion.

Among the Bacilli-fermented, sticky and nonsalty soybean foods, natto, for example, has the following contents (p. 194-96): Introduction, history, preparation and culinary, socioeconomy, microbiology and food safety, biochemistry, nutritional composition, and functional properties. Kinema and thua-nao similarly subdivided, however some lesser-known soyfoods and some non-soy foods are described in less detail.

The Introduction (p. 192-93) discusses Dr. Tamang's revised "KNT triangle" theory, with two maps. "Within the proposed triangle-bound countries, many fermented sticky nonsalty soybean foods are consumed by the different ethnic groups of people in Cambodia, Laos, Vietnam, Darjeeling hills and Northeast states of India, eastern part of Nepal, southern part of Bhutan, Myanmar, and southern parts of China (Figure 6.2). Beyond this hypothetical 'KNT triangle' there is no report of kinema-like products that are sticky and ammonia-flavored fermented soybean foods, and the proposed 'KNT triangle' does not include salted, nonsticky and non-bacilli fermented soybean products such as *tempe, miso, sufu, soy sauce,* etc. (Tamang 2010)."

Fermented soyfoods can be classified in various ways: (1) Those fermented by bacteria (primarily *Bacillus subtilis*), such as natto, thua nao, kinema, etc. (all have a characteristic stickiness), and those fermented by molds, such as soy sauce, miso, tempeh, etc. (2) Nonsalted (those to which no salt has been added, such as natto, kinema, tempeh), and salted (such as soy sauce, miso, douchi, etc.) (p. 194). Pepok (p. 207) is an ethnic fermented soyfood from northern Myanmar (formerly Burma). To make pepok: Soak soybeans in water overnight, drain, and bring to a boil. Then wrap in leaves and allow to ferment for 2-4 days. Mash the fermented beans with salt and hot chili pepper, roll out into disks, and dry in the sun. Use as a seasoning or consume after roasting.

Sieng (p. 207) is a traditional fermented soyfood from Cambodia. To make sieng: Soak soybeans in water overnight, drain, and bring to a boil. Spread in shallow bamboo baskets and allow to ferment naturally for 2 days by bacteria adhering to the baskets or suspended in the air. Then immediately transfer the fermented soybeans to salt water and soak for 5-7 days; occasionally tree sap or enzymes are added to the salt water. Use with salt and spices as a seasoning.

Tables: (1) Nutritional composition of boiled soybeans (as a control), natto, and tempe [incl. vitamins, minerals, and fatty acids]. (2) Nutritional composition of kinema and raw soybeans.

Figures (photos unless described otherwise): (1) Map of the natto triangle (based on Nakano 1972). (2) Stylized map of the KNT (kinema–natto–thua nao) triangle. (3) Chopsticks lifting up natto from a polystyrene paper package. *Bacillus subtilis* (natto) produces a polyglutamate, a viscous material, which is called *ito,* meaning "string," in Japanese. (4) Natto in a classical package made of rice straw. (5) A bowl of kinema–freshly fermented. (6) Kinema curry in a bowl and on a plate. (7) Thua nao in a plastic bag, with the label in Thai. (8a) The front of a package of chungkokjang, labeled in Korean, with a photo on the label of the product in a thick spicy stew (*chigae*). (8b-c) Top view and side view of a mound of chungkokjang. (9a) The front of a package of Rusto's Tempeh. (9b-c) Top view and side view of a cake of tempe. The spaces between soybean cotyledons are packed tightly with white mycelia of *Rhizopus oligosporus.* Address: 1. Genebank, National Inst. of Agrobiological Sciences, Tsukuba, Japan; 2. Food Microbiology Lab., Sikkim Government College, Sikkim Univ., Gangtok, Sikkim, India.

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11352. Nishimura, Mayumi. 2010. Mayumi's kitchen: Macrobiotic cooking for body and soul. Tokyo, New York: Kodansha International. 157 p. Illust. (mainly color). Index. 26 cm. [15 ref]

• ***Summary:*** This is Mayumi's first English-language book. Madonna (of worldwide musical fame) wrote her a letter that appears in this book (p. 7): "Dear Mayumi, Congratulations on your fabulous book!... Not only are you the best chef in the world, you are part of our family, and we thank you for your love and warmth.

"In the seven years you lived with us and cooked for us, your amazing food helped me to be a happier, healthier person, balanced in body and mind. I feel better than I did 20 years ago. I am very grateful to you for this."

The index of this stylish book contains 24 entries for tofu (some in the chapter titled "Protein dishes"–p. 97-104), 20 for miso, 14 for seitan, and 11 for tempeh. How nice to find a Japanese cookbook that calls for the use of brown rice (basic recipe, p. 67).

The centerpiece of Mayumi's book is her 10-day detox diet.

Also contains specific recipes for: Nabe (with "2 pieces abura-age {deep-fried tofu skins}, halved or cut open on one side to form pouches," p. 67). Soybean and millet croquettes with beet sauce (with "15 oz {425 gm} canned soybeans, drained," p. 84). Seitan pot stickers (with seitan and tofu, p. 113). Smoked tofu salad (with "7 oz {200 gm} firm tofu," p. 104). Black soybean tea (p. 113).

The Glossary (p. 140-49) includes entries for: abura-age, adzuki beans, brown rice, brown rice mochi, edamame, hijiki, kombu, koyadofu, kuzu, mirin, miso, nori, rice milk, rice syrup, seitan, sesame oil, shiso, shoyu (incl. soy sauce and tamari), soba, soy meat nuggets (TVP), soymilk, tahini, tempeh, tofu, umeboshi plum, umeboshi plum paste, wakame, wasabi, whole-wheat flour.

About the author (inside rear dust jacket): "Mayumi Nishimura was born on the small island of Shinojima in Aichi Prefecture [in Mikawa Bay Quasi-National Park]. In 1982 she moved to the U.S. and began studying macrobiotics under Michio Kushi–the leading authority in the field–at the Kushi Institute. Later she worked at the school as head cooking instructor. In 2001 Mayumi became Madonna's private macrobiotic chef, joining her on her Drowned World Tour. Between 2001 and 2008 she cooked for the superstar full-time. Currently Mayumi travels between Japan, where she writes and lectures on macrobiotics, and the U.S." She has written four books published in Japanese. A large color photo of Mayumi appears on the front dust jacket.

The book is dedicated to Mayumi's children, Lisa and Norihiko, to her parents, and to Michio Kushi and his wife, Midori.

11353. Sugawara, Etsuko. 2010. Fermented soybean pastes miso and shoyu with reference to aroma. In: Jyoti P. Tamang and K. Kailasapathy, eds. 2010. Fermented Foods and Beverages of the World. Boca Raton, Florida: CRC Press / Taylor & Francis. xii + 448 p. See p. 225-45. [29 ref]

• ***Summary:*** Contents: Introduction. Aroma compounds of miso and shoyu. Brewing of miso. Brewing of shoyu. Identification of important aromatic compounds that exist together in miso and shoyu. Changes in the concentration of HEMF during fermentation. Formation mechanism of HEMF by yeast cultivation in model media. Effects of the type of yeast and growth conditions on the formation of HEMF. HEMF formation pathway by yeast in miso and shoyu (Contribution of ribose and glycine to HEMF structure, contribution of glucose to the ethyl group of HEMF). Conclusion. Acknowledgments.

HEMF is 4-hydroxy-2(or 5)-methyl-3(2H)- furanone.

More than 300 aroma components have been determined in shoyu and miso.

Figures show: (1) Quantitatively important aroma compounds in miso and shoyu: 1-Hexanol, Maltol, 2-Furfural, HDMF, 2-phenylethanol, HEMF, 4EG(4-ethylguaiacol), Methionol. (2) Simplified manufacturing process [flow sheet] for a fermented soybean paste (red salty rice miso) (with the halotolerant yeast *Zygosaccharomyces rouxii* and/or *Candida versatilis* added). (3) Simplified manufacturing process [flow sheet] of shoyu (with the halotolerant yeasts *Zygosaccharomyces rouxii* and *Candida versatilis* added). (4) Effects of nitrogenous compounds in the media of the formation of HMF by the yeast. C1: polypeptone. C2: casamino acid. C3: glutamic acid. C4: threonine. C5: serine. C6: alanine. (5) Effects of medium preparation on the formation of HMF by *Z. rouxii* 061. (6) Effect of glucose concentration and NaCl concentration in the medium on the formation of HEMF by *Z. rouxii* 061. (7) Hypothetical formation pathway of HEMF by yeast. Note: The title of this chapter seems unusual: miso is a fermented soybean paste but shoyu (soy sauce) is a liquid. However the author states (p. 227): "The original meaning of *miso* in Japanese is 'immature shoyu.'" Address: Faculty of Education, Iwate Univ., Morioka, Japan.

11354. Sumi, Hiroyuki. 2010. Nattô wa kiku: kaimei sareta nattô, pawaa no himitsu [Natto works: It has now been made clear, natto is the secret to power]. Tokyo: Dainamikkuseraa Zushuppan. 270 p. 19 cm. [Jap]*

11355. Tamang, Jyoti Prakash. 2010. Himalayan fermented foods: Microbiology, nutrition, and ethnic values. Boca Raton, Florida: CRC Press. xix + 295 p. See p. 65-78. 230-31, 233. Illust. 25 cm. [584 ref]

• ***Summary:*** This is a very interesting, original, well researched and well written book. It is also the best source of detailed, well documented information on kinema and its close relatives seen to date.

The word Sanskrit word Himalayas means literally

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"abode of the snows." This region is the home of over 65 million people. Those in the eastern Himalayas are of Mongolian ethnicity and ancestry.

Chapter 3, titled "Fermented legumes," includes a section titled "3.1 Important fermented soybean foods" which states (p. 65): "Some of the common ethnic nonsalted sticky fermented soybean foods of the eastern Himalayas are *kinema* (Nepal, Darjeeling hills, Sikkim, and South Bhutan), *hawaijar* (Manipur), *tungrymbai* (Meghalaya; food of the Khasi and Garo peoples), *bekang* (Mizoram; food of the Mizo people), *aakhone* (also called *axone,* Nagaland; food of the Sema Naga), and *peruyyan* (Arunachal Pradesh). Manipur, Meghalaya, Mizoram, Nagaland, and Arunachal Pradesh are small states in northeastern India.

All of these foods are similar to *kinema.*

Note: As a guide to the Seven Sister states of North East India, we are including a color map of the area created for Soyinfo Center.

For all these six foods is given: The name of the food, a close-up photo of the food, indigenous knowledge of preparation, a flow chart showing the indigenous method of making the food, culinary practices (how the food is prepared / cooked and eaten), economy (its role in the local economy), microorganisms (dominant and secondary).

Section 3.3 is "Microbiology" (of fermented legumes): Kinema (microorganisms, source of inoculation in kinema production optimization of fermentation period, in situ fermentation of kinema, selection of starter culture, monoculture fermentation of kinema, development of pulverized starter for kinema production, phylogenetic similarity of *Bacillus* strains from Asian fermented soybeans), other fermented soybean foods of north east India.

Section 3.4 is "Nutritive value" (table 3.1 compares the nutritional composition of raw soybean and kinema). And section 3.5 is "Conclusion."

The long and very interesting section (9.1.1) on the "Antiquity of kinema" (p. 230-34) states that it is a food of the Kirat ethnic group (to which the Limboo belong) of eastern Nepal. The origin of the word "kinema" can be traced back to the word *kinaba* of the Limboo language (*ki* = fermented; *namba* = flavor). It is not clear whether *kinema* appeared first, then was disseminated and diversified, or vice versa. The Limboo believe that their discovery and domestication of the soybean (which they named *chembi*) is mentioned in one of their oral myths known as *mundhuns.* This myth, which is described here in detail, might have been written between 2500 and 100 BC (p. 231).

Kinema is made by fermenting whole soybeans, without inoculation, with strains of *Bacillus subtilis* bacteria. It is alkaline in nature / pH, has a sticky, stringy texture and a strong flavor.

Natto [salty natto, not itohiki natto] is believed to have been introduced to Japan from China during the Nara period around 710-714 AD (Ito et al. 1996; Kiuchi 2001). Kinema might have originated in east Nepal around 600 B.C. to 100 A.D. during the Kirat dynasty.

Products closely resembling kinema are popular foods in many non-Brahmin communities in the eastern Himalayas. "The Lepcha [the aboriginal inhabitants of today's Sikkim] call it *satlyangser;* the Tibetans and Bhutia [of Bhutan and Sikkim] call it *bari;* the Khasi [of Meghalaya] call it *tungrymbai;* the Meitei [of Manipur] call it *hawaijar;* the Mizo [of Mizoram] call it *bekang;* the Sema Naga [of Nagaland] call it *aakhone;* and the Apatani [of Arunachal Pradesh] call it *peruyyan."*

Soybean products closely resembling kinema outside of the Himalaya region are *natto* of Japan, *chungkokjang* of Korea, and *thua-nao* of Thailand [From Google Books Preview].

Dr. Sasuke Nakao (1972) coined the term "natto triangle," but Dr. Tamang proposes that the hypothetical triangle be renamed "Kinema–Natto–Thua-nao triangle" (or KNT triangle).

Note: Four facts support Dr. Tamang's elegant new triangle:

(1) Indonesia and its mold-fermented tempeh should not have been part of the original natto triangle.

(2) Nakano (1972) guessed that natto might have come to Japan from Java during the Muromachi period, however extensive research on natto and tempeh after 1972 offers no support to his guess.

(3) Many new relatives of natto have been discovered since 1988, many of them by Dr. Tamang and co-workers. All of these (except the relatives of dawadawa made from soybeans found in West Africa) fall within the KNT triangle.

(4) No mold-fermented soyfoods–such as tempeh, miso, soy sauce, jiang, or fermented tofu–fall within the new KNT triangle.

An illustration / map (Fig. 9.1) shows this improved triangle with Japan (natto), Nepal-India-Bhutan (kinema), and Thailand (thua nao) at its three vertices / corners; it also includes chungkokjang (Korea), pepok (Myanmar), sieng (Thailand), and [incorrectly, mold-fermented] *douche* [*douchi*] from south China. These mildly alkaline, sticky fermented foods are popular among the peoples of Mongolian origin. This may be due to their typical flavor called *umami* (Kawamura and Kara 1987). This flavor is developed during the hydrolysis of soy protein (by protease enzymes) into amino acids during fermentation. Have people of Mongolian origin evolved or developed particular senses which incline them to enjoy the umami flavor? In the eastern Himalayas green vegetable soybeans are also boiled and eaten.

Section 10.3, "Commercialization through ethnic food tourism," suggests that just as tourists visit the vineyards of France, tempeh shops in Indonesia, and artisans or factories that make shoyu or sake in Japan, there are potential tourist

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sites for experiencing how traditional foods are made in the Himalayan villages. For kinema, try visiting Aho village in Sikkim.

About the author (p. xix): A good biography and portrait photo are given. In the "Acknowledgments" (p. xvii) he writes: "I am thankful to my wife Dr. Namrata Thapa for constant support and technical assistance in the preparation of this book. Over the past 16 years the team of brilliant Ph.D. students that I have recruited from the Food Microbiology Laboratory, Sikkim Government College, Gangtok, has been the real driving force in researching and identifying the scientific mechanisms of ethnic Himalayan fermented foods." He then lists their names. Address: Food Microbiology Lab., Sikkim Government College, Gangtok, Sikkim 737 102, India.

11356. Fu, Jia-Chen. 2011. Re: In China or Japan or Korea was soymilk traditionally fed to infants or to recently-weaned children? Letter (e-mail) to William Shurtleff at Soyinfo Center, Jan. 18. 1 p. [2 ref]
• ***Summary:*** "I know of one medical study by Dr. Ruth Guy (citation below), a physician at the First Health Station of the Beiping Municipality, who found little evidence that Beiping women used soybean milk to feed their children. Dr. Guy notes that though the drink was available through street vendors, it was generally drunk by 'old people in place of tea.' Home preparation was difficult and laborious, and therefore avoided. (Ruth A. Guy, 'The Diets of Nursing Mothers and Young Children in Peiping,' *Chinese Medical Journal* 50 {April 1936}:440).

"This assessment seems in keeping with the broader Chinese medical and materia media literature of pediatrics. I've not seen soybean milk recommended in classical medical texts for infant feeding. In cases in which the mother cannot breastfeed her child, medical texts generally recommend that (1) a midwife be found, (2) animal milk (e.g., sow's milk) be used as supplement, or (3) a thin gruel made with ground cereal in water (often rice) be prepared.

"For a more extensive treatment of breastfeeding and infant feeding practices in late imperial China, please see Ping-chen Hsiung, 'To Nurse the Young: Breastfeeding and Infant Feeding in Late Imperial China,' *Journal of Family History,* 20:3 (1995): 217-238." Address: Case Western Reserve Univ., Dep. of History, Mather House, 11201 Euclid Ave., Cleveland, Ohio 44106.

11357. Kushi, Norio. 2011. Re: History of Erewhon, Los Angeles. Letter (e-mail) to William Shurtleff at Soyinfo Center, Jan. 20. 1 p.
• ***Summary:*** "Erewhon Los Angles was initially located at 8001 Beverly Boulevard. It was opened in the fall of 1970. John Deming and John Fountain were major investors in helping to open the LA store and during the 1980s Erewhon troubles in Boston, ownership of the LA Store was transferred to John Fountain before Tom DeSilva finally (in 1980) bought Erewhon Los Angeles. Tom DeSilva later (May 1991) moved Erewhon to its present location at 7660-B Beverly Blvd. #A, Los Angeles, CA 90036-2737. Phone: (323) 937-0777." Address: Traveling by truck in Portland, Oregon.

11358. Andoh, Elizabeth. 2011. Setsubun, sushi, sardines & beans. *Taste of Culture Newsletter* (*A*). Feb. 1.
• ***Summary:*** "Mark the date on your calendar: February 3 is Setsubun, a day to oust ogres, welcome in good fortune, gobble plump rolls of uncut sushi, and eat sardines and simmered [soy] beans to insure good health and strength.

"Written with calligraphy for 'season' and 'break,' setsubun is a marker signaling the end of one calendar segment and the start of the next. Technically there are many setsubun throughout the year, though today in Japan the word is synonymous with February 3, the start of the lunar new year (what in many Western cultures is called 'Chinese New Year'). Like many customs associated with the start of a new year, setsubun marks a time for ridding oneself of previous unpleasantness leaving lots of room for good things to come.

"Begin by expelling evil from the past. First, don a monster mask–they run the gamut from *kowai* (really scary) to *kawaii* (oh, s-o-o-o cute), and yell a bean-throwing jingle (*'Oni wa soto. Fuku wa uchi'*). According to some sources (my Japanese in-laws, included), the number of pan-roasted beans you throw should match your age.

Bean-throwing takes place at work (go ahead: pelt the boss!), at school (teachers and students toss beans at each other), at home (Dad's usually a good sport, though he probably prefers playing Santa), and in public–most *Jinja* (shrines) have *mamé maki* ceremonies. At these bean-tossing events, tiny packets of *fuku mamé* (good fortune beans) are thrown to those with out-stretched hands. In Kyoto, pretty Maiko-san toss the beans (in some locales, local politicians do the bean-throwing). Are you in Japan? Join the fun at the nearest shrine.

"Invite good fortune by eating an uncut *eiho maki* sushi roll while facing South Southwest (this year's auspicious direction). All the *konbini* (convenience stores), *suupa* (supermarkets) and *démaé* (neighborhood take-out joints that deliver) offer specials at this time of year. Sardine (*iwashi*) dishes and dried bean cookery are also part of Setsubun's culinary customs. Quenelle-like dumplings called *tsumiré* made from freshly filleted, minced sardines liberally seasoned with ginger, scallions and miso are poached in *kombu* (kelp) broth to make a wonderful, ward-off-winter soup. *Gomoku mamé ni,* a nutritious mix of veggies and slow-cooked, soy-simmered soybeans find their way into boxed lunches, folded into omelets, or on their own. I offer you both vegan and carnivore (chicken added) recipes, below." Address: Japan.

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11359. Otsuka Pharmaceutical Co., Ltd. 2011. Otsuka to begin phased launch of Soyjoy nutritional food product (News release). Japan. Feb. 2.
• ***Summary:*** "Otsuka Pharmaceutical Co., Ltd. has announced that it will begin a phased launch of its Soyjoy nutritional fruit product in France, Belgium, Italy and Spain, starting in February 2011 through its subsidiary Nutrition & Sante SAS.

"For the Otsuka Group, with its two core pharmaceutical and nutraceutical businesses (NC business), the development of the NC business in Europe is an important step in its globalization efforts.

"Soyjoy, a fruit soy bar made from soy flour, is a product that could help unlock the global potential of soybeans due to their high nutritional value. The SOYJOY line up in Europe will feature seven varieties, including strawberry and blueberry which have become hits in Japan.

"Moving forward, Otsuka Pharmaceutical will first focus efforts on the success of SOYJOY in Europe by expanding sales channels in the region, followed by the strengthening of its product line up to include original items and reviewing the potential for localized production." Address: Japan.

11360. Kushi, Norio. 2011. Re: The origin of the first Erewhon retail store at 303-B Newbury St. in Boston. Letter (e-mail) to William Shurtleff at Soyinfo Center, Feb. 9. 1 p.
• ***Summary:*** "Prior to the Erewhon store [in April 1966], starting in September 1964, at 101 Walden St, Cambridge, Massachusetts, we started buying items in bulk from Japan as well as grains in bulk from within the US. We would stock them in the basement and I along with others would package them into smaller containers. We would sell these every day since we had dinners and lectures most evenings. It was a busy happening place. We moved to 7 Eastman Circle in Wellesley, Massachusetts in December 1, 1965 and then to 216 Gardner Rd, Brookline, Massachusetts in March 31st 1966. During these moves we continued to buy the food products in bulk, package them and sell them at our dinners. It was while living in Wellesley, Massachusetts that Evan Root came to live with us.

"We had barely moved into 216 Gardner Rd, Brookline, when within a couple of weeks, the town of Brookline, Health Department finding out about the food operation, shut us down. This is what necessitated the opening of the Erewhon Natural Food Store at 303-B Newbury St. [in April 1966]. The name Erewhon, although it is known that it came from Samuel Butler's book, was actually picked because George Ohsawa had a special fondness for the book Erewhon. George Ohsawa created a comic series titled, 'Jack & Miti in Erewhon.'

"One year later, when my mother opened 'Sanae' Restaurant one block to the east of Erewhon, the original intention was to call the restaurant 'Nowhere.' When Evan Root went to the Boston City Hall to register the name, the people there thought the name was really odd and refused to allow the restaurant to be called Nowhere. Evan called my mother and while on the phone, my mother picked Sanae for the name." Address: Traveling by truck.

11361. Young, Jean Allison. 2011. Chronology of interests in macrobiotics and work with Erewhon (Interview). *SoyaScan Notes.* Feb. 10. Conducted by William Shurtleff of Soyinfo Center.
• ***Summary:*** Chronology: 1945 June 1–Jean is born in St. Paul, Minnesota. She has two brothers. Her father was killed in a traffic accident when she was 18 months old. Her mother went into the hospital for about 2 years. Her mother later came back into their lives, but her father's parents were suing for custody of the children. So her mother married her stepfather (who turned out to be a nice guy) and in 1949 the two of them moved with the 3 children to Los Angeles when Jean was age 4–to get away from the custody lawsuit.

1959 Aug. 22–The family moves to the Hawaiian Islands the day they became a state of the USA. Jean goes to high school in Hilo, on the island of Hawaii, and graduates in 1963 with honors.

1963 early summer–Jean leaves Hawaii to work for the summer at Army/Navy Supply House in San Francisco, California, as a secretary. In the fall she enters San Francisco State College while continuing her job part time during the fall. During college she also worked in several temporary jobs ranging from tax work and insurance to general office work. During 1965-66 she worked part time at Wilson's Advertising Agency in San Francisco as a secretary. She did not graduate from college (this was a time of turmoil, strikes, and protests at San Francisco State) but she does have a 4½ year education in Liberal Arts. Like many students, Jean did participate in the protests.

At the college, Jean was involved in acting, and through that she met both Paul Hawken and Bill Tara, who were doing theater in San Francisco and the psychedelic "drug scene" at that time.

1963-1967–Jean, Paul Hawken and Bill Tara grew to know one another well during the six years when they lived (often together) in San Francisco. In the early spring of 1966, shortly after rock concerts began at the Fillmore Auditorium [at the corner of Fillmore St. and Geary Blvd.] in San Francisco, they rented an old abandoned firehouse [fire station] at 3767 Sacramento Street, north of the Haight-Ashbury district in the Sunset District. Jean, Paul and Bill all lived in the firehouse the entire time they were there. Jean was Bill's girlfriend. They organized and hosted live musical performances and dancing with some of the original street bands in San Francisco–Sopwith Camel, The Charlatans, Big Brother and the Holding Co. (including Janis Joplin), etc. The firehouse held about 100 people, and the door was kept "closed," admitting people only in small groups. The resulting noise was kept carefully under control so as

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not to disturb the residential neighborhood. People paid a mandatory "donation" [one ticket shows: "Donation $2.00"] to hear the performance, and the hosts did not make change. No one sat, as there were no chairs, so everyone danced–although it was usually so crowded that no one could dance.

Concerts were held at the firehouse for at least 3 months [Feb. 12 to April 2]. "Since the last concert was the Wreckers Ball, I would assume that we had been told by the landlord that the place was to be raised and he wanted us out." "It was a wonderful and exciting time–to be there at the beginning of the rock and roll music scene in San Francisco." Jean thinks they moved from the firehouse directly to the warehouse south of Market Street, but she is not sure.

Note: This Firehouse is now part of early rock and roll legend in San Francisco. See the long blog titled Rockarchaeology101. See also: http:// www.chickenona unicycle.com/ Firehouse%20 History.htm.

"The rest of the time we were dealing and using drugs." The only LSD they could get in those days was the real Sandoz LSD. Several days in advance of each trip, they carefully prepared their minds, bodies, and the environment. They had someone who was not taking it who was in the room with them to ground them. They did it the right way because it was "a spiritual experience."

They soon moved into and rented one floor of a warehouse on an alley [65 Harriet St.] south of Market Street, between 6th and 7th streets. They pooled the money to pay the rent. "The warehouse was actually an old factory for making the pre-packaged small half-pies that you could buy at a convenience store. Initially, we had a wicked problem with rats and mice (a house cat took care of that) but had so many cockroaches that we use to have a monthly 'cockroach killing party' with Raid and beer. Great fun."

"We lived communally in a huge warehouse space, except for a single room in the back. We each set up our own bedroom area–but shared the living room area (defined by a sofa, chairs and a rug) and open kitchen (defined by a table, stove, refrig and cupboards). Bill lived there, I lived there but moved out before Bill, and Paul lived there for a time also."

"The word 'studio' fits to a certain degree. Bill Tara and I were a couple for several years although we broke up at about the time we started the macrobiotic diet–which was Renee came along. Michio and Aveline Kushi made several attempts to get us back together as a couple as they wanted to send us off as a 'teaching team.'"

Jean thinks that Paul Hawken was the first of the group to learn about macrobiotics in about 1967, perhaps from little yellow book that he was given by Roger Hillyard, who was doing light shows in San Francisco at the time. "My memory says that we were pretty much off of drugs by then. As a group we were pretty disgusted with the whole 'flower child' movement of the late 1960's–the indiscriminate use of drugs just to get as high as you could. We were also more cautious about the drugs that were available at that time, they were cut [diluted] with just about anything that came to hand. You couldn't be sure about the quality. So I would expect that we started with the exact diet as proposed by Ohsawa–brown rice for X number of weeks, gradually adding miso, shoyu, veges [vegies], etc. Alcohol was never a big deal with any of us, so I expect we just stopped. As to sugar, you know how hard that one is!! But, I expect we all tried hard. Very idealistic. I also think we were several months in to the diet–close to a year, before we left for Boston." Continued. Address: Chatham, Massachusetts.

11362. Young, Jean Allison. 2011. Chronology of interests in macrobiotics and work with Erewhon. Part II (Interview). *SoyaScan Notes.* Feb. 10. Conducted by William Shurtleff of Soyinfo Center.

• ***Summary:*** Continued: 1967 early summer–Jean arrives in Boston, Massachusetts. In the summer and fall of 1967 she works at Harvard University, Carpenter Center for Visual Arts as an assistant to the head of purchasing and accounts receivable.

1968 fall–She joins the macrobiotic community in Boston. From the fall of 1968 until the spring of 1970 she was one of the early employees at Erewhon Trading Co., Inc. Her work with Erewhon is described later.

She lived both at Gardner Road and on University Road, and elsewhere. She never lived "off campus." "Being part of the 'elite' of the store, most of the time was spent at Gardner Rd. I moved to University Rd. to be closer to an impermanent lover of the time. At University Rd. I cooked the dinners for a while until I was asked to step down. I was trying to experiment with foods–trying to used standard macrobiotic ingredients to replicate items in the normal American diet, e.g. can you make strawberry 'shortcake' with 'whip cream' out of flours, rice and berries, etc. This didn't sit well with people who wanted only miso soup, rice and vegetables.

1970 spring–Jean leaves Erewhon and sets out on a trip around the world. Her biological father had left her $3,000 as insurance. She did not know what to do with it but she wanted to go to Japan so she bought a ticket on a airplane. She left Boston, "I believe with Jim Gronemeyer (an off-site macrobiotic lover of the time), traveling through most of Europe, then Greece, Iran, Afghanistan, Pakistan, Kashmir, India, Thailand, Vietnam (where I tried to get to visit some macrobiotics living in the demilitarized zone was turned back by the military), Hong Kong and then Japan. I taught a few cooking classes in Germany although since I was paying my own way, my time was my own. In addition, my two-months stay in India [which she found the most fascinating so far] included cooking and teaching at a hospital outside of Calcutta, with macrobiotic Joe Levine, for Indian patients that had been 'given up' by their local doctors as incurable. Cooking and prep was done on the floor on top of pottery jars filled with cow dung. The cockroaches were as big as

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bats and they would hover just out of reach of the knife, sneaking in when you weren't looking! Good fun!"

By the time she reached Japan, she had run out of money. But she intended to land in Japan because she and Beverly Stiskin were best friends (and Nahum was a close friend)–and had been for at least several years in Boston. They had met in Boston through macrobiotics.

1970 Nov. to 1972 spring–Jean arrives in Tokyo, Japan with $5 in her pocket. She knew the Stiskins were there. She called Nahum (in Kyoto) and asks him what she should do. He said, "I'm sending you a ticket." She stays in Japan at the home of Nahum and Beverly Stiskin in Uzumasa (near *Kitano-jinja*–Kitano Shrine), west of Kyoto. Reuben Stiskin was a baby at the time. She pays her way by teaching English in Kyoto to Japanese, and she studies tea ceremony (with Bev) with a Japanese teacher. Michio Kushi wanted all his macrobiotic students to study Japanese culture and language. Jean learned a little Japanese–"enough to get around." The Stiskins help support her financially, in part with a room in their home. When the Stiskins move to Tokyo, Jean moves with them. Nahum was writing a book on Shinto.

1972 spring–Jean leaves Tokyo, returns to California, stays with relatives, buys a car (1957 Ford Fairlane station wagon with a mattress in the back), and during that summer and fall (10 months) takes a slow, interesting trip across the United States by herself–seeing places such as the Grand Canyon, Yellowstone, Wounded Knee she had long wanted to see–and seeing how people lived. "It was important to me to know America."

In Boston she moved in with two semi-macrobiotics in an alley off Beacon Street in a basement (not in a macrobiotic house; Woodie and his wife and their two children). When Woodie and his family move out, Jean keeps the place.

1973-1974–Martha Fielding (later associated with Shambhala Books) moves in with Jean.

1973 fall–Jean works for 2-3 years at the Center for International Affairs at Harvard University as a staff assistant; this center was the predecessor of the Kennedy School of Government.

1974 early–Jean meets her husband to be, Andrew P. ("Andy") Young, who was not a macrobiotic and had no interest in it. He was deeply interested in Japanese food and loved sushi with raw fish. At that point Jean let go of her interest in macrobiotics.

1979 June 30–Jean Allison and Andrew P. Young are married. He goes to Tuck School of Business at Dartmouth College. In 1981 she completes her B.A. degree there–unfinished since San Francisco State days. She becomes a mother of two.

1981–They move (full time) to Chatham, Massachusetts (at the "elbow" of Cape Cod) where Andy starts his own management consulting business. After several years he goes to work for the local bank. He is now a commercial loan officer. Address: Chatham, Massachusetts.

11363. Amador-Toro, Diana. 2011. Re: Warning letter. Insanitary conditions. Letter to Mr. Shoji Ihara, Acting Vice President, Global Protein Foods, Inc., 170 Avenue L. Newark, New Jersey 07105-3831, Feb. 10. 2 p. Typed, on letterhead.

• ***Summary:*** Some of the more blatant findings include: "Floor drains throughout the facility were clogged with product such as soybeans and soybean sprouts. Water was pooling in the clogged drains near wooden water tanks in the soybean sprouting area, and in the soybean sprout production area. Pooling water with organic matter fosters the growth of pathogens which may be transferred through splashing onto food or food contact surfaces."

"You must take effective measures to exclude pests from the processing areas and protect against the contamination of food on the premises by pests, as required by 21 CFR 110.35(c). However, our investigator observed the following:

"A dead mouse on the floor near an unused fryer unit stored in the tofu fryer room.

"Live flies, too numerous to count throughout the facility, including in production areas. The flies were landing on equipment and packaging materials.

"Live roach-like insects, too numerous to count, in an unused damaged vacuum sealer stored next to the label packaging table, which is near the sprout and tofu packaging tables.

"Rodent excreta-like pellets, too numerous to count, in the walk-in refrigerator next to finished tofu product, in the receiving area where soybeans used for tofu and soymilk are washed, behind pallets of bags of soybean seeds along the walls in the warehouse area, near stored unused pallets in the receiving area, on and next to bags of citric acid in the refrigerator room, and on the floor near the hand-washing sink in the production area.

"Spider webs were throughout the facility, including in the receiving area on the overhead pipes, and a web containing a live spider was directly above the tofu production line." Address: District Director, New Jersey District. Phone: (973) 331.4900.

11364. Tara, Bill. 2011. Re: Creative work with music, dance and lights in San Francisco (1966-67) before starting work at Erewhon in Boston. Letter (e-mail) to William Shurtleff at Soyinfo Center, Feb. 13 and March 3. 2 p. Plus part of website printout: http://rockarchaeology101. blogspot.com/ 2009/11/ firehouse-3763- sacramento-street-san.html. Printed Feb. 13.

• ***Summary:*** "... I signed the lease on the Firehouse (at 3737 Sacramento St., San Francisco) from a guy who built a small theatre on one side of the space for a Jewish youth theatre group. Myself (and George Eby) met at the Ashland Shakespeare Festival where we were part of the company.

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The plan was to open it as an experimental theatre venue. We had started to do readings in the upstairs and lived there along with Jean Allison, a theatre major at San Francisco State [College]. Paul Hawken had returned from the South as a photographer of the civil rights movement. Paul and I decided to start producing events at the Firehouse.

"We produced seven evening events that were part 'happening,' part music and dance. The first event was February 1966 and continued till April of that year. I worked a little at the Matrix (the first Rock club in the city and did a little lighting work with Ray Anderson). George knew a few musicians so we created these crazy evenings. Paul worked out lighting. We featured Big Brother and the Holding Co., The Amazing Charlatans, the Sopwith Camel, Wildflower and The Great Society (Grace Slick's first band) as well as some folk and blues performers such as Jessie Fuller and Ale Extrom.

"Ray Anderson and Elias Romero did light shows and film, we had actors, dancers and generally a crazy time. We had some of the first light shows in the city. We had to move out since the building was sold and was to be turned into a parking lot. The last event was called the Wreckers Ball. After moving out Paul Hawkins, Jean and I formed the Calliope Company. Our group also included Wally Gorell [see handbill for concert on 26 July 1966]. We had a warehouse South of Market [on Hariett St.] and Paul and I fitted it out and lived there as well as using it as a rehearsal space and a studio for the light shows. We produced several Rock Concert / Dances in the California Hall featuring the Dead and the Airplane [Grateful Dead, Jefferson Airplane]. One of these was October 31, 1966 and called the "Dance of Death" generally credited as being produced by Bob McKendrick–he was the money man. It was scheduled on the same night that Ken Kesey was trying to do the Acid Test Graduation and the Dead had signed a contract they couldn't break. The best version of this story is in *The Electric Kool-Aid Acid Test,* by Tom Wolfe.

"Paul was introduced to macrobiotics through a book by Ohsawa given to him by Roger Hillyard who was also doing light shows. Paul and I were both interested in Eastern philosophy and environmental issues. We started to experiment with diet and had fun doing it. Paul and I sought out sources in SF for miso etc. and started to meet some people who had studied with Michio Kushi in Boston. Renee Gremore (later Tara), Paul Petrofsky (founder [with Hy Lerner] of Baldwin Hills Bakery) and Evan Root (the first Erewhon worker). We invited Herman Aihara down to give a talk to a group of outrageous hippies in the warehouse backed by a huge American flag. Years later Herman would comment how he was first to teach the 'hippies.' Paul went to the East Coast to install a light show in Washington, DC, visited Boston, met Michio and Aveline, and told me that Michio was the real deal.

"I was just finishing a show I directed but within a few months, Jean, Wally and I had moved to Boston. Roger came later. Paul, Jean, Wally, Roger and I all ended up in the Erewhon crew."

Note: Bill now lives in Scotland and have spent about 15 years in the UK since 1970. He lived for a while in Portugal. He was born and raised in Santa Cruz, California.

11365. Sharp, Carolyn Heidenry. 2011. Re: Erewhon, Michio and Aveline Kushi, and the Boston macrobiotic scene. Part I. Letter to William Shurtleff at Soyinfo Center, Feb. 15. 11 p. • ***Summary:*** "I was a minor player in the Erewhon story, but I lived in Los Angeles (L.A.) and Boston and experienced a little of its life, especially towards the end.

"In September of 1967 I arrived in Boston, age 19, at 29 University Road, the Kushis' first study house (aside from their own home). My then boyfriend was ill and wanted to try macrobiotics. We had been living in Fairfax, California, when a friend passing through during the summer left behind a copy of *Zen Macrobiotics.* When the doctors could find nothing wrong with him, but he was still sick, we went first to the Zen Macrobiotic Restaurant in L.A. on Hollywood Blvd. near Western, which was run by a very nice Japanese man and his family. I don't remember their family name. It was there for many years and was visited by John Lennon, among others. When we went to Boston I thought we were going to some kind of clinic. I had no interest in macrobiotics myself, and continued to eat my usual diet, which was pretty bad at the time.

"At 29 University Road, we had a room on the third floor next to Matt and Richard Sandler, and in another room, Wally Gorrel. Also in the house were Nahum Stiskin, Bill and Rene Tara, Rebecca Dubawsky, John Palumbo, Bob White and his wife (a black and white couple, unusual for that time), John Claude Ducet, a French Canadian who made the benches and tables for the first Sanae restaurant at 272B Newbury St., Steve Helfner, and Mrs. Ninomiya and her son, who had a separate little apartment or room and did not eat with the rest of us. She made 'happy coats' a kind of short kimono to sell to whoever would buy them. There were several others there whose names I do not remember.

"Michio would often come over during the day to check on things, and on people (a few had health issues) and sometimes would give a lecture in the evening in the living room. The Kushis' home at 216 Gardner Road was less than a mile away.

"At the beginning I didn't know I was expected to eat the same food as the rest of the household until Steve Helfner asked me one day not to heat up the canned soup, containing meat, that I was going to eat, in the pots used for the rest of the cooking. I think I had a frosted cake in the fridge, too. I don't know if everyone was being polite or just didn't take the time to explain to me how things worked there. I was kind of clueless. Anyway, I wouldn't eat most of the food served at dinner, for a good while, except the rice

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and beans, as everything looked so unfamiliar. Michio made numerous dietary recommendations for my friend, that I had to cook specially for about three months. After that period he was well again. We split up and I went to work at Sanae restaurant with Evan Root and Peggy Taylor early in 1968.

"My first impression of Michio, besides that he seemed very cordial, kind, humorous and good-natured, was that this man knows something about life. I didn't know what though. A few lectures began to enlighten me. It was obvious that he had a different level of understanding. I went to the Arlington St. church lectures also.

"At Sanae, I helped with prepping the vegetables and fruits during the day, along with Peggy, and waitressed in the evenings. Later Rosemary Traill, future sister-in-law of Richard Young, waitressed there also, as did others from time to time. Richard Young worked at a small flower shop just a few blocks away, and would drop by the restaurant during the day sometimes. He was a friend of Peggy and sisters Rosemary and Maureen Traill. He would later marry Maureen Traill after she and Bruce McDonald married and divorced. During the year I worked at Sanae, Marty Russell and then Billy Anton also worked there.

"Evan was a very good restaurant cook, a good boss, and was also very good with the customers. Responsible, solid, earthy, dependable, funny, and I respected him. The customers liked him, and a lot of fellows in the community looked up to him. He was a very good 'root' for the macrobiotic movement in Boston. I remember him taking Michio home late at night once, after lecture, on the back of his motorcycle. Michio looked hilarious in a motorcycle helmet. Eventually Richard Sandler took over Evan's job.

"I moved to the Kushis' home at 216 Gardner Road, doing the housekeeping and handling minor bookkeeping. Among those who lived there during the year or so I was there were Judy Flohr, who later married Denny Waxman, Susan Sims, who was married to Duncan Sims and moved to Canada, Jim Ledbetter, who made some very strange food in the downstairs kitchen of the 3-story home which Aveline referred to as 'dogfood,' Anne Riegal, now the wife of Ron Kotzsch, Eric Utne, Peggy Winter and, of course, Michio and Aveline and their children. Shizuko Yamamoto visited once or twice.

"After about a year I went out to Los Angeles, where Aveline was now living temporarily, to study cooking with her. I intended to stay about six weeks, but ended up staying seven years. I arrived in May 1970 at the 7511 Franklin St. home that Aveline had rented. During this summer Jimmy and Susan Silver and their toddler Rachel lived there, as well as Bruce and Maureen McDonald and their baby daughter, I, Diane Brewer and a few others.

"Aveline would prepare lunches for the Erewhon crew every morning and deliver them to the retail store on Beverly Blvd. Diane Brewer and I would have to prepare and deliver special meals to a rather tyrannical old woman in a wheelchair who seemed permanently dissatisfied with everything.

"Sometimes Aveline would ask one or more of us to accompany her to Little Tokyo, where she would take her youngest child to get treated by a Japanese doctor for a leg injury, the result of a fall on the stairs in Boston. Her other children remained in Boston with Michio. Once the police stopped us on the freeway because Aveline was driving too slowly. Years later, she said that she had failed her driving test or exam (I'm not sure which) three times. After the third try the examiner told her that if she paid him a certain amount of money ($75 I think) he would give her a passing mark. She paid." Continued. Address: P.O. Box 125, Hinsdale, Massachusetts 01235.

11366. Sharp, Carolyn Heidenry. 2011. Re: Erewhon, Michio and Aveline, and the Boston macrobiotic scene (Continued, Part II). Letter to William Shurtleff at Soyinfo Center, Feb. 15. 11 p.

• ***Summary:*** Continued: "Michio came out to visit once, during the summer I was there, perhaps for meetings about Erewhon. He gave a lecture in the living room at 7511 Franklin also. I remember a cat, perched on the mantelpiece behind the blackboard, stretching its neck around to look at Michio writing something on the board, and everyone laughed. Michio's immediate response–'Even cat wants to study, why not man?'

"Another memory from that summer–Aveline and I sitting in the back yard and she telling me 'Michio always thinks (of) my happiness.'

"Another–scrubbing the new warehouse floor, catty corner from the retail store, on my hands and knees. My first experience working for Erewhon.

"Around September I think, Aveline rented a huge mansion up the street at 7357 Franklin Ave. and we all moved in. Jimmy and Susan Silver, Bruce and Maureen McDonald, Tom DeSilva and his two little boys Joe and Patrick, and many others. The house had once been owned by film star Ruby Keeler, and her name was still there, engraved on the metal mailbox. Ozzie and Harriet lived across the street. Gloria Swanson called once to speak to Aveline and was furious with me because I didn't know where Aveline was. She'd gone out.

"Hollywood was always more or less present in this Hollywood house. The landlady had been in show business in earlier days in some way and was always willing to let the various film companies shoot films in the front yard or in the house (they paid well I believe). Several were shot during the couple of years I was there. This was always happening in L.A. and you would often see a film shoot taking place on this or that street as you drove by.

"Aveline returned to Boston late that autumn, I think, and left me in charge of the house. I wasn't a particularly good cook, by any means, but tried my best, and others

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cooked also.

"Many people stayed at that house for long or short periods of time. At one time there were nearly 60 people, staying in every nook and cranny, the attic, the basement, over the garage, in the cleaned-out tool shed, everywhere. I occupied a large closet for a while. It was all rather hippie-ish, without the drugs, though there might have been one now and then who took drugs, but certainly not openly that I ever knew about. But many had taken drugs in the past.

"Ron and Iona Teeguarden were there, during which time I think Iona wrote a lovely cookbook. John Fountain was a frequent dinner guest. John Deming was there briefly, and there was much interest in macrobiotics and always many people. Jacques and Yvette de Langre [DeLangre] lived a few blocks away, and held 'Soba Night' on Tuesdays. Yvette was a very good cook, and Jacques was a happy, upbeat and friendly personality in the community. He had a photography studio close by on Sunset Blvd., a few blocks away from his home, and once took a number of photos of the Franklin St. house and people there. Mrs. Durkin, the landlady, dropped by from time to time to check on things, a little nervous I think about so many people living there– young, hippie types. She was a kind woman, but made me ask a 16 year old girl to leave the house, worried about having an underage person living there. And also a nice black fellow because she thought he would draw too much attention from the wealthy neighbors. Michio came out from time to time and gave lectures in the very large library, and consultations and sometimes a cooking class. The lectures were very well attended. During one lecture, he levitated (I wouldn't believe this until I saw it with my own eyes). This was the only time I ever heard him ask the audience to be very quiet as he had to 'concentrate.' Usually there were babies making noises in the back of the room or children playing in the hall outside the sliding doors. Michio told the audience that he had been levitating recently to cure the arrogance of some of the teachers, presumably in Boston as L.A. didn't really have any. Later on, he said he stopped levitating because people were giving it too much attention, over his dietary teachings.

"After a couple of years I left the house in the hands of Roy and Mariko Stevens, and went to work as a secretary for Erewhon in the warehouse in Culver City.

"I think Jim Gronemeyer was vice president when I got there around late 1972 or early 1973, not sure when. I remember him coming in wearing his tennis clothes and carrying his tennis racket, quite late in the morning. Not sure if he took his responsibilities seriously. Byron Jennings took over his job at some point. I don't know if Gronemeyer left of his own accord, or was fired. Byron was very intense, very yang, but a good fellow, strong, hard-working and with a good sense of humor. He cared about the job and the company. Very brusque and took no b.s. from anybody. But I liked and respected him. He wasn't a slacker.

"Loren Spector was there also, in upper management. He had previously run one of the Kushis' study houses in Boston. He was also intense, also hard-working, and also seemed to care very much about the job and the company. He and Byron seemed to work well together and both seemed together, intelligent and focused.

"I typed letters and answered the phone, and later took orders, so I have no idea what the financial condition of the company was, or the state of operations. But all seemed well. Jeff Flasher ran the warehouse in the back. He was very popular, smart and worked well with people.

"It was kind of a hippie operation, except for Eddie ___, the accountant, another good guy, who was also very focused and worked hard.

"I remember Paul Hawken came out from Boston, for meetings I suppose, and to have a look at things, and arrived at the warehouse at 6 a.m. before anyone was there, and found the front door unlocked. Someone had forgotten to lock it. I'm not sure, but I had the feeling that relations between Erewhon Boston and Erewhon L.A. were not as cordial as they might have been. At that time anyway. But as I said, I don't really know much about what went on.

"Once, as I left the building at the end of the day, I walked into the middle of a film shoot taking place on the street. I had no idea that anyone was filming the front of the warehouse, and inadvertently disrupted the filming." Continued. Address: P.O. Box 125, Hinsdale, Massachusetts 01235.

11367. Sharp, Carolyn Heidenry. 2011. Re: Erewhon, Michio and Aveline, and the Boston macrobiotic scene (Continued, Part III). Letter to William Shurtleff at Soyinfo Center, Feb. 15. 11 p.

• ***Summary:*** Continued: "After a year I left Erewhon L.A., and one day Tom De Si1va suggested that I open a macro restaurant. So I did. I found some backers and bought a little hole in the wall restaurant at 525½ Fairfax Avenue, a few blocks from Erewhon. It was only about 25 seats. The menu was very basic, as was the decor (rice, beans, veggies, soups, salad, desserts, tempura, stirfries) but there was no lack of customers. People were hungry for natural foods. Being L.A. we were also visited by a number of celebrities and actors, including John Lennon and Governor Jerry Brown who visited a half dozen times at least, and once conducted an interview there during dinner.

"Three years later I sold the restaurant to a mother and daughter team and moved back to Boston. There I lived and worked at 62 Buckminster Road, which was now the location of the Kushis' home. I arrived there in September 1977. Laura Knudson, who later married New Hampshire teacher Blake Gould, and I shared the office work and the cooking. Olivia Oredson was also there.

"Aveline had been searching and searching for a location in which to open the Kushi Institute. Finally she found a

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third floor space (three rooms) in a warehouse at 17 Station St., less than a mile from their home. Michio and Aveline asked Olivia and me to manage it, using a $20,000 loan from Sandy Pukel. The opening ceremonies took place on September 25th (I think) 1978. As there was no cooking class room yet, Aveline cooked all the delicacies for the opening at Buckminster Road (which was quite a job) and then had them all transported down to Station St. and carried up the stairs (there was no elevator) to the third floor. It was a very happy day for Michio and Aveline.

"A year later, around August or September of 1979, Michio asked me to come to a meeting at Buckminster Road. Michio had decided to start a 'Human Relations Board' (HRB) at the Erewhon warehouse in Cambridge to help the situation there. I believe there were union rumblings [at Erewhon] at the time, though I don't remember how far along things were.

"The HRB was to be composed of Marty Roth, Lewis Legon, and me. We three and Michio were seated on the floor, in front of the couch in the living room, around a coffee table (Michio always preferred sitting Japanese style) and Michio went over the two or three pages outlining the HRB's responsibilities. So, in the course of one weekend, I went from working at the Kushi Institute in which I'd been totally absorbed, to walking into a situation I knew nothing about. I'd never worked at Erewhon in Boston, and my job at the L.A. warehouse had been secretarial.

"I don't really know why he wanted me included in this Human Relations Board. I think he was pleased with the way the Kushi Institute was going at the time. (I was the administrative director and Olivia Oredson was the educational director, but those were big titles for what was still a two-bit operation). For the first couple of weeks at Erewhon I had to go to the Kushi Institute each evening after working all day at Erewhon, to explain my job to my replacement, Steve Gagne.

"In this new job, I was unsure at first, uncertain where to begin, because I had no knowledge of the situation. But it didn't take too long to get the general picture. My memories of the time I spent in the HRB are as follows:

"There was heavy tension between Jeff Flasher, who was now president of Erewhon, and Marty Roth. I do not know the reason for it, but it was palpable on Jeff's side. I don't think Jeff supported the HRB. He wasn't at the meeting at Buckminster Road, or chose not to attend, though presumably Michio had informed him beforehand.

"Lewis, Marty and I worked well together, and might have been able to make a significant improvement in the company had we had Jeff's support. But I think he felt very threatened by the HRB, particularly by Marty.

"Instead of handling what we were supposed to handle, Jeff had Marty and I handle union negotiations, along with Evan Root, who was then vice president.

"Before the union negotiations began, Evan seemed a little unsure of his position, and didn't seem to have a niche, or much to do. At some point he said he was staying for the money. He added a solid feeling to the company, but his talents were not utilized, I think, until union negotiations began.

"The company wasn't unified. There was an 'us and them' feeling between the truckers and the production floor employees, on the one hand, and the managers and 'suits' on the second floor. At least there was this feeling on the part of the former. So it was a perfect environment for the union organizers to take hold, and as I found out, these were not the noble union organizers one thinks of as saving the day for the down- trodden employees. They were out for blood.

"I remember being astonished by the woman from the local union who was coaching and advising the employees during our evening meetings. She seemed to be *extremely* hostile to put it mildly. Excitable, ready for a fight. The employees totally distrusted us, and were very into accusing. I think much of this was fostered by the union organizers. Many of the employees were victims in a way, somewhat brain-washed by the union organizers.

"Walking past the Arlington St. Church one weekend, someone outside handed me a flyer and encouraged me to come in and listen to Caesar Chavez speak. I thought well of him at the time from the little I knew about him. However, the incredibly vile things he said during that speech shocked me. I never respected him after that. Had there been a tv crew or microphone there, I think the speech would have been completely different. He may not have realized that he wasn't speaking only to hard core union sympathizers, but also to members of the general public.

"That experience and the experience of being in on the union negotiations at Erewhon, completely changed my formerly rather benign and supportive views about unions and union organizers. Not very honorable people from the little I saw." (Continued). Address: P.O. Box 125, Hinsdale, Massachusetts 01235.

11368. Sharp, Carolyn Heidenry. 2011. Re: Erewhon, Michio and Aveline, and the Boston macrobiotic scene (Continued, Part IV). Letter to William Shurtleff at Soyinfo Center, Feb. 15. 11 p.

• ***Summary:*** Continued: "I still have my notes, from the three or four months I worked at the Erewhon warehouse in Cambridge in 1979, for a meeting with Michio. Excerpts: 'Both Lewis and Marty are paranoid about Jeff Flasher, in part justifiable, due to the emotional state and suppressed tension of Jeff, and a few incidents that happened.' (Can no longer recall what those were). 'Jeff put up a brick wall against the HRB, though he likes me personally I think, and I think he also likes Lewis, so the administration and the HRB are divided. Can't work under this. Must be unified, or at least not hostile. But Jeff feels threatened. Hands of HRB are tied. Jeff gave Marty and me union negotiations to deal with,

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along with Evan.'"

"'The HRB has had two different proposals for its purpose, one from you (meaning MK) and one from Jeff. The result is confusion, an uncomfortable situation and stagnation.'"

"'Erewhon needs yang–clear, just policies, good systems and accountability to a yang source. Erewhon's systems and structures not orderly. The warehouse is not clean. The company needs to follow American-style business logic to succeed. Some of the employees need someone firm to tell them when they're really out of line.'"

"'Besides firm authority, they also need some understanding. The employees are hungry for support (many of them) and encouragement. Problems: no one seemed to listen to them, or cared when they listened, prior to union negotiations. No one communicated the company's side when suggestions were turned down. There seems to be no one (in authority) who cares about them, everyone is busy with other things. Need a channel for their ideas and some practical utilization of their ideas, and communication about why, when not used.' (I remember thinking that upper management, in general, was not heartless, just so very focused on the future that they didn't give enough attention to the present, to the employees).

"'Jeff now tightening very much on the HRB and a few of the managers, but mostly the HRB. No one knows or understands what we are doing. We don't know our limits and freedoms.' Also, 'Not enough fellowship. Time is crowded. Most of my time is spent keeping the peace between HRB and Jeff, union correspondence and communication.'"

"'The warehouse also needs yin, improvements to the dining room, better cafeteria food, little parties, socializing, etc.' I suggested that Michio think about all of this, and then discuss it with us before he left for Europe, for a seminar tour.

"'Key points

"1. Straighten out Jeff and Marty's relationship.

"2. Straighten out Jeff and HRB's relationship.

"3. Clarify in Jeff's presence our purpose and function.

"4. Straighten out where there is overlap, and how to handle.'"

"The only way the situation would have been fixable, in my opinion, would have been if Jeff had used the talent that was already on board in the following way. Of course, hindsight is 20/20 they say.

"(1) If Marty Roth had been made operations manager, the company would. have undergone a number of much-needed improvements. Marty was very smart, capable, somewhat experience (I believe he learned a lot about business management from his father), had good sense and good suggestions, and management ability. He was capable of making tough decisions, if necessary. But he was relatively powerless in the position he was in, given Jeff's attitude and the change in the purpose of the HRB.

"(2) If Lewis Legon had been empowered to deal with all employee issues, he would have gone to bat for them, but in a way fair to the company, as he could see both sides. This would have helped morale, and taken some of the wind out of the sails of the union organizers. Lewis was capable, smart, and very good natured. He was a great asset to the company in my opinion, and Marty could have been as well.

"(3) While Evan was less willing to consider the employees side as much, he was a good company man. 'Into protecting the interests of the company. Sees certain sides no one else thinks of. Good at certain administrative duties, like security, benefits, complicated work dealing with outsiders. Very good at representing the company in matters other than financial, though (at that time) lacking in expressing interest or concern for people's needs.' He could have continued to take some of the load off Jeff's shoulders.

"(4) In addition to those three, who were already working at Erewhon, I believe the company need a different person in the position of comptroller, for a number of reasons.

"With those four players, the major problems could have been turned into manageable challenges.

"Michio and Aveline were not at Erewhon much, at least not during those few months I worked at the warehouse, except for a couple of times. I remember both of them attending a meeting we had with one of the lawyers who was advising us on some aspect of the union negotiations. The lawyer had been speaking at length when suddenly Michio began to snore softly. He had fallen asleep, sitting up perfectly straight (eyes closed) on a couch between Aveline and me. Aveline bent forward, looked over at me with a comical expression, repressing a laugh. Evan looked over at Michio and said 'let him sleep' and turned his attention back to the lawyer. Aveline dug her elbow into Michio's side. I wondered what the lawyer thought.

"The lawyers were expensive, one older male, and one younger female. Evan said Erewhon was probably paying for her training (through this experience of helping to handle Erewhon's union negotiations). But then that was true of many of Erewhon's employees and managers. Eventually the negotiations went to federal mediation. The mediator was a little surprised, I think, at the company's greenness and lack of sophistication. Anyway, I left after three or four months feeling that the situation wasn't fixable, or at least that there was no way I could help to make it better under the current circumstances." Continued. Address: P.O. Box 125, Hinsdale, Massachusetts 01235.

11369. Sharp, Carolyn Heidenry. 2011. Re: Erewhon, Michio and Aveline, and the Boston macrobiotic scene (Continued, Part V). Letter to William Shurtleff at Soyinfo Center, Feb. 15. 11 p.

• ***Summary:*** Continued: "I think Erewhon failed for a

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variety of reasons, not just one thing, but the two most important reasons were that: (l) There was too much youth in management. There were no older, riper, mature heads to steady things. (2) There was almost no one in management who had business skills and training, certainly not at the level and of the type that Erewhon needed at that stage of its growth.

"There was an absence of older, experienced and qualified people managing all of Michio and Aveline's enterprises and organizations. They were mostly always young and unqualified for the positions they held (including me and including, sometimes, Michio and Aveline's children). It was the 'Peter Principle' ["In a hierarchy every employee tends to rise to his level of incompetence." "Members are promoted so long as they work competently. Sooner or later they are promoted to a position at which they are no longer competent"]. If you did well in one thing (and sometimes a person was selected even without that slim qualification) you were given more to handle, often much more, often beyond your capabilities.

"So almost everyone was out of their depth, in all of their enterprises. Most everyone was learning on the job, finding their way, with only a very few exceptions, whether in L.A. or Boston. This was also true of Michio and Aveline, but they were not usually involved in the day-to-day management of their businesses. (And they had the additional difficulty of dealing with a different culture, ways of doing things, different language, etc.) They also had so many enterprises going at the same time, which resulted in them giving only a little attention to each, in between travelling and teaching, both abroad and at home.

"Michio and Aveline were inexperienced and unfamiliar with what they were dealing with at Erewhon, and weren't there often anyway, and wouldn't have always known what to do if they were. Michio's success at Takashimaya in NYC in earlier days didn't translate into success at Erewhon.

"The seventies and eighties were a time when things were developing fast. There was so much interest in macrobiotics or, at least, in natural foods. I don't think Michio and Aveline, or anyone else, thought it would diminish. Many problems were seen just as difficulties on the way up the mountain to further development and success. Michio and Aveline both had an enormous capacity to remain unperturbed by calamity, a least until it was too late.

"Michio's lawyer, Morris Kirsner, had a strong influence on Michio and Aveline. He was a very good and trustworthy man, and very protective of the Kushis, but I think his outlook and advice was often too protective, too strict and unyielding, and thus at odds with the more laid back and informal approach of many of the Kushi managers and employees, and even of Michio and Aveline themselves, who were almost always casual and informal. So the two sides didn't jive, they were both rather extreme, and there wasn't a lot of middle ground.

"Other reasons include:

"–The fact that so much money was lost to the law firm to handle the union negotiations. In effect, the union organizers helped to lose all of the jobs of the people they were supposedly trying to help, because the company went into Chapter 11 bankruptcy and was sold. But the union may not have gained a foothold, had management listened and cared more.

"–The fact that so much money was lost to upper level management and other employees who, in my opinion, were taking too high salaries. I doubt if most of them were able to command such salaries at wherever they worked after they left Erewhon. Though some were talented, not all were quite the hotshots some thought they were. Somebody should have put a cap on the salaries. I do not believe Michio and Aveline were involved in this. If they were, I very much doubt that they had any accurate frame of reference for what they were agreeing to. (Often the case.) Aveline didn't handle money well (she handled it quite badly) and Michio didn't handle it at all. But more than a few Erewhonians in the offices on the second floor seemed to be living rather high on the hog.

"–Too much money was lost to Tony Harnett of Bread and Circus. Though Richard Young was a good man, he may have been practically giving the goods away in his job as salesman. I do not know if this is definitely true, but I heard something of the sort during the time I worked at the warehouse. He should have been reined in, fast.

"–When the decision was taken to carry dairy foods, meat, etc. to 'remain competitive with other distributors' that change in direction changed the heart and soul of Erewhon, and its integrity and purpose, on some level at least. Michio would only have made such a decision if presented to him in a very positive light as the only way to go. I think one must look at all this from the Kushis' perspective as well. They were always engulfed in a swirl of opinions, pro and con, on many matters, and often didn't know who was right or who to believe. They were too busy and overloaded as well. They were also dealing, a lot of the time, with many young and inexperienced people, some of whom were rather full of themselves, had all the answers, knew all the solutions, or so they thought. More than a few of them should have been very grateful that they were employed by the Kushi organizations and businesses, as they wouldn't have had a chance at getting similar positions anywhere else. People also often left on the spur of the moment, and several people stole money or awarded themselves 'bonuses' without the Kushis' knowledge, until after the fact (and those are just the ones I know about–probably there are some that were never known to anyone else). Riding these rapids, and bumping along in the turbulence, Michio and Aveline Kushi tried to stay afloat. They both had their faults, most certainly, and made their share of mistakes, but so did their employees and associates. That should be remembered and taken into account.

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"–Lastly I think there was another financial drain on the company. Jeff Flasher told me he'd taken a $10,000 loan from Erewhon, during the months I was at the warehouse. I wonder if there were other 'loans' after I left. I wonder why Tom Williams, the comptroller, disappeared." Continued. Address: P.O. Box 125, Hinsdale, Massachusetts 01235.

11370. Sharp, Carolyn Heidenry. 2011. Re: Erewhon, Michio and Aveline, and the Boston macrobiotic scene (Continued, Part VI). Letter to William Shurtleff at Soyinfo Center, Feb. 15. 11 p.

• ***Summary:*** Continued: "Given all of the above I suppose it was inevitable that Erewhon should fall.

"Many people would have had difficulty filling the shoes of president. Not an easy job. Probably no one, among the community of friends and associates that Michio and Aveline knew, and from whom they would have selected a president, had the experience or training to handle the job. And most anyone would have had some successes, and also made some mistakes. However, if Tom DeSilva or Evan Root had been president of Erewhon, I don't think either of them would have tolerated too-high salaries, too-low profit margins, or hired Tom Williams as comptroller. Or taken out $10,000 loans from the company.

"After the collapse of Erewhon, Michio once said that if ever he began a food company again, he would make it a very simple operation, selling grains, beans, sea vegetables, Condiments, miso, soy sauce, noodles, etc. of very good quality, rather than the hundreds of items (thousands I think) that Erewhon carried before it died.

"So, about 12 years later (in about 1994), I was very disappointed and puzzled when he began KFC–Kushi Food Corp. And not sorry when it folded. Michio often had a short memory.

Note: The company was originally named "Kushi Macrobiotic Corporation" (KMC). It was listed on Nasdaq as KMAC as early as 7 Nov. 1995 and as late as 23 Aug. 1996. But by Feb. 1996 it had been renamed (probably for wider appeal) to "Kushi Natural Foods Corporation." On 26 Sept. 1996 its merger with American Phoenix Group, Inc. was completed.

"When I met the CEO that Michio and Fred Sternau selected to run the company, I was stunned. I mentioned my misgivings firmly to Michio and Fred, separately, when I next saw them. They both seemed strangely casual and not too concerned about it, and didn't seem to realize the huge impact this person would have on the company.

"One final note: In all the years I worked for Michio and Aveline and in all the time I lived at their home, I never heard either of them say one word that could be construed as anti-semitic. In fact, there were so many Jewish people working for them in their various enterprises and organizations, that I remember the Kushis being criticized for having too many Jewish people running things. Michio's secretary for several years, Donna Cowan, was also Jewish. Michio's lawyer for several decades, Morris Kirsner, was Jewish. And many students and employees were Jewish or half Jewish. Michio seemed too evolved to carry around prejudice of any kind. He was, and is, a great friend of humanity. All humanity." Address: P.O. Box 125, Hinsdale, Massachusetts 01235.

11371. Root, Evan. 2011. Re: History of Erewhon from Aug. 1967 to Nov. 1968. Letter (e-mail) to William Shurtleff at Soyinfo Center, Feb. 17–in reply to inquiry from William Shurtleff. 1 p.

• ***Summary:*** "This is my recollection, not perfect, I'm sure.

"In August of 1967, there was an understanding between Paul Hawken, the Kushis, and Evan Root that Paul would take over the management of Erewhon from Evan Root. However, Paul needed to return to San Francisco to wind up his affairs there, pack and return. This would take about a month or perhaps a bit more.

"Paul and Evan took this trip to SF together via 'drive-away' car, stopping at various macrobiotic friendly stops along the way. Evan gave 'lectures' and cooking classes, and Paul helped out as well as continued to soak up everything he could as preparation for his next step.

"Paul, Bill Tara, Rene, and, I think Jean, lived in a warehouse in San Francisco which they had converted to living quarters. It was quite unique. I gave a MB [macrobiotic] class there which about 30 people attended, Jean and Ty Smith among them.

"The whole trip back and forth took a month or more, so we returned to Boston in late September, 1967. During our absence, Martin Russell, I think, was the main store keeper holding the place for Paul's return.

"During the next several years, several people from that SF warehouse scene started arriving in Boston, Bill Tara and his then girlfriend (soon to be wife) Rene, Jean, Ty, in particular.

"In my opinion, and I could be wrong, Jean probably signed on to Erewhon one year later than she recalls. The reason I think this is that the first time I met her was in SF in Sept. of 1967. If she arrived in Boston, as stated in #3, in the early summer of 1967, she would have had to return to SF for me to initially meet her there. I suppose that is possible, though she would have had to leave her employment at Harvard to do so. If, however. she arrived in the early summer of 1968 and started at Erewhon in September of that year, then it all makes sense." Address: Ashland, Massachusetts.

11372. Silver, Jimmy. 2011. Re: Erewhon and San Francisco rock music. Letter (e-mail) to William Shurtleff at Soyinfo Center, Feb. 17. 1 p.

• ***Summary:*** Jimmy and his wife, Susan, arrived in Boston in December 1970. "The Erewhon store was first in a little

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basement space further down Newbury Street [at 303-B Newbury] from Massachusetts Ave. and on the opposite side of the street from the bigger store [at 342 Newbury St.] that succeeded it (the original space became Tao Books and then Redwing Books).

Once the new store was built, as I recall Jim Gronemeyer was one of the first managers and was succeeded by Eric Utne. I was sent over from the warehouse to keep an eye on Eric for a while, as he was sort of an unknown quantity who was probably chosen by Michio Kushi for the job, for some unknown reason. At least that is my hazy recollection.

"Roger Hillyard and Ben Van Meter's company [in San Francisco] was called the North American Ibis Alchemical Company [NAIAC] and they appear on many dance posters from that era. Roger then became president of a synthesizer company for a while.

"The North American Ibis Alchemical Company put on light shows and provided the 'atmosphere' at many, many of the rock concerts of that era. If you check out the posters for the Fillmore, Avalon and other venues, down at the bottom or somewhere in the body, you will find NAIAC on many of them. I would venture to say that they were THE light show provider of that time."

Note: NAIAC existed by 17 March 1967; they folded in 1968 and their kit was sold off, Brotherhood of Light buying 12 carousels off of Ben. One website says of them: "possibly the best lightshow name... EVER."

I remember Marty Russell. Very sweet little guy, walked with a limp and had vitiligo–the skin on his face and neck was discolored brownish and pink. He was married to the oldest of the Coates sisters, Ronnie. I think he died a few years ago, but I'm not certain. The other Coates sisters, Dora and Judy, married Paul Hawken and John Deming respectively. Dora was also married to Richard Young for a while, I believe. There may have been a fourth Coates sister, not in the macro scene–I'm not sure. Note: Sarah Coates and Nancy Coates were not in the macro scene.

"I mainly worked at the warehouse, costing out the import shipments. I sat... at a big desk that had been moved out onto the landing outside the door into the offices. As I recall the offices were on the top floor, the fourth floor, so it was a walk up four flights of stairs and there was my desk, facing the wall outside the door. Paul had the desk moved out there for me–the offices were tight for room but it always seemed kind of personal too.

"However, I was, for a while, sent to 'work' at the store and keep an eye on Eric Utne. Eric was pretty loose, so it was fun in a way, although he liked to do all these things that I thought were somehow not what the higher-ups had in mind, like going over to the Prudential Center where they had a sauna and steam room almost every day, or going down to Sanae (at that time there was only 'little' Sanae, on Newbury Street, before The Seventh Inn was built and opened across from the Commons) for lunch. Eric's idea of work was more like hanging out." Address: President, Pure Sales, Irvine, California.

11373. Kushi, Norio. 2011. Re: Kushi Macrobiotic Corporation (KMC), formed in 1994. Letter (e-mail) to William Shurtleff at Soyinfo Center, Feb. 26. 1 p.

• ***Summary:*** "KMC are the initials of the company that was formed in 1994. The full name was Kushi Macrobiotic Corporation, headquartered in Stamford, Connecticut.

"An associate of my father's, Fred Sternau, approached my father about starting a publicly traded 'Macrobiotic' food manufacturing company. Fred Sternau, through his connections, raised over $2 million to start this venture, which was named, Kushi Macrobiotic Corporation."

"Basically my father wanted to re-create Erewhon, under the family name 'Kushi.' My feeling is that the company was ill conceived and the corporate players had no vision other than to make money. The company basically folded within two years after spending all the venture capital.

"Once it was seen that the company was not going to make any money since the product line was ill conceived and there was no demand for these 'value added' products, the CEO resigned with a hefty severance pay of roughly $200,000 to $300,000.00–I don't recall exactly.

"Apparently there is still 'value' in having a NASDAQ listed 'shell.' Therefore the KMAC shell was split and a company, called American Phoenix, bought 1/2 of the 'shell' thereby potentially retaining value for the share holders. American Phoenix was actually based in Australia and they were involved in some products relating to yachts or sailboats.

"The other half of the KMAC shell was renamed Kushi Food Corporation with the intention that the Macrobiotic Food venture would be resurrected, or, it could be used to lure a private 'Macro' biased food company into a public 'shell.' As far as I know, nothing ever came of the Kushi Food Corporation shell.

"The CEO of Kushi Macrobiotic Corporation, Robert Morrow, came with an impressive resume, and, as it turned out was either fiction or elaboration of the positions he had held in prior companies. He had no knowledge of the natural food industry, and, the first time he stepped foot in my parents home, stated, 'Don't you dare ever offer me any of this Macrobiotic Food, I refuse to ever touch any of it!' This was prior to him even being hired. In spite of this remark, my father, who was chairman of the board, promptly hired him without checking any of his background." Address: Traveling by truck.

11374. Kushi, Norio. 2011. Re: My brothers and sisters. Letter (e-mail) to William Shurtleff at Soyinfo Center, March 2. 1 p.

• ***Summary:*** "My sister and brothers are:

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"Lily, Lillian Midori Kushi, born July 20 1953.

"Norio, Arnold Norio Kushi, born December 15, 1954.

"Haruo or Larry, Lawrence Haruo Kushi, born December 10, 1956.

"Phiya, Phillip Yoshio Kushi, born October 29, 1959.

"Hisao, Hisao Tenshin Kushi, born June 8, 1965.

"Phiya is a nickname that I came up with when we were children and the name stuck. My father picked the western names, which were used as the first name and my mother picked the middle Japanese names, with the exception of our youngest brother Hisao. When Hisao was born, my grandparents on my father's side were living with us. My mother picked the name Hisao, which was decided to be the first name and my grandmother picked the name Tenshin to be used as the middle name.

"The four older children were born in New York City and Hisao, was born in Cambridge, Massachusetts. All of us kids were born in a hospital. "My sister spelled her name 'Lilly' for most of her life. However, in her later years, perhaps the last five years of her life, definitely after the book titled *Aveline* was printed, she began spelling her name 'Lily.' She never made a big deal about it and never corrected anyone if someone were to spell her name 'Lilly.' However, she herself would always spell her name 'Lily.'

Norio (who has long loved cars) writes (3 March 2011, in reply to a question): "I initially started driving a truck in 1981. I also drove for Greyhound and helped to start a bus company, Premier Coach of Vermont for the owner, Ron Charlebois. I went back to driving a truck back in 2002 and have been doing so since then, other than a short period when my father got sick and went into the hospital. I pretty much live in the truck full time, getting home to Asheville, North Carolina, about once a month. I left Asheville on Monday and am currently in Oxnard, California, having made a delivery here this afternoon.

A photo shows Norio, holding a guitar, with truck in background. Address: Traveling by truck.

11375. Fujita, Y.; Iki, M.; Tamaki, J.; et al. 2011. Association between vitamin K intake from fermented soybeans, natto, and bone mineral density in elderly Japanese men: the Fujiwara-kyo Osteoporosis Risk in Men (FORMEN) study. *Osteoporosis International.* March 11. [Epub ahead of print]. [38 ref. Eng]

• ***Summary:*** "A cross-sectional analysis of 1,662 community dwelling elderly Japanese men suggested that habitual natto intake was significantly associated with higher bone mineral density (BMD). When adjustment was made for undercarboxylated osteocalcin levels, this association was insignificant, showing the natto-bone association to be primarily mediated by vitamin K."

"Conclusion: Habitual intake of natto was associated with a beneficial effect on bone health in elderly men, and this association is primarily due to vitamin K content of natto, although the lack of information on dietary nutrient intake, including vitamin K1 and K2, prevented us from further examining the association." Address: Dep. of Public Health, Kinki Univ. Faculty of Medicine, 377-2 Oono-higashi, Osaka-Sayama, Osaka, 589-8511, Japan.

11376. Macdonald, Bruce. 2011. Competition and feelings between Erewhon and Chico-San. The short-grain brown rice saga (Interview). *SoyaScan Notes.* March 28. Conducted by William Shurtleff of Soyinfo Center.

• ***Summary:*** The split between the Kushis and the Aiharas began in 1961 when Herman and Cornellia, following Ohsawa's advice, moved to Chico, California, with the group (including Bob Kennedy) that started Chico-San, Inc. in early 1972; Michio and Aveline decided to stay on the East Coast. All four (Michio and Herman, Aveline and Cornellia) were best buddies up until 1961. After than, there was a certain coolness. Bruce remembers, for examples, that when he and others were out in California, they never invited Herman (a sensei) down to lectures or other events. That was unusual.

But Bruce knows much more about the business side of things. "Essentially Bob Kennedy was irate with us because we were selling directly to stores and he was selling through big distributors." He had chosen to go that route as the easy way to get distribution for his products. This was also in the era before there were many natural food retail stores. "We were underpricing Bob Kennedy, in part because we did not have to go through a distributor and in part because we were willing to sell larger quantities at a time–such as 50- or 100-lb bags. Koda brown rice came in 100 lb bags; Lundberg brown rice came in 50 lb bags. The bags were a generic brown multi-wall paper bag. "I think it said 'Premium Short-Grain Brown Rice' on each bag.

In Los Angeles, Bruce first saw short-grain brown rice grown by Lundberg [Note: It was probably harvested in the fall of 1970]. It was described in the Erewhon catalog as "unsprayed." It was not listed in catalogs as "organic" because Erewhon was afraid of a lawsuit from Chico-San. "Essentially everybody knew that it was the same rice that Chico-San was selling [i.e., organically grown]. How did they know? They just kind of knew. The word got out. At Erewhon, Los Angeles, we had to move a lot. The rice, in bags was piled 4-5 bags high on the floor of their little warehouse across the street from the retail store. Erewhon West hadn't yet started their warehouse in Culver City, which they moved into in the summer of 1970. So Bruce probably saw this rice in L.A. in early 1970. Bruce has always understood that the Lundbergs had done OK with their organic brown rice in the first year they grew it, but they had gotten trouble in the 2nd year. Bruce suggests that Shurtleff contact Homer or Harlan Lundberg to try to resolve this conflict of dates–and to try to see the actual contract.

In Japan, as Bruce understands it, the traditional practice

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was to sell rice at little or no markup so that everyone could afford to eat. "I always loved that idea. That's one reason why Erewhon's unsprayed rice wholesaled for $11.00 per 100 lb. bag. We did not take a full markup on that." Address: Natural Import Co., Asheville, North Carolina. Phone: 802-869-2010.

11377. Yasuda, Masaaki. 2011. Fermented tofu, tofuyo. In: Tzi Bun Ng, ed. 2011. Soybean–Biochemistry, Chemistry and Physiology. Rijeka, Croatia: InTech. 642 p. See p. 299-322. Free, open access online publication. http:// www.intechopen.com/ source/pdfs/ 15715/InTech- Fermented_ tofu_ tofuyo.pdf [54 ref. Eng]
• ***Summary:*** Contents: Introduction. History of tofuyo: History of fermented tofu, history of tofuyo. Production of tofuyo (3-step process): Processes for making tofu and dehydrated tofu-cubes, processes for making rice koji, soaking and ripening. Characterization of tofuyo: Chemical changes in tofuyo during the ripening period, physical changes in tofuyo during the ripening period, the flavor compounds in tofuyo, the physiologically functional properties of tofuyo (angiotensin I-converting enzyme inhibitory peptides in tofuyo, antihypertensive and hypocholesterolemic effects of tofuyo in spontaneously hypertensive rats, effect of tofuyo on erythrocyte deformability in high-fat-fed mice and other bioactivities). Microbial biochemistry in tofuyo production: Characterization and application of aspartic proteinases from *Monascus* fungus, characterization and application of serine carboxypeptidases from genus Monascus, characterization of glucoamylases from genus *Monascus.* Conclusions. Address: Faculty of Agriculture, Univ. of the Ryukyus, Okinawa pref., Japan.

11378. Yasuda, Masaaki. 2011. Fermented tofu, tofuyo: History of fermented tofu (Document part). In: Tzi Bun Ng, ed. 2011. Soybean–Biochemistry, Chemistry and Physiology. Rijeka, Croatia: InTech. 642 p. See p. 301-02. Free, open access online publication. http:// www.intechopen.com/ source/pdfs/ 15715/InTech- Fermented_tofu_ tofuyo.pdf [Eng]
• ***Summary:*** "Fermented tofu is considered to have originated in China; however, the exact time and place of its origin remain uncertain. Hong (1985) reported that the first description concerning fermented tofu was found in *Peng Long Ye Hua* written by Li Ri-Hua in the Ming dynasty (1368-1644), where it was prepared with molded tofu. Reference to furu appeared in the famous book on Chinese medicinal and herbal materials, *Pen Ts'ao Kang Mu* (*Honzo Kou Moku,* in Japanese) published by Li Shih-Chen in 1596. In this book, furu was prepared without the molding procedure. From these old records, it appears that there were two techniques involved in furu production, treatment with and without mold. Although the name rufu appears in the section of animals of this book, it is not fermented tofu, but refers to milk-curd, which is produced from the coagulation of protein in milk under acidic conditions.

"During the Ch'ing dynasty (1644-1912), many records on fermented tofu production appeared, indicating that the molding procedure had become mainstream. The making of fermented tofu with the molding procedure is described in the book, *Shi Xian Hong Mi* written by Wang Zi-Zhen, in the middle of the Kang-Xi period (1681-1706). Interestingly, the author found that the fermented tofu was made with the 'red koji' [*beni-koji*] in this record. From this description, it is strongly suggested that the origin of tofuyo is the fermented tofu described herein. References to rufu often appear in documents of that time. Rufu seemed to be one of the finest products in the district of Jiang Nan, China, and was introduced in a kind of guidebook on local production, *Jiang Nan Tong Zhi* (1736). In this record, rufu was not milk-curd, but fermented tofu. It was revealed that the methods of making fermented tofu recorded in *Xing Yuan Lu* written by Li Shi-Ting in the middle of the Quianlong period (1757-1776) are similar to present-day methods. Fermented tofu, rufu, was also described in *Sui Yuan Shi Dan* written by Yuan Mei (1782), and the white type of rufu (containing shrimp eggs) or famous production sites, and other aspects, were introduced in this document. From a variety of literature, it can be concluded that the development and spread of fermented tofu occurred in the Ch'ing dynasty, and became popular in the diets of people in mainland China and Taiwan, and continues to be enjoyed even today. As the Chinese fermented tofu spread to other countries in East and Southeast Asia, it was given its own name in each country, as described in the Introduction. From that time to the present, the fermented tofu of each country has been traditionally made in the home or small cottage industries." Address: Faculty of Agriculture, Univ. of the Ryukyus, Okinawa pref., Japan.

11379. Yasuda, Masaaki. 2011. Fermented tofu, tofuyo: History of tofuyo (Document part). In: Tzi Bun Ng, ed. 2011. Soybean–Biochemistry, Chemistry and Physiology. Rijeka, Croatia: InTech. 642 p. See p. 302-03. Free, open access online publication. http:// www.intechopen.com/ source/pdfs/ 15715/InTech- Fermented_tofu_ tofuyo.pdf [Eng]
• ***Summary:*** "Although fermented tofu has never been widely known nor consumed in mainland Japan, it has a long and interesting history in Okinawa Prefecture, where a mellow, delicious product named tofuyo has been enjoyed for nearly 200 years. Okinawa is one of Japan's southern prefectures, and consists of hundreds of the Ryukyu Islands in a chain over 1,000 km long, extending southwest from Kyushu to Taiwan. The Ryukyu Kingdom existed in this area before the Japanese Meiji Period (1868). Since the islands are located in the center of the East China Sea and are relatively close to Japan, China and Southeast Asia,

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the Ryukyu Kingdom became a prosperous trading nation. However, four years after the beginning of the Meiji period (1872), the kingdom was officially annexed by Japan.

"The earliest known reference to fermented tofu in Japan comes from Osaka. In 1883, Ka Hitsu Jun published the famous book, *Tofu Hyaku Chin Zokuhen* (The Sequel to One Hundred Favorite Tofu Recipes). In this book, 'red tofu' and the other fermented tofu, 'tofu-ji', were introduced. According to the book, how to make the red tofu was a family secret, and few details on its production were provided. The other description was clearly of Chinese style red furu, because the materials not only included red koji from China, shiro zake (white sake, Chinese distilled liquor named 'Bai-Jiu'), *sansho* (Japanese spice, this spice seems to be used instead of chili), but also refer to it as tofu-ji and use the same method of preparation." However, this fermented food subsequently disappeared from and can no longer be found in mainland Japan. On the other hand, because relations between the Kingdom of Ryukyu and China were close at that time, it strongly suggests that furu production methods were brought to Ryukyu from China (probably from Fujiang) in cultural exchanges between the two countries at that time. However, there is very little information available on fermented tofu in Ryukyu. Red tofu, fermented tofu, furu or tofuru were not described in the Ryukyu's Old Language Dictionary *Kongo Kensyu* [*Kongo Kenshu*] (1711), or in the book on the History of Ryukyu *Ryukyu Koku Yurai Ki* (1713) edited by the Government of Ryukyu Ohfu.

"Red furu was likely introduced to Ryukyu during the late 1700s. Since the product was brined and had a strong taste and smell, it was not immediately accepted in its original form by the people. Therefore, it has been re-created using awamori. Namely, the processes of preparing molded tofu and fermenting the mold-overgrown curd in salt-brine were eliminated by cooks in the dynasty, resulting in a more palatable taste that was milder in flavor. Thereafter, they were able to decrease the amount of salt in the original recipe, and increase the shelf life without salt. Thus, an elegant, mellow and delicious fermented food, dubbed tofuyo, was newly created.

"The earliest known indirect reference was in the book *Account of a Voyage of Discovery to the West Corea and the Great Loo-Choo Island* written by Basil Hall in 1818. In this book, *Corea* refers to "Korea." Interestingly, Ryukyu was called the great Loo-Choo islands on the old map at that time. The Englishman Hall and his party visited Naha harbor in 1816, on route from China, where they were entertained by the Government of Ryukyu Kingdom and served the local cuisine. They were served "hard boiled eggs, cut into slices, the outside of the white being colored red... sackee (the liquor; awamori)... and something like cheese." The red color is thought to be the red koji-pigments produced by the genus *Monascus,* and the cheese-like food may be the fermented tofu, tofuyo, which is often made with red koji.

"The earliest known direct reference to tofuyo and red koji was in *Gozen Hon Sou* written by the physician Tokashiki Tsukan Peichin in 1832. Peichin is a term for a high-ranking officer. In this book, foods, and medicinal and herbal materials in Okinawa were described in the context of medicine and pharmacy. He describes that "Tofuyo has a delicious flavor and is good for the stomach. It makes eating a pleasure and is good for various types of sickness". From these descriptions, it was considered that tofuyo was consumed by the royal family and the upper classes as a medicinal food and as a side dish. This group established the methods of making tofuyo, but the secret of its preparation has been a stubbornly guarded family-secret. In fact, there were no references to it from 1832 until 1938.

"It was not mentioned in the accounts of visits to Ryukyu by the English captain Frederick W. Beechey (1831) and the famous American Commander Matthew C. Perry (1857), nor in any documents from the Meiji period (1868-1912). This may explain why its use did not spread and why so few references have been made to it. During the early Showa period (1926-1989), home-made tofuyo was popular only among the upper classes in the cities of Shuri (the former capital) and Naha (the new capital) in Okinawa. However, its production was not clarified at all. Ladies ate it with tea, while men took it with awamori. Typically, a small cube was placed on a small dish and eaten with chopsticks or a tooth-pick (Fig. 2). The product was never widely known by regular people because it was only rarely made at home. In 1938, Shojyun Danshaku, who was a descendant of the Ryukyu Royal Family and a well-known connoisseur, wrote an article entitled 'In Praise of Tofu' in the magazine, *Monthly Ryukyu.* He noted that tofuyo is one of the best rare and tasty foods in the world, if not the best.

"After World War II, the special family-secret of making tofuyo techniques was, for many years, inherited only at select homes; few people are aware of the food. As it is a unique low-salt soybean cheese, its industrialization has been greatly expected. However, in order to develop its production, it is necessary to clarify features of the food making that depend upon intuition and experience, and to establish the manufacturing technology in proportion to mass production. Thus, we revealed its features, and scientifically established the basic technology involved (Yasuda, 1990). The outcome was transferred to the local industry during the mid-1980s. Subsequently, tofuyo that reflects the gastronomic culture in the age of the Ryukyu dynasty has been marketed. Furthermore, the red type of tofuyo is popular, and its production been greatly developing. Nowadays, attention is being paid to this food as a health food that is cholesterol free, and is a low-salt fermented soybean cheese. Therefore, it would also be suitable for western people because it could be utilized in almost the same way as cheese." Address: Faculty of Agriculture, Univ. of the Ryukyus, Okinawa pref., Japan.

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11380. Nabozny, James. 2011. Tofuyo, Okinawan fermented tofu (Interview). *SoyaScan Notes.* April 13. Conducted by William Shurtleff of Soyinfo Center.
• ***Summary:*** James lived on Okinawa Island for a total of 14 years as a U.S. Marine. Tofuyo is made on many of the Okinawa Islands and the Ryukyu Islands of Japan. He has tasted several different varieties of tofuyo on the island of Ishikawa, a tiny inhabited island south of Okinawa in the archipelago, which almost no outsiders visit. The people and culture there are very traditional–as from a bygone era. The tofu there is curded using seawater and is very delicious–as is the unique tofuyo. Address: Tucson, Arizona.

11381. *SoyaScan Notes.* 2011. Updated USDA database on the isoflavone levels in foods, commercial ingredients, soybeans and soyfoods (Overview). April 23. Compiled by William Shurtleff of Soyinfo Center. [1 ref]
• ***Summary:*** The link is now http://www.ars. usda.gov/ SP2UserFiles/ Place/12354500/ Data/isoflav/ Isoflav_ R2.pdf. "Legumes and legume products" starts on p. 16. Start by going to page 24, which is where the soy section begins. Then you can do a PDF search for fermented soyfoods such as: Tempeh, miso, soy sauce, natto, or Sufu (fermented tofu)–and you will see that they are NOT lower in total (or specific isoflavones) than nonfermented soyfoods such as: Tofu, soymilk, soybeans (immature), soybeans (mature), etc.

11382. Earle, Steve. 2011. Re: Takayoshi Sato has written a history of San-J, based on his recollections, mostly about the period after 1981. Letter (e-mail) to William Shurtleff at Soyinfo Center, April 28. 1 p. [1 ref]
• ***Summary:*** A couple of years ago Takayoshi Sato, the younger of the two San-Jirushi brothers, put together a history of San-J based on his recollections; he was kind enough to send me a copy and it was quite well done, despite a few mistakes. This was written for an internal (company) audience and I would not feel right about passing it on without his permission, but suggest that you contact his son, Takashi Sato, current president of San-J in Richmond. Address: Assistance, Richmond, Virginia.

11383. *SoyaScan Notes.* 2011. What ever happened to the LA Tofu Festival, held from 1996 to 2007 in Los Angeles, sponsored as a fundraiser for the Little Tokyo Service Center? (Overview). May 4. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** In 2008 the Tofu Festival was replaced by "La Vida Sake," a sake and food tasting event held at the Petersen Automotive Museum in Los Angeles, California, on May 22.

11384. Shurtleff, William; Aoyagi, Akiko. comps. 2011. How Japanese and Japanese-Americans brought soyfoods to the United States and the Hawaiian Islands–A history (1851-2011): Extensively annotated bibliography and sourcebook. Lafayette, California: Soyinfo Center. 328 p. Subject/ geographical index. Printed 12 July 2011. 28 cm. [1259 ref]
• ***Summary:*** Begins with a chronology of how Japanese and Japanese-Americans brought soyfoods to the United States and the Hawaiian Islands. Contains 110 historical photos and illustrations (some in color), graphs, and tables. http://www. soyinfocenter. com/books/146. Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

11385. Storup, Bernard. 2011. Re: New developments with soyfoods in France. Letter (e-mail) to William Shurtleff at Soyinfo Center, July 19. 1 p. [Eng]
• ***Summary:*** "On my side, I am still enjoying the soyfood adventure and surprised not to be tired of it!

"As you may know we closed a kind of circle with Nutrition & Soja (whose name is now Nutrition & Nature since the beginning of 2011) as the company is now controlled by a Japanese company, Otsuka Group.

"We are very happy of this situation and have very good and qualitative relationship with them." Address: B.P. 33, Z.I. de la Pomme, 31250 Revel (near Toulouse), France. Phone: +33 62 18 72 50.

11386. Kageura, Makiko. 2011. Re: Color photos of Mr. Rustono, of tempeh made by Rustono and Japanese-style recipes made from it by Makiko. Letter (e-mail) to William Shurtleff at Soyinfo Center, July 25. 1 p. Typed, with signature. [Eng]
• ***Summary:*** The tempeh was made by Rustono, who was born in Indonesia and who has a tempeh shop in Otsu, Shiga prefecture near his home. He is now building (by himself) a much larger tempeh shop–actually a factory. He has 4,000 to 5,000 customers now for his tempeh. The dishes were created by Makiko. Photos show: (1) A package of fresh tempeh, made by Rustono, in a perforated plastic bag. (2) Slices of this tempeh on a cutting board in the kitchen of Makiko's apartment building, 'Takasegawa House, in Kyoto, Japan. (3) Tempeh sushi, with a bead of mayonnaise on top! (4) Rustono at his tempeh factory in Otsu holding a large piece of fresh tempeh he made. (5) Rustono with a friend. (6) Rustono laughing. (7) Rustono in his tempeh factory. (8) Rustono with a co-worker. (9) Slices of tempeh freshly fried by Makiko. (10) A tempeh curry dish made by Makiko. (11) Keripik tempeh [tempeh chips] dish made by Makiko. (12) Japanese-style tempeh recipe made by Makiko. (13-14) Rustono at his new tempeh factory in Otsu. Address: 608 Honyakushi, Nara City 630, Japan.

11387. Omizu, Yohei; Tsukamoto, Chigen; Chettri, Rajen; Tamang, Jyoti Prakash. 2011. Determination of saponin content in raw soybean and fermented soybean foods of India. *J. of Scientific and Industrial Research* 70:533-38.

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July. [21 ref]
• ***Summary:*** "Saponin composition and contents in seeds of raw dried soybean and fermented foods of India (*kinema, bekang,* and *tungrymbai*) were investigated by liquid chromatography-tandem mass spectrometry analysis." Address: 1-2. Food Chemistry Lab., Dep. of Biological Chemistry and Food Science, Faculty of Agriculture, Iwate Univ., Morioka, Iwate 020-8550, Japan; 3-4. Food Microbiology Lab., Sikkim Government College, Sikkim Univ., Tadong 737102, India.

11388. Kageura, Makiko. 2011. Re: Color photos of Mr. Rustono at his tempeh factory in Japan. Letter (e-mail) to William Shurtleff at Soyinfo Center, Aug. 1. 1 p. Typed, with signature. [Eng]

• ***Summary:*** Four photos. The tempeh was made by Rustono, who was born in Indonesia and who has a tempeh shop in Otsu, Shiga prefecture near his home.

Note: Makiko says (Feb. 2014) that Rustono started making and selling tempeh in Japan in 2000 after he moved to Shiga prefecture and got a permit from the Japanese government.
Address: 608 Honyakushi, Nara City 630, Japan.

11389. Salen, Patricia; de Lorgeril, Michel. 2011. The Okinawan diet: A modern view of an ancestral healthy lifestyle. *World Review of Nutrition and Dietetics* 102:114-23. Epub 2011 Aug. 5. In: A.P. Simopoulos, ed. 2011. Healthy Agriculture, Healthy Nutrition, Healthy People. [53 ref]
• ***Summary:*** Contents: Introduction. Social interconnections in Okinawa ("everyone must share and help each other"). The traditional Okinawan diet. Caloric restriction. High carbohydrate intake associated with low fat and low protein intake. A rather low sodium intake (as compared with Japan). High consumption of plant foods. Low to moderate consumption of sea foods. Traditional herbs and spices. Okinawa beverages (the people drink a lot of tea–green and jasmine–which is very rich in flavonoids). The main source of alcohol in Okinawa used to be *awamori,* a distilled sake made from rice, which typically contains 30-43% alcohol compared with less than 10% for sake.

In the section on "High carbohydrate intake..." are three paragraphs (p. 118) on the place of soyfoods in the Okinawan diet. Okinawans consume soy mostly in the form of tofu and miso. Their longevity has been attributed in part to their high intake of soyfoods (Willcox, Willcox & Suzuki 2001; Willcox, Willcox, Todoriki & Suzuki 2009).

Soy is a rich source of polyphenols (isoflavonoids). Okinawan tofu (the most widely eaten type being called *shimadofu*) contains less water / moisture than typical Japanese tofu and more healthy polyphenols, fat and protein. Tofu is often made at home in Okinawa and used in many different recipes.

The high intake of soy isoflavones has been associated with the very low rates of breast and prostate cancers in Okinawa (references 36-38), whereas the low rate of dementia, including Alzheimer's disease, in Okinawa may be related to the high consumption of natto, a traditional Japanese fermented food that is typically eaten on rice at breakfast. Address: Laboratoire Cour & Nutrition, TIMC-IMAG CNRS 5525, Université Joseph Fourier, Faculté de Médecine, Grenoble, France..

11390. Sharp, Carolyn Heidenry. 2011. Re: Gung Ho!: Aveline Kushi and macrobiotics. (Continued–Part II). Letter to William Shurtleff at Soyinfo Center, Aug. 15. 11 p.
• ***Summary:*** Continued. Perspective: As to the why of Aveline's unbalanced diet, again as with Michio, I think there were many reasons that contributed to her unusual way of eating. Thinking back to when she first arrived in this country, around 1951, at her destination, New York City, one can easily imagine some of what she experienced. Gone from her life were all the little shops she had frequented in Japan, filled with what she was used to cooking, and had grown up eating. The many varieties of vegetables, the extremely fresh fish on display everywhere, the noodle shops, different types of delicious pickles, various kinds of mochi and gelatins that girls and young women ate so frequently in little shops, tofu dishes, roasted sweet potatoes and chestnuts, and all the other little niceties to which she had been accustomed. In their place was an alien world with an alien cuisine-steaks

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and ham, hot dogs and donuts, pizza and hamburgers. Small vegetable selections, unlike now, that didn't include much of what she was used to cooking, and that also lacked the sea vegetables she liked so much.

"Many of the foods that she would have enjoyed and that would have contributed to a more balanced diet simply weren't available. This was long before Erewhon, Infinity, Chico-San, Eden, Ohsawa, Great Eastern Sun, Natural Import Co., and all the other high quality natural food wholesalers and retailers that developed in later years. And though New York had a Chinatown, I doubt whether it had the variety and abundance available there now, and what there was was not all of good quality. In addition, Michio and Aveline had no car for a long time, and it's unlikely that Aveline would have lugged groceries home on the subway from Chinatown more than just occasionally. Not with an infant in one arm, and then later an infant in one arm and a toddler in tow. Then two toddlers, then three. Even with a car this would have been a difficult expedition. She probably shopped as locally in her neighborhood as she possibly could. And that meant many limitations.

"She was also away from all the support she would have had at home in Japan, not only culinary, but also the support of and interaction with friends, family members, neighbors, and teachers (another kind of "food"–for the soul and heart) especially Lima Ohsawa who would have continued to be a very good influence on her. Then, too, she was away from all the charm and graciousness and quaint little ways and ancient traditions of her native land, which would have been still another form of nourishment. Away from the musical language that would have surrounded her daily. Away from the wonderful calligraphy on display in the shops and streets. So though she was now living in an interesting and powerful city, there were many things missing from her life to which she had been accustomed.

"She had to have been a rather headstrong person to live without all that and then, as well, to eat in a way that was so completely different from the way the people in her new country did, a way that was also, to a significant degree, somewhat inaccessible to her given the few stores where she could buy the relatively inferior products with which she was at least familiar. Had she come here as part of a large family, probably it would have been somewhat easier. But she came alone, and joined one man. So for the first 20 to 30 years there weren't all the hundreds of natural, organic, quality products we now take for granted. It made a macrobiotic diet quite limited. Still, she made very good meals, but it was quite different and less varied than it is now.

"Homesick: She once told me that when living in New York in the early years, she happened to eat some fruit one day, and then started weeping because she was so homesick for Japan. After that she avoided eating fruit for a long time, not wanting to feel that sadness and longing for Japan which she thought had been induced by the fruit she had eaten. It was a lesson in how food affects psychology, but it also ultimately led to a too-yang condition. However, she wanted to stay yang, so she would be strong, and not pining away for Japan. There was not a trace of self pity in her when she spoke of this. Rather, she was kind of laughing about it. She knew she had chosen to come here, and that in some ways she had had a very good life. But apparently there was an undercurrent sometimes when memories tugged at her heart. It gradually faded over the years, I think, the longing for, though not the memories of, Japan. The trips back and forth to Japan in later years probably helped.

"It wasn't until the mid-to-late sixties that the first developments in the natural food industry (as we know it today) came about, all very well detailed in Bill Shurtleff's "History of Erewhon" which covers so much more than just Erewhon. But for a long time, for years and years, Aveline was somewhat isolated from all that she knew and remembered about food, and was usually without many of the products she would have enjoyed and used in Japan. Michio, too. How much he would have enjoyed all the neighborhood sushi restaurants and noodle shops if he wanted to go out, as Japanese men so often do with each other, had he and Aveline returned to, or never left, Japan. All he had here and all he could usually afford were coffee shops, which had very different menu selections, to say the least.

"So Aveline had a somewhat imbalanced and impoverished diet right from the start in America, as did Michio, and for a very long time after that. Instead of living in a country, city and neighborhood enriched by a wide variety of wonderful vegetable, grain and fish dishes, she made do with a lot less for a long time. I think this was a very big factor in contributing to her imbalanced diet and condition.

"Another factor was that she had done so much cooking for so many years, first for the family when the children were younger, then for so many parties and special occasions for the students, as well as making lunches for employees when Erewhon first started up in Los Angeles, and also all the cooking classes–so many over the years in so many countries. On top of all that there were the dinners for a crowd every night when the students began staying with them. And so, eventually, she delegated the preparation of daily meals at home to others, to student cooks, though she continued to give many cooking classes, both in Boston and wherever she and Michio travelled. After so much intense cooking for so many years, she understandably wanted a change.

"Too yang: Having first learned from George Ohsawa, Aveline leaned towards a rather restricted version of a macrobiotic diet, like her teacher. I think most people who have used the macrobiotic eating plan for any length of time, however much they might appreciate Ohsawa's insights, life and wisdom, feel nevertheless that his dietary approach was

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too restrictive to be healthful and balanced in the long run. While his recommendations might be helpful as a cleansing diet for certain people for short periods of time, they can produce a tight mental state and even nutritional deficiencies over time. George Ohsawa was an extraordinary man and an extraordinary teacher, and it would be challenging to encapsulate all that he contributed to our understanding of the impact of food on individuals and societies. However, his approach was lacking in sufficient vegetables, variety and sweets, at least for the average American accustomed to a diet heavy in meat, dairy foods, and sugar. Yet something in Aveline responded to his overly yang style and recommendations, (perhaps that was simply all she knew) and though having children loosened and broadened her views, there was still this tendency towards an overly restrictive approach to her own diet for a long time.

"Aveline was not really a student and teacher of macrobiotic principles in the way Michio was. But she had a strong interest in sharing the traditional cooking and food customs of her native land, and she balanced Michio's theoretical teachings with the daily practicalities of feeding her family and teaching her students. She also enjoyed teaching the traditional ways of caring for infants, and sharing the happy sounds and sights of her childhood and adolescence, some of which are included in her books." Continued. Address: P.O. Box 125, Hinsdale, Massachusetts 01235.

11391. Kikkoman Corporation. 2011. Annual report 2011. Year ended March 31, 2011. 250 Noda, Noda-shi, Chiba 278-8601, Japan. 47 p. 28 cm. [Eng]

• ***Summary:*** Net sales in yen decreased by 0.78% to ¥283,463 million. Net income in yen decreased by 9.68% to ¥7,770 million.

Under "Major group companies–Kikkoman Corporation, Japan" (p. 44) is listed: Kikkoman Soyfoods Company, 2-1-1 Irifune, Chuo-ku, Tokyo 104-8553, Japan. Phone: +81 (3) 3206-0778. This company was formerly Kibun Foods.

A photo (p. 2) shows Yuzaburo Mogi (Honorary Chief Executive Officer and Chairman of the Board of Directors) and Mitsuo Someya (President and CEO).

The Great East Japan Earthquake struck Japan on 11 March 2011. Kikkoman was affected, and "booked an extraordinary loss of ¥2,352 million due mainly to the impact of the Nippon Del Monte Fukushima plant, which will be closed in September 2011, as was previously scheduled." Address: Noda, Japan.

11392. Kushi, Michio. 2011. Kushi Institute International Aveline Award presented to William Shurtleff and Akiko Aoyagi.

• ***Summary:*** The plaque reads: "In recognition for your enduring support of macrobiotics. Your teachings and writings have brought hope and healing to people around the world. With this award Michio Kushi expresses his gratitude to you for your important contribution to macrobiotics, humanity, and the world."

Signed, Michio Kushi.

"Presented on August 4, 2011, at the International Macrobiotic Summer Conference.

Note: The award was presented in absentia since Shurtleff was unable to be present at the award ceremony. The plaque is 10½ by 13 inches, with a leather border. The body of the plaque is the printed paper covered by a sheet of glass. The blue logo of the Kushi Institute International is near the top of the sheet of paper. Address: Massachusetts.

11393. Shurtleff, William; Aoyagi, Akiko. comps. 2011. William J. Morse–History of his work with soybeans and soyfoods (1884-1959): Extensively annotated bibliography and sourcebook. Including Charles Vancouver Piper and Palemon Howard Dorsett. Lafayette, California: Soyinfo Center. 482 p. Subject/geographical index. Printed 6 Sept. 2011. 28 cm. [866 ref]

• ***Summary:*** Begins with a chronology of Morse's work. Contains 126 photos and several maps. http://www.soyinfocenter. com/books/147. Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

11394. *SoyaScan Notes.* 2011. What ever happened to Global Protein Foods of Valley Cottage, New York, then Newark, New Jersey? (Overview). Sept. 12. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** Talk with Sam Weinreb, founder of Local Tofu, West Nyack, New York. 2011. Aug. 31. Global Protein Foods had been a competitor of his, so he kept track of what they were doing. They were in Newark, New Jersey and they were shut down about 6 months ago for some violations of water and/or health codes. They never went back into business, in part (Sam thinks) because of the earthquake and tsunami in Japan on March 11, 2001. Sam has a daughter who lived in Japan, where she learned how to make kimonos.

Letter (e-mail) from Katie Karkheck, history librarian, Valley Cottage Library, New York. 2011. Sept. 12. "Your question was forwarded to me from the reference desk since I have been keeping the records of local happenings. I first searched our local history clipping files, but found nothing about this company. I did find one OSHA citation from 2001, which can be found here:

http://www.osha.gov/ pls/oshaweb/ owadisp.show_ document? p_table= NEWS_RELEASES&p_id=238.

"It seems that Global Protein Foods' factory moved to Newark, NJ in 2002 or 2003. There seems to be a plethora of citations and an FDA warning letter from Feb. 10, 2011 citing them for lots of health code violations, including dead rodents and droppings near foods. After reading this letter, I have a feeling that this many violations would shut down any food producing company, though I have found nothing

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confirming this. Here is the link to that 2011 letter: http://www.fda.gov/ICECI/ EnforcementActions/ WarningLetters/ucm243397.htm.

"Unfortunately, I have not found a single article stating what happened, and the warning letter was the only thing I found that was recent. It seems that their closing was very quiet. They were not included in the search of over 100 newspapers and journals, nor were they in any of our business directories. I'm sorry I couldn't come up with more info than that."

Note: On 30 Sept. 2011 Katie did find a local newspaper (*Journal News*) article titled "Global Protein may be shut down," dated 25 Oct. 1998. She kindly scanned it and sent it to Soy Infocenter. See separate 1998 record.

11395. Kageura, Makiko. 2011. Re: Teaching high school students how to make tempeh in Japan. Letter (e-mail) to William Shurtleff at Soyinfo Center, Sept. 27. 1 p. [Eng]
• ***Summary:*** Makiko, who lived in Canada for a year and studied the tempeh market there, has now returned to Japan and taken an interest in tempeh in Japan. She was invited by a friend to visit Ehime Prefecture Ozu Agricultural Senior High School (*Ehime Kenritsu Ohzu Nogyo Kotôgakkô*), a public agricultural high school on the island of Shikoku, where she met Mr. Yamada, the biology teacher. She imagined that he had a personal interest in tempeh but she did not know when or where he had developed that interest. She has just returned home from the one-day trip.

To her surprise, Mr. Yamada told her that teaching students how to make tempeh in the classroom is part of the biology curriculum–and has been for at least 10 years. The process is described as a lesson plan in the textbook and each student is required to make his or her own tempeh!

Mr. Yamada got soybeans from the local public market in Ohzu and he sometimes uses soybeans grown at the school. He ordered tempeh starter culture via the Internet. They made the tempeh at room temperature at the laboratory. In winter, he told me to use the experimental incubator installed in the school to keep the normal temperature. Even in September they can make it at room temperature; its often good over a bit 30ºC (and at least 25ºC). They also made okara tempeh.

The students then cooked and ate their fresh tempeh, in the form of tempeh cookies, tempeh yokan [contains no azuki beans], and tempeh donuts.

What a great way to learn about microbiology, molds, fermentation, fermented foods, and tempeh.

This shows that anyone can make tempeh at home. The only requirements are several cups of soybeans, some tempeh starter culture, and a warm place or incubator.

Makiko adds: "One interesting thing is that everyone can make tempeh at home and tempeh sushi seems to be good for everyone. My mum loves my tempeh sandwiches too!" Address: 27-1 Kamikarakawa, Iyo-city, Ehime 799-3134, Japan.

11396. Norton, Amy. 2011. Soy supplement may improve crow's feet: An experimental supplement derived from soy may help postmenopausal women smooth their "crow's feet" a bit, a small pilot study suggests (Web article). http://www.reuters.com. 2 p.
• ***Summary:*** "Crow's feet" are those lines that begin to appear in the skin at the corners of the eyes as one nears menopause.

The supplement is being developed by Tokyo-based drug and supplement maker, Otsuka Pharmaceutical. "It contains a compound named S-equol, which is made from fermented soy germ. The body can produce S-equal naturally, as a byproduct of digesting soy isoflavones." The compound is thought to attach to estrogen receptors in body cells, and may have weak estrogen-like effects. It is also thought that decreasing estrogen levels in post-menopausal women may contribute to skin aging.

11397. Kageura, Makiko. 2011. Re: Color photos of Daitokuji natto. Letter (e-mail) to William Shurtleff at Soyinfo Center, Oct. 28. 1 p. [Eng]

• ***Summary:*** "I went to Daitoku-ji [a large and famous Rinzai Zen Buddhist temple in northern Kyoto] to take some photos of Daitokuji natto. I saw various shops around the temple but finally decided on the Daitokuji Nattoku Ikkyu shop, which is officially named from the temple. I took some photos for you. I got two labels from Mr. Tsuda. I can send them to you if you want."

Photos show: (1) White and red labels. (2) Packages of souvenirs of Daitokuji natto. (3) A bag of Daitokuji natto. (4) One front view of the Daitokuji Nattoku Ikkyu shop. (5) Another front view of the Daitokuji Nattoku Ikkyu shop. (6) A close-up of Ikkyu's Daitokuji natto itself. It has

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a chunky texture and a flavor resembling that of any dark miso, especially Hatcho miso. (7) The main gate of the entire Daitokuji Zen temple.

Note 1. Makiko asked the head priest at the Ikkyu subtemple if he had any early dated documents from which we could learn something about the history of Daitokuji natto. He said "no."

Note 2. As of 5 Dec. 2011 we are not sure that Ikkyu still makes Daitokuji natto; the products they sell may be made by nearby Isoda at 41 Shimomonzencho, Murasakino, in Kita-ku, Kyoto. Or there may be other makers. Address: 608 Honyakushi, Nara City 630, Japan.

11398. Kageura, Makiko. 2011. Re: Color photos of Hamanatto. Letter (e-mail) to William Shurtleff at Soyinfo Center, Nov. 4. 1 p. [Eng]

• ***Summary:*** She ordered a package of hamanatto from Daifuku-ji. The photos show: (1) The front of the package, with white letters on a green background. Four vertical lines from left to right read: (1a) Nippon ganso (the founder in Japan). (1b) Daifukuji natto. (1c) Enshuu (A far-away province). (1d) Mikkabi Daifukuji (Made at Daifukuji).

(2) The back of the package. 7 lines from top to bottom read: (2a) Meishô: daifukuji natto. (2b) Genzairyo: daizu, hadaka-mugi, shio, sanshô (ingredients: soybeans, naked barley, salt, sansho {Japanese pepper}). (2c) naiyôryô: 180 guramu (weight: 180 gm). (2d) Hozon houhou: youreizou. (2e) Shoumi kigen (address in Hamamatsu): Heisei 24, 2 gatsu 29 nichi, 431-1411 Kôyasan Shingonshû, Daifukuji, Hamamatsu-shi, Kita-ku, Mikkabi chô, Fukunaga, 220-3, Japan.

(3) The contents of this package of Daifukuji Natto on a white plate. (4) Illustration of the gate in front of Daifukuji, a Buddhist temple. (5) The two inside panels of a small brochure that came with these fermented black soybeans. The left panel tells the history of Daifukuji natto. The right panel is two tanka poems by two old Japanese poets: Oota Shokuzanjin and Fujino Shizuteru. Each poem mentions hamanatto. Address: 608 Honyakushi, Nara City 630, Japan.

11399. Lee, Gyoung-Ah; Crawford, G.W.; Liu, L.; Sasaki, Y.; Chen, X. 2011. Archaeological soybean (*Glycine max*) in East Asia: Does size matter? *PloS ONE* 6(11): e26720. doi:10.1371/ journal.pone.0026720. Published: Nov. 4. [69 ref]

• ***Summary:*** The authors, archaeologists, say that soybean adoption came earlier than previously thought. Moreover, domestication occurred outside of China, in countries such as South Korea and Japan.

"The recently acquired archaeological record for soybean from Japan, China and Korea is shedding light on the context in which this important economic plant became associated with people and was domesticated. This paper examines archaeological (charred) soybean seed size variation to determine what insight can be gained from a comprehensive comparison of 949 specimens from 22 sites. Seed length alone appears to represent seed size change through time, although the length x width x thickness

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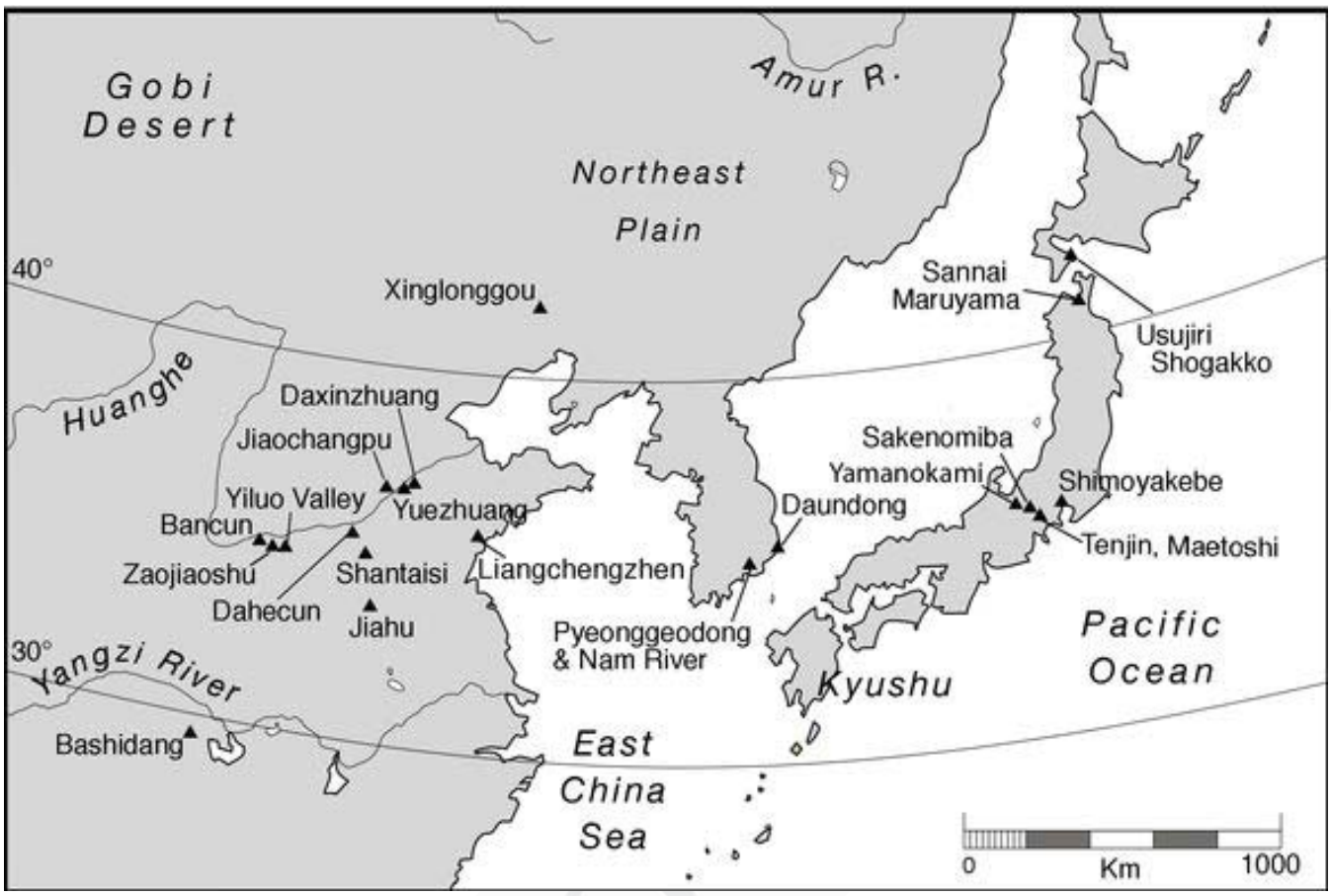

product has the potential to provide better size change resolution.

"A widespread early association of small seeded soybean is as old as 9000-8600 cal BP in northern China and 7000 cal BP in Japan. Direct AMS radiocarbon dates on charred soybean seeds indicate selection resulted in large seed sizes in Japan by 5000 cal BP (Middle Jomon) and in Korea by 3000 cal BP (Early Mumun). Soybean seeds recovered in China from the Shang through Han periods are similar in length to the large Korean and Japanese specimens, but the overall size of the large Middle and Late Jomon, Early Mumun through Three Kingdom seeds is significantly larger than any of the Chinese specimens. The archaeological record appears to disconfirm the hypothesis of a single domestication of soybean and supports the view informed by recent phyologenetic research that soybean was domesticated in several locations in East Asia."

Note: "BP" stands for "Before the present" where "the present" is taken as 1950. "cal" means calculated to adjust for historically uneven distributions of carbon 14 in the environment. "AMS" stands for "accelerator mass spectrometry." AMS radiocarbon dating is a form of radiocarbon dating that is more precise and requires less carbon than conventional radiocarbon methods. Address: 1. Asst. Prof., Anthropology Dep., Univ. of Oregon; 2. Prof., Anthropology Dep., Univ. of Toronto Mississauga [Southern Ontario, Canada]; 3. Stanford Univ. Archaeology Center [Stanford, California].

11400. Iino, Maki. 2011. O-tofuya-san [A tofu maker / shop]. *Kagaku no Tomo.* Nov. 28 p. [Jap]

• ***Summary:*** This monthly magazine, titled "Friend of Science," is published for Japanese school children. This delightful November issue, written and illustrated by Maki Iino, follows a mother and her son as they visit the neighborhood tofu shop early in the morning and see the fresh tofu products in the window where the wife is selling them. The tofu maker kindly shows the boy every step in the process of making soymilk, then tofu, and preparing deep-fried tofu pouches (aburagé), cutlets (atsuagé) and tofu burgers (ganmodoki). The text is written entirely in hiragana (no Chinese characters) so young students can read along as they look at the large, charming color illustrations.

A smaller 8-page insert gives additional details. Address: Japan. Phone: 05 62 18 72 78. E-mail: info@soy.fr.

11401. Storup, Bernard. 2011. Re: New developments at Nutrition & Nature. Letter (e-mail) to William Shurtleff at Soyinfo Center, Dec. 13. 1 p. [Eng]

• ***Summary:*** "Dear Bill, I am writing you these few words as I had a very interesting discussion this afternoon with somebody I work with, here in Revel, and whose name is

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Taro Mikuriya.

"Taro-san is in fact making the 'link' between Nutrition & Santé, our mother company and Otsuka Group in Japan. He lives in Revel with his wife and children since 3 years. Not only he is indispensable for the company to help resolve the cultural misunderstandings which could appear between the teams of 2 countries, but he is also the best ambassador of the Soylution, with a deep understanding of the stakes of soyfoods in the world.

"I already told Taro in the past that if I am actually doing what I am doing in France that's partly because I met you one day...

"He is travelling quite a lot and will be in San Francisco this week. If there would be a possibility for you to meet him at your place, he could bring you some fresh products of our own as well as some documentation and could exchange a while with you. Of course he speaks the most perfect English, and I think you didn't forget your Japanese...

"As he is leaving France this evening he will contact you directly to see if it's possible to meet you.

"Here everything is OK. Françoise and I are grandparents since a few days (Aurore, our elder daughter had twins girls), and it's a real marker of time passing by. Best regards.

P.S. Yes. "In fact Nutrition & Nature is the new name of Nutrition & Soja since 1 Jan. 2011, as N&Soja merged with another small company called Céréalpes [Cerealpes] (making non-soya based vegetable burgers): both entities are now under one legal entity called N&Nature.

"Nutrition & Santé is the name of our mother company, which holds 100% of the shares of N&Nature." Address: B.P. 33, Z.I. de la Pomme, 31250 Revel (near Toulouse), France. Phone: +33 62 18 72 50.

11402. Mikuriya, Taro. 2011. About the Otsuka Group in Japan and Nutrition & Nature in Europe (Interview). *SoyaScan Notes.* Dec. 14. Conducted by William Shurtleff of Soyinfo Center. [Eng]

• ***Summary:*** For information about Nutrition & Sante in Europe go to http://www. nutrition-sante-brands.com. Click history and you can read the following (organized by decade):

1928–The Gerblé [Gerble] brand is created.

1934–The Céréal [Cereal] brand is created.

1972–Alain Chatilon founds Diététique & Santé (Dietetics & Health), a company affiliated to Rhône-Poulenc in 1974.

1975–Gerblé launches the first dietetic breakfast cereals.

1977–Isostar founds the first European Sports range.

1981–Diététique & Santé acquires Milical, the oldest brand of slimming foods on the market.

1982–Soy [Bernard Storup] launches the first range of Soya products.

1984–Isostar drinks launched in France.

1986–Gerblé becomes the top dietetics advertiser on national TV.

1990–Diététique & Santé becomes a subsidiary of the Sandoz group. 1993–Acquisition of Soy [Bernard Storup] and launch of a new subsidiary Nutrition & Soja.

1994–Diététique & Santé is born out of the merger of Diététique & Santé (Gerblé and Milical) with Cereal Wander Nutrition (Céréal and Isostar).

1994–N&S acquires Boribel and Boldofluorine brands.

1994–Launch of Gerlinéa, first product range of hypocaloric meal substitutes on supermarket shelves.

1996–Sandoz, shareholder in N&S, becomes Novartis.

2000–The Nutrition Observatory at Revel [France] is opened to the public.

2003–Creation of 3 N&S subsidiaries in Italy, Spain and Benelux [Belgium, Netherlands, Luxembourg].

2006–ABN Amro Capital Finance (now Abénex Capital), L Capital, and the new management team are the new shareholders of Nutrition & Santé.

2007–Milical launches a range of targeted slimming products.

2007–The Gerlinéa Nutri-Soins are THE slimming innovation in major retail outlets.

2007–The arrival of Céréal Bio revolutionises organic sales in major retail outlets.

Note: 2008 Dec. 22–The Otsuka Group (Japan) purchases Nutrition & Santé.

The organizational structure of the Otsuka Group, headquartered in Japan, is as follows. At the top of the structure, the apex group is Otsuka Holdings Co., Ltd.

Immediately below that is the Otsuka Group (which began in 1921, when Busaburo Otsuka established a factory manufacturing chemical compounds in Naruto, Tokushima Prefecture {now Otsuka Pharmaceutical Factory Inc.}).

The Otsuka Group has 3 divisions, one of which is the Otsuka Pharmaceutical Co., Ltd. Immediately below that is the Nutraceuticals Division, which has factories and sales operations on three continents: Japan, Europe, and North America. Operations in Japan are many and complex.

In Europe, the top organization is Nutrition & Santé (40 years old, with 1,100 people employed). This includes sales and marketing organizations in Iberia (Spain and Portugal, 200 people), the Benelux nations (50 people), and Italy (30 people). These organizations sell products made by Otsuka companies worldwide, including, for example, Soyjoy nutrition bars made in California by Pharmavite LLC.

Immediately below Nutrition & Santé is Nutrition & Nature (30 years old, 110 people) which has both manufacturing and sales. In Europe the main center of manufacturing and other operations is in Revel, France. Located in Revel are Nutrition & Soja [Nutrition & Nature] (29 years old, 110 employees) and Céréalpes [Cerealpes] (20 employees, which was purchased in 2008 by Nutrition & Soja and is located in Mane, France–southwest of Toulouse).

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Located in Castellterçol (Barcelona) Spain is Natursoy S.L. (23 years old, with 70 employees and a factory), a leader in the organic food market; it makes products from soy and wheat gluten. Natursoy was founded by Tomas Redondo and Carmen Asensio in 1988 in Castellterçol.

In the United States Otsuka owns Pharmavite LLC (founded in 1971), makers of Soyjoy nutrition bars and Nature Made vitamins, minerals, herbs and supplements. In Jan. 1989 The Otsuka Group acquired Pharmavite LLC–which according to the 2010 financial report had 961 employees. In October Pharmavite announced start of construction of a new factory and packaging facility in Opelika, Alabama. Taro says that Otsuka plans to keep the Pharmavite plant in Northridge, California, running at its present capacity. The new plant in Alabama will provide additional capacity for Pharmavite to supply the East Coast market of the USA.

In France, with Nutrition & Nature, Otsuka is trying to mainstream these products. Without changing the ingredients in the products, it has stopped marketing to only the niche bio / organic, vegetarian and vegan markets, and started to market to the much larger supermarket and chain store markets. For this, each product needs a new label. Address: B.P. 33, Z.I. de la Pomme, 31250 Revel (near Toulouse), France. Phone: +33 62 18 72 50.

11403. *SoyaScan Notes.* 2011. Why seitan has not become as popular as tofu as a source of plant protein in the USA (Overview). Dec. 21. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** 1. Historical: Tofu has been a basic food in all countries of East Asia for at least 1,000 years. This includes China, Japan, Korea, Vietnam, and Indonesia. So wherever people with ancestry from these countries live, tofu is made. It has no class affiliation and is inexpensive, so it is eaten by people of all classes and income levels from these countries. And it appears in virtually all cookbooks for these cultures. So there has long been a large demand for tofu in the USA.

2. Tofu manufacturers in the USA: Since 1900 there have been plenty of tofu shops to supply the demand. Between 1905 and 1975 at least 528 different Japanese-owned tofu manufacturers were established in the USA. Probably at least that many Chinese-owned tofu makers also started.

3. Seitan historical: It was invented in about 1962 by George Ohsawa, the macrobiotic teacher, together with Mr. Kiyoshi Mokutani, the owner of a small soy sauce company (Marushima shoyu) in Japan. So it has a very short history. And originally (starting in 1969) it was all imported from Japan.

4. Macrobiotics: Seitan has been limited mostly to macrobiotic community. Wikipedia says incorrectly that seitan is another name for wheat gluten. Not true. Seitan is a product made from wheat gluten just like tofu burgers are made from tofu.

5. Evolution of the meaning of the word: Seitan was originally a salty seasoning, not a protein source. But over the years the meaning of the word gradually changed; it came to refer to any wheat gluten seasoned with soy sauce.

6. Not widely made in the USA since not much demand.

7. Very expensive compared with tofu, in part because not widely available so had to be sent by UPS or mail.

8. Wasteful process. It is made from wheat by discarding all but about 14% of the original wheat and using only the protein. Or, if you start with "vital wheat gluten" (a powder) the quality of the seitan is not nearly as good as if you start with whole wheat flour.

9. Process causes pollution: Dumping all of that starch into any sewage system pollutes the system and usually leads to either a fixed fee or a fine on the manufacturer.

10. Few books about seitan, and no much press coverage or information. Only 3 books about seitan (with "seitan" in the title) have ever been published in English: Jacobs 1987, Wingate 1988, and Bates 1993. Just the opposite with tofu.

11404. Iso, Miyuki. 2011. Ohisama nattô, tamago de genki [Ohisama natto with eggs will make you healthy (Photograph)]. Tokyo: Doshinsha. 27 x 39 cm. [Jap]*

• ***Summary:*** A color photograph for children. Ohisama is a children's word meaning "Honorable Mr. Sun" and probably part of the name of a natto product. This photograph may well be an advertisement.

11405. Kanda, Sumiko; Ohshima, Taeko. 2011. Yûrei nattô [Ghost natto]. Tokyo: Arisukan. Unpaginated. 24 cm. [Jap]

• ***Summary:*** For a juvenile audience.

11406. Koshihara, Haruka; Yugi, Satomi. 2011. Bijin o tsukuru hakkôshoku reshipi: shikôji, amazake, yooguruto, nattô. kantan oishii karada ni yokute kirei ni nareru [Fermented food recipes to make you beautiful: shio-koji, amazake, yogurt, natto. Simple, delicious and good for your body; you'll become pretty]. Tokyo: Jakometei Shuppan. 87 p. 21 cm. [Jap]*

11407. Koshimizu, Masami. 2011. Kôji, miso, nattô, tenpe, amazake [Koji, miso, natto, tempeh, amazake]. Tokyo: Nosangyoson Bunkakyokai. 138 p. 21 cm. Internet resource. [Jap]*

• ***Summary:*** Note that all are Japanese fermented foods; miso, natto, and tempeh are fermented soyfoods.

11408. Mattson, Robert. comp. 2011. Macronology: A chronological survey of the macrobiotic movement towards world health and world peace. Waltham, Massachusetts: Published by the compiler. 125 p.

• ***Summary:*** A historical chronology available in printed and electronic (Microsoft Word) formats from 400 B.C.

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(Hippocrates) to 31 Dec. 2010. Contents: Introduction (p. 1-4). Yin and yang (p. 4). Chronology (p. 5-125).

Macrobiotics books list (47 p.).

The International Macrobiotic Directory is available as a printed, bound book or as part of the e-book. The names are arranged alphabetically by country (and within the USA by state), with name, position, address, phone and fax numbers, and email if available (62 p. + 11 p. of yellow pages). Address: Publisher, 46 Howard Street, Waltham, Massachusetts 02451. Phone: 413-281-5584.

11409. Vos, Heidemarie. 2011. Passions of a foodie: An international kitchen companion, A to Z. Durham, Connecticut: Eloquent Books. An imprint of Strategic Book Group. 598 p. 26 cm.

• ***Summary:*** Best-selling author Heidemarie Vos recounts a fascinating story and her journey of putting together the world's first cross-referenced book regarding food-using more than five languages. This cookbook [which contains no recipes] will become an invaluable resource for your kitchen (from the publisher).

The Introduction states: "There are 7922 entries, 300,017 words... based on my own travels to 6 continents and over 40 countries." Note: This is somewhere between a dictionary (in 5+ languages) or brief encyclopedia of food names. It immediately sets the language and cultural context for each word, and ends with broader or narrower terms. For example: "Aburage: Japanese cooking = A fried bean curd... Also see Bean Curd." It contains more than its share of errors and outdated terminology and spellings. It is a "print on demand" book.

It includes: Aburage. Adzuki beans [sic], Agé. Aji Nomoto [sic], see monosodium glutamate. Aka miso–red bean paste. See Miso. Almond milk. Almond oil. Arachide / Arachis. See Peanut. Arachide oil. See Peanut oil. Bean cake, fermented: Chinese cooking, "fu yu" [fermented tofu]. Bean curd, pickled: Chinese cooking. [What is it?]. Bean curd cheese, red: Chinese cooking, "nam yu" or "nan yu" [red fermented tofu]. Bean curd: Oriental cooking. Known as "tofu" in Japanese or "dow fu" in Chinese. Pressed bean curd is "dow fu kon" [doufu-gan, pressed tofu].

"Bean curd, dried [yuba]: Chinese cooking = Known as 'tiem jook' [sweet yuba] / 'fu jook pei', other dialects are 't'ien ch'u' and 'fu pi chi'. It is soybean milk residue, which comes in a thin rectangular sheet or is curled into round sticks. They are usually tan- or cream-coloured with a shiny, glossy smooth texture."

Bean paste, red: Chinese cooking. "Made from soybeans and sugar mashed together then fried and dried out until it resembles sand." Used to fill Chinese moon cakes. Bean sauce, Chinese: Chinese and Asian cookery. Many types including "min see jiong" or "do bahn jiang." Incl. "Black bean sauce." Beans, black: Chinese cooking. "A pulse [sic] known as 'wu dow' / 'wu do' [Black soybeans].

"Beans, black salted fermented: Chinese cooking = Known as 'dow si / dou shih,' used as a vegetable or spice. Known as 'wu dow' dried and salted. They are dull, wrinkled, moist and tender and have an appetising fragrance, yet are pungent with a tangy salty flavor. Used as a flavor enhancer in dark sauces." Keep covered so they do not dry out... "Must be rinsed prior to use to avoid over-salting. Store in a closed jar in the refrigerator after opening."

Bean sprouts: Asian cooking [small green are mung bean sprouts, large yellow soybean sprouts]. Benne seeds: Sesame seeds are used to make sesame oil and tahini (sesame paste). Black beans, Chinese. Also known as 'salted black beans' or 'fermented black beans' and as 'dow si' (Chinese). China beans: See Soya / soy bean. Earth nut: See Peanut. Edamame: Japanese cooking. "Fresh soybean in or out of the pod." Firm tofu. Fried tofu puffs. Ground nut: See peanut. Hard tofu. Hydrogenated fats. See fats. Miso. Naahm yu: Chinese term. "A cheesy-looking bright red bean curd sauce" [Red fermented tofu]. Nam yu / Nan yu: See Bean curd cheese, red. Shoyu: Japanese cooking. Japanese soy sauce. Soy bean / Soya bean. *Glycine soja,* also known as "'China beans,' 'Butter Beans' and 'Haricot de Java' (French)." Soy bean jam / condiment. See Main see. Silken tofu. Silken firm tofu. Soya oil. Soya sauce. Soy sauce. Tamari soy sauce. Tofu. Tofu tempeh [sic].

Not listed: Amazake. Lecithin. Daitokuji natto. Fermented black beans. Hamanatto. Kudzu. Kuzu. Meat alternatives. Meat substitutes. Milk alternatives or substitutes. Milk, nondairy. Milk, soy. Natto. Seitan. Soy milk. Soy protein concentrate. Soy protein isolate. Soy protein, textured. Tempeh. Teriyaki sauce. Yuba.

Errors: Arame is not also known as "Hijiki." Address: Port Elizabeth, South Africa.

11410. *SoyaScan Notes.* 2012. Kinako recipes from Japan: An alphabetical list (Overview). Jan. 5. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** Kinako (roasted whole soy flour) is widely used as an important ingredient in Japanese confections, including the following: Abekawa mochi. Kinako mochi. Ohagi.

11411. Barber, Linda. 2012. Re: Use of kinako in 1983 in cooking classs at Kobe College in Japan. Letter (e-mail) to William Shurtleff at Soyinfo Center, Jan. 6. 1 p.

• ***Summary:*** "One way I did use kinako in Japan for our Betty Crocker cooking was to mix a few tablespoons of kinako in our regular white flour for baking. At that time, getting whole wheat flour was very difficult, and I was into using ingredients my students could easily get in their own stores. We also mixed in a few tablespoons of nonfat dry milk powder to boost protein. I called it Power Flour.

"This mix did not change the taste or look of baked goods, but it did change the baking time. We baked the cookies or breads, cakes, etc. at a lower temperature, or for

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a shorter period of time. Since our ovens were convection (yes, even back then!) the cooking times had to be adjusted anyway." Address: 10868 North Cornell St., Indianapolis, Indiana 46280.

11412. Kageura, Makiko. 2012. Re: List of Japanese foods in which kinako is an important ingredient, with color photos. Letter (e-mail) to William Shurtleff at Soyinfo Center, Jan. 8. 2 p. [Eng]

• ***Summary:*** (1) Abekawa mochi.
(2) kinako ohagi (bota mochi).
(3) kinako cookies.
(4) kinako ice cream.
(5) kinako donuts.
(6) kinako scones (with okara).
(7) kinako butter (like peanut butter).
(8) horenso kinako-ae (spinach with kinako).
(9) kinako ame (a confection).
(10) kinako rollcake.
(11) kinako dashi.
(12) kinako furikake.
(13) kinako dressing.
(14) pumpkin with kinako.
(15) kinako zoni (traditional dish from Nara).
(16) warabi mochi.
(17) uzurin (a kind of warabi mochi).
(18) akumaki.
(19) nerikuri (nettabo and imomochi) (from Kagoshima and Miyazaki of Kyushu).
(20) sasamaki (from Niigata).
(21) yaseuma (from Oita).
(22) mitsu dango (from Ibaraki).
Address: 608 Honyakushi, Nara City 630, Japan.

11413. Barber, Linda. 2012. Re: Work with tofu and natto in Japan. Letter (e-mail) to William Shurtleff at Soyinfo Center, Jan. 9. 3 p.

• ***Summary:*** Introduction: Linda Barber Pike was born and raised in Milwaukee, Wisconsin. She graduated from the University of Wisconsin-Stout with a bachelor of science degree in Home Economics Education, specializing in urban education (1971). After teaching for 6 years in Milwaukee, she accepted a position at Kobe College teaching Oral English and Home Management. It was during this time that she became interested in Japanese cuisine and indigenous foods, especially tofu, and natto. After returning to the United States in 1982, Ms. Pike earned a Master of Science degree in Vocational Education from the University of Wisconsin-Stout. Her thesis, "Development, presentation, and evaluation of an instruction package on tofu for high school students" provided a model for introducing tofu to teenagers in a family consumer class setting.

Linda started a family with Marvin Pike in 1985 and moved to Indianapolis, Indiana. She returned to teaching in 1991 as a preschool teacher where her son, Dallis, was attending. In 1996 she accepted a position at Carmel High School, Carmel, Indiana in the Family and Consumer Science Department. She enjoyed teaching Foods and Nutrition, Foreign Foods, Child Development, and directed the on-site preschool that offered high school seniors the opportunity to teach 3 and 4 year olds. From 2005-07, Linda also enjoyed being an adjunct instructor for Ivy Tech Community College, Indianapolis, teaching child care licensure classes. Ms. Pike retired from all teaching in 2010, except for mentoring Dallis while he is earning a PhD in educational studies. Linda still enjoys reading books on tofu, sampling soy foods at Trader Joes, and serving her friends healthy snacks that contain tofu hidden in some form.

For most foreigners living in Japan, an English-Japanese dictionary was the most used book and carried everywhere.

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For me, it was *The Book of Tofu.* It wasn't long after I arrived in Kobe in 1977 to teach home management skills to the young women of Kobe College, that I discovered tofu. A low teacher's salary, and lack of western food stuff prompted me to shop in neighborhood markets. Tofu was always there. And it was always cheap. But, I had no idea how to prepare it. I needed a book in English that would help me use this food stuff.

Lucky for me, I discovered *The Book of Tofu.* I was drawn to the illustrations and recipes that used just a few ingredients. But what really sold me was the recipe for Tofu Ice Cream. A Wisconsin girl had to have her ice cream, but in Japan, it was expensive and not readily available.

My Japanese students and friends were amazed when I put tofu in a blender and added sugar and cocoa. They were amazed when I pulled it out of the freezer and scooped it into bowls. The were delighted with the taste. For me, it was the beginning of a soy food journey that continues to this day.

My students and I had faculty teas with tofu cookies, cheesecake and quiche. Soon these parties became news and I was asked to do short cooking segments at various T.V. networks. Making western-style recipes from a Japanese food such as tofu or natto was considered an oddity. I traveled all over Japan making T.V. appearances. For a tofu and natto company I developed recipes for their products and starred in their commercials to promote these products. I designed food layouts and recipes for their company's brochure. Various printed media companies were also expressing interest in recipes and ideas that used tofu and natto in western ways. I began giving magazine interviews about western ways to use Japanese soy foods. It was after I learned how to make tofu in my kitchen, that the Kobe YWCA asked that I teach classes to their Japanese members. My adult Japanese students did not know how to do this, as they purchased their tofu from supermarkets and small markets, much like Americans would buy bread from the grocery store and not know how to make bread from scratch.

I had fun creating western style recipes for tofu and natto and found it easy because of my background in food science. I simply used tofu in recipes where a protein like eggs was included. Because natto tasted like aged Wisconsin cheese to me, I included natto in dishes that used cheddar. One of my last projects included co-authoring a cook book, *The Tofu Gourmet* (in English), published in Japan. It is still available all over the world.

Besides recipes, *The Book of Tofu* became a travel guide for me. I wanted to visit the places, restaurants, and shops that were highlighted in the book. Mentioning *The Book of Tofu* and its author, Bill Shurtleff, I was welcomed in these shops and allowed to photograph how the foods were made. When asked to develop recipes for a company, I asked for a tour of the company and documented the manufacturing process. The photos of the natto factory are examples of such a tour.

I enjoyed meeting other Americans who were discovering the joys of tofu and natto. During one of these visits, Richard Leviton from Soy food magazine asked me to write an article for the journal. *Natto: The Taste of Japan* was written and printed in 1982. Natto was everywhere in Japan, but because of it's unusual texture was not liked by many Westerners. There was a lack of ideas on how to use it in recipes that might appeal to Americans. The article was my attempt to inspire Americans to incorporate natto in their meals.

I learned about the tofu making process by working alongside a tofu master in a small neighborhood tofu shop in Kyoto. This experience was arranged by the soy food trade newspaper, *Toyo Shinpo.* During my short apprenticeship I was intrigued by the meditative experience of making tofu. I carried that feeling of being present in my daily chores. Washing dishes were never the same for me. Seeing the craftsman's tools, many handed down from father to son, were honored and cared for. Today, my mother's well worn wooden spoon looks different to me. It is not just an old spoon, but something that holds a family spirit and it imparts that spirit into everything I stir.

I left Japan in 1982 to go back to school. I wrote my master's thesis on introducing tofu to high school students. Tofu ice cream and tofu spice cookies were the first ways my students experienced tofu.

When I taught preschool in the 1990s, I put my tofu making tools in the home making center, and served tofu carrot cake at snack time. The little ones learned how to say "Ohiyo" [Ohayô = "Good morning" in Japanese] and how to use chopsticks. They folded origami, and made fish kites. They dressed up in mama-san aprons and walked in tabi socks.

I returned to the high school classroom, this time in Carmel, Indiana, to teach foods classes. It was fun to expose young people to new tastes, culture and soy foods. For a special experience, the Japanese language teacher and I divided our classes. She taught my cooking class some Japanese phrases, and I taught her students how to prepare something with tofu.

The "way of tofu" changed my life, career, and my student's lives. Tofu not only nourished my body, but it nourished my spirit and experiences. And yes, *The Book of Tofu* is still on my bookshelf, complete with scribbles, and stains, right next to the not so worn English-Japanese dictionary. Address: 10868 North Cornell St., Indianapolis, Indiana 46280.

11414. Herz, Rachel. 2012. You eat that? Disgust is one of our basic emotions–the only one we have to learn–and nothing triggers it more reliably than the strange food of others. *Wall Street Journal.* Jan. 28-29. p. C3.
• ***Summary:*** This interesting article begins: "Nattô is a stringy, sticky, slimy, chunky fermented soybean dish that

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Japanese regularly eat for breakfast. It can be eaten straight up, but it is usually served cold over rice and seasoned with soy sauce, mustard, or wasabi."

For Westerners, nattô suffers from its alien smell and odor; it "smells like the marriage of ammonia and a tire fire... I've never met a Westerner who can take a bite of nattô on the first attempt. What Japanese love, we find disgusting."

A color photo shows natto on chopsticks being lifted out of a bowl partly filled with nattô; stretchy strings connect the upper nattô to the lower nattô. Address: Teacher and author, Brown Univ. [Providence, Rhode Island].

11415. Nguyen, Andrea Quynhgiao. 2012. Asian tofu: Discover the best, make your own, and cook it at home. Berkeley, California: Ten Speed Press. [viii] + 232 p. Illust. (color photos by Maren Caruso). Index. 24 x 24 cm. [21 ref]
• ***Summary:*** Another very attractive book and well-written book by Andrea Nguyen. In researching this book, Andrea traveled to many countries in East- and Southeast Asia. The color photos and the book design are both superb.

Contents: Introduction: East Asian stronghold (China, Japan, Korea), wavering Southeast Asia (Vietnam, Thailand, Cambodia, Laos, Singapore, Malaysia, Indonesia, Philippines, Myanmar / Burma), South Asian newcomer (India), tofu in America (Samuel Bowen, Benjamin Franklin, Commodore Matthew Perry, Civil War soldiers, Piper & Morse, George Washington Carver, Mildred Lager, World War II), alternative to mainstream (Boys Market in Los Angeles, *Diet for a Small Planet, The Book of Tofu,* Jeremiah Ridenour, Los Angeles Tofu Festival), tofu today (United Soybean Board Survey, Hodo Soy, Dong Phuong Tofu [Westminster, Orange County, California]).

Tofu buying guide: Tofu types (tofu blocks {silken, medium, medium firm, firm, extra firm, super firm}, pressed tofu, tofu noodles, tofu skin [yuba; an unfortunate term since yuba has nothing to do with tofu] {fresh tofu skin packets = dou fu bao, tofu skin rounds = dou fu pi or fu pi, dried tofu sticks [dried yuba sticks] = fu zhu or "tofu bamboo"}, fried tofu {fried tofu slices}, tofu pudding (like silken tofu but made by pouring rich soymilk into a tallish pot with a little calcium sulfate and tapioca starch dissolved in water in the bottom), fermented tofu {red or white}, soy milk).

Note: This is the earliest English-language document seen (Oct. 2012) that uses the term "fresh tofu skin packets" or the term *dou fu bao* in connection with yuba.

Tofu cooking tips: Cutting, draining, frying.

Homemade tofu tutorial (incl. homemade soy milk, soy milk lees, homemade silken tofu, homemade tofu pudding, block tofu, confetti tofu, oboro tofu, zaru tofu, seasoned pressed tofu, tea-smoked pressed tofu, white fermented tofu, frozen tofu, fresh tofu skin, soy-simmered fried tofu).

Recipes–Fresh and satisfying: Snacks and starters. Soothing and soft: Soups and hot pots. Homey and wholesome: Main dishes. Versatile and delicious: Salads and sides. Religion and artistry: Mock meats. Building on traditions: Buns, dumplings, crepes, noodles and rice. Amazing transformations: Sweets and desserts. Basics. Ingredients (glossary). Acknowledgments. Measurement conversion charts.

Note 1. This book contains many recipes that use meat, poultry, or fish as ingredients.

Note 2. The Vietnamese term for tofu is *dau phu.* Address: Food writer, Santa Cruz, California.

11416. Katz, Ellix Sandor. 2012. The art of fermentation: An in-depth exploration of essential concepts and process from around the world. White River Junction, Vermont: Chelsea-Green Publishing Co. xxiii + 498 p. April. Illust. (photos and illustrations). Index. 25 cm. [109 (Chap. 10 + 11) ref]
• ***Summary:*** A marvelous book by self-described "fermentation revivalist" Sandor Katz, whose books and lectures have inspired thousands to rediscover the ancient art of fermentation.

In this book Katz redefines an old noun "ferment" (no longer used to mean enzyme) to mean fermented food(s). It works quite nicely. For example: "The Japanese soy ferment *natto* contains an enzyme called *nattokinase."* Although information on fermented soyfoods is found throughout the book (see the excellent index), most of it is found in two chapters, 10 and 11 (p. 274-335). The contents of these two: 10. Growing mold cultures: Introduction. Incubation chambers for growing molds (oven method, aquarium method, temperature controller, dedicated incubator designs). Making tempeh. Cooking with tempeh. Propagating tempeh spores. Making koji. Amazake. Plant sources of mold cultures. Troubleshooting. Sidebars: Microorganisms in my bed, a poem by qilo. Sculpting with tempeh. Ode to tempeh, by Spiky. Tempeh variations (chickpea tempeh, etc.).

Note: Koji is mentioned on 41 pages in this book, and especially on pages 296-300.

11. Fermenting beans, seeds, and nuts: Introduction... Spontaneous fermentation of beans. Idli / Dhokla / Khaman... Soybeans. Miso. Using miso. Soy sauce. Fermented soy "nuggets" [fermented black soybeans]: Hamanatto and douchi. Natto. Dawadawa and related West African fermented seed condiments. Fermenting tofu. Troubleshooting.

The section titled "Non-dairy milks, yogurts and cheeses" (p. 207-08) begins: *"Milk* has come to refer to any creamy liquid of substance, such as coconut milk. In our time soymilk has become a ubiquitous alternative to cow milk, but any nut or seed can be extracted as milk (or turned into cheese)." We have hemp seed milk and almond milk. "The seed milk ferment that most closely resembles its dairy analogue is soymilk fermented with yogurt cultures. You can ferment soymilk using the same procedure as dairy milk, and you can even buy commercial cultured soy 'yogurt' to use as a starter."

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Sidebars: Dosa variations. Miso generic proportions. Miso soup with William Shurtleff. In the middle of this chapter are 15 pages of very helpful color photos. Address: Short Mountain Sanctuary, in the hills of Tennessee.

11417. Japan Oilseed Processors Association (JOPA). 2012. Seiyu Sangyo to Nihon Shokubutsu-yu Kyokai 50 nen no ayumi [Progress of the oil milling industry and the Japan Oilseed Processors Association (JOPA) during the past 50 years]. Tokyo: Saiwai Shobu. [11] + 281 p. May 15. Illust. (color). No index. 27 cm.

• ***Summary:*** This beautiful hardcover book, printed on glossy paper, was written to celebrate JOPA's 50th anniversary. It was officially published on 15 May 2012 and distributed to the participants / members at the ceremony celebrating JOPA's 50th anniversary on that day. Although it was officially written by JOPA, the main author and researcher was Yoshinori Komura (executive director of JOPA) in cooperation with Mr. Tomoaki Kuwano (a writer from the publishing company, which publishes a magazine for Japan's oils and fats complex). This book is strengthened by its abundance of graphs and tables, but weakened by its complete lack of references and of an index.

Contents: Part I History of the oilseed industry in our country [Japan] (p. 3).

Chapter 1. Changes in the structure of the oil industry (p. 3): Section 1. Quickening of modernization of oil industry structure (p. 3), 1.2 Movement towards soybean trade liberalization (p. 5), 1.6 Expansion of demand for assorted (compound) feed and supply of soybean meal (p. 14), 1.6.1 Promotion of stockbreeding and supply increase of soybean meal (p. 14).

Section 2. Steps toward stabilized growth (p. 17), 2.2 America's political strategy of soy export ban and its effect on our domestic market (p. 18), 2.4 Expansion of rapeseed oil extraction / production and increase of demand for soybean meal (p. 22), 2.4.2 Expansion of demand for soybean meal and increase of import (p. 23), 2.5.1 Arrival of era for importing large quantities of soybean meal (p. 27), 2.6.2 Sudden rise of soybean price and rapid drop of soybean oil extraction (p. 42), 2.8.3 Pressure of imported soybean meal (p. 51).

Chapter 2. Changes in the market for domestic oil for food (p. 54), 2.2 From soybean oil to rapeseed oil and then to palm oil (p. 56), 2.5 The day palm oil exceeds soy oil (p. 69).

Chapter 3. Changes in the world oilseed market (p. 73), 3.1 World oilseed market that followed after soybeans (p. 73), 3.1.1 American soybeans that supported the world's oilseed market (p. 74), American soybean production expanded smoothly (p. 74). Sudden big rise of American soybeans (p. 74), 3.1.2 Increase of South American soybean production, America's rival (p. 77), South American soybeans exceed American soybeans (p. 79), 3.2 Palm oil production's increased production, it passed soy oil (p. 81), 3.5.4. 50,000,000 tons of soybean imports arrive daily (p. 89).

Part III. Materials (p. 217).

1. 50 year chronology / timetable of the Japan Oilseed Processors Association (p. 217).

2. Lists of companies and industry members of the Japan Oilseed Processors Association (updated to March 2012) (p. 253).

3. List of successive officials of the Japan Oilseed Processors Association (p. 254).

(3.1) List of successive presidents (p. 254).

(3.2) List of successive vice presidents (p. 254).

(3.3) List of successive directors / trustees (p. 257).

(3.4) List of successive supervisors (p. 259).

4. Changes of yields of oil extraction from various oilseed materials (p. 260).

5. Changes of production amount from various oilseeds (p. 262).

6. Chronology (timetable) of the Japan Oilseed Processors Association: Committees and sectional meetings (p. 264).

7. List of overseas expeditions of the Japan Oilseed Processors Association (p. 265).

8. Historical tables of 10 biggest news events each year, by year for Japan's oilseed industry (p. 267).

Tables:

1-1-1. 1961 Index (indicator) of main oil industry.

1-1-2. Non-trade liberalized items related oil production in the beginning days of Japan Vegetable Oil Association (April 1962 to present).

1-1-3. Changes in the production amount of assorted (compound) feed and its factory numbers after supply and demand stabilization law for amount of assorted (compound) feed.

1-1-4. Production amount of assorted (compound) feed and amount of usage of soybean meal.

1-1-5. Changes of tax on vegetable oils at main of import/export negotiation time.

1-3-1. Summary of America's export regulations for soybeans and cotton seeds.

1-3-2. Amount of soybean production in Brazil's Cerrado area.

1-3-4. The Big Three companies of oil production capacity in Europe.

Page 189. This table has no number or title, but it mentions soybeans.

Page 190. This table has no number or title, but it mentions soybeans.

Graphs (and photos):

1-1-5. Changes of vegetable oil production by (various) oil seeds.

1-1-7. Changes of price index (1970 average = 100).

1-1-8. Changes of supply of soy oil and rapeseed oil.

1-1-10. Changes of supply of soybean meal.

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1-1-11. Amount of importing soybean meal by supplying country after 1980.

1-1-12 (photo) American soybean farm–you can see a clear difference in the amount of other weeds growing.

1-1-14. Changes of oil production by various oilseeds.

1-1-15. Changes of oil supplies by various oilseeds (large classifications).

1-2-2. Changes of vegetable oil supplies by composition percentages of various oil seeds.

1-2-3. Changes of supply by various seed oils.

11418. Soyfoods Council (The). 2012. Soyfood myths: Get the facts. *Iowa Soybean Review* (*Iowa Soybean Association, Urbandale, Iowa*) 23(7):7. Spring.

• ***Summary:*** "Myth #1: Anybody who has had breast cancer should avoid traditional soyfoods such as tofu and soymilk.

"Actuality: The American Cancer Society says breast cancer patients can safely consume up to three servings of traditional soyfoods per day.

"Myth #2: People in Japan and other Asian countries consume only small amounts of soyfoods and use them primarily as condiments.

"Actuality: The results from large surveys indicate, on average, Japanese and Shanghai adults consume 1 1/2 servings of soyfoods per day.

"Myth #3: Soyfoods cause mineral deficiencies or imbalances.

"Actuality: Evidence unequivocally shows calcium absorption from soymilk and cow's milk are similar.

"Myth #4: Soyfoods contain estrogen and men who eat them may experience feminization or even impairment of their fertility

"Actuality: Soyfoods do not contain estrogen and evidence indicates soyfoods do not feminize men. Soy doesn't lower testosterone levels or sperm concentration.

"Myth #5: Soyfoods should be avoided because they are harmful to the thyroid.

"Actuality: More than 20 clinical studies have shown neither eating soyfoods nor using soybean extracts cause thyroid problems."

11419. Shurtleff, William. 2012. The global value chain for soybeans (Editorial). *SoyaScan Notes.* June 12.

• ***Summary:*** "The value chain is a concept from business management that was first described and popularized by Michael Porter in his 1985 best-seller, *Competitive Advantage: Creating and Sustaining Superior Performance"* The value chain concept can be applied at various levels of activity, such as a worldwide level, an industry-wide level in a particular country, or at the level of a particular company operating in a specific industry. The key links in a value chain are those points at which value is added to products. Quantitative data are necessary to analyze the amount of value added (Source: Wikipedia at value chain, June 2012).

In the global soybean chain we have identified four major links or points: (1) Soybean production: This is highly fragmented, with hundreds of thousands of farmers, both large and small, growing soybeans. However some of those farmers are organized into groups, often cooperatives (such as AGP in the United States).

(2) Crushing and other soybean processing. Crushing soybeans to make crude soy oil and defatted soybean meal is main way that soybeans are processed. However in East Asia, whole soybeans are also processed into human foods, such as tofu, miso, soymilk, tempeh, etc. Large soybean crushers which operate worldwide include Cargill, ADM, Bunge, AGP, Sanbra (Brazil) etc. Defatted soybean meal is further processed to make animal feeds, soy sauce, etc. Crude soy oil is further refined to make edible vegetable oil biodiesel, etc.

(3) Transportation / distribution of soybeans and/ or soybean products. Major firms (which are vertically integrated) include Cargill, ADM, Bunge, Dreyfus, the Noble Group of Hong Kong, etc.

(4) End use / retail: The main end uses for soybeans are: From whole soybeans–human foods, often divided into four types: (a) Traditional East Asian fermented soyfoods, such as miso, tempeh, natto and its relatives. The largest makers are miso makers and natto makers in Japan. (b) Traditional East Asian non-fermented soyfoods, such as tofu, soymilk, edamame, roasted soy flour, yuba. The largest makers are tofu makers and soymilk makers in Japan, Hong Kong, and USA. From defatted soybean meal: animal feeds, soy sauce, modern Western soy protein ingredients: textured soy flour / textured vegetable protein (TVP in ad ADM trademark), soy protein concentrates, textured soy protein concentrates, soy protein isolates, and textured soy protein isolates. The largest makers of animal feeds are the same as the major soybean crushers: Cargill, ADM, Bunge, etc. From crude soybean oil: Refined soybean oil and biodiesel. The largest refiners of soybean oil are the major soybean crushers. From refined soybean oil: Edible vegetable oil, salad dressings, margarine, etc. Address: Founder and owner, Soyfoods Center, Lafayette, California. Phone: 925-283-2991.

11420. Shurtleff, William. 2012. Thoughts about tofu and sexual desire (Editorial). *SoyaScan Notes.* June 20.

• ***Summary:*** This line of though began with an e-mail (on June 19) from Mark Messina:

"Have you ever come across in your reading of original texts anything that makes reference to the kinds of statements below that are very prevalent on the net? The source on the net is the Weston A. Price Foundation, yet there are no citations to the original source documents.

"In fact, a popular tradition in Japan is for wives to feed their husbands tofu when they want to prevent pregnancy! Buddhist monks traditionally eat tofu to lower their libido."

"It is widely known throughout Asia that when a woman

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does not want to have sexual relations with her husband any more, she feeds him more and more tofu! Monks in monasteries needing to be celibate are urged to eat more tofu and soy products. In Asia, it is common knowledge that soy reduces sexual urge and ability."

Mark then adds: "I just checked another 20 comments about the monks and only found one referenced.

"Ancient monks used to eat extra tofu to help them to easily maintain their vows of celibacy." (2).

"Reference 2 is to Kaayla Daniels' book, *The Whole Soy Story.*–Thanks, Mark.

I (Shurtleff) look for this quote in Daniels' book and soon find it on page 11. It states:

"Liu-An's initial reason for turning soybean dross into tofu gold was his desire to add a low-cost protein to the vegetarian monastic diet (19-21; see Shurtleff & Aoyagi twice + Keshun Liu). Over time the monks may have noticed that randy behavior declined when tofu consumption went up. The aptly named "meat without a bone" soon appeared regularly on monastery menus as an aid to spiritual development and sexual abstinence, a dietary strategy validated by recent studies showing that the plant-form of estrogens (called phytoestrogens) in soy can lower testosterone levels (22; see Fallon and Enig, 'Tragedy and Hype') (See Chapters 28 and 29).

Shurtleff adds: "I'll bet that bit of speculation is the origin of all the information you found on the Web."

When Messina sees this quotation and comment he asks Shurtleff: "To be clear, as far as you know, the above statement has no basis in fact. It wasn't added to the menu as an aid to sexual abstinence? I understand selectively citing studies and misinterpreting data but making something up is quite weird."

Shurtleff then repeats that, so far as he knows, the above statement has no basis in fact.

Shurtleff then shows the two initial statements / quotations that Messina sent to Akiko Aoyagi and asked her to take 10-20 minutes reading and thinking about them, then to see if she could find any similar information in Japanese on the Web.

She was born and raised in Japan, and graduated from college there. She obviously has spent more time thinking about and working with tofu than most Japanese–except tofu makers.

She said: 1. She has never heard anything like either of these two statements. So far as she knows they have no basis in fact.

2. She could not find anything like either of these two statements in Japanese on the Web.

In short, she has the same opinion about the two statements that Shurtleff does. They were invented, probably (at least the first) by Kaayla Daniels on page 11 of her book *The Whole Soy Story.* Address: Founder and owner, Soyfoods Center, Lafayette, California. Phone: 925-283-2991.

11421. Tsai, Minh. 2012. Making and marketing yuba at Hodo Soy Beanery (Interview). *SoyaScan Notes.* July 4. Conducted by William Shurtleff of Soyinfo Center.

• ***Summary:*** During the past 8 years Hodo Soy has been very effective and innovative in introducing yuba to people in the Bay Area of California. Part of this success has been through effort and part has been (Minh modestly admits) through timing and luck. "We are very fortunate to be in the Bay Area. The only two other places it might work are Los Angeles and Manhattan, New York."

Yuba is now an important and profitable product for Hodo Soy, accounting for about 20% of total sales. However the yuba tables take up about half of all Hodo Soy's manufacturing space.

What are the key's to yuba's success for Hodo Soy? First, education. We have worked to educate our customers who are chefs at restaurants about the large amount of labor that goes into making yuba and contributes to its high price (about $15 a pound). We have also met with chefs in restaurants and explained that 1 ounce of yuba is quite a good serving size; so each serving costs less than $1.00. And it looks great on the menu and on the dish." Minh also educates chefs about yuba's versatility (use it as a wrap, put it in soups, etc.) which enables them to develop recipes. The chefs have developed innovative recipes using yuba and their customers seem to enjoy their creations. Most people really love the taste of yuba. "People think of it as a starch-free, gluten-free noodle. It's always al-dente; it doesn't fall apart."

"I believe that we have been doing more education on tofu and yuba than all the big tofu-makers combined." Minh does 95% of this education himself–in person. He enjoys this teaching quite a bit, and he knows these chefs personally.

Yuba has brought a lot of positive publicity to Hodo Soy. It has been called everything from "the lingerie of tofu" to "the sashimi of tofu." Daniel Patterson, chef at Coi restaurant described yuba as tofu's "elegant and sexy cousin" (New York Times, 6 Aug. 2006). This is important in terms of branding, as the company is known to be the introducer and maker of this new product.

Minh (who has Chinese ancestry) was smart (and innovative) to call the product "yuba" instead of "bean-curd skin"–like most Chinese restaurants. But there was another reason he called it yuba. "Our research shows that, as far as willingness to pay for food at a premium price, the Japanese are at the top of the list. They know what it is and they realize it is expensive. And the majority of our Asian customers are actually Japanese." But Hodo Soy's Asian customer base is still relatively small; Minh mission is to introduce high-quality soyfoods to mainstream America.

Hodo Soy sells mostly "mature yuba" (plain fresh yuba) and value-added yuba products, such as Spicy Yuba Strips. From time to time he has requests from high-end restaurants for "nama yuba," which is soft, formless yuba that is not

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yet mature and fully formed. Each chef wants a particular texture, so Minh sells it to them on a customized basis–and requires that the chef come to Hodo Soy the first time to make exactly the texture of yuba they want.

Hodo Soy delivers all its own yuba and tofu products; they have four delivery vehicles that deliver to 50-60 accounts in the Bay Area–both restaurants and natural grocery stores; Rainbow Grocery in SF, Tokyo Fish Market, and Berkeley Bowl all carry Hodo Soy's fresh yuba. They have a "make to order approach" and a restaurant must order 4-5 days in advance. Value added products are sold through chains such as Costco, Whole Foods Markets in Northern California, Andronico's, and Molly Stone's.

The two Bay Area restaurants that have done the most to introduce yuba are Coi (Daniel Patterson, in SF's North Beach) and The Slanted Door (Charles Phan; modern Vietnamese cooking near the Ferry Building). Other restaurants that offer may serve yuba include Cyrus (Healdsburg), The French Laundry (Yountville, California), and Ozumo (Oakland and San Francisco).

Hodo Soy has never done focus groups or taste panels with yuba.

Minh first made yuba in about May 2004 when he was tinkering with Sogo Tofu in San Jose. They had a yuba table (with 10-12 frames) that they weren't using. Sogo Tofu was initially built as an adjunct to a large Chinese health grocery store–sort of a Chinese Whole Foods. This store (named Sogo) was part of a chain named Marina Foods, which has a handful of stores in the Bay Area. Sogo, the grocery store, has since closed down but the tofu shop continued to operate. Minh asked Sogo Tofu to make yuba for him, then he experimented using this yuba in recipes, and introduced these dishes to his customers at farmers' markets. The people who owned and operated Sogo Tofu were relatives of Minh's wife. The three yuba dishes, starting in May 2004, were Soy Omelette, Yuba (Fresh), and Poached Yuba Loaf. Minh quickly learned the people at farmers' markets really liked these products. They learned about yuba from him, and he learned from them. The first soy product gave them was the Poached Yuba Loaf, followed by Soy Omelette (yuba marinated in soy sauce and a little brown sugar, then pan fried in a little oil). People were generally surprised at the texture and taste, but they found it to be delicious and asked, "What is it?" He replied, "It's yuba." They asked back, "What's yuba?" So he explained. Eventually they came to want the plain fresh yuba so they could experiment with their own recipes. Another early yuba product was Spicy Yuba Strips (made at Sogo Tofu starting in Dec. 2004); this is still a best-seller at retail outlets for Hodo Soy Minh's 5th yuba product was Sesame Yuba Strips (made at Sogo Tofu and discovered by accident; the other ingredients were toasted sesame paste / butter, a little brown sugar and soy sauce).

To take a step back: Minh approached tofu-making very much from a Western food processing and food science point of view. He wanted to leave the basic traditional methods (as shown for example, in a flow chart) unchanged but introduce modern equipment to do the work of lifting, pressing, scooping, and slicing, and modern methods for measuring temperatures, times, and Brix, etc. Minh soon realized (in about 2004-05) that he needed to supervise the making of tofu at Sogo Tofu. But he was just a beginner. How can a beginner, in a traditional Chinese family and craft, tell his experiences aunts and uncles to change. "It was an impossible situation. After about 2 years Sogo had reached saturation–in terms of quality, sanitation, good manufacturing practices, and traceability of ingredients. Starting at the end of 2005, our sales for the next 2-3 years basically remained static. In 2006 we decided to build a plant in Oakland, and that took about 2 years." Minh traveled a lot, learned a lot, visited some tofu companies, and made some mistakes. As Minh prepared to open his tofu plant in Oakland, he realized that he "did not want to hire anyone with legacy tofu experience. I wanted to teach them from the very beginning."

Minh's wife, Jean Ku, was not directly involved with the tofu and yuba business at all. But she has been a tremendous supporter by bringing home the income to support the family during the early years. Jean is a top executive at the Energy Foundation–Program Manager for the China Sustainable Energy Program. Although it has been in existence for only 20 years, the Energy Foundation is the biggest contributor to the reduction of carbon dioxide in China. The foundation began with the sole mission of reducing carbon dioxide, and it identified China as the biggest potential culprit. Its founder decided to focus all of its resources on China. So a foundation based in San Francisco has been focused on China's CO2 problems for 20 years! Amazing. It is responsible for the very progressive energy policy in China today–which is more progressive than that of the U.S. One of the advantages of a dictatorship is that it can move policy much more quickly than is possible in a democracy. The Energy Foundation has learned a great deal about problem solving during these 2 decades and the model has now been expanded to Brazil and India. She is doing exactly what she finds most interesting and important–critical to the future of the planet. "She loves what she does, and she is very grateful, just like I am, that we have work that we love." Continued. Address: Founder, Hodo Soy Beanery, 2923 Adeline Street, Oakland, California 94608. Phone: 510-735-4587.

11422. Welters, Sjon. 2012. Re: Photos of and basic information about making koji by hand at Rhapsody Natural Foods in Vermont. Letter (e-mail) to William Shurtleff at Soyinfo Center, July 9. 3 p.

• ***Summary:*** Sjon attaches many color photos he just took of his koji-making process. "We started to make koji this January because there was no organic koji available on a

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commercial scale. We got the basics from your book *Miso Production* and talked a lot with our friends George and Trees Rozing, who've been making koji and amazake since the early 1980's. The basic recipe we followed is in your book and for the sake of propriety we'd prefer to keep the details to ourselves at this point and refer to your book, which basically tells it all. After all those years it is still *the* reference book."

(a) Day 1: Polish brown rice. The outer layers of brown rice prevent penetration of the koji mold. (b) Comparison of polished rice (in scoop) and brown rice. (c) Rice bran removed from brown rice during polishing. (d-e) Late afternoon–rinse polished rice. (f) Late afternoon–soak rice overnight.

(g) Day 2: Divide rice among steamer pans. (h) Steam rice in steamer. (i) Steamed rice. (j) Break up steamed rice with rice paddle. (k) Cool steamed rice. (l) Add koji spores. Sprinkle them evenly over rice to inoculate. (m) Pile inoculated rice. (n) Inoculated rice ready to be covered with cloth for the night. (o) Temperature and humidity of rice and room.

(p) Day 3: Morning, aerate rice. Temperature is 96ºF. (q) Noon rice temperature is 108ºF. (r-s) Noon, divide rice into trays. (t) Room temperature and humidity. (u) Rice is fermenting. (v) Rice is fermenting at high humidity.

(w-y) Day 4: Koji is done–ready. Three views.

Comments by Sjon: It was a challenge to take pictures in the koji room, because of the high humidity that fogged up the camera lens all the time.

Questions by Shurtleff, answers by Sjon. Q1. Why do you use no wood? Several people have contacted me recently saying their health inspectors will not allow wood. Ans. "Actually behind the current wall which is a sheet of aluminum covered insulation is cedar. The koji table is also made from cedar and I even made a cedar koji tray. The problem was that the cedar gave such a strong aroma to the koji that was overwhelming, and gave a distinct flavor to the amazake made from that koji. So my advice is to try cedar that is well aged, although I am not sure the cedar smell will ever go away. Here in the West people want a cleaner, more neutral flavor? Health inspectors need to read up, because in The Netherlands the same argument was used in the 1970s for distributing organic vegetables to the natural food stores in wooden crates. Turns out that the wooden ones were really clean, while the plastic ones were contaminated although they looked clean, in terms of bacterial contamination."

Q2. Do you now prefer not to use wood? Ans: "George Rozing changed to all stainless steel because he kept having to deal with chipped trays, wood splinters in the koji, etc."

Q3. I see your trays are stainless steel. What are the other containers made of? Ans: "At the moment we use perforated aluminum sheets covered with baking sheet paper, but have stainless steel trays on order. Although you would think so, perforated actually does not work better, solid trays give better koji."

Q4. Is all this koji for use in making amazaké? Ans: "We are in the process of starting miso production. We got wine barrels that we are now making watertight by soaking them in water, because they'd not been used for a while. But our amazake is now 100% organic and soon we'll have new labels showing that.

"By the way, I also got a lot of information from watching many hours of YouTube videos put on the web by Japanese sake makers. Fascinating. Steaming was the biggest hurdle, but we overcame that by watching all those videos to see how they did it. Eventually, through trial and error we figured it out, though: small scale koji makers should use MarketForge steamers." Address: Founder and general manager, Rhapsody Natural Foods, 72 Danville Hill Rd., Cabot, Vermont 05647-9622. Phone: 802-563-2172.

11423. Palmer, Sharon. 2012. The plant-powered diet: The lifelong eating plan for achieving optimal health, beginning today. New York, NY: The Experiment. xx + 412 p. Foreword by David L. Katz, MD, MPH. [228 ref]

• ***Summary:*** A positive attitude toward traditional soyfoods is found throughout this excellent book. The traditional Japanese diet (p. 19-20)–one of the healthiest–leads to an average life expectancy of 80 years for men and 85 years for women. The Japanese diet is characterized by a "Focus on soy foods. Whole soyfoods such as edamame, tofu, and miso are regular features of the diet."

The section titled "Soy, the superfood" (p. 58-59) describes the basic types of soyfoods and their benefits. The next section is "A word about soy meat alternatives" (p. 60-61) including veggie burgers, soy meat crumbles, and vegetarian hot dogs.

The "Plant-based dairy alternatives guide" (p. 72-76) includes various types of soy milk, soy milk yogurt, and soy ice cream.

The word "soy" appears on 55 pages of this book, "tofu" on 54 pages, "tempeh" on 18 pages, "soy foods" on 17 pages, "seitan" on 15 pages, "edamame" on 10 pages, "soybeans" on 10 pages, "soy milk" on 8 pages, "soy sauce" on 6 pages, "miso" on 6 pages, "soy milk yogurt," "soy ice cream" and "soybean oil" on 2 pages each, and "soy cheese" and "soy cream cheese" on 1 page each.

Includes "75 original plant-based recipes for every meal–all with nutritional data." "A 14-day meal plan with action alerts to get you started." "Essential information on the healthiest plant food–whole grains, vegetables, fruits, nuts, legumes, and even herbs, spices, dark chocolate (rich in polyphenol antioxidants), coffee (contains many beneficial antioxidants), tea (rich in polyphenol antioxidants, and takes the place of high-calorie, high-sugar drinks), and wine.

Virginia Messina, in her blog The Vegan RD, says this: "It's a book that makes the scientific case for eating fewer animal products and more plant foods while admitting that

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there is no precise definition for 'plant-based diet.' The information in the book is balanced, honest, and practical, and the recipes–which appear to all be vegan–look really nice. In the forward to the book, Dr. David Katz, of the Yale University Prevention Research Center says this about Sharon's book: 'So much of modern health advice is about marketing a particular perspective that such a balanced and moderate approach is a truly surprising and welcome departure.'

"I agree, and it's the thing that made this book stand out for me. Admittedly, I wish the book had included more perspective on making compassionate food choices. When animals are part of the discussion (and I think they should always be part of the discussion) a vegan diet is the one and only best way to eat. When the focus moves away from animals, then diet-related issues become somewhat less clear. So far, no one has proven that a vegan diet is healthier than other plant-based ways of eating, and it's unlikely that they ever will. So, this isn't a book I would use to promote veganism–it presents a vegan option, but not a vegan imperative–but, it is one I would use to promote healthy plant-based eating for those who are looking for that type of information."

About the author: "Sharon received her Bachelor of Sciences Degree with Honors from Loma Linda University, California. She enjoyed a diverse 16-year dietetics career with experiences as a clinical dietitian, wellness dietitian, chief clinical dietitian, food and nutrition services director, and consultant dietitian." Address: RD (Registered Dietitian), P.O. Box 1052, Duarte, California 91009.

11424. Familia Hattori, Empresa familiar, de origem japonesa, chegou ao Rio Grande do Sul em 1955 [Hattori Family: Making miso and shoyu in Rio Grande do Sul, Brazil since 1955]. 2012. http://familiahattori.com.br. 10 p. Printed 31 Aug. 2012. [Por]
Address: Rio Grande do Sul, Brazil.

11425. Kikkoman Corporation. 2012. Annual report 2012. Year ended March 31, 2012. 250 Noda, Noda-shi, Chiba 278-8601, Japan. 47 p. 28 cm. [Eng]
• ***Summary:*** Net sales in yen decreased by 0.01% to ¥283,239 million. Net income in yen increased by 15.6% to ¥8,963 million.

Under "Major group companies–Kikkoman Corporation, Japan (p. 44) is listed: Kikkoman Soyfoods Company, 2-1-1 Irifune, Chuo-ku, Tokyo 104-8553, Japan. Phone: +81 (3) 3206-0778. This company was formerly Kibun Foods.

Under "Corporate History" we read (for the first time): "2008 Aug.–Kibun Food Chemifa Co., Ltd. (now Kikkoman Soyfoods Company) becomes a wholly owned subsidiary of Kikkoman."

A photo (p. 2) shows Yuzaburo Mogi (Honorary Chief Executive Officer and Chairman of the Board of Directors) and Mitsuo Someya (President and CEO). On this page we read that Kikkoman's sales decreased because of "lower demand for soy sauce and the termination of sales of some beverages and casual wines." Address: Noda, Japan.

11426. Shurtleff, William; Aoyagi, Akiko. comps. 2012. Jokichi Takamine (1854-1922) and Caroline Hitch Takamine (1866-1954): Biography and bibliography. Lafayette, California: Soyinfo Center. 261 p. Subject/geographical index. Printed 10 Sept. 2012. 28 cm. [1560 ref]
• ***Summary:*** Begins with a detailed chronology of Jokichi and Caroline Takamine (plus ancestors and descendants) based on published documents. Contains 114 historical illustrations and photos (most in color). http://www.soyinfocenter.com/books/155. Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

11427. Heinbaugh, Pat. 2012. Re: Pat is an expert on Mr. Shinzo Ohki of the Oriental Show You factory in Columbia City, Indiana. Letter (e-mail) to William Shurtleff at Soyinfo Center, Oct. 1-2. 1 p.
• ***Summary:*** "Greetings, my name is Pat Heinbaugh, and I am a research volunteer for the Whitley County Historical Society, Columbia City, Indiana. I am currently assisting the local Rotary Club with an article they wish to publish in a future edition of *The Rotarian* magazine. The local club wishes to focus the article on Mr. Shinzo Ohki, who was founder of the Oriental Show You Factory in Columbia City, in the early 1900's. Mr. Ohki was a 40+ year member of the club, as well as a man who'd come from Japan to Columbia City in the earlier 1900's. Among Mr. Ohki's interests, was the return of Samurai swords, which had been taken by American soldiers during World War II to their proper owners. He was able to return at least two of the swords. My wish to you, is that I might obtain copies of any information you have on Mr. Ohki, whether it be about his product, or the return of the swords. I've read several portions on your soyinfo page, and am asking how I might obtain copies of any / all information about Mr. Ohki.

Bill, yes I do have the information, in the form of a full bottle of Oriental Show You sauce, as well as a larger empty bottle. Also a copy of the patent for bottle. I have frequent communication with Ohki's grand daughter, Tanya Watanabe, who lives in Nikko, Japan. Mr. Ohki graduated from Columbia City High School, which is our local high school, and our museum has a picture of him with his graduating class. We have several items in the museum that were gifted to us by friends of Ohki, after his death.

Mr. Ohki's brewmaster was Esta Keirn, and his daughter, Nancy Knepple verified a lot of facts / figures for me. The company was sold to a company in Ohio, and Mr. Keirn went with the company for a period of about 9 yrs, then he retired. I believe Mr. Ohki is credited with being one of the first companies to have fermented soy sauce. I

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know several people in our town who worked for Mr. Ohki, especially during the 1930s and 1940s, and the building that was the factory is still, in part, in tact, on Factory Avenue, Columbia City. In his earlier years, Ohki went to Detroit, started a factory, but it failed, so he returned to Japan, to learn more about factory operations, as well as to marry his wife, Taka. They returned to Columbia City and it became their hometown. He was a highly regarded and philanthropic man, helping many people in this area. Some oldsters tell me that their older siblings who worked in the factory returned home with bags of warm noodles.

There is also a recipe book published by Oriental Show You, Columbia City, with many recipes in which one could use the sauce. This book was evidently given / sold to, possibly restaurants, etc. I have several copies of this booklet. Also, there is a 1938 video done for the Columbia City Fire Department, which shows a clip of workers in the Show You Factory, as well as Mr. Ohki coming out of the Presbyterian Church on a Sunday morning. And also a clip of Ohki's daughter, Grace, playing in the high school marching band, as they marched around our courthouse. Address: Volunteer researcher, Whitley County Historical Society, 6850 N. Wise Rd., Columbia City, Indiana 46725. Phone: patheinbaugh@yahoo.com.

11428. Shurtleff, William; Aoyagi, Akiko. comps. 2012. History of Yuba–The film that forms atop heated soymilk (1587-2012): Extensively annotated bibliography and sourcebook. Lafayette, California: Soyinfo Center. 418 p. Subject/geographical index. Printed 1 Nov. 2012. 28 cm. [733 ref]

• ***Summary:*** This is the most comprehensive book ever published about the history of yuba. It has been compiled, one record at a time over a period of 35 years, in an attempt to document the history of this unique soyfood. It is also the single most current and useful source of information on this subject.

Contents: Search engine keywords. Explanation of the Chinese and Japanese characters on the title page. Dedication. Acknowledgments. Introduction: What is yuba? In what countries is yuba widely used? Why do we call it "yuba" instead of "bean curd skin"? Our main purpose in giving English-language names to Asian soyfoods. Brief chronology / timeline of yuba (1587-2012). Alphabetical list of names of yuba (useful for searching digital / electronic text). About this book. Abbreviations used in this book. How to make best use of this digital book–Search it. Five pages of color photos. Contains 64 photographs and illustrations. http://www.soyinfocenter.com/books/159. Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

11429. Shurtleff, William; Aoyagi, Akiko. comps. 2012. History of roasted whole soy flour (kinako), soy coffee, coffee alternatives, problems with coffee, and soy chocolate (1540-2012): Extensively annotated bibliography and sourcebook. Lafayette, California: Soyinfo Center. 709 p. Subject/geographical index. Printed 25 Nov. 2012. 28 cm. [1420 ref]

• ***Summary:*** This is the most comprehensive book ever published about the history of roasted whole soy flour (kinako), soy coffee, coffee alternatives, problems with coffee, and soy chocolate. It has been compiled, one record at a time over a period of 35 years, in an attempt to document the history of these unique soyfoods. It is also the single most current and useful source of information on this subject.

Contents: Search engine keywords. Explanation of the Chinese and Japanese characters on the copyright page. Dedication and acknowledgments. Introduction: Three beans. Names and popularity of roasted soy flour in East Asia. Brief chronology / timeline of roasted whole soy flour (1540-2012). About this book. Abbreviations used in this book. How to make best use of this digital book–Search it. Seven pages of color photos. Contains 76 photographs and illustrations. http://www.soyinfocenter.com/books/160. Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

11430. Nespoto, Massimo. 2012. Le soja au Japon: mythe ou réalité? [Soy in Japan: myth or reality?] *Alternatives Végétariennes* No. 109. Sept/Nov. p. 20-22. [Fre]

• ***Summary:*** The Japanese consume soy in many forms: The main fermented soyfoods are miso, shoyu, and natto. The main nonfermented soyfoods are tofu, soymilk, yuba, okara, Koyadofu, edamame, daizu [whole soybeans], and moyashi [soy sprouts]. A brief description of each is given.

There follows and interview with a traditional tofu maker, Shuji Uemura, owner of Uemura Tofu, who arises each morning at 3:30 a.m. Color photos show: (1) The outside front of Uemura Tofu shop with blue and white norens hanging. (2) Mr. Uemura standing inside his shop. (3-4) Freshly made tofu in a cooling tank and in individual tubs. (5) Many packaged soyfoods in Japan. Address: Prof., Univ. of Lorraine.

11431. Skiff, James. 2012. MicroSoy Corporation in Jefferson, Iowa, maker of MicroSoy Flakes, has closed, apparently permanently (Interview). *SoyaScan Notes.* Dec. 5. Conducted by William Shurtleff of Soyinfo Center.

• ***Summary:*** MicroSoy Corporation closed in Feb. 2012. Itaru "Terry" Tanaka, CEO, age 64, committed suicide on 17 Nov. 2011. He had been "cooking the books" for a number of years and he owed a local farmers' cooperative lots of money.

Note: Terry was born in Fukuoka, Japan to Hitoe and Moriyuki Tanaka. He grew up mainly in Yokohama, Japan and graduated from Kanagawa University with a degree in economics. He was survived by his wife, Yoko, his two

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daughters, Miho and June, and his son, Jay. He has three brothers and a sister in Japan. Address: Mattoon, Illinois.

11432. Condiss, John. 2012. Recollections of Caroline Yuki Takamine, Kathryn Anne Kramer, Ted Kramer, and the Takamine family (Interview). *SoyaScan Notes.* Dec. 7.
• ***Summary:*** (1) Kathryn Kramer: John and Kathryn Anne "Kathy" Kramer were married on 15 April 1972 in Tucson, Arizona at St. Demetrios Orthodox Church. John is Greek. It was a gigantic, gigantic wedding–the mayor and other officials, all the Republicans because of Carolyn Yuki, who was a very important and fun to be around. "We were married for about a year; we went together for maybe 6 months before that. I met her, with Ted and Carolyn [pronounced KAR-uh-lun] on a holiday in Mexico. I was there with a friend and we bumped into them. Ted was real animated and a lot of fun and Carolyn at that time was head of the Republican party in Pima County. She had M.S. [multiple sclerosis]. She died on the floor of her garage in her condominium and wasn't found until three days later. She couldn't get up because of the M.S. She was using a walker. There were a million people, her friends, who would have loved to come and help her. She had so many friends. She was a gregarious woman. She was funny. She was delightful to be around. If she was in the room, you were having fun. She was never a complainer about her disease. You would never sense she had a disease, and she never complained. It was always getting worse. She died in her garage, The door was shut. I guess she was going out to her car. I'm pretty sure (but not positive) that Carolyn died before her husband, Ted.

Kathryn, my ex-wife, was an expert in English riding. We opened Condiss (my name) training stable where she taught kids to ride and train horses. I loved it. I cleaned the stalls and trailered all the horses for all the horse shows. We were on a horse-show circuit. She was very good. "Then I caught my ex-wife, Kathryn, committing adultery. Then she started going with a baseball player who had spring training in Tucson. She knew he was married. I was a cop at the time I married her. Then this baseball guy left Kathryn–walked out the door. He had a wife and family back at his house. She picked up a gun, and as he left and closed the door, she shot herself and killed herself. She was a hysterical girl. Before that, she picked up my police pistol over something ridiculous. I was trying to go to work, putting my uniform on, and she picked up my police gun and put it to her head. It took me about 15 minutes to talk her down–and it was over nothing. She was that way; she wanted to make statements all the time. And she was a cheater, too. She chased after pro athletes and this baseball guy that was shacking up with her–even though he was married. He said he couldn't do it any more; he was gonna leave. And he did. He heard the shot, and he came back and reported it. I suspect from being a cop–and I worked homicide–she angled the pistol against the side of her head, pointed up. I think she just wanted to scare him, but I'm not sure. I'm the only one who thinks she did not want to kill herself. I think she meant to shoot straight up, but when she pulled the trigger she accidentally jerked the gun. I think she meant to make a statement; that was her way. The bullet penetrated her skull, went around inside because it was a small caliber. I went to the hospital, met Ted and Carolyn there. They both loved me, and they were sorry for what she did to me. So we were very close friends. I saw Kathryn on the table. She was unconscious, in a coma. Eventually she died.

(2) Carolyn Yuki Takamine married a guy named Kramer [Theodore "Ted" W. Kramer III]. John married Carolyn's daughter. Carolyn's father [Jokichi "Jo" Takamine] committed suicide, did he not? I was told that he jumped out a window. Ted Kramer told me that again and again, as well as at the funeral of his daughter who committed suicide. They had no reason to tell me this if it weren't true. They weren't proud of it. Carolyn was never a liar. That family is prone to suicide. Carolyn and Ted had only two children. Kathryn had a brother named John, but John Condiss is fairly sure that Ted Kramer and Carolyn Takamine were not John's parents. He is quite sure that Kathryn Kramer was Ted and Carolyn's only child. John Condiss does not remember, if he ever knew, who John Kramer's parents were. John Condiss recalls: "Carolyn Yuki took to me like a son. We were very, very close. She came to my second wedding and was good friends with my new wife and myself. She was very happy that I found the girl that I found. She was the most interesting person in this family. Every Christmas she would bring us something she had made–I think it was for breakfast. She realized she had M.S. before meeting me, and [being born in May 1923] she was about 49-50 at the time. The M.S. was already apparent but she was still active, active, active in politics. I opened a restaurant and she filled it with people. When she came to my second wedding, she gave us a couple of real old Takamine-acquired dishes, made in Japan. She was with us every Christmas–came to my house. She and her husband, Ted, separated and eventually divorced. They were separated before Kathryn committed suicide. Ted came and lived with us–for a while. I liked Ted a lot, but he got pretty bossy about his daughter, Kathryn. One night I was making dinner. I put him in his place and told him he had to move. He was not going to come into my house and tell me how my wife and I should handle things. But we stayed friends. He started crying when I walked into the funeral home [after Kathryn's death]. They both loved me and I loved them. They were great people. And my 2nd wife loved them. John, Kathryn's brother–I think he committed suicide.

Note: John died on 27 June 1999 at age 57 at his home in Tucson. His wife was Dianna Kramer.

"John was a city attorney. I think he became a city judge, but I'm not sure. John got caught with marijuana–possession of marijuana. He was so arrogant he thought he

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could do anything. He really did a lot of terrible things to his wife. I don't mean beatings, just bad things. She was abused by him, not physically but sexually. He tired to get her to do things with his friends; it was terrible. Now I'm thinking it was his wife Marilyn who committed suicide or she died early–I'm not sure which one. He was a real jerk. She was a hospital delivery room nurse at Tucson Medical Center. We had become friends, and sort of stayed friends when we saw each other after Kathryn committed suicide and I was remarried. She helped deliver one of my kids. It was delightful having her in the room.

(3) What kind of person as Ted Kramer? "Ted was a friendly drunk. What was his business. I think he was a consulting engineer. He was a big talker. I invited him to stay with us because I was trying to help him. I'm a Greek guy; we take in family. Finally–I didn't yell at him. I just told him, Ted, it's not a pleasure having you here any more and I think you should find another place to stay. He did find another place but I don't know how much longer he lived after Kathryn's death. I lost track of him after Kathryn's funeral. Note: Ted Kramer died on 2 Nov. 2000 in Tucson, Arizona.

"Of Carolyn and Ted descendants, the only person I knew about was the fellow who committed suicide. Carolyn used to laugh with me about how she was blond even though her father was Japanese, and Kathryn was blond. Neither of them looked at all Japanese. Carolyn Yuki was a pretty woman, even during the time of her disease. And Kathryn was pretty. John didn't look like one of them. Ted was very thin and he drank too much. I know there was an aunt–probably on the Takamine side–that Carolyn was hoping she would inherit some money from. They were always talking about inheritance in that family–waiting for it. Actually Carolyn needed money near the end but she wasn't into thinking or talking about inheritance. She wasn't waiting to be the rich lady. She lived her life.

"I recently lost my Greek restaurant–The Olive Tree–after 32 years so I'm in pretty bad shape financially. Now I run a hot dog stand in Pinetop, Arizona. I'm earning much less money and having way more fun. But I'm struggling. My younger son is named Nick; his business is repairing and installing computers and video cameras.

John Constantine Condiss was born on 11 May 1944 in Chicago to Constantine John Condiss (who was born about 1916) and Jane Kourakos Condiss (who was born on 26 June 1922). They were married in about 1944. John was the eldest child; he had a brother, James, 2½ years younger than him. His father died at age 54 of a heart attack. "After I was a policeman, I joined up with two Greek guys. One was a chef from Detroit, the other was a cafe operator. They needed a Greek guy who spoke English. I had just married Kathryn. Deciding to stop being a cop was probably the hardest thing I have ever done. I was the first sniper in the state of Arizona and formed the first SWAT (Special Weapons and Tactics) team in the state. Went to the FBI academy and trained. I loved all of that. But I saw as I got promotions I was being taken off the street and put behind a desk. Then these guys made me an offer and I took it. They were both lazy so I learned everything they knew, I began cooking, then at one point told them not to bother coming in any more because they offended people. And after about 7 years I had to sue them to get my portion because I wanted out. Then I opened The Olive Tree, a Greek restaurant; we were written up in Gourmet magazine, New York Times, Los Angeles Times. I finally had to close it in about 2006. The no smoking ordinance hurt us. I had probably the most popular bar in town. Senator Jon Kyl and Senator John McCaine hung out there. It got to be where I lost $15,000 a month out of my pocket just from the smoking ordinance. Then the payroll tax was the last straw. Picture it this way; today I owe nothing on payroll and tomorrow I owe $100,000 a year out of my pocket. Then the sales tax in Arizona went up 3 times in two years. It all cut into my check. I had 38 to 42 employees. But I wasn't making money any more. We were grossing a million dollars every year. I went through 3 recessions. All my friends who had restaurants went under and I made it. I lost more money when the restaurant was packed at the end than when it was empty, because I could not raise my prices." John now lives in the White Mountains in eastern Arizona. Address: Pinetop, White Mountains, eastern Arizona.

11433. Shurtleff, William; Aoyagi, Akiko. comps. 2012. History of soynuts, soynut butter, Japanese-style roasted soybeans (*irimame*) and *setsubun* (with *mamemaki*) (1068-2012): Extensively annotated bibliography and sourcebook. Lafayette, California: Soyinfo Center. 590 p. Subject/geographical index. Printed 17 Dec. 2012. 28 cm. [1336 ref] • ***Summary:*** This is the most comprehensive book ever published about the history of soynuts, soynut butter, Japanese-style roasted soybeans (*irimame*) or *setsubun* (with *mamemaki*). It has been compiled, one record at a time over a period of 35 years, in an attempt to document the history of these unique soyfoods. It is also the single most current and useful source of information on this subject.

Contents: Search engine keywords. Dedication and acknowledgments. Introduction: What are soynuts and soynut butter? Roasted soybeans East and West. Brief chronology / timeline of soynuts and soynut butter (1068-2012). About this book. Abbreviations used in this book. How to make best use of this digital book–Search it. Six pages of color photos. Contains 114 photographs and illustrations. http://www.soyinfocenter.com/books/161. Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

11434. Shurtleff, William; Aoyagi, Akiko. 2012. The book of tofu: Protein source of the future–Now! 2nd ed. Revised. Lafayette, California: Soyinfo Center / www.createspace.

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com. 344 p. Dec. 22. Illust. by Akiko Aoyagi Shurtleff. Index. 28 cm. [321 ref]
• ***Summary:*** This edition, published as a print-on-demand book by www.createspace.com, is 8 pages longer than any previous edition. The entire Glossary (with all illustrations) from the original 1975 edition is included, as is the updated Preface, the complete "Directory of Tofu Manufacturers" in the Western world (as of Feb. 2001), and the complete bibliography of 321 entries. After the Index is an updated full page of information about Soyinfo Center, then the original photo of Shurtleff and Aoyagi in 1975 from the original edition, and updated page "About the Authors," with new photos of Bill and his son Joey at Yosemite in 1994 and Akiko Aoyagi Shurtleff at the Lafayette Reservoir in 1999.

Then comes the section "Sending Tofu in the Four Directions," with a new photo of William Shurtleff with his tofu master's family at Sangen-ya Tofu Shop during his apprenticeship period, Tokyo, circa 1974. On the last page is (1) Information about the book *Tofu & Soymilk Production* and (2) about the SoyaScan database, which now contains more than 90,000 records from 1100 B.C. to the present. To order a customized search of this remarkable database, contact Soyinfo Center at 925-283-2991 or www.soyinfocenter.com.

Thanks to Akiko for redesigning the front and rear covers, and for skillfully and artistically integrating all the pieces into this newly revised edition. Address: P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

11435. Deutsch, Jonathan; Murakhver, Natalya. 2012. They eat that? A cultural encyclopedia of weird and exotic food from around the world. Santa Barbara, California: ABC-CLIO, LLC. 220 p.
• ***Summary:*** The first entry under the letter "N" is "Natto. Natto is a traditional Japanese food." "Bacterial fermentation yields its strong earthy aroma, often compared to ripe cheese, rotten mushrooms, or body odor, and mucilaginous texture (*neba-neba* in Japanese), the combination of which makes natto an acquired taste for many."

"Natto's strong odor and status as an everyday breakfast food in some parts of Japan give it important iconic status. For foreigners living in or visiting Japan, enjoying natto is considered a sign of Japanese acculturation, of having made the transition from visitor to resident."

11436. Ishitsuka, Makoto. 2012. Ibaraki-ken nazotoki sanpo: nattô, ankô, nabe kara antoraa, su kômon sama made hitachinokkuni niwa ima mo mukashi mo miryoku ga ippai Ibaraki ni itte mippe [A walk through mysterious Ibaraki prefecture: natto...]. Tokyo: Shinjin-butsu Ooraisha. 287 p. 15 cm. Internet resource. Series: Shinjinbutsu bunko I-8-1. [Jap]*
• ***Summary:*** Mito, the capital of Ibaraki prefecture, located just north of Tokyo, is famous for its small-seeded soybeans, long preferred by manufacturers of natto.

11437. McDougall, John A.; McDougall, Mary A. 2012. The starch solution: Eat the foods you love, regain your health, and lose the weight for good! Emmaus, Pennsylvania: Rodale Press. xx + 348 p. [374 ref]
• ***Summary:*** This book presents the case against the "Paleo Diet." Dr. McDougall defines starches as follows (p. 7): (1) Grains: Barley, buckwheat, corn, millet, oats, rice, rye, sorghum, wheat, and wild rice. (2) Legumes: Beans, lentils, and peas. (3) Starchy vegetables: Carrots, Jerusalem artichokes, parsnips, potatoes, salsify, sweet potatoes, winter squashes (acorn, banana, butternut), yams. The least processed starches are the best; brown rice is better than white.

"You've probably heard about the benefits of a plant-based diet–one that reduces or eliminates animal foods like meat, dairy, and eggs. This concept does not go far enough. Without the addition of starch, a diet of low-calorie leafy greens like lettuce and kale, crucifers like broccoli and cauliflower, and fruits like oranges and apples will leave you feeling hungry and fatigued" (p. 8).

The Glycemic Index idea is incorrect (p. 160-63; foods such as potatoes and rice, which have relatively high GIs, are good for you).

Soy foods in Asian diets (p. 141). Not all soy foods are the same: The fake ones and the highly refined ones are not eaten in traditional East Asia diets. Those which are eaten are edamame (green vegetable soybeans boiled in their pods), soy milk, soybean sprouts, soy sauce, soy flour, tempeh, tofu, yuba, okara, miso, and natto. "A traditional family in Japan or China gets fewer than 5% of their daily calories from soy." Fake soy foods (highly processed) cause harm (p. 142-44). The most highly processed soy ingredient is soy protein isolates–to be avoided. Concerns over soy lead to changing recommendations–especially for infants (p. 144-45). Which soy foods are healthiest (p. 196).

The word "soy" appears on 75 pages in this book, "tofu" on 44 pages, "soy sauce" on 32 pages. "soy milk" on 21 pages, "soy foods" on 9 pages, "miso" on 6 pages, "soy protein isolates" and "soybeans" on 5 pages each, "edamame" and "soy flour" on 3 pages each, "tempeh" on 2 pages, and "natto," "soybean sprouts," "soy protein concentrates" and "textured soy flour" on 1 page each. Address: 1. M.D. Both: Santa Rosa, California. Phone: (707) 538-8609.

11438. Rushford, Jaime Salas; Benno, Yoshimi. 2012. Morinaga BB536: Japan's leading clinically proven probiotic. Salt Lake City, Utah: Woodland Publishing. 52 p. Illust. 22 cm.
• ***Summary:*** Morinaga BB536 is a probiotic, a proprietary strain of *Bifidobacterium longum* named *Bifidobacterium longum* BB536. It is highly stable and does not cause adverse

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effects.

Contents: Probiotics: What are probiotics?, It's about balance, why we need probiotics. types of probiotics, how probiotics work, the life and times of BB536.

Introducing Bifidobacteria and BB536: Bifidobacteria and intestinal health, what Bifidobacteria don't do, Bifidobacteria in the intestinal tract.

Benefits of *Bifidobacterium longum* BB536: Bifidobacteria, BB536 and intestinal health, gastrointestinal disorders, BB536 maintains intestinal health, diarrhea, constipation, probiotics and irritable bowel syndrome, probiotics and ulcerative colitis, probiotics and Chron's Disease, BB536 and allergies, BB536 and cholesterol, probiotics, BB536 and cancer, Bifidobacteria and infections in premature infants BB536 and bone strength.

Prebiotics: Feed your beneficial bacteria: Fructooligosaccharides, inulins, other prebiotics, benefits of prebiotics, *Bifidobacterium longum* BB536 and safety, is BB536 safe?, BB536 in functional foods.

References: General, intestinal health and gastrointestinal disorders, allergies, cholesterol, cancer, influenza, premature infants, osteoporosis, safety and stability, prebiotics.

Glossary. Appendix: Directory of leading organizations. About the authors. Address: 1. M.D.; 2. DVM, PhD.

11439. Shuldiner, Joseph. 2012. Pure vegan: 70 recipes for beautiful meals and clean living. San Francisco, California: Chronicle Books. 224 p. Illust. (color photos by Emily Brooke Sandor and Joseph Shuldiner). Index. 28 x 23 cm.
• ***Summary:*** Exquisite! Wonderful writing. Superb photography. Get this book–now! "The only vegan cookbook that celebrates eating and enjoyment rather than emphasizing the politics of a vegan lifestyle,..."

The word "tofu" appears on 38 pages in this book, "soy" on 13 pages, "soy sauce" on 5 pages, and "yuba" on 3 pages. The headnotes to Yuba spring rolls (p. 128-30) states: "Most Westerners aren't familiar with yuba, but I have a feeling that's about to change. A traditional food from China and Japan, yuba is the skin that forms on the surface of heated soymilk. It is gently lifted off the simmering soymilk in sheets and either used fresh or dried and then reconstituted. It has a slightly nutty flavor and a chewy texture." It is available at most larger Asian groceries. If unavailable, packaged egg roll wrappers make an acceptable substitute.

A full-page color photo (p. 129) shows sheets of yuba, a whole gingerroot, and several bottles of soy sauce. Address: Graphic designer, photographer, writer, and cook with a passion, Los Angeles.

11440. Marra, Toshie. 2013. Re: There is no entry for soybean sprouts in the *Nihon Kokugo Daijiten* (Japanese Language Dictionary). Letter (e-mail) to William Shurtleff at Soyinfo Center, Jan. 4. 1 p. 28 cm.
• ***Summary:*** She found there was no entry in this dictionary for any of the following: "daizu no moyashi," "daizu moyashi," or "moyashi daizu."

Note: Published by Sokgaku-kan, this is the largest Japanese language dictionary published. Based on historical principles, it resembles the *Oxford English Dictionary.* The 20-volume first edition was published from 1972 to 1976.

The 14-volume second edition was published from November 2000 to December 2001. It includes substantial additions to and improvements over the first edition. The height of each volume in the 2nd edition is much larger. The 2nd edition has roughly 500,000 entries and supposedly 1 million example sentences. It was composed under the collaboration of 3000 specialists, not merely Japanese language and literature scholars but also specialists of History, Buddhist studies, the Chinese Classics, and the social and physical sciences, over the course of 40 years. (Source: Wikipedia, at Nihon Kokugo Daijiten, Jan. 2013). Address: Reference Librarian, East Asiatic Library, Univ. of California, Berkeley.

11441. Colliver, Victoria. 2013. Prostate cancer: Soybean, mushroom extract offers hope. *San Francisco Chronicle.* Feb. 27. p. C2.
• ***Summary:*** In a study published in the journal *Endocrine-Related Cancer,* researchers at Cal Davis say a nontoxic extract cultured from soybeans and shiitake mushrooms could extend the life of prostate cancer patients who have not responded well to commonly used therapies.

The extract, known as genistein-combined polysaccharide, or GCP, is a proprietary pharmaceutical made by a Japanese company. Tests so far have been done only on cells in laboratories (in vitro) and in lab animals.

"Prostate cancer cells feed off testosterone, so many treatments for the disease focus on lowering testosterone levels."

11442. Canadian Soybean Council; Conseil Canadien du Soya. 2013. Canadian Soybean Council 2013 mission to Asia–a networking success (News release). Guelph, Ontario, Canada. 1 p. March 1.
• ***Summary:*** Guelph, Ontario (March 1, 2013)–Representatives from the Canadian soybean industry recently returned home from an international trade mission in Asia promoting Canadian soybeans. The theme of this year's program was Canada's commitment to soybean research and how the entire soybean industry works together to make sure Canada is providing the highest quality products to its customers.

"The program was held from January 27th–February 1st in the countries of Taiwan and Japan. The program was sponsored by the Canadian Soybean Council (CSC) and coordinated by the Canadian International Grains Institute (Cigi). Representatives for the program included individuals

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from CSC, Cigi, Grain Farmers of Ontario, the Canadian Grain Commission, the Canadian Soybean Exporters Association as well as an IP soybean farmer from Ontario.

"The trade mission was part of ongoing market development activities conducted by CSC to strengthen marketing opportunities for Canadian soybean producers..." Address: 100 Stone Road West, Suite 201, Guelph, ONT N1E 7K7, Canada.

11443. *SoyaScan Notes.* 2013. Three early students of soyfoods in Japan after World War II: A.K. Smith, William Brandemuhl, and William Shurtleff (Overview). April 15. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** Dr. A.K. Smith, had a strong academic background, having earned MA and PhD degrees from Columbia University. His interest in East Asian soyfoods began in about April 1948 when he began to write questions about fermented soyfoods to Lewis B. Lockwood, PhD and microbiologist. By June 1948 he had departed from the United States on a 3-month study tour that would take him to China, Japan and Korea. He collected samples of 100 microorganisms used in fermenting soyfoods. His articles on "Oriental use of soybeans as food" began appearing in *Soybean Digest* in Feb. 1949. He was mainly interested in fermented soyfoods; his articles about each food were accurate but relatively short.

William Brandemuhl studied soyfoods only in Japan. He arrived in Kyoto, Japan in Jan. 1963 and became a research fellow at the Department of Agricultural Economics, Kyoto University, Kyoto, Japan. Between Feb. 1963 and May 1964 (15 months) he conducted field research on soybean utilization in Japan. In June 1963 (after William had been in Japan for 4 months), Tomoko completed her graduate studies, graduated from the University of Wisconsin, and (since her scholarship was finished), returned to Japan–to be with William and to help him with his research in Japanese, which he spoke only moderately well. She traveled with him throughout Japan and translated for him during the many interviews he conducted. William's monthly check from Honeymead paid for his room and board–but not for his travel and research, so he had to work part time doing English translation for a Japanese company. On trips, he took many photos using his expensive Nikon camera. Tomoko's family lived near Kobe, where she and William were married on 8 Aug. 1964–three months after he finished his field research.

William's primary interests were: (1) To describe in detail, with photos, how each of different Japanese soyfoods were made. He was extremely thorough. (2) The place of each food in Japanese culture. (3) The industry of which each food was a part and its trade associations (if any). (4) The future of that food in Japan. He was not particularly interested in transmitting these foods and their technology to the United States, and he took almost no interest in carefully selecting names for these foods (or the equipment used to make them) which would give them the best chance of catching on in the best chance of catching on in the United States.

William Shurtleff first visited Japan for 3 months in the summer of 1967 while a student at Stanford University; he lived in a Zen temple in Kyoto, practiced meditation each evening, and studied Japanese language and culture. After graduating from Stanford and living for 2½ years at Tassajara Zen Mountain Center, he arrived in Japan on 16 Jan. 1971 with the intent of becoming fluent in Japanese so he could translate the writings of Dogen Zenji, an early Soto Zen master. For the first year he lived with a Japanese family in Kyoto and became a full-time student at the *Nihongo Gakko,* a Japanese language school in Kyoto. At the end of that year he moved to Kyoto, where he entered a university to continue his Japanese language studies. While in Tokyo, he became close friends with Akiko Aoyagi, a Japanese artist and cook. In Oct. 1972 he first visited and met Mr. Toshio Arai, a Japanese tofu master under whose guidance Shurtleff would later become an apprentice. In Dec. 1972 he started to write a booklet for Americans about tofu; he believed that tofu could be a very positive addition to the American diet and that young Americans would enjoy making tofu as a new occupation. On 13 Jan. 1973 he signed a contract with Autumn Press, a small publishing company in Japan owned by Americans Nahum and Beverly Stiskin. For the next 2½ Shurtleff and Aoyagi researched and wrote *The Book of Tofu,* which was published in Dec. 1975. Shurtleff made enough money to live in Japan by working as an interpreter, translator and researcher for his father's tool company. The story of this adventure is told in the Preface to *The Book of Tofu* (see 2001 or subsequent editions). Shurtleff's interests and work were different from those of William Brandemuhl in several important ways: (1) He spoke very good Japanese. (2) His initial focus was almost entirely on tofu, although he later wrote a book about miso. (3) He was just as interested as Brandemuhl in describing accurately how tofu (and other soyfoods) were made in Japan, but primarily with the intent of transferring this technology to the United States and other parts of the world. To this end he was deeply interested in choosing names for soyfoods and equipment that would help them take root in their hew homes. On 13 June 1978 Shurtleff and Aoyagi, after being married, moved from Japan to live in the United States. For the rest of his life Shurtleff did research on and wrote books about soyfoods, and simultaneously worked to introduce them to the United States. By late 1999 soyfoods had become important foods in the USA; soy sauce, soymilk and tofu had become mainstream foods.

11444. Shurtleff, William; Aoyagi, Akiko. comps. 2013. History of tofu and tofu products (965 CE to 2013): Extensively annotated bibliography and sourcebook.

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Lafayette, California: Soyinfo Center. 4004 p. Subject/geographical index. Printed 20 May 2013. 28 cm. [13302 ref] • ***Summary:*** This is the most comprehensive book ever published about the history of tofu or tofu products. It has been compiled, one record at a time over a period of 35 years, in an attempt to document the history of this ancient and interesting soyfood. It is also the single most current and useful source of information on this subject.

Contents: Search engine keywords. Dedication and acknowledgments. Introduction: Brief chronology / timeline of tofu and tofu products. About this book. Abbreviations used in this book. How to make best use of this digital book–Search it. Ten pages of color photos. Contains 538 photographs and illustrations. http://www.soyinfocenter.com/books/163.

Brief chronology of tofu and tofu products.

965 CE–Tofu is first mentioned in China in a document, the Qing Yilu (Wade-Giles: Ch'ing I Lu) [Anecdotes, Simple and Exotic], by Tao Ku. It states: "In the daily market were several catties of doufu. People of the region called doufu the 'vice mayor's mutton.'" It goes on to tell the story of a vice mayor named Jishu, who was so poor that he couldn't afford to buy mutton. Instead he bought a few pieces of tofu every day and ate them as a side dish with rice. Soon people in the area came to call tofu the "vice mayor's mutton." The story implies that tofu was widely consumed in China in those days and that it was less expensive than mutton.

1183–Tofu is first mentioned in Japan in the diary of Hiroshige NAKAOMI, a Shinto priest of the Kasuga shrine at Nara; the tofu was used as an offering at the shrine's altar.

1457–The word "tofu" is first written in Japan with the characters used today.

1603–The word "tofu" is first mentioned in a European-language (Portuguese) document, Vocabulario da lingoa de Iapam... [Vocabulary of the language of Japan], the earliest dictionary of the Japanese language compiled by Europeans (Jesuits living in Nagasaki, Japan). Tofu is referred to as Cabe, Tôfu, or Taufu.

1613–The word tofu is first referred to (though indirectly) for the second time by a Westerner, Captain John Saris, in the log of his trip to Japan. He wrote "Of Cheese [probably tofu] they haue plentie. Butter they make none, neither will they eate any Milke, because they hold it to bee as bloud [blood], nor tame beasts." This is the earliest English-language document that mentions tofu in connection with Japan.

1665–Tofu is first mentioned specifically by a Westerner, Domingo Fernández de Navarrete, in his book A Collection of Voyages and Travels. Navarrete, who served as a Dominican missionary in China, wrote: "Before I proceed to the next chapter, because I forgot it in the first book, I will here briefly mention the most usual, common and cheap sort of food all China abounds in, and which all men in that empire eat, from the emperor to the meanest Chinese, the emperor and great men as a dainty, the common sort as necessary sustenance. It is call'd teu fu, that is, paste of kidney-beans. I did not see how they made it. They draw the milk out of the kidney-beans, and turning it, make great cakes of it like cheeses, as big as a large sieve, and five or six fingers thick. All the mass is as white as the very snow, to look to nothing can be finer. It is eaten raw, but generally boil'd and dressed with herbs, fish, and other things. Alone it is insipid, but very good so dressed and excellent fry'd in butter. They have it also dry'd and smok'd, and mix'd with caraway-seeds, which is best of all. It is incredible what vast quantities of it are consum'd in China, and very hard to conceive there should be such abundance of kidney-beans. That Chinese who has teu fu, herbs and rice, needs no other sustenance to work; and I think there is no body but has it, because they may have a pound (which is above twenty ounces) of it any where for a half-penny. It is a great help in case of want, and is good for carriage. It has one good quality, which is, that it causes the different airs and seasons, which in that vast region vary much, to make no alteration in the body, and therefore they that travel from one province to another make use of it. Teu fu is one of the most remarkable things in China, there are many will leave pullets for it. If I am not deceiv'd, the Chineses of Manila [Philippines] make it, but no European eats it, which is perhaps because they have not tasted it, no more than they do fritters fry'd in oil of Ajonjoli ([sesame seed] a very small seed they have in Spain and India, which we have not) which the Chineses make in that city and is an extraordinary dainty."

1704–Friar Domingo Navarrete's book is published in English. This is the earliest English-language document that mentions tofu in connection with China.

1770 Jan. 3–James Flint in Capringe writes Benjamin Franklin in London (in response to an inquiry from Franklin) a detailed description of how the "Chinese convert Callivances into Towfu" (soybeans into tofu).

1770 Jan. 11–The earliest document seen in which an American mentions tofu is a letter written by the famous Benjamin Franklin (who was in London) to John Bartram in Philadelphia, Pennsylvania. He sent Bartram some soybeans (which he called "Chinese caravances") and with them he sent "Father Navarrete's account of the universal use of a cheese made of them in China, which so excited my curiosity, that I caused enquiry to be made of Mr. [James] Flint, who lived many years there, in what manner the cheese was made, and I send you his answer. I have since learned that some runnings of salt (I suppose runnet) is put into water, when the meal is in it, to turn it to curds."

1821–The second earliest reference seen to tofu in America, and the first to be published in the USA, appeared when A.F.M. Willich of Philadelphia mentioned it in The Domestic Encyclopedia. Speaking of soybeans (which he called "the seeds of the Chinese plant Dolichos soja"), he writes: These seeds are used in China and Japan as food; they

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are made into a kind of jelly or curd, which is esteemed very nutritious, and which is rendered palatable by seasonings of different kinds."

1870 Dec.–The term "Bean curd" is first used by Emil V. Bretschneider, writing in English in the *Chinese Recorder and Missionary Journal* (Foochow, p. 173). He says: "Bean-curd is one of the most important articles of food in China." Then he gives an accurate description of how it was made.

1880–Tofu is first made in Europe by Paillieux, in France, for the Society for Acclimatization (but not on a commercial scale).

1878–The earliest tofu company in the USA, Wo Sing & Co., is in business at 708½ Dupont St. in San Francisco, making both fermented and regular tofu.

1896 June–Tofu first appears in print in an American scientific journal (*American Journal of Pharmacy*), in an article by Henry Trimble, a pharmacist, titled "Recent Literature on the Soja Bean."

1905–Five tofu shops are now owned and operated by Japanese in the United States: (1) Minato-ya, 24½ Quincy St., San Francisco, California. (2) Murata-ten (Renamed Murata Tofu-ya by 1906), P.O. Box 51, Isleton, California. (3) Nishi Tofu-ya, 87 Japanese Alley, Sacramento, California. (4) Okumura Kuraoka Tofu-ya [Tofu Shop] (Renamed Okumura Tofu-ya by 1906), 632 N. 6th St., San Jose, California. (5) Ichino Tofu-ya / Shintaro Kodama, 446 Jackson St., Los Angeles, California. Note that all are located in California. (Source: Zaibei Nippon-jin Nenkan; The Japanese-American Yearbook. 1905).

The first Japanese tofu shop in Washington State was in operation by 1906 (in Seattle); in Utah by 1907 (Ogden); in Nevada by 1908 (Reno); in New York by 1911 (Brooklyn, NYC), and in Idaho by 1913 (Sugar City). Thus, almost all of the earliest known tofu shops in the United States were started by people of Japanese ancestry–most of them in small communities in California, Oregon and Washington.

By 1910 at least 61 Japanese tofu shops had been established in the USA, by 1920 at least 166, by 1930 at least 293, by 1940 at least 392, and by 1950 at least 425. Continued. Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

11445. Nakamura, M. 2013. Kibun's interest in and involvement with soymilk (Interview). *SoyaScan Notes.* July 11.
• ***Summary:*** Kibun Food Chemifa is now 100% owned by Kikkoman. Address: Home Economist for Kibun, Japan. Phone: 544-2781.

11446. Nakamura, Mitsunoba. 2013. Re: When did Kikkoman acquire Kibun Food Chemifa Co., Ltd? Letter (e-mail) to William Shurtleff at Soyinfo Center, July 12–in reply to inquiry. 1 p.
• ***Summary:*** In Kikkoman's 2012 Annual Report, the "Corporate History" section states: "2008 August–Kibun Food Chemifa Co., Ltd. (now Kikkoman Soyfoods Company) becomes a wholly owned subsidiary of Kikkoman."

Mr. Nakamura found in other news that Kibun had been acquired via a share swap.

In 2004 Kikkoman first invested in Kibun Food Chemifa.

In June in 2006 Kibun Food Chemifa became a consolidated subsidiary of Kikkoman in June 2006 Address: Kikkoman International Inc., P.O. Box 420784, San Francisco, California 94142-0784.

11447. Nakamura, Mitsunoba. 2013. Re: The soymilk industry and market in Japan today. Letter (e-mail) to William Shurtleff at Soyinfo Center, July 23–in reply to inquiry. 1 p.
• ***Summary:*** Mr. Nakamure got these statistics by e-mail from Kikkoman's headquarters in Japan. The leading manufacturers of soymilk in Japan today are:

1. Kibun (Kikkoman) 53%
2. Marusan 20%
3. Meiraku 10%
4. Sugoi Daizu (Otsuka) 5%
5. Toraku 4%

Others 8%

In 2012 the total shipment of soymilk in Japan was 256 million kiloliters. In 1984 it was 110 million kiloliters. Therefore Japanese are consuming a little more than twice as much soymilk today as they were in 1984.

The value of the soymilk market in Japan is approximately 45,000 to 50,000 million yen (about US$450 million to $500 million). Address: Kikkoman International Inc., P.O. Box 420784, San Francisco, California 94142-0784.

11448. Shurtleff, William; Aoyagi, Akiko. comps. 2013. History of soymilk and other non-dairy milks (1226-2013): Extensively annotated bibliography and sourcebook. Lafayette, California: Soyinfo Center. 2,972 p. Subject/geographical index. Printed 30 Aug. 2013. 28 cm. [8761 ref]
• ***Summary:*** This is the most comprehensive book ever published about the history of soymilk and other non-dairy milks. It has been compiled, one record at a time over a period of 35 years, in an attempt to document the history of these interesting beverages. It is also the single most current and useful source of information on this subject.

Contents: Search engine keywords. Dedication and acknowledgments. Introduction: Brief chronology / timeline of soymilk and other non-dairy milks. About this book. Abbreviations used in this book. How to make best use of this digital book–Search it. Eight pages of color photos. Contains 233 photographs and illustrations. http://www.soyinfocenter.com/books/166.

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Contents: Scope for Soymilk: This book focuses on the use of soymilk as a beverage. Soymilk has long been the most widely consumed non-dairy milk worldwide. Soymilk also appears as a step in the process for making tofu, yuba, soy yogurt, soy ice cream, soy cheese, fermented soymilk (incl. soy acidophilus milk), etc. Each of these soy products is or will be the subject of a separate book.

Amazaké, a thick fermented non-dairy rice beverage from Japan, usually served hot, topped with a dab of grated gingerroot, is also the subject of a separate book.

Use in East Asia: Only in China has soymilk (*doujiang*) long been used as a beverage. Traditionally it was been served hot, ladled from a caldron for breakfast, at the place where it was made either sweetened or as the base of a salted soup served with deep-fried crullers. It was not used to feed infants or as an infant formula.

Starting in the 1920s, a small number of companies in China started to make and sell bottled soymilk.

In Hong Kong, Vitasoy was launched in 1940 by K.S. Lo as a nutritious food for refugees fleeing during World War II. By 1968 it had captured 25% of the Hong Kong soft drink market, second only to Coca-Cola.

In Japan, bottled soymilk arrived in about 1957. The first soymilk boom started in about 1980; the many brands of soymilk were all sold in 180 ml aseptic cartons.

In the United States and Europe, soymilk started to become popular in the 1980s. The first two brands sold nationwide were Vitasoy and Edensoy, both aseptically packaged so they did not need refrigeration. The first superstar of soymilks, Silk, was launched by White Wave of Boulder, Colorado, in early 1996. It was sold in the dairy case in gable-top cartons that looked like typical milk cartons.

The first widely popular rice milk was Rice Dream, launched in June 1990 by Imagine Foods of Palo Alto, California

Brief chronology of soymilk and other non-dairy products.

1226–Kitab al-tabik [A Baghdad Cookery Book], by al-Baghdadi et al. is the earliest document seen that mentions a non-dairy milk–almond milk.

1365?–Yiya Yiyi [Remnant Notions from I Ya], by Han Yi is the earliest document seen that mentions soymilk, which it calls doufujiang.

1390–"Almond milk" is first mentioned in English in The Forme of Cury. It came to be widely used in Europe during Lent–the first popular non-dairy milk in the Western world.

1640 ca.–Soymilk is probably in use in China by the beginning of the Qing dynasty (H.T. Huang 2006).

1704–Soymilk is first mentioned in English by Domingo Fernandez Navarrete in his book A Collection of Voyages and Travels. Navarrete served as a Dominican missionary in China.

1790?–An undated painting of hawkers selling soymilk (doujiang) in China, by Yao Wenhan, is from the Qing dynasty.

1790–Soymilk is mentioned by Juan de Loureiro in his book The Flora of Cochin China. Loureiro was a Portuguese Jesuit missionary who lived in what is now Vietnam. He notes that soymilk is part of the process for making tofu.

1866–Soymilk is first discussed as a drink in its own right by the Frenchman Paul Champion, who traveled in China. In a French-language article he stated that the Chinese had taken their cups to tofu shops to get hot soymilk, which they drank for breakfast.

1896 June–Soymilk is first referred to in the United States by Henry Trimble in the American Journal of Pharmacy.

1897 July 7–The term "soy-bean milk" (or any cognate / relative thereof) first appears in a USDA or U.S. government publication: C.F. Langworthy. 1897. "Soy beans as food for man." USDA Farmers' Bulletin No. 58. p. 20-23. July 7. The table, titled "Comparison of the composition of soy-bean milk and cows' milk," gives the nutritional composition of the two liquids. The same term next appeared in Dec. 1916 in a USDA Bulletin by Piper & Morse, and then on 7 Feb. 1917 in a USDA Weekly News Letter.

1897 Nov. 16–Peanut cream and peanut butter are now being made in Kokomo, Indiana by Lane Bros. (Kokomo Daily Tribune, p. 4). This is the earliest document seen that contains the term "peanut cream."

1899–Almeda Lambert of Battle Creek, Michigan, in her book Guide for Nut Cookery, describes how to make "peanut butter, peanut cream, peanut milk, raw peanut milk and cream, almond milk, hickory milk, pine-nut milk, chufas milk and cocoanut milk" at home. This is the earliest document seen that contains the term "peanut milk" or the term "cocoanut milk."

1906 April–Katayama, in Japan, reports that he has made "A condensed vegetable milk" from soy-beans.

1909–The first soy-based infant formulas and soymilk made from full-fat soy flour are developed in the United States by John Ruhräh, a pediatrician. He reports his results in the Archives of Pediatrics (July 1909).

1910–The world's first soy dairy, named Caséo-Sojaïne, is founded by Li Yu-ying, a Chinese citizen, biologist and engineer, at 46-48 Rue Denis Papin, Les Vallées, Colombes (near Asnières), a few miles northwest of Paris. In December 1910 he applies for the world's first soymilk patents (British Patents No. 30,275 and 30,351). The first patent is titled "Vegetable milk and its derivatives." He is issued both patents in Feb. 1912.

1913 June 13–Li Yu-ying is issued the first U.S. soymilk patent (No. 1,064,841), titled "Method of manufacturing products from soja." He filed the application on 10 Oct. 1911.

1914–Maria M. Gilbert, in her book Meatless Cookery,

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gives a recipe for "Rice milk."–the earliest know use of this term.

1917–Soymilk is being produced commercially in the U.S. by J.A. Chard Soy Products in New York City.

1921 Sept. 23–Vita Rice Products plans to build a factory to make "rice milk products," including Vita Rice Milk, in San Francisco (San Francisco Business, p. 20).

1921–Leon Rouest of France gives the first detailed discussion (in French) of calf-milk replacers based on soymilk.

1929 Nov.–T.A. Van Gundy, founder of La Sierra Industries in Arlington, California, launches La Sierra Soy Milk, and becomes the first Seventh-day Adventist worldwide to make soymilk commercially. The product was canned and the beany flavor removed by live steam processing.

1929 Dec.–Bottled soy bean milk is now widely made and sold in China. "One large factory in Peking now makes and distributes over a thousand bottles of [soy] milk daily; in Shanghai two factories each meet an even greater daily demand. The industry is bound to grow rapidly to greater dimensions" (Adolph and Wang 1929).

1931–Madison Foods of Madison, Tennessee, introduces Madison Soy Milk–the world's earliest known soymilk to be fortified with calcium and the second commercial soymilk product made by Seventh-day Adventists in the USA. Madison Foods is a company run by students and faculty within Madison College, a pioneering work/study school.

1936 Jan.–Dr. Harry W. Miller and his son, Willis, start making Vetose Soya Milk, sold in natural or chocolate flavors in sterilized half pint or quart bottles at their Vetose Nutritional Laboratories in Shanghai, China. Dr. Miller is a Seventh-day Adventist physician, a student of Dr. John Harvey Kellogg, and a medical missionary living in China. The world's first "soy dairy," this company also made soy ice cream and Acidophilus Vetose (a cultured soya milk)–both launched in Jan. 1936. But Japan was invading China. Within months after the soy-milk business began booming, a Japanese bomb blew up the soy dairy.

1936 April–The earliest known English-language document to contain the modern word "soymilk" is: Miller, Harry W.; Wen, C. Jean. 1936. "Experimental nutrition studies of soymilk in human nutrition." Chinese Medical Journal 50(4):450-59. April. Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

11449. Kikkoman Corporation. 2013. Annual report 2013. Year ended March 31, 2012. 250 Noda, Noda-shi, Chiba 278-8601, Japan. 51 p. 28 cm. [Eng]

• ***Summary:*** Net sales in yen increased by 6.0% to ¥300,200 million. Net income in yen increased by 22.6% to ¥11,012 million.

A very interesting section titled "The Kikkoman Group's growth story" (p. 6-13) states: Long-term strategies of globalization and diversification have spurred a strong phase of growth for the Kikkoman Group. A bar graph shows overseas soy sauce sales volume [volume sold] from 1974 to 2013. It has increased from about 10,000 kl in 1974 to 187,000 kl in 2013, an increase of almost 19-fold. A pie chart shows that about 80% of the volume is in the USA, 11% is in Europe, and 9% in Asia and Oceania.

In North America (p. 8) soy sauce sales have increased by 31% since 2002 for a compound annual growth rate (CAGR) of 2.5%. Kikkoman has a 56.3% share of the U.S. home-use market.

In Europe (p. 9) soy sauce sales have increased 3.23-fold since 2002 for a compound annual growth rate (CAGR) of 11.2%.

In Asia and Oceania (p. 9) soy sauce sales have increased by 42% since 2002 for a compound annual growth rate (CAGR) of 3.3%.

Japan (p. 10) Kikkoman is the leading maker of soy sauce, with a 31.0% share of the Japanese soy sauce market (including Group company Higeta Shoyu Co., Ltd.). Also in Japan the soy milk market is expanding, so in June 2013 Kikkoman opened its 3rd domestic soymilk plant in Ibaraki. For calendar year 2012, Kikkoman had a 52.6% share of the Japanese soymilk market.

A photo (p. 2) shows Yuzaburo Mogi (Honorary Chief Executive Officer and Chairman of the Board of Directors) and Noriaki Horikiri (President and CEO).

Note: For some reason, that is not explained in this report, during the past year Noriaki Horikiri replaced Mitsuo Someya as President and CEO of Kikkoman.

On page 3 we read that Kikkoman's sales of soy sauce decreased but "this was outweighed by growth in sales of food products and sake and wine. Strong sales of soy milk and Del Monte beverages also contributed to growth. In overseas operations, sales of soy sauce grew steadily, centered on North America and Europe." Address: Noda, Japan.

11450. Shurtleff, William; Aoyagi, Akiko. comps. 2013. History of soy ice cream and other non-dairy frozen desserts (1899-2013): Extensively annotated bibliography and sourcebook. Lafayette, California: Soyinfo Center. 782 p. Subject/geographical index. Printed 1 Oct. 2013. 28 cm. [1838 ref]

• ***Summary:*** This is the most comprehensive book ever published about the history of soy ice cream other non-dairy frozen desserts. It has been compiled, one record at a time over a period of 35 years, in an attempt to document the history of these interesting desserts. It is also the single most current and useful source of information on this subject.

Contents: Search engine keywords. Dedication and acknowledgments. Introduction: Brief chronology / timeline of soy ice cream and other non-dairy frozen desserts. About this book. Abbreviations used in this book. How to make

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best use of this digital book–Search it. Seven pages of color photos. Contains 203 photographs and illustrations. http://www.soyinfocenter.com/books/167.

Contents: Background and context: Soy ice cream is largely a United States phenomenon. This is not surprising. The USA has the world's largest per capita consumption of (dairy) ice cream. As a result of the U.S. counterculture and vegetarian movements of the 1960s and 1970s, America was home to a large number of entrepreneurs with new ideas. And the number of Americans who keep a kosher diet has long been very large. Kosher rules say that one cannot eat meat and dairy products at the same meal; hence an interest in developing non-dairy products.

Moreover, the soyfoods movement originated in the United States in the early 1970s, and by the end of this decade was steadily developing momentum. Many of the entrepreneurs who developed soy ice creams were involved with other soyfoods before they branched out into soy ice creams and other non-dairy frozen desserts.

Brief chronology of soy ice cream and other non-dairy frozen desserts.

1899–Almeda Lambert, a Seventh-day Adventist of Battle Creek, Michigan, in her *Guide for Nut Cookery* (452 p.), publishes the world's earliest known recipes for non-dairy ice creams: Ice cream (made of almond or peanut cream). Ice cream made of peanut milk. Almond ice cream.

1918 March–Arao Itano of Japan is the world's first person to conceive of making an ice cream from soy. In an article titled "Soy beans as human food, in the *Massachusetts Agricultural Experiment Station Bulletin* No. 182 he states "Vegetable butter, ice cream, oil (table use) and lard (cooking): The manufacture of these articles from soy beans further investigation."

1921 April–At a meeting of the Ways and Means Committee of the U.S. House of Representatives, George Washington Carver, a professor at the Tuskegee Institute, "astonished both the members and spectators with visible proof that he can manufacture one hundred and forty-five different foods and useful articles, including milk and cream, from peanuts." From it he has also made ice cream, which he says was the finest he ever tasted (St. Louis Globe Democrat, April 3, p. 3).

1922 Nov. 28–Lee Len Thuey, a citizen of the United States and a resident of Indianapolis, Indiana, is the world's first person to be issued a patent for a soy ice cream. Titled "Frozen confection and process of making same," he filed the application on 18 Oct. 1920. It was made from tofu, flavoring, and a sweetener.

1930 Sept.–The term "soybean ice cream" first appears in the Proceedings of the American Soybean Association (p. 3-6). At 12:00 noon a "special soybean lunch" was served at the University of Illinois South Farm, prepared by ladies of the First M.E. Church. The desserts were "soybean ice cream, and soybean ice."

1930–The world's first commercial soy ice cream is introduced by Jethro Kloss, a Seventh-day Adventist, at Takoma Park Station, Washington, DC. Named Soy Ice Cream and honey sweetened, it is sold in strawberry, chocolate, and vanilla flavors. He named his company the Scientific Food & Benevolent Association. By 1934 he was serving his soy ice cream at his lectures in Florida (Miami Daily News, 1934, April) and in 1935 he included a recipe for soy "Ice cream" (non-dairy; made with "4 qts. Soy bean milk") in his herbal classic Back to Eden (p. 105).

1930s early–Henry Ford's soy researchers, Robert Boyer and Edsel Ruddiman, develop an experimental soy ice cream at Greenfield Village in Detroit, Michigan. It is based on fresh tofu curds and soy protein isolates. By August 1935 Henry Ford was serving soy ice cream for dessert at VIP and press luncheons held at the Ford Engineering Laboratory in Dearborn (Literary Digest 1935 July 27; Simonds 1938; Strother 1961).

1936–Vetose Nutritional Laboratories in Shanghai, China (run by Dr. Harry W. Miller and his son, Willis, both Seventh-day Adventists), starts to sell soy ice cream in small quantities (Raymond Moore, 1961, p. 182).

1945 April 16–The term "frozen dessert" is first used in connection with soy in an article titled "Who's who and why" (about Herbert Marshall Taylor and Delsoy), by Fred L. Olmsted, published in the Detroit News (p. 4).

1945–The modern term "soy ice cream" first appears in that remarkable book *The Useful Soybean: A Plus Factor in Modern Living*, by Mildred Lager of Southern California. In her "recipe" for "Soy ice cream" (p. 250) she notes that "Soy milk may be used in place of regular milk in ice-cream recipes."

1946 March–The word "dairylike" first appears in connection with soy in an article titled "Imitation or improvement? Dairy `replacement' products widening market, seeking to equal margarine's success," by Lawrence E. Doherty in Food Business (p. 22-23, 56).

1951–Robert Rich, founder of Rich Products Corporation of Buffalo, New York, introduces Chill-Zert–a non-dairy soy ice cream (Buffalo Evening News, 1952). Rich had learned how to make soymilk from Henry Ford's researchers. The U.S. Food and Drug Administration (FDA) seized the product, claiming that it should be labeled "imitation chocolate ice cream." Rich Products fought back, in state after state, and eventually won. All subsequent makers of non-dairy ice cream owe Robert Rich a huge debt of gratitude.

1968 May–In their classic vegan cookbook, *A Good Cook–Ten Talents,* Frank and Rosalie Hurd (both Seventh-day Adventists; he is a Doctor of Chiropractic) have five recipes for non-dairy ice creams, one in which "rich soy milk" is an ingredient and four in which "soy milk powder" is an optional ingredient.

1969 Aug.–The term "non-dairy frozen dessert" first

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appears in an article titled "How to make parevine," by Wendell S. Arbuckle in the American Dairy Review.

1971–Heller Enterprises of New York launches Heller's Non-Dairy Frozen Dessert, perhaps the first commercially successful non-dairy frozen dessert based on isolated soy proteins.

1976 Aug.–A new wave of interest in soy ice creams begins with the introduction of Ice Bean by Farm Foods in San Rafael, California. Developed at The Farm in Summertown, Tennessee, it was soon sold nationwide.

1979 summer–Pesach Lazaroff introduces David Mintz to tofu. That summer Lazaroff spent more than 100 hours working with Mintz as a consultant.

1980 July–Jolly Licks Ice-C-Bean is introduced by Mark Brawerman of San Francisco, California. Marketed and distributed by Jolly Licks, it is sold in six flavors. Later that month the product name is changed to simply Jolly Licks and the name of the marketer-distributor is changed to Pacific Trading Co. In Nov. 1982 Pacific Trading Co. was renamed Living Lightly.

1980 Dec.–Farm Foods starts a national ad campaign for Soy Ice Bean with full-page color ads in national magazines: *New Age, Whole Foods, East West Journal,* and *Vegetarian Times.*

1981 Aug.–Tofutti is first sold at Mintz's Buffet, a kosher Jewish deli on Third Ave. in Manhattan's chic Upper East Side. Developed by David Mintz (and Pesach Lazaroff) this was the product that made soy ice creams famous and attracted huge amounts of free media publicity. Tofutti was first sold in this deli as a soft-serve non-dairy frozen dessert in 9 flavors. During the previous two months it had been sold in the deli under other names: Tofu Time Non-Dairy Frozen Dessert (the first flavor was carrot-raisin), then Tofu Time Tofu Ice Kream.

1982 June–Farm Foods presents Ice Bean at the American Booksellers Convention in Anaheim, California.

1982 July–The term "Dairy free" first appears in a leaflet titled "Tofutti: Dairy free," created by Mintz's Buffet of New York City.

1982–Tofutti begins to be sold outside Mintz's deli in New York City, including at a number of the city's most stylish eateries–such as Bloomingdale's and Zabar's.

1983 April–Rice Dream, a non-dairy frozen dessert based on amazake (cultured rice) in launched in 3 flavors in pints by Gloria Gilbert, owner of Fresh Foods, in Boulder, Colorado. The product had been developed in 1980 (non-commercially) by Barbara Svenning and Marty Roth in Santa Fe, New Mexico. They sold their business, Community Kitchens, to Gloria. Steve Demos of White Wave in Boulder made Gloria's Rice Dream. It was on the market for only 3-6 months. On 10 Feb. 1984 Robert Nissenbaum (who was already making amazake) purchased the name Rice Dream from Gloria for $2,000.

1983 June–The world's first non-dairy ice cream sandwich is launched by Farm Foods of Summertown, Tennessee. Made of Ice Bean (soy ice cream) sandwiched between two carob coated honey wafers, it comes in three flavors: Honey Vanilla, Carob, or Peanut Butter. Continued. Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

11451. Gildersleeve, Colleen. 2013. Discovery of antique Choshi Shoyu Co., Ltd. soy sauce bottle in Oregon (Interview). *SoyaScan Notes.* Oct. 7.

• ***Summary:*** The glass bottle, which can be dated using the company name, is about 100 years old. The color is turquoise and height is about 20 inches. Around the bottom of the bottle is written: Choshi Shoyu Trade Mark. The Choshi company logo, which appears in raised glass on the bottle, is located between the words "Trade" and "Mark."

She writes: "My parents Leland and Sybil Lambert, Leland having been raised on the 'home place' returned to Oregon in 1952 and purchased the adjoining 100 acres that lay directly to the west, which is now the address 40565 SW Gibson Rd. This Leland Lambert property was where I found the bottle in the woods 'dump.'"

"I remember my father talking about a Japanese family of onion farmers whose last name was Furukawa, who lived very locally (perhaps on the adjacent lot) the 1940's era." Address: Lambert Farm, 14750 SW Spring Hill Rd., Gaston

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(Willamette Valley), Oregon 97119.

11452. Shurtleff, William; Aoyagi, Akiko. comps. 2013. History of early named soybean varieties in the United States and Canada (1890-2013): Extensively annotated bibliography and sourcebook. Lafayette, California: Soyinfo Center. 961 p. Subject/geographical index. Printed 12 Oct. 2013. 28 cm. [2119 ref]

• ***Summary:*** This is one of the most comprehensive books ever published about early named soybean varieties in the United States and Canada. It has been compiled, one record at a time over a period of 35 years, in an attempt to document the history of this interesting subject. It is also the single most current and useful source of information on this subject.

Contents: Search engine keywords. Dedication and acknowledgments. Introduction: Brief chronology / timeline of early named soybean varieties in the United States and Canada. About this book. Abbreviations used in this book. How to make best use of this digital book–Search it. Nine pages of color photos. Contains 85 photographs and illustrations. http://www.soyinfocenter.com/books/168.

Contents: Background and context:

Background: The soybean was introduced to North America in 1765 by Samuel Bowen, a seaman employed by the East India Company, who brought soybeans to Savannah, The Colony of Georgia, from China via London (Hymowitz & Harlan 1983). The second soybean introduction to North America was by Benjamin Franklin. In 1770 he sent seeds from London to the botanist John Bartram in Philadelphia, Pennsylvania. In 1851 the soybean was introduced to Illinois (via California), and thence to the rest of the Corn Belt by Benjamin Franklin Edwards (Hymowitz 1987). By the year 1889 there were only a small number of soybean varieties in North America and none of them had names.

In 1890 C.C. Georgeson et al. described four soy beans, two of which Georgeson had brought to Kansas from Japan where he had been a professor. Two of the soy beans had Japanese names and two had descriptive / generic English names.

Also in 1890 William P. Brooks described two soja beans which he had brought to Massachusetts from Japan. One soy bean variety had a Japanese name and one had a descriptive / generic English name.

The main contributions of this book are to clarify the earliest known date that each new, named soybean variety was mentioned in print or old letters, and (2) the relative importance of early named varieties based on how often each was mentioned in the literature. Working over several decades, we have searched our SoyaScan database of more than 90,000 records to find the earliest date mentioned. Moreover, we carefully cite the source of our information on each variety.

Which old soybean varieties are mentioned most often in the literature? The following is a list of the number of different documents in this book in which the most popular varieties are mentioned–in descending order of popularity:

Ito San–420
Manchuria–324
Mammoth Yellow–303
Peking–246
Virginia–241
Hollybrook–234
Haberlandt–232
Wilson–231
Biloxi–221
Medium Green–199
Otootan–173

What is a variety? All soybeans are members of the same genus and species–*Glycine max* (L.) Merr. However, just as there are many types of apples (Granny Smith, McIntosh, Golden Delicious), so there are many varieties (called "cultivars"–cultivated varieties–by professionals) of soybeans–each having slightly different characteristics and germplasm. Only the most promising or widely cultivated varieties are given names. Varieties can be crossed by traditional plant breeders to create new varieties with desired traits. For example, a gene for drought resistance can be backcrossed into a high-yielding variety.

Do most soybeans have yellow seed coats? No. The wild ancestors of the soybean all have black seed coats. Since the late 1970s, almost all the soybeans in the USA have had yellow seed coats. Most Americans, including many soybean farmers, have never heard of soybeans that were black, green, brown, white, red, bicolored, or mottled. But have yellow soybeans always predominated in America?

"Previous to the numerous introductions by the United States Department of Agriculture beginning in 1898, not more than eight varieties of soy beans were grown in the United States, namely, Ito San, Mammoth, and Butterball, with yellow seeds; Buckshot and Kingston, with black seeds; Guelph or Medium Green, with green seeds; and Eda and Ogemaw, with brown seeds." Thus of these eight pre-1898 varieties, 3 varieties (37.5%) had yellow seeds, 2 varieties (25%) had black seeds, 2 varieties (25%) had brown seeds, and 1 variety (12.5%) had green seeds (Piper & Morse 1910). The following table shows the earliest known date that each early, named soybean variety was mentioned in print or old letters, followed (if known) by the color of the seedcoat / seed and hilum (seed scar). Our focus is on those mentioned before 1924, but we include those named later if they are large seeded or specialty varieties (e.g., high protein). Notice that many early soybean names describe the time of maturity (early, medium early, etc), the color of the seed, and/or the seed size. This table also cites key publications about soybean varieties.

1890 Dec. Yellow Soy Bean–Yellow
1890 Dec. Eda Mame–Yellow (straw), hilum pale
1890 Dec. Kiyusuke Daizu

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1891 Yamagata Cha-daidzu–Brown
1892 Green Samarow–Green
1892 Apr. Medium Early White
1892 Apr. Medium White
1892 Apr. Medium Black–Black
1892 Apr. Medium Green–Green (chromium)
1894 Early White–Yellow (straw), hilum pale
1896 Extra Early Dwarf–Brown (chocolate)
1896 Jan. American Coffee Bean
1897 Mar. Medium Early Black–Black
1897 Mar. Medium Early Green–Green
1897 Medium Late Black–Black

1897 fall–The Section of Foreign Seed and Plant Introduction (FSPI) is organized within the USDA in Washington, DC, with David Fairchild in charge. Its mission is to centralize introduction activities. The new Section is within the Seed Division. On 22 March 1898 Congress allocates $20,000 for the collection, purchase, testing, and preparation of foreign seeds, plants, bulbs, shrubs, and trees.

1898–The Section soon began publishing its periodical *Foreign Seeds and Plants Imported by the Section of Seed and Plant Introduction*–the single best source of information on early soybean introductions to the USA. A permanent sequential S.P.I. number was assigned to each new seed or plant introduced. The earliest Seed and Plant Inventory numbers for "Glycine hispida–Soja bean" are #480 (received March 1898 through Prof. N.E. Hansen, from South Ussurie, Siberia) and #647-56 (received March 4, 1898, through Hon. A.E. Buck, from Tokyo, Japan). Over the next century many new soybean varieties entered the USDA through this route, each bearing an S.P.I. number. All were tested (mostly at USDA plant introduction gardens) for their adaptability to U.S. growing conditions. Only the most promising were given a name.

1899 Dec. Early Dwarf
1899 Dec. Late Mammoth
1900 Black–Black (shiny)
1900 Yellow
1900 Mar. Early Yellow–Yellow (straw), hilum pale
1901 Mar. Asahi
1901 Mar. Best Green–Yellow (olive), hilum pale
1901 Mar. Nalrade
1901 Mar. Tamarat Sukun
1902 Early Green–Green
1902 Feb. Mammoth–Yellow (straw), hilum tawny
1902 Apr. Medium Early Yellow–Yellow (straw)
1902 Apr. Extra Early Black–Black
1902 Apr. Ito San–Yellow (straw), hilum pale
1902 Apr. Early Black–Black
1902 Apr. Bakaziro/Bakajiro–Yellow (straw)
1902 Apr. Gosha–Yellow (straw)
1902 Apr. Green Medium–Yellow (greenish or olive), hilum pale
1902 Apr. Rokugatsu
1902 Apr. Black Round
1902 Apr. Yoshioka
1903 Olive Medium–Olive, shading to brown
1903 Wisconsin Black–Black, hilum black
1903 Apr. Medium Yellow–Yellow (straw)
1903 June Early Brown–Brown (auburn / reddish brown)
1904 Hankow–Brown with black banding or mottling, hilum black
1904 Ogemaw–Brown (chocolate)
1904 Jan. Mammoth Yellow–Yellow (straw)
1904 Mar. Flat Black
1904 Mar. Green
1905 Hollybrook Early–Yellow (straw), hilum tawny to cinnamon brown
1906 June Hollybrook–Yellow (straw), hilum tawny
1907 Mar. Very Dwarf Brown–Brown
1907 May Amherst–Yellow (straw)
1907 May Baird–Brown
1907 May Brownie–Brown
1907 May Buckshot–Black
1907 May Butterball–Yellow
1907 May Ebony–Black
1907 May Eda–Brown
1907 May Flat King–Black
1907 May Guelph–Green (chromium)
1907 May Haberlandt–Yellow (straw), hilum dusty brown
1907 May Kingston–Black
1907 May Large Black–Black
1907 May Manhattan–Yellow (straw)
1907 May Meyer–Black and Brown in concentric bands or mottling
1907 May Nuttall–Black
1907 May Riceland–Black
1907 May Samarow–Green
1907 May Tokyo or Tokio–Yellow (olive), hilum pale
1907 May Yosho–Yellow (olive)

1907 May 27–"Soy Bean Varieties," by Carleton R. Ball is published in USDA Bureau of Plant Industry, Bulletin No. 98. 30 p. This publication started a new system for naming soybeans, giving them common names such as Buckshot, Ogemaw, and Ito San. It first classified and then described all of the 23 known soybeans that had a name, first by color (there were 6 black and 6 yellow varieties), within color by seed size, and within seed size by maturity. This is the earliest document seen which tries to standardize early soybean varietal names / nomenclature to prevent confusion. It also gives a list of 29 synonyms, and of 86 S.P. I. numbers. Four full-page photos show the pods (side view) and seeds (side and front views) of (typically) five soybean varieties.

1907 Dec. Acme–Yellow (straw)
1908 Brown–Brown
1908 Mar. Medium Brown–Brown

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1908 Apr. Tashing–Green (chromium)
1908 July Shanghai–Black
1908 July Edward–Yellow (straw)
1909 Mar. Sherwood–Yellow (straw)
1909 Mar. Wilson–Black (jet), hilum black. Continued.
Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

11453. Shurtleff, William; Aoyagi, Akiko. comps. 2013. History of early named soybean varieties in the United States and Canada (1890-2013): Extensively annotated bibliography and sourcebook (Continued–Document part II). Lafayette, California: Soyinfo Center. 961 p. Subject/geographical index. Printed 12 Oct. 2013. 28 cm. [2119 ref]
• ***Summary:*** Continued:
1909 Mar. Cloud–Black
1909 Mar. Jet–Black
1909 Mar. Duggar–Brown (olive)
1909 Apr. Austin–Yellow (olive)
1909 Apr. Morse–Yellow (olive), hilum tawny to brown
1909 Apr. Brooks–Yellow (straw)
1909 Apr. Brindle–Brown and black
1909 Apr. Chestnut–Brown (russet)
1909 Apr. Habaro–Yellow (straw), hilum dusky brown
1909 Apr. Hongkong–Black
1909 Apr. Hope–Yellow (olive)
1909 Apr. Merko–Brown (olive)
1909 Apr, Pingsu–Black
1909 Apr. Shingto–Yellow (olive)
1909 Apr. Taha
1909 Oct. 7–"Soy Beans," by Piper & Nielsen is published as Farmers' Bulletin (USDA) No. 372. 26 p. It describes 12 soy bean varieties, and states that USDA has tested nearly 200 soy bean varieties during the past three years.
1910 Mongol–Yellow to olive green
1910 Wing's Mikado
1910 Wing's Mongol
1910 Wing's Sable
1910 Apr. Hansen–Brown
1910 Dec. Arlington–Black
1910 Dec. Auburn–Black, hilum pale
1910 Dec. Barchet–Brown (olive)
1910 Dec. Chernie–Black
1910 Dec. Columbia–Green (chromium)
1910 Dec. Elton–Yellow (straw), hilum pale
1910 Dec. Fairchild–Black
1910 Dec. Farnham–Yellow (straw)
1910 Dec. Flava–Yellow (straw)
1910 Dec. Lowrie–Yellow (olive)
1910 Dec. Morgan–Yellow (olive)
1910 Dec. Natsu–Yellow (straw)
1910 Dec. Nemo–Yellow (olive)
1910 Dec. Nielson–Yellow (olive)
1910 Dec. Nigra–Black
1910 Dec. Okute or O'Kute–Yellow (olive)
1910 Dec. Sedo–Brown (deep)
1910 Dec. Stuart–Yellow (olive)
1910 Dec. Swan–Yellow (straw)
1910 Dec. Trenton–Brown
1910 Dec. Vireo–Yellow (olive)
1910 Dec. Peking–Black
1910 Dec. 21–"The Soy Bean: History, Varieties, and Field Studies," by Piper & Morse is published in USDA Bureau of Plant Industry, Bulletin No. 197. 84 p. This is the most important document ever published on early soybean varieties in the USA.
1911 Wing's Extra Select Sable–Black
1912 Feb. Sooty–Black (rusty), hilum black.
1913 Early Dwarf Green–Green
1913 Mar. Mikado–Yellow (straw), hilum cinnamon brown
1913 Oct. Kentucky
1914 O.A.C. 81
1914 Quebec No. 537
1914 Quebec No. 92–Yellow, hilum dark
1914 Mar. Perley's Mongol
1914 Mar. Otootan–Black, hilum black
1914 Dec. Edna–Black
1914 Dec. Ohio 9035
1914 Dec. Tarheel–Black, hilum black
1914 Dec. Claud
1915 Jan. Biloxi–Brown (chocolate)
1915 Apr. Manchu–Yellow (straw), hilum black
1915 May Black Eyebrow–Black, hilum brown
1915 June Tarheel Black–Black, hilum black
1915 July Virginia–Brown (olive)
1916 Jan. Wing's Pedigreed Sable–Black
1916 Apr. Ohio 9001–Yellow
1916 Apr. Manchuria
1916 Apr. Ohio 9016–Yellow
1916 June Chiquita–Yellow (straw), hilum cinnamon brown
1916 Sept. White Eyebrow–Brown (olive)
1916 Dec. Lexington–Yellow (olive), hilum tawny
1917 Apr. A.K.–Yellow (straw), hilum pale
1918 Black Ebony–Black
1918 July Hahto–Yellow (olive), hilum black
1918 July Wilson-Five–Black
1918 July Yokoten–Yellow (straw), hilum cinnamon brown
1918 July–"The Soy Bean: Its Culture and Uses," by W.J. Morse is published in Farmers' Bulletin (USDA) No. 973. 32 p. It describes 22 varieties of soybeans.
1919 Jan. Hoosier
1919 Jan. Mandarin–Yellow (straw), hilum pale
1919 Jan. O.A.C. 111–Yellow (straw), hilum pale
1919 Jan. Easycook or Easy Cook–Yellow (straw),

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hilum cinnamon brown

1919 June Mammoth Brown–Brown (russet)

1920 Mar. Minnesota 166 and 167

1920 June Kentucky A

1920 July Patuxent–Yellow

1921 Mar. Saskatoon–Yellow

1921 Apr. Askarben–Yellow (straw), hilum pale

1921 Apr. Soysota

1921 Apr. Minsoy–Yellow (straw), hilum cinnamon brown

1921 May Dunfield–Yellow (straw), hilum light brown

1921 May Pinpu

1921 May Wea–Yellow (straw), hilum dark olive

1921 Sept. Indiana Hollybrook–Yellow (straw), hilum tawny

1922 Nov. O.A.C. 211–Yellow

1922 Dec. Midwest–Yellow (straw), hilum tawny to cinnamon brown

1923 Feb. Southern Prolific–Yellow (straw), hilum light brown

1923 Feb.–The Soybean, by Piper & Morse is published. This is the first comprehensive book about the soybean written in English, and the most important book on soybeans and soyfoods written up to this time. It describes 43 soybean varieties and lists 7 synonyms.

1923 Mar. Hamilton–Brown or auburn (reddish brown)

1923 Mar. Hurrelbrink

1927 April–Soy Beans: Culture and Varieties, by W.J. Morse is published as Farmer' Bulletin (USDA) No. 1520. 34 p. It describes 59 soybean varieties and lists 44 synonyms.

1929 Sept. Laredo–Black

1935 Aug. Rokusun (large seeded)–Yellow (straw), hilum brown

1935 Aug.–"Green vegetable Soybeans," by W.J. Morse, is published in Proceedings of the American Soybean Association (p. 44-45). This is the earliest document seen that mentions large-seeded, vegetable-type soybeans in the USA.

1936 Mar. Bansei (large seeded)–Yellow (straw), hilum pale / colorless to light

1936 Mar. Chusei (large seeded)–Yellow (straw), hilum yellow

1936 Apr. Chame (large seeded)–Brown, hilum brown

1936 Apr. Fuji (large seeded)–Green, hilum black

1936 Apr. Goku (large seeded)–Yellow (straw), hilum yellow

1936 Apr. Hakote (large seeded)–Yellow (olive), hilum black

1936 Apr. Higan (large seeded)–Yellow (straw), hilum brown

1936 Apr. Hiro (large seeded)–Black

1936 Apr. Hokkaido (large seeded)–Yellow, hilum, colorless

1936 Apr. Jogun (large seeded)–Yellow (straw), hilum pale / colorless

1936 Apr. Kanro (large seeded)–Yellow (straw), hilum pale to brown

1936 Apr. Kura (large seeded)–Black plus olive yellow, hilum black

1936 Apr. Nanda (large seeded)–Yellow (straw), hilum pale

1936 Apr. Osaya (large seeded)–Yellow (straw), hilum yellow

1936 Apr. Sato (large seeded)–Black, hilum black

1936 Apr. Shiro (large seeded)–Yellow (olive), hilum brown or black

1936 Apr. Sousei (large seeded)–Yellow (olive), hilum brown

1936 Apr. Suru (large seeded)–Yellow (straw)

1936 Apr. Toku (large seeded)–Yellow (straw), hilum brown

1936 Apr. Waseda (large seeded)–Yellow (straw), hilum pale to brown

1936 April–"Soybean introductions named in January 1936," W.J. Morse issued as a 2-page leaflet by USDA Bureau of Plant Industry, Division of Forage Crops and Diseases. The named introductions include 20 new large-seeded vegetable-type soybeans. Dorsett and Morse obtained most of these in Japan during their trip to Asia in 1929-1931.

1937 Agate (large seeded)–Yellow (straw) and brown, hilum brown

1937 Aug. Giant Green (large seeded)–Green, hilum black

1937 Sept. Funk Delicious (large seeded)–Yellow (straw), hilum pale

1938 May Illington (large seeded)

1938 May Imperial (large seeded)–Yellow (straw), hilum pale

1938 May Tortoise Egg (large seeded)

1938 May Willomi (large seeded)–Yellow (straw), hilum pale-brown

1938 May–"A study of Soybeans with Reference to their Use as Food," by Woodruff and Klass is published as Illinois Agricultural Experiment Station, Bulletin No. 443 (p. 421-67). In it they list 17 soybean varieties, six of which showed special merit for table use. Four are new large-seeded vegetable-type soybeans.

1938 Sept. Sioux (large seeded)–Yellow (olive), hilum black

1938 Sept. Aoda (large seeded)–Green, hilum light brown

1939 Mar. Emperor (large seeded)–Yellow (straw), hilum light brown

1939 March–"Eighteen varieties of Edible Soybeans: Their Adaptability, Acceptability and Characteristics," by Lloyd and Burlison is published as Illinois Agricultural Experiment Station, Bulletin No. 453 (p. 385-439). This is the most complete and interesting report on this subject

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published up to this time. Continued. Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

11454. Brown, Lester R. 2013. 10 things to know about food on World Food Day. *www.earthpolicy.org.* Oct. 16. [1 ref]
• ***Summary:*** "Today is World Food Day. It offers the opportunity to strengthen national and international solidarity in the fight to end hunger, malnutrition, and poverty. With falling water tables, eroding soils, and rising temperatures making it difficult to feed growing populations, control of arable land and water resources is moving to center stage in the global struggle for food security. Here are some facts to consider:

"1. There will be 219,000 people at the dinner table tonight who were not there last night-many of them with empty plates. Ensuring adequate food supplies was once a rather simple matter, the sole responsibility of the ministry of agriculture. When governments wanted to accelerate growth in the grain harvest, they simply raised the support price paid to farmers. Now that is changing. Securing future food supplies has become incredibly complex. It may now depend more on policies in the ministry of health and family planning or of energy than in the ministry of agriculture itself.

"2. Today, with incomes rising fast in emerging economies, there are at least 3 billion people moving up the food chain, consuming more grain-intensive livestock and poultry products.

"Today, the growth in world grain consumption is concentrated in China. It is adding over 8 million people per year, but the big driver is the rising affluence of its nearly 1.4 billion people. As incomes go up, people tend to eat more meat. China's meat consumption per person is still only half that of the United States, leaving a huge potential for future demand growth.

"3. In India some 190 million people are being fed with grain produced by overpumping groundwater. For China, there are 130 million in the same boat.

"Aquifer depletion now threatens harvests in the big three grain producers-China, India, and the United States-that together produce half of the world's grain. The question is not whether water shortages will affect future harvests in these countries, but rather when they will do so.

"4. In Nigeria, 27 percent of families experience foodless days. In India it is 24 percent, in Peru 14 percent.

"The world is in transition from an era dominated by surpluses to one defined by scarcity. Not eating at all on some days is how the world's poorest are coping with the doubling of world grain prices since 2006. But even as we face new constraints on future production, the world population is growing by 80 million people each year.

"5. Water supply is now the principal constraint on efforts to expand world food production.

"During the last half of the twentieth century, the world's irrigated area expanded from some 250 million acres in 1950 to roughly 700 million in 2000. This near tripling of world irrigation within 50 years was historically unique. Since then the growth in irrigation has come to a near standstill, expanding only 10 percent between 2000 and 2010.

"6. Nearly a third of the world's cropland is losing topsoil faster than new soil is forming, reducing the land's inherent fertility.

"Future food production is also threatened by soil erosion. The thin layer of topsoil that covers the earth's land surface was formed over long stretches of geological time as new soil formation exceeded the natural rate of erosion. Sometime within the last century, the situation was reversed as soil erosion began to exceed new soil formation. Now, nearly a third of the world's cropland is losing topsoil faster than new soil is forming, reducing the land's inherent fertility. Soil that was formed on a geological time scale is being lost on a human time scale. Peak soil is now history.

"7. The generation of farmers now on the land is the first to face manmade climate change.

"In addition to wells going dry and soils eroding, both at an unprecedented pace, the generation of farmers now on the land is the first to face manmade climate change. Agriculture as it exists today developed over 11,000 years of rather remarkable climate stability. It has evolved to maximize production within that climate system. Now, suddenly, the climate is changing. With each passing year, the agricultural system is more and more out of sync with the climate system.

"8. At no time since agriculture began has the world faced such a predictably massive threat to food production as that posed by the melting mountain glaciers of Asia.

"Mountain glaciers are melting in the Andes, the Rocky Mountains, the Alps, and elsewhere, but nowhere does melting threaten world food security more than in the glaciers of the Himalayas and on the Tibetan Plateau that feed the major rivers of India and China. Ice melt helps sustain these rivers during the dry season. In the Indus, Ganges, Yellow, and Yangtze river basins, where irrigated agriculture depends heavily on rivers, the loss of glacial-fed, dry-season flow will shrink harvests and could create potentially unmanageable food shortages.

9. After several decades of raising grain yields, farmers in the more agriculturally advanced countries have recently hit a glass ceiling, one imposed by the limits of photosynthesis itself.

"In Japan, the longtime leader in raising cropland productivity, the rise in the yield of rice that began in the 1880s essentially came to a halt in 1996. Having maximized productivity, farmers ran into the inherent limits of photosynthesis and could no longer increase the amount they could harvest from a given plot. In China, rice yields

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are now just 4 percent below Japan's. Unless China can raise its yields above those in Japan, which seems unlikely, it, too, is facing a plateauing of rice yields. Yields of wheat, the world's other food staple, are also plateauing in the more agriculturally advanced countries. For example, France, Germany, and the United Kingdom–Europe's leading wheat producers–had been raising wheat yields for several decades, but roughly a decade ago, all three hit plateaus. Corn yields in the United States, which accounts for nearly 40 percent of the world corn harvest, are starting to level off. Yields in some other corn-growing countries such as Argentina, France, and Italy also appear to be stagnating.

"10. To state the obvious, we are in a situation both difficult and dangerous.

"The world today desperately needs leadership on the food security issue to help the world understand both the enormity of the challenge we face and the extraordinary scope of a response, one that, among other things, requires a total restructuring of the energy economy. The scale of this economic restructuring is matched only by the urgency of doing so. Political leaders talk about cutting carbon emissions 80 percent by 2050, but if we stay on the current trajectory the game will be over long before then. If we want to stabilize climate, we need to cut carbon emissions far more rapidly. President Obama needs to understand both the gravity and urgency of the tightening food situation and the consequences of leaving it unattended. We are not looking at 2030 or 2050. We are looking at an abrupt disruption in the world food supply that could be just one poor harvest away." Address: Earth Policy Inst., 1350 Connecticut Ave., N.W., Suite 403, Washington, DC 20036. Phone: 202-496-9290.

11455. Hymowitz, Theodore. 2013. Illinois has storied history with soybeans: From the Auckland to Lincolnland. *Illinois Field and Bean* (*Illinois Soybean Assoc.*). Nov. p. 5-6. Special issue.

• ***Summary:*** This excellent overview of the history of the soybean in Illinois begins: "On Christmas Day in 1850, the U.S. merchant ship *Auckland* sailed from Hong Kong for San Francisco, Calif., carrying a shipment of sugar. About 500 miles off the coast of Japan the *Auckland* came across the *Eiriki maru,* a Japanese vessel drifting helplessly on the sea. The crew of 17 was removed from the ship and taken aboard the *Auckland.* The Japanese took aboard some of their belongings, including navigational equipment and agricultural foodstuffs.

"On March 4, 1851, the *Auckland* arrived at the port of San Francisco. The Japanese were not permitted to leave the ship and were kept in quarantine until March 16. The youngest member oil the Japanese crew was a 14-year-old boy named Hizoko. Subsequently, Hizoko changed his name to Joseph Heco and was the first Japanese to become a naturalized U.S. citizen."

Also discusses Dr. Benjamin Franklin Edwards of Alton, Illinois, John H. Lea of Alton, Osborne and Mendel (1917), Garner and Allard (1920), North Carolina, University of Illinois professors William I. Burlison (administration), J.C. Hackleman (extension) and Clyde M. Woodworth (plant breeding). Funk Bros. Seed Co., A.E. Staley Mfg. Co., ADM, Richard Bernard, wild perennial soybeans.

Includes a brief biography and portrait photo of Prof. Hymowitz. Address: Prof. Emeritus, Univ. of Illinois. Phone: 1-800-525-0177.

11456. Spots at front of book: History of soybeans and soyfoods in Japan. 2014.

• ***Summary:*** (a) Graph of soybean production in Japan, 1878-1984. Soybean production in Japan was first recorded in 1878. From that date until its all-time peak in 1920, it climbed steadily.

In 1905, after the Russo-Japanese (1904-05), victorious Japan, through the Portsmouth Treaty, became the lessee of the Kwantung Leased Territory (1,337 square miles), the southernmost point of Manchuria. It contained the greater part of the southern branch of the Chinese Eastern Railway, which is now known as the South Manchuria Railway. This was Japan's first foothold on Manchuria.

In 1910 (Aug. 22) Japan annexed Korea as Chosen, a colony; this harsh domination lasted until 1945–the end of World War II.

After about 1910, Japan started to import small but steadily increasing amounts from Korea and Manchuria. These imports finally became so large that they led to a decrease in soybean production in Japan.

1931–"Manchurian Incident," also called the "Mukden Incident" took place on the night of 18 September 1931. A bomb exploded on the tracks of the Japanese railway north of Mukden. Japanese Colonel ordered a full-scale attack against the Chinese troops in Mukden, and General Honjô, hearing of the crisis, called out the whole Kwantung Army–which proceeding to take over Manchuria.

By early 1932 the conquest of all Manchuria had been completed. In March 1932 Manchuria was proclaimed an independent state named Manchukuo or Manchoukuo under the last Ch'ing ruler (P'u-yi).

The Lytton Commission of the League of Nations visited Manchuria in the spring of 1932 and condemned Japan as an aggressor. The report was adopted by the League of Nations, from which Japan withdrew in protest the following year. Japan was now in control of Manchuria, the world's greatest producer of soybeans.

1941–Japan attacks Pearl Harbor; soybean production plummets during the war. But it quickly climbed after Japan surrendered in 1945 and imports from the USA began.

11457. Spots at front of book: Okara and soy fiber. 2014.

• ***Summary:*** (a) Draining okara from a fresh batch of homemade soymilk. (b) Fresh okara. (c) Okara stir fried with

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vegetables. (d) Packaged okara as sold by Global Protein Foods. (e) Carrot-ginger eggless egg rolls. (f) Carrot bread with okara. (g) Cherry-orange muffins with okara. (h) The muffins sliced open, showing the inside. (i) English muffin bread. (j) Back to school muffins with okara. (k) Okara chocolate banana muffins. (l) A slice of Abbey's infamous cheesecake with okara. (m) The whole cheesecake. (n) Okara bread and waffle. (o) Okara cookies. (p) Apricot-pecan scones with okara. (q) Okara pasta.

11458. Spots at front of book: Tofu and tofu products. 2014.
• ***Summary:*** (a) An early White Wave Tofu label (1978). (b) Traditional hand-turned stone mill. (c-d) Galactina flavored tofu sold in sausage shapes. (e) T-Nugget (baked tofu cubes). (f) Wo Chong Fresh Soy Bean Cakes. (g) Morinaga Revolutionary Tofu (ca. 1988). (h) Chef lifting tofu from blotter. (i) Cubes of fresh tofu. (j) Cubes of tofu deep fried in breaded batter. (k) Silken tofu and cubes on a wooden cutting board. (l) Inari-zushi. (m) Tofu squares in a sauce with veggies. (n) Grilled slabs of tofu with miso topping. (o) Cake of silken tofu in a blue bowl. (p) Grilled tofu kebabs. (q) A kit for making tofu at home. (r) Tofu cheesecake with whipped tofu topping. (s) Pan-fried tofu slices. (t) Typical cakes of regular tofu. (u) Cubes of deep fried tofu with a dipping sauce. (v) Chinese style pressed tofu. (w) Cubes marinated and baked tofu. (x) Guindon. 1985. Cartoon in Detroit Free Press. "I not only did the sewing. I made the cloth from soybeans."

11459. Spots: Fermented black soybeans, Daitokuji natto, Hamanatto. 2014.
• ***Summary:*** The first four photos all show Daitokuji natto. The photo showing three packages of Daitokuji natto, each with a bowl of the contents below are (from left to right): (1) Daitokuji Zuihon. (2) Honke Isoda. (3) Daitokuji Ikkyu. Each product has a somewhat different taste and appearance. (4) Another closer view of a different brand of Daitokuji natto made in Kyoto by another maker. (5) View using the "Google Ngram Viewer" of the relative frequency of appearance in books digitized by Google, from 1800 to 2000 of the three case-sensitive terms "black bean sauce" (by far the most frequent), "fermented black beans," and "hamanatto." (6) Fermented black soybeans on a mat. (7-8) Chinese characters for douchi / doushi.

(9) A red banner or label with white lettering, probably obtained in about 1978. Here is what it says: Top right two Chinese characters (2 Cc): Enshû = another name for Western Shizuoka prefecture, which is located southwest of Tokyo; the largest city in the prefecture is Hamamatsu. Top left (2Cc): Meisan = Specialty product. Right side half way down. Two smaller Cc: Ganso = Originator = The first or original maker. Four largest Cc in middle. Hamana Natto = Hamanatto. Four smaller Chinese characters in lower left: Daifukuji sei = Made at Daifukuji temple [located in western Shizuoka prefecture].

Note: A Chubu region (Japan) website titled "Travel to Ten Thrilling Scenic Sites" states: Daifuku-ji temple is an old temple of the Shingon sect that is located in a secluded mountain overlooking Lake Inohana. The temple owns many treasures, including Fugen-jurasetsunyo-zu (Samantabhadra and Ten Princesses Iron Fan). There is also a famous garden in the kaiyu style which is suspected to have been built during the Muromachi period. Hantoshi-zakura cherry blossoms which bloom little by little from October to the beginning of March are also a must-see. Daifukuji natto (natto=fermented soy bean product) made here has a history of being presented to the Ashikaga or Tokugawa Shogun Families.

11460. Spots: Natto. 2014.
• ***Summary:***

11461. Spots: Roasted soy flour (kinako). 2014.
• ***Summary:*** (a) Nestlé KitKat Kinako Ohagi, a traditional Japanese confection coated with roasted soy flour (kinako). (b) Kinako in a bluish-white Japanese bowl. (c) Rounds of mochi dango coated with roasted soy flour. (d) Two skewered mochi dango coated with kinako. (e) In Korean *k'ongaru, k'ong karu, konggaru* ("roasted soybean powder") is widely used to cover rice cakes (mochi). (f-g) It can be found at most Korean grocery stores. (h) In Indonesian *Bubuk kedele* means roasted soy flour. (i-j) Sari Bubuk Kedelai (from Indonesia). (k-l) *Bubuk kedele* as a coating for mochi (pounded rice cakes) in Indonesia. (m-n) Two views of Japanese kinako. (o) Sifting kinako. (p-q) Two bags of Shirakiku kinako from Japan. (r) Korean konggaru. (s) A Korean woman coating a food with *konggomul* (roasted whole soy flour). (t) Indonesian lontong (rice steamed in banana leaves, sliced and served topped with *bubuk kedelai*).

11462. Spots: Soy sauce. 2014.
• ***Summary:*** (1) View using the "Google Ngram Viewer" of the relative frequency of appearance in books digitized by Google, from 1800 to 2000 of the three case-sensitive terms "soy" (the most frequent), "soy sauce," and "shoyu" (increasing in use since about 1980).

Note that "soy" changed its meaning in about the 1980s. Originally it had referred to soy sauce. Then, as "soy sauce" began to replace, it came to be used as a general term for soybeans, soyfoods, and the "essence" of both. For example: "The health benefits of soy." (2) Soy jar, used for storing soy sauce, from Santa Cruz, California. (3) A traditional illustration of Japanese men probably pouring moromi into a vat so it can start fermenting. (4) Japanese men working around large fermentation vats bound with braided bamboo hoops. (5) A pottery jar that once held soy [sauce] manufactured by Sollonyama, Nagasaki, Japan. (6-7) A wide illustration (divided vertically into halves) of a Noda

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Shoyu (later Kikkoman) soy sauce brewery at the turn of the century (1900). For an explanation see *The Book of Miso,* by Shurtleff & Aoyagi (1976, p. 222-23). (8) Characters for shoyu. (9) Cruet bottle.

11463. Spots: Soy sprouts. 2014.
• ***Summary:*** (a) Mature soy sprouts in a bamboo basket. (b) Cooked soy sprouts served with chopsticks. (c) Vigorous soy sprouts growing. (d) A bag of Korean soy sprouts. (e) Soybeans sprouting in a sprouter. (e-f) A background of soybean sprouts. (g-i) Kongnamul Korean soybean sprout dish. (k-l) More background of soy sprouts.

11464. Spots: Soynuts and roasted soybeans. 2014.
• ***Summary:*** (a) A wooden Japanese measuring box (*masu*) partly filled with roasted soybeans for Setsubun on New Year's Eve. (b-g) Roasted soybeans being scattered at various temple in Japan on Setsubun. (h) Two plastic bags filled with *fuku-mame* (good-luck beans for use at Setsubun). (i) A wooden masu with the characters *fuku-mame* written in red on one side. (j) A wooden masu with the character *fuku* ("good luck") written in black on one side. (k) A glass jar filled with roasted soynuts. (l) "Mom–I really like this stuff!"

11465. Spots: Whole dry soybeans. 2014.
• ***Summary:*** (a) View using the "Google Ngram Viewer" of the relative frequency of appearance in books digitized by Google, from 1800 to 2000 of the three case-sensitive terms "soybean" (by far the most frequent), "soybeans," and "soy bean" (decreasing in use since about 1918). (b) Whole dry soybeans in round Japanese *zaru* made of woven bamboo. (c) Mamechan cooked whole soybeans with kombu (dark strips) in Japan. (d) Bowls of boiled black and yellow soybeans. (e) Whole dry soybeans in a plastic bag. (f) Budo-mame. Cooked whole soybeans in a light-green bowl. (g) Budo-mame, sweet-salty cooked whole soybeans, a popular Bento (Japanese lunch box) filler. (h) Soaked yellow soybeans in a large glass bowl. (i) Nimame in a white bowl. (j) Simmered black soybeans (nimame) in a blue and black bowl. (k) Yellow soybeans being soaked in water. (l) Eden Organic Black Soy Beans. (m) Demand Dyer's Pork and Beans (With and Without Tomato Sauce).

11466. Spots: Yuba. 2014.
• ***Summary:*** (a) Sheets of yuba in a clear Japanese soup. (b-c) Fresh yuba rolls. (d) Sheets of yuba at Hodo Soy (Oakland, California) hanging over steaming soymilk. (e) Fillings in a yuba wrapper. (f) Pieces of reconstituted yuba sticks in a soup. (g) Bundles wrapped in yuba. (h) A package of Chinese dried yuba sticks. (i) Dried yuba sticks on a table. (j) A Japanese yuba label. (p-v) Chinese and Japanese characters for doufu pi, doufu i, and yuba–on title page.

11467. History of the International Soybean Processing and Utilization Conferences (ISPUC) (Overview). 2014. Compiled by William Shurtleff of Soyinfo Center. [Eng]
• ***Summary:*** (1) 1990 June 26 to July 4–International Soybean Processing and Utilization Conference (ISPUC-I) held in Jilin, China.

(2) 1996 Jan. 8-13–International Soybean Processing and Utilization Conference (ISPUC-II) held in Bangkok, Thailand. Proceedings published.

(3) 2000 Oct. 15-20–International Soybean Processing and Utilization Conference (ISPUC-III) held Tsukuba, Japan. Proceedings published. Theme: Dawn of the innovative era for soybeans.

(4) 2004 Feb. 29 to March 5–International Soybean Processing and Utilization Conference (ISPUC-IV) held in Foz do Igussa, Brazil.

(5) 2008 Dec. 10-14–International Soybean Processing and Utilization Conference (ISPUC-V) held in Bhopal, India.

(6) 2011 Oct. 31 to Nov. 2–International Soybean Processing and Utilization Conference (ISPUC-VI) St. Louis, Missouri. Also described as the "Soy & Grain Trade Summit... in association with USSEC–U.S. Soybean Export Council." The website promotes it as "The critical strategic event of the agribusiness calendar." The sessions are: Soybean processing session I. Soy in health and human nutrition. New soy quality traits and unique soy foods, ingredients and applications. Soybean processing session I. Soy in animal nutrition. Explore the wild side of soy session (will explore some of the lesser-known, new and novel applications for soy from around the world).

11468. History of the International Symposium on the Role of Soy in Preventing and Treating Chronic Disease and the subsequent International Soy Symposium (Overview). 2014. Compiled by William Shurtleff of Soyinfo Center. [Eng]
• ***Summary:*** (1) 1994 Feb. 20-23–First International Symposium on the Role of Soy in Preventing and Treating Chronic Disease, held in Mesa, Arizona. Proceedings published in the *J. of Nutrition,* March 1995 Supplement (p. 567S-808S).

(2) 1996 Sept. 15-18–Second International Symposium on the Role of Soy in Preventing and Treating Chronic Disease, held in Brussels, Belgium. Proceedings published in the *American J. of Clinical Nutrition,* Dec. 1998 Supplement (p. 1329S-1544S).

(3) 1999 Oct. 31 to Nov. 3–Third International Symposium on the Role of Soy in Preventing and Treating Chronic Disease, held in Washington, DC. Proceedings published in the *J. of Nutrition,* (4) 2001 Nov. 4-7–"Fourth International Symposium on the Role of Soy in Preventing and Treating Chronic Disease, held in San Diego, California. Proceedings published in *J. of Nutrition,* March 2002 Supplement (p. 545S-619S).

(5) 2003 Sept. 21-24–Fifth International Symposium on the Role of Soy in Preventing and Treating Chronic Disease,

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held in Orlando, Florida. Proceedings published in *J. of Nutrition,* 2004 May Supplement (p. 1205S-1293S).

(6) 2005 Oct. 30 to Nov. 2–Sixth International Symposium on the Role of Soy in Preventing and Treating Chronic Disease, held in Chicago, Illinois. This is the first year that no conference proceedings were published. However a 52-page symposium program was published in Nov. 2005 by the American Oil Chemists' Society (Champaign, Illinois). (7) 2007 March 7-9–7th International Soy Symposium: Role of Soy in Health and Disease Prevention, held in Bangkok, Thailand. No proceedings were published, but a 100-page bound color booklet contains the program, long abstracts, organizational and sponsor information. The conference in Bangkok lasted only 2 days versus 4 for all the others and it consisted mostly of review presentations. The most important presentations were summarized in the *Soy Connection* (summer 2007, Vol. 15, No. 3). (8) 2008 Nov. 9-12–International Soy Symposium held in Tokyo, Japan.

11469. *SoyaScan Notes.* 2014. Soyfoods historical research and writing wish list (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** 1. Early history of Chinese soyfoods companies and products in America and Europe. Especially Chinese tofu manufacturers in San Francisco and Los Angeles from 1850 to 1910.

2. Statistics on soyfoods in China during the 1980s.

3. The Swedish trading mission in Canton during the 1700s and 1800s and its work with soy sauce.

4. A lengthy, scholarly history (with an extensive bibliography) of soybeans and soyfoods in China written by a Chinese.

5. A lengthy, scholarly history (with an extensive bibliography) of soybeans and soyfoods in Japan written by a Japanese.

6. A lengthy, scholarly history (with an extensive bibliography) of soybeans and soyfoods in Korea written by a Korean.

7. A history of the health foods industry in America, 1930-1980.

8. A book on mochi or how mochi came to the West, with a clear chronology of commercial mochi manufacturers in the western world.

9. A scholarly history (with an extensive bibliography) of each of the following soyfoods in Japan, written by a Japanese with a long-term involvement in the field: natto, miso, shoyu, tofu.

10. Explain why Linnaeus stated in *Hortus Cliffortianus* (1737, p. 499) that the soy bean was grown in the colony of Virginia in North America.

11. A lengthy, scholarly history (with a good bibliography) of Chinese growing and processing soybeans in California. They must have grown them between 1849 and 1899! (13 Sept. 1991)

12. Visit the best libraries and centers in Germany for doing research on soybeans and soyfoods (See #37465) and try to get missing old documents.

13. Try to document the statement that the soybean was used as a coffee substitute during the Civil War in the USA (1861-1865).

14. Use the Coker family archives in South Carolina to write a history of the company's pioneering work with the soybean.

15. A history of early experimental gardens such as those that the Portuguese developed on the Cape Verde Islands, the British at Kew, Nairobi, Singapore, and the colony of Georgia (the Trustees' Garden of Georgia, a government experimental farm at Savannah, laid out in 1733), the Spanish (under Cortez / Cortés) in today's Mexico, etc. Did soybeans appear in any of them? When did they first appear in each?

16. Learn much more about Korean natto. Did it exist in Korea before Korea became a Japanese colony? Try to find some references, as in early studies of food in Korea. How widely was it made and used? Try to find some estimates of annual production. How was it served? What was its distribution in Korea in 1900? 1950? 2000?

17. A scholarly biography of Clifford E. Clinton of Los Angeles.

11470. *SoyaScan Notes.* 2014. Commercial soyfoods products wish list (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** 1. Organic, non-GE soy protein isolates (2002/03). 2. A very low calorie soy beverage for weight loss in hospitals. Must be able to be used as a sole source of nutrition. 3. More smoked tofu in America.

4. Meatless pepperoni, sausage shaped, for use atop a meatless pizza. 5. Natural shoyu brewed in America, ideally as part of a joint venture with a Japanese shoyu company. 6. A vegetarian Worcestershire sauce, with no anchovies (John Troy developed "The Wizard's Worcestershire Sauce" for Joel Dee's Premier Japan line in about 1995; it was vegetarian).

7. A low-calorie, low-fat tofu. Fat and calorie content should be at least 30% lower than that made from whole soybeans. The easiest way to make this product would be to run soymilk made from whole soybeans through a decanting centrifuge (like a cream separator) to remove the desired amount of fat, just like the dairy industry does to make low-fat or non-fat milk. There is a big potential market for such a product since 1% fat milk has now passed low-fat milk (2%) as the best-seller in American supermarkets (11 Sept. 1991). 8. Bland soymilk base (11 July 1997). Presently no company (including International ProSoya Corp. of Canada, Pacific Foods of Oregon, and Ted Nordquist dba TAN Industries, Inc. etc.) offers this product.

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9. A soy-based kefir made from authentic kefir grains/ cultures plus FOS (fructooligosaccharides), a dietary fiber derived from chicory roots. FOS feeds and increases the level of "good guy bifidobacteria by up to five times in the gastrointestinal tract, and boosts the body's absorption of calcium and other minerals by up to 50 percent." See article in *Ag Innovation News* (April 1999, p. 3, 14).

11471. *SoyaScan Notes.* 2014. Soyfoods big ventures wish list (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** The Soyfoods Association should team up with other interested parties (such as Protein Technologies International) and petition the FDA to outlaw the use of the term "non-dairy" on the label of (or otherwise in connection with) products which contain sodium caseinate or any other product derived from cow's milk. This would open the way to many new soy-based dairylike products.

A joint venture with a Japanese company such as Sendai Miso Shoyu to brew Japanese-style shoyu in America in the traditional way. Large amounts are now imported from Japan.

11472. *SoyaScan Notes.* 2014. The languages and writing systems of East Asia, including Korea, China, and Japan (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** According to *East Asia: The Great Tradition,* by Reischauer and Fairbank (1960, p. 15-18), the two main language groups of East Asia are the Sinitic (or Sino-Tibetan, the largest group) and the Altaic. Within the Sinitic group, Chinese is by far the largest and historically the most important subdivision. The main Sinitic languages inside China are Mandarin, Wu (near Shanghai), Kan, Min (near Fukien / Fujian), Hsiang, Cantonese, Miao-Yao (southwest China), and Tibetan. Note that these are different enough from Mandarin to be considered virtually independent languages rather than dialects. Sinitic languages outside China include Burmese, Thai, Vietnamese.

The three major Altaic languages (named after the Altai Mountains in Mongolia) are Mongolian, Turkish (in the west), and Tungusic (in the far northeast). Peoples speaking Altaic languages, unlike the agriculturist Chinese, were nomads. "Korean and Japanese show close structural resemblances to the definitely Altaic languages, and the Koreans and Japanese may, therefore, be two eastern extensions of Altaic-speaking people into predominantly agricultural areas."

Concerning the Korean writing system, in the late 600s (7th century), a system called idu, using Chinese characters for phonetic purposes was developed as an aid to rendering Chinese texts into Korean. Though never extensively used, it was the beginning of Korea's native writing system. In the mid-1400s an excellent phonetic system for writing the Korean language was developed by the ruler named Sejong. Originally known as onmun ("vernacular writing") but known today as han'gul ("Korean letters") it was officially adopted by royal decree in 1446. "Han'gul is perhaps the most scientific system of writing in any country... Finally, the advantages of an alphabetic script and a syllabary (in which each symbol represents a whole syllable) are combined by bunching the individual letters into syllabic groups" (p. 435-36). [Note: the bunching makes use of a word processor more difficult than the linear alphabetic Indo-European languages]. Although han'gul was simple, it was little used during the next 5 centuries; scholars emphasized the Chinese written language. "It was not until after the liberation of Korea from Japanese rule in 1945 that han'gul came into its own as the primary method of writing in Korea."

In Japan, the development of purely phonetic scripts (called the Kana Syllabaries, hiragana and katakana) arrived in the early 800s and were attributed to Kôbô Daishi (Kûkai), Japan's most beloved and best known Buddhist saint, who founded the Shingon sect in Japan in about 806 and built his monastic headquarters atop Mt. Koya in 816. "The development of the kana was no doubt influenced by the Sanskrit studies of Buddhist monks and their knowledge of the alphabets of India. The kana, however, did not constitute alphabets but were syllabaries, in which the symbols represented whole Japanese syllables., which at that time invariably consisted of one of the five vowels (a, i, u, e, o) usually preceded but never followed by a consonant. Thus they required a minimum of 47 different symbols, instead of the 14 that would have sufficed to write 10th century Japanese with an alphabet... Thus hiragana and katakana constituted a less simple and flexible system than an alphabet would have provided."

11473. *SoyaScan Notes.* 2014. The best libraries for Asian-American studies in California (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** Mr. Seizo Oka of San Francisco, whose life work is writing a history of Japanese in America, has built an excellent library of documents on this subject. These archives have many early documents including America's best collection of early Japanese-American City Directories. Mr. Oka used to work for Bank of Tokyo, renamed Bank of California, and his project was part of the California First Bank History Project. The bank provided him with financial support. But they withdrew their support in late 1989, and on 15 Dec. 1989 the library had to be closed. But, with community support, it was reopened in Dec. 1990 in a new room at the same location: History Archives of the Japanese Cultural & Community Center, 1840 Sutter St., #206, San Francisco, CA 94115.

The second library is the Japanese-American Library, located at 1619 Sutter St, on Octavia & Sutter on the entire ground floor (1,500 square feet) of Hinode Towers (P.O.

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Box 590598, San Francisco, CA 94159. Phone: 415-567-5006). The director, Karl Matsushita, a graduate of UCLA in his mid- to late-40s, has collected for 20 years. Founded in 1969 (at the time of student demands for Ethnic Studies Programs) by Karl and a group named Center for Japanese-American Studies from Ethnic Studies Program, it became independent from the group in 1985. The library has at least 10,000 documents, lots in boxes, mostly post-war. They have no early city directories. The pre-war material is mostly in English. They have little or no information on soyfoods. They are planning to computerize the library to make it compatible with the University of California at Berkeley, Stanford, and Harvard-Yenching libraries. In the meantime they are typing 3x5 catalog cards for their documents.

Two libraries at the University of California have excellent, large collection of documents, many very early and many archival, on Chinese and Japanese in America. The Bancroft Library focuses on the far western USA. The Asian American Studies Library is more nationwide in scope. Its holdings include monographs, serials, theses and dissertations, conference papers, student research papers, and non-print media. It is the best source of Chinese-American documents in California. Many documents came from the Chinese Historical Society in San Francisco. Unfortunately no one on the staff can read or speak Japanese none of their Japanese-language documents can be cataloged.

A major library is found at the Asian-American Studies Center at UCLA; it is complemented by the East Asian Library at UCLA, which has mostly Asian-language materials. Hosokawa (1969) notes that "the Japanese American Citizens League, a nationwide organization of fewer than 25,000 members, launched in 1962 what was called the Japanese American Research Project. Funds were contributed by members and other interested persons and $100,000 presented to the University of California at Los Angeles. UCLA in turn undertook to seek out and preserve documentary materials and gather and analyze information relating to the Japanese Americans. Despite its modest scale this research project proved to be of sufficient academic and sociological interest that the Carnegie Corporation and the National Institute of Mental Health, a federal agency, provided grants for detailed studies into specific contributions by Japanese Americans to the American way of life." A number of independent papers, both popular and scholarly, have resulted from this project.

Another interesting group, which has no library, is the Center for Japanese-American Studies.

11474. *SoyaScan Notes.* 2014. Chronology of Soyfoods Center: The work of William Shurtleff and Akiko Aoyagi. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** 1. Introducing soyfoods to the West: Popular books (1972 Oct.–1979 July).

The Book of Tofu:

1972 Oct. 22–First visit to San-gen-ya tofu shop in Tokyo. Mr. Toshio Arai begins to teach William Shurtleff the traditional art of making tofu.

1972 Dec. 22–Meet Nahum Stiskin of Autumn Press. Start to write tofu booklet.

1973 Jan. 13–Sign contract for *Book of Tofu* with Autumn Press.

1973 March 2–Visit Sasa-no-yuki tofu restaurant in Tokyo.

1975 Dec. 12–*The Book of Tofu** published by Autumn Press.

* = Book illustrated by Akiko Aoyagi.

1978 Dec. 22–*The Book of Tofu** published by Ballantine Books in a mass-market pocketbook edition that retails for $2.95.

The Book of Miso

1974 Feb/March–Study miso and shoyu in Japan on trip with Bob Gerner, head of Westbrae Natural Foods.

1974 May 7–Start to write *The Book of Miso,* table of contents.

1975 April–Autumn Press accepts idea of publishing *The Book of Miso.* Contract signed Aug. 18.

1976 Sept. 23–*The Book of Miso** published by Autumn Press.

1976 Sept. 29–1977 Feb. 3–Tofu & Miso America Tour. We do 70 public programs, many TV and radio interviews, drive our van 15,000 miles in 17 weeks.

The Book of Tempeh

1977 May–To Indonesia for one month of tempeh research.

1978 Feb. 27–Sign contract with Harper & Row.

1979 July 14–*The Book of Tempeh** published by Harper & Row.

2. Working to build a soyfoods industry in the Western world (1977 April–present)

1977 April 5–Establish Takai Tofu and Soymilk Equipment Co.

1977 Aug. 16–First Takai catalog of tofu and soymilk equipment published.

1977 Aug. 16–*Miso Production** published by Soyfoods Center–the first book we self-published.

1978 July 28-30–The Soycrafters' Association of North America is founded in Ann Arbor, Michigan. William Shurtleff helps to organize the inaugural meeting, is a founding member, and a member of the first board of directors.

1978–Soyfoods Center starts to develop a mailing list (typed so as to fit on pressure sensitive labels) of all people who have purchased books or contacted us.

1979 July 15–*Tofu and Soymilk Production** published by Soyfoods Center.

1979 July–The first issue of *Soycraft* magazine is published by Richard Leviton, director of Soycrafters' Association in Massachusetts. Each mailing is based on the

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use of Soyfood Center's mailing list–free of charge.

1980 March 10–*Tempeh Production** published by Soyfoods Center.

1980 Sept.-Dec.–Our mailing list of about 5,000 names and addresses, divided into 70 coded categories, is computerized by Parallel Procedures in San Francisco. This was done primarily to help Richard Leviton of *Soycraft* magazine.

1981 Dec.–There are now 10,900 names on our computerized Soyfoods mailing list, rising to 13,800 names by May 1982.

3. Documenting the history of soybeans and soyfoods (1980 Oct.–present)

1980 Sept. 10–Start to build what we hope will become a large library at Soyfoods Center with regular trips to the University of California at Berkeley library system.

1980 Oct. 22–Start writing *History of Soybeans and Soyfoods.*

1984 June 1–History book manuscript is now completely in our word processor: 2,500+ pages, 70+ chapters.

1984 June 21–Soyfood Center's annual summer intern program begins. Irene Yen, a Stanford student starting her senior year, is our first summer intern.

1984 July 17–*History of Tempeh published*–our first history book.

4. Studying the burgeoning soyfoods industry and market (1982 Sept.–1985 Feb.)

1982 May 16–*Soyfoods Directory and Databook* (1st edition) published. Renamed *Soyfoods Industry and Market: Directory and Databook* on 26 Feb. 1983. 3rd edition.

1982 Sept. 10–*Soyfoods Labels, Posters, and Other Graphics* published. But there is a much larger significance. We have now started a "Graphics Collection," separate from the documents in our library. The graphics are mostly for soyfood products, and they are filed alphabetically by product. These graphics will much later (starting March 2008) become the "face" of our digital book series published online.

1984 Feb. 25–*Soymilk Industry and Market* published.

1985 Feb. 22–*Tofutti and Other Soy Ice Creams* published.

1990 May 8–*Tofu Industry and Market in Europe* published.

1990 July 17–*Soymilk Industry and Market in Europe* published.

1994 Jan.–*Soyfoods Industry and Market: Bibliography and Sourcebook* published.

5. Foreign language editions of our books are published (1980 -)

1980 July–*Das Miso Buch** (hardcover and paperback) published by Ahorn Verlag (Wolfgang and Gabriella Furth-Kuby) in Germany.

1981 Aug.–*Das Tofu Buch** (hardcover) published by Ahorn Verlag in Germany.

1988 Nov.–*Das Tempeh Buch** (hardcover) published by Ahorn Verlag in Germany–6 years after the project started.

1988 Nov.–New German pocketbook editions of *Das Tofu Buch* and *Das Miso Buch* (paperback) published by Goldmann Verlag.

6. Developing a computerized information center (1980 Dec.–present).

1980 Dec. 12–Mailing lists of Soyfoods Center and Soyfoods magazine merged and computerized by Parallel Procedures in San Francisco. 5,500 names in 50 categories.

1983 Sept. 28–Install first computer at Soyfoods Center, IBM-PC with 20 MB hard disk and word processing software to use for writing our book on *History of Soybeans and Soyfoods.*

1985 May 9–Install Revelation database manager software for developing a computerized bibliographic database on soya.

1985 July 31–Finish keying all 6,677 file cards (3x5 inch) into our computerized database. Our library is now computerized.

1985 Aug. 30–Our computerized database, containing 9,500 bibliographic records, is now available for use by the public.

1986 Sept. 1-16–The first of many trips to do library research at the USDA National Agricultural Library, Library of Congress, and National Library of Medicine–America's three national libraries, all located in and about Washington, DC.

1987 July 6–Start entering Commercial Soy Products into our database.

1987 Oct. 11–*Bibliography of Soymilk, from 1578 to 1987: With 1,584 References* published–our first bibliography.

1987 Oct. 19–Coin the name SoyaScan, start using it to refer to our computerized database, and apply for a registered trademark, which we are issued on 19 July 1988.

1993 Feb.–Install a Novell 5-user network to link our various computers.

1995 Feb. 11–We enter the 50,000th record into our SoyaScan database.

1997 Nov. 24–We enter the 55,000th record into our SoyaScan database.

1997 Nov. 24–We enter the 55,000th record into our SoyaScan database.

2000 May 9–We enter the 60,000th record into our SoyaScan database.

2004 Oct. 3–We enter the 70,000th record into our SoyaScan database.

2008 Aug. 31–We enter the 80,000th record into our SoyaScan database.

2013 July 29–We enter the 90,000th record into our SoyaScan database.

7. Current status of computerized information–2013

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January 1

SoyaScan database now contains 90,799 records from 1100 B.C. to the present, including 76,165 published documents, 15,760 commercial soy products, 6,044 original interviews and overviews, and 6,866 unpublished archival documents.

More than 83.6% of all SoyaScan records have a summary/abstract averaging 161 words in length.

More than 43,000 records (47% of the total) are for documents published before 1970.

Thirty five major books in the series Bibliographies and Sourcebooks on Soya, produced from the SoyaScan database, are now available, published by Soyfoods Center.

Soyfoods Center Library owns about 75,000 documents, almost all of which have a record in the SoyaScan database.

SoyaScan Directory now contains the name, address, and phone number of 20,300 people and organizations worldwide actively involved with soyfoods and soybeans. Each entry is coded to show the type of activity, e.g. 2A = Tofu manufacturers.

8. Collecting and Publishing Information on Vegetarianism and Other Non-Soy Food Products that can Replace Animal Products.

1984 Oct. 31–Create our first vegetarian keyword (subject heading) VegeAnim = Vegetarian Diets and Animal Rights.

1988 Feb. 21–*Amazake and Amazake Frozen Desserts: Industry and Market in North America* published. Updated bibliographic supplement published in March 1995.

1992 Oct.–Start actively collecting information specifically on vegetarianism and veganism, and entering it into our new VegeScan database.

1992 March 4–*Bibliography of Vegetarianism: 1,755 References from A.D. 1170 to 1992, Extensively Annotated* published (360 p. large format, preliminary edition).

1992 June 12–*Sourcebook on Wheat Gluten Foods and Seitan* published. Expanded edition published in Jan. 1994.

2013 Jan. 1–VegeScan database now contains 8,800 bibliographic records on vegetarianism and veganism from 238 B.C. to the present.

Best selling books from Soyfoods Center (English-language editions only, as of Jan. 2013).

The Book of Tofu–600,000 copies sold.

The Book of Miso–140,000 copies sold.

The Book of Tempeh–47,950 copies sold.

Tofu & Soymilk Production–5,020 copies sold.

Other–9,200 copies sold.

Total–820,070 copies sold.

2007 Dec. 29.–We start to publish digital soy history books in PDF format on our website (www.soyinfocenter.com), free of charge. Each book contains many color photographs, illustrations, and sometimes maps. Our first book is "History of Soybeans and Soyfoods in the Middle East." On 20 Jan. 2010 we also publish the first of these books on Google Books; soon we publish all past books in this series on Google Books as well. By Sept. 2013 we have published 48 books in this series. The largest of these books, *History of Tofu and Tofu Products*, published on 20 May 2013, contains 4,004 pages (8½ x 11 inches), 13,302 references in chronological order, and 538 photographs and illustrations. Address: Lafayette, California. Phone: 925-283-2991.

11475. *SoyaScan Notes.* 2014. The best libraries and centers in Japan for doing research on soybeans and soyfoods (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** The two best general libraries are: (1) The National Diet Library (*Kokuritsu Kokkai Toshokan*), Nagata-cho 1-10-1, Chiyoda-ku, Tokyo 100, Japan. This is Japan's "Library of Congress." As of 1989 this library owned 4.18 million books / monographs, 42,000 current periodicals, 240,000 maps, 135,000 microforms, 266,000 sound recordings. (2) Tokyo University, Department of Agriculture Library (*Tôkyô Daigaku, Nogaku-bu Toshokan*), Yayoi-cho 1-1-1, Bunkyo-ku, Tokyo 113, Japan. Phone: 03-815-8391. They own the following journals: Byochugai Zasshi, Yakugaku Zasshi (1905-13), Nogaku Kaiho, Sapporo Norin Gakkai-ho, Nogyo Oyobi Engei, Rikagaku Kenkyusho Hokoku (1932-38).

Also good is Tokyo University of Agriculture (*Tokyo Nogyo Daigaku*), 1-1-1 Sakuragaoka, Setagaya-ku, Tokyo 156, Japan. Phone: 03-420-2131.

11476. *SoyaScan Notes.* 2014. Chronology of Korea. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** 1st century B.C.–Recorded history began.

688 A.D.–The country was united in a kingdom under the Silla dynasty. It was at times associated with the Chinese empire.

1592-98–Invaded by Japanese under Hideyoshi.

About 1637 shut out foreign contacts.

1876–Forced to grant treaty ports to Japan, which recognized Korean independence. 1894-95–Sino-Japanese war caused by Korea uniting with Japan in a time of internal disorder in order to resist Chinese interference (Korea was considered a Chinese vassal). The treaty that concluded this war recognized Korea's complete independence.

1904-04–Russo-Japanese War caused in part by rivalry between Russia and Japan over Korea.

1907–Became a Japanese protectorate.

1910–Japan forcibly annexed Korea as a province called Chôsen.

1945 July–At the Potsdam conference, the 38th parallel was designated as the line dividing the country into two zones of occupation: Russian in the north and American in the south.

1945 Aug. 10–Russian troops enter Korea. Aug. 15–

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Korea celebrates Victory over Japan Day, which liberated Korea from colonial rule. 1945 Sept. 8–U.S. Troops enter Korea. The Soviet military organizes socialists and communists and blocks efforts to let the Koreans unite their country.

1948 May 1–North Korea declares independence. The Democratic People's Republic of Korea founded in north Korea; its capital is P'yongyang. 1948 May–The South Koreans declare independence and form the Republic of Korea with Seoul as the capital. Dr. Syngman Rhee is chosen president. 1948 Aug. 15. South Korea gains independence. Freed from Japanese control upon defeat of Japan at the end of World War II.

1950 June 25–Over 60,000 North Korean troops invade South Korea in a surprise attack, starting the Korean War. The North is the stronger state, both industrially because of its mineral and hydro-power resources, and militarily because of Soviet armament for offensive warfare. The attack is immediately condemned by the United Nations Security Council. June 27–The U.S. under president Truman, backed by the United Nations Security Council, sends in Air Force and Naval troops under the unified command of General Douglas MacArthur. Troops from many countries in the United Nations join the fight. June 30–Truman approves air and ground strikes against the north.

1950 Sept. 15–General Douglas MacArthur launches a surprise amphibious invasion of Korea at Inchon, South Korea, behind the North Korean Army's lines. The battle of Incheon resulted in a decisive victory and strategic reversal in favor of the United Nations (UN). The operation involved some 75,000 troops and 261 naval vessels, and led to the recapture of the South Korean capital, Seoul, two weeks later.

1951 April 11–General MacArthur's increasingly public disagreement with the fixed American policy of no more than a limited war led to his dismissal by President Truman. 1951 July–Truce talks begin at Panmunjom, but drag on for 2 years (due to Stalin's stalling tactics) while sporadic fighting continues.

1953 July 27–After 3 years of fighting, an armistice is signed. A closed border at about the 38th parallel is established. U.S. troops remain in the south, and U.S. economic and military aid are continued. War casualties were: Chinese about 900,000, North Korean 520,000, South Korean 300,000, American 142,000 (the 4th largest in U.S. history).

1960 April 26–A movement spearheaded by college students forces the resignation of president Syngman Rhee in South Korea.

1961 May 16–In an army coup, General Park Chung Hee becomes chairman of the ruling junta. In 1963 he is elected president. A 1972 referendum allows him to be reelected for 6-year terms unlimited times. 1979 Oct. 26–Park is assassinated by the chief of the Korean CIA.

11477. *SoyaScan Notes.* 2014. Translations of documents on soya from Asian languages to English, wish list (Overview). Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** 1. Translate from Chinese: C.N. Li, comp. 1958. Dou-lei [*Varieties of beans*]. This book contains every known quotation about soybeans published in China from 1100 B.C. to recent times–100 pages total on soybeans. It is a treasury of key historical information that has never been translated into English.

2. Translate from Japanese: Wataru Kawamura. 1958. *Miso enkakushi* [*History of miso*]. 817 p. 22 cm. The definitive book on this subject. Pages 187-213 list all early Japanese books mentioning miso, with a summary of what each says.

11478. *SoyaScan Notes.* 2014. Chronology of China, from 1912. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** 1912 Jan. 1–China becomes a republic (ending the rule of emperors) following the Wuchang Uprising inspired by Dr. Sun Yet-sen.

1931 Sept. 18–Japan seizes the Northeastern Provinces (Manchuria) and sets up a puppet state that they call Manchukuo. 1933–The border state of Jehol is cut off as a buffer state. 1937 July 7–Japan invades China proper.

1949 Sept. 21–The People's Republic of China is proclaimed in Peking by the Chinese People's Political Consultative Conference under Mao Zedong. The USA refuses to recognize the new regime. 1949 Dec. 8–The Kuomintang government, under Chiang Kai-shek, moves to Taiwan, 90 miles off China's southeastern coast.

1950 Feb. 15–China and the USSR sign a 30-year treaty of "friendship, alliance and assistance. 1950 Nov. 26–The PRC sends armies into Korea to aid the North Koreans and forces a stalemate. 1951–China invades Tibet and a communist government is installed in 1953. 1949-1952–Industry, agriculture, and social and economic institutions are forcibly molded to fit Maoist ideals. However frequent changes in policy and violent factionalism interfere with economic development. As estimated 800,000 people are executed during this period according to a statement by Mao Zedong in 1957, but opponents claim much higher figures. 1958-60–The Great Leap Forward tries to accelerate the pace of economic development through intensive labor on huge new rural communes, and through ideological purity and enthusiasm. The program caused resistance and was largely abandoned. Serious food shortages developed, and the government was forced to buy grain from the West. 1958-61–Famine in China leads to about 27 million deaths; it is caused by Mao's destructive collectivization of agriculture.

1960s–Relations with the USSR deteriorate, with disagreements on borders, ideology and leadership of world communism. The USSR cancelled aid accords, and China, with Albania, launched anti-Soviet propaganda drives.

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1965–The Great Proletarian Cultural Revolution is launched in an attempt to oppose pragmatism and bureaucratic power and instruct a new generation in revolutionary principles. Massive purges take place. A program of forcibly relocating millions of urban teenagers into the countryside is launched. By 1968 the movement had run its course; many purged officials returned to office in subsequent years, and reforms in education and industry that had placed ideology above expertise were gradually weakened. But some date the Cultural Revolution from 1966 to 1976.

1971 Oct. 25–The United Nations General Assembly ousts the Taiwan government from the UN and seats the PRC in its place. The U.S. supports admission of the PRC but opposes Taiwan's expulsion. 1972 Feb. 21-28–U.S. President Nixon visits Beijing, China, on invitation of Zhou Enlai, ending years of antipathy between the two nations. He called his 8-day visit a "journey for peace." 1973 May-June–China and the USA open liaison offices in each other's capitals. 1976–Mao Zedong and Premier Zhou Enlai die. 1978 Dec. 15–The U.S. formally recognizes the PRC as the sole legal government of China. 1979 Jan. 1–Diplomatic relations are established between the USA and China. 1979 Feb. 17–In retaliation for Vietnam's invasion of Cambodia and alleged persecution of ethnic Chinese in Vietnam, China attacks 4 Vietnamese border provinces and heavy border fighting ensues.

1981 Jan. 25–In a continuing "reassessment" of the policies of Mao Zedong, Mao's widow, Jiang Quing, and other Gang of Four members are convicted of "committing crimes during the Cultural Revolution." By the mid-1980s, China's new leadership under the pragmatists Deng Xiaoping and Zhao Ziyang has introduced decentralized decision-making, material incentives, specialization by household and production region, and greater dependence upon international trade. This is a move from rigid central planning toward market-oriented socialism. 1989 May 4–Some 100,000 students and workers stage a march in Beijing to demand democratic reforms. The demonstrations continue during a visit to Beijing by Soviet leader Mikhail Gorbachev on May 15-18. This was the first Sino-Soviet summit since 1959. A million people gather in Beijing to demand democratic reforms and the removal of Deng and other leaders. There are protests in at least 20 other Chinese cities, Martial law is imposed May 20 but is mostly ignored by the protesters. 1989 June 3-4–Chinese army tanks and personnel carriers attack Tiananmen Square, outside the Great Hall of the People, which is the main scene of the demonstrations and hunger strikes. According to the *World Almanac* (1997), an estimated 5,000 students and workers are killed, 10,000 injured, and hundreds arrested.

1997 Sept. 19–Jiang Zemin (who was mayor of Shanghai in 1989) emerges as the most powerful political figure in China. He is reelected president of the Communist Part for another 5 years. His political allies also win powerful positions during this week's party congress. His main rival is gone from the powerful 7-man Politburo Standing Committee. Most significant is the promotion to No. 3 in the Party of Ju Rong-ji, China's economic leader and strategist, who is known to be hard on corruption. He will probably become the country's next prime minister when Li Pung retires in March 1998. Like Jiang, Ju Rong-ji is from Shanghai; he was closely associated with the renaissance of that city. To him will lie the tasks of implementing Jiang's ambitions plans to sell off or shut down vast amounts of the country's state-owned firms. Chinese people feel good about the new leadership, and their ability to deal with the challenges ahead. Thus reform in China continues to be economic, but not yet political. The leadership is centrist, with almost no opposition from the left or right. China sits atop two massive contradictions and questions: (1) Is it a communist economy moving toward capitalism? To whom will it sell the state-owned industries and how? (2) Is it an authoritarian political system moving toward democracy?

11479. *SoyaScan Notes.* 2014. The visionary work of Henry Ford and his researchers with soyfoods–then and now: Popularized the use of soybeans as foods in America (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** Before Henry Ford began his pioneering work with soybeans in the early 1930s, most American consumers and farmers thought their only use was as feed for animals. Ford and his researchers and chefs played a major role in developing a remarkable variety of tasty and nutritious American-style foods from soybeans, and in publicizing these foods and their health benefits nationwide.

Prior to 1934 (according to records in the SoyaScan database) only about 188 commercial soyfood products had been introduced in America. Of these, 78 had been launched in the Hawaiian Islands, so only 110 had been introduced on the American mainland. Of these 110, at least 46 were made by Asian-American companies primarily for Asian-Americans (such as Chinese-Americans, Japanese-Americans, etc.). Thus only 70 products were made by Caucasian-American companies, and, of these, 27 products were made by Seventh-day Adventist companies and sold mostly to other Seventh-day Adventists. In short, between 1766-1767 (When Samuel Bowen launched America's first two commercial soy products–Soy-based Vermicelli Noodles and Bowen's Patent Soy [Sauce]) and 1934, only 43 commercial soy products had been introduced by Caucasian-American companies, not including Seventh-day Adventists.

Henry Ford's ideas about introducing American-style soyfoods took their first clear form on August 13, 1934, when he presented an all-soy gala dinner banquet for the American media at the immensely popular Ford Exhibit in the Century of Progress World's Fair in Chicago, Illinois. Note first that he chose a world-class event to introduce

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the little-known Cinderella crop. Now listen to the names of dishes on the menu: "Tomato juice seasoned with soy bean sauce. Salted soy beans. Celery stuffed with soy bean cheese [tofu]. Puree of soy bean. Soy bean cracker. Soy bean croquettes with tomato sauce. Buttered green soy beans. Pineapple ring with soy bean cheese [tofu] and soy bean dressing. Soy bean bread with soy bean relish. Soy bean biscuit with soy bean butter. Apple pie (soy bean crust). Cocoa with soy bean milk. Soy bean coffee. Assorted soy bean cookies. Soy bean cakes. Assorted soy bean candy."

This menu represented a fresh, new vision of soyfoods in America! Note the creative use of tofu in a pineapple ring and as a celery stuffing, and of soymilk with cocoa.

But this was just the beginning. By Aug. 1935 Ford was serving soy ice cream for dessert at VIP and press luncheons held at the Ford Engineering Laboratory. In about 1936 Ford's Edison Institute published a 19-page booklet titled "Recipes for Soy Bean Foods," which contained 58 innovative American-style preparations including: Soy bran bread. Cinnamon buns. Muffins (for diabetic patients). Waffles (with soy flour). Scalloped green soy beans. Omelette (with tofu). Salad soy bean sprouts. Gingerbread. Honey soy bean ice box cookies. Macaroons. Coconut balls (with chopped soynuts). Lady fingers. Soy bean chocolate bars. Apple sauce cake. Doughnuts. Soy bean custard (with soymilk).

In 1938, when Ford researcher Bob Smith invented a new and greatly improved type of soymilk (based on soy protein isolates), Ford and his researchers focused on developing new dairylike products based on this soymilk, including a non-dairy whipped cream, and an improved soy ice cream. The soymilk itself was widely served at Ford institutions in and around Dearborn, Michigan.

Indeed a strong case can be made that Henry Ford and his coworkers played the leading pioneer role in developing American-style soyfoods and introducing them in a big way to America. In so doing, they set the stage for the rapid rise of soyfoods consumption among typical Americans that began in a small way during World War II, and in a big way starting in the 1970s and continuing into the 1990s.

11480. *SoyaScan Notes.* 2014. The visionary work of Henry Ford and his researchers with soyfoods–then and now: Developed spun soy protein fibers to replace wool and fur in auto upholstery, felt hats, and other non-food industrial products (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** The first textile filament spun from a protein derived from a plant/vegetable source (specifically from soybeans) was developed by Ryohei Inouye of Japan. On 5 March 1938 he received the Fuji prize award for his discovery. At about this same time, the same product was being developed by Robert Boyer and William T. Atkinson at the Ford Motor Co. In April 1938 Boyer displayed his first soy fiber (for use in auto upholstery) at the Fourth Annual Conference of the Farm Chemurgic Council, in Omaha, Nebraska. The earliest article seen on Boyer's soy fiber appeared in *Science News Letter* on 7 May 1938. Boyer and Atkinson applied for the first U.S. patent for industrial (non-edible) spun soy protein fibers in June 1941; it was issued in June 1945 (No. 2,377,854).

In early 1942 the Ford Motor Co. began operation of a pilot plant at Highland Park, Michigan, that produced 1,000 pounds per day of soybean "wool," a synthetic fiber, at less than half the cost of sheep's wool. Soon a fabric containing 25% soybean wool and 75% sheep's wool was used in the sidewall of some cars used by Ford company employees. And Henry Ford began sporting a suit made of soybean fiber on special media occasions.

In November 1943, under pressure to produce machinery for World War II, Ford sold its entire soy protein and soybean fiber spinning operations to The Drackett Co. of Cincinnati, Ohio. On 2 Dec. 1943 Drackett began commercial production of Soybean Azlon, the world's first commercial fiber made from plant proteins. The fibers were used mainly in felt hats by the American Hat Corporation.

11481. *SoyaScan Notes.* 2014. Historical research on the dissemination of the soybeans worldwide: Wish list (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** In the record titled "Countries, overseas dependencies, and Canadian provinces in which we have no record of soya ever having been cultivated (Overview)," try to find when and where soybeans were first cultivated in each of these geographical areas.

Africa: In 1873 Prof. F. Haberlandt obtained soybeans from Tunisia. What was his source? When, how and from where were these soybeans first introduced to Tunisia?

Asia–Central: In 1873 Prof. F. Haberlandt obtained soybeans from Transcaucasia. What was his source?–Perhaps the Republic of Georgia. When, how and from where were these soybeans first introduced to Transcaucasia. Clarify when and where soybeans were first cultivated in the Republic of Georgia (before 1911, maybe before 1873), and in Kazakhstan (before 1940), and in general in Transcaucasia. Learn more about the work of G. Sturua with soybeans.

Canada–The story of the arrival of the soybean in Canada between 1855 and 1894 needs to be researched. There must be some early records, similar to those from the Commissioner of Patents.

Europe–Western: Make a good translation of F. Haberlandt's 1878 classic *Die Sojabohne*, accompanied by 2 maps of the places in Europe where Haberlandt and his cooperators grew soybeans (one of the area in 1878 and one now; travel in Eastern Europe to get these) and a database for making a good overview: What kind of people tested

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the soybeans? (Gutsbesitzer, Freiherr, Schloss-gaertner, agricultural institutions, etc.). Who got the best yields and where? In Aug. 1878 Prof. Friedrich Haberlandt wrote: "In Tirol [Tyrol, Austria] the soybean is called the Coffee Bean (*Kaffebohne*) and used to prepare a coffee substitute." When and how were these soybeans introduced to Tirol?

Europe–Eastern: Write a biography of Mr. Ovsinskii (Also spelled Ovsinski, Owinsky, Ovinsky) of Podolia, Ukraine (See Sempolowsky 1900) who traveled to Asia, introduced soybeans to Russia, was the first man in Russia to grow and test them extensively, then publicize their many virtues.

USA: Write a good history (with a good bibliography) of Chinese growing and processing soybeans in California. They must have grown them between 1849 and 1899! Likewise with Japanese growing soybeans in California.

11482. *SoyaScan Notes.* 2014. Definition of the green vegetable soybeans and edamamé (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** Green vegetable soybeans are called edamamé (pronounced ay-dah-MAH-may) in Japan and at some Japanese-American food stores and restaurants. are harvested at the fresh green stage, slightly before they mature and dry. In East Asia, the entire soybean plant is often uprooted at this stage, tied into a bundle, and sold with the green soybeans in their pods attached to the plant. Removed from the plants, the pods are usually boiled in lightly salted water for 15-20 minutes, then allowed to cool, and served in the pods as a snack or an hors d'oeuvre. To enjoy, push the beans with your fingertips from the pods into your mouth. Discard the pods. Like potato chips, these nutritious little morsels are positively addicting. In July or August, any American soybean farmer can easily enjoy green vegetable soybeans served in this way.

Green vegetable soybeans contain more protein than any other fresh vegetable; they are also an excellent source of dietary fiber and an easy way to add the benefits of soy to typical American diets.

Traditionally in East Asia, and increasingly in America, green vegetable soybeans are grown from what are called "vegetable-type" or "food-grade" soybeans, which have an East-Asian pedigree and are larger seeded and better tasting than typical "commercial" soybeans that have been bred as a source of soybean oil and meal.

Green vegetable soybeans are now more and more widely available in America, and especially in California, Hawaii, and Minnesota. Look for them at supermarkets (usually in the produce section), Asian-American food stores, natural food stores, and Trader Joe's. In California and Hawaii, the most popular brand, from Yamato, is sold at many supermarkets and natural and Asian food stores, precooked, in the pods, and ready to eat. Edamamé are also sold frozen in three different forms: Shelled, in the pods, or mixed with other vegetables (such as baby broccoli), in the frozen vegetable section of supermarkets. Address: Soyfoods Center.

11483. *SoyaScan Notes.* 2014. Definition of the yuba (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** Yuba is the film that forms atop soymilk when it is heated. If you have ever simmered a pot of milk over very low heat or set a bowl of hot milk aside to cool, you have no doubt noticed the thin, delicate film that soon forms on the milk's surface. The longer it is allowed to set, the firmer and thicker it becomes. And if you have ever tried lifting this film off and tasting it, you may have found it to be soft, warm, and delicious.

In the same way, if fairly thick soymilk is gently heated in shallow open pans at 80-90ºC, a cream-yellow, bland flavored film gradually forms on its surface. The films are successively removed from the soymilk surface using a long skewer or chopstick, and hung up on the skewer in racks to dry. Each successive film becomes a little thicker and sweeter than the one before it. In Japan, this delicacy is called yuba. In China, it is called *tofu p'i* or *fuzhu.* In Chinese restaurants it is often called "bean curd skin." Scientists sometimes refer to it as a "protein-lipid film."

Fine-quality yuba has been made in America (Los Angeles, California, area) by one company since Feb. 1982. It is sold there in three forms: Fresh frozen sheets, half-dried sheets, and dried sticks. These products are sold mostly to Chinese restaurants. A large amount of dried yuba, in many different shapes, is also imported to America from East Asia and sold at Asian-American food stores. The dried yuba sheets may also be named bean curd skin, bean curd sheets, or dried bean curd. The twisted u-shaped rolls may be labeled dried yuba sticks or rolls, bamboo yuba, or bean curd sticks. The sweet bottom yuba is called tien chu in Mandarin Chinese, tiem jook in Cantonese, and ama-yuba in Japanese.

Yuba is most widely used as a wrapper for other foods. However small amounts can be added to soups or stir fries, and fresh yuba can be pressed into molds and steamed to make chewy, tasty meatlike products. Deep-fried yuba makes delicious, crisp and crunchy protein-rich chips–which some people prefer to potato chips. Address: Soyfoods Center.

11484. *SoyaScan Notes.* 2014. Chronology of soymilk worldwide–1950 to present. Part II. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** 1950's–Soymilk enters the modern era as it begins to be marketed in bottles like soft drinks, largely due to work by K.S. Lo of Vitasoy in Hong Kong and Yeo Hiap Seng in Singapore.

1957–Japan's first commercial soymilk, sold in bottles, named *Tônyû*, is introduced by the Ueda Tofu Shop in Hachioji, Tokyo. Dr. Harry Miller was the inspiration for and

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helped to establish the shop.

1960s–In Japan, soymilk slowly increases in popularity. New manufacturers are: Nihon Tanpaku Kogyo (1962). College Health Foods (later renamed San-iku Foods) in Chiba prefecture with its Soyalac (1969, also inspired and aided by Dr. Harry Miller). Luppy Tanpaku (House Shokuhin) in Saitama prefecture with its Luppy soymilk (1969).

1965–ProSobee, the world's earliest known non-dairy infant formula based on soy protein isolates, is launched by Mead Johnson & Co. of Evansville, Indiana.

1966–The enzyme lipoxygenase is discovered by scientists at Cornell University [Ithaca, New York] to be responsible for the "beany" flavor in soymilk. A process is developed which could be used to help eliminate this flavor.

1967–Soymilk begins to be packaged aseptically in Tetra Pak cartons. This allows it to be sold without refrigeration for six months or more. The first such product was Beanvit, made by Yeo Hiap Seng Ltd. in Singapore and packaged in a disposable tetrahedron-shaped container.

1970's and 1980's–Soymilk becomes a popular beverage throughout Asia, spreading to Europe, Australia and the United States.

1979–Hong Kong Soya Bean Products Co. Ltd. starts to export Vitasoy, packed in Tetra Brik cartons, to selected countries throughout the world. By the early 1980s exports were going to over 20 countries, both developed and developing. Exports to the USA began in 1980. 1980 Jan.–DE-VAU-GE Gesundkostwerk, a Seventh-day Adventist food company near Hamburg, Germany, launches GranoVita Soja Drink in 500 ml Tetra Brik cartons; this soymilk product is made by N.V. Vandemoortele (one of Europe's largest oilseed crushers, founded in 1934) in Izegem, Belgium.

1980 June–N.V. Alpro is founded by Vandemoortele to take over production of this soymilk. Inspired and headed by Philippe Vandemoortele, Alpro purchased the land on which it was located from Vandemoortele, and became an independent manufacturer. Alpro quickly became Europe's leading producer of soymilk, making private-label brands for scores of companies.

1983 July–Edensoy brand soymilk is launched by Eden Foods of Clinton, Michigan. Imported from Japan (where it is made by Marusan-Ai Co.), it is sold in plain and carob flavors in stand-up foil retort pouches.

1984 Feb.–The first comprehensive study of the soymilk market in the U.S. is published by Soyfoods Center of Lafayette, California. It estimates that total soymilk consumption in the U.S. in 1983 (not including soy-based infant formulas) was 2.68 million gallons (26% of this was imported), and total production of soy-based infant formulas was 32 million gallons.

1984 Aug.–Westsoy Natural brand soymilk is launched by Westbrae Natural Foods of Emeryville, California. Imported from Japan (where it is made by San-Iku Foods), it is sold in one flavor in standup foil retort pouches.

1984 Oct.–Westbrae Natural Malted's, a thick soymilk resembling a milk shake, are launched in many flavors by Westbrae Natural Foods, imported from Japan.

1986 Nov.–Edensoy starts to be made in America by American Soy Products (ASP) at a large, modern plant in Saline, Michigan, and sold in Tetra Brik aseptic cartons. ASP is a joint venture of 4 Japanese companies and Eden Foods.

1988 Nov.–Pacific Foods of Oregon, launches its first soymilk product, Naturally Northwest Soy Beverage [Plain], in a 1-quart Tetra Brik Aseptic carton. The company's new factory is in Tualatin, Oregon.

1990 April–WestSoy Lite, America's first "lite" soymilk, with a low fat content, is introduced in plain, vanilla, and cocoa flavors by Westbrae Natural Foods. Made by adding water to regular soymilk, the product is less expensive to make, but also contains less nutrients.

1990 June–Alpro opens a new soymilk plant at Wevelgem, Belgium. Costing about US$15 million and having a capacity of 45 million liters a year, it is reputed to be the largest in the world. Alpro now makes about 70% of the soymilk in Europe.

1990 Sept. 24–The company name is changed to Vitasoy International Holdings Ltd. from Hong Kong Soya Bean Products Co. Ltd.

1991–There are at least 35 processors or marketers of soymilk in the U.S., increasing production to approximately 9.8 million gallons. Consumption is estimated to be growing at between 15 and 20% per year since 1984.

1993–More than 200 scientific journal articles about soymilk have been published in English, and at least 80 English-language patents on soymilk have been issued between 1912 and 1993.

1994 Jan.–Soy-Um, a low-priced and attractively packaged soymilk, is launched by J&G Inc., a product developer and distributor in Chicago, Illinois. The product is made in Oregon by Pacific Foods.

1995–A market study is published, estimating that $108 million of soymilk was sold in the U.S. in 1994. This equates to approximately 13.5 gallons of soymilk. By 1995 sales are projected to have risen to over $130 million, or approximately 16.3 million gallons.

11485. *SoyaScan Notes.* 2014. Chronology of tofu worldwide–965 A.D. to 1929. Part I. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** 965 A.D.–Tofu is first mentioned in China in a document, the *Qing Yilu* (Wade-Giles: *Ch'ing I Lu*) [Anecdotes, Simple and Exotic], by Tao Ku. It states: "In the daily market were several catties of doufu. People of the region called doufu the 'vice mayor's mutton.'" It goes on to tell the story of a vice mayor named Jishu, who was so poor that he couldn't afford to buy mutton. Instead he bought a few pieces of tofu every day and ate them as a side

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dish with rice. Soon people in the area came to call tofu the "vice mayor's mutton." The story implies that tofu was widely consumed in China in those days and that it was less expensive than mutton.

1183 A.D.–Tofu is first mentioned in Japan in the diary of Hiroshige NAKAOMI, a Shinto priest of the shrine at Nara; the tofu was used as an offering at the shrine's altar.

1489–The word "tofu" is first written in Japan with the characters used today.

1603–The word "tofu" is first mentioned in a European-language (Portuguese) document, *Vocabulario da lingoa de Iapam...* [*Vocabulary of the language of Japan*], the earliest dictionary of the Japanese language compiled by Europeans (Jesuits living in Nagasaki, Japan). Tofu is referred to as *Cabe, Tôfu,* or *Taufu.*

1613–The word tofu is first referred to (though indirectly) for the second time by a Westerner, Captain John Saris, in the log of his trip to Japan. He wrote "Of Cheese [probably tofu] they haue plentie. Butter they make none, neither will they eate any Milke, because they hold it to bee as bloud [blood], nor tame beasts." This is the earliest English-language document that mentions tofu in connection with Japan.

1665–Tofu is first mentioned specifically by a Westerner, Domingo Fernández de Navarrete, in his book *A Collection of Voyages and Travels.* Navarrete, who served as a Dominican missionary in China, wrote: "Before I proceed to the next chapter, because I forgot it in the first book, I will here briefly mention the most usual, common and cheap sort of food all *China* abounds in, and which all men in that empire eat, from the emperor to the meanest *Chinese,* the emperor and great men as a dainty, the common sort as necessary sustenance. It is call'd *teu fu,* that is, paste of kidney-beans. I did not see how they made it. They draw the milk out of the kidney-beans, and turning it, make great cakes of it like cheeses, as big as a large sieve, and five or six fingers thick. All the mass is as white as the very snow, to look to nothing can be finer. It is eaten raw, but generally boil'd and dressed with herbs, fish, and other things. Alone it is insipid, but very good so dressed and excellent fry'd in butter. They have it also dry'd and smok'd, and mix'd with caraway-seeds, which is best of all. It is incredible what vast quantities of it are consum'd in *China,* and very hard to conceive there should be such abundance of kidney-beans. That *Chinese* who has *teu fu,* herbs and rice, needs no other sustenance to work; and I think there is no body but has it, because they may have a pound (which is above twenty ounces) of it any where for a half-penny. It is a great help in case of want, and is good for carriage. It has one good quality, which is, that it causes the different airs and seasons, which in that vast region vary much, to make no alteration in the body, and therefore they that travel from one province to another make use of it. *Teu fu* is one of the most remarkable things in *China,* there are many will leave pullets for it. If I am not deceiv'd, the *Chineses* of *Manila* [Philippines] make it, but no *European* eats it, which is perhaps because they have not tasted it, no more than they do fritters fry'd in oil of *Ajonjoli* ([sesame seed] a very small seed they have in *Spain* and *India,* which we have not) which the *Chineses* make in that city and is an extraordinary dainty."

1704–Friar Domingo Navarrete's book is published in English. This is the earliest English-language document that mentions tofu in connection with China.

1770 Jan. 3–James Flint in Capringe writes Benjamin Franklin in London (in response to an inquiry from Franklin) a detailed description of how the "Chinese convert Callivances into Towfu" (soybeans into tofu).

1770 Jan. 11–The earliest document seen in which an American mentions tofu is a letter written by the famous Benjamin Franklin (who was in London) to John Bartram in Philadelphia, Pennsylvania. He sent Bartram some soybeans (which he called "Chinese caravances") and with them he sent "Father Navarrete's account of the universal use of a cheese made of them in China, which so excited my curiosity, that I caused enquiry to be made of Mr. [James] Flint, who lived many years there, in what manner the cheese was made, and I send you his answer. I have since learned that some runnings of salt (I suppose runnet) is put into water, when the meal is in it, to turn it to curds."

1821–The second earliest reference seen to tofu in America, and the first to be published in the USA, appeared when A.F.M. Willich of Philadelphia mentioned it in *The Domestic Encyclopedia.* Speaking of soybeans (which he called "the seeds of the Chinese plant *Dolichos soja"*), he wrote: These *seeds* are used in China and Japan as food; they are made into a kind of jelly or curd, which is esteemed very nutritious, and which is rendered palatable by seasonings of different kinds."

1870 Dec.–The term "Bean curd" is first used by Emil V. Bretschneider, writing in English in the *Chinese Recorder and Missionary Journal* (Foochow, p. 173). He said: "Bean-curd is one of the most important articles of food in China." Then he gave an accurate description of how it was made.

1880–Tofu is first made in Europe by Paillieux, in France, for the Society for Acclimatization (but not on a commercial scale).

1878–The earliest tofu company in the USA, Wo Sing & Co., is in business at 708½ Dupont St. in San Francisco, making both fermented and regular tofu.

1895–Hirata & Co. in Sacramento, California, the earliest known Japanese-American company in the USA, starts making tofu.

1896 June–Tofu first appears in print in an American scientific journal (*American Journal of Pharmacy*), in an article by Henry Trimble, a pharmacist, titled "Recent Literature on the Soja Bean."

1906–Quong Hop & Co., the oldest existing tofu maker in America today, starts making tofu in San Francisco,

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California.

1910–Europe's first commercial soyfoods manufacturer, named *Caséo-Sojaïne,* is founded by Li Yu-ying, a Chinese citizen, biologist and engineer, at 46-48 Rue Denis Papin, Les Vallées, Colombes (near Asnières), a few miles northwest of Paris. By May 1911 he was making and selling tofu, and by August 1911 he had added smoked tofu, pressed tofu sheets, fermented tofu cheese (in Gruyere, Roquefort, and Camembert flavors), and soymilk.

1923–The two oldest existing Japanese-American tofu companies (House Foods & Yamauchi Inc. of Los Angeles and Aala Tofu Co. of Honolulu) are founded in Hawaii. They both began as H. Iwanaga Daufu at 1031 Aala St. in Honolulu. In 1926 the company was renamed Shoshiro Kanehori Tofu, and in 1937 Haruko Uyeda Tofu, still at the same address. In about 1939 the company was purchased by Mr. and Mrs. Shokin Yamauchi, who later renamed it Aala Tofu Co. Their son, Shoan Yamauchi, made tofu at the family company until 1946, when he went to Los Angeles, purchased the Hinode Tofu Co., and began making tofu there in 1947. After becoming Matsuda-Hinode Tofu Co. in 1963, the company was renamed House Foods & Yamauchi Inc. in 1983.

1929 Nov.–T.A. Van Gundy, a Seventh-day Adventist and founder of La Sierra Industries in Arlington, California (near Riverside), becomes the first Westerner to make tofu commercially when he introduces La Sierra Soya Cheese. This tofu was canned and pimiento was added to prevent graying after canning. Continued.

11486. *SoyaScan Notes.* 2014. Chronology of tofu worldwide–1930 to present. Part II. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** 1930s early–Azumaya Tofu Seizo-sho (later renamed Azumaya Co.) starts making tofu, *yaki-dofu* (grilled tofu), and *ganmodoki* (fried tofu patties) in San Francisco at 1636 Post St. between Buchanan and Laguna streets. The company is owned by Mr. Teranishi, who may have started it as early as the early 1920s. In Feb. 1937 it was sold to George and Jack Mizono, and their mother and father (Saichi Mizono).

1932, Dec.–Madison Foods, part of Madison College in Madison, Tennessee, was making Soy Cheese, then by 1939 they had launched Cheze-O-Soy (seasoned tofu), and by 1940 they were making a canned tofu bologna named Yum.

1934–By this year Loma Linda Food Co. (Adventist) in Loma Linda, California, was making Loma Linda Vege-Cheese (canned tofu with pimiento).

1942 Sept.–Dr. Harry Miller, a Seventh-day Adventist doctor who had worked for many years in China as a medical missionary, begins making Miller's Soya Cheese (tofu) at Mt. Vernon, Ohio.

1944 Sept.–Butler Food Co. in Cedar Lake, Michigan, introduces Butler's Soynut Cheese. Note that the first five Caucasian-run tofu companies in the Western World were all founded and run by Seventh-day Adventists. Note also that each of these five Seventh-day Adventist tofu products used the word "cheese" in the name and that each was canned. 1957 Aug.–Shizuka Hayashi, head of the Japanese-American Soybean Institute in Tokyo, publishes (in *Soybean Digest*) the earliest English-language statistics on tofu in Japan. "There are approximately 45,000 tofu manufacturers in Japan, of which about 23,000 are members of the Tofu Association. There is one large factory in Osaka, the largest in Japan, which consumes 2 tons of soybeans a day." In 1957 Japan will use somewhere between 160,000 and 308,000 tons of soybeans to make tofu.

1958–The world's first packaged tofu is sold in Los Angeles, California, by Matsuda Hinode Tofu Co. Mr. Shoan Yamauchi, owner, conceived of the idea of putting individual cakes of tofu each in a plastic bag with water, sealing the bag with a heat sealer, placing the bag in a stiff paper deli carton with a wire handle, then folding over the top. The process was labor intensive. This happened at about the same time that a letter from journalist George Yoshinaga had led the city to pass a new regulation requiring tofu to be packaged in individual containers.

1958–Tofu is first sold in a U.S. supermarket–Boy's Market supermarket chain (which had about 12 stores at the time) in Los Angeles. The tofu was sold in individual packages (see above) and made by Matsuda Hinode Tofu Co., whose owner, Mr. Shoan Yamauchi was responsible for this major innovation, and for seeing the mainstream potential of tofu.

1965–The Library of Congress establishes the subject heading "Tofu" as the official name for that food in cataloging books for libraries across America. However, in the mid-1970's disputes arose there about the proper form of romanization of that term. The dispute was resolved by the decision to use the common English term "Bean Curd" instead.

1966–Tofu is first packaged in plastic trays/tubs, the type so widely used today. Again, Mr. Yamauchi conceived of the idea. He went to the Sealright Company in Los Angeles that made Sealright trays and asked them to make a waterproof plastic tray for his tofu. Mr. Yamauchi created three specific early innovations in tray packaging: (1) A very deep tray, holding 26-28 ounces; (2) A method for heat sealing a plastic film to the flange of a tray which had cold water flooding over the flange; (3) High-speed sealing machines to pack and seal the tofu in his plant.

1975 March–Alec Evans, owner of first of the new breed of Caucasian-run tofu shops, starts to make "Tofu" in Corvallis, Oregon. His Welcome Home Bakery and Tofu Shop is the sixth Caucasian-run tofu company in America.

1975 Dec.–*The Book of Tofu,* by Shurtleff and Aoyagi, is published by Autumn Press. This book, which had sold about 550,000 copies by 1997, played a major role in introducing

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tofu to the Western World.

1977 Aug.–Takai Tofu & Soymilk Equipment Co. publishes its first English-language equipment catalog, which helps many American and European tofu shops to get started.

1977 Sept.–White Wave, owned by Steve Demos, starts making tofu at 1738 Pearl St., in Boulder, Colorado.

1977–Morinaga Milk Industry Co., Ltd. in Japan introduces the world's first aseptically packaged tofu in a Tetra Brik carton. It is named "Morinaga brand Tofu. Soybean Curd." In 1978 the name was changed to "Morinaga brand Ever-Fresh Silken Tofu."

1977–Swan Foods Corporation, owned by Robert Brooks and Mary Pung, starts making "Tofu–Organic" at The Soybeanery, 5758½ Bird Rd., Miami, Florida. This is the first tofu in the Western World labeled "Organic." Swan Foods is also the first American company to make a wide variety of soyfoods, and the first to open a soy deli–which had a take-out menu.

1978 April–Nasoya Foods, owned by John Paino and Bob Bergwall, starts making Nasoya Organic Tofu (water pack) at Mechanic Street Exit, Leominster, Massachusetts.

1978 Dec.–*The Book of Tofu,* by Shurtleff and Aoyagi, is published by Ballantine Books in a mass-market edition that retails for $2.95.

1979 July–*Tofu & Soymilk Production,* by Shurtleff and Aoyagi, is published by Soyfoods Center in California. This book is used to start hundreds of tofu manufacturing companies throughout the Western World and in some Third World countries.

1982 April–There are 242 tofu manufacturers in the Western World, including 173 in the United States.

1985 June–The Library of Congress decides to change its subject heading from "Bean curd" back to "Tofu." This, perhaps more than any other single thing, makes the word tofu "official."

1983–House Food Industrial Co., Ltd. of Japan purchases 50% ownership in Yamauchi Enterprises (formerly Hinode Tofu Co., owned by Mr. Shoan Yamauchi) in Los Angeles. The company is renamed House Foods & Yamauchi, Inc.

1989 Dec.–Sixty-five books (each more than 48 pages long) on tofu have been published in the Western World since 1970. Each one has the word "tofu" or its equivalent in the title. Forty of these books were published in the United States, 6 in Canada, 5 in Switzerland, 5 in Japan (but written in English for sale primarily outside of Japan), 3 in West Germany, 3 in France (but 2 of these were published simultaneously and primarily in Quebec, Canada), 2 in England, and 1 each in Italy, Sweden, and Brazil.

1990 Aug. 3–Hong Kong Soya Bean Products Co. Ltd. (makers of Vitasoy) acquires Nasoya Foods of Leominster, Massachusetts.

1993 June–Vitasoy purchases Azumaya Inc. (America's largest tofu manufacturer, and the low-price leader) in California for an estimated $4-$5 million.

1993–House Foods Corp. of Japan purchases the remaining 50% of House Foods & Yamauchi, Inc. from Mr. Shoan Yamauchi. The new company is renamed House Foods American Corporation.

1997 March 12–House Foods America Corporation holds the opening ceremony for America's largest tofu factory, in Garden Grove, California; the company closes its tofu plant in central Los Angeles.

11487. *SoyaScan Notes.* 2014. Chronology of Charles Christian Georgeson (1851-1931) of Kansas and Alaska. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** 1851 June 26–Born in Denmark on the island of Langeland. 1872–Emigrated to the USA. 1878–Graduated from Michigan Agricultural College with a B.Sc. degree. 1878-1880–Associate editor for the *Rural New Yorker* of New York City. 1880 fall–Chosen professor of agriculture and horticulture at the Texas Agricultural and Mechanical College. 1882–Received an MSc degree from the same College. 1885–Invited to teach in Japan. 1886-1889–From early 1886 to late 1889 he is employed by the Japanese government for 4 years as Professor of Agriculture at the Imperial College of Agriculture and Dendrology at Komaba, near Tokyo, Japan. 1887 Dec. Publishes "Fertilizer Experiments with Rice," which is *Bulletin of the College of Agriculture, Tokyo Imperial University* No. 1. 1889 fall–He returns to the United States. Very shortly thereafter he is offered the position of professor of agriculture in the Kansas Agricultural College at Manhattan, Kansas. 1890 Jan.–He accepts the offer and remains at the college for nearly 8 years until Sept. 1897, when the final dispersion of the old faculty took place at the hands of the Populist party. 1890 April–He receives a considerable consignment of seeds directly from Japan for experimental trial in Kansas. Among these seeds are three varieties of soya beans (including one later identified as the famous Ito San) and one or two varieties of adzuki beans. 1890 June 7–Writes his first article, titled "Farm Notes," that mentions soya beans in *The Industrialist* (Manhattan, Kansas). He reports that he grew both his Japanese and American ("home-grown") soybeans. "In all cases we find that home-grown seed has given us the best stand."

1890 Dec.–Writes his first article about testing azuki beans in Kansas. 1893 Jan.–Sent to Europe by the U.S. Secretary of Agriculture to investigate the thriving dairy industry in Denmark. 1898 March–Appointed special agent in Charge of the Alaska agricultural investigations, and at once started for Sitka, Alaska.

1925 Jan.–Publishes the earliest document seen about soybeans in Alaska or the cultivation of soybeans in Alaska. It appears in "Report of the Agronomist in Charge," *Alaska Agric. Exp. Stations, Annual Report.* The soybean varieties Mandarin and Pekin [Peking] were planted on 15 May 1923

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for use as silage.

1927–He retires. 1931 April 1–Dies at his home in Seattle, Washington. He is nearly 80 years of age.

11488. *SoyaScan Notes.* 2014. Chronology of miso and soybean chiang. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** 1st century B.C.–Soybean chiang is first mentioned in China in the *Shih chi* [*Historical records*] by Ssu-ma Ch'ien, and in the *Chi chiu p'ien* [*Primer on addressing matters*], by Shih Yu.

535 A.D.–The *Ch'i min yao shu* in China gives the first detailed descriptions of making soybean chiang–and other soyfoods.

701–Soybean hishio, miso, and fermented black soybeans start to be made in Japan by the *Hishio Tsukasa,* a government bureau. References to these seasonings are found in documents published between 730 and 748.

901-08–The modern word for *miso* first appears in Japan in the *Sandai Jitsuroku.*

927–The *Engi Shiki* gives the first details about the production of soybean hishio-miso in Japan.

1597–Miso is first mentioned by a Westerner, the Florentine Francesco Carletti; he calls it *misol.*

1712–Englebert Kaempfer, a German who lived in Japan, is the first European to give detailed descriptions of how miso and shoyu are made in Japan. Also mentions koji.

1727–Miso is first mentioned in an English-language publications, *The History of Japan,* by E. Kaempfer. He spells it *"Midsu,* a mealy Pap, which they dress their Victuals withal, as we do butter."

1779–The word "miso" ("that is used as butter") first appears in an English-language publication, the *Encyclopaedia Britannica.* 1847–The word "miso" first appears in print in the United States, in a letter from T.W.H. of Cambridge, Massachusetts, to the *Farmers' Cabinet and Herd Book.*

1908–Miso is first made commercially in the continental United States by the Fujimoto Co. of San Francisco, California. Brand name: Kanemasa Miso.

1921–The term "bean paste" is first used to refer to miso by J.L. North of England in the *Illustrated London News.*

1929–Amano Brothers, Canada's first commercial miso maker, starts in Vancouver, British Columbia. Founder: Mr. Teiichi Amano. 1960–Dr. C.W. Hesseltine and K. Shibasaki, of the Northern Regional Research Laboratory in Peoria, Illinois, publish the first of many important scientific articles on miso.

1963–Michio and Aveline Kushi, teachers of macrobiotics in Boston, start to teach Americans about miso.

1966 April–Aveline Kushi (with Evan Root) starts Erewhon, a pioneering retailer in Boston, that soon starts selling miso.

1968–Erewhon expands to become an importer and distributor of natural and macrobiotic food. Their first two misos, Mugi Miso and Hacho Miso, are imported from Japan.

1976 June–Miyako Oriental Foods, a division of Yamajirushi Miso Co. in Japan, starts making miso in Los Angeles. Owned by Noritoshi Kanai. Brands: Yamajirushi, Kanemasa, Yamaizumi.

1976 Sept.–*The Book of Miso,* by Shurtleff and Aoyagi, is published by Autumn Press of Hayama, Japan. This is the first book about miso in the Western world.

1978 Oct.–The Ohio Miso Co., the first Caucasian-run miso company in the Western world, is founded by Thom Leonard and Richard Kluding. They begin miso production on 13 March 1979.

1978 Nov.–Joel Dee of Edward & Sons (New Jersey) launches Natural Instant Miso Cup, an instant miso soup made with freeze-dried miso from Japan.

1978 Dec.–Miyako Oriental Foods of Los Angeles introduces Cold Mountain Firm Granular Rice Koji, the first koji sold commercially in the USA. In 1979 they start selling Cold Mountain Miso, the first miso with an American-style brand.

1979 Oct.–John and Jan Belleme arrive in Japan to study traditional miso–and koji-making with the Onozaki family in Yaita, Japan. They are the first Caucasians to do this, and then to return to the West to start making miso commercially. From 1981 on they write many superb articles about miso, published in America.

1979 April–Shin-Mei-Do Miso is founded by Lulu and Yasuo Yoshihara in British Columbia, Canada.

1981 April–John Troy of Elf Works, Ltd. in Chapel Hill, North Carolina, launches Hot Stuff, an early and very successful American miso product. He first learned about miso from Joel Dee.

1981 Aug.–John and Jan Belleme begin full-time, large-scale production of miso and koji at Erewhon Miso Co. in Rutherfordton, North Carolina. By early 1982 their company is renamed American Miso Co. with Barry Evans as the new owner.

1982 Oct. 25–Christian and Gaella Elwell start making miso and koji at South River Miso Co. in Conway, Massachusetts. Earlier that year they purchased The Ohio Miso Co. Address: Lafayette, California. Phone: 925-283-2991.

11489. *SoyaScan Notes.* 2014. Chronology of green vegetable soybeans and edamamé (incl. maodou) worldwide–A.D. 1275 to 1939. Part I. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** First a few basic definitions: (1) "Vegetable-type soybeans" refers to certain large-seeded soybean varieties developed for use as a vegetable crop. (2) "Green vegetable soybeans" refers to vegetable-type soybeans harvested at the green stage for use as a vegetable. The beans can be

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cooked and served in or out of the pods. (3) "Edamamé" is the Japanese term for green vegetable soybeans cooked and served in the pods, often as a snack–like peanuts in the shell. The green beans are popped out of the pods directly into the mouth of the person eating them.

Before 7th century BC–The *Shijing* (*Book of Odes*) is China's earliest classic and the earliest document seen worldwide that mentions the soybean, which it calls *shu.* It does not mention green vegetable soybeans. Zheng Xuan (Wade-Giles: Chêng Hsüan), the most important commentator of the 2nd century AD, confirms that *shu* refers to the soybean and that soybean leaves, called *huo,* can be pickled–presumably when green, then presumably eaten.

AD 100–The term *Sheng dadou* [Chinese characters: raw / fresh + large + bean] appears in both *Shennong bencao jing* (*Classical pharmacopoeia of Shen Nung*) and later (about AD 450-500) in the *Mingyi bielu* (*A critical record of famous doctors. A materia medica*). However a careful analysis of the context by a Chinese scholar who is an expert in the history of Chinese foods and of soybeans (H.T. Huang, PhD) indicates that this term refers to raw soybeans rather than fresh green soybeans. Therefore, surprisingly, we know of no early reference to green vegetable soybeans in China.

1275 July 26–The word "edamamé" first appears in Japan when the well-known Buddhist saint Nichiren Shônin writes a note thanking a parishioner for the edamamé he left at the temple. In: In: *Nichiren Shonin Gosho Zenshu* (*The Collected Writings of Saint Nichiren*).

1406–The Ming dynasty famine herbal titled *Jihuang bencao,* by Zhu Xiao is the earliest Chinese document seen that describes: (1) eating the tender leaves of soybean seedlings (*doumiao*)*;* (2) eating the whole pods of young soybeans, (3) eating green vegetable soybeans; (4) or grinding the green beans for use with flour. The last three uses are recommended for times of famine only.

1620–*Maodou* (Chinese characters: hairy + bean) are first mentioned in the *Runan pushi* [*An account of the vegetable gardens at Runan*], by Zhou Wenhua. "*Maodou* has green, hairy pods. It is also called *qingdou* ('green beans).' It is mentioned in the *Bencao* [materia medica] literature [we are not told which book], which states that it has a sweet flavor, is neutral, and nontoxic. It can be used medicinally mainly to 'kill bad / evil chi.' It stops bodily pain, eliminates water [reduces edema], dispels heat in the stomach, reduces bad blood, and is an antidote to poisonous drugs... Boil the beans in the pods until done, then remove the beans from the pods and eat them. The flavor will be sweet and fresh. Or you can remove the beans from the pods before cooking, then cook the beans in lightly salted water. Or the beans can be placed on a metal screen over a charcoal fire to roast or dry them... They can be served with tea or fruits, as a snack." This is also the earliest document seen that gives medicinal uses for green vegetable soybeans.

1855 April 12–T.V. Peticolas of Mount Carmel, Ohio, is the first Westerner to mention green vegetable soybeans. In an article on soybeans in the *Country Gentleman* (p. 12) he writes: "They are inconvenient to use green, being so difficult to hull."

1856–Only a year later, at least two Americans have apparently figured out how to shell them with ease, and to enjoy them. Thomas Maslin of Virginia writes: "They are fine for table use, either green or dry..." Abram Weaver of Bloomfield, Iowa, praises them in the *Report of the Commissioner of Patents, Agriculture* (p. 256-57). "I had some of them cooked, while green, at their largest size, and found them delicious."

1890 Dec.–The first large-seeded vegetable-type soybean variety arrives in America. Named Edamame, it was introduced from Japan by Charles C. Georgeson, who had been a professor of agriculture in Japan. Other early large-seeded varieties included Easycook (introduced in 1894 from Shandong Province, China) and Hahto (1915, from Wakamatsu, Japan).

1915 Jan.–William J. Morse (of USDA's Office of Forage Crop Investigations), the man most responsible for introducing green vegetable soybeans and vegetable type soybeans to the United States, mentions them for the first time in a USDA special publication titled "Soy beans in the cotton belt": "The green bean when three-fourths to full grown has been found to compare favorably with the butter or Lima bean."

1917–During World War I, USDA researchers conduct cooking tests on many soybean varieties in search of an inexpensive source of protein that lacks the typical unpleasant beany flavor and will cook quickly. Only two such varieties are found–Hahto and Easy Cook; both are large-seeded. Some progress is made in convincing Americans to eat these varieties–but only as whole dry soybeans.

1923 March–*The Soybean,* by Charles V. Piper and William J. Morse, published by McGraw-Hill (329 p.), is the first major book written about this plant in the United States. It contains a long section titled "Immature or Green Soybeans" (p. 221-22) that includes a description, nutritional analysis, recipe ideas. It also includes the first photograph in a U.S. publication of green vegetable soybeans, showing many cooked, open pods on a white plate. The caption reads: "Seeds and pods of the Hahto variety of soybeans, the seeds being especially valuable as a green vegetable." Between 1915 and 1929 Morse mentioned green vegetable soybeans in more than 20 publications.

1929-32–During the USDA sponsored Dorsett-Morse Expedition to East Asia, William J. Morse (now a soybean expert) and P.H. Dorsett were surprised to learn that: (1) Soybeans are widely "used as a green vegetable" or as "green vegetable beans," served in the pods. (2) The seeds for these soybean varieties are sold by horticultural seed companies, are listed with the garden beans in their seed catalogs, and

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are larger and sweeter than regular soybeans. On 24 April 1929, while in Tokyo, Dorsett made the first edamamé purchases, seven varieties with "Edamame" in the varietal name from T. Sakata & Co. They eventually collected more than 100 varieties of large-seeded vegetable-type soybeans (other suppliers included Yamato Seed Co. in Tokyo) and had them grown for a year at USDA's Arlington Farm in Virginia. (3) Edamamé account for less than 1% (actually 0.8%) of all the soybeans used in Japan. (4) Green soybeans are salt-pickled in the pod in Hokkaido, the northernmost main island. (5) The soybean seeds are planted at intervals of several weeks in the same field, then, when ready, the plants are uprooted and sold in bundles. On 15 July 1929 Morse wrote: "Saw many plantings of soybeans from just coming up to ready to pull for market. It is extremely interesting to note how they are planted for succession. We saw many plantings of beans ready for pulling for market with rows interplanted as seedlings or transplants just coming into bloom." Near Tokyo, three crops of vegetable soybeans are grown during the season–early, medium and late season. The 8,000-page typewritten report is interspersed with many photos of green vegetable soybeans at various stages from the farm to the table.

1929 July 20–A letter from William Morse in Tokyo is read before the attendees at the Tenth Annual Meeting of the American Soybean Association in Guelph, Ontario, Canada, and later published in the *Proceedings of the American Soybean Assoc.* (Vol. 2., p. 50-52). It is the first publication in which Morse describes his many new discoveries concerning vegetable soybeans.

1931 Jan. 3–Morse writes in his log in Tokyo: "At one of the department stores, in the vegetable market section, we found small bundles of soybean sprouts and also some bundles of green vegetable soybean plants." This is the earliest document seen that contains the term "green vegetable soybean(s)."

1934–Vegetable-type soybean varieties that yielded well at Arlington Farm are sent to many state agricultural experiment stations for further trials. In addition, extensive investigations of the cooking qualities and composition of the green shelled and dry edible soybeans are conducted at various departments of home economics. The green beans are found to be one of the most nutritious vegetables ever analyzed.

1935 Dec.–Dr. John Harvey Kellogg of Battle Creek, Michigan, is the first person on record to can green vegetable soybeans, or to consider harvesting them mechanically. In a letter dated Dec. 9 he writes to William Morse at USDA. "We have been doing some experimenting this year with growing and canning shell soy beans. I am having a couple of cans sent you so you can see what our product is like. We think it is very fine. The few thousand cans we put up went off like hot cakes... One of the difficulties in the way of the soy shell bean business is the expense of picking from the vines and shelling the pods. Do you know of any machinery that is used for either of these purposes?"

1935 Aug.–Rokusun, the first vegetable-type soybean is mentioned in a U.S. publication–followed in March 1936 by Bansei, and Chusei. These soybeans are now publicly available in the U.S.

1936 April–A 2-page leaflet titled "Soybean introductions named in January 1936" is published by the USDA, Bureau of Plant Industry, Div. of Forage Crops and Diseases. It is the first official publication in which varietal names are given to the new vegetable type soybeans introduced by Dorsett and Morse from Japan and tested at USDA's Arlington Farm. Twenty varieties suitable for use as a "green vegetable" are listed, together with their seed color, days to maturity, and region of the USA best suited for production. This is the earliest English-language document seen that mentions the following vegetable-type varieties–all with Japanese names: Chame, Fuji, Goku, Hakote, Higan, Hiro, Hokkaido, Jogun, Kanro (in USA), Kura, Nanda, Osaya, Sato, Shiro, Sousei, Suru, Toku, and Waseda. It is also the earliest document seen in which soybeans are classified by use as "green vegetable" or "dry edible bean" or both.

1936 July–Green Shelled Soy Beans (canned) are first sold in the USA by Dr. John Harvey Kellogg's Battle Creek Food Co. in Battle Creek, Michigan. This is the earliest known commercial green vegetable soybean product in the USA.

1936 Oct. 30–A long article titled "Canning green soy beans," by Corinne Loskowske, appears in the *Herald,* published by the students of Henry Ford's Edison Institute. They have mechanized the canning process. They canned and sold 500 cans in 1935 and 1,000 cans in 1936. Similar canned green soybean products soon follow: 1939–Mother's Choice Brand Green Vegetable Soybeans (Canned), by the Fox Valley Canning Co. of Hortonville, Wisconsin.

1939 March–"Eighteen Varieties of Edible Soybeans," by J.W. Lloyd and W.L. Burlison is published at the *University of Illinois Agricultural Experiment Station, Bulletin* No. 453. The 58-page report is the most detailed and interesting to date, being based in part on comments received from 1935 to 1938 from more than 685 home gardeners, market gardeners, and canners in Illinois. The university offered to send free seed and growing instructions to any gardener who would test the green soybeans and submit frank comments in writing. The new way of growing and eating soybeans got rave reviews. For example: "Fresh soybeans had a satisfying flavor... They were delicious... We like them better than peas or beans... I served soybeans to all guests this summer and most everyone liked them... Everyone who tried them said they were splendid... We have never eaten beans as good... The beans were delicious to eat and were universally liked by my family and guests. In fact it took persuasion to leave any for seed."

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During the 1930s William Morse and the University of Illinois took the lead in popularizing both green-vegetable soybeans and vegetable-type soybeans in the USA. Continued. Address: Lafayette, California. Phone: 925-283-2991.

11490. *SoyaScan Notes.* 2014. Chronology of green vegetable soybeans and edamamé (incl. maodou) worldwide–1940 to 2001. Part II. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** Continued: 1940 Dec.–Vegetable-type soybeans (Bansei and Jogun) are first offered for sale in the USA, by Strayer Seed Farms of Hudson, Iowa (Ad in *Soybean Digest,* p. 12).

1941-1945–During World War II, green vegetable soybeans are grown in Victory Gardens in the Midwest and at least six new canned products are introduced. By 1945 some 44 large-seeded vegetable-type soybean varieties have been named and released in the USA.

1944 Sept.–The first English-language advertisement for green vegetable soybeans appears in *Soybean Digest* (p. 61). Titled "Meet the vegetable cow," it is a full-page, black-and-white ad run by Dr. Harry Miller of the International Nutrition Laboratory, and a former student of Dr. John Harvey Kellogg. It shows the head of a cow made entirely from soybeans. The horns, forelock, parts surrounding the eyes, nostrils, and mouth are made of soybeans in their [green] pods.

1946–The Japanese government (*Norinsho* or Ministry of Agriculture, Forestry, and Fisheries) starts keeping statistics on domestic edamame area, production (weight including pods), and yield. In 1946 these figures were about 7,000 ha and 30,000 metric tons (tonnes). Yields peaked in 1969 at almost 10 tonnes/ha. In about 1982 both area (14,000 ha) and production (122,000 tonnes) peaked, then began a very slow decline as imports rose dramatically (Lumpkin & Konovsky 1991, p. 123).

1950s early–Varietal improvement of vegetable-type soybeans starts in Taiwan.

In the United States, the period from 1935 to 1947 saw the first wave of interest in green vegetable soybeans and vegetable-type soybeans. But after World War II, interest almost disappeared. A second and even larger wave of interest began in the late 1960s and has continued to grow.

1966 July–Mr. Noritoshi Kanai, President of Mutual Trading Co. (MTC, Los Angeles, California), imports the first edamame and the first frozen edamame to the United States. They are imported from Japan and sold under Mutual's Miyako brand to local restaurants. Initially only two cases of 30 x 10.5 oz bags/case are imported as a trial. The company next imports frozen edamame on 1 July 1970; during 1970 MTC imports 70 cases from Japan and again sells them to restaurants (Personal communication with Atsuko Kanai of MTC, June 2001).

1972–Taiwan exports 472 tonnes of green vegetable soybeans, yet total area and production of these soybeans are negligible. By 1989 that figure had jumped 77-fold to 34,821 tonnes, with Japan buying 99% of the exports in frozen form. Japan's total consumption that year was about 160,000 tonnes–by far the largest in the world.

1980 Sept.–The sushi "boom" in California begins when the very popular TV miniseries and epic drama *Shogun,* based on the novel by James Clavell, created a great interest in traditional Japanese culture among Americans. With the sushi, they drank Japanese beer and saké. In America, beer is usually served with peanuts. But, true to tradition, Japanese restaurants served edamamé, free of charge, with the beer. Atsuko Kanai of Mutual Trading Co. recalls: "It was a mass sampling of the edamamé without people having ordered it! So the success of sushi, Japanese beers, Japanese saké, and edamamé, are all tied in together."

1982 April–Researchers at AVRDC in Taiwan [Shanmugasundaram et al.] publish their first two investigations on "immature green soybeans."

1982–Rodale Research Center in Kutztown, Pennsylvania, publishes as excellent 25-page report titled "Fresh green soybeans: Analysis of field performance and sensory qualities," based on two years of research [May 1980 to Dec. 1981]. It identifies eight varieties found to be exceptional in both field and sensory qualities and gives the address of the seed company from which each can be purchased. Rodale Press (publisher of *Organic Gardening & Farming* magazine) also did pioneering work in introducing green vegetable soybeans to Americans, with at least 23 articles or books on the subject between 1962 and the present.

1985–AVRDC in Taiwan starts research on mechanical harvesting of vegetable soybeans.

1987–Reiko Weston, a Japanese woman who owns Fuji-Ya, a Japanese restaurant in Minneapolis, Minnesota, decides she wants to try growing edamame in Minnesota rather than paying more for an imported product. The same business savvy that earned her the titles of U.S. and Minnesota 'Businesswoman of the Year' sparked research in 1987 by Jim Lambert of the Jameson-Williams Company into the viability of raising this new crop. Unfortunately, Weston died shortly before the first year's crop was harvested." Jameson-Williams steadily increases their production of edamame from 7,000 pounds in 1988 to the 350,000 pounds in 1990. In Nov. 1990 Lambert describes Jameson-Williams as "the only commercial producer of edamame in the U.S." He has experimented with hundreds of edamame varieties.

1991 June–Yamato Flight Kitchen of Burlingame, California, starts serving edamame on Japan Airlines flights from San Francisco to Japan.

1991 Aug. 5–An article in the *St. Paul Pioneer Press* (Minnesota) states that Jameson-Williams' company name has been changed to Minnesota Edamame Co. The

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Nishimoto Trading Co. of Tokyo likes the taste and look of these green soybeans so much that they decided last week to place more than $100,000 worth of their bagging and packaging equipment in the Minnesota Edamame plant. In September, Minnesota Edamame will start using Nishimoto's equipment to ship 1 million pounds of partially processed immature soybeans to Japan. That's a big jump from the 7,000 pounds shipped in 1988. Minnesota Edamame has contracts to supply Nishimoto with 3 million pounds of the soybeans from the 1992 Minnesota crop, 6 million pounds in 1993 and 15 million pounds by 1996. Unfortunately, quality problems in Minnesota prevented these rosy predictions from coming true.

1991 June–Yamato Flight Kitchen starts serving edamame on United Airlines flights from San Francisco to Japan.

1991 April 29 to May 2–The first international workshop / symposium on green vegetable soybeans is held at Kenting, Taiwan. The excellent proceedings, titled *Vegetable Soybean: Research Needs for Production and Quality Improvement,* were edited by S. Shanmugasundaram of the Asian Vegetable Research and Development Center (AVRDC) in Shanhua, Tainan, Taiwan. These are the first English-language proceedings and the first English-language book devoted to green vegetable soybeans. AVRDC has become a leader in research on green vegetable soybeans in Asia–in part because this crop has now become Taiwan's leading agricultural export, with most of the sales going to Japan.

In these proceedings is an especially interesting paper titled "A critical analysis of vegetable soybean production, demand, and research in Japan," by Thomas A. Lumpkin and John Konovsky of Washington state; it contains extensive new information on the history of edamame plus a superb bibliography of 187 references. In about 1986 Lumpkin founded the East Asian Crop Development Program at Washington State University (WSU), in Pullman, Washington. In the summer of 1989 he first grew a trial crop of edamame (20 varieties); this was reported in a 1989 publication. By 1991 he is full-time head of a team of 12 people in this program, all of whom except himself are working part-time, developing East Asian plants–including edamamé–to be grown in Washington state. Lumpkin is interested (among other things) in documenting the history of various East Asian crops. He has collected about 400 varieties of edamamé; the germplasm is maintained at Pullman.

1994 April–The first bibliography devoted to green vegetable soybeans, with 489 references, compiled by Shurtleff and Aoyagi, is published by Soyfoods Center in Lafayette, California.

1994 May 27–Tak Kimura ("Mr. Edamamé"), a food broker from Concord, California, introduces Eda Mame, America's first refrigerated, ready-to-eat edamamé–first sold at Whole Foods Market in Berkeley, California. 8 ounces of precooked, lightly salted green soybeans are packed in a plastic tray with a clear film lid by Yamato Flight Kitchen of Burlingame, California. In Oct. 1994 the first local supermarket to carry Tak's product was Mollie Stone's, an upscale supermarket with six stores in the San Francisco Bay Area. In Feb. 1998 Safeway supermarkets in Northern California become the first large supermarket chain to carry this product, again with Tak Kimura as the broker. By Jan. 2000 this edamamé product was served on United Airlines. Wholesale sales grew from $18,000 in 1994 to more than $540,000 in 1998. In 1998 the market for edamame in the USA (especially on the West Coast) exploded!

1994 July 1–Minnesota Edamame is renamed SunRich Foods. Their 1994 edamame crop is a record 750,000 lb–but still not enough to meet demand.

Other important "firsts" among commercial products after 1990: 1995 Jan.–Sweet Beans (SunRich Inc., Minnesota). 1996 Jan.–Freshlike Baby Broccoli Blend (with 40% green soybeans; Dean Foods Vegetable Co.). 1996 Dec.–Frozen Organic Sweet Beans (Sno Pac Foods, Inc.). 1997 June–Birds Eye Baby Broccoli Blend (Dean Foods Vegetable Co.). 1997 Sept.–Trader Joe's Edamame (frozen in the pods, imported from China by Seaside Farms). 1998 Feb.–Cold Mountain Eda-Mame (Mutual Trading Co., Inc., frozen). 1999 April–Edamame–Blanched Soybeans (retail or foodservice; Seapoint Farms, formerly Seaside Farms). 1999 Aug.–Melissa's Soybeans (Edamame) (Melissa's World Variety Produce). 1999 Oct.–Edamamé (Frieda's, Inc.). 2000 May–Freeze-Dried Green Soybeans in Salsa, Indian Spice, and Sweet & Sour flavors (Eat Your Heart Out, New York; the first freeze-dried and the first flavored or spicy edamame).

In 1999 at least 8 new edamame products were introduced, followed by 9 in the year 2000, and 5 more by May 2001.

2001–The U.S. company with the most innovative and extensive line of edamame products, the best and most colorful graphics (labels and ads), and the most extensive advertising, is Seapoint Farms of Huntington Beach, California, founded in 1997 by soyfoods pioneer Kevin Cross.

2001 July–At least 70% of the green vegetable soybeans consumed in the USA are imported, mainly from China or Taiwan. The two main U.S. growers are SunRich in Minnesota and Cascadian Farms in Washington state. Address: Lafayette, California. Phone: 925-283-2991.

11491. *SoyaScan Notes.* 2014. The development of conventions and systems for naming soybean varieties in the United States (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** (1) Japanese varietal names imported to USA: In 1891 the first two soybeans with varietal names appear in the United States. They are Eda Mame and

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Yamagata Cha-daidzu, both imported from Japan by Prof. Charles Georgeson of Kansas State Univ. He apparently left the Japanese varietal names unchanged. Other early varieties which apparently kept their Japanese names were: Kiyusuke daizu (1890-1892), Asahi (1901), Bakajiro (1902), Rokugatsu (1902), Yoshioka (1902), Hahto (1918).

(2) Varieties named in the USA by maturity and color: In 1894 the first three varieties were named in the USA. The form of the two-word name was maturity plus color: Medium Black, Medium Green, and Early White.

(3) Three-word names introduced: In 1896 the first three-word name was introduced: Extra Early Dwarf. It was also the first name to include the size of the plant ("Dwarf"). In 1897 three more three-word names appeared, each specifying the maturity more precisely: Medium Early Black, Medium Early Green, Medium Late Black.

(4) Single-word names introduced: Black (1900), Yellow (1900), Mammoth (1902), Green (1904).

(5) Japanese names given by American soybean workers: By 1902 Ito San was named by Mr. E.E. Evans, a soybean breeder in West Branch, Michigan, in honor of Marquis Ito, the Japanese statesman. "San" is an honorific suffix in Japanese. So "Ito San" means "the honorable Mr. Ito."

(6) American place names become part of variety names: In 1903 Wisconsin Black was introduced. It was followed by Ogemaw (1904, a county in Michigan where E.E. Evans lived and bred soybeans), Amherst (Massachusetts, 1907), Manhattan (Kansas, 1907), Arlington (Virginia, 1910), Auburn (1910), Columbia (1910), Virginia (1915), etc.

(7) The names of American and European soybean workers used in variety names: In 1907 the variety Haberlandt is named after the first Friedrich J. Haberlandt of Vienna, Austria, the first Westerner to conduct large-scale soybean trials or to write a book about soybeans. Also in 1907 the variety Meyer is named after Frank N. Meyer (1875-1918), an early USDA plant explorer in Asia who sent back hundreds of soybean varieties. Also in 1907 the variety Nuttall is named after Thomas Nuttall of the Botanic Garden, Cambridge, Massachusetts. He cultivated soybeans is the summer of 1829 and wrote an early article about them in Oct. 1929. Also in 1907 the variety Baird is named for Reverend W.M. Baird, a missionary, who secured the seeds in Korea, and had them sent to the USA. Also: Wilson (1909), Brooks (1909), Morse (1909), Hansen (1910), Fairchild (1910), Nielsen (1910).

(8) Fanciful American names: Hollybrook (1906), Buckshot (1907), Butterball (1907), Cloud (1909), Hope (1909), Acme (1910).

(9) Numbers are included in soybean variety names–usually at the end: Ohio 9035 (1914), O.A.C. 81 (1914), Wilson-Five (1918), O.A.C. 211 (1922).

11492. *SoyaScan Notes.* 2014. Definition of teriyaki and teriyaki sauce (Overview). Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** Etymology: Formed from the Japanese verbs *teru* "to shine or be glossy or bright" and *yaku* "to grill or broil" (traditionally over charcoal or coals, using a hibachi, a small, usually round charcoal brazier).

Teriyaki, a Japanese appetizer, is said to have originated in Japan during the Edo period (1600-1867; see *The History and Culture of Japanese Food,* by Naomichi Ishige, 2001, p. 116; he does not cite his source). The word "teriyaki" originally referred to fish (or occasionally poultry), cut into small pieces, marinated in a Mirin-Shoyu sauce, skewered on bamboo skewers, grilled on the hibachi, and basted / brushed occasionally with the sauce; the mirin was considered the key to the glossy appearance. Note: Mirin is sweetened sake for cooking or seasoning. Shoyu is regular Japanese-style soy sauce.

As the recipe became Westernized in the early 1950s, it was transformed; the mirin was often omitted, garlic (ideally fresh, crushed), and a small amount of sweetener (such as sugar or pineapple juice) were added, and chunks or thin strips of beef were often used in place of fish. The teriyaki sauce was used initially as a marinade, then later in the cooking process for basting while grilling.

Although teriyaki originated in Japan, it came to the United States largely from Hawaii in the early 1950s, and was soon viewed by Americans as an Hawaiian recipe and dish. American versions may skewer chunks of fruit (such as pineapple) or vegetables (green or red bell peppers) alternatively with chunks of meat. Vegetarian versions usually use pressed firm tofu or seitan in place of meat. Address: Soyfoods Center.

11493. *SoyaScan Notes.* 2014. Chronology of early isolated soy protein (soy protein isolate) developed for food use. 5 June 2011. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** 1911–Beltzer develops isolated soy protein (ISP) for food use in France.

1921–Satow develops ISP for food use in Japan.

1935–First U.S. patent for ISP issued to Buruss & Ruth.

1932–The Glidden Co. (Chicago) first develops ISP for food use in the USA but did not yet make a commercial product.

1939–Albusoy, made by The Glidden Co. in Chicago, is launched. It takes the place of egg albumen (egg whites) in a wide variety of products, especially confections.

1942–Central Soya Co. launches a similar whipping compound named Soy Whip–also meant to replace an animal product–egg whites.

1945–Rich Products Corp. (Buffalo, New York), during World War II when whipping cream is unavailable, launches Whip Topping, made from "Soy Cream," based on ISP. It is also soon sold frozen, and is a smash success.

1946–Borden Co., Whitson Products Div., launches

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Soyco–a "soy albumen whipping agent."

1947–Vegetable Products Corp. (Saline, Michigan) launches Wonder Whip–a soy-based non-dairy whip topping.

1948–Rich Products Corp. launches Whip Topping, based on isolated soy protein, in a pressurized aerosol metal can.

1950–Presto Food Products (Industry, California) launches Mocha-Mix Coffee Creamer (later renamed Mocha Mix Non-Dairy Creamer)–based on ISP.

1951–Rich Products Corp. launches Chil-Zert, the first non-dairy frozen dessert (ice cream)–based on ISP.

1951–Hoffman Products (York, Pennsylvania), Subsidiary of York Barbell Co., launches Bob Hoffman's Hi-Proteen (powder)–based on ISP.

1952–Rich Products Corp. launches Sundi Whip, a non-dairy fountain topping in a pressurized can- based on ISP.

1952–Rich Products Corp. launches Rich's Chocolate Eclairs (non-dairy and frozen), filled with Rich's Whip Topping.

1959–Central Soya Co. (Chicago, Illinois) launches Promine–food-grade ISP in two types; D is dispersible, R is regular.

1962–Ralston Purina launches Edi-Pro–spray-dried ISP.

Observations:

1. Using plant proteins to replace animal proteins is generally a good thing for many reasons, and is definitely a long term green trend.

2. Many people who are unable (allergies, lactose intolerance, heart condition, etc.) or unwilling (vegan, kosher) to use dairy products are extremely grateful for non-dairy alternatives made from soy protein.

3. One of the Buddhist precepts is not to find fault with others... which may be interpreted to include other things. There is a place for just about everything if it is used wisely. The few groups criticizing isolated soy proteins are those promoting animal products (meat, dairy and eggs); they are therefore criticizing the competition–soyfoods and edible soy products.

11494. *SoyaScan Questions.* 2014. Questions about the history of Worcestershire sauce. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** The history of this sauce has never been well documented and there are some interesting unanswered questions and contradictions in the history as it is popularly presented.

To answer these questions it would be best to travel to Worcester, England, and to spend at least 1-2 weeks there.

Have any local newspapers or magazines (near Worcester) been digitized so that they can be searched electronically for information on this subject. If yes, which ones and for what years? Ideally we would start by searching publications dating back to the 1830s.

In what year and month did Lea and Perrins first sell their Worcestershire sauce (about 1837)?

Did they make and sell the first seasoning named "Worcestershire sauce"?

What was the name and address of the second company to make "Worcestershire sauce?"

If the Worcestershire sauce made in Worcester used soy sauce as a major ingredient, when did it start to be used? From the very first batch?

In what foreign country (Japan, China) was Lea and Perrins soy sauce made? By which company? Did the same company (and only one company) make this soy sauce up until World War II?

How was this soy sauce transported to Worcestershire? Was it first transported by boat? Up the River Severn?

When did the transportation switch from boat to train / rail? Were any photos ever taken of the soy sauce being unloaded from the vehicle in which it was transported. Or were any news stories ever published of the arrival of a shipment of unknown goods from East Asia?

Try to locate the company John Duncan's Sons or John Duncan & Sons (or their archives) of New York. Do they have any records showing when they first imported Worcestershire sauce? Do they have any early labels or records showing ingredients?

Which organizations or individuals in Worcestershire know the most about or are most interested in the history of Lea and Perrins and / or of Worcestershire sauce? From Web: (1) Worcestershire Historical Society, Tettenhall, Wolverhampton. (2) Worcester and District Industrial Archaeology / local History Society, Redditch, Worcestershire. (3) Worcestershire Local History Forum, Trinity Street, Worcestershire. Has this story ever been told in any histories of Worcester or Worcestershire? Have any articles ever been published on this subject? (See a local Worcester library). When did soy sauce switch from being shipped in wooden kegs / casks to more modern containers such as barrels or drums?

Did Lea & Perrins ever make its own fermented soy sauce? If so, starting when? Where? How did they learn the process? How long was it fermented.

What year and month (during World War II) did Lea and Perrins stop using fermented soy sauce from Asia and start using HVP? But note that about April 1978, when Craig Claiborne of *The New York Times* visited the plant in Fair Lawn, New Jersey, he was told that "soy" (probably referring to the soybean hydrolysate in HVP) was one of the ingredients, and that the mixture was fermented. He noted a pleasant smell around the 35 giant wooden curing vats–each holding a total of 6,0000 gallons. No one would tell him how long the base for the sauces is aged, but he estimated a minimum of two years.

How long has Lea & Perrin's sauce been fermented at different points in its history? Is it fermented now? In New Jersey? If so, for how long? If not, when did fermentation

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stop?

11495. *SoyaScan Questions.* 2014. Questions about the history of tempeh in Japan. Further research needed. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** 1. When was *Taiwan Sotokufu Chuo Kenkuyujo* founded? 2. When did NAKAZAWA Ryoji start to work at the Taiwan lab? When did he finally leave for Japan?

3. In what year did NAKANO Masahiro start to work at the Taiwan lab? 4. In Nakazawa's *Hakko Bunken-shu* (11 volumes, 1950-65), is there any reference to tempeh under *Penicillium?* There is NOT any reference under *Rhizopus.*

5. Was any research on using defatted soybean meal (*dashi daizu*) to make tempeh done in Japan after World War II? (Dr. Nakano does not remember any).

6. Did Ohta or Karauchi write a very early article on tempeh in about Showa 7 or 8? (1932-33)? Ohta mentioned this.

7. Get a citation for Ohta's article on tempeh in *Nihon Jozo Kyokai Zasshi* from about 1980-81.

8. Try to get the early article (1947-48) from *Nosan Seizo,* written by Ohta or Nakano.

9. What were the main reasons that the Natto Association started to take a serious interest in tempeh in about 1981-82? When did this interest start? What people were most actively involved at the beginning?

10. What is the substrate used for growing tempeh spores at NFRI? Rice? Bread? Potatoes? Potato starch?

11. Is there a tie between Kalki's research on lactic acid and production of B-12 in tempeh?

12. When did the *Natto Gyokai News* (or any natto newspaper) publish its first article on tempeh? I'd like to get copies of recent and important articles it has published, as about the June 1983 trip to Indonesia.

13. Who is Mr. Kikuchi, at natto meeting, in charge of making tempeh spores?

14. How many pages does Nakazawa have on *Rhizopus?*? Does he mention tempeh at *Penicillium*?

15. Who wrote the early article on tempeh at Kyushu University that interested Torigoe?

16. Did Ohta or Karauchi write an early article on tempeh in about Showa 7 or 8 (1932-33)? Ohta mentioned this.

17. Try to get the article (about 1947-48) from *Nosan Seizo,* written by Ohta Teruo or Nakano Masahiro.

20. Who made the early tempeh starter in Japan?

21. When did Takashin start to make tempeh? How many kilograms do they now make per week?

11496. *SoyaScan Questions.* 2014. Questions about the history of Chico-San, Inc. in Chico, California. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** 1. When did Chico-San first start operation as a business in Chico, California? What did they do and what was their address? Shumway says (1961 Dec. 8): Believers in eating "natural" foods, they have started the "Chico-San" Bakery and plan to share the profits. They will bake breads with no sugar and little yeast.

They also plan to start a restaurant where the menu will show the exact number of calories per serving, and where live music will be provided by group members.

2. Did they ever start that restaurant? If they did, when did it open and at what address? Did it get any reviews in the local paper? How long did it last?

3. When did Chico-San's first imports arrive from Japan? What products were they and where (at what address) did they store them?

4. When and why did Chico-San first move into the basement of a small hearing aid shop in Chico. What was the address and what was the name of the hearing aid shop?

5. At the time of the fire on 14 Sept. 1972, Chico-San's warehouse was located at 1262 Humboldt Ave. in Chico. When and from where did the company move there? What was the size of the building?

11497. Hackler, Vincent. 2014. Nattokinase and the company that put it in the map (Interview). SoyaScan Notes. Feb. 7. Conducted by William Shurtleff of Soyinfo Center.
• Summary: Nattokinase, an enzyme isolated from natto, has been shown in scientific studies to reduce one's risk of heart disease when consumed regularly as a supplement. Vincent works closely with Japan Bioscience Laboratory (Nihon Seibutsu Kenkyujo) to study and disseminate the benefits of nattokinase. This company put nattokinase on the map. They have funded 14 human trials and 13 non-human trials that show the efficacy of the product. They have also funded one human study that shows the safety of nattokinase.

How does the enzyme work in the human body? Nattokinase decreases the ability of blood to clot. This "thins the blood" and might protect against conditions caused by blood clots such as stroke, heart attack, and others. Natto has been used (mainly in Japan) as a folk remedy for diseases of the heart and circulatory system (cardiovascular disease) for hundreds of years. Nattokinase, the chemical in natto that is probably responsible for its effects, was discovered by a University of Chicago researcher, Dr. Hiroyuki Sumi. Nattokinase has also been found to lower C-reactive protein (CRP), a protein found in the blood, the levels of which rise in response to inflammation. CSP is synthesized by the liver. Measuring CRP level is a screen for infectious and inflammatory diseases. Rapid, marked increases in CRP occur with inflammation, infection, trauma and tissue necrosis, malignancies, and autoimmune disorders. Because there are many disparate conditions that can increase CRP production, an elevated CRP level does not diagnose a specific disease. CRP is used mainly as a marker of inflammation.

Nattokinase is used for cardiovascular diseases

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including heart disease, high blood pressure, stroke, chest pain (angina), deep vein thrombosis (DVT), "hardening of the arteries" (atherosclerosis), hemorrhoids, varicose veins, poor circulation, and peripheral artery disease (PAD).

It is also used for pain, fibromyalgia, chronic fatigue syndrome, endometriosis, uterine fibroids, muscle spasms, infertility, cancer, and a vitamin-deficiency disease called beriberi.

11498. Vélez, Luisa. 2014. Re: The story of Rustono's work with tempeh in Japan. Letter (e-mail) to William Shurtleff at Soyinfo Center, Feb. 7. 2 p. [Eng]

• Summary: "Rustono was born on 3 Oct. 1968 in Grobogan, Central Java–in a very poor village without electricity. His father's name was Parwoto Utomo and his mother's name was Paryumi. Both of his parents finished elementary school in Grobogan, Central Java. His father's occupation was kepala desa which means 'leader of the village,' the one who takes care of the needs of the village and villagers.

"As a child, he used to walk to school and back to home where he used to take care of 3 buffalo. He used to take them to the field to eat grass, and he lay down in their backs to see the sky. His first dream was to fly in an airplane, like the ones he saw from the fields. Later, in 2011, his first dream met his 12th dream, when he ate his own tempeh as part of the menu of Garuda, Indonesia's famous airline.

"Rustono is self taught in English. He began to learn when he worked in the hotel Sahid Yogyakarta (in the city of Yogyakarta), from 1990 to 1997 as a bellboy; he practiced with the guests at the hotel.

"Rustono met his Japanese wife in Indonesia at the hotel where he worked. Her name is Tsuruko Kuzumoto.

"Rustono's story with tempeh started before he got married. Before living in Japan, he asked for her permission to do business in Japan. Without her permission, he would prefer to stay in Indonesia. She said, 'Yes.'

"Rustono arrived in Japan in 1997; he and his wife were married in Uji, on the southern outskirts of Kyoto city, in Kyoto prefecture. Tsuruko's parents lived in Kyoto.

"After arriving in Japan he looked around for 3 weeks to find a good idea for a business. He noticed that in Japan there were many foods from other countries, but none from Indonesia. He also observed that there were many foods made from soybeans, so he thought that making tempeh might be a great idea for a business; he decided to start this dream, even it seemed very hard and full of obstacles. To fulfill that dream, he worked in part-time jobs in Japan's food industry for 3 years and 6 months to learn about Japanese food regulations and to gain knowledge and experience in that field.

"In 1998, after earning enough money for the rent and for saving enough money to make his dream come true, he got some soybeans and called his mother in Indonesia to learn how to make tempeh. She explained the process to him step by step, by telephone, and she sent him tempeh starter from Indonesia. He didn't have good results for 4 months and finally he got information about the importance of the quality of water for making tempeh. Since it is better to use spring water, he went to the temple and got 20 bottles of water from there (which came from a mountain spring). The tempeh was very good quality this time.

"Even though his tempeh was good, he was not yet confident enough to sell his tempeh because of the strict rules in Japan regarding food, so he didn't offer his tempeh to anybody.

"He decided to return to Indonesia to learn more. Even though many tempeh makers refused to teach him, around 60 of them welcomed him and taught him for 3 months; they were from Grobogan, Yogyakarta, Semarang, East Java and other places.

"He started making tempeh in Oct. 1998 in Kyoto. His tempeh was named Rusto's Tempeh from the beginning. His first production after returning from Indonesia was 40 pieces and they were sold to Indonesian students living in Japan. The first tempeh he sold was sold to his friends, Heri Susanto and Setyo Budi in Yawata, Kyoto, in 1998. He didn't sell his tempeh to Japanese people until he got his government and license got a government certificate and started producing and selling officially in Shiga in 2002.

"Rustono and his wife had 2 children (daughters) Noemi Kuzumoto (born 21 April 1998) and Remina Kuzumoto (born 17 January 2001); both born in Kyoto, they both use Kuzumoto as their family name since Rustono (like many people from Java) has no family name.

"He moved to Shiga prefecture in 2001 after realizing that the type of water was very important for a fine quality tempeh; in Shiga spring water was available. The move to Shiga was complicated. The building of the factory started 2001 and was over in 2002. It was all done by hand, including cutting the trees. Remina was already born and was about 8 months old when they moved to Shiga. When they moved Rustono still worked part-time in a food company and needed to save money for buying material and building the factory. Every day, whenever he had time, he went from Kyoto to Shiga to work on the factory, until they finally moved to a rented house in Shiga.

"The next step was to apply for a government permit / certificate to manufacture tempeh, a fermented food unknown to Japanese food and health inspectors. So Rustono had to educate them and prove that this traditional Indonesian food was safe. At first, the government office denied to give the certificate because there were details to change. Many times he got 'no' for answer but he kept on making the necessary changes until he was finally given the certificate to manufacture tempeh.

"He eventually got two government certificates (from the *Hokenjô*), one in February 2002 for production capacity of 500 pieces of tempeh and other one dated 2 Dec. 2003 for

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capacity of 1000 pieces.

"After building the factory they saved money to build their own home. Some years later they decided to buy a new house, big enough to welcome friends all around the world.

"Their present address is: Sakashita cho 257-1, Katsuragawa, Otsushi [Otsu city], Shigaken [Shiga prefecture], Japan.

"He built his tempeh factory by himself, in the winter, and got the attention from journalists who immediately wrote newspaper articles about him. Later on his business grew until now he is called the 'King of tempeh.'

"Rustono is eager to help tempeh grow and spread around the world. His dream from the beginning was to be a tempeh professional. There are still many challenges but there is a big will to overcome obstacles. He is happy to receive people from any country to teach them how to make tempeh, and after that he will continue to sharing guidance. People are invited to go to Japan to stay with him and learn, enjoy and start producing tempeh in their countries. He is very confident because he is a professional and makes tempeh in a country with very high standards of quality. If he was successful in Japan, he can show others to be successful in other countries.

"Rustono is a member of the Tempe Society of Japan (*Nihon Tenpe Kenkyu-kai*), which now has 20 members and with an average of 60 people attending each meeting, including listeners. He was invited to join by Horii Sensei when he was well known in Japan for his tempeh. This association has one meeting per year and members are specialists in soybeans, nutrition, molds, fermentation, etc. The meetings take place all over the country, using a seminar format, to be updated and share new knowledge. The main purpose of this association is education and networking. The society also publishes the *Journal of the Tempe Society of Japan* (*in Japanese*).

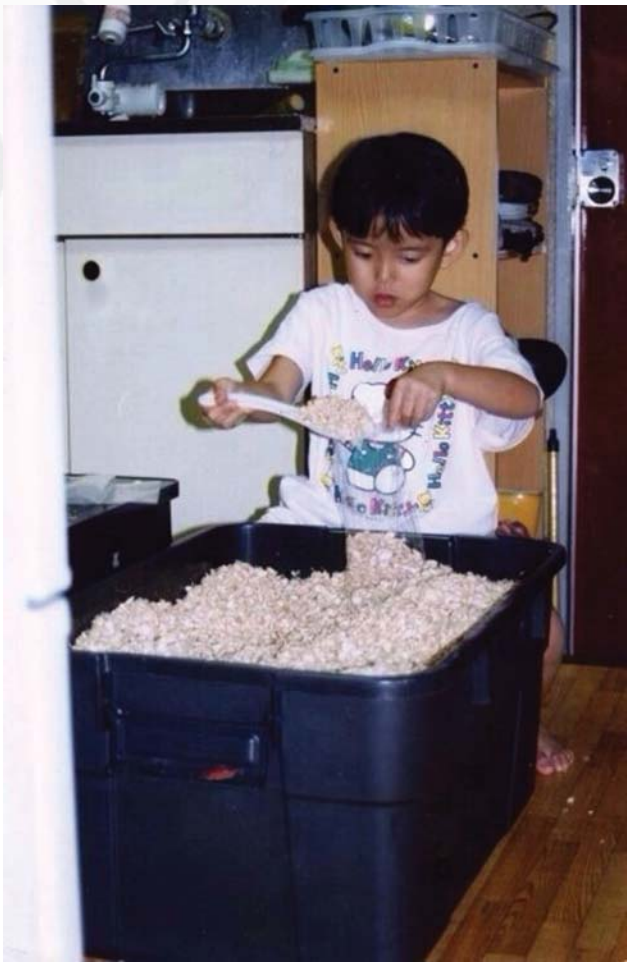
"In 2009 I read Rustono's success story in a newspaper in Mexico, and in 2012 I wrote to him to say that his story inspired me. Since then he mentored me to grow my business in Mexico, which started in 2005. Now we are in one team working together to spread tempeh all over Mexico and other countries in Latin America for the future. We know about people making tempeh in Australia, New Zealand, Canada, USA, Italy, Costa Rica, Brasil, France, Hungary, Poland, Korea, India, Pakistan and Mexico.

"In 2012, Rustono and I participated together in seminars in Indonesia, Jakarta and Yogyakarta, sharing our stories with tempeh producers and students at universities, as well as participating in TV interviews about the importance of tempeh around the world and it's future as a global food. It was so interesting and exciting to share with them how tempeh is appreciated in other countries, seen as a very nutritious and healthy food.

"I enclose for you the government certificate given to Rustono with the dates and quantities, as well as some pictures about his story.

"I also enclose a picture of a French lady, Ana Larderet, who stayed in Japan for 1 month to learn from him how to start a tempeh business in Europe.

Photos show: (1) Certificate to make 1,000 pieces of "Rusto's Tempeh" dated 2003 Dec. 2. (2) A color photo of their small child, Noemi, trying to help in packing tempeh. (3) Rustono in Shiga building his factory. (4) Rustono and other Japanese at a meeting of the Tempeh Society of Japan (*Nihon Tenpe Kenkyu-kai*) (5) Rustono standing next to another member of the Tempeh Society of Japan. (6) A page from a Japanese-language magazine article about Rustono published on 28 June 2008 in a Kyoto newspaper; one color photo shows him with his family at table; another shows him laughing. (7) Part of an English-language newspaper article titled 'A life's dream sprouted from soybeans: Otsu-based family puts in long hours to introduce Indonesian staple to Japan, world,' by Akino Yoshihara, published on 19 Feb. 2009 in *The Daily Yomiuri*. A photo in the article shows Rustono and his wife, Tsuruko Kuzumoto (wearing a white hat and clothing), in their tempeh shop. (8) Luisa and Rustono standing together in Indonesia. (9) Ana Larderet, from France, learning how to make tempeh at Rustono's tempeh shop. Address: Mexico City, Mexico).



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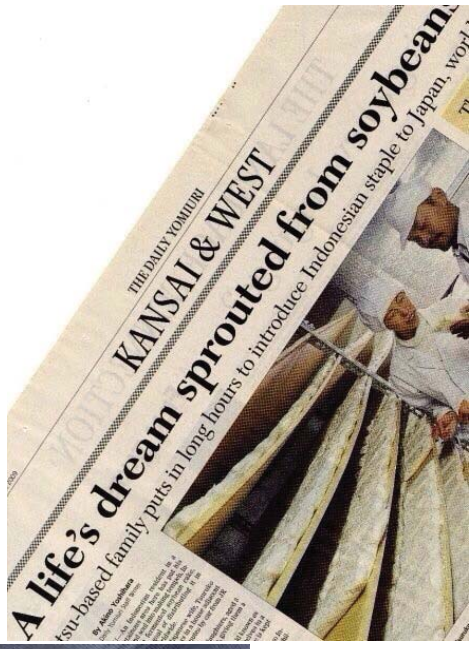
THE DAILY YOMIURI

KANSAI & WEST

A life's dream sprouted from soybeans

tsu-based family puts in long hours to introduce Indonesian staple to Japan, wor

Last minute additions:

11499. Young, Louise. 1998. Japan's total empire: Manchuria and the culture of wartime imperialism. Berkeley, California: University of California Press. xiii + 487 p. Map. Index. 23 cm. Series: Twentieth-Century Japan. *

• Summary: Contents: Part I: Making of a total empire–Manchukuo and Japan. 1 Jewel in the crown: the international context of Manchukuo.

Part II: Manchurian incident and the new military imperialism, 1931-1933. 2. War fever: imperial jingoism and the mass media. 3. Go-fast imperialism: elite politics and mass mobilization.

Part III: Manchurian experiment in colonial development, 1932-1941. 4. Uneasy partnership: soldiers and capitalists in the colonial economy. 5. Brave new empire: utopian vision and the new intelligentsia.

Part IV: New social imperialism and the farm colonization program, 1932-1945. 6. Reinventing agrarianism: rural crisis and the wedding of agriculture to empire. 7. Migration machine: Manchurian colonization and state growth. 8. Victims of empire.

Part V: Conclusion. 9. Paradox of total empire.

From the publisher's description: "In this first social and cultural history of Japan's construction of Manchuria, Louise Young offers an incisive examination of the nature of Japanese imperialism. Focusing on the domestic impact of Japan's activities in Northeast China between 1931 and 1945, Young considers 'metropolitan effects' of empire building: how people at home imagined and experienced the empire they called Manchukuo. Contrary to the conventional assumption that a few army officers and bureaucrats were responsible for Japan's overseas expansion, Young finds that a variety of organizations helped to mobilize popular support for Manchukuo–the mass media, the academy, chambers of commerce, women's organizations, youth groups, and agricultural cooperatives–leading to broad-based support among diverse groups of Japanese. As the empire was being built in China, Young shows, an imagined Manchukuo was emerging at home, constructed of visions of a defensive lifeline, a developing economy, and a settler's paradise."

A new, semi-privately-held company was established with a capitalization of 200 million yen to operate the railroad and to develop settlements and industries along its route (p. 25).

11500. Ketsueki sarasara no saishû heiki tenpe ga kiku!: niowanai nebaranai yume no yô na nattô ga yatte kita [To make your blood flow better, tempeh works as the ultimate weapon. It doesn't smell. It's not sticky. The natto you dreamed for has finally arrived]. 2003. Tokyo: Shufu no Tomo-sha. 67 p. [Jap]*

• Summary: Note: What's going on here? Two very similar books about tempeh, both published in 2003 in Japan by Shufunotomo-sha. Each with the same number of pages. But

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with clearly different yet similar titles.

Could one have been published first, sold out, and then the title was changed before the second printing the same year?

Toshie Marra, Librarian for the Japanese Collection, C.V. Starr East Asian Library, University of California (Berkeley) replies: "Because the two books share the same ISBN, I believe these records are for the same book. This happens occasionally–two different titles are taken by different catalogers, especially because two different sets of cataloging rules are used in Japan and in the U.S. By the way, WorldCat contains records created by U.S. catalogers and those created by Japanese libraries in two separate records." She sends a photo of the cover which proves she is right; all of the words in the title and subtitle appear on the very busy cover. There was only one book, and not two printings.

11501. Tenpe ga kiku! Ketsueki sarasara no saishû heiki [Tempeh works! The ultimate weapon for making your blood flow better]. 2003. Tokyo: Shufu no Tomo-sha. 67 p. [Jap]*
• Summary: A 2nd record (from WorldCat/OCLC) for an early popular Japanese book about tempeh.

11502. Oki, Satsuki. 2005. Tenpe no oishii reshipi: chô mo ohada mo wakagaeru wadai no daizu shokuzai [Delicious tempeh recipes: A soyfood that's good for your digestion and skin, and makes you look young]. Tokyo: Hôken 127 p. [Jap]* Address: Japan.

11503. Oishiku tabeyô tokachi no tenpe [Let's eat delicious tokachi tempeh]. 2005. Obihiro, Japan: Kunau Magajin. [Jap]*

11504. Koike, Yoshiko. 2006. Koike Yoshiko no tezukuri shokuhin kakô kotsu no kotsu. 3, Tsukemono sôzai okowa mochi tenpe konnyaku kunsei [Yoshiko Koike's tricks for homemade foods. No. 3. Japanese pickles, common side dishes, sekihan made with glutinous rice, mochi, tempeh, konnyaku, and smoked foods]. Tokyo: Nôsan Gyoson Bunka Kyôkai. 146 p. [Jap]*
• Summary: The Japan word okowa can refer to either kowa-meshi or sekihan. Okowa refers to a festive dish made by boiling glutinous rice with azuki beans (which are red and add a festive color to the dish). Sekihan is usually made by boiling regular (non-glutinous rice) with azuki beans.

11505. The South Manchuria Railway: Important facts (from Wikipedia). 2014. Retrieved 18 Feb. 2014.
• Summary: Introduction: "South Manchuria Railway was built as a part of the Chinese Eastern Railway in 1898-1903 by Imperial Russia according to the Russian-Chinese convention and the Convention of Peking 1860. The South Manchuria Railway Company (Minami Manshu Tetsudo Kabushiki-gaisha, or Mantetsu) was a company founded in the Empire of Japan in 1906, taken over after the Russo-Japanese War (1904-1905), and operated within China in the Japanese-controlled South Manchuria Railway Zone. The railway itself ran from Lüshun Port at the southern tip of the Liaodong Peninsula to Harbin, where it connected to the Chinese Eastern Railway.

History: "Following the Japanese victory over Imperial Russia and the signing of the Treaty of Portsmouth, the southernmost section of the southern branch (Harbin–Port Arthur) of the China Far East Railway was transferred to Japanese control. The last station remaining in Russian hands was Kuancheng (Kuanchengtze, in contemporary spelling); the first Japanese station was Changchun [1, 2]. A new, semi-privately-held company was established with a capitalization of 200 million yen to operate the railroad and to develop settlements and industries along its route.[3] The organizing committee was headed by General Kodama Gentaro, and after his death, by General Terauchi Masatake

"Over 75% of Mantetsu's income was generated by its freight business, with the key to profitability coming from soybean exports, both to Japan proper and to Europe. Soybean production increased exponentially with increasing demand for soy oil, and for soy meal for use in fertilizer and animal feed. By 1927, half of the world's supply of soybean was from Manchuria and the efforts by Mantetsu to expand production and to ship to export ports was a classic example of an extractive colonial economy dependent on a single product [8].

"The South Manchuria Railway was also charged with a government-like role in managing the rail transportation system after the formation of Manchukuo in 1932. By 1938, Mantetsu had 72 subsidiary companies, development projects in 25 urban areas and carried 17,515,000 passengers per year [9]. Between 1930-1940, the Japanese population of Manchukuo rose by 800,000 making ethnic Japanese the majority in many of the towns and cities served by Mantetsu. Mantetsu prided itself on state-of-the-art urban planning, with modern sewer systems, public parks, and creative modern architecture far in advance of what could be found in Japan itself. These things were possible due to Mantetsu's tremendous profitability, and its political power to seize property and silence opposition and dissent at will through its political connections to the military and totalitarian national leadership [10]."

An asterisk (*) at the end of the record means that SOYFOODS CENTER does not own that document.
A plus after eng (eng+) means that SOYFOODS CENTER has done a partial or complete translation into English of that document.
An asterisk in a listing of number of references [23* ref] means that most of these references are not about soybeans or soyfoods.

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Africa–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in a certain African country. 1315, 1562, 2466, 2777, 3323, 3558, 3733, 3761

Africa–Introduction of Soybeans to. This document contains the earliest date seen for soybeans in a certain African country. 587, 1315, 2233, 3282, 3323, 3558, 3724, 3761, 6345

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Africa–Mozambique (Moçambique; Portuguese East Africa before 1975). 4961, 7461, 11131

Africa–Niger (Part of French West Africa from 1904-1959). 11276

Africa–Nigeria, Federal Republic of. 1338, 1543, 1671, 2226, 2365, 3503, 3557, 3558, 3779, 3896, 3897, 4173, 4480, 4481, 4961, 5345, 5713, 5896, 6111, 6129, 6254, 6345, 6556, 6637, 6964, 6977, 7188, 7461, 7892, 7919, 8091, 8099, 8444, 8445, 8457, 8587, 8723, 8835, 8850, 8934, 9031, 9120, 9135, 9250, 9357, 9458, 9707, 9982, 10012, 10153, 10343, 10421, 10478, 10678, 10893, 10895, 11047, 11131, 11276, 11307

Africa–Reunion (Réunion is a Department of France, in the Mascarene Islands, 425 Miles East of Madagascar). 394, 1064, 3323, 3509, 7461

Africa–Rwanda (Part of the Belgian trust territory of Ruanda-Urundi or Belgian East Africa until 1962). 3816, 4480, 4481, 4961, 5896, 6345, 7919, 8525, 9250, 10478, 11047, 11131, 11307

Africa–Senegal (Part of French West Africa from 1895-1959. Sénégal & Sudanese Republic from June 20 to August 20, 1960. Includes Senegambia). 1064, 1623, 3509, 5713, 5896, 8196, 8569, 11276

Africa–Sierra Leone. 1543, 1671, 2226, 3282, 3503, 4961, 5197, 5713, 5896, 6345, 11276

Africa–Somalia. (Formed in 1960 by the Union of British Somaliland and Italian Somaliland. Formerly Part of Italian East Africa). 4961

Africa–South Africa, Republic of (Including four former Homelands–Bophuthatswana, Transkei, Venda, and Ciskei). Named Union of South Africa from May 1910 to May 1961. 514, 1250, 1315, 1319, 1374, 1384, 1412, 1427, 1514, 1533, 1543, 1551, 1671, 1784, 1815, 1817, 2078, 2226, 2244, 2479, 2717, 3275, 3323, 3331, 3503, 3509, 3511, 3557, 3558, 3583, 3647, 3724, 3816, 3897, 3900, 4173, 4282, 4283, 4480, 4481, 4961, 5746, 5785, 5793, 6254, 6556, 6980, 7188, 7373, 7461, 7890, 7919, 8010, 8444, 8457, 8835, 8998, 9209, 9250, 9864, 9982, 10012, 10478, 10705, 10731, 11047, 11131, 11161, 11173, 11307

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Africa–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 3779, 3795, 3816, 4173, 4480, 4481, 5793, 6345, 7188, 8569, 8835, 9250, 10478, 11047

Africa–Sudan (Anglo-Egyptian Sudan from 1899-1956). 1064, 2777, 3139, 3323, 3509, 4459, 7461, 8587, 11285

Africa–Swaziland, Kingdom of (Independent Kingdom Inside South Africa; Formerly Also Spelled Swazieland). 4961

Africa–Tanzania, United Republic of (Formed the Bulk of German East Africa 1895-1946. Tanganyika existed 1920-1961. Created in 1964 by Merger of Tanganyika and Zanzibar). 1449, 1562, 2466, 3724, 3766, 3779, 3781, 4173, 4480, 4481, 4961, 5345, 5713, 5785, 5793, 5896, 6345, 6637, 6883, 6964, 7188, 7461, 7919, 8601, 8723, 9250, 10478, 11047

Africa–Togo (Togoland until 1914). 1847, 3557, 3558, 5713, 5896, 7461, 9953, 11276

Africa–Tunisia. 586, 587, 1514, 2233, 2972, 3323, 3333, 3509, 3557, 3558, 4961, 5197, 6786, 7958, 8196, 9056, 11481

Africa–Uganda. 2466, 3724, 3816, 4459, 4480, 4481, 4961, 5785, 5793, 6637, 6964, 7188, 7254, 7641, 7919, 9250, 10343, 10478, 11047, 11131

Africa–Zambia (Northern Rhodesia from 1899-1964). 1527, 3509, 3557, 3558, 3779, 4961, 5345, 8445, 8835, 8986, 9503, 9953, 10478, 11047, 11131, 11307

Africa–Zimbabwe (Southern Rhodesia from 1923-1970, Rhodesia from 1970-79). 1527, 2108, 3323, 3509, 3557, 3558, 3779, 3795, 3816, 4480, 4481, 4792, 4961, 5345, 5418, 6556, 7919, 8445, 8457, 8569, 8601, 8835, 8986, 9250, 9868, 10478, 11047, 11131, 11307

Africa Basic Foods. *See* Harrison, D.W. (M.D.), and Africa Basic Foods (Uganda)

Agricultural Adjustment Administration (AAA). *See* United States Department of Agriculture (USDA)–Agricultural Adjustment Administration

Agricultural Chemistry and Engineering, Bureau. *See* United States Department of Agriculture (USDA)–Bureau of Agricultural and Industrial Chemistry

Agricultural Economics, Bureau of. *See* United States Department of Agriculture (USDA)–Bureau of Agricultural Economics

Agricultural Experiment Stations in the United States. 607, 645, 764, 775, 780, 782, 797, 806, 811, 812, 818, 819, 820, 826, 841, 848, 850, 851, 852, 870, 875, 876, 879, 888, 892, 893, 895, 905, 919, 931, 950, 952, 965, 972, 983, 984, 987, 1004, 1011, 1014, 1017, 1028, 1029, 1031, 1035, 1043, 1091, 1097, 1181, 1190, 1207, 1237, 1254, 1257, 1275, 1318, 1335, 1358, 1359, 1366, 1453, 1455, 1510, 1555, 1570, 1648, 1673, 1690, 1741, 1789, 1806, 1822, 1887, 1891, 1938, 1968, 1974, 1991, 2244, 2247, 2373, 2374, 2424, 2496, 2504, 2670, 2671, 2912, 2928, 2929, 3008, 3061, 3170, 3358, 3359, 3363, 3388, 3389, 3427, 3467, 3468, 3581, 3623, 3628, 3630, 3685, 3705, 3713, 3727, 3734, 3899, 3961, 4021, 4184, 4792, 4848, 5725, 5831, 5859, 6094, 6316, 6553, 6922, 7231, 7976, 8064, 8415, 8524, 8745, 8979, 9209, 9211, 9409, 9598, 9828, 9839, 10050, 10069, 10227, 10358, 10423, 10558, 10905, 11487, 11489

Agricultural Marketing Service of USDA. *See* United States Department of Agriculture (USDA)–Agricultural Marketing Service (AMS)

Agricultural Research Service of USDA. *See* United States Department of Agriculture (USDA)–Agricultural Research Service (ARS)

Agricultural Service of USDA. *See* United States Department of Agriculture (USDA)–Agricultural Cooperative Service. Including Farmer Cooperative Service (1926)

Agricultural colleges and universities, state. *See* Land-Grant Colleges and Universities

AGRI Industries, Inc. (Iowa). 7687

Agronomy, soybean. *See* Cultural Practices, Soybean Production

Aihara, Herman and Cornellia–Their Life and Work with Macrobiotics. 3858, 4603, 4604, 4610, 4662, 4663, 4806, 4858, 4922, 4964, 5110, 5137, 5174, 5175, 5245, 5325, 5506, 5523, 5583, 5839, 5842, 5843, 5848, 5876, 5909, 5959, 5989, 5990, 5991, 5992, 6053, 6096, 6101, 6104, 6125, 6126, 6135, 6154, 6234, 6278, 6362, 6380, 6387, 6394, 6396, 6654, 6691, 6946, 6950, 6967, 7058, 7110, 7156, 7204, 7365, 7367, 7465, 7475, 7484, 7486, 7490, 7491, 7510, 7521, 7522, 7618, 7619, 7620, 7635, 7677, 7729, 7737, 7743, 7745, 7747, 7748, 7880, 7900, 7901, 8047, 8048, 8164, 8166, 8333, 8343, 8389, 8459, 8616, 8800, 9219, 9766, 9800, 9896, 9901, 9911, 10130, 10156, 10326, 10518, 10570, 10674, 10696, 10782, 10979, 11021, 11072, 11178, 11364, 11384, 11408

Ajinomoto Co. Inc. (Tokyo, Japan). 2213, 2433, 2660, 2741, 2973, 3346, 3349, 3393, 3425, 3618, 3831, 3869, 3881, 4109, 4137, 4245, 4286, 4287, 4288, 4289, 4391, 4412, 4416, 4504, 4559, 4577, 4588, 4650, 4670, 4812, 4813, 4814, 4821, 4979, 5043, 5179, 5180, 5394, 5400, 5460, 5474, 5566, 5740, 5758, 5775, 5969, 6205, 6210, 6372, 6844, 6896, 7036, 7345, 7378, 7379, 7380, 7416, 7457, 7468, 7493, 7502, 7646, 7672, 8017, 8115, 8178, 8382, 8383, 8413, 8414, 8591, 8681, 9343, 9482, 9787, 10098, 10224, 10306, 10348, 10468, 10883

Akwarius Almere. *See* Manna Natural Foods (Amsterdam, The Netherlands)

Albert's Tofuhaus (Lautersheim, Germany). Formerly named Albert Hess Tofuhaus Rittersheim, Tofuhaus Tiefenthal, and Das Tofuhaus. 8162, 9438, 10172, 11073

Alcohol and vegetarianism. *See* Vegetarianism and the Temperance Movement

Alfa-Laval (Lund, Sweden). 7537, 7816, 7886, 8010, 8011, 8091, 8169, 8493, 8512, 8529, 8750, 8879, 8990, 8998, 9053, 9306, 9591,

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10079, 10567, 10646, 10712, 11448

Alfalfa Sprouts (*Medicago sativa*). 5804, 8143, 9876

Alfalfa or Lucerne / Lucern (*Medicago sativa*)–Other Uses for Human Food or Drink, Including Tea, Flour, Tablets, and Leaf Protein Concentrate (LPC). See Also Alfalfa Sprouts. 5998, 6059, 6371, 9155, 9217, 10035, 10719, 10877

Alfalfa or Lucerne / Lucern (*Medicago sativa*). 514, 576, 780, 818, 851, 879, 905, 913, 965, 1011, 1023, 1237, 1271, 1318, 1570, 2330, 2728, 3258, 5804, 6379, 8064, 8143, 9008, 9876, 10661, 11381

Alkaline food, ash, reaction, or balance in diet and health. *See* Nutrition–Acid-Base Balance

All-India Research Project on Soyabean (ICAR). *See* Asia, South–India. Work of the Indian Council of Agricultural Research (ICAR)

Allergies. *See* Nutrition–Biologically Active Phytochemicals–Allergens

Allied Mills, Inc. Including (by July 1929) American Milling Co. (Peoria, Illinois) and Wayne Feed Mills (Chicago, Peoria, or Taylorville, Illinois). 3581, 3667

Allis-Chalmers Manufacturing Co. (Milwaukee, Wisconsin). Made Farm Equipment (Tractors, Combines) and Soybean Processing Equipment (Driers, Rolling and Flaking Mills, Solvent Extraction Units). 4225, 4458, 5212

Almond Butter or Almond Paste. 1053, 6059, 7125

Almond Milk and Cream. See also: Almonds Used to Flavor Soymilk, Rice Milk, etc. 1805, 1867, 1870, 1873, 2143, 2432, 2475, 6403, 9762, 10062, 10266, 10719, 11409, 11416

Almond Oil. 438, 486, 519, 665, 676, 829, 1350, 1873

Almonds Used to Flavor Commercial Soymilk, Soy Ice Cream, Soy Cheese, Amazake, Rice Milk, or Other Commercial Non-Dairy Products. 8410

Almonds (*Prunus dulcis* syn. *P. amygdalus*)–Especially Origin and Early History of the Almond. Including Almond Bread, Almond Meal, and Almonds Seasoned with Soy Sauce / Tamari. 201, 303, 509, 514, 519, 576, 592, 768, 788, 805, 847, 1207, 1357, 1597, 2106, 2171, 2302, 2303, 3469, 5967, 5998, 6213, 6379, 6406, 6828, 11448

Alpro (Wevelgem, Belgium), Including the Provamel and Belsoy Brands Sold in Health Foods Stores. 7905, 8010, 8650, 8880, 8998, 9020, 9027, 9310, 9355, 9596, 9666, 9892, 10079, 10319, 10712, 11073, 11448, 11484

Alternative medicine. *See* Medicine–Alternative

Aluminum in Soybeans and Soyfoods. 4329, 5148, 6260, 7441, 10753

Amaranth, Grown for Grain / Seed (*Amaranthus hypochondriacus, A. caudatus,* and *A. cruentus.* Genus formerly spelled *Amarantus*). 560, 704, 715, 6436, 9674, 10062, 10251, 10283, 10719

Amazake. *See* Rice Milk (Non-Dairy)

American Milling Co. *See* Allied Mills, Inc.

American Miso Co. (Rutherfordton, North Carolina). 6948, 7097, 7110, 7155, 7172, 7236, 7284, 7318, 7450, 7481, 7504, 7598, 7622, 7862, 8127, 8161, 8171, 8203, 8217, 8246, 8264, 8300, 8353, 8357, 8423, 8495, 8516, 8552, 8882, 8884, 8929, 9026, 9048, 9049, 9052, 9110, 9178, 9391, 9467, 9658, 9861, 9909, 9913, 10218, 10219, 10229, 10230, 10231, 10413, 10447, 10673, 10674, 10675, 10676, 10691, 10695, 10696, 10703, 10745, 10764, 10765, 10766, 10770, 10771, 10772, 10774, 10775, 10777, 10783, 10785, 10789, 11488

American Philosophical Society (Philadelphia). *See* Franklin, Benjamin

American Soy Products (Michigan). *See* Natural Foods Distributors and Manufacturers in the USA–Eden Foods

American Soy Products (Saline, Michigan). Started Nov. 1986. 5595, 8576, 8594, 8620, 8626, 8630, 8633, 8639, 8642, 8643, 9027, 9672, 9902, 10140, 10141, 10395, 10549, 11384, 11448, 11484

American Soybean Association (ASA)–Activities in the United States and Canada, and General Information (Headquarters in St. Louis, Missouri. Established 3 Sept. 1920. Named National Soybean Growers' Association until 1925). 2557, 3581, 3685, 4021, 4189, 4414, 4421, 5372, 5727, 5749, 6303, 6527, 7093, 7256, 7257, 7258, 7259, 7260, 7280, 7315, 7340, 7344, 7791, 7872, 8232, 8885, 9084, 9351, 9502, 9770, 9983, 10176, 10352, 10446, 10708, 10790

American Soybean Association (ASA)–Activities, Offices, and Influence Worldwide (General). 4192, 4222, 4230, 5749, 5862, 5935, 8885, 8897, 10352, 10430, 11070

American Soybean Association (ASA)–Activities, Offices, and Influence in Africa. 5197, 5201

American Soybean Association (ASA)–Activities, Offices, and Influence in Asia. 3782, 3977, 3981, 4192, 4197, 4222, 4225, 4226, 4230, 4231, 4236, 4240, 4256, 4259, 4290, 4293, 4306, 4317, 4335, 4338, 4347, 4348, 4349, 4358, 4363, 4406, 4425, 4426, 4430, 4436, 4437, 4448, 4492, 4505, 4514, 4515, 4526, 4542, 4544, 4559, 4574, 4600, 4608, 4621, 4626, 4629, 4636, 4652, 4654, 4660, 4661, 4669, 4740, 4741, 4742, 4748, 4756, 4759, 4760, 4764, 4774, 4810, 4816, 4827, 4830, 4839, 4859, 4870, 4874, 4904, 4915, 4925, 4959, 4963, 4995, 5003, 5015, 5046, 5047, 5049, 5050, 5056, 5072, 5074, 5075, 5079, 5098, 5099, 5104, 5109, 5161, 5164, 5165, 5192, 5201, 5202, 5204, 5265, 5275, 5295, 5296, 5299, 5304, 5347, 5365, 5366, 5371, 5372, 5377, 5394, 5458, 5460, 5468, 5479, 5551, 5559, 5560, 5569, 5577, 5580, 5598, 5599, 5607, 5749, 5825, 5919, 5931, 5935, 6067, 6105, 6143, 6204, 6214, 6303, 6314, 6356, 6388, 6497, 6527, 6554, 7288, 7299, 7315, 7320, 7338, 7340, 7443, 7489, 7632, 7641, 7678, 7816, 7866, 7874, 7956, 8122, 8160, 8325, 8468, 8647, 8770, 8780, 8897, 8931, 9084, 9169, 9212, 9381, 9382, 9408, 9507, 9577, 9591, 9770, 9863, 9930, 9937, 10042, 10088, 10181, 10253, 10256,

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10277, 10351, 10352, 10430, 10441, 10455, 10508, 10531, 10707, 10792, 10794, 11007, 11013, 11299, 11339

American Soybean Association (ASA)–Activities, Offices, and Influence in Europe (Western and Eastern). 4293, 4347, 5049, 5372, 5569, 5577, 5749, 5935, 6214, 6230, 7315, 7340, 8251, 8897, 9373, 9454, 10319, 10430, 10441

American Soybean Association (ASA)–Activities, Offices, and Influence in Latin America. 5049, 6214, 6303, 6574, 7041, 7315, 7641, 10441, 11070

American Soybean Association (ASA)–American Soybean Institute (1969-1973), an Industry-Wide Association. 5550, 5569

American Soybean Association (ASA)–Certificate / Certificates of Meritorious Service. 6105

American Soybean Association (ASA)–Checkoff Programs (Legislated / Mandatory Funding. State Programs Starting in North Carolina in Sept. 1966, National Programs–SPARC–Starting in 1989-1991), and State Promotion Boards (Research & Promotion Councils). 5577, 5580, 5600, 5606, 6214, 7315, 7340, 7375, 7678, 7679, 7680, 7681, 7682, 7683, 7684, 7685, 7956, 8214, 8885, 10023, 10455, 10512, 10884

American Soybean Association (ASA)–Funding and Fundraising Before Checkoff Program or 1971. Voluntary or from USDA (FAS or ARS). 4230, 4232, 4240, 4248, 4290, 4306, 4335, 4349, 4406, 4436, 4442, 4542, 4608, 4636, 4642, 4963, 5197, 5372, 5550, 5551, 5569, 5577, 5600, 5606, 10884

American Soybean Association (ASA)–Honorary Life Members. 4347, 4434, 4446, 4760, 5736, 6105, 7340, 9169

American Soybean Association (ASA)–Japanese-American Soybean Institute (JASI). 4230, 4236, 4240, 4247, 4249, 4253, 4256, 4259, 4290, 4293, 4297, 4306, 4317, 4330, 4338, 4339, 4347, 4349, 4356, 4357, 4358, 4363, 4425, 4426, 4430, 4433, 4434, 4437, 4442, 4446, 4448, 4485, 4505, 4514, 4515, 4526, 4559, 4574, 4597, 4600, 4608, 4611, 4621, 4626, 4629, 4636, 4652, 4660, 4661, 4669, 4680, 4708, 4734, 4740, 4742, 4743, 4748, 4759, 4760, 4764, 4774, 4810, 4827, 4830, 4839, 4870, 4874, 4904, 4915, 4925, 4959, 4995, 5003, 5015, 5046, 5047, 5048, 5050, 5056, 5072, 5074, 5079, 5084, 5087, 5098, 5099, 5109, 5161, 5164, 5166, 5173, 5192, 5202, 5275, 5347, 5365, 5366, 5368, 5372, 5377, 5458, 5468, 5479, 5560, 5599, 5727, 5749, 7093, 7299, 8071, 10351, 11486

American Soybean Association (ASA)–Legislative Activities. 3748, 5600, 5606, 10020

American Soybean Association (ASA)–Meetings / Conventions (Annual) and Meeting Sites. 2373, 2647, 2919, 3079, 3667, 3756, 4446, 5939, 7041

American Soybean Association (ASA)–Members and Membership Statistics. 4544, 5577, 5600, 7315, 7340, 9502, 9770, 10441, 10884, 11007

American Soybean Association (ASA)–Officers, Directors (Board), and Special Committees. 2776, 3667, 3685, 3764, 4347, 4398, 4543, 4756, 5370, 6067, 7315

American Soybean Association (ASA)–Periodicals, Including Soybean Digest, Proceedings of the American Soybean Assoc., Soybean Blue Book, Soya Bluebook, Late News, etc. 3779, 4338, 4597, 5345, 5372, 5684, 6527, 7093, 7188, 7340, 8569, 8835, 9983, 10446, 10884

American Soybean Association (ASA)–Soybean Council of America (June 1956-1969). Replaced by American Soybean Institute (Est. 11 July 1969). 4248, 4293, 4347, 4349, 4492, 4544, 4597, 4629, 4642, 4905, 4915, 4958, 4963, 5049, 5197, 5201, 5372, 5550, 5560, 5727, 5749, 6786, 7340, 9454, 10884

American Soybean Association (ASA)–State Soybean Associations and Boards (Starting with Minnesota in 1962). 5577, 6527, 7340, 9502, 10106, 10194, 10319, 10340, 10455, 11004, 11089, 11103, 11322

American Soybean Association (ASA)–State Soybean Associations and United Soybean Board–Activities Related to Food Uses of Soybeans / Soyfoods, or Soy Nutrition, in the United States (Not Including Soy Oil or Edible Oil Products). 3079, 3170, 3425, 3427, 3725, 3756, 3779, 4434, 4756, 5939, 6303, 7188, 9502, 10030, 10106, 10194, 10248, 10312, 10319, 10340, 10405, 10406, 10523, 10561, 10629, 11004, 11322

American Soybean Association (ASA)–Strayer. *See* Strayer Family of Iowa

American Soybean Association (ASA)–United Soybean Board (USB, Established 1991, Chesterfield, Missouri). 10023, 10106, 10248, 10319, 10351, 10512, 10523, 10561, 10629, 11322

American Soybean Association (ASA) or United Soybean Board–Activities Related to Food Uses of Soybeans / Soyfoods, or Soy Nutrition, Outside the United States (Not Including Soy Oil). 3730, 4197, 4222, 4226, 4236, 4358, 4406, 4425, 4515, 4526, 4542, 4559, 4600, 4621, 4626, 4629, 4660, 4669, 4740, 4748, 4764, 4810, 4816, 4830, 4904, 4963, 5056, 5072, 5079, 5109, 5165, 5275, 5347, 5458, 5460, 5569, 5599, 5749, 5919, 6204, 6303, 6356, 6388, 6554, 6814, 7641, 7678, 7905, 7956, 8122, 8173, 8251, 9212, 9370, 9378, 9408, 9577, 9591, 9937, 10453

Amino Acids and Amino Acid Composition and Content. See also Nutrition–Protein Quality; Soy Sauce, HVP Type. 1196, 1297, 1624, 1625, 1626, 1730, 1759, 1850, 1870, 2273, 2382, 2417, 2418, 2421, 2422, 2451, 2493, 2494, 2495, 2547, 2632, 2660, 2701, 2813, 2815, 2861, 2862, 2907, 3052, 3158, 3175, 3179, 3199, 3259, 3260, 3263, 3290, 3371, 3398, 3498, 3727, 3876, 3945, 3946, 3958, 3997, 4023, 4105, 4151, 4218, 4229, 4234, 4276, 4277, 4359, 4380, 4458, 4459, 4463, 4464, 4560, 4561, 4562, 4582, 4583, 4668, 4702, 4764, 4796, 4800, 4852, 4855, 4864, 4916, 4917, 5131, 5132, 5133, 5235, 5253, 5257, 5259, 5290, 5300, 5329, 5337, 5338, 5355, 5356, 5357, 5358, 5383, 5436, 5437, 5449, 5478, 5482, 5484, 5586, 5620, 5641, 5716, 5740, 5745, 5774, 5810, 5815, 5817, 5820, 5838, 5867, 5869, 5885, 5967, 6027, 6044, 6046, 6107, 6109, 6110, 6112, 6130, 6163, 6173, 6207, 6234, 6282, 6293, 6324, 6332, 6362, 6442, 6444, 6471, 6472, 6473, 6476, 6581, 6600, 6653, 6663, 6665, 6666, 6766, 6778,

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6968, 7161, 7218, 7345, 7467, 7586, 7611, 7639, 7652, 7736, 7757, 7793, 7809, 8126, 8203, 8204, 8481, 8655, 8803, 8809, 8885, 8887, 8930, 9004, 9041, 9075, 9093, 9196, 9276, 9343, 9354, 9471, 9498, 9582, 9629, 9771, 9773, 9774, 9998, 10151, 10224, 10248, 10348, 10389, 10479, 10567, 10568, 10952, 11007

Anatomy, soybean. *See* Soybean–Morphology, Structure, and Anatomy

Anderson International Corp. (Cleveland, Ohio). Manufacturer of Expellers for Soybean Crushing and Extrusion Cooking Equipment. Formerly V.D. Anderson Co. and Anderson IBEC. 2471, 2775, 3173, 4458, 10352

Andreas Family of Minnesota and Iowa–Incl. Reuben Peter Andreas, and his sons Albert, Glenn, Dwayne (1918-), and Lowell Andreas (1922-). 4731, 6306, 9224, 10151, 10224, 10581

Ang-kak or angkak. *See* Koji, Red Rice

Ang-kak. *See* Koji, Red Rice

Animal Rights / Liberation. Avoidance of Exploitation of Animals by Humans. 9735

Animal Welfare (Including Protection and Cruel Treatment of Animals). See also: Animal Rights. 578, 896, 1094, 8238

Animal Welfare and Animal Rights–Documents Published before 1900. 896, 1094

Antarctica. 1479, 6801, 7029

Antinutritional Factors (General). See also: Allergens, Estrogens, Goitrogens, Hemagglutinins (Lectins), Trypsin / Protease Inhibitors. See also: Phytic Acid. 3343, 4458, 5647, 6130, 6518, 7467, 7894, 8107, 8602, 8885, 9280, 9335, 9336, 9376, 9686, 10327, 10423

Antioxidants and Antioxidant / Antioxidative Activity (Especially in Soybeans and Soyfoods). 3425, 3954, 4420, 4638, 4639, 4792, 5069, 5093, 5128, 5205, 5316, 5461, 5774, 5872, 5943, 5972, 5984, 6216, 6368, 6421, 6738, 7688, 8078, 8176, 8385, 8431, 8667, 9016, 9115, 9580, 9695, 9720, 9722, 9771, 9908, 9926, 9999, 10151, 10192, 10205, 10207, 10353, 10505, 10530, 10581, 10689, 10749, 10805

Appliances. *See* Blender, Juicer

Appropriate Foods, Inc. (Brooklyn, New York). Founded by Robert Werz and David Sibek in Nov. 1980. Incl. Tempeh Brothers and Soy Source. 8098, 8287, 9288, 10008

APV Systems, Soya Technology Division. Named Danish Turnkey Dairies Ltd., Soya Technology Division until 1987 (Aarhus, Denmark; DTD / STS). 7866, 7905, 7922, 8010, 8169, 8404, 8529, 8879, 9555, 10052, 10366, 11448

Aquaculture. *See* Fish or Crustaceans (e.g. Shrimp) Fed Soybean Meal Using Aquaculture or Mariculture

Archaeology and Archaeological Discoveries of Soybeans or Soyfoods. 3042, 5134, 5653, 6471, 6472, 6473, 6612, 6787, 6796, 7215, 7217, 7838, 8022, 8198, 9002, 9751, 9957, 10255, 10877

Archer Daniels Midland Co. (ADM) (Decatur, Illinois; Minneapolis, Minnesota until 1969). 3581, 3756, 4021, 5288, 5810, 5820, 6027, 6106, 6254, 6306, 6786, 7036, 7251, 7327, 7759, 7905, 7974, 8115, 8162, 8231, 8232, 8265, 8271, 8879, 9030, 9112, 9224, 9451, 9547, 9657, 9666, 9684, 9730, 9735, 9828, 9868, 9907, 10038, 10074, 10079, 10151, 10211, 10224, 10280, 10319, 10320, 10341, 10348, 10352, 10355, 10433, 10451, 10453, 10469, 10526, 10533, 10581, 10630, 10663, 10700, 10712, 11103, 11172, 11486

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Arkady, British. *See* British Arkady Co. Ltd.

Arkansas Grain Corp. *See* Riceland Foods

Arlington Experimental Farm. *See* United States Department of Agriculture (USDA)–Arlington Experimental Farm

Arrowhead Mills (Hereford, Deaf Smith County, Texas). Established in Aug. 1960 by Frank Ford. Including Arrowhead Distributing. 5593, 5594, 5595, 5663, 5683, 5752, 5850, 6059, 6096, 6135, 6360, 6379, 6380, 6741, 7076, 7465, 7510, 7511, 9216, 9217, 9219, 9369, 9887, 10035, 10134, 10551

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Asia, East–China–Chinese Restaurants Outside China, or Soy Ingredients Used in Chinese-Style Recipes, Food Products, or Dishes Outside China. 1704, 1904, 5031, 5124, 5781, 6180, 6607, 7303, 7883, 8536, 8545, 8580, 8628, 9269, 10672

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Asia, East–Introduction of Soy Products to. Earliest document seen concerning soybean products in a certain East Asian country. Soybeans as such have not yet been reported in this country. 85, 773

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Asia, East–Taiwan (Republic of China. Widely called by its Portuguese name, Formosa, from the 1870s until about 1945). 79, 86, 88, 89, 92, 94, 95, 899, 1048, 1140, 1229, 1335, 1414, 1453, 1454, 1489, 1490, 1514, 1688, 1706, 1751, 1763, 1889, 1926, 1993, 2007, 2108, 2183, 2203, 2226, 2292, 2293, 2295, 2452, 2466, 2534, 2535, 2557, 2558, 2583, 2604, 2605, 2725, 2786, 2992, 3017, 3043, 3137, 3151, 3183, 3185, 3267, 3390, 3557, 3598, 3620, 3645, 3662, 3731, 3795, 3816, 3888, 4024, 4163, 4266, 4267, 4273, 4350, 4360, 4480, 4481, 4509, 4539, 4616, 4744, 4961, 4962, 5163, 5167, 5178, 5182, 5332, 5333, 5364, 5374, 5443, 5479, 5549, 5577, 5579, 5598, 5719, 5819, 5935, 5955, 6000, 6039, 6105, 6111, 6204, 6225, 6230, 6235, 6303, 6358, 6375, 6395, 6401, 6467, 6556, 6559, 6636, 6637, 6690, 6735, 6736, 6824, 6923, 6958, 6974, 6977, 7032, 7055, 7141, 7229, 7256, 7257, 7258, 7259, 7260, 7270, 7275, 7315, 7322, 7344, 7373, 7375, 7444, 7509, 7512, 7607, 7625, 7642, 7643, 7711, 7718, 7767, 7848, 7867, 7882, 7892, 7919, 8010, 8036, 8070, 8098, 8122, 8173, 8200, 8206, 8212, 8225, 8240, 8287, 8373, 8444, 8445, 8457, 8464, 8703, 8712, 8723, 8728, 8774, 8780, 8826, 8889, 8921, 8986, 8998, 9012, 9084, 9088, 9104, 9141, 9212, 9248, 9250, 9302, 9303, 9336, 9337, 9370, 9378, 9400, 9461, 9471, 9513, 9562, 9577, 9600, 9607, 9624, 9671, 9703, 9704, 9706, 9708, 9713, 9716, 9718, 9734, 9795, 9797, 9839, 9866, 9868, 9912, 9937, 9953, 9954, 9969, 9982, 10021, 10087, 10093, 10114, 10119, 10133, 10163, 10174, 10190, 10236, 10271, 10274, 10286, 10289, 10304, 10308, 10316, 10332, 10397, 10429, 10441, 10455, 10475, 10494, 10507, 10536, 10537, 10546, 10577, 10582, 10622, 10655, 10661, 10668, 10731, 10786, 10803, 10897, 10911, 10912, 10915, 10980, 11065, 11098, 11145, 11260, 11381, 11434, 11478

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Asia, Middle East–Afghanistan, Islamic State of. 2180, 3467, 3896, 3897, 4961, 7270

Asia, Middle East–Bahrain, State of (Also spelled Bahrein). 2108,

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2293, 7461

Asia, Middle East–Cyprus. 3323, 4864, 5049, 9667, 10441

Asia, Middle East–Introduction of Soy Products to. Earliest document seen concerning soybean products in a certain Middle Eastern country. Soybeans as such have not yet been reported by that date in this country. 1344, 2325, 3131, 4024, 4961, 7461

Asia, Middle East–Introduction of Soy Products to. This document contains the earliest date seen for soybean products in a certain Middle Eastern country. Soybeans as such had not yet been reported by that date in this country. 1344, 2325, 3131, 4024, 4961, 7461

Asia, Middle East–Introduction of Soybeans to. Earliest document seen concerning soybeans in a certain Middle Eastern country. 2324, 3323, 3897

Asia, Middle East–Introduction of Soybeans to. Earliest document seen concerning soybeans or soyfoods in connection with (but not yet in) a certain Middle Eastern country. 1409, 3323

Asia, Middle East–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in a certain Middle Eastern country. 3323, 3897

Asia, Middle East–Introduction of Soybeans to. This document contains the earliest date seen for soybeans in a certain Middle Eastern country. 2324, 3897, 6345

Asia, Middle East–Introduction of Soybeans to. This document contains the earliest date seen for the cultivation of soybeans in a certain Middle Eastern country. 3897, 6345

Asia, Middle East–Iran, Islamic Republic of (Jomhori-e-Islami-e-Irân; Persia before 1935). 598, 2108, 2293, 2324, 2325, 3467, 3557, 3781, 4961, 5197, 5201, 5550, 5551, 5569, 5577, 5600, 6558, 6559, 6637, 6786, 7188, 7461, 7711, 8457, 10480, 10703, 10884, 11173, 11189

Asia, Middle East–Iraq (al Jumhouriya al ‘Iraqia). 2302, 2303, 3467, 4961, 6345, 6559, 7444, 7461, 11189

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Asia, Middle East–Kuwait (Dowlat al-Kuwait). 7461, 10731

Asia, Middle East–Lebanon (al-Jumhouriya al-Lubnaniya). 496, 3766, 4049, 4864, 4961, 5713, 5896, 6173, 9277

Asia, Middle East–Oman, Sultanate of (Saltanat ‘Uman). 4961, 7461

Asia, Middle East–Palestine (Divided between Israel and Jordan in 1948-49). 3323, 3509, 5713, 5896

Asia, Middle East–Qatar, State of (Dawlet al-Qatar; Also called Katar). 7461

Asia, Middle East–Saudi Arabia, Kingdom of (al-Mamlaka al-`Arabiya as-Sa`udiya). 4024, 6345, 6558, 6559, 7444, 7461, 9667, 9868, 11038

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Asia, Middle East–Syria (Syrian Arab Republic; Including Latakia, Alawiya, and Territory of the Alaouites). 3131, 3380, 3466, 5282, 5713, 5896, 11189

Asia, Middle East–Turkey (Including Anatolia or Asia Minor). 1344, 1409, 2218, 2324, 2325, 3323, 3509, 3779, 3781, 3816, 4173, 4480, 4481, 4961, 5282, 5550, 6637, 7188, 7345, 8445, 8457, 8569, 8850, 9250, 9302, 9498, 9667, 10151, 11038, 11189, 11472

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Asia, Middle East–Yemen (Formed in May 1990 by the Merger of Pro-Soviet South Yemen [People’s Democratic Republic of Yemen, Including Aden] and Pro-Western North Yemen [Yemen Arab Republic]). 2293, 7461, 9667

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846, 853, 904, 937, 943, 985, 987, 1047, 1050, 1053, 1069, 1136, 1144, 1167, 1170, 1183, 1190, 1193, 1213, 1260, 1271, 1282, 1303, 1306, 1315, 1318, 1319, 1321, 1327, 1335, 1336, 1345, 1366, 1374, 1401, 1411, 1416, 1442, 1445, 1453, 1454, 1459, 1464, 1473, 1489, 1514, 1527, 1533, 1544, 1551, 1561, 1574, 1585, 1598, 1679, 1687, 1710, 1719, 1741, 1770, 1815, 1847, 1870, 1883, 1906, 1935, 1955, 1963, 1967, 1974, 1976, 1994, 2017, 2110, 2167, 2180, 2218, 2226, 2234, 2235, 2243, 2251, 2304, 2367, 2377, 2407, 2410, 2423, 2466, 2479, 2848, 3016, 3043, 3046, 3078, 3137, 3214, 3256, 3271, 3275, 3282, 3323, 3328, 3331, 3363, 3384, 3385, 3390, 3496, 3509, 3511, 3522, 3557, 3583, 3614, 3647, 3724, 3766, 3781, 3788, 3888, 3893, 3896, 3897, 3900, 4017, 4024, 4049, 4211, 4214, 4282, 4283, 4326, 4350, 4433, 4492, 4509, 4544, 4551, 4571, 4580, 4616, 4668, 4699, 4729, 4771, 4927, 4961, 4970, 5097, 5126, 5156, 5160, 5176, 5182, 5185, 5197, 5201, 5258, 5282, 5290, 5364, 5514, 5515, 5589, 5666, 5669, 5713, 5785, 5810, 5896, 5927, 5967, 6095, 6111, 6129, 6135, 6136, 6189, 6254, 6276, 6345, 6378, 6449, 6556, 6558, 6559, 6563, 6637, 6880, 6883, 6964, 6977, 7016, 7061, 7188, 7270, 7304, 7329, 7421, 7461, 7509, 7512, 7563, 7582, 7591, 7641, 7711, 7754, 7783, 7874, 7892, 7900, 7919, 7981, 8010, 8017, 8070, 8091, 8098, 8099, 8115, 8132, 8136, 8200, 8262, 8287, 8337, 8343, 8441, 8444, 8445, 8454, 8457, 8485, 8493, 8512, 8529, 8569, 8587, 8661, 8668, 8680, 8709, 8723, 8835, 8850, 8879, 8885, 8889, 8897, 8984, 8986, 8987, 8998, 9112, 9256, 9302, 9336, 9344, 9372, 9472, 9547, 9562, 9624, 9667, 9789, 9851, 9880, 9883, 9953, 9982, 10051, 10052, 10069, 10187, 10276, 10301, 10387, 10430, 10441, 10478, 10480, 10497, 10499, 10539, 10567, 10611, 10617, 10619, 10639, 10703, 10773, 10917, 10975, 11001, 11047, 11073, 11083, 11132, 11161, 11169, 11170, 11194, 11198, 11251, 11284, 11307, 11317, 11321, 11339, 11351, 11355, 11387, 11467, 11472, 11494

Asia, South–India, Northeast / North-East. The Contiguous Seven Sister States and Sikkim–Which are Ethnically Distinct. The States are Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, and Tripura. 707, 716, 795, 1144, 1271, 1306, 1335, 1453, 1454, 1459, 1533, 2234, 3282, 3323, 3557, 5258, 5666, 7270, 8337, 8661, 8668, 8680, 8984, 8987, 10539, 10619, 11001, 11351, 11355, 11387

Asia, South–India. Work of the Indian Agricultural Research Institute (IARI, New Delhi) with Soyabeans in India. Established in 1905 as the Imperial Agricultural Research Institute (Pusa Samastipur, and Bihar). 9336

Asia, South–India. Work of the Indian Council of Agricultural Research (ICAR), the All-India Research Project on Soyabean (ICAR, Uttar Pradesh), and the National Research Centre for Soybean (ICAR, Madhya Pradesh)–with Soyabeans in India. 7061, 7874, 8441, 8445, 8889, 11307

Asia, South–India. Work of the Indian Institute of Science (Bangalore) with Soyabeans in India. 5182

Asia, South–Introduction of Soy Products to. Earliest document seen concerning soybean products in a certain South Asian country. Soybeans as such have not yet been reported in this country. 90, 106

Asia, South–Introduction of Soy Products to. This document contains the earliest date seen for soybean products in a certain South Asian country. Soybeans as such had not yet been reported by that date in this country. 90, 4214

Asia, South–Introduction of Soybeans to or Dissemination of Soybeans from. Other or general information and leads concerning South Asia. 1144

Asia, South–Introduction of Soybeans to. Earliest document seen concerning soybeans (but only wild perennial relatives of soybeans) in a certain South Asian country; cultivated soybeans have not yet been reported. 215

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Asia, South–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in a certain South Asian country. 251, 655

Asia, South–Introduction of Soybeans to. This document contains the earliest date seen for soybeans in a certain South Asian country. 251, 655

Asia, South–Introduction of Soybeans to. This document contains the earliest date seen for the cultivation of soybeans in a certain South Asian country. 251

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6637, 6830, 6964, 7329, 7509, 7512, 7591, 7641, 7711, 7776, 7874, 7919, 8010, 8017, 8098, 8202, 8287, 8441, 8444, 8445, 8493, 8837, 8889, 8986, 8998, 9302, 9472, 9789, 9880, 9953, 9982, 10051, 10052, 10304, 10478, 10480, 10611, 11047, 11173, 11194, 11307

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Asia, Southeast–Brunei (State of Brunei Darussalam; Part of British Borneo before 1984). 7461, 9789

Asia, Southeast–Cambodia, Kingdom of (Kampuchea from 1979 to the 1980s; Also Khmer Republic). 91, 467, 609, 1058, 1064, 1210, 1211, 1366, 1384, 1489, 1932, 2051, 2108, 2180, 2234, 3323, 3557, 3620, 3761, 3779, 3795, 3816, 4480, 4481, 4539, 4695, 4961, 5345, 5968, 6276, 6937, 7188, 8441, 8680, 9250, 9880, 9953, 10052, 10190, 10478, 10480, 10647, 11047, 11351

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Asia, Southeast–Indonesians overseas. *See* Indonesians Overseas, Especially Work with Soy

Asia, Southeast–Introduction of Soy Products to. Earliest document seen concerning soybean products in a certain Southeast Asian country. Soybeans as such have not yet been reported in this country. 73, 84, 101, 105, 110, 340

Asia, Southeast–Introduction of Soy Products to. This document contains the earliest date seen for soybean products in a certain Southeast Asian country. Soybeans as such had not yet been reported by that date in this country. 73, 84, 110, 340, 4214, 9880

Asia, Southeast–Introduction of Soybeans to. Earliest document seen concerning soybeans in a certain Southeast Asian country. 652, 657, 1058, 1064, 1345

Asia, Southeast–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in a certain Southeast Asian country. 652, 657, 1489

Asia, Southeast–Introduction of Soybeans to. This document contains the earliest date seen for soybeans in a certain Southeast Asian country. 652, 657, 1345

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Asia, Southeast–Vietnam–Vietnamese Restaurants or Grocery Stores Outside Vietnam, or Soy Ingredients Used in Vietnamese-Style Recipes, Food Products, or Dishes outside Vietnam. 6937, 8994

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Asia, Southeast–Vietnamese overseas. *See* Vietnamese Overseas, Especially Work with Soy

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Asia, Transcaucasia (Presently Armenia, Azerbaijan, and Georgia. Formerly Transcaucasian Soviet Republics from about 1917 to Dec. 1991). 562, 586, 587, 607, 645, 1033, 1045, 2233, 2820, 3647, 5039, 11481

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Asia, Transcaucasia–Azerbaijan (Azerbaijani Republic; Formerly Azerbaijan SSR, a Transcaucasian Soviet Republic from 1917 to Dec. 1991. Also spelled Azerbaidzhan, Aderbijan). 5039

Asia, Transcaucasia–Georgia, Republic of (Formerly Georgian SSR, a Transcaucasian Soviet Republic from 1921 to Dec. 1991). 1033, 2820, 3136, 4687, 5039, 6256, 7981, 11481

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Asian soybean crushers (general). *See* Soybean Crushers (Asia)

Asparagus bean. *See* Yard-Long Bean or Asparagus Bean

Aspergillus oryzae. *See* Koji, Miso, or Soy Sauce

Associated Seed Growers, Inc. *See* Asgrow (Des Moines, Iowa)

Atlantic Ocean islands. *See* Oceania

Auenland Tofu und Soja Produkte (Prien-Chiemsee, Germany). Started by Peter Wiegand in March 1982. 8162, 11444

Australasia. *See* Oceania

Australia. *See* Oceania–Australia

AVRDC (Taiwan). *See* International Soybean Programs

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Azuki Bean. *Vigna angularis* (Willd.) Ohwi & H. Ohashi. Also called Adzuki, Aduki, Adsuki, Adzinki, Red Bean, Chinese Red Bean, Red Mung Bean, Small Red Bean. Japanese–Kintoki, Komame, Shôzu. Chinese–Xiaodou, Chixiaodou, Hsiao Tou [Small Bean], Ch'ih Hsiao Tou [Red Small Bean]. Former scientific names: *Phaseolus radiatus* (L.), *Dolichos angularis* (Willd.), *Phaseolus angularis* (Willd.) Wight, or *Azukia angularis* (Willd.) Ohwi. 2, 4, 26, 68, 138, 152, 158, 217, 235, 244, 245, 254, 333, 346, 357, 438, 441, 452, 470, 492, 499, 513, 515, 516, 518, 537, 542, 548, 564, 565, 584, 608, 621, 622, 632, 635, 656, 670, 671, 681, 706, 708, 717, 720, 732, 770, 775, 782, 785, 797, 804, 806, 808, 812, 820, 822, 826, 828, 840, 841, 843, 844, 850, 851, 852, 870, 875, 891, 893, 912, 918, 947, 948, 952, 954, 966, 968, 975, 1016, 1025, 1037, 1086, 1137, 1139, 1147, 1171, 1173, 1179, 1190, 1207, 1210, 1247, 1259, 1260, 1262, 1268, 1270, 1283, 1286, 1291, 1297, 1330, 1353, 1360, 1376, 1395, 1420, 1455, 1465, 1466, 1467, 1541, 1603, 1662, 1676, 1682, 1684, 1690, 1697, 1698, 1704, 1705, 1707, 1711, 1713, 1716, 1767, 1773, 1775, 1776, 1777, 1802, 1813, 1842, 1843, 1845, 1874, 1897, 1953, 1962, 1972, 1990, 2049, 2060, 2061, 2065, 2077, 2118, 2154, 2176, 2205, 2226, 2247, 2354, 2359, 2457, 2463, 2467, 2527, 2538, 2557, 2619, 2620, 2622, 2626, 2647, 2665, 2668, 2724, 2727, 2745, 2893, 2894, 2983, 3038, 3039, 3095, 3096, 3217, 3332, 3337, 3345, 3432, 3544, 3679, 3710, 3794, 3844, 3846, 3949, 4020, 4078, 4086, 4149, 4207, 4208, 4254, 4327, 4439, 4570, 4596, 4603, 4604, 4663, 4688, 4694, 4902, 4922, 4923, 5030, 5038, 5040, 5110, 5124, 5127, 5137, 5159, 5185, 5200, 5242, 5323, 5325, 5384, 5505, 5516, 5632, 5648, 5650, 5658, 5663, 5669, 5683, 5688, 5720, 5779, 5780, 5781, 5847, 5888, 5894, 5951, 5955, 5963, 5967, 5989, 5991, 6022, 6041, 6059, 6096, 6098, 6113, 6126, 6132, 6239, 6289, 6292, 6296, 6358, 6379, 6380, 6436, 6560, 6628, 6634, 6691, 6787, 6923, 7011, 7038, 7058, 7076, 7081, 7083, 7125, 7172, 7230, 7237, 7262, 7363, 7366, 7519, 7549, 7559, 7620, 7626, 7664, 7676, 7677, 7719, 7901, 7948, 7968, 7974, 8022, 8197, 8199, 8223, 8299, 8446, 8447, 8450, 8525, 8552, 8591, 8673, 8714, 8724, 8760, 8867, 8904, 8994, 9263, 9267, 9352, 9386, 9513, 9540, 9671, 9750, 9785, 9843, 9846, 9847, 9862, 9872, 9915, 9957, 9959, 9962, 10003, 10058, 10062, 10063, 10065, 10094, 10112, 10129, 10174, 10201, 10219, 10220, 10250, 10251, 10272, 10283, 10307, 10334, 10404, 10492, 10497, 10606, 10611, 10617, 10635, 10645, 10659, 10675, 10690, 10691, 10694, 10718, 10719, 10990, 10998, 11265, 11274, 11328, 11343, 11352, 11409, 11487

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Bacon or bacon bits, meatless. *See* Meat Alternatives–Meatless Bacon, Ham, Chorizo and Other Pork-related Products

Bacteria causing toxicity. *See* Toxins and Toxicity in Foods and Feeds–Microorganisms, Especially Bacteria, and that Cause Food Poisoning

Bacteria in intestines–beneficial. *See* Intestinal Flora / Bacteria

Balanced Foods, Inc. (New York City, and North Bergen, New Jersey). Wholesale Distributor of Health Foods and Natural Foods. Founded in 1939 by Maurice "Doc" Shefferman, Sam and Will Reiser. Purchased in Dec. 1986 by Tree of Life. 5594, 6741, 9766

Bambarra groundnuts (*Voandzeia subterranea*). Also spelled Bambara. 327, 408, 514, 517, 576, 688, 704, 708, 715, 716, 828, 849, 975, 1058, 1064, 1815, 2817, 3733, 5967, 6436

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Barricini Foods (Mountain Lakes, New Jersey)–Soy Ice Cream Company. Acquired Farm Foods and Ice Bean on 31 May 1985.

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Sold Farm Foods to 21st Century in 1993. 8240, 8404, 8650, 9100, 9101, 9113, 9451, 10712, 11450

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Bartram, John (1699-1777) and William (1739-1823). 200, 268, 9598, 11485

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Beach, Charles P. *See* Charles P. Beach and Caroline Takamine Beach in Arizona

Bean curd skin. *See* Yuba

Bean curd sticks, dried. *See* Yuba–Dried Yuba Sticks

Bean curd. *See* Tofu

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Beef alternatives. *See* Meat Alternatives–Beef Alternatives, Including Beef Jerky, etc. See also Meatless Burgers

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Biological control. *See* Integrated Pest Management (IPM)

Biotechnology applied to soybeans. *See* Genetic Engineering, Transgenics, Transgenic Plants and Biotechnology / Biotech

Black Bean Paste, Sweet. *See* Sweet Black Soybean Paste (Non-Fermented). Also Called Sweet Black Bean Paste

Black Bean Sauce or Black Soybean Sauce. Occasionally Called Black Bean Paste. Traditionally Made in the Kitchen by Crushing Salted, Fermented Black Soybeans, Usually with Minced Ginger, Garlic, Chilis and/or Chinese-style Wine. Typically Not a Commercial Product or Sauce. See Also Black Soybean Jiang (a Commercial Product). 4472, 5031, 5781, 6624, 7303, 8536, 9846, 10492, 10611, 10672, 10718, 10728

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Black Gram or Urd. *Vigna mungo.* Formerly *Phaseolus mungo*. 787, 1271, 1690, 5967

Black soybean sauce. *See* Black Bean Sauce

Black soybeans. *See* Soybean Seeds–Black, Soybean Seeds–Black

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in Color, Soybean Seeds–Black in Color–Etymology

Black-eyed pea. *See* Cowpea–*Vigna unguiculata*

Blaw-Knox Co. (Pittsburgh, Pennsylvania). Maker of Soybean Crushing Equipment, Especially the Rotocel. 4458, 6130, 11138

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Borden, Inc. (Columbus, Ohio; New York City, New York; Waterloo, Iowa; Elgin and Kankakee, Illinois). 4953, 7261, 7644, 9020, 11493

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Brassica napus (L.) var. napus. *See* Canola

Brassica napus. *See* Rapeseed

Brazil. *See* Latin America, South America–Brazil

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Bunge Corp. (White Plains, New York). Including Lauhoff Grain Co. (Danville, Illinois) since 1979. 5214, 6779, 6786, 9112, 9451,

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CanAmera Foods (Plant at Hamilton, Ontario, Canada). Includes Maple Leaf Foods. Named Central Soya of Canada Ltd. until March 1992. Named Canadian Vegetable Oil Products (CVOP; Div. of Canada Packers, Hamilton, Ontario) Before the mid-1980s. Named Canadian Vegetable Oil Processing Before 1984. 9684, 10325

Canada–Child Haven International. *See* Child Haven International (Maxville, Ontario, Canada)

Canada–Introduction of Soybeans to. Earliest document seen concerning soybeans in Canada or a certain Canadian province. 444, 977, 1914

Canada–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in Canada or a certain Canadian province. 977, 1914

Canada–Introduction of Soybeans to. This document contains the earliest date seen for soybeans in Canada or a certain Canadian province. 444, 977

Canada–Introduction of Soybeans to. This document contains the earliest date seen for the cultivation of soybeans in Canada or a certain Canadian province. 977

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Central Soya Co. (Fort Wayne, Indiana; Acquired in Oct. 1987 by the Ferruzzi Group in Ravenna, Italy. In 1991 became part of CSY Agri-Processing, Inc. [a holding company], operating as a member of the Eridania / Beghin-Say agro-industrial group, within Ferruzzi-Montedison). Acquired in Oct. 2002 by Bunge. 3669, 4458, 5288, 5466, 6130, 6159, 6254, 6306, 6784, 6978, 7036, 7327, 7990, 8232, 8241, 8265, 8271, 8921, 9041, 9112, 9171, 9445, 9451, 9498, 9523, 9612, 9669, 9684, 9985, 10151, 10319, 10352, 10533, 10630, 10712, 10978, 11138

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Chico-San Inc. (Chico, California). Maker of Macrobiotic and Natural Foods. Founded in March 1962. 3858, 4773, 4806, 4866, 4922, 4964, 5137, 5271, 5505, 5558, 5663, 5683, 5844, 5848, 5857, 5904, 5905, 5909, 5927, 5959, 5963, 5989, 6033, 6041, 6059, 6088, 6096, 6097, 6098, 6135, 6171, 6172, 6278, 6379, 6673, 6691, 6741, 7076, 7204, 7237, 7465, 7482, 7484, 7486, 7510, 7511, 7519, 7521, 7522, 7605, 7618, 7619, 7722, 7729, 7731, 7737, 7745, 7749, 7751, 7752, 7784, 7786, 7789, 7814, 7900, 7908, 7991, 7998, 8166, 8333, 8389, 8459, 8616, 8840, 9026, 9766, 9802, 9872, 9873, 9874, 9885, 9890, 9914, 10148, 10358, 10782, 10885, 11287, 11376, 11408, 11496

Child Haven International (Headquarters: Maxville, Ontario, Canada). Founded by Fred and Bonnie Cappuccino in 1985. Homes in India, Bangladesh, Nepal and Tibet. 11339, 11448

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Chocolate–Problems with or Prohibitions against the Consumption of Chocolate, Initially Because it Was Considered a Stimulant, Later Because of the Harmful Caffeine-like Effects of Theobromine. 11429

Chocolate substitute made from roasted peanuts. *See* Peanut Chocolate

Chocolate substitute made from roasted soybeans. *See* Soy

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Chocolate

Cholesterol. *See* Carbohydrates–Effects of Dietary Carbohydrates (Especially Fiber and Saponins) on Blood Lipids (Especially Cholesterol), Lipids–Effects on Blood Lipids, Protein–Effects on Blood Lipids

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Christian Nagel Tofumanufaktur. *See* Tofumanufaktur Christian Nagel GmbH (Hamburg, Germany)

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Chufa / Chufas (*Cyperus esculentus*). Also Called Earth Almond, Tiger Nuts/Tigernut, Nut Grass, Ground Almond, Hognut, Earth Nut, Rush Nut, Zulu Nut. French: Voandzou, Souchet. German: Erdmandel. Italian: Cipero comestible. 511, 514, 519, 529, 532, 665, 676, 708, 828, 829, 847, 907, 975, 1271, 1813, 2359, 10719

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Cliffrose. *See* Natural Food Distributors and Master Distributors–General and Other Smaller: Cliffrose, Shadowfax, etc.

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Coffee–Problems with or Prohibitions against the Consumption of Coffee, Initially Because it Was Considered a Stimulant, Later Because of the Harmful Effects of Caffeine. 11429

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Costs and/or Profits / Returns from Producing Soybeans. 983, 1344

Cottage cheese, non-dairy. *See* Dairylike Non-dairy Soy-based Products, Other

Cotton Cloth, Fabric, Textile, Fibers or Raw Cotton in Bales, All from the Boll of the Cotton Plant (*Gossypium sp.* L.). 392, 553, 574, 584, 608, 616, 619, 687, 853, 878, 936, 1091, 1132, 1166, 1246, 1251, 1263, 1269, 1379, 1429, 1430, 1536, 1697, 1698, 3214, 4467, 6439, 7706

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Cotton Plant and Crop (*Gossypium sp.* L.). See also Cottonseed Oil, Cake, and Meal. 258, 269, 302, 480, 762, 786, 787, 953, 1025, 1268, 1338, 1465, 1466, 1527, 1533, 2292, 2297, 2298, 3893

Cottonseed Meal and Cake (Defatted). Previously Spelled Cotton-Seed Cake. 607, 619, 875, 907, 913, 919, 1187, 1291, 1294, 1303, 1307, 1315, 1318, 1333, 1337, 1344, 1345, 1374, 1376, 1394, 1400, 1409, 1442, 1445, 1447, 1477, 1480, 1509, 1536, 1683, 1741, 1780, 1803, 1859, 1900, 1931, 2635, 2929, 3151, 3662, 4459, 4468, 5086, 6280

Cottonseed Oil. Previously Spelled Cotton-Seed Oil or Cotton Oil. 509, 541, 720, 907, 1025, 1166, 1265, 1291, 1303, 1333, 1334, 1337, 1344, 1368, 1370, 1372, 1374, 1376, 1381, 1384, 1394, 1409, 1442, 1445, 1447, 1464, 1465, 1466, 1477, 1480, 1509, 1536, 1687, 1774, 1789, 1806, 1819, 1827, 1884, 1915, 1920, 1931, 1946, 1953, 1968, 2016, 2031, 2108, 2130, 2152, 2163, 2218, 2277, 2296, 2370, 2432, 2885, 2928, 2929, 3617, 3645, 3748, 3783, 4178, 4184, 4283, 4863, 5018, 5168, 5201, 5282, 6523, 8939, 10000, 10176, 10382, 10383

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Cottonseeds / Cottonseed. Previously Spelled Cotton Seeds / Seed. 1246, 1338, 1671, 1804, 2237, 2293, 2297, 2298, 3146, 3551, 3928, 4137

Cover Crop, Use of Soybeans as. See also: Intercropping. 1194, 1275, 3079, 3282, 10631

Cowpea / Cowpeas / Black-Eyed Peas–Etymology of These Terms and Their Cognates / Relatives in Various Languages. 470, 780, 875, 5967

Cowpea or Black-Eyed Pea. *Vigna unguiculata* (L.) Walp. Formerly spelled Cow Pea. Also called Blackeye Pea, Pea Bean, Yardlong Cowpea. Chinese: Jiangdou. Previous scientific names: *Vigna sinensis* (L.) (1890s-1970s), *Vigna catjang* (1898-1920), *Vigna Katiang* (1889). 470, 524, 559, 621, 632, 645, 717, 780, 811, 841, 843, 844, 848, 851, 855, 870, 875, 905, 931, 947, 950, 952, 965, 972, 976, 980, 989, 995, 1023, 1024, 1041, 1043, 1051, 1091, 1097, 1237, 1240, 1257, 1271, 1318, 1353, 1453, 1555, 1562, 1574, 1597, 1648, 1673, 1734, 1741, 1813, 1873, 1906, 1991, 2029, 2226, 2251, 2330, 2359, 2479, 2619, 2670, 3268, 3544, 3733, 3764, 5967, 8323, 8415, 8447, 9135, 9959, 10003, 10153, 10343, 10423, 10611, 10719, 11274

Cows / Cattle for Dairy Milk and Butter Fed Soybeans, Soybean Forage, or Soybean Cake or Meal as Feed. 541, 607, 637, 764, 870, 875, 876, 879, 907, 913, 919, 932, 959, 965, 980, 983, 1011, 1014, 1181, 1291, 1294, 1315, 1318, 1344, 1374, 1409, 1427, 1445, 1480, 1671, 1804, 1931, 2226, 2249, 3323, 3961, 9381

Crayons. *See* Candles, Crayons, and Soybean Wax

Cream Cheese. *See* Soy Cream Cheese

Cream, sour, alternative. *See* Sour Cream Alternatives

Cream, soymilk. *See* Soymilk Cream

Creamer or soy cream for coffee. *See* Coffee Creamer / Whitener

Crop Rotation Using Soybean Plants for Soil Improvement. 607, 818, 870, 984, 1091, 1353, 1375, 1412, 1536, 1673, 1806, 2140, 2255, 2956, 2957, 3159, 3214, 3268, 3282, 3647, 3761, 4901, 5029, 5688, 5709, 6225, 8197, 9293, 9712, 9984, 10147

Cropping Systems: Intercropping, Interplanting, or Mixed Cropping (Often Planted in Alternating Rows with Some Other Crop). 116, 122, 1091, 1319, 1336, 1384, 1449, 1510, 1536, 1574, 1585, 1602, 1815, 2243, 2292, 2775, 2928, 2957, 3645, 3646, 3831, 3896, 4267, 4891, 5725, 6345, 6564, 7875, 8022, 8023, 8179, 8723, 9954, 10975

Crown Iron Works Co. (Minneapolis, Minnesota). Maker of Soybean Processing Equipment. Acquired by CPM (Formerly California Pellet Mill, Waterloo, Iowa) on 16 Aug. 2007. 4349

Cruets (Glass Bottles for Serving Soy Sauce–or Oil or Vinegar–at the Table) and Cruet Frames and Stands (of Plated Metal). Also spelled Crewets, Crewits, Creuits, Cruetts, Cruits. 489, 2277, 2316

Crushing statistics for soybeans, and soy oil and meal production and consumption. *See* individual geographic regions (such as Asia, Europe, Latin America, United States, World, etc.) and nations within each region

Crushing, soybean–equipment manufacturers. *See* Allis-Chalmers, Anderson International Corp., Blaw-Knox Co. and Rotocel, Crown Iron Works Co., French Oil Mill Machinery Co.

Cultural Practices, Cultivation & Agronomy (Including Crop Management, Erosion, Planting, Seedbed Preparation, Water Management / Irrigation). 116, 122, 137, 146, 270, 334, 424, 428, 432, 434, 440, 444, 446, 448, 453, 463, 464, 475, 479, 483, 529, 542, 551, 562, 569, 570, 571, 582, 586, 587, 598, 611, 613, 616, 626, 627, 686, 708, 716, 720, 775, 788, 818, 819, 821, 828, 840, 849, 850, 851, 870, 874, 876, 888, 893, 905, 919, 931, 932, 965, 975, 977, 980, 983, 984, 1011, 1021, 1091, 1092, 1136, 1181, 1217, 1240, 1257, 1309, 1315, 1318, 1319, 1353, 1411, 1427, 1512, 1514, 1536, 1543, 1555, 1561, 1562, 1563, 1574, 1585, 1614, 1741, 1771, 1780, 1806, 1813, 1891, 1906, 1946, 1949, 2001, 2039, 2146, 2226, 2243, 2328, 2330, 2350, 2352, 2360, 2479, 2718, 2767, 2912, 2923, 2951, 2956, 2957, 2968, 3137, 3151, 3159, 3242, 3282, 3323, 3328, 3384, 3385, 3491, 3511, 3584, 3612, 3646, 3647, 3700, 3745, 3781, 3809, 3859, 3896, 3950, 4098, 4215, 4264, 4266, 4269, 4279, 4563, 4580, 4891, 4901, 5029, 5640, 5789, 5950, 6308, 6566, 6923, 7224, 7581, 7711, 7875, 8023, 8024, 8026, 8444, 8703, 8723, 8753, 8889, 9190, 9710, 9712, 9755, 9969, 9970, 9974, 10044, 11316

Culture Media / Medium (for Growing Microorganisms)–Industrial Uses of Soybeans, as in Antibiotic / Antibiotics Industry. 887, 898, 1444, 1485, 1491, 1881, 10176

Cultures of nitrogen fixing bacteria for soybeans. *See* Nitrogen Fixing Cultures

Curds Made from Soymilk (Soft, Unpressed Tofu) as an End

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Product or Food Ingredient. In Japanese: Oboro. In Chinese: Daufu-fa, Doufu-hua, Doufu-hwa, Douhua, Toufu-hwa, Tow-foo-fah ("Bean Curd Flowers") or Doufu-nao, Fu-nao ("Bean Curd Brains"). In Filipino: Taho (Often Served as a Dessert with a Sugary Syrup). 1475, 1921, 2226, 2242, 3384, 3624, 3788, 4438, 4466, 4966, 6043, 6213, 6351, 6395, 6401, 6404, 6637, 6709, 6737, 6958, 7003, 7008, 7322, 7419, 7479, 7867, 7907, 9135, 9141, 9263, 9621, 9806, 9846, 10091, 10105, 10532, 10582, 10719, 10728, 10801, 10829, 10857, 10859, 10897, 11121, 11145, 11260, 11345, 11415, 11434, 11444

Cyperus esculentus. *See* Chufa. Also Called Earth Almond, Tiger Nuts, etc.

Dairy alternative, rice based. *See* Rice Milk Products–Ice Creams

Dairy alternatives (soy based). *See* Coffee Creamer / Whitener or Cream Alternative, Sour Cream Alternatives, Soy Cheese–Fermented, Soy Cheese–Non-Fermented, Soy Cheese or Cheese Alternatives, Soy Cheesecake or Cream Pie, Soy Cream Cheese, Soy Pudding, Custard, Parfait, or Mousse, Soy Yogurt, Soymilk, Soymilk, Fermented, Soymilk, Fermented–Soy Kefir, Tofu (Soy Cheese), Whip Topping

Dairylike Non-dairy Soy-based Products, Other (Cottage Cheese, and Icing). See also Non-dairy Whip Topping, Soy Ice Cream, Soy Yogurt, Soy Cheese, Cream Cheese or Cheesecakes, Coffee Creamer / Whitener or Cream, and Sour Cream. 5937, 6395, 6401, 7003, 7259, 8096, 8487, 10010, 10445, 10569, 10627, 11260

Daitokuji / Daitoku-ji natto. *See* Daitokuji Fermented Black Soybeans–from Japan

Daitokuji Fermented Black Soybeans–from Japan. In Japan called Daitokuji Natto or Daitoku-ji Natto. 7, 2627, 5212, 5213, 5215, 5620, 5894, 5899, 6030, 6395, 6400, 6404, 6471, 6473, 6613, 6745, 6858, 6927, 6947, 6991, 7054, 7547, 7557, 7838, 8293, 8680, 8706, 9790, 9869, 10929, 10932, 11260, 11397, 11459

Dammann & Co. (San Giovanni a Teduccio {near Naples}, Italy). 1275, 1453, 1719

Danshi / danchi (pinyin). *See* Fermented Black Soybeans, Unsalted or Bland

Davis, Adelle (1904-1974). Author and Health Foods Advocate. 5998

Dawa-dawa. *See* Natto–Soybean Dawa-dawa

Dawson Mills (Dawson, Minnesota) (Tri-County Soy Bean Co-operative Association until 1969) and Dawson Food Ingredients (from 1974)–Cooperative. 7327, 7353

Day-neutral soybean varieties. *See* Soybean–Physiology–Day-Neutral / Photoperiod Insensitive Soybean Varieties

Death certificates. *See* Obituaries, Eulogies, Death Certificates, and Wills

Deceptive or misleading labeling or products. *See* Unfair Practices–Including Possible Deceptive / Misleading Labeling, Advertising, etc. See also: Adulteration

Delsoy Products, Inc. (Dearborn, Michigan). Soy Protein Company. Renamed Whitehouse Products in 1963. Purchased by C.J. Christoff & Sons in 1983 (Lowell, Michigan). Renamed Chadalee Farms, Inc. 10010, 11450

Demos, Steve. *See* White Wave, Inc. (Boulder, Colorado)

Detection of soy oil as an adulterant. *See* Adulteration of Foods and its Detection–Soy Oil

Detection of soy proteins. *See* Soy Proteins–Detection

Detergents or soaps made from soy oil. *See* Soaps or Detergents

DE-VAU-GE Gesundkostwerk GmbH (Lueneburg, Germany). 7251, 8404, 8879, 9547, 9934, 10014, 10712, 11073, 11484

Developing countries, soybean production in. *See* Tropical and Subtropical Countries, Soybean Production in (Mostly in

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Diabetes and Diabetic Diets. 735, 748, 758, 774, 788, 794, 805, 808, 837, 838, 849, 880, 932, 942, 1024, 1062, 1141, 1172, 1334, 1336, 1344, 1365, 1369, 1374, 1386, 1412, 1427, 1464, 1496, 1504, 1511, 1533, 1551, 1554, 1574, 1596, 1610, 1719, 1735, 1742, 1786, 1803, 1806, 1815, 1827, 1869, 1884, 1906, 1938, 1953, 2026, 2068, 2078, 2148, 2149, 2180, 2237, 2302, 2303, 2474, 2475, 2477, 2484, 2717, 2843, 2923, 2929, 2951, 3214, 3256, 3328, 3384, 3385, 3646, 3953, 5960, 7412, 7467, 9424, 10062, 10902, 10909, 10999, 11028, 11062, 11130, 11314, 11479

Dies, Edward Jerome (1891-1979). 3581, 3662, 10905

Diesel Fuel, SoyDiesel, Biodiesel–Interchem Industries, Inc., Interchem Environmental, Inc., Midwest Biofuels, Ag Environmental Processing (AEP), Bill Ayres and Doug Pickering. Pioneer Biodiesel Makers and Marketers in the USA. 9930, 10028, 10120, 10256

Diesel Fuel, SoyDiesel, Biodiesel–Kenlon Johannes, Pioneer in the USA. 9930, 10028, 10085, 10120, 10256, 10270

Diesel Fuel, SoyDiesel, Biodiesel, or Artificial Petroleum (Made from Methyl Esters of Soybean Oil). 2134, 2145, 2157, 2158, 2170, 2220, 2311, 2357, 2415, 2480, 2481, 2482, 2483, 2525, 2526, 2735, 3323, 3522, 3597, 3741, 3753, 8939, 9930, 10028, 10042, 10085, 10120, 10176, 10203, 10253, 10256, 10270, 10277, 10313, 10430, 10531, 10978, 11089, 11161

Diet and Breast Cancer Prevention (Soy May Not Be Mentioned). 6888, 7968, 8407, 8710, 9485, 9702, 9804, 9993, 10071, 10207, 10211, 10225, 10246, 10258, 10266, 10346, 10418, 10426, 10461,

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10492, 10506, 10526, 10527, 10528, 10534, 10596, 10598, 10661, 10710, 10749, 10841, 11303, 11381

Diet and Cancer (Vegetarian Diet Is Not Mentioned; Soy May Not Be Mentioned). 5242, 7624, 7709, 7824, 9261, 9366, 9520, 9999, 10319, 10534, 11322

Diet and Prostate Cancer Prevention (Soy May Not Be Mentioned). 8710, 9332, 9804, 9987, 9993, 10037, 10071, 10207, 10211, 10291, 10426, 10601, 10635, 10749, 10841, 11010, 11441

Directories–Japanese and Japanese-Americans in the USA. 1458, 3254, 3904, 11384

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Diseases, plant protection from. *See* Soybean Rust

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Documents with More Than 20 Keywords. 26, 68, 138, 152, 158, 191, 200, 205, 215, 233, 244, 251, 275, 334, 346, 393, 394, 416, 418, 438, 439, 440, 441, 444, 486, 496, 509, 511, 514, 516, 524, 529, 533, 537, 541, 542, 551, 562, 569, 570, 584, 586, 587, 589, 590, 591, 592, 607, 608, 613, 614, 617, 619, 620, 621, 627, 637, 645, 652, 654, 655, 665, 668, 676, 686, 688, 704, 706, 707, 708, 715, 716, 717, 720, 732, 736, 748, 761, 768, 770, 774, 782, 788, 795, 806, 819, 820, 821, 824, 828, 829, 837, 840, 841, 843, 844, 849, 850, 851, 853, 870, 875, 879, 880, 886, 888, 889, 891, 893, 907, 908, 919, 924, 932, 952, 965, 972, 974, 975, 978, 980, 983, 987, 997, 1004, 1005, 1011, 1014, 1018, 1021, 1025, 1027, 1041, 1045, 1053, 1064, 1091, 1092, 1105, 1147, 1149, 1190, 1216, 1237, 1254, 1257, 1260, 1265, 1271, 1275, 1278, 1291, 1299, 1306, 1309, 1315, 1318, 1319, 1335, 1336, 1338, 1344, 1346, 1353, 1366, 1368, 1369, 1372, 1374, 1376, 1379, 1384, 1391, 1409, 1412, 1414, 1416, 1427, 1428, 1429, 1442, 1445, 1453, 1454, 1455, 1456, 1457, 1464, 1465, 1466, 1469, 1475, 1477, 1480, 1489, 1496, 1509, 1510, 1513, 1514, 1527, 1533, 1536, 1543, 1544, 1551, 1555, 1574, 1585, 1596, 1599, 1603, 1671, 1673, 1683, 1687, 1690, 1704, 1719, 1741, 1771, 1774, 1786, 1789, 1796, 1803, 1804, 1806, 1813, 1815, 1827, 1830, 1847, 1859, 1869, 1870, 1873, 1884, 1887, 1889, 1896, 1906, 1914, 1921, 1926, 1928, 1934, 1935, 1938, 1974, 1991, 2001, 2005, 2016, 2026, 2031, 2039, 2046, 2051, 2068, 2071, 2076, 2078, 2106, 2108, 2113, 2117, 2118, 2130, 2140, 2148, 2149, 2152, 2177, 2180, 2218, 2226, 2233, 2234, 2237, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2251, 2255, 2258, 2277, 2292, 2293, 2298, 2302, 2303, 2304, 2324, 2325, 2330, 2357, 2373, 2429, 2432, 2433, 2463, 2465, 2466, 2471, 2472, 2474, 2475, 2478, 2479, 2484, 2496, 2504, 2517, 2538, 2557, 2591, 2647, 2717, 2736, 2759, 2761, 2774, 2775, 2776, 2845, 2848, 2851, 2867, 2913, 2923, 2928, 2929, 2951, 2956, 2957, 3008, 3016, 3017, 3043, 3131, 3142, 3151, 3159, 3173, 3214, 3228, 3240, 3242, 3256, 3268, 3275, 3282, 3323, 3328, 3329, 3331, 3333, 3346, 3349, 3358, 3363, 3379, 3384, 3385, 3387, 3388, 3389, 3390, 3427, 3467, 3468, 3491, 3503, 3509, 3511, 3551, 3557, 3558, 3581, 3583, 3612, 3617, 3623, 3628, 3645, 3646, 3647, 3662, 3667, 3669, 3685, 3700, 3705, 3720, 3727, 3728, 3740, 3743, 3755, 3756, 3761, 3766, 3779, 3781, 3783, 3785, 3788, 3795, 3802, 3811, 3816, 3826, 3828, 3831, 3858, 3887, 3888, 3893, 3896, 3897, 3898, 3899, 3900, 3947, 3948, 3949, 3954, 3961, 4024, 4049, 4137, 4173, 4197, 4222, 4282, 4283, 4362, 4406, 4434, 4458, 4459, 4460, 4472, 4480, 4481, 4506, 4542, 4570, 4597, 4600, 4603, 4604, 4616, 4663, 4666, 4668, 4688, 4753, 4764, 4806, 4864, 4901, 4904, 4922, 4924, 4961, 4962, 5029, 5031, 5038, 5086, 5095, 5110, 5137, 5182, 5185, 5197, 5201, 5212, 5213, 5214, 5242, 5271, 5278, 5282, 5288, 5290, 5294, 5323, 5345, 5364, 5372, 5460, 5514, 5515, 5549, 5577, 5593, 5594, 5595, 5632, 5648, 5658, 5663, 5683, 5713, 5725, 5742, 5746, 5749, 5779, 5781, 5804, 5810, 5820, 5848, 5888, 5894, 5896, 5904, 5905, 5909, 5927, 5939, 5962, 5967, 5989, 5991, 5992, 5998, 6000, 6020, 6027, 6041, 6059, 6088, 6096, 6098, 6101, 6106, 6130, 6135, 6136, 6170, 6171, 6172, 6230, 6234, 6254, 6256, 6281, 6292, 6296, 6303, 6345, 6360, 6379, 6380, 6383, 6395, 6401, 6433, 6436, 6442, 6444, 6471, 6476, 6527, 6545, 6547, 6548, 6556, 6558, 6559, 6562, 6628, 6632, 6637, 6641, 6646, 6670, 6680, 6709, 6735, 6741, 6786, 6814, 6825, 6871, 6874, 6884, 6937, 6958, 6964, 6965, 6977, 7003, 7011, 7036, 7058, 7060, 7076, 7082, 7093, 7125, 7170, 7172, 7188, 7204, 7210, 7226, 7230, 7237, 7254, 7256, 7257, 7258, 7259, 7260, 7269, 7270, 7276, 7300, 7304, 7322, 7326, 7329, 7340, 7353, 7357, 7421, 7455, 7461, 7465, 7467, 7479, 7509, 7510, 7511, 7512, 7525, 7542, 7557, 7563, 7591, 7626, 7641, 7677, 7687, 7699, 7711, 7719, 7729, 7743, 7754, 7766, 7783, 7809, 7814, 7866, 7867, 7872, 7877, 7878, 7880, 7892, 7900, 7905, 7907, 7919, 7963, 7968, 7981, 7998, 8010, 8011, 8017, 8020, 8034, 8039, 8045, 8046, 8051, 8064, 8070, 8087, 8091, 8098, 8115, 8122, 8130, 8162, 8172, 8200, 8204, 8209, 8232, 8240, 8241, 8251, 8262, 8265, 8271, 8287, 8299, 8343, 8444, 8445, 8453, 8457, 8524, 8525, 8552, 8569, 8587, 8601, 8680, 8700, 8714, 8723, 8724, 8789, 8806, 8835, 8837, 8844, 8850, 8872, 8879, 8885, 8888, 8889, 8904, 8939, 8979, 8986, 8998, 9002, 9027, 9088, 9090, 9105, 9112, 9117, 9141, 9155, 9198, 9209, 9210, 9211, 9212, 9217, 9224, 9250, 9263,

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9293, 9302, 9310, 9336, 9343, 9351, 9352, 9355, 9368, 9369, 9372, 9378, 9451, 9498, 9502, 9523, 9540, 9547, 9577, 9600, 9621, 9624, 9658, 9666, 9667, 9679, 9707, 9730, 9735, 9737, 9745, 9750, 9762, 9766, 9785, 9789, 9799, 9839, 9846, 9847, 9851, 9861, 9864, 9868, 9872, 9873, 9874, 9892, 9893, 9907, 9915, 9934, 9937, 9953, 9982, 10000, 10001, 10008, 10010, 10014, 10015, 10029, 10038, 10050, 10052, 10062, 10069, 10074, 10079, 10112, 10119, 10134, 10142, 10151, 10176, 10191, 10193, 10194, 10198, 10208, 10236, 10237, 10243, 10245, 10251, 10274, 10283, 10319, 10352, 10358, 10389, 10396, 10423, 10429, 10445, 10451, 10456, 10469, 10478, 10492, 10497, 10523, 10533, 10537, 10546, 10551, 10557, 10565, 10567, 10575, 10581, 10582, 10606, 10611, 10617, 10635, 10645, 10646, 10651, 10659, 10665, 10673, 10674, 10676, 10688, 10694, 10703, 10705, 10712, 10718, 10719, 10725, 10728, 10731, 10752, 10783, 10853, 10857, 10859, 10884, 10897, 10905, 10917, 10920, 10975, 10978, 10980, 10990, 11047, 11073, 11103, 11111, 11131, 11145, 11148, 11172, 11251, 11260, 11276, 11287, 11307, 11317, 11355, 11381, 11384, 11434, 11469, 11474, 11481, 11484, 11485, 11486, 11488, 11489, 11490, 11491

Dogs, Cats, and Other Pets / Companion Animals Fed Soybeans, Soybean Forage, or Soybean Cake or Meal as Feed / Pet Food / Petfood. 1338, 2249, 3727, 3961, 4458, 8736

Domestic Science / Home Economics Movement in the United States. 692, 989, 1090, 1156, 1513, 1827

Domestication of the soybean. *See* Origin, Domestication, and Dissemination of the Soybean (General)

Dorsett, Palemon Howard (1862-1943, USDA). 1190, 2337, 2338, 2492, 2557, 2558, 2560, 2603, 2607, 2612, 2613, 2616, 2617, 2620, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2633, 2639, 2640, 2644, 2646, 2647, 2649, 2657, 2658, 2667, 2669, 2725, 2726, 2727, 2730, 2731, 2733, 2734, 2738, 2739, 2740, 2742, 2743, 2745, 2746, 2747, 2750, 2751, 2755, 2760, 2763, 2764, 2767, 2768, 2769, 2772, 2776, 2784, 2786, 2822, 2823, 2824, 2828, 2829, 2830, 2831, 2832, 2847, 2856, 2905, 2908, 2958, 3467, 3468, 3725, 3730, 3743, 3811, 3893, 5725, 6020, 6136, 6556, 7151, 7248, 7323, 7872, 8064, 8172, 8844, 10497, 10511, 10558, 11030, 11299, 11393, 11489

Dorsett-Morse Expedition to East Asia (1929-1931). 2557, 2558, 2560, 2603, 2604, 2607, 2612, 2613, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2631, 2633, 2639, 2640, 2644, 2646, 2647, 2649, 2655, 2657, 2658, 2659, 2665, 2667, 2668, 2669, 2725, 2726, 2727, 2729, 2730, 2731, 2733, 2734, 2738, 2739, 2740, 2742, 2743, 2744, 2745, 2746, 2747, 2750, 2751, 2755, 2760, 2763, 2764, 2767, 2768, 2769, 2772, 2773, 2776, 2784, 2786, 2822, 2823, 2824, 2826, 2828, 2829, 2830, 2831, 2832, 2838, 2847, 2856, 2905, 2908, 2956, 2957, 2958, 3468, 3628, 3725, 3743, 3893, 5725, 6020, 6136, 6556, 7248, 7323, 7420, 7872, 8172, 8844, 10497, 10511, 11030, 11299, 11489

Douchi or doushi or dow see or dowsi. *See* Fermented Black Soybeans

Drackett Co. (The) (Cincinnati and Sharonville [or Evendale], Ohio). 3756, 3895, 3947, 4137, 8232, 9351, 11480

Dried yuba sticks. *See* Yuba–Dried Yuba Sticks

Dried-frozen tofu. *See* Tofu, Frozen, Dried-frozen, or Dried Whole

Drying of soybeans. *See* Storage of Seeds

DTD–Danish Turnkey Dairies. *See* APV Systems, Soya Technology Division

DuPont (E.I. Du Pont de Nemours & Co., Inc.) and DuPont Agricultural Enterprise / Products (Wilmington, Delaware). Formerly spelled Du Pont. 3895, 6439, 6786, 8232, 10469, 10508, 10700, 10712

Dust Suppressants and Dust Control–Industrial Uses of Soy Oil as a Non-Drying Oil. 8885, 8939, 9351, 10176

Dutch East India Company (VOC; *Vereenigde Ost-Indische Compagnie*). 73, 79, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 94, 95, 96, 99, 100, 101, 103, 104, 105, 106, 107, 108, 109, 110, 111, 113, 114, 115, 165, 166, 167, 168, 169, 173, 174, 175, 186, 189, 229, 230, 487, 1173, 3907, 4914, 9262, 9472, 9841, 9880, 11171, 11173, 11191, 11194, 11243

Earliest articles on soy in major magazines and newspapers. *See* Media–Earliest Articles on Soy

Earliest commercial soy products. *See* Historical–Earliest Commercial Product

Earliest document seen... *See* Historical–Earliest Document Seen

Eastern Foods, Inc. *See* Mainland Express (Spring Park, Minnesota)

Ecology ("The Mother of All the Sciences") and Ecosystems. 3761, 3932, 3940, 4389, 4602, 4697, 5237, 5868, 5951, 5962, 6059, 6129, 6226, 6369, 6436, 6546, 6569, 6591, 6722, 7226, 7363, 7421, 7736, 9368, 9599, 9618, 9799, 10062, 10185, 10397, 10872

Economic Research Service of USDA. *See* United States Department of Agriculture (USDA)–Economic Research Service (ERS)

Economics of soybean production and hedging. *See* Marketing Soybeans

Edamame–imports, exports, international trade. *See* Green Vegetable Soybeans–Imports, Exports, International Trade

Edamamé. *See* Green Vegetable Soybeans, Green Vegetable Soybeans–Edamamé

Eden Foods, Inc. (Clinton, Michigan; Founded 4 Nov. 1969) and American Soy Products (Saline, Michigan; Founded Aug. 1986). 5593, 5594, 5595, 5632, 6135, 6562, 6658, 6741, 7447, 7636, 7637, 7813, 7877, 7884, 7920, 7929, 7998, 8010, 8047, 8264, 8270, 8484, 8576, 8594, 8620, 8621, 8626, 8630, 8633, 8639, 8642, 8643, 8669, 8675, 8772, 8858, 8880, 8884, 8904, 8998, 9020, 9027, 9037, 9110, 9131, 9182, 9199, 9210, 9216, 9217, 9296, 9297, 9394, 9491, 9523, 9593, 9658, 9672, 9769, 9799, 9800, 9801, 9861, 9870, 9872, 9873, 9902, 9977, 10031, 10079, 10140, 10141, 10245, 10281, 10282,

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10288, 10358, 10395, 10415, 10451, 10459, 10523, 10549, 10570, 10600, 10802, 10885, 11066, 11079, 11096, 11484

Edible Soy Products, makers of Pro-Nuts (Hudson, Iowa). *See* Solnuts B.V.

Edible or food-grade soybeans. *See* Green Vegetable Soybeans–Vegetable-Type, Garden-Type, or Edible Soybeans

Efficiency of animals in converting feeds into human foods. *See* Feeds–Efficiency

Efficiency of plants vs. animals in producing food. *See* Vegetarianism–Efficiency of Plants... in Producing Food

Egypt. *See* Africa–Egypt

Elizabeth City Oil and Fertilizer Co. (Elizabeth City, North Carolina; 1915). 1789, 1806, 1884, 1968, 5749

Embargoes, tariffs, duties. *See* Trade Policies (International) Concerning Soybeans, Soy Products, or Soyfoods–Tariffs, Duties, Embargoes, Moratoriums

Empresa Brasileira de Pesquisa Agropecuaria (Brazilian Enterprise for Research on Management of Land for Animal Production; EMBRAPA) (Brazil). Established 26 April 1973. Includes Centro Nacional de Pesquisa de Soja (National Soybean Research Center; CNPS or CNPSo). 6263, 6608, 6895, 9295, 10381, 10382, 10383, 10806, 10807, 10816, 11307

Energy Consumption during Crop Production, Food Processing, etc. 7697, 8989

Energy bars. *See* Bars–Energy Bars or Nutrition Bars Made with Soy

Energy, renewable, from soybeans. *See* Diesel Fuel, SoyDiesel, Biodiesel, or Artificial Petroleum

England. *See* Europe, Western–United Kingdom

Environmental Issues, Concerns, and Protection (General, Including Deep Ecology, Pollution of the Environment, Renewable Energy, etc.). See also Global Warming / Climate Change, and Water Use. 5593, 7421, 10635, 10900

Environmental issues, concerns, and protection. *See* Vegetarianism, the Environment, and Ecology, Water Use, Misuse, and Scarcity

Environmental issues. *See* Water Issues and Vegetarianism

Enzyme active soy flour. *See* Soy Flour, Grits, and Flakes–Enzyme Active

Enzymes (General). 934, 1019, 1234, 1468, 1537, 1680, 1983, 2079, 3054, 3526, 5150, 5748, 5858, 5883, 5906, 5995, 6184, 6969, 8358, 8390, 8708, 8818, 9737, 9806, 9926

Enzymes–Commercial Enzyme Preparations Used in Making Soyfoods by Hydrolyzing or Modifying Soy Protein, Carbohydrates, or Lipids (Including Phosphatides). 2854, 2938, 2940, 3530, 3539, 3959, 5305, 5315, 5457, 5466, 5540, 5548, 5567, 5617, 5637, 5638, 5647, 5701, 5711, 5712, 5722, 5734, 5735, 5738, 5821, 5836, 5859, 5977, 5978, 6027, 6092, 6119, 6241, 6258, 6300, 6301, 7039, 7104, 7142, 7468, 8006, 8017, 8308, 8320, 8690, 8761, 8764, 8870, 8896, 8909, 8930, 9116, 9152, 9436

Enzymes–Non-Soy (Early and General). See Also: (1) Enzymes in the Body of Humans and Other Animals. (2) Enzymes Produced During Fermentations Involving Koji or *Aspergillus Oryzae*. (3) Rice Milk (Non-Dairy)–Made with Commercial Enzymes. 5121

Enzymes Produced During Fermentations Involving Koji or *Aspergillus Oryzae* (Including Enzymes in Miso and Fermented Soy Sauce). 628, 768, 792, 878, 923, 944, 964, 981, 1018, 1076, 1148, 1150, 1151, 1468, 1531, 1537, 1622, 1632, 1643, 1650, 1694, 1695, 1730, 1846, 1861, 1864, 1875, 1996, 2084, 2156, 2221, 2223, 2225, 2238, 2258, 2264, 2280, 2290, 2291, 2313, 2334, 2413, 2443, 2446, 2469, 2477, 2529, 2683, 2684, 2685, 2687, 2865, 2932, 2939, 3018, 3108, 3143, 3270, 3309, 3315, 3447, 3525, 3611, 3732, 3807, 3908, 3951, 4035, 4037, 4038, 4115, 4116, 4127, 4135, 4157, 4158, 4182, 4235, 4351, 4353, 4375, 4399, 4400, 4404, 4405, 4445, 4476, 4486, 4494, 4497, 4498, 4579, 4755, 4847, 4880, 5086, 5121, 5143, 5240, 5252, 5302, 5338, 5360, 5390, 5413, 5497, 5501, 5582, 5585, 5614, 5671, 5838, 5981, 5982, 5983, 5994, 6161, 6163, 6221, 6222, 6310, 6653, 6734, 6742, 6922, 7156, 7218, 7231, 7237, 7345, 7468, 7769, 7846, 8092, 8221, 8222, 8363, 8440, 8708, 8729, 8796, 8841, 8890, 8891, 8971, 8979, 8996, 8997, 9022, 9027, 9064, 9072, 9076, 9087, 9313, 9324, 9471, 9505, 9828, 10148, 10748

Enzymes Produced During Fermentations Involving Tempeh, Natto, Fermented Tofu, or Fermented Black Soybeans. 934, 1018, 1116, 1567, 1574, 1624, 1830, 2098, 2258, 2264, 2280, 2291, 2313, 2334, 2376, 2393, 2394, 2488, 2516, 2699, 2901, 2903, 2904, 3270, 4441, 4519, 5093, 5121, 5316, 5614, 5647, 5671, 5774, 5972, 6442, 6444, 6596, 6597, 6598, 6734, 6922, 7769, 7846, 8006, 8092, 8655, 8672, 8674, 8682, 8708, 8761, 8877, 8909, 8979, 9241, 9313, 9579, 9647, 9828, 10015, 10039, 10043, 10238, 10247, 10906

Enzymes in Soybean Seeds–Lipoxygenase (Formerly Called Lipoxidase) and Its Inactivation. 5055, 5290, 5334, 5733, 6027, 7178, 7894, 8011, 8107, 8129, 8232, 8328, 8362, 8408, 8427, 8553, 8646, 8817, 8885, 8892, 8912, 8990, 9168, 9280, 9335, 9336, 9498, 9502, 9597, 9730, 9774, 9782, 10175, 10199, 10302, 10329, 10330, 10347, 10435, 10486, 10575, 10748, 10838, 10973, 11484

Enzymes in Soybean Seeds–Other. 774, 803, 1519, 1725, 1884, 2036, 2226, 2292, 2765, 2951, 3173, 3395, 3432, 3727, 3739, 3829, 3906, 3967, 4033, 4063, 4069, 4070, 4077, 4091, 4106, 4114, 4296, 4439, 4458, 4601, 4609, 4860, 5095, 5273, 5329, 7270, 7356, 7373, 7377, 7467, 8011, 8449, 8856, 9360, 9978, 9985, 10159

Enzymes in Soybean Seeds–Urease and Its Inactivation. 1297, 1331, 1488, 1519, 1929, 2139, 2193, 2213, 2214, 2227, 2257, 2269, 2274, 2279, 2282, 2292, 2300, 2882, 3355, 3656, 4011, 4085, 9336

Enzymes in the Body of Humans and Other Animals (Including Lactase, Trypsin, Phytase). 9521

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Equipment for Soybean Processing (Not Including Farm Machinery). 1703, 5661, 6610, 6708, 7356, 7411, 7763, 7795, 7889, 8303, 8504, 8557, 8978, 9106, 9134, 9203, 9204, 9205, 11470

Equipment for making soymilk. *See* Soymilk Equipment

Equipment for making tofu. *See* Tofu Equipment

Equipment for soybean crushing–manufacturers. *See* Anderson International Corp., Blaw-Knox Co. and Rotocel, Crown Iron Works Co., French Oil Mill Machinery Co.

Erewhon (Boston, Massachusetts). Founded April 1966 by Aveline and Michio Kushi in Boston. Merged with U.S. Mills in 1986. 3858, 5271, 5322, 5488, 5558, 5568, 5593, 5594, 5595, 5663, 5683, 5804, 5843, 5848, 5850, 5857, 5927, 5962, 6037, 6059, 6096, 6097, 6098, 6135, 6170, 6171, 6172, 6177, 6377, 6379, 6380, 6384, 6562, 6658, 6688, 6691, 6715, 6741, 6843, 7017, 7076, 7145, 7155, 7365, 7366, 7450, 7462, 7465, 7466, 7481, 7482, 7491, 7510, 7511, 7587, 7626, 7729, 7731, 7737, 7745, 7746, 7814, 7900, 7908, 7992, 7998, 8007, 8008, 8389, 8884, 9049, 9131, 9216, 9217, 9298, 9329, 9558, 9735, 9737, 9766, 9799, 9800, 9801, 9802, 9864, 9872, 9873, 9874, 9878, 9884, 9885, 9886, 9887, 9889, 9890, 9899, 9901, 9902, 9903, 9915, 9924, 10035, 10130, 10156, 10170, 10171, 10218, 10229, 10230, 10231, 10282, 10318, 10358, 10386, 10415, 10650, 10673, 10674, 10675, 10676, 10694, 10695, 10696, 10698, 10704, 10765, 10770, 10772, 10774, 10783, 10873, 10885, 11072, 11096, 11176, 11193, 11291, 11336, 11338, 11341, 11342, 11360, 11361, 11362, 11364, 11365, 11367, 11368, 11369, 11370, 11371, 11372, 11373, 11374, 11376, 11384, 11408, 11488

Erewhon–Los Angeles / West / West Coast. Established Sept. 1969. Purchased from Erewhon (Boston) by John Fountain & John Deming on 1 Aug. 1975. Named Mondo in Oct. 1976. Then Broken Up and Re-Sold in 1979. Part Became Erewhon West. 5752, 5753, 5804, 5843, 5844, 5927, 5961, 5962, 6096, 6097, 6098, 6155, 6360, 6380, 6691, 6741, 7465, 7511, 7814, 8007, 8389, 9799, 9872, 9873, 9874, 9878, 9885, 9886, 10035, 10156, 10171, 10222, 10650, 11357, 11361, 11365, 11366, 11376

Ernst, Andrew H. (1796-1860)–Pioneer Horticulturalist and Nurseryman of Cincinnati, Ohio. 416, 418, 427, 434, 440, 444, 1455, 2247

Erosion of soils. *See* Soil Science–Soil Conservation or Soil Erosion

Essene Traditional Foods (Philadelphia, Pennsylvania). 5927, 7465, 9878, 9924

Estrogens in plants. *See* Phytoestrogens

Ethanol (ethyl alcohol). *See* Solvents

Etymology of the Word "Soy" and its Cognates / Relatives in English. 5098, 7679, 10319, 10506

Etymology of the Word "Soyfoods" and its Cognates / Relatives in Various Languages. 1018, 1870, 1885, 2106, 3630, 3803, 4668, 6848, 6863, 8270, 8271, 9671, 10015

Etymology of the Words "Soya," "Soy," and "Soybean" and their Cognates / Relatives in Various Languages. 68, 134, 138, 143, 152, 158, 161, 193, 200, 204, 205, 209, 212, 215, 227, 232, 233, 240, 244, 249, 253, 268, 273, 275, 300, 321, 322, 324, 333, 334, 346, 355, 361, 407, 416, 427, 436, 439, 441, 442, 456, 460, 462, 463, 476, 479, 494, 509, 512, 514, 516, 527, 529, 533, 537, 541, 542, 544, 550, 551, 555, 560, 562, 569, 607, 610, 614, 627, 632, 633, 634, 644, 645, 651, 665, 668, 676, 687, 688, 693, 704, 715, 721, 732, 740, 770, 771, 773, 774, 775, 782, 789, 795, 796, 806, 812, 819, 820, 841, 843, 849, 851, 853, 854, 855, 870, 876, 897, 905, 919, 924, 935, 939, 965, 970, 972, 974, 976, 980, 983, 995, 1021, 1036, 1048, 1069, 1151, 1190, 1254, 1275, 1278, 1291, 1318, 1324, 1356, 1366, 1381, 1383, 1391, 1411, 1416, 1442, 1453, 1475, 1548, 1603, 1623, 1719, 1763, 1774, 1789, 1896, 1906, 2106, 2226, 2234, 2236, 2247, 2250, 2429, 2471, 2479, 2664, 3026, 3214, 3323, 3328, 3331, 3624, 3641, 3687, 3689, 3700, 3809, 3828, 3899, 3905, 3961, 4506, 4685, 5749, 5925, 6392, 6576, 6977, 7061, 7208, 7301, 7329, 7542, 7557, 8033, 8720, 8723, 8867, 9002, 9502, 9857, 10234, 10908

Etymology of vegetarianism. *See* Vegetarianism–Etymology

Etymology. *See* the specific product concerned (e.g. soybeans, tofu, soybean meal, etc.)

Euronature (Paris, France). *See* Lima N.V. / Lima Foods (Sint-Martens-Latem, Belgium; and Mezin, France)

Europe–European Union (EU) or European Economic Community (EEC; also known as the Common Market), renamed the European Community (Headquarters: Brussels, Belgium). 5579, 5944, 6000, 6070, 6201, 6215, 6230, 6523, 6635, 7036, 7173, 7206, 7429, 8174, 8196, 8601, 8780, 8842, 8850, 8872, 9224, 9344, 9372, 9373, 9375, 9377, 9497, 9548, 9667, 9856, 10074, 10317, 10361, 10362, 10364, 10430, 10451, 11038, 11073, 11151, 11198, 11218, 11275, 11284, 11317

Europe–Soybean crushers (general). *See* Soybean Crushers (Europe)

Europe, Eastern (General). 3887, 6000, 6137, 6254, 7188, 7304, 7892, 10665, 10853, 10980

Europe, Eastern–Bulgaria. 2254, 3482, 3503, 3509, 3557, 3581, 3583, 3645, 3662, 3669, 3795, 3816, 3887, 3896, 3897, 3898, 5364, 6295, 6556, 6644, 8240, 8445, 8457, 9982, 10151

Europe, Eastern–Croatia (Hrvatska; Declared Independence from Yugoslavia on 21 June 1991; Includes Istria or Istrian Peninsula and Rijeka (formerly Fiume)). 586, 587, 591, 592, 611, 686, 703, 1870, 3557, 3781, 9211, 9745, 10948

Europe, Eastern–Czech Republic (Ceská Republika; Including Bohemia or Cechy, and Moravia or Morava. From 1918 until 1 Jan. 1993, Western Part of Czechoslovakia, which also included Slovakia or Slovensko). 569, 570, 586, 590, 591, 592, 607, 627, 639, 645, 768, 1554, 1574, 1869, 2233, 2472, 2475, 2484, 3016, 3017, 3781

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Europe, Eastern–Czechoslovakia (From 1918 until 1 Jan. 1993; then divided into The Czech Republic [formerly Bohemia and Moravia], and Slovakia [officially "The Slovak Republic"]). 2180, 2233, 2472, 2475, 2484, 3016, 3017, 3323, 3390, 3503, 3511, 3551, 3583, 3645, 3647, 3662, 3781, 3795, 3816, 3896, 3897, 3898, 4480, 4481, 4668, 4961, 5364, 5399, 8445, 8850, 9250, 9504, 9864, 9982, 10151, 10705

Europe, Eastern–Estonia (Formerly Estonian SSR, a Soviet Republic from Aug. 1940 to Aug. 1991; Also Spelled Esthonia). 2108, 2293, 3503

Europe, Eastern–Hungary (Magyar Köztársaság). 542, 569, 570, 571, 572, 586, 590, 591, 592, 607, 611, 617, 620, 627, 637, 645, 646, 650, 665, 686, 688, 703, 704, 708, 715, 768, 770, 788, 828, 837, 853, 908, 919, 975, 985, 1306, 1366, 1416, 1469, 1554, 1574, 1719, 1870, 2071, 2106, 2126, 2226, 2233, 2462, 2479, 3016, 3017, 3323, 3379, 3557, 3583, 3645, 3647, 3781, 3795, 3816, 3887, 3896, 3897, 4282, 4283, 4480, 4481, 4668, 4792, 4961, 5399, 6254, 6556, 7905, 8445, 8457, 8601, 8850, 9250, 9590, 9864, 10151

Europe, Eastern–Introduction of Soybeans to or Dissemination of Soybeans from. Other or general information and leads concerning Eastern Europe. 985, 11481

Europe, Eastern–Introduction of Soybeans to. Earliest document seen concerning soybeans in a certain Eastern European country. 569, 570, 1338, 1859, 3503

Europe, Eastern–Introduction of Soybeans to. Earliest document seen concerning soybeans or soyfoods in connection with (but not yet in) a certain Eastern European country. 306, 542

Europe, Eastern–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in a certain Eastern European country. 569, 570, 2180, 6256

Europe, Eastern–Introduction of Soybeans to. This document contains the earliest date seen for soybeans in a certain Eastern European country. 569, 570, 586, 958, 1338, 1859, 3503

Europe, Eastern–Introduction of Soybeans to. This document contains the earliest date seen for the cultivation of soybeans in a certain Eastern European country. 569, 570, 586, 958, 2180, 3781, 6256

Europe, Eastern–Latvia (Formerly Latvian SSR, a Soviet Republic from Aug. 1940 to Aug. 1991). 1338, 3503, 3551, 6256, 7981

Europe, Eastern–Lithuania (Formerly Lithuanian SSR, a Soviet Republic from Aug. 1940 to Aug. 1991). 3728, 6256, 7981

Europe, Eastern–Moldova (Moldavia until Aug. 1991; Formerly Moldavian SSR, a Soviet Republic from 1917 to 26 Dec. 1991). 3181, 3647, 3781, 3897, 6256, 7981

Europe, Eastern–Poland. 569, 570, 572, 586, 590, 591, 602, 607, 613, 645, 689, 1719, 2180, 2226, 2233, 3017, 3128, 3256, 3323, 3390, 3503, 3509, 3557, 3583, 3647, 3662, 3761, 3781, 3795, 3816, 3896, 3897, 3973, 4194, 4282, 4283, 4842, 4961, 4962, 5294, 6230, 6254, 6358, 6644, 7421, 8445, 8844, 8850, 9209, 9336, 9864, 10150, 10274

Europe, Eastern–Romania (Including Moldavia and Bessarabia until 1940-44). Also spelled Rumania. 591, 1719, 1926, 2108, 2180, 2233, 2888, 3016, 3017, 3181, 3323, 3482, 3503, 3511, 3557, 3583, 3647, 3669, 3795, 3816, 3896, 3897, 3898, 4480, 4481, 4961, 6295, 6556, 8445, 8457, 8986, 9250, 9624

Europe, Eastern–Russia (Russian Federation; Formerly Russian SFSR, a Soviet Republic from 1917 to Dec. 1991). 306, 311, 384, 524, 529, 544, 550, 586, 590, 591, 598, 620, 649, 654, 660, 661, 662, 688, 704, 715, 774, 899, 958, 985, 994, 1006, 1027, 1033, 1045, 1063, 1066, 1087, 1122, 1140, 1246, 1254, 1294, 1305, 1306, 1308, 1309, 1310, 1315, 1332, 1335, 1336, 1337, 1344, 1346, 1347, 1350, 1353, 1381, 1384, 1409, 1412, 1422, 1423, 1429, 1438, 1439, 1440, 1442, 1445, 1450, 1453, 1456, 1469, 1476, 1480, 1489, 1490, 1505, 1514, 1527, 1543, 1574, 1598, 1649, 1673, 1678, 1714, 1719, 1722, 1792, 1803, 1804, 1816, 1825, 1840, 1859, 1896, 1919, 1926, 1928, 1956, 2106, 2108, 2124, 2140, 2172, 2233, 2236, 2292, 2293, 2317, 2325, 2401, 2432, 2466, 2472, 2479, 2504, 2848, 3016, 3136, 3159, 3275, 3282, 3328, 3333, 3349, 3363, 3379, 3384, 3385, 3467, 3503, 3551, 3557, 3583, 3646, 3755, 3770, 3780, 3781, 3802, 3846, 3893, 3897, 3898, 4194, 4259, 4571, 4668, 5019, 5364, 5765, 6134, 6136, 6256, 6295, 6436, 6556, 6735, 6900, 7526, 7549, 7981, 8064, 8172, 8445, 8700, 8806, 9209, 9541, 9608, 9719, 9736, 9826, 9889, 9931, 9959, 9982, 10332, 10441, 10511, 10557, 10715, 10731, 10754, 10872, 11104, 11469, 11481

Europe, Eastern–Serbia and Montenegro (Named Yugoslavia before 13 March 2002). Composed of Serbia and Montenegro (Plus Autonomous Provinces of Vojvodina and Kosovo) since 17 April 1992. 2293, 9211, 9745, 10413

Europe, Eastern–Slovakia (Slovak Republic, or Slovensko; Eastern Part of Czechoslovakia from 1918 until 1 Jan. 1993). 586, 985, 3016, 3017, 5399, 10329

Europe, Eastern–Slovenia (Slovenija; Declared Independence from Yugoslavia on 21 June 1991). 586, 587, 590, 591, 592, 686, 1870, 3557, 3781, 9745, 10185

Europe, Eastern–Soybean Crushing–Soy Oil and Meal Production and Consumption–Statistics, Trends, and Analyses. 9624

Europe, Eastern–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 2108, 3333, 3379, 3551, 3583, 3720, 3779, 3795, 3816, 3887, 4173, 4480, 4481, 4901, 5364, 6295, 7188, 9250, 10478

Europe, Eastern–USSR (Union of Soviet Socialist Republics or Soviet Union; called Russia before 1917. Ceased to exist in Dec. 1991). 899, 1140, 1679, 1840, 1859, 1896, 1919, 1926, 1928, 1956, 2104, 2106, 2108, 2124, 2140, 2147, 2172, 2180, 2226, 2233, 2236, 2292, 2293, 2299, 2325, 2337, 2401, 2466, 2479, 2504, 2517, 2519, 2601, 2675, 2820, 2848, 2851, 3016, 3136, 3139, 3275, 3282, 3323, 3328, 3333, 3349, 3363, 3379, 3384, 3385, 3390, 3474, 3503, 3509, 3511, 3551, 3552, 3557, 3583, 3614, 3635, 3645, 3646, 3647, 3662, 3669, 3720, 3728, 3736, 3745, 3755, 3770, 3780, 3781, 3795, 3802,

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3816, 3846, 3887, 3893, 3896, 3897, 3898, 4173, 4194, 4259, 4282, 4283, 4480, 4481, 4571, 4580, 4668, 4687, 4901, 5010, 5019, 5029, 5039, 5294, 5364, 5709, 5765, 6108, 6134, 6136, 6226, 6254, 6256, 6295, 6358, 6378, 6436, 6556, 6735, 6824, 6900, 6964, 7157, 7188, 7206, 7270, 7304, 7421, 7526, 7549, 7570, 7783, 7818, 7892, 7958, 7981, 8064, 8172, 8196, 8445, 8457, 8601, 8622, 8700, 8806, 8850, 8853, 8897, 8986, 8995, 9002, 9056, 9078, 9112, 9185, 9209, 9224, 9250, 9307, 9350, 9371, 9525, 9541, 9608, 9624, 9719, 9736, 9826, 9931, 9953, 9959, 9982, 10020, 10074, 10332, 10497, 10511, 10557, 10715

Europe, Eastern–Ukraine (Ukrayina; Formerly Ukranian SSR, a Soviet Republic from 1917 to Dec. 1991). 569, 572, 586, 590, 591, 1275, 1366, 1416, 1455, 1464, 1574, 1719, 2233, 3275, 3503, 3557, 3647, 3893, 3897, 6256, 7981, 8622, 9185, 9608, 9736, 9931, 11481

Europe, Eastern–Yugoslavia. Composed of Serbia and Montenegro from 17 April 1992 to 13 March 2002. From 1918-1991 included the 6 Republics of Serbia / Servia, Croatia, Bosnia and Herzegovina, Slovenia, Macedonia, and Montenegro. Included Carnaro, Fiume / Rijeka / Rieka 1947-1992; Formerly Also Spelled Jugoslavia. See also Serbia and Montenegro. 2108, 2293, 3053, 3503, 3509, 3557, 3583, 3645, 3662, 3795, 3816, 3896, 3897, 3898, 4173, 4269, 4480, 4481, 4668, 4891, 4961, 5201, 6226, 6295, 8240, 8445, 8457, 8601, 8850, 8986, 9211, 9250, 9736, 9745, 9864, 9982, 10413, 10478

Europe, Western–Andorra, Principality of. 9864

Europe, Western–Austria (Österreich). 251, 540, 542, 562, 563, 566, 569, 570, 571, 572, 582, 586, 587, 588, 589, 590, 591, 592, 599, 602, 607, 611, 613, 614, 617, 620, 627, 631, 637, 638, 645, 646, 665, 672, 686, 688, 691, 703, 704, 708, 715, 768, 770, 788, 828, 837, 849, 853, 880, 881, 919, 934, 964, 975, 978, 1019, 1216, 1217, 1237, 1306, 1319, 1336, 1386, 1416, 1440, 1453, 1455, 1464, 1468, 1489, 1537, 1574, 1719, 1735, 1803, 1804, 1869, 1870, 1934, 2071, 2106, 2113, 2126, 2148, 2149, 2171, 2180, 2218, 2226, 2233, 2237, 2247, 2292, 2429, 2466, 2472, 2848, 2929, 3017, 3053, 3256, 3271, 3275, 3323, 3328, 3371, 3384, 3385, 3390, 3503, 3551, 3557, 3583, 3645, 3647, 3662, 3781, 3795, 3816, 3896, 3897, 3898, 3899, 4049, 4282, 4283, 4668, 4961, 5601, 6135, 6303, 7315, 7331, 7515, 7796, 7798, 7905, 8005, 8162, 8445, 8525, 8750, 8850, 9211, 9368, 9417, 9667, 9864, 9982, 10173, 10319, 10413, 10441, 10632, 10665, 10731, 10797, 10853, 10869, 10948, 10980, 11328, 11329, 11481, 11491

Europe, Western–Belgium, Kingdom of. 568, 932, 1336, 1384, 1489, 1638, 1683, 1719, 1803, 1825, 2005, 2071, 2124, 2218, 2226, 2467, 2972, 3016, 3017, 3142, 3275, 3282, 3289, 3323, 3503, 3509, 3619, 3625, 3645, 3647, 3781, 3897, 4282, 4283, 4491, 4603, 4604, 4961, 5399, 5514, 5515, 5927, 6096, 6135, 6303, 6533, 6641, 6714, 6720, 6824, 7036, 7126, 7204, 7315, 7350, 7353, 7444, 7461, 7510, 7511, 7775, 7798, 7818, 7905, 8010, 8162, 8343, 8525, 8750, 8778, 8904, 8998, 9041, 9219, 9310, 9355, 9368, 9372, 9422, 9451, 9554, 9596, 9624, 9666, 9673, 9735, 9864, 9892, 9905, 9909, 9982, 10000, 10045, 10078, 10079, 10123, 10274, 10319, 10369, 10430, 10433, 10440, 10441, 10533, 10665, 10712, 10731, 10853, 10980, 11468, 11484, 11486

Europe, Western–Denmark (Danmark; Including the Province of Greenland [Kalaallit Nunaat]). 352, 385, 1017, 1299, 1344, 1363, 1368, 1374, 1464, 1489, 1683, 1687, 1719, 1720, 1792, 1803, 1825, 1926, 1928, 2071, 2108, 2130, 2226, 2237, 2292, 2293, 2471, 2717, 2761, 2845, 2913, 2929, 3017, 3136, 3142, 3151, 3275, 3289, 3384, 3445, 3503, 3509, 3551, 3552, 3557, 3645, 3720, 3888, 3954, 4282, 4283, 4864, 5049, 5278, 5294, 5927, 5944, 6000, 6092, 6135, 6201, 6641, 7036, 7217, 7251, 7353, 7905, 8010, 8162, 8750, 8998, 9120, 9368, 9372, 9521, 9546, 9547, 9601, 9694, 9982, 10050, 10150, 10366, 10405, 10533, 10665, 10712, 10731, 10853, 10980, 11487

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Faba bean or fava bean. *See* Broad Bean (*Vicia faba*)

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Fairchild, David (1869-1954). In 1897 founded Section of Foreign Seed and Plant Introduction. After March 1901, Renamed Office of Foreign Seed and Plant Introduction, then Office of Foreign Plant Introduction, then Division of Foreign Plant Introduction. 879, 1105, 1190, 1220, 1456, 1598, 1648, 2032, 3078, 3467, 3743, 3810, 3811, 3893, 10558

Family history. *See* Genealogy and Family History

Fantastic Foods, Inc. (Petaluma, California). 7998, 8573, 10245, 10282

Far-Mar-Co, Inc. (A Cooperative; Hutchinson, Kansas). Created on 1 June 1968 by the merger of four regional grain cooperatives including Farmers Union Cooperative Marketing Assn., which had owned the former Dannen soybean crushing plant in St. Joseph, Missouri, since Sept. 1963. Parts later sold to PMS Foods, Inc. 5810, 7687, 8232

Farm (The) (Summertown, Tennessee). See also Soyfoods Companies (USA)–Farm Food Co. 6327, 6637, 6672, 6734, 6807, 6849, 6874, 7076, 7092, 7304, 7513, 7792, 7877, 7916, 7998, 8164, 8240, 8241, 8271, 8399, 8510, 9451, 9762, 10251, 10659

Farm Food Co. (San Rafael, then San Francisco, California), Farm Foods, and Farm Soy Dairy (Summertown, Tennessee). Div. of Hain Food Group (Uniondale, New York). Merged with Barricini Foods on 31 May 1985. Acquired by 21st Century Foods from Barracini Foods in mid-1993. 6573, 6650, 6672, 6692, 6734, 6746, 6807, 7034, 7076, 7092, 7633, 7634, 7792, 7877, 7922, 7923, 7998, 8240, 8241, 8399, 8404, 8510, 9100, 9101, 9113, 9451, 10245, 10712

Farm Machinery–Etymology of Related Terms and Their Cognates. 444, 888, 919, 980, 983, 1555

Farm machinery. *See* Tractors

Farmers Union Grain Terminal Association (GTA). Established in 1938 in St. Paul, Minnesota. 5212, 7687

Farming and gardening, biodynamic. *See* Biodynamic / Bio-Dynamic Farming and Gardening (General)

Farmland Industries, Inc. Named Consumers Cooperative Association from 1934 to 1 Sept. 1966. Declared Bankruptcy in May 2002. 7687

Fasting–Abstaining from All Food and Nourishment, Consuming Only Water. 148, 5242, 10062

Fatty Acids for Non-Drying or Drying Applications (As in Hot-Melt Glues or the Curing Component of Epoxy Glues)–Industrial Uses of Soy Oil. 1644, 2157, 2158, 2357, 2415, 2482, 2483, 3349, 4203, 4301, 4423, 4856, 4868, 8115, 10176

Fearn, Dr. Charles E. (-1949), and Fearn Soya Foods / Fearn Natural Foods. 3559, 4506, 6379, 6380, 7798, 8404

Feeds–Efficiency of Animals in Converting Feeds into Human Foods. 811, 6215, 6395, 6401, 6545, 6547, 6548, 7867, 8262, 10582, 10897, 10917, 11145, 11148, 11260, 11434

Feeds–Soybeans, soybean forage, or soy products fed to various types of animals. *See* The type of animal–chickens, pigs, cows, horses, etc.

Feeds / Forage from Soybean Plants–Hay (Whole Dried Soybean Plants, Foliage and Immature Seed Included). 627, 706, 716, 718, 740, 780, 819, 820, 851, 875, 888, 895, 905, 919, 931, 932, 937, 950, 959, 965, 972, 976, 980, 983, 984, 1004, 1005, 1011, 1029, 1041, 1097, 1240, 1257, 1318, 1319, 1353, 1412, 1427, 1449, 1533, 1543, 1555, 1574, 1673, 1719, 1741, 1906, 2148, 2149, 2226, 2243, 2330, 2357, 2479, 2496, 2558, 2728, 2736, 2759, 2928, 2929, 3727, 3809, 3896, 3961, 9209

Feeds / Forage from Soybean Plants–Pasture, Grazing or Foraging. 919, 965, 972, 980, 983, 1005, 1051, 1318, 1427, 1453, 1555, 1570, 1741, 1906, 2226, 2243, 2330, 2479, 2496, 2736, 2759, 2928, 3043, 3151, 3323, 3363, 3387, 3647, 3899, 10358, 10511, 10975

Feeds / Forage from Soybean Plants–Pastures & Grazing–Hogging Down / Off, Pasturing Down, Grazing Down, Lambing Down / Off, and Sheeping-Down / Off. 919, 983, 1091, 1318, 1427, 1453, 1570, 2226, 2736, 2759, 3043, 3961, 5725, 10358, 10975

Feeds / Forage from Soybean Plants–Silage / Ensilage Made in a Silo. 617, 626, 627, 764, 780, 814, 841, 851, 870, 875, 879, 888, 893, 895, 913, 919, 959, 972, 1005, 1014, 1051, 1091, 1191, 1194, 1318, 1319, 1336, 1412, 1427, 1449, 1543, 1555, 1671, 1719, 1906, 2226, 2243, 2330, 2479, 2496, 2736, 2759, 2775, 3043, 3151, 3323, 3363, 3387, 3647, 3809, 3961, 5725, 11487

Feeds / Forage from Soybean Plants–Soilage and Soiling (Green Crops Cut for Feeding Confined Animals). 841, 851, 870, 875, 876, 905, 919, 972, 1014, 1029, 1181, 1427, 1555, 1741, 1906, 2226, 2496, 2736, 2759, 3043, 3151, 3961, 5725, 8024

Feeds / Forage from Soybean Plants–Straw (Stems of Whole Dried Soybean Plants). Also Fertilizing Value, Other Uses, Yields, and Chemical Composition. 571, 572, 582, 586, 590, 592, 607, 637, 645, 655, 720, 770, 787, 1005, 1092, 1411, 1449, 1555, 1574, 1719, 1906, 2243, 2244, 2736, 2759, 2775, 2828, 2929, 3151, 3961, 4215

Feeds / Forage from Soybean Plants or Full-Fat Seeds (Including Forage, Fodder {Green Plants}, or Ground Seeds). 158, 416, 434, 438, 444, 446, 458, 461, 463, 464, 475, 479, 480, 541, 551, 584, 607, 611, 613, 614, 619, 620, 621, 632, 639, 644, 645, 668, 686, 703, 708, 712, 736, 754, 782, 789, 795, 796, 799, 811, 818, 839, 848, 850, 852, 853, 880, 907, 955, 977, 995, 1006, 1062, 1072, 1136, 1144, 1190, 1260, 1271, 1278, 1306, 1344, 1358, 1359, 1384, 1416, 1445, 1457, 1480, 1510, 1527, 1541, 1551, 1561, 1563, 1585, 1598, 1668, 1713, 1765, 1780, 1786, 1789, 1803, 1813, 1840, 1869, 1870, 1878, 1934, 1938, 1991, 2026, 2084, 2107, 2108, 2110, 2180, 2235, 2247, 2254, 2285, 2292, 2504, 2517, 2521, 2648, 2671, 2817, 2867, 2923, 2951, 3137, 3240, 3282, 3328, 3331, 3333, 3384, 3385, 3389, 3390, 3511, 3646, 3802, 3887, 3897, 4891, 6735, 9211, 9381, 9382, 11070

Feeds Made from Soybean Meal (Defatted). 667, 716, 937, 1213,

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1241, 1250, 1254, 1271, 1291, 1294, 1299, 1309, 1315, 1319, 1344, 1346, 1356, 1381, 1383, 1403, 1409, 1436, 1442, 1445, 1492, 1541, 1543, 1554, 1574, 1683, 1702, 1803, 1806, 1831, 1968, 2006, 2076, 2078, 2152, 2186, 2292, 2433, 2517, 2781, 2782, 2845, 2913, 2923, 2951, 2955, 3137, 3138, 3174, 3333, 3349, 3894, 3961, 4458, 4580, 4600, 4741, 4774, 4839, 4848, 4925, 4952, 4997, 5003, 5010, 5074, 5166, 5281, 5283, 5290, 5393, 5549, 5706, 6201, 6254, 6670, 7210, 7320, 7682, 7683, 7760, 8160, 8214, 8256, 8468, 8770, 8774, 8780, 8789, 8872, 8897, 8921, 9084, 9351, 9382, 10309

Feeds, Other Types (Okara, Calf Milk Replacers, Soybean Hulls, etc.). 2509, 7402, 7513, 8795, 9041

Feminization. *See* Reproduction / Reproductive, Fertility, or Feminization Problems

Fermented Black Soybean Extract (*Shizhi / Shih Chih*), and Fermented Black Soybean Sauce (Mandarin: Shiyou / Shih-yu. Cantonese: Shi-yau / Si-yau / Seow. Japanese: Kuki-jiru). See also Black Bean Sauce. 151, 435, 509, 556, 721, 796, 936, 963, 1069, 2431, 6576, 7055, 7557, 7809, 8070, 8680, 10389, 10456, 10718, 10877

Fermented Black Soybean Production–How to Make Fermented Black Soybeans on a Commercial Scale. 4407, 5899, 6471, 6473, 6745, 6750, 6858, 6865

Fermented Black Soybeans–Etymology of This Term and Its Cognates / Relatives in Various Languages. 1, 19, 50, 58, 556, 854, 997, 1040, 2538, 2627, 3788, 4407, 5215, 5780, 5894, 6400, 6704, 6858, 6864, 7276, 10718

Fermented Black Soybeans–Whole Soybeans Fermented with Salt–Also called Fermented Black Beans, Salted Black Beans, Salty Black Beans, Black Fermented Beans, Black Beans, Black Bean Sauce, Black Bean and Ginger Sauce, Chinese Black Beans, Preserved Black Beans or Preserved Chinese Black Beans. In Chinese (Mandarin): Shi, Doushi, or Douchi (pinyin), Tou-shih, Toushih, or Tou-ch'ih (Wade-Giles). Cantonese: Dow see, Dow si, Dow-si, Dowsi, or Do shih. In Japan: Hamanatto, Daitokuji Natto, Shiokara Natto, or Tera Natto. In the Philippines: Tausi or Taosi / Tao-si. In Malaysia or Thailand: Tao si. In Indonesia: Tao dji, Tao-dji, or Tao-djie. 1, 3, 5, 7, 14, 18, 19, 26, 48, 50, 56, 58, 64, 136, 138, 151, 435, 509, 556, 575, 617, 706, 721, 796, 824, 828, 853, 854, 857, 936, 963, 975, 997, 1021, 1040, 1068, 1069, 1341, 1535, 1544, 1554, 1574, 1599, 2064, 2149, 2226, 2240, 2251, 2357, 2431, 2538, 2627, 2699, 3221, 3323, 3332, 3384, 3729, 3788, 3820, 3826, 3831, 3900, 4198, 4406, 4407, 4472, 4666, 4753, 5031, 5036, 5124, 5212, 5213, 5214, 5215, 5514, 5515, 5529, 5620, 5646, 5780, 5781, 5801, 5894, 5897, 5898, 5899, 5997, 6018, 6030, 6130, 6180, 6272, 6297, 6325, 6395, 6400, 6401, 6404, 6433, 6442, 6444, 6465, 6471, 6472, 6473, 6476, 6496, 6576, 6613, 6624, 6632, 6637, 6646, 6704, 6740, 6745, 6750, 6758, 6759, 6796, 6810, 6858, 6864, 6865, 6927, 6937, 6945, 6947, 6957, 6958, 6971, 6991, 7046, 7054, 7055, 7060, 7082, 7210, 7215, 7226, 7276, 7300, 7303, 7321, 7348, 7538, 7547, 7549, 7557, 7563, 7569, 7676, 7688, 7699, 7809, 7816, 7838, 7867, 8046, 8070, 8079, 8087, 8088, 8122, 8199, 8204, 8223, 8251, 8293, 8310, 8313, 8327, 8464, 8499, 8518, 8536, 8674, 8676, 8680, 8701, 8706, 8722, 8808, 8979, 9000, 9124, 9141, 9263, 9378, 9471, 9472, 9479, 9750, 9790, 9846, 9847, 9851, 9869, 9890, 10048, 10165, 10219, 10255, 10283, 10373, 10374, 10377, 10389, 10425, 10456, 10468, 10487, 10492, 10582, 10606, 10611, 10646, 10672, 10718, 10719, 10728, 10844, 10857, 10871, 10877, 10897, 10902, 10909, 10929, 10932, 10989, 10990, 11054, 11095, 11109, 11111, 11112, 11120, 11130, 11145, 11147, 11168, 11247, 11260, 11267, 11321, 11397, 11398, 11409, 11434, 11459

Fermented Black Soybeans–from The Philippines–Tau-si, Tausi, Tao-si, Taosi. 3788, 6465, 6745, 6858, 7082, 7547, 7557, 7699, 7809, 8251, 8979, 9846, 9847, 10389, 10718, 10719, 11109

Fermented Black Soybeans from Japan–Kuki. 1, 5, 7, 18, 19, 26, 50, 58, 435, 857, 1535, 5036, 5780, 6471, 6810, 7676, 10932, 11147

Fermented Black Soybeans from Japan–Other Names (Tera Natto, Shiokara Natto, Jofukuji Natto). 18, 19, 26, 48, 50, 56, 58, 64, 313, 5898, 5899, 6442, 6444, 6465, 6471, 6476, 6613, 6864, 7688, 8087, 8088, 8204, 8293, 8313, 8674, 8676, 8808, 9869, 10929, 11247

Fermented Black Soybeans, Homemade–How to Make at Home or on a Laboratory Scale, by Hand. 5529, 5781, 5997, 10425

Fermented Black Soybeans, Unsalted or Bland (Soybean Koji)–Whole Soybeans Fermented without Salt in China (Danshi / Danchi in pinyin, or Tanshih, Tan-shih, or Tan-ch'ih in Wade-Giles). 6018, 7547, 7549, 7563, 8680, 8701, 9471, 10048, 10373, 10374, 10377, 11054, 11112

Fermented Soyfoods and Their Fermentation (General). See also: Microbiology and Bacteriology–History of Early Discoveries. 554, 583, 761, 878, 882, 934, 988, 1019, 1101, 1115, 1237, 1354, 1468, 1498, 1537, 1628, 1680, 1735, 1830, 2011, 2064, 2117, 2118, 2223, 2225, 2258, 2259, 2456, 2469, 2593, 2609, 2611, 2737, 3270, 3343, 3521, 3611, 3729, 3732, 3820, 3880, 4043, 4054, 4284, 4457, 4476, 4579, 4703, 5121, 5240, 5314, 5420, 5421, 5425, 5469, 5529, 5585, 5657, 5778, 5791, 5890, 5895, 5929, 5945, 5986, 5995, 5997, 6010, 6023, 6024, 6032, 6130, 6335, 6418, 6452, 6465, 6491, 6543, 6545, 6547, 6548, 6557, 6734, 6742, 6792, 6922, 6949, 6957, 6973, 7063, 7068, 7080, 7082, 7231, 7285, 7294, 7300, 7345, 7442, 7699, 7806, 7809, 7963, 7976, 8327, 8377, 8440, 8462, 8651, 8677, 8979, 9171, 9479, 9504, 9505, 9642, 9850, 9851, 10389, 10417, 10481, 10539, 10960, 11120, 11148, 11351, 11353, 11416

Fermented Specialty Soyfoods–Soy Wine, Cantonese Wine Starter (Kiu-Tsee / Tsée), Soy Fermentation Pellicle or Bean Ferment (Tou Huang), Soyidli / Idli, Dosa / Dosai, Dhokla, and Soy Ogi. 706, 758, 828, 975, 1574, 1832, 2557, 2649, 3332, 3339, 3357, 3557, 3561, 4180, 4375, 4454, 5529, 6637, 6964, 7809, 8748, 9479, 10389, 11120

Fermented tofu, commercial production. *See* Tofu, Fermented... Production

Fermented tofu. *See* Tofu, Fermented

Fermented whole soybeans. *See* Natto, Dawa-dawa, Kinema, Thua-nao

Ferruzzi-Montedison (Italy). Purchased Central Soya Co. (USA) in

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Oct. 1987. European crushing operations renamed Cereol on 1 Jan. 1990. Cereol acquired by Bunge in April 2003. 6230, 9451, 10533, 10978

Fertilizer, soybean meal used as. *See* Soybean Meal / Cake, Fiber (as from Okara), or Shoyu Presscake as a Fertilizer or Manure for the Soil

Fertilizers / Fertilizer (Incl. Foliar Sprays), Fertilization, Plant Nutrition, Mineral Needs, and Nutritional / Physiological Disorders of Soybeans (Including Chlorosis). 542, 840, 841, 848, 870, 1187, 1439, 1446, 1449, 1451, 1469, 1555, 1561, 1562, 1741, 1813, 1906, 2162, 2330, 2479, 2639, 2676, 2956, 2957, 3159, 3700, 3713, 3896, 4778, 4901, 5029, 5418, 8023, 8753, 9706, 9984

Fiber–Okara or Soy Pulp–Etymology of This Term and Its Cognates / Relatives in Various Languages. 128, 154, 207, 516, 527, 553, 681, 682, 712, 717, 724, 754, 766, 840, 880, 1002, 1106, 1147, 1149, 1600, 1698, 1887, 2667, 2759, 3008, 3337, 3557, 3734, 3949, 4207, 4570, 6395, 6409, 7513, 8213, 9837

Fiber–Okara or Soy Pulp, Used as an Ingredient in Commercial Soyfood Products. 7645, 8220, 8788, 8825, 8943, 9058, 9157

Fiber–Okara or Soy Pulp, from Making Soymilk or Tofu–Value Added Uses (Not Including Livestock Feeds) and Solutions to Disposal Problems. 754, 1698, 1935, 3008, 3736, 3961, 6395, 6401, 6920, 7358, 7359, 8486, 8663, 8736, 8795, 8825, 8828, 8896, 9436, 9579, 9810, 10241, 10801, 11260

Fiber–Okara or Soy Pulp, the Residue Left from Making Soymilk or Tofu. Also called Bean Curd Residue, Soybean Curd Residue, Dou-fu-zha (Pinyin). 33, 126, 128, 154, 207, 271, 390, 516, 524, 527, 553, 624, 681, 682, 712, 714, 717, 724, 732, 754, 766, 786, 836, 840, 853, 880, 932, 943, 966, 1002, 1106, 1107, 1147, 1149, 1260, 1376, 1410, 1475, 1574, 1596, 1600, 1698, 1778, 1794, 1847, 1887, 1921, 1935, 2026, 2148, 2149, 2226, 2242, 2463, 2465, 2509, 2538, 2667, 2734, 2736, 2759, 2866, 2894, 3008, 3129, 3337, 3339, 3357, 3469, 3470, 3544, 3557, 3561, 3630, 3696, 3710, 3730, 3734, 3736, 3948, 3949, 3961, 4149, 4207, 4281, 4466, 4477, 4560, 4561, 4570, 4582, 4583, 4622, 4810, 5055, 5100, 5213, 5217, 5222, 5223, 5225, 5227, 5228, 5319, 5323, 5879, 5888, 5909, 5967, 5989, 5990, 5991, 6240, 6281, 6289, 6292, 6296, 6332, 6395, 6399, 6401, 6404, 6409, 6421, 6476, 6520, 6577, 6637, 6646, 6648, 6709, 6894, 6920, 6958, 6964, 7003, 7005, 7011, 7034, 7058, 7065, 7069, 7076, 7114, 7138, 7170, 7172, 7181, 7199, 7211, 7230, 7257, 7258, 7267, 7268, 7322, 7358, 7359, 7416, 7422, 7434, 7439, 7479, 7487, 7513, 7557, 7590, 7633, 7634, 7644, 7719, 7767, 7780, 7859, 7865, 7867, 7887, 7907, 7909, 7922, 7962, 7965, 7972, 8015, 8087, 8112, 8152, 8204, 8206, 8211, 8213, 8267, 8328, 8399, 8447, 8455, 8480, 8486, 8508, 8527, 8532, 8564, 8577, 8578, 8634, 8663, 8702, 8727, 8736, 8748, 8795, 8828, 8847, 8896, 8961, 8979, 8990, 8999, 9135, 9136, 9141, 9145, 9152, 9240, 9272, 9275, 9305, 9380, 9436, 9480, 9509, 9511, 9579, 9580, 9586, 9621, 9658, 9744, 9745, 9749, 9750, 9762, 9788, 9810, 9837, 9846, 9893, 9901, 10003, 10008, 10016, 10019, 10103, 10104, 10110, 10111, 10232, 10233, 10241, 10250, 10297, 10380, 10424, 10450, 10471, 10476, 10492, 10496, 10532, 10582, 10603, 10611, 10617, 10646, 10649, 10654, 10659, 10684, 10718, 10719, 10737, 10801, 10859, 10864, 10875, 10897, 10948, 10984, 10998, 11025, 11071, 11114, 11121, 11132, 11136, 11141, 11145, 11163, 11201, 11208, 11222, 11260, 11267, 11289, 11309, 11343, 11345, 11395, 11412, 11430, 11434, 11437, 11457

Fiber–Presscake, Residue or Dregs from Making Soy Sauce. 584, 608, 616, 619, 743, 771, 786, 840, 878, 882, 889, 943, 978, 1018, 1021, 1092, 1341, 1349, 1457, 1566, 1643, 1667, 2111, 2131, 2259, 2617, 3083, 4467, 4468, 5041, 5213

Fiber–Seventh-day Adventist Writings or Products (Especially Early) Related to Dietary Fiber. 2302, 2303, 7513, 10062

Fiber–Soy Cotyledon Fiber / Polysaccharides (from Making Soy Protein Isolates). 9376, 10045, 10241

Fiber, Soy–Bran (Pulverized Soybean Hulls / Seed Coats) and Other Uses of Soybean Hulls. 1971, 1974, 2192, 2226, 2325, 3332, 4474, 5367, 5406, 5996, 7005, 7513, 7665, 8348, 10241, 11479

Fiber, Soy–Bran–Etymology of This Term and Its Cognates / Relatives in Various Languages. 1974, 2226, 2325, 3332, 7665

Fiber, Soy–General, for Food Use (Specific Type Unknown). 7261, 8364, 10241

Fiber, Soy–Okara, Soy Bran (from Pulverized Soybean Hulls, or Isolate Fiber)–Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 8206, 9436

Fiber. *See* Carbohydrates–Dietary Fiber

Fibers (Artificial Wool or Textiles Made from Spun Soy Protein Fiber, Including Azlon, Soylon, and Soy Silk / Soysilk)–Industrial Uses of Soy Proteins. 1596, 3323, 3400, 3403, 3404, 3405, 3406, 3407, 3408, 3420, 3429, 3486, 3487, 3500, 3507, 3556, 3572, 3574, 3576, 3577, 3580, 3582, 3583, 3591, 3619, 3622, 3625, 3655, 3740, 3756, 3889, 3895, 3947, 4137, 4873, 4969, 4992, 5032, 5044, 6439, 8017, 8232, 9002, 9351, 9730, 10023, 10176, 11480

Fiji. *See* Oceania–Fiji

Fires or explosions. *See* Soybean Crushing–Explosions and/or Fires in Soybean Solvent Extraction Plants

Fish or Crustaceans (e.g., Shrimp) Fed Soybean Meal or Oil as Feed Using Aquaculture or Mariculture. 5770, 6261, 6696, 8192, 8805, 8885, 9084, 10309, 10688, 11070

Fish or Crustaceans raised by Aquaculture / Fish Culture / Pisiculture–Early–Soy Is Not Mentioned. 558, 6795

Fish, meatless. *See* Meat Alternatives–Meatless Fish, Shellfish, and Other Seafood-like Products

Fitness. *See* Physical Fitness, Physical Culture, and Exercise

Five-spice pressed tofu. *See* Tofu, Five-Spice Pressed (*Wu-hsiang Toufukan / Wuxiang Doufugan*)

Flakes, from whole soybeans. *See* Whole Soy Flakes

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Flatulence or Intestinal Gas–Caused by Complex Sugars (As the Oligosaccharides Raffinose and Stachyose in Soybeans), by Fiber, or by Lactose in Milk. 2, 1482, 1621, 1732, 1828, 1974, 2117, 2118, 2500, 2843, 2989, 3015, 3269, 3341, 4709, 5081, 5127, 5281, 5301, 5367, 5406, 5567, 5617, 6612, 7394, 7467, 7747, 8632, 8764, 9117, 9370, 9498, 9520, 9618, 9664, 9665, 9669, 9714, 10198, 10301, 10327, 10355, 10426, 10508, 10546, 10688

Flavor Problems and Ways of Solving Them (Especially Beany Off-Flavors in Soy Oil, Soymilk, Tofu, Whole Dry Soybeans, or Soy Protein Products, and Ways of Masking or Eliminating Them). 439, 570, 853, 1398, 1786, 1914, 1935, 1974, 2026, 2152, 2192, 2242, 2484, 3053, 3173, 3315, 3756, 3781, 3896, 3913, 3918, 3978, 4060, 4066, 4174, 4179, 4467, 4591, 4904, 4962, 5083, 5109, 5191, 5272, 5289, 5363, 5437, 5466, 5470, 5540, 5548, 5561, 5701, 5711, 5722, 5734, 5740, 5741, 5748, 5821, 5836, 5940, 5995, 6010, 6027, 6092, 6130, 6161, 6216, 6300, 6317, 6493, 6989, 7039, 7104, 7142, 7178, 7229, 7353, 7380, 7394, 7642, 7644, 7665, 7691, 7823, 7886, 7942, 8011, 8039, 8091, 8097, 8242, 8328, 8348, 8370, 8435, 8449, 8487, 8529, 8666, 8743, 8801, 8817, 8824, 8950, 8990, 9004, 9038, 9086, 9129, 9173, 9177, 9246, 9251, 9276, 9335, 9347, 9360, 9370, 9445, 9498, 9555, 9610, 9714, 9760, 9774, 9784, 9788, 9810, 10330, 10424, 10435, 10540, 10651, 10810, 10973, 11484, 11489

Flax plant or flaxseed. *See* Linseed Oil, Linseed Cake / Meal, or the Flax / Flaxseed Plant

Flint, James. Translator, Agent and Resident Administrator (Supercargo) in China of the East India Company (England) in the Late 1700s. Died 1793. Chinese Name–Hung Jen. See also: Samuel Bowen. 11485

Flour, soy. *See* Soy Flour

Fluoridation of Municipal Drinking Water with Fluorine. 11336

Foams for Fighting Fires–Industrial Uses of Soy Proteins (Foam, Foaming Agents). 3947, 4101, 9351, 10176

Fodder, soybean. *See* Feeds / Forage from Soybean Plants or Full-Fat Seeds

Food Production and Distribution Administration of USDA. *See* United States Department of Agriculture (USDA)–War Food Administration (WFA)

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Hackleman, Jay C. (1888-1970, Extension Agronomist, Univ. of Illinois). 3388, 3667

Hain Celestial Group, Inc. (Uniondale, New York). Hain Food Group, Inc. before 30 May 2000. Hain Pure Food Co. since Nov. 1931. Founded in Oct. 1926 by Harold Hain as Hain Health Foods. 4506, 5850, 6303, 7076, 7371, 8240, 8241, 8510, 10245, 10469, 10523, 10600, 10712, 10885, 10978, 11073, 11172, 11474, 11484

Haldane Foods Group Ltd. (Newport Pagnell, Buckinghamshire, England). Including Regular Tofu Co., Realeat Foods, Direct Foods, Haldane Foods, Vegetarian Feasts, Vegetarian Cuisine, Genice, Unisoy, and Granose Foods Ltd. Acquired by The Hain Celestial Group in fall 2006. 7251, 7974, 8162, 8879, 9451, 9547, 9666, 9735, 10079, 10320, 10581, 10712, 11096

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Hamanatto Fermented Black Soybeans–from Japan. In Japan called Hamanatto or (formerly) Hamananatto. 138, 1040, 2226, 2240, 2251, 2357, 2538, 2627, 2699, 3384, 4406, 4407, 4666, 5212, 5213, 5214, 5529, 5620, 5801, 5899, 5997, 6130, 6272, 6325, 6395, 6400, 6404, 6433, 6471, 6472, 6473, 6496, 6613, 6637, 6646, 6704, 6745, 6750, 6758, 6759, 6796, 6858, 6864, 6865, 6945, 6947, 6957, 6991,

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Harrison, D.W. (M.D.) (1921-2011), and Africa Basic Foods (Uganda). 7254, 9934

Hartz (Jacob) Seed Co. (Stuttgart, Arkansas). Founded by Jacob Hartz, Sr. (1888-1963) in 1942. Continued by Jake Hartz, Jr. (1920-). Acquired by Monsanto in April 1983. Headquarters at Des Moines, Iowa, since Jan. 1998. 3079, 3685, 6151, 7476, 8351, 8892, 9451, 9937, 10137, 10138, 10139, 10141, 10236, 10394, 10396, 10423, 10502, 10646

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Health–Domestic science. *See* Domestic Science / Home Economics Movement in the United States

Health Food Company of New York (Started in 1875 by Frank Fuller). 692

Health Foods–Manufacturers. 692, 2361, 3438, 4506, 9547, 9934

Health Foods Distributors and Wholesalers–General and Other (1890s to 1960s). 5804, 6741, 9766

Health Foods Industry–Trade Associations–Natural Products Association (NPA). Named National Nutritional Foods Association (NNFA) from 1970 until 15 July 2006. Founded in 1937 as the National Health Foods Association by Anthony Berhalter of Chicago. Renamed NNFA in 1970. 5962, 7877, 10885

Health Foods Movement and Industry in United Kingdom. 5241, 6053, 9547

Health Foods Movement and Industry in the United States–General (Started in the 1890s by Seventh-day Adventists). 748, 1705, 2268, 2906, 4506, 5663, 6053, 6447, 7076, 10360, 10744, 10749, 10755

Health Foods Stores / Shops (mostly USA)–Early (1877 to 1970s). 2361, 3438, 5241, 5841, 5856, 5905, 6033, 9766

Health Foods, Inc. (Des Plaines, Illinois). Wholesale Distributor of Health Foods and Natural Foods. Founded in 1936 by Samuel Middell. 6741, 9766

Health Valley (Los Angeles, then Montebello, California). Acquired by Natural Nutrition Group. Acquired by Hain Food Group of Uniondale, New York, on 18 May 1999. 7076, 8884

Health and Dietary / Food Reform Movements, especially from 1830 to the 1930s. 4460, 4736, 5645, 6158, 7352, 7900

Health claims. *See* Claim or Claims of Health Benefits–Usually Authorized by the FDA

Health foods distributors and wholesalers. *See* Balanced Foods, Inc. (New York City, and New Jersey), Health Foods, Inc. (Illinois), Kahan & Lessin Co. (California), Landstrom Co. (California)

Health foods manufacturers. *See* Health Food Company of New York

Health foods movement in Los Angeles, California. *See* Davis, Adelle

Heart disease and diet. *See* Cardiovascular Disease, Especially Heart Disease and Stroke

Hemagglutinins (Lectins or Soyin) (Proteins Which Agglutinate Red Blood Cells). 5316, 5461, 5774, 5943, 6368, 9336

Hemp Oil or Hempseed Oil (from the seeds of *Cannabis sativa*). 393, 438, 486, 519, 665, 666, 676, 706, 720, 829, 1025, 1350, 1465, 1466, 1857, 1975, 2046, 2081, 2108, 2218, 2296, 2297, 2433, 2459, 3146, 3551

Hemp (*Cannabis sativa*)–Used as a Source of Fiber for Textiles or Paper, Protein (Edestin), or Seeds (*Asanomi*). Includes Marijuana / Marihuana. See Also Hemp Oil or Hempseed Oil. Does NOT include Wild Hemp (*Sesbania macrocarpa*) or Sunn Hemp (*Crotolaria juncea*) or Manila hemp (*Musa textilis,* a species of plantain). 379, 393, 438, 486, 503, 514, 519, 565, 574, 584, 623, 665, 676, 694, 706, 762, 770, 771, 784, 787, 812, 844, 847, 912, 946, 947, 953, 1025, 1086, 1166, 1207, 1210, 1229, 1247, 1265, 1268, 1356, 1376, 1429, 1465, 1466, 1473, 1578, 1600, 1693, 1713, 1769, 2002, 2024, 2046, 2108, 2147, 2296, 2297, 2538, 2652, 2957, 3146, 3551, 4838, 5780, 5967, 6410, 6436, 7060, 8232, 9267, 9957, 10255, 10719, 11416

Henselwerk GmbH (Magstadt near Stuttgart, Germany). 3636, 4953

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Herbicides. *See* Weeds–Control and Herbicide Use

Heuschen-Schrouff B.V. (Landgraaf, Netherlands), Including Its Subsidiary SoFine Foods (The Latter Acquired by Vandemoortele Group on 23 June 2006). 8162, 9666, 11073, 11444

Hexane. *See* Solvents

Higashimaru. *See* Soy Sauce Companies (Asia)

Higeta. *See* Soy Sauce Companies (Asia)

Hinoichi / Hinode, House Foods & Yamauchi Inc. *See* House Foods America Corporation (Los Angeles, California)

Historical–Documents (Published After 1923) About Soybeans or Soyfoods Before 1900. 4154, 4210, 4699, 5412, 5516, 6805, 8198, 9262, 9640, 9648, 9649, 9841, 9880, 9881, 9882, 9883, 9962, 9968, 9971, 10057, 10201, 10202, 10857, 10858, 10877, 11108, 11147, 11189

Historical–Documents (Published After 1923) About Soybeans or Soyfoods from 1900 to 1923. 9000

Historical–Documents about Food Uses of Soybeans in the USA before 1900. 200, 202, 203, 209, 227, 268, 273, 281, 318, 334, 387, 389, 416, 423, 424, 434, 436, 441, 444, 445, 446, 463, 464, 470, 475, 476, 503, 551, 552, 557, 607, 614, 641, 644, 645, 648, 773, 841, 851, 852, 854, 908, 924, 965, 972, 974

Historical–Documents on Soybeans or Soyfoods Published Before 1900. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 401, 405, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978

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Historical–Earliest Commercial Product Seen of a Particular Type or Made in a Particular Geographic Area. 71, 77, 78, 97, 98, 911, 2199, 4376, 4886, 6271, 6369, 6420, 6720, 7645, 7849, 10602

Historical–Earliest Document Seen Containing a Particular Word, Term, or Phrase. 33, 56, 66, 68, 70, 112, 135, 145, 152, 158, 191, 193, 200, 205, 209, 212, 214, 215, 244, 249, 268, 275, 291, 300, 318, 321, 355, 361, 374, 389, 408, 416, 428, 438, 441, 444, 463, 496, 509, 511, 514, 516, 529, 533, 537, 541, 544, 551, 553, 556, 566, 586, 607, 617, 619, 623, 628, 644, 665, 668, 687, 688, 711, 712, 716, 717, 732, 748, 754, 755, 761, 764, 770, 774, 775, 795,

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803, 806, 819, 840, 843, 848, 851, 853, 862, 870, 877, 882, 886, 888, 893, 902, 907, 908, 919, 924, 952, 965, 980, 983, 987, 997, 1004, 1011, 1018, 1023, 1091, 1106, 1107, 1122, 1147, 1160, 1183, 1187, 1190, 1228, 1237, 1254, 1264, 1291, 1294, 1297, 1299, 1302, 1310, 1333, 1335, 1348, 1363, 1365, 1371, 1376, 1379, 1384, 1391, 1403, 1453, 1454, 1510, 1527, 1555, 1562, 1603, 1616, 1625, 1716, 1776, 1789, 1847, 1870, 1884, 1885, 1887, 1906, 1926, 2026, 2052, 2076, 2113, 2226, 2242, 2293, 2302, 2303, 2308, 2323, 2325, 2429, 2534, 2538, 2620, 2624, 2651, 2739, 2761, 2774, 2776, 2811, 2923, 3007, 3008, 3054, 3151, 3170, 3189, 3332, 3337, 3349, 3395, 3468, 3491, 3612, 3689, 3736, 3764, 4222, 4280, 4348, 4464, 5205, 5323, 5589, 5632, 5741, 5746, 5925, 5926, 5967, 6099, 6130, 6174, 6241, 6336, 6345, 6379, 6395, 6401, 6562, 6624, 6698, 6863, 6954, 7003, 7093, 7322, 7479, 7582, 7907, 8020, 8129, 8172, 8241, 8313, 8559, 9355, 9621, 10301, 10859, 11260

Historical–Earliest Document Seen That Mentions a Particular Soybean Variety. 782, 806, 812, 870, 913, 919, 965, 983, 1011, 1041, 1043, 1091, 1097, 1190, 1456, 1673, 1789, 1906, 1980, 2246, 2429, 2479, 2504, 2923, 3170, 3389, 3427, 3628

Historical–Earliest Document Seen of a Particular Type. 193, 473, 538, 607, 2557

Historical–Earliest Document Seen on a Particular Geographical Area–a Nation / Country, U.S. State, Canadian Province, or Continent. 1, 14, 77, 78, 135, 195, 233, 240, 251, 268, 273, 334, 416, 417, 418, 427, 439, 440, 444, 448, 450, 456, 462, 463, 480, 483, 529, 541, 551, 562, 568, 569, 570, 586, 587, 600, 607, 609, 620, 648, 651, 652, 655, 657, 706, 707, 773, 820, 841, 849, 888, 911, 932, 965, 977, 987, 1027, 1033, 1058, 1064, 1105, 1291, 1315, 1338, 1344, 1345, 1372, 1489, 1562, 1585, 1719, 1771, 1859, 1914, 2180, 2199, 2324, 2466, 3131, 3268, 3323, 3503, 3558, 3583, 3700, 3728, 3733, 3761, 3781, 3897, 4024, 4864, 4961, 5039, 5713, 6256, 6369

Historical–Earliest Document Seen on a Particular Subject. 7, 13, 15, 18, 24, 31, 34, 63, 66, 68, 76, 94, 97, 112, 138, 148, 152, 174, 212, 215, 249, 267, 269, 300, 307, 309, 314, 318, 321, 340, 346, 384, 394, 418, 427, 428, 439, 444, 448, 458, 473, 479, 497, 512, 516, 518, 527, 529, 538, 541, 542, 551, 554, 555, 562, 566, 571, 589, 592, 614, 617, 619, 633, 665, 669, 691, 748, 760, 761, 807, 808, 820, 846, 849, 850, 853, 882, 889, 898, 906, 907, 919, 924, 934, 958, 967, 980, 1004, 1005, 1011, 1022, 1025, 1035, 1039, 1059, 1084, 1091, 1105, 1122, 1143, 1160, 1190, 1233, 1260, 1297, 1299, 1309, 1315, 1346, 1347, 1348, 1379, 1413, 1421, 1427, 1428, 1443, 1457, 1465, 1466, 1469, 1475, 1495, 1510, 1543, 1555, 1644, 1673, 1689, 1697, 1704, 1713, 1729, 1748, 1792, 1887, 1906, 1921, 1974, 2071, 2108, 2134, 2312, 2325, 2370, 2373, 2433, 2465, 2471, 2627, 2654, 2751, 2774, 2867, 2946, 3141, 3142, 3189, 3228, 3339, 3395, 3400, 3496, 3636, 3770, 3821, 3922, 4046, 4173, 4197, 4230, 4302, 4376, 4459, 4467, 4491, 4526, 4542, 4603, 4611, 4622, 4743, 4812, 5085, 5110, 5145, 5163, 5177, 5214, 5632, 5652, 5663, 5683, 5917, 5992, 6096, 6098, 6171, 6230, 6263, 6370, 6383, 6442, 6533, 6545, 6547, 6548, 6637, 6848, 6888, 6948, 7003, 7189, 7307, 7450, 7461, 7479, 7481, 7769, 7849, 7887, 7905, 7907, 8240, 8877, 9416, 9432, 9607, 9621, 9655, 10280, 10859

Historical–Earliest Document Seen on a Particular Subject. 31, 34, 66, 79, 83, 108, 169, 212, 306, 385, 407, 452, 455, 474, 480, 514, 520, 542, 566, 608, 614, 618, 735, 776, 782, 830, 889, 896, 918, 919, 954, 983, 1035, 1045, 1051, 1053, 1065, 1081, 1092, 1094, 1101, 1163, 1214, 1276, 1294, 1306, 1314, 1346, 1409, 1456, 1482, 1581, 1624, 1687, 1729, 1774, 1806, 1840, 1860, 1881, 1882, 1926, 1935, 1964, 1974, 2001, 2180, 2292, 2463, 2472, 2670, 2838, 2980, 3163, 3240, 3360, 3387, 3405, 3551, 3557, 4096, 4230, 4330, 4407, 4494, 4611, 5031, 5035, 5040, 5215, 5327, 5689, 5742, 5903, 6043, 6325, 6327, 6471, 6613, 6667, 7805, 7838, 8310, 8311, 8312, 8314, 8315, 8854, 10602, 11020, 11485

Historically Important Events, Trends, or Publications. 5, 6, 8, 9, 12, 15, 21, 26, 31, 50, 55, 65, 69, 75, 76, 80, 132, 290, 384, 387, 457, 554, 579, 626, 704, 715, 723, 951, 1120, 1505, 1574, 1704, 1750, 1830, 1979, 2465, 2535, 2653, 3090, 3164, 3218, 3783, 3881, 4005, 4685, 4878, 5095, 5462, 5486, 5487, 5603, 5944, 5965, 6073, 6092, 6240, 6390, 6573, 6611, 6746, 6890, 6965, 7034, 7208, 7371, 7631, 7633, 7634, 7900, 7922, 7923, 8010, 8168, 8169, 8170, 8240, 8404, 8405, 8650, 8835, 8927, 8928, 8939, 8998, 9351, 9354, 9397, 9411, 9498, 10148, 10400, 10469, 10978, 11013, 11150, 11263

History–Chronology. *See* Chronology / Timeline

History of medicine. *See* Medicine–History

History of the Soybean–Myths and Early Errors Concerning Its History. 770, 853, 1934, 2026, 3253, 3387, 3833

History. See also Historical–Earliest..., Biography, Chronology / Timeline, and Obituaries. 2, 4, 7, 17, 22, 25, 26, 48, 50, 54, 67, 125, 138, 158, 164, 215, 220, 244, 290, 302, 305, 373, 393, 406, 410, 418, 451, 472, 504, 524, 533, 539, 584, 609, 617, 620, 627, 658, 660, 661, 662, 686, 688, 704, 706, 708, 712, 715, 721, 750, 828, 854, 880, 899, 912, 947, 975, 978, 980, 994, 1025, 1032, 1045, 1050, 1069, 1140, 1149, 1150, 1173, 1210, 1237, 1271, 1336, 1358, 1366, 1409, 1416, 1428, 1429, 1430, 1432, 1433, 1434, 1445, 1453, 1454, 1455, 1456, 1465, 1466, 1469, 1475, 1476, 1477, 1478, 1489, 1496, 1514, 1535, 1536, 1542, 1544, 1574, 1597, 1646, 1663, 1667, 1695, 1700, 1712, 1719, 1741, 1764, 1774, 1786, 1803, 1813, 1815, 1884, 1921, 1934, 1935, 1991, 2005, 2010, 2011, 2016, 2026, 2032, 2071, 2140, 2147, 2148, 2149, 2153, 2162, 2177, 2180, 2181, 2217, 2226, 2247, 2250, 2253, 2292, 2298, 2302, 2303, 2304, 2306, 2330, 2357, 2364, 2373, 2433, 2465, 2471, 2478, 2479, 2484, 2504, 2554, 2557, 2586, 2590, 2592, 2597, 2599, 2635, 2664, 2717, 2720, 2728, 2757, 2761, 2777, 2819, 2845, 2913, 2951, 2956, 2957, 3096, 3129, 3136, 3141, 3242, 3253, 3323, 3328, 3331, 3333, 3358, 3381, 3384, 3385, 3387, 3390, 3391, 3467, 3511, 3557, 3585, 3615, 3634, 3646, 3657, 3667, 3699, 3700, 3719, 3724, 3732, 3766, 3769, 3775, 3778, 3781, 3783, 3811, 3828, 3833, 3846, 3855, 3858, 3861, 3879, 3880, 3885, 3887, 3888, 3893, 3896, 3897, 3898, 3899, 3903, 3907, 3942, 3981, 3993, 4017, 4018, 4021, 4062, 4075, 4096, 4141, 4150, 4198, 4206, 4207, 4212, 4214, 4243, 4282, 4283, 4340, 4347, 4376, 4378, 4434, 4446, 4457, 4460, 4462, 4466, 4467, 4468, 4478, 4539, 4543, 4571, 4572, 4576, 4577, 4581, 4598, 4681, 4687, 4699, 4702, 4736, 4760, 4795, 4806, 4812, 4897, 4909, 4914, 4915, 4924, 4963, 5016, 5017, 5018, 5019, 5036, 5037, 5039, 5042, 5083, 5086, 5127, 5134, 5182, 5212, 5213, 5214, 5215, 5216, 5219, 5221, 5222, 5232, 5244, 5245, 5271, 5278, 5280, 5294, 5317, 5324, 5364, 5372, 5412, 5413, 5416, 5462, 5486, 5514, 5515, 5516, 5517, 5522, 5560, 5590, 5593, 5594, 5595, 5610, 5634, 5635, 5636, 5645, 5651, 5687, 5688, 5725, 5726, 5736, 5746, 5749, 5752, 5782, 5784, 5785, 5789, 5790, 5798,

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5819, 5841, 5850, 5871, 5886, 5887, 5893, 5895, 5905, 5939, 5944, 5951, 5992, 6001, 6005, 6006, 6008, 6009, 6017, 6018, 6019, 6024, 6025, 6026, 6027, 6028, 6033, 6061, 6075, 6096, 6097, 6098, 6106, 6133, 6135, 6136, 6139, 6143, 6144, 6145, 6171, 6172, 6225, 6234, 6245, 6247, 6256, 6263, 6274, 6277, 6280, 6291, 6297, 6298, 6299, 6303, 6326, 6343, 6366, 6383, 6395, 6401, 6432, 6442, 6444, 6446, 6449, 6450, 6452, 6453, 6454, 6504, 6508, 6527, 6532, 6533, 6545, 6547, 6548, 6549, 6553, 6556, 6576, 6608, 6609, 6626, 6630, 6631, 6642, 6643, 6650, 6664, 6671, 6691, 6711, 6713, 6714, 6715, 6722, 6729, 6735, 6780, 6781, 6782, 6783, 6784, 6785, 6787, 6795, 6797, 6798, 6802, 6804, 6808, 6810, 6815, 6822, 6830, 6842, 6844, 6855, 6861, 6864, 6870, 6906, 6914, 6928, 6929, 6930, 6931, 6933, 6935, 6936, 6957, 6958, 6965, 6977, 6984, 7033, 7046, 7062, 7063, 7067, 7070, 7087, 7089, 7093, 7094, 7095, 7105, 7107, 7108, 7126, 7128, 7134, 7140, 7147, 7153, 7156, 7158, 7168, 7176, 7182, 7184, 7201, 7208, 7212, 7215, 7217, 7229, 7232, 7238, 7243, 7248, 7249, 7254, 7256, 7257, 7258, 7259, 7260, 7266, 7276, 7277, 7280, 7285, 7288, 7290, 7291, 7298, 7299, 7304, 7313, 7315, 7320, 7322, 7329, 7338, 7340, 7341, 7342, 7344, 7345, 7352, 7354, 7358, 7361, 7364, 7365, 7366, 7367, 7368, 7370, 7387, 7422, 7430, 7435, 7443, 7451, 7458, 7462, 7463, 7465, 7466, 7467, 7481, 7482, 7485, 7486, 7487, 7491, 7504, 7509, 7510, 7511, 7512, 7513, 7514, 7516, 7517, 7518, 7521, 7522, 7523, 7526, 7531, 7532, 7533, 7534, 7535, 7537, 7544, 7547, 7549, 7560, 7563, 7570, 7573, 7591, 7608, 7609, 7618, 7619, 7631, 7636, 7641, 7642, 7644, 7648, 7676, 7727, 7729, 7731, 7737, 7742, 7743, 7744, 7745, 7754, 7761, 7762, 7763, 7766, 7770, 7775, 7783, 7785, 7798, 7813, 7814, 7821, 7822, 7827, 7829, 7832, 7833, 7838, 7855, 7859, 7861, 7867, 7872, 7878, 7880, 7881, 7888, 7895, 7900, 7901, 7902, 7919, 7925, 7933, 7941, 7960, 7961, 7963, 7965, 7975, 8007, 8008, 8010, 8011, 8012, 8013, 8015, 8017, 8019, 8022, 8023, 8024, 8028, 8042, 8047, 8051, 8052, 8057, 8058, 8062, 8065, 8066, 8067, 8068, 8070, 8071, 8079, 8080, 8085, 8090, 8091, 8095, 8098, 8099, 8103, 8113, 8162, 8180, 8197, 8198, 8202, 8207, 8209, 8221, 8223, 8232, 8240, 8241, 8249, 8251, 8262, 8264, 8265, 8271, 8287, 8288, 8289, 8290, 8296, 8300, 8309, 8310, 8311, 8312, 8313, 8314, 8340, 8343, 8373, 8385, 8386, 8399, 8401, 8416, 8443, 8448, 8451, 8453, 8456, 8458, 8461, 8464, 8477, 8484, 8517, 8518, 8521, 8524, 8525, 8534, 8576, 8599, 8600, 8616, 8620, 8626, 8627, 8642, 8643, 8651, 8669, 8674, 8677, 8680, 8700, 8707, 8717, 8720, 8731, 8749, 8750, 8778, 8806, 8812, 8818, 8820, 8831, 8838, 8844, 8854, 8860, 8862, 8867, 8886, 8917, 8936, 8939, 8942, 8986, 8991, 8998, 9001, 9002, 9008, 9009, 9010, 9016, 9022, 9028, 9040, 9042, 9046, 9048, 9049, 9052, 9053, 9055, 9068, 9097, 9098, 9105, 9106, 9107, 9112, 9121, 9122, 9123, 9127, 9131, 9140, 9141, 9163, 9167, 9169, 9178, 9181, 9182, 9193, 9198, 9199, 9203, 9204, 9205, 9206, 9207, 9208, 9209, 9211, 9214, 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10798, 10818, 10819, 10848, 10852, 10858, 10862, 10873, 10877, 10884, 10894, 10897, 10903, 10904, 10905, 10912, 10916, 10917, 10918, 10919, 10920, 10921, 10931, 10932, 10933, 10940, 10948, 10951, 10962, 10978, 10979, 10983, 11006, 11030, 11057, 11069, 11075, 11092, 11096, 11098, 11109, 11111, 11112, 11113, 11114, 11132, 11143, 11145, 11148, 11150, 11168, 11170, 11171, 11173, 11175, 11176, 11181, 11184, 11191, 11199, 11200, 11203, 11204, 11233, 11240, 11244, 11246, 11247, 11249, 11250, 11251, 11260, 11262, 11265, 11271, 11272, 11273, 11315, 11326, 11328, 11329, 11339, 11364, 11371, 11376, 11377, 11378, 11379, 11383, 11384, 11393, 11394, 11408, 11417, 11426, 11427, 11428, 11429, 11433, 11434, 11444, 11448, 11450, 11452, 11453, 11455, 11469, 11472, 11473, 11474, 11476, 11478, 11479, 11481, 11484, 11485, 11486, 11487, 11488, 11489, 11490, 11494, 11495, 11496

Hogging down soybeans. *See* Forage from Soybean Plants–Hogging Down

Hohnen Oil Co., Ltd. (Tokyo, Japan). Also spelled Hônen or Honen. Formerly Suzuki Shoten (Suzuki & Co.). 1748, 1860, 1883, 1913, 1928, 1986, 2016, 2045, 2072, 2073, 2081, 2095, 2099, 2111, 2120, 2127, 2140, 2167, 2172, 2432, 2433, 2465, 2474, 2735, 2761, 2940, 2964, 2972, 3346, 3349, 3483, 3561, 3618, 3981, 4197, 4222, 4225, 4401, 4435, 4636, 4751, 4772, 4869, 5016, 5017, 5018, 5019, 5020, 5033, 5052, 5091, 5168, 5204, 5214, 5275, 5297, 5394, 5459, 5686, 5703, 6375, 6537, 6622, 6785, 7041, 7221, 7389, 7608, 7609, 7684, 7932, 8541, 8857, 9450

Hoisin / Haisien Sauce. 5031, 5781, 6624, 6937, 8199, 8271, 9263, 9846, 10306, 10487, 10492, 10606, 10718, 10728, 10990, 11324

Holland. *See* Europe, Western–Netherlands

Holmberg, Sven A. (1894-1982, Fiskeby, Norrköping, Sweden). Soybean Breeder for the Far North. 3770, 3780, 3877, 3890, 4194, 4195, 5765, 6137, 6295, 6556, 6644, 6698, 7526, 7692, 7981, 9683, 10150, 10260, 10477, 10725

Home Economics, Bureau of. *See* United States Department of Agriculture (USDA)–Bureau of Human Nutrition and Home Economics

Home economics movement. *See* Domestic Science / Home

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Economics Movement in the United States

Homemade black bean sauce. *See* Black Bean Sauce, Homemade–How to Make at Home or on a Laboratory or Community Scale, by Hand

Homemade fermented black soybean. *See* Fermented Black Soybeans, Homemade–How to Make at Home or on a Laboratory Scale, by Hand

Homemade fried tofu. *See* Tofu, Fried, Homemade–How to Make at Home or on a Laboratory Scale, by Hand

Homemade frozen tofu. *See* Tofu, Frozen, Homemade–How to Make at Home or on a Laboratory or Community Scale, by Hand

Homemade koji. *See* Koji, Homemade–How to Make at Home or on a Laboratory or Community Scale, by Hand

Homemade miso. *See* Miso, Homemade–How to Make at Home or on a Laboratory or Community Scale, by Hand

Homemade natto. *See* Natto, Homemade–How to Make at Home or on a Laboratory Scale, by Hand

Homemade peanut butter. *See* Peanut Butter, Homemade–How to Make at Home or on a Laboratory Scale, by Hand

Homemade roasted whole soy flour (kinako). *See* Roasted Whole Soy Flour (Kinako), Homemade–How to Make at Home or on a Laboratory Scale, by Hand

Homemade soy sauce (including shoyu). *See* Soy Sauce (Including Shoyu), Homemade–How to Make at Home or on a Laboratory Scale, by Hand

Homemade soy sprouts. *See* Soy Sprouts, Homemade–How to Grow at Home or on a Laboratory Scale, by Hand

Homemade soymilk. *See* Soymilk, Homemade–How to Make at Home or on a Laboratory or Community Scale

Homemade soynut butter. *See* Soynut Butter, Homemade–How to Make at Home or on a Laboratory Scale, by Hand

Homemade tempeh. *See* Tempeh, Homemade–How to Make at Home or on a Laboratory Scale, by Hand

Homemade teriyaki sauce. *See* Teriyaki Sauce, Homemade–How to Make at Home or on a Laboratory Scale, by Hand

Homemade tofu. *See* Tofu, Homemade–How to Make at Home or on a Laboratory or Community Scale, by Hand

Homemade yuba. *See* Yuba, Homemade–How to Make at Home or on a Laboratory Scale, by Hand

Honeybees. *See* Bees

Honeymead (Mankato, Minnesota)–Cooperative. 5212, 7687

Hong Kong. *See* Asia, East–Hong Kong

Hormones from soybeans. *See* Sterols or Steroid Hormones

Horse bean. *See* Broad Bean (*Vicia faba*)

Horses, Ponies, Mules, Donkeys or Asses Fed Soybeans, Soybean Forage, or Soybean Cake or Meal as Feed. 417, 479, 584, 614, 618, 655, 668, 686, 706, 708, 709, 712, 720, 770, 812, 816, 844, 868, 932, 946, 1025, 1037, 1084, 1091, 1105, 1127, 1254, 1278, 1335, 1346, 1412, 1804, 1857, 2099, 2249, 2664, 2736, 2759

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Hyacinth Bean. *Lablab purpureus* (L.) Sweet; formerly *Dolichos lablab*. Also Called Bonavist Bean, Egyptian Kidney Bean, Egyptian Lentil. In South and Southeast Asia Called Lablab Bean. Chinese–Biandou (W.-G. Pien Tou). 576, 602, 620, 843, 918, 954, 1064, 1353, 1469, 5967

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Ink for Printing–Industrial Uses of Soy Oil as a Drying Oil. 1543, 1906, 1938, 2085, 2113, 2471, 2761, 2919, 2928, 3214, 3662, 3954, 8885, 8939, 9002, 9351, 9770, 9974, 10044, 10176, 10430, 10455

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Institut de Recherches Agronomiques Tropicales (IRAT–Tropical Institute of Agronomic Research). 9302

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Interchem Industries (Kansas). *See* Diesel Fuel, SoyDiesel, Biodiesel–Interchem

Intercropping–use of soybeans in. *See* Cropping Systems: Intercropping, Interplanting, or Mixed Cropping

International Institute of Agriculture (IIA) (Rome). 1713, 1815, 1825, 1926, 2108, 2293, 2294, 2295, 2296, 2297, 2298, 2459, 3256, 3267, 3268, 3282, 3323, 3384, 3551, 3552, 3720, 4668

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International soybean programs. *See* Asian Vegetable R&D Center (AVRDC, Taiwan), INTSOY–International Soybean Program (Univ. of Illinois, Urbana, Illinois), International Institute of Agriculture (IIA) (Rome), International Institute of Tropical Agriculture (IITA) (Ibadan, Nigeria), United Nations (Including UNICEF, FAO, UNDP, UNESCO, and UNRRA) Work with Soy, *Institut de Recherches Agronomiques Tropicales* (IRAT–Tropical Institute of Agronomic

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Internment / relocation camps in the United States. *See* Japanese the the United States–Work with Soy in Internment / Relocation Camps during World War II

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Inyu. *See* Soy Sauce–Taiwanese Black Bean Sauce (*Inyu*)

Iodine number. *See* Soy Oil Constants–Iodine Number

Iowa State University / College (Ames, Iowa), and Univ. of Iowa (Iowa City). 4184, 7835, 9025, 9490, 9674, 9693, 9810, 9893, 10029, 10125, 10132, 10139, 10191, 10194, 10197, 10208, 10243, 10329, 10330, 10631, 10661, 10973, 11381

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Island Spring, Inc. (Vashon, Washington). 6573, 6890, 7034, 7092, 7311, 7333, 7371, 7524, 7525, 7542, 7557, 7633, 8051, 8098, 8117, 8240, 8271, 8287, 8650, 8879, 9053, 10079, 11444

Isoflavone or Phytoestrogen Content of Soyfoods, Soy-based

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Products, Soy Ingredients, and Soybean Varieties (Esp. Genistein, Daidzein, and Glycitein). 8349, 9760, 10125, 10174, 10197, 10372, 10661, 10815, 11152, 11381

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Isoflavones. *See* Estrogens (in Plants–Phytoestrogens, Especially in Soybeans and Soyfoods), Including Isoflavones (Including Genistein, Daidzein, Glycetein, Coumestrol, Genistin, and Daidzin)

Isolated soy proteins. *See* Soy Proteins–Isolates

Israel. *See* Asia, Middle East–Israel and Judaism

Ito San soybean variety. *See* Soybean Varieties USA–Ito San

Ivory Coast. *See* Africa–Côte d'Ivoire

Jack Bean. *Canavalia ensiformis* (L.) D.C. Also Called Sword Bean (Erroneously; it is *Canavalia gladiata*) and Horse Bean (Rarely). Chinese–Daodou (pinyin); formerly Tao-tou (Wade-Giles). 843, 918, 954, 1562, 5967

Jackson, James Caleb (1811-1881). American Health Reformer and Vegetarian (New York). 8249

Jang–Korean-Style Fermented Soybean Paste. Includes Doenjang / Toenjang / Doen Jang / Daen Chang (Soybean Miso), and Kochujang / Koch'ujang / Gochujang / Kochu Jang / Ko Chu Jang / Kochu Chang (Red-Pepper and Soybean Paste). 946, 1002, 2384, 3124, 6208, 6395, 6433, 6545, 6548, 6731, 6810, 6825, 7046, 7060, 7276, 7695, 7703, 7718, 7754, 7809, 7878, 8450, 8680, 9267, 9374, 9851, 10389, 10468, 10610, 10718, 10920, 10989, 11109, 11148, 11168, 11169

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Japan–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics. See also Trade (International). 1445, 8889

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Japanese and Japanese-Americans in the USA–Directories. *See* Directories–Japanese and Japanese-Americans in the USA

Japanese in the United States–Work with Soy in Internment / Relocation Camps during World War II. 3742, 8981, 10066, 11227, 11384

Japanese restaurants outside Japan, or Japanese recipes that use soy ingredients outside Japan. *See* Asia, East–Japan–Japanese Restaurants or Grocery Stores Outside Japan

Jerky, Soy. Including Jerky-Flavored Soy Products. See also: Tofu, Flavored / Seasoned and Baked, Grilled, Braised or Roasted. 7003, 7479, 7907, 9621, 10859

Jerky, tofu. *See* Tofu, Flavored / Seasoned and Baked, Broiled, Grilled, Braised or Roasted

Jiang–Chinese-Style Fermented Soybean Paste / Miso (Soybean Jiang {doujiang} or Chiang / Tou Chiang [Wade-Giles]). Includes *Tuong* from Indochina, Tao-Tjiung and Tao-Tjiong from Indonesia. 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 20, 26, 56, 151, 509, 556, 649, 824, 1053, 1211, 1354, 1384, 1475, 1489, 1557, 1574, 1599, 1663, 1719, 1868, 1921, 1932, 2078, 2113, 2517, 2717, 2821, 2848, 3323, 3332, 3831, 4198, 4462, 5031, 5036, 5323, 5421, 6006, 6139, 6140, 6180, 6471, 6472, 6473, 6576, 6610, 6957, 7140, 7215, 7217, 7335, 7570, 8070, 8198, 9000, 9098, 9214, 9263, 9341, 9643, 9851, 10255, 10425, 10646, 10789, 10844, 10857, 10877, 10951, 11111, 11147, 11267, 11277, 11488

Jiang–Early Non-Soy Pase Made with Meat or Fish in China or Japan. 6

Job's Tears (*Coix lachryma-jobi;* formerly *Coix lacryma*). Called *Hatomugi* or *Hato Mugi* in Japanese, and Adlay in South Asia. Sometimes mistakenly called "Pearl Barley" (Since it is unrelated to Barley). 217, 346, 393, 514, 706, 782, 844, 891, 1025, 1465, 1466, 8552, 8621, 8858, 9027, 10062, 10283, 10645, 10718

Johannes, Kenlon. *See* Diesel Fuel, SoyDiesel, Biodiesel

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Johnson & Stokes (Philadelphia, Pennsylvania). 1011, 1039, 1051

Johnson Family of Stryker, Williams County, Ohio. Including (1) Edward Franklin "E.F. Soybean" Johnson (1889-1961) of Johnson Seed Farms (Stryker, Ohio), Delphos Grain and Soya Processing Co. (Ohio), and Ralston Purina Company (Missouri); (2) Elmer Solomon Johnson (1879-1920); (3) Perhaps E.C. Johnson and Hon. Solomon Johnson (1850-1918). 3581, 3667, 10000

Jonathan P.V.B.A. (Kapellen, Belgium). 6720, 7905, 8162, 8525, 9451, 9892, 9905, 10077, 10712

Juicer, Electric or Manual (Kitchen Appliance / Utensil)–Early Records Only. 10127, 10687

Julian, Percy (African-American Organic Chemist). See also Glidden Company. 8265

Kaempfer, Engelbert (1651-1716)–German physician and traveler. 152, 158, 183, 191, 200, 202, 203, 205, 209, 212, 215, 217, 227, 232, 233, 238, 240, 249, 251, 254, 273, 275, 300, 321, 373, 385, 389, 524, 586, 588, 589, 617, 658, 659, 662, 686, 688, 704, 708, 715, 750, 828, 975, 1050, 1173, 1416, 1453, 1454, 1496, 1690, 2226, 2306, 3214, 3833, 3898, 3907, 7217, 7342, 9211, 10779, 11488

Kahan & Lessin Co. (Los Angeles then Compton, California). Wholesale Distributor of Health Foods and Natural Foods. Formed in 1945 by Merger of Two Companies Founded in 1932 and 1935 Respectively. 5804, 6741, 9766, 9799, 10171

Kanjang / Ganjang–Korean-Style Fermented Soy Sauce. Also spelled Kan Jang / Gan Jang. 946, 1002, 1209, 4753, 5772, 6208, 6465, 6545, 6548, 6632, 6637, 6731, 6825, 7046, 7060, 7082, 7461, 7518, 7639, 7670, 7699, 7718, 7809, 7878, 7880, 8070, 8251, 8450, 8464, 8680, 8979, 9267, 10389, 10606, 10611, 10871, 10920, 10960, 10989, 10990, 11148, 11168, 11200, 11294

Kecap manis. *See* Soy Sauce, Indonesian Sweet, Kecap Manis / Ketjap Manis

Kecap, Kechap, Ketjap, Ketchup. *See* Soy Sauce, Indonesian Style or from the Dutch East Indies (Kecap, Kécap, Kechap, Ketjap, Kétjap)

Kefir / Kephir (Made From Dairy / Cow's Milk). 9919

Kefir, soy. *See* Soymilk, Fermented–Soy Kefir

Kellogg Co. (breakfast cereals; Battle Creek, Michigan). *See* Kellogg, Will Keith,... Kellogg Company

Kellogg, John Harvey (M.D.) (1852-1943), Sanitas Nut Food Co. and Battle Creek Food Co. (Battle Creek, Michigan). Battle Creek Foods Was Acquired by Worthington Foods in 1960. 669, 906, 1081, 1721, 1960, 2008, 2143, 2302, 2303, 2361, 2472, 2774, 2836, 3189, 3225, 3227, 3228, 3438, 3570, 3721, 3811, 5278, 5804, 5939, 7256, 7257, 7258, 7259, 7260, 7261, 7280, 7304, 7344, 7352, 8017, 8232, 9934, 10077, 10145, 10752, 10905, 11489, 11490

Kellogg, Will Keith (1860-1951), Kellogg's Toasted Corn Flake Co. Later Kellogg Company (of breakfast cereal fame; Battle Creek, Michigan). 4979, 5727, 7093, 7280, 8232, 10476, 10712, 10742, 10885

Kerry Ingredients (Formerly the Kerry Group). Purchased Plants from Solnuts B.V. (Tilburg, The Netherlands; and Hudson, Iowa) in Jan. 2002. Name Changed to Nutriant (Jan. 2002 to 2006), Then Changed Back to Kerry. 10978, 11172

Kesp. *See* Meat Alternatives–Kesp (Based on Spun Soy Protein Fibers)

Ketchup–Western-Style, Other, Such as Anchovy-, Apple-, Cockle-, Cockle & Mussel-, Cucumber-, English-, Grape-, Lemon-, Lobster-, Mussel-, Pontac- or Pontack-, Pudding-, Sea-, Shallot-, Tartarian-, White-, Windermere-, Wolfram-, etc. 223, 301, 331, 1761

Ketchup / Catsup / Catchup–Etymology of These Terms and Their Cognates / Relatives in Various Languages. 144, 200, 355, 389, 854, 936, 10719, 11170

Ketchup and Soy Sauce, relationship. *See* Soy Sauce and Ketchup: Key Records Concerning the Relationship between the Two

Ketchup, Catsup, Catchup, Ketchop, Ketchap, Katchup, Kitjap, etc. Word Mentioned in Document. 144, 150, 159, 171, 183, 187, 200, 201, 202, 209, 210, 223, 227, 236, 287, 301, 303, 319, 324, 331, 343, 355, 359, 386, 389, 449, 486, 493, 522, 615, 708, 735, 736, 738, 747, 774, 788, 838, 853, 854, 935, 936, 997, 1018, 1021, 1053, 1068, 1483, 1557, 1574, 1761, 1914, 2266, 2304, 3183, 3323, 4666, 4804, 5323, 5796, 5797, 6114, 6236, 6399, 6632, 6637, 6964, 7699, 7809, 8251, 8518, 9088, 9124, 9263, 9355, 9600, 10610, 10718, 10719, 11169, 11170, 11171, 11173, 11194, 11243

Ketchup, Mushroom (Mushroom Ketchup, Western-Style), or Ketchup in which Mushrooms are the Main Ingredient. 236, 301, 319, 331, 486, 493, 615, 935, 1053, 1068, 1761, 2266, 5797, 10719, 11170, 11171

Ketchup, Oyster (Oyster Ketchup, Western-Style), or Ketchup in which Oysters are the Main Ingredient. 236, 301, 319, 331, 10719, 11171

Ketchup, Tomato (Tomato / Tomata Ketchup, Western-Style), or Ketchup in which Tomatoes are the Main Ingredient. 301, 486, 935, 1053, 1068, 1761, 1914, 4804, 5796, 6114, 9263, 10611, 10719, 11169, 11170

Ketchup, Walnut (Walnut Ketchup, Western-Style), or Ketchup in which Walnuts are the Main Ingredient. 236, 301, 319, 331, 486, 935, 1068, 1761, 2266, 5797, 11170, 11171

Ketjap manis. *See* Soy Sauce, Indonesian Sweet, Kecap Manis / Ketjap Manis

Kibun. *See* Soymilk Companies (Asia)

Kidney / Renal Function. 8967, 9424, 10280

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Kikkoman Corporation (Tokyo, Walworth, Wisconsin; and Worldwide). Incl. Noda Shoyu Co. and Kikkoman International Inc., and Kikkoman Shoyu Co. 97, 98, 180, 194, 196, 197, 208, 213, 339, 524, 539, 619, 681, 685, 844, 910, 978, 999, 1106, 1107, 1429, 1432, 1433, 1434, 1482, 1531, 1577, 1584, 1663, 1729, 2004, 2010, 2116, 2200, 2259, 2310, 2340, 2378, 2399, 2400, 2465, 2467, 2524, 2557, 2586, 2587, 2588, 2589, 2590, 2592, 2596, 2597, 2599, 2615, 2617, 2719, 2725, 2729, 2976, 3084, 3085, 3096, 3117, 3251, 3281, 3391, 3421, 3426, 3435, 3458, 3505, 3510, 3514, 3540, 3568, 3579, 3585, 3615, 3638, 3639, 3640, 3660, 3661, 3664, 3666, 3668, 3670, 3699, 3714, 3773, 3774, 3796, 3820, 3826, 3830, 3834, 3835, 3845, 3854, 3855, 3860, 3864, 3865, 3868, 3901, 3914, 3915, 3916, 3917, 3920, 3930, 3938, 3960, 3963, 3964, 3968, 3969, 3974, 3983, 4002, 4030, 4031, 4047, 4048, 4050, 4055, 4056, 4079, 4094, 4095, 4116, 4122, 4130, 4138, 4141, 4157, 4182, 4211, 4214, 4217, 4260, 4263, 4275, 4303, 4310, 4311, 4312, 4318, 4332, 4351, 4352, 4353, 4370, 4372, 4383, 4384, 4385, 4393, 4394, 4395, 4427, 4428, 4429, 4441, 4444, 4445, 4456, 4468, 4472, 4483, 4484, 4486, 4488, 4494, 4497, 4506, 4510, 4511, 4524, 4540, 4541, 4552, 4570, 4576, 4590, 4592, 4605, 4606, 4615, 4617, 4620, 4624, 4649, 4651, 4652, 4655, 4657, 4658, 4661, 4665, 4675, 4705, 4726, 4739, 4755, 4758, 4761, 4763, 4769, 4775, 4776, 4777, 4804, 4805, 4808, 4832, 4843, 4844, 4854, 4880, 4976, 4982, 5030, 5035, 5040, 5086, 5105, 5141, 5144, 5157, 5170, 5195, 5206, 5214, 5328, 5340, 5354, 5360, 5362, 5376, 5378, 5380, 5381, 5391, 5392, 5411, 5425, 5429, 5441, 5457, 5464, 5475, 5476, 5482, 5485, 5494, 5514, 5515, 5517, 5522, 5525, 5526, 5527, 5530, 5532, 5533, 5536, 5541, 5552, 5553, 5556, 5567, 5585, 5602, 5608, 5609, 5651, 5656, 5658, 5667, 5668, 5694, 5695, 5697, 5708, 5723, 5724, 5743, 5744, 5750, 5751, 5771, 5778, 5783, 5800, 5822, 5824, 5830, 5831, 5838, 5845, 5856, 5859, 5874, 5875, 5886, 5893, 5903, 5908, 5913, 5921, 5922, 5970, 5974, 5977, 5981, 5982, 5983, 5988, 5998, 6008, 6009, 6013, 6024, 6031, 6065, 6069, 6074, 6075, 6089, 6091, 6103, 6107, 6114, 6122, 6123, 6152, 6153, 6170, 6171, 6172, 6179, 6188, 6202, 6218, 6221, 6222, 6227, 6231, 6239, 6274, 6298, 6312, 6319, 6333, 6366, 6414, 6434, 6446, 6463, 6477, 6478, 6548, 6549, 6552, 6565, 6585, 6617, 6618, 6620, 6624, 6638, 6653, 6684, 6695, 6743, 6744, 6782, 6789, 6790, 6810, 6814, 6817, 6818, 6819, 6854, 6863, 6866, 6887, 6889, 6971, 6972, 6973, 6995, 6999, 7009, 7010, 7013, 7035, 7070, 7078, 7090, 7107, 7108, 7119, 7120, 7128, 7132, 7170, 7209, 7210, 7212, 7216, 7218, 7219, 7230, 7238, 7269, 7295, 7312, 7325, 7369, 7370, 7372, 7387, 7423, 7425, 7426, 7430, 7433, 7442, 7451, 7461, 7468, 7471, 7518, 7539, 7557, 7573, 7599, 7600, 7604, 7648, 7653, 7654, 7659, 7663, 7689, 7718, 7741, 7752, 7753, 7757, 7758, 7761, 7762, 7787, 7809, 7811, 7821, 7822, 7827, 7846, 7849, 7866, 7873, 7885, 7908, 7918, 7921, 7943, 7953, 7961, 7966, 7967, 7983, 7993, 8028, 8057, 8070, 8090, 8097, 8180, 8191, 8205, 8221, 8234, 8285, 8340, 8342, 8363, 8409, 8425, 8426, 8462, 8464, 8473, 8474, 8602, 8603, 8607, 8618, 8625, 8635, 8636, 8644, 8713, 8721, 8729, 8737, 8738, 8751, 8762, 8791, 8793, 8796, 8803, 8810, 8836, 8837, 8838, 8841, 8886, 8890, 8891, 8917, 9019, 9035, 9042, 9046, 9077, 9079, 9080, 9087, 9088, 9091, 9092, 9093, 9110, 9127, 9166, 9200, 9238, 9265, 9277, 9299, 9338, 9343, 9360, 9385, 9403, 9405, 9412, 9419, 9423, 9434, 9470, 9471, 9472, 9572, 9583, 9599, 9600, 9642, 9723, 9737, 9772, 9776, 9792, 9827, 9840, 9850, 9851, 9880, 9929, 9940, 9958, 9978, 10015, 10026, 10030, 10079, 10086, 10115, 10173, 10196, 10262, 10294, 10305, 10306, 10323, 10333, 10347, 10363, 10385, 10389, 10401, 10425, 10428, 10429, 10436, 10437, 10451, 10452, 10468, 10485, 10500, 10517, 10520, 10524, 10537, 10541, 10542, 10543, 10544, 10555, 10606, 10612, 10618, 10668, 10689, 10697, 10778, 10810, 10819, 10903, 10929, 10932, 10952, 10969, 10971, 10990, 11006, 11012, 11035, 11036, 11056, 11079, 11084, 11090, 11101, 11111, 11120, 11135, 11147, 11172, 11180, 11186, 11200, 11203, 11204, 11246, 11248, 11264, 11273, 11313, 11325, 11337, 11347, 11384, 11391, 11425, 11446, 11447, 11449

Kinako. *See* Roasted Whole Soy Flour (Kinako–Dark Roasted with Dry Heat, Full-Fat) and Grits

Kinema (Whole Soybeans Fermented with *Bacillus subtilis* strains from Eastern Nepal, Darjeeling Hills, Sikkim, and South Bhutan). Occasionally spelled Kenima. Close relatives are from Northeast India are: *Aakhone, Akhoni, Akhuni* (Nagaland), *Bekang* (Mizoram), *Hawaijar* (Manipur), *Peruyyan* (Arunachal Pradesh), *Tungrymbai* (Meghalaya). 6018, 7557, 7563, 7804, 8134, 8293, 8301, 8309, 8337, 8518, 8651, 8661, 8665, 8668, 8678, 8680, 8979, 8984, 8987, 8992, 9124, 9851, 10015, 10182, 10474, 10539, 10619, 10871, 11001, 11054, 11112, 11255, 11351, 11355, 11387

Kiribati. *See* Oceania

Kloss, Jethro (1863-1946) and his Book *Back to Eden*. 7184, 7261, 7352, 9934, 10062, 11450

Kloss, Jethro. *See* Seventh-day Adventists–Cookbooks and Their Authors

Koji (Cereal Grains {Especially Rice or Barley} and / or Soybeans Fermented with a Mold, Especially *Aspergillus oryzae*) or Koji Starter. Chinese *Qu* / Pinyin or Ch'ü / Wade-Giles. 6, 15, 22, 26, 52, 68, 76, 126, 152, 190, 212, 215, 220, 250, 329, 503, 516, 537, 548, 554, 565, 579, 583, 608, 616, 619, 628, 634, 638, 654, 674, 681, 689, 717, 720, 732, 757, 761, 768, 769, 771, 792, 840, 844, 847, 878, 882, 883, 900, 923, 934, 944, 948, 964, 981, 988, 997, 999, 1018, 1019, 1021, 1056, 1057, 1101, 1109, 1115, 1150, 1151, 1196, 1205, 1211, 1214, 1216, 1234, 1289, 1293, 1296, 1352, 1360, 1367, 1432, 1434, 1461, 1468, 1484, 1489, 1498, 1525, 1528, 1531, 1537, 1557, 1566, 1573, 1583, 1587, 1588, 1596, 1622, 1625, 1626, 1628, 1632, 1639, 1643, 1650, 1660, 1667, 1694, 1695, 1703, 1712, 1724, 1729, 1736, 1759, 1760, 1782, 1869, 1870, 1872, 1887, 1893, 1950, 1996, 2084, 2114, 2153, 2156, 2168, 2191, 2216, 2217, 2221, 2223, 2238, 2258, 2259, 2261, 2262, 2264, 2276, 2280, 2290, 2291, 2313, 2319, 2320, 2323, 2333, 2334, 2348, 2351, 2426, 2436, 2441, 2446, 2469, 2470, 2529, 2553, 2611, 2627, 2690, 2715, 2723, 2725, 2726, 2737, 2756, 2793, 2826, 2855, 2865, 2870, 2893, 2894, 2897, 2917, 2936, 2939, 3008, 3108, 3166, 3183, 3202, 3205, 3251, 3261, 3270, 3274, 3300, 3315, 3333, 3356, 3364, 3390, 3394, 3397, 3424, 3446, 3447, 3451, 3488, 3489, 3494, 3495, 3599, 3611, 3679, 3703, 3706, 3729, 3732, 3773, 3774, 3820, 3826, 3830, 3834, 3835, 3870, 3873, 3880, 3908, 3909, 3920, 3934, 3951, 3962, 3968, 3972, 3973, 3976, 3983, 3984, 3985, 3990, 3996, 3999, 4000, 4001, 4020, 4030, 4035, 4036, 4037, 4038, 4050, 4055, 4059, 4090, 4092, 4111, 4112, 4113, 4115, 4116, 4120, 4121, 4127, 4128, 4131, 4132, 4133, 4136, 4149, 4157, 4158, 4165, 4179, 4182, 4188, 4214, 4235, 4260, 4262, 4303, 4310, 4322, 4351, 4352, 4353, 4359, 4375, 4384, 4399, 4400, 4404, 4405, 4406, 4407, 4441, 4445, 4467, 4468, 4476, 4494, 4497, 4529, 4579, 4666, 4685, 4705, 4720, 4721, 4723, 4769, 4833, 4847, 4934, 4973, 5041, 5066, 5067, 5069, 5086, 5095, 5121, 5143, 5150, 5154, 5160, 5171, 5213, 5239, 5240, 5252, 5257, 5301, 5323, 5338, 5340, 5351, 5362, 5386, 5387, 5388, 5390, 5398, 5411, 5413, 5421, 5437,

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5447, 5466, 5469, 5477, 5501, 5529, 5582, 5585, 5602, 5644, 5791, 5829, 5838, 5852, 5857, 5876, 5902, 5904, 5905, 5907, 5917, 5929, 5970, 5981, 5982, 5983, 5988, 5989, 5994, 5997, 6018, 6024, 6050, 6051, 6052, 6088, 6104, 6125, 6163, 6170, 6176, 6255, 6278, 6289, 6317, 6320, 6325, 6379, 6380, 6384, 6442, 6444, 6472, 6476, 6486, 6496, 6526, 6534, 6535, 6544, 6545, 6547, 6548, 6628, 6646, 6653, 6673, 6684, 6688, 6704, 6708, 6725, 6742, 6792, 6861, 6865, 6870, 6890, 6922, 6931, 6941, 6957, 6960, 7046, 7054, 7055, 7083, 7085, 7097, 7107, 7110, 7113, 7140, 7155, 7156, 7172, 7208, 7215, 7218, 7237, 7264, 7269, 7272, 7276, 7284, 7325, 7351, 7418, 7442, 7461, 7468, 7471, 7481, 7519, 7522, 7549, 7550, 7592, 7598, 7622, 7635, 7655, 7699, 7718, 7742, 7743, 7745, 7746, 7747, 7748, 7751, 7752, 7846, 7850, 7878, 7880, 7885, 7901, 7903, 7976, 8000, 8028, 8057, 8109, 8161, 8212, 8217, 8221, 8223, 8333, 8357, 8363, 8386, 8440, 8442, 8459, 8462, 8464, 8552, 8584, 8708, 8721, 8722, 8729, 8748, 8796, 8803, 8829, 8831, 8837, 8841, 8852, 8871, 8891, 8929, 8975, 8979, 8985, 9019, 9022, 9026, 9046, 9049, 9052, 9064, 9072, 9075, 9076, 9081, 9093, 9098, 9131, 9132, 9182, 9191, 9214, 9284, 9296, 9310, 9324, 9325, 9341, 9355, 9374, 9385, 9471, 9481, 9505, 9549, 9558, 9583, 9630, 9642, 9643, 9661, 9679, 9721, 9745, 9828, 9829, 9834, 9848, 9850, 9851, 9869, 9915, 9919, 9944, 10015, 10026, 10050, 10062, 10063, 10101, 10148, 10157, 10172, 10173, 10177, 10219, 10232, 10233, 10255, 10273, 10378, 10389, 10425, 10442, 10538, 10539, 10543, 10602, 10607, 10612, 10618, 10645, 10646, 10673, 10674, 10675, 10676, 10704, 10705, 10719, 10728, 10734, 10748, 10767, 10771, 10772, 10777, 10782, 10783, 10785, 10789, 10844, 10857, 10871, 10909, 10920, 10929, 10932, 10951, 10998, 11097, 11101, 11111, 11112, 11129, 11147, 11148, 11157, 11164, 11267, 11271, 11287, 11377, 11378, 11379, 11406, 11407, 11416, 11422, 11488

Koji Production–How to Make Koji on a Commercial Scale. 6545, 6708, 7085, 7351

Koji, Homemade–How to Make at Home or on a Laboratory or Community Scale, by Hand. 6545

Koji, Red Rice. (Also Called Fermented Red Rice, Ang-Kak / Angkak, Hongzao or Hong Qu / Hongqu in Chinese / Pinyin, Hung Ch'ü in Chinese / Wade-Giles, or Beni-Koji in Japanese). Made with the Mold *Monascus purpureus* Went, and Used as a Natural Red Coloring Agent (as with Fermented Tofu). 216, 307, 617, 750, 2030, 2651, 2889, 2924, 5421, 6736, 7082, 7769, 7809, 7909, 8092, 8244, 8255, 9846, 9847, 9935, 9997, 10177, 10269, 10290, 10389, 10516, 10607, 10857, 10871, 10989, 11334, 11377, 11378, 11379

Koji, Soybean (Soybeans Fermented with a Mold, Especially *Aspergillus oryzae*), Such as Miso-dama or Meju. 14, 26, 151, 1021, 1626, 1628, 2114, 2465, 3643, 3983, 4443, 4498, 4558, 4735, 5338, 5898, 5899, 6392, 6471, 6545, 6548, 6661, 6704, 6731, 6745, 6750, 6825, 6858, 7046, 7060, 7082, 7276, 7703, 7809, 8088, 8204, 8293, 8450, 8464, 8680, 8979, 9046, 9471, 9830, 9831, 9861, 10242, 10273, 10389, 10607, 10844, 10871, 10989, 11168, 11294

Konggaru. *See* Roasted Whole Soy Flour in Korea–K'onggaru / K'ongaru / Konggaru / Konggomul / Kong Ka Ru (Roasted with Dry Heat, Full-Fat)

Korea–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics. See also Trade (International). 8889

Korea. *See* Asia, East–Korea

Korean-style fermented soy sauce. *See* Kanjang–Korean-Style Fermented Soy Sauce

Korean-style fermented soybean paste. *See* Jang–Korean-Style Fermented Soybean Paste

Korean-style miso, etymology of. *See* Miso, Korean-Style

Korean-style natto, etymology. *See* Natto, Korean- Style

Korean-style natto. *See* Natto, Korean-Style–Chungkook-Jang / Chung Kook Jang / Chungkuk Jang

Korean-style recipes, soyfoods used in. *See* Asia, East–Korea–Soy Ingredients Used in Korean-Style Recipes

Koreans Overseas, Especially Work with Soy. 7518, 7846, 7877, 8028, 8836, 9088, 9202, 9334, 9600, 9617, 10365, 10403, 10438, 10574, 11073, 11144, 11473

Kosher / Kashrus, Pareve / Parve / Parevine–Regulations or Laws. See also: Kosher Products (Commercial). 7125, 7326, 7347, 7357, 7455, 7789, 8241, 8521, 8923, 9089, 9108, 9284, 9352, 9514, 9612, 10124

Kraft Foods Inc. (Work with Soy). Including Anderson Clayton, Boca Burger, and Balance Bar. 8240, 9077, 9107, 9475, 10312

Kudzu or Kuzu (*Pueraria montana* var. *lobata.* Formerly *Pueraria lobata, Pueraria thunbergiana, Pachyrhizus thunbergianus, Dolichos lobatus*). For Rhodesian Kudzu Vine see *Neonotonia wightii.* See also Tropical Kudzu or Puero (*Pueraria phaseoloides*). 152, 217, 333, 346, 384, 499, 513, 514, 518, 533, 559, 560, 565, 584, 596, 608, 632, 652, 670, 680, 687, 706, 708, 720, 752, 770, 786, 828, 843, 891, 947, 966, 971, 975, 1008, 1037, 1068, 1147, 1179, 1213, 1353, 1603, 1732, 1813, 1897, 1993, 2527, 2644, 2655, 2670, 2734, 4663, 4718, 4922, 5110, 5137, 5185, 5242, 5632, 5648, 5650, 5663, 5683, 5779, 5780, 5894, 5904, 5909, 5989, 5990, 5991, 5999, 6041, 6059, 6088, 6292, 6360, 6379, 6380, 6436, 6546, 6628, 6691, 6722, 6727, 6845, 7011, 7058, 7076, 7172, 7230, 7237, 7339, 7519, 7626, 7637, 7677, 7719, 7785, 8165, 8195, 8552, 8701, 8714, 8904, 9461, 9540, 9562, 9872, 9874, 9888, 9932, 9988, 10062, 10112, 10153, 10170, 10190, 10220, 10283, 10307, 10334, 10384, 10466, 10635, 10645, 10659, 10694, 10719, 11169, 11326

Kuki. *See* Fermented Black Soybeans from Japan–Kuki

Kushi, Michio and Aveline–Their Life and Work with Macrobiotics, and Organizations They Founded or Inspired. 3858, 4491, 5185, 5245, 5271, 5322, 5384, 5488, 5558, 5632, 5837, 5843, 5844, 5848, 5850, 5905, 5960, 5961, 5962, 6059, 6096, 6098, 6132, 6135, 6155, 6156, 6168, 6170, 6171, 6177, 6310, 6320, 6360, 6380, 6571, 6688, 6691, 6714, 6715, 6720, 6760, 6843, 6877, 6892, 6897, 6909, 6948, 6998, 7011, 7028, 7137, 7145, 7148, 7155, 7172, 7250, 7332, 7365, 7366, 7367, 7462, 7465, 7466, 7475, 7481, 7482, 7486, 7491, 7510, 7511, 7543, 7588, 7618, 7619, 7624, 7631, 7701, 7709, 7729, 7731, 7742, 7743, 7744, 7745, 7746, 7814, 7880, 7900, 7968, 8007, 8008,

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Linolenic Acid–Omega-3 (Alpha-Linolenic Acid) Fatty Acid Content of Soybeans and Soybean Products. 8885, 10062, 10251, 10492, 10688

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Linoleum, Floor Coverings, Oilcloth, and Waterproof Goods–Industrial Uses of Soy Oil as a Drying Oil. 1371, 1489, 1796, 1806, 1827, 1896, 1906, 1938, 1968, 1991, 2016, 2085, 2113, 2170, 2177, 2182, 2255, 2357, 2433, 2471, 2496, 2735, 2761, 2919, 2928, 2929, 3214, 3323, 3346, 3349, 3662, 5294, 8939, 9002, 9351, 10176

Linseed Oil, Linseed Cake / Meal, or the Flax / Flaxseed Plant (*Linum usitatissimum* L.). 486, 514, 598, 614, 623, 627, 665, 676, 787, 824, 829, 875, 888, 913, 965, 983, 984, 1017, 1166, 1233, 1303, 1333, 1350, 1358, 1371, 1372, 1374, 1376, 1384, 1442, 1445, 1464, 1477, 1496, 1509, 1527, 1543, 1599, 1671, 1683, 1687, 1697, 1719, 1789, 1803, 1804, 1819, 1884, 1920, 1931, 1956, 2046, 2055, 2108, 2130, 2152, 2218, 2237, 2277, 2293, 2296, 2297, 2298, 2370, 2639, 2642, 2928, 2929, 3146, 3151, 3551, 3645, 3662, 3669, 3846, 4117, 4137, 4203, 4282, 4464, 4474, 4790, 4842, 5011, 6096, 6106, 6306, 7687, 8232, 8939, 9907, 10176, 10461

Lipid and Fatty Acid Composition of Soybeans (Seeds or Plant), or Soybean Products (Including Soy Oil). 512, 562, 570, 595, 604, 626, 634, 649, 672, 675, 683, 708, 740, 754, 758, 768, 812, 849, 997, 1125, 1130, 1144, 1306, 1327, 1469, 1489, 1533, 1551, 1974, 2039, 2506, 2630, 2679, 2922, 2942, 3029, 3125, 3146, 3178, 3733, 3761, 4009, 4533, 4568, 4713, 5007, 5012, 5069, 5941, 5951, 6054, 6055, 6121, 6392, 6484, 6485, 6496, 6604, 6659, 6660, 6661, 6704, 6766, 6835, 7020, 7456, 7467, 7506, 8502, 8544, 8683, 9027, 9168, 9319, 9632, 10567

Lipids–Effects of Dietary Lipids (Especially Soy Oil and Lecithin) on Blood Lipids (Especially Cholesterol). 1122, 6130, 7467, 8329, 9112

Lipids. *See* Linolenic Acid–Omega-3, Linolenic Acid and Linolenate

Lipolytic enzymes in the soybean. *See* Enzymes in the Soybean–Lipoxygenase and Its Inactivation

Lipoxygenase. *See* Enzymes in the Soybean–Lipoxygenase and Its Inactivation

Lists and Descriptions (Official and / or Extensive) of Early U.S. Soybean Varieties with Their P.I. Numbers and Synonyms. 1190, 1318, 1453, 1906, 2226, 2479, 3240, 3389, 3511, 3628, 4362, 6735, 8844, 9209

Llama Toucan & Crow. *See* Stow Mills, Inc.

Lock-soy. *See* Rice Vermicelli

Loma Linda Foods (Riverside, California). Named La Loma Foods from Feb. 1989 to Jan. 1990. Acquired by Worthington Foods in Jan. 1990. 3919, 4434, 4460, 4736, 5104, 5109, 5165, 5278, 5645, 5783, 5841, 6334, 6344, 6383, 6570, 6880, 6980, 7016, 7168, 7229, 7251, 7259, 7260, 7261, 7352, 7353, 7513, 7642, 7644, 9451, 9517, 9934, 10077, 10079, 10712, 11486

Loma Linda University (Loma Linda, California). Including Loma Linda Hospital (Formerly named Loma Linda Sanitarium and College of Medical Evangelists). 4736, 5278, 7254, 7260, 8139, 8167, 11423

Los Angeles–City and County–Work with Soyfoods, Natural / Health Foods, and / or Vegetarianism. 1219, 1500, 1894, 2268, 2332, 2361, 2551, 2751, 2843, 2906, 3141, 3154, 3345, 3842, 3858, 4024, 4049, 4509, 4616, 4663, 4922, 4961, 5105, 5137, 5159, 5178, 5200, 5271, 5325, 5473, 5648, 5804, 5905, 5927, 5962, 6008, 6096, 6097, 6098, 6128, 6132, 6154, 6360, 6380, 6383, 6544, 6570, 6631, 6672, 6673, 6674, 6681, 6685, 6691, 6864, 6871, 6874, 6954, 6996, 7032, 7071, 7072, 7073, 7074, 7075, 7076, 7125, 7146, 7192, 7337, 7424, 7470, 7565, 7587, 7623, 7644, 7735, 7750, 7763, 7782, 7814, 7817, 7833, 7847, 7930, 7931, 8241, 8286, 8339, 8389, 8391, 8472, 8514, 8535, 8540, 8551, 8554, 8559, 8568, 8570, 8598, 8606, 8623, 8627, 8628, 8643, 8660, 8714, 8717, 8740, 8771, 8790, 8811, 8864, 8874, 8887, 8907, 8937, 9008, 9028, 9029, 9036, 9042, 9048, 9055, 9071, 9090, 9091, 9114, 9132, 9139, 9143, 9161, 9162, 9174, 9175, 9181, 9189, 9198, 9202, 9203, 9204, 9205, 9206, 9207, 9210, 9215, 9218, 9219, 9221, 9229, 9230, 9231, 9235, 9244, 9245, 9249, 9269, 9270, 9271, 9279, 9283, 9300, 9340, 9343, 9352, 9366, 9367, 9379, 9388, 9390, 9393, 9402, 9410, 9415, 9429, 9431, 9435, 9437, 9441, 9443, 9446, 9451, 9475, 9489, 9495, 9508, 9518, 9528, 9529, 9555, 9563, 9581, 9588, 9592, 9593, 9597, 9598, 9599, 9616, 9662, 9692, 9751, 9752, 9756, 9766, 9799, 9872, 9873, 9874, 9878, 9879, 9894, 9904, 9920, 9925, 9945, 9946, 9964, 9979, 10004, 10005, 10033, 10034, 10038, 10040, 10076, 10089, 10119, 10122, 10143, 10154, 10155, 10156, 10164, 10165, 10171, 10183, 10210, 10222, 10227, 10228, 10240, 10252, 10287, 10300, 10314, 10315, 10337, 10338, 10339, 10344, 10345, 10350, 10356, 10365, 10367, 10379, 10403, 10410, 10411, 10418, 10427, 10431, 10438, 10444, 10445, 10449, 10456, 10462, 10463, 10469, 10483, 10509, 10514, 10519, 10524, 10530, 10548, 10552, 10553, 10554, 10556, 10559, 10560, 10561, 10565, 10572, 10573, 10574, 10596, 10636, 10643, 10644, 10650, 10669, 10673, 10679, 10680, 10692, 10699, 10721, 10752, 10758, 10761, 10771, 10780, 10788, 10799, 10848, 10850, 10886, 10899, 10924, 10968, 10974, 11022, 11040, 11052, 11074, 11128, 11133, 11199, 11305, 11383, 11469, 11473, 11483, 11485, 11486, 11488, 11490

Low cost extrusion cookers. *See* Extruders and Extrusion Cooking: Low Cost Extrusion Cookers (LECs)

Low-cost extrusion cookers. *See* Extruders and Extrusion Cooking, Low Cost

Lubricants, Lubricating Agents, and Axle Grease for Carts–Industrial Uses of Soy Oil as a Non-Drying Oil. 614, 1233, 1346, 1475, 1527, 1796, 1827, 1896, 1906, 1921, 1938, 1975, 1991, 2016,

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2113, 2255, 2401, 2717, 2735, 2761, 3077, 3214, 3349

Lucerne / lucern. *See* Alfalfa or Lucerne

Lukoskie, Luke. *See* Island Spring, Inc. (Vashon, Washington)

Lupins or Lupin (Also spelled Lupine, Lupines, Lupinseed; *Lupinus albus, L. angustifolius, L. luteus, L. mutabilis*). 152, 158, 212, 249, 300, 321, 416, 441, 496, 514, 541, 570, 576, 588, 589, 598, 602, 608, 673, 688, 691, 704, 709, 715, 720, 770, 790, 840, 841, 847, 870, 907, 917, 1065, 1091, 1207, 1416, 1454, 1543, 1813, 1870, 2315, 2527, 3282, 9371, 10719, 10872

Lust, Benedict (1872-1945), Louise Stroebel Lust (1868-1925; his wife) and Louis Lust. Pioneers in Naturopathy in the United States (New York City; "Yungborn," Butler, New Jersey; Tangerine, Florida). 1113, 6158

Lysinoalanine (LAL)–An Unusual, Toxic Amino Acid Created by Severe Alkali Processing of Food Proteins (As in Spun Protein Fibers). 6480, 7551, 8905

MSG (Monosodium Glutamate, the Sodium Salt of Glutamic Acid). 2433, 2660, 2812, 3182, 3224, 3346, 3349, 3425, 3502, 3523, 3618, 3751, 3756, 3826, 3831, 3856, 3869, 4124, 4137, 4166, 4391, 4559, 4600, 4666, 4764, 4983, 5031, 5086, 5394, 5460, 5655, 5658, 5781, 5996, 6171, 6301, 6784, 6896, 7161, 7233, 7345, 7378, 7691, 8987, 9002, 9132, 9176, 9196, 9263, 9343, 10224, 10468, 10688, 11261, 11315

Macao / Macau. *See* Asia, East–Macao / Macau (Portuguese Colony)

Machinery (Agricultural), Implements, Equipment, and Mechanization (Binders, Cultivators, Cutters, Harvesters, Mowers, Pickers, Planters, Reapers, Separators, Thrashers, or Threshers). See also: Combines and Tractors. 444, 446, 848, 888, 905, 919, 980, 983, 1011, 1257, 1318, 1555, 1574, 2243, 3673, 3811, 4215, 4901, 6106, 10044, 10119, 10227, 10382, 10629, 10803

Machinery, farm. *See* Combines

Macrobiotic Cookbooks. 4603, 4604, 4663, 4922, 5110, 5137, 5242, 5325, 5384, 5505, 5632, 5648, 5779, 5837, 5839, 5842, 5848, 5888, 5904, 5909, 5927, 5989, 5990, 5991, 5992, 5998, 6088, 6104, 6125, 6126, 6132, 6154, 6234, 6292, 6379, 6380, 6395, 6401, 6545, 6547, 6548, 6571, 6760, 6892, 6958, 7011, 7058, 7076, 7172, 7226, 7237, 7332, 7598, 7620, 7631, 7677, 7693, 7737, 7867, 7880, 7968, 7974, 8299, 8446, 8459, 8516, 8552, 8653, 8704, 8715, 8800, 8806, 9141, 9540, 10062, 10069, 10162, 10251, 10569, 10582, 10688, 10897, 11021, 11107, 11145, 11148, 11254, 11260, 11300, 11434

Macrobiotics–Criticisms of its Dietary Philosophy and Practice. 3858, 7900

Macrobiotics. *See* Aihara, Herman and Cornellia–Their Life and Work, Kushi, Michio and Aveline–Their Life and Work, Muramoto, Noboru–His Life and Work, Ohsawa, George and Lima

Macrobiotics. See also: George Ohsawa, Michio and Aveline Kushi, Herman and Cornellia Aihara. 148, 3858, 4280, 4298, 4491, 4603, 4604, 4610, 4662, 4663, 4806, 4858, 4866, 4922, 4964, 5110, 5120, 5130, 5137, 5159, 5174, 5175, 5185, 5200, 5242, 5245, 5271, 5322, 5325, 5384, 5488, 5505, 5506, 5523, 5558, 5568, 5583, 5593, 5594, 5595, 5632, 5648, 5662, 5663, 5683, 5752, 5753, 5779, 5802, 5804, 5837, 5839, 5842, 5843, 5844, 5847, 5848, 5850, 5857, 5888, 5904, 5905, 5909, 5927, 5960, 5961, 5962, 5963, 5989, 5990, 5991, 5992, 5998, 6033, 6037, 6041, 6053, 6059, 6088, 6096, 6097, 6098, 6101, 6104, 6125, 6126, 6132, 6135, 6154, 6158, 6168, 6170, 6171, 6172, 6177, 6234, 6237, 6278, 6292, 6310, 6320, 6360, 6362, 6377, 6379, 6380, 6384, 6387, 6393, 6394, 6395, 6396, 6401, 6427, 6440, 6533, 6534, 6535, 6545, 6547, 6548, 6571, 6641, 6651, 6654, 6658, 6688, 6691, 6714, 6715, 6720, 6760, 6809, 6827, 6843, 6845, 6877, 6881, 6892, 6897, 6909, 6946, 6948, 6950, 6958, 6967, 6998, 7004, 7011, 7017, 7028, 7058, 7064, 7076, 7110, 7126, 7137, 7145, 7148, 7155, 7156, 7172, 7204, 7226, 7236, 7237, 7250, 7284, 7285, 7318, 7332, 7350, 7365, 7366, 7367, 7462, 7465, 7466, 7475, 7481, 7482, 7484, 7486, 7490, 7491, 7504, 7510, 7511, 7515, 7519, 7521, 7522, 7543, 7563, 7588, 7598, 7605, 7616, 7618, 7619, 7620, 7622, 7624, 7626, 7631, 7635, 7636, 7637, 7677, 7693, 7701, 7709, 7722, 7729, 7731, 7737, 7742, 7743, 7744, 7745, 7746, 7748, 7749, 7751, 7752, 7754, 7775, 7784, 7786, 7789, 7813, 7814, 7861, 7862, 7867, 7880, 7900, 7901, 7929, 7968, 7974, 7991, 7992, 8007, 8008, 8010, 8047, 8048, 8070, 8102, 8161, 8164, 8165, 8166, 8171, 8195, 8246, 8264, 8283, 8299, 8300, 8333, 8343, 8344, 8345, 8357, 8389, 8416, 8446, 8447, 8459, 8484, 8490, 8516, 8525, 8552, 8558, 8576, 8594, 8616, 8620, 8626, 8633, 8642, 8643, 8653, 8675, 8704, 8715, 8772, 8778, 8800, 8806, 8840, 8884, 8900, 8904, 8920, 8998, 9009, 9026, 9027, 9028, 9048, 9049, 9052, 9058, 9105, 9110, 9141, 9159, 9160, 9178, 9182, 9191, 9198, 9199, 9210, 9216, 9217, 9219, 9291, 9296, 9297, 9298, 9310, 9329, 9339, 9355, 9368, 9391, 9394, 9396, 9418, 9419, 9422, 9451, 9514, 9540, 9546, 9553, 9558, 9566, 9608, 9670, 9672, 9673, 9679, 9735, 9736, 9737, 9745, 9750, 9766, 9785, 9799, 9800, 9801, 9802, 9817, 9861, 9864, 9870, 9872, 9873, 9874, 9878, 9884, 9885, 9888, 9889, 9890, 9892, 9894, 9895, 9896, 9899, 9900, 9901, 9902, 9903, 9905, 9909, 9910, 9911, 9912, 9914, 9915, 9916, 9924, 9932, 9977, 9988, 9992, 10003, 10019, 10031, 10035, 10038, 10062, 10069, 10072, 10112, 10113, 10117, 10123, 10124, 10127, 10130, 10148, 10156, 10162, 10170, 10171, 10179, 10185, 10214, 10219, 10220, 10222, 10229, 10230, 10231, 10250, 10251, 10254, 10263, 10272, 10278, 10279, 10281, 10282, 10283, 10288, 10292, 10307, 10318, 10324, 10326, 10334, 10358, 10386, 10413, 10415, 10420, 10422, 10440, 10448, 10459, 10466, 10518, 10524, 10525, 10550, 10569, 10570, 10582, 10625, 10632, 10633, 10635, 10645, 10649, 10650, 10673, 10674, 10675, 10676, 10687, 10688, 10691, 10694, 10695, 10696, 10698, 10703, 10704, 10705, 10712, 10764, 10765, 10766, 10770, 10771, 10772, 10775, 10782, 10783, 10802, 10873, 10885, 10897, 10907, 10948, 10958, 10979, 11021, 11026, 11073, 11107, 11132, 11145, 11148, 11176, 11178, 11183, 11193, 11254, 11260, 11287, 11291, 11300, 11326, 11335, 11336, 11338, 11341, 11342, 11352, 11360, 11365, 11366, 11367, 11368, 11369, 11370, 11371, 11373, 11374, 11376, 11384, 11390, 11392, 11408, 11422, 11434, 11488

Madison Foods and Madison College (Madison, Tennessee). Madison Foods (Then a Subsidiary of Nutritional Corp.) Was Acquired by Worthington Foods in Aug. 1964. 2963, 3079, 3438, 3570, 3740, 4376, 4398, 4506, 5610, 5939, 7184, 7249, 7254, 7280, 7291, 7352, 8139, 8167, 9934, 11448, 11486

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Maggi (Kempthal / Kemptal, Switzerland). 768, 846, 1216, 1496, 1870, 2474, 2484, 3391, 7362

Mainland Express (Spring Park, Minnesota). Div. of Goods, Inc. Named Tofu, Inc. and Eastern Foods, Inc., Minneapolis, Minnesota, from 1978 to March 1989. 7525, 8404, 8885, 11444

Maize. *See* Corn / Maize

Malnutrition Matters (Ottawa, Ontario, Canada). Non-Profit Organization. Founded in 2000 by Frank Daller and Brian Herrigan. 11339, 11448

Malnutrition, hunger, famine, and food shortages. *See* Hunger, Malnutrition, Famine, Food Shortages, and Mortality

Mame-maki. *See* Roasted / Parched Soybeans (*Irimame*)

Mammoth Yellow soybean variety. *See* Soybean Varieties USA–Mammoth Yellow

Manchu soybean variety. *See* Soybean Varieties USA–Manchu

Manchuria–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics. See also Trade (International). 1026, 1265, 1445, 2130, 2356

Manchuria. *See* Asia, East–Manchuria

Manna Foods, Inc. (Scarborough, Ontario, Canada). 6641, 6741, 7465

Manna Natural Foods (Amsterdam, The Netherlands). Named Stichting Natuurvoeding Amsterdam until 1982. Absorbed by Akwarius Almere in 1987. 7905, 8162, 9310, 9355, 9368, 9389, 9735, 10117

Map / Maps. 15, 258, 379, 393, 507, 574, 786, 1011, 1173, 1231, 1232, 1245, 1249, 1265, 1269, 1283, 1287, 1316, 1323, 1376, 1398, 1414, 1475, 1542, 1574, 1698, 1766, 1803, 1906, 2243, 2957, 3303, 3585, 3617, 3646, 3761, 3831, 3896, 4362, 4736, 5034, 5105, 5212, 5213, 5238, 5687, 5780, 5853, 6018, 6053, 6075, 6149, 6379, 6656, 6794, 6796, 6931, 7055, 7188, 7270, 7277, 7416, 7597, 8064, 8080, 8301, 8445, 8448, 8569, 8942, 9684, 9868, 9932, 9957, 10153, 10166, 10343, 10381, 10445, 10497, 10565, 10570, 10581, 10609, 10678, 10725, 11475

Maple Leaf Foods. *See* CanAmera Foods (Hamilton, Ontario, Canada)

Maple Leaf Monarch or Maple Leaf Mills. *See* ADM Agri-Industries Ltd. (Windsor, Ontario, Canada)

Margarine–Etymology of This Term and Its Cognates / Relatives in Various Languages. 1687, 4282, 4283, 7783

Margarine Made with Soy Oil. 1309, 1319, 1475, 1480, 1489, 1687, 1719, 1784, 1806, 1857, 1896, 1906, 1921, 1991, 2051, 2071, 2173, 2177, 2186, 2251, 2357, 2433, 2558, 2735, 2928, 2929, 3617, 3662, 3689, 3748, 3783, 5468, 5479, 6130, 6786, 8569, 10248, 10381, 10383, 10497, 10575, 10825

Margarine Made without Soy Oil. 665, 676, 829, 2203, 7582

Margarine. 1847, 1867, 1887, 1914, 1968, 2016, 2152, 2226, 2255, 2277, 2432, 2471, 2484, 2777, 2845, 2913, 2919, 3323, 3346, 3349, 3425, 3740, 3748, 3779, 3803, 3954, 4107, 4282, 4283, 4414, 4629, 4764, 4848, 4864, 4869, 4904, 5052, 5082, 5277, 5282, 5290, 5294, 5365, 5458, 5935, 6306, 6453, 6523, 7093, 7188, 7771, 7783, 8020, 8091, 8283, 8850, 9657, 9684, 9694, 9750, 10010, 10492, 10719

Market statistics on soybean production. *See* Soybean Production and Trade–Industry and Market Statistics,

Market statistics. *See* the specific product concerned, e.g. Tofu Industry and Market Statistics

Market studies. *See* Industry and Market Analyses

Marketing–Soyfoods and Soyfood Products. 3615, 4669, 5002, 5168, 5830, 6164, 6822, 6824, 7078, 7173, 7429, 8289, 8477, 8491, 8530, 8747, 8768, 8926, 9042, 9408, 9937

Marketing Soybeans, Market Development, and Economics (Including Futures Markets, Hedging, and Mathematical Models). 1419, 1697, 1890, 2074, 2425, 2601, 2608, 2716, 2755, 2777, 2796, 2845, 2873, 2956, 2957, 2975, 2987, 3206, 3207, 3302, 3304, 3306, 3314, 3375, 3482, 3634, 3646, 4187, 4227, 4236, 4240, 4246, 4248, 4306, 4492, 4544, 4742, 4745, 4751, 4848, 4859, 4864, 4870, 4913, 4915, 4963, 5013, 5033, 5056, 5075, 5099, 5102, 5173, 5190, 5193, 5197, 5288, 5296, 5472, 5479, 5549, 5557, 5569, 5579, 5600, 5606, 5702, 5789, 5834, 5862, 5944, 6000, 6095, 6106, 6212, 6224, 6230, 6497, 6507, 6508, 6527, 6622, 6669, 6670, 6682, 6686, 6730, 6779, 6923, 7089, 7173, 7188, 7288, 7299, 7320, 7340, 7375, 7421, 7581, 7591, 7679, 7685, 7818, 8026, 8033, 8123, 8174, 8601, 8703, 8728, 8746, 8754, 8812, 8842, 8868, 8872, 8885, 8888, 8977, 8995, 9023, 9103, 9109, 9117, 9188, 9290, 9301, 9349, 9373, 9497, 9502, 9574, 9657, 9705, 9818, 9856, 9893, 10020, 10044, 10074, 10087, 10138, 10139, 10140, 10151, 10186, 10191, 10194, 10208, 10237, 10368, 10507, 10575, 10863, 11083, 11419

Marketing of soyfoods. *See* Individual foods, e.g., Tofu–Marketing of

Marketing soybeans. *See* Chicago Board of Trade

Markets and Crop Estimates, Bureau of. *See* United States Department of Agriculture (USDA)–Bureau of Agricultural Economics

Marshall Islands. *See* Oceania–Marshall Islands

Marusan-Ai. *See* Soymilk Companies (Asia)

Massachusetts. *See* United States–States–Massachusetts

Maturity groups. *See* Soybean–Physiology and Biochemistry–Maturity Groups

Mauritius. *See* Africa–Mauritius (Ile Maurice)

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McCay, Clive M. and Jeanette (Cornell Univ.). 3689, 3727, 4458, 10752

McCoy, Frank (thrived 1923-1940). Health Foods Author, Lecturer and Radio Personality, and Drugless Physician. 2551, 2843

Meal or cake, soybean. *See* Soybean Meal

Meals for Millions Foundation (Los Angeles, California), Multi-Purpose Food (MPF), and Freedom from Hunger. 3766, 4024, 4049, 4348, 4350, 4386, 4433, 4509, 4551, 4616, 4695, 4745, 4961, 4970, 5097, 5126, 5343, 5596, 5642, 5689, 5823, 6984, 7919, 11469

Meals, vegetarian or vegan, served at institutions. *See* Vegetarianism–Vegetarian or Vegan Meals Served at Institutions

Meat Alternatives (Traditional Asian)–Ganmodoki and Hiryozu (Deep-Fried Tofu Burgers and Treasure Balls). 717, 1095, 2331, 2538, 2727, 3949, 4206, 4466, 4570, 4688, 5038, 5213, 5222, 5225, 5226, 5227, 5819, 5897, 5909, 5991, 6043, 6101, 6170, 6172, 6174, 6232, 6292, 6376, 6395, 6401, 6402, 6404, 6476, 6628, 6637, 6646, 6807, 6914, 6958, 7003, 7011, 7059, 7083, 7230, 7434, 7449, 7557, 7771, 7851, 7937, 7962, 7972, 8046, 8087, 8204, 8211, 8299, 8455, 8480, 8591, 8706, 8714, 8724, 8727, 8748, 8756, 8860, 8946, 9421, 9480, 9827, 9836, 9846, 9891, 9917, 9962, 10103, 10367, 10719, 10737, 10788, 10875, 10899, 10931, 10962, 10984, 11260, 11400, 11486

Meat Alternatives (Traditional Asian)–Made from Yuba (Such as Buddha's Chicken, Buddha's Ham, or Buddha's Duck). 5781, 6395, 6397, 8545, 11260

Meat Alternatives–Beef Alternatives, Including Meatless Beef Jerky, Chili Con Carne, Goulash, Lasagna, Meat Balls, Mince, Mincemeat, Sloppy Joes, Spaghetti Sauce, Steak, Veal, etc. See also Meatless Burgers. 5632, 7003, 7479, 7907, 8318, 9621, 10859

Meat Alternatives–Commercial Products (Meatlike Meatless Meat, Poultry, or Fish / Seafood Analogs. See Also Meat Extenders). 8681, 9058

Meat Alternatives–Documents About (Meatlike Meatless Meat, Poultry, or Fish / Seafood Analogs. See Also Meat Extenders). 3689, 5095, 5632, 5746, 5810, 6157, 6160, 6165, 6254, 6394, 6815, 7276, 7693, 7763, 8318, 8552, 8656, 8806, 8875, 8896, 8904, 9002, 9057, 9198, 9210, 9216, 9217, 9219, 9310, 9369, 9375, 9389, 9422, 9779, 9877, 9888, 9896, 9909, 9911, 9914, 10162

Meat Alternatives–General and Other Meatless Meatlike Products. See Also Meat Extenders. 5685, 6720, 6795, 6897, 8444, 8946, 10324

Meat Alternatives–Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 10551

Meat Alternatives–Industry and Market Statistics, Trends, and Analyses–Individual Companies. 9517

Meat Alternatives–Kesp (Based on Spun Soy Protein Fibers). See Also Meat Extenders. 6439, 9730

Meat Alternatives–Meatless Bacon, Bacon Bits, Ham, Chorizo, and Other Pork-related Products. See also Meatless Sausages. 2148, 2149, 2478, 5448, 5783, 6303, 6395, 6401, 8017, 9633, 9762, 9916, 10038, 10102, 10245, 11260

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Meharry, Charles Leo (1885-1937), the A.P. Meharry Farms (One Near Tolono, Champaign County, Illinois, and Three in Indiana), and William E. Riegel, Meharry Farm Manager and Independent Soybean Grower in Tolono, Illinois. 2373, 3667, 5372, 10884

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Messina, Mark (PhD) and Virginia (MPH, RD) (Nutrition Matters, Inc., Port Townsend, Washington state). World's leading expert on soy nutrition. 9702, 9941, 10071, 10194, 10211, 10239, 10319, 10327, 10405, 10406, 10423, 10426, 10501, 10513, 10526, 10527, 10978, 11322

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Meyer, Frank N. (1875-1918). USDA Plant Explorer in Asia. 1045, 1190, 1220, 1254, 1275, 1278, 1325, 1353, 1732, 1803, 1845, 1934, 1935, 2008, 2032, 2113, 2242, 2243, 2255, 3467, 3468, 3743, 3810, 3811, 3893, 8064, 8172, 8844, 9336, 10358, 10497, 10557, 10558, 10752, 11491

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MicroSoy Corporation (Jefferson, Iowa; Osaka, Japan). Formerly Nichii Co. and MYCAL Corp. 7189, 7928, 8506, 8802, 9333, 9476, 9487, 9488, 9526, 9527, 9537, 9559, 9569, 9570, 9605, 9663, 9666, 9685, 9690, 9691, 9693, 9697, 9698, 9699, 9700, 9701, 9739, 9768, 9807, 9808, 9810, 9868, 9947, 9973, 10025, 10029, 10041, 10073, 10141, 10234, 10954, 10964, 11103, 11231, 11238, 11266, 11431

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Middle America. *See* Latin America–Central America; and Latin America–Caribbean or West Indies, Latin America, Central

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America, and Latin America, Caribbean or West Indies

Midwest Natural Foods Distributors, Inc. (Ann Arbor, Michigan). 5594, 6741, 8047, 9801, 9977

Migros & Conserves Estavayer (Estavayer-le-Lac, Switzerland). 7775, 7905, 8162, 8168, 8405

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Miller, Harry W. (M.D.) (1879-1977) and International Nutrition Laboratory (Mt. Vernon, Ohio). 3228, 3586, 3657, 3693, 3721, 3722, 3736, 3756, 3800, 3803, 3826, 3919, 4186, 4273, 4350, 4376, 4431, 4434, 4446, 4460, 4502, 4629, 4653, 4736, 4753, 4908, 4953, 5167, 5178, 5182, 5278, 5555, 5610, 5645, 5841, 5939, 6334, 6344, 6383, 6395, 6401, 6403, 6570, 6664, 6958, 7003, 7168, 7229, 7249, 7254, 7256, 7257, 7258, 7259, 7260, 7261, 7280, 7291, 7344, 7479, 7489, 7642, 7770, 7867, 7907, 8010, 8014, 8017, 8091, 8998, 9370, 9556, 9567, 9621, 9934, 10582, 10859, 10897, 11145, 11260, 11340, 11434, 11448, 11484, 11486, 11489, 11490

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4374, 4382, 4383, 4388, 4390, 4406, 4436, 4442, 4443, 4450, 4453, 4457, 4459, 4462, 4463, 4466, 4470, 4472, 4476, 4485, 4489, 4490, 4491, 4492, 4498, 4506, 4515, 4521, 4526, 4529, 4542, 4549, 4550, 4551, 4554, 4555, 4556, 4557, 4558, 4559, 4565, 4567, 4569, 4578, 4579, 4586, 4591, 4595, 4600, 4603, 4604, 4606, 4607, 4619, 4621, 4622, 4627, 4636, 4662, 4663, 4666, 4685, 4688, 4700, 4701, 4703, 4707, 4713, 4714, 4715, 4716, 4717, 4722, 4723, 4724, 4731, 4735, 4738, 4743, 4746, 4747, 4751, 4752, 4753, 4764, 4767, 4771, 4795, 4800, 4801, 4803, 4804, 4805, 4806, 4817, 4826, 4832, 4847, 4859, 4877, 4881, 4893, 4894, 4902, 4904, 4905, 4906, 4909, 4912, 4916, 4917, 4922, 4923, 4924, 4932, 4933, 4934, 4935, 4936, 4940, 4943, 4947, 4948, 4957, 4962, 4979, 4982, 4983, 4986, 5005, 5013, 5030, 5035, 5036, 5037, 5038, 5040, 5041, 5047, 5058, 5059, 5060, 5061, 5062, 5063, 5064, 5067, 5069, 5071, 5082, 5089, 5090, 5095, 5100, 5102, 5107, 5110, 5116, 5120, 5122, 5124, 5125, 5129, 5130, 5132, 5133, 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10434, 10435, 10442, 10445, 10447, 10449, 10456, 10468, 10471, 10476, 10481, 10491, 10492, 10493, 10501, 10508, 10522, 10523, 10528, 10529, 10534, 10536, 10538, 10539, 10542, 10551, 10562, 10567, 10571, 10575, 10582, 10589, 10598, 10600, 10605, 10606, 10608, 10611, 10613, 10617, 10618, 10620, 10621, 10625, 10635, 10641, 10645, 10646, 10659, 10660, 10662, 10666, 10667, 10668, 10672, 10673, 10674, 10675, 10676, 10688, 10691, 10694, 10695, 10696, 10698, 10703, 10704, 10705, 10706, 10707, 10710, 10711, 10718, 10719, 10720, 10722, 10723, 10726, 10727, 10729, 10731, 10736, 10737, 10738, 10745, 10748, 10750, 10760, 10764, 10765, 10766, 10767, 10769, 10770, 10772, 10773, 10774, 10775, 10777, 10781, 10782, 10783, 10785, 10789, 10793, 10812, 10828, 10840, 10854, 10864, 10866, 10867, 10869, 10871, 10874, 10875, 10876, 10878, 10879, 10887, 10897, 10907, 10920, 10927, 10929, 10931, 10935, 10937, 10938, 10939, 10940, 10941, 10942, 10946, 10949, 10951, 10955, 10956, 10958, 10960, 10966, 10973, 10976, 10984, 10986, 10987, 10988, 10990, 10998, 11016, 11017, 11025, 11026, 11046, 11050, 11057, 11058, 11061, 11065, 11075, 11080, 11088, 11095, 11100, 11103, 11107, 11109, 11120, 11124, 11129, 11139, 11145, 11146, 11147, 11148, 11154, 11155, 11160, 11163, 11164, 11165, 11178, 11189, 11193, 11195, 11196, 11199, 11205, 11208, 11219, 11222, 11251, 11254, 11260, 11267, 11271, 11277, 11278, 11287, 11288, 11293, 11294, 11300, 11301, 11308, 11312, 11319, 11320, 11321, 11324, 11325, 11326, 11330, 11331, 11341, 11343, 11352, 11353, 11355, 11358, 11361, 11362, 11364, 11370, 11384, 11389, 11392, 11407, 11416, 11422, 11423, 11424, 11430, 11434, 11437, 11443, 11469, 11474, 11477, 11488

Miso–Etymology of This Term and Its Cognates / Relatives in Various Languages. 13, 68, 74, 85, 88, 92, 94, 114, 115, 139, 152, 158, 212, 215, 220, 244, 249, 300, 321, 608, 615, 619, 622, 761, 886, 1391, 1626, 2323, 2538, 2723, 3007, 3337, 3920, 4406, 4603, 4604, 4817, 5632, 6545, 6547, 6548, 6549, 7217, 7754, 8020, 8613, 11148

Miso–Imports, Exports, International Trade. 103, 105, 185, 247, 510, 1260, 1272, 1323, 1382, 1510, 1858, 1959, 1967, 1969, 1976, 1994, 2079, 2111, 2218, 2726, 3843, 4211, 4214, 5271, 5663, 5683, 5904, 6033, 6088, 6096, 6171, 6172, 6237, 6379, 6380, 6545, 6547, 6548, 6549, 6718, 6760, 7017, 7237, 7444, 7470, 7484, 7510, 7511, 7519, 7786, 7900, 7991, 8220, 9028, 9048, 9132, 9137, 9170, 9178, 9185, 9310, 9355, 9368, 9670, 9679, 9735, 9737, 9766, 9988, 10096, 10210, 10536, 10731, 10958, 11148, 11202

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Miso–Marketing of. 6377, 7088, 7519, 7637, 7991, 8127, 8217, 8495, 8882, 8929, 9298, 9339

Miso Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 597, 761, 878, 1260, 1414, 1626, 1858, 1870, 2323, 2623, 2776, 2867, 3802, 3854, 3873, 3897, 4155, 4330, 4406, 4600, 4621, 4743, 4764, 4804, 4805, 4877, 5082, 5089, 5136, 5163, 5211, 5275, 5460, 5945, 5953, 5994, 6028, 6448, 6557, 6637, 6680, 6742, 6760, 6799, 6818, 6825, 7017, 7210, 7215, 7382, 7461, 7470, 7542, 7557, 7623, 7688, 7754, 7766, 7806, 7851, 7963, 8051, 8124, 8130, 8209, 8268, 8271, 8622, 8789, 8888, 8914, 9026, 9117, 9371, 9374, 9513, 9523, 9623, 9771, 9783, 9861, 9893, 9937, 10055, 10079, 10096, 10184, 10191, 10193, 10198, 10413, 10536, 10538, 10600, 10731, 10813, 10854, 11057, 11330

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Miso Production–How to Make Miso on a Commercial Scale. 647, 2945, 2946, 3773, 5917, 6255, 6545, 6548, 6708, 7085, 7097, 7110, 7140, 7276, 7318, 7351, 7622, 7878, 9214, 10674, 10771, 10783, 10920, 11148, 11168

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Miso companies (USA). *See* American Miso Co. (Rutherfordton, North Carolina), Miyako Oriental Foods (Baldwin Park, California), South River Miso Co. (Conway, Massachusetts)

Miso in Second Generation Products, Documents About. 5663, 5683, 6059, 7088

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Miso, Homemade–How to Make at Home or on a Laboratory or Community Scale, by Hand. 3217, 3710, 5643, 5992, 6234, 6278, 6545, 6548, 6877, 7140, 7276, 7376, 7748, 7878, 9214, 10605, 10920, 10938, 10942, 11148, 11165, 11293, 11320

Miso, Indonesian-Style–Etymology of This Term and Its Cognates / Relatives in Various Languages. 889, 997, 6632

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Miso, Korean-Style–Etymology of This Term and Its Cognates / Relatives in Various Languages. 6395, 6731, 6825, 8450, 10718

Miso, Non-Soy Relatives (Such as Modern Chickpea Miso, Oat Miso, Etc.). 6545, 6547, 6548, 7276, 7475, 7549, 7754, 7878, 8264, 9371, 9471, 9721, 9861, 10676, 10920, 11148

Miso, Used as an Ingredient in Commercial Products. 3616, 6585, 6943, 7390, 7401, 7653, 7654, 7849, 8220, 8619, 8635, 9421, 9631, 9813, 9814, 9815, 9816, 11202

Miso, early non-soy paste made with meat and fish in China or Japan. *See* Jiang–Early Non-Soy

Miso, soybean–Chinese-Style. *See* Jiang–Chinese-Style Fermented Soybean Paste

Miso, soybean–Korean-style. *See* Jang–Korean-Style Fermented Soybean Paste

Missouri. *See* United States–States–Missouri

Mitoku–Natural Foods Exporter and Distributor (Tokyo, Japan). 5271, 5558, 5594, 5753, 5801, 5802, 5850, 5905, 6096, 6098, 6171, 6172, 6237, 6526, 6673, 6688, 6713, 7465, 7481, 7491, 7504, 7510, 7511, 7626, 7785, 7814, 8161, 8246, 8389, 9020, 9026, 9048, 9052, 9110, 9131, 9155, 9160, 9178, 9296, 9339, 9368, 9391, 9394, 9553, 9670, 9679, 9735, 9785, 9801, 9813, 9814, 9815, 9816, 9817, 9861, 9864, 9873, 9874, 9884, 9885, 9887, 9888, 9889, 9909, 9932, 9977, 9988, 10035, 10128, 10214, 10218, 10229, 10230, 10231, 10254, 10415, 10447, 10673, 10674, 10675, 10695, 10705, 10771, 10772, 10775, 10777, 10783, 10958, 10979, 11026, 11066, 11193, 11287, 11300

Mitsui & Co., Ltd. (Mitsui Bussan Kaisha, Japanese Trading Co., founded 1876). 1063, 1309, 1332, 1337, 1338, 1344, 1347, 1379, 1384, 1404, 1409, 1419, 1429, 1430, 1553, 1685, 1832, 1899, 1928, 2120, 2128, 2173, 2177, 2183, 2753, 2845, 2999, 3384, 5393, 6204, 8206, 8334, 8888, 9719, 9984, 10141, 10193, 10194, 10208, 10628, 10715

Miyako Oriental Foods (Baldwin Park, California). 6544, 6673, 7125, 7470, 7597, 8871, 9026, 9052, 9105, 9352, 9558, 9861, 10165, 10210, 10705, 10789, 11287, 11384, 11488

Mizono family. *See* Azumaya, Inc. (San Francisco, California)

Mochi. *See* Rice-Based Foods–Mochi

Molasses, soy. *See* Soy Molasses or Soy Solubles

Moldavia. *See* Europe, Eastern–Moldova

Monosodium glutamate. *See* MSG

Monsanto Co. (St. Louis, Missouri) and its HybriTech Seed International subsidiary. Acquired Jacob Hartz Seed Co. in April 1983. Acquired Asgrow in April Feb. 1997. Merged with Pharmacia & Upjohn on 31 March 2000 and was renamed Pharmacia Corp. 5782, 8351, 8892, 9451, 9498, 10050, 10137, 10138, 10139, 10141, 10236, 10317, 10319, 10361, 10362, 10364, 10394, 10395, 10396, 10423, 10430, 10469, 10479, 10502, 10523, 10568, 10635, 10646, 10664, 10712, 10797, 11041, 11150, 11275

Moorman Manufacturing Co. *See* Quincy Soybean Products Co. (Quincy, Illinois)

Morinaga Nutritional Foods, Inc., and Morinaga Nyûgyô (Torrance, California, and Tokyo, Japan). 5145, 5690, 6420, 6572, 6573, 6675, 6763, 6847, 6890, 6904, 6954, 7118, 7149, 7234, 7371, 7445, 7564, 7644, 7660, 7782, 7830, 7866, 7938, 8009, 8096, 8188, 8286, 8339, 8344, 8391, 8404, 8535, 8540, 8551, 8568, 8598, 8606, 8650, 8717, 8740, 8760, 8771, 8790, 8794, 8811, 8887, 8907, 8918, 8922, 8927, 8937, 8941, 9008, 9029, 9034, 9036, 9053, 9054, 9055, 9071, 9077, 9086, 9091, 9100, 9101, 9107, 9113, 9114, 9139, 9143, 9150, 9161, 9162, 9174, 9175, 9181, 9189, 9210, 9215, 9218, 9221, 9222, 9229, 9230, 9231, 9235, 9237, 9244, 9245, 9249, 9269, 9270, 9271, 9279, 9283, 9300, 9340, 9343, 9366, 9367, 9379, 9388, 9390, 9393, 9397, 9402, 9403, 9410, 9413, 9415, 9429, 9431, 9435, 9437, 9441, 9443, 9444, 9446, 9475, 9489, 9495, 9508, 9510, 9518, 9528, 9529, 9555, 9563, 9581, 9588, 9592, 9593, 9599, 9662, 9692, 9808, 9879, 9904, 9920, 9925, 9941, 9945, 9946, 9964, 9979, 10001, 10004, 10005, 10033, 10034, 10040, 10076, 10079, 10082, 10089, 10122, 10126, 10143, 10154, 10155, 10183, 10211, 10240, 10252, 10294, 10300, 10314, 10315, 10319, 10328, 10350, 10356, 10400, 10407, 10418, 10427, 10431, 10451, 10462, 10463, 10469, 10509, 10514, 10552, 10572, 10573, 10636, 10669, 10699, 10740, 10761, 10796, 10799, 10886, 10924, 10974, 11022, 11040, 11074, 11128, 11213, 11384, 11438, 11444, 11458, 11486

Morphology, soybean. *See* Soybean–Morphology, Structure, Anatomy, Soybean–Morphology, Structure, and Anatomy

Morrill Act. *See* Land-Grant Colleges and Universities, and Their Origin with the Land

Morse, W.J., on expedition to East Asia. *See* Tofu Dorsett-Morse Expedition to East Asia (1929-1931)

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8556, 8583, 8587, 8591, 8602, 8604, 8611, 8612, 8628, 8634, 8651, 8652, 8655, 8661, 8662, 8665, 8668, 8671, 8672, 8673, 8674, 8676, 8678, 8680, 8684, 8692, 8695, 8696, 8704, 8706, 8714, 8722, 8747, 8761, 8769, 8775, 8789, 8807, 8808, 8831, 8848, 8860, 8861, 8866, 8875, 8877, 8883, 8888, 8892, 8908, 8909, 8916, 8932, 8934, 8948, 8949, 8958, 8966, 8969, 8979, 8984, 8987, 8992, 8993, 9000, 9004, 9006, 9007, 9058, 9060, 9066, 9069, 9102, 9117, 9120, 9124, 9128, 9141, 9145, 9151, 9154, 9164, 9233, 9240, 9254, 9290, 9291, 9292, 9321, 9348, 9358, 9386, 9408, 9452, 9458, 9460, 9471, 9474, 9479, 9481, 9484, 9502, 9505, 9523, 9530, 9531, 9532, 9533, 9534, 9535, 9536, 9538, 9542, 9544, 9545, 9560, 9568, 9576, 9582, 9585, 9590, 9602, 9606, 9613, 9623, 9627, 9628, 9632, 9634, 9635, 9636, 9637, 9638, 9640, 9644, 9647, 9650, 9653, 9673, 9675, 9683, 9688, 9725, 9726, 9728, 9732, 9733, 9745, 9750, 9765, 9783, 9791, 9794, 9796, 9805, 9811, 9819, 9820, 9822, 9823, 9829, 9832, 9833, 9847, 9848, 9851, 9860, 9862, 9864, 9891, 9893, 9897, 9917, 9919, 9923, 9929, 9936, 9937, 9940, 9942, 9943, 9952, 9962, 9974, 9990, 10003, 10009, 10011, 10013, 10015, 10027, 10039, 10043, 10046, 10047, 10055, 10060, 10061, 10063, 10068, 10070, 10079, 10080, 10081, 10083, 10087, 10098, 10099, 10109, 10112, 10117, 10128, 10129, 10131, 10137, 10139, 10141, 10158, 10166, 10167, 10169, 10178, 10182, 10185, 10186, 10191, 10193, 10194, 10198, 10201, 10202, 10208, 10215, 10232, 10233, 10235, 10236, 10238, 10243, 10247, 10249, 10250, 10260, 10266, 10283, 10316, 10357, 10367, 10372, 10373, 10374, 10376, 10377, 10384, 10389, 10393, 10394, 10395, 10396, 10403, 10408, 10417, 10419, 10425, 10432, 10452, 10456, 10457, 10464, 10471, 10472, 10473, 10474, 10481, 10488, 10489, 10493, 10495, 10498, 10508, 10521, 10539, 10566, 10579, 10582, 10584, 10599, 10604, 10611, 10615, 10616, 10618, 10619, 10630, 10634, 10635, 10637, 10645, 10646, 10657, 10658, 10659, 10684, 10688, 10690, 10702, 10707, 10713, 10714, 10718, 10719, 10730, 10732, 10733, 10737, 10769, 10770, 10804, 10813, 10820, 10821, 10830, 10837, 10840, 10854, 10856, 10860, 10862, 10868, 10871, 10877, 10880, 10881, 10883, 10888, 10889, 10890, 10891, 10896, 10897, 10906, 10920, 10929, 10931, 10936, 10939, 10944, 10957, 10958, 10960, 10963, 10983, 10985, 10991, 10993, 10994, 10997, 10999, 11001, 11002, 11018, 11019, 11020, 11025, 11028, 11029, 11033, 11037, 11048, 11051, 11053, 11054, 11055, 11058, 11060, 11062, 11063, 11064, 11069, 11076, 11077, 11085, 11086, 11087, 11095, 11099, 11110, 11112, 11115, 11116, 11118, 11119, 11120, 11122, 11123, 11125, 11127, 11142, 11145, 11148, 11149, 11163, 11166, 11167, 11168, 11174, 11177, 11179, 11183, 11185, 11187, 11188, 11190, 11208, 11214, 11215, 11217, 11219, 11222, 11223, 11247, 11251, 11255, 11260, 11262, 11267, 11272, 11276, 11280, 11281, 11282, 11283, 11288, 11290, 11296, 11308, 11324, 11325, 11326, 11330, 11331, 11332, 11343, 11348, 11349, 11351, 11354, 11355, 11375, 11381, 11384, 11387, 11404, 11405, 11406, 11407, 11409, 11413, 11414, 11430, 11434, 11435, 11436, 11437, 11460, 11469, 11495

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Natto–Other Types–Soeda or Rul-kre from Bhutan, Pepok or Pe-Pok or Pe-Poke or Pe-boutsu or Pe-bout or Pe-Ngapi from Myanmar (Burma), Sieng or Seang from Cambodia. 7563, 8309, 8651, 8668, 8680, 11112, 11351, 11355

Natto–Soybean Dawadawa (From West Africa). Also called Dawa-dawa, Dadawa, Daddawa, Iru, Local Maggi, Ogiri, Soumbala / Soumbara / Sumbala, or Tonou. 8651, 9120, 10960, 11112, 11276, 11351

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Natto Industry and Market Statistics, Trends, and Analyses–Individual Companies. 7887, 9544, 10137, 10198, 10393

Natto Production–How to Make Natto on a Commercial Scale. 877, 908, 924, 3008, 4153, 4297, 5353, 5602, 6725, 6841, 6970, 7135, 7316, 7569, 7717

Natto enzymes. *See* Subtilisin, a Strong Proteolytic Enzyme from Natto (Whole Soybeans Fermented with *Bacillus natto*)

Natto from Nepal. *See* Kinema

Natto from Thailand. *See* Thua-nao

Natto, Daitokuji / Daitoku-ji natto. *See* Daitokuji Fermented Black Soybeans–from Japan

Natto, Hamana. *See* Hamanatto Fermented Black Soybeans–from Japan

Natto, Homemade–How to Make at Home or on a Laboratory Scale, by Hand. 4153, 5992, 6442, 6444, 6657, 6685, 7569, 7717, 7895, 7986, 8299, 8661, 10604, 11355

Natto, Korean-Style (Salted Natto Paste)–Chungkook-Jang / Chungkookjang / Chung Kook Jang / Chungkuk Jang / Chung Kuk Jang / Chongkukjang / Chungkukjang / Ch'onggukchang / Cheonggukjang / Joenkukjang / Chunggugjang. 6637, 6825, 8450, 8680, 10472, 10473, 10539, 10599, 10619, 10925, 11001, 11054, 11168, 11217, 11351, 11355, 11469

Natto, Korean-Style. Etymology of This Term and Its Cognates / Relatives in Various Languages. 6825, 7563, 8450, 10472, 10473

Natto, Yukiwari. Made in Japan by Mixing Itohiki Natto with Rice Koji and Salt, then Aging the Mixture. 6442, 6444, 6476, 6496, 6704, 6725, 6740, 6796, 6941, 6960, 7809, 7850, 8204, 8722, 8979, 10389, 11112, 11120, 11247

Nattokinase, a Strong Fibrinolytic Enzyme from Natto (Whole Soybeans Fermented with *Bacillus natto*). 8877, 9634, 9635, 9647, 9822, 10039, 10043, 10238, 10247, 10906, 11018, 11019, 11028, 11033, 11054, 11055, 11062, 11076, 11086, 11099, 11168, 11174, 11190, 11223, 11247

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Natural / Vegetarian Food Products Companies. *See* American Natural Snacks, Boca Burger, Fantastic Foods, Gardenburger

Natural Food Associates–and America's First Natural Foods Movement. Organized Jan/Feb. 1953. Based in Atlanta, Texas. 11336

Natural Foods Distributors and Master Distributors (Canada). *See* Lifestream Natural Foods Ltd. (Vancouver then Richmond, British Columbia, Canada), Manna Foods, Inc. (Scarborough, Ontario, Canada)

Natural Foods Distributors and Master Distributors (USA). *See* Arrowhead Mills (Hereford, Deaf Smith County, Texas), Ceres (Colorado Springs, Colorado), Cliffrose, Green Mountain Commodities, Inter-Natural Trading, Mountain Rose, Shadowfax, and Other Small Natural Food Distributors, Cornucopia Natural Foods, Eden Foods, Inc. (Clinton, Michigan). Founded 4 Nov. 1969, Erewhon (Boston, Massachusetts), Erewhon–Los Angeles / West, Essene Traditional Foods (Philadelphia, Pennsylvania), Food for Life (Illinois), Great Eastern Sun and Macrobiotic Wholesale Co. (North Carolina), Health Valley (Los Angeles, then Montebello, California), Infinity Food Co. Renamed Infinity Company by 1973 (New York City), Janus Natural Foods (Seattle, Washington), Laurelbrook Natural Foods (Bel Air, Maryland), Midwest Natural Foods (Ann Arbor, Michigan), Mountain People's Warehouse, Stow Mills, Inc. (Brattleboro, Vermont) Lama Trading Co., Tree of Life (St. Augustine, Florida), United Natural Foods, Inc. (UNFI), Well (The), Pure & Simple, and New Age Distributing Co. (San Jose, California), Westbrae Natural Foods, Inc. (Berkeley, California)

Natural Foods Distributors or Master Distributors in the USA–General and Other Smaller Companies: Cliffrose, Shadowfax. 9802

Natural Foods Exporter and Distributor (Japan). *See* Mitoku (Tokyo, Japan)

Natural Foods Exporters and Distributors (Japan). *See* Muso Shokuhin (Osaka, Japan)

Natural Foods Movement and Industry in the United States (Started in the Mid-1950s). 2302, 2303, 3858, 4280, 4491, 4603, 4604, 5110, 5130, 5245, 5271, 5487, 5518, 5593, 5594, 5595, 5603, 5648, 5752, 5804, 5856, 5904, 5905, 5927, 5965, 5998, 6041, 6088, 6171, 6172, 6240, 6292, 6390, 6395, 6401, 6573, 6641, 6741, 6746, 6890, 7034, 7076, 7237, 7285, 7371, 7504, 7633, 7634, 7900, 7922, 7923, 8168, 8169, 8170, 8343, 8404, 8405, 8552, 8573, 8612, 8650, 8904, 8919, 8920, 8927, 8928, 9369, 9517, 9547, 9658, 9679, 9756, 9769, 9785, 9799, 9800, 9825, 9924, 10062, 10134, 10156, 10171, 10307, 10551, 10635, 10802, 11096, 11193, 11260, 11304, 11326, 11336

Natural Products Association (NPA). *See* Health Foods Industry–Trade Associations–National Products Association

Natural and Health Foods Retail Chains or Supermarkets: Bread & Circus (Tony Harnett, MA), Frazier Farms (Bill Frazier, Southern Calif.), Fresh Fields (Rockville, MD), GNC = General Nutrition Corp. (Pittsburgh, PA), Mrs. Gooch's (Los Angeles, CA), Nature Foods Centres (Wilmington, MA; Ronald Rossetti), Trader Joe's, Whole Foods Market (Austin, TX), Wild Oats. 6383, 8007, 9369, 9903, 10014, 10029, 10124, 10130, 10134, 10281, 10294, 10355, 10445, 10447, 10551, 10554, 10565, 10650, 10749, 10758, 10774, 10781, 10885, 11482, 11490

Naturopathy pioneers. *See* Lust, Benedict (1872-1947)

Nauru. *See* Oceania

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Near Infrared Reflectance (NIR) or Transmittance (NIT) Analysis. *See* Seed, Food or Feed Composition–High-Speed Measurement Techniques, such as Near Infrared Reflectance (NIR) Anlysis and Spectrophotometry

Nematodes–Disease Control (Nematodes). Early Called Eelworms / Eel-Worms or Gallworms / Gall-Worms that Caused Root-Knot or Root-Gall. 1041, 1043, 1453, 1750, 1779, 1906, 1951, 1991, 2103, 2125, 2226, 2243, 2408, 2479, 2754, 2818, 3896, 4005, 4078, 4530, 4571, 4580, 5029, 5954, 6020, 6136, 8024, 8172, 10021, 10166

Neonotonia wightii (Also called Rhodesian Kudzu Vine, Perennial Soybean, or *Soja perene / Soya Perenne;* Formerly *Glycine javanica* or *Glycine wightii*). 275, 452, 716, 747, 1036, 2449, 6556, 7373

Nestlé (Nestle–The World's Biggest Food Group). 3384, 7362, 8010, 8888, 8998, 9504, 9577, 9730, 9760

Netherlands. *See* Europe, Western–Netherlands

New Caledonia (French Territory of). *See* Oceania–Pacific Ocean Islands that are Part of France–Territory of New Caledonia and Dependencies

New England Soy Dairy. *See* Tomsun Foods, Inc.

New Uses Movement (USA, starting 1987)–Industrial Uses of Soybeans. Successor to the Farm Chemurgic Movement (1930s to 1950s). And Value-Added Industrial Applications. See also: Research & Development Centers–USDA-ARS National Center for Agricultural Utilization Research (Peoria, Illinois). 8885, 8939, 9025, 9287, 9399, 9490, 9674, 10020, 10023, 10176, 10531

New York State Agric. Experiment Station (Geneva, NY). *See* Cornell University (Ithaca, New York)

New York. *See* United States–States–New York

New Zealand. *See* Oceania–New Zealand

Nichii Company. *See* Whole Dry Soybean Flakes

Nigeria. *See* Africa–Nigeria

Nisshin Oil Mills, Ltd. (Tokyo, Japan). 1267, 1348, 1475, 1478, 1921, 1928, 1975, 2097, 2120, 2128, 2129, 2167, 2172, 2177, 2183, 2375, 2432, 2465, 2484, 2639, 2731, 2755, 3346, 3349, 3483, 3618, 4531, 4623, 4760, 4812, 4845, 5051, 5057, 5084, 5204, 5214, 5275,

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5368, 5394, 5395, 5448, 5500, 5562, 5590, 5592, 5703, 5736, 5810, 5825, 5930, 6078, 6165, 6372, 6489, 6592, 6983, 7229, 7271, 7353, 7378, 7394, 7406, 7541, 7601, 7642, 7734, 7830, 7869, 7911, 7914, 7939, 7940, 7985, 8115, 8190, 8430, 8647, 8849, 8963, 8991, 9067, 9242, 9449, 9450, 10923, 11249

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No-till farming. *See* Soybean Cultural Practices–No Till Farming

Noblee & Thoerl GmbH (Hamburg, Germany). 1869, 1870, 2429, 2474, 2484, 3049

Nodulation. *See* Nitrogen Fixation, Inoculum, Inoculation, and Nodulation by Rhizobium Bacteria

Nomenclature of Soybean Varieties–Standardization of and Confusion Concerning Names. 1190, 1318, 1453, 1906, 2226, 2479, 3240, 3389, 3511, 3764, 4362, 6735, 8844, 9209

Non-Dairy milks. *See* Rice Milk, Almond Milk, Coconut Milk, Sesame Milk, etc

Non-dairy products (so-called) made from casein or caseinates. *See* Casein or Caseinates–Problems in So-Called Non-Dairy Products

Non-dairy, non-soy milk. *See* Milk, Non-Dairy, Non-Soy Milks and Creams Made from Nuts, Grains, Seeds, or Legumes

Nordquist, Ted. *See* WholeSoy & Co. (subsidiary of TAN Industries, Inc., California)

North America. *See* United States of America, and Canada. For Mexico, see Latin America, Central America

North Carolina. *See* United States–States–North Carolina

Northeast India. *See* Asia, South–India, Northeast / North-East. The Contiguous Seven Sister States and Sikkim

Northern Regional Research Center (NRRC) (Peoria, Illinois). *See* National Center for Agricultural Utilization Research (NCAUR) (USDA-ARS)

Northern Soy, Inc. (Rochester, New York). 6370, 6746, 6871, 6873, 6890, 7003, 7004, 7092, 7311, 7326, 7479, 7525, 7542, 7557, 7877, 7879, 7907, 8045, 8051, 8098, 8240, 8271, 8287, 9210, 9334, 9621, 9808, 10451, 10859, 11444

Northrup King Co. A subsidiary of Sandoz (1995), then Novartis (1996), then Syngenta (2001). 1039, 10396, 10469

Noted personalities–vegetarians. *See* Vegetarian Celebrities–Noted Personalities and Famous People

Novartis, Including Novartis Seeds. Novartis was formed in March 1996 by the Merger of Sandoz AG and Ciba-Geigy (both based in Basel, Switzerland). 10469

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Nut Butters, Non-Soy. Including Butter Made from Nuts or Seeds, Such as Brazil Nuts, Cashews, Coconuts, Filberts, Hazelnuts, Hickory Nuts, Hemp Seeds, Macadamia Nuts, Pecans, Pignolias, Pine Nuts, Pistachios, Pumpkin Seeds, Sunflower Seeds, Walnuts, etc. See also: Almond Butter (from 1373), Peanut Butter (from 1896), Sesame Butter, Soynut Butter. 1053, 1774, 1873, 7076, 7125, 9329, 9352, 9878

Nut milk or cream. *See* Milk–Non-Dairy Milks and Creams Made from Nuts

Nutraceuticals. *See* Functional Foods or Nutraceuticals

Nutrisoya, Inc. (Quebec). 10274

Nutrition (General). 580, 581, 590, 614, 735, 754, 758, 770, 828, 889, 900, 902, 908, 952, 975, 1006, 1172, 1176, 1216, 1425, 1529, 1534, 1676, 1786, 2106, 2171, 2198, 2307, 2464, 2557, 2704, 2774, 2781, 2825, 2835, 2963, 2997, 3002, 3099, 3161, 3190, 3191, 3283, 3292, 3328, 3384, 3385, 3425, 3436, 3480, 3624, 3710, 3733, 3747, 3826, 3831, 3948, 3953, 4042, 4087, 4103, 4307, 4363, 4433, 4533, 4536, 4537, 4618, 4686, 4711, 4743, 4753, 4789, 4882, 4883, 4884, 4885, 4899, 4900, 4923, 4961, 5112, 5167, 5182, 5184, 5246, 5247, 5274, 5303, 5415, 5457, 5581, 5639, 5728, 5787, 5840, 5967, 5968, 5974, 5996, 6186, 6219, 6250, 6281, 6354, 6355, 6395, 6401, 6476, 6494, 6545, 6547, 6548, 6606, 6626, 6646, 6715, 6722, 6814, 6826, 6932, 6958, 6993, 7036, 7059, 7118, 7140, 7219, 7262, 7276, 7322, 7432, 7467, 7640, 7701, 7867, 7876, 7878, 7880, 8018, 8032, 8087, 8262, 8283, 8289, 8424, 8454, 8667, 8707, 8722, 8820, 8837, 8945, 9002, 9133, 9141, 9156, 9214, 9215, 9221, 9235, 9240, 9249, 9257, 9304, 9588, 9771, 9983, 10069, 10078, 10164, 10446, 10458, 10582, 10622, 10795, 10897, 10901, 10902, 10909, 10917, 10920, 10946, 11082, 11091, 11094, 11145, 11148, 11206, 11207, 11209, 11210, 11211, 11212, 11216, 11221, 11222, 11223, 11224, 11225, 11226, 11228, 11229, 11230, 11232, 11260, 11274, 11314, 11389, 11418, 11434, 11437

Nutrition–Acid-Base Balance in Diet and Health, or Individual

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Foods, or Acid-Alkaline Ash in Diet, or Acid-Forming and Base-Forming Elements in Foods. 2302, 2303, 2538, 2670, 2774, 2836, 3008, 3371, 3427, 5506, 6168, 6292, 6387, 6442, 6444, 6794, 7011, 7289, 7467, 7934, 9750, 10038, 10981

Nutrition–Biologically Active Phytochemicals–Allergens, Allergy / Allergies, and Allergic Reactions Caused (or Remedied) by Soybeans, Soyfoods, Peanuts, or Animal Milks. 212, 249, 300, 321, 706, 2836, 4273, 5178, 5203, 5397, 7227, 7306, 7327, 8763, 9334, 9845, 9998, 10007, 10147, 10312, 10533, 10568, 10826, 10835, 10836

Nutrition–Biologically active phytochemicals. *See* Antioxidants, Phytic Acid, Phytates, and Phytin, Reproductive / Fertility Problems, Saponins, Trypsin / Protease Inhibitors

Nutrition–Biologically active substances. *See* Antinutritional Factors (General), Goitrogens and Thyroid Function, Hemagglutinins (Lectins or Soyin)

Nutrition–Carbohydrates. *See* Oligosaccharides, Starch

Nutrition–Lipids. *See* Linolenic Acid and Linolenate, Sterols or Steroid Hormones

Nutrition–Medical / Medicinal-Therapeutic Aspects. *See* Chinese Medicine, Traditional

Nutrition–Medical Aspects. *See* Cancer Preventing Substances in Soy, Cancer or Tumor Causing / Promoting Substances in Soybeans or Soyfoods, Cardiovascular Disease, Especially Heart Disease and Stroke, Cognitive / Brain Function. Including Alzheimer's Disease, Diabetes and Diabetic Diets, Kidney / Renal Function, Medical / Medicinal-Therapeutic Uses / Aspects (General), Menopause–Relief of Its Unpleasant Symptoms, Osteoporosis, Bone and Skeletal Health

Nutrition–Minerals. *See* Aluminum in Soybeans and Soyfoods, Calcium Availability, Absorption, and Content of Soy

Nutrition–Protein–Early and basic research. *See* Protein–Early and Basic Research

Nutrition–Protein. *See* Amino Acids and Amino Acid Composition and Content

Nutrition Education (Or Lack Thereof in Medical Schools), Food Groups, and Food Pyramids. 10248

Nutrition bars. *See* Bars–Energy Bars or Nutrition Bars Made with Soy

Nutrition et Nature (Revel near Toulouse, France). Founded in June 1982 as Société SOY (Cerny, France). Named Nutrition et Soja, Div. of Nutrition et Santé from 1 Aug. 1994 until 1 Jan. 2011. 7889, 7905, 8019, 8162, 8778, 9418, 9494, 9522, 9622, 10079, 10319, 10320, 10712, 11298, 11344, 11385, 11401, 11402

Nutrition, human, USDA bureau of. *See* United States Department of Agriculture (USDA)–Bureau of Human Nutrition and Home Economics

Nutrition. *See* Carbohydrates (General). See also Starch, Dietary Fiber, and Oligosaccharides (Complex Sugars), Carbohydrates–Dietary Fiber, Carbohydrates–Effects of Dietary Carbohydrates (Especially Fiber and Saponins) on Blood Lipids (Especially Cholesterol), Chemical / Nutritional Composition or Analysis, Claim or Claims of Health Benefits–Usually Authorized by the FDA, Concerns about the Safety, Toxicity, or Health Benefits of Soy in Human Diets, Diet and Breast Cancer Prevention, Diet and Cancer. See also–Vegetarian Diets–Medical Aspects–Cancer, Diet and Prostate Cancer Prevention, Flatulence or Intestinal Gas, Functional Foods or Nutraceuticals, Human Nutrition–Clinical Trials, Intestinal Flora / Bacteria, Isoflavone or Phytoestrogen Content of Soyfoods, Soy-based Products,, Lactose Intolerance, Lipid and Fatty Acid Composition of Soy, Lipids–Effects on Blood Lipids, Lysinoalanine (LAL)–An Unusual Toxic Amino Acid, Microbiological Problems (Food Spoilage, Sanitation, and Contamination), Minerals (General), Protein–Effects on Blood Lipids, Protein Quality, and Supplementation, Protein Resources and Shortages, and the "World Protein Crisis / Gap / Problem" of 1950-1979, Toxins and Toxicity in Foods and Feeds, Toxins and Toxicity in Foods and Feeds–Bongkrek Poisoning, Toxins and Toxicity in Foods and Feeds–General, Toxins and Toxicity in Foods and Feeds–Microorganisms, Especially Bacteria that Cause Food Poisoning, Toxins and Toxicity in Foods and Feeds–Trichloroethylene Solvent and the Duren / Dueren Disease or Poisoning of Cattle / Ruminants, Vitamins (General), Vitamins B-12 (Cyanocobalamin, Cobalamins), Vitamins E (Tocopherols), Vitamins K (Coagulant)

Nutritional aspects of vegetarian diets. *See* Vegetarian and Vegan Diets–Nutrition / Nutritional Aspects

Nuts made from roasted soybeans. *See* Soynuts

Obituaries, Eulogies, Death Certificates, and Wills. See Also: Biographies, Biographical Sketches and Autobiographies. 2032, 2407, 4543, 4544, 7016, 7184, 7526, 9565, 10212, 10278, 10279, 10518

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Oceania–Introduction of Soy Products to. Earliest document seen concerning soybean products in a certain country in Oceania. Soybeans as such have not yet been reported in this country. 4961, 10731

Oceania–Introduction of Soy Products to. This document contains the earliest date seen for soybean products in a certain country in Oceania. Soybeans as such had not yet been reported by that date in this country. 4961, 10731

Oceania–Introduction of Soybeans to. Earliest document seen concerning soybeans (but only wild perennial relatives of soybeans) in a certain country in Oceania; cultivated soybeans have not yet been reported. 3185

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Oceania–Introduction of Soybeans to. This document contains the earliest date seen for soybeans in a certain country in Oceania. 600, 3268, 3769

Oceania–Introduction of Soybeans to. This document contains the earliest date seen for the cultivation of soybeans in a certain country in Oceania. 3268, 3769

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Oceania–Vanuatu, Republic of (Named New Hebrides until 1980). 2108, 2293, 4961, 7461, 9336, 9461, 9562, 9839, 9866

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Oelmuehle Hamburg AG (Hamburg, Germany). Founded in 1965 by incorporating Stettiner Oelwerke AG (founded 1910), Toeppfer's Oelwerke GmbH (founded 1915), and Hansa-Muehle AG (founded 1916 as Hanseatische Muehlenwerke AG). 1509, 2304, 2432, 2474, 3954, 4023, 4458, 4668, 9112, 10581

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Oil, soy–industrial uses of. *See* Industrial Uses of Soy Oil, Paint Manufacturers' Association of the U.S., Incl. Henry A. Gardner, L.P. Nemzek and Industrial Uses of Soybeans, Steroids, Steroid Hormones, and Sterols

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Oil, soy, constants. *See* Soy Oil Constants

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Pasture from soybeans. *See* Forage from Soybean Plants–Hogging Down

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States Department of Agriculture (USDA)–Patent Office and Commissioner of Patents (Forerunners of USDA)

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Pogeler, Glenn Henry (1915-1995). Soybean Pioneer. Iowa Cooperatives, Soybean Council of America (SCA), National Soybean Processors Association (NSPA). 5197

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Safety concerns about soy in human diets. *See* Concerns about the Safety, Toxicity, or Health Benefits of Soy in Human Diets

Saishikomi. *See* Soy Sauce–Saishikomi

Sake–Rice Wine. In Japanese also spelled Saké, Saki, Sakki, Sacke, Sackee, Saque. In Chinese spelled Jiu (pinyin) or Chiu (Wade-Giles). 15, 18, 26, 31, 55, 59, 61, 65, 68, 76, 79, 83, 84, 85, 86, 90, 91, 92, 94, 96, 103, 104, 105, 109, 110, 111, 113, 138, 163, 230, 307, 410, 451, 489, 491, 501, 516, 524, 528, 537, 554, 608, 619, 622, 628, 679, 689, 690, 717, 732, 757, 777, 786, 792, 807, 873, 878, 883, 923, 957, 964, 978, 981, 988, 1019, 1150, 1151, 1173, 1216, 1258, 1263, 1417, 1429, 1461, 1468, 1484, 1498, 1524, 1530, 1535, 1583, 1625, 1643, 1663, 1695, 1747, 1787, 1820, 1964, 1996, 2016, 2052, 2084, 2188, 2210, 2419, 2463, 2465, 2467, 2473, 2538, 2645, 2647, 2726, 2865, 3154, 3270, 3589, 3778, 3885, 4154, 4457, 4476, 5040, 5729, 5801, 5894, 6021, 6877, 7236, 7284, 7715, 7719, 7976, 8311, 9021, 9255, 10617, 10951, 11075, 11490

Samoa. *See* Oceania–Samoa

San Jirushi Corp., and San-J International (Kuwana, Japan; and Richmond, Virginia). Purchased in Nov. 2005 by Yamasa Corporation. 267, 6305, 7004, 7076, 7107, 7115, 7116, 7158, 7297, 7368, 7587, 7605, 7722, 7723, 7792, 7877, 7879, 7908, 7920, 7996, 7998, 8010, 8070, 8116, 8573, 8657, 8852, 8858, 8863, 8873, 8884, 8886, 8998, 9026, 9037, 9046, 9096, 9131, 9166, 9179, 9196, 9197, 9201, 9210, 9226, 9240, 9281, 9282, 9284, 9285, 9297, 9323, 9369, 9394, 9419, 9491, 9492, 9500, 9514, 9645, 9658, 9769, 9785, 9886, 9913, 10030, 10121, 10134, 10306, 10551, 10600, 10930, 11012, 11111, 11150, 11256, 11382, 11384

Sandoz AG (Basel, Switzerland). Merged with Ciba-Geigy in March 1996 to Become Novartis. 7889, 7905, 8019, 8162, 8778, 9418, 9494, 9522, 9622, 10079, 10320, 10469, 10712

Sanitarium Health Food Company (Wahroonga, NSW, Australia). In 2002 they acquired SoyaWorld of British Columbia, Canada. 7251, 9547, 9934, 10214

Sanitation and spoilage of food. *See* Microbiological Problems (Food Spoilage, Sanitation, and Contamination)

Saponins (Bitter Carbohydrates / Glucosides That Cause Foaming). 2581, 2653, 2654, 2811, 3009, 3010, 3013, 3014, 3036, 3341, 3342, 3343, 3348, 3349, 3352, 3365, 3366, 3399, 3416, 3417, 3483, 3492, 3499, 3665, 3798, 4229, 4962, 6246, 6458, 6791, 7553, 7665, 7942, 8235, 8254, 8292, 8348, 8452, 8801, 8824, 8950, 9129, 9173, 9177, 9246, 9354, 9464, 9496, 9564, 9595, 9609, 9630, 9661, 9676, 9677, 9678, 9695, 9714, 9717, 9784, 9788, 10160, 10205, 10213, 10426, 10590, 11387

Sauce, Quin's. *See* Quin's Sauce / Quin Sauce

Sauce, soy nugget. *See* Fermented Black Soybean Extract

Sausages, meatless. *See* Meat Alternatives–Meatless Sausages

School Lunch Program. 3803, 4194, 4551, 6204, 6235, 6356, 6388, 7639, 8017, 8524, 9567, 10045

Scotland. *See* Europe, Western–Scotland (Part of United Kingdom)

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Screw presses. *See* Soybean Crushing–Equipment–Screw Presses and Expellers

Sea Vegetables (Edible Seaweeds)–Etymology of These Terms and Their Cognates / Relatives in Various Languages. 6703

Sea Vegetables–Imports, Exports, International Trade. 1467, 1711

Sea Vegetables or Edible Seaweeds, Often Used with Soyfoods. 215, 346, 408, 467, 484, 509, 514, 519, 528, 558, 565, 584, 608, 619, 622, 623, 632, 633, 674, 679, 687, 720, 770, 785, 804, 871, 936, 982, 992, 993, 1025, 1028, 1054, 1080, 1083, 1098, 1111, 1147, 1174, 1176, 1210, 1251, 1271, 1465, 1466, 1483, 1597, 1619, 1704, 1705, 1711, 1744, 1749, 1873, 1874, 1962, 2052, 2306, 2538, 2624, 2647, 2660, 2739, 2745, 3008, 3152, 3337, 3414, 3468, 3778, 3855, 3926, 4102, 4166, 4208, 4382, 4468, 4525, 4570, 4603, 4604, 4663, 4688, 4817, 4838, 4902, 4922, 5038, 5110, 5137, 5211, 5213, 5307, 5323, 5325, 5398, 5424, 5515, 5632, 5648, 5650, 5651, 5658, 5663, 5683, 5780, 5804, 5839, 5888, 5894, 5904, 5909, 5927, 5963, 5967, 5989, 5990, 5991, 5999, 6033, 6041, 6059, 6088, 6126, 6135, 6138, 6139, 6168, 6228, 6239, 6292, 6296, 6360, 6379, 6380, 6395, 6397, 6401, 6441, 6515, 6545, 6546, 6547, 6548, 6568, 6585, 6605, 6626, 6628, 6632, 6651, 6658, 6703, 6709, 6720, 6744, 6826, 6859, 6864, 6881, 6897, 6943, 7003, 7011, 7058, 7076, 7125, 7145, 7159, 7161, 7172, 7226, 7230, 7237, 7332, 7363, 7369, 7398, 7432, 7441, 7447, 7479, 7519, 7538, 7540, 7588, 7626, 7637, 7653, 7654, 7677, 7701, 7719, 7736, 7812, 7814, 7849, 7863, 7907, 7918, 7921, 7944, 7968, 7974, 7998, 8046, 8195, 8211, 8213, 8234, 8299, 8332, 8333, 8439, 8448, 8459, 8516, 8519, 8521, 8544, 8552, 8562, 8612, 8635, 8636, 8644, 8704, 8714, 8806, 8832, 8839, 8879, 8904, 9047, 9110, 9156, 9185, 9216, 9217, 9263, 9298, 9310, 9339, 9352, 9355, 9540, 9566, 9621, 9631, 9672, 9750, 9762, 9785, 9816, 9874, 9889, 9894, 9895, 9903, 9914, 9915, 9919, 9924, 9962, 9988, 9995, 10062, 10112, 10130, 10162, 10219, 10250, 10251, 10272, 10283, 10307, 10354, 10376, 10384, 10413, 10415, 10458, 10466, 10471, 10492, 10538, 10617, 10622, 10635, 10645, 10659, 10691, 10694, 10718, 10719, 10859, 10882, 11019, 11066, 11137, 11148, 11178, 11202, 11260, 11277, 11326

Seafood, meatless. *See* Meat Alternatives–Meatless Fish, Shellfish, and Other Seafood-like Products

Seaweeds, edible. *See* Sea Vegetables

Second Generation Soyfood Products. 7003, 7479, 7907, 9621, 10859, 10899

Seed Certification and Certified Seeds (Soybeans). 2226, 4816, 6151

Seed Cleaning–Especially for Food or Seed Planting Uses. 1348, 1475, 1596, 2243, 2929, 2956, 2957, 4197, 4222, 4406, 5326, 6151, 8197, 9471, 10141, 10147, 10257, 10286, 10502

Seed Color (Soybeans)–Gives the Color of Seed (and Often Hilum) for Various Specific Varieties. See also: Soybean Seeds of Different Colors. 499, 529, 555, 621, 668, 706, 720, 770, 782, 806, 821, 843, 913, 919, 1037, 1091, 1190, 1254, 1278, 1319, 1335, 1412, 1453, 1456, 1603, 1806, 1845, 1889, 2068, 2121, 2148, 2180, 2246, 2248, 2429, 2449, 2504, 2676, 3240, 3387, 3389, 3427, 3623, 3646, 3662, 3896, 3900, 3905, 4542, 4810, 9625, 10055, 10166, 10748, 11489, 11491

Seed Companies and Seedsmen, Early Soybean, Worldwide (Especially Before 1925)–Including Siebold & Co., Vilmorin-Andrieux, Wood & Sons, Haage & Schmidt, Dammann & Co., Peter Henderson, Thorburn & Co., Mark W. Johnson, Johnson & Stokes, Harry N. Hammond, Burpee, E.E. Evans, Funk Bros. Seed Co. 473, 474, 551, 612, 620, 627, 641, 645, 646, 652, 656, 686, 706, 708, 776, 782, 789, 790, 791, 806, 820, 841, 913, 965, 984, 1011, 1027, 1035, 1039, 1091, 1097, 1105, 1190, 1191, 1254, 1275, 1278, 1318, 1412, 1416, 1449, 1453, 1455, 1543, 1548, 1719, 2233, 2236, 3016, 3017, 3170, 3228, 3242, 3331, 3363, 3685, 3781, 3893, 4194, 5399, 6295, 6556, 6698, 7692, 9209, 10392

Seed Germination or Viability–Not Including Soy Sprouts. 592, 780, 970, 1519, 1529, 1543, 1574, 1675, 1906, 2039, 2068, 2292, 2540, 2765, 4389, 5028, 6137, 10832, 10842

Seed Quality of Soybeans–Condition, Grading, and Grades (Moisture, Foreign Material, Damage, etc.). 1315, 1843, 2146, 2286, 2357, 2367, 2681, 2929, 3137, 3472, 3779, 3899, 3928, 3977, 3981, 3993, 4197, 4222, 4226, 4230, 4246, 4249, 4406, 4440, 4485, 4515, 4542, 4591, 4816, 4971, 5007, 5947, 6220, 6347, 6869, 7023, 7112, 7278, 8124, 8387, 8397, 8766, 8885, 8913, 8931, 9117, 9312, 9319, 9383, 9450, 9893, 9969, 10088, 10119, 10180, 10181

Seed Quality, Composition, and Component / Value-Based Pricing (Percentage and Quality of Protein, Oil, Fatty Acids, etc.). 4545, 4996, 6680, 6883, 7221, 8766, 8881, 8885, 9023, 9319, 9383, 9498, 9502, 9626, 10088, 10180, 10194, 10831, 11007

Seed Treatment with Chemicals (Usually Protectant Fungicides) for Protection. (For Treatment with Nitrogen-Fixing Bacteria see–Soybean Production–Nitrogen Fixation & Inoculation). 4228, 4901, 5029, 7711

Seed Weight / Size (Soybeans)–Weight of 100 Seeds / Grains in Grams, or Number of Seeds Per Pound or Per Kilogram, and Agronomic Significance of Seed Weight. 571, 617, 691, 761, 780, 1058, 1064, 1319, 2245, 2246, 2251, 2449, 2479, 2676, 3035, 3387, 3389, 3427, 3646, 3662, 3900, 3905, 4239, 4542, 4597, 4602, 4810, 4901, 5029, 6136, 6137, 6256, 6564, 6600, 6663, 6665, 6666, 7248, 7476, 7692, 7768, 7835, 8124, 8237, 8387, 8396, 8640, 8783, 8789, 9280, 9307, 9524, 9625, 9626, 9716, 9937, 9955, 10049, 10055, 10139, 10166, 10198, 10435, 10804, 10852, 10921, 10975

Seed and plant introduction to the USA. *See* United States Department of Agriculture (USDA)–United States Department of Agriculture (USDA)–Section of Foreign Seed and Plant Introduction

Seed companies–Thompson. *See* Thompson (W.G.) & Sons Limited, Blenheim, Ontario, Canada

Seed companies, soybean. *See* Asgrow (Des Moines, Iowa), Coker Pedigreed Seed Co. (Hartsville, South Carolina), Dammann & Co. (San Giovanni a Teduccio {near Naples}, Italy), DuPont (E.I. Du Pont de Nemours & Co., Inc.) (Wilmington, Delaware),

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Evans Seed Co. (West Branch, Ogemaw County, Michigan) and Mr. Edward Ellsworth Evans (1864-1928), Funk Brothers Seed Co. (Bloomington, Illinois), Haage & Schmidt (Erfurt, Germany), Hartz (Jacob) Seed Co. (Stuttgart, Arkansas), Johnson & Stokes (Philadelphia, Pennsylvania), Monsanto Co. (St. Louis, Missouri), Northrup King Co., Peter Henderson & Co. (New York City), Pioneer Hi-Bred International, Inc. (Des Moines, Iowa), Vilmorin-Andrieux & Co. (France), Wannamaker (John E.) (St. Matthews, South Carolina), Wing Seed Co. (Mechanicsburg, Champaign County, Ohio)

Seed quality development in soybeans. *See* Breeding or Evaluation of Soybeans for Seed Quality, such as Low in Trypsin Inhibitors, Lipoxygenase, Linolenic Acid, etc.

Seed, Food or Feed Composition–High-Speed Measurement Techniques, such as Near Infrared Reflectance (NIR) or Transmitance (NIT) Anlysis and Spectrophotometry. 8885, 8902, 8913, 9331, 9336, 9625, 9626, 10194

Seedlings, soybean. *See* Green Vegetable Soybeans–Soybean Seedlings or Their Leaves Served as a Tender Vegetable. Called *Doumiao* in Chinese

Seeds, soybean–Variety development and breeding of soybeans. *See* Variety Development and Breeding

Seitan. *See* Wheat Gluten Made into Seitan

Sensory evaluation. *See* Taste Panel, Taste Test Results, or Sensory / Organoleptic Evaluation

Serbia and Montenegro. *See* Europe, Eastern–Serbia and Montenegro

Sesame / Sesamum / Benné or Benne / Gingelly or Gingili / Til or Teel–Etymology of These Terms and Their Cognates/Relatives in Various Languages. 200, 209, 408, 556, 619

Sesame Butter, Tahini / Tahina / Tahin, Sesame Halva / Halwa, or Sesame Paste. 3949, 4459, 4603, 4604, 4663, 4694, 4922, 5110, 5137, 5185, 5242, 5264, 5325, 5505, 5650, 5658, 5663, 5683, 5779, 5797, 5847, 5848, 5927, 5990, 6033, 6041, 6059, 6126, 6169, 6360, 6379, 6380, 6632, 7011, 7058, 7076, 7125, 7172, 7230, 7626, 8007, 8521, 8714, 8806, 9198, 9352, 9737, 9847, 9892, 9899, 9913, 10062, 10112, 10127, 10130, 10492, 10606, 10611, 10659, 10672, 10694, 10718, 10719, 10990, 11195, 11343

Sesame Meal or Cake (Defatted). 608, 619, 1356, 1683, 1926, 3167, 3250, 4468

Sesame Milk. 6403

Sesame Oil. 200, 209, 274, 438, 467, 486, 509, 511, 514, 532, 533, 556, 559, 574, 584, 598, 622, 641, 676, 706, 707, 720, 761, 793, 824, 829, 854, 882, 891, 946, 1002, 1025, 1149, 1166, 1173, 1350, 1384, 1465, 1466, 1475, 1599, 1687, 1704, 1857, 1868, 1870, 1873, 1921, 1981, 2016, 2031, 2052, 2081, 2096, 2108, 2147, 2203, 2242, 2293, 2295, 2296, 2431, 2432, 2459, 2478, 2639, 3139, 3146, 3469, 3551, 3681, 4184, 4470, 4603, 4604, 4688, 4764, 5038, 5168, 5185, 5271, 5558, 5632, 5648, 5658, 5663, 5683, 5707, 5780, 5797, 5848, 5909, 6169, 6172, 6292, 6296, 6632, 7060, 7237, 7303, 7390, 7626, 8450, 8552, 8612, 8628, 8714, 8904, 9110, 9815, 9847, 9872, 9873, 9911, 9932, 10162, 10219, 10367, 10456, 10492, 10611, 10659, 10691, 10718, 10722, 10728, 10847, 10990, 11137, 11254, 11343

Sesame Seed (*Sesamum indicum,* formerly *Sesamum orientale*). (Also Called Ajonjoli, Benne, Benni, Benniseed, Gingelly, Gingely, Gingelie, Jinjili, Sesamum, Simsim, Teel, Til). Including Sesame as an Oilseed, Sesame Flour, and Sesame Salt / Gomashio. See also Sesame Butter / Tahini, Sesame Cake or Meal, Sesame Milk, and Sesame Oil. 26, 126, 200, 209, 217, 298, 346, 379, 408, 438, 467, 486, 509, 511, 514, 517, 532, 533, 542, 556, 559, 574, 584, 598, 619, 621, 622, 640, 641, 673, 676, 681, 684, 696, 706, 707, 720, 761, 762, 770, 785, 786, 787, 793, 824, 829, 844, 847, 854, 869, 882, 891, 946, 947, 993, 1025, 1080, 1149, 1166, 1173, 1210, 1211, 1229, 1246, 1249, 1260, 1265, 1322, 1350, 1356, 1357, 1384, 1464, 1465, 1466, 1475, 1599, 1603, 1683, 1687, 1697, 1704, 1705, 1868, 1870, 1873, 1897, 1921, 1926, 1932, 1981, 2016, 2031, 2046, 2052, 2108, 2140, 2147, 2176, 2203, 2242, 2292, 2293, 2295, 2296, 2297, 2432, 2459, 2478, 2527, 2538, 2639, 2726, 2739, 2817, 3008, 3146, 3551, 3645, 3844, 3858, 3896, 4154, 4184, 4208, 4459, 4466, 4468, 4470, 4547, 4551, 4570, 4603, 4604, 4616, 4663, 4688, 4764, 4806, 4838, 4863, 4866, 4902, 4922, 5030, 5038, 5085, 5095, 5110, 5126, 5137, 5168, 5185, 5264, 5458, 5632, 5648, 5658, 5663, 5683, 5780, 5797, 5848, 5894, 5904, 5909, 5963, 5967, 5989, 6088, 6139, 6169, 6172, 6292, 6296, 6379, 6395, 6401, 6436, 6533, 6548, 6628, 6632, 6727, 6795, 6827, 6937, 7011, 7064, 7065, 7145, 7172, 7237, 7330, 7390, 7424, 7441, 7626, 7677, 7719, 7730, 7737, 7782, 7972, 8228, 8441, 8450, 8525, 8552, 8612, 8714, 8724, 8757, 8839, 8904, 8994, 9110, 9145, 9267, 9672, 9725, 9766, 9785, 9813, 9815, 9831, 9847, 9870, 9872, 9873, 9892, 9911, 9913, 9932, 9962, 10062, 10103, 10112, 10127, 10162, 10219, 10283, 10367, 10434, 10445, 10456, 10492, 10606, 10617, 10635, 10659, 10672, 10694, 10718, 10719, 10769, 10801, 10847, 10866, 10877, 10990, 11071, 11077, 11084, 11137, 11178, 11196, 11265, 11343, 11485

Sesamum indicum. *See* Sesame Seed

Setsubun. *See* Roasted / Parched Soybeans (*Irimame*)

Seventh-day Adventist work with vegetarianism. *See* Vegetarianism–Seventh-day Adventist Work with

Seventh-day Adventist writings or products (especially early) related to dietary fiber. *See* Fiber–Seventh-day Adventist Writings or Products

Seventh-day Adventists–Adventist Small Food Companies in the USA. Including Butler Food Products, Cedar Lake Foods, Hilkrest / Hillcrest, Lange Foods, Millstone Foods, Texas Protein Sales. See also: Battle Creek Foods, Loma Linda Foods, La Sierra Industries, Madison Foods, or Sovex Natural Foods (Fuller Life Inc.). 3228, 7076, 9934, 11486

Seventh-day Adventists–Cookbooks and Their Authors, Dietitians and Nutritionists–Ella E.A. Kellogg (1852-1920), Anna L. Colcord (1860?-1940?), Jethro Kloss (1863-1946), Almeda Lambert (1864-1921), Lenna Frances Cooper (1875-1961), Julius G. White (1878-1955), Frances Dittes (1891-1979), Edyth Cottrell (1900-1995),

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Dorothea Van Gundy Jones (1903-1979), Philip S. Chen (1903-1978), Frank & Rosalie Hurd (1936-), etc. 3438, 4273, 5109, 5487, 7016, 7254, 7260, 7291, 7352, 9934, 11450

Seventh-day Adventists–General and Historical. 7532, 9616, 9934, 11479

Seventh-day Adventists–Influence Today of Seventh-day Adventist Affiliated Organizations in the Fields of Vegetarianism, Health, and Soyfoods (Not Including Original Medical Research on Adventists). 6462, 7251, 8164, 8575, 8806, 9702, 9934, 10755

Seventh-day Adventists–Original Health-Related and Medical Research on Seventh-day Adventists Worldwide (Especially the two large epidemiological Adventist Health Studies). 9934

Seventh-day Adventists–Overseas Companies Making Soyfoods (Europe). *See* DE-VAU-GE Gesundkostwerk GmbH (Lueneburg, Germany), Granose Foods Ltd. (Bucks., England)

Seventh-day Adventists–Overseas Companies Making Soyfoods (Europe, Asia, and Latin America). Other, Including Alimentos Colpac, Nutana, Saniku / San-iku Foods, Spicer Memorial College, Superbom. 4376, 4502, 4653, 5555, 5610, 5761, 5841, 5896, 5939, 6309, 6315, 6424, 6503, 6664, 7122, 7168, 7251, 7254, 7257, 7260, 7280, 7310, 7313, 7314, 7353, 7478, 7489, 7504, 7564, 7644, 7667, 7668, 7770, 7830, 8012, 8014, 8169, 8193, 8246, 8270, 8418, 9547, 9556, 9566, 9567, 9610, 9633, 9864, 9934, 10214, 11448, 11450, 11484

Seventh-day Adventists–Overseas Companies Making Soyfoods (Oceania). *See* Sanitarium Health Food Company (Wahroonga, Australia)

Seventh-day Adventists. *See* Harrison, D.W. (M.D.), and Africa Basic Foods (Uganda), Kellogg, John Harvey (M.D.) (1852-1943), Sanitas Nut Food Co. and Battle Creek Food Co., Kellogg, Will Keith,... Kellogg Co., Kloss, Jethro (1863-1946) and his Book *Back to Eden*, Loma Linda Foods (Riverside, California), Loma Linda University (Loma Linda, California), Madison Foods and Madison College (Madison, Tennessee), Miller, Harry W. (M.D.) (1879-1977), Van Gundy, Theodore A., and La Sierra Industries (La Sierra, California), White, Ellen G (1827-1915), Worthington Foods, Inc. (Worthington, Ohio)

Shadowfax. *See* Natural Food Distributors and Master Distributors–General and Other Smaller: Cliffrose, Shadowfax, etc.

Shakes–Made with Soymilk, Tofu, Amazake, Soy Protein, etc.–Etymology of These Terms and Their Cognates / Relatives in Various Languages. 6395, 6401, 7509, 8453, 11260

Shakes–Made with Soymilk, Tofu, Amazake, Soy Protein, etc. Usually non-dairy. 6395, 6401, 6958, 7003, 7326, 7357, 7455, 7479, 7509, 7907, 8188, 8453, 8790, 9114, 9174, 9175, 9189, 9621, 9692, 10859, 11260, 11448

Sharon's Finest. *See* Rella Good Cheese Co.

Sheep, Lambs, Ewes, or Rams Fed Soybeans, Soybean Forage, or Soybean Cake or Meal as Feed to Make Wool or Mutton. 479, 584, 621, 627, 655, 718, 740, 984, 1011, 1091, 1097, 1318, 1671, 2099, 2226, 2243

Shennong / Shen Nung. *See* Asia, East–China–Shennong / Shên Nung / Shen Nung

Shiokara-natto. *See* Fermented Black Soybeans from Japan–Other Names

Shiro shoyu. *See* Soy Sauce, Pale (*Shiro Shoyu*)

Shortening–Etymology of This Term and Its Cognates / Relatives in Various Languages. 1344, 2484, 2923, 4017

Shortening Made with Soy Oil. 2558

Shortening. 592, 1344, 1687, 1784, 1819, 1887, 1896, 1906, 1921, 1991, 2071, 2170, 2173, 2177, 2237, 2256, 2277, 2357, 2432, 2433, 2471, 2484, 2496, 2517, 2717, 2735, 2776, 2919, 2923, 2928, 2929, 3285, 3346, 3349, 3425, 3491, 3617, 3662, 3779, 3783, 4282, 4283, 4764, 4848, 4864, 4869, 4904, 5282, 5294, 6130, 6303, 7188, 7582, 7687, 8569, 8850, 9032, 10492, 10575, 10719

Showa Sangyo Co. Ltd. (Tokyo, Japan). 3400, 3405, 3561, 3572, 3575, 3577, 3619, 3622, 3625, 3655, 3838, 5204, 5275, 5393, 5703, 6372, 6509, 7409, 7410, 8303

Showa Shoyu Brewing Co. (Glendale, Arizona). Maker of Marusho Shoyu. Founded by John Tadano in about 1942. 3141, 3649, 9961, 11384

Shoyu. *See* Soy Sauce

Shurtleff, William. *See* Soyinfo Center (Lafayette, California)

Siebold, Philipp Franz von (1796-1866)–German Physician and Naturalist. 333, 346, 373, 380, 384, 473, 474, 499, 513, 518, 560, 569, 586, 587, 588, 658, 659, 661, 662, 668, 693, 820, 849, 919, 1454, 2306, 5687, 6158, 7960, 9477, 10392, 10656, 10752, 10779, 10869

Silage, soybean. *See* Feeds / Forage from Soybean Plants–Forage Used for Silage / Ensilage

Simply Natural, Inc. (Philadelphia, Pennsylvania). Founded by Christine Pirello. 8404, 9052, 9101, 9105, 9113, 11444

Sinaiko Family of Madison, Wisconsin–Incl. Joe Sinaiko of Iowa Milling Co. and Decatur Soy Products Co. (1891-1988), His Brother Ike Sinaiko of Illinois Soy Products Co. (1897-1977), and His Brothers-in-Law Max Albert of Galesburg Soy Products Co. (1893-1966) and Irving Rosen of Quincy Soybean Products Co. (1907-1964). 10581

Single Cell Proteins (Photosynthetic, Including Algae / Microalgae Such as Spirulina, Chlorella, and Scenedesmus). 4087, 4102, 4459, 6371, 6786, 7229, 7642, 7809, 10050, 10062, 10389

Single cell proteins. *See* Microbial Proteins (Non-Photosynthetic)

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Sino-Japanese War (1894-1895)–Soybeans and Soyfoods. Rarely called Chinese-Japanese War. 899, 967, 990, 1025, 1026, 1429, 2108, 2119, 2128, 2433, 2845, 3888, 3898, 4458, 9826, 11476

Size of soybean seeds. *See* Seed Weight / Size (Soybeans)–Weight of 100 Seeds in Grams, or Number of Seeds Per Pound

Sizings for paper or textiles. *See* Paper Coatings or Sizings, or Textile Sizing

Smoked tofu. *See* Tofu, Smoked

Smoothie–Made with Dairy Milk, Ice Cream, or Dairy Ingredients. Also spelled Smoothies or Smoothees. 11448

Smoothie–Made with Soymilk, Tofu, Soy Yogurt, Soy Protein Isolate, Rice Milk, or Other Non-Dairy Smoothie Ingredients. Also spelled Smoothies or Smoothees. 7847, 8426, 9692, 10226, 10431, 10483, 10523, 10553, 10560, 10687, 10721, 11073, 11103, 11448

Soaps or Detergents–Industrial Uses of Soy Oil as a Non-Drying Oil–Soap, Detergent. 1184, 1291, 1299, 1309, 1314, 1315, 1319, 1321, 1338, 1369, 1381, 1397, 1398, 1409, 1410, 1414, 1418, 1442, 1445, 1464, 1477, 1480, 1489, 1496, 1509, 1518, 1527, 1543, 1565, 1574, 1579, 1644, 1687, 1719, 1747, 1796, 1803, 1804, 1806, 1815, 1819, 1823, 1824, 1827, 1833, 1847, 1878, 1884, 1896, 1906, 1931, 1932, 1938, 1953, 1968, 1971, 1991, 2001, 2016, 2071, 2108, 2113, 2117, 2118, 2152, 2163, 2173, 2177, 2186, 2218, 2226, 2237, 2255, 2256, 2311, 2357, 2370, 2401, 2415, 2416, 2433, 2471, 2480, 2481, 2482, 2483, 2735, 2761, 2776, 2795, 2845, 2919, 2923, 2928, 2929, 3060, 3076, 3077, 3088, 3093, 3131, 3151, 3323, 3346, 3349, 3466, 3491, 3662, 3802, 4301, 4764, 4848, 5086, 5290, 5294, 8115, 8939, 10176

Societe Soy (Saint-Chamond, France). *See* Soyfoods Companies (Europe)–Nutrition et Soja

Society for Acclimatization (*Société d'Acclimatation,* France). 439, 503, 504, 512, 515, 526, 543, 558, 559, 569, 586, 612, 617, 618, 620, 621, 627, 629, 646, 650, 652, 656, 686, 699, 706, 708, 828, 947, 975, 1366, 1416, 1623, 1672, 1786, 2005, 2233, 3898, 9983, 10446, 11485

Soil Science–Soil Erosion and Soil Conservation. 3282, 3896, 4901, 5029, 7421, 9350, 10382, 10502, 11316

Soil Science. 251, 637, 716, 2270, 2921, 4896

Soilage, soybean. *See* Feeds / Forage from Soybean Plants–Soilage and Soiling

Sojadoc (Clermond-Ferrand, France). 8778, 9418, 9622, 11444

Sojarei Vollwertkost GmbH (Traiskirchen, near Vienna, Austria). Formerly Sojarei Ebner-Prosl. 8162, 9417, 11444

Sojinal / Biosoja (Formerly Cacoja; Affiliate of Coopérative Agricole de Colmar–Issenheim & Colmar, France). Acquired by B & K Holdings, of Switzerland, in mid-1993. Acquired by Alpro (Belgium) on 22 April 1996. 8750, 8919, 8920, 9418, 9522, 9622, 9666, 10319, 10712

Solbar Hatzor Ltd. (Israel). *See* Hayes Ashdod Ltd. (renamed Solbar Hatzor Ltd. in April 1987) and Hayes General Technology (Israel)

Solnuts B.V. (Tilburg, The Netherlands; and Hudson, Iowa). Including Edible Soy Products, makers of Pro-Nuts, founded in 1970. Acquired by Specialty Food Ingredients Europe BV in Dec. 1991. Acquired by the Kerry Group in Jan. 2000 and Name Changed to Nutriant (Jan. 2002 to 2006). 8650, 9738, 10712, 10978

Solomon Islands. *See* Oceania–Solomon Islands

Solvent extraction equipment. *See* Soybean Crushing–Equipment–Solvent extraction

Solvents–Ethanol (Ethyl Alcohol)–Used for Soy Oil Extraction, or Washing / Purification of Soy Products (Protein, Lecithin, Saponins, etc.). 2499, 2562, 2581, 2637, 2653, 2698, 2701, 2708, 2709, 2710, 2748, 2749, 2834, 2835, 2927, 2981, 3010, 3071, 3072, 3074, 3090, 3211, 3360, 3367, 3368, 3369, 3370, 3499, 3578, 3618, 3672, 3694, 3702, 3704, 3707, 3746, 3752, 3763, 3936, 4025, 4184, 4427, 4451, 4464, 4844, 4976, 5141, 5272, 5567, 5836, 7380

Solvents–Hexane–Used Mainly for Soy Oil Extraction. 3756, 4184, 4458, 4464, 6130, 6216, 7591, 8232, 9053, 9284, 9394, 9419, 9491, 9514, 9872, 10301

Solvents–Trichloroethylene (Trichlorethylene, Trichlor). 4012, 4184, 4458, 4464

Solvents Used for Extraction of the Oil from Soybeans (General, Type of Solvent, Unspecified, or Other). See also Ethanol, Hexane, and Trichloroethylene Solvents. 541, 654, 803, 829, 908, 1183, 1294, 1527, 1687, 1806, 1927, 1931, 2034, 2099, 2152, 2167, 2186, 2317, 2432, 2704, 2761, 2827, 2851, 2859, 2968, 3145, 3173, 3293, 3838, 3912, 3922, 3981, 4023, 4225, 4538, 5020, 5310, 5541, 6027, 6345, 6567, 6815, 7609, 7687, 9803, 10137, 10280

Solvents Used for Extraction of the Oil from Soybeans: Benzene / Benzine / Benzol / Benzin. 1464, 1643, 1685, 1689, 1748, 1796, 1841, 1852, 1853, 1860, 1908, 1915, 1920, 1974, 1977, 1988, 2096, 2117, 2118, 2127, 2140, 2153, 2217, 2324, 2370, 2375, 2474, 2638, 3346, 3349, 3483, 5017, 5018, 5019

Solvents Used for Extraction of the Oil from Soybeans: Naphtha / Naphthas. Also spelled Naptha / Napthas. 1299, 1319, 3947, 4458

Solvents, industrial. *See* Release or Curing Agents for Concrete or Asphalt, Industrial Solvents, Hydraulic Fluids, and Other Minor or General Uses

Solvents. *See* Soybean Crushing–Solvents

Soup, miso. *See* Miso Soup

Sour Cream Alternatives (Non-Dairy–Usually Contains Soy). 6395, 6401, 7003, 7479, 7907, 9621, 9762, 10492, 10859, 11260

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South Africa. *See* Africa–South Africa

South America–Soybean Crushing–Soy Oil and Meal Production and Consumption–Statistics, Trends, and Analyses. 9624

South America trade statistics. *See* Latin America–South America–Trade (Imports or Exports)

South America, soyfoods movement in. *See* Soyfoods Movement in South America

South America. *See* Latin America–South America

South Asia / Indian Subcontinent–Soybean Crushing–Soy Oil and Meal Production and Consumption–Statistics, Trends, and Analyses. 9624

South Manchuria Railway and the South Manchuria Railway Company (*Minami Manshu Tetsudo Kabushiki Kaisha*). 1140, 1184, 1227, 1262, 1305, 1323, 1347, 1357, 1361, 1362, 1373, 1379, 1407, 1408, 1414, 1473, 1475, 1516, 1546, 1586, 1604, 1605, 1617, 1635, 1636, 1641, 1644, 1645, 1647, 1651, 1685, 1689, 1696, 1699, 1748, 1767, 1781, 1793, 1841, 1860, 1919, 1921, 1949, 1961, 1990, 2059, 2070, 2074, 2080, 2081, 2093, 2112, 2119, 2120, 2127, 2128, 2140, 2142, 2146, 2150, 2153, 2157, 2158, 2163, 2167, 2170, 2173, 2177, 2181, 2182, 2186, 2196, 2217, 2219, 2256, 2278, 2301, 2304, 2311, 2324, 2347, 2350, 2352, 2353, 2357, 2360, 2367, 2395, 2415, 2429, 2433, 2480, 2481, 2482, 2483, 2547, 2555, 2562, 2617, 2635, 2637, 2638, 2652, 2653, 2681, 2701, 2702, 2703, 2704, 2705, 2707, 2708, 2709, 2710, 2712, 2713, 2714, 2715, 2718, 2754, 2796, 2811, 2841, 2845, 2851, 2873, 2879, 2887, 2913, 2923, 2927, 2955, 2956, 3009, 3024, 3025, 3048, 3055, 3069, 3071, 3072, 3074, 3079, 3081, 3088, 3090, 3091, 3092, 3094, 3135, 3138, 3144, 3146, 3206, 3207, 3211, 3219, 3223, 3269, 3284, 3293, 3302, 3303, 3304, 3306, 3314, 3317, 3346, 3349, 3360, 3388, 3459, 3483, 3499, 3578, 3606, 3618, 3671, 3673, 3704, 3707, 3752, 3755, 3763, 3888, 5017, 5019, 5057, 5324, 6134, 7468, 9931

South River Miso Co. (Conway, Massachusetts). Including Ohio Miso Co. 6877, 7250, 7743, 7744, 8900, 9026, 9132, 9861, 10447, 10698, 10703, 10704, 10705, 10711, 10745, 10767, 10789, 10958, 11488

Soy Cheese–Etymology of This Term and Its Cognates / Relatives in Various Languages. 7258, 11260

Soy Cheese–Fermented, Western Style, That Melts. May Contain Casein (Cow's Milk Protein). 1873, 5189, 5446, 5782, 6241, 6515, 6539, 6834, 6969, 7003, 7019, 7068, 7240, 7258, 7304, 8308, 8320, 9105, 9761

Soy Cheese–Non-Fermented, Western Style, That Melts. Typically Made with Tofu or Isolated Soy Proteins. Usually Contains Casein (A Protein from Cow's Milk). 5177, 6515, 6898, 7509, 7634, 8832, 9100, 9768

Soy Cheese Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 8750

Soy Cheese or Cheese Alternatives–General, Western Style, That Melts. Often Contains Casein (Cow's Milk Protein). 5260, 5647, 5936, 6352, 7150, 7260, 8010, 8014, 8750, 8928, 8998, 9079, 9155, 9240, 9346, 9449, 9806, 10001, 10004, 10245, 10251, 10291, 10451, 10523, 10758, 10954, 11073, 11103, 11150, 11172, 11208, 11276, 11448

Soy Cheesecake or Cream Pie, Usually Made with Tofu. 6240, 6395, 6401, 6404, 6573, 6727, 6874, 7003, 7004, 7034, 7171, 7326, 7357, 7371, 7455, 7479, 7561, 7621, 7628, 7907, 8086, 8096, 8143, 8447, 8521, 8578, 8650, 8773, 8887, 9036, 9162, 9621, 9762, 9901, 9902, 9915, 10106, 10122, 10124, 10127, 10130, 10155, 10257, 10438, 10445, 10448, 10530, 10548, 10559, 10560, 10649, 10742, 10859, 11260, 11342, 11413

Soy Chocolate (Toasted Soy Flour) (Also includes use of non-roasted Soy Flour or Soymilk in Making Chocolate). 592, 1574, 1585, 1646, 1735, 1784, 1869, 1870, 2148, 2149, 2170, 2292, 2472, 2484, 2951, 3333, 3390, 3557, 7535, 11429

Soy Coffee (Roasted Soy Flour)–Etymology of This Term and Its Cognates / Relatives in Various Languages. 529, 637, 1391, 1585, 2029, 2236, 2292

Soy Coffee–Made from Roasted Soy Flour or Ground Roasted Soybeans. 529, 549, 569, 570, 586, 587, 590, 591, 592, 617, 637, 650, 686, 691, 703, 708, 710, 736, 819, 837, 841, 847, 851, 852, 859, 874, 876, 905, 907, 913, 924, 940, 972, 974, 983, 995, 1004, 1011, 1334, 1335, 1338, 1374, 1381, 1383, 1391, 1412, 1416, 1427, 1442, 1453, 1469, 1496, 1533, 1543, 1551, 1574, 1585, 1610, 1646, 1735, 1741, 1742, 1784, 1806, 1815, 1827, 1837, 1847, 1869, 1870, 1884, 1887, 1896, 1906, 1935, 1974, 2001, 2016, 2029, 2078, 2148, 2149, 2170, 2226, 2234, 2236, 2243, 2292, 2325, 2472, 2484, 2662, 2728, 2736, 2759, 2768, 2817, 2838, 2923, 2951, 2961, 3043, 3214, 3253, 3323, 3333, 3390, 3469, 3491, 3557, 3560, 3689, 3740, 3779, 3781, 3788, 3961, 4506, 5511, 5749, 6405, 6553, 6637, 6964, 7258, 7535, 7557, 8064, 11429, 11469, 11481

Soy Cream Cheese–Etymology of This Term and Its Cognates / Relatives in Various Languages. 7322, 11260

Soy Cream Cheese, Usually Made of Tofu or Soy Yogurt. 6027, 6395, 6958, 7003, 7259, 7322, 7479, 7867, 7907, 8404, 9105, 9141, 9310, 9355, 9621, 9762, 9768, 10492, 10582, 10859, 10897, 11145, 11260, 11423, 11434

Soy Flour–Whole or Full-fat. 193, 393, 439, 509, 592, 702, 735, 736, 738, 768, 788, 824, 849, 932, 1081, 1105, 1141, 1210, 1511, 1805, 1847, 2106, 2113, 2126, 2171, 2324, 2462, 2474, 2484, 2717, 2843, 2848, 2951, 3173, 3371, 3384, 3469, 3561, 3636, 3727, 3887, 3948, 4492, 4506, 4668, 4949, 4953, 5095, 5182, 6281, 6379, 6395, 6401, 6433, 6637, 7258, 7557, 7766, 7841, 7919, 7985, 8011, 8199, 8822, 8828, 9523, 9730, 10041, 10052, 10533, 10683, 11208, 11260, 11316

Soy Flour Equipment. 5219

Soy Flour Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 4961, 5095, 6514, 6637, 7919, 8271, 9041, 9523, 10079, 10533

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Soy Flour Industry and Market Statistics, Trends, and Analyses–Individual Companies or Products. 4024, 4509, 10079, 10683

Soy Flour or Defatted Soybean Meal in Cereal-Soy Blends, with Emphasis on Dry Products Used in Third World Countries (such as CSM, WSB, etc.). 592, 4492, 4961, 5347, 5603, 5713, 5896, 6130, 6573, 6577, 6637, 6823, 6964, 7254, 7641, 7919, 8271, 10079, 11157

Soy Flour, Defatted or Partially Defatted, Used as an Ingredient in Second Generation Commercial Products Such as Baked Goods, Pasta, etc. 6720

Soy Flour, Grits and Flakes (Usually Defatted)–Etymology of These Terms and Their Cognates / Relatives in Various Languages. 509, 735, 788, 824, 1344, 1412, 7919

Soy Flour, Grits, Meal, Powder, or Flakes–For Food Use (Usually Defatted or Low-Fat). See also Soy Flour–Whole or Full-fat. 272, 319, 509, 735, 758, 788, 824, 838, 1070, 1278, 1309, 1310, 1319, 1336, 1338, 1344, 1346, 1352, 1357, 1365, 1369, 1386, 1410, 1412, 1416, 1427, 1457, 1464, 1475, 1483, 1489, 1509, 1511, 1518, 1536, 1543, 1554, 1565, 1574, 1585, 1596, 1599, 1610, 1719, 1735, 1742, 1784, 1786, 1796, 1806, 1827, 1832, 1867, 1869, 1870, 1878, 1884, 1885, 1887, 1891, 1894, 1906, 1914, 1921, 1934, 1935, 1938, 1953, 1971, 1974, 1978, 1991, 2008, 2016, 2026, 2051, 2076, 2078, 2081, 2110, 2143, 2148, 2149, 2159, 2170, 2175, 2192, 2223, 2226, 2237, 2243, 2245, 2251, 2292, 2325, 2357, 2433, 2474, 2484, 2517, 2557, 2622, 2727, 2736, 2759, 2761, 2774, 2775, 2817, 2821, 2833, 2834, 2835, 2836, 2843, 2912, 2923, 2929, 2961, 2963, 2972, 2999, 3049, 3053, 3079, 3151, 3159, 3191, 3276, 3323, 3328, 3333, 3349, 3363, 3371, 3379, 3384, 3385, 3387, 3395, 3425, 3427, 3436, 3438, 3466, 3469, 3483, 3491, 3503, 3557, 3559, 3561, 3584, 3586, 3612, 3624, 3628, 3646, 3647, 3689, 3693, 3700, 3705, 3722, 3754, 3755, 3756, 3779, 3781, 3783, 3784, 3787, 3802, 3837, 3842, 3873, 3880, 3887, 3894, 3896, 3899, 3900, 3947, 3961, 4023, 4024, 4049, 4222, 4350, 4375, 4401, 4433, 4440, 4454, 4459, 4460, 4474, 4483, 4484, 4509, 4535, 4536, 4580, 4595, 4597, 4626, 4629, 4636, 4669, 4711, 4730, 4745, 4771, 4792, 4800, 4801, 4811, 4842, 4845, 4904, 4905, 4906, 4908, 4913, 4958, 4962, 4970, 5056, 5079, 5094, 5097, 5102, 5109, 5126, 5163, 5171, 5172, 5189, 5213, 5241, 5249, 5272, 5274, 5290, 5294, 5347, 5355, 5356, 5357, 5358, 5378, 5406, 5423, 5461, 5507, 5549, 5567, 5586, 5596, 5603, 5663, 5683, 5709, 5712, 5746, 5760, 5774, 5779, 5782, 5783, 5797, 5806, 5815, 5817, 5836, 5850, 5888, 5911, 5925, 5926, 5934, 5941, 5962, 5996, 5998, 6010, 6027, 6057, 6059, 6063, 6110, 6130, 6160, 6173, 6216, 6254, 6279, 6292, 6306, 6334, 6345, 6360, 6379, 6395, 6401, 6422, 6514, 6524, 6637, 6670, 6738, 6788, 6814, 6815, 6823, 6846, 6884, 6958, 6959, 6964, 6984, 7005, 7036, 7039, 7076, 7142, 7188, 7210, 7226, 7280, 7300, 7327, 7383, 7392, 7402, 7405, 7409, 7414, 7542, 7557, 7584, 7641, 7661, 7687, 7766, 7793, 7815, 7816, 7867, 7919, 7932, 8020, 8045, 8051, 8122, 8220, 8251, 8265, 8271, 8283, 8325, 8413, 8417, 8441, 8442, 8444, 8447, 8450, 8453, 8493, 8562, 8569, 8693, 8885, 8911, 8946, 9002, 9041, 9072, 9135, 9141, 9192, 9224, 9240, 9310, 9355, 9375, 9523, 9851, 9890, 9960, 10000, 10003, 10069, 10075, 10079, 10127, 10133, 10174, 10236, 10243, 10245, 10248, 10251, 10372, 10424, 10439, 10451, 10499, 10523, 10533, 10567, 10575, 10582, 10649, 10688, 10707, 10709, 10746, 10855, 10897, 10946, 11014, 11103, 11145, 11221, 11260, 11266, 11359, 11434, 11437, 11479

Soy Flour, Grits, and Flakes–Enzyme Active (Whole / Full-Fat, Unheated). 6027, 8011, 9730, 10575

Soy Flour, Grits, and Flakes–Use in Brewing Beer, Such as ADM Pro-zyme Flakes and Soybean Brew Flakes. 3276, 3961, 6027

Soy Flour, Textured (Including TVP, Textured Vegetable Protein). 5615, 5692, 5810, 5923, 6157, 6165, 6254, 6306, 6815, 6884, 6959, 7076, 7251, 7353, 7382, 7386, 7452, 7641, 7660, 7985, 8017, 8325, 8946, 9041, 9224, 9380, 9523, 9730, 9735, 9779, 9787, 10000, 10071, 10245, 10355, 11218

Soy Flour, Whole or Full-fat–Etymology of These Terms and Their Cognates / Relatives in Various Languages. 439, 592, 768, 3469

Soy Ice Cream (Frozen or Dry Mix)–Imports, Exports, International Trade. 8346, 8352, 8354, 8367, 8403, 8404, 8471, 8475, 8477, 8479, 8592, 8650, 8768, 9089, 9108, 10451, 11450

Soy Ice Cream (General–Usually Non-Dairy). 1887, 2106, 3173, 3425, 3624, 3756, 3803, 3954, 4460, 4502, 4597, 4898, 5115, 5610, 5645, 5665, 5779, 6027, 6130, 6240, 6395, 6401, 6573, 6709, 6784, 6958, 6965, 7003, 7030, 7034, 7064, 7229, 7256, 7257, 7258, 7259, 7260, 7308, 7326, 7347, 7357, 7371, 7455, 7479, 7509, 7537, 7557, 7565, 7596, 7621, 7630, 7633, 7642, 7767, 7828, 7831, 7853, 7866, 7867, 7878, 7907, 7923, 7990, 7998, 8010, 8014, 8051, 8086, 8139, 8167, 8169, 8196, 8209, 8231, 8232, 8240, 8241, 8250, 8266, 8271, 8277, 8303, 8316, 8346, 8352, 8354, 8367, 8371, 8375, 8399, 8400, 8403, 8404, 8410, 8411, 8447, 8471, 8475, 8477, 8479, 8524, 8534, 8548, 8558, 8569, 8592, 8597, 8650, 8734, 8743, 8768, 8879, 8885, 8895, 8920, 8928, 8954, 8998, 9040, 9057, 9079, 9089, 9108, 9134, 9141, 9152, 9225, 9234, 9346, 9365, 9398, 9451, 9502, 9604, 9610, 9612, 9621, 9700, 9707, 9762, 10069, 10079, 10245, 10445, 10451, 10554, 10560, 10581, 10582, 10622, 10651, 10712, 10801, 10859, 10892, 10897, 10920, 10954, 11132, 11133, 11145, 11208, 11260, 11345, 11423, 11434, 11450, 11474, 11493

Soy Ice Cream–Etymology of This Term and Its Cognates / Relatives in Various Languages. 1887, 6395, 7565, 7828, 8240, 11450

Soy Ice Cream–Non-Soy Non-Dairy Relatives (As Made from Amazake, Fruit Juices, Peanuts, Field Peas, etc.). 1873, 8240, 8871, 9040, 9234, 9558, 9915, 10148, 11287, 11450

Soy Ice Cream Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 8240, 10079, 11450

Soy Ice Cream Industry and Market Statistics, Trends, and Analyses–Individual Companies. 7767, 8240, 8241, 8346, 8352, 8354, 8411, 8768, 9089, 9108, 10079, 11450

Soy Ice Cream, Homemade–How to Make at Home or on a Laboratory or Community Scale, by Hand. 11450

Soy Molasses or Soy Solubles–A By-Product of Making Soy Protein Concentrate Using the Aqueous Alcohol Wash Process. Rich in Isoflavones. 10221, 10533

Soy Oil–Etymology of This Term and Its Cognates / Relatives in

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Various Languages. 438, 439, 509, 514, 533, 541, 574, 617, 666, 676, 837, 1077, 1299, 1333, 1412, 1789, 3093, 3379, 3612, 7591, 9502

Soy Oil Constants–Iodine Number / Value. 803, 908, 1125, 1319, 1371, 1496, 1747, 1789, 1884, 1896, 2152, 2157, 2323, 2416, 2481, 2735, 2771, 2795, 2929, 3062, 3077, 3081, 3091, 3093, 3363, 3626, 3629, 3631, 3632, 3680, 3701, 4159, 4829, 6130

Soy Oil Constants. Includes Index of Refreaction, Refreactive Index, Solidification Point (*Erstarrungspunkt*), Specific Gravity. See also Iodine Number. 803, 908, 1125, 1747, 1896, 2127, 2323, 2497, 2502, 2735, 3077, 3093

Soy Oil as a Commodity, Product, or Ingredient for Food Use (in Cookery or Foods). Its Manufacture, Refining, Trade, and Use. See Also: Industrial Uses of Soy Oil, and Nutrition: Lipids. 343, 438, 439, 509, 514, 527, 533, 541, 568, 574, 586, 589, 592, 613, 614, 617, 618, 621, 637, 652, 654, 655, 665, 666, 667, 676, 686, 688, 703, 704, 706, 708, 709, 710, 715, 716, 720, 736, 750, 758, 773, 795, 796, 803, 805, 816, 824, 828, 829, 836, 837, 843, 853, 874, 891, 907, 908, 917, 925, 932, 937, 940, 943, 946, 947, 953, 967, 975, 1006, 1025, 1026, 1045, 1050, 1063, 1074, 1077, 1092, 1105, 1122, 1125, 1130, 1133, 1136, 1147, 1166, 1183, 1198, 1199, 1200, 1201, 1208, 1211, 1213, 1228, 1233, 1236, 1238, 1241, 1244, 1245, 1246, 1248, 1250, 1251, 1253, 1254, 1256, 1260, 1262, 1265, 1266, 1269, 1271, 1278, 1283, 1287, 1292, 1299, 1300, 1303, 1304, 1308, 1309, 1310, 1311, 1312, 1315, 1318, 1319, 1320, 1323, 1324, 1326, 1333, 1334, 1335, 1336, 1337, 1338, 1344, 1345, 1346, 1348, 1350, 1363, 1365, 1368, 1369, 1370, 1371, 1372, 1374, 1376, 1379, 1381, 1383, 1384, 1389, 1393, 1394, 1397, 1398, 1409, 1412, 1426, 1427, 1437, 1445, 1447, 1449, 1457, 1459, 1464, 1465, 1466, 1473, 1474, 1475, 1476, 1477, 1478, 1480, 1483, 1489, 1496, 1501, 1508, 1509, 1516, 1518, 1520, 1521, 1527, 1533, 1536, 1543, 1544, 1551, 1554, 1560, 1565, 1569, 1574, 1585, 1586, 1596, 1599, 1610, 1617, 1618, 1620, 1623, 1635, 1636, 1638, 1641, 1642, 1645, 1647, 1651, 1671, 1678, 1679, 1683, 1684, 1685, 1687, 1688, 1689, 1692, 1693, 1696, 1697, 1714, 1719, 1720, 1722, 1723, 1737, 1739, 1740, 1742, 1748, 1752, 1762, 1767, 1774, 1781, 1786, 1789, 1790, 1791, 1793, 1796, 1803, 1804, 1806, 1815, 1817, 1819, 1821, 1823, 1824, 1826, 1827, 1832, 1841, 1843, 1856, 1857, 1860, 1868, 1869, 1870, 1876, 1878, 1880, 1884, 1887, 1888, 1889, 1890, 1895, 1896, 1899, 1902, 1910, 1911, 1912, 1913, 1914, 1915, 1919, 1920, 1921, 1922, 1925, 1927, 1928, 1931, 1932, 1934, 1935, 1938, 1939, 1943, 1944, 1946, 1947, 1949, 1953, 1954, 1956, 1958, 1968, 1970, 1973, 1975, 1977, 1981, 1985, 1986, 1988, 1990, 1991, 1995, 2008, 2012, 2013, 2016, 2023, 2024, 2026, 2031, 2037, 2038, 2045, 2046, 2048, 2051, 2055, 2058, 2062, 2069, 2071, 2076, 2078, 2080, 2081, 2085, 2095, 2096, 2097, 2101, 2108, 2110, 2111, 2112, 2117, 2118, 2119, 2120, 2122, 2124, 2127, 2128, 2130, 2140, 2141, 2147, 2148, 2149, 2152, 2153, 2154, 2159, 2161, 2163, 2166, 2167, 2172, 2173, 2175, 2177, 2179, 2183, 2190, 2192, 2196, 2203, 2207, 2217, 2218, 2219, 2226, 2243, 2251, 2254, 2256, 2265, 2267, 2277, 2292, 2293, 2294, 2295, 2296, 2297, 2299, 2304, 2307, 2317, 2323, 2324, 2325, 2335, 2344, 2347, 2353, 2356, 2365, 2367, 2375, 2433, 2459, 2462, 2465, 2471, 2475, 2478, 2484, 2497, 2502, 2505, 2506, 2507, 2515, 2517, 2523, 2538, 2555, 2557, 2562, 2608, 2617, 2635, 2637, 2638, 2639, 2642, 2647, 2652, 2656, 2663, 2697, 2698, 2701, 2703, 2708, 2709, 2710, 2714, 2717, 2718, 2731, 2735, 2736, 2749, 2753, 2755, 2759, 2771, 2775, 2777, 2794, 2795, 2807, 2838, 2851, 2858, 2859, 2867, 2871, 2885, 2923, 2927, 2929, 2930, 2940, 2951, 2956, 2957, 2961, 2962, 2972, 2977, 2981, 2988, 2998, 3003, 3004, 3043, 3048, 3049, 3051, 3058, 3059, 3063, 3071, 3072, 3074, 3077, 3082, 3090, 3093, 3131, 3135, 3137, 3139, 3142, 3151, 3159, 3168, 3173, 3182, 3190, 3211, 3222, 3258, 3269, 3275, 3284, 3317, 3331, 3332, 3333, 3341, 3343, 3346, 3349, 3360, 3363, 3379, 3380, 3382, 3384, 3385, 3387, 3390, 3398, 3425, 3436, 3440, 3445, 3466, 3469, 3476, 3483, 3521, 3551, 3552, 3553, 3557, 3558, 3560, 3571, 3578, 3596, 3612, 3617, 3618, 3634, 3635, 3645, 3646, 3647, 3662, 3663, 3669, 3672, 3690, 3693, 3694, 3700, 3704, 3707, 3711, 3737, 3746, 3752, 3755, 3759, 3763, 3781, 3787, 3802, 3826, 3831, 3855, 3868, 3887, 3894, 3897, 3898, 3899, 3900, 3970, 3971, 4023, 4108, 4110, 4184, 4339, 4356, 4357, 4424, 4426, 4437, 4448, 4451, 4478, 4506, 4514, 4526, 4538, 4579, 4595, 4600, 4753, 4764, 4844, 4848, 4849, 4864, 4867, 4904, 4958, 4968, 4994, 5016, 5017, 5018, 5019, 5046, 5050, 5054, 5056, 5057, 5079, 5085, 5101, 5107, 5168, 5193, 5197, 5198, 5201, 5265, 5272, 5275, 5290, 5294, 5295, 5297, 5299, 5304, 5345, 5365, 5458, 5511, 5549, 5550, 5557, 5578, 5607, 5669, 5732, 5770, 5825, 5863, 5874, 5875, 5881, 5930, 5935, 5996, 6000, 6067, 6071, 6096, 6106, 6108, 6124, 6130, 6181, 6216, 6261, 6270, 6303, 6314, 6375, 6395, 6401, 6432, 6467, 6509, 6523, 6537, 6567, 6584, 6669, 6670, 6686, 6696, 6699, 6770, 6783, 6784, 6785, 6798, 6825, 6936, 6958, 7039, 7061, 7080, 7093, 7099, 7142, 7188, 7211, 7221, 7288, 7320, 7416, 7429, 7443, 7582, 7591, 7608, 7641, 7679, 7680, 7681, 7684, 7685, 7707, 7771, 7866, 7867, 7940, 7951, 7958, 7964, 8026, 8174, 8196, 8209, 8223, 8271, 8444, 8453, 8611, 8647, 8766, 8770, 8774, 8789, 8804, 8812, 8849, 8850, 8872, 8885, 8888, 8889, 8897, 8978, 8995, 9002, 9025, 9032, 9117, 9141, 9242, 9319, 9336, 9502, 9513, 9523, 9761, 9907, 9931, 9983, 10069, 10074, 10075, 10137, 10142, 10251, 10446, 10451, 10567, 10582, 10649, 10756, 10897, 11083, 11103, 11145, 11157, 11172, 11208, 11260, 11434

Soy Plant (The) (Ann Arbor, Michigan). *See* Rosewood Products Inc. (Ann Arbor)

Soy Protein Concentrates, Textured. 6390, 6960, 8017, 8265, 8325, 9380, 10038, 10492, 11218

Soy Protein Council (Food Protein Council from 1971 to Dec. 1981). 6371, 8020

Soy Protein Isolates, Concentrates, or Textured Soy Protein Products–Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 5095, 5746, 6514, 6639, 6670, 6815, 7382, 8017, 8271, 8325, 9041, 9224, 9380, 9523, 9937, 10000, 10079, 10433, 10533, 10700, 10712, 10813

Soy Protein Isolates, Concentrates, or Textured Soy Protein Products–Industry and Market Statistics, Trends, and Analyses–Individual Companies. 6254, 6645, 7327, 8142, 8271, 9171, 9517, 10000, 10045, 10079, 10151, 10355, 10433, 10469, 10700

Soy Protein Isolates, Textured (For Food Use Only, Including Spun Soy Protein Fibers or Soy Isolate Gels). See also: Industrial Uses of Soy Proteins–Fibers (Artificial Wool Made from Spun Soy Protein Fibers). 5507, 5521, 5746, 5810, 5820, 5897, 5923, 5924, 5953, 6027, 6130, 6157, 6165, 6226, 6240, 6254, 6264, 6395, 6401, 6513, 6514, 6521, 6689, 6784, 6785, 6815, 6960, 7353, 7404, 7452, 7551, 7557, 8017, 8169, 8232, 8325, 9384, 9730, 10000, 10567, 10655, 11218, 11260, 11419

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Soy Protein Products (General, or Modern Products). See also: Nutrition–Protein, Protein Quality, and Amino Acid Composition. 2105, 2148, 2149, 2187, 2475, 2484, 2600, 2878, 3070, 3150, 3359, 3488, 3489, 3495, 3840, 3867, 3912, 3936, 3937, 4003, 4104, 4162, 4415, 4440, 4459, 4875, 4886, 4898, 4905, 4906, 4960, 4988, 5023, 5068, 5072, 5095, 5141, 5274, 5303, 5521, 5530, 5562, 5581, 5592, 5676, 5685, 5696, 5701, 5711, 5712, 5722, 5735, 5738, 5758, 5773, 5820, 5840, 5953, 5996, 6027, 6063, 6092, 6115, 6164, 6204, 6206, 6254, 6279, 6300, 6340, 6354, 6355, 6356, 6371, 6372, 6489, 6492, 6493, 6500, 6505, 6506, 6511, 6513, 6514, 6524, 6554, 6639, 6655, 6670, 6699, 6783, 6814, 6821, 6822, 6976, 6980, 6983, 7022, 7036, 7059, 7080, 7150, 7271, 7378, 7380, 7397, 7542, 7557, 7611, 7766, 7905, 8051, 8087, 8251, 8271, 8341, 8366, 8370, 8414, 9372, 9502, 9775, 9783, 9855, 9965, 9966, 10000, 10079, 10102, 10423, 10492, 10833, 11172

Soy Protein and Proteins–Etymology of These Terms and Their Cognates / Relatives in Various Languages. 607, 608, 614, 637, 737, 740, 774, 788, 811, 917, 952, 1852, 3168, 3379, 3727, 4506

Soy Proteins–Concentrates. 5095, 5400, 5466, 5521, 5587, 5603, 5647, 5733, 5734, 5746, 5926, 5996, 6130, 6306, 6336, 6395, 6401, 6433, 6514, 6815, 6960, 7036, 7327, 7382, 7385, 7557, 7661, 7815, 7816, 7932, 7985, 8017, 8051, 8265, 8325, 8405, 8569, 8650, 8928, 8963, 9041, 9171, 9224, 9380, 9384, 9498, 9707, 10000, 10075, 10151, 10221, 10236, 10433, 10492, 10533, 10567, 10742, 10978, 11014, 11208, 11222, 11260, 11419

Soy Proteins–Detection When Added to Other Food Products (Such as Meat or Dairy Products, Wheat Flour or Baked Goods). 2115, 3151, 6027, 7018, 7030, 7503, 8381

Soy Proteins–Hydrolyzed and Hydrolysates (General), as in Flavourings, HVP, Cosmetics, Personal Care Products, Predigested Milk Replacers, etc. 2312, 2825, 3751, 4287, 4288, 4289, 5548, 5701, 7734, 9276

Soy Proteins–Isolates–Enzyme-Modified Soy Protein with Whipping / Foaming Properties Used to Replace Egg Albumen, and Early Related Whipping / Aerating Agents or Products. 3779, 3947, 3959, 4101, 5540, 5925, 5926, 5934, 5938, 5940, 5996, 6027, 8017, 8190, 8284, 8930

Soy Proteins–Isolates–Etymology of These Terms and Their Cognates / Relatives in Various Languages. 6336

Soy Proteins–Isolates, for Food Use. See also: Isolates, for Industrial (Non-Food) Use. 2117, 2226, 2748, 3379, 3561, 4029, 4034, 4137, 4229, 4406, 4440, 4474, 4711, 4906, 4962, 5068, 5078, 5095, 5115, 5379, 5395, 5400, 5402, 5500, 5507, 5521, 5603, 5693, 5746, 5836, 5859, 5867, 5897, 5926, 6010, 6027, 6065, 6092, 6130, 6159, 6231, 6336, 6390, 6433, 6514, 6515, 6645, 6784, 6785, 6815, 6898, 6968, 6975, 7036, 7163, 7261, 7274, 7327, 7382, 7384, 7393, 7508, 7586, 7633, 7661, 7759, 7764, 7816, 7890, 7923, 7932, 7959, 7990, 8004, 8010, 8017, 8051, 8142, 8168, 8231, 8240, 8241, 8265, 8273, 8316, 8325, 8365, 8405, 8430, 8481, 8524, 8569, 8687, 8743, 8752, 8905, 8928, 8963, 8998, 9041, 9053, 9067, 9071, 9224, 9231, 9376, 9384, 9498, 9523, 9596, 9612, 9662, 9707, 9926, 9941, 9980, 10000, 10016, 10045, 10069, 10079, 10151, 10214, 10236, 10280, 10342, 10433, 10469, 10493, 10533, 10575, 10597, 10660, 10688, 10700, 10712, 10768, 10808, 10826, 10886, 11009, 11014, 11022, 11054, 11103, 11208, 11219, 11221, 11222, 11437, 11470, 11479, 11484, 11486, 11493

Soy Proteins–Isolates, for Industrial (Non-Food) Use. See also: Isolates, for Food Use. 1596, 2117, 2118, 2972, 3323, 3947, 4137, 5095, 8017, 8939, 9224, 9351, 10176, 11480

Soy Proteins–Properties (Including Types {Globulins, Glycinin, Beta- and Gamma-Conglycinin} Protein Fractions and Subunits, Sedimentation Coefficients, Nitrogen Solubility, and Rheology). 608, 619, 675, 689, 709, 712, 720, 724, 754, 770, 772, 821, 853, 889, 892, 952, 1147, 1207, 1234, 1596, 1616, 1830, 1849, 1908, 2034, 2117, 2118, 2170, 2312, 2417, 2418, 2421, 2422, 2493, 2494, 2495, 2499, 2547, 2698, 2701, 2749, 2783, 2861, 2862, 2881, 2882, 2940, 2979, 2984, 3054, 3068, 3073, 3168, 3371, 3501, 3760, 3836, 3986, 3987, 3988, 4034, 4118, 4464, 4483, 4484, 4678, 4810, 4965, 4966, 5014, 5078, 5139, 5144, 5162, 5170, 5179, 5180, 5191, 5195, 5267, 5298, 5369, 5375, 5389, 5440, 5454, 5457, 5467, 5474, 5475, 5476, 5530, 5541, 5543, 5548, 5566, 5567, 5572, 5581, 5605, 5741, 5750, 5756, 5822, 5828, 5840, 5849, 5915, 5925, 5926, 5934, 5938, 6013, 6027, 6065, 6100, 6115, 6193, 6196, 6197, 6203, 6219, 6313, 6321, 6322, 6328, 6329, 6330, 6354, 6355, 6364, 6386, 6463, 6470, 6479, 6480, 6481, 6482, 6541, 6552, 6561, 6578, 6618, 6652, 6679, 6683, 6716, 6836, 6862, 6993, 7207, 7222, 7374, 7610, 7967, 8004, 8146, 8273, 8284, 8365, 8380, 8384, 8393, 8541, 8638, 8776, 8857, 8883, 8955, 9276, 9498, 9711, 9773, 9774, 9778, 9827, 9845, 9849, 9951, 9985, 9994, 10007, 10168, 10175, 10192, 10275, 10310, 10405, 10435, 10486, 10567, 10810, 10835, 10836

Soy Proteins–Textured Isolates–Etymology of These Terms and Their Cognates / Relatives in Various Languages. 5810

Soy Proteins–Used as an Ingredient in or for Early Second Generation Commercial Food or Beverage Products. 5115

Soy Proteins, Textured (General). 5395, 5400, 5448, 5690, 5691, 5746, 5810, 5820, 6157, 6196, 6197, 6211, 6226, 6235, 6388, 6490, 6670, 6717, 6824, 6915, 6978, 6989, 7117, 7391, 7400, 7646, 7647, 7649, 7721, 8178, 8215, 8361, 8681, 8805, 9384, 9777, 10451, 11103, 11218

Soy Pudding, Custard, Parfait, or Mousse (Usually made from Soymilk. Non-Dairy Milk, or Tofu). See also Soy Yogurt–Not Fermented. 1935, 2026, 2106, 2277, 2662, 2717, 2951, 3173, 3333, 3469, 4597, 4688, 4902, 5227, 6154, 6172, 6395, 6397, 6401, 6404, 6628, 6632, 6849, 7003, 7239, 7424, 7472, 7479, 7496, 7509, 7561, 7621, 7719, 7826, 7907, 7922, 8086, 8122, 8240, 8306, 8453, 8552, 8627, 8649, 8759, 8767, 8879, 8887, 8907, 9036, 9114, 9270, 9355, 9563, 9621, 9664, 9902, 10185, 10240, 10252, 10300, 10356, 10427, 10438, 10463, 10483, 10496, 10560, 10721, 10801, 10859, 11071, 11121, 11260, 11415, 11479

Soy Sauce (Including Shoyu and Worcestershire Sauce)–Imports, Exports, International Trade. 79, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 94, 95, 96, 99, 100, 101, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 135, 138, 150, 158, 165, 166, 167, 168, 169, 172, 173, 174, 175, 178, 179, 186, 189, 193, 195, 199, 201, 211, 219, 223, 224, 229, 230, 231, 237, 241, 244, 245, 251,

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Soy Sauce (Including Shoyu), Homemade–How to Make at Home or on a Laboratory Scale, by Hand. 264, 301, 350, 5529, 5992, 6234, 7878

Soy Sauce (Including Shoyu). See Also Tamari, Teriyaki Sauce, and Traditional Worcestershire Sauce. 26, 30, 36, 43, 45, 50, 52, 55, 56, 59, 66, 67, 68, 71, 72, 73, 76, 78, 79, 81, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 94, 95, 96, 97, 99, 100, 101, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 118, 120, 121, 123, 126, 129, 130, 131, 132, 133, 135, 138, 142, 144, 145, 147, 148, 150, 151, 152, 155, 157, 158, 161, 163, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 177, 178, 179, 180, 183, 184, 186, 187, 189, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 208, 209, 210, 211, 212, 213, 215, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 236, 237, 238, 239, 241, 242, 244, 245, 246, 248, 249, 251, 252, 253, 255, 258, 263, 264, 265, 268, 269, 273, 275, 276, 277, 279, 281, 282, 285, 287, 289, 291, 294, 296, 299, 300, 301, 302, 303, 306, 309, 310, 311, 312, 314, 315, 316, 317, 318, 319, 321, 323, 324, 325, 326, 328, 329, 330, 331, 332, 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Soybean–Physiology–Photoperiodism / Photoperiod, Photoperiodic Effects, or Photo-Thermal Responses. 3728, 3890, 3994, 4194, 4432, 4710, 4901, 5029, 6111, 6136, 6137, 7270, 7275, 8712, 9002, 10546

Soybean–Physiology–Tolerance to Cold, Chilling, or Low Temperatures, and Cold Tolerant Varieties. 5652, 5757, 6137, 6295, 6916, 7225, 8024, 10477, 10725, 10923

Soybean–Physiology and Biochemistry (Including Photoperiodism, Photosynthesis, Translocation, Plant Water Relations, Respiration, Photorespiration). 1286, 1469, 2109, 2121, 2989, 3015, 3682, 3811, 3852, 4004, 4022, 4046, 4239, 4323, 4324, 4377, 4432, 4493, 4546, 4602, 4679, 4696, 4697, 4732, 4762, 4828, 4840, 4841, 4862, 4889, 4890, 5113, 5640, 5757, 5949, 6916, 7467, 7848, 8022, 8024, 8723, 8789, 9857, 10817

Soybean–Physiology and Biochemistry–Maturity Groups. 3932, 3933, 4362, 4542, 4602, 5742, 5846, 6136, 6556, 6735

Soybean–Taxonomy / Classification. 143, 144, 161, 183, 191, 204, 205, 217, 232, 233, 238, 240, 254, 322, 327, 346, 352, 384, 452, 513, 514, 518, 529, 544, 550, 560, 693, 716, 795, 897, 1036, 1366, 1384, 1420, 1453, 1454, 1469, 1514, 1603, 1763, 2226, 2352, 2519, 2992, 3185, 4924, 6977, 7012, 7329, 7848, 9336, 9461, 9857, 9953

Soybean–Terminology and Nomenclature–Fanciful Terms and Names. 2113, 3736, 8837

Soybean–origin and domestication. *See* Origin, Domestication, and Dissemination of the Soybean (General)

Soybean Council of America. *See* American Soybean Association (ASA)–Soybean Council of America

Soybean Crushers (Asia)–(General). 4225, 4869, 5204, 7608, 7609

Soybean Crushers (Canada), Early (Started Before 1941)–Milton Oil Refineries Ltd. (Milton, Ontario; March 1930–Renamed Canadian Soyabeans Ltd. by March 1935), Dominion Linseed Oil Co. (Baden, ONT; 1932), Soy Bean Oil and Meal Co-operative Company of Canada, Ltd. (Chatham, ONT; 1932), Dominion Soya Industries / Dominion Soya Products Co. (Montreal, Quebec; spring 1935), Soya Mills Limited (Stratford, ONT; Jan. 1936), Edgar Soya Products (Belle River, Ontario; 1936), Toronto Elevators Ltd. (Toronto, ONT; 1938). 3151, 6106, 10074

Soybean Crushers (Europe)–General. 1294, 1309, 1310, 1315, 1333, 1464, 7591

Soybean Crushers (Europe). *See* Unilever Corp., Lever Brothers Co., Unimills B.V. (Netherlands)

Soybean Crushers (USA), Cooperative–General and Other. 6820, 7687

Soybean Crushers (USA), Early–Pacific Oil Mills and Albers Brothers Milling Co. (Seattle, Washington; 1911), Elizabeth City Oil and Fertilizer Co. (Elizabeth City, North Carolina; 1915. By 1917 six other North Carolina oil mills were crushing soybeans), Chicago Heights Oil Mfg. Co. (Chicago Heights, Illinois; 1920),

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A.E. Staley Mfg. Co. (Decatur, Illinois; 1922), Piatt County Cooperative Soy Bean Co. (Monticello, Illinois; 1923–batch solvent), Blish Milling Co. (Seymour and Crothersville, Indiana; 1923), Eastern Cotton Oil Co. (Norfolk, Virginia; 1924–continuous solvent). 1363, 1443, 1570, 1774, 1789, 1803, 1806, 1884, 1941, 1968, 5749

Soybean Crushers (USA), Small Crushers–Arkansas Grain Corp. (Helena & Stuttgart, Arkansas), Hemphill Soy Products (Kennett, Missouri), Old Fort Mills (Marion, Ohio), Sioux Soya Mills (Sioux City, Iowa), Soy Bean Processing Co. (Waterloo, Iowa), Soybean Products, Inc. (Cedar Rapids, Iowa), Southern Soya Corp. (Cameron, South Carolina), Soy-Rich Products (Wichita, Kansas), Toledo Soybean Products (Toledo, Ohio) Western Soybean Mills (Sioux Falls, South Dakota), etc. 4231

Soybean Crushers (USA). *See* Seed Companies, Soybean–Funk Brothers Seed Co. (Bloomington, Illinois)–After 1924, Sinaiko Family and Iowa Milling Co. (Cedar Rapids, Iowa)

Soybean Crushing (General: Soy / Soybean Oil and Soybean Meal). 1032, 1267, 1404, 1617, 1629, 2070, 2072, 2073, 2099, 2129, 2170, 2237, 2357, 2496, 2707, 2761, 2844, 2845, 2913, 3145, 3359, 3491, 3758, 3814, 3841, 3922, 3928, 3929, 3954, 3981, 4197, 4225, 4333, 4427, 4440, 4621, 4743, 4751, 4812, 4959, 4996, 5013, 5033, 5049, 5084, 5102, 5204, 5276, 5368, 5379, 5460, 5703, 5931, 6027, 6311, 6779, 6814, 7041, 7089, 7173, 7187, 7207, 7380, 7493, 7542, 7557, 7687, 8031, 8033, 8232, 8485, 8645, 8837, 9112, 9624, 9684, 9872, 10142, 10144, 10181, 10193, 10276, 10674, 10884, 11138, 11417, 11419

Soybean Crushing–Equipment–Hydraulic Presses. 1314, 1323, 1348, 1445, 1478, 1480, 1796, 1804, 1860, 1913, 1977, 2111, 2120, 2128, 2177, 2207, 2304, 2357, 2433, 2471, 2474, 2652, 3346, 3349, 3385, 3831, 3922, 5057, 9872, 9931

Soybean Crushing–Equipment–Screw Presses and Expellers (Continuous, Mechanical). 1915, 1920, 2120, 2433, 2471, 2474, 2775, 3173, 3756, 3922, 3954, 4764, 5057, 6027, 6567, 7687, 10352

Soybean Crushing–Equipment–Solvent Extraction. 1464, 2117, 2118, 2432, 2474, 3360, 4458, 7591, 8232

Soybean Crushing–Equipment–Wedge Presses (Early Technology from China and Manchuria). 2120, 2433, 2652, 3346, 3349, 3831, 7591

Soybean Crushing–Explosions and/or Fires in Soybean Solvent Extraction Plants (Making Soy Oil and Soybean Meal). 5310, 9803, 11138

Soybean Crushing–Processing Capacity and/or Storage Capacity of Individual Plants–Statistics. 1689, 1925

Soybean Crushing, Including Production and Trade of Soybean Oil, Meal or Cake, Margarine, or Shortening–Industry and Market Statistics, Trends, and Analyses -. 1299, 1308, 1374, 1389, 1398, 1409, 1418, 1439, 1445, 1465, 1466, 1475, 1543, 1565, 1683, 1685, 1796, 1819, 1881, 1899, 1915, 1920, 1921, 1922, 1928, 1939, 1956, 1995, 2016, 2031, 2046, 2055, 2071, 2096, 2108, 2111, 2128, 2152, 2172, 2177, 2186, 2226, 2293, 2294, 2295, 2296, 2297, 2317, 2347, 2353, 2357, 2471, 2777, 2851, 2867, 2919, 2928, 2998, 3346, 3349, 3551, 3581, 3617, 3662, 3663, 3711, 3779, 3783, 3887, 3947, 3954, 4197, 4333, 4437, 4597, 4621, 4764, 4904, 4959, 4994, 4996, 5010, 5018, 5033, 5085, 5102, 5107, 5193, 5265, 5276, 5294, 5345, 5368, 5379, 5460, 5549, 5684, 6130, 6230, 6311, 6345, 6467, 6523, 6669, 6670, 6686, 6799, 7188, 7288, 7320, 7687, 7783, 7964, 8020, 8174, 8271, 8569, 8766, 8780, 8789, 8835, 8849, 8872, 8885, 8897, 8939, 9030, 9084, 9112, 9224, 9242, 9337, 9523, 9684, 9907, 10079, 10137

Soybean Cultural Practices–No-Till, Conservation Tillage, and Minimum Tillage Farming / Agriculture. 4901, 5029, 6527, 9974, 10044, 10382, 10502

Soybean Meal (SBM) (Defatted). Formerly Called Bean Cake, Beancake, Soybean Cake, Oilmeal, or Presscake. 279, 438, 439, 486, 490, 509, 541, 565, 574, 586, 589, 590, 613, 654, 655, 665, 667, 673, 686, 708, 709, 710, 711, 716, 736, 768, 773, 785, 796, 804, 824, 837, 840, 843, 844, 845, 847, 860, 868, 874, 933, 937, 946, 953, 967, 990, 1017, 1025, 1026, 1045, 1063, 1079, 1084, 1086, 1087, 1092, 1110, 1132, 1133, 1147, 1166, 1187, 1193, 1198, 1199, 1200, 1201, 1213, 1227, 1229, 1231, 1232, 1238, 1241, 1242, 1243, 1245, 1246, 1248, 1249, 1250, 1251, 1253, 1254, 1255, 1256, 1260, 1262, 1265, 1266, 1271, 1278, 1281, 1283, 1287, 1289, 1291, 1294, 1299, 1302, 1303, 1307, 1309, 1310, 1311, 1314, 1315, 1316, 1319, 1320, 1321, 1322, 1323, 1324, 1326, 1330, 1332, 1333, 1334, 1336, 1337, 1338, 1344, 1346, 1348, 1350, 1356, 1361, 1362, 1363, 1368, 1369, 1370, 1371, 1372, 1374, 1379, 1381, 1383, 1384, 1386, 1389, 1390, 1393, 1394, 1398, 1401, 1403, 1409, 1410, 1413, 1414, 1416, 1427, 1430, 1435, 1436, 1437, 1438, 1439, 1442, 1443, 1444, 1445, 1447, 1449, 1451, 1464, 1465, 1466, 1473, 1475, 1476, 1477, 1478, 1480, 1483, 1485, 1489, 1490, 1492, 1505, 1509, 1514, 1516, 1520, 1521, 1526, 1533, 1536, 1541, 1543, 1551, 1553, 1554, 1569, 1570, 1574, 1599, 1605, 1617, 1618, 1635, 1636, 1637, 1642, 1643, 1651, 1666, 1673, 1678, 1680, 1683, 1684, 1685, 1687, 1688, 1689, 1696, 1697, 1710, 1711, 1719, 1722, 1739, 1740, 1742, 1754, 1762, 1767, 1772, 1774, 1780, 1784, 1789, 1790, 1791, 1793, 1796, 1803, 1804, 1806, 1815, 1817, 1825, 1831, 1832, 1841, 1856, 1857, 1858, 1859, 1860, 1863, 1868, 1869, 1870, 1878, 1880, 1881, 1884, 1890, 1896, 1899, 1900, 1902, 1903, 1906, 1907, 1913, 1920, 1921, 1926, 1928, 1929, 1931, 1932, 1934, 1935, 1946, 1948, 1953, 1954, 1956, 1968, 1973, 1974, 1991, 2006, 2016, 2023, 2031, 2041, 2045, 2046, 2048, 2069, 2071, 2076, 2078, 2080, 2081, 2085, 2086, 2089, 2096, 2097, 2100, 2111, 2112, 2117, 2118, 2119, 2124, 2128, 2130, 2140, 2141, 2146, 2147, 2148, 2149, 2150, 2152, 2153, 2154, 2161, 2167, 2172, 2177, 2183, 2184, 2186, 2190, 2194, 2203, 2207, 2208, 2217, 2218, 2219, 2226, 2237, 2243, 2249, 2251, 2255, 2256, 2270, 2275, 2278, 2292, 2299, 2304, 2314, 2317, 2324, 2325, 2356, 2367, 2386, 2387, 2422, 2429, 2432, 2433, 2451, 2462, 2465, 2474, 2475, 2484, 2496, 2505, 2517, 2533, 2541, 2546, 2557, 2569, 2608, 2609, 2635, 2639, 2652, 2703, 2704, 2712, 2714, 2715, 2717, 2718, 2731, 2736, 2753, 2755, 2759, 2775, 2776, 2777, 2778, 2781, 2782, 2786, 2794, 2807, 2821, 2834, 2840, 2841, 2845, 2851, 2864, 2867, 2869, 2871, 2875, 2913, 2916, 2917, 2919, 2921, 2923, 2928, 2930, 2940, 2951, 2955, 2956, 2957, 2961, 2962, 2968, 2972, 2977, 3003, 3030, 3043, 3048, 3063, 3131, 3135, 3137, 3138, 3139, 3145, 3148, 3151, 3159, 3168, 3174, 3182, 3222, 3224, 3250, 3253, 3259, 3275, 3291, 3323, 3333, 3346, 3349, 3360, 3367, 3368, 3369, 3370, 3379, 3380, 3384,

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3390, 3400, 3436, 3446, 3447, 3452, 3479, 3481, 3483, 3491, 3493, 3518, 3521, 3548, 3558, 3569, 3571, 3591, 3599, 3612, 3618, 3634, 3635, 3645, 3662, 3663, 3711, 3751, 3788, 3802, 3826, 3831, 3836, 3845, 3855, 3876, 3880, 3887, 3888, 3894, 3897, 3898, 3986, 4012, 4038, 4047, 4124, 4168, 4196, 4197, 4225, 4229, 4230, 4286, 4287, 4288, 4289, 4291, 4308, 4309, 4316, 4343, 4344, 4367, 4368, 4375, 4413, 4458, 4464, 4499, 4504, 4531, 4554, 4555, 4556, 4557, 4579, 4580, 4597, 4708, 4741, 4753, 4764, 4774, 4790, 4799, 4813, 4814, 4821, 4839, 4848, 4849, 4864, 4867, 4904, 4938, 4949, 4952, 4967, 4976, 4994, 4997, 5002, 5003, 5010, 5019, 5056, 5057, 5074, 5079, 5086, 5089, 5092, 5107, 5141, 5166, 5181, 5182, 5199, 5201, 5268, 5275, 5281, 5283, 5288, 5290, 5294, 5304, 5305, 5369, 5393, 5440, 5454, 5468, 5479, 5534, 5544, 5545, 5546, 5549, 5550, 5567, 5589, 5651, 5706, 5716, 5953, 6000, 6057, 6084, 6130, 6165, 6171, 6172, 6201, 6204, 6214, 6230, 6301, 6306, 6336, 6345, 6371, 6375, 6467, 6551, 6557, 6669, 6670, 6742, 6784, 6795, 6799, 6815, 6825, 6976, 7061, 7111, 7215, 7221, 7229, 7288, 7320, 7405, 7421, 7468, 7591, 7608, 7609, 7610, 7641, 7642, 7682, 7683, 7685, 7749, 7760, 7851, 8026, 8160, 8174, 8209, 8212, 8214, 8256, 8265, 8363, 8393, 8444, 8453, 8468, 8569, 8770, 8780, 8789, 8812, 8835, 8858, 8872, 8873, 8885, 8889, 8897, 8921, 8995, 9084, 9197, 9281, 9282, 9284, 9323, 9337, 9351, 9373, 9377, 9382, 9384, 9394, 9419, 9491, 9492, 9502, 9514, 9523, 9783, 9856, 9907, 9931, 9937, 10022, 10069, 10074, 10075, 10221, 10224, 10280, 10301, 10309, 10351, 10383, 10429, 10430, 10451, 10575, 10649, 11083

Soybean Meal–Etymology of This Term and Its Cognates / Relatives in Various Languages. 711, 1026, 1291, 1294, 1302, 1310, 1356, 1379, 1403, 1841, 1971, 1974, 2854, 3151, 3346, 3349

Soybean Meal / Cake, Fiber (as from Okara), or Shoyu Presscake as a Fertilizer or Manure for the Soil–Industrial Uses. 438, 439, 565, 574, 613, 616, 619, 665, 667, 686, 708, 712, 754, 773, 786, 796, 840, 843, 874, 878, 943, 953, 967, 990, 1018, 1025, 1026, 1086, 1131, 1132, 1147, 1165, 1184, 1187, 1213, 1229, 1231, 1232, 1241, 1245, 1251, 1254, 1259, 1260, 1265, 1269, 1278, 1292, 1302, 1303, 1307, 1309, 1314, 1316, 1319, 1321, 1323, 1334, 1344, 1346, 1374, 1375, 1376, 1379, 1398, 1400, 1403, 1413, 1414, 1435, 1436, 1439, 1443, 1446, 1451, 1465, 1466, 1475, 1476, 1480, 1506, 1509, 1536, 1543, 1574, 1673, 1685, 1696, 1698, 1711, 1745, 1751, 1789, 1791, 1796, 1803, 1806, 1856, 1859, 1860, 1868, 1881, 1900, 1903, 1921, 1928, 1946, 1968, 1991, 2078, 2111, 2130, 2140, 2173, 2183, 2186, 2218, 2226, 2270, 2299, 2321, 2357, 2429, 2433, 2465, 2609, 2639, 2717, 2736, 2759, 2761, 2775, 2776, 2777, 2845, 2913, 2919, 2921, 2961, 3137, 3138, 3145, 3151, 3323, 3349, 3360, 3390, 3898, 3961, 4458, 5019, 7691, 8736, 8939, 10176

Soybean Production–General, and Amount Produced. 15, 57, 134, 215, 232, 258, 269, 333, 416, 468, 474, 478, 507, 543, 655, 707, 807, 868, 946, 961, 1025, 1066, 1092, 1139, 1144, 1268, 1346, 1403, 1427, 1449, 1465, 1466, 1471, 1476, 1477, 1478, 1487, 1508, 1538, 1541, 1546, 1604, 1607, 1608, 1610, 1651, 1671, 1719, 1731, 1762, 1775, 1776, 1777, 1895, 1909, 1921, 1928, 2003, 2005, 2008, 2038, 2051, 2059, 2070, 2085, 2099, 2110, 2124, 2142, 2207, 2215, 2219, 2233, 2234, 2235, 2324, 2325, 2397, 2433, 2479, 2496, 2541, 2557, 2717, 2807, 2817, 2820, 2821, 2845, 2851, 2860, 2913, 2930, 2998, 3003, 3004, 3025, 3039, 3066, 3069, 3095, 3128, 3133, 3135, 3142, 3181, 3253, 3275, 3303, 3333, 3349, 3353, 3390, 3436, 3462, 3491, 3509, 3581, 3606, 3659, 3663, 3667, 3685, 3697, 3705, 3711, 3720, 3726, 3731, 3737, 3788, 3795, 3816, 3841, 3887, 3894, 3948, 4086, 4107, 4221, 4333, 4340, 4360, 4363, 4378, 4418, 4475, 4479, 4545, 4572, 4581, 4687, 4699, 4772, 4778, 4831, 4897, 4915, 5034, 5039, 5089, 5136, 5187, 5324, 5364, 5372, 5413, 5579, 5709, 5727, 5789, 5793, 5951, 6093, 6106, 6133, 6201, 6208, 6214, 6281, 6303, 6359, 6430, 6431, 6483, 6495, 6558, 6564, 6574, 6640, 6669, 6686, 6739, 6799, 6814, 6895, 6977, 7093, 7098, 7129, 7131, 7134, 7188, 7201, 7421, 7542, 7557, 7690, 7700, 7713, 7796, 7851, 7987, 8022, 8026, 8031, 8036, 8197, 8271, 8289, 8298, 8441, 8453, 8457, 8661, 8723, 8765, 8789, 8853, 8889, 8935, 9002, 9078, 9293, 9954, 10069, 10079, 10381, 10382, 10383, 11045, 11083, 11276, 11306

Soybean Production–Industry and Market Statistics, Trends, and Analyses. 5029, 6000, 7188, 7320, 7340, 7542, 7557, 8206, 8271, 8647, 8770, 8842, 8853, 8872, 8883, 8892, 8931, 8932, 9023, 9104, 9112, 9280, 9319, 9377, 9513, 9856, 9970, 10079, 10151, 10237, 10302, 10351, 10575

Soybean Rust (Fungal Disease). 1059, 1167, 2093, 2466, 2583, 2754, 2818, 4676, 6225, 6276, 6711, 7711, 7848, 8200, 9953, 10271, 10332, 11131

Soybean Seeds–Black in Color–Etymology of This Term and Its Cognates / Relatives in Various Languages. 529

Soybean Seeds–Black in Color. Food Use is Not Mentioned. 134, 152, 158, 327, 346, 385, 470, 473, 518, 529, 541, 549, 560, 562, 570, 571, 574, 584, 586, 587, 590, 591, 592, 600, 611, 612, 621, 627, 629, 652, 668, 706, 709, 710, 750, 758, 774, 795, 812, 816, 821, 824, 828, 837, 843, 844, 849, 870, 875, 879, 893, 895, 919, 931, 939, 948, 955, 959, 965, 970, 972, 975, 980, 985, 997, 1005, 1011, 1014, 1021, 1025, 1026, 1027, 1035, 1037, 1041, 1043, 1091, 1105, 1147, 1170, 1179, 1190, 1192, 1216, 1220, 1257, 1275, 1279, 1283, 1291, 1303, 1306, 1318, 1319, 1335, 1345, 1352, 1366, 1369, 1395, 1410, 1412, 1416, 1442, 1453, 1455, 1456, 1465, 1466, 1469, 1475, 1480, 1487, 1489, 1510, 1512, 1533, 1543, 1544, 1548, 1551, 1562, 1580, 1599, 1603, 1676, 1716, 1771, 1789, 1796, 1803, 1806, 1822, 1832, 1845, 1874, 1889, 1890, 1906, 1921, 1934, 1973, 1990, 1991, 2005, 2016, 2051, 2068, 2076, 2119, 2121, 2148, 2149, 2155, 2176, 2180, 2226, 2233, 2243, 2244, 2246, 2247, 2248, 2255, 2281, 2285, 2304, 2324, 2479, 2504, 2518, 2519, 2521, 2538, 2625, 2647, 2652, 2727, 2784, 2845, 2856, 2894, 2913, 2923, 2928, 2929, 2951, 2957, 3043, 3054, 3146, 3151, 3235, 3239, 3240, 3242, 3243, 3256, 3267, 3268, 3379, 3387, 3389, 3427, 3511, 3623, 3646, 3662, 3678, 3728, 3733, 3745, 3781, 3900, 3948, 4134, 4149, 4267, 4362, 4421, 4472, 4923, 5213, 5319, 5725, 5749, 6041, 6082, 6136, 6281, 6404, 6436, 6735, 7061, 7626, 7809, 8148, 8172, 8680, 8700, 8844, 9209, 9267, 9293, 9307, 9625, 9839, 9959, 10062, 10299, 10358, 10388, 10394, 10557, 10579, 10786, 10975, 11328, 11352, 11465, 11487, 11489, 11491

Soybean Seeds–Black in Color. Used as Food (Including in Fermented Black Soybeans and Inyu), Beverage, Feed, or Medicine, or Their Nutritional Value. 126, 161, 212, 249, 300, 321, 394, 515, 542, 617, 618, 655, 720, 768, 770, 853, 889, 891, 993, 1006, 1254, 1271, 1278, 1309, 1457, 1535, 1544, 1574, 1682, 1705, 1711, 1830, 2117, 2118, 2149, 2165, 2429, 2472, 2624, 2658, 2739, 2745, 3214, 3332, 3628, 3727, 3896, 3949, 3961, 4206, 4392, 4506, 4603, 4604, 4666, 5110, 5220, 5384, 5631, 5632, 5658, 5663, 5683, 5779, 5781, 5888, 5894, 5904, 5927, 5989, 6088, 6132, 6292, 6379, 6395, 6401, 6442, 6444, 6535, 6566, 6628, 6632, 6796, 7011, 7055, 7058, 7076,

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7114, 7172, 7226, 7237, 7330, 7369, 7519, 7532, 7743, 7867, 7918, 7921, 7948, 7968, 8161, 8198, 8264, 8299, 8327, 8446, 8447, 8450, 8552, 8644, 8904, 9310, 9355, 9480, 9540, 9566, 9750, 9785, 9838, 10003, 10103, 10125, 10165, 10166, 10174, 10250, 10265, 10283, 10307, 10358, 10456, 10471, 10492, 10523, 10582, 10617, 10645, 10676, 10704, 10718, 10719, 10801, 10864, 10897, 10943, 10984, 10995, 10998, 11145, 11152, 11260, 11434

Soybean Seeds–Brown in Color. Especially Early Records. 334, 499, 529, 555, 569, 571, 582, 587, 611, 617, 621, 627, 655, 668, 686, 708, 768, 770, 789, 806, 821, 843, 850, 853, 870, 875, 913, 985, 1027, 1065, 1091, 1190, 1191, 1216, 1254, 1257, 1275, 1278, 1318, 1319, 1335, 1366, 1442, 1453, 1455, 1456, 1457, 1533, 1543, 1574, 1603, 1796, 1830, 1889, 1906, 1934, 1991, 2039, 2051, 2068, 2121, 2165, 2180, 2233, 2246, 2247, 2248, 2283, 2479, 2504, 2923, 3151, 3230, 3242, 3331, 3378, 3379, 3389, 3511, 3662, 3896, 4362, 8844, 9209, 10358

Soybean Seeds–Green in Color. Food Use is Not Mentioned. Early Named Varieties Include Aoda, Columbia, Giant Green, Guelph or Medium Green, Medium Early Green, Medium Green, Samarow, Sonoma, and Tashing. 15, 134, 193, 356, 439, 473, 499, 511, 529, 541, 584, 587, 612, 617, 621, 646, 665, 668, 671, 686, 706, 708, 720, 770, 774, 814, 843, 844, 870, 879, 891, 893, 919, 955, 965, 980, 1004, 1005, 1014, 1025, 1027, 1035, 1037, 1091, 1105, 1179, 1190, 1191, 1254, 1257, 1275, 1278, 1279, 1318, 1319, 1335, 1366, 1409, 1442, 1453, 1455, 1456, 1465, 1466, 1469, 1533, 1535, 1543, 1574, 1603, 1616, 1796, 1845, 1889, 1897, 1906, 1935, 1973, 1991, 2148, 2149, 2180, 2233, 2243, 2244, 2246, 2247, 2248, 2255, 2429, 2479, 2496, 2504, 2519, 2647, 2739, 3231, 3362, 3389, 3422, 3511, 3627, 3662, 3756, 3799, 3896, 4362, 4421, 6735, 8844, 9209, 10166, 10358, 11491

Soybean Seeds–Green in Color. Used as Food, Beverage, Feed, or Medicine, or Their Nutritional Value. 356, 770, 1254, 1705, 2429, 2647, 6136

Soybean Seeds–Mottled, Speckled, Spotted, Striped, Banded, Flecked, Variegated, or Bicolored. 499, 529, 584, 617, 621, 652, 668, 706, 720, 770, 821, 843, 1037, 1179, 1190, 1254, 1279, 1318, 1335, 1412, 1442, 1453, 1456, 1469, 1533, 1544, 1603, 1796, 1845, 2118, 2246, 2308, 3896

Soybean Seeds–Red in Color. 499, 555, 570, 590, 591, 612, 621, 652, 668, 706, 720, 770, 1335, 1416, 1455, 1469, 1603, 1889

Soybean Seeds–White in Color. 134, 143, 144, 152, 161, 191, 205, 212, 215, 327, 346, 352, 385, 438, 441, 473, 516, 537, 541, 553, 582, 584, 588, 612, 617, 619, 621, 652, 665, 668, 706, 712, 717, 720, 732, 770, 771, 795, 813, 815, 821, 843, 870, 875, 879, 891, 893, 919, 931, 955, 965, 980, 1011, 1014, 1025, 1035, 1037, 1039, 1052, 1105, 1147, 1170, 1179, 1190, 1216, 1254, 1271, 1279, 1306, 1335, 1345, 1366, 1410, 1412, 1442, 1455, 1456, 1465, 1466, 1512, 1533, 1575, 1705, 1716, 1830, 1889, 1906, 1973, 2016, 2247, 2255, 4226, 5511

Soybean Seeds–Yellow in Color. Including Yellowish White, Cream Colored, and Pale (*Pallida*). Especially Early Records. See also: Soybean Seeds–White. 134, 191, 205, 233, 346, 439, 475, 511, 529, 533, 541, 549, 569, 570, 571, 582, 584, 586, 587, 590, 591, 592, 598, 602, 611, 612, 613, 617, 620, 621, 627, 629, 646, 652, 654, 655, 665, 668, 696, 706, 708, 712, 716, 720, 768, 770, 771, 772, 774, 782, 806, 820, 821, 824, 843, 850, 851, 853, 870, 875, 876, 891, 893, 923, 952, 955, 965, 970, 980, 983, 985, 997, 1004, 1005, 1006, 1011, 1021, 1025, 1026, 1027, 1039, 1052, 1065, 1091, 1097, 1147, 1190, 1194, 1207, 1210, 1254, 1257, 1275, 1278, 1303, 1309, 1318, 1319, 1335, 1352, 1366, 1369, 1372, 1409, 1410, 1412, 1416, 1442, 1453, 1455, 1456, 1457, 1465, 1466, 1469, 1475, 1480, 1510, 1511, 1533, 1543, 1544, 1548, 1574, 1599, 1616, 1676, 1682, 1716, 1774, 1789, 1796, 1803, 1832, 1845, 1868, 1870, 1897, 1905, 1906, 1934, 1935, 1991, 2005, 2026, 2051, 2117, 2118, 2119, 2121, 2148, 2149, 2165, 2167, 2176, 2180, 2233, 2243, 2245, 2246, 2247, 2248, 2254, 2255, 2374, 2479, 2496, 2504, 2863, 2928, 3151, 3171, 3225, 3226, 3232, 3233, 3234, 3236, 3238, 3241, 3244, 3245, 3246, 3247, 3248, 3256, 3361, 3378, 3379, 3389, 3410, 3412, 3428, 3511, 3626, 3628, 3629, 3631, 3632, 3662, 3680, 3701, 3733, 3896, 3899, 4226, 4362, 6106, 6735, 8844, 9839, 10725, 11491

Soybean Varieties Canada–Harosoy. 4362, 4542, 4645, 4648, 4719, 4740, 4801, 4810, 5173, 5213, 5670, 5911, 5912, 5941, 6106, 6136, 6860, 8700, 9524, 10260

Soybean Varieties Canada–Harovinton–Large-Seeded and / or Vegetable-Type. 9653, 9974, 10139, 10168, 10198, 10275, 10435, 10624, 10748, 10750

Soybean Varieties Canada–Maple Arrow. 7089, 8700, 9760, 10260, 10275, 10725, 11251

Soybean Varieties Canada–O.A.C. 111–Early Development. 2504, 10725

Soybean Varieties Canada–O.A.C. 211–Early Development. 2504, 2648, 3151, 4362, 6106, 8844, 10557, 10725, 11491

Soybean Varieties Canada–O.A.C. No. 81–Early Development. 11491

Soybean Varieties Canada–Quebec No. 537–Early Development. 3151

Soybean Varieties Canada–Quebec No. 92–Early Development. 2504, 3151, 3646

Soybean Varieties Europe–Gelbe Riesen ("Yellow Giant" / Giant Yellow)–Early Introduction. 1275, 1456, 4362, 9209

Soybean Varieties USA–A.K.–Early Introduction. 2928, 2929, 4362, 5742, 6020, 6082, 6106, 6735, 9839

Soybean Varieties USA–Acme–Early Introduction. 1453, 1456, 1510, 4542, 4810, 6136, 9209, 10260, 11491

Soybean Varieties USA–Agate–Large-Seeded and / or Vegetable-Type. 3378, 3389, 3427, 3511, 3623, 3628, 3662, 3896, 3900, 4362, 5742, 8172, 8844

Soybean Varieties USA–Aksarben–Early Introduction. 2244, 2246, 2479, 3379, 3389, 3511, 3662, 4362, 8844

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Soybean Varieties USA–American Coffee Berry–Early Introduction. Renamed Ito-San by about 1902. 913, 1004, 1005

Soybean Varieties USA–Amherst–Early Introduction. 1190, 1456, 1991, 2244, 4362, 9209, 11491

Soybean Varieties USA–Aoda–Large-Seeded and / or Vegetable-Type. 3422, 3427, 3511, 3623, 3628, 3662, 3705, 3722, 3785, 3896, 3900, 4362, 5742, 8172, 8844

Soybean Varieties USA–Arlington–Early Introduction. 1456, 1771, 1789, 1991, 2039, 2068, 2479, 3389, 4362, 6735, 8844, 10358, 11491

Soybean Varieties USA–Asahi–Early Introduction. 1010, 1011, 11491

Soybean Varieties USA–Auburn–Early Selection (1907). 1453, 1456, 1789, 1991, 2244, 4362, 9209, 10358, 11491

Soybean Varieties USA–Austin–Early Introduction. 1318, 1453, 1456, 1991, 2180, 2479, 3379, 4362, 6735, 8844

Soybean Varieties USA–Baird–Early Introduction. 1190, 1275, 1456, 4362, 9209, 11491

Soybean Varieties USA–Bakaziro / Bakajiro–Early Introduction. Renamed Amherst by May 1907. 1041, 1043, 1091, 1105, 1991, 4362, 11491

Soybean Varieties USA–Bansei–Large-Seeded and / or Vegetable-Type. 3225, 3227, 3228, 3240, 3387, 3389, 3427, 3511, 3623, 3628, 3662, 3705, 3722, 3727, 3785, 3896, 3900, 4362, 4542, 5679, 8172, 8844, 11452, 11453, 11489, 11490

Soybean Varieties USA–Barchet–Early Introduction. 1453, 1456, 1510, 1803, 1906, 1934, 1980, 1991, 2005, 2039, 2068, 2148, 2149, 2180, 2246, 2479, 3389, 3511, 3662, 4362, 6735, 8844, 10975

Soybean Varieties USA–Best Green–Early Introduction. Renamed Hope by 1910. 1011, 1035, 1041, 1043, 1105, 1190, 1991, 4362

Soybean Varieties USA–Biloxi–Early Introduction. 1803, 1906, 1934, 1935, 1980, 2039, 2068, 2180, 2243, 2244, 2246, 2248, 2479, 2518, 3043, 3268, 3389, 3511, 3646, 3662, 4362, 6735, 8844, 9209, 9839, 10557

Soybean Varieties USA–Black–Early Introduction. Renamed Buckshot by May 1907. 1190, 2118, 11491

Soybean Varieties USA–Black Ebony–Early Introduction. 10358

Soybean Varieties USA–Black Eyebrow–Early Introduction. 1789, 1803, 1906, 1934, 1991, 2005, 2039, 2068, 2091, 2148, 2149, 2155, 2244, 2246, 2248, 2479, 2504, 2518, 2928, 2929, 3389, 3511, 3662, 3781, 4362, 6735, 8844, 10358

Soybean Varieties USA–Black Round–Early Introduction. 1041, 1105, 10358

Soybean Varieties USA–Brindle–Early Introduction. 1453, 1456, 4362, 9209, 10358

Soybean Varieties USA–Brooks–Early Introduction. 1453, 1456, 4362, 9209, 11491

Soybean Varieties USA–Brown–Early Introduction. 1456, 1991, 2479, 2504

Soybean Varieties USA–Brownie–Early Introduction. 1190, 1275, 1456, 4362, 9209

Soybean Varieties USA–Buckshot–Early Introduction. 1190, 1257, 1275, 1278, 1318, 1453, 1456, 1543, 1548, 1991, 2226, 2246, 2518, 4362, 9209, 10358, 11491

Soybean Varieties USA–Butterball–Early Introduction. 1190, 1275, 1278, 1453, 1456, 2226, 2246, 2518, 4362, 9209, 10358, 11491

Soybean Varieties USA–Chame–Large-Seeded and / or Vegetable-Type. 3230, 3240, 3389, 3427, 3511, 3623, 3628, 3662, 4362, 9209, 11489

Soybean Varieties USA–Chernie–Early Introduction. 1453, 1456, 1548, 2233, 2479, 3389, 3511, 3662, 9209, 10358

Soybean Varieties USA–Cherokee–Large-Seeded and / or Vegetable-Type. 4362, 8172, 8844

Soybean Varieties USA–Chestnut–Early Selection (1907). 1453, 1456, 1822, 2246, 2479, 2518, 3389, 3511, 3662, 3905, 4362, 6735, 8844, 10557

Soybean Varieties USA–Chiquita–Early Introduction. 1789, 1803, 1906, 1991, 2180, 2243, 2244, 2245, 2246, 2248, 2479, 2518, 3389, 3511, 3662, 4362, 9209, 10975

Soybean Varieties USA–Chusei–Large-Seeded and / or Vegetable-Type. 3226, 3227, 3228, 3240, 3387, 3389, 3427, 3511, 3623, 3628, 3662, 3705, 4362, 8148, 8172, 8844, 10545, 11489

Soybean Varieties USA–Claud–Early Introduction. 10358

Soybean Varieties USA–Cloud–Early Introduction. 1453, 1456, 2244, 4362, 6735, 8844, 10358, 11491

Soybean Varieties USA–Columbia / Columbian–Early Introduction. 1456, 2246, 2479, 2518, 3389, 3511, 3662, 4362, 6735, 8844, 11491

Soybean Varieties USA–Delsoy–Large-Seeded and / or Vegetable-Type. 4362, 8172, 8844

Soybean Varieties USA–Disoy–Large-Seeded and / or Vegetable-Type. 6136, 7692, 8172, 9937

Soybean Varieties USA–Duggar–Early Introduction. 4362, 9209, 10557

Soybean Varieties USA–Dunfield–Early Introduction. 2479, 2928,

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2929, 3379, 3387, 3389, 3511, 3662, 3900, 4362, 5725, 6020, 6735, 8844, 9839

Soybean Varieties USA–Early Black–Early Introduction. Renamed Buckshot by May 1907. 1041, 1043, 1091, 1190, 1456, 1991, 2155, 4362, 10358

Soybean Varieties USA–Early Brown–Early Introduction. 1257, 1366, 1453, 1456, 1906, 1934, 2039, 2068, 2180, 2246, 2248, 2479, 2504, 3151, 4362, 9209

Soybean Varieties USA–Early Dwarf–Early Introduction. 965, 980

Soybean Varieties USA–Early Dwarf Green–Early Introduction. 1991

Soybean Varieties USA–Early Green–Early Introduction. 1190, 1366, 1543, 1906, 2479, 3511, 4362

Soybean Varieties USA–Early White–Early Introduction. Renamed Ito-San by about 1902. 870, 879, 893, 919, 931, 955, 1190, 1366, 1456, 1906, 4362, 11491

Soybean Varieties USA–Early Yellow–Early Introduction. Renamed Ito San by about 1902. 983, 1011, 1190, 1366, 1456, 1548, 1906, 2374, 2479, 2504, 3151, 3511, 4362, 6106, 10260, 10725

Soybean Varieties USA–Easycook / Easy Cook–Early Introduction. Large-Seeded and/or Vegetable-Type. 2180, 2245, 2246, 2248, 2472, 2479, 2736, 2759, 3387, 3389, 3427, 3511, 3612, 3628, 3662, 3705, 4362, 4542, 6735, 7248, 8844, 11489

Soybean Varieties USA–Ebony–Early Introduction. 1190, 1278, 1453, 1456, 2155, 2244, 2246, 2479, 2518, 2928, 2929, 3387, 3389, 3511, 3662, 4362, 6082, 6735, 8844, 10358

Soybean Varieties USA–Eda–Early Introduction. 1190, 1453, 1456, 2226, 2518, 4362, 9209, 10358

Soybean Varieties USA–Eda Mame–Early Introduction. Renamed Ito San by 1910. 782, 806, 812, 820, 850, 870, 875, 893, 1456, 4362, 10545, 10984, 11491

Soybean Varieties USA–Edna–Early Introduction. 9209, 10358

Soybean Varieties USA–Edward–Early Introduction. 1453, 1456, 1510, 4362, 9209

Soybean Varieties USA–Elton–Early Introduction. 1453, 1456, 1510, 1906, 1934, 2180, 2244, 2246, 2479, 3389, 3511, 3662, 4362, 6735, 8844

Soybean Varieties USA–Emerald–Large-Seeded and / or Vegetable-Type. 9937

Soybean Varieties USA–Emperor–Large-Seeded and / or Vegetable-Type. 3628, 3662, 3705, 3785, 4362, 4542, 8172, 8844

Soybean Varieties USA–Etum or Eatum–Large-Seeded and / or Vegetable-Type. 3626, 3628, 3662, 3785, 3799, 4362, 8172, 8844

Soybean Varieties USA–Extra Early Black–Early Introduction. Renamed Buckshot by May 1907. 1190, 1412, 1456, 2233, 4362, 10358

Soybean Varieties USA–Extra Early Dwarf–Early Introduction. 913, 1004, 1005, 1011, 11491

Soybean Varieties USA–Fairchild–Early Introduction. 1456, 4362, 9209, 10358, 11491

Soybean Varieties USA–Farnham–Early Introduction. 1453, 1456, 4362, 9209

Soybean Varieties USA–Flat Black–Early Introduction. Renamed Flat King by May 1907. 4362, 10358

Soybean Varieties USA–Flat King–Early Introduction. 1190, 1453, 1456, 4362, 9209, 10358

Soybean Varieties USA–Flava–Early Selection (1907). 1453, 1456, 4362, 9209

Soybean Varieties USA–Fuji–Large-Seeded and / or Vegetable-Type. 3231, 3240, 3389, 3427, 3511, 3623, 3628, 3662, 3705, 3727, 4362, 4542, 8172, 8844, 11489, 11490

Soybean Varieties USA–Funk Delicious–Large-Seeded and / or Vegetable-Type. 3361, 3427, 3511, 3628, 3662, 3705, 3896, 3900, 4362, 4542, 8844

Soybean Varieties USA–Gardensoy–Large-Seeded and / or Vegetable-Type. 11039

Soybean Varieties USA–Giant Green–Large-Seeded and / or Vegetable-Type. 3362, 3628, 3705, 3785, 4362, 4542, 5742, 6082, 8844

Soybean Varieties USA–Goku–Large-Seeded and / or Vegetable-Type. 3232, 3240, 3389, 3427, 3511, 3623, 3628, 3662, 4362, 5742, 8172, 11489

Soybean Varieties USA–Gosha–Early Introduction. Renamed Manhattan by May 1907. 1041, 1091, 1105, 1991, 4362

Soybean Varieties USA–Grande–Large-Seeded and / or Vegetable-Type. 9937, 10275

Soybean Varieties USA–Green–Early Introduction. 1190, 2479, 11491

Soybean Varieties USA–Green Medium–Early Introduction. Renamed Guelph by May 1907. 1041, 1043, 1105, 1991

Soybean Varieties USA–Green Samarow–Early Introduction. Renamed Samarow in 1907. 1190, 1366, 1456, 4362

Soybean Varieties USA–Green and Black–Large-Seeded and / or Vegetable-Type. 3628, 4362, 8172, 8844

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Soybean Varieties USA–Guelph–Early Introduction. 1190, 1191, 1257, 1318, 1366, 1453, 1455, 1456, 1543, 1803, 1906, 1991, 2005, 2148, 2149, 2180, 2226, 2243, 2246, 2247, 2248, 2429, 2479, 2518, 3379, 3511, 4362, 6735, 8844, 10358

Soybean Varieties USA–Habaro–Early Introduction. Also spelled "Habara" in Canada. 1456, 1548, 2244, 2246, 2479, 2504, 2648, 3379, 3389, 3511, 3662, 3900, 4362, 5725, 6735, 8844, 10260, 10557, 10725

Soybean Varieties USA–Haberlandt–Early Introduction. 1190, 1254, 1257, 1318, 1453, 1456, 1789, 1803, 1906, 1991, 2005, 2148, 2180, 2244, 2245, 2246, 2248, 2429, 2479, 2518, 2928, 2929, 3379, 3389, 3427, 3511, 3662, 3733, 3781, 3900, 4362, 6136, 6735, 8844, 9839, 11491

Soybean Varieties USA–Hahto–Early Introduction. Large-Seeded and / or Vegetable-Type. 1905, 1906, 1957, 2005, 2039, 2068, 2082, 2148, 2149, 2180, 2243, 2245, 2246, 2248, 2479, 2518, 2736, 2759, 3170, 3387, 3389, 3427, 3511, 3612, 3628, 3662, 3785, 4362, 6735, 7248, 8844, 11489, 11491

Soybean Varieties USA–Hakote–Large-Seeded and / or Vegetable-Type. 3233, 3240, 3389, 3427, 3511, 3623, 3628, 3662, 4362, 8172, 8844, 11489

Soybean Varieties USA–Hamilton–Early Introduction. 2244, 2246, 2479, 2518, 2928, 4362, 9209

Soybean Varieties USA–Hankow–Early Introduction. 1091, 1190, 1294, 1309, 1456, 1464, 4362, 9209, 10358

Soybean Varieties USA–Hansen–Early Introduction. 1456, 4362, 9209, 11491

Soybean Varieties USA–Higan–Large-Seeded and / or Vegetable-Type. 3234, 3240, 3387, 3389, 3427, 3511, 3623, 3628, 3662, 3705, 4362, 4542, 8172, 8844, 9839, 10545, 11489

Soybean Varieties USA–Hiro–Large-Seeded and / or Vegetable-Type. 3235, 3240, 3389, 3427, 3511, 3623, 3628, 3662, 4362, 9209, 10358, 11489

Soybean Varieties USA–Hokkaido–Large-Seeded and / or Vegetable-Type. 3236, 3238, 3240, 3387, 3389, 3427, 3511, 3623, 3628, 3662, 3705, 3722, 3727, 3728, 3896, 3900, 4194, 4362, 4542, 4810, 5221, 5222, 5231, 5912, 8172, 8844, 11489

Soybean Varieties USA–Hollybrook–Early Introduction. 1190, 1257, 1275, 1278, 1318, 1366, 1453, 1456, 1510, 1543, 1789, 1803, 1906, 1934, 2005, 2148, 2149, 2155, 2180, 2246, 2248, 2479, 2504, 3389, 3511, 3662, 3948, 6281, 6735, 8844, 9293, 11491

Soybean Varieties USA–Hollybrook Early–Early Introduction. Renamed Midwest by 1948. 4362

Soybean Varieties USA–Hongkong / Hong Kong–Early Introduction. 1456, 2479, 3389, 3511, 3662, 3900, 4362, 6735, 8844, 10358

Soybean Varieties USA–Hoosier–Early Introduction. 2246, 2479, 2518, 3389, 3511, 3662, 4362, 6735, 8844

Soybean Varieties USA–Hope–Early Selection (1905). 1453, 1456, 4362, 9209, 11491

Soybean Varieties USA–Hurrelbrink–Early Introduction. 2928, 3389, 3511, 3662, 4362, 8844

Soybean Varieties USA–Illington–Large-Seeded and / or Vegetable-Type. 3409, 3628, 4362, 4542, 6082, 8844

Soybean Varieties USA–Imperial–Large-Seeded and / or Vegetable-Type. 3410, 3427, 3511, 3623, 3628, 3662, 3785, 4362, 4542, 8172, 8844

Soybean Varieties USA–Indiana Hollybrook–Early Development. 2479, 3511, 4362

Soybean Varieties USA–Ito San–Early Introduction. Synonyms–Medium Early Yellow, Early White, Early Yellow, Kaiyuski Daizu, Kiyusuki Daidzu, Kysuki, Yellow Eda Mame, Dwarf Early Yellow, Early, Eda Mame, Coffee Berry. 1091, 1190, 1257, 1275, 1318, 1366, 1453, 1455, 1456, 1510, 1789, 1803, 1906, 1934, 1991, 2005, 2091, 2148, 2149, 2155, 2180, 2226, 2233, 2236, 2243, 2244, 2245, 2246, 2247, 2248, 2429, 2472, 2479, 2496, 2504, 2518, 2863, 2928, 2929, 3379, 3389, 3511, 3662, 4362, 6106, 9209, 10358, 11452, 11453, 11487, 11491

Soybean Varieties USA–Jackson–Large-Seeded and / or Vegetable-Type. 3627, 3628, 4362, 4542, 4622, 6136, 8172

Soybean Varieties USA–Jefferson–Large-Seeded and / or Vegetable-Type. 3628, 4362, 7692, 8172, 8844

Soybean Varieties USA–Jet–Early Introduction. 1456, 1991, 2479, 4362, 9209, 10358

Soybean Varieties USA–Jogun–Large-Seeded and / or Vegetable-Type. 3240, 3387, 3389, 3427, 3511, 3623, 3628, 3662, 3705, 3727, 3785, 3896, 3900, 4362, 4542, 5742, 8172, 8844, 11489, 11490

Soybean Varieties USA–Kahala–Large-Seeded and / or Vegetable-Type. 6316

Soybean Varieties USA–Kaikoo–Large-Seeded and / or Vegetable-Type. 5677

Soybean Varieties USA–Kailua–Large-Seeded and / or Vegetable-Type. 5678, 6316

Soybean Varieties USA–Kanrich–Large-Seeded and / or Vegetable-Type. 4362, 4542, 5808, 5910, 5911, 5941, 5994, 6136, 6680, 6698, 8123, 8172, 9937, 10198, 10275

Soybean Varieties USA–Kanro–Large-Seeded and / or Vegetable-Type. 2429, 3238, 3240, 3387, 3389, 3427, 3511, 3623, 3628, 3646, 3662, 3705, 3785, 3896, 3900, 4362, 8172, 8844, 9839, 10545, 11489

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Soybean Varieties USA–Kanum–Large-Seeded and / or Vegetable-Type. 3628, 3662, 3785, 4362, 8172, 8844

Soybean Varieties USA–Kentucky–Early Introduction. 4362

Soybean Varieties USA–Kentucky A–Early Selection. 9209

Soybean Varieties USA–Kim–Large-Seeded and / or Vegetable-Type. 4362, 4542, 6136, 9937

Soybean Varieties USA–Kingston–Early Introduction. 1190, 1192, 1257, 1318, 1453, 1456, 2226, 2429, 2518, 3242, 3379, 4362, 6735, 8844, 10358

Soybean Varieties USA–Kiyusuke Daizu–Early Introduction. Also spelled Kiyusuki, Kiuski, Kaiyuski, Kuiske, Keyuska, Kysuki. 782, 806, 812, 820, 841, 850, 870, 875, 876, 893, 952, 1190, 1456, 4362, 11491

Soybean Varieties USA–Kura–Large-Seeded and / or Vegetable-Type. 3239, 3240, 3387, 3389, 3427, 3511, 3623, 3628, 3662, 3705, 4362, 8172, 8844, 10358, 11489

Soybean Varieties USA–Laredo–Early Introduction. 1980, 2180, 2246, 2479, 2518, 2558, 2928, 3043, 3387, 3389, 3511, 3662, 3900, 4362, 5749, 8844, 9839, 10358, 10394, 10557, 10975

Soybean Varieties USA–Large Black–Early Introduction. 1190, 1456, 3905, 4362, 10358

Soybean Varieties USA–Late Mammoth–Early Introduction. 965, 980

Soybean Varieties USA–Lexington–Early Introduction. 1803, 1906, 2246, 2479, 2518, 3389, 3511, 3662, 4362, 8844, 10557

Soybean Varieties USA–Lowrie–Early Selection (1908). 1453, 1456, 4362, 9209

Soybean Varieties USA–Magna–Large-Seeded and / or Vegetable-Type. 6136, 8172, 9937

Soybean Varieties USA–Mammoth–Early Introduction. 1039, 1190, 1318, 1353, 1453, 1455, 1456, 1543, 1771, 1774, 1789, 1803, 1906, 1934, 2005, 2039, 2148, 2149, 2180, 2226, 2243, 2244, 2245, 2247, 2248, 2330, 2429, 2479, 3379, 10358, 11491

Soybean Varieties USA–Mammoth Brown–Early Introduction. 2246, 2479, 3379, 3389, 3511, 3662, 4362, 9209

Soybean Varieties USA–Mammoth Yellow–Early Introduction. 1091, 1097, 1190, 1257, 1366, 1508, 1774, 1803, 1957, 1991, 2245, 2246, 2374, 2479, 2496, 2518, 2863, 2928, 3256, 3328, 3379, 3389, 3511, 3662, 3733, 3899, 3900, 4362, 6735, 8844, 9839

Soybean Varieties USA–Manchu–Early Introduction. 1803, 1906, 1934, 1991, 2005, 2091, 2148, 2149, 2155, 2180, 2244, 2245, 2246, 2248, 2479, 2504, 2648, 2928, 2929, 3043, 3151, 3256, 3387, 3389, 3511, 3662, 3733, 4362, 5725, 6020, 6735, 8700, 8844, 9839

Soybean Varieties USA–Manchuria–Early Introduction. 2479, 3728, 4362, 6735, 8844

Soybean Varieties USA–Mandarin–Early Introduction. 2091, 2155, 2180, 2244, 2246, 2479, 2504, 2518, 3151, 3379, 3387, 3389, 3511, 3646, 3662, 3733, 3900, 4362, 4542, 5725, 5910, 5941, 5994, 6020, 6106, 6735, 8844, 9839, 10260, 11487

Soybean Varieties USA–Manhattan–Early Introduction. 1190, 1456, 1510, 1991, 4362, 9209, 11491

Soybean Varieties USA–Medium Black–Early Introduction. Renamed Buckshot by 1948. 812, 870, 879, 893, 919, 955, 1014, 1190, 1366, 1456, 4362, 10358, 11491

Soybean Varieties USA–Medium Early Black–Early Introduction. Renamed Buckshot by 1907. 919, 1011, 1091, 1190, 1456, 4362, 10358, 11491

Soybean Varieties USA–Medium Early Green–Early Introduction. Renamed Guelph by about 1907. 919, 1014, 1091

Soybean Varieties USA–Medium Early White–Early Introduction. 812, 813, 875

Soybean Varieties USA–Medium Early Yellow–Early Introduction. 1091, 1366, 2155

Soybean Varieties USA–Medium Green–Early Introduction. 812, 814, 870, 879, 893, 955, 1004, 1005, 1190, 1257, 1318, 1366, 1453, 1455, 1456, 1906, 2155, 2226, 2243, 2244, 2246, 2247, 2479, 2496, 2504, 2518, 3389, 3511, 3662, 4362, 6735, 8844, 10358, 11491

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Soyfoods movement. *See* Farm (The) (Summertown, Tennessee), Rodale Press (Emmaus, Pennsylvania), Soyatech (Bar Harbor, Maine), Soyfoods Association of North America (SANA), Soyfoods Restaurants or Delis, New

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Soyinfo Center (Lafayette, California). Named Soyfoods Center until 1 Jan. 2007. Founded by William and Akiko Shurtleff. 4302, 5937, 6043, 6143, 6171, 6172, 6174, 6175, 6188, 6194, 6259, 6309, 6327, 6334, 6344, 6346, 6376, 6381, 6383, 6387, 6391, 6395, 6396, 6397, 6398, 6399, 6400, 6401, 6402, 6405, 6406, 6407, 6408, 6409, 6410, 6411, 6427, 6456, 6462, 6464, 6487, 6488, 6516, 6525, 6526, 6528, 6529, 6530, 6531, 6532, 6536, 6545, 6546, 6547, 6548, 6555, 6562, 6565, 6569, 6570, 6571, 6648, 6654, 6656, 6671, 6672, 6673, 6678, 6692, 6693, 6703, 6708, 6709, 6713, 6718, 6722, 6724, 6725, 6727, 6728, 6729, 6741, 6793, 6807, 6816, 6833, 6837, 6845, 6847, 6848, 6849, 6858, 6863, 6871, 6872, 6873, 6874, 6884, 6894, 6903, 6904, 6958, 6959, 6965, 6991, 6996, 7003, 7004, 7005, 7032, 7052, 7085, 7092, 7093, 7115, 7116, 7118, 7130, 7138, 7140, 7149, 7152, 7155, 7162, 7175, 7242, 7256, 7257, 7258, 7259, 7260, 7276, 7304, 7311, 7322, 7323, 7324, 7326, 7329, 7332, 7340, 7342, 7344, 7350, 7351, 7352, 7357, 7359, 7376, 7395, 7424, 7427, 7437, 7438, 7455, 7459, 7467, 7479, 7509, 7512, 7513, 7514, 7525, 7531, 7532, 7533, 7534, 7535, 7542, 7547, 7550, 7557, 7563, 7591, 7600, 7641, 7754, 7766, 7774, 7783, 7785, 7802, 7809, 7814, 7815, 7816, 7829, 7830, 7831, 7832, 7836, 7838, 7842, 7855, 7866, 7867, 7872, 7874, 7878, 7879, 7900, 7901, 7902, 7907, 7908, 7919, 7973, 7975, 8010, 8011, 8017, 8041, 8051, 8052, 8068, 8070, 8085, 8098, 8099, 8113, 8114, 8164, 8173, 8210, 8240, 8262, 8271, 8272, 8287, 8288, 8289, 8290, 8317, 8343, 8350, 8373, 8399, 8458, 8524, 8620, 8660, 8837, 8854, 8998, 8999, 9040, 9097, 9098, 9105, 9113, 9121, 9122, 9131, 9141, 9145, 9214, 9234, 9286, 9287, 9288, 9304, 9341, 9399, 9411, 9418, 9433, 9437, 9598, 9603, 9612, 9621, 9721, 9731, 9745, 9750, 9857, 9901, 9916, 9932, 9934, 9977, 9981, 9992, 10008, 10026, 10077, 10078, 10079, 10108, 10123, 10138, 10176, 10185, 10222, 10241, 10336, 10389, 10392, 10393, 10444, 10445, 10447, 10456, 10497, 10550, 10565, 10582, 10625, 10626, 10627, 10630, 10633, 10638, 10649, 10673, 10751, 10789, 10849, 10852, 10859, 10897, 10905, 10916, 10917, 10918, 10919, 10920, 11023, 11032, 11072, 11145, 11148, 11171, 11176, 11234, 11244, 11260, 11312, 11326, 11336, 11384, 11392, 11393, 11419, 11426, 11428, 11429, 11433, 11434, 11444, 11448, 11450, 11452, 11453, 11474, 11482, 11483, 11484, 11486, 11488, 11490, 11495

Soyland Farm. *See* Fouts Family of Indiana

Soymilk–Etymology of This Term and Its Cognates / Relatives in Various Languages. 512, 527, 553, 794, 837, 853, 886, 889, 902, 924, 987, 989, 1060, 1160, 1174, 1319, 1391, 1585, 1600, 1887, 2016, 2836, 3469, 3689, 4908, 6315, 6671, 6884, 7509, 8010, 8091, 8998, 11448

Soymilk–Imports, Exports, International Trade. 4460, 9037, 11448

Soymilk–Marketing of. 6456, 7920, 7998, 8210, 8880, 9947, 11172, 11448

Soymilk Companies (Asia)–Kibun, Marusan-Ai, Mitsubishi, Meiji, and Saniku Shokuhin in Japan. 4376, 5555, 5595, 5610, 5761, 5841, 5939, 6228, 6309, 6315, 6424, 6503, 6573, 6664, 6757, 6932, 6975, 6985, 7045, 7122, 7168, 7178, 7229, 7260, 7273, 7289, 7306, 7308, 7310, 7313, 7314, 7356, 7377, 7378, 7398, 7447, 7478, 7489, 7504, 7537, 7545, 7552, 7555, 7556, 7564, 7574, 7585, 7601, 7627, 7629, 7630, 7633, 7642, 7643, 7644, 7664, 7728, 7732, 7770, 7790, 7808, 7819, 7820, 7828, 7830, 7837, 7841, 7854, 7857, 7866, 7869, 7871, 7877, 7886, 7890, 7911, 7912, 7922, 7929, 7934, 7935, 8010, 8011, 8013, 8014, 8056, 8118, 8168, 8169, 8193, 8246, 8270, 8303, 8324, 8402, 8418, 8478, 8484, 8493, 8511, 8512, 8520, 8529, 8576, 8593, 8594, 8596, 8609, 8626, 8629, 8630, 8637, 8639, 8643, 8646, 8650, 8734, 8761, 8814, 8879, 8888, 8893, 8957, 8998, 9027, 9067, 9116, 9147, 9148, 9256, 9498, 9566, 9567, 9610, 10214, 10301, 10549, 11273, 11391, 11425, 11445, 11446, 11447, 11448, 11449, 11484

Soymilk Cream (Rich, Thick Soymilk to Be Used Like Cream). See also: Non-Dairy Creamer. 1365, 2304, 2972, 3557, 4502, 7259, 7509, 9762, 11448

Soymilk Equipment Companies (Europe). *See* APV Systems, Soya Technology Division. Formerly named Danish Turnkey Dairies Ltd., Alfa-Laval (Lund, Sweden), Tetra Pak International (Lund, Sweden)

Soymilk Equipment. 6650, 7377, 7815, 7886, 8010, 8091, 8529, 8639, 8646, 8879, 8998, 9053, 9306, 9591, 11448

Soymilk Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 5163, 5178, 6815, 6825, 7289, 7306, 7314, 7377, 7489, 7542, 7557, 7564, 7601, 7727, 7759, 7766, 7770, 7779,

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7826, 7830, 7870, 7914, 7920, 8010, 8014, 8019, 8043, 8051, 8053, 8100, 8118, 8122, 8130, 8138, 8173, 8206, 8209, 8271, 8405, 8478, 8602, 8609, 8612, 8624, 8639, 8646, 8750, 8778, 8858, 8879, 8880, 8888, 8932, 8990, 8998, 9020, 9027, 9037, 9067, 9195, 9304, 9369, 9523, 9577, 9591, 9596, 9666, 9667, 9786, 9868, 10078, 10079, 10116, 10134, 10193, 10214, 10551, 10651, 10813, 10972, 11447, 11448

Soymilk Industry and Market Statistics, Trends, and Analyses–Larger Companies. 4062, 4273, 5083, 5095, 5167, 5178, 5182, 5782, 6985, 7032, 7476, 7542, 7557, 7601, 8010, 8011, 8271, 8484, 8510, 8576, 8594, 8620, 8626, 8639, 8642, 8643, 8778, 8879, 8880, 8888, 8990, 8998, 9020, 9027, 9067, 9117, 9178, 9304, 9369, 9451, 9593, 9870, 9892, 10078, 10079, 10134, 10198, 10288, 10311, 10551, 10651, 10712, 11448

Soymilk Industry and Market Statistics, Trends, and Analyses–Smaller Companies. 9149, 11448

Soymilk Made from Sprouted / Germinated Soybeans. 11448

Soymilk Production–How to Make Soymilk on a Commercial Scale. 6602, 6709, 7003, 7411, 7479, 7907, 8399, 9621, 10567, 10859, 11448

Soymilk Standards or Standard of Identity. 7307, 8687, 9067, 9370, 9867, 10030, 10289, 10453, 11448

Soymilk and tofu in India. *See* Child Haven International (Maxville, Ontario, Canada)

Soymilk companies (Canada). *See* Malnutrition Matters, ProSoya, SoyaWorld, Inc. (Near Vancouver, British Columbia, Canada)

Soymilk companies (Europe and Africa). *See* Actimonde S.A. (Agrolactor system)

Soymilk companies (Europe). *See* Alpro (Wevelgem, Belgium), Plamil Foods Ltd. (Folkestone, Kent, England) and The Plantmilk Society, Unisoy Milk 'n' By-Products (Stockport, Cheshire, England)

Soymilk companies (USA). *See* American Soy Products (Saline, Michigan), Pacific Foods of Oregon, Inc. (Tualatin, Oregon), Vitasoy, White Wave Foods, a Division of Dean Foods (Dallas, Texas); Maker of Silk Soymilk, WholeSoy & Co. (subsidiary of TAN Industries, Inc., California)

Soymilk curds. *See* Curds Made from Soymilk

Soymilk fed (or not fed) to infants in China. *See* Infants or Recently-Weaned Children Fed (or Not Fed) Soymilk in China

Soymilk in Second Generation Products, Documents About. 7509, 8303, 8871, 11448

Soymilk shakes. *See* Shakes

Soymilk, Concentrated or Condensed (Canned, Bottled, or Bulk). Also Called Soybase or Soy Base. 1160, 1174, 1182, 1221, 1225, 1319, 1334, 1364, 1522, 1574, 1596, 1732, 1805, 1818, 1827, 1887, 1906, 1914, 1938, 2085, 2226, 2243, 2475, 2484, 2951, 2972, 3189, 3557, 4062, 4065, 4908, 4910, 5323, 5470, 5967, 6334, 6395, 6403, 6709, 6958, 7003, 7261, 7479, 7907, 8091, 8276, 8879, 8990, 9053, 9255, 9306, 9621, 10289, 10301, 10540, 10646, 10859, 11448

Soymilk, Fermented–Soy Kefir. 1574, 3560, 4284, 6379, 6709, 6958, 6975, 7003, 7304, 7479, 7557, 7809, 7907, 9621, 10859, 11470

Soymilk, Fermented–Unusual Fermented Dairy Products (Such as Viili or Piima) that Can Also Be Made from Soymilk. See also: Soy Yogurt–Fermented and Soy Cheese–Fermented. 7809, 10389

Soymilk, Fermented, in Liquid or Viscous Form (Basic Research, Acidophilus Soymilk or Soy Acidophilus Milk, Soy Viili, Buttermilk, Koumiss, Lassi, Piima, etc.). See also: Soy Yogurt, Soy Cheese, and Soy Kefir. 1365, 1557, 1596, 1830, 1887, 2226, 2475, 2484, 2951, 3189, 3557, 3800, 3811, 4028, 4580, 4904, 4906, 4962, 5145, 5626, 5740, 5745, 5747, 5776, 5997, 6010, 6023, 6240, 6395, 6401, 6414, 6461, 6573, 6583, 6592, 6603, 6737, 6757, 6818, 6890, 6949, 6971, 7003, 7045, 7210, 7229, 7256, 7257, 7258, 7259, 7260, 7261, 7269, 7304, 7309, 7312, 7359, 7479, 7552, 7557, 7642, 7867, 7907, 7935, 8006, 8158, 8221, 8276, 8327, 8358, 8370, 8390, 8447, 8487, 8530, 8650, 8761, 8785, 8792, 8799, 8869, 8870, 8909, 9141, 9520, 9521, 9621, 10003, 10078, 10145, 10582, 10646, 10859, 10871, 10897, 11073, 11145, 11260, 11267, 11416, 11434

Soymilk, Homemade–How to Make at Home or on a Laboratory or Community Scale, by Hand or with a Soymilk Maker / Machine. 1887, 2465, 5957, 5992, 6395, 6401, 6958, 7322, 7867, 9141, 10582, 10897, 11145, 11260, 11434, 11448

Soymilk, Soy Drinks / Beverages, Soy-Based Infant Formulas, and Nogs (Liquid, Non-Fermented). Note–For Soymilk Products See Tofu, Yuba, Shakes, Soy Ice Cream, Soy Yogurt, and Soy Cheese or Cheese Alternatives. 48, 271, 512, 526, 527, 553, 565, 618, 736, 794, 816, 836, 837, 838, 853, 880, 886, 889, 901, 902, 908, 924, 932, 942, 974, 987, 989, 1021, 1045, 1060, 1090, 1113, 1156, 1159, 1160, 1174, 1183, 1221, 1264, 1309, 1312, 1319, 1328, 1334, 1336, 1341, 1365, 1369, 1384, 1391, 1412, 1420, 1427, 1448, 1469, 1475, 1480, 1509, 1513, 1533, 1550, 1551, 1557, 1574, 1585, 1596, 1600, 1615, 1630, 1640, 1643, 1719, 1732, 1735, 1742, 1771, 1774, 1778, 1784, 1786, 1798, 1805, 1806, 1815, 1818, 1827, 1830, 1838, 1847, 1867, 1869, 1870, 1873, 1878, 1884, 1885, 1887, 1891, 1894, 1906, 1914, 1921, 1935, 1938, 1953, 1974, 1991, 2001, 2008, 2016, 2026, 2051, 2068, 2076, 2078, 2081, 2085, 2106, 2113, 2115, 2126, 2143, 2148, 2149, 2170, 2178, 2223, 2226, 2243, 2251, 2277, 2292, 2304, 2315, 2316, 2324, 2325, 2336, 2357, 2429, 2432, 2463, 2465, 2474, 2475, 2478, 2484, 2517, 2538, 2557, 2646, 2652, 2662, 2666, 2717, 2727, 2736, 2759, 2761, 2773, 2774, 2775, 2817, 2833, 2836, 2843, 2848, 2916, 2951, 2953, 2961, 2963, 2972, 3008, 3043, 3049, 3078, 3129, 3136, 3147, 3159, 3189, 3214, 3227, 3228, 3271, 3276, 3323, 3328, 3333, 3353, 3363, 3384, 3385, 3387, 3390, 3425, 3436, 3438, 3469, 3491, 3557, 3559, 3560, 3586, 3612, 3624, 3628, 3646, 3647, 3657, 3689, 3693, 3700, 3721, 3722, 3727, 3734, 3736, 3740, 3749, 3755, 3756, 3779, 3787, 3788, 3803, 3811, 3826, 3831, 3842, 3894, 3896, 3900, 3919, 3948, 3961, 4015, 4062, 4065, 4074, 4089, 4149, 4186, 4273, 4299, 4350, 4376, 4398, 4406, 4434, 4446, 4460, 4466, 4472, 4477, 4502, 4553, 4560, 4561, 4562, 4572, 4580, 4583, 4597,

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4629, 4645, 4646, 4647, 4653, 4666, 4668, 4736, 4753, 4764, 4771, 4796, 4810, 4887, 4892, 4898, 4904, 4905, 4906, 4908, 4910, 4913, 4939, 4945, 4950, 4953, 4960, 4977, 4978, 4983, 4988, 4989, 4990, 5016, 5043, 5055, 5068, 5083, 5092, 5095, 5110, 5142, 5145, 5146, 5167, 5178, 5182, 5213, 5225, 5278, 5290, 5319, 5323, 5325, 5369, 5470, 5487, 5494, 5507, 5521, 5549, 5555, 5593, 5594, 5595, 5603, 5610, 5621, 5639, 5645, 5665, 5686, 5741, 5751, 5761, 5782, 5787, 5797, 5820, 5841, 5859, 5870, 5897, 5926, 5933, 5939, 5957, 5965, 5967, 5976, 5992, 5996, 6027, 6117, 6130, 6168, 6170, 6171, 6172, 6228, 6240, 6275, 6279, 6281, 6289, 6300, 6302, 6303, 6306, 6309, 6312, 6315, 6317, 6334, 6344, 6363, 6388, 6390, 6391, 6401, 6403, 6404, 6424, 6433, 6456, 6468, 6469, 6476, 6503, 6504, 6522, 6561, 6570, 6573, 6579, 6587, 6588, 6594, 6599, 6602, 6603, 6623, 6637, 6646, 6664, 6670, 6671, 6697, 6709, 6746, 6757, 6768, 6788, 6807, 6808, 6815, 6825, 6829, 6852, 6863, 6874, 6880, 6884, 6890, 6902, 6932, 6939, 6940, 6958, 6959, 6964, 6965, 6975, 6980, 6985, 6996, 7003, 7021, 7023, 7032, 7034, 7045, 7059, 7060, 7065, 7071, 7072, 7073, 7076, 7104, 7121, 7122, 7141, 7152, 7168, 7178, 7190, 7211, 7214, 7229, 7249, 7251, 7254, 7256, 7257, 7258, 7259, 7260, 7261, 7269, 7273, 7280, 7289, 7292, 7300, 7306, 7307, 7309, 7310, 7313, 7314, 7322, 7323, 7324, 7326, 7334, 7344, 7357, 7362, 7371, 7378, 7411, 7413, 7416, 7446, 7447, 7455, 7467, 7476, 7478, 7479, 7487, 7489, 7496, 7497, 7498, 7501, 7504, 7508, 7529, 7537, 7538, 7541, 7542, 7545, 7546, 7552, 7554, 7555, 7556, 7557, 7558, 7564, 7567, 7568, 7574, 7575, 7583, 7585, 7589, 7601, 7627, 7629, 7630, 7633, 7642, 7643, 7644, 7658, 7664, 7665, 7671, 7674, 7675, 7701, 7702, 7706, 7707, 7712, 7720, 7724, 7725, 7726, 7727, 7728, 7732, 7738, 7739, 7740, 7759, 7766, 7768, 7770, 7772, 7779, 7788, 7790, 7791, 7793, 7796, 7797, 7799, 7800, 7808, 7813, 7816, 7819, 7820, 7825, 7826, 7830, 7831, 7837, 7841, 7843, 7854, 7857, 7866, 7867, 7868, 7869, 7870, 7871, 7874, 7877, 7879, 7884, 7886, 7890, 7905, 7907, 7911, 7912, 7913, 7914, 7917, 7920, 7922, 7923, 7929, 7934, 7939, 7941, 7942, 7944, 7946, 7955, 7956, 7962, 7965, 7968, 7989, 7998, 8003, 8009, 8010, 8011, 8012, 8013, 8014, 8019, 8020, 8026, 8032, 8034, 8039, 8043, 8045, 8047, 8051, 8053, 8054, 8056, 8059, 8060, 8087, 8091, 8100, 8102, 8108, 8112, 8118, 8122, 8130, 8137, 8138, 8139, 8143, 8150, 8161, 8167, 8168, 8169, 8170, 8173, 8181, 8193, 8199, 8204, 8209, 8210, 8231, 8232, 8246, 8251, 8270, 8271, 8277, 8294, 8299, 8306, 8324, 8348, 8392, 8399, 8402, 8404, 8405, 8418, 8432, 8435, 8437, 8444, 8447, 8449, 8453, 8470, 8471, 8478, 8484, 8493, 8510, 8511, 8512, 8520, 8544, 8560, 8566, 8569, 8576, 8587, 8588, 8591, 8593, 8594, 8596, 8602, 8603, 8609, 8612, 8620, 8621, 8624, 8626, 8627, 8628, 8629, 8630, 8633, 8638, 8639, 8641, 8642, 8643, 8649, 8650, 8669, 8675, 8682, 8687, 8688, 8691, 8695, 8750, 8759, 8761, 8764, 8778, 8785, 8802, 8806, 8834, 8858, 8869, 8878, 8880, 8883, 8884, 8885, 8892, 8893, 8902, 8904, 8905, 8907, 8919, 8920, 8924, 8927, 8928, 8932, 8933, 8943, 8957, 8962, 8967, 8990, 8998, 8999, 9001, 9002, 9020, 9026, 9027, 9037, 9038, 9040, 9048, 9054, 9067, 9094, 9106, 9113, 9121, 9129, 9135, 9141, 9144, 9147, 9148, 9149, 9155, 9178, 9195, 9199, 9210, 9212, 9216, 9217, 9234, 9240, 9251, 9255, 9256, 9263, 9304, 9310, 9333, 9334, 9335, 9354, 9355, 9360, 9365, 9369, 9370, 9378, 9384, 9391, 9397, 9408, 9409, 9414, 9418, 9422, 9487, 9488, 9498, 9517, 9520, 9523, 9540, 9548, 9566, 9567, 9577, 9589, 9591, 9596, 9603, 9610, 9615, 9620, 9621, 9623, 9658, 9663, 9667, 9669, 9672, 9694, 9707, 9750, 9762, 9763, 9774, 9782, 9786, 9789, 9799, 9801, 9806, 9827, 9847, 9867, 9868, 9870, 9892, 9893, 9902, 9905, 9921, 9937, 9941, 9944, 9947, 9973, 9976, 9980, 9993, 10001, 10003, 10010, 10014, 10029, 10030, 10038, 10052, 10069, 10078, 10079, 10082, 10087, 10105, 10112, 10123, 10133, 10134, 10140, 10141, 10147, 10164, 10168, 10178, 10179, 10185, 10193, 10207, 10211, 10212, 10214, 10220, 10234, 10236, 10243, 10245, 10251, 10255, 10266, 10275, 10288, 10289, 10301, 10307, 10311, 10320, 10329, 10330, 10334, 10335, 10336, 10346, 10347, 10360, 10362, 10366, 10372, 10381, 10388, 10393, 10395, 10424, 10435, 10451, 10453, 10454, 10461, 10469, 10471, 10486, 10487, 10492, 10499, 10501, 10503, 10523, 10524, 10540, 10547, 10549, 10551, 10560, 10561, 10567, 10569, 10570, 10575, 10582, 10611, 10617, 10646, 10647, 10649, 10651, 10653, 10660, 10661, 10683, 10687, 10688, 10701, 10707, 10719, 10728, 10737, 10748, 10749, 10758, 10762, 10784, 10829, 10830, 10857, 10859, 10875, 10879, 10893, 10897, 10901, 10946, 10954, 10956, 10964, 10972, 10998, 11004, 11025, 11036, 11071, 11073, 11079, 11087, 11095, 11103, 11121, 11132, 11133, 11145, 11155, 11172, 11189, 11208, 11219, 11222, 11245, 11251, 11260, 11263, 11264, 11267, 11273, 11287, 11308, 11335, 11339, 11340, 11343, 11352, 11356, 11381, 11391, 11409, 11415, 11419, 11423, 11425, 11430, 11434, 11443, 11445, 11446, 11447, 11448, 11449, 11470, 11474, 11479, 11484

Soymilk, Spray-Dried or Powdered, Used as an Ingredient in Non-Beverage Commercial Products Such as Ice Creams, Yogurts, Cheeses, Desserts, or Entrees. 6118, 11448

Soymilk, Spray-Dried or Powdered. 1365, 1489, 1574, 1778, 1971, 2123, 2148, 2149, 2226, 2304, 2474, 2475, 2484, 2833, 2951, 2972, 3228, 3276, 3469, 3557, 3560, 3586, 3722, 3800, 3803, 4044, 4045, 4062, 4186, 4431, 4460, 4551, 4748, 4895, 4937, 4951, 5083, 5095, 5343, 5521, 5587, 5750, 5782, 5831, 5933, 5967, 6010, 6027, 6175, 6332, 6395, 6403, 6422, 6637, 6981, 6982, 7011, 7229, 7258, 7259, 7260, 7269, 7356, 7362, 7642, 7643, 7770, 7841, 7864, 7868, 7923, 7985, 8003, 8510, 8698, 8822, 8825, 9002, 9020, 9448, 9577, 9591, 10289, 10311, 10567, 10575, 10646, 10683, 11448

Soymilk, Used as an Ingredient in Non-Beverage Commercial Products Such as Ice Creams, Yogurts, Cheeses, Desserts, or Entrees. 7346, 7472, 8063, 8637, 8767, 11448

Soymilk. *See* Calf, Lamb, or Pig Milk Replacers

Soynut Butter (Soynuts / Roasted Soybeans Ground to a Paste Resembling Peanut Butter; May Also Be Made from (Roasted) Soy Flour Mixed with a Little Oil). 3557, 3560, 6027, 6405, 7533, 7535, 7557, 8372, 10687, 10712, 11103, 11433

Soynut Butter–Etymology of This Term and Its Cognates / Relatives in Various Languages. 3557, 11433

Soynut Butter, Homemade–How to Make at Home or on a Laboratory Scale, by Hand. 6405

Soynut companies (Europe & USA). *See* Solnuts B.V. (Tilburg, The Netherlands; and Hudson, Iowa). Including Edible Soy Products

Soynut companies (USA). *See* Sycamore Creek Co. (Mason, Michigan). Before 1993, INARI, Ltd.

Soynuts (Oil Roasted or Dry Roasted / Toasted). See Also *Irimame* Used in Bean-Scattering (*Mame-Maki*) Ceremony at Setsubun (Lunar New Year) in Japan and Parched Soybeans. 18, 22, 23, 26, 126, 140, 238, 382, 570, 607, 645, 663, 713, 732, 761, 795, 882,

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1022, 1045, 1395, 1774, 1847, 1887, 1935, 1974, 2001, 2226, 2292, 2472, 2557, 2602, 2620, 2624, 2625, 2647, 2736, 2739, 2759, 2768, 2774, 2776, 2828, 2953, 3043, 3147, 3363, 3491, 3557, 3628, 3725, 3727, 3779, 3788, 3831, 3896, 3900, 3902, 4223, 4470, 4688, 4691, 4753, 5220, 5319, 5798, 5864, 5989, 5998, 6131, 6297, 6303, 6309, 6395, 6401, 6404, 6406, 6433, 6637, 6825, 6884, 6928, 6958, 6960, 6964, 7076, 7324, 7330, 7533, 7542, 7557, 7584, 7620, 7632, 7766, 7866, 7867, 8051, 8122, 8151, 8153, 8154, 8155, 8156, 8159, 8175, 8223, 8225, 8251, 8271, 8288, 8310, 8311, 8444, 8569, 8650, 8928, 8959, 9310, 9355, 9502, 9523, 9590, 9878, 10053, 10079, 10134, 10236, 10346, 10372, 10388, 10393, 10424, 10439, 10461, 10499, 10551, 10575, 10582, 10707, 10724, 10757, 10759, 10870, 10897, 11076, 11077, 11103, 11145, 11208, 11260, 11433, 11434, 11464

Soynuts–Etymology of This Term and Its Cognates / Relatives in Various Languages. 18, 607, 713, 732, 761, 882, 1774, 1847, 2001, 2461, 2624, 2739, 2745, 3147, 3491, 3557, 6406, 7533, 8311, 9355, 11433

Soynuts Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 8271, 9523, 10079, 11433

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Soynuts Production–How to Make Soynuts on a Commercial Scale. 11433

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Spectrophotometry. *See* Seed Composition–High-Speed Measurement Techniques, such as Near Infrared Reflectance (NIR) Anlysis and Spectrophotometry

Spencer Kellogg & Sons, Inc. (Buffalo, New York). 4597, 5288

Spillers Premier Products Ltd. (Puckeridge, Ware, Hertfordshire, England). Including Soya Foods Ltd [Named Soya Flour Manufacturing Co. Ltd. (1929-42), and Soya Foods Ltd. (1933)]. And incorporating British Soya Products (1932). 2951, 3328, 3384, 3385, 4021, 4668, 9730

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Staley (A.E.) Manufacturing Co. (Decatur, Illinois; Acquired by Tate & Lyle PLC in June 1988). 3756, 5288, 6254, 6306, 7036, 7518, 7758, 8271, 10712

Standardization of nomenclature of soybean varieties. *See* Nomenclature of Soybean Varieties–Standardization of and Confusion

Standards for soyfoods. *See* Individual foods, e.g., Tofu Standards

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Starch (Its Presence or Absence, Especially in Soybean Seeds). 541, 554, 569, 619, 689, 691, 774, 788, 820, 853, 1141, 2050, 2197, 2248, 2335, 2636, 8497, 10913

Starter culture for tempeh. *See* Tempeh Starter Culture, Spores, or Inoculum

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Statistics on soybean production, area and stocks. *See* individual geographic regions (such as Asia, Europe, Latin America, United States, etc.) and nations within each region

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Sterols or Steroid Hormones in Soybeans (Phytosterols–Including Beta-Sitosterol, Campesterol, and Stigmasterol from Which Steroids Such as Progesterone, Hydrocortisone, and Cortisone Can Be Made). 1501, 2555, 2581, 2970, 3024, 3060, 3177, 4499, 4531, 4962, 5290, 5291, 5495, 6217, 6988, 7163, 7274, 7586, 7651, 8115, 8265

Stinky tofu, etymology. *See* Tofu, Fermented–Stinky Tofu (*Chou Doufu*). Etymology of This Term

Stinky tofu. *See* Tofu, Fermented–Stinky Tofu (*Chou Doufu*). Etymology of This Term

Storage capacity of individual soybean crushing plants. *See* Soybean Crushing–Processing Capacity and/or Storage Capacity of

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Individual Plants–Statistics

Storage of Seeds, Viability and Life-Span During Storage or Storability, and Drying of Soybeans. 980, 1025, 1257, 1318, 1465, 1466, 1543, 1671, 1793, 1813, 1928, 2046, 2226, 2330, 2357, 2367, 2433, 2851, 2956, 2957, 3159, 3647, 3896, 4215, 4637, 4901, 5029, 5549, 6290, 6723, 7023, 7112, 7139, 7278, 7381, 7408, 7460, 7499, 7501, 7502, 7610, 7778, 8197, 8237, 8387, 8393, 9312, 9498, 9607, 10809, 10839

Stow Mills, Inc. Including Llama Toucan & Crow (Brattleboro, Vermont), and Lama Trading Co. 6741, 7465, 7587, 10774

Straw, soybean. *See* Feeds / Forage from Soybean Plants–Straw

Strayer Family of Iowa–Incl. George Strayer (1910-1981; executive officer of the American Soybean Association 1940-1967), His Father Bert Strayer (1880-1941), and His Nephew Dennis Strayer (born 1938). 3748, 3977, 4021, 4189, 4192, 4194, 4197, 4222, 4225, 4226, 4227, 4230, 4248, 4293, 4349, 4430, 4544, 4642, 4654, 4664, 4741, 4748, 4756, 4816, 4915, 4963, 5370, 5372, 5727, 7093, 7340, 10194, 10351, 10352, 10884, 11490

Subtilisin, a Strong Proteolytic Enzyme from Natto (Whole Soybeans Fermented with *Bacillus natto*). 5860, 10896, 10906, 11054, 11190

Sufu. *See* Tofu, Fermented

Sugars, complex, such as raffinose, stachyose, and verbacose. *See* Oligosaccharides

Sukiyaki–Famous Japanese Recipe and Dish. Its Basic Ingredients Include Tofu (Usually Grilled) and Soy Sauce. 1495, 1733, 1964, 2018, 2052, 2428, 2752, 2902, 2973, 3096, 3154, 3180, 3217, 3351, 3393, 3589, 3621, 3744, 3777, 3844, 3886, 3949, 3957, 3966, 4032, 4093, 4129, 4166, 4208, 4220, 4237, 4238, 4250, 4334, 4402, 4411, 4447, 4466, 4472, 4569, 4570, 4603, 4604, 4628, 4663, 4688, 4689, 4692, 4794, 4836, 4838, 4902, 4922, 4930, 5038, 5040, 5082, 5137, 5165, 5188, 5264, 5269, 5270, 5279, 5285, 5286, 5344, 5359, 5382, 5444, 5465, 5473, 5481, 5511, 5535, 5564, 5565, 5588, 5650, 5658, 5699, 5708, 5710, 5715, 5721, 5731, 5739, 6036, 6045, 6062, 6064, 6068, 6127, 6175, 6296, 6318, 6395, 6401, 6402, 6466, 6886, 6966, 7136, 7244, 7972, 8426, 8714, 8899, 9080, 9727, 10931, 10977

SunOpta, Inc. (Toronto, Ontario, Canada). Formerly SunRich Food Group (Hope, Minnesota). Formerly Minnesota Waxy Corn Growers Export Inc., Minnesota Edamame, Jameson-Williams Co. Acquired by Stake Technology Ltd. (Norval, Ontario, Canada) in July 1999, Stake changes its name to SunOpta on 31 Oct. 2003. 9607, 9734, 9754, 9764, 9854, 10106, 10119, 10186, 10223, 10311, 10312, 10453, 10546, 10583, 10681, 10701, 10803, 10905, 11490

SunRich Food Group (Hope, Minnesota). *See* SunOpta, Inc.

Sunflower Oil / Sunflowerseed Oil / Sunoil. 1925, 8569, 9907

Sunflower Seeds and Sunflowers (*Helianthus annuus*)–Including Sunflowerseed Oil, Cake, and Meal. Once called the Heliotrope, Heliotropion, and Heliotropium. 1442, 1683, 1803, 1884, 2046, 2226, 2298, 2330, 2504, 3146, 3551, 4137, 4459, 4474, 4863, 5458, 5683, 5804, 5820, 5962, 5967, 6059, 6135, 6371, 6379, 6380, 6523, 7076, 7125, 7188, 7687, 7906, 7910, 8569, 8850, 8853, 8904, 9112, 9352, 9684, 9907, 10147, 10237, 10506, 10575, 11416

Sunrise Markets Inc. (Vancouver, BC, Canada). 10001, 10978, 11444

Sunsoy Products Ltd. *See* Victory Soya Mills Ltd.

Sustainable Development and Growth, Including Low-Input Sustainable Agriculture (LISA), Renewable Energy Resources (Solar, Wind), Steady State Economics, and Voluntary Simplicity Worldwide. 7421, 10142, 10153, 10397, 10494, 10799

Suzuki Shoten (Suzuki & Co.). *See* Hohnen Oil Co., Ltd. (Tokyo, Japan)

Swan Food Corp. (Miami, Florida). Started in 1977 by Robert Brooks and Mary Pung. 6871, 6874, 10673, 11486

Swan Gardens Inc. and Soya Kaas Inc. (St. Ignatius, Montana; Atlanta, Georgia). Founded by Richard and Jocelyn McIntyre. 7311, 7371, 7525, 7634, 8650, 9090, 9808, 11444

Sweet Black Soybean Paste (Non-Fermented). Also Called Black Bean Paste or Sweet Black Bean Paste. Like Sweet Red / Azuki Bean Paste (*An*), But Made with Black Soybeans. May Be Used As a Filling for Chinese Cakes / Pastries. 10611

Sweet Oil. 223

Swift & Co. (Chicago, Champaign, and Oak Brook, Illinois). 3581, 4021, 5288, 5393, 5692, 5810, 6130, 6254, 6785, 7353, 8232, 8241

Sword Bean. *Canavalia gladiata* (Jacq.) D.C. Also Known as the Knife Bean, Saber Bean. 621

Sycamore Creek Co. (Mason, Michigan). Before 1993, INARI, Ltd.–International Nutrition and Resources Inc. Purchased by W.G. Thompson & Sons Ltd. of Canada, Jan. 1999. 7923, 8151, 8153, 8154, 8155, 8156, 8159, 8175, 8225, 8372, 9451, 10712, 10759

Syngenta AG (based in Basel, Switzerland)–Formed in Nov. 2000 by the Merger of Novartis Agribusiness (formed in March 1996 by the Merger of Sandoz AG and Ciba-Geigy; both based in Basel, Switzerland) and Zeneca Agrochemicals. 10469

Tadano, John. *See* Showa Shoyu Brewing Co. (Glendale, Arizona). Founded by John Tadano

Tahini or tahina or tahin. *See* Sesame Butter

Taifun-Produkte (Freiburg, Germany). *See* Life Food GmbH

Taiwan. *See* Asia, East–Taiwan

Taiwanese black bean sauce. *See* Soy Sauce–Taiwanese Black Bean Sauce (*Inyu*)

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Takamine, Jokichi (1854-1922; Introduced Koji, Commercial Microbial Enzyme Production, and Taka-Diastase to the USA). He Also Isolated Adrenalin / Adrenaline. Donated Famous Japanese Cherry Trees to Washington, DC. 964, 1019, 1024, 1093, 1468, 1537, 1597, 1694, 1695, 1733, 1964, 1996, 2156, 2469, 2477, 2756, 2865, 3054, 3270, 3395, 3611, 4050, 4235, 4375, 4476, 4579, 4723, 5121, 5143, 5150, 5171, 5240, 5301, 5302, 5466, 5637, 6024, 6092, 6459, 6676, 6922, 8440, 8708, 8979, 9828, 10951, 11426, 11432

Tamari, Including Real Tamari (Soy Sauce Which Contains Little or No Wheat) or the Macrobiotic Word Tamari Meaning Traditional Shoyu. 22, 25, 26, 30, 50, 54, 67, 68, 119, 138, 148, 151, 267, 844, 857, 865, 948, 1214, 1252, 1295, 1298, 1343, 1367, 1461, 1484, 1498, 1566, 1589, 1625, 1628, 1680, 1718, 1730, 1760, 1996, 2084, 2357, 2419, 2420, 2426, 2478, 2484, 2559, 2568, 2594, 2822, 3093, 3177, 3261, 3270, 3440, 3611, 3732, 3879, 3975, 3999, 4000, 4001, 4092, 4120, 4121, 4128, 4133, 4140, 4443, 4467, 4468, 4496, 4501, 4573, 4579, 4663, 4685, 4735, 4738, 4806, 4833, 4853, 4922, 5041, 5086, 5110, 5137, 5185, 5239, 5240, 5319, 5384, 5464, 5488, 5505, 5515, 5531, 5593, 5632, 5638, 5648, 5659, 5847, 5848, 5850, 5856, 5905, 5927, 5960, 5963, 5990, 5992, 5996, 5998, 6018, 6037, 6041, 6059, 6096, 6098, 6101, 6126, 6130, 6132, 6135, 6154, 6158, 6171, 6177, 6234, 6237, 6305, 6360, 6377, 6379, 6380, 6384, 6387, 6402, 6471, 6472, 6473, 6520, 6533, 6545, 6547, 6548, 6549, 6565, 6658, 6691, 6714, 6720, 6750, 6809, 6827, 6843, 6858, 6950, 6957, 6971, 7004, 7011, 7058, 7064, 7076, 7107, 7108, 7115, 7116, 7125, 7126, 7128, 7148, 7156, 7158, 7172, 7204, 7218, 7219, 7226, 7230, 7269, 7276, 7286, 7287, 7297, 7332, 7350, 7365, 7368, 7433, 7462, 7465, 7482, 7484, 7495, 7510, 7516, 7519, 7521, 7522, 7549, 7557, 7587, 7605, 7618, 7619, 7626, 7631, 7636, 7637, 7676, 7709, 7718, 7722, 7723, 7737, 7749, 7785, 7809, 7814, 7861, 7878, 7880, 7902, 7952, 7961, 7968, 7974, 7992, 7996, 7999, 8007, 8070, 8116, 8161, 8195, 8212, 8223, 8299, 8377, 8446, 8458, 8464, 8516, 8522, 8552, 8573, 8616, 8724, 8729, 8731, 8733, 8735, 8772, 8831, 8852, 8854, 8863, 8873, 8884, 8886, 8904, 9000, 9037, 9046, 9096, 9131, 9155, 9166, 9179, 9193, 9196, 9197, 9201, 9210, 9226, 9263, 9281, 9282, 9284, 9285, 9297, 9323, 9339, 9352, 9355, 9391, 9394, 9419, 9422, 9471, 9491, 9492, 9500, 9514, 9540, 9553, 9645, 9658, 9679, 9735, 9737, 9756, 9762, 9769, 9785, 9799, 9817, 9830, 9831, 9832, 9834, 9847, 9848, 9851, 9872, 9873, 9874, 9884, 9886, 9889, 9892, 9919, 9932, 9977, 10006, 10035, 10112, 10121, 10170, 10171, 10214, 10251, 10254, 10272, 10273, 10279, 10283, 10306, 10386, 10389, 10413, 10417, 10459, 10492, 10606, 10611, 10618, 10645, 10677, 10688, 10691, 10718, 10743, 10770, 10774, 10867, 10894, 10920, 10930, 10990, 11021, 11111, 11147, 11148, 11150, 11194, 11219, 11254, 11256, 11277, 11300, 11326, 11352, 11382, 11392, 11409, 11416

Tamari, Tamari Shoyu, and Tamari Soy Sauce–Etymology of These Terms and Their Cognates / Relatives in Various Languages. 68, 844, 1343, 1730, 3093, 5110, 6171, 7861

Tanshi, Tan-shih, or Tan-ch'ih (Wade-Giles). *See* Fermented Black Soybeans, Unsalted or Bland

Taosi or tao-si or tausi or tau-si. *See* Fermented Black Soybeans–from The Philippines

Tariffs, duties, embargoes. *See* Trade Policies (International) Concerning Soybeans, Soy Products, or Soyfoods–Tariffs, Duties, Embargoes, Moratoriums, and Other Trade Barriers or Subsidies

Taste Panel, Taste Test Results, or Sensory / Organoleptic Evaluation of the Quality of Foods and Beverages. 592, 4632, 4648, 4935, 4936, 5086, 5354, 5391, 5392, 5429, 5441, 5533, 5552, 5553, 5608, 5609, 5668, 6027, 6173, 7312, 8618, 8652, 8801, 9327, 9371, 10245

Tauco–Indonesian-Style Fermented Soybean Paste. Also Spelled Taucho, Tauceo, Tau Chiow, Taoco, Tao-Tjo, Taotjo, Taocho, Taoetjo. 889, 902, 997, 1018, 1021, 1354, 1830, 2304, 3323, 5323, 6433, 6545, 6548, 6632, 7082, 7276, 7754, 7878, 7880, 8680, 9507, 9851, 10920, 11109, 11148

Taxonomy. *See* Soybean–Taxonomy

Tempeh (Spelled *Témpé* in Malay-Indonesian). 788, 889, 902, 993, 997, 1018, 1021, 1483, 1830, 2304, 2534, 2535, 2545, 2557, 2779, 3183, 3214, 3323, 3357, 3762, 3880, 3953, 3956, 4459, 4551, 4558, 4666, 4680, 4771, 4792, 4796, 4905, 4906, 4962, 4983, 5069, 5093, 5112, 5128, 5163, 5167, 5182, 5196, 5205, 5207, 5233, 5316, 5323, 5383, 5403, 5404, 5420, 5421, 5461, 5471, 5507, 5529, 5657, 5755, 5774, 5815, 5835, 5872, 5889, 5897, 5943, 5967, 5972, 5984, 5997, 6018, 6120, 6130, 6216, 6327, 6335, 6368, 6391, 6395, 6399, 6401, 6418, 6428, 6433, 6456, 6465, 6534, 6546, 6623, 6637, 6648, 6693, 6715, 6734, 6738, 6774, 6863, 6884, 6922, 6958, 6959, 6964, 6965, 6973, 7004, 7011, 7042, 7059, 7068, 7076, 7082, 7102, 7141, 7152, 7172, 7191, 7210, 7220, 7269, 7294, 7300, 7324, 7326, 7332, 7357, 7359, 7376, 7455, 7462, 7471, 7515, 7523, 7542, 7543, 7557, 7593, 7596, 7606, 7616, 7624, 7639, 7699, 7701, 7709, 7743, 7766, 7767, 7775, 7792, 7793, 7796, 7799, 7801, 7803, 7804, 7806, 7809, 7812, 7823, 7836, 7839, 7840, 7842, 7846, 7858, 7859, 7860, 7863, 7865, 7866, 7867, 7877, 7882, 7896, 7900, 7904, 7906, 7910, 7916, 7925, 7945, 7954, 7963, 7968, 7973, 7975, 7976, 7988, 7998, 8001, 8018, 8019, 8034, 8045, 8049, 8051, 8058, 8061, 8062, 8069, 8071, 8073, 8074, 8075, 8076, 8077, 8078, 8079, 8083, 8087, 8093, 8098, 8103, 8104, 8105, 8113, 8119, 8120, 8122, 8131, 8135, 8140, 8141, 8149, 8164, 8176, 8208, 8212, 8233, 8245, 8248, 8251, 8252, 8260, 8262, 8271, 8274, 8275, 8278, 8281, 8287, 8288, 8290, 8293, 8296, 8297, 8299, 8301, 8304, 8305, 8307, 8309, 8317, 8319, 8322, 8323, 8327, 8330, 8331, 8334, 8347, 8350, 8356, 8385, 8388, 8399, 8412, 8424, 8444, 8446, 8483, 8491, 8492, 8496, 8509, 8518, 8528, 8531, 8533, 8539, 8542, 8549, 8552, 8564, 8569, 8571, 8574, 8582, 8586, 8587, 8615, 8651, 8652, 8656, 8659, 8665, 8666, 8667, 8668, 8670, 8677, 8680, 8682, 8696, 8704, 8708, 8773, 8797, 8798, 8820, 8831, 8847, 8866, 8875, 8904, 8919, 8925, 8926, 8978, 8979, 8994, 9011, 9016, 9058, 9097, 9115, 9120, 9124, 9128, 9141, 9146, 9155, 9164, 9184, 9194, 9212, 9219, 9227, 9236, 9239, 9240, 9247, 9288, 9305, 9321, 9356, 9358, 9359, 9362, 9363, 9364, 9365, 9369, 9371, 9395, 9401, 9409, 9418, 9422, 9479, 9501, 9507, 9509, 9511, 9523, 9565, 9577, 9578, 9579, 9580, 9587, 9590, 9602, 9608, 9658, 9735, 9736, 9742, 9743, 9745, 9746, 9747, 9748, 9759, 9762, 9769, 9796, 9798, 9827, 9828, 9846, 9847, 9851, 9858, 9859, 9871, 9877, 9893, 9918, 9919, 9927, 9928, 9939, 9943, 10008, 10011, 10012, 10015, 10016, 10019, 10024, 10050, 10062, 10069, 10071, 10079, 10098, 10099, 10113, 10117, 10123, 10134, 10160, 10172, 10185, 10188, 10236, 10243, 10245, 10248, 10250, 10251, 10254, 10266, 10346, 10389, 10417, 10421, 10425, 10439, 10445, 10451, 10465, 10492, 10508, 10523, 10539, 10551, 10567, 10575, 10582, 10606, 10611, 10635, 10646, 10659, 10687, 10688, 10718, 10719, 10728, 10802, 10830, 10857, 10897, 10917, 10960, 10989, 10990, 11103, 11113, 11114,

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11120, 11132, 11145, 11152, 11166, 11189, 11208, 11217, 11219, 11222, 11223, 11251, 11260, 11267, 11286, 11301, 11302, 11310, 11352, 11355, 11381, 11386, 11388, 11395, 11407, 11416, 11423, 11434, 11474, 11495

Tempeh–Etymology of This Term and Its Cognates / Relatives in Various Languages. 788, 902, 997, 2534, 2535, 3323, 8098, 8287, 10008

Tempeh–Rhizopus Molds Are Discussed Without Mentioning Tempeh. 1101, 1367, 1528, 2333, 3524, 5492, 5614, 5671, 7549, 8222, 8748, 8761, 9241, 9313, 10008

Tempeh Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 5163, 7542, 7557, 7766, 7963, 8051, 8098, 8122, 8271, 8287, 8549, 8652, 9362, 9523, 10008, 10079, 10172

Tempeh Industry and Market Statistics, Trends, and Analyses–Larger Companies. 7543, 7616, 7766, 7767, 8051, 8098, 8271, 8287, 8797, 9769, 10008, 10079, 10113

Tempeh Production–How to Make Tempeh on a Commercial Scale. 997, 6648

Tempeh Starter Culture, Spores, or Inoculum (Called *Ragi Tempe* or *Usar* in Indonesia). 6399, 6648, 6693, 7860, 8262, 8319, 8327, 9742, 11495

Tempeh companies (USA). *See* Appropriate Foods, Inc. (Brooklyn, New York), Soyfoods Unlimited, Inc. (San Leandro, California)

Tempeh companies. *See* Turtle Island Foods, Inc. (Hood River, Oregon. Maker of Tofurky and Tempeh)

Tempeh in Second Generation Products, Documents About. 10008

Tempeh, Homemade–How to Make at Home or on a Laboratory Scale, by Hand. 6327, 6399, 6648, 8288, 8299, 8539, 8666, 11395, 11416

Tempeh, Non-Soy Relatives–Onchom (Oncom, Ontjom)–A cake of Peanut Presscake or Okara (Oncom Tahu) Fermented with *Neurospora* (*Monilia sitophila = Oidium lupuli*) molds. 408, 889, 1021, 1354, 1528, 1537, 1729, 1830, 2333, 2334, 2534, 2535, 2545, 2779, 3148, 3183, 3323, 3762, 3880, 4558, 4666, 4962, 5967, 5997, 6433, 6465, 6637, 7976, 8120, 8293, 8496, 8625, 8847, 8992, 9239, 9288, 9471, 9847, 9851, 10008, 10719

Tempeh, Non-Soy Relatives–Other Substrates Such as Winged Beans, Lupins, Velvet Beans, Brown Rice, Cassava, etc. 5967, 8262, 9288, 9371, 10008, 10917

Tempeh, Non-Soy Relatives–Tempeh Bongkrek–A Cake of Fermented Coconut Presscake or Grated Coconut. 889, 997, 4558, 9288, 10008

Tempeh, Okara (Okara Tempeh), Incl. Mei Dou Za, Mei-Tou-Cha, Meitauza from China, and Tempe Gembus (from Central and Eastern Java). 3339, 3357, 6637, 6964, 7865, 8564, 8634, 8979, 9305, 9509, 9579, 9580, 10016, 11395

Tempeh, Used as an Ingredient in Second Generation Commercial Products Such as Entrees, etc. 7834, 8189, 8519

Tempehworks. *See* Lightlife Foods, Inc.

Temperance movement (abstaining from alcohol) and vegetarianism. *See* Vegetarianism and the Temperance Movement Worldwide

Teranatto or Tera-Natto. *See* Fermented Black Soybeans from Japan–Other Names

Teriyaki Sauce and Teriyaki (Soy Sauce is the Main Sauce Ingredient). 760, 948, 1153, 1711, 2983, 3863, 3949, 4032, 4093, 4191, 4250, 4302, 4397, 4466, 4467, 4469, 4472, 4518, 4628, 4655, 4737, 4902, 5038, 5040, 5108, 5270, 5344, 5382, 5444, 5481, 5535, 5554, 5588, 5650, 5658, 6068, 6074, 6213, 6296, 6318, 6404, 6434, 6466, 6624, 6628, 6694, 6712, 6859, 6937, 6958, 7003, 7083, 7154, 7170, 7230, 7252, 7471, 7479, 7530, 7730, 7758, 7873, 7888, 7907, 7966, 7996, 7998, 8016, 8199, 8212, 8342, 8522, 8536, 8724, 8739, 8803, 8886, 8938, 8994, 9042, 9088, 9138, 9299, 9421, 9426, 9434, 9491, 9600, 9621, 9785, 9846, 10058, 10262, 10306, 10322, 10429, 10445, 10485, 10487, 10537, 10565, 10611, 10688, 10718, 10852, 10859, 10867, 10931, 10932, 11084, 11155, 11233, 11258, 11313, 11409, 11492

Teriyaki Sauce, Homemade Recipe–How to Make at Home or on a Laboratory Scale, by Hand. 2983, 3863, 3949, 4250, 4302, 4397, 4472, 5658, 7230, 8994, 10611

Terminology for soybeans–Fanciful. *See* Soybean–Terminology and Nomenclature–Fanciful Terms and Names

Tetra Pak International (Lund, Sweden). 5595, 6390, 6573, 6890, 7034, 7149, 7314, 7371, 7447, 7557, 7564, 7633, 7643, 7770, 7772, 7790, 7820, 7841, 7890, 7920, 7922, 8010, 8013, 8014, 8043, 8053, 8510, 8512, 8576, 8639, 8643, 8650, 8675, 8878, 8879, 8880, 8884, 8907, 8927, 8941, 8990, 9020, 9053, 9054, 9055, 9091, 9117, 9210, 9397, 9413, 9555, 9581, 9593, 9667, 10030, 10079, 10183, 10214, 10712, 10761, 10799, 11264, 11448, 11484, 11486

Textiles made from spun soy protein fibers. *See* Fibers (Artificial Wool or Textiles Made from Spun Soy Protein Fibers, Including Azlon, Soylon, and Soy Silk / Soysilk)

Textured soy flours. *See* Soy Flours, Textured (Including TVP, Textured Vegetable Protein)

Textured soy protein concentrates. *See* Soy Protein Concentrates, Textured

Textured soy protein isolates. *See* Soy Protein Isolates, Textured (For Food Use Only). Including Spun Fibers

Textured soy proteins. *See* Soy Proteins, Textured

Thai restaurants outside Japan, or Thai recipes that use soy ingredients outside Thailand. *See* Asia, Southeast–Thailand–Thai Restaurants Grocery Stores Outside Thailand

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Therapeutic uses / aspects of soybeans, general. *See* Medical / Medicinal-Therapeutic Uses / Aspects, General

Third World / Developing Nations. 3647, 6111, 7512, 7513, 7531, 7532, 7534, 7535, 7641, 8017, 8030

Thompsons Limited. Before Jan. 2004 named Thompson (W.G.) & Sons Limited, Blenheim, Ontario, Canada. Before 1963 W.G. Thompson. Founded in 1924 by Wesley G. "Tommy" Thompson. 9523, 10147, 10274, 10435, 10624, 10712, 10790, 10923

Thua-nao / Tua Nao (Whole Fermented Soybeans From Thailand). 6465, 6725, 6733, 6960, 7557, 7563, 7699, 7896, 8046, 8293, 8301, 8304, 8309, 8555, 8651, 8661, 8665, 8668, 8678, 8984, 9321, 9851, 9952, 10015, 10046, 10047, 10474, 10960, 11054, 11112, 11190, 11351, 11355

Thyroid function. *See* Goitrogens and Thyroid Function

Tibet. *See* Asia, East–Tibet and Tibetans Outside Tibet

Tillage practices. *See* Soybean Cultural Practices–No Till Farming

Timeline. *See* Chronology / Timeline

Timor-Leste (East Timor). *See* Asia, Southeast–Timor-Leste (East Timor)

Tivall (Tivol), Maker of Meat Alternatives (Ashrat, Israel). 9369, 11073

TKW (Germany). *See* Tofukost-Werk GmbH

Tocopherols. *See* Vitamins E (Tocopherols)

Tofu (Also Called Soybean Curd or Bean Curd until about 1975-1985). See also Tofu–Fermented, Soy Ice Creams, Soy Yogurts, and Cheesecake, Which Often Use Tofu as a Major Ingredient. 21, 26, 27, 28, 29, 32, 33, 34, 35, 37, 38, 39, 41, 42, 44, 46, 48, 49, 51, 53, 61, 66, 67, 68, 70, 72, 93, 102, 117, 125, 126, 130, 131, 138, 181, 182, 188, 191, 204, 205, 214, 216, 218, 233, 235, 238, 255, 271, 275, 284, 295, 306, 309, 314, 318, 320, 341, 346, 352, 353, 359, 374, 387, 393, 435, 439, 491, 509, 512, 515, 516, 517, 523, 524, 526, 527, 529, 533, 535, 537, 538, 541, 548, 553, 556, 564, 565, 580, 581, 584, 585, 589, 590, 594, 595, 596, 597, 603, 609, 615, 617, 618, 619, 620, 621, 622, 624, 627, 631, 635, 640, 644, 647, 649, 652, 654, 658, 662, 668, 675, 677, 682, 683, 687, 689, 698, 700, 702, 703, 706, 709, 712, 713, 714, 716, 717, 720, 722, 724, 725, 726, 727, 728, 731, 732, 734, 736, 737, 739, 740, 748, 750, 752, 754, 756, 758, 763, 765, 767, 768, 770, 772, 773, 785, 788, 789, 794, 795, 804, 805, 807, 816, 821, 824, 828, 830, 836, 837, 838, 840, 843, 844, 847, 853, 858, 868, 878, 880, 886, 889, 892, 896, 901, 902, 903, 906, 908, 916, 918, 924, 928, 932, 934, 937, 940, 942, 943, 948, 949, 959, 966, 968, 970, 974, 975, 978, 982, 985, 986, 987, 989, 992, 997, 1001, 1002, 1005, 1009, 1018, 1021, 1022, 1025, 1028, 1045, 1049, 1050, 1052, 1053, 1067, 1078, 1080, 1081, 1084, 1090, 1094, 1095, 1105, 1106, 1107, 1111, 1119, 1136, 1137, 1141, 1142, 1143, 1145, 1146, 1149, 1154, 1156, 1158, 1159, 1160, 1171, 1174, 1175, 1176, 1177, 1178, 1183, 1197, 1203, 1210, 1211, 1212, 1216, 1217, 1219, 1260, 1261, 1264, 1270, 1271, 1275, 1278, 1283, 1284, 1311, 1319, 1335, 1336, 1338, 1344, 1345, 1346, 1352, 1360, 1365, 1369, 1376, 1384, 1386, 1391, 1398, 1410, 1413, 1416, 1420, 1427, 1435, 1436, 1439, 1446, 1453, 1457, 1465, 1466, 1467, 1469, 1470, 1475, 1480, 1489, 1496, 1499, 1509, 1511, 1513, 1523, 1533, 1535, 1543, 1544, 1545, 1547, 1551, 1574, 1580, 1585, 1596, 1599, 1600, 1615, 1623, 1662, 1666, 1704, 1705, 1708, 1709, 1710, 1711, 1716, 1719, 1735, 1738, 1742, 1744, 1749, 1767, 1768, 1771, 1774, 1784, 1786, 1794, 1796, 1803, 1804, 1812, 1815, 1820, 1826, 1827, 1830, 1832, 1837, 1868, 1869, 1870, 1873, 1874, 1884, 1885, 1887, 1889, 1891, 1894, 1896, 1898, 1914, 1921, 1924, 1932, 1935, 1937, 1938, 1946, 1953, 1964, 1973, 1974, 2001, 2005, 2016, 2026, 2040, 2043, 2052, 2075, 2078, 2081, 2111, 2113, 2117, 2118, 2138, 2148, 2149, 2180, 2201, 2203, 2205, 2216, 2226, 2242, 2243, 2251, 2258, 2259, 2277, 2292, 2302, 2304, 2306, 2315, 2316, 2325, 2335, 2336, 2403, 2404, 2425, 2428, 2429, 2458, 2462, 2463, 2465, 2467, 2474, 2475, 2478, 2484, 2490, 2517, 2520, 2521, 2537, 2551, 2557, 2623, 2625, 2629, 2631, 2640, 2647, 2652, 2662, 2671, 2717, 2727, 2729, 2734, 2736, 2752, 2757, 2759, 2769, 2774, 2775, 2776, 2786, 2817, 2821, 2831, 2838, 2843, 2848, 2867, 2902, 2906, 2912, 2941, 2951, 2953, 2961, 2972, 3008, 3040, 3043, 3049, 3054, 3096, 3129, 3130, 3140, 3141, 3147, 3151, 3154, 3159, 3162, 3214, 3217, 3228, 3240, 3251, 3272, 3277, 3284, 3321, 3323, 3332, 3333, 3337, 3344, 3350, 3351, 3363, 3384, 3387, 3390, 3393, 3401, 3414, 3425, 3427, 3436, 3465, 3467, 3468, 3469, 3470, 3543, 3557, 3566, 3584, 3612, 3624, 3628, 3630, 3632, 3642, 3647, 3651, 3663, 3678, 3688, 3689, 3691, 3693, 3700, 3710, 3725, 3727, 3730, 3731, 3734, 3736, 3738, 3743, 3755, 3779, 3787, 3788, 3802, 3803, 3811, 3826, 3831, 3837, 3842, 3844, 3853, 3855, 3876, 3885, 3886, 3894, 3896, 3897, 3900, 3905, 3948, 3949, 3955, 3961, 3966, 4026, 4068, 4074, 4089, 4104, 4126, 4129, 4166, 4197, 4198, 4206, 4207, 4208, 4220, 4222, 4226, 4236, 4237, 4238, 4240, 4250, 4256, 4258, 4304, 4325, 4326, 4330, 4334, 4335, 4336, 4337, 4338, 4355, 4366, 4368, 4392, 4402, 4406, 4411, 4436, 4438, 4442, 4447, 4450, 4459, 4460, 4466, 4471, 4472, 4477, 4482, 4485, 4492, 4502, 4506, 4526, 4529, 4542, 4548, 4558, 4559, 4560, 4561, 4569, 4570, 4580, 4582, 4583, 4591, 4595, 4597, 4600, 4603, 4604, 4611, 4621, 4622, 4629, 4630, 4631, 4632, 4634, 4635, 4636, 4640, 4641, 4644, 4645, 4646, 4647, 4648, 4660, 4663, 4666, 4683, 4685, 4686, 4688, 4689, 4694, 4699, 4704, 4729, 4731, 4736, 4740, 4743, 4748, 4753, 4756, 4764, 4771, 4803, 4810, 4818, 4819, 4820, 4825, 4826, 4830, 4833, 4834, 4835, 4836, 4837, 4838, 4881, 4898, 4902, 4904, 4905, 4906, 4913, 4919, 4920, 4922, 4923, 4924, 4927, 4928, 4930, 4937, 4938, 4939, 4950, 4957, 4960, 4963, 4966, 4983, 4984, 4986, 4988, 4989, 4998, 5004, 5009, 5013, 5024, 5025, 5026, 5030, 5031, 5038, 5040, 5045, 5055, 5068, 5076, 5089, 5095, 5096, 5100, 5102, 5106, 5107, 5108, 5116, 5124, 5125, 5134, 5136, 5137, 5161, 5163, 5165, 5173, 5182, 5188, 5194, 5211, 5212, 5213, 5214, 5222, 5223, 5224, 5225, 5226, 5227, 5232, 5235, 5236, 5239, 5242, 5263, 5264, 5268, 5269, 5270, 5271, 5274, 5275, 5279, 5280, 5285, 5286, 5307, 5319, 5323, 5342, 5344, 5359, 5369, 5382, 5408, 5415, 5434, 5444, 5451, 5452, 5454, 5456, 5458, 5460, 5462, 5467, 5473, 5479, 5481, 5486, 5494, 5507, 5511, 5514, 5515, 5519, 5521, 5528, 5535, 5536, 5547, 5549, 5554, 5563, 5564, 5565, 5581, 5587, 5588, 5601, 5602, 5624, 5627, 5629, 5632, 5633, 5650, 5651, 5656, 5658, 5664, 5665, 5680, 5681, 5682, 5699, 5700, 5704, 5705, 5708, 5710, 5712, 5714, 5715, 5720, 5721, 5727, 5728, 5731, 5739, 5759, 5777, 5781, 5783, 5790, 5795, 5796, 5804, 5808, 5816, 5818, 5819, 5826, 5836, 5840, 5853, 5854, 5861, 5865, 5873, 5879, 5882, 5888, 5894, 5897, 5909, 5914, 5918, 5925, 5927, 5928, 5931, 5937, 5939, 5953, 5956, 5957, 5958, 5960, 5965, 5967, 5971, 5979,

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5989, 5990, 5991, 5992, 5996, 5998, 5999, 6003, 6015, 6018, 6019, 6025, 6027, 6030, 6036, 6040, 6043, 6045, 6058, 6060, 6062, 6064, 6071, 6072, 6073, 6077, 6080, 6081, 6084, 6087, 6095, 6101, 6102, 6110, 6115, 6121, 6125, 6126, 6127, 6128, 6130, 6131, 6138, 6140, 6143, 6148, 6150, 6151, 6164, 6168, 6169, 6171, 6172, 6174, 6175, 6178, 6194, 6208, 6213, 6219, 6234, 6240, 6252, 6262, 6277, 6279, 6281, 6284, 6286, 6289, 6292, 6296, 6297, 6300, 6307, 6309, 6318, 6334, 6340, 6344, 6346, 6350, 6354, 6355, 6357, 6363, 6369, 6370, 6374, 6376, 6381, 6383, 6385, 6387, 6390, 6391, 6393, 6395, 6401, 6404, 6410, 6412, 6423, 6426, 6427, 6432, 6433, 6438, 6441, 6445, 6456, 6462, 6464, 6466, 6468, 6469, 6473, 6476, 6488, 6505, 6512, 6516, 6519, 6520, 6528, 6529, 6530, 6531, 6532, 6534, 6538, 6545, 6546, 6547, 6548, 6555, 6562, 6564, 6568, 6570, 6571, 6573, 6577, 6603, 6604, 6612, 6623, 6624, 6626, 6628, 6630, 6632, 6637, 6646, 6650, 6651, 6654, 6656, 6670, 6671, 6672, 6674, 6678, 6680, 6681, 6685, 6691, 6705, 6716, 6719, 6722, 6726, 6727, 6728, 6746, 6747, 6749, 6751, 6754, 6761, 6780, 6784, 6793, 6794, 6795, 6799, 6815, 6816, 6818, 6825, 6826, 6827, 6828, 6832, 6833, 6845, 6848, 6849, 6853, 6857, 6862, 6863, 6867, 6868, 6871, 6872, 6873, 6874, 6876, 6877, 6884, 6885, 6886, 6888, 6890, 6891, 6892, 6899, 6903, 6907, 6909, 6914, 6919, 6921, 6923, 6925, 6937, 6947, 6958, 6959, 6960, 6962, 6964, 6965, 6966, 6967, 6987, 6990, 6992, 6994, 6996, 7001, 7003, 7004, 7006, 7007, 7011, 7017, 7021, 7023, 7032, 7034, 7052, 7058, 7060, 7064, 7065, 7069, 7073, 7076, 7081, 7082, 7083, 7084, 7089, 7092, 7096, 7099, 7103, 7106, 7109, 7112, 7114, 7118, 7119, 7125, 7127, 7130, 7137, 7138, 7141, 7146, 7147, 7152, 7159, 7160, 7166, 7168, 7170, 7171, 7172, 7175, 7176, 7177, 7181, 7182, 7189, 7192, 7207, 7208, 7210, 7211, 7221, 7226, 7228, 7229, 7230, 7237, 7238, 7239, 7243, 7245, 7252, 7253, 7254, 7256, 7257, 7258, 7259, 7260, 7266, 7268, 7269, 7276, 7277, 7278, 7281, 7293, 7298, 7300, 7302, 7306, 7313, 7317, 7322, 7323, 7324, 7326, 7328, 7333, 7337, 7347, 7357, 7360, 7361, 7363, 7365, 7371, 7376, 7378, 7382, 7390, 7401, 7402, 7405, 7409, 7412, 7416, 7417, 7419, 7422, 7431, 7432, 7433, 7434, 7437, 7439, 7441, 7448, 7449, 7453, 7455, 7460, 7461, 7462, 7466, 7469, 7476, 7479, 7482, 7487, 7488, 7501, 7510, 7512, 7515, 7517, 7522, 7524, 7536, 7537, 7538, 7540, 7542, 7544, 7557, 7561, 7562, 7565, 7576, 7577, 7584, 7594, 7596, 7602, 7613, 7614, 7615, 7616, 7617, 7619, 7620, 7621, 7624, 7628, 7631, 7633, 7634, 7639, 7642, 7643, 7644, 7660, 7677, 7678, 7686, 7693, 7694, 7696, 7701, 7704, 7707, 7708, 7714, 7719, 7720, 7730, 7733, 7735, 7736, 7743, 7763, 7765, 7766, 7767, 7768, 7771, 7775, 7782, 7793, 7795, 7796, 7799, 7803, 7804, 7806, 7815, 7816, 7817, 7826, 7833, 7835, 7847, 7851, 7855, 7859, 7866, 7867, 7874, 7878, 7879, 7887, 7889, 7900, 7901, 7905, 7907, 7922, 7923, 7928, 7930, 7931, 7942, 7947, 7949, 7950, 7957, 7962, 7965, 7966, 7968, 7970, 7972, 7978, 7980, 7994, 8005, 8011, 8015, 8017, 8019, 8020, 8026, 8032, 8033, 8034, 8039, 8043, 8045, 8046, 8051, 8054, 8061, 8071, 8084, 8086, 8087, 8091, 8096, 8102, 8117, 8122, 8123, 8126, 8130, 8132, 8135, 8136, 8139, 8143, 8147, 8162, 8164, 8168, 8169, 8170, 8182, 8194, 8198, 8199, 8202, 8204, 8209, 8211, 8213, 8216, 8223, 8224, 8226, 8227, 8228, 8229, 8234, 8238, 8239, 8240, 8243, 8244, 8247, 8251, 8253, 8255, 8262, 8264, 8271, 8277, 8280, 8283, 8289, 8290, 8291, 8295, 8299, 8303, 8310, 8318, 8320, 8321, 8326, 8328, 8332, 8343, 8367, 8369, 8371, 8374, 8375, 8378, 8379, 8392, 8399, 8400, 8404, 8405, 8416, 8434, 8439, 8444, 8446, 8447, 8448, 8450, 8453, 8455, 8465, 8466, 8472, 8475, 8480, 8489, 8490, 8500, 8504, 8505, 8506, 8507, 8509, 8513, 8514, 8515, 8524, 8525, 8526, 8529, 8534, 8543, 8545, 8547, 8550, 8552, 8554, 8559, 8563, 8565, 8567, 8569, 8570, 8580, 8585, 8587, 8588, 8590, 8591, 8595, 8600, 8602, 8603, 8611, 8612, 8617, 8623, 8625, 8627, 8628, 8636, 8649, 8650, 8660, 8688, 8691, 8692, 8702, 8704, 8706, 8709, 8714, 8715, 8724, 8727, 8745, 8746, 8752, 8756, 8757, 8761, 8769, 8773, 8778, 8779, 8786, 8789, 8801, 8802, 8804, 8806, 8814, 8821, 8822, 8824, 8830, 8832, 8833, 8834, 8837, 8839, 8843, 8845, 8851, 8860, 8861, 8864, 8870, 8871, 8874, 8876, 8879, 8881, 8883, 8884, 8892, 8896, 8899, 8909, 8911, 8919, 8920, 8923, 8927, 8928, 8932, 8933, 8940, 8943, 8960, 8967, 8988, 8992, 8994, 8999, 9003, 9006, 9007, 9008, 9010, 9011, 9017, 9018, 9023, 9025, 9027, 9039, 9047, 9051, 9053, 9054, 9057, 9058, 9059, 9074, 9077, 9079, 9080, 9085, 9089, 9100, 9101, 9104, 9106, 9107, 9108, 9109, 9113, 9116, 9117, 9118, 9119, 9125, 9126, 9129, 9130, 9132, 9134, 9141, 9142, 9144, 9145, 9148, 9149, 9151, 9152, 9153, 9156, 9165, 9167, 9172, 9183, 9186, 9191, 9202, 9203, 9204, 9205, 9206, 9207, 9210, 9212, 9240, 9263, 9267, 9272, 9278, 9280, 9286, 9289, 9306, 9308, 9332, 9333, 9334, 9335, 9343, 9345, 9346, 9347, 9348, 9352, 9353, 9354, 9357, 9365, 9368, 9369, 9378, 9379, 9387, 9389, 9392, 9397, 9398, 9401, 9403, 9404, 9406, 9408, 9409, 9416, 9417, 9418, 9422, 9424, 9427, 9430, 9432, 9434, 9437, 9438, 9439, 9440, 9442, 9445, 9447, 9448, 9451, 9476, 9478, 9480, 9482, 9483, 9486, 9487, 9488, 9493, 9494, 9498, 9502, 9503, 9507, 9512, 9518, 9519, 9522, 9523, 9526, 9528, 9537, 9541, 9543, 9544, 9546, 9547, 9553, 9554, 9557, 9561, 9567, 9573, 9574, 9575, 9577, 9586, 9590, 9592, 9595, 9597, 9598, 9599, 9603, 9604, 9605, 9608, 9615, 9616, 9620, 9621, 9622, 9623, 9641, 9653, 9655, 9656, 9658, 9659, 9663, 9664, 9668, 9682, 9687, 9689, 9690, 9693, 9694, 9696, 9698, 9699, 9700, 9701, 9707, 9724, 9729, 9735, 9737, 9739, 9745, 9750, 9762, 9763, 9769, 9774, 9778, 9780, 9782, 9783, 9786, 9788, 9792, 9793, 9805, 9807, 9808, 9809, 9810, 9827, 9829, 9830, 9836, 9837, 9842, 9846, 9847, 9848, 9864, 9876, 9877, 9890, 9891, 9892, 9893, 9895, 9899, 9900, 9901, 9902, 9903, 9904, 9905, 9913, 9915, 9917, 9919, 9922, 9938, 9944, 9947, 9962, 9974, 9976, 9981, 9988, 9992, 9993, 9994, 9995, 10001, 10003, 10014, 10015, 10017, 10018, 10019, 10024, 10025, 10029, 10032, 10037, 10054, 10061, 10066, 10069, 10070, 10071, 10079, 10082, 10084, 10087, 10092, 10095, 10097, 10103, 10105, 10112, 10123, 10129, 10134, 10138, 10139, 10146, 10147, 10149, 10154, 10155, 10157, 10164, 10168, 10172, 10174, 10178, 10179, 10185, 10186, 10188, 10191, 10193, 10194, 10200, 10201, 10202, 10208, 10211, 10214, 10216, 10217, 10223, 10226, 10228, 10232, 10233, 10234, 10236, 10243, 10244, 10245, 10248, 10250, 10251, 10254, 10255, 10257, 10258, 10259, 10260, 10265, 10266, 10272, 10275, 10279, 10283, 10285, 10286, 10287, 10291, 10294, 10316, 10324, 10327, 10329, 10330, 10331, 10335, 10337, 10338, 10339, 10344, 10345, 10346, 10350, 10351, 10354, 10359, 10360, 10365, 10367, 10370, 10372, 10379, 10384, 10388, 10393, 10395, 10399, 10400, 10402, 10403, 10409, 10410, 10411, 10412, 10421, 10424, 10435, 10438, 10439, 10442, 10444, 10445, 10448, 10451, 10454, 10456, 10460, 10461, 10465, 10469, 10470, 10471, 10476, 10483, 10487, 10492, 10493, 10496, 10497, 10499, 10501, 10502, 10503, 10504, 10508, 10513, 10519, 10523, 10524, 10525, 10526, 10530, 10532, 10534, 10538, 10548, 10550, 10551, 10553, 10554, 10556, 10559, 10560, 10561, 10563, 10565, 10567, 10569, 10573, 10574, 10575, 10578, 10580, 10582, 10596, 10602, 10606, 10610, 10611, 10614, 10617, 10625, 10626, 10627, 10631, 10633, 10635, 10638, 10642, 10643, 10644, 10646, 10647, 10649, 10651, 10652, 10654, 10659, 10660, 10661, 10664, 10670, 10678, 10679, 10680, 10687, 10688, 10692, 10693, 10707, 10708, 10709, 10710, 10718, 10719, 10720, 10721, 10722, 10728, 10736, 10737, 10741, 10742, 10747, 10753, 10755, 10760, 10762, 10763, 10768, 10769, 10780, 10782, 10784, 10788, 10790, 10792, 10794, 10801, 10802, 10804, 10805, 10808, 10823, 10827, 10828, 10830, 10832, 10840, 10848, 10849, 10850, 10854, 10857, 10858, 10859, 10864, 10867,

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Tofu Shop (The) (Telluride, Colorado, and Arcata, California) and Tofu Shop Specialty Foods Inc. Founded by Matthew Schmit. 6746, 6890, 11444

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Tofu companies (Asia). *See* Asahimatsu Shokuhin (Japan)

Tofu companies (Canada). *See* Sunrise Markets Inc. (Vancouver, BC, Canada), Victor Food Products, Ltd. (Scarborough, Ontario, Canada)

Tofu companies (Europe). *See* Auenland Tofu und Soja Produkte (Prien-Chiemsee, Germany), Cauldron Foods Ltd. (Bristol, England), Heuschen-Schrouff B.V. (Landgraaf, Netherlands), Sojadoc (Clermond-Ferrand, France), Sojarei Vollwertkost GmbH (Traiskirchen, near Vienna, Austria). Formerly Sojarei Ebner-Prosl, Soyastern Naturkost GmbH / Dorstener Tofu Produktions GmbH (Dorsten, Germany), Tofukost-Werk TKW GmbH (Wadersloh, Germany), Tofumanufaktur Christian Nagel GmbH (Hamburg, Germany), Tofurei Svadesha Naturkost Produkte GmbH (Munich, Germany). Including Byodo Naturkost

Tofu companies (USA). *See* Azumaya, Inc. (San Francisco, California), Global Protein Foods (Valley Cottage, New York). And Parent Company, Kyoto Tanpaku K.K. of Kyoto, Japan, House Foods America Corporation (Los Angeles, California), Island Spring, Inc. (Vashon, Washington), Kyoto Food Corp. USA (Terre Haute, Indiana), Legume, Inc. (Fairfield, New Jersey), Mainland Express (Spring Park, Minnesota), Morinaga Nutritional Foods, Inc., and Morinaga Nyûgyô (Torrance, California, and Tokyo, Japan), Nasoya Foods, Inc. (Leominster, Massachusetts). Subsidiary of Vitasoy, Northern Soy, Inc. (Rochester, New York), Ota Tofu Co.

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(Portland, Oregon. Founded in 1911), Pulmuone U.S.A., Inc. (South Gate, California), Quong Hop & Co. (San Francisco, California), Rosewood Products Inc. (Ann Arbor, Michigan), Simply Natural, Inc. (Philadelphia, Pennsylvania), Swan Gardens Inc. and Soya Kaas Inc. (Atlanta, Georgia), Tofu Shop (The) (Telluride, Colorado, and Arcata, California) and Tofu Shop Specialty Foods Inc., Tomsun Foods, Inc. (Greenfield, Massachusetts; Port Washington, New York, Wildwood Harvest, Inc.

Tofu curds. *See* Curds Made from Soymilk

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Tofu, Fermented–Etymology of This Term and Its Cognates / Relatives in Various Languages. 824, 1046, 1935, 2242, 2357, 2650, 2651, 2903, 3339, 3743, 3755, 3788, 3886, 4472, 4753, 5576, 6709, 6958, 8373

Tofu, Fermented–Stinky Tofu (pinyin: Chou Doufu (W.-G. Ch'ou Toufu). Also Called, Stinking, Smelly or Redolent Tofu / Bean Curd). 824, 10611, 10719

Tofu, Fermented–Stinky Tofu (*Chou Doufu*). Etymology of This Term and Its Cognates / Relatives in Various Languages. 824

Tofu, Fermented–Tofuyo from Okinawa, Japan (Made with Red Rice {*Beni-Koji*} Containing *Monascus purpureus*). 307, 354, 3415, 3497, 4807, 5422, 5573, 6001, 6803, 6804, 6924, 7055, 7223, 7655, 7769, 7909, 8000, 8061, 8072, 8092, 8135, 8244, 8255, 8317, 8355, 8373, 8401, 8581, 8679, 9003, 9549, 9586, 9851, 9935, 9997, 10101, 10157, 10177, 10269, 10290, 10320, 10375, 10516, 10653, 10825, 11027, 11078, 11219, 11223, 11334, 11377, 11378, 11379, 11380

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Tofu, Five-Spice Pressed (*Wu-hsiang Toufukan / Wuxiang Doufugan*). 2242, 6395, 6401, 7003, 7479, 7907, 9621, 9847, 10646, 10719, 10857, 10859, 11260, 11444

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Tofu, Flavored, Seasoned, or Marinated, but not Baked, Broiled, Grilled, Braised, or Roasted. Including most Five-Spice Pressed Tofu (*wu-hsiang toufukan / wuxiang doufugan*). 2242, 2331, 5040, 6395, 6401, 8295, 9079, 9555, 9847, 10646, 10719, 10857, 11260, 11267, 11444, 11486

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7170, 7172, 7208, 7210, 7211, 7230, 7244, 7246, 7265, 7269, 7322, 7326, 7355, 7357, 7361, 7369, 7416, 7422, 7434, 7439, 7455, 7474, 7479, 7480, 7483, 7512, 7548, 7557, 7572, 7594, 7645, 7677, 7719, 7720, 7735, 7763, 7771, 7815, 7817, 7833, 7851, 7867, 7883, 7887, 7889, 7907, 7918, 7921, 7937, 7962, 7966, 7972, 8016, 8019, 8046, 8081, 8082, 8087, 8096, 8143, 8187, 8204, 8209, 8211, 8213, 8218, 8219, 8277, 8299, 8382, 8383, 8439, 8447, 8455, 8480, 8506, 8525, 8573, 8588, 8591, 8611, 8644, 8706, 8714, 8724, 8727, 8748, 8756, 8860, 8898, 8905, 8944, 8946, 8947, 8988, 9003, 9061, 9062, 9089, 9099, 9141, 9149, 9151, 9153, 9264, 9272, 9378, 9421, 9428, 9447, 9480, 9486, 9494, 9522, 9544, 9557, 9615, 9621, 9655, 9656, 9658, 9724, 9727, 9729, 9745, 9750, 9780, 9792, 9827, 9829, 9832, 9836, 9837, 9846, 9847, 9891, 9893, 9917, 9956, 9962, 9995, 10001, 10003, 10058, 10063, 10095, 10103, 10123, 10129, 10146, 10193, 10198, 10201, 10202, 10232, 10233, 10243, 10367, 10393, 10403, 10443, 10445, 10456, 10471, 10492, 10493, 10496, 10503, 10526, 10532, 10582, 10606, 10610, 10611, 10617, 10626, 10646, 10659, 10672, 10678, 10680, 10718, 10719, 10721, 10728, 10737, 10769, 10788, 10801, 10857, 10859, 10864, 10867, 10875, 10881, 10897, 10899, 10931, 10944, 10962, 10984, 10990, 10995, 11023, 11049, 11102, 11118, 11121, 11133, 11145, 11147, 11155, 11162, 11163, 11222, 11260, 11321, 11324, 11343, 11352, 11400, 11409, 11415, 11434, 11444, 11458, 11486

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Tofu, Frozen or Dried-Frozen, Used as an Ingredient in Commercial Soyfood Products. 7849, 11444

Tofu, Frozen, Dried-frozen, or Dried Whole (Not Powdered). 54, 67, 75, 76, 80, 81, 124, 132, 149, 153, 176, 206, 214, 216, 257, 261, 266, 304, 308, 337, 347, 378, 426, 516, 537, 608, 617, 618, 619, 654, 655, 679, 681, 682, 687, 710, 720, 768, 772, 808, 836, 840, 844, 849, 886, 901, 906, 908, 924, 943, 974, 978, 985, 987, 997, 1018, 1028, 1096, 1099, 1106, 1107, 1147, 1149, 1177, 1216, 1260, 1344, 1346, 1391, 1457, 1475, 1523, 1600, 1870, 1873, 1887, 1921, 2005, 2016, 2040, 2076, 2226, 2242, 2304, 2357, 2463, 2465, 2478, 2484, 2517, 2538, 2625, 2647, 2727, 2734, 2893, 2894, 2972, 3007, 3262, 3384, 3436, 3485, 3637, 3679, 3755, 3894, 3949, 4020, 4029, 4082, 4099, 4105, 4142, 4149, 4200, 4299, 4300, 4368, 4390, 4406, 4485, 4506, 4526, 4529, 4559, 4560, 4568, 4582, 4594, 4600, 4611, 4621, 4636, 4666, 4688, 4743, 4764, 4902, 4904, 4909, 4923, 4962, 5088, 5100, 5184, 5211, 5212, 5213, 5214, 5217, 5218, 5228, 5229, 5230, 5260, 5261, 5268, 5275, 5280, 5319, 5323, 5326, 5336, 5347, 5361, 5460, 5467, 5496, 5507, 5521, 5524, 5547, 5565, 5572, 5584, 5587, 5602, 5604, 5618, 5619, 5623, 5651, 5665, 5781, 5802, 5803, 5828, 5849, 5871, 5897, 5909, 5953, 5987, 5990, 6007, 6027, 6043, 6110, 6126, 6170, 6171, 6172, 6178, 6198, 6239, 6289, 6292, 6299, 6300, 6323, 6395, 6401, 6402, 6404, 6405, 6408, 6417, 6432, 6455, 6476, 6498, 6575, 6611, 6621, 6628, 6630, 6637, 6646, 6680, 6709, 6799, 6818, 6826, 6862, 6958, 6987, 7003, 7011, 7058, 7059, 7069, 7076, 7083, 7099, 7114, 7117, 7210, 7230, 7255, 7269, 7322, 7326, 7357, 7358, 7369, 7382, 7416, 7419, 7434, 7439, 7455, 7456, 7474, 7479, 7512, 7538, 7557, 7639, 7657, 7677, 7697, 7707, 7719, 7867, 7907, 7918, 7921, 7927, 7933, 7972, 8026, 8032, 8046, 8087, 8168, 8177, 8204, 8209, 8211, 8246, 8429, 8447, 8455, 8480, 8588, 8591, 8644, 8686, 8691, 8714, 8724, 8727, 8837, 8859, 8862, 8904, 8944, 8989, 9003, 9117, 9141, 9253, 9272, 9310, 9355, 9398, 9420, 9480, 9540, 9544, 9621, 9623, 9631, 9762, 9780, 9783, 9785, 9827, 9836, 9837, 9846, 9847, 9893, 9932, 9995, 10003, 10103, 10188, 10193, 10219, 10220, 10243, 10250, 10265, 10307, 10334, 10388, 10434, 10471, 10492, 10493, 10496, 10582, 10617, 10646, 10648, 10685, 10718, 10719, 10737, 10744, 10825, 10857, 10859, 10875, 10887, 10897, 10899, 10984, 10995, 11054, 11121, 11145, 11155, 11222, 11260, 11343, 11350, 11352, 11415, 11430, 11434, 11444

Tofu, Frozen, Homemade–How to Make at Home or on a Laboratory or Community Scale, by Hand. 6395, 6408, 8944, 11444

Tofu, Grilled, Braised, Broiled, or Roasted (*Yaki-dôfu* in Japanese). A Japanese-Style Commercial Product. 126, 138, 255, 538, 649, 844, 948, 1095, 1137, 1360, 2016, 2331, 2727, 2893, 2894, 3678, 3679, 3949, 4020, 4149, 4506, 4570, 4666, 4688, 5038, 5040, 5213, 5222, 5224, 5225, 5226, 5227, 5319, 5511, 5804, 5894, 5967, 6025, 6043, 6180, 6289, 6292, 6296, 6389, 6395, 6401, 6402, 6404, 6476, 6628, 6637, 6646, 6674, 6709, 6807, 6914, 6958, 7003, 7083, 7170, 7172, 7230, 7322, 7439, 7479, 7512, 7557, 7639, 7719, 7833, 7883, 7907, 7972, 7998, 8046, 8055, 8087, 8204, 8211, 8439, 8706, 8714, 8724, 8756, 9348, 9428, 9447, 9621, 9727, 9745, 9829, 9836, 9837, 9846, 9847, 9995, 10032, 10367, 10388, 10496, 10532, 10606, 10611, 10617, 10646, 10659, 10718, 10719, 10859, 10875, 10990, 11163, 11260, 11343, 11444, 11458, 11486

Tofu, Grilled, Broiled, Braised, or Roasted–Etymology of This Term and Its Cognates / Relatives in Various Languages. 844, 1137, 2331, 2894, 3154, 3949, 5319, 5804, 5894, 6292, 6389, 7172, 11444

Tofu, Homemade–How to Make at Home or on a Laboratory or Community Scale, by Hand. 1887, 2149, 2465, 5909, 5927, 5992, 5998, 6138, 6234, 6292, 6296, 6309, 6376, 6383, 6395, 6401, 6520, 6728, 6729, 6919, 6958, 7011, 7172, 7322, 7419, 7686, 7693, 7775, 7965, 8299, 8595, 8702, 8989, 9148, 9810, 9829, 10019, 10123, 10281, 10283, 10316, 10645, 11444

Tofu, Non-Soy Relatives (Such as Winged Bean Tofu or Peanut Tofu). 724, 1021, 4551, 6357, 8072, 8757, 11444

Tofu, Pressed, Chinese-Style (*Toufukan / Doufugan / Dougan*). 393, 948, 997, 1159, 1475, 1935, 2242, 2431, 2769, 3469, 3557, 4082, 4833, 5781, 5937, 6401, 6637, 7003, 7141, 7512, 7815, 8046,

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8199, 8758, 9091, 9762, 9846, 10084, 10627, 10646, 10719, 10728, 10847, 10857, 10858, 10871, 11157, 11323, 11409, 11415, 11444, 11458, 11485

Tofu, Silken (Kinugoshi)–Etymology of This Term and Its Cognates / Relatives in Various Languages. 141, 5224, 5967, 6395, 6628, 6709, 6958, 7065, 8717, 11260, 11444

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Tofu, Smoked–Etymology of This Term and Its Cognates / Relatives in Various Languages. 6395, 7003, 10857, 11444

Tofu, Smoked. 1369, 1574, 1596, 1873, 1935, 2113, 2148, 2149, 2242, 2243, 2478, 2517, 2972, 3469, 5109, 6271, 6395, 7003, 7479, 7512, 7907, 9210, 9355, 9621, 9745, 9762, 10492, 10719, 10728, 10857, 10859, 10948, 11260, 11352, 11415, 11444, 11470, 11485

Tofu, Spray-dried or Powdered, Used as an Ingredient in Second Generation Commercial Products Such as Ice Creams, Beverages, etc. 11444

Tofu, Spray-dried or Powdered. 6517, 7571, 7701, 9310, 9355, 10283, 10311, 10645, 11444

Tofu, Used as an Ingredient in Second Generation Commercial Products Such as Dressings, Entrees, Ice Creams, etc. 6271, 7937, 8282, 8410, 9070, 9158, 9213, 9421, 11040, 11444

Tofu, baked or broiled at flavored / seasoned/marinated. *See* Tofu, Flavored/Seasoned/Marinated and Baked, Broiled, Grilled, Braised, or Roasted

Tofukost-Werk TKW GmbH (Wadersloh, Germany). 8162, 11444

Tofumanufaktur Christian Nagel GmbH (Hamburg, Germany). Previously Christian Nagel Tofumanufaktur from 1984 to 1 Jan. 1989. 8162, 10172, 11073, 11444

Tofurei Svadesha Naturkost Produkte GmbH (Munich, Germany). Including Byodo Naturkost. 8162, 9438, 11444

Tofutown.com (formerly Viana Naturkost GmbH) and Bernd Drosihn (Wiesbaum / Vulkaneifel, Germany). 10172, 11073

Tofutti Brands, Inc. (Cranford, New Jersey)–Soy Ice Cream Company. Mintz's Buffet Until Jan. 1982. 7034, 7326, 7347, 7357, 7371, 7455, 7879, 7922, 7923, 7998, 8168, 8169, 8170, 8240, 8241, 8346, 8352, 8354, 8367, 8371, 8400, 8403, 8404, 8405, 8411, 8471, 8475, 8477, 8479, 8524, 8592, 8650, 8768, 8927, 9089, 9108, 9398, 9604, 9700, 10445, 10451, 10554, 10560, 11450, 11474

Tomato ketchup. *See* Ketchup, Tomato (Tomato Ketchup, Western-Style)

Tomsun Foods, Inc. (Greenfield, Massachusetts; Port Washington, New York. Named New England Soy Dairy from 1978-1983). 6746, 6849, 6871, 6872, 6874, 6876, 6890, 6996, 7004, 7032, 7034, 7076, 7092, 7118, 7239, 7311, 7371, 7462, 7512, 7525, 7542, 7557, 7633, 7634, 7792, 7877, 7879, 7922, 7923, 8045, 8051, 8168, 8271, 8404, 8524, 8650, 8933, 9053, 9404, 11444

Tonga. *See* Oceania

Touchi or tou ch'i. *See* Fermented Black Soybeans

Toxins and Toxicity in Foods and Feeds (General). 1346, 1541, 3665, 3798, 4861, 5420, 5778, 6270, 6584, 6695, 7441, 7670, 7810, 8473, 8589, 8719, 8819, 9033, 9740, 10315

Toxins and Toxicity in Foods and Feeds–Aflatoxins (Caused by certain strains of *Aspergillus flavus* and *A. parasiticus* molds). 5340, 5362, 5398, 5411, 5425, 5447, 5469, 5477, 5791, 5838, 5907, 6050, 6051, 6052, 6280, 6800, 6953, 7253, 7272, 7279, 7442, 7468, 8440, 8729, 9642

Toxins and Toxicity in Foods and Feeds–Bongkrek Poisoning, Caused by Either Bongkrek Acid or Toxoflavin Produced in Some Coconut Tempeh by the Aerobic Bacteria *Pseudomonas cocovenenans*. 889, 997, 4558, 10008

Toxins and Toxicity in Foods and Feeds–Microorganisms, Especially Bacteria (Such as *Escherichia coli, Salmonella, Clostridium botulinum*), that Cause Food Poisoning. See also: Aflatoxins (produced by molds) and Bongkrek Poisoning (produced in coconut by bacteria). 830, 4026, 8524, 8718, 8925, 9020, 9379, 9393, 9395, 9403, 9413, 9431, 9437, 10401, 10437

Toxins and Toxicity in Foods and Feeds–Trichloroethylene Solvent and the Duren / Dueren Disease or Poisoning of Cattle / Ruminants.

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4012, 4458, 4464

Tractors. 2775

Trade (International–Imports, Exports) of Soybeans, Soy Oil, and / or Soybean Meal. See also Trade–Tariffs and Duties. 224, 325, 510, 554, 563, 574, 654, 665, 711, 729, 730, 747, 774, 788, 804, 823, 843, 844, 868, 946, 953, 956, 967, 978, 990, 994, 1015, 1021, 1025, 1026, 1063, 1066, 1084, 1093, 1125, 1130, 1131, 1132, 1141, 1147, 1165, 1166, 1183, 1187, 1193, 1198, 1199, 1200, 1201, 1208, 1211, 1229, 1231, 1232, 1238, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1253, 1255, 1256, 1262, 1265, 1269, 1281, 1283, 1287, 1291, 1292, 1294, 1299, 1300, 1303, 1305, 1307, 1308, 1309, 1310, 1311, 1312, 1314, 1315, 1316, 1320, 1321, 1322, 1323, 1324, 1329, 1332, 1333, 1336, 1337, 1338, 1344, 1346, 1347, 1348, 1350, 1356, 1359, 1362, 1363, 1369, 1370, 1372, 1374, 1376, 1379, 1381, 1384, 1389, 1390, 1393, 1394, 1398, 1400, 1401, 1403, 1404, 1407, 1408, 1409, 1410, 1413, 1414, 1418, 1422, 1423, 1426, 1430, 1435, 1437, 1438, 1439, 1440, 1442, 1443, 1445, 1446, 1447, 1450, 1457, 1464, 1465, 1466, 1471, 1473, 1475, 1476, 1477, 1478, 1480, 1489, 1490, 1505, 1506, 1508, 1509, 1510, 1514, 1516, 1517, 1518, 1520, 1521, 1526, 1527, 1533, 1536, 1542, 1543, 1551, 1553, 1565, 1569, 1570, 1585, 1605, 1610, 1617, 1618, 1635, 1636, 1637, 1641, 1642, 1649, 1666, 1672, 1673, 1678, 1679, 1683, 1684, 1685, 1687, 1688, 1692, 1693, 1698, 1710, 1719, 1720, 1722, 1723, 1739, 1740, 1745, 1748, 1751, 1766, 1767, 1768, 1770, 1772, 1773, 1775, 1776, 1780, 1789, 1790, 1791, 1792, 1793, 1796, 1802, 1803, 1804, 1806, 1815, 1816, 1819, 1821, 1825, 1826, 1832, 1833, 1841, 1842, 1843, 1855, 1856, 1857, 1858, 1859, 1867, 1868, 1869, 1870, 1880, 1881, 1883, 1884, 1890, 1895, 1899, 1900, 1901, 1919, 1920, 1921, 1922, 1926, 1928, 1931, 1934, 1935, 1937, 1939, 1941, 1942, 1943, 1945, 1946, 1947, 1948, 1953, 1954, 1955, 1956, 1963, 1967, 1968, 1970, 1973, 1976, 1985, 1990, 1994, 1995, 2003, 2012, 2013, 2017, 2021, 2024, 2031, 2037, 2045, 2046, 2048, 2049, 2055, 2058, 2061, 2062, 2069, 2070, 2071, 2076, 2081, 2086, 2089, 2090, 2096, 2097, 2099, 2100, 2101, 2108, 2111, 2112, 2117, 2122, 2124, 2128, 2129, 2130, 2140, 2147, 2148, 2149, 2152, 2154, 2161, 2164, 2167, 2176, 2177, 2181, 2183, 2184, 2186, 2207, 2215, 2218, 2219, 2226, 2237, 2243, 2251, 2256, 2265, 2277, 2292, 2293, 2295, 2296, 2297, 2299, 2304, 2317, 2324, 2325, 2347, 2356, 2357, 2365, 2367, 2370, 2377, 2410, 2423, 2432, 2433, 2459, 2471, 2496, 2538, 2601, 2608, 2635, 2652, 2716, 2717, 2725, 2744, 2753, 2761, 2776, 2796, 2807, 2821, 2845, 2851, 2867, 2873, 2913, 2923, 2928, 2929, 2930, 2940, 2956, 2957, 2962, 2977, 2998, 2999, 3003, 3004, 3043, 3048, 3063, 3131, 3135, 3136, 3137, 3139, 3142, 3151, 3153, 3159, 3214, 3219, 3222, 3256, 3258, 3264, 3268, 3275, 3302, 3304, 3306, 3323, 3328, 3331, 3333, 3349, 3375, 3380, 3384, 3385, 3387, 3445, 3466, 3482, 3491, 3503, 3551, 3552, 3583, 3633, 3634, 3645, 3646, 3647, 3662, 3663, 3669, 3676, 3711, 3720, 3731, 3737, 3761, 3782, 3783, 3788, 3789, 3876, 3887, 3888, 3897, 3928, 3947, 3977, 3981, 3993, 4023, 4107, 4173, 4187, 4189, 4197, 4222, 4225, 4227, 4230, 4240, 4246, 4247, 4248, 4249, 4256, 4282, 4295, 4333, 4339, 4361, 4381, 4406, 4418, 4435, 4437, 4485, 4500, 4526, 4595, 4622, 4642, 4751, 4754, 4790, 4827, 4848, 4849, 4863, 4864, 4867, 4870, 4871, 4872, 4876, 4877, 4878, 4904, 4931, 4935, 4936, 4952, 4955, 4962, 4967, 4991, 4994, 4996, 4997, 5001, 5006, 5007, 5010, 5012, 5013, 5049, 5056, 5085, 5087, 5090, 5101, 5107, 5136, 5187, 5190, 5197, 5198, 5201, 5211, 5265, 5282, 5288, 5290, 5294, 5345, 5364, 5366, 5443, 5451, 5472, 5549, 5550, 5559, 5563, 5579, 5580, 5651, 5684, 5702, 5709, 5725, 5749, 5799, 5834, 5851, 5880, 5881, 5935, 5944, 5951, 6000, 6073, 6078, 6080, 6086, 6087, 6108, 6111, 6129, 6151, 6208, 6212, 6215, 6230, 6295, 6311, 6338, 6345, 6359, 6375, 6378, 6467, 6483, 6574, 6622, 6637, 6669, 6670, 6680, 6686, 6719, 6730, 6779, 6786, 6799, 6820, 6869, 6875, 7041, 7093, 7111, 7188, 7201, 7206, 7207, 7320, 7340, 7375, 7382, 7581, 7584, 7591, 7625, 7641, 7687, 7760, 7818, 7958, 8020, 8031, 8033, 8034, 8039, 8054, 8091, 8122, 8123, 8130, 8160, 8174, 8196, 8468, 8569, 8645, 8647, 8703, 8728, 8744, 8745, 8770, 8780, 8789, 8812, 8813, 8835, 8837, 8850, 8868, 8872, 8876, 8881, 8883, 8885, 8888, 8889, 8931, 8936, 8939, 8942, 8977, 8995, 9002, 9012, 9025, 9056, 9079, 9104, 9109, 9117, 9126, 9188, 9212, 9220, 9224, 9280, 9293, 9301, 9311, 9312, 9319, 9344, 9349, 9373, 9377, 9454, 9498, 9502, 9507, 9513, 9523, 9525, 9541, 9574, 9577, 9684, 9719, 9795, 9805, 9856, 9863, 9893, 9907, 9931, 9974, 10022, 10044, 10069, 10074, 10075, 10087, 10088, 10114, 10142, 10151, 10152, 10178, 10180, 10181, 10206, 10237, 10274, 10351, 10368, 10369, 10371, 10381, 10383, 10396, 10430, 10453, 10507, 10567, 10575, 10581, 10664, 10665, 10715, 10728, 10851, 10853, 10854, 10915, 10926, 10949, 10980, 11005, 11014, 11024, 11038, 11045, 11068, 11083, 11134, 11151, 11198, 11251, 11266, 11284, 11285, 11299, 11317

Trade Policies (International) Concerning Soybeans, Soy Products, or Soyfoods–Tariffs, Duties, Embargoes, Moratoriums, and Other Trade Barriers or Subsidies. 394, 566, 793, 1089, 1218, 1272, 1308, 1333, 1338, 1344, 1348, 1374, 1382, 1393, 1409, 1414, 1418, 1445, 1447, 1464, 1474, 1476, 1477, 1509, 1619, 1683, 1719, 1738, 1803, 1832, 1843, 1870, 1910, 1919, 1928, 2071, 2076, 2080, 2101, 2112, 2181, 2218, 2237, 2256, 2471, 2496, 2731, 2923, 2928, 3153, 3258, 3634, 3731, 4316, 4349, 4772, 4878, 5237, 5294, 5480, 5579, 5651, 6000, 6033, 6070, 6071, 6072, 6073, 6076, 6077, 6078, 6079, 6080, 6081, 6083, 6084, 6085, 6086, 6087, 6095, 6201, 6224, 6359, 6367, 6371, 6375, 6574, 6686, 6786, 7093, 7099, 7581, 7958, 8174, 8196, 8780, 8842, 8868, 8897, 9012, 9056, 9103, 9112, 9188, 9224, 9373, 9497, 9523, 9577, 9893, 9907, 10020, 10151, 10198, 10535, 10536, 11285

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Trade statistics, Canada. *See* Canada–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics

Trade statistics, Central America. *See* Latin America–Central America–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics

Trade statistics, China. *See* China–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics

Trade statistics, East Asia. *See* Asia, East–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics

Trade statistics, Japan. *See* Japan–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics

Trade statistics, Korea. *See* Korea–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics

Trade statistics, Manchuria. *See* Manchuria–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics

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Trade statistics, Southeast Asia. *See* Asia, Southeast–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics

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United Natural Foods, Inc. (UNFI, Auburn, Washington state). Formed in 1995. Includes Mountain People's Warehouse (Nevada City, California), Cornucopia Natural Foods (Connecticut) and Stow Mills (Vermont and New Hampshire), Rainbow Natural Foods, Albert's Organics, and Hershey Imports Co. 6741, 7465, 7587, 10774

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United States Department of Agriculture (USDA)–Arlington Experimental Farm at Arlington, Virginia (1900-1942). 1003, 1007, 1105, 1275, 1335, 1353, 1453, 1669, 1690, 1803, 1822, 1906, 1957, 2113, 2155, 2243, 2246, 2251, 2373, 2374, 2518, 2619, 2647, 2671, 2729, 2838, 3363, 3387, 3388, 3389, 3511, 3893, 11489

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United States Department of Agriculture (USDA)–Bureau of Agricultural and Industrial Chemistry (1943-1953). Including Bureau of Agricultural Chemistry and Engineering (1938-1943), Bureau of Chemistry and Soils (1927-1938), and Bureau of Chemistry (1901-1927). Transferred to the Agricultural Research Service (ARS) in 1953. 1415, 1732, 1940, 1950, 1959, 1962, 1969, 1983, 2015, 2030, 2079, 2084, 2156, 2223, 2258, 2259, 2260, 2261, 2262, 2271, 2469, 3053, 3756, 3804, 3806, 3831

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Vestro Foods, Inc. *See* Westbrae Natural Foods

Viability and life-span of soybean seeds. *See* Storage of Seeds

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Victor Food Products, Ltd. (Scarborough, Ontario, Canada). Founded by Stephen Yu in 1978. 7525, 8010, 11444

Victory Soya Mills Ltd. (Toronto, Ontario, Canada. Started in Nov. 1944 as Victory Mills Ltd. Named Sunsoy Products Ltd. from 1936 to 1945. Renamed Victory Mills, Ltd. from 1945 to 1954. Owned by (Subsidiary of) Canadian Breweries Ltd., then by Procter & Gamble from 1954, then by Central Soya Co. from 1985). 6106, 8174, 9523, 9657, 10074

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Vilmorin-Andrieux & Co. (France). In 1975 Vilmorin joined the Limagrain Group (*Groupe Limagrain*) and is now officially named Vilmorin s.a. 612, 620, 627, 646, 652, 656, 686, 706, 708, 1035, 1275, 1412, 1416, 1453, 1719, 2233, 3781, 3893, 10392

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Vitasoy International Holdings Ltd. (Hong Kong Soya Bean Products Co. Ltd. before 24 Sept. 1990), and Vitasoy (USA) Inc., (Brisbane, California–south of San Francisco). Including Nasoya Foods (from Aug. 1990) and Azumaya Inc. (from May 1993). Founded by K.S. Lo (Lived 1910 to 1995), in Hong Kong. Started in March 1940. 3736, 3803, 4062, 4350, 4629, 5083, 5095, 5167, 5178, 5182, 5603, 5782, 5820, 6390, 6395, 6401, 6403, 6504, 6709, 6958, 6996, 7003, 7034, 7256, 7257, 7258, 7259, 7260, 7344, 7371, 7479, 7509, 7633, 7792, 7831, 7866, 7867, 7886, 7907, 7920, 7923, 7998, 8010, 8011, 8012, 8013, 8056, 8091, 8168, 8170, 8646, 8650, 8880, 8888, 8927, 8998, 9020, 9027, 9100, 9101, 9113, 9117, 9141, 9210, 9240, 9370, 9414, 9451, 9523, 9593, 9621, 9658, 9996, 10001, 10014, 10017, 10079, 10116, 10141, 10146, 10198, 10212, 10214, 10234, 10295, 10350, 10451, 10469, 10523, 10554, 10565, 10582, 10712, 10849, 10850, 10859, 10897, 10901, 11079, 11145, 11172, 11260, 11434, 11448, 11484, 11486

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Walnut Acres (Penns Creek, Pensylvania). Grower of Organic Foods. Miller of Stone-Ground Flours and Cereals. Seller (in Store and by Mail Order) of Natural Foods. Founded about 1946-1949 by Paul and Betty Keene. 6096, 7510, 9872, 9890

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War, Russo-Japanese. *See* Russo-Japanese War (1904-1905)–Soybeans and Soyfoods

War, Sino-Japanese. *See* Sino-Japanese War (1894-1895)–Soybeans and Soyfoods

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Westbrae Natural Foods, Inc. (Berkeley, California). Founded in Feb. 1971 by Bob Gerner. Later in Carson. Subsidiary of Vestro Foods, Inc. Acquired by the Hain Food Group of Uniondale, New York, 14 Oct. 1997. 5271, 6171, 6172, 6383, 6536, 6672, 6673, 6741, 6793, 6853, 7125, 7465, 7587, 7626, 7785, 7902, 7908, 7952, 7998, 7999, 8195, 8270, 8544, 8560, 8561, 8573, 8880, 9020, 9027, 9037, 9100, 9101, 9113, 9155, 9210, 9296, 9352, 9391, 9394, 9451, 9491, 9658, 9756, 9861, 9864, 10001, 10014, 10079, 10211, 10220, 10245, 10284, 10311, 10334, 10451, 10469, 10523, 10600, 10712, 10885, 11079, 11484

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White Wave Foods, a Division of Dean Foods (Dallas, Texas); Maker of Silk Soymilk. 11448

White Wave, Inc. (Boulder, Colorado). Founded in Sept. 1977 by Steve Demos. Including Soyfoods Unlimited. Owned by Dean Foods Co. since 8 May 2002. 6746, 6871, 6873, 6874, 6890, 7003, 7092, 7311, 7371, 7479, 7525, 7542, 7557, 7633, 7766, 7877, 7879,

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Whole Dry Soybeans, Ground or Mashed to a Paste After Boiling, or Ground Raw with Water to a Fresh Puree or Slurry (Including Japanese Gô). 552, 592, 1006, 1847, 2472, 3705, 3727, 4561, 6395, 6401, 6825, 6958, 6969, 7322, 7330, 7487, 7867, 8999, 9135, 10582, 10897, 11145, 11260, 11263, 11434

Whole Soy Flakes (Flaked Soybeans), Grits, Granules, or Textured Products, Made from Whole Dry Soybeans (Not Defatted). See Also: Soy Flour: Whole or Full-fat. 592, 5941, 7189, 7721, 7919, 7928, 8506, 8588, 8802, 8901, 9333, 9476, 9487, 9488, 9526, 9527, 9537, 9559, 9569, 9570, 9605, 9663, 9666, 9685, 9690, 9691, 9693, 9697, 9698, 9699, 9700, 9701, 9739, 9768, 9777, 9807, 9808, 9810, 9947, 9973, 10025, 10029, 10041, 10178, 10234, 10424, 10954, 10964, 11103, 11231, 11238

WholeSoy & Co. (subsidiary of TAN Industries, Inc.), Modesto WholeSoy Co. (California), and Aros Sojaprodukter (Örsundsbro, then Enkoeping, Sweden; Founded by Ted Nordquist. Started Feb. 1981). 6383, 6534, 7371, 7475, 8162, 9053, 9054, 9721, 10540, 11073, 11448, 11470

Wild Annual Soybean (*Glycine soja* Siebold & Zuccarini, formerly named *G. ussuriensis* Regel & Maack, and *G. angustifolia* Miquel). 269, 333, 346, 384, 452, 474, 499, 513, 518, 544, 550, 555, 560, 588, 667, 670, 688, 693, 701, 704, 715, 716, 795, 839, 849, 897, 919, 943, 995, 1036, 1048, 1170, 1275, 1335, 1366, 1381, 1453, 1454, 1603, 1763, 1897, 2212, 2449, 2519, 2527, 2992, 3016, 3035, 3249, 3813, 3896, 4010, 4016, 4797, 5238, 5399, 5868, 6046, 6136, 6207, 6556, 6636, 6787, 6900, 7025, 7373, 7711, 7848, 8024, 8398, 8445, 9002, 9307, 9461, 9839, 9857, 9959, 10190, 10332, 10387, 10392

Wild Soybeans (General). 134, 244, 367, 514, 607, 965, 980, 1497, 2397, 2755, 2763, 3687, 3888, 4155, 4183, 5287, 5952, 6038, 6094, 6616, 8022, 8700, 8844, 9564, 10836, 10838

Wild, Perennial Relatives of the Soybean–Glycine Species (*Glycine albicans, G. aphyonota, G. arenaria, G. argyrea, G. canescens, G. clandestina, G. curvata, G. cyrtoloba, G. falcata, G. gracei, G. hirticaulis, G. lactovirens, G. latifolia, G. latrobeana, G. montis-douglas, G. mycrophylla, G. peratosa, G. pindanica, G. G. rubiginosa, G. stenophita, G. syndetika, G. tabacina, G. pullenii tomentella*) (Former Names and Synonyms Include *G. sericea, and G. tomentosa*). 215, 452, 513, 518, 716, 1036, 1453, 2449, 2466, 3185, 3813, 4016, 4163, 6046, 6556, 6636, 7025, 7607, 7848, 8445, 8826, 9336, 9461, 9562, 9839, 9857, 9866, 9959, 10190, 10387, 10975

Wild, perennial relatives of the soybean. *See* Neonotonia wightii

Wildwood Harvest Foods, Inc. Formed on 24 Aug. 2001 by the merger of Wildwood Natural Foods, Inc. (Santa Cruz and Fairfax, California; started Nov. 1977) and Midwest Harvest, Inc. (Grinnell, Iowa; started Jan. 1999). 6746, 7293, 7371, 7920, 8045, 8162, 8490, 9198, 9219, 9346, 10029, 10294, 10540, 10550, 10631, 10649, 11073, 11079, 11415, 11444

Wildwood Natural Foods, Inc. *See* Wildwood Harvest, Inc.

Wilson soybean variety. *See* Soybean Varieties USA–Mammoth Yellow

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Wing Seed Co. (Mechanicsburg, Champaign County, Ohio). Founded 1909. Including Joseph Elwyn Wing (1861-1915), Charles Bullard Wing (1878-1949), and David Grant Wing (1896-1984). 2728, 4349, 4362, 5372, 8844

Winged Bean (*Psophocarpus tetragonolobus*) (Also Called Four-Angled Bean, Goa Bean, Goabean, Asparagus Bean, Asparagus Pea, Segidilla, Seguidilla or Seguidillas Bean, Square Podded Pea, Square Podded Crimson Pea, *Botor tetragonoloba, Dolichos-,* or *Lotus tetragonolobus,* Pois Carré, Kecipir or Ketjeper, Calamismis or Kalamismis). 215, 233, 327, 452, 511, 514, 529, 549, 849, 993, 1352, 1813, 1815, 1845, 2185, 2330, 2670, 5967, 6436, 8146, 8394, 10008, 10718, 10719

Wizard's Cauldron, Ltd. (Cedar Grove, North Carolina). Formerly Linden's Elfworks, then Elf Works, Ltd., then American Natural Foods. Founded by John Troy. 7450, 8264, 8353, 8469, 9785, 9913, 10231, 10676, 10772, 10774, 10775, 10783, 10789, 11488

Woodworth, C.M. (1888-1960, Plant Breeder, Univ. of Illinois). 3388, 6111

Worcestershire Sauce (Soy Sauce Was the Main Ingredient before the 1940s). Including Lea & Perrins. 528, 566, 623, 666, 692, 844, 868, 978, 1053, 1068, 1081, 1092, 1100, 1226, 1261, 1357, 1365, 1384, 1585, 1646, 1704, 1711, 1742, 1761, 1847, 1874, 1914, 1972, 1973, 2113, 2258, 2315, 2318, 2477, 2761, 2848, 2983, 3047, 3777, 3844, 3869, 3957, 4284, 4570, 4809, 5030, 5797, 6114, 6399, 6449, 6450, 9088, 9166, 9600, 10688, 10774, 10867, 11470, 11494

Worcestershire Sauce–Brands Made by Companies Other than Lea & Perrins. 6089, 6114

Worcestershire Sauce–Key Words, Terms, and Events Related to Its History (Both Real and Fictitious). 1053, 1100

Worcestershire Sauce–With Soy Sauce Used as an Ingredient. 564, 666, 739, 868, 927, 1053, 1078, 1092, 1261, 1351, 1357, 1365, 1384, 1585, 1646, 1662, 1704, 1935, 2113, 2258, 2477, 2848, 2972, 3047, 5797, 10774

World–Soybean Crushing–Soy Oil and Meal Production and Consumption–Statistics, Trends, and Analyses. 1344, 9624

World–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 2161, 2459, 2471, 2717, 3142, 3384, 3503, 3779, 3783, 3795, 3816, 3887, 3888, 4173, 4480, 4481, 4901, 5364, 6000, 7188, 9250, 10142, 10237, 10575

World–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics. See also Trade (International). 11198, 11284, 11317

World Problems–Major (General). 9350, 10142, 10397

World War I–Soybeans and Soyfoods. Also known as the "First World War" and "The Great War". 1697, 1714, 1720, 1722, 1723, 1742, 1751, 1770, 1789, 1792, 1793, 1842, 1847, 1857, 1867, 1869, 1870, 1881, 1884, 1895, 1919, 1920, 1922, 1928, 1953, 1991, 2008, 2026, 2031, 2051, 2080, 2113, 2124, 2149, 2173, 2180, 2181, 2183, 2218, 2277, 2292, 2297, 2299, 2316, 2324, 2429, 2433, 2474, 2478, 2845, 3270, 3360, 3427, 3467, 3503, 3781, 3802, 3888, 3897, 3981, 4023, 4668, 4909, 5017, 5018, 5019, 5020, 5294, 5725, 6298, 6449, 7467, 7512, 7532, 7783, 7963, 8232, 10176, 10233, 10358, 10635, 10752, 11489

World War II–Soybeans and Soyfoods. Also Called the "Second World War". 2602, 3496, 3649, 3667, 3669, 3681, 3685, 3689, 3718, 3719, 3727, 3731, 3736, 3740, 3748, 3755, 3756, 3769, 3777, 3782, 3783, 3803, 3818, 3831, 3838, 3855, 3876, 3887, 3888, 3893, 3895, 3897, 3899, 3925, 3926, 3928, 3947, 3953, 3981, 4017, 4018, 4023, 4062, 4137, 4196, 4225, 4230, 4254, 4338, 4361, 4398, 4418, 4434, 4459, 4460, 4462, 4489, 4575, 4636, 4642, 4668, 4702, 4708, 4736, 4760, 4898, 4909, 5083, 5086, 5120, 5176, 5211, 5282, 5294, 5372, 5468, 5514, 5529, 5651, 5725, 5782, 5785, 5789, 5793, 5841, 5892, 5898, 5939, 6005, 6019, 6106, 6300, 6378, 6384, 6450, 6495, 6612, 6744, 6779, 6786, 6796, 6799, 7033, 7093, 7249, 7254, 7285, 7290, 7291, 7340, 7345, 7353, 7358, 7361, 7485, 7512, 7517, 7531, 7532, 7534, 7560, 7582, 7591, 7750, 7783, 7817, 7833, 7876, 7900, 7909, 7919, 8024, 8028, 8087, 8180, 8196, 8232, 8241, 8249, 8265, 8327, 8343, 8601, 8939, 8942, 9046, 9047, 9113, 9127, 9140, 9200, 9351, 9374, 9572, 9615, 9616, 9713, 9864, 10010, 10116, 10150, 10151, 10176, 10201, 10202, 10212, 10381, 10412, 10503, 10543, 10559, 10635, 10752, 10901, 10904, 11044, 11175, 11184, 11201, 11247, 11250, 11253, 11265, 11268, 11476, 11479, 11480, 11490, 11494

World problems–Environmental issues & concerns. *See* Environmental Issues, Concerns, and Protection (General, Including Deep Ecology, Pollution of the Environment, Global Warming, etc.)

World problems. *See* Hunger, Malnutrition, Famine, Food Shortages, and Mortality, Nuclear Power, Weapons, War, Fallout, or Radioactivity, Population Growth (Human) and Related Problems (Including Poverty), Protein Resources and Shortages, and the "World Protein Crisis / Gap / Problem" of 1950-1979, Resource Shortages (Including Water and Energy), Economic Growth, Pollution, Appropriate Technology, Sustainable Development and Growth

World. 286, 1366, 1409, 1542, 1574, 1825, 2071, 2108, 2124, 2226, 2293, 2459, 2471, 2998, 3004, 3142, 3275, 3289, 3323, 3390, 3467, 3503, 3551, 3552, 3583, 3646, 3659, 3676, 3720, 3795, 3816, 3887, 3888, 3896, 3897, 3910, 4248, 4350, 4432, 4433, 4449, 4480, 4481, 4539, 4602, 4696, 4697, 4863, 4913, 4958, 5029, 5095, 5167, 5197, 5282, 5569, 5579, 5830, 6000, 6009, 6023, 6230, 6254, 6341, 6558, 6622, 6631, 6781, 6789, 6814, 6977, 7041, 7060, 7078, 7157, 7173, 7188, 7206, 7251, 7256, 7257, 7258, 7259, 7260, 7261, 7382, 7700, 7875, 7958, 8010, 8030, 8036, 8093, 8174, 8196, 8210, 8444, 8457, 8587, 8774, 8780, 8812, 8837, 8850, 8868, 8879, 8885, 8977, 8995, 8998, 9041, 9056, 9103, 9112, 9250, 9302, 9307, 9409, 9454, 9601, 9624, 9781, 9795, 10237, 10302, 10433, 10465, 10533, 10575, 10719, 10752, 10830, 10900, 10911, 11045, 11083, 11092, 11151, 11175, 11198, 11273, 11274, 11284, 11313, 11317, 11337, 11391, 11409, 11425, 11449, 11454, 11467, 11468, 11484, 11485, 11486

Worthington Foods, Inc. (Worthington, Ohio). Including Battle Creek Foods (Michigan) from 1960, and Madison Foods (Tennessee) from 1964. A subsidiary of Miles Laboratories from March 1970 to Oct. 1982. Including Loma Linda Foods from Jan.

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1990. 4597, 5810, 6240, 6254, 6303, 7076, 7254, 7259, 7353, 7400, 7922, 8010, 8017, 8139, 8232, 8404, 8884, 8998, 9451, 9517, 9888, 9934, 10077, 10079, 10523, 10712, 10885

Yamasa Corporation (Choshi, Japan; and Salem, Oregon). 78, 138, 524, 685, 807, 978, 1429, 1433, 1663, 1729, 2266, 2322, 2357, 2454, 2617, 2909, 3096, 3274, 3391, 3424, 3808, 3909, 4158, 4261, 4506, 4576, 4667, 4708, 5464, 5465, 5602, 6005, 6642, 6878, 7108, 7782, 7961, 8057, 8065, 8070, 8109, 8121, 8268, 8739, 8818, 9127, 10135, 10425, 10452, 11012, 11111, 11150, 11384

Yamato Tofuhaus Sojaprodukte GmbH. *See* Huegli Naehrmittel A.G. (Steinach-Arbon, Switzerland)

Yard-Long Bean or Asparagus Bean–*Vigna sesquipedalis* (L.) Fruw. 1673, 5967

Yellow soybeans. *See* Soybean Seeds–Yellow

Yeo Hiap Seng Ltd. (Singapore and Malaysia) and Affiliates. 7476, 8011, 8888, 9117, 9523, 9996, 10198, 11484

Yield Statistics, Soybean. 445, 465, 479, 540, 551, 557, 569, 572, 590, 607, 611, 613, 627, 710, 762, 764, 775, 780, 787, 806, 811, 812, 814, 820, 821, 822, 844, 848, 850, 870, 875, 888, 895, 907, 908, 919, 932, 943, 955, 959, 972, 977, 978, 980, 983, 984, 1004, 1005, 1011, 1014, 1025, 1029, 1039, 1051, 1092, 1097, 1170, 1181, 1192, 1194, 1240, 1257, 1260, 1268, 1292, 1306, 1327, 1346, 1376, 1411, 1413, 1416, 1427, 1439, 1475, 1508, 1510, 1533, 1536, 1543, 1548, 1551, 1555, 1561, 1574, 1585, 1671, 1690, 1719, 1731, 1771, 1803, 1804, 1813, 1837, 1878, 1921, 2001, 2039, 2068, 2108, 2226, 2244, 2294, 2295, 2296, 2297, 2299, 2324, 2325, 2330, 2479, 2504, 2647, 2728, 2776, 2845, 2913, 2923, 2928, 2956, 2957, 3069, 3142, 3151, 3159, 3242, 3256, 3275, 3282, 3323, 3333, 3551, 3581, 3617, 3626, 3629, 3631, 3645, 3647, 3662, 3700, 3711, 3728, 3745, 3756, 3779, 3795, 3816, 3859, 3877, 3890, 4017, 4086, 4125, 4173, 4194, 4340, 4481, 4790, 5288, 5318, 5332, 5364, 5374, 5418, 5725, 5736, 5951, 6094, 6106, 6201, 6295, 6375, 6564, 6786, 6923, 7711, 7796, 8023, 8174, 8209, 8723, 8753, 8765, 8789, 8872, 8935, 9293, 9301, 9523, 9607, 9704, 9706, 9713, 9718, 10055, 10119, 10142, 10166, 10193, 10478, 11490

Yogurt (From Dairy / Cow's Milk)–Its Market or the Product Compared with the Market for Tofu or Other Soyfoods, or the Soyfoods Themselves. 7453, 8933

Yogurt, etymology. *See* Soy Yogurt

Yogurt, soy. *See* Soy Yogurt

Yoshihara Oil Mill, Ltd. (Kobe, Japan). 3922, 4225, 5204, 5214, 5394, 5459, 5923, 5930, 6124, 6173, 6204, 6303, 6314, 6372, 7036, 7414

Yuba (The Film That Forms Atop Soymilk When It Is Heated). In Chinese (Mandarin): Doufu Pi ("Tofu Skin") or Doufu Yi ("Tofu Robes," pinyin), Toufu P'i or Toufu I (Wade-Giles). English-Language Chinese Cookbooks and Restaurants: "Bean Curd Skin". 63, 131, 132, 151, 162, 259, 290, 295, 305, 309, 377, 512, 516, 527, 537, 548, 553, 565, 581, 584, 615, 619, 654, 681, 682, 683, 687, 717, 720, 731, 732, 772, 849, 886, 891, 924, 948, 966, 974, 987, 989, 997, 1005, 1090, 1099, 1106, 1107, 1147, 1149, 1156, 1174, 1176, 1216, 1217, 1391, 1448, 1475, 1513, 1523, 1535, 1543, 1596, 1615, 1711, 1803, 1887, 1921, 1946, 2005, 2076, 2218, 2226, 2241, 2251, 2315, 2357, 2463, 2475, 2484, 2538, 2557, 2622, 2647, 2652, 2893, 2894, 2972, 3129, 3323, 3384, 3560, 3679, 3688, 3696, 3756, 3826, 3844, 4020, 4149, 4198, 4204, 4208, 4460, 4466, 4560, 4561, 4582, 4663, 4666, 4753, 4922, 5031, 5125, 5137, 5170, 5211, 5212, 5213, 5214, 5216, 5217, 5218, 5239, 5243, 5319, 5323, 5602, 5728, 5781, 5888, 5894, 5897, 5967, 5999, 6027, 6030, 6043, 6110, 6170, 6171, 6172, 6175, 6286, 6289, 6297, 6339, 6365, 6391, 6395, 6397, 6401, 6404, 6427, 6433, 6456, 6476, 6499, 6505, 6510, 6593, 6611, 6627, 6628, 6637, 6646, 6709, 6748, 6752, 6826, 6856, 6884, 6928, 6937, 6958, 6959, 6964, 7003, 7011, 7059, 7060, 7065, 7114, 7170, 7172, 7210, 7230, 7256, 7267, 7269, 7300, 7322, 7416, 7439, 7479, 7514, 7538, 7542, 7557, 7633, 7643, 7719, 7815, 7829, 7832, 7867, 7876, 7907, 7962, 8017, 8046, 8087, 8122, 8130, 8143, 8202, 8204, 8211, 8232, 8251, 8299, 8310, 8447, 8455, 8480, 8545, 8580, 8588, 8591, 8632, 8706, 8724, 8837, 8871, 8888, 8905, 8906, 8999, 9000, 9141, 9212, 9263, 9272, 9334, 9353, 9378, 9411, 9566, 9621, 9623, 9750, 9783, 9827, 9829, 9846, 9847, 9893, 9906, 10003, 10095, 10103, 10201, 10202, 10236, 10243, 10384, 10416, 10424, 10471, 10476, 10482, 10493, 10532, 10567, 10582, 10606, 10610, 10611, 10614, 10617, 10640, 10645, 10646, 10718, 10719, 10728, 10737, 10769, 10793, 10857, 10859, 10867, 10875, 10897, 10899, 10953, 10955, 10959, 10984, 10987, 10988, 10990, 10998, 11025, 11054, 11100, 11121, 11126, 11145, 11155, 11163, 11182, 11222, 11260, 11267, 11309, 11321, 11333, 11343, 11345, 11409, 11415, 11419, 11421, 11428, 11430, 11434, 11437, 11439, 11466, 11483

Yuba–Dried Yuba Sticks or Rolls, and Sweet Dried Yuba–Chinese-Style. In Chinese (Mandarin): Fuzhu (pinyin; zhu = "bamboo"). Fu Chu (Wade-Giles). In Cantonese Chinese Foo Jook / Fu Jook / Joke or Tiem Jook / Tim Jook / Tiem Joke. Also: Bean Curd Sticks, Bean Curd Bamboo. 309, 341, 1099, 1803, 2076, 2218, 3147, 3560, 5031, 5781, 7060, 7815, 8199, 8545, 9829, 9846, 10610, 10646, 10728, 11157, 11409, 11428, 11483

Yuba–Etymology of This Term and Its Cognates / Relatives in Various Languages. 63, 290, 295, 309, 377, 512, 516, 527, 553, 654, 681, 720, 772, 997, 1391, 1475, 1946, 5031, 5781, 6397, 7514, 8545, 8905, 9829, 10728, 10857, 11222, 11415, 11428

Yuba–Imports, Exports, International Trade. 1099, 1803, 2218, 11428

Yuba Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 5216, 11428

Yuba Industry and Market Statistics, Trends, and Analyses–Individual Companies. 11428

Yuba Production–How to Make Yuba on a Commercial Scale. 2241, 5212, 5217, 5602, 6709, 7003, 7267, 7479, 7829, 7832, 7907, 9621, 10859, 11421, 11428

Yuba as a Step in the Tofu- or Soymilk-Making Process. 151, 512, 681, 987, 1946, 2972

Yuba made into meat alternatives. *See* Meat Alternatives

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(Traditional Asian)–Made from Yuba

Yuba, Homemade–How to Make at Home or on a Laboratory Scale, by Hand. 1887, 6395, 6397, 6401, 6958, 11121, 11428

Yugoslavia. *See* Europe, Eastern–Serbia and Montenegro

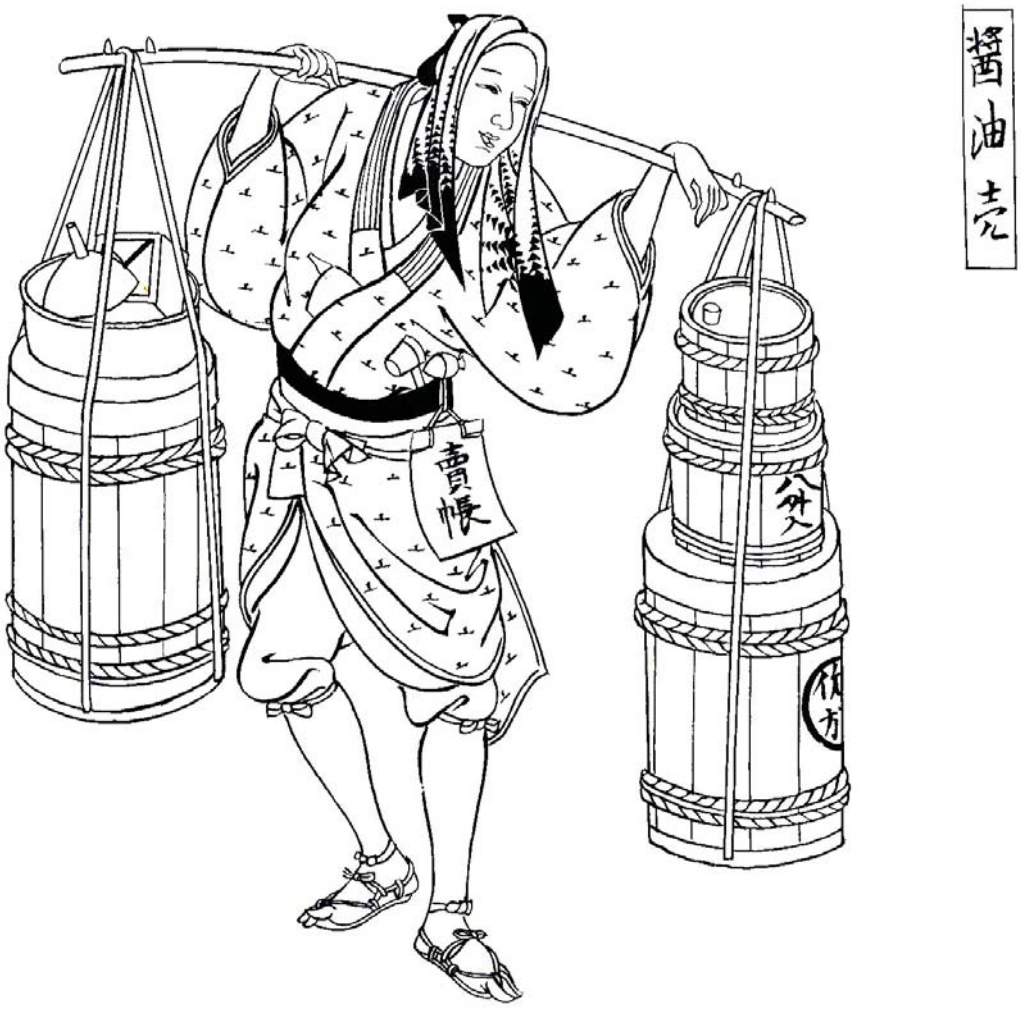
Yukiwari natto. *See* Natto, Yukiwari

Yves Fine Foods (Founded by Yves Potvin, Feb. 1985, Vancouver, BC, Canada). Renamed Yves Veggie Cuisine in 1992. Acquired by Hain Celestial Group in June 2001. 10001, 10245, 10651

Zaire. *See* Africa–Congo (formerly Zaire). Officially Democratic Republic of the Congo. Also known as Congo-Kinshasa

Zavitz, Charles Ambrose (1863-1942) of Ontario Agricultural College, Canada. 850, 955, 1004, 1005, 1029, 1548, 2504, 6106, 10725

Zea mays. *See* Corn / Maize



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